YANKEE ATOMIC ELECTRIC COMPANY

Telephone (413) 424-5261

49 Yankee Road, Rowe, Massachusetts 01367

June 5, 2012
BYR 2012-020

Mr. David Howland
Department of Environmental Protection
Western Regional Office
436 Dwight Street
Springfield, MA 01103

Subject: Post-Closure Maintenance and Monitoring Report – 2012

This letter transmits the Post-Closure Maintenance and Monitoring Report documenting the results of the monitoring required by the Massachusetts Department of Environmental Protection as stipulated in the "Filed" Deed Notices for the Southeast Construction Fill Area (SCFA) and the Beneficial Use Determination (BUD) Area and the SCFA Closure Certification Report Financial Assurance Mechanism review. The attached report documents the results of the following post-closure monitoring activities:

- Groundwater and Surface Water Monitoring (Attachment 1)
- Soil Stability Monitoring – Settlement, Cracks, Erosion and Vegetative Cover (Attachment 2)
- Southeast Construction Fill Area (SCFA) Financial Assurance Mechanism (FAM) review (Attachment 3)

Should you require additional information please contact me at (413) 424-5261 Extension 303.

Sincerely,

YANKEE ATOMIC ELECTRIC COMPANY

Robert Mitchell
ISFSI Manager

c w/encl.; E. Waterman, US Environmental Protection Agency, Region 1
R. Gallagher, Acting Director, MA DPH
Citizen Awareness Network – Business Office
Franklin Regional Council of Governments (FRCOG)

June 5, 2012
BYR 2012-020

ATTACHMENT 1

POST CLOSURE GROUNDWATER AND SURFACE WATER

MONITORING REPORT

SPRING 2012

Post Closure Groundwater and Surface Water Monitoring Report, Spring 2012 Yankee Nuclear Power Station

Prepared for:

Yankee Atomic Electric Company
Yankee Nuclear Power Station
49 Yankee Road
Rowe, Massachusetts

Prepared by:

AMEC Environment & Infrastructure, Inc.
511 Congress Street
Portland, Maine 04101

June 5, 2012

Project Number 3617087152

Post Closure Groundwater and Surface Water Monitoring Report, Spring 2012

Yankee Nuclear Power Station

Prepared for:

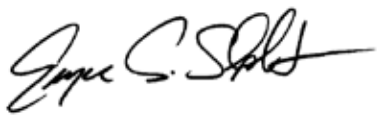
Yankee Atomic Electric Company
Yankee Nuclear Power Station
49 Yankee Road
Rowe, Massachusetts

Prepared by:

AMEC Environment & Infrastructure, Inc.
511 Congress Street
Portland, Maine 04101

June 5, 2012

Project Number 3617087152



Eugene Shephard
Senior Project Manager

Miles van Noordennen
Scientist

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1.0 INTRODUCTION

AMEC Environment & Infrastructure, Inc. (AMEC), formerly MACTEC Engineering and Consulting, Inc. (MACTEC), has been contracted by Yankee Nuclear Power Station (YNPS) to conduct the Post Closure Groundwater and Surface Water Monitoring Program at their site, located at 49 Yankee Road in Rowe, Massachusetts.

YNPS completed its decommissioning in 2007, under the oversight of the Nuclear Regulatory Commission (NRC). However, as part of the closure process, ongoing groundwater and surface water monitoring is still required under the Massachusetts Department of Environmental Protection (MassDEP). This work is to demonstrate that the groundwater is in compliance with the Massachusetts Contingency Plan (MCP) and for post closure monitoring of the Beneficial Use Determination (BUD) Area and the Southeast Construction Fill Area (SCFA). This report presents the findings from samples collected in March and April 2012 in support of the site closure requirements under the MCP.

2.0 BACKGROUND

Through the site closure process, a comprehensive investigation was conducted to characterize environmental conditions and to develop the conceptual site model, not only to identify source areas and impacted media, but to also describe the fate and transport of both chemicals and radionuclides in soils, groundwater, and surface water. These findings have been published in numerous reports and have achieved the appropriate regulatory approvals. The conceptual site model for groundwater at YNPS was published in the Final Groundwater Conditions Report, submitted to the NRC on February 15, 2007 (YNPS, 2007).

As part of the decommissioning project, 81 groundwater monitoring wells were installed to characterize the hydrogeology, and groundwater quality. Currently there are 15 wells that remain on site. Of these wells, seven groundwater monitoring wells were sampled in March 2012 and four groundwater monitoring wells were re-sampled in April 2012 to demonstrate compliance with the MCP and to support post closure monitoring. The April 2012 re-sampling event was conducted to evaluate detections of cesium-137 at some groundwater and surface water locations sampled during the March 2012 sampling. The March 2012 sampling event was the first event conducted under the

post-closure monitoring program where cesium-137 was detected above the detection limit in any groundwater or surface water samples**.** Inconsistencies were identified during validation of the March 2012 data concerning the reported results for cesium-137. Due to these inconsistencies YNPS re-sampled the wells in April 2012 and analyzed these samples for cesium-137 at two independent laboratories. All results are presented and discussed in the following report.

3.0 SCOPE OF WORK

Groundwater monitoring for closure under the License Termination Plan (LTP) has been completed. However, groundwater and surface water monitoring is still required to reach closure under the MassDEP and to support post closure monitoring. In keeping with this goal this program was completed in accordance with the MassDEP-approved Groundwater Monitoring Plan to Support Closure under the MCP (ERM, 2007) as well as the Phase II - Comprehensive Site Assessment Report (MassDEP, April 08, 2009).

The March 2012 sampling program included the sampling of seven groundwater monitoring wells and nine surface water sample locations. The April 2012 sampling program included the re-sampling of four groundwater monitoring wells and four surface water sample locations. The sampling programs are summarized in Table 1. The sampling locations are shown on Figure 1. All groundwater samples were collected in accordance with Low Stress (Low Flow) Purging and Sampling guidance (USEPA, 1996a) and in accordance with the Health and Safety Plan (MACTEC, 2006). Field data records are presented in Appendix A, and a summary of the field data parameters is presented in Table 2.

The radiochemistry data were validated in accordance with Site procedure RP-05, Rev. 3 (YNPS, 2009). Chemical analytical data were validated in accordance with EPA Region 1, New England Validation Guidelines (USEPA, 1989 and 1996b). A summary of the data validation findings and tabulated validated data are provided in Appendix B-1 (radiological), B-2 (chemical), and B-3 (validation checklists).

4.0 FINDINGS

Groundwater samples were submitted for both radiological and chemical parameters. The results and findings from the sampling events are presented in the following subsections.

4.1 RADIOLOGICAL PARAMETERS

Radionuclides in groundwater are compared to the United States Environmental Protection Agency's (USEPA's) Maximum Contaminant Level (MCL). In additional to these criteria, data are also evaluated over time to assess if trends are decreasing, stable, or increasing. Consistent with evaluations presented in previous Annual Post Closure Groundwater and Surface Water Monitoring Reports, a change of 15 percent over previous sampling events has been used to identify trends.

Groundwater samples were collected from four monitoring wells and four surface water locations for analysis of radionuclides in March 2012. The tritium results are presented on Table 3 with previous data to demonstrate that there continues to be a generally downward and/or stable trend in tritium concentrations. Tritium was not detected in any of the surface water locations sampled during this event.

Consistent with historical results, the highest concentration of tritium was detected at MW-107C at 11,400 picocuries per liter (pCi/L), with the next highest detection reported at monitoring well MW-105B (2,500 pCi/L). The MCL for tritium is 20,000 pCi/L. As shown on Table 3, these detections are consistent with the conceptual site model.

Cesium-137 was detected at some groundwater and surface water locations sampled during the March 2012 sampling event at concentrations below the MCL, including the equipment blank sample. The March 2012 sampling event was the first event conducted under the post-closure monitoring program where cesium-137 was detected above the detection limit in any groundwater or surface water samples**.** Inconsistencies were identified during validation of the March 2012 data concerning the reported results for cesium-137. For this data set, cesium-137 was reported in the equipment blank (9.7 pCi/L) associated with the groundwater samples, and was also reported in several groundwater samples and most of the surface water samples. All samples and the equipment blank were analyzed concurrently, and reported concentrations for groundwater and surface water samples in this analytical batch (6.1 - 12.7 pCi/L) were in the range of the equipment blank detection. These results appear to be anomalous since the concentrations are consistent throughout the analytical batch, whereas equipment blank contamination would typically be indicative of one or more highly concentrated samples. In addition, the laboratory rejected one of the cesium-137 detections due to low abundance which resulted in an uncertain identification.

Data validation was performed in accordance with SAIC guidance, resulting in one rejected result and several results qualified as estimated. Split-samples were collected at each location from the March 2012 sampling event and sent to the MassDEP for analysis. Cesium-137 was not detected in any sample submitted to the MassDEP. No other radionuclides were detected in any of the groundwater or surface water sample locations sampled during the March 2012 event.

Due to the inconsistencies identified during validation of the March 2012 data for cesium-137, YNPS re-sampled all four monitoring wells and all four surface water locations in April 2012 and analyzed these samples for cesium-137 at two independent laboratories. Cesium-137 was not detected above the detections limits by either laboratory in any sample collected in April 2012.

Based on the above discussion, results reporting cesium-137 above the detection limit from the March 2012 sampling event are considered suspect and will not be used in any additional evaluation of site conditions.

Validated radiological data from both sampling events is provided in Appendix B-1. Data provided by the MassDEP for the split-samples collected in March 2012 is included in Appendix B-4.

4.2 CHEMICAL PARAMETERS

Groundwater chemical data are evaluated using the GW-1 groundwater standards (310 CMR 40.0974(2)) (MassDEP, 2008). For the analyses where GW-1 standards are not published, data are compared to Massachusetts MCLs or Massachusetts Secondary MCLs (SMCLs) (MassDEP, 2007). Surface water chemical data are evaluated using USEPA Ambient Water Quality Criteria (AWQC) (USEPA, 2002). For the analyses where AWQC are not published, data are compared to Massachusetts MCLs or SMCLs (MassDEP, 2007).

Former Southeast Construction Fill Area. Samples were collected from three groundwater monitoring wells (CFW-1, CFW-5, and CFW-6) and five surface water locations (SW-1 through SW-5) to assess the potential environmental impacts from the Former SCFA. A summary of the sampling program is presented in Table 1.

No volatile organic compounds (VOCs) were detected in any of the groundwater or surface water samples. Several metals and other naturally occurring compounds were detected in both

groundwater and surface water samples; however the concentrations are consistent with background and historic data. Only iron and manganese were detected at concentrations that exceed the SMCLs. SMCLs are used to assess the aesthetic qualities of drinking water and are not health-based standards; concentrations that exceed SMCLs are not necessarily indicative of potential health risks.

A summary of the groundwater data for wells downgradient of the SCFA is presented on Table 4. A summary of the surface water data for locations associated with the SCFA is presented in Table 5.

Sherman Spring. Sampling was completed at the Sherman Spring surface water location (SP-1) and samples were analyzed for VOCs and total Resource Conservation and Recovery Act (RCRA) 8 metals plus thallium. Barium and lead were detected well below applicable criteria. All other results were reported as not detected. Validated data is included in Appendix B-2.

Sherman Reservoir. Sampling was completed at the Sherman Reservoir surface water location (SW-011) and samples were analyzed for dissolved RCRA 8 metals. Barium was detected well below applicable criteria. All other results were reported as not detected. Validated data is included in Appendix B-2.

Background Location. Background sampling was completed at the location where the Deerfield River enters the Sherman Reservoir (SW-408) and samples were analyzed for dissolved RCRA 8 metals. Barium was detected well below applicable criteria. All other results were reported as not detected. Validated data is included in Appendix B-2.

5.0 CONCLUSIONS

The results from the March and April 2012 groundwater sampling event were consistent with the approved conceptual site model. Based on the data collected during the March 2012 sampling event, tritium concentrations continue to be stable or decreasing across the site, with the highest concentration reported at MW-107C at an activity of 11,400 pCi/L compared to the MCL of 20,000 pCi/L.

Results from the March 2012 sampling event reported cesium-137 in some groundwater and surface water locations at concentrations below the MCL, including the equipment blank sample. Split-samples were collected at each location from the March 2012 sampling event and sent to the MassDEP for analysis. Cesium-137 was not detected in any sample submitted to the MassDEP. Due to the inconsistencies identified during validation of the March 2012 data for cesium-137, YNPS re-sampled all four monitoring wells and all four surface water locations in April 2012 and analyzed these samples for cesium-137 at two independent laboratories. Cesium-137 was not detected by either laboratory in any sample collected in April 2012. Results reporting cesium-137 above the detection limit from the March 2012 sampling event are considered suspect and will not be used in any additional evaluation of site conditions.

No additional sampling is warranted at this time. In accordance with the Post Closure Groundwater and Surface Water Monitoring Plan, the next groundwater sampling event is scheduled for March 2014.

6.0 RECOMMENDATIONS

As the groundwater monitoring program is progressing, wells that are no longer part of the active network were recommended for closure in accordance with MassDEP Guidelines in previous reports. Following the March and April 2012 sampling events, YNPS, with concurrence from MassDEP, grouted 21 monitoring wells at the Site to the ground surface. The monitoring wells remaining at the Site include the seven wells that are sampled as part of the long-term monitoring program and eight wells that are no longer sampled but, at the request of MassDEP, are kept active for potential future sampling events. In consultation with the MassDEP, YAEC maintenance responsibilities for the eight (8) wells that will be left for possible future monitoring will be to protect from damage, and complete a visual inspection and lock replacement once every three years, beginning in 2012 (MassDEP, 2011).

7.0 ACRONYMS

AMEC	AMEC Environment & Infrastructure, Inc.
AWQC	Ambient Water Quality Criteria
BUD	Beneficial Use Determination
LTP	License Termination Plan
MACTEC	MACTEC Engineering and Consulting Services, Inc.
MassDEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MCP	Massachusetts Contingency Plan
mg/L	milligrams per liter
NRC	Nuclear Regulatory Commission
pCi/L	picocuries per liter
RCRA	Resource Conservation and Recovery Act
SCFA	Southeast Construction Fill Area
SMCL	Secondary Maximum Concentration Limit
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
YNPS	Yankee Nuclear Power Station

8.0 REFERENCES

ERM 2007. Groundwater Monitoring Plan to Support Closure under the Massachusetts Contingency Plan, Yankee Nuclear Power Station, Site Closure Project, Rowe, Massachusetts, June 2007.

MACTEC, 2006. Health and Safety Plan, Yankee Nuclear Power Station, Rowe, Massachusetts, April 2006.

MassDEP, 2007. Standards and Guidelines for Contaminants in Massachusetts Drinking Waters. Spring 2007. Department of Environmental Protection, Office of Research and Standards.

MassDEP, 2008. Massachusetts Contingency Plan, 310 CMR 40.000. February 14, 2008.

MassDEP, 2009. Phase II – Comprehensive Site Assessment Report, April 8, 2009.

MassDEP, 2011. Letter from Massachusetts Department of Environmental Protection to Yankee Atomic Electric Company dated December 6, 2011, "Approval of Groundwater Monitoring Well Abandonment Plan".

USEPA, 1989. "Region I, Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses;" Hazardous Site Evaluation Division; February, 1989.

USEPA, 1996a. Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Ground Water Monitoring Wells, July 1996.

USEPA, 1996b. "Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, Parts I and II," Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December, 1996.

USEPA. 2002. Nationally Recommended Water Quality Criteria: 2002. Office of Water, Science and Technology. Doc. No. EPA-822-R-02-047

YNPS, 2009. Groundwater Monitoring Program, RP-05, Rev. 3, ISFSI Radiation Protection, June 16, 2009.

YNPS, 2007. Final Groundwater Conditions Report, Yankee Nuclear Power Station, Rowe, Massachusetts, February 15, 2007.

APPENDIX A

FIELD DATA RECORDS – MARCH and APRIL 2012

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location YANKEE-ROWE Well Designation CFW-1

Sampling Team RENE AUBE Sample Period MARCH 2012

Date 3/8/12 Time 0930-1010

	Depth to Mid Screen —	(ft)
Measuring Point TOR	Diameter of Well 2.0	(in)
Well Depth (from measuring point) (D)	9.12	(ft)
Depth to water (DTW)	3.36	(ft)
Length of Water Column (LWC)	5.76	(ft) (LWC=D-DTW)
Volume of Water in Well (VW)	0.92 gal	Conversion Factor 0.16
Volume of Purge (VTP) (VTP = VW x 3)	2.76	(gal)

At Time of Measurements:

Color SLIGHTLY CLOUDY Odor NONE

Total volume purged DRY Duration of purging NA

Purging method GEOPUMP Did well go dry? YES

Weather conditions SUNNY, COOL, CALM.

Pump Serial Number S008-33

Water Quality Monitor Serial Number 10E100326

Analyses Requested VOC 8260, VOC 8011, METALS LIST 1, CYANIDE, NO3/CL/SO4, TDS, ALK, COD.

Previous Final Readings: pH 4.97 Cond 0.95 Turb 28.9 DO 0.95 Temp 6.1 ORP 215 DTW 3.37

Flow NA ^{3}H ___

WATER QUALITY PARAMETERS

Form 2

PAGE 1 OF 1

Sample Round CFW-1 MARCH 2012 3/8/12

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
RPA ~~5~~ 0945	7.20	0.026	25.7	13.20	5.37	54.9	3.36	
RPA ~~10~~ 0955	COLLECT SAMPLES							
RPA ~~15~~ 1010	FINISH SAMPLING							
20								
25	WELL WAS PURGED DRY @ BEGINING OF							
30	PROGRAM. RECORD ONE SET FIELD PARAMETERS							
35	THEN COLLECT SAMPLES.							
40								
45								
50								
55								
60								
65								
70								
75								
80								
85								
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95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location CFW 5 Well Designation CFW-5

Sampling Team Melanie Pierce Sample Period March 2012

Date 3.6.2012 Time 1107 (sample time) Start: 1000 End: 1200

Depth to Mid Screen — (ft)

Measuring Point TOR Diameter of Well 2.0 (in)

Well Depth (from measuring point) (D) 8.32 (ft)

Depth to water (DTW) 4.80 (ft)

Length of Water Column (LWC) 3.52 (ft) (LWC=D-DTW)

Volume of Water in Well (VW) 0.5632 gal Conversion Factor 0.16

1.690

Volume of Purge (VTP) (VTP = VW x 3) ~~4.355~~ 3.5.12 (gal)

At Time of Measurements:

Color clear Odor none

Total volume purged 3.5.12 ~~4.355~~ 7.868 gal. Duration of purging 67

Purging method Geopump Did well go dry? no

Weather conditions sunny, cold, slightly windy

Pump Serial Number 5008-36

Water Quality Monitor Serial Number YSI 10E 101136

Analyses Requested VOC, COD, CN, Nitrate, chloride, Sulfate, metals, TDS, alkalinity

Previous Final Readings: pH 5.96 Cond .440 Turb 2.33 DO 0.0 Temp 11.5 ORP -78 DTW 5.11

Flow 150 ^{3}H —

WATER QUALITY PARAMETERS

Form 2

Sample Round: March 2012 — CFWS

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
3-6-12 0 Begin Purge	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv	4.80	Rate
1005 5	5.96	0.476	58.7	2.52	4.36	73.6	5.27	250 ml/min
1010 10	6.03	0.469	18.5	1.12	4.32	-68.5	5.36	
1015 15	6.13	0.476	41.1	0.64	4.07	-73.7	5.35	
1020 20	5.86	0.469	36.4	0.76	4.22	-82.3	5.32	
1025 25	6.16	0.468	18.8	0.75	4.32	-84.3	5.33	
1030 30	6.09	0.468	16.7	0.80	4.10	-86.2	5.34	
1035 35	6.06	0.466	7.91	0.82	4.16	-84.5	5.35	
1040 40	6.17	0.465	6.02	0.80	4.15	-91.7	5.36	
1045 45	6.23	0.462	4.29	0.77	4.34	-93.5	5.36	
1050 50	6.23	0.462	4.27	0.78	4.42	-95.2	5.36	
1055 55	6.25	0.461	3.21	0.85	4.57	-97.1	5.36	
1100 60	6.25	0.460	2.09	0.89	4.64	-103.0	5.36	
1105 65	6.26	0.459	1.27	0.86	4.64	-102.4	5.36	
1107 ~~70~~ MP 3.6.12	Collect	Samples,	Dup	MS	MSD			
1200 ~~75~~ MP 3.6.12	Finished	collecting.		Well Secure				
80								
85								
90								
95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location YANKEE-ROWE Well Designation CFW-6

Sampling Team RENE AUBE Sample Period MARCH 2012

Date 3/6/12 Time 0945 - 1155

	Depth to Mid Screen —	(ft)
Measuring Point TOR	Diameter of Well 2.0	(in)
Well Depth (from measuring point) (D)	8.37	(ft)
Depth to water (DTW)	6.16	(ft)
Length of Water Column (LWC)	2.21	(ft) (LWC=D-DTW)
Volume of Water in Well (VW)	0.35 gal	Conversion Factor 0.16
Volume of Purge (VTP) (VTP = VW x 3)	1.05	(gal)

At Time of Measurements:

Color CLEAR Odor NONE

Total volume purged 2.18 Duration of purging 56 MIN

Purging method LO-FLO GEOPUMP Did well go dry? NO

Weather conditions SUNNY, COLD, BREEZY

Pump Serial Number 5008-33

Water Quality Monitor Serial Number 10E100326

Analyses Requested VOC 8260, VOC 8011, METALS LIST 1, CYANIDE, NO3/CL/SO4, TDS, ALK, COD.

Previous Final Readings: pH 5.49 Cond 3.172 Turb 0.83 DO 11.04 Temp 4.7 ORP 35 DTW 6.94

Flow 150 H —

WATER QUALITY PARAMETERS

Form 2

PAGE 1 OF 1

Sample Round CFW-6 MARCH 2012 3/6/12

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
1005	BEGIN	PURGE						150 ML/MN
5 1010	6.12	0.391	6.07	5.51	4.47	-38.8	6.63	
10 1015	6.10	0.378	3.91	2.07	4.26	-24.3	6.68	
15 1020	6.11	0.379	2.88	1.33	4.26	-18.5	6.75	
20 1025	6.10	0.381	2.00	1.01	4.38	-15.3	6.79	
25 1030	6.15	0.389	1.15	0.87	4.06	-12.7	6.88	
30 1035	6.15	0.388	1.02	0.75	4.21	-10.3	6.98	
35 1040	6.14	0.388	0.88	0.72	4.26	-8.6	7.05	
40 1045	6.14	0.388	0.85	0.73	4.28	-7.6	7.07	
45 1050	6.15	0.388	0.85	0.73	4.30	-6.4	7.08	
50 1055	6.14	0.387	0.83	0.72	4.31	-5.0	7.08	
55 1100	6.14	0.387	0.84	0.71	4.31	-4.1	7.08	✓
RPA ~~60~~ 1101	COLLECT SAMPLES							
RPA ~~65~~ 1155	FINISH SAMPLING							
70								
75								
80								
85								
90								
95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location Monroe dam Well Designation Monroe Dam

Sampling Team M. VanNoordenne Sample Period March 2012

Date 3-7-2012 Time 1510 (sample) Start: 1458 End: 1525

Depth to Mid Screen _____ (ft)

Measuring Point _____ Diameter of Well _____ (in)

Well Depth (from measuring point) (D) _____ (ft)

Depth to water (DTW) _____ (ft)

Length of Water Column (LWC) N/A _____ (ft) (LWC=D-DTW)

Volume of Water in Well (VW) _____ gal Conversion Factor ____

Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

At Time of Measurements:

Color clear Odor none

Total volume purged N/A Duration of purging N/A

Purging method N/A Did well go dry? N/A

Weather conditions clear, 50°F

Pump Serial Number N/A

Water Quality Monitor Serial Number YSI 10E101133 HACH-2100P-2 M024-21

Analyses Requested 8-Sr-c, Sr-90, H-3

Previous Final Readings: pH 6.71 Cond 0.075 Turb 3.10 DO 2.18 Temp 2.0 ORP 152 DTW NA

Flow NA ^{3}H NA <MDA

AW 3/2/12

WATER QUALITY PARAMETERS

Form 2

Sample Round March 2012 Monroe dam

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
3-5-12 0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
AM 3.5.12 ~~5~~ 1510	6.55	0.035	2.54	101.05	9.17	-289.9	NA	Called + samples
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								
75								
80								
85								
90								
95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location MW-104A Well Designation MW-104A

Sampling Team M. VanNordennen Sample Period March 2012

Date 3-7-12 Time 0914 - 1210

Depth to Mid Screen ——— (ft)

Measuring Point TOR Diameter of Well 2 (in)

Well Depth (from measuring point) (D) 27.72 (ft)

Depth to water (DTW) 20.85 (ft)

Length of Water Column (LWC) 6.87 (ft) (LWC=D-DTW)

Volume of Water in Well (VW) 1.10 gal Conversion Factor 0.16

Volume of Purge (VTP) (VTP = VW x 3) 3.30 (gal)

At Time of Measurements:

Color Clear Odor None

Total volume purged 2.20 gal Duration of purging 47 min.

Purging method Geopump Low-Flow Did well go dry? No

Weather conditions Sunny, 35°F

Pump Serial Number S008-32

Water Quality Monitor Serial Number YSI 556 (10E101136), HACH 2100P (m024-23)

Analyses Requested Gamma Spec, Sr-90, H-3

Previous Final Readings: pH 6.01 Cond 0.702 Turb 1.08 DO 0.00 Temp 9.2 ORP 119 DTW 21.15

Flow 200 ^{3}H 960

WATER QUALITY PARAMETERS

Form 2

MW-104A

Sample Round: March 2012

	Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
		Current Readings							Flow Rate
3.2.12 0920	0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
0925	5	6.64	0.308	0.39	1.14	9.29	162.2	20.85	180 mL/min
0930	10	6.52	0.305	0.45	0.51	9.51	126.5	20.86	
0935	15	6.54	0.306	0.48	0.42	9.42	92.3	20.86	
0940	20	6.53	0.308	0.46	0.44	9.54	81.2	20.87	
0945	25	6.53	0.306	0.27	0.38	9.65	74.3	20.87	
0950	30	6.53	0.308	0.39	0.35	9.78	63.1	20.87	
0955	35	6.52	0.309	0.33	0.34	9.77	52.8	20.87	
1000	40	6.52	0.306	0.19	0.28	9.91	54.4	20.87	
1005	45	6.53	0.309	0.21	0.29	9.77	52.1	20.87	
1007	~~50~~ AM 3.2.12	Collect Samples, including Dup/MS/MSD/ DEP split							
1210	~~55~~ AM 3.2.12	Sampling complete. well secure							
	60								
	65								
	70								
	75								
	80								
	85								
	90								
	95								
	100								
	105								
	110								
	115								
	120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location YANKEE-ROWE Well Designation MW-105B

Sampling Team RENE AUBE Sample Period MARCH 2012

Date 3/7/12 Time 0930 - 1355

	Depth to Mid Screen —	(ft)
Measuring Point TOR	Diameter of Well 2.0	(in)
Well Depth (from measuring point) (D)	75.45	(ft)
Depth to water (DTW)	24.18	(ft)
Length of Water Column (LWC)	51.27	(ft) (LWC=D-DTW)
Volume of Water in Well (VW)	8.20 gal	Conversion Factor 0.16
Volume of Purge (VTP) (VTP = VW x 3)	24.6	(gal)

At Time of Measurements:

Color CLEAR Odor NONE

Total volume purged 3.67 GAL Duration of purging ~~81~~ 141 MIN

Purging method Lo-Flo BLADDER PUMP Did well go dry? No

Weather conditions SUNNY, COLD, LITE BREEZE

Pump Serial Number PINE ENV 5002

Water Quality Monitor Serial Number 10E100326

Analyses Requested GAMMA SPEC, SR-90, TRITIUM

Previous Final Readings: pH 6.77 Cond 0.534 Turb 2.01 DO 0.00 Temp 7.8 ORP -145 DTW 28.74

Flow 100 ^{3}H ___

WATER QUALITY PARAMETERS

PAGE 1 OF 2

Form 2

Sample Round MW-105B MARCH 2012 3/7/12

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1	+/- 3%	+/- 10%	+/-10%	+/- 1 E	+/-10 mv		
1005	~~std unit~~ BEGIN PURGE		NA <10NTU					100 ML/MN
5 1010	7.25	0.500	17.7	9.28	9.40	58.6	24.60	
10 1015	7.32	0.508	25.8	5.42	9.33	32.7	24.94	
15 1020	7.59	0.557	46.5	3.04	9.01	-29.7	25.36	
20 1025	7.77	0.579	38.1	2.25	8.99	-63.5	25.75	
25 1030	7.87	0.590	29.9	1.59	8.99	-88.5	26.10	
30 1035	7.93	0.595	21.0	1.14	9.02	-104.1	26.40	
35 1040	7.91	0.595	17.6	1.03	9.10	-109.9	26.67	
40 1045	7.84	0.592	11.3	0.95	9.18	-107.8	26.95	
45 1050	7.75	0.588	7.57	0.97	9.20	-102.6	27.15	
50 1055	7.64	0.584	5.81	1.03	9.18	-97.9	27.36	
55 1100	7.55	0.581	4.98	0.93	9.22	-94.3	27.55	
60 1105	7.49	0.579	4.22	0.89	9.25	-93.8	27.71	
65 1110	7.42	0.579	3.56	0.83	9.23	-95.9	27.85	
70 1115	7.39	0.579	3.00	0.77	9.30	-99.7	27.98	
75 1120	7.37	0.580	2.77	0.72	9.37	-106.2	28.11	
80 1125	7.35	0.581	2.51	0.85	9.40	-112.8	28.20	
85 1130	7.34	0.583	2.22	0.67	9.40	-119.2	28.30	
90 1135	7.34	0.586	2.20	0.63	9.42	-124.9	28.40	
95 1140	7.32	0.588	2.19	0.65	9.64	-129.3	28.47	
100 1145	7.32	0.591	2.20	0.58	9.79	-131.6	28.51	
105 1150	7.33	0.595	2.21	0.58	9.98	-133.7	28.55	
110 1155	7.33	0.597	2.21	0.58	10.04	-134.7	28.58	
115 1200	7.33	0.599	2.18	0.57	10.09	-135.3	28.60	
120 1205	7.33	0.600	2.19	0.58	10.07	-135.1	28.62	↓

Sample Round MW-105B MARCH 2012 3/7/12

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
~~125~~ 1210	7.33	0.601	2.18	0.58	10.08	-134.2	28.63	100 ML/MN
~~130~~ 1215	7.33	0.601	2.20	0.58	10.10	-134.0	28.64	↓
~~135~~ 1220	7.33	0.602	2.21	0.57	10.11	-133.9	28.64	↓
~~140~~ 1225	7.32	0.602	2.20	0.57	10.13	-133.7	28.64	↓
RPA ~~145~~ 1226	COLLECT SAMPLES							
RPA ~~150~~ 1355	FINISH SAMPLING							
155								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location MW106A Well Designation MW106A

Sampling Team Melissa Pace Sample Period RP: 3.7.12 SA March 2012

Date 3.7.12 Time 1022 Sample time Finish: 1138, Start: 0925

	Depth to Mid Screen —	(ft)
Measuring Point TOR	Diameter of Well 2	(in)
Well Depth (from measuring point) (D)	21.70	(ft)
Depth to water (DTW)	6.80	(ft)
Length of Water Column (LWC)	14.90	(ft) (LWC=D-DTW)
Volume of Water in Well (VW)	2.235 gal	Conversion Factor 0.16
Volume of Purge (VTP) (VTP = VW x 3)	6.705	(gal)

At Time of Measurements:

Color Clear Odor none

Total volume purged 2.002 Duration of purging 55 min

Purging method Geo pump Did well go dry? no

Weather conditions 25°F sunny, no wind

Pump Serial Number 5008.33

Water Quality Monitor Serial Number YSI 556 - 10E101133

Analyses Requested Tritium, SR-90, Gamma Isotopic

Previous Final Readings: pH 5.79 Cond 0.316 Turb 2.40 DO 0.00 Temp 7.0 ORP 90 DTW 7.61

Flow 100 ^{3}H 530

WATER QUALITY PARAMETERS

Form 2

Sample Round: March 2012 MW106 A

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
3.7.12 0925 0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10% Begin Purge	+/- 1 E	+/-10 mv	6.80	Start
0930 5	6.14	0.326	8.80	4.66	7.43	-199.8	7.55	140 mL/min
0935 10	6.17	0.322	1.47	1.05	7.20	-319.3	7.80	
0940 15	6.22	0.320	0.19	0.91	6.94	-313.9	7.92	
0945 20	6.21	0.318	0.50	0.83	6.80	-311.8	7.96	
0950 25	6.26	0.318	0.65	0.65	6.76	-311.6	8.00	
0955 30	6.28	0.318	0.50	0.62	6.85	-321.0	8.03	
1000 35	6.29	0.318	0.35	0.56	6.85	-295.2	8.04	
1005 40	6.28	0.318	0.53	0.54	6.70	-282.2	8.04	
1010 45	6.28	0.319	0.64	0.50	6.67	-287.8	8.04	
1015 50	6.28	0.318	0.52	0.53	6.71	-293.5	8.04	
1020 55	6.28	0.318	0.49	0.55	6.75	-293.9	8.04	
1022 ~~60~~ 3.7.12	Collect Samples for Tritium, Sr-90, Gamma Isotopic							
1038 ~~65~~ min 3.7.12	Finish collecting, will secure							
70								
75								
80								
85								
90								
95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location YANKEE-ROWE Well Designation MW-107C

Sampling Team RENE AUBE Sample Period MARCH 2012

Date 3/5/2012 Time 1340-1740

	Depth to Mid Screen	— (ft)
Measuring Point TOR	Diameter of Well	2.0 (in)
Well Depth (from measuring point) (D)		42.80 (ft)
Depth to water (DTW)		24.03 (ft)
Length of Water Column (LWC)	18.77	(ft) (LWC=D-DTW)
Volume of Water in Well (VW)	3.00	gal Conversion Factor 0.16
Volume of Purge (VTP) (VTP = VW x 3)	9.00	(gal)

At Time of Measurements:

Color CLEAR Odor NONE

Total volume purged 3.15 GAL Duration of purging 121 MIN

Purging method LO-FLO BLADDER PUMP Did well go dry? NO

Weather conditions SUNNY, COLD, BREEZY

Pump Serial Number PINE ENV 5002

Water Quality Monitor Serial Number 10E100326

Analyses Requested GAMMA SPEC, SR-90, TRITIUM

Previous Final Readings: pH 6.47 Cond 0.355 Turb 2.16 DO 4.24 Temp 7.3 ORP -68 DTW 29.70

Flow 100 ^{3}H ___

WATER QUALITY PARAMETERS

PAGE 1 OF 1

Form 2

Sample Round MW-107C MARCH 2012 3/5/12

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
~~1355~~ 1410	BEGIN	PURGE						100 ML/MN
RPA 5 1415	6.97	0.436	3.53	1.98	6.72	26.7	25.86	
10 1420	6.96	0.436	2.15	2.56	6.60	24.8	26.38	
15 1425	6.99	0.436	2.85	2.41	6.62	23.9	26.82	
20 1430	7.00	0.435	2.50	3.47	6.65	22.4	27.21	
25 1435	7.01	0.435	2.37	1.99	6.60	21.5	27.50	
30 1440	7.02	0.436	2.22	2.75	6.44	14.4	27.79	
35 1445	7.02	0.437	2.01	2.52	6.32	7.1	28.05	
40 1450	7.03	0.437	1.97	1.99	6.47	1.7	28.23	
45 1455	7.04	0.435	~~2.26~~ RPA	2.26	6.36	-3.3	28.42	NTU 1.90
50 1500	7.04	0.432	1.84	1.67	6.60	-7.8	28.58	
55 1505	7.05	0.430	1.86	1.64	6.73	-11.4	28.70	
60 1510	7.07	0.427	1.86	1.88	6.88	-14.9	28.82	
65 1515	7.08	0.426	1.65	1.57	6.70	-17.1	28.94	
70 1520	7.09	0.424	1.59	1.56	6.71	-19.1	29.01	
75 1525	7.10	0.423	1.55	1.25	6.40	-20.9	29.12	
80 1530	7.09	0.420	1.50	1.16	6.58	-22.2	29.21	
85 1535	7.10	0.419	1.33	1.21	6.62	-23.8	29.31	
90 1540	7.09	0.418	1.17	1.07	6.70	-25.0	29.40	
95 1545	7.10	0.417	1.11	0.99	6.82	-26.3	29.49	
100 1550	7.10	0.417	1.10	1.01	6.61	-26.5	29.54	
105 1555	7.11	0.415	1.08	1.03	6.60	-27.1	29.56	
110 1600	7.12	0.415	1.05	1.02	6.57	-27.7	29.57	
115 1605	7.12	0.415	1.06	1.01	6.58	-28.0	29.57	
120 1610	7.12	0.414	1.06	1.01	6.57	-28.2	29.57	√

1611 COLLECT SAMPLES
1740 FINISH SAMPLING

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location SP-1 Well Designation SP. 1

Sampling Team Melaina Perez Sample Period March 2012

Date 3-8-12 Time ~~0930~~ 3.5.12 1005

Depth to Mid Screen _____ (ft)

Measuring Point _____ Diameter of Well _____ (in)

Well Depth (from measuring point) (D) _____ (ft)

Depth to water (DTW) _____ (ft)

Length of Water Column (LWC) N/A _____ (ft) (LWC=D-DTW)

Volume of Water in Well (VW) _____ gal Conversion Factor ____

Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

At Time of Measurements:

Color clear Odor none

Total volume purged N/A Duration of purging N/A

Purging method N/A Did well go dry? N/A

Weather conditions clear, 45°F

Pump Serial Number N/A

Water Quality Monitor Serial Number YSI 10E 10113

Analyses Requested VOC, metals, g-spec, Sr-90, H-3

Previous Final Readings: pH 5.17 Cond .341 Turb 4.44 DO 12.49 Temp 6.2 ORP 18.2 DTW N/A

Flow N/A ^{3}H 244

WATER QUALITY PARAMETERS

Form 2

3-8-12

Sample Round	March 2012				SP-1			
				Current Readings				
Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
1005 3-8-12	7.20	0.102	10.7	14.17	2.61	-197.7	N/A	Collect Samples
10								
15								
20								
25								
30								
35								
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115								
120								

GROUND WATER SAMPLING FIELD LOG
Form 1

Sample Location YANKEE-ROWE Well Designation SW-1
Sampling Team RENE AUBE Sample Period MARCH 2012
Date 3/8/12 Time 1015 - 1045

SURFACE WATER SAMPLE

Depth to Mid Screen NA (ft)
Measuring Point NA Diameter of Well NA (in)
Well Depth (from measuring point) (D) NA (ft)
Depth to water (DTW) NA (ft)
Length of Water Column (LWC) NA (ft) (LWC=D-DTW)
Volume of Water in Well (VW) NA gal Conversion Factor NA
Volume of Purge (VTP) (VTP = VW x 3) NA (gal)

At Time of Measurements:
Color CLEAR Odor NONE
Total volume purged NA Duration of purging NA
Purging method NA Did well go dry? NA
Weather conditions SUNNY, COOL, CALM

Pump Serial Number NA
Water Quality Monitor Serial Number 10E100326
Analyses Requested VOC 8260, VOC 8011, METALS LIST 1, CYANIDE, NO3/CL/SO4, TDS, ALK, COD.

