

Chapter 10

Summary of Environmental Impact Analysis

CHAPTER 10

SUMMARY OF ENVIRONMENTAL IMPACT ANALYSIS

10.1 INTRODUCTION

In accordance with the MEPA review process, an Environmental Impact Report (EIR) is required as part of the Town of Chatham's CWMP. The Code of Massachusetts Regulations (301 CMR 11.00) provides the outline for the information required for the EIR and this information is presented as part of the Comprehensive Wastewater Management Planning Report. The purpose of this chapter is to outline the existing conditions of the Town; and provide an analysis of effects for the Town of Chatham's recommended plan and the "No Action" alternative.

The existing conditions establish an environmental baseline to help assess the potential impacts of construction and operation of the recommended plan and the no action alternative. Following the establishment of the existing environment and the environmental impacts associated with the Town of Chatham's preferred plan (Phases 1 and 2) versus the no action alternative, a recommended plan is then selected and any potential impacts are identified. Mitigation measures are then identified, where practicable, to minimize these impacts to the proposed sites, while allowing for full functionality of the proposed facilities.

The main focus of this CWMP is to address the nitrogen TMDLs developed for Chatham's estuaries. Based on the evaluations performed as part of the CWMP, this is best accomplished by sewerage Chatham, first to address TMDLs, and then as a comprehensive sewer system for the entire Town. This would include transmission of the wastewater to the Chatham WWTF, upgrade of that facility to increase treatment capacity and performance, and then recharge of the treated water back to the groundwater. The main focus of the environmental impact analysis is the upgrade of the WWTF and the sewer extensions that have been recommended for addressing the TMDLs (Phase 1) and then future expansion to sewer the entire Town (Phase 2). It is at

these locations that the greatest environmental benefit will occur and the potential impacts associated with construction. These areas were described in detail in Chapter 2.

10.2 EXISTING ENVIRONMENT

A. **Introduction.** To properly assess the potential site impacts, background information regarding the physical, biological, chemical, economic, and social conditions of the Town must be outlined. The majority of this information was compiled in the August 1999 Phase I Needs Assessment Report and the several documents prepared as part of the MEP project, outlined in Chapter 4.

Environmental information is outlined in the EIR to aid in the assessment of the three alternatives by establishing existing conditions in these wastewater AOCs. However, for the purpose of this report, overall existing conditions will be discussed since the AOCs encompass such a large area of the Town of Chatham. AOC detail will be outlined for existing conditions where additional data is available and directly pertinent to the WWTF project planning decision-making.

Figure 1-1, Project Location Map, illustrates the project location and some existing conditions in Chatham.

B. **Town-wide Environmental Features.** These features are described in detail in Chapter 4 of the 1999 NAR and additional detail on freshwater ponds and coastal embayments are discussed in Chapters 2 and 4 of this report, respectively.

10.3 NATURAL RESOURCES

A. **Topography.** Chatham, like most towns on Cape Cod, is comprised mostly of glacial deposits. Chatham consists of hilly, wooded areas to the north and west and barrier beaches to the south and east. Chatham has numerous kettle hole ponds, salt-water pond estuaries, beaches and coastal dunes. Ground elevations in Town vary from Mean Sea Level (MSL) to an elevation of 130 feet at Great Hill. The Town is bordered to the north by Pleasant Bay, to the south by Nantucket Sound, to the east by the Atlantic Ocean, and to the west by the Town of Harwich. The mainland part of town is approximately 7,600 acres. This does not include the 2,900 acres,

which make up Strong Island, Monomoy Island, and Nauset Beach (which is part of the Cape Cod National Seashore). Chatham's surface topography is identified on Figure 10-1.

B. Geology/Soils. The Chatham Open Space and Recreation Plan describes the Town of Chatham as being divided into two geologic units: Chatham Kame deposits and Harwich outwash plains. Bedrock is estimated to be 250 to 500 feet below mean sea level (MSL), and the glacial deposits are presumed to be underlain by layers of clayey silt and compacted till. The Chatham Kame deposit is a 1.5-mile long steep ridge in the middle of Chatham, due south of Ryder's Cove. This formation is surrounded by the Harwich outwash plains, with larger boulders and till located to the east of the Kame deposit (Open Space and Recreation Plan, 1985).

C. Groundwater. The Town of Chatham receives its drinking water from the Monomoy Lens, which is a sole source aquifer that also provides drinking water to Brewster, Dennis, Harwich, and Orleans.

