COUGHLIN ENVIRONMENTAL SERVICES, LLC

November 9, 2018

U.S. Environmental Protection Agency – Region 1
Office of Ecosystem Protection
EPA/OEP RGP Applications Coordinator
5 Post Office Square – Suite 100 (OEP06-01)
Boston, MA 02109-3912
Attn: Remediation General Permit NOI

To Whom it May Concern,

Coughlin Environmental Services is pleased to submit the attached revised Notice of Intent (NOI) for the National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) on behalf of L.M. Heavy Civil (LMH). This NOI has been submitted for the management of groundwater discharge from the proposed Hancock Lot Parking Facility project in Quincy, MA.

It is anticipated that most of the excavation for the foundation of the parking facility may intercept the groundwater table depending upon season variations. The foundation area may require construction dewatering via an excavation sump and pump during the excavation process. Design plans are included in this package to define the limits and extent of work. The proposed footing excavation is anticipated to take approximately 6 months for construction and dewatering activity is anticipated to only be required during the active excavation and installation process which on average would be 8 to 10 hours per day. The footing and foundation area shown on the attached plan, Figure S-1 Temporary Support of Excavation – Plan View, is anticipated to be maintained in a dewatered state for an extended period due to the cast-in-place concrete work associated with the installation. A period of 6 months could be anticipated for periodic dewatering activity.

Laboratory testing was performed on a groundwater sample collected on September 18, 2018 from one (1) nearby existing monitoring well at the site, labeled HA11-B7. Test results from the observation well indicated low levels of contamination of various inorganics. None of the contamination levels exceeded the Technology Based Effluent Limitations (TBELs) set by the RGP. Non-Halogenated VOCs, halogenated VOCs, non-halogenated SVOCs, halogenated SVOCs, fuels parameters, and ethanol were all not detected at their corresponding reporting limits. To address the limited contamination issue several dewatering treatment and disposal strategies were examined and a sequential process to deal with the dewatering flows was devised. It is envisioned that the methods would vary depending upon actual dewatering flows needed to facilitate foundation excavation and construction.

As such, it is expected that the primary dewatering and disposal system (Option A) would entail discharging the dewatering flows into the Quincy Municipal Drainage System. The catch basin that is proposed to be used for discharge is located on-site. Its location is marked on the

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attached plans. The municipal drainage system directs flows to an outfall on Town Brook. The dewatering pump would be nested in a stoned sump installed around a perforated pipe (see attached detail) to enhance groundwater flow to the sump/well. Average pumping rates of 21 GPM were projected with instantaneous fluctuations from 11 to 32 GPM based upon sump filling and lowering. The treatment train contained in this submission was prepared based upon a treatment system sufficient to allow discrete treatment of the currently targeted parameters: TSS, iron, chloride, and lead. WQBEL concentrations were calculated based upon available water quality data. Under Option A it is anticipated that the use of one or more frac tanks and sand filters may be necessary to facilitate settleable solids and TSS reduction.

If disposal to the Quincy Municipal Drainage System proves to be unviable for dewatering Water disposal due to higher than anticipated flows entering the excavations or contamination levels in the water, re-infiltrating dewatering flows back into the ground elsewhere on site is an option (future Option B). The approximate location of the proposed recharge pit can be seen on the attached plans.

The parking lot has been present since at least the 1950s so filling activities were completed prior to the 1950's. Therefore, the soils above the water table are classified as "historical fill" per the definition by MassDEP. They exhibit a firm and compacted gravelly texture and are projected to have vertical permeabilities in the 6 inch per hour range. Based upon the average pumping rate of 21 GPM and the available space for a recharge pit, there should be sufficient volume and allowable infiltration to accommodate an 8 to 10 hour work shift and fully infiltrate or recover by the next day.

If excessive fines are encountered, blinding of the infiltration sump could become problematic, so it is advisable to prep at least two sumps for alternating use. If TSS levels are excessive, additional siltation removal appurtenances may be needed and incorporated into the treatment scheme to reduce TSS and turbidity. The use of an 18,000 gallon fractionalization (frac) tank is anticipated for all flows, but additional silt collection pillows could be added to the treatment train prior to discharge to either the targeted catch basin or on-site re-infiltration pit. After treatment, under Option A, effluent water will flow to an on-site catch basin where it will enter the Quincy municipal stormwater collection system. It will combine with other municipal drainage and discharge into the Town Brook. The treatment system discharge will be closely monitored to ensure compliance with the limitations set forth in the RGP.

Location plans and process schematics are attached in appendix materials for each option. Additional "typical" process component data for the treatment schemes are also included along with anticipated sample locations. A formal Best Management Practices Plan (BMPP) will be formulated, developed and implemented prior to initiating construction excavation activities and will include defined testing parameters, sample recording forms and action levels which would trigger treatment component activation. Should you have any questions or concerns please contact the undersigned.

Sincerely,

Daniel J. Coughlin, P.E.
Project Manager

enclosures

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

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
Hancock Lot Parking Facility</td><td colspan="3">Site address:
Street: 25 Cottage Avenue</td></tr>
<tr><td>City: Quincy</td><td>State: MA</td><td>Zip: 02169</td></tr>
<tr><td rowspan="4">2. Site owner
City of Quincy, Town Hall

Owner is (check one): ☐ Federal ☐ State/Tribal ☐ Private
■ Other; if so, specify: CITY</td><td colspan="3">Contact Person: Paul Costello</td></tr>
<tr><td colspan="2">Telephone: (617) 376-1950</td><td>Email: pcostello@quincyma.gov</td></tr>
<tr><td colspan="3">Mailing address:
Street: 1305 Hancock Street</td></tr>
<tr><td>City: Quincy</td><td>State: MA</td><td>Zip: 02169</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
LM Heavy Civil Construction, LLC</td><td colspan="3">Contact Person: Mario Marchese</td></tr>
<tr><td colspan="2">Telephone: (617) 756-0798</td><td>Email: mmarchese@lmheavycivil.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 100 Hancock Street</td></tr>
<tr><td>City: Quincy</td><td>State: MA</td><td>Zip: 02171</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:
N/A

NPDES permit is (check all that apply: ☐ RGP ☐ DGP ☐ CGP
☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:</td><td colspan="3">5. Other regulatory program(s) that apply to the site (check all that apply):
■ MA Chapter 21e; list RTN(s):
3-0033385
☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:
☐ CERCLA
☐ UIC Program
☐ POTW Pretreatment
☐ CWA Section 404</td></tr>
</table>

B. Receiving water information:

1. Name of receiving water(s):	Waterbody identification of receiving water(s):	Classification of receiving water(s):
Town Brook	Segment MA74-09	B

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:

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. Listed as Category 5 water. (See Appendix C)

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.	7Q10 = 0.201 ft3/s
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.	DF = 11.71

6. Has the operator received confirmation from the appropriate State for the 7Q10and 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	☐ Contaminated surface water	☐ The receiving water	☐ Potable water; if so, indicate municipality or origin:
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	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	☐ A surface water other than the receiving water; if so, indicate waterbody:	☐ Other; if so, specify:

2. Source water contaminants: Lead	
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): 1. Town Brook	Outfall location(s): (Latitude, Longitude) 1. 42.2509 deg. N 70.9977 deg. W
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: Water will be discharged into the Quincy Municipal Drainage System via an on-site CB. The drainage system directs flow to an outfall on Town Brook. ☐ 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: NOI will be sent to the municipality and NPDES at the same time. Timeframe for permission is similar for both. 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): (Immediately) October 2018 - March 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	

<table>
<tr><td>2. Activity Category: (check all that apply)</td><td colspan="2">3. Contamination Type Category: (check all that apply)</td></tr>
<tr><td rowspan="4">☐ 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</td><td colspan="2">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</td></tr>
<tr><td colspan="2">b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)</td></tr>
<tr><td>■ G. Sites with Known Contamination</td><td>☐ H. Sites with Unknown Contamination</td></tr>
<tr><td>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>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>

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		✓	1	121,4500	75	138	-	Report mg/L	---
Chloride		✓	1	44,300.0	25000	285,000	-	Report µg/l	---
Total Residual Chlorine	✓		1	121,4500	20	ND	-	0.2 mg/L	.058 mg/L
Total Suspended Solids		✓	1	121,2540	5000	18,000	-	30 mg/L	---
Antimony	✓		1	3,200.8	4.00	ND	-	206 µg/L	
Arsenic		✓	1	3,200.8	1.00	2.02	-	104 µg/L	
Cadmium	✓		1	3,200.8	0.20	ND	-	10.2 µg/L	
Chromium III	✓		1	107	10	ND	-	323 µg/L	
Chromium VI	✓		1	1,7196A	10	ND	-	323 µg/L	
Copper		✓	1	3,200.8	1.00	11.06	-	242 µg/L	10.5
Iron		✓	1	19,200.7	50	3160	-	5,000 µg/L	
Lead		✓	1	3,200.8	1.00	26.75	-	160 µg/L	1.67
Mercury	✓		1	3,245.1	0.20	ND	-	0.739 µg/L	
Nickel		✓	1	3,200.8	2.00	3.15	-	1,450 µg/L	
Selenium	✓		1	3,200.8	5.00	ND	-	235.8 µg/L	
Silver	✓		1	3,200.8	0.40	ND	-	35.1 µg/L	
Zinc		✓	1	3,200.8	10.00	18.39	-	420 µg/L	
Cyanide	✓		1	121,4500	5	ND	-	178 mg/L	
B. Non-Halogenated VOCs									
Total BTEX	✓		1	128,624.1	-	ND	-	100 µg/L	---
Benzene	✓		1	128,624.1	1.0	ND	-	5.0 µg/L	---
1,4 Dioxane	✓		1	128,624.1	50	ND	-	200 µg/L	---
Acetone	✓		1	128,624.1	10	ND	-	7.97 mg/L	---
Phenol	✓		1	4,420.1	30	ND	-	1,080 µg/L	

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
C. Halogenated VOCs									
Carbon Tetrachloride	✓		1	128,624.1	1.0	ND	-	4.4 µg/L	
1,2 Dichlorobenzene	✓		1	128,624.1	5.0	ND	-	600 µg/L	---
1,3 Dichlorobenzene	✓		1	128,624.1	5.0	ND	-	320 µg/L	---
1,4 Dichlorobenzene	✓		1	128,624.1	5.0	ND	-	5.0 µg/L	---
Total dichlorobenzene	✓		1	128,624.1	-	ND	-	763 µg/L in NH	---
1,1 Dichloroethane	✓		1	128,624.1	1.5	ND	-	70 µg/L	---
1,2 Dichloroethane	✓		1	128,624.1	1.5	ND	-	5.0 µg/L	---
1,1 Dichloroethylene	✓		1	128,624.1	1.0	ND	-	3.2 µg/L	---
Ethylene Dibromide	✓		1	14,504.1	0.010	ND	-	0.05 µg/L	---
Methylene Chloride	✓		1	128,624.1	1.0	ND	-	4.6 µg/L	---
1,1,1 Trichloroethane	✓		1	128,624.1	2.0	ND	-	200 µg/L	---
1,1,2 Trichloroethane	✓		1	128,624.1	1.5	ND	-	5.0 µg/L	---
Trichloroethylene	✓		1	128,624.1	1.0	ND	-	5.0 µg/L	---
Tetrachloroethylene	✓		1	128,624.1	1.0	ND	-	5.0 µg/L	
cis-1,2 Dichloroethylene	✓		1	128,624.1	1.0	ND	-	70 µg/L	---
Vinyl Chloride	✓		1	128,624.1	1.0	ND	-	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✓		1	129,625.1	-	ND		190 µg/L	
Diethylhexyl phthalate	✓		1	129,625.1	2.2	ND	-	101 µg/L	
Total Group I PAHs	✓		1	129,625.1	-	ND		1.0 µg/L	---
Benzo(a)anthracene	✓		1	129,625.1	0.10	ND	-	As Total PAHs	
Benzo(a)pyrene	✓		1	129,625.1	0.10	ND	-		
Benzo(b)fluoranthene	✓		1	129,625.1	0.10	ND	-		
Benzo(k)fluoranthene	✓		1	129,625.1	0.10	ND	-		
Chrysene	✓		1	129,625.1	0.10	ND	-		
Dibenzo(a,h)anthracene	✓		1	129,625.1	0.10	ND	-		
Indeno(1,2,3-cd)pyrene	✓		1	129,625.1	0.10	ND	-		

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
Total Group II PAHs	✓		1					100 µg/L	---
Naphthalene	✓		1	129,625.1	0.10	ND	-	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✓		1	127,608.3	-	ND	-	0.000064 µg/L	---
Pentachlorophenol	✓		1	129,625.1	1.0	ND	-	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons			1	74,1664A	4000	ND	-	5.0 mg/L	---
Ethanol	✓		1	1671A	500	ND	-	Report mg/L	---
Methyl-tert-Butyl Ether	✓		1	128,624.1	10	ND	-	70 µg/L	
tert-Butyl Alcohol	✓		1	128,624.1	100	ND	-	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✓		1	128,624.1	20	ND	-	90 µg/L in MA 140 µg/L in NH	---
Other (i.e., pH, temperature, hardness, salinity, LC_{50}, additional pollutants present); if so, specify:									
pH			1	PCB-608.3		7	7		

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 effluent will be pumped from the dewatering well or sump into an 18,000 gallon Frac Tank with an aeation eductor. From the Frac Tank the water will either flow to a Silt Filter Pillow for TSS Removal or directly into the Catch Basin and the Quincy Municipal Drainage System.

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: Silt Filter Pillow

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: Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	70
Provide the proposed maximum effluent flow in gpm.	32 GPM
Provide the average effluent flow in gpm.	21 GPM
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	N/A

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 N/A

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

N/A

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.

Location maps and construction plans detailing the work to be performed are attached. Analytical lab data from a well nearby the areas of excavation are also attached. Also attached is supporting information for the Endangered Species Act determination and the National Historic Preservation Act eligibility determination. Appendix E includes the specifications and details of the proposed pumps, frac tank, and other dewatering treatment system components.

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 requirement of this general permit will be implemented upon the submittal of this NOI.	
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: 11/9/18
Print Name and Title: MARIO S. MARCHESE, PROJECT MANAGER	

APPENDIX A

Location and Locus Maps

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

BLUE HILLS QUADRANGLE
MASSACHUSETTS
7.5-MINUTE SERIES

SITE LOCATION

BOSTON
SUFFOLK CO.
NORFOLK CO.
Milton
Quincy Center
North Commons
QUINCY
ADAMS NATIONAL HISTORICAL PARK
South Quincy
Blue Hills
Brush Hill
Curry Cem
Paul's Bridge
Camp Sayre
Babel Rock
Great Dome
Little Dome
The Crags
Blue Hill Range
Fox Hill
Wampatuck Hill
Rattlesnake Hill
Quincy Cem
Pine Hill
Five Corners
CHICKATAWBUT RD
The Broken Hills
Nahanton Hill
Slide Notch
Kitchamakin Hill
Chickatawbut Hill
Breakneck Ledge
Hancock
Hemenway Hill
Wildcat Notch
Little Blue Hill
Great Blue Hill
Wolcott Hill
Houghton Hill
Breeze Hill
Tucker Hill
Boyce Hill
Buck Hill
Hawk Hill
Southeast Ridge
Hole In Rock
Burnt Hill
Blue Hill River
Braintree
Blue Hill Cem
Cherry Hill
North Randolph
South Braintree
Ponkapoag
Braintree Highlands
Central Cem
Lindwood Cem
Tower Hill
Puddin Hill
Neary Mtn
Randolph
Holbrook
North Stoughton
Four Corners
Pearl Street Cem
Maplewood Cem
Holy Sepulchre Cem
West Stoughton
Stoughton
Avon
Saint Michaels Cem
BROCKTON

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 19T
10 000-foot ticks: Massachusetts Coordinate System of 1983 (mainland zone)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery	NAIP,	July 2014
Roads	HERE,	©2013 - 2014
Names	GNIS,	2015
Hydrography	National Hydrography Dataset,	2014
Contours	National Elevation Dataset,	2012
Boundaries	Multiple sources; see metadata file	1972 - 2015

UTM GRID AND 2015 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
CQ
Grid Zone Designation 19T

SCALE 1:24 000
1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
0.5 0
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011. A metadata file associated with this product is draft version 0.6.18

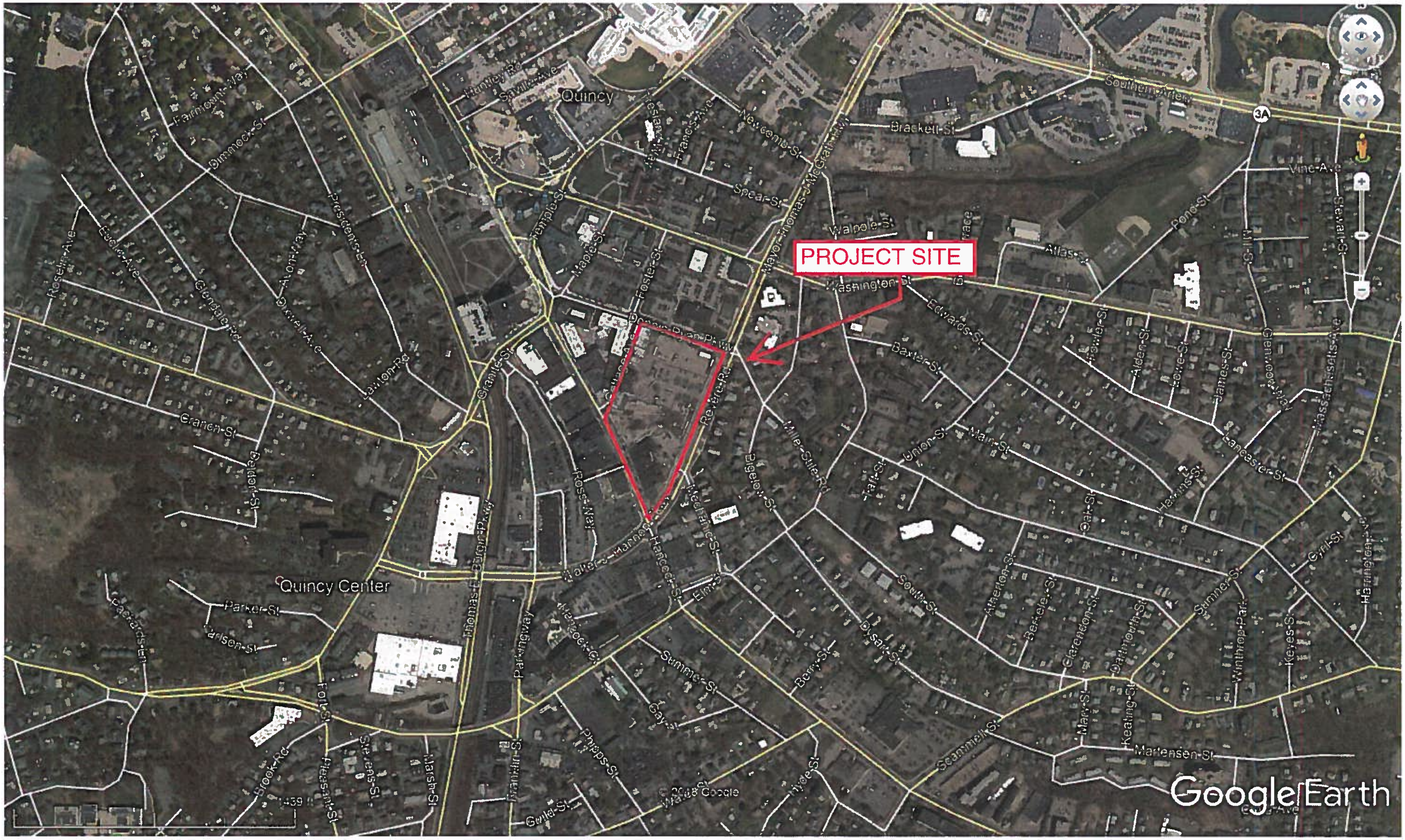
MASSACHUSETTS
QUADRANGLE LOCATION

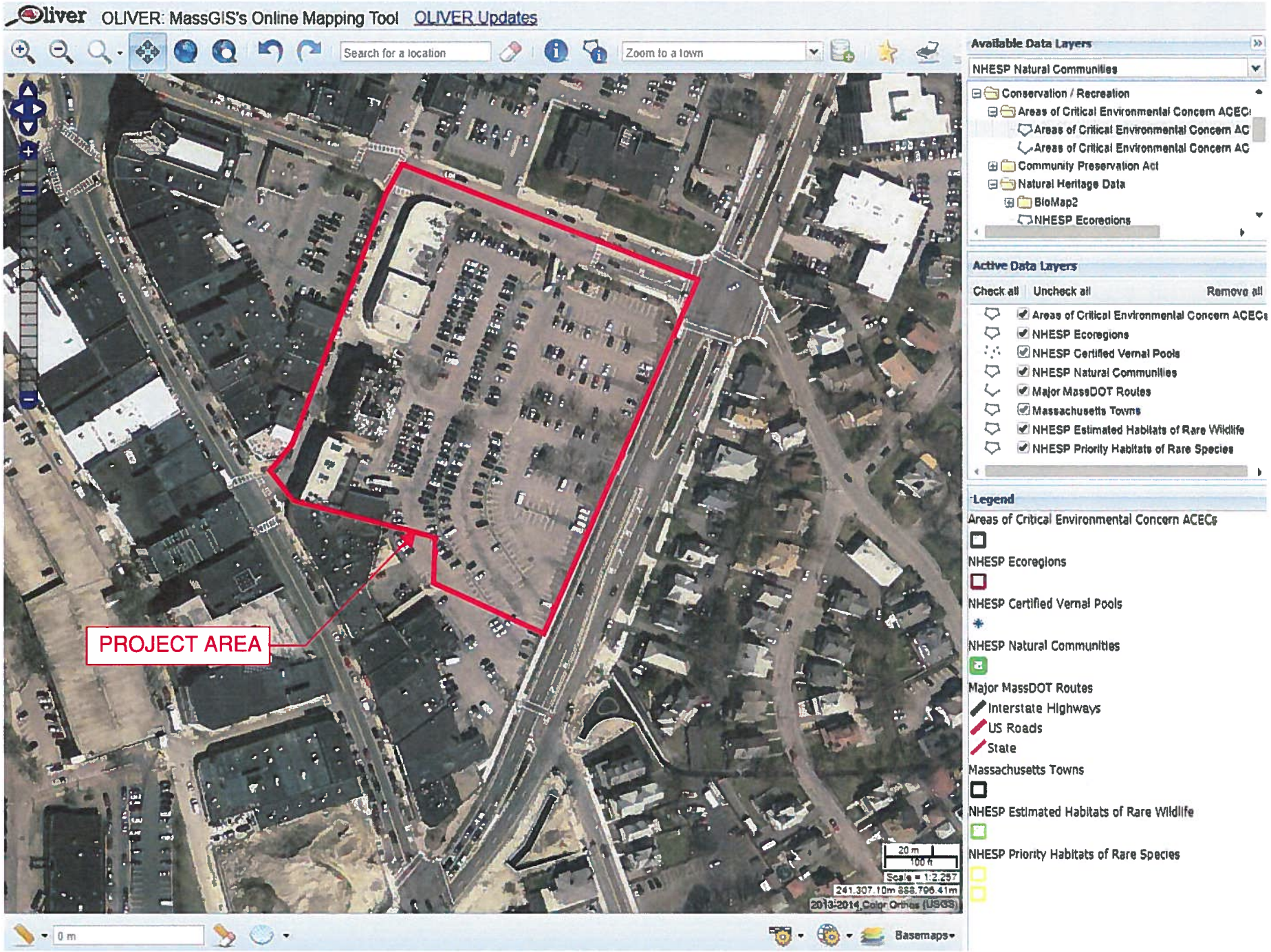
1 Newton
2 Boston South
3 Hull
4 Norwood
5 Weymouth
6 Mansfield
7 Brockton
8 Whitman
ADJOINING QUADRANGLES

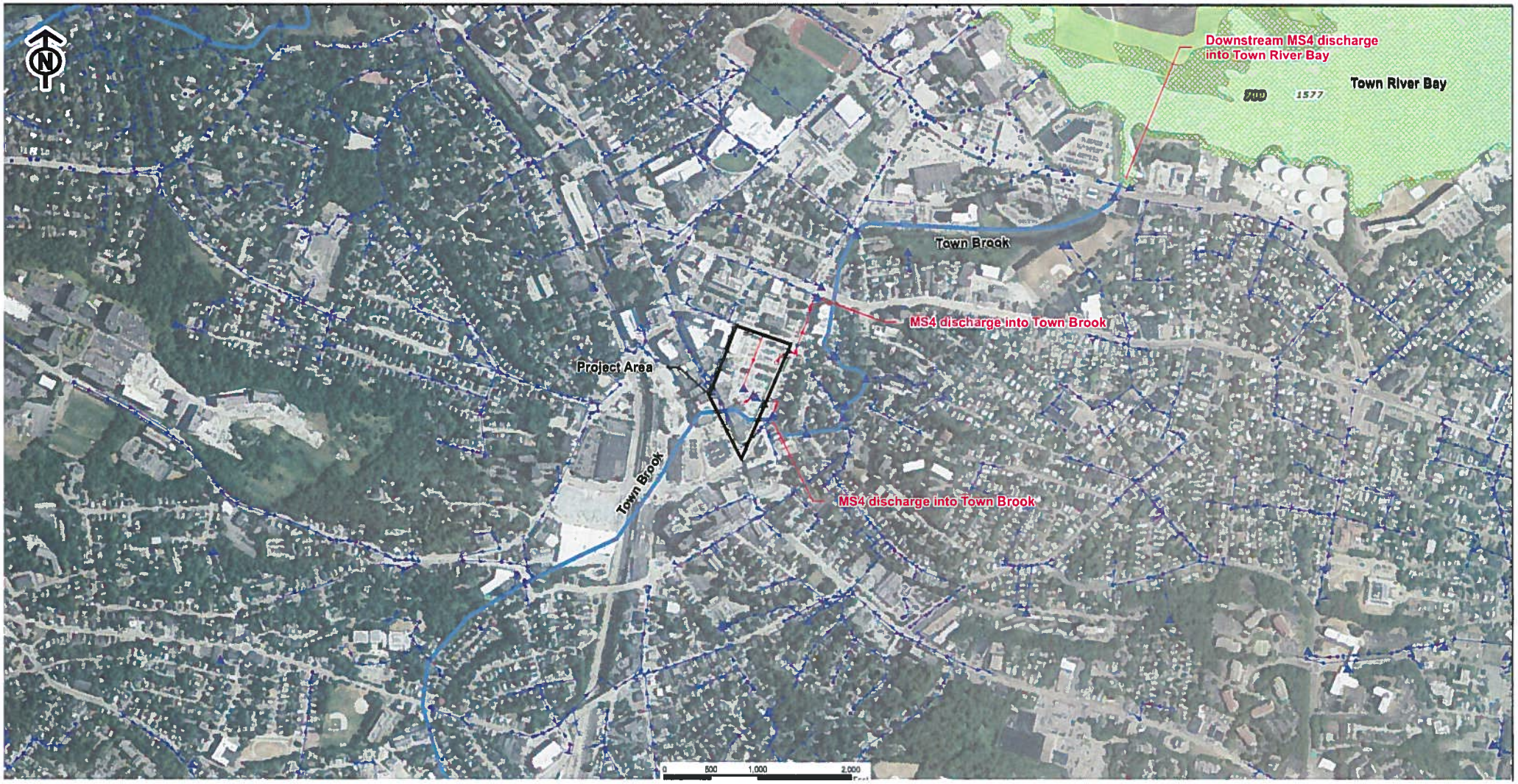
ROAD CLASSIFICATION
Expressway — Local Connector
Secondary Hwy — Local Road
Ramp — 4WD
Interstate Route — US Route — State Route

BLUE HILLS, MA
2015

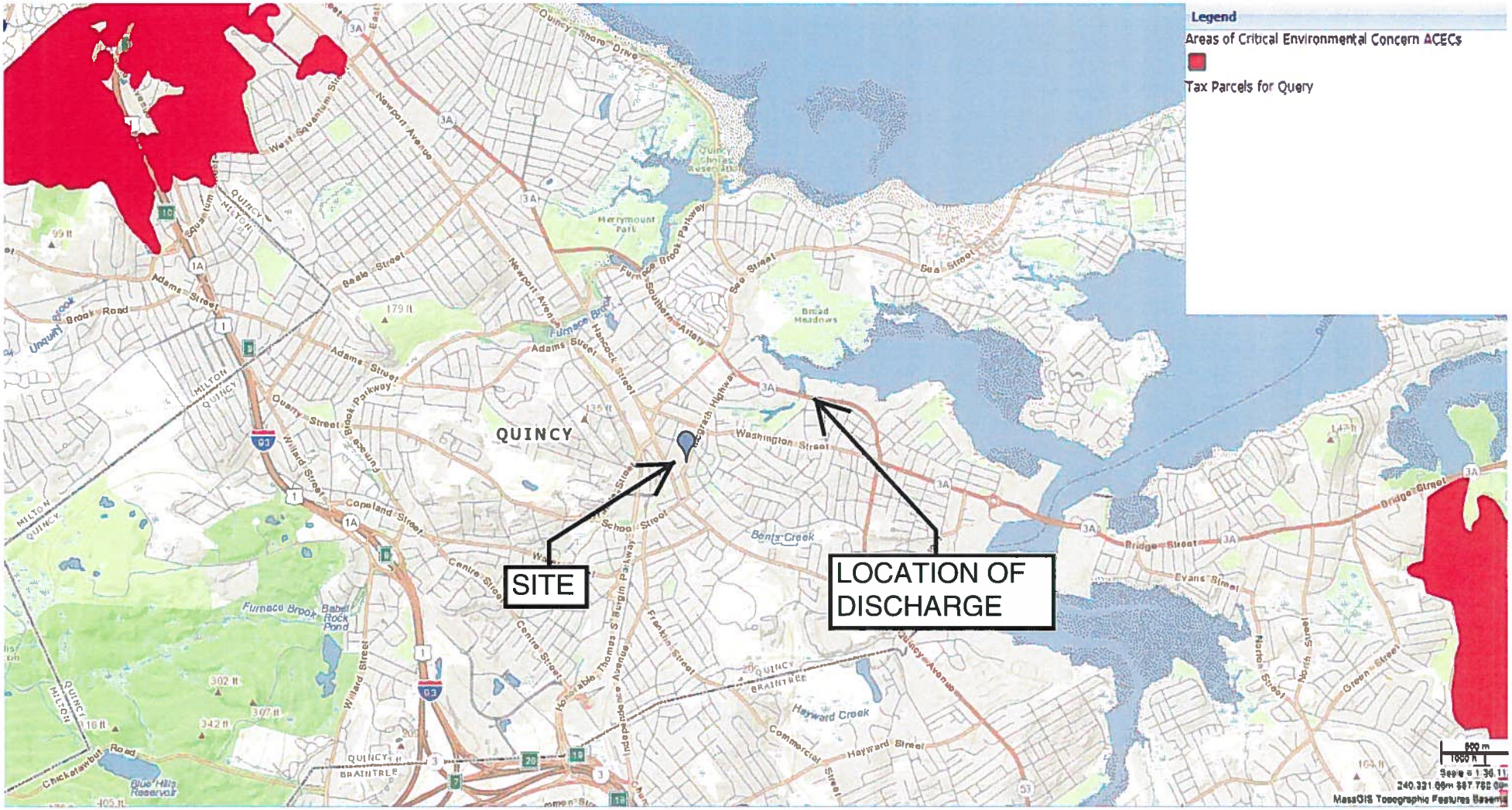
Hancock Lot Aerial
Quincy, Massachusetts




Oliver
OLIVER: MassGIS's Online Mapping Tool
OLIVER Updates
Search for a location
Zoom to a town
Available Data Layers
NHESP Natural Communities
Conservation / Recreation
Areas of Critical Environmental Concern ACEC
Areas of Critical Environmental Concern AC
Areas of Critical Environmental Concern AC
Community Preservation Act
Natural Heritage Data
BioMap2
NHESP Ecoregions
Active Data Layers
Check all
Uncheck all
Remove all
Areas of Critical Environmental Concern ACECs
NHESP Ecoregions
NHESP Certified Vernal Pools
NHESP Natural Communities
Major MassDOT Routes
Massachusetts Towns
NHESP Estimated Habitats of Rare Wildlife
NHESP Priority Habitats of Rare Species
Legend
Areas of Critical Environmental Concern ACECs
NHESP Ecoregions
NHESP Certified Vernal Pools
NHESP Natural Communities
Major MassDOT Routes
Interstate Highways
US Roads
State
Massachusetts Towns
NHESP Estimated Habitats of Rare Wildlife
NHESP Priority Habitats of Rare Species
PROJECT AREA
20 m
100 ft
Scale = 1:2,257
241,307.10m 888,796.41m
2013-2014 Color Ortho (USGS)
0 m
Basemaps


Downstream MS4 discharge into Town River Bay
Town River Bay
709
1577
Town Brook
MS4 discharge into Town Brook
Project Area
Town Brook
MS4 discharge into Town Brook
0
500
1,000
2,000

AREAS OF CRITICAL ENVIRONMENTAL CONCERN
QUINCY, MASSACHUSETTS



APPENDIX B

Proposed Construction Plan
Areas Requiring Dewatering

NOTES:

1. REMOVE, STACK AND REUSE VGC. TRANSPORT ALL COBBLE STONE AND UNUSED VGC TO QUINCY DPW, 55 SEA STREET, QUINCY, MA
2. EXCAVATION IN EXISTING SIDEWALKS SLATED TO REMAIN SHALL BE SAWCUT AT NEAREST CONTROL OR EXPANSION JOINT AND REPLACED IN KIND
3. TEST PITS SHALL BE EXCAVATED AS CONTRACTOR, ENGINEER OR CITY REQUIRES
4. ALL EXISTING EROSION CONTROL MEASURES TO BE INSPECTED, CLEANED OR REPLACED WITHIN OR ADJACENT TO LIMIT OF WORK AS NEEDED OR DIRECTED BY ENGINEER
5. PROTECT ALL UTILITIES TO REMAIN FROM CONSTRUCTION ACTIVITIES
6. PROVIDE SILT SACK INLET PROTECTION AT ALL CATCH BASINS WITHIN 200 OF LIMITS OF WORK AND AS DIRECTED BY ENGINEER
7. PROVIDE COMPOST SILT SOCKS AT ALL DOWN GRADIENT POINTS OF DISTURBANCE
8. REMOVE AND DISPOSE EXISTING ABANDONED UTILITIES AS REQUIRED TO COMPLETE WORK
9. COORDINATE WITH ALL UTILITY PROVIDERS TO DECOMMISSION OVERHEAD WIRES WITHIN LIMITS OF WORK
10. FOR BUILDING DEMOLITION: ALL UTILITY SERVICE CONNECTIONS SHALL BE REMOVED AND CAPPED TO THE CURB LINE, EXCEPT FOR WATER. WATER SERVICE CONNECTIONS SHALL BE REMOVED AND CAPPED TO THE WATER MAIN
11. CONTRACTOR TO PROVIDE PASSABLE ROADS AT THE END OF EACH WORKING DAY
12. CONTRACTOR SHALL COORDINATE WORK WITH BUSINESSES AND DELIVERIES
13. CONTRACTOR SHALL USE CAUTION WHEN OPERATING UNDER EXISTING OVERHEAD WIRES

