

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)
Operator Modification
Construction Dewatering
Mystic River/Boston Inner Harbor
Boston, Massachusetts 02129
MAG910758**

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 Maffa Way, Main Street, Beacham Street, Arlington Avenue and Alford Street in Boston and Mystic Substation 250 in Charlestown (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 Boston Water and Sewer Commission (BWSC). All stormwater drainage systems subject to this RGP discharge to the Mystic River/Boston. Post treatment discharge rates will range from 25 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 Boston Water and Sewer Commission stormwater drainage system and ultimately to the Mystic River/Boston Inner Harbor.

Groundwater Characterization

To characterize groundwater along the proposed route of construction, groundwater samples were collected from groundwater monitoring wells MW-505A, MW-505B, B3 and B17 between January 2017 and September 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 Limitations (WQBEL).

Contaminants of concern are analytes that exceeded either the TBEL or WQBEL. Contaminants of concern detected in at least one of the monitoring well MW-505A, MW-505B, B3 or B17 include group I PAHs, bis(2-ethylhexyl) phthalate (DEHP), zinc, iron, copper, polychlorinated biphenyls (PCBs), acetone, naphthalene, benzene, total BTEX 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 either adjacent to a roadway (B3 and B17) paved parking lot (MW-505B) and a MassDOT salt and snow staging area (MW-505A), the chloride detected in groundwater samples is likely associated with road salting during the winter months.

Receiving Water Characterization

Mystic River/Boston Inner Harbor after the Amelia Earhart Dam (waterbody identification MA71-03) is classified as a Class SB (CSO) impaired water body and is listed in the 303(d) Impaired Waterbodies document. According to the United States Geologic Survey's StreamStats online application, the 7Q10 value was calculated the total flow for North Harbor, Mystic River (Boston Harbor) (adjacent to the Site) was calculated to be 2.16 million gallons per day (MGD). During critical low flow conditions, it is assumed that there is no flow in saltwater environments; therefore, a 7-day 10-year low flow (7Q10) value was not calculated for this RGP. Additionally, dilution factors for sites discharging to saltwater receiving 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, one surface water sample was collected within a quarter mile of the potential outfall locations prior to discharging and analyzed for contaminants of concern that were present in the groundwater samples from the monitoring wells discussed above. The surface water sample was collected in November 2017 and sent for laboratory analysis of metals detected in the effluent samples and ammonia, hexavalent chromium, pH and salinity. The surface water sampling location is shown on Figure 1, Dewatering Plan, in Appendix B.

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

construction activities. Additionally, the discharge is to the Mystic River and ultimately Boston Inner Harbor which is not a habitat where the northern long-eared bat exists.

- According to United States Fish and Wildlife Services (USFWS) Information, Planning and Conservation (IPaC) tool there are no critical habitats within the Site. USFWS confirmed there are no critical habitats in the area and confirmed permit eligibility meets "Criterion A."
 - Additionally, according to the MassGIS Priority Resource Map, no NHESP Priority Habitats for Rare Species or Estimated Habitats for Rare Wildlife, were present within half a mile downstream of the discharge location. Therefore, permit eligibility meets "Criterion A."
- As shown on the map generated by the MassGIS online viewer (Figure 2), no ACECs or Estimated Habitats of Rare Wildlife areas are located within half a mile downstream of the discharge location.
- An electronic review of the Massachusetts Cultural Resource Information System database (Appendix D), made available through Massachusetts Historical Commission, found several historical areas along Mystic Avenue in Medford and Somerville, but it is believed that discharges and discharge related activities will not affect historic properties as groundwater will be pumped into fractionation tanks, treated and discharged to an existing drainage network. No historical areas are located directly within excavation areas. Therefore, permit eligibility meets "Criterion B."
- Groundwater samples were collected from on-Site groundwater monitoring wells MW-505B, B-3 and B-17 between January and September 2017. The groundwater samples were submitted for laboratory analysis of 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.
- The surface water sample was collected from Mystic River after the Amelia Earhart Dam within a quarter mile of the potential outfall locations 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 E. A copy of the laboratory analytical report is included in Appendix F.

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 MAG910758, 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

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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 MAG910758
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: Eversource Electrical Transmission Line Project	Site address: Intersection of Middlesex Ave and Mystic Ave (URAM area) Street: Mystic Ave, Main Street, Beacham Street, Arlington Street and Alford Street		
2. Site owner Eversource Energy d/b/a NSTAR Electric Company Owner is (check one): ☐ Federal ☐ State/Tribal ☐ Private ☒ Other; if so, specify: Utility on Public Right of Way	City: Medford, Somerville and Boston	State: MA	Zip: 02145
3. Site operator, if different than owner The Middlesex Corporation	Contact Person: Jose Nieto Telephone: 978-742-440 Email: jnieto@middlesexco.com Mailing address: 1 Spectacle Pond Street: City: Littleton State: MA Zip: 01460		
4. NPDES permit number assigned by EPA: MAR1000RI NPDES permit is (check all that apply): ☐ RGP ☐ DGP ☒ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:	5. Other regulatory program(s) that apply to the site (check all that apply): ☒ MA Chapter 21e; list RTN(s): 3-34457 ☐ NH Groundwater Management Permit or Groundwater Release Detection Permit: ☐ CERCLA ☐ UIC Program ☐ POTW Pretreatment ☐ CWA Section 404		

B. Receiving water information:

1. Name of receiving water(s): Mystic River	Waterbody identification of receiving water(s): MA71-03	Classification of receiving water(s): Class SB (CSO)
Receiving water is (check any that apply): ☐ Outstanding Resource Water ☐ Ocean Sanctuary ☐ territorial sea ☐ Wild and Scenic River		
2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): ☒ Yes ☐ No Are sensitive receptors present near the site? (check one): ☒ Yes ☐ No If yes, specify: Mystic River - Surface Water Body		
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. Fish-Passage Barrier, Non-Native Aquatic Plants, Arsenic, Chlordane in Fish Tissue, Chlorophyll-a, DDT in Fish Tissue, DO Saturation, Escherichia		
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.		0.216 MGD
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.		0
6. Has the operator received confirmation from the appropriate State for the 7Q10 and dilution factor indicated? (check one): ☐ Yes ☒ 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): ☐ Yes ☒ No		

C. Source water information:

1. Source water(s) is (check any that apply):			
☒ 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): ☒ Yes ☐ No	☐ 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): ☐ Yes ☐ No	☐ The receiving water	☐ Potable water; if so, indicate municipality or origin: ☐ Other; if so, specify:
		☐ A surface water other than the receiving water; if so, indicate waterbody:	

2. Source water contaminants: Iron, Chloride and Ammonia	
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): ☐ Yes ☒ 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): ☐ Yes ☐ No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): ☐ Yes ☒ No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): ☐ Existing discharge ☒ New discharge ☐ New source	
Outfall(s): Mystic River - Amelia Earhart Dam to Boston Inner Harbor	Outfall location(s): (Latitude, Longitude) 42.387862/-71.072422; 42.387614/-71.072037; 42.392312/-71.07001; 42.390425/-71.070649
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ☒ Indirect discharge, if so, specify: Via Boston Water and Sewer Drainage System ☐ A private storm sewer system ☒ 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): ☐ Yes ☒ No Has the operator has received permission from the owner to use such system for discharges? (check one): ☐ Yes ☒ No, if so, explain, with an estimated timeframe for obtaining permission: The contractor will obtain the necessary discharge permits from the Boston Water and Sewer Commission prior to discharge. Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ☒ No	
Provide the expected start and end dates of discharge(s) (month/year): October 2019 to December 2020	
Indicate if the discharge is expected to occur over a duration of: ☐ less than 12 months ☒ 12 months or more ☐ is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ☒ Yes ☐ No	

2. Activity Category: (check all that apply)	3. Contamination Type Category: (check all that apply)	
☐ I – Petroleum-Related Site Remediation ☐ II – Non-Petroleum-Related Site Remediation ☒ III – Contaminated Site Dewatering ☐ IV – Dewatering of Pipelines and Tanks ☐ V – Aquifer Pump Testing ☐ VI – Well Development/Rehabilitation ☐ VII – Collection Structure Dewatering/Remediation ☐ VIII – Dredge-Related Dewatering	a. If Activity Category I or II: (check all that apply) ☐ A. Inorganics ☐ B. Non-Halogenated Volatile Organic Compounds ☐ C. Halogenated Volatile Organic Compounds ☐ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☐ F. Fuels Parameters	
	b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)	
	<table border="1"> <tr> <td data-bbox="970 800 1419 873">☒ G. Sites with Known Contamination</td><td data-bbox="1419 800 2003 873">☐ H. Sites with Unknown Contamination</td></tr> </table>	☒ G. Sites with Known Contamination
☒ G. Sites with Known Contamination	☐ H. Sites with Unknown Contamination	
<table border="1"> <tr> <td data-bbox="970 873 1419 1409"> c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply) ☒ A. Inorganics ☒ B. Non-Halogenated Volatile Organic Compounds ☒ C. Halogenated Volatile Organic Compounds ☒ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☒ F. Fuels Parameters </td><td data-bbox="1419 873 2003 1409"> d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply </td></tr> </table>	c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply) ☒ A. Inorganics ☒ B. Non-Halogenated Volatile Organic Compounds ☒ C. Halogenated Volatile Organic Compounds ☒ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☒ F. Fuels Parameters	d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply
c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply) ☒ A. Inorganics ☒ B. Non-Halogenated Volatile Organic Compounds ☒ C. Halogenated Volatile Organic Compounds ☒ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☒ F. Fuels Parameters	d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply	

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✓	6	350.1	0.50	9.09	0.78	Report mg/L	---
Chloride		✓	6	300.0	250	4,800	1,495	Report µg/l	---
Total Residual Chlorine	✓		6	4500-C1 D	20	<10	0	0.2 mg/L	11
Total Suspended Solids		✓	6	2540D	5	39,800,000	11,549,000	30 mg/L	---
Antimony	✓		6	200.7	5	<5	0	206 µg/L	640
Arsenic		✓	6	3113B	5	7.5	4.4	104 µg/L	10
Cadmium		✓	6	3113B	0.15	1.9	1.9	10.2 µg/L	0.25
Chromium III		✓	6	200.7	10	62	21.2	323 µg/L	74
Chromium VI	✓		6	3500Cr	10	<10	0	323 µg/L	11
Copper		✓	6	200.7	2	206	54	242 µg/L	9
Iron		✓	6	200.7	20	24,600	12,208	5,000 µg/L	1,000
Lead		✓	6	3113B	3	34.5	11.1	160 µg/L	2.5
Mercury	✓		6	245.1	0.2	<0.2	0	0.739 µg/L	0.77
Nickel		✓	6	200.7	4	25.6	13.3	1,450 µg/L	52
Selenium	✓		6	3113B	6	<6	0	235.8 µg/L	5.0
Silver	✓		6	200.7	1	<1	0	35.1 µg/L	3.2
Zinc		✓	6	200.7	10	771	211	420 µg/L	120
Cyanide	✓		6	4500CN	5	<5	0	178 mg/L	5.2
B. Non-Halogenated VOCs									
Total BTEX		✓	6	524.2	0.5	130.9	15.9	100 µg/L	---
Benzene		✓	6	524.2	0.5	244	42.7	5.0 µg/L	---
1,4 Dioxane		✓	6	8270D	0.25	0.950	0.607	200 µg/L	---
Acetone		✓	6	524.2	5	24.6	4.9	7.97 mg/L	---
Phenol	✓		6	420.1	100	<100	0	1,080 µg/L	300

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	✓		6	524.2	0.3	<0.3	0	4.4 µg/L	1.6
1,2 Dichlorobenzene		✓	6	524.2	0.5	1.0	0.3	600 µg/L	---
1,3 Dichlorobenzene	✓		6	524.2	0.5	<0.5	0	320 µg/L	---
1,4 Dichlorobenzene	✓		6	524.2	0.5	<0.5	0	5.0 µg/L	---
Total dichlorobenzene		✓	6	524.2	0.5	1.0	0.65	763 µg/L in NH	---
1,1 Dichloroethane	✓		6	524.2	1	<1	<1	70 µg/L	---
1,2 Dichloroethane	✓		6	524.2	1	<1	<1	5.0 µg/L	---
1,1 Dichloroethylene	✓		6	524.2	1	<1	<1	3.2 µg/L	---
Ethylene Dibromide	✓		6	504.1	0.015	<0.015	<0.015	0.05 µg/L	---
Methylene Chloride		✓	6	524.2	0.5	0.2	0.2	4.6 µg/L	---
1,1,1 Trichloroethane	✓		6	524.2	0.5	<0.5	<0.5	200 µg/L	---
1,1,2 Trichloroethane	✓		6	524.2	0.5	<0.5	<0.5	5.0 µg/L	---
Trichloroethylene	✓		6	524.2	0.5	<0.5	<0.5	5.0 µg/L	---
Tetrachloroethylene		✓	6	524.2	0.5	1.4	1.4	5.0 µg/L	3.3
cis-1,2 Dichloroethylene	✓		6	524.2	1	<1	<1	70 µg/L	---
Vinyl Chloride	✓		6	524.2	1	<1	<1	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates		✓	6	625 SIM	2.34	30.85	10.94	190 µg/L	3
Diethylhexyl phthalate		✓	6	625 SIM	1.87	24	8.79	101 µg/L	2.2
Total Group I PAHs		✓	6	625 SIM	0.05	1.38	0.597	1.0 µg/L	---
Benzo(a)anthracene		✓	6	625 SIM	0.05	0.25	0.110	As Total PAHs	NE
Benzo(a)pyrene		✓	6	625 SIM	0.05	0.26	0.127		NE
Benzo(b)fluoranthene		✓	6	625 SIM	0.05	0.33	0.155		NE
Benzo(k)fluoranthene		✓	6	625 SIM	0.05	0.12	0.063		NE
Chrysene		✓	6	625 SIM	0.05	0.24	0.123		0.0038
Dibenzo(a,h)anthracene		✓	6	625 SIM	0.05	0.05	0.047		0.0038
Indeno(1,2,3-cd)pyrene		✓	6	625 SIM	0.05	0.18	0.097		0.0038

[illegible]

E. Treatment system information

1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply) ☐ Adsorption/Absorption ☐ Advanced Oxidation Processes ☐ Air Stripping ☒ Granulated Activated Carbon (“GAC”)/Liquid Phase Carbon Adsorption ☐ Ion Exchange ☒ Precipitation/Coagulation/Flocculation ☒ Separation/Filtration ☐ Other; if so, specify:	
2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge. The treatment system is composed of flocculent tubes, two 10,000-gallon fractionation tank, one sand filter unit and two particulate filters, two granular activated carbon (GAC) filters and two clay vessels. The groundwater will pumped from the excavation into the flocculent tubes and then into the fractionation tanks. From the fractionation tanks, the pumped through a sand filter and particulate filter for the removal of solids, then into the GAC filters and clay vessels to remove organics and then through one more particulate filter to remove any residual solids Identify each major treatment component (check any that apply): ☒ Fractionation tanks ☐ Equalization tank ☐ Oil/water separator ☐ Mechanical filter ☒ Media filter ☐ Chemical feed tank ☐ Air stripping unit ☒ Bag filter ☐ Other; if so, specify: Indicate if either of the following will occur (check any that apply): ☐ Chlorination ☐ De-chlorination	
3. Provide the design flow capacity in gallons per minute (gpm) of the most limiting component. Indicate the most limiting component: 150 Is use of a flow meter feasible? (check one): ☒ Yes ☐ No, if so, provide justification:	50-150
Provide the proposed maximum effluent flow in gpm.	150
Provide the average effluent flow in gpm.	50
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	
4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): ☒ Yes ☐ No	

F. Chemical and additive information

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)

☐ Algaecides/biocides ☐ Antifoams ☒ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ☒ Flocculants ☐ Neutralizing agents ☐ Oxidants ☐ Oxygen ☐ scavengers ☐ pH conditioners ☐ Bioremedial agents, including microbes ☐ Chlorine or chemicals containing chlorine ☐ Other; if so, specify:

2. Provide the following information for each chemical/additive, using attachments, if necessary:

See attached cover letter/ SDS for the following information

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)).

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): ☒ Yes ☐ 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): ☐ Yes ☐ No

G. Endangered Species Act eligibility determination

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

☒ **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”.

☐ **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): ☐ Yes ☐ No; if no, is consultation underway? (check one): ☐ Yes ☐ No

☐ **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) ☐ the operator ☐ EPA ☐ Other; if so, specify:

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

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

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

H. National Historic Preservation Act eligibility determination

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

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

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

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

I. Supplemental information

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

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

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

J. Certification requirement

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

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

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

Check one: Yes ☒ No ☐

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

Check one: Yes ☒ No ☐

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

Check one: Yes ☒ No ☐ NA ☐

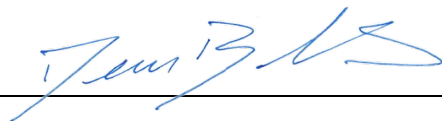
Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.

Check one: Yes ☒ No ☐ NA ☐

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

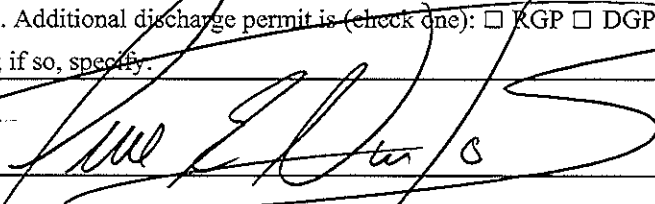
Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.

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:

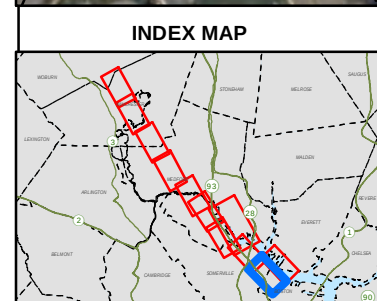
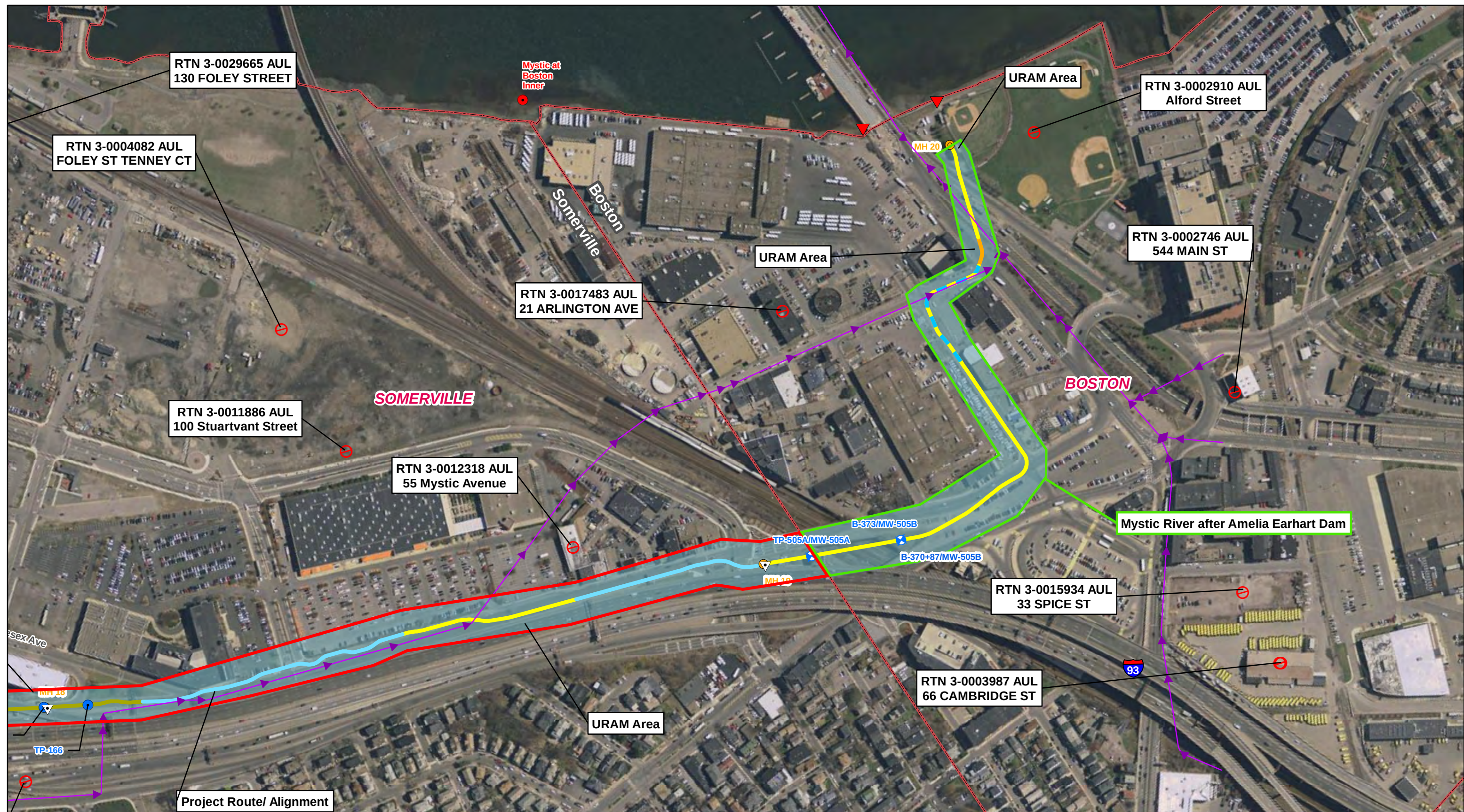


Date:

10/4/19

Print Name and Title: Jose Nieto, Project Manager

APPENDIX B



Legend

- Test Pit Location
- Geotech Boring
- Geotech Boring/ Monitoring Well
- River Sediment Sample
- MA DEP AUL Site
- Proposed Manhole
- Existing Manhole
- Surface Water Sample
- Municipal Boundary
- MWRA Sewer Pipe
- Laydown Yard
- RGP Boundaires Aberjona River
- RGP Boundaires Mystic River Crossing
- RGP Boundaires Mystic River after Amelia Earhart Dam
- RGP Boundary Winter Pond

Soil Type

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

Approximate Outfall Location

- Boston Water Sewer Commission
- MassDOT
- Medford
- Somerville
- Winchester

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**

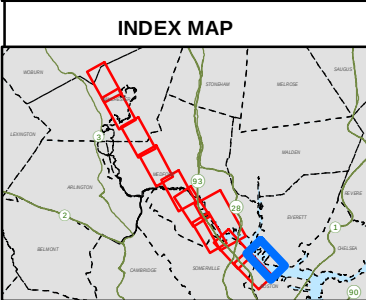
Figure 1: Aerial Dewatering Site Plan

Mapsheet 09 of 11

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Legend

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

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

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

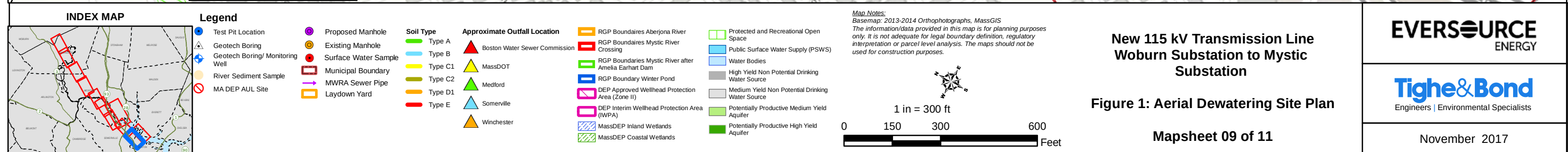
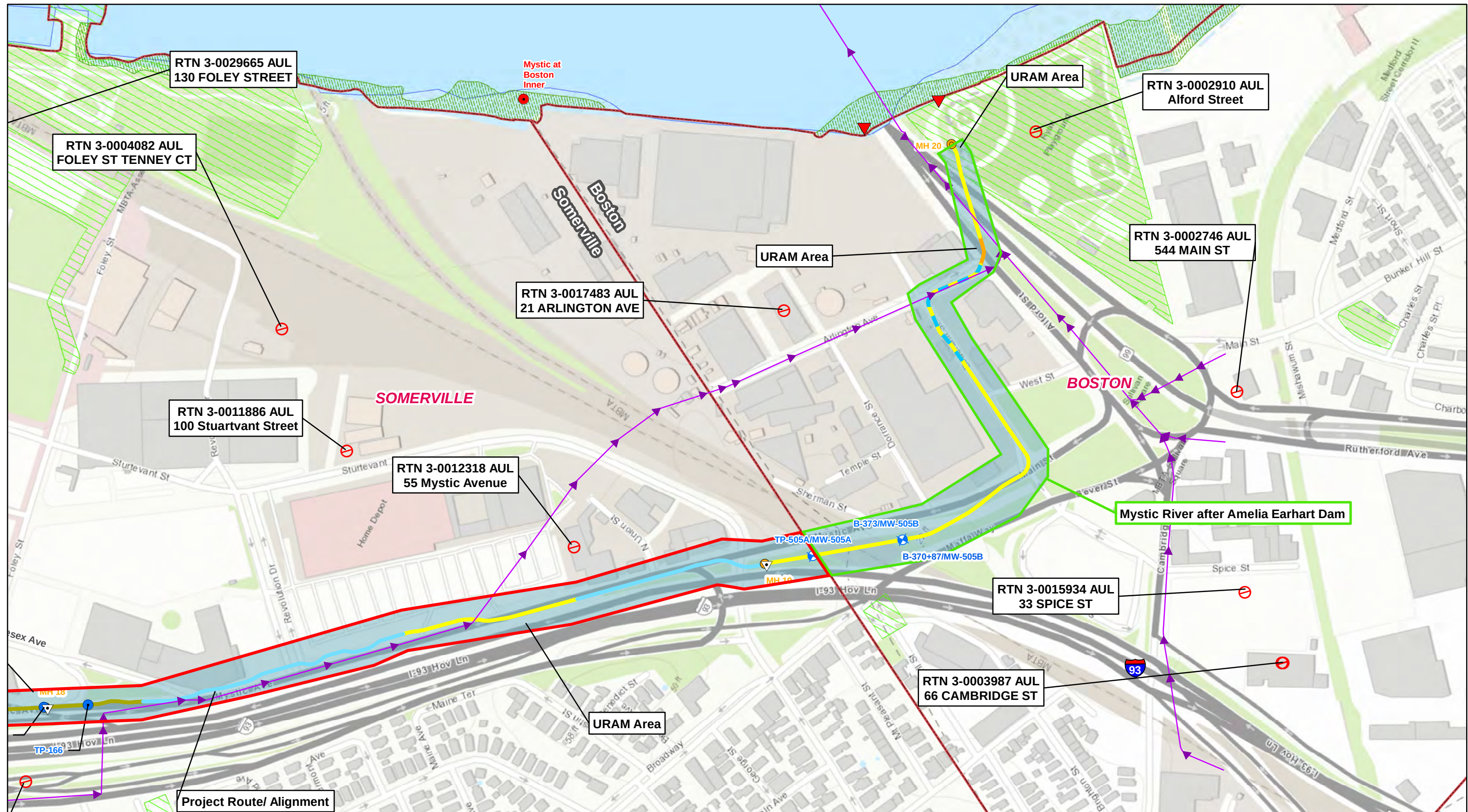
Figure 1: Aerial Dewatering Site Plan

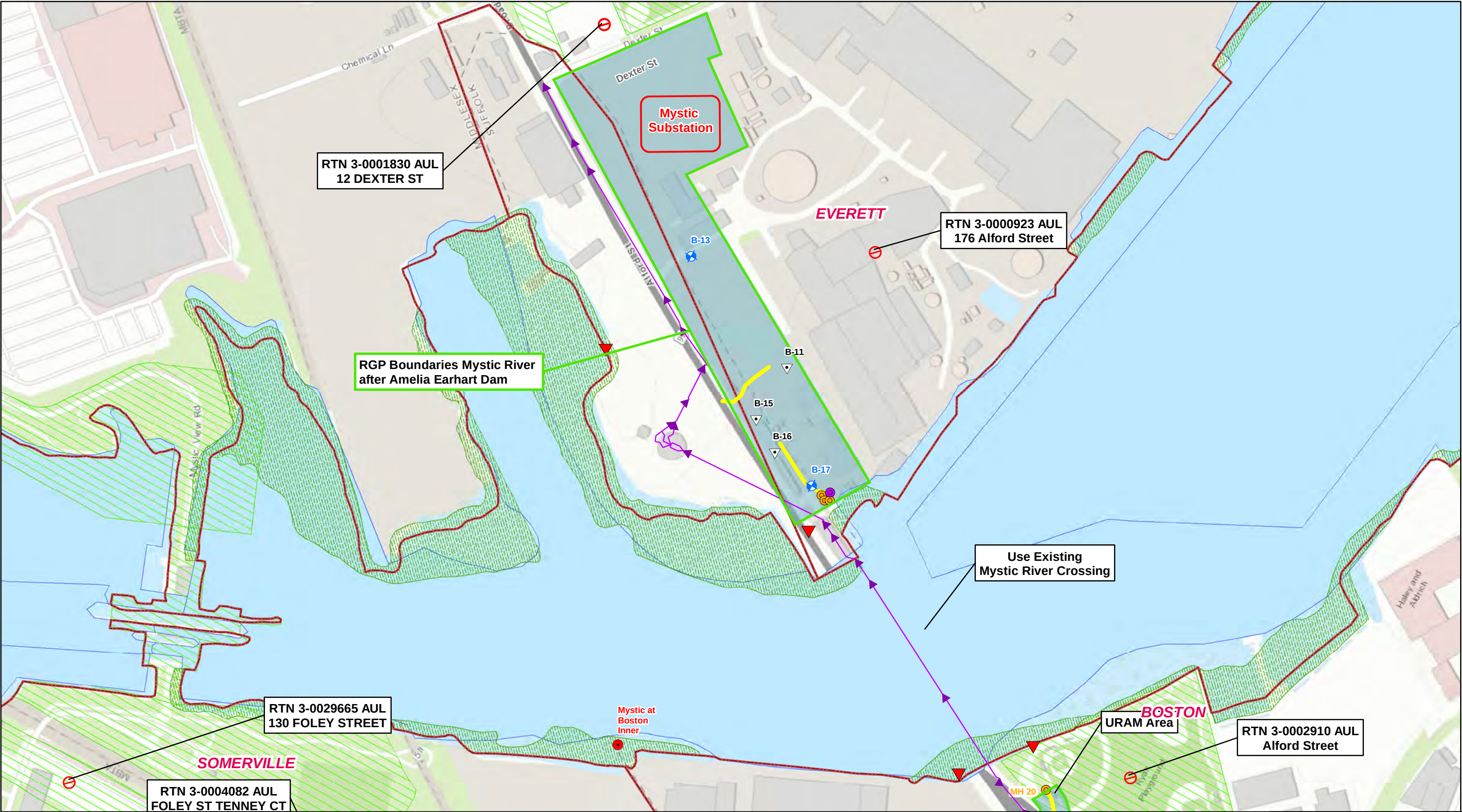
Mapsheet 10 of 11

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November 2017





INDEX MAP

Legend

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

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

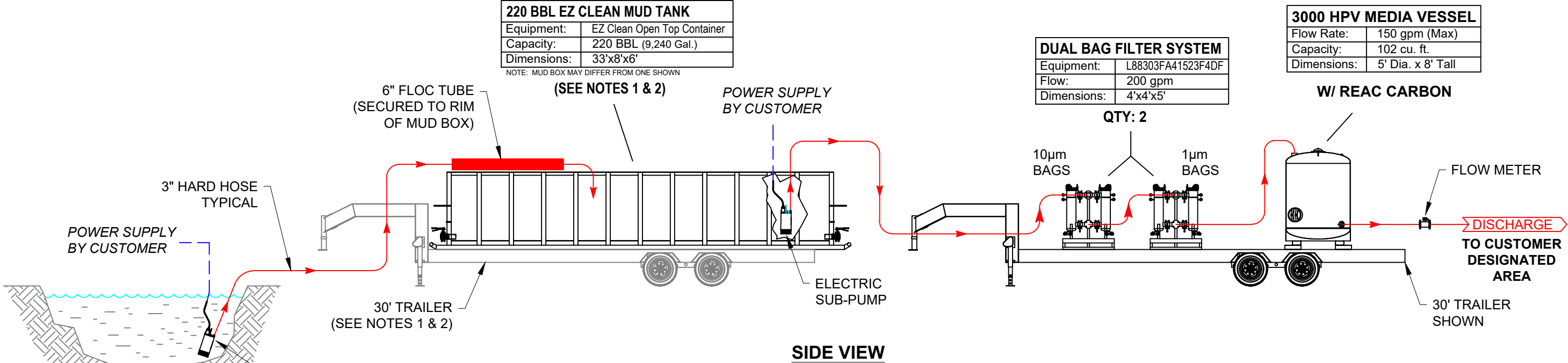
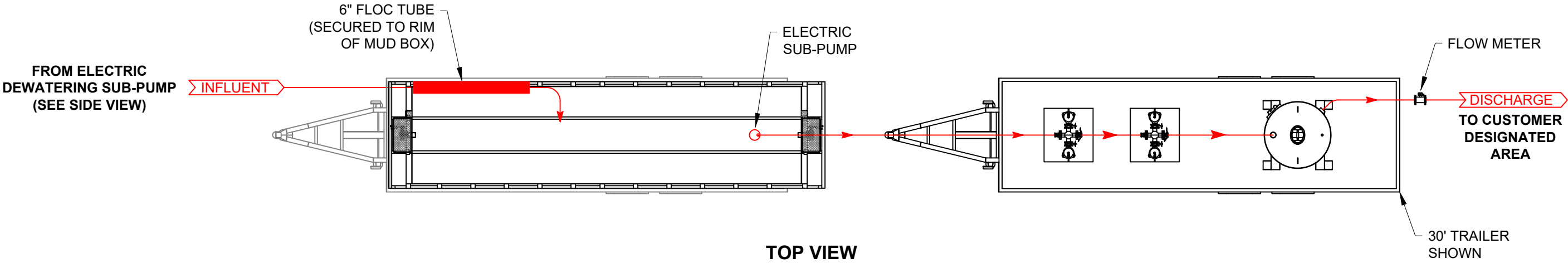
Mapsheet 10 of 11

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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: -

**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

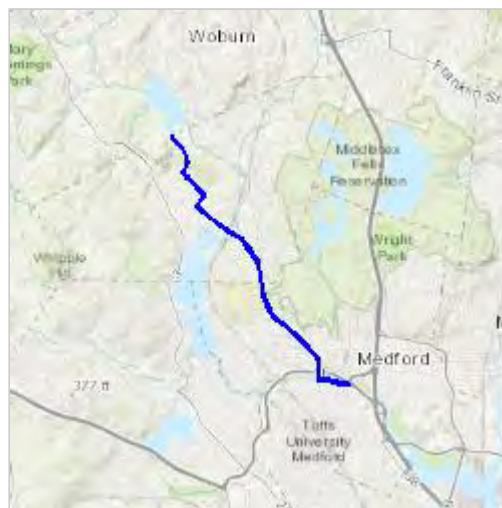
Project Type: ** OTHER **

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 <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

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



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 Project N-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
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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: Brona 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 _P = Enter discharge flow in MGD
0	Downstream 7Q10

Enter a dilution factor, if other than zero

↓	
0	

Enter values in the units specified

↓	
0	C _d = Enter influent hardness in mg/L CaCO ₃
0	C _s = Enter receiving water hardness in mg/L CaCO ₃

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

↓	
7.75	pH in Standard Units
17.2	Temperature in °C
0.43	Ammonia in mg/L
0	Hardness in mg/L CaCO ₃
14.9	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
0	Copper in µg/L
0	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
0	Zinc in µg/L

Enter **influent** concentrations in the units specified

↓	
0	TRC in µg/L
1.96	Ammonia in mg/L
0	Antimony in µg/L
7.5	Arsenic in µg/L
0.99	Cadmium in µg/L
16.7	Chromium III in µg/L
0	Chromium VI in µg/L
62.8	Copper in µg/L
15500	Iron in µg/L
7.6	Lead in µg/L
0	Mercury in µg/L
23.2	Nickel in µg/L
0	Selenium in µg/L
0	Silver in µg/L
771	Zinc in µg/L
0	Cyanide in µg/L
0	Phenol in µg/L
0	Carbon Tetrachloride in µg/L
1.4	Tetrachloroethylene in µg/L
30.85	Total Phthalates in µg/L
24	Diethylhexylphthalate in µg/L
0.25	Benzo(a)anthracene in µg/L
0.26	Benzo(a)pyrene in µg/L
0.33	Benzo(b)fluoranthene in µg/L
0.12	Benzo(k)fluoranthene in µg/L
0.24	Chrysene in µg/L
0.05	Dibenzo(a,h)anthracene in µg/L
0.18	Indeno(1,2,3-cd)pyrene in µg/L
0	Methyl-tert butyl ether in µg/L

Dilution Factor	0.0					
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	7.5	µg/L	50	µg/L
Total Suspended Solids	30	mg/L	---			
Antimony	206	µg/L	640	µg/L		
Arsenic	104	µg/L	36	µg/L		
Cadmium	10.2	µg/L	8.9	µg/L		
Chromium III	323	µg/L	100.0	µg/L		
Chromium VI	323	µg/L	50	µg/L		
Copper	242	µg/L	3.7	µg/L		
Iron	5000	µg/L	---	µg/L		
Lead	160	µg/L	8.5	µg/L		
Mercury	0.739	µg/L	1.11	µg/L		
Nickel	1450	µg/L	8.3	µg/L		
Selenium	235.8	µg/L	71	µg/L		
Silver	35.1	µg/L	2.2	µg/L		
Zinc	420	µg/L	86	µg/L		
Cyanide	178	mg/L	1.0	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	7.97	mg/L	---			
Phenol	1,080	µg/L	300	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	4.4		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

Analytical Test	Sample Identification Sample Date	Effluent Limitation	Sullivan Square		Station 250	
			MW-5058	MW-5058	B-3	B-17
			1/10/2017	1/11/2017	7/13/2017	7/13/2017
TPH - mg/L	TPH	5	ND (5)	ND (5)	ND(5,000)	ND(5,000)
Total PAHs Group I - ug/L	Benzo(a)Anthracene	0.0163	0.10	ND (0.05)	0.25	0.10
	Benzo(a)Pyrene	0.0163	0.19	ND (0.05)	0.26	0.09
	Benzo(b)Fluoranthene	0.0163	0.24	ND (0.05)	0.33	0.11
	Benzo(k)Fluoranthene	0.0163	0.06	ND (0.05)	0.12	ND(0.05)
	Chrysene	0.0163	0.15	ND (0.05)	0.24	0.12
	Dibenzo(a,h)Anthracene	0.0163	0.05	ND (0.05)	ND(0.05)	ND(0.05)
	Indeno(1,2,3-cd)Pyrene	0.0163	0.14	ND (0.05)	0.18	0.06
	Total PAHs Group I	1.0	0.93	ND	1.38	0.48
Total PAHs Group II - ug/L	Acenaphthene	NE	0.11	0.08	0.35	0.26
	Acenaphthylene	NE	ND (0.20)	ND (0.19)	ND(0.19)	ND(0.19)
	Anthracene	NE	0.06	ND (0.19)	ND(0.19)	ND(0.19)
	Benzo(ghi)Perylene	NE	0.18	ND (0.19)	0.19	ND(0.19)
	Fluoranthene	NE	0.14	ND (0.19)	0.41	0.31
	Fluorene	NE	0.11	0.06	0.19	ND(0.19)
	Naphthalene	20	1.72	17.4	ND(0.19)	0.37
	Phenanthrene	NE	0.21	0.06	ND(0.19)	0.48
	Pyrene	NE	0.27	0.02	ND(0.19)	0.39
	Total PAHs Group II	100	2.8	17.62	1.14	1.81
Phthalates - ug/L	Butylbenzylphthalate	NE	0.88	0.39	ND(2.34)	ND(2.34)
	Bis (2-Ethylhexyl) Phthalate	NE	24	2.88	9.48	8.31
	Diethylphthalate	NE	3.71	3.19	ND(2.34)	ND(2.34)
	Dimethylphthalate	NE	NA	NA	ND(2.34)	ND(2.34)
	Di-n-butylphthalate	NE	1.11	0.47	ND(2.34)	ND(2.34)
	Di-n-octylphthalate	NE	1.15	ND (2.34)	ND(2.34)	ND(2.34)
	Total Phthalates	190	30.85	6.93	9.48	8.31
SVOCs - ug/L	Pentachlorophenol	1.0	ND (0.90)	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(10.0)	ND(10.0)
	Arsenic	104	7.5	5.5	3.5	1.9
	Barium	NE	65	106	NA	NA
	Beryllium	NE	0.4	0.6	NA	NA
	Cadmium	10.2	ND (5.0)	0.05	0.99	0.42
	Chromium	NE	7.4	17.3	11.6	16.7
	Chromium III	323	ND (10)	17.0	11.6	16.7
	Lead	160	1.3	6.2	7.6	4.6
	Mercury	0.739	ND (0.20)	ND (0.20)	ND(0.200)	ND(0.200)
	Nickel	1,450	ND (10.0)	6.3	23.2	11.1
	Selenium	235.8	ND (5.0)	ND (5.0)	ND(2.0)	ND(2.0)
	Silver	35.1	ND (0.2)	ND (0.20)	ND(1.0)	ND(2.0)
	Thallium	NE	ND (1.0)	ND (10.0)	NA	NA
	Vanadium	NE	2.6	7.0	NA	NA
	Zinc	367	28.3	78.8	771	174
	Iron	5,000	15,500	15,400	7,430	9,260
	Copper	242	ND (10)	17	62.8	27.0
Ethanol - ug/L	Ethanol	Report	ND (10)	ND (10)	ND(10)	ND(10)
	1,2-Dibromoethane (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)	0.263	0.950
PCB - ug/L	Aroclor-1016	NE	ND (0.11)	ND (0.09)	ND(0.09)	ND(0.09)
	Aroclor-1221	NE	ND (0.11)	ND (0.09)	ND(0.09)	ND(0.09)
	Aroclor-1232	NE	ND (0.11)	ND (0.09)	ND(0.09)	ND(0.09)
	Aroclor-1242	NE	ND (0.11)	ND (0.09)	ND(0.09)	ND(0.09)
	Aroclor-1248	NE	ND (0.11)	ND (0.09)	ND(0.09)	ND(0.09)
	Aroclor-1254	NE	ND (0.11)	ND (0.09)	ND(0.09)	ND(0.09)
	Aroclor-1260	NE	ND (0.11)	ND (0.09)	ND(0.09)	0.10
	Aroclor-1262	NE	ND (0.11)	ND (0.09)	ND(0.09)	ND(0.09)
	Aroclor-1268	NE	ND (0.11)	ND (0.09)	ND(0.09)	ND(0.09)
	Total PCBs	0.000064	ND	ND	ND	0.10
VOCs - ug/L	tert-Butyl Alcohol (TBA)	120	ND (25.0)	ND (25.0)	ND(25.0)	ND(25.0)
	tert-Amyl Methyl Ether	90	ND (1.0)	ND (1.0)	ND(1.0)	ND(1.0)
	Naphthalene	20	2.5	22.6	0.6	1.1
	Carbon Tetrachloride	4.4	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.3)
	1,2 Dichlorobenzene (o-DCB)	600	0.3	1.0	ND(0.5)	ND(0.5)
	1,3 Dichlorobenzene (m-DCB)	320	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	1,4 Dichlorobenzene (p-DCB)	5.0	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	1,1 Dichloroethane (DCA)	70.0	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	1,2 Dichloroethane (DCA)	5.0	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	1,1 Dichloroethene (DCE)	3.2	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	sec-Butylbenzene	NE	2.9	ND (1.0)	NA	NA
	tert-Butyl Ethyl Ether (TBEE)	NE	1.3	ND (1.0)	NA	NA
	cis-1,2 Dichloroethene (DCE)	70	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Methylene Chloride	4.6	0.2	ND (2.0)	ND(0.5)	ND(0.5)
	Tetrachloroethene (PCE)	5.0	ND (1.0)	ND (1.0)	ND(0.5)	1.4
	1,1,1 Trichloro-ethane (TCA)	200	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	1,1,2 Trichloro-ethane (TCA)	5.0	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Trichloroethene (TCE)	5.0	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Methyl tert-Butyl Ether	70	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Acetone	7.97	10.3	ND (10)	18.1	24.6
	Vinyl Chloride	2.0	ND (1.0)	ND (1.0)	ND(0.2)	ND(0.2)
BTX - ug/L	Benzene	5.0	14.9	244	ND(0.5)	ND(0.5)
	Toluene	NE	1.3	4.2	ND(0.5)	ND(0.5)
	Ethylbenzene	NE	9.2	77.8	ND(0.5)	ND(0.5)
	Total Xylenes	NE	6.4	48.9	ND(0.5)	2.0
	Total BTX	100	31.8	130.9	ND	2.0
Classical Chemistry	Chloride (mg/L)	Report	63	70	1,040	399
	Ammonia (mg/L)	Report	0.16	ND (10)	1.96	0.77
	Hexavalent Chromium (ug/L)	323	ND (10)	ND (10)	ND(10.0)	ND(10.0)
	Total Cyanide (ug/L)	4	ND (5.00)	ND (5.00)	239,000	259,000
	Phenols (ug/L)	1,080	ND (100)	ND (100)	ND(5.00)	ND (5.00)
	Total Residual Chlorine (ug/L)	32	ND (10)	ND (10)	ND(10)	ND(10)
	Total Suspended Solids (ug/L)	300,000	39,800,000	62,000	ND(20.0)	ND(20.0)
	Hardness (ug/L)	NE	NA	NA	27,600,000	474,000

Notes:

VOCs = Volatile Organic Compounds

SVOCs = Semi-Volatile Organic

TPH = Total Petroleum

PCBs = Polychlorinated biphenyls

mg/L = milligrams per kilogram

ug/L = micrograms per kilogram

< 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

Red text = exceeds effluent

TABLE 2**Surface Water Results**

Eversource: Woburn - Mystic

Analytical Test	Sample Identification	Effluent Limitation	Mystic at Boston Inner
	Sample Date		11/15/2017
Metals (ug/L)	Arsenic	104	ND(5)
	Cadmium	10.2	ND(10)
	Chromium	323	ND(20)
	Chromium III	323	ND(20)
	Copper	16	ND(10)
	Iron	5,000	ND(100)
	Lead	160	ND(2)
	Nickel	1,450	ND(20)
	Silver	35.1	NA
	Zinc	367	ND(50)
Classical Chemistry	Ammonia as N (mg/L)	Report	0.43
	Hexavalent Chromium (ug/L)	323	ND(10)
	pH	NE	7.75
	Salinity (ppt)	NE	14.9
	Hardness (ug/L)	NE	NA

Notes:*mg/L= milligrams per kilogram (ppm)**ug/L= micrograms per kilogram (ppb)**NE = Not Established**NA = Not Analyzed**ND = Not Detected*

APPENDIX F



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-Cl 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-Cl 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-Cl 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-Cl 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-Cl 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):