Previous Final Readings: pH 4.77 Cond 0.023 Turb 1.10 DO 10.77 Temp 1.5 ORP 261 DTW NA
Flow NA ^{3}H

WATER QUALITY PARAMETERS

Form 2

PAGE 1 OF 1

Sample Round SW-1 MARCH 2012 3/8/12

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
RPA ~~5~~ 1025	6.99	0.025	1.69	21.56	1.74	28.0	0.50	
RPA ~~10~~ 1030	COLLECT SAMPLES							
RPA ~~15~~ 1045	FINISH SAMPLING							
20								
25								
30								
35								
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100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location SW-2 Well Designation SW-2

Sampling Team Miles van Noordennen Sample Period March 2012

Date 3-8-12 Time 0930 (sample) Start: 0928 End: 0935

Depth to Mid Screen _____ (ft)

Measuring Point _____ Diameter of Well _____ (in)

Well Depth (from measuring point) (D) _____ (ft)

Depth to water (DTW) _____ (ft)

Length of Water Column (LWC) N/A _____ (ft) (LWC=D-DTW)

Volume of Water in Well (VW) _____ gal Conversion Factor ____

Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

At Time of Measurements:

Color clear Odor none

Total volume purged N/A Duration of purging N/A

Purging method N/A Did well go dry? N/A

Weather conditions clear, 45°F

Pump Serial Number N/A

Water Quality Monitor Serial Number YSI 10E101133

Analyses Requested VOC, CN, NO3 SO4 Cl⁻ TDS, alkalinity, COD, metals

Previous Final Readings: pH 6.33 Cond .027 Turb 4.12 DO 5.62 Temp 1.1 ORP 91 DTW NA

Flow NA ^{3}H —

WATER QUALITY PARAMETERS

Form 2

Sample Round March 2012 SW.2

3.8.12

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0 sep 3.8.12	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
0930	6.28	0.019	1.44	14.82	0.56	-178.9	NA	Collect Samples
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								
75								
80								
85								
90								
95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location SW-3 Well Designation SW-3

Sampling Team Miles van Noordennen Sample Period March 2012

Date 3.8.2012 Time 0910 (collect) Start: 0930 End: 0945

Depth to Mid Screen _____ (ft)

Measuring Point _____ Diameter of Well _____ (in)

Well Depth (from measuring point) (D) _____ (ft)

Depth to water (DTW) _____ (ft)

Length of Water Column (LWC) N/A _____ (ft) (LWC=D-DTW)

Volume of Water in Well (VW) _____ gal Conversion Factor ____

Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

At Time of Measurements:

Color clear Odor none

Total volume purged N/A Duration of purging N/A

Purging method N/A Did well go dry? N/A

Weather conditions clear, 45°F

Pump Serial Number N/A

Water Quality Monitor Serial Number YSI 10E101133

Analyses Requested VOC, CN, SO_4, NO_3, Cl, TDS, Alkalinity, COD, metals

Previous Final Readings: pH 6.45 Cond. 0.27 Turb 3.44 DO 12.13 Temp 0.9 ORP 40 DTW N/A

Flow N/A ^3H —

WATER QUALITY PARAMETERS

Form 2

Sample Round	March 2012			SW-3				
	Current Readings							
Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
~~5~~ 0910	6.46	0.020	1.69	15:22	0.57	-136.0	NA	Collect Samples
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								
75								
80								
85								
90								
95								
100								
105								
110								
115								
120								

3.8.12

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location SW-4 - SCFA Well Designation SW-4

Sampling Team M. VanNordenne Sample Period March 2012

Date 3-6-12 Time 1050 - 1150 Sample: 1115

Depth to Mid Screen _____ (ft)

Measuring Point _____ Diameter of Well _____ (in)

Well Depth (from measuring point) (D) _____ (ft)

Depth to water (DTW) _____ (ft)

Length of Water Column (LWC) _____ (ft) (LWC=D-DTW)

Volume of Water in Well (VW) _____ gal Conversion Factor ____

Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

At Time of Measurements:

Color Slight reddish brown tint Odor Slight organic odor

Total volume purged N/A Duration of purging N/A

Purging method N/A Did well go dry? N/A

Weather conditions Sunny, 35°F

Pump Serial Number N/A

Water Quality Monitor Serial Number YSI 556 (10E101133), HACH 2100 P (M024-23)

Analyses Requested VOC, metals, CN, COD, anions, TDS, alkalinity

Previous Final Readings: pH 6.45 Cond 0.429 Turb 3.41 DO 13.85 Temp 1.0 ORP 51 DTW —

Flow — ^{3}H —

WATER QUALITY PARAMETERS

Form 2

SW-4

Sample Round March 2012

	Current Readings							
Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
3-6-12 1115	6.39	0.033	1.32	14.99	0.39	-246.0	—	Collect Samples
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								
75								
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85								
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95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location SW-5 Well Designation SW-5

Sampling Team M. VanNordenne Sample Period March 2012

Date 3-6-12 Time 0955-1045 Sample: 1015

Depth to Mid Screen _____ (ft)

Measuring Point _____ Diameter of Well _____ (in)

Well Depth (from measuring point) (D) _____ (ft)

Depth to water (DTW) _____ (ft)

Length of Water Column (LWC) N/A (ft) (LWC=D-DTW)

Volume of Water in Well (VW) _____ gal Conversion Factor ____

Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

Grab 3.6.12

At Time of Measurements:

Color Slight reddish brown tint Odor Slight organic odor

Total volume purged N/A Duration of purging N/A

Purging method N/A Did well go dry? N/A

Weather conditions Sunny, 25°F

Pump Serial Number N/A

Water Quality Monitor Serial Number YSI 556 (10E101133), HACH 2100P (M024-23)

Analyses Requested VOCs, metals, CN, COD, anions, TDS, alkalinity

Previous Final Readings: pH 6.42 Cond 0.221 Turb 1.31 DO 12.54 Temp 0.9 ORP 91 DTW —

Flow — ^{3}H —

WATER QUALITY PARAMETERS

Form 2

SW-5

Sample Round	March 2012							
				Current Readings				
Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
3-6-12 5 min 1015	6.61	0.027	1.48	15.12	0.16	-232.7	—	Collect Samples
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
60								
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70								
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85								
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110								
115								
120								

GROUND WATER SAMPLING FIELD LOG
Form 1

Sample Location YANKEE-ROWE Well Designation SW-11

Sampling Team RENE AUBE Sample Period MARCH 2012

Date 3/7/12 Time 1500 - 1550

SURFACE WATER SAMPLE

Depth to Mid Screen NA (ft)

Measuring Point NA Diameter of Well NA (in)

Well Depth (from measuring point) (D) NA (ft)

Depth to water (DTW) NA (ft)

Length of Water Column (LWC) NA (ft) (LWC=D-DTW)

Volume of Water in Well (VW) NA gal Conversion Factor NA

Volume of Purge (VTP) (VTP = VW x 3) NA (gal)

At Time of Measurements:

Color CLEAR Odor NONE

Total volume purged NA Duration of purging NA

Purging method NA Did well go dry? NA

Weather conditions SUNNY, COLD, LITE BREEZE

Pump Serial Number S0008-33

Water Quality Monitor Serial Number 10E100326

Analyses Requested METALS LIST 3, GAMMA SPEC, SR-90, TRITIUM.

Previous Final Readings: pH 7.76 Cond 0.037 Turb 2.10 DO 9.22 Temp 1.1 ORP 153 DTW NA

Flow NA ^{3}H ___

WATER QUALITY PARAMETERS

Form 2

PAGE 1 OF 1

Sample Round SW-11 MARCH 2012 3/7/12

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
RPA ~~5~~ 1515	7.35	0.033	2.16	15.06	3.16	-33.0	1.00	
RPA ~~10~~ 1520	COLLECT SAMPLES							
RPA ~~15~~ 1550	FINNISH SAMPLING							
20								
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								
75								
80								
85								
90								
95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location SW-408 Well Designation SW-408

Sampling Team M. van Noordennen Sample Period March 2012

Date 3-7-2012 Time 1435 (sample) Start: 1420 End: 1450

Depth to Mid Screen _____ (ft)

Measuring Point _____ Diameter of Well _____ (in)

Well Depth (from measuring point) (D) _____ (ft)

Depth to water (DTW) _____ (ft)

Length of Water Column (LWC) N/A _____ (ft) (LWC=D-DTW)

Volume of Water in Well (VW) _____ gal Conversion Factor ____

Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

At Time of Measurements:

Color Clear Odor none

Total volume purged N/a Duration of purging N/A

Purging method N/A Did well go dry? N/A

Weather conditions clear, 50°F

Pump Serial Number N/A

Water Quality Monitor Serial Number YSI 10E101133 HACH 2100P. M02121

Analyses Requested metals 8-Spec, SR-90, H-3

Previous Final Readings: pH 6.36 Cond 0.835 Turb 2.53 DO 12.56 Temp 1.6 ORP 15.4 DTW NA

Flow - ^{3}H <mda

WATER QUALITY PARAMETERS

Form 2

Sample Round March 2012 SW-408

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
3-5-12 0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
1435 3.5.12	6.42	0.039	10.8	12.68	4.01	-261.1	N/A	Collect Samples
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								
75								
80								
85								
90								
95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location MW-104A Well Designation MW-104A

Sampling Team MH Sample Period APRIL 2012

Date 4/24/12 Time 900-1120

Depth to Mid Screen — (ft)

Measuring Point TOC Diameter of Well 2 (in)

Well Depth (from measuring point) (D) 27.72 ~~20.84~~ (ft)

Depth to water (DTW) 20.84 (ft)

Length of Water Column (LWC) 6.87 (ft) (LWC=D-DTW)

Volume of Water in Well (VW) 1.09 gal Conversion Factor 16

Volume of Purge (VTP) (VTP = VW x 3) 3.29 (gal)

At Time of Measurements:

Color Clear Odor None

Total volume purged 3.5 Duration of purging 60 minutes

Purging method GeoPump Did well go dry? NO

Weather conditions Cloudy, Flurries, 35°

Pump Serial Number GeoPump S008-29

Water Quality Monitor Serial Number 10E101131

Analyses Requested 60 Cs-137

Previous Final Readings: pH 6.53 Cond 0.309 Turb 0.21 DO 0.29 Temp 9.77 ORP 52.1 DTW 20.87

Flow 180 ^{3}H 456

WATER QUALITY PARAMETERS

Form 2

Sample Round: April - 2012

Current Readings

	Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
920	0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
924	5	6.54	0.414	1.12	3.0	9.18	211.9	20.89	purge rate 221
929	10	6.11	0.341	0.74	0.61	9.04	118.8	20.89	
934	15	5.97	0.313	0.59	0.47	8.98	31.7	20.89	
939	20	5.84	0.310	0.19	0.35	8.97	-6.1	20.89	
944	25	5.81	0.311	0.33	0.29	8.91	-44.9	20.89	
949	30	5.81	0.309	0.28	0.27	9.00	-92.5	20.89	
954	35	5.92	0.308	0.31	0.27	9.00	-141.6	20.89	
959	40	5.93	0.307	0.53	0.21	8.97	-156.1	20.89	
1004	45	5.98	0.307	0.47	0.22	8.87	-166.6	20.89	
1009	50	5.95	0.307	0.46	0.21	8.91	-179.7	20.89	
1014	55	6.02	0.308	0.38	0.20	8.90	-172.1	20.89	
1019	60	6.01	0.307	0.31	0.21	8.84	-174.0	20.89	
	65								
	70								
	75								
	80								
	85								
	90								
	95								
	100								
	105								
	110								
	115								
	120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location MW-105B Well Designation MW-105B

Sampling Team M&L Sample Period APRIL 2012

Date 4/24/12 Time 1130 - 1440

Depth to Mid Screen — (ft)

Measuring Point TOR Diameter of Well 2 (in)

Well Depth (from measuring point) (D) 75.41 (ft)

Depth to water (DTW) 24.58 (ft)

Length of Water Column (LWC) 50.87 (ft) (LWC=D-DTW)

Volume of Water in Well (VW) 8.13 gal Conversion Factor 6.16

Volume of Purge (VTP) (VTP = VW x 3) 24.4 (gal)

At Time of Measurements:

Color Clear Odor Slight Leachate / H_2S

Total volume purged 2.86 Duration of purging 3 hrs

Purging method Bladder Pump Did well go dry? NO

Weather conditions Snow Showers Windy, 31°

Pump Serial Number Prime B Pit

Water Quality Monitor Serial Number 10E101131, HACH 2100P. Mod4-14

Analyses Requested CS-137

Previous Final Readings: pH 7.32 Cond 0.602 Turb 2.26 DO 0.53 Temp 10.3 ORP -133 DTW 28.64

Flow 102 ^3H 2500

WATER QUALITY PARAMETERS

Form 2

Sample Round		April - 2012							
		Current Readings							
	Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
1141	0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
1147	5	6.69	0.496	4.52	7.13	9.42	-48.7	25.94	rate - 175 ml/min
1152	10	6.94	0.561	32.6	2.87	9.69	-157.3	26.39	rate - 100 ml/min
1157	15	7.04	0.594	38.4	1.64	9.82	-197.8	26.67	
1202	20	7.34	0.604	360	0.96	9.82	-222.2	26.85	
1207	25	7.39	0.606	33.6	0.80	9.58	-221.2	27.14	
1212	30	7.41	0.607	32.9	0.60	9.58	-232.6	27.34	
1217	35	7.46	0.606	28.6	0.63	9.61	-230.9	27.58	
1222	40	7.52	0.601	24.2	0.54	9.41	-237.1	27.82	
1227	45	7.47	0.602	20.2	0.54	9.60	-241.3	27.98	
1232	50	7.35	0.595	16.2	0.51	8.85	-241.7	28.37	
1237	55	7.24	0.592	11.7	0.41	9.21	-254.8	28.51	
1242	60	7.24	0.593	10.1	0.51	9.56	-253.4	28.64	
1247	65	7.21	0.593	8.85	0.50	9.81	-251.0	28.70	
1252	70	7.33	0.594	5.63	0.50	9.81	-247.2	28.77	
1257	75	7.21	0.594	5.51	0.47	9.63	-208.1	28.90	
	80								Battery Bar Broke
1307 ~~1257~~	85	7.23	0.595	3.79	0.38	9.51	-232.1	29.13	
1311	90	7.22	0.596	3.14	0.40	9.34	-221.7	29.21	
1317	95	7.07	0.593	3.29	0.38	9.52	-239.1	29.26	
1322	100	7.14	0.593	3.35	0.38	9.84	-247.4	29.31	
1327	105	7.18	0.595	3.31	0.42	9.94	-246.1	29.31	
1332	110	7.21	0.594	3.16	0.39	9.84	-238 239.6	29.31	
	115								
	120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location MW-106A Well Designation MW-106A

Sampling Team MAL Sample Period APRIL 2012

Date 4/24/12 Time 1450 - 1625

Depth to Mid Screen — (ft)

Measuring Point TOR Diameter of Well 2 (in)

Well Depth (from measuring point) (D) 21.70 (ft)

Depth to water (DTW) 5.98 (ft)

Length of Water Column (LWC) 15.72 (ft) (LWC=D-DTW)

Volume of Water in Well (VW) 2.5 gal Conversion Factor 0.16

Volume of Purge (VTP) (VTP = VW x 3) 7.5 (gal)

At Time of Measurements:

Color Clear Odor None

Total volume purged 2.18 Duration of purging 60 minutes

Purging method Geopump Did well go dry? NO

Weather conditions P. Sunny, Windy, 45°

Pump Serial Number Geopump

Water Quality Monitor Serial Number 10B101131, Mody-IV

Analyses Requested Cs-137

Previous Final Readings: pH 6.29 Cond 0.318 Turb 0.49 DO 0.55 Temp 6.75 ORP -193.5 DTW 8.04

Flow 140 ^{3}H <MDA

WATER QUALITY PARAMETERS

Form 2

Sample Round: April 2012

Current Readings

	Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
1505	0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
1507	5	6.55	0.321	1.32	7.67	8.05	-68.0	7.05	Purge rate ~200 ml/m
1512	10	6.15	0.312	1.31	1.17	7.80	-119.0	7.85	Purge rate ~ 175
1517	15	6.07	0.311	1.67	0.85	7.57	-143.2	8.04	Purge rate ~ 150
1522	20	6.04	0.310	1.51	1.00	7.48	-144.4	8.09	
1527	25	6.01	0.309	2.60	1.01	7.43	-166.3	8.06	
1532	30	6.00	0.310	3.03	1.15	7.38	-153.0	8.06	
1537	35	6.00	0.308	1.43	1.27	7.33	-159.4	8.06	
1542	40	6.00	0.308	1.71	1.06	7.31	-166.0	8.06	
1547	45	6.01	0.308	1.61	0.91	7.48	-161.9	8.06	
1552	50	6.06	0.308	1.67	0.96	8.01	-180.9	8.06	
1557	55	6.01	0.309	1.74	0.91	8.20	-181.7	8.06	Temp. 8.20 (Sun)
1602	60	6.03	0.308	1.59	0.86	8.30	-174.1	8.06	
	65								
	70								
	75								
	80								
	85								
	90								
	95								
	100								
	105								
	110								
	115								
	120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location MW-107C Well Designation MW-107C

Sampling Team MHL Sample Period April 2012

Date 4/23/12 Time 1100 - 1332

Depth to Mid Screen ——— (ft)

Measuring Point TOR Diameter of Well 2 (in)

Well Depth (from measuring point) (D) 46.8 (ft)

Depth to water (DTW) 23.61 (ft)

Length of Water Column (LWC) 19.19 (ft) (LWC=D-DTW)

Volume of Water in Well (VW) 3.07 gal Conversion Factor 0.16

Volume of Purge (VTP) (VTP = VW x 3) 9.27 (gal)

At Time of Measurements:

Color Clear Odor None

Total volume purged 3.2 Duration of purging 2.5 hrs

Purging method Bladder pump / Low Flow Did well go dry? NO

Weather conditions Showers, 45° F

Pump Serial Number Pine-BPH

Water Quality Monitor Serial Number ~~MO~~ 10 E 101131 (YSI) MQ24-14 (Hach 2Yoy)

Analyses Requested CS-137

Previous Final Readings: pH 7.12 Cond 0.414 Turb 1.06 DO 1.01 Temp 6.57 ORP -28.2 DTW 29.57

Flow 100 ^{3}H 11400

WATER QUALITY PARAMETERS

Form 2

Sample Round	APRIL - 2012						MW-107C	
	Current Readings							
Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
1105 0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
1112 5	6.67	0.524	6.85	5.74	10.12	226	24.94	
1117 10	6.70	0.428	3.13	4.38	9.79	133.4	25.24	
1122 15	6.73	0.414	2.68	4.06	9.51	30.4	25.61	
1127 20	6.75	0.407	2.27	3.88	9.40	-48.7	25.94	Flow rate 100 ml/min
1132 25	6.76	0.403	2.37	3.78	9.37	-93.9	26.19	
1137 30	6.78	0.401	2.08	3.78	9.40	-123.4	26.48	
1142 35	6.83	0.398	2.17	3.70	9.43	-145.9	26.77	
1147 40	6.85	0.399	2.40	3.52	9.44	-159.7	27.05	
1152 45	6.85	0.401	2.69	3.27	9.44	-164.1	27.24	
1157 50	6.82	0.404	—	2.80	9.51	-167.5	27.47	turbidity Bottle Broke
1202 55	6.83	0.407	—	2.32	9.57	-175.3	27.55	Chlorine Bottles
1212 60	6.83	0.411	2.38	1.85	9.61	-177.0	27.87	
1217 65	6.84	0.412	1.86	1.66	9.67	-179.3	28.02	
1222 70	6.84	0.411	1.44	1.64	9.71	-175.5	28.08	
1227 75	6.85	0.411	1.33	1.33	9.71	-175.1	28.18	
1232 80	6.86	0.409	1.66	1.26	9.79	-174.4	28.21	
1237 85	6.88	0.408	1.51	1.16	9.84	-176.1	28.28	
1242 90	6.87	0.407	1.19	1.07	9.87	-182.0	28.33	
1247 95	6.88	0.406	1.31	0.99	9.89	-177.9	28.41	
1252 100	6.88	0.401	1.30	0.97	9.91	-177.5	28.44	
1257 105	6.90	0.403	1.14	0.91	9.93	-174.6	28.51	
1302 110	6.91	0.402	1.08	0.83	10.03	-180.1	28.51	
1307 115	6.92	0.401	1.03	0.82	10.10	-183.3	28.52	
1312 120	6.92	0.400	0.76	0.84	10.14	-172.1	28.51	

Sample Round	April - 2012						MW-107C	
	Current Readings							
Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
1317 125	6.93	0.399	0.83	0.73	10.16	-173.4	28.58	
1322 130	6.94	0.398	0.71	0.70	10.20	-168.1	28.61	
1327 135	6.93	0.397	0.75	0.73	10.26	-167.0	28.61	
1332 140	6.91	0.397	0.64	0.68	10.29	-171.7	28.61	
145							28.61	Final water Level
150								
155								

GROUND WATER SAMPLING FIELD LOG
Form 1

Sample Location Monroe Dam Well Designation Monroe Dam
Sampling Team M. van Noordennen Sample Period April 2012
Date 4.24.12 Time 1130-1150 Sample time: 1145

Depth to Mid Screen _____ (ft)
Measuring Point _____ Diameter of Well _____ (in)
Well Depth (from measuring point) (D) _____ (ft)
Depth to water (DTW) _____ (ft)
Length of Water Column (LWC) _____ (ft) (LWC=D-DTW)
Volume of Water in Well (VW) _____ gal Conversion Factor ____
Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

4.24.12

At Time of Measurements:
Color Clear Odor None
Total volume purged N/A Duration of purging N/A
Purging method N/A Did well go dry? N/A
Weather conditions Cloudy, windy, 50°F

Pump Serial Number N/A
Water Quality Monitor Serial Number YSI 556 (10E101133), HACH 2100P (m024.21)
Analyses Requested C5-13) (Gamma spec)

Previous Final Readings: pH 6.55 Cond 0.035 Turb 3.55 DO 14.05 Temp 8.10 ORP -189.7 DTW —
Flow — ^{3}H <MDA

WATER QUALITY PARAMETERS

Form 2

Minor Dam

Sample Round Apr. 1 2012

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
CW 4/4/12 / ~~5~~ 4/2/12 1145	7.20	0.051	2.32	11.06	8.51	108.5	–	Collect Samples
10								
15								
20								
25								
30								
35								
40								
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60								
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70								
75								
80								
85								
90								
95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG
Form 1

Sample Location SP-1 Well Designation SP-1
Sampling Team M. VanNoordennen Sample Period April 2012
Date 4.24.12 Time 1430 - 1450 Sample Time: 1445

Depth to Mid Screen _____ (ft)
Measuring Point _____ Diameter of Well _____ (in)
Well Depth (from measuring point) (D) _____ (ft)
Depth to water (DTW) _____ (ft)
Length of Water Column (LWC) _____ (ft) (LWC=D-DTW)
Volume of Water in Well (VW) _____ gal Conversion Factor ____
Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

4.24.12

At Time of Measurements:
Color Clear Odor None
Total volume purged N/A Duration of purging N/A
Purging method N/A Did well go dry? N/A
Weather conditions Cloudy, 50°F

Pump Serial Number N/A
Water Quality Monitor Serial Number YSI 556 (10E101133), HACH 2100P (m024.21)
Analyses Requested Cs-137 (Gamma spec)

Previous Final Readings: pH 7.20 Cond 0.102 Turb 10.1 DO 14.1 Temp 7.61 ORP -152.3 DTW —
Flow — ^{3}H <mDA

WATER QUALITY PARAMETERS

Form 2

SP-1

Sample Round Apr. 1 2012

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
~~5~~ 4.24.12 1445 (AW 4.24.12)	7.42	0.251	1.70	11.07	9.98	220.9	—	Collect Sample
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
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70								
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80								
85								
90								
95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location SW-011 Well Designation SW-011

Sampling Team RENE AUBE Sample Period APRIL 2012

Date 4/23/12 Time 1400 - 1450

SAMPLE TIME: 1440

Depth to Mid Screen _____ (ft)

Measuring Point _____ Diameter of Well _____ (in)

Well Depth (from measuring point) (D) _____ (ft)

Depth to water (DTW) _____ (ft)

Length of Water Column (LWC) N/A _____ (ft) (LWC=D-DTW)

Volume of Water in Well (VW) _____ gal Conversion Factor ____

Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

Rene Aube 4/23/12

At Time of Measurements:

Color CLEAR Odor NONE

Total volume purged NA Duration of purging NA

Purging method NA Did well go dry? NA

Weather conditions COOL, CLOUDY, LITE BREEZE

Pump Serial Number NA HACH 2100P M024-15

Water Quality Monitor Serial Number YSI 556 MPS 10E101131

Analyses Requested CS-137 (GAMMA SPEC)

Previous Final Readings: pH 7.35 Cond 6.055 Turb 2.16 DO 5.04 Temp 3.16 ORP -33.0 DTW —

Flow — ^{3}H < MDA

WATER QUALITY PARAMETERS

Form 2

Sample Round APRIL 2012 SW-011

Current Readings

Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
5 1440	7.48	0.044	2.02	9.12	11.81	-88.0	—	COLLECT SAMPLE
10								
15								
20								
25								
30								
35								
40								
45								
50								
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60								
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90								
95								
100								
105								
110								
115								
120								

GROUND WATER SAMPLING FIELD LOG

Form 1

Sample Location SW-408 Well Designation SW-408

Sampling Team M. VanNoordennen Sample Period April 2012

Date 4-24-12 Time 1040-1100 Sample Time: 1050

Depth to Mid Screen _____ (ft)

Measuring Point _____ Diameter of Well _____ (in)

Well Depth (from measuring point) (D) _____ (ft)

Depth to water (DTW) _____ (ft)

Length of Water Column (LWC) _____ (ft) (LWC=D-DTW)

Volume of Water in Well (VW) _____ gal Conversion Factor ____

Volume of Purge (VTP) (VTP = VW x 3) _____ (gal)

4.24.12

At Time of Measurements:

Color Clear Odor None

Total volume purged N/A Duration of purging N/A

Purging method N/A Did well go dry? N/A

Weather conditions Cloudy, windy, 50°F

Pump Serial Number N/A

Water Quality Monitor Serial Number YSI 556 (10E101133), HACH 2100P (m024.21)

Analyses Requested Cs-137 (Gamma Spec)

Previous Final Readings: pH 6.42 Cond 0.039 Turb 10.2 DO 12.68 Temp 4.01 ORP -26.1 DTW —

Flow — ^{3}H <MDA

WATER QUALITY PARAMETERS

Form 2

SW-408

Sample Round April 2012

Current Readings								
Time (min)	pH	Cond mS/cm	Turb (NTU)	D.O (mg/L)	Temp (°C)	ORP (mv)	DTW (feet)	Comments
0	+/- 0.1 std.unit	+/- 3%	+/- 10% NA <10NTU	+/-10%	+/- 1 E	+/-10 mv		
5 4.24.12 1050 (SW 4.24.12)	7.54	0.039	3.18	11.60	7.77	118.3	—	Collect Samples
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
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65								
70								
75								
80								
85								
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95								
100								
105								
110								
115								
120								

APPENDIX B

ANALYTICAL DATA – MARCH and APRIL 2012

APPENDIX B-1

RADIOLOGICAL DATA - MARCH and APRIL 2012

APPENDIX B-1
Radiological Data - March and April 2012

Yankee Nuclear Power Station

			Location	MW-107C			MW-107C			MW-104A		
			Sample ID	MW-107C			MW-107C			MW-104A		
			Sample Date	3/5/2012			4/23/2012			3/7/2012		
			Qc Code	FS			FS			FS		
Lab Id	**Analysis**	**Parameter**	**Units**	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty
GEL	EPA 901.1	Antimony-125	pCi/L	-13.5	U	12				-5.09	U	9.27
GEL	EPA 901.1	Cesium-134	pCi/L	-1.33	U	3.39				2.69	U	3.26
GEL	EPA 901.1	Cesium-137	pCi/L	10.9	J	5.22	0.493	U	2.9		R	
GEL	EPA 901.1	Cobalt-60	pCi/L	0.883	U	2.86				-1.4	U	3.11
GEL	EPA 901.1	Europium-152	pCi/L	-2.88	U	11.9				-0.708	U	9.54
GEL	EPA 901.1	Europium-154	pCi/L	0.639	U	9.82				-0.393	U	9.7
GEL	EPA 901.1	Europium-155	pCi/L	-4.6	U	13.2				0.126	U	12
GEL	EPA 901.1	Niobium-94	pCi/L	1.25	U	2.9				1.89	U	2.77
GEL	EPA 901.1	Silver-108	pCi/L	-3.14	U	3.37				1.83	U	2.97
GEL	EPA 905.0 Modified	Strontium-90	pCi/L	0.228	U	0.936				-0.546	U	0.777
GEL	EPA 906.0 Modified	Tritium	pCi/L	11,400		2,340				456		296
TA-SL	GA-01-R MOD	Cesium-137	pCi/L				-0.02	U	8.9			

Notes:
FS = Field Sample
FD = Field Duplicate
EB = Equipment Rinsate Blank
pCi/L = Picocuries per liter
U = Not detected
R = Rejected during data validation
J = Result is estimated

APPENDIX B-1
Radiological Data - March and April 2012

Yankee Nuclear Power Station

			Location	MW-104A			MW-104A			MW-104A		
			Sample ID	MW-104A			MW-104ADUP			MW-104A DUP		
			Sample Date	4/24/2012			3/7/2012			4/24/2012		
			Qc Code	FS			FD			FD		
Lab Id	**Analysis**	**Parameter**	**Units**	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty
GEL	EPA 901.1	Antimony-125	pCi/L				3.62	U	8.09			
GEL	EPA 901.1	Cesium-134	pCi/L				2.38	U	2.91			
GEL	EPA 901.1	Cesium-137	pCi/L	-3.96	U	3.87	11.9	J	4.78	0.413	U	2.59
GEL	EPA 901.1	Cobalt-60	pCi/L				-0.744	U	2.68			
GEL	EPA 901.1	Europium-152	pCi/L				-2.42	U	8.9			
GEL	EPA 901.1	Europium-154	pCi/L				-7.48	U	8.06			
GEL	EPA 901.1	Europium-155	pCi/L				-6.34	U	10.4			
GEL	EPA 901.1	Niobium-94	pCi/L				1.1	U	2.46			
GEL	EPA 901.1	Silver-108	pCi/L				0.51	U	2.38			
GEL	EPA 905.0 Modified	Strontium-90	pCi/L				0.907	U	1.06			
GEL	EPA 906.0 Modified	Tritium	pCi/L				361	U	302			
TA-SL	GA-01-R MOD	Cesium-137	pCi/L	0.01	U	5.4				3.1	U	6.8

Notes:
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J = Result is estimated

APPENDIX B-1
Radiological Data - March and April 2012

Yankee Nuclear Power Station

			Location	MW-105B			MW-105B			MW-106A		
			Sample ID	MW-105B			MW-105B			MW-106A		
			Sample Date	3/7/2012			4/24/2012			3/7/2012		
			Qc Code	FS			FS			FS		
Lab Id	**Analysis**	**Parameter**	**Units**	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty
GEL	EPA 901.1	Antimony-125	pCi/L	4.15	U	9.8				2.55	U	9.33
GEL	EPA 901.1	Cesium-134	pCi/L	0.14	U	3.33				4.14	U	3.76
GEL	EPA 901.1	Cesium-137	pCi/L	12.7	J	4.34	-6.54	U	6.65	5.92	U	3.36
GEL	EPA 901.1	Cobalt-60	pCi/L	-1.47	U	3.28				0.149	U	3.16
GEL	EPA 901.1	Europium-152	pCi/L	2.74	U	12.1				-13.3	U	13
GEL	EPA 901.1	Europium-154	pCi/L	-7.2	U	11.2				4.03	U	10.4
GEL	EPA 901.1	Europium-155	pCi/L	-2.38	U	14.8				-2.52	U	12.7
GEL	EPA 901.1	Niobium-94	pCi/L	3.43	U	3.25				0.942	U	3.18
GEL	EPA 901.1	Silver-108	pCi/L	1.46	U	3.14				-1.26	U	2.94
GEL	EPA 905.0 Modified	Strontium-90	pCi/L	-0.463	U	0.897				0.585	U	1.03
GEL	EPA 906.0 Modified	Tritium	pCi/L	2,500		650				395	U	282
TA-SL	GA-01-R MOD	Cesium-137	pCi/L				-2.5	U	8.7			

Notes:
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pCi/L = Picocuries per liter
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APPENDIX B-1
Radiological Data - March and April 2012

Yankee Nuclear Power Station

			Location	MW-106A			Monroe Dam			Monroe Dam		
			Sample ID	MW-106A			Monroe Dam			Monroe Dam		
			Sample Date	4/24/2012			3/7/2012			4/24/2012		
			Qc Code	FS			FS			FS		
Lab Id	**Analysis**	**Parameter**	**Units**	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty
GEL	EPA 901.1	Antimony-125	pCi/L				-2.51	U	6.26			
GEL	EPA 901.1	Cesium-134	pCi/L				-0.63	U	2.45			
GEL	EPA 901.1	Cesium-137	pCi/L	-0.141	U	3.25	10.7		4.33	0.131	U	3.54
GEL	EPA 901.1	Cobalt-60	pCi/L				-0.299	U	2.3			
GEL	EPA 901.1	Europium-152	pCi/L				1.09	U	6.23			
GEL	EPA 901.1	Europium-154	pCi/L				-0.107	U	6.71			
GEL	EPA 901.1	Europium-155	pCi/L				13.1	U	10.1			
GEL	EPA 901.1	Niobium-94	pCi/L				-0.164	U	2.2			
GEL	EPA 901.1	Silver-108	pCi/L				-0.383	U	2.11			
GEL	EPA 905.0 Modified	Strontium-90	pCi/L				-0.52	U	0.917			
GEL	EPA 906.0 Modified	Tritium	pCi/L				207	U	261			
TA-SL	GA-01-R MOD	Cesium-137	pCi/L	-0.1	U	7.1				-3.4	U	9.7

Notes:
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FD = Field Duplicate
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J = Result is estimated

APPENDIX B-1
Radiological Data - March and April 2012

Yankee Nuclear Power Station

			Location	SP-1			SP-1			SW-011		
			Sample ID	SP-1			SP-1			SW-011		
			Sample Date	3/8/2012			4/24/2012			3/7/2012		
			Qc Code	FS			FS			FS		
Lab Id	**Analysis**	**Parameter**	**Units**	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty
GEL	EPA 901.1	Antimony-125	pCi/L	-7.32	U	8.19				0.348	U	5.75
GEL	EPA 901.1	Cesium-134	pCi/L	1.12	U	2.7				-0.787	U	2.1
GEL	EPA 901.1	Cesium-137	pCi/L	6.11		5.5	0.866	U	3.16	7.08		3.66
GEL	EPA 901.1	Cobalt-60	pCi/L	-0.0298	U	3.09				0.905	U	2.29
GEL	EPA 901.1	Europium-152	pCi/L	-4.01	U	8.58				0.282	U	6.99
GEL	EPA 901.1	Europium-154	pCi/L	-3.16	U	6.73				1.48	U	7.01
GEL	EPA 901.1	Europium-155	pCi/L	5.73	U	11.1				-5.08	U	9.14
GEL	EPA 901.1	Niobium-94	pCi/L	0.564	U	2.11				-1.45	U	2.08
GEL	EPA 901.1	Silver-108	pCi/L	0.104	U	2.59				0.211	U	1.89
GEL	EPA 905.0 Modified	Strontium-90	pCi/L	-0.895	U	0.688				1.12	U	1.2
GEL	EPA 906.0 Modified	Tritium	pCi/L	216	U	257				0	U	237
TA-SL	GA-01-R MOD	Cesium-137	pCi/L				0.6	U	6.7			

Notes:
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FD = Field Duplicate
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APPENDIX B-1
Radiological Data - March and April 2012

Yankee Nuclear Power Station

			Location	SW-011			SW-408			SW-408		
			Sample ID	SW-011			SW-408			SW-408		
			Sample Date	4/23/2012			3/7/2012			4/24/2012		
			Qc Code	FS			FS			FS		
Lab Id	**Analysis**	**Parameter**	**Units**	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty
GEL	EPA 901.1	Antimony-125	pCi/L				0.975	U	4.45			
GEL	EPA 901.1	Cesium-134	pCi/L				1.24	U	1.74			
GEL	EPA 901.1	Cesium-137	pCi/L	0.278	U	2.55	2.71	U	2.22	2.76	U	4.04
GEL	EPA 901.1	Cobalt-60	pCi/L				1.27	U	1.71			
GEL	EPA 901.1	Europium-152	pCi/L				3.34	U	5			
GEL	EPA 901.1	Europium-154	pCi/L				-1.2	U	4.87			
GEL	EPA 901.1	Europium-155	pCi/L				2.63	U	6.17			
GEL	EPA 901.1	Niobium-94	pCi/L				2.29	U	1.9			
GEL	EPA 901.1	Silver-108	pCi/L				0.292	U	1.52			
GEL	EPA 905.0 Modified	Strontium-90	pCi/L				-0.251	U	0.957			
GEL	EPA 906.0 Modified	Tritium	pCi/L				176	U	250			
TA-SL	GA-01-R MOD	Cesium-137	pCi/L	1.1	U	5.8				0.2	U	4.2

