

N-0998-11-13
December 1, 2017
Updated October 4, 2019

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
Winter Pond
Winchester, Massachusetts 01890
MAG910759**

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) application for a National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) for the proposed construction dewatering activities conducted during installation of a new below grade electric transmission line and associated manholes along Woodside Road in Winchester (the Site). A copy of the previous 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.

The purpose of this NOI is to facilitate the change in operator status from the existing contractor, BOND Brothers to the new operator, the Middlesex Corporation (Middlesex). A Notice of Termination for the former operator (Bond Brothers) has been filed.

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 and surface water 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 resume in October 2019 and end in December 2020.

Dewatered groundwater at the Site will be treated by a groundwater treatment system before being discharged to on-site catch basins and into a stormwater drainage system managed by the Town of Winchester. All stormwater drainage systems subject to this RGP discharge to the Winter Pond. Post treatment discharge rates will range from 50 gallons per minute (GPM) to 150 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 seven feet BGS. Property uses along the project route are residential.

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

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 for sites in Massachusetts, of the RGP permit.

Contaminants of concern are analytes that exceeded either the TBEL or WQBEL. Contaminants of concern detected in MW-36 and MW-37 included group I polycyclic aromatic hydrocarbons (PAHs), bis (2-Ethylhexyl) phthalate (DEHP), lead, iron, copper, chloride, ammonia and total suspended solids (TSS). DEHP is commonly associated with PVC and is most likely associated with the monitoring well installation. Since these monitoring wells were installed adjacent to a roadway, the chloride is most likely associated with road salting during the winter months.

Receiving Water Characterization

Winter Pond (waterbody identification MA71-047) is classified as a Class B impaired water body and is listed in the 303(d) Impaired Waterbodies Document. Dilution factors for sites discharging to freshwater ponds or lakes waters is assumed to be zero (1:1) in accordance with *Appendix V: Dilution Factor and Effluent Limitation Calculations for Massachusetts* of the NPDES RGP.

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

Treatment System

Dewatered groundwater at the Site will be treated by a mobile system before being discharged to on-Site catch basins and into a stormwater drainage system managed by the Town of Winchester stormwater drainage system ultimately discharging to the Aberjona River. A list of the proposed stormwater outfall, including location, latitude/longitude coordinates, municipality and system owner is provided in Appendix A.

Mobile Treatment System

Depending on the level of treatment required and discharge flow rate, the mobile treatment system will be mounted on two 30-foot mobile trailers. The mounted treatment system could consist of a flocculant tube, particulate filter units, bag filters and/or granular activated carbon (GAC)/clay filter, as shown on Figure 3 in Appendix B "Process Flow Diagram". Based on effluent monitoring results, the treatment system or flow rate will be modified to comply with the effluent limits. The Safety Data Sheets (SDS) associated with the treatment system are provided in Appendix H.

Flow Rate (GPM)	Proposed Treatment System
0-50	TSS treatment via a silt/pipe sock or bag filter
50-150	Two 30-foot trailer with particulate filter units, bag filters and/or GAC/clay filter. Coagulants/flocculants

Chemical & Additives Information

Based on groundwater samples collected from the Site and in order to achieve effluent limitations for the groundwater, coagulants/ flocculants have been added to the treatment system. Information for the coagulants/ flocculants as required in Part 2.5.2.g.iii of the RGP is provided below. Please note, the product name, chemical abstract service (CAS) number, chemical formula, and manufacturer of the chemical/additives are provided in the SDS included in Appendix H.

To achieve effluent limitations specifically for TSS, coagulants/flocculants as part of the HaloKlear Dual Polymer System (DBP) have been added to the treatment system design. The DPS uses a sequence of coagulation (DBP-2100) and flocculation (GEL-Floc) treatment reactions to remove particles from the influent. The coagulant will neutralize the electrical charges which make particles suspended in solution, and the flocculant will collect the particles so they can agglomerate. Agglomerates will then settle out of solution in the following fractionation tanks and/or bag filters prior to effluent discharge. Through the removal of suspended solids within the water stream, it is anticipated that metals adsorbed to soil particles will also settle out and the metals concentrations in the effluent will decrease.

The DPS uses a sequence of polymers that perform coagulation and flocculation reactions. Both the coagulant (DBP-2100) and flocculant (GEL-Floc) are dry powders integrated into the treatment system as socks, placed within the flocculant tube. The socks continually dose as the influent flows through the tube; therefore, the method of application is in-line discharge prior to water entering the fractionation tanks. Each sock doses at 200 parts per million (ppm) for a flow of 150 GPM. Since flow through the sock is 150 GPM, the maximum concentration would be 200 ppm per minute. Since the dosing is dependent on flow through the treatment system, the frequency and duration at which influent is exposed to the coagulant/flocculant is continuous flow, whenever dewatering is occurring. The coagulant/flocculant will be added at a constant dosage rate of 200 ppm per minute. The treatment system will be operated for a maximum of 8 hours per day for a maximum daily concentration of 288,000 ppm per day.

Required Statements

As required in Part 2.5.3.d.ii, the addition of coagulants/flocculants as proposed for this treatment system:

- 1) Will not add any pollutants in concentrations which exceed permit effluent limitations;

- 2) Will not exceed any applicable water quality standards;
- 3) Will not add any pollutants that would justify the application of permit conditions that are different from or absent in this permit.

Chemicals included in the DPS are naturally derived and 100% biodegradable. The coagulant (DBP-2100) is a dry powder formulated from a plant-based protein, and the flocculant (GEL-Floc) is made from chitosan lactate, which is made from crustacean exoskeletons. Additionally, the chemical combinations proposed as part of the coagulant/flocculants passed fish kill studies.

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 meeting the requirement of the RGP will be developed and implemented upon initiation of the discharge.

Owner and Operator

Owner

NSTAR Electric Company
d/b/a Eversource
Dean S. Bebis
247 Station Drive
Westwood, MA 02090

Operator

Middlesex Corporation
Jose Nieto
1 Spectacle Pond Road
Littleton, MA 01460

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 Resources 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. No known hibernacula or maternity roost trees are located within the project area. 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 will not affect any trees.
- 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 no historical areas along Woodside Avenue in Winchester, Massachusetts. Discharges and discharge related activities do not have the potential to cause effects on any historic properties. Therefore, permit eligibility meets "Criterion A."
- Groundwater samples were collected from on-site groundwater monitoring wells MW-36 and MW-37 in January 2017. The groundwater samples were submitted for laboratory analysis for RGP parameters. Laboratory analytical results were compared to *Table 1: Parameters, Required Minimum Levels (MLs), and Common Test Methods, used for selecting sufficiently sensitive test methods for RGP NOI preparation*. Although some of the laboratory analytical results do not meet the requirements set in Table 1, it is the opinion of Tighe & Bond that data collected meets the Existing Data Substitution, as specified in the RGP Part 4, Section 5. The laboratory analytical results are summarized in Table 1 included in Appendix E. Copies of the laboratory analytical reports are included in Appendix F. Laboratory analytical results were compared to the RGP TBEL and WQBEL to determine the applicable effluent limitations for the Project Site.
- A surface water sample was collected from Winter Pond at the potential outfall location in November 2017. The surface water sample was submitted for laboratory analysis of RGP parameters that were detected in the effluent samples. The laboratory analytical results are summarized in Table 2 included in Appendix F. Laboratory analytical results were compared to the RGP TBEL or WQBEL.

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 the parameters specified in EPA Authorization MAG910759, dated December 20, 2017. A copy of the EPA authorization is included in Appendix G. 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 Bryan Gammons at (508) 304-6366 or Michael Martin at (508) 304-6355 at your convenience.

Very truly yours,

TIGHE & BOND, INC.



Bryan O. Gammons
Senior Environmental Scientist



Michael E. Martin
Project Manager

Enclosures

Copy: Michael Zylich, Eversource
Dean Bebis, Eversource
Jose Nieto, Middlesex Corporation
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	WQBEL Calculations Groundwater Summary Table 1 Surface Water Summary Table 2
Appendix F	Laboratory Analytical Results
Appendix G	EPA Authorization MAG910759
Appendix H	SDS and Diagrams for Treatment System

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: <table border="1" data-bbox="888 475 1950 557"> <tr> <td data-bbox="888 475 1591 557">City:</td><td data-bbox="1591 475 1722 557">State:</td><td data-bbox="1722 475 1950 557">Zip:</td></tr> </table>	City:	State:	Zip:									
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:	<table border="1"> <tr> <td colspan="3" data-bbox="888 557 1950 630">Contact Person:</td></tr> <tr> <td data-bbox="888 630 1461 698">Telephone:</td><td colspan="2" data-bbox="1461 630 1950 698">Email:</td></tr> <tr> <td colspan="3" data-bbox="888 698 1950 800">Mailing address: Street:</td></tr> <tr> <td data-bbox="888 800 1591 876">City:</td><td data-bbox="1591 800 1722 876">State:</td><td data-bbox="1722 800 1950 876">Zip:</td></tr> </table>	Contact Person:			Telephone:	Email:		Mailing address: Street:			City:	State:	Zip:
Contact Person:													
Telephone:	Email:												
Mailing address: Street:													
City:	State:	Zip:											
3. Site operator, if different than owner	<table border="1"> <tr> <td colspan="3" data-bbox="888 876 1950 938">Contact Person:</td></tr> <tr> <td data-bbox="888 938 1461 998">Telephone:</td><td colspan="2" data-bbox="1461 938 1950 998">Email:</td></tr> <tr> <td colspan="3" data-bbox="888 998 1950 1101">Mailing address: Street:</td></tr> <tr> <td data-bbox="888 1101 1591 1153">City:</td><td data-bbox="1591 1101 1722 1153">State:</td><td data-bbox="1722 1101 1950 1153">Zip:</td></tr> </table>	Contact Person:			Telephone:	Email:		Mailing address: Street:			City:	State:	Zip:
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): <table border="0"> <tr> <td data-bbox="888 1209 1461 1242"><input type="checkbox"/> MA Chapter 21e; list RTN(s):</td><td data-bbox="1461 1209 1950 1242"><input type="checkbox"/> CERCLA</td></tr> <tr> <td data-bbox="888 1250 1461 1282"></td><td data-bbox="1461 1250 1950 1282"><input type="checkbox"/> UIC Program</td></tr> <tr> <td data-bbox="888 1291 1461 1339"><input type="checkbox"/> NH Groundwater Management Permit or Groundwater Release Detection Permit:</td><td data-bbox="1461 1291 1950 1339"><input type="checkbox"/> POTW Pretreatment</td></tr> <tr> <td data-bbox="888 1347 1461 1380"></td><td data-bbox="1461 1347 1950 1380"><input type="checkbox"/> CWA Section 404</td></tr> </table>	<input type="checkbox"/> MA Chapter 21e; list RTN(s):	<input type="checkbox"/> CERCLA		<input type="checkbox"/> UIC Program	<input type="checkbox"/> NH Groundwater Management Permit or Groundwater Release Detection Permit:	<input type="checkbox"/> POTW Pretreatment		<input type="checkbox"/> CWA Section 404				
<input type="checkbox"/> MA Chapter 21e; list RTN(s):	<input type="checkbox"/> CERCLA												
	<input type="checkbox"/> UIC Program												
<input type="checkbox"/> NH Groundwater Management Permit or Groundwater Release Detection Permit:	<input type="checkbox"/> POTW Pretreatment												
	<input type="checkbox"/> CWA Section 404												

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)
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: <input type="checkbox"/> A private storm sewer system <input type="checkbox"/> A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: Has notification been provided to the owner of this system? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No 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: 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	
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="970 799 1419 873"><input type="checkbox"/> G. Sites with Known Contamination</td><td data-bbox="1419 799 2003 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 2003 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 ($\mu\text{g/l}$)	Influent		Effluent Limitations	
						Daily maximum ($\mu\text{g/l}$)	Daily average ($\mu\text{g/l}$)	TBEL	WQBEL
A. Inorganics									
Ammonia								Report mg/L	---
Chloride								Report $\mu\text{g/l}$	---
Total Residual Chlorine								0.2 mg/L	
Total Suspended Solids								30 mg/L	---
Antimony								206 $\mu\text{g/L}$	
Arsenic								104 $\mu\text{g/L}$	
Cadmium								10.2 $\mu\text{g/L}$	
Chromium III								323 $\mu\text{g/L}$	
Chromium VI								323 $\mu\text{g/L}$	
Copper								242 $\mu\text{g/L}$	
Iron								5,000 $\mu\text{g/L}$	
Lead								160 $\mu\text{g/L}$	
Mercury								0.739 $\mu\text{g/L}$	
Nickel								1,450 $\mu\text{g/L}$	
Selenium								235.8 $\mu\text{g/L}$	
Silver								35.1 $\mu\text{g/L}$	
Zinc								420 $\mu\text{g/L}$	
Cyanide								178 mg/L	
B. Non-Halogenated VOCs									
Total BTEX								100 $\mu\text{g/L}$	---
Benzene								5.0 $\mu\text{g/L}$	---
1,4 Dioxane								200 $\mu\text{g/L}$	---
Acetone								7.97 mg/L	---
Phenol								1,080 $\mu\text{g/L}$	

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 design flow capacity 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"/> FWS Criterion A: 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"/> FWS Criterion 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"/> FWS Criterion C: 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>

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 ☐

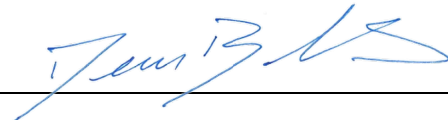
Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.

