

**Appendix A**  
**Project Scope**

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## PROJECT SCOPE

**Task No. 12: Provide assistance to the CWMP Review Committee (RC) as detailed in the final scope approved at the May 3, 2010 Board of Selectman's meeting as repeated below in the following subtasks:**

**12-1.** Estimate and summarize capital costs for the following alternative wastewater management scenarios.

- **Scenario 3C** which includes the following components:
  - Treatment at the MMR Site (Site 3)
  - Membrane Bioreactor (MBR) and Granular Activated Carbon (GAC), and Reverse Osmosis (RO) treatment to Total Nitrogen (TN) standard of 1 mg/l on average and Total Organic Carbon (TOC) standard of less than 1 mg/l (Treatment system C)
  - Groundwater recharge through injection wells along the Route 151 ROW
  - Groundwater modelling of this recharge (Particle tracking and groundwater mounding) using the subregional model developed previously (described in the Draft CWMP/EIR on page 2-10 and Appendix 2-1)
  - Summary of these modelling evaluations in a Supplementary Investigation and Groundwater Modelling Report that would summarize the findings of these evaluations as well as the findings of investigations of the additional sites as described in subsequent Scenarios
  - Phase 1 and 2 collection system (This is the area along Route 28 and south to Vineyard Sound from the Mashpee Town line to the Falmouth Inner Harbor). Costs will be summarized for this collection system with and without the Falmouth Heights Area (Area outside the Little Pond Watershed area)
  - All Costs will be updated to January 2010 time frame ( phases 1,2,3 )
  
- **Scenario 3D ALT** which includes the following components:
  - Treatment at the MMR Site (Site 3)
  - ENR treatment system at that site to TN standard of 3 mg/l on average
  - Ocean outfall discharge at CC Canal near current Otis AFB WWTF infiltration site. (Assume new forcemain to follow existing forcemain)
  - Evaluate elevation/quantity impacts to Sagamore Lens from an ocean outfall

- Phase 1 and 2 collection system. Costs will be summarized for this collection system with and without the Falmouth Heights Area (Area outside the Little Pond Watershed area)
- Costs will be updated to January 2010 time frame
- **Scenario 2A (modified)** which includes the following components:
  - Treatment at the Falmouth Country Club (FCC) Site (Site 2)
  - Treatment technology to meet the TMDL Nutrient budget which may include MBR and GAC treatment to Total Nitrogen (TN) standard of 2 mg/l on average and TOC standard of less than 3 mg/l (Treatment system B) or ENR treatment to Total Nitrogen standard of 3 mg/l on average with no additional polishing for TOC removal (Treatment system A)
  - Groundwater recharge at various underground leaching system locations identified as follows:

West portion of FCC within Green Pond watershed, Allen parcel (14 acres), Dupee ball field parcel (14.25 acres), AFCEE leaching trenches at Sandwich Rd.

Preliminary analysis of these locations for suitability as discharge sites will be done prior to cost calculations and will form part of added scope of services. These evaluations will include:

- Site visit and inspection
- Review of As-Built drawings and sizing information on the AFCEE leaching trenches at Sandwich Road
- Soil investigation at the sites to include:
  - Excavation of test pits and completion of percolation tests at the bottom of the test pits by a certified soil evaluator similar to the previous subsurface investigations as described in the Alternatives Screening Analysis Report page 5-24 and Appendix 5-2. (Backhoe and operator to complete the excavation to be provided by Falmouth DPW as provided previously)
- Conceptual sizing of infiltration facilities at the sites to accommodate the treated water flows based on infiltration rates developed previously as supported by test pit data received at the sites
- Groundwater modelling (Particle tracking and groundwater mounding) using the subregional model developed previously (described in the Draft CWMP/EIR on page 2-10 and Appendix 2-1)
- Summary of these evaluations in a Supplementary Investigations and Groundwater Modelling Report

- Phase 1 and 2 collection system. Costs will be summarized for this collection system with and without the Falmouth Heights Area (Area outside the Little Pond Watershed area)
- All Costs will be updated to January 2010 time frame ( phases 1,2&3)
- **Scenario 1A (modified)** which includes the following components:
  - Treatment at the Blacksmith Shop Road (BSR) Site (Site 1)
  - MBR and GAC treatment to Total Nitrogen (TN) standard of 2 mg/l on average and TOC standard of less than 3 mg/l (Treatment system B)
  - Groundwater recharge through injection wells along Rt. 28 north ROW, or along the westerly end of Thomas B. Landers Rd. and Rt. 28A ROWs. Other potential site for review is 7.42 acre land swap parcel from 22 Acres Realty Trust, presumably for underground discharge.