Notes:
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pCi/L = Picocuries per liter
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APPENDIX B-1
Radiological Data - March and April 2012

Yankee Nuclear Power Station

			Location	QC			QC		
			Sample ID	EB-004			EB-005		
			Sample Date	3/6/2012			4/23/2012		
			Qc Code	EB			EB		
Lab Id	**Analysis**	**Parameter**	**Units**	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty
GEL	EPA 901.1	Antimony-125	pCi/L	2.66	U	7.11			
GEL	EPA 901.1	Cesium-134	pCi/L	0.352	U	2.49			
GEL	EPA 901.1	Cesium-137	pCi/L	9.73		4.8	0.308	U	2.46
GEL	EPA 901.1	Cobalt-60	pCi/L	2.29	U	2.91			
GEL	EPA 901.1	Europium-152	pCi/L	1.23	U	7.83			
GEL	EPA 901.1	Europium-154	pCi/L	-0.232	U	7.42			
GEL	EPA 901.1	Europium-155	pCi/L	6.68	U	9.96			
GEL	EPA 901.1	Niobium-94	pCi/L	2.88	U	2.77			
GEL	EPA 901.1	Silver-108	pCi/L	-1.03	U	2.27			
GEL	EPA 905.0 Modified	Strontium-90	pCi/L	0.183	U	1.05			
GEL	EPA 906.0 Modified	Tritium	pCi/L	175	U	248			
TA-SL	GA-01-R MOD	Cesium-137	pCi/L				1.1	U	6.1

Notes:
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APPENDIX B-2

CHEMICAL DATA – MARCH and APRIL 2012

APPENDIX B-2
Chemical Data - March 2012

Yankee Nuclear Power Station

			Location	CFW-5		CFW-5		CFW-6		SW-4		SW-5		CFW-1	
			Sample Date	3/6/2012		3/6/2012		3/6/2012		3/6/2012		3/6/2012		3/8/2012	
			Sample ID	CFW-5		CFW-5DUP		CFW-6		SW-4		SW-5		CFW-1	
			Qc Code	FS		FD		FS		FS		FS		FS	
Analysis	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW846 8260B	T	1,1,1,2-Tetrachloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,1,1-Trichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,1,2,2-Tetrachloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,1,2-Trichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,1-Dichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,1-Dichloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,2,4-Trichlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,2-Dichlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,2-Dichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,2-Dichloropropane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,3-Dichlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,3-Dichloropropene (total)	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,4-Dichlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	2-Butanone	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
SW846 8260B	T	4-Methyl-2-pentanone	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
SW846 8260B	T	Acetone	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
SW846 8260B	T	Benzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Bromodichloromethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Bromoform	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Bromomethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Carbon tetrachloride	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Chlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Chlorodibromomethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Chloroform	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Cis-1,2-Dichloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Ethyl benzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Methyl Tertbutyl Ether	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Methylene chloride	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
SW846 8260B	T	Naphthalene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Styrene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Tetrachloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Toluene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	trans-1,2-Dichloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Trichloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Vinyl chloride	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Xylenes, Total	ug/L	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8011	T	1,2-Dibromoethane	ug/L	0.0197	U	0.0197	U	0.0199	U	0.0198	U	0.0198	U	0.0195	U
SW846 6020A	D	Arsenic	ug/L												
SW846 6020A	D	Barium	ug/L												
SW846 6020A	D	Cadmium	ug/L												
SW846 6020A	D	Chromium	ug/L												
SW846 6020A	D	Lead	ug/L												
SW846 6020A	D	Selenium	ug/L												
SW846 6020A	D	Silver	ug/L												
SW846 6020A	T	Arsenic	ug/L	1.7	U	1.7	UJ	1.7	U	1.7	U	1.7	U	1.7	U
SW846 6020A	T	Barium	ug/L	68.1		68.5	J	60.2		14.2		12.6		24.8	
SW846 6020A	T	Cadmium	ug/L	0.11	U	0.11	UJ	0.11	U	0.11	U	0.11	U	0.11	U
SW846 6020A	T	Calcium	ug/L	31,900		33,000	J	16,700		3,120		2,770		1,900	
SW846 6020A	T	Chromium	ug/L	2	U	2	UJ	2	U	2	U	2	U	2.63	J
SW846 6020A	T	Copper	ug/L	0.35	U	0.35	UJ	0.35	U	0.35	U	0.35	U	4.06	
SW846 6020A	T	Iron	ug/L	85,500		86,400	J	67,100		2,080		1,520		9,150	
SW846 6020A	T	Lead	ug/L	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	1.2	J
SW846 6020A	T	Manganese	ug/L	5,320		5,360	J	4,930		240		141		220	
SW846 6020A	T	Selenium	ug/L	1.5	U	1.5	UJ	1.5	U	1.5	U	1.5	U	1.5	U
SW846 6020A	T	Silver	ug/L	0.2	U	0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	U
SW846 6020A	T	Sodium	ug/L	3,110		2,950	J	5,050		960		883		958	
SW846 6020A	T	Thallium	ug/L												
SW846 6020A	T	Zinc	ug/L	3.5	U	3.5	UJ	3.5	U	4.56	J	3.5	U	14.2	
SW846 7470A	D	Mercury	ug/L												
SW846 7470A	T	Mercury	ug/L	0.066	U	0.066	UJ	0.066	U	0.066	U	0.066	U	0.066	U
SW846 9012B	T	Cyanide, Total	ug/L	5	U	5	U	4.12	J	5	U	5	U	5	U
EPA 410.4	T	Chemical Oxygen Demand	mg/L	59.7		52.7		59.7		13.2	J	13.2	J	13.2	J
SM 2320B	T	Total Alkalinity, as CaCO3	mg/L		R	152		126		6.67		13.9		5.64	
SM 2540C	T	Total Dissolved Solids	mg/L		R	180		187		28.6		20		15	J
SW846 9056A	T	Chloride	mg/L		R	3.92		1.53		0.711		0.662		0.6	
SW846 9056A	T	Nitrate as N	mg/L		R	0.1	U	0.1	U	0.205		0.195		0.1	U
SW846 9056A	T	Sulfate	mg/L		R	0.557		0.755		4.79		4.67		2.78	

Notes:
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FD = Field Duplicate
TB = Trip Blank
ug/L = Micro grams per liter
mg/L = Milligrams per liter
U = Not detected
R = Rejected during data validation
J = Result is estimated

APPENDIX B-2
Chemical Data - March 2012

Yankee Nuclear Power Station

			Location	SP-1		SW-1		SW-2		SW-3		SW-011		SW-408	
			Sample Date	3/8/2012		3/8/2012		3/8/2012		3/8/2012		3/7/2012		3/7/2012	
			Sample ID	SP-1		SW-1		SW-2		SW-3		SW-011		SW-408	
			Qc Code	FS		FS		FS		FS		FS		FS	
Analysis	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW846 8260B	T	1,1,1,2-Tetrachloroethane	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,1,1-Trichloroethane	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,1,2,2-Tetrachloroethane	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,1,2-Trichloroethane	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,1-Dichloroethane	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,1-Dichloroethene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,2,4-Trichlorobenzene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,2-Dichlorobenzene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,2-Dichloroethane	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,2-Dichloropropane	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,3-Dichlorobenzene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,3-Dichloropropene (total)	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	1,4-Dichlorobenzene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	2-Butanone	ug/L	5	U	5	U	5	U	5	U				
SW846 8260B	T	4-Methyl-2-pentanone	ug/L	5	U	5	U	5	U	5	U				
SW846 8260B	T	Acetone	ug/L	5	U	5	U	5	U	5	U				
SW846 8260B	T	Benzene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Bromodichloromethane	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Bromoform	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Bromomethane	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Carbon tetrachloride	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Chlorobenzene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Chlorodibromomethane	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Chloroform	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Cis-1,2-Dichloroethene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Ethyl benzene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Methyl Tertbutyl Ether	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Methylene chloride	ug/L	5	U	5	U	5	U	5	U				
SW846 8260B	T	Naphthalene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Styrene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Tetrachloroethene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Toluene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	trans-1,2-Dichloroethene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Trichloroethene	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Vinyl chloride	ug/L	1	U	1	U	1	U	1	U				
SW846 8260B	T	Xylenes, Total	ug/L	1	U	1	U	1	U	1	U				
SW846 8011	T	1,2-Dibromoethane	ug/L	0.0197	U	0.0197	U	0.0197	U	0.0198	U				
SW846 6020A	D	Arsenic	ug/L									1.7	U	1.7	U
SW846 6020A	D	Barium	ug/L									10.2		10.9	
SW846 6020A	D	Cadmium	ug/L									0.11	U	0.11	U
SW846 6020A	D	Chromium	ug/L									2	U	2	U
SW846 6020A	D	Lead	ug/L									0.5	U	0.5	U
SW846 6020A	D	Selenium	ug/L									1.5	U	1.5	U
SW846 6020A	D	Silver	ug/L									0.2	U	0.2	U
SW846 6020A	T	Arsenic	ug/L	1.7	U	1.7	U	1.7	U	1.7	U				
SW846 6020A	T	Barium	ug/L	28		12.3		10.7		10.6					
SW846 6020A	T	Cadmium	ug/L	0.11	U	0.11	U	0.11	U	0.11	U				
SW846 6020A	T	Calcium	ug/L			2,390		1,890		1,950					
SW846 6020A	T	Chromium	ug/L	2	U	2	U	2	U	2	U				
SW846 6020A	T	Copper	ug/L			0.35	U	0.35	U	0.35	U				
SW846 6020A	T	Iron	ug/L			133		48	J	362					
SW846 6020A	T	Lead	ug/L	0.881	J	0.5	U	0.5	U	0.5	U				
SW846 6020A	T	Manganese	ug/L			14		4	J	24					
SW846 6020A	T	Selenium	ug/L	1.5	U	1.5	U	1.5	U	1.5	U				
SW846 6020A	T	Silver	ug/L	0.2	U	0.2	U	0.2	U	0.2	U				
SW846 6020A	T	Sodium	ug/L			878		675		654					
SW846 6020A	T	Thallium	ug/L	0.45	U										
SW846 6020A	T	Zinc	ug/L			4.51	J	4.91	J	3.62	J				
SW846 7470A	D	Mercury	ug/L									0.066	U	0.066	U
SW846 7470A	T	Mercury	ug/L	0.066	U	0.066	U	0.066	U	0.066	U				
SW846 9012B	T	Cyanide, Total	ug/L			5	U	5	U	5	U				
EPA 410.4	T	Chemical Oxygen Demand	mg/L			20	U	20	U	20	U				
SM 2320B	T	Total Alkalinity, as CaCO3	mg/L			2.57		2.05		3.08					
SM 2540C	T	Total Dissolved Solids	mg/L			20		15.7		8.57	J				
SW846 9056A	T	Chloride	mg/L			0.591		0.556		0.553					
SW846 9056A	T	Nitrate as N	mg/L			0.25		0.227		0.228					
SW846 9056A	T	Sulfate	mg/L			4.97		4.26		4.28					

Notes:
FS = Field Sample
FD = Field Duplicate
TB = Trip Blank
ug/L = Micro grams per liter
mg/L = Milligrams per liter
U = Not detected
R = Rejected during data validation
J = Result is estimated

APPENDIX B-2
Chemical Data - March 2012

Yankee Nuclear Power Station

			Location	QC		QC	
			Sample Date	3/6/2012		3/8/2012	
			Sample ID	TB-007		TB-008	
			Qc Code	TB		TB	
Analysis	Fraction	Parameter	Units	Result	Qualifier	Result	Qualifier
SW846 8260B	T	1,1,1,2-Tetrachloroethane	ug/L	1	U	1	U
SW846 8260B	T	1,1,1-Trichloroethane	ug/L	1	U	1	U
SW846 8260B	T	1,1,2,2-Tetrachloroethane	ug/L	1	U	1	U
SW846 8260B	T	1,1,2-Trichloroethane	ug/L	1	U	1	U
SW846 8260B	T	1,1-Dichloroethane	ug/L	1	U	1	U
SW846 8260B	T	1,1-Dichloroethene	ug/L	1	U	1	U
SW846 8260B	T	1,2,4-Trichlorobenzene	ug/L	1	U	1	U
SW846 8260B	T	1,2-Dichlorobenzene	ug/L	1	U	1	U
SW846 8260B	T	1,2-Dichloroethane	ug/L	1	U	1	U
SW846 8260B	T	1,2-Dichloropropane	ug/L	1	U	1	U
SW846 8260B	T	1,3-Dichlorobenzene	ug/L	1	U	1	U
SW846 8260B	T	1,3-Dichloropropene (total)	ug/L	1	U	1	U
SW846 8260B	T	1,4-Dichlorobenzene	ug/L	1	U	1	U
SW846 8260B	T	2-Butanone	ug/L	5	U	5	U
SW846 8260B	T	4-Methyl-2-pentanone	ug/L	5	U	5	U
SW846 8260B	T	Acetone	ug/L	5	U	5	U
SW846 8260B	T	Benzene	ug/L	1	U	1	U
SW846 8260B	T	Bromodichloromethane	ug/L	1	U	1	U
SW846 8260B	T	Bromoform	ug/L	1	U	1	U
SW846 8260B	T	Bromomethane	ug/L	1	U	1	U
SW846 8260B	T	Carbon tetrachloride	ug/L	1	U	1	U
SW846 8260B	T	Chlorobenzene	ug/L	1	U	1	U
SW846 8260B	T	Chlorodibromomethane	ug/L	1	U	1	U
SW846 8260B	T	Chloroform	ug/L	1	U	1	U
SW846 8260B	T	Cis-1,2-Dichloroethene	ug/L	1	U	1	U
SW846 8260B	T	Ethyl benzene	ug/L	1	U	1	U
SW846 8260B	T	Methyl Tertbutyl Ether	ug/L	1	U	1	U
SW846 8260B	T	Methylene chloride	ug/L	5	U	5	U
SW846 8260B	T	Naphthalene	ug/L	1	U	1	U
SW846 8260B	T	Styrene	ug/L	1	U	1	U
SW846 8260B	T	Tetrachloroethene	ug/L	1	U	1	U
SW846 8260B	T	Toluene	ug/L	1	U	1	U
SW846 8260B	T	trans-1,2-Dichloroethene	ug/L	1	U	1	U
SW846 8260B	T	Trichloroethene	ug/L	1	U	1	U
SW846 8260B	T	Vinyl chloride	ug/L	1	U	1	U
SW846 8260B	T	Xylenes, Total	ug/L	1	U	1	U
SW846 8011	T	1,2-Dibromoethane	ug/L	0.0201	U	0.0198	U
SW846 6020A	D	Arsenic	ug/L				
SW846 6020A	D	Barium	ug/L				
SW846 6020A	D	Cadmium	ug/L				
SW846 6020A	D	Chromium	ug/L				
SW846 6020A	D	Lead	ug/L				
SW846 6020A	D	Selenium	ug/L				
SW846 6020A	D	Silver	ug/L				
SW846 6020A	T	Arsenic	ug/L				
SW846 6020A	T	Barium	ug/L				
SW846 6020A	T	Cadmium	ug/L				
SW846 6020A	T	Calcium	ug/L				
SW846 6020A	T	Chromium	ug/L				
SW846 6020A	T	Copper	ug/L				
SW846 6020A	T	Iron	ug/L				
SW846 6020A	T	Lead	ug/L				
SW846 6020A	T	Manganese	ug/L				
SW846 6020A	T	Selenium	ug/L				
SW846 6020A	T	Silver	ug/L				
SW846 6020A	T	Sodium	ug/L				
SW846 6020A	T	Thallium	ug/L				
SW846 6020A	T	Zinc	ug/L				
SW846 7470A	D	Mercury	ug/L				
SW846 7470A	T	Mercury	ug/L				
SW846 9012B	T	Cyanide, Total	ug/L				
EPA 410.4	T	Chemical Oxygen Demand	mg/L				
SM 2320B	T	Total Alkalinity, as CaCO3	mg/L				
SM 2540C	T	Total Dissolved Solids	mg/L				
SW846 9056A	T	Chloride	mg/L				
SW846 9056A	T	Nitrate as N	mg/L				
SW846 9056A	T	Sulfate	mg/L				

Notes:
FS = Field Sample
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J = Result is estimated

APPENDIX B-3

VALIDATION CHECKLISTS – MARCH and APRIL 2012

Data Validation Summary
Yankee Nuclear Power Station
Rowe, Massachusetts
SDG: YR-004

INTRODUCTION

Eleven groundwater samples, seven surface water samples, two trip blanks, and one equipment blank were collected on March 5, 2012, through March 8, 2012, at the Yankee Nuclear Power Station, located in Rowe, Massachusetts. The samples were analyzed for one or more of the following parameters: volatile organic compounds (VOC) including ethylene dibromide, total metals, dissolved metals, wet chemistry parameters (cyanide, chemical oxygen demand [COD], nitrate, chloride, sulfate, total dissolved solids [TDS], and alkalinity), and radionuclides strontium-90, tritium, and gamma isotopes antimony-125, cesium-134, cesium-137, cobalt-60, europium-152, europium-154, europium-155, niobium-94, and silver-108. Sample analyses for all parameters were performed by GEL Laboratories, located in Charleston, South Carolina.

A chemist review was performed on all samples and analyses using information supplied by the laboratory. The data package was validated using USEPA Region I EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses (USEPA, 1996), the Yankee Nuclear Power Station Groundwater Monitoring Program, Document RP-05, Revision 3 (YNPS, 2009), and "Laboratory Data Validation Guidelines for Evaluating Radionuclide Analyses," Revision 7 (SAIC, 2002).

The following samples collected during March 2012 are included in the data evaluation:

Field Sample ID	GEL ID	Sample Date	Comment
CFW-5	297122001	3/6/12	VOC, total metals*, cyanide, COD, nitrate, chloride, sulfate, TDS, alkalinity
CFW-5 DUP	297122002	3/6/12	VOC, total metals*, cyanide, COD, nitrate, chloride, sulfate, TDS, alkalinity
CFW-6	297122003	3/6/12	VOC, total metals*, cyanide, COD, nitrate, chloride, sulfate, TDS, alkalinity
MW-107C	297122004	3/5/12	Gamma isotopes, strontium-90, tritium
SW-4	297122005	3/6/12	VOC, total metals*, cyanide, COD, nitrate, chloride, sulfate, TDS, alkalinity
SW-5	297122006	3/6/12	VOC, total metals*, cyanide, COD, nitrate, chloride, sulfate, TDS, alkalinity
TB-007	297122007	3/6/12	VOC
MW-104A	297122008	3/7/12	Gamma isotopes, strontium-90, tritium
MW-104A DUP	297122009	3/7/12	Gamma isotopes, strontium-90, tritium
MW-105B	297122010	3/7/12	Gamma isotopes, strontium-90, tritium
MW-106A	297122011	3/7/12	Gamma isotopes, strontium-90, tritium
EB-004	297122012	3/6/12	Gamma isotopes, strontium-90, tritium
CFW-1	297122013	3/8/12	VOC, total metals*, cyanide, COD, nitrate, chloride, sulfate, TDS, alkalinity
Monroe Dam	297122014	3/7/12	Gamma isotopes, strontium-90, tritium
SP-1	297122015	3/8/12	VOC, gamma isotopes, strontium-90, tritium, total metals**
SW-1	297122016	3/8/12	VOC, total metals*, cyanide, COD, nitrate, chloride, sulfate, TDS, alkalinity
SW-2	297122017	3/8/12	VOC, total metals*, cyanide, COD, nitrate, chloride, sulfate, TDS, alkalinity
SW-3	297122018	3/8/12	VOC, total metals*, cyanide, COD, nitrate, chloride, sulfate, TDS, alkalinity
SW-011	297122019	3/7/12	Gamma isotopes, strontium-90, tritium
SW-011	297122020	3/7/12	RCRA 8 dissolved metals
SW-408	297122021	3/7/12	Gamma isotopes, strontium-90, tritium
SW-408	297122022	3/7/12	RCRA 8 dissolved metals
TB-008	297122023	3/8/12	VOC

* Metals include – RCRA 8 (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver) + copper, iron, manganese, zinc, calcium, sodium

** Metals include – RCRA 8 (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver) + thallium

DATA REVIEW SUMMARY

Data were evaluated for the following parameters:

	Collection and Preservation
*	Holding Times
	Data Completeness
*	Surrogate Recoveries
	Blank Contamination
*	Duplicates
*	Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
	Miscellaneous

* - all criteria were met for this parameter

With the exception of the following items discussed below, results were determined to be usable as reported by the laboratory.

Collection and Preservation

Metals – The metals container for field duplicate CFW-5 DUP was received by the laboratory with a pH of 5, indicating improper preservation with nitric acid. The sample was preserved with nitric acid upon receipt by the laboratory. Based on Region I guidance, positive and non-detected results for CFW-5 DUP were qualified as estimated (J/UJ).

Wet Chemistry – The sample container for nitrate, chloride, sulfate, TDS, and alkalinity for sample CFW-5 was received by the laboratory with a pH <2, indicating possible preservation with nitric acid or potential mislabeling of the container in the field. Based on this finding, all results obtained from this container (nitrate, chloride, sulfate, TDS, and alkalinity) for sample CFW-5 were qualified as rejected (R). Final results for these parameters should be reported from the associated field duplicate CFW-5 DUP.

Data Completeness

VOC – The LCS and MS/MSD were reported using a subset of the VOC target analyte list. Consistent with the quality control requirements for Method 8260B, the laboratory reported five spiked compounds: 1,1-dichloroethene, benzene, toluene, chlorobenzene, and trichloroethene. The project QAPP stipulates LCS and MS/MSD containing the full VOC target list. The laboratory was reminded of the project requirement for future sampling events.

Blank Contamination

Cesium-137 – Cesium-137 (9.7 pCi/L) was reported in the equipment blank EB-004. An action level was calculated at five times the blank concentration and then compared to associated sample results. Based on SAIC guidance for validation of radionuclide data, low level detections of Cs-137 that were below the action level were qualified as estimated (J) in associated samples MW-107C, MW-104A DUP, and MW-105B.

Matrix Spike/Matrix Spike Duplicate

Alkalinity – The MS/MSD associated with sample CFW-5 and its field duplicate CFW-5DUP had percent recoveries of 0, indicating no recovery. The sample container for CFW-5 was received at the laboratory with a pH <2, indicating possible mislabeling of the alkalinity container or inadvertent spiking with nitric acid intended for preservation of the metals container. Based on this finding there was no action taken for the low MS/MSD recoveries, and all results obtained from analyses using the suspect sample container were qualified as rejected (R).

Miscellaneous

Wet Chemistry – All non-detected results for nitrate, chloride, sulfate, TDS, alkalinity, COD, and cyanide were reported on the electronic data deliverable (EDD) using MDL values. Standard AMEC convention is to report non-detected results for wet

chemistry parameters at the RLs. The non-detected values were manually changed from MDLs to RLs on the EDD during data validation.

Cesium-137 - The suspected Cs-137 radionuclide peak was detected in sample MW-104A, but failed to meet the positive identification criteria. The Cs-137 result was rejected by the laboratory due to the low abundance which resulted in the uncertain identification. Due to this uncertainty, the result was qualified as rejected (R).

References:

U.S. Environmental Protection Agency (USEPA), 1996. "Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, Parts I and II," Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December, 1996.

Yankee Nuclear Power Station (YNPS), 2009. "YNPS Groundwater Monitoring Program." ISFSI Radiation Protection, RP-05: Revision 3, June 16, 2009.

Science Applications International Corporation (SAIC), 2002. "Laboratory Data Validation Guidelines for Evaluating Radionuclide Analyses." Thomas L. Rucker, Ph.D. and C. Matrin Johnson, Jr.; Revision 7, April, 2002.

Data Validator: Julie Ricardi

Julie Ricardi

April 10, 2012

SENIOR REVIEW - BRADLEY B. LAFLEUR, NRCC-FAC APRIL 11, 2012

Bradley B. LaFleur

		Sample Delivery Group	YR-004			YR-004			YR-004			YR-004			YR-004			
		Location	Monroe Dam			MW-104A			MW-104A			MW-105B			MW-106A			M
		Sample Date	3/7/2012			3/7/2012			3/7/2012			3/7/2012			3/7/2012			3
		Sample ID	Monroe Dam			MW-104A			MW-104ADUP			MW-105B			MW-106A			M
		Qc Code	FS			FS			FD			FS			FS			
Analysis	Fraction	Parameter	Units	Result	Qualifier	Uncert.	Result	Qualifier	Uncert.	Result	Qualifier	Uncert.	Result	Qualifier	Uncert.	Result	Qualifier	Uncert.	Result
EPA 901.1	T	Antimony-125	pCi/L	-2.51	U	6.26	-5.09	U	9.27	3.62	U	8.09	4.15	U	9.8	2.55	U	9.33	-13.5
EPA 901.1	T	Cesium-134	pCi/L	-0.63	U	2.45	2.69	U	3.26	2.38	U	2.91	0.14	U	3.33	4.14	U	3.76	-1.33
EPA 901.1	T	Cesium-137	pCi/L	10.7		4.33		R	4.95	11.9	J	4.78	12.7	J	4.34	5.92	U	3.36	10.9
EPA 901.1	T	Cobalt-60	pCi/L	-0.299	U	2.3	-1.4	U	3.11	-0.744	U	2.68	-1.47	U	3.28	0.149	U	3.16	0.883
EPA 901.1	T	Europium-152	pCi/L	1.09	U	5.23	-0.708	U	9.54	-2.42	U	8.9	2.74	U	12.1	-13.3	U	13	-2.88
EPA 901.1	T	Europium-154	pCi/L	-0.107	U	6.71	-0.393	U	9.7	-7.48	U	8.06	-7.2	U	11.2	4.03	U	10.4	0.639
EPA 901.1	T	Europium-155	pCi/L	13.1	U	10.1	0.126	U	12	-6.34	U	10.4	-2.38	U	14.8	-2.52	U	12.7	-4.6
EPA 901.1	T	Niobium-94	pCi/L	-0.164	U	2.2	1.89	U	2.77	1.1	U	2.48	3.43	U	3.25	0.942	U	3.18	1.25
EPA 901.1	T	Silver-108	pCi/L	-0.383	U	2.11	1.83	U	2.97	0.51	U	2.38	1.46	U	3.14	-1.26	U	2.94	-3.14
EPA 905.0 Modified	T	Strontium-90	pCi/L	-0.52	U	0.917	-0.546	U	0.777	0.907	U	1.06	-0.463	U	0.897	0.585	U	1.03	0.228
EPA 906.0 Modified	T	Tritium	pCi/L	207	U	261	456		296	361	U	302	2500		650	395	U	282	11400

1 edit p. 1; else OK
Reviewed by
4/10/12

		Sample Delivery Group	YR-004			YR-004			YR-004			YR-004			YR-004		
		Location	IW-107C			QC			SP-1			SW-011			SW-408		
		Sample Date	3/5/2012			3/6/2012			3/8/2012			3/7/2012			3/7/2012		
		Sample ID	IW-107C			EB-004			SP-1			SW-011			SW-408		
		Qc Code	FS			EB			FS			FS			FS		
Analysis	Fraction	Parameter	Units	Qualifier	Uncert.	Result	Qualifier	Uncert.	Result	Qualifier	Uncert.	Result	Qualifier	Uncert.	Result	Qualifier	Uncert.
EPA 901.1	T	Antimony-125	pCi/L	U	12	2.66	U	7.11	-7.32	U	8.19	0.348	U	5.75	0.975	U	4.45
EPA 901.1	T	Cesium-134	pCi/L	U	3.39	0.352	U	2.49	1.12	U	2.7	-0.787	U	2.1	1.24	U	1.74
EPA 901.1	T	Cesium-137	pCi/L	J	5.22	9.73		4.8	6.11		5.5	7.08		3.66	2.71	U	2.22
EPA 901.1	T	Cobalt-60	pCi/L	U	2.86	2.29	U	2.91	-0.0298	U	3.09	0.905	U	2.29	1.27	U	1.71
EPA 901.1	T	Europium-152	pCi/L	U	11.9	1.23	U	7.83	-4.01	U	8.58	0.282	U	6.99	3.34	U	5
EPA 901.1	T	Europium-154	pCi/L	U	9.82	-0.232	U	7.42	-3.16	U	6.73	1.48	U	7.01	-1.2	U	4.87
EPA 901.1	T	Europium-155	pCi/L	U	13.2	6.68	U	9.96	5.73	U	11.1	-5.08	U	9.14	2.63	U	6.17
EPA 901.1	T	Niobium-94	pCi/L	U	2.9	2.88	U	2.77	0.554	U	2.11	-1.45	U	2.08	2.29	U	1.9
EPA 901.1	T	Silver-108	pCi/L	U	3.37	-1.03	U	2.27	0.104	U	2.59	0.211	U	1.89	0.292	U	1.52
EPA 905.0 Modified	T	Strontium-90	pCi/L	U	0.936	0.183	U	1.05	-0.895	U	0.688	1.12	U	1.2	-0.251	U	0.957
EPA 906.0 Modified	T	Tritium	pCi/L		2340	175	U	248	216	U	257	0	U	237	175	U	250

		Sample Delivery Group	YR-004		YR-004		YR-004		YR-004		YR-004		YR-004		YR-004	
		Location	CFW-1		CFW-5		CFW-5		CFW-6		QC		QC		SP-1	
		Sample Date	3/6/2012		3/6/2012		3/6/2012		3/6/2012		3/6/2012		3/8/2012		3/8/2012	
		Sample ID	CFW-1		CFW-5		CFW-5DUP		CFW-6		TB-007		TB-008		SP-1	
		Qc Code	FS		FS		FD		FS		TB		TB		FS	
Analysis	Fraction	Parameter	Units	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW846 8260B	T	1,1,1,2-Tetrachloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,1,1-Trichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,1,2,2-Tetrachloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,1,2-Trichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,1-Dichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,1-Dichloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,2,4-Trichlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,2-Dichlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,2-Dichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,2-Dichloropropane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,3-Dichlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,3-Dichloropropene (total)	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	1,4-Dichlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	2-Butanone	ug/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U
SW846 8260B	T	4-Methyl-2-pentanone	ug/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U
SW846 8260B	T	Acetone	ug/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U
SW846 8260B	T	Benzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Bromodichloromethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Bromoform	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Bromomethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Carbon tetrachloride	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Chlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Chlorodibromomethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Chloroform	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Cis-1,2-Dichloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Ethyl benzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Methyl Tertbutyl Ether	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Methylene chloride	ug/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U
SW846 8260B	T	Naphthalene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Styrene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Tetrachloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Toluene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	trans-1,2-Dichloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Trichloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Vinyl chloride	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8260B	T	Xylenes, Total	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SW846 8011	T	1,2-Dibromoethane	ug/L	0.0195	U	0.0197	U	0.0197	U	0.0199	U	0.0201	U	0.0198	U	0.0197	U
SW846 3005A/6020A	T	Arsenic	ug/L	1.7	U	1.7	U	1.7	UJ	1.7	U					1.7	U
SW846 3005A/6020A	T	Barium	ug/L	24.8		68.1		68.5	J	60.2						28	
SW846 3005A/6020A	T	Cadmium	ug/L	0.11	U	0.11	U	0.11	UJ	0.11	U					0.11	U
SW846 3005A/6020A	T	Calcium	ug/L	1,900		31,900		33,000	J	16,700							
SW846 3005A/6020A	T	Chromium	ug/L	2.63	J	2	U	2	UJ	2	U					2	U
SW846 3005A/6020A	T	Copper	ug/L	4.06		0.35	U	0.35	UJ	0.35	U						
SW846 3005A/6020A	T	Iron	ug/L	9,150		85,500		86,400	J	67,100							
SW846 3005A/6020A	T	Lead	ug/L	1.2	J	0.5	U	0.5	UJ	0.5	U					0.881	J
SW846 3005A/6020A	T	Manganese	ug/L	220		5320		5360	J	4930							
SW846 3005A/6020A	T	Selenium	ug/L	1.5	U	1.5	U	1.5	UJ	1.5	U					1.5	U
SW846 3005A/6020A	T	Silver	ug/L	0.2	U	0.2	U	0.2	UJ	0.2	U					0.2	U
SW846 3005A/6020A	T	Sodium	ug/L	958		3110		2950	J	5050							
SW846 3005A/6020A	T	Thallium	ug/L													0.45	U
SW846 3005A/6020A	T	Zinc	ug/L	14.2		3.5	U	3.5	UJ	3.5	U						
SW846 3005A/6020A	D	Arsenic	ug/L														

Reviewed by
4/10/12

		Sample Delivery Group	YR-004		YR-004		YR-004		YR-004		YR-004		YR-004		YR-004	
		Location	CFW-1		CFW-5		CFW-5		CFW-6		QC		QC		SP-1	
		Sample Date	3/8/2012		3/6/2012		3/6/2012		3/6/2012		3/6/2012		3/8/2012		3/8/2012	
		Sample ID	CFW-1		CFW-5		CFW-5DUP		CFW-6		TB-007		TB-008		SP-1	
		Qc Code	FS		FS		FD		FS		TB		TB		FS	
Analysis	Fraction	Parameter	Units	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW846 3005A/6020A	D	Barium	ug/L														
SW846 3005A/6020A	D	Cadmium	ug/L														
SW846 3005A/6020A	D	Chromium	ug/L														
SW846 3005A/6020A	D	Lead	ug/L														
SW846 3005A/6020A	D	Selenium	ug/L														
SW846 3005A/6020A	D	Silver	ug/L														
SW846 7470A	T	Mercury	ug/L	0.066	U	0.066	U	0.065	UJ	0.066	U					0.066	U
SW846 7470A	D	Mercury	ug/L														
SW846 9012B	T	Cyanide, Total	ug/L	5	U	5	U	5	U	4.12	J						
EPA 410.4	T	Chemical Oxygen Demand	mg/L	13.2	J	59.7		52.7		58.7							
SM 2320B	T	Total Alkalinity, as CaCO3	mg/L	5.64		R		152		126							
SM 2540C	T	Total Dissolved Solids	mg/L	15	J	R		180		187							
SW846 9056A	T	Chloride	mg/L	0.6		R		3.92		1.53							
SW846 9056A	T	Nitrate as N	mg/L	0.1	U	R		0.1	U	0.1	U						
SW846 9056A	T	Sulfate	mg/L	2.78		R		0.557		0.755							

		Sample Delivery Group	YR-004		YR-004		YR-004		YR-004		YR-004		YR-004		YR-004	
		Location	SW-011		SW-1		SW-2		SW-3		SW-4		SW-408		SW-5	
		Sample Date	3/7/2012		3/6/2012		3/6/2012		3/6/2012		3/6/2012		3/7/2012		3/6/2012	
		Sample ID	SW-011		SW-1		SW-2		SW-3		SW-4		SW-408		SW-5	
		Qc Code	FS		FS		FS		FS		FS		FS		FS	
Analysis	Fraction	Parameter	Units	Result Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW846 8260B	T	1,1,1,2-Tetrachloroethane	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,1,1-Trichloroethane	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,1,2,2-Tetrachloroethane	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,1,2-Trichloroethane	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,1-Dichloroethane	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,1-Dichloroethene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,2,4-Trichlorobenzene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,2-Dichlorobenzene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,2-Dichloroethane	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,2-Dichloropropane	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,3-Dichlorobenzene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,3-Dichloropropene (total)	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	1,4-Dichlorobenzene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	2-Butanone	ug/L		5	U	5	U	5	U	5	U			5	U
SW846 8260B	T	4-Methyl-2-pentanone	ug/L		5	U	5	U	5	U	5	U			5	U
SW846 8260B	T	Acetone	ug/L		5	U	5	U	5	U	5	U			5	U
SW846 8260B	T	Benzene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Bromodichloromethane	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Bromoform	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Bromomethane	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Carbon tetrachloride	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Chlorobenzene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Chlorodibromomethane	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Chloroform	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Cis-1,2-Dichloroethene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Ethyl benzene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Methyl Tertbutyl Ether	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Methylene chloride	ug/L		5	U	5	U	5	U	5	U			5	U
SW846 8260B	T	Naphthalene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Styrene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Tetrachloroethene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Toluene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	trans-1,2-Dichloroethene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Trichloroethene	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Vinyl chloride	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8260B	T	Xylenes, Total	ug/L		1	U	1	U	1	U	1	U			1	U
SW846 8011	T	1,2-Dibromoethane	ug/L		0.0197	U	0.0197	U	0.0198	U	0.0198	U			0.0198	U
SW846 3005A/6020A	T	Arsenic	ug/L		1.7	U	1.7	U	1.7	U	1.7	U			1.7	U
SW846 3005A/6020A	T	Barium	ug/L		12.3		10.7		10.6		14.2				12.6	
SW846 3005A/6020A	T	Cadmium	ug/L		0.11	U	0.11	U	0.11	U	0.11	U			0.11	U
SW846 3005A/6020A	T	Calcium	ug/L		2,390		1,890		1,950		3,120				2,770	
SW846 3005A/6020A	T	Chromium	ug/L		2	U	2	U	2	U	2	U			2	U
SW846 3005A/6020A	T	Copper	ug/L		0.35	U	0.35	U	0.35	U	0.35	U			0.35	U
SW846 3005A/6020A	T	Iron	ug/L		133		48	J	382		2,080				1,520	
SW846 3005A/6020A	T	Lead	ug/L		0.5	U	0.5	U	0.5	U	0.5	U			0.5	U
SW846 3005A/6020A	T	Manganese	ug/L		14.4		4.37	J	24.2		240				141	
SW846 3005A/6020A	T	Selenium	ug/L		1.5	U	1.5	U	1.5	U	1.5	U			1.5	U
SW846 3005A/6020A	T	Silver	ug/L		0.2	U	0.2	U	0.2	U	0.2	U			0.2	U
SW846 3005A/6020A	T	Sodium	ug/L		878		675		654		950				883	
SW846 3005A/6020A	T	Thallium	ug/L													
SW846 3005A/6020A	T	Zinc	ug/L		4.51	J	4.91	J	3.62	J	4.58	J			3.5	U
SW846 3005A/6020A	D	Arsenic	ug/L	1.7 U									1.7	U		