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:

10/3/19

Print Name and Title: Dean Bebis, Environmental Compliance Specialist

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 ☐

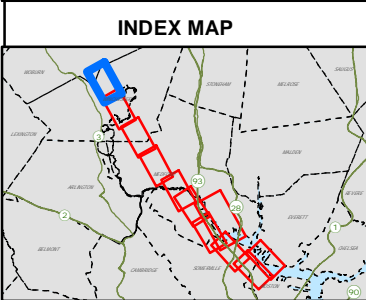
Signature:

Date:

10/4/19

Print Name and Title: Jose Nieto, Project Manager

APPENDIX B



Legend

● Test Pit Location	▲ Approximate Outfall Location	▭ RGP Boundaires Aberjona River	Soil Type — 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 Boundaires 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**

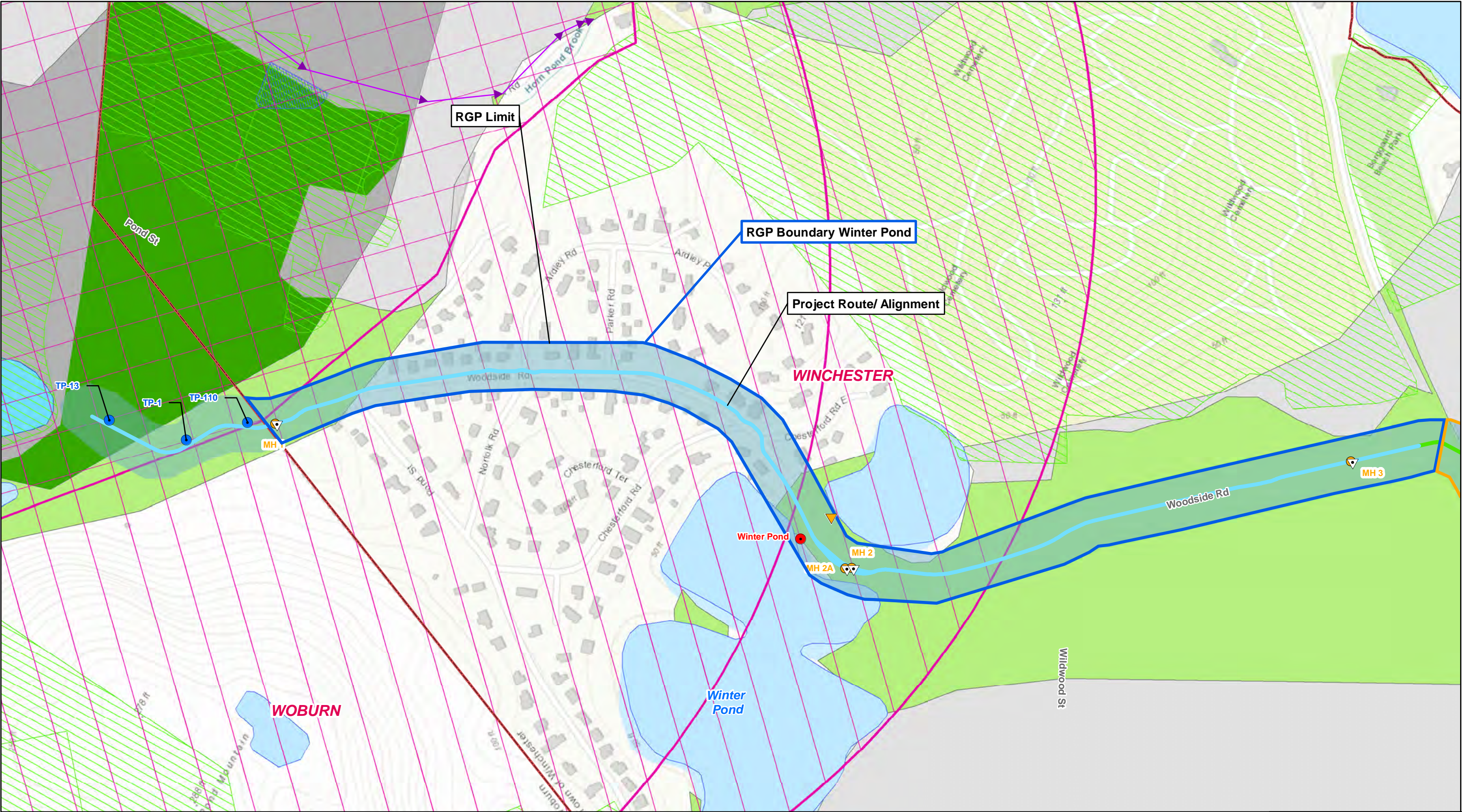
Figure 1: Aerial Dewatering Site Plan

Mapsheet 01 of 01

EVERSOURCE ENERGY

Tighe&Bond
Engineers | Environmental Specialists

November 2017



INDEX MAP

Legend

Test Pit Location	Approximate Outfall Location	Soil Type	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

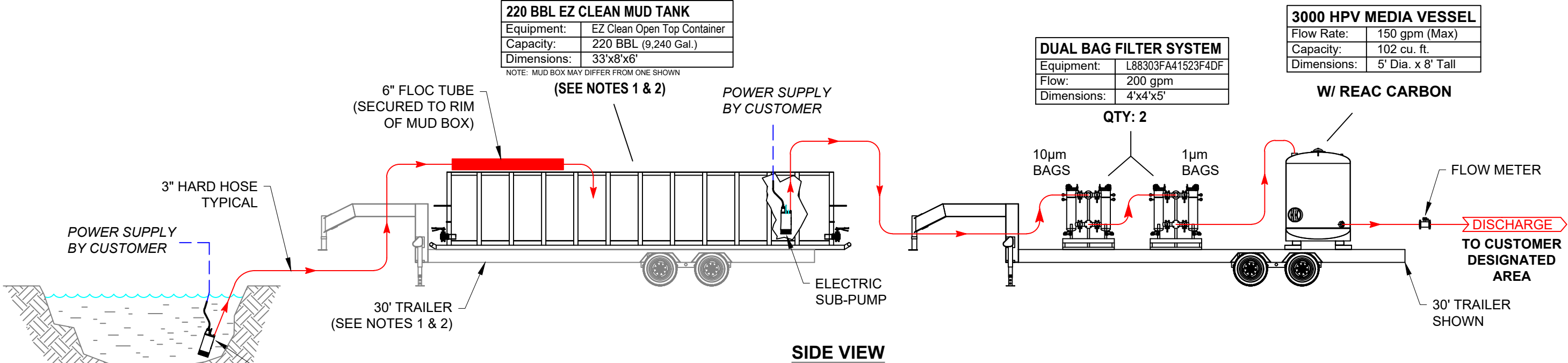
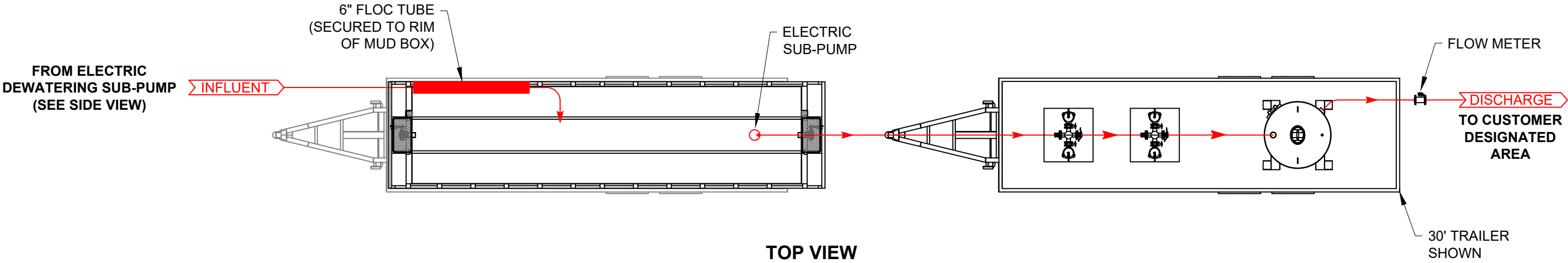
Mapsheet 01 of 01

EVERSOURCE ENERGY

Tighe&Bond
Engineers | Environmental Specialists

November 2017

TREATMENT SYSTEM 150 GPM




The information presented on this drawing is for informational purposes only. Use of this drawing is not a replacement for a professional engineering evaluation of the application. This drawing is intended to show preliminary equipment requirements and arrangement and is in no way a replacement for a thorough engineering review of the application at hand. A representative of the customer or end user should always conduct the final evaluation of the application. That representative, and not United Rentals, or its employees and representatives, is responsible for the final engineering design and performance of the application.

No warranty is provided or implied, including any warranty of fitness for a particular purpose. As such, the customer agrees that by using the suggestions shown on this drawing, you assume the risk of all loss or injury resulting from any information found within. In no event shall United Rentals, or any representative or agent thereof, be liable under any theory based in contract, negligence or strict liability or any other legal or equitable theory to any party for amounts including, without limitation, lost revenues, lost profits, lost business or indirect, consequential, incidental, special or punitive damages. This disclaimer shall survive any and all notices advising of the possibility that any user may suffer harm from any inaccuracies contained herein.

NOTES:

1. DUE TO TRAILER WEIGHT RESTRICTIONS - MUD BOX MUST BE REMOVED FROM TRAILER DURING OPERATION.
2. MUD BOX MUST BE EMPTIED PRIOR LOADING ONTO TRAILER AND REMAIN EMPTIED DURING TRANSPORT FOR PROJECT RELOCATION.

The designs, information and data contained herein is proprietary and is submitted in confidence and shall not be disclosed, used or duplicated in whole or in part for any purposes whatsoever without prior written permission from United Rentals. This document shall be returned to United Rentals on its demand. Receipt of this document shall be deemed to be an acceptance of the conditions specified herein.		 7800 N. DALLAS PARKWAY, SUITE 500 PLANO, TX 75024-4087	
SHEET SIZE: B 11" x 17"		TITLE: TREATMENT SYSTEM 150 GPM PROCESS FLOW DIAGRAM	
MATERIAL:		CUSTOMER: MIDDLESEX CORP	
FINISH:		DWG BY: M. BROOKS	DATE: 09-10-18
		CKD BY: M. SCOPELLETI	DATE: 09-10-18
		SCALE: -	SHEET: 1 OF: 1
		DWG No: SKF5387	REV: -

APPENDIX C

**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 ¹	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 ¹	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). 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

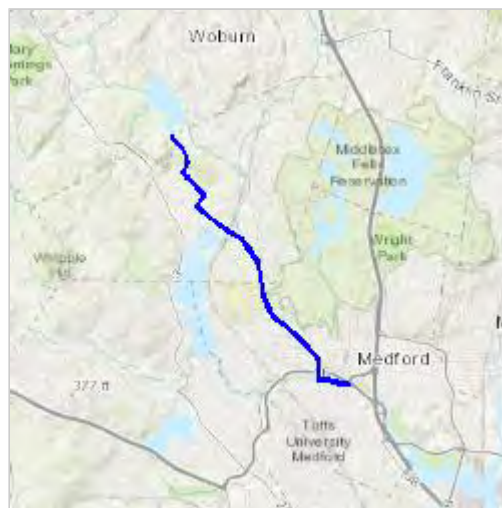
Project Type: ** OTHER **

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: Woodside Rd; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
----------	---------------	--------	------	------



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

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

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/

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, 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)

Enter number values in green boxes below

Enter values in the units specified

↓	
0	Q _R = Enter upstream flow in MGD
0.504	Q _D = Enter discharge flow in MGD
0	Downstream 7Q10

Enter a dilution factor, if other than zero

↓	
0	

Enter values in the units specified

↓	
142	C _d = Enter influent hardness in mg/L CaCO₃
30.5	C _r = Enter receiving water hardness in mg/L CaCO₃

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

↓	
6.66	pH in Standard Units
17.7	Temperature in °C
0.14	Ammonia in mg/L
30.5	Hardness in mg/L CaCO₃
0	Salinity in ppt
0	Antimony in µg/L
0	Arsenic in µg/L
0	Cadmium in µg/L
0	Chromium III in µg/L
0	Chromium VI in µg/L
2.1	Copper in µg/L
223	Iron in µg/L
0	Lead in µg/L
0	Mercury in µg/L
0	Nickel in µg/L
0	Selenium in µg/L
0	Silver in µg/L
12.3	Zinc in µg/L

Enter **influent** concentrations in the units specified

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

Notes:Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approvedSaltwater (estuarine and marine): enter Q_R 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_R; 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

Dilution Factor	1.0					
A. Inorganics	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
Ammonia	Report	mg/L	---			
Chloride	Report	µg/L	---			
Total Residual Chlorine	0.2	mg/L	11	µg/L	50	µg/L
Total Suspended Solids	30	mg/L	---			
Antimony	206	µg/L	640	µg/L		
Arsenic	104	µg/L	10	µg/L		
Cadmium	10.2	µg/L	0.3509	µg/L		
Chromium III	323	µg/L	114.8	µg/L		
Chromium VI	323	µg/L	11.4	µg/L		
Copper	242	µg/L	12.6	µg/L		
Iron	5000	µg/L	1000	µg/L		
Lead	160	µg/L	4.97	µg/L		
Mercury	0.739	µg/L	0.91	µg/L		
Nickel	1450	µg/L	70.2	µg/L		
Selenium	235.8	µg/L	5.0	µg/L		
Silver	35.1	µg/L	6.9	µg/L		
Zinc	420	µg/L	161.3	µg/L		
Cyanide	178	mg/L	5.2	µg/L	---	µg/L
B. Non-Halogenated VOCs						
Total BTEX	100	µg/L	---			
Benzene	5.0	µg/L	---			
1,4 Dioxane	200	µg/L	---			
Acetone	7970	µg/L	---			
Phenol	1,080	µg/L	300	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	4.4	µg/L	1.6	µg/L		
1,2 Dichlorobenzene	600	µg/L	---			
1,3 Dichlorobenzene	320	µg/L	---			
1,4 Dichlorobenzene	5.0	µg/L	---			
Total dichlorobenzene	---	µg/L	---			
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	3.3	µg/L		
cis-1,2 Dichloroethylene	70	µg/L	---			
Vinyl Chloride	2.0	µg/L	---			
D. Non-Halogenated SVOCs						
Total Phthalates	190	µg/L	---	µg/L		
Diethylhexyl phthalate	101	µg/L	2.2	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	1.0	µg/L	---			
Benzo(a)anthracene	1.0	µg/L	0.0038	µg/L	0.1	µg/L
Benzo(a)pyrene	1.0	µg/L	0.0038	µg/L	0.1	µg/L
Benzo(b)fluoranthene	1.0	µg/L	0.0038	µg/L	0.1	µg/L
Benzo(k)fluoranthene	1.0	µg/L	0.0038	µg/L	0.1	µg/L
Chrysene	1.0	µg/L	0.0038	µg/L	0.1	µg/L
Dibenzo(a,h)anthracene	1.0	µg/L	0.0038	µg/L	0.1	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	0.0038	µg/L	0.1	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	100	µg/L	---			
Naphthalene	20	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	0.000064	µg/L	---		0.5	µg/L
Pentachlorophenol	1.0	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	5.0	mg/L	---			
Ethanol	Report	mg/L	---			
Methyl-tert-Butyl Ether	70	µg/L	20	µg/L		
tert-Butyl Alcohol	120	µg/L	---			
tert-Amyl Methyl Ether	90	µg/L	---			

