

N-0998-11-13  
December 1, 2017

Ms. Shauna Little  
United States Environmental Protection Agency – Region 1  
1 Congress Street, Suite 1100  
Boston, Massachusetts 02114-2023

Re: **Submittal of Notice of Intent (NOI) Remediation General Permit (RGP)**  
Construction Dewatering  
Aberjona River  
Winchester, Massachusetts 01890

Dear Ms. Little:

On behalf of NSTAR Electric Company d/b/a Eversource Energy (Eversource), Tighe & Bond, Inc. (Tighe & Bond) has prepared this Notice of Intent (NOI) for application of a National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) for the proposed construction dewatering activities conducted during the installation of a new below grade electric transmission line and associated manholes beneath the Massachusetts Bay Transit Authority (MBTA) Wedgemere commuter rail station, along Fletcher Street, Bacon Street and a portion of Main Street in Winchester, Massachusetts to the City of Medford Border (the Site). A copy of the NOI is included in Appendix A. The limits of the Site are shown on the Aerial Dewatering Site Plan (Figure 1) and the Massachusetts Geographic Information Systems (MassGIS) Priority Resource Map (Figure 2) in Appendix B.

As there is a need to treat and discharge water generated from the construction dewatering activities, the enclosed NOI form provides required information on general Site conditions, proposed treatment systems, discharge locations, receiving water, and laboratory analytical results from pre-discharge sampling. The proposed treatment systems are shown on Figure 3 (Process Flow Diagram) in Appendix B. The excavation dewatering and discharge of treated groundwater are scheduled to begin in December 2017 and end in December 2019.

Dewatered groundwater at the Site will be treated by a treatment system before being discharged to on-Site catch basins and into a stormwater drainage system managed by the City of Winchester. All subject stormwater drainage systems for this RGP eventually discharge to the Aberjona River in Winchester, Massachusetts. Post treatment discharge rates will range from 25 gallons per minute (GPM) to 350 GPM.

## Project Background

The overall project involves the installation of 7.7 miles of new electric transmission line and 19 manholes between Mystic Substation 250 in Charlestown, Massachusetts to the Woburn Substation 211 in Woburn Massachusetts. The proposed electrical transmission line trench will measure approximately three feet wide and will be installed at an approximate depth of five feet below ground surface (BGS). The manholes will be approximately 10 feet wide, by 25 feet long and 10 feet deep. Initial pre-characterization efforts have indicated that the average depth to groundwater at the Site is approximately 10 feet BGS. Property uses along the Site are residential.

This RGP Permit Application is for the discharge of treated groundwater to the Winchester stormwater drainage system and ultimately to the Aberjona River.





## Groundwater Characterization

To characterize groundwater along the proposed route of construction, groundwater samples were collected from groundwater monitoring wells MW-36 and MW-37 in January 2017. The groundwater samples were submitted for laboratory analysis for Environmental Protection Agency (EPA) RGP parameters. The laboratory analytical results are summarized in Table 1 included in Appendix E. A copy of the laboratory analytical report is included in Appendix F. Laboratory analytical results were compared to the RGP Technology Based Effluent Limitations (TBEL) and Water Quality Based Effluent Limit (WQBEL). The WQBEL were calculated in accordance with Appendix V of the RGP permit, for sites in Massachusetts.

Contaminants of concern are analytes that exceeded either the TBEL or WQBEL. Contaminants of concern detected in MW-36 and MW-37 include group I PAHs, iron, and total suspended solids (TSS). Since these monitoring wells were installed adjacent to a roadway, chloride detected in groundwater samples is most likely associated with road salting during the winter months.

## Receiving Water Characterization

Aberjona River (waterbody identification MA71-01) is classified as a Class B impaired water body and is listed in the 303(d) Impaired Waterbodies Document. According to the United States Geologic Survey's StreamStats online application, the 7Q10 value at Aberjona River was calculated at 0.968 million gallons per day (MGD).

As required by the NPDES RGP, a surface water sample was collected prior to discharge and analyzed for contaminants of concern that were present in the groundwater samples from the monitoring wells discussed above. The surface water sample was collected in November 2017 and sent for laboratory analysis of metals, ammonia, hexavalent chromium, pH and hardness. The surface water sample was collected within a quarter mile of the potential outfall location at the Aberjona River, and is shown on Figure 1 (Dewatering Site Plan) in Appendix B. Contaminants of concern detected in the surface water sample include arsenic, copper, iron, zinc and ammonia.

## Treatment Systems

Dewatered groundwater at the Site will be treated prior to discharge to a City of Winchester stormwater drainage system ultimately discharging to the Aberjona River. Based on project demands, dewatered groundwater may also be transported to a project Laydown yard in Medford for treatment prior to discharge to the Mystic River. The Mystic River discharge is subject to a separate RGP NOI being filed concurrently. Outfall locations are shown on Figure 1 (Dewatering Site Plan) in Appendix B. As required, the City of Winchester and Medford will be notified of the potential discharge activities and permission will be obtained prior to commencement of discharge.

**Mobile Treatment System** – Depending on the level of treatment required and discharge flow rate, the mobile treatment system will be mounted on either a 24 or 48-foot mobile trailer located on-Site. The mobile treatment system will consist of a weir tank, particulate filter units, bag filters and/or granular activated carbon (GAC)/clay filter. Based on effluent monitoring results, the treatment system or flow rate will be modified to comply with the effluent limits.



Flow Rate (GPM)	Proposed Treatment System
0-50	TSS treatment via a silt/pipe sock or bag filter
50-150	24-foot trailer with particulate filter units, bag filters and/or GAC/clay filter
150-350	48-foot trailer weir tank, particulate filter units, bag filters and/or GAC/clay filter

**Stationary Treatment System** - The stationary treatment system located at the project Laydown yard in Medford is composed of one or two 10,000-gallon fractionation tanks, one sand filter unit and two particulate filters, two GAC filters, and two clay vessels. Groundwater will be pumped from the excavation into a tanker truck and transported to the laydown yard. From the tank truck, the groundwater will be pumped into the fractionation tanks and then through a sand filter and particulate filter for the removal of solids, into the GAC filters and clay vessels to remove organics, and then through a particulate filter to remove any residual solids. The Mystic River discharge is subject to a separate RGP NOI being filed concurrently.

**Best Management Practices Plan** – Tighe & Bond designed a Best Management Practices Plan (BMPP) for the groundwater extraction and treatment systems for the Site. The BMPP is intended to satisfy the requirements of Section 2.5 of the RGP. A copy of the BMPP will be available at the Site prior to initiating dewatering activities..

## Owner and Operator

### Owner

NSTAR Electric Company  
d/b/a Eversource  
Michael J. Zylich  
247 Station Drive  
Westwood, MA 02090

### Operator

BOND Brothers  
Rich McKanas  
145 Spring Street  
Everett, MA 02127

## Notice of Intent

Preparation of this NOI has included a review of the literature pertaining to Areas of Critical Environmental Concern (ACEC), Endangered Species Act (ESA), and the National Historic Preservation Act (NHPA), as documented below:

- Review of a MassGIS Priority Resource Map, Figure 2, shows the Site is not within an ACEC;
- Review of the “Federally Listed Endangered and Threatened Species in Massachusetts” (Appendix C) found that there are two listed species in Middlesex County. The first species is the whorled pogonia which prefers forest habitat, and the second species is the northern long-eared bat, which prefers mines and caves in the winter and forested habitats in the summer. The small whorled pogonia is found in the Groton area while the northern long-eared bat is found statewide. As the Site is not in Groton, the small whorled pogonia will not be affected from construction activities or from the proposed discharges. The project area consists of an asphalt roadway that borders a residential area. No vegetation will be disturbed during construction activities. As a result, it is the opinion of Tighe & Bond that the habitats for northern long-eared bat will not be disturbed during construction activities. Additionally, the discharge is to Aberjona River which is not a habitat where the northern long-eared bat exists.



- According to United States Fish and Wildlife Services (USFWS) Information, Planning and Conservation (IPaC) tool there are no critical habitats within the Site. USFWS confirmed there are no critical habitats in the area and confirmed permit eligibility meets "Criterion A."
  - Additionally, according to the MassGIS Priority Resource Map, no NHESP Priority Habitats for Rare Species or Estimated Habitats for Rare Wildlife, were present within half a mile downstream of the discharge location. Therefore, permit eligibility meets "Criterion A."
- An electronic review of the Massachusetts Cultural Resource Information System database (Appendix D), made available through the Massachusetts Historical Commission, found several historical areas along Fletcher Street, Bacon Street and Main Street in Winchester, Massachusetts. Discharges and discharge related activities do not have the potential to cause effects on these historic properties as the discharge activities are limited to the roadway and will go through already existing drainage systems. Therefore, permit eligibility meets "Criterion B."
- Groundwater samples were collected from on-site groundwater monitoring wells MW-36 and MW-37 in January of 2017. The groundwater samples were submitted for laboratory analysis for RGP parameters. The laboratory analytical results are summarized in the Table included in Appendix E. A copy of the laboratory analytical report is included in Appendix F. Laboratory analytical results were compared to the RGP TBEL or WQBEL.
- Surface water samples were collected from the Aberjona River within a quarter mile of the potential outfall location in November of 2017 submitted for laboratory analysis of RGP parameters that were detected in the groundwater samples. The laboratory analytical results are summarized in the Table 2 included in Appendix E and F compared to the RGP TBEL or WQBEL.

Based on the critical low flow (7Q10) value of the receiving water (0.968 MGD) and the proposed maximum discharge rate of up to 0.504 MGD, a dilution factor of 2.92 was established for this permit and verified by the Massachusetts Department of Environmental Protection (MassDEP), the MassDEP confirmation is included in Appendix E. The 7Q10 value was calculated using the United States Geologic Survey's StreamStats online application, and the dilution factor was calculated as instructed by the EPA *Dilution Factor and Effluent Limitation Calculations for Massachusetts*, Appendix V.

The proposed treatment systems have been designed to reduce contaminants of concern to below the applicable effluent limits. Effluent compliance monitoring will be conducted on a monthly basis and the effluent samples submitted for environmental laboratory analysis of iron, Group I PAHs, TSS, and pH. Additionally, the flow rate, pH and turbidity levels will be monitored in the field and recorded.



If you need any additional information or assistance on this project, please do not hesitate to contact Michael E. Martin at (508) 564-7285 at your convenience.

Very truly yours,

**TIGHE & BOND, INC.**



Michael E. Martin  
Project Manager



Gary W.T. Hedman, LSP  
Project Manager

Enclosures

Copy: Michael Zylich, Eversource  
Rich Mckanas, BOND  
MassDEP, Division of Watershed Management  
MassDEP, Boston

### **List of Appendices**

Appendix A	Notice of Intent
Appendix B	Figures
Appendix C	Federally Endangered Species in Massachusetts, USFWS Consultation Letter
Appendix D	Massachusetts Cultural Resources Information System Report
Appendix E	MassDEP Dilution Factor Confirmation WQBEL Calculations Groundwater Summary Table 1 Surface Water Summary Table 2
Appendix F	Laboratory Analytical Results

### **List of Figures**

Figure 1	Aerial Dewatering Site Plan
Figure 2	MassDEP Priority Resource Map
Figure 3	Process Flow Diagrams







## II. Suggested Format for the Remediation General Permit Notice of Intent (NOI)

### A. General site information:

1. Name of site:	Site address:		
	Street:		
	City:	State:	Zip:
2. Site owner     Owner is (check one): <input type="checkbox"/> Federal <input type="checkbox"/> State/Tribal <input type="checkbox"/> Private <input type="checkbox"/> Other; if so, specify:	Contact Person:		
	Telephone:	Email:	
	Mailing address:		
	Street:		
	City:	State:	Zip:
3. Site operator, if different than owner	Contact Person:		
	Telephone:	Email:	
	Mailing address:		
	Street:		
	City:	State:	Zip:
4. NPDES permit number assigned by EPA:   NPDES permit is (check all that apply): <input type="checkbox"/> RGP <input type="checkbox"/> DGP <input type="checkbox"/> CGP <input type="checkbox"/> MSGP <input type="checkbox"/> Individual NPDES permit <input type="checkbox"/> Other; if so, specify:	5. Other regulatory program(s) that apply to the site (check all that apply):		
	<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> MA Chapter 21e; list RTN(s):   <input type="checkbox"/> NH Groundwater Management Permit or  Groundwater Release Detection Permit: </div> <div> <input type="checkbox"/> CERCLA  <input type="checkbox"/> UIC Program  <input type="checkbox"/> POTW Pretreatment  <input type="checkbox"/> CWA Section 404 </div> </div>		



**B. Receiving water information:**

1. Name of receiving water(s):	Waterbody identification of receiving water(s):	Classification of receiving water(s):
Receiving water is (check any that apply): <input type="checkbox"/> Outstanding Resource Water <input type="checkbox"/> Ocean Sanctuary <input type="checkbox"/> territorial sea <input type="checkbox"/> Wild and Scenic River		
2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No Are sensitive receptors present near the site? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, specify:		
3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP.		
4. Indicate the seven day-ten-year low flow (7Q10) of the receiving water determined in accordance with the instructions in Appendix V for sites located in Massachusetts and Appendix VI for sites located in New Hampshire.		
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.		
6. Has the operator received confirmation from the appropriate State for the 7Q10 and dilution factor indicated? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, indicate date confirmation received:		
7. Has the operator attached a summary of receiving water sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No		

**C. Source water information:**

1. Source water(s) is (check any that apply):			
<input type="checkbox"/> Contaminated groundwater  Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Contaminated surface water  Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> The receiving water	<input type="checkbox"/> Potable water; if so, indicate municipality or origin:  <input type="checkbox"/> Other; if so, specify:
		<input type="checkbox"/> A surface water other than the receiving water; if so, indicate waterbody:	



2. Source water contaminants:	
a. For source waters that are contaminated groundwater or contaminated surface water, indicate are any contaminants present that are not included in the RGP? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, indicate the contaminant(s) and the maximum concentration present in accordance with the instructions in Appendix VIII.	b. For a source water that is a surface water other than the receiving water, potable water or other, indicate any contaminants present at the maximum concentration in accordance with the instructions in Appendix VIII? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No	

#### **D. Discharge information**

1.The discharge(s) is a(n) (check any that apply): <input type="checkbox"/> Existing discharge <input type="checkbox"/> New discharge <input type="checkbox"/> New source	
Outfall(s):	Outfall location(s): (Latitude, Longitude)
<p>Discharges enter the receiving water(s) via (check any that apply): <input type="checkbox"/> Direct discharge to the receiving water <input type="checkbox"/> Indirect discharge, if so, specify:</p> <p><input type="checkbox"/> A private storm sewer system <input type="checkbox"/> A municipal storm sewer system</p> <p>If the discharge enters the receiving water via a private or municipal storm sewer system:</p> <p>Has notification been provided to the owner of this system? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Has the operator has received permission from the owner to use such system for discharges? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No, if so, explain, with an estimated timeframe for obtaining permission:</p> <p>Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	
Provide the expected start and end dates of discharge(s) (month/year):	
Indicate if the discharge is expected to occur over a duration of: <input type="checkbox"/> less than 12 months <input type="checkbox"/> 12 months or more <input type="checkbox"/> is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No	



2. Activity Category: (check all that apply)	3. Contamination Type Category: (check all that apply)	
<input type="checkbox"/> I – Petroleum-Related Site Remediation <input type="checkbox"/> II – Non-Petroleum-Related Site Remediation <input type="checkbox"/> III – Contaminated Site Dewatering <input type="checkbox"/> IV – Dewatering of Pipelines and Tanks <input type="checkbox"/> V – Aquifer Pump Testing <input type="checkbox"/> VI – Well Development/Rehabilitation <input type="checkbox"/> VII – Collection Structure Dewatering/Remediation <input type="checkbox"/> VIII – Dredge-Related Dewatering	<p>a. If Activity Category I or II: (check all that apply)</p> <p><input type="checkbox"/> A. Inorganics</p> <p><input type="checkbox"/> B. Non-Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> C. Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> D. Non-Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> E. Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> F. Fuels Parameters</p>	
	<p>b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)</p>	
	<table border="1"> <tr> <td data-bbox="970 800 1419 873"><input type="checkbox"/> G. Sites with Known Contamination</td><td data-bbox="1419 800 2005 873"><input type="checkbox"/> H. Sites with Unknown Contamination</td></tr> </table>	<input type="checkbox"/> G. Sites with Known Contamination
<input type="checkbox"/> G. Sites with Known Contamination	<input type="checkbox"/> H. Sites with Unknown Contamination	
<table border="1"> <tr> <td data-bbox="970 873 1419 1409"> <p>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)</p> <p><input type="checkbox"/> A. Inorganics</p> <p><input type="checkbox"/> B. Non-Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> C. Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> D. Non-Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> E. Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> F. Fuels Parameters</p> </td><td data-bbox="1419 873 2005 1409"> <p>d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply</p> </td></tr> </table>	<p>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)</p> <p><input type="checkbox"/> A. Inorganics</p> <p><input type="checkbox"/> B. Non-Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> C. Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> D. Non-Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> E. Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> F. Fuels Parameters</p>	<p>d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply</p>
<p>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)</p> <p><input type="checkbox"/> A. Inorganics</p> <p><input type="checkbox"/> B. Non-Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> C. Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> D. Non-Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> E. Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> F. Fuels Parameters</p>	<p>d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply</p>	



#### 4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia								Report mg/L	---
Chloride								Report µg/l	---
Total Residual Chlorine								0.2 mg/L	
Total Suspended Solids								30 mg/L	---
Antimony								206 µg/L	
Arsenic								104 µg/L	
Cadmium								10.2 µg/L	
Chromium III								323 µg/L	
Chromium VI								323 µg/L	
Copper								242 µg/L	
Iron								5,000 µg/L	
Lead								160 µg/L	
Mercury								0.739 µg/L	
Nickel								1,450 µg/L	
Selenium								235.8 µg/L	
Silver								35.1 µg/L	
Zinc								420 µg/L	
Cyanide								178 mg/L	
B. Non-Halogenated VOCs									
Total BTEX								100 µg/L	---
Benzene								5.0 µg/L	---
1,4 Dioxane								200 µg/L	---
Acetone								7.97 mg/L	---
Phenol								1,080 µg/L	



Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
C. Halogenated VOCs									
Carbon Tetrachloride								4.4 µg/L	
1,2 Dichlorobenzene								600 µg/L	---
1,3 Dichlorobenzene								320 µg/L	---
1,4 Dichlorobenzene								5.0 µg/L	---
Total dichlorobenzene								763 µg/L in NH	---
1,1 Dichloroethane								70 µg/L	---
1,2 Dichloroethane								5.0 µg/L	---
1,1 Dichloroethylene								3.2 µg/L	---
Ethylene Dibromide								0.05 µg/L	---
Methylene Chloride								4.6 µg/L	---
1,1,1 Trichloroethane								200 µg/L	---
1,1,2 Trichloroethane								5.0 µg/L	---
Trichloroethylene								5.0 µg/L	---
Tetrachloroethylene								5.0 µg/L	
cis-1,2 Dichloroethylene								70 µg/L	---
Vinyl Chloride								2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates								190 µg/L	
Diethylhexyl phthalate								101 µg/L	
Total Group I PAHs								1.0 µg/L	---
Benzo(a)anthracene								As Total PAHs	
Benzo(a)pyrene									
Benzo(b)fluoranthene									
Benzo(k)fluoranthene									
Chrysene									
Dibenzo(a,h)anthracene									
Indeno(1,2,3-cd)pyrene									



[illegible]



### E. Treatment system information

<p>1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply)</p> <p><input type="checkbox"/> Adsorption/Absorption <input type="checkbox"/> Advanced Oxidation Processes <input type="checkbox"/> Air Stripping <input type="checkbox"/> Granulated Activated Carbon (“GAC”)/Liquid Phase Carbon Adsorption</p> <p><input type="checkbox"/> Ion Exchange <input type="checkbox"/> Precipitation/Coagulation/Flocculation <input type="checkbox"/> Separation/Filtration <input type="checkbox"/> Other; if so, specify:</p>	
<p>2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.</p> <p>Identify each major treatment component (check any that apply):</p> <p><input type="checkbox"/> Fractionation tanks <input type="checkbox"/> Equalization tank <input type="checkbox"/> Oil/water separator <input type="checkbox"/> Mechanical filter <input type="checkbox"/> Media filter</p> <p><input type="checkbox"/> Chemical feed tank <input type="checkbox"/> Air stripping unit <input type="checkbox"/> Bag filter <input type="checkbox"/> Other; if so, specify:</p> <p>Indicate if either of the following will occur (check any that apply):</p> <p><input type="checkbox"/> Chlorination <input type="checkbox"/> De-chlorination</p>	
<p>3. Provide the <b>design flow capacity</b> in gallons per minute (gpm) of the most limiting component.</p> <p>Indicate the most limiting component:</p> <p>Is use of a flow meter feasible? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No, if so, provide justification:</p>	
<p>Provide the proposed maximum effluent flow in gpm.</p>	
<p>Provide the average effluent flow in gpm.</p>	
<p>If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:</p>	
<p>4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	



### F. Chemical and additive information

<p>1. Indicate the type(s) of chemical or additive that will be applied to effluent prior to discharge or that may otherwise be present in the discharge(s): (check all that apply)</p> <p><input type="checkbox"/> Algaecides/biocides <input type="checkbox"/> Antifoams <input type="checkbox"/> Coagulants <input type="checkbox"/> Corrosion/scale inhibitors <input type="checkbox"/> Disinfectants <input type="checkbox"/> Flocculants <input type="checkbox"/> Neutralizing agents <input type="checkbox"/> Oxidants <input type="checkbox"/> Oxygen <input type="checkbox"/> scavengers <input type="checkbox"/> pH conditioners <input type="checkbox"/> Bioremedial agents, including microbes <input type="checkbox"/> Chlorine or chemicals containing chlorine <input type="checkbox"/> Other; if so, specify:</p>
<p>2. Provide the following information for each chemical/additive, using attachments, if necessary:</p> <p>a. Product name, chemical formula, and manufacturer of the chemical/additive; b. Purpose or use of the chemical/additive or remedial agent; c. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each chemical/additive; d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive; e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks; and f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)).</p>
<p>3. Has the operator attached an explanation which demonstrates that the addition of such chemicals/additives may be authorized under this general permit in accordance with the instructions in F, above? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No; if no, has the operator attached data that demonstrates each of the 126 priority pollutants in CWA Section 307(a) and 40 CFR Part 423.15(j)(1) are non-detect in discharges with the addition of the proposed chemical/additive? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No</p>

### G. Endangered Species Act eligibility determination

<p>1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:</p> <p><input type="checkbox"/> <b>FWS Criterion A:</b> No endangered or threatened species or critical habitat are in proximity to the discharges or related activities or come in contact with the “action area”.</p> <p><input type="checkbox"/> <b>FWS Criterion B:</b> Formal or informal consultation with the FWS under section 7 of the ESA resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by FWS on a finding that the discharges and related activities are “not likely to adversely affect” listed species or critical habitat (informal consultation). Has the operator completed consultation with FWS? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No; if no, is consultation underway? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> <b>FWS Criterion C:</b> Using the best scientific and commercial data available, the effect of the discharges and related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the operator and affirmed by EPA, that the discharges and related activities will have “no effect” on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the FWS. This determination was made by: (check one) <input type="checkbox"/> the operator <input type="checkbox"/> EPA <input type="checkbox"/> Other; if so, specify:</p>
---



- ☐ **NMFS Criterion:** A determination made by EPA is affirmed by the operator that the discharges and related activities will have “no effect” or are “not likely to adversely affect” any federally threatened or endangered listed species or critical habitat under the jurisdiction of NMFS and will not result in any take of listed species. Has the operator previously completed consultation with NMFS? (check one): ☐ Yes ☐ No

2. Has the operator attached supporting documentation of ESA eligibility in accordance with the instructions in Appendix I, and G, above? (check one): ☐ Yes ☐ No

Does the supporting documentation include any written concurrence or finding provided by the Services? (check one): ☐ Yes ☐ No; if yes, attach.