Groundwater flow has been examined multiple times and referenced in several reports. These reports indicate that groundwater recharge occurs at the central parts of Chatham and flows towards Nantucket Sound, Chatham Harbor and Pleasant Bay. Several pumping tests have been conducted in Chatham to determine the Zones of Contribution (ZOC) for existing and future drinking water supply wells. Values of hydraulic conductivity from these tests have ranged from 38 to 290 ft/day, with a typical value estimated at 150 ft/day. Many reports identify the existence of an upper and lower aquifer system, separated by a segmented silty clay layer with limited vertical hydraulic conductivity values from 0.025 to 10 ft/day.

The Town of Chatham approved a Water Resource Protection District at Town meeting in 1996. This district, established by the Water Resource Protection District Bylaw, included the existing Zone II areas known at that time; estimates for Zone II areas expected for five proposed wells; and a 200 foot buffer area at the Zone II areas. See Figure 10-2.

The Water Resource Protection District was extended to the boundaries of the properties that were crossed by Zone II areas with few exceptions for site specific considerations.

D. Fresh Surface Waters. The Town of Chatham contains no navigable freshwater streams or rivers, but does contain numerous freshwater ponds. There are 28 named fresh water ponds in Chatham, most of which are located to the west of the Route 28 loop. The Commonwealth of Massachusetts defines any pond larger than 10 acres as a “Great Pond”. Of the 28 named ponds in Chatham, seven fit this description. These ponds are (from largest to smallest): Goose Pond, Lovers Lake, White Pond, Mill Pond, Schoolhouse Pond, Stillwater Pond and Emery Pond. It is noted that only three of these ponds (Goose Pond, Schoolhouse, and White Pond) have designated public access. The Town has acquired property adjacent to Mill Pond, Stillwater Pond, and Lovers Lake; however, formal public access has not been established.

The majority of the ponds in Chatham were formed as a result of receding glacial movements across Cape Cod. As the glaciers receded, chunks of ice broke off and were buried by glacial outwash. When the ice melted it formed what are known as kettle holes or glacial lakes. Some of the more prominent of these kettle hole ponds are: Goose Pond, White Pond, Lover’s Lake and Schoolhouse Pond.

Water quality of the Town’s fresh water ponds is discussed in greater detail in Chapter 2 and the Action Plan for the Town of Chatham Ponds, included in Appendix C.

E. Coastal Embayments. The Town of Chatham is bordered to the south by Nantucket Sound, the east by Chatham Harbor and the Atlantic Ocean, and the north by Pleasant Bay. Each of these major surface saltwater bodies help form the coastal embayments for which Chatham is known. Chatham’s coastal embayments are one of the Town’s most valuable resources. They support a valuable fin fishing and shell fishing industry, which provides year-round jobs; they provide scenic beauty and recreational areas, which have created the Town’s vacation and tourism industry.

The water quality impacts on the Town’s coastal embayments are discussed in greater detail in Chapter 4 and the MEP Reports. These impacts are the primary focus of the CWMP.

F. Wetlands. Wetlands occur in both salt and freshwater environments, and are valuable for flood protection, nutrient uptake and release, wildlife habitat and propagation, groundwater recharge and open space for recreation and scenic beauty.

Salt marshes comprise 1,120 acres or approximately ten percent of the Town. The largest salt marshes are located behind the barrier beaches along Nantucket Sound. In addition, the Town has 2,230 acres of tidal flats, 1,100 acres of marine flats, and 1,130 acres of estuarine flats.

Wetlands are identified in Figure 10-3. The delineations were developed from Massachusetts DEP mapping. Each of these wetlands is delineated with a 100-foot buffer zone, which is based on Federal and State wetland regulations and Chatham's local regulations regarding on-site treatment systems. According to the Title 5 regulations (310 CMR 15.0000), the minimum setback requirement for Bordering Vegetated Wetlands (BVW), salt marshes, and inland and coastal banks is 50 feet for Soil Absorption Systems. The Town of Chatham has expanded these setbacks. According to the "Town of Chatham – Minimum Requirements for the Subsurface Disposal of Sanitary Sewage", no disposal facility shall be closer than 100 feet to a watercourse. A watercourse is defined as:

Any natural or man-made stream, pond, lake, wetland, coastal wetland, swamp, or other body of water and shall include wet meadows, marshes, swamps, bogs, and areas where groundwater, flowing or standing surface water, or ice provides a significant part of the supporting substrate for a plant community for at least five (5) months of the year.

G. Floodplains and Velocity Zones. Floodplains are nature's way of buffering land from excessive storm events because they act to dissipate the wind and wave action generated during these storms. The Town of Chatham Protective By-law prohibits new development within areas designated as V (Velocity) Zones by the Federal Flood Insurance Program. V-Zones are designated by the Federal Emergency Management Agency (FEMA) and are defined as areas susceptible to 100 year coastal flooding with high velocity wave action. The V-Zones are illustrated in Figure 10-4.

