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Town of Barnstable Wastewater Facilities Plan and Final Environmental Impact Report, Executive Summary and Table of Contents

EXECUTIVE SUMMARY
WASTEWATER FACILITIES PLANNING PROJECT

FINAL WASTEWATER FACILITIES PLAN AND FINAL ENVIRONMENTAL IMPACT REPORT

TOWN OF BARNSTABLE, MASSACHUSETTS

1.1 BACKGROUND

The Town of Barnstable (Town) is performing this Wastewater Facilities Planning Project (Project) to provide a comprehensive strategy for wastewater treatment and disposal issues for a 20-year planning period. The planning period design year is 2014 which is 20 years after the Project started in 1993 and 1994.

This Final Wastewater Facilities Plan and Final Environmental Impact Report documents the third of three major phases of the Project. The first phase was the Needs Assessment which was documented in the December 1993 Needs Assessment Report, and identified wastewater needs at several wastewater areas of concern (AOC) in Town and at the Hyannis Water Pollution Control Facility (WPCF). The second phase was the Identification and Screening of Alternative Solutions to meet the wastewater needs, and was documented in the February 1996 Alternatives Screening Analysis Report. The third phase is the Detailed Evaluation, Environmental Analysis, and Development of a Recommended Plan and was documented in the Draft Wastewater Facilities Plan and Draft Environmental Impact Report (Draft WWFP/EIR). This final Wastewater Facilities Plan and Environmental Impact Report has been prepared to address remaining issues of the Project and the Draft WWFP/EIR.

The Study is proceeding with a joint regulatory review process with the Massachusetts Executive Office of Environmental Affairs MEPA Unit and the Cape Cod Commission. The review process was initiated in 1987 when the Secretary of the Executive Office of Environmental Affairs (EOEA) required that the Town prepare an Environmental Impact Report as part of a Town Wastewater Facilities Plan (WWFP). The Town initiated the WWFP with the completion of a Needs Assessment Report and Alternatives Screening Analysis Report, and then filed a Notice of Project Change in March 13, 1996 for the review of these items and the establishment

of a Project scope for the third phase of the Project. Since then there has been interim implementation of several needed upgrades at the Hyannis WPCF and for several sewer repairs and short extensions as approved through additional NPC. These interim implementation projects and NPC are listed below:

1. **Design and Construction of a New Secondary Clarifier for the Hyannis WPCF.** This project dates to April 24, 1996 and the Secretary's Certificate on an NPC which approved a new secondary clarifier at the Hyannis WPCF. The Needs Assessment had identified the secondary clarifier capacity as a limiting factor in treatment capacity and performance. The project was constructed in 1997 and is currently operational.

2. **Design and Construction of Three Short Sewer Extensions.** These projects date to April 24, 1996 and the Secretary's Certificate on an NPC which approved the sewer extensions. These projects include:

- Sewer replacement and extension along Barnstable Road.
- Sewer replacement and extension along Bearses Way.
- Sewer extension along Corporation Street.

These projects are all complete and operational.

3. **Design and Construction of Aeration System and Biological Process Modifications at the Hyannis WPCF.** This project dates to September 15, 1997 and was the construction of modifications to the aeration system and biological nitrogen removal process at the Hyannis WPCF. The Secretary's Certificate on an NPC approved these modifications. This project was recommended in the Needs Assessment and included the following components:

- Conversion of the nitrogen removal process from a cyclical aeration process to a Modified Ludzack-Ettinger process.
- Construction of a new aeration blower building and installation of diffused aeration in the treatment process.
- Installation of new return activated sludge pumps.

The project is complete and the new nitrogen removal process is removing nitrogen to typical values of 5 to 7 mg/L.

4. **Design and Construction of Two Short Sewer Extensions.** These projects date to the September 15, 1997 NPC request and include:

- Sewer extension at Summerside Lane in Hyannis.
- Sewer repair at Center Street in Hyannis.

The projects are complete.

5. **Design and Construction of a Sewer Extension at Norris Street.** This sewer extension was approved with an NPC and includes a small sewer extension into the H1 AOC (Stewarts Creek). The extension is now complete.