#### **H. National Historic Preservation Act eligibility determination**

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

- ☐ **Criterion A:** No historic properties are present. The discharges and discharge-related activities (e.g., BMPs) do not have the potential to cause effects on historic properties.
- ☐ **Criterion B:** Historic properties are present. Discharges and discharge related activities do not have the potential to cause effects on historic properties.
- ☐ **Criterion C:** Historic properties are present. The discharges and discharge-related activities have the potential to have an effect or will have an adverse effect on historic properties.

2. Has the operator attached supporting documentation of NHPA eligibility in accordance with the instructions in H, above? (check one): ☐ Yes ☐ No

Does the supporting documentation include any written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (TPHO), or other tribal representative that outlines measures the operator will carry out to mitigate or prevent any adverse effects on historic properties? (check one): ☐ Yes ☐ No

#### **I. Supplemental information**

Describe any supplemental information being provided with the NOI. Include attachments if required or otherwise necessary.

Has the operator attached data, including any laboratory case narrative and chain of custody used to support the application? (check one): ☐ Yes ☐ No

Has the operator attached the certification requirement for the Best Management Practices Plan (BMPP)? (check one): ☐ Yes ☐ No



**J. Certification requirement**

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

BMPP certification statement: A BMPP meeting the requirements of this general permit will be developed and implemented upon initiation of discharge.


Notification provided to the appropriate State, including a copy of this NOI, if required. Check one: Yes ☒ No ☐

Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested. Check one: Yes ☒ No ☐

Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested. Check one: Yes ☒ No ☐ NA ☐

Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission. Check one: Yes ☒ No ☐ NA ☐

Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): ☐ RGP ☐ DGP ☐ CGP ☐ MSGP ☐ Individual NPDES permit Check one: Yes ☐ No ☐ NA ☐  
☐ Other; if so, specify:

Signature: 

Date: 10-25-17

Print Name and Title: Rich Mckanas



**J. Certification requirement**

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

BMPP certification statement: **A BMPP meeting the requirements of this general permit will be developed and implemented upon initiation of discharge.**

Notification provided to the appropriate State, including a copy of this NOI, if required.

Check one: Yes ☒ No ☐

Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested.

Check one: Yes ☒ No ☐

Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested.

Check one: Yes ☒ No ☐ NA ☐

Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.

Check one: Yes ☒ No ☐ NA ☐

Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): ☐ RGP ☐ DGP ☐ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:

Check one: Yes ☐ No ☐ NA ☐

Signature:



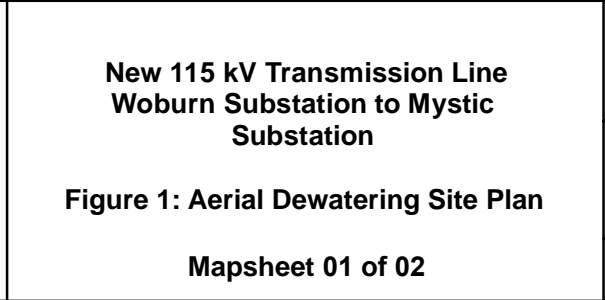
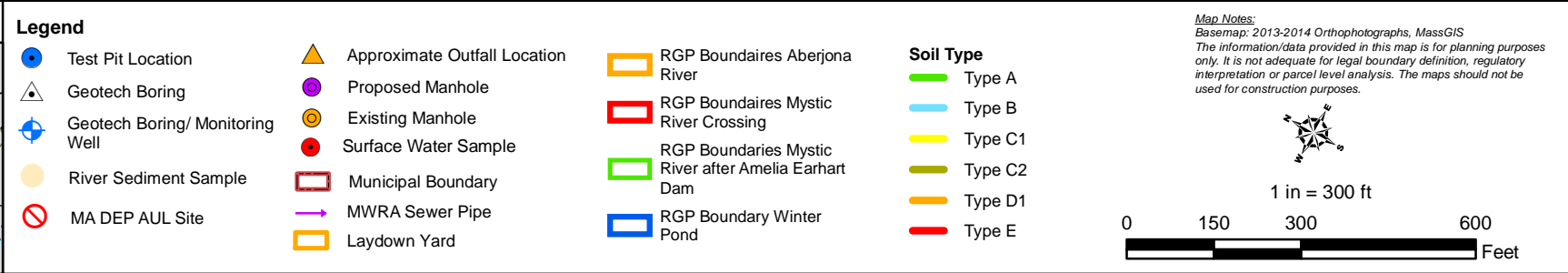
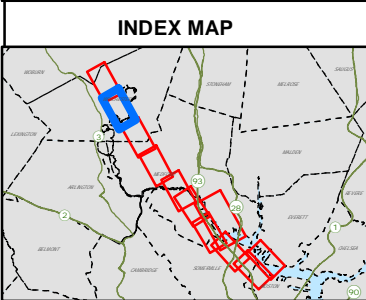
Date: 11/29/2017

Print Name and Title: **Michael Zylich, Senior Environmental Engineer**

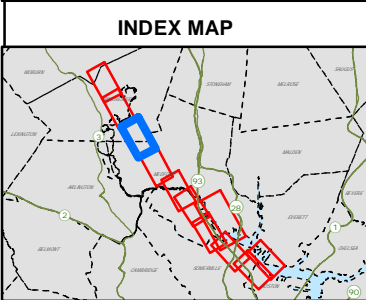
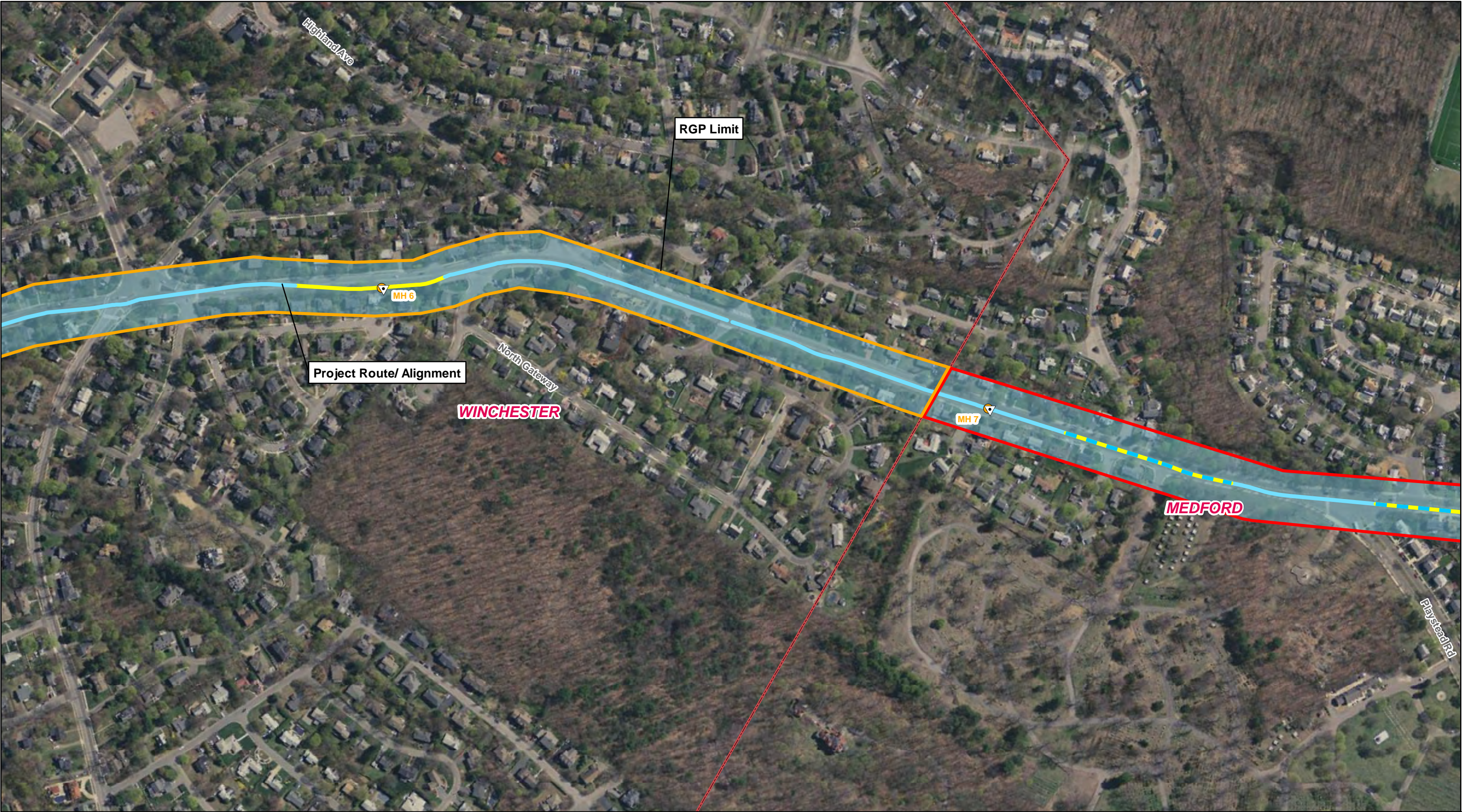












**Legend**

● Test Pit Location	▲ Approximate Outfall Location	▭ RGP Boundaires Aberjona River	<b>Soil Type</b> Type A Type B Type C1 Type C2 Type D1 Type E
▲ Geotech Boring	● Proposed Manhole	▭ RGP Boundaires Mystic River Crossing	
● Geotech Boring/ Monitoring Well	● Existing Manhole	▭ RGP Boundaries Mystic River after Amelia Earhart Dam	
● River Sediment Sample	● Surface Water Sample	▭ RGP Boundary Winter Pond	
● MA DEP AUL Site	▭ Municipal Boundary		
	→ MWRA Sewer Pipe		
	▭ Laydown Yard		

*Map Notes:*  
Basemap: 2013-2014 Orthophotographs, MassGIS  
The information/data provided in this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel level analysis. The maps should not be used for construction purposes.

1 in = 300 ft

0 150 300 600 Feet

**New 115 kV Transmission Line  
Woburn Substation to Mystic Substation**

**Figure 1: Aerial Dewatering Site Plan**

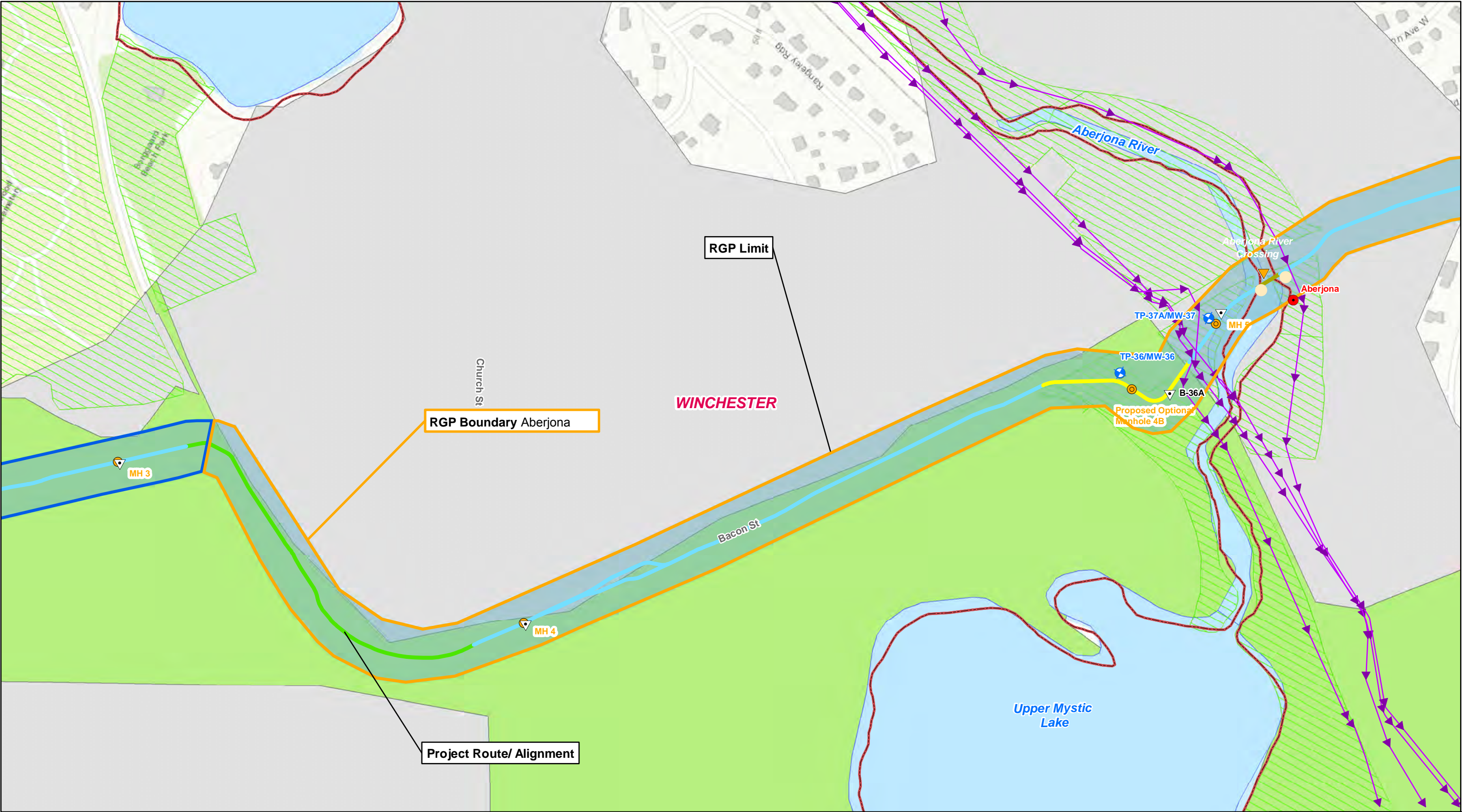
**Mapsheet 02 of 02**

**EVERSOURCE ENERGY**

**Tighe&Bond**  
Engineers | Environmental Specialists

November 2017





**INDEX MAP**

**Legend**

Test Pit Location	Approximate Outfall Location	<b>Soil Type</b>	RGP Boundaries Aberjona River	MassDEP Inland Wetlands
Geotech Boring	Proposed Manhole	Type A	RGP Boundaries Mystic River Crossing	MassDEP Coastal Wetlands
Geotech Boring/ Monitoring Well	Existing Manhole	Type B	RGP Boundaries Mystic River after Amelia Earhart Dam	Protected and Recreational Open Space
River Sediment Sample	Surface Water Sample	Type C1	RGP Boundary Winter Pond	Public Surface Water Supply (PSWS)
MA DEP AUL Site	Municipal Boundary	Type C2	DEP Approved Wellhead Protection Area (Zone II)	Water Bodies
	MWRA Sewer Pipe	Type D1	DEP Interim Wellhead Protection Area (IWPA)	High Yield Non Potential Drinking Water Source
	Laydown Yard	Type E		Medium Yield Non Potential Drinking Water Source
				Potentially Productive Medium Yield Aquifer
				Potentially Productive High Yield Aquifer

**Map Notes:**  
Basemap: 2013-2014 Orthophotographs, MassGIS  
The information/data provided in this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel level analysis. The maps should not be used for construction purposes.

1 in = 300 ft

0 150 300 600 Feet

**New 115 kV Transmission Line  
Woburn Substation to Mystic Substation**

**Figure 2: Priority Resource Map**

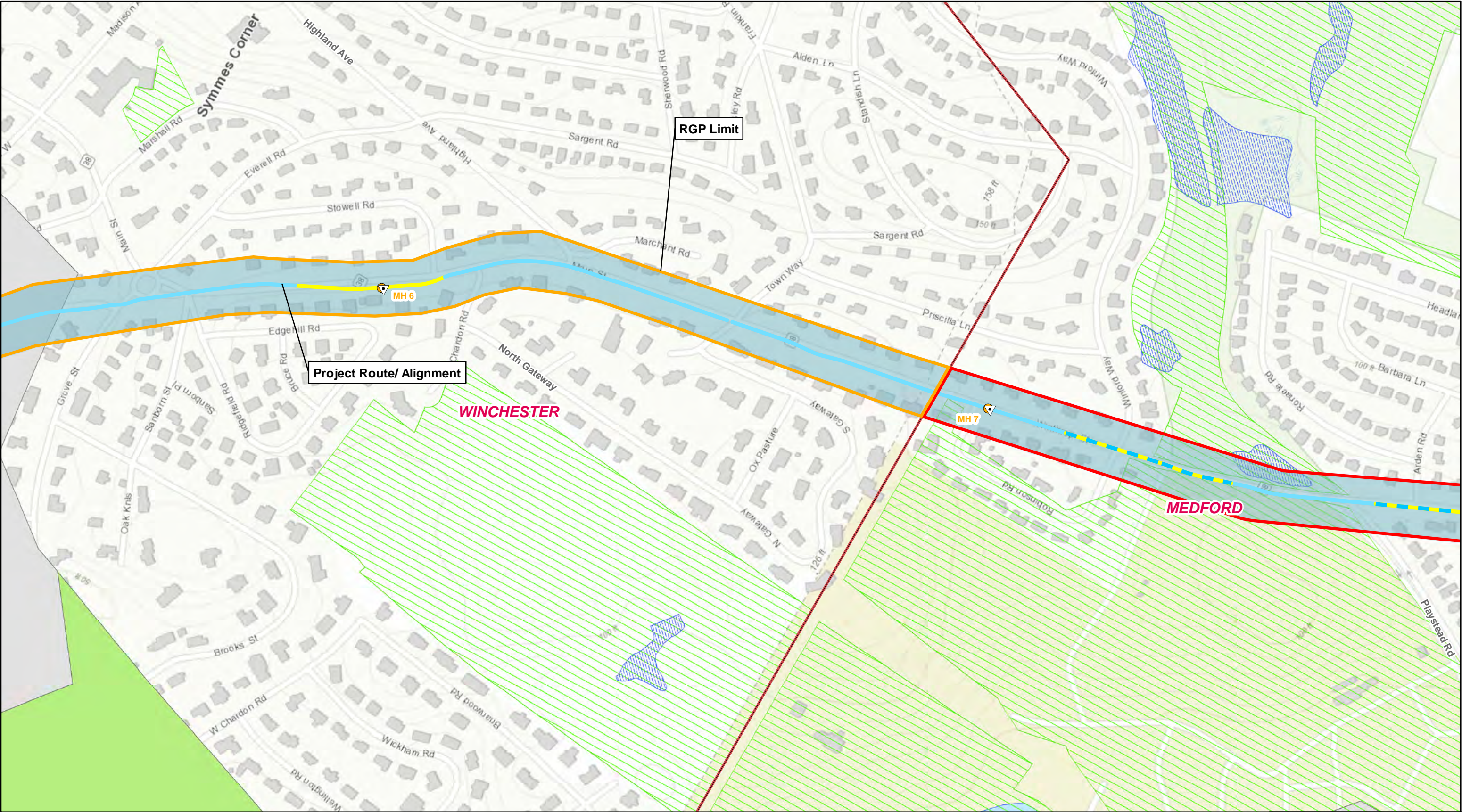
**Mapsheets 01 of 02**

**EVERSOURCE ENERGY**

**Tighe & Bond**  
Engineers | Environmental Specialists

November 2017





**INDEX MAP**

**Legend**

- Test Pit Location
- Geotech Boring
- Geotech Boring/ Monitoring Well
- River Sediment Sample
- MA DEP AUL Site

- Approximate Outfall Location
- Proposed Manhole
- Existing Manhole
- Surface Water Sample
- Municipal Boundary
- MWRA Sewer Pipe
- Laydown Yard

**Soil Type**

- Type A
- Type B
- Type C1
- Type C2
- Type D1
- Type E

- RGP Boundaries Aberjona River
- RGP Boundaries Mystic River Crossing
- RGP Boundaries Mystic River after Amelia Earhart Dam
- RGP Boundary Winter Pond
- DEP Approved Wellhead Protection Area (Zone II)
- DEP Interim Wellhead Protection Area (IWPA)

- MassDEP Inland Wetlands
- MassDEP Coastal Wetlands
- Protected and Recreational Open Space
- Public Surface Water Supply (PSWS)
- Water Bodies
- High Yield Non Potential Drinking Water Source
- Medium Yield Non Potential Drinking Water Source
- Potentially Productive Medium Yield Aquifer
- Potentially Productive High Yield Aquifer

**Map Notes:**  
Basemap: 2013-2014 Orthophotographs, MassGIS  
The information/data provided in this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel level analysis. The maps should not be used for construction purposes.