☒ 8260 VOC CAM II A	☐ 7470/7471 Hg CAM III B	☐ MassDEP VPH CAM IV A	☐ 8081 Pesticides CAM V B	☒ 7196 Hex Cr CAM VI B	☐ MassDEP APH CAM IX A
☒ 8270 SVOC CAM II B	☒ 7010 Metals CAM III C	☐ MassDEP EPH CAM IV B	☐ 8151 Herbicides CAM V C	☐ 8330 Explosives CAM VIII A	☐ TO-15 VOC CAM IX B
☒ 6010 Metals CAM III A	☐ 6020 Metals CAM III D	☒ 8082 PCB CAM V A	☐ 6860 Perchlorate CAM VIII B	☒ 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 ☒ No ☐
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes ☒ No ☐
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 ☒ No ☐
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 ☒ No ☐
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 ☐ No ☐
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ☐ No ☐
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 ☒ No ☐

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)? 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.	Yes ☒ No ☐ *
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	Yes ☐ No ☒ *
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ☐ No ☒ *

***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-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 23:09	50	25	CA71146
Arsenic	5.5 (5.0)	0.4	7010		1	KJK	01/14/17 16:23	50	25	CA71146
Barium	106 (25.0)	1.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Beryllium	0.6 (0.5)	0.1	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Cadmium	J 0.05 (0.5)	0.03	7010		1	KJK	01/17/17 16:16	50	25	CA71146
Chromium	17.3 (10.0)	1.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Chromium III	17 (10)		6010C		1	JLK	01/13/17 3:56	1	1	[CALC]
Copper	18.7 (5.0)	2.0	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Iron	15400 (50.0)	11.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Lead	6.2 (2.5)	0.5	7010		1	KJK	01/18/17 21:29	50	25	CA71146
Mercury	ND (0.20)	0.12	7470A		1	MJV	01/13/17 12:56	20	40	CA71147
Nickel	J 6.3 (10.0)	1.0	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Selenium	ND (5.0)	0.6	7010		1	KJK	01/15/17 3:58	50	25	CA71146
Silver	ND (0.2)	0.08	7010		1	KJK	01/17/17 19:22	50	25	CA71146
Thallium	ND (1.0)	0.5	7010		1	KJK	01/14/17 19:04	50	25	CA71146
Vanadium	J 7.0 (10.0)	1.0	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Zinc	B 78.8 (25.0)	4.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 15:04		CA71203
Aroclor 1221	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1232	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1242	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1248	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1254	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1260	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1262	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1268	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	73 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	78 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	78 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	63 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 20:06	C7A0161	CA71231
1,1,2-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,1-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,1-Dichloroethene	ND (1.0)	0.3	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,2-Dibromoethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,2-Dichlorobenzene	J 1.0 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,2-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,3-Dichlorobenzene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,4-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,4-Dioxane - Screen	ND (500)	190	8260B		1	01/12/17 20:06	C7A0161	CA71231
Acetone	ND (10.0)	2.7	8260B		1	01/12/17 20:06	C7A0161	CA71231
Benzene	244 (10.0)	1.0	8260B		10	01/13/17 18:32	C7A0161	CA71231
Carbon Tetrachloride	ND (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
cis-1,2-Dichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Ethylbenzene	77.8 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
Methyl tert-Butyl Ether	ND (1.0)	0.3	8260B		1	01/12/17 20:06	C7A0161	CA71231
Methylene Chloride	ND (2.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Naphthalene	22.6 (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Tertiary-amyl methyl ether	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Tertiary-butyl Alcohol	ND (25.0)	10.0	8260B		1	01/12/17 20:06	C7A0161	CA71231
Tetrachloroethene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Toluene	4.2 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
Trichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Vinyl Chloride	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Xylene O	8.1 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
Xylene P,M	40.8 (2.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	98 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	93 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	97 %		70-130
<i>Surrogate: Toluene-d8</i>	98 %		70-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 0.08 (0.19)	0.04	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Acenaphthylene	ND (0.19)	0.03	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Anthracene	ND (0.19)	0.03	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(a)anthracene	ND (0.05)	0.01	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(a)pyrene	ND (0.05)	0.01	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(b)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(g,h,i)perylene	ND (0.19)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(k)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
bis(2-Ethylhexyl)phthalate	B 2.88 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Butylbenzylphthalate	B, J 0.39 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Chrysene	ND (0.05)	0.01	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Dibenzo(a,h)Anthracene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Diethylphthalate	3.19 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Dimethylphthalate	ND (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Di-n-butylphthalate	J 0.47 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Di-n-octylphthalate	ND (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Fluoranthene	ND (0.19)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Fluorene	J 0.06 (0.19)	0.03	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Indeno(1,2,3-cd)Pyrene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Naphthalene	17.4 (0.93)	0.20	8270D SIM		5	01/13/17 15:29	C7A0164	CA71116
Pentachlorophenol	ND (0.84)	0.30	8270D SIM		1	01/19/17 14:01	C7A0164	CA71116
Phenanthrene	J 0.06 (0.19)	0.04	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Pyrene	J 0.02 (0.19)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	63 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	131 %	S+	15-110
<i>Surrogate: 2-Fluorobiphenyl</i>	74 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	82 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	84 %		30-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 17:18	mg/L	CA71301
Chloride	70.0 (10.0)		§		1	SUB	01/13/17 20:47	mg/L	CA71826
Hexavalent Chromium	ND (10)		7196A		1	JLK	01/11/17 21:00	ug/L	CA71144
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	62000 (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-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 20:29		CA71322
		<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-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 18:27		CA71246



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B
Date Sampled: 01/11/17 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-06
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 23:14	50	25	CA71146
Arsenic	7.5 (5.0)	0.4	7010		1	KJK	01/14/17 16:40	50	25	CA71146
Barium	65.0 (25.0)	1.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Beryllium	J 0.4 (0.5)	0.1	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Cadmium	ND (0.5)	0.03	7010		1	KJK	01/17/17 16:22	50	25	CA71146
Chromium	J 7.4 (10.0)	1.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Chromium III	ND (10)		6010C		1	KJK	01/13/17 4:00	1	1	[CALC]
Copper	5.3 (5.0)	2.0	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Iron	15500 (50.0)	11.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Lead	J 1.3 (2.5)	0.5	7010		1	KJK	01/14/17 22:47	50	25	CA71146
Mercury	ND (0.20)	0.12	7470A		1	MJV	01/13/17 12:58	20	40	CA71147
Nickel	ND (10.0)	1.0	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Selenium	ND (5.0)	0.6	7010		1	KJK	01/15/17 4:15	50	25	CA71146
Silver	ND (0.2)	0.08	7010		1	KJK	01/17/17 20:20	50	25	CA71146
Thallium	ND (1.0)	0.5	7010		1	KJK	01/14/17 19:10	50	25	CA71146
Vanadium	J 2.6 (10.0)	1.0	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Zinc	B 28.3 (25.0)	4.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146



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

Total Metals

Batch CA71144 - [CALC]

Blank

Chromium III	ND	10	ug/L							

LCS

Chromium III	ND		ug/L							

LCS Dup

Chromium III	ND		ug/L							

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

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							

LCS

Mercury	6.34	0.20	ug/L	6.000		106	80-120			

LCS Dup

Mercury	6.26	0.20	ug/L	6.000		104	80-120	1	20	

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			



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

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

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

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

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

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							

LCS

Total Residual Chlorine	2		mg/L	1.800		100	85-115			

Batch CA71144 - General Preparation

Blank

Hexavalent Chromium	ND	10	ug/L							

LCS

Hexavalent Chromium	0.5		mg/L	0.4998		99	90-110			

LCS Dup

Hexavalent Chromium	0.5		mg/L	0.4998		99	90-110	0.2	20	

Batch CA71229 - General Preparation

Blank

Total Suspended Solids	ND	5000	ug/L							

LCS

Total Suspended Solids	64		mg/L	68.70		93	80-120			

Batch CA71301 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L							

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

Classical Chemistry

Batch CA71301 - NH4 Prep

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

LCS

Ammonia as N	1.11	0.10	mg/L	0.9994		112	80-120			

Batch CA71306 - General Preparation

Blank

Total Petroleum Hydrocarbon	ND	5	mg/L							

LCS

Total Petroleum Hydrocarbon	15	5	mg/L	19.38		78	66-114			

Batch CA71317 - TCN Prep

Blank

Total Cyanide (LL)	ND	5.00	ug/L							

LCS

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

LCS

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

LCS Dup

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

Batch CA71336 - General Preparation

Blank

Phenols	ND	100	ug/L							

LCS

Phenols	116	100	ug/L	100.0		116	80-120			

LCS

Phenols	997	100	ug/L	1000		100	80-120			

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

Batch CA71322 - 504/8011

Blank

1,2-Dibromoethane	ND	0.015	ug/L							

1,2-Dibromoethane [2C]	ND	0.015	ug/L							

Surrogate: Pentachloroethane	0.162		ug/L	0.2000		81	30-150			

Surrogate: Pentachloroethane [2C]	0.151		ug/L	0.2000		76	30-150			

LCS

1,2-Dibromoethane	0.200	0.015	ug/L	0.2000		100	60-140			

1,2-Dibromoethane [2C]	0.190	0.015	ug/L	0.2000		95	70-130			

Surrogate: Pentachloroethane	0.167		ug/L	0.2000		83	30-150			

Surrogate: Pentachloroethane [2C]	0.162		ug/L	0.2000		81	30-150			

LCS

1,2-Dibromoethane	0.084	0.015	ug/L	0.08000		105	60-140			

1,2-Dibromoethane [2C]	0.057	0.015	ug/L	0.08000		72	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

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.

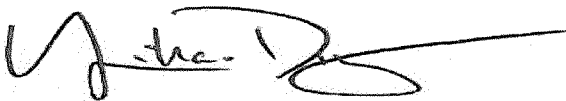
All samples were analyzed within the established guidelines of US EPA approved methods with all requirements met, unless otherwise noted at the end of a given sample's analytical results or in a case narrative.

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		☒ Yes ☐ No		Internal Use Only				Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-Na2S2O3			
Seals Intact		☒ Yes ☐ No NA:		☐ Pickup				Sampled by:			
Cooler Temperature: <u>3.5°C</u>				☐ Technician				Comments:			
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:

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

Analysis

TSS

TRC

Ammonia

Chloride

Lead

Chrom

Hex. Chrom

Tric. Chrom

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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

Analysis

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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

Analysis

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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

Analysis

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TRC

Ammonia

Chloride

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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:

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

Sample Matrix Sample ID

ESS Lab ID Collection Date Collection Time

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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

Analysis

Ammonia

chloride

TRC

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Container Type: AG-Amber Glass

B-BOD Bottle

G-Glass

P-Poly

S-Sterile

V-Vial

O-Other

Preservation Code: 1-Non Preserved

2-HCl

3-H2SO4

4-HNO3

5-NaOH

6-Methanol

7-Na2S2O3

8-ZnAcAc

9-NH4Cl

10-DI H2O

11-Other

Number of Containers: 73

Sampled by: pu

Comments:

Cooler Present: yes

Seals Intact:

Cooler Temperature: 5.8 °C

Relinquished by: (Signature, Date & Time)

Received By: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time)

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Received By: (Signature, Date & Time)

CERTIFICATE OF ANALYSIS

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

RE: Station 250/Mystic Charlestown Eversource RGP (N/A)
ESS Laboratory Work Order Number: 1707259

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 3:36 pm, Jul 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: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

SAMPLE RECEIPT

The following samples were received on July 13, 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 laboratory that is able to achieve this limit. The data for Ethanol has been reported using our current method reporting limit.

Lab Number	Sample Name	Matrix	Analysis
1707259-01	B-3	Ground Water	1664A, 200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608, 625 SIM, 8270D SIM, ASTM D3695
1707259-02	B-17	Ground Water	1664A, 200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608, 625 SIM, 8270D SIM, ASTM D3695

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

PROJECT NARRATIVE

524.2 Volatile Organic Compounds

1707259-01 Due to high sediment content vials were composited
 1707259-02 Due to high sediment content vials were composited
 C7G0199-CCV1 Continuing Calibration %Diff/Drift is above control limit (CD+).
 1,1-Dichloroethene (86% @ 30%), Tertiary-butyl Alcohol (63% @ 30%)
 CG71431-BSD1 Blank Spike recovery is above upper control limit (B+).
 1,1-Dichloroethene (201% @ 70-130%), Tertiary-butyl Alcohol (163% @ 70-130%)
 CG71431-BSD1 Relative percent difference for duplicate is outside of criteria (D+).
 1,1-Dichloroethene (59% @ 20%), Tertiary-butyl Alcohol (33% @ 25%)

625(SIM) Semi-Volatile Organic Compounds

1707259-01 Present in Method Blank (B).
 bis(2-Ethylhexyl)phthalate
 1707259-01 Surrogate recovery(ies) below lower control limit (S-).
 1,2-Dichlorobenzene-d4 (29% @ 30-130%)
 1707259-02 Present in Method Blank (B).
 bis(2-Ethylhexyl)phthalate
 C7G0249-CCV1 Continuing Calibration %Diff/Drift is above control limit (CD+).
 Di-n-octylphthalate (24% @ 20%)
 CG71808-BS2 Blank Spike recovery is above upper control limit (B+).
 Benzo(k)fluoranthene (142% @ 40-140%), bis(2-Ethylhexyl)phthalate (268% @ 40-140%),
 Di-n-octylphthalate (151% @ 40-140%), Pyrene (144% @ 40-140%)
 CG71808-BSD2 Blank Spike recovery is above upper control limit (B+).
 Benzo(a)pyrene (150% @ 40-140%), Benzo(b)fluoranthene (148% @ 40-140%), Benzo(k)fluoranthene
 (154% @ 40-140%), bis(2-Ethylhexyl)phthalate (244% @ 40-140%), Butylbenzylphthalate (142% @
 40-140%), Di-n-butylphthalate (153% @ 40-140%), Di-n-octylphthalate (159% @ 40-140%), Pyrene
 (146% @ 40-140%)

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

C7G0195-TUN1 DDT breakdown > 20%

Classical Chemistry

1707259-01 The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
 1707259-02 The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.

No other observations noted.

End of Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

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](#)

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: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
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 (10.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Arsenic	3.5 (1.0)		3113B		1	KJK	07/19/17 5:32	100	20	CG71436
Cadmium	0.99 (0.25)		3113B		5	KJK	07/18/17 18:35	100	20	CG71436
Chromium	11.6 (4.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Chromium III	11.6 (10.0)		200.7		1	JLK	07/15/17 15:59	1	1	[CALC]
Copper	62.8 (4.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Hardness	239000 (165)		200.7		1	KJK	07/15/17 15:59	1	1	[CALC]
Iron	7430 (20.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Lead	7.6 (1.0)		3113B		1	KJK	07/18/17 23:07	100	20	CG71436
Mercury	ND (0.200)		245.1		1	MJV	07/17/17 20:03	20	40	CG71438
Nickel	23.2 (10.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Selenium	ND (2.0)		3113B		1	KJK	07/19/17 8:20	100	20	CG71436
Silver	ND (1.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Zinc	771 (10.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: GEM

524.2 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 (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,1,2-Trichloroethane	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,1-Dichloroethane	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,1-Dichloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,2-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,2-Dichloroethane	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,3-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,4-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Acetone	18.1 (5.0)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Benzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Carbon Tetrachloride	ND (0.3)		524.2		1	07/14/17 12:53	C7G0199	CG71431
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Ethylbenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Methylene Chloride	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Naphthalene	0.6 (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Tetrachloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Toluene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Trichloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Vinyl Chloride	ND (0.2)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Xylene O	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Xylene P,M	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	<i>111 %</i>		<i>80-120</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>104 %</i>		<i>80-120</i>



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 7/14/17 11:05

608 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)		608		1	07/14/17 19:07		CG71414
Aroclor 1221	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1232	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1242	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1248	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1254	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1260	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1262	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1268	ND (0.09)		608		1	07/14/17 19:07		CG71414

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: Decachlorobiphenyl	43 %		30-150
Surrogate: Decachlorobiphenyl [2C]	47 %		30-150
Surrogate: Tetrachloro-m-xylene	66 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	73 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/18/17 13:45

625(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	0.35 (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Acenaphthylene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Anthracene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(a)anthracene	0.25 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(a)pyrene	0.26 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(b)fluoranthene	0.33 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(g,h,i)perylene	0.19 (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(k)fluoranthene	0.12 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
bis(2-Ethylhexyl)phthalate	B 9.48 (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Butylbenzylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Chrysene	0.24 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Dibenzo(a,h)Anthracene	ND (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Diethylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Dimethylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Di-n-butylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Di-n-octylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Fluoranthene	0.41 (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Fluorene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Indeno(1,2,3-cd)Pyrene	0.18 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Naphthalene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Pentachlorophenol	ND (0.84)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Phenanthrene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Pyrene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	29 %	S-	30-130
Surrogate: 2,4,6-Tribromophenol	76 %		15-110
Surrogate: 2-Fluorobiphenyl	45 %		30-130
Surrogate: Nitrobenzene-d5	47 %		30-130
Surrogate: p-Terphenyl-d14	59 %		30-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 7/14/17 16:30

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

<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>
1,4-Dioxane	0.263 (0.250)		8270D SIM		1	07/17/17 16:45	C7G0223	CG71356

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,4-Dioxane-d8	36 %		15-115



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
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	1.96 (0.10)		350.1		1	EEM	07/18/17 14:46	mg/L	CG71705
Chloride	1040 (250)		300.0		500	JLK	07/17/17 23:04	mg/L	CG71735
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	07/13/17 22:16	ug/L	CG71352
Phenols	ND (100)		420.1		1	EEM	07/19/17 14:45	ug/L	CG71920
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	07/18/17 11:05	ug/L	CG71817
Total Petroleum Hydrocarbon	ND (5)		1664A		1	CRR	07/19/17 15:05	mg/L	CG71740
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	07/13/17 21:46	ug/L	CG71353
Total Suspended Solids	27600 (100)		2540D		1	EEM	07/14/17 14:30	mg/L	CG71317



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/14/17 11:30

504.1 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>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2-Dibromoethane	ND (0.015)		504.1		1	07/14/17 15:08		CG71426
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: Pentachloroethane</i>		125 %		30-150				
<i>Surrogate: Pentachloroethane [2C]</i>		116 %		30-150				



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 7/19/17 10:04

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)		ASTM D3695		1	ZLC	07/19/17 11:58		CG71915



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
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 (10.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Arsenic	1.9 (1.0)		3113B		1	KJK	07/19/17 5:43	100	20	CG71436
Cadmium	0.42 (0.15)		3113B		3	KJK	07/18/17 17:26	100	20	CG71436
Chromium	16.7 (4.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Chromium III	16.7 (10.0)		200.7		1	JLK	07/15/17 16:04	1	1	[CALC]
Copper	27.0 (4.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Hardness	259000 (165)		200.7		1	KJK	07/15/17 16:04	1	1	[CALC]
Iron	9260 (20.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Lead	4.6 (1.0)		3113B		1	KJK	07/19/17 0:44	100	20	CG71436
Mercury	ND (0.200)		245.1		1	MJV	07/17/17 20:05	20	40	CG71438
Nickel	11.1 (10.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Selenium	ND (2.0)		3113B		1	KJK	07/19/17 9:00	100	20	CG71436
Silver	ND (1.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Zinc	174 (10.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: GEM

524.2 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 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,1,2-Trichloroethane	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,1-Dichloroethane	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,1-Dichloroethene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,2-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,2-Dichloroethane	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,3-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,4-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Acetone	24.6 (5.0)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Benzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Carbon Tetrachloride	ND (0.3)		524.2		1	07/14/17 13:27	C7G0199	CG71431
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Ethylbenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Methylene Chloride	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Naphthalene	1.1 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Tetrachloroethene	1.4 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Toluene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Trichloroethene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Vinyl Chloride	ND (0.2)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Xylene O	0.7 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Xylene P,M	1.3 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	<i>106 %</i>		<i>80-120</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>101 %</i>		<i>80-120</i>



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 7/14/17 11:05

608 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)		608		1	07/14/17 19:25		CG71414
Aroclor 1221	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1232	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1242	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1248	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1254	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1260	0.10 (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1262	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1268	ND (0.09)		608		1	07/14/17 19:25		CG71414

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	51 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	54 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	85 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	95 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/18/17 13:45

625(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	0.26 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Acenaphthylene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Anthracene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(a)anthracene	0.10 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(a)pyrene	0.09 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(b)fluoranthene	0.11 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(g,h,i)perylene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(k)fluoranthene	ND (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
bis(2-Ethylhexyl)phthalate	B 8.31 (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Butylbenzylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Chrysene	0.12 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Dibenzo(a,h)Anthracene	ND (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Diethylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Dimethylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Di-n-butylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Di-n-octylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Fluoranthene	0.31 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Fluorene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Indeno(1,2,3-cd)Pyrene	0.06 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Naphthalene	0.37 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Pentachlorophenol	ND (0.84)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Phenanthrene	0.48 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Pyrene	0.39 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	30 %		30-130
Surrogate: 2,4,6-Tribromophenol	61 %		15-110
Surrogate: 2-Fluorobiphenyl	46 %		30-130
Surrogate: Nitrobenzene-d5	51 %		30-130
Surrogate: p-Terphenyl-d14	58 %		30-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 7/14/17 16:30

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

<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>
1,4-Dioxane	0.950 (0.250)		8270D SIM		1	07/17/17 17:17	C7G0223	CG71356

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,4-Dioxane-d8	36 %		15-115



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
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	0.77 (0.10)		350.1		1	EEM	07/18/17 14:47	mg/L	CG71705
Chloride	399 (50.0)		300.0		100	JLK	07/17/17 20:38	mg/L	CG71735
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	07/13/17 22:16	ug/L	CG71352
Phenols	ND (100)		420.1		1	EEM	07/19/17 14:45	ug/L	CG71920
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	07/18/17 11:05	ug/L	CG71817
Total Petroleum Hydrocarbon	ND (5)		1664A		1	CRR	07/19/17 15:05	mg/L	CG71740
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	07/13/17 21:46	ug/L	CG71353
Total Suspended Solids	474 (10)		2540D		1	EEM	07/14/17 14:30	mg/L	CG71317



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/14/17 11:30

504.1 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>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2-Dibromoethane	ND (0.015)		504.1		1	07/14/17 16:08		CG71426
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: Pentachloroethane</i>		75 %		30-150				
<i>Surrogate: Pentachloroethane [2C]</i>		72 %		30-150				



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 7/19/17 10:04

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)		ASTM D3695		1	ZLC	07/19/17 12:44		CG71915



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

Total Metals

Batch CG71352 - [CALC]

Blank

Chromium III	ND	10.0	ug/L

LCS

Chromium III	ND		ug/L

LCS Dup

Chromium III	ND		ug/L

Batch CG71436 - 3005A

Blank

Antimony	ND	10.0	ug/L
Arsenic	ND	1.0	ug/L
Cadmium	ND	0.05	ug/L
Chromium	ND	4.0	ug/L
Chromium III	ND	4.00	ug/L
Copper	ND	4.0	ug/L
Hardness	ND	165	ug/L
Iron	ND	20.0	ug/L
Lead	ND	1.0	ug/L
Nickel	ND	10.0	ug/L
Selenium	ND	2.0	ug/L
Silver	ND	1.0	ug/L
Zinc	ND	10.0	ug/L

LCS

Antimony	99.1	10.0	ug/L	100.0	99	85-115
Arsenic	98.8	25.0	ug/L	100.0	99	85-115
Cadmium	49.8	25.0	ug/L	50.00	100	85-115
Chromium	100	4.0	ug/L	100.0	100	85-115
Chromium III	100	4.00	ug/L			
Copper	106	4.0	ug/L	100.0	106	85-115
Hardness	6520	165	ug/L			
Iron	475	20.0	ug/L	500.0	95	85-115
Lead	111	25.0	ug/L	100.0	111	85-115
Nickel	102	10.0	ug/L	100.0	102	85-115
Selenium	217	50.0	ug/L	200.0	109	85-115
Silver	46.6	1.0	ug/L	50.00	93	85-115
Zinc	103	10.0	ug/L	100.0	103	85-115

LCS Dup

Antimony	107	10.0	ug/L	100.0	107	85-115	7	20
Arsenic	96.2	25.0	ug/L	100.0	96	85-115	3	20
Cadmium	55.3	25.0	ug/L	50.00	111	85-115	10	20
Chromium	108	4.0	ug/L	100.0	108	85-115	7	20
Chromium III	108	4.00	ug/L					
Copper	114	4.0	ug/L	100.0	114	85-115	7	20
Hardness	6960	165	ug/L					
Iron	513	20.0	ug/L	500.0	103	85-115	8	20



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

Total Metals

Batch CG71436 - 3005A

Lead	107	25.0	ug/L	100.0		107	85-115	4	20	
Nickel	109	10.0	ug/L	100.0		109	85-115	7	20	
Selenium	226	50.0	ug/L	200.0		113	85-115	4	20	
Silver	48.2	1.0	ug/L	50.00		96	85-115	3	20	
Zinc	105	10.0	ug/L	100.0		105	85-115	2	20	

Batch CG71438 - 245.1/7470A

Blank

Mercury	ND	0.200	ug/L							

LCS

Mercury	6.42	0.200	ug/L	6.000		107	85-115			

LCS Dup

Mercury	6.30	0.200	ug/L	6.000		105	85-115	2	20	

524.2 Volatile Organic Compounds

Batch CG71431 - 524.2

Blank

1,1,1-Trichloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	0.5	ug/L							
1,1-Dichloroethane	ND	0.5	ug/L							
1,1-Dichloroethene	ND	0.5	ug/L							
1,2-Dichlorobenzene	ND	0.5	ug/L							
1,2-Dichloroethane	ND	0.5	ug/L							
1,3-Dichlorobenzene	ND	0.5	ug/L							
1,4-Dichlorobenzene	ND	0.5	ug/L							
Acetone	ND	5.0	ug/L							
Benzene	ND	0.5	ug/L							
Carbon Tetrachloride	ND	0.3	ug/L							
cis-1,2-Dichloroethene	ND	0.5	ug/L							
Ethylbenzene	ND	0.5	ug/L							
Methyl tert-Butyl Ether	ND	0.5	ug/L							
Methylene Chloride	ND	0.5	ug/L							
Naphthalene	ND	0.5	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tertiary-butyl Alcohol	ND	25.0	ug/L							
Tetrachloroethene	ND	0.5	ug/L							
Toluene	ND	0.5	ug/L							
Trichloroethene	ND	0.5	ug/L							
Vinyl Chloride	ND	0.2	ug/L							
Xylene O	ND	0.5	ug/L							
Xylene P,M	ND	0.5	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	5.10		ug/L	5.000		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.02		ug/L	5.000		100	80-120			

LCS

1,1,1-Trichloroethane	10.6		ug/L	10.00		106	70-130			



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

524.2 Volatile Organic Compounds

Batch CG71431 - 524.2

1,1,2-Trichloroethane	10.2		ug/L	10.00		102	70-130			
1,1-Dichloroethane	10.0		ug/L	10.00		100	70-130			
1,1-Dichloroethene	11.0		ug/L	10.00		110	70-130			
1,2-Dichlorobenzene	10.3		ug/L	10.00		103	70-130			
1,2-Dichloroethane	10.4		ug/L	10.00		104	70-130			
1,3-Dichlorobenzene	10.3		ug/L	10.00		103	70-130			
1,4-Dichlorobenzene	10.5		ug/L	10.00		105	70-130			
Acetone	48.1		ug/L	50.00		96	70-130			
Benzene	10.3		ug/L	10.00		103	70-130			
Carbon Tetrachloride	10.9		ug/L	10.00		109	70-130			
cis-1,2-Dichloroethene	10.5		ug/L	10.00		105	70-130			
Ethylbenzene	10.3		ug/L	10.00		103	70-130			
Methyl tert-Butyl Ether	10.3		ug/L	10.00		103	70-130			
Methylene Chloride	9.1		ug/L	10.00		91	70-130			
Naphthalene	10.5		ug/L	10.00		105	70-130			
Tertiary-amyl methyl ether	9.9		ug/L	10.00		99	70-130			
Tertiary-butyl Alcohol	58.8		ug/L	50.00		118	70-130			
Tetrachloroethene	10.6		ug/L	10.00		106	70-130			
Toluene	10.5		ug/L	10.00		105	70-130			
Trichloroethene	10.6		ug/L	10.00		106	70-130			
Vinyl Chloride	10.3		ug/L	10.00		103	70-130			
Xylene O	10.1		ug/L	10.00		101	70-130			
Xylene P,M	20.4		ug/L	20.00		102	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	5.05		ug/L	5.000		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.84		ug/L	5.000		97	80-120			

LCS Dup

1,1,1-Trichloroethane	9.5		ug/L	10.00		95	70-130	12	20	
1,1,2-Trichloroethane	10.1		ug/L	10.00		101	70-130	1	20	
1,1-Dichloroethane	10.2		ug/L	10.00		102	70-130	2	20	
1,1-Dichloroethene	20.1		ug/L	10.00		201	70-130	59	20	B+, D+
1,2-Dichlorobenzene	9.1		ug/L	10.00		91	70-130	12	20	
1,2-Dichloroethane	9.8		ug/L	10.00		98	70-130	6	20	
1,3-Dichlorobenzene	9.3		ug/L	10.00		93	70-130	10	20	
1,4-Dichlorobenzene	9.5		ug/L	10.00		95	70-130	10	20	
Acetone	49.0		ug/L	50.00		98	70-130	2	20	
Benzene	10.4		ug/L	10.00		104	70-130	1	20	
Carbon Tetrachloride	9.3		ug/L	10.00		93	70-130	16	20	
cis-1,2-Dichloroethene	9.8		ug/L	10.00		98	70-130	7	20	
Ethylbenzene	9.9		ug/L	10.00		99	70-130	4	20	
Methyl tert-Butyl Ether	9.8		ug/L	10.00		98	70-130	5	20	
Methylene Chloride	10.5		ug/L	10.00		105	70-130	14	20	
Naphthalene	8.6		ug/L	10.00		86	70-130	20	20	
Tertiary-amyl methyl ether	9.1		ug/L	10.00		91	70-130	8	20	
Tertiary-butyl Alcohol	81.7		ug/L	50.00		163	70-130	33	25	B+, D+
Tetrachloroethene	9.6		ug/L	10.00		96	70-130	10	20	



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

524.2 Volatile Organic Compounds

Batch CG71431 - 524.2

Toluene	9.7		ug/L	10.00		97	70-130	8	20	
Trichloroethene	10.3		ug/L	10.00		103	70-130	3	20	
Vinyl Chloride	9.8		ug/L	10.00		98	70-130	5	20	
Xylene O	9.4		ug/L	10.00		94	70-130	7	20	
Xylene P,M	18.6		ug/L	20.00		93	70-130	9	20	
Surrogate: 1,2-Dichlorobenzene-d4	4.47		ug/L	5.000		89	80-120			
Surrogate: 4-Bromofluorobenzene	4.99		ug/L	5.000		100	80-120			

608 Polychlorinated Biphenyls (PCB)

Batch CG71414 - 3510C

Blank										
Aroclor 1016	ND	0.10	ug/L							
Aroclor 1016 [2C]	ND	0.10	ug/L							
Aroclor 1221	ND	0.10	ug/L							
Aroclor 1221 [2C]	ND	0.10	ug/L							
Aroclor 1232	ND	0.10	ug/L							
Aroclor 1232 [2C]	ND	0.10	ug/L							
Aroclor 1242	ND	0.10	ug/L							
Aroclor 1242 [2C]	ND	0.10	ug/L							
Aroclor 1248	ND	0.10	ug/L							
Aroclor 1248 [2C]	ND	0.10	ug/L							
Aroclor 1254	ND	0.10	ug/L							
Aroclor 1254 [2C]	ND	0.10	ug/L							
Aroclor 1260	ND	0.10	ug/L							
Aroclor 1260 [2C]	ND	0.10	ug/L							
Aroclor 1262	ND	0.10	ug/L							
Aroclor 1262 [2C]	ND	0.10	ug/L							
Aroclor 1268	ND	0.10	ug/L							
Aroclor 1268 [2C]	ND	0.10	ug/L							
Surrogate: Decachlorobiphenyl	0.0351		ug/L	0.05000		70	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0366		ug/L	0.05000		73	30-150			
Surrogate: Tetrachloro-m-xylene	0.0268		ug/L	0.05000		54	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0310		ug/L	0.05000		62	30-150			

LCS										
Aroclor 1016	0.86	0.10	ug/L	1.000		86	40-140			
Aroclor 1016 [2C]	0.90	0.10	ug/L	1.000		90	40-140			
Aroclor 1260	0.87	0.10	ug/L	1.000		87	40-140			
Aroclor 1260 [2C]	0.83	0.10	ug/L	1.000		83	40-140			
Surrogate: Decachlorobiphenyl	0.0415		ug/L	0.05000		83	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0419		ug/L	0.05000		84	30-150			
Surrogate: Tetrachloro-m-xylene	0.0355		ug/L	0.05000		71	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0359		ug/L	0.05000		72	30-150			

LCS Dup										



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

608 Polychlorinated Biphenyls (PCB)

Batch CG71414 - 3510C

Aroclor 1016	1.02	0.10	ug/L	1.000		102	40-140	16	20	
Aroclor 1016 [2C]	1.05	0.10	ug/L	1.000		105	40-140	16	20	
Aroclor 1260	0.91	0.10	ug/L	1.000		91	40-140	4	20	
Aroclor 1260 [2C]	0.88	0.10	ug/L	1.000		88	40-140	6	20	

Surrogate: Decachlorobiphenyl	0.0449		ug/L	0.05000		90	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0465		ug/L	0.05000		93	30-150			
Surrogate: Tetrachloro-m-xylene	0.0355		ug/L	0.05000		71	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0365		ug/L	0.05000		73	30-150			

625(SIM) Semi-Volatile Organic Compounds

Batch CG71808 - 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	3.08	2.50	ug/L							
Butylbenzylphthalate	ND	2.50	ug/L							
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	ND	2.50	ug/L							
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							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	1.01		ug/L	2.500		40	30-130			
Surrogate: 2,4,6-Tribromophenol	3.41		ug/L	3.750		91	15-110			
Surrogate: 2-Fluorobiphenyl	1.47		ug/L	2.500		59	30-130			
Surrogate: Nitrobenzene-d5	1.72		ug/L	2.500		69	30-130			
Surrogate: p-Terphenyl-d14	1.76		ug/L	2.500		70	30-130			

LCS

Acenaphthene	2.73	0.20	ug/L	2.500		109	40-140			
Acenaphthylene	2.69	0.20	ug/L	2.500		108	40-140			
Anthracene	2.90	0.20	ug/L	2.500		116	40-140			



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

625(SIM) Semi-Volatile Organic Compounds

Batch CG71808 - 3510C

Benzo(a)anthracene	3.02	0.05	ug/L	2.500		121	40-140			
Benzo(a)pyrene	3.50	0.05	ug/L	2.500		140	40-140			
Benzo(b)fluoranthene	3.45	0.05	ug/L	2.500		138	40-140			
Benzo(g,h,i)perylene	2.98	0.20	ug/L	2.500		119	40-140			
Benzo(k)fluoranthene	3.54	0.05	ug/L	2.500		142	40-140			B+
bis(2-Ethylhexyl)phthalate	6.70	2.50	ug/L	2.500		268	40-140			B+
Butylbenzylphthalate	3.45	2.50	ug/L	2.500		138	40-140			
Chrysene	3.14	0.05	ug/L	2.500		126	40-140			
Dibenzo(a,h)Anthracene	2.97	0.05	ug/L	2.500		119	40-140			
Diethylphthalate	2.94	2.50	ug/L	2.500		118	40-140			
Dimethylphthalate	3.28	2.50	ug/L	2.500		131	40-140			
Di-n-butylphthalate	3.40	2.50	ug/L	2.500		136	40-140			
Di-n-octylphthalate	3.77	2.50	ug/L	2.500		151	40-140			B+
Fluoranthene	3.11	0.20	ug/L	2.500		125	40-140			
Fluorene	3.05	0.20	ug/L	2.500		122	40-140			
Indeno(1,2,3-cd)Pyrene	3.09	0.05	ug/L	2.500		124	40-140			
Naphthalene	2.24	0.20	ug/L	2.500		89	40-140			
Pentachlorophenol	2.85	0.90	ug/L	2.500		114	30-130			
Phenanthrene	2.81	0.20	ug/L	2.500		112	40-140			
Pyrene	3.60	0.20	ug/L	2.500		144	40-140			B+
Surrogate: 1,2-Dichlorobenzene-d4	0.902		ug/L	2.500		36	30-130			
Surrogate: 2,4,6-Tribromophenol	3.26		ug/L	3.750		87	15-110			
Surrogate: 2-Fluorobiphenyl	1.39		ug/L	2.500		56	30-130			
Surrogate: Nitrobenzene-d5	1.45		ug/L	2.500		58	30-130			
Surrogate: p-Terphenyl-d14	1.61		ug/L	2.500		64	30-130			

LCS Dup

Acenaphthene	2.81	0.20	ug/L	2.500		113	40-140	3	20	
Acenaphthylene	2.81	0.20	ug/L	2.500		112	40-140	4	20	
Anthracene	3.15	0.20	ug/L	2.500		126	40-140	8	20	
Benzo(a)anthracene	3.12	0.05	ug/L	2.500		125	40-140	3	20	
Benzo(a)pyrene	3.74	0.05	ug/L	2.500		150	40-140	7	20	B+
Benzo(b)fluoranthene	3.69	0.05	ug/L	2.500		148	40-140	7	20	B+
Benzo(g,h,i)perylene	3.07	0.20	ug/L	2.500		123	40-140	3	20	
Benzo(k)fluoranthene	3.86	0.05	ug/L	2.500		154	40-140	8	20	B+
bis(2-Ethylhexyl)phthalate	6.09	2.50	ug/L	2.500		244	40-140	10	20	B+
Butylbenzylphthalate	3.54	2.50	ug/L	2.500		142	40-140	3	20	B+
Chrysene	3.29	0.05	ug/L	2.500		131	40-140	5	20	
Dibenzo(a,h)Anthracene	3.02	0.05	ug/L	2.500		121	40-140	2	20	
Diethylphthalate	3.04	2.50	ug/L	2.500		122	40-140	3	20	
Dimethylphthalate	3.39	2.50	ug/L	2.500		136	40-140	3	20	
Di-n-butylphthalate	3.81	2.50	ug/L	2.500		153	40-140	11	20	B+
Di-n-octylphthalate	3.97	2.50	ug/L	2.500		159	40-140	5	20	B+
Fluoranthene	3.39	0.20	ug/L	2.500		135	40-140	8	20	
Fluorene	3.08	0.20	ug/L	2.500		123	40-140	0.9	20	
Indeno(1,2,3-cd)Pyrene	3.09	0.05	ug/L	2.500		123	40-140	0.1	20	



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

625(SIM) Semi-Volatile Organic Compounds

Batch CG71808 - 3510C

Naphthalene	2.34	0.20	ug/L	2.500		94	40-140	5	20	
Pentachlorophenol	3.11	0.90	ug/L	2.500		124	30-130	9	20	
Phenanthrene	2.99	0.20	ug/L	2.500		120	40-140	6	20	
Pyrene	3.64	0.20	ug/L	2.500		146	40-140	1	20	B+
Surrogate: 1,2-Dichlorobenzene-d4	1.10		ug/L	2.500		44	30-130			
Surrogate: 2,4,6-Tribromophenol	3.60		ug/L	3.750		96	15-110			
Surrogate: 2-Fluorobiphenyl	1.57		ug/L	2.500		63	30-130			
Surrogate: Nitrobenzene-d5	1.58		ug/L	2.500		63	30-130			
Surrogate: p-Terphenyl-d14	1.55		ug/L	2.500		62	30-130			

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Batch CG71356 - 3535A

Blank

1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	ND		ug/L	5.000		38	15-115			

LCS

1,4-Dioxane	12.0	0.250	ug/L	10.00		120	40-140			
Surrogate: 1,4-Dioxane-d8	1.85		ug/L	5.000		37	15-115			

LCS Dup

1,4-Dioxane	10.9	0.250	ug/L	10.00		109	40-140	10	20	
Surrogate: 1,4-Dioxane-d8	1.70		ug/L	5.000		34	15-115			

Classical Chemistry

Batch CG71317 - General Preparation

Blank

Total Suspended Solids	ND	5	mg/L							

LCS

Total Suspended Solids	44		mg/L	43.50		101	80-120			

Batch CG71352 - General Preparation

Blank

Hexavalent Chromium	ND	10.0	ug/L							

LCS

Hexavalent Chromium	0.494		mg/L	0.4998		99	90-110			

LCS Dup

Hexavalent Chromium	0.493		mg/L	0.4998		99	90-110	0.2	20	

Batch CG71353 - General Preparation

Blank

Total Residual Chlorine	ND	20.0	ug/L							

LCS

Total Residual Chlorine	1.80		mg/L	1.800		100	85-115			

Batch CG71705 - NH4 Prep



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

Classical Chemistry

Batch CG71705 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L							

LCS

Ammonia as N	0.11	0.10	mg/L	0.09994		112	80-120			

LCS

Ammonia as N	0.92	0.10	mg/L	0.9994		92	80-120			

Batch CG71735 - NH4 Prep

Blank

Chloride	ND	0.5	mg/L							

LCS

Chloride	2.6		mg/L	2.500		103	90-110			

Batch CG71740 - General Preparation

Blank

Total Petroleum Hydrocarbon	ND	5	mg/L							

LCS

Total Petroleum Hydrocarbon	13	5	mg/L	19.38		69	66-114			

Batch CG71817 - TCN Prep

Blank

Total Cyanide (LL)	ND	5.00	ug/L							

LCS

Total Cyanide (LL)	20.0	5.00	ug/L	20.06		100	90-110			

LCS

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

LCS Dup

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

Batch CG71920 - General Preparation

Blank

Phenols	ND	100	ug/L							

LCS

Phenols	102	100	ug/L	100.0		102	80-120			

LCS

Phenols	958	100	ug/L	1000		96	80-120			

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Batch CG71426 - 504/8011

Blank

1,2-Dibromoethane	ND	0.015	ug/L							

1,2-Dibromoethane [2C]	ND	0.015	ug/L							

Surrogate: Pentachloroethane	0.298		ug/L	0.2000		149	30-150			

Surrogate: Pentachloroethane [2C]	0.248		ug/L	0.2000		124	30-150			



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Batch CG71426 - 504/8011

LCS

1,2-Dibromoethane	0.070	0.015	ug/L	0.08000		88	70-130			
1,2-Dibromoethane [2C]	0.064	0.015	ug/L	0.08000		80	70-130			

Surrogate: Pentachloroethane	0.0877		ug/L	0.2000		44	30-150			
Surrogate: Pentachloroethane [2C]	0.0783		ug/L	0.2000		39	30-150			

LCS

1,2-Dibromoethane	0.219	0.015	ug/L	0.2000		110	70-130			
1,2-Dibromoethane [2C]	0.212	0.015	ug/L	0.2000		106	70-130			

Surrogate: Pentachloroethane	0.290		ug/L	0.2000		145	30-150			
Surrogate: Pentachloroethane [2C]	0.242		ug/L	0.2000		121	30-150			

Alcohol Scan by GC/FID

Batch CG71915 - No Prep

Blank

Ethanol	ND	10	mg/L							

LCS

Ethanol	1270	10	mg/L	1000		127	60-140			

LCS Dup

Ethanol	1060	10	mg/L	1000		106	60-140	18	30	



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Notes and Definitions

X5	Due to high sediment content vials were composited
U	Analyte included in the analysis, but not detected
S-	Surrogate recovery(ies) below lower control limit (S-).
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
DDT	DDT breakdown > 20%
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
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
RL	Reporting Limit
EDL	Estimated Detection Limit



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

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: 1707259

Shipped/Delivered Via: ESS Courier

Date Received: 7/13/2017

Project Due Date: 7/20/2017

Days for Project: 5 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: 2.8 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:

COC = B15 Label = B17 LHC 7/13/17

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	148177	Yes	NA	Yes	1L Poly - Unpres	NP	
01	148179	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	148181	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	
01	148183	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	148185	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	148187	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	148194	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148195	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148196	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148197	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148198	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148199	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148201	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	148203	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	148207	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148208	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148209	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148211	Yes	NA	Yes	VOA Vial - Unpres	NP	
01	148215	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148216	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148217	Yes	No	Yes	VOA Vial - HCl	HCl	
02	148176	Yes	NA	Yes	1L Poly - Unpres	NP	
02	148178	Yes	NA	Yes	250 mL Poly - Unpres	NP	
02	148180	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	

pH > 12 w 7/13/17 1830

pH > 12 w 7/13/17 1830

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Tighe & Bond - KPB/TB/MM

ESS Project ID: 1707259

Date Received: 7/13/2017

02	148182	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4
02	148184	Yes	NA	Yes	1L Amber - H2SO4	H2SO4
02	148186	Yes	NA	Yes	500 mL Poly - HNO3	HNO3
02	148188	Yes	NA	Yes	1L Amber - Unpres	NP
02	148189	Yes	NA	Yes	1L Amber - Unpres	NP
02	148190	Yes	NA	Yes	1L Amber - Unpres	NP
02	148191	Yes	NA	Yes	1L Amber - Unpres	NP
02	148192	Yes	NA	Yes	1L Amber - Unpres	NP
02	148193	Yes	NA	Yes	1L Amber - Unpres	NP
02	148200	Yes	NA	Yes	500 mL Poly - HNO3	HNO3
02	148202	Yes	NA	Yes	1L Amber - H2SO4	H2SO4
02	148204	Yes	No	Yes	VOA Vial - HCl	HCl
02	148205	Yes	No	Yes	VOA Vial - HCl	HCl
02	148206	Yes	No	Yes	VOA Vial - HCl	HCl
02	148210	Yes	NA	Yes	VOA Vial - Unpres	NP
02	148212	Yes	No	Yes	VOA Vial - HCl	HCl
02	148213	Yes	No	Yes	VOA Vial - HCl	HCl
02	148214	Yes	No	Yes	VOA Vial - HCl	HCl

2nd Review

Are barcode labels on correct containers?