A-Zones are also designated by FEMA and are areas where flooding is predicted to occur once every 100 years. This flooding occurs with minimal associated wave action, and these areas are located landward of the V-Zones, typically in salt marshes and low elevation areas of Chatham. The surface elevations in these areas typically lie below ten feet MSL. The A-Zones are illustrated in Figure 10-4.

H. **Forests.** As a result of Chatham’s rapid development throughout the years, forests and open space have been dramatically reduced. According to the Open Space and Recreation Plan developed by the Town of Chatham in 1985, the Town has experienced a 20 percent reduction in total forested area from 1951 to 1980. The plan also identified that only 21 percent of the Town at that time was forest. The Town Forest is the largest single wooded area owned by the Town at 148 acres. The forest is located along the western side of the Town along the Chatham/Harwich Town line.

I. **Protected Natural Areas.**

1. **Massachusetts Natural Heritage Program.** The Massachusetts Natural Heritage Program (MNHP) maintains an atlas of estimated habitats and priority sites for rare plants and wildlife on Cape Cod. The atlas identifies estimated habitat, which should be protected for these species. These areas are shown on Figure 10-3. Table 10-1 lists those species found in Chatham currently listed as endangered, threatened or species of special concern.

2. **Area of Critical Environmental Concerns.** The Pleasant Bay Area of Critical Environmental Concern (ACEC) encompasses northern portions of Chatham (Figure 10-4). The major water bodies and landmasses in the ACEC are: Mill Pond (in northwest Chatham), Muddy Creek, Minister Pond, Lovers Lake, Stillwater Pond, Frost Fish Creek, Pleasant Bay, Ryder's Cove, Crows Pond, Bassing Harbor, and Strong Island. The entire Pleasant Bay ACEC is over 9,000 acres and includes 12 threatened or endangered species, with an additional 16 species identified as of special concern in Massachusetts. The Pleasant Bay Resource Management Plan (Pleasant Bay TAC, et al, 1998) was adopted in 1998, updated in 2003 and 2008. Although not included within the ACEC boundary, Chatham Harbor and its watershed is included in the resource management plan planning area.

3. **Chatham Conservation Foundation Lands.** This Conservation Trust is one of the oldest land trusts on Cape Cod. The trust has accumulated over 550 acres (Chatham Planning Department) of land throughout Chatham, via private purchase, donation, and easements. These lands are used as open space and recreational areas. Some of these lands have hiking trails while other lands are protected as natural habitats.

4. **Cape Cod National Seashore.** In 1961, the United States Congress established the Cape Cod National Seashore (CCNS) as part of the National Park Service. The CCNS was developed to protect sensitive natural, cultural, and recreational resources on Cape Cod. The southern portion of Nauset Beach is the only area of the CCNS in Chatham. Currently it is undeveloped and is separated from mainland Chatham by Chatham Harbor and Pleasant Bay. Portions of this barrier beach have been identified as a habitat for species protected by both the Commonwealth of Massachusetts and the Federal Government. South Beach (part of Nauset Beach prior to the 1987 breach) is also part of the CCNS although the beach is owned by the Town (Chatham Planning Department).

5. **Areas of Critical Marine Habitat.** The Pleasant Bay ACEC Resource Management Plan in 1998 identified several critical marine habitats including four in Chatham waters. These areas include: sandy tidal flats, muddy tidal flats, eelgrass beds, fringe marsh, and areas of freshwater up welling. These areas provide much needed habitats for finfish, shellfish and other aquatic wildlife.

Those areas designated by the plan are:

- The intertidal zone and flats north of Tern Island, south of Ministers Point, and west of the channel.
- The intertidal zone and flats south, east, and west of Strong Island.
- The intertidal zone of Nickerson's Neck from the Strong Island Town Landing to the southeastern tip of Fox Hill.
- The intertidal zone of Nickerson's Neck from the Chatham Yacht Club north to the 7th tee of Eastward Ho! Country Club.

10.4 ASSESSMENT OF IMPACTS

A. **General.** An assessment of impacts is performed to assess the environmental impacts of the two proposed alternatives developed, the Town of Chatham's preferred alternative and the "No Action" alternative. The assessment of impacts is a detailed description of the negative and positive potential environmental impacts of the proposed project and its alternative(s). The purpose of the EIR is to assess quantitatively, to the extent practicable, the direct and indirect potential environmental impacts from all aspects of the planned project that are within the scope;

as well as the short-term and long-term impacts. This information, in combination with the cost-benefit analysis and the previously discussed screening information will then be used to select the best alternative for the Town of Chatham and will recommend it as part of the Draft CWMP for the Town.