6. **Town-wide Wastewater Facilities Planning NPC dated June 23, 2003 (EOEA #6553).** This NPC was filed because more than three years had elapsed since the previous Secretary's Certificate for this project. There was no proposed change to the project scope, but there was acknowledgement that the Massachusetts Estuaries Project had been initiated and nitrogen limits for the Town's coastal estuaries were scheduled to be completed in the next five to eight years.

As part of the NPC review, there was a decision to finish the Wastewater Facilities Plan (EOEA #6553) for the wastewater AOCs that were recommended for connection to the Hyannis WPCF, and to defer recommendation and implementation of the Title 5 technologies (individual and grouped septic systems) for the AOC in the western portion of the Town. The Town did not want to require Title 5 improvements in the western portion of the Town when the Massachusetts Estuaries Project could identify estuarine limits that would require advanced nitrogen removal that is not possible in Title 5 systems. At that time, the project scope for the Town's Nutrient Management Program was reviewed and there was broad agreement on this planning approach.

The Secretary's Certificate for this NPC is included in Appendix 1-3 of this document.

7. **Design and Construction of Future Improvements at the Hyannis WPCF.** These improvements were approved with an NPC and include the design of additional aeration and nitrogen removal process tankage; improvements to the Pretreatment Building and Primary Pump Building; and yard piping improvements. This project has been designed and approved for SRF loans and is scheduled for construction in 2007.

8. **Design and Construction of an Effluent Force Main and a Sewerage Force Main as Part of the Route 132 Road Reconstruction Project.** These improvements were approved with an NPC and include the design and construction of 2 force main systems to be constructed as part of the Route 132 Road Project. This project has been designed and approved for SRF loans and is scheduled for construction in late 2007 and 2008. The approval also allowed for an effluent recharge through sand filter beds at the 6.9-acre property purchased with sewer reserve funds and located adjacent to the Route 6/132 interchange, and 2 short sewer extensions in Hyannis.

There have been three main reports that have been produced and reviewed as part of this project as summarized below.

1. **The Needs Assessment Report** identified wastewater-related problems in over 20 Areas of Concern (AOC) and several problems at the Hyannis WPCF.

2. **The Alternatives Screening Analysis Report** identified and screened alternative technologies and solutions for these problem areas in the following major categories.

- Decentralized treatment and disposal alternatives
- Centralized wastewater treatment and effluent recharge alternatives
- Residuals management alternatives
- Collection system technologies
- Flow and loading reduction alternatives

These alternative technologies and solutions were screened to select the most feasible solutions for detailed evaluation. The most feasible ones were then evaluated in detail and the following AOC were identified for connection to the Hyannis WPCF.

- Long Beach Road Area (AOC Area CE1)

- Red Lily Pond Area (AOC Area CE2)
- Wequaquet Lake, Shootflying Hill Road Area, South of Route 132 and part of Phinneys Lane down to Pine Street (AOC Area CE4)
- Stewart's Creek and Greenwood Avenue Area; and H3, Hall's Creek (AOC Area H1)
- Hyannis Avenue (AOC Area H2)
- Area within the Zone of Contribution for Barnstable Water System well BWMEL1 (AOC Area BWMEL1A and B)
- Area within the Zone of Contribution of Barnstable Water System well BWST1 (AOC Area BWST1)
- Area within the Zone of Contribution managed by the C-O-MM Water District for Well CO7 (AOC Area CO7)
- Residential neighborhood area south of Route 28 along Bearses Way as identified by the Board of Health and based on high density of development (AOC Area Bearses Way).

The other AOC had recommended solutions that were not connected to the Hyannis WPCF such as Title 5 solutions (individual and grouped septic systems). As mentioned above, in June 2003, there was acknowledgement that the Massachusetts Estuaries Project had been initiated and nitrogen limits for the Town's coastal estuaries were scheduled to be completed in the next five to eight years. There was a decision to finish the Wastewater Facilities Plan for the wastewater AOCs that were recommended for connection to the Hyannis WPCF, and to defer recommendation and implementation the AOC in the western portion of the Town (the ones recommended for individual and grouped septic systems).

3. **The Draft Wastewater Facilities Plan and Draft Environmental Impact Report** presented the detailed evaluation of the alternatives and summarized the environmental evaluations to meet the state and regional environmental requirements. The Draft WWFP/EIR was the draft version of this Final Wastewater Facilities Plan and Final Environmental Impact Report.