Yes / No

Completed

By:

Date & Time:

7/13/17

1830

Reviewed

By:

Date & Time:

7/13/17

1910

Delivered

By:

7/13/17

1913

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

ESS LAB PROJECT ID
1707259

Turn Time X Standard Rush _____ Approved By: _____

State where samples were collected: MA NH

Reporting Limits -	
RGP	

Is this project for:

Electronic Deliverable Yes ☒ No ☐
Format: Excel ☒ Access ☐ PDF ☐ Other ☐

RGP

Project Manager: Mike Martin
Company: Tighe & Bond
Address: 1 University Ave
Westwood, MA 02559

Project #
Project Name: Station 250 Mystic Charlestown Eversource RGP
PO #

[illegible]

Preservation Code: 1-NP, 2-HCl, 3-H₂SO₄, 4-HNO₃, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-

Container Type: P-Poly G-Glass/ AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ☒ Yes ☐ No

Sampled by: APC added project name per MEM and updated ID per APC. mkm 7/14/17

Seals Intact ☐ Yes ☐ No NA: ☒

Comments: 1) RGP Metals include Sb, As, Cd, Cu, Fe, Pb, Ni, Se, Ag and Zn by 200.7/200.9 and Hg by 245.1

Cooler Temperature: 2-8 °F ✓

2) Parameters in **BOLD** have Short hold-time

PERMIT ATTACHED

* TSS, TRC and Cl taken from the same container

Relinquished by: (Signature)	Date/Time
	7/13/17

Received by: (Signature)	7-13-17	Relinquished by: (Signature)

Relinquished by: (Signature)	Date/Time

Received by: (Signature)	Relinquished by: (Signature)

7-12-17 Date/Time 1745

Received by: (Signature)  7/13/17 1820

	Date/Time

Received by: (Signature)

Please E-mail all changes to Chain of Custody in writing

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

ESS LAB PROJECT ID
1707259

Turn Time X Standard Rush _____ Approved By: _____

State where samples were collected: MA NH

Is this project for:

Electronic Deliverable Yes X No

Format: Excel X Access ___ PDF ___ Other ___

RGP

Project Manager: Mike Martin

Project #

Company: Tight & Bond

Project Name:

Address: 1 University Ave
Westwood, MA 02559

PO #

Received by: (Signature)

Page 35 of 35



CERTIFICATE OF ANALYSIS

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

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

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

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 2:25 pm, Nov 20, 2017

Analytical Summary

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

SAMPLE RECEIPT

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

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

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

PROJECT NARRATIVE

Total Metals

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

Cadmium , Copper , Nickel

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

Cadmium , Copper , Nickel

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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: Mystic at Boston Inner
Date Sampled: 11/15/17 11:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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 (5.0)		3113B		10	KJK	11/19/17 4:59	100	10	CK71531
Cadmium	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium	ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium III	ND (20.0)		200.7		10	JLK	11/16/17 15:24	1	1	[CALC]
Copper	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Iron	ND (100)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Lead	ND (2.0)		3113B		10	KJK	11/17/17 21:31	100	10	CK71531
Nickel	EL ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Zinc	ND (50.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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	0.43 (0.10)		350.1		1	EEM	11/17/17 14:51	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.75 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.2 °C. (N/A)								
Salinity	14.9 (0.1)		2520B		1	JLK	11/16/17 17:10	ppt	CK71644



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

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

LCS

Chromium III	ND		ug/L



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
Total Metals										
Batch CK71546 - [CALC]										
LCS Dup										
Chromium III	ND		ug/L							
Classical Chemistry										
Batch CK71546 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	0.503		mg/L	0.4998		101	90-110			
LCS Dup										
Hexavalent Chromium	0.516		mg/L	0.4998		103	90-110	3	20	
Batch CK71613 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.08	0.10	mg/L	0.09994		81	80-120			
LCS										
Ammonia as N	1.02	0.10	mg/L	0.9994		102	80-120			
Batch CK71644 - General Preparation										
LCS										
Salinity	1.0		ppt	1.000		96	85-115			



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	RGF

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: ☒	Seals Intact: ☒	Comments: Please specify "Other" preservative and containers types in this space	
Cooler Temperature: 0.4°C		Eversource Pricing	

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

CERTIFICATE OF ANALYSIS

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

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

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



Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 2:25 pm, Nov 20, 2017

Analytical Summary

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

SAMPLE RECEIPT

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

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

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

PROJECT NARRATIVE

Total Metals

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

Cadmium , Copper , Nickel

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

Cadmium , Copper , Nickel

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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: Mystic at Winter
Date Sampled: 11/15/17 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-01
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	11/18/17 6:38	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:08	1	1	[CALC]
Copper	ND (2.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Hardness	184000 (824)		200.7		10	KJK	11/16/17 15:04	1	1	[CALC]
Iron	251 (100)		200.7		10	KJK	11/16/17 15:04	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Zinc	10.9 (10.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic at Winter
Date Sampled: 11/15/17 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-01
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	0.45 (0.10)		350.1		1	EEM	11/17/17 14:44	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.25 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.4 °C. (N/A)								



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic
Date Sampled: 11/15/17 10:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-02
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	11/18/17 6:44	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:12	1	1	[CALC]
Copper	ND (2.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Hardness	181000 (824)		200.7		10	KJK	11/16/17 15:08	1	1	[CALC]
Iron	121 (100)		200.7		10	KJK	11/16/17 15:08	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Zinc	10.2 (10.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic
Date Sampled: 11/15/17 10:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-02
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	0.27 (0.10)		350.1		1	EEM	11/17/17 14:47	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.36 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.2 °C. (N/A)								



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic Crossing
Date Sampled: 11/15/17 09:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-03
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	11/18/17 6:55	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:16	1	1	[CALC]
Copper	ND (2.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Hardness	147000 (824)		200.7		10	KJK	11/16/17 15:12	1	1	[CALC]
Iron	134 (100)		200.7		10	KJK	11/16/17 15:12	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Zinc	11.1 (10.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic Crossing
Date Sampled: 11/15/17 09:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-03
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	0.35 (0.10)		350.1		1	EEM	11/17/17 14:48	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.13 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.1 °C. (N/A)								



CERTIFICATE OF ANALYSIS

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

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

Extraction Method: 3005A/200.7

Total Metals

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



CERTIFICATE OF ANALYSIS

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

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

Classical Chemistry

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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 (5.0)		3113B		10	KJK	11/19/17 4:59	100	10	CK71531
Cadmium	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium	ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium III	ND (20.0)		200.7		10	JLK	11/16/17 15:24	1	1	[CALC]
Copper	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Iron	ND (100)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Lead	ND (2.0)		3113B		10	KJK	11/17/17 21:31	100	10	CK71531
Nickel	EL ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Zinc	ND (50.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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	0.43 (0.10)		350.1		1	EEM	11/17/17 14:51	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.75 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.2 °C. (N/A)								
Salinity	14.9 (0.1)		2520B		1	JLK	11/16/17 17:10	ppt	CK71644



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-07
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 (5.0)		3113B		10	KJK	11/19/17 5:04	100	10	CK71531
Cadmium	EL ND (10.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Chromium	ND (20.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Chromium III	ND (20.0)		200.7		10	JLK	11/16/17 16:04	1	1	[CALC]
Copper	EL ND (10.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Hardness	221000 (824)		200.7		10	KJK	11/17/17 11:22	1	1	[CALC]
Iron	274 (100)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Lead	ND (2.0)		3113B		10	KJK	11/17/17 21:48	100	10	CK71531
Nickel	EL ND (20.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Zinc	ND (50.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-07
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	0.28 (0.10)		350.1		1	EEM	11/17/17 14:51	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.46 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.6 °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

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

LCS

Chromium III	ND		ug/L



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
Total Metals										
Batch CK71546 - [CALC]										
LCS Dup										
Chromium III	ND		ug/L							
Classical Chemistry										
Batch CK71546 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	0.503		mg/L	0.4998		101	90-110			
LCS Dup										
Hexavalent Chromium	0.516		mg/L	0.4998		103	90-110	3	20	
Batch CK71613 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.08	0.10	mg/L	0.09994		81	80-120			
LCS										
Ammonia as N	1.02	0.10	mg/L	0.9994		102	80-120			
Batch CK71644 - General Preparation										
LCS										
Salinity	1.0		ppt	1.000		96	85-115			



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: ☒	Seals Intact: ☒	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 #MAG910758, for the Eversource Electrical Transmission Line Project site located in Charlestown and Boston, 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 Boston storm sewer system¹ to Mystic River (MA71-03) 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 EPA notes that this site is authorized to use four discharge locations associated with the City of Boston storm sewer system. To meet the requirements of the RGP, the effluent monitoring location must be consistent with the discharge point from the mobile treatment system, prior to co-mingling with any other waste streams.

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>.

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 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.

In accordance with Part 2.2.1 of the RGP and using the calculation methodology included in Appendix V, EPA corrected the calculated WQBELs applicable to this proposed discharge. The cause of the calculation error was identified as the incorrect entry of the upstream flow and dilution factor in the fillable electronic format submitted with the NOI. Since the proposed discharge is to a saltwater receiving water, no dilution applies. The reason for these corrections is to determine the WQBELs that apply to the proposed discharge. Based on the revised calculations, your authorization to discharge includes revised WQBELs of 3.7 µg/L for total recoverable copper, 8.3 µg/L for total recoverable nickel, 86 µg/L for total recoverable zinc, 2.2 µg/L for diethylhexyl phthalate, and 0.0038 µg/L for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.

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,



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
Boston Water and Sewer Commission, via email

GENERAL PERMIT FOR REMEDIATION ACTIVITY DISCHARGES

Table 1: Authorization Information

Permit Number	MAG910758
Receiving Water	Mystic River
Outfall Number	Outfall 001 to City of Boston
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	3.7 µg/L
Iron ⁴	5,000 µg/L
Lead ⁴	160 µg/L
Mercury ⁴	0.739 µg/L
Nickel ⁴	8.3 µg/L
Selenium ⁴	235.8 µg/L
Silver ⁴	35.1 µg/L
Zinc ⁴	86 µg/L
B. Non-Halogenated Volatile Organic Compounds	
Total BTEX	100 µg/L
Benzene	5.0 µg/L
1,4 Dioxane	200 µg/L
Acetone	7.97 mg/L
C. Halogenated Volatile Organic Compounds	
1,2 Dichlorobenzene	600 µg/L
Methylene Chloride	4.6 µg/L
Tetrachloroethylene	5.0 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	
tert-Butyl Alcohol	120 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
Saltwater	6.5 to 8.5 SU

Table 4 Notes

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

^a SU = standard units



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 1

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

VIA EMAIL

December 20, 2017

Rick McKanas,
Bond Brothers
145 Spring Street
Everett, MA 02127
rmckanas@bondbrothers.com

Re: Authorization to discharge under the Remediation General Permit (RGP) – Authorization #MAG910758, for the Eversource Electrical Transmission Line Project site located in Charlestown and Boston, MA

Dear Mr. McKanas:

Based on the review of a Notice of Intent (NOI) dated October 25, 2017 submitted by Tighe & Bond, Inc. for the site referenced above, the U.S. Environmental Protection Agency, Region 1 (EPA) hereby authorizes Bond Brothers, as a named operator and co-permittee with NSTAR Electric Company d/b/a Eversource Energy, 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 Boston storm sewer system¹ to Mystic River (MA71-03) 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 EPA notes that this site is authorized to use four discharge locations associated with the City of Boston storm sewer system. To meet the requirements of the RGP, the effluent monitoring locations must be consistent with the discharge point from the mobile treatment system, prior to co-mingling with any other waste streams.

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>.

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 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.

In accordance with Part 2.2.1 of the RGP and using the calculation methodology included in Appendix V, EPA corrected the calculated WQBELs applicable to this proposed discharge. The cause of the calculation error was identified as the incorrect entry of the upstream flow and dilution factor in the fillable electronic format submitted with the NOI. Since the proposed discharge is to a saltwater receiving water, no dilution applies. The reason for these corrections is to determine the WQBELs that apply to the proposed discharge. Based on the revised calculations, your authorization to discharge includes revised WQBELs of 3.7 µg/L for total recoverable copper, 8.3 µg/L for total recoverable nickel, 86 µg/L for total recoverable zinc, 2.2 µg/L for diethylhexyl phthalate, and 0.0038 µg/L for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.

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,



Thelma Murphy, Chief
Storm Water and Construction Permits Section

Enclosure

cc: Michael Zylich, Eversource Energy, 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
Boston Water and Sewer Commission, via email

GENERAL PERMIT FOR REMEDIATION ACTIVITY DISCHARGES

Table 1: Authorization Information

Permit Number	MAG910758
Receiving Water	Mystic River
Outfall Number	Outfall 001 to City of Boston
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	3.7 µg/L
Iron ⁴	5,000 µg/L
Lead ⁴	160 µg/L
Mercury ⁴	0.739 µg/L
Nickel ⁴	8.3 µg/L
Selenium ⁴	235.8 µg/L
Silver ⁴	35.1 µg/L
Zinc ⁴	86 µg/L
B. Non-Halogenated Volatile Organic Compounds	
Total BTEX	100 µg/L
Benzene	5.0 µg/L
1,4 Dioxane	200 µg/L
Acetone	7.97 mg/L
C. Halogenated Volatile Organic Compounds	
1,2 Dichlorobenzene	600 µg/L
Methylene Chloride	4.6 µg/L
Tetrachloroethylene	5.0 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	
tert-Butyl Alcohol	120 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
Saltwater	6.5 to 8.5 SU

Table 4 Notes

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

^a SU = standard units

N-0998-11-13
December 1, 2017

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

Re: **Submittal of Notice of Intent (NOI) Remediation General Permit (RGP)**
Construction Dewatering
Mystic River/Boston Inner Harbor
Boston, Massachusetts

Dear Ms. Little:

On behalf of NSTAR Electric Company d/b/a Eversource Energy (Eversource), Tighe & Bond, Inc. (Tighe & Bond) has prepared this Notice of Intent (NOI) for application of a National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) for the proposed construction dewatering activities conducted during the installation of new below grade electric transmission line and associated manholes along Maffa Way, Main Street, Beacham Street, Arlington Avenue and Alford Street in Boston and Mystic Substation 250 in Charlestown, Massachusetts (the Site). A copy of the NOI is included in Appendix A. The limits of the Site are shown on the Locus Plan (Figure 1), the Massachusetts Geographic Information Systems (MassGIS) Priority Resource Map (Figure 2) and Aerial Dewatering Site Plan (Figure 3) in Appendix B.

As there is a need to treat and discharge water generated from the construction dewatering activities, the enclosed NOI form provides required information on general Site conditions, proposed treatment systems, discharge locations, receiving water, and laboratory analytical results from pre-discharge sampling and surface water sampling. The proposed treatment systems are shown on Figure 4 (Process Flow Diagram) in Appendix B. The excavation dewatering and discharge of treated groundwater are scheduled to begin in December 2017 and end in December 2019.

Dewatered groundwater at the Site will be treated by a mobile treatment system before being discharged to on-Site catch basins and into a stormwater drainage system managed by the Boston Water and Sewer Commission (BWSC). All subject stormwater drainage systems for this RGP eventually discharge to Mystic River/Boston Inner Harbor. Post treatment discharge rates will range from 25 gallons per minute (GPM) to 350 GPM.

Project Background

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



This RGP Permit Application is for the discharge of treated groundwater to the Boston Water and Sewer Commission stormwater drainage system and ultimately to the Mystic River/Boston Inner Harbor.

MCP History

During the pre-construction soil assessment activities, concentrations of lead and polycyclic aromatic hydrocarbons (PAHs) were detected in soil samples B-52, B-65, B-66, B-70, B-76 MH-17 and MH-18 above the respective Massachusetts Department of Environmental Protection (MassDEP) Reportable Concentration (RCS-1/RCS-2) values.

On September 14, 2017, Tighe & Bond, on behalf of Eversource, submitted a Utility-related Abatement Measure (URAM) Notification Report to MassDEP under Release Tracking Number (RTN) 3-34457. The URAM details measures implemented to manage excess soils and groundwater generated during the installation of the new underground electric transmission line and electric manholes along Mystic Ave. Boundaries of the URAM are shown on Figure 1 in Appendix B.

Groundwater Characterization

To characterize groundwater along the proposed route of construction, groundwater samples were collected from groundwater monitoring wells MW-505A, MW-505B, B3 and B17 between January 2017 and September 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 Limitations (WQBEL).

Contaminants of concern are analytes that exceeded either the TBEL or WQBEL. Contaminants of concern detected in at least one of the monitoring well MW-505A, MW-505B, B3 or B17 include group I PAHs, bis(2-ethylhexyl) phthalate (DEHP), zinc, iron, copper, polychlorinated biphenyls (PCBs), acetone, naphthalene, benzene, total BTEX 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 either adjacent to a roadway (B3 and B17) paved parking lot (MW-505B) and a MassDOT salt and snow staging area (MW-505A), the chloride detected in groundwater samples is likely associated with road salting during the winter months.

Receiving Water Characterization

Mystic River/Boston Inner Harbor after the Amelia Earhart Dam (waterbody identification MA71-03) is classified as a Class SB (CSO) impaired water body and is listed in the 303(d) Impaired Waterbodies document. According to the United States Geologic Survey's StreamStats online application, the 7Q10 value was calculated the total flow for North Harbor, Mystic River (Boston Harbor) (adjacent to the Site) was calculated to be 2.16 million gallons per day (MGD).

As required by the NPDES RGP, one surface water sample was collected within a quarter mile of the potential outfall locations prior to discharging and analyzed for contaminants of concern that were present in the groundwater samples from the monitoring wells discussed above. The surface water sample was collected in November 2017 and sent for laboratory analysis of metals detected in the effluent samples and ammonia, hexavalent chromium, pH and salinity. The surface water sampling location is shown on Figure 1, Dewatering Plan, in Appendix B.

Treatment Systems

Dewatered groundwater at the Site will be treated prior to discharge to the Boston Water and Sewer Commission stormwater drainage system ultimately discharging to the Mystic River/Boston Inner Harbor. Based on project demands, dewatered groundwater may also be transported to a project Laydown yard in Medford for treatment prior to discharge to the Mystic River. The Mystic River discharge is subject to a separate RGP NOI filed on December 1, 2017. Outfall locations are shown on Figure 1 (Dewatering Site Plan) in Appendix B.

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

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

Stationary Treatment System - The stationary treatment system located at the project Laydown yard in Medford is composed of one or two 10,000-gallon fractionation tanks, one sand filter unit and two particulate filters, two GAC filters, and two clay vessels. Groundwater will be pumped from the excavation into a tanker truck and transported to the laydown yard. From the tank truck, the groundwater will be pumped into the fractionation tanks and then through a sand filter and particulate filter for the removal of solids, into the GAC filters and clay vessels to remove organics, and then through a particulate filter to remove any residual solids. The Mystic River discharge is subject to a separate RGP NOI being filed concurrently. The Mystic River discharge is subject to a separate RGP NOI filed on December 1, 2017.

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
Michael J. Zylich
247 Station Drive
Westwood, MA 02090

Operator

BOND Brothers
Rich McKanas
145 Spring Street
Everett, MA 02127

Notice of Intent

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

- Review of a MassGIS Priority Resource Map, Figure 2, shows the Site is not within an ACEC;
- Review of the “Federally Listed Endangered and Threatened Species in Massachusetts” (Appendix C) found that there are two listed species in Middlesex County. The first species is the whorled pogonia which prefers forest habitat, and the second species is the northern long-eared bat, which prefers mines and caves in the winter and forested habitats in the summer. The small whorled pogonia is found in the Groton area while the northern long-eared bat is found statewide. As the Site is not in Groton, the small whorled pogonia will not be affected from construction activities or from the proposed discharges. The project area consists of an asphalt roadway that borders residential and commercial areas. No vegetation will be disturbed during construction activities. As a result, it is the opinion of Tighe & Bond that the habitats for northern long-eared bat will not be disturbed during construction activities. Additionally, the discharge is to the Mystic River and ultimately Boston Inner Harbor which is not a habitat where the northern long-eared bat exists.
- According to United States Fish and Wildlife Services (USFWS) Information, Planning and Conservation (IPaC) tool there are no critical habitats within the Site. USFWS confirmed there are no critical habitats in the area and confirmed permit eligibility meets “Criterion A.”
 - Additionally, according to the MassGIS Priority Resource Map, no NHESP Priority Habitats for Rare Species or Estimated Habitats for Rare Wildlife, were present within half a mile downstream of the discharge location. Therefore, permit eligibility meets “Criterion A.”
- As shown on the map generated by the MassGIS online viewer (Figure 2), no ACECs or Estimated Habitats of Rare Wildlife areas are located within half a mile downstream of the discharge location.
- An electronic review of the Massachusetts Cultural Resource Information System database (Appendix D), made available through Massachusetts Historical Commission, found several historical areas along Mystic Avenue in Medford and Somerville, but it is believed that discharges and discharge related activities will not affect historic properties as groundwater will be pumped into fractionation tanks, treated and discharged to an existing drainage network. No historical areas are located directly within excavation areas. Therefore, permit eligibility meets “Criterion B.”
- Groundwater samples were collected from on-Site groundwater monitoring wells MW-505B, B-3 and B-17 between January and September 2017. The groundwater samples were submitted for laboratory analysis for RGP parameters. The laboratory analytical results are summarized in Table 1 included in Appendix E. Copies of the laboratory analytical report are included in Appendix F. Laboratory analytical results were compared to the RGP TBEL and WQBEL.
- The surface water sample was collected from Mystic River after the Amelia Earhart Dam within a quarter mile of the potential outfall locations 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 E. A copy of the laboratory analytical report is included in Appendix F.

Based on the critical low flow (7Q10) value of the receiving water, 2.16 MGD and the proposed maximum discharge rate of up to 350 GPM (0.504 MGD), a dilution factor of 5.29

was established for this permit and was verified by the Massachusetts Department of Environmental Protection (MassDEP) on November 29, 2017 and included Appendix E. The 7Q10 value was calculated using the United States Geologic Survey's StreamStats online application, and the dilution factor was calculated as instructed by the EPA *Dilution Factor and Effluent Limitation Calculations for Massachusetts*, Appendix V.

The proposed treatment systems have been designed to reduce the levels of associated contaminants of concern to below the applicable effluent limits. Prior to discharge of treated effluent, weekly post treatment samples will be collected and submitted to a Massachusetts environmental laboratory for the group I PAHs, DEHP, zinc, iron, copper, PCBs, acetone, naphthalene, benzene, total BTEX and TSS analyses to confirm the treatment was successful. Additionally, the flow and turbidity levels will be monitored within the field and recorded.

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

Very truly yours,

TIGHE & BOND, INC.



Michael E. Martin
Project Manager



Gary W.T. Hedman, LSP
Project Manager

Enclosures

Copy: Michael Zylich, Eversource
Rich Mckanas, BOND
MassDOT
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
Appendix D	Massachusetts Cultural Resources Information System Report
Appendix E	Groundwater Summary Table 1 Surface Water Summary Table 2
Appendix F	Laboratory Analytical Results

List of Figures

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

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

A. General site information:

1. Name of site: Eversource Electrical Transmission Line Project	Site address: Intersection of Middlesex Ave and Mystic Ave (URAM area) Street: Mystic Ave, Main Street, Beacham Street, Arlington Street and Alford Street		
2. Site owner Eversource Energy d/b/a NSTAR Electric Company Owner is (check one): ☐ Federal ☐ State/Tribal ☐ Private ☒ Other; if so, specify: Utility on Public Right of Way	City: Medford, Somerville and Boston	State: MA	Zip: 02145
3. Site operator, if different than owner Bond Brothers Inc	Contact Person: Rich Mckanas Telephone: 6713946201 Email: rmckanas@bondbrothers.com Mailing address: 145 Spring Street Street: City: Everett State: MA Zip: 02127		
4. NPDES permit number assigned by EPA: MAR1000RI NPDES permit is (check all that apply): ☐ RGP ☐ DGP ☒ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:	5. Other regulatory program(s) that apply to the site (check all that apply): ☒ MA Chapter 21e; list RTN(s): 3-34457 ☐ NH Groundwater Management Permit or Groundwater Release Detection Permit: ☐ CERCLA ☐ UIC Program ☐ POTW Pretreatment ☐ CWA Section 404		

B. Receiving water information:

1. Name of receiving water(s): Mystic River	Waterbody identification of receiving water(s): MA71-03	Classification of receiving water(s): Class SB (CSO)
Receiving water is (check any that apply): ☐ Outstanding Resource Water ☐ Ocean Sanctuary ☐ territorial sea ☐ Wild and Scenic River		
2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): ☒ Yes ☐ No Are sensitive receptors present near the site? (check one): ☒ Yes ☐ No If yes, specify: Mystic River - Surface Water Body		
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. Fish-Passage Barrier, Non-Native Aquatic Plants, Arsenic, Chlordane in Fish Tissue, Chlorophyll-a, DDT in Fish Tissue, DO Saturation, Escherichia		
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.		2.16 MGD
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.		5.29
6. Has the operator received confirmation from the appropriate State for the 7Q10 and dilution factor indicated? (check one): ☒ Yes ☐ No If yes, indicate date confirmation received: 11/29/2017		
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): ☐ Yes ☒ No		

C. Source water information:

1. Source water(s) is (check any that apply):			
☒ 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): ☒ Yes ☐ No	☐ 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): ☐ Yes ☐ No	☐ The receiving water	☐ Potable water; if so, indicate municipality or origin: ☐ Other; if so, specify:
		☐ A surface water other than the receiving water; if so, indicate waterbody:	

2. Source water contaminants: Iron, Chloride and Ammonia	
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): ☐ Yes ☒ 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): ☐ Yes ☐ No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): ☐ Yes ☒ No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): ☐ Existing discharge ☒ New discharge ☐ New source	
Outfall(s): Mystic River - Amelia Earhart Dam to Boston Inner Harbor	Outfall location(s): (Latitude, Longitude) 42.387862/-71.072422; 42.387614/-71.072037; 42.392312/-71.07001; 42.390425/-71.070649
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ☒ Indirect discharge, if so, specify: Via Boston Water and Sewer Drainage System ☐ A private storm sewer system ☒ 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): ☐ Yes ☒ No Has the operator has received permission from the owner to use such system for discharges? (check one): ☐ Yes ☒ No, if so, explain, with an estimated timeframe for obtaining permission: The contractor will obtain the necessary discharge permits from the Boston Water and Sewer Commission prior to discharge. Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ☒ No	
Provide the expected start and end dates of discharge(s) (month/year): December 2017 to December 2019	
Indicate if the discharge is expected to occur over a duration of: ☐ less than 12 months ☒ 12 months or more ☐ is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ☒ Yes ☐ No	

2. Activity Category: (check all that apply)	3. Contamination Type Category: (check all that apply)	
☐ I – Petroleum-Related Site Remediation ☐ II – Non-Petroleum-Related Site Remediation ☒ III – Contaminated Site Dewatering ☐ IV – Dewatering of Pipelines and Tanks ☐ V – Aquifer Pump Testing ☐ VI – Well Development/Rehabilitation ☐ VII – Collection Structure Dewatering/Remediation ☐ VIII – Dredge-Related Dewatering	a. If Activity Category I or II: (check all that apply) ☐ A. Inorganics ☐ B. Non-Halogenated Volatile Organic Compounds ☐ C. Halogenated Volatile Organic Compounds ☐ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☐ F. Fuels Parameters	
	b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)	
	<table border="1"> <tr> <td data-bbox="970 800 1419 873">☒ G. Sites with Known Contamination</td><td data-bbox="1419 800 2003 873">☐ H. Sites with Unknown Contamination</td></tr> </table>	☒ G. Sites with Known Contamination
☒ G. Sites with Known Contamination	☐ H. Sites with Unknown Contamination	
<table border="1"> <tr> <td data-bbox="970 873 1419 1409"> c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply) ☒ A. Inorganics ☒ B. Non-Halogenated Volatile Organic Compounds ☒ C. Halogenated Volatile Organic Compounds ☒ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☒ F. Fuels Parameters </td><td data-bbox="1419 873 2003 1409"> d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply </td></tr> </table>	c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply) ☒ A. Inorganics ☒ B. Non-Halogenated Volatile Organic Compounds ☒ C. Halogenated Volatile Organic Compounds ☒ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☒ F. Fuels Parameters	d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply
c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply) ☒ A. Inorganics ☒ B. Non-Halogenated Volatile Organic Compounds ☒ C. Halogenated Volatile Organic Compounds ☒ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☒ F. Fuels Parameters	d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply	

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✓	6	350.1	0.50	9.09	0.78	Report mg/L	---
Chloride		✓	6	300.0	250	4,800	1,495	Report µg/l	---
Total Residual Chlorine	✓		6	4500-C1 D	20	<10	0	0.2 mg/L	11
Total Suspended Solids		✓	6	2540D	5	39,800,000	11,549,000	30 mg/L	---
Antimony	✓		6	200.7	5	<5	0	206 µg/L	640
Arsenic		✓	6	3113B	5	7.5	4.4	104 µg/L	10
Cadmium		✓	6	3113B	0.15	1.9	1.9	10.2 µg/L	0.25
Chromium III		✓	6	200.7	10	62	21.2	323 µg/L	74
Chromium VI	✓		6	3500Cr	10	<10	0	323 µg/L	11
Copper		✓	6	200.7	2	206	54	242 µg/L	9
Iron		✓	6	200.7	20	24,600	12,208	5,000 µg/L	1,000
Lead		✓	6	3113B	3	34.5	11.1	160 µg/L	2.5
Mercury	✓		6	245.1	0.2	<0.2	0	0.739 µg/L	0.77
Nickel		✓	6	200.7	4	25.6	13.3	1,450 µg/L	52
Selenium	✓		6	3113B	6	<6	0	235.8 µg/L	5.0
Silver	✓		6	200.7	1	<1	0	35.1 µg/L	3.2
Zinc		✓	6	200.7	10	771	211	420 µg/L	120
Cyanide	✓		6	4500CN	5	<5	0	178 mg/L	5.2
B. Non-Halogenated VOCs									
Total BTEX		✓	6	524.2	0.5	130.9	15.9	100 µg/L	---
Benzene		✓	6	524.2	0.5	244	42.7	5.0 µg/L	---
1,4 Dioxane		✓	6	8270D	0.25	0.950	0.607	200 µg/L	---
Acetone		✓	6	524.2	5	24.6	4.9	7.97 mg/L	---
Phenol	✓		6	420.1	100	<100	0	1,080 µg/L	300

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	✓		6	524.2	0.3	<0.3	0	4.4 µg/L	1.6
1,2 Dichlorobenzene		✓	6	524.2	0.5	1.0	0.3	600 µg/L	---
1,3 Dichlorobenzene	✓		6	524.2	0.5	<0.5	0	320 µg/L	---
1,4 Dichlorobenzene	✓		6	524.2	0.5	<0.5	0	5.0 µg/L	---
Total dichlorobenzene		✓	6	524.2	0.5	1.0	0.65	763 µg/L in NH	---
1,1 Dichloroethane	✓		6	524.2	1	<1	<1	70 µg/L	---
1,2 Dichloroethane	✓		6	524.2	1	<1	<1	5.0 µg/L	---
1,1 Dichloroethylene	✓		6	524.2	1	<1	<1	3.2 µg/L	---
Ethylene Dibromide	✓		6	504.1	0.015	<0.015	<0.015	0.05 µg/L	---
Methylene Chloride		✓	6	524.2	0.5	0.2	0.2	4.6 µg/L	---
1,1,1 Trichloroethane	✓		6	524.2	0.5	<0.5	<0.5	200 µg/L	---
1,1,2 Trichloroethane	✓		6	524.2	0.5	<0.5	<0.5	5.0 µg/L	---
Trichloroethylene	✓		6	524.2	0.5	<0.5	<0.5	5.0 µg/L	---
Tetrachloroethylene		✓	6	524.2	0.5	1.4	1.4	5.0 µg/L	3.3
cis-1,2 Dichloroethylene	✓		6	524.2	1	<1	<1	70 µg/L	---
Vinyl Chloride	✓		6	524.2	1	<1	<1	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates		✓	6	625 SIM	2.34	30.85	10.94	190 µg/L	3
Diethylhexyl phthalate		✓	6	625 SIM	1.87	24	8.79	101 µg/L	2.2
Total Group I PAHs		✓	6	625 SIM	0.05	1.38	0.597	1.0 µg/L	---
Benzo(a)anthracene		✓	6	625 SIM	0.05	0.25	0.110	As Total PAHs	NE
Benzo(a)pyrene		✓	6	625 SIM	0.05	0.26	0.127		NE
Benzo(b)fluoranthene		✓	6	625 SIM	0.05	0.33	0.155		NE
Benzo(k)fluoranthene		✓	6	625 SIM	0.05	0.12	0.063		NE
Chrysene		✓	6	625 SIM	0.05	0.24	0.123		0.0038
Dibenzo(a,h)anthracene		✓	6	625 SIM	0.05	0.05	0.047		0.0038
Indeno(1,2,3-cd)pyrene		✓	6	625 SIM	0.05	0.18	0.097		0.0038

[illegible]

E. Treatment system information

1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply) ☐ Adsorption/Absorption ☐ Advanced Oxidation Processes ☐ Air Stripping ☒ Granulated Activated Carbon (“GAC”)/Liquid Phase Carbon Adsorption ☐ Ion Exchange ☒ Precipitation/Coagulation/Flocculation ☒ Separation/Filtration ☐ Other; if so, specify:	
2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge. The treatment system is composed of flocculent tubes, two 10,000-gallon fractionation tank, one sand filter unit and two particulate filters, two granular activated carbon (GAC) filters and two clay vessels. The groundwater will pumped from the excavation into the flocculent tubes and then into the fractionation tanks. From the fractionation tanks, the pumped through a sand filter and particulate filter for the removal of solids, then into the GAC filters and clay vessels to remove organics and then through one more particulate filter to remove any residual solids Identify each major treatment component (check any that apply): ☒ Fractionation tanks ☐ Equalization tank ☐ Oil/water separator ☐ Mechanical filter ☒ Media filter ☐ Chemical feed tank ☐ Air stripping unit ☒ Bag filter ☐ Other; if so, specify: Indicate if either of the following will occur (check any that apply): ☐ Chlorination ☐ De-chlorination	
3. Provide the design flow capacity in gallons per minute (gpm) of the most limiting component. Indicate the most limiting component: 25-350 Is use of a flow meter feasible? (check one): ☒ Yes ☐ No, if so, provide justification:	25-350
Provide the proposed maximum effluent flow in gpm.	350
Provide the average effluent flow in gpm.	25
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	
4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): ☒ Yes ☐ No	

F. Chemical and additive information

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)

☐ Algaecides/biocides ☐ Antifoams ☐ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ☐ Flocculants ☐ Neutralizing agents ☐ Oxidants ☐ Oxygen ☐ scavengers ☐ pH conditioners ☐ Bioremedial agents, including microbes ☐ Chlorine or chemicals containing chlorine ☐ Other; if so, specify:

2. Provide the following information for each chemical/additive, using attachments, if necessary:

- 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)).

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): ☐ Yes ☐ 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): ☐ Yes ☐ No

G. Endangered Species Act eligibility determination

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

- ☒ **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”.
- ☐ **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): ☐ Yes ☐ No; if no, is consultation underway? (check one): ☐ Yes ☐ No
- ☐ **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) ☐ the operator ☐ EPA ☐ Other; if so, specify:

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

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

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

H. National Historic Preservation Act eligibility determination

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

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

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

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

I. Supplemental information

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

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

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

J. Certification requirement

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

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

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

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

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

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

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

Signature: 

Date: 10-25-17

Print Name and Title: Rich Mckanas

J. Certification requirement

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

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

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

Check one: Yes ☒ No ☐

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

Check one: Yes ☒ No ☐

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

Check one: Yes ☒ No ☐ NA ☐

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

Check one: Yes ☒ No ☐ NA ☐

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

Check one: Yes ☐ No ☐ NA ☐

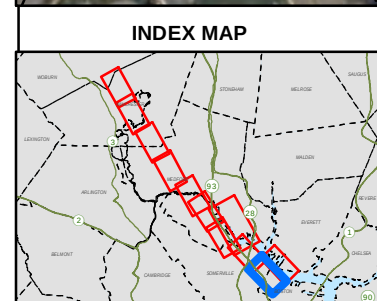
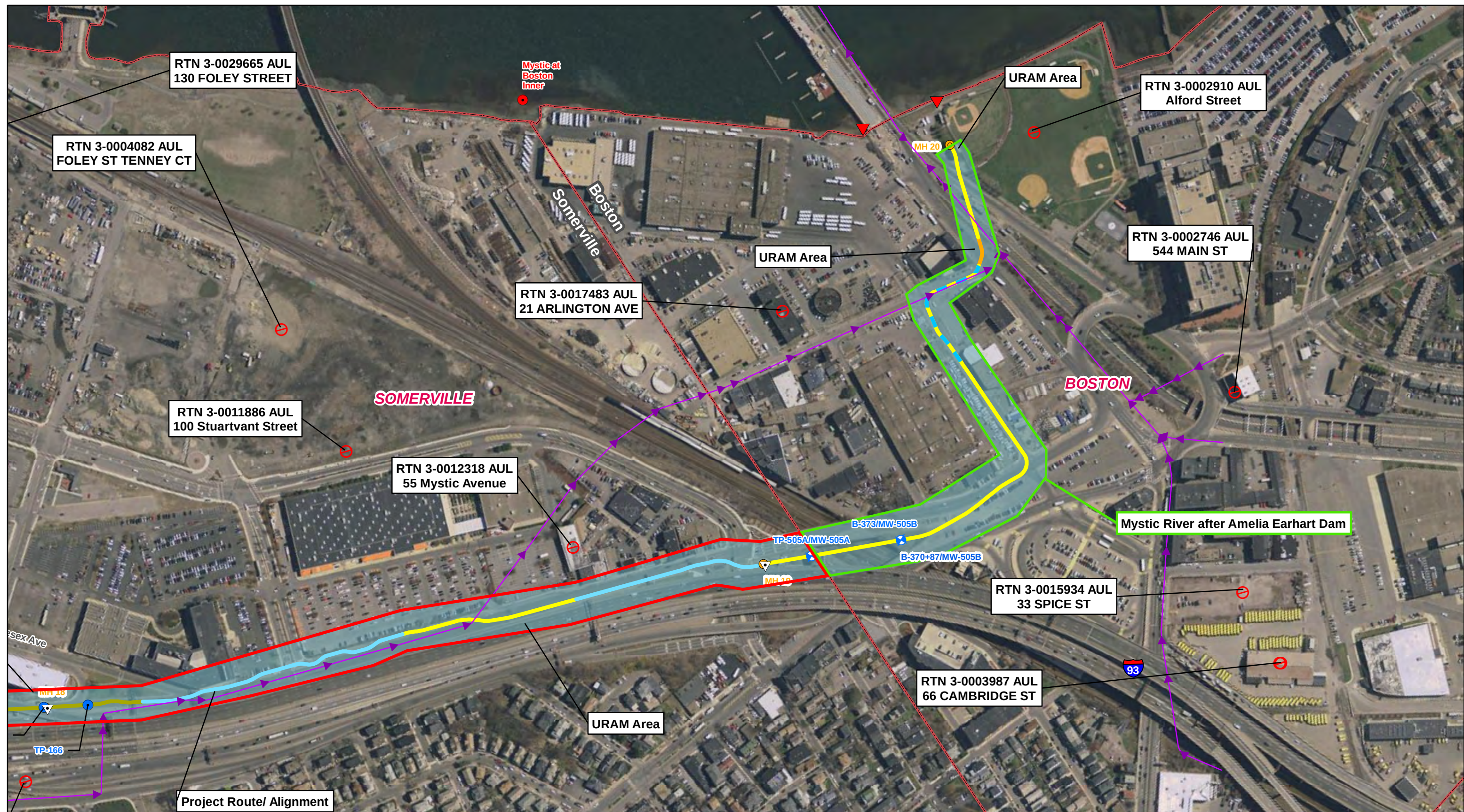
Signature:



Date: 11/29/2017

Print Name and Title: Michael Zylich, Senior Environmental Engineer

APPENDIX B



Legend

- Test Pit Location
- Geotech Boring
- Geotech Boring/ Monitoring Well
- River Sediment Sample
- MA DEP AUL Site
- Proposed Manhole
- Existing Manhole
- Surface Water Sample
- Municipal Boundary
- MWRA Sewer Pipe
- Laydown Yard
- RGP Boundaires Aberjona River
- RGP Boundaires Mystic River Crossing
- RGP Boundaires Mystic River after Amelia Earhart Dam
- RGP Boundary Winter Pond

Soil Type

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

Approximate Outfall Location

- Boston Water Sewer Commission
- MassDOT
- Medford
- Somerville
- Winchester

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**

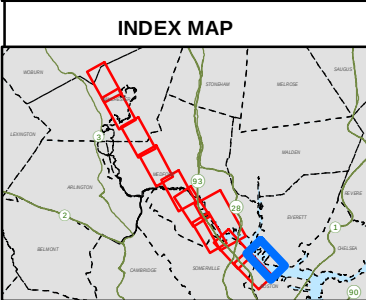
Figure 1: Aerial Dewatering Site Plan

Mapsheet 09 of 11

EVERSOURCE
ENERGY

Tighe&Bond
Engineers | Environmental Specialists

November 2017



Legend

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

Map Notes:
Basemap: 2013-2014 Orthophotographs, MassGIS
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1 in = 300 ft

0 150 300 600 Feet

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

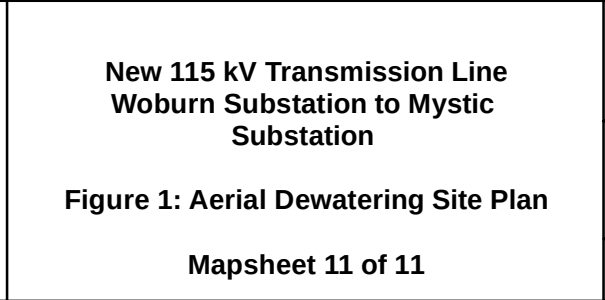
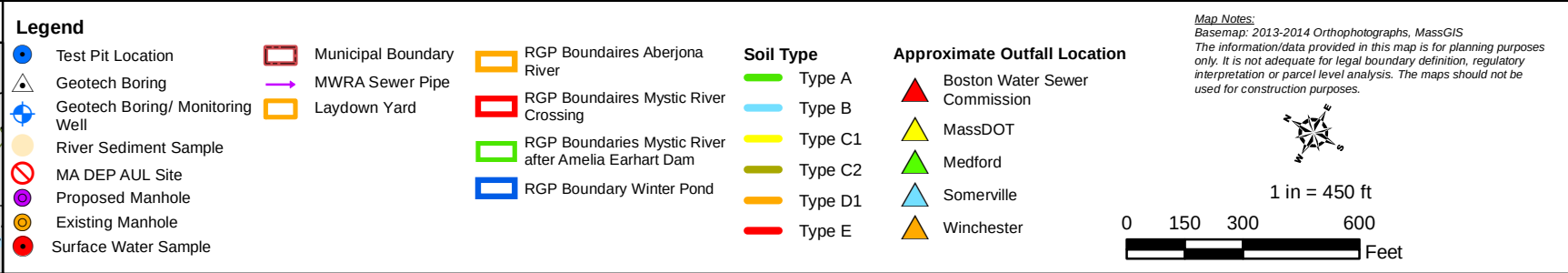
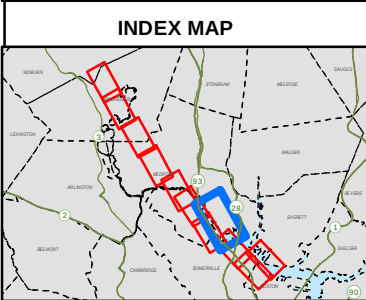
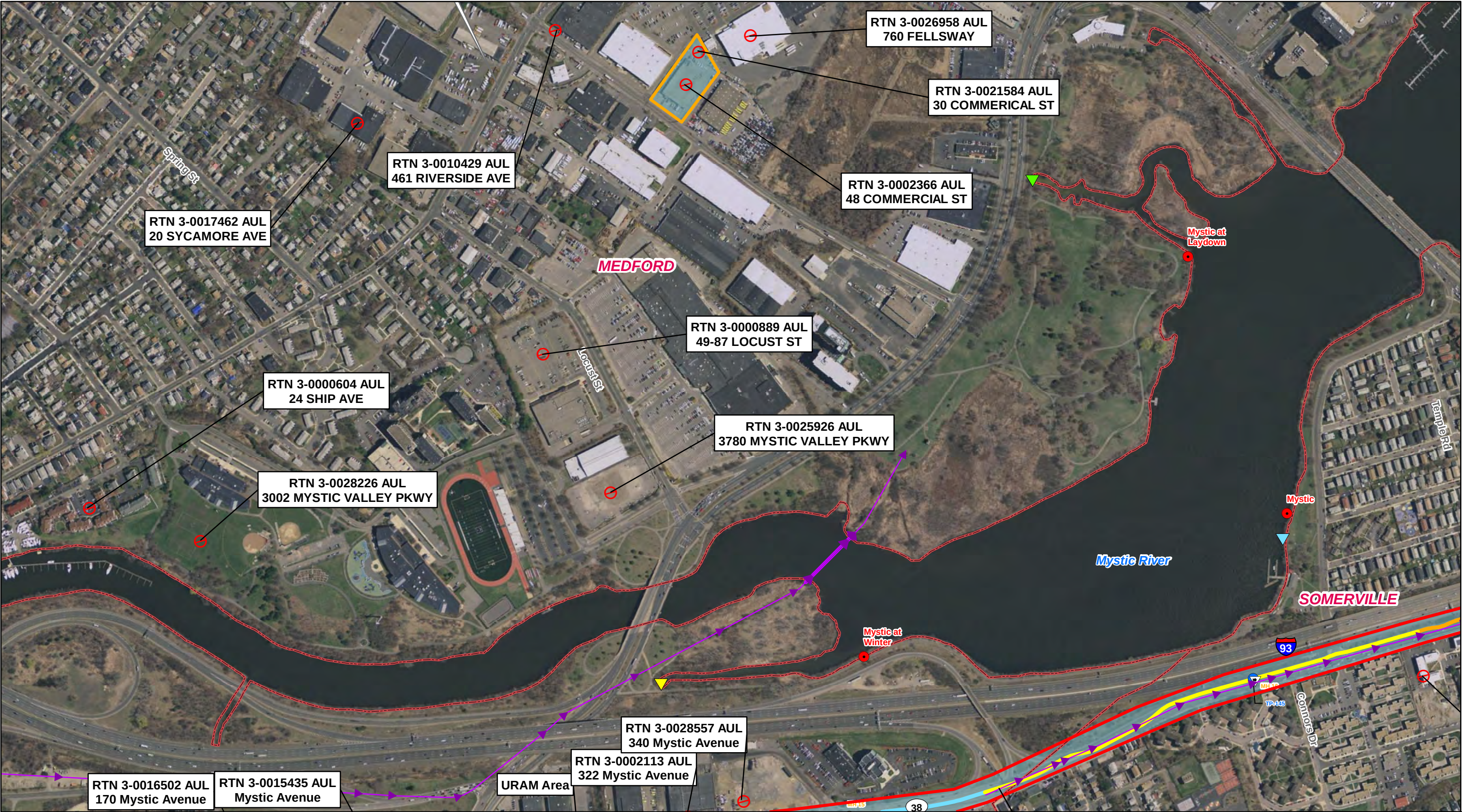
Figure 1: Aerial Dewatering Site Plan

