

proposed infrastructure is outside of all flood zones. While it appears that the existing New Seabury wastewater treatment plant and Site 7 discharge location are outside the current 1% and 0.2% flood zones (i.e., 100 and 500-year floods, respectively), the Town should evaluate the flood risk given the expected sea level rise over the design life of the proposed structures. In addition, the U.S. Geological Survey (USGS) has just completed a model of how groundwater will migrate upward as sea level rises on Cape Cod. We encourage the Town to use the results of this model to evaluate the long-term (20, 40, 60-year) viability of proposed and existing treated wastewater discharge sites and to plan for and acquire any necessary additional discharge sites as the Town moves toward build-out and as rising groundwater affects existing sites.

Bivalve Propagation as a Nutrient Remediation Strategy

A major component of the Town's proposed nutrient remediation plan is to remove nitrogen from watersheds via bivalve propagation. While the Town provides some estimate of the ability of bivalves to remove nitrogen in various watersheds (e.g., Tables ES-1 and 5-16), the assumption that littlenecks contain 60 g of nitrogen and that oysters contain 100 g of nitrogen (see Notes at the bottom of ES-1) appears to be significantly higher than published estimates. For example, the January 2014 Woods Hole Sea Grant Program Marine Extension Bulletin described Cape Cod quahogs (littlenecks) as containing 0.22 g of nitrogen on average and Cape Cod oysters as containing 0.28 g nitrogen on average.¹ Using the Woods Hole Sea Grant Program values to revise the values in Table 5-16, 5 million oysters have the potential to remediate 1.4 metric tons of nitrogen (only 28% of the Mashpee River Watershed load, not 50% as stated in the DEIR) and 4.87 million quahogs have the potential to remediate 1.07 metric tons of nitrogen (only 71% of the Popponesset Bay Watershed load, not 100% as stated in the DEIR). CZM suggests that the Town revise its estimates of the number and cost of bivalve propagation proposed for remediation in each sub watershed. Further, the costs associated with bivalve aquaculture (e.g., Table 5-18) appear to make several assumptions that do not appear to be realistic. For example, the Town's approach assumes that no individuals are lost to predators, weather, parasites, poaching, or low dissolved oxygen associated with eutrophication.

In addition, it is not clear if the costs include the costs of replacing lost individuals, the cost of hiring staff, or all costs associated with bivalve husbandry (vessels, gas, cages, upwellers), and the cost of enforcement. CZM also notes that several of the water bodies (Mashpee River, Shoestring Bay, Hamblin Pond) proposed for shellfish propagation are impaired by high bacteria concentrations and are on the Massachusetts Department of Environmental Protection (MassDEP) "Integrated List." Nowhere in the DEIR is there mention that the shellfish propagation approach is supported by Massachusetts Division of Marine Fisheries (*Marine Fisheries*). If the Town intends to move forward with bivalve propagation, CZM would expect that the Final EIR (FEIR) would contain specific itemizations of all costs as well as a letter of support from *Marine Fisheries*. While it appears that there are many logistical hurdles to using bivalve propagation as a successful nutrient remediation strategy in waters that are already impaired, we applaud the Town for beginning to discuss alternative nutrient remediation and for considering a contingency plan should the proposed scheme for remediating nutrients via bivalve aquaculture not be adequate. We believe this contingency plan should be more explicitly stated in the FEIR (e.g., how many years of study would be needed and what would the threshold level be in order for the Town and MassDEP to consider bivalve propagation to be an inadequate remedy).

Lastly, should the Town move forward with bivalve propagation as a nutrient remediation strategy, CZM suggests that the Town describe how the nitrogen will be removed from the greater Cape Cod watershed. If the proposal is simply to harvest the clams and oysters and sell them to

¹ <http://www.whoi.edu/files/server.do?id=175985&pt=2&p=88928>

Cape Cod residents or use them in some other fashion on Cape Cod, the nutrients may not truly be leaving the impaired watersheds.