HANCOCK STREET

FORMER COTTAGE STREET

COTTAGE AVENUE

DENNIS RYAN PARKWAY

REVERE ROAD

SEE SHEET C-201 FOR COTTAGE AVENUE AND HANCOCK STREET SITE PREPARATION PLAN

SEE SHEET C-202 FOR DENNIS RYAN PARKWAY SITE PREPARATION PLAN

SEE SHEET CE-101 FOR MANHOLE

CONCRETE BOX CULVERT UNDER CONSTRUCTION (BY OTHERS)

Approximate Location of Recharge Pit (Option B)

CB for Discharge (Option A)

NOT FOR CONSTRUCTION

DESMAN Design Management

WOODARD & CURRAN
COMMITMENT & INTEGRITY DRIVE RESULTS
980 Washington Street, Suite 325
Dedham, Massachusetts 02026
800.446.5618 | www.woodardcurran.com

CITY OF QUINCY
HANCOCK LOT PARKING FACILITY
QUINCY MASSACHUSETTS

NO	DESCRIPTION	DATE
1	FOR PRICING	1/8/18

DRAWING TITLE: PARKING FACILITY SITE PREPARATION PLAN

DRAWING NO: C-200

SCALE: 1" = 20'
DATE: JANUARY, 2018
PROJECT NO: 20-16143.00
DESIGN | DRAWN | CHKD
HCP | KCC | DAW

LEGEND

BGS = BELOW GROUND SURFACE (AS MEASURED FROM EXISTING GRADE)

- SUPPLEMENTAL SOIL BORING LOCATIONS 0-5 BGS
- AUGUST/SEPTEMBER 2017 WASTE DISPOSAL BORINGS
- NORTHEAST GEOTECHNICAL INC. SOIL BORINGS
- STRATEGIC ENVIRONMENTAL SERVICES INC. SOIL BORINGS
- MONITORING WELL
- SOIL BORING
- DISPOSAL SITE BOUNDARY
- REVISED WASTE SAMPLING AREAS
- GRID
- REQUIRED EXCAVATION DISPOSAL SITE BOUNDARY ACTIVITIES

REVISED SOIL DISPOSAL CLASSIFICATION (0 TO 5 FEET BGS)

- RCS-1
- RCS-2
- ASPHALT BATCHING / COMM-97 UNLINED
- COMM-97 LINED
- RCRA-D OTHER IMPACTED MATERIAL
- HAZ

COTTAGE AVENUE

HANCOCK STREET

ATRIUM (R-4) (BY OTHERS) FFE = 23.50

EXISTING BUILDING TO REMAIN

FORMER COTTAGE STREET

PROPOSED PARK (BY OTHERS)

DENNIS RYAN PARKWAY

NOVA RESIDENCES (R-4) (BY OTHERS) FFE = 23.50

PROPOSED PLAZA

CHESTNUT PLACE (R-1) (BY OTHERS) FFE = 30.00

PROPOSED MULTI LEVEL PARKING FACILITY FFE = 23.00

Approximate location of building layout

REVERE ROAD

NOT FOR CONSTRUCTION

DESMAN Design Management

860 Washington Street, Suite 3J5
Dedham, Massachusetts 02026
800.445.5518 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

CITY OF QUINCY
HANCOCK LOT PARKING FACILITY
QUINCY MASSACHUSETTS

NO.	DESCRIPTION	DATE
1	FOR PRICING	1/18/18

DRAWING TITLE: PARKING FACILITY ENVIRONMENTAL REMEDIATION PLAN 1 (0-5 FEET BGS)

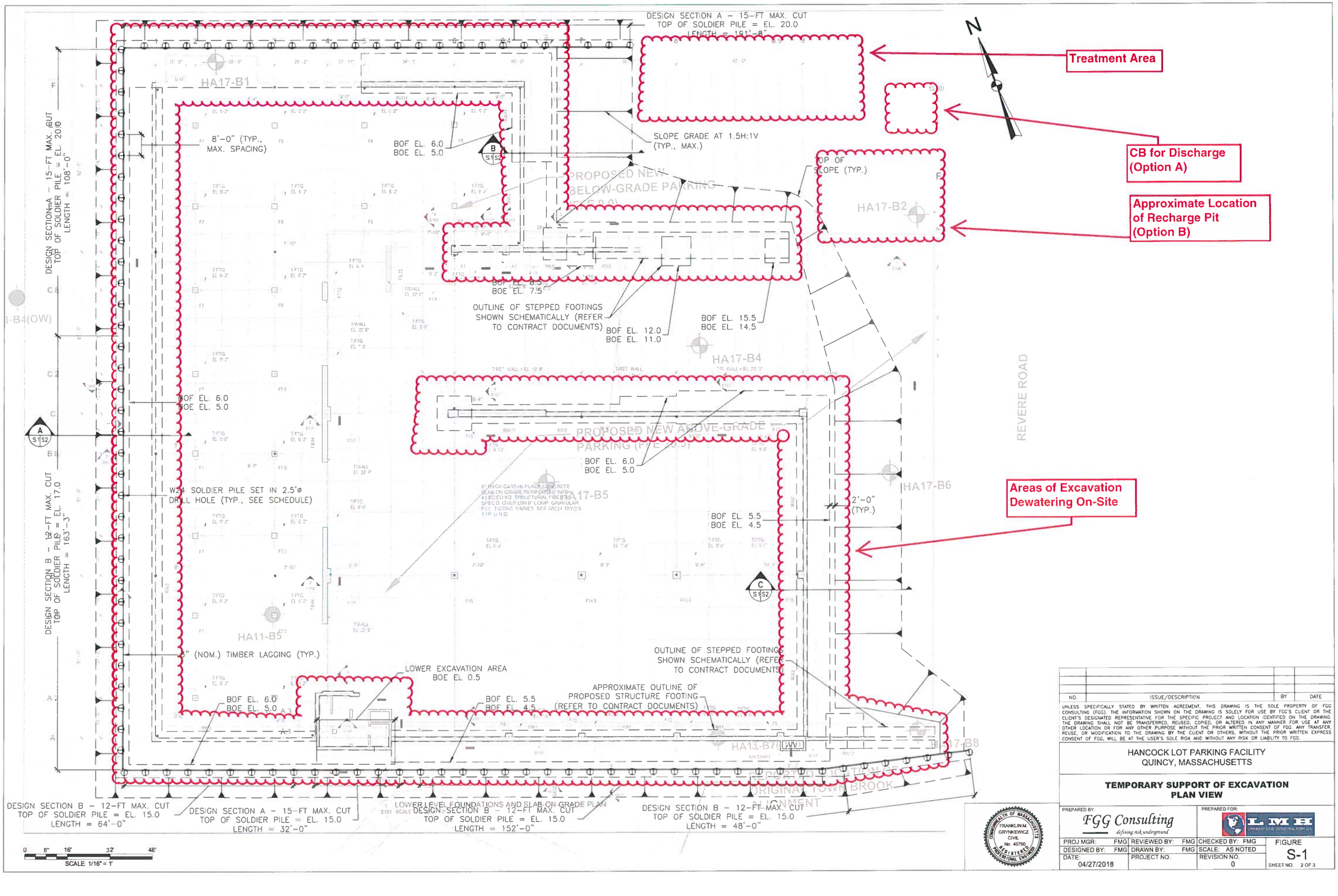
DRAWING NO: C-300

SCALE: 1" = 20'

DATE: JANUARY, 2018

PROJECT NO: 20-16143.00-1

DESIGN	DRAWN	CHKD
HCP	KCC	DAW



NO.	ISSUE/DESCRIPTION	BY	DATE

HANCOCK LOT PARKING FACILITY
QUINCY, MASSACHUSETTS

TEMPORARY SUPPORT OF EXCAVATION PLAN VIEW

COMMONWEALTH OF MASSACHUSETTS — FRANKLIN M. GRYNKEWICZ — CIVIL — No. 45790 — REGISTERED PROFESSIONAL ENGINEER

PREPARED BY: FGG Consulting — defining risk underground
PREPARED FOR: LMH

PROJ MGR:	FMG	REVIEWED BY:	FMG	CHECKED BY:	FMG
DESIGNED BY:	FMG	DRAWN BY:	FMG	SCALE:	AS NOTED
DATE: 04/27/2018		PROJECT NO.		REVISION NO. 0	

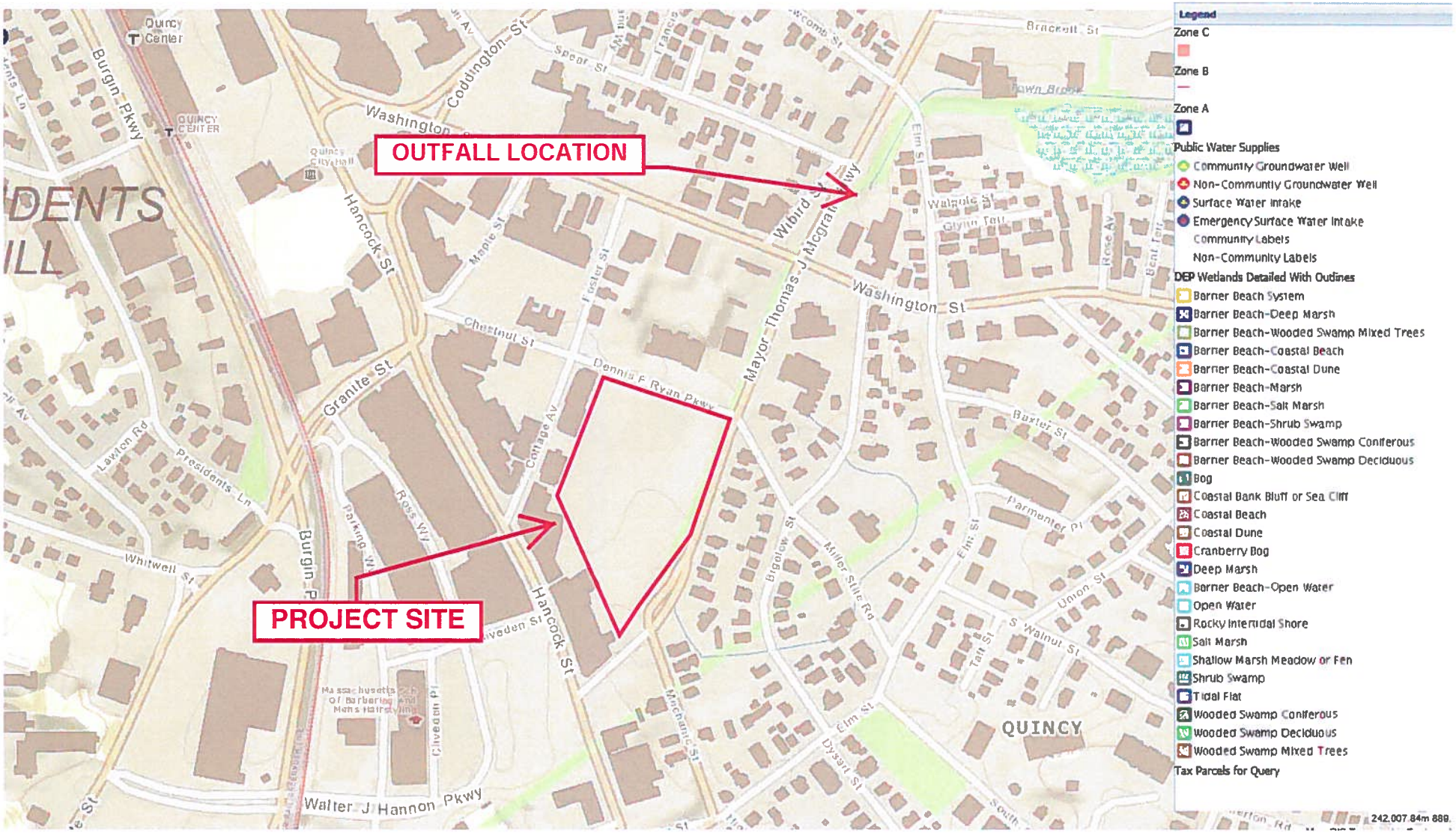
FIGURE S-1
SHEET NO. 2 OF 3

APPENDIX C

Receiving Water Information

Project Site and Outfall Location Map

Mapped with OLIVER: MassGIS's Online Mapping Tool



Category 5 waters listed alphabetically by major watershed
The 303(d) List – "Waters requiring a TMDL"

WATER BODY	SEGMENT ID	DESCRIPTION	SIZE	UNITS	IMPAIRMENT	EPA TMDL NO.
Crooked Meadow River	MA74-01	Headwaters, outlet Cushing Pond, Hingham to confluence with Fulling Mill Brook (forming headwater of Weir River), Hingham.	1	MILES	Nutrient/Eutrophication Biological Indicators	
Farm River	MA74-07	From Randolph/Braintree border (where name changes from Blue Hill River), to confluence with Cochato River (forming headwaters of Monatiquot River), Braintree.	3.1	MILES	Escherichia coli	
Furnace Brook	MA74-10	From headwaters north of Blue Hills Reservoir, Quincy to confluence with Blacks Creek, Quincy (portions culverted underground).	4.2	MILES	Escherichia coli	
					Oxygen, Dissolved	
Hingham Harbor	MA74-18	Hingham Harbor inside a line from Crows Point to Worlds End, Hingham (formerly reported as MA70-08).	1.12	SQUARE MILES	Escherichia coli	
					Fecal Coliform	
					Other (Contaminants in Fish and Shellfish)	
					PCB in Fish Tissue	
Lake Holbrook	MA74013	Holbrook.	31	ACRES	Nutrient/Eutrophication Biological Indicators	
MARY LEE BROOK	MA74-23	Headwaters, north of West High Street, Avon to mouth at confluence with Cochato River, Randolph.	2.7	MILES	Escherichia coli	
Mill River	MA74-04	Headwaters, west of Route 18 and south of Randolph Street, Weymouth to inlet Whitmans Pond, Weymouth (portions culverted underground).	3.4	MILES	Escherichia coli	
					Fecal Coliform	
Monatiquot River	MA74-08	Headwaters at confluence of Cochato and Farm rivers, Braintree to confluence with Weymouth Fore River at Commercial Street, Braintree.	4.4	MILES	(Physical substrate habitat alterations*)	
					Aquatic Macroinvertebrate Bioassessments	
					Escherichia coli	
					Fecal Coliform	
					Oxygen, Dissolved	
Old Swamp River	MA74-03	Headwaters just west of Pleasant Street and north of Liberty Street, Rockland to inlet Whitmans Pond, Weymouth.	4.6	MILES	Escherichia coli	
					Fecal Coliform	
PLYMOUTH RIVER	MA74-20	Headwaters, perennial portion (including channelized, culverted section) north of Route 3 (Pilgrim Highway), Weymouth to the mouth at inlet of Cushing Pond, Hingham (entire river not depicted on Weymouth USGS quad).	3.6	MILES	Escherichia coli	
Sylvan Lake	MA74021	Holbrook.	6	ACRES	Chlordane in Fish Tissue	
					DDT in Fish Tissue	
Town Brook	MA74-09	Headwaters, outlet Old Quincy Reservoir, Braintree to confluence with Town River Bay north of Route 3A, Quincy (SARIS note: includes "The Canal"/Town River) (portions culverted underground).	3.5	MILES	(Other flow regime alterations*)	
					(Physical substrate habitat alterations*)	
					Aquatic Macroinvertebrate Bioassessments	
					Escherichia coli	
					Fecal Coliform	
Town River Bay	MA74-15	From the headwaters at the Route 3A bridge, Quincy to the mouth at Weymouth Fore River between Shipyard and Germantown	0.46	SQUARE MILES	Enterococcus	
					Fecal Coliform	

Appendix 1
Assessment units and integrated list categories presented alphabetically by major watershed

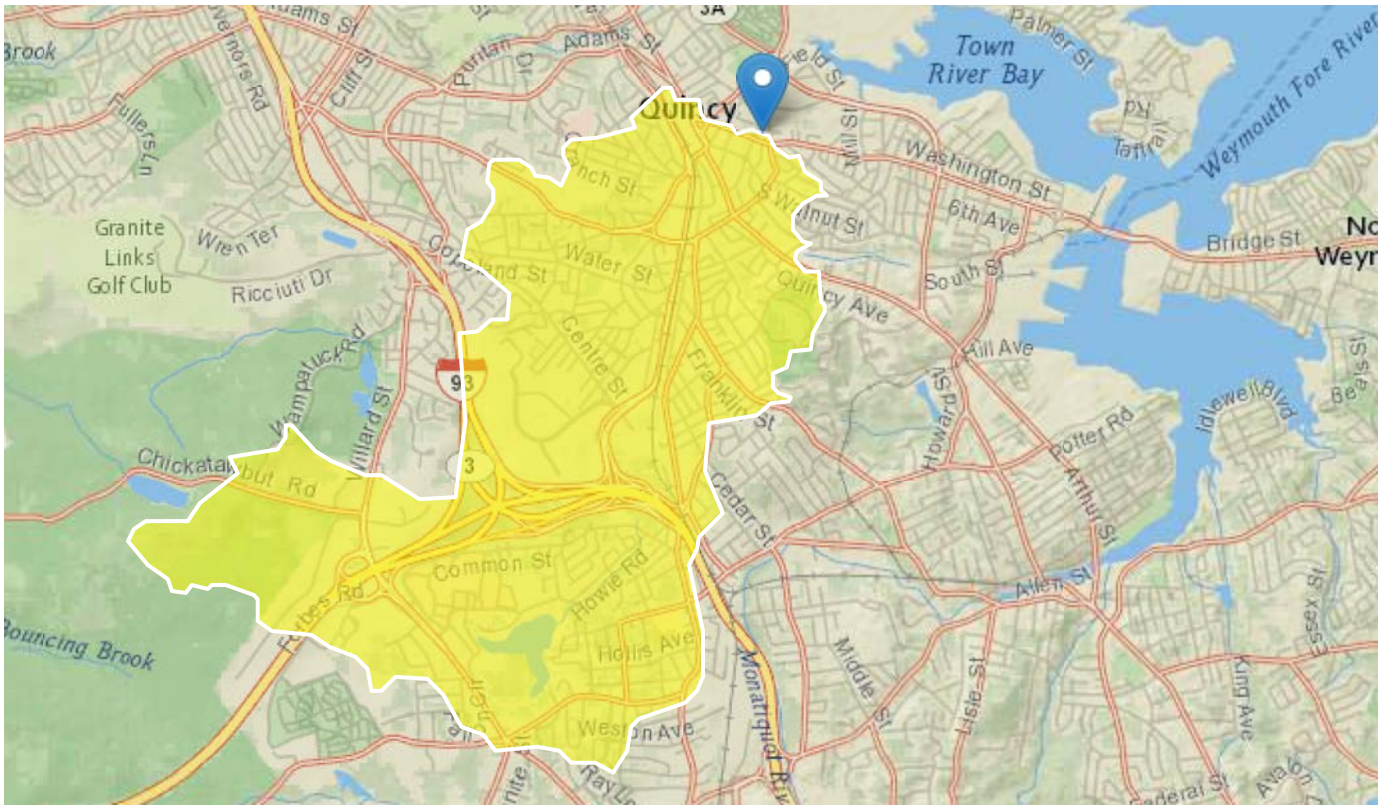
WATER BODY	SEGMENT ID	DESCRIPTION	SIZE	UNITS	CATEGORY
Town Brook	MA74-09	Headwaters, outlet Old Quincy Reservoir, Braintree to confluence with Town River Bay north of Route 3A, Quincy (SARIS note: includes "The Canal"/Town River) (portions culverted underground).	3.5	MILES	5
Town River Bay	MA74-15	From the headwaters at the Route 3A bridge, Quincy to the mouth at Weymouth Fore River between Shipyard and Germantown Points, Quincy.	0.46	SQUARE MILES	5
Trout Brook	MA74-12	Headwaters southwest of South Street, Holbrook to inlet Lake Holbrook, Holbrook.	1.2	MILES	3
Unnamed Tributary	MA74-19	Unnamed Tributary to Plymouth River, headwaters, west of Route 53 (Whiting Street), Hingham to mouth at confluence with Plymouth River, Hingham.	1.1	MILES	3
Weir River	MA74-02	Headwaters at confluence of Crooked Meadow River and Fulling Mill Brook, Hingham to Foundry Pond outlet, Hingham (through former pond segment Foundry Pond MA74011) (area associated with Weir River ACEC designated as ORW).	2.7	MILES	5
Weir River	MA74-11	From Foundry Pond outlet, Hingham to mouth at Worlds End, Hingham and Nantasket Road near Beech Avenue, Hull (including unnamed tributary from outlet Straits Pond, Hingham/Hull) (area associated with Weir River ACEC designated as ORW).	0.83	SQUARE MILES	5
Weymouth Back River	MA74-05	Headwaters, outlet Elias Pond, Weymouth to the base of the fish ladder north of Commercial Street,Weymouth (area associated with Weymouth Back River ACEC designated as ORW).	0.7	MILES	5
Weymouth Back River	MA74-13	From the base of the fish ladder north of Commercial Street, Weymouth to mouth between Lower Neck, Weymouth (to the west) and Wompatuck Road, Hingham (area associated with Weymouth Back River ACEC designated as ORW).	0.85	SQUARE MILES	5
Weymouth Fore River	MA74-14	Commercial Street, Braintree to mouth (eastern point at Lower Neck, Weymouth and western point at Wall Street on Houghs Neck, Quincy).	2.29	SQUARE MILES	5
Whitmans Pond	MA74025	Weymouth.	176	ACRES	5
Buzzards Bay					
"Inner" Sippican Harbor	MA95-70	The waters landward of a line from Allen Point, Marion around the southeastern tip of Ram Island, then westerly from the southern tip of Ram Island to the point of land south of Nyes Wharf, Marion excluding Hammett Cove (formerly reported as a portion of segment MA95-08).	0.57	SQUARE MILES	5
Abner Pond	MA95001	Plymouth.	9	ACRES	3
Acushnet River	MA95-31	Headwaters, outlet New Bedford Reservoir, Acushnet to Hamlin Street culvert, Acushnet.	2.9	MILES	5
Acushnet River	MA95-32	Hamlin Street culvert, Acushnet to culvert at Main Street, Acushnet.	1.1	MILES	5
Acushnet River	MA95-33	Outlet Main Street culvert, Acushnet to Coggeshall Street/Howland Road bridge, New Bedford/Fairhaven.	0.31	SQUARE MILES	5
Agawam River	MA95-28	Outlet Mill Pond, Wareham to Wareham WWTP outfall, Wareham.	0.61	MILES	3
Agawam River	MA95-29	Wareham WWTP outfall, Wareham to confluence with Wankinco River (forming headwaters of the Wareham River) just north of the Route 6 bridge, Wareham.	0.16	SQUARE MILES	5
ANGELINE BROOK	MA95-83	Perennial portion south of Charlotte White Road, Westport to mouth at West Branch Westport River (Angeline Cove), Westport.	4.4	MILES	5

Appendix 2
Impairments *added* to categories 4 or 5 of the integrated list in 2016
(waters listed alphabetically by major watershed)

Water Body	Segment ID	Category 2014	Category 2016	Impairment	Explanation
Old Swamp River	MA74-03	5	5	Escherichia coli	Impairment added based on new data/assessment.
PLYMOUTH RIVER	MA74-20	--	5	Escherichia coli	New segment - Impairment added based on new data/assessment.
Sylvan Lake	MA74021	5	5	Chlordane in Fish Tissue	Impairment changed from "Chlordane" to "Chlordane in Fish Tissue".
				DDT in Fish Tissue	Impairment changed from "DDT" to "DDT in Fish Tissue".
Town Brook	MA74-09	5	5	Escherichia coli	Impairment added based on new data/assessment.
Town River Bay	MA74-15	5	5	Enterococcus	Impairment added based on new data/assessment.
Weymouth Back River	MA74-05	5	5	Escherichia coli	Impairment added based on new data/assessment.
Weymouth Fore River	MA74-14	5	5	Enterococcus	Impairment added based on new data/assessment.
Whitmans Pond	MA74025	5	5	DDT in Fish Tissue	Impairment changed from "DDT" to "DDT in Fish Tissue".
Buzzards Bay					
Acushnet River	MA95-32	5	5	Aquatic Macroinvertebrate Bioassessments	Impairment added based on new data/assessment.
Acushnet River	MA95-33	5	5	Nutrient/Eutrophication Biological Indicators	Impairment added based on new data/assessment.
ANGELINE BROOK	MA95-83	--	5	Enterococcus	New segment - Impairment added based on new data/assessment.
Apponagansett Bay	MA95-39	5	5	Estuarine Bioassessments	Impairment added based on new data/assessment.
				Nutrient/Eutrophication Biological Indicators	Impairment added based on new data/assessment.
Dunham Pond	MA95044	3	5	Chlorophyll-a	Impairment added based on new data/assessment.
				Secchi disk transparency	Impairment added based on new data/assessment.
East Branch Westport River	MA95-41	5	5	Nutrient/Eutrophication Biological Indicators	Impairment added based on new data/assessment.
Fiddlers Cove	MA95-79	5	5	Estuarine Bioassessments	Impairment added based on new data/assessment.
				Fecal Coliform	Impairment added based on new data/assessment.
				Oxygen, Dissolved	Impairment added based on new data/assessment.
Halfway Pond	MA95178	3	5	Harmful Algal Bloom	Impairment added based on new data/assessment.
Inner Sippican Harbor	MA95-70	5	5	Estuarine Bioassessments	Impairment added based on new data/assessment.
KIRBY BROOK	MA95-82	--	5	Enterococcus	New segment - Impairment added based on new data/assessment.
Leonards Pond	MA95080	3	5	(Aquatic Plants (Macrophytes)*)	Impairment added based on new data/assessment.
				(Non-Native Aquatic Plants*)	Impairment added based on new data/assessment.
				Chlorophyll-a	Impairment added based on new data/assessment.
				Secchi disk transparency	Impairment added based on new data/assessment.
Mattapoisett River	MA95-36	3	5	Enterococcus	Impairment added based on new data/assessment.
				Escherichia coli	Impairment added based on new data/assessment.
Megansett Harbor	MA95-19	5	5	Fecal Coliform	Impairment added based on new data/assessment.

Town Brook StreamStats Report

Region ID: MA
Workspace ID: MA20180928165126256000
Clicked Point (Latitude, Longitude): 42.25058, -70.99777
Time: 2018-09-28 12:51:40 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4.22	square miles
BSLDEM250	Mean basin slope computed from 1:250K DEM	3.102	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.22	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless
ELEV	Mean Basin Elevation	98	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	1.77	percent

Peak-Flow Statistics Parameters [Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.22	square miles	0.16	512
ELEV	Mean Basin Elevation	98	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	1.77	percent	0	32.3

Peak-Flow Statistics Flow Report [Peak Statewide 2016 5156]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SEp
2 Year Peak Flood	135	ft^3/s	68.4	265	42.3
5 Year Peak Flood	221	ft^3/s	110	440	43.4
10 Year Peak Flood	287	ft^3/s	140	588	44.7
25 Year Peak Flood	384	ft^3/s	181	814	47.1
50 Year Peak Flood	464	ft^3/s	212	1020	49.4
100 Year Peak Flood	548	ft^3/s	243	1240	51.8
200 Year Peak Flood	641	ft^3/s	275	1490	54.1
500 Year Peak Flood	773	ft^3/s	340	1750	57.6

Peak-Flow Statistics Citations

Zarriello, P.J.,2017, Magnitude of flood flows at selected annual exceedance probabilities for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2016–5156, 99 p. (https://dx.doi.org/10.3133/sir20165156)

Low-Flow Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.22	square miles	1.61	149

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
BSLDEM250	Mean Basin Slope from 250K DEM	3.102	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.22	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

Low-Flow Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SE	SEp
7 Day 2 Year Low Flow	0.451	ft^3/s	0.155	1.27	49.5	49.5
7 Day 10 Year Low Flow	0.201	ft^3/s	0.0544	0.693	70.8	70.8

Low-Flow Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

Application Version: 4.2.1

APPENDIX D

WQBEL
Summary and Support

Enter number values in green boxes below		Notes:
Enter values in the units specified		
↓		Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approved
0.130	Q_R = Enter upstream flow in **MGD**	Saltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry
0.03024	Q_P = Enter discharge flow in **MGD**	Discharge flow is equal to the design flow or 1 MGD, whichever is less
0.0	Downstream 7Q10	Only if approved by State as the entry for Q_R, leave 0 if no entry
Enter a dilution factor, if other than zero		Saltwater (estuarine and marine): only if approved by the State
↓		Leave 0 if no entry
0		
Enter values in the units specified		
↓		
0	C_d = Enter influent hardness in **mg/L** $CaCO_3$	Freshwater only
20	C_s = Enter receiving water hardness in **mg/L** $CaCO_3$	
Enter **receiving water** concentrations in the units specified		pH, temperature, and ammonia required for all discharges
↓		Hardness required for freshwater
6.8	pH in **Standard Units**	Salinity required for saltwater (estuarine and marine)
13.2	Temperature in **°C**	Metals required for all discharges if present and if dilution factor is > 1
0.180	Ammonia in **mg/L**	Enter 0 if non-detect or testing not required
20	Hardness in **mg/L** $CaCO_3$	
0	Salinity in **ppt**	
0	Antimony in **µg/L**	
0	Arsenic in **µg/L**	
0	Cadmium in **µg/L**	
0	Chromium III in **µg/L**	
0	Chromium VI in **µg/L**	
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		if >1 sample, enter maximum
↓		if >10 samples, may enter 95th percentile
0	TRC in **µg/L**	Enter 0 if non-detect or testing not required
0.138	Ammonia in **mg/L**	
0	Antimony in **µg/L**	
2.02	Arsenic in **µg/L**	
0	Cadmium in **µg/L**	
0	Chromium III in **µg/L**	
0	Chromium VI in **µg/L**	
11.06	Copper in **µg/L**	
3160	Iron in **µg/L**	
26.75	Lead in **µg/L**	
0	Mercury in **µg/L**	
3.15	Nickel in **µg/L**	
0	Selenium in **µg/L**	
0	Silver in **µg/L**	
18.39	Zinc in **µg/L**	
0	Cyanide in **µg/L**	
0	Phenol in **µg/L**	
0	Carbon Tetrachloride in **µg/L**	
0	Tetrachloroethylene in **µg/L**	
0	Total Phthalates in **µg/L**	
0	Diethylhexylphthalate in **µg/L**	
0	Benzo(a)anthracene in **µg/L**	
0	Benzo(a)pyrene in **µg/L**	
0	Benzo(b)fluoranthene in **µg/L**	
0	Benzo(k)fluoranthene in **µg/L**	
0	Chrysene in **µg/L**	
0	Dibenzo(a,h)anthracene in **µg/L**	
0	Indeno(1,2,3-cd)pyrene in **µg/L**	
0	Methyl-tert butyl ether in **µg/L**	

Dilution Factor	5.3					
	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
A. Inorganics						
Ammonia	**Report**	mg/L	---			
Chloride	**Report**	µg/L	---			
Total Residual Chlorine	0.2	mg/L	**58**	µg/L	---	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	3391	µg/L		
Arsenic	**104**	µg/L	53	µg/L		
Cadmium	**10.2**	µg/L	0.3727	µg/L		
Chromium III	**323**	µg/L	103.0	µg/L		
Chromium VI	**323**	µg/L	60.6	µg/L		
Copper	242	µg/L	**10.5**	µg/L		
Iron	**5000**	µg/L	5299	µg/L		
Lead	160	µg/L	**1.67**	µg/L		
Mercury	**0.739**	µg/L	4.80	µg/L		
Nickel	**1450**	µg/L	59.3	µg/L		
Selenium	**235.8**	µg/L	26.5	µg/L		
Silver	**35.1**	µg/L	0.9	µg/L		
Zinc	**420**	µg/L	136.0	µg/L		
Cyanide	**178**	mg/L	27.6	µg/L	---	µg/L
B. Non-Halogenated VOCs						
Total BTEX	**100**	µg/L	---			
Benzene	**5.0**	µg/L	---			
1,4 Dioxane	**200**	µg/L	---			
Acetone	**7970**	µg/L	---			
Phenol	**1,080**	µg/L	1590	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**	µg/L	8.5	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	17.5	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	11.7	µg/L		

Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	**1.0**	µg/L	0.0201	µg/L	---	µg/L
Benzo(a)pyrene	**1.0**	µg/L	0.0201	µg/L	---	µg/L
Benzo(b)fluoranthene	**1.0**	µg/L	0.0201	µg/L	---	µg/L
Benzo(k)fluoranthene	**1.0**	µg/L	0.0201	µg/L	---	µg/L
Chrysene	**1.0**	µg/L	0.0201	µg/L	---	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.0201	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	**1.0**	µg/L	0.0201	µg/L	---	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	106	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

APPENDIX E

Groundwater Sampling Results

Legend

- November 2017 Waste Disposal Borings (Discrete Locations in 5-foot Depth Intervals)
- Aug./Sept. 2017 Waste Disposal Borings (Composited Across Sampling Area in 5-foot Depth Intervals)
- Northeast Geotechnical Inc. Soil Borings
- Strategic Environmental Services Inc. Soil Borings
- Monitoring Well
- Soil Boring
- Disposal Site Boundary
- Revised Sampling Areas
- Grid
- Property Boundary

Dennis Ryan Parkway

Cottage Ave

Revere Road

TESTED WELL

Approximate Extent of Work within Disposal Site Boundary on R-4 Parcel by LBC Boston

0 25 50 100 Feet

49 Dennis F. Ryan Parkway
Quincy, MA

Site Plan

FIGURE 2

WOODARD &CURRAN

Woodard & Curran shall assume no liability for any of the following; 1.Any errors, omissions, or inaccuracies in the information provided regardless of how caused or; 2.Any decision or action taken or not taken by the reader in reliance upon any information or data furnished hereunder.