1 in = 300 ft

**New 115 kV Transmission Line  
Woburn Substation to Mystic  
Substation**

**Figure 2: Priority Resource Map**

**Mapsheets 02 of 02**

**EVERSOURCE**  
ENERGY

**Tighe&Bond**  
Engineers | Environmental Specialists

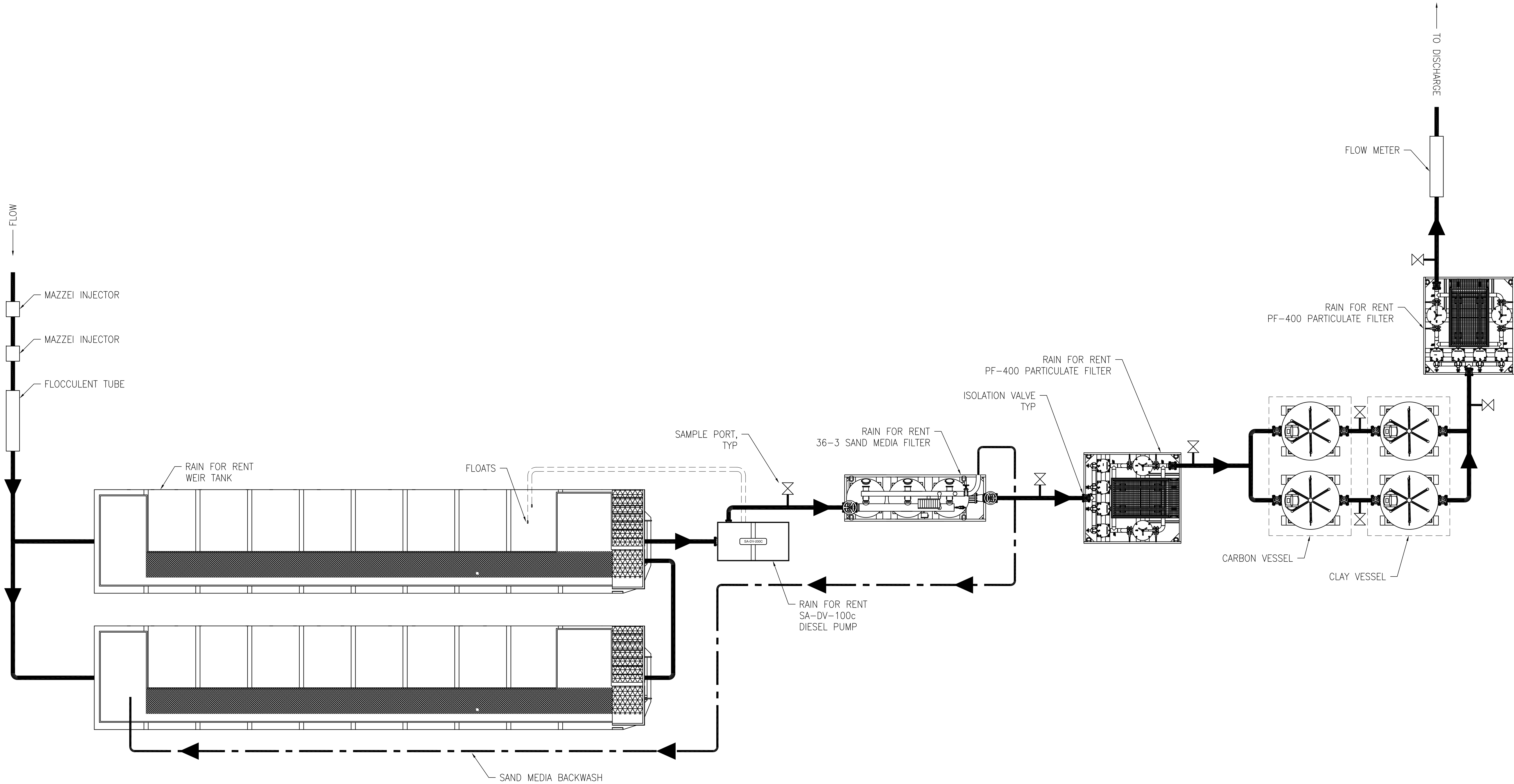
November 2017



REV.NO.	DESCRIPTION	PREVIOUS DWG	BY	DATE
1				

Figure 3.1: Process Flow Diagram

ITEM	QTY.	REF.	DESCRIPTION



PLAN VIEW

FILTRATION  
LAYOUT

BOND BROTHERS  
350 GPM

Rain for Rent  
Engineering



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CONFIDENTIAL

Rain for Rent Information Number 232101-17

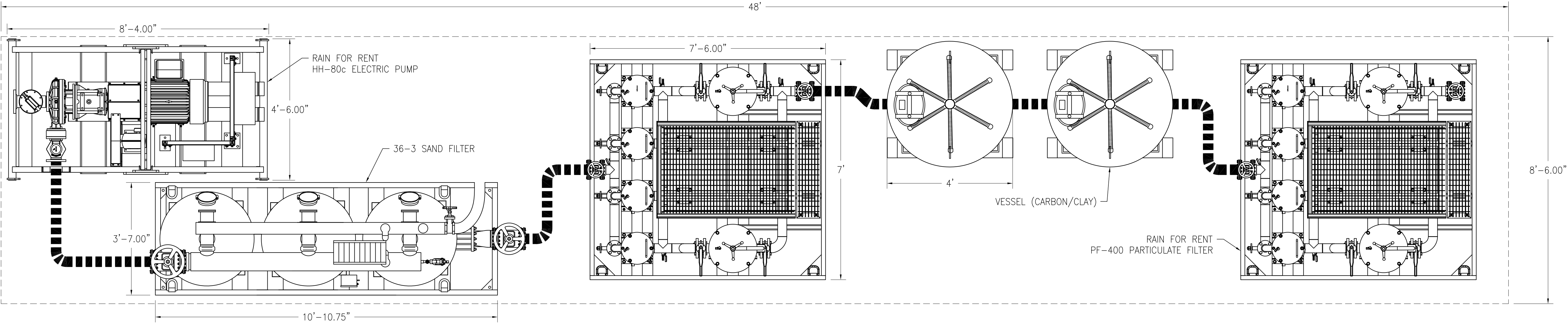
1 SHEET OF 1



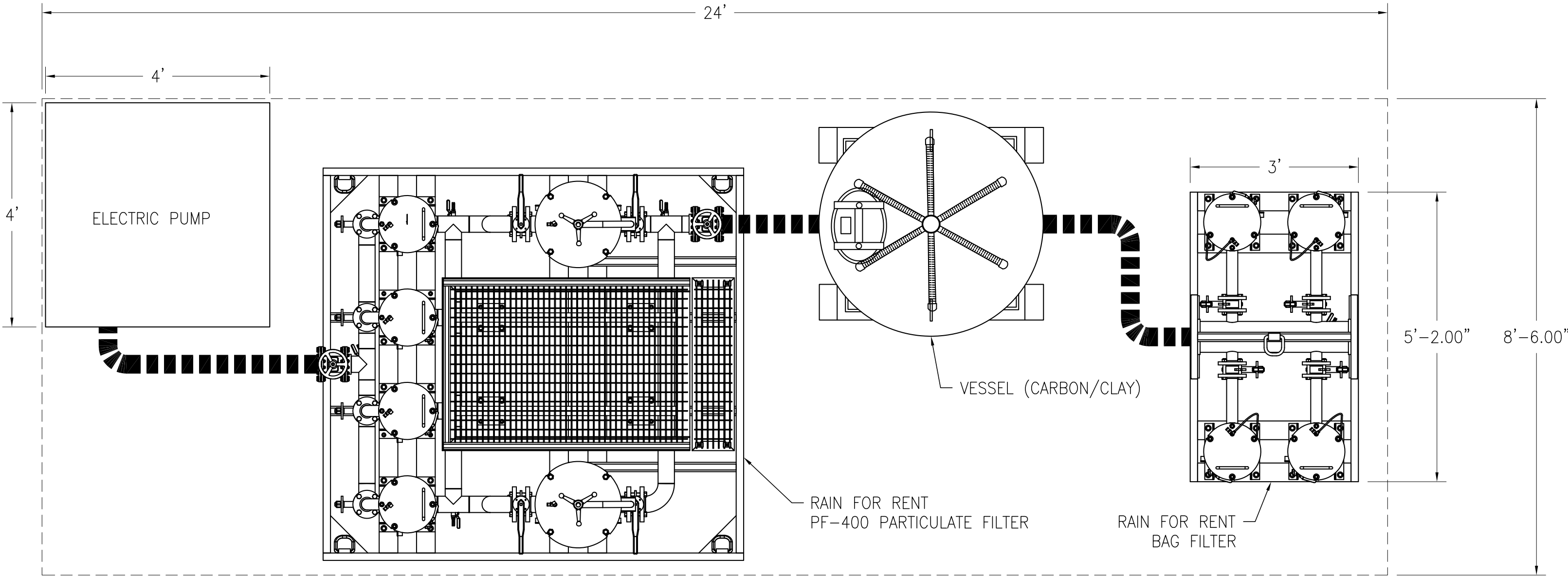
REV.NO.	DESCRIPTION	PREVIOUS DWG	BY	DATE
1				

Figure 3.2: Process Flow Diagram

ITEM	QTY.	REF.	DESCRIPTION



48ft TRAILER CONCEPT



24ft TRAILER CONCEPT

CONCEPT

BOND BROTHERS

Rain for Rent  
Engineering



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01-15043-02-01



CONFIDENTIAL

RAIN FOR RENT INFORMATION NUMBER 232101-17

1 SHEET OF 1







**FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES  
IN MASSACHUSETTS**

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Essex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Gloucester, Essex and Manchester
	Piping Plover	Threatened	Coastal Beaches	Gloucester, Essex, Ipswich, Rowley, Revere, Newbury, Newburyport and Salisbury
	Red Knot <sup>1</sup>	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Franklin	Northeastern bulrush	Endangered	Wetlands	Montague, Warwick
	Dwarf wedgemussel	Endangered	Mill River	Whately
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hampshire	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Hadley
	Puritan tiger beetle	Threatened	Sandy beaches along the Connecticut River	Northampton and Hadley
	Dwarf wedgemussel	Endangered	Rivers and Streams.	Hatfield, Amherst and Northampton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hampden	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Southwick
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Middlesex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Groton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Nantucket	Piping Plover	Threatened	Coastal Beaches	Nantucket
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Nantucket
	American burying beetle	Endangered	Upland grassy meadows	Nantucket
	Red Knot <sup>1</sup>	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide





## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
New England Ecological Services Field Office  
70 Commercial Street, Suite 300  
Concord, NH 03301-5094  
Phone: (603) 223-2541 Fax: (603) 223-0104  
<http://www.fws.gov/newengland>



In Reply Refer To:

October 17, 2017

Consultation Code: 05E1NE00-2018-SLI-0163

Event Code: 05E1NE00-2018-E-00412

Project Name: Mystic to Woburn - 115 kV UG Transmission Line

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the



human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan ([http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-



# Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**New England Ecological Services Field Office**

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

---



## Project Summary

Consultation Code: 05E1NE00-2018-SLI-0163

Event Code: 05E1NE00-2018-E-00412

Project Name: Mystic to Woburn - 115 kV UG Transmission Line

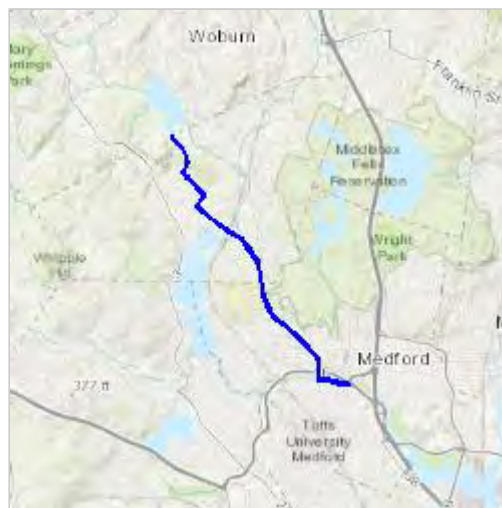
Project Type: \*\* OTHER \*\*

Project Description: This project includes the management of excavation groundwater during the installation of approximately 4.23 miles of a new underground 115 kV electrical transmission line and manholes.

Project Location:

Approximate location of the project can be viewed in Google Maps:

<https://www.google.com/maps/place/42.43961099802177N71.13352130056799W>



Counties: Middlesex, MA



## Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

### Mammals

#### NAME

#### STATUS

Northern Long-eared Bat *Myotis septentrionalis*

Threatened

No critical habitat has been designated for this species.

Species profile: <https://ecos.fws.gov/ecp/species/9045>

### Critical habitats

There are no critical habitats within your project area under this office's jurisdiction.

---







# Massachusetts Cultural Resource Information System

## MACRIS

### MACRIS Search Results

Search Criteria: Town(s): Winchester; Street Name: fletcher st; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
WNT.930	Middlesex Canal Earthworks	Fletcher St	Winchester	c 1802
WNT.773		3 Fletcher St	Winchester	r 1895
WNT.774		9 Fletcher St	Winchester	r 1895
WNT.74	Maynard, Lorenzo Tenant House	14-16 Fletcher St	Winchester	c 1900
WNT.775		15 Fletcher St	Winchester	r 1905
WNT.73	Maynard, Lorenzo Tenant House	18-20 Fletcher St	Winchester	c 1900
WNT.72	Maynard, Lorenzo Tenant House	22-24 Fletcher St	Winchester	c 1900
WNT.776		23-25 Fletcher St	Winchester	r 1895
WNT.1174		32 Fletcher St	Winchester	
WNT.1175		38 Fletcher St	Winchester	c 1922
WNT.778		45 Fletcher St	Winchester	r 1895
WNT.779		55 Fletcher St	Winchester	r 1905
WNT.780		61 Fletcher St	Winchester	r 1895
WNT.1178		68 Fletcher St	Winchester	
WNT.1179		70 Fletcher St	Winchester	c 1932
WNT.71	Nickerson, Phineas A. - Smith, Nellie A. House	81 Fletcher St	Winchester	c 1903



# Massachusetts Cultural Resource Information System

## MACRIS

### MACRIS Search Results

Search Criteria: Town(s): Winchester; Street Name: Bacon st; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
WNT.927	Mystic Valley Parkway - Bacon Street Rotary	Bacon St	Winchester	r 1920
WNT.937	Bacon Street Bridge over Aberjona River	Bacon St	Winchester	1922
WNT.299	Symmes, Theodore House	6 Bacon St	Winchester	1868
WNT.321	Mystic Schoolhouse, Old	10 Bacon St	Winchester	1900
WNT.665		64 Bacon St	Winchester	r 1935
WNT.667		72 Bacon St	Winchester	r 1905
WNT.668		78 Bacon St	Winchester	r 1915
WNT.669		82 Bacon St	Winchester	r 1905
WNT.670		84 Bacon St	Winchester	r 1895
WNT.671		86 Bacon St	Winchester	r 1895
WNT.348	Whitten, Charles F. House	88 Bacon St	Winchester	c 1893
WNT.377	Bradford, Capt. John House	89 Bacon St	Winchester	c 1871
WNT.378	Holt, Stephen A. - Briggs, Bodwell House	91 Bacon St	Winchester	c 1877
WNT.672		92 Bacon St	Winchester	r 1905
WNT.925	Mystic Valley Parkway - Northern Segment	Mystic Valley Pkwy	Winchester	1898
WNT.624		2 Ravenscroft Rd	Winchester	r 1895
WNT.349	Challis, John House	2 Stratford Rd	Winchester	c 1893



# Massachusetts Cultural Resource Information System

## MACRIS

### MACRIS Search Results

Search Criteria: Town(s): Winchester; Street Name: main St; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
WNT.901	Converse Bridge	Main St	Winchester	1914
WNT.908	Boston and Lowell Railroad Signal Bridge	Main St	Winchester	c 1930
WNT.295	Russell, James W. House	86 Main St	Winchester	c 1872
WNT.296	Symmes, Alice House	208 Main St	Winchester	c 1893
WNT.298	Symmes, Dea. John House	212 Main St	Winchester	c 1807
WNT.300	Symmes, Marshall House	230 Main St	Winchester	c 1817
WNT.301	Symmes, Marshall Tenant House	233 Main St	Winchester	r 1875
WNT.302	Symmes, Walter F. House	243 Main St	Winchester	c 1889
WNT.303	Symmes, Fred M. House	282 Main St	Winchester	c 1880
WNT.304	Mason, Susan F. and Elizabeth N. House	288-290 Main St	Winchester	1905
WNT.305	Wells, Thomas F. House	319 Main St	Winchester	c 1889
WNT.306	Grafton, S. G. House	326 Main St	Winchester	c 1850
WNT.307	Weld, Aaron D. House	336 Main St	Winchester	c 1851
WNT.308	Hayward, A. H. - Dwinell, James F. House	346 Main St	Winchester	c 1844
WNT.270	Plummer, Bard - Lawson, Thomas W. House	366 Main St	Winchester	1853
WNT.271	Wilbur, Hervy House	379 Main St	Winchester	r 1845
WNT.269	Hovey, Josiah - Winn, Dennis House	384 Main St	Winchester	1841
WNT.285	Murdock, John K. House	387 Main St	Winchester	c 1905
WNT.268	Hutchinson, Samuel - Blood, Cyrus House	394-396 Main St	Winchester	c 1840
WNT.267	Sharon House	403 Main St	Winchester	c 1835
WNT.266	Vinton, Alfred - Putnam, Ralph C. House	409 Main St	Winchester	c 1865
WNT.265	Parker, Harrison Barn	410 Main St	Winchester	1865
WNT.263	Vinton, Alfred House	417 Main St	Winchester	c 1854
WNT.262	Simonds, William House	418-420 Main St	Winchester	1877
WNT.1015	McCall Junior High School	458 Main St	Winchester	1932
WNT.309	Winchester Unitarian Church	478 Main St	Winchester	1899
WNT.129	Locatelli, Albert J. Building	522-546 Main St	Winchester	1935



Inv. No.	Property Name	Street	Town	Year
WNT.128	Ripley, Frank L. Block	527-535 Main St	Winchester	1910
WNT.1021	Woolworth, F. W. Building	537-539 Main St	Winchester	1927
WNT.1013	Woolworth, F. W. Company	547-551 Main St	Winchester	c 1930
WNT.1022	Lieberman Block	547-551 Main St	Winchester	r 1890
WNT.1017		552-564 Main St	Winchester	c 1915
WNT.127	Brown and Stanton Block	553-569 Main St	Winchester	1879
WNT.126	White, Col. Samuel Bartlett Building	568-572 Main St	Winchester	r 1889
WNT.1018		576 Main St	Winchester	c 1960
WNT.1019		584 Main St	Winchester	c 1970
WNT.125	Harriman, William House and Harness Shop	600 Main St	Winchester	c 1875
WNT.1020		600 Main St	Winchester	c 1940
WNT.124	Niles, Louiville V. Apartment House	612-626 Main St	Winchester	c 1894
WNT.123	Mystic Valley Garage	632 Main St	Winchester	1910
WNT.530	Marion, Leonard W. Carriage Factory	724 Main St	Winchester	1889
WNT.529	Cutter, Andrew House	735-737 Main St	Winchester	c 1831
WNT.528	Cutter, Henry House	760-762 Main St	Winchester	c 1845
WNT.527	Holt, Stephen A. House	778 Main St	Winchester	c 1861
WNT.1047		805 Main St	Winchester	r 1880
WNT.1048		807 Main St	Winchester	r 1880
WNT.1036		808-810 Main St	Winchester	r 1925
WNT.1049	Farrow, Eugene B. House	809-811 Main St	Winchester	r 1880
WNT.1038	Church, Dr. Benjamin T. Double House	812-814 Main St	Winchester	c 1886
WNT.1050		815-817 Main St	Winchester	r 1880
WNT.1051		823 Main St	Winchester	r 1880
WNT.1052	Cutter House	826-828 Main St	Winchester	r 1880
WNT.1053		831 Main St	Winchester	r 1970
WNT.1037	Farrow, Joshua House	834 Main St	Winchester	c 1870
WNT.1122	Farrow, Joshua Shop	834 Main St	Winchester	
WNT.1054		844 Main St	Winchester	r 1935
WNT.526	Beatty, J. - Lytton, Henry House	846 Main St	Winchester	r 1860
WNT.1055		848-850 Main St	Winchester	r 1890
WNT.1057		864 Main St	Winchester	r 1965
WNT.1058		872-880 Main St	Winchester	r 1925
WNT.1059		881-889 Main St	Winchester	r 1965
WNT.1060		890-892 Main St	Winchester	r 2000
WNT.1061		891-893 Main St	Winchester	r 1890
WNT.1062	Moffet - Benincasa Double House	895-897 Main St	Winchester	r 1920
WNT.525	Moseley, Charles H. House	898 Main St	Winchester	c 1870



Inv. No.	Property Name	Street	Town	Year
WNT.1039	Taylor, Samuel House	905 Main St	Winchester	r 1860
WNT.1063		907 Main St	Winchester	r 1920
WNT.1040	Dowd, Patrick House	910 Main St	Winchester	r 1860
WNT.524	Blanchard and Kendall Wood Company Mill	921 Main St	Winchester	c 1905
WNT.522	Nichols, Stilman House	940-942 Main St	Winchester	c 1851
WNT.1663	Winchester Telephone Exchange	954 Main St	Winchester	1957
WNT.521	Winn, J. F. Fuel Company Office Building	955 Main St	Winchester	1900
WNT.523	Blanchard and Kendall Wood Company Warehouse	955 Main St	Winchester	1905
WNT.520	Bean, George G. Petticoat Factory	959 Main St	Winchester	c 1909
WNT.1645		965-967 Main St	Winchester	c 1914
WNT.1647		977-979 Main St	Winchester	c 1919
WNT.1648		987-989 Main St	Winchester	c 1919
WNT.519	Russell, Charles House	993 Main St	Winchester	1841
WNT.1124	Immaculate Conception Roman Catholic Rectory	1004 Main St	Winchester	1936
WNT.517	Hutchinson, Albert A. Leather Machine Factory	1021 Main St	Winchester	c 1906
WNT.518	Chapman Gravity Spindle Factory	1021 Main St	Winchester	c 1910
WNT.1626		1 Russell Rd	Winchester	1913
WNT.1627		2 Russell Rd	Winchester	c 1914
WNT.1644		49 Russell Rd	Winchester	c 1914





20 Black Brook Road  
Aquinnah, MA 02535

**Tribal Historic Preservation Office**  
**Wampanoag Tribe of Gay Head (Aquinnah)**

Office (508)645-9265  
Fax (508)645-3790

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April 5, 2017

Daniel P. Rukakoski  
53 South Hampton Road  
Westfield, MA, 01085-5308  
DPRukakoski@tighebond.com  
Re: Mystic-Woburn Transmission Line ProjectN-099811-04(5200)

Dear Daniel P. Rukakoski,

The Wampanoag Tribe of Gay Head (Aquinnah) (WTGHA) Tribal Historic Preservation Office (THPO) has received notification of your project form dated. Once reviewed we will notify you of further action which may include any of the following;

- No further comments on the project
- An initial site visit will be scheduled
- Monitoring will be required at a rate of \$55.00 per hour in addition to mileage at the current federal rate paid by the proponent ( Third party consultants must provide proponent billing information)
- Any archeological surveying may be monitored and requires two weeks advance notice of said survey.