Nitrogen Source Reduction

CZM looks forward to seeing the Town develop and implement a fertilizer bylaw to help reduce the sources of nutrients to coastal water bodies. We agree with the DEIR that purchasing open space and developing a growth neutral/flow neutral policy are important tools to reducing future sources of nitrogen. It is clear from Table 1-1 that the Town will need to address 100% of the existing septic system load in at least half of the sub watersheds of the planning area; this indicates that any additional load to these areas will also need to be addressed. Even if sewerage areas appear to be built out, additional nutrient loads are expected in sewerage areas because relief from Title 5 constraints can expand occupancy on built properties and allow development on previously undevelopable properties. If the Town does not plan for future sources of nutrients, then the great public investment proposed in the DEIR related to sewerage, building treatment and discharge facilities, and shellfish propagation would be at risk for not achieving the desired water quality and ecological goals. We look forward to seeing the Town further develop source reduction strategies in the FEIR.

Nitrogen Removal and Long-Term Monitoring

In our comments on the Draft Alternative Scenarios Analysis and Site Evaluation Report, CZM requested that information be presented in the DMP/DEIR relating to the efficacy and fate of nutrients in the water quality models. This requested information included the following:

- A description of the modeling and monitoring that will be used to establish the efficacy of the proposed alternative at removing nitrogen from the watershed,
- A description of the modeling and groundtruthing efforts that will be used to determine the ultimate fate of the nitrogen load, and
- The long-term monitoring program upstream and downstream of the project that will be used to ensure that the selected alternative continues to remove nitrogen at the required rate for the duration of the project

CZM believes this information is an important part of the Town's Comprehensive Wastewater Management Plan, the results of this modeling and monitoring will guide the Town in its proposed adaptive management approach, and will ultimately be used to determine the success of the Town's nitrogen removal efforts. CZM recommends this information be provided prior to final development of the FEIR.

Federal Consistency

The proposed project may be subject to CZM federal consistency review. For further information on this process, please contact, Robert Boeri, Project Review Coordinator, at 617-626-1050 or visit the CZM web site at www.state.ma.us/czm/fcr.htm.

BC/sm/tc/rlb

cc: Stephen McKenna, CZM Cape & Islands Regional Coordinator

MEMORANDUM

TO: Deirdre Buckley, Environmental Reviewer, MEPA Unit

THROUGH: Jonathan Hobill, Regional Engineer, Bureau of Resource Protection
Philip Weinberg, Regional Director
David Johnston, Deputy Regional Director, BRP
Maria Pinaud, Deputy Regional Director, BWP
Millie Garcia-Serrano, Deputy Regional Director, BWSC
Brenda Chabot, Deputy Regional Director, ADMIN

CC: Elizabeth Kouloheras, Chief, Wetlands and Waterways
Jeffrey Gould, Chief, Wastewater Management Program
Brian Dudley, Wastewater Management Program
Pamela Truesdale, Municipal Facilities
Leonard Pinaud, Chief, Site Management
Allen Hemberger, Site Management
Gary Moran, Deputy Commissioner

FROM: Sharon Stone, SERO MEPA Coordinator

DATE: September 5, 2014

RE: DEIR EOEEA #12615 – MASHPEE – Comprehensive Watershed
Nitrogen Management Plan
(CWMP)

"For Use in Intra-Agency Policy Deliberations"

The Southeast Regional Office of the Department of Environmental Protection (MassDEP) has reviewed the Environmental Notification Form (ENF) for the proposed CWMP developed for the Town of Mashpee, Massachusetts (EOEEA #12615).

Wastewater Management Program
Introduction

The Town of Mashpee Sewer Commission has prepared a Recommended Plan/Draft Environmental Impact Report (DEIR) for addressing nitrogen impairment in the Popponesset and the Quashnet River, Hamblin Pond, Little River, Jehu Pond and Great River subwatersheds in the Waquoit Bay system (East Waquoit watersheds) which incorporates elements of traditional and non-traditional approaches all within an adaptive management framework. The DEIR also provides significant opportunity for regional cooperation with Mashpee's neighboring communities of Barnstable, Falmouth Sandwich all within a well-defined, flexible phased schedule over a 25 year period.

