



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Jonathan L. Gulliver, Highway Administrator



January 29, 2021

RE: HULL- RECONSTRUCTION OF ATLANTIC AVENUE AND RELATED WORK FROM
NANTASKET AVENUE TO COHASSET TOWN LINE

To whom it may concern:

I have enclosed for your review, as required by the Massachusetts Environmental Policy Act Regulations, a copy of the Environmental Notification Form for the above-referenced project filed by MassDOT- Highway Division in conjunction with the Town of Hull. This document was filed with the Executive Office of Environmental and Energy Affairs and will be noticed in the February 10, 2021 publication of the Environmental Monitor. Comments on this project are due by March 02, 2021.

All comments should be sent electronically to MEPA@mass.gov or through MEPA's [Public Comment Portal](#). Please send a copy of your comments to bryan.cordeiro@dot.state.ma.us.

If you need any additional information regarding the subject project, please contact me at bryan.cordeiro@state.ma.us.

Sincerely,

Bryan Cordeiro
Senior Environmental Planner
Environmental Services Division

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Section 1

Environmental Notification Form (ENF)

Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Massachusetts Environmental Policy Act (MEPA) Office

Environmental Notification Form

For Office Use Only

EEA#: _____

MEPA Analyst: _____

The information requested on this form must be completed in order to submit a document electronically for review under the Massachusetts Environmental Policy Act, 301 CMR 11.00.

Project Name: Atlantic Avenue Reconstruction Project		
Street Address: Atlantic Avenue		
Municipality: Hull	Watershed: Boston Harbor	
Universal Transverse Mercator Coordinates: 19 T: 348307 e; 4681082 n	Latitude: 42° 16' 2" Longitude: 070° 50' 20"	
Estimated commencement date: Fall 2021	Estimated completion date: Summer 2023	
Project Type: Road Improvement	Status of project design: 75 %complete	
Proponent: MassDOT in conjunction with the Town of Hull		
Street Address: 10 Park Plaza		
Municipality: Boston	State: MA	Zip Code: 02116
Name of Contact Person: Bryan Cordeiro		
Firm/Agency: MassDOT	Street Address: 10 Park Plaza	
Municipality: Boston	State: MA	Zip Code: 02116
Phone: 857-368-8813	Fax: 857-368-0609	E-mail: Bryan.Cordeiro@dot.state.ma.us
Does this project meet or exceed a mandatory EIR threshold (see 301 CMR 11.03)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
If this is an Expanded Environmental Notification Form (ENF) (see 301 CMR 11.05(7)) or a Notice of Project Change (NPC), are you requesting:		
a Single EIR? (see 301 CMR 11.06(8))	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
a Special Review Procedure? (see 301CMR 11.09)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
a Waiver of mandatory EIR? (see 301 CMR 11.11)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
a Phase I Waiver? (see 301 CMR 11.11)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>(Note: Greenhouse Gas Emissions analysis must be included in the Expanded ENF.)</i>		
Which MEPA review threshold(s) does the project meet or exceed (see 301 CMR 11.03)? Wetlands, Waterways & Tidelands: 11.03(3)(b)1.a. alteration of coastal dune, barrier beach or coastal bank; 11.03(3)(b)1.c. 1,000 or more sf of salt marsh or outstanding resource waters; Transportation - 11.03(6)(b)2.a. Construction, widening or maintenance of a roadway or its right-of-way that will: alter the bank or terrain located ten more feet from the existing roadway for one-half or more miles, unless necessary to install a structure or equipment; ACEC - 11.03(11)(b). ENF and Other MEPA Review if the Secretary So Requires. Any Project within a designated ACEC, unless the Project consists solely of one single family dwelling.		

Which State Agency Permits will the project require?

1. **Order of Conditions – Town of Hull Conservation Commission;**
2. **DEP §401 Water Quality Certification/Chapter 91 License Application;**
3. **CZM Consistency Review;**

Identify any financial assistance or land transfer from an Agency of the Commonwealth, including the Agency name and the amount of funding or land area in acres: Ma DOT funding

Summary of Project Size & Environmental Impacts	Existing	Change	Total
LAND			
Total site acreage	7.9 acres		
New acres of land altered		NA	6.74 acres
Acres of impervious area	6.71 acres	0.03 ac -1,307 s.f.	6.74 acres
Square feet of new bordering vegetated wetlands alteration		NA	
Square feet of new other wetland alteration		Salt Marsh/BVW 881 s.f. - alter 961 s.f.-replicate/ restore	
Acres of new non-water dependent use of tidelands or waterways		- 0.1 ac new road/sidewalk/ use of tidelands	
STRUCTURES			
Gross square footage	NA	NA	NA
Number of housing units	NA	NA	NA
Maximum height (feet)	NA	NA	NA
TRANSPORTATION			
Vehicle trips per day	NA	No Change	NA
Parking spaces	8	No Change	8
WASTEWATER			
Water Use (Gallons per day)	NA	NA	NA
Water withdrawal (GPD)	NA	NA	NA
Wastewater generation/treatment (GPD)	NA	NA	NA
Length of water mains (miles)	NA	NA	NA
Length of sewer mains (miles)	NA	NA	NA

Has this project been filed with MEPA before?

Yes (EEA # _____) No

Has any project on this site been filed with MEPA before?

Yes (EEA # _____) No

GENERAL PROJECT INFORMATION – all proponents must fill out this section

PROJECT DESCRIPTION: See below & attached Project Narrative (Section 2)

On behalf of the Town of Hull Department of Public Works (DPW) and Massachusetts Department of Transportation – Highway Division (MassDOT), CHA Consulting, Inc. (CHA) has prepared this Environmental Notification Form (ENF) application for the proposed roadway reconstruction/improvements to Atlantic Avenue within the Town of Hull from the Nantasket Avenue/Route 228 at the western end of the project to the Hull/Cohasset Town Line near Summit Street located at the eastern end of the project east of Straits Pond. Atlantic Avenue is designated as an Urban Minor Collector and reconstruction and related work along its approximately 1.3-mile length include: reconstruction of the existing roadway and sidewalk, improvements to the existing stormwater drainage, intersection safety modifications and enhancement of bicycle and pedestrian accommodations, new signing, striping, curbing and guardrail replacement where necessary. Selective vegetation clearing and thinning are proposed to clear zones and intersection sight distance.

Describe the existing conditions and land uses on the project site: _____

The site of the proposed Project is located along Atlantic Avenue in Hull, Massachusetts. Coastal waters north of Atlantic Avenue along Nantasket Beach, Gun Rock Beach, Crescent Beach and Black Rock Beach (listed west to east) are part of the Massachusetts Bay/Atlantic Ocean (See Figures 1 & 2– Locus Map). The brackish estuary/tidal pond south of Atlantic Avenue is identified as Straits Pond on the USGS Nantasket Beach Topographic Quadrangle Map. It connects to Hull Bay (west) and Massachusetts Bay via a tidal flood gate at the southwest end of the pond beneath Nantasket Avenue/Route 228. Land use along Atlantic Avenue is densely residential, with the Town of Hull Municipal buildings (Town Hall, police and fire departments) located at the western end of the project along School Street near Nantasket Avenue/Route 228. Sporadic commercial businesses occur along Atlantic Avenue as well. Open space along the project corridor consists of coastal/barrier beaches, coastal banks/seawalls and intertidal rocky shores to the north, sporadic stands of landscaped trees/shrubs located on both sides of the Atlantic Avenue associated with the residential properties, and Straits Pond to the south. The Green Hill Playground and tennis/basketball court is located near the center of the project west of the junction of Stony Beach Road near Gun Rock Beach.

Topography along Atlantic Avenue in the project area is variable with elevations ranging from approximately 4 –54 feet above sea level. The highest elevations (54 +/- feet) are associated with the municipal buildings and residential communities that occur on Atlantic Hill, a drumlin at the western end of the project. Green Hill, a drumlin accessed by Summit Avenue at the eastern end of Atlantic Avenue between Black Rock and Crescent Beaches, is over 45 feet in height. The lowest elevations exist in the middle of the project route opposite/south of Crescent Beach. These areas are designated as barrier beaches (See Figure 6) with FEMA 100-year velocity and flood zones, although due to the seawalls, houses and road infrastructure, they provide little natural function any longer (See Section 2.3.1.4 below). Hull is comprised primarily of glacial outwash materials characterized as well-sorted gravels and sand, as well as cobbles and occasional small boulders. Soils are variable along Atlantic Avenue with the dominant soil types classified as Canton-Urban land -Rock outcrop, Urban land-Hooksan complex, Paxton loam and the Canton-Chatfield-Rock outcrop (See Appendix G – NRCS Soil Information). Black Rock and Crescent Beaches are comprised of sand, gravel, cobble and rock substrate while Gun Rock Beach is predominantly coarse and fine sands.

Uplands along the project corridor are a mix of un-vegetated and vegetated areas. Un-vegetated areas consist of open beach, seawalls, paved roads and sidewalks. Manicured lawns and landscaped trees and shrubs associated with the single-family residences as well as undeveloped road edges represent the vegetated areas along Atlantic Avenue, although saltmarsh is present along some stretches of Straits Pond south of the road. A concrete/stone sea wall of variable height (approximately 3-10+ feet) parallels Atlantic Avenue along Gun Rock Beach, Crescent Beach, and Black Rock Beach and protects the road from the majority of erosive tidal storm surges. Rock outcrops/rocky intertidal shore occur intermittently along Green Hill and Atlantic Hill between the beaches bordering Massachusetts Bay north of the road.

The paved travel way of Atlantic Avenue varies in width from 24 to 32 feet. There are minimally defined, paved and unpaved shoulders. Presently, the pavement surface on Atlantic Avenue from Nantasket Avenue/Route 228 to the Town Hall is in fair condition. This section had a pavement overlay in the late 1990's. The remainder of Atlantic Avenue is in poor condition with numerous potholes and utility trench patches, although sections of roadway have been recently resurfaced during the past few years due to utility work and poor pavement. Prior to resurfacing, there was a significant amount of map cracking and some pavement spalling along Atlantic Avenue. The severity of the pavement failures, significant amount of patching, and areas of deformation indicate that the subbase is in poor condition as well.

Bituminous concrete sidewalks are in very poor condition along the south side for the project's entire length. Isolated sections of sidewalk are located along portions of the northern side of Atlantic Avenue passing mainly through a thickly settled residential area. A few side streets have sidewalks, but with virtually no connecting walkways, and pedestrian access between streets is restricted. Parallel parking by permit only exists along portions of the south side of Atlantic Avenue. The Hull Town Hall, Marylou's Coffee, Green Hill Playground, and multiple beach access points are located along the project corridor serving as pedestrian generators.

Stormwater runoff along the roadway is collected by multiple closed drainage systems consisting of catch basins and manholes, although direct discharge of surface runoff to Straits Pond occurs via pipes from the roadway gutter and a paved waterway. The stormwater is conveyed to various outlet points along the corridor, many of which discharge directly to Straits Pond. The existing drainage structures appear to be in poor condition and most will be replaced.

Environmental Resource Areas

Wetland resource areas were delineated in October 2009 and reviewed in the Spring 2020 by a CHA Professional Wetland Scientist (PWS) in accordance with the Department of Environmental Protection (DEP) publication "Delineating Bordering Vegetated Wetlands" under the Massachusetts Wetlands Protection Act (1995) and the U. S. Army Corps of Engineers Wetland Delineation Manual (*Environmental Laboratory 1987*). Coastal resources under the jurisdiction of the WPA identified in the project vicinity during field investigations and through research include: coastal beaches/tidal flats (310 CMR 10.27); coastal bank (310 CMR 10.30); salt marshes (310 CMR 10.32); land subject to coastal storm flowage (LSCSF)/FEMA Floodplains (310 CMR 10.04 and 10.21); land under salt ponds (310 CMR 10.33); and, 100-foot buffer zones (310 CMR 10.02) associated with coastal beaches, coastal bank and vegetated wetlands/salt marsh. Each resource area is described in detail in the sections below.

Coastal Beach/Tidal Flats & Barrier Beach

Areas of coastal beach defined under 310 CMR 10.27 (2) of the WPA Regulations “*extend from the MLW landward to the dune line, coastal bank line or the seaward edge of existing man-made structure*”. Tidal flats are defined as “*any nearly level part of a coastal beach which usually extends from the mean low water line (MLW) landward to a more steeply sloping face of coastal beach*” under 310 CMR 10.27 (2). Black Rock and Crescent Beaches are comprised of sand, gravel, cobbles and rock substrate while Gun Rock Beach is predominantly coarse and fine sands. There is a 100-foot buffer associated with coastal beach.

Barrier beach (See Figure 6) is defined under 310 CMR 10.29 (2) as “*a narrow low-lying strip of land generally consisting of coastal beaches and coastal dunes extending roughly parallel to the trend of the coast. It is separated from the mainland by a narrow body of fresh, brackish or saline water or a marsh system. A barrier beach may be joined to the mainland at one or both ends.*” Barrier beaches are designated from Gun Rock Beach and Crescent Beach south to Straits Pond and encompass the landforms between the beaches and the estuary/tidal pond. Another section of barrier beach occurs east of Summit Avenue in Hull and extends east to Jerusalem Road in Cohasset. Due to the existing coastal seawalls, residential development and road infrastructure, natural function in these areas is limited.

Coastal Bank

Areas of Coastal Bank as defined under 310 CMR 10.30 (2) of the WPA Regulations include “*the seaward face or side of any elevated landform, other than a coastal dune, which lies at the landward edge of coastal beach, land subject to tidal action, or other wetland*”. Coastal bank is calculated according to the *Wetlands Program Policy 92-1: Coastal Banks* using slope gradients and Land Subject to Coastal Storm Flowage (LSCSF)/FEMA 100-year velocity/flood elevation lines. It occurs at the approximate landward edge of the coastal beach, vegetated wetlands/salt marsh and/or along seawalls/riprap slopes along Atlantic Avenue. Due to historic road/infrastructure and residential development along the project corridor, coastal banks at the landward edge of coastal beaches north of Atlantic Avenue along Gun Rock, Crescent and Black Rock Beaches (See Figures 1 & 2) occur predominantly at the top of the concrete/rock seawalls. Natural coastal bank/intertidal rocky shores occur along the drumlins, Green Hill (eastern portion of project) and Atlantic Hill (western portion of project), and intermittently between Nantasket, Gun Rock, Crescent and Black Rock Beaches. On the south side of Atlantic Avenue, topography is relatively flat in most locations and coastal bank occurs at the approximate mean high water (MHW) line at the landward edge of vegetated wetlands/salt marsh, along lawns/small private retaining walls associated with residential properties and/or at the top of riprap slopes. An extensive riprap embankment, over 1,000 feet in length, separates Straits Pond from Atlantic Avenue between Driftway “Road” and Summit Avenue, opposite Green Hill. Coastal Bank occurs at the top of the riprap slope in this location south of Atlantic Avenue/sidewalk and extends east along the top of slope to the Hull/Cohasset Town Line. In addition, opposite the Green Hill Playground and tennis/basketball court near Gun Rock Beach, coastal bank occurs at the top of slope south of Atlantic Avenue/sidewalk in this area as well. There is a 100-foot buffer associated with coastal bank.

Salt Marshes/Bordering Vegetated Wetland

Salt marshes are defined under 310 CMR 10.32 (2) of the WPA regulations as “*coastal wetlands that extend landward up to the highest high tide line, that is, the highest spring tide of the year, and are*

characterized by plants that are well adapted to or prefer living in, saline soils. A salt marsh may contain tidal creeks, ditches and pools". Bordering vegetated wetlands (BVW) are defined under 310 CMR 10.55 (2) of the WPA regulations as "*freshwater wetlands which border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants*".

The DEP identified common reed as a saltmarsh species under the WPA (October 2014) in addition to the various saltmarsh grasses (*Spartina* spp.) and other coastal species. Wetland Series A, B, C and D (See Appendix E) define coastal vegetated wetlands along Straits Pond that are classified as estuarine, emergent communities dominated by salt marsh (*Spartina* spp.) and common reed (*Phragmites australis*). The wetland boundaries were delineated at/adjacent to the approximate MHW line in many locations with pink, survey, nylon flags. Saltmarsh cordgrass (*Spartina alterniflora*) and common reed are the dominant species within the intertidal zone below the MHW line. Marsh elder (*Iva frutescens*), common reed, saltgrass (*Distichlis spicata*), saltmeadow cordgrass (*Spartina patens*) and seaside goldenrod (*Solidago sempervirens*) occupy the adjacent areas at/above MHW at the wetland/upland transition zone. In drier wetland areas above MHW, such as along Wetland D near the edge of Atlantic Avenue opposite the Green Hill Playground, the vegetative communities are dominated by a monoculture of common reed. With the return of tidal cycles within Straits Pond as a result of the construction of the new tide gate, vegetated wetlands/salt marsh are recolonizing some areas, but common reed is still prevalent at the upper reaches of the intertidal zone and above in many areas. Adjacent to Wetland A at the eastern end of the project near the Hull/Cohasset Town line, a stand of American beachgrass (*Ammophila breviligulata*) has colonized a low-gradient slope between Atlantic Avenue and the wetland edge. The community represents a dune resource area and was included within the delineation line of Wetland A

Soils within the saltmarsh communities are characterized by a deep organic surface layer (O_A). However, in areas along the road and over-wash zones as a result of storm surges and flooding from Massachusetts Bay, coarse and fine sand deposition 2 - 3+ inches deep was observed at the surface. Trash, in the form of bottles, bags and other household garbage due to the adjacent residential communities and road traffic from Atlantic Avenue was prevalent in some areas observed during the field evaluation. There is a 100-foot buffer associated with vegetated wetlands/salt marsh.

Land Subject to Tidal and Coastal Storm Flowage

Land Subject to Tidal and Coastal Storm Flowage (LSCSF) is defined as "*land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, whichever is greater*" (310 CMR 10.04 & 10.21). Federal Insurance Rate Maps (FIRM) from the Federal Emergency Management Agency (FEMA) (See Figure 4) for the Town of Hull (Panel #25023C 0039J - July 17, 2012) indicate 100-year flood and velocity zones (Zone AE & VE) are associated with Atlantic Avenue and adjacent infrastructure within the proposed project area. The Zone AE areas are designated between 10 and 17 feet above sea level, while the Zone VE areas along Massachusetts Bay are designated between 19 and 25 feet.

Land Under Salt Ponds

WPA regulations 310 CMR 10.33(2) define a salt pond as "*a shallow enclosed or semi-enclosed body of saline water that may be partially or totally restricted by barrier beach formation. Salt ponds may receive freshwater from small streams emptying into their upper reaches and/or springs in the salt pond itself.*" The substrate of Straits Pond is a mixture of fines, sand and gravel, although fines,

forming a thick mud, dominate many areas. Straits Pond does not receive inputs from freshwater systems and is not designated as an *Anadromous/Catadromous* (“fish run”) (See Figure 5) nor a “land containing shellfish” (See Figure 7). However, Straits Pond is anticipated to provide habitat for larval and juvenile marine fish species, various crustaceans and shellfish as well as diverse bird species and is designated as part of the Weir River ACEC as identified in Section 2.3.2.3. There is a 100-foot buffer associated with land under salt ponds measured from the mean high water line (MHW).

High/Low Water Lines for Straits Pond and Massachusetts Bay/Hull Bay

Straits Pond, identified on the USGS Nantasket Beach Topographic Quadrangle Map, is characterized as a brackish estuary/tidal pond and constitutes a Water of the United States within the Commonwealth of Massachusetts. It connects to Hull Bay (west) and Massachusetts Bay (north) via a tide gate at the southwest end of the pond beneath Nantasket Avenue/Route 228. The tide gate, operated by the Hull Conservation Commission, controls the tidal range within the pond (See Appendix H, MHW/MLW Supporting Documentation). The controlled mean high water (MHW) line for Straits Pond was established from surveyed salt marsh zones at Wetland C and review of tide gate records at approximately 2.8 feet above mean sea level (NAVD 88) and the controlled mean low water (MLW) line was determined at 1.6 feet. The high tide line was identified at 3.2 feet. Water levels may fluctuate to as low as 1.0 foot during pond drawdown conditions and may rise above 3.8 feet during significant precipitation events or tidal surges over the seawalls during coastal storm events. In accordance with a DEP Formal Determination of Applicability (W00-025) in April, 2001 (See Appendix H) for a property on Bay Street bordering Hull Bay, MHW was established at approximately 5.0 feet (NVGD 29) with MLW presumably at approximately 0.0 feet. For the purposes of the stairwell replacement/relocation at Gun Rock Beach along Massachusetts Bay, MHW is designated at 5.0 feet.

100-foot Buffer Zone to Coastal Beach, Coastal Bank and Salt Marshes/BVW

Proposed Atlantic Avenue reconstruction and related work, including roadway widening/ intersection safety modifications and enhancement, sidewalk replacement and storm drainage improvements, will take place within the 100-foot buffer zone to coastal beach/tidal flats, coastal bank and/or salt marsh/BVW.

Other State and Local Resources

Weir River Area of Critical Environmental Concern/Outstanding Resource Waters

The proposed project corridor borders the Weir River Area of Critical Environmental Concern (ACEC) along Straits Pond. Constituting some of the most extensive salt marsh in the Greater Boston Area, the Weir River ACEC encompasses approximately 950 acres of land and water and is considered significant to flood control and the protection land containing shellfish, fisheries and wildlife habitat. The legal boundary corresponds with the 100-year floodplain in many areas, although it overlaps the MHW line and/or follows other artificial boundaries in some locations, particularly along Straits Pond (See Figure 5). According to the *Designation of Portions of the Towns of Cohasset, Hingham and Hull as the Weir River ACEC* (designated 12/11/86), the boundary of the ACEC in the area in question is as follows: *The line extends easterly to a point on Atlantic Avenue in Hull where Straits Pond is directly adjacent, this point defined as the northerly corner of Subdivision Lot 8, Sheet 51, Town of Hull Assessor’s Map dated June 2, 1944, 1”=100’, where the boundary again reverts to MHW. The line extends around Straits Pond at this elevation until it reaches a point,*

on the Cohasset/Hull Town line in the area known as West Corner, where Nantasket Avenue crosses the river, at or adjacent to the intersection of Nantasket Avenue and Rockland Street. At this point, the boundary reverts to the 100 year flood elevation and proceeds southerly and westerly along and under Rockland Street to the dam and a fish ladder at Foundry Pond”. Therefore, the MHW line (elevation 2.8 feet NAVD 88) of Straits Pond (See Section 2.3.1.6 above) marks the ACEC boundary. The ACEC is also designated as an outstanding resource water (ORW).

State Threatened and Endangered Species

A review of the NHESP Massachusetts Natural Heritage Atlas (August 2017 edition) and Massachusetts GIS data layers (2020) indicate that no estimated habitats of rare wildlife, certified or potential vernal pools or State BioMap Core or Critical Habitats occur on or immediately adjacent to the project site (See Figure 3 – NHESP Habitat Map). In addition, according to NHESP Fact Sheets for the northern long-eared bat (*Myotis septentrionalis*) (NLEB), a species listed statewide by the Massachusetts Division of Fisheries & Wildlife (DF&W) as an endangered, no NLEB known roost or maternity nest trees or hibernacula occur within the Town of Hull. The proposed work associated with the project within the WPA jurisdiction adjacent to the Straits Pond occurs predominately within/adjacent to paved roadways of Atlantic Avenue. Although clearing of road-side, landscaped trees is proposed for the project, any cutting/removal will occur within prescribed work windows and no “incidental takes” or significant adverse impacts to the bats or their habitat are anticipated.

Water Quality/Impaired Water Resources/Contaminants

The Weir River is classified under the DEP *Massachusetts Year 2016 Integrated List of Waters* as a Massachusetts Category 5 impaired surface water (MA74-11) that requires the DEP to develop a Total Maximum Daily Load (TMDL) for “fecal coliform” and “PCB in fish tissue”. Category 5 water bodies are defined as “water bodies not expected to meet surface water quality standards after implementation of technology-based controls”. A TMDL for the Weir River has not yet been established for the identified impairments. Straits Pond is not classified as an impaired waterbody by the DEP, but due to tidal interchange with the Weir River estuary at the tide gate under Nantasket Avenue/Route 228, it may have elevated levels of fecal coliform.

Please see the attached Project Narrative (Section 2) for more details on the various land uses and resource areas associated with the project.

Describe the proposed project and its programmatic and physical elements: _____

Proposed Road Reconstruction and Related work

Proposed Cross Section

The proposed cross section for the majority of Atlantic Avenue is a 30-foot-wide roadway with a 5.5-foot sidewalk running along the south side of the road for the full length. The 30-foot roadway consists of two 11-foot lanes and two 4-foot shoulders. The 4-foot shoulder widths are in accordance with the required 4 – 12-foot width stated in Section 5.3.3.1 of MassDOT’s Project Development and Design Guide (PDDG). The 11-foot wide travel lanes also meet the required width of 11 to 12 feet stated in Section 5.3.3.3 of the Design Guide.

A 33-foot-wide cross section is proposed in areas where restricted parking is currently allowed along the corridor. This roadway consists of two 11-foot lanes and a 7-foot shoulder on the south side and a

4-foot shoulder along the north side of Atlantic Avenue.

Roadway Reconstruction

Based on the results of the pavement cores, the poor pavement conditions, and the constraints along the corridor, especially the structures located in close proximity to the roadway, Atlantic Avenue will require full depth pavement reconstruction. The narrow width of the roadway and close proximity of buildings makes pavement reclamation a challenging task, so it is proposed that the existing pavement structure be removed in its entirety and replaced with a new pavement structure. Since it is apparent the subbase is inadequate, it will be removed and replaced as well.

Drainage Improvements

Proposed drainage improvements include the installation of new drainage structures, grates, inlets and pipes as well as adjusting, and rebuilding existing structures. Catch basin grates will also be traversable by bicycles which is consistent with the intended multi-use of the roadway shoulder.

Bicycle & Pedestrian Accommodations

The proposed improvements include reconstructing the existing sidewalks along Atlantic Avenue and providing wheelchair ramps, compliant with current ADA and MassDOT standards at intersections and driveways. Widening of the roadway to a minimum of 30 feet will improve bicycle accommodations by providing adequate room for vehicles and bicycles to safely share the roadway. However, an additional 5 feet is not available for bicycle accommodation adjacent to the proposed widened shoulder for residential permit parking without major impacts to private properties and resource areas. Shared pavement markings “sharrows” will be added in highly trafficked areas including Mary Lou’s Coffee, the Green Hill Playground/basketball court and Gun Rock Beach access. “Share the Road” signs will be added throughout the project corridor for improved bicycle and pedestrian awareness.

Pedestrian Facilities

New asphalt sidewalks with granite curbs are proposed as part of this project. A continuous sidewalk along the south side of Atlantic Avenue is proposed. New wheelchair ramps, compliant with current ADA and MassDOT standards will be constructed at intersections and driveways, where required. New crosswalks and signage are proposed to improve pedestrian safety.

Safety Improvements

Existing traffic signs that are in poor condition, or that are not warranted, will be removed. New signs, conforming to the provisions of the Manual on Uniform Traffic Control Devices (MUTCD) and the MassDOT, will be installed. These signs will be consistent with the proposed roadway design.

Thermoplastic pavement markings are proposed to delineate the traveled ways and shoulders. Stop lines and crosswalks will be added at intersections. The yellow centerline will be painted to appropriately designate no passing zones throughout the project length.

The intersection of School Street and Atlantic Avenue is currently configured with a landscaped island and a designated left turn lane onto Atlantic. The crossing distance for the intersection is 155’.

Existing and projected traffic volumes were analyzed, and it was determined that the left turn lane is not needed for this intersection. School Street has been designed to reduce the pavement width to better facilitate pedestrian crossing.

Minor geometric changes are proposed to the Summit Avenue and Stony Beach Road intersections with Atlantic Avenue. Currently these roadways intersect at poor angles with Atlantic Avenue, restricting sight distance and creating a safety hazard with no discernable edge of pavement along Atlantic Avenue. The proposed alignments will provide more of a “T” configuration, intersecting Atlantic Avenue at about a 90-degree angle. This will make the intersections smaller, provide some separation between adjacent side streets, provide better channelization, and provide definitive stop conditions.

NOTE: The project description should summarize both the project’s direct and indirect impacts (including construction period impacts) in terms of their magnitude, geographic extent, duration and frequency, and reversibility, as applicable. It should also discuss the infrastructure requirements of the project and the capacity of the municipal and/or regional infrastructure to sustain these requirements into the future.

Describe the on-site project alternatives (and alternative off-site locations, if applicable), considered by the proponent, including at least one feasible alternative that is allowed under current zoning, and the reasons(s) that they were not selected as the preferred alternative: _____

Alternative Analysis

No Action Alternative

The “no action” alternative would not improve the existing conditions along the project corridor. The existing roadway is relatively narrow in certain locations, and the area around the Hull Town Hall and Mary Lou’s Coffee has frequent use of on-street parking. However, the existing pavement section is too narrow to accommodate the vehicles and requires cars to pull onto the sidewalk or park in the active travel lanes. In addition, the geometry of the existing intersection east of the Town Hall, which is wide with unclear lane delineation and creates driver confusion, will not be improved.

Along most of Atlantic Avenue, the existing sidewalk is not well defined where the existing curb and sidewalk are HMA (hot mix asphalt), effectively blending the shoulder and road. Also, the existing curb ramps are non-existent or non-ADA (Americans with Disabilities Act) compliant. There is a lack of crosswalks across Atlantic Avenue from Nantasket Avenue to Straits Pond as well. Finally, the existing storm drainage system does not extend the entire length of Atlantic Avenue, and current outfalls discharge directly from the roadway surface to Straits Pond without any treatment of the stormwater runoff. The “no action” alternative will not extend the service life of Atlantic Avenue or improve pedestrian or environmental conditions along the existing road system.

Simple Resurfacing Alternative

Simple resurfacing of the existing roadway was also considered. While this alternative would extend the surface life of the roadway, it will not achieve the project goals of improving roadway conditions, pedestrian and bicycle safety, improved storm water quality/control as well as pedestrian and vehicular safety at intersections along Atlantic Avenue.

Rerouting Alternative

Atlantic Avenue is one of only three roadways that provides access to Hull and it serves as the only land-based connection to the mainland. Rerouting Atlantic Avenue further from Straits Pond, in areas where it is feasible, to avoid impacts to special resource interests such as vegetated wetlands/salt marsh and/or the Weir River ACEC is not a practical alternative. Land acquisition would be difficult and costly due to existing residential properties and/or conservation lands along the road corridor. Moreover, the continuity of Atlantic Avenue precludes avoidance of linear features such as the designated barrier beach system (See Figure 6) and the FEMA 100-year Velocity and Flood Zones/LSCSF (See Figure 4) that occupy the central and eastern portions of the project route.

Intersections Alternatives

There are 18 intersections along Atlantic Avenue within the project limits, 16 of which are with minor side streets that lead to small residential neighborhoods. The other two are with Nantasket Avenue at the start of the project, which is an arterial roadway that provides a primary access way to the Hull peninsula, and at School Street which is located near the Town Hall and acts as a cut through between Atlantic Avenue and Nantasket Avenue.

Each intersection throughout the project was evaluated for safety improvements including the potential for traffic calming measures, and pedestrian and bicycle accommodations. Due to limited right of way and the additional environmental and fiscal impacts associated with the earthworks, traffic calming measures, such as chicanes, and mini roundabouts were deemed impractical for this project. In addition, other measures such as speed humps or raised intersections are not appropriate for an arterial roadway like Atlantic Avenue. Traffic signals were considered for the intersections at Nantasket Avenue and at School Street but ultimately decided against as a result of a traffic signal warrant analysis.

The preferred alternative includes re-aligning side street approaches to Atlantic Avenue to “T” up the intersection which has the benefit of reducing travel speeds as well as pedestrian crossing distances while minimizing impacts to resources areas.

Preferred Alternative

The preferred alternative will provide a consistent cross section consisting of two 11-foot lanes, two 4-foot shoulders and a 5.5-foot sidewalk. From Meade Avenue to Driftway, a 7-foot shoulder will be provided on the south side of Atlantic Avenue for resident permit parking. The proposed improvements will occur primarily within the existing road right-of-way although minor permanent easements are required to provide a minimum 5.5-foot wide sidewalk with the 7-foot shoulder. The proposed storm drainage system includes a closed system with deep sump sedimentation catch basins and/or manholes. No new storm drainage outlets are proposed, and existing outlet points will be replaced in the same locations with many of the outlets discharging into Straits Pond. Coastal vegetated wetlands/salt marsh that are impacted by the proposed drainage work around Straits Pond will be replicated at a ratio of 1.1:1. The preferred alternative includes necessary upgrades to roadway infrastructure along Atlantic Avenue and safety improvements/ accommodations for all roadway users. As identified in the previous section and discussed in the following section, the preferred alternative proposes improvements to the Atlantic Avenue road corridor, avoids impacts to the extent feasible and mitigates environmental resource areas to increase overall function and value to Straits Pond and its adjacent intercoastal zone.

NOTE: *The purpose of the alternatives analysis is to consider what effect changing the parameters and/or siting of a project, or components thereof, will have on the environment, keeping in mind that the objective of the MEPA review process is to avoid or minimize damage to the environment to the greatest extent feasible. Examples of alternative projects include alternative site locations, alternative site uses, and alternative site configurations.*

Summarize the mitigation measures proposed to offset the impacts of the preferred alternative:

Environmental permitting (See Appendix A) associated with the project involves filing a Notice of Intent with the Town of Hull Conservation Commission, a §401 Water Quality Certificate with the Department of Environmental Protection (DEP), a DEP Ch. 91 Waterways License due to work in filled and/or flowed tidelands and within an ORW (Weir River ACEC), a Consistency Review with the CZM as well as a Pre-Construction Notification (PCN) application under the US Army Corps of Engineers (Corps) General Permit (PGP) program, for proposed work within and/or adjacent to wetland resource areas.

The proposed work qualifies as a limited project under the Wetlands Protection Act 310 CMR 10.24(7)(c)1. – *Maintenance and improvement of existing public roadways, but limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving drainage systems*, and requires a NOI to be filed with the Hull Conservation Commission and Massachusetts DEP. The roadway design has been developed to avoid and/or reduce impacts to wetland resource areas to the greatest extent practicable. Proposed roadway improvements will occur within: coastal beach, coastal bank, vegetated wetlands/salt marsh and their associated 100-foot buffer zones, land under salt ponds, land subject to coastal storm flowage (LSCSF) (100-year floodplain/velocity zones) as well as the Weir River Area of Critical Environmental Concern (ACEC). Impacts to vegetated wetlands/salt marsh, coastal beach/bank, LSCSF and the ACEC will be minimized to the greatest extent practicable. Approximately 881 square feet (s.f.) of impacts to vegetated wetlands/salt marsh, 961 s.f. of which will be replicated within areas along Straits Pond. The proposed work is a reconstruction project, no new stormwater drainage outlets are proposed with this work.

Special resources in the vicinity of the project area include the Weir River ACEC (See Figure 5) associated with Straits Pond that is designated as an outstanding resource water (ORW). Barrier beach, as identified on the MassGIS website (See Figure 6), and Federal Emergency Management Association (FEMA) 100-year velocity (VE) and flood (AE) zone areas (See Figure 4) occur within the central and eastern portions of the project. No Natural Heritage Endangered Species Program (NHESP) estimated or Priority Habitat of rare-listed species (See Figure 3) or NHESP BioMap Core Habitat as identified on MassGIS data layers (See Section 2.3.2.1 below) occur along the proposed project route. However, the US Fish and Wildlife Service (USFWS) lists the northern long-eared bat (*Myotis septentrionalis*) as threatened statewide for the Commonwealth of Massachusetts and Time of Year (TOY) clearing restrictions have been prescribed for tree clearing to protect this species. No surface drinking water (Zone A or B) or DEP Wellhead Protection Areas (Zone II or IWPA) are associated with Straits Pond or the Atlantic Avenue project route, and no cultural, historical or archeological resources were identified for the project area with the Massachusetts Historic Commission (MHC).

Environmental Resource Areas

Coastal resources under the jurisdiction of the WPA identified in the project vicinity during field investigations and through research include: coastal beaches/tidal flats (310 CMR 10.27); coastal bank

(310 CMR 10.30); salt marshes (310 CMR 10.32); land subject to coastal storm flowage (LSCSF)/FEMA Floodplains (310 CMR 10.04 and 10.21); land under salt ponds (310 CMR 10.33); and, 100-foot buffer zones (310 CMR 10.02) associated with coastal beaches, coastal bank and vegetated wetlands/salt marsh. Each resource area with proposed impacts and mitigation measures is described in detail in the sections below.

Coastal Beach/Tidal Flats & Barrier Beach

An existing concrete stairwell is located on Gun Rock Beach opposite Montana Avenue. Removal of the existing stairwell (150 s.f.) and relocation and replacement with a new concrete stairwell (190 s.f.) to the west (approximately 70 feet) is required for public access and safety. The relocation and minor loss of coastal beach, approximately 40 s.f., is not anticipated to significantly impact wave action or sediment transport on Gun Rock Beach and the improvements for public safety by relocating the stairwell entrance further from Atlantic Avenue travel lanes will outweigh any losses.

Proposed road reconstruction will involve work/disturbance within barrier beaches (114,975 s.f. temporary impacts and 1,777 s.f. permanent). However, these areas are predominately existing, disturbed road edges immediately adjacent to Atlantic Avenue associated with densely residential communities. Road reconstruction and related work is not anticipated to significantly impact the current function of barrier beaches along the project corridor and will improve road drainage to Straits Pond and public safety.

Coastal Bank

South of Atlantic Avenue, replacement and minor extension of existing stormwater culverts/outlets along Straits Pond and widening/restoring riprap slope and wetland replication/restoration will result in 145 s.f. of disturbance. This impact is minor and associated with stormwater system upgrades and will improve overall water quality discharged to Straits Pond without compromising coastal bank function in these areas.

Salt Marshes/Bordering Vegetated Wetland

Approximately 264 square feet (s.f.) of salt marsh and 617 s.f. of BVW are proposed to be impacted as discussed below associated with wetland replication/restoration, slope work and stormwater management/erosion protection (See Appendix G, Wetland Replication & Restoration Plan and Section 5, Project Plans). Approximately 327 s.f. of salt marsh replication/restoration (227 s.f. low marsh (\leq 2.8 feet (MHW – NAVD 88)) and 100 s.f. high marsh ($>$ 2.8 feet and $<$ 3.2 feet) are proposed. Another 319 s.f. of BVW are also proposed to be replicated. Due to its position on the landscape and elevation requirements at/below MHW, the low marsh replication area is proposed to be sited on existing high marsh (218 s.f.) and BVW (109 s.f.) wetland areas, and access is also required through these wetland habitats. Following grading and revegetation of the low marsh, the high marsh (100 s.f.) and BVW (315 s.f.) temporarily altered will be restored and/or replicated. It should be noted that of the total 617 s.f. of BVW proposed to be impacted for the project, approximately 109 s.f. is located within the newly proposed, replicated salt marsh (below 3.2 feet elevation), and additional BVW replication area, approximately 319 s.f., has been incorporated into the project design accordingly. The replicated BVW is proposed on upland areas adjacent to existing salt marsh/BVW within the 100-foot buffer zone. Restoration of 2,080 s.f. of the 100-foot buffer zone associated with improvements to the stormwater control outlet and parking area reconfiguration is proposed adjacent to the salt marsh and BVW replication areas in this vicinity.

Land Subject to Tidal and Coastal Storm Flowage

Proposed improvements and related work, approximately 225,800 s.f./5.2 acres (223,700 s.f. temporary and 2,100 s.f. permanent) associated with road reconstruction will occur within FEMA flood storage and velocity zones but are not anticipated to result in significant adverse impacts to the current functions of these areas.

Land Under Salt Ponds

Replacement and minor extension of existing stormwater culverts/outlets and extension of modified rock-fill slopes will result in 85 s.f. of disturbance to salt marsh adjacent to land under salt ponds adjacent to Wetland C. This impact is minor and associated with stormwater system upgrades and will improve the overall quality of stormwater discharges to Straits Pond.