A rating system was developed to aid in analyzing the alternatives and their impacts on the existing conditions in the planning areas. The rating system examines the impact on each parameter discussed previously in this Chapter and assigns it a numerical value of -2, -1, 0, 1, or 2. Negative values represent the magnitude of the negative impacts of the parameter on the environment, and positive values represent positive impacts. A rating of zero indicates that there is either no impact or it is negligible. Each of the parameters is described briefly in the following section of this chapter.

The ratings are summed for each alternative to develop a total value and the final ranking of the alternative.

B. General Impacts of all Alternatives.

1. **Soil Disturbance.** Construction of an on-site system or a treatment plant requires soil excavation for wastewater facilities, building foundations, tanks and other structures. The actual amount of soil disturbance for a site is a function of the size of the facility, and the topography of the individual sites involved.

Construction and/or repair of an on-site system disturbs a much smaller area than construction of a centralized treatment facility based on the relative size of the treatment system, but repairs to a large number of these systems within Town can translate into a large overall soil disturbance.

Conversely, a modification to the existing WWTF requires large excavations in a localized area, but drastically reduces the number of sites impacted. Centralized treatment does require additional construction and expansion of the existing collection system, but the soil beneath the roadway is already considered disturbed and thus collection system construction is not considered a major impact.

2. **Surface Water Quality and Hydrology.** The Town of Chatham has numerous fresh and saltwater ponds, but no major rivers within its borders. With proper erosion control and site protection measures in place, surface water quality impacts due to construction will be negligible.

Wetlands, bogs, ponds and the ocean represent the major surface water bodies potentially impacted (benefited) by treated water recharge from the existing or any proposed new facility. Since the Town is not directly discharging to any of these aforementioned surface waters, the impacts on the water quality is a function of infiltration from the groundwater.

A concern, associated with increased wastewater flow to the existing WWTF, is the generation of a groundwater impact to this portion of Town. Extensive USGS and local groundwater model scenarios have been run to evaluate treated water recharge impacts at the WWTF (and other remote sites) on wells and water bodies. The MEP evaluations for Cockle Cove Creek determined that nitrogen concentrations above the existing concentration in the creek (approximately 3 mg/L) would not cause an impact. The preferred alternative would meet this limit.

Modifications to the existing WWTF will produce a higher quality effluent than achievable with on-site septic systems and will improve the water quality by reducing the nitrogen discharged to the Town's estuaries as required by the nitrogen TMDLs. Elimination of on-site septic systems along freshwater ponds and lakes will eliminate the flow of phosphorus-laden wastewater to these systems and will aid in the improvement of the water quality in these areas.

3. **Groundwater Quality and Hydrology.** Groundwater hydrology could be impacted by any of the proposed plans since all require groundwater recharge. Currently, the Town of Chatham draws its drinking water from a sole source aquifer.

Groundwater modeling has shown that groundwater mounding at the WWTF generated by increased flow will not alter the groundwater flow path of the existing landfill plume or the general groundwater flow path, potentially impacting the Indian Hill Well.

Subsurface leaching systems will affect groundwater flow, but as the flow is distributed over larger areas the overall impact on the groundwater's flow direction is reduced.

Although on-site systems (especially the ones designed for nitrogen removal) reduce the amount of nutrients and contaminants that enter the groundwater, these reductions cannot compare to those produced by a centralized wastewater treatment and recharge facility designed for total nitrogen removal to 3 mg/L. A centralized wastewater treatment facility provides a higher level of treatment, reducing nitrogen and providing improved BOD and TSS removal.

Any advanced treatment helps improve the groundwater quality, especially in areas of dense development, because the groundwater is no longer being impacted by the nutrients from on-site septic systems, cesspools and failed on-site treatment systems.

The overall groundwater quality will improve from implementation of the preferred alternative.

4. **Air Quality.** During any construction, dust is often generated on site. Emissions generated by construction equipment also have negative impacts on air quality. To reduce these impacts, proper pollution control measures are necessary to limit these effects and provide a positive means to prevent airborne dust and reduce vehicle emissions.

Odors generated during operations at the WWTF and pumping stations can be limited by designing centralized treatment facilities with odor control units and tank covers. On-site systems typically only generate odors during pump-outs, repairs, or system failures.

5. **Noise.** The majority of noise impacts are generated during the construction phase of any project. The larger the extent of construction, the more noise associated with that work. In Chatham, noise impacts from collection system construction will be greatest in the Planning Areas with narrow streets and where buildings are in close proximity to both the road and each other. Noise will also be a problem during any on-site system construction, but for a shorter duration.