1 inch = 50 feet	DOC: Fig.2 Site Plan.mxd
DATE: FEBRUARY 2018	PROJECT #: 228978
DRAWN BY: SMO	SOURCE: ESRI

Figure Exported: 2/12/2018 By: sdney Using: \\wolshared\Projects\22279 Quincy MA - Downtown Redevelopment\wip\GIS\Project Files\MXDs\2018 02 RAM Plan\Fig. 2 Site Plan.mxd

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA11-B7 (OW)

Project PROPOSED QUINCY CENTER REDEVELOPMENT, QUINCY, MA
Client HANCOCK ADAMS ASSOCIATES, LLC
Contractor GEOLOGIC-EARTH EXPLORATION, INC.

File No. 35571-006
Sheet No. 1 of 2
Start 11 May 2011
Finish 11 May 2011
Driller J. Galvin
H&A Rep. S. Shay
Elevation 20.0 (est.)
Datum NAVD 1988
Location See Plan

	Casing	Sampler	Barrel
Type	HW	S	-
Inside Diameter (in.)	4	1 3/8	-
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures:
Rig Make & Model: Mobile B-57 Drill Truck
Bit Type: Roller Bit
Drill Mud: None
Casing: HW Driven to 19.0 ft
Hoist/Hammer: Winch Doughnut Hammer
PID Make & Model: MiniRAE 2000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel %	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test: Dilatancy	Toughness	Plasticity	Strength
0						19.5	-ASPHALT-									
	8 12 14	S1 12	0.5 2.0	SP-SM		0.5	Medium dense brown poorly graded SAND with silt (SP-SM), mps 8 mm, no structure, no odor, dry PID = 0.0/0.0 ppm	5	5	20	20	40	10			
	16 12 10 7	S2 14	2.0 4.0	SP		18.0 2.0	Medium dense brown poorly graded SAND with gravel (SP), mps 2 cm, no structure, no odor, moist PID = 0.0/0.0 ppm	5	10	20	35	25	5			
5	18 10 6 4	S3 12	4.0 6.0	SP			Similar to above									
							-GRANULAR FILL-									
	12	S4	6.0	SP		13.5	Very dense dark brown poorly graded SAND (SP), mps 2 mm, no structure, no odor, wet			20	40	35	5			
	24 38 36	4 S4A 10	6.5 6.5 8.0	SM		6.5	Note: Possible perched water at 6.5 ft. PID = 0.0/0.0 ppm		10	15	30	30	15			
							Very dense olive-brown with irregular gray-brown coloring silty SAND (SM), mps 6 mm, variable sorting with pockets, no odor, moist PID = 0.0/0.0 ppm									
							-GLACIOFLUVIAL DEPOSITS-									
	8 13 23 53	S5 20	9.0 11.0	CL		10.5 9.5	Note: Stratum change at 9.5 ft based on change in effort to drive split spoon.					5	95			
10							Hard yellow-brown lean CLAY (CL), mps 2.5 cm has single rounded gravel piece, no structure, no odor, wet PID = 0.0/0.0 ppm									
							-GLACIAL TILL-									
	20 36 96 60	S6 18	14.0 16.0	CL			Hard yellow-brown brown sandy lean CLAY (CL), mps 2 cm, no structure, no odor, wet PID = 0.0/0.0 ppm		5	10	10	10	65			
15						2.5 17.5										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/12/11	0705	16	19.0	35.0	10.0

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft) 35.0
Rock Cored (ft) -
Samples S10
Boring No. HA11-B7 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-07-1 REV HA-LIB07-1-BOS GLB HA-TB+CORE+WELL-07-1 GDT G:\35571\FIELD DATA\-006\35571-006_TB.GPJ 6 Jul 11

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA11-B7 (OW)
File No. 35571-006
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	24 32 52 43	S7 18	19.0 21.0	SM			Very dense yellow-brown silty SAND (SM), mps 1.5 cm, no structure, no odor, wet PID = 0.0/0.0 ppm		5	10	15	25	45				
							-GLACIAL TILL-										
25	72 108	S8 10	24.0 25.0	SM			Similar to above		5	10	15	25	45				
30	100/4"	S9 3	29.0 29.3	ML			Very dense yellow-brown sandy SILT with gravel (ML), mps 2 cm, no structure, no odor, wet		15	5	5	5	70				
							Note: Color change from yellow-brown to olive-brown between 29.0 and 34.0 ft.										
35	68 110	S10 12	34.0 35.0	SM			Very dense olive-brown silty SAND with gravel (SM), mps 1.2 cm, no structure although well bonded, no odor, wet	5	10	15	15	20	35				
						-15.0 35.0	BOTTOM OF EXPLORATION 35.0 FT										
							Note: Groundwater observation well installed in completed borehole; well screen from 8.0 to 18.0 ft.										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. HA11-B7 (OW)

H&A-TEST BORING-07-1 REV HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\35571\FIELD DATA\-006\35571-006_TB.GPJ 6 Jul 11

HALEY & ALDRICH

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Well No. HA11-B7 (OW)
Boring No. HA11-B7 (OW)

Project PROPOSED QUINCY CENTER REDEVELOPMENT
Location QUINCY, MA
Client HANCOCK ADAMS ASSOCIATES, LLC
Contractor GEOLOGIC-EARTH EXPLORATION, INC.
Driller J. Galvin

Initial Water Level (depth bgs) 10.0 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 35571-006
Date Installed 11 May 2011
H&A Rep. S. Shay
Location See Plan

Ground El. 20.0 (est.)
Datum NAVD 1988

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	20.0
ASPHALT	0.5			0.5	19.5
GRANULAR FIL				5.0	15.0
	6.5			7.0	13.0
GLACIOFLUVIAL DEPOSITS				8.0	12.0
	9.5				
GLACIAL TILL (Clayey)					
	17.5			18.0	2.0
				20.0	0.0
GLACIAL TILL (Silty Sand)					
	35.0			35.0	-15.0

WELL CONSTRUCTION DETAILS

Type of protective cover: Pentagonal Center Bolt
Depth of Steel Road Box below ground surface: 0.0 ft
Depth of top of riser below ground surface: 0.2 ft
Type of protective casing: Steel Road Box
- Length: 0.9 ft
- Inside diameter: 4.0 in.
- Depth of bottom of Steel Road Box: 0.9 ft

Type of riser pipe: Schedule 40 PVC
- Inside diameter of riser pipe: 2.0 in.
- Depth of bottom of riser pipe: 8.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	0.5
Bentonite	5.0	2.0
Bentonite	20.0	15.0

Diameter of borehole: 4.5 in.
Depth to top of well screen: 8.0 ft
- Type of screen: Machine slotted Sch 40 PVC
- Screen gauge or size of openings: 0.010 in.
- Diameter of screen: 2.0 in.
- Type of Backfill around Screen: #0 Filter Sand
- Depth to bottom of well screen: 18.0 ft

Bottom of silt trap: -
Depth of bottom of borehole: 35.0 ft

ANALYTICAL REPORT

Lab Number:	L1837184
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	HANCOCK LOT
Project Number:	COUGHLIN ENV SERVICE
Report Date:	09/27/18

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1837184-01	HA11-B7 (OW)	WATER	25 COTTAGE AVE., QUINCY, MA	09/18/18 09:50	09/18/18

Project Name:	HANCOCK LOT	**Lab Number:**	L1837184
Project Number:	COUGHLIN ENV SERVICE	**Report Date:**	09/27/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name:	HANCOCK LOT	**Lab Number:**	L1837184
Project Number:	COUGHLIN ENV SERVICE	**Report Date:**	09/27/18

Case Narrative (continued)

Report Submission

The analysis of Ethanol was subcontracted. A copy of the laboratory report is included as an addendum.

Please note: This data is only available in PDF format and is not available on Data Merger.

Total Metals

The WG1161024-2 LCS recovery, associated with L1837184-01, is above the acceptance criteria for silver (117%); however, the associated sample is non-detect for this target analyte. The results of the original analysis are reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 09/27/18

ORGANICS

VOLATILES

Project Name: HANCOCK LOT **Lab Number:** L1837184

Project Number: COUGHLIN ENV SERVIC **Report Date:** 09/27/18

SAMPLE RESULTS

Lab ID: L1837184-01
Client ID: HA11-B7 (OW)
Sample Location: 25 COTTAGE AVE., QUINCY, MA

Date Collected: 09/18/18 09:50
Date Received: 09/18/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 128,624.1
Analytical Date: 09/20/18 22:36
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethane	ND		ug/l	1.5	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1
Trichloroethene	ND		ug/l	1.0	--	1
1,2-Dichlorobenzene	ND		ug/l	5.0	--	1
1,3-Dichlorobenzene	ND		ug/l	5.0	--	1
1,4-Dichlorobenzene	ND		ug/l	5.0	--	1
p/m-Xylene	ND		ug/l	2.0	--	1
o-xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
Acetone	ND		ug/l	10	--	1
Methyl tert butyl ether	ND		ug/l	10	--	1
Tert-Butyl Alcohol	ND		ug/l	100	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--	1

Project Name: HANCOCK LOT **Lab Number:** L1837184

Project Number: COUGHLIN ENV SERVIC **Report Date:** 09/27/18

SAMPLE RESULTS

Lab ID: L1837184-01 Date Collected: 09/18/18 09:50

Client ID: HA11-B7 (OW) Date Received: 09/18/18

Sample Location: 25 COTTAGE AVE., QUINCY, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	103		60-140
Fluorobenzene	96		60-140
4-Bromofluorobenzene	100		60-140

Project Name: HANCOCK LOT **Lab Number:** L1837184

Project Number: COUGHLIN ENV SERVIC **Report Date:** 09/27/18

SAMPLE RESULTS

Lab ID: L1837184-01
Client ID: HA11-B7 (OW)
Sample Location: 25 COTTAGE AVE., QUINCY, MA

Date Collected: 09/18/18 09:50
Date Received: 09/18/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 128,624.1-SIM
Analytical Date: 09/20/18 22:36
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	50	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	104		60-140
4-Bromofluorobenzene	103		60-140

Project Name: HANCOCK LOT **Lab Number:** L1837184

Project Number: COUGHLIN ENV SERVIC **Report Date:** 09/27/18

SAMPLE RESULTS

Lab ID: L1837184-01
Client ID: HA11-B7 (OW)
Sample Location: 25 COTTAGE AVE., QUINCY, MA

Date Collected: 09/18/18 09:50
Date Received: 09/18/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 09/26/18 12:56
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 09/26/18 10:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Microextractables by GC - Westborough Lab							
1,2-Dibromoethane	ND		ug/l	0.010	--	1	B

Project Name: HANCOCK LOT **Lab Number:** L1837184

Project Number: COUGHLIN ENV SERVICE **Report Date:** 09/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 09/20/18 12:11
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1159412-4					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
Tetrachloroethene	ND		ug/l	1.0	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Vinyl chloride	ND		ug/l	1.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--
Trichloroethene	ND		ug/l	1.0	--
1,2-Dichlorobenzene	ND		ug/l	5.0	--
1,3-Dichlorobenzene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	5.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Methyl tert butyl ether	ND		ug/l	10	--
Tert-Butyl Alcohol	ND		ug/l	100	--
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE
Lab Number: L1837184
Report Date: 09/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 09/20/18 12:11
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1159412-4					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	113		60-140
Fluorobenzene	99		60-140
4-Bromofluorobenzene	103		60-140

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE
Lab Number: L1837184
Report Date: 09/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1-SIM
Analytical Date: 09/20/18 12:11
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1159417-4					
1,4-Dioxane	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	105		60-140
4-Bromofluorobenzene	103		60-140

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE
Lab Number: L1837184
Report Date: 09/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 09/26/18 12:28
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 09/26/18 10:04

Parameter	Result	Qualifier	Units	RL	MDL	
Microextractables by GC - Westborough Lab for sample(s): 01 Batch: WG1161008-1						
1,2-Dibromoethane	ND		ug/l	0.010	--	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1159412-3								
Methylene chloride	100		-		60-140	-		28
1,1-Dichloroethane	85		-		50-150	-		49
Carbon tetrachloride	110		-		70-130	-		41
1,1,2-Trichloroethane	95		-		70-130	-		45
Tetrachloroethene	120		-		70-130	-		39
1,2-Dichloroethane	100		-		70-130	-		49
1,1,1-Trichloroethane	105		-		70-130	-		36
Benzene	95		-		65-135	-		61
Toluene	110		-		70-130	-		41
Ethylbenzene	110		-		60-140	-		63
Vinyl chloride	130		-		5-195	-		66
1,1-Dichloroethene	100		-		50-150	-		32
cis-1,2-Dichloroethene	90		-		60-140	-		30
Trichloroethene	90		-		65-135	-		48
1,2-Dichlorobenzene	100		-		65-135	-		57
1,3-Dichlorobenzene	95		-		70-130	-		43
1,4-Dichlorobenzene	105		-		65-135	-		57
p/m-Xylene	112		-		60-140	-		30
o-xylene	105		-		60-140	-		30
Acetone	96		-		40-160	-		30
Methyl tert butyl ether	90		-		60-140	-		30
Tert-Butyl Alcohol	79		-		60-140	-		30
Tertiary-Amyl Methyl Ether	80		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1159412-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	102				60-140
Fluorobenzene	97				60-140
4-Bromofluorobenzene	101				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1159417-3								
1,4-Dioxane	88		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	103				60-140
4-Bromofluorobenzene	101				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184

Report Date: 09/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab	Associated sample(s): 01		Batch: WG1161008-2						
1,2-Dibromoethane	106		-		80-120	-			B

Matrix Spike Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184

Report Date: 09/27/18

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*	*Column*
Microextractables by GC - Westborough Lab	Associated sample(s): 01	QC Batch ID: WG1161008-3		QC Sample: L1837184-01		Client ID: HA11-B7 (OW)							
1,2-Dibromoethane	ND	0.249	0.284	114		-	-		80-120	-		20	B

SEMIVOLATILES

Project Name: HANCOCK LOT
Lab Number: L1837184
Project Number: COUGHLIN ENV SERVIC
Report Date: 09/27/18

SAMPLE RESULTS

Lab ID: L1837184-01
Client ID: HA11-B7 (OW)
Sample Location: 25 COTTAGE AVE., QUINCY, MA

Date Collected: 09/18/18 09:50
Date Received: 09/18/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 129,625.1
Analytical Date: 09/21/18 12:30
Analyst: CB

Extraction Method: EPA 625.1
Extraction Date: 09/20/18 06:36

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	68		42-122
2-Fluorobiphenyl	64		46-121
4-Terphenyl-d14	67		47-138

Project Name: HANCOCK LOT **Lab Number:** L1837184

Project Number: COUGHLIN ENV SERVIC **Report Date:** 09/27/18

SAMPLE RESULTS

Lab ID: L1837184-01
Client ID: HA11-B7 (OW)
Sample Location: 25 COTTAGE AVE., QUINCY, MA

Date Collected: 09/18/18 09:50
Date Received: 09/18/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 09/21/18 17:24
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 09/20/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
Fluoranthene	ND		ug/l	0.10	--	1
Naphthalene	ND		ug/l	0.10	--	1
Benzo(a)anthracene	ND		ug/l	0.10	--	1
Benzo(a)pyrene	ND		ug/l	0.10	--	1
Benzo(b)fluoranthene	ND		ug/l	0.10	--	1
Benzo(k)fluoranthene	ND		ug/l	0.10	--	1
Chrysene	ND		ug/l	0.10	--	1
Acenaphthylene	ND		ug/l	0.10	--	1
Anthracene	ND		ug/l	0.10	--	1
Benzo(ghi)perylene	ND		ug/l	0.10	--	1
Fluorene	ND		ug/l	0.10	--	1
Phenanthrene	ND		ug/l	0.10	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--	1
Pyrene	ND		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	40		25-87
Phenol-d6	29		16-65
Nitrobenzene-d5	67		42-122
2-Fluorobiphenyl	65		46-121
2,4,6-Tribromophenol	88		45-128
4-Terphenyl-d14	66		47-138

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE
Lab Number: L1837184
Report Date: 09/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
Analytical Date: 09/20/18 11:27
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 09/19/18 15:02

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1158610-1					
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	61		42-122
2-Fluorobiphenyl	65		46-121
4-Terphenyl-d14	69		47-138

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE
Lab Number: L1837184
Report Date: 09/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1-SIM
Analytical Date: 09/20/18 10:16
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 09/19/18 15:03

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1158611-1					
Acenaphthene	ND		ug/l	0.10	--
Fluoranthene	ND		ug/l	0.10	--
Naphthalene	ND		ug/l	0.10	--
Benzo(a)anthracene	ND		ug/l	0.10	--
Benzo(a)pyrene	ND		ug/l	0.10	--
Benzo(b)fluoranthene	ND		ug/l	0.10	--
Benzo(k)fluoranthene	ND		ug/l	0.10	--
Chrysene	ND		ug/l	0.10	--
Acenaphthylene	ND		ug/l	0.10	--
Anthracene	ND		ug/l	0.10	--
Benzo(ghi)perylene	ND		ug/l	0.10	--
Fluorene	ND		ug/l	0.10	--
Phenanthrene	ND		ug/l	0.10	--
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--
Pyrene	ND		ug/l	0.10	--
Pentachlorophenol	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	33		25-87
Phenol-d6	23		16-65
Nitrobenzene-d5	58		42-122
2-Fluorobiphenyl	55		46-121
2,4,6-Tribromophenol	74		45-128
4-Terphenyl-d14	60		47-138

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1158610-2								
Bis(2-ethylhexyl)phthalate	105		-		29-137	-		30
Butyl benzyl phthalate	105		-		1-140	-		30
Di-n-butylphthalate	103		-		8-120	-		30
Di-n-octylphthalate	112		-		19-132	-		30
Diethyl phthalate	98		-		1-120	-		30
Dimethyl phthalate	89		-		1-120	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	95				42-122
2-Fluorobiphenyl	84				46-121
4-Terphenyl-d14	83				47-138

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184

Report Date: 09/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1158611-2								
Acenaphthene	74		-		60-132	-		30
Fluoranthene	82		-		43-121	-		30
Naphthalene	61		-		36-120	-		30
Benzo(a)anthracene	78		-		42-133	-		30
Benzo(a)pyrene	83		-		32-148	-		30
Benzo(b)fluoranthene	84		-		42-140	-		30
Benzo(k)fluoranthene	82		-		25-146	-		30
Chrysene	80		-		44-140	-		30
Acenaphthylene	66		-		54-126	-		30
Anthracene	84		-		43-120	-		30
Benzo(ghi)perylene	83		-		1-195	-		30
Fluorene	77		-		70-120	-		30
Phenanthrene	78		-		65-120	-		30
Dibenzo(a,h)anthracene	83		-		1-200	-		30
Indeno(1,2,3-cd)pyrene	87		-		1-151	-		30
Pyrene	82		-		70-120	-		30
Pentachlorophenol	63		-		38-152	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184

Report Date: 09/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1158611-2								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	42				25-87
Phenol-d6	30				16-65
Nitrobenzene-d5	72				42-122
2-Fluorobiphenyl	56				46-121
2,4,6-Tribromophenol	88				45-128
4-Terphenyl-d14	67				47-138

PCBS

Project Name: HANCOCK LOT
Lab Number: L1837184
Project Number: COUGHLIN ENV SERVIC
Report Date: 09/27/18

SAMPLE RESULTS

Lab ID: L1837184-01
Client ID: HA11-B7 (OW)
Sample Location: 25 COTTAGE AVE., QUINCY, MA

Date Collected: 09/18/18 09:50
Date Received: 09/18/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 09/25/18 06:30
Analyst: AWS

Extraction Method: EPA 608.3
Extraction Date: 09/22/18 11:33
Cleanup Method: EPA 3665A
Cleanup Date: 09/23/18
Cleanup Method: EPA 3660B
Cleanup Date: 09/23/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/l	0.250	--	1	A
Aroclor 1221	ND		ug/l	0.250	--	1	A
Aroclor 1232	ND		ug/l	0.250	--	1	A
Aroclor 1242	ND		ug/l	0.250	--	1	A
Aroclor 1248	ND		ug/l	0.250	--	1	A
Aroclor 1254	ND		ug/l	0.250	--	1	A
Aroclor 1260	ND		ug/l	0.200	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	85		37-123	B
Decachlorobiphenyl	71		38-114	B
2,4,5,6-Tetrachloro-m-xylene	81		37-123	A
Decachlorobiphenyl	64		38-114	A

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE
Lab Number: L1837184
Report Date: 09/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 127,608.3
Analytical Date: 09/25/18 06:05
Analyst: AWS

Extraction Method: EPA 608.3
Extraction Date: 09/22/18 11:33
Cleanup Method: EPA 3665A
Cleanup Date: 09/23/18
Cleanup Method: EPA 3660B
Cleanup Date: 09/23/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1159721-1						
Aroclor 1016	ND		ug/l	0.250	--	A
Aroclor 1221	ND		ug/l	0.250	--	A
Aroclor 1232	ND		ug/l	0.250	--	A
Aroclor 1242	ND		ug/l	0.250	--	A
Aroclor 1248	ND		ug/l	0.250	--	A
Aroclor 1254	ND		ug/l	0.250	--	A
Aroclor 1260	ND		ug/l	0.200	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	83		37-123	B
Decachlorobiphenyl	85		38-114	B
2,4,5,6-Tetrachloro-m-xylene	80		37-123	A
Decachlorobiphenyl	80		38-114	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184

Report Date: 09/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 Batch: WG1159721-2									
Aroclor 1016	85		-		50-140	-		36	A
Aroclor 1260	85		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	95				37-123	B
Decachlorobiphenyl	93				38-114	B
2,4,5,6-Tetrachloro-m-xylene	93				37-123	A
Decachlorobiphenyl	82				38-114	A

METALS

Project Name: HANCOCK LOT
Lab Number: L1837184
Project Number: COUGHLIN ENV SERVIC
Report Date: 09/27/18

SAMPLE RESULTS

Lab ID: L1837184-01
Client ID: HA11-B7 (OW)
Sample Location: 25 COTTAGE AVE., QUINCY, MA
Date Collected: 09/18/18 09:50
Date Received: 09/18/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.00400	--	1	09/26/18 10:55	09/26/18 15:27	EPA 3005A	3,200.8	AM
Arsenic, Total	0.00202		mg/l	0.00100	--	1	09/26/18 10:55	09/26/18 15:27	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/26/18 10:55	09/26/18 15:27	EPA 3005A	3,200.8	AM
Chromium, Total	0.00249		mg/l	0.00100	--	1	09/26/18 10:55	09/26/18 15:27	EPA 3005A	3,200.8	AM
Copper, Total	0.01106		mg/l	0.00100	--	1	09/26/18 10:55	09/26/18 15:27	EPA 3005A	3,200.8	AM
Iron, Total	3.16		mg/l	0.050	--	1	09/26/18 10:55	09/27/18 10:42	EPA 3005A	19,200.7	PS
Lead, Total	0.02675		mg/l	0.00100	--	1	09/26/18 10:55	09/26/18 15:27	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/20/18 14:09	09/20/18 22:43	EPA 245.1	3,245.1	MG
Nickel, Total	0.00315		mg/l	0.00200	--	1	09/26/18 10:55	09/26/18 15:27	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/26/18 10:55	09/26/18 15:27	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/26/18 10:55	09/26/18 15:27	EPA 3005A	3,200.8	AM
Zinc, Total	0.01839		mg/l	0.01000	--	1	09/26/18 10:55	09/26/18 15:27	EPA 3005A	3,200.8	AM
General Chemistry - Mansfield Lab											
Chromium, Trivalent	ND		mg/l	0.010	--	1		09/26/18 15:27	NA	107,-	

Project Name: HANCOCK LOT **Lab Number:** L1837184

Project Number: COUGHLIN ENV SERVIC **Report Date:** 09/27/18

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1159019-1										
Mercury, Total	ND		mg/l	0.00020	--	1	09/20/18 14:09	09/20/18 22:28	3,245.1	MG

Prep Information

Digestion Method: EPA 245.1

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1161024-1										
Antimony, Total	ND		mg/l	0.00400	--	1	09/26/18 10:55	09/26/18 15:15	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/26/18 10:55	09/26/18 15:15	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/26/18 10:55	09/26/18 15:15	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/26/18 10:55	09/26/18 15:15	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	09/26/18 10:55	09/26/18 15:15	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/26/18 10:55	09/26/18 15:15	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	09/26/18 10:55	09/26/18 15:15	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/26/18 10:55	09/26/18 15:15	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/26/18 10:55	09/26/18 15:15	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	09/26/18 10:55	09/26/18 15:15	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1161028-1										
Iron, Total	ND		mg/l	0.050	--	1	09/26/18 10:55	09/27/18 10:32	19,200.7	PS

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184

Report Date: 09/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1159019-2								
Mercury, Total	91		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1161024-2								
Antimony, Total	103		-		85-115	-		
Arsenic, Total	108		-		85-115	-		
Cadmium, Total	104		-		85-115	-		
Chromium, Total	100		-		85-115	-		
Copper, Total	99		-		85-115	-		
Lead, Total	96		-		85-115	-		
Nickel, Total	99		-		85-115	-		
Selenium, Total	103		-		85-115	-		
Silver, Total	**117**	Q	-		85-115	-		
Zinc, Total	110		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1161028-2								
Iron, Total	108		-		85-115	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1159019-3 QC Sample: L1836615-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00411	82		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1159019-5 QC Sample: L1836757-08 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00387	77		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1161024-3 QC Sample: L1837184-01 Client ID: HA11-B7 (OW)												
Antimony, Total	ND	0.5	0.5547	111		-	-		70-130	-		20
Arsenic, Total	0.00202	0.12	0.1220	100		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05138	101		-	-		70-130	-		20
Chromium, Total	0.00249	0.2	0.2034	100		-	-		70-130	-		20
Copper, Total	0.01106	0.25	0.2718	104		-	-		70-130	-		20
Lead, Total	0.02675	0.51	0.5145	96		-	-		70-130	-		20
Nickel, Total	0.00315	0.5	0.5153	102		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1236	103		-	-		70-130	-		20
Silver, Total	ND	0.05	0.05974	119		-	-		70-130	-		20
Zinc, Total	0.01839	0.5	0.5861	114		-	-		70-130	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1161024-5 QC Sample: L1837404-01 Client ID: MS Sample									
Antimony, Total	ND	0.5	0.4972	99	-	-	70-130	-	20
Arsenic, Total	0.0062	0.12	0.1343	107	-	-	70-130	-	20
Cadmium, Total	ND	0.051	0.05688	112	-	-	70-130	-	20
Chromium, Total	0.0023	0.2	0.1870	92	-	-	70-130	-	20
Copper, Total	0.05996	0.25	0.2861	90	-	-	70-130	-	20
Lead, Total	0.0040	0.51	0.5828	113	-	-	70-130	-	20
Nickel, Total	0.0024	0.5	0.4710	94	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1353	113	-	-	70-130	-	20
Silver, Total	ND	0.05	0.05586	112	-	-	70-130	-	20
Zinc, Total	0.0876	0.5	0.6052	104	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1161028-3 QC Sample: L1837184-01 Client ID: HA11-B7 (OW)									
Iron, Total	3.16	1	4.23	107	-	-	75-125	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1159019-4 QC Sample: L1836615-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1159019-6 QC Sample: L1836757-08 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1161024-4 QC Sample: L1837184-01 Client ID: HA11-B7 (OW)						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.00202	0.00191	mg/l	6		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.00249	0.00288	mg/l	14		20
Copper, Total	0.01106	0.01074	mg/l	3		20
Lead, Total	0.02675	0.02537	mg/l	5		20
Nickel, Total	0.00315	0.00298	mg/l	6		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.01839	0.01838	mg/l	0		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1161024-6 QC Sample: L1837404-01 Client ID: DUP Sample						
Copper, Total	0.05996	0.05893	mg/l	2		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1161028-4 QC Sample: L1837184-01 Client ID: HA11-B7 (OW)						
Iron, Total	3.16	3.22	mg/l	2		20

INORGANICS
&
MISCELLANEOUS

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE
Lab Number: L1837184
Report Date: 09/27/18

SAMPLE RESULTS

Lab ID: L1837184-01
Client ID: HA11-B7 (OW)
Sample Location: 25 COTTAGE AVE., QUINCY, MA
Date Collected: 09/18/18 09:50
Date Received: 09/18/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	18.		mg/l	5.0	NA	1	-	09/20/18 11:55	121,2540D	DR
Cyanide, Total	ND		mg/l	0.005	--	1	09/19/18 12:10	09/19/18 14:43	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	09/19/18 08:01	121,4500CL-D	MA
Nitrogen, Ammonia	0.138		mg/l	0.075	--	1	09/19/18 13:30	09/19/18 23:06	121,4500NH3-BH	AT
TPH, SGT-HEM	ND		mg/l	4.00	--	1	09/19/18 16:25	09/19/18 21:30	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	09/19/18 09:14	09/19/18 13:29	4,420.1	BR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/18 02:30	09/19/18 03:09	1,7196A	MA
Anions by Ion Chromatography - Westborough Lab										
Chloride	285.		mg/l	25.0	--	50	-	09/21/18 19:10	44,300.0	JR

Project Name: HANCOCK LOT **Lab Number:** L1837184

Project Number: COUGHLIN ENV SERVICE **Report Date:** 09/27/18

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1158351-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/18 02:30	09/19/18 03:05	1,7196A	MA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1158433-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/19/18 13:30	09/19/18 22:58	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1158447-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	09/19/18 08:01	121,4500CL-D	MA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1158477-1										
Phenolics, Total	ND		mg/l	0.030	--	1	09/19/18 09:14	09/19/18 13:21	4,420.1	BR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1158480-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/19/18 12:10	09/19/18 14:28	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1158638-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	09/19/18 16:25	09/19/18 21:30	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1158941-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/20/18 11:55	121,2540D	DR
Anions by Ion Chromatography - Westborough Lab for sample(s): 01 Batch: WG1159778-1										
Chloride	ND		mg/l	0.500	--	1	-	09/21/18 17:58	44,300.0	JR

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1158351-2								
Chromium, Hexavalent	97		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1158433-2								
Nitrogen, Ammonia	84		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1158447-2								
Chlorine, Total Residual	101		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1158477-2								
Phenolics, Total	102		-		70-130	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1158480-2								
Cyanide, Total	107		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1158638-2								
TPH	90		-		64-132	-		34
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 Batch: WG1159778-2								
Chloride	105		-		90-110	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158351-4 QC Sample: L1837184-01 Client ID: HA11-B7 (OW)												
Chromium, Hexavalent	ND	0.1	0.104	104		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158433-4 QC Sample: L1837129-03 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.91	98		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158447-4 QC Sample: L1837184-01 Client ID: HA11-B7 (OW)												
Chlorine, Total Residual	ND	0.248	0.21	85		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158477-4 QC Sample: L1837080-01 Client ID: MS Sample												
Phenolics, Total	ND	0.4	0.41	103		-	-		70-130	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158480-4 QC Sample: L1836929-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.182	91		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158638-4 QC Sample: L1837015-01 Client ID: MS Sample												
TPH	ND	20	14.8	74		-	-		64-132	-		34
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1159778-3 QC Sample: L1837423-02 Client ID: MS Sample												
Chloride	322	100	450	**129**	Q	-	-		90-110	-		18

Lab Duplicate Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184

Report Date: 09/27/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158351-3 QC Sample: L1837184-01 Client ID: HA11-B7 (OW)						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158433-3 QC Sample: L1837129-03 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158447-3 QC Sample: L1837022-01 Client ID: DUP Sample						
Chlorine, Total Residual	5.0	5.2	mg/l	4		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158477-3 QC Sample: L1837080-01 Client ID: DUP Sample						
Phenolics, Total	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158480-3 QC Sample: L1836929-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158638-3 QC Sample: L1837015-01 Client ID: DUP Sample						
TPH	ND	ND	mg/l	NC		34
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1158941-2 QC Sample: L1837217-01 Client ID: DUP Sample						
Solids, Total Suspended	460	470	mg/l	2		29
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1159778-4 QC Sample: L1837423-02 Client ID: DUP Sample						
Chloride	322	324	mg/l	1		18

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1837184-01A	Plastic 250ml HNO3 preserved	A	<2	<2	3.7	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1837184-01B	Amber 1000ml Na2S2O3	A	7	7	3.7	Y	Absent		PCB-608.3(7)
L1837184-01C	Amber 1000ml Na2S2O3	A	7	7	3.7	Y	Absent		PCB-608.3(7)
L1837184-01D	Amber 1000ml Na2S2O3	A	7	7	3.7	Y	Absent		PCB-608.3(7)
L1837184-01E	Amber 1000ml Na2S2O3	A	7	7	3.7	Y	Absent		PCB-608.3(7)
L1837184-01F	Amber 1000ml Na2S2O3	A	7	7	3.7	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1837184-01G	Amber 1000ml Na2S2O3	A	7	7	3.7	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1837184-01H	Vial HCl preserved	A	NA		3.7	Y	Absent		SUB-ETHANOL(14)
L1837184-01I	Vial HCl preserved	A	NA		3.7	Y	Absent		SUB-ETHANOL(14)
L1837184-01J	Vial HCl preserved	A	NA		3.7	Y	Absent		SUB-ETHANOL(14)
L1837184-01K	Vial Na2S2O3 preserved	A	NA		3.7	Y	Absent		504(14)
L1837184-01L	Vial Na2S2O3 preserved	A	NA		3.7	Y	Absent		504(14)
L1837184-01M	Vial Na2S2O3 preserved	A	NA		3.7	Y	Absent		504(14)
L1837184-01N	Vial Na2S2O3 preserved	A	NA		3.7	Y	Absent		504(14)
L1837184-01O	Vial Na2S2O3 preserved	A	NA		3.7	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1837184-01P	Vial Na2S2O3 preserved	A	NA		3.7	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1837184-01Q	Vial Na2S2O3 preserved	A	NA		3.7	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1837184-01R	Vial Na2S2O3 preserved	A	NA		3.7	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1837184-01S	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		CL-300(28),HEXCR-7196(1),TRC-4500(1)
L1837184-01T	Plastic 500ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		NH3-4500(28)
L1837184-01U	Plastic 250ml NaOH preserved	A	>12	>12	3.7	Y	Absent		TCN-4500(14)

*Values in parentheses indicate holding time in days

Project Name: HANCOCK LOT
Project Number: COUGHLIN ENV SERVICE

Lab Number: L1837184
Report Date: 09/27/18

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1837184-01V	Amber 1000ml HCl preserved	A	NA		3.7	Y	Absent		TPH-1664(28)
L1837184-01W	Amber 1000ml HCl preserved	A	NA		3.7	Y	Absent		TPH-1664(28)
L1837184-01X	Amber 950ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		TPHENOL-420(28)
L1837184-01Y	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		TSS-2540(7)

*Values in parentheses indicate holding time in days

Project Name:	HANCOCK LOT	**Lab Number:**	L1837184
Project Number:	COUGHLIN ENV SERVICE	**Report Date:**	09/27/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample¿s toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: Data Usability Report

Project Name:	HANCOCK LOT	**Lab Number:**	L1837184
Project Number:	COUGHLIN ENV SERVICE	**Report Date:**	09/27/18

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	HANCOCK LOT	**Lab Number:**	L1837184
Project Number:	COUGHLIN ENV SERVICE	**Report Date:**	09/27/18

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.