Preliminary analysis of the feasibility of this concept will be done prior to cost calculations and will form part of added scope of services. These evaluations will include:

- Site visit and inspection
- Review of soil borings in this area of Falmouth as available from AFCEE or other agencies
- Conceptual sizing and location of injection wells similar to conceptual sizing and location of injection wells as done previously and described in the Draft CWMP/EIR starting on page 4-14.
- Groundwater modelling (Particle tracking and groundwater mounding) using the subregional model developed previously (described in the Draft CWMP/EIR on page 2-10 and Appendix 2-1)
- Summary of these evaluations in a Supplementary Soil Investigations and Groundwater Modelling Report
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- Phase 1 and 2 collection system. Costs will be summarized for this collection system with and without the Falmouth Heights Area (Area outside the Little Pond Watershed area)
- Costs will be updated to January 2010 time frame
- **Scenario 1D** which includes the following components:
  - Treatment at the BSR Site (Site 1)
  - Expansion of the existing ENR treatment system at that site to TN standard of 3 mg/l on average
  - Ocean outfall discharge at Nobska Point at Woods Hole area
  - Evaluate elevation/quantity impacts to Sagamore Lens from an ocean outfall

- Phase 1 and 2 collection system. Costs will be summarized for this collection system with and without the Falmouth Heights Area (Area outside the Little Pond Watershed area)
  - Costs will be updated to January 2010 time frame

The Costs will be summarized in specific categories and groupings to facilitate Town municipal cost sharing and financing evaluations, and decision making. It is noted that costs for Scenario 3C and 1D have been developed and are summarized in the Draft CWMP/EIR document tables 4-3, 4-5, 4-9 and 4-10. The other Scenarios will require additional costing based on the unit costs developed for Scenarios 2A (modified), and 1A (modified).

Subtasks include:

- 1a. Summarize capital cost into the following categories:
  - ▶ Land purchase costs
  - ▶ Construction costs
  - ▶ Contingency costs (25% of construction costs)
  - ▶ Fiscal, legal, and engineering (FLE) (25% of construction costs)
  
- 1b. Group the capital costs into the following categories (each itemized separately) to facilitate cost sharing and funding evaluations:
  - ▶ Cost elements that could be supported by 100% property taxes to include:
    - Soft costs of fiscal, legal, and engineering
    - Treatment and recharge facilities including treated water forcemain from the WWTF to the recharge facility
    - Land acquisition costs
    - Major pump stations and forcemains that lead to the WWTF
  - ▶ Cost elements that could be supported by 50% property taxes and 50% betterment charges (50/50 Split) to include:
    - Peninsular main collection lines and pump stations in the following major roadways: Route 28, Seapit, Seacoast Shores Blvd., Central Avenue, Davisville Road, Acapesket Road, Maravista Avenue, and Worcester Court.
  - ▶ Cost elements that could be supported by 100% betterment charges to include:
    - All other sewer laterals, collection lines, and pumping/lift stations located in the public right-of-way (ROW) serving the residential and commercial/industrial properties.
  - ▶ Cost elements that would be paid by property owners (potential support from low-interest loans as allowed by the Barnstable

County Community Septic Management Program) to connect to the municipal collection facilities in the public ROW to include:

- Piping from the structure to the ROW and any needed sewage pumps to convey the sewage to the ROW.

- 1c. Summarize operation and maintenance (O&M) cost into the following categories:
  - WWTF O&M costs of treatment systems 3C, 2A (modified), 1A (modified) and 1D
  - Collection system O&M costs
- 1d. Summarize the number of Future Sewer Units for the 6 major sewer service areas for use in cost distribution evaluations (Currently summarized in Table 4-3 of the Draft CWMP/EIR) including:
  - Estimate projected future (build out) wastewater flow for these areas
  - Estimate projected future sewer connection at the buildout condition based on the future wastewater generation rate on 170 gpd/residence
- 1e. Summarize these costs (and their basis) into a draft technical memorandum for review by the WPRC.