Modification to the existing WWTF will generate minimal noise impacts on neighboring properties. The existing property has an adequate buffer from these properties. Modifications to the wastewater treatment facilities can be designed to minimize noise from pumps and blowers by designing the buildings accordingly.

6. **Wildlife Species and Habitat.** The impacts on ecosystems vary based on the size of the area being disturbed during construction. Construction at any site considered pristine, would pose the largest impacts to natural habitats in those areas.

Improved effluent quality, resulting from an improved wastewater treatment process, provides a more positive impact on the surrounding environment. With improved wastewater treatment, shellfish beds and wetland areas will receive less nutrients and other contaminants, and as a result these areas will experience improved water quality through reductions in contaminant loadings.

7. **Wetlands.** The majority of construction for any of the proposed alternatives will be located outside of the 100-foot buffer zone to any existing wetlands. Construction of the collection system should avoid wetlands, as these systems are projected to be installed in the right-of-way of existing roads. Any construction within the 100-foot buffer to the wetlands shall be performed following the proper protocols to protect the wetlands.

As previously discussed, improving effluent quality helps improve Town-wide water quality which has positive effects on the health of the wetlands.

8. **Coastal Zones.** Impacts to coastal zones could result from the repairing and replacing of existing on-site systems, collection system construction along the coastline, or in flood zones. These impacts can be reduced through proper implementation of erosion control and other mitigation measures.

The recommended plan's primary goal is to meet the TMDLs set by MassDEP and USEPA and therefore, implementation of any plan to meet these goals will provide great improvement over existing conditions for the coastal embayments.

9. **Traffic.** Chatham's roadway infrastructure varies depending on location. Some areas consist of many narrow or private roads. Any construction on these roads will create traffic problems. Repair, replacement or expansion of existing collection systems in these areas will also create traffic problems, especially during the summer. Collection systems require construction within road right-of-ways, which is more disruptive than the construction of on-site septic systems. Alternative routes and designated trucking and equipment routes will help

alleviate these problems. Therefore, the Town has decided that collection system construction shall be done in the “off season” and major road work will not be performed during the summer months (June through August).

10. **Scenic Qualities, Open Space, and Recreation.** Limited impacts on scenic qualities, open space and recreational facilities may occur during construction, especially during the installation of collection systems. These impacts are to be kept to a minimum during the construction process. Operation of facilities with advanced nitrogen removal will help improve water quality in the Town’s coastal embayments, improving the scenic quality and improving the water quality. Sewering properties will also remove the phosphorus-laden wastewater from Chatham’s fresh water ponds, thereby reducing or eliminating the eutrophication of these water bodies. Impacts to open space, scenic quality, and recreation can be kept to a minimum through design, architecture and landscaping.

11. **Historic Resources.** Chatham is an historic town and any construction on or near properties in the Historic District of Town has the potential of negatively impacting historic sites or archaeological sites, both known and unknown. Because collection systems are located under roadways they are presumed to have minimal impacts on the land within the road right-of-way (ROW). Because streets are narrow, there is always the chance of disturbing existing structures adjacent to roadways during construction, and these impacts would have to be minimized. Any new structures located inside the Historic District could also be architecturally designed to remain consistent with the character of the Town.

As part of this Comprehensive Wastewater Management Plan, none of these sites is to be adversely impacted as a result of the implementation of any of the alternative plans. As part of the MEPA process, the MHC will be providing comments and recommendations on any proposed sites which may have historical or archaeological significance.

12. **Land Usage.** Land usage for the EIR alternative analysis examines a property’s current usage, potential future usage, and what impacts construction and operation of a treatment facility or on-site system has on an individual site. Improved wastewater treatment can improve land use and provide increased flexibility in the types of use allowable for various sites. The Town may be required to acquire land or establish utility right-of-ways in order to expand the

existing collection system, which would be considered negative impacts to the current owners of those properties.

Growth is always a concern when working in towns on Cape Cod, but growth in Chatham has continued over the years without extensive centralized wastewater treatment facilities and if this trend continues, the Town has been concerned over the negative impact it could have on the Town and its resources. Therefore, the Town has developed a growth neutral regulation with respect to sewer extensions.

13. **Water Usage.** Water usage is not expected to increase drastically during the construction of any new facilities. Construction will require some increased water use during plant testing, startup, and for dust control.

Chatham already has high water demands in the summer months due to the tourist populations, but may see a slight increase in year-round water use following installation of additional collection systems. This is often curbed by the water and sewer billing program that encourages water conservation, and the Town's current water conservation measures and incentives.