The purpose of this Final Wastewater Facilities Plan and Final Environmental Impact Report is to summarize the detailed evaluations, and the environmental impact analysis; and present a recommended plan for the Town's wastewater facilities, addressing remaining issues and comments received from the submittal of the Draft WWFP/EIR.

1.2 RECOMMENDED PLAN

A. **Wastewater Collection System Extensions and Improvements.** Wastewater collection system extensions and improvements are recommended to collect the wastewater from the AOC's and convey it to the Hyannis WPCF. These extensions and modifications are briefly summarized below:

1. Extension to connect the Cape Cod Community College (CCCC) including:

    - Route 132 force main (FM) extension to be constructed during the Route 132 Reconstruction Project.
    - CCCC Pump Station and FM extension from Route 132, down Bearses Way to the Hyannis WPCF.

2. Main Street pump station (PS) and force main modifications to address capacity problems with the existing PS, force main, and down-stream collection system. A Notice of Project Change for the modifications was filed and approved because the Town plans to proceed with this project in early 2007 (before a full approval on the EIR is expected).

3. Collection System Extension to the Wequaquet Lake/Long Pond Area (Area CE4).

4. Collection System Extensions to the Stewarts Creek Area (Area H1).

5. Collection System Extensions to the Following Zone II drinking water protection areas including:

    - CO7 Zone II Area
    - BWST1A, B, and C Zone II Areas
    - BWMEL 1 A and B Zone II Areas

It is noted that the Wequaquet Lake/Long Pond Area (CE4) also includes a Zone II contributing area to the Barnstable Fire District Waster Department (BFD-WD) Wells.

6. Collection system extensions to the following coastal protection areas:

    - CEI Area at the Craigville Beach area

- CE2 Area at the Red Lilly Pond Area
- H3 Area at the Hyannis port area

7. Collection System extension to the densely developed areas along Bearses Way where there is much housing stock and many failed septic systems.

8. Old Colony Road pump station improvements to include:

   - New SCADA, pump controls and flow meters.
   - Further evaluations on the 10-inch force main to increase capacity and subsequent improvements.

9. South Street gravity line replacements to increase capacity.

10. West Main Street gravity line modification and replacements to increase capacity.

These extensions and modifications are all illustrated on Figure 7-2. A cost summary on these recommendations is provided in Table 7-3.

B. **Improvements at the Hyannis WPCF**. The following improvements as part of the Hyannis WPCF are recommended:

1. Aeration tank additions and improvements to the Primary Pump Building, Pretreatment Building, Septage Building, and to the yard piping. These improvements are already approved and scheduled for construction in 2007. This project will bring the treatment capacity of the Hyannis WPCF to 4.2 mgd.

2. Effluent facility additions to allow 0.5 mgd effluent recharge at the 6.9-acre site. These improvements are already approved and will begin permitting in the future. These facilities will include:

   - Modifications to the pump gallery
   - Effluent filtration and UV disinfection
   - Piping, valves and sand infiltration beds at the 6.9-acre site

3. Sludge Management improvements and addition of a new employee locker room including:

- Additional thickened sludge storage
- Additional waste activated sludge storage
- Addition of a 3rd sludge thickener
- Addition of a new employee locker and meeting room to replace the outdated existing one.

The locations of the new aeration tank and sludge management facility are illustrated on Figure 10-1. Costs for the Sludge Management improvements and employee locker room are summarized on Table 7-2. The wastewater flows that will be treated at the Hyannis WPCF from the various areas of the proposed collection system are summarized on Table 10-1 and will sum to slightly less than 4.2 mgd which is the capacity of the WPCF once the aeration tank addition is completed (planned in 2008 or 2009).

C. **Groundwater Monitoring Modifications and Implementation of an Adaptive Management Plan for the Effluent Recharge at the Hyannis WPCF Site.** A Groundwater Adaptive Management Plan has been developed to monitor for potential impacts to low elevation properties near the Hyannis WPCF from high groundwater events occurring naturally every 10 to 25 years in combination with an incremental increase to the groundwater elevation due to the groundwater recharge at the WPCF site. It is also developed to identify procedures that will be used if groundwater reaches specific elevations (threshold elevations) in a group of sentinel wells. If groundwater elevations reach elevation threshold levels, the following immediate actions will be implemented:

1. Verify the groundwater rise or potential impact, including:

   a. More detailed survey and site visit to verify the GIS elevations that been used to date.
   b. Possible correlation of groundwater rise to the WPCF recharge.
   c. Investigation of impacts from other possible water sources such as broken water mains or poor drainage.

d. Inquiries to adjacent property owners that may be impacted as to whether groundwater is entering any basement living space or if problems have been noted with operation of their septic systems.