**12-2.** Develop cost and non-monetary comparison for centralized vs. cluster-system wastewater management for a typical peninsular area (up to Route 28) to be selected by the Review Committee. Subtasks include:

- 2a. Summarize **centralized** capital and O&M costs for this area based on costs developed in Task 1.
  - Capital and O&M costs of the treatment and recharge facilities located outside the peninsular area will be developed based on the ratio of the flow from the peninsular area to the total flow at the WWTF.
  - Capital and O&M costs for the collection system in this area, and lift station and forcemain to the WWTF will be summarized from the costs developed in Task 1.
  - Costs to connect to the municipal collection system in the public ROW will be summarized from the costs developed in Task 1
- 2b. Estimate and summarize **cluster-system** capital and O&M costs for this area based on input from the WPRC including:

- ▶ Number of cluster-systems desired.
- ▶ Treatment performance desired (Enhance Nitrogen Removal standard to 3 mg/l on average, or Biological Nitrogen Removal standard of 7 mg/l TN on average, or TOC removal to 3 mg/l or 1mg/l.
- ▶ Preferred collection system type (gravity, low pressure with grinder pumps, STEP system, STEG system, vacuum system).
- ▶ Cluster system locations and sewersheds.

Selection of cluster system location will be a group activity to review GIS maps made for this discussion and identify vacant and/or other properties for the cluster systems. Also committee preference for the treatment performance desired and collection system type desired will be decided by the committee after presentation of the key issues of the choices. Treated water recharge will be assumed to be through leaching fields and or trenches on Town properties (existing or purchased) using conventional infiltration rates. Costs will be developed with the same contingency & FLE factors as for Item 2a.

- 2c. Summarize cost and non-monetary factor comparison and their basis into draft technical memorandum for review by WPRC

**12-3.** Analyse options for project phasing for the 4 alternative scenarios identified in Task #1. Subtasks include:

- 3a. Identify major collection system sewershed areas as likely sewer-extension phase boundaries in a WPRC discussion.

- 3b. Identify typical time requirements for the following components:

- ▶ Draft CWMP revisions and submittal for MEPA review.
- ▶ MEPA review of Draft CWMP.
- ▶ Revisions and submittal of Final CWMP for MEPA review.
- ▶ Cape Cod Commission DRI approval.
- ▶ Agreement with the site Treatment Site Owner to allow Project to Proceed
- ▶ Allowance for lawsuits or other delay tactics initiated to block treatment site development
- ▶ SRF application preparation and submittal timelines.
- ▶ WWTF preliminary design and groundwater discharge permit approval.
- ▶ Collection system preliminary design.
- ▶ Detailed design of WWTF Phase 1a and production of bidding documents.
- ▶ Detailed design of Collection System Phase 1a and production of bidding documents

- Construction of Phase 1a WWTF and Collection Systems.
- Detailed design of WWTF Phase 1b and Collection System Phase 1b.
- Construction of WWTF Phase 1b and Collection System Phase 1b.
- Additional design and construction phases as needed.

A technical memorandum will be developed describing these time requirements and possible ways that they could overlap in a 20 to 40 year timeline to be distributed to the WPRC before the workshop identified in subtask 3a.

- 3c. Summarize the findings of this task in a draft technical memorandum for WPRC review
- 3d. Receive comments, finalize the technical memorandum, and issue it to the WPRC.

**12-4.** Assist Town in identifying federal and state grant opportunities

**12-5.** Administrative and project management items including:

- 5a. Meeting attendance at 13 Committee meetings
- 5b. PowerPoint and handout preparation for the meetings
- 5c. Project management

**12-6.** Summarize costs for planned sewer implementation for the West Falmouth Harbor and Scranton Avenue areas as developed in the 2001 Wastewater Facility Plan and subsequent evaluations for the West Falmouth Harbor Area including: Summarize the previous evaluations in a technical memorandum with attached excerpts of the previous documents, Update the costs to a timeframe of January 2010

- Provide a brief discussion on The West Falmouth nitrogen TMDL that has been developed since the previous evaluations and identify potential next steps to proceed with implementation of the 2001 approved Facilities Plan. . The discussion will also include any needed process requirements to change the approved plan. No new technical evaluations will be conducted.