TABLE 1
Groundwater Results
Eversource: Woburn - Mystic

			Wedgemere Crossing			
			MW-37	MW-37 FF	MW-36	MW-36 FF
			1/11/2017	1/11/2017	1/11/2017	1/11/2017
Analytical Test	Sample Identification Sample Date	Effluent Limitation				
TPH - mg/L	TPH	5	ND (5)	ND (5)	ND (5)	ND (5)
Total PAHs Group I - ug/L	Benzo(a)Anthracene	0.0038	0.26	0.04	ND (0.05)	ND (0.05)
	Benzo(a)Pyrene	0.0038	0.29	0.03	ND (0.05)	ND (0.05)
	Benzo(b)Fluoranthene	0.0038	0.37	0.04	ND (0.05)	ND (0.05)
	Benzo(k)Fluoranthene	0.0038	0.14	ND (0.05)	ND (0.05)	ND (0.05)
	Chrysene	0.0038	0.35	0.04	ND (0.05)	ND (0.05)
	Dibenzo(a,h)Anthracene	0.0038	0.05	ND (0.05)	ND (0.05)	ND (0.05)
	Indeno(1,2,3-cd)Pyrene	0.0038	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	2.2	3.07	3.00	2.72	2.02
	Diethylphthalate	NE	0.29	0.27	ND (2.34)	3.85
	Dimethylphthalate	NE	NA	NA	NA	NA
	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	NE	11.6	2.9	2.8	ND (10.0)
	Chromium III	323	12.0	ND (10)	ND (10)	ND (10)
	Lead	4.97	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	12.6	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	0.00064	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	NE	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)	11	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:
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 from NPDES General Permit for Remediation Activity Discharges DRAFT at <https://www3.epa.gov/region1/npdes/remediation/2016DraftPermit.pdf>
Red text = exceeds effluent

TABLE 2**Surface Water Results**

Eversource: Woburn - Mystic

Analytical Test	Sample Identification	Effluent Limitation	Winter Pond
	Sample Date		11/15/2017
Metals (ug/L)	Arsenic	104	ND(2.5)
	Cadmium	10.2	ND(2)
	Chromium	NE	ND(4)
	Chromium III	323	ND(10)
	Copper	12.6	2.1
	Iron	1,000	223
	Lead	4.97	ND(4)
	Nickel	1,450	ND(4)
	Silver	35.1	ND(1)
	Zinc	420	12.3
Classical Chemistry	Ammonia as N (mg/L)	Report	0.14
	Hexavalent Chromium (ug/L)	323	ND(10)
	pH	NE	6.66
	Hardness (ug/L)	NE	30,500

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

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

REVIEWED

By ESS Laboratory at 5:56 pm, Jan 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 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 Analvses

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)?
<i>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.</i> | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> * |
| H | Were all 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
Benzene	J 0.2 (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
Ethylbenzene	J 0.2 (1.0)	0.1	8260B		1	01/12/17 18:19	C7A0161	CA71231
Methyl tert-Butyl Ether	J 0.7 (1.0)	0.3	8260B		1	01/12/17 18:19	C7A0161	CA71231
Methylene Chloride	J 0.2 (2.0)	0.2	8260B		1	01/12/17 18:19	C7A0161	CA71231
Naphthalene	B, J 0.4 (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
Toluene	J 0.2 (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
Xylene O	J 0.2 (1.0)	0.1	8260B		1	01/12/17 18:19	C7A0161	CA71231
Xylene P,M	J 0.6 (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
<hr/>									
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>					
<i>Surrogate: Pentachloroethane</i>		110 %		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: 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	J 3.8 (5.0)	0.4	7010		1	KJK	01/14/17 16:05	50	25	CA71146
Barium	131 (25.0)	1.5	6010C		1	KJK	01/13/17 3:43	50	25	CA71146
Beryllium	J 0.3 (0.5)	0.1	6010C		1	KJK	01/13/17 3:43	50	25	CA71146
Cadmium	J 0.05 (0.5)	0.03	7010		1	KJK	01/17/17 15:59	50	25	CA71146
Chromium	J 2.9 (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	J 4.2 (5.0)	2.0	6010C		1	KJK	01/13/17 3:43	50	25	CA71146
Iron	1650 (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, J 20.5 (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
Benzene	J 0.2 (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
Ethylbenzene	J 0.2 (1.0)	0.1	8260B		1	01/12/17 18:46	C7A0161	CA71231
Methyl tert-Butyl Ether	J 0.6 (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
Naphthalene	B, J 0.4 (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
Toluene	J 0.2 (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
Xylene O	J 0.2 (1.0)	0.1	8260B		1	01/12/17 18:46	C7A0161	CA71231
Xylene P,M	J 0.5 (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
Total Suspended Solids	13000 (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-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
Barium	81.1 (25.0)	1.5	6010C		1	KJK	01/13/17 3:47	50	25	CA71146
Beryllium	J 0.1 (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
Chromium	J 2.8 (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]
Copper	J 3.3 (5.0)	2.0	6010C		1	KJK	01/13/17 3:47	50	25	CA71146
Iron	B 505 (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
Vanadium	J 1.1 (10.0)	1.0	6010C		1	KJK	01/13/17 3:47	50	25	CA71146
Zinc	B, J 18.8 (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
Benzene	J 0.1 (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
Naphthalene	B, J 0.2 (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
bis(2-Ethylhexyl)phthalate	B 2.72 (2.34)	0.19	8270D SIM		1	01/12/17 23:41	C7A0164	CA71116
Butylbenzylphthalate	B, J 0.34 (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
Chloride	100 (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
Total Suspended Solids	116000 (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
<hr/>									
		<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
Barium	72.0 (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
Cadmium	J 0.03 (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
Iron	B 89.6 (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
Zinc	B, J 18.9 (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
Naphthalene	B, J 0.2 (1.0)	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
Toluene	J 0.1 (1.0)	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
bis(2-Ethylhexyl)phthalate	B, J 2.02 (2.34)	0.19	8270D SIM		1	01/13/17 0:31	C7A0164	CA71116
Butylbenzylphthalate	B, J 0.43 (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
Diethylphthalate	3.85 (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
Di-n-butylphthalate	J 0.69 (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
Chloride	100 (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

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 CA71144 - [CALC]

Blank

Chromium III	ND	10	ug/L							
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LCS

Chromium III	ND		ug/L							
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LCS Dup

Chromium III	ND		ug/L							
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Batch CA71146 - 3005A

Blank

Antimony	ND	5.0	ug/L							
Arsenic	ND	5.0	ug/L							
Barium	ND	25.0	ug/L							
Beryllium	ND	0.5	ug/L							
Cadmium	ND	0.5	ug/L							
Chromium	ND	10.0	ug/L							
Chromium III	ND	10	ug/L							
Copper	ND	5.0	ug/L							
Iron	31.6	50.0	ug/L							J
Lead	ND	2.5	ug/L							
Nickel	ND	10.0	ug/L							
Selenium	ND	5.0	ug/L							
Silver	ND	0.2	ug/L							
Thallium	ND	1.0	ug/L							
Vanadium	ND	10.0	ug/L							
Zinc	7.3	25.0	ug/L							J

LCS

Antimony	237	125	ug/L	250.0	95	80-120				
Arsenic	280	125	ug/L	250.0	112	80-120				
Barium	256	25.0	ug/L	250.0	102	80-120				
Beryllium	24.7	0.5	ug/L	25.00	99	80-120				
Cadmium	121	250	ug/L	125.0	97	80-120				J
Chromium	257	10.0	ug/L	250.0	103	80-120				
Chromium III	257	10	ug/L							
Copper	243	5.0	ug/L	250.0	97	80-120				
Iron	1290	50.0	ug/L	1250	103	80-120				
Lead	281	62.5	ug/L	250.0	113	80-120				
Nickel	256	10.0	ug/L	250.0	102	80-120				
Selenium	459	125	ug/L	500.0	92	80-120				
Silver	109	25.0	ug/L	125.0	87	80-120				
Thallium	281	25.0	ug/L	250.0	113	80-120				
Vanadium	253	10.0	ug/L	250.0	101	80-120				
Zinc	246	25.0	ug/L	250.0	98	80-120				

LCS Dup

Antimony	229	125	ug/L	250.0	92	80-120	3	20		
Arsenic	267	125	ug/L	250.0	107	80-120	5	20		



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

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 CA71146 - 3005A

Barium	243	25.0	ug/L	250.0		97	80-120	5	20	
Beryllium	23.5	0.5	ug/L	25.00		94	80-120	5	20	
Cadmium	114	250	ug/L	125.0		91	80-120	6	20	J
Chromium	243	10.0	ug/L	250.0		97	80-120	6	20	
Chromium III	243	10	ug/L							
Copper	230	5.0	ug/L	250.0		92	80-120	5	20	
Iron	1190	50.0	ug/L	1250		95	80-120	8	20	
Lead	273	62.5	ug/L	250.0		109	80-120	3	20	
Nickel	243	10.0	ug/L	250.0		97	80-120	5	20	
Selenium	438	125	ug/L	500.0		88	80-120	5	20	
Silver	104	25.0	ug/L	125.0		83	80-120	5	20	
Thallium	274	25.0	ug/L	250.0		110	80-120	3	20	
Vanadium	240	10.0	ug/L	250.0		96	80-120	5	20	
Zinc	234	25.0	ug/L	250.0		94	80-120	5	20	

Batch CA71147 - 245.1/7470A

Blank

Mercury	ND	0.20	ug/L							
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LCS

Mercury	6.34	0.20	ug/L	6.000		106	80-120			
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LCS Dup

Mercury	6.26	0.20	ug/L	6.000		104	80-120	1	20	
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8082A Polychlorinated Biphenyls (PCB)

Batch CA71203 - 3510C

Blank

Aroclor 1016	ND	0.05	ug/L							
Aroclor 1221	ND	0.05	ug/L							
Aroclor 1232	ND	0.05	ug/L							
Aroclor 1242	ND	0.05	ug/L							
Aroclor 1248	ND	0.05	ug/L							
Aroclor 1254	ND	0.05	ug/L							
Aroclor 1260	ND	0.05	ug/L							
Aroclor 1262	ND	0.05	ug/L							
Aroclor 1268	ND	0.05	ug/L							

Surrogate: Decachlorobiphenyl	0.0373		ug/L	0.05000		75	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0338		ug/L	0.05000		68	30-150			
Surrogate: Tetrachloro-m-xylene	0.0282		ug/L	0.05000		56	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0363		ug/L	0.05000		73	30-150			

LCS

Aroclor 1016	0.92	0.05	ug/L	1.000		92	40-140			
Aroclor 1260	0.84	0.05	ug/L	1.000		84	40-140			

Surrogate: Decachlorobiphenyl	0.0407		ug/L	0.05000		81	30-150			
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CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8082A Polychlorinated Biphenyls (PCB)

Batch CA71203 - 3510C

Surrogate: Decachlorobiphenyl [2C]	0.0384		ug/L	0.05000		77	30-150			
Surrogate: Tetrachloro-m-xylene	0.0345		ug/L	0.05000		69	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0394		ug/L	0.05000		79	30-150			

LCS Dup

Aroclor 1016	0.98	0.05	ug/L	1.000		98	40-140	5	20	
Aroclor 1260	0.86	0.05	ug/L	1.000		86	40-140	3	20	

Surrogate: Decachlorobiphenyl	0.0477		ug/L	0.05000		95	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0448		ug/L	0.05000		90	30-150			
Surrogate: Tetrachloro-m-xylene	0.0388		ug/L	0.05000		78	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0449		ug/L	0.05000		90	30-150			

8260B Volatile Organic Compounds

Batch CA71231 - 5030B

Blank

1,1,1-Trichloroethane	ND	1.0	ug/L							
1,1,2-Trichloroethane	ND	1.0	ug/L							
1,1-Dichloroethane	ND	1.0	ug/L							
1,1-Dichloroethene	ND	1.0	ug/L							
1,2-Dibromoethane	ND	1.0	ug/L							
1,2-Dichlorobenzene	ND	1.0	ug/L							
1,2-Dichloroethane	ND	1.0	ug/L							
1,3-Dichlorobenzene	ND	1.0	ug/L							
1,4-Dichlorobenzene	ND	1.0	ug/L							
1,4-Dioxane - Screen	ND	500	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.0	ug/L							
Carbon Tetrachloride	ND	1.0	ug/L							
cis-1,2-Dichloroethene	ND	1.0	ug/L							
Ethylbenzene	ND	1.0	ug/L							
Methyl tert-Butyl Ether	ND	1.0	ug/L							
Methylene Chloride	ND	2.0	ug/L							
Naphthalene	0.4	1.0	ug/L							J
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tertiary-butyl Alcohol	ND	25.0	ug/L							
Tetrachloroethene	ND	1.0	ug/L							
Toluene	ND	1.0	ug/L							
Trichloroethene	ND	1.0	ug/L							
Vinyl Chloride	ND	1.0	ug/L							
Xylene O	ND	1.0	ug/L							
Xylene P,M	ND	2.0	ug/L							
Surrogate: 1,2-Dichloroethane-d4	24.2		ug/L	25.00		97	70-130			
Surrogate: 4-Bromofluorobenzene	23.8		ug/L	25.00		95	70-130			
Surrogate: Dibromofluoromethane	24.5		ug/L	25.00		98	70-130			



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CA71231 - 5030B

<i>Surrogate: Toluene-d8</i>	<i>25.7</i>		ug/L	<i>25.00</i>		<i>103</i>	<i>70-130</i>			
LCS										
1,1,1-Trichloroethane	9.4		ug/L	10.00		94	70-130			
1,1,2-Trichloroethane	8.4		ug/L	10.00		84	70-130			
1,1-Dichloroethane	9.4		ug/L	10.00		94	70-130			
1,1-Dichloroethene	10.8		ug/L	10.00		108	70-130			
1,2-Dibromoethane	9.0		ug/L	10.00		90	70-130			
1,2-Dichlorobenzene	8.2		ug/L	10.00		82	70-130			
1,2-Dichloroethane	9.7		ug/L	10.00		97	70-130			
1,3-Dichlorobenzene	8.6		ug/L	10.00		86	70-130			
1,4-Dichlorobenzene	8.6		ug/L	10.00		86	70-130			
1,4-Dioxane - Screen	0.0		ug/L	200.0			0-332			
Acetone	48.2		ug/L	50.00		96	70-130			
Benzene	9.4		ug/L	10.00		94	70-130			
Carbon Tetrachloride	8.8		ug/L	10.00		88	70-130			
cis-1,2-Dichloroethene	9.6		ug/L	10.00		96	70-130			
Ethylbenzene	9.5		ug/L	10.00		95	70-130			
Methyl tert-Butyl Ether	10.1		ug/L	10.00		101	70-130			
Methylene Chloride	9.6		ug/L	10.00		96	70-130			
Naphthalene	9.5		ug/L	10.00		95	70-130			
Tertiary-amyl methyl ether	9.7		ug/L	10.00		97	70-130			
Tertiary-butyl Alcohol	50.1		ug/L	50.00		100	70-130			
Tetrachloroethene	8.6		ug/L	10.00		86	70-130			
Toluene	9.5		ug/L	10.00		95	70-130			
Trichloroethene	9.1		ug/L	10.00		91	70-130			
Vinyl Chloride	8.9		ug/L	10.00		89	70-130			
Xylene O	9.0		ug/L	10.00		90	70-130			
Xylene P,M	19.2		ug/L	20.00		96	70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>26.0</i>		ug/L	<i>25.00</i>		<i>104</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>23.1</i>		ug/L	<i>25.00</i>		<i>93</i>	<i>70-130</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>24.8</i>		ug/L	<i>25.00</i>		<i>99</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>25.1</i>		ug/L	<i>25.00</i>		<i>100</i>	<i>70-130</i>			