With legislation passed in April 2014 establishing the Mashpee Water and Sewer District (District), the Town will be in transition with regard to responsibilities for management and oversight of planning, designing and managing infrastructure. The DEIR proposed a Memorandum of Understanding (MOU) between the Town and the District; however, there will have to be close coordination between the two entities since non-traditional approaches that normally would fall out of the purview of a water and sewer district are going to be employed.

The Popponesset and East Waquoit watersheds have been assessed and evaluated under the auspices of the Massachusetts Estuaries Project (MEP) and found to be nitrogen impaired and are both subject to Total Maximum Daily Loads (TMDLs) developed pursuant to the Federal Clean Water Act. To address the TMDLs, the DEIR focuses on a combination of nitrogen control strategies falling within the categories of 1) source reduction, 2) direct environmental mitigation and 3) land management strategies.

Traditional approaches for source reduction include integrating several privately owned wastewater treatment facilities within the two watersheds into the overall approach either by utilizing existing excess capacity or by expanding existing capacity. To accommodate areas within the watershed not accessible to the private plants, the DEIR provides options for constructing new wastewater facilities or, pending appropriate management agreements, expanding the wastewater treatment facility at Joint Base Cape Cod (JBCC) to provide treatment for some of the proposed sewer services areas. In addition to these approaches, the DEIR recommends continued Best Management Practices (BMPs) for stormwater, development of a fertilizer by-law, continued use of innovative/alternative onsite systems (I/A) and potential consideration of composting and/or urine diversion toilets (eco-toilets).

The Town of Mashpee's Shellfish Constable, in association with the Wampanoag Tribe has initiated shellfish propagation projects in the Mashpee River (2004) and Great River (2013) and proposes to expand into Popponesset Bay, Shoestring Bay, Jehu Pond and Hamblin Pond. This is proposed as the major component of the DEIR's direct environmental mitigation. Other approaches considered are permeable reactive barriers (PRBs) and bog/wetland restoration to remove or attenuate groundwater nitrogen and dredging/inlet opening to improve flushing within the embayment systems.

Land management strategies are intended to reduce the potential of build out conditions adversely impacting other nitrogen reduction efforts as opposed to considering them a strategy for immediate nitrogen mitigation. The approaches considered are a Growth/Flow Neutral by-law (required for eligibility of a 0% interest State Revolving Fund (SRF) loan), land purchases, phasing implementation with respect to maximizing near term improvements to minimize initial investments in infrastructure.

General Comments

The DEIR is well prepared and follows a logical progression allowing for flexibility in its mix of traditional and non-traditional approaches. It maintains a focus on a manageable

timeline with appropriate decision points built in to the schedule to evaluate what options should be pursued or abandoned at various stages of implementation.

The DEIR focuses on traditional wastewater infrastructure coupled with shellfish aquaculture. While acknowledging that traditional approaches will be required, the DEIR anticipates that, shellfish aquaculture, if successfully documented, may augment nitrogen reductions and reduce the amount of infrastructure, with concomitant cost reductions, necessary for TMDL compliance. Several innovative approaches emerge from the plan. The first is that several existing private wastewater treatment facilities within Mashpee (New Seabury, Willowbend, Mashpee Commons, Southport and Stratford Ponds) as well as in the neighboring towns of Barnstable (Cotuit Meadows) and Sandwich (Forestdale School) figure prominently in the overall implementation strategy. The DEIR acknowledges that issues of ownership must be satisfactorily addressed, but the hope is that by utilizing excess capacity or expanding existing capacity, infrastructure costs for source reduction can be minimized.

In addition to the private facilities, use of the wastewater treatment facility at JBCC is included in the overall plan. JBCC is in the midst of a MassDevelopment evaluation to determine best uses for the site. Among the proposals is the potential for expanding JBCC's wastewater treatment facility to accommodate additional flow from the proposed project area (PPA). As with the private wastewater treatment facilities, ownership issues have to be discussed and resolved.