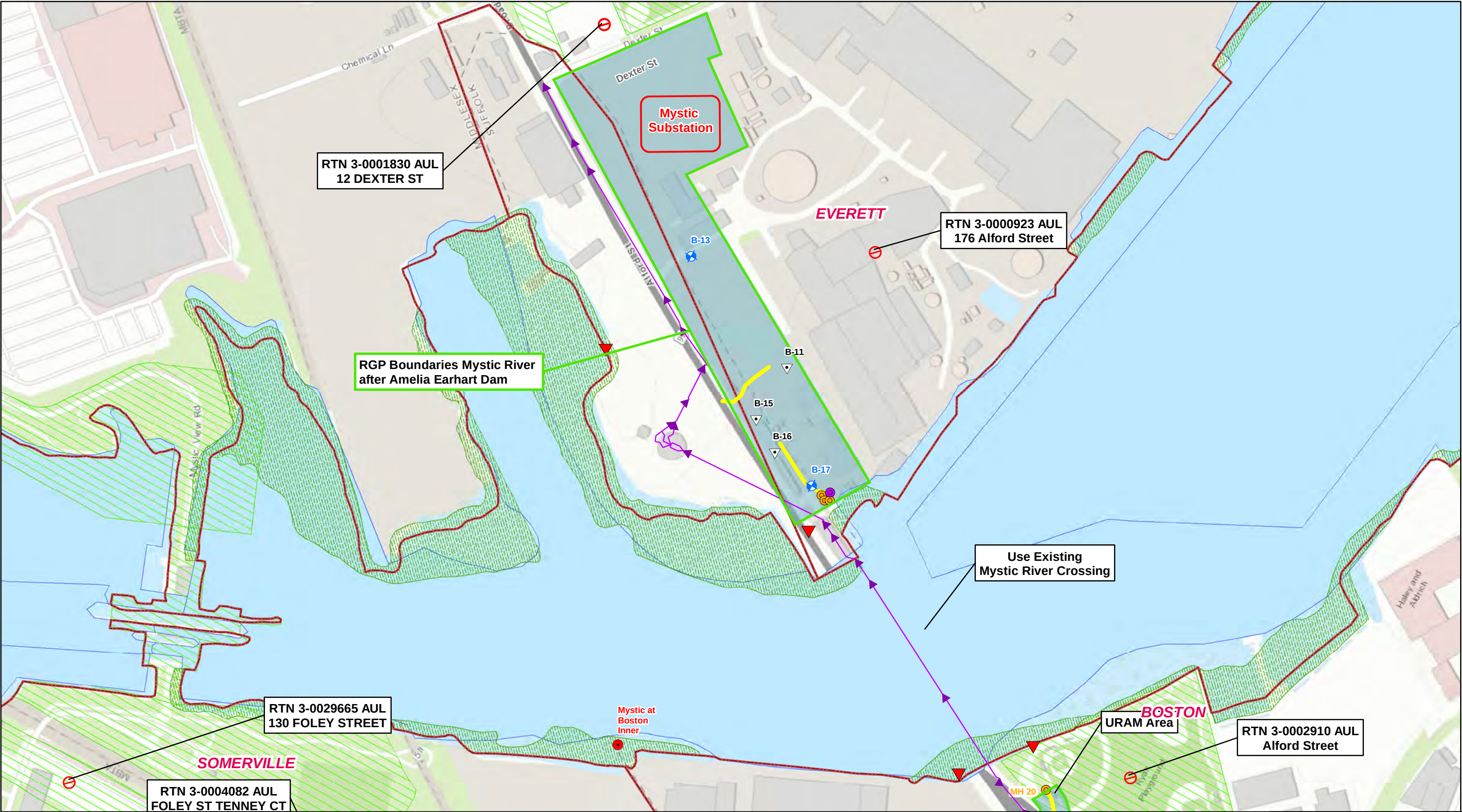
Mapsheet 10 of 11

**EVERSOURCE
ENERGY**

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November 2017





INDEX MAP

Legend

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

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

1 in = 300 ft

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

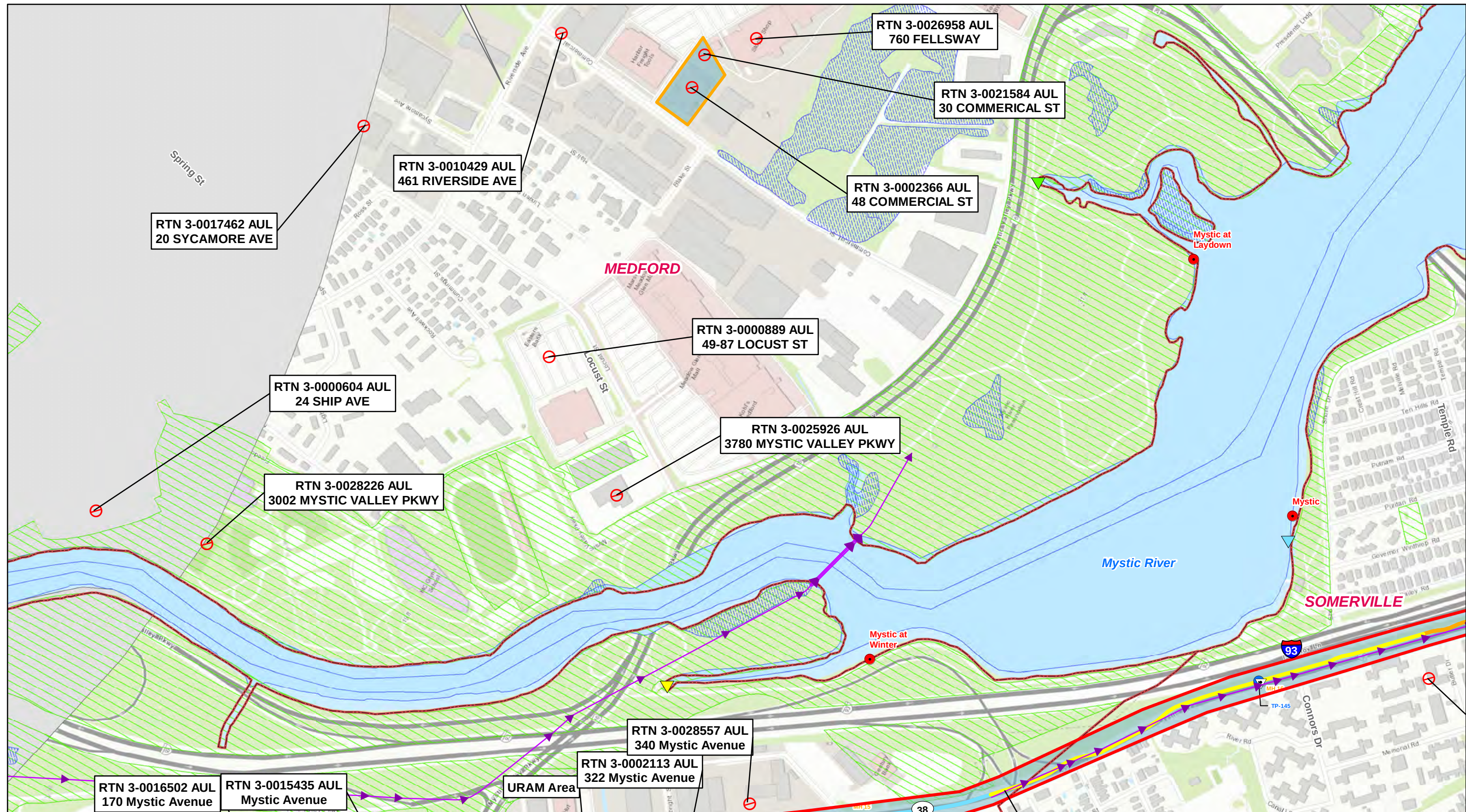
Figure 1: Aerial Dewatering Site Plan

Mapsheet 10 of 11

**EVERSOURCE
ENERGY**

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November 2017



INDEX MAP

Legend

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

Map Notes:
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1 in = 450 ft

0 150 300 600 Feet

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

Figure 1: Aerial Dewatering Site Plan

Mapsheet 11 of 11

**EVERSOURCE
ENERGY**

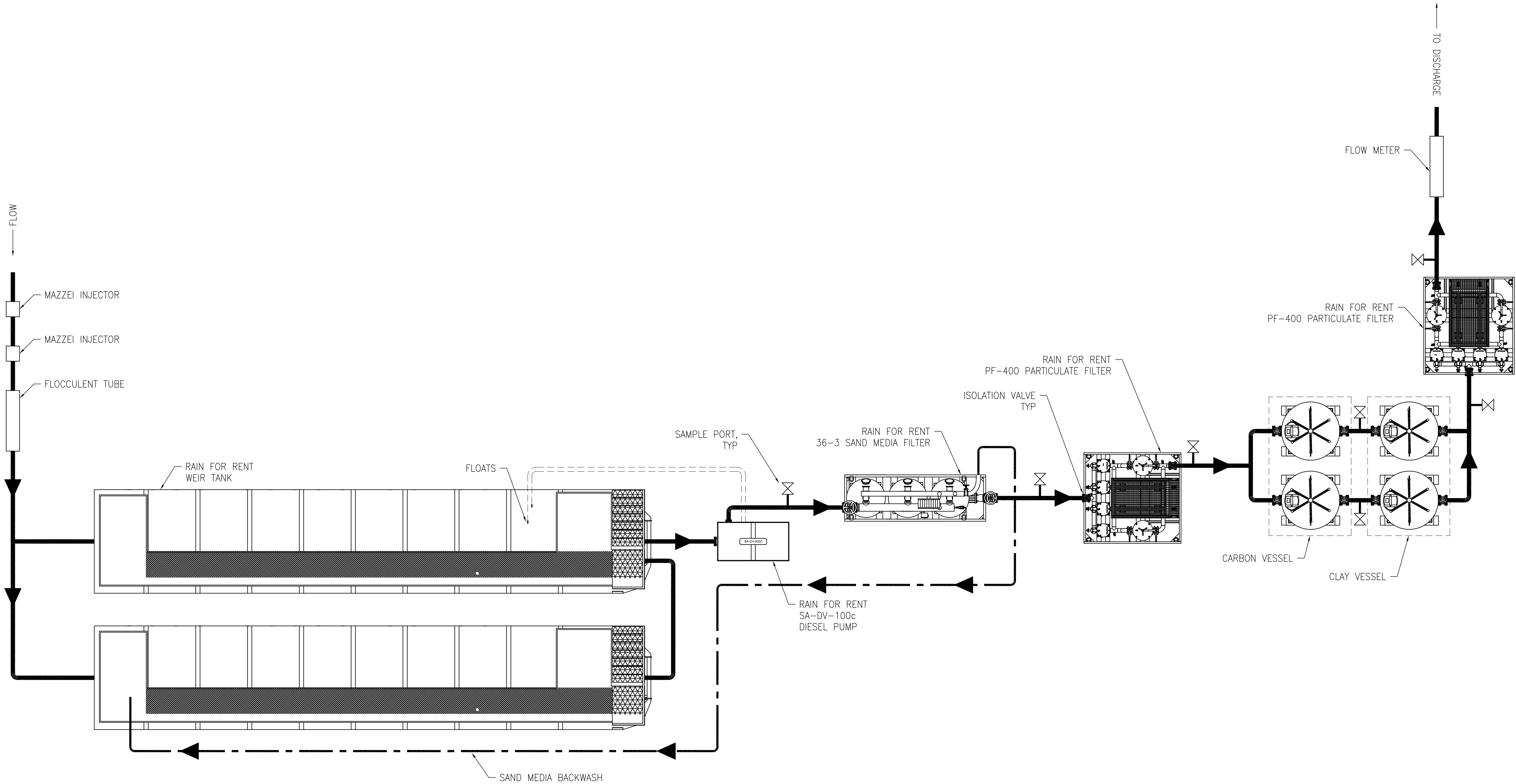
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Engineers | Environmental Specialists

November 2017

REV.NO.	DESCRIPTION	PREVIOUS DWG	BY	DATE
1				

Figure 3.1: Process Flow Diagram

ITEM	QTY.	REF.	DESCRIPTION



PLAN VIEW

FILTRATION
LAYOUT

BOND BROTHERS
350 GPM

Rain for Rent
Engineering



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01-15043-02-01



CONFIDENTIAL RAIN FOR RENT INFORMATION NUMBER 232101-17

1 SHEET OF 1

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

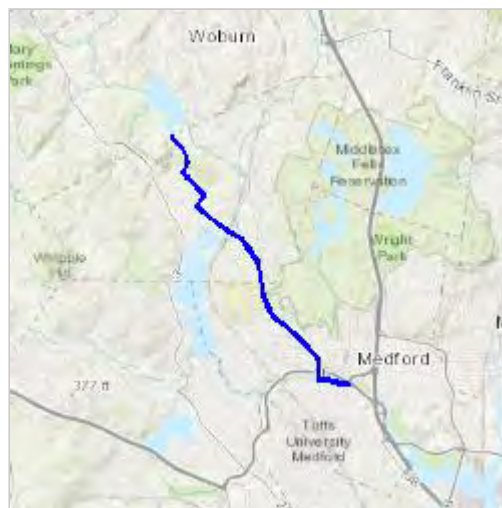
Project Type: ** OTHER **

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 <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

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



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 Project N-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: Brona Simon, MHC
Ramona Peters, MWT (via email attachment)
Bettina Washington, WTGH/A (via email attachment)

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

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

Tighe&Bond

Engineers | Environmental Specialists

Eversource Project

Mystic-Woburn Transmission Project

US EPA RGP Dilution Factor Calculations

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

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

Where:

DF = Dilution Factor

QD = Effluent Discharge Flow Rate (MGD)

QS = 7Q10 Stream Flow Rate (MGD)

MGD = Million Gallons per Day

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

Enter number values in green boxes below

Enter values in the units specified

↓	
2.16	Q _R = Enter upstream flow in MGD
0.504	Q _P = Enter discharge flow in MGD
2.16	Downstream 7Q10

Enter a dilution factor, if other than zero

↓	
5.29	

Enter values in the units specified

↓	
	C _I = Enter influent hardness in mg/L CaCO ₃
	C _S = Enter receiving water hardness in mg/L CaCO ₃

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

↓	
7.75	pH in Standard Units
17.2	Temperature in °C
0.43	Ammonia in mg/L
0	Hardness in mg/L CaCO ₃
14.9	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
0	Copper in µg/L
0	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
0	Zinc in µg/L

Enter **influent** concentrations in the units specified

↓	
0	TRC in µg/L
1.96	Ammonia in mg/L
0	Antimony in µg/L
7.5	Arsenic in µg/L
0.99	Cadmium in µg/L
16.7	Chromium III in µg/L
0	Chromium VI in µg/L
62.8	Copper in µg/L
15500	Iron in µg/L
7.6	Lead in µg/L
0	Mercury in µg/L
23.2	Nickel in µg/L
0	Selenium in µg/L
0	Silver in µg/L
771	Zinc in µg/L
0	Cyanide in µg/L
0	Phenol in µg/L
0	Carbon Tetrachloride in µg/L
1.4	Tetrachloroethylene in µg/L
30.85	Total Phthalates in µg/L
24	Diethylhexylphthalate in µg/L
0.25	Benzo(a)anthracene in µg/L
0.26	Benzo(a)pyrene in µg/L
0.33	Benzo(b)fluoranthene in µg/L
0.12	Benzo(k)fluoranthene in µg/L
0.24	Chrysene in µg/L
0.05	Dibenzo(a,h)anthracene in µg/L
0.18	Indeno(1,2,3-cd)pyrene in µg/L
0	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 approved

Saltwater (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	5.3					
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	32.1	µg/L	50	µg/L
Total Suspended Solids	30	mg/L	---			
Antimony	206	µg/L	2743	µg/L		
Arsenic	104	µg/L	154	µg/L		
Cadmium	10.2	µg/L	37.9	µg/L		
Chromium III	323	µg/L	428.6	µg/L		
Chromium VI	323	µg/L	216	µg/L		
Copper	242	µg/L	16.0	µg/L		
Iron	5000	µg/L	---	µg/L		
Lead	160	µg/L	36.5	µg/L		
Mercury	0.739	µg/L	4.74	µg/L		
Nickel	1450	µg/L	35.5	µg/L		
Selenium	235.8	µg/L	305	µg/L		
Silver	35.1	µg/L	9.6	µg/L		
Zinc	420	µg/L	367	µg/L		
Cyanide	178	mg/L	4.3	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	7.97	mg/L	---			
Phenol	1,080	µg/L	1286	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	4.4		6.9	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	14.1	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	9.4	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	1.0	µg/L	---			
Benzo(a)anthracene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Benzo(a)pyrene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Benzo(b)fluoranthene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Benzo(k)fluoranthene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Chrysene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Dibenzo(a,h)anthracene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	0.0163	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	86	µg/L		
tert-Butyl Alcohol	120	µg/L	---			
tert-Amyl Methyl Ether	90	µg/L	---			

TABLE 1
Groundwater Results - Mystic

Eversource: Woburn - Mystic

Analytical Test	Sample Identification Sample Date	Effluent Limitation	Average Concentration	Sullivan Square Crossing				Station 250	
				MW-505B 1/10/2017	MW-505B 1/11/2017	MW-505A 1/10/2017	MW-505A FF 1/10/2017	B-3 7/13/2017	B-17 7/13/2017
TPH - mg/L	TPH	5.0	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND(5)	ND(5)
Total PAHs Group I - ug/L	Benzo(a)Anthracene	0.0163/0.1 ⁽¹⁾	0.110	0.10	ND (0.05)	0.11	ND (0.05)	0.25	0.10
	Benzo(a)Pyrene	0.0163/0.1 ⁽¹⁾	0.127	0.19	ND (0.05)	0.12	ND (0.05)	0.26	0.09
	Benzo(b)Fluoranthene	0.0163/0.1 ⁽¹⁾	0.155	0.24	ND (0.05)	0.15	ND (0.05)	0.33	0.11
	Benzo(k)Fluoranthene	0.0163/0.1 ⁽¹⁾	0.063	0.06	ND (0.05)	0.05	ND (0.05)	0.12	ND(0.05)
	Chrysene	0.0163/0.1 ⁽¹⁾	0.123	0.15	ND (0.05)	0.13	ND (0.05)	0.24	0.12
	Dibenzo(a,h)Anthracene	0.0163/0.1 ⁽¹⁾	0.047	0.05	ND (0.05)	0.03	ND (0.05)	0.18	ND(0.05)
	Indeno(1,2,3-cd)Pyrene	0.0163/0.1 ⁽¹⁾	0.097	0.14	ND (0.05)	0.1	ND (0.05)	0.18	0.06
	Total PAHs Group I	1.0	0.597	0.93	ND	0.69	ND	1.38	0.48
Total PAHs Group II - ug/L	Acenaphthene	NE	0.17	0.11	0.08	0.04	ND (0.19)	0.35	0.26
	Acenaphthylene	NE	ND (0.19)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.19)	ND(0.19)	ND(0.19)
	Anthracene	NE	0.12	0.06	ND (0.19)	0.08	0.03	ND(0.19)	ND(0.19)
	Benzo(ghi)Perylene	NE	0.17	0.18	ND (0.19)	0.10	ND (0.19)	0.19	ND(0.19)
	Fluoranthene	NE	0.24	0.14	ND (0.19)	0.21	ND (0.19)	0.41	0.31
	Fluorene	NE	0.13	0.11	0.06	0.06	ND (0.19)	0.19	ND(0.19)
	Naphthalene	20	3.30	1.72	17.4	0.05	0.04	ND(0.19)	0.37
	Phenanthrene	NE	0.22	0.21	0.06	0.18	ND (0.19)	ND(0.19)	0.48
	Pyrene	NE	0.22	0.27	0.02	0.25	ND (0.19)	ND(0.19)	0.39
	Total PAHs Group II	100	3.64	2.8	17.62	0.22	0.07	1.14	1.81
Phthalates - ug/L	Butylbenzylphthalate	NE	1.15	0.88	0.39	0.61	0.31	ND(2.34)	ND(2.34)
	Bis (2-Ethylhexyl) Phthalate	9.4	8.79	24	2.88	5.22	2.83	9.48	8.31
	Diethylphthalate	NE	2.08	3.71	3.19	0.54	0.36	ND(2.34)	ND(2.34)
	Dimethylphthalate	NE	ND (2.34)	NA	NA	NA	NA	ND(2.34)	ND(2.34)
	Di-n-butylphthalate	NE	1.82	1.11	0.47	ND (2.34)	ND (2.34)	ND(2.34)	ND(2.34)
	Di-n-octylphthalate	NE	1.79	1.15	ND (2.34)	0.21	ND (2.34)	ND(2.34)	ND(2.34)
	Total Phthalates	190	10.94	30.85	6.93	6.58	3.5	9.48	8.31
SVOCs - ug/L	Pentachlorophenol	1.0	ND (0.84)	ND (0.90)	ND (0.84)	ND(0.84)	ND(0.84)	ND(0.84)	ND(0.84)
	All Other SVOCs	NE	ND	< c/s	< c/s	< 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)	ND (5.0)	ND(10.0)	ND(10.0)
	Arsenic	104	4.4	7.5	5.5	2.7	ND (5.0)	3.5	1.9
	Barium	NE	191	65	106	279	314	NA	NA
	Beryllium	NE	0.93	0.4	0.6	1.9	0.8	NA	NA
	Cadmium	10.2	2.0	ND (5.0)	0.05	0.80	ND (5.0)	0.99	0.42
	Chromium	323	7.4	7.4	17.3	61.5	2.1	11.6	16.7
	Chromium III	323	21.2	ND (10)	17.0	62	ND (10)	11.6	16.7
	Lead	160	11.1	1.3	6.2	34.5	ND (12.5)	7.6	4.6
	Mercury	0.739	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND(0.20)	ND(0.20)
	Nickel	1,450	13.3	ND (10.0)	6.3	25.6	3.8	23.2	11.1
	Selenium	235.8	ND (2.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND(2.0)	ND(2.0)
	Silver	35.1	ND (0.2)	ND (0.2)	ND (0.20)	ND (0.2)	ND (0.20)	ND(1.0)	ND(2.0)
	Thallium	NE	ND (1.0)	ND (1.0)	ND (10.0)	ND (3.0)	ND (10.0)	NA	NA
	Vanadium	NE	9.7	2.6	7.0	26.6	2.4	NA	NA
	Zinc	367	211	28.3	78.8	203	12.8	771	174
	Iron	5,000	12,208	15,500	15,400	24,600	1,060	7,430	9,260
	Copper	16	54	ND (10)	17.0	206	2.6	62.8	27.0
Ethanol - ug/L	Ethanol	Report	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND(10)	ND(10)
1,2-Dibromoethane - ug/L	1,2-Dibromoethane (EDB)	0.05	ND (0.015)	ND (0.015)	ND (0.015)	ND (0.015)	ND (0.015)	ND(0.015)	ND(0.015)
1,4-Dioxane - ug/L	1,4-Dioxane	200	0.607	ND (500)	ND (500)	ND (500)	ND (500)	0.263	0.950
PCB - ug/L	Aroclor-1016	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1221	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1232	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1242	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1248	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1254	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1260	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	0.10
	Aroclor-1262	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1268	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Total PCBs	0.000064/0.5 ⁽¹⁾	0.06	ND	ND	ND	ND	ND	0.10
VOCs - ug/L	tert-Butyl Alcohol (TBA)	120	ND (25.0)	ND (25.0)	ND (25.0)	ND (25.0)	ND (25.0)	ND(25.0)	ND(25.0)
	tert-Amyl Methyl Ether	90	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(1.0)	ND(1.0)
	Napthalene	20	4.7	2.5	22.6	0.3	ND (1.0)	0.6	1.1
	Carbon Tetrachloride	4.4	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.3)
	1,2 Dichlorobenzene (o-DCB)	600	ND(0.5)	0.3	1.0	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	1,3 Dichlorobenzene (m-DCB)	320	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.5)
	1,4 Dichlorobenzene (p-DCB)	5.0	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.5)
	1,1 Dichloroethane (DCA)	70	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.5)
	1,2 Dichloroethane (DCE)	5.0	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.5)
	1,1 Dichloroethene (DCE)	3.2	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.5)
	sec-Butylbenzene	NE	1.5	2.9	ND (1.0)	ND (1.0)	ND (1.0)	NA	NA
	tert-Butyl Ethyl Ether (TBE)	NE	1.1	1.3	ND (1.0)	ND (1.0)	ND (1.0)	NA	NA
	cis-1,2 Dichloroethene (DCE)	70	ND(0.5)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Methylene Chloride	4.6	0.2	0.2	ND (2.0)	ND (2.0)	ND (2.0)	ND(0.5)	ND(0.5)
	Tetrachloroethene (PCE)	5.0	1.4	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	1.4
	1,1,1 Trichloro-ethane (TCA)	200	ND(0.5)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	1,1,2 Trichloro-ethane (TCA)	5.0	ND(0.5)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Trichloroethene (TCE)	5.0	ND(0.5)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Methyl tert-Butyl Ether	70	ND(0.5)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Acetone	7.97	4.9	10.3	ND (10)	3.6	ND (10)	18.1	24.6
	Vinyl Chloride	2.0	ND(0.2)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.2)	ND(0.2)
BTEX - ug/L	Benzene	5.0	42.7	14.9	244	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Toluene	NE	1.3	1.3	4.2	ND (1.0)	0.2	ND(0.5)	ND(0.5)
	Ethylbenzene	NE	15.0	9.2	77.8	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Total Xylenes	NE	10.0	6.4	48.9	ND (1.0)	ND (1.0)	ND(0.5)	2.0
	Total BTEX	100	15.9	31.8	130.9	ND	0.2	ND	2.0
Classical Chemistry	Chloride (mg/L)	Report	1,495	63	70	4,800	2,600	1,040	399
	Ammonia (mg/L)	Report	0.78	0.16	ND (10)	0.20	0.82	1.96	0.77
	Hexavalent Chromium (ug/L)	323	ND (10)	ND (10)	ND (10)	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)	ND (5.00)	ND(5.00)	ND(5.00)
	Phenols (ug/L)	1,080	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND(5.00)	ND(5.00)
	Total Residual Chlorine (ug/L)	32.1/50 ⁽¹⁾	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND(10)	ND(10)
	Total Suspended Solids (ug/L)	30,000	11,549,000	39,800,000	62,000	1,350,000	8,000	27,600,000	474,000
	Hardness (ug/L)	NE	249,000	NA	NA	NA	NA	239,000	259,000

Notes:

1: The second standard is the compliance level

SVOCs = Volatile Organic Compounds

TPH = Total Petroleum Hydrocarbons

PCBs = Polychlorinated biphenyls

mg/L = milligrams per kilogram (ppm)

ug/L = micrograms per kilogram (ppb)

< xx = not detected above the indicated laboratory method detection limit

c/s = compound specific

NE = Not Established

NA = Not Analyzed

ND = Not Detected

* = Effluent limits calculated using the US EPA's Dilution Factor and Effluent Limitation Calculations for Massachusetts Form (Appendix V)

Red text = exceeds RGP limit

TABLE 2**Surface Water Results**

Eversource: Woburn - Mystic

Analytical Test	Sample Identification	Effluent Limitation	Mystic at Boston Inner
	Sample Date		11/15/2017
Metals (ug/L)	Arsenic	104	ND(5)
	Cadmium	10.2	ND(10)
	Chromium	323	ND(20)
	Chromium III	323	ND(20)
	Copper	16	ND(10)
	Iron	5,000	ND(100)
	Lead	160	ND(2)
	Nickel	1,450	ND(20)
	Silver	35.1	NA
	Zinc	367	ND(50)
Classical Chemistry	Ammonia as N (mg/L)	Report	0.43
	Hexavalent Chromium (ug/L)	323	ND(10)
	pH	NE	7.75
	Salinity (ppt)	NE	14.9
	Hardness (ug/L)	NE	NA

Notes:*mg/L= milligrams per kilogram (ppm)**ug/L= micrograms per kilogram (ppb)**NE = Not Established**NA = Not Analyzed**ND = Not Detected*



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-Cl 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-Cl 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-Cl 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-Cl 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-Cl 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):

☒ 8260 VOC CAM II A	☐ 7470/7471 Hg CAM III B	☐ MassDEP VPH CAM IV A	☐ 8081 Pesticides CAM V B	☒ 7196 Hex Cr CAM VI B	☐ MassDEP APH CAM IX A
☒ 8270 SVOC CAM II B	☒ 7010 Metals CAM III C	☐ MassDEP EPH CAM IV B	☐ 8151 Herbicides CAM V C	☐ 8330 Explosives CAM VIII A	☐ TO-15 VOC CAM IX B
☒ 6010 Metals CAM III A	☐ 6020 Metals CAM III D	☒ 8082 PCB CAM V A	☐ 6860 Perchlorate CAM VIII B	☒ 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 ☒ No ☐
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes ☒ No ☐
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 ☒ No ☐
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 ☒ No ☐
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 ☐ No ☐
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ☐ No ☐
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 ☒ No ☐

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 ☒ No ☐ *
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	Yes ☐ No ☒ *
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ☐ No ☒ *

****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-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 23:09	50	25	CA71146
Arsenic	5.5 (5.0)	0.4	7010		1	KJK	01/14/17 16:23	50	25	CA71146
Barium	106 (25.0)	1.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Beryllium	0.6 (0.5)	0.1	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Cadmium	J 0.05 (0.5)	0.03	7010		1	KJK	01/17/17 16:16	50	25	CA71146
Chromium	17.3 (10.0)	1.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Chromium III	17 (10)		6010C		1	JLK	01/13/17 3:56	1	1	[CALC]
Copper	18.7 (5.0)	2.0	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Iron	15400 (50.0)	11.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Lead	6.2 (2.5)	0.5	7010		1	KJK	01/18/17 21:29	50	25	CA71146
Mercury	ND (0.20)	0.12	7470A		1	MJV	01/13/17 12:56	20	40	CA71147
Nickel	J 6.3 (10.0)	1.0	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Selenium	ND (5.0)	0.6	7010		1	KJK	01/15/17 3:58	50	25	CA71146
Silver	ND (0.2)	0.08	7010		1	KJK	01/17/17 19:22	50	25	CA71146
Thallium	ND (1.0)	0.5	7010		1	KJK	01/14/17 19:04	50	25	CA71146
Vanadium	J 7.0 (10.0)	1.0	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Zinc	B 78.8 (25.0)	4.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 15:04		CA71203
Aroclor 1221	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1232	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1242	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1248	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1254	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1260	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1262	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1268	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	73 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	78 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	78 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	63 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 20:06	C7A0161	CA71231
1,1,2-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,1-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,1-Dichloroethene	ND (1.0)	0.3	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,2-Dibromoethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,2-Dichlorobenzene	J 1.0 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,2-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,3-Dichlorobenzene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,4-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,4-Dioxane - Screen	ND (500)	190	8260B		1	01/12/17 20:06	C7A0161	CA71231
Acetone	ND (10.0)	2.7	8260B		1	01/12/17 20:06	C7A0161	CA71231
Benzene	244 (10.0)	1.0	8260B		10	01/13/17 18:32	C7A0161	CA71231
Carbon Tetrachloride	ND (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
cis-1,2-Dichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Ethylbenzene	77.8 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
Methyl tert-Butyl Ether	ND (1.0)	0.3	8260B		1	01/12/17 20:06	C7A0161	CA71231
Methylene Chloride	ND (2.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Naphthalene	22.6 (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Tertiary-amyl methyl ether	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Tertiary-butyl Alcohol	ND (25.0)	10.0	8260B		1	01/12/17 20:06	C7A0161	CA71231
Tetrachloroethene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Toluene	4.2 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
Trichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Vinyl Chloride	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Xylene O	8.1 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
Xylene P,M	40.8 (2.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	98 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	93 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	97 %		70-130
<i>Surrogate: Toluene-d8</i>	98 %		70-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 0.08 (0.19)	0.04	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Acenaphthylene	ND (0.19)	0.03	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Anthracene	ND (0.19)	0.03	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(a)anthracene	ND (0.05)	0.01	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(a)pyrene	ND (0.05)	0.01	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(b)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(g,h,i)perylene	ND (0.19)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(k)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
bis(2-Ethylhexyl)phthalate	B 2.88 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Butylbenzylphthalate	B, J 0.39 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Chrysene	ND (0.05)	0.01	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Dibenzo(a,h)Anthracene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Diethylphthalate	3.19 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Dimethylphthalate	ND (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Di-n-butylphthalate	J 0.47 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Di-n-octylphthalate	ND (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Fluoranthene	ND (0.19)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Fluorene	J 0.06 (0.19)	0.03	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Indeno(1,2,3-cd)Pyrene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Naphthalene	17.4 (0.93)	0.20	8270D SIM		5	01/13/17 15:29	C7A0164	CA71116
Pentachlorophenol	ND (0.84)	0.30	8270D SIM		1	01/19/17 14:01	C7A0164	CA71116
Phenanthrene	J 0.06 (0.19)	0.04	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Pyrene	J 0.02 (0.19)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	63 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	131 %	S+	15-110
<i>Surrogate: 2-Fluorobiphenyl</i>	74 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	82 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	84 %		30-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 17:18	mg/L	CA71301
Chloride	70.0 (10.0)		§		1	SUB	01/13/17 20:47	mg/L	CA71826
Hexavalent Chromium	ND (10)		7196A		1	JLK	01/11/17 21:00	ug/L	CA71144
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	62000 (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-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 20:29		CA71322
		<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-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 18:27		CA71246



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B
Date Sampled: 01/11/17 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-06
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 23:14	50	25	CA71146
Arsenic	7.5 (5.0)	0.4	7010		1	KJK	01/14/17 16:40	50	25	CA71146
Barium	65.0 (25.0)	1.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Beryllium	J 0.4 (0.5)	0.1	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Cadmium	ND (0.5)	0.03	7010		1	KJK	01/17/17 16:22	50	25	CA71146
Chromium	J 7.4 (10.0)	1.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Chromium III	ND (10)		6010C		1	KJK	01/13/17 4:00	1	1	[CALC]
Copper	5.3 (5.0)	2.0	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Iron	15500 (50.0)	11.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Lead	J 1.3 (2.5)	0.5	7010		1	KJK	01/14/17 22:47	50	25	CA71146
Mercury	ND (0.20)	0.12	7470A		1	MJV	01/13/17 12:58	20	40	CA71147
Nickel	ND (10.0)	1.0	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Selenium	ND (5.0)	0.6	7010		1	KJK	01/15/17 4:15	50	25	CA71146
Silver	ND (0.2)	0.08	7010		1	KJK	01/17/17 20:20	50	25	CA71146
Thallium	ND (1.0)	0.5	7010		1	KJK	01/14/17 19:10	50	25	CA71146
Vanadium	J 2.6 (10.0)	1.0	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Zinc	B 28.3 (25.0)	4.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146



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

Total Metals

Batch CA71144 - [CALC]

Blank

Chromium III	ND	10	ug/L							

LCS

Chromium III	ND		ug/L							

LCS Dup

Chromium III	ND		ug/L							

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

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							

LCS

Mercury	6.34	0.20	ug/L	6.000		106	80-120			

LCS Dup

Mercury	6.26	0.20	ug/L	6.000		104	80-120	1	20	

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			



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

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

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

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

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

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							

LCS

Total Residual Chlorine	2		mg/L	1.800		100	85-115			

Batch CA71144 - General Preparation

Blank

Hexavalent Chromium	ND	10	ug/L							

LCS

Hexavalent Chromium	0.5		mg/L	0.4998		99	90-110			

LCS Dup

Hexavalent Chromium	0.5		mg/L	0.4998		99	90-110	0.2	20	

Batch CA71229 - General Preparation

Blank

Total Suspended Solids	ND	5000	ug/L							

LCS

Total Suspended Solids	64		mg/L	68.70		93	80-120			

Batch CA71301 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L							

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

Classical Chemistry

Batch CA71301 - NH4 Prep

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

LCS

Ammonia as N	1.11	0.10	mg/L	0.9994		112	80-120			

Batch CA71306 - General Preparation

Blank

Total Petroleum Hydrocarbon	ND	5	mg/L							

LCS

Total Petroleum Hydrocarbon	15	5	mg/L	19.38		78	66-114			

Batch CA71317 - TCN Prep

Blank

Total Cyanide (LL)	ND	5.00	ug/L							

LCS

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

LCS

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

LCS Dup

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

Batch CA71336 - General Preparation

Blank

Phenols	ND	100	ug/L							

LCS

Phenols	116	100	ug/L	100.0		116	80-120			

LCS

Phenols	997	100	ug/L	1000		100	80-120			

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

Batch CA71322 - 504/8011

Blank

1,2-Dibromoethane	ND	0.015	ug/L							

1,2-Dibromoethane [2C]	ND	0.015	ug/L							

Surrogate: Pentachloroethane	0.162		ug/L	0.2000		81	30-150			

Surrogate: Pentachloroethane [2C]	0.151		ug/L	0.2000		76	30-150			

LCS

1,2-Dibromoethane	0.200	0.015	ug/L	0.2000		100	60-140			

1,2-Dibromoethane [2C]	0.190	0.015	ug/L	0.2000		95	70-130			

Surrogate: Pentachloroethane	0.167		ug/L	0.2000		83	30-150			

Surrogate: Pentachloroethane [2C]	0.162		ug/L	0.2000		81	30-150			

LCS

1,2-Dibromoethane	0.084	0.015	ug/L	0.08000		105	60-140			

1,2-Dibromoethane [2C]	0.057	0.015	ug/L	0.08000		72	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

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.

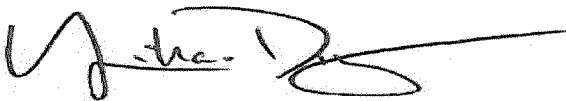
All samples were analyzed within the established guidelines of US EPA approved methods with all requirements met, unless otherwise noted at the end of a given sample's analytical results or in a case narrative.

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		☒ Yes ☐ No		Internal Use Only				Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-Na2S2O3			
Seals Intact		☐ Yes ☐ No NA:		☐ Pickup				Sampled by:			
Cooler Temperature: <u>3.5°C</u>				☐ Technician				Comments:			
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 / NA
 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 18L

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:0998-11-13 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 781-326-1100 FAX Number 781-326-1101 Email Address Ds.Bobis@Tighebond.com

Sample Matrix G Sample ID MW-37

Sample Type G Collection Date 1/11/17 Collection Time 8:00

ESS Lab ID 1

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

ESS Lab # 1701214

Reporting Limits EPA RGP Eff limits Appendix VIII

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

Analysis TSS TRC Ammonia Chloride Lead Chrom Hex. Chrom Urea, Hg, As, Cd, Cr, Ni, Pb, Se, Ag, Zn VOCs SVOCs TPH MIB, THM THM5 Edman PCB, T. Phenols EDB Cr+6

ESS Lab ID 1

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcAc NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers: 73

Container Type: AG-Amber Glass B-BOD Bottle G G-Glass P-Poly S-Sterile V-Vial O-Other

Laboratory Use Only

Cooler Present: yes

Seals Intact: yes

Cooler Temperature: 5.8 °C

Sampled by: pu

Comments:

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

Relinquished by: (Signature, Date & Time)

Received By: (Signature, Date & Time)

Relinquished By: (Signature, Date & Time)

Received By: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time)

Received By: (Signature, Date & Time)

Relinquished By: (Signature, Date & Time)

Received By: (Signature, Date & Time)

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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 # 1701214

Reporting Limits EPA RGP Eff limits (Appendix VIII)

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

Company Name Tigne + Bond			Project # N:0998-11-B		Project Name water to mystic	
Contact Person Dean Bels			Address One Univ. Ave		Address	
City West Wood			State MA		Zip Code 02090	
Telephone Number			FAX Number		PO #	
ESS Lab ID			Collection Date		Collection Time	
Sample Type			Sample Matrix		Sample ID	
1	1/11/17	81020	G	GW	MW-37	
2		1050			MW-37 FF	
3		1120			MW-36	
4		1150			MW-36 FF	
					MW-505B	
5		830			MW-505B FF	
6		800	G	BW	MW-805B	
Analysis						
TSS						
TRC						
Ammonia						
Chloride						
Lead						
Hex. Chrom						
Mn (Perm), As, Cd, Cr, Ni, Cu, Fe, Pb, Hg, Se, Ag, Zn						
VOCs						
SVOCs						
TPH						
MTBE, TBA						
Edams						

Container Type:									
AG-Amber Glass									
B-BOD Bottle									
G-Glass									
P-Poly									
S-Sterile									
V-Vial									
O-Other									
Preservation Code:									
1-Non Preserved									
2-HCl									
3-H2SO4									
4-HNO3									
5-NaOH									
6-Methanol									
7-Na2S2O3									
8-ZnAc2									
9-NH4Cl									
10-DI H2O									
11-Other									
Number of Containers:									
33									

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

Number of Containers: 73

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

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

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

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

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

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

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

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

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

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

CERTIFICATE OF ANALYSIS

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

RE: Station 250/Mystic Charlestown Eversource RGP (N/A)
ESS Laboratory Work Order Number: 1707259

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 3:36 pm, Jul 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: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

SAMPLE RECEIPT

The following samples were received on July 13, 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.

Lab Number	Sample Name	Matrix	Analysis
1707259-01	B-3	Ground Water	1664A, 200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608, 625 SIM, 8270D SIM, ASTM D3695
1707259-02	B-17	Ground Water	1664A, 200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608, 625 SIM, 8270D SIM, ASTM D3695

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

PROJECT NARRATIVE

524.2 Volatile Organic Compounds

1707259-01 Due to high sediment content vials were composited
 1707259-02 Due to high sediment content vials were composited
 C7G0199-CCV1 Continuing Calibration %Diff/Drift is above control limit (CD+).
 1,1-Dichloroethene (86% @ 30%), Tertiary-butyl Alcohol (63% @ 30%)
 CG71431-BSD1 Blank Spike recovery is above upper control limit (B+).
 1,1-Dichloroethene (201% @ 70-130%), Tertiary-butyl Alcohol (163% @ 70-130%)
 CG71431-BSD1 Relative percent difference for duplicate is outside of criteria (D+).
 1,1-Dichloroethene (59% @ 20%), Tertiary-butyl Alcohol (33% @ 25%)

625(SIM) Semi-Volatile Organic Compounds

1707259-01 Present in Method Blank (B).
 bis(2-Ethylhexyl)phthalate
 1707259-01 Surrogate recovery(ies) below lower control limit (S-).
 1,2-Dichlorobenzene-d4 (29% @ 30-130%)
 1707259-02 Present in Method Blank (B).
 bis(2-Ethylhexyl)phthalate
 C7G0249-CCV1 Continuing Calibration %Diff/Drift is above control limit (CD+).
 Di-n-octylphthalate (24% @ 20%)
 CG71808-BS2 Blank Spike recovery is above upper control limit (B+).
 Benzo(k)fluoranthene (142% @ 40-140%), bis(2-Ethylhexyl)phthalate (268% @ 40-140%),
 Di-n-octylphthalate (151% @ 40-140%), Pyrene (144% @ 40-140%)
 CG71808-BSD2 Blank Spike recovery is above upper control limit (B+).
 Benzo(a)pyrene (150% @ 40-140%), Benzo(b)fluoranthene (148% @ 40-140%), Benzo(k)fluoranthene
 (154% @ 40-140%), bis(2-Ethylhexyl)phthalate (244% @ 40-140%), Butylbenzylphthalate (142% @
 40-140%), Di-n-butylphthalate (153% @ 40-140%), Di-n-octylphthalate (159% @ 40-140%), Pyrene
 (146% @ 40-140%)

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

C7G0195-TUN1 DDT breakdown > 20%

Classical Chemistry

1707259-01 The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
 1707259-02 The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.

No other observations noted.