LCS Dup										
1,1,1-Trichloroethane	9.2		ug/L	10.00		92	70-130	2	25	
1,1,2-Trichloroethane	8.0		ug/L	10.00		80	70-130	6	25	
1,1-Dichloroethane	9.4		ug/L	10.00		94	70-130	0.3	25	
1,1-Dichloroethene	10.5		ug/L	10.00		105	70-130	3	25	
1,2-Dibromoethane	8.6		ug/L	10.00		86	70-130	4	25	
1,2-Dichlorobenzene	8.0		ug/L	10.00		80	70-130	3	25	
1,2-Dichloroethane	9.5		ug/L	10.00		95	70-130	2	25	
1,3-Dichlorobenzene	8.0		ug/L	10.00		80	70-130	8	25	
1,4-Dichlorobenzene	8.4		ug/L	10.00		84	70-130	3	25	
1,4-Dioxane - Screen	0.0		ug/L	200.0			0-332		200	
Acetone	49.6		ug/L	50.00		99	70-130	3	25	



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CA71231 - 5030B

Benzene	9.4		ug/L	10.00		94	70-130	0.1	25	
Carbon Tetrachloride	8.6		ug/L	10.00		86	70-130	2	25	
cis-1,2-Dichloroethene	9.8		ug/L	10.00		98	70-130	2	25	
Ethylbenzene	9.6		ug/L	10.00		96	70-130	0.8	25	
Methyl tert-Butyl Ether	10.5		ug/L	10.00		105	70-130	3	25	
Methylene Chloride	9.7		ug/L	10.00		97	70-130	1	25	
Naphthalene	9.2		ug/L	10.00		92	70-130	3	25	
Tertiary-amyl methyl ether	9.5		ug/L	10.00		95	70-130	3	25	
Tertiary-butyl Alcohol	44.2		ug/L	50.00		88	70-130	13	25	
Tetrachloroethene	8.6		ug/L	10.00		86	70-130	0.5	25	
Toluene	9.2		ug/L	10.00		92	70-130	3	25	
Trichloroethene	9.0		ug/L	10.00		90	70-130	0.9	25	
Vinyl Chloride	8.4		ug/L	10.00		84	70-130	5	25	
Xylene O	8.7		ug/L	10.00		87	70-130	4	25	
Xylene P,M	18.7		ug/L	20.00		93	70-130	3	25	
Surrogate: 1,2-Dichloroethane-d4	25.8		ug/L	25.00		103	70-130			
Surrogate: 4-Bromofluorobenzene	23.4		ug/L	25.00		94	70-130			
Surrogate: Dibromofluoromethane	25.3		ug/L	25.00		101	70-130			
Surrogate: Toluene-d8	25.1		ug/L	25.00		100	70-130			

8270D(SIM) Semi-Volatile Organic Compounds

Batch CA71116 - 3510C

Blank

Acenaphthene	ND	0.20	ug/L							
Acenaphthylene	ND	0.20	ug/L							
Anthracene	ND	0.20	ug/L							
Benzo(a)anthracene	ND	0.05	ug/L							
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
bis(2-Ethylhexyl)phthalate	2.37	2.50	ug/L							J
Butylbenzylphthalate	0.32	2.50	ug/L							J
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							
Diethylphthalate	ND	2.50	ug/L							
Dimethylphthalate	ND	2.50	ug/L							
Di-n-butylphthalate	ND	2.50	ug/L							
Di-n-octylphthalate	0.26	2.50	ug/L							J
Fluoranthene	ND	0.20	ug/L							
Fluorene	ND	0.20	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	0.05	ug/L							
Naphthalene	ND	0.20	ug/L							
Pentachlorophenol	ND	0.90	ug/L							
Phenanthrene	ND	0.20	ug/L							



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D(SIM) Semi-Volatile Organic Compounds

Batch CA71116 - 3510C

Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	0.791		ug/L	2.500		32	30-130			
Surrogate: 2,4,6-Tribromophenol	2.97		ug/L	3.750		79	15-110			
Surrogate: 2-Fluorobiphenyl	1.22		ug/L	2.500		49	30-130			
Surrogate: Nitrobenzene-d5	1.42		ug/L	2.500		57	30-130			
Surrogate: p-Terphenyl-d14	2.24		ug/L	2.500		90	30-130			

LCS

Acenaphthene	2.51	0.20	ug/L	4.000		63	40-140			
Acenaphthylene	2.18	0.20	ug/L	4.000		54	40-140			
Anthracene	2.90	0.20	ug/L	4.000		73	40-140			
Benzo(a)anthracene	3.23	0.05	ug/L	4.000		81	40-140			
Benzo(a)pyrene	3.24	0.05	ug/L	4.000		81	40-140			
Benzo(b)fluoranthene	3.19	0.05	ug/L	4.000		80	40-140			
Benzo(g,h,i)perylene	3.23	0.20	ug/L	4.000		81	40-140			
Benzo(k)fluoranthene	3.07	0.05	ug/L	4.000		77	40-140			
bis(2-Ethylhexyl)phthalate	5.83	2.50	ug/L	4.000		146	40-140			B+
Butylbenzylphthalate	4.39	2.50	ug/L	4.000		110	40-140			
Chrysene	3.47	0.05	ug/L	4.000		87	40-140			
Dibenzo(a,h)Anthracene	3.03	0.05	ug/L	4.000		76	40-140			
Diethylphthalate	3.24	2.50	ug/L	4.000		81	40-140			
Dimethylphthalate	2.93	2.50	ug/L	4.000		73	40-140			
Di-n-butylphthalate	3.33	2.50	ug/L	4.000		83	40-140			
Di-n-octylphthalate	3.99	2.50	ug/L	4.000		100	40-140			
Fluoranthene	3.28	0.20	ug/L	4.000		82	40-140			
Fluorene	2.81	0.20	ug/L	4.000		70	40-140			
Indeno(1,2,3-cd)Pyrene	3.14	0.05	ug/L	4.000		78	40-140			
Naphthalene	1.61	0.20	ug/L	4.000		40	40-140			
Pentachlorophenol	3.98	0.90	ug/L	4.000		100	30-130			
Phenanthrene	2.88	0.20	ug/L	4.000		72	40-140			
Pyrene	3.64	0.20	ug/L	4.000		91	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	0.754		ug/L	2.500		30	30-130			
Surrogate: 2,4,6-Tribromophenol	3.65		ug/L	3.750		97	15-110			
Surrogate: 2-Fluorobiphenyl	1.40		ug/L	2.500		56	30-130			
Surrogate: Nitrobenzene-d5	1.40		ug/L	2.500		56	30-130			
Surrogate: p-Terphenyl-d14	2.48		ug/L	2.500		99	30-130			

LCS Dup

Acenaphthene	2.99	0.20	ug/L	4.000		75	40-140	17	20	
Acenaphthylene	2.57	0.20	ug/L	4.000		64	40-140	17	20	
Anthracene	3.10	0.20	ug/L	4.000		77	40-140	7	20	
Benzo(a)anthracene	3.32	0.05	ug/L	4.000		83	40-140	3	20	
Benzo(a)pyrene	3.40	0.05	ug/L	4.000		85	40-140	5	20	
Benzo(b)fluoranthene	3.48	0.05	ug/L	4.000		87	40-140	9	20	
Benzo(g,h,i)perylene	3.43	0.20	ug/L	4.000		86	40-140	6	20	
Benzo(k)fluoranthene	3.32	0.05	ug/L	4.000		83	40-140	8	20	
bis(2-Ethylhexyl)phthalate	5.73	2.50	ug/L	4.000		143	40-140	2	20	B+



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D(SIM) Semi-Volatile Organic Compounds

Batch CA71116 - 3510C

Butylbenzylphthalate	4.62	2.50	ug/L	4.000		115	40-140	5	20	
Chrysene	3.63	0.05	ug/L	4.000		91	40-140	4	20	
Dibenzo(a,h)Anthracene	3.20	0.05	ug/L	4.000		80	40-140	6	20	
Diethylphthalate	3.59	2.50	ug/L	4.000		90	40-140	10	20	
Dimethylphthalate	3.31	2.50	ug/L	4.000		83	40-140	12	20	
Di-n-butylphthalate	3.49	2.50	ug/L	4.000		87	40-140	5	20	
Di-n-octylphthalate	4.22	2.50	ug/L	4.000		105	40-140	6	20	
Fluoranthene	3.40	0.20	ug/L	4.000		85	40-140	4	20	
Fluorene	3.20	0.20	ug/L	4.000		80	40-140	13	20	
Indeno(1,2,3-cd)Pyrene	3.35	0.05	ug/L	4.000		84	40-140	6	20	
Naphthalene	1.98	0.20	ug/L	4.000		49	40-140	21	20	D+
Pentachlorophenol	4.13	0.90	ug/L	4.000		103	30-130	4	20	
Phenanthrene	3.03	0.20	ug/L	4.000		76	40-140	5	20	
Pyrene	3.76	0.20	ug/L	4.000		94	40-140	3	20	
Surrogate: 1,2-Dichlorobenzene-d4	0.979		ug/L	2.500		39	30-130			
Surrogate: 2,4,6-Tribromophenol	3.78		ug/L	3.750		101	15-110			
Surrogate: 2-Fluorobiphenyl	1.67		ug/L	2.500		67	30-130			
Surrogate: Nitrobenzene-d5	1.73		ug/L	2.500		69	30-130			
Surrogate: p-Terphenyl-d14	2.55		ug/L	2.500		102	30-130			

Classical Chemistry

Batch CA71143 - General Preparation

Blank

Total Residual Chlorine	ND	10	ug/L							
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LCS

Total Residual Chlorine	2		mg/L	1.800		100	85-115			
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Batch CA71144 - General Preparation

Blank

Hexavalent Chromium	ND	10	ug/L							
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LCS

Hexavalent Chromium	0.5		mg/L	0.4998		99	90-110			
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LCS Dup

Hexavalent Chromium	0.5		mg/L	0.4998		99	90-110	0.2	20	
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Batch CA71229 - General Preparation

Blank

Total Suspended Solids	ND	5000	ug/L							
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LCS

Total Suspended Solids	64		mg/L	68.70		93	80-120			
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Batch CA71301 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L							
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LCS



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Classical Chemistry

Batch CA71301 - NH4 Prep

Ammonia as N	0.10	0.10	mg/L	0.09994		98	80-120			
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LCS

Ammonia as N	1.11	0.10	mg/L	0.9994		112	80-120			
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Batch CA71306 - General Preparation

Blank

Total Petroleum Hydrocarbon	ND	5	mg/L							
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LCS

Total Petroleum Hydrocarbon	15	5	mg/L	19.38		78	66-114			
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Batch CA71317 - TCN Prep

Blank

Total Cyanide (LL)	ND	5.00	ug/L							
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LCS

Total Cyanide (LL)	21.1	5.00	ug/L	20.06		105	90-110			
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LCS

Total Cyanide (LL)	149	5.00	ug/L	150.4		99	90-110			
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LCS Dup

Total Cyanide (LL)	148	5.00	ug/L	150.4		98	90-110	0.6	20	
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Batch CA71336 - General Preparation

Blank

Phenols	ND	100	ug/L							
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LCS

Phenols	116	100	ug/L	100.0		116	80-120			
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LCS

Phenols	997	100	ug/L	1000		100	80-120			
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8011 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Batch CA71322 - 504/8011

Blank

1,2-Dibromoethane	ND	0.015	ug/L							
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1,2-Dibromoethane [2C]	ND	0.015	ug/L							
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Surrogate: Pentachloroethane	0.162		ug/L	0.2000		81	30-150			
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Surrogate: Pentachloroethane [2C]	0.151		ug/L	0.2000		76	30-150			
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LCS

1,2-Dibromoethane	0.200	0.015	ug/L	0.2000		100	60-140			
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1,2-Dibromoethane [2C]	0.190	0.015	ug/L	0.2000		95	70-130			
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Surrogate: Pentachloroethane	0.167		ug/L	0.2000		83	30-150			
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Surrogate: Pentachloroethane [2C]	0.162		ug/L	0.2000		81	30-150			
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LCS

1,2-Dibromoethane	0.084	0.015	ug/L	0.08000		105	60-140			
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1,2-Dibromoethane [2C]	0.057	0.015	ug/L	0.08000		72	70-130			
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CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8011 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Batch CA71322 - 504/8011

Surrogate: Pentachloroethane	0.0704		ug/L	0.08000		88	30-150			
Surrogate: Pentachloroethane [2C]	0.0674		ug/L	0.08000		84	30-150			

Alcohol Scan by GC/FID

Batch CA71246 - No Prep

Blank										
Ethanol	ND	10	mg/L							
LCS										
Ethanol	948	10	mg/L	1000		95	60-140			
LCS Dup										
Ethanol	854	10	mg/L	1000		85	60-140	10	30	



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Woburn to Mystic - RGP/MCP

ESS Laboratory Work Order: 1701214

Notes and Definitions

U	Analyte included in the analysis, but not detected
S+	Surrogate recovery(ies) above upper control limit (S+).
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
BT	Benzidine tailing factor >2.
B+	Blank Spike recovery is above upper control limit (B+).
B	Present in Method Blank (B).
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



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

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

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.

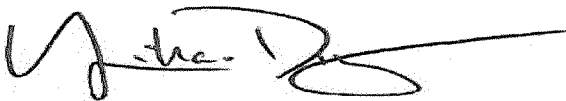
All samples were analyzed within the established guidelines of US EPA approved methods with all requirements met, unless otherwise noted at the end of a given sample's analytical results or in a case narrative.

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.