A second innovative consideration is the option for comprehensive inclusion of the neighboring towns of Barnstable, Falmouth and Sandwich. The DEIR clearly identifies subareas within the PPA throughout the four towns, along with the associated wastewater treatment facilities, which have the potential for accommodation in the overall implementation strategy. While no formal agreements have been finalized, the phasing plan allows for ongoing discussions among the communities to explore appropriate options for inter-municipal cooperation.

Third among the innovative strategies is the inclusion of shellfish aquaculture. As this falls outside the normal approach of source control and is considered direct environmental mitigation, the DEIR quite appropriately approaches this alternative with cautious optimism. MassDEP considers source reduction as the preferred method for nitrogen mitigation; however, approaches such as shellfish aquaculture are recognized as viable alternatives to complement and augment source reduction efforts. The DEIR documents the ongoing efforts by the town of Mashpee in piloting this approach, and provides some estimated projections of effectiveness. MassDEP would advise caution in suggesting that shellfish aquaculture alone may be able to address required nitrogen reductions in some of subembayments such as Popponesset Bay (including Popponesset Creek), Ockway Bay, Great River, Jehu Pond, Hamblin Pond and Little River. MassDEP is encouraged that Mashpee recognizes that ongoing monitoring is necessary to evaluate the ultimate effectiveness of this approach. As part of an ongoing piloting and demonstration program, Mashpee must consult with MassDEP on its proposed protocol in order to insure that the sampling and monitoring program yields appropriate verifiable

data that can be accepted for MassDEP's review and evaluation of the demonstration projects. While recognizing the potential cost savings associated with shellfish aquaculture, Mashpee should balance the certainty of traditional source control methods with the uncertainty of more non-traditional approaches to strike an appropriate balance between the two. As discussed later, the DEIR does provide several opportunities within its phased timeline to evaluate and reevaluate the effectiveness of all options proposed.

The DEIR appropriately provides a contingency plan in the event that shellfish aquaculture does not yield the removals projected in the DEIR. Construction of wastewater treatment plants at Sites 4 and 6, so-called, with effluent recharge at various sites both publicly and privately owned is proposed. The major uncertainty in this plan is that Mashpee does not appear to have established appropriate agreements with either Willowbend or New Seabury for use of their property for effluent recharge. While Willowbend's special permit from the town does allow for the town to assume ownership of the "sewage treatment facility, collection system and any other appurtenant items..." it is not clear if this extends to the areas identified for effluent recharge. Furthermore, no such provision seems to exist for New Seabury. MassDEP would expect Mashpee to initiate discussions with these and any other entities over which the town has no ownership or control to establish agreements for use of property for any uses relative to the contingency plan. Such agreements and their status, or alternatives should agreements be unobtainable, should be more fully discussed in the Final EIR. MassDEP also notes that it is not specifically stated in the DEIR if this contingency plan alone will meet the nitrogen removal targets necessary for TMDL compliance. The Final EIR should clarify this point. As an alternative to effluent recharge at these sites, recent changes to the Ocean Sanctuaries Act may make an ocean outfall feasible which could possibly negate the need for effluent recharge at these sites. The Final EIR should explore this option in more detail.

The DEIR provides a detailed phasing plan that extends from 2016 to 2040. The interim timeframe from the present through 2015 includes establishing an MOU between the Town and the District. The Final EIR should provide more detail with respect to the MOU in outlining responsibilities of each party and the means by which they will coordinate their efforts in refining the recommended plan. Other actions proposed during this period are to continue with the shellfish propagation program, continue with ownership discussions regarding JBCC and the use of private wastewater treatment facilities, continued discussion for regional MOUs with the towns of Barnstable, Falmouth and Sandwich, implementation of fertilizer management and/or bylaw and continued use of stormwater BMPs.

Phase 1 covering the period from 2016 to 2020 includes expansion of the shellfish propagation program to related sections of Popponesset Bay and new sites in Jehu Pond and Hamblin Pond. This phase also proposes the design and construction of improvements at JBCC, (or at the Town owned Back Road site if there is no agreement on a regional facility at JBCC) design and construction of the Site 4 Facility or 0.1 MGD and related collection system and connection of the Quashnet and Combs schools to the Mashpee Commons wastewater treatment facility. Culminating this phase will be an

update of the MEP models (land use and hydrodynamics) to calibrate with water quality and benthic flux sampling.