End of Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

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](#)

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: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
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 (10.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Arsenic	3.5 (1.0)		3113B		1	KJK	07/19/17 5:32	100	20	CG71436
Cadmium	0.99 (0.25)		3113B		5	KJK	07/18/17 18:35	100	20	CG71436
Chromium	11.6 (4.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Chromium III	11.6 (10.0)		200.7		1	JLK	07/15/17 15:59	1	1	[CALC]
Copper	62.8 (4.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Hardness	239000 (165)		200.7		1	KJK	07/15/17 15:59	1	1	[CALC]
Iron	7430 (20.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Lead	7.6 (1.0)		3113B		1	KJK	07/18/17 23:07	100	20	CG71436
Mercury	ND (0.200)		245.1		1	MJV	07/17/17 20:03	20	40	CG71438
Nickel	23.2 (10.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Selenium	ND (2.0)		3113B		1	KJK	07/19/17 8:20	100	20	CG71436
Silver	ND (1.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Zinc	771 (10.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: GEM

524.2 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 (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,1,2-Trichloroethane	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,1-Dichloroethane	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,1-Dichloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,2-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,2-Dichloroethane	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,3-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,4-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Acetone	18.1 (5.0)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Benzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Carbon Tetrachloride	ND (0.3)		524.2		1	07/14/17 12:53	C7G0199	CG71431
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Ethylbenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Methylene Chloride	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Naphthalene	0.6 (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Tetrachloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Toluene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Trichloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Vinyl Chloride	ND (0.2)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Xylene O	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Xylene P,M	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	111 %		80-120
Surrogate: 4-Bromofluorobenzene	104 %		80-120



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 7/14/17 11:05

608 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)		608		1	07/14/17 19:07		CG71414
Aroclor 1221	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1232	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1242	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1248	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1254	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1260	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1262	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1268	ND (0.09)		608		1	07/14/17 19:07		CG71414

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: Decachlorobiphenyl	43 %		30-150
Surrogate: Decachlorobiphenyl [2C]	47 %		30-150
Surrogate: Tetrachloro-m-xylene	66 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	73 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/18/17 13:45

625(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	0.35 (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Acenaphthylene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Anthracene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(a)anthracene	0.25 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(a)pyrene	0.26 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(b)fluoranthene	0.33 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(g,h,i)perylene	0.19 (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(k)fluoranthene	0.12 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
bis(2-Ethylhexyl)phthalate	B 9.48 (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Butylbenzylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Chrysene	0.24 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Dibenzo(a,h)Anthracene	ND (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Diethylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Dimethylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Di-n-butylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Di-n-octylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Fluoranthene	0.41 (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Fluorene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Indeno(1,2,3-cd)Pyrene	0.18 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Naphthalene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Pentachlorophenol	ND (0.84)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Phenanthrene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Pyrene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	29 %	S-	30-130
Surrogate: 2,4,6-Tribromophenol	76 %		15-110
Surrogate: 2-Fluorobiphenyl	45 %		30-130
Surrogate: Nitrobenzene-d5	47 %		30-130
Surrogate: p-Terphenyl-d14	59 %		30-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 7/14/17 16:30

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

<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>
1,4-Dioxane	0.263 (0.250)		8270D SIM		1	07/17/17 16:45	C7G0223	CG71356

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,4-Dioxane-d8	36 %		15-115



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
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	1.96 (0.10)		350.1		1	EEM	07/18/17 14:46	mg/L	CG71705
Chloride	1040 (250)		300.0		500	JLK	07/17/17 23:04	mg/L	CG71735
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	07/13/17 22:16	ug/L	CG71352
Phenols	ND (100)		420.1		1	EEM	07/19/17 14:45	ug/L	CG71920
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	07/18/17 11:05	ug/L	CG71817
Total Petroleum Hydrocarbon	ND (5)		1664A		1	CRR	07/19/17 15:05	mg/L	CG71740
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	07/13/17 21:46	ug/L	CG71353
Total Suspended Solids	27600 (100)		2540D		1	EEM	07/14/17 14:30	mg/L	CG71317



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/14/17 11:30

504.1 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>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2-Dibromoethane	ND (0.015)		504.1		1	07/14/17 15:08		CG71426
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: Pentachloroethane</i>		125 %		30-150				
<i>Surrogate: Pentachloroethane [2C]</i>		116 %		30-150				



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 7/19/17 10:04

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)		ASTM D3695		1	ZLC	07/19/17 11:58		CG71915



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
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 (10.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Arsenic	1.9 (1.0)		3113B		1	KJK	07/19/17 5:43	100	20	CG71436
Cadmium	0.42 (0.15)		3113B		3	KJK	07/18/17 17:26	100	20	CG71436
Chromium	16.7 (4.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Chromium III	16.7 (10.0)		200.7		1	JLK	07/15/17 16:04	1	1	[CALC]
Copper	27.0 (4.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Hardness	259000 (165)		200.7		1	KJK	07/15/17 16:04	1	1	[CALC]
Iron	9260 (20.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Lead	4.6 (1.0)		3113B		1	KJK	07/19/17 0:44	100	20	CG71436
Mercury	ND (0.200)		245.1		1	MJV	07/17/17 20:05	20	40	CG71438
Nickel	11.1 (10.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Selenium	ND (2.0)		3113B		1	KJK	07/19/17 9:00	100	20	CG71436
Silver	ND (1.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Zinc	174 (10.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: GEM

524.2 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 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,1,2-Trichloroethane	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,1-Dichloroethane	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,1-Dichloroethene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,2-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,2-Dichloroethane	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,3-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,4-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Acetone	24.6 (5.0)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Benzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Carbon Tetrachloride	ND (0.3)		524.2		1	07/14/17 13:27	C7G0199	CG71431
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Ethylbenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Methylene Chloride	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Naphthalene	1.1 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Tetrachloroethene	1.4 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Toluene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Trichloroethene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Vinyl Chloride	ND (0.2)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Xylene O	0.7 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Xylene P,M	1.3 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	<i>106 %</i>		<i>80-120</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>101 %</i>		<i>80-120</i>



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 7/14/17 11:05

608 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)		608		1	07/14/17 19:25		CG71414
Aroclor 1221	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1232	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1242	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1248	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1254	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1260	0.10 (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1262	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1268	ND (0.09)		608		1	07/14/17 19:25		CG71414

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	51 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	54 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	85 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	95 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/18/17 13:45

625(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	0.26 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Acenaphthylene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Anthracene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(a)anthracene	0.10 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(a)pyrene	0.09 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(b)fluoranthene	0.11 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(g,h,i)perylene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(k)fluoranthene	ND (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
bis(2-Ethylhexyl)phthalate	B 8.31 (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Butylbenzylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Chrysene	0.12 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Dibenzo(a,h)Anthracene	ND (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Diethylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Dimethylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Di-n-butylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Di-n-octylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Fluoranthene	0.31 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Fluorene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Indeno(1,2,3-cd)Pyrene	0.06 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Naphthalene	0.37 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Pentachlorophenol	ND (0.84)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Phenanthrene	0.48 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Pyrene	0.39 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	30 %		30-130
Surrogate: 2,4,6-Tribromophenol	61 %		15-110
Surrogate: 2-Fluorobiphenyl	46 %		30-130
Surrogate: Nitrobenzene-d5	51 %		30-130
Surrogate: p-Terphenyl-d14	58 %		30-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 7/14/17 16:30

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

<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>
1,4-Dioxane	0.950 (0.250)		8270D SIM		1	07/17/17 17:17	C7G0223	CG71356
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
Surrogate: 1,4-Dioxane-d8		36 %		15-115				



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
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	0.77 (0.10)		350.1		1	EEM	07/18/17 14:47	mg/L	CG71705
Chloride	399 (50.0)		300.0		100	JLK	07/17/17 20:38	mg/L	CG71735
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	07/13/17 22:16	ug/L	CG71352
Phenols	ND (100)		420.1		1	EEM	07/19/17 14:45	ug/L	CG71920
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	07/18/17 11:05	ug/L	CG71817
Total Petroleum Hydrocarbon	ND (5)		1664A		1	CRR	07/19/17 15:05	mg/L	CG71740
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	07/13/17 21:46	ug/L	CG71353
Total Suspended Solids	474 (10)		2540D		1	EEM	07/14/17 14:30	mg/L	CG71317



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/14/17 11:30

504.1 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>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2-Dibromoethane	ND (0.015)		504.1		1	07/14/17 16:08		CG71426
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: Pentachloroethane</i>		75 %		30-150				
<i>Surrogate: Pentachloroethane [2C]</i>		72 %		30-150				



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 7/19/17 10:04

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)		ASTM D3695		1	ZLC	07/19/17 12:44		CG71915



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CG71352 - [CALC]										
Blank										
Chromium III	ND	10.0	ug/L							
LCS										
Chromium III	ND		ug/L							
LCS Dup										
Chromium III	ND		ug/L							
Batch CG71436 - 3005A										
Blank										
Antimony	ND	10.0	ug/L							
Arsenic	ND	1.0	ug/L							
Cadmium	ND	0.05	ug/L							
Chromium	ND	4.0	ug/L							
Chromium III	ND	4.00	ug/L							
Copper	ND	4.0	ug/L							
Hardness	ND	165	ug/L							
Iron	ND	20.0	ug/L							
Lead	ND	1.0	ug/L							
Nickel	ND	10.0	ug/L							
Selenium	ND	2.0	ug/L							
Silver	ND	1.0	ug/L							
Zinc	ND	10.0	ug/L							
LCS										
Antimony	99.1	10.0	ug/L	100.0		99	85-115			
Arsenic	98.8	25.0	ug/L	100.0		99	85-115			
Cadmium	49.8	25.0	ug/L	50.00		100	85-115			
Chromium	100	4.0	ug/L	100.0		100	85-115			
Chromium III	100	4.00	ug/L							
Copper	106	4.0	ug/L	100.0		106	85-115			
Hardness	6520	165	ug/L							
Iron	475	20.0	ug/L	500.0		95	85-115			
Lead	111	25.0	ug/L	100.0		111	85-115			
Nickel	102	10.0	ug/L	100.0		102	85-115			
Selenium	217	50.0	ug/L	200.0		109	85-115			
Silver	46.6	1.0	ug/L	50.00		93	85-115			
Zinc	103	10.0	ug/L	100.0		103	85-115			
LCS Dup										
Antimony	107	10.0	ug/L	100.0		107	85-115	7	20	
Arsenic	96.2	25.0	ug/L	100.0		96	85-115	3	20	
Cadmium	55.3	25.0	ug/L	50.00		111	85-115	10	20	
Chromium	108	4.0	ug/L	100.0		108	85-115	7	20	
Chromium III	108	4.00	ug/L							
Copper	114	4.0	ug/L	100.0		114	85-115	7	20	
Hardness	6960	165	ug/L							
Iron	513	20.0	ug/L	500.0		103	85-115	8	20	



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

Total Metals

Batch CG71436 - 3005A

Lead	107	25.0	ug/L	100.0		107	85-115	4	20	
Nickel	109	10.0	ug/L	100.0		109	85-115	7	20	
Selenium	226	50.0	ug/L	200.0		113	85-115	4	20	
Silver	48.2	1.0	ug/L	50.00		96	85-115	3	20	
Zinc	105	10.0	ug/L	100.0		105	85-115	2	20	

Batch CG71438 - 245.1/7470A

Blank

Mercury	ND	0.200	ug/L							

LCS

Mercury	6.42	0.200	ug/L	6.000		107	85-115			

LCS Dup

Mercury	6.30	0.200	ug/L	6.000		105	85-115	2	20	

524.2 Volatile Organic Compounds

Batch CG71431 - 524.2

Blank

1,1,1-Trichloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	0.5	ug/L							
1,1-Dichloroethane	ND	0.5	ug/L							
1,1-Dichloroethene	ND	0.5	ug/L							
1,2-Dichlorobenzene	ND	0.5	ug/L							
1,2-Dichloroethane	ND	0.5	ug/L							
1,3-Dichlorobenzene	ND	0.5	ug/L							
1,4-Dichlorobenzene	ND	0.5	ug/L							
Acetone	ND	5.0	ug/L							
Benzene	ND	0.5	ug/L							
Carbon Tetrachloride	ND	0.3	ug/L							
cis-1,2-Dichloroethene	ND	0.5	ug/L							
Ethylbenzene	ND	0.5	ug/L							
Methyl tert-Butyl Ether	ND	0.5	ug/L							
Methylene Chloride	ND	0.5	ug/L							
Naphthalene	ND	0.5	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tertiary-butyl Alcohol	ND	25.0	ug/L							
Tetrachloroethene	ND	0.5	ug/L							
Toluene	ND	0.5	ug/L							
Trichloroethene	ND	0.5	ug/L							
Vinyl Chloride	ND	0.2	ug/L							
Xylene O	ND	0.5	ug/L							
Xylene P,M	ND	0.5	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	5.10		ug/L	5.000		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.02		ug/L	5.000		100	80-120			

LCS

1,1,1-Trichloroethane	10.6		ug/L	10.00		106	70-130			



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

524.2 Volatile Organic Compounds

Batch CG71431 - 524.2

1,1,2-Trichloroethane	10.2		ug/L	10.00		102	70-130			
1,1-Dichloroethane	10.0		ug/L	10.00		100	70-130			
1,1-Dichloroethene	11.0		ug/L	10.00		110	70-130			
1,2-Dichlorobenzene	10.3		ug/L	10.00		103	70-130			
1,2-Dichloroethane	10.4		ug/L	10.00		104	70-130			
1,3-Dichlorobenzene	10.3		ug/L	10.00		103	70-130			
1,4-Dichlorobenzene	10.5		ug/L	10.00		105	70-130			
Acetone	48.1		ug/L	50.00		96	70-130			
Benzene	10.3		ug/L	10.00		103	70-130			
Carbon Tetrachloride	10.9		ug/L	10.00		109	70-130			
cis-1,2-Dichloroethene	10.5		ug/L	10.00		105	70-130			
Ethylbenzene	10.3		ug/L	10.00		103	70-130			
Methyl tert-Butyl Ether	10.3		ug/L	10.00		103	70-130			
Methylene Chloride	9.1		ug/L	10.00		91	70-130			
Naphthalene	10.5		ug/L	10.00		105	70-130			
Tertiary-amyl methyl ether	9.9		ug/L	10.00		99	70-130			
Tertiary-butyl Alcohol	58.8		ug/L	50.00		118	70-130			
Tetrachloroethene	10.6		ug/L	10.00		106	70-130			
Toluene	10.5		ug/L	10.00		105	70-130			
Trichloroethene	10.6		ug/L	10.00		106	70-130			
Vinyl Chloride	10.3		ug/L	10.00		103	70-130			
Xylene O	10.1		ug/L	10.00		101	70-130			
Xylene P,M	20.4		ug/L	20.00		102	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	5.05		ug/L	5.000		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.84		ug/L	5.000		97	80-120			

LCS Dup

1,1,1-Trichloroethane	9.5		ug/L	10.00		95	70-130	12	20	
1,1,2-Trichloroethane	10.1		ug/L	10.00		101	70-130	1	20	
1,1-Dichloroethane	10.2		ug/L	10.00		102	70-130	2	20	
1,1-Dichloroethene	20.1		ug/L	10.00		201	70-130	59	20	B+, D+
1,2-Dichlorobenzene	9.1		ug/L	10.00		91	70-130	12	20	
1,2-Dichloroethane	9.8		ug/L	10.00		98	70-130	6	20	
1,3-Dichlorobenzene	9.3		ug/L	10.00		93	70-130	10	20	
1,4-Dichlorobenzene	9.5		ug/L	10.00		95	70-130	10	20	
Acetone	49.0		ug/L	50.00		98	70-130	2	20	
Benzene	10.4		ug/L	10.00		104	70-130	1	20	
Carbon Tetrachloride	9.3		ug/L	10.00		93	70-130	16	20	
cis-1,2-Dichloroethene	9.8		ug/L	10.00		98	70-130	7	20	
Ethylbenzene	9.9		ug/L	10.00		99	70-130	4	20	
Methyl tert-Butyl Ether	9.8		ug/L	10.00		98	70-130	5	20	
Methylene Chloride	10.5		ug/L	10.00		105	70-130	14	20	
Naphthalene	8.6		ug/L	10.00		86	70-130	20	20	
Tertiary-amyl methyl ether	9.1		ug/L	10.00		91	70-130	8	20	
Tertiary-butyl Alcohol	81.7		ug/L	50.00		163	70-130	33	25	B+, D+
Tetrachloroethene	9.6		ug/L	10.00		96	70-130	10	20	



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

524.2 Volatile Organic Compounds

Batch CG71431 - 524.2

Toluene	9.7		ug/L	10.00		97	70-130	8	20	
Trichloroethene	10.3		ug/L	10.00		103	70-130	3	20	
Vinyl Chloride	9.8		ug/L	10.00		98	70-130	5	20	
Xylene O	9.4		ug/L	10.00		94	70-130	7	20	
Xylene P,M	18.6		ug/L	20.00		93	70-130	9	20	
Surrogate: 1,2-Dichlorobenzene-d4	4.47		ug/L	5.000		89	80-120			
Surrogate: 4-Bromofluorobenzene	4.99		ug/L	5.000		100	80-120			

608 Polychlorinated Biphenyls (PCB)

Batch CG71414 - 3510C

Blank										
Aroclor 1016	ND	0.10	ug/L							
Aroclor 1016 [2C]	ND	0.10	ug/L							
Aroclor 1221	ND	0.10	ug/L							
Aroclor 1221 [2C]	ND	0.10	ug/L							
Aroclor 1232	ND	0.10	ug/L							
Aroclor 1232 [2C]	ND	0.10	ug/L							
Aroclor 1242	ND	0.10	ug/L							
Aroclor 1242 [2C]	ND	0.10	ug/L							
Aroclor 1248	ND	0.10	ug/L							
Aroclor 1248 [2C]	ND	0.10	ug/L							
Aroclor 1254	ND	0.10	ug/L							
Aroclor 1254 [2C]	ND	0.10	ug/L							
Aroclor 1260	ND	0.10	ug/L							
Aroclor 1260 [2C]	ND	0.10	ug/L							
Aroclor 1262	ND	0.10	ug/L							
Aroclor 1262 [2C]	ND	0.10	ug/L							
Aroclor 1268	ND	0.10	ug/L							
Aroclor 1268 [2C]	ND	0.10	ug/L							
Surrogate: Decachlorobiphenyl	0.0351		ug/L	0.05000		70	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0366		ug/L	0.05000		73	30-150			
Surrogate: Tetrachloro-m-xylene	0.0268		ug/L	0.05000		54	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0310		ug/L	0.05000		62	30-150			

LCS										
Aroclor 1016	0.86	0.10	ug/L	1.000		86	40-140			
Aroclor 1016 [2C]	0.90	0.10	ug/L	1.000		90	40-140			
Aroclor 1260	0.87	0.10	ug/L	1.000		87	40-140			
Aroclor 1260 [2C]	0.83	0.10	ug/L	1.000		83	40-140			
Surrogate: Decachlorobiphenyl	0.0415		ug/L	0.05000		83	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0419		ug/L	0.05000		84	30-150			
Surrogate: Tetrachloro-m-xylene	0.0355		ug/L	0.05000		71	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0359		ug/L	0.05000		72	30-150			

LCS Dup										



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

608 Polychlorinated Biphenyls (PCB)

Batch CG71414 - 3510C

Aroclor 1016	1.02	0.10	ug/L	1.000		102	40-140	16	20	
Aroclor 1016 [2C]	1.05	0.10	ug/L	1.000		105	40-140	16	20	
Aroclor 1260	0.91	0.10	ug/L	1.000		91	40-140	4	20	
Aroclor 1260 [2C]	0.88	0.10	ug/L	1.000		88	40-140	6	20	

Surrogate: Decachlorobiphenyl	0.0449		ug/L	0.05000		90	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0465		ug/L	0.05000		93	30-150			
Surrogate: Tetrachloro-m-xylene	0.0355		ug/L	0.05000		71	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0365		ug/L	0.05000		73	30-150			

625(SIM) Semi-Volatile Organic Compounds

Batch CG71808 - 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	3.08	2.50	ug/L							
Butylbenzylphthalate	ND	2.50	ug/L							
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	ND	2.50	ug/L							
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							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	1.01		ug/L	2.500		40	30-130			
Surrogate: 2,4,6-Tribromophenol	3.41		ug/L	3.750		91	15-110			
Surrogate: 2-Fluorobiphenyl	1.47		ug/L	2.500		59	30-130			
Surrogate: Nitrobenzene-d5	1.72		ug/L	2.500		69	30-130			
Surrogate: p-Terphenyl-d14	1.76		ug/L	2.500		70	30-130			

LCS

Acenaphthene	2.73	0.20	ug/L	2.500		109	40-140			
Acenaphthylene	2.69	0.20	ug/L	2.500		108	40-140			
Anthracene	2.90	0.20	ug/L	2.500		116	40-140			



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

625(SIM) Semi-Volatile Organic Compounds

Batch CG71808 - 3510C

Benzo(a)anthracene	3.02	0.05	ug/L	2.500		121	40-140			
Benzo(a)pyrene	3.50	0.05	ug/L	2.500		140	40-140			
Benzo(b)fluoranthene	3.45	0.05	ug/L	2.500		138	40-140			
Benzo(g,h,i)perylene	2.98	0.20	ug/L	2.500		119	40-140			
Benzo(k)fluoranthene	3.54	0.05	ug/L	2.500		142	40-140			B+
bis(2-Ethylhexyl)phthalate	6.70	2.50	ug/L	2.500		268	40-140			B+
Butylbenzylphthalate	3.45	2.50	ug/L	2.500		138	40-140			
Chrysene	3.14	0.05	ug/L	2.500		126	40-140			
Dibenzo(a,h)Anthracene	2.97	0.05	ug/L	2.500		119	40-140			
Diethylphthalate	2.94	2.50	ug/L	2.500		118	40-140			
Dimethylphthalate	3.28	2.50	ug/L	2.500		131	40-140			
Di-n-butylphthalate	3.40	2.50	ug/L	2.500		136	40-140			
Di-n-octylphthalate	3.77	2.50	ug/L	2.500		151	40-140			B+
Fluoranthene	3.11	0.20	ug/L	2.500		125	40-140			
Fluorene	3.05	0.20	ug/L	2.500		122	40-140			
Indeno(1,2,3-cd)Pyrene	3.09	0.05	ug/L	2.500		124	40-140			
Naphthalene	2.24	0.20	ug/L	2.500		89	40-140			
Pentachlorophenol	2.85	0.90	ug/L	2.500		114	30-130			
Phenanthrene	2.81	0.20	ug/L	2.500		112	40-140			
Pyrene	3.60	0.20	ug/L	2.500		144	40-140			B+
Surrogate: 1,2-Dichlorobenzene-d4	0.902		ug/L	2.500		36	30-130			
Surrogate: 2,4,6-Tribromophenol	3.26		ug/L	3.750		87	15-110			
Surrogate: 2-Fluorobiphenyl	1.39		ug/L	2.500		56	30-130			
Surrogate: Nitrobenzene-d5	1.45		ug/L	2.500		58	30-130			
Surrogate: p-Terphenyl-d14	1.61		ug/L	2.500		64	30-130			

LCS Dup

Acenaphthene	2.81	0.20	ug/L	2.500		113	40-140	3	20	
Acenaphthylene	2.81	0.20	ug/L	2.500		112	40-140	4	20	
Anthracene	3.15	0.20	ug/L	2.500		126	40-140	8	20	
Benzo(a)anthracene	3.12	0.05	ug/L	2.500		125	40-140	3	20	
Benzo(a)pyrene	3.74	0.05	ug/L	2.500		150	40-140	7	20	B+
Benzo(b)fluoranthene	3.69	0.05	ug/L	2.500		148	40-140	7	20	B+
Benzo(g,h,i)perylene	3.07	0.20	ug/L	2.500		123	40-140	3	20	
Benzo(k)fluoranthene	3.86	0.05	ug/L	2.500		154	40-140	8	20	B+
bis(2-Ethylhexyl)phthalate	6.09	2.50	ug/L	2.500		244	40-140	10	20	B+
Butylbenzylphthalate	3.54	2.50	ug/L	2.500		142	40-140	3	20	B+
Chrysene	3.29	0.05	ug/L	2.500		131	40-140	5	20	
Dibenzo(a,h)Anthracene	3.02	0.05	ug/L	2.500		121	40-140	2	20	
Diethylphthalate	3.04	2.50	ug/L	2.500		122	40-140	3	20	
Dimethylphthalate	3.39	2.50	ug/L	2.500		136	40-140	3	20	
Di-n-butylphthalate	3.81	2.50	ug/L	2.500		153	40-140	11	20	B+
Di-n-octylphthalate	3.97	2.50	ug/L	2.500		159	40-140	5	20	B+
Fluoranthene	3.39	0.20	ug/L	2.500		135	40-140	8	20	
Fluorene	3.08	0.20	ug/L	2.500		123	40-140	0.9	20	
Indeno(1,2,3-cd)Pyrene	3.09	0.05	ug/L	2.500		123	40-140	0.1	20	



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

625(SIM) Semi-Volatile Organic Compounds

Batch CG71808 - 3510C

Naphthalene	2.34	0.20	ug/L	2.500		94	40-140	5	20	
Pentachlorophenol	3.11	0.90	ug/L	2.500		124	30-130	9	20	
Phenanthrene	2.99	0.20	ug/L	2.500		120	40-140	6	20	
Pyrene	3.64	0.20	ug/L	2.500		146	40-140	1	20	B+
Surrogate: 1,2-Dichlorobenzene-d4	1.10		ug/L	2.500		44	30-130			
Surrogate: 2,4,6-Tribromophenol	3.60		ug/L	3.750		96	15-110			
Surrogate: 2-Fluorobiphenyl	1.57		ug/L	2.500		63	30-130			
Surrogate: Nitrobenzene-d5	1.58		ug/L	2.500		63	30-130			
Surrogate: p-Terphenyl-d14	1.55		ug/L	2.500		62	30-130			

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Batch CG71356 - 3535A

Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	ND		ug/L	5.000		38	15-115			
LCS										
1,4-Dioxane	12.0	0.250	ug/L	10.00		120	40-140			
Surrogate: 1,4-Dioxane-d8	1.85		ug/L	5.000		37	15-115			
LCS Dup										
1,4-Dioxane	10.9	0.250	ug/L	10.00		109	40-140	10	20	
Surrogate: 1,4-Dioxane-d8	1.70		ug/L	5.000		34	15-115			

Classical Chemistry

Batch CG71317 - General Preparation

Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	44		mg/L	43.50		101	80-120			

Batch CG71352 - General Preparation

Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	0.494		mg/L	0.4998		99	90-110			
LCS Dup										
Hexavalent Chromium	0.493		mg/L	0.4998		99	90-110	0.2	20	

Batch CG71353 - General Preparation

Blank										
Total Residual Chlorine	ND	20.0	ug/L							
LCS										
Total Residual Chlorine	1.80		mg/L	1.800		100	85-115			

Batch CG71705 - NH4 Prep



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

Classical Chemistry

Batch CG71705 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L							

LCS

Ammonia as N	0.11	0.10	mg/L	0.09994		112	80-120			

LCS

Ammonia as N	0.92	0.10	mg/L	0.9994		92	80-120			

Batch CG71735 - NH4 Prep

Blank

Chloride	ND	0.5	mg/L							

LCS

Chloride	2.6		mg/L	2.500		103	90-110			

Batch CG71740 - General Preparation

Blank

Total Petroleum Hydrocarbon	ND	5	mg/L							

LCS

Total Petroleum Hydrocarbon	13	5	mg/L	19.38		69	66-114			

Batch CG71817 - TCN Prep

Blank

Total Cyanide (LL)	ND	5.00	ug/L							

LCS

Total Cyanide (LL)	20.0	5.00	ug/L	20.06		100	90-110			

LCS

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

LCS Dup

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

Batch CG71920 - General Preparation

Blank

Phenols	ND	100	ug/L							

LCS

Phenols	102	100	ug/L	100.0		102	80-120			

LCS

Phenols	958	100	ug/L	1000		96	80-120			

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Batch CG71426 - 504/8011

Blank

1,2-Dibromoethane	ND	0.015	ug/L							

1,2-Dibromoethane [2C]	ND	0.015	ug/L							

Surrogate: Pentachloroethane	0.298		ug/L	0.2000		149	30-150			

Surrogate: Pentachloroethane [2C]	0.248		ug/L	0.2000		124	30-150			



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Batch CG71426 - 504/8011

LCS

1,2-Dibromoethane	0.070	0.015	ug/L	0.08000		88	70-130			
1,2-Dibromoethane [2C]	0.064	0.015	ug/L	0.08000		80	70-130			

Surrogate: Pentachloroethane	0.0877		ug/L	0.2000		44	30-150			
Surrogate: Pentachloroethane [2C]	0.0783		ug/L	0.2000		39	30-150			

LCS

1,2-Dibromoethane	0.219	0.015	ug/L	0.2000		110	70-130			
1,2-Dibromoethane [2C]	0.212	0.015	ug/L	0.2000		106	70-130			

Surrogate: Pentachloroethane	0.290		ug/L	0.2000		145	30-150			
Surrogate: Pentachloroethane [2C]	0.242		ug/L	0.2000		121	30-150			

Alcohol Scan by GC/FID

Batch CG71915 - No Prep

Blank

Ethanol	ND	10	mg/L							

LCS

Ethanol	1270	10	mg/L	1000		127	60-140			

LCS Dup

Ethanol	1060	10	mg/L	1000		106	60-140	18	30	



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Notes and Definitions

X5	Due to high sediment content vials were composited
U	Analyte included in the analysis, but not detected
S-	Surrogate recovery(ies) below lower control limit (S-).
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
DDT	DDT breakdown > 20%
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
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
RL	Reporting Limit
EDL	Estimated Detection Limit



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

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: 1707259

Shipped/Delivered Via: ESS Courier

Date Received: 7/13/2017

Project Due Date: 7/20/2017

Days for Project: 5 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: 2.8 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?

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:

COC = B15 Label = B17 LHC 7/13/17

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	148177	Yes	NA	Yes	1L Poly - Unpres	NP	
01	148179	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	148181	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	
01	148183	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	148185	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	148187	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	148194	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148195	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148196	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148197	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148198	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148199	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148201	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	148203	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	148207	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148208	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148209	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148211	Yes	NA	Yes	VOA Vial - Unpres	NP	
01	148215	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148216	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148217	Yes	No	Yes	VOA Vial - HCl	HCl	
02	148176	Yes	NA	Yes	1L Poly - Unpres	NP	
02	148178	Yes	NA	Yes	250 mL Poly - Unpres	NP	
02	148180	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	

pH > 12 w 7/13/17 1830

pH > 12 w 7/13/17 1830

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Tighe & Bond - KPB/TB/MM

ESS Project ID: 1707259

Date Received: 7/13/2017

02	148182	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4
02	148184	Yes	NA	Yes	1L Amber - H2SO4	H2SO4
02	148186	Yes	NA	Yes	500 mL Poly - HNO3	HNO3
02	148188	Yes	NA	Yes	1L Amber - Unpres	NP
02	148189	Yes	NA	Yes	1L Amber - Unpres	NP
02	148190	Yes	NA	Yes	1L Amber - Unpres	NP
02	148191	Yes	NA	Yes	1L Amber - Unpres	NP
02	148192	Yes	NA	Yes	1L Amber - Unpres	NP
02	148193	Yes	NA	Yes	1L Amber - Unpres	NP
02	148200	Yes	NA	Yes	500 mL Poly - HNO3	HNO3
02	148202	Yes	NA	Yes	1L Amber - H2SO4	H2SO4
02	148204	Yes	No	Yes	VOA Vial - HCl	HCl
02	148205	Yes	No	Yes	VOA Vial - HCl	HCl
02	148206	Yes	No	Yes	VOA Vial - HCl	HCl
02	148210	Yes	NA	Yes	VOA Vial - Unpres	NP
02	148212	Yes	No	Yes	VOA Vial - HCl	HCl
02	148213	Yes	No	Yes	VOA Vial - HCl	HCl
02	148214	Yes	No	Yes	VOA Vial - HCl	HCl

2nd Review

Are barcode labels on correct containers?

Yes / No

Completed

By:

Date & Time:

7/13/17

1830

Reviewed

By:

Date & Time:

7/13/17

1910

Delivered

By:

7/13/17

1913

www.esslaboratory.com

1707259

Reporting Limits -

Is this project for:

Electronic Deliverable Yes X No

Format: Excel X Access ___ PDF ___ Other ___

Address: 1 University Ave
Westwood, MA 02559

Project #

Project Name:

PO #

Analysis

PCB Metals Total

BCB Metals Nice

Hardness (Calculation)

ETHANOL ACTIVITY

***UUC opisno**

Total Cuentas 450011

TDL 1664

STCC 2510D

TDC 1500 CI D*

[illegible]

11-00000-00000

04-00014004

100

1970

3
4
5
6
7

THE

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— 6 —

RESEARCH

Received by: (Signature) _____

Page 35 of 35

CERTIFICATE OF ANALYSIS

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

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

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



Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 2:25 pm, Nov 20, 2017

Analytical Summary

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

SAMPLE RECEIPT

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

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

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

PROJECT NARRATIVE

Total Metals

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

Cadmium , Copper , Nickel

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

Cadmium , Copper , Nickel

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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: Mystic at Boston Inner
Date Sampled: 11/15/17 11:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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 (5.0)		3113B		10	KJK	11/19/17 4:59	100	10	CK71531
Cadmium	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium	ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium III	ND (20.0)		200.7		10	JLK	11/16/17 15:24	1	1	[CALC]
Copper	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Iron	ND (100)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Lead	ND (2.0)		3113B		10	KJK	11/17/17 21:31	100	10	CK71531
Nickel	EL ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Zinc	ND (50.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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	0.43 (0.10)		350.1		1	EEM	11/17/17 14:51	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.75 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.2 °C. (N/A)								
Salinity	14.9 (0.1)		2520B		1	JLK	11/16/17 17:10	ppt	CK71644



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

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

LCS

Chromium III	ND		ug/L



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

Total Metals

Batch CK71546 - [CALC]

LCS Dup

Chromium III	ND		ug/L							

Classical Chemistry

Batch CK71546 - General Preparation

Blank

Hexavalent Chromium	ND	10.0	ug/L							

LCS

Hexavalent Chromium	0.503		mg/L	0.4998		101	90-110			

LCS Dup

Hexavalent Chromium	0.516		mg/L	0.4998		103	90-110	3	20	

Batch CK71613 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L							

LCS

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

LCS

Ammonia as N	1.02	0.10	mg/L	0.9994		102	80-120			

Batch CK71644 - General Preparation

LCS

Salinity	1.0		ppt	1.000		96	85-115			



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: ☒	Seals Intact: ☒	Comments: Please specify "Other" preservative and containers types in this space	
Cooler Temperature: 0.4 °C		Eversource Pricing	

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



CERTIFICATE OF ANALYSIS

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

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

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

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 2:25 pm, Nov 20, 2017

Analytical Summary

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

SAMPLE RECEIPT

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

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

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

PROJECT NARRATIVE

Total Metals

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

Cadmium , Copper , Nickel

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

Cadmium , Copper , Nickel

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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: Mystic at Winter
Date Sampled: 11/15/17 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-01
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	11/18/17 6:38	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:08	1	1	[CALC]
Copper	ND (2.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Hardness	184000 (824)		200.7		10	KJK	11/16/17 15:04	1	1	[CALC]
Iron	251 (100)		200.7		10	KJK	11/16/17 15:04	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Zinc	10.9 (10.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic at Winter
Date Sampled: 11/15/17 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-01
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	0.45 (0.10)		350.1		1	EEM	11/17/17 14:44	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.25 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.4 °C. (N/A)								



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic
Date Sampled: 11/15/17 10:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-02
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	11/18/17 6:44	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:12	1	1	[CALC]
Copper	ND (2.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Hardness	181000 (824)		200.7		10	KJK	11/16/17 15:08	1	1	[CALC]
Iron	121 (100)		200.7		10	KJK	11/16/17 15:08	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Zinc	10.2 (10.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic
Date Sampled: 11/15/17 10:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-02
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	0.27 (0.10)		350.1		1	EEM	11/17/17 14:47	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.36 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.2 °C. (N/A)								



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic Crossing
Date Sampled: 11/15/17 09:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-03
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	11/18/17 6:55	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:16	1	1	[CALC]
Copper	ND (2.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Hardness	147000 (824)		200.7		10	KJK	11/16/17 15:12	1	1	[CALC]
Iron	134 (100)		200.7		10	KJK	11/16/17 15:12	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Zinc	11.1 (10.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic Crossing
Date Sampled: 11/15/17 09:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-03
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	0.35 (0.10)		350.1		1	EEM	11/17/17 14:48	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.13 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.1 °C. (N/A)								



CERTIFICATE OF ANALYSIS

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

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

Extraction Method: 3005A/200.7

Total Metals

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



CERTIFICATE OF ANALYSIS

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

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

Classical Chemistry

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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 (5.0)		3113B		10	KJK	11/19/17 4:59	100	10	CK71531
Cadmium	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium	ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium III	ND (20.0)		200.7		10	JLK	11/16/17 15:24	1	1	[CALC]
Copper	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Iron	ND (100)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Lead	ND (2.0)		3113B		10	KJK	11/17/17 21:31	100	10	CK71531
Nickel	EL ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Zinc	ND (50.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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	0.43 (0.10)		350.1		1	EEM	11/17/17 14:51	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.75 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.2 °C. (N/A)								
Salinity	14.9 (0.1)		2520B		1	JLK	11/16/17 17:10	ppt	CK71644



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-07
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 (5.0)		3113B		10	KJK	11/19/17 5:04	100	10	CK71531
Cadmium	EL ND (10.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Chromium	ND (20.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Chromium III	ND (20.0)		200.7		10	JLK	11/16/17 16:04	1	1	[CALC]
Copper	EL ND (10.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Hardness	221000 (824)		200.7		10	KJK	11/17/17 11:22	1	1	[CALC]
Iron	274 (100)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Lead	ND (2.0)		3113B		10	KJK	11/17/17 21:48	100	10	CK71531
Nickel	EL ND (20.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Zinc	ND (50.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-07
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	0.28 (0.10)		350.1		1	EEM	11/17/17 14:51	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.46 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.6 °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

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

LCS

Chromium III	ND		ug/L



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

Total Metals

Batch CK71546 - [CALC]

LCS Dup

Chromium III	ND		ug/L							

Classical Chemistry

Batch CK71546 - General Preparation

Blank

Hexavalent Chromium	ND	10.0	ug/L							

LCS

Hexavalent Chromium	0.503		mg/L	0.4998		101	90-110			

LCS Dup

Hexavalent Chromium	0.516		mg/L	0.4998		103	90-110	3	20	

Batch CK71613 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L							

LCS

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

LCS

Ammonia as N	1.02	0.10	mg/L	0.9994		102	80-120			

Batch CK71644 - General Preparation

LCS

Salinity	1.0		ppt	1.000		96	85-115			



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: ☒	Seals Intact: ☒	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 #MAG910758, for the Eversource Electrical Transmission Line Project site located in Charlestown and Boston, 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 Boston storm sewer system¹ to Mystic River (MA71-03) 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 EPA notes that this site is authorized to use four discharge locations associated with the City of Boston storm sewer system. To meet the requirements of the RGP, the effluent monitoring location must be consistent with the discharge point from the mobile treatment system, prior to co-mingling with any other waste streams.

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>.

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 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.

In accordance with Part 2.2.1 of the RGP and using the calculation methodology included in Appendix V, EPA corrected the calculated WQBELs applicable to this proposed discharge. The cause of the calculation error was identified as the incorrect entry of the upstream flow and dilution factor in the fillable electronic format submitted with the NOI. Since the proposed discharge is to a saltwater receiving water, no dilution applies. The reason for these corrections is to determine the WQBELs that apply to the proposed discharge. Based on the revised calculations, your authorization to discharge includes revised WQBELs of 3.7 µg/L for total recoverable copper, 8.3 µg/L for total recoverable nickel, 86 µg/L for total recoverable zinc, 2.2 µg/L for diethylhexyl phthalate, and 0.0038 µg/L for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.

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,



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
Boston Water and Sewer Commission, via email

GENERAL PERMIT FOR REMEDIATION ACTIVITY DISCHARGES

Table 1: Authorization Information

Permit Number	MAG910758
Receiving Water	Mystic River
Outfall Number	Outfall 001 to City of Boston
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	3.7 µg/L
Iron ⁴	5,000 µg/L
Lead ⁴	160 µg/L
Mercury ⁴	0.739 µg/L
Nickel ⁴	8.3 µg/L
Selenium ⁴	235.8 µg/L
Silver ⁴	35.1 µg/L
Zinc ⁴	86 µg/L
B. Non-Halogenated Volatile Organic Compounds	
Total BTEX	100 µg/L
Benzene	5.0 µg/L
1,4 Dioxane	200 µg/L
Acetone	7.97 mg/L
C. Halogenated Volatile Organic Compounds	
1,2 Dichlorobenzene	600 µg/L
Methylene Chloride	4.6 µg/L
Tetrachloroethylene	5.0 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	
tert-Butyl Alcohol	120 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
Saltwater	6.5 to 8.5 SU

Table 4 Notes

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

^a SU = standard units



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 1

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

VIA EMAIL

December 20, 2017

Rick McKanas,
Bond Brothers
145 Spring Street
Everett, MA 02127
rmckanas@bondbrothers.com

Re: Authorization to discharge under the Remediation General Permit (RGP) – Authorization #MAG910758, for the Eversource Electrical Transmission Line Project site located in Charlestown and Boston, MA

Dear Mr. McKanas:

Based on the review of a Notice of Intent (NOI) dated October 25, 2017 submitted by Tighe & Bond, Inc. for the site referenced above, the U.S. Environmental Protection Agency, Region 1 (EPA) hereby authorizes Bond Brothers, as a named operator and co-permittee with NSTAR Electric Company d/b/a Eversource Energy, 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 Boston storm sewer system¹ to Mystic River (MA71-03) 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 EPA notes that this site is authorized to use four discharge locations associated with the City of Boston storm sewer system. To meet the requirements of the RGP, the effluent monitoring locations must be consistent with the discharge point from the mobile treatment system, prior to co-mingling with any other waste streams.

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>.

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 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.

In accordance with Part 2.2.1 of the RGP and using the calculation methodology included in Appendix V, EPA corrected the calculated WQBELs applicable to this proposed discharge. The cause of the calculation error was identified as the incorrect entry of the upstream flow and dilution factor in the fillable electronic format submitted with the NOI. Since the proposed discharge is to a saltwater receiving water, no dilution applies. The reason for these corrections is to determine the WQBELs that apply to the proposed discharge. Based on the revised calculations, your authorization to discharge includes revised WQBELs of 3.7 µg/L for total recoverable copper, 8.3 µg/L for total recoverable nickel, 86 µg/L for total recoverable zinc, 2.2 µg/L for diethylhexyl phthalate, and 0.0038 µg/L for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.

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,



Thelma Murphy, Chief
Storm Water and Construction Permits Section

Enclosure

cc: Michael Zylich, Eversource Energy, 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
Boston Water and Sewer Commission, via email

GENERAL PERMIT FOR REMEDIATION ACTIVITY DISCHARGES

Table 1: Authorization Information

Permit Number	MAG910758
Receiving Water	Mystic River
Outfall Number	Outfall 001 to City of Boston
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	3.7 µg/L
Iron ⁴	5,000 µg/L
Lead ⁴	160 µg/L
Mercury ⁴	0.739 µg/L
Nickel ⁴	8.3 µg/L
Selenium ⁴	235.8 µg/L
Silver ⁴	35.1 µg/L
Zinc ⁴	86 µg/L
B. Non-Halogenated Volatile Organic Compounds	
Total BTEX	100 µg/L
Benzene	5.0 µg/L
1,4 Dioxane	200 µg/L
Acetone	7.97 mg/L
C. Halogenated Volatile Organic Compounds	
1,2 Dichlorobenzene	600 µg/L
Methylene Chloride	4.6 µg/L
Tetrachloroethylene	5.0 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	
tert-Butyl Alcohol	120 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
Saltwater	6.5 to 8.5 SU

Table 4 Notes

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

^a SU = standard units

N-0998-11-13
December 1, 2017

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

Re: **Submittal of Notice of Intent (NOI) Remediation General Permit (RGP)**
Construction Dewatering
Mystic River/Boston Inner Harbor
Boston, Massachusetts

Dear Ms. Little:

On behalf of NSTAR Electric Company d/b/a Eversource Energy (Eversource), Tighe & Bond, Inc. (Tighe & Bond) has prepared this Notice of Intent (NOI) for application of a National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) for the proposed construction dewatering activities conducted during the installation of new below grade electric transmission line and associated manholes along Maffa Way, Main Street, Beacham Street, Arlington Avenue and Alford Street in Boston and Mystic Substation 250 in Charlestown, Massachusetts (the Site). A copy of the NOI is included in Appendix A. The limits of the Site are shown on the Locus Plan (Figure 1), the Massachusetts Geographic Information Systems (MassGIS) Priority Resource Map (Figure 2) and Aerial Dewatering Site Plan (Figure 3) in Appendix B.

As there is a need to treat and discharge water generated from the construction dewatering activities, the enclosed NOI form provides required information on general Site conditions, proposed treatment systems, discharge locations, receiving water, and laboratory analytical results from pre-discharge sampling and surface water sampling. The proposed treatment systems are shown on Figure 4 (Process Flow Diagram) in Appendix B. The excavation dewatering and discharge of treated groundwater are scheduled to begin in December 2017 and end in December 2019.

Dewatered groundwater at the Site will be treated by a mobile treatment system before being discharged to on-Site catch basins and into a stormwater drainage system managed by the Boston Water and Sewer Commission (BWSC). All subject stormwater drainage systems for this RGP eventually discharge to Mystic River/Boston Inner Harbor. Post treatment discharge rates will range from 25 gallons per minute (GPM) to 350 GPM.

Project Background

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



This RGP Permit Application is for the discharge of treated groundwater to the Boston Water and Sewer Commission stormwater drainage system and ultimately to the Mystic River/Boston Inner Harbor.

MCP History

During the pre-construction soil assessment activities, concentrations of lead and polycyclic aromatic hydrocarbons (PAHs) were detected in soil samples B-52, B-65, B-66, B-70, B-76 MH-17 and MH-18 above the respective Massachusetts Department of Environmental Protection (MassDEP) Reportable Concentration (RCS-1/RCS-2) values.

On September 14, 2017, Tighe & Bond, on behalf of Eversource, submitted a Utility-related Abatement Measure (URAM) Notification Report to MassDEP under Release Tracking Number (RTN) 3-34457. The URAM details measures implemented to manage excess soils and groundwater generated during the installation of the new underground electric transmission line and electric manholes along Mystic Ave. Boundaries of the URAM are shown on Figure 1 in Appendix B.

Groundwater Characterization

To characterize groundwater along the proposed route of construction, groundwater samples were collected from groundwater monitoring wells MW-505A, MW-505B, B3 and B17 between January 2017 and September 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 Limitations (WQBEL).

Contaminants of concern are analytes that exceeded either the TBEL or WQBEL. Contaminants of concern detected in at least one of the monitoring well MW-505A, MW-505B, B3 or B17 include group I PAHs, bis(2-ethylhexyl) phthalate (DEHP), zinc, iron, copper, polychlorinated biphenyls (PCBs), acetone, naphthalene, benzene, total BTEX 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 either adjacent to a roadway (B3 and B17) paved parking lot (MW-505B) and a MassDOT salt and snow staging area (MW-505A), the chloride detected in groundwater samples is likely associated with road salting during the winter months.

Receiving Water Characterization

Mystic River/Boston Inner Harbor after the Amelia Earhart Dam (waterbody identification MA71-03) is classified as a Class SB (CSO) impaired water body and is listed in the 303(d) Impaired Waterbodies document. According to the United States Geologic Survey's StreamStats online application, the 7Q10 value was calculated the total flow for North Harbor, Mystic River (Boston Harbor) (adjacent to the Site) was calculated to be 2.16 million gallons per day (MGD).

As required by the NPDES RGP, one surface water sample was collected within a quarter mile of the potential outfall locations prior to discharging and analyzed for contaminants of concern that were present in the groundwater samples from the monitoring wells discussed above. The surface water sample was collected in November 2017 and sent for laboratory analysis of metals detected in the effluent samples and ammonia, hexavalent chromium, pH and salinity. The surface water sampling location is shown on Figure 1, Dewatering Plan, in Appendix B.

Treatment Systems

Dewatered groundwater at the Site will be treated prior to discharge to the Boston Water and Sewer Commission stormwater drainage system ultimately discharging to the Mystic River/Boston Inner Harbor. Based on project demands, dewatered groundwater may also be transported to a project Laydown yard in Medford for treatment prior to discharge to the Mystic River. The Mystic River discharge is subject to a separate RGP NOI filed on December 1, 2017. Outfall locations are shown on Figure 1 (Dewatering Site Plan) in Appendix B.

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

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

Stationary Treatment System - The stationary treatment system located at the project Laydown yard in Medford is composed of one or two 10,000-gallon fractionation tanks, one sand filter unit and two particulate filters, two GAC filters, and two clay vessels. Groundwater will be pumped from the excavation into a tanker truck and transported to the laydown yard. From the tank truck, the groundwater will be pumped into the fractionation tanks and then through a sand filter and particulate filter for the removal of solids, into the GAC filters and clay vessels to remove organics, and then through a particulate filter to remove any residual solids. The Mystic River discharge is subject to a separate RGP NOI being filed concurrently. The Mystic River discharge is subject to a separate RGP NOI filed on December 1, 2017.

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
Michael J. Zylich
247 Station Drive
Westwood, MA 02090

Operator

BOND Brothers
Rich McKanas
145 Spring Street
Everett, MA 02127

Notice of Intent

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

- Review of a MassGIS Priority Resource Map, Figure 2, shows the Site is not within an ACEC;
- Review of the “Federally Listed Endangered and Threatened Species in Massachusetts” (Appendix C) found that there are two listed species in Middlesex County. The first species is the whorled pogonia which prefers forest habitat, and the second species is the northern long-eared bat, which prefers mines and caves in the winter and forested habitats in the summer. The small whorled pogonia is found in the Groton area while the northern long-eared bat is found statewide. As the Site is not in Groton, the small whorled pogonia will not be affected from construction activities or from the proposed discharges. The project area consists of an asphalt roadway that borders residential and commercial areas. No vegetation will be disturbed during construction activities. As a result, it is the opinion of Tighe & Bond that the habitats for northern long-eared bat will not be disturbed during construction activities. Additionally, the discharge is to the Mystic River and ultimately Boston Inner Harbor which is not a habitat where the northern long-eared bat exists.
- According to United States Fish and Wildlife Services (USFWS) Information, Planning and Conservation (IPaC) tool there are no critical habitats within the Site. USFWS confirmed there are no critical habitats in the area and confirmed permit eligibility meets “Criterion A.”
 - Additionally, according to the MassGIS Priority Resource Map, no NHESP Priority Habitats for Rare Species or Estimated Habitats for Rare Wildlife, were present within half a mile downstream of the discharge location. Therefore, permit eligibility meets “Criterion A.”
- As shown on the map generated by the MassGIS online viewer (Figure 2), no ACECs or Estimated Habitats of Rare Wildlife areas are located within half a mile downstream of the discharge location.
- An electronic review of the Massachusetts Cultural Resource Information System database (Appendix D), made available through Massachusetts Historical Commission, found several historical areas along Mystic Avenue in Medford and Somerville, but it is believed that discharges and discharge related activities will not affect historic properties as groundwater will be pumped into fractionation tanks, treated and discharged to an existing drainage network. No historical areas are located directly within excavation areas. Therefore, permit eligibility meets “Criterion B.”
- Groundwater samples were collected from on-Site groundwater monitoring wells MW-505B, B-3 and B-17 between January and September 2017. The groundwater samples were submitted for laboratory analysis for RGP parameters. The laboratory analytical results are summarized in Table 1 included in Appendix E. Copies of the laboratory analytical report are included in Appendix F. Laboratory analytical results were compared to the RGP TBEL and WQBEL.
- The surface water sample was collected from Mystic River after the Amelia Earhart Dam within a quarter mile of the potential outfall locations 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 E. A copy of the laboratory analytical report is included in Appendix F.