100-foot Buffer Zone to Coastal Beach, Coastal Bank and Salt Marshes/BVW

Proposed Atlantic Avenue reconstruction and related work, including roadway widening/ intersection safety modifications and enhancement, sidewalk replacement and storm drainage improvements, will take place within the 100-foot buffer zone to coastal beach/tidal flats, coastal bank and/or vegetated wetlands/salt marsh. Approximately 3.4 acres (149,500 s.f.) of alteration is proposed, although the majority of this area is existing paved road (2.9 acres/126,100 s.f.) and disturbed, maintained road shoulders, with a proposed minor decrease in impervious area of approximately 1,600 s.f. (proposed - 2.9 acres/124,500 s.f.) associated with intersection improvements and narrowing/redefining curb cuts. For the entire project, there will be a minor increase in impervious area (approximately 1,307 s.f.), but this occurs in uplands outside of WPA jurisdiction. Erosion controls will be placed at the limits of work, as seen on project plans (See Section 5.), to prevent sedimentation from entering wetland resource areas, and all pervious areas will be stabilized with vegetation and/or appropriate roadside treatments such as retaining walls, gravel, etc. following construction.

Other State and Local Resources

Weir River Area of Critical Environmental Concern/Outstanding Resource Waters

Minimal work is proposed within the Weir River ACEC (below MHW line) associated with Straits Pond, and the project will not have a significant adverse impact to the interests of the ACEC designation or the WPA. Road widening, sidewalk replacement and stormwater improvements will only result in 881 s.f. of impact to salt marsh/BVW (located above MHW and currently vegetated with common reed) and this will be replicated at a ratio of 1.1:1 with 961 s.f. of new vegetated wetlands/salt marsh resulting in net gain. BMPs associated with this project (See Section 2.5.1), will be installed at the limits of work within/adjacent to the buffers to coastal beach, coastal bank and vegetated wetlands/salt marsh prior to the commencement of construction. These controls will be inspected and maintained throughout construction and will remain in place until areas are permanently stabilized and avoid discharges of silt laden water and sediments from entering the Straits Pond/Weir River ACEC to avoid adversely impacting its function as an outstanding resource water.

Water Quality/Impaired Water Resources/Contaminants

A TMDL for the Weir River has not yet been established for the identified impairments. Straits Pond

is not classified as an impaired waterbody by the DEP, but due to tidal interchange with the Weir River estuary at the tide gate under Nantasket Avenue/Route 228, it may have elevated levels of fecal coliform. However, road reconstruction and related improvements associated with Atlantic Avenue are not anticipated to increase levels of the identified impairments, and the renovations to the existing stormwater system are anticipated to improve the water quality of stormwater discharges into Straits Pond. In addition, minimal impacts are proposed to vegetated wetlands/salt marsh communities that may help to naturally filter fecal coliform.

Public Shade Trees

An estimated 4 public shade trees, identified as those individuals of 14-inch diameter at breast height or greater within public road rights-of-way, will be removed as a result of roadway/ sidewalk reconstruction and widening. Clearing of public shade trees has been avoided to the greatest extent practicable, and only a total of 11 trees will be cleared (including shade trees). However, due to road widening and increased area of pavement, no new trees are proposed to be replaced.

If the project is proposed to be constructed in phases, please describe each phase:

The project is not to be constructed in phases

AREAS OF CRITICAL ENVIRONMENTAL CONCERN:

Is the project within or adjacent to an Area of Critical Environmental Concern?

Yes (Specify **Weir River ACEC**)

No

If yes, does the ACEC have an approved Resource Management Plan? ___ Yes **X** No;

If yes, describe how the project complies with this plan.

Will there be stormwater runoff or discharge to the designated ACEC? **X** Yes ___ No;

If yes, describe and assess the potential impacts of such stormwater runoff/discharge to the designated ACEC.

Improve existing stormwater system. See Project Narrative (Section II) and above

RARE SPECIES:

Does the project site include Estimated and/or Priority Habitat of State-Listed Rare Species? (see http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/priority_habitat/priority_habitat_home.htm)

Yes (Specify _____) No

HISTORICAL /ARCHAEOLOGICAL RESOURCES:

Does the project site include any structure, site or district listed in the State Register of Historic Place or the inventory of Historic and Archaeological Assets of the Commonwealth?

Yes (Specify _____) No

If yes, does the project involve any demolition or destruction of any listed or inventoried historic or archaeological resources? Yes (Specify _____) No

WATER RESOURCES:

Is there an Outstanding Resource Water (ORW) on or within a half-mile radius of the project site? **X** Yes ___ No;

if yes, identify the ORW and its location. **Weir River ACEC**

(NOTE: Outstanding Resource Waters include Class A public water supplies, their tributaries, and bordering wetlands; active and inactive reservoirs approved by MassDEP; certain waters within Areas of Critical Environmental Concern, and certified vernal pools. Outstanding resource waters are listed in the Surface Water Quality Standards, 314 CMR 4.00.)

Are there any impaired water bodies on or within a half-mile radius of the project site? **X** Yes ___ No; if yes, identify the water body and pollutant(s) causing the impairment: **Weir River – fecal coliform & PCB in fish tissue**

See Project Narrative (Section II) and above

Is the project within a medium or high stress basin, as established by the Massachusetts Water Resources Commission? ___ Yes X No

STORMWATER MANAGEMENT:

Generally describe the project's stormwater impacts and measures that the project will take to comply with the standards found in MassDEP's Stormwater Management Regulations: See Appendix I – Stormwater Management Report

The following is an explanation on how the proposed project meets the Stormwater Management Standards as prepared by the Massachusetts Department of Environmental Protection, Revised February 2008. Please refer to the Stormwater Checklist and Certification in Section 5 for additional documentation related to both the site and access road.

Standard 1: No New Untreated Discharges – The project is considered redevelopment and meets this standard to the maximum extent practicable. Stormwater runoff will be directed to existing discharge points and no new discharge locations are proposed. Several discharge pipes will be replaced and enhanced with runoff velocity dissipator stone pads as outlined in the Stormwater Report to prevent erosion. Three discharge points will be abandoned. Previous stormwater runoff to these discharge points will be redirected to nearby existing points. Tide gates are proposed at outlets along Straits Pond to prevent tidal fluctuations from washing out the stormwater drainage system.

Standard 2: Peak Rate Attenuation –The project meets this standard to the maximum extent practicable. The project scope includes roadway reconstruction with minor widening. The project will result in an increase of approximately a 0.03-acres of impervious surfaces over the 1.3-mile long project. This includes both roadway widening and sidewalk areas. There are large impervious areas being removed at certain intersections that will offset the proposed roadway widening and sidewalks. Many of the areas where roadway widening will occur are impervious or unvegetated disturbed areas, which may contribute untreated, silt-laden runoff to resource areas. The project will provide granite curb along the edges of roadway, revegetate the edges of roadway, and prevent gutter flow from eroding these disturbed areas. This widening will yield a minimal increase in the flow and volume to the outlets. Stone dissipator pads are proposed where appropriate, based on impacts to Straits Pond, topography, and discharge velocities, to mitigate the increase in flow due to the proposed closed drainage system and widening.

Detention BMP's were considered for this project but ultimately deemed not practicable due to a high groundwater table, proximity to the Straits Pond ACEC, and lack of suitable land due to topography and abutting residential buildings near discharge points.

Standard 3: Recharge – The project meets this standard to the maximum extent practicable. The project will result in a 0.03 increase in impervious surfaces over the 1.3 mile long project that will constitute a minor reduction in groundwater recharge over existing conditions.

Recharge BMP's were considered for this project but ultimately deemed not practicable due to a high groundwater table, proximity to the Straits Pond ACEC, and lack of suitable land due to topography and abutting residential buildings near discharge points.

Standard 4: Water Quality – The project meets this standard to the maximum extent practicable. The proposed stormwater management system improves upon the existing drainage by eliminating catch basin-to-catch basin connections. Seventy-four (74) new deep sump catch basins (25% TSS

removal) are proposed as a part of this project. The proposed tide gates at discharge points along Straits Pond will prevent tidal fluctuations from washing out the drainage system. See Section 4.1: Water Quality Calculations and Section 4.2: Total Suspended Solids Calculations.

Water quality BMP's were considered for this project but ultimately deemed not practicable due to a high groundwater table, proximity to the Straits Pond ACEC, and lack of suitable land due to topography and abutting residential buildings near discharge points.

Standard 5: Land Uses with Higher Pollutant Loads – Standard 5 does not apply to the project. There are no land uses with higher pollutant loads within the project area.

Standard 6: Critical Areas – The project meets this standard to the maximum extent practicable. The project abuts Straits Pond, a portion of the Weir River ACEC which is a Outstanding Resource Water (ORW). Straits Pond is not classified as an impaired water body by the DEP, but due to tidal interchange with the Weir River estuary at the tide gate under Nantasket Avenue, it may have elevated levels of fecal coliform. Roadway reconstruction and related improvements associated with this project are not anticipated to increase levels of the identified impairments. Existing discharges that convey surface runoff directly to the pond are proposed to be collected in a closed drainage system with deep sump catch basins and tide gates to improve treatment over existing conditions (see Standard 4). In addition, the project offers some spill prevention by improving pavement condition, roadway drainage, intersection geometry, and installing new guardrail that will reduce the likelihood of errant vehicles entering Straits Pond.

Standard 7: Redevelopment and Other Projects Subject to the Standards only to the maximum extent practicable – The project is a redevelopment and the design is subject to meet Stormwater Management Standards #2, #3, and the pretreatment and structural stormwater BMP requirements of Standards #4, #5, and #6 to the maximum extent practicable. Existing stormwater discharges will comply with Standard #1 only to the maximum extent practicable. The project will also comply with all other requirements of the Stormwater Management Standards and improve upon existing conditions as outlined throughout this report.

Standard 8: Construction Period Pollution Prevention Plan and Erosion and Sedimentation Control – The project meets this standard. The Contractor will be required to obtain a NPDES Construction General Permit containing a Construction Period Pollution Prevention Plan. Erosion and sedimentation control (ESC) measures consisting of compost filter tubes and silt fence will be installed at the limits of work within and adjacent to the buffers to coastal beach, coastal bank, and vegetated wetlands/ salt marsh prior to the commencement of construction. Earth moving activities will be conducted only after the ESC measures are installed and inspected.

Standard 9: Operation and Maintenance Plan - The project meets this standard. An Operation and Maintenance plan has been customized to fit the design of the road improvements. Provisions to maintain runoff control devices have been assured through structural, non-structural, and construction management approaches. See Section 2: Long-Term Pollution Prevention Plan of the Stormwater Report.

Standard 10: Prohibition of Illicit Discharges – The project meets this standard. The Operation and Maintenance plan required by Standard 9 includes measures to prevent illicit discharges. Illicit discharges will be discontinued where the elimination of these discharges will not result in stormwater damages to contributing parcels. An Illicit Discharge Compliance Statement is included within the Stormwater Report.

MASSACHUSETTS CONTINGENCY PLAN:

Has the project site been, or is it currently being, regulated under M.G.L.c.21E or the Massachusetts Contingency Plan? Yes ___ No X ; if yes, please describe the current status of the site (including Release Tracking Number (RTN), cleanup phase, and Response Action Outcome classification): No

Is there an Activity and Use Limitation (AUL) on any portion of the project site? Yes ___ No X ; if yes, describe which portion of the site and how the project will be consistent with the AUL: _____

Are you aware of any Reportable Conditions at the property that have not yet been assigned an RTN? Yes ___ No X ; if yes, please describe: _____

SOLID AND HAZARDOUS WASTE:

If the project will generate solid waste during demolition or construction, describe alternatives considered for re-use, recycling, and disposal of, e.g., asphalt, brick, concrete, gypsum, metal, wood: _____

The project will generate asphalt waste from the full depth pavement over the existing roadway surface. Milled asphalt will be reused where possible, such as under guardrails as a means to suppress weed growth. Excess asphalt milling will be recycled and reused as new asphalt.

(NOTE: Asphalt pavement, brick, concrete and metal are banned from disposal at Massachusetts landfills and waste combustion facilities and wood is banned from disposal at Massachusetts landfills. See 310 CMR 19.017 for the complete list of banned materials.)

Will your project disturb asbestos containing materials? Yes ___ No X ; if yes, please consult state asbestos requirements at <http://mass.gov/MassDEP/air/asbhom01.htm>

MassDOT Highway Division’s Hazardous Materials Unit reviews all projects to determine if they will encounter and/or generate waste containing asbestos. If asbestos containing materials are encountered, appropriate special conditions are provided in the project’s contract, such that contractors handle and dispose of those materials appropriately and in accordance with all applicable local, state and federal regulations.

Describe anti-idling and other measures to limit emissions from construction equipment: _____

The Project has been designed to conform to MassDOT standards and guidelines. Construction equipment will be required to abide to Massachusetts 5-minute idle law. Furthermore, MassDOT requires that contractors install emission control devices in all off-road vehicles. MassDOT’s Revised Diesel Retrofit Specification states emissions control standards must be met or technology must be used for non-road diesel powered construction equipment in excess of 50 horsepower on MassDOT job sites.

DESIGNATED WILD AND SCENIC RIVER:

Is this project site located wholly or partially within a defined river corridor of a federally designated Wild and Scenic River or a state designated Scenic River? Yes ___ No X ; if yes, specify name of river and designation:

If yes, does the project have the potential to impact any of the “outstandingly remarkable” resources of a federally Wild and Scenic River or the stated purpose of a state designated Scenic River? Yes ___ No ___ ; if yes, specify name of river and designation: _____; if yes, will the project will result in any impacts to any of the designated “outstandingly remarkable” resources of the Wild and Scenic River or the stated purposes of a Scenic River. Yes ___ No ___ ;

if yes, describe the potential impacts to one or more of the “outstandingly remarkable” resources or stated purposes and mitigation measures proposed.

ATTACHMENTS:

1. List of all attachments to this document.
 - **Attachment A- Distribution List**
 - **Attachment B- Project figures**
 - **Attachment C- Project Correspondence**
 - **Attachment D- Historic and Cultural Resources**
 - **Attachment E- Summary of MassDEP Disposal Sites Memorandum**
 - **Attachment F- Environmental Permits**
 - **Attachment G- Public Notice**
 - **Attachment H- Project Plans**
2. U.S.G.S. map (good quality color copy, 8-½ x 11 inches or larger, at a scale of 1:24,000) indicating the project location and boundaries.
See attachment B
- 3.. Plan, at an appropriate scale, of existing conditions on the project site and its immediate environs, showing all known structures, roadways and parking lots, railroad rights-of-way, wetlands and water bodies, wooded areas, farmland, steep slopes, public open spaces, and major utilities.
See attachment H
 - Key Plan Locations**
 - Typical Sections**
 - Construction Plans**
 - Alignment Plans**
 - Traffic Plans**
 - Sign Summary**
 - Temporary Traffic Control Plans**
 - Utility Plans**
 - Landscape Plans**
 - Construction Details**
 - Cross Sections**
4. Plan, at an appropriate scale, depicting environmental constraints on or adjacent to the project site such as Priority and/or Estimated Habitat of state-listed rare species, Areas of Critical Environmental Concern, Chapter 91 jurisdictional areas, Article 97 lands, wetland resource area delineations, water supply protection areas, and historic resources and/or districts.
See attachment B
5. Plan, at an appropriate scale, of proposed conditions upon completion of project (if construction of the project is proposed to be phased, there should be a site plan showing conditions upon the completion of each phase).
The Project will not be phased. Attachment H- Construction Plans provide the proposed condition of the roadway and surrounding areas after construction.
6. List of all agencies and persons to whom the proponent circulated the ENF, in accordance with 301 CMR 11.16(2).
See Attachment A- Distribution List
7. List of municipal and federal permits and reviews required by the project, as applicable.
 - **Massachusetts Wetlands Protection Act - Order of Conditions**
 - **DEP §401 Water Quality Certificate**
 - **DEP Ch. 91 Waterways Program License**
 - **CZM Consistency Review**
 - **Section 106 - Massachusetts Historic Commission (MHC) - No Adverse Effect Finding**
 - **NPDES General Permit- Construction Related Activities**

LAND SECTION – all proponents must fill out this section

I. Thresholds / Permits

A. Does the project meet or exceed any review thresholds related to **land** (see 301 CMR 11.03(1))
 Yes No; if yes, specify each threshold:

II. Impacts and Permits

A. Describe, in acres, the current and proposed character of the project site, as follows:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Footprint of buildings	<u>NA</u>	<u>NA</u>	<u>NA</u>
Internal roadways	<u>6.71 ac</u>	<u>0.03 ac</u>	<u>6.74 ac</u>
Parking and other paved areas	<u>8 (0.05 ac)</u>	<u>0</u>	<u>8 (0.05 ac)</u>
Other altered areas	<u>NA</u>	<u>NA</u>	<u>NA</u>
Undeveloped areas	<u>NA</u>	<u>NA</u>	<u>NA</u>
Total: Project Site Acreage	<u>7.9 ac</u>	<u>0.03</u>	<u>7.9 ac</u>

B. Has any part of the project site been in active agricultural use in the last five years?
 Yes No; if yes, how many acres of land in agricultural use (with prime state or locally important agricultural soils) will be converted to nonagricultural use?

C. Is any part of the project site currently or proposed to be in active forestry use?
 Yes No; if yes, please describe current and proposed forestry activities and indicate whether any part of the site is the subject of a forest management plan approved by the Department of Conservation and Recreation:

D. Does any part of the project involve conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97? Yes No; if yes, describe:

E. Is any part of the project site currently subject to a conservation restriction, preservation restriction, agricultural preservation restriction or watershed preservation restriction? Yes No; if yes, does the project involve the release or modification of such restriction?
 Yes No; if yes, describe:

F. Does the project require approval of a new urban redevelopment project or a fundamental change in an existing urban redevelopment project under M.G.L.c.121A? Yes No; if yes, describe:

G. Does the project require approval of a new urban renewal plan or a major modification of an existing urban renewal plan under M.G.L.c.121B? Yes No ; if yes, describe:

III. Consistency

A. Identify the current municipal comprehensive land use plan
Title: Hull Community Development Plan (HCDP) Date July 2004

B. Describe the project's consistency with that plan with regard to:
1) economic development The proposed roadway improvements are consistent with the HCDP and will enhance access along the Atlantic Avenue corridor (one of three access points/only land access to the Town of Hull) into the Town center that will help sustain existing businesses, such as Marylou's Coffee, and support redevelopment.
2) adequacy of infrastructure HDCP indicates that roads and sidewalks along Atlantic Avenue are frequently undermined as a result of damage due to storms and overwash. The proposed project proposes to repair the road base, sidewalk and storm drainage system as suggested in the HDCP, although long-range solutions were not identified within the scope of

the project. Due to the proximity of the Atlantic Ocean/Massachusetts Bay, overwash and flooding are a chronic problem in this area. The Atlantic Avenue/School Street intersection will be modified with geometric improvements, street markings signage and to reduce driver confusion and accidents and is consistent with the HCDP.

3) open space impacts Road reconstruction will have minimal expansion and essentially no impacts to open space while improving access to open space assess points to Straits Pond. The proposed project is consistent with preservation of, and accessibility to, public open space per the HCDP.

4) compatibility with adjacent land uses Right of way acquisition from abutting properties including permanent sidewalk, utility, drainage, and guardrail easements are required for this project per consistency with the HCDP. The infrastructure improvements requiring these easements will improve pedestrian and bicycle connectivity of residential and commercial properties as well as access to Gun Rock Beach. Stormwater improvements will reduce flooding of the roadway as well as adjacent properties.

C. Identify the current Regional Policy Plan of the applicable Regional Planning Agency (RPA)
RPA: Metropolitan Planning Council (MAPC) – South Shore Coalition (SSC)

Title: South Shore Coalition (SSC) Fiscal 2017 Work Plan Date 2017

D. Describe the project's consistency with that plan with regard to:

- 1) economic development Consistency with HDCP (see above)
- 2) adequacy of infrastructure Consistency with HDCP (see above)
- 3) open space impacts Consistency with HDCP (see above)

RARE SPECIES SECTION

I. Thresholds / Permits

- A. Will the project meet or exceed any review thresholds related to **rare species or habitat** (see 301 CMR 11.03(2))? ___ Yes **X** No; if yes, specify, in quantitative terms:

(NOTE: If you are uncertain, it is recommended that you consult with the Natural Heritage and Endangered Species Program (NHESP) prior to submitting the ENF.)

- B. Does the project require any state permits related to **rare species or habitat**? ___ Yes **X** No
- C. Does the project site fall within mapped rare species habitat (Priority or Estimated Habitat?) in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes **X** No.
- D. If you answered "No" to all questions A, B and C, proceed to the **Wetlands, Waterways, and Tidelands Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Rare Species section below.

II. Impacts and Permits

- A. Does the project site fall within Priority or Estimated Habitat in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes ___ No. If yes,
1. Have you consulted with the Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP)? ___ Yes ___ No; if yes, have you received a determination as to whether the project will result in the "take" of a rare species? ___ Yes ___ No; if yes, attach the letter of determination to this submission.
 2. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes ___ No; if yes, provide a summary of proposed measures to minimize and mitigate rare species impacts
 3. Which rare species are known to occur within the Priority or Estimated Habitat?
 4. Has the site been surveyed for rare species in accordance with the Massachusetts Endangered Species Act? ___ Yes ___ No
 4. If your project is within Estimated Habitat, have you filed a Notice of Intent or received an Order of Conditions for this project? ___ Yes ___ No; if yes, did you send a copy of the Notice of Intent to the Natural Heritage and Endangered Species Program, in accordance with the Wetlands Protection Act regulations? ___ Yes ___ No
- B. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes ___ No; if yes, provide a summary of proposed measures to minimize and mitigate impacts to significant habitat:

WETLANDS, WATERWAYS, AND TIDELANDS SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **wetlands, waterways, and tidelands** (see 301 CMR 11.03(3))? X Yes ___ No; if yes, specify, in quantitative terms:

The project will require work within coastal bank and barrier beach ((3)(b)1.a.), alteration of an ORW (Weir River ACEC) ((3)(b)1.c.), fill within a FEMA Velocity Zone ((3)(b)1.e.), and work in filled and/or flowed tidelands requiring a DEP Ch. 91 Waterways License for non-water dependent use ((3)(b)5.)

B. Does the project require any state permits (or a local Order of Conditions) related to **wetlands, waterways, or tidelands**? X Yes ___ No; if yes, specify which permit:

The project will require a Notice of Intent from the Town of Hull, a DEP §401 Water Quality Certificate, a DEP Ch. 91 Waterways License due to work in filled and/or flowed tidelands and a Consistency Review with the CZM.

C. If you answered "No" to both questions A and B, proceed to the **Water Supply Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wetlands, Waterways, and Tidelands Section below.

II. Wetlands Impacts and Permits

A. Does the project require a **new** or amended Order of Conditions under the Wetlands Protection Act (M.G.L. c.131A)? X Yes ___ No; if yes, has a Notice of Intent been filed? ___ Yes X No; if yes, list the date and MassDEP file number: _____; if yes, has a local Order of Conditions been issued? ___ Yes X No; Was the Order of Conditions appealed? ___ Yes X No. Will the project require a Variance from the Wetlands regulations? ___ Yes X No.

B. Describe any proposed permanent or temporary impacts to wetland resource areas located on the project site: **See Project Narrative (Section 2) and previous discussion for a description of wetland resource areas.**

Approximately 881 square feet (s.f.) of salt marsh/BVW will be impacted; 961 s.f. will be replicated to replace it (ratio of approx. 1:1.5 existing/replication). See Project Narrative for a description of wetland resource areas.

C. Estimate the extent and type of impact that the project will have on wetland resources, and indicate whether the impacts are temporary or permanent:

<u>Coastal Wetlands</u>	<u>Area (square feet) or Length (linear feet)</u>	<u>Temporary or Permanent Impact?</u>
Land Under the Ocean	-	-
Designated Port Areas	-	-
Coastal Beaches	-	-
Coastal Dunes	-	-
Barrier Beaches	116,752 s.f	1,777 s.f perm./114,975 s.f temp.
Coastal Banks	-	-
	-	-
Rocky Intertidal Shores	-	-
Salt Marshes	264 s.f.	Permanent
Land Under Salt Ponds	85 s.f. rep.	Permanent

Land Containing Shellfish	-	-
Fish Runs	-	-
Land Subject to Coastal Storm Flowage	225,800 s.f	2,100 s.f perm./223,700 s.f temp.
Inland Wetlands		
Bank (lf)	-	-
Bordering Vegetated Wetlands	617 s.f. (315 s.f. temp./ 302 s.f. perm.)	634 s.f. (315 s.f. restoration/ 319 s.f. replication)
Isolated Vegetated Wetlands	-	-
Land under Water	-	-
Isolated Land Subject to Flooding	-	-
Bordering Land Subject to Flooding	-	-
Riverfront Area	-	-

D. Is any part of the project:

1. proposed as a **limited project**? Yes ___ No; if yes, what is the area (in sf)? Approximately 344,120 s.f. (7.9 Acres)
2. the construction or alteration of a **dam**? ___ Yes No; if yes, describe:
3. fill or structure in a **velocity zone** or **regulatory floodway**? ___ Yes No
4. dredging or disposal of dredged material? ___ Yes No; if yes, describe the volume of dredged material and the proposed disposal site:
5. a discharge to an **Outstanding Resource Water (ORW)** or an **Area of Critical Environmental Concern (ACEC)**? Yes ___ No
6. subject to a wetlands restriction order? ___ Yes No; if yes, identify the area (in sf):
7. located in buffer zones? Yes ___ No; if yes, how much (in sf) 53,902 s.f.

E. Will the project:

1. be subject to a local wetlands ordinance or bylaw? ___ Yes No
2. alter any federally-protected wetlands not regulated under state law? ___ Yes No; if yes, what is the area (sf)?

III. Waterways and Tidelands Impacts and Permits

A. Does the project site contain waterways or tidelands (including filled former tidelands) that are subject to the Waterways Act, M.G.L.c.91? Yes ___ No; if yes, is there a current Chapter 91 License or Permit affecting the project site? ___ Yes No; if yes, list the date and license or permit number and provide a copy of the historic map used to determine extent of filled tidelands:

B. Does the project require a new or modified license or permit under M.G.L.c.91? Yes ___ No; if yes, how many acres of the project site subject to M.G.L.c.91 will be for non-water-dependent use? Current 1.1 ac Change -0.1 ac Total 1.0 ac

Road/sidewalk improvements will result in conversion of 0.1 ac filled tidelands.
If yes, how many square feet of solid fill or pile-supported structures (in sf)?
No structures proposed.

C. For non-water-dependent use projects, indicate the following:

Area of filled tidelands on the site: 1.1 ac (existing 1.0 ac/ new 0.1 ac)

Area of filled tidelands covered by buildings: NA

For portions of site on filled tidelands, list ground floor uses and area of each use:

Road edges/sidewalk

Does the project include new non-water-dependent uses located over flowed tidelands?

Yes ___ No

Height of building on filled tidelands No buildings – new road consistent with existing road elevations

Also show the following on a site plan: Mean High Water, Mean Low Water, Water-dependent Use Zone, location of uses within buildings on tidelands, and interior and exterior areas and facilities dedicated for public use, and historic high and historic low water marks.

D. Is the project located on landlocked tidelands? ___ Yes No; if yes, describe the project's impact on the public's right to access, use and enjoy jurisdictional tidelands and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

E. Is the project located in an area where low groundwater levels have been identified by a municipality or by a state or federal agency as a threat to building foundations? ___ Yes No; if yes, describe the project's impact on groundwater levels and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

F. Is the project non-water-dependent **and** located on landlocked tidelands **or** waterways or tidelands subject to the Waterways Act **and** subject to a mandatory EIR? ___ Yes No;
(NOTE: If yes, then the project will be subject to Public Benefit Review and Determination.)

G. Does the project include dredging? ___ Yes No; if yes, answer the following questions:

What type of dredging? Improvement ___ Maintenance ___ Both ___

What is the proposed dredge volume, in cubic yards (cys) _____

What is the proposed dredge footprint ___ length (ft) ___ width (ft) ___ depth (ft);

Will dredging impact the following resource areas?

Intertidal Yes ___ No ___; if yes, ___ sq ft

Outstanding Resource Waters Yes ___ No ___; if yes, ___ sq ft

Other resource area (i.e. shellfish beds, eel grass beds) Yes ___ No ___; if yes ___ sq ft

If yes to any of the above, have you evaluated appropriate and practicable steps to: 1) avoidance; 2) if avoidance is not possible, minimization; 3) if either avoidance or minimize is not possible, mitigation?

If no to any of the above, what information or documentation was used to support this determination?

Provide a comprehensive analysis of practicable alternatives for improvement dredging in accordance with 314 CMR 9.07(1)(b). Physical and chemical data of the sediment shall be included in the comprehensive analysis.

Sediment Characterization

Existing gradation analysis results? ___ Yes ___ No; if yes, provide results.

Existing chemical results for parameters listed in 314 CMR 9.07(2)(b)6? ___ Yes ___ No; if yes, provide results.

Do you have sufficient information to evaluate feasibility of the following management options for dredged sediment? If yes, check the appropriate option.

Beach Nourishment ___

Unconfined Ocean Disposal ___

Confined Disposal:

Confined Aquatic Disposal (CAD) ___

Confined Disposal Facility (CDF) ___

Landfill Reuse in accordance with COMM-97-001 ___

Shoreline Placement ___

Upland Material Reuse ___

In-State landfill disposal ___

Out-of-state landfill disposal ___

(NOTE: This information is required for a 401 Water Quality Certification.)

IV. Consistency:

- A. Does the project have effects on the coastal resources or uses, and/or is the project located within the Coastal Zone? Yes ___ No; if yes, describe these effects and the projects consistency with the policies of the Office of Coastal Zone Management:

The following section identifies the Massachusetts Coastal Zone Management (CZM) policies (301 CMR 20.00) that are applicable to the proposed project and describes how the project is consistent with these policies.

Water Quality

WATER QUALITY POLICY #1 – Ensure that point source discharges in or affecting the coastal zone are consistent with federally approved state effluent limitations and water quality standards.

Not Applicable. No new point source discharges are proposed. Existing discharges will be upgraded with catch basins and/or other treatment structures.

WATER QUALITY POLICY #2 – Ensure that non-point pollution controls promote the attainment of state surface water quality standards in the coastal zone.

The proposed project involves the creation of 1,307 square feet of impervious paved road surface associated with the reconstruction of Atlantic Avenue and related work. Erosion and sediment control (ESC) measures placed at the limits of work prior to ground disturbance to control temporary runoff during construction will be maintained throughout the construction phase and until all areas are completely stabilized with vegetation and/or road treatments. No new outlets are proposed with this project and there will be no increase in runoff rates or volume toward the Straits Pond/Weir River Estuary as a result of the proposed work.

WATER QUALITY POLICY #3 – Ensure that activities in or affecting the coastal zone conform to applicable state and federal requirements governing subsurface waste discharges.

Not Applicable. No subsurface waste discharges are anticipated with this project.

Habitat

HABITAT POLICY #1 – Protect coastal, estuarine, and marine habitats including salt marshes, shellfish beds, submerged aquatic vegetation, dunes, beaches, barrier beaches, banks, salt ponds, eelgrass beds, tidal flats, rocky shores, bays, sounds, and other ocean habitats, and coastal freshwater streams, ponds, and wetlands to preserve critical wildlife habitat and other important functions and services including nutrient and sediment attenuation, wave and storm damage protection, and landform movement and processes.

The Atlantic Avenue project corridor within the existing road right-of-way does not represent significant wildlife habitat in terms of food, shelter or breeding/migration areas due to the existing densely residential development, active road use and regular maintenance of the existing road rights-of-way. No Natural Heritage Endangered Species Program (NHESP)

estimated or Priority Habitat of rare-listed species (See Figure 3) or NHESP BioMap Core Habitat as identified on MassGIS data layers occur along the proposed project route. Although northern long-eared bats are listed as a federally endangered species statewide in Massachusetts, no habitat is listed for the Town of Hull. Proposed clearing of road-side, landscaped trees for the project is minimal, 11 trees total, and any cutting/removal will occur outside of restricted work windows (June 01 – July 31) and no “incidental takes” or significant adverse impacts to the bats or their habitat are anticipated.

Straits Pond is not designated as an *Anadromous/Catadromous* (“fish run”) (See Figure 5) nor a “land containing shellfish” (See Figure 7). However, Straits Pond is anticipated to provide habitat for larval and juvenile marine fish species, various crustaceans and shellfish as well as diverse bird species and is designated as part of the Weir River ACEC. Minimal work is proposed within the Weir River ACEC associated with Straits Pond, and the project will not have a significant adverse impact to the interests of the ACEC designation or the WPA. Road widening, sidewalk replacement and stormwater improvements (rock-fill slope modifications and outlet treatments) will only result in 881 s.f. of impact to vegetated salt marsh/BVW and this will be replicated with 961 s.f., resulting in net gain. BMPs associated with this project (See Section 2.5.), will be installed at the limits of work within/adjacent to the buffers to coastal beach, coastal bank and vegetated wetlands/salt marsh prior to the commencement of construction. These controls will be inspected and maintained throughout construction and will remain in place until areas are permanently stabilized and avoid discharges of silt laden water and sediments from entering Straits Pond/Weir River ACEC to avoid adversely impacting its function as an ORW. In addition, proposed stormwater system upgrades will improve the overall quality of stormwater discharges to Straits Pond.

Proposed improvements and related work, approximately 225,800 s.f./5.2 acres (223,700 s.f. temporary and 2,100 s.f. permanent) associated with road reconstruction will occur within LSCSF/FEMA flood storage and velocity zones (See Figure 4) (Panel #25023C 0039J - July 17, 2012) as well as within barrier beaches (See Figure 6). These areas are predominately existing, disturbed road edges immediately adjacent to Atlantic Avenue associated with densely residential communities. The proposed road reconstruction work is not anticipated to significantly impact the current function of LSCSF or barrier beaches that act as natural habitats for wildlife along the project corridor and will improve road drainage to Straits Pond and public safety. Modifications/improvements to the existing seawalls were not considered within the scope of the Atlantic Avenue reconstruction project.

HABITAT POLICY #2 – Advance the restoration of degraded or former habitats in coastal and marine areas.

As indicated above, the Atlantic Avenue project corridor within the existing road right-of-way does not represent significant wildlife habitat in terms of food, shelter or breeding/migration areas due to active road use and regular maintenance of the existing road right-of-way. The project will require minor impacts to vegetated wetlands/salt marsh surrounding Straits Pond due to a proposed rockfill slope and outlet treatments. The wetland impacts will be replicated at a ratio of 1:1.5 existing/proposed.

Protected Areas

PROTECTED AREAS POLICY #1 – Preserve, restore and enhance complexes of coastal resources of regional or statewide significance through the Areas of Critical Environmental Concern program.

For projects located in ACECs (310 CMR 10.24(5)), the WPA requires that that any proposed project shall have “no adverse effect” on areas determined to be significant to the protection of jurisdictional interests. Minimal work is proposed within the Weir River ACEC (at/below MHW line elevation 2.8 feet) associated with Straits Pond. Proposed work includes slope work associated with roadway widening/sidewalk reconstruction and stormwater improvements within saltmarsh/BVW (Wetland A, C and D). This salt marsh/BVW is vegetated with a monoculture of common reed, an invasive coastal and inland wetland species. The filled area, 881 s.f., will be replicated with 961 s.f. of native saltmarsh species (*Spartina* spp.) at Wetland C and improve the value and function of the wetland in this area and does not represent an adverse impact. In areas where the existing stormwater drainage system is renovated along Straits Pond, the existing outfalls to be replaced and/or modified (approximately 239 s.f. (46 s.f. salt marsh/193 BVW) will occur within riprap slopes. No adverse impacts are anticipated to coastal resource areas that function as natural habitats for wildlife as a result of outfall replacement and future stormwater runoff from Atlantic Avenue will not be directly discharged into Straits Pond.

PROTECTED AREAS POLICY #2 – Protect state and locally designated scenic rivers and state classified scenic rivers in the coastal zone.

Not applicable. There are no state and locally designated scenic rivers or state classified scenic rivers within the project limits.

PROTECTED AREAS POLICY #3 – Ensure that proposed developments in or near designated or registered historic districts or sites respect the preservation intent of the designation and that potential adverse effects are minimized.

Not applicable. There are no historical districts or sites that will be impacted by the proposed roadway construction.

Coastal Hazards

COASTAL HAZARD POLICY #1 – Preserve, protect, restore and enhance the beneficial functions of storm damage prevention and flood control provided by natural coastal landforms such as dunes, beaches, barrier beaches, coastal banks, land subject to coastal storm flowage, salt marshes and land under the ocean.

As identified in Habitat Policy #1, LSCSF/FEMA flood storage and velocity zones as well as barrier beaches occur along the Atlantic Avenue road corridor. Atlantic Avenue is bordered by residential communities, commercial businesses and municipal buildings, and the potential to restore these resources is limited due to this existing infrastructure. The proposed road reconstruction work is not anticipated to significantly impact the current function of LSCSF

or barrier beaches along the project and will improve road drainage to Straits Pond and public safety.

COASTAL HAZARDS POLICY #2 – Ensure construction in water bodies and contiguous land areas will minimize interference with water circulation and sediment transport. Approve permits for flood or erosion control projects only when it has been determined that there will be no significant adverse effects on the project site or adjacent or down-coast areas.

The proposed roadway construction is not anticipated to interfere with water circulation and sediment transport. All existing catch basins to remain and proposed catch basins to be installed will be protected with silt sacks during the various phases of construction to eliminate temporary sedimentation from construction activities entering the drainage system.

COASTAL HAZARD POLICY #3 – Ensure that state and federally funded public works projects proposed for location within the coastal zone will: 1. not exacerbate existing hazards or damage natural buffers or other natural resources, 2. be reasonably safe from flood and erosion related damage, 3. not promote growth and development in hazard-prone or buffer areas, especially in Velocity zones and ACECs, and, 4. not be used on Coastal Barrier Resource Units for new or substantial reconstruction of structures in a manner inconsistent with the Coastal Barrier Resource / Improvement Acts.

As identified in Habitat Policy #1, the proposed road reconstruction work is not anticipated to significantly impact the current function of LSCSF or barrier beaches along the project and will improve road drainage to Straits Pond and public safety. The project mostly occurs within already disturbed areas associated with existing roadway and residential community.

Port and Harbor Infrastructure

PORTS POLICY #1 – Ensure that dredging and disposal of dredged material minimize adverse effects on water quality, physical processes, marine productivity and public health.

Not Applicable. The project is not associated with Port or Harbor infrastructure.

PORTS POLICY #2 – Obtain the widest possible public benefit from channel dredging, ensuring that designated ports and developed harbors are given highest priority in the allocation of federal and state dredging funds. Ensure that this dredging is consistent with marine environment policies.

Not Applicable.

PORTS POLICY #3 – Preserve and enhance the capacity of Designated Port Areas (DPAs) to accommodate water dependent industrial uses, and prevent the exclusion of such uses from tidelands and any other DPAs lands over which a state agency exerts control by virtue of ownership, regulatory authority, or other legal jurisdiction.

Not Applicable.

PORTS MANAGEMENT PRINCIPLE #4 – Encourage, through technical and financial assistance, expansion of water dependent uses in designated ports and developed harbors, re-development or urban waterfronts, and expansion of visual access.

Not Applicable.

Public Access

PUBLIC ACCESS POLICY #1 – Ensure that development (both water-dependent or non-water-dependent) of coastal sites subject to state waterways regulation will promote general public use and enjoyment of the water’s edge, to an extent commensurate with the Commonwealth’s interests in flowed and filled tidelands under the Public Trust Doctrine.

A large area of “scored” concrete in front of residential properties at 184, 186, and 188 Atlantic Avenue will be installed to create a public space where benches or other public facilities could be installed. This area is currently used for parking spaces for the adjacent beaches and overflow cars from the residential buildings. However, the proposed project provides sufficient on-street parking that will allow this area to be renovated as a public walking or resting area.