Should you have any questions or concerns please feel free to contact me at [bettina@wampanoagtribe.net](mailto:bettina@wampanoagtribe.net)  
The THPO department would like to thank you for adhering to the Section 106 regulations of the National Historic Preservation Act.

In the spirit of Preservation,

*Bettina M. Washington*

Bettina M. Washington  
Tribal Historic Preservation Officer





The COMMONWEALTH OF MASSACHUSETTS  
BOARD OF UNDERWATER ARCHAEOLOGICAL RESOURCES  
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS  
251 Causeway Street, Suite 800, Boston, MA 02114-2136  
Tel. (617) 626-1141 Fax (617) 626-1240 Web Site: [www.mass.gov/eea/agencies/czm/buar/](http://www.mass.gov/eea/agencies/czm/buar/)

March 29, 2017

Mr. Daniel P. Rukakoski  
Tighe & Bond, Inc.  
53 Southampton Road  
Westfield, MA 01085-5308

RE: Mystic-Woburn Transmission Line Project, Bacon Street, Aberjona River, Winchester, MA

Dear Mr. Rukakoski,

The staff of the Massachusetts Board of Underwater Archaeological Resources has reviewed the above referenced project's SHPO/THPO Notification Form and supporting materials submitted by Tighe & Bond, Inc., on behalf of Evesource Energy. We offer the following comments.

The Board has conducted a preliminary review of its files and secondary literature sources to identify known and potential submerged cultural resources in the proposed project area. No record of any underwater archaeological resources was found. The Board notes, however, the area may be generally archaeologically sensitive given its riparian landscape and associated features. The topographical setting is strongly associated with the presence of prehistoric archaeological deposits. However, much of the Aberjona River has undergone extensive prior disturbance and land modification activities (dredging, channelization, landscaping, etc.) which have significantly reduced integrity and/or preservation for submerged cultural resources. The Board finds the project unlikely to adversely affect submerged cultural resources.

However, should heretofore-unknown submerged cultural resources be encountered during the course of the project, the Board expects that the project's sponsor will take steps to limit adverse affects and notify the Board and the Massachusetts Historical Commission, as well as other appropriate agencies, immediately in accordance with the Board's *Policy Guidance for the Discovery of Unanticipated Archaeological Resources*.

The Board appreciates the opportunity to provide these comments as part of the review process. Should you have any questions regarding this letter, please do not hesitate to contact me at the address above, by email at [victor.mastone@state.ma.us](mailto:victor.mastone@state.ma.us), or by telephone at (617) 626-1141.

Sincerely,

A handwritten signature in blue ink, appearing to read "Victor T. Mastone".

Victor T. Mastone  
Director

/vtm

Cc: Bruna Simon, MHC  
Ramona Peters, MWT (via email attachment)  
Bettina Washington, WTGH/A (via email attachment)







Sent: Wednesday, November 29, 2017 4:41 PM  
To: Michael E. Martin <MEMartin@tigheBond.com>  
Cc: Ruan, Xiaodan (DEP) <xiaodan.ruan@state.ma.us>  
Subject: RE: Eversource - Mystic to Woburn RGP Dilution Factors

Hi Michael,  
The 7Q10s and the dilution factor calculations that you provided are correct. The receiving waters (Mystic and Aberjona rivers) are not Outstanding Resource Waters so you are all set with MassDEP.

Tighe&Bond

Engineers | Environmental Specialists

Eversource Project

Mystic-Woburn Transmission Project

US EPA RGP Dilution Factor Calculations

Receiving Water	Effluent Discharge Flow [MGD]	7Q10 Flow [MGD]	Dilution Factor
Mystic River	0.504	2.16	5.29
Aberjona River	0.504	0.968	2.92

$$DF = \frac{QD + QS}{QD}$$

Where:

DF = Dilution Factor

QD = Effluent Discharge Flow Rate (MGD)

QS = 7Q10 Stream Flow Rate (MGD)

MGD = Million Gallons per Day

Please let me know if you have any further questions.  
Cathy



Enter number values in green boxes below

Enter values in the units specified

↓	
0.968	Q <sub>R</sub> = Enter upstream flow in <b>MGD</b>
0.504	Q <sub>P</sub> = Enter discharge flow in <b>MGD</b>
0.968	Downstream 7Q10

Enter a dilution factor, if other than zero

↓
2.92

Enter values in the units specified

↓	
142	C <sub>d</sub> = Enter influent hardness in <b>mg/L</b> CaCO <sub>3</sub>
145	C <sub>s</sub> = Enter receiving water hardness in <b>mg/L</b> CaCO <sub>3</sub>

Enter **receiving water** concentrations in the units specified

↓	
7.03	pH in <b>Standard Units</b>
17.1	Temperature in <b>°C</b>
1.01	Ammonia in <b>mg/L</b>
145	Hardness in <b>mg/L</b> CaCO <sub>3</sub>
0	Salinity in <b>ppt</b>
0	Antimony in <b>µg/L</b>
4.7	Arsenic in <b>µg/L</b>
0	Cadmium in <b>µg/L</b>
0	Chromium III in <b>µg/L</b>
0	Chromium VI in <b>µg/L</b>
3.1	Copper in <b>µg/L</b>
596	Iron in <b>µg/L</b>
0	Lead in <b>µg/L</b>
0	Mercury in <b>µg/L</b>
0	Nickel in <b>µg/L</b>
0	Selenium in <b>µg/L</b>
0	Silver in <b>µg/L</b>
44.8	Zinc in <b>µg/L</b>

Enter **influent** concentrations in the units specified

↓	
0	TRC in <b>µg/L</b>
0.64	Ammonia in <b>mg/L</b>
0	Antimony in <b>µg/L</b>
7.8	Arsenic in <b>µg/L</b>
0.1	Cadmium in <b>µg/L</b>
12	Chromium III in <b>µg/L</b>
0	Chromium VI in <b>µg/L</b>
14.2	Copper in <b>µg/L</b>
3100	Iron in <b>µg/L</b>
9	Lead in <b>µg/L</b>
0	Mercury in <b>µg/L</b>
1.5	Nickel in <b>µg/L</b>
0	Selenium in <b>µg/L</b>
0.09	Silver in <b>µg/L</b>
62	Zinc in <b>µg/L</b>
0	Cyanide in <b>µg/L</b>
0	Phenol in <b>µg/L</b>
0	Carbon Tetrachloride in <b>µg/L</b>
0	Tetrachloroethylene in <b>µg/L</b>
6.99	Total Phthalates in <b>µg/L</b>
3.07	Diethylhexylphthalate in <b>µg/L</b>
0.26	Benzo(a)anthracene in <b>µg/L</b>
0.29	Benzo(a)pyrene in <b>µg/L</b>
0.37	Benzo(b)fluoranthene in <b>µg/L</b>
0.14	Benzo(k)fluoranthene in <b>µg/L</b>
0.35	Chrysene in <b>µg/L</b>
0.05	Dibenzo(a,h)anthracene in <b>µg/L</b>
0.22	Indeno(1,2,3-cd)pyrene in <b>µg/L</b>
0.7	Methyl-tert butyl ether in <b>µg/L</b>

Notes:

Freshwater: Q<sub>R</sub> equal to the 7Q10; enter alternate Q<sub>R</sub> if approved by the State; enter 0 if no dilution factor approved

Saltwater (estuarine and marine): enter Q<sub>R</sub> if approved by the State; enter 0 if no entry

Discharge flow is equal to the design flow or 1 MGD, whichever is less

Only if approved by State as the entry for Q<sub>R</sub>; leave 0 if no entry

Saltwater (estuarine and marine): only if approved by the State

Leave 0 if no entry

Freshwater only

pH, temperature, and ammonia required for all discharges

Hardness required for freshwater

Salinity required for saltwater (estuarine and marine)

Metals required for all discharges if present and if dilution factor is > 1

Enter 0 if non-detect or testing not required

if >1 sample, enter maximum

if >10 samples, may enter 95th percentile

Enter 0 if non-detect or testing not required



<b>Dilution Factor</b>	2.9					
<b>A. Inorganics</b>	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
Ammonia	<b>Report</b>	mg/L	---			
Chloride	<b>Report</b>	µg/L	---			
Total Residual Chlorine	0.2	mg/L	<b>21</b>	µg/L	50	µg/L
Total Suspended Solids	<b>30</b>	mg/L	---			
Antimony	<b>206</b>	µg/L	1229	µg/L		
Arsenic	<b>104</b>	µg/L	10	µg/L		
Cadmium	<b>10.2</b>	µg/L	0.4836	µg/L		
Chromium III	<b>323</b>	µg/L	314.5	µg/L		
Chromium VI	<b>323</b>	µg/L	22.0	µg/L		
Copper	<b>242</b>	µg/L	29.0	µg/L		
Iron	5000	µg/L	<b>1000</b>	µg/L		
Lead	<b>160</b>	µg/L	16.57	µg/L		
Mercury	<b>0.739</b>	µg/L	1.74	µg/L		
Nickel	<b>1450</b>	µg/L	194.4	µg/L		
Selenium	<b>235.8</b>	µg/L	9.6	µg/L		
Silver	<b>35.1</b>	µg/L	28.0	µg/L		
Zinc	<b>420</b>	µg/L	361.0	µg/L		
Cyanide	<b>178</b>	mg/L	10.0	µg/L	---	µg/L
<b>B. Non-Halogenated VOCs</b>						
Total BTEX	<b>100</b>	µg/L	---			
Benzene	<b>5.0</b>	µg/L	---			
1,4 Dioxane	<b>200</b>	µg/L	---			
Acetone	<b>7970</b>	µg/L	---			
Phenol	<b>1,080</b>	µg/L	576	µg/L		
<b>C. Halogenated VOCs</b>						
Carbon Tetrachloride	<b>4.4</b>	µg/L	3.1	µg/L		
1,2 Dichlorobenzene	<b>600</b>	µg/L	---			
1,3 Dichlorobenzene	<b>320</b>	µg/L	---			
1,4 Dichlorobenzene	<b>5.0</b>	µg/L	---			
Total dichlorobenzene	---	µg/L	---			
1,1 Dichloroethane	<b>70</b>	µg/L	---			
1,2 Dichloroethane	<b>5.0</b>	µg/L	---			
1,1 Dichloroethylene	<b>3.2</b>	µg/L	---			
Ethylene Dibromide	<b>0.05</b>	µg/L	---			
Methylene Chloride	<b>4.6</b>	µg/L	---			
1,1,1 Trichloroethane	<b>200</b>	µg/L	---			
1,1,2 Trichloroethane	<b>5.0</b>	µg/L	---			
Trichloroethylene	<b>5.0</b>	µg/L	---			
Tetrachloroethylene	<b>5.0</b>	µg/L	6.3	µg/L		
cis-1,2 Dichloroethylene	<b>70</b>	µg/L	---			
Vinyl Chloride	<b>2.0</b>	µg/L	---			
<b>D. Non-Halogenated SVOCs</b>						
Total Phthalates	<b>190</b>	µg/L	---	µg/L		
Diethylhexyl phthalate	<b>101</b>	µg/L	4.2	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	<b>1.0</b>	µg/L	---			
Benzo(a)anthracene	1.0	µg/L	<b>0.0073</b>	µg/L	0.1	µg/L
Benzo(a)pyrene	1.0	µg/L	<b>0.0073</b>	µg/L	0.1	µg/L
Benzo(b)fluoranthene	1.0	µg/L	<b>0.0073</b>	µg/L	0.1	µg/L
Benzo(k)fluoranthene	1.0	µg/L	<b>0.0073</b>	µg/L	0.1	µg/L
Chrysene	1.0	µg/L	<b>0.0073</b>	µg/L	0.1	µg/L
Dibenzo(a,h)anthracene	1.0	µg/L	<b>0.0073</b>	µg/L	0.1	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	<b>0.0073</b>	µg/L	0.1	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	<b>100</b>	µg/L	---			
Naphthalene	<b>20</b>	µg/L	---			
<b>E. Halogenated SVOCs</b>						
Total Polychlorinated Biphenyls	<b>0.000064</b>	µg/L	---		0.5	µg/L
Pentachlorophenol	<b>1.0</b>	µg/L	---			
<b>F. Fuels Parameters</b>						
Total Petroleum Hydrocarbons	<b>5.0</b>	mg/L	---			
Ethanol	<b>Report</b>	mg/L	---			
Methyl-tert-Butyl Ether	<b>70</b>	µg/L	38	µg/L		
tert-Butyl Alcohol	<b>120</b>	µg/L	---			
tert-Amyl Methyl Ether	<b>90</b>	µg/L	---			



TABLE 1 Groundwater Results Eversource: Woburn - Mystic			Wedgemere Crossing			
Analytical Test	Sample Identification	Effluent Limitation	MW-37	MW-37 FF	MW-36	MW-36 FF
	Sample Date		1/11/2017	1/11/2017	1/11/2017	1/11/2017
TPH - mg/L	TPH	5	ND (5)	ND (5)	ND (5)	ND (5)
Total PAHs Group I - ug/L	Benzo(a)Anthracene	0.0073/0.1 <sup>(1)</sup>	0.26	0.04	ND (0.05)	ND (0.05)
	Benzo(a)Pyrene	0.0073/0.1 <sup>(1)</sup>	0.29	0.03	ND (0.05)	ND (0.05)
	Benzo(b)Fluoranthene	0.0073/0.1 <sup>(1)</sup>	0.37	0.04	ND (0.05)	ND (0.05)
	Benzo(k)Fluoranthene	0.0073/0.1 <sup>(1)</sup>	0.14	ND (0.05)	ND (0.05)	ND (0.05)
	Chrysene	0.0073/0.1 <sup>(1)</sup>	0.35	0.04	ND (0.05)	ND (0.05)
	Dibenzo(a,h)Anthracene	0.0073/0.1 <sup>(1)</sup>	0.05	ND (0.05)	ND (0.05)	ND (0.05)
	Indeno(1,2,3-cd)Pyrene	0.0073/0.1 <sup>(1)</sup>	0.22	0.02	ND (0.05)	ND (0.05)
	Total PAHs Group I	1.0	1.68	0.17	ND	ND
Total PAHs Group II - ug/L	Acenaphthene	NE	0.21	0.14	ND (0.19)	ND (0.19)
	Acenaphthylene	NE	0.10	ND (0.19)	ND (0.19)	ND (0.19)
	Anthracene	NE	0.23	0.05	ND (0.19)	ND (0.19)
	Benzo(ghi)Perylene	NE	0.21	0.02	ND (0.19)	ND (0.19)
	Fluoranthene	NE	0.78	0.11	ND (0.19)	ND (0.19)
	Fluorene	NE	0.34	0.07	ND (0.19)	ND (0.19)
	Naphthalene	20	0.11	0.11	ND (0.19)	ND (0.19)
	Phenanthrene	NE	0.85	0.16	ND (0.19)	ND (0.19)
	Pyrene	NE	0.76	0.10	ND (0.19)	ND (0.19)
	Total PAHs Group II	100	3.59	0.76	ND	ND
Phthalates - ug/L	Butylbenzylphthalate	NE	0.31	0.36	0.34	0.43
	Bis (2-Ethylhexyl) Phthalate	101	3.07	3.00	2.72	2.02
	Diethylphthalate	NE	0.29	0.27	ND (2.34)	3.85
	Di-n-butylphthalate	NE	0.19	0.43	ND (2.34)	0.69
	Di-n-octylphthalate	NE	ND (2.34)	ND (2.34)	ND (2.34)	ND (2.34)
	Total Phthalates	190	3.86	4.06	3.06	6.99
SVOCs - ug/L	Pentachlorophenol	1.0	ND (0.84)	ND (0.84)	ND (0.84)	ND (0.84)
	All Other SVOCs	NE	< c/s	< c/s	< c/s	< c/s
Metals- ug/L	Antimony	206	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
	Arsenic	104	7.8	3.8	ND (5.0)	ND (5.0)
	Barium	NE	108	131	81.1	72.0
	Beryllium	NE	0.3	0.3	0.1	ND (5.0)
	Cadmium	10.2	0.10	0.05	ND (0.50)	0.03
	Chromium	323	11.6	2.9	2.8	ND (10.0)
	Chromium III	323	12.0	ND (10)	ND (10)	ND (10)
	Lead	160	9.0	ND (2.5)	ND (2.5)	ND (2.5)
	Mercury	0.739	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
	Nickel	1,450	1.5	ND (10.0)	ND (10.0)	ND (10.0)
	Selenium	235.8	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
	Silver	35.1	0.09	ND (0.20)	ND (0.20)	ND (0.20)
	Thallium	NE	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	Vanadium	NE	2.8	ND (10.0)	1.1	ND (10.0)
	Zinc	420	62	20.5	18.8	18.9
	Iron	1,000	3,100	1,650	505	89.6
	Copper	242	14.2	4.2	3.3	ND (5)
Ethanol - ug/L	Ethanol	Report	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dibromoethane - ug/L	1,2-Dibroethane (EDB)	0.05	ND (0.015)	ND (0.015)	ND (0.015)	ND (0.015)
1,4-Dioxane - ug/L	1,4-Dioxane	200	ND (500)	ND (500)	ND (500)	ND (500)
PCB - ug/L	Aroclor-1016	NE	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.09)
	Aroclor-1221	NE	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.09)
	Aroclor-1232	NE	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.09)
	Aroclor-1242	NE	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.09)
	Aroclor-1248	NE	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.09)
	Aroclor-1254	NE	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.09)
	Aroclor-1260	NE	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.09)
	Aroclor-1262	NE	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.09)
	Aroclor-1268	NE	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.09)
	Total PCBs	0.000064/0.5 <sup>(1)</sup>	ND	ND	ND	ND
VOCs - ug/L	tert-Butyl Alcohol (TBA)	120	ND (25.0)	ND (25.0)	ND (25.0)	ND (25.0)
	tert-Amyl Methyl Ether (TAME)	90	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	Napthalene	20	0.4	0.4	0.20	0.20
	Carbon Tetrachloride	4.4	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	1,2 Dichlorobenzene (o-DCB)	600	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	1,3 Dichlorobenzene (m-DCB)	320	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	1,4 Dicholorbenzene (p-DCB)	5.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	1,1 Dichloroethane (DCA)	70.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	1,2 Dichloroethane (DCA)	5.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	1,1 Dichloroethene (DCE)	3.2	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	sec-Butylbenzene	NE	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	tert-Butyl Ethyl Ether (TBEE)	NE	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	cis-1,2 Dichloroethene (DCE)	70	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	Methylene Chloride	4.6	0.20	ND (2.0)	ND (2.0)	ND (2.0)
	Tetrachloroethene (PCE)	5.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	1,1,1 Trichloro-ethane (TCA)	200	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	1,1,2 Trichloro-ethane (TCA)	5.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	Trichloroethene (TCE)	5.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
	Methyl tert-Butyl Ether (MtBE)	70	0.70	0.60	ND (1.0)	ND (1.0)
	Acetone	7,970	ND (1.0)	ND (10)	ND (10)	ND (10)
	Vinyl Chloride	2.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
BTEX - ug/L	Benzene	5.0	0.20	0.20	0.10	ND (1.0)
	Toluene	NE	0.20	0.20	ND (1.0)	0.10
	Ethylbenzene	NE	0.20	0.20	ND (1.0)	ND (1.0)
	Total Xylenes	NE	0.80	0.70	ND (2.0)	ND (1.0)
	Total BTEX	100	1.40	1.30	0.10	0.10
Classical Chemistry	Chloride (mg/L)	Report	200	240	100	70
	Ammonia (mg/L)	Report	0.64	0.61	ND (0.10)	ND (0.1)
	Hexavalent Chromium (ug/L)	323	ND (10)	ND (10)	ND (10)	ND (10)
	Total Cyanide (ug/L)	178	ND (5.00)	ND (5.00)	ND (5.00)	ND (5.00)
	Phenols (ug/L)	1,080	ND (100)	ND (100)	ND (100)	ND (100)
	Total Residual Chlorine (ug/L)	21/50 <sup>(1)</sup>	ND (10)	ND (10)	ND (10)	ND (10)
	Total Suspended Solids (ug/L)	30,000	1,640,000	13,000	116,000	ND (5,000)
	Hardness (ug/L)	NE	NA	NA	142,000	NA