Based on the critical low flow (7Q10) value of the receiving water, 2.16 MGD and the proposed maximum discharge rate of up to 350 GPM (0.504 MGD), a dilution factor of 5.29

was established for this permit and was verified by the Massachusetts Department of Environmental Protection (MassDEP) on November 29, 2017 and included Appendix E. The 7Q10 value was calculated using the United States Geologic Survey's StreamStats online application, and the dilution factor was calculated as instructed by the EPA *Dilution Factor and Effluent Limitation Calculations for Massachusetts*, Appendix V.

The proposed treatment systems have been designed to reduce the levels of associated contaminants of concern to below the applicable effluent limits. Prior to discharge of treated effluent, weekly post treatment samples will be collected and submitted to a Massachusetts environmental laboratory for the group I PAHs, DEHP, zinc, iron, copper, PCBs, acetone, naphthalene, benzene, total BTEX and TSS analyses to confirm the treatment was successful. Additionally, the flow and turbidity levels will be monitored within the field and recorded.

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

Very truly yours,

TIGHE & BOND, INC.



Michael E. Martin
Project Manager



Gary W.T. Hedman, LSP
Project Manager

Enclosures

Copy: Michael Zylich, Eversource
Rich Mckanas, BOND
MassDOT
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
Appendix D	Massachusetts Cultural Resources Information System Report
Appendix E	Groundwater Summary Table 1 Surface Water Summary Table 2
Appendix F	Laboratory Analytical Results

List of Figures

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

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

A. General site information:

1. Name of site: Eversource Electrical Transmission Line Project	Site address: Intersection of Middlesex Ave and Mystic Ave (URAM area) Street: Mystic Ave, Main Street, Beacham Street, Arlington Street and Alford Street		
2. Site owner Eversource Energy d/b/a NSTAR Electric Company Owner is (check one): ☐ Federal ☐ State/Tribal ☐ Private ☒ Other; if so, specify: Utility on Public Right of Way	City: Medford, Somerville and Boston	State: MA	Zip: 02145
3. Site operator, if different than owner Bond Brothers Inc	Contact Person: Rich Mckanas Telephone: 6713946201 Email: rmckanas@bondbrothers.com Mailing address: 145 Spring Street Street: City: Everett State: MA Zip: 02127		
4. NPDES permit number assigned by EPA: MAR1000RI NPDES permit is (check all that apply): ☐ RGP ☐ DGP ☒ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:	5. Other regulatory program(s) that apply to the site (check all that apply): ☒ MA Chapter 21e; list RTN(s): 3-34457 ☐ NH Groundwater Management Permit or Groundwater Release Detection Permit: ☐ CERCLA ☐ UIC Program ☐ POTW Pretreatment ☐ CWA Section 404		

B. Receiving water information:

1. Name of receiving water(s): Mystic River	Waterbody identification of receiving water(s): MA71-03	Classification of receiving water(s): Class SB (CSO)
Receiving water is (check any that apply): ☐ Outstanding Resource Water ☐ Ocean Sanctuary ☐ territorial sea ☐ Wild and Scenic River		
2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): ☒ Yes ☐ No Are sensitive receptors present near the site? (check one): ☒ Yes ☐ No If yes, specify: Mystic River - Surface Water Body		
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. Fish-Passage Barrier, Non-Native Aquatic Plants, Arsenic, Chlordane in Fish Tissue, Chlorophyll-a, DDT in Fish Tissue, DO Saturation, Escherichia		
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.		2.16 MGD
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.		5.29
6. Has the operator received confirmation from the appropriate State for the 7Q10 and dilution factor indicated? (check one): ☒ Yes ☐ No If yes, indicate date confirmation received: 11/29/2017		
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): ☐ Yes ☒ No		

C. Source water information:

1. Source water(s) is (check any that apply):			
☒ 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): ☒ Yes ☐ No	☐ 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): ☐ Yes ☐ No	☐ The receiving water	☐ Potable water; if so, indicate municipality or origin: ☐ Other; if so, specify:
		☐ A surface water other than the receiving water; if so, indicate waterbody:	

2. Source water contaminants: Iron, Chloride and Ammonia	
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): ☐ Yes ☒ 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): ☐ Yes ☐ No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): ☐ Yes ☒ No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): ☐ Existing discharge ☒ New discharge ☐ New source	
Outfall(s): Mystic River - Amelia Earhart Dam to Boston Inner Harbor	Outfall location(s): (Latitude, Longitude) 42.387862/-71.072422; 42.387614/-71.072037; 42.392312/-71.07001; 42.390425/-71.070649
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ☒ Indirect discharge, if so, specify: Via Boston Water and Sewer Drainage System ☐ A private storm sewer system ☒ 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): ☐ Yes ☒ No Has the operator has received permission from the owner to use such system for discharges? (check one): ☐ Yes ☒ No, if so, explain, with an estimated timeframe for obtaining permission: The contractor will obtain the necessary discharge permits from the Boston Water and Sewer Commission prior to discharge. Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ☒ No	
Provide the expected start and end dates of discharge(s) (month/year): December 2017 to December 2019	
Indicate if the discharge is expected to occur over a duration of: ☐ less than 12 months ☒ 12 months or more ☐ is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ☒ Yes ☐ No	

2. Activity Category: (check all that apply)	3. Contamination Type Category: (check all that apply)	
☐ I – Petroleum-Related Site Remediation ☐ II – Non-Petroleum-Related Site Remediation ☒ III – Contaminated Site Dewatering ☐ IV – Dewatering of Pipelines and Tanks ☐ V – Aquifer Pump Testing ☐ VI – Well Development/Rehabilitation ☐ VII – Collection Structure Dewatering/Remediation ☐ VIII – Dredge-Related Dewatering	a. If Activity Category I or II: (check all that apply) ☐ A. Inorganics ☐ B. Non-Halogenated Volatile Organic Compounds ☐ C. Halogenated Volatile Organic Compounds ☐ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☐ F. Fuels Parameters	
	b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)	
	<table border="1"> <tr> <td data-bbox="970 799 1419 873">☒ G. Sites with Known Contamination</td><td data-bbox="1419 799 2003 873">☐ H. Sites with Unknown Contamination</td></tr> </table>	☒ G. Sites with Known Contamination
☒ G. Sites with Known Contamination	☐ H. Sites with Unknown Contamination	
<table border="1"> <tr> <td data-bbox="970 873 1419 1409"> c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply) ☒ A. Inorganics ☒ B. Non-Halogenated Volatile Organic Compounds ☒ C. Halogenated Volatile Organic Compounds ☒ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☒ F. Fuels Parameters </td><td data-bbox="1419 873 2003 1409"> d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply </td></tr> </table>	c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply) ☒ A. Inorganics ☒ B. Non-Halogenated Volatile Organic Compounds ☒ C. Halogenated Volatile Organic Compounds ☒ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☒ F. Fuels Parameters	d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply
c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply) ☒ A. Inorganics ☒ B. Non-Halogenated Volatile Organic Compounds ☒ C. Halogenated Volatile Organic Compounds ☒ D. Non-Halogenated Semi-Volatile Organic Compounds ☐ E. Halogenated Semi-Volatile Organic Compounds ☒ F. Fuels Parameters	d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply	

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✓	6	350.1	0.50	9.09	0.78	Report mg/L	---
Chloride		✓	6	300.0	250	4,800	1,495	Report µg/l	---
Total Residual Chlorine	✓		6	4500-C1 D	20	<10	0	0.2 mg/L	11
Total Suspended Solids		✓	6	2540D	5	39,800,000	11,549,000	30 mg/L	---
Antimony	✓		6	200.7	5	<5	0	206 µg/L	640
Arsenic		✓	6	3113B	5	7.5	4.4	104 µg/L	10
Cadmium		✓	6	3113B	0.15	1.9	1.9	10.2 µg/L	0.25
Chromium III		✓	6	200.7	10	62	21.2	323 µg/L	74
Chromium VI	✓		6	3500Cr	10	<10	0	323 µg/L	11
Copper		✓	6	200.7	2	206	54	242 µg/L	9
Iron		✓	6	200.7	20	24,600	12,208	5,000 µg/L	1,000
Lead		✓	6	3113B	3	34.5	11.1	160 µg/L	2.5
Mercury	✓		6	245.1	0.2	<0.2	0	0.739 µg/L	0.77
Nickel		✓	6	200.7	4	25.6	13.3	1,450 µg/L	52
Selenium	✓		6	3113B	6	<6	0	235.8 µg/L	5.0
Silver	✓		6	200.7	1	<1	0	35.1 µg/L	3.2
Zinc		✓	6	200.7	10	771	211	420 µg/L	120
Cyanide	✓		6	4500CN	5	<5	0	178 mg/L	5.2
B. Non-Halogenated VOCs									
Total BTEX		✓	6	524.2	0.5	130.9	15.9	100 µg/L	---
Benzene		✓	6	524.2	0.5	244	42.7	5.0 µg/L	---
1,4 Dioxane		✓	6	8270D	0.25	0.950	0.607	200 µg/L	---
Acetone		✓	6	524.2	5	24.6	4.9	7.97 mg/L	---
Phenol	✓		6	420.1	100	<100	0	1,080 µg/L	300

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	✓		6	524.2	0.3	<0.3	0	4.4 µg/L	1.6
1,2 Dichlorobenzene		✓	6	524.2	0.5	1.0	0.3	600 µg/L	---
1,3 Dichlorobenzene	✓		6	524.2	0.5	<0.5	0	320 µg/L	---
1,4 Dichlorobenzene	✓		6	524.2	0.5	<0.5	0	5.0 µg/L	---
Total dichlorobenzene		✓	6	524.2	0.5	1.0	0.65	763 µg/L in NH	---
1,1 Dichloroethane	✓		6	524.2	1	<1	<1	70 µg/L	---
1,2 Dichloroethane	✓		6	524.2	1	<1	<1	5.0 µg/L	---
1,1 Dichloroethylene	✓		6	524.2	1	<1	<1	3.2 µg/L	---
Ethylene Dibromide	✓		6	504.1	0.015	<0.015	<0.015	0.05 µg/L	---
Methylene Chloride		✓	6	524.2	0.5	0.2	0.2	4.6 µg/L	---
1,1,1 Trichloroethane	✓		6	524.2	0.5	<0.5	<0.5	200 µg/L	---
1,1,2 Trichloroethane	✓		6	524.2	0.5	<0.5	<0.5	5.0 µg/L	---
Trichloroethylene	✓		6	524.2	0.5	<0.5	<0.5	5.0 µg/L	---
Tetrachloroethylene		✓	6	524.2	0.5	1.4	1.4	5.0 µg/L	3.3
cis-1,2 Dichloroethylene	✓		6	524.2	1	<1	<1	70 µg/L	---
Vinyl Chloride	✓		6	524.2	1	<1	<1	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates		✓	6	625 SIM	2.34	30.85	10.94	190 µg/L	3
Diethylhexyl phthalate		✓	6	625 SIM	1.87	24	8.79	101 µg/L	2.2
Total Group I PAHs		✓	6	625 SIM	0.05	1.38	0.597	1.0 µg/L	---
Benzo(a)anthracene		✓	6	625 SIM	0.05	0.25	0.110	As Total PAHs	NE
Benzo(a)pyrene		✓	6	625 SIM	0.05	0.26	0.127		NE
Benzo(b)fluoranthene		✓	6	625 SIM	0.05	0.33	0.155		NE
Benzo(k)fluoranthene		✓	6	625 SIM	0.05	0.12	0.063		NE
Chrysene		✓	6	625 SIM	0.05	0.24	0.123		0.0038
Dibenzo(a,h)anthracene		✓	6	625 SIM	0.05	0.05	0.047		0.0038
Indeno(1,2,3-cd)pyrene		✓	6	625 SIM	0.05	0.18	0.097		0.0038

[illegible]

E. Treatment system information

1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply) ☐ Adsorption/Absorption ☐ Advanced Oxidation Processes ☐ Air Stripping ☒ Granulated Activated Carbon (“GAC”)/Liquid Phase Carbon Adsorption ☐ Ion Exchange ☒ Precipitation/Coagulation/Flocculation ☒ Separation/Filtration ☐ Other; if so, specify:	
2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge. The treatment system is composed of flocculent tubes, two 10,000-gallon fractionation tank, one sand filter unit and two particulate filters, two granular activated carbon (GAC) filters and two clay vessels. The groundwater will pumped from the excavation into the flocculent tubes and then into the fractionation tanks. From the fractionation tanks, the pumped through a sand filter and particulate filter for the removal of solids, then into the GAC filters and clay vessels to remove organics and then through one more particulate filter to remove any residual solids Identify each major treatment component (check any that apply): ☒ Fractionation tanks ☐ Equalization tank ☐ Oil/water separator ☐ Mechanical filter ☒ Media filter ☐ Chemical feed tank ☐ Air stripping unit ☒ Bag filter ☐ Other; if so, specify: Indicate if either of the following will occur (check any that apply): ☐ Chlorination ☐ De-chlorination	
3. Provide the design flow capacity in gallons per minute (gpm) of the most limiting component. Indicate the most limiting component: 25-350 Is use of a flow meter feasible? (check one): ☒ Yes ☐ No, if so, provide justification:	25-350
Provide the proposed maximum effluent flow in gpm.	350
Provide the average effluent flow in gpm.	25
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	
4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): ☒ Yes ☐ No	

F. Chemical and additive information

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)

☐ Algaecides/biocides ☐ Antifoams ☐ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ☐ Flocculants ☐ Neutralizing agents ☐ Oxidants ☐ Oxygen ☐ scavengers ☐ pH conditioners ☐ Bioremedial agents, including microbes ☐ Chlorine or chemicals containing chlorine ☐ Other; if so, specify:

2. Provide the following information for each chemical/additive, using attachments, if necessary:

- 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)).

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): ☐ Yes ☐ 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): ☐ Yes ☐ No

G. Endangered Species Act eligibility determination

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

- ☒ **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”.
- ☐ **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): ☐ Yes ☐ No; if no, is consultation underway? (check one): ☐ Yes ☐ No
- ☐ **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) ☐ the operator ☐ EPA ☐ Other; if so, specify:

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

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

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

H. National Historic Preservation Act eligibility determination

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

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

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

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

I. Supplemental information

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

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

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

J. Certification requirement

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

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

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

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

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

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

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

Signature: 

Date: 10-25-17

Print Name and Title: Rich Mckanas

J. Certification requirement

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

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

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

Check one: Yes ☒ No ☐

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

Check one: Yes ☒ No ☐

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

Check one: Yes ☒ No ☐ NA ☐

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

Check one: Yes ☒ No ☐ NA ☐

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

Check one: Yes ☐ No ☐ NA ☐

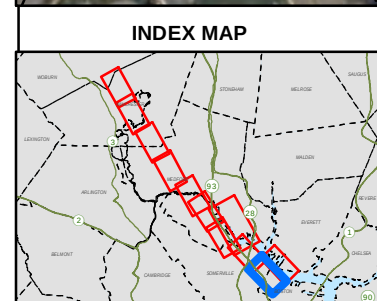
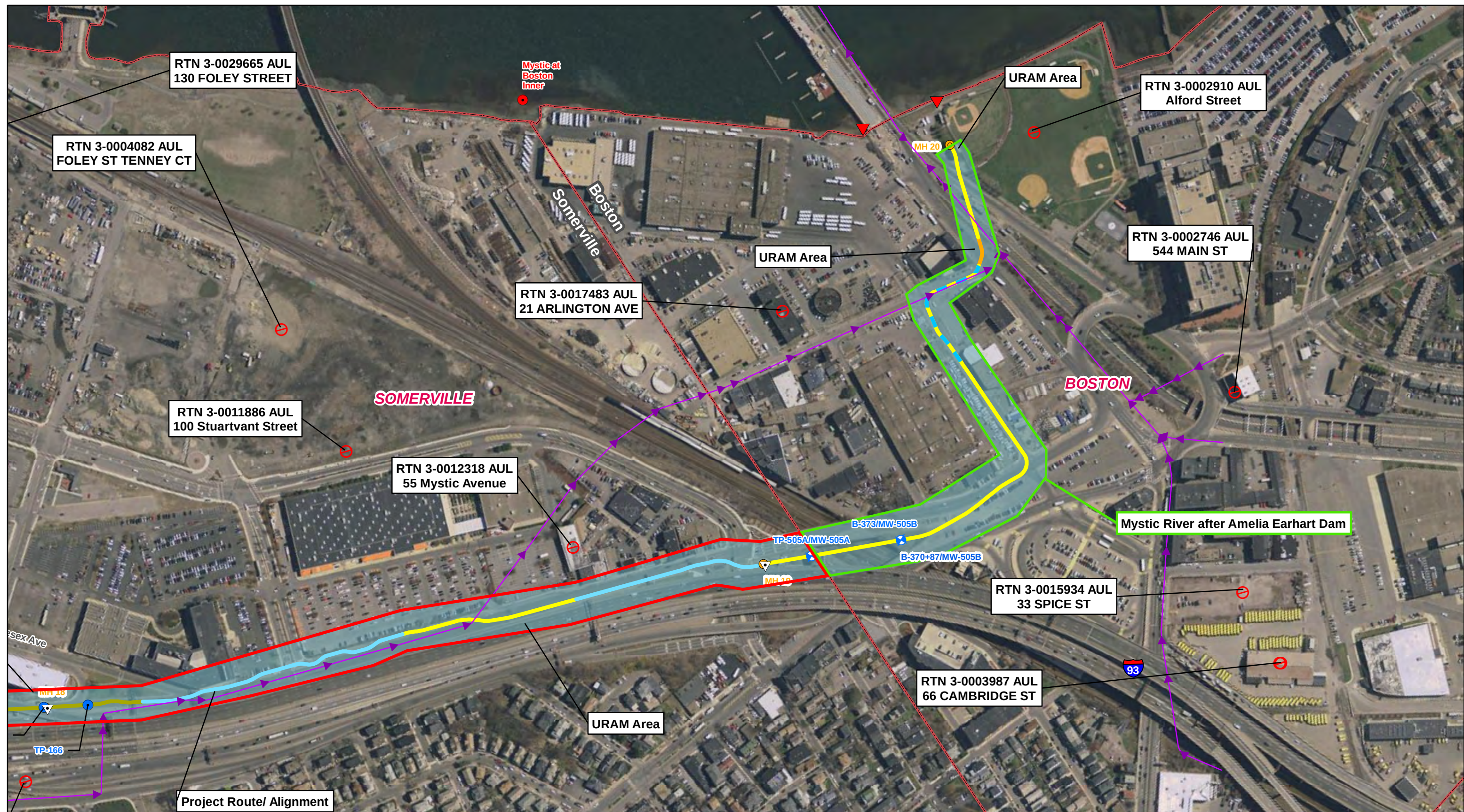
Signature:



Date: 11/29/2017

Print Name and Title: Michael Zylich, Senior Environmental Engineer

APPENDIX B



Legend

- Test Pit Location
- Geotech Boring
- Geotech Boring/ Monitoring Well
- River Sediment Sample
- MA DEP AUL Site
- Proposed Manhole
- Existing Manhole
- Surface Water Sample
- Municipal Boundary
- MWRA Sewer Pipe
- Laydown Yard
- RGP Boundaires Aberjona River
- RGP Boundaires Mystic River Crossing
- RGP Boundaires Mystic River after Amelia Earhart Dam
- RGP Boundary Winter Pond
- Soil Type
 - Type A
 - Type B
 - Type C1
 - Type C2
 - Type D1
 - Type E
- Approximate Outfall Location
 - Boston Water Sewer Commission
 - MassDOT
 - Medford
 - Somerville
 - Winchester

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

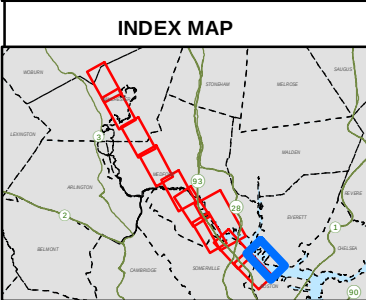
Figure 1: Aerial Dewatering Site Plan

Mapsheet 09 of 11

EVERSOURCE
ENERGY

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November 2017



Legend

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

Map Notes:
Basemap: 2013-2014 Orthophotographs, MassGIS
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1 in = 300 ft

0 150 300 600 Feet

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

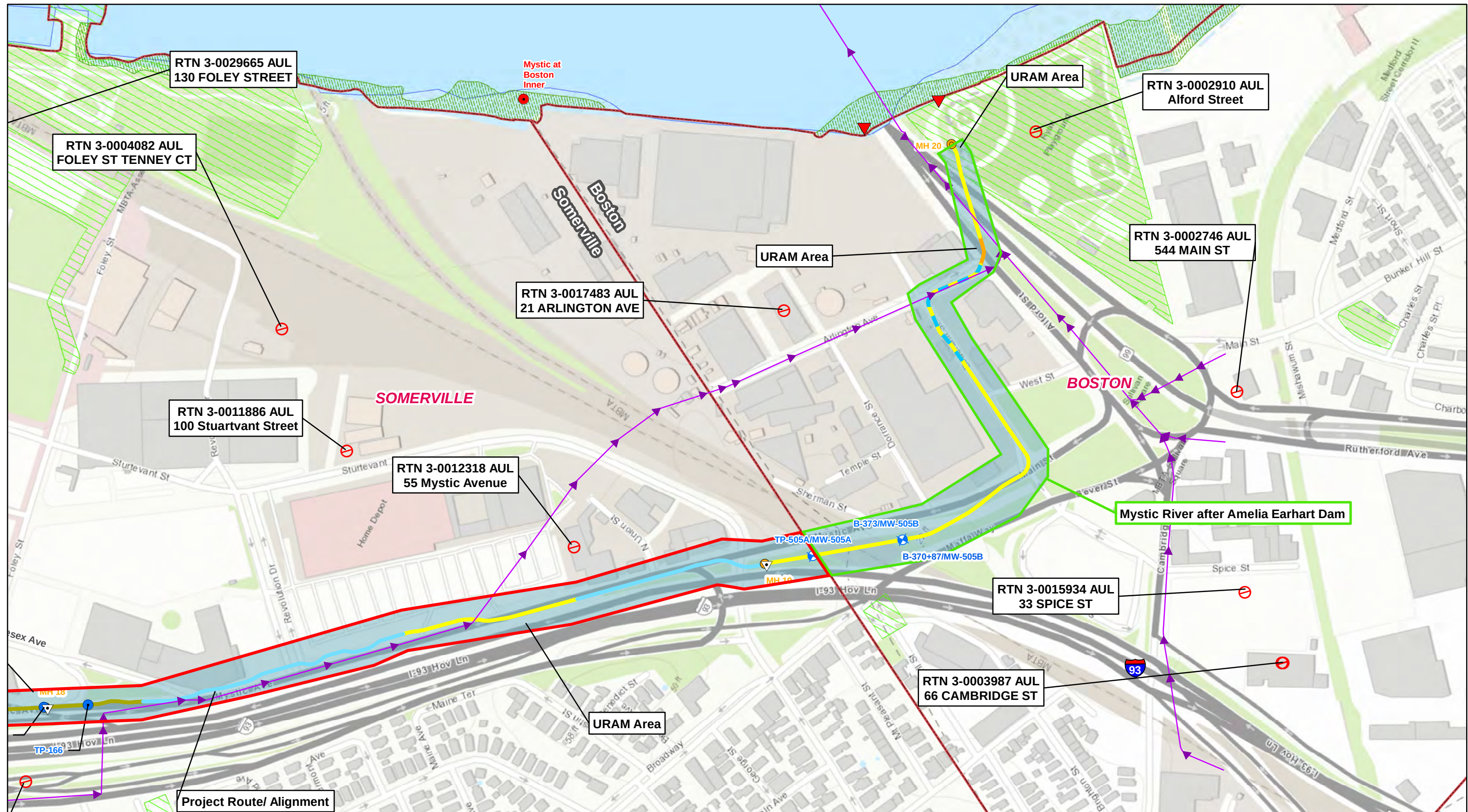
Figure 1: Aerial Dewatering Site Plan

Mapsheet 10 of 11

EVERSOURCE ENERGY

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November 2017



INDEX MAP

Legend

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

Map Notes:
Basemap: 2013-2014 Orthophotographs, MassGIS
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**New 115 kV Transmission Line
Woburn Substation to Mystic
Substation**

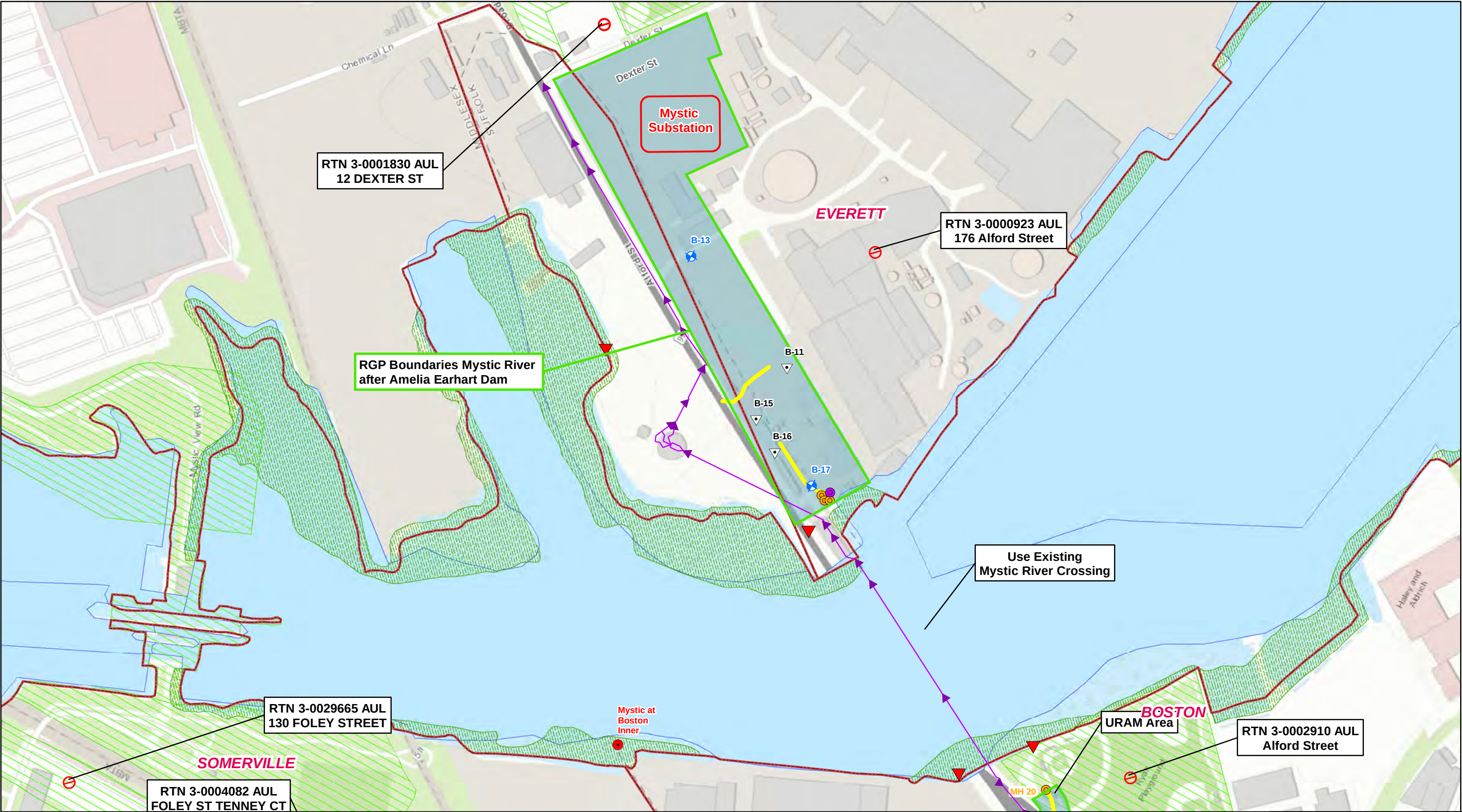
Figure 1: Aerial Dewatering Site Plan

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**EVERSOURCE
ENERGY**

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November 2017



INDEX MAP

Legend

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

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1 in = 300 ft

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

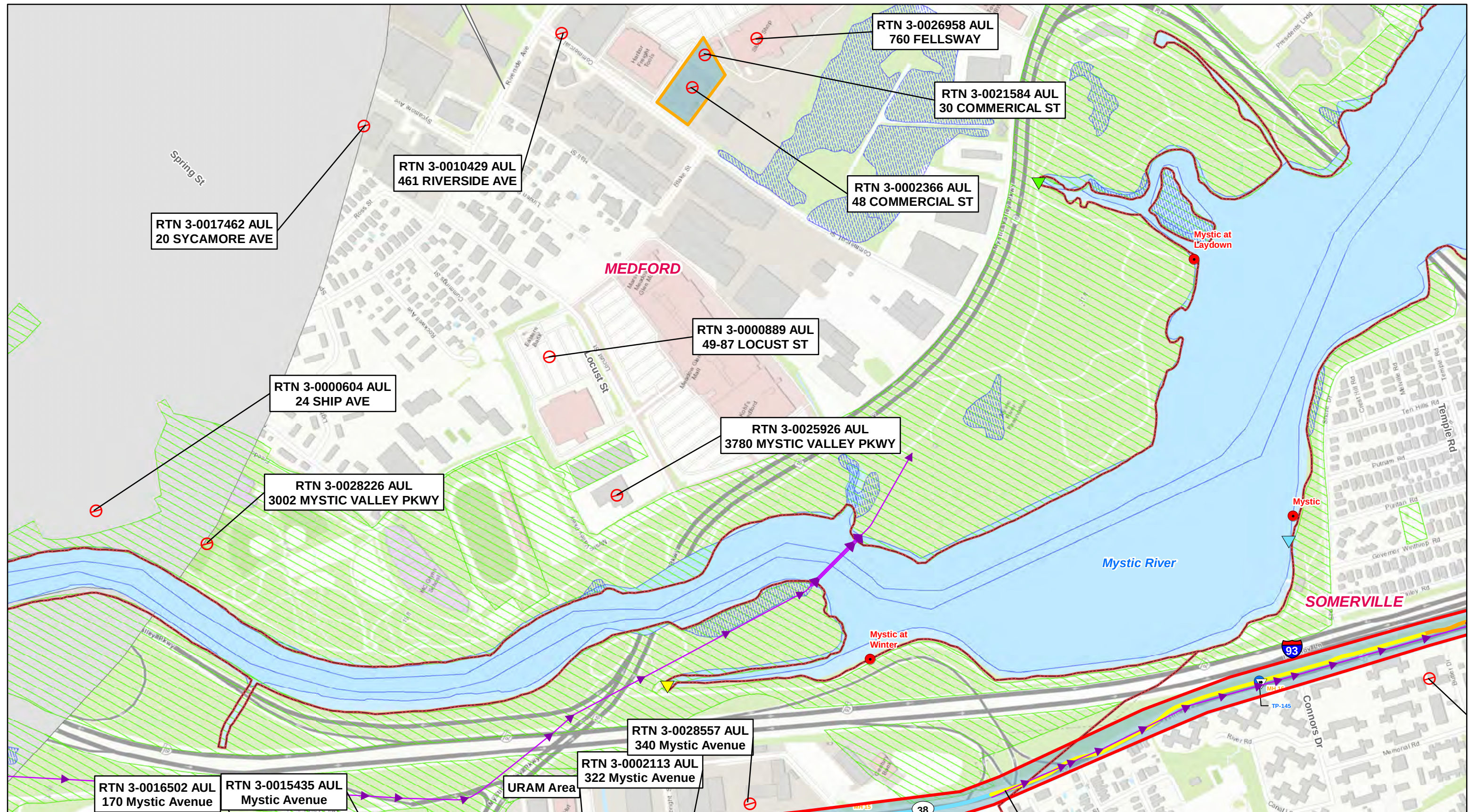
Figure 1: Aerial Dewatering Site Plan

Mapsheet 10 of 11

**EVERSOURCE
ENERGY**

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November 2017



INDEX MAP

Legend

- Test Pit Location
- Geotech Boring
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- Existing Manhole
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 - Type B
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 - MassDOT
 - Medford
 - Somerville
 - Winchester
- RGP Boundaries
 - Aberjona River
 - Mystic River Crossing
 - Mystic River after Amelia Earhart Dam
 - Winter Pond
 - DEP Approved Wellhead Protection Area (Zone II)
 - DEP Interim Wellhead Protection Area (WPA)
 - MassDEP Inland Wetlands
 - MassDEP Coastal Wetlands
- Protected and Recreational Open Space
- Public Surface Water Supply (PSWS)
- Water Bodies
- High Yield Non Potential Drinking Water Source
- Medium Yield Non Potential Drinking Water Source
- Potentially Productive Medium Yield Aquifer
- Potentially Productive High Yield Aquifer

Map Notes:
Base map: 2013-2014 Orthophotographs, MassGIS
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1 in = 450 ft

0 150 300 600 Feet

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

Figure 1: Aerial Dewatering Site Plan

Mapsheet 11 of 11

EVERSOURCE ENERGY

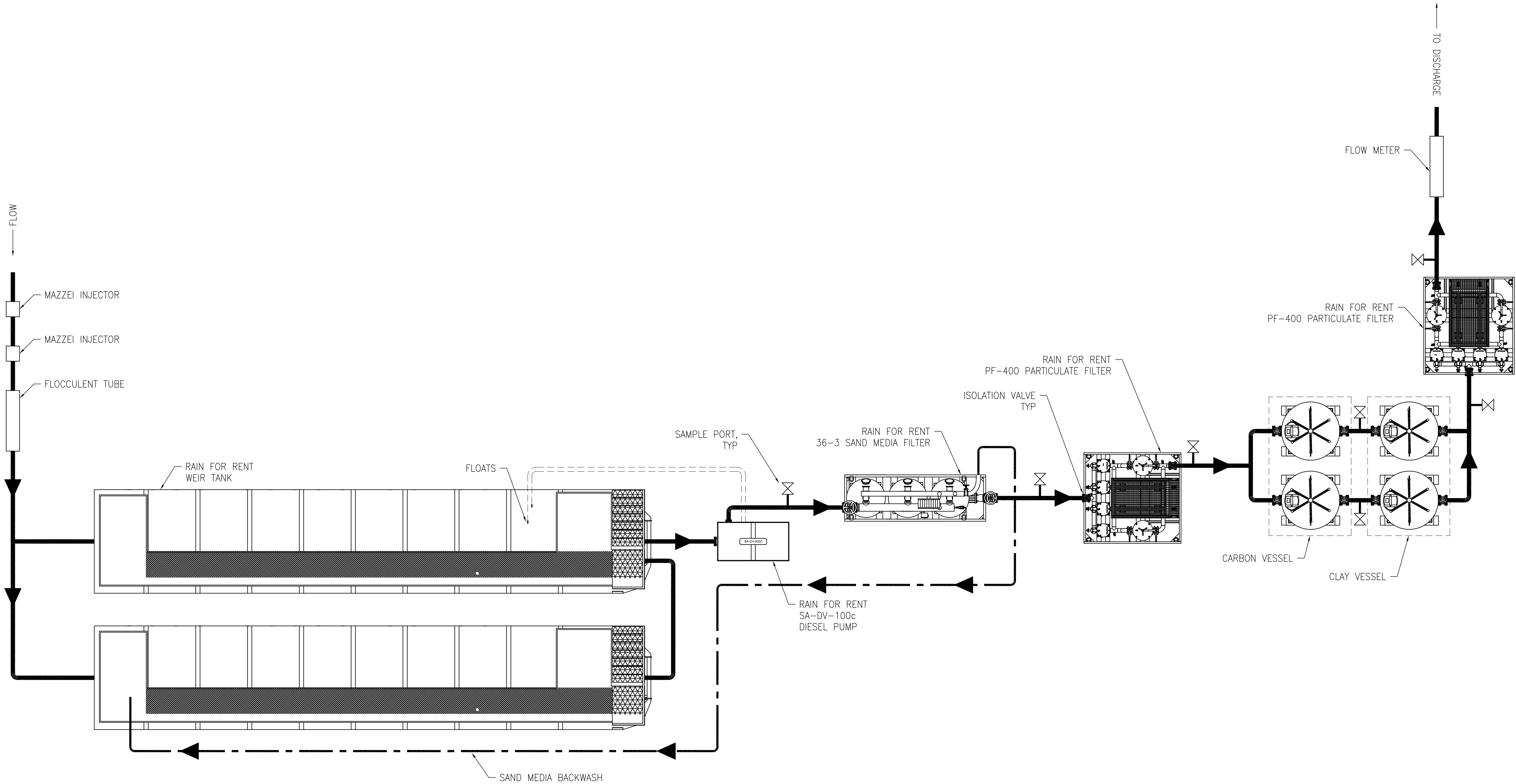
Tighe & Bond
Engineers | Environmental Specialists

November 2017

REV.NO.	DESCRIPTION	PREVIOUS DWG	BY	DATE
1				

Figure 3.1: Process Flow Diagram

ITEM	QTY.	REF.	DESCRIPTION



PLAN VIEW

FILTRATION
LAYOUT

BOND BROTHERS
350 GPM

Rain for Rent
Engineering



01-15043-02-01

1 of 1

CONFIDENTIAL

232101-17



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**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

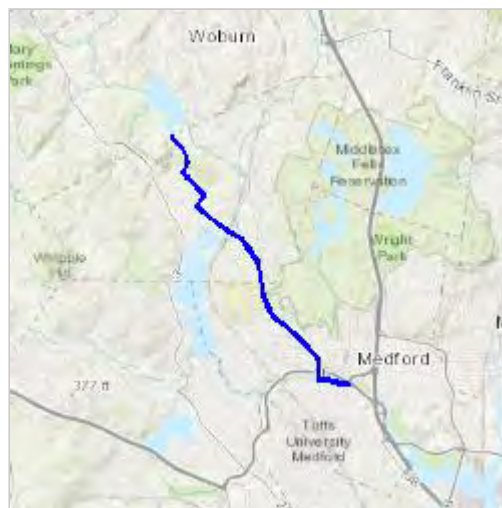
Project Type: ** OTHER **

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 <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

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

APPENDIX D



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 Project N-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: Brona Simon, MHC
Ramona Peters, MWT (via email attachment)
Bettina Washington, WTGH/A (via email attachment)

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

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

Tighe&Bond

Engineers | Environmental Specialists

Eversource Project

Mystic-Woburn Transmission Project

US EPA RGP Dilution Factor Calculations

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

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

Where:

DF = Dilution Factor

QD = Effluent Discharge Flow Rate (MGD)

QS = 7Q10 Stream Flow Rate (MGD)

MGD = Million Gallons per Day

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

Enter number values in green boxes below

Enter values in the units specified

↓	
2.16	Q _R = Enter upstream flow in MGD
0.504	Q _P = Enter discharge flow in MGD
2.16	Downstream 7Q10

Enter a dilution factor, if other than zero

↓	
5.29	

Enter values in the units specified

↓	
	C _I = Enter influent hardness in mg/L CaCO ₃
	C _S = Enter receiving water hardness in mg/L CaCO ₃

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

↓	
7.75	pH in Standard Units
17.2	Temperature in °C
0.43	Ammonia in mg/L
0	Hardness in mg/L CaCO ₃
14.9	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
0	Copper in µg/L
0	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
0	Zinc in µg/L

Enter **influent** concentrations in the units specified

↓	
0	TRC in µg/L
1.96	Ammonia in mg/L
0	Antimony in µg/L
7.5	Arsenic in µg/L
0.99	Cadmium in µg/L
16.7	Chromium III in µg/L
0	Chromium VI in µg/L
62.8	Copper in µg/L
15500	Iron in µg/L
7.6	Lead in µg/L
0	Mercury in µg/L
23.2	Nickel in µg/L
0	Selenium in µg/L
0	Silver in µg/L
771	Zinc in µg/L
0	Cyanide in µg/L
0	Phenol in µg/L
0	Carbon Tetrachloride in µg/L
1.4	Tetrachloroethylene in µg/L
30.85	Total Phthalates in µg/L
24	Diethylhexylphthalate in µg/L
0.25	Benzo(a)anthracene in µg/L
0.26	Benzo(a)pyrene in µg/L
0.33	Benzo(b)fluoranthene in µg/L
0.12	Benzo(k)fluoranthene in µg/L
0.24	Chrysene in µg/L
0.05	Dibenzo(a,h)anthracene in µg/L
0.18	Indeno(1,2,3-cd)pyrene in µg/L
0	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 approved

Saltwater (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	5.3					
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	32.1	µg/L	50	µg/L
Total Suspended Solids	30	mg/L	---			
Antimony	206	µg/L	2743	µg/L		
Arsenic	104	µg/L	154	µg/L		
Cadmium	10.2	µg/L	37.9	µg/L		
Chromium III	323	µg/L	428.6	µg/L		
Chromium VI	323	µg/L	216	µg/L		
Copper	242	µg/L	16.0	µg/L		
Iron	5000	µg/L	---	µg/L		
Lead	160	µg/L	36.5	µg/L		
Mercury	0.739	µg/L	4.74	µg/L		
Nickel	1450	µg/L	35.5	µg/L		
Selenium	235.8	µg/L	305	µg/L		
Silver	35.1	µg/L	9.6	µg/L		
Zinc	420	µg/L	367	µg/L		
Cyanide	178	mg/L	4.3	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	7.97	mg/L	---			
Phenol	1,080	µg/L	1286	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	4.4		6.9	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	14.1	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	9.4	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	1.0	µg/L	---			
Benzo(a)anthracene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Benzo(a)pyrene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Benzo(b)fluoranthene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Benzo(k)fluoranthene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Chrysene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Dibenzo(a,h)anthracene	1.0	µg/L	0.0163	µg/L	0.1	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	0.0163	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	86	µg/L		
tert-Butyl Alcohol	120	µg/L	---			
tert-Amyl Methyl Ether	90	µg/L	---			