		Sample Delivery Group	YR-004		YR-004		YR-004		YR-004		YR-004		YR-004	
		Location	SW-011		SW-1		SW-2		SW-3		SW-4		SW-408		SW-5	
		Sample Date	3/7/2012		3/8/2012		3/8/2012		3/8/2012		3/6/2012		3/7/2012		3/6/2012	
		Sample ID	SW-011		SW-1		SW-2		SW-3		SW-4		SW-408		SW-5	
		Qc Code	FS		FS		FS		FS		FS		FS		FS	
Analysis	Fraction	Parameter	Units	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW846 3005A/6020A	D	Barium	ug/L	10.2								10.9					
SW846 3005A/6020A	D	Cadmium	ug/L	0.11	U							0.11	U				
SW846 3005A/6020A	D	Chromium	ug/L	2	U							2	U				
SW846 3005A/6020A	D	Lead	ug/L	0.5	U							0.5	U				
SW846 3005A/6020A	D	Selenium	ug/L	1.5	U							1.5	U				
SW846 3005A/6020A	D	Silver	ug/L	0.2	U							0.2	U				
SW846 7470A	T	Mercury	ug/L			0.066	U	0.066	U	0.066	U	0.066	U			0.066	U
SW846 7470A	D	Mercury	ug/L	0.066	U									0.066	U		
SW846 9012B	T	Cyanide, Total	ug/L			5	U	5	U	5	U	5	U			5	U
EPA 410.4	T	Chemical Oxygen Demand	mg/L			20	U	20	U	20	U	13.2	J			13.2	J
SM 2320B	T	Total Alkalinity, as CaCO3	mg/L			2.57		2.05		3.08		6.57				13.9	
SM 2540C	T	Total Dissolved Solids	mg/L			20		15.7		8.57	J	28.6				20	
SW846 9056A	T	Chloride	mg/L			0.591		0.556		0.553		0.711				0.562	
SW846 9056A	T	Nitrate as N	mg/L			0.25		0.227		0.228		0.205				0.195	
SW846 9056A	T	Sulfate	mg/L			4.97		4.26		4.28		4.79				4.67	

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Alkalinity

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
CFW-5	3/13/12	FS	Yes	See (1) below	Yes	See attached checklist
CFW-5DUP	3/13/12	DU (Field)	Yes	O.K.	Yes	See attached checklist
CFW-6	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-4	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-5	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-2	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-3	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202616599	3/13/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202616600	3/13/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202616603	3/13/12	DU (Lab)	Yes	O.K.	Yes	See attached checklist
QC1202619150	3/13/12	SK	Yes	O.K.	Yes	See attached checklist
QC1202619151	3/13/12	SK	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? X Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

(1) Sample CFW-5 received at lab with pH <2 due to suspected mislabeling of container intended for metals analyses; alkalinity result qualified rejected (R) -see attached checklist. No other processing issues or missing analytes

III. Resolution of Sample Processing/Missing Analytes comments:

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

(1) Sample CFW-5 received at lab with pH <2 due to suspected mislabeling of container intended for metals analyses; alkalinity result qualified rejected (R) -see attached checklist. No other processing issues or missing analytes

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):

See attached checklist for details on sample qualifications

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Minard Date: April 10, 2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Nitrate, Sulfate, Chloride

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
CFW-5	3/7/12	FS	Yes	See (1) below	Yes	See attached checklist
CFW-5DUP	3/7/12	DU (Field)	Yes	O.K.	Yes	See attached checklist
CFW-6	3/7/12	FS	Yes	O.K.	Yes	See attached checklist
SW-4	3/7/12	FS	Yes	O.K.	Yes	See attached checklist
SW-5	3/7/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-1	3/9/12	FS	Yes	O.K.	Yes	See attached checklist
SW-1	3/9/12	FS	Yes	O.K.	Yes	See attached checklist
SW-2	3/9/12	FS	Yes	O.K.	Yes	See attached checklist
SW-3	3/9/12	FS	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202613095	3/7/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202613098	3/7/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202613096	3/7/12	DU (Lab)	Yes	O.K.	Yes	See attached checklist
QC1202613097	3/7/12	SK	Yes	O.K.	Yes	See attached checklist
QC1202614784	3/9/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202614787	3/9/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202614785	3/9/12	DUP (Lab)	Yes	O.K.	Yes	See attached checklist
QC1202614786	3/9/12	SK	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

(1) Sample CFW-5 received at lab with pH <2 due to suspected mislabeling of container

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

intended for metals analyses; anions results qualified rejected (R) -see attached checklist. No other processing issues or missing analytes

III. Resolution of Sample Processing/Missing Analytes comments:

(1) Sample CFW-5 received at lab with pH <2 due to suspected mislabeling of container intended for metals analyses; anions results qualified rejected (R) -see attached checklist. No other processing issues or missing analytes

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):

See attached checklist for details on sample qualifications

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Minard Date: April 10, 2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Chemical Oxygen Demand

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
CFW-5	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-5DUP	3/13/12	DU (Field)	Yes	O.K.	Yes	See attached checklist
CFW-6	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-4	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-5	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-2	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-3	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202616501	3/13/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202616508	3/13/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202616503	3/13/12	DU (Lab)	Yes	O.K.	Yes	See attached checklist
QC1202616506	3/13/12	SK	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes

III. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

See attached checklist for details on sample qualifications

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Minard Date: April 10, 2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Cyanide

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
CFW-5	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-5DUP	3/13/12	DU (Field)	Yes	O.K.	Yes	See attached checklist
CFW-6	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-4	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-5	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-2	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-3	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202615224	3/13/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202615231	3/13/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202615225	3/13/12	DU (Lab)	Yes	O.K.	Yes	See attached checklist
QC1202615227	3/13/12	SK	Yes	O.K.	Yes	See attached checklist
QC1202615229	3/13/12	SK	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes

III. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):
See attached checklist for details on sample qualifications

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Miano Date: April 10, 2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Dissolved Mercury

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
SW-408	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
SW-011	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202620796	3/21/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202620797	3/21/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202620798	3/21/12	DU	Yes	O.K.	Yes	See attached checklist
QC1202620799	3/21/12	SK	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes

III. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):

See attached checklist for details on sample qualifications; no qualifications required

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Ward Date: April 4,2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Dissolved Metals (excluding mercury)

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
SW-408	3/22-23/10	FS	Yes	O.K.	Yes	See attached checklist
SW-011	3/22-23/10	FS	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202615043	3/21-23/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202615042	3/21-23/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202615044	3/22-23/12	SK	Yes	O.K.	Yes	See attached checklist
QC1202615045	3/22-23/12	SK	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes

III. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):

See attached checklist for details on sample qualifications; no qualifications required

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Nivard Date: April 4,2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC, Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

1,2-Dibromoethane (EDB)

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
CFW-5	3/20/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-5DUP	3/20/12	DU (Field)	Yes	O.K.	Yes	See attached checklist
CFW-6	3/20/12	FS	Yes	O.K.	Yes	See attached checklist
SW-4	3/20/12	FS	Yes	O.K.	Yes	See attached checklist
SW-5	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
TB-007	3/21/12	BL (Trip)	Yes	O.K.	Yes	See attached checklist
CFW-1	3/22/12	FS	Yes	O.K.	Yes	See attached checklist
SP-1	3/22/12	FS	Yes	O.K.	Yes	See attached checklist
SW-1	3/22/12	FS	Yes	O.K.	Yes	See attached checklist
SW-2	3/22/12	FS	Yes	O.K.	Yes	See attached checklist
SW-3	3/22/12	FS	Yes	O.K.	Yes	See attached checklist
TB-008	3/22/12	BL (Trip)	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202621596	3/20/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202621597	3/20/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202621595	3/20/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202621886	3/22/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202621887	3/22/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202621885	3/22/12	BL	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

II. Resolution of Sample Processing/Missing Analytes comments:
No processing issues or missing analytes

III. Resolution of Sample Processing/Missing Analytes comments:
No processing issues or missing analytes

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):
See attached checklist for details on sample qualifications; no qualifications required

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Rivard Date: April 4,2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Gamma Isotopes

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
MW-107C	3/9/12	FS	Yes	O.K.	Yes	See (1) below
MW-104A	3/9/12	FS	Yes	O.K.	Yes	See (2) below
MW-104A DUP	3/9/12	DU (Field)	Yes	O.K.	Yes	See (1) below
MW-105B	3/13/12	FS	Yes	O.K.	Yes	See (1) below
MW-106A	3/9/12	FS	Yes	O.K.	Yes	See attached Checklist
EB-004	3/9/12	BL (Field)	Yes	O.K.	Yes	See attached Checklist
Monroe Dam	3/9/12	FS	Yes	O.K.	Yes	See attached Checklist
SP-1	3/9/12	FS	Yes	O.K.	Yes	See attached Checklist
SW-011	3/9/12	FS	Yes	O.K.	Yes	See attached Checklist
SW-408	3/12/12	FS	Yes	O.K.	Yes	See attached Checklist
Laboratory QC						
QC1202614788	3/9/12	BL	Yes	O.K.	Yes	See attached Checklist
QC1202614791	3/9/12	QC	Yes	O.K.	Yes	See attached Checklist
QC1202614789	3/9/12	DU (Lab)	Yes	O.K.	Yes	See attached Checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes.

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

III. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes.

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):

(1) Cs-137 detected in equipment blank EB-004; positive detections less than five times the blank concentration were qualified as estimated (J) per validation guidance. (2) Cs-137 result for MW-104A qualified as rejected (R) based on uncertain identification and rejection of data by lab due to low abundance. See attached checklist for details; no other sample qualifications required.

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Minard Date: April10, 2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Strontium-90

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
MW-107C	3/17/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-104A	3/17/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-104A DUP	3/17/12	DU (Field)	Yes	O.K.	Yes	See attached Checklist
MW-105B	3/17/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-106A	3/17/12	FS	Yes	O.K.	Yes	See attached Checklist
EB-004	3/17/12	BL (Field)	Yes	O.K.	Yes	See attached Checklist
Monroe Dam	3/17/12	FS	Yes	O.K.	Yes	See attached Checklist
SP-1	3/17/12	FS	Yes	O.K.	Yes	See attached Checklist
SW-011	3/17/12	FS	Yes	O.K.	Yes	See attached Checklist
SW-408	3/17/12	FS	Yes	O.K.	Yes	See attached Checklist
Laboratory QC						
QC1202617503	3/17/12	BL	Yes	O.K.	Yes	See attached Checklist
QC1202617506	3/17/12	QC	Yes	O.K.	Yes	See attached Checklist
QC1202617505	3/17/12	SK	Yes	O.K.	Yes	See attached Checklist
QC1202617504	3/17/12	DU (Lab)	Yes	O.K.	Yes	See attached Checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes.

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

III. Resolution of Sample Processing/Missing Analytes comments:
No processing issues or missing analytes.

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):
(1) See attached checklist for details; no sample qualifications required.

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Miranda Date: April10, 2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Total Dissolved Solids

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
CFW-5	3/9/12	FS	Yes	See (1) below	Yes	See attached checklist
CFW-5DUP	3/9/12	DU (Field)	Yes	O.K.	Yes	See attached checklist
CFW-6	3/9/12	FS	Yes	O.K.	Yes	See attached checklist
SW-4	3/9/12	FS	Yes	O.K.	Yes	See attached checklist
SW-5	3/9/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-2	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-3	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202614491	3/9/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202614495	3/9/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202614493	3/9/12	DU (Lab)	Yes	O.K.	Yes	See attached checklist
QC1202616487	3/13/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202616490	3/13/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202616488	3/13/12	DU (Lab)	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

(1) Sample CFW-5 received at lab with pH <2 due to suspected mislabeling of container intended for metals analyses; TDS result qualified rejected (R) -see attached checklist. No other processing issues or missing analytes

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

III. Resolution of Sample Processing/Missing Analytes comments:

(1) Sample CFW-5 received at lab with pH <2 due to suspected mislabeling of container intended for metals analyses; TDS result qualified rejected (R) -see attached checklist. No other processing issues or missing analytes

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):

See attached checklist for details on sample qualifications

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Miranda Date: April 10, 2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Total Mercury

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
CFW-5	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-5DUP	3/21/12	DU (Field)	Yes	See (1) below	Yes	See attached checklist
CFW-6	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
SW-4	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
SW-5	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-1	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
SP-1	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
SW-1	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
SW-2	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
SW-3	3/21/12	FS	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202620796	3/21/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202620797	3/21/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202620798	3/21/12	DU	Yes	O.K.	Yes	See attached checklist
QC1202620799	3/21/12	SK	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

(1) Sample received by lab at pH = 5 and preserved upon receipt; see attached checklist for data qualifiers. No processing issues or missing analytes

III. Resolution of Sample Processing/Missing Analytes comments:

(1) Sample received by lab at pH = 5 and preserved upon receipt; see attached checklist

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

for data qualifiers. No processing issues or missing analytes

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):
See attached checklist for details on sample qualifications

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Mirabel Date: April 4,2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Total Metals (excluding mercury)

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
CFW-5	3/21-27/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-5DUP	3/22-27/12	DU (Field)	Yes	See (1) below	Yes	See attached checklist
CFW-6	3/22-27/12	FS	Yes	O.K.	Yes	See attached checklist
SW-4	3/22-27/12	FS	Yes	O.K.	Yes	See attached checklist
SW-5	3/22-27/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-1	3/22-27/12	FS	Yes	O.K.	Yes	See attached checklist
SP-1	3/22-23/12	FS	Yes	O.K.	Yes	See attached checklist
SW-1	3/22-27/12	FS	Yes	O.K.	Yes	See attached checklist
SW-2	3/22-27/12	FS	Yes	O.K.	Yes	See attached checklist
SW-3	3/22-27/12	FS	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202615043	3/21-27/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202615042	3/21-27/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202615044	3/22-27/12	SK	Yes	O.K.	Yes	See attached checklist
QC1202615045	3/22-27/12	SK	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments;

(1) Sample received by lab at pH = 5 and preserved upon receipt; see attached checklist for data qualifiers. No processing issues or missing analytes

III. Resolution of Sample Processing/Missing Analytes comments;

(1) Sample received by lab at pH = 5 and preserved upon receipt; see attached checklist

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

for data qualifiers. No processing issues or missing analytes

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):
See attached checklist for details on sample qualifications

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Miranda Date: April 10, 2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Tritium

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
MW-107C	3/21/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-104A	3/21/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-104A DUP	3/21/12	DU (Field)	Yes	O.K.	Yes	See attached Checklist
MW-105B	3/22/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-106A	3/21/12	FS	Yes	O.K.	Yes	See attached Checklist
EB-004	3/21/12	BL (Field)	Yes	O.K.	Yes	See attached Checklist
Monroe Dam	3/21/12	FS	Yes	O.K.	Yes	See attached Checklist
SP-1	3/21/12	FS	Yes	O.K.	Yes	See attached Checklist
SW-011	3/21/12	FS	Yes	O.K.	Yes	See attached Checklist
SW-408	3/21/12	FS	Yes	O.K.	Yes	See attached Checklist
Laboratory QC						
QC1202615331	3/21/12	BL	Yes	O.K.	Yes	See attached Checklist
QC1202615334	3/21/12	QC	Yes	O.K.	Yes	See attached Checklist
QC1202615333	3/21/12	SK	Yes	O.K.	Yes	See attached Checklist
QC1202615332	3/21/12	DU (Lab)	Yes	O.K.	Yes	See attached Checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

No processing issues or missing analytes.

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

III. Resolution of Sample Processing/Missing Analytes comments:
No processing issues or missing analytes.

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):
(1) See attached checklist for details; no sample qualifications required.

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Nivard Date: April10, 2012

Yankee Rowe GW Monitoring
SDG YR-004
GEL Work Order 297122
Duplicate Error Ratio (DER) Calculation Check

			Result	TPU	Duplicate Result	TPU		RPD	DER		QC Type
MW-104A	Tritium		456	296	361	302	U	23	0.22	OK	Field Dup
MW-104A	Tritium		456	296	569	306		22	0.27	OK	Lab Dup

RPD relative percent difference
DER duplicate error ratio
TPU total propagated error

Produced by: JAR 04/10/2012

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Volatile Organic Compounds (VOCs)

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
CFW-5	3/12/12	FS	Yes	O.K.	Yes	See attached checklist
CFW-5DUP	3/12/12	DU (Field)	Yes	O.K.	Yes	See attached checklist
CFW-6	3/12/12	FS	Yes	O.K.	Yes	See attached checklist
SW-4	3/12/12	FS	Yes	O.K.	Yes	See attached checklist
SW-5	3/12/12	FS	Yes	O.K.	Yes	See attached checklist
TB-007	3/12/12	BL (Trip)	Yes	O.K.	Yes	See attached checklist
CFW-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SP-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-1	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-2	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
SW-3	3/13/12	FS	Yes	O.K.	Yes	See attached checklist
TB-008	3/13/12	BL (Trip)	Yes	O.K.	Yes	See attached checklist
Laboratory QC						
QC1202615896	3/12/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202615893	3/12/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202617233	3/13/12	QC	Yes	O.K.	Yes	See attached checklist
QC1202617232	3/13/12	BL	Yes	O.K.	Yes	See attached checklist
QC1202615894	3/12/12	SK	Yes	O.K.	Yes	See attached checklist
QC1202615895	3/12/12	SK	Yes	O.K.	Yes	See attached checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

II. Resolution of Sample Processing/Missing Analytes comments:
No processing issues or missing analytes

III. Resolution of Sample Processing/Missing Analytes comments:
No processing issues or missing analytes

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):
See attached checklist for details on sample qualifications; no qualifications required

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Minard Date: April 4,2012

RADIONUCLIDE ANALYSES
VALIDATION CHECKLIST for YANKEE ROWE

TIER I / II / III / Chemist Review (circle one)

SITE: Yankee Rowe Project #: 361708715L/02 SDG #: YR-004

LAB #: 297122

Sample IDs: MW-107C MW-105B Monroe Dam SW-408
MW-104A MW-106A SP-1
MW-104A DUP EB-004 SW-011

YES NO NA		
Data completeness		
☑ ☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑ ☐	Data summaries match EDD	
Holding Times and Preservation		
☑ ☐	Hold times met (6 months)	
☑ ☐ ☐	Preserved	
Blanks (Background Checks)		
☑ ☐	Method blank was prepared with each batch of samples or with a maximum of 20 samples ** (J)	EB-004 : Cs-137 9.73 pCi/L (DL = 4.81) (J) MW-107C, MW-104A DUP, MW-105B; else ND or not associated w/ EB per Mike VanN. 4/4/12
☑ ☐	Are result <MDA qualify not detected (U)	
☐ N/A ☐	Are results > 5 times blank concentration	
Tracer Recovery		
☑ ☐ ☐	Recovery > 50% and <100%	EB-004 101% → OK since 110% & w/in control limits of 25-125%.
☐ ☑ ☐	Recovery >100%	SW-408 104%
Matrix Spikes MW-104A		
☑ ☐ ☐	Percent recovery of 75-125% excluding results exceeding the spike concentration by ≥4x	Sr-90 - OK Tritium - OK
☐ ☑ ☐	Was a field blank used for spike analysis	
Laboratory Control Samples (LCS)		
☑ ☐ ☐	Percent recoveries are within limits of 75-125%	
☑ ☐ ☐	LCS was analyzed for each matrix, batch of samples, or every 20 samples.	

** Per SAIC guidelines for validation, qualify results as estimated (J)

RADIONUCLIDE ANALYSES
VALIDATION CHECKLIST for YANKEE ROWE

TIER I / II / III / (Chemist Review) (circle one)

Laboratory Duplicate MW-104A ☐ ☑ Was a field blank used as the lab duplicate ☑ ☐ RPD within 20% for results greater than 5X CRDL ☐ ☑ Is the AZS >3 OK; see attached DQR calc. check ☑ ☐ ☐ Duplicate analyzed for every matrix and every 20 samples or batch	If the AZS for a particular radionuclide is > 3, qualify the results for that radionuclide in all associated samples of the same matrix as estimated (J).
Field Duplicate MW-104A / MW-104A DUP ☑ ☐ RPD within 20% for results greater than 5X CRDL ☐ ☐ Is the AZS >3	
Quantitation ☑ ☐ Results <DL qualified as non-detect (U)	NOTE: Cs-137 in MW-104A was reported by the lab as rejected, "uncertain identification" due to low abundance; final result qualified as ~~estimated (UJ)~~ rejected (R) based on prof. judgment & validation history. See attached narrative (e.mail) comments from GEL Labs.

Validator's Signature: Julie Mowell

Date: 4/4/12

Reviewed By: _____

Date: _____

Main Identity

From: "Julie Ricardi" <jricardi@maine.rr.com>
To: "julie ricardi" <jricardi@Maine.rr.com>
Sent: Tuesday, April 10, 2012 9:05 AM
Subject: Re: Yankee Rowe SDG 297122 - Rad Question

----- Original Message -----
From: "Edie Kent" <emk@gel.com>
To: "Julie Ricardi" <jricardi@maine.rr.com>
Cc: <team.kent@gel.com>; "VanNoordennen, Miles G" <Miles.VanNoordennen@amec.com>; "LaForest, Brad B" <Brad.LaForest@amec.com>; "Cunningham, Tige L." <Tige.Cunningham@amec.com>; "Nancy Mattern" <nancy.mattern@gel.com>
Sent: Tuesday, April 10, 2012 8:43 AM
Subject: Re: Yankee Rowe SDG 297122 - Rad Question

> Julie:
> Concerning the Cs-137 results, the lab reviewed the data and the spectral
> data appears correct. Cs-137 seems to be present in most of the samples.
> During the review the lab did not find any reason to suggest that the
> peaks identified were the result of anything but Cs-137. One thing
> noticed by the lab during the review was that the sample you mentioned as
> being rejected (MW-104A, GEL ID 297122008, did have a Cs-137 peak (661.6
> keV) when viewed on the spectrum, however, the software had difficulty
> resolving it from the 665 peak of Bi-214. As a result, the peak centroid
> was located at 663.3 keV which is outside our range of ± 1.5 keV of the
> known centroid of 661.6 keV. A rough estimate puts the activity as a
> similar amount to MW-104ADUP, GEL ID 297122009. The lab attempted to
> adjust the Gaussian and standard sensitivities to help the software
> properly resolve this peak but was unsuccessful.
>
> Edie
>
> Julie Ricardi wrote:
>
>> Hi All,
>> I've learned that we don't have any history of detection of Cs-137 at
>> any of the locations for Yankee Rowe, yet it has been reported at low
>> levels in most of the samples as well as in the equipment blank EB-004.
>> Based on this information, and the narrative comments concerning the
>> Cs-137 detection which the lab rejected in MW-104A (see e-mail below),
>> I'd like to ask the lab to carefully review all of the data for Cs-137
>> analyses for all samples and QC in SDG 297122 and let us know if anything
>> at all looks anomalous.
>> Thanks very much,
>> Julie
>>
>> >>

Quality Control (QC) Information:

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

Designated QC
The following sample was used for QC: 297122008 (MW-104A).

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

Technical Information:

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

Sample Re-prep/Re-analysis
Sample 297122021 (SW-408) was recounted due to a peak shift. Sample 297122010 (MW-105B) was recounted due to a high Eu-152 required detection limit.

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.

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

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to low abundance.	Cesium-137	297122008	MW-104A

"Uncertain identification" : qualify as rejected (R)

jn 4/10/12

Method/Analysis Information

Product:	**GFPC, Sr90, liquid**
Analytical Method:	EPA 905.0 Modified
Analytical Batch Number:	1196118

Sample ID	Client ID
297122004	MW-107C
297122008	MW-104A
297122009	MW-104ADUP

Yankee Rowe GW Monitoring
SDG YR-004
GEL Work Order 297122
Duplicate Error Ratio (DER) Calculation Check

			Result	TPU	Duplicate Result	TPU		RPD	DER		QC Type
MW-104A	Tritium		456	296	361	302	U	23	0.22	OK	Field Dup
MW-104A	Tritium		456	296	569	306		22	0.27	OK	Lab Dup

RPD relative percent difference
DER duplicate error ratio
TPU total propagated error

Produced by: JAR 04/10/2012

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: March 22, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: MW-107C
Sample ID: 297122004
Matrix: GW
Collect Date: 05-MAR-12
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid "As Received"													
Antimony-125	U	-13.5	+/-10.3	16.0	+/-12.0	30.0	pCi/L		KXG3	03/09/12	1413	1195010	1
Cesium-134	U	-1.33	+/-3.34	5.89	+/-3.39	10.0	pCi/L						
Cesium-137		10.9 J	+/-5.22	6.42	+/-5.22	20.0	pCi/L						
Cobalt-60	U	0.883	+/-2.83	5.78	+/-2.86	10.0	pCi/L						
Europium-152	U	-2.88	+/-11.9	18.8	+/-11.9	20.0	pCi/L						
Europium-154	U	0.639	+/-9.81	18.9	+/-9.82	30.0	pCi/L						
Europium-155	U	-4.6	+/-13.1	23.1	+/-13.2	60.0	pCi/L						
Niobium-94	U	1.25	+/-2.84	5.47	+/-2.90	50.0	pCi/L						
Silver-108m	U	-3.14	+/-3.06	4.85	+/-3.37	15.0	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Sr90, liquid "As Received"													
Strontium-90	U	0.228	+/-0.935	1.78	+/-0.936	2.00	pCi/L		VXC2	03/17/12	1417	1196118	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Liquid "As Received"													
Tritium		11400	+/-782	463	+/-2340	700	pCi/L		BYS1	03/21/12	2340	1195236	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1196118	97.8	(25%-125%)

Notes:

4/4/12

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: March 22, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: MW-104A
Sample ID: 297122008
Matrix: GW
Collect Date: 07-MAR-12
Receive Date: 08-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid "As Received"													
Antimony-125	U	-5.09	+/-8.98	14.9	+/-9.27	30.0	pCi/L		KXG3	03/09/12	1503	1195010	1
Cesium-134	U	2.69	+/-3.02	5.68	+/-3.26	10.0	pCi/L						
Cesium-137	~~UI~~ U	0.00 R	+/-3.53	6.86	+/-4.95	20.0	pCi/L						
Cobalt-60	U	-1.4	+/-3.04	5.22	+/-3.11	10.0	pCi/L						
Europium-152	U	-0.708	+/-9.54	16.5	+/-9.54	20.0	pCi/L						
Europium-154	U	-0.393	+/-9.70	14.9	+/-9.70	30.0	pCi/L						
Europium-155	U	0.126	+/-12.0	20.6	+/-12.0	60.0	pCi/L						
Niobium-94	U	1.89	+/-2.64	4.89	+/-2.77	50.0	pCi/L						
Silver-108m	U	1.83	+/-2.86	5.06	+/-2.97	15.0	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Sr90, liquid "As Received"													
Strontium-90	U	-0.546	+/-0.777	1.79	+/-0.777	2.00	pCi/L		VXC2	03/17/12	1417	1196118	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Liquid "As Received"													
Tritium		456	+/-283	440	+/-296	700	pCi/L		BYS1	03/21/12	1835	1195236	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1196118	97.8	(25%-125%)

Notes:

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: March 22, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: MW-104ADUP
Sample ID: 297122009
Matrix: GW
Collect Date: 07-MAR-12
Receive Date: 08-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid "As Received"													
Antimony-125	U	3.62	+/-7.93	14.0	+/-8.09	30.0	pCi/L		KXG3	03/09/12	1504	1195010	1
Cesium-134	U	2.38	+/-2.71	5.14	+/-2.91	10.0	pCi/L						
Cesium-137		11.9 J	+/-4.78	4.52	+/-4.78	20.0	pCi/L						
Cobalt-60	U	-0.744	+/-2.66	4.71	+/-2.68	10.0	pCi/L						
Europium-152	U	-2.42	+/-8.84	15.2	+/-8.90	20.0	pCi/L						
Europium-154	U	-7.48	+/-7.32	11.9	+/-8.06	30.0	pCi/L						
Europium-155	U	-6.34	+/-10.0	16.7	+/-10.4	60.0	pCi/L						
Niobium-94	U	1.10	+/-2.41	4.42	+/-2.46	50.0	pCi/L						
Silver-108m	U	0.510	+/-2.37	4.14	+/-2.38	15.0	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Sr90, liquid "As Received"													
Strontium-90	U	0.907	+/-1.05	1.75	+/-1.06	2.00	pCi/L		VXC2	03/17/12	1417	1196118	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Liquid "As Received"													
Tritium	U	361	+/-294	479	+/-302	700	pCi/L		BYS1	03/21/12	2357	1195236	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1196118	98.9	(25%-125%)

Notes:

4/14/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company: AMEC Environment & Infrastructure
Address: 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: March 22, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: MW-105B
Sample ID: 297122010
Matrix: GW
Collect Date: 07-MAR-12
Receive Date: 08-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid "As Received"													
Antimony-125	U	4.15	+/-9.62	16.9	+/-9.80	30.0	pCi/L		KXG3	03/13/12	0921	1195010	1
Cesium-134	U	0.140	+/-3.33	5.66	+/-3.33	10.0	pCi/L						
Cesium-137		12.7 J	+/-4.34	5.01	+/-4.34	20.0	pCi/L						
Cobalt-60	U	-1.47	+/-3.21	5.42	+/-3.28	10.0	pCi/L						
Europium-152	U	2.74	+/-12.0	19.3	+/-12.1	20.0	pCi/L						
Europium-154	U	-7.2	+/-10.7	15.0	+/-11.2	30.0	pCi/L						
Europium-155	U	-2.38	+/-14.8	25.4	+/-14.8	60.0	pCi/L						
Niobium-94	U	3.43	+/-2.85	5.05	+/-3.25	50.0	pCi/L						
Silver-108m	U	1.46	+/-3.07	5.39	+/-3.14	15.0	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Sr90, liquid "As Received"													
Strontium-90	U	-0.463	+/-0.897	1.98	+/-0.897	2.00	pCi/L		VXC2	03/17/12	1417	1196118	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Liquid "As Received"													
Tritium		2500	+/-435	472	+/-650	700	pCi/L		BYS1	03/22/12	0013	1195236	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1196118	91.1	(25%-125%)

Notes:

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: March 22, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: MW-106A
Sample ID: 297122011
Matrix: GW
Collect Date: 07-MAR-12
Receive Date: 08-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid "As Received"													
Antimony-125	U	2.55	+/-9.26	16.6	+/-9.33	30.0	pCi/L		KXG3	03/09/12	1505	1195010	1
Cesium-134	U	4.14	+/-3.26	6.22	+/-3.76	10.0	pCi/L						
Cesium-137	U	5.92	+/-3.36	6.03	+/-3.36	20.0	pCi/L						
Cobalt-60	U	0.149	+/-3.16	5.72	+/-3.16	10.0	pCi/L						
Europium-152	U	-13.3	+/-11.5	16.7	+/-13.0	20.0	pCi/L						
Europium-154	U	4.03	+/-10.3	16.7	+/-10.4	30.0	pCi/L						
Europium-155	U	-2.52	+/-12.6	22.1	+/-12.7	60.0	pCi/L						
Niobium-94	U	0.942	+/-3.15	5.60	+/-3.18	50.0	pCi/L						
Silver-108m	U	-1.26	+/-2.89	5.02	+/-2.94	15.0	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Sr90, liquid "As Received"													
Strontium-90	U	0.585	+/-1.03	1.82	+/-1.03	2.00	pCi/L		VXC2	03/17/12	1418	1196118	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Liquid "As Received"													
Tritium	U	395	+/-272	430	+/-282	700	pCi/L		BYS1	03/21/12	1923	1195236	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1196118	100	(25%-125%)

Notes:

dr 4/4/12

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Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: March 22, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: EB-004
Sample ID: 297122012
Matrix: GW
Collect Date: 07-MAR-12
Receive Date: 08-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

EB

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid "As Received"													
Antimony-125	U	2.66	+/-7.01	13.7	+/-7.11	30.0	pCi/L		KXG3	03/09/12	1516	1195010	1
Cesium-134	U	0.352	+/-2.49	4.86	+/-2.49	10.0	pCi/L						
Cesium-137		9.73	+/-4.80	4.81	+/-4.80	20.0	pCi/L						
Cobalt-60	U	2.29	+/-2.72	6.09	+/-2.91	10.0	pCi/L						
Europium-152	U	1.23	+/-7.81	14.2	+/-7.83	20.0	pCi/L						
Europium-154	U	-0.232	+/-7.42	14.6	+/-7.42	30.0	pCi/L						
Europium-155	U	6.68	+/-9.49	17.9	+/-9.96	60.0	pCi/L						
Niobium-94	U	2.88	+/-2.45	5.21	+/-2.77	50.0	pCi/L						
Silver-108m	U	-1.03	+/-2.22	3.99	+/-2.27	15.0	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Sr90, liquid "As Received"													
Strontium-90	U	0.183	+/-1.05	2.00	+/-1.05	2.00	pCi/L		VXC2	03/17/12	1418	1196118	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Liquid "As Received"													
Tritium	U	175	+/-246	420	+/-248	700	pCi/L		BYS1	03/21/12	1940	1195236	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1196118	101	(25%-125%)

Notes:

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Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: March 22, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: Monroe Dam
Sample ID: 297122014
Matrix: SW
Collect Date: 07-MAR-12
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid "As Received"													
Antimony-125	U	-2.51	+/-6.15	10.6	+/-6.26	30.0	pCi/L		KXG3	03/09/12	1628	1195010	1
Cesium-134	U	-0.63	+/-2.43	4.47	+/-2.45	10.0	pCi/L						
Cesium-137		10.7	+/-4.33	3.95	+/-4.33	20.0	pCi/L						
Cobalt-60	U	-0.299	+/-2.29	4.51	+/-2.30	10.0	pCi/L						
Europium-152	U	1.09	+/-6.21	11.5	+/-6.23	20.0	pCi/L						
Europium-154	U	-0.107	+/-6.71	13.4	+/-6.71	30.0	pCi/L						
Europium-155	U	13.1	+/-8.23	16.3	+/-10.1	60.0	pCi/L						
Niobium-94	U	-0.164	+/-2.20	4.12	+/-2.20	50.0	pCi/L						
Silver-108m	U	-0.383	+/-2.10	3.71	+/-2.11	15.0	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Sr90, liquid "As Received"													
Strontium-90	U	-0.52	+/-0.917	1.99	+/-0.917	2.00	pCi/L		VXC2	03/17/12	1418	1196118	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Liquid "As Received"													
Tritium	U	207	+/-258	437	+/-261	700	pCi/L		BYS1	03/21/12	1956	1195236	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1196118	98.9	(25%-125%)

Notes:

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Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: March 22, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SP-1
Sample ID: 297122015
Matrix: SW
Collect Date: 08-MAR-12
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid "As Received"													
Antimony-125	U	-7.32	+/-7.50	12.5	+/-8.19	30.0	pCi/L		KXG3	03/09/12	1628	1195010	1
Cesium-134	U	1.12	+/-2.66	5.19	+/-2.70	10.0	pCi/L						
Cesium-137		6.11	+/-5.50	5.47	+/-5.50	20.0	pCi/L						
Cobalt-60	U	-0.0298	+/-3.08	5.80	+/-3.09	10.0	pCi/L						
Europium-152	U	-4.01	+/-8.39	14.9	+/-8.58	20.0	pCi/L						
Europium-154	U	-3.16	+/-6.57	11.7	+/-6.73	30.0	pCi/L						
Europium-155	U	5.73	+/-10.8	19.8	+/-11.1	60.0	pCi/L						
Niobium-94	U	0.564	+/-2.10	4.04	+/-2.11	50.0	pCi/L						
Silver-108m	U	0.104	+/-2.59	4.77	+/-2.59	15.0	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Sr-90, liquid "As Received"													
Strontium-90	U	-0.895	+/-0.687	1.80	+/-0.688	2.00	pCi/L		VXC2	03/17/12	1418	1196118	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Liquid "As Received"													
Tritium	U	216	+/-254	428	+/-257	700	pCi/L		BYS1	03/21/12	2012	1195236	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1196118	97.8	(25%-125%)

Notes:

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Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
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Report Date: March 22, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-011
Sample ID: 297122019
Matrix: SW
Collect Date: 07-MAR-12
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid "As Received"													
Antimony-125	U	0.348	+/-5.75	10.8	+/-5.75	30.0	pCi/L		KXG3	03/09/12	1659	1195010	1
Cesium-134	U	-0.787	+/-2.07	3.84	+/-2.10	10.0	pCi/L						
Cesium-137		7.08	+/-3.66	4.62	+/-3.66	20.0	pCi/L						
Cobalt-60	U	0.905	+/-2.25	4.76	+/-2.29	10.0	pCi/L						
Europium-152	U	0.282	+/-6.99	12.9	+/-6.99	20.0	pCi/L						
Europium-154	U	1.48	+/-6.98	14.0	+/-7.01	30.0	pCi/L						
Europium-155	U	-5.08	+/-8.85	15.0	+/-9.14	60.0	pCi/L						
Niobium-94	U	-1.45	+/-1.98	3.45	+/-2.08	50.0	pCi/L						
Silver-108m	U	0.211	+/-1.89	3.57	+/-1.89	15.0	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Sr90, liquid "As Received"													
Strontium-90	U	1.12	+/-1.19	1.97	+/-1.20	2.00	pCi/L		VXC2	03/17/12	1418	1196118	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Liquid "As Received"													
Tritium	U	0.00	+/-237	436	+/-237	700	pCi/L		BYS1	03/21/12	2029	1195236	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1196118	100	(25%-125%)

Notes:

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Company : AMEC Environment & Infrastructure
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Report Date: March 22, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-408
Sample ID: 297122021
Matrix: SW
Collect Date: 07-MAR-12
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid "As Received"													
Antimony-125	U	0.975	+/-4.43	8.23	+/-4.45	30.0	pCi/L		KXG3	03/12/12	1140	1195010	1
Cesium-134	U	1.24	+/-1.65	3.38	+/-1.74	10.0	pCi/L						
Cesium-137	U	2.71	+/-1.85	3.75	+/-2.22	20.0	pCi/L						
Cobalt-60	U	1.27	+/-1.62	3.41	+/-1.71	10.0	pCi/L						
Europium-152	U	3.34	+/-4.77	9.16	+/-5.00	20.0	pCi/L						
Europium-154	U	-1.2	+/-4.84	8.70	+/-4.87	30.0	pCi/L						
Europium-155	U	2.63	+/-6.06	11.1	+/-6.17	60.0	pCi/L						
Niobium-94	U	2.29	+/-1.59	3.23	+/-1.90	50.0	pCi/L						
Silver-108m	U	0.292	+/-1.51	2.80	+/-1.52	15.0	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Sr-90, liquid "As Received"													
Strontium-90	U	-0.251	+/-0.956	1.94	+/-0.957	2.00	pCi/L		VXC2	03/17/12	1418	1196118	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Liquid "As Received"													
Tritium	U	176	+/-248	423	+/-250	700	pCi/L		BYS1	03/21/12	2045	1195236	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1196118	104	(25%-125%)

Notes:

4/4/12

anions CN⁻ alkalinity COD TDS

Project: Yankee Rowe **Method:** 9056A ; 9012B ; SM 2320B ; 410.4 ; SM 2540C
Project #: 361708715 2/02 **Laboratory and SDG:** GEL # 297122 ; YR-004
Date: 4/4/12 **Reviewer:** Julie Ricardi

Sample IDs: CFW-5 * SW-5 SW-3
CFW-5 DUP CFW-1
CFW-6 SW-1
SW-4 SW-2

1. **Case Narrative and Data Package Completeness**

* Sample container for nitrate, chloride, sulfate, TDS, & alkalinity CFW-5 appeared to have been inadvertently preserved with HNO_3 (intended for metals container, which is also discussed on Inorganic Validation checklist); qualify results for these parameters as rejected (R) and use CFW-5 DUP for final reporting of nitrate, chloride, sulfate, TDS, and alkalinity.