**Notes:**  
1: The second standard is the compliance level  
VOCs = Volatile Organic Compounds  
SVOCs = Semi-Volatile Organic Compounds  
TPH = Total Petroleum Hydrocarbons  
PCBs = Polychlorinated biphenyls  
mg/L= milligrams per kilogram (ppm)  
ug/L= micrograms per kilogram (ppb)  
< xx = not detected above the indicated laboratory method detection limit  
c/s = compound specific  
NE = Not Established  
NA = Not Analyzed  
ND = Not Detected  
\* - Effluent limits calculated using the US EPA's Dilution Factor and Effluent Limitation Calculations for Massachusetts Form (Appendix V)  
Red text = exceeds RGP limit  
FW- Freshwater



**TABLE 2****Surface Water Results**

Eversource: Woburn - Mystic

Analytical Test	Sample Identification	Effluent Limitation	Aberjona
	Sample Date		11/15/2017
Metals (ug/L)	Arsenic	104	4.7
	Cadmium	10.2	ND(2)
	Chromium	NE	ND(4)
	Chromium III	323	ND(10)
	Copper	242	3.1
	Iron	1,000	596
	Lead	160	ND(4)
	Nickel	1,450	ND(4)
	Silver	35.1	ND(1)
	Zinc	420	44.8
Classical Chemistry	Ammonia as N (mg/L)	Report	1.01
	Hexavalent Chromium (ug/L)	323	ND(10)
	pH	NE	7.03
	Hardness (ug/L)	NE	145,000

**Notes:***mg/L= milligrams per kilogram (ppm)**ug/L= micrograms per kilogram (ppb)**NE = Not Established**NA = Not Analyzed**ND = Not Detected**\* - Effluent limits from NPDES General Permit for Remediation Activity Discharges DRAFT at**<https://www3.epa.gov/region1/npdes/remediation/2016DraftPermit.pdf>*









*CERTIFICATE OF ANALYSIS*

Michael Martin  
Tighe & Bond  
4 Barlows Landing Road, Unit 15  
Pocasset, MA 02559

**REVIEWED**

**By ESS Laboratory at 5:56 pm, Jan 20, 2017**

**RE: Woburn to Mystic - RGP/MCP (N-0998-11-13)**  
**ESS Laboratory Work Order Number: 1701214**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state tandards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

**Subcontracted Analyses**

RI Analytical Laboratories, Inc. - Warwick, Chloride  
RI





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

**SAMPLE RECEIPT**

The following samples were received on January 11, 2017 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Data Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1701214-01	MW-37	Ground Water	§, 1664A, 2540D, 420.1, 4500 CN CE, 4500 NH3 G, 4500-CI E, 6010C, 7010, 7196A, 7470A, 8011, 8015, 8082A, 8260B, 8270D SIM
1701214-02	MW-37 FF	Ground Water	§, 1664A, 2540D, 420.1, 4500 CN CE, 4500 NH3 G, 4500-CI E, 6010C, 7010, 7196A, 7470A, 8011, 8015, 8082A, 8260B, 8270D SIM
1701214-03	MW-36	Ground Water	§, 1664A, 2540D, 420.1, 4500 CN CE, 4500 NH3 G, 4500-CI E, 6010C, 7010, 7196A, 7470A, 8011, 8015, 8082A, 8260B, 8270D SIM
1701214-04	MW-36 FF	Ground Water	§, 1664A, 2540D, 420.1, 4500 CN CE, 4500 NH3 G, 4500-CI E, 6010C, 7010, 7196A, 7470A, 8011, 8015, 8082A, 8260B, 8270D SIM
1701214-05	MW-505B FF	Ground Water	§, 1664A, 2540D, 4500 CN CE, 4500 NH3 G, 4500-CI E, 6010C, 7010, 7196A, 7470A, 8011, 8015, 8082A, 8260B, 8270D SIM
1701214-06	MW-505B	Ground Water	6010C, 7010, 7470A





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

**PROJECT NARRATIVE**

**8260B Volatile Organic Compounds**

1701214-01 [Present in Method Blank \(B\).](#)  
Naphthalene  
1701214-02 [Present in Method Blank \(B\).](#)  
Naphthalene  
1701214-03 [Present in Method Blank \(B\).](#)  
Naphthalene  
1701214-04 [Present in Method Blank \(B\).](#)  
Naphthalene

**8270D(SIM) Semi-Volatile Organic Compounds**

1701214-01 [Present in Method Blank \(B\).](#)  
bis(2-Ethylhexyl)phthalate , Butylbenzylphthalate  
1701214-02 [Present in Method Blank \(B\).](#)  
bis(2-Ethylhexyl)phthalate , Butylbenzylphthalate  
1701214-03 [Present in Method Blank \(B\).](#)  
bis(2-Ethylhexyl)phthalate , Butylbenzylphthalate  
1701214-04 [Present in Method Blank \(B\).](#)  
bis(2-Ethylhexyl)phthalate , Butylbenzylphthalate  
1701214-05 [Present in Method Blank \(B\).](#)  
bis(2-Ethylhexyl)phthalate , Butylbenzylphthalate  
1701214-05 [Surrogate recovery\(ies\) above upper control limit \(S+\).](#)  
2,4,6-Tribromophenol (131% @ 15-110%)  
C7A0148-TUN1 [Benzidine tailing factor >2.](#)  
C7A0164-CCV1 [Continuing Calibration %Diff/Drift is above control limit \(CD+\).](#)  
Butylbenzylphthalate (22% @ %), Di-n-octylphthalate (28% @ %)  
CA71116-BS1 [Blank Spike recovery is above upper control limit \(B+\).](#)  
bis(2-Ethylhexyl)phthalate (146% @ 40-140%)  
CA71116-BSD1 [Blank Spike recovery is above upper control limit \(B+\).](#)  
bis(2-Ethylhexyl)phthalate (143% @ 40-140%)  
CA71116-BSD1 [Relative percent difference for duplicate is outside of criteria \(D+\).](#)  
Naphthalene (21% @ 20%)

**Total Metals**

1701214-01 [Present in Method Blank \(B\).](#)  
Zinc  
1701214-02 [Present in Method Blank \(B\).](#)  
Zinc  
1701214-03 [Present in Method Blank \(B\).](#)  
Iron , Zinc  
1701214-04 [Present in Method Blank \(B\).](#)  
Iron , Zinc





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

1701214-05 [Present in Method Blank \(B\).](#)

Zinc

1701214-06 [Present in Method Blank \(B\).](#)

Zinc

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

1010A - Flashpoint  
6010C - ICP  
6020A - ICP MS  
7010 - Graphite Furnace  
7196A - Hexavalent Chromium  
7470A - Aqueous Mercury  
7471B - Solid Mercury  
8011 - EDB/DBCP/TCP  
8015C - GRO/DRO  
8081B - Pesticides  
8082A - PCB  
8100M - TPH  
8151A - Herbicides  
8260B - VOA  
8270D - SVOA  
8270D SIM - SVOA Low Level  
9014 - Cyanide  
9038 - Sulfate  
9040C - Aqueous pH  
9045D - Solid pH (Corrosivity)  
9050A - Specific Conductance  
9056A - Anions (IC)  
9060A - TOC  
9095B - Paint Filter  
MADEP 04-1.1 - EPH / VPH

**Prep Methods**

3005A - Aqueous ICP Digestion  
3020A - Aqueous Graphite Furnace / ICP MS Digestion  
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion  
3060A - Solid Hexavalent Chromium Digestion  
3510C - Separatory Funnel Extraction  
3520C - Liquid / Liquid Extraction  
3540C - Manual Soxhlet Extraction  
3541 - Automated Soxhlet Extraction  
3546 - Microwave Extraction  
3580A - Waste Dilution  
5030B - Aqueous Purge and Trap  
5030C - Aqueous Purge and Trap  
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.





**CERTIFICATE OF ANALYSIS**

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

**MassDEP Analytical Protocol Certification Form**

MADEP RTN: \_\_\_\_\_

This form provides certification for the following data set: **1701214-01 through 1701214-06**

Matrices: ☒ Ground Water/Surface Water    ☐ Soil/Sediment    ☐ Drinking Water    ☐ Air    ☐ Other: \_\_\_\_\_

**CAM Protocol** (check all that apply below):

<input checked="" type="checkbox"/> 8260 VOC CAM II A	<input type="checkbox"/> 7470/7471 Hg CAM III B	<input type="checkbox"/> MassDEP VPH CAM IV A	<input type="checkbox"/> 8081 Pesticides CAM V B	<input checked="" type="checkbox"/> 7196 Hex Cr CAM VI B	<input type="checkbox"/> MassDEP APH CAM IX A
<input checked="" type="checkbox"/> 8270 SVOC CAM II B	<input checked="" type="checkbox"/> 7010 Metals CAM III C	<input type="checkbox"/> MassDEP EPH CAM IV B	<input type="checkbox"/> 8151 Herbicides CAM V C	<input type="checkbox"/> 8330 Explosives CAM VIII A	<input type="checkbox"/> TO-15 VOC CAM IX B
<input checked="" type="checkbox"/> 6010 Metals CAM III A	<input type="checkbox"/> 6020 Metals CAM III D	<input checked="" type="checkbox"/> 8082 PCB CAM V A	<input type="checkbox"/> 6860 Perchlorate CAM VIII B	<input checked="" type="checkbox"/> 9014 Total Cyanide/PAC CAM VI A	

**Affirmative responses to questions A through F are required for "Presumptive Certainty" status**

- |   |   |   |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?  | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?  | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?                  | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| E | a. VPH, EPH, APH and TO-15 only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).  | Yes <input type="checkbox"/> No <input type="checkbox"/>            |
|   | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?  | Yes <input type="checkbox"/> No <input type="checkbox"/>            |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?                                   | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |

**Responses to Questions G, H and I below are required for "Presumptive Certainty" status**

- |   |  |   |
|---|--|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?<br><b>Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.</b> | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> * |
| H | Were <b>all</b> QC performance standards specified in the CAM protocol(s) achieved?  | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> * |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> * |

**\*All negative responses must be addressed in an attached laboratory narrative.**

**I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.**

Signature: Laurel Stoddard  
Printed Name: Laurel Stoddard

Date: January 20, 2017  
Position: Laboratory Director





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37  
Date Sampled: 01/11/17 10:20  
Percent Solids: N/A

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-01  
Sample Matrix: Ground Water  
Units: ug/L

Extraction Method: 3005A

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (5.0)	0.6	7010		1	KJK	01/17/17 22:22	50	25	CA71146
Arsenic	7.8 (5.0)	0.4	7010		1	KJK	01/14/17 15:59	50	25	CA71146
Barium	108 (25.0)	1.5	6010C		1	KJK	01/13/17 3:39	50	25	CA71146
Beryllium	J 0.3 (0.5)	0.1	6010C		1	KJK	01/13/17 3:39	50	25	CA71146
Cadmium	J 0.1 (0.5)	0.03	7010		1	KJK	01/17/17 15:53	50	25	CA71146
Chromium	11.6 (10.0)	1.5	6010C		1	KJK	01/13/17 3:39	50	25	CA71146
Chromium III	12 (10)		6010C		1	JLK	01/13/17 3:39	1	1	[CALC]
Copper	14.2 (5.0)	2.0	6010C		1	KJK	01/13/17 3:39	50	25	CA71146
Iron	3100 (50.0)	11.5	6010C		1	KJK	01/13/17 3:39	50	25	CA71146
Lead	9.0 (2.5)	0.5	7010		1	KJK	01/14/17 22:07	50	25	CA71146
Mercury	ND (0.20)	0.12	7470A		1	MJV	01/13/17 12:48	20	40	CA71147
Nickel	J 1.5 (10.0)	1.0	6010C		1	KJK	01/13/17 3:39	50	25	CA71146
Selenium	ND (5.0)	0.6	7010		1	KJK	01/15/17 3:36	50	25	CA71146
Silver	J 0.09 (0.2)	0.08	7010		1	KJK	01/17/17 18:59	50	25	CA71146
Thallium	ND (1.0)	0.5	7010		1	KJK	01/14/17 18:42	50	25	CA71146
Vanadium	J 2.8 (10.0)	1.0	6010C		1	KJK	01/13/17 3:39	50	25	CA71146
Zinc	B 62.0 (25.0)	4.5	6010C		1	KJK	01/13/17 3:39	50	25	CA71146





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37  
Date Sampled: 01/11/17 10:20  
Percent Solids: N/A  
Initial Volume: 1070  
Final Volume: 1  
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-01  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: SMR  
Prepared: 1/13/17 9:30  
Cleanup Method: 3665A

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.09)	0.03	8082A		1	01/13/17 13:47		CA71203
Aroclor 1221	ND (0.09)	0.03	8082A		1	01/13/17 13:47		CA71203
Aroclor 1232	ND (0.09)	0.03	8082A		1	01/13/17 13:47		CA71203
Aroclor 1242	ND (0.09)	0.03	8082A		1	01/13/17 13:47		CA71203
Aroclor 1248	ND (0.09)	0.03	8082A		1	01/13/17 13:47		CA71203
Aroclor 1254	ND (0.09)	0.03	8082A		1	01/13/17 13:47		CA71203
Aroclor 1260	ND (0.09)	0.03	8082A		1	01/13/17 13:47		CA71203
Aroclor 1262	ND (0.09)	0.03	8082A		1	01/13/17 13:47		CA71203
Aroclor 1268	ND (0.09)	0.03	8082A		1	01/13/17 13:47		CA71203

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	60 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	62 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	62 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	68 %		30-150





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37  
Date Sampled: 01/11/17 10:20  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 5  
Extraction Method: 5030B

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-01  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: MD

**8260B Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
1,1,2-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
1,1-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
1,1-Dichloroethene	ND (1.0)	0.3	8260B		1	01/12/17 18:19	C7A0161	CA71231
1,2-Dibromoethane	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
1,2-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 18:19	C7A0161	CA71231
1,2-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
1,3-Dichlorobenzene	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
1,4-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 18:19	C7A0161	CA71231
1,4-Dioxane - Screen	ND (500)	190	8260B		1	01/12/17 18:19	C7A0161	CA71231
Acetone	ND (10.0)	2.7	8260B		1	01/12/17 18:19	C7A0161	CA71231
<b>Benzene</b>	<b>J 0.2</b> (1.0)	0.1	8260B		1	01/12/17 18:19	C7A0161	CA71231
Carbon Tetrachloride	ND (1.0)	0.1	8260B		1	01/12/17 18:19	C7A0161	CA71231
cis-1,2-Dichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
<b>Ethylbenzene</b>	<b>J 0.2</b> (1.0)	0.1	8260B		1	01/12/17 18:19	C7A0161	CA71231
<b>Methyl tert-Butyl Ether</b>	<b>J 0.7</b> (1.0)	0.3	8260B		1	01/12/17 18:19	C7A0161	CA71231
<b>Methylene Chloride</b>	<b>J 0.2</b> (2.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
<b>Naphthalene</b>	<b>B, J 0.4</b> (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
Tertiary-amyl methyl ether	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
Tertiary-butyl Alcohol	ND (25.0)	10.0	8260B		1	01/12/17 18:19	C7A0161	CA71231
Tetrachloroethene	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
<b>Toluene</b>	<b>J 0.2</b> (1.0)	0.1	8260B		1	01/12/17 18:19	C7A0161	CA71231
Trichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
Vinyl Chloride	ND (1.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
<b>Xylene O</b>	<b>J 0.2</b> (1.0)	0.1	8260B		1	01/12/17 18:19	C7A0161	CA71231
<b>Xylene P,M</b>	<b>J 0.6</b> (2.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>104 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>96 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>98 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>103 %</i>		<i>70-130</i>





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37  
Date Sampled: 01/11/17 10:20  
Percent Solids: N/A  
Initial Volume: 1070  
Final Volume: 0.25  
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-01  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: VSC  
Prepared: 1/12/17 10:15

**8270D(SIM) Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Acenaphthene	0.21 (0.19)	0.04	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Acenaphthylene	J 0.10 (0.19)	0.03	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Anthracene	0.23 (0.19)	0.03	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Benzo(a)anthracene	0.26 (0.05)	0.01	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Benzo(a)pyrene	0.29 (0.05)	0.01	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Benzo(b)fluoranthene	0.37 (0.05)	0.02	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Benzo(g,h,i)perylene	0.21 (0.19)	0.02	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Benzo(k)fluoranthene	0.14 (0.05)	0.02	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
bis(2-Ethylhexyl)phthalate	B 3.07 (2.34)	0.19	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Butylbenzylphthalate	B, J 0.31 (2.34)	0.19	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Chrysene	0.35 (0.05)	0.01	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Dibenzo(a,h)Anthracene	0.05 (0.05)	0.02	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Diethylphthalate	J 0.29 (2.34)	0.19	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Dimethylphthalate	ND (2.34)	0.19	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Di-n-butylphthalate	J 0.19 (2.34)	0.19	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Di-n-octylphthalate	ND (2.34)	0.19	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Fluoranthene	0.78 (0.19)	0.02	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Fluorene	0.34 (0.19)	0.03	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Indeno(1,2,3-cd)Pyrene	0.22 (0.05)	0.02	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Naphthalene	J 0.11 (0.19)	0.04	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Pentachlorophenol	ND (0.84)	0.30	8270D SIM		1	01/19/17 1:59	C7A0164	CA71116
Phenanthrene	0.85 (0.19)	0.04	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116
Pyrene	0.76 (0.19)	0.02	8270D SIM		1	01/12/17 22:03	C7A0164	CA71116

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	46 %		30-130
Surrogate: 2,4,6-Tribromophenol	108 %		15-110
Surrogate: 2-Fluorobiphenyl	77 %		30-130
Surrogate: Nitrobenzene-d5	76 %		30-130
Surrogate: p-Terphenyl-d14	93 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37  
Date Sampled: 01/11/17 10:20  
Percent Solids: N/A

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-01  
Sample Matrix: Ground Water

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Ammonia as N	0.64 (0.10)		4500 NH3 G		1	JLK	01/16/17 17:19	mg/L	CA71301
Chloride	200 (10.0)		§		1	SUB	01/13/17 19:51	mg/L	CA71826
Hexavalent Chromium	ND (10)		7196A		1	JLK	01/11/17 21:00	ug/L	CA71144
Phenols	ND (100)	30	420.1		1	JLK	01/13/17 17:00	ug/L	CA71336
Total Cyanide (LL)	ND (5.00)	1.80	4500 CN CE		1	EEM	01/13/17 11:40	ug/L	CA71317
Total Petroleum Hydrocarbon	ND (5)		1664A		1	CRR	01/16/17 14:42	mg/L	CA71306
Total Residual Chlorine	ND (10)		4500-Cl E		1	JLK	01/11/17 20:08	ug/L	CA71143
Total Suspended Solids	164000 (10000)		2540D		1	JLK	01/12/17 18:08	ug/L	CA71229





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37  
Date Sampled: 01/11/17 10:20  
Percent Solids: N/A  
Initial Volume: 35  
Final Volume: 2  
Extraction Method: 504/8011

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-01  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: JXS  
Prepared: 1/13/17 12:00

**8011 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2-Dibromoethane	ND (0.015)	0.005	8011		1	JXS	01/13/17 18:35		CA71322

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Pentachloroethane</i>	<i>110 %</i>		<i>30-150</i>





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37  
Date Sampled: 01/11/17 10:20  
Percent Solids: N/A  
Initial Volume: 1  
Final Volume: 1  
Extraction Method: No Prep

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-01  
Sample Matrix: Ground Water  
Units: mg/L  
Analyst: DPS  
Prepared: 1/12/17 14:30

**Alcohol Scan by GC/FID**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Ethanol	ND (10)		8015		1	DPS	01/13/17 16:56		CA71246





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37 FF  
Date Sampled: 01/11/17 10:50  
Percent Solids: N/A

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-02  
Sample Matrix: Ground Water  
Units: ug/L

Extraction Method: 3005A

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (5.0)	0.6	7010		1	KJK	01/17/17 22:28	50	25	CA71146
Arsenic	<b>J 3.8</b> (5.0)	0.4	7010		1	KJK	01/14/17 16:05	50	25	CA71146
Barium	<b>131</b> (25.0)	1.5	6010C		1	KJK	01/13/17 3:43	50	25	CA71146
Beryllium	<b>J 0.3</b> (0.5)	0.1	6010C		1	KJK	01/13/17 3:43	50	25	CA71146
Cadmium	<b>J 0.05</b> (0.5)	0.03	7010		1	KJK	01/17/17 15:59	50	25	CA71146
Chromium	<b>J 2.9</b> (10.0)	1.5	6010C		1	KJK	01/13/17 3:43	50	25	CA71146
Chromium III	ND (10)		6010C		1	JLK	01/13/17 3:43	1	1	[CALC]
Copper	<b>J 4.2</b> (5.0)	2.0	6010C		1	KJK	01/13/17 3:43	50	25	CA71146
Iron	<b>1650</b> (50.0)	11.5	6010C		1	KJK	01/13/17 3:43	50	25	CA71146
Lead	ND (2.5)	0.5	7010		1	KJK	01/14/17 22:12	50	25	CA71146
Mercury	ND (0.20)	0.12	7470A		1	MJV	01/13/17 12:50	20	40	CA71147
Nickel	ND (10.0)	1.0	6010C		1	KJK	01/13/17 3:43	50	25	CA71146
Selenium	ND (5.0)	0.6	7010		1	KJK	01/15/17 3:41	50	25	CA71146
Silver	ND (0.2)	0.08	7010		1	KJK	01/17/17 19:04	50	25	CA71146
Thallium	ND (1.0)	0.5	7010		1	KJK	01/14/17 18:47	50	25	CA71146
Vanadium	ND (10.0)	1.0	6010C		1	KJK	01/13/17 3:43	50	25	CA71146
Zinc	<b>B, J 20.5</b> (25.0)	4.5	6010C		1	KJK	01/13/17 3:43	50	25	CA71146