TABLE 1
Groundwater Results - Mystic

Eversource: Woburn - Mystic

Analytical Test	Sample Identification Sample Date	Effluent Limitation	Average Concentration	Sullivan Square Crossing				Station 250	
				MW-505B 1/10/2017	MW-505B 1/11/2017	MW-505A 1/10/2017	MW-505A FF 1/10/2017	B-3 7/13/2017	B-17 7/13/2017
TPH - mg/L	TPH	5.0	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND(5)	ND(5)
Total PAHs Group I - ug/L	Benzo(a)Anthracene	0.0163/0.1 ⁽¹⁾	0.110	0.10	ND (0.05)	0.11	ND (0.05)	0.25	0.10
	Benzo(a)Pyrene	0.0163/0.1 ⁽¹⁾	0.127	0.19	ND (0.05)	0.12	ND (0.05)	0.26	0.09
	Benzo(b)Fluoranthene	0.0163/0.1 ⁽¹⁾	0.155	0.24	ND (0.05)	0.15	ND (0.05)	0.33	0.11
	Benzo(k)Fluoranthene	0.0163/0.1 ⁽¹⁾	0.063	0.06	ND (0.05)	0.05	ND (0.05)	0.12	ND(0.05)
	Chrysene	0.0163/0.1 ⁽¹⁾	0.123	0.15	ND (0.05)	0.13	ND (0.05)	0.24	0.12
	Dibenzo(a,h)Anthracene	0.0163/0.1 ⁽¹⁾	0.047	0.05	ND (0.05)	0.03	ND (0.05)	0.18	ND(0.05)
	Indeno(1,2,3-cd)Pyrene	0.0163/0.1 ⁽¹⁾	0.097	0.14	ND (0.05)	0.1	ND (0.05)	0.18	0.06
	Total PAHs Group I	1.0	0.597	0.93	ND	0.69	ND	1.38	0.48
Total PAHs Group II - ug/L	Acenaphthene	NE	0.17	0.11	0.08	0.04	ND (0.19)	0.35	0.26
	Acenaphthylene	NE	ND (0.19)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.19)	ND(0.19)	ND(0.19)
	Anthracene	NE	0.12	0.06	ND (0.19)	0.08	0.03	ND(0.19)	ND(0.19)
	Benzo(ghi)Perylene	NE	0.17	0.18	ND (0.19)	0.10	ND (0.19)	0.19	ND(0.19)
	Fluoranthene	NE	0.24	0.14	ND (0.19)	0.21	ND (0.19)	0.41	0.31
	Fluorene	NE	0.13	0.11	0.06	0.06	ND (0.19)	0.19	ND(0.19)
	Naphthalene	20	3.30	1.72	17.4	0.05	0.04	ND(0.19)	0.37
	Phenanthrene	NE	0.22	0.21	0.06	0.18	ND (0.19)	ND(0.19)	0.48
	Pyrene	NE	0.22	0.27	0.02	0.25	ND (0.19)	ND(0.19)	0.39
	Total PAHs Group II	100	3.64	2.8	17.62	0.22	0.07	1.14	1.81
Phthalates - ug/L	Butylbenzylphthalate	NE	1.15	0.88	0.39	0.61	0.31	ND(2.34)	ND(2.34)
	Bis (2-Ethylhexyl) Phthalate	9.4	8.79	24	2.88	5.22	2.83	9.48	8.31
	Diethylphthalate	NE	2.08	3.71	3.19	0.54	0.36	ND(2.34)	ND(2.34)
	Dimethylphthalate	NE	ND (2.34)	NA	NA	NA	NA	ND(2.34)	ND(2.34)
	Di-n-butylphthalate	NE	1.82	1.11	0.47	ND (2.34)	ND (2.34)	ND(2.34)	ND(2.34)
	Di-n-octylphthalate	NE	1.79	1.15	ND (2.34)	0.21	ND (2.34)	ND(2.34)	ND(2.34)
	Total Phthalates	190	10.94	30.85	6.93	6.58	3.5	9.48	8.31
SVOCs - ug/L	Pentachlorophenol	1.0	ND (0.84)	ND (0.90)	ND (0.84)	ND(0.84)	ND(0.84)	ND(0.84)	ND(0.84)
	All Other SVOCs	NE	ND	< c/s	< c/s	< 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)	ND (5.0)	ND(10.0)	ND(10.0)
	Arsenic	104	4.4	7.5	5.5	2.7	ND (5.0)	3.5	1.9
	Barium	NE	191	65	106	279	314	NA	NA
	Beryllium	NE	0.93	0.4	0.6	1.9	0.8	NA	NA
	Cadmium	10.2	2.0	ND (5.0)	0.05	0.80	ND (5.0)	0.99	0.42
	Chromium	323	7.4	7.4	17.3	61.5	2.1	11.6	16.7
	Chromium III	323	21.2	ND (10)	17.0	62	ND (10)	11.6	16.7
	Lead	160	11.1	1.3	6.2	34.5	ND (12.5)	7.6	4.6
	Mercury	0.739	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND(0.20)	ND(0.20)
	Nickel	1,450	13.3	ND (10.0)	6.3	25.6	3.8	23.2	11.1
	Selenium	235.8	ND (2.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND(2.0)	ND(2.0)
	Silver	35.1	ND (0.2)	ND (0.2)	ND (0.20)	ND (0.2)	ND (0.20)	ND(1.0)	ND(2.0)
	Thallium	NE	ND (1.0)	ND (1.0)	ND (10.0)	ND (3.0)	ND (10.0)	NA	NA
	Vanadium	NE	9.7	2.6	7.0	26.6	2.4	NA	NA
	Zinc	367	211	28.3	78.8	203	12.8	771	174
	Iron	5,000	12,208	15,500	15,400	24,600	1,060	7,430	9,260
	Copper	16	54	ND (10)	17.0	206	2.6	62.8	27.0
Ethanol - ug/L	Ethanol	Report	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND(10)	ND(10)
1,2-Dibromoethane - ug/L	1,2-Dibromoethane (EDB)	0.05	ND (0.015)	ND (0.015)	ND (0.015)	ND (0.015)	ND (0.015)	ND(0.015)	ND(0.015)
1,4-Dioxane - ug/L	1,4-Dioxane	200	0.607	ND (500)	ND (500)	ND (500)	ND (500)	0.263	0.950
PCB - ug/L	Aroclor-1016	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1221	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1232	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1242	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1248	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1254	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1260	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	0.10
	Aroclor-1262	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Aroclor-1268	NE	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND(0.09)	ND(0.09)
	Total PCBs	0.000064/0.5 ⁽¹⁾	0.06	ND	ND	ND	ND	ND	0.10
VOCs - ug/L	tert-Butyl Alcohol (TBA)	120	ND (25.0)	ND (25.0)	ND (25.0)	ND (25.0)	ND (25.0)	ND(25.0)	ND(25.0)
	tert-Amyl Methyl Ether	90	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(1.0)	ND(1.0)
	Napthalene	20	4.7	2.5	22.6	0.3	ND (1.0)	0.6	1.1
	Carbon Tetrachloride	4.4	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.3)
	1,2 Dichlorobenzene (o-DCB)	600	ND(0.5)	0.3	1.0	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	1,3 Dichlorobenzene (m-DCB)	320	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.5)
	1,4 Dichlorobenzene (p-DCB)	5.0	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.5)
	1,1 Dichloroethane (DCA)	70	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.5)
	1,2 Dichloroethane (DCE)	5.0	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.5)
	1,1 Dichloroethene (DCE)	3.2	ND(0.3)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.3)	ND(0.5)
	sec-Butylbenzene	NE	1.5	2.9	ND (1.0)	ND (1.0)	ND (1.0)	NA	NA
	tert-Butyl Ethyl Ether (TBE)	NE	1.1	1.3	ND (1.0)	ND (1.0)	ND (1.0)	NA	NA
	cis-1,2 Dichloroethene (DCE)	70	ND(0.5)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Methylene Chloride	4.6	0.2	0.2	ND (2.0)	ND (2.0)	ND (2.0)	ND(0.5)	ND(0.5)
	Tetrachloroethene (PCE)	5.0	1.4	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	1.4
	1,1,1 Trichloro-ethane (TCA)	200	ND(0.5)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	1,1,2 Trichloro-ethane (TCA)	5.0	ND(0.5)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Trichloroethene (TCE)	5.0	ND(0.5)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Methyl tert-Butyl Ether	70	ND(0.5)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Acetone	7.97	4.9	10.3	ND (10)	3.6	ND (10)	18.1	24.6
	Vinyl Chloride	2.0	ND(0.2)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND(0.2)	ND(0.2)
BTEX - ug/L	Benzene	5.0	42.7	14.9	244	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Toluene	NE	1.3	1.3	4.2	ND (1.0)	0.2	ND(0.5)	ND(0.5)
	Ethylbenzene	NE	15.0	9.2	77.8	ND (1.0)	ND (1.0)	ND(0.5)	ND(0.5)
	Total Xylenes	NE	10.0	6.4	48.9	ND (1.0)	ND (1.0)	ND(0.5)	2.0
	Total BTEX	100	15.9	31.8	130.9	ND	0.2	ND	2.0
Classical Chemistry	Chloride (mg/L)	Report	1,495	63	70	4,800	2,600	1,040	399
	Ammonia (mg/L)	Report	0.78	0.16	ND (10)	0.20	0.82	1.96	0.77
	Hexavalent Chromium (ug/L)	323	ND (10)	ND (1.0)	ND (10)	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)	ND (5.00)	ND(5.00)	ND(5.00)
	Phenols (ug/L)	1,080	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND(5.00)	ND(5.00)
	Total Residual Chlorine (ug/L)	32.1/50 ⁽¹⁾	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND(10)	ND(10)
	Total Suspended Solids (ug/L)	30,000	11,549,000	39,800,000	62,000	1,350,000	8,000	27,600,000	474,000
	Hardness (ug/L)	NE	249,000	NA	NA	NA	NA	239,000	259,000

Notes:

1: The second standard is the compliance level

SVOCs = Volatile Organic Compounds

TPH = Total Petroleum Hydrocarbons

PCBs = Polychlorinated biphenyls

mg/L = milligrams per kilogram (ppm)

ug/L = micrograms per kilogram (ppb)

< xx = not detected above the indicated laboratory method detection limit

c/s = compound specific

NE = Not Established

NA = Not Analyzed

ND = Not Detected

* = Effluent limits calculated using the US EPA's Dilution Factor and Effluent Limitation Calculations for Massachusetts Form (Appendix V)

Red text = exceeds RGP limit

TABLE 2**Surface Water Results**

Eversource: Woburn - Mystic

Analytical Test	Sample Identification	Effluent Limitation	Mystic at Boston Inner
	Sample Date		11/15/2017
Metals (ug/L)	Arsenic	104	ND(5)
	Cadmium	10.2	ND(10)
	Chromium	323	ND(20)
	Chromium III	323	ND(20)
	Copper	16	ND(10)
	Iron	5,000	ND(100)
	Lead	160	ND(2)
	Nickel	1,450	ND(20)
	Silver	35.1	NA
	Zinc	367	ND(50)
Classical Chemistry	Ammonia as N (mg/L)	Report	0.43
	Hexavalent Chromium (ug/L)	323	ND(10)
	pH	NE	7.75
	Salinity (ppt)	NE	14.9
	Hardness (ug/L)	NE	NA

Notes:*mg/L= milligrams per kilogram (ppm)**ug/L= micrograms per kilogram (ppb)**NE = Not Established**NA = Not Analyzed**ND = Not Detected*



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-Cl 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-Cl 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-Cl 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-Cl 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-Cl 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):

☒ 8260 VOC CAM II A	☐ 7470/7471 Hg CAM III B	☐ MassDEP VPH CAM IV A	☐ 8081 Pesticides CAM V B	☒ 7196 Hex Cr CAM VI B	☐ MassDEP APH CAM IX A
☒ 8270 SVOC CAM II B	☒ 7010 Metals CAM III C	☐ MassDEP EPH CAM IV B	☐ 8151 Herbicides CAM V C	☐ 8330 Explosives CAM VIII A	☐ TO-15 VOC CAM IX B
☒ 6010 Metals CAM III A	☐ 6020 Metals CAM III D	☒ 8082 PCB CAM V A	☐ 6860 Perchlorate CAM VIII B	☒ 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 ☒ No ☐
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes ☒ No ☐
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 ☒ No ☐
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 ☒ No ☐
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 ☐ No ☐
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ☐ No ☐
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 ☒ No ☐

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 ☒ No ☐ *
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	Yes ☐ No ☒ *
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ☐ No ☒ *

****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-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 23:09	50	25	CA71146
Arsenic	5.5 (5.0)	0.4	7010		1	KJK	01/14/17 16:23	50	25	CA71146
Barium	106 (25.0)	1.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Beryllium	0.6 (0.5)	0.1	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Cadmium	J 0.05 (0.5)	0.03	7010		1	KJK	01/17/17 16:16	50	25	CA71146
Chromium	17.3 (10.0)	1.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Chromium III	17 (10)		6010C		1	JLK	01/13/17 3:56	1	1	[CALC]
Copper	18.7 (5.0)	2.0	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Iron	15400 (50.0)	11.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Lead	6.2 (2.5)	0.5	7010		1	KJK	01/18/17 21:29	50	25	CA71146
Mercury	ND (0.20)	0.12	7470A		1	MJV	01/13/17 12:56	20	40	CA71147
Nickel	J 6.3 (10.0)	1.0	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Selenium	ND (5.0)	0.6	7010		1	KJK	01/15/17 3:58	50	25	CA71146
Silver	ND (0.2)	0.08	7010		1	KJK	01/17/17 19:22	50	25	CA71146
Thallium	ND (1.0)	0.5	7010		1	KJK	01/14/17 19:04	50	25	CA71146
Vanadium	J 7.0 (10.0)	1.0	6010C		1	KJK	01/13/17 3:56	50	25	CA71146
Zinc	B 78.8 (25.0)	4.5	6010C		1	KJK	01/13/17 3:56	50	25	CA71146



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 15:04		CA71203
Aroclor 1221	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1232	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1242	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1248	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1254	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1260	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1262	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203
Aroclor 1268	ND (0.09)	0.03	8082A		1	01/13/17 15:04		CA71203

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	73 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	78 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	78 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	63 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 20:06	C7A0161	CA71231
1,1,2-Trichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,1-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,1-Dichloroethene	ND (1.0)	0.3	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,2-Dibromoethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,2-Dichlorobenzene	J 1.0 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,2-Dichloroethane	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,3-Dichlorobenzene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,4-Dichlorobenzene	ND (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
1,4-Dioxane - Screen	ND (500)	190	8260B		1	01/12/17 20:06	C7A0161	CA71231
Acetone	ND (10.0)	2.7	8260B		1	01/12/17 20:06	C7A0161	CA71231
Benzene	244 (10.0)	1.0	8260B		10	01/13/17 18:32	C7A0161	CA71231
Carbon Tetrachloride	ND (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
cis-1,2-Dichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Ethylbenzene	77.8 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
Methyl tert-Butyl Ether	ND (1.0)	0.3	8260B		1	01/12/17 20:06	C7A0161	CA71231
Methylene Chloride	ND (2.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Naphthalene	22.6 (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Tertiary-amyl methyl ether	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Tertiary-butyl Alcohol	ND (25.0)	10.0	8260B		1	01/12/17 20:06	C7A0161	CA71231
Tetrachloroethene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Toluene	4.2 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
Trichloroethene	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Vinyl Chloride	ND (1.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231
Xylene O	8.1 (1.0)	0.1	8260B		1	01/12/17 20:06	C7A0161	CA71231
Xylene P,M	40.8 (2.0)	0.2	8260B		1	01/12/17 20:06	C7A0161	CA71231

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	98 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	93 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	97 %		70-130
<i>Surrogate: Toluene-d8</i>	98 %		70-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 0.08 (0.19)	0.04	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Acenaphthylene	ND (0.19)	0.03	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Anthracene	ND (0.19)	0.03	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(a)anthracene	ND (0.05)	0.01	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(a)pyrene	ND (0.05)	0.01	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(b)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(g,h,i)perylene	ND (0.19)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Benzo(k)fluoranthene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
bis(2-Ethylhexyl)phthalate	B 2.88 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Butylbenzylphthalate	B, J 0.39 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Chrysene	ND (0.05)	0.01	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Dibenzo(a,h)Anthracene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Diethylphthalate	3.19 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Dimethylphthalate	ND (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Di-n-butylphthalate	J 0.47 (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Di-n-octylphthalate	ND (2.34)	0.19	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Fluoranthene	ND (0.19)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Fluorene	J 0.06 (0.19)	0.03	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Indeno(1,2,3-cd)Pyrene	ND (0.05)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Naphthalene	17.4 (0.93)	0.20	8270D SIM		5	01/13/17 15:29	C7A0164	CA71116
Pentachlorophenol	ND (0.84)	0.30	8270D SIM		1	01/19/17 14:01	C7A0164	CA71116
Phenanthrene	J 0.06 (0.19)	0.04	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116
Pyrene	J 0.02 (0.19)	0.02	8270D SIM		1	01/13/17 1:20	C7A0164	CA71116

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	63 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	131 %	S+	15-110
<i>Surrogate: 2-Fluorobiphenyl</i>	74 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	82 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	84 %		30-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 17:18	mg/L	CA71301
Chloride	70.0 (10.0)		§		1	SUB	01/13/17 20:47	mg/L	CA71826
Hexavalent Chromium	ND (10)		7196A		1	JLK	01/11/17 21:00	ug/L	CA71144
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	62000 (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-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 20:29		CA71322
		<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-505B FF
Date Sampled: 01/11/17 08:30
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-05
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 18:27		CA71246



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP/MCP
Client Sample ID: MW-505B
Date Sampled: 01/11/17 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 1701214
ESS Laboratory Sample ID: 1701214-06
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 23:14	50	25	CA71146
Arsenic	7.5 (5.0)	0.4	7010		1	KJK	01/14/17 16:40	50	25	CA71146
Barium	65.0 (25.0)	1.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Beryllium	J 0.4 (0.5)	0.1	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Cadmium	ND (0.5)	0.03	7010		1	KJK	01/17/17 16:22	50	25	CA71146
Chromium	J 7.4 (10.0)	1.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Chromium III	ND (10)		6010C		1	KJK	01/13/17 4:00	1	1	[CALC]
Copper	5.3 (5.0)	2.0	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Iron	15500 (50.0)	11.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Lead	J 1.3 (2.5)	0.5	7010		1	KJK	01/14/17 22:47	50	25	CA71146
Mercury	ND (0.20)	0.12	7470A		1	MJV	01/13/17 12:58	20	40	CA71147
Nickel	ND (10.0)	1.0	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Selenium	ND (5.0)	0.6	7010		1	KJK	01/15/17 4:15	50	25	CA71146
Silver	ND (0.2)	0.08	7010		1	KJK	01/17/17 20:20	50	25	CA71146
Thallium	ND (1.0)	0.5	7010		1	KJK	01/14/17 19:10	50	25	CA71146
Vanadium	J 2.6 (10.0)	1.0	6010C		1	KJK	01/13/17 4:00	50	25	CA71146
Zinc	B 28.3 (25.0)	4.5	6010C		1	KJK	01/13/17 4:00	50	25	CA71146



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

Total Metals

Batch CA71144 - [CALC]

Blank

Chromium III	ND	10	ug/L							

LCS

Chromium III	ND		ug/L							

LCS Dup

Chromium III	ND		ug/L							

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

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							

LCS

Mercury	6.34	0.20	ug/L	6.000		106	80-120			

LCS Dup

Mercury	6.26	0.20	ug/L	6.000		104	80-120	1	20	

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			



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

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

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

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

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

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							

LCS

Total Residual Chlorine	2		mg/L	1.800		100	85-115			

Batch CA71144 - General Preparation

Blank

Hexavalent Chromium	ND	10	ug/L							

LCS

Hexavalent Chromium	0.5		mg/L	0.4998		99	90-110			

LCS Dup

Hexavalent Chromium	0.5		mg/L	0.4998		99	90-110	0.2	20	

Batch CA71229 - General Preparation

Blank

Total Suspended Solids	ND	5000	ug/L							

LCS

Total Suspended Solids	64		mg/L	68.70		93	80-120			

Batch CA71301 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L							

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

Classical Chemistry

Batch CA71301 - NH4 Prep

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

LCS

Ammonia as N	1.11	0.10	mg/L	0.9994		112	80-120			

Batch CA71306 - General Preparation

Blank

Total Petroleum Hydrocarbon	ND	5	mg/L							

LCS

Total Petroleum Hydrocarbon	15	5	mg/L	19.38		78	66-114			

Batch CA71317 - TCN Prep

Blank

Total Cyanide (LL)	ND	5.00	ug/L							

LCS

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

LCS

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

LCS Dup

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

Batch CA71336 - General Preparation

Blank

Phenols	ND	100	ug/L							

LCS

Phenols	116	100	ug/L	100.0		116	80-120			

LCS

Phenols	997	100	ug/L	1000		100	80-120			

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

Batch CA71322 - 504/8011

Blank

1,2-Dibromoethane	ND	0.015	ug/L							

1,2-Dibromoethane [2C]	ND	0.015	ug/L							

Surrogate: Pentachloroethane	0.162		ug/L	0.2000		81	30-150			

Surrogate: Pentachloroethane [2C]	0.151		ug/L	0.2000		76	30-150			

LCS

1,2-Dibromoethane	0.200	0.015	ug/L	0.2000		100	60-140			

1,2-Dibromoethane [2C]	0.190	0.015	ug/L	0.2000		95	70-130			

Surrogate: Pentachloroethane	0.167		ug/L	0.2000		83	30-150			

Surrogate: Pentachloroethane [2C]	0.162		ug/L	0.2000		81	30-150			

LCS

1,2-Dibromoethane	0.084	0.015	ug/L	0.08000		105	60-140			

1,2-Dibromoethane [2C]	0.057	0.015	ug/L	0.08000		72	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

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.

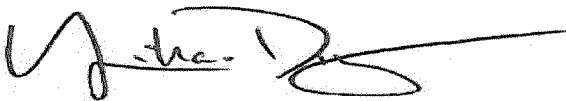
All samples were analyzed within the established guidelines of US EPA approved methods with all requirements met, unless otherwise noted at the end of a given sample's analytical results or in a case narrative.

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		☒ Yes ☐ No		Internal Use Only				Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-Na2S2O3			
Seals Intact		☐ Yes ☐ No		NA: <u>3.5C</u>		Sampled by:		Comments:		*Provide ESS Deliverables	
Cooler Temperature: <u>3.5C</u>											
Relinquished by: (Signature, Date & Time)		Received by: (Signature, Date & Time)		Relinquished by: (Signature, Date & Time)		Received by: (Signature, Date & Time)		Relinquished by: (Signature, Date & Time)		Received by: (Signature, Date & Time)	

* 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 / ☒ NA
 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: MA-MCP ☐ CT-RCP ☒ RCP

Is this project for any of the following?:

☐ MA-MCP ☐ CT-RCP ☒ RCP ☐ Remediation

Project # N:0998-11-13 Project Name Woburn to mystic

Contact Person Dean Bobis Address One Univ. Ave

City Westwood State MA Zip Code 02090 PO #

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

FAX Number 508-550-1500 Sample ID

ESS Lab ID

Collection Date

Collection Time

Sample Type

Sample Matrix

Sample ID

Analysis

ESS Lab #

Reporting Limits

Electronic Deliverables

Limit Checker

Other (Please Specify)

Excel

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

PCB, T. Phenols

EDB Cr+6

Laboratory Use Only

Cooler Present: yes

Seals Intact: yes

Cooler Temperature: 5.8 °C

Sampled by: pu

Comments:

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

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

Relinquished by: (Signature, Date & Time)

Received By: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time)

Received By: (Signature, Date & Time)

Relinquished By: (Signature, Date & Time)

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Relinquished By: (Signature, Date & Time)

Received By: (Signature, Date & Time)

Relinquished By: (Signature, Date & Time)

Received By: (Signature, Date & Time)

CHAIN OF CUSTODY

Turn Time: 5 day Rush: _____
 Laboratory State: _____

Is this project for any of the following?:

	CT-RCP	RGP	Remediation
1			
2			
3			
4			
5			

ESS Lab ID		Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis		Project #	Project Name	Address	Zip Code	PO #
1	1/11/17	81020	G	GW	MW-37		TSS	TRC					
2	1050				MW-37 FF		X						
3	1120				MW-36		X						
4	1150				MW-36 FF		X						
5	830				MW-505 B		X						
6	800				MW-505 B FF		X						
					MW-805 B								
Container Type: AG-Amber Glass B-BOD Bottle G-Glass P-Poly S-Sterile V-Vial O-Other Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2 NaOH 9-NH4Cl 10-DI H2O 11-Other													
Number of Containers: 33													

Laboratory Use Only		Sampled by: <i>pu</i>		Please specify "Other" preservative and containers types in this space	
		Comments:			
Cooler Present: <i>yes</i>					
Seals Intact:					
Cooler Temperature: <i>5.8</i> °C					
Relinquished by: <i>[Signature]</i>	Received by: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)		
<i>[Signature]</i>	<i>11/11/17 1242</i>	<i>[Signature]</i>	<i>11/11/17 1500</i>	<i>[Signature]</i>	<i>11/11/17 1700</i>
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)		
				<i>[Signature]</i>	<i>11/11/17 1722</i>
				<i>[Signature]</i>	<i>11/11/17 1722</i>

CERTIFICATE OF ANALYSIS

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

RE: Station 250/Mystic Charlestown Eversource RGP (N/A)
ESS Laboratory Work Order Number: 1707259

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 3:36 pm, Jul 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: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

SAMPLE RECEIPT

The following samples were received on July 13, 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.

Lab Number	Sample Name	Matrix	Analysis
1707259-01	B-3	Ground Water	1664A, 200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608, 625 SIM, 8270D SIM, ASTM D3695
1707259-02	B-17	Ground Water	1664A, 200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608, 625 SIM, 8270D SIM, ASTM D3695

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

PROJECT NARRATIVE

524.2 Volatile Organic Compounds

1707259-01 Due to high sediment content vials were composited
 1707259-02 Due to high sediment content vials were composited
 C7G0199-CCV1 Continuing Calibration %Diff/Drift is above control limit (CD+).
 1,1-Dichloroethene (86% @ 30%), Tertiary-butyl Alcohol (63% @ 30%)
 CG71431-BSD1 Blank Spike recovery is above upper control limit (B+).
 1,1-Dichloroethene (201% @ 70-130%), Tertiary-butyl Alcohol (163% @ 70-130%)
 CG71431-BSD1 Relative percent difference for duplicate is outside of criteria (D+).
 1,1-Dichloroethene (59% @ 20%), Tertiary-butyl Alcohol (33% @ 25%)

625(SIM) Semi-Volatile Organic Compounds

1707259-01 Present in Method Blank (B).
 bis(2-Ethylhexyl)phthalate
 1707259-01 Surrogate recovery(ies) below lower control limit (S-).
 1,2-Dichlorobenzene-d4 (29% @ 30-130%)
 1707259-02 Present in Method Blank (B).
 bis(2-Ethylhexyl)phthalate
 C7G0249-CCV1 Continuing Calibration %Diff/Drift is above control limit (CD+).
 Di-n-octylphthalate (24% @ 20%)
 CG71808-BS2 Blank Spike recovery is above upper control limit (B+).
 Benzo(k)fluoranthene (142% @ 40-140%), bis(2-Ethylhexyl)phthalate (268% @ 40-140%),
 Di-n-octylphthalate (151% @ 40-140%), Pyrene (144% @ 40-140%)
 CG71808-BSD2 Blank Spike recovery is above upper control limit (B+).
 Benzo(a)pyrene (150% @ 40-140%), Benzo(b)fluoranthene (148% @ 40-140%), Benzo(k)fluoranthene
 (154% @ 40-140%), bis(2-Ethylhexyl)phthalate (244% @ 40-140%), Butylbenzylphthalate (142% @
 40-140%), Di-n-butylphthalate (153% @ 40-140%), Di-n-octylphthalate (159% @ 40-140%), Pyrene
 (146% @ 40-140%)

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

C7G0195-TUN1 DDT breakdown > 20%

Classical Chemistry

1707259-01 The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
 1707259-02 The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.

No other observations noted.

End of Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

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](#)

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: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
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 (10.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Arsenic	3.5 (1.0)		3113B		1	KJK	07/19/17 5:32	100	20	CG71436
Cadmium	0.99 (0.25)		3113B		5	KJK	07/18/17 18:35	100	20	CG71436
Chromium	11.6 (4.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Chromium III	11.6 (10.0)		200.7		1	JLK	07/15/17 15:59	1	1	[CALC]
Copper	62.8 (4.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Hardness	239000 (165)		200.7		1	KJK	07/15/17 15:59	1	1	[CALC]
Iron	7430 (20.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Lead	7.6 (1.0)		3113B		1	KJK	07/18/17 23:07	100	20	CG71436
Mercury	ND (0.200)		245.1		1	MJV	07/17/17 20:03	20	40	CG71438
Nickel	23.2 (10.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Selenium	ND (2.0)		3113B		1	KJK	07/19/17 8:20	100	20	CG71436
Silver	ND (1.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436
Zinc	771 (10.0)		200.7		1	KJK	07/15/17 15:59	100	20	CG71436



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: GEM

524.2 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 (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,1,2-Trichloroethane	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,1-Dichloroethane	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,1-Dichloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,2-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,2-Dichloroethane	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,3-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
1,4-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Acetone	18.1 (5.0)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Benzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Carbon Tetrachloride	ND (0.3)		524.2		1	07/14/17 12:53	C7G0199	CG71431
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Ethylbenzene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Methylene Chloride	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Naphthalene	0.6 (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Tetrachloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Toluene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Trichloroethene	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Vinyl Chloride	ND (0.2)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Xylene O	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431
Xylene P,M	ND (0.5)		524.2		1	07/14/17 12:53	C7G0199	CG71431

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	<i>111 %</i>		<i>80-120</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>104 %</i>		<i>80-120</i>



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 7/14/17 11:05

608 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)		608		1	07/14/17 19:07		CG71414
Aroclor 1221	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1232	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1242	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1248	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1254	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1260	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1262	ND (0.09)		608		1	07/14/17 19:07		CG71414
Aroclor 1268	ND (0.09)		608		1	07/14/17 19:07		CG71414

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: Decachlorobiphenyl	43 %		30-150
Surrogate: Decachlorobiphenyl [2C]	47 %		30-150
Surrogate: Tetrachloro-m-xylene	66 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	73 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/18/17 13:45

625(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	0.35 (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Acenaphthylene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Anthracene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(a)anthracene	0.25 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(a)pyrene	0.26 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(b)fluoranthene	0.33 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(g,h,i)perylene	0.19 (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Benzo(k)fluoranthene	0.12 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
bis(2-Ethylhexyl)phthalate	B 9.48 (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Butylbenzylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Chrysene	0.24 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Dibenzo(a,h)Anthracene	ND (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Diethylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Dimethylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Di-n-butylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Di-n-octylphthalate	ND (2.34)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Fluoranthene	0.41 (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Fluorene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Indeno(1,2,3-cd)Pyrene	0.18 (0.05)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Naphthalene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Pentachlorophenol	ND (0.84)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Phenanthrene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808
Pyrene	ND (0.19)		625 SIM		1	07/18/17 19:41	C7G0249	CG71808

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	29 %	S-	30-130
Surrogate: 2,4,6-Tribromophenol	76 %		15-110
Surrogate: 2-Fluorobiphenyl	45 %		30-130
Surrogate: Nitrobenzene-d5	47 %		30-130
Surrogate: p-Terphenyl-d14	59 %		30-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 7/14/17 16:30

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

<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>
1,4-Dioxane	0.263 (0.250)		8270D SIM		1	07/17/17 16:45	C7G0223	CG71356

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,4-Dioxane-d8	36 %		15-115



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
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	1.96 (0.10)		350.1		1	EEM	07/18/17 14:46	mg/L	CG71705
Chloride	1040 (250)		300.0		500	JLK	07/17/17 23:04	mg/L	CG71735
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	07/13/17 22:16	ug/L	CG71352
Phenols	ND (100)		420.1		1	EEM	07/19/17 14:45	ug/L	CG71920
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	07/18/17 11:05	ug/L	CG71817
Total Petroleum Hydrocarbon	ND (5)		1664A		1	CRR	07/19/17 15:05	mg/L	CG71740
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	07/13/17 21:46	ug/L	CG71353
Total Suspended Solids	27600 (100)		2540D		1	EEM	07/14/17 14:30	mg/L	CG71317



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/14/17 11:30

504.1 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>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2-Dibromoethane	ND (0.015)		504.1		1	07/14/17 15:08		CG71426
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: Pentachloroethane</i>		125 %		30-150				
<i>Surrogate: Pentachloroethane [2C]</i>		116 %		30-150				



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-3
Date Sampled: 07/13/17 11:40
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 7/19/17 10:04

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)		ASTM D3695		1	ZLC	07/19/17 11:58		CG71915



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
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 (10.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Arsenic	1.9 (1.0)		3113B		1	KJK	07/19/17 5:43	100	20	CG71436
Cadmium	0.42 (0.15)		3113B		3	KJK	07/18/17 17:26	100	20	CG71436
Chromium	16.7 (4.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Chromium III	16.7 (10.0)		200.7		1	JLK	07/15/17 16:04	1	1	[CALC]
Copper	27.0 (4.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Hardness	259000 (165)		200.7		1	KJK	07/15/17 16:04	1	1	[CALC]
Iron	9260 (20.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Lead	4.6 (1.0)		3113B		1	KJK	07/19/17 0:44	100	20	CG71436
Mercury	ND (0.200)		245.1		1	MJV	07/17/17 20:05	20	40	CG71438
Nickel	11.1 (10.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Selenium	ND (2.0)		3113B		1	KJK	07/19/17 9:00	100	20	CG71436
Silver	ND (1.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436
Zinc	174 (10.0)		200.7		1	KJK	07/15/17 16:04	100	20	CG71436



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: GEM

524.2 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 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,1,2-Trichloroethane	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,1-Dichloroethane	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,1-Dichloroethene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,2-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,2-Dichloroethane	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,3-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
1,4-Dichlorobenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Acetone	24.6 (5.0)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Benzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Carbon Tetrachloride	ND (0.3)		524.2		1	07/14/17 13:27	C7G0199	CG71431
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Ethylbenzene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Methylene Chloride	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Naphthalene	1.1 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Tetrachloroethene	1.4 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Toluene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Trichloroethene	ND (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Vinyl Chloride	ND (0.2)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Xylene O	0.7 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431
Xylene P,M	1.3 (0.5)		524.2		1	07/14/17 13:27	C7G0199	CG71431

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	106 %		80-120
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %		80-120



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 7/14/17 11:05

608 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)		608		1	07/14/17 19:25		CG71414
Aroclor 1221	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1232	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1242	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1248	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1254	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1260	0.10 (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1262	ND (0.09)		608		1	07/14/17 19:25		CG71414
Aroclor 1268	ND (0.09)		608		1	07/14/17 19:25		CG71414

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: Decachlorobiphenyl	51 %		30-150
Surrogate: Decachlorobiphenyl [2C]	54 %		30-150
Surrogate: Tetrachloro-m-xylene	85 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	95 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/18/17 13:45

625(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	0.26 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Acenaphthylene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Anthracene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(a)anthracene	0.10 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(a)pyrene	0.09 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(b)fluoranthene	0.11 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(g,h,i)perylene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Benzo(k)fluoranthene	ND (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
bis(2-Ethylhexyl)phthalate	B 8.31 (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Butylbenzylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Chrysene	0.12 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Dibenzo(a,h)Anthracene	ND (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Diethylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Dimethylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Di-n-butylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Di-n-octylphthalate	ND (2.34)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Fluoranthene	0.31 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Fluorene	ND (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Indeno(1,2,3-cd)Pyrene	0.06 (0.05)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Naphthalene	0.37 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Pentachlorophenol	ND (0.84)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Phenanthrene	0.48 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808
Pyrene	0.39 (0.19)		625 SIM		1	07/18/17 20:28	C7G0249	CG71808

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	30 %		30-130
Surrogate: 2,4,6-Tribromophenol	61 %		15-110
Surrogate: 2-Fluorobiphenyl	46 %		30-130
Surrogate: Nitrobenzene-d5	51 %		30-130
Surrogate: p-Terphenyl-d14	58 %		30-130



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 7/14/17 16:30

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

<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>
1,4-Dioxane	0.950 (0.250)		8270D SIM		1	07/17/17 17:17	C7G0223	CG71356

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,4-Dioxane-d8	36 %		15-115



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
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	0.77 (0.10)		350.1		1	EEM	07/18/17 14:47	mg/L	CG71705
Chloride	399 (50.0)		300.0		100	JLK	07/17/17 20:38	mg/L	CG71735
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	07/13/17 22:16	ug/L	CG71352
Phenols	ND (100)		420.1		1	EEM	07/19/17 14:45	ug/L	CG71920
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	07/18/17 11:05	ug/L	CG71817
Total Petroleum Hydrocarbon	ND (5)		1664A		1	CRR	07/19/17 15:05	mg/L	CG71740
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	07/13/17 21:46	ug/L	CG71353
Total Suspended Solids	474 (10)		2540D		1	EEM	07/14/17 14:30	mg/L	CG71317



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/14/17 11:30

504.1 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>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2-Dibromoethane	ND (0.015)		504.1		1	07/14/17 16:08		CG71426
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: Pentachloroethane</i>		75 %		30-150				
<i>Surrogate: Pentachloroethane [2C]</i>		72 %		30-150				



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Station 250/Mystic Charlestown Eversource RGP
Client Sample ID: B-17
Date Sampled: 07/13/17 13:50
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1707259
ESS Laboratory Sample ID: 1707259-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 7/19/17 10:04

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)		ASTM D3695		1	ZLC	07/19/17 12:44		CG71915



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

Total Metals

Batch CG71352 - [CALC]

Blank

Chromium III	ND	10.0	ug/L

LCS

Chromium III	ND		ug/L

LCS Dup

Chromium III	ND		ug/L

Batch CG71436 - 3005A

Blank

Antimony	ND	10.0	ug/L
Arsenic	ND	1.0	ug/L
Cadmium	ND	0.05	ug/L
Chromium	ND	4.0	ug/L
Chromium III	ND	4.00	ug/L
Copper	ND	4.0	ug/L
Hardness	ND	165	ug/L
Iron	ND	20.0	ug/L
Lead	ND	1.0	ug/L
Nickel	ND	10.0	ug/L
Selenium	ND	2.0	ug/L
Silver	ND	1.0	ug/L
Zinc	ND	10.0	ug/L

LCS

Antimony	99.1	10.0	ug/L	100.0	99	85-115
Arsenic	98.8	25.0	ug/L	100.0	99	85-115
Cadmium	49.8	25.0	ug/L	50.00	100	85-115
Chromium	100	4.0	ug/L	100.0	100	85-115
Chromium III	100	4.00	ug/L			
Copper	106	4.0	ug/L	100.0	106	85-115
Hardness	6520	165	ug/L			
Iron	475	20.0	ug/L	500.0	95	85-115
Lead	111	25.0	ug/L	100.0	111	85-115
Nickel	102	10.0	ug/L	100.0	102	85-115
Selenium	217	50.0	ug/L	200.0	109	85-115
Silver	46.6	1.0	ug/L	50.00	93	85-115
Zinc	103	10.0	ug/L	100.0	103	85-115

LCS Dup

Antimony	107	10.0	ug/L	100.0	107	85-115	7	20
Arsenic	96.2	25.0	ug/L	100.0	96	85-115	3	20
Cadmium	55.3	25.0	ug/L	50.00	111	85-115	10	20
Chromium	108	4.0	ug/L	100.0	108	85-115	7	20
Chromium III	108	4.00	ug/L					
Copper	114	4.0	ug/L	100.0	114	85-115	7	20
Hardness	6960	165	ug/L					
Iron	513	20.0	ug/L	500.0	103	85-115	8	20



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

Total Metals

Batch CG71436 - 3005A

Lead	107	25.0	ug/L	100.0		107	85-115	4	20	
Nickel	109	10.0	ug/L	100.0		109	85-115	7	20	
Selenium	226	50.0	ug/L	200.0		113	85-115	4	20	
Silver	48.2	1.0	ug/L	50.00		96	85-115	3	20	
Zinc	105	10.0	ug/L	100.0		105	85-115	2	20	

Batch CG71438 - 245.1/7470A

Blank

Mercury	ND	0.200	ug/L							

LCS

Mercury	6.42	0.200	ug/L	6.000		107	85-115			

LCS Dup

Mercury	6.30	0.200	ug/L	6.000		105	85-115	2	20	

524.2 Volatile Organic Compounds

Batch CG71431 - 524.2

Blank

1,1,1-Trichloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	0.5	ug/L							
1,1-Dichloroethane	ND	0.5	ug/L							
1,1-Dichloroethene	ND	0.5	ug/L							
1,2-Dichlorobenzene	ND	0.5	ug/L							
1,2-Dichloroethane	ND	0.5	ug/L							
1,3-Dichlorobenzene	ND	0.5	ug/L							
1,4-Dichlorobenzene	ND	0.5	ug/L							
Acetone	ND	5.0	ug/L							
Benzene	ND	0.5	ug/L							
Carbon Tetrachloride	ND	0.3	ug/L							
cis-1,2-Dichloroethene	ND	0.5	ug/L							
Ethylbenzene	ND	0.5	ug/L							
Methyl tert-Butyl Ether	ND	0.5	ug/L							
Methylene Chloride	ND	0.5	ug/L							
Naphthalene	ND	0.5	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tertiary-butyl Alcohol	ND	25.0	ug/L							
Tetrachloroethene	ND	0.5	ug/L							
Toluene	ND	0.5	ug/L							
Trichloroethene	ND	0.5	ug/L							
Vinyl Chloride	ND	0.2	ug/L							
Xylene O	ND	0.5	ug/L							
Xylene P,M	ND	0.5	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	5.10		ug/L	5.000		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.02		ug/L	5.000		100	80-120			

LCS

1,1,1-Trichloroethane	10.6		ug/L	10.00		106	70-130			



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

524.2 Volatile Organic Compounds

Batch CG71431 - 524.2

1,1,2-Trichloroethane	10.2		ug/L	10.00		102	70-130			
1,1-Dichloroethane	10.0		ug/L	10.00		100	70-130			
1,1-Dichloroethene	11.0		ug/L	10.00		110	70-130			
1,2-Dichlorobenzene	10.3		ug/L	10.00		103	70-130			
1,2-Dichloroethane	10.4		ug/L	10.00		104	70-130			
1,3-Dichlorobenzene	10.3		ug/L	10.00		103	70-130			
1,4-Dichlorobenzene	10.5		ug/L	10.00		105	70-130			
Acetone	48.1		ug/L	50.00		96	70-130			
Benzene	10.3		ug/L	10.00		103	70-130			
Carbon Tetrachloride	10.9		ug/L	10.00		109	70-130			
cis-1,2-Dichloroethene	10.5		ug/L	10.00		105	70-130			
Ethylbenzene	10.3		ug/L	10.00		103	70-130			
Methyl tert-Butyl Ether	10.3		ug/L	10.00		103	70-130			
Methylene Chloride	9.1		ug/L	10.00		91	70-130			
Naphthalene	10.5		ug/L	10.00		105	70-130			
Tertiary-amyl methyl ether	9.9		ug/L	10.00		99	70-130			
Tertiary-butyl Alcohol	58.8		ug/L	50.00		118	70-130			
Tetrachloroethene	10.6		ug/L	10.00		106	70-130			
Toluene	10.5		ug/L	10.00		105	70-130			
Trichloroethene	10.6		ug/L	10.00		106	70-130			
Vinyl Chloride	10.3		ug/L	10.00		103	70-130			
Xylene O	10.1		ug/L	10.00		101	70-130			
Xylene P,M	20.4		ug/L	20.00		102	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	5.05		ug/L	5.000		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.84		ug/L	5.000		97	80-120			

LCS Dup

1,1,1-Trichloroethane	9.5		ug/L	10.00		95	70-130	12	20	
1,1,2-Trichloroethane	10.1		ug/L	10.00		101	70-130	1	20	
1,1-Dichloroethane	10.2		ug/L	10.00		102	70-130	2	20	
1,1-Dichloroethene	20.1		ug/L	10.00		201	70-130	59	20	B+, D+
1,2-Dichlorobenzene	9.1		ug/L	10.00		91	70-130	12	20	
1,2-Dichloroethane	9.8		ug/L	10.00		98	70-130	6	20	
1,3-Dichlorobenzene	9.3		ug/L	10.00		93	70-130	10	20	
1,4-Dichlorobenzene	9.5		ug/L	10.00		95	70-130	10	20	
Acetone	49.0		ug/L	50.00		98	70-130	2	20	
Benzene	10.4		ug/L	10.00		104	70-130	1	20	
Carbon Tetrachloride	9.3		ug/L	10.00		93	70-130	16	20	
cis-1,2-Dichloroethene	9.8		ug/L	10.00		98	70-130	7	20	
Ethylbenzene	9.9		ug/L	10.00		99	70-130	4	20	
Methyl tert-Butyl Ether	9.8		ug/L	10.00		98	70-130	5	20	
Methylene Chloride	10.5		ug/L	10.00		105	70-130	14	20	
Naphthalene	8.6		ug/L	10.00		86	70-130	20	20	
Tertiary-amyl methyl ether	9.1		ug/L	10.00		91	70-130	8	20	
Tertiary-butyl Alcohol	81.7		ug/L	50.00		163	70-130	33	25	B+, D+
Tetrachloroethene	9.6		ug/L	10.00		96	70-130	10	20	



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1707259

Quality Control Data

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

524.2 Volatile Organic Compounds

Batch CG71431 - 524.2

Toluene	9.7		ug/L	10.00		97	70-130	8	20	
Trichloroethene	10.3		ug/L	10.00		103	70-130	3	20	
Vinyl Chloride	9.8		ug/L	10.00		98	70-130	5	20	
Xylene O	9.4		ug/L	10.00		94	70-130	7	20	
Xylene P,M	18.6		ug/L	20.00		93	70-130	9	20	
Surrogate: 1,2-Dichlorobenzene-d4	4.47		ug/L	5.000		89	80-120			
Surrogate: 4-Bromofluorobenzene	4.99		ug/L	5.000		100	80-120			

608 Polychlorinated Biphenyls (PCB)

Batch CG71414 - 3510C

Blank										
Aroclor 1016	ND	0.10	ug/L							
Aroclor 1016 [2C]	ND	0.10	ug/L							
Aroclor 1221	ND	0.10	ug/L							
Aroclor 1221 [2C]	ND	0.10	ug/L							
Aroclor 1232	ND	0.10	ug/L							
Aroclor 1232 [2C]	ND	0.10	ug/L							
Aroclor 1242	ND	0.10	ug/L							
Aroclor 1242 [2C]	ND	0.10	ug/L							
Aroclor 1248	ND	0.10	ug/L							
Aroclor 1248 [2C]	ND	0.10	ug/L							
Aroclor 1254	ND	0.10	ug/L							
Aroclor 1254 [2C]	ND	0.10	ug/L							
Aroclor 1260	ND	0.10	ug/L							
Aroclor 1260 [2C]	ND	0.10	ug/L							
Aroclor 1262	ND	0.10	ug/L							
Aroclor 1262 [2C]	ND	0.10	ug/L							
Aroclor 1268	ND	0.10	ug/L							
Aroclor 1268 [2C]	ND	0.10	ug/L							
Surrogate: Decachlorobiphenyl	0.0351		ug/L	0.05000		70	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0366		ug/L	0.05000		73	30-150			
Surrogate: Tetrachloro-m-xylene	0.0268		ug/L	0.05000		54	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0310		ug/L	0.05000		62	30-150			

LCS										
Aroclor 1016	0.86	0.10	ug/L	1.000		86	40-140			
Aroclor 1016 [2C]	0.90	0.10	ug/L	1.000		90	40-140			
Aroclor 1260	0.87	0.10	ug/L	1.000		87	40-140			
Aroclor 1260 [2C]	0.83	0.10	ug/L	1.000		83	40-140			
Surrogate: Decachlorobiphenyl	0.0415		ug/L	0.05000		83	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0419		ug/L	0.05000		84	30-150			
Surrogate: Tetrachloro-m-xylene	0.0355		ug/L	0.05000		71	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0359		ug/L	0.05000		72	30-150			

LCS Dup										



CERTIFICATE OF ANALYSIS

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Quality Control Data

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

608 Polychlorinated Biphenyls (PCB)

Batch CG71414 - 3510C

Aroclor 1016	1.02	0.10	ug/L	1.000		102	40-140	16	20	
Aroclor 1016 [2C]	1.05	0.10	ug/L	1.000		105	40-140	16	20	
Aroclor 1260	0.91	0.10	ug/L	1.000		91	40-140	4	20	
Aroclor 1260 [2C]	0.88	0.10	ug/L	1.000		88	40-140	6	20	

Surrogate: Decachlorobiphenyl	0.0449		ug/L	0.05000		90	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0465		ug/L	0.05000		93	30-150			
Surrogate: Tetrachloro-m-xylene	0.0355		ug/L	0.05000		71	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0365		ug/L	0.05000		73	30-150			

625(SIM) Semi-Volatile Organic Compounds

Batch CG71808 - 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	3.08	2.50	ug/L							
Butylbenzylphthalate	ND	2.50	ug/L							
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	ND	2.50	ug/L							
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							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	1.01		ug/L	2.500		40	30-130			
Surrogate: 2,4,6-Tribromophenol	3.41		ug/L	3.750		91	15-110			
Surrogate: 2-Fluorobiphenyl	1.47		ug/L	2.500		59	30-130			
Surrogate: Nitrobenzene-d5	1.72		ug/L	2.500		69	30-130			
Surrogate: p-Terphenyl-d14	1.76		ug/L	2.500		70	30-130			

LCS

Acenaphthene	2.73	0.20	ug/L	2.500		109	40-140			
Acenaphthylene	2.69	0.20	ug/L	2.500		108	40-140			
Anthracene	2.90	0.20	ug/L	2.500		116	40-140			



CERTIFICATE OF ANALYSIS

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Quality Control Data

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

625(SIM) Semi-Volatile Organic Compounds

Batch CG71808 - 3510C

Benzo(a)anthracene	3.02	0.05	ug/L	2.500		121	40-140			
Benzo(a)pyrene	3.50	0.05	ug/L	2.500		140	40-140			
Benzo(b)fluoranthene	3.45	0.05	ug/L	2.500		138	40-140			
Benzo(g,h,i)perylene	2.98	0.20	ug/L	2.500		119	40-140			
Benzo(k)fluoranthene	3.54	0.05	ug/L	2.500		142	40-140			B+
bis(2-Ethylhexyl)phthalate	6.70	2.50	ug/L	2.500		268	40-140			B+
Butylbenzylphthalate	3.45	2.50	ug/L	2.500		138	40-140			
Chrysene	3.14	0.05	ug/L	2.500		126	40-140			
Dibenzo(a,h)Anthracene	2.97	0.05	ug/L	2.500		119	40-140			
Diethylphthalate	2.94	2.50	ug/L	2.500		118	40-140			
Dimethylphthalate	3.28	2.50	ug/L	2.500		131	40-140			
Di-n-butylphthalate	3.40	2.50	ug/L	2.500		136	40-140			
Di-n-octylphthalate	3.77	2.50	ug/L	2.500		151	40-140			B+
Fluoranthene	3.11	0.20	ug/L	2.500		125	40-140			
Fluorene	3.05	0.20	ug/L	2.500		122	40-140			
Indeno(1,2,3-cd)Pyrene	3.09	0.05	ug/L	2.500		124	40-140			
Naphthalene	2.24	0.20	ug/L	2.500		89	40-140			
Pentachlorophenol	2.85	0.90	ug/L	2.500		114	30-130			
Phenanthrene	2.81	0.20	ug/L	2.500		112	40-140			
Pyrene	3.60	0.20	ug/L	2.500		144	40-140			B+
Surrogate: 1,2-Dichlorobenzene-d4	0.902		ug/L	2.500		36	30-130			
Surrogate: 2,4,6-Tribromophenol	3.26		ug/L	3.750		87	15-110			
Surrogate: 2-Fluorobiphenyl	1.39		ug/L	2.500		56	30-130			
Surrogate: Nitrobenzene-d5	1.45		ug/L	2.500		58	30-130			
Surrogate: p-Terphenyl-d14	1.61		ug/L	2.500		64	30-130			