PUBLIC ACCESS POLICY #2 – Improve public access to coastal recreation facilities and alleviate auto traffic and parking problems through improvements in public transportation and trail links (land- or water-based) to other nearby facilities. Increase capacity of existing recreation areas by facilitating multiple use and by improving management, maintenance, and public support facilities. Ensure that the adverse impacts of developments proposed near existing public access and recreation sites are minimized.

Public access to recreational facilities along the project including Gun Rock Beach and the Green Hill playground will be improved under this project by the reconstruction of sidewalks to meet current MassDOT and Americans with Disabilities (ADA) standards. High visibility crosswalk pavement markings and appropriate signage will increase safety for pedestrians and the improved sidewalk network will reduce demand for on-street parking in the area.

PUBLIC ACCESS POLICY #3 – Expand existing recreation facilities and acquire and develop new public areas for coastal recreational activities, giving highest priority to regions of high need or limited site availability. Provide technical assistance to developers of both public and private recreation facilities and sites that increase public access to the shoreline to ensure that both transportation access and the recreation facilities are compatible with social and environmental characteristics of surrounding communities.

There is no room within the project corridor for additional public areas for coastal recreational activities due to existing residential properties, commercial businesses, municipal buildings and residential/private roads.

Energy

ENERGY POLICY #1 – For coastally dependent energy facilities, consider siting in

alternative coastal locations. For non-coastally dependent energy facilities, consider siting in areas outside of the coastal zone. Weigh the environmental and safety impacts of locating proposed energy facilities at alternative sites.

Not Applicable. The project is not associated with energy facilities.

ENERGY MANAGEMENT PRINCIPLE #2 – Encourage energy conservation and the use of renewable sources such as solar and wind power in order to assist in meeting the energy needs of the Commonwealth.

Not Applicable.

Ocean Resources

OCEAN RESOURCES POLICY #1 – Support the development of environmentally sustainable aquaculture, both for commercial and enhancement (public shellfish stocking) purposes. Ensure that the review process regulating aquaculture facility sites (and access routes to those areas) protects ecologically significant resources (salt marshes, dunes, beaches, barrier beaches, and salt ponds) and minimizes adverse impacts upon the coastal and marine environment.

Not Applicable. The project is not associated with aquaculture.

OCEAN RESOURCES POLICY #2 – Except where such activity is prohibited by the Ocean Sanctuaries Act, the Massachusetts Ocean Management Plan, or other applicable provision of law, the extraction of oil, natural gas, or marine minerals (other than sand and gravel) in or affecting the coastal zone must protect marine resources, marine water quality, fisheries, and navigational, recreational and other uses.

Not Applicable. The project is not associated with the extraction of natural gas or minerals.

OCEAN RESOURCES POLICY #3 – Accommodate offshore sand and gravel extraction needs in areas and in ways that will not adversely affect marine resources, navigation, or shoreline areas due to alteration of wave direction and dynamics. Extraction of sand and gravel, when and where permitted, will be primarily for the purpose of beach nourishment or shoreline stabilization.

Not Applicable.

Growth Management

GROWTH MANAGEMENT PRINCIPLE #1 – Encourage sustainable development that is consistent with state, regional, and local plans and supports the quality and character of the community.

The proposed roadway reconstruction project will provide a multi-modal passage from Nantasket Avenue to the Hull/Cohasset Town Line. There will be continuous sidewalks

along the south side of the roadway and numerous crosswalks where natural crossings occur near businesses, buildings, and playgrounds. “Share the Road” signs and “sharrows” are proposed along the project corridor, creating awareness of bicyclists even though the nature of the area will not allow a designated bike lane.

GROWTH MANAGEMENT PRINCIPLE #2 – Ensure that state and federally funded infrastructure projects primarily serve existing developed areas, assigning highest priority to projects that meet the needs of urban and community development centers.

This transportation project does not provide new access to an area by means of an entirely new right-of-way, increase the design capacity more than 50%, or introduce a new transportation mode adding capacity to the area’s total capacity. This project will not change the land development or use within the project limits. This project does not anticipate adverse visual impacts associated with bicycle and pedestrian accommodations, new signing, striping, curbing and guardrail replacement.

GROWTH MANAGEMENT PRINCIPLE #3 – Encourage the revitalization and enhancement of existing development centers in the coastal zone through technical assistance and federal and state financial support for residential, commercial and industrial development.

There are no development centers within the project limits. The character of the project corridor is residential, mainly single-family homes that were originally seasonal homes that have been converted into yearlong residences with a few apartment buildings/complexes. Commercial businesses are limited along Atlantic Avenue, and although the Town Hall occurs at the western end of the project, there is minimal real estate for expansion and design improvements municipal building were not considered in the scope of the project.

B. Is the project located within an area subject to a Municipal Harbor Plan? ___ Yes X No; if yes, identify the Municipal Harbor Plan and describe the project's consistency with that plan:

WATER SUPPLY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **water supply** (see 301 CMR 11.03(4))? ___ Yes X No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **water supply**? ___ Yes X No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Wastewater Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Water Supply Section below.

II. Impacts and Permits

A. Describe, in gallons per day (gpd), the volume and source of water use for existing and proposed activities at the project site:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Municipal or regional water supply	_____	_____	_____
Withdrawal from groundwater	_____	_____	_____
Withdrawal from surface water	_____	_____	_____
Interbasin transfer	_____	_____	_____

(NOTE: Interbasin Transfer approval will be required if the basin and community where the proposed water supply source is located is different from the basin and community where the wastewater from the source will be discharged.)

B. If the source is a municipal or regional supply, has the municipality or region indicated that there is adequate capacity in the system to accommodate the project? ___ Yes ___ No

C. If the project involves a new or expanded withdrawal from a groundwater or surface water source, has a pumping test been conducted? ___ Yes ___ No; if yes, attach a map of the drilling sites and a summary of the alternatives considered and the results. _____

D. What is the currently permitted withdrawal at the proposed water supply source (in gallons per day)? _____ Will the project require an increase in that withdrawal? ___ Yes ___ No; if yes, then how much of an increase (gpd)? _____

E. Does the project site currently contain a water supply well, a drinking water treatment facility, water main, or other water supply facility, or will the project involve construction of a new facility? ___ Yes ___ No. If yes, describe existing and proposed water supply facilities at the project site:

	<u>Permitted Flow</u>	<u>Existing Avg Daily Flow</u>	<u>Project Flow</u>	<u>Total</u>
Capacity of water supply well(s) (gpd)	_____	_____	_____	_____
Capacity of water treatment plant (gpd)	_____	_____	_____	_____

F. If the project involves a new interbasin transfer of water, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or proposed?

G. Does the project involve:

1. new water service by the Massachusetts Water Resources Authority or other agency of the Commonwealth to a municipality or water district? ___ Yes ___ No
2. a Watershed Protection Act variance? ___ Yes ___ No; if yes, how many acres of alteration?
3. a non-bridged stream crossing 1,000 or less feet upstream of a public surface drinking

water supply for purpose of forest harvesting activities? ___ Yes ___ No

III. Consistency

Describe the project's consistency with water conservation plans or other plans to enhance water resources, quality, facilities and services:

WASTEWATER SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **wastewater** (see 301 CMR 11.03(5))? ___ Yes X No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **wastewater**? ___ Yes X No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Transportation -- Traffic Generation Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wastewater Section below.

II. Impacts and Permits

A. Describe the volume (in gallons per day) and type of disposal of wastewater generation for existing and proposed activities at the project site (calculate according to 310 CMR 15.00 for septic systems or 314 CMR 7.00 for sewer systems):

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Discharge of sanitary wastewater	_____	_____	_____
Discharge of industrial wastewater	_____	_____	_____
TOTAL	_____	_____	_____

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Discharge to groundwater	_____	_____	_____
Discharge to outstanding resource water	_____	_____	_____
Discharge to surface water	_____	_____	_____
Discharge to municipal or regional wastewater facility	_____	_____	_____
TOTAL	_____	_____	_____

B. Is the existing collection system at or near its capacity? ___ Yes ___ No; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:

C. Is the existing wastewater disposal facility at or near its permitted capacity? ___ Yes ___ No; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:

D. Does the project site currently contain a wastewater treatment facility, sewer main, or other wastewater disposal facility, or will the project involve construction of a new facility? ___ Yes ___ No; if yes, describe as follows:

	<u>Permitted</u>	<u>Existing Avg Daily Flow</u>	<u>Project Flow</u>	<u>Total</u>
Wastewater treatment plant capacity (in gallons per day)	_____	_____	_____	_____

E. If the project requires an interbasin transfer of wastewater, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or new?

(NOTE: Interbasin Transfer approval may be needed if the basin and community where wastewater will be discharged is different from the basin and community where the source of water supply is located.)

F. Does the project involve new sewer service by the Massachusetts Water Resources Authority (MWRA) or other Agency of the Commonwealth to a municipality or sewer district? ___ Yes ___ No

G. Is there an existing facility, or is a new facility proposed at the project site for the storage, treatment, processing, combustion or disposal of sewage sludge, sludge ash, grit, screenings, wastewater reuse (gray water) or other sewage residual materials? ___ Yes ___ No; if yes, what is the capacity (tons per day):

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Storage	_____	_____	_____
Treatment	_____	_____	_____
Processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

H. Describe the water conservation measures to be undertaken by the project, and other wastewater mitigation, such as infiltration and inflow removal.

III. Consistency

A. Describe measures that the proponent will take to comply with applicable state, regional, and local plans and policies related to wastewater management:

B. If the project requires a sewer extension permit, is that extension included in a comprehensive wastewater management plan? ___ Yes ___ No; if yes, indicate the EEA number for the plan and whether the project site is within a sewer service area recommended or approved in that plan:

TRANSPORTATION SECTION (TRAFFIC GENERATION)

I. Thresholds / Permit

A. Will the project meet or exceed any review thresholds related to **traffic generation** (see 301 CMR 11.03(6))? ___ Yes X No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **state-controlled roadways**? ___ Yes X No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Roadways and Other Transportation Facilities Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Traffic Generation Section below.

II. Traffic Impacts and Permits

A. Describe existing and proposed vehicular traffic generated by activities at the project site:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Number of parking spaces	<u>1</u>	<u>+ 5</u>	<u>6</u>
Number of vehicle trips per day	<u>4,310</u>	<u>-</u>	<u>4,310</u>
ITE Land Use Code(s):	<u> </u>	<u> </u>	<u> </u>

B. What is the estimated average daily traffic on roadways serving the site?

	<u>Roadway</u>	<u>Existing</u>	<u>Change</u>	<u>Total</u>
1.	<u>Not Applicable</u>	<u> </u>	<u> </u>	<u> </u>
2.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
3.	<u> </u>	<u> </u>	<u> </u>	<u> </u>

C. If applicable, describe proposed mitigation measures on state-controlled roadways that the project proponent will implement: **Not Applicable.**

D. How will the project implement and/or promote the use of transit, pedestrian and bicycle facilities and services to provide access to and from the project site?

The proposed improvements include reconstructing the existing sidewalks along Atlantic Avenue and providing wheelchair ramps, compliant with current ADA and MassDOT standards at intersections and driveways. Widening of the roadway to a minimum of 30 feet will improve bicycle accommodations by providing adequate room for vehicles and bicycles to safely share the roadway. However, an additional 5 feet is not available for bicycle accommodation adjacent to the proposed widened shoulder for residential permit parking without major impacts to private properties and resource areas. Shared pavement markings “sharrows” will be added in highly trafficked areas including Mary Lou’s Coffee, the Green Hill Playground/basketball court and Gun Rock Beach access. “Share the Road” signs will be added throughout the project corridor for improved bicycle and pedestrian awareness.

E. Is there a Transportation Management Association (TMA) that provides transportation demand management (TDM) services in the area of the project site? ___ Yes X No; if yes, describe if and how will the project will participate in the TMA:

F. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation facilities? ___ Yes X No; if yes, generally describe:

G. If the project will penetrate approach airspace of a nearby airport, has the proponent filed a Massachusetts Aeronautics Commission Airspace Review Form (780 CMR 111.7) and a Notice of Proposed Construction or Alteration with the Federal Aviation Administration (FAA) (CFR Title

14 Part 77.13, forms 7460-1 and 7460-2)?

III. Consistency

Describe measures that the proponent will take to comply with municipal, regional, state, and federal plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services:

TRANSPORTATION SECTION (ROADWAYS AND OTHER TRANSPORTATION FACILITIES)

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **roadways or other transportation facilities** (see 301 CMR 11.03(6))? Yes ___ No; if yes, specify, in quantitative terms:

The proposed project falls within the MEPA jurisdiction and is subject to MEPA review thresholds associated with: (5) 301 CMR 11.03(6)(b)2.a – construction, widening or maintenance of a roadway or its right-of-way that will: alter the bank or terrain located ten or more feet from the existing roadway for one-half or more miles, unless necessary to install structure or equipment.

The existing paved width of Atlantic Avenue varies from 24 to 32 feet. There are inconsistent and minimally defined paved and unpaved shoulders along the corridor. The project proposes a 30-foot-wide roadway cross section (2- 11 foot travel lanes with 4 foot outside shoulders) with a 5.5 foot wide sidewalk on at least one side of the road for the full length. A 33-foot-wide cross section is proposed (2- 11 foot travel lanes with a 4 foot shoulder on the north side and a 7 foot shoulder on the south side) where restricted parking is currently allowed. The widening and sidewalk construction will impact abutting residential and commercial properties including but not limited to: regrading and seeding of front lawns, driveway reconstruction, tree and planting removal, and fence relocation. Permanent sidewalk easements from predominately residential properties are required along approximately 0.4 miles of the project. Where Atlantic Avenue abuts Straits Pond, the roadway has been designed to minimize impacts to the existing rockfill slope and resource areas. There are 18 intersections along Atlantic Avenue within the project limits, 16 of which are with minor side streets that lead to small residential neighborhoods. The project will “T” up these intersections where practical in order to reduce approach speeds, improve pedestrian crossings, and increase intersection sight distances as a means of improving safety for all roadway users. At the School Street intersection, the center median will be reconstructed, and sidewalk bump outs installed to better define the roadway and reduce the pedestrian crossing distance across the School Street leg.

B. Does the project require any state permits related to **roadways or other transportation facilities**? Yes ___ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Energy Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Roadways Section below.

II. Transportation Facility Impacts

A. Describe existing and proposed transportation facilities in the immediate vicinity of the project site:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Length (in linear feet) of new or widened roadway	<u>≈ 1.3 mi.</u>	<u>0</u>	<u>≈ 1.3 mi.</u>
Width (in feet) of new or widened roadway	<u>variable</u>	<u>≈ 2+/-</u>	<u>variable</u>

B. Will the project involve any

1. Alteration of bank or terrain (in linear feet)?	<u>NA – Exist. roadways/ sidewalks/driveways</u>
2. Cutting of living public shade trees (number)?	<u>4</u>
3. Elimination of stone wall (in linear feet)?	<u>0</u>

III. Consistency -- Describe the project's consistency with other federal, state, regional, and local plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services, including consistency with the applicable regional transportation plan and the Transportation Improvements Plan (TIP), the State Bicycle Plan, and the State Pedestrian Plan:

The project roadway is proposed to be improved for bicycle and pedestrian accommodations and safety including new guardrails and intersection improvements. The project is consistent with the State Transportation Improvement Plan, as it will improve safety performance while also improving regional connectivity.

ENERGY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **energy** (see 301 CMR 11.03(7))?
___ Yes **X** No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **energy**? ___ Yes **X** No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Air Quality Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Energy Section below.

II. Impacts and Permits

A. Describe existing and proposed energy generation and transmission facilities at the project site:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Capacity of electric generating facility (megawatts)	_____	_____	_____
Length of fuel line (in miles)	_____	_____	_____
Length of transmission lines (in miles)	_____	_____	_____
Capacity of transmission lines (in kilovolts)	_____	_____	_____

B. If the project involves construction or expansion of an electric generating facility, what are:

1. the facility's current and proposed fuel source(s)?
2. the facility's current and proposed cooling source(s)?

C. If the project involves construction of an electrical transmission line, will it be located on a new, unused, or abandoned right of way? ___Yes ___No; if yes, please describe:

D. Describe the project's other impacts on energy facilities and services:

III. Consistency

Describe the project's consistency with state, municipal, regional, and federal plans and policies for enhancing energy facilities and services:

AIR QUALITY SECTION

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **air quality** (see 301 CMR 11.03(8))? ___ Yes **X** No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **air quality**? ___ Yes **X** No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Solid and Hazardous Waste Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Air Quality Section below.

II. Impacts and Permits

A. Does the project involve construction or modification of a major stationary source (see 310 CMR 7.00, Appendix A)? ___ Yes ___ No; if yes, describe existing and proposed emissions (in tons per day) of:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Particulate matter	_____	_____	_____
Carbon monoxide	_____	_____	_____
Sulfur dioxide	_____	_____	_____
Volatile organic compounds	_____	_____	_____
Oxides of nitrogen	_____	_____	_____
Lead	_____	_____	_____
Any hazardous air pollutant	_____	_____	_____
Carbon dioxide	_____	_____	_____

B. Describe the project's other impacts on air resources and air quality, including noise impacts:

III. Consistency

A. Describe the project's consistency with the State Implementation Plan:

B. Describe measures that the proponent will take to comply with other federal, state, regional, and local plans and policies related to air resources and air quality:

SOLID AND HAZARDOUS WASTE SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **solid or hazardous waste** (see 301 CMR 11.03(9))? ___ Yes **X** No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **solid and hazardous waste**? ___ Yes **X** No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Historical and Archaeological Resources Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Solid and Hazardous Waste Section below.

II. Impacts and Permits

A. Is there any current or proposed facility at the project site for the storage, treatment, processing, combustion or disposal of solid waste? ___ Yes ___ No; if yes, what is the volume (in tons per day) of the capacity:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Storage	_____	_____	_____
Treatment, processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

B. Is there any current or proposed facility at the project site for the storage, recycling, treatment or disposal of hazardous waste? ___ Yes ___ No; if yes, what is the volume (in tons or gallons per day) of the capacity:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Storage	_____	_____	_____
Recycling	_____	_____	_____
Treatment	_____	_____	_____
Disposal	_____	_____	_____

C. If the project will generate solid waste (for example, during demolition or construction), describe alternatives considered for re-use, recycling, and disposal:

D. If the project involves demolition, do any buildings to be demolished contain asbestos?
___ Yes ___ No

E. Describe the project's other solid and hazardous waste impacts (including indirect impacts):

III. Consistency

Describe measures that the proponent will take to comply with the State Solid Waste Master Plan:

HISTORICAL AND ARCHAEOLOGICAL RESOURCES SECTION

I. Thresholds / Impacts

A. Have you consulted with the Massachusetts Historical Commission? Yes ___ No; if yes, attach correspondence. For project sites involving lands under water, have you consulted with the Massachusetts Board of Underwater Archaeological Resources? ___ Yes No; if yes, attach correspondence

B. Is any part of the project site a historic structure, or a structure within a historic district, in either case listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ___ Yes No; if yes, does the project involve the demolition of all or any exterior part of such historic structure? ___ Yes ___ No; if yes, please describe:

C. Is any part of the project site an archaeological site listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ___ Yes No; if yes, does the project involve the destruction of all or any part of such archaeological site? ___ Yes ___ No; if yes, please describe:

D. If you answered "No" to all parts of both questions A, B and C, proceed to the **Attachments and Certifications** Sections. If you answered "Yes" to any part of either question A or question B, fill out the remainder of the Historical and Archaeological Resources Section below.

II. Impacts

Describe and assess the project's impacts, direct and indirect, on listed or inventoried historical and archaeological resources:

Coordination letters with the Massachusetts Historic Commission (MHC) and the Town of Hull Historical Commission have been sent out and are attached. The project will not have any significant impacts on historic properties/districts/buildings/areas, archeological resources, publicly owned parks, recreation areas or wildlife refuges.

III. Consistency

Describe measures that the proponent will take to comply with federal, state, regional, and local plans and policies related to preserving historical and archaeological resources:

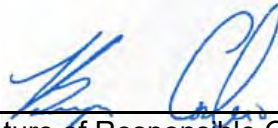

CERTIFICATIONS:

1. The Public Notice of Environmental Review has been/will be published in the following newspapers in accordance with 301 CMR 11.15(1):

(Name) Patriot Ledger (Date) On or before January 29

2. This form has been circulated to Agencies and Persons in accordance with 301 CMR 11.16(2).

Signatures:

01/29/2021		01/29/2021	
Date	Signature of Responsible Officer or Proponent	Date	Signature of person preparing ENF (if different from above)

<u>Bryan Cordeiro</u>	<u>John G. Morgan, Jr.</u>
Name (print or type)	Name (print or type)

<u>MassDOT- Highway Division</u>	<u>CHA Consulting, Inc.</u>
Firm/Agency	Firm/Agency

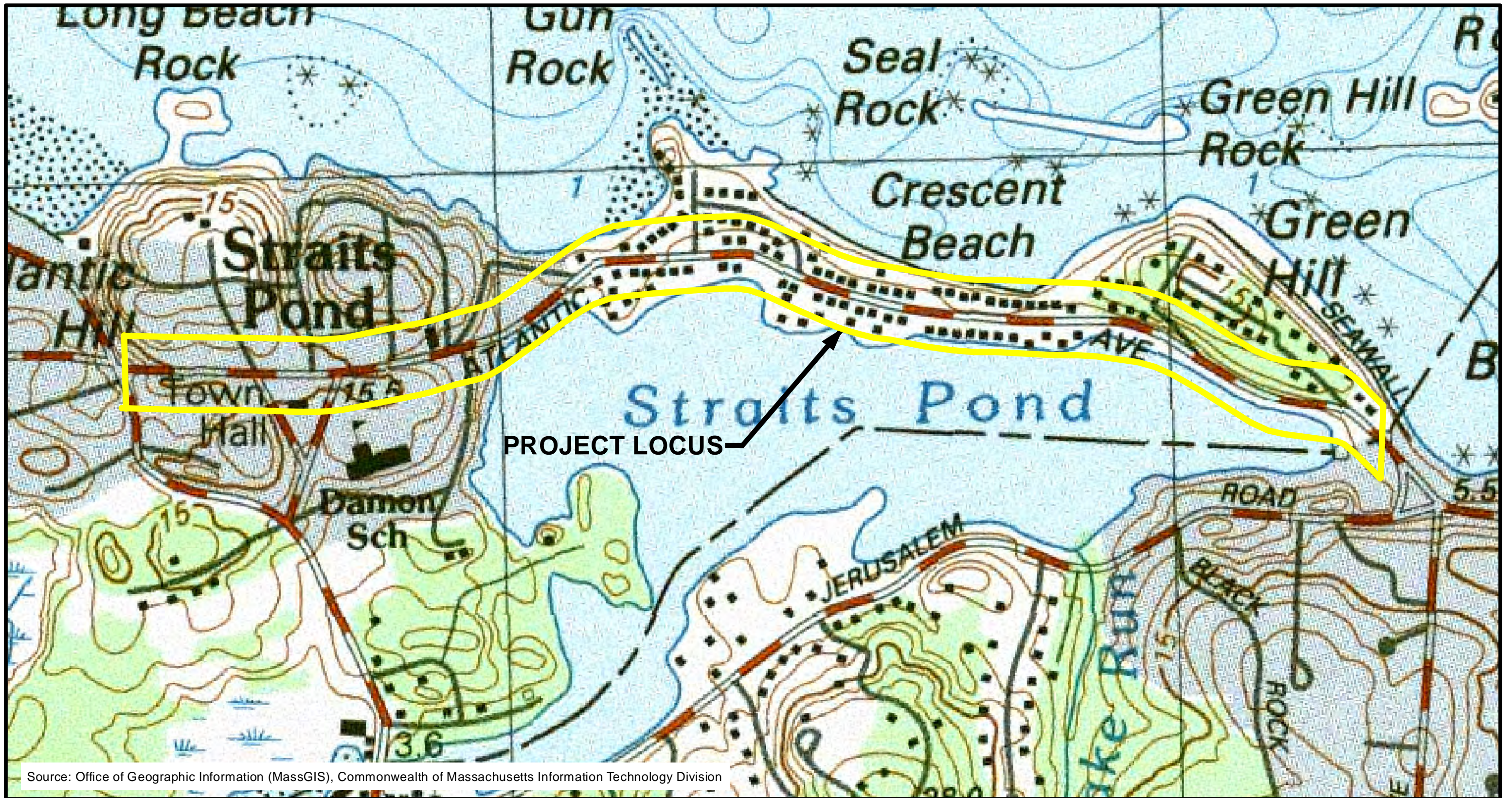
<u>10 Park Plaza</u>	<u>141 Longwater Drive, Suite 104</u>
Street	Street

<u>Boston, MA 02116</u>	<u>Norwell, MA 02061</u>
Municipality/State/Zip	Municipality/State/Zip

<u>(857) 368 8813</u>	<u>781-982-5437</u>
Phone	Phone

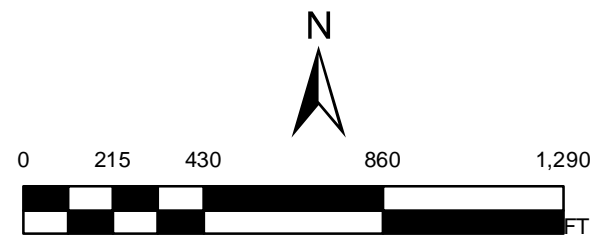
Section 2

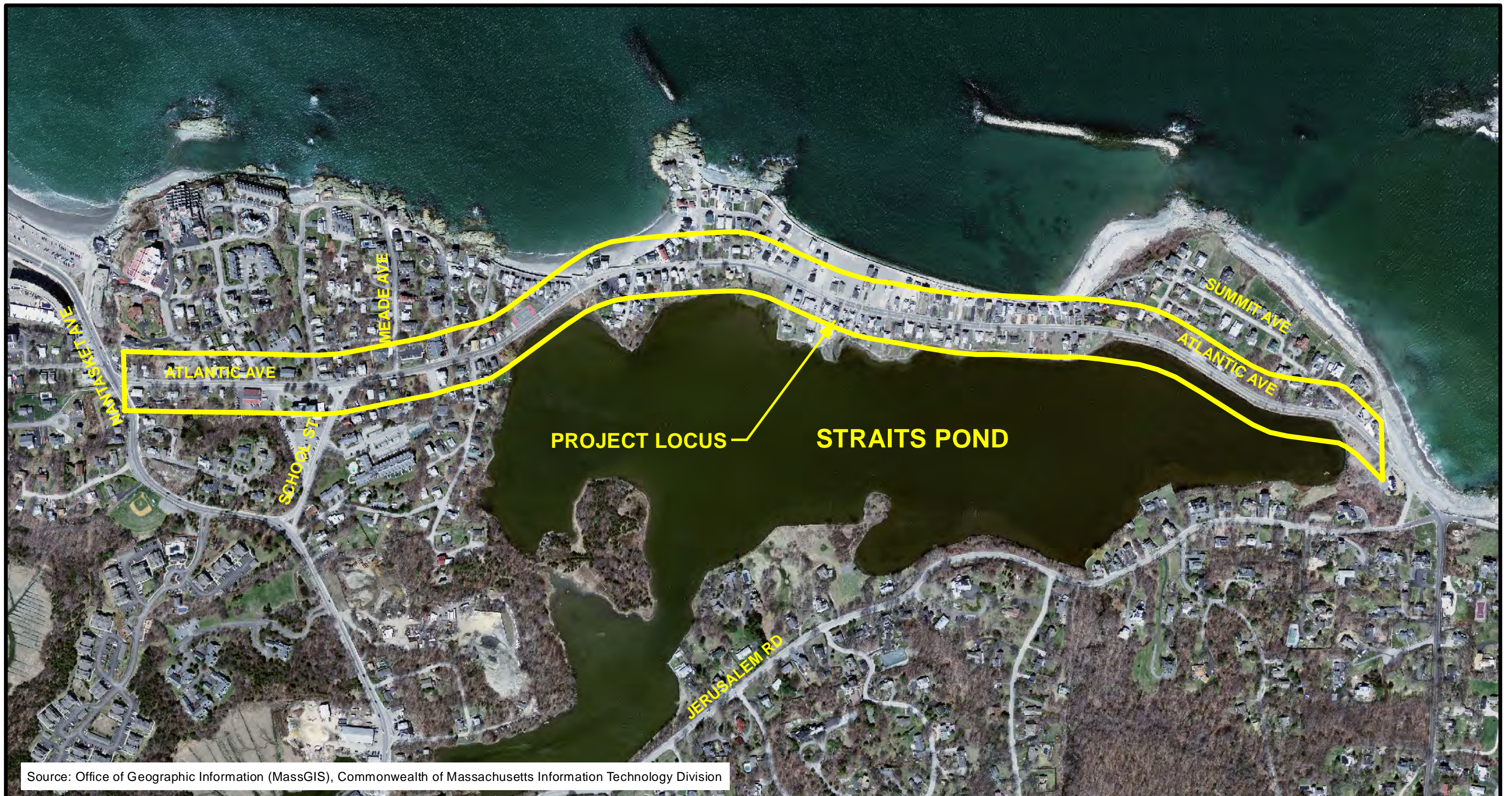
Figures



**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

FIGURE 1. USGS TOPOGRAPHY MAP

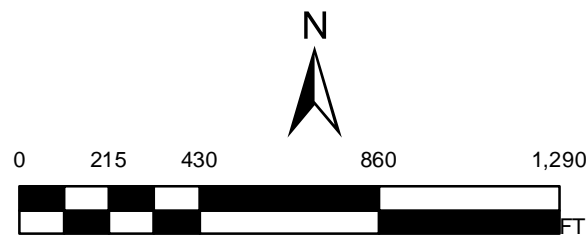


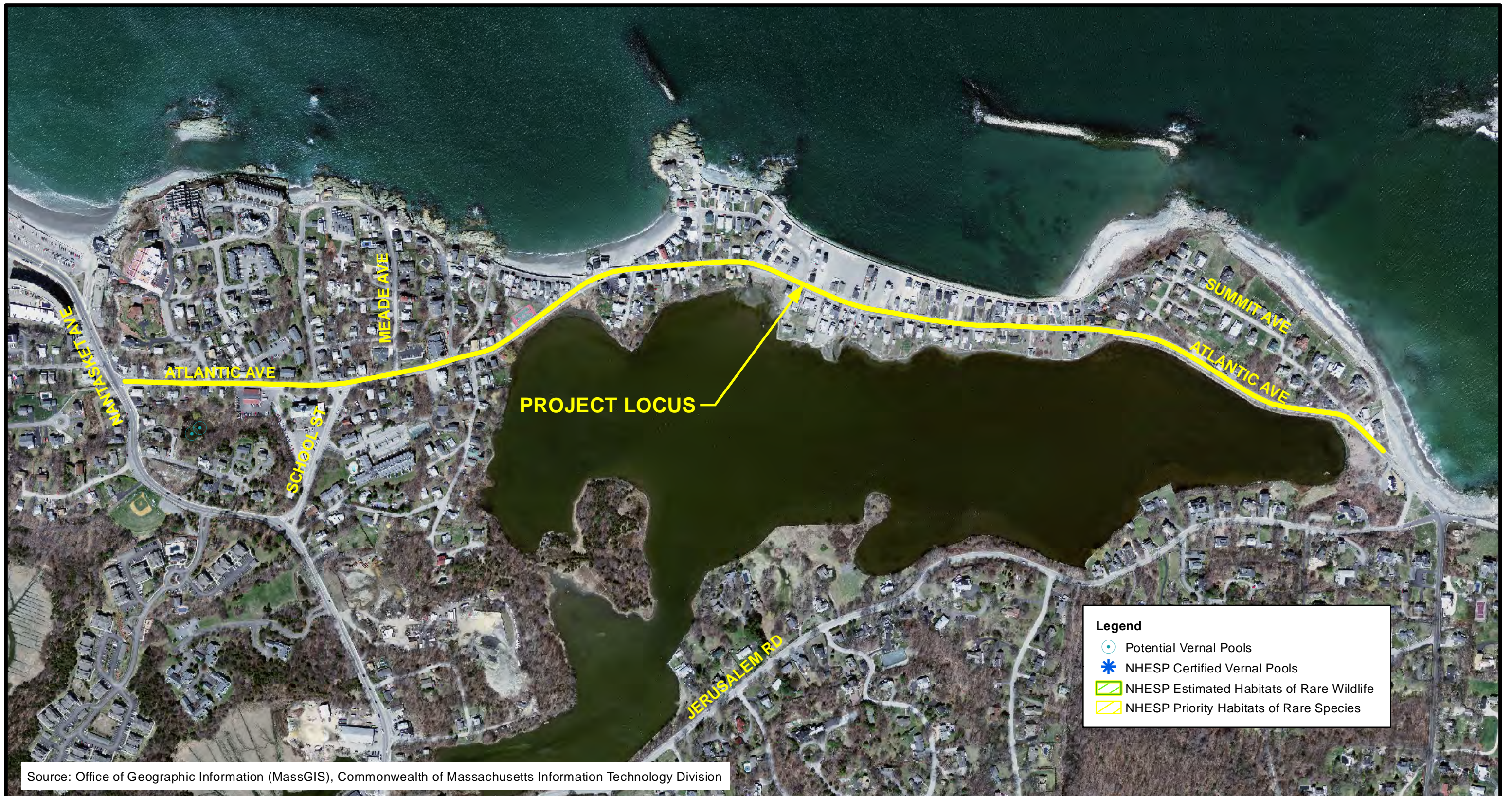


Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts Information Technology Division

**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

FIGURE 2. LOCUS MAP

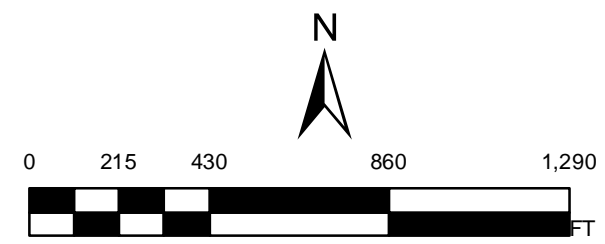




Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts Information Technology Division

**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

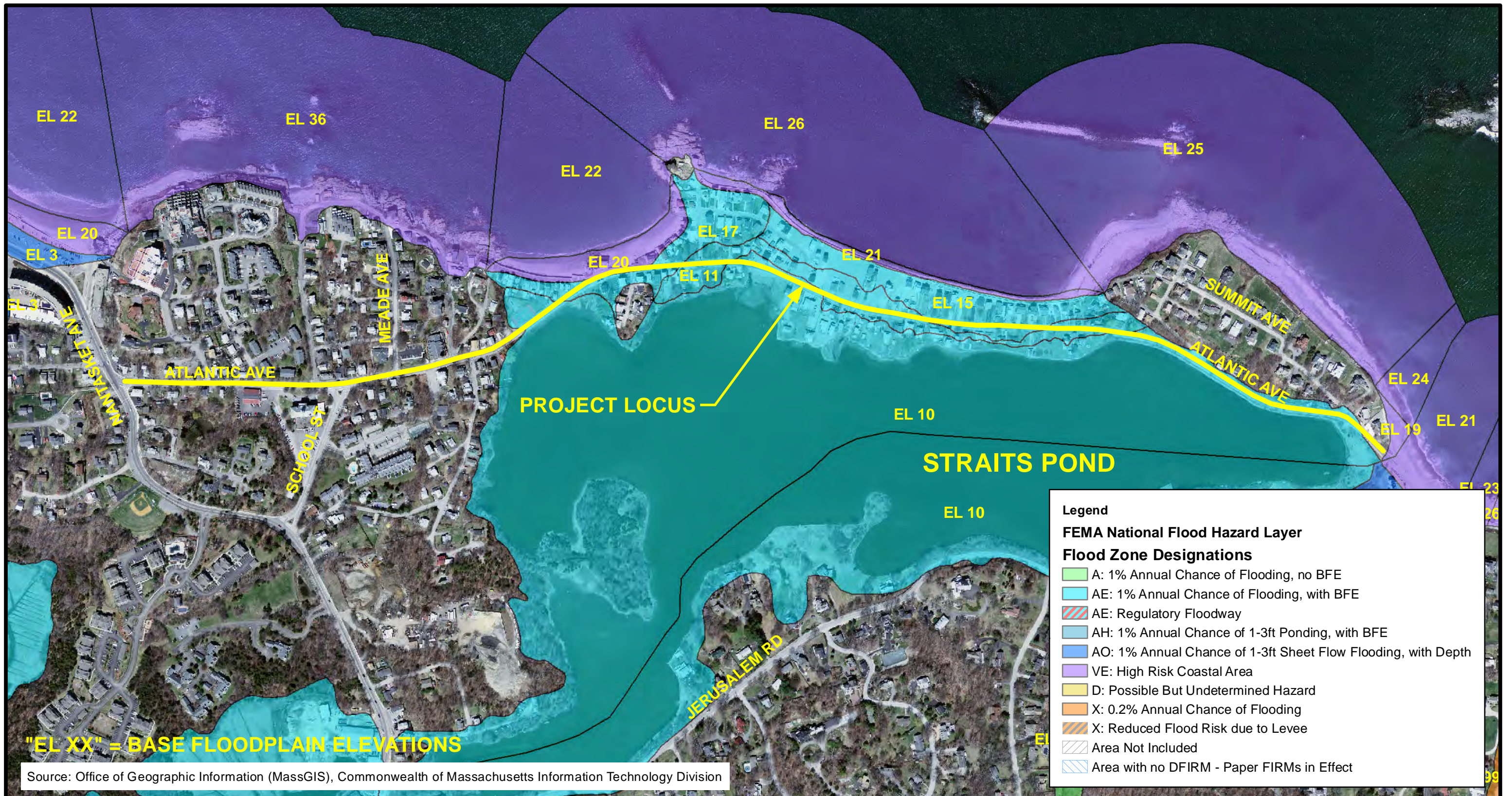
FIGURE 3. NHESP HABITATS



Legend

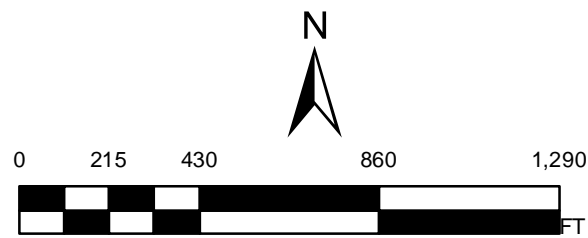
- Potential Vernal Pools
- ✱ NHESP Certified Vernal Pools
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Priority Habitats of Rare Species

