

Chapter 11

Potential Sites for Drinking Water Supply, Wastewater Treatment and Recharge Facilities

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POTENTIAL SITES FOR DRINKING WATER SUPPLY, WASTEWATER TREATMENT AND RECHARGE FACILITIES

11.1 INTRODUCTION

The treated water recharge alternatives identified in Chapter 10 can be considered for use at a new wastewater treatment facility site as well as for sites remote from a treatment site. In addition to the screening criteria identified in Chapter 6, considerations for remote siting of treated water recharge facilities include distance from any potential treatment facility, proximity to sensitive embayments, and proximity to zones of contribution to public drinking water supplies.

11.2 POTENTIAL SITES FOR PUBLIC DRINKING WATER SUPPLY

The Municipal Water Distribution System Master Plan developed for the Town of Eastham investigated eleven possible drinking water source sites in the Town of Eastham. All sites were evaluated based on factors such as ownership, ability to meet MassDEP Zone I requirements (minimum 400-foot radius), impacts on environmental receptors, potential yield, water quality and proximity to service area. Of the eleven sites evaluated, four sites were ranked as being “highly favorable” based on the factors mentioned above; three sites within Well-field Protection Zoning District “H” located east of Nauset Road and south of Cable Road and the existing Nauset Regional High School well. Table 11-1 displays the well site screening matrix developed by Environmental Partners Group for the Town of Eastham and Figure 4-2 illustrates the location of these well sites. Sites investigated but not found suitable for drinking water supply are evaluated in the next section as potential sites for treated water recharge.

11.3 POTENTIAL SITES FOR WASTEWATER TREATMENT AND TREATED WATER RECHARGE FACILITIES

In determining potential treated water recharge sites within Eastham, many factors are considered including whether the site is located within an estuarine recharge area and/or a TMDL exists for the watershed, whether the site is town owned and if groundwater studies are favorable. Potential pumping yields have been identified by Environmental Partners Group in Table 11-1. As discussed previously in this chapter, four sites were ranked as being “highly favorable” for drinking water supply; three sites within Well-field Protection Zoning District “H” located east of Nauset Road and south of Cable Road, and the existing Nauset Regional High School well. Therefore, effort is made not to locate a potential treated water recharge site near a potential municipal drinking water supply wells.

Sites investigated through the Municipal Water Distribution System Master Plan are itemized on Table 11-2. Initial analyses include the drinking water supply ranking previously assigned and whether the site is town owned. Based on an “unfavorable” ranking for drinking water supply and the site being a town owned property, the site then receives a “favorable” ranking for a potential site wastewater treatment and/or treated water recharge site. Based on the site potential established in Table 11-2, additional siting factors are incorporated into Table 11-2 including whether a TMDL exists for the watershed, watershed location and soil conditions. Existing conditions evaluated in Chapter 4 are also incorporated into the table, indicating whether the sites are located within interim wellhead protection areas, flood zones, areas of critical environmental concern, MassDEP wetlands, and Natural Heritage and Endangered Species Program estimated or rare species habitats.

In addition to the sites investigated through the Municipal Water Distribution System Master Plan, the Town went through an exercise to determine whether additional parcels in Eastham could be used to site a wastewater treatment facility or treated water recharge. Additional sites were discussed but determined not to be feasible based on various location factors.

These evaluations identify the Roach Property as being the most favorably ranked site although it is located within the Wellfleet Harbor Recharge Watershed which may provide some siting concerns for the Town. The Eastham Senior Center was ranked second but falls within an interim wellhead protection area and estimated or rare species habitat area. Eastham Elementary

School and Nursery School/Day Care are also located within interim wellhead protection areas and estimated or rare species habitat areas in addition to MassDEP wetland areas. The fact that these two sites have schools on the properties may also introduce some public acceptance issues as well.

A. Sizing and Land Area Considerations for Small Treatment Facilities. The land area required for a small wastewater treatment facility is determined by three primary factors:

1. Land area needed for process equipment and operations building.
2. Land area needed for treated water recharge facilities, such as sand infiltration beds or subsurface leaching facilities.
3. The necessary buffer area to visually screen the facility from neighboring properties.

The land area of the process equipment and operations buildings is approximately the same for the different biological nitrogen removal processes identified. The rotating biological contactor process may require slightly more area and the sequencing batch reactor process may require slightly less area, but these incremental increases are small when compared to the land area requirements for treated water recharge facilities and buffer area. Treated water recharge area requirements are based on the use of sand infiltration beds that require the least space and are the easiest to maintain. As previously mentioned, subsurface leaching beds have a larger area requirement, but may have an advantage if they can be located under a parking area or other open space that has a multiple use. The buffer areas required for a particular small wastewater treatment facility will depend on the site selected and the neighboring properties. The buffer areas estimated are based on a separation distance of 100 feet between the property boundary and the process facilities. This separation distance is greater than the distances required by MassDEP's guidelines, but would allow space for a driveway access and sufficient planting to provide a visual screen from adjoining properties. Even greater space is often needed to gain approval from neighboring residential properties.