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37 FF  
Date Sampled: 01/11/17 10:50  
Percent Solids: N/A  
Initial Volume: 1070  
Final Volume: 1  
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-02  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: SMR  
Prepared: 1/13/17 9:30  
Cleanup Method: 3665A

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.09)	0.03	8082A		1	01/13/17 14:06		CA71203
Aroclor 1221	ND (0.09)	0.03	8082A		1	01/13/17 14:06		CA71203
Aroclor 1232	ND (0.09)	0.03	8082A		1	01/13/17 14:06		CA71203
Aroclor 1242	ND (0.09)	0.03	8082A		1	01/13/17 14:06		CA71203
Aroclor 1248	ND (0.09)	0.03	8082A		1	01/13/17 14:06		CA71203
Aroclor 1254	ND (0.09)	0.03	8082A		1	01/13/17 14:06		CA71203
Aroclor 1260	ND (0.09)	0.03	8082A		1	01/13/17 14:06		CA71203
Aroclor 1262	ND (0.09)	0.03	8082A		1	01/13/17 14:06		CA71203
Aroclor 1268	ND (0.09)	0.03	8082A		1	01/13/17 14:06		CA71203

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	66 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	72 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	68 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	71 %		30-150





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37 FF  
Date Sampled: 01/11/17 10:50  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 5  
Extraction Method: 5030B

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-02  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: MD

**8260B Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
1,1,2-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
1,1-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
1,1-Dichloroethene	ND (1.0)	0.3	8260B		1	01/12/17 18:46	C7A0161	CA71231
1,2-Dibromoethane	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
1,2-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 18:46	C7A0161	CA71231
1,2-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
1,3-Dichlorobenzene	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
1,4-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 18:46	C7A0161	CA71231
1,4-Dioxane - Screen	ND (500)	190	8260B		1	01/12/17 18:46	C7A0161	CA71231
Acetone	ND (10.0)	2.7	8260B		1	01/12/17 18:46	C7A0161	CA71231
<b>Benzene</b>	<b>J 0.2</b> (1.0)	0.1	8260B		1	01/12/17 18:46	C7A0161	CA71231
Carbon Tetrachloride	ND (1.0)	0.1	8260B		1	01/12/17 18:46	C7A0161	CA71231
cis-1,2-Dichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
<b>Ethylbenzene</b>	<b>J 0.2</b> (1.0)	0.1	8260B		1	01/12/17 18:46	C7A0161	CA71231
<b>Methyl tert-Butyl Ether</b>	<b>J 0.6</b> (1.0)	0.3	8260B		1	01/12/17 18:46	C7A0161	CA71231
Methylene Chloride	ND (2.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
<b>Naphthalene</b>	<b>B, J 0.4</b> (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
Tertiary-amyl methyl ether	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
Tertiary-butyl Alcohol	ND (25.0)	10.0	8260B		1	01/12/17 18:46	C7A0161	CA71231
Tetrachloroethene	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
<b>Toluene</b>	<b>J 0.2</b> (1.0)	0.1	8260B		1	01/12/17 18:46	C7A0161	CA71231
Trichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
Vinyl Chloride	ND (1.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231
<b>Xylene O</b>	<b>J 0.2</b> (1.0)	0.1	8260B		1	01/12/17 18:46	C7A0161	CA71231
<b>Xylene P,M</b>	<b>J 0.5</b> (2.0)	0.2	8260B		1	01/12/17 18:46	C7A0161	CA71231

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	103 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	96 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	100 %		70-130
<i>Surrogate: Toluene-d8</i>	102 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37 FF  
Date Sampled: 01/11/17 10:50  
Percent Solids: N/A  
Initial Volume: 1070  
Final Volume: 0.25  
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-02  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: VSC  
Prepared: 1/12/17 10:15

**8270D(SIM) Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Acenaphthene	J 0.14 (0.19)	0.04	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Acenaphthylene	ND (0.19)	0.03	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Anthracene	J 0.05 (0.19)	0.03	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Benzo(a)anthracene	J 0.04 (0.05)	0.01	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Benzo(a)pyrene	J 0.03 (0.05)	0.01	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Benzo(b)fluoranthene	J 0.04 (0.05)	0.02	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Benzo(g,h,i)perylene	J 0.02 (0.19)	0.02	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Benzo(k)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
bis(2-Ethylhexyl)phthalate	B 3.00 (2.34)	0.19	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Butylbenzylphthalate	B, J 0.36 (2.34)	0.19	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Chrysene	J 0.04 (0.05)	0.01	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Dibenzo(a,h)Anthracene	ND (0.05)	0.02	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Diethylphthalate	J 0.27 (2.34)	0.19	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Dimethylphthalate	ND (2.34)	0.19	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Di-n-butylphthalate	J 0.43 (2.34)	0.19	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Di-n-octylphthalate	ND (2.34)	0.19	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Fluoranthene	J 0.11 (0.19)	0.02	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Fluorene	J 0.07 (0.19)	0.03	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Indeno(1,2,3-cd)Pyrene	J 0.02 (0.05)	0.02	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Naphthalene	J 0.11 (0.19)	0.04	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Pentachlorophenol	ND (0.84)	0.30	8270D SIM		1	01/19/17 2:48	C7A0164	CA71116
Phenanthrene	J 0.16 (0.19)	0.04	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116
Pyrene	J 0.10 (0.19)	0.02	8270D SIM		1	01/12/17 22:51	C7A0164	CA71116

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	55 %		30-130
Surrogate: 2,4,6-Tribromophenol	108 %		15-110
Surrogate: 2-Fluorobiphenyl	83 %		30-130
Surrogate: Nitrobenzene-d5	84 %		30-130
Surrogate: p-Terphenyl-d14	91 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37 FF  
Date Sampled: 01/11/17 10:50  
Percent Solids: N/A

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-02  
Sample Matrix: Ground Water

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Ammonia as N	0.61 (0.10)		4500 NH3 G		1	JLK	01/16/17 17:23	mg/L	CA71301
Chloride	240 (10.0)		§		1	SUB	01/13/17 20:05	mg/L	CA71826
Hexavalent Chromium	ND (10)		7196A		1	JLK	01/11/17 21:00	ug/L	CA71144
Phenols	ND (100)	30	420.1		1	JLK	01/13/17 17:00	ug/L	CA71336
Total Cyanide (LL)	ND (5.00)	1.80	4500 CN CE		1	EEM	01/13/17 11:40	ug/L	CA71317
Total Petroleum Hydrocarbon	ND (5)		1664A		1	CRR	01/16/17 14:42	mg/L	CA71306
Total Residual Chlorine	ND (10)		4500-Cl E		1	JLK	01/11/17 20:08	ug/L	CA71143
<b>Total Suspended Solids</b>	<b>13000 (5000)</b>		2540D		1	JLK	01/12/17 18:08	ug/L	CA71229





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37 FF  
Date Sampled: 01/11/17 10:50  
Percent Solids: N/A  
Initial Volume: 35  
Final Volume: 2  
Extraction Method: 504/8011

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-02  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: JXS  
Prepared: 1/13/17 12:00

**8011 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2-Dibromoethane	ND (0.015)	0.005	8011		1	JXS	01/13/17 19:04		CA71322
<hr/>									
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>					
<i>Surrogate: Pentachloroethane</i>		108 %		30-150					





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-37 FF  
Date Sampled: 01/11/17 10:50  
Percent Solids: N/A  
Initial Volume: 1  
Final Volume: 1  
Extraction Method: No Prep

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-02  
Sample Matrix: Ground Water  
Units: mg/L  
Analyst: DPS  
Prepared: 1/12/17 14:30

**Alcohol Scan by GC/FID**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Ethanol	ND (10)		8015		1	DPS	01/13/17 17:19		CA71246





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36  
Date Sampled: 01/11/17 11:20  
Percent Solids: N/A

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-03  
Sample Matrix: Ground Water  
Units: ug/L

Extraction Method: 3005A

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (5.0)	0.6	7010		1	KJK	01/17/17 22:34	50	25	CA71146
Arsenic	ND (5.0)	0.4	7010		1	KJK	01/14/17 16:11	50	25	CA71146
<b>Barium</b>	<b>81.1</b> (25.0)	1.5	6010C		1	KJK	01/13/17 3:47	50	25	CA71146
<b>Beryllium</b>	<b>J 0.1</b> (0.5)	0.1	6010C		1	KJK	01/13/17 3:47	50	25	CA71146
Cadmium	ND (0.5)	0.03	7010		1	KJK	01/17/17 16:05	50	25	CA71146
<b>Chromium</b>	<b>J 2.8</b> (10.0)	1.5	6010C		1	KJK	01/13/17 3:47	50	25	CA71146
Chromium III	ND (10)		6010C		1	JLK	01/13/17 3:47	1	1	[CALC]
<b>Copper</b>	<b>J 3.3</b> (5.0)	2.0	6010C		1	KJK	01/13/17 3:47	50	25	CA71146
<b>Iron</b>	<b>B 505</b> (50.0)	11.5	6010C		1	KJK	01/13/17 3:47	50	25	CA71146
Lead	ND (2.5)	0.5	7010		1	KJK	01/14/17 22:30	50	25	CA71146
Mercury	ND (0.20)	0.12	7470A		1	MJV	01/13/17 12:52	20	40	CA71147
Nickel	ND (10.0)	1.0	6010C		1	KJK	01/13/17 3:47	50	25	CA71146
Selenium	ND (5.0)	0.6	7010		1	KJK	01/15/17 3:47	50	25	CA71146
Silver	ND (0.2)	0.08	7010		1	KJK	01/17/17 19:10	50	25	CA71146
Thallium	ND (1.0)	0.5	7010		1	KJK	01/14/17 18:53	50	25	CA71146
<b>Vanadium</b>	<b>J 1.1</b> (10.0)	1.0	6010C		1	KJK	01/13/17 3:47	50	25	CA71146
<b>Zinc</b>	<b>B, J 18.8</b> (25.0)	4.5	6010C		1	KJK	01/13/17 3:47	50	25	CA71146





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36  
Date Sampled: 01/11/17 11:20  
Percent Solids: N/A  
Initial Volume: 1070  
Final Volume: 1  
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-03  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: SMR  
Prepared: 1/13/17 9:30  
Cleanup Method: 3665A

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.09)	0.03	8082A		1	01/13/17 14:25		CA71203
Aroclor 1221	ND (0.09)	0.03	8082A		1	01/13/17 14:25		CA71203
Aroclor 1232	ND (0.09)	0.03	8082A		1	01/13/17 14:25		CA71203
Aroclor 1242	ND (0.09)	0.03	8082A		1	01/13/17 14:25		CA71203
Aroclor 1248	ND (0.09)	0.03	8082A		1	01/13/17 14:25		CA71203
Aroclor 1254	ND (0.09)	0.03	8082A		1	01/13/17 14:25		CA71203
Aroclor 1260	ND (0.09)	0.03	8082A		1	01/13/17 14:25		CA71203
Aroclor 1262	ND (0.09)	0.03	8082A		1	01/13/17 14:25		CA71203
Aroclor 1268	ND (0.09)	0.03	8082A		1	01/13/17 14:25		CA71203

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	54 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	56 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	67 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	69 %		30-150





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36  
Date Sampled: 01/11/17 11:20  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 5  
Extraction Method: 5030B

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-03  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: MD

**8260B Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
1,1,2-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
1,1-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
1,1-Dichloroethene	ND (1.0)	0.3	8260B		1	01/12/17 19:13	C7A0161	CA71231
1,2-Dibromoethane	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
1,2-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 19:13	C7A0161	CA71231
1,2-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
1,3-Dichlorobenzene	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
1,4-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 19:13	C7A0161	CA71231
1,4-Dioxane - Screen	ND (500)	190	8260B		1	01/12/17 19:13	C7A0161	CA71231
Acetone	ND (10.0)	2.7	8260B		1	01/12/17 19:13	C7A0161	CA71231
<b>Benzene</b>	<b>J 0.1</b> (1.0)	0.1	8260B		1	01/12/17 19:13	C7A0161	CA71231
Carbon Tetrachloride	ND (1.0)	0.1	8260B		1	01/12/17 19:13	C7A0161	CA71231
cis-1,2-Dichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
Ethylbenzene	ND (1.0)	0.1	8260B		1	01/12/17 19:13	C7A0161	CA71231
Methyl tert-Butyl Ether	ND (1.0)	0.3	8260B		1	01/12/17 19:13	C7A0161	CA71231
Methylene Chloride	ND (2.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
<b>Naphthalene</b>	<b>B, J 0.2</b> (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
Tertiary-amyl methyl ether	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
Tertiary-butyl Alcohol	ND (25.0)	10.0	8260B		1	01/12/17 19:13	C7A0161	CA71231
Tetrachloroethene	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
Toluene	ND (1.0)	0.1	8260B		1	01/12/17 19:13	C7A0161	CA71231
Trichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
Vinyl Chloride	ND (1.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231
Xylene O	ND (1.0)	0.1	8260B		1	01/12/17 19:13	C7A0161	CA71231
Xylene P,M	ND (2.0)	0.2	8260B		1	01/12/17 19:13	C7A0161	CA71231

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>104 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>93 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>101 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>100 %</i>		<i>70-130</i>





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36  
Date Sampled: 01/11/17 11:20  
Percent Solids: N/A  
Initial Volume: 1070  
Final Volume: 0.25  
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-03  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: VSC  
Prepared: 1/12/17 10:15

**8270D(SIM) Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Acenaphthene	ND (0.19)	0.04	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Acenaphthylene	ND (0.19)	0.03	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Anthracene	ND (0.19)	0.03	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Benzo(a)anthracene	ND (0.05)	0.01	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Benzo(a)pyrene	ND (0.05)	0.01	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Benzo(b)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Benzo(g,h,i)perylene	ND (0.19)	0.02	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Benzo(k)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
<b>bis(2-Ethylhexyl)phthalate</b>	<b>B 2.72</b> (2.34)	0.19	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
<b>Butylbenzylphthalate</b>	<b>B, J 0.34</b> (2.34)	0.19	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Chrysene	ND (0.05)	0.01	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Dibenzo(a,h)Anthracene	ND (0.05)	0.02	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Diethylphthalate	ND (2.34)	0.19	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Dimethylphthalate	ND (2.34)	0.19	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Di-n-butylphthalate	ND (2.34)	0.19	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Di-n-octylphthalate	ND (2.34)	0.19	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Fluoranthene	ND (0.19)	0.02	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Fluorene	ND (0.19)	0.03	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Indeno(1,2,3-cd)Pyrene	ND (0.05)	0.02	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Naphthalene	ND (0.19)	0.04	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Pentachlorophenol	ND (0.84)	0.30	8270D SIM		1	01/19/17 5:10	C7A0164	CA71116
Phenanthrene	ND (0.19)	0.04	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Pyrene	ND (0.19)	0.02	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	61 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	75 %		15-110
<i>Surrogate: 2-Fluorobiphenyl</i>	85 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	79 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	97 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36  
Date Sampled: 01/11/17 11:20  
Percent Solids: N/A

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-03  
Sample Matrix: Ground Water

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Ammonia as N	ND (0.10)		4500 NH3 G		1	JLK	01/16/17 17:20	mg/L	CA71301
<b>Chloride</b>	<b>100</b> (10.0)		§		1	SUB	01/13/17 20:19	mg/L	CA71826
Hexavalent Chromium	ND (10)		7196A		1	JLK	01/11/17 21:00	ug/L	CA71144
Phenols	ND (100)	30	420.1		1	JLK	01/13/17 17:00	ug/L	CA71336
Total Cyanide (LL)	ND (5.00)	1.80	4500 CN CE		1	EEM	01/13/17 11:40	ug/L	CA71317
Total Petroleum Hydrocarbon	ND (5)		1664A		1	CRR	01/16/17 14:42	mg/L	CA71306
Total Residual Chlorine	ND (10)		4500-Cl E		1	JLK	01/11/17 20:08	ug/L	CA71143
<b>Total Suspended Solids</b>	<b>116000</b> (5000)		2540D		1	JLK	01/12/17 18:08	ug/L	CA71229





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36  
Date Sampled: 01/11/17 11:20  
Percent Solids: N/A  
Initial Volume: 35  
Final Volume: 2  
Extraction Method: 504/8011

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-03  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: JXS  
Prepared: 1/13/17 12:00

**8011 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2-Dibromoethane	ND (0.015)	0.005	8011		1	JXS	01/13/17 19:32		CA71322

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Pentachloroethane</i>	124 %		30-150





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36  
Date Sampled: 01/11/17 11:20  
Percent Solids: N/A  
Initial Volume: 1  
Final Volume: 1  
Extraction Method: No Prep

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-03  
Sample Matrix: Ground Water  
Units: mg/L  
Analyst: DPS  
Prepared: 1/12/17 14:30

**Alcohol Scan by GC/FID**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Ethanol	ND (10)		8015		1	DPS	01/13/17 17:42		CA71246





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36 FF  
Date Sampled: 01/11/17 11:50  
Percent Solids: N/A

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-04  
Sample Matrix: Ground Water  
Units: ug/L

Extraction Method: 3005A

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (5.0)	0.6	7010		1	KJK	01/17/17 22:39	50	25	CA71146
Arsenic	ND (5.0)	0.4	7010		1	KJK	01/14/17 16:17	50	25	CA71146
<b>Barium</b>	<b>72.0</b> (25.0)	1.5	6010C		1	KJK	01/13/17 3:51	50	25	CA71146
Beryllium	ND (0.5)	0.1	6010C		1	KJK	01/13/17 3:51	50	25	CA71146
<b>Cadmium</b>	<b>J 0.03</b> (0.5)	0.03	7010		1	KJK	01/17/17 16:11	50	25	CA71146
Chromium	ND (10.0)	1.5	6010C		1	KJK	01/13/17 3:51	50	25	CA71146
Chromium III	ND (10)		6010C		1	JLK	01/13/17 3:51	1	1	[CALC]
Copper	ND (5.0)	2.0	6010C		1	KJK	01/13/17 3:51	50	25	CA71146
<b>Iron</b>	<b>B 89.6</b> (50.0)	11.5	6010C		1	KJK	01/13/17 3:51	50	25	CA71146
Lead	ND (2.5)	0.5	7010		1	KJK	01/14/17 22:36	50	25	CA71146
Mercury	ND (0.20)	0.12	7470A		1	MJV	01/13/17 12:54	20	40	CA71147
Nickel	ND (10.0)	1.0	6010C		1	KJK	01/13/17 3:51	50	25	CA71146
Selenium	ND (5.0)	0.6	7010		1	KJK	01/15/17 3:53	50	25	CA71146
Silver	ND (0.2)	0.08	7010		1	KJK	01/17/17 19:16	50	25	CA71146
Thallium	ND (1.0)	0.5	7010		1	KJK	01/14/17 18:59	50	25	CA71146
Vanadium	ND (10.0)	1.0	6010C		1	KJK	01/13/17 3:51	50	25	CA71146
<b>Zinc</b>	<b>B, J 18.9</b> (25.0)	4.5	6010C		1	KJK	01/13/17 3:51	50	25	CA71146





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36 FF  
Date Sampled: 01/11/17 11:50  
Percent Solids: N/A  
Initial Volume: 1070  
Final Volume: 1  
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-04  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: SMR  
Prepared: 1/13/17 9:30  
Cleanup Method: 3665A

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.09)	0.03	8082A		1	01/13/17 14:44		CA71203
Aroclor 1221	ND (0.09)	0.03	8082A		1	01/13/17 14:44		CA71203
Aroclor 1232	ND (0.09)	0.03	8082A		1	01/13/17 14:44		CA71203
Aroclor 1242	ND (0.09)	0.03	8082A		1	01/13/17 14:44		CA71203
Aroclor 1248	ND (0.09)	0.03	8082A		1	01/13/17 14:44		CA71203
Aroclor 1254	ND (0.09)	0.03	8082A		1	01/13/17 14:44		CA71203
Aroclor 1260	ND (0.09)	0.03	8082A		1	01/13/17 14:44		CA71203
Aroclor 1262	ND (0.09)	0.03	8082A		1	01/13/17 14:44		CA71203
Aroclor 1268	ND (0.09)	0.03	8082A		1	01/13/17 14:44		CA71203

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	76 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	81 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	64 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	67 %		30-150





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36 FF  
Date Sampled: 01/11/17 11:50  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 5  
Extraction Method: 5030B

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-04  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: MD