185 Frances Avenue, Cranston RI 02910-2211

Tel. (401)461-7181 Fax (401)461-4486

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.		ext 3083		email: <u>smorrell@thielsch.com</u>							
ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis	Chloride 300.0
	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
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							
Seals Intact		<input type="checkbox"/> Yes <input type="checkbox"/> No NA:		<input type="checkbox"/> Pickup							
Cooler Temperature: <u>3.5°C</u>				[] Technician							
Relinquished by: (Signature, Date & Time)		Received by: (Signature, Date & Time)		Relinquished by: (Signature, Date & Time)		Received by: (Signature, Date & Time)		*Provide ESS Deliverables			
Relinquished by: (Signature, Date & Time)		Received by: (Signature, Date & Time)		Relinquished by: (Signature, Date & Time)		Received 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

ESS Laboratory

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

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

City Westwood State MA Zip Code 02090 PO #

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

Sample Matrix

Sample ID

Analysis

Electronic Deliverables ☐ Limit Checker ☐ Excel

Other (Please Specify) → EVERSON EDD

ESS Lab # 1701214

Reporting Limits EPA RGP Eff limits Appendix VIII

EDB Cr+6

PCB, T. Phenols

Tris (Guany, AS, Cd, Cr, Hg, Pb, Se, Ag, Zn)

Hx. Chrom

Chloride

Ammonia

TRC

TSS

ag

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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)

[Signature] 1/11/17 1242

Relinquished by: (Signature, Date & Time)

[Signature] 1/11/17 1500

Relinquished by: (Signature, Date & Time)

[Signature] 1/11/17 1700

Received By: (Signature, Date & Time)

[Signature] 1/11/17 1700

Received By: (Signature, Date & Time)

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Received By: (Signature, Date & Time)

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Received By: (Signature, Date & Time)

[Signature] 1/11/17 1700

ESS Laboratory

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185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

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 ID Collection Date Collection Time Sample Type Sample Matrix Sample ID

ESS Lab ID Collection Date Collection Time Sample Type Sample Matrix Sample ID

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ESS Lab # 1701214

Reporting Limits EPA RGP Eff limits (Appendix VIII)

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

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ESS Lab # 1701214

Reporting Limits EPA RGP Eff limits (Appendix VIII)

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

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ESS Lab # 1701214

Reporting Limits EPA RGP Eff limits (Appendix VIII)

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

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ESS Lab # 1701214

Reporting Limits EPA RGP Eff limits (Appendix VIII)

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

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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 laboatroy 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

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for 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 - 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: Winter Pond
Date Sampled: 11/15/17 08:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-05
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>
Arsenic	ND (2.5)		3113B		5	KJK	11/19/17 2:30	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:25	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:25	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:25	1	1	[CALC]
Copper	2.1 (2.0)		200.7		2	KJK	11/16/17 16:25	100	10	CK71531
Hardness	30500 (824)		200.7		10	KJK	11/16/17 15:20	1	1	[CALC]
Iron	223 (100)		200.7		10	KJK	11/16/17 15:20	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:25	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:25	100	10	CK71531
Silver	ND (1.0)		200.7		2	KJK	11/16/17 16:25	100	10	CK71531
Zinc	12.3 (10.0)		200.7		2	KJK	11/16/17 16:25	100	10	CK71531



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Winter Pond
Date Sampled: 11/15/17 08:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-05
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	0.14 (0.10)		350.1		1	EEM	11/17/17 14:50	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	6.66 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.7 °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

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

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: Tighe & Bond - KPB/TB/MM

ESS Project ID: 1711482

Date Received: 11/15/2017

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

CHAIN OF CUSTODY

ESS Lab #

1711482

Turn Time	5-Day	Rush	2-Day
Regulatory State	Massachusetts		
Is this project for any of the following?:			
OCT RCP	OMA MCP	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 dsbebis@tighebond.com		

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)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 1

**5 Post Office Square, Suite 100
BOSTON, MA 02109-3912**

VIA EMAIL

December 20, 2017

Michael Zylich
Eversource Energy
247 Station Drive, SE270
Westwood, MA 02090
michael.zylich@eversource.com

Re: Authorization to discharge under the Remediation General Permit (RGP) – Authorization #MAG910759, for the Eversource Electrical Transmission Line Project site located in Winchester, MA

Dear Mr. Zylich:

Based on the review of a Notice of Intent (NOI) dated November 29, 2017 submitted by Tighe & Bond, Inc. for the site referenced above, the U.S. Environmental Protection Agency, Region 1 (EPA) hereby authorizes NSTAR Electric Company d/b/a Eversource Energy, as the named owner, and as a named operator and co-permittee with Bond Brothers, to discharge from this site in accordance with the provisions of the RGP. Since this site has discharges to different receiving waters, separate authorizations have been issued. Discharges via the City of Winchester storm sewer system¹ to Winter Pond (MA71-047) are authorized by the number listed above. Discharges from this site to Mystic River (MA71-02) are subject to authorization #MAG910761. The effective date of coverage is the date of this authorization letter.

Enclosed with this RGP authorization to discharge is a summary of the applicable parameters and effluent limitations for your activity category III, contaminated site dewatering discharge. A dilution factor of zero (i.e., 1:1), was used in calculating effluent limits applicable to the proposed discharge from this site. Please note that this summary does not represent the complete requirements of the RGP. Operators must comply with all of the applicable requirements of the RGP, including influent and effluent monitoring, record keeping, and reporting requirements. For the complete general permit, see EPA's RGP website.²

This EPA general permit and authorization to discharge will expire on **April 8, 2022**, or upon Notice of Termination (NOT), whichever occurs first. However, in accordance with Part 5.3 of the general permit, your permit coverage will be administratively continued until issuance of a new RGP. Please note that you must submit a NOT within thirty (30) days of the termination of the discharge. You have reported your discharges are expected to terminate December 2019. Because your discharge is expected to last

¹ The operator is responsible for obtaining permission to discharge to this system, prior to initiating discharges. EPA's authorization to discharge does not convey any such permission.

² <https://www.epa.gov/npdes-permits/remediation-general-permit-rgp-massachusetts-new-hampshire>.

twelve (12) months or more, you are subject to discharge monitoring requirements that begin **January 1, 2019**. See Part 4.6 and 5.2 of the RGP, and Appendix IV, Part 3 for more information regarding reporting requirements.

Please ensure that sufficiently sensitive test methods are used for all sample analyses conducted for this permit. To be considered sufficiently sensitive, test methods must achieve MLs for analysis for a given parameter that is no greater than the effluent limitation for that parameter, unless otherwise specified in the RGP for that parameter. Where no effluent limitation applies, EPA has provided the ML required with the enclosed summary. Where a compliance level applies, EPA has specified the compliance level and provided the ML required with the enclosed summary.

Thank you in advance for your cooperation in this matter. Please contact Shauna Little at (617) 918-1989 or little.shauna@epa.gov, if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Thelma Murphy".

Thelma Murphy, Chief
Storm Water and Construction Permits Section

Enclosure

cc: Rick McKanas, Bond Brothers, via email
Gary W.T. Hedman, LSP, Tighe & Bond, Inc., via email
Michael E. Martin, Tighe & Bond, Inc., via email
Cathy Vakalopoulos, MassDEP, via email
City of Winchester, Department of Public Works, via email

GENERAL PERMIT FOR REMEDIATION ACTIVITY DISCHARGES

Table 1: Authorization Information

Permit Number	MAG910759
Receiving Water	Winter Pond
Outfall Number	Outfall 001 to City of Winchester
Monitoring Frequency	See Part 4.1.2 of the RGP
Reporting Requirement	See Part 4.6.1 of the RGP; NetDMR requirements begin Jan 1, 2019

Table 2: Chemical-Specific Effluent Limitations and Monitor-Only Requirements¹

Parameter	Effluent Limitation
A. Inorganics	
Ammonia ²	Report mg/L
Chloride ³	Report µg/L
Total Suspended Solids	30 mg/L
Antimony ⁴	206 µg/L
Arsenic ⁴	104 µg/L
Cadmium ⁴	10.2 µg/L
Chromium III ⁴	323 µg/L
Chromium VI ⁴	323 µg/L
Copper ⁴	12.6 µg/L
Iron ⁴	1,000 µg/L
Lead ⁴	4.97 µg/L
Mercury ⁴	0.739 µg/L
Nickel ⁴	1,450 µg/L
Selenium ⁴	235.8 µg/L
Silver ⁴	35.1 µg/L
Zinc ⁴	420 µg/L
B. Non-Halogenated Volatile Organic Compounds	
Total BTEX	100 µg/L
Benzene	5.0 µg/L
C. Halogenated Volatile Organic Compounds	
Methylene Chloride	4.6 µg/L
D. Non-Halogenated Semi-Volatile Organic Compounds	
Total Phthalates	190 µg/L
Diethylhexyl Phthalate	2.2 µg/L
Total Group I Polycyclic Aromatic Hydrocarbons ⁵	1.0 µg/L
Benzo(a)anthracene ⁵	0.0038 µg/L
Benzo(a)pyrene ⁵	0.0038 µg/L
Benzo(b)fluoranthene ⁵	0.0038 µg/L
Benzo(k)fluoranthene ⁵	0.0038 µg/L
Chrysene ⁵	0.0038 µg/L
Dibenzo(a,h)anthracene ⁵	0.0038 µg/L
Indeno(1,2,3-cd)pyrene ⁵	0.0038 µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	100 µg/L

F. Fuels Parameters	
Methyl-tert-Butyl Ether	70 µg/L

Table 2 Notes:

¹ The following abbreviations are used in Table 2, above:

^a mg/L = milligrams per liter

^b µg/L = micrograms per liter

² The minimum level (ML) for analysis of ammonia must be less than or equal to 0.1 mg/L.

³ The ML for analysis of chloride must be less than or equal to 230 mg/L.

⁴ The limitation for this parameter is on the basis of total recoverable metal in the water column.

⁵ The compliance level for group I polycyclic aromatic hydrocarbons (PAHs) is 0.1 µg/L. The ML for analysis of group I PAHs must be less than or equal to 0.1 µg/L.

Table 3: Effluent Flow Limitation

Effluent Flow	Effluent Limitation
	0.504 MGD

Table 3 Notes

¹ The following abbreviations are used in Table 3, above:

^a MGD = million gallons per day

Table 4: pH Limitations for Discharges in Massachusetts

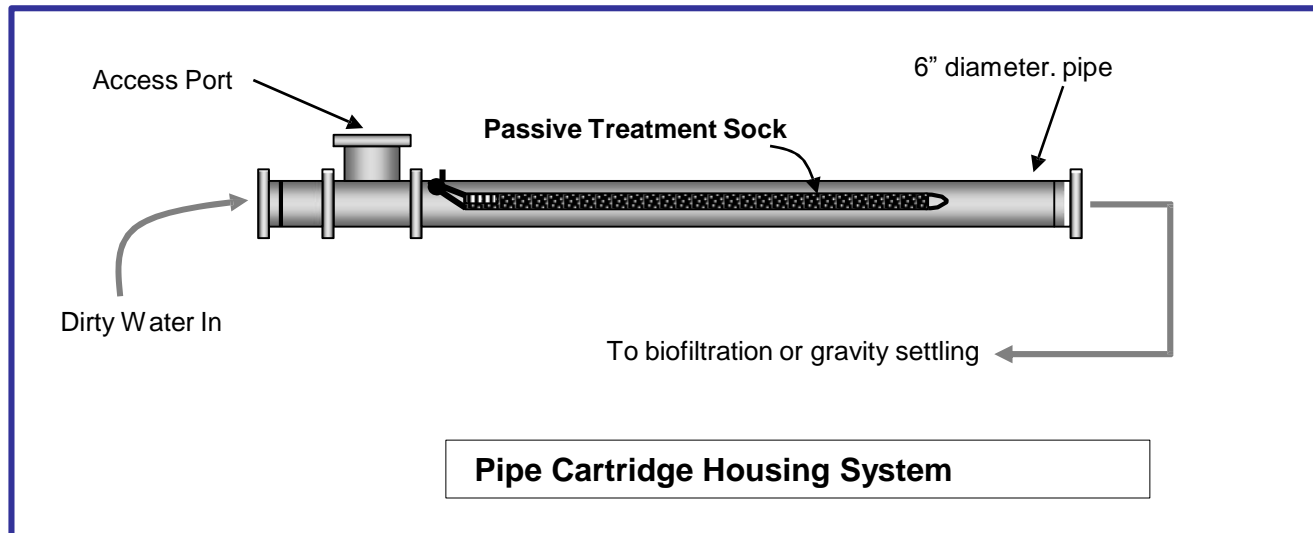
Receiving Water Class	Effluent Limitation
Freshwater	6.5 to 8.3 SU

Table 4 Notes

¹ The following abbreviations are used in Table 4, above:

^a SU = standard units

How to Use the Passive Treatment Sock



Passive Treatment Sock 1-lb.

Specifications:

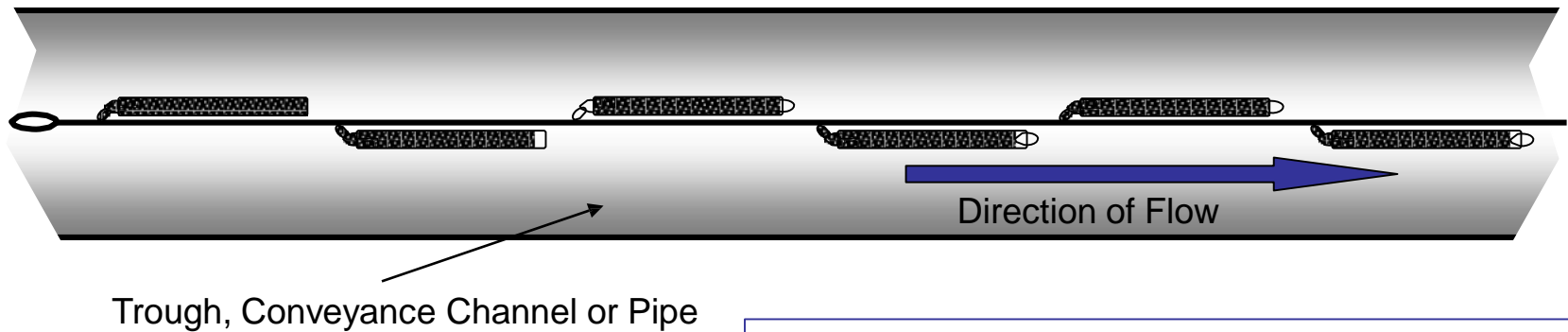
Length	36 Inches
Width:	5 in. diameter
Fabric:	Woven polypropylene
Chitosan:	1.0 lb (dry weight)
Treatment:	100,000 gal. @ 1 mg/L

Passive Treatment Sock 2-lb.