2. **Holding Time**

All analyzed within HT

3. **QC Blanks**

All ND

NOTE: wet chemistry parameters reported match RFP Table 6.

4. **Initial Calibration Results**

N/A – Chemist Review

5. **Continuing Calibration Results**

6. **Laboratory Control Sample Review**

All in control

7. **Field Duplicate Precision**

All in control CFW-5 / CFW-5 DUP

8. **Matrix Spike Results (if applicable)**

Alkalinity MS/MSD (CFW-5) : 0% recoveries due to inadvertent acidification of CFW-5 from mis-labeling containers in the field; no action taken for low MS/MSD; all other QC is acceptable.

NOTE: EDD reports ND result to MDL value; AMEC convention is to report wet chem non-detects @ "RL 4"; non-detect results manually changed to "U" 4 during validation.

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Report Date: March 28, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-5
Sample ID: 297122001
Matrix: GW
Collect Date: 06-MAR-12 11:07
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Use CFW-5 Dup for nitrate, sulfate, chloride, TDS, and alkalinity

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
SW9012B Cyanide, Total "As Received"											
Cyanide, Total	~~U~~	~~ND~~ R 5 U	1.50	5.00	ug/L	1	AXH3	03/13/12	1300	1195202	1
Ion Chromatography											
SW846 9056A Chloride, Nitrate, and Sulfate "As Received"											
Chloride		~~3.90~~ R	0.066	0.200	mg/L	1	VH1	03/07/12	2057	1194267	2
Nitrate-N	~~U~~	~~ND~~	0.033	0.100	mg/L	1					
Sulfate		~~0.589~~ ↓	0.100	0.400	mg/L	1					
Solids Analysis											
SM2540C Solids, Dissolved "As Received"											
Total Dissolved Solids		~~514~~ R	3.40	14.3	mg/L		LYG1	03/09/12	0928	1194884	3
Spectrometric Analysis											
EPA 410.4 Chem. Oxygen Demand "As Received"											
COD		59.7	6.50	20.0	mg/L	1	TXT1	03/13/12	1521	1195717	4
Titration Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3	~~U~~	~~ND~~ R	0.725	1.00	mg/L		LXA1	03/13/12	1201	1195754	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	03/12/12	0945	1195200

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9012B	
2	SW846 9056A	
3	SM 2540C	
4	EPA 410.4	
5	SM 2320B	

DN 4/4/12

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Certificate of Analysis

Report Date: March 28, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-5DUP
Sample ID: 297122002
Matrix: GW
Collect Date: 06-MAR-12 11:07
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
SW9012B Cyanide, Total "As Received"												
Cyanide, Total	U	ND	5 U	1.50	5.00	ug/L	1	AXH3	03/13/12	1313	1195202	1
Ion Chromatography												
SW846 9056A Chloride, Nitrate, and Sulfate "As Received"												
Chloride		3.92		0.066	0.200	mg/L	1	VH1	03/07/12	2215	1194267	2
Nitrate-N	U	ND	0.1 U	0.033	0.100	mg/L	1					
Sulfate		0.557		0.100	0.400	mg/L	1					
Solids Analysis												
SM2540C Solids, Dissolved "As Received"												
Total Dissolved Solids		180		7.93	33.3	mg/L		LYG1	03/09/12	0928	1194884	3
Spectrometric Analysis												
EPA 410.4 Chem. Oxygen Demand "As Received"												
COD		52.7		6.50	20.0	mg/L	1	TXT1	03/13/12	1523	1195717	4
Titration Analysis												
SM 2320B Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		152		0.725	1.00	mg/L		LXA1	03/13/12	1208	1195754	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	03/12/12	0945	1195200

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9012B	
2	SW846 9056A	
3	SM 2540C	
4	EPA 410.4	
5	SM 2320B	

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Certificate of Analysis

Report Date: March 28, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-6
Sample ID: 297122003
Matrix: GW
Collect Date: 06-MAR-12 11:01
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
SW9012B Cyanide, Total "As Received"											
Cyanide, Total	J	4.12	1.50	5.00	ug/L	1	AXH3	03/13/12	1314	1195202	1
Ion Chromatography											
SW846 9056A Chloride, Nitrate, and Sulfate "As Received"											
Chloride		1.53	0.066	0.200	mg/L	1	VH1	03/07/12	2241	1194267	2
Nitrate-N	U	ND 0.1 U	0.033	0.100	mg/L	1					
Sulfate		0.755	0.100	0.400	mg/L	1					
Solids Analysis											
SM2540C Solids, Dissolved "As Received"											
Total Dissolved Solids		187	7.93	33.3	mg/L		LYG1	03/09/12	0928	1194884	3
Spectrometric Analysis											
EPA 410.4 Chem. Oxygen Demand "As Received"											
COD		59.7	6.50	20.0	mg/L	1	TXT1	03/13/12	1523	1195717	4
Titration Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		126	0.725	1.00	mg/L		LXA1	03/13/12	1219	1195754	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	03/12/12	0945	1195200

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9012B	
2	SW846 9056A	
3	SM 2540C	
4	EPA 410.4	
5	SM 2320B	

4/5/12

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Report Date: March 28, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-4
Sample ID: 297122005
Matrix: SW
Collect Date: 06-MAR-12 11:15
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
SW9012B Cyanide, Total "As Received"											
Cyanide, Total	U	ND 5u	1.50	5.00	ug/L	1	AXH3	03/13/12	1316	1195202	1
Ion Chromatography											
SW846 9056A Chloride, Nitrate, and Sulfate "As Received"											
Chloride		0.711	0.066	0.200	mg/L	1	VH1	03/07/12	2307	1194267	2
Nitrate-N		0.205	0.033	0.100	mg/L	1					
Sulfate		4.79	0.100	0.400	mg/L	1					
Solids Analysis											
SM2540C Solids, Dissolved "As Received"											
Total Dissolved Solids		28.6	3.40	14.3	mg/L		LYG1	03/09/12	0928	1194884	3
Spectrometric Analysis											
EPA 410.4 Chem. Oxygen Demand "As Received"											
COD	J	13.2	6.50	20.0	mg/L	1	TXT1	03/13/12	1524	1195717	4
Titration Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		6.67	0.725	1.00	mg/L		LXA1	03/13/12	1233	1195754	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	03/12/12	0945	1195200

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9012B	
2	SW846 9056A	
3	SM 2540C	
4	EPA 410.4	
5	SM 2320B	

4/5/12

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Certificate of Analysis

Report Date: March 28, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-5
Sample ID: 297122006
Matrix: SW
Collect Date: 06-MAR-12 10:15
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
SW9012B Cyanide, Total "As Received"											
Cyanide, Total	U	ND 5 U	1.50	5.00	ug/L	1	AXH3	03/13/12	1317	1195202	1
Ion Chromatography											
SW846 9056A Chloride, Nitrate, and Sulfate "As Received"											
Chloride		0.662	0.066	0.200	mg/L	1	VH1	03/07/12	2333	1194267	2
Nitrate-N		0.195	0.033	0.100	mg/L	1					
Sulfate		4.67	0.100	0.400	mg/L	1					
Solids Analysis											
SM2540C Solids, Dissolved "As Received"											
Total Dissolved Solids		20.0	3.40	14.3	mg/L		LYG1	03/09/12	0928	1194884	3
Spectrometric Analysis											
EPA 410.4 Chem. Oxygen Demand "As Received"											
COD	J	13.2	6.50	20.0	mg/L	1	TXT1	03/13/12	1524	1195717	4
Titration Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		13.9	0.725	1.00	mg/L		LXA1	03/13/12	1257	1195754	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	03/12/12	0945	1195200

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9012B	
2	SW846 9056A	
3	SM 2540C	
4	EPA 410.4	
5	SM 2320B	

4/5/12

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 28, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-1
Sample ID: 297122013
Matrix: GW
Collect Date: 08-MAR-12 09:55
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
SW9012B Cyanide, Total "As Received"												
Cyanide, Total	U	ND	5 u	1.50	5.00	ug/L	1	AXH3	03/13/12	1318	1195202	1
Ion Chromatography												
SW846 9056A Chloride, Nitrate, and Sulfate "As Received"												
Chloride		0.600		0.066	0.200	mg/L	1	MAR1	03/09/12	1237	1195009	2
Nitrate-N	U	ND	0.1 u	0.033	0.100	mg/L	1					
Sulfate		2.78		0.100	0.400	mg/L	1					
Solids Analysis												
SM2540C Solids, Dissolved "As Received"												
Total Dissolved Solids	J	15.0		5.95	25.0	mg/L		LYG1	03/13/12	0924	1195713	3
Spectrometric Analysis												
EPA 410.4 Chem. Oxygen Demand "As Received"												
COD	J	13.2		6.50	20.0	mg/L	1	TXT1	03/13/12	1525	1195717	4
Titration Analysis												
SM 2320B Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		5.64		0.725	1.00	mg/L		LXA1	03/13/12	1304	1195754	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	03/12/12	0945	1195200

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9012B	
2	SW846 9056A	
3	SM 2540C	
4	EPA 410.4	
5	SM 2320B	

dr 4/5/12

GEL LABORATORIES LLC
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Certificate of Analysis

Report Date: March 28, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-1
Sample ID: 297122016
Matrix: SW
Collect Date: 08-MAR-12 10:30
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
SW9012B Cyanide, Total "As Received"											
Cyanide, Total	U	ND 5 u	1.50	5.00	ug/L	1	AXH3	03/13/12	1319	1195202	1
Ion Chromatography											
SW846 9056A Chloride, Nitrate, and Sulfate "As Received"											
Chloride		0.591	0.066	0.200	mg/L	1	MAR1	03/09/12	1306	1195009	2
Nitrate-N		0.250	0.033	0.100	mg/L	1					
Sulfate		4.97	0.100	0.400	mg/L	1					
Solids Analysis											
SM2540C Solids, Dissolved "As Received"											
Total Dissolved Solids		20.0	3.40	14.3	mg/L		LYG1	03/13/12	0924	1195713	3
Spectrometric Analysis											
EPA 410.4 Chem. Oxygen Demand "As Received"											
COD	U	ND 20 u	6.50	20.0	mg/L	1	TXT1	03/13/12	1526	1195717	4
Titration Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		2.57	0.725	1.00	mg/L		LXA1	03/13/12	1313	1195754	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	03/12/12	0945	1195200

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9012B	
2	SW846 9056A	
3	SM 2540C	
4	EPA 410.4	
5	SM 2320B	

4/5/12

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Certificate of Analysis

Report Date: March 28, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-2
Sample ID: 297122017
Matrix: SW
Collect Date: 08-MAR-12 09:30
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
SW9012B Cyanide, Total "As Received"											
Cyanide, Total	U	ND 5 U	1.50	5.00	ug/L	1	AXH3	03/13/12	1320	1195202	1
Ion Chromatography											
SW846 9056A Chloride, Nitrate, and Sulfate "As Received"											
Chloride		0.556	0.066	0.200	mg/L	1	MAR1	03/09/12	1335	1195009	2
Nitrate-N		0.227	0.033	0.100	mg/L	1					
Sulfate		4.26	0.100	0.400	mg/L	1					
Solids Analysis											
SM2540C Solids, Dissolved "As Received"											
Total Dissolved Solids		15.7	3.40	14.3	mg/L		LYG1	03/13/12	0924	1195713	3
Spectrometric Analysis											
EPA 410.4 Chem. Oxygen Demand "As Received"											
COD	U	ND 20 U	6.50	20.0	mg/L	1	TXT1	03/13/12	1526	1195717	4
Titration Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		2.05	0.725	1.00	mg/L		LXA1	03/13/12	1331	1195754	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	03/12/12	0945	1195200

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9012B	
2	SW846 9056A	
3	SM 2540C	
4	EPA 410.4	
5	SM 2320B	

4/5/12

GEL LABORATORIES LLC
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Certificate of Analysis

Report Date: March 28, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-3
Sample ID: 297122018
Matrix: SW
Collect Date: 08-MAR-12 09:10
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
SW9012B Cyanide, Total "As Received"											
Cyanide, Total	U	ND 5 u	1.50	5.00	ug/L	1	AXH3	03/13/12	1321	1195202	1
Ion Chromatography											
SW846 9056A Chloride, Nitrate, and Sulfate "As Received"											
Chloride		0.553	0.066	0.200	mg/L	1	MAR1	03/09/12	1404	1195009	2
Nitrate-N		0.228	0.033	0.100	mg/L	1					
Sulfate		4.28	0.100	0.400	mg/L	1					
Solids Analysis											
SM2540C Solids, Dissolved "As Received"											
Total Dissolved Solids	J	8.57	3.40	14.3	mg/L		LYG1	03/13/12	0924	1195713	3
Spectrometric Analysis											
EPA 410.4 Chem. Oxygen Demand "As Received"											
COD	U	ND 20 u	6.50	20.0	mg/L	1	TXT1	03/13/12	1527	1195717	4
Titration Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		3.08	0.725	1.00	mg/L		LXA1	03/13/12	1338	1195754	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	03/12/12	0945	1195200

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9012B	
2	SW846 9056A	
3	SM 2540C	
4	EPA 410.4	
5	SM 2320B	

4/5/12

No Quals
JN
4/3/12

Chemist Review

REGION I TIER II VALIDATION CHECKLIST
Criteria and Qualifications: REGION I Organics Guideline (Draft 12/96)
VOLATILE
8260B and EDB by 8011

Site: Yankee Rowe Project #: 3617087152 Box #: YR-004
GEL # 297122

Sample IDs: See attached tracking sheet or samples listed.

CFW-5	SW-5	SW-1	
CFW-5DUP	TB-027	SW-2	
CFW-6	CFW-1	SW-3	
SW-4	SP-1	TB-028	

This checklist is used to document Tier II validation. It can also be used to document Level III validation. During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO		
☑	☐	Hold Times	Attach list of samples which exceed hold times. Indicate total hold time and qualifiers.
Data completeness			Comments on missing information (if any) and action taken.
☑	☐	Cover page, Forms I-VIII, DC-1, DC-2, and raw data	GEL Labs SDG 297122
☑	☐	Original shipping and receiving documents Chain of Custody	NOTE: COC not relinquished by sampler for CFW-1, SP-1, SW-1, SW-2, SW-3, TB-028 deliverable provided (all vials intact); COC subsequently signed.
☐	☑	All original lab records of sample preparation and analysis Reduced	
GC/MS Instrument Performance Check			Attach copy of Form V if criteria was not met. Highlight criteria not met, list samples affected, and list qualifiers added.
☐ N/A	☐	Form V present and complete for all samples for each 12-hour period samples were analyzed	
☐	☐	Appropriate number of significant figures reported (at least 2)	
☐	☐	Mass/Charge list (m/z) criteria met	
GC/MS Initial Calibration			Attach copy of Form VI if criteria was not met. Highlight criteria not met, list samples affected, and list qualifiers added.
☐ N/A	☐	Form VI present and complete for all samples	
☐	☐	%RSD less than or equal to 30%	
☐	☐	RRF greater than or equal to 0.05	
GC/MS Continuing Calibration			Attach copy of Form VII if criteria was not met. Highlight criteria not met, list samples affected, and list qualifiers added.
☐ N/A	☐	Form VII present and complete for all samples	
☐	☐	%D less than or equal to 25%	
☐	☐	RRF greater than or equal to 0.05.	
Method Blanks			Attach copy of Form IV for all samples. List all contaminants, concentrations and action level.
☑	☐	Form I & IV present and complete for all blanks	
☑	☐	One analyzed per GC/MS system per tune	Attach copy of Form I for contaminated field or trip blanks. Circle all contaminants. Field QC blanks will not be used to determine action levels for non-aqueous samples. Flag samples EB (equipment blank), TB (trip blank), or BB (bottle blank) as indicated in the guideline.
☑	☐	One analyzed per matrix/concentration level	
☑	☐	Contaminants (1) ND (2) See below	
☐ N/A	☐	A cleaning blank was analyzed after any high concentration sample (exceeding calibration range)	

(2) MB 3/13/12 : Naphthalene @ 0.25 J $\frac{ug}{L}$; all assoc. samples ND
i.e. no quals needed.

NOTE: VOC target list reported matches RFP Table 6.

Chemist Review

REGION I TIER II VALIDATION CHECKLIST
Criteria and Qualifications: REGION I Organics Guideline (Draft 12/96)
VOLATILE

Site: Yankee Rowe Project #: 361708715.2 Box #: YR-004

		Describe professional judgements and qualifiers if applied.
Trip/Equipment Blanks TB-007; TB-008 ☐ ☑ Contaminants Both ND		
Surrogate/System Monitoring Compounds Recovery ☐ ☑ Form II present and complete for all samples ☑ ☐ Percent recovery criteria met		Attach copies of Form II (Part 2) for all non-compliant %R. Circle outliers & indicate qualifier.
CFW-5 MS/MSD Matrix Spike/Matrix Spike Duplicate ☑ ☐ Form I and III present and complete (1) ☑ ☐ Percent recovery criteria met ☐ N/A ☐ non-target compound RPD criteria met		Attach copy of Form III for all non-compliant % and RPD. Circle all non-compliances and indicate qualifiers.
Field Duplicates CFW-5/CFW-5DUP ☑ ☐ Form I's present and complete ☑ ☐ RPD criteria (water <30%, soils <50%) met		Identify field duplicate pair and attach list of all compounds with non-compliant RfDs. Indicate qualifiers.
Internal Standard ☐ N/A ☐ Form VIII present and complete for all samples ☐ ☐ Area counts within -50 to +100 percent of calib. std. ☐ ☐ Retention Time within 30 seconds of calib. std.		Attach copy of Form VIII if criteria was not met. Highlight criteria not met, list samples affected, and list qualifiers added.
Target Compounds List (TCL) ☑ ☐ Form I present and complete for all samples ☑ ☐ Reviewed narrative for anomalies		Call (Fax) lab for re-submittals. Attach copy of facsimile transmission to this review.
Tentatively Identified Compounds (TICs) ☐ N/A ☐ Form I Part B present and complete for all samples Not requested on COC ☐ ☐ TCL compounds reported as TICs		Call lab for missing data. Fill out TIC Form and submit to data entry.
Table 1 Check ☑ ☐ Check Table 1 results against Form I's and ensure all data on Table 1 is correct.		

Reviewer's Signature: Julie Rivard

Date: 4/3/12

Comments: LCS: All in control for analytes reported (see (1) below).

(1) MS/MSD & LCS - only 5 "CLP" target analytes were reported; all are in control. (1,1-Dcs; Benzene; chlorobenzene; Toluene; TCE) Method 8260B specifies only these 5 compounds, whereas the QAPP stipulates the full VOC target list. Note in val report: lab notified to provide full list spikes in future.

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-5
Sample ID: 297122001
Matrix: GW
Collect Date: 06-MAR-12 11:07
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/12/12	1334	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

JF 4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-5
Sample ID: 297122001

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	49.7 ug/L	50.0	99.3	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	50.1 ug/L	50.0	100	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	48.7 ug/L	50.0	97.4	(80%-120%)

4/4/12

GEL LABORATORIES LLC
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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID:	CFW-5DUP	Project:	AMECROWE
Sample ID:	297122002	Client ID:	AMEC002
Matrix:	GW		
Collect Date:	06-MAR-12 11:07		
Receive Date:	07-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/12/12	1404	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

JR 4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-5DUP
Sample ID: 297122002

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	51.3 ug/L	50.0	103	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	50.0 ug/L	50.0	100	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	48.9 ug/L	50.0	97.8	(80%-120%)

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GEL LABORATORIES LLC
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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-6
Sample ID: 297122003
Matrix: GW
Collect Date: 06-MAR-12 11:01
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/12/12	1435	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-6 Project: AMECROWE
Sample ID: 297122003 Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	51.2 ug/L	50.0	102	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	50.3 ug/L	50.0	101	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	48.6 ug/L	50.0	97.1	(80%-120%)

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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID:	SW-4	Project:	AMECROWE
Sample ID:	297122005	Client ID:	AMEC002
Matrix:	SW		
Collect Date:	06-MAR-12 11:15		
Receive Date:	07-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/12/12	1505	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-4 Project: AMECROWE
Sample ID: 297122005 Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	52.9 ug/L	50.0	106	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	50.4 ug/L	50.0	101	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	49.4 ug/L	50.0	98.9	(80%-120%)

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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-5
Sample ID: 297122006
Matrix: SW
Collect Date: 06-MAR-12 10:15
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/12/12	1535	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-5 Project: AMECROWE
Sample ID: 297122006 Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	50.1 ug/L	50.0	100	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	48.1 ug/L	50.0	96.1	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	48.0 ug/L	50.0	95.9	(80%-120%)

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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: TB-007
Sample ID: 297122007
Matrix: GW
Collect Date: 06-MAR-12 12:40
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

TB

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/12/12	1605	119543B	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

4/14/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: TB-007 Project: AMECROWE
Sample ID: 297122007 Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	53.2 ug/L	50.0	106	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	50.5 ug/L	50.0	101	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	50.1 ug/L	50.0	100	(80%-120%)

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GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company :	AMEC Environment & Infrastructure
Address :	1090 Elm Street Suite 201
	Rocky Hill, Connecticut 06067
Contact:	Mr. Miles van Noordennen
Project:	Yankee Rowe Groundwater Monitoring

Client Sample ID:	CFW-1	Project:	AMECROWE
Sample ID:	297122013	Client ID:	AMEC002
Matrix:	GW		
Collect Date:	08-MAR-12 09:55		
Receive Date:	09-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/13/12	1158	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

JR 4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-1 Project: AMECROWE
Sample ID: 297122013 Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	52.7 ug/L	50.0	105	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	49.4 ug/L	50.0	98.8	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	49.7 ug/L	50.0	99.4	(80%-120%)

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GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SP-1
Sample ID: 297122015
Matrix: SW
Collect Date: 08-MAR-12 10:05
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/13/12	1229	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SP-1 Project: AMECROWE
Sample ID: 297122015 Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	52.5 ug/L	50.0	105	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	50.5 ug/L	50.0	101	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	49.7 ug/L	50.0	99.5	(80%-120%)

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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-1
Sample ID: 297122016
Matrix: SW
Collect Date: 08-MAR-12 10:30
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/13/12	1259	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

4/4/12

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-1 Project: AMECROWE
Sample ID: 297122016 Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	50.7 ug/L	50.0	101	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	48.7 ug/L	50.0	97.4	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	48.3 ug/L	50.0	96.6	(80%-120%)

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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-2
Sample ID: 297122017
Matrix: SW
Collect Date: 08-MAR-12 09:30
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/13/12	1329	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

4/4/12

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Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-2 Project: AMECROWE
Sample ID: 297122017 Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	51.2 ug/L	50.0	102	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	49.4 ug/L	50.0	98.8	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	49.2 ug/L	50.0	98.3	(80%-120%)

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-3
Sample ID: 297122018
Matrix: SW
Collect Date: 08-MAR-12 09:10
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/13/12	1359	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-3 Project: AMECROWE
Sample ID: 297122018 Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	49.5 ug/L	50.0	98.9	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	49.3 ug/L	50.0	98.7	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	48.4 ug/L	50.0	96.8	(80%-120%)

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: TB-008
Sample ID: 297122023
Matrix: SW
Collect Date: 08-MAR-12 10:34
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

TB

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
GEL 8260B Method List Liquid "As Received"											
1,1,1,2-Tetrachloroethane	U	ND	0.300	1.00	ug/L	1	CDS1	03/13/12	1430	1195438	1
1,1,1-Trichloroethane	U	ND	0.325	1.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.250	1.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.250	1.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	1.00	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
1,2,4-Trichlorobenzene	U	ND	0.300	1.00	ug/L	1					
1,2-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.250	1.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.250	1.00	ug/L	1					
1,3-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
1,3-Dichloropropylene	U	ND	0.250	1.00	ug/L	1					
1,4-Dichlorobenzene	U	ND	0.250	1.00	ug/L	1					
2-Butanone	U	ND	1.25	5.00	ug/L	1					
4-Methyl-2-pentanone	U	ND	1.25	5.00	ug/L	1					
Acetone	U	ND	1.50	5.00	ug/L	1					
Benzene	U	ND	0.300	1.00	ug/L	1					
Bromodichloromethane	U	ND	0.250	1.00	ug/L	1					
Bromoform	U	ND	0.250	1.00	ug/L	1					
Bromomethane	U	ND	0.300	1.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	1.00	ug/L	1					
Chlorobenzene	U	ND	0.250	1.00	ug/L	1					
Chloroform	U	ND	0.250	1.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	1.00	ug/L	1					
Ethylbenzene	U	ND	0.250	1.00	ug/L	1					
Methylene chloride	U	ND	2.00	5.00	ug/L	1					
Naphthalene	U	ND	0.250	1.00	ug/L	1					
Styrene	U	ND	0.250	1.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	1.00	ug/L	1					
Toluene	U	ND	0.250	1.00	ug/L	1					
Trichloroethylene	U	ND	0.250	1.00	ug/L	1					
Vinyl chloride	U	ND	0.500	1.00	ug/L	1					
Xylenes (total)	U	ND	0.300	1.00	ug/L	1					
cis-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					
tert-Butyl methyl ether	U	ND	0.250	1.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	1.00	ug/L	1					

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: TB-008
Sample ID: 297122023

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	GEL 8260B Method List Liquid "As Received"	51.7 ug/L	50.0	103	(76%-127%)
Bromofluorobenzene	GEL 8260B Method List Liquid "As Received"	50.8 ug/L	50.0	102	(80%-120%)
Toluene-d8	GEL 8260B Method List Liquid "As Received"	50.4 ug/L	50.0	101	(80%-120%)

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID:	CFW-5	Project:	AMECROWE
Sample ID:	297122001	Client ID:	AMEC002
Matrix:	GW		
Collect Date:	06-MAR-12 11:07		
Receive Date:	07-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00592	0.0197	ug/L	1	TXK2	03/20/12	2244	1197876	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/20/12	1930	1197873

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.22 ug/L	3.52	91.4	(73%-135%)

JV 4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID:	CFW-5DUP	Project:	AMECROWE
Sample ID:	297122002	Client ID:	AMEC002
Matrix:	GW		
Collect Date:	06-MAR-12 11:07		
Receive Date:	07-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00592	0.0197	ug/L	1	TXK2	03/20/12	2306	1197876	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/20/12	1930	1197873

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.13 ug/L	3.52	89.0	(73%-135%)

4/4/12

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Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-6
Sample ID: 297122003
Matrix: GW
Collect Date: 06-MAR-12 11:01
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00598	0.0199	ug/L	1	TXK2	03/20/12	2327	1197876	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/20/12	1930	1197873

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.09 ug/L	3.56	86.8	(73%-135%)

4/4/12

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Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID:	SW-4	Project:	AMECROWE
Sample ID:	297122005	Client ID:	AMEC002
Matrix:	SW		
Collect Date:	06-MAR-12 11:15		
Receive Date:	07-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00595	0.0198	ug/L	1	TXK2	03/20/12	2348	1197876	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/20/12	1930	1197873

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.22 ug/L	3.54	91.0	(73%-135%)

4/4/12

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Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-5
Sample ID: 297122006
Matrix: SW
Collect Date: 06-MAR-12 10:15
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00593	0.0198	ug/L	1	TXK2	03/21/12	0009	1197876	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/20/12	1930	1197873

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.23 ug/L	3.53	91.4	(73%-135%)

4/4/12

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Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: TB-007
Sample ID: 297122007
Matrix: GW
Collect Date: 06-MAR-12 12:40
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

TB

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00602	0.0201	ug/L	1	TXK2	03/21/12	0030	1197876	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/20/12	1930	1197873

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.42 ug/L	3.58	95.4	(73%-135%)

JT 4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-1
Sample ID: 297122013
Matrix: GW
Collect Date: 08-MAR-12 09:55
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00585	0.0195	ug/L	1	TXK2	03/22/12	2033	1198003	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/22/12	1730	1198002

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.12 ug/L	3.48	89.5	(73%-135%)

JR 4/4/12

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Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID:	SP-1	Project:	AMECROWE
Sample ID:	297122015	Client ID:	AMEC002
Matrix:	SW		
Collect Date:	08-MAR-12 10:05		
Receive Date:	09-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.0059	0.0197	ug/L	1	TXK2	03/22/12	2054	1198003	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/22/12	1730	1198002

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.06 ug/L	3.51	87.2	(73%-135%)

4/4/12

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Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr, Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID:	SW-1	Project:	AMECROWE
Sample ID:	297122016	Client ID:	AMEC002
Matrix:	SW		
Collect Date:	08-MAR-12 10:30		
Receive Date:	09-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00592	0.0197	ug/L	1	TXK2	03/22/12	2115	1198003	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/22/12	1730	1198002

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.19 ug/L	3.52	90.5	(73%-135%)

4/4/12

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Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-2
Sample ID: 297122017
Matrix: SW
Collect Date: 08-MAR-12 09:30
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00592	0.0197	ug/L	1	TXK2	03/22/12	2136	1198003	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/22/12	1730	1198002

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.02 ug/L	3.52	85.7	(73%-135%)

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID:	SW-3	Project:	AMECROWE
Sample ID:	297122018	Client ID:	AMEC002
Matrix:	SW		
Collect Date:	08-MAR-12 09:10		
Receive Date:	09-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00593	0.0198	ug/L	1	TXK2	03/22/12	2158	1198003	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/22/12	1730	1198002

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.05 ug/L	3.53	86.4	(73%-135%)

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 26, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: TB-008
Sample ID: 297122023
Matrix: SW
Collect Date: 08-MAR-12 10:34
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

TB

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP											
8011 1,2-Dibromoethane "As Received"											
1,2-Dibromoethane	U	ND	0.00595	0.0198	ug/L	1	TXK2	03/22/12	2219	1198003	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	TXK2	03/19/12	1800	1196638
SW846 8011 PREP	8011 Prep	TXK2	03/22/12	1730	1198002

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	8011 1,2-Dibromoethane "As Received"	3.36 ug/L	3.54	94.8	(73%-135%)

jm 4/4/12

REGION I TIER II VALIDATION CHECKLIST
Criteria and Qualifiers: Region I Guidelines (6/13/88 Modified 2/89)
INORGANIC

SITE: Yankee Rowe Project #: 3617.0887.152 Box #: YR-004
GEL # 297122

Sample IDs: See attached tracking sheet or samples listed:

CFW-5	SW-4	SP-1	SW-3
CFW-5 DUP	SW-5	SW-1	SW-011 (Diss.)
CFW-6	CFW-1	SW-2	SW-408 (Diss.)

YES	NO	VALIDATION CHECK	NONCOMPLIANCE NOTES
☑	☐	Hold Times Met	Attach list of samples which exceed hold times. Indicate total hold time and qualifiers.
☐	☑	Samples preserved (1)	
Data Completeness			Comments on missing information (if any) and action taken. See COC comment on VOC checklist
☐ N/A ☐		Cover page, Forms I - XIV, DC-1, DC-2, and raw data.	
☑	☐	Original shipping and receiving documents	Chain of Custody Method 6020A
☐ N/A ☐		Lab records of sample transfer, preparation and analysis	Internal laboratory chain of custody
Calibration			NOTE: metals list reported matches COC request and RFP Table 6.
☐ N/A ☐		Appropriate number of standards used to establish calibration curve.	ICP: at least one blank and one standard AA and CN⁻: at least one blank and three standards, with one standard at the CRDL for AA. Hg: at least one blank and four standards
☐	☐	Correlation coefficient > 0.995.	Correlation coefficient criteria applicable to all analyses except ICP
☐	☐	Calibrated daily.	If correlation coefficient is not acceptable, discuss deficiencies, affected samples and action taken.
☐	☐	CRI/CRA analyzed at the proper frequency in the analytical run sequence.	See method.
☐	☐	CRI/CRA %R within acceptance range.	No acceptance range dictated by CLP methods or National Functional Guidelines. See regional guidelines for guidance.
☐	☐	ICV/CCV %R within acceptance range.	90-110% for ICP, 85-115% for CN⁻, 80-120% for Hg
☐	☐	CCVs analyzed at the proper frequency.	Every 10 samples or every 2 hrs. Attach copy of Form II (2A) for all noncompliant ICVs and CCVs. Circle non-compliances and indicate qualifiers.
☐	☐	Traceable ICV source.	

(1) Metals container for CFW-5 DUP rec'd @ lab w/ pH = 5; preserved w/ Nitric acid on receipt; qualify metals (J/UJ)

(2) NOTE! MDL & PQL for following metals do not meet project requirements per e-mail (attached): ← (GEL MDL / GEL PQL)
Ca .06 mg/L / 0.2 mg/L Fe .033 mg/L / .1 mg/L OK; all PALs are
Cr .002 mg/L / .01 mg/L

Laboratory Duplicate MS/MSD ☐ ☑ Was a field blank used as the lab duplicate ☑ ☐ Is the RPD within control limits of ±20% (35% for soil) for sample values >5x CRDL ☑ ☐ Is the control limit of ± CRDL (35% for soil) met for sample values <5x CRDL ☑ ☐ Was a duplicate analyzed for every matrix and every 20 samples or batch (MS/MSD)	Attach copy of Lab-Duplicate form for criteria not met. Indicate exceeded limits, samples affected, and action taken.
Field Duplicate CFW-5 / CFW-5 DUP ☑ ☐ For sample values >5x CRDL, the RPD control limit of ± 30% (50% for soil) was met ☑ ☐ For sample values <5x CRDL, the control limit of ±2x CRDL (4x CRDL for soil) was met	Attach list of samples that did not meet criteria requirements and qualifiers used.
Laboratory Control Samples (LCS) ☑ ☐ Percent recoveries are within limits of 80-120% for aqueous samples and within control limits for soils. ☑ ☐ An LCS was analyzed for each matrix, batch of samples, or every 20 samples.	Attach copy of Form VII (7) from for all noncompliant recoveries. Circle non-compliances and indicate qualifiers, and samples affected.
Furnace AA Analysis ☐ N/A ☐ Spike recovery criteria (85 ≤ % R ≤ 115) was met ☐ ☐ Duplicate injection criteria met ☐ ☐ Are "M" flags present on Form I's indicating failing duplicate injection criteria ☐ ☐ Are "S" flags present on Form I's indicating MAS analysis was required	Attach sheet indicating criteria not met and qualifiers used.
Serial Dilution All OK ☐ N/A ☐ Are any percent difference criteria > 15% ☐ ☐ Are results of the diluted samples > the original sample results	Attach copy of Serial Dilution Form for criteria not met. Circle criteria not met, samples affected, and qualifiers used.
Reviewer's Signature: Julie Rivera Date 4/4/12	Comments:

Subject: Re: YR-04, GEL Workorder 297122 - Alkalinity QC Issue
From: Edie Kent <emk@gel.com>
Date: Mon, 26 Mar 2012 08:27:04 -0400
To: "VanNoordennen, Miles" <MGVANNOORDENNEN@mactec.com>

Miles:
You had mentioned earlier that you thought the issue was that the well was near an iron laden stream and that some of the containers had more iron in them than others. From our standpoint, we really could not tell other than the color and the pH.