**8260B Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
1,1,2-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
1,1-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
1,1-Dichloroethene	ND (1.0)	0.3	8260B		1	01/12/17 19:39	C7A0161	CA71231
1,2-Dibromoethane	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
1,2-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 19:39	C7A0161	CA71231
1,2-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
1,3-Dichlorobenzene	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
1,4-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 19:39	C7A0161	CA71231
1,4-Dioxane - Screen	ND (500)	190	8260B		1	01/12/17 19:39	C7A0161	CA71231
Acetone	ND (10.0)	2.7	8260B		1	01/12/17 19:39	C7A0161	CA71231
Benzene	ND (1.0)	0.1	8260B		1	01/12/17 19:39	C7A0161	CA71231
Carbon Tetrachloride	ND (1.0)	0.1	8260B		1	01/12/17 19:39	C7A0161	CA71231
cis-1,2-Dichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
Ethylbenzene	ND (1.0)	0.1	8260B		1	01/12/17 19:39	C7A0161	CA71231
Methyl tert-Butyl Ether	ND (1.0)	0.3	8260B		1	01/12/17 19:39	C7A0161	CA71231
Methylene Chloride	ND (2.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
<b>Naphthalene</b>	<b>B, J 0.2 (1.0)</b>	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
Tertiary-amyl methyl ether	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
Tertiary-butyl Alcohol	ND (25.0)	10.0	8260B		1	01/12/17 19:39	C7A0161	CA71231
Tetrachloroethene	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
<b>Toluene</b>	<b>J 0.1 (1.0)</b>	0.1	8260B		1	01/12/17 19:39	C7A0161	CA71231
Trichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
Vinyl Chloride	ND (1.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231
Xylene O	ND (1.0)	0.1	8260B		1	01/12/17 19:39	C7A0161	CA71231
Xylene P,M	ND (2.0)	0.2	8260B		1	01/12/17 19:39	C7A0161	CA71231

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>99 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>95 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>99 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>101 %</i>		<i>70-130</i>





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36 FF  
Date Sampled: 01/11/17 11:50  
Percent Solids: N/A  
Initial Volume: 1070  
Final Volume: 0.25  
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-04  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: VSC  
Prepared: 1/12/17 10:15

**8270D(SIM) Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Acenaphthene	ND (0.19)	0.04	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Acenaphthylene	ND (0.19)	0.03	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Anthracene	ND (0.19)	0.03	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Benzo(a)anthracene	ND (0.05)	0.01	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Benzo(a)pyrene	ND (0.05)	0.01	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Benzo(b)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Benzo(g,h,i)perylene	ND (0.19)	0.02	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Benzo(k)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
<b>bis(2-Ethylhexyl)phthalate</b>	<b>B, J 2.02</b> (2.34)	0.19	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
<b>Butylbenzylphthalate</b>	<b>B, J 0.43</b> (2.34)	0.19	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Chrysene	ND (0.05)	0.01	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Dibenzo(a,h)Anthracene	ND (0.05)	0.02	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
<b>Diethylphthalate</b>	<b>3.85</b> (2.34)	0.19	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Dimethylphthalate	ND (2.34)	0.19	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
<b>Di-n-butylphthalate</b>	<b>J 0.69</b> (2.34)	0.19	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Di-n-octylphthalate	ND (2.34)	0.19	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Fluoranthene	ND (0.19)	0.02	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Fluorene	ND (0.19)	0.03	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Indeno(1,2,3-cd)Pyrene	ND (0.05)	0.02	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Naphthalene	ND (0.19)	0.04	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Pentachlorophenol	ND (0.84)	0.30	8270D SIM		1	01/19/17 5:59	C7A0164	CA71116
Phenanthrene	ND (0.19)	0.04	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Pyrene	ND (0.19)	0.02	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	<i>65 %</i>		<i>30-130</i>
<i>Surrogate: 2,4,6-Tribromophenol</i>	<i>87 %</i>		<i>15-110</i>
<i>Surrogate: 2-Fluorobiphenyl</i>	<i>83 %</i>		<i>30-130</i>
<i>Surrogate: Nitrobenzene-d5</i>	<i>80 %</i>		<i>30-130</i>
<i>Surrogate: p-Terphenyl-d14</i>	<i>92 %</i>		<i>30-130</i>





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36 FF  
Date Sampled: 01/11/17 11:50  
Percent Solids: N/A

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-04  
Sample Matrix: Ground Water

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Ammonia as N	ND (0.10)		4500 NH3 G		1	JLK	01/16/17 17:20	mg/L	CA71301
<b>Chloride</b>	<b>100</b> (10.0)		§		1	SUB	01/13/17 20:33	mg/L	CA71826
Hexavalent Chromium	ND (10)		7196A		1	JLK	01/11/17 21:00	ug/L	CA71144
Phenols	ND (100)	30	420.1		1	JLK	01/13/17 17:00	ug/L	CA71336
Total Cyanide (LL)	ND (5.00)	1.80	4500 CN CE		1	EEM	01/13/17 11:40	ug/L	CA71317
Total Petroleum Hydrocarbon	ND (5)		1664A		1	CRR	01/16/17 14:42	mg/L	CA71306
Total Residual Chlorine	ND (10)		4500-Cl E		1	JLK	01/11/17 20:08	ug/L	CA71143
Total Suspended Solids	ND (5000)		2540D		1	JLK	01/12/17 18:08	ug/L	CA71229





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36 FF  
Date Sampled: 01/11/17 11:50  
Percent Solids: N/A  
Initial Volume: 35  
Final Volume: 2  
Extraction Method: 504/8011

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-04  
Sample Matrix: Ground Water  
Units: ug/L  
Analyst: JXS  
Prepared: 1/13/17 12:00

**8011 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2-Dibromoethane	ND (0.015)	0.005	8011		1	JXS	01/13/17 20:00		CA71322
<hr/>									
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>					
<i>Surrogate: Pentachloroethane</i>		107 %		30-150					





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP/MCP  
Client Sample ID: MW-36 FF  
Date Sampled: 01/11/17 11:50  
Percent Solids: N/A  
Initial Volume: 1  
Final Volume: 1  
Extraction Method: No Prep

ESS Laboratory Work Order: 1701214  
ESS Laboratory Sample ID: 1701214-04  
Sample Matrix: Ground Water  
Units: mg/L  
Analyst: DPS  
Prepared: 1/12/17 14:30

**Alcohol Scan by GC/FID**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Ethanol	ND (10)		8015		1	DPS	01/13/17 18:04		CA71246





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meedc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>



## LABORATORY REPORT

ESS Laboratory  
Attn: Mr. Shawn Morrell  
185 Frances Avenue  
Cranston, RI 02910-2211

**Date Received:** 1/12/2017  
**Date Reported:** 1/17/2017  
**P.O. Number** B02406

**Work Order #:** 1701-00787

**Project Name:** PROJECT: 1701214

Enclosed are the analytical results and Chain of Custody for your project referenced above. The sample(s) were analyzed by our Warwick, RI laboratory unless noted otherwise. When applicable, indication of sample analysis at our Hudson, MA laboratory and/or subcontracted results are noted and subcontracted reports are enclosed in their entirety.

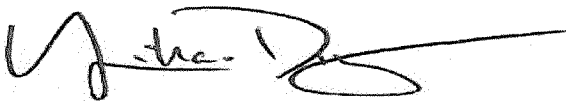
All samples were analyzed within the established guidelines of US EPA approved methods with all requirements met, unless otherwise noted at the end of a given sample's analytical results or in a case narrative.

The Detection Limit is defined as the lowest level that can be reliably achieved during routine laboratory conditions.

These results only pertain to the samples submitted for this Work Order # and this report shall not be reproduced except in its entirety.

We certify that the following results are true and accurate to the best of our knowledge. If you have questions or need further assistance, please contact our Customer Service Department.

Approved by:



Yihai Ding  
Technical Director

Laboratory Certification Numbers (as applicable to sample's origin state):

Warwick RI \* RI LAI00033, MA M-RI015, CT PH-0508, ME RI00015, NH 2070, NY 11726  
Hudson MA \* M-MA1117, RI LAO00319



## R.I. Analytical Laboratories, Inc.

## Laboratory Report

ESS Laboratory

Work Order #: 1701-00787

Project Name: PROJECT: 1701214

**Sample Number:** 001  
**Sample Description:** 1701214-01  
**Sample Type :** GRAB  
**Sample Date / Time :** 1/11/2017 @ 10:20

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE/TIME ANALYZED	ANALYST
Chloride	200	10	mg/l	EPA 300.0	1/13/2017 19:51	AEG

**Sample Number:** 002  
**Sample Description:** 1701214-02  
**Sample Type :** GRAB  
**Sample Date / Time :** 1/11/2017 @ 10:50

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE/TIME ANALYZED	ANALYST
Chloride	240	10	mg/l	EPA 300.0	1/13/2017 20:05	AEG

**Sample Number:** 003  
**Sample Description:** 1701214-03  
**Sample Type :** GRAB  
**Sample Date / Time :** 1/11/2017 @ 11:20

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE/TIME ANALYZED	ANALYST
Chloride	100	10	mg/l	EPA 300.0	1/13/2017 20:19	AEG

**Sample Number:** 004  
**Sample Description:** 1701214-04  
**Sample Type :** GRAB  
**Sample Date / Time :** 1/11/2017 @ 11:50

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE/TIME ANALYZED	ANALYST
Chloride	100	10	mg/l	EPA 300.0	1/13/2017 20:33	AEG



## R.I. Analytical Laboratories, Inc.

## Laboratory Report

ESS Laboratory

Work Order #: 1701-00787

Project Name: PROJECT: 1701214

---

**Sample Number:** 005  
**Sample Description:** 1701214-05  
**Sample Type :** GRAB  
**Sample Date / Time :** 1/11/2017 @ 08:30

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE/TIME ANALYZED	ANALYST
Chloride	70	10	mg/l	EPA 300.0	1/13/2017 20:47	AEG





ESS Laboratory  
1701-00787  
1/17/17

**-Method Blanks Results-**

Parameter	Units	Results	Date Analyzed
Chloride	mg/l	<1.0	1/13/2017

**-LCS/LCS Duplicate Data Results-**

Parameter	Spike Conc	LCS Conc	LCS % Rec	LCS Dup Conc	LCS DUP % Rec	% RPD	Date Analyzed
Chloride	10.0	9.37	94				1/13/2017



# ESS Laboratory

Division of Thielsch Engineering, Inc.

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www.esslaboratory.com

## RIAL

## CHAIN OF CUSTODY

Turn Time **DUE 1/18/17**

Regulatory State: **MA** RI CT NH NJ NY ME Other

Is this project for any of the following: (please circle)

MA-MCP Navy USACE CT DEP Other **RGP**

Co. Name		ESS Laboratory		Project #		1701214		ESS Lab #		1701214	
Contact Person		Shawn Morrell		Proj. Location				Reporting Limits - EPA RGP Appendix VII			
Address		City, State		Zip		PO #		Electronic Deliverables <u>Excel*</u> Access PDF			
Tel.		email: <u>smorrell@thielsch.com</u>		Sample ID		Pres Code		Analysis		Chloride 300.0	
ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container		
	1/11/17	1020		GW	1701214-01	1	1	P		X	
	1/11/17	1050		GW	1701214-02	1	1	P		X	
	1/11/17	1120		GW	1701214-03	1	1	P		X	
	1/11/17	1150		GW	1701214-04	1	1	P		X	
	1/11/17	0830		GW	1701214-05	1	1	P		X	
Container Type: P-Poly G-Glass AG- Amber Glass S-Sterile V-VOA				Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter							
Cooler Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Internal Use Only				Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-Na2S2O3			
Seals Intact <input type="checkbox"/> Yes <input type="checkbox"/> No NA: <u>        </u>				[ ] Pickup				Sampled by: <u>        </u>			
Cooler Temperature: <u>3.5°C</u>				[ ] Technician <u>        </u>				Comments: <u>        </u>			
Relinquished by: (Signature, Date & Time)				Received by: (Signature, Date & Time)				Relinquished by: (Signature, Date & Time)			
Relinquished by: (Signature, Date & Time)				Received by: (Signature, Date & Time)				Relinquished by: (Signature, Date & Time)			

\* By circling MA-MCP, client acknowledges samples were

collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

## Report Method Blank & Laboratory Control Sample Results

1701-00787



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: Tighe & Bond - KPB/TB/MM  
 Shipped/Delivered Via: ESS Courier

ESS Project ID: 1701214  
 Date Received: 1/11/2017  
 Project Due Date: 1/18/2017  
 Days for Project: 5 Day

1. Air bill manifest present? ☐ No  
 Air No.: NA
2. Were custody seals present? ☐ No
3. Is radiation count <100 CPM? ☐ Yes
4. Is a Cooler Present? ☐ Yes  
 Temp: 5.8 Iced with: Ice
5. Was COC signed and dated by client? ☐ Yes

6. Does COC match bottles? ☐ Yes
7. Is COC complete and correct? ☐ Yes
8. Were samples received intact? ☐ Yes
9. Were labs informed about short holds & rushes? ☒ Yes / No / NA
10. Were any analyses received outside of hold time? Yes ☒ No

11. Any Subcontracting needed? ☒ Yes / No  
 ESS Sample IDs: 1-5  
 Analysis: Chloride  
 TAT: 5 day

12. Were VOAs received? ☒ Yes / No  
 a. Air bubbles in aqueous VOAs? Yes / ☒ No  
 b. Does methanol cover soil completely? Yes / No / ☒ NA

13. Are the samples properly preserved? ☒ Yes / No  
 a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_  
 b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes ☒ No  
 a. Was there a need to contact the client? Yes / No  
 Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	98457	Yes	No	Yes	VOA Vial - HCl	HCl	
01	98458	Yes	No	Yes	VOA Vial - HCl	HCl	
01	98459	Yes	No	Yes	VOA Vial - HCl	HCl	
01	98472	Yes	No	Yes	VOA Vial - Unpres	NP	
01	98473	Yes	No	Yes	VOA Vial - Unpres	NP	
01	98474	Yes	No	Yes	VOA Vial - Unpres	NP	
01	98484	Yes	NA	Yes	1L Amber - Unpres	NP	
01	98485	Yes	NA	Yes	1L Amber - Unpres	NP	
01	98494	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	98495	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	98500	Yes	NA	Yes	1L Poly - Unpres	NP	
01	98505	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	98510	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
01	98515	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	
01	98520	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	98525	Yes	NA	Yes	250 mL Poly - Unpres	NP	
02	98454	Yes	No	Yes	VOA Vial - HCl	HCl	
02	98455	Yes	No	Yes	VOA Vial - HCl	HCl	
02	98456	Yes	No	Yes	VOA Vial - HCl	HCl	
02	98469	Yes	No	Yes	VOA Vial - Unpres	NP	
02	98470	Yes	No	Yes	VOA Vial - Unpres	NP	
02	98471	Yes	No	Yes	VOA Vial - Unpres	NP	
02	98482	Yes	NA	Yes	1L Amber - Unpres	NP	
02	98483	Yes	NA	Yes	1L Amber - Unpres	NP	

pH > 12 RL 1/11/17 1812



# ESS Laboratory Sample and Cooler Receipt Checklist

Client: Tighe & Bond - KPB/TB/MM

ESS Project ID: 1701214

Date Received: 1/11/2017

02	98492	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
02	98493	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
02	98499	Yes	NA	Yes	1L Poly - Unpres	NP	
02	98504	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
02	98509	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
02	98514	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	pH > 12
02	98519	Yes	NA	Yes	250 mL Poly - Unpres	NP	EL 1/11/17 1812
02	98524	Yes	NA	Yes	250 mL Poly - Unpres	NP	
03	98451	Yes	No	Yes	VOA Vial - HCl	HCl	
03	98452	Yes	No	Yes	VOA Vial - HCl	HCl	
03	98453	Yes	No	Yes	VOA Vial - HCl	HCl	
03	98466	Yes	No	Yes	VOA Vial - Unpres	NP	
03	98467	Yes	No	Yes	VOA Vial - Unpres	NP	
03	98468	Yes	No	Yes	VOA Vial - Unpres	NP	
03	98480	Yes	NA	Yes	1L Amber - Unpres	NP	
03	98481	Yes	NA	Yes	1L Amber - Unpres	NP	
03	98490	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
03	98491	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
03	98498	Yes	NA	Yes	1L Poly - Unpres	NP	
03	98503	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
03	98508	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
03	98513	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	pH > 12
03	98518	Yes	NA	Yes	250 mL Poly - Unpres	NP	EL 1/11/17 1812
03	98523	Yes	NA	Yes	250 mL Poly - Unpres	NP	
04	98448	Yes	No	Yes	VOA Vial - HCl	HCl	
04	98449	Yes	No	Yes	VOA Vial - HCl	HCl	
04	98450	Yes	No	Yes	VOA Vial - HCl	HCl	
04	98463	Yes	No	Yes	VOA Vial - Unpres	NP	
04	98464	Yes	No	Yes	VOA Vial - Unpres	NP	
04	98465	Yes	No	Yes	VOA Vial - Unpres	NP	
04	98478	Yes	NA	Yes	1L Amber - Unpres	NP	
04	98479	Yes	NA	Yes	1L Amber - Unpres	NP	
04	98488	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
04	98489	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
04	98497	Yes	NA	Yes	1L Poly - Unpres	NP	
04	98502	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
04	98507	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
04	98512	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	pH > 12
04	98517	Yes	NA	Yes	250 mL Poly - Unpres	NP	EL 1/11/17 1812
04	98522	Yes	NA	Yes	250 mL Poly - Unpres	NP	
05	98445	Yes	No	Yes	VOA Vial - HCl	HCl	
05	98446	Yes	No	Yes	VOA Vial - HCl	HCl	
05	98447	Yes	No	Yes	VOA Vial - HCl	HCl	
05	98460	Yes	No	Yes	VOA Vial - Unpres	NP	
05	98461	Yes	No	Yes	VOA Vial - Unpres	NP	
05	98462	Yes	No	Yes	VOA Vial - Unpres	NP	
05	98476	Yes	NA	Yes	1L Amber - Unpres	NP	
05	98477	Yes	NA	Yes	1L Amber - Unpres	NP	
05	98486	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
05	98496	Yes	NA	Yes	1L Poly - Unpres	NP	
05	98501	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
05	98506	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
05	98511	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	pH > 12
05	98516	Yes	NA	Yes	250 mL Poly - Unpres	NP	1/11/17 1812
05	98521	Yes	NA	Yes	250 mL Poly - Unpres	NP	
06	98475	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	

## 2nd Review

Are barcode labels on correct containers?

☒ Yes / ☐ No

Completed

By: [Signature]

Date & Time: 1/11/17 1812

Reviewed

By: [Signature]

Date & Time: 1/11/17 1850

Delivered

By: [Signature]

Date & Time: 1/11/17 1850



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## CHAIN OF CUSTODY

Turn Time: 5 day Rush:

Regulatory State: RI

Is this project for any of the following?:

☐ MA-MCP ☐ CT-RCP ☒ RCP ☐ Remediation

Project # N:0998-11-B Project Name Woburn to mystic

Company Name Tighe + Bond Address One Univ. Ave

Contact Person Dean Bobis PO #

City Westwood State MA Zip Code 02090

Telephone Number 508-550-1500 Email Address Ds.Bobis@Tighebond.com

FAX Number 508-550-1500 Sample ID

ESS Lab ID

Collection Date

Collection Time

Sample Type

Sample Matrix

Container Type:

Preservation Code:

Number of Containers:

ag ag

ag

ag

ag

ag

ag

ag

ag

ag

ag

ag

ag

ESS Lab # 1701214

Reporting Limits EPA RGP Eff limits Appendix VIII

Electronic Deliverables ☐ Limit Checker ☐ Excel

Other (Please Specify) Everson EDD

Analysis

TSS

TRC

Ammonia

Chloride

Lead

Hex. Chrom

Mn, Cu, Pb, Fe, Ni, Zn, Cd, Cr, Hg, As, Se, Ag, Bi

VOCs

SVOCs

TPH

MTBE, TBA

EDDMA

PCB, T. Phenols

EDB Cr+6

## Laboratory Use Only

Cooler Present: yes

Seals Intact: yes

Cooler Temperature: 5.8 °C

Sampled by: pu

Comments:

analysis added per MEM 1/12/17 mkm - not enough volume for T. Phenols on MW-505B FF

Relinquished by: (Signature, Date & Time)

Received By: (Signature, Date & Time)

Relinquished By: (Signature, Date & Time)

Received By: (Signature, Date & Time)

1/11/17 1242

1/11/17 1500

1/11/17 1700

1/11/17 1722



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## CHAIN OF CUSTODY

Turn Time: 5 day Rush:           

Regulatory State:            Is this project for any of the following?:  
☐ MA-MCP ☐ CT-RCP ☒ RCP ☐ Remediation

Project # N:0998-11-B Project Name Woburn to mystic  
Contact Person Dean Bobis Address One Univ. Ave  
City Westwood State MA Zip Code 02090 PO #             
Telephone Number            FAX Number            Email Address Ds.Bobis@Tigrebond.com

ESS Lab # 1701214

Reporting Limits EPA RGP Eff limits (Appendix VIII)

Electronic Deliverables ☒ Limit Checker ☐ Excel ☐ Other (Please Specify) → EVERSON EDD

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	TSS	TRC	Ammonia	Chloride	Cyanide	Hx. Chrom	Mn, Cu, Pb, Hg, Ni, Zn, Ag, Cr	VOCs	SVOCs	TPH	MTBE, TBA	Ed. Benz
1	1/11/17	81020	G		6W	MW-37	X											
2		1050				MW-37 FF	X											
3		1120				MW-36	X											
4		1150				MW-36 FF	X											
5		800				MW-505B FF	X											
6		800				MW-505B												

Container Type: AG-Amber Glass B-BOD Bottle G-Glass P-Poly S-Sterile V-Vial O-Other  
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Laboratory Use Only  
Cooler Present: yes  
Seals Intact:             
Cooler Temperature: 5.8 °C

Relinquished by: (Signature, Date & Time) Received By: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time) Received By: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time) Received By: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time) Received By: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time) Received By: (Signature, Date & Time)




## CERTIFICATE OF ANALYSIS

Michael Martin  
Tighe & Bond  
4 Barlows Landing Road, Unit 15  
Pocasset, MA 02559

**RE: Woburn to Mystic - RGP (N-998-11)**  
**ESS Laboratory Work Order Number: 1711482**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED****By ESS Laboratory at 2:25 pm, Nov 20, 2017****Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP

ESS Laboratory Work Order: 1711482

**SAMPLE RECEIPT**

The following samples were received on November 15, 2017 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the 2017 Remediation General Permit under the National Pollutant Discharge Elimination System (NPDES).