Specifications:

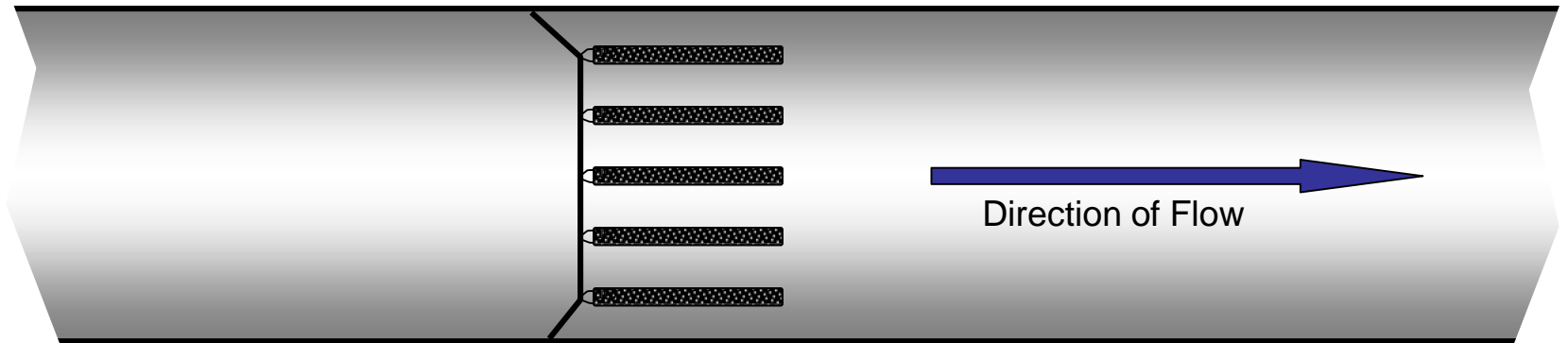
Length	72 Inches
Width:	5 in. diameter
Fabric:	Woven polypropylene
Chitosan:	2.0 lb (dry weight)
Treatment:	200,000 gal. @ 1 mg/L

Passive Treatment Socks Connected to a Common Rope Tether in Series



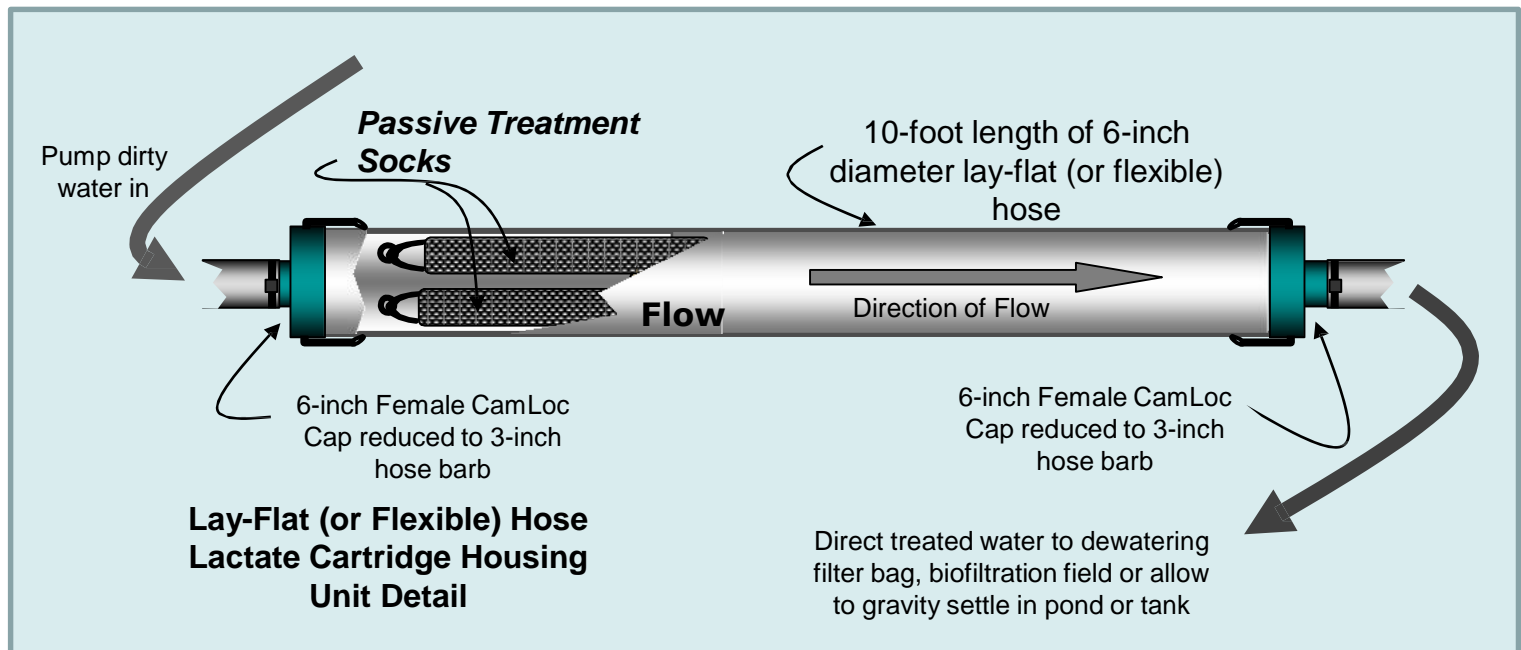
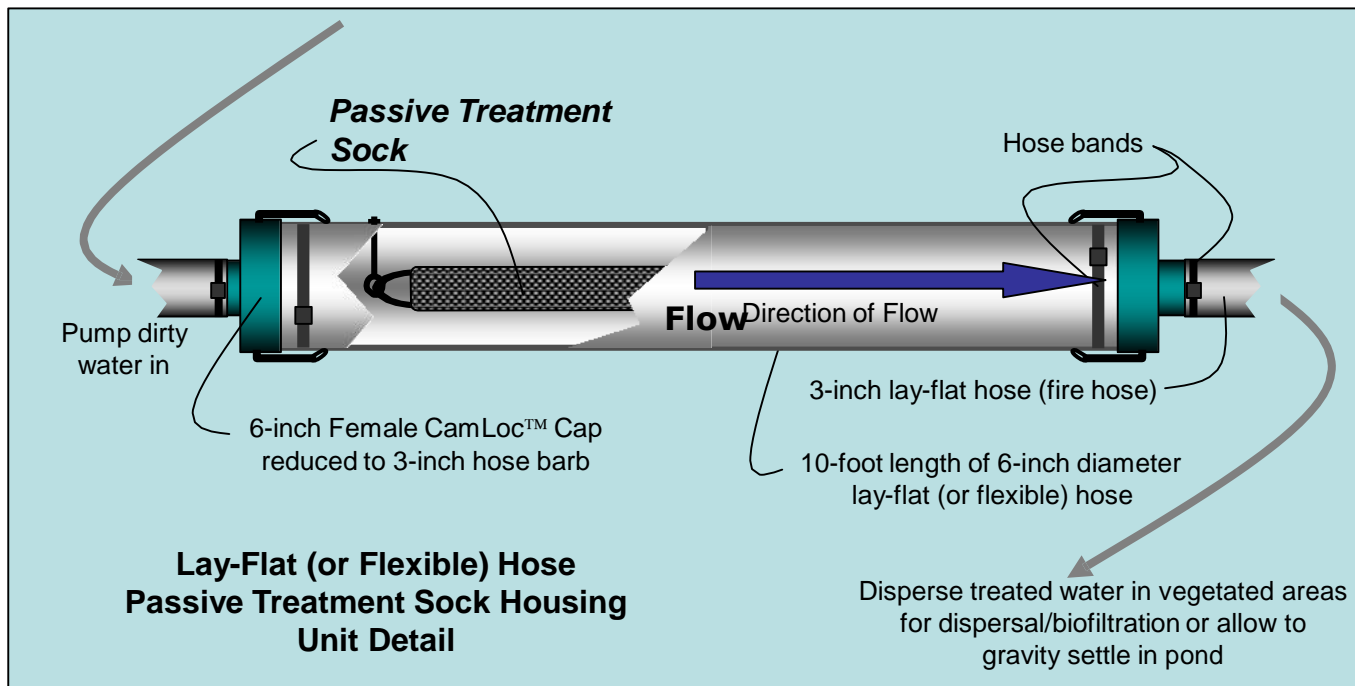
For applications where more than one Sock is needed simply connect them to a common rope

Passive Treatment Socks Connected to a Common Rope Tether in Parallel

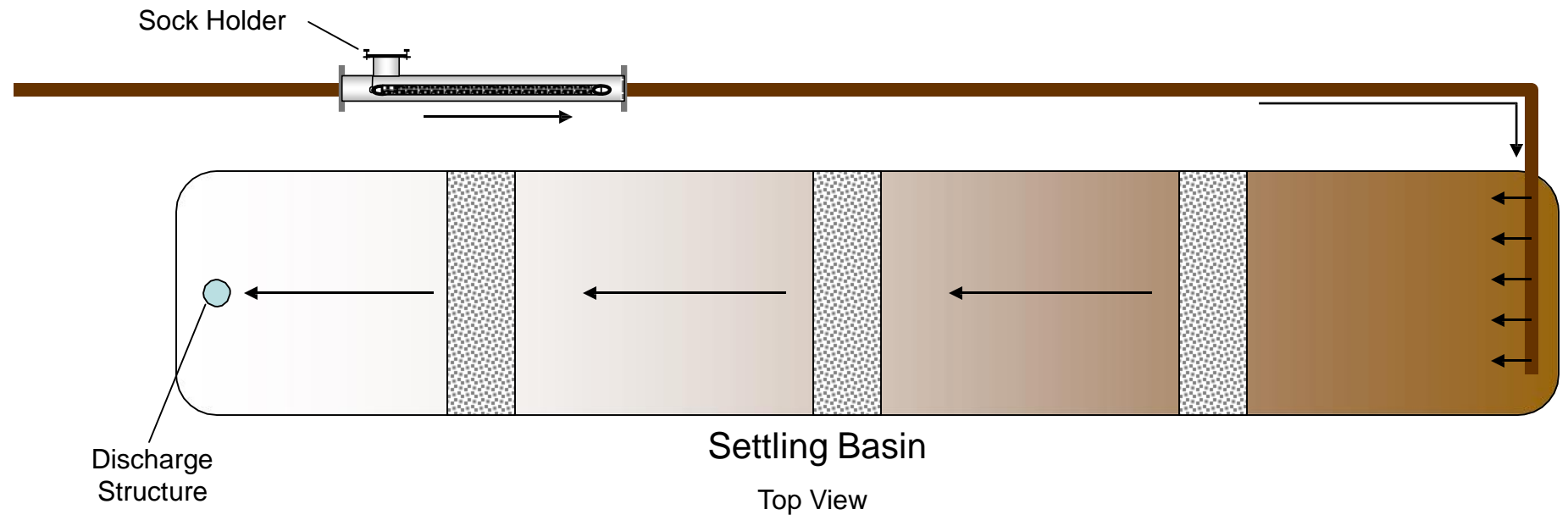
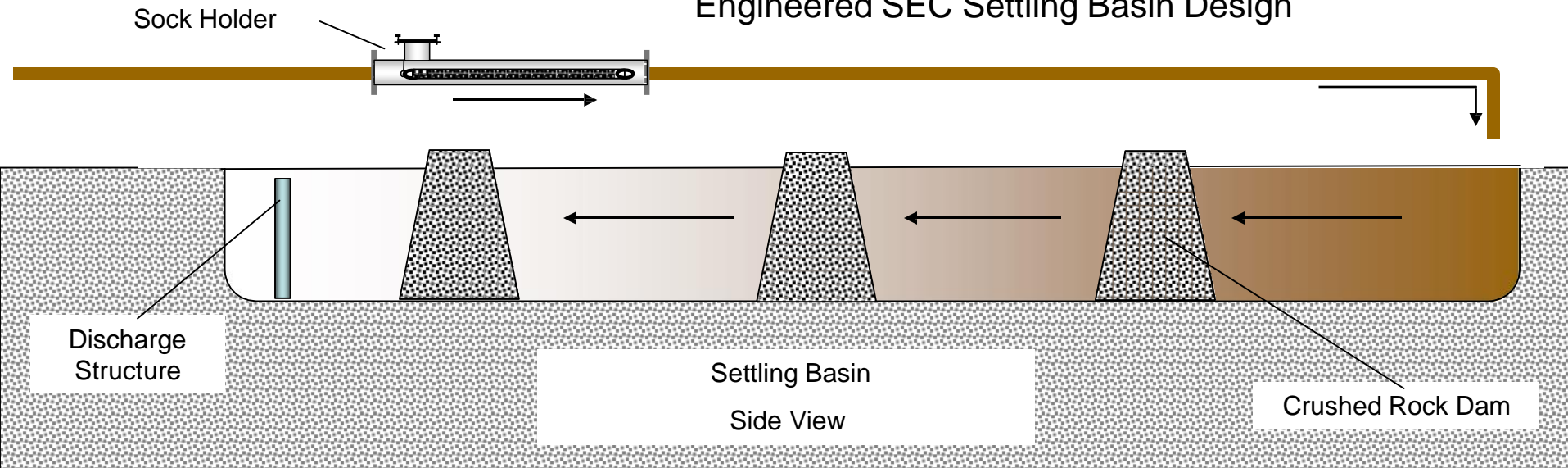