Edie

VanNoordennen, Miles wrote:

> So it sounds like the sampler put the wrong labels on the bottles, perhaps mixing up preserved samples with unpreserved? We'll be sure to note that in our validation files as well. Sorry about all of that - we're planning on having a little sampling protocol training here in the office...
>
> Miles van Noordennen | Project Scientist
> AMEC Environment & Infrastructure
> 1090 Elm Street | Suite 201 | Rocky Hill, Connecticut 06067
> Office 860.529.7191 | Cell 860.817.3152 | Fax 860.529.7448
> Email miles.vannoordennen@amec.com| Web www.amec.com
>
> -----Original Message-----
> From: Edie Kent [mailto:emk@gel.com] Sent: Thursday, March 22, 2012 9:43 AM
> To: VanNoordennen, Miles
> Subject: YR-04, GEL Workorder 297122 - Alkalinity QC Issue
>
> Miles:
> For the Alkalinity analysis, the container that the lab used for CFW-5 had a low pH and as a result the QC failed recovery. I did put instructions to the labs to use the clear bottle if possible but I think the analyst did not see my instructions and used the sample containing more iron in it. I asked the lab what the pH of CFW-5 was in comparison with CFW-5DUP and the other samples in the SDG. She said that the pH of CFW-5 was <2 and the pH of all the other samples in the SDG were >6.
>
> Edie
>
> VanNoordennen, Miles wrote:
>
> > If possible yes, use the clear.
> > Sent from my Blackberry
> >
> > ----- Original Message -----
> > From: Edie Kent <emk@gel.com>
> > To: VanNoordennen, Miles
> > Cc: team.kent <team.kent@gel.com>
> > Sent: Fri Mar 09 10:16:18 2012
> > Subject: Re: Yankee Rowe Sample CFW-5 - Please Advise
> >
> > Since this is the well used for MS/MSD, I'm not going to be able to guarantee which container the lab is using for analysis unless they ask me first. If they ask (as this analyst did), do you want me to tell them to use the clear if possible?
> >
> > Edie
> >
> > VanNoordennen, Miles wrote:

Metals CFW-5 DUP pH = 5*
alk CFW-5 pH < 2
all non-alk CFW-5 pH > 6 (except metals)

* subsequently preserved at lab; note in report & qual flag as appropriate (J/UJ) prof. judg. per Region 1 Nov '06

gr 4/4/12

* use CFW-5 DUP for all wet chem NO3, SO4, Chloride, alk, TDS ; reject CFW-5 anions

Subject: Re: Yankee Rowe SDG YR-004, GEL Workorder 297122 - Receipt Issue
From: Edie Kent <emk@gel.com>
Date: 3/7/2012 2:24 PM
To: "VanNoordennen, Miles" <MGVANNOORDENNEN@mactec.com>
CC: "team.kent" <team.kent@gel.com>

Miles:
The anions bottle has a similar pH. We will go ahead and add Nitric and attempt to lower the pH.

Edie

VanNoordennen, Miles wrote:

> Edie -
>
> Can you verify that the sample bottle labeled for the anions has a similar (or higher) pH? If so, please add nitric acid to the metals bottle to lower the pH. If the anions bottle happens to have a pH lower than 2, I imagine the labels were swapped. Sorry about that.
>
> Miles van Noordennen | Project Scientist
> AMEC Environment & Infrastructure
> 1090 Elm Street | Suite 201 | Rocky Hill, Connecticut 06067
> Office 860.529.7191 | Cell 860.817.3152 | Fax 860.529.7448
> Email miles.vannoordennen@amec.com| Web www.amec.com
>
> -----Original Message-----
> From: Edie Kent [mailto:emk@gel.com] Sent: Wednesday, March 07, 2012 12:41 PM
> To: Miles Van Noordennen
> Cc: team.kent
> Subject: Re: Yankee Rowe SDG YR-004, GEL Workorder 297122 - Receipt Issue
>
> Miles:
> There is one other receipt issue. The metals container for CFW-5DUP was received at a pH of 5 instead of <2. Do you want us to add Nitric Acid and attempt to lower the pH?
>
> Edie
>
> Edie Kent wrote:
>
> > Miles:
> > One of the sample vials for CFW-5MS was received empty. The vial was intact and sealed so it does not appear as if the sample leaked out of the vial. We have sufficient volume for analysis and QC.
> >
> > Edie

CFW-5DUP metals container pH adjusted @ lab; note in report & qualify metals as appropriate (J/UJ) prof. judg. per Region I Nov. '08

OK

JR 4/4/12

--
Edith M. Kent
Project Manager
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC (USA) 29407

Subject: Metals Method and Detection Limits for Yankee Rowe
From: Edie Kent <emk@gel.com>
Date: Wed, 07 Mar 2012 15:08:28 -0500
To: Miles Van Noordennen <miles.vannoordennen@amec.com>
CC: "team.kent" <team.kent@gel.com>, Anna White <akw@gel.com>

Miles:
This is an error on our part. We quoted you method 6010 for the metals analysis. However, in order to achieve your detection limits, we will need to use method 6020A. We cannot achieve your DLs with method 6010. It is our error so we will honor the pricing that we provided.

Also, we should have taken exception on the following metals:

Calcium:
GEL MDL: 0.06 mg/L
GEL PQL: 0.2 mg/L

Chromium:
GEL MDL: 0.002 mg/L
GEL PQL: 0.01 mg/L

Iron:
GEL MDL: 0.033 mg/L
GEL PQL: 0.1 mg/L

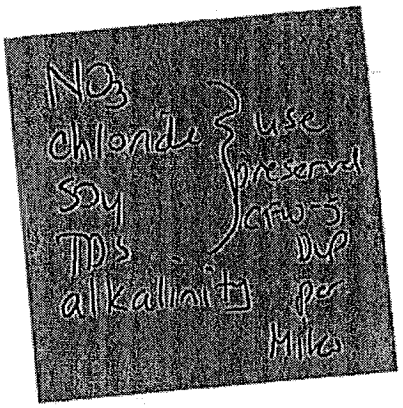
OK; all RLs < PALs
JR 4/9/12

I apologize for not catching that earlier.

Edie

--
Edith M. Kent
Project Manager
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC (USA) 29407
Direct: 843.769.7385 x4453
Main: 843.556.8171
Fax: 843.766.1178
E-mail: emk@gel.com
Web: www.gel.com

Subject: Re: Yankee Rowe Sample CFW-5 - Please Advise
From: "VanNoordennen, Miles" <MGVANNOORDENNEN@mactec.com>
Date: Fri, 9 Mar 2012 10:20:06 -0500
To: "'emk@gel.com'" <emk@gel.com>



If possible yes, use the clear.
Sent from my Blackberry

----- Original Message -----
From: Edie Kent <emk@gel.com>
To: VanNoordennen, Miles
Cc: team.kent <team.kent@gel.com>
Sent: Fri Mar 09 10:16:18 2012
Subject: Re: Yankee Rowe Sample CFW-5 - Please Advise

Since this is the well used for MS/MSD, I'm not going to be able to guarantee which container the lab is using for analysis unless they ask me first. If they ask (as this analyst did), do you want me to tell them to use the clear if possible?

Edie

VanNoordennen, Miles wrote:

> Edie -
>
> That well location is basically in an iron-laden stream. During purging activities, there is a tendency for particulates to be drawn into the samples. I think for now, proceed with the samples as they are. If the results sway too much, and if you haven't already, please make a note in the narrative (or include this email chain). Sorry about that!
>
> Miles van Noordennen | Project Scientist
> AMEC Environment & Infrastructure
> 1090 Elm Street | Suite 201 | Rocky Hill, Connecticut 06067
> Office 860.529.7191 | Cell 860.817.3152 | Fax 860.529.7448
> Email miles.vannoordennen@amec.com| Web www.amec.com
>
> -----Original Message-----
> From: Edie Kent [mailto:emk@gel.com]
> Sent: Friday, March 09, 2012 10:00 AM
> To: Miles Van Noordennen
> Cc: team.kent
> Subject: Yankee Rowe Sample CFW-5 - Please Advise
>
> Miles:
> The TDS analyst contacted me this morning concerning sample CFW-5. She pulled the MS and the MSD bottles. She said that the MS bottle was clear and the MSD bottle is not clear with an orange tint. We saw the same thing between the CFW-5 and CFW-5DUP for the Anions analysis. Please let me know as soon as possible how you want us to proceed.
>
> Edie

--
Edith M. Kent
Project Manager
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC (USA) 29407
Direct: 843.769.7385 x4453
Main: 843.556.8171
Fax: 843.766.1178

Main Identity

From: "VanNoordennen, Miles G" <Miles.VanNoordennen@amec.com>
To: "Julie Ricardi" <jricardi@maine.rr.com>; "Cunningham, Tige L." <Tige.Cunningham@amec.com>
Sent: Tuesday, April 03, 2012 4:26 PM
Subject: RE: Rowe Data

I don't think I could have summed it up any better myself ☺

Miles van Noordennen | Project Scientist
AMEC Environment & Infrastructure
1090 Elm Street | Suite 201 | Rocky Hill, Connecticut 06067
Office 860.529.7191 | Cell 860.817.3152 | Fax 860.529.7448
Email miles.vannoordennen@amec.com | Web www.amec.com

From: Julie Ricardi [mailto:jricardi@maine.rr.com]
Sent: Tuesday, April 03, 2012 4:16 PM
To: VanNoordennen, Miles G; Cunningham, Tige L.
Subject: Re: Rowe Data

Hi Miles,

After reviewing the e-mail chain, I want to make sure I understand correctly and propose what might make the most sense (I think this is consistent with what you're thinking) –

(1) Metals container for CFW-5DUP was received at pH = 5 and subsequently adjusted to pH 2 at the lab using nitric acid; these results will be qualified as estimated (J/UJ) due to improper preservation

(2) Alkalinity container for CFW-5 (which also is nitrate, chloride, sulfate, TDS) was received at pH < 2, therefore invalidating the alkalinity analysis for starters. For CFW-5 I recommend rejecting (R) results for alkalinity, nitrate, chloride, sulfate, and TDS based on suspicion of improper preservation and will report only the CFW-5DUP results for these parameters.

(3) MS/MSDs performed on CFW-5 may also be suspect...I'll review and narrate as needed?

Does that sound like I understood it all correctly?

Thanks,
Julie

> ---- Original Message ----
> **From:** VanNoordennen, Miles G
> **To:** 'Julie Ricardi' ; Cunningham, Tige
> **Sent:** Monday, April 02, 2012 3:42 PM
> **Subject:** RE: Rowe Data
>
> I think after looking through the data, the emails back and forth, and historical data, we should consider rejecting all the data connected to the "unpreserved" bottle for CFW-5. That would mean nitrate, chloride, sulfate, TDS, and alkalinity. Since a DUP was also collected, I could use that data for the report. I'm just not comfortable using the data knowing that these analyses were conducted on a preserved sample... thoughts?
>
> Miles van Noordennen | Project Scientist
> AMEC Environment & Infrastructure
> 1090 Elm Street | Suite 201 | Rocky Hill, Connecticut 06067
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GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-5
Sample ID: 297122001
Matrix: GW
Collect Date: 06-MAR-12 11:07
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.104	0.066	0.200	ug/L	1	BYV1	03/21/12	1534	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Metals List 1 "As Received"											
Arsenic	U	1.17	1.70	5.00	ug/L	1	PRB	03/21/12	2353	1195126	2
Barium		68.1	0.600	2.00	ug/L	1					
Cadmium	U	0.088	0.110	1.00	ug/L	1					
Calcium		31900	60.0	200	ug/L	1					
Chromium	U	0.272	2.00	10.0	ug/L	1					
Lead	U	0.079	0.500	2.00	ug/L	1					
Silver	U	0.026	0.200	1.00	ug/L	1					
Sodium		3110	80.0	250	ug/L	1					
Zinc	U	1.74	3.50	10.0	ug/L	1					
Selenium	U	0.134	1.50	5.00	ug/L	1	PRB	03/23/12	0331	1195126	3
Iron		85500	330	1000	ug/L	10	PRB	03/23/12	0411	1195126	4
Manganese		5320	10.0	50.0	ug/L	10					
Copper	U	0.248	0.350	1.00	ug/L	1	SKJ	03/27/12	0317	1195126	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	

4/4/12

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-5DUP
Sample ID: 297122002
Matrix: GW
Collect Date: 06-MAR-12 11:07
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U J	-0.126	0.066	0.200	ug/L	1	BYV1	03/21/12	1541	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Metals List 1 "As Received"											
Arsenic	U J	1.20	1.70	5.00	ug/L	1	PRB	03/22/12	0035	1195126	2
Barium		68.5	0.600	2.00	ug/L	1					
Cadmium	U	0.013	0.110	1.00	ug/L	1					
Calcium		33000	60.0	200	ug/L	1					
Chromium	U	0.169	2.00	10.0	ug/L	1					
Lead	U	0.037	0.500	2.00	ug/L	1					
Silver	U	0.029	0.200	1.00	ug/L	1					
Sodium		2950	80.0	250	ug/L	1					
Zinc	U	1.30	3.50	10.0	ug/L	1					
Selenium	U	0.302	1.50	5.00	ug/L	1	PRB	03/23/12	0351	1195126	3
Iron		86400	330	1000	ug/L	10	PRB	03/23/12	0428	1195126	4
Manganese		5360	10.0	50.0	ug/L	10					
Copper	U J	0.029	0.350	1.00	ug/L	1	SKJ	03/27/12	0340	1195126	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed;

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	

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Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: CFW-6
Sample ID: 297122003
Matrix: GW
Collect Date: 06-MAR-12 11:01
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.111	0.066	0.200	ug/L	1	BYV1	03/21/12	1542	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Metals List 1 "As Received"											
Arsenic	U	0.797	1.70	5.00	ug/L	1	PRB	03/22/12	0044	1195126	2
Barium		60.2	0.600	2.00	ug/L	1					
Cadmium	U	0.007	0.110	1.00	ug/L	1					
Calcium		16700	60.0	200	ug/L	1					
Chromium	U	0.371	2.00	10.0	ug/L	1					
Lead	U	0.050	0.500	2.00	ug/L	1					
Silver	U	0.024	0.200	1.00	ug/L	1					
Sodium		5050	80.0	250	ug/L	1					
Zinc	U	1.92	3.50	10.0	ug/L	1					
Selenium	U	0.584	1.50	5.00	ug/L	1	PRB	03/23/12	0355	1195126	3
Iron		67100	330	1000	ug/L	10	PRB	03/23/12	0432	1195126	4
Manganese		4930	10.0	50.0	ug/L	10					
Copper	U	0.122	0.350	1.00	ug/L	1	SKJ	03/27/12	0343	1195126	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	

4/4/12

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Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-4
Sample ID: 297122005
Matrix: SW
Collect Date: 06-MAR-12 11:15
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.11	0.066	0.200	ug/L	1	BYV1	03/21/12	1544	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Metals List 1 "As Received"											
Arsenic	U	-0.585	1.70	5.00	ug/L	1	PRB	03/22/12	0052	1195126	2
Barium		14.2	0.600	2.00	ug/L	1					
Cadmium	U	0.013	0.110	1.00	ug/L	1					
Calcium		3120	60.0	200	ug/L	1					
Chromium	U	-0.331	2.00	10.0	ug/L	1					
Iron		2080	33.0	100	ug/L	1					
Lead	U	0.050	0.500	2.00	ug/L	1					
Manganese		240	1.00	5.00	ug/L	1					
Silver	U	-0.001	0.200	1.00	ug/L	1					
Sodium		960	80.0	250	ug/L	1					
Zinc	J	4.56	3.50	10.0	ug/L	1					
Selenium	U	-0.475	1.50	5.00	ug/L	1	PRB	03/23/12	0449	1195126	3
Copper	U	0.134	0.350	1.00	ug/L	1	SKJ	03/27/12	0347	1195126	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	

4/4/12

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-5
Sample ID: 297122006
Matrix: SW
Collect Date: 06-MAR-12 10:15
Receive Date: 07-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.097	0.066	0.200	ug/L	1	BYV1	03/21/12	1546	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Metals List 1 "As Received"											
Arsenic	U	0.602	1.70	5.00	ug/L	1	PRB	03/22/12	0126	1195126	2
Barium		12.6	0.600	2.00	ug/L	1					
Cadmium	U	0.019	0.110	1.00	ug/L	1					
Calcium		2770	60.0	200	ug/L	1					
Chromium	U	-0.084	2.00	10.0	ug/L	1					
Iron		1520	33.0	100	ug/L	1					
Lead	U	0.031	0.500	2.00	ug/L	1					
Manganese		141	1.00	5.00	ug/L	1					
Silver	U	-0.002	0.200	1.00	ug/L	1					
Sodium		883	80.0	250	ug/L	1					
Zinc	U	3.15	3.50	10.0	ug/L	1					
Selenium	U	0.286	1.50	5.00	ug/L	1	PRB	03/23/12	0453	1195126	3
Copper	U	0.125	0.350	1.00	ug/L	1	SKJ	03/27/12	0350	1195126	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	

JF 4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 29, 2012

Company :	AMEC Environment & Infrastructure
Address :	1090 Elm Street Suite 201
	Rocky Hill, Connecticut 06067
Contact:	Mr. Miles van Noordennen
Project:	Yankee Rowe Groundwater Monitoring

Client Sample ID:	CFW-1	Project:	AMECROWE
Sample ID:	297122013	Client ID:	AMEC002
Matrix:	GW		
Collect Date:	08-MAR-12 09:55		
Receive Date:	09-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.11	0.066	0.200	ug/L	1	BYV1	03/21/12	1548	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Metals List 1 "As Received"											
Arsenic	U	-0.296	1.70	5.00	ug/L	1	PRB	03/22/12	0135	1195126	2
Barium		24.8	0.600	2.00	ug/L	1					
Cadmium	U	0.082	0.110	1.00	ug/L	1					
Calcium		1900	60.0	200	ug/L	1					
Chromium	J	2.63	2.00	10.0	ug/L	1					
Iron		9150	33.0	100	ug/L	1					
Lead	J	1.20	0.500	2.00	ug/L	1					
Manganese		220	1.00	5.00	ug/L	1					
Silver	U	0.007	0.200	1.00	ug/L	1					
Sodium		958	80.0	250	ug/L	1					
Zinc		14.2	3.50	10.0	ug/L	1					
Selenium	U	0.017	1.50	5.00	ug/L	1	PRB	03/23/12	0457	1195126	3
Copper		4.06	0.350	1.00	ug/L	1	SKJ	03/27/12	0353	1195126	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SP-1
Sample ID: 297122015
Matrix: SW
Collect Date: 08-MAR-12 10:05
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.111	0.066	0.200	ug/L	1	BYV1	03/21/12	1549	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Metals List 2 "As Received"											
Arsenic	U	0.074	1.70	5.00	ug/L	1	PRB	03/22/12	0143	1195126	2
Barium		28.0	0.600	2.00	ug/L	1					
Cadmium	U	0.023	0.110	1.00	ug/L	1					
Chromium	U	0.910	2.00	10.0	ug/L	1					
Lead	J	0.881	0.500	2.00	ug/L	1					
Silver	U	0.006	0.200	1.00	ug/L	1					
Thallium	U	0.034	0.450	2.00	ug/L	1					
Selenium	U	-0.199	1.50	5.00	ug/L	1	PRB	03/23/12	0501	1195126	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-1
Sample ID: 297122016
Matrix: SW
Collect Date: 08-MAR-12 10:30
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.18	0.066	0.200	ug/L	1	BYV1	03/21/12	1554	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Metals List 1 "As Received"											
Arsenic	U	-0.568	1.70	5.00	ug/L	1	PRB	03/22/12	0152	1195126	2
Barium		12.3	0.600	2.00	ug/L	1					
Cadmium	U	0.010	0.110	1.00	ug/L	1					
Calcium		2390	60.0	200	ug/L	1					
Chromium	U	-0.084	2.00	10.0	ug/L	1					
Iron		133	33.0	100	ug/L	1					
Lead	U	0.118	0.500	2.00	ug/L	1					
Manganese		14.4	1.00	5.00	ug/L	1					
Silver	U	-0.002	0.200	1.00	ug/L	1					
Sodium		878	80.0	250	ug/L	1					
Zinc	J	4.51	3.50	10.0	ug/L	1					
Selenium	U	0.084	1.50	5.00	ug/L	1	PRB	03/23/12	0505	1195126	3
Copper	U	0.160	0.350	1.00	ug/L	1	SKJ	03/27/12	0407	1195126	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-2
Sample ID: 297122017
Matrix: SW
Collect Date: 08-MAR-12 09:30
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.101	0.066	0.200	ug/L	1	BYV1	03/21/12	1556	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Metals List I "As Received"											
Arsenic	U	-0.289	1.70	5.00	ug/L	1	PRB	03/22/12	0200	1195126	2
Barium		10.7	0.600	2.00	ug/L	1					
Cadmium	U	0.012	0.110	1.00	ug/L	1					
Calcium		1890	60.0	200	ug/L	1					
Chromium	U	0.046	2.00	10.0	ug/L	1					
Iron	J	48.3	33.0	100	ug/L	1					
Lead	U	0.107	0.500	2.00	ug/L	1					
Manganese	J	4.37	1.00	5.00	ug/L	1					
Silver	U	-0.001	0.200	1.00	ug/L	1					
Sodium		675	80.0	250	ug/L	1					
Zinc	J	4.91	3.50	10.0	ug/L	1					
Selenium	U	-0.33	1.50	5.00	ug/L	1	PRB	03/23/12	0510	1195126	3
Copper	U	0.260	0.350	1.00	ug/L	1	SKJ	03/27/12	0410	1195126	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	

dr 4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-3
Sample ID: 297122018
Matrix: SW
Collect Date: 08-MAR-12 09:10
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.114	0.066	0.200	ug/L	1	BYV1	03/21/12	1558	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Metals List 1 "As Received"											
Arsenic	U	-0.429	1.70	5.00	ug/L	1	PRB	03/22/12	0209	1195126	2
Barium		10.6	0.600	2.00	ug/L	1					
Cadmium	U	0.017	0.110	1.00	ug/L	1					
Calcium		1950	60.0	200	ug/L	1					
Chromium	U	-0.025	2.00	10.0	ug/L	1					
Iron		362	33.0	100	ug/L	1					
Lead	U	0.058	0.500	2.00	ug/L	1					
Manganese		24.2	1.00	5.00	ug/L	1					
Silver	U	0.00	0.200	1.00	ug/L	1					
Sodium		654	80.0	250	ug/L	1					
Zinc	J	3.62	3.50	10.0	ug/L	1					
Selenium	U	-0.393	1.50	5.00	ug/L	1	PRB	03/23/12	0514	1195126	3
Copper	U	0.183	0.350	1.00	ug/L	1	SKJ	03/27/12	0413	1195126	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	

JR 4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-011
Sample ID: 297122020
Matrix: SW
Collect Date: 07-MAR-12 15:20
Receive Date: 09-MAR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.112	0.066	0.200	ug/L	1	BYV1	03/21/12	1559	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Dissolved Metals List 3 "As Received"											
Arsenic	U	0.018	1.70	5.00	ug/L	1	PRB	03/22/12	0217	1195126	2
Barium		10.2	0.600	2.00	ug/L	1					
Cadmium	U	0.016	0.110	1.00	ug/L	1					
Chromium	U	-0.074	2.00	10.0	ug/L	1					
Lead	U	0.099	0.500	2.00	ug/L	1					
Silver	U	-0.001	0.200	1.00	ug/L	1					
Selenium	U	-0.005	1.50	5.00	ug/L	1	PRB	03/23/12	0518	1195126	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	

4/4/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 29, 2012

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201

Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID:	SW-408	Project:	AMECROWE
Sample ID:	297122022	Client ID:	AMEC002
Matrix:	SW		
Collect Date:	07-MAR-12 14:35		
Receive Date:	09-MAR-12		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7470 Cold Vapor Hg Liquid "As Received"											
Mercury	U	-0.113	0.066	0.200	ug/L	1	BYV1	03/21/12	1601	1197577	1
Metals Analysis-ICP-MS											
SW846 3005A/6020A Dissolved Metals List 3 "As Received"											
Arsenic	U	-0.12	1.70	5.00	ug/L	1	PRB	03/22/12	0226	1195126	2
Barium		10.9	0.600	2.00	ug/L	1					
Cadmium	U	0.015	0.110	1.00	ug/L	1					
Chromium	U	0.043	2.00	10.0	ug/L	1					
Lead	U	0.202	0.500	2.00	ug/L	1					
Silver	U	-0.002	0.200	1.00	ug/L	1					
Selenium	U	-0.255	1.50	5.00	ug/L	1	PRB	03/23/12	0522	1195126	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	AXG2	03/21/12	0800	1195125
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	03/20/12	1455	1197576

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020A	
3	SW846 3005A/6020A	

4/4/12

ATTACHMENT D
REVIEW OF CHAIN OF CUSTODY AND SAMPLE DOCUMENTATION

Sampling Event Date(s) March 2012 Shipment Date 3-6-12

Wells Sampled in this Batch: CFW-5, CFW-5DUP, CFW-5MS, CFW-5MSD, CFW-6, MW-10DC, SW-4, SW-5, TB-001

I. All samples identified on COC forms? X Yes ____ No

II. Samples obtained match those required by sampling plan? X Yes ____ No

III. Verification of unbroken chain of custody for samples? X Yes ____ No

IV. Samples received intact by laboratory? X Yes ____ No

V. Sample flush volumes and flow parameters consistent with historical data and acceptable? X Yes ____ No

VI. Sample non-radiological parameters consistent with historical data and acceptable? X Yes ____ No

VII. All preservative and container requirements met? X Yes ____ No

VIII. Samples obtained match those required by sampling plan? X Yes ____ No

IX. Evaluation for accepting sample for any questions I – VIII answered "NO" (indicate if resample will be done prior to shipment):

N/A

Reviewer _____ Date 3-12-12

2 coolers shipped to GEL

297122

Chain Of Custody/Analysis Request Form

YNPS- Rowe

AMEC
Tige Cunningham
207 828-3415

Lab: GEL

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material		Preservative	Media	Method	Fraction
829	3/6/2012	11:07	CFW-5		10							
				FS	1	1	Liter	Poly	NaOH	GW	Cyanide - (9010)	T
				FS	3	40	mL	Glass Vials	HCL, 4 Deg C	GW	VOC - (8011)	T
				FS	1	500	mL	Poly	HNO3	GW	Metals List 1 - (6010/7470)***	T
				FS	3	40	mL	Glass Vials	HCL, 4 Deg C	GW	VOC - (8260)	T
				FS	1	500	mL	Plastic	4 Deg C	GW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T
				FS	1	250	mL	Amber Glass	H2SO4	GW	COD - (SM 5220C)	T
830	3/6/2012	11:07	CFW-5DUP		10							
				FD	3	40	mL	Glass Vials	HCL, 4 Deg C	GW	VOC - (8260)	T
				FD	3	40	mL	Glass Vials	HCL, 4 Deg C	GW	VOC - (8011)	T
				FD	1	500	mL	Poly	HNO3	GW	Metals List 1 - (6010/7470)***	T
				FD	1	1	Liter	Poly	NaOH	GW	Cyanide - (9010)	T
				FD	1	500	mL	Plastic	4 Deg C	GW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T
				FD	1	250	mL	Amber Glass	H2SO4	GW	COD - (SM 5220C)	T

Std TAT
SDG: YR-004
PO#: contact Miles VanNoordennen

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material		Preservative	Media	Method	Fraction
831	3/6/2012	11:07	CFW-5MS		10							
				MS		3	40	mL Glass Vials	HCL, 4 Deg C	GW	VOC - (8011)	T
				MS		3	40	mL Glass Vials	HCL, 4 Deg C	GW	VOC - (8260)	T
				MS		1	500	mL Plastic	4 Deg C	GW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T
				MS		1	250	mL Amber Glass	H2SO4	GW	COD - (SM 5220C)	T
				MS		1	1	Liter Poly	NaOH	GW	Cyanide - (9010)	T
				MS		1	500	mL Poly	HNO3	GW	Metals List 1 - (6010/7470)***	T
832	3/6/2012	11:07	CFW-5MSD		10							
				MSD		1	250	mL Amber Glass	H2SO4	GW	COD - (SM 5220C)	T
				MSD		1	500	mL Poly	HNO3	GW	Metals List 1 - (6010/7470)***	T
				MSD		3	40	mL Glass Vials	HCL, 4 Deg C	GW	VOC - (8011)	T
				MSD		3	40	mL Glass Vials	HCL, 4 Deg C	GW	VOC - (8260)	T
				MSD		1	500	mL Plastic	4 Deg C	GW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T
				MSD		1	1	Liter Poly	NaOH	GW	Cyanide - (9010)	T
833	3/6/2012	11:01	CFW-6		10							
				FS		3	40	mL Glass Vials	HCL, 4 Deg C	GW	VOC - (8260)	T
				FS		3	40	mL Glass Vials	HCL, 4 Deg C	GW	VOC - (8011)	T
				FS		1	250	mL Amber Glass	H2SO4	GW	COD - (SM 5220C)	T
				FS		1	500	mL Plastic	4 Deg C	GW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T
				FS		1	500	mL Poly	HNO3	GW	Metals List 1 - (6010/7470)***	T
				FS		1	1	Liter Poly	NaOH	GW	Cyanide - (9010)	T

Std TAT
SDG: YR-004
PO#: Contact Miles VanNoordennen

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material		Preservative	Media	Method	Fraction
840	3/5/2012	16:11	MW-107C		3							
				FS		1	2	Liter	Poly	HNO3	GW	Gamma isotopic - (Gamma Spec)*	T
				FS		1	2	Liter	Poly	HNO3	GW	Sr-90 - (GPC, LSC)	T
				FS		1	500	mL	Poly		GW	Tritium - (LSC)	T
846	3/6/2012	11:15	SW-4		10							
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8260)	T
				FS		1	250	mL	Amber Glass	H2SO4	SW	COD - (SM 5220C)	T
				FS		1	1	Liter	Poly	NaOH	SW	Cyanide - (9010)	T
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8011)	T
				FS		1	500	mL	Poly	HNO3	SW	Metals List 1 - (6010/7470)***	T
				FS		1	500	mL	Plastic	4 Deg C	SW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T
847	3/6/2012	10:15	SW-5		10							
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8011)	T
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8260)	T
				FS		1	500	mL	Poly	HNO3	SW	Metals List 1 - (6010/7470)***	T
				FS		1	1	Liter	Poly	NaOH	SW	Cyanide - (9010)	T
				FS		1	500	mL	Plastic	4 Deg C	SW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T
				FS		1	250	mL	Amber Glass	H2SO4	SW	COD - (SM 5220C)	T
851	3/6/2012	12:40	TB-007		6							
				TB		3	40	mL	Glass Vials	HCL, 4 Deg C	NAL	VOC - (8011)	T
				TB		3	40	mL	Glass Vials	HCL, 4 Deg C	NAL	VOC - (8260)	T

Std TAT
SDG. YR-004
POA: Contact Miles van Noordennen

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material	Preservative	Media	Method	Fraction

*** = Metals List 1 - RCRA 8 plus copper, iron, manganese, zinc, calcium, sodium *** = Metals List 2 - RCRA 8 plus thallium

*** = Metals List 3 - Dissolved (field filtered) RCRA 8 ## = Nitrate/Chloride/Sulfate - (9056), TDS - (SM2540C), Alkalinity - (310.0)

* = Gamma isotopic includes: Co-60, Cs-134, Cs-137, Nb-94, Sb-125, Eu-152, Eu-154, Eu-155, Ag-108m

Relinquished: _____ Date: 3 / 6 / 12 Time: 1330

Received: J. Lampli Date: 03 / 07 / 12 Time: 0840

Std TAT

SDG: YR.004

PO#: Contact Miles VanNoordennen

GEL | Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: VNRS	SDG/AR/COC/Work Order: 297122
Received By: Y. Lampkin	Date Received: March 7, 2012 @ 0840

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?		X	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 20 cpm
Classified Radioactive II or III by RSO?		X	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		X	
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		X	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: (Ice bags) Blue ice Dry ice None Other (describe) 4° *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: 415-02182 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	X			
4	Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH? 4mL 3/7/12	X		X	Sample ID's, containers affected and observed pH: CFW-5MS pH=5 * see below
6	VOA vials free of headspace (defined as < 6mm bubble)?	X			If Preservation added, Lot#: Metals container Sample ID's and containers affected:
7	Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	X			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11	Number of containers received match number indicated on COC?	X			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			X	
13	COC form is properly signed in relinquished/received sections?	X			
14	Carrier and tracking number.				Circle Applicable: (FedEx Air) FedEx Ground UPS Field Services Courier Other 8731 9509 8411 -4° 8731 9509 8400 -4°

Comments (Use Continuation Form if needed):

Sample vial CFW-5MS received empty. Container/vial was intact and sealed tight.

* Sample Preserved w/HNO3 Per P.M. Lot# L03022

PM (or PMA) review: Initials YM Date 3/7/12 Page 1 of 1

ATTACHMENT D
REVIEW OF CHAIN OF CUSTODY AND SAMPLE DOCUMENTATION

Sampling Event Date(s) March 2012 Shipment Date 3-7-12

Wells Sampled in this Batch: MW-104A, MW-104ADup, MW-104AMS, MW-104AMSD, MW-105D, MW-106A, EB-004

I. All samples identified on COC forms? X Yes ____ No

II. Samples obtained match those required by sampling plan? X Yes ____ No

III. Verification of unbroken chain of custody for samples? X Yes ____ No

IV. Samples received intact by laboratory? X Yes ____ No

V. Sample flush volumes and flow parameters consistent with historical data and acceptable? X Yes ____ No

VI. Sample non-radiological parameters consistent with historical data and acceptable? X Yes ____ No

VII. All preservative and container requirements met? X Yes ____ No

VIII. Samples obtained match those required by sampling plan? X Yes ____ No

IX. Evaluation for accepting sample for any questions I – VIII answered "NO" (indicate if resample will be done prior to shipment):

N/A

Reviewer _____ Date 3.12.12

2 coolers shipped to GEL

Chain Of Custody/Analysis Request Form

297122

YNPS- Rowe

AMEC
Tige Cunningham
207 828-3415

Lab: GEL

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material		Preservative	Media	Method	Fraction
834	3/7/2012	10:07	MW-104A		3							
				FS	1	500	mL	Poly		GW	Tritium - (LSC)	T
				FS	1	2	Liter	Poly	HNO3	GW	Sr-90 - (GPC, LSC)	T
				FS	1	2	Liter	Poly	HNO3	GW	Gamma isotopic - (Gamma Spec)*	T
835	3/7/2012	10:07	MW-104ADUP		3							
				FD	1	2	Liter	Poly	HNO3	GW	Gamma isotopic - (Gamma Spec)*	T
				FD	1	500	mL	Poly		GW	Tritium - (LSC)	T
				FD	1	2	Liter	Poly	HNO3	GW	Sr-90 - (GPC, LSC)	T
836	3/7/2012	10:07	MW-104AMS		3							
				MS	1	2	Liter	Poly	HNO3	GW	Sr-90 - (GPC, LSC)	T
				MS	1	2	Liter	Poly	HNO3	GW	Gamma isotopic - (Gamma Spec)*	T
				MS	1	500	mL	Poly		GW	Tritium - (LSC)	T

SDG: YR-004
21-Day TAT
POC: Contact Miles van Noordennen

297122

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material		Preservative	Media	Method	Fraction
837	3/7/2012	10:07	MW-104AMSD		3							
				MSD		1	2	Liter	Poly	HNO3	GW	Gamma isotopic - (Gamma Spec)*	T
				MSD		1	2	Liter	Poly	HNO3	GW	Sr-90 - (GPC, LSC)	T
				MSD		1	500	mL	Poly		GW	Tritium - (LSC)	T
838	3/7/2012	12:26	MW-105B		3							
				FS		1	2	Liter	Poly	HNO3	GW	Gamma isotopic - (Gamma Spec)*	T
				FS		1	500	mL	Poly		GW	Tritium - (LSC)	T
				FS		1	2	Liter	Poly	HNO3	GW	Sr-90 - (GPC, LSC)	T
839	3/7/2012	10:22	MW-106A		3							
				FS		1	2	Liter	Poly	HNO3	GW	Sr-90 - (GPC, LSC)	T
				FS		1	2	Liter	Poly	HNO3	GW	Gamma isotopic - (Gamma Spec)*	T
				FS		1	500	mL	Poly		GW	Tritium - (LSC)	T
850	3/6/2012	15:30	EB-004		3							
				EB		1	500	mL	Poly		NAL	Tritium - (LSC)	T
				EB		1	2	Liter	Poly	HNO3	NAL	Sr-90 - (GPC, LSC)	T
				EB		1	2	Liter	Poly	HNO3	NAL	Gamma isotopic - (Gamma Spec)*	T

SDG: YR-004

21-Day TAT

PO# : Contact Miles VanNoordennen

297122

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material	Preservative	Media	Method	Fraction

*** = Metals List 1 - RCRA 8 plus copper, iron, manganese, zinc, calcium, sodium *** = Metals List 2 - RCRA 8 plus thallium

*** = Metals List 3 - Dissolved (field filtered) RCRA 8 ## = Nitrate/Chloride/Sulfate - (9056A), TDS - (SM2540C), Alkalinity - (SM2320B)

* = Gamma isotopic includes: Co-60, Cs-134, Cs-137, Nb-94, Sb-125, Eu-152, Eu-154, Eu-155, Ag-108m

Relinquished: _____ Date: 3 / 7 / 12 Time: 1330

Received: Y. Langdon Date: 03 / 08 / 12 Time: 0910

SDG: YR-004

21-Day TAT

POC: Contact Miles VanNoordennen

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: YANK	SDG/AR/COC/Work Order: 297122
Received By: J. Hankins	Date Received: March 8, 2012 @ 0910

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?		X	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 20 CPM
Classified Radioactive II or III by RSO?		X	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		X	
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		X	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		X		Preservation Method: Ice bags Blue ice Dry ice (None) Other (describe) 13°, 14° *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: 41502182 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	X			
4	Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	X			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		X		Sample ID's and containers affected:
7	Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	X			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11	Number of containers received match number indicated on COC?	X			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			X	
13	COC form is properly signed in relinquished/received sections?	X			
14	Carrier and tracking number.				Circle Applicable: (FedEx Air) FedEx Ground UPS Field Services Courier Other 8731 9509 8422 -14° (No Ice) 8504 1774 3830 -13° (No Ice)

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials RH Date 3/8/12 Page 1 of 1

ATTACHMENT D
REVIEW OF CHAIN OF CUSTODY AND SAMPLE DOCUMENTATION

Sampling Event Date(s) March 2012 Shipment Date 3-8-12

Wells Sampled in this Batch: CES-1, Monroe Dam, SP-1, SW-1, SW-2, SW-3, SW-011, SW-408, TB-002

I. All samples identified on COC forms? X Yes ____ No

II. Samples obtained match those required by sampling plan? X Yes ____ No

III. Verification of unbroken chain of custody for samples? X Yes ____ No

IV. Samples received intact by laboratory? X Yes ____ No

V. Sample flush volumes and flow parameters consistent with historical data and acceptable? X Yes ____ No

VI. Sample non-radiological parameters consistent with historical data and acceptable? X Yes ____ No

VII. All preservative and container requirements met? X Yes ____ No

VIII. Samples obtained match those required by sampling plan? X Yes ____ No

IX. Evaluation for accepting sample for any questions I – VIII answered "NO" (indicate if resample will be done prior to shipment):