Typical land area requirements for small wastewater treatment facilities to treat wastewater flows of 10,000, 35,000, and 110,000 gpd (typical flows that might be expected for cluster systems in the planning area) are 1.8, 2.8, and 3.7 acres, respectively. Diagrams indicating a typical plan

view of wastewater treatment systems for these flows are included as Figures 11-1, 11-2, and 11-3, respectively.

11.4 WASTEWATER TREATMENT ISSUES AND REQUIREMENTS FOR TREATED WATER RECHARGE AT NEW REMOTE SITES

The proposed Reclaimed Water Permit Program and Standards Regulations (the “Reclaimed Water Regulations”) 314 CMR 20.00 are a new set of regulations governing the use of reclaimed water in Massachusetts. Reclaimed water is defined as domestic wastewater that is treated to a level such that it is suitable for beneficial reuse. Eliminating or reducing the concentrations of microbial and chemical constituents of concern through treatment and/or limiting public or worker exposure to the water via design or operational controls achieves making reclaimed water suitable and safe.

As the Town considers developing new treated water recharge sites, potential future discharge limits must be considered.

1. Treated water that is recharged into subsurface leaching or irrigation facilities must have low suspended solids to avoid plugging the soil infiltration system and requiring costly repairs. Effluent filtration would reduce this potential.
2. Treated water recharges upgradient of freshwater ponds and lakes would likely need phosphorus removal to avoid the creation of a phosphorus plume that could migrate to the freshwater body and cause eutrophication.
3. The discharge of treated wastewater to the Zone II or IWPA of a well is termed as an indirect aquifer recharge and is considered a form of reclaimed water. The standards are not included in these regulations but in the draft revisions to the Ground Water Discharge Permitting Program Regulations (the “Ground Water Regulations”) 314 CMR 5.00. The Ground Water Regulations currently contain a list of specific effluent limits. These limits are based on the maximum contaminant limits set forth in the Drinking Water Regulations at the time MassDEP promulgated the Ground Water Regulations. To simplify the regulations, MassDEP is eliminating the list of specific effluent limits and replacing the list with a requirement that except

as otherwise provided, all discharges must meet the standards set forth in the Drinking Water Regulations.

The proposed regulations establish three classes of discharge; Class A, Class B and Class C. Class A is the most stringent since the public is more likely to come into contact with the reclaimed water. Class A uses include landscape irrigation such as golf courses, parks, playgrounds and athletic fields. Class B and Class C are described in greater detail in Chapter 12 under the wastewater reuse and recycling section. The most critical standards for Class A are listed below:

pH	6.5 - 8.5
BOD Concentration	≤10 mg/L
Turbidity	≤2 Nephelometric turbidity units (NTU)
Fecal Coliform Content	Median of non-detectable (ND)/100 ml over continuous seven day sampling periods with no one sample to exceed 14/100 ml.
TSS Concentration.....	≤5 mg/L
TN Concentration	≤10 mg/L

It should be noted that on a case-by-case basis, MassDEP may establish a limit on phosphorus and/or establish a limit on total nitrogen that is more stringent than 10 mg/L in order to maintain or achieve compliance.

4. MassDEP may not allow discharge of a chlorinated effluent into a Zone II area due to the possible formation of disinfection byproducts. In this case, ultraviolet radiation disinfection would be needed.

These requirements and issues will need to be incorporated into the individual site evaluations.

11.5 WASTEWATER REGIONALIZATION

The Town of Orleans which neighbors Eastham to the south completed a Draft CWMP in October 2008. The Draft recommended plan proposes a new wastewater treatment facility at the Tri-Town Septage Treatment Plant which is located near Exit 11 of Route 6. The Tri-Town Facility (Wastewater Treatment Site) and proposed collection area is illustrated on Figure 11-4.

The Draft CWMP discusses coordination with Brewster and Eastham on wastewater regionalization. The Town of Orleans is currently involved with a wastewater regionalization study funded by the Cape Cod Water Protection Collaborative, “Shared Watershed, Shared Responsibilities” Grant Program. The application is titled *Application by the Town of Orleans to Investigate Economies of Scale Associated with Regional Wastewater Infrastructure and Appropriate Cost Sharing Formulas* which is expected to show cost savings through shared wastewater facilities. The recommended plan discusses how regionalization of this type would aid in the watershed-wide effort to demonstrate TMDL compliance.

As towns enter into the CWMP process, and the results of MEP Technical Reports and TMDLs are released for additional embayments, it becomes more apparent that water quality issues cross municipal lines and therefore effective solutions may also cross these lines. The Draft MEP Technical Report for the Rock Harbor Embayment system states that approximately 79 percent of the existing wastewater nitrogen loading to the watershed needs to be removed to remediate the impacted water quality in the lower portion of the watershed. The Rock Harbor Estuary is shared by the Towns of Orleans and Eastham.

The Nauset-Town Cove Estuary nitrogen limits are currently being developed by the MEP and are expected to be released by July 2009 and will identify nitrogen removal responsibilities for the Towns of Eastham and Orleans. A preliminary estimate of the wastewater nitrogen that needs to be removed from this watershed (discussed earlier in Chapter 4) indicates that 55 percent of the existing wastewater nitrogen needs to be removed to meet the proposed limit.

Coordination with the Town of Orleans will continue as the costs of regional treatment at the Tri-Town Facility are developed and considered.