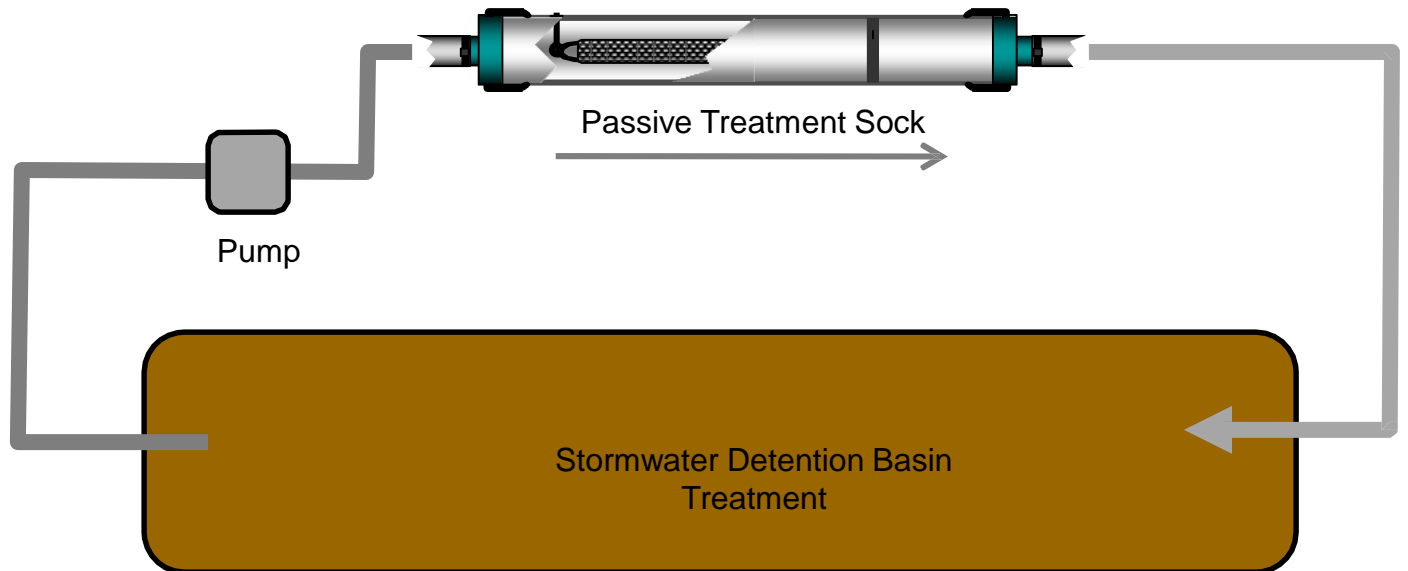
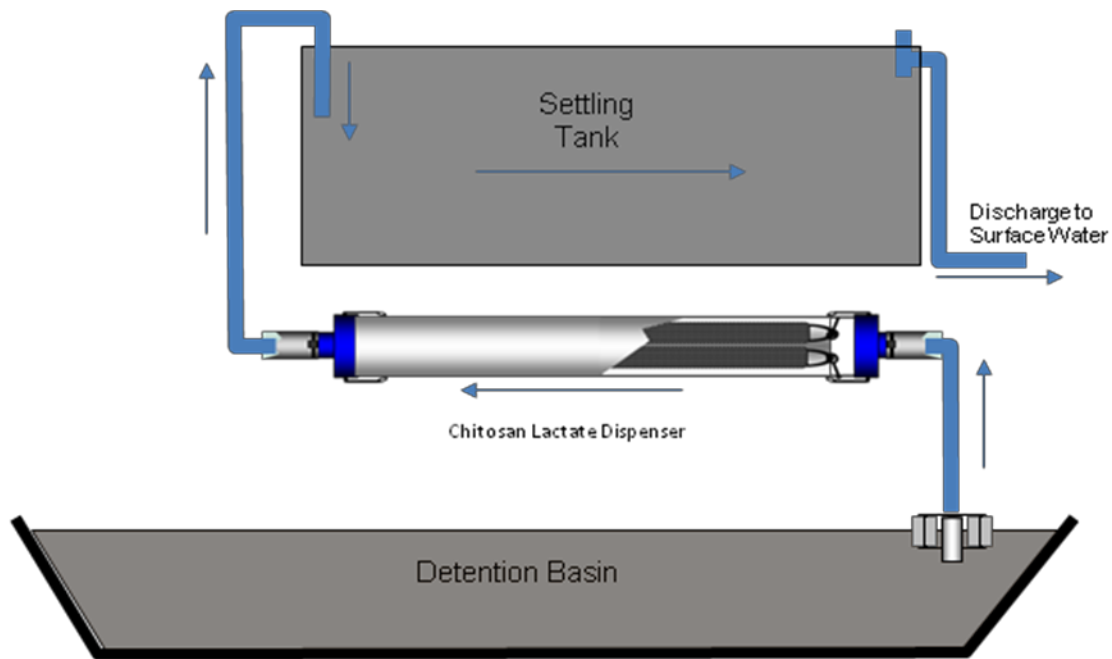
Trough, Conveyance Channel or Pipe

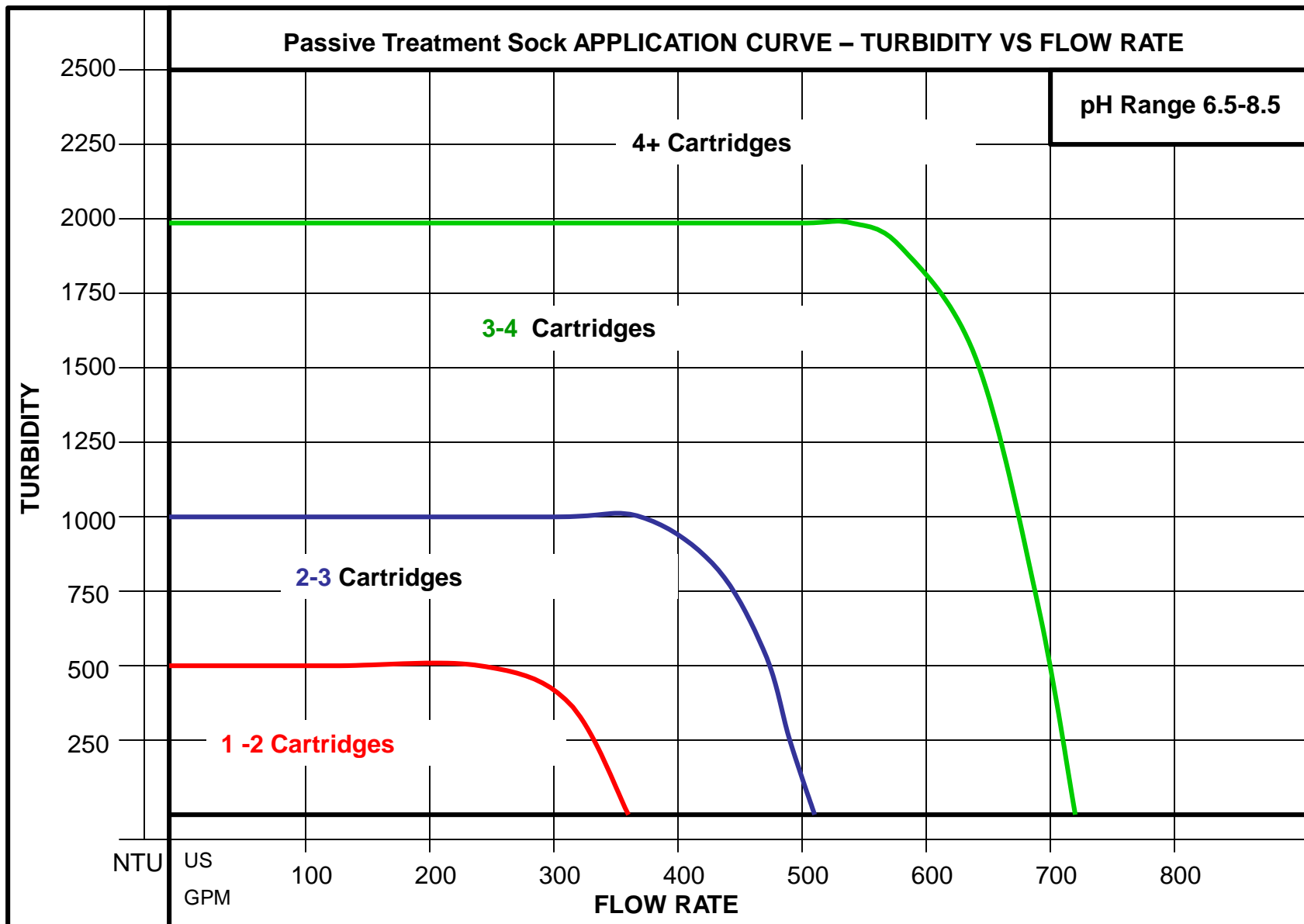
For wide channel installation simply connect Socks in parallel



Engineered SEC Settling Basin Design







DUAL PRODUCT SYSTEM

WE'VE NEVER KILLED A FISH!



Description

HaloKlear's All-Natural Water Treatment System

The **Dual Product System (DPS)** is quickly gaining national and international recognition as the premier all-natural stormwater treatment solution, providing unparalleled performance and reliable results in an array of projects across the globe. **HaloKlear DPS** uses biodegradable, natural flocculants that perform on a wide array of soil types and pH ranges. In contrast to other products on the market, the HaloKlear Dual Product System creates dense flocs with great shear strength and a low water content that settle very quickly. Solids can be efficiently removed from the water column – increasing performance and productivity while keeping costs low. In addition, **HaloKlear DPS** is extremely flexible with a successful track record in active, passive, and semi-passive deployment.

GREEN FOR LESS

Don't just clean the water, clean the environment

Our chemistries are less toxic when water is returned to its natural environment. All of HaloKlear's products exhibit exceptionally low toxicity, and the **Dual Product System** has been proven to have zero toxicity.* No bioaccumulation concerns exist when and where HaloKlear products are used, and our products are 100% biodegradable through enzymatic activity.

* Third-party toxicity testing concluded that no fish were killed by the Dual Product System (DPS) when both parts were used in combination of following Best Management Practices.

Clean Water.
Naturally.

Product Benefits

- Biodegradable natural flocculants
- Effective on a wide range of pH conditions and soil types
- Functions in active, semi-passive and passive applications
- Effective in fresh water and salt water
- Works with existing equipment of a part of a customized product
- Capable of trapping hydrocarbons, metals and nutrients
- Increases performance and productivity while keeping costs low

Part One

LBP-2101 = Liquid
DBP-2100 = Dry socks
DBP-2100 MB = Loose, dry
DPS DC-1 = Dry concentrate
for making down into liquid**

Part Two

LiquiFloc = Liquid
GelFloc = Dry socks
GelFloc MB = Loose, dry
DPS DC-2 = Dry concentrate
for making down into liquid**

**Not available in the North American market

For additional information contact Dober at:

(800) 323-4983

info@dober.com

www.dober.com/water_treatment

DOBER



BakerCorp Water Treatment Technology

Product Description (Dual Polymer Passive Treatment System)

DBP-2100 FS (Green product, very low toxicity) is a dry product most effective when used in conjunction with ***(PTS)*** chitosan lactate as part of a Dual Polymer System (DPS) to maximize floc size. This natural biopolymer is 100 percent biodegradable through simple natural enzymatic activity, leaving you no bioaccumulation concern. Currently being used in active, passive treatment systems. ***(Dose & mix DBP-2100 first then add Chitosan lactate powder)***

Gel-Floc PTS Our Passive Treatment Sock product is an organic water clarifier made from high quality chitosan lactate flake and placed within a permeable fabric. It slowly dissolves as the water flows over and through the cartridge. Once in solution, the chitosan flocculates suspended sediment particles which settle and can be filtered out. This natural biopolymer is 100 percent biodegradable through simple natural enzymatic activity, leaving no bioaccumulation concern. Currently being used in construction, industrial, municipal, and log yard water treatment systems.



Safety Data Sheet

acc. to OSHA HCS

1 IDENTIFICATION

- **Product identifier**

Product form	: Substance
Product name	: HaloKlear DBP-2100 Socks
Chemical name	: Xanthan Gum
CAS No	: 11138-66-2
Product code	: 210014

- **Relevant identified uses of the substance or mixture and uses advised against**

Uses of the substance/mixture	: Flocculant
-------------------------------	--------------

- **Manufacturer/Supplier:**

Sound Environmental Concepts
 22726 102nd Ave SE, Woodinville, WA 98077
 1 (206) 730 - 5376
 ray@soundenvirocon.com

- **Information department:** Product safety department

- **Telephone number:**

+ 1 (206) 730 – 5376

- Information department: Product safety department

- Emergency telephone number: +1 (800) 424-9300 (24 Hours)

During normal opening times: +1 (425) 881-6464

CHEMTREC (Domestic, North America) +1-703-527-3887 CHEMTREC (International, collect calls accepted)

2 HAZARD(S) IDENTIFICATION

- **Classification of the substance or mixture**

GHS-US Classification

Not classified

Safety Data Sheet

Trade Name: HaloKlear DBP-2100 Socks

2 HAZARD(S) IDENTIFICATION CONTD.

- **Label Elements**
GHS-US Labelling
No labeling applicable
- **Other hazards**
Other hazards not contributing to the classification : *May form combustible dust concentrations in air. May cause eye irritation.*
- **Unknown acute toxicity (GHS-US)**
Not applicable

3 COMPOSITION/INFORMATION ON INGREDIENTS

- **Substance**
Substance type : *Mono-constituent*
Name : *HaloKlear DBP-2100 Socks*
CAS No : *11138-66-2*
Fulltext of H-statements: see section 16
- **Mixture**
Not applicable

4 FIRST AID MEASURES

- **Description of first aid measures**
First-aid measures general : *Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).*
First-aid measures after inhalation : *Allow breathing of fresh air. Allow the victim to rest.*
First-aid measures after skin contact : *Removed affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.*
First-aid measures after eye contact : *Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.*
First-aid measures after ingestion : *Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.*

Safety Data Sheet

Trade Name: HaloKlear DBP-2100 Socks

4 FIRST AID MEASURES

- **Most important symptoms and effects, both acute and delayed**
Symptoms/Injuries after eye contact : Not expected to present a significant hazard under anticipated conditions of normal use.
- **Indication of any immediate medical attention and special treatment needed**
No additional information available

5 FIRE-FIGHTING MEASURES

- **Extinguishing media**
Suitable extinguished media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.
Unsuitable extinguishing media : Do not use a heavy water stream.
- **Special hazards arising from the substance or mixture**
Reactivity : The product is non-reactive under normal conditions of use, storage and transport.
- **Advice for firefighters**
Firefighting instructions : Exercise caution when fighting any chemical fire.
 Eliminate all ignition sources if safe to do so.
 Use water spray of fog for cooling exposed containers.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.
Other information : Spills produce extremely slippery surfaces. Avoid dust formation.

6 ACCIDENTAL RELEASE MEASURES

- **Personal precautions, protective equipment and emergency procedures**
- **For non-emergency personnel**
Emergency procedures : Evacuate unnecessary personnel.
- **For emergency responders**
Protective equipment : Equip cleanup crew with proper protection.
Emergency procedures : Ventilate area
- **Environmental precautions**
Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

Safety Data Sheet

Trade Name: HaloKlear DBP-2100 Socks

6 ACCIDENTAL RELEASE MEASURES

- **Personal precautions, protective equipment and emergency procedures**
General measures : Use special care to avoid static electric charges.
- **For non-emergency personnel**
Emergency procedures : Evacuate unnecessary personnel.
- **For emergency responders**
Protective equipment : Equip cleanup crew with proper protection.
Emergency procedures : Ventilate area.
- **Environmental precautions**
Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.
- **Methods and material for containment and cleaning up**
Methods of cleaning up : On land, sweep or shovel into suitable containers.
Minimize generation of dust. Store away from other materials.
- **Reference to other sections**
See Section 8. Exposure controls and personal protection.