N/A

Reviewer _____ Date 3-12-12

2 coolers shipped to GEL

Chain Of Custody/Analysis Request Form

297/22

YNPS- Rowe

AMEC
Tige Cunningham
207 828-3415

Lab: GEL

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material		Preservative	Media	Method	Fraction
828	3/8/2012	9:55	CFW-1		10							
				FS	3	40	mL	Glass Vials	HCL, 4 Deg C	GW	VOC - (8011)	T
				FS	1	250	mL	Amber Glass	H2SO4	GW	COD - (~~SM 5220C~~) EPA 410.4	T
				FS	1	1	Liter	Poly	NaOH	GW	Cyanide - (~~9010~~) 9012B	T
				FS	1	500	mL	Plastic	4 Deg C	GW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T
				FS	3	40	mL	Glass Vials	HCL, 4 Deg C	GW	VOC - (8260)	T
				FS	1	500	mL	Poly	HNO3	GW	Metals List 1 - (~~6010B/7470~~) 6020A***	T
841	3/7/2012	15:10	Monroe Dam		3							
				FS	1	2	Liter	Poly	HNO3	SW	Sr-90 - (GPC, LSC)	T
				FS	1	2	Liter	Poly	HNO3	SW	Gamma isotopic - (Gamma Spec)*	T
				FS	1	500	mL	Poly		SW	Tritium - (LSC)	T

SDG: YR-0041

21-Day TAT

PO#: Contact Miles VanNoordennen

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material		Preservative	Media	Method	Fraction
842	3/8/2012	10:05	SP-1		10							
				FS		1	2	Liter	Poly	HNO3	SW	Sr-90 - (GPC, LSC)	T
				FS		1	500	mL	Poly	HNO3	SW	Metals List 2 - (6010/7470)*** 6c20A	T
				FS		1	2	Liter	Poly	HNO3	SW	Gamma isotopic - (Gamma Spec)*	T
				FS		1	500	mL	Poly		SW	Tritium - (LSC)	T
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8260)	T
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8011)	T
843	3/8/2012	10:30	SW-1		10							
				FS		1	500	mL	Plastic	4 Deg C	SW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T
				FS		1	500	mL	Poly	HNO3	SW	Metals List 1 - (~~6010/7470~~)*** 6c20A	T
				FS		1	250	mL	Amber Glass	H2SO4	SW	COD - (~~SM 5220C~~) EPA 410.4	T
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8011)	T
				FS		1	1	Liter	Poly	NaOH	SW	Cyanide - (~~9010~~) 9012B	T
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8260)	T
844	3/8/2012	9:30	SW-2		10							
				FS		1	500	mL	Poly	HNO3	SW	Metals List 1 - (~~6010/7470~~)*** 6c20A	T
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8260)	T
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8011)	T
				FS		1	250	mL	Amber Glass	H2SO4	SW	COD - (~~SM 5220C~~) EPA 410.4	T
				FS		1	1	Liter	Poly	NaOH	SW	Cyanide - (~~9010~~) 9012B	T
				FS		1	500	mL	Plastic	4 Deg C	SW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T

SDG: YL004
21 Day TAT
PM: Contact Miles VanNoordenken

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material			Preservative	Media	Method	Fraction	
845	3/8/2012	9:10	SW-3		10									
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8260)	T	
				FS		1	1	Liter	Poly	NaOH	SW	Cyanide - ~~(9010)~~ 9012B	T	
				FS		3	40	mL	Glass Vials	HCL, 4 Deg C	SW	VOC - (8011)	T	
				FS		1	500	mL	Plastic	4 Deg C	SW	Nitrate, Chloride, Sulfate, TDS, Alkalinity ##	T	
				FS		1	500	mL	Poly	HNO3	SW	Metals List 1 - (~~6010~~ 6020A/7470)***	T	
				FS		1	250	mL	Amber Glass	H2SO4	SW	COD - (~~SM-5220C~~ EPA 410.4)	T	
848	3/7/2012	15:20	SW-011		4									
				FS		1	2	Liter	Poly	HNO3	SW	Gamma isotopic - (Gamma Spec)*	T	
				FS		1	500	mL	Poly	HNO3	SW	Diss. Metals List 3 (filtered) - (6020A/7470)***	T	- 2 . 5
				FS		1	2	Liter	Poly	HNO3	SW	Sr-90 - (GPC, LSC)	T	
				FS		1	500	mL	Poly		SW	Tritium - (LSC)	T	
849	3/7/2012	14:35	SW-408		4									
				FS		1	500	mL	Poly	HNO3	SW	Diss. Metals List 3 (filtered) - (6020A/7470)***	T	
				FS		1	500	mL	Poly		SW	Tritium - (LSC)	T	. 2 . 5
				FS		1	2	Liter	Poly	HNO3	SW	Gamma isotopic - (Gamma Spec)*	T	
				FS		1	2	Liter	Poly	HNO3	SW	Sr-90 - (GPC, LSC)	T	
852	3/8/2012	10:34	TB-008		6									
				TB		3	40	mL	Glass Vials	HCL, 4 Deg C	NAL	VOC - (8011)	T	- 3
				TB		3	40	mL	Glass Vials	HCL, 4 Deg C	NAL	VOC - (8260)	T	

SDG: YC:004
21-Day TAT
PO # Contact Miles VanNoordennen

Samp #	Sample Date	Sample Time	Field Sample ID	QC Code	Qty Total	Qty Each	Bottle Size and Material	Preservative	Media	Method	Fraction

*** = Metals List 1 - RCRA 8 plus copper, iron, manganese, zinc, calcium, sodium *** = Metals List 2 - RCRA 8 plus thallium

*** = Metals List 3 - Dissolved (field filtered) RCRA 8 ## = Nitrate/Chloride/Sulfate - (9056A), TDS - (SM2540C), Alkalinity - (SM2320B)

* = Gamma isotopic includes: Co-60, Cs-134, Cs-137, Nb-94, Sb-125, Eu-152, Eu-154, Eu-155, Ag-108m

Relinquished: _____ Date: 3 / 8 / 12 Time: 1300

Received: Y. Zamplis Date: 03 / 09 / 12 Time: 0850

SDG: YR-004

21-Day TAT

PD*: Contact Miles VanNoordennen

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: YANK			SDG/AR/COC/Work Order: 297122
Received By: Y. Lamken			Date Received: March 9, 2012 0850
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?		X	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 20 cpm
Classified Radioactive II or III by RSO?		X	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		X	
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		X	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: (Ice bags) Blue ice Dry ice (None) Other (describe) 6° *all temperatures are recorded in Celsius 13°
2a	Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: 415021B2 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	X			
4	Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	X			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?	X			Sample ID's and containers affected:
7	Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	X			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11	Number of containers received match number indicated on COC?	X			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			X	
13	COC form is properly signed in relinquished/received sections?			X	Chain not relinquished
14	Carrier and tracking number.				Circle Applicable: (FedEx Air) FedEx Ground UPS Field Services Courier Other 8731 9509 8812-13 (No Ice) 8731 9509 8823-6 (Ice)

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials CP Date 3/9/12 Page 1 of 1

RP-05

ATTACHMENT E

YANKEE NUCLEAR POWER STATION
SITE CHARACTERIZATION QUALITY ASSURANCE PROGRAM PLAN FOR
SAMPLE DATA QUALITY

Identify analytes individually

Sample	Analyte	Date	Reject, Resample or Reanalyze	Brief Description
CFW-5	Alkalinity	3/13/12	Reject	Improper Preservation
CFW-5	Anions[1]	3/7/12	Reject	Improper Preservation
CFW-5	TDS	3/9/12	Reject	Improper Preservation

I. Identify the specific reason for rejection of sample result, resample or reanalysis requirements (this should include a description of why the data point for that analyte may/may not be omitted):

For sample CFW-5, the container labeled for wet chemistry analyses (alkalinity, anions, and TDS) was received at the laboratory at pH <2. It was suspected that the sample was inadvertently preserved with nitric acid and then mislabeled in the field. A matrix spike/matrix spike duplicate pair for alkalinity was performed on this sample and yielded 0% recoveries, indicating the acidification adversely affected the analysis. Due to improper preservation (acidification) of the sample, the results for alkalinity, nitrate, chloride, sulfate, and TDS in CFW-5 should be omitted and not used in any data analysis.

II. Are other analytes from this sample affected? Explain

No other analytes from this sample were affected.

III. Are changes to the procedures for sampling, preservation, transport, analysis or assessment required (review AP-9601 for any specific program requirements)? Explain specific changes.

No procedural changes are necessary. The issue noted above was random and was not the result of any procedural issues. Field staff will be reminded to be attentive to labeling.

Reviewer: Julie Ricardi

Signature: Julie Ricardi Date: April 9, 2012

RP-05

ATTACHMENT E

YANKEE NUCLEAR POWER STATION
SITE CHARACTERIZATION QUALITY ASSURANCE PROGRAM PLAN FOR
SAMPLE DATA QUALITY

Identify analytes individually

Sample	Analyte	Date	Reject, Resample or Reanalyze	Brief Description
MW-104A	Cesium-137	3/9/12	Reject	Uncertain Identification

I. Identify the specific reason for rejection of sample result, resample or reanalysis requirements (this should include a description of why the data point for that analyte may/may not be omitted):

The suspected Cesium-137 radionuclide peak was detected in sample MW-104A, but failed to meet the positive identification criteria. The Cs-137 result was rejected by the laboratory due to the low abundance which resulted in the uncertain identification. Due to this uncertainty, the result should be omitted and not used in any data analysis.

II. Are other analytes from this sample affected? Explain

No other analytes from this sample were affected.

III. Are changes to the procedures for sampling, preservation, transport, analysis or assessment required (review AP-9601 for any specific program requirements)? Explain specific changes.

No procedural changes are necessary. The issue noted above was random and was not the result of any procedural issues.

Reviewer: Julie Ricardi

Signature: Julie Ricardi Date: April 10, 2012

Data Validation Summary
Yankee Nuclear Power Station
Rowe, Massachusetts
SDG: YR-005 (GEL Work Order: 303309)

INTRODUCTION

Nine groundwater samples and one equipment blank were collected on April 23, 2012, through April 24, 2012, at the Yankee Nuclear Power Station, located in Rowe, Massachusetts. The samples were analyzed for the following parameter: radionuclide cesium-137. Sample analyses for all parameters were performed by GEL Laboratories, located in Charleston, South Carolina.

A chemist review was performed on all samples and analyses using information supplied by the laboratory. The data package was validated using USEPA Region I EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses (USEPA, 1996), the Yankee Nuclear Power Station Groundwater Monitoring Program, Document RP-05, Revision 3 (YNPS, 2009), and "Laboratory Data Validation Guidelines for Evaluating Radionuclide Analyses," Revision 7 (SAIC, 2002).

The following samples collected during April 2012 are included in the data evaluation:

Field Sample ID	GEL ID	Sample Date	Comment
MW-104A	303309001	4/24/12	Gamma isotope cesium-137
MW-104A DUP	303309002	4/24/12	Gamma isotope cesium-137
MW-105B	303309003	4/24/12	Gamma isotope cesium-137
MW-106A	303309004	4/24/12	Gamma isotope cesium-137
MW-107C	303309005	4/23/12	Gamma isotope cesium-137
SP-1	303309006	4/24/12	Gamma isotope cesium-137
SW-011	303309007	4/23/12	Gamma isotope cesium-137
SW-408	303309008	4/24/12	Gamma isotope cesium-137
Monroe Dam	303309009	4/24/12	Gamma isotope cesium-137
EB-005	303309010	4/23/12	Gamma isotope cesium-137

DATA REVIEW SUMMARY

Data were evaluated for the following parameters:

Collection and Preservation
* Holding Times
* Data Completeness
* Surrogate Recoveries – N/A
* Blank Contamination
* Duplicates
* Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
* Matrix Spike/Matrix Spike Duplicates (MS/MSD) – N/A
* Miscellaneous

* - all criteria were met for this parameter

With the exception of the following items discussed below, results were determined to be usable as reported by the laboratory.

Collection and Preservation

Cesium-137– The sample container for equipment blank EB-005 was received by the laboratory with a pH of 5, indicating improper preservation with nitric acid. The sample was preserved with nitric acid upon receipt by the laboratory. Data qualifiers are not applied to equipment blanks; therefore, results for EB-005 were reported unqualified.

References:

U.S. Environmental Protection Agency (USEPA), 1996. "Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, Parts I and II," Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December, 1996.

Yankee Nuclear Power Station (YNPS), 2009. "YNPS Groundwater Monitoring Program." ISFSI Radiation Protection, RP-05: Revision 3, June 16, 2009.

Science Applications International Corporation (SAIC), 2002. "Laboratory Data Validation Guidelines for Evaluating Radionuclide Analyses." Thomas L. Rucker, Ph.D. and C. Matrin Johnson, Jr.; Revision 7, April, 2002.

Data Validator: Julie Ricardi

Julie Ricardi

May 21, 2012

Reviewed by: Tige Cunningham, NRCC-EAC 5/24/12

Tige

	Sample Delivery Group		YR-005			YR-005			YR-005			YR-005			YR-005			
	Location		Monroe Dam			MW-104A			MW-104A			MW-105B			MW-106A			
	Sample Date		4/24/2012			4/24/2012			4/24/2012			4/24/2012			4/24/2012			
	Sample ID		Monroe Dam			MW-104A			MW-104A DUP			MW-105B			MW-106A			
	Qc Code		FS			FS			FD			FS			FS			
Analysis	Parameter	Units	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result
EPA 901.1	Cesium-137	pCi/L	0.131	U	3.54	-3.96	U	3.87	0.413	U	2.59	-6.54	U	6.65	-0.141	U	3.25	0.493

Edit p.2 else OK
5/21/12

	Sample Delivery Group	YR-005			YR-005			YR-005			YR-005			YR-005		
	Location	MW-107C			QC			SP-1			SW-011			SW-408		
	Sample Date	4/23/2012			4/23/2012			4/24/2012			4/23/2012			4/24/2012		
	Sample ID	MW-107C			EB-005			SP-1			SW-011			SW-408		
	Qc Code	FS			FS			FS			FS			FS		
Analysis	Parameter	Units	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty	Result	Qualifier	Uncertainty
EPA 901.1	Cesium-137	pCi/L	U	2.9	0.308	U	2.46	0.866	U	3.16	0.278	U	2.55	2.76	U	4.04

No Quals
JT 5/21/12

RADIONUCLIDE ANALYSES

VALIDATION CHECKLIST for YANKEE ROWE

Gamma - Cs-137 only

TIER I / II / III / Chemist Review (circle one)

SITE: YANKEE ROWE Project #: 36170871S2 SDG #: YR-005

LAB #: 303309

Sample IDs: _____

YES NO NA		
Data completeness		
☑ ☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑ ☐	Data summaries match EDD	
Holding Times and Preservation		Note; equipment blank EB-005 was recd @ pH = 5; lab adjusted pH < 2 w/ HNO_3 per client instructions (e.mail 4/26/12)
☑ ☐	Hold times met (6 months)	
☑ ☐ ☐	Preserved	
Blanks (Background Checks)		
☑ ☐	Method blank was prepared with each batch of samples or with a maximum of 20 samples	
☑ ☐	Are result <MDA qualify not detected (U)	
☐ ☐ N/A	Are results > 5 times blank concentration	
Tracer Recovery		
☐ ☐ ☑	Recovery > 50% and <100%	
☐ ☐ ☑	Recovery >100%	
Matrix Spikes		
☐ ☐ ☑ N/A	Percent recovery of 75-125% excluding results exceeding the spike concentration by ≥4x	
☐ ☐ ☑	Was a field blank used for spike analysis	
Laboratory Control Samples (LCS)		104%
☑ ☐ ☐	Percent recoveries are within limits of 75-125%	
☑ ☐ ☐	LCS was analyzed for each matrix, batch of samples, or every 20 samples.	

RADIONUCLIDE ANALYSES
VALIDATION CHECKLIST for YANKEE ROWE

GeL # 303309, cont'd.

TIER I / II / III / Chemist Review (circle one)

Laboratory Duplicate MW-104A ☐ ☑ Was a field blank used as the lab duplicate ☑ ☐ RPD within 20% for results greater than 5X CRDL ☐ ☑ Is the AZS >3 ☑ ☐ ☐ Duplicate analyzed for every matrix and every 20 samples or batch	If the AZS for a particular radionuclide is > 3, qualify the results for that radionuclide in all associated samples of the same matrix as estimated (J).
Field Duplicate MW-104A / MW-104A DUP ☑ ☐ RPD within 20% for results greater than 5X CRDL ☐ ☑ Is the AZS >3	
Quantitation ☑ ☐ Results <DL qualified as non-detect (U)	

Validator's Signature: Julie Mianes

Date: 5/21/12

Reviewed By: Julie Mianes

Date: 5/24/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067
Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Report Date: May 14, 2012

Client Sample ID: MW-104A
Sample ID: 303309001
Matrix: GW
Collect Date: 24-APR-12
Receive Date: 26-APR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Cs-137 "As Received"													
Cesium-137	U	-3.96	+/-3.44	5.41	+/-3.87	20.0	pCi/L		MJH1	05/06/12	1428	1208343	1

The following Analytical Methods were performed

Method	Description
1	EPA 901.1

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

5/22/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: May 14, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: MW-104A DUP
Sample ID: 303309002
Matrix: GW
Collect Date: 24-APR-12
Receive Date: 26-APR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Cs-137 "As Received"													
Cesium-137	U	0.413	+/-2.58	4.89	+/-2.59	20.0	pCi/L		MJH1	05/06/12	1428	1208343	1

The following Analytical Methods were performed

Method	Description
1	EPA 901.1

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

5/22/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: May 14, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: MW-105B
Sample ID: 303309003
Matrix: GW
Collect Date: 24-APR-12
Receive Date: 26-APR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Cs-137 "As Received"													
Cesium-137	U	-6.54	+/-5.96	10.6	+/-6.65	20.0	pCi/L		MJH1	05/06/12	1429	1208343	1

The following Analytical Methods were performed

Method	Description
1	EPA 901.1

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

5/22/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: May 14, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: MW-106A
Sample ID: 303309004
Matrix: GW
Collect Date: 24-APR-12
Receive Date: 26-APR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Cs-137 "As Received"													
Cesium-137	U	-0.141	+/-3.25	5.11	+/-3.25	20.0	pCi/L		MJH1	05/06/12	1429	1208343	1

The following Analytical Methods were performed

Method	Description
1	EPA 901.1

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

JW 5/22/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: May 14, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: MW-107C
Sample ID: 303309005
Matrix: GW
Collect Date: 23-APR-12
Receive Date: 26-APR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Cs-137 "As Received"													
Cesium-137	U	0.493	+/-2.89	5.32	+/-2.90	20.0	pCi/L		MJH1	05/06/12	1430	1208343	1

The following Analytical Methods were performed

Method	Description
1	EPA 901.1

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

5/22/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: May 14, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SP-1
Sample ID: 303309006
Matrix: SW
Collect Date: 24-APR-12
Receive Date: 26-APR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Cs-137 "As Received"													
Cesium-137	U	0.866	+/-3.14	6.07	+/-3.16	20.0	pCi/L		MJH1	05/06/12	1430	1208343	1

The following Analytical Methods were performed

Method	Description
1	EPA 901.1

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

5/22/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: May 14, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-011
Sample ID: 303309007
Matrix: SW
Collect Date: 23-APR-12
Receive Date: 26-APR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Cs-137 "As Received"													
Cesium-137	U	0.278	+/-2.55	4.93	+/-2.55	20.0	pCi/L		MJH1	05/06/12	1431	1208343	1

The following Analytical Methods were performed

Method	Description
1	EPA 901.1

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

5/22/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: May 14, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: SW-408
Sample ID: 303309008
Matrix: SW
Collect Date: 24-APR-12
Receive Date: 26-APR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Cs-137 "As Received"													
Cesium-137	U	2.76	+/-3.84	8.19	+/-4.04	20.0	pCi/L		MJH1	05/06/12	1431	1208343	1

The following Analytical Methods were performed

Method	Description
1	EPA 901.1

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

5/22/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: May 14, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: Monroe Dam
Sample ID: 303309009
Matrix: SW
Collect Date: 24-APR-12
Receive Date: 26-APR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Cs-137 "As Received"													
Cesium-137	U	0.131	+/-3.54	6.57	+/-3.54	20.0	pCi/L		MJH1	05/07/12	0810	1208343	1

The following Analytical Methods were performed

Method	Description
1	EPA 901.1

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

5/22/12

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AMEC Environment & Infrastructure
Address : 1090 Elm Street Suite 201
Rocky Hill, Connecticut 06067

Report Date: May 14, 2012

Contact: Mr. Miles van Noordennen
Project: Yankee Rowe Groundwater Monitoring

Client Sample ID: EB-005
Sample ID: 303309010
Matrix: W
Collect Date: 23-APR-12
Receive Date: 26-APR-12
Collector: Client

Project: AMECROWE
Client ID: AMEC002

EB

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Cs-137 "As Received"													
Cesium-137	U	0.308	+/-2.46	4.75	+/-2.46	20.0	pCi/L		MJH1	05/07/12	0839	1208343	1

The following Analytical Methods were performed

Method	Description
1	EPA 901.1

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

5/22/12

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Gamma Isotopes

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
MW-104A	5/6/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-104A DUP	5/6/12	DU (Field)	Yes	O.K.	Yes	See attached Checklist
MW-105B	5/6/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-106A	5/6/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-107C	5/6/12	FS	Yes	O.K.	Yes	See attached Checklist
SP-1	5/6/12	FS	Yes	O.K.	Yes	See attached Checklist
SW-011	5/6/12	FS	Yes	O.K.	Yes	See attached Checklist
SW-408	5/6/12	FS	Yes	O.K.	Yes	See attached Checklist
Monroe Dam	5/7/12	FS	Yes	O.K.	Yes	See attached Checklist
EB-005	5/7/12	BL (Field)	Yes	O.K.	Yes	See (1) below
Laboratory QC						
QC1202647128	5/7/12	BL	Yes	O.K.	Yes	See attached Checklist
QC1202647131	5/7/12	QC	Yes	O.K.	Yes	See attached Checklist
QC1202647129	5/7/12	DU (Lab)	Yes	O.K.	Yes	See attached Checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X___Yes _____No

II. Resolution of Sample Processing/Missing Analytes comments:

(1) EB-005 was received at the laboratory with a pH of 5; per client instructions the laboratory adjusted the equipment blank to pH < 2 using nitric acid. No data

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

qualifiers were required.

III. Resolution of Sample Processing/Missing Analytes comments:
No processing issues or missing analytes.

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):
See attached checklist; no sample qualifications required.

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Munro Date: May21, 2012

Data Validation Summary
Yankee Nuclear Power Station
Rowe, Massachusetts
SDG: YR-005 (TAL Work Order: F2D300469)

INTRODUCTION

Nine groundwater samples and one equipment blank were collected on April 23, 2012, through April 24, 2012, at the Yankee Nuclear Power Station, located in Rowe, Massachusetts. The samples were analyzed for the following parameter: radionuclide cesium-137. Sample analyses for all parameters were performed by Test America Laboratories, Inc., located in Earth City, Missouri.

A chemist review was performed on all samples and analyses using information supplied by the laboratory. The data package was validated using USEPA Region I EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses (USEPA, 1996), the Yankee Nuclear Power Station Groundwater Monitoring Program, Document RP-05, Revision 3 (YNPS, 2009), and "Laboratory Data Validation Guidelines for Evaluating Radionuclide Analyses," Revision 7 (SAIC, 2002).

The following samples collected during April 2012 are included in the data evaluation:

Field Sample ID	LAB ID	Sample Date	Comment
MW-104A	F2D300469-001	4/24/12	Gamma isotope cesium-137
MW-104A DUP	F2D300469-002	4/24/12	Gamma isotope cesium-137
MW-105B	F2D300469-003	4/24/12	Gamma isotope cesium-137
MW-106A	F2D300469-004	4/24/12	Gamma isotope cesium-137
MW-107C	F2D300469-005	4/23/12	Gamma isotope cesium-137
SP-1	F2D300469-006	4/24/12	Gamma isotope cesium-137
SW-011	F2D300469-007	4/23/12	Gamma isotope cesium-137
SW-408	F2D300469-008	4/24/12	Gamma isotope cesium-137
Monroe Dam	F2D300469-009	4/24/12	Gamma isotope cesium-137
EB-005	F2D300469-010	4/23/12	Gamma isotope cesium-137

DATA REVIEW SUMMARY

Data were evaluated for the following parameters:

* Collection and Preservation
* Holding Times
* Data Completeness
* Surrogate Recoveries – N/A
* Blank Contamination
* Duplicates
* Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
* Matrix Spike/Matrix Spike Duplicates (MS/MSD) – N/A
* Miscellaneous

* - all criteria were met for this parameter

Results for all associated quality control measurements were within control limits, and sample results were determined to be usable as reported by the laboratory.

References:

U.S. Environmental Protection Agency (USEPA), 1996. "Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, Parts I and II," Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December, 1996.

Yankee Nuclear Power Station (YNPS), 2009. "YNPS Groundwater Monitoring Program." ISFSI Radiation Protection, RP-05: Revision 3, June 16, 2009.

Science Applications International Corporation (SAIC), 2002. "Laboratory Data Validation Guidelines for Evaluating Radionuclide Analyses." Thomas L. Rucker, Ph.D. and C. Matrin Johnson, Jr.; Revision 7, April, 2002.

Data Validator: Julie Ricardi

Julie Ricardi

May 23, 2012

Reviewed by: Tige Cunningham MRCC-EAC 5/24/12

Tige Cunningham

					Analysis	GA-01-R MOD		
					Parameter	Cesium-137		
					Fraction	T		
					Units	pCi/L		
Sample Delivery Group	Location	Sample Date	Sample ID	Lab Sample Id	Qc Code	Result	Qualifier	Uncertainty
F2D300469	Monroe Dam	4/24/2012	Monroe Dam	F2D300469009	FS	-3.4	U	9.7
F2D300469	MW-104A	4/24/2012	MW-104A	F2D300469001	FS	0.01	U	5.4
F2D300469	MW-104A	4/24/2012	MW-104A DUP	F2D300469002	FD	3.1	U	6.8
F2D300469	MW-105B	4/24/2012	MW-105B	F2D300469003	FS	-2.5	U	8.7
F2D300469	MW-106A	4/24/2012	MW-106A	F2D300469004	FS	-0.1	U	7.1
F2D300469	MW-107C	4/23/2012	MW-107C	F2D300469005	FS	-0.02	U	8.9
F2D300469	QC	4/23/2012	EB-005	F2D300469010	EB	1.1	U	6.1
F2D300469	SP-1	4/24/2012	SP-1	F2D300469006	FS	0.6	U	6.7
F2D300469	SW-011	4/23/2012	SW-011	F2D300469007	FS	1.1	U	5.8
F2D300469	SW-408	4/24/2012	SW-408	F2D300469008	FS	0.2	U	4.2

Reviewed by
Julie Rivam
5/23/12

RADIONUCLIDE ANALYSES
VALIDATION CHECKLIST for YANKEE ROWE

TIER I / II / III / Chemist Review (circle one)

SITE: YANKEE ROWE Project #: 36170871S2 SDG #: YR-005

LAB #: F2D300469 (TAL St. Louis)

Sample IDs: MW-104A MW-106A SW-011
MW-104A DUP MW-107C SW-408 EB-005
MW-105B SP-1 Monroe Dam

YES NO NA		
Data completeness		
☑ ☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours. NOTE: Lab reported results for Bismuth-214 and Lead-214 in 4 samples, although only Cs-137 was requested as a target analyte. Will report only Cs-137 in final data set per M. VanNoordennen 5/22/12
☑ ☐	Data summaries match EDD	
Holding Times and Preservation		
☑ ☐	Hold times met (6 months)	
☑ ☐ ☐	Preserved	
Blanks (Background Checks)		EB-005: ND
☑ ☐	Method blank was prepared with each batch of samples or with a maximum of 20 samples	
☑ ☐	Are result <MDA qualify not detected (U)	
☐ ☐ N/A	Are results > 5 times blank concentration	
Tracer Recovery		
☐ ☐ ☑	Recovery > 50% and <100%	
☐ ☐ ☑	Recovery >100%	
Matrix Spikes		
☐ ☐ ☑	Percent recovery of 75-125% excluding results exceeding the spike concentration by ≥4x	
☐ ☐ ☑	Was a field blank used for spike analysis	
Laboratory Control Samples (LCS)		
☑ ☐ ☐	Percent recoveries are within limits of 75-125%	
☑ ☐ ☐	LCS was analyzed for each matrix, batch of samples, or every 20 samples.	

RADIONUCLIDE ANALYSES
VALIDATION CHECKLIST for YANKEE ROWE

TIER I / II / III / Chemist Review (circle one) SDG F2P300469

Laboratory Duplicate MW-104A ☐ ☑ Was a field blank used as the lab duplicate ☑ ☐ RPD within 20% for results greater than 5X CRDL ☐ ☑ Is the AZS >3 Both result ND ☑ ☐ ☐ Duplicate analyzed for every matrix and every 20 samples or batch	If the AZS for a particular radionuclide is > 3, qualify the results for that radionuclide in all associated samples of the same matrix as estimated (J).
Field Duplicate MW-104A / MW-104A DUP ☑ ☐ RPD within 20% for results greater than 5X CRDL ☐ ☑ Is the AZS >3 Both result ND	
Quantitation ☑ ☐ Results <DL qualified as non-detect (U)	

Validator's Signature: Julie Miranda

Date: 5/22/12

Reviewed By: Jaja Cumpa

Date: 5/24/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: MW-104A

Radiochemistry

Lab Sample ID: F2D300469-001
Work Order: MR948
Matrix: WATER

Date Collected: 04/24/12 1100
Date Received: 04/26/12 0925

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				pCi/L		Batch # 2123105	Yld %
Cesium 137	0.01	U	5.4	20.0	10	05/02/12	05/03/12
--- Other Detected Radionuclides ---							
Bismuth 214	77		22		22	05/02/12	05/03/12
Lead 214	83		24		23	05/02/12	05/03/12

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.
F2D300469
U Result is less than the sample detection limit.

5/23/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: MW-104A DUP

Radiochemistry

Lab Sample ID: F2D300469-001X
Work Order: MR948
Matrix: WATER

Date Collected: 04/24/12 1100
Date Received: 04/26/12 0925

LAB DUP - do not report

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				pCi/L		Batch # 2123105	Yld %
Cesium 137	1.3	U	5.5	20.0	9.9	05/02/12	05/03/12
--- Other Detected Radionuclides ---							
Bismuth 214	99		25		20	05/02/12	05/03/12
Lead 214	106		24		19	05/02/12	05/03/12

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.

U Result is less than the sample detection limit.

5/23/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: MW-104A DUP

Radiochemistry

Lab Sample ID: F2D300469-002
Work Order: MR949
Matrix: WATER

Date Collected: 04/24/12 1100
Date Received: 04/26/12 0925

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				pCi/L		Batch # 2123105	Yld %
Cesium 137	3.1	U	6.8	20.0	12	05/02/12	05/03/12

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.

U Result is less than the sample detection limit.

5/23/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: MW-105B

Radiochemistry

Lab Sample ID: F2D300469-003
Work Order: MR95A
Matrix: WATER

Date Collected: 04/24/12 1420
Date Received: 04/26/12 0925

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				pCi/L		Batch # 2123105	Yld %
Cesium 137	-2.5	U	8.7	20.0	15	05/02/12	05/03/12
--- Other Detected Radionuclides ---							
Bismuth 214	300		51		31	05/02/12	05/03/12
Lead 214	342		49		32	05/02/12	05/03/12

NOTE(S).

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.

U Result is less than the sample detection limit.

5/23/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: MW-106A

Radiochemistry

Lab Sample ID: F2D300469-004
Work Order: MR95C
Matrix: WATER

Date Collected: 04/24/12 1625
Date Received: 04/26/12 0925

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				pCi/L		Batch # 2123105	Yld %
Cesium 137	-0.1	U	7.1	20.0	13	05/02/12	05/03/12

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.

U Result is less than the sample detection limit.

5/23/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: MW-107C

Radiochemistry

Lab Sample ID: F2D300469-005
Work Order: MR95D
Matrix: WATER

Date Collected: 04/23/12 1440
Date Received: 04/26/12 0925

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				pCi/L		Batch # 2123105	Yld %
Cesium 137	-0.02	U	8.9	20.0	17	05/02/12	05/03/12
--- Other Detected Radionuclides ---							
Bismuth 214	45		18		24	05/02/12	05/03/12
Lead 214	59		23		27	05/02/12	05/03/12

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.

U Result is less than the sample detection limit.

5/23/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: SP-1

Radiochemistry

Lab Sample ID: F2D300469-006
Work Order: MR95E
Matrix: WATER

Date Collected: 04/24/12 1445
Date Received: 04/26/12 0925

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				pCi/L		Batch # 2123105	Yld %
Cesium 137	0.6	U	6.7	20.0	12	05/02/12	05/03/12

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.

U Result is less than the sample detection limit.

5/23/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: SW-011

Radiochemistry

Lab Sample ID: F2D300469-007
Work Order: MR95F
Matrix: WATER

Date Collected: 04/23/12 1440
Date Received: 04/26/12 0925

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				pCi/L		Batch # 2123105	Yld %
Cesium 137	1.1	U	5.8	20.0	11	05/02/12	05/03/12

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.

U Result is less than the sample detection limit.

5/23/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: SW-408

Radiochemistry

Lab Sample ID: F2D300469-008
Work Order: MR95G
Matrix: WATER

Date Collected: 04/24/12 1050
Date Received: 04/26/12 0925

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				pCi/L		Batch # 2123105	Yld %
Cesium 137	0.2	U	4.2	20.0	8.4	05/02/12	05/03/12

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.
U Result is less than the sample detection limit.

5/23/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: MONROE DAM

Radiochemistry

Lab Sample ID: F2D300469-009
Work Order: MR95J
Matrix: WATER

Date Collected: 04/24/12 1145
Date Received: 04/26/12 0925

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				**pCi/L**		**Batch # 2123105**	**Yld %**
Cesium 137	-3.4	U	9.7	20.0	17	05/02/12	05/03/12

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.
U Result is less than the sample detection limit.

5/23/12

AMEC Environment & Infrastructure, Inc.

Client Sample ID: EB-005

Radiochemistry

Lab Sample ID: F2D300469-010
Work Order: MR95K
Matrix: WATER

Date Collected: 04/23/12 1520
Date Received: 04/26/12 0925

EB

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by DOE GA-01-R MOD				pCi/L		Batch # 2123105	Yld %
Cesium 137	1.1	U	6.1	20.0	11	05/02/12	05/03/12

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.

U Result is less than the sample detection limit.

5/23/12

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

List each analysis individually. Use a separate table for QC. Duplicates, Blanks and Spikes. (Several pages will be required for each batch)

Gamma Isotopes

Sample ID	Analysis Date	Sample Designator (Note 1)	All Scheduled Analyses Performed?	Sample Processing Comments?	Units Correct?	Assessment Criteria (Note 2) (Note 3)
MW-104A	5/3/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-104A DUP	5/3/12	DU (Field)	Yes	O.K.	Yes	See attached Checklist
MW-105B	5/3/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-106A	5/3/12	FS	Yes	O.K.	Yes	See attached Checklist
MW-107C	5/3/12	FS	Yes	O.K.	Yes	See attached Checklist
SP-1	5/3/12	FS	Yes	O.K.	Yes	See attached Checklist
SW-011	5/3/12	FS	Yes	O.K.	Yes	See attached Checklist
SW-408	5/3/12	FS	Yes	O.K.	Yes	See attached Checklist
Monroe Dam	5/3/12	FS	Yes	O.K.	Yes	See attached Checklist
EB-005	5/3/12	BL (Field)	Yes	O.K.	Yes	See attached Checklist
Laboratory QC						
F2E020000-105B	5/3/12	BL	Yes	O.K.	Yes	See attached Checklist
F2E020000-105C	5/3/12	QC	Yes	O.K.	Yes	See attached Checklist
F2D300469-001X	5/3/12	DU (Lab)	Yes	O.K.	Yes	See attached Checklist

NOTE

1.0 FS = Field Sample, BL = Blank, QC = Lab Quality Control. DU = Duplicate, SK = Spike

2.0 Reported MDC ≤ Required MDC for FS, DU, BL. Yield for all samples evaluated when reported.

3.0 Requirements for SK, DU, and QC per section D.

I. All Requested analyses performed on all samples? __X__ Yes _____ No

II. Resolution of Sample Processing/Missing Analytes comments:

ATTACHMENT C
ASSESSMENT OF DATA QUALITY

No processing issues or missing analytes.

III. Resolution of Sample Processing/Missing Analytes comments:
No processing issues or missing analytes.

IV. Resolution of Anomalies in QC, Duplicates, Spikes, or Blanks (Identified above):
See attached checklist; no sample qualifications required.

V. Data verification calculation sheets are attached(at least one calculation per batch) NA

Reviewer Julie Minard Date: May 23, 2012

APPENDIX B-4

MASSDEP-PROVIDED SPLIT-SAMPLE RESULTS – MARCH 2012

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

JUDYANN BIGBY, MD
SECRETARY

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COMMISSIONER

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
Bureau of Environmental Health
Radiation Control Program
Schrafft Center – Suite 1M2A
529 Main Street, Charlestown, MA 02129
(617) 242-3035 (617) 242-3457 - Fax

March 20, 2012

Mr. Robert L. Gallaghar, Deputy Director
Massachusetts Department of Public Health
Radiation Control Program
Schrafft Center – 1M2A
529 Main Street
Charlestown, MA 02129

Dear Mr. Gallaghar:

Please find attached a summary of analytical results for one sampling of groundwater and surface water totaling eight sources from the vicinity of the former Yankee Rowe Nuclear Power Station in Rowe, Massachusetts. These samples were collected on March 5th , 7th and 8th, 2012 and received at the Massachusetts Environmental Radiation Laboratory (MERL) on March 13th.

A one liter aliquot from each individual sample was counted for 55,000 seconds on a high purity germanium detector to capture, measure and characterize gamma emissions. These spectrums were analyzed using Canberra Genie 2K Gamma Spectrum System software and libraries.