4 Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Revised March 1983.

14 Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water. EPA/600/4-88/039, Revised July 1991.

19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

74 Method 1664,Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.

107 Alpha Analytical - In-house calculation method.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

127 Method 608.3: Organochlorine Pesticides and PCBs by GC/HSD, EPA 821-R-16-009, December 2016.

128 Method 624.1: Purgeables by GC/MS, EPA 821-R-16-008, December 2016.

129 Method 625.1: Base/Neutrals and Acids by GC/MS, EPA 821-R-16-007, December 2016.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

EST Associates, Inc.
51 Fremont Street Needham, MA 02494 Tel: 781-455-0003, Fax: 781-455-8336

L1837184

CHAIN OF CUSTODY RECORD

Laboratory: Alpha Analytical

Client	Coughlin Environmental Services, LLC
Address	62 Montvale Avenue, Suite H
Contact	Stoneham, MA 02180-3637
Phone #	
Project Name	Hancock Lot
Address	25 Cottage Avenue, Quincy, MA
Contact	Dan Coughlin tel: 781-832-1002 X203
Location ID #	Mult Locs Fax: 781-438-9654
Description	NPDES RGP Sampling PO# 2590-08X

MATRIX
1. Wastewater
2. Groundwater
3. Drinking Water
4. Soil
5. Surface Water
6. Other

EST to Invoice: Coughlin Envtl
Lab to Invoice: EST (ALPHA Q#6361)
Lab Report to: dcoughlin@coughlinenvironmental.com
Billing Reference: Q#00541

Field ID / Point of Collection	Collection Date	Collection Time	Matrix	# of bottles Glass	# of bottles Plastic	# of bottles VOA's	Preservation HCL	NaOH	HNO3	H2SO4	MEOH	Other	None	TSS SM 2540	TRC - SM 4500, CrVI, Cl by IC EPA 300.0	Total CN - SM 4500	TPH by EPA 1664	EDB & DBCP 504, RGP 624.1 & EPA 624.1-SIM-RGP	Total Phenol - EPA 420.1	Total RGP Metals	RGP ABN 625.1 , EPA 625.1-SIM & PCB-608.3	Ammonia Nitrogen SM 4500	SUB-ETHANOL (by 1671 Rev. A)	Comments:
HA11-B7 (OW)	9/18/18	0950	2	9	5	11	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	
~~SB-23/MW-23~~			2	9	5	11	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	
~~SB-14/MW-14~~			2	9	5	11	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	

Turnaround Information
- Std. 10 Day Turnaround
- 7 Day RUSH
- 6 Day RUSH
- 3 Day RUSH
- 2 Day RUSH
- 1 Day RUSH

Approved By:

QA/QC
SPECIAL QA/QC or DATA Requirements:

Additional Information
EACH BOTTLE SET TO INCLUDE:
TPH: (2) 1L Glass Amber w/HCl; **Phenol**: (1) 1L Glass w/H2SO4; **625/PCB**: (6) 1L Ambers w/Na2S2O3; **CrVI/TRC/Cl**: (1) 1L P w/NP; **TSS**: (1) 1L P w/NP; **Metals**: (1) 250ml P w/HNO3; **NH3**: (1) 500ml P w/H2SO4; **TCN**: (1) 250ml P w/NaOH; **504/624:** (8) 40ml Vials w/Na2S2O3; SUB **Ethanol**: (3) 40ml Vials w/HCl

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler: 1		Date Time: 9/18/18 1300	Received By: 1 AAL	Date Time: 9/18/18 16:00	
Relinquished by Sampler: 2 AAL		Date Time: 9/18/18 17:00	Received By: 2	Date Time:	
Relinquished by Sampler: 3	Date Time:	Received By: 3	Date Time:	Seal #	Preserve where applicable ☐ On Ice ☐ Temp.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-159588-1
Client Project/Site: L1837184

For:
Alpha Analytical Inc
145 Flanders Road
Westborough, Massachusetts 01581-1019

Attn: Ashaley Kane

Authorized for release by:
9/27/2018 4:30:59 PM

Ken Hayes, Project Manager II
(615)301-5035
ken.hayes@testamericainc.com

Table of Contents

Sample Summary

Client: Alpha Analytical Inc
Project/Site: L1837184

TestAmerica Job ID: 490-159588-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-159588-1	HA11-B7 (OW)	Water	09/18/18 09:50	09/20/18 09:10

Case Narrative

Client: Alpha Analytical Inc
Project/Site: L1837184

TestAmerica Job ID: 490-159588-1

Job ID: 490-159588-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-159588-1

Comments
No additional comments.

Receipt
The sample was received on 9/20/2018 9:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.4° C.

GC Semi VOA
Method 1671A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 490-545383.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Alpha Analytical Inc
Project/Site: L1837184

TestAmerica Job ID: 490-159588-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1837184

TestAmerica Job ID: 490-159588-1

Client Sample ID: HA11-B7 (OW)

Date Collected: 09/18/18 09:50
Date Received: 09/20/18 09:10

Lab Sample ID: 490-159588-1

Matrix: Water

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L			09/25/18 18:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*84*		*70 - 130*		*09/25/18 18:25*	*1*

QC Sample Results

Client: Alpha Analytical Inc
Project/Site: L1837184

TestAmerica Job ID: 490-159588-1

Method: 1671A - Ethanol (GC/FID)

Lab Sample ID: MB 490-545383/4
Matrix: Water
Analysis Batch: 545383

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L			09/25/18 17:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*94*		*70 - 130*		*09/25/18 17:30*	*1*

Lab Sample ID: LCS 490-545383/5
Matrix: Water
Analysis Batch: 545383

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ethanol			50200	52840		ug/L		105	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Isopropyl acetate (Surr)	*77*		*70 - 130*

Lab Sample ID: LCSD 490-545383/6
Matrix: Water
Analysis Batch: 545383

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethanol			50200	55740		ug/L		111	70 - 130	5	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Isopropyl acetate (Surr)	*80*		*70 - 130*

QC Association Summary

Client: Alpha Analytical Inc
Project/Site: L1837184

TestAmerica Job ID: 490-159588-1

GC VOA

Analysis Batch: 545383

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-159588-1	HA11-B7 (OW)	Total/NA	Water	1671A	
MB 490-545383/4	Method Blank	Total/NA	Water	1671A	
LCS 490-545383/5	Lab Control Sample	Total/NA	Water	1671A	
LCSD 490-545383/6	Lab Control Sample Dup	Total/NA	Water	1671A	

Lab Chronicle

Client: Alpha Analytical Inc
Project/Site: L1837184

TestAmerica Job ID: 490-159588-1

Client Sample ID: HA11-B7 (OW)

Date Collected: 09/18/18 09:50
Date Received: 09/20/18 09:10

Lab Sample ID: 490-159588-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	1671A		1			545383	09/25/18 18:25	AAB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Alpha Analytical Inc
Project/Site: L1837184

TestAmerica Job ID: 490-159588-1

Method	Method Description	Protocol	Laboratory
1671A	Ethanol (GC/FID)	EPA	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Alpha Analytical Inc
Project/Site: L1837184

TestAmerica Job ID: 490-159588-1

Laboratory: TestAmerica Nashville

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2938	10-31-18

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
1671A		Water	Ethanol

Maine	State Program	1	TN00032	11-03-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
1671A		Water	Ethanol

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-159588 Chain of Custody

Cooler Received/Opened On 09-20-2018 @ 09:10

Time Samples Removed From Cooler 17:00 Time Samples Placed In Storage 17:13 (2 Hour Window)

1. Tracking # 1ZE306540490772 (last 4 digits, FedEx) Courier: UPS NEXT DAY AIR
   IR Gun ID 31470368 (8923) pH Strip Lot N/A Chlorine Strip Lot N/A
2. Temperature of rep. sample or temp blank when opened: 4.4 *Degrees Celsius*
3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO (NA)
4. Were custody seals on outside of cooler? YES (NO) NA
   If yes, how many and where: none
5. Were the seals intact, signed, and dated correctly? YES NO (NA)
6. Were custody papers inside cooler? (YES) NO NA

I certify that I opened the cooler and answered questions 1-6 (intial) JJ

7. Were custody seals on containers: YES (NO) and Intact YES NO (NA)
   Were these signed and dated correctly? YES NO (NA)
8. Packing mat'l used? (Bubblewrap) Plastic bag Peanuts Vermiculite Foam Insert Paper Other None
9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None
10. Did all containers arrive in good condition (unbroken)? (YES) NO NA
11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA
12. Did all container labels and tags agree with custody papers? (YES) NO NA
13a. Were VOA vials received? (YES) NO NA
   b. Was there any observable headspace present in any VOA vial? YES (NO) NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES (NO) NA If multiple coolers, sequence #

I certify that I unloaded the cooler and answered questions 7-14 (intial) KI

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES NO (NA)
   b. Did the bottle labels indicate that the correct preservatives were used (YES) NO NA
16. Was residual chlorine present? YES NO (NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) KI

17. Were custody papers properly filled out (ink, signed, etc)? (YES) NO NA
18. Did you sign the custody papers in the appropriate place? (YES) NO NA
19. Were correct containers used for the analysis requested? (YES) NO NA
20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) KI

I certify that I attached a label with the unique LIMS number to each container (intial) KI

21. Were there Non-Conformance issues at login? YES (NO) Was a NCM generated? YES (NO) #

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

Subcontract Chain of Custody

Test America (Nashville)
2960 Foster Creighton Drive
Nashville, TN 37204

Alpha Job Number
L1837184

Client Information	Project Information	Regulatory Requirements/Report Limits
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 508-439-5132 Email: akane@alphalab.com	Project Location: MA Project Manager: Ashaley Kane **Turnaround & Deliverables Information** Due Date: 10/04/18 Deliverables:	State/Federal Program: Regulatory Criteria:

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L1837184

Report to include Method Blank, LCS/LCSD:

Additional Comments: Send all results/reports to subreports@alphalab.com

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
	HA11-B7 (OW)	09-18-18 09:50	WATER	Ethanol by EPA 1671 Revision A	

.oc: 490
159588

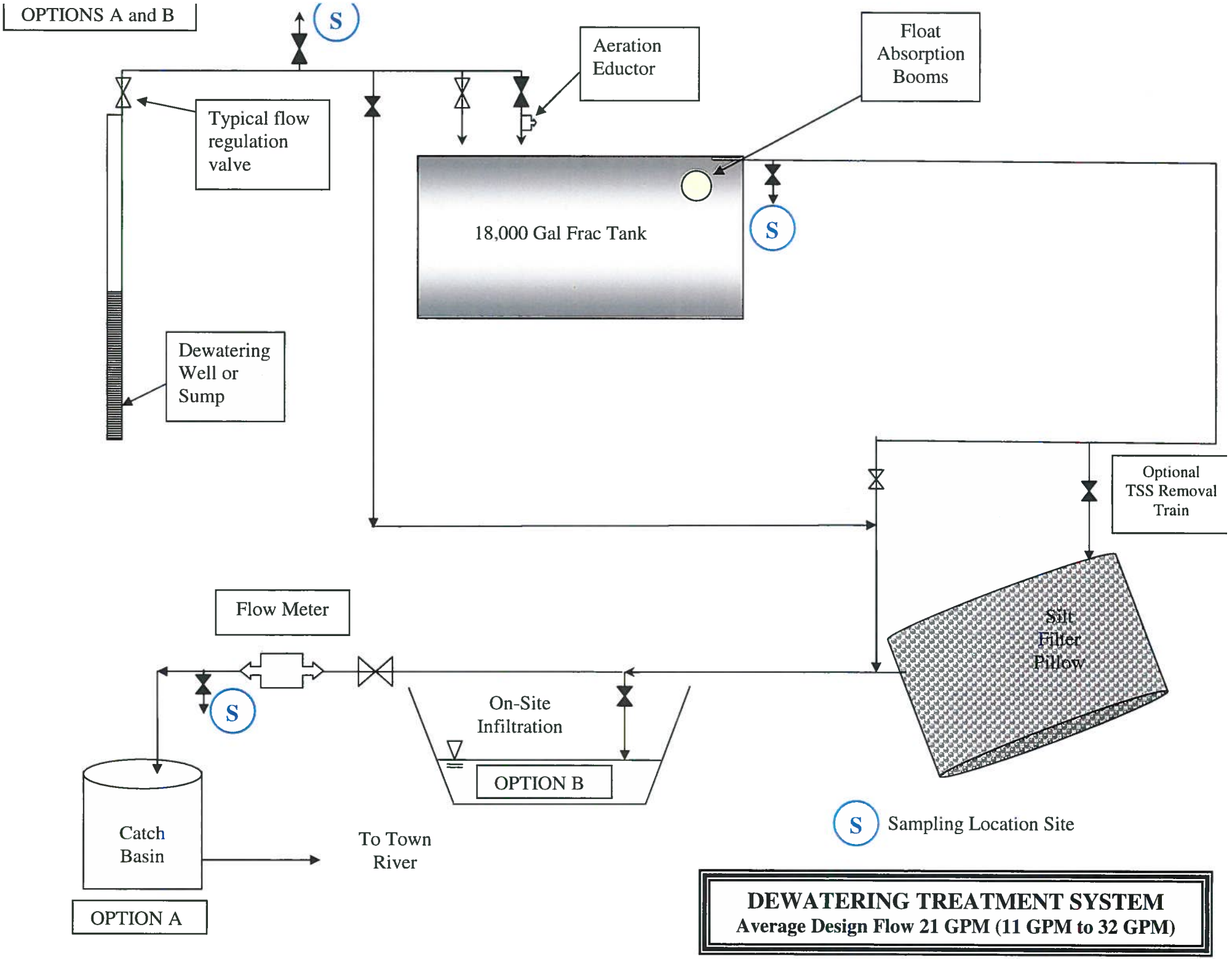
Relinquished By:	Date/Time:	Received By:	Date/Time:
Chris Tebeau	9/19/18 14:11	TA-NAS	09-20-201Y 09:10

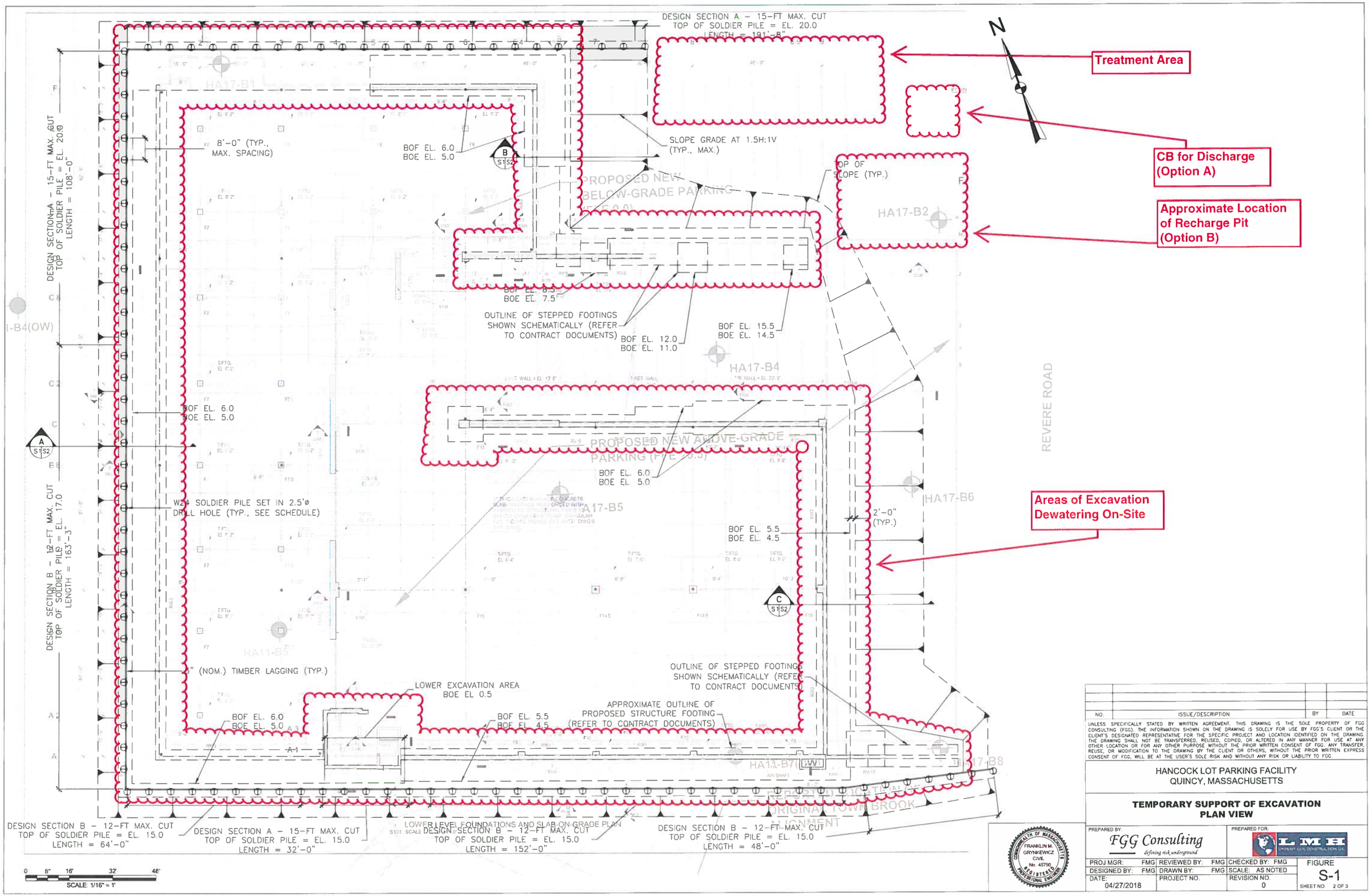
Form No: AL_subcoc

4.4

APPENDIX F

Options A and B Treatment Scheme


OPTIONS A and B
S
Aeration Eductor
Float Absorption Booms
Typical flow regulation valve
18,000 Gal Frac Tank
S
Dewatering Well or Sump
Optional TSS Removal Train
Flow Meter
Silt Filter Pillow
S
On-Site Infiltration
OPTION B
Catch Basin
To Town River
OPTION A
S Sampling Location Site
DEWATERING TREATMENT SYSTEM
Average Design Flow 21 GPM (11 GPM to 32 GPM)



NO.	ISSUE/DESCRIPTION	BY	DATE

HANCOCK LOT PARKING FACILITY
QUINCY, MASSACHUSETTS

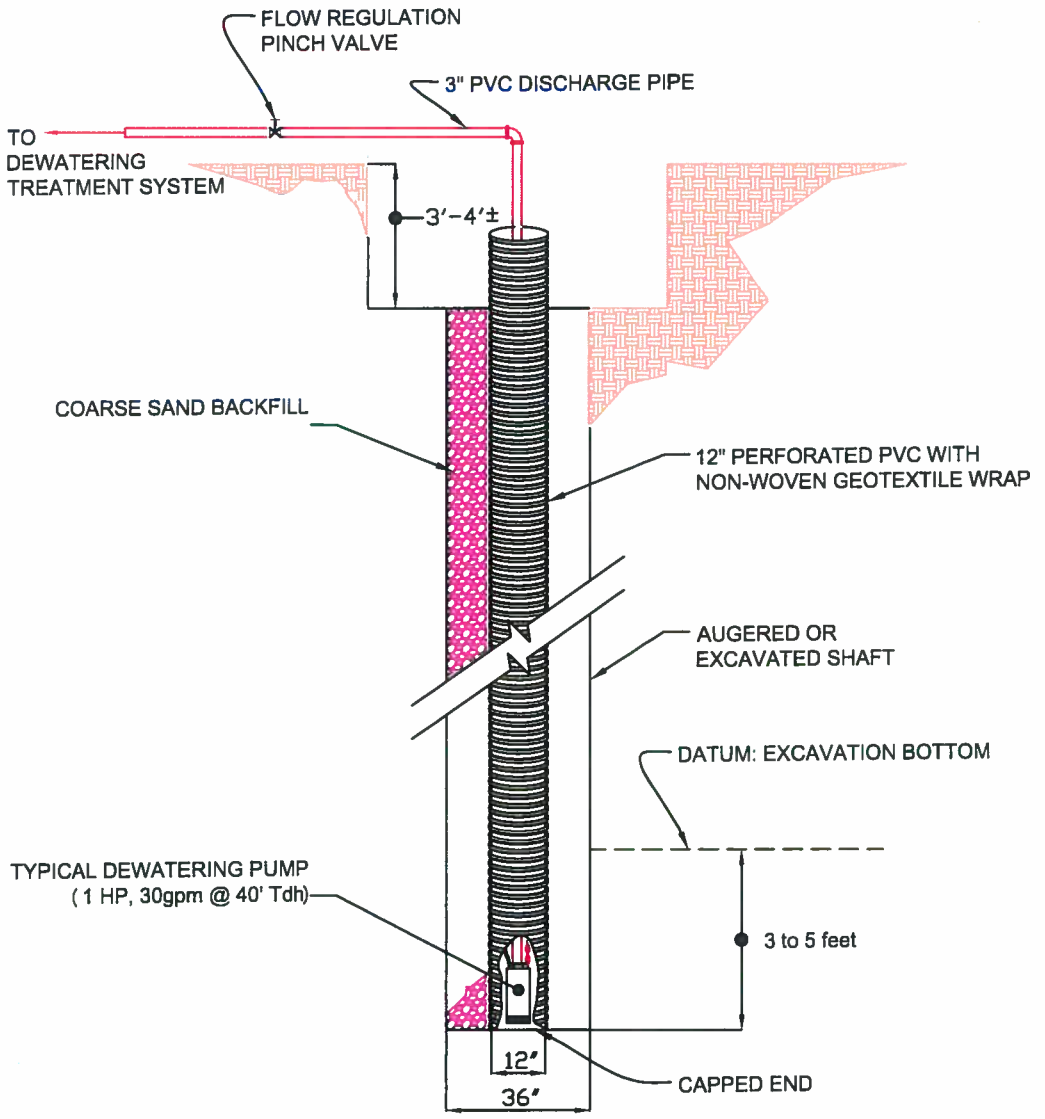
TEMPORARY SUPPORT OF EXCAVATION PLAN VIEW

COMMONWEALTH OF MASSACHUSETTS
FRANKLIN M. GRYNKEWICZ
CIVIL
No. 45790
REGISTERED PROFESSIONAL ENGINEER

PREPARED BY: FGG Consulting — defining risk underground
PREPARED FOR: LMH DEVELOPMENT CONSTRUCTION LLC

PROJ MGR:	FMG	REVIEWED BY:	FMG	CHECKED BY:	FMG
DESIGNED BY:	FMG	DRAWN BY:	FMG	SCALE:	AS NOTED
DATE:	04/27/2018	PROJECT NO.		REVISION NO.	0

FIGURE S-1
SHEET NO. 2 OF 3



DEWATERING WELL/SUMP

HANCOCK LOT PARKING FACILITY
QUINCY, MA

COUGHLIN ENVIRONMENTAL SERVICES, LLC

CONSULTING ENGINEERS AND PLANNERS

62 Montvale Avenue
Stoneham, MA 02180-3637
Phone: (781) 832-1002
Fax: (781) 438-9654
Email: mail@coughlinenvironmental.com

REV.	DATE:

DATE: July 2018

SCALE: N.T.S

APPLICATIONS

Specifically designed to remove water from:

- Drainage ditches
- Trenches
- Basements
- Manholes
- Excavating drainage in the building trades

SPECIFICATIONS

Pump:

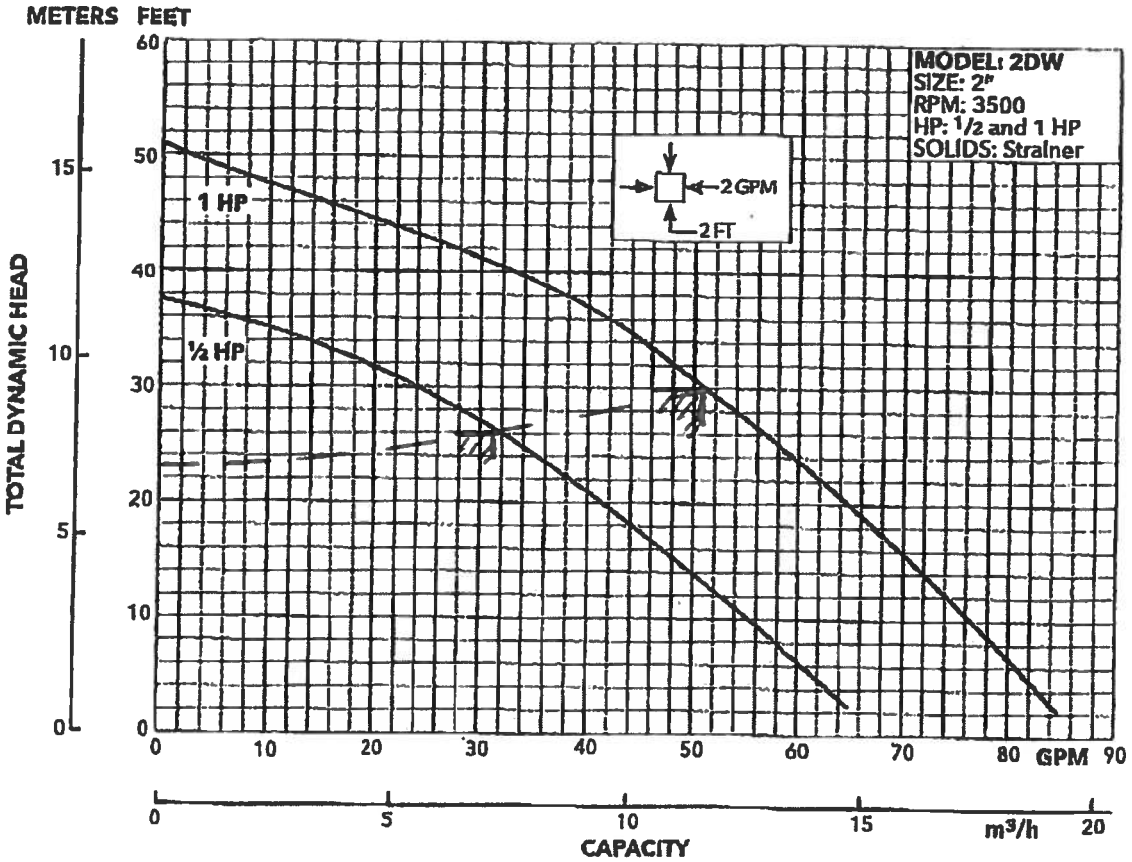
- Discharge size: 2" NPSM threaded hose coupling design, can be rotated
- Capacities: up to 84 GPM
- Total heads: up to 51 feet
- Maximum solids: any particles passing through strainer
- Mechanical seals: outer seal – silicon carbide, inner seal – carbon ceramic
- Temperature limit: 95°F (35° C) maximum
- Depth of immersion: 16.5 feet (5m) maximum

Motor:

- Single phase: 3500 RPM, ½ HP and 1 HP, 115 and 230 V, 60 Hz
- Built-in starter with full overload and temperature protection.
- Class F insulation.
- Air filled design.
- Upper and lower heavy duty ball bearing construction.
- Power cord: 50 feet.

AGENCY LISTINGS

Tested to UL778 and CSA 22.2 108 standards by Canadian Standards Association.
NRTL File #LR13533



REPLACEMENT KITS

Each kit contains the following parts:

Impeller Kit (15K97 for ½ HP, 15K98 for 1 HP) – Impeller, impeller screw, protective plug, washer, assembly instruction

Diffuser Kit (15K99 for both ½ HP and 1 HP) – Diffuser, barrel nuts, screws, washers, assembly instruction, sticker

Outer seal Kit (15K14 for both ½ HP and 1 HP) - Mechanical face-seal unit, assembly instruction, sticker

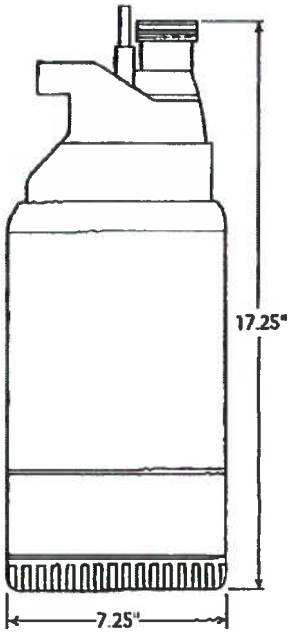
O-ring Kit (15K100 for both ½ HP and 1 HP) – All o-rings

MODEL INFORMATION

Order No.	HP	Volts	Phase	Maximum Amp	RPM	Height (in.)	Weight (lbs.)
2DW0S11	½	115	1	5.5	3500	17.25	26
2DW0S12		230		2.9			
2DW1011	1	115		9.8			32
2DW1012		230		4.9			

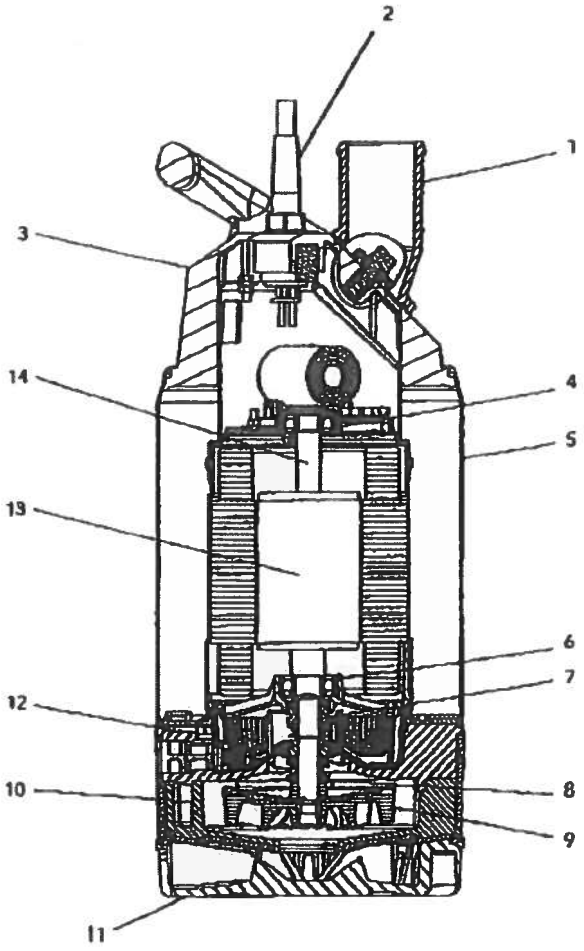
↑ AS REQUIRED

DIMENSIONS



COMPONENTS

Item No.	Description	
1	Discharge	Not Available
2	Power cord	Not Available
3	Handle/cover	Not Available
4	Support bearing	Not Available
5	Pump casing	Not Available
6	Main bearing	Not Available
7	Inner mechanical seal	Not Available
8	Outer mechanical seal	Available
9	Impeller	Available
10	Suction cover/diffuser	Available
11	Strainer	Not Available
12	Oil plug	Not Available
13, 14	Motor	Not Available



xylem
Let's Solve Water

Xylem, Inc.
2881 East Bayard Street Ext., Suite A
Seneca Falls, NY 13148
Phone: (866) 325-4210
Fax: (888) 322-5877
www.xyleminc.com/brands/gouldswatertechnology

Elasto-Valve Rubber Products., Inc.
1691 Pioneer Road Sudbury, ON
Canada P3G 1B2
Phone: 705-523-2026
Email: sales@evrproducts.com
Website: www.evrproducts.com

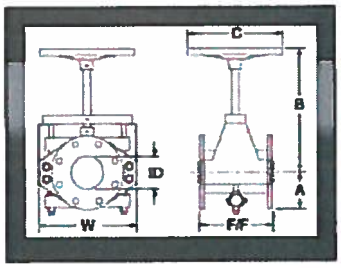
Series 1000 Manual Pinch Valve

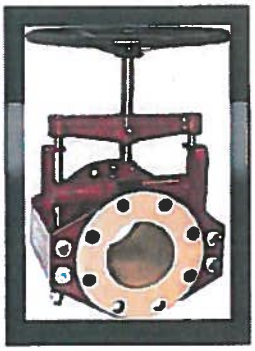
- Centerline closure for streamline flow
- Tight shut-off even with small trapped solids
- Built-in over-pinch protection
- Positive opening tabs standard on all sleeves
- Valve position easily visible

The Series 1000 Pinch Valve features a simple, proven and cost-effective design. Virtually maintenance-free, the sleeve is the valve's only wetted part, eliminating possible contamination of the process materials.

The 1000 Series Valve has no seats that require grinding, no packing glands or stuffing boxes which require repacking. The valve will not become locked or jammed even when dealing with solids in the flow. Reduce port, funnel port or double wall sleeves are available for these applications.

