

General Project Description

The USEPA, in cooperation with the Town, is proposing construction of a stormwater Best Management Practice (BMP) targeted toward the removal of nitrogen. The project is funded by the *Southeast New England Coastal Watershed Restoration Program* (SNECWRP) which promotes an ecosystem approach to protecting and restoring coastal watersheds from Westerly, RI to Chatham, MA. The SNECWRP is funding pilot projects in Chatham and Barnstable at no direct cost to the municipalities. The project is designed to pilot an innovative stormwater BMP that will tie into existing infrastructure and treat stormwater for both pathogens and nitrogen. The goal of the project is to develop a stormwater BMP that can be shared with other New England communities.

The Oyster Pond BMP would divert stormwater from an existing trunk line that drains approximately 16.9 acres of which an estimated 5.7 acres is impervious. The stormwater network currently discharges at an outfall at the Oyster Pond Furlong Town Landing directly into Oyster Pond. The Oyster Pond BMP project complements prior and ongoing town efforts to mitigate stormwater and wastewater nitrogen impacts in order to restore water quality and ecosystem health in Oyster Pond and the overall Stage Harbor Complex.

A surface gravel wetland is proposed for the Oyster Pond BMP site based on design specifications from the University of New Hampshire Stormwater Center. The proposed gravel wetland treatment system has been designed to accommodate 0.3 inches of runoff over the contributing impervious area. Current design practices for a gravel wetland are to size it to accommodate the water quality volume (WQV), defined as 1-inch of runoff over the contributing impervious area; however, there is insufficient space to enable that level of treatment at this site. Lack of available space will be an issue at many potential sites on Cape Cod so this pilot study will determine the ability of this BMP to be implemented at other locations. The UNH Stormwater Center has noted *"the majority of nitrogen washoff in parking lots occurs with the first 0.3-inch of precipitation"*. Therefore, this stormwater BMP has been designed to treat a minimum of 0.3-inches of runoff from the contributing area.

The general design components are as follows:

- Installation of a new manhole in the existing stormwater trunk line running down Oyster Pond Furlong. A diversion wall will be constructed within this manhole to direct low flows into the stormwater BMP via a new pipe while allowing storms exceeding BMP capacity to bypass through the existing trunk line down Oyster Pond Furlong.
- Pretreatment in a new deep sump catch basin to be installed off-line from the existing trunk line.
- Construction of two gravel wetland cells approximately 3-feet deep, each capable of holding in excess on 0.15-inches of runoff over the impervious area. The initial design calls for these cells to consist of 24 inches of crushed stone, topped by 6 inches of smaller pea stone and 8 inches of loam/wetland soil mix capable of supporting plantings. Due to high groundwater conditions the cells will be lined along the bottoms and sides with an impervious liner to eliminate contact between the stormwater and groundwater. Additionally, a perimeter drain will be installed around a portion of the stormwater BMP to help dewater the area.
- The wetland cells are proposed to be planted with a wetland seed mix.
- The gravel wetland cell will be interconnected with a subsurface pervious piping system to achieve lateral water flow through the BMP.

- Overflow from the second gravel wetland will be controlled by an outlet structure, capable of releasing water into the downstream drainage channel. The overflow structure, combined with the lined basins will serve to always maintain a water level within the underlying gravel layer to anaerobic conditions suitable for nitrogen removal.
- An emergency overflow of riprap will be installed in the second wetland cell, capable of bypassing stormwater in excess of the outlet structure capacity.
- A pervious access road will be constructed around the eastern portion of the cells to allow for maintenance.
- Assuming construction is completed in spring or fall 2015 a monitoring program would begin in summer 2016 to ensure that the BMP is fully functional. Gravel wetland and subsurface gravel wetland systems depend on bacteria and other microbes to reduce nitrogen and other pollutant loads. The microbes require time from construction and "seeding" to full functionality in removing nitrogen and other pollutants.
- Material and equipment storage will utilize the parking area of the Oyster Pond Furlong Town Landing at the end of Oyster Pond Furlong.

Alternatives Analysis

1. No Action Alternative – In the No Action Alternative untreated stormwater runoff from approximately 5.7 acres of impervious area will continue to discharge nitrogen, bacteria and other pollutants directly into Oyster Pond negatively impacting water quality, overall ecosystem health and public use.
2. Alternatives to the Current Design – As discussed in the General Description the site is limited by the presence of wetland resources, and existing roadways on two sides. Initial designs for the BMP have been modified to move the proposed project as far from the BVW as practicable. A sediment forebay was removed and replaced by a deep sump catch basin at the edge of the road, which will provide a comparable level of treatment, to allow the overall system to be moved away from the BVW. The shape of the cells is elongated rather than rectangular to maximize distance from the BVW. The maintenance road has been eliminated on the west side of the wetland cells to allow for BVW setback. A minimum setback of 10 feet to the BVW will be maintained.

Performance Standards Narrative

Pursuant to CWPR 4.03, a conservation variance is requested as the project proposed disturbance within 50ft of the bordering vegetated wetland. The project location is driven by land availability, site constraints, and the need to retrofit the project into the existing stormwater infrastructure. However, this impact is offset by the public benefits resulting from removal of nitrogen, bacteria and other pollutants from the stormwater that will allow restoration of water quality and ecosystem health in Oyster Pond which is heavily used by residents and visitors for swimming, boating, shellfishing (recreational and commercial), and other uses important to the community. Therefore, it is believed that the Conservation Commission can grant a conservation variance for this project with a finding that the project qualifies as an overriding public benefit.

Further, CWPR 3.02 and 310 CMR 10.55 – the project will not destroy or impair the functions of the bordering vegetated wetland.

The lot was created prior to October 6, 1997.

The site is NOT within mapped areas of state-listed rare or endangered species.

Proposed work will not impair the capacity of the area to provide wildlife habitat functions.

Proposed work will not impair groundwater or surface water quality. The project is designed to do the opposite, improve surface water quality. Erosion and sedimentation controls will be employed during construction.