LCS Dup

Acenaphthene	2.81	0.20	ug/L	2.500		113	40-140	3	20	
Acenaphthylene	2.81	0.20	ug/L	2.500		112	40-140	4	20	
Anthracene	3.15	0.20	ug/L	2.500		126	40-140	8	20	
Benzo(a)anthracene	3.12	0.05	ug/L	2.500		125	40-140	3	20	
Benzo(a)pyrene	3.74	0.05	ug/L	2.500		150	40-140	7	20	B+
Benzo(b)fluoranthene	3.69	0.05	ug/L	2.500		148	40-140	7	20	B+
Benzo(g,h,i)perylene	3.07	0.20	ug/L	2.500		123	40-140	3	20	
Benzo(k)fluoranthene	3.86	0.05	ug/L	2.500		154	40-140	8	20	B+
bis(2-Ethylhexyl)phthalate	6.09	2.50	ug/L	2.500		244	40-140	10	20	B+
Butylbenzylphthalate	3.54	2.50	ug/L	2.500		142	40-140	3	20	B+
Chrysene	3.29	0.05	ug/L	2.500		131	40-140	5	20	
Dibenzo(a,h)Anthracene	3.02	0.05	ug/L	2.500		121	40-140	2	20	
Diethylphthalate	3.04	2.50	ug/L	2.500		122	40-140	3	20	
Dimethylphthalate	3.39	2.50	ug/L	2.500		136	40-140	3	20	
Di-n-butylphthalate	3.81	2.50	ug/L	2.500		153	40-140	11	20	B+
Di-n-octylphthalate	3.97	2.50	ug/L	2.500		159	40-140	5	20	B+
Fluoranthene	3.39	0.20	ug/L	2.500		135	40-140	8	20	
Fluorene	3.08	0.20	ug/L	2.500		123	40-140	0.9	20	
Indeno(1,2,3-cd)Pyrene	3.09	0.05	ug/L	2.500		123	40-140	0.1	20	



CERTIFICATE OF ANALYSIS

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Quality Control Data

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

625(SIM) Semi-Volatile Organic Compounds

Batch CG71808 - 3510C

Naphthalene	2.34	0.20	ug/L	2.500		94	40-140	5	20	
Pentachlorophenol	3.11	0.90	ug/L	2.500		124	30-130	9	20	
Phenanthrene	2.99	0.20	ug/L	2.500		120	40-140	6	20	
Pyrene	3.64	0.20	ug/L	2.500		146	40-140	1	20	B+
Surrogate: 1,2-Dichlorobenzene-d4	1.10		ug/L	2.500		44	30-130			
Surrogate: 2,4,6-Tribromophenol	3.60		ug/L	3.750		96	15-110			
Surrogate: 2-Fluorobiphenyl	1.57		ug/L	2.500		63	30-130			
Surrogate: Nitrobenzene-d5	1.58		ug/L	2.500		63	30-130			
Surrogate: p-Terphenyl-d14	1.55		ug/L	2.500		62	30-130			

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Batch CG71356 - 3535A

Blank

1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	ND		ug/L	5.000		38	15-115			

LCS

1,4-Dioxane	12.0	0.250	ug/L	10.00		120	40-140			
Surrogate: 1,4-Dioxane-d8	1.85		ug/L	5.000		37	15-115			

LCS Dup

1,4-Dioxane	10.9	0.250	ug/L	10.00		109	40-140	10	20	
Surrogate: 1,4-Dioxane-d8	1.70		ug/L	5.000		34	15-115			

Classical Chemistry

Batch CG71317 - General Preparation

Blank

Total Suspended Solids	ND	5	mg/L							

LCS

Total Suspended Solids	44		mg/L	43.50		101	80-120			

Batch CG71352 - General Preparation

Blank

Hexavalent Chromium	ND	10.0	ug/L							

LCS

Hexavalent Chromium	0.494		mg/L	0.4998		99	90-110			

LCS Dup

Hexavalent Chromium	0.493		mg/L	0.4998		99	90-110	0.2	20	

Batch CG71353 - General Preparation

Blank

Total Residual Chlorine	ND	20.0	ug/L							

LCS

Total Residual Chlorine	1.80		mg/L	1.800		100	85-115			

Batch CG71705 - NH4 Prep



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

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ESS Laboratory Work Order: 1707259

Quality Control Data

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

Classical Chemistry

Batch CG71705 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L							

LCS

Ammonia as N	0.11	0.10	mg/L	0.09994		112	80-120			

LCS

Ammonia as N	0.92	0.10	mg/L	0.9994		92	80-120			

Batch CG71735 - NH4 Prep

Blank

Chloride	ND	0.5	mg/L							

LCS

Chloride	2.6		mg/L	2.500		103	90-110			

Batch CG71740 - General Preparation

Blank

Total Petroleum Hydrocarbon	ND	5	mg/L							

LCS

Total Petroleum Hydrocarbon	13	5	mg/L	19.38		69	66-114			

Batch CG71817 - TCN Prep

Blank

Total Cyanide (LL)	ND	5.00	ug/L							

LCS

Total Cyanide (LL)	20.0	5.00	ug/L	20.06		100	90-110			

LCS

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

LCS Dup

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

Batch CG71920 - General Preparation

Blank

Phenols	ND	100	ug/L							

LCS

Phenols	102	100	ug/L	100.0		102	80-120			

LCS

Phenols	958	100	ug/L	1000		96	80-120			

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Batch CG71426 - 504/8011

Blank

1,2-Dibromoethane	ND	0.015	ug/L							

1,2-Dibromoethane [2C]	ND	0.015	ug/L							

Surrogate: Pentachloroethane	0.298		ug/L	0.2000		149	30-150			

Surrogate: Pentachloroethane [2C]	0.248		ug/L	0.2000		124	30-150			



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Quality Control Data

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

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Batch CG71426 - 504/8011

LCS

1,2-Dibromoethane	0.070	0.015	ug/L	0.08000		88	70-130			
1,2-Dibromoethane [2C]	0.064	0.015	ug/L	0.08000		80	70-130			

Surrogate: Pentachloroethane	0.0877		ug/L	0.2000		44	30-150			
Surrogate: Pentachloroethane [2C]	0.0783		ug/L	0.2000		39	30-150			

LCS

1,2-Dibromoethane	0.219	0.015	ug/L	0.2000		110	70-130			
1,2-Dibromoethane [2C]	0.212	0.015	ug/L	0.2000		106	70-130			

Surrogate: Pentachloroethane	0.290		ug/L	0.2000		145	30-150			
Surrogate: Pentachloroethane [2C]	0.242		ug/L	0.2000		121	30-150			

Alcohol Scan by GC/FID

Batch CG71915 - No Prep

Blank

Ethanol	ND	10	mg/L							

LCS

Ethanol	1270	10	mg/L	1000		127	60-140			

LCS Dup

Ethanol	1060	10	mg/L	1000		106	60-140	18	30	



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

Notes and Definitions

X5	Due to high sediment content vials were composited
U	Analyte included in the analysis, but not detected
S-	Surrogate recovery(ies) below lower control limit (S-).
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
DDT	DDT breakdown > 20%
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
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
RL	Reporting Limit
EDL	Estimated Detection Limit



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond

Client Project ID: Station 250/Mystic Charlestown Eversource RGP

ESS Laboratory Work Order: 1707259

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: 1707259

Shipped/Delivered Via: ESS Courier

Date Received: 7/13/2017

Project Due Date: 7/20/2017

Days for Project: 5 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: 2.8 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:

COC = B15 Label = B17 LHC 7/13/17

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	148177	Yes	NA	Yes	1L Poly - Unpres	NP	
01	148179	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	148181	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	
01	148183	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	148185	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	148187	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	148194	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148195	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148196	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148197	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148198	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148199	Yes	NA	Yes	1L Amber - Unpres	NP	
01	148201	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	148203	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	148207	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148208	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148209	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148211	Yes	NA	Yes	VOA Vial - Unpres	NP	
01	148215	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148216	Yes	No	Yes	VOA Vial - HCl	HCl	
01	148217	Yes	No	Yes	VOA Vial - HCl	HCl	
02	148176	Yes	NA	Yes	1L Poly - Unpres	NP	
02	148178	Yes	NA	Yes	250 mL Poly - Unpres	NP	
02	148180	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	

pH > 12 w 7/13/17 1830

pH > 12 w 7/13/17 1830

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Tighe & Bond - KPB/TB/MM

ESS Project ID: 1707259

Date Received: 7/13/2017

02	148182	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4
02	148184	Yes	NA	Yes	1L Amber - H2SO4	H2SO4
02	148186	Yes	NA	Yes	500 mL Poly - HNO3	HNO3
02	148188	Yes	NA	Yes	1L Amber - Unpres	NP
02	148189	Yes	NA	Yes	1L Amber - Unpres	NP
02	148190	Yes	NA	Yes	1L Amber - Unpres	NP
02	148191	Yes	NA	Yes	1L Amber - Unpres	NP
02	148192	Yes	NA	Yes	1L Amber - Unpres	NP
02	148193	Yes	NA	Yes	1L Amber - Unpres	NP
02	148200	Yes	NA	Yes	500 mL Poly - HNO3	HNO3
02	148202	Yes	NA	Yes	1L Amber - H2SO4	H2SO4
02	148204	Yes	No	Yes	VOA Vial - HCl	HCl
02	148205	Yes	No	Yes	VOA Vial - HCl	HCl
02	148206	Yes	No	Yes	VOA Vial - HCl	HCl
02	148210	Yes	NA	Yes	VOA Vial - Unpres	NP
02	148212	Yes	No	Yes	VOA Vial - HCl	HCl
02	148213	Yes	No	Yes	VOA Vial - HCl	HCl
02	148214	Yes	No	Yes	VOA Vial - HCl	HCl

2nd Review

Are barcode labels on correct containers?

Yes / No

Completed

By:

Date & Time:

7/13/17

1830

Reviewed

By:

Date & Time:

7/13/17

1910

Delivered

By:

7/13/17

1913

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

ESS LAB PROJECT ID
1707259

Turn Time X Standard Rush _____ Approved By: _____

State where samples were collected: MA NH

Reporting Limits -	
RGP	

Is this project for:

Electronic Deliverable Yes ☒ No ☐
Format: Excel ☒ Access ☐ PDF ☐ Other ☐

RGP

Project Manager: Mike Martin
Company: Tighe & Bond
Address: 1 University Ave
Westwood, MA 02559

Project #
Project Name: Station 250 Mystic Charlestown Eversource RGP
PO #

[illegible]

Preservation Code: 1-NP, 2-HCl, 3-H₂SO₄, 4-HNO₃, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-

Container Type: P-Poly G-Glass/ AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes No

Sampled by: APC added project name per MEM and updated ID per APC. mkm 7/14/17

Seals Intact Yes No NA: ☒

Comments: 1) RGP Metals include Sb, As, Cd, Cu, Fe, Pb, Ni, Se, Ag and Zn by 200.7/200.9 and Hg by 245.1

Cooler Temperature: 2-8 °F (2-8 °C)

2) Parameters in **BOLD** have Short hold-time **PERMIT ATTACHED**

* TSS, TRC and Cl taken from the same container

Relinquished by: (Signature)	Date/Time
	7/13/17

Received by: (Signature)	7-13-11	Relinquished by: (Signature)

Relinquished by: (Signature)	Date/Time

Received by: (Signature)	Relinquished by: (Signature)

7-12-17 Date/Time 1745

Received by: (Signature) 

Date/Time	

Received by: (Signature)

Please E-mail all changes to Chain of Custody in writing

CERTIFICATE OF ANALYSIS

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

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

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



Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 2:25 pm, Nov 20, 2017

Analytical Summary

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

SAMPLE RECEIPT

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

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

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

PROJECT NARRATIVE

Total Metals

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

Cadmium , Copper , Nickel

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

Cadmium , Copper , Nickel

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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: Mystic at Boston Inner
Date Sampled: 11/15/17 11:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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 (5.0)		3113B		10	KJK	11/19/17 4:59	100	10	CK71531
Cadmium	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium	ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium III	ND (20.0)		200.7		10	JLK	11/16/17 15:24	1	1	[CALC]
Copper	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Iron	ND (100)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Lead	ND (2.0)		3113B		10	KJK	11/17/17 21:31	100	10	CK71531
Nickel	EL ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Zinc	ND (50.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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	0.43 (0.10)		350.1		1	EEM	11/17/17 14:51	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.75 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.2 °C. (N/A)								
Salinity	14.9 (0.1)		2520B		1	JLK	11/16/17 17:10	ppt	CK71644



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

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

LCS

Chromium III	ND		ug/L



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

Total Metals

Batch CK71546 - [CALC]

LCS Dup

Chromium III	ND		ug/L

Classical Chemistry

Batch CK71546 - General Preparation

Blank

Hexavalent Chromium	ND	10.0	ug/L

LCS

Hexavalent Chromium	0.503		mg/L	0.4998	101	90-110

LCS Dup

Hexavalent Chromium	0.516		mg/L	0.4998	103	90-110	3	20

Batch CK71613 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L

LCS

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

LCS

Ammonia as N	1.02	0.10	mg/L	0.9994	102	80-120

Batch CK71644 - General Preparation

LCS

Salinity	1.0		ppt	1.000	96	85-115



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: ☒	Seals Intact: ☒	Comments: Please specify "Other" preservative and containers types in this space	
Cooler Temperature: 0.4°C		Eversource Pricing	

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

CERTIFICATE OF ANALYSIS

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

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

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



Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 2:25 pm, Nov 20, 2017

Analytical Summary

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

SAMPLE RECEIPT

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

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

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

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482

PROJECT NARRATIVE

Total Metals

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

Cadmium , Copper , Nickel

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

Cadmium , Copper , Nickel

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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: Mystic at Winter
Date Sampled: 11/15/17 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-01
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	11/18/17 6:38	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:08	1	1	[CALC]
Copper	ND (2.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Hardness	184000 (824)		200.7		10	KJK	11/16/17 15:04	1	1	[CALC]
Iron	251 (100)		200.7		10	KJK	11/16/17 15:04	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531
Zinc	10.9 (10.0)		200.7		2	KJK	11/16/17 16:08	100	10	CK71531



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic at Winter
Date Sampled: 11/15/17 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-01
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	0.45 (0.10)		350.1		1	EEM	11/17/17 14:44	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.25 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.4 °C. (N/A)								



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic
Date Sampled: 11/15/17 10:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-02
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	11/18/17 6:44	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:12	1	1	[CALC]
Copper	ND (2.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Hardness	181000 (824)		200.7		10	KJK	11/16/17 15:08	1	1	[CALC]
Iron	121 (100)		200.7		10	KJK	11/16/17 15:08	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531
Zinc	10.2 (10.0)		200.7		2	KJK	11/16/17 16:12	100	10	CK71531



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic
Date Sampled: 11/15/17 10:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-02
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	0.27 (0.10)		350.1		1	EEM	11/17/17 14:47	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.36 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.2 °C. (N/A)								



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic Crossing
Date Sampled: 11/15/17 09:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-03
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	11/18/17 6:55	100	10	CK71531
Cadmium	ND (2.00)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Chromium	ND (4.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Chromium III	ND (10.0)		200.7		2	JLK	11/16/17 16:16	1	1	[CALC]
Copper	ND (2.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Hardness	147000 (824)		200.7		10	KJK	11/16/17 15:12	1	1	[CALC]
Iron	134 (100)		200.7		10	KJK	11/16/17 15:12	100	10	CK71531
Lead	ND (4.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Nickel	ND (4.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531
Zinc	11.1 (10.0)		200.7		2	KJK	11/16/17 16:16	100	10	CK71531



CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Woburn to Mystic - RGP
Client Sample ID: Mystic Crossing
Date Sampled: 11/15/17 09:30
Percent Solids: N/A

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-03
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	0.35 (0.10)		350.1		1	EEM	11/17/17 14:48	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.13 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.1 °C. (N/A)								



CERTIFICATE OF ANALYSIS

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

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

Extraction Method: 3005A/200.7

Total Metals

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



CERTIFICATE OF ANALYSIS

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

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

Classical Chemistry

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



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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 (5.0)		3113B		10	KJK	11/19/17 4:59	100	10	CK71531
Cadmium	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium	ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Chromium III	ND (20.0)		200.7		10	JLK	11/16/17 15:24	1	1	[CALC]
Copper	EL ND (10.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Iron	ND (100)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Lead	ND (2.0)		3113B		10	KJK	11/17/17 21:31	100	10	CK71531
Nickel	EL ND (20.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531
Zinc	ND (50.0)		200.7		10	KJK	11/16/17 15:24	100	10	CK71531



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-06
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	0.43 (0.10)		350.1		1	EEM	11/17/17 14:51	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.75 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.2 °C. (N/A)								
Salinity	14.9 (0.1)		2520B		1	JLK	11/16/17 17:10	ppt	CK71644



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-07
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 (5.0)		3113B		10	KJK	11/19/17 5:04	100	10	CK71531
Cadmium	EL ND (10.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Chromium	ND (20.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Chromium III	ND (20.0)		200.7		10	JLK	11/16/17 16:04	1	1	[CALC]
Copper	EL ND (10.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Hardness	221000 (824)		200.7		10	KJK	11/17/17 11:22	1	1	[CALC]
Iron	274 (100)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Lead	ND (2.0)		3113B		10	KJK	11/17/17 21:48	100	10	CK71531
Nickel	EL ND (20.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531
Zinc	ND (50.0)		200.7		10	KJK	11/16/17 16:04	100	10	CK71531



CERTIFICATE OF ANALYSIS

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

ESS Laboratory Work Order: 1711482
ESS Laboratory Sample ID: 1711482-07
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	0.28 (0.10)		350.1		1	EEM	11/17/17 14:51	mg/L	CK71613
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	11/15/17 20:47	ug/L	CK71546
pH	7.46 (N/A)		9040		1	BCA	11/15/17 21:40	S.U.	CK71549
pH Sample Temp	Aqueous pH measured in water at 17.6 °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

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

LCS

Chromium III	ND		ug/L



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

Total Metals

Batch CK71546 - [CALC]

LCS Dup

Chromium III	ND		ug/L							

Classical Chemistry

Batch CK71546 - General Preparation

Blank

Hexavalent Chromium	ND	10.0	ug/L							

LCS

Hexavalent Chromium	0.503		mg/L	0.4998		101	90-110			

LCS Dup

Hexavalent Chromium	0.516		mg/L	0.4998		103	90-110	3	20	

Batch CK71613 - NH4 Prep

Blank

Ammonia as N	ND	0.10	mg/L							

LCS

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

LCS

Ammonia as N	1.02	0.10	mg/L	0.9994		102	80-120			

Batch CK71644 - General Preparation

LCS

Salinity	1.0		ppt	1.000		96	85-115			



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		

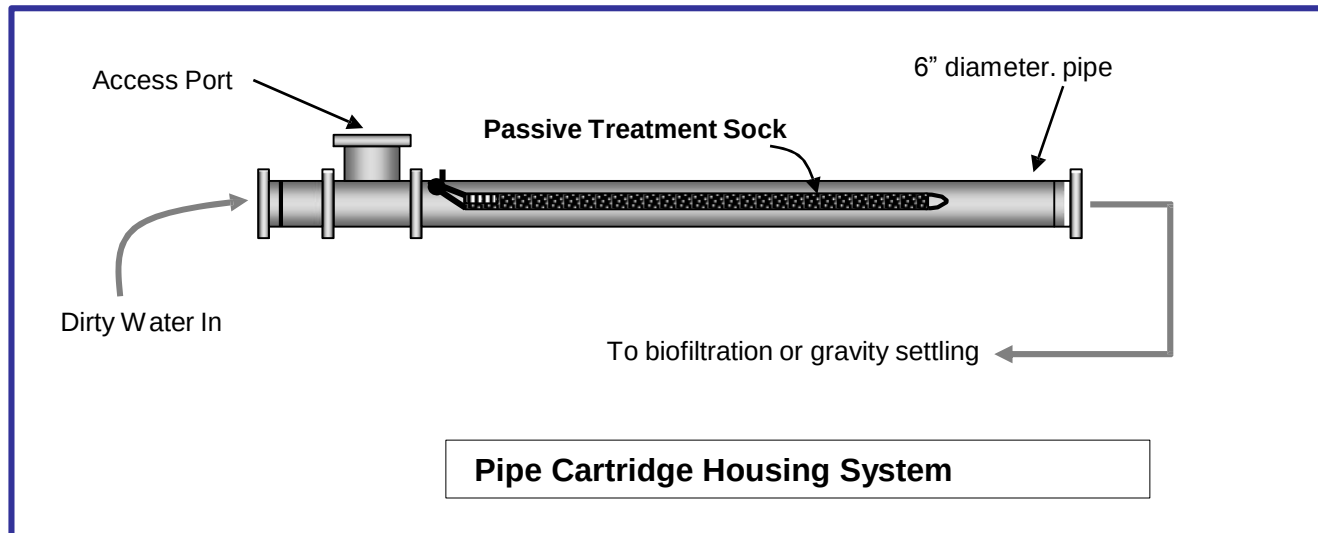
ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	pH	Hardness	Cr+6	NH4	Salinity	Arsenic	Cadmium	Chromium III	Copper	Iron	Lead	Nickel	Silver	Zinc
01	11-15-17	10:00	Grab	Surface Water	Mystic at Winter	X	X	X	X		X	X	X	X	X	X	X		X
02	11-15-17	10:30	Grab	Surface Water	Mystic	X	X	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: ☒	Seals Intact: ☒	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)

How to Use the Passive Treatment Sock



Passive Treatment Sock 1-lb.

Specifications:

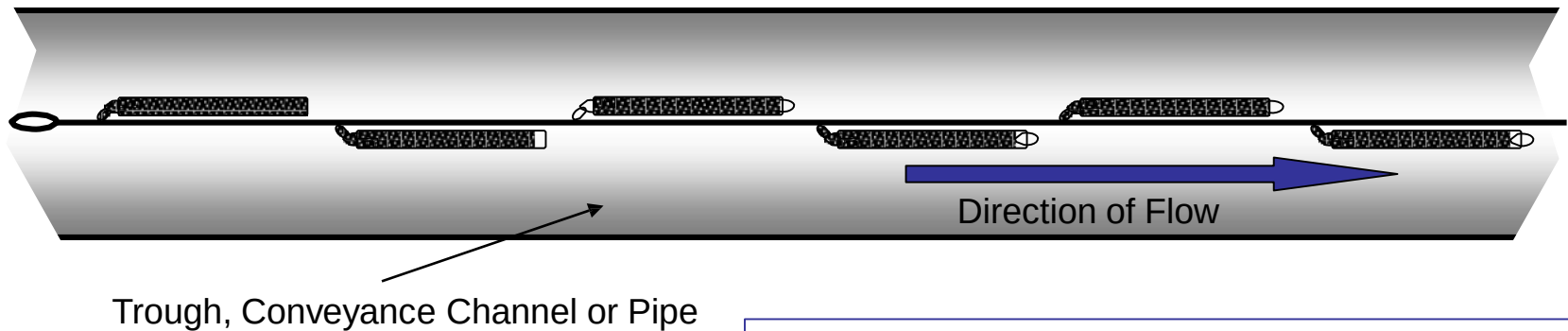
Length	36 Inches
Width:	5 in. diameter
Fabric:	Woven polypropylene
Chitosan:	1.0 lb (dry weight)
Treatment:	100,000 gal. @ 1 mg/L

Passive Treatment Sock 2-lb.

Specifications:

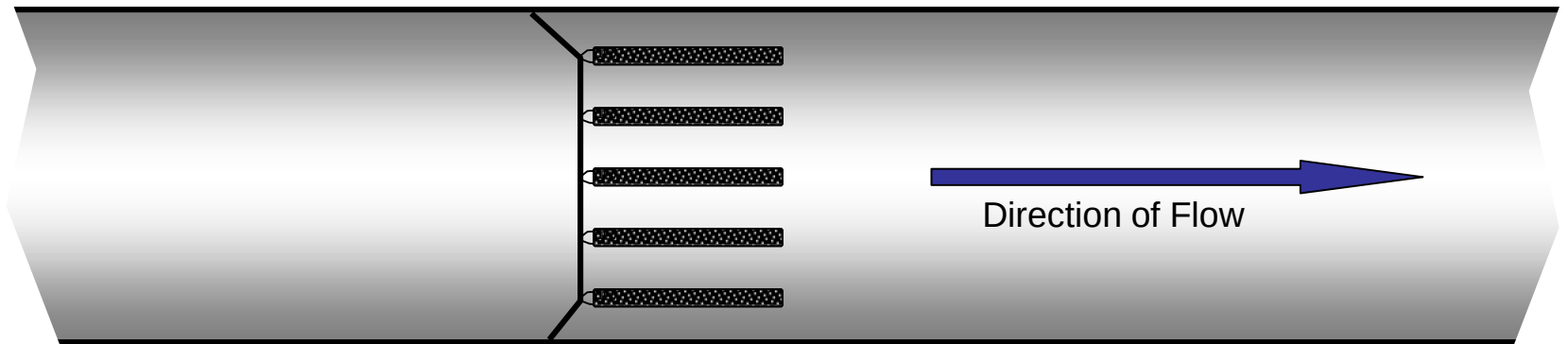
Length	72 Inches
Width:	5 in. diameter
Fabric:	Woven polypropylene
Chitosan:	2.0 lb (dry weight)
Treatment:	200,000 gal. @ 1 mg/L

Passive Treatment Socks Connected to a Common Rope Tether in Series



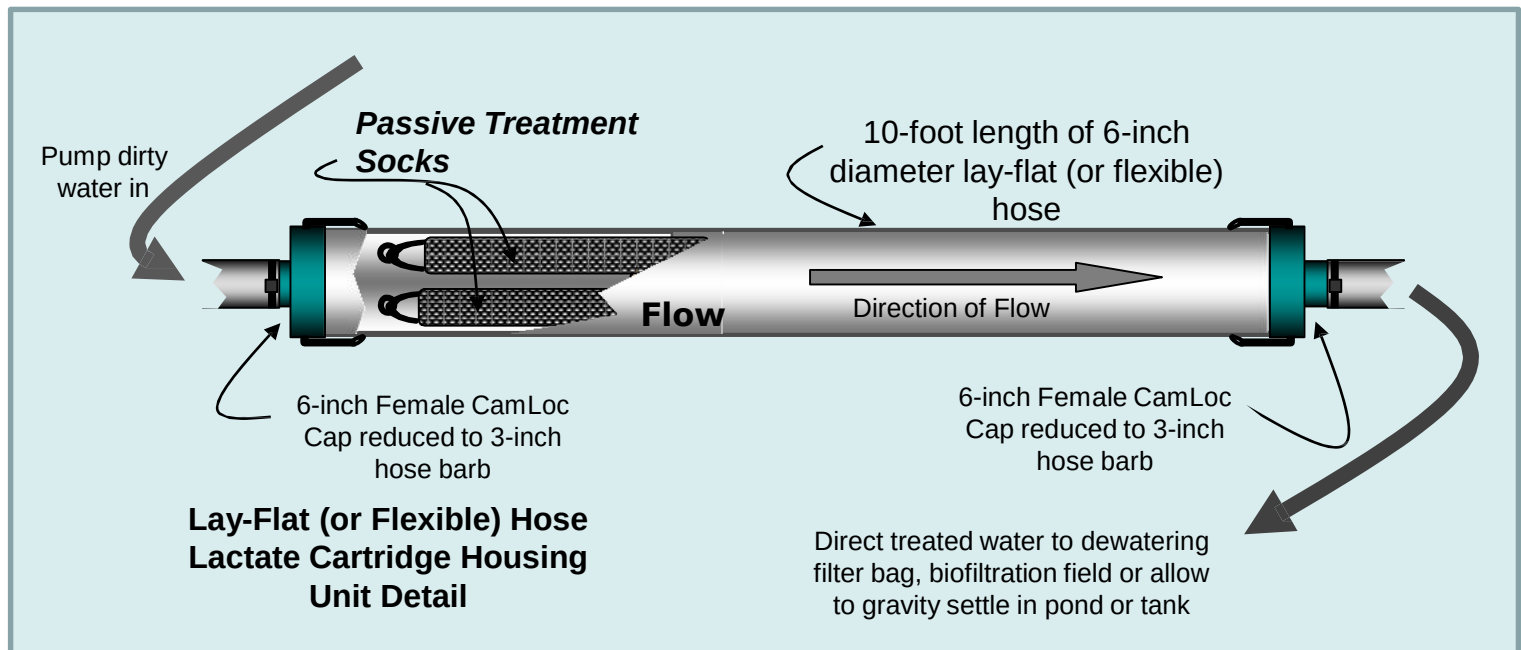
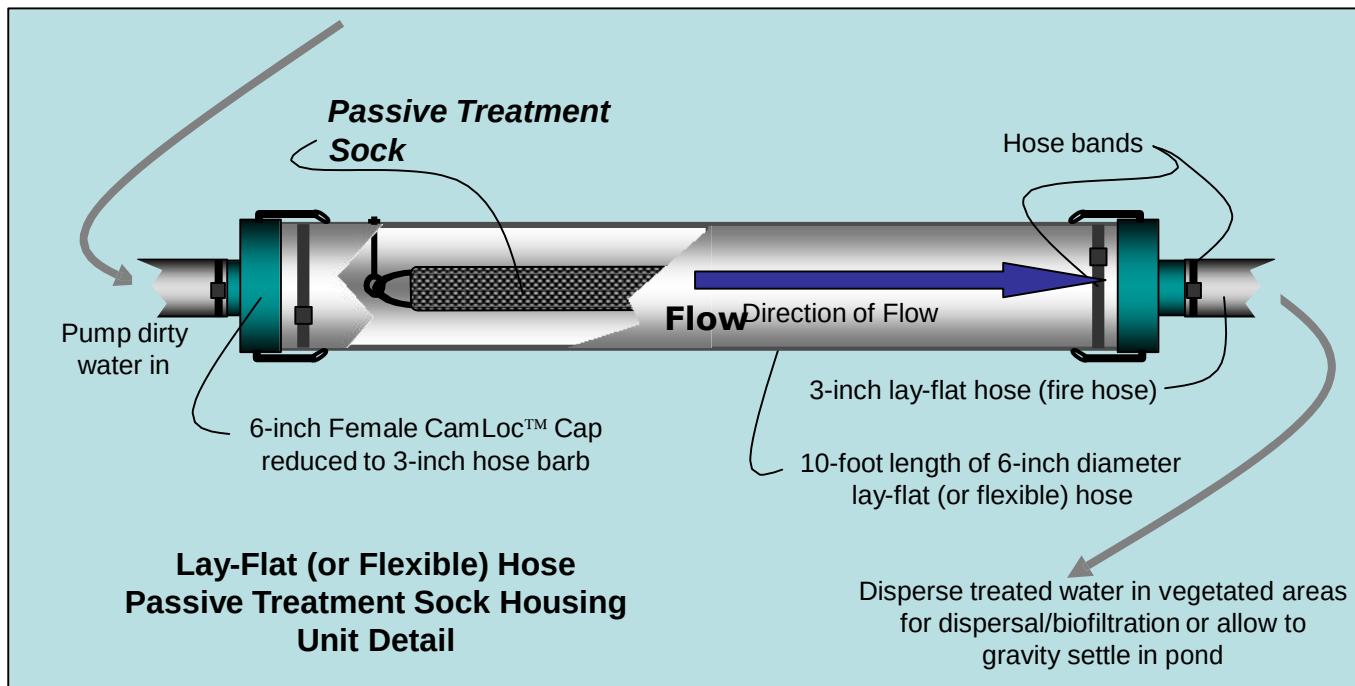
For applications where more than one Sock is needed simply connect them to a common rope

Passive Treatment Socks Connected to a Common Rope Tether in Parallel

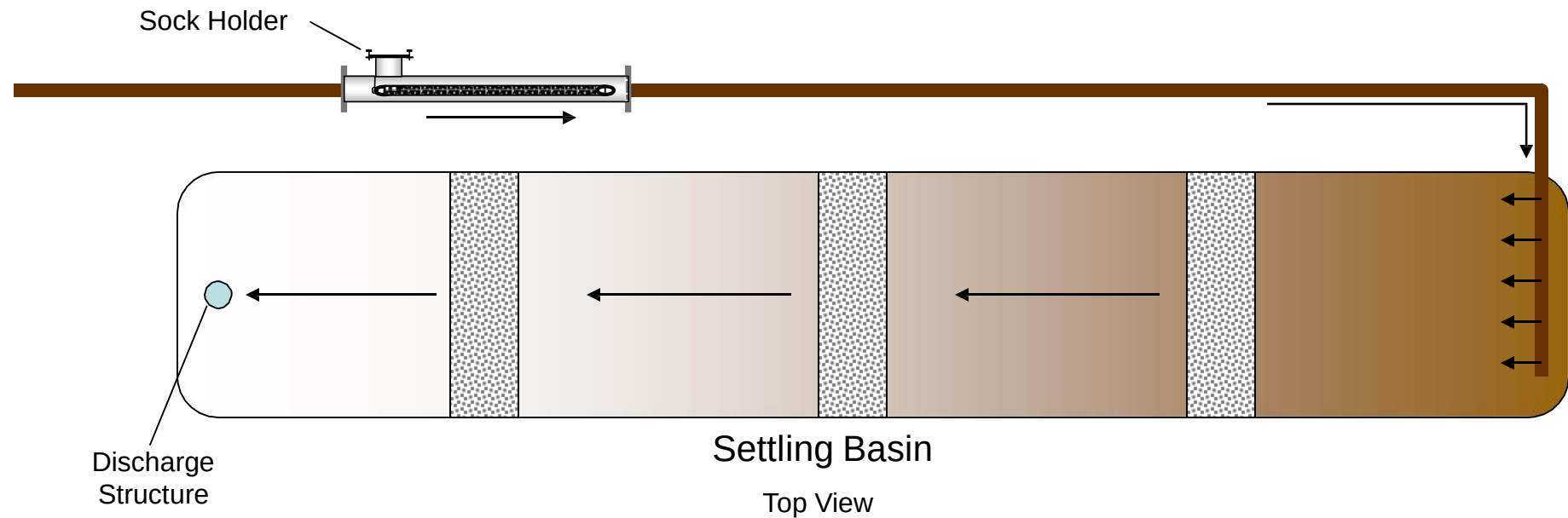
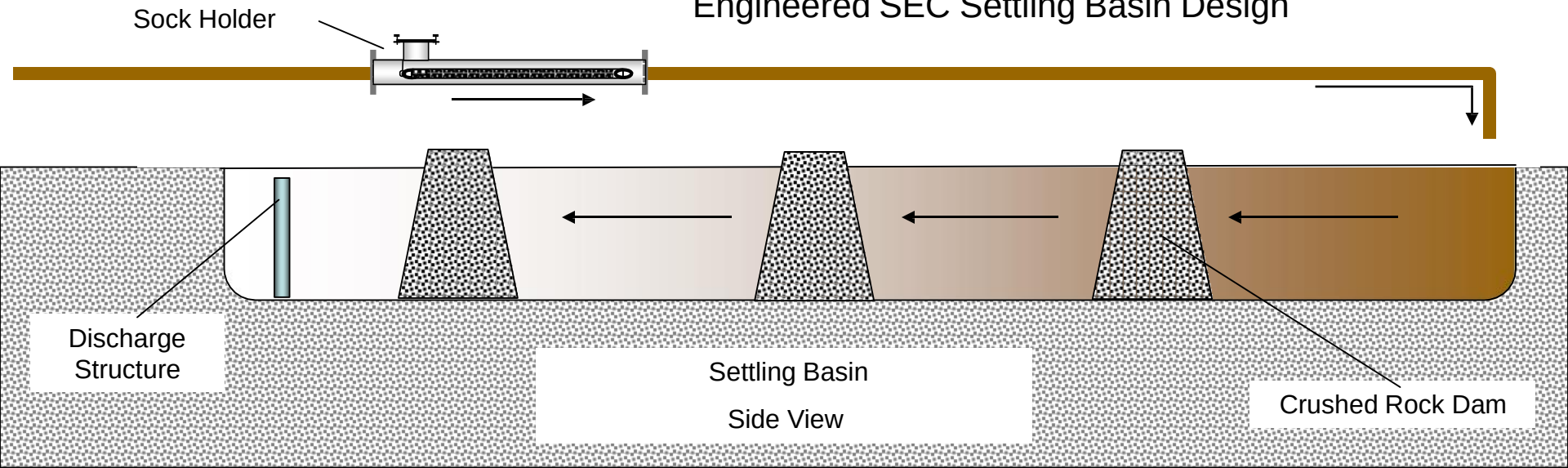


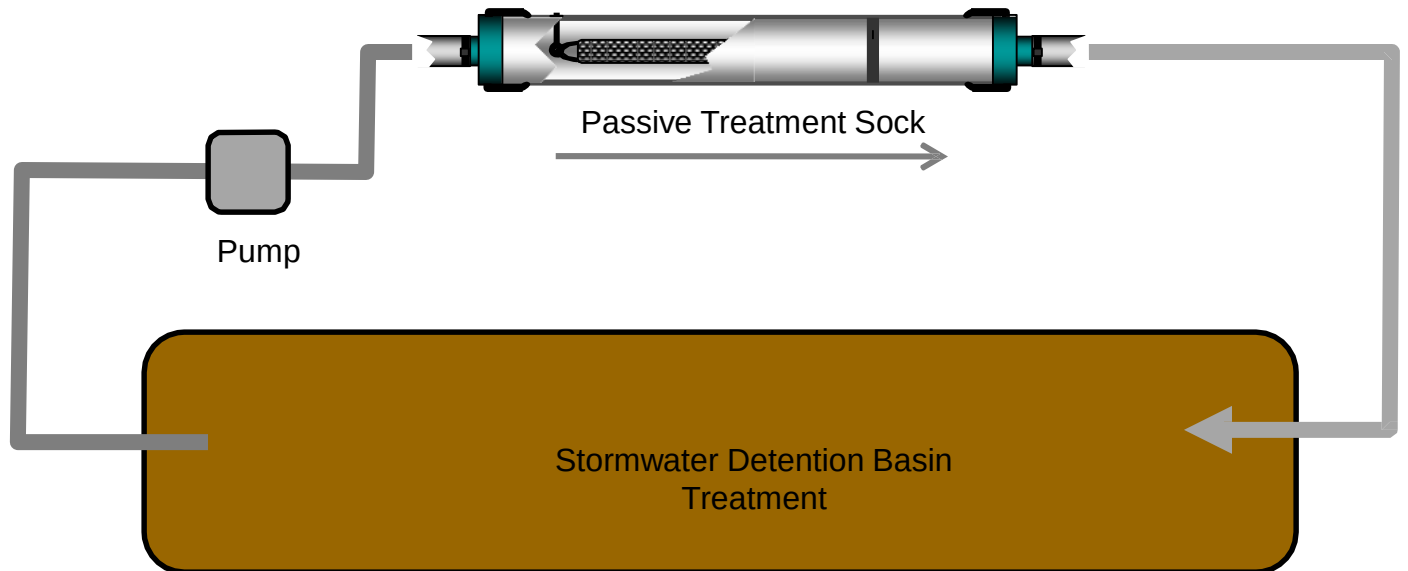
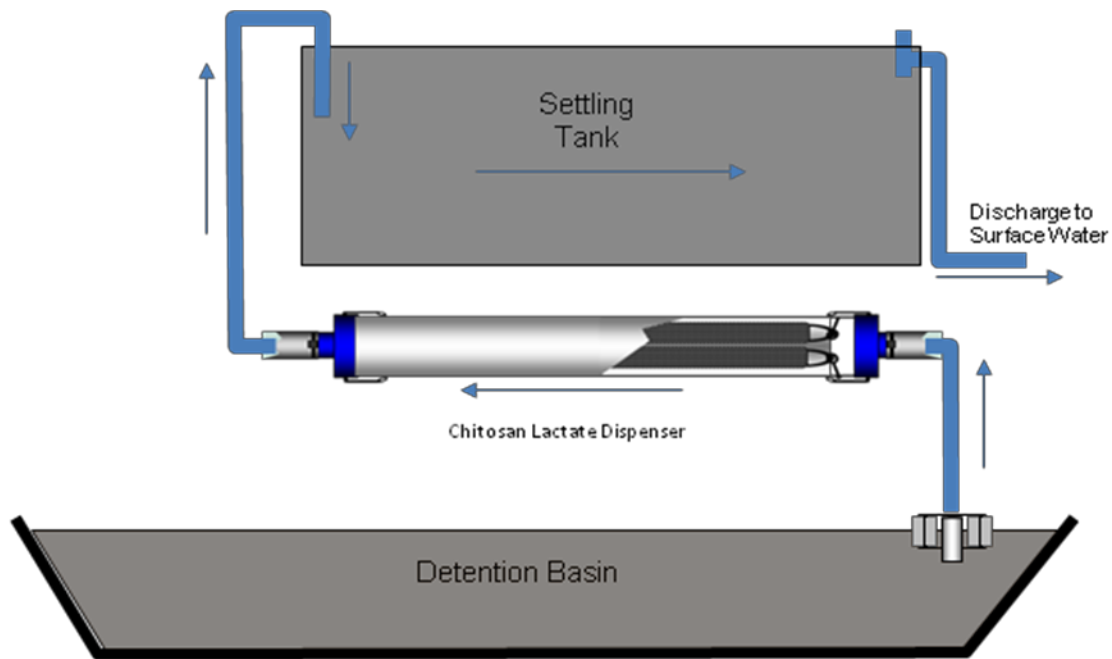
Trough, Conveyance Channel or Pipe

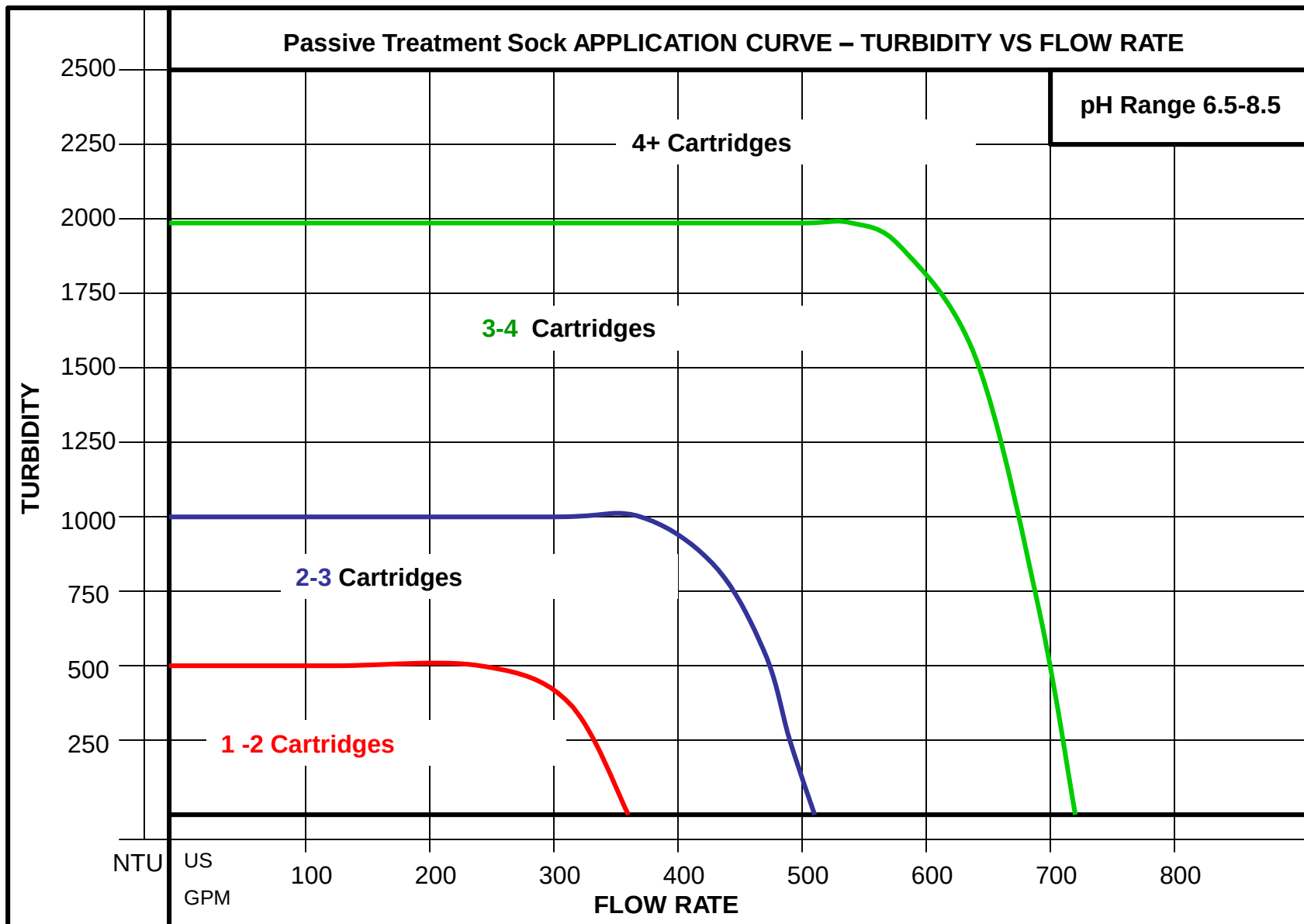
For wide channel installation simply connect Socks in parallel



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

Trade Name: HaloKlear DBP-2100 Socks

9 PHYSICAL AND CHEMICAL PROPERTIES

Explosive properties : No data available

Explosive limits : No data available

No additional information available

10 STABILITY AND REACTIVITY

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

Stable under normal conditions.

No dangerous reactions known under normal conditions of use.

Avoid dust formation.

Oxidizing agent.

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

11 TOXICOLOGICAL INFORMATION

Acute toxicity : Not classified

pH: approximately neutral (1% solution)

pH: approximately neutral (1% solution)

Germ cell mutagenicity : Not classified

Reproductive toxicity : Not classified

(single exposure)

Safety Data Sheet

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.

Safety Data Sheet

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

Safety Data Sheet

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.

Safety Data Sheet

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.*

Safety Data Sheet

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*

Safety Data Sheet

Trade Name: HaloKlear: Gel-Floc

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>

Safety Data Sheet

Trade Name: HaloKlear: Gel-Floc

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.

Safety Data Sheet

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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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)