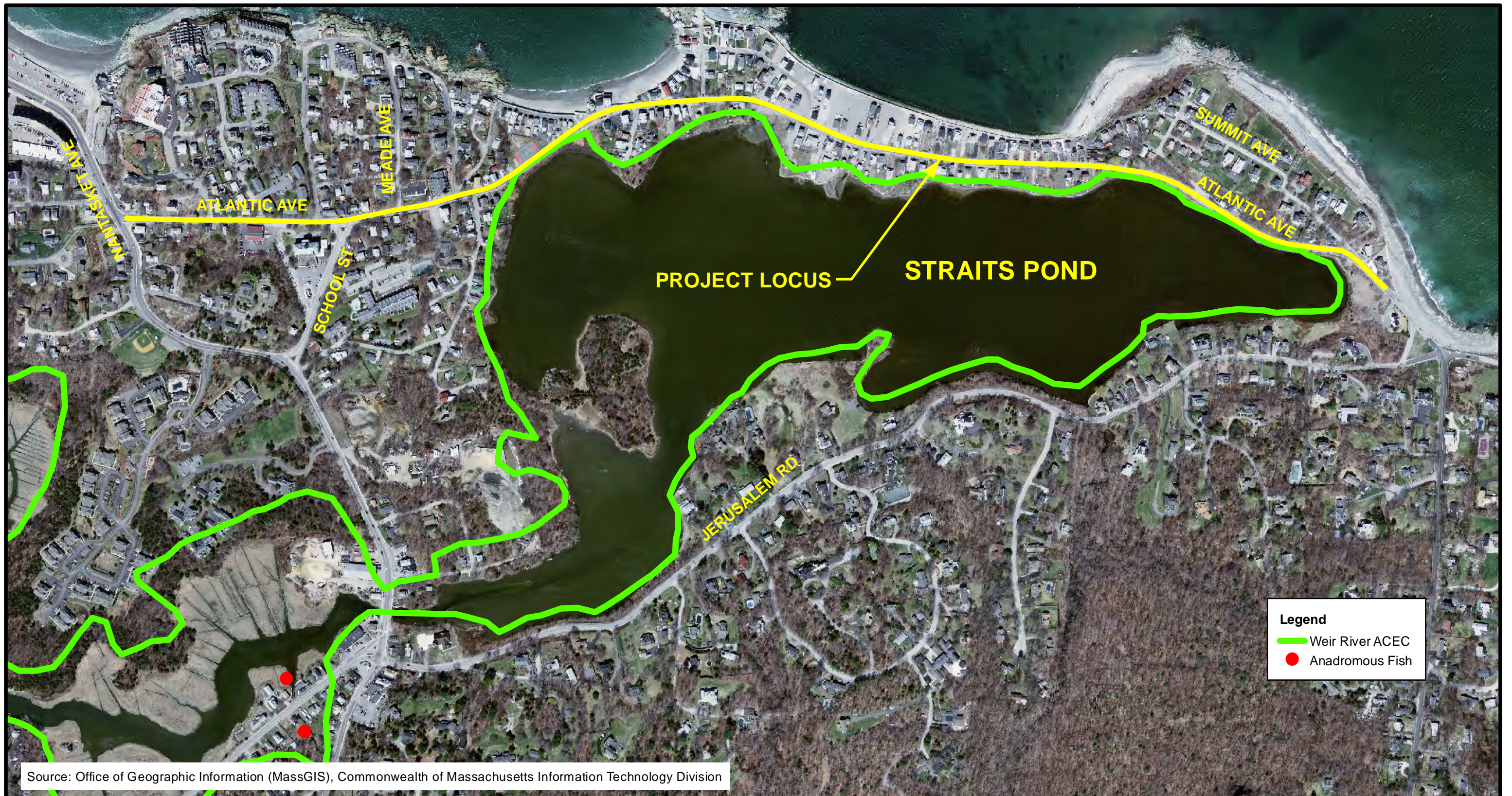




**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

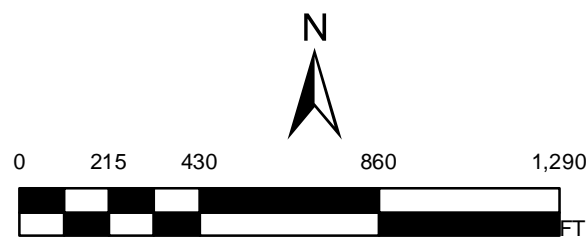
FIGURE 4. FEMA FLOODPLAIN ZONES





**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

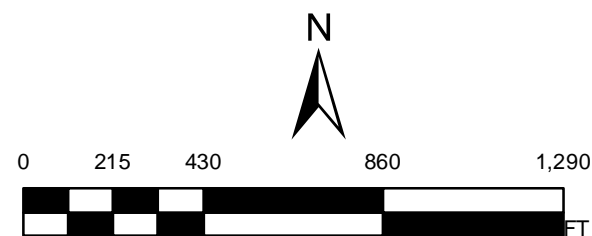
FIGURE 5. ACEC & ANADROMOUS FISH RUN

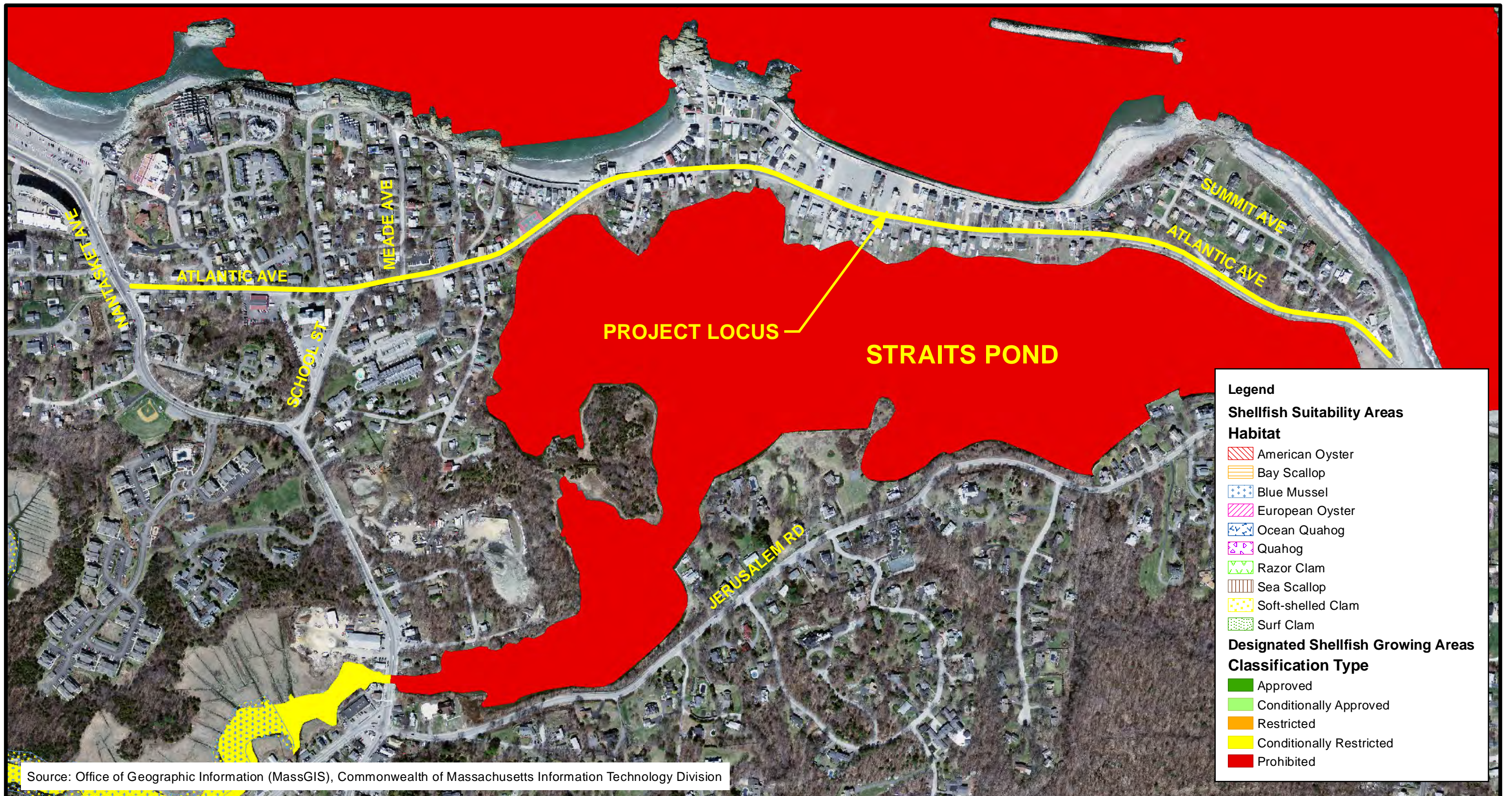




**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

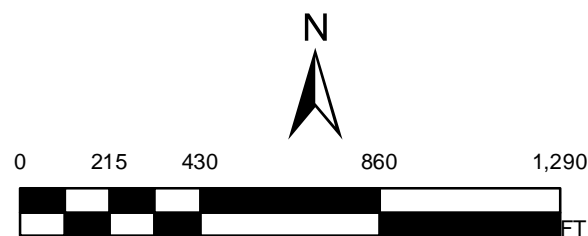
Figure 6. TIDAL JURISDICTION





**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

FIGURE 7. SHELLFISH HABITAT & GROWING AREAS





TOWN OF HULL, MA
 ATLANTIC AVENUE RECONSTRUCTION
 FIGURE 8. STORMWATER OUTLET LOCATIONS



Section 3

Appendices

Appendix A

Agency Permit Matrix

**FEDERAL AND LOCAL PERMITS/REVIEW
PROPOSED ATLANTIC AVENUE RECONSTRUCTION PROJECT, HULL, MA**

Permit	Issuing Agency	Status
Federal Permits/Review		
Section 404 permit Pre-Construction Notification	Army Corps of Engineers (Corps) New England District	To Be Filed
Notification/Clearance	Section 106 National Historic Preservation Act/ MA Historical Commission (SHPO)	Finding of "No Effect" 12/17/12
Notification/Clearance	National Environmental Policy Act (NEPA) - Categorical Exclusion	CE Checklist Submitted Aug. 2020
Notification/Clearance	Federal Highway Administration (FHWA) U.S. Dept. of Transportation – Section 4(f)	de minimis impact determination CE Checklist - Aug. 2020
Notification/Clearance	U. S. Fish and Wildlife Service Section 7 Consultation	No Species/Habitat Present Correspondence - 01/02/09
Local Permits/Review		
Notice of Intent MGL 131, Section 40	Town of Hull Conservation Commission - Order of Conditions	Order of Conditions Issued 12/14/20

Appendix B

MEPA Circulation and Public Notification

PUBLIC NOTICE OF ENVIRONMENTAL REVIEW

PROJECT: The Applicant is proposing reconstruction and related work along the approximately 1.3-mile length of Atlantic Avenue that includes: roadway reconstruction, improvements to the existing stormwater drainage system, intersection safety modifications and enhancement of bicycle and pedestrian accommodations, new signing, striping, curbing and guardrail replacement where necessary. Selective clearing and thinning are proposed to maintain clear zones and intersection sight distance

LOCATION: Atlantic Avenue, Hull, MA

PROPONENT: Town of Hull Department of Public Works in conjunction with MassDOT-Highway Division

The undersigned is submitting an Environmental Notification Form ("ENF") to the Secretary of Energy & Environmental Affairs on or before
01/29/21 (date)

This will initiate review of the above project pursuant to the Massachusetts Environmental Policy Act ("MEPA", M.G.L. c. 30, s.s. 61-62I). Copies of the ENF may be obtained from:

Massachusetts Department of Transportation
10 Park Plaza, Room 4260
Boston, MA 02116
Eric Woodward (978) 855-0243

Copies of the ENF are also being sent to the Conservation Commission and Planning Board of Town of Hull where they may be inspected.

The Secretary of Energy & Environmental Affairs will publish notice of the ENF in the Environmental Monitor, will receive public comments on the project for 20 days, and will then decide, within ten days, if an environmental Impact Report is needed. A site visit and consultation session on the project may also be scheduled. All persons wishing to comment on the project, or to be notified of a site visit or consultation session, should write to the Secretary of Energy & Environmental Affairs, 100 Cambridge St., Suite 900, Boston, Massachusetts 02114, Attention: MEPA Office, referencing the above project.

CIRCULATION LIST

	Copies
Executive Office of Energy and Environmental Affairs Secretary of Environmental Affairs ATTN: MEPA Office 100 Cambridge Street, Suite 900 Boston, MA 02114	2
Department of Environmental Protection (DEP) Attn: Commissioner's Office —MEPA Coordinator One Winter Street Boston, MA 02108	1
DEP/SE Regional Office MEPA Coordinator 20 Riverside Drive Lakeville, MA 02347	1
Department of Conservation and Recreation Attn: MEPA Coordinator 251 Causeway Street, Suite 600 Boston, MA 02114	1
Natural Heritage Endangered Species Program MA Division of Fisheries and Wildlife 1 Rabbit Hill Road, Westborough, MA 01581	1
Massachusetts Department of Transportation – Highway Division Engineering Expediting/Public Private Development Unit 10 Park Plaza Room 6340 Boston, MA 02116	1
MassDOT District #5 Attn: MEPA Coordinator Box 111 1000 County Street Taunton, MA 02780	1
Massachusetts Historical Commission The MA Archives Building 220 Morrissey Blvd Boston, MA 02125	1
Massachusetts Office of Coastal Zone Management Attn: MEPA Coordinator 251 Causeway Street, Suite 800 Boston, MA 02114	1

MA Division of Marine Fisheries Attn: MEPA Coordinator/Env. Reviewer 30 Emerson Avenue Gloucester, MA 01930	1
Metropolitan Area Planning Council 60 Temple Place/6 th Floor Boston, MA 02111	1
Hull Conservation Commission 253 Atlantic Ave. Hull, MA 02045	1
Hull Board of Selectmen 253 Atlantic Ave. Hull, MA 02045	1
Hull Board of Health 253 Atlantic Ave. Hull, MA 02045	1
Hull Planning Board 253 Atlantic Ave. Hull, MA 02045	1
Hull Public Library 9 Main St Hull, MA 02045	1

Appendix C

Agency Consultations

November 4, 2009

Richard Hartley
Massachusetts Division of Fisheries & Wildlife
1 Rabbit Run Road
Westborough, MA 01581

RE: Atlantic Ave. – Hull – Resurfacing
And Improvements (Project File No. 601607)
Section 106 Review


Dear Mr. Hartley:

The Massachusetts Highway Department (MassHighway) and the Town of Hull propose to perform roadway improvements along Atlantic Avenue. It is anticipated that this project will be supported in part with federal funds and will require review, therefore, under Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800). The enclosed project information is provided for the Massachusetts Division of Fisheries & Wildlife's review in compliance with the regulations governing Section 106.

The Atlantic Avenue Reconstruction project, includes the reconstruction of Atlantic Avenue from its intersection with Nantasket Avenue (Route 228), east to the Cohasset Town Line. The total project length is approximately 6300 feet. The project consists of pavement rehabilitation and widening. The project also consists of related items of work, including sidewalk construction, drainage upgrades, and new signing and striping.

Attached is a USGS locus map showing the project area, along with a narrative summarizing the purpose and need, existing conditions, and proposed improvements. If you require additional information, please contact Coler & Colantonio Inc. at (781) 982-5478.

Sincerely,


Melissa Brindley
Coler & Colantonio, Inc.

atts: locus map, scope of work
xcs: Marie Rose, Director of Project Management

November 4, 2009

Rick O'Donnell, Chairman
Town of Hull Historical Commission
253 Atlantic Ave, Town Hall,
Hull, MA 02045

RE: Atlantic Ave. – Hull – Resurfacing
And Improvements (Project File No. 601607)
Section 106 Review

Dear Mr. O'Donnell:


The Massachusetts Highway Department (MassHighway) and the Town of Hull propose to perform roadway improvements along Atlantic Avenue. It is anticipated that this project will be supported in part with federal funds and will require review, therefore, under Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800). The enclosed project information is provided for the Hull Historical Commission's review in compliance with the regulations governing Section 106.

The Atlantic Avenue Reconstruction project, includes the reconstruction of Atlantic Avenue from its intersection with Nantasket Avenue (Route 228), east to the Cohasset Town Line. The total project length is approximately 6300 feet. The project consists of pavement rehabilitation and widening. The project also consists of related items of work, including sidewalk construction, drainage upgrades, and new signing and striping.

MassHighway and the Town of Hull request that the Hull Historical Commission review the enclosed materials at their earliest convenience, and solicits any comments that the Commission wishes to make regarding this project. Written comments should be submitted to: Frank Tramontozzi, P.E., Chief Engineer, Massachusetts Highway Department, 10 Park Plaza, Boston, MA 02116, Attn: Jeffrey Shrimpton.

If you have any questions concerning the enclosed project information, please feel free to contact Pamela Haznar of MassHighway's Project Management Section. If you have any questions concerning the Section 106 process, please feel free to contact Jeffrey Shrimpton (617 973-7497) of MassHighway's Cultural Resources Unit.

Sincerely,


Melissa Brindley
Coler & Colantonio, Inc.

atts: locus map, scope of work
xcs: B. Simon, DSHPO, MHC, with atts.
J. Shrimpton, MassHighway, with atts.

November 4, 2009

Mr. George Green Jr., THPO
Mashpee Wampanoag Indian Tribe Council
483 Great Neck Road, Couth
P.O. Box 1048
Mashpee, MA 02649

RE: Atlantic Ave. – Hull – Resurfacing
And Improvements (Project File No. 601607)
Section 106 Review

Dear Mr. Green:

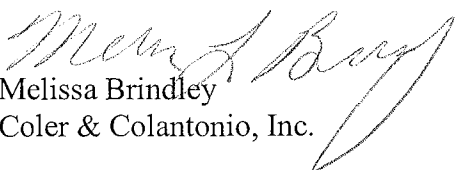
The Massachusetts Highway Department (MassHighway) and the Town of Hull propose to perform roadway improvements along Atlantic Avenue. It is anticipated that this project will be supported in part with federal funds and will require review, therefore, under Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800). The enclosed project information is provided for the Mashpee Wampanoag THPO's review in compliance with the regulations governing Section 106.

The Atlantic Avenue Reconstruction project, includes the reconstruction of Atlantic Avenue from its intersection with Nantasket Avenue (Route 228), east to the Cohasset Town Line. The total project length is approximately 6300 feet. The project consists of pavement rehabilitation and widening. The project also consists of related items of work, including sidewalk construction, drainage upgrades, and new signing and striping.

MassHighway & the Town of Hull request that the Mashpee Wampanoag THPO review the enclosed materials at their earliest convenience, and solicits any comments that the THPO wishes to make regarding this project. Written comments should be submitted to: Frank Tramontozzi, P.E., Chief Engineer, Massachusetts Highway Department, 10 Park Plaza, Boston, MA 02116, Attn: Jeffrey Shrimpton.

If you have any questions concerning the Section 106 process, please feel free to contact Geoffrey Fulgione (617 973-8253) of MassHighway's Cultural Resources Unit.

Sincerely,


Melissa Brindley
Coler & Colantonio, Inc.

atts: scope of work, locus map
xcs: B. Simon, DSHPO, MHC, with atts.
J. Shrimpton, MassHighway, with atts.

November 4, 2009

Ms. Bettina Washington, THPO
Wampanoag Tribe of Gay Head (Aquinnah)
20 Black Brook Road.
Aquinnah, MA 02535-9701

RE: Atlantic Ave. – Hull – Resurfacing
And Improvements (Project File No. 601607)
Section 106 Review

Dear Ms. Washington:

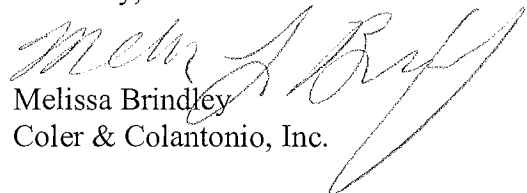
The Massachusetts Highway Department (MassHighway) and the Town of Hull propose to perform roadway improvements along Atlantic Avenue. It is anticipated that this project will be supported in part with federal funds and will require review, therefore, under Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800). The enclosed project information is provided for the Wampanoag THPO's review in compliance with the regulations governing Section 106.

The Atlantic Avenue Reconstruction project, includes the reconstruction of Atlantic Avenue from its intersection with Nantasket Avenue (Route 228), east to the Cohasset Town Line. The total project length is approximately 6300 feet. The project consists of pavement rehabilitation and widening. The project also consists of related items of work, including sidewalk construction, drainage upgrades, and new signing and striping.

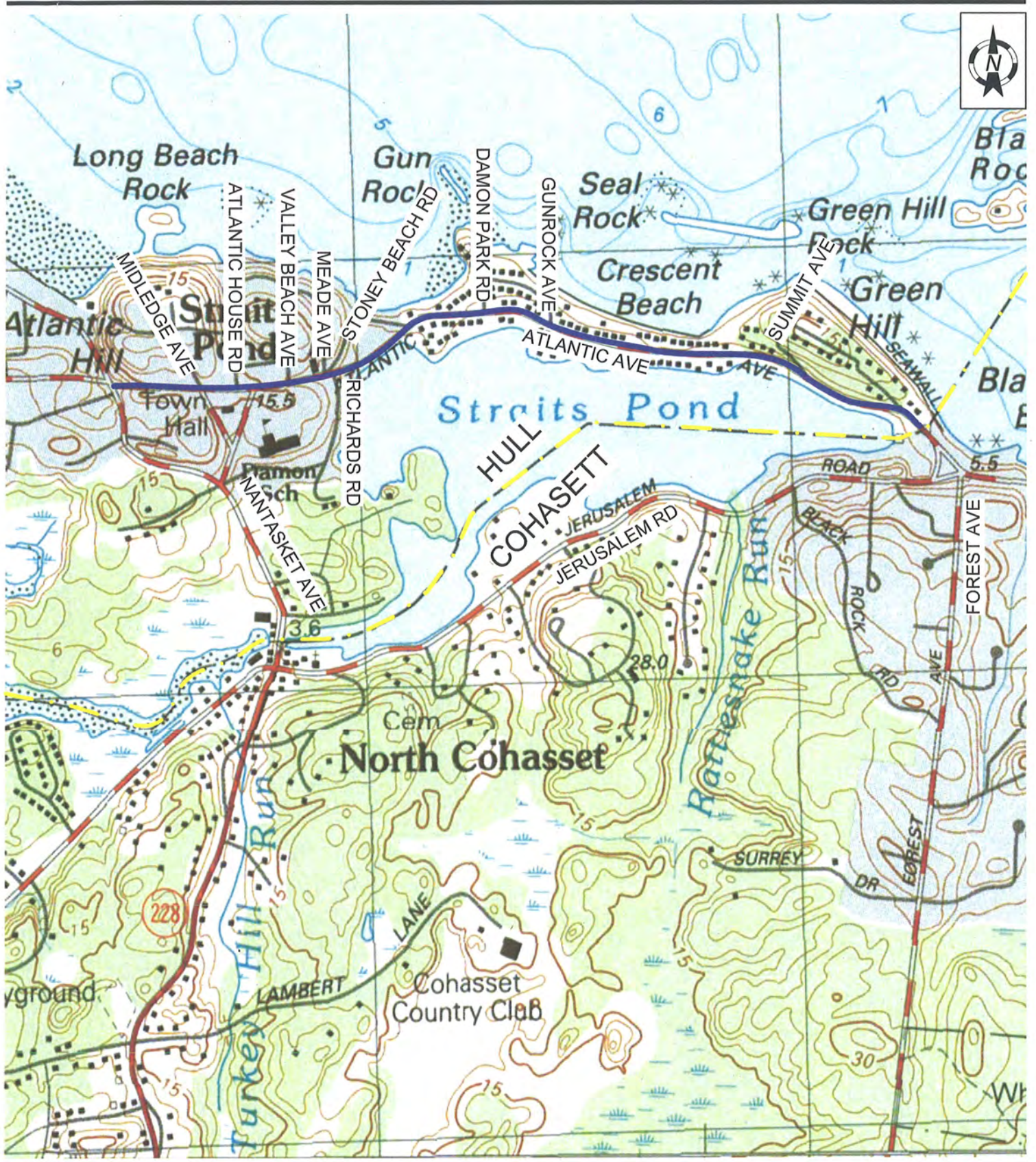
MassHighway & the Town of Hull request that the Wampanoag THPO review the enclosed materials at their earliest convenience, and solicits any comments that the THPO wishes to make regarding this project. Written comments should be submitted to: Frank Tramontozzi, P.E., Chief Engineer, Massachusetts Highway Department, 10 Park Plaza, Boston, MA 02116, Attn: Jeffrey Shrimpton.

If you have any questions concerning the Section 106 process, please feel free to contact Geoffrey Fulgione (617 973-8253) of MassHighway's Cultural Resources Unit.

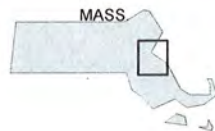
Sincerely,


Melissa Brindley
Coler & Colantonio, Inc.

atts: scope of work, locus map
xcs: B. Simon, DSHPO, MHC, with atts.
J. Shrimpton, MassHighway, with atts.



COLER & COLANTONIO INC
ENGINEERS AND SCIENTISTS



- Project Corridor
- Town Line

Project Locus Map

Town of Hull
Atlantic Avenue Reconstruction

Figure 1

March 31, 2010

Ms. Melanie Griffin
Massachusetts Division of Marine Fisheries
251 Causeway Street, Suite 400
Boston, MA 02114-2152

RE: Atlantic Ave. – Hull – Resurfacing
And Improvements (Project File No. 601607)
Section 106 Review

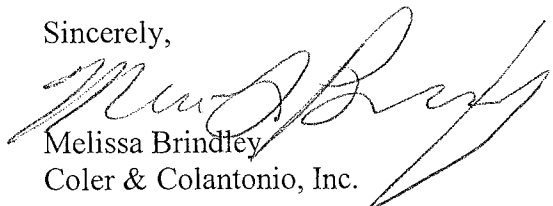
Dear Ms. Griffin:

The Massachusetts Highway Department (MassHighway) and the Town of Hull propose to perform roadway improvements along Atlantic Avenue. It is anticipated that this project will be supported in part with federal funds and will require review, therefore, under Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800). The enclosed project information is provided for the Massachusetts Division of Marine Fisheries' review in compliance with the regulations governing Section 106.

The Atlantic Avenue Reconstruction project, includes the reconstruction of Atlantic Avenue from its intersection with Nantasket Avenue (Route 228), east to the Cohasset Town Line. The total project length is approximately 6300 feet. The project consists of pavement rehabilitation and widening. The project also consists of related items of work, including sidewalk construction, drainage upgrades, and new signing and striping.

Attached is a USGS locus map showing the project area, along with a narrative summarizing the purpose and need, existing conditions, and proposed improvements. If you require additional information, please contact Coler & Colantonio Inc. at (781) 982-5478.

Sincerely,



Melissa Brindley
Coler & Colantonio, Inc.

atts: locus map, scope of work
xcs: Marie Rose, Director of Project Management



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087
<http://www.fws.gov/northeast/newenglandfieldoffice>

January 2, 2009

To Whom It May Concern:

This project was reviewed for the presence of federally-listed or proposed, threatened or endangered species or critical habitat per instructions provided on the U.S. Fish and Wildlife Service's New England Field Office website:

<http://www.fws.gov/northeast/newenglandfieldoffice/EndangeredSpec-Consultation.htm>

Based on the information currently available, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service (Service) are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes the review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your cooperation. Please contact Mr. Anthony Tur at 603-223-2541 if we can be of further assistance.

Sincerely yours,



Thomas R. Chapman
Supervisor
New England Field Office

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

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Barnstable	Piping Plover	Threatened	Coastal Beaches	All Towns
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Chatham
	Sandplain gerardia	Endangered	Open areas with sandy soils.	Sandwich and Falmouth.
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Bourne (north of the Cape Cod Canal)
Berkshire	Bog Turtle	Threatened	Wetlands	Egremont and Sheffield
Bristol	Piping Plover	Threatened	Coastal Beaches	Fairhaven, Dartmouth, Westport
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Fairhaven, New Bedford, Dartmouth, Westport
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Taunton
Dukes	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Piping Plover	Threatened	Coastal Beaches	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Aquinnah and Chilmark
	Sandplain gerardia	Endangered	Open areas with sandy soils.	West Tisbury
Essex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Gloucester, Essex and Manchester
	Piping Plover	Threatened	Coastal Beaches	Gloucester, Essex, Ipswich, Rowley, Revere, Newbury, Newburyport and Salisbury
Franklin	Northeastern bulrush	Endangered	Wetlands	Montague
	Dwarf wedgemussel	Endangered	Mill River	Whately
Hampshire	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Hadley
	Puritan tiger beetle	Threatened	Sandy beaches along the Connecticut River	Northampton and Hadley
	Dwarf wedgemussel	Endangered	Rivers and Streams.	Hadley, Hatfield, Amherst and Northampton
Hampden	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Southwick
Middlesex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Groton
Nantucket	Piping Plover	Threatened	Coastal Beaches	Nantucket
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Nantucket
	American burying beetle	Endangered	Upland grassy meadows	Nantucket
Plymouth	Piping Plover	Threatened	Coastal Beaches	Scituate, Marshfield, Duxbury, Plymouth, Wareham and Mattapoisett
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Kingston, Middleborough, Carver, Plymouth, Bourne, Wareham, Halifax, and Pembroke
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Plymouth, Marion, Wareham, and Mattapoisett.
Suffolk	Piping Plover	Threatened	Coastal Beaches	Winthrop
Worcester	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Leominster

- Eastern cougar and gray wolf are considered extirpated in Massachusetts.
- Endangered gray wolves are not known to be present in Massachusetts, but dispersing individuals from source populations in Canada may occur statewide.
- Critical habitat for the Northern Red-bellied Cooter is present in Plymouth County.

Revised 06/22/2009



MassWildlife

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

Melissa Brindley
Coler & Colantonio, Inc.
101 Accord Park Drive
Norwell, MA 02061

December 8, 2009

**RE: Resurfacing Atlantic Avenue
Hull, MA
NHESP Tracking No. 09-27469**

Dear Ms. Brindley:

Thank you for contacting the Division of Fisheries and Wildlife for information relative to the above referenced project. There are no freshwater fisheries resources within the vicinity of the proposed project. For information on the presence of marine or anadromous species, we recommend you contact the Division of Marine Fisheries at (617) 626-1520.

Best management practices for erosion and sedimentation control must be adhered to for all phases of construction to minimize potential impacts to the fisheries resources. To the greatest extent practicable, all in stream work should be conducted during low flow periods throughout the year. Times of year when stream flow is high due to extended rain and/or snow melt events should be avoided. If the projects results in the replacement of existing culverts, the culvert replacement should meet the replacement recommendations found in the "Massachusetts River and Stream Crossing Standards: Technical Guidelines, August 6, 2004" (the Standards) including, a minimum height of 6 feet, openness ratio of 0.5-0.75, natural bottom substrates through the crossing structure, and spanning 1.2 times the bank-full width to the greatest extent practical. If the project results in the placement of new culverts, the new crossing structure should, at minimum, meet the general standards for new crossing and strive for the optimum standards whenever possible including, a minimum height of 6 feet, openness ratio of 0.5-0.75, natural bottom substrates through the crossing structure, and spanning 1.2 times the bank-full width to the greatest extent practical. The Standards can be found at http://www.umass.edu/nrec/pdf_files/guidelines_river_stream_crossings.pdf. Also, if the project will alter the streambed, we request that the existing grade be maintained.

At this time the site is not mapped as Priority or Estimated Habitat and the NHESP database does not contain any state-listed species records in the immediate vicinity of this site. This evaluation is based on the most recent information available in

www.masswildlife.org

Division of Fisheries and Wildlife

Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-7890

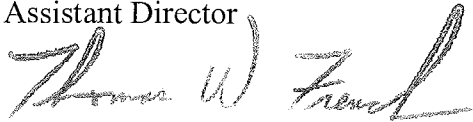
An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

the NHESP database, which is constantly being expanded and updated through ongoing research and inventory. Should your site plans change, or new rare species information become available, this evaluation may be reconsidered.

For questions regarding the Natural Heritage & Endangered Species Program, please contact Amanda Veinotte at (508) 389-6380. For questions regarding fisheries issues, please contact Richard Hartley at (508) 389-6330.

Sincerely,

Thomas W. French, PhD
Assistant Director

A handwritten signature in cursive script that reads "Thomas W. French". The signature is written in dark ink and is positioned below the typed name and title.

Cc. Hull Conservation Commission

CULTURAL RESOURCES PROJECT RECORD

City/Town	Hull	Project #	601607	Date Cleared	12/17/2012
Project Name	Atlantic Avenue	Date Filed	12/17/2012	Finding Under Review	<input type="checkbox"/>
Project Type	Highway Reconstr - No Added Capacity	FHWA to MHC		Early Coord. Letter Sent:	<input checked="" type="checkbox"/>
Review	Section 106 (PA)	Comment Received:	<input type="checkbox"/> MHC <input type="checkbox"/> LHC		
Finding:	Stip VB - No historic properties affected	Reviewer	JPS		
Comment	Early environmental coordination letters sent on November 4, 2009, to Hull Historical Commission (cc to SHPO), Mashpee THPO, and Wampanoag SHPO. No responses received by MassDOT.				

Determination based on: Scope of Work Plan Inventory Site Visit Archaeological Survey

Attach appropriate documentation for checked items

Projects Requiring No Massachusetts SHPO Review

Programmatic Agreement, Appendix 1 (check all that apply) :

- | | |
|---|---|
| <input type="checkbox"/> 1) Interstate bridge or roadway projects | <input type="checkbox"/> 16) Bridge (less than 20' span) |
| <input type="checkbox"/> 2) Resurfacing, repair existing roadways | * <input type="checkbox"/> 17) Highway safety improvement |
| * <input type="checkbox"/> 3) Reconstruction on existing roadway | <input type="checkbox"/> 18) Drainage system element |
| * <input type="checkbox"/> 4) Roadway geometrics, intersections | * <input type="checkbox"/> 19) Traffic signal, safety improvement |
| * <input type="checkbox"/> 5) Curbs and sidewalks | * <input type="checkbox"/> 20) Intelligent Transportation System project |
| <input type="checkbox"/> 6) Pavement markings, rumble strips, etc | <input type="checkbox"/> 21) Rest area, maintenance facility |
| <input type="checkbox"/> 7) Curbs, sidewalks (MAAB, ADA) | * <input type="checkbox"/> 22) Bicycle, pedestrian lane, path or facility |
| * <input type="checkbox"/> 8) Removal of trees | <input type="checkbox"/> 23) Lighting system |
| <input type="checkbox"/> 9) Landscaping | <input type="checkbox"/> 24) Sign |
| <input type="checkbox"/> 10) Utilities | <input type="checkbox"/> 25) Hazardous waste |
| <input type="checkbox"/> 11) Railroad crossing | <input type="checkbox"/> 26) Highway fencing |
| <input type="checkbox"/> 12) Stream stabilization and restoration | <input type="checkbox"/> 27) Emergency repair |
| <input type="checkbox"/> 13) Wetland mitigation area | <input type="checkbox"/> 28) Erosion control |
| * <input type="checkbox"/> 14) Bridge (NR "Not Eligible" or "Conditionally Not Eligible") | <input type="checkbox"/> 29) Noise barrier |
| * <input type="checkbox"/> 15) Bridge (concrete slab post 1900, steel stringer) | * National Register eligibility evaluation required |

-OR-

No Historic Properties Affected

Programmatic Agreement Stipulation V.B. (check one):

- No NR listed or -eligible properties within Area of Potential Effect
- No effect on National Register listed or -eligible properties

Reviewer's Initials:

Summary of MassDOT Highway Division Finding (Appendix 1 and Section V.B. Projects only)

This project proposes to reconstruct the full length of Atlantic Avenue in Hull from the Cohasset Town Line on the east to the T-intersection at Nantasket Avenue on the west, a distance of 1.3 miles. The project consists of full-depth roadway reconstruction, minor widening within the existing highway layout to create uniform roadway widths, geometric improvements at intersections, sidewalk construction within the existing highway layout, and replacement or adjustment of existing drainage structures.

A review of the National Register of Historic Places revealed no listed properties within or adjacent to the project area. A review of the Inventory of Historic and Archaeological Assets of the Commonwealth revealed that the project area passes through Area E, known as the Atlantic Avenue Streetscape, which is a relatively intact grouping of eleven modest late-19th century wood-frame vacation houses on the neck of land between Straits Pond and the Atlantic Ocean. Area E may be eligible for listing in the National Register of Historic Places, although more research and a site visit would be necessary to make a definitive eligibility determination.

The project area also is adjacent to the Hull Town Hall (HUL.21), a monumental Neo-Georgian style government building constructed in 1921. The Hull Town Hall is characterized by a tall cupola on its main hip roof and a two-story pedimented front portico with four Corinthian columns. The building appears to be individually eligible for listing in the National Register of Historic Places. The Hull Town Hall is situated on a prominent triangular parcel bounded by Atlantic Avenue on the north, School Street on the east, and Atlantic House Road on the west. Proposed work in the vicinity of the Hull Town Hall includes bumping out the corners of the two Atlantic Avenue intersections on either side of the Town Hall to create more perpendicular configurations. This work will be undertaken within the existing highway layout and will not affect the character-defining features of the NR-eligible Hull Town Hall.

Other inventoried properties adjacent to the project area include three late-19th century wood-frame dwellings at 86 Atlantic Avenue (HUL.9), 88 Atlantic Avenue (HUL.10), and 227 Atlantic Avenue (HUL.16). None of these properties appears to exhibit the distinguishing characteristics necessary for individual listing in the National Register, nor do they appear to be part of any NR-eligible historic district. A fourth inventoried property at 2 Atlantic Avenue (HUL.1) appears to have been demolished.

All of the inventoried properties described above, including the Hull Town Hall and the Atlantic Avenue Streetscape, also are included in a larger area that has been inventoried as the Straits Pond Area (HUL.A). Area A as a whole does not appear to be eligible for listing in the National Register because of multiple demolitions and modern infill construction, although as noted above, the potentially NR-eligible Atlantic Avenue Streetscape (HUL.E) and the Hull Town Hall (HUL.21) are located within Area A.

A review of the MHC archaeological base maps revealed two recorded pre-Contact sites north of Atlantic Avenue near the westerly end of the project area: the Atlantic Ledges Site (19-PL-1) on the Atlantic shore and Atlantic Hill (19-PL-268) north of Town Hall. both north of Atlantic Avenue near the Atlantic shore toward the westerly end of the project area. The project area also is in the vicinity of one recorded historic archaeological site: the Atlantic Hill Native Cemetery (HUL.HA.1), which is located approximately 800' north of the Hull Town Hall. Little or no archaeological potential may be ascribed to the project area based on the nature of the work, past roadway construction, and roadside development. This project requires no further review under Stipulation V(B) ("No Effect on National Register –listed or –eligible properties") of the Section 106 Programmatic Agreement.

Reviewer's Initials: _____

Appendix D

Site Photographs

Atlantic Avenue Restoration Project



Westerly View of Straits Pond and Wetland A/Salt Marsh at East End of Project at Hull/Cohasset Town Line



Northwesterly View of Straits Pond and Wetland A/Salt Marsh at East End of Project at Hull/Cohasset Town Line



Easterly View of Atlantic Avenue and Straits Pond/Wetland A (East End of Straits Pond)
Opposite Green Hill/Summit Avenue West of the Hull/Cohasset Town Line



Northerly View of Atlantic Avenue and Straits Pond/Wetland A (East End of Straits Pond)
Opposite Green Hill/Summit Avenue West of the Hull/Cohasset Town Line



Westerly View of Wetland C (Central Portion of Straits Pond) – Straits Pond on Left (South) and Atlantic Avenue and Residential Parking Area on Right (North)



Southerly View of Wetland C/Straits Pond (Central Portion) from Atlantic Ave. and Residential Parking Area - Sediment/Gravel Over-wash from Coastal Storms Creating Fill South of Atlantic Avenue



Southeasterly View of Wetland C (Central Portion of Straits Pond) – Straits Pond on Right (South) – Sediment/Gravel Over-wash from Coastal Storms Creating Fill in Straits Pond South of Atlantic Avenue



Northeasterly View of Wetland C from Straits Pond - Atlantic Avenue between Houses - Sediment/Gravel Over-wash from Coastal Storms Creating Fill on South Side of Atlantic Avenue



Westerly View of Atlantic Avenue and Straits Pond/Wetland D (Western End of Straits Pond)
Opposite Basket Ball/Tennis Courts near Junction with Stoney Beach Road



Easterly View of Atlantic Avenue and Straits Pond/Wetland D (Western End of Straits Pond)
Opposite Basket Ball/Tennis Courts near Junction with Stoney Beach Road

Appendix E

DEP Data Forms

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Hull – DPW/MADOT Prepared by: CHA, Consulting, Inc. Project Location: Atlantic Avenue DEP File #: _____

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: Wetland A Transect Number: Series C – 6/5 Date of Delineation: 10/18/15

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
<u>Trees:</u> NA				
<u>Saplings:</u> NA				
<u>Shrubs:</u> NA				
<u>Herb:</u> seashore saltgrass (<i>Distichlis spicata</i>)	93	93/103.5 =90%	yes	FACW*
marsh elder (<i>Iva frutescens</i>)	10.5	10.5/103.5=10%	no	FACW+
<u>Vine:</u> NA				

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion: Hydrophytic Plant Community

Number of dominant wetland indicator plants: 1 **Number of dominant non-wetland indicator plants: 0**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: 100% yes no

Section II. Indicators of Hydrology

Hydric Soil Interpretation

Wetland Series A

1. Soil Survey

Is there a published soil survey for this site? Yes no

title/date: **Soil Survey of Plymouth County (2010) – USDA NRCS
Web Soil Survey**

map number: **NA**

soil type mapped: **Canton-Urban land-Rock outcrop, Urban land-
Hooksan complex, Paxton loam, and Canton-Chatfield-Rock outcrop**

hydric soil inclusions: **Oxyaquic Udipsamments**

Are field observations consistent with soil survey? Yes no

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
C ₁	0– 16+”	10YR 5/2 (70%) 10YR 3/3(20%) 10YR 4/6 (10%)	coarse/fine sand

Remarks: **Occurs below MHW mark of Straits Pond**

3. Other:

Conclusion: Is soil hydric? Yes No

Other Indicators of Hydrology: (check all that apply and describe)

- Site inundated: plot adjacent to Straits Pond
- Depth to free water in observation hole: _____
- Depth to soil saturation in observation hole: surface
- Water marks: _____
- Drift lines: _____
- Sediment deposits: _____
- Drainage patterns in BVW: plot below MHW of Straits Pond
- Oxidized rhizospheres: _____
- Water-stained leaves: _____
- Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____
-
- Other: _____

Vegetation and Hydrology Conclusion

	yes	no
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wetland hydrology present:		
hydric soil present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
other indicators of hydrology present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sample location is in BVW	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Submit this form with the Request for Determination of Applicability or Notice of Intent.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Hull – DPW/MADOT Prepared by: CHA, Consulting, Inc. Project Location: Atlantic Avenue DEP File #: _____

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: Upland A Transect Number: Series A – 5/6/ Date of Delineation: 10/18/15

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Trees: N/A				
Saplings: <i>Ailanthus (Ailanthus altissima)</i>	20.5	20.5/20.5= 100%	yes	FAC
Shrubs: Eastern red cedar (<i>Juniperus virginiana</i>)	20.5	20.5/51.5= 40%	yes	FACU
Tartarian honeysuckle (<i>Lonicera tatarica</i>)	20.5	20.5/51.5= 40%	yes	FACU
<i>Ailanthus (Ailanthus altissima)</i>	10.5	10.5/51.5= 20%	yes	FAC
Herb: multiflora rose (<i>Rosa multiflora</i>)	38	38/48= 80%	yes	FACU
yarrow (<i>Achillea millefolium</i>)	3	3/48=6%	no	FACU
seaside goldenrod (<i>Solidago sempervirens</i>)	3	3/48=6%	no	FACW*
staghorn sumac (<i>Rhus typhina</i>)	3	3/48=6%	no	FACU
common mullein (<i>Verbascum thapsus</i>)	1	1/48=2%	yes	NI-FACU
Vine: poison ivy (<i>Toxicodendron radicans</i>)	3	3/3= 100%	no	FAC*

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion: Upland Plant Community
Number of dominant wetland indicator plants: 2
Number of dominant non-wetland indicator plants: 3
Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: 40% yes <input type="checkbox"/> no <input checked="" type="checkbox"/>

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent.