14. **Public Health.** Construction will not have a negative impact on public health in Chatham. The improved wastewater treatment gained through the construction of new wastewater treatment facilities will have a positive impact on the Town's surrounding ecosystems. It will also result in the reduction or elimination of individual septic systems, thus reducing public health risks through contact or exposure.

C. **Impacts Specific to WWTF Site.**

1. **WWTF Land Use.** The existing site is relatively flat and located on a small plateau of land just north of Cockle Cove Creek. Surface elevations range from 60 to 70 feet above sea level over most of the site. See Figure 10-5.

The site of the proposed work is an 80.20-acre parcel of Town-owned land. The parcel is used for the existing wastewater treatment facility and for the capped municipal landfill/transfer station. The proposed work will be limited to approximately 15 acres of that site.

Soils as mapped by the USDA indicate that there are no prime farmlands located at the project site. The soils are mainly carver coarse sands, udipsamments, and landfill (disturbed) lands.

Within close proximity (1/2 mile radius) to the WWTF site are 1,029 parcels. Those parcels are made up of the following land uses:

- 760 residential properties
- 56 commercial/industrial properties
- 178 undeveloped properties
- 35 State or Town owned properties, including 21 conservation properties

The site of the proposed work is not classified as Important Farmland, Prime Forest Land, Prime Rangeland, or Formally Classified Lands.

2. **Coastal Resources.** The WWTF site is located outside of the 100 year flood zones and velocity zones (See Figure 10-6). The site of the proposed work is not within the 100- or 500-year flood plain.

Additional modeling was performed to evaluate the impacts of a larger recharge (up to 1.9 mgd) at a concentration of 3 mg/L total nitrogen to determine any impact on the down-gradient creek. Treated water is recharged into the groundwater system by means of the existing (and additional) sand infiltration basins. Groundwater then flows to the south, emerging into the Cockle Cove Creek salt marsh system. The findings of the modeling were that the proposed recharge does not exceed nitrogen loading limits for Cockle Cove Creek. Each of the proposed alternatives would rely on continued groundwater recharge at the existing site.

10.5 WETLANDS

There are no wetlands located on the proposed site (between Middle Road and the bike trail); however, there are some wetland systems to the immediate north and south of the property. The southern wetland consists of the upper reaches of the Cockle Cove Creek Marsh system.

The wetlands in the vicinity of the project site are shown on Figure 10-7. The treated water that is recharged to rapid sand infiltration basins on the WWTF site recharges to the groundwater

table which flows south to the Cockle Cove Creek Salt Marsh system. While the construction activities will not affect the wetlands, there will be an indirect impact as a result of groundwater recharge. Although future flows at the WWTF will increase from the existing flows, the treated water will be of a higher quality as a result of the proposed upgrades. Studies performed by the MEP have shown no adverse impact on Cockle Cove Creek Marsh from the existing or proposed effluent recharge at an annual average concentration of 3 mg/L TN.

10.6 CULTURAL RESOURCES

The WWTF site is not an historic property. There is an historic district to the immediate south of the project site.

The Massachusetts Historical Commission was contacted in an effort to determine if there are any concerns regarding any impact the proposed work may have on historic resources. As shown on the enclosed correspondence (Appendix T), the MHC does not believe the project will adversely impact any historical or archaeological resources.

No visually sensitive areas are in the vicinity of the WWTF site. The property is bordered to the west by a commercial and industrial zoned area. To the east of the WWTF is the capped landfill and transfer station. A small number of residential properties are located to the north and south of the property. A buffer strip (primarily trees) will be maintained to the north side of the property. The residences to the south currently have a limited view of the WWTF due to site topography. The topography blocking the WWTF from the southern neighbors will not be altered.

10.7 BIOLOGICAL RESOURCES

The Massachusetts Division of Fisheries and Wildlife has developed the Natural Heritage and Endangered Species Program (NHESP). NHESP maintains an Atlas of estimated and priority habitats sites for rare plants and wildlife. The habitats identified in the atlas are protected under the Massachusetts Endangered Species Act and the Wetlands Protection Act. As shown in the letter from NHESP (Appendix T), the WWTF site is not located within Priority or Estimated Habitat (see Figure 10-7); however, two State listed rare species have been found in the vicinity and a small portion of the site may need to be mapped in the future.

The state-listed rare species habitats that may be listed in the upcoming Atlas are:

- Enallagma Recurvatum - Pine Barrens Bluet
- Enallagma Laterale - New England Bluet

As the project progresses, inquiry will be made to determine the extent of the estimated and priority habitat as determined by NHESP. If further evaluation during design shows that the proposed construction would encroach on the rare species' habitats, the plans will be re-evaluated to determine an approach that will minimize the disturbance of the habitats.