When placing your order, please Indicate sleeve material by appending elastomer abbreviation (CR, NR, etc) to the model name. IE: Series 1000-CR





1

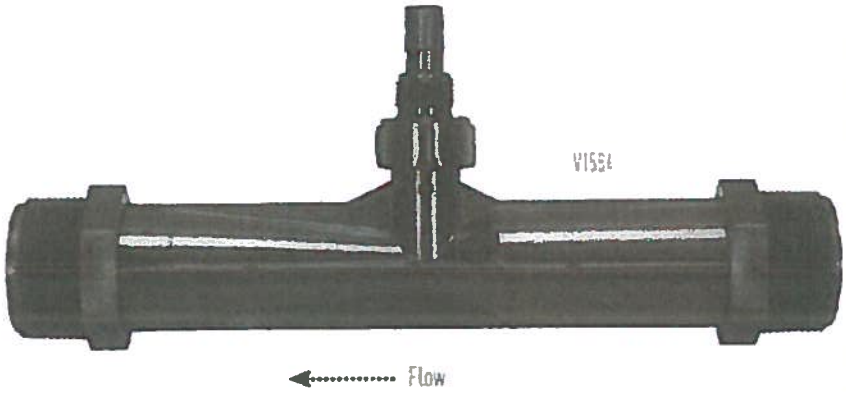
Item #	Inside Diameter	Length F/F	Width W	A	Max. Work Pressure	Weight (est.)
1000-1/2	1/2 in	4 in	3 1/2 in	1 3/4 in	200 psi	5.0 Pound
1000-3/4	3/4 in	5 in	5 in	2 in	200 psi	7 Pound
1000-1	1 in	5 1/2 in	6 in	2 1/8 in	150 psi	10 Pound
1000-1-1/2	1 1/2 in	6 1/2 in	6 5/8 in	2 1/2 in	150 psi	15 Pound
1000-2	2 in	7 in	8 3/8 in	3 in	150 psi	24 Pound
1000-2-1/2	2 1/2 in	7 1/2 in	9 1/4 in	3 1/2 in	150 psi	30 Pound
1000-3	3 in	8 in	10 1/8 in	3 3/4 in	150 psi	37 Pound

Item #	Inside Diameter	Length F/F	Width W	A	Max. Work Pressure	Weight (est.)
1000-4	4 in	N/A	11 3/4 in	4 1/2 in	150 psi	55 Pound
1000-5	5 in	10 in	14 in	5 in	125 psi	73 Pound
1000-6	6 in	10 1/2 in	15 1/2 in	5 1/2 in	125 psi	88 Pound
1000-8	8 in	16 in	20 in	6 3/4 in	75 psi	142 Pound
1000-10	10 in	20 in	24 in	8 in	75 psi	275 Pound
1000-12	12 in	24 in	28 in	9 1/2 in	75 psi	378 Pound
1000-14	14 in	28 in	31 3/8 in	10 1/2 in	50 psi	440 Pound
1000-16	16 in	32 in	35 in	1 3/4 in	50 psi	500 Pound
1000-18	18 in	36 in	37 1/4 in	12 1/2 in	50 psi	550 Pound
1000-20	20 in	40 in	44 in	13 3/4 in	50 psi	650 Pound
1000-24	24 in	48 in	51 3/4 in	16 in	50 psi	900 Pound

PENTAIR

Venturi Injectors

PART #: V384 to V514



'hen you need to inject air, oxygen, or ozone into ater, a venturi injector is one of the best ıethods to use. Tests have shown that when stalled properly, these injectors can transfer zone into water with efficiencies as high as 99%. 'hile typically used for ozone, air, or oxygen jection, venturi injectors are also compatible ith liquids.

ot every air injector is also an ozone injector. zone can react with certain materials, such as 'pes of rubber, breaking them down over a ıatter of days or weeks. Our venturi injectors are ɔnstructed of PVDF, a highly non-reactive .astic that is very resistant to ozone, chlorine, V, and other damaging substances.

lazzei® venture injectors have no moving parts nd provide trouble-free operation. All models xcept the **V514** include a 1/4" barbed ozone afe check valve. Maximum operating pressure t 100°F (38°C) is 400 psi.

Model	GPM	Inlet/Outlet	CFH	Price	Qty
V384	1	1/2" MNPT	1	**$70.39**	0
V584	4	3/4" Barb	5	**$56.69**	0
V584-2	4	3/4" MNPT	5	**$62.99** 4+ **$56.69 EA**	0
V978	7	1" MNPT	9	**$135.49**	0

V1584	31 GPM X2	1 1/2" MNPT	72	$185.89	0
V514	57	2" MNPT	394	$388.49	0

ADD TO CART

PRODUCT REVIEWS

CUSTOMER REVIEWS

Venturi Injector Review by Jim

Best design to inject air, ozone or oxygen into process water

(Posted on 5/24/2017)

Write Your Own Review

MAZZEI TECHNICAL BULLETIN No. 2

REMOVAL OF IRON AND MANGANESE BY AERATION

It is a straight forward task to determine the theoretical amount of air which is required to oxidize and precipitate iron and/or manganese from water. The actual amount of air can then be estimated quite accurately so as to determine the correct Mazzei Injector to use and the recommended operating conditions for that injector.

A. Water Chemistry

Water pH is a critical parameter in the oxidation and precipitation of iron and manganese. For iron oxidation by aeration, the water pH should be at least 7.2, and ideally, maintained in the range of 7.5 to 8.0. If manganese is present, the minimum recommended pH is 9.5. Below that pH, air oxidation of manganese is quite slow. In water with low pH or low levels of alkalinity, it may be necessary to feed supplemental alkaline materials such as sodium hydroxide to elevate water pH.

B. Other Factors

Air oxidation of iron and manganese is not instantaneous. For this reason it is advisable to employ a retention, or contact tank to allow for sufficient residence time for complete oxidation and precipitation to occur. Depending upon actual conditions, contact times may range from 5 to 15 minutes.

C. Formulas

The following reaction describes the oxidation of ferrous iron by oxygen

$$4Fe(HCO_3)_2 + O_2 + 2H_2O \; 4Fe(OH)_3 + 8CO_2$$

The following reaction describes the oxidation of manganous manganese by oxygen

$$2Mn(HCO_3)_2 + O_2 + 2H_2O \; 2Mn(OH)_4 + 4CO_2$$

D. Ratios

1. Iron

   The atomic weight of iron is 55.847. As one oxygen molecule reacts with four iron atoms, the iron reaction weight is four times this, or 223.39. The molecular weight of oxygen is 31.999. The reaction ratio is thus (31.999) / (223.39), or 0.1432. This

means that 0.1432 mg/l of oxygen is required for each mg/l of iron (measured as iron).

2. Manganese

The atomic weight of manganese is 54.938. As two atoms of manganese reacts with one molecule of oxygen., the manganese reaction weight is twice times this, or 109.88. The molecular weight of oxygen is 31.999. The reaction ratio is thus (31.999) / (109.88), or 0.2912. This means that 0.2912 mg/l of oxygen is required for each mg/l of manganese (measured as manganese).

E. Oxygen Residual

Sufficient air must be injected to maintain the required oxygen residual. Maintaining an oxygen residual serves several purposes. First, it provides a buffer of oxygen to react with surges of iron or manganese. Second, it produces a more palatable water. Third, the air required to maintain the oxygen residual provides mixing so that iron and manganese can react quickly and efficiently with oxygen.

An accepted value of residual oxygen is 5.0 mg/l. Sufficient air must be injected to maintain this level. The initial oxygen level in waters with iron and/or manganese present is typically zero. If there is an initial oxygen residual present, this may be subtracted from the desired level of 5.0 mg/l when determining the amount of oxygen required.

F. Theoretical Oxygen Required

The theoretical amount of oxygen required to oxidize iron and manganese may be calculated from the following formula:

Oxygen Required = $X_f \cdot (Fe) + X_m \cdot (Mn) + R$, where

X_f = Iron reaction factor
(Fe) = Iron concentration in mg/l
X_m = Manganese reaction factor
(Mn) = Manganese concentration in mg/l
R = Final oxygen residual = (5.0 – Initial Oxygen) in mg/l

An example for (Fe) = 10 mg/l, (Mn) = 2.5 mg/l and Initial Oxygen = 0.0 mg/l:

Oxygen Required = (0.1432)(10) + (0.2912)(2.5) + (5.0 –0.0)
= 1.432 + 0.728 + 5.0
= 7.16 mg per liter of water flow

G. Theoretical Air Required

Air has a density of 1.2047 g/l at 20o C. and 1.0 atmosphere of pressure. Under these same conditions, air contains 20.95% oxygen. Thus, each liter of air contains (1.2047 g/l)(0.2095) = 0.2524 g/l of oxygen = 252.4 mg/l of oxygen. In order to determine the theoretical amount of air required for oxidation of iron and manganese, the water flow rate must be known. If the levels of iron and manganese are known, a convenient unit of flow is "per 1,000 liters".

For example, using the contaminant levels in the previous example, and a flow rate of 100 l/min, the theoretical amount of air required would be:

$$\frac{(100 \text{ l/min})(7.16 \text{ mg/l})}{(252.4 \text{ mg/l})} = 2.84 \text{ l/min of air}$$

Using this value, the theoretical amount of air required would be 28.4 liters per 1,000 liters of water.

H. Actual Amount of Air Required

The oxygen transfer efficiency of aeration devices ranges from a low end of ~5% to a high end of 25% to 35% for Mazzei Injectors. Using a figure of 25% for Mazzei Injectors is conservative and is supported by both laboratory and field data. This means that the actual amount of air required is approximately four times the theoretical amount of air required.

For the examples above, if the theoretical amount of air required is 2.84 l/m (or 28.4 liters per 1,000 liters of water), the actual amount of air required would be four times this amount or 11.4 l/m (or 113.6 liters per 1,000 liters of water). Depending upon particular circumstances, it may be wise to add to this amount an additional "safety factor" of 10% to 20%.

To aid in converting to English Units:

1 l/m of water flow = 0.264 gal/min
1 gal/min of water flow = 3.785 l/m

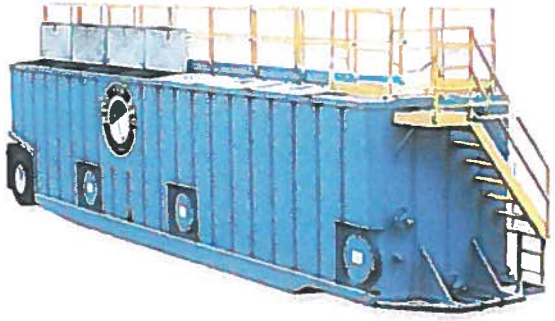
1 l/m of air flow = 0.03531 ft^3/min
1 ft^3/min of air flow = 28.3 l/m

Steel Tank

Flip Top Weir

Overview:

18,100 gallon flip top weir tanks from Rain for Rent have a standard "V" shaped floor for ease of draining all stored liquids completely through a 4" butterfly valve with Buna seals standard.



Features:

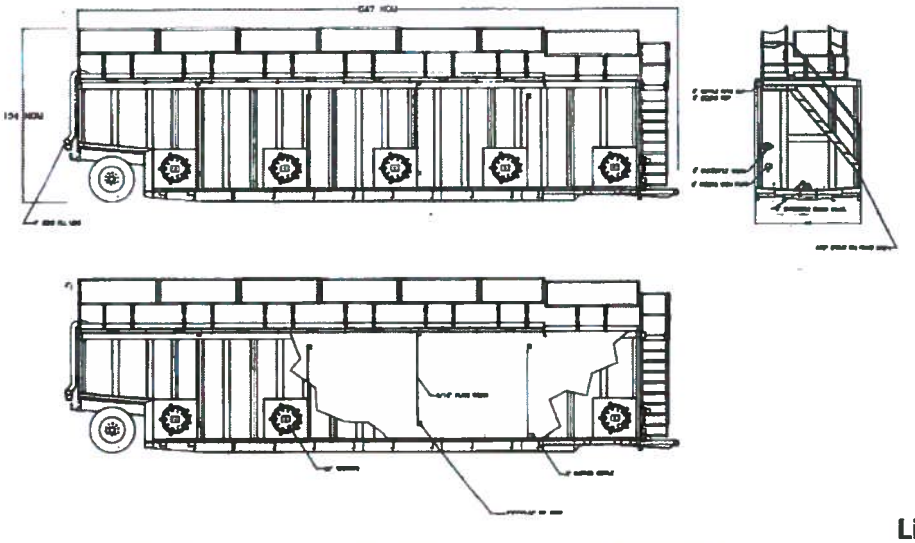
Store liquids with confidence with Rain for Rent's 18,100 gallon flip top weir tank. Permanently attached axels for maximum maneuverability allow this 18,100 gallon tank to be moved with ease on the jobsite and a safety staircase ensures proper protection for workers on site. Internal weirs allow for extra filtration and settling of materials.

Specs:

Manways	Four 22" hatches
Material	Steel
Capacity	18,100 gallons
Dry weight	27,000 lbs.
Footprint:	516" x 96" x 126"

Accessories:

- Spillguard
- Suction and Discharge Hoses
- Level gauges



PUMPS • TANKS • FILTRATION • PIPE • SPILLGUARDS

Liquid ingenuity.™

800-742-7246

rainforrent.com

New Pig

Free 24 Can Oval Cooler with a $250 order

OPTIONS

Qty 1 **$99.00**

- (•) **Ship One Time**
- ( ) **Buy with Autoship**

Get a Free Gift with every delivery! Learn More ▶

ADD TO CART

PIG® Oil-Only Absorbent Boom

BOM406 ★★★★★ (5) Write a Review

3" x 10', Absorbs up to 2 gal. per boom, 8 booms

As Low As **$91.00**

Confine and absorb oil and fuel spills on land or water. Read More ▶

PRICING (Based on quantity)

1 - 4 $99.00	**5 - 11 $95.00**	**12 + $91.00 Best Buy**

Always in stock. Ships in 24 hours.

EXCLUSIVE

Description

Confine and absorb oil and fuel spills on land or water.

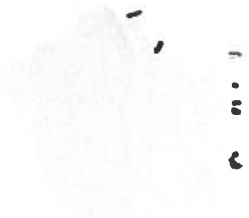
- Field-proven performance works in all conditions to absorb oil spills on land or water
- Floats to confine and soak up spills on water; hugs ground for land-based spills
- Tough outer mesh is UV resistant for long-term outdoor use without degradation; lets fluids easily pass through to filler material
- Rope running along length of boom withstands up to 400-lb. loads, adding strength for deployment and retrieval
- Spunbond polypropylene skin is UV resistant up to 12 months; meets NFPA 99 standards for static decay
- Booms float at surface for easy retrieval, even when saturated
- Absorbs and retains oils and oil-based liquids - including lubricants and fuels - without taking in a drop of water
- Strong, zinc-plated carbon steel attachment clips and rings allow you to link booms together for greater length
- Bright white color makes booms easier to see in outdoor environments and clearly shows saturation level
- Can be incinerated after use to reduce waste or for fuels blending

Specifications

Fluid Absorbed	**Oil-Based Liquids - Not Water**
Color	**White**
Dimensions	**ext. dia. 3" x 10' L**
Recycled Content	**98% Pre-Consumer Recycled Polypropylene Filler**
Absorbency	**Up to 16 gal. per bag**
Absorbency per	**Up to 2 gal. per boom**
Clip/Ring	**Zinc Plated Carbon Steel**

Configuration	Boom
Filler	Polypropylene
Skin/Outer Mesh	Skin - Polypropylene, Outer Mesh - Polyester
Sold as	8 booms per bag
Weight	24 lbs.
NSN (National Stock Number)	7930-01-436-8327
# per Pallet	18
Composition	Outer Mesh Skin - Polyester Inner Skin - Polypropylene Pulp Filler - Polypropylene Clip/Ring - Zinc Plated Carbon Steel
Application	Spill Response
UNSPSC	47131907
Pigalog® Page Number	Page 63

Accessories for BOM406



MAT405-01

PIG® Oil-Only Skimming Sweep

- Lightweight
- 17" x 50'
- 1 each

$46.00 - $56.

Reviews

Show All

WRITE A REVIEW

By Leslie4/26/2016

Boom!

New Pig has done a great job with this product and are always on top of their game in it arriving FAST!

By Billy11/24/2015

Great product, great service

The product arrived in a timely matter as always with PIG and was put to use instantly. It worked as advertised. I will definitely be buying these as well as other absorbent products from PIG as well.

By Dan1/31/2013

BOM406- Lives up to the title of a Hog.

I am currently the point of contact for a 24 hour hazardous response line within my company. I always make sure to have New Pig 10' and 20' oil absorbent boom stocked in my spill kits. The boom consistently preforms as it is supposed to and collects oil based liquids while shedding water. The other consistent feature that I have discovered with the Pig booms is that they will last as a barrier, where other competitors products will allow product to bleed through.

Show All

Additional Information

Product Data Sheet (PDS)

UV-Resistance Comparison Testing of Spunbond and Meltblown

Instructions for Using PIG® Absorbent Booms

Spill Response Training: Absorbent Booms ▶

Safety Data Sheet (SDS) for PIG® Oil-Only Absorbents ▶

40 CFR 112.7 ▶
SPCC planning requirements state that facilities subject to these regulations must have written plans in place discussing the products, countermeasures and procedures that are in place, or will be taken by the facility to prevent discharge of oil into waters of the United States.

40 CFR 122.26 ▶
When applying for a National Pollutant Discharge Elimination System (NPDES) permit, facilities must have a plan in place that describes actions, procedures, control techniques, management practices and equipment available to prevent illegal discharge of pollutants into waterways.

Certifications, Approvals and Ratings

NFPA 99

ONE PORK AVENUE • PO BOX 304 • TIPTON, PA 16684-0304

1-855-493-HOGS (493-4647) • Fax: 1-800-621-PIGS (621-7447) • hothogs@newpig.com

DeWatering Bag

FLT617 For Oil; Sediment, For Up to a 6" Dia. Discharge Hose, 15' x 15'

High surface area designs remove oil and sediment from higher-volume pumping outflows.

- Accommodates up to a 6" discharge hose for high-volume pumping
- Captures both sediment and oils for extra water filtration
- Non-woven polypropylene construction resists chemicals, and full bag can hold approximately 4,320 lb.
- Extra-large Bag has a greater capacity for extensive dewatering
- Disperses water to help prevent erosion
- Useful as a best management practice for stormwater pollution prevention
- Ideal for spill cleanup or pumping out containment areas, sumps, lagoons or ponds
- Non-biodegradable skin has low ash and high BTU value
- Landfillable or incinerable for waste reduction/fuels blending

Specifications

Capacity	225 cu. ft.
Style	Oil, Water, Sediment Separators
Use With	Up to a 6" Dia. Discharge Hose
Color	Black
Dimensions	15' W x 15' L
Recycled Content	100% Post-Consumer Recycled Textiles
Absorbency	Up to 22.6 gal.
Micron Rating	180 Microns
Separator Type	Dewatering & Silt Bags & Socks
Substance Filtered	Oil; Sediment
Sold as	1 each
Weight	27.684 lbs.
# per Pallet	16
Composition	Non-Woven Polypropylene Geotextile

Maximum Flow Rate	500 gal./Minute
UNSPSC	47101525
Pigalog® Page Number	**Page 293**

Metric Equivalent

Absorbency	Up to 85.5 L
Dimensions	4.6m W x 4.6m L
Weight	12.6 kg

Technical Information

Technical Documents

Why is there no SDS?

40 CFR 122.26

New Pig
World's best stuff for leaks, drips and spills

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1-855-493-4647 • Fax: 1-800-621-7447 • newpig.com • hothogs@newpig.com

CertainTeed

Certa-Lok® Yelomine™

Specifications & Dimensions

Restrained Joint PVC Pressure Piping System

GENERAL INFORMATION

CertainTeed's Certa-Lok® Yelomine™ Restrained Joint PVC Pressure Pipe meets the performance requirements of ASTM D2241 "Standard Specification for Poly (Vinyl Chloride) (PVC), Pressure Rated Pipe (SDR Series)."

Certa-Lok® Yelomine pipe and couplings are manufactured from a specially formulated PVC compound that **contains impact modifiers and ultraviolet inhibitors to give higher impact strength over an extended period of time.** CertainTeed Certa-Lok® Yelomine compound meets or exceeds cell classification 12454 per ASTM D1784.

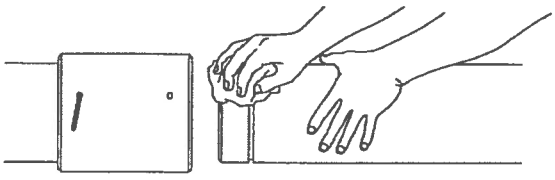
The Certa-Lok® system provides a noncorrosive restrained joint by utilizing precision-machined grooves on the pipe and in the coupling which, when aligned, allow a spline to be inserted, locking the pipe and coupling together. A flexible elastomeric seal (O-ring) in the coupling provides a hydraulic seal.

Certa-Lok® Yelomine couplings are boxed and shipped including splines and factory installed O-rings (gaskets). Note: Specify permanent or non-permanent joint when ordering

Certa-Lok® Yelomine joints meet the requirements of ASTM D3139 "Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals."

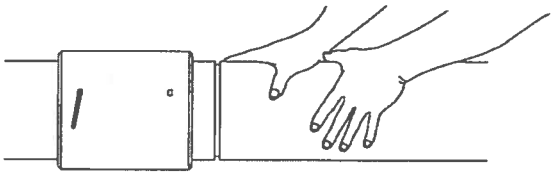
O-rings meet the requirements of ASTM F477 "Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe."

JOINT ASSEMBLY



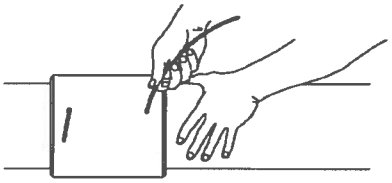
1

Clean joining surfaces.



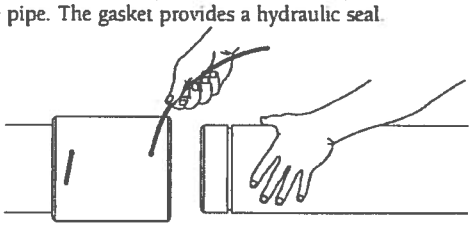
2

Align and insert pipe into Certa-Lok® coupling and push home. When the pipe end seats against the coupling stop, the locking grooves are automatically aligned for spline insertion.



3

The spline is then inserted through the insertion hole in the coupling, until it is fully seated. This securely locks the coupling to the pipe. The gasket provides a hydraulic seal.



4

When needed, the joint can be disassembled and reused.

IMPORTANT: *For pipe sizes 2" through 4", using non-perm rings, CertainTeed recommends using lubricant when assembling the joint. Pipe sizes 6" and above (non-perm), and all sizes using perm rings, require lubricant to assemble. CertainTeed supplies sufficient lubricant to join the pipe. When using lubricant, apply a small amount to the rubber rings and pipe ends. Note: Specify permanent or non-permanent joint when ordering.*

CertainTeed
SAINT-GOBAIN

NSF-INTERNATIONAL LISTINGS

It should be noted that the NSF-14 establishes minimum physical, performance, health effect, quality assurance, marking and record keeping requirements for plastic piping products. Similarly, NSF-61 specifically covers requirements pertaining to the environmental aspects of piping used for potable drinking water. A potable drinking water product that has an NSF-14 listing must (by default) also have an NSF-61 listing. In contrast, a product that is NSF-61 listed (for use in potable water applications) may not necessarily have an NSF-14 "performance specification" listing.

Certa-Lok® Yelomine restrained joint pipe and couplings up to class 250 PSI are listed under NSF-14 and include compliance with NSF-61 for potable water applications. Certa-Lok® Yelomine restrained joint PVC and coupling class 315 PSI, Certa-Lok® Yelomine Integral Bell pipe and 16" fiber-wound couplings are listed under NSF-61 only (in compliance with general market and application usage requirements).

Independent laboratory test data pertaining to all listings and certifications is available upon request.

CERTIFICATION OF QUALITY

1) The Yelomine formulation will contain sufficient impact modifier to demonstrate approximately twice the Izod impact level of conventional white PVC pipe, and shall meet or exceed the below listed plant production specifications.

2) The Yelomine formulation will contain a sufficient amount of high-purity TiO_2 to prevent surface discoloration and to provide superior long-term UV protection against impact strength degradation.

3) All Certa-Lok® YELOMINE pipe will be manufactured at CertainTeed's Lodi, California, and McPherson, Kansas extrusion plants. All fabricated fittings will be manufactured at CertainTeed's McPherson, KS, fabrication facility.

PIPE IMPACT PRODUCTION SPECIFICATIONS

NOM. SIZE (IN.)	SDR 26 (FT-LBS.)	SDR 21 (FT-LBS.)	SDR 17 & 13.5 (FT-LBS.)
2"	—	—	170
3"	—	—	245
4"	210	255	320
6"	305	380	470
8"	400	495	610
10"	500	530	—
12"	500	530	—
14"	500	530	—
16"	500	530	—

NOMINAL PROPERTY VALUES

PIPE PROPERTY	TEST METHOD	VALUE
Izod Impact	ASTM D256	1.15 ft.- lbs./ in. of notch
Tensile Strength	ASTM D638	7,000 psi
Modulus of Elasticity	ASTM D638	400,000 psi
Deflection Temperature	ASTM D648	158°F
Flammability	ASTM D635	Self-Extinguishing

NON-PERMANENT USE AND PERMANENT USE CERTA-LOK® JOINTS

Certa-Lok® Yelomine pipe and fittings have been successfully servicing the industry for many years. In order to enhance performance and better accommodate customer needs, CertainTeed offers two types of Certa-Lok® Yelomine...Permanent Use and Non-Permanent Use. Non-Permanent O-rings have a slightly reduced cross-section for easy assembly and disassembly. Permanent Use O-rings have a slightly larger cross-section and are not designed for disassembly. Permanent Use Certa-Lok® Joint requires lubricant to assemble, which is supplied in sufficient quantities by CertainTeed.

NON-PERMANENT USE CERTA-LOK® JOINT

Non-Permanent Use Certa-Lok® Joints, which utilize a Teflon coated O-ring, are typically used in above-ground, exposed installations such as mining, irrigation, temporary bypass or slurry lines or any installation that will require disassembly and reuse.

CAUTION: Non-Permanent Use Certa-Lok® joints should not be used in buried or submerged applications.

PERMANENT USE CERTA-LOK® JOINT

Permanent Use Certa-Lok® Joints utilize a Teflon-coated O-ring with a slightly larger cross-section. The joint assembles easily with lubricant. Disassembly can be achieved, but can be extremely difficult depending on the diameter of the piping system.

Permanent Use Certa-Lok® Joints are intended for use in all installations which do not require disassembly during the service life of the system. Applications include buried installations, bridge, river and road crossings, and all installations in which joints are subjected to long-term or excessive misalignment due to external loads. CertainTeed supplies sufficient lubricant for Permanent Use Certa-Lok® Joint installations.

If in doubt as to which coupling system, Non-Permanent or Permanent Use, is best suited for your application, contact your local CertainTeed distributor or CertainTeed Territory Sales Manager.

PIPE GROOVING INSTRUCTIONS

CERTA-LOK® YELOMINE RESTRAINED JOINT

CAUTION: Unplug router before removing or inserting bits. Always wear eye protection. Support the pipe near the end to be grooved.

CAUTION: Certain products are factory end-thickened and should not be cut and re-grooved. See page 4, Note 3.

PREPARATION

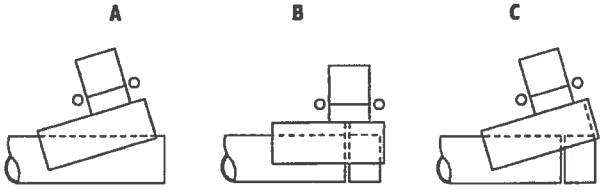
The pipe must first be cut square, to ensure that the spline groove will align properly with mating grooves in the Certa-Lok® Yelomine Coupling. Check with a square.

APPLICATION

1) Select and install the proper bit for conformance with the groove dimensions shown. The bit must be tightly secured in the router, and the router must be tightly fastened to the jig. Use the black plastic spacer under the router to achieve motor support.

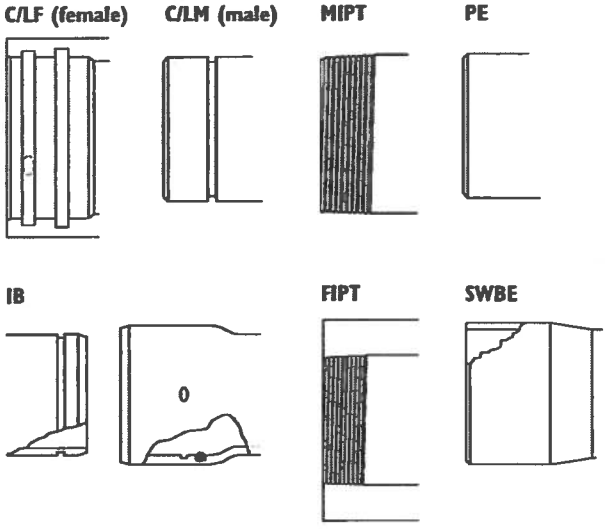
PIPE SIZE	GROOVE WIDTH (IN.)	GROOVE DEPTH (IN.)	BEVEL LENGTH (IN.)
4"	0.375	.135	0.188 (0.25 IB)
6"	0.375	.135	0.313 (0.25 IB)
8"	0.500	.145	0.656
10"	0.500	.215	0.656
10" IRR	0.500	.145	0.656
12"	0.750	.215	0.656
12" IRR	0.500	.145	0.656
14"	0.500	.215	0.656
16"	0.750	.215	0.656

2) Make short trial cuts on a scrap piece of pipe before grooving the line pipe.
3) Turn router on, hold handles firmly, and set the jig on the pipe with the rear slide bar and forward guide post resting on the pipe (figure A). Slide the jig toward the pipe and maintain pressure against the pipe end with the forward guide post (figure B). Move the jig slowly and firmly clockwise around the pipe, or better, rotate the pipe to achieve the same motion. Best results are obtained when the jig is held on the top of the pipe with the pipe to your right, and the pipe is rotated slowly towards you.
4) To remove the jig, tilt the guide post end up while maintaining contact with the pipe end (figure C). This prevents the cutter from ruining the groove by gouging the sides.
5) Bevel pipe end.



DEFINITIONS & ABBREVIATIONS

C/L	Certa-Lok®
C/LM	Certa-Lok® Grooved (male) Pipe End
FIPT	IPS (female) Pipe Thread (NPT)
SW	Solvent Weld
C/LF	Certa-Lok® Gasketed (female)
MIPT	IPS (male) Pipe Thread (NPT)
SWBE	Solvent Weld Bell End
PE	Plain End
HP	High Pressure
DT	Double Tapped
IB	Integral Bell
SMG	Standard Metal Groove



FLEXIBILITY

Certa-Lok® Yelomine can bend easily around many obstructions, typically reducing the number of fittings required. The pipe ***should not*** be bent to a lesser (tighter) radius than shown.

PIPE DIA.	MIN. R. CURVATURE (FT.)	OFFSET/ 20 FT. (IN.)
2"	40	59
3"	58	41
4"	75	32
6"	110	22
8"	144	17
10"	179	13
12"	213	11
14"	233	10
16"	267	9

NOTE: Values shown are for pressure-pipe applications.

YELOMINE INTEGRAL BELL (IB) PIPING PRODUCTS

Gasket (O-ring) and Spline included

SIZE (IN.)	PSI	SDR	OD	BOD	P	C	MIN. WALL	APP. WT. (LBS./FT.)	NON-PERM PART NO.	PERM PART NO.
4"	200	21	4.500	5.11	0.25	3.00	.214	1.89	266225	266324
4"	250	17	4.500	5.27	0.25	3.00	.265	2.29	266218	266317
6"	200	21	6.625	7.50	0.25	3.00	.316	4.07	266249	266348
6"	250	17	6.625	7.74	0.25	3.00	.390	4.94	266232	266331
8"	200	21	8.625	9.75	0.656	3.16	.410	6.72	266379	266362

CERTA-LOK® YELOMINE PIPE

WITH COUPLINGS

Certa-Lok® Coupling, Gaskets (O-ring) and Spline included

SIZE (IN.)	PSI	SDR	OD	BOD	L	P	C	MIN. WALL	WT. (LBS./FT.)	PART NO.
2" ②	250	17	2.375	3.20	5.25	0.188	1.75	.140	0.69	216213
3" ②	250	17	3.500	4.38	7.25	0.188	2.50	.206	1.48	217210
4" ②	200	21	4.500	5.47	8.25	0.188	3.00	.214	2.11	226212
4"	250	17	4.500	5.47	8.25	0.188	3.00	.265	2.50	218217
4" HP ②	315	13.5	4.500	5.96	8.25	0.188	3.00	.333	3.10	250217
6"	160	26	6.625	7.84	8.25	0.313	3.00	.255	3.58	235214
6"	200	21	6.625	7.84	8.25	0.313	3.00	.316	4.30	227219
6"	250	17	6.625	7.84	8.25	0.313	3.00	.390	5.18	219214
6" HP ②	315	13.5	6.625	8.37	8.25	0.313	3.00	.491	6.59	251214
8"	160	26	8.625	10.19	10.13	0.656	3.16	.332	6.07	236211
8"	200	21	8.625	10.19	10.13	0.656	3.16	.410	7.26	228216
8"	250	17	8.625	10.19	10.13	0.656	3.16	.508	8.71	220210
8" HP ②	315	13.5	8.625	10.95	10.13	0.656	3.16	.639	11.30	237218
10"	160	26	10.750	12.44	12.13	0.656	3.50	.413	9.73	214219
10"	200	21	10.750	12.44	12.13	0.656	3.50	.511	11.60	230219
12"	160	26	12.750	14.65	12.13	0.656	3.63	.490	13.63	215223
12"	200	21	12.750	14.65	12.13	0.656	3.63	.606	16.21	239229
14"	160	26	14.000	16.00	12.13	0.656	3.50	.538	14.70	247217
14"	160 ①	21	14.000	16.00	12.13	0.656	3.50	.666	18.03	247200
16"	90 ①	26	16.000	17.40	12.13	0.656	3.61	.615	20.37	248214 ②
16"	160	26	16.000	17.22	12.00	0.656	3.61	.615	20.22	248214 ③
16"	200	21	16.000	17.22	12.00	0.656	3.61	.762	24.85	248337

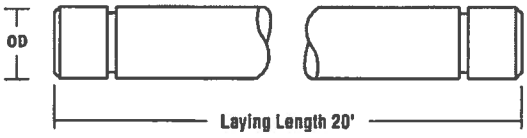
Laying length on Yelomine IB and Yelomine is 20'.

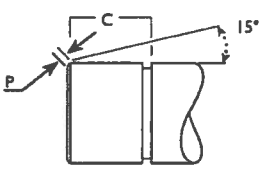
Note: All dimensions are in inches and are subject to normal manufacturing tolerances (all charts in this brochure).