Section II. Indicators of Hydrology

Hydric Soil Interpretation

Upland Series A

1. Soil Survey

Is there a published soil survey for this site? Yes no

title/date: **Soil Survey of Plymouth County (2010) – USDA NRCS Web Soil Survey**

map number: **NA**

soil type mapped: **Canton-Urban land-Rock outcrop, Urban land-Hooksan complex, Paxton loam, and Canton-Chatfield-Rock outcrop**

hydric soil inclusions: **Oxyaquic Udipsamments**

Are field observations consistent with soil survey? Yes no

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
C ₁	0– 16+”	10YR 3/3(50%) 10YR 5/2 (25%) 10YR 4/1 (25%)	loamy coarse/ fine sand

Remarks: **Plot occurs at edge of Atlantic Avenue – historic fill, occasional ocean overwash from Black Rock Beach**

3. Other:

Conclusion: Is soil hydric? Yes No

Other Indicators of Hydrology: (check all that apply and describe)

Site inundated: _____

Depth to free water in observation hole: _____

Depth to soil saturation in observation hole: _____

Water marks: _____

Drift lines: _____

Sediment deposits: _____

Drainage patterns in BVW: _____

Oxidized rhizospheres: _____

Water-stained leaves: _____

Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____

Other: _____

Vegetation and Hydrology Conclusion

	yes	no
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Wetland hydrology present:

hydric soil present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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other indicators of hydrology present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Sample location is in BVW	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Submit this form with the Request for Determination of Applicability or Notice of Intent.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Hull – DPW/MADOT Prepared by: CHA, Consulting, Inc. Project Location: Atlantic Avenue DEP File #: _____

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: Wetland D Transect Number: Series D – 6/7 Date of Delineation: 10/18/15

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
<u>Trees:</u> NA				
<u>Saplings:</u> NA				
<u>Shrubs:</u> NA				
<u>Herb:</u> common reed (<i>Phragmites australis</i>)	100	100/100= 100%	yes	FACW*
<u>Vine:</u> NA				

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion: Hydrophytic Plant Community

Number of dominant wetland indicator plants: 1 **Number of dominant non-wetland indicator plants:** 0

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: 100% yes no

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Hull – DPW/MADOT Prepared by: CHA, Consulting, Inc. Project Location: Atlantic Avenue DEP File #: _____

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: Wetland B&C Transect Number: Series C – 6/5 Date of Delineation: 10/18/15

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
<u>Trees:</u> NA				
<u>Saplings:</u> NA				
<u>Shrubs:</u> NA				
<u>Herb:</u>				
saltmarsh cordgrass (<i>Spartina alterniflora</i>)	63	63/107 = 59%	yes	OBL*
marsh elder (<i>Iva frutescens</i>)	20.5	20.5/107=19%	no	FACW+
common reed (<i>Phragmites australis</i>)	20.5	20.5/107= 19%	no	FACW*
seaside goldenrod (<i>Solidago sempervirens</i>)	3	3/107 = 3%	no	FACW*
<u>Vine:</u> NA				

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion: Hydrophytic Plant Community
Number of dominant wetland indicator plants: 1
Number of dominant non-wetland indicator plants: 0
Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: 100% yes <input checked="" type="checkbox"/> no <input type="checkbox"/>

Section II. Indicators of Hydrology

Hydric Soil Interpretation

Wetland Series B&C

1. Soil Survey

Is there a published soil survey for this site? Yes no

title/date: **Soil Survey of Plymouth County (2010) – USDA NRCS Web Soil Survey**

map number: **NA**

soil type mapped: **Canton-Urban land-Rock outcrop, Urban land-Hooksan complex, Paxton loam, and Canton-Chatfield-Rock outcrop**

hydric soil inclusions: **Oxyaquic Udipsamments**

Are field observations consistent with soil survey? Yes no

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
C ₁	0– 3"	10YR 4/3	coarse sand
A ₁	3– 6"	10YR 2/1	silty sand/ loam
A ₂	6– 18"	10YR 2/1	sandy silt
C ₂	18– 20+"	2.5YR 2/1	coarse sand

Remarks: Occurs below MHW mark of Straits Pond

3. Other:

Conclusion: Is soil hydric? Yes No

Other Indicators of Hydrology: (check all that apply and describe)

- Site inundated: **plot adjacent to Straits Pond**
- Depth to free water in observation hole: _____
- Depth to soil saturation in observation hole: **surface**
- Water marks: _____
- Drift lines: _____
- Sediment deposits: _____
- Drainage patterns in BVW: **plot below MHW of Straits Pond**
- Oxidized rhizospheres: _____
- Water-stained leaves: _____
- Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____

Other: **sulphur smell**

Vegetation and Hydrology Conclusion

	yes	no
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wetland hydrology present:		
hydric soil present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
other indicators of hydrology present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sample location is in BVW	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Submit this form with the Request for Determination of Applicability or Notice of Intent.

Section II. Indicators of Hydrology

Hydric Soil Interpretation

Upland Series B&C

1. Soil Survey

Is there a published soil survey for this site? Yes no

title/date: **Soil Survey of Plymouth County (2010) – USDA NRCS Web Soil Survey**

map number: **NA**

soil type mapped: **Canton-Urban land-Rock outcrop, Urban land-Hooksan complex, Paxton loam, and Canton-Chatfield-Rock outcrop**

hydric soil inclusions: **Oxyaquic Udipsamments**

Are field observations consistent with soil survey? Yes no

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
C	0 – 12"	10 YR 4/3	coarse sand w/ gravel cobble

Refusal

Remarks: **Plot occurs at edge of parking area in gravel/overwash flood zone adjacent to wetland**

3. Other:

Conclusion: Is soil hydric? Yes No

Other Indicators of Hydrology: (check all that apply and describe)

Site inundated: _____

Depth to free water in observation hole: _____

Depth to soil saturation in observation hole: _____

Water marks: _____

Drift lines: _____

Sediment deposits: _____

Drainage patterns in BVW: _____

Oxidized rhizospheres: _____

Water-stained leaves: _____

Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____

Other: _____

Vegetation and Hydrology Conclusion

	yes	no
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Wetland hydrology present:

hydric soil present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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other indicators of hydrology present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Sample location is in BVW	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Submit this form with the Request for Determination of Applicability or Notice of Intent.

Section II. Indicators of Hydrology

Hydric Soil Interpretation

Wetland Series D

1. Soil Survey

Is there a published soil survey for this site? Yes no

title/date: **Soil Survey of Plymouth County (2010) – USDA NRCS
Web Soil Survey**

map number: **NA**

soil type mapped: **Canton-Urban land-Rock outcrop, Urban land-
Hooksan complex, Paxton loam, and Canton-Chatfield-Rock outcrop**

hydric soil inclusions: **Oxyaquic Udipsamments**

Are field observations consistent with soil survey? Yes no

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
O_A	0– 16"	10YR 2/1	OM
Refusal – cobble/gravel			

Remarks: Plot occurs at edge of Straits Pond

3. Other:

Conclusion: Is soil hydric? Yes No

Other Indicators of Hydrology: (check all that apply and describe)

- Site inundated: plot adjacent to Straits Pond
- Depth to free water in observation hole: 8"
- Depth to soil saturation in observation hole: _____
- Water marks: _____
- Drift lines: _____
- Sediment deposits: _____
- Drainage patterns in BVW: plot below MHW of Straits Pond
- Oxidized rhizospheres: _____
- Water-stained leaves: _____
- Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____
- Other: sulphur smell

Vegetation and Hydrology Conclusion

	yes	no
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wetland hydrology present:		
hydric soil present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
other indicators of hydrology present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sample location is in BVW	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Submit this form with the Request for Determination of Applicability or Notice of Intent.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Hull – DPW/MADOT Prepared by: CHA, Consulting, Inc. Project Location: Atlantic Avenue DEP File #: _____

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: Upland D Transect Number: Series D – 6/7 Date of Delineation: 10/18/15

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
<u>Trees:</u> N/A				
<u>Saplings:</u> N/A				
<u>Shrubs:</u> rugosa rose (<i>Rosa rugosa</i>)	38	38/38= 100%	yes	FACU
<u>Herb:</u> Kentucky bluegrass (<i>Poa pratensis</i>)	20.5	20.5/26.5= 78%	yes	FACU
broad-leaved plantain (<i>Plantago major</i>)	3	3/26.5= 11%	no	FACU
common reed (<i>Phragmites australis</i>)	3	3/26.5= 11%	no	FACW*
<u>Vine:</u> Oriental bittersweet (<i>Celastrus orbiculatus</i>)	20.5	20.5/31= 66%	yes	FACU
poison ivy (<i>Toxicodendron radicans</i>)	10.5	10.5/31= 34%	yes	FAC*

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion: Upland Plant Community

Number of dominant wetland indicator plants: 1 **Number of dominant non-wetland indicator plants:** 3

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: 25% yes no

Section II. Indicators of Hydrology

Hydric Soil Interpretation

Upland Series D

1. Soil Survey

Is there a published soil survey for this site? Yes no

title/date: **Soil Survey of Plymouth County (2010) – USDA NRCS Web Soil Survey**

map number: **NA**

soil type mapped: **Canton-Urban land-Rock outcrop, Urban land-Hooksan complex, Paxton loam, and Canton-Chatfield-Rock outcrop**

hydric soil inclusions: **Oxyaquic Udipsamments**

Are field observations consistent with soil survey? Yes no

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
O ₁	2 – 0”	10 YR 3/1	OM
A ₁	0 – 12”	10 YR 3/2	loam
A ₂	12 – 14”	10 YR 4/6	loam
Refusal - gravel			

Remarks: **Plot occurred at disturbed road edge**

3. Other:

Conclusion: Is soil hydric? Yes No

Other Indicators of Hydrology: (check all that apply and describe)

Site inundated: _____

Depth to free water in observation hole: _____

Depth to soil saturation in observation hole: _____

Water marks: _____

Drift lines: _____

Sediment deposits: _____

Drainage patterns in BVW: _____

Oxidized rhizospheres: _____

Water-stained leaves: _____

Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____

Other: _____

Vegetation and Hydrology Conclusion

	yes	no
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Wetland hydrology present:

hydric soil present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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other indicators of hydrology present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Sample location is in BVW	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Submit this form with the Request for Determination of Applicability or Notice of Intent.

Appendix F

Wetland Replication & Restoration Plan

WETLAND REPLICATION & RESTORATION PLAN

The intent of the proposed Wetland Replication & Restoration Plan (WR&RP) along Straits Pond at approximate Sta. 33+00 is to provide for the functional replacement/restoration of salt marsh and bordering vegetated wetland (BVW) altered during the proposed Atlantic Avenue roadway improvements. The project proposes to create/replicate low marsh in an existing high marsh/BVW area and restore/replicate BVW as mitigation for the project as discussed below. The high marsh, BVW and adjacent buffer zone areas are infested with phragmites. In addition, the area has been historically filled with sand, gravel and cobble from overwash/storms from Massachusetts Bay, and the site is heavily disturbed and exhibits poor function. However, a seawall along Massachusetts Bay north of Atlantic Avenue has been raised by 2 feet in recent years, and with the proposed storm water/road improvements for Atlantic Avenue, the replication/restoration of the salt marsh and BVW will improve resource area function of this area. Eradication/management of the phragmites was considered in the design and will be instrumental for the successful restoration of this area.

Approximately 264 square feet (s.f.) of salt marsh and 617 s.f. of BVW are proposed to be impacted as discussed below associated with wetland replication/restoration, slope work and stormwater management/erosion protection as identified on Project Plans (See Section 5) along Atlantic Avenue. Approximately 327 s.f. of salt marsh replication/restoration (227 s.f. low marsh (≤ 2.8 feet (MHW – NAVD 88)) and 100 s.f. high marsh (> 2.8 feet and < 3.2 feet)) are proposed. Another 319 s.f. of BVW are also proposed to be replicated. Due to its position on the landscape and elevation requirements at/below MHW, the low marsh replication area is proposed to be sited on existing high marsh (218 s.f.) and BVW (109 s.f.) wetland areas, and access is also required through these wetland habitats. Following grading and revegetation of the low marsh, the high marsh (100 s.f.) and BVW (315 s.f.) temporarily altered will be restored and/or replicated. It should be noted that of the total 617 s.f. of BVW proposed to be impacted for the project, approximately 109 s.f. is located within the newly proposed, replicated salt marsh (below 3.2 feet elevation), and additional BVW replication area, approximately 319 s.f., has been incorporated into the project design accordingly. The replicated BVW is proposed on upland areas adjacent to existing salt marsh/BVW within the 100-foot buffer zone. Restoration of 2,080 s.f. of the 100-foot buffer zone associated with improvements to the stormwater control outlet and parking area reconfiguration is proposed adjacent to the salt marsh and BVW replication areas in this vicinity.

Salt Marsh/BVW/Buffer Zone Restoration and/or Replication Overview

The primary characteristic necessary to ensure the success of the Salt Marsh Replication and Restoration Area (SMR&RA) is the presence of hydrology adequate to support hydrophytic vegetation and to establish hydric soils. The SMR&RA will be located adjacent to existing wetland resource areas above/below the mean high water (MHW) line up to the high tide line (HTL) and topography of the site has been designed to match adjacent existing features. To ensure that adequate hydrology will be available, soil tests may be taken to determine seasonal groundwater levels (by mottles and other soil characteristics). If a change in the location of the SMR&RA is necessary, the applicant will seek approval from the Project Engineer and Hull Conservation Commission prior to implementing any changes.

Approximately 12 inches of clean, sand material will be installed throughout the SMR&RA, the BVW and upland buffer zone restoration areas. If there is insufficient usable soil from proposed fill/excavation areas on the project, additional soils will be imported for use at the replication site. Imported soils will be inspected and approved by a qualified Wetland Specialist before application. However, due to the presence of common reed (*Phragmites australis*) that dominates some areas of buffer zone, BVW and/or salt marsh along Atlantic Avenue, no material excavated from the wetland and adjacent upland buffer areas may be used for the proposed replication/restoration areas. A discussion of invasive, noxious and/or weedy species management and control measures is provided in the final section of this plan.

The SMR&RA will be revegetated with indigenous salt marsh species. The presence of various saltmarsh (*Spartina* spp.) communities and other coastal species observed along Straits Pond, as well as the improvement of active tidal cycles associated with the repair of the tidal gate under Nantasket Avenue/Route 228 (2012), suggest suitable conditions for redevelopment of indigenous salt marsh communities present in the area. The SMR&RA will occur above/below the MHW line up to the HTL, and species composition and abundance (See Table 1 below) have been selected for proposed site conditions. Smooth cordgrass (*Spartina alterniflora*), saltmeadow cordgrass (*Spartina patens*), seashore saltgrass (*Distichlis spicata*) and saltmeadow rush (*Juncus gerardii*) will be planted in the zone at/adjacent to MHW. Marsh elder/high-tide bush (*Iva frutescens*) will be planted at the upper limits of MHW up to the HTL at the salt marsh/BVW transition zone.

As identified in the BVW Replication and Restoration Area Construction Sequence below, switchgrass (*Panicum virgatum*), a salt tolerant grass species, and seaside goldenrod (*Solidago sempervirens*) are proposed to be planted adjacent to the SMR&RA. The Buffer Zone Restoration Construction Sequence, also identified below, also includes switchgrass and seaside goldenrod as well as shrubs, such as Virginia rose (*Rosa virginia*), Northern bayberry (*Morella pensylvanica*) and beach plum (*Prunus maritima*), that will be planted between the BVW replication area and Atlantic Avenue. A conservation seed mix/coastal salt tolerant grass mix is proposed to be used for side slopes and roadside slopes.

A botanist, ecologist, wetland scientist, or other individual with similar qualifications, thoroughly versed in the Commonwealth of Massachusetts Wetlands Protection Act (WPA) (MGL C. 131, s.40) and all other relevant regulations of the DEP and as described in the MassDOT special provision (Item 755.75), will be present on-site to oversee the replication process. This individual, herein after referred to as "Wetland Specialist", shall be approved by the Project Engineer and Hull Conservation Commission.

Salt Marsh Replication and Restoration Construction Sequence

The Contractor shall plan and execute operations in a manner minimizing the amount of erosion and disturbance during excavation of the wetland/upland areas for replication and restoration of the SMR&RA along the banks of Straits Pond. Work at the edge of existing wetlands will be coordinated to occur during periods when tides are below the work zone to reduce sedimentation to Straits Pond. The area will be contoured to create the minimum gradient possible given the rise over run of the wetland replication site and adjacent restoration/replication areas.

Species spacing/seeding densities have been adjusted above recommended levels to promote vegetative growth and to prevent the colonization by common reed from adjacent areas. As mentioned previously, a discussion of invasive, noxious and/or weedy species management and control measures is provided in the final section of this plan. Table 1 represents the composition and abundance of species to be planted within the proposed SMR&RA.

Table 1. – Salt Marsh Replication (227 S.F.) and Restoration (100 S.F.) Area						
Symbol	Quantity	Common Name	Botanical Name	Size	Spacing¹	Planting Area¹
SPAL	250	smooth cordgrass ²	<i>Spartina alterniflora</i>	2" peat pot	12" O.C.	227 S.F.
SPPA	35	saltmeadow cordgrass ³	<i>Spartina patens</i>	2" peat pot	12" O.C.	34 S.F.
DISP	35	seashore saltgrass ³	<i>Distichlis spicata</i>	2" peat pot	12" O.C.	33 S.F.
JUGE	35	saltmeadow rush ³	<i>Juncus gerardii</i>	2" peat pot	12" O.C.	33 S.F.
IVFR	15	Marsh elder ⁴	<i>Iva frutescens</i>	12-18"; #1 C.G.	3' O.C..	25 L.F. Zone

¹ On-center (O.C.); square feet (S.F.); linear feet (L.F.)

² Individuals should be planted between 2.2' – 2.8' elevation

³ Individuals should be inter-planted alternately between 2.8' – 3.2' elevation

⁴ Individuals should be planted along SMR&R rack line at 2.8'- 3.2' elevation

The following section describes the sequence of construction activities and provides information regarding grading and planting in the SMR&RA. It also contains temporary and permanent erosion and sedimentation control (ESC) measures that will be utilized during the various phases of construction.

Erosion and Sedimentation Controls

Prior to the commencement of construction activities, erosion and sedimentation control (ESC) measures will be installed along the boundaries of existing resource areas abutting the proposed SMR&RA (See Section 5, Wetland Replication Area Plan). In addition, upon completion of planting the SMR&RA, additional ESC measures may be placed at the toe of slopes/BVW boundary, as necessary, to prevent sedimentation from adjacent areas. Erosion controls will be inspected throughout construction and maintained as required to prevent sediment from entering adjacent wetland areas and will remain in place until the replication area is fully vegetated and stabilized.

Silt fence, burlap sandbags, mulch filter tubes (above 4.0 feet elevation) or an equivalent shall be installed along the boundary of the active work areas (limits of work) along wetland resources bordering Straits Pond to reduce sedimentation to the pond/existing wetlands. Mulch filter tubes shall be secured with 1" x 1" x 3' stakes, or per design specifications, spaced evenly and driven solidly into the underlying material. The ESC measures shall serve as the limit of work line and will protect the replication/restoration areas from erosion and from foreign materials which could potentially enter the areas.

A silt boom or equivalent structure may be installed in Straits Pond in the vicinity of the SMR&RA as necessary to reduce turbidity to the pond. The boom or equivalent structure will remain in place throughout construction activities and removed once stabilization is complete. Accumulation of sediment at the base of the boom will be removed with a hand shovel during low tides if channel bottom substrates are firm enough to walk across without causing further disruption/sedimentation to the intertidal zone.

Clearing

The proposed replication area will be cleared of existing vegetation, predominantly herbaceous species including common reed. Common reed is a noxious/invasive species and may germinate from seed, rhizomes and/or stems, and care must be taken to ensure that all plant material cleared from the area is bagged and removed and disposed of in a suitable waste facility.

Rough Grading

Rough grades for the proposed SMR&RA will be established at approximately 12 inches below desired final grade/elevation of existing adjacent wetland resource areas to accommodate surface organic layers. The final elevation of replicated areas will be determined according to the Wetland Restoration Site Plan and/or modified in the field by a qualified Wetland Specialist in order to successfully create suitable hydrologic conditions to support hydrophytic species. Upland side slopes will be graded at 3:1 slopes and/or blended into existing uplands and/or roadside slopes per construction requirements. All materials removed from the proposed replication area are presumed to be infested with common reed and should be removed from the project area and disposed of in a suitable waste facility to avoid contamination of other areas on or outside of the project limits. If common reed roots are observed below 12 inches, areas should be over-excavated to remove all visible roots per the Wetland Specialist or Project Engineer recommendations. Areas excavated below 12 inches may be backfilled with a sand mix and/or material of similar composition to that observed during excavation.

Soil Installation

For salt marsh replication areas, approximately 12 inches of clean, sand material will be installed throughout the SMR&RA. Usable sand with minimal organic matter and/or no invasive species plant material may be stripped and stockpiled from proposed fill/excavation areas on the project. Sand excavated from the intertidal zone may be saline. Saline soils shall not be used in landscape areas outside intertidal wetlands of similar salinity. Imported soils for planting shall be clean, sand conforming to the requirements of M1.04.0 Type 'a' Sand Borrow per the Massachusetts Department of Transportation (MassDOT) Division III of the Standard Specifications or an equivalent. Compost or organic soil amendments shall not be used within tidal wetland replication areas to limit colonization of common reed.

Planting

All plant material used shall be nursery-grown, healthy, have a well-developed root systems, and be free of disease, insect pests, eggs or larvae. Plant material shall be planted as soon as possible (within a week) after it has been purchased. If it arrives at the site more than 12 hours before it is planted, it shall be maintained by careful watering (brackish/saline solution - may be obtained from Straits Pond). Wetland plantings will be installed using hand implements, e.g., shovel, trowel or planting bars, under the supervision of a Wetland Specialist.

Container-grown plants/peat pots shall have sufficient roots to hold planting mix intact after removal from containers but should not be root bound. Plants shall be positioned in the area as shown on plans and placed in staggered rows. Spacings shall be determined under the direction and guidance of a qualified Wetland Specialist. To install each container plant, a small hole shall be dug by hand using spades, dibbles, or planting bars. The plant shall be removed from its container and set in the hole in a manner so that the top of the "root ball" is level with the surface of the ground. Care will be taken to avoid damage to the roots during handling. A small portion of slow-release fertilizer, approved by the Wetland Specialist, may be placed in the hole prior to the input of the "root ball". Fertilizer that is high in phosphorus composition will aid in plant root development, and care shall be taken not to over-fertilize the transplanted plant material. If, by the determination of the Wetland Specialist, some plants are burned due to over-application of the fertilizer, all affected plant material must be replaced in kind.

Irrigation

Saltmarsh vegetation will be watered with a saline/brackish solution on the same day of planting. Depending on site conditions, the restoration area will be irrigated with an approved water source (may be obtained from Straits Pond), if natural hydrological cycles do not provide sufficient water to sustain the newly planted vegetation.

Monitoring

Monitoring of the replication areas will be performed by a Wetland Specialist approved by the Project Engineer and Hull Conservation Commission. Monitoring reports will be prepared and submitted to the Commission/permitting agency upon the completion of planting and following the first and second growing seasons. The reports will describe the work completed, development of soils, hydrology and vegetation within restored/replicated sites as well as any action to be taken to repair, restore, or replant the restoration/replication areas if needed. Following annual inspections, the contractor will replace all plants that have not become established and re-seed areas that have not reached the desired 75 % cover after the first growing season.

BVW Replication & Restoration Area Construction Sequence

Switchgrass (*Panicum virgatum*) and seaside goldenrod (*Solidago sempervirens*) are proposed to be planted within the BVW Restoration and Replication Area (BVW R&RA) adjacent to the SMR&RA. Species spacing/seeding densities have been adjusted above recommended levels to promote vegetative growth and to prevent the colonization by common reed from adjacent areas. Table 2 represents the composition and abundance of species to be planted within the proposed restoration/replication site.

Table 2. –BVW Restoration (315 S.F.) and Replication (319 S.F.) Area						
Symbol	Quantity	Common Name	Botanical Name	Size	Spacing¹	Planting Area¹
PAVI	35	switchgrass ²	<i>Panicum virgatum</i>	#1 C.G.	3' O.C.	634 S.F.
SOSE	35	seaside goldenrod ²	<i>Solidago sempervirens</i>	#1 C.G.	3' O.C.	634 S.F.

¹ On-center (O.C.); square feet (S.F.); linear feet (L.F.)

² Individuals should be inter-planted alternately between 3.2' – 3.6' elevation

The following section describes the sequence of construction activities and provides information regarding grading, planting and seeding in the BVW R&RA. It also contains temporary and permanent erosion and sedimentation control (ESC) measures that will be utilized during the various phases of construction.

The Contractor shall plan and execute operations in a manner minimizing the amount of erosion and disturbance during excavation of the upland/wetland areas for BVW restoration/replication along the banks of Straits Pond. Work at the edge of existing wetlands will be coordinated to occur during periods when tides are below the work zone to reduce sedimentation to Straits Pond. The area will be contoured to create the minimum gradient possible given the rise over run of the wetland replication site and adjacent sidewalk and guardrail adjacent to Atlantic Avenue.

Erosion and Sedimentation Controls

Prior to the commencement of construction activities, erosion and sedimentation control (ESC) measures will be installed along the boundaries of existing resource areas abutting the proposed SMR&RA. In addition, upon completion of planting the SMR&RA, additional ESC measures may be placed at the toe of side slopes/ SMR&RA-BVW boundary, as necessary, to prevent sedimentation from uplands areas. Erosion controls will be inspected throughout construction and maintained as required to prevent sediment from entering adjacent wetland areas and will remain in place until the replication area is fully vegetated and stabilized.

Silt fence, burlap sandbags, mulch filter tubes (above 4.0 feet elevation), or an equivalent shall be installed along the boundary of the active work areas (limits of work) adjacent to the MHW line and along any wetland resources bordering Straits Pond to reduce sedimentation to the pond and existing wetlands. Mulch filter tubes shall be secured with 1" x 1" x 3' stakes, or per design specifications, spaced evenly and driven solidly into the underlying material. The ESC measures shall serve as the limit of work line and will protect the replacement area from erosion and from foreign materials which could potentially enter the area.

Clearing

The proposed restoration/replication area will be cleared of existing vegetation, predominantly herbaceous species including common reed. Common reed is a noxious/invasive species and may germinate from seed, rhizomes and/or stems, and care must be taken to ensure that all plant material cleared from the area is bagged and removed and disposed of in a suitable waste facility.

Rough Grading

Rough grades for the proposed BVW R&RA will be established at approximately 12 inches below desired final grade/elevation of existing adjacent wetland resource areas to accommodate surface organic layers. The final elevation of replicated areas will be determined in the field by a qualified Wetland Specialist in order to successfully create suitable hydrologic conditions to support hydrophytic species. Upland side slopes will be graded at 3:1 slopes and/or blended into existing uplands and/or roadside slopes per construction requirements. All materials removed from the proposed replication area are presumed to be infested with common reed and should be removed from the project area and disposed of in a suitable waste facility to avoid contamination of other areas on or outside of the project limits. If common reed roots are observed below 12 inches, areas should be over-excavated to remove all visible roots. Areas excavated below 12 inches can be backfilled with a loamy sand mix and/or material of similar composition to that observed during excavation.

Soil Installation

For the BVW R&RA, approximately 12 inches of clean, sand material will be utilized to create suitable soil layers as needed to establish final grades with approximately 12 inches of soil material at the surface. The soil will be inspected and approved by a qualified Wetland Specialist before application. Imported soils will be blended with adjacent areas to create elevations as identified on site plans (See Section V). Imported soils for planting shall be clean, sand conforming to the requirements of M1.04.0 Type 'a' Sand Borrow per MassDOT Division III of the Standard Specifications or an equivalent. Compost or organic soil amendments shall not be used within wetland replication areas.

Planting

Container-grown/peat pot plants, including switchgrass and seaside goldenrod, shall have sufficient roots to hold planting mix intact after removal from containers, but should not be root bound. Plants shall be positioned in the area per spacing dimensions and/or as shown on plans and placed in staggered rows. Spacings shall be determined under the direction and guidance of a qualified Wetland Specialist. To install each container plant, a small hole shall be dug. The plant shall be removed from its container and set in the hole in a manner so that the top of the "root ball" is level with the surface of the ground. Care will be taken to avoid damage to the roots during handling. A small portion of slow-release fertilizer, approved by the Wetland Specialist, must be placed in the hole prior to the input of the "root ball". Fertilizer that is high in phosphorus composition will aid in plant root development, and care shall be taken not to over-fertilize the transplanted plant material. If, by the determination of the Wetland Specialist, some plants are burned due to over-application of the fertilizer, all affected plant material must be replaced in kind. No fertilizer shall be placed in the hole of bare-root material at the time of planting.

Irrigation

All vegetation within the BVW R&RA will be watered on the same day as planting with fresh water. If necessary, the restoration area will be irrigated with an approved water source if natural hydrological cycles do not provide sufficient water to sustain the newly planted vegetation.

Monitoring

Monitoring of the replication areas will be performed by a Wetland Specialist approved by the Project Engineer and Hull Conservation Commission. Monitoring reports will be prepared and submitted to the Commission upon the completion of planting and following the first and second growing seasons. The reports will describe the work completed, development of soils, hydrology and vegetation within replicated

sites as well as any action to be taken to repair, restore, or replant the replication areas if needed. Following annual inspections, the contractor will replace all plants that have not become established and re-seed areas that have not reached the desired 75 % cover after the first growing season.

Buffer Zone Restoration Area Construction Sequence

The Buffer Zone Restoration Area (BZRA) identified below includes switchgrass and seaside goldenrod as well as shrubs, Virginia rose (*Rosa virginia*), Northern bayberry (*Morella pensylvanica*) and beach plum (*Prunus maritima*). These species will be planted adjacent to the BVW replication area up to Atlantic Avenue, and a conservation seed mix/coastal salt tolerant grass mix is proposed to be used for the roadside slopes and disturbed areas. Species spacing/seeding densities have been adjusted above recommended levels to promote vegetative growth and to prevent the colonization by common reed from adjacent areas. Table #3 represents the composition and abundance of species to be planted within the proposed restoration site.

Symbol	Quantity	Common Name	Botanical Name	Size	Spacing^{1,2}	Planting Area¹
ROVI	108	Virginia rose	<i>Rosa virginia</i>	12-18"; #1 C.G.	3' O.C.	980 S.F.
MOPE	10	Northern bayberry	<i>Morella pensylvanica</i>	12-18"; #1 C.G.	As shown/ 5' O.C.	250 S.F.
PRMA	27	beach plum	<i>Prunus maritima</i>	3-6"; #3 C.G.	As shown/ 5' O.C.	675 S.F.
PAVI	10	switchgrass	<i>Panicum virgatum</i>	#1 C.G.	3' O.C.	180 S.F.
SOSE	10	seaside goldenrod	<i>Solidago sempervirens</i>	#1 C.G.	3' O.C.	180 S.F.
Seed	2 lbs	N.E. Coastal Salt Tolerant Grass Mix	Various Species	1 lb / 1,250 sf	2lbs	2,080 S.F.

¹ On-center (O.C.); square feet (S.F.); linear feet (L.F.)

² Location/spacing shown on site plans

³ Individuals should be inter-planted alternately between 3.6' – 5.0+' elevation

This section describes construction activities for the approximately 2,080 s.f. 100-foot buffer zone to be restored adjacent to the proposed BVW R&RA as identified on Project Plans (See Section 5). Erosion and sediment control (ESC) measure installation, site clearing, rough grading and soil installation phases as well as planting container-grown root stock will be consistent with the sequence for the BVW R&RA as provided above. The wetland restoration/replication area will be seeded with a conservation seed mix/coastal salt tolerant erosion control grass mix at an application rate of 1 pound per 1,250 square feet and will be used for the side slopes of the replication areas and any other disturbed areas for stabilization and re-vegetation. Late spring and summer seeding will benefit with a light mulching of clean, weed-free straw to conserve soil moisture. If conditions are drier than usual, watering may be required. Upon completion of seeding, additional erosion controls will be placed at the toe of side slopes as necessary to prevent sedimentation into resource areas. Upon completion of seeding, additional erosion controls will be placed at the buffer/BVW boundary as necessary to prevent sedimentation into resource areas. Site monitoring and invasive species management/control will be performed concurrently with the BVW R&RA and SMR&RA.

Invasive Species Management/Control

Invasive species management and control may require one or a combination of methods for eradication and can include physical removal, smothering, chemical control or biological control and should be conducted according to the MassDOT Special Provisions Control of Invasive Plants Existing on Site (Item 102.3) and Invasive Plant Management Strategy (Item 102.33). The specific invasive species identified on site, and the area of coverage, will determine which removal efforts will be most effective. Common reed (*Phragmites australis*) is classified as an invasive/noxious species and occurs and within the high marsh/salt marsh, BVW and buffer zone. Physical eradication of common reed within these areas may occur during the initial

clearing and grading phases of restoration/replication. However, common reed may require eradication through herbicide applications in adjacent areas as well as discussed below dependent on site conditions.

Manual/Mechanical Removal

Digging/grubbing is effective for small, immature plants of invasive, noxious and/or weedy species such as common reed, purple loosestrife, multiflora rose and/or Tartarian honeysuckle, especially those rooted in loose soil, such that entire root systems may be removed to prevent re-sprouting. Excessive soil disturbance should be avoided to reduce creation of bare areas and minimize future colonization. Native vegetation should be left in place to the greatest extent possible to encourage expansion of existing populations. For herbaceous species such as common reed and purple loosestrife, plants should be removed prior to the onset of seed production (mid-summer) and seed heads should be cut and bagged to avoid further spread. All plant parts should be bagged, removed and placed in proper containers for disposal. Mature herbaceous and woody plants are generally too large for grubbing and are difficult to remove; therefore, these plants should be eradicated through a combination of clipping/cutting and/or herbicide application with a backpack-type sprayer or through foliar spot applications.

Herbicide Application

Herbicide application is the most effective, efficient and least destructive means of removing invasive, noxious and/or weedy species such as common reed, purple loosestrife, multiflora rose and/or Tartarian honeysuckle. Before any herbicide application is used, the Project Engineer and Hull Conservation Commission will be notified of the proposed use for review and approval.

Glyphosate is the most common compound used for eradicating common reed and purple loosestrife and other invasive species and comes in two forms: (1) "Roundup" for use on dry sites (to the edge if water); and (2) "Rodeo" for use on wet or standing water sites. Glyphosate applied with a backpack-type sprayer from late July through September has been recognized to be effective in eradication of invasive species (Wisconsin Department of Natural Resources). Herbicides can be sprayed onto foliage in a one percent solution. However, glyphosate is a nonselective herbicide, and will kill any green foliage that it comes in contact with. Care should be taken to avoid treating non-target plants. Herbicide applications can be applied directly to vegetation during the leaf-out period in the spring and summer by hand and "swiping" the vegetation from bottom to top with approved gloves saturated with an appropriate herbicide. For fall applications, herbicides can be applied directly to the cut stem/stump following clearing using a foam brush/paint brush to allow the herbicide to be absorbed into the plant's root system and kill the plant. These two methods represent targeted applications and avoid the need to spray and any associated overspray damage to indigenous/desirable species. However, "swiping" and/or cutting and painting/spot applications are labor intensive and can be expensive. Due to the limited size of the area and low number of herbicide applications anticipated, impacts to local wildlife and benthic organisms in Straits Pond should not be affected.

"Garlon 3A" is a broadleaf (dicot) specific herbicide recently found to be effective on purple loosestrife and other invasive species as well. Its advantage over glyphosate is that it doesn't harm monocots such as grasses, sedges, cattails, rushes, reeds, etc. Aquatic labeled 2-4, D has similar advantages to Garlon 3A and both are labeled for over water use and may be an alternative to Rodeo.

Monitoring

The Wetland Specialist shall conduct follow-up inspections of the salt marsh, BVW and buffer zone restoration/replication areas after the first and second growing seasons to determine the success of re-vegetation and noxious species eradication. If excessive noxious and/or invasive species germinate/re-grow,

a professional agronomist or other certified professional may need to be consulted to determine the need for additional eradication and/or restoration measures. Other invasive/noxious species such as purple loosestrife, as well as weedy species such as multiflora rose (*Rosa multiflora*), European buckthorn (*Rhamnus frangula*) and Tartarian honeysuckle (*Lonicera tatarica*), have been documented along Straits Pond and clearing and herbicide applications may be necessary to control these species as well.