No impacts to fish are expected from this project. Massachusetts Division of Fisheries and Wildlife has stated that future delineations of protected or endangered species may exist near the northern border of the WWTF site. As the plan approaches design, the site plan will be reviewed to determine if modifications are necessary to minimize impacts to protected habitats.

The northern portion of the site is a wooded area. The predominant tree varieties are scrub oak and scrub pine.

The WWTF site is not located within an Area of Critical Environmental Concern.

A listing of the endangered, threatened, or species of special concern in Chatham are listed on Table 10-1.

10.8 SOCIO-ECONOMIC ISSUES

The proposed project includes upgrades to an already existing treatment facility. There would be no change in current land use at that site and, therefore, no expected change to the socio-economic makeup of the area.

Rather than posing any adverse human health or environmental effects, this project will provide benefits to all Town residents regardless of economic status. Improved wastewater treatment will improve the quality of the surrounding water bodies. The centralized treatment of

wastewater will also protect the quality of the aquifer that is used as the source of Chatham's drinking water.

10.9 MISCELLANEOUS ISSUES

A. **Air Quality.** The project is not anticipated to be a major source of air emissions during construction. The only potential emissions will be from construction vehicles and dust. Contractors are required to meet the requirements of the Diesel Retrofit Program to minimize emissions from their construction equipment. After construction, emissions will be minimal. Contractors will also be required to implement dust control measures.

B. **Transportation.** Work at the WWTF site will not result in any changes or modifications to traffic patterns. The facility will continue to receive septage until all areas of Town are sewerred, and will continue to transport sludge offsite. In addition, the new facilities will require additional process chemicals be delivered to the site. These chemicals will be delivered via trucks. However, these chemicals will be delivered infrequently, so it is not anticipated that the additional delivery trucks will create a disruption in existing traffic patterns.

Depending on the type of supplemental carbon source provided, additional precautions may be required due to the physical properties of these chemicals (flammability, combustibility). Storage facilities for these chemicals will be designed in accordance with applicable codes.

C. **Noise.** There are no noise sensitive areas close enough to the WWTF project site to be disturbed by construction activities.

D. **Impacts Associated with Collection System Within Sewersheds**

1. **General.** Based on the preliminary design and the sewersheds as shown on Figures 9-1 and 9-6 the following areas were identified for possible impacts that will, during design, be addressed to minimize impacts to sensitive habitats, flood plains and historic districts.

Table 10-2 identifies sewersheds (by number) which are within an ACEC, NHESP Habitat area, flood zones, or historic district. Sewersheds are also grouped by those necessary to meet

TMDLs (Phase 1) and those that would be constructed as part of the second “phase” of the CWMP.

The majority of construction within these sewersheds is expected to be within roads and road right-of-ways; however easements and pumping stations may require work on individual properties. Sewer locations will also be dependant on existing utilities and road layouts and, therefore, may be within sensitive areas or buffer zones. Those cases will be identified individually during design and permitted and mitigated as required.

2. **Cultural Resources.** As stated previously, Chatham is an historic town. Several sewersheds, as shown on Table 10-2, fall within the identified historic district in Chatham. For the majority of the collection system work, this will equate to minimal impacts as the sewers are constructed within the disturbed areas of the road right-of-ways. However, additional provisions may be necessary in constructing pumping stations in Sewersheds 3, 51, 50, 37 and 79 to make sure that they are done in accordance with the Town’s requirements for construction of structures within these areas.

During design, these areas will also be reviewed with MHC, as was done with the WWTF, to determine if the proposed pumping station sites or collection system routes will have any impact on sites of historical or archaeological significance.

3. **Natural Resources.** Similar to the historic district, several proposed sewersheds fall within areas identified as Estimated or Priority Habitats by NHDES, ACECs or flood zones. These sewersheds are summarized on Table 10-2. Seventeen of the 44 sewersheds that include one of these sensitive areas have potential pumping station locations (based on preliminary design) that may be within or adjacent to one of these sensitive areas. The impacts will be assessed during final design, and if necessary, an alternative location may need to be identified.

The connection of waterfront properties along freshwater systems to a centralized collection system will have a long term positive impact on these ponds and lakes by eliminating phosphorus from septic system effluent. The elimination of septic systems will also have a long term benefit to marine environments, specifically those impacted by nitrogen as identified by MEP.

10.10 REGULATION STANDARDS AND PERMIT REQUIREMENTS

A. **General.** A detailed outline of the Regulatory Issues associated with the Town of Chatham's CWMP was discussed in the Phase I, Needs Assessment Report developed for this project in 1999. This Chapter summarizes the major regulatory and permitting issues associated with this phase of the CWMP process.