ESS Laboratory is unable to achieve the required detection limit of 0.4 mg/L for Ethanol for the RGP permit. We have also been unable to procure a subcontract laboatory that is able to achieve this limit. The data for Ethanol has been reported using our current method reporting limit.

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1711482-01	Mystic at Winter	Surface Water	200.7, 3113B, 350.1, 3500Cr B-2009, 9040
1711482-02	Mystic	Surface Water	200.7, 3113B, 350.1, 3500Cr B-2009, 9040
1711482-03	Mystic Crossing	Surface Water	200.7, 3113B, 350.1, 3500Cr B-2009, 9040
1711482-04	Aberjona	Surface Water	200.7, 3113B, 350.1, 3500Cr B-2009, 9040
1711482-05	Winter Pond	Surface Water	200.7, 3113B, 350.1, 3500Cr B-2009, 9040
1711482-06	Mystic at Boston Inner	Surface Water	200.7, 2520B, 3113B, 350.1, 3500Cr B-2009, 9040
1711482-07	Mystic at Laydown	Surface Water	200.7, 3113B, 350.1, 3500Cr B-2009, 9040





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP

ESS Laboratory Work Order: 1711482

**PROJECT NARRATIVE**

**Total Metals**

1711482-06 [Elevated Method Reporting Limits due to sample matrix \(EL\).](#)

Cadmium , Copper , Nickel

1711482-07 [Elevated Method Reporting Limits due to sample matrix \(EL\).](#)

Cadmium , Copper , Nickel

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

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[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP

ESS Laboratory Work Order: 1711482

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

1010A - Flashpoint  
6010C - ICP  
6020A - ICP MS  
7010 - Graphite Furnace  
7196A - Hexavalent Chromium  
7470A - Aqueous Mercury  
7471B - Solid Mercury  
8011 - EDB/DBCP/TCP  
8015C - GRO/DRO  
8081B - Pesticides  
8082A - PCB  
8100M - TPH  
8151A - Herbicides  
8260B - VOA  
8270D - SVOA  
8270D SIM - SVOA Low Level  
9014 - Cyanide  
9038 - Sulfate  
9040C - Aqueous pH  
9045D - Solid pH (Corrosivity)  
9050A - Specific Conductance  
9056A - Anions (IC)  
9060A - TOC  
9095B - Paint Filter  
MADEP 04-1.1 - EPH / VPH

**Prep Methods**

3005A - Aqueous ICP Digestion  
3020A - Aqueous Graphite Furnace / ICP MS Digestion  
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion  
3060A - Solid Hexavalent Chromium Digestion  
3510C - Separatory Funnel Extraction  
3520C - Liquid / Liquid Extraction  
3540C - Manual Soxhlet Extraction  
3541 - Automated Soxhlet Extraction  
3546 - Microwave Extraction  
3580A - Waste Dilution  
5030B - Aqueous Purge and Trap  
5030C - Aqueous Purge and Trap  
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP  
Client Sample ID: Aberjona  
Date Sampled: 11/15/17 09:00  
Percent Solids: N/A

ESS Laboratory Work Order: 1711482  
ESS Laboratory Sample ID: 1711482-04  
Sample Matrix: Surface Water  
Units: ug/L

Extraction Method: 3005A/200.7

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
<b>Arsenic</b>	<b>4.7 (2.5)</b>		3113B		5	KJK	11/19/17 2:18	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:21	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:21	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:21	1	1	[CALC]
<b>Copper</b>	<b>3.1 (2.0)</b>		200.7		2	KJK	11/16/17 16:21	100	10	CK71531
<b>Hardness</b>	<b>145000 (824)</b>		200.7		10	KJK	11/16/17 15:16	1	1	[CALC]
<b>Iron</b>	<b>596 (100)</b>		200.7		10	KJK	11/16/17 15:16	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:21	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:21	100	10	CK71531
Silver	ND (1.0)		200.7		2	KJK	11/16/17 16:21	100	10	CK71531
<b>Zinc</b>	<b>44.8 (10.0)</b>		200.7		2	KJK	11/16/17 16:21	100	10	CK71531





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic - RGP  
Client Sample ID: Aberjona  
Date Sampled: 11/15/17 09:00  
Percent Solids: N/A

ESS Laboratory Work Order: 1711482  
ESS Laboratory Sample ID: 1711482-04  
Sample Matrix: Surface Water

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Ammonia as N	1.01 (0.10)		350.1		1	EEM	11/17/17 14:49	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.03 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.1 °C. (N/A)								





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP

ESS Laboratory Work Order: 1711482

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Total Metals**

**Batch CK71531 - 3005A/200.7**

**Blank**

Arsenic	ND	0.5	ug/L
Cadmium	ND	1.00	ug/L
Chromium	ND	2.0	ug/L
Chromium III	ND	2.00	ug/L
Copper	ND	1.0	ug/L
Hardness	ND	82.4	ug/L
Iron	ND	10.0	ug/L
Lead	ND	0.2	ug/L
Lead	ND	2.0	ug/L
Nickel	ND	2.0	ug/L
Silver	ND	0.5	ug/L
Zinc	ND	5.0	ug/L

**LCS**

Arsenic	44.8	12.5	ug/L	50.00	90	85-115
Cadmium	23.6	1.00	ug/L	25.00	94	85-115
Chromium	48.9	2.0	ug/L	50.00	98	85-115
Chromium III	48.9	2.00	ug/L			
Copper	52.4	1.0	ug/L	50.00	105	85-115
Hardness	3260	82.4	ug/L			
Iron	239	10.0	ug/L	250.0	96	85-115
Lead	45.3	5.0	ug/L	50.00	91	85-115
Lead	49.7	2.0	ug/L	50.00	99	85-115
Nickel	48.8	2.0	ug/L	50.00	98	85-115
Silver	26.1	0.5	ug/L	25.00	104	85-115
Zinc	51.7	5.0	ug/L	50.00	103	85-115

**LCS Dup**

Arsenic	48.5	12.5	ug/L	50.00	97	85-115	8	20
Cadmium	23.4	1.00	ug/L	25.00	94	85-115	0.7	20
Chromium	48.7	2.0	ug/L	50.00	97	85-115	0.4	20
Chromium III	48.7	2.00	ug/L					
Copper	52.0	1.0	ug/L	50.00	104	85-115	0.8	20
Hardness	3210	82.4	ug/L					
Iron	237	10.0	ug/L	250.0	95	85-115	0.8	20
Lead	47.5	5.0	ug/L	50.00	95	85-115	5	20
Lead	49.8	2.0	ug/L	50.00	100	85-115	0.02	20
Nickel	48.2	2.0	ug/L	50.00	96	85-115	1	20
Silver	26.0	0.5	ug/L	25.00	104	85-115	0.2	20
Zinc	53.8	5.0	ug/L	50.00	108	85-115	4	20

**Batch CK71546 - [CALC]**

**Blank**

Chromium III	ND	10.0	ug/L
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**LCS**

Chromium III	ND		ug/L
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*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP

ESS Laboratory Work Order: 1711482

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Total Metals**

**Batch CK71546 - [CALC]**

**LCS Dup**

Chromium III	ND		ug/L							
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**Classical Chemistry**

**Batch CK71546 - General Preparation**

**Blank**

Hexavalent Chromium	ND	10.0	ug/L							
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**LCS**

Hexavalent Chromium	0.503		mg/L	0.4998		101	90-110			
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**LCS Dup**

Hexavalent Chromium	0.516		mg/L	0.4998		103	90-110	3	20	
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**Batch CK71613 - NH4 Prep**

**Blank**

Ammonia as N	ND	0.10	mg/L							
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**LCS**

Ammonia as N	0.08	0.10	mg/L	0.09994		81	80-120			
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**LCS**

Ammonia as N	1.02	0.10	mg/L	0.9994		102	80-120			
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**Batch CK71644 - General Preparation**

**LCS**

Salinity	1.0		ppt	1.000		96	85-115			
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*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP

ESS Laboratory Work Order: 1711482

**Notes and Definitions**

Z16d	Aqueous pH measured in water at 17.7 °C.
Z16c	Aqueous pH measured in water at 17.6 °C.
Z16b	Aqueous pH measured in water at 17.4 °C.
Z16a	Aqueous pH measured in water at 17.2 °C.
Z16	Aqueous pH measured in water at 17.1 °C.
U	Analyte included in the analysis, but not detected
EL	Elevated Method Reporting Limits due to sample matrix (EL).
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP

ESS Laboratory Work Order: 1711482

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: Tighe & Bond - KPB/TB/MM

ESS Project ID: 1711482

Shipped/Delivered Via: ESS Courier

Date Received: 11/15/2017

Project Due Date: 11/17/2017

Days for Project: 2 Day

1. Air bill manifest present? ☐ No  
Air No.: NA

6. Does COC match bottles? ☐ Yes

2. Were custody seals present? ☐ No

7. Is COC complete and correct? ☐ Yes

3. Is radiation count <100 CPM? ☐ Yes

8. Were samples received intact? ☐ Yes

4. Is a Cooler Present? ☐ Yes  
Temp: 0.4 Iced with: Ice

9. Were labs informed about short holds & rushes? ☒ Yes / No / NA

5. Was COC signed and dated by client? ☐ Yes

10. Were any analyses received outside of hold time? ☒ Yes / No

11. Any Subcontracting needed? Yes ☒ No  
ESS Sample IDs: \_\_\_\_\_  
Analysis: \_\_\_\_\_  
TAT: \_\_\_\_\_

12. Were VOAs received? Yes ☒ No  
a. Air bubbles in aqueous VOAs? Yes / No  
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? ☒ Yes / No

a. If metals preserved upon receipt:

Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

b. Low Level VOA vials frozen:

Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes ☒ No

a. Was there a need to contact the client? Yes / No

Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	182550	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	182557	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
01	182570	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	182571	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	182578	Yes	NA	Yes	250 mL Amber - Unpres	NP	
02	182549	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
02	182556	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
02	182568	Yes	NA	Yes	250 mL Poly - Unpres	NP	
02	182569	Yes	NA	Yes	250 mL Poly - Unpres	NP	
02	182577	Yes	NA	Yes	250 mL Amber - Unpres	NP	
03	182548	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
03	182555	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
03	182566	Yes	NA	Yes	250 mL Poly - Unpres	NP	
03	182567	Yes	NA	Yes	250 mL Poly - Unpres	NP	
03	182576	Yes	NA	Yes	250 mL Amber - Unpres	NP	
04	182547	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
04	182554	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
04	182564	Yes	NA	Yes	250 mL Poly - Unpres	NP	
04	182565	Yes	NA	Yes	250 mL Poly - Unpres	NP	
04	182575	Yes	NA	Yes	250 mL Amber - Unpres	NP	
05	182546	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
05	182553	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
05	182562	Yes	NA	Yes	250 mL Poly - Unpres	NP	
05	182563	Yes	NA	Yes	250 mL Poly - Unpres	NP	



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: <u>Tighe &amp; Bond - KPB/TB/MM</u>					ESS Project ID: <u>1711482</u>
					Date Received: <u>11/15/2017</u>

05	182574	Yes	NA	Yes	250 mL Amber - Unpres	NP
06	182545	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4
06	182552	Yes	NA	Yes	250 mL Poly - HNO3	HNO3
06	182560	Yes	NA	Yes	250 mL Poly - Unpres	NP
06	182561	Yes	NA	Yes	250 mL Poly - Unpres	NP
06	182573	Yes	NA	Yes	250 mL Amber - Unpres	NP
07	182544	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4
07	182551	Yes	NA	Yes	250 mL Poly - HNO3	HNO3
07	182558	Yes	NA	Yes	250 mL Poly - Unpres	NP
07	182559	Yes	NA	Yes	250 mL Poly - Unpres	NP
07	182572	Yes	NA	Yes	250 mL Amber - Unpres	NP

**2nd Review**

Are barcode labels on correct containers?

☒ Yes / No

Completed

By: [Signature]

Date & Time: 11/15/17 1907

Reviewed

By: [Signature]

Date & Time: 11/15/17 2029

Delivered

By: [Signature]

11/15/17 2029



# ESS Laboratory

Division of Thielsch Engineering, Inc.  
185 Frances Avenue, Cranston RI 02910  
Tel. (401) 461-7181 Fax (401) 461-4486  
[www.esslaboratory.com](http://www.esslaboratory.com)

## CHAIN OF CUSTODY

ESS Lab #

1711482

Turn Time	5-Day	Rush	2-Day
Regulatory State	Massachusetts		
Is this project for any of the following?:			
<input type="checkbox"/> OCT RCP <input type="checkbox"/> OMA MCP <input checked="" type="checkbox"/> RGP			

Reporting Limits

GW-1

Electronic Deliverables

☒ Limit Checker

☒ Standard Excel

☒ Other (Please Specify →) pdf

Company Name Tighe & Bond		Project # N-998-11	Project Name Mystic to Woburn	
Contact Person Dean Bebis		Address 1 University Ave		
City Westwood	State MA	Zip Code 02090	PO #	
Telephone Number (508) 654-0492	FAX Number	Email Address <a href="mailto:dsbebis@tighebond.com">dsbebis@tighebond.com</a>		

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	pH	Hardness	Cr+6	NH4	Salinity	Arsenic	Cadmium	Chromium III	Copper	Iron	Lead	Nickel	Silver	Zinc
01	11-15-17	10:00	Grab	Surface Water	Mystic at Winter	X	X	X	X		X	X	X	X	X	X	X		X
02	11-15-17	10:30	Grab	Surface Water	Mystic	X	X	X	X		X	X	X	X	X	X	X		X
03	11-15-17	9:30	Grab	Surface Water	Mystic Crossing	X	X	X	X		X	X	X	X	X	X	X		X
04	11-15-17	9:00	Grab	Surface Water	Aberjona	X	X	X	X		X	X	X	X	X	X	X	X	X
05	11-15-17	8:30	Grab	Surface Water	Winter Pond	X	X	X	X		X	X	X	X	X	X	X	X	X
06	11-15-17	11:30	Grab	Surface Water	Mystic at Boston Inner	X		X	X	X	X	X	X	X	X	X	X		X
07	11-15-17	11:00	Grab	Surface Water	Mystic at Laydown	X	X	X	X		X	X	X	X	X	X	X		X

Container Type:	AC-Air Cassette	AG-Amber Glass	B-BOD Bottle	C-Cubitainer	G - Glass	O-Other	P-Poly	S-Sterile	V-Vial		
Container Volume:	1-100 mL	2-2.5 gal	3-250 mL	4-300 mL	5-500 mL	6-1L	7-VOA	8-2 oz	9-4 oz	10-8 oz	11-Other*
Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*
Number of Containers per Sample:											

Laboratory Use Only		Sampled by: Colleen Brothers	
Cooler Present: <input checked="" type="checkbox"/>	Seals Intact: <input checked="" type="checkbox"/>	Comments: Please specify "Other" preservative and containers types in this space	
Cooler Temperature: 0.4°C		Eversource Pricing	

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
<i>Colleen E. Brothers</i> 11-15-17 14:00	<i>[Signature]</i> 11/15/17 16:00	<i>[Signature]</i> 11/15/17 17:00	<i>[Signature]</i> 11/15/17 18:55
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)



## CERTIFICATE OF ANALYSIS

Michael Martin  
Tighe & Bond  
4 Barlows Landing Road, Unit 15  
Pocasset, MA 02559

**RE: Woburn to Mystic (N-0998-11-13)**  
**ESS Laboratory Work Order Number: 1711673**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED****By ESS Laboratory at 2:35 pm, Nov 28, 2017****Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic

ESS Laboratory Work Order: 1711673

**SAMPLE RECEIPT**

The following samples were received on November 22, 2017 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1711673-01	MW-36	Ground Water	6010C
1711673-02	MW-102	Ground Water	6010C





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic

ESS Laboratory Work Order: 1711673

**PROJECT NARRATIVE**

**No unusual observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic

ESS Laboratory Work Order: 1711673

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

1010A - Flashpoint  
6010C - ICP  
6020A - ICP MS  
7010 - Graphite Furnace  
7196A - Hexavalent Chromium  
7470A - Aqueous Mercury  
7471B - Solid Mercury  
8011 - EDB/DBCP/TCP  
8015C - GRO/DRO  
8081B - Pesticides  
8082A - PCB  
8100M - TPH  
8151A - Herbicides  
8260B - VOA  
8270D - SVOA  
8270D SIM - SVOA Low Level  
9014 - Cyanide  
9038 - Sulfate  
9040C - Aqueous pH  
9045D - Solid pH (Corrosivity)  
9050A - Specific Conductance  
9056A - Anions (IC)  
9060A - TOC  
9095B - Paint Filter  
MADEP 04-1.1 - EPH / VPH

**Prep Methods**

3005A - Aqueous ICP Digestion  
3020A - Aqueous Graphite Furnace / ICP MS Digestion  
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion  
3060A - Solid Hexavalent Chromium Digestion  
3510C - Separatory Funnel Extraction  
3520C - Liquid / Liquid Extraction  
3540C - Manual Soxhlet Extraction  
3541 - Automated Soxhlet Extraction  
3546 - Microwave Extraction  
3580A - Waste Dilution  
5030B - Aqueous Purge and Trap  
5030C - Aqueous Purge and Trap  
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic  
Client Sample ID: MW-36  
Date Sampled: 11/22/17 06:00  
Percent Solids: N/A

ESS Laboratory Work Order: 1711673  
ESS Laboratory Sample ID: 1711673-01  
Sample Matrix: Ground Water  
Units: ug/L

Extraction Method: [CALC]

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Hardness	142000 (412)		6010C		1	KJK	11/22/17 23:13	1	1	[CALC]





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
Client Project ID: Woburn to Mystic  
Client Sample ID: MW-102  
Date Sampled: 11/22/17 06:30  
Percent Solids: N/A

ESS Laboratory Work Order: 1711673  
ESS Laboratory Sample ID: 1711673-02  
Sample Matrix: Ground Water  
Units: ug/L

Extraction Method: [CALC]

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Hardness	426000 (412)		6010C		1	KJK	11/22/17 23:47	1	1	[CALC]





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic

ESS Laboratory Work Order: 1711673

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Total Metals**

**Batch CK72229 - 3005A/200.7**

**Blank**

Calcium	ND	0.100	mg/L							
Hardness	ND	412	ug/L							
Magnesium	ND	0.100	mg/L							

**LCS**

Calcium	2.38	0.100	mg/L	2.500		95	80-120			
Hardness	15400	412	ug/L							
Magnesium	2.30	0.100	mg/L	2.500		92	80-120			

**LCS Dup**

Calcium	2.40	0.100	mg/L	2.500		96	80-120	0.6	20	
Hardness	15600	412	ug/L							
Magnesium	2.33	0.100	mg/L	2.500		93	80-120	1	20	





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic

ESS Laboratory Work Order: 1711673

**Notes and Definitions**

U	Analyte included in the analysis, but not detected
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit





*CERTIFICATE OF ANALYSIS*

Client Name: Tighe & Bond  
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ESS Laboratory Work Order: 1711673

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179  
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750  
[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002  
<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002  
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424  
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313  
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006  
[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752  
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>



# ESS Laboratory Sample and Cooler Receipt Checklist

Client: Tighe & Bond - KPB/TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1711673  
 Date Received: 11/22/2017  
 Project Due Date: 11/28/2017  
 Days for Project: 2 Day

1. Air bill manifest present? ☐ No  
 Air No.: NA
2. Were custody seals present? ☐ No
3. Is radiation count <100 CPM? ☐ Yes
4. Is a Cooler Present? ☐ Yes  
 Temp: 2.3 Iced with: Ice
5. Was COC signed and dated by client? ☐ Yes

6. Does COC match bottles? ☐ Yes
7. Is COC complete and correct? ☐ Yes
8. Were samples received intact? ☐ Yes
9. Were labs informed about short holds & rushes? ☒ Yes / No / NA
10. Were any analyses received outside of hold time? ☒ Yes / No

11. Any Subcontracting needed? Yes ☒ No  
 ESS Sample IDs: \_\_\_\_\_  
 Analysis: \_\_\_\_\_  
 TAT: \_\_\_\_\_

12. Were VOAs received? Yes / ☒ No  
 a. Air bubbles in aqueous VOAs? Yes / No  
 b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? ☒ Yes / No  
 a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_  
 b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / ☒ No  
 a. Was there a need to contact the client? Yes / ☒ No  
 Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	185126	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
02	185125	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	

## 2nd Review

Are barcode labels on correct containers? ☒ Yes / No

Completed By: [Signature] Date & Time: 11/22/17 1845  
 Reviewed By: [Signature] Date & Time: 11/22/17 1944  
 Delivered By: [Signature] Date & Time: 11/22/17 1944



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Tel. (401) 461-7181 Fax (401) 461-4486  
[www.esslaboratory.com](http://www.esslaboratory.com)

Turn Time	2 Day	Rush	Yes
Regulatory State	Massachusetts		
Is this project for any of the following?:			
<input type="radio"/> OCT RCP	<input checked="" type="radio"/> MA MCP	<input type="radio"/> ORGP	

1711673

GW-1

☒ Standard Excel

Eversource EDD

[dsbebis@tiqhebond.com](mailto:dsbebis@tiqhebond.com)

Y

Q

3

4

1

$^{\circ}\text{C}$  ile temp: 2.3

Please specify "Other" preservative and containers types in this space

Excess price

Pricing provided in Quote provide by Tim Byrnes

Received By: (Signature, Date &amp; Time)

Received By: (Signature, Date &amp; Time)