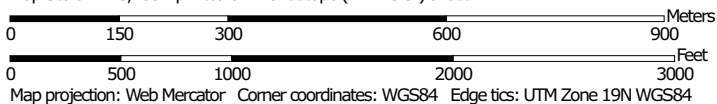
Appendix G

NRCS Soil Information

Soil Map—Norfolk and Suffolk Counties, Massachusetts, and Plymouth County, Massachusetts




Map Scale: 1:10,400 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:25,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
 Survey Area Data: Version 10, Sep 19, 2014

Soil Survey Area: Plymouth County, Massachusetts
 Survey Area Data: Version 7, Sep 19, 2014

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 30, 2011—Sep 4, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Norfolk and Suffolk Counties, Massachusetts (MA616)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
105D	Rock outcrop-Hollis complex, 3 to 25 percent slopes	0.1	0.8%
610	Beaches	0.1	0.9%
Subtotals for Soil Survey Area		0.3	1.8%
Totals for Area of Interest		14.8	100.0%

Plymouth County, Massachusetts (MA023)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
110C	Canton - Chatfield - Rock outcrop complex, 8 to 15 percent slopes	0.0	0.1%
110E	Canton - Chatfield - Rock outcrop complex, 15 to 35 percent slopes	1.0	6.5%
306E	Paxton loam, 15 to 35 percent slopes, very stony	2.3	15.8%
607	Water, saline	0.2	1.4%
610	Beaches, sandy	0.2	1.1%
614A	Oxyaquic Udipsamments, 0 to 3 percent slopes	0.7	4.6%
635C	Canton - Urban land - Rock outcrop complex, 3 to 15 percent slopes	6.9	46.9%
639B	Urban land - Hooksan complex, 0 to 8 percent slopes	3.2	21.9%
Subtotals for Soil Survey Area		14.5	98.2%
Totals for Area of Interest		14.8	100.0%

Appendix H

MHW & MLW Supporting Documentation

STRAITS POND TIDE GATE OPERATION AND MAINTENANCE PLAN



TOWN OF HULL, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

WEST CORNER CULVERT
ROUTE 228 OVER STRAITS CHANNEL
HULL, COHASSET, AND HINGHAM, MASSACHUSETTS



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December 5, 2007

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ATTACHMENTS

ATTACHMENT A: INSPECTION AND PREVENTATIVE MAINTENANCE CHECKLIST

ATTACHMENT B: ADJUSTMENT LOG

INTRODUCTION

This Tide Gate Operation and Maintenance (O&M) Plan, prepared for the West Corner Culvert Replacement/Straits Pond Habitat Restoration Project, addresses the procedures, protocols and evaluation methods that will be applied to the inspection, operation and override of the tide gates that control tidal exchange and the water level within Straits Pond. This O&M Plan should be periodically reviewed and modified to reflect operational and environmental changes related to the project. This manual was prepared by The Louis Berger Group, Inc. as a provision of the 401 Water Quality Certification, MA CZM Federal Consistency Concurrence, and the US Army Corps of Engineers permit and approval for the Massachusetts Highway Department reconstruction of the West Corner Culvert Replacement Bridge No. C-17-004 Route 228 Over Straits Channel Hull-Cohasset-Hingham and will serve as an enforceable mechanism for the operation of the associated tide gates. The Town of Hull Department of Public Works (DPW) is the responsible party overseeing construction and future operation of the West Corner tide gates. By adhering to the procedures set forth in this plan, involved parties can ensure the application of a consistent approach to tide gate operation and maintenance.

BACKGROUND

The Bridge Replacement of Route 228 (Nantasket Avenue) over Straits Channel is located in the Towns of Hull, Cohasset, and Hingham. See Locus Map. The West Corner Bridge is at the junction of these three Towns. Straits Channel connects to Straits Pond, which is a shallow coastal pond over 90 acres in size, located in the southeasterly area of Hull and northwestern area of Cohasset. Straits Pond forms the boundary between Hull and Cohasset. The Bridge is approximately 250 feet north of the Route 228/Rockland Street/Jerusalem Road intersection.

The existing West Corner Bridge (Route 228) consists of a 12-foot span, 8-1/2 foot rise culvert with stone masonry walls. The upstream or east side of the structure includes twin manually operated slide gates (one of which is 4x4 feet and the other is 5x5 feet). The combined structure provides flood protection to low-lying properties along Straits Pond. However, the current structure is too small to provide effective tidal exchange within the Pond, which has resulted in water quality impairments, major infestations of midges, explosive growth of widgeon grass, periodic algae blooms, and the spread of invasive plants.

Under current conditions, the opening of the gates can raise or lower the pond about 1 foot during a tide cycle.¹ Until relatively recently Straits Pond was typically maintained at a level of 3.3 feet, NGVD 1929 with only occasional operation of the gates in an attempt to allow some exchange or increased flood storage prior to storm events. More recently, tide gate operators have been responsible for regulating flushing and water levels in Straits Pond by manually opening and closing the tide gates using a protocol developed by ENSR,² although management has deviated from this protocol due to various management goals.³

¹ Army Corps of Engineers, 2004. Straits Pond Tidal Flushing Study- Hull, Cohasset and Hingham, Massachusetts. New England District, Concord, MA. 32 pp.

² ENSR Inc., 2002. Weir River Estuary Flow Study: Hull, Hingham, and Cohasset Massachusetts. Prepared for Massachusetts Department of Environmental Management. Document No. 04481-009.

³ Army Corps of Engineers, 2004. Straits Pond Tidal Flushing Study- Hull, Cohasset and Hingham, Massachusetts. New England District, Concord, MA. 32 pp.



Figure 1: USGS Locus Map.

Twin 7-foot wide by 5-foot rise box culverts outfitted with automatically actuated sluice gates are proposed to replace the failing infrastructure and increase tidal circulation within Straits Pond. The Hull DPW will be the Responsible Party for undertaking water level management and routine actions, inspection, maintenance, repairs, and corrective actions as prescribed by the Straits Pond Advisory Committee.

PURPOSE AND INTENT

In addition to replacing the failing infrastructure, the current project seeks to restore degraded coastal wetland habitat upgradient of the West Corner Bridge by increasing tidal exchange and improving water quality and habitat value within Straits Pond, and improving ecological connectivity to the Weir River Estuary while controlling the risk of preventable flooding from the Weir River and overwash along Atlantic Avenue. The attached Inspection and Preventative Maintenance Checklist (Attachment A) provides a standardized method of keeping records for regular inspections. The attached Tide Gate Adjustment Log (Attachment B), in addition to the automated water level data logging equipment installed at the culvert, insures adequate record keeping of water level management. Record keeping will create the ability to make informed management decisions regarding future modifications to the gate management protocol. Further protocols may need to be developed between these parties. This document will provide basic guidelines to assist Department of Public Works officials to:

- Manage Straits Pond with oversight by the Straits Pond Advisory Committee.
- Perform and document the inspections and other relevant information regarding the status of surrounding resources (Attachment A).
- Document adjustments made to tide gate operations and manual override actions (Attachment B).
- To insure that emergency contact information is available.

The culvert at West Corner is a tidal restriction site listed in the Atlas of Tidal Restrictions on the South Shore of Massachusetts (MAPC/MA Wetlands Restoration Program, 2001) as a high priority site for restoration based on the size of affected area (>50 Acres), the presence of an anadromous fishway, it's status as an Area of Critical Environmental Concern (ACEC), and for potential upstream benefits.

In 2002, an investigation into management alternatives to control nuisance infestations of Chronomid midges and excessive primary production was conducted by Environmental Science Services, Inc. (ESS)⁴. This study evaluated chemical, in-pond, and watershed management alternatives. One watershed management alternative identified in the report was flow improvements through such means as modifications to the tide gates at the Route 228 Bridge. This study articulated benefits of increased tidal exchange between the estuary and pond as “such improvements are expected to improve benthic and fisheries habitat and passage by increasing tidal exchange, flushing nutrients, increasing DO and salinity, and reducing water temperatures”.

⁴ ESS 2002. Midge Management Recommendations for Straits Pond, Towns of Hull and Cohasset, Massachusetts. Prepared for Town of Hull 253 Atlantic Avenue Hull, Massachusetts 02045 Project No.: H114-000

In an effort to inform management and environmental issues the Straits Pond Watershed Association, in cooperation with local, state, and federal partners developed and presented a comprehensive public informational forum series that was recorded and presented on local cable access for those not able to make the forums in person (powerpoint presentations also available on the Hull Conservation Commission web page at http://www.town.hull.ma.us/Public_Documents/HullMA_conservation/spforum). At the conclusion of the informational forum series a facilitated public meeting was held during which the most salient environmental issues and management options were identified and prioritized. Increased tidal exchange through an expanded and enlarged culvert was universally identified as the top priority.

The goals for the management of Straits Pond through monitoring and adjustments to the proposed tide gates include:

- Increase in tidal prism
- No increase in flooding-related property damage
- Increase and stabilization of pond salinity levels
- Increase in pore water salinity levels
- Decrease in pond temperature
- Increase and stabilization of pond dissolved oxygen levels, and
- Increase in estuarine nekton species assemblage
- Increase in frequency of tidal exchange

PRE-REPLACEMENT CONDITION

Straits Pond is a large coastal pond that is located in the southeast side of Hull and northwest side of Cohasset. The pond reportedly supported tidal marshes prior to being dammed in order to provide hydropower for a mill near the existing bridge. The grist mill remained until it was destroyed by fire in 1800. In as early as 1900, the state Board of Health investigated complaints of nuisance plant growth and nuisance odors.

The existing West Corner Bridge (Route 228) consists of a 12-foot span, 8-1/2 foot rise culvert with stone masonry walls, and a reinforced concrete slab roof. This structure was last reconstructed in approximately 1908.

Tide gates were added during the 1940s in response to recommendations to improve water quality within Straits Pond. The current tide gates are manually operated slide gates (one of which is 4x4 feet and the other is 5x5 feet). During the 1950's, funds were appropriated for the construction of sewers within Hull and various chemical treatments began in an attempt to control both nuisance vegetation and midges (a nonbiting insect which hatch in prolific numbers creating a major nuisance for abutters to the Pond). Some species of midges are direct indicators of poor water quality and excess nutrients. During peak emergence, residential areas are inundated with midges, leading to inhalation and respiratory problems that result in quality-of-life issues for Pond abutters. The Town of Hull has applied insecticides under an Emergency Declaration issued by the Board of Health since the 1950's. However, the chemical control of midges generally has limited and short-term success and was discontinued in 2004.

A 1980 study cited continued eutrophication problems due to failing septic systems, direct discharge of sewage and storm water runoff. In subsequent years, additional sewer and stormwater management improvements have been implemented in Hull and Cohasset to reduce pollutant levels entering Straits Pond. Midge larvae numbers have been regularly monitored by professionally guided local volunteers and high school students. In the past, the Pond was typically managed to maintain a constant water level and the tide gates were manually operated to lower water levels in response to a predicted storm event to increase available water storage capacity. More recently, a protocol for more regular tidal flushing has been implemented to increase salinity levels and numbers of predatory fishes during spring months as a more effective midge control measure. A study of midges in Straits Pond revealed that midges taken from the Pond ceased to pupate and often died at salinities greater than 18-22 ppt. Additional studies of Straits Pond have shown that fish such as mummichogs and striped killifish fed extensively on midges, although ceased to feed or died at high water temperatures and low oxygen conditions.

The lack of effective tidal exchange within the Pond continues to cause water quality impairments, major infestations of midges, explosive growth of widgeon grass, periodic algae blooms and infestations of midges, and the spread of invasive plants. Figure 1 graphically represents tide data collected in May, 2003 and demonstrates the limited water level fluctuation within Straits Pond with both existing gates in an open position. Under moderate tides, the Pond can only experience water level fluctuations of approximately 1 foot between high and low tides.

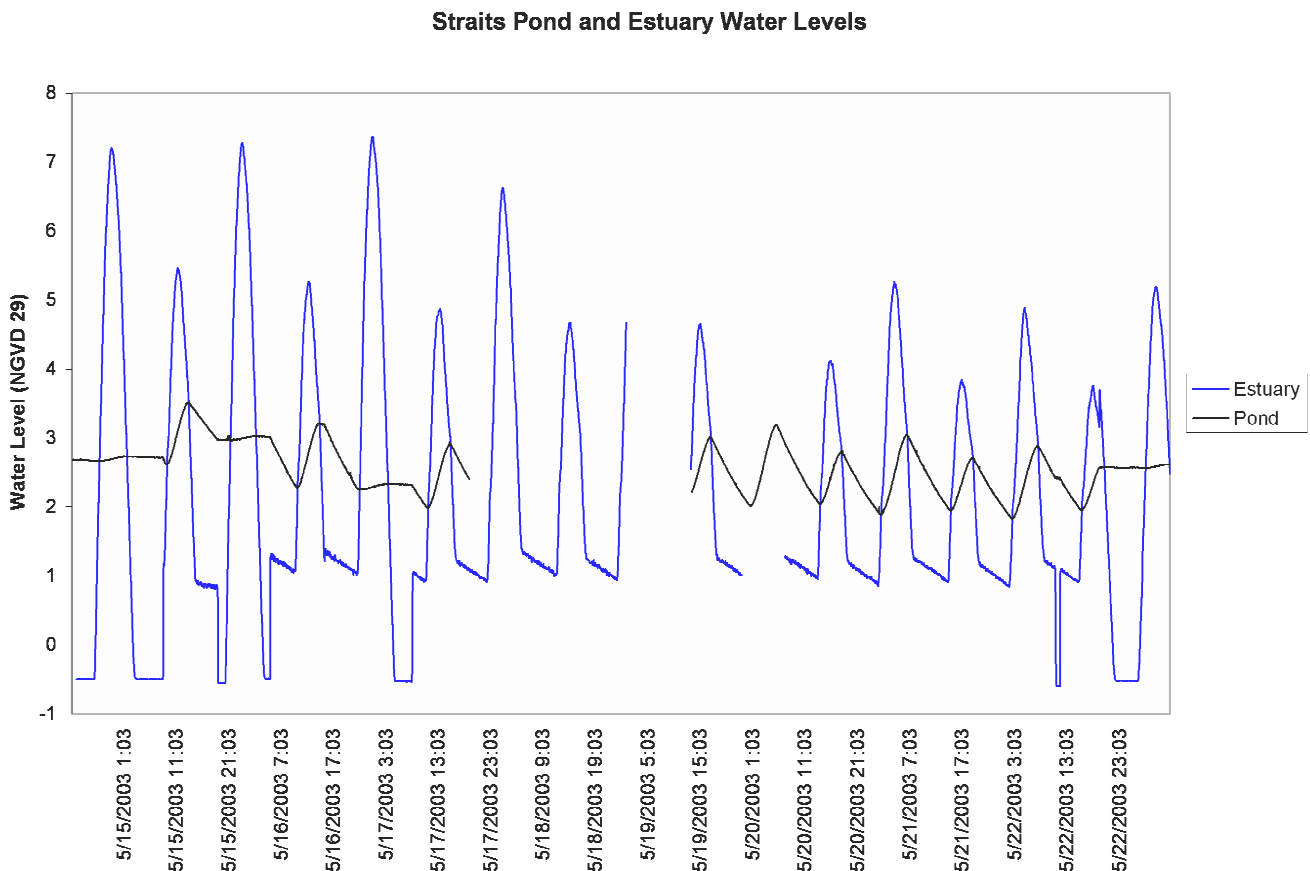


Figure 2: March 2003 Tide Data for Straits Pond and Weir River Estuary.

Stands of the invasive common reed or *Phragmites* reduce habitat value and are a considerable fire hazard. Low-lying properties surrounding the pond are susceptible to flooding impacts as flow becomes impounded above the road crossing. All of these symptoms present significant quality-of-life issues for residents surrounding the pond.

Historically, Straits Pond was maintained at a constant level of 3.3 feet, NGVD 29. More recently, a resident has been responsible for regulating flushing and water levels in Straits Pond by manually opening and closing the tide gates using a protocol developed by ENSR⁵ in an attempt to increase tidal flushing and salinities and reduce residential time within the pond. These operations are the subject of an Existing Order of Conditions with the Hull and Cohasset Conservation Commissions. However, for several seasons the tide gates have not been operated per the ENSR protocol. Most recently the tide gates have been operated under an OOC that was based on the investigation of several management scenarios evaluated using automated level data loggers and in-situ salinity measurements that provided improvements over the ENSR protocol. This spring the revised operational scenario was altered as the existing ENSR tidal exchange protocol was insufficient to maintain high salinity values in the Pond during wet weather and high spring flow/groundwater conditions. Under the interim protocol the tide gates are operated in the open position as often as possible while attempting to maintain pond height in a range between approximately 2.4 and 3.4 feet NGVD 29. The gates have been open for approximately 1 week of the month during the highest high tides. During the two weeks of the month with roughly average tides, the gates have been closed for approximately 6 hours per day during one low tide cycle. During neap tides it is periodically necessary to close the gates for portions of both daily low tide cycles in order to achieve pond elevations above 3.0. Manual operations of the gates also occur in response to predicted major precipitation or coastal storm events in an effort to lower water levels and provide additional flood water storage capacity.

REPLACEMENT CONDITION

The project originated as a municipal project led by the Town of Hull with additional financial support from the Towns of Cohasset and Hingham, as well as the NOAA National Marine Fisheries Service and the Conservation Law Foundation in support of habitat restoration goals. The project recently received federal funding for construction through the Federal Highways Administration and as a result will be advertised as a MassHighway project. In addition, the project has received additional funding from the Massachusetts Transportation Improvement Program (TIP). The replacement design of twin 7-foot wide by 5-foot rise box culverts outfitted with automatically actuated sluice gates is based upon recommendations from a US Army Corps of Engineers study (include citation). This study conducted under the Flood Plain Management Services Program, determined that larger hydraulic openings than the recommended twin 7 X 5 foot culverts provided only minor additional flow to the Pond. The predicted range in pond surface elevation (during a relatively low high tide event of 5.2 feet, NGVD 1929), is anticipated to increase from 1.2 feet to 2.6 feet, with the new culvert/tide gate structure. While the predicted minimum pond surface elevation is controlled by an outcrop of bedrock, higher maximum pond surface elevations would be anticipated during higher tide events without resulting in flooding impacts to properties abutting the Pond which through pre-construction topographic surveys has been determined to be approximately 3.8 feet (NGVD 29). The automatic tide gates will also be outfitted with manual overrides for corrective actions and emergencies, including power failures.

⁵ ENSR Inc., 2002. Weir River Estuary Flow Study: Hull, Hingham, and Cohasset Massachusetts. Prepared for Massachusetts Department of Environmental Management. Document No. 04481-009.

Studies of water quality conducted by the Office of Coastal Zone Management have found that with the existing tide gates left in an open position, salinity levels significantly increase throughout the Pond both spatially and at depth and water released on an outgoing tide is not the same water that returns on a subsequent incoming tide. It is anticipated that the predicted increase in tidal exchange with the new culverts will result in further water quality and habitat enhancements, will reduce habitat fragmentation, and increase ecological integrity.

The Town of Hull DPW will maintain signage on both sides of the culvert warning boaters and kayakers to stay out of area adjacent to the culvert.

STRAITS POND ADVISORY COMMITTEE

The Hull Department of Public Works is the Responsible Party for undertaking initial water level monitoring and water quality monitoring, adjusting gate operations, conducting necessary inspections, maintenance and repairs, and undertaking corrective actions as prescribed by the Straits Pond Advisory Committee. Restoration monitoring of water quality, vegetation, nekton, sediment, and benthic invertebrates is ongoing and being performed by the Straits Pond Watershed Association (SPWA) and the Cohasset Center for Student Coastal Research (CSCR) with technical and financial support from the CZM Wetland Restoration Program, the MassBays Program, and the Gulf of Maine Council on the Environment. The Straits Pond Advisory Committee is responsible for developing a management approach with regard to initial calibration, review of environmental conditions and prescribing modifications when necessary. Members of the Advisory Committee are identified below:

Director, Hull DPW
Attn: Marc Fournier
9 Nantasket Avenue
Hull, MA 02045
P: 781-925-0900
781-910-3973 (Emergency)
F: 781-925-0401
E: mfournier@town.hull.ma.us

CZM South Shore Regional Coordinator or
CZM Wetland Restoration Program
Attn: Jason Burtner
C/O: Stellwagen Bank National Marine
Sanctuary
175 Edward Foster Road
Scituate, MA 02066
P: 781-545-8026 x209
F: 781-545-8036
E: jason.burtner@state.ma.us

MA DEP Restoration Coordinator
Attn: James Sprague
1 Winter Street
Boston, MA
P: 617-645-6601
E: James.Sprague@state.ma.us

MassBays Estuaries Program
Attn: Christian Krahforst
251 Causeway Street
Boston, MA 02041
P: 617-626-1216
F: 617-626-1240
E: Christian.Krahforst@state.ma.us

Areas of Critical Environmental Concern
(ACEC) Program
Coastal Coordinator
Attn: Lisa G. Berry Engler
251 Causeway Street, Suite 700
Boston, MA 02114
T: (617) 626-1435
F: (617) 626-1349
Lisa.Engler@state.ma.us

Hingham Conservation Agent
Attn: Cliff Prentiss
210 Central Street
Hingham, MA 02043
P: 781-741-1445
E: cprentiss@hingham-ma.com

Straits Pond Watershed Association
Attn: Lawry Reid
31 Richards Road
Hull, Ma 02045
P: 781-925-8659
E: viaspeech@comcast.net

Conservation Administrator
Hull Conservation Commission
Attn: Anne Herbst
253 Atlantic Avenue
Hull, MA 02045
P: 781-925-8102
F: 781-925-8509
E: conservationemail@town.hull.ma.us

Conservation Agent
Cohasset Conservation Commission
Attn: Paul Shea
41 Highland Avenue
Cohasset, MA 02025
P: 781-383-4119 or
508-240-6811
E: PaulShea@cape.com

Gulf of Maine Habitat Restoration
Coordinator
Attn: Eric W. Hutchins
NOAA Restoration Center
1 Blackburn Drive, Gloucester, MA 01930
P: 978-281-9313
F: 978-281-9301
E: Eric.Hutchins@noaa.gov

Superintendent
Cohasset DPW
Attn: Carl Sestito
91 Cedar St.
Cohasset, MA 02025
P: 781 383 0273
F: 781 383 4125
E: cohassetdpw@yahoo.com

The initial testing and configuration of the automatic tide gate actuators will be scheduled with the contractor well in advance of installation. Configuration will require careful testing in order to achieve the targeted water elevation and water elevation change within Straits Pond. The Straits Pond Advisory Committee will provide oversight for initial testing and operation. It is anticipated that water quality habitat degradation, and ecological integrity problems will be improved with the increased tidal flushing allowed by the larger tide gates. An increase in tidal exchange will also provide fisheries benefits through increased opportunity for fish passage between the estuary and the pond, will reduce habitat fragmentation resulting from existing tide gate design/operation, and that the improved ecological “connectivity” between the pond and the estuary will enhance the pond’s ability to respond to environmental stressors such as nutrient loading and eutrophication. An increase in the degree and frequency of tidal exchange will serve to increase and stabilize salinity, lower and stabilize water temperature, and that with a reduction in eutrophic conditions water column dissolved oxygen is anticipated to improve and sediment oxygen demand is anticipated to be reduced thereby improving overall habitat value. However, the need for adaptive management remains a priority. Adverse environmental conditions are to be managed with advanced coordination and oversight by the Straits Pond Advisory Committee.

INITIAL TIDE GATE CALIBRATION AND OPERATION PROTOCOL

Maximum Water Level

Once the existing structure and tide gates are replaced, maximum water surface elevations would be controlled by the new automatically actuated sluice gates which would automatically close when the Pond reaches a predetermined water surface elevation and automatically open when elevations within the Estuary would fall below this elevation. The first action of the Hull DPW with input from the Straits Pond Advisory Committee will be the initial adjustments of the level switches to determine the appropriate Pond and Estuary water levels which will actuate the gates to prevent flooding from high water levels. The elevation of the pond water level will be automatically recorded by a GlobalWater WL16 unit that is mounted in the vicinity of the tide gates and will be configured to record water level at regular intervals so as to be comparable with the NOAA Boston recording facility. These adjustments will require careful monitoring of water levels to establish a maximum water level acceptable to local officials and Straits Pond abutters without causing avoidable adverse consequences to low-lying structures surrounding the Pond. The maximum water elevation is anticipated to be approximately 3.8 feet (NGVD 1926) or approximately 0.5 feet higher than typical high water conditions. During the initial configuration stage, tide gauges and salinity probes will be deployed within the Pond and Estuary to document water levels and salinity levels, water flow direction and velocity, water temperature, and dissolved oxygen in response to adjustments of the level switches. The automated actuators will initially be set to close the tide gates at a pond water level of approximately +3.5 feet (NGVD), or at the currently observed/recorded average high water level. Following the preliminary data collection phase for the initial setting, of approximately one month, the Straits Pond Advisory Committee will meet to review the available data and any reported concerns regarding pond water levels. The outcome of this meeting will be to establish the water level settings for the switches which will activate the gates under routine conditions. Based on the maximum water levels resulting from the initial actuator setting water level and closure settings will be incrementally adjusted to maximize pond water levels without flooding and with consideration of a reasonable safety factor. The intent is to incrementally adjust actuator settings once during each spring to facilitate better environmental response data collection.

Minimum Water Level

Establishing the maximum water level is only one tide gate O&M variable for restoration, relieving eutrophic conditions, addressing the midge infestations, etc and all of the associated quality-of-life issues that go along with the impairment of the Pond. Consideration of the minimum water level (i.e. tidal prism) and frequency of exchange are also critical considerations as they, collectively, will be what determine the degree and success of restoration and improvement of conditions for abutters. It is anticipated that the minimum water level in the pond will be a self-controlling function of culvert/tide gate design and pond channel/ledge bathymetry. The predicted range in pond surface elevation (during a relatively low high tide event of 5.2 feet, NGVD 1929), is anticipated to increase from 1.2 feet to 2.6 feet, with the new culvert/tide gate structure. This increase in the tide range is a result of expanded cross-sectional area of the culvert/tide gates and the associated hydrology of the system. The minimum potential water level in the pond is controlled by a ledge outcropping upgradient (pond-side) of the tide gates and the corresponding low water pond water elevation is approximately +1.0 feet (NGVD). At this minimum water level there is approximately 75% surface water coverage on the pond. This minimum level surface water coverage has been determined by detailed bathometric survey and photographic documentation when the Pond water level was in a drawn down condition. As +1.0 feet is a fixed minimum water level, and the average low water elevation during tidal exchange will primarily be higher than this level, it is anticipated that the large degree of surface water coverage during the transitional/short term low tide in the Pond will be sufficient to address abutter concerns regarding

prolonged exposure of extensive inter-tidal flats as discussed during project public informational meetings. This lower water elevation is viewed as a longer-term goal of the restoration and the Advisory Committee. The initial actuator low water setting will seek to maintain a minimum water surface elevation of 2.0 feet (NGVD 29) with annual incremental adjustments of approximately 0.2 feet annually over a 5-6 year period. These adjustments will be determined by the Advisory Committee taking into consideration abutter concerns and adaptive management strategies that will be informed by ongoing restoration monitoring and in coordination with the appropriate permitting agencies. The Advisory Committee will need to consider the balance between maximized exchange and abutter concern with low water levels in the pond.

Protocol for drawing down the level of the pond to provide additional flood storage in anticipation of a significant storm event is discussed below.

Tidal Exchange Frequency

In order to maximize potential benefit for water quality, habitat, ecological integrity and quality-of-life considerations for residential abutters, tidal exchange between the estuary and the pond will be allowed to proceed unimpeded (except as discussed above and below) on a normal twice-daily regime in order to more closely mimic native hydrology and ecology of the tidal system.

The automatic tide gates will also be outfitted with manual overrides for corrective actions and emergencies, including power failures. This initial monitoring phase will also be useful to establish the time frames necessary to respond to a predicted major precipitation of a coastal storm flooding event where lowering pond levels is desirable for increased flood storage. In certain circumstances, more than a single ebb tide cycle may be necessary to lower the pond to elevation 1.0 feet (NGVD 1929). This is the maximum lowering possible due to bedrock outcrops within Straits Channel just upstream of West Corner Bridge. During this initial monitoring phase, the Straits Pond Advisory Committee will establish the minimum respond times (tides cycles) required for the manual operation of the gates for increased flood water capacity.

ROUTINE FIELD INSPECTIONS

Following the installation of the new culverts, routine annual field inspections will be conducted by the Hull Department of Public Works using the Inspection and Preventative Maintenance Checklist (Attachment A) and kept on record by the DPW. The routine inspections will evaluate performance, address maintenance needs and identify problems. Substantial corrective actions requiring the removal or placement of material via machinery will be reviewed and approved by the Advisory Committee. The Department of Public Works will be the primary contact to report observed problems with the functioning of the structure.

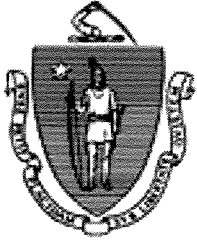
TIDE GATE ADJUSTMENTS AND MANUAL OVERRIDE EVENTS

All adjustments to the level switches which operate the tide gates will be coordinated with the Straits Pond Advisory Committee. The attached Tide Gate Adjustment Log (Attachment B) and the automated water level data loggers will insure adequate record keeping of water level management including all manual overrides of the gates. Record keeping will create the ability to make informed management decisions. Based on circumstances which may occur following installation, further protocols may become necessary. It is anticipated that the Advisory Committee will meet on an annual basis to review records and reports from the previous year and determine whether any adjustments to tide gate operations

are warranted. Any modifications to operating procedures will be developed in cooperation with the Advisory Committee and clearly documented. Records of tide gate adjustments and operations will be distributed to municipal officials and resource agencies as directed by permit conditions.

ON-GOING TIDE GATE OPERATIONS

By December 15th of each year, the Straits Pond Advisory Committee will prepare a summary report. The report will document and justify any modifications or adjustments made to gate operations with supporting monitoring data. It is anticipated that this information will include data on water levels, salinity, temperature, and DO,. The report will discuss observed trends in the data and the extent to which to project is achieving management goals. To the extent that additional data is collected, it will be provided in the annual report.



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

ARGEO PAUL CELLUCCI
Governor

JANE SWIFT
Lieutenant Governor

BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

April 4, 2001

Mr. Jeremiah Mulcahy
c/o Mr. Robert Alvarez
P.O. Box 250
Wareham, MA 02571-0250

RE: **Formal Determination of Applicability, W00-0025**
33 Bay Street, Hull, Weir River, Plymouth County

Dear Mr. Alvarez:

Thank you for requesting to know whether M.G.L. Chapter 91, the Public Waterfront Act and the Waterways Regulations 310 CMR 9.00, apply to the above referenced site. The Department appreciates the applicant's patience in the review process as we have worked through the complex issues raised by this application.

The proposed project involves the construction of a former home at 33 Bay Street in the town of Hull. The previous structure received three emergency authorizations from the Department to repair pile supports on February 27, 1998; April 8, 1998; September 29, 1998. The home has since been completely removed and unauthorized pilings placed on the site. A previous application with the file number of W98-8959-N is noted as withdrawn in this request.

Enclosed is the Determination of Applicability for the referenced application issued pursuant to Waterways Regulations 310 CMR 9.06. This Determination may be recorded at the Plymouth County Registry of Deeds and a copy will be maintained in the Department files.

The Department has been in extensive consultation with the National Oceanographic and Atmospheric Administration (NOAA) over the exact elevation of MHW based upon the NTDE 1960-1978 pursuant to 310 CMR 9.04 related to the NGVD 29 datum plane in the Weir River area of Hull. The Department has determined, in cooperation with NOAA officials, that the elevation of MHW in NGVD 29 is 4.99ft. Furthermore, NOAA estimates sea level rise since the 1960-1978 NTDE to be approximately 0.1ft. In light of these facts, the soon to be published new NTDE should render MHW in NGVD 29 for the area around 5.1ft.

Based upon spot elevations you provided, the Department has determined the proposed project is located within a geographic area subject to jurisdiction pursuant to 310 CMR 9.04(1) and the construction would require the submission of a license application pursuant to 310 CMR 9.05(1). As noted, the new NTDE will expand the Department's jurisdiction, encompassing more of the structure in the near future.

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

DEP on the World Wide Web: <http://www.magnet.state.ma.us/dep>

Printed on Recycled Paper

A significant portion of the site, including the sonotube supports, for the proposed structure were submersed in tidewater at the afternoon high tide of October 18, 2000. Likewise, the applicant noted in a March 26, 1998 letter that they were unable to pour new supports due to incoming tides when requiring an extension to the original emergency authorization. Noting the very gradual slope of the shore at this particular site, the Department believes that many higher high tides inundate most of the site.

The Department recognizes the complexities of this case and that the new construction of the home would not qualify for a variance pursuant to 310 CMR 9.21(1). Furthermore, the structure is not eligible for the simplified procedures pursuant to 310 CMR 9.10(1) as the primary residential structure cannot be considered accessory. Accordingly, the structure should be moved in the horizontal plane landward to ensure that the elevation of MHW is seaward of the structure currently and in the new NTDE and thus removing the structure from jurisdiction.

This formal determination is only for purposes of M.G.L. Chapter 91, and you may be required to obtain other local, state or federal authorizations for development, including but not limited to, any approvals which may be required pursuant to the Wetlands Protection Act.

If you have any questions or wish to schedule a pre-application meeting please feel free to contact me at the Waterways Regulation Program at (617) 292-5869.

Sincerely,

Christian D. Schock II, AICP
Regional Planner
Waterways Regulation Program

cc: Jeremiah Mulcahy, Applicant
Town of Hull, Conservation Commission
DEP- NERO
WRP Files

Appendix I

Stormwater Management Report

**STORMWATER REPORT for
Reconstruction of Atlantic Avenue
and Related Work
Nantasket Avenue to Cohasset Town Line
HULL, MA**

**APPLICANT:
TOWN OF HULL
DEPARTMENT OF PUBLIC WORKS
9 NANTASKET AVE
HULL, MA 02045**

CHA Project #25463

SEPTEMBER 2020

Submitted To:

Hull Conservation Commission
Hull Town Hall
253 Atlantic Ave
Hull, MA 02045

Prepared By:

CHA Consulting, Inc.
141 Longwater Drive, Suite 104
Norwell, MA 02061
p (781) 982-5400
f (781) 982-5490



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Section 1

Narrative

1.1 EXECUTIVE SUMMARY

On behalf of the Hull Department of Public Works, CHA Consulting, Inc. is pleased to provide the following Stormwater Engineering Report for the Atlantic Avenue Corridor Improvement Project. Following is a description of the existing conditions of the roadway and the proposed improvements to be implemented as part of the project.

Purpose and Need

The Atlantic Avenue Reconstruction Project in Hull, MA is a 1.3-mile corridor improvement project with the goal of rehabilitating the existing roadway infrastructure, improving drainage, improving intersection safety, and enhancing bicycle and pedestrian accommodations. The project is needed to address aging infrastructure and safety for all roadway users along Atlantic Avenue between Nantasket Avenue and the Cohasset Town Line.

Existing Conditions

The project encompasses approximately 6,600 feet of Atlantic Avenue between Nantasket Avenue (Route 228) and the Cohasset town line. Atlantic Avenue is designated as an Urban Minor Collector. The paved travel way varies in width from 24 to 32 feet and the Right of Way varies from 40 to 45 feet along the corridor. The roadway handles approximately 3,900 vehicles daily that increases during the summer months. The homes along the majority of Atlantic Avenue that were once summer cottages are now year round residences. This change has affected the use and demands placed upon this roadway.

Atlantic Avenue is bordered on the north by a combination of residential and commercial properties and beaches along the Atlantic Coast. To the South, residential properties and Straits Pond, a salt pond that flows into the Weir River, which is collectively designated as an Area of Critical Environmental Concern (ACEC), border Atlantic Avenue. The roadway right-of-way is adjacent to areas of salt marsh, beach, and several revetments. In addition, the portion of Atlantic Avenue around Straits Pond is located within the 100-year flood plain, is designated as Special Flood Hazard Areas, Coastal Flood Zone, and is considered land subject to coastal storm flowage and/or land subject to flooding under the Massachusetts Wetlands Protection Act Regulations.

Bituminous concrete sidewalks are in very poor condition along the south side of the roadway for the project's entire length. Isolated sections of sidewalk are located along portions of the northern side of Atlantic Avenue, mainly in the thickly settled residential area. Several side streets have sidewalks, but with virtually no connecting walkways, pedestrian access between streets is restricted. Parallel parking by permit exists along portions of the south side of Atlantic Avenue. The Hull Town Hall, Marylou's Coffee, basketball court/park, and multiple beach access points are located along the project corridor serving as pedestrian generators.

Stormwater runoff along the roadway is collected by multiple closed drainage systems consisting of catch basins and manholes. The stormwater is conveyed to various outlet points along the corridor, many of which discharge directly to Straits Pond. The existing drainage structures appear to be in poor condition and most will be replaced.

Proposed Improvements

Roadway Cross Section

The proposed cross section for the majority of Atlantic Avenue is a 30-foot wide roadway with a 5.5-foot sidewalk running along the south side of the road for the full length. The 30-foot roadway consists of two 11-foot lanes and two 4-foot shoulders. The 4-foot shoulder widths are in accordance with the required 4-12 foot width stated in Section 5.3.3.1 of the Design Guide. The 11-foot wide travel lanes also meet the required width of 11 to 12 feet stated in Section 5.3.3.3 of the Design Guide.

A 33-foot wide cross section is proposed in areas where restricted parking is currently permitted along the corridor. This roadway consists of two 11-foot lanes and a 7-foot shoulder on the south side and a 4-foot shoulder along the north side of Atlantic Avenue.

Bicycle & Pedestrian Accommodations

The proposed improvements include reconstructing the existing sidewalks along Atlantic Avenue and providing wheelchair ramps, compliant with current ADA and MassDOT standards at intersections and driveways. Widening of the roadway to a minimum of 30 feet will improve bicycle accommodations by providing adequate room for vehicles and bicycles to safely share the roadway. New signage and pavement markings will also be installed throughout the corridor for improved bicycle and pedestrian awareness.

Drainage Improvements

It is proposed to replace the vast majority of the drainage system, with 74 new deep sump catch basins, 43 new drain manholes, and approximately 5230 feet of a combination of ductile iron pipe (DIP) and reinforced concrete pipe (RCP). Vertical granite curbing is proposed throughout the corridor to create a closed drainage system that directs stormwater to the proposed inlets. There is a total of 12 existing drainage outlets along the project. The proposed modification, if any, to these outlets is shown below. Three (3) of the outlets will be abandoned due to the modifications of the proposed drainage system. Seven (7) of the outlets will be replaced due to the poor condition of the existing pipes and/or to increase the size of the outlet as required. Stone dissipator pads to reduce outflow velocities and erosion are proposed at locations based on field investigation of each individual area. Because Straits Pond is an ACEC, careful consideration with recommendations from a wetland scientist from CHA and MassDOT was given to each outlet. Stone dissipators qualify as permanent impacts to the ACEC and are only proposed where appropriate based on outflow velocities, adjacent topography, and proximity to the ACEC.

<u>Location</u>	<u>Type</u>	<u>Receiving Waterbody</u>	<u>Disposition</u>
Atlantic Ave. 4+67 RT	8" CMP	Wetland, behind residence	Retain
Atlantic Ave. 19+76 RT	12" RCP	Straits Pond	Abandon
Atlantic Ave. 21+44 RT	12" RCP	Straits Pond	Replace w/ 18" RCP & tide gate
Atlantic Ave. 26+19 LT	12" RCP through Retaining Wall	Gunrock Beach/ Atlantic Ocean	Abandon
Atlantic Ave. 32+66 RT	12" RCP	Straits Pond	Replace w/ 15" DIP, install rip rap slope protection, stone dissipator pad & tide gate
Atlantic Ave. 38+31 RT	12" CMP	Straits Pond, behind residences	Retain
Atlantic Ave. 51+16 RT	8" PVC	Straits Pond	Replace w/ 12" RCP, install tide gate
Atlantic Ave. 54+00 RT	8" CI	Straits Pond	Replace w/ 12" RCP, install tide gate
Atlantic Ave. 57+87 RT	Record 9" Pipe (deteriorated and not visible in field)	Straits Pond	Replace w/ 12" DIP, install tide gate
Atlantic Ave. 60+48 RT	Record outlet (area washed out and pipe not visible in field)	Straits Pond	Abandon
Atlantic Ave. 62+03 RT	8" C.I.	Straits Pond	Replace w/ 12" DIP, install tide gate
Atlantic Ave. 62+79 RT	10" C.I.	Straits Pond	Replace w/ 12" DIP, install stone dissipater pad & tide gate

Catch basin to catch basin connections will be eliminated and a new closed drainage trunk line system constructed. Surface “scupper” pipes discharging stormwater directly from the roadway gutter at Sta. 54+00 and Sta. 62+03 will be eliminated and a closed drainage system proposed to collect surface runoff. Tide gates are proposed at the ends each of the new outlet pipes and will prevent tidal water from washing out the drainage system. Poor soils, right-of-way constraints, and inadequate separation from groundwater limit opportunities to construct stormwater BMPs as outlined in Section 1.4.