If the threshold elevations are exceeded and the exceedances are believed to be due to Hyannis WPCF recharge at the site, the following correction action alternative evaluations will occur:

1. Evaluate various mitigation alternatives to address the high groundwater that may include the following:

a. Drainage improvements.
b. Wellpoint dewatering and recharge at an appropriate and permitted location.
c. More wide spread rotation of effluent recharge within the Hyannis WPCF sand filter beds.
d. Relocation of up to 0.5 mgd to the 6.9-acre site.
e. Property purchase of the affected property.
f. Evaluation, planning, approval, and implementation of additional remote effluent recharge locations.
g. Discontinuation of sewer connections to properties that want to be served by the sewer (sewer moratorium).

2. Prepare an evaluation report for submittal to MADEP summarizing the evaluations and recommended actions and timetable.

Also, as requested by the CCC, the AMP includes the creation of a Technical Advisory Group (TAG) to review groundwater monitoring and assessments. The TAG will be headed by Mark Ells, DPW Director, and include staff members from the MADEP, CCC, SMAST, USGS and the Town's DPW. This group may meet semi-annually.

1.3 PLANNED MITIGATION EFFORTS

Collection system extensions are planned in the road layouts to avoid impacts to animal habitats, wetlands, historic area or potential archeological sites. Construction in these areas will impact traffic (vehicle, pedestrian, and bicycle) in the roadways during construction. These impacts will be of short duration and construction will not be timed for the summer season to avoid traffic

congestion. Construction procedures for traffic control, erosion protection, dust control, noise prevention, and wetland protection will be implemented.

The collection system pump stations need to be located in low-elevation areas to be able to utilize gravity pipes that flow to a low area for collection and subsequent pumping. Wetland regulations and permitting will be followed to minimize impacts to any adjacent wetlands.

The Craigville Beach area (CE1 Area) is considered a barrier beach and state requirements (Executive Order 181) have the following stringent requirements for the construction of sewers on a barrier beach.

- All infrastructure must be protected from coastal flood hazards
- The sewers cannot promote additional growth on the barrier beach that would not have otherwise been allowed.

As a result, this collection system extension will be designed to withstand coastal flood hazards with pump stations that will not be flooded with a 100-year storm and all pipes and equipment suitably protected from wave action.

Also Town of Barnstable staff conducted a series of public meetings with citizens and Town Council representatives of Centerville (which includes AOC CE-1) in 2006. The meetings were broadly publicized, including direct mailings. Participants expressed their support for growth controls and a sewer-neutral regulation in the Craigville Beach area. The Town is considering several options that have sewer-neutral results to prevent growth on the barrier beach beyond the growth that is allowed by the current sanitary regulations of Title 5 State code as well as the Town's Board of Health bylaws. (A copy of Chatham's sewer regulation that takes a similar approach is attached in Appendix 10-1 and is being considered as a model for Barnstable's regulation).

The Town of Barnstable is in the process of updating its 1996 Local Comprehensive Plan (LCP). Upon completion, the LCP update will be submitted to the CCC for a determination of consistency with the Cape Cod Regional Policy Plan (RPP). The draft LCP update proposes to establish a "sewer neutral" policy for areas proposed to be connected to public sewers, similar to the Sewer Neutral Regulation adopted by the Town of Chatham. The growth neutral controls are planned to be in place before any sewers are implemented.

1.4 ONGOING WASTEWATER PLANNING EVALUATIONS

The Town has initiated its Nutrient Management Program which will include a large component on Wastewater Management to meet the new nutrient limits being developed by the Massachusetts Estuaries Project (MEP) as discussed in Chapter 1. The Nitrogen limit development work as well as the three years of water quality monitoring are the main components of Phase I of this program that has been on-going since 2002. The full Plan of Study for this planning program is attached in Appendix 1-7.

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