Federal regulations are contained in the Code of Federal Regulations (CFR) and are enforced by the United States Environmental Protection Agency (USEPA). Massachusetts regulations are contained in the Code of Massachusetts Regulations (CMR) and Massachusetts General Law (M.G.L.) and are enforced by the Massachusetts Department of Environmental Protection (DEP). There are also regional and local regulations which may be enforced by the Cape Cod Commission (CCC), the Chatham Zoning Board, Chatham Department of Health and Environment, the Chatham Water and Sewer Division, and other Chatham Town Departments.

B. **Federal.** The National Environmental Policy Act of 1970 (NEPA) provides the basis for the protection of the environment. The NEPA process is designed to aid public officials in the decision making process regarding the use of federal property and provide an understanding of the environmental consequences of that use. The NEPA process would require the filing of an Environmental Impact Statement (EIS) with regards to any proposed site usage on or adjacent to federal property which could potentially impact that property.

C. **State.** Similar to the NEPA process of the Federal government, the Commonwealth of Massachusetts developed the Massachusetts Environmental Policy Act (MEPA) Office which is an agency of the Commonwealth of Massachusetts, and is part of the Executive Office of Energy and Environmental Affairs (EOEEA). This MEPA process is identified in 301 CMR 11.00. A joint environmental review process with the EOEEA MEPA unit, and the CCC was initiated for this project. The environmental review process as well as the identification of previous project documents and evaluations for this CWMP is outlined in Chapter 1 of this report.

There are several more specific State regulations which apply to the Town of Chatham's CWMP. These include: The Massachusetts Groundwater Discharge Permit Program and Groundwater Quality Standards (314 CMR 5.00 and 6.00, respectively); the Massachusetts State Environmental Code, Title 5 (310 CMR 15.00); the Massachusetts Ocean Sanctuaries Act

(M.G.L. c132A); the Massachusetts Surface Water Quality Standards (314 CMR 4.00); the Wetlands Protection Act (M.G.L. Ch. 131, s. 40); MassDEP’s Interim Guidelines on Reclaimed Water; and the Massachusetts Natural Heritage & Endangered Species Program.

D. **Regional.** The Cape Cod Commission was created in 1990 by an Act of the Massachusetts General Court and confirmed by a majority of Barnstable County voters. Due to the unprecedented growth boom in the 1980s, the Cape Cod Commission Act found that the region known as Cape Cod (Barnstable County) possesses unique natural, coastal, historical, cultural and other values which are threatened by uncoordinated or inappropriate uses of the region's land and other resources.

The Commission was established as a regional planning and regulatory agency to prepare and implement a regional land use policy plan for all of Cape Cod, review and regulate Developments of Regional Impact, and recommend designation of certain areas as Districts of Critical Planning Concern. The Commission is a department of Barnstable County and is funded by the Cape Cod Environmental Protection Fund.

This report is also being reviewed by the Cape Cod Commission as part of a joint environmental review process with MEPA.

E. **Local.** Several local regulations are applicable to the CWMP process including: the Town of Chatham Board of Health Nitrogen Loading Regulations, Town of Chatham Board of Health Minimum Requirements for the Subsurface Disposal of Sanitary Sewage, and the Chatham Water and Sewer Division Sewer Use Regulations.

10.11 ALTERNATIVE RANKING AND SUMMARY OF EVALUATIONS

Each of the alternative plans were rated and ranked based on the criteria established in Section 3 of this Chapter. Table 10-3 summarizes the ranking analysis for these alternatives.

Although this ranking system is subjective, it does allow decision-makers a quantitative analysis of the alternatives as required by The Code of Massachusetts Regulations (301 CMR 11.07). Table 10-3 shows that overall, the Town-wide Sewer Alternative (Alternative #4), has the least impact on the existing environment with a ranking of “-5”. The negative ranking is mainly a

result of the large extent of sewerage that is called for and the impacts on traffic and other related issues during such a large construction project, however the net benefits are such that this will address public health (drinking water supplies and reduction/elimination of septic systems) and environmental health (estuaries and freshwater ponds) within the Town. The “No Action” alternative is the worst alternative, and as expected, shows an overall negative impact on the existing environment ranking with “-14”.

The largest ranking discrepancies between the alternatives were associated with the following factors: Surface & Groundwater Quality & Hydrology; Plant & Animal Species & Habitat; and Built Environment & Demographics. The smallest ranking discrepancies between the two alternatives were associated with the following three factors: Soil Disturbance; Air Quality & Noise; and Scenic Qualities, Open Space & Recreational Resources.

Factors of cost and other non-monetary issues developed in previous chapters of this report must be used in combination with the Environmental Impact Analysis ranking.