Safety Improvements

Safety improvements are proposed throughout the corridor. Lane and shoulder widths will meet MassDOT minimum requirements for major collector roadways, which will improve safety for vehicles and bicyclists. Sight distance at intersections has been reviewed and improvements made where possible.

Existing traffic signs that are in poor condition, or that are not warranted, will be removed. New regulatory and warning signs conforming to the provisions of the MUTCD and MassDOT will be installed. These signs will be consistent with the proposed roadway

design. Thermoplastic pavement markings are proposed to delineate the traveled ways, shoulders, stop lines, and crosswalks.

1.2 OBJECTIVE OF STORMWATER CALCULATIONS

The purpose of this stormwater analysis is to examine the stormwater runoff from the proposed site based upon the Stormwater Management Policy as revised in February 2008. In addition, the design uses BMPs to the extent practicable to reduce source runoff and remove suspended solids.

Stormwater management will be provided according to latest policy established by the Massachusetts Department of Environmental Protection Stormwater Management Policy as revised, and the applicable requirements of the Town of Hull. The goal of the stormwater management system design on this project is to provide water quality improvements and protect the surrounding area from any potential flooding and/or environmental impacts associated with the unmitigated condition.

1.3 METHODOLOGY

Hydraflow Storm Sewers extension for AutoCAD Civil 3D is an easy-to-use, full-featured computer program for urban hydrosystems engineering. The software is utilized as a tool in hydraulic analysis of storm sewer networks. The program can be used to determine the hydraulic grade line for both existing and proposed storm sewer systems. Storm and Sanitary Analysis utilizes the rainfall intensities from IDF curves to determine flows based on the Rational Method.

The site consists of soils with HSG classifications from “A” to “C” type based on soil groups mapped by the USDA Web Soil Survey Map. The soil in the project location consist of Canton-Chatfield rock outcrop complex (HSG A), Paxton fine sandy loam (HSG C), Newsfield fine sandy loam (HSG B), Oxyaquic Udipsammments (HSG A), Canton Urban Land rock outcrop complexes (HSG A), and Urban land-Hooksan complex (HSG A).

1.4 COMPLIANCE WITH STORMWATER MANAGEMENT STANDARDS

The following is an explanation on how the proposed project meets the Stormwater Management Standards as prepared by the Massachusetts Department of Environmental Protection, Revised February 2008. Please refer to the Stormwater Checklist and Certification in Section 5 for additional documentation related to both the site and access road.

Standard 1: No New Untreated Discharges – The project is considered redevelopment and meets this standard to the maximum extent practicable. Stormwater runoff will be directed to existing discharge points and no new discharge locations are proposed. Several discharge pipes will be replaced and enhanced with runoff velocity dissipator stone pads as outlined on page 3 to prevent erosion. Three discharge points will be abandoned. Previous stormwater runoff to these discharge points will be redirected to nearby existing points.

Tide gates are proposed at outlets along Straits Pond to prevent tidal fluctuations from washing out the stormwater drainage system.

Standard 2: Peak Rate Attenuation – The project meets this standard to the maximum extent practicable. The project scope includes roadway reconstruction with minor widening. The project will result in an increase of approximately a 0.03-acres of impervious surfaces over the 1.3-mile long project. This includes both roadway widening and sidewalk areas. There are large impervious areas being removed at certain intersections that will offset the proposed roadway widening and sidewalks. Many of the areas where roadway widening will occur are impervious or unvegetated disturbed areas, which may contribute untreated, silt-laden runoff to resource areas. The project will provide granite curb along the edges of roadway, revegetate the edges of roadway, and prevent gutter flow from eroding these disturbed areas. This widening will yield a minimal increase in the flow and volume to the outlets. Stone dissipater pads are proposed where appropriate, based on impacts to Straits Pond, topography, and discharge velocities, to mitigate the increase in flow due to the proposed closed drainage system and widening.

Detention BMP's were considered for this project but ultimately deemed not practicable due to a high groundwater table, proximity to the Straits Pond ACEC, and lack of suitable land due to topography and abutting residential buildings near discharge points.

Standard 3: Recharge – The project meets this standard to the maximum extent practicable. The project will result in a 0.03 increase in impervious surfaces over the 1.3 mile long project that will constitute a minor reduction in groundwater recharge over existing conditions.

Recharge BMP's were considered for this project but ultimately deemed not practicable due to a high groundwater table, proximity to the Straits Pond ACEC, and lack of suitable land due to topography and abutting residential buildings near discharge points.

Standard 4: Water Quality – The project meets this standard to the maximum extent practicable. The proposed stormwater management system improves upon the existing drainage by eliminating catch basin-to-catch basin connections. Seventy-four (74) new deep sump catch basins (25% TSS removal) are proposed as a part of this project. The proposed tide gates at discharge points along Straits Pond will prevent tidal fluctuations from washing out the drainage system. See Section 4.1: Water Quality Calculations and Section 4.2: Total Suspended Solids Calculations.

Water quality BMP's were considered for this project but ultimately deemed not practicable due to a high groundwater table, proximity to the Straits Pond ACEC, and lack of suitable land due to topography and abutting residential buildings near discharge points.

Standard 5: Land Uses with Higher Pollutant Loads – Standard 5 does not apply to the project. There are no land uses with higher pollutant loads within the project area.

Standard 6: Critical Areas – The project meets this standard to the maximum extent practicable. The project abuts Straits Pond, a portion of the Weir River ACEC which is a Outstanding Resource Water (ORW). Straits Pond is not classified as an impaired water body by the DEP, but due to tidal interchange with the Weir River estuary at the tide gate under Nantasket Avenue, it may have elevated levels of fecal coliform. Roadway reconstruction and related improvements associated with this project are not anticipated to increase levels of the identified impairments. Existing discharges that convey surface runoff directly to the pond are proposed to be collected in a closed drainage system with deep sump catch basins and tide gates to improve treatment over existing conditions (see Standard 4). In addition, the project offers some spill prevention by improving pavement condition, roadway drainage, intersection geometry, and installing new guardrail that will reduce the likelihood of errant vehicles entering Straits Pond.

Standard 7: Redevelopment and Other Projects Subject to the Standards only to the maximum extent practicable – The project is a redevelopment and the design is subject to meet Stormwater Management Standards #2, #3, and the pretreatment and structural stormwater BMP requirements of Standards #4, #5, and #6 to the maximum extent practicable. Existing stormwater discharges will comply with Standard #1 only to the maximum extent practicable. The project will also comply with all other requirements of the Stormwater Management Standards and improve upon existing conditions as outlined throughout this report.

Standard 8: Construction Period Pollution Prevention Plan and Erosion and Sedimentation Control – The project meets this standard. The Contractor will be required to obtain a NPDES Construction General Permit containing a Construction Period Pollution Prevention Plan. Erosion and sedimentation control (ESC) measures consisting of compost filter tubes and silt fence will be installed at the limits of work within and adjacent to the buffers to coastal beach, coastal bank, and vegetated wetlands/ salt marsh prior to the commencement of construction. Earth moving activities will be conducted only after the ESC measures are installed and inspected.

Standard 9: Operation and Maintenance Plan - The project meets this standard. An Operation and Maintenance plan has been customized to fit the design of the road improvements. Provisions to maintain runoff control devices have been assured through structural, non-structural, and construction management approaches. See Section 2: Long-Term Pollution Prevention Plan.

Standard 10: Prohibition of Illicit Discharges – The project meets this standard. The Operation and Maintenance plan required by Standard 9 includes measures to prevent illicit discharges. Illicit discharges will be discontinued where the elimination of these discharges will not result in stormwater damages to contributing parcels. An Illicit Discharge Compliance Statement is included within this report (See Section 6: Illicit Discharge Statement).

1.5 BEST MANAGEMENT PRACTICES (BMPs)

A system of street sweeping and deep sump catch basins will be used to treat stormwater runoff. See Section 4.2: Total Suspended Solids (TSS) Calculations. A description of the devices incorporated is indicated below.

1. DEEP SUMP CATCH BASINS (74 Each)

Deep sump catch basins are modified versions of inlet structures typically installed on city streets. The deep sumps, with a 4 ft. minimum depth below the invert, are most effective if placed “off-line”, that is they do not have inlet pipes. Deep sumps provide capacity for sediment accumulation and can serve as pretreatment for other downstream BMPs. Gutter inlets are proposed to be connected to drainage manholes with a 4 ft. sump.

1.6 HYDRAULICS AND PIPE SIZING

The closed-conveyance storm drain collection system was analyzed using the Rational Method.

$Q=CiA$ for estimating runoff where C is a coefficient dependent on land cover, i is storm intensity in in/hr based upon published I-D-F curves, and A is area in acres. Q or flow is calculated in cubic feet per second

The project site and access roads were subdivided by catch basin or inlets based upon contributory drainage areas. A C value for each area was assigned based upon overall character of land. C values ranged from 0.9 in paved/impervious conditions to 0.3 for grass and landscaped areas. IDF curves from Boston, Massachusetts are used to establish the rainfall rate for the 10-year event.

Pipe hydraulic design was completed using Manning’s full flow capacity equation for circular pipe with a n-value of 0.013 for concrete, 0.012 for Ductile Iron, and 0.011 for PVC.

$Q = 1.49/n AR^{2/3} S^{1/2}$ where, n is coefficient depending on channel roughness, A is area of flow, R is the hydraulic radius, and S is the channel slope.

The road pipe network infrastructure was designed to handle the 10-year rational storm event solving for Manning’s full flow capacity. The road infrastructure features drainage with conventional inlet and catch basins to assure proper flow during large storm events. Refer to the calculations in Section 3.

1.7 SUMMARY OF STORMWATER CALCULATIONS

Stormwater is treated by deep sump catch basins (25% TSS removal) and semi-annual street sweeping.

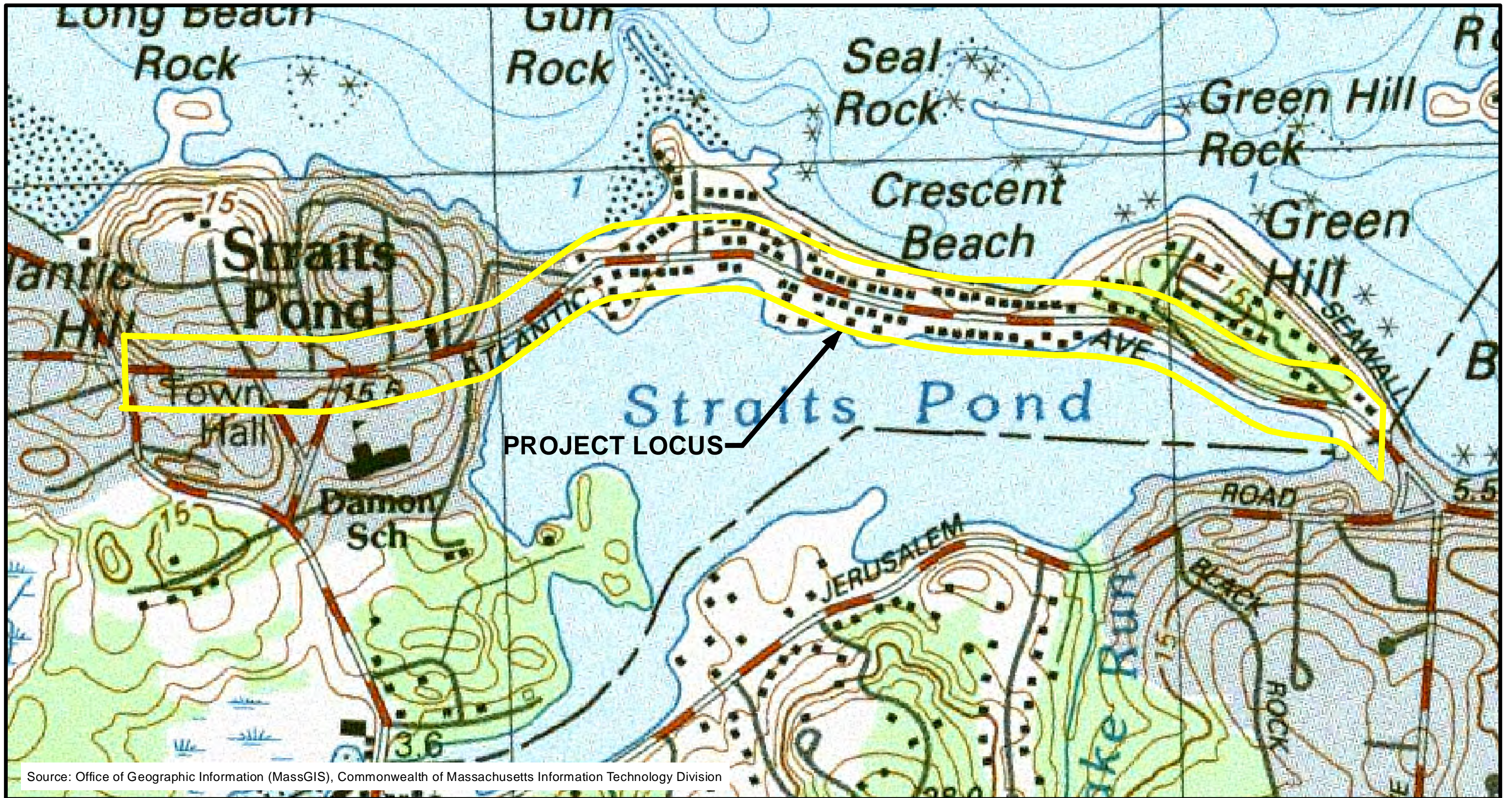
To guard against possible impacts from the proposed improvements, erosion and sedimentation control measures will be incorporated into the sequence of construction. Erosion/sedimentation control installations include placement of compost filter tubes around disturbed areas and silt sacks at storm drainage inlet points. On-going stabilization of disturbed areas should be completed as the work progresses. Restoration/stabilization measures include seeding, mulching, and placement of stabilization fabric where required. The Owner is aware that the project will be subject to the United States Environmental Protection Agency (EPA) Phase II Stormwater Program for land disturbances greater than one acre. The Contractor will be required to file a NPDES Construction General Permit.

1.8 CONCLUSION

In conclusion, the primary goals of the Atlantic Avenue Reconstruction project is to improve pedestrian, bicycle, and vehicular access. In addition to the improved paved surface, the Town seeks to improve drainage and improve safety along the corridor. The following calculations, Manning's full flow pipe sizing, BMP design, and associated documentation within this report have been prepared to illustrate that increases in runoff associated with the redevelopment of the site have been mitigated to the extent practicable.

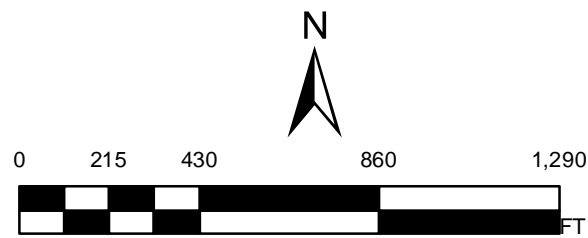
1.9 REFERENCES

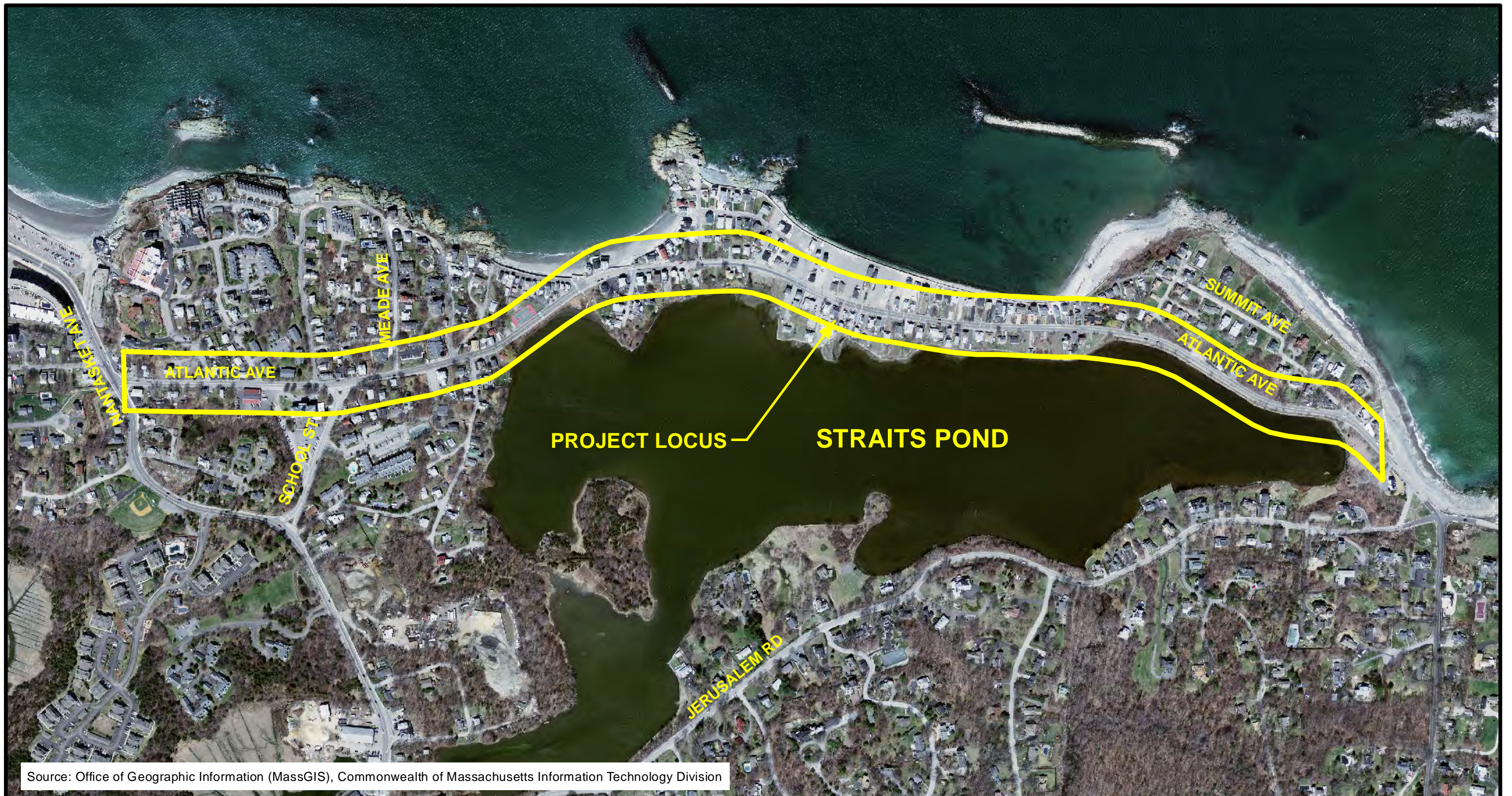
1. Commonwealth of Massachusetts, Department of Environmental Protection, Office of Coastal Zone Management. Stormwater Management Policy Handbook. Volumes 1&2, 1997 (DEP Stormwater Management Policy 1997).
2. Commonwealth of Massachusetts, Department of Environmental Protection, Stormwater Management Standards Handbook. Volumes 1-3 February 2008 (DEP Stormwater Management Policy 2008).
3. Commonwealth of Massachusetts, Department of Environmental Protection. 310 CMR 10.00: Massachusetts Wetlands Protection Act Regulations. 2008.
4. Commonwealth of Massachusetts, Department of Environmental Protection. 314 CMR 6.00: Massachusetts Groundwater Quality Standards. 1990.
5. Commonwealth of Massachusetts, Department of Environmental Protection. 314 CMR 9.00: Massachusetts Water Quality Regulations 2008.



**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

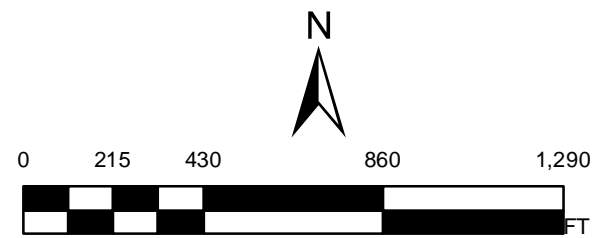
FIGURE 1. USGS TOPOGRAPHY MAP





**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

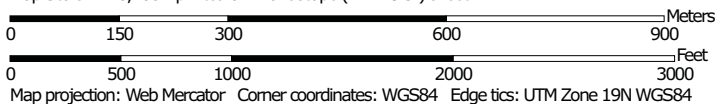
FIGURE 2. LOCUS MAP



Soil Map—Norfolk and Suffolk Counties, Massachusetts, and Plymouth County, Massachusetts



Map Scale: 1:10,400 if printed on A landscape (11" x 8.5") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:25,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
 Survey Area Data: Version 10, Sep 19, 2014

Soil Survey Area: Plymouth County, Massachusetts
 Survey Area Data: Version 7, Sep 19, 2014

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

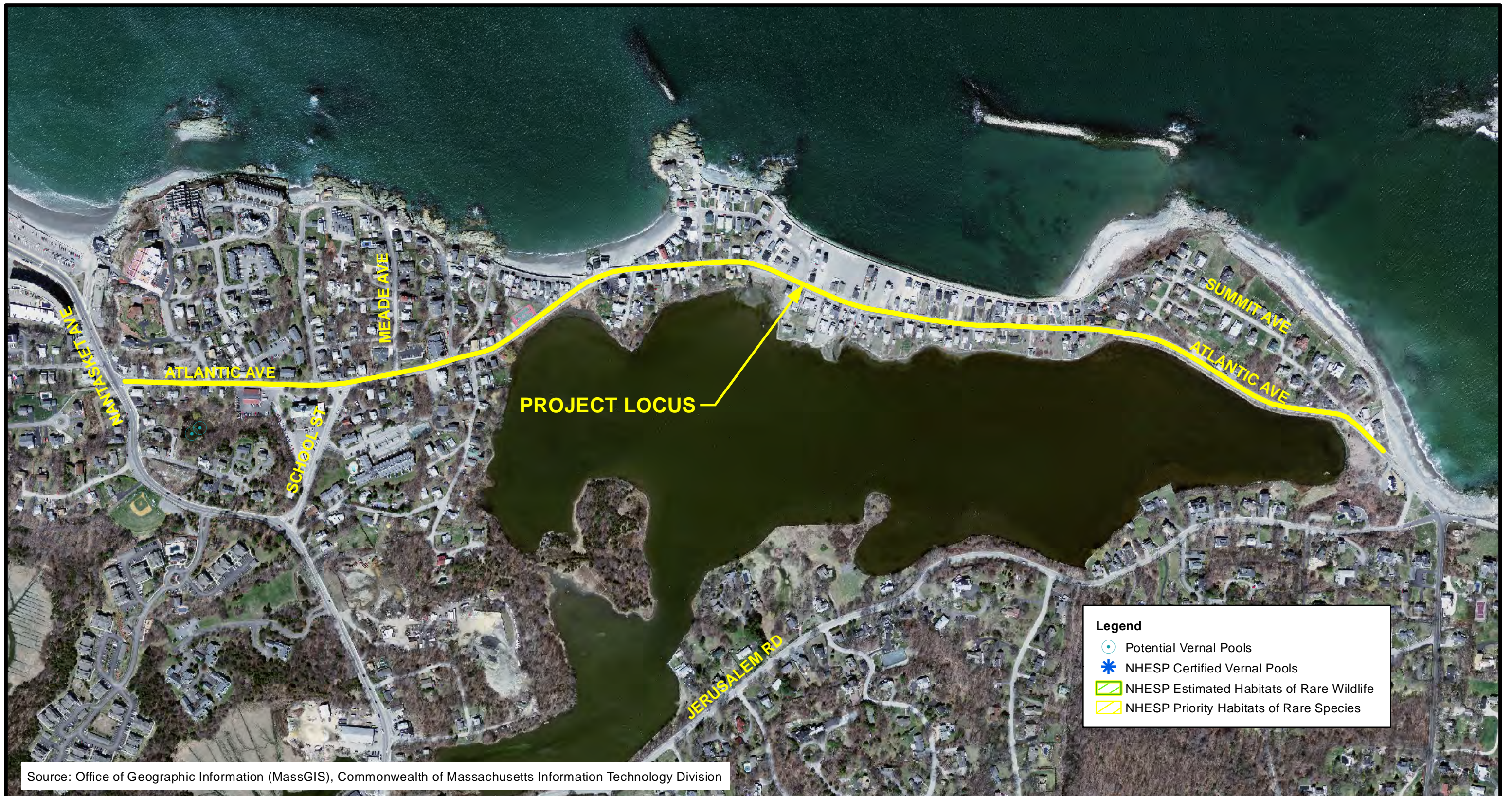
Date(s) aerial images were photographed: Mar 30, 2011—Sep 4, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

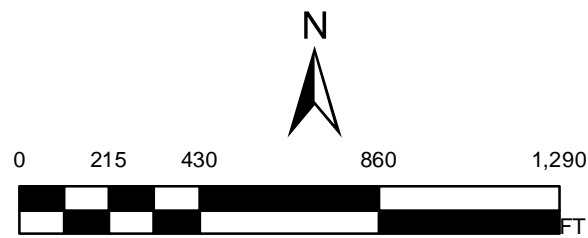
Norfolk and Suffolk Counties, Massachusetts (MA616)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
105D	Rock outcrop-Hollis complex, 3 to 25 percent slopes	0.1	0.8%
610	Beaches	0.1	0.9%
Subtotals for Soil Survey Area		0.3	1.8%
Totals for Area of Interest		14.8	100.0%

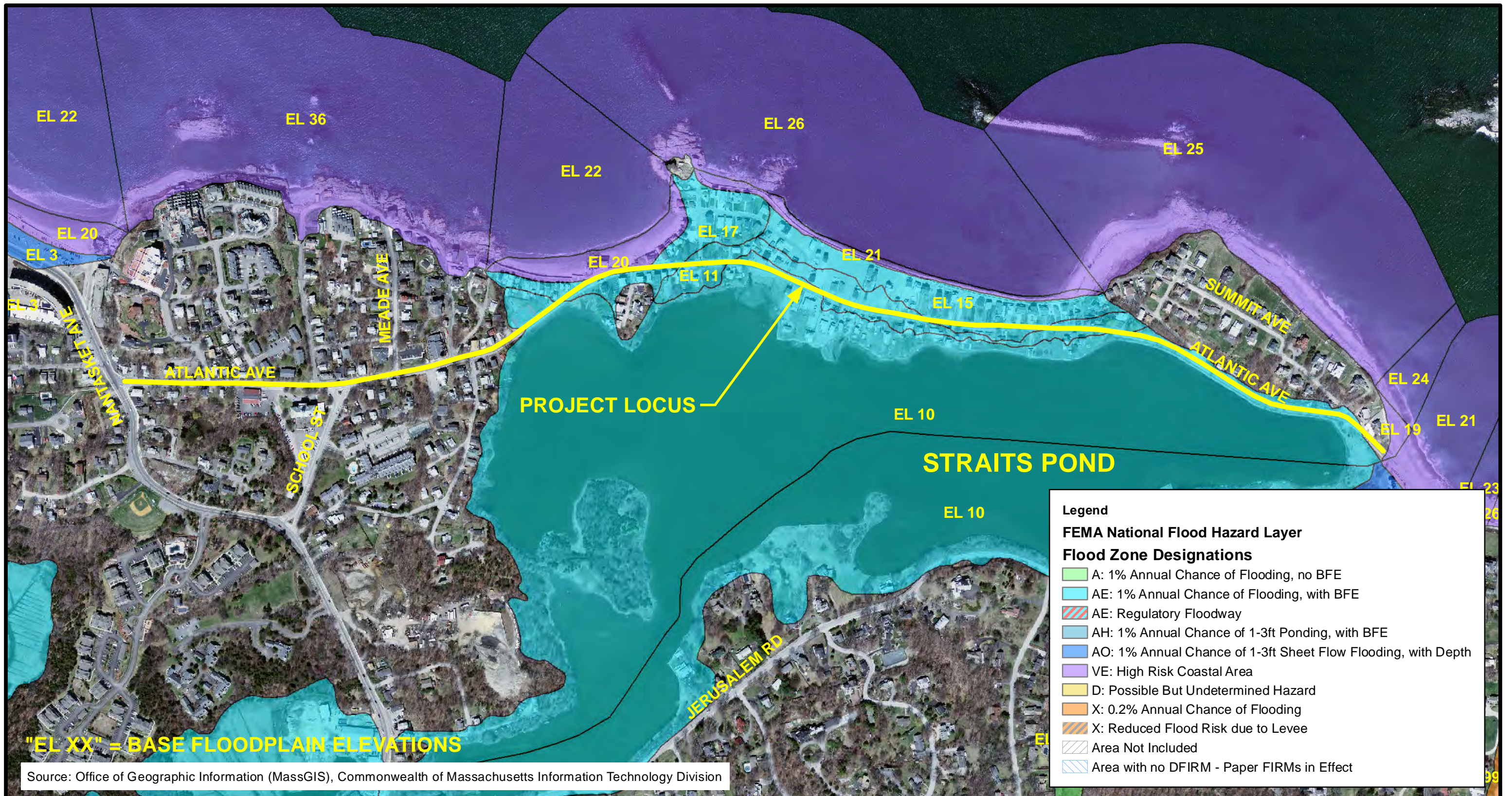
Plymouth County, Massachusetts (MA023)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
110C	Canton - Chatfield - Rock outcrop complex, 8 to 15 percent slopes	0.0	0.1%
110E	Canton - Chatfield - Rock outcrop complex, 15 to 35 percent slopes	1.0	6.5%
306E	Paxton loam, 15 to 35 percent slopes, very stony	2.3	15.8%
607	Water, saline	0.2	1.4%
610	Beaches, sandy	0.2	1.1%
614A	Oxyaquic Udipsamments, 0 to 3 percent slopes	0.7	4.6%
635C	Canton - Urban land - Rock outcrop complex, 3 to 15 percent slopes	6.9	46.9%
639B	Urban land - Hooksan complex, 0 to 8 percent slopes	3.2	21.9%
Subtotals for Soil Survey Area		14.5	98.2%
Totals for Area of Interest		14.8	100.0%



TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION

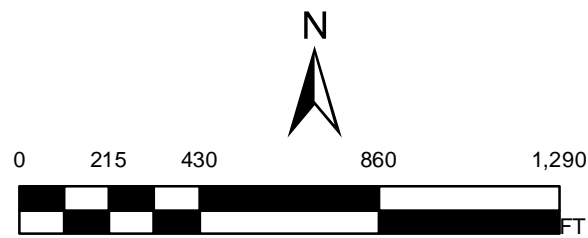
FIGURE 3. NHESP HABITATS

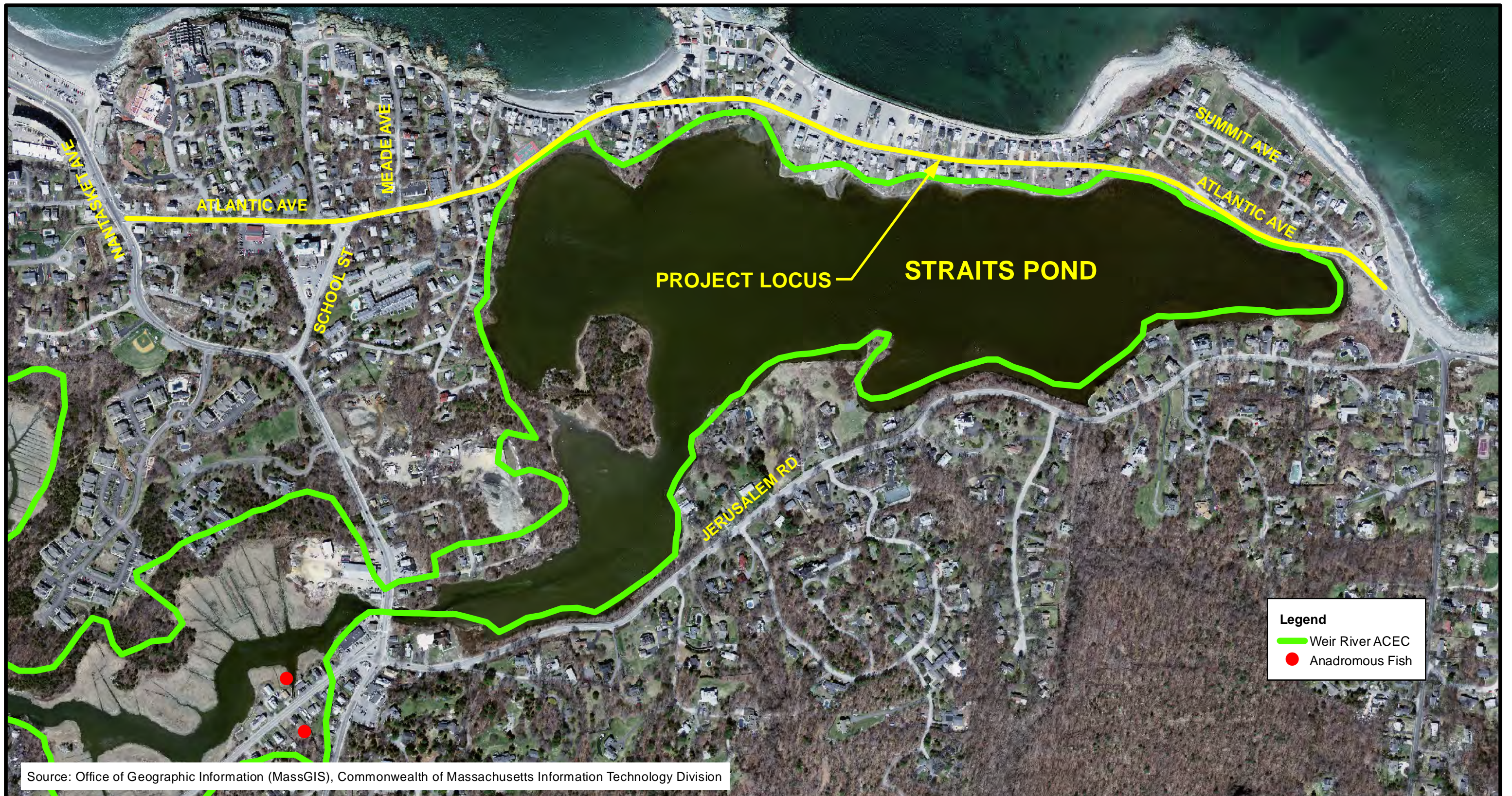




**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

FIGURE 4. FEMA FLOODPLAIN ZONES

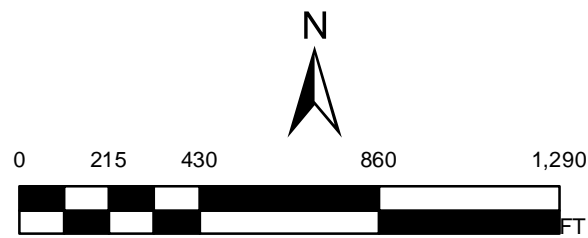




Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts Information Technology Division

**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

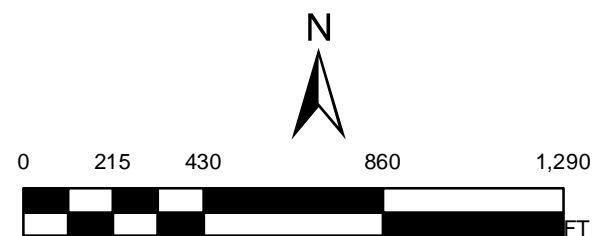
FIGURE 5. ACEC & ANADROMOUS FISH RUN

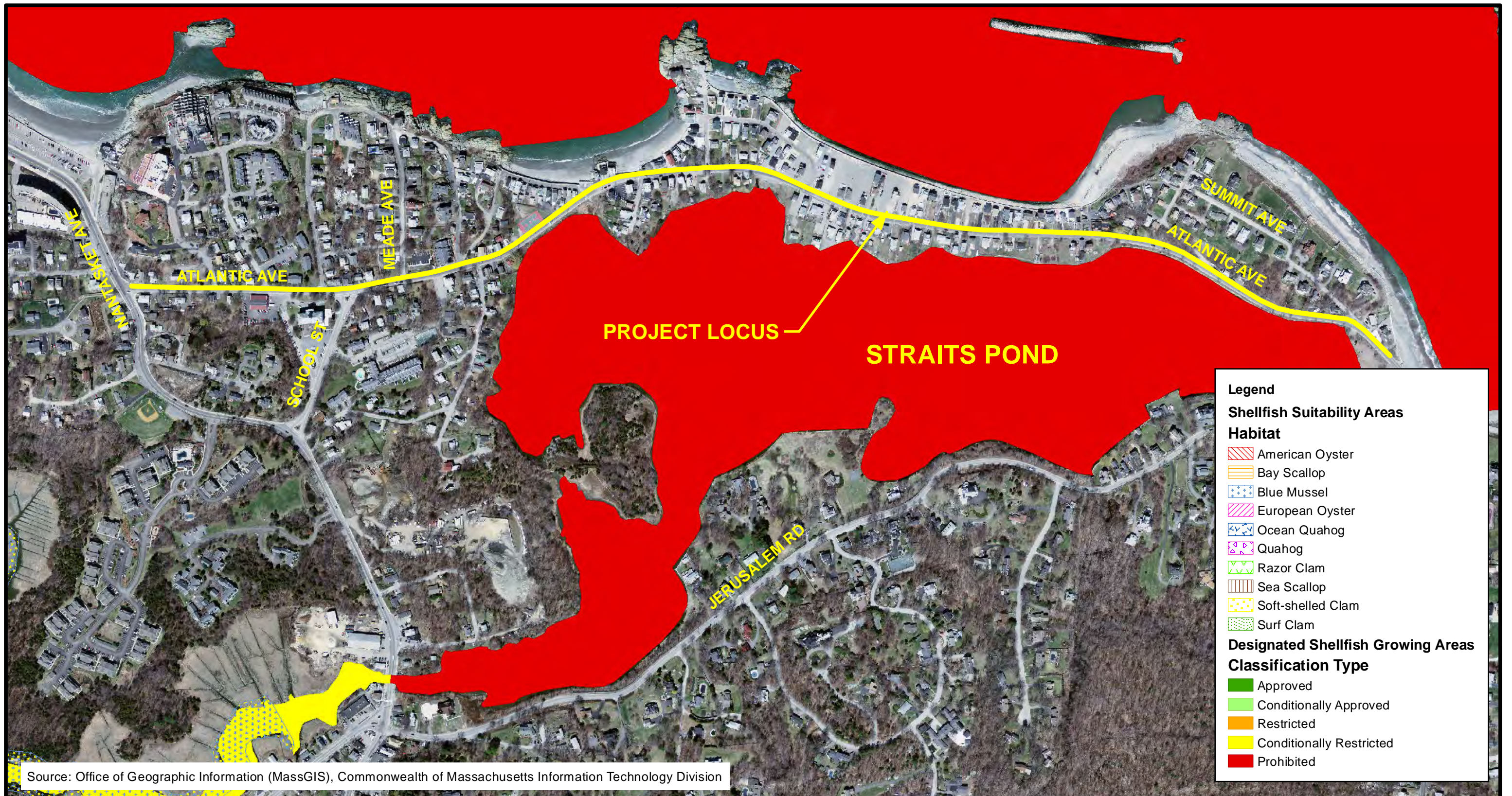




**TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION**

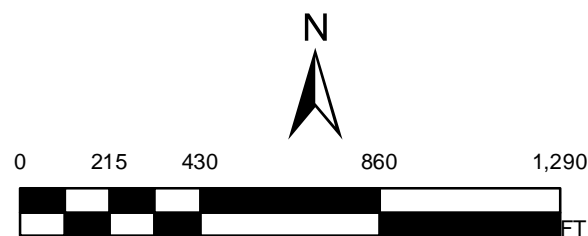
Figure 6. TIDAL JURISDICTION





TOWN OF HULL, MA
ATLANTIC AVENUE RECONSTRUCTION

FIGURE 7. SHELLFISH HABITAT & GROWING AREAS





TOWN OF HULL, MA
 ATLANTIC AVENUE RECONSTRUCTION
 FIGURE 8. STORMWATER OUTLET LOCATIONS

Section 2

Long-Term Pollution Prevention and Operation & Maintenance Plan

RECOMMENDED LONG-TERM STORMWATER POLLUTION PREVENTION PLAN FOR ATLANTIC AVENUE

OWNER AND RESPONSIBLE PARTY:

Owner: Town of Hull

Responsible Party: Town of Hull

PROJECT OVERVIEW:

The Atlantic Avenue Reconstruction Project in Hull, MA is a 1.3 mile corridor improvement project with the goal of rehabilitating the existing roadway, improving drainage, improving intersection safety, and enhancing bicycle and pedestrian accommodations. The project is needed to improve roadway conditions and safety for all roadway users along Atlantic Avenue from Nantasket Avenue to Cohasset town line. Drainage improvements and pavement rehabilitation will increase the life of the roadway. New signage and striping will increase awareness of pedestrian and bicycle users along the project corridor.