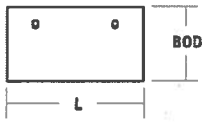
① *PSI on this item is limited by the pressure rating of the coupling.*

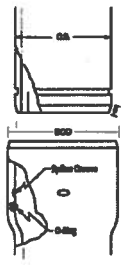
② *These products are produced with thickened ends to accommodate the Certa-Lok® groove while maintaining their designed pressure rating. NOTE: Grooving the non-thickened pipe body will result in less-than-designed pressure rating for the new joint and ultimately the entire system. When fabrication is required for thickened end products, apply a Certa-Lok® by solvent weld coupling or apply a Certa-Lok® adapter.*

③ *Specify desired pressure rating on P.O.*







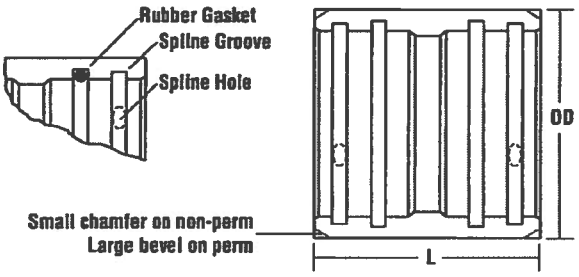


CERTA-LOK® YELOMINE COUPLING

COMPLETE WITH SPLINES AND O-RINGS

SIZE (IN.)	PSI	L (IN.)	WT./PC. (LBS.)	OD (IN.)	PART NO. NON PERM. USE	PART NO. PERM. USE
2"	250	5.25	1.05	3.20	705021	715020
3"	250	7.25	2.17	4.38	705038	715037
4"	250	8.25	4.92	5.47	705045	715044
4" HP	315	8.25	5.00	5.96	745034	—
6"	250	8.25	6.20	7.84	705069	715068
6" HP	315	8.25	10.40	8.37	745041	—
8"	250	10.13	10.93	10.19	705076	715075
8" HP	315	10.13	20.00	10.95	745058	—
10"	200	12.13	21.70	12.44	705106	715105
12"	200	12.13	28.80	14.65	716669	716652
14"	160	12.13	40.00	16.00	745010	745218
16" ①	90	12.13	30.00	17.40	745027	745225
16" ②	200	12.00	27.00	17.22	745416	745409

① PVC, 16"
② Composite 16"



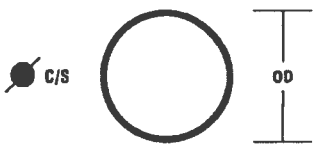
CERTA-LOK® YELOMINE O-RING

NON-PERMANENT USE

Teflon coated for easy assembly
No lubricant required to assemble 2"-4"

SIZE (IN.)	C/S (IN.)	MATERIAL	OD (IN.)	PART NO.
2"	.210	NBR	2.770	861215
3"	.210	NBR	3.895	861222
4"	.210	NBR	4.895	861239
6"	.275	NBR	7.176	861277
8"	.375	IR/SBR	9.350	862717
10"	.407	IR/SBR	11.500	861697
12"	.407	IR/SBR	13.500	861703
14"	.407	IR/SBR	14.825	861765
16"	.407	IR/SBR	16.825	861772

NBR – Nitrile Butadiene Rubber
IR/SBR – Isoprene/Styrene Butadiene Blend



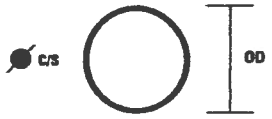
CERTA-LOK® O-RING

PERMANENT USE

Teflon coated for ease of assembly
Maximum compression, high disassembly effort
Lubricant required to assemble all sizes.

SIZE (IN.)	C/S (IN.)	OD (IN.)	PART NO.
2"	.240	2.770	860607
3"	.240	3.900	860614
4"	.240	4.910	860621
6"	.313	7.176	860638
8"	.400	9.270	860645
10"	.438	11.500	860652
12"	.438	13.500	860669
14"	.438	14.825	860683
16"	.438	16.825	860690

Material = IR/SBR – Isoprene/Styrene Butadiene Blend



CERTA-LOK® SPLINES

SIZE (IN.)	L (IN.)	C/S (IN.)	CONFIGURATION	PART NO.
2"	10.5	.188	ROUND	864605
3"	16.0	.250	ROUND	864612
4"	18.0	.250	ROUND	864629
4" HP	18.0	.250	SQUARE	864889
6"	24.0	.250	ROUND	864636
6" HP	24.0	.250	SQUARE	865060
8"	32.0	.313	SQUARE	864643
8" HP	32.0	.313	SQUARE	864643
10"	39.0	.375	SQUARE	864650
12"	46.0	.375 x .625	RECTANGLE	867309
14"	48.0	.375	SQUARE	864902
16"	56.0	.375 x .625	RECTANGLE	865336

CERTA-LOK®

ACID RESISTANT SPLINES

SIZE (IN.)	L (IN.)	C/S (IN.)	CONFIG.	MATERIAL	PART NO.
3"	16.0	0.250	Round	PVDF	865718
4"	18.0	0.250	Round	PVDF	865725
6"	24.0	0.250	Round	PVDF	865749
8"	32.0	0.313	Square	PVDF	865756
10"	39.0	0.313	Round	PP	864735
12"	46.0	0.313	Round	PP	865299

**2" is available on special-order basis only*
PVDF-Polyvinylidene Fluoride
PP-Polypropylene

CERTA-LOK® SPLINE INSERTION TOOL

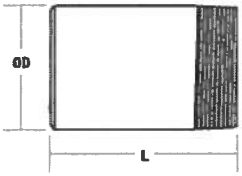
SPLINE SIZE	PART NO.
0.25" ROUND & 0.25" SQUARE	707964
0.313" SQUARE & 0.313" x 0.375" RECTANGLE	707971
0.375" SQUARE	707995
0.375" x 0.625" RECTANGLE	707940

CAUTION: Care must be taken not to overtap the spline when using insertion tool.

CERTA-LOK® NIPPLE

PE x MIPT

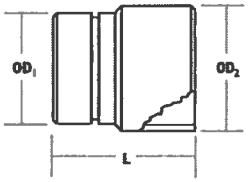
SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO.
2"	200	0.60	2.375	5.25	705892
3"	190	1.25	3.500	6.50	705908
4"	160	2.50	4.500	7.00	705915
6"	140	5.70	6.625	9.00	705922
8"	120	10.25	8.625	10.40	705939



CERTA-LOK® BY CAST IRON ADAPTER NIPPLE

C/L MALE x CAST IRON O.D. ADAPTER

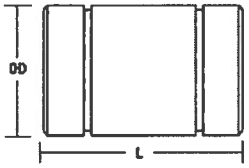
SIZE (IN.)	PSI	WT./PC. (LBS.)	OD_1 (IN.)	L (IN.)	OD_2 (IN.)	PART NO.
4"	250	2.62	4.500	10.0	4.80	708855
6"	250	6.25	6.625	12.0	6.90	708862
8"	250	12.52	8.625	13.0	9.05	708879
10"	200	21.50	10.750	16.0	11.10	707810
12"	200	23.00	12.750	16.0	13.20	707827



CERTA-LOK® NIPPLE

C/L MALE x C/L MALE

SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO.
4"	250	2.3	4.500	10.0	711008
6"	250	5.2	6.625	12.0	711015
8"	250	9.7	8.625	13.0	711022



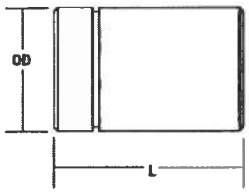
DESCRIPTION	PART NO.
1 1/2 HP PORTABLE ROUTER (110VOLT)	860072
4" JIG FIXTURE	860102
6" JIG FIXTURE	860119
8" JIG FIXTURE	860126
10" JIG FIXTURE	860133
12" JIG FIXTURE	860140
14" JIG FIXTURE	860416
16" JIG FIXTURE	860423
15 ° BEVELING BIT	860904
3/8" BIT ①	860171
1/2" BIT ②	860188
3/4" BIT ③	860362

① for 4"-6" diameter ② for 8"-10" diameter ③ for 12", 14", and 16" diameter

CERTA-LOK® NIPPLE

C/L MALE x PE

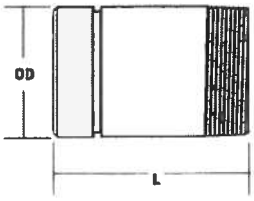
SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO.
2"	250	0.60	2.375	7.0	705847
3"	250	1.40	3.500	9.0	705854
4"	250	2.30	4.500	10.0	705861
4" HP	315	3.10	4.500	10.0	706646
6"	250	5.20	6.625	12.0	705878
6" HP	315	7.20	6.625	12.0	706653
8"	250	9.70	8.625	13.0	705885
8" HP	315	13.80	8.625	13.0	706660
10"	200	11.07	10.750	16.0	706325
12"	200	15.50	12.750	16.0	706806
14"	160	20.25	14.000	18.0	706349
16"	200	25.00	16.000	18.0	706356



CERTA-LOK® NIPPLE

C/L MALE x MIPT

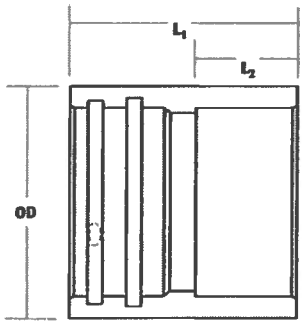
SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO.
2"	200	0.60	2.375	7.00	705991
3"	190	1.30	3.500	9.00	706004
4"	160	2.40	4.500	10.00	706011
6"	140	5.20	6.625	12.00	706028
8"	120	9.00	8.625	13.00	706035



CERTA-LOK® X SOLVENT WELD COUPLING

C/L FEMALE x SOLVENT WELD SOCKET END

SIZE (IN.)	PSI	WT./PC. (LBS.)	L_1	L_2	OD	PART NO. NON PERM. USE	PART NO. PERM. USE
2"	250	1.00	5.50	2.375	3.20	705359	715358
3"	250	2.20	8.00	3.500	4.38	705366	715365
4"	250	3.50	9.00	4.000	5.47	705373	715372
6"	250	6.40	9.00	4.000	7.84	705380	715389
8"	250	11.30	10.13	4.500	10.19	705397	715396
10"	200	16.00	12.13	5.750	12.44	705083	715082
12"	200	17.80	12.13	5.750	14.65	705090	715099
14"	160	36.60	12.13	5.750	16.00	705205	715129
16"	90	22.00	12.13	5.750	17.40	705212	715136

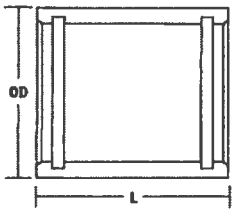


IPS REPAIR COUPLING

UNRESTRAINED

SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO.
2"	250	1.52	3.20	9.0	742026
3"	250	2.32	4.38	9.0	742040
4"	250	3.38	5.47	9.0	742064
6"	250	6.12	7.84	9.0	742088
8"	250	10.17	10.19	10.13	742095
10"	200	14.25	12.44	12.13	742101
12"	200	21.50	14.65	12.13	742118

Note: When used with Certa-Lok® Yelomine system, which is a restrained system, repair couplings must be externally restrained. If a restrained joint is required, it must be applied externally.

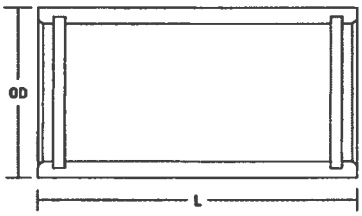


IPS REPAIR COUPLING

LONG LENGTHS 18" UNRESTRAINED

SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO.
2"	250	3.81	3.20	18.0	741029
3"	250	5.76	4.38	18.0	741043
4"	250	7.91	5.47	18.0	741067
6"	250	14.13	7.84	18.0	741081
8"	250	24.38	10.19	18.0	741098
10"	200	34.46	12.44	18.0	741104
12"	200	45.78	14.65	18.0	741111

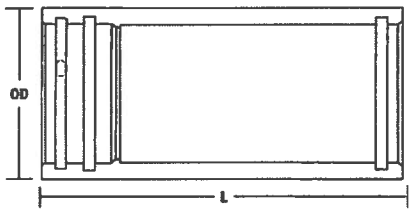
Note: When used with Certa-Lok® Yelomine system, which is a restrained system, repair couplings must be externally restrained. If a restrained joint is required, it must be applied externally.



CERTA-LOK® YELOMINE X IPS EXPANSION COUPLING

SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO.
2"	250	3.32	3.20	18.00	716423
3"	250	5.00	4.38	18.00	716430
4"	250	6.98	5.47	18.00	716447
6"	250	12.69	7.84	18.00	716454
8"	250	21.30	10.19	18.00	716461
10"	200	28.13	12.44	18.00	716478
12"	200	37.45	14.65	18.00	716485
14"	160	49.00	16.00	18.00	716522
16"	200	47.45	17.40	18.00	716539

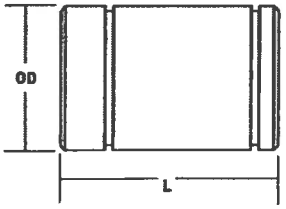
Note: Expansion couplings are not a restrained joint.



CERTA-LOK® TRANSITION FITTING

C/L MALE x STANDARD METAL GROOVE (SMG)

SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO.
2"	**	0.60	2.375	7.0	710315
3"	**	1.60	3.500	9.0	710322
4"	**	2.50	4.500	10.0	710339
4" HP	**	3.10	4.500	10.0	706523
6"	**	5.20	6.625	12.0	710346
6" HP	**	7.20	6.625	12.0	706530
8"	**	9.00	8.625	13.5	710353
10"	**	11.07	10.750	16.0	707834
12"	**	19.20	12.750	16.0	707841
14"	**	20.25	14.000	18.0	710360
16"	**	25.00	16.000	18.0	710377



**Caution: Certa-Lok® to "SMG" Adapters, when assembled with the proper Victaulic, Grinnell or similar coupling, have long-term hydrostatic strengths equal to all other Certa-Lok® fittings. However, the resistance of the grooved adapter and coupling assembly to thrust loads is significantly less than that of Certa-Lok® couplings. Therefore, these adapters should be supported against thrust loads.*

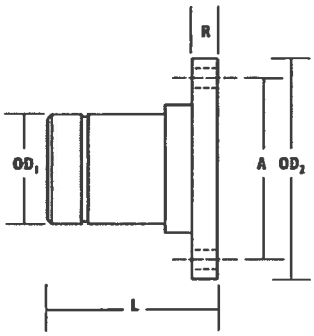
***Unrestrained pressure rating (PSI) to be determined by the Victaulic coupling or similar coupling manufacturer, as each manufacturer's rating may be different due to design.*

CERTA-LOK® FLANGE ADAPTER

C/L MALE x FLANGE

SIZE (IN.)	PSI	WT/PC. (LBS.)	OD_1 (IN.)	OD_2 (IN.)	NOM. R. (IN.)	L (IN.)	BOLT CIRCLE DIA. A (IN.)	NO. HOLES	PART NO.
2"	150	1.60	2.375	6.00	0.813	7.19	4.75	4	705748
3"	150	3.20	3.500	7.50	1.063	9.25	6.00	4	705755
4"	150	5.00	4.500	9.00	1.125	10.25	7.50	8	705762
6"	150	9.00	6.625	11.00	1.281	12.44	9.50	8	705779
8"	150	16.00	8.625	13.50	1.375	13.38	11.75	8	705786
10"	150	25.40	10.750	16.00	1.625	16.69	14.25	12	707773
12"	150	36.70	12.750	19.00	1.500	16.63	17.00	12	707780
14"	150	75.00	14.000	21.00	2.000	18.50	18.75	12	706479
16"	150	105.00	16.000	23.50	2.375	18.75	21.25	16	706486

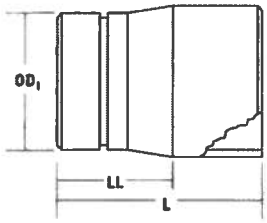
① *All flanges Van Stone style with glass-filled PVC ring.*



CERTA-LOK® ADAPTER

C/L MALE x SOLVENT WELD BELL

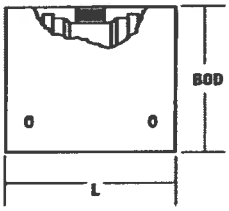
SIZE (IN.)	PSI	WT./PC. (LBS.)	OD_1 (IN.)	L (IN.)	LL (IN.)	PART NO.
2"	250	0.50	2.375	6.625	4.125	705304
3"	250	1.40	3.500	8.625	5.125	705311
4"	250	2.30	4.500	9.250	4.875	705328
4" HP	315	6.10	4.500	9.250	4.875	706493
6"	250	5.30	6.625	11.375	5.375	705335
6" HP	315	10.70	6.625	11.375	5.375	706509
8"	250	9.00	8.625	12.875	6.875	705342
8" HP	315	18.60	8.625	12.875	6.875	706516
10"	200	11.00	10.750	15.250	9.250	705168
12"	200	15.00	12.750	15.250	9.250	705175



CERTA-LOK® TAPPED COUPLING

C/L FEMALE x C/L FEMALE • FIPT OUTLET

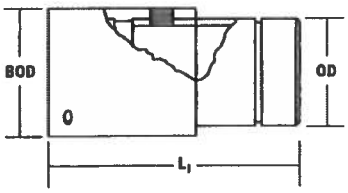
SIZE (IN.)	PSI	WT./PC. (LBS.)	OUTLET SIZE (IN.)	BOD (IN.)	L (IN.)	PART NO. NON PERM. USE	PART NO. PERM. USE
2" x 2"	200	1.50	0.75	3.20	7.00	705403	715402
2" x 2"	200	1.40	1.00	3.20	7.00	705441	715440
3" x 3"	200	2.60	0.75	4.38	9.50	705410	715419
3" x 3"	200	2.90	1.00	4.38	9.50	705458	715457
3" x 3"	160	2.70	1.50	4.38	9.50	705465	715464
4" x 4"	200	4.10	0.75	5.47	10.50	705427	715426
4" x 4"	200	4.10	1.00	5.47	10.50	705472	715471
4" x 4"	200	4.00	1.50	5.47	10.50	705489	715488
4" x 4" HP	250	8.50	1.50	5.96	10.50	706585	716584
6" x 6"	200	7.90	0.75	7.84	11.25	705434	715433
6" x 6"	200	7.90	1.00	7.84	11.25	705496	715495
6" x 6"	200	7.90	1.50	7.84	11.25	705502	715501
6" x 6" HP	250	14.00	1.50	8.37	11.25	706592	716591
6" x 6"	160	7.90	2.00	7.84	11.25	705540	715549
6" x 6"	160	9.83	2.00 DT	7.84	11.25	705557	715556
8" x 8"	200	15.00	1.00	10.19	12.50	705519	715518
8" x 8"	200	15.00	1.50	10.19	12.50	705526	715525
8" x 8"	160	15.00	2.00	10.19	12.50	705533	715532
8" x 8"	160	17.30	2.00 DT	10.19	12.50	705564	715563
8" x 8"	130	19.50	3.00	10.19	13.50	705588	715587
8" x 8"	130	19.50	3.00 DT	10.19	13.50	705571	715570
10" x 10"	200	18.90	1.50	12.44	15.00	707858	717857
10" x 10"	160	19.00	2.00	12.44	15.00	707797	717796
10" x 10"	130	27.30	3.00 DT	12.44	16.00	705595	—



CERTA-LOK® TAPPED COUPLING

C/L FEMALE x C/L MALE • FIPT OUTLET

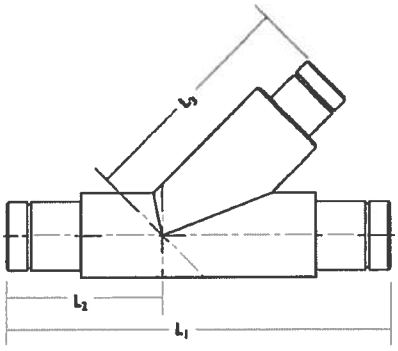
SIZE (IN.)	PSI	WT./PC. (LBS.)	OUTLET SIZE (IN.)	OD (IN.)	BOD (IN.)	L (IN.)	PART NO. NON PERM. USE	PART NO. PERM. USE
2" x 2"	250	1.60	0.75	2.375	3.20	10.13	700651	710650
2" x 2"	250	1.50	1.00	2.375	3.20	10.13	700668	710667
3" x 3"	250	3.60	1.50	3.500	4.38	13.50	705687	715686
4" x 4"	250	5.80	1.50	4.500	5.47	15.00	705694	715693
6" x 6"	250	11.50	1.50	6.625	7.84	17.00	700569	710568
6" x 6"	250	11.40	2.00	6.625	7.84	17.00	700576	710575
8" x 8"	250	20.60	1.50	8.625	10.19	19.00	705724	715723
8" x 8"	250	21.40	2.00	8.625	10.19	19.00	705731	715730
10" x 10"	200	27.00	2.00	10.750	12.44	22.25	705663	715662
12" x 12"	200	33.00	2.00	12.750	14.65	22.25	705670	715679



CERTA-LOK® WYES

C/L MALE X C/L MALE X C/L MALE

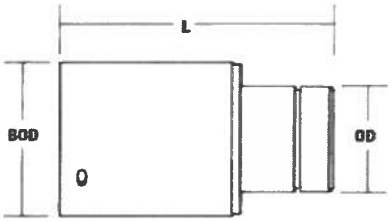
SIZE (IN.)	PSI	WT/PC (LBS.)	DIMENSIONS (IN.) L1	L2	L3	PART NO.
4"	150	11.00	26.25	10.78	16.03	707018
6"	150	27.70	33.88	13.41	20.63	706677
8"	100	69.00	44.75	18.06	26.69	706721



CERTA-LOK® REDUCER

C/L FEMALE x C/L MALE

SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	BOD (IN.)	L (IN.)	PART NO. NON PERM. USE	PART NO. PERM. USE
3" x 2"	250	4.30	2.375	4.380	13.88	706134	—
4" x 2"	250	5.00	2.375	5.470	15.25	706141	716140
4" x 3"	250	5.70	3.500	5.470	16.56	706158	716157
6" x 2"	250	10.40	2.375	7.840	15.75	706165	716164
6" x 3"	250	11.00	3.500	7.840	16.50	706318	716317
6" x 4"	250	11.10	4.500	7.840	17.38	706172	716171
8" x 2"	250	11.10	2.375	10.190	17.00	706189	716188
8" x 4"	250	24.10	4.500	10.190	15.63	706196	716195
8" x 6"	250	24.60	6.625	10.190	18.50	706202	716201
10" x 8"	200	42.00	8.625	12.440	19.75	706219	716218
12" x 8"	200	54.00	8.625	14.650	19.25	706226	716225
12" x 10"	200	44.10	10.750	14.650	22.25	706257	—
14" x 12"	160	52.20	12.750	16.000	22.25	706233	716232
16" x 10"	90	27.00	10.750	17.400	24.25	707025	—
16" x 12"	90	70.35	12.750	17.400	24.25	706400	—

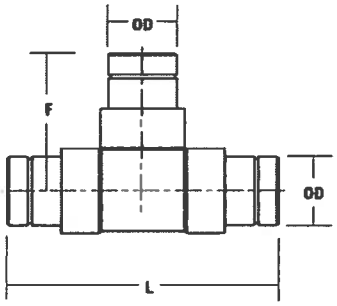


CERTA-LOK® TEE

C/L MALE x C/L MALE x C/L MALE

SIZE (IN.)	PSI	WT/PC. (LBS.)	OD (IN.)	L (IN.)	F (IN.)	PART NO.
2" x 2" x 2"	250	2.30	2.375	16.50	10.88	704918
3" x 3" x 3"	250	5.80	3.500	21.50	11.25	704925
4" x 4" x 4"	250	10.70	4.500	24.75	12.38	704628
4" x 4" x 4" HP	315	12.90	4.500	24.75	12.38	706608
6" x 6" x 6"	250	25.00	6.625	31.00	15.50	704635
8" x 8" x 8"	250	48.00	8.625	36.25	17.75	704642
10" x 10" x 10"	200	63.00	10.750	45.38	22.70	704581
12" x 12" x 12"	200	86.00	12.750	45.00	22.50	704598
14" x 14" x 14"	160	164.30	14.000	52.00	26.00	704529
16" x 16" x 16"	200	216.00	16.000	54.00	27.00	704536

Note: Also available on special order with pipe threaded branch in size 2" through 8"

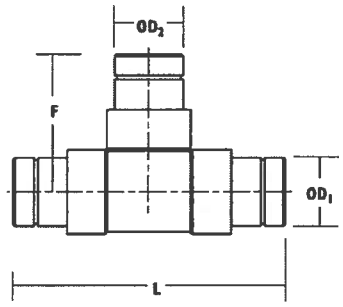


CERTA-LOK® REDUCING TEE

C/L MALE x C/L MALE x C/L MALE

SIZE (IN.)	PSI	WT/PC. (LBS.)	OD_1 (IN.)	OD_2 (IN.)	L (IN.)	F (IN.)	PART NO.
3" x 3" x 2"	250	5.00	3.500	2.375	21.00	8.84	704932
4" x 4" x 2"	250	10.10	4.500	2.375	22.88	9.47	704673
4" x 4" x 3"	250	10.80	4.500	3.500	24.19	11.66	704680
6" x 6" x 2"	250	23.83	6.625	2.375	28.13	11.63	704697
6" x 6" x 3"	250	24.20	6.625	3.500	28.13	12.75	704703
6" x 6" x 4"	250	24.40	6.625	4.500	29.19	13.75	704710
8" x 8" x 6"	250	50.90	8.625	6.625	33.50	16.81	704727
10" x 10" x 6"	200	62.10	10.750	6.625	39.75	17.84	704543
12" x 12" x 4"	200	87.00	12.750	4.500	42.75	16.75	704505
12" x 12" x 6"	200	89.40	12.750	6.625	47.00	21.75	704567
12" x 12" x 8"	200	98.60	12.750	8.625	41.56	24.63	704574

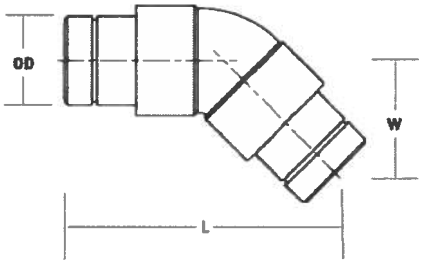
Note: Also available on special order with pipe threaded branch in size 2" through 8"



CERTA-LOK® 45° ELLS

C/L MALE x C/L MALE

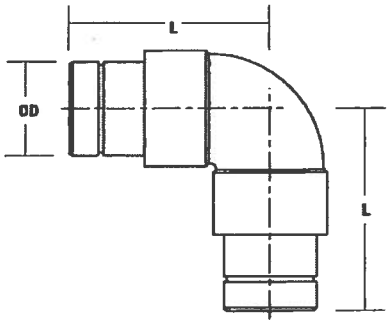
SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	W (IN.)	PART NO.
2"	250	1.60	2.375	12.964	5.370	704949
3"	250	3.90	3.500	16.858	6.983	704956
4"	250	7.10	4.500	18.939	7.845	704826
4" HP	315	8.60	4.500	18.939	7.845	706615
6"	250	16.10	6.625	23.473	9.723	704833
8"	250	30.90	8.625	25.607	10.607	704840
10"	200	37.00	10.750	31.750	13.150	704789
12"	200	65.00	12.750	32.600	13.500	704796
14"	160	82.00	14.000	37.750	15.650	705007
16"	200	144.00	16.000	39.800	16.500	705014



CERTA-LOK® 90° ELLS

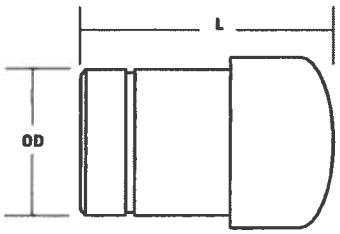
C/L MALE x C/L MALE

SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO.
2"	250	1.70	2.375	8.44	704963
3"	250	4.10	3.500	11.06	704970
4"	250	7.50	4.500	12.63	704888
4" HP	315	10.00	4.500	12.63	706622
6"	250	17.40	6.625	15.75	704895
8"	250	33.70	8.625	17.75	704901
10"	200	65.00	10.750	21.78	704765
12"	200	83.00	12.750	22.88	704772
14"	160	141.50	14.000	31.50	704741
16"	200	172.40	16.000	33.50	704758



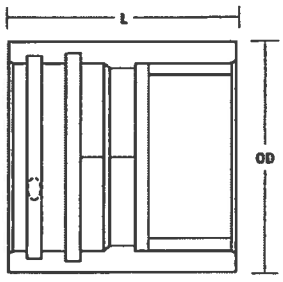
CERTA-LOK® END PLUG

SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO.
2"	250	0.90	2.375	7.50	704987
3"	250	2.00	3.500	10.00	704994
4"	250	3.70	4.500	11.00	706288
4" HP	315	4.40	4.500	11.00	706639
6"	250	8.50	6.625	14.00	706295
8"	250	16.20	8.625	17.50	706301



CERTA-LOK® END CAP

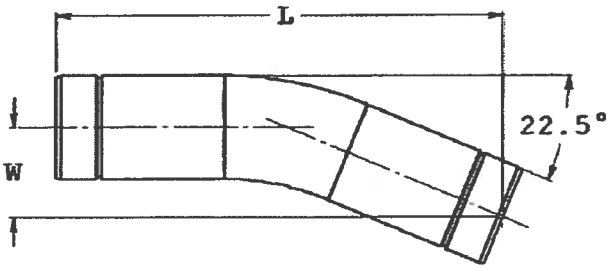
SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	PART NO. (NON-PERM)
4"	250	4.20	5.47	9.00	700002
6"	250	9.00	7.84	9.00	700019
8"	250	17.00	10.19	12.125	700026
10"	200	22.00	12.638	12.125	700033
12"	200	28.00	14.668	12.125	700040



CERTA-LOK® 22.5° SWEEP BENDS

C/L MALE x C/L MALE

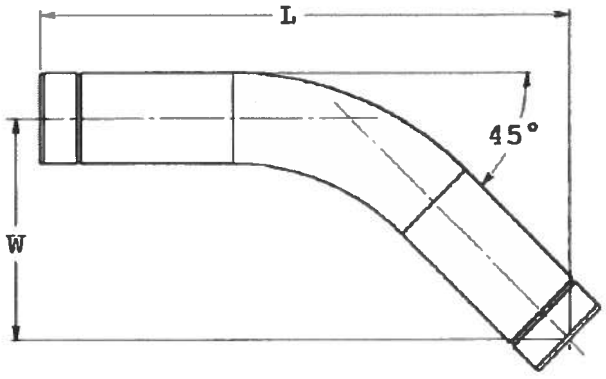
SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	W (IN.)	PART NO.
2"	250	2.00	2.375	17-5/16	3-7/16	710780
3"	250	4.90	3.500	26	5-3/16	710797
4"	250	7.50	4.500	26-1/16	5-3/16	710803
6"	250	18.30	6.625	28-15/16	5-3/4	710810
8"	250	35.00	8.625	43-3/8	8-5/8	710827
10"	200	87.00	10.750	69-7/16	13-13/16	705236
12"	200	105.00	12.750	69-7/16	13-13/16	705243
14"	160	105.40	14.000	83-7/8	16-11/16	706417
16"	200	119.00	16.000	83-7/8	16-11/16	706424



CERTA-LOK® 45° SWEEP BENDS

C/L MALE x C/L MALE

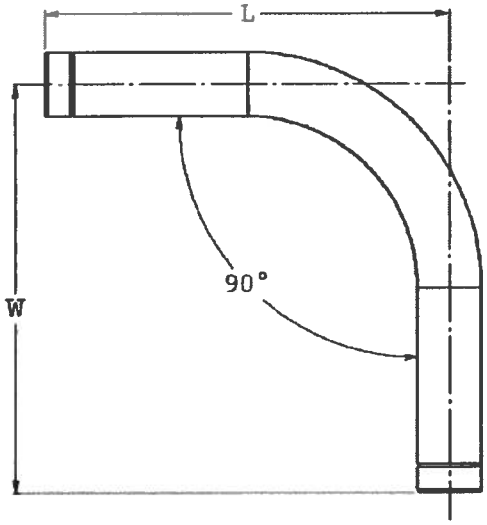
SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	W (IN.)	PART NO.
2"	250	2.00	2.375	18-1/8	7-1/2	710834
3"	250	4.90	3.500	25-11/16	10-3/4	710841
4"	250	7.50	4.500	28-3/4	11-7/8	710858
4" HP	315	11.60	4.500	28-3/4	11-7/8	706561
6"	250	18.30	6.625	39-3/16	16-1/4	710865
6" HP	315	26.20	6.625	39-3/16	16-1/4	706578
8"	250	35.00	8.625	52	21-9/16	710872
10"	200	87.00	10.750	72-7/8	30-3/16	705250
12"	200	105.00	12.750	72-15/16	30-3/16	705274
14"	160	151.00	14.000	85-7/8	35-9/16	706431
16"	200	162.00	16.000	85-7/8	35-9/16	706448



CERTA-LOK® 90° SWEEP BENDS

C/L MALE x C/L MALE

SIZE (IN.)	PSI	WT./PC. (LBS.)	OD (IN.)	L (IN.)	W (IN.)	PART NO.
2"	250	2.40	2.375	16-1/16	16-1/16	710889
3"	250	6.40	3.500	23-1/8	23-1/8	710896
4"	250	12.70	4.500	30-1/4	30-1/4	710902
4" HP	315	14.90	4.500	30-1/4	30-1/4	706547
6"	250	31.00	6.625	42	42	710919
6" HP	315	45.30	6.625	42	42	706554
8"	250	59.00	8.625	46-5/8	46-5/8	710926
10"	200	120.00	10.750	71-3/8	71-3/8	705267
12"	200	165.00	12.750	71-13/16	71-13/16	705281
14"	160	217.00	14.000	78-5/8	78-5/8	706455
16"	200	234.00	16.000	78-5/8	78-5/8	706462



CertainTeed Corporation
P.O. Box 860
Valley Forge, PA 19482

Phone: 866-CT4-PIPE (866-284-7473)
Fax: 610-254-5428

Code No. 40-90-43M

Restrained Joint PVC Pressure Fittings

Couplings and Fittings for Certa-Lok™ Yelomine™ Pipe

Certa-Lok™ fittings, like the pipe, provide the simplicity and integrity of the Certa-Lok™ joint. Adaptors allow easy connections to other piping materials and joints.

All Yelomine™ fittings are compatible with respect to chemical resistance and pressure ratings with Yelomine™ pipe (see Section A). Spline couplings are as strong as the pipe with respect to both internal pressure and axial forces resulting from internal pressure.

Definitions & Abbreviations

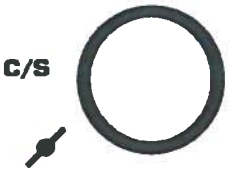
- C/L..... Certa-Lok
- C/LF..... Certa-Lok Gasketed (female)
- C/LM.... Certa-Lok Grooved (male) Pipe End
- MIPT.... IPS (male) pipe thread (NPT)
- FIPT ..... IPS (female) pipe thread (NPT)
- SW.....Solvent Weld
- PE.....Plain End
- BE.....Bell End

Splines

DESCRIPTION	PRODUCT NUMBER
2" Certa-Lok Spline	23044
3" Certa-Lok Spline	23134
4" Certa-Lok Spline	23138 1
6" Certa-Lok Spline	23347
8" Certa-Lok Spline	23368 15
10" Certa-Lok Spline*	23400 15
12" Certa-Lok Spline*	23510 15
8" Spline Insertion Tool	23540
10" & 12" Spline Insertion Tool	23540 1

Permanent Use "O"-Ring

Maximum compression, high disassembly effort. Lubricant required to assemble.