Each analysis report has been reviewed by the chief radiation scientist and the laboratory supervisor at MERL and is on file at MERL for your review. No measureable levels of radioactivity were discerned for the listed specific radionuclides of interest as follows:

Manganese-54
Iron-59
Cobalt-60
Zinc-65
Cesium-137

These samples appear to contain very low concentrations of decay-chain daughter products of radon, such as , Pb-212, Bi-214 and Pb-214, and some naturally occurring uranium ore constituents.

Our written standard method of analysis is available at MERL for your review and scrutiny.

Unacidified duplicates of these same samples were also received at MERL. These samples will be distilled and analyzed for tritium at the first opportune moment and reported to you in a separate correspondence.

If you have any questions, please do not hesitate to contact me at 617-983-6891.

Unless instructed otherwise by you by May 12, 2012, these samples will be scheduled for removal and disposal on May 15, 2012. Thank you.

Very truly yours,

J. Thomas Coulombe, MPH
Supervisor
Massachusetts Environmental Radiation Laboratory

JTC:jtc

GAMMA SPECTRUM ANALYSES DATE of REPORT: MARCH 20, 2012

ALL GROUNDWATER SAMPLES WERE COLLECTED ON MARCH 5 th , 7th and 8th, 2012

ALL SAMPLES WERE RECEIVED ON March 13th, 20120

SAMPLE COUNTING WAS PERFORMED ON MARCH 13, 14, 15 & 16, 2012

Yankee Rowe Power Station

Monitoring Well	Internal ID	Mn-54 pCi/L	Fe-59 pCi/L	Co-60 pCi/L	Zn-65 pCi/L	Cs-137 pCi/L
MW 104 A	2012E0162	<MDA	<MDA	<MDA	<MDA	<MDA
MW 105 B	2012E0163	<MDA	<MDA	<MDA	<MDA	<MDA
MW 106 A	2012E0164	<MDA	<MDA	<MDA	<MDA	<MDA
MW 107 C	2012E0165	<MDA	<MDA	<MDA	<MDA	<MDA
MONROE DAM	2010E0166	<MDA	<MDA	<MDA	<MDA	<MDA
SW-011	2010E0167	<MDA	<MDA	<MDA	<MDA	<MDA
SW-408	2010E0167	<MDA	<MDA	<MDA	<MDA	<MDA
SP-1	2010E0169	<MDA	<MDA	<MDA	<MDA	<MDA

Samples are counted using Canberra Genie 2K digital signal analyzer and associated software.

Samples are counted for 55,000 seconds each. During gamma spectral counting and analysis the computation software calculates the minimum detectable activity (MDA) for each radionuclide and ordinarily displays the value for each characteristic energy peak of the radionuclides listed in the 'Nuclide Report' printout.

FIGURES

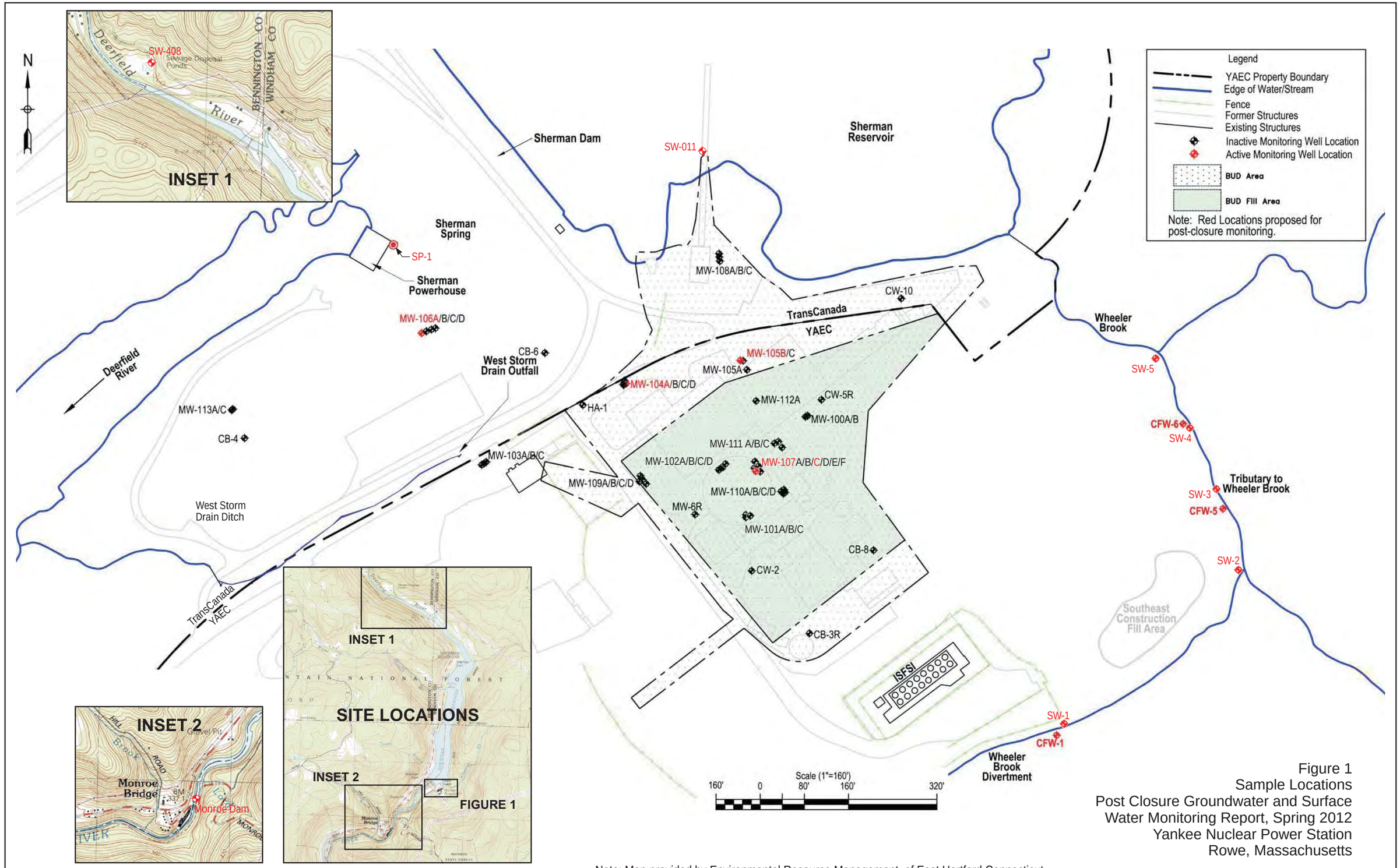

Figure 1
Sample Locations
Post Closure Groundwater and Surface Water Monitoring Report, Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

Note: Map provided by Environmental Resource Management, of East Hartford Connecticut.

PORT2012020a.cdr

TABLES

Table 1
Groundwater and Surface Water Monitoring Program Summary
March 2012

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

				March 2012 Event											April 2012 Event	
			Analysis Method	VOC - (8260)	VOC - (8011)	Metals List 1 - (6020A/7470)	Metals List 2 - (6020A/7470)	RCRA 8 Metals - (6020A/7470)	Cyanide - (9012B)	Nitrate/Chloride/Sulfate - (9056A), TDS - (SM2540C), Alkalinity - (SM2320B)	COD - (EPA 410.4)	Gamma isotopic[1] - (Gamma Spec)	Strontium-90 - (GPC, LSC)	Tritium - (LSC)	Cesium-137 - (Gamma Isotopic)	Cesium-137 - (Gamma Isotopic)
			Fraction	T	T	T	T	D	T	T	T	T	T	T	T	T
			Bottle Size	40	40	500	500	500	1	500	250	2	2	500	2	1
			Bottle Size Units	mL	mL	mL	mL	mL	Liter	mL	mL	Liter	Liter	mL	Liter	Liter
			Bottle Material	Glass Vial	Glass Vial	Poly	Poly	Poly	Poly	Poly	Amber Glass	Poly	Poly	Poly	Poly	Poly
			Preservative	HCl	HCl	HNO3	HNO3	HNO3	NaOH	4 Deg C	H2SO4	HNO3	HNO3	None	HNO3	HNO3
			Lab ID	GEL	GEL	GEL	GEL	GEL	GEL	GEL	GEL	GEL	GEL	GEL	GEL	TAL
Media	**Loc Name**	**Field Sample ID**	**QC Code**													
GW	CFW-1	CFW-1	FS	X	X	X			X	X	X					
GW	CFW-5	CFW-5	FS	X	X	X			X	X	X					
GW	CFW-5	CFW-5DUP	FD	X	X	X			X	X	X					
GW	CFW-5	CFW-5MS	MS	X	X	X			X	X	X					
GW	CFW-5	CFW-5MSD	MSD	X	X	X			X	X	X					
GW	CFW-6	CFW-6	FS	X	X	X			X	X	X					
GW	MW-104A	MW-104A	FS									X	X	X	X	X
GW	MW-104A	MW-104ADUP	FD									X	X	X	X	X
GW	MW-104A	MW-104AMS	MS									X	X	X	X	X
GW	MW-104A	MW-104AMSD	MSD									X	X	X	X	X
GW	MW-105B	MW-105B	FS									X	X	X	X	X
GW	MW-106A	MW-106A	FS									X	X	X	X	X
GW	MW-107C	MW-107C	FS									X	X	X	X	X
SW	Monroe Dam	Monroe Dam	FS									X	X	X	X	X
SW	SP-1	SP-1	FS	X	X		X					X	X	X	X	X
SW	SW-1	SW-1	FS	X	X	X			X	X	X					
SW	SW-2	SW-2	FS	X	X	X			X	X	X					
SW	SW-3	SW-3	FS	X	X	X			X	X	X					
SW	SW-4	SW-4	FS	X	X	X			X	X	X					
SW	SW-5	SW-5	FS	X	X	X			X	X	X					
SW	SW-011	SW-011	FS					X				X	X	X	X	X
SW	SW-408	SW-408	FS					X				X	X	X	X	X
QC	EB-004	EB-004	EB									X	X	X		
QC	EB-005	EB-005	EB												X	X
QC	TB-007	TB-007	TB	X	X											
QC	TB-008	TB-008	TB	X	X											
TOTAL				**14**	**14**	**11**	**1**	**2**	**11**	**11**	**11**	**12**	**12**	**12**	**12**	**12**

Prepared/Date: MGV 05/10/12
Checked/Date: MLP 05/10/12

Table 1
Groundwater and Surface Water Monitoring Program Summary
March 2012

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

Notes:
Metals List 1 - RCRA 8 plus copper, iron, manganese, zinc, calcium, sodium
Metals List 2 - RCRA 8 plus thallium
[1] = Gamma isotopic includes: Co-60, Cs-134, Cs-137, Nb-94, Sb-125, Eu-152, Eu-154, Eu-155, Ag-108m

4 Deg C	4 Degrees Celsius
COD	chemical oxygen demand
D	Dissolved
EB	Equipment Blank
FD	Field Duplicate
FS	Field Sample
GEL	General Engineering Laboratories
GPC	Gross Proportional Counter
GW	Groundwater Sample
H2SO4	Sulfuric Acid
HCl	Hydrochloric Acid
HNO3	Nitric Acid
LSC	Liquid Scintillation Counter
mL	milliliter
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NaOH	Sodium Hydroxide
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
SW	Surface Water Sample
T	Total
TB	Trip Blank
TDS	Total Dissolved Solids
TICs	Tentatively Identified Compounds
VOC	volatile organic compound
X	indicates parameter scheduled for analysis.

Table 2
Field Parameter Measurements

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

	Parameter	Conductivity	DO	Eh	pH	Temperature	Turbidity
	Units	µSiemens/cm	mg/L	mv	S.U.	Deg C	NTUs
Field Sample ID	Sample Date						
CFW-1	3/8/2012	26	13.2	55	7.2	5	25.7
CFW-5	3/6/2012	459	0.9	-100	6.3	5	1.3
CFW-6	3/6/2012	387	0.7	-4.1	6.1	4	0.8
Monroe Dam	3/7/2012	35	14.1	-290	6.6	2	2.5
Monroe Dam	4/24/2012	51	11.1	180	7.2	9	2.3
MW-104A	3/7/2012	309	0.3	52	6.5	10	0.2
MW-104A	4/24/2012	307	0.2	-170	6.0	9	0.3
MW-105B	3/7/2012	602	0.6	-130	7.3	10	2.2
MW-105B	4/24/2012	595	0.4	-240	7.2	10	3.2
MW-106A	3/7/2012	318	0.6	-290	6.3	7	0.5
MW-106A	4/24/2012	308	0.9	-180	6.0	8	1.6
MW-107C	3/5/2012	414	1.0	-28	7.1	7	1.1
MW-107C	4/23/2012	397	0.7	-170	7.0	10	0.7
SP-1	3/8/2012	102	14.2	-200	7.2	3	10.7
SP-1	4/24/2012	251	11.1	220	7.4	10	1.7
SW-1	3/8/2012	25	21.6	28	7.0	2	1.7
SW-2	3/8/2012	19	14.8	-180	6.3	1	1.4
SW-3	3/8/2012	20	15.2	-140	6.4	1	1.7
SW-4	3/6/2012	33	15.0	-250	6.4	0	1.3
SW-5	3/6/2012	27	15.1	-240	6.6	0	1.5
SW-011	3/7/2012	33	15.1	-33	7.4	3	2.2
SW-011	4/23/2012	44	9.1	-88	7.5	12	2.0
SW-408	3/7/2012	39	12.7	-260	6.4	4	10.8
SW-408	4/24/2012	39	11.6	120	7.5	8	3.2

Notes:
Deg C - Degrees Celsius
DO - dissolved oxygen
Eh - oxidation/reduction potential
µSiemens/cm - microseimens per centimeter
mg/L - milligrams per liter
mv - millivolts
NTUs - Nephlemetric Units
S.U. - Standard Units

Prepared/Date: MGV 05/10/12
Checked/Date: MLP 05/10/12

Table 3
Summary of Tritium Analytical Data and Trend Analysis

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

Location	Aug-03 pCi/L	Sep-03 pCi/L	Nov-03 pCi/L	Mar-04 pCi/L	May-04 pCi/L	Dec-06 pCi/L	Mar-07 pCi/L	Mar-08 pCi/L	Mar-09 pCi/L	Mar-10 pCi/L	Mar-12 pCi/L	Trend Analysis*
CFW-5	-		-		-	-	392	-	-			
CFW-6	-		-		-	581	4000/4210	-	2440			
MW-102D						6530	8580	1590	-	-		Decrease
MW-104A						2850	3100/2930	1850	831/900	967/774	456 / -	Decrease
MW-105B	4850		5220	4890	4530	2900	3440	4710	3490	3890	2500	Stable
MW-106A						3010	- /2850	846	484	530	-	Stable
MW-107C		48000	45780	8880**	39020	29100	30900	25700	21300	20100	11400	Stable
MW-107D		9150	9710	5940	10910	9310	9440	9380	8210	7280		Stable
MW-107E						5700	6420	5060 / 5160	4650	5470		Stable
MW-107F						9210	9220	9890	8150	8940		Stable
Monroe Dam									-	-	-	Not Applicable
SP-1	-		-	210	890	1100	452	-	-	244	-	Stable
SW-011									-	-	-	Not Applicable
SW-408									-	-	-	Not Applicable

Prepared/Date: MGV 04/10/12
Checked/Date: MLP 04/11/12

* Trend analysis is based on a concentration change of greater than 15% from previous four events.
** Result outside expected range and considered questionable. Subsequent results support conceptual site model.
967/774 - shows sample and duplicate sample
"-" signifies concentration less than minimum detectable activity
pCi/L - picocuries per liter

Table 4
Summary of Chemical Data From SCFA Monitoring Wells

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

Analysis	Parameter	Location / Sample Date / Sample ID / QC Code / MCP Criteria	CFW-1 8/7/2003 CFW-1-080703 FS	CFW-1 8/18/2004 CFW-1-081804 FS	CFW-1 8/19/2005 CFW-1-081905 FS	CFW-1 8/25/2005 CFW-1-082505 FS	CFW-1 9/18/2006 CFW-1-091806 FS	CFW-1 9/19/2006 CFW-1-091906 FS	CFW-1 3/15/2007 CFW-1-031507 FS	CFW-1 3/16/2007 CFW-1-031607 FS
VOCs	4-Methyl-2-pentanone	350	-	-	0.0014 J		-		-	
	Acetone	6.3	R	-	-		R		-	
	Chloromethane	1000	-	0.00069 J	0.0007 J		-		-	
	Naphthalene	0.14	-		-		-		-	
	Toluene	1000	-	0.00043 J	-		-		-	
Metals	Arsenic	0.01	-	-	-			-		-
	Barium	2	0.017	0.014	0.012			0.0451		0.0138
	Cadmium	0.005	-	-	-			-		0.0005 J
	Calcium	NA								1.83
	Chromium	0.1	-	-	-			0.0036 J		-
	Copper	1	-	-	-			0.0091		0.0026 J
	Iron	0.3*	***1.8***	***1.2 J***	***0.706 J***			***10.7***		***1.98***
	Lead	0.015	-	-	-			0.0056 J		0.0041 J
	Manganese	0.05*	0.047	***0.11***	***0.0533***			***0.305***		***0.12***
	Mercury	0.002	-	-	-			-		-
	Nickel	0.1	-	-	-			0.0073		
	Selenium	0.05	-	-	-			-		-
	Silver	0.1	-	-	-			-		0.0013 J
	Sodium	20								1.28
	Zinc	5	-	-	-			-		0.0126
Cyanide	Cyanide, Total	0.2	-	-	-			-		-
Wet Chemistry	Total Alkalinity, as CaCO3	NA	6	5.1	7		5		7.14	
	Chemical Oxygen Demand	NA	-	-	-		14.4			17.8
	Chloride	250*	-	-	-		-		0.67 J	
	Nitrate as N	10	-	-		-		0.08 J		-
	Sulfate	250*	4.4 J	4.9	3.81 J		3.7		3.32	
	Total Dissolved Solids	500*	-	4	22	13		29		12

Notes:
All results in milligrams per liter (mg/L)
Bold Italics indicates an exceedance of applicable criteria.
Applicable criteria is the MCP GW-1 standard (310 CMR 40.0974(2); effecitve 2/14/2008) and, if not avaible, the Maximum Contaminant Level or Secondary Maximum Contaminant Level (SMCL) (MADEP, 2007)
* indicates SMCL; not a health-based standard
FD - Field Duplicate
FS - Field Sample
J - estimated value
NA - Not Available
QC - Quality Control
R - data rejected during validation; unusable
VOCs - volatile organic compounds
"-" indicates analyte not detected

Table 4
Summary of Chemical Data From SCFA Monitoring Wells

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

Analysis	Parameter	Location / Sample Date / Sample ID / QC Code / MCP Criteria	CFW-1 3/25/2008 CFW-1 FS	CFW-1 3/11/2009 CFW-1 FS	CFW-1 3/3/2010 CFW-1 FS	CFW-1 3/8/2012 CFW-1 FS	CFW-5 8/5/2003 CFW-5-080503 FS	CFW-5 8/18/2004 CFW-5-081804 FS	CFW-5 8/17/2005 CFW-5-081705 FS	CFW-5 9/13/2006 CFW-5-091306 FS
VOCs	4-Methyl-2-pentanone	350	-	-	-	-	-	-	0.0006 J	-
	Acetone	6.3	0.0027	-	-	-	-	-	-	R
	Chloromethane	1000					-	0.00069 J	0.0009 J	-
	Naphthalene	0.14	-	-	-	-	-		-	-
	Toluene	1000	-	-	-	-	-	-	-	-
Metals	Arsenic	0.01	-	-	-	-	-	-	-	-
	Barium	2	-	-	-	0.0248	0.043	0.061	0.0612	0.0638
	Cadmium	0.005	-	-	-	-	-	-	-	-
	Calcium	NA	1.5	1.7	1.3	1.9				
	Chromium	0.1	-	-	-	0.00263 J	-	-	-	-
	Copper	1	-	-	-	0.00406	-	-	-	-
	Iron	0.3*	***5.8 J***	***3.6 J***	***5.7***	***9.15***	***38***	***67***	***89.2***	***75.1***
	Lead	0.015	-	-	-	0.0012 J	R	-	-	0.0036 J
	Manganese	0.05*	***0.15***	***0.14***	***0.2***	***0.22***	***3.5***	***4.4***	***4.16 J***	***4.62***
	Mercury	0.002	-	-	-	-	-	-	-	-
	Nickel	0.1					-	-	-	0.0129
	Selenium	0.05	-	-	-	-	-	-	-	0.007 J
	Silver	0.1	-	-	-	-	-	-	-	-
	Sodium	20	0.94	-	0.81	0.958				
	Zinc	5	-	-	-	0.0142	-	-	-	-
Cyanide	Cyanide, Total	0.2	-	-	-	-	-	-	-	-
Wet Chemistry	Total Alkalinity, as CaCO3	NA	3.4	3.4 J	4.6	5.64	87	93	101	130
	Chemical Oxygen Demand	NA	-	-	-	13.2 J	26	32	27.3	36.9
	Chloride	250*	-	-	-	0.6	-	2.7	1.91	15.5 J
	Nitrate as N	10	-	-	-	-	-	-	-	-
	Sulfate	250*	3.2	3.3	2.6	2.78	1.2	1.2	0.58 J	-
	Total Dissolved Solids	500*	46	1	-	15 J	120	200	111	170

Notes:
All results in milligrams per liter (mg/L)
Bold Italics indicates an exceedance of applicable criteria.
Applicable criteria is the MCP GW-1 standard (310 CMR 40.0974(2); effecitve 2/14/2008) and, if not avaible, the Maximum Contaminant Level or Secondary Maximum Contaminant Level (SMCL) (MADEP, 2007)
* indicates SMCL; not a health-based standard
FD - Field Duplicate
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J - estimated value
NA - Not Available
QC - Quality Control
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VOCs - volatile organic compounds
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Table 4
Summary of Chemical Data From SCFA Monitoring Wells

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

Analysis	Parameter	Location / Sample Date / Sample ID / QC Code / MCP Criteria	CFW-5 3/8/2007 CFW-5-030807 FS	CFW-5 3/26/2008 CFW-5 FS	CFW-5 3/26/2008 CFW-5 DUP FD	CFW-5 3/10/2009 CFW-5 FS	CFW-5 3/10/2009 CFW-5DUP FD	CFW-5 3/2/2010 CFW-5 FS	CFW-5 3/2/2010 CFW-5 Dup FD	CFW-5 3/6/2012 CFW-5 FS
VOCs	4-Methyl-2-pentanone	350	-	-	-	-	-	-	-	-
	Acetone	6.3	-	-	-	-	-	-	-	-
	Chloromethane	1000	-							
	Naphthalene	0.14	-	-	-	-	-	-	-	-
	Toluene	1000	-	-	-	-	-	-	-	-
Metals	Arsenic	0.01	0.0063	-	-	-	-	-	-	-
	Barium	2	0.0537	-	-	0.051	0.052	0.053	0.053	0.0681
	Cadmium	0.005	-	-	-	-	-	-	-	-
	Calcium	NA	29.1	16	15	28	28	28	27	31.9
	Chromium	0.1	-	-	-	-	-	-	-	-
	Copper	1	-	-	-	-	-	-	-	-
	Iron	0.3*	***70.6***	***32 J***	***31 J***	***65 J***	***63 J***	***70***	***71***	***85.5***
	Lead	0.015	-	-	-	-	-	-	-	-
	Manganese	0.05*	***4.28***	***1.9***	***1.8***	***3.7***	***3.7***	***3.8***	***3.7***	***5.32***
	Mercury	0.002	-	-	-	-	-	-	-	-
	Nickel	0.1								
	Selenium	0.05	-	-	-	-	-	0.021 J	0.022 J	-
	Silver	0.1	-	-	-	0.017	0.018	-	-	-
	Sodium	20	3.71	1.8	1.6	-	-	2.9	2.9	3.11
	Zinc	5	-	-	-	-	-	-	-	-
Cyanide	Cyanide, Total	0.2	0.0176	-	-	0.012	0.012	-	-	-
Wet Chemistry	Total Alkalinity, as CaCO3	NA	127	69	63	130 J	170 J	110	140	R
	Chemical Oxygen Demand	NA	51.9	18	17	35	30	29	26	59.7
	Chloride	250*	9.12	2.3	2.2	4.8	4.2	5.1 J	5 J	R
	Nitrate as N	10	0.04 J	-	-	-	-	-	-	R
	Sulfate	250*	0.44 J	2.3	2.3	-	-	-	-	R
	Total Dissolved Solids	500*	170	110	100	110	150	130 J	140 J	R

Notes:
All results in milligrams per liter (mg/L)
Bold Italics indicates an exceedance of applicable criteria.
Applicable criteria is the MCP GW-1 standard (310 CMR 40.0974(2); effecitve 2/14/2008) and, if not avaible, the Maximum Contaminant Level or Secondary Maximum Contaminant Level (SMCL) (MADEP, 2007)
* indicates SMCL; not a health-based standard
FD - Field Duplicate
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Table 4
Summary of Chemical Data From SCFA Monitoring Wells

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

Analysis	Parameter	Location / Sample Date / Sample ID / QC Code / MCP Criteria	CFW-5 3/6/2012 CFW-5DUP FD	CFW-6 8/11/2003 CFW-6-081103 FS	CFW-6 8/18/2004 CFW-6-081804 FS	CFW-6 8/24/2005 FD001-082405 FD	CFW-6 8/24/2005 CFW-6-082405 FS	CFW-6 4/19/2006 CFW-6-042006 FS	CFW-6 9/13/2006 CFW-6-091306 FS	CFW-6 9/13/2006 FD001-091306 FD
VOCs	4-Methyl-2-pentanone	350	-	-	-	0.0009 J	0.0008 J	-	-	-
	Acetone	6.3	-	-	-	-	0.008 J	0.0026 J	R	R
	Chloromethane	1000		-	-	-	-	-	-	-
	Naphthalene	0.14	-	-		-	-	-	-	-
	Toluene	1000	-	-	-	-	-	-	-	-
Metals	Arsenic	0.01	-	-	-	-	-	-	-	-
	Barium	2	0.0685 J	0.069	0.077	0.0641	0.0629		0.0544	0.0592
	Cadmium	0.005	-	-	-	-	-	-	-	-
	Calcium	NA	33 J							
	Chromium	0.1	-	-	-	-	-	-	0.0024 J	0.0027 J
	Copper	1	-	-	-	-	-	-	-	-
	Iron	0.3*	***86.4 J***	***67***	***51 J***	***71.5***	***71***		***64.6***	***68.1***
	Lead	0.015	-	-	-	-	-	-	0.0031 J	0.003 J
	Manganese	0.05*	***5.36 J***	***8.8***	***6.9***	***7.65***	***7.54***		***6.69***	***7.2***
	Mercury	0.002	-	-	-	-	-	-	0.00018 J	-
	Nickel	0.1		-	-	-	-	-	0.0098	0.01
	Selenium	0.05	-	-	-	-	-	-	0.0091 J	0.0101 J
	Silver	0.1	-	-	-	-	-	-	-	-
	Sodium	20	2.95 J							
	Zinc	5	-	-	-	-	-	-	0.0134	-
Cyanide	Cyanide, Total	0.2	-	-	-	-	0.0127		-	-
Wet Chemistry	Total Alkalinity, as CaCO3	NA	152	100	110	136	116		108	131
	Chemical Oxygen Demand	NA	52.7	38	33	30.1	31.8		35.1	36.4
	Chloride	250*	3.92	-	2.3	9.12	7.79		14.7 J	16.1 J
	Nitrate as N	10	-	-	-	-	-		0.04 J	-
	Sulfate	250*	0.557	-	-	-	-		-	-
	Total Dissolved Solids	500*	180	180	200	204	214		147	172

Notes:
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FD - Field Duplicate
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Table 4
Summary of Chemical Data From SCFA Monitoring Wells

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

Analysis	Parameter	Location / Sample Date / Sample ID / QC Code / MCP Criteria	CFW-6 3/8/2007 CFW-6-030807 FS	CFW-6 3/8/2007 FD007-030807 FD	CFW-6 3/25/2008 CFW-6 FS	CFW-6 3/10/2009 CFW-6 FS	CFW-6 3/2/2010 CFW-6 FS	CFW-6 3/6/2012 CFW-6 FS
VOCs	4-Methyl-2-pentanone	350	-	-	-	-	-	-
	Acetone	6.3	-	-	-	-	-	-
	Chloromethane	1000	-	-				
	Naphthalene	0.14	-	-	-	-	-	-
	Toluene	1000	-	-	-	-	-	-
Metals	Arsenic	0.01	0.0054 J	0.0049 J	-	-	-	-
	Barium	2	0.0612	0.0592	-	-	-	0.0602
	Cadmium	0.005	0.0005 J	0.0002 J	-	-	-	-
	Calcium	NA	25.5	25.4	7.4	14	14	16.7
	Chromium	0.1	0.0022 J	0.0028 J	-	-	-	-
	Copper	1	-	-	-	-	-	-
	Iron	0.3*	***56.8***	***58.8***	***0.57 J***	***39 J***	***20***	***67.1***
	Lead	0.015	0.0029 J	-	-	-	-	-
	Manganese	0.05*	***6.74***	***6.8***	***0.2***	***3.6***	***2.9***	***4.93***
	Mercury	0.002	0.00006 J	-	-	-	-	-
	Nickel	0.1						
	Selenium	0.05	-	-	-	-	-	-
	Silver	0.1	-	-	-	0.013	-	-
	Sodium	20	1.56	1.52	1.3	-	2.7	5.05
	Zinc	5	-	0.0056	-	-	-	-
Cyanide	Cyanide, Total	0.2	-	-	-	-	-	0.00412 J
Wet Chemistry	Total Alkalinity, as CaCO3	NA	100	128	17	100 J	71	126
	Chemical Oxygen Demand	NA	26.3	51.9	27	23	12	59.7
	Chloride	250*	12.5	11.8	-	3.2	2.7 J	1.53
	Nitrate as N	10	0.04 J	0.04 J	-	-	-	-
	Sulfate	250*	0.7 J	0.68 J	4.7	5.8	4.3 J	0.755
	Total Dissolved Solids	500*	189	181	33	77	89 J	187

Prepared/Date: BJS 04/10/12
Checked/Date: MGV 04/11/12

Notes:
All results in milligrams per liter (mg/L)
Bold Italics indicates an exceedance of applicable criteria.
Applicable criteria is the MCP GW-1 standard (310 CMR 40.0974(2); effecitve 2/14/2008) and, if not avaible, the Maximum Contaminant Level or Secondary Maximum Contaminant Level (SMCL) (MADEP, 2007)
* indicates SMCL; not a health-based standard
FD - Field Duplicate
FS - Field Sample
J - estimated value
NA - Not Available
QC - Quality Control
R - data rejected during validation; unusable
VOCs - volatile organic compounds
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Table 5
Summary of Chemical Data for SCFA Surface Water Locations

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

		Loc Name	SW-1	SW-1	SW-1	SW-1	SW-2	SW-2	SW-2	SW-2
		Field Sample Date	3/25/2008	3/10/2009	3/3/2010	3/8/2012	3/25/2008	3/10/2009	3/3/2010	3/8/2012
		Field Sample ID	SW-1	SW-1	SW-1	SW-1	SW-2	SW-2	SW-2	SW-2
		QC Code	FS	FS	FS	FS	FS	FS	FS	FS
Analysis	**Parameter**	**Screening Values**								
VOCs	Target Compounds		-	-	-	-	-	-	-	-
Metals	Barium		-	-	-	0.0123	-	-	-	0.0107
	Calcium	NA	2.5	2.2	2.6	2.39	2.3	2.1	2.5	1.89
	Iron	1	0.016 J	0.064 J	0.032	0.133	0.021 J	0.063 J	0.037	0.0483 J
	Manganese	0.05*	-	-	-	0.0144	-	-	-	0.00437 J
	Sodium	20*	1.1	-	0.78	0.878	1.1	-	0.8	0.675
	Zinc		-	-	-	0.00451 J	-	-	-	0.00491 J
Cyanide	Cyanide, Total	0.0052	-	-	-	-	-	-	-	-
Wet Chemistry	Total Alkalinity, as CaCO3	20	1.9	2.3	5.4	2.57	1.1	2.1	5.4	2.05
	Chemical Oxygen Demand		-	-	-	-	-	-	-	-
	Chloride		-	-	-	0.591	-	-	-	0.556
	Nitrate as N		-	-	-	0.25	-	-	-	0.227
	Sulfate	250*	5	4.2	5.5	4.97	5	5.4	5.5	4.26
	Total Dissolved Solids	250*	21	5	19 J	20	54	16	19 J	15.7

Notes:
All results in milligrams per liter (mg/L)
Screening value is the USEPA Ambient Water Quality Criteria (AWQC) and, if not available, the Maximum Contaminant Level or Secondary Maximum Contaminant Level (MADEP, 2007)
* indicates criteria is from the Secondary Maximum Contaminant Level; not a health-based standard
FS - Field Sample
J - estimated value
NA - Not Available
QC - Quality Control
VOCs - volatile organic compounds
"-" indicates analyte not detected

Table 5
Summary of Chemical Data for SCFA Surface Water Locations

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

		Loc Name	SW-3	SW-3	SW-3	SW-3	SW-4	SW-4	SW-4	SW-4
		Field Sample Date	3/25/2008	3/10/2009	3/3/2010	3/8/2012	3/25/2008	3/10/2009	3/2/2010	3/6/2012
		Field Sample ID	SW-3	SW-3	SW-3	SW-3	SW-4	SW-4	SW-4	SW-4
		QC Code	FS	FS	FS	FS	FS	FS	FS	FS
Analysis	**Parameter**	**Screening Values**								
VOCs	Target Compounds		-	-	-	-	-	-	-	-
Metals	Barium		-	-	-	0.0106	-	-	-	0.0142
	Calcium	NA	2.2	2	2.4	1.95	2.6	2.2	2.4	3.12
	Iron	1	0.029 J	0.061 J	0.5	0.362	***1.1*** J	0.55 J	0.9	***2.08***
	Manganese	0.05*	-	-	***0.074***	0.0242	***0.14***	***0.076***	***0.13***	***0.24***
	Sodium	20*	1.1	-	0.6	0.654	1.1	-	0.65	0.96
	Zinc		-	-	-	0.00362 J	-	-	-	0.00456 J
Cyanide	Cyanide, Total	0.0052	-	-	-	-	-	-	-	-
Wet Chemistry	Total Alkalinity, as CaCO3	20	-	1.7	5.6	3.08	3.5	2.9	6.5	6.67
	Chemical Oxygen Demand		-	-	-	-	-	-	-	13.2 J
	Chloride		-	-	-	0.553	-	-	-	0.711
	Nitrate as N		-	-	-	0.228	-	-	-	0.205
	Sulfate	250*	5.9	5.3	4.8	4.28	5.1	5.2	4.8 J	4.79
	Total Dissolved Solids	250*	8	26	13 J	8.57 J	19	35	11 J	28.6

Notes:
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Screening value is the USEPA Ambient Water Quality Criteria
(AWQC) and, if not available, the Maximum Contaminant
Level or Secondary Maximum Contaminant Level (MADEP, 2007)
* indicates criteria is from the Secondary Maximum
Contaminant Level; not a health-based standard
FS - Field Sample
J - estimated value
NA - Not Available
QC - Quality Control
VOCs - volatile organic compounds
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Table 5
Summary of Chemical Data for SCFA Surface Water Locations

Post Closure Groundwater and Surface Water Monitoring Report Spring 2012
Yankee Nuclear Power Station
Rowe, Massachusetts

		Loc Name	SW-5	SW-5	SW-5	SW-5
		Field Sample Date	3/25/2008	3/10/2009	3/2/2010	3/6/2012
		Field Sample ID	SW-5	SW-5	SW-5	SW-5
		QC Code	FS	FS	FS	FS
Analysis	**Parameter**	**Screening Values**				
VOCs	Target Compounds		-	-	-	-
Metals	Barium		-	-	-	0.0126
	Calcium	NA	2.3	2.2	2	2.77
	Iron	1	0.26 J	0.48 J	0.27	***1.52***
	Manganese	0.05*	0.04	***0.071***	0.044	***0.141***
	Sodium	20*	1	-	0.6	0.883
	Zinc		-	-	-	-
Cyanide	Cyanide, Total	0.0052	-	-	-	-
Wet Chemistry	Total Alkalinity, as CaCO3	20	1.5	2.7	4.3	13.9
	Chemical Oxygen Demand		-	-	-	13.2 J
	Chloride		-	-	-	0.662
	Nitrate as N		-	-	-	0.195
	Sulfate	250*	5	5.3	4.2 J	4.67
	Total Dissolved Solids	250*	31	3	4 J	20

Notes:
Prepared/Date: BJS 04/11/12
Checked/Date: MGV 04/11/12

All results in milligrams per liter (mg/L)
Screening value is the USEPA Ambient Water Quality Criteria (AWQC) and, if not available, the Maximum Contaminant Level or Secondary Maximum Contaminant Level (MADEP, 2007)
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June 5, 2012
BYR 2012-020

ATTACHMENT 2

Post-Closure Soil Stability Monitoring – Settlement, Cracks, Erosion and Vegetative Cover

Monitoring of the soil stability of the Southeast Construction Fill Area (SCFA) and the Beneficial Use Determination (BUD) Area was performed in 2010 and 2011. The following provides results of the monitoring:

Southeast Construction Fill Area

No problems were noted with the soil stability during the post-closure monitoring of the SCFA in 2010 and 2011. No settlement, cracks or erosion was noted and the grassy cover remained intact.

Beneficial Use Determination Area

No problems were noted with the soil stability during the post-closure monitoring of the BUD Area in 2010 and 2011. No settlement, cracks or erosion was noted and the grassy cover remained intact.

June 5, 2012
BYR 2012-020

ATTACHMENT 3

Southeast Construction Fill Area (SCFA) Financial Assurance Mechanism (FAM) Review

As required by the Southeast Construction Fill Area Closure Certification Report; Condition 13, the Financial Assurance Mechanism for the SCFA is evaluated every two years and the results reported to the Massachusetts Department of Environmental Protection.

The Financial Assurance Mechanism for the SCFA has been reviewed and no changes are required at this time.