CONSTRUCTION MANAGEMENT:

A construction manager with adequate knowledge and experience on projects of similar size and scope shall be employed to oversee all site work related construction. The contractor shall incorporate the appropriate techniques to control sediment and erosion pollution during construction in accordance with the *Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas*. The project will be subject to the United States Environmental Protection Agency (EPA) Phase II Stormwater Program as land disturbances are greater than 1 acre of disturbance. Refer to the SWPPP prepared for additional information regarding construction related erosion & sedimentation control.

During construction, silt-laden runoff or discharge from dewatering operations (if necessary) will be prevented from entering wetlands and resource areas untreated. Siltation barriers consisting of compost filter tubes will be erected in advance of construction along the downstream edge of all disturbed areas and maintained throughout the construction period. Check dams/Compost filter tubes/Sand Bag dikes will be used in temporary constructed drainage ways as necessary to reduce erosion.

If dewatering is required during the construction, runoff will discharge through a temporary sedimentation basin and washed stone prior to discharging into vegetated areas. Outflow of silt-laden runoff shall not be permitted to flow directly into the wetlands or resource areas. Upon completion of site stabilization, the catch basins and existing conveyance system shall be thoroughly cleaned of silt and sediment and made ready for the proposed operation.

Siltation barriers, temporary sedimentation basins, and coffer dams shall be constructed and inspected by the resident project Engineer on a monthly basis or as necessary, after any significant (0.5" or more) storm event and daily while dewatering operations are proceeding.

Care should be taken when constructing stormwater control structures. Light earth-moving equipment shall be used to excavate in the vicinity of the infiltration areas. Use of heavy-equipment causes excessive compaction of the soils beneath the basin resulting in reduced infiltration capacity. At no time shall temporary infiltration areas or settling basins be constructed in the vicinity of the proposed infiltration system in order to prevent the soils from becoming clogged with sediment.

ON-GOING MAINTENANCE CONTRACT

The Owner and responsible party will be required to contract with a maintenance company or hire appropriate staff to complete the following non-structural and structural approaches. The maintenance company will be required to provide adequate personnel and access to proper equipment to complete the tasks.

NON-STRUCTURAL APPROACHES:

STREET SWEEPING

As street sweeping is a BMP under EPA guidelines, this also satisfies other criteria in a comprehensive stormwater management program. The Town shall maintain a program of roadway sweeping to reduce sediment accumulation in the deep sump catch basins. Street sweeping will be performed on semi-annual basis (primarily in the spring and fall) to keep BMPs operating effectively. The Town must maintain an on-going agreement and plan for street sweeping.

GRADING

Atlantic Avenue is an existing roadway with an existing profile that is not proposed to be modified significantly. Slopes will be permanently vegetated to dissipate energy and reduce potential erosion. No constructed vegetated slopes should exceed 2H:1V. Steep slopes may require soil reinforcement and additional vegetation. Slopes that exceed 2H:1V are proposed to be reinforced with rip rap.

FLOW OVER VEGETATED AREAS

Wherever possible, runoff from paved areas and snowmelt shall be directed over vegetated areas to promote settlement of suspended solids before entering a wetland or resource area.

SNOW STORAGE AND DEICING

Designated snow storage will be provided within the Right-of-Way. When the snow piles exceed the allotted space, the Town may load and truck the snow offsite for disposal. The snow will be placed such that melt water will be directed towards the drainage system for treatment.

STRUCTURAL BEST MANAGEMENT PRACTICES:

Prior to final completion of the roadway construction a representative of the contractor and/or Engineer at the Responsible Parties request shall properly instruct the Town of the required maintenance responsibilities to maintain the effectiveness of the drainage system. These frequencies and requirements are recommendations to maintain minimum effectiveness. Ultimately, the Town will implement the procedures and frequencies as they see fit under their current plan and inspect the systems as needed to maintain minimum effectiveness.

DEEP SUMP CATCH BASINS AND MANHOLE STRUCTURES

Catch basins shall be cleaned, in dry weather, when half of the sump capacity is filled or at a minimum of once per year or as required through periodic inspection. Cleaning will take place at the completion of construction and in early spring after sanding of roadways has ceased or as needed depending on the frequency of major storm events (> 1" of rainfall). All manholes shall be inspected at least once annually or as dictated by the responsible party. Any obstructions, sediment, and debris that could potentially cause clogs shall be removed within the conveyance system as necessary. Inverts, grates, and hoods shall be checked and replaced as necessary to maintain hydraulic effectiveness.

LONG TERM STRUCTURAL BEST MANAGEMENT PRACTICE INSPECTION & MAINTENANCE MATRIX AFTER CONSTRUCTION

Note: BMP's shall be visually inspected and repaired by a qualified party in accordance with the following chart. Note these are minimum inspection criteria/frequencies and should be adjusted throughout the project lifespan as required to maintain effectiveness. Refer to maintenance standards for drainage facilities and structural best management practices in the "Recommended Long-Term Stormwater Pollution Prevention Plan."

<i>Conventional & LID Best Management Practices</i>	<i>Recommended Minimum Inspection & Maintenance Frequency</i>	<i>Erosion/Scouring</i>	<i>Tree Growth Hazards</i>	<i>Differential Settlement/Seepage</i>	<i>Structural Damage/Obstructions</i>	<i>Trash & Debris</i>	<i>Removal of Accumulated Sediment</i>	<i>Slope Integrity</i>	<i>*Mow Vegetation/Poor Vegetation Coverage</i>	<i>Remove/Reset Filter Fabric & Stone As Required</i>	<i>Remove & Replace Hardwood mulch/media</i>	<i>Vac Truck Sediment & Contaminants</i>	<i>Remove/Reset Riprap as Required</i>
Deep Sump Catch Basin	Annually		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>	

Section 3

Hydraulic Calculations

STORMWATER REPORT - HYDRAULIC CALCULATIONS

System #	Street Name	Manhole Location		Discharge				Pipe Data					Vertical Control				
		Structures		Drainage Area (Acres)	Coefficient	Tc (Min)	I (In./Hr)	Design Discharge		Diameter (in)	Full-Flow Capacity (cfs)	Full-Flow Velocity (fps)	Invert Elevation		Top of MH Elevation		
		From Inlet	To Outlet					Length (ft)	Slope (%)				Upper	Lower	Upper	Lower	
1	Atlantic Ave	EXIST-CB-1	EXIST-DMH-1	0.00	0.9	5	5.8	1.43	20.3	1.0	12.0	3.62	4.35	20.17	19.96	22.82	14.83
1	Atlantic Ave	EXIST-DMH-1	EXIST-DMH-2	0.00	0.9	5	5.8	1.43	53.8	3.8	12.0	6.94	6.97	17.56	15.52	14.83	11.46
1	Atlantic Ave	EXIST-DMH-2	OUTFALL	0.00	0.9	5	5.8	1.43	15.7	6.2	12.0	8.86	8.29	13.97	13.00	11.46	OUTFALL
1	Atlantic Ave	PROP-CB-1	PROP-DMH-1	0.08	0.9	5	5.8	0.42	23.4	5.1	12.0	8.03	5.41	40.09	38.90	43.59	42.90
1	Atlantic Ave	PROP-CB-2	PROP-DMH-1	0.11	0.9	5	5.8	0.57	12.4	6.8	12.0	9.29	6.56	39.74	38.90	43.74	42.90
1	Atlantic Ave	PROP-CB-72	PROP-CIT-10	0.09	0.9	5	5.8	0.49	30.3	5.2	12.0	8.09	5.70	22.34	20.78	25.84	23.98
1	Atlantic Ave	PROP-CIT-10	EXIST-CB-1	0.00	0.9	5	5.8	0.49	34.4	1.4	12.0	4.21	3.60	20.70	20.22	23.98	22.82
1	Atlantic Ave	PROP-DMH-1	PROP-DMH-2	0.00	0.9	5	5.8	0.98	176.7	7.3	12.0	9.60	7.96	33.80	20.96	42.90	25.08
1	Atlantic Ave	PROP-DMH-2	EXIST-CB-1	0.00	0.9	5	5.8	0.97	76.9	5.8	12.0	3.23	3.63	20.80	16.37	25.08	22.82
2	Atlantic Ave	PROP-CB-3	PROP-DMH-3	0.08	0.9	5	5.8	0.41	19.4	0.1	10.0	1.27	2.42	49.54	49.52	52.04	52.19
2	Atlantic Ave	PROP-CB-4	PROP-CIT-1	0.10	0.9	5	5.8	0.52	16.7	0.2	12.0	2.07	2.43	49.42	49.39	51.92	52.01
2	Atlantic Ave	PROP-CB-5	PROP-DMH-4	0.08	0.9	5	5.8	0.41	20.1	2.0	12.0	5.02	3.87	51.62	51.22	55.12	55.12
2	Atlantic Ave	PROP-CB-6	PROP-DMH-4	0.08	0.9	5	5.8	0.40	13.8	2.9	12.0	6.07	4.35	51.62	51.22	55.12	55.12
2	Atlantic Ave	PROP-DMH-3	PROP-DMH-3	0.02	0.9	5	5.8	0.11	46.5	0.2	10.0	1.32	2.38	49.62	49.52	51.98	52.19
2	Atlantic Ave	PROP-CIT-1	OUTFALL	0.00	0.9	5	5.8	1.77	92.5	2.9	8.0	2.68	8.23	49.39	46.70	52.01	OUTFALL
2	Atlantic Ave	PROP-DMH-3	PROP-CIT-1	0.00	0.9	5	5.8	1.28	8.8	0.9	12.0	2.94	3.61	49.47	49.39	52.19	52.01
2	Atlantic Ave	PROP-DMH-4	PROP-DMH-3	0.00	0.9	5	5.8	0.78	171.9	0.9	12.0	3.44	4.51	51.12	49.52	55.12	52.19
3	Atlantic Ave	EXIST-CB-2	EXIST-DMH-3	0.01	0.9	5	5.8	0.03	22.3	5.4	10.0	6.59	3.13	34.01	32.82	36.91	37.17
3	Atlantic Ave	EXIST-CB-3	PROP-CIT-2	0.03	0.9	5	5.8	0.14	41.8	9.9	8.0	3.79	6.15	25.27	21.15	27.72	23.67
3	Atlantic Ave	EXIST-CB-4	PROP-CIT-4	0.07	0.9	5	5.8	0.38	29.4	1.4	12.0	4.16	3.79	11.95	11.55	15.30	15.09
3	Atlantic Ave	EXIST-DMH-3	PROP-DMH-8	0.00	0.9	5	5.8	0.03	18.8	18.3	12.0	15.24	3.92	32.82	29.39	37.17	33.68
3	Atlantic Ave	PROP-CB-10	PROP-DMH-7	0.10	0.9	5	5.8	0.53	22.7	0.9	12.0	3.35	3.40	35.36	35.16	38.86	39.06
3	Atlantic Ave	PROP-CB-11	PROP-DMH-7	0.14	0.9	5	5.8	0.73	8.5	1.3	12.0	4.06	3.92	34.31	34.20	38.81	39.06
3	Atlantic Ave	PROP-CB-12	PROP-DMH-9	0.16	0.9	5	5.8	0.85	8.3	0.5	12.0	2.47	2.86	22.28	22.24	26.78	26.71
3	Atlantic Ave	PROP-CB-13	PROP-DMH-8	0.10	0.9	5	5.8	0.49	39.9	0.9	12.0	3.34	3.87	29.74	29.39	33.24	33.68
3	Atlantic Ave	PROP-CB-14	PROP-DMH-9	0.07	0.9	5	5.8	0.38	25.2	1.6	12.0	4.54	3.83	23.22	22.81	26.72	26.71
3	Atlantic Ave	PROP-CB-15	PROP-CIT-3	0.05	0.9	5	5.8	0.24	36.6	2.2	12.0	5.30	4.28	19.32	18.51	23.50	22.05
3	Atlantic Ave	PROP-CB-16	PROP-CIT-4	0.08	0.9	5	5.8	0.40	7.1	0.4	12.0	2.32	2.22	11.88	11.85	15.38	15.09
3	Atlantic Ave	PROP-CB-17	PROP-DMH-14	0.11	0.9	5	5.8	0.56	20.1	0.5	12.0	2.38	2.69	4.25	4.16	8.50	8.71
3	Atlantic Ave	PROP-CB-18	PROP-CIT-5	0.14	0.9	5	5.8	0.74	6.4	1.6	12.0	4.44	4.19	4.95	4.85	8.45	8.52
3	Atlantic Ave	PROP-CB-19	PROP-DMH-15	0.05	0.9	5	5.8	0.28	19.8	0.5	12.0	2.53	2.54	4.35	4.25	8.56	8.74
3	Atlantic Ave	PROP-CB-20	PROP-DMH-15	0.08	0.9	5	5.8	0.43	14.3	0.4	12.0	2.31	2.37	5.02	4.96	8.52	8.74
3	Atlantic Ave	PROP-CB-21	PROP-DMH-16	0.14	0.9	5	5.8	0.74	13.6	3.3	12.0	6.48	5.49	7.62	7.17	11.12	11.17
3	Atlantic Ave	PROP-CB-22	PROP-DMH-16	0.12	0.9	5	5.8	0.61	20.5	3.7	12.0	6.86	5.42	7.93	7.17	11.43	11.17
3	Atlantic Ave	PROP-CB-7	PROP-DMH-5	0.05	0.9	5	5.8	0.24	14.5	3.7	12.0	6.88	4.11	51.93	51.39	55.43	55.39
3	Atlantic Ave	PROP-CB-74	PROP-DMH-6	0.18	0.9	5	5.8	0.96	14.1	5.9	12.0	8.65	7.26	43.26	42.43	46.76	46.53
3	Atlantic Ave	PROP-CB-8	PROP-DMH-5	0.06	0.9	5	5.8	0.31	23.4	2.4	12.0	5.51	3.95	51.95	51.39	55.45	55.39
3	Atlantic Ave	PROP-CB-9	PROP-DMH-6	0.14	0.9	5	5.8	0.71	22.6	2.8	12.0	6.00	5.14	43.27	42.63	46.77	46.53
3	Atlantic Ave	PROP-CIT-2	PROP-DMH-10	0.00	0.9	5	5.8	0.14	10.2	3.8	10.0	5.57	4.17	21.05	20.66	23.67	23.41
3	Atlantic Ave	PROP-CIT-3	PROP-CIT-4	0.00	0.9	5	5.8	5.23	128.8	5.4	12.0	8.28	11.20	18.41	11.45	22.05	15.09
3	Atlantic Ave	PROP-CIT-4	PROP-CIT-5	0.00	0.9	5	5.8	5.86	235.6	3.0	15.0	11.20	9.36	11.35	4.27	15.09	8.52
3	Atlantic Ave	PROP-CIT-5	OUTFALL	0.00	0.9	5	5.8	8.77	17.3	1.7	18.0	13.85	8.29	3.30	3.00	8.52	OUTFALL
3	Atlantic Ave	PROP-DMH-10	PROP-CIT-3	0.00	0.9	5	5.8	5.02	30.8	2.6	12.0	5.74	8.25	19.31	18.51	23.41	22.05
3	Atlantic Ave	PROP-DMH-14	PROP-CIT-5	0.00	0.9	5	5.8	2.55	15.4	2.7	12.0	5.82	7.17	3.94	3.53	8.71	8.52
3	Atlantic Ave	PROP-DMH-15	PROP-DMH-14	0.00	0.9	5	5.8	2.01	25.1	0.4	12.0	2.36	3.39	4.15	4.04	8.74	8.71

STORMWATER REPORT - HYDRAULIC CALCULATIONS

Manhole Location		Discharge						Pipe Data				Vertical Control					
System #	Street Name	Structures		Drainage Area (Acres)	Coefficient	Tc (Min)	I (In./Hr)	Design Discharge		Slope (%)	Diameter (in)	Full-Flow Capacity (cfs)	Full-Flow Velocity (fps)	Invert Elevation		Top of MH Elevation	
		From Inlet	To Outlet					Length (ft)	Discharge (cfs)					Upper	Lower	Upper	Lower
3	Atlantic Ave	PROP-DMH-16	PROP-DMH-15	0.00	0.9	5	5.8	1.32	137.2	1.9	12.0	4.96	5.52	7.07	4.41	11.17	8.74
3	Atlantic Ave	PROP-DMH-5	PROP-DMH-6	0.00	0.9	5	5.8	0.53	294.4	3.0	12.0	6.15	6.56	51.29	42.53	55.39	46.53
3	Atlantic Ave	PROP-DMH-6	PROP-DMH-7	0.00	0.9	5	5.8	2.11	195.6	3.8	12.0	6.92	7.81	42.43	35.06	46.53	39.06
3	Atlantic Ave	PROP-DMH-7	PROP-DMH-8	0.00	0.9	5	5.8	3.29	126.6	3.8	12.0	6.94	8.77	34.10	29.29	39.06	33.68
3	Atlantic Ave	PROP-DMH-8	PROP-DMH-9	0.00	0.9	5	5.8	3.78	146.5	4.8	12.0	7.81	9.92	29.19	22.14	33.68	26.71
3	Atlantic Ave	PROP-DMH-9	PROP-DMH-10	0.00	0.9	5	5.8	4.89	64.3	4.1	12.0	7.20	9.87	22.04	19.41	26.71	23.41
4	Atlantic Ave	PROP-CB-23	PROP-DMH-17	0.12	0.9	5	5.8	0.63	12.2	0.7	12.0	3.07	3.07	9.39	9.30	13.89	14.06
4	Atlantic Ave	PROP-CB-24	PROP-DMH-17	0.11	0.9	5	5.8	0.57	21.2	0.8	12.0	3.19	3.19	9.47	9.30	13.97	14.06
4	Atlantic Ave	PROP-CB-25	PROP-DMH-18	0.16	0.9	5	5.8	0.84	11.0	1.1	12.0	3.72	3.83	4.68	4.56	8.18	8.42
4	Atlantic Ave	PROP-CB-26	PROP-DMH-19	0.10	0.9	5	5.8	0.50	42.7	2.5	12.0	5.59	5.17	5.35	4.30	8.85	8.26
4	Atlantic Ave	PROP-CB-27	PROP-DMH-19	0.03	0.9	5	5.8	0.17	7.8	1.5	12.0	4.43	2.71	3.97	3.85	8.47	8.26
4	Atlantic Ave	PROP-CB-28	PROP-DMH-20	0.09	0.9	5	5.8	0.45	12.5	0.8	12.0	4.14	3.45	2.95	2.85	5.95	6.03
4	Atlantic Ave	PROP-CB-29	PROP-DMH-20	0.06	0.9	5	5.8	0.29	20.1	1.0	12.0	4.62	3.58	3.05	2.85	6.01	6.03
4	Atlantic Ave	PROP-CB-30	PROP-DMH-22	0.09	0.9	5	5.8	0.48	12.1	0.3	10.0	1.64	2.62	2.41	2.37	4.81	5.05
4	Atlantic Ave	PROP-CB-31	PROP-DMH-22	0.06	0.9	5	5.8	0.33	20.6	0.4	10.0	1.77	2.81	2.45	2.37	4.87	5.05
4	Atlantic Ave	PROP-CB-32	PROP-DMH-23	0.07	0.9	5	5.8	0.35	12.1	0.2	10.0	1.27	2.08	2.50	2.48	4.83	5.07
4	Atlantic Ave	PROP-CB-33	PROP-DMH-23	0.05	0.9	5	5.8	0.25	20.6	0.4	10.0	1.77	2.73	2.56	2.48	4.89	5.07
4	Atlantic Ave	PROP-CB-34	PROP-DMH-24	0.11	0.9	5	5.8	0.59	12.1	0.3	10.0	1.64	2.76	2.99	2.95	5.40	5.61
4	Atlantic Ave	PROP-CB-35	PROP-DMH-24	0.10	0.9	5	5.8	0.49	21.4	0.4	10.0	1.74	3.04	3.03	2.95	5.48	5.61
4	Atlantic Ave	PROP-DMH-17	PROP-DMH-18	0.00	0.9	5	5.8	1.12	300.1	1.6	12.0	4.50	6.38	9.20	4.42	14.06	8.42
4	Atlantic Ave	PROP-DMH-18	PROP-DMH-20	0.00	0.9	5	5.8	2.46	165.2	0.5	12.0	2.59	3.92	3.56	2.69	8.42	6.03
4	Atlantic Ave	PROP-DMH-19	PROP-DMH-18	0.00	0.9	5	5.8	0.66	21.1	0.4	12.0	2.33	2.56	3.75	3.66	8.26	8.42
4	Atlantic Ave	PROP-DMH-20	PROP-DMH-21	0.00	0.9	5	5.8	3.07	80.7	0.7	12.0	3.86	5.49	2.59	2.03	6.03	5.33
4	Atlantic Ave	PROP-DMH-21	OUTFALL	0.00	0.9	5	5.8	5.38	32.2	0.5	15.0	5.73	5.32	1.95	1.80	5.33	OUTFALL
4	Atlantic Ave	PROP-DMH-22	PROP-DMH-21	0.00	0.9	5	5.8	2.37	77.7	0.4	12.0	2.83	4.09	2.32	2.03	5.05	5.33
4	Atlantic Ave	PROP-DMH-23	PROP-DMH-22	0.00	0.9	5	5.8	1.61	20.3	0.3	12.0	2.52	3.40	2.43	2.37	5.07	5.05
4	Atlantic Ave	PROP-DMH-24	PROP-DMH-23	0.00	0.9	5	5.8	1.04	115.0	0.4	12.0	2.28	3.17	2.95	2.48	5.61	5.07
5	Atlantic Ave	PROP-CB-36	PROP-DMH-25	0.09	0.9	5	5.8	0.45	5.5	0.5	10.0	2.10	3.06	2.78	2.75	5.78	5.80
5	Atlantic Ave	PROP-CB-37	PROP-DMH-25	0.06	0.9	5	5.8	0.29	30.9	1.9	10.0	3.93	4.79	2.84	2.25	5.84	5.80
5	Atlantic Ave	PROP-CB-38	PROP-DMH-26	0.11	0.9	5	5.8	0.57	11.1	4.2	10.0	5.80	6.78	2.81	2.35	5.81	6.05
5	Atlantic Ave	PROP-CB-39	PROP-DMH-26	0.07	0.9	5	5.8	0.35	20.0	2.6	10.0	4.59	4.98	2.87	2.35	5.87	6.05
5	Atlantic Ave	PROP-CB-40	PROP-DMH-27	0.16	0.9	5	5.8	0.83	12.1	1.7	12.0	4.59	4.43	3.75	3.55	7.25	7.45
5	Atlantic Ave	PROP-CB-41	PROP-DMH-27	0.11	0.9	5	5.8	0.56	20.6	1.3	12.0	4.08	3.65	3.82	3.55	7.32	7.45
5	Atlantic Ave	PROP-CB-42	PROP-DMH-28	0.10	0.9	5	5.8	0.54	14.6	2.2	12.0	5.28	4.34	5.99	5.67	9.49	9.67
5	Atlantic Ave	PROP-CB-43	PROP-DMH-28	0.06	0.9	5	5.8	0.32	27.2	1.6	12.0	4.53	3.78	6.11	5.67	9.61	9.67
5	Atlantic Ave	PROP-DMH-25	OUTFALL	0.00	0.9	5	5.8	3.39	145.4	0.5	12.0	3.41	5.10	2.01	1.22	5.80	OUTFALL
5	Atlantic Ave	PROP-DMH-26	PROP-DMH-25	0.00	0.9	5	5.8	2.75	25.9	0.7	12.0	3.97	5.46	2.25	2.06	6.05	5.80
5	Atlantic Ave	PROP-DMH-27	PROP-DMH-26	0.00	0.9	5	5.8	1.98	177.1	0.6	12.0	2.68	3.85	3.35	2.35	7.45	6.05
5	Atlantic Ave	PROP-DMH-28	PROP-DMH-27	0.00	0.9	5	5.8	0.78	288.6	0.7	12.0	3.05	5.06	5.57	3.45	9.67	7.45
6	Atlantic Ave	PROP-CB-44	PROP-DMH-29	0.07	0.9	5	5.8	0.38	8.6	1.7	12.0	4.70	3.61	6.08	5.93	9.58	9.62
6	Atlantic Ave	PROP-CB-45	PROP-DMH-29	0.05	0.9	5	5.8	0.27	26.7	2.7	10.0	4.65	4.95	6.83	6.12	9.58	9.62
6	Atlantic Ave	PROP-CB-46	PROP-DMH-30	0.07	0.9	5	5.8	0.37	26.5	0.9	10.0	2.77	3.89	4.53	4.28	7.28	7.07
6	Atlantic Ave	PROP-CB-47	PROP-DMH-31	0.02	0.9	5	5.8	0.11	20.2	1.5	10.0	3.47	3.31	4.34	4.04	7.09	6.67
6	Atlantic Ave	PROP-CB-48	PROP-DMH-31	0.15	0.9	5	5.8	0.76	9.8	0.3	10.0	1.57	2.87	4.07	4.04	6.41	6.67
6	Atlantic Ave	PROP-CB-49	PROP-DMH-32	0.02	0.9	5	5.8	0.08	24.3	1.6	10.0	3.56	3.27	3.78	3.40	6.53	6.16

STORMWATER REPORT - HYDRAULIC CALCULATIONS

Manhole Location		Discharge						Pipe Data				Vertical Control					
System #	Street Name	Structures		Drainage Area (Acres)	Coefficient	Tc (Min)	I (In./Hr)	Design Discharge		Slope (%)	Diameter (in)	Full-Flow Capacity (cfs)	Full-Flow Velocity (fps)	Invert Elevation		Top of MH Elevation	
		From Inlet	To Outlet					Length (ft)	Discharge (cfs)					Upper	Lower	Upper	Lower
6	Atlantic Ave	PROP-CB-50	PROP-DMH-32	0.10	0.9	5	5.8	0.51	10.3	0.4	10.0	1.78	2.82	3.44	3.40	5.94	6.16
6	Atlantic Ave	PROP-CB-51	PROP-DMH-33	0.16	0.9	5	5.8	0.84	10.4	2.0	10.0	4.05	5.86	3.46	3.25	5.96	6.19
6	Atlantic Ave	PROP-CB-52	PROP-DMH-33	0.03	0.9	5	5.8	0.15	24.5	2.2	10.0	4.23	4.12	3.79	3.25	6.54	6.19
6	Atlantic Ave	PROP-DMH-29	PROP-DMH-30	0.00	0.9	5	5.8	0.62	209.5	0.6	12.0	3.70	4.91	5.62	4.28	9.62	7.07
6	Atlantic Ave	PROP-DMH-30	PROP-DMH-31	0.00	0.9	5	5.8	0.96	52.2	0.4	12.0	2.79	3.24	4.23	4.04	7.07	6.67
6	Atlantic Ave	PROP-DMH-31	PROP-DMH-32	0.00	0.9	5	5.8	1.74	141.0	0.4	12.0	2.30	3.32	3.99	3.40	6.67	6.16
6	Atlantic Ave	PROP-DMH-32	PROP-DMH-33	0.00	0.9	5	5.8	2.24	19.9	0.5	12.0	3.28	4.49	3.35	3.25	6.16	6.19
6	Atlantic Ave	PROP-DMH-33	PROP-DMH-34	0.00	0.9	5	5.8	3.11	31.9	0.5	12.0	3.38	4.89	3.20	3.03	6.19	6.58
6	Atlantic Ave	PROP-DMH-34	OUTFALL	0.00	0.9	5	5.8	3.11	17.6	2.2	12.0	5.23	6.95	2.98	2.60	6.58	OUTFALL
7	Atlantic Ave	PROP-CB-53	PROP-DMH-36	0.09	0.9	5	5.8	0.44	20.6	0.5	12.0	3.23	3.13	3.28	3.18	6.28	7.08
7	Atlantic Ave	PROP-CB-54	PROP-DMH-37	0.08	0.9	5	5.8	0.39	20.6	0.3	12.0	2.50	2.67	3.37	3.31	6.37	7.14
7	Atlantic Ave	PROP-CB-55	PROP-DMH-36	0.02	0.9	5	5.8	0.11	9.5	2.1	12.0	6.73	3.18	3.75	3.55	7.25	7.08
7	Atlantic Ave	PROP-CB-56	PROP-DMH-37	0.03	0.9	5	5.8	0.15	9.2	6.4	12.0	11.72	5.22	3.83	3.24	7.33	7.14
7	Atlantic Ave	PROP-CB-57	PROP-DMH-38	0.01	0.9	5	5.8	0.04	25.6	8.7	12.0	13.69	3.85	6.61	4.37	9.61	7.37
7	Atlantic Ave	PROP-CB-58	PROP-DMH-38	0.01	0.9	5	5.8	0.08	31.4	2.0	12.0	6.61	3.45	5.01	4.37	6.28	7.37
7	Atlantic Ave	PROP-DMH-35	OUTFALL	0.00	0.9	5	5.8	1.20	17.6	0.9	12.0	3.29	3.86	2.85	2.70	6.39	OUTFALL
7	Atlantic Ave	PROP-DMH-36	PROP-DMH-35	0.00	0.9	5	5.8	1.20	28.5	0.5	12.0	3.13	3.73	3.08	2.95	7.08	6.39
7	Atlantic Ave	PROP-DMH-37	PROP-DMH-36	0.00	0.9	5	5.8	0.66	20.3	0.3	12.0	2.52	2.70	3.24	3.18	7.14	7.08
7	Atlantic Ave	PROP-DMH-38	PROP-DMH-37	0.00	0.9	5	5.8	0.11	52.9	1.9	12.0	6.30	3.09	4.37	3.39	7.37	7.14
8	Atlantic Ave	PROP-CB-59	PROP-DMH-39	0.10	0.9	5	5.8	0.50	19.0	0.2	10.0	1.31	2.49	3.59	3.55	6.09	6.07
8	Atlantic Ave	PROP-CB-60	PROP-DMH-39	0.01	0.9	5	5.8	0.07	11.0	0.5	10.0	1.92	1.99	3.55	3.50	6.05	6.07
8	Atlantic Ave	PROP-CB-61	PROP-DMH-40	0.07	0.9	5	5.8	0.38	12.6	1.1	10.0	3.01	3.78	3.59	3.45	6.09	6.08
8	Atlantic Ave	PROP-CB-62	PROP-DMH-41	0.10	0.9	5	5.8	0.52	22.4	0.4	10.0	1.59	2.94	3.07	2.99	5.40	6.30
8	Atlantic Ave	PROP-CB-63	PROP-DMH-41	0.04	0.9	5	5.8	0.20	25.1	0.4	10.0	1.61	2.58	3.08	2.99	5.58	6.30
8	Atlantic Ave	PROP-DMH-39	PROP-DMH-40	0.00	0.9	5	5.8	0.57	17.4	3.0	10.0	4.93	6.03	3.50	2.98	6.07	6.08
8	Atlantic Ave	PROP-DMH-40	OUTFALL	0.00	0.9	5	5.8	1.63	19.9	0.6	12.0	3.45	4.33	2.68	2.57	6.08	OUTFALL
8	Atlantic Ave	PROP-DMH-41	PROP-DMH-40	0.00	0.9	5	5.8	0.71	62.3	0.4	12.0	2.75	2.97	3.00	2.78	6.30	6.08
9	Atlantic Ave	PROP-CB-64	PROP-DMH-42	0.11	0.9	5	5.8	0.59	29.5	4.3	10.0	5.91	6.96	3.59	2.32	4.87	4.94
9	Atlantic Ave	PROP-CB-65	PROP-DMH-42	0.04	0.9	5	5.8	0.20	20.5	0.5	10.0	1.99	2.76	2.54	2.44	4.98	4.94
9	Atlantic Ave	PROP-CB-66	PROP-DMH-42	0.05	0.9	5	5.8	0.28	21.6	0.3	10.0	1.50	2.59	2.47	2.41	4.80	4.94
9	Atlantic Ave	PROP-CB-67	PROP-DMH-42	0.15	0.9	5	5.8	0.80	9.4	0.2	10.0	1.31	2.53	2.41	2.39	4.74	4.94
9	Atlantic Ave	PROP-DMH-42	PROP-DMH-43	0.00	0.9	5	5.8	1.86	42.0	0.4	12.0	2.77	3.80	2.32	2.17	4.94	5.05
9	Atlantic Ave	PROP-DMH-43	OUTFALL	0.00	0.9	5	5.8	1.85	21.0	0.4	12.0	2.86	3.88	2.17	2.09	5.05	OUTFALL
10	Atlantic Ave	EXIST-CB-5	PROP-CIT-6	0.01	0.9	5	5.8	0.06	24.2	1.5	10.0	2.71	2.63	7.21	6.84	9.56	9.39
10	Atlantic Ave	PROP-CB-68	PROP-DMH-45	0.17	0.9	5	5.8	0.89	10.5	1.0	12.0	3.47	3.71	4.52	4.42	8.02	8.32
10	Atlantic Ave	PROP-CB-69	PROP-DMH-45	0.02	0.9	5	5.8	0.10	18.5	2.7	12.0	5.80	2.99	4.91	4.42	8.91	8.32
10	Atlantic Ave	PROP-CB-70	PROP-DMH-46	0.02	0.9	5	5.8	0.12	10.1	1.2	12.0	3.89	2.27	9.11	8.99	12.86	13.05
10	Atlantic Ave	PROP-CB-71	PROP-DMH-46	0.01	0.9	5	5.8	0.03	21.5	1.7	12.0	4.61	1.58	9.11	8.75	13.11	13.05
10	Atlantic Ave	PROP-CIT-6	PROP-DMH-44	0.00	0.9	5	5.8	0.06	42.0	7.7	12.0	12.83	4.06	6.64	3.42	9.39	6.00
10	Atlantic Ave	PROP-DMH-44	OUTFALL	0.00	0.9	5	5.8	1.16	25.2	0.5	12.0	3.20	3.75	3.42	3.30	6.00	OUTFALL
10	Atlantic Ave	PROP-DMH-45	PROP-DMH-44	0.00	0.9	5	5.8	1.10	84.8	0.9	12.0	4.50	4.77	4.22	3.42	8.32	6.00
10	Atlantic Ave	PROP-DMH-46	PROP-DMH-45	0.00	0.9	5	5.8	0.14	230.4	1.9	12.0	4.88	4.06	8.65	4.32	13.05	8.32

Section 4

Stormwater Management Calculations

**STANDARD #3 – GROUNDWATER RECHARGE
ATLANTIC AVENUE – HULL,**

WATER QUALITY VOLUME (WQV)

Site Area = 20.40 acres

Total Existing Impervious = 283,558 sq. ft. = 6.51 acres

Total Removed Impervious = 8,444 sq. ft. = 0.19 acres

Total Additional Impervious = 10,192 sq. ft. = 0.23 acres

Total Impervious = 151,636 sq. ft. = 3.48 acres

WQV based on 1.0 inches

WQV = 1.0/12”x 10,192 sq. ft. (0.23 acres) = 849.33 ft³

GROUNDWATER RECHARGE

Soils are classified as HSG A, B, C & D based on published soil surveys. Soils are estimated to be primarily 67% HSG A, 9% HSG B, 17% HSG C, and 1% HSG D.

Proposed Impervious Area = 10,192 sq. ft. = 0.23 acres

Recharge Volume = ReVa

$$\begin{aligned} \text{ReVa} &= 0.67 \times \text{Ia} \times 0.6'' + 0.09 \times \text{Ia} \times 0.35'' + 0.17 \times \text{Ia} \times 0.25'' + 0.01 \times \text{Ia} \times 0.1'' \\ &= 0.67 \times 0.23 \times 0.6''/12 + 0.09 \times 0.23 \times 0.35''/12 + 0.17 \times 0.23 \times 0.25''/12 + 0.01 \times \\ &\quad 0.23 \times 0.1''/12 \\ &= 0.01 \text{ ac-ft} \qquad \qquad \qquad \text{approx.} = 413 \text{ ft}^3 \end{aligned}$$

INSTRUCTIONS:

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location:

	B	C	D	E	F
	BMP ¹	TSS Removal Rate ¹	Starting TSS Load*	Amount Removed (C*D)	Remaining Load (D-E)
TSS Removal Calculation Worksheet	Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
		0.00	0.75	0.00	0.75
		0.00	0.75	0.00	0.75
		0.00	0.75	0.00	0.75
		0.00	0.75	0.00	0.75

Total TSS Removal =

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project:
 Prepared By:
 Date:

*Equals remaining load from previous BMP (E) which enters the BMP

Section 5

Stormwater Management Checklist



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

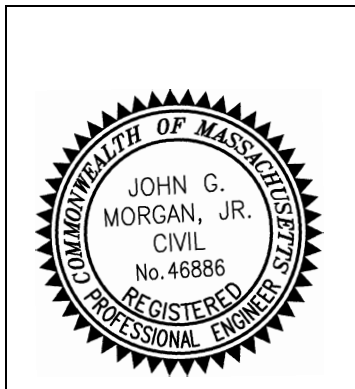
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Signature and Date

9-28-20

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- New development
- Redevelopment
- Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- No disturbance to any Wetland Resource Areas
- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
 - Credit 1
 - Credit 2
 - Credit 3
- Use of “country drainage” versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe): _____

Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - Static
 - Simple Dynamic
 - Dynamic Field¹
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - Site is comprised solely of C and D soils and/or bedrock at the land surface
 - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - Solid Waste Landfill pursuant to 310 CMR 19.000
 - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - is within the Zone II or Interim Wellhead Protection Area
 - is near or to other critical areas
 - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - involves runoff from land uses with higher potential pollutant loads.
 - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
 - The ½" or 1" Water Quality Volume or
 - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - Limited Project
 - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - Bike Path and/or Foot Path
 - Redevelopment Project
 - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance tasks;
 - Plan showing the location of all stormwater BMPs maintenance access areas;
 - Description and delineation of public safety features;
 - Estimated operation and maintenance budget; and
 - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

Section 6

Illicit Discharge Statement


ILLICIT DISCHARGE COMPLIANCE STATEMENT

Standard 10: Massachusetts Stormwater Standards Handbook

Illicit discharges are defined as discharges into waters of the State or municipal separate stormwater system (MS4) that are not entirely comprised of stormwater. Exclusions for non-stormwater discharges into drainage systems include activities or facilities for firefighting, water line flushing, landscape irrigation, uncontaminated groundwater discharge, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, water used to clean residential buildings without detergents, water used for street washing, and flows from riparian habitats/wetlands. These exclusions are subject to change and are under the discretion of the local governing authority.

To the best of our knowledge and professional belief no illicit discharges to the stormwater system, surface waters, or wetland resource areas will remain on the site after construction. We will agree to implement a pollution prevention plan to prevent illicit discharges into the stormwater management system. The design of the site based on the plans and specifications entitled "Reconstruction of Atlantic Avenue and Related Work" prepared by CHA Consulting, Inc., 141 Longwater Drive, Suite 104, Norwell, Massachusetts show a separation and no direct connection between the stormwater management systems and the wastewater and/ or groundwater on the site. To the maximum extent practicable, the design prevents entry of illicit discharges into the stormwater management system.

Engineer's Name: John G. Morgan Jr.
(please print)

Engineer's Signature:  Date: 9-28-20

Company: CHA Consulting, Inc.

Section 4

Project Plans