SIZE	MATERIAL	PRODUCT NUMBER
2"	IR	23043 1
3"	IR	23133 1
4"	IR	23238 01
6"	IR	23346 01
8"	IR	23368 1
10"	IR	23400 1
12"	IR	23510 1

IR–Polyisoprene Rubber

Non-Permanent Use "O"-Ring

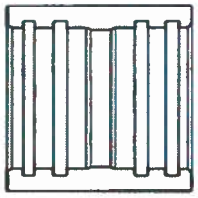
Teflon coated for easy assembly. No lubricant required to assemble 2"–6".

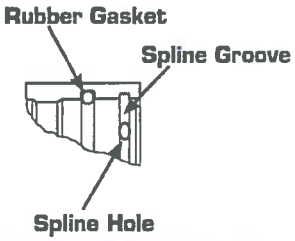
SIZE	MATERIAL	PRODUCT NUMBER
2"	NBR	23043
3"	NBR	23133
4"	NBR	23238
6"	NBR	23346
8"	IR	23368 1
10"	IR	23400 1
12"	IR	23510 1

NBR–Nitrile Butadiene Rubber
IR– Polyisoprene Rubber

Restrained Joint PVC Pressure Fittings

Yelomine™ Couplings (With Splines and "O"-Rings)

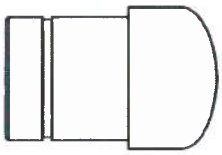




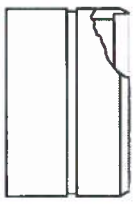
SIZE	PRESSURE RATING (psi)	NON-PERMANENT
2"	250	23042
3"	250	23132
4"	250	23237
6"	250	23345
8"	200	23368
10"	160	23400
12"	160	23510

SIZE	PRESSURE RATING (psi)	PERMANENT USE
2"	250	23042 05
3"	250	23132 05
4"	250	23237 05
6"	250	23345 05
8"	200	23368 05
10"	160	23400 05
12"	160	23510 03

Certa-Lok End Plug



2" & 8"

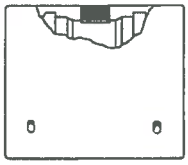


10" & 12"

SIZE (in.)	PRESSURE RATING (psi)	PRODUCT NUMBER
2	250	23084
3	250	23132 9
4	250	23288
6	250	23355
8	200	23368 9
10	160	23410
12	160	23520

Certa-Lok Tapped Couplings

(C/L Female x C/L Female) (FIPT Outlet)

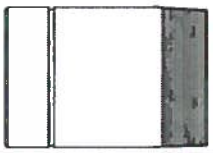


SIZE (in.)	OUTLET SIZE (in.)	PSI RATING (psi)	PRODUCT NUMBER USE	
			NON-PERMANENT	PERMANENT
2 x 2	¾	200	23052	23042 34
2 x 2	1	200	23042 35	23042 36
3 x 3	¾	200	23132 32	23132 33
3 x 3	1	200	23132 34	23132 35
3 x 3	1½	160	23132 36	23132 37
4 x 4	¾	200	23373	23273 01
4 x 4	1	200	23373 02	23273 03
4 x 4	1½	160	23373 04	23273 05
6 x 6	¾	200	23323	23323 01
6 x 6	1	200	23323 02	23323 03
6 x 6	1½	200	23323 04	23323 05
8 x 8	1	200	23368 44	23368 45
8 x 8	1½	200	23368 46	23368 47
8 x 8	2	160	23368 48	23368 49
10 x 10	1½	160	23400 42	23400 43
10 x 10	2	160	23400 44	23400 45
12 x 12	1½	160	23510 42	23510 43
12 x 12	2	160	23510 44	23510 45

NOTE: Maximum outlet sizes are as shown above. Outlet sizes ½", ¾", 1", 1¼" if not shown above are available on a special order basis only. Contact your local Team EJP sales office for price and availability.

Certa-Lok Nipple

(C/L Male x Male Pipe Threads (NPT))

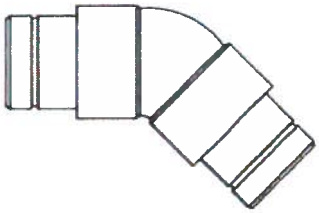


SIZE	PRESSURE RATING (psi)	PRODUCT NUMBER
2"	200	23011
3"	190	23102
4"	160	23277
6"	120	23351
8"	110	23368 18

Restrained Joint PVC Pressure Fittings

Certa-Lok 45° Ells

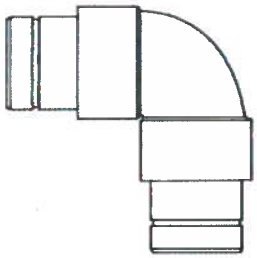
(C/L Male x C/L Male)



SIZE (in.)	PRESSURE RATING (psi)	PRODUCT NUMBER
2	160	23035
2	250	23035 1
3	160	23135 1
3	250	23135 2
4	250	23231 1
6	250	23313
8	200	23369 1
10	200	23405 1
12	200	23515 1

Certa-Lok 90° Ells

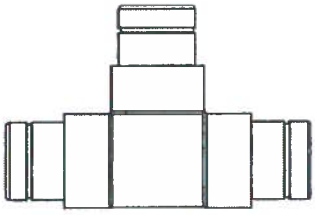
(C/L Male x C/L Male)



SIZE (in.)	PRESSURE RATING (psi)	PRODUCT NUMBER
2	160	23022
2	250	23022 1
3	160	23135 4
3	250	23135 5
4	250	23218
6	250	23305
8	200	23369 3
10	200	23405 3
12	200	23515 3

Certa-Lok Tee

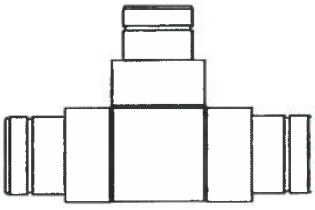
(C/L Male x C/L Male x C/L Male)



SIZE (in.)	PRESSURE RATING (psi)	PRODUCT NUMBER
2 × 2 × 2	160	23047
2 × 2 × 2	250	23047 1
3 × 3 × 3	160	23136
3 × 3 × 3	250	23136 1
4 × 4 × 4	250	23245
6 × 6 × 6	250	23320 1
8 × 8 × 8	250	23370
10 × 10 × 10	200	23407
12 × 12 × 12	200	23517

Certa-Lok Reducing Tee

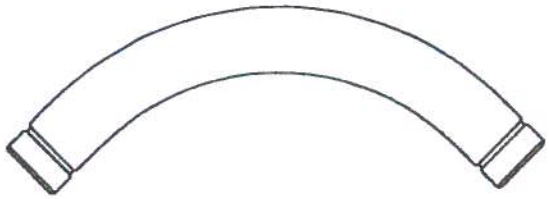
(C/L Male x C/L Male x C/L Male)



SIZE (in.)	PRESSURE RATING (psi)	PRODUCT NUMBER
3 × 3 × 2	250	23136 2
4 × 4 × 2	250	23268
4 × 4 × 3	250	23268 1
6 × 6 × 2	250	23336
6 × 6 × 3	250	23336 1
6 × 6 × 4	250	23334
8 × 8 × 6	200	23370 1

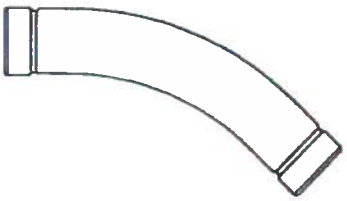
Restrained Joint PVC Pressure Fittings

Certa-Lok 90° Sweep Bend
(C/L Male x C/L Male)



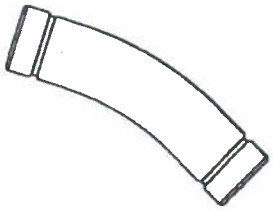
SIZE (in.)	PRESSURE RATING (psi)	PRODUCT NUMBER
2	250	23022 2
3	250	23135 6
4	250	23218 1
6	250	23305 1
8	200	23369 4
10	160	23405 4
12	160	23515 4

Certa-Lok 45° Sweep Bend
(C/L Male x C/L Male)



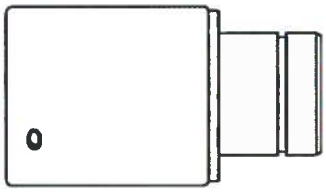
SIZE (in.)	PRESSURE RATING (psi)	PRODUCT NUMBER
2	250	23035 2
3	250	23135 3
4	250	23231 2
6	250	23313 1
8	200	23369 2
10	160	23405 2
12	160	23515 2

Certa-Lok 22½° Sweep Bend
(C/L Male x C/L Male)



SIZE (in.)	PRESSURE RATING (psi)	PRODUCT NUMBER
2	250	23036
3	250	23135
4	250	23233
6	250	23315
8	200	23369
10	160	23405
12	160	23515

Certa-Lok Reducer
(C/L Female x C/L Male)



SIZE (in.)	PSI	PRODUCT NUMBER	
		NON-PERMANENT USE	PERMANENT USE
4 x 2	250	23244 15	23244 20
4 x 3	250	23244	23244 1
6 x 2	250	23346 60	23346 61
6 x 4	250	23346 62	23346 63
8 x 2	200	23368 70	23368 71
8 x 4	200	23368 72	23368 73
8 x 6	200	23368 74	23368 75
10 x 8	160	23400 70	23400 71
12 x 8	160	23510 70	23510 71

APPENDIX G

Endangered Species Act Eligibility Determination

IPaC Information for Planning and Consultation

U.S. Fi

MY PROJECTS

Hancock Lot Parking Facility Norfolk County, Massachusetts

PROJECT HOME | REGULATORY REVIEW | LOCAL OFFICE N

Hancock Lot Parking Facility

700 Car Parking Garage

LOCATION Norfolk County, Massachusetts

CREATED July 3, 2018

1 MEMBER | 2 DOCUMENTS

What's next?

ENDANGERED SPECIES REV

Review this project's effe
species 1 pursuant to
Species Act, as part of th
regulatory review.

RESUME REVIEW

SPECIES LIST

An official species list wa
minutes ago. Species lis
valid for 90 days.

REQUEST UPDATED LIST

Local office

Species determinations

For listed species 1 not covered by determination keys, an impact analysis should be performed to reach a conclusion about how this project will impact the species. These conclusions will result in *determinations* for each species, which will be used in consultation with the U.S. Fish and Wildlife Service.

Mammals

NAME	DETERMINATION
Northern Long-eared Bat Myotis septentrionalis	None

Critical habitats

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

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:
Consultation Code: 05E1NE00-2018-SLI-2279
Event Code: 05E1NE00-2018-E-05327
Project Name: Hancock Lot Parking Facility

July 03, 2018

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-2279

Event Code: 05E1NE00-2018-E-05327

Project Name: Hancock Lot Parking Facility

Project Type: DEVELOPMENT

Project Description: 700 Car Parking Garage

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.25307859323864N70.98930061739443W

Counties: Norfolk, 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.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* 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.

U.S. Fish & Wildlife Service

Northern Long-Eared Bat

Myotis septentrionalis

The northern long-eared bat is federally listed as a threatened species under the Endangered Species Act. ***Endangered*** species are animals and plants that are in danger of becoming extinct. ***Threatened*** species are animals and plants that are likely to become endangered in the foreseeable future. Identifying, protecting and restoring endangered and threatened species is the primary objective of the U.S. Fish and Wildlife Service's Endangered Species Program.

Photo by Steve Taylor, University of Illinois

This northern long-eared bat, observed during an Illinois mine survey, shows visible symptoms of white-nose syndrome.

What is the northern long-eared bat?

Appearance: The northern long-eared bat is a medium-sized bat with a body length of 3 to 3.7 inches and a wingspan of 9 to 10 inches. Their fur color can be medium to dark brown on the back and tawny to pale-brown on the underside. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*.

Winter Habitat: Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Within hibernacula, surveyors find them hibernating most often in small crevices or cracks, often with only the nose and ears visible.

Summer Habitat: During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. They rarely roost in human structures like barns and sheds.

Reproduction: Breeding begins in late summer or early fall when males begin to swarm near hibernacula. After copulation, females store sperm during hibernation until spring. In spring, females emerge from their hibernacula, ovulate and the stored sperm fertilizes an egg. This strategy is called delayed fertilization.

After fertilization, pregnant bats migrate to summer areas where they roost in small colonies and give birth to a single pup. Maternity colonies of females and young generally have 30 to 60 bats at the beginning of the summer, although larger maternity colonies have also been observed. Numbers of bats in roosts typically decrease from the time of pregnancy to post-lactation. Most bats within a maternity colony give birth around the same time, which may occur from late May or early June to late July, depending where the colony is located within the species' range. Young bats start flying by 18 to 21 days after birth. Maximum lifespan for the northern long-eared bat is estimated to be up to 18.5 years.

Feeding Habits: Like most bats, northern long-eared bats emerge at dusk to feed. They primarily fly through the understory of forested areas feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation or by gleaning motionless insects from vegetation.

Range: The northern long-eared bat's range includes much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. The species' range includes 37 States and the District of Columbia: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

Why is the northern long-eared bat in trouble?

White-nose Syndrome: No other threat is as severe and immediate as

this. If this disease had not emerged, it is unlikely that northern long-eared bat populations would be experiencing such dramatic declines. Since symptoms were first observed in New York in 2006, white-nose syndrome has spread rapidly from the Northeast to the Midwest and Southeast; an area that includes the core of the northern long-eared bat's range, where it was most common before this disease. Numbers of northern long-eared bats (from hibernacula counts) have declined by up to 99 percent in the Northeast. Although there is uncertainty about the rate that white-nose syndrome will spread throughout the species' range, it is expected to continue to spread throughout the United States in the foreseeable future.

Other Sources of Mortality:

Although no significant population declines have been observed due to the sources of mortality listed below, they may now be important factors affecting this bat's viability until we find ways to address WNS.

Impacts to Hibernacula: Gates or other structures intended to exclude people from caves and mines not only restrict bat flight and movement, but also change airflow and microclimates. A change of even a few degrees can make a cave unsuitable for hibernating bats. Also, cave-dwelling bats are vulnerable to human disturbance while hibernating. Arousal during hibernation causes bats to use up their energy stores, which may lead to bats not surviving through winter.

Loss or Degradation of Summer Habitat: Highway construction, commercial development, surface mining, and wind facility construction permanently remove habitat and are activities prevalent in many areas of this bat's range. Many forest management activities benefit bats by keeping areas forested rather than converted to other uses. But, depending on type and timing, some forest management activities can cause mortality and temporarily remove or degrade roosting and foraging habitat.

Wind Farm Operation: Wind turbines kill bats, and, depending on the species, in very large numbers. Mortality from windmills has been documented for northern long-eared bats, although a small number have been found to date. However, there are many wind projects within a large portion of the bat's range and many more are planned.

What Is Being Done to Help the Northern Long-Eared Bat?

Disease Management: Actions have been taken to try to reduce or slow the spread of white-nose syndrome through human transmission of the fungus into caves (e.g. cave and mine closures and advisories; national decontamination protocols). A national plan was prepared by the Service and other state and federal agencies that details actions needed to investigate and manage white-nose syndrome. Many state and federal agencies, universities and non-governmental organizations are researching this disease to try to control its spread and address its affect. See www.whitenosesyndrome.org/ for more.

Addressing Wind Turbine Mortality: The Service and others are working to minimize bat mortality from wind turbines on several fronts. We fund and conduct research to determine why bats are susceptible to turbines, how to operate turbines to minimize mortality and where important bird and bat migration routes are located. The Service, state natural resource agencies, and the wind energy industry are developing a Midwest Wind Energy Habitat Conservation Plan, which will provide wind farms a mechanism to continue operating legally while minimizing and mitigating listed bat mortality.

Listing: The northern long-eared bat is listed as a threatened species under the federal Endangered Species Act. Listing a species affords it the protections of the Act and also increases the priority of the species for funds, grants, and recovery opportunities.

Hibernacula Protection: Many federal and state natural resource agencies and conservation organizations have protected caves and mines that are important hibernacula for cave-dwelling bats.

What Can I Do?

Do Not Disturb Hibernating Bats: To protect bats and their habitats, comply with all cave and mine closures, advisories, and regulations. In areas without a cave and mine closure policy, follow approved decontamination protocols (see http://whitenosesyndrome.org/topics/decontamination). Under no circumstances should clothing, footwear, or equipment that was used in a white-nose syndrome affected state or region be used in unaffected states or regions.

Leave Dead and Dying Trees Standing: Like most eastern bats, the northern long-eared bat roosts in trees during summer. Where possible and not a safety hazard, leave dead or dying trees on your property. Northern long-eared bats and many other animals use these trees.

Install a Bat Box: Dead and dying trees are usually not left standing, so trees suitable for roosting may be in short supply and bat boxes may provide additional roost sites. Bat boxes are especially needed from April to August when females look for safe and quiet places to give birth and raise their pups.

Support Sustainability: Support efforts in your community, county and state to ensure that sustainability is a development goal. Only through sustainable living will we provide rare and declining species, like the northern long-eared bat, the habitat and resources they need to survive alongside us.

Spread the Word: Understanding the important ecological role that bats play is a key to conserving the northern long-eared and other bats. Helping people learn more about the northern long-eared bat and other endangered species can lead to more effective recovery efforts. For more information, visit www.fws.gov/midwest/nleb and www.whitenosesyndrome.org

Join and Volunteer: Join a conservation group; many have local chapters. Volunteer at a local nature center, zoo, or national wildlife refuge. Many state natural resource agencies benefit greatly from citizen involvement in monitoring wildlife. Check your state agency websites and get involved in citizen science efforts in your area.

Northern Long-Eared Bat (*Myotis septentrionalis*) Species Guidance

Family: Vespertilionidae- the evening bats

State Status: Threatened

State Rank: S1S3

Federal Status: None

Global Rank: G4

Wildlife Action Plan Area of Importance Score: 3

Range of the northern long-eared bat in Wisconsin. Source: WI Bat Program 2012

Dave Redell, Wisconsin DNR

Species Information

General Description: The northern long-eared bat, also referred to as the northern bat, is a medium-sized member of the genus *Myotis*. Adults weigh five to nine grams (0.2-0.3 oz). Individual weights vary seasonally and are lowest in the spring as bats emerge from hibernation (WI Bat Program 2010). Total length is 77-92 mm (3.0-3.63 in), adult forearm length is 34-38 mm (1.3-1.5 in), and females are generally larger than males (Kurta 1995). Wingspan is 23-26 cm (9.1-10.2 in; Barbour and Davis 1969). Fur color is light to dark brown. The northern long-eared bat is classified as a cave bat because it uses caves and mines for hibernation.

Similar Species: Three bat species in Wisconsin- the northern long-eared bat, the little brown bat (*Myotis lucifugus*) and the Indiana (*Myotis sodalis*) bat – are best distinguished by close (in-hand) inspection. The northern long-eared bat is most often confused with the little brown bat. The northern long-eared bat has longer ears than the little brown bat, and when folded alongside the head, the tips of the ears should extend 3 mm or more past the tip of the nose. Little brown bat ear length in Wisconsin, however, can be highly variable, and tragus shape and length in relation to the rest of the ear are the two best features to use to distinguish these two species (Fig. 1). The tragus of the northern long-eared bat is more pointed and spear-like than that of the little brown bat. The little brown bat also has a glossier appearance than the northern long-eared. The northern long-eared bat may also be confused with the Indiana bat, but the two can be distinguished much the same way as the little brown bat from the northern long-eared bat. The Indiana bat's keeled calcar, a spur of cartilage extended from the ankle and supporting the interfemoral membrane, is a distinguishing feature that the northern long-eared bat lacks. The northern long-eared bat can be identified by the echolocation call (Fig. 2), however both other *Myotis* species share similar call characteristics, and only trained individuals should positively identify the species through echolocation calls.

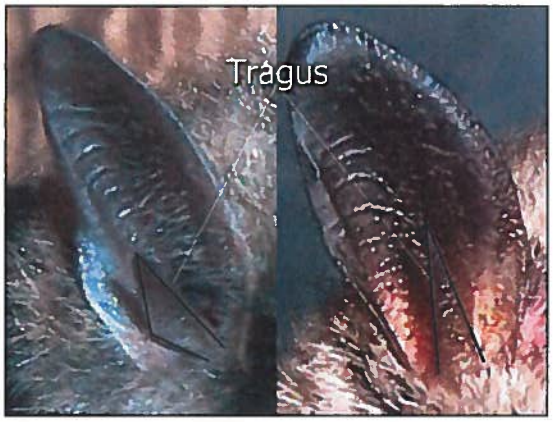


Figure 1. The asymmetrical tragus of the little brown bat (left), and the symmetrical, spear-like tragus of the northern long-eared bat (right). Dave Redell, Wisconsin DNR

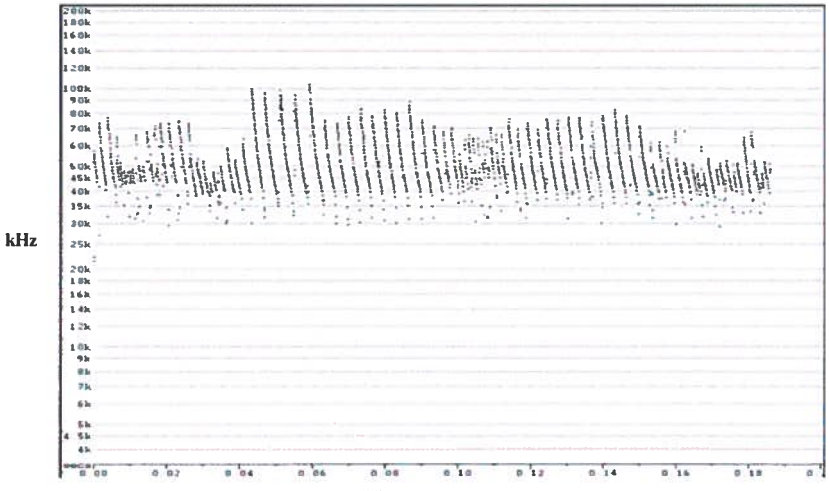


Figure 2. Echolocation call: Northern long-eared bats produce high-frequency calls of a shorter duration, broader bandwidth and lower intensity than other *Myotis* species. The call frequency ranges between 126 and 40 kHz (Caceres and Barclay 2000). The northern long-eared bat sonogram may appear similar to the little brown bat and the Indiana bat.

Associated Species: Northern long-eared bat predators include owls, hawks, occasionally snakes, and raccoons (*Procyon lotor*). As many as 13 feral cats have also been observed congregating at a mine entrance at dusk to prey upon bats as they leave the hibernaculum (D. Redell pers. obs.). Northern long-eared bats often share hibernacula with other bat species such as the tri-colored bat (*Perimyotis subflavus*), the little brown bat, the big brown bat (*Eptesicus fuscus*) and the Indiana bat, but the northern bat rarely, if ever, forms hibernating clusters with other species. Northern long-eared bats forage with other bat species, but there is no evidence of direct competition between species.

State Distribution and Abundance: Northern long-eared bats are found throughout the state of Wisconsin (but see "Threats" section below), but they are never abundant (Jackson 1961, WDNR 2013).

Global Distribution and Abundance: Northern long-eared bats are widely distributed in the eastern United States and Canada, with the exception of the very southeastern United States and Texas (see Fig. 3, BCI 2012).

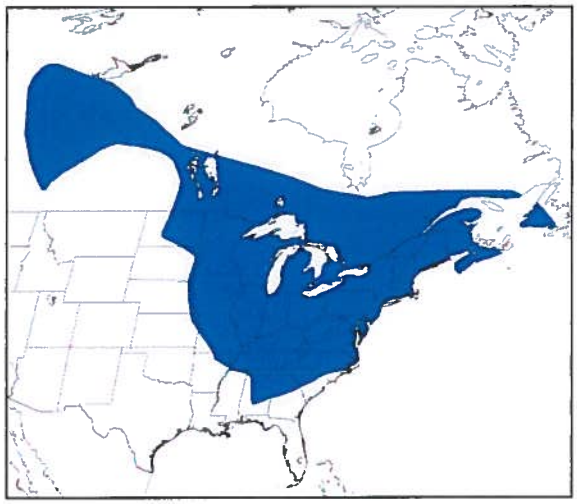
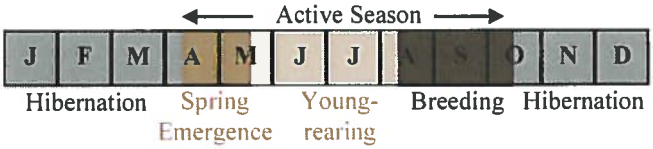


Figure 3. Global distribution of *Myotis septentrionalis*. (BCI 2012)

Diet: The northern long-eared bat is insectivorous and uses echolocation to locate and capture prey. Northern long-eared bat prey includes moths (*Lepidoptera*), flies (*Diptera*) and beetles (*Coleoptera*). This species is commonly referred to as a gleaning bat because it often catches insects that are at rest on leaves or twigs, in addition to catching insects that are flying (Lee and McCracken 2004).

Reproductive Cycle: The reproductive cycle for the northern long-eared bat begins when breeding occurs in the fall and sometimes into winter hibernation. Sperm is stored in the uterus of the female until April or May when the females emerge from hibernation and fertilization occurs. Females form small maternity colonies of up to 30 bats in late spring and females give birth to a single pup in June or early July (Caceres and Barclay 2000, Owen et. al. 2002). Pups are born hairless and flightless. The pup nurses for about a month and is left at the roost nightly while the mother goes out to feed. The pup begins to fly and explore on its own at four to six weeks. Maternity colonies disperse shortly after young are volant (able to fly) and bats move closer to hibernacula in the fall and mate before they hibernate. Young of the year do not usually mate, but some juvenile males appear reproductively active (WI Bat Program 2009, 2010). More research is needed to determine breeding and reproductive behavior of the northern long-eared bat.



Ecology: Female and male northern long-eared bats emerge from hibernation in April and May. In summer, the northern long-eared bat roosts alone, or females may form a colony with some other females. The northern long-eared bat chooses day roosts in tall trees and snags. Night roosts for this species include caves and rock shelters where they will rest between feeding bouts (Caceres and Barclay 2000). Roost fidelity is low in this species, and individual bats switch roosts about every two days in the summer (Foster and Kurta 1999). This species is a relatively long lived mammal for its size, and usually lives up to 8-10 years. Banding records indicated a northern long-eared bat caught in the wild lived up to 18 years (Caceres and Barclay 2000). In the fall, northern long-eared bats will make short migrations from summer habitat to winter hibernacula (caves and abandoned mines), and will often return to the same hibernaculum but not always in sequential seasons (Caceres and Barclay 2000). This species hibernates with other species such as the little brown bat and tri-colored bat, but often in different parts of the hibernaculum. The northern long-eared bat hibernates deep in crevices, rather than clustering on exposed surfaces like other cave bats, which makes it difficult to survey and monitor for this species during the winter (Caceres and Barclay 2000). More research is needed on northern long-eared bats' basic life history and behavior.

Natural Community Associations: (WDNR 2005 and WDNR 2009)

Many bat species are associated more with structural features within natural communities than with any particular natural community or group of natural communities (see "Habitat" section).

Significant: coldwater streams, coolwater streams, ephemeral pond
Moderate: alder thicket, bog relict, boreal rich fen, calcareous fen (southern), central sands pine – oak forest, coastal plain marsh, emergent aquatic, floodplain forest, hemlock relict, inland lakes, northern dry forest, northern dry-mesic forest, northern hardwood swamp, northern mesic forest, northern sedge meadow, oak barrens, oak woodland, open bog, shrub carr, southern dry forest, southern

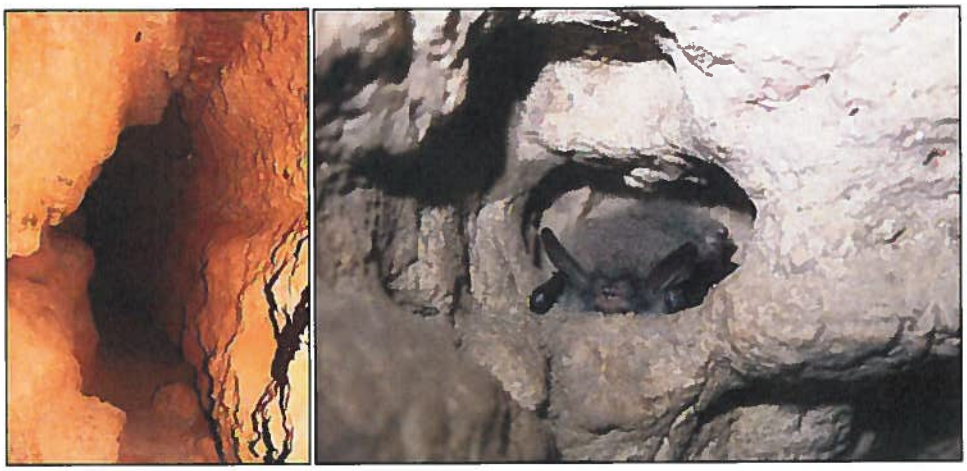
dry-mesic forest, southern hardwood swamp, southern mesic forest, southern sedge meadow, submergent aquatic, submergent aquatic-oligotrophic marsh, warmwater rivers, warmwater streams, white pine – red maple swamp
Minimal: none

Habitat: Northern long-eared bat habitat use changes over the course of the year, and varies based on sex and reproductive status. Reproductive females often use different summer habitat from males and non-reproductive females.

Summer: Northern long-eared bats commonly roost in trees but have been known to roost in man-made structures. This species often roosts under bark or close to the tree trunk in crevices of tree species such as maples and ashes (Foster and Kurta 1999). Northern long-eared bats prefer to roost in tall trees with a dynamic forest structure including old growth and some young trees (Foster and Kurta 1999). Females form small maternity colonies which are located in trees, under shingles, and in buildings. Northern long-eared bats commonly forage within the forest and below the canopy mainly in upland forests on hillsides and ridges (Owen et al. 2003), but have also been noted to forage along paths, ponds and streams, and at forest edges. Foster and Kurta (1999) found all roost trees to be close to wetlands. More information is needed to more fully describe northern long-eared bat foraging habitats and summer roosting in Wisconsin.

Home range: Northern long-eared bats use approximately 150 acres for their home range in summer (Owen et al. 2003). More information is needed to accurately describe northern long-eared bat home range and habitat in Wisconsin.

Winter: The northern long-eared bat hibernates in caves and abandoned mines in winter and tends to be found in deep crevices (Kurta 1994, Caceres and Barclay 2000). More research is needed to determine what characteristics make suitable caves and mines for northern long-eared bat hibernation.



Northern long-eared bat hibernacula in southwestern Wisconsin: Passage of a mine in Grant County that houses northern bats (left), and solitary northern long-eared bat in a crevice in Pierce County (right). Heather Kaarakka, Wisconsin DNR

Edge habitat (transition zone between two types of vegetation) is important for northern long-eared bats as they migrate and forage. When bats migrate from wintering caves to summer habitat or commute from roosts to feeding grounds, they move through the landscape in a manner that protects them from wind and predators. Instead of flying the shortest distance across a field, for instance, bats will take longer routes that follow edge habitat. In addition to offering protection, this behavior may also allow bats more feeding opportunities because food is more abundant around edge habitat (Limpens and Kapteyn 1991). Commuting along edge habitat may assist the bats with navigation and orientation through use of linear edges as landmarks (Verboom and Huitema 1997).

Threats: Lack of information on bat species' basic ecology is one of the greatest threats to bat conservation in Wisconsin. The northern long-eared bat faces two emerging threats, and several ongoing threats. White-nose syndrome (WNS) was discovered in 2006 in a hibernaculum in New York State, and appears as a white, powdery substance on the bat's face, tail and wings. White-nose syndrome has spread rapidly since 2007 to other hibernacula in neighboring states (USFWS 2012). Infected little brown bat and northern bat hibernacula in New York and surrounding states have experienced mortality rates of over 90%. White-nose syndrome has been called the "most precipitous wildlife decline in the past century in North America" (BCI 2009), and is caused by a fungus called *Geomyces destructans* (Lorch et al. 2011). This fungus grows best in the cool, wet conditions of hibernacula (Verant et al. 2012). Mortality from the fungus appears to come from increased arousals during torpor, which deplete bats' fat reserves and cause starvation (Reeder et al. 2012) and dehydration (Cryan et al. 2010). For up-to-date WNS information, see the USFWS WNS website and the USGS National Wildlife Health Center website (see *Additional Information).* Neither the fungus nor the disease has been found in Wisconsin as of this writing. Cave-hibernating bats, including the northern long-eared bat, should be monitored closely for any

indication of WNS; the Wisconsin Bat Program conducts WNS surveillance and monitoring in the state.

Wind power is another emerging threat to bats – wind turbines have been shown to fatally impact all bat species in Wisconsin (Johnson 2003, Arnett et al. 2008). Wind-turbine blades cause mortality through direct impact or through the pressure differential caused by the motion of the spinning blades. This pressure differential causes a bat's lungs to fill with fluid as it flies near the spinning blades, and this phenomenon (known as barotrauma) kills the bat instantly (Baerwald et. al. 2008). More research is under way to better understand bat wind-turbine vulnerabilities, but current studies suggest that bats face the greatest risk during migration from summer foraging sites to wintering grounds (tree bats) or hibernacula (cave bats) (Johnson 2003, Kunz et al. 2007). Research is needed on all Wisconsin bat species to better understand wind-turbine mortality in the state and the long term population impacts of turbine-related deaths.

Northern long-eared bats also face the ongoing threat of habitat degradation. Habitat degradation is caused by increased agricultural, industrial, and household pesticide use, and it has negative effects on bats through direct exposure and through dietary accumulation (O'Shea et al. 2001). Pesticides are a threat to many taxa, but bats may be more vulnerable than other small mammals due to certain life characteristics (Shore et al. 1996, O'Shea et al. 2001). Bats' longevity and high trophic level means pesticides can concentrate in their body fat (Clark and Prouty 1977, Clark 1988). Even after pesticide exposure ceases, residues can be passed on to nursing young (Clark 1988). Bat species that migrate long distances may be more affected because pesticide residues become increasingly concentrated in the brain tissue as fat reserves are depleted during long-distance flights. This concentration can lead to convulsions and even death (Geluso et al. 1976, Clark 1978).

Northern long-eared bats also face the ongoing threat of hibernaculum disturbance from humans entering hibernacula in winter and waking bats from torpor. Bats in torpor reduce their metabolism and body temperature to low levels that require less energy than being fully awake. Interrupting torpor costs energy; a little brown bat uses up to 100 mg of fat reserves waking and the returning to torpor (and more if the bat starts flying), or the energetic equivalent of up to 67 days of torpor (Thomas et al. 1990, Thomas 1992). This loss clearly represents a large percentage of total body weight of the bat, and repeated arousals may cause bats to run out of energy reserves before spring arrives and therefore starve in the hibernaculum or die from exposure if they seek food outside (Thomas 1995).