7 HANDLING AND STORAGE

- **Precautions for safe handling**
Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and leaving work. Provide good ventilation in process area to prevent formation of vapor. No smoking.
- **Conditions for safe storage, including and incompatibles**
Storage conditions : Keep only in the original container in a cool, well-ventilated place. Keep container closed when not in use.
Incompatible products : Oxidizing agent.
Incompatible materials : Sources of ignition.
- **Specific end use(s)**
No additional information available

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

- **Control parameters**
HaloKlear DBP-2100 Socks
ACGIH : Not applicable
OSHA : Not applicable

Safety Data Sheet

Trade Name: HaloKlear DBP-2100 Socks

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

· **Exposure controls**

<i>Personal protective equipment</i>	: Avoid all unnecessary exposure.
<i>Hand protection</i>	: Wear protective gloves/protective clothing/eye protection/face protection protective gloves.
<i>Eye protection</i>	: Chemical goggles or safety glasses.
<i>Respiratory protection</i>	: Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
<i>Other information</i>	: Do not eat, drink or smoke during use.

9 PHYSICAL AND CHEMICAL PROPERTIES

· **Information on basic physical and chemical properties**

<i>Physical state</i>	: Solid
<i>Color</i>	: White to tan
<i>Odor</i>	: odorless
<i>Odour threshold</i>	: No data available
<i>pH</i>	: approximately neutral (1% solution)
<i>Relative evaporation rate</i>	: No data available
<i>Melting point</i>	: No data available
<i>Freezing point</i>	: No data available
<i>Boiling point</i>	: No data available
<i>Flash point</i>	: No data available
<i>Auto-ignition temperature</i>	: No data available
<i>Decomposition temperature</i>	: No data available
<i>Flammability (solid, gas)</i>	: No data available
<i>Vapor pressure</i>	: No data available
<i>Relative vapor density</i>	: No data available
<i>Relative density</i>	: No data available
<i>Solubility</i>	: Water: 100 %
<i>Log Pow</i>	: No data available
<i>Log Kow</i>	: No data available
<i>Viscosity, kinematic</i>	: No data available

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Trade Name: HaloKlear DBP-2100 Socks

9 PHYSICAL AND CHEMICAL PROPERTIES

Viscosity, dynamic : No data available

Explosive properties : No data available

Oxidizing properties : No data available

Explosive limits : No data available

• **Other Information**

No additional information available

10 STABILITY AND REACTIVITY

• **Reactivity**

The product is non-reactive under normal conditions of use, storage and transport.

• **Chemical stability**

Stable under normal conditions.

• **Possibility of hazardous reactions**

No dangerous reactions known under normal conditions of use.

• **Conditions to avoid**

Avoid dust formation.

• **Incompatible materials**

Oxidizing agent.

• **Hazardous decomposition products**

Thermal decomposition generates: Carbon dioxide. Carbon monoxide. Fume.

11 TOXICOLOGICAL INFORMATION

• **Information on toxicological effects**

Acute toxicity : Not classified

Skin corrosion/irritation : Not classified

pH: approximately neutral (1% solution)

Serious eye damage/irritation : Not classified

pH: approximately neutral (1% solution)

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity : Not classified

(single exposure)

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Trade Name: HaloKlear DBP-2100 Socks

11 TOXICOLOGICAL INFORMATION

<i>Specific target organ toxicity (repeated exposure)</i>	: <i>Not classified</i>
<i>Aspiration hazard</i>	: <i>Not classified</i>
<i>Potential adverse human health effects and symptoms</i>	: <i>Based on available data, the classification criteria are not met.</i>

12 ECOLOGICAL INFORMATION

- **Toxicity**
HaloKlear DBP-2100 Socks (11138-66-2)
LC50 fish 1 491 mg/l Rainbow Trout; 96 hour
- **Persistence and degradability**
HaloKlear DBP-2100 Socks (11138-66-2)
Persistence and degradability The product is biodegradable
- **Bioaccumulative potential**
HaloKlear DBP-2100 Socks (11138-66-2)
Bioaccumulative potential Inherently biodegradable
- **Mobility in soil**
HaloKlear DBP-2100 Socks (11138-66-2)
Mobility in soil Not available
- **Other adverse effects**
Effect on Global warming : No known ecological damaged caused by this product.
Other information : No other effects known.

13 DISPOSAL CONSIDERATIONS

- **Waste treatment methods**
Waste disposal recommendations : Dispose of contents/container in accordance with
 Licensed collector's sorting instructions.
- Ecology – waste materials* : None known.

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Trade Name: HaloKlear DBP-2100 Socks

14 TRANSPORT INFORMATION

UN-No.(DOT): : Non Regulated

UN-No. (IMDG): : Non Regulated

UN-No. (IATA): : Non Regulated

· **UN proper shipping name**

Proper Shipping Name (DOT): : Not applicable

Proper Shipping Name (IMDG): : Not applicable

Proper Shipping Name (IATA): : Not applicable

· **Transport hazard class(es)**

Transport hazard class(es) (DOT): : Not applicable

Transport hazard class(es) (IMDG): : Not applicable

Transport hazard class(es) (IATA): : Not applicable

· **Packing group**

Packing group (DOT): : Not applicable

Packing group (IMDG): : Not applicable

Packing group (IATA): : Not applicable

· **Environmental hazards**

Marine pollutant(IMDG): : No

Marine pollutant(IATA): : No

15 REGULATORY INFORMATION

· **US Federal regulations**

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency ToxicSubstances Control Act (TSCA) inventory.

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

· **International Regulations**

Canada

Aluminum chloride hydroxide sulfate (39290-78-3)

No additional information available

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Trade Name: HaloKlear DBP-2100 Socks

15 REGULATORY INFORMATION

· **US State regulations**

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm.

16 OTHER INFORMATION

Other information: : None

NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

NFPA specific hazard : NA - Not Applicable

HMIS III Rating

Health : 0 - No significant risk to health

Flammability : 0

Physical : 0

Personal Protection : B



Safety Data Sheet

acc. to OSHA HCS

1 IDENTIFICATION

- **Product identifier**
- **Trade name:** HaloKlear: Gel-Floc
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
 Sound Environmental Concepts
 22726 102nd Ave SE, Woodinville, WA 98077
 1 (206) 730 - 5376
 ray@soundenvirocon.com
- **Information department:** Product safety department
- **Telephone number:**
 + 1 (206) 730 – 5376
- Information department: Product safety department
- Emergency telephone number: +1 (800) 424-9300 (24 Hours)
 During normal opening times: +1 (425) 881-6464
 CHEMTREC (Domestic, North America) +1-703-527-3887 CHEMTREC (International, collect calls accepted)

2 HAZARD(S) IDENTIFICATION

- **Classification of the substance or mixture**
The product is not classified according to the Globally Harmonized System (GHS).
- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC** *Not applicable.*
Information concerning particular hazards for human and environment:
The product does not have to be labeled due to the calculation procedure of international guidelines
Classification system:
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

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Trade Name: HaloKlear: Gel-Floc

2 HAZARD(S) IDENTIFICATION CONTD.

- **Label elements**
- **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals. The product is not subject to identification regulations according to directives on hazardous materials.
- **Classification System**
 - **NFPA ratings (scale 0 - 4)**
 - *Health = 0*
 - *Fire = 0*
 - *Reactivity = 0*
 - **HMIS-ratings (scale 0 - 4)**
 - *Health = 0*
 - *Fire = 0*
 - *Reactivity = 0*
- *Other hazards*
- *Results of PBT and vPvB assessment*
- *PBT: Not applicable*
- *vPvB: Not applicable*

3 COMPOSITION/INFORMATION ON INGREDIENTS

- **Chemical characterization:** *Mixtures*
- **Description:** *Mixture of the substances listed below with nonhazardous additions.*
- **Dangerous components:** *Void*

4 FIRST-AID MEASURES

- **Description of first aid measures**
- **General information:** *No special measures required.*
- **After inhalation:** *Supply fresh air; consult doctor in case of complaints.*
- **After skin contact:** *Generally the product does not irritate the skin.*
- **After eye contact:** *Rinse opened eye for several minutes under running water.*
- **After swallowing:** *If symptoms persist consult doctor.*

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Trade Name: HaloKlear: Gel-Floc

4 FIRST AID MEASURES CONTD.

- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed** *No further relevant information available.*
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available

5 FIRE-FIGHTING MEASURES

- **Extinguishing media**
- **Suitable extinguishing agents:** *CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.*
- **Special hazards arising from the substance or mixture** *No further relevant information available.*
- **Advice for firefighters**
- **Protective equipment:** *No special measures required.*

6 ACCIDENTAL RELEASE MEASURES

- **Personal precautions, protective equipment and emergency procedures** *Not required.*
- **Environmental precautions:** *Do not allow to enter sewers/ surface or ground*
- **Methods and material for containment and cleaning up:** *Pick up mechanically*
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 HANDLING AND STORAGE

- **Handling:**
- **Precautions for safe handling** *No special measures required.*
- **Information about protection against explosions and fires:** *No special measures required.*
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** *No special requirements.*
- **Information about storage in one common storage facility:** *Not required.*
- **Further information about storage conditions:** *None.*
- **Specific end use(s)** *Water flocculent*

Safety Data Sheet

Trade Name: HaloKlear: Gel-Floc

8 EXPOSURE CONTROLS/PERSONAL PROTECTION CONTD.

- **Additional information about design of technical systems:** *No further data; see item 7.*
- **Control parameters**
- **Components with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** *The lists that were valid during the creation were used a basis.*
- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
The usual precautionary measures for handling chemicals should be followed.
- **Breathing equipment:** *Not required.*
- **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
- **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can't be calculated in advance and has therefore to be checked prior to the application.
- **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:** *Not required.*

9 PHYSICAL AND CHEMICAL PROPERTIES

- **Information on basic physical and chemical properties**
 - **General Information**
 - **Appearance:**
 - **Form:** *Powder*
 - **Color:** *Whitish*
 - **Odor:** *Product specific*
 - **Odour threshold:** *Not determined*
-
- pH-value at 20 °C (68 °F):** *Not applicable*

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9 PHYSICAL AND CHEMICAL PROPERTIES CONTD.

· Change in condition	
· Melting point/Melting range:	<i>Undetermined</i>
· Boiling point/Boiling range:	<i>> 999 °C (> 1830 °F)</i>
· Flash point:	<i>Not applicable</i>
· Flammability (solid, gaseous):	<i>Not determined</i>
· Ignition temperature:	
· Decomposition temperature:	<i>Not determined</i>
· Auto igniting:	<i>Product is not selfigniting</i>
· Danger of explosion:	<i>Product does not present an explosion hazard.\</i>
· Explosion limits:	
Lower:	<i>Not determined</i>
Upper:	<i>Not determined</i>
· Vapor pressure at 20 °C (68 °F):	<i>Not applicable</i>
· Density at 20 °C (68 °F):	<i>Not determined</i>
· Relative density	<i>Not determined</i>
· Vapour density	<i>Not applicable</i>
· Evaporation rate	<i>Not applicable</i>
· Solubility in / Miscibility with	
Water:	<i>Insoluble</i>
· Partition coefficient (n-octanol/water):	<i>Not determined</i>
· Viscosity:	
Dynamic:	<i>Not applicable</i>
Kinematic:	<i>Not applicable</i>

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9 PHYSICAL AND CHEMICAL PROPERTIES CONTD.

- **Solvent content:**
- Organic solvents:** 0.0 %
- Solids content:** 100.0%
- **Other information** No further relevant information available.

10 STABILITY AND REACTIVITY

- **Reactivity**
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

11 TOXICOLOGICAL INFORMATION

- **Information on toxicological effects**
- **Acute toxicity:**
- **Primary irritant effect:**
- on the skin:** No irritant effect.
- on the eye:** No irritating effect.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**
*The product is not subject to classification according to internally approved calculation methods for preparations:
 When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.*
- **Carcinogenic categories**
-
- **IARC (International Agency for Research on Cancer)**
None of the ingredients is listed.
-
- **NTP (National Toxicology Program)**
None of the ingredients is listed.

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Trade Name: HaloKlear: Gel-Floc

11 TOXICOLOGICAL INFORMATION CONTD.

- **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

12 ECOLOGICAL INFORMATION

- **Toxicity**
- **Aquatic toxicity:** *No further relevant information available.*
- **Persistence and degradability** *No further relevant information available.*
- **Behavior in environmental systems:**
- **Bioaccumulative potential** *No further relevant information available.*
- **Mobility in soil** *No further relevant information available.*
- **Additional ecological information:**
- **General notes:** *Water hazard class 1 (self-assessment): Slightly hazardous for water. Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.*
- **Results of PBT and vPvB assessment**
- **PBT:** *Not applicable.*
- **vPvB:** *Not applicable.*
- **Other adverse effects** *No further relevant information available.*

13 DISPOSAL CONSIDERATIONS

- **Waste treatment methods**
- **Recommendation:** *Smaller quantities can be disposed of with household waste.*
- **Uncleaned packaging:**
- **Recommendation:** *Disposal must be made according to official regulations.*

14 TRANSPORT INFORMATION

- **UN-Number**
 - **DOT, IMDG, IATA** *Not regulated*
-
- **UN proper shipping name**
 - **DOT, IMDG, IATA** *Not regulated*

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14 TRANSPORT INFORMATION CONTD.

- Transport hazard class(es)
- DOT, IMDG, IATA
- Class *Not regulated*
- Packing group
- DOT, IMDG, IATA *Not regulated*
- Special precautions for user *Not applicable*
- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code *Not applicable*
- UN "Model Regulation": -

15 REGULATORY INFORMATION

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- Sara
- Section 355 (extremely hazardous substances):
None of the ingredients are listed.
- Section 313 (Specific toxic chemical listings):
None of the ingredients are listed.
- TSCA (Toxic Substances Control Act):
All ingredients are listed.
- Proposition 65
- Chemicals known to cause cancer:
None of the ingredients are listed.
- Chemicals known to cause reproductive toxicity for females:
None of the ingredients are listed.
- Chemicals known to cause reproductive toxicity for males:
None of the ingredients are listed.

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Trade Name: HaloKlear: Gel-Floc

15 REGULATORY INFORMATION CONTD.

- **Chemicals known to cause developmental toxicity:**
None of the ingredients are listed.
- **Carcinogenic categories**
- **EPA (Environmental Protection Agency)**
None of the ingredients are listed.
- **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients are listed.
- **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients are listed.
- **Product related hazard informations:**
Observe the general safety regulations when handling chemicals. The product is not subject to identification regulations according to directives on hazardous materials.
- **Chemical safety assessment:** *A Chemical Safety Assessment has not been carried out.*

16 OTHER INFORMATION

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing SDS:** *Environment protection department.*
- **Contact: Mrs. Jackson**
Date of preparation / last revision 02/09/2015 / - Present
- **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances

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16 OTHER INFORMATION CONTD.

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)