Climate Change Impacts: The effects of climate change on the northern long-eared bat are unclear. Predictions suggest a northward expansion in the ranges of all cave-bat species, in pursuit of optimal hibernation (Humphries et al. 2002, USFWS 2007). This prediction assumes an abundance of suitable caves and other hibernaculum structures further north, but this assumption may not hold for karst-free regions at higher latitudes. Bat species may adapt by reducing torpor depth and duration during winter if prey insect species are available for more of the year (Weller et al. 2009), but bats' adaptive capacities in this regard may be limited and are not well known. Shifts in prey insect emergence may also cause mismatches with bat emergence and cause food shortages in the spring or fall.

Survey Guidelines: Persons handling northern long-eared bats must possess a valid Endangered and Threatened Species Permit. If surveys are being conducted for regulatory purposes, survey protocols and surveyor qualifications must first be approved by the Endangered Resources Review Program (see *Contact Information*).

Acoustic surveys, which should be done by trained individuals, are performed for all Wisconsin bat species in spring, summer, and fall; and are used to determine presence/absence, phenology, and distribution around the state. The Wisconsin Bat Program's eventual goal is to use acoustic survey data to determine bat population trends in Wisconsin. Northern long-eared bats are ubiquitous around the state, and therefore surveys can be done wherever appropriate habitat exists. Acoustic recording systems that detect echolocation calls can survey bats as they fly through an area. The bat detection system detects and records these acoustic signals as bats fly by, and records the date and time of each encounter. The Wisconsin Bat Program currently uses broadband frequency division ultrasound detection equipment with a PDA (Personal Data Assistant) and a Global Positioning System. Start acoustic surveys half an hour after sunset, but only if the daytime temperature exceeds 50° F, and conduct the survey for at least one hour. There are three seasons for acoustic surveys: spring (April and May), summer (June and July), and fall (August and September). Acoustic surveys record bat passes, which can then be identified to species by trained individuals. These surveys could be used by land managers to create inventories of species distribution and relative abundance. Visit the Wisconsin bat monitoring website for additional information.

Wisconsin DNR also conducts a roost monitoring program to determine abundance of bats roosting in buildings and bat houses. People with bat houses or other roost sites identify species and count bats over the summer at night as bats leave the roost. People who find a bat roost while doing field surveys should contact the Wisconsin Bat Program to report the information.

Summarize results, including survey dates, times, weather conditions, number of detections, detection locations, and behavioral data and submit via the WDNR online report: <http://dnr.wi.gov, keyword "rare animal field report form">

Management Guidelines

The following guidelines typically describe actions that will help maintain or enhance habitat for the species. These actions are not mandatory unless required by a permit, authorization or approval.

Summer Management

Roost availability is thought to limit northern long-eared bat populations, as it does for many bat species, and thus habitat management is important for the continued survival of this species (Duchamp et al. 2007). Northern long-eared bats are forest dwelling bats, and forest management to promote occupation by this species should increase roosting and foraging habitat (see Habitat section above). Northern long-eared bats have been shown to use both live and dead trees for roosting sites (Foster and Kurta 1999). These bats often roost under exfoliating bark, and therefore snags and dying trees may be important for encouraging northern long-eared bats. Forest managers are encouraged to promote mixed-species, mixed-aged plots as the northern long-eared bat chooses trees based on suitability of crevices and bark as roosts, rather than on tree species (Foster and Kurta 1999). The northern long-eared bat is known to switch roost trees frequently (about every 2 days) over the course of the summer, and therefore this species needs a large number of trees (Foster and Kurta 1999). As with many bat species, suitable forested habitat for northern long-eared bats is a multi-species matrix that contains some open areas (Owen et al. 2003).

Linear corridors are important for migrating and commuting bats, and forests may be managed such that suitable foraging habitat is connected by corridors; this may include managing edge habitat along roads, logging trails and riparian habitat. Land managers should also make an effort to reduce or eliminate burdock (*Arctium minus*), an exotic weed that produces seeds that trap bats and cause death from exposure.

Special consideration should be given to protecting snags or dying trees, especially those near known roost locations, particularly from June 1 through August 15 while bats may have pups at the roost.

Seasonal pools in woodlands may be important foraging and water sources for the northern long-eared bat and other Wisconsin bat species because they provide areas for feeding and drinking in an otherwise closed-canopy forest (Francl 2008). Pool size and depth do not appear to determine usage by northern long-eared bats; instead the presence of an opening in the forest is enough to encourage foraging and drinking (Francl 2008).

Fall Management

During fall swarm, large proportions of Wisconsin's cave bat population gather near entrances of the state's hibernacula (see "Habitat" section), and become concentrated and vulnerable to direct impacts. To avoid disturbance during crucial life history events, management activities such as logging and use of heavy machinery within 0.25 miles of hibernacula entrances should be avoided during fall swarm (August 15-October 15) or during spring emergence (April 1-May 15) because bats may use the surrounding area for roosting during those time periods.

Winter Management

Little is known about how northern long-eared bats choose hibernation sites, but suitable Wisconsin hibernacula typically have steady temperatures between 4° C and 12° C (39-53° F), high humidity, and no human disturbance. Artificial sites that can mimic this environment may provide suitable hibernacula. Artificial hibernacula include bunkers, food storage-caves and basements. Contact the Wisconsin Bat Program to inquire about developing artificial hibernacula.

Natural hibernacula can also be managed to encourage bat use. For example, closing but not sealing the entrance to an abandoned mine not only buffers temperature and humidity, but also reduces disturbance from humans and predators. Eliminating disturbance from humans, except for WNS surveillance, is the best management activity for natural cave hibernacula. Contact the Wisconsin Bat Program for more information about managing bat hibernacula.

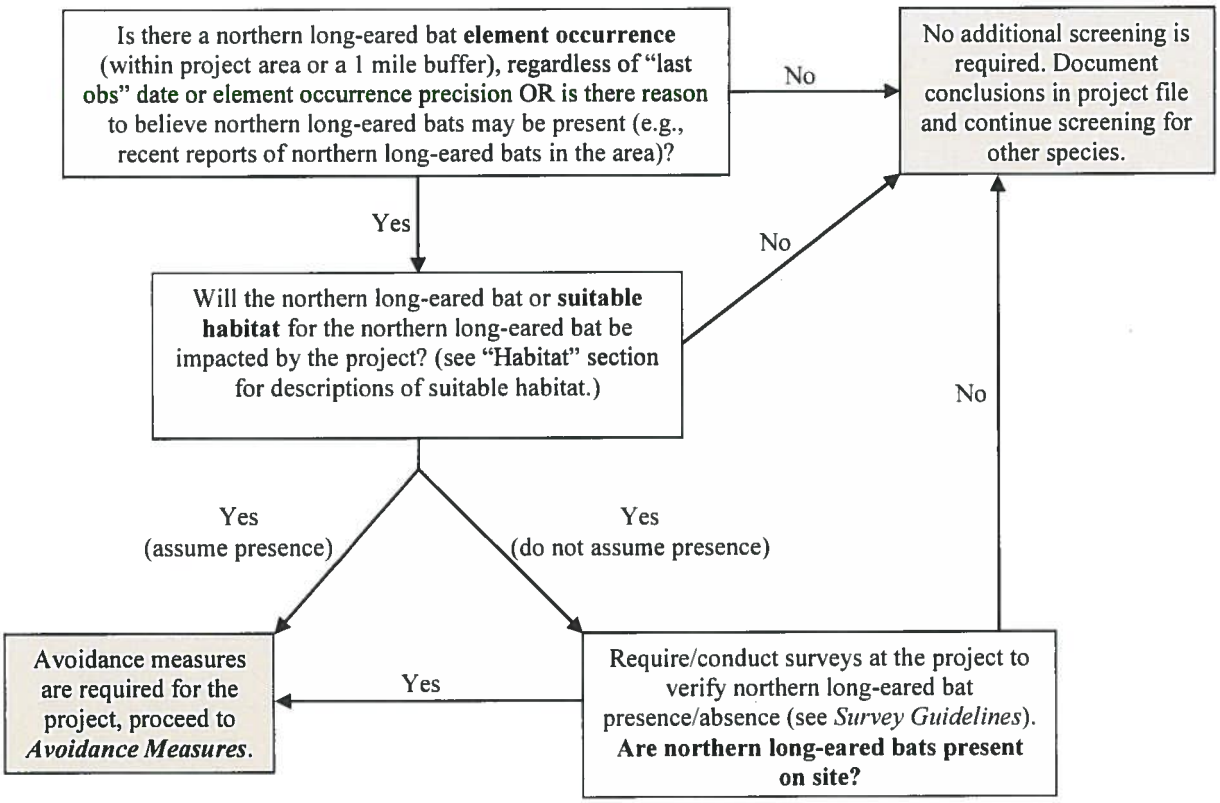
Northern long-eared bats – and their populations as a whole – are particularly vulnerable during winter hibernation because they are concentrated in just a few major hibernacula and because repeated disturbance during hibernation can lead to mortality (see "Threats" section above). Each time a bat is aroused from torpor, it uses up a substantial proportion of the fat reserves it relies on to hibernate through the winter and faces greater odds of starvation before spring (see "Threats" section above). Therefore, avoid entering hibernacula from October 1 through May 15 unless conducting approved and permitted management, surveillance, or research.

Screening Procedures

The following procedures must be followed by DNR staff reviewing proposed projects for potential impacts to the species.

Follow the "Conducting Endangered Resources Reviews: A Step-by-Step Guide for Wisconsin DNR Staff" document (summarized below) to determine if northern long-eared bats will be impacted by a project (WDNR 2012):

Those seeking to complete wind farm projects should review and follow the Guidance for Minimizing Impacts to Natural Resources from Terrestrial Commercial Wind Energy Development created by the WDNR.



Avoidance Measures

The following measures are specific actions required by DNR to avoid take (mortality) of state threatened or endangered species per Wisconsin's Endangered Species law (s. 29.604, Wis. Stats.) These guidelines are typically not mandatory for non-listed species (e.g., special concern species) unless required by a permit, authorization or approval.

According to Wisconsin's Endangered Species Law (s. 29.604, Wis. Stats.), it is illegal to take, transport, possess, process, or sell any wild animal on the Wisconsin Endangered and Threatened Species List (ch. NR 27, Wis. Admin. Code). Take of an animal is defined as shooting, shooting at, pursuing, hunting, catching or killing.

If *Screening Procedures* above indicate that avoidance measures are required for a project, follow the measures below. If you have not yet read through *Screening Procedures*, please review them first to determine if avoidance measures are necessary for the project.

1. The simplest and preferred method to avoid take of northern long-eared bats is to avoid directly impacting individuals, known northern long-eared bat locations, or areas of suitable habitat (described above in the "Habitat" section and in *Screening Procedures*). The U.S. Fish and Wildlife Services identifies humans and their equipment as a possible vectors for spores of *Geomyces destructans* – the fungus that causes white-nose syndrome (WNS) – and therefore simply entering hibernacula at any time of year and moving between them poses threats to bats. Cavers and researchers must observe all cave and mine closures and decontamination protocols (s. NR 40.07, Wis. Admin. Code; see *Additional Information*). In addition, it is illegal to use pesticides and poisons when attempting to evict bats from house roosts (s. 94.708, Wis. Stats.).

2. If suitable habitat cannot be avoided, follow these time-of-year restrictions to avoid take:

Summer Avoidance **(June 1-Aug 15)**

Reproductive females and their young are highly vulnerable to mass mortality during the species' maternity period (June 1 – August 15) because they may aggregate in maternity colonies, and because pups cannot fly and therefore cannot leave the roost for several weeks after birth. Maternity colonies may occur in human structures, and those seeking to exclude bats from a building or other roost must follow the Cave Bat Broad Incidental Take Permit and Authorization (see *Additional Information*).

3. If impacts cannot be avoided during restoration or management activities, including wind projects and forestry management, but activities are covered under the Cave Bat Broad Incidental Take Permit and Authorization; the project is covered for any unintentional take that may occur. For information about natural roost avoidance, see *Management Guidelines* and "Habitat" section above.

4. If northern long-eared bat impacts cannot be avoided, please contact the Natural Heritage Conservation Incidental Take Coordinator (see *Contact Information*) to discuss possible project-specific avoidance measures. If take cannot be avoided, an Incidental Take Permit or Authorization (see *Additional Information*) is necessary.

Additional Information

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Linked Websites:

- Cave bat Broad Incidental Take Permit and Authorization:< http://dnr.wi.gov/topic/erreview/itbats.html>
- Natural Communities of Wisconsin: <http://dnr.wi.gov/org/land/er/communities/>
- Natural Heritage Conservation Permit Requirements: <http://dnr.wi.gov/topic/EndangeredResources/permits.html>

- Rare Animal Field Report Form: <http://dnr.wi.gov, key word "rare animal field report form">
- USFW WNS Website: <http://www.whitenosesyndrome.org>
- USGS National Wildlife Health Center: <http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/>
- Wind Guidance: <http://dnr.wi.gov/topic/Sectors/documents/energy/WindGuidelines.pdf>
- Wisconsin Bat Program Exclusion Instructions: <http://wiatri.net/inventory/bats/Monitoring/Roosts/docs/BatExclusion.pdf>
- Wisconsin Bat Program: <http://wiatri.net/inventory/bats>
- WDNR Decontamination Protocols for Preventing Spread of White-nose syndrome: <http://dnr.wi.gov/topic/WildlifeHabitat/documents/WNS_DeconProtocols.pdf>
- Wisconsin Endangered and Threatened Species: <http://dnr.wi.gov, key word "endangered resources">
- Wisconsin Endangered and Threatened Species Permit: <http://dnr.wi.gov, key word "endangered species permit">"
- Wisconsin Initiative on Climate Change Impacts: <http://www.wicci.wisc.edu/>
- Wisconsin Natural Heritage Inventory Working List Key: <http://dnr.wi.gov/topic/NHI/WList.html>
- Wisconsin's Wildlife Action Plan: <http://dnr.wi.gov/topic/wildlifehabitat/actionplan.html>

Funding

- Natural Resources Foundation of Wisconsin: <http://www.wisconservation.org/>
- USFWS State Wildlife Grants Program: <http://wsfrprograms.fws.gov/subpages/grantprograms/swg/swg.htm>
- Wisconsin Natural Heritage Conservation Fund
- Wisconsin DNR Division of Forestry

Endangered Resources Review Program Contacts

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- Wisconsin Bat Program (608-266-5216, DNRbats@wisconsin.gov)

Suggested Citation

- Wisconsin Department of Natural Resources. 2013. Wisconsin Northern Long-Eared Bat Species Guidance. Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources, Madison, Wisconsin. PUB-ER-700.

Developed by

- Heather M. Kaarakka, Emma M. Pelton, David N. Redell primary authors
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APPENDIX H

Historical Review

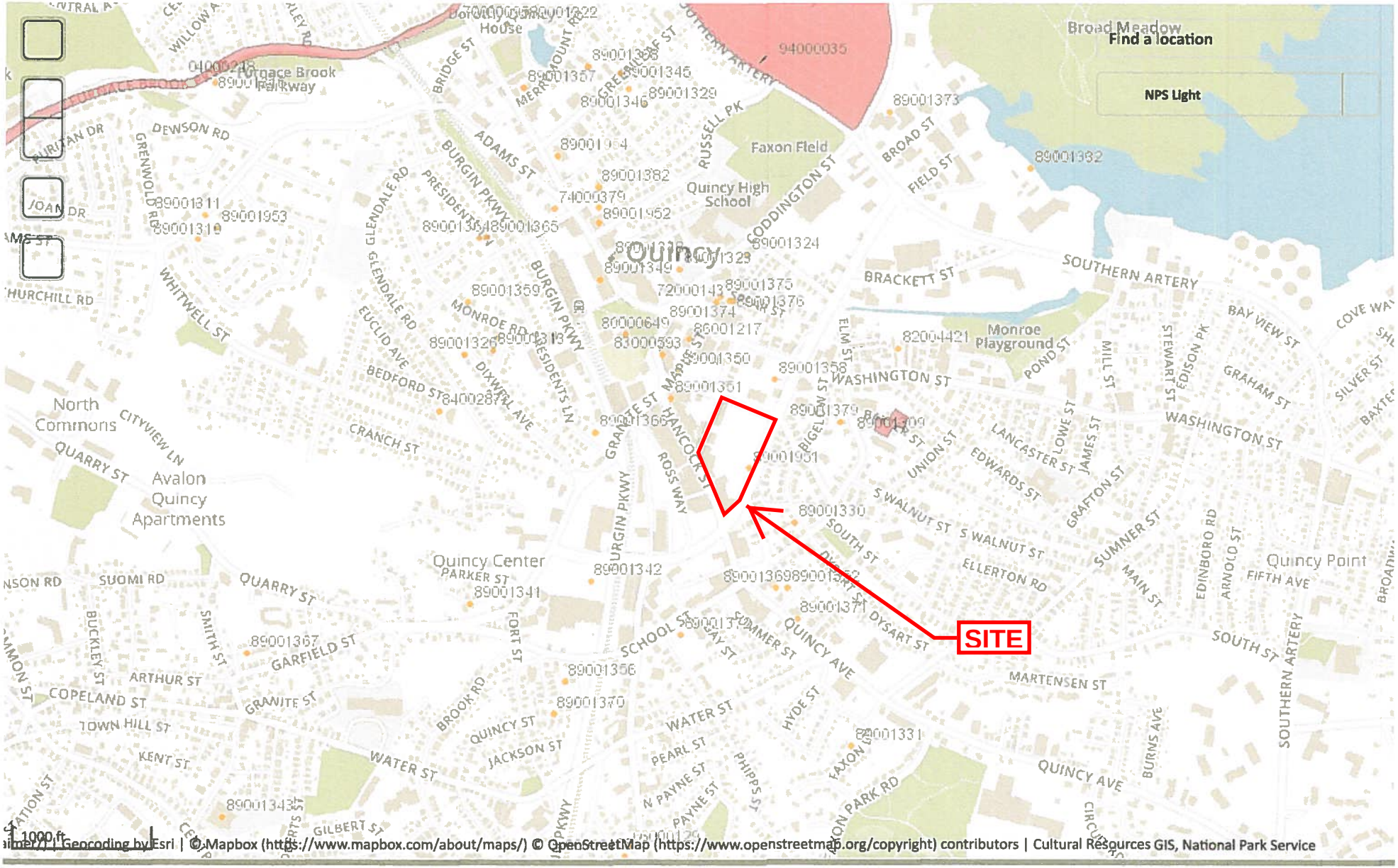
Section H: National Historic Preservation Act Eligibility Determination

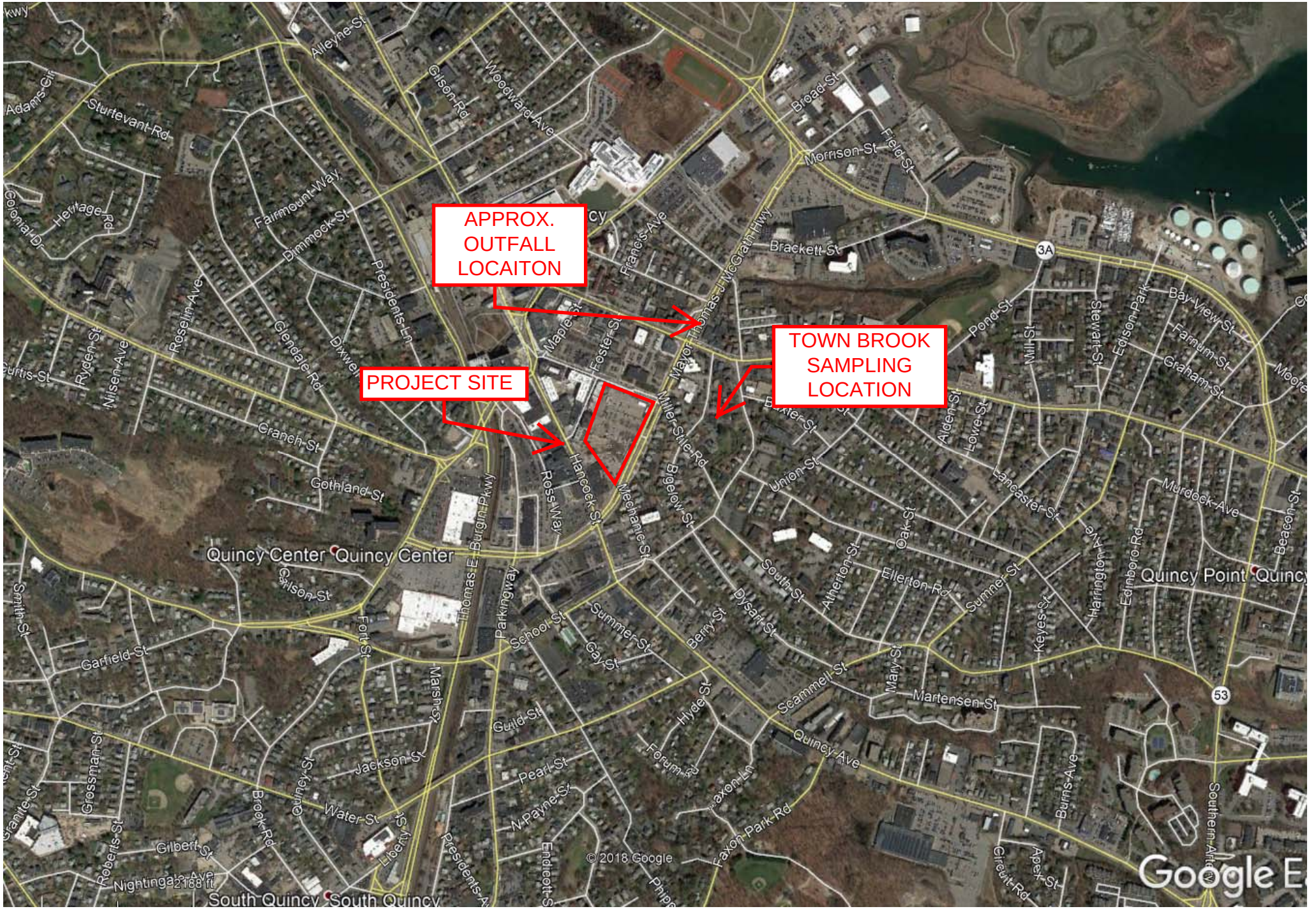
It was determined that the discharge is eligible for coverage under this general permit under Criterion A: No historic properties are present. The discharges and discharge-related activities do not have the potential to cause effects on historic properties. This determination was made by using the Public, non-restricted data depicting National Register spatial data processed by the Cultural Resources GIS facility. These spatial data are available on the National Register of Historic Places website. The attached map depicts the project location and the location of historic properties.

National Register of Historic Places

National Park Service
U.S. Department of the Interior

Public, non-restricted data depicting National Register spatial data processed by the Cultural Resources GIS facility. ...




APPROX. OUTFALL LOCAITON
TOWN BROOK SAMPLING LOCATION
PROJECT SITE
Quincy Center
Quincy Center
Quincy Point
South Quincy
South Quincy
Adams-Cir
Sturtevant-Rd
Alleyne-St
Gilson-Rd
Woodward-Ave
Broad-St
Morrison-St
Field-St
Colonial-Dr
Heritage-Rd
Fairmount-Way
Dimmock-St
Presidents-Ln
Roselin-Ave
Glendale-Rd
Dixwell
Curtis-St
Ryden-St
Nilsen-Ave
Granch-St
Gothland-St
Maple-St
Foster-St
Franeis-Ave
Mayor-Thomas-J-McGrath-Hwy
Brackett-St
3A
Pond-St
Mill-St
Stewart-St
Edison-Park
Bay-View-St
Farnum-St
Graham-St
Baxter-St
Alden-St
Lowe-St
Union-St
Lancaster-St
Murdock-Ave
Beacon-St
Edmboro-Rd
Harrington-Ave
Keyes-Ct
Oak-St
Atherton-St
Ellerton-Rd
Summer-St
South-St
Dysart-St
Berry-St
Miller-Stile-Rd
Bigelow-St
Mechanic-St
Hancock-St
Ross-Way
Thomas-E-Burgin-Pkwy
Parkingway
School-St
Summer-St
Gay-St
Fort-St
Marsh-St
Garfield-St
Smith-St
Carlson-St
Guild-St
Jackson-St
Pearl-St
N-Payne-St
Water-St
Liberty-St
Quincy-St
Brook-Rd
Grossman-St
Roberts-St
Granite-St
Gilbert-St
Nightingale-Ave
Presidents-Ave
Endicott-St
Hyde-St
Forum-Rd
Faxon-Ln
Faxon-Park-Rd
Seammell-St
Mary-St
Martensen-St
Quincy-Ave
Burris-Ave
Circuit-Rd
Apex-St
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ANALYTICAL REPORT

Lab Number:	L1849990
Client:	Coughlin Environmental 62 Montvale Avenue Suite H Stoneham, MA 02180
ATTN:	Jake Morrman
Phone:	(781) 832-1002
Project Name:	HANCOCK LOT
Project Number:	2590-08
Report Date:	12/07/18

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: HANCOCK LOT
Project Number: 2590-08

Lab Number: L1849990
Report Date: 12/07/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1849990-01	A, B, C	WATER	25 COTTAGE AVE., QUINCY, MA	12/06/18 11:00	12/06/18

Project Name: HANCOCK LOT **Lab Number:** L1849990
Project Number: 2590-08 **Report Date:** 12/07/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name:	HANCOCK LOT	**Lab Number:**	L1849990
Project Number:	2590-08	**Report Date:**	12/07/18

Case Narrative (continued)

Report Submission

December 07, 2018: This final report includes the results of all requested analyses.

December 07, 2018: This is a preliminary report.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative Date: 12/07/18

METALS

Project Name: HANCOCK LOT
Lab Number: L1849990
Project Number: 2590-08
Report Date: 12/07/18

SAMPLE RESULTS

Lab ID: L1849990-01
Client ID: A, B, C
Sample Location: 25 COTTAGE AVE., QUINCY, MA
Date Collected: 12/06/18 11:00
Date Received: 12/06/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	ND		mg/l	0.00100	--	1	12/07/18 07:50	12/07/18 11:18	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00021		mg/l	0.00020	--	1	12/07/18 07:50	12/07/18 11:18	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	12/07/18 07:50	12/07/18 11:18	EPA 3005A	3,200.8	AM
Copper, Total	0.00775		mg/l	0.00100	--	1	12/07/18 07:50	12/07/18 11:18	EPA 3005A	3,200.8	AM
Iron, Total	0.666		mg/l	0.050	--	1	12/07/18 07:50	12/07/18 11:40	EPA 3005A	19,200.7	LC
Lead, Total	ND		mg/l	0.00100	--	1	12/07/18 07:50	12/07/18 11:18	EPA 3005A	3,200.8	AM
Nickel, Total	0.00257		mg/l	0.00200	--	1	12/07/18 07:50	12/07/18 11:18	EPA 3005A	3,200.8	AM
Zinc, Total	0.03746		mg/l	0.01000	--	1	12/07/18 07:50	12/07/18 11:18	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	76.8		mg/l	0.660	NA	1	12/07/18 07:50	12/07/18 11:40	EPA 3005A	19,200.7	LC

Project Name: HANCOCK LOT
Project Number: 2590-08
Lab Number: L1849990
Report Date: 12/07/18

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1186687-1										
Arsenic, Total	ND		mg/l	0.00100	--	1	12/07/18 07:50	12/07/18 11:03	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	12/07/18 07:50	12/07/18 11:03	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	12/07/18 07:50	12/07/18 11:03	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	12/07/18 07:50	12/07/18 11:03	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	12/07/18 07:50	12/07/18 11:03	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	12/07/18 07:50	12/07/18 11:03	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	12/07/18 07:50	12/07/18 11:03	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1186689-1										
Iron, Total	ND		mg/l	0.050	--	1	12/07/18 07:50	12/07/18 11:30	19,200.7	LC

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab for sample(s): 01 Batch: WG1186689-1										
Hardness	ND		mg/l	0.660	NA	1	12/07/18 07:50	12/07/18 11:30	19,200.7	LC

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: 2590-08

Lab Number: L1849990

Report Date: 12/07/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1186687-2								
Arsenic, Total	90		-		85-115	-		
Cadmium, Total	106		-		85-115	-		
Chromium, Total	94		-		85-115	-		
Copper, Total	96		-		85-115	-		
Lead, Total	98		-		85-115	-		
Nickel, Total	97		-		85-115	-		
Zinc, Total	103		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1186689-2								
Iron, Total	107		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 Batch: WG1186689-2								
Hardness	107		-		85-115	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: HANCOCK LOT
Project Number: 2590-08

Lab Number: L1849990
Report Date: 12/07/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1186687-3 QC Sample: L1849990-01 Client ID: A, B, C												
Arsenic, Total	ND	0.12	0.1119	93		-	-		70-130	-		20
Cadmium, Total	0.00021	0.051	0.05453	106		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.1955	98		-	-		70-130	-		20
Copper, Total	0.00775	0.25	0.2547	99		-	-		70-130	-		20
Lead, Total	ND	0.51	0.4915	96		-	-		70-130	-		20
Nickel, Total	0.00257	0.5	0.5071	101		-	-		70-130	-		20
Zinc, Total	0.03746	0.5	0.5676	106		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1186689-3 QC Sample: L1849990-01 Client ID: A, B, C												
Iron, Total	0.666	1	1.76	109		-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1186689-3 QC Sample: L1849990-01 Client ID: A, B, C												
Hardness	76.8	66.2	148	108		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: 2590-08

Lab Number: L1849990

Report Date: 12/07/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1186687-4 QC Sample: L1849990-01 Client ID: A, B, C						
Arsenic, Total	ND	ND	mg/l	NC		20
Cadmium, Total	0.00021	0.00021	mg/l	1		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	0.00775	0.00707	mg/l	9		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	0.00257	0.00252	mg/l	2		20
Zinc, Total	0.03746	0.03514	mg/l	6		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1186689-4 QC Sample: L1849990-01 Client ID: A, B, C						
Iron, Total	0.666	0.669	mg/l	0		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1186689-4 QC Sample: L1849990-01 Client ID: A, B, C						
Hardness	76.8	77.7	mg/l	1		20

INORGANICS
&
MISCELLANEOUS

Project Name: HANCOCK LOT
Project Number: 2590-08
Lab Number: L1849990
Report Date: 12/07/18

SAMPLE RESULTS

Lab ID: L1849990-01
Client ID: A, B, C
Sample Location: 25 COTTAGE AVE., QUINCY, MA
Sample Depth:
Matrix: Water

Date Collected: 12/06/18 11:00
Date Received: 12/06/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
pH (H)	6.7		SU	-	NA	1	-	12/06/18 22:00	121,4500H+-B	AS
Nitrogen, Ammonia	0.183		mg/l	0.075	--	1	12/07/18 13:40	12/07/18 20:35	121,4500NH3-BH	AT

Project Name: HANCOCK LOT
Project Number: 2590-08
Lab Number: L1849990
Report Date: 12/07/18

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1186711-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	12/07/18 13:40	12/07/18 20:06	121,4500NH3-BH	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: 2590-08

Lab Number: L1849990

Report Date: 12/07/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1186575-1								
pH	100		-		99-101	-		5
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1186711-2								
Nitrogen, Ammonia	81		-		80-120	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: HANCOCK LOT
Project Number: 2590-08

Lab Number: L1849990
Report Date: 12/07/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1186711-4 QC Sample: L1849990-01 Client ID: A, B, C												
Nitrogen, Ammonia	0.183	4	3.96	94		-	-		80-120	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: HANCOCK LOT

Project Number: 2590-08

Lab Number: L1849990

Report Date: 12/07/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1186575-2 QC Sample: L1848020-01 Client ID: DUP Sample						
pH	7.4	7.3	SU	1		5
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1186711-3 QC Sample: L1849990-01 Client ID: A, B, C						
Nitrogen, Ammonia	0.183	0.216	mg/l	17		20

Project Name: HANCOCK LOT
Project Number: 2590-08

Lab Number: L1849990
Report Date: 12/07/18

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1849990-01A	Plastic 60ml unpreserved	A	7	7	3.5	Y	Absent		PH-4500(.01)
L1849990-01B	Plastic 250ml HNO3 preserved	A	<2	<2	3.5	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),HARDU(180),AS-2008T(180),CR-2008T(180),PB-2008T(180)
L1849990-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.5	Y	Absent		NH3-4500(28)

*Values in parentheses indicate holding time in days

Project Name:	HANCOCK LOT	**Lab Number:**	L1849990
Project Number:	2590-08	**Report Date:**	12/07/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample¿s toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: Data Usability Report

Project Name:	HANCOCK LOT	**Lab Number:**	L1849990
Project Number:	2590-08	**Report Date:**	12/07/18

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	HANCOCK LOT	**Lab Number:**	L1849990
Project Number:	2590-08	**Report Date:**	12/07/18

REFERENCES

3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.

19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

EPA 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 12/6/18

ALPHA Job #: L849990

ALPHA ANALYTICAL
8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: Coughlin Environmental
Address: 62 Montvale Ave, Suite H
Stoneham, MA 02180
Phone: 781-832-1002
Email: jmoorman@ces-ma.com

Project Information

Project Name: Hancock Lot
Project Location: 25 Cottage Ave, Quincy, MA
Project #: 2590-08
Project Manager: Jake Moorman
ALPHA Quote #:

Report Information - Data Deliverables

☐ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☒ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved!)
Date Due: 1 Day Rush

Additional Project Information:

1 Day Rush

ANALYSIS

VOC: ☐ 8260 ☐ 624 ☐ 524.2
SVOC: ☐ ABN ☐ PAH
METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15
METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13
EPH: ☐ Ranges & Targets ☐ Ranges Only
VPH: ☐ Ranges & Targets ☐ Ranges Only
☐ PCB ☐ PEST
TPH: ☐ Quant Only ☐ Fingerprint
Fingerprint
Ammonia Nitrogen 350.1/350.2
Hardness
Total As,Cr,Cd,Pb,Fe,Ni,Zn

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	Fingerprint	Ammonia Nitrogen	Hardness	Total As,Cr,Cd,Pb,Fe,Ni,Zn	Sample Comments	TOTAL # BOTTLES
49990-01	A	12/06	11:00am	SW	JMM	X				Clear	1
	B	12/06	11:00am	SW	JMM		X	X		1 Particulate, clear otherwise	1
	C	12/06	11:00am	SW	JMM	X				Clear	1

Container Type	X									P	P	P	P			
Preservative	X									A	D	C	C			

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Jake Moorman	12/6/18 1427	[signature] AAL	12/6/18 1427
[signature] AAL	12/6/18 1820	[signature] Pamela Matt	12/6/18 1820

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

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