Phase 2 covers the period from 2021-2025. If the JBCC facility is available, then connection of some of the Falmouth and Sandwich sections of the PPA would begin to start to address Quashnet River TMDL requirements. Shellfish propagation efforts would continue to be expanded. At this point, as part of the adaptive management process, existing shellfish propagation efforts would be evaluated and if removals have not met anticipated levels then the Site 4 facility would be expanded to serve Mashpee River and Popponesset Bay, upgrade the private facilities at Willowbend, Stratford Ponds, South Cape Village and Windchime Point, extend the sewer in the Mashpee River and Popponesset Bay. In conjunction with Barnstable's planning efforts, certain sections of Cotuit within the PPA could be addressed at this time. Culminating this phase will be an update of the MEP models (land use and hydrodynamics) to calibrate with water quality and benthic flux sampling.

Phase 3 will initiate in 2026 and end in 2030. If proven successful, additional shellfish propagation will proceed. If the shellfish program is not meeting expectations then the private wastewater treatment facility at Southport will be upgraded, the Site 4 wastewater treatment facility will be expanded along with expansion of the sewer service area to serve the Mashpee River and Popponesset Bay subwatersheds, the Willowbend wastewater treatment facility service will be expanded, the Site 6 wastewater treatment facility will be designed and constructed to serve the Ockway Bay area, New Seabury recharge facilities will be constructed to receive effluent from Mashpee Commons and Site 6. This phase would also anticipate Barnstable and Sandwich addressing the remaining portions in the Popponesset watershed. Culminating this phase will be an update of the MEP models (land use and hydrodynamics) to calibrate with water quality and benthic flux sampling.

Phase 4, from 2031 to 2035 will evaluate the need to upgrade the privately owned Cotuit Meadows and Wampanoag Village wastewater treatment facilities to provide additional nitrogen removal. If the shellfish propagation program is not meeting expected levels of performance, then expansion of the Site 6 wastewater treatment facility and associated sewer, Site 4 collection system, collection system on Great Neck Road to Mashpee Commons, and collection system Hamblin and Jehu Pond areas will be initiated. Upgrade and expansion of the New Seabury wastewater treatment facility is also anticipated at this time. Culminating this phase will be an update of the MEP models (land use and hydrodynamics) to calibrate with water quality and benthic flux sampling.

The final phase, Phase 5, will occur from 2035-2040. Based on performance of the shellfish propagation effort, the options are to complete collection system expansion within Mashpee. Remaining portions of Barnstable and Sandwich would be removed outside the watershed or treated to appropriate levels as determined by MEP modeling. Culminating this phase will be an update of the MEP models (land use and hydrodynamics) to calibrate with water quality and benthic flux sampling.

Monitoring will be an important part of the recommended plan so that progress and effectiveness of its various elements can be properly documented. The DEIR acknowledges that wastewater treatment facility performance will be monitored through MassDEP's Groundwater Discharge Permit Program. Performance of the shellfish propagation program is proposed to be evaluated through commercial harvest data reported to the Division of Marine Fisheries (DMF) and recreational harvest data monitored by Mashpee. Shellfish will be analyzed for nitrogen content and quantified. While water quality monitoring data will follow the same protocols through the ongoing Mashpee Water Quality Monitoring Program, Mashpee and MassDEP need to discuss the details of the shellfish aquaculture program to insure that all monitoring and data collection is adequate and appropriate for use in determining nitrogen removal credits assigned to shellfish aquaculture.

MassDEP believes that the phased program over a 25 year period strikes the appropriate balance between the need to provide flexibility in evaluating innovative nitrogen reduction strategies that may help reduce costs while allowing for defined decision points to determine if more traditional approaches need to be pursued.

The approach taken in the DEIR appears to be consistent with the spirit and intent of the Cape Cod Commission's ongoing 208 planning process. The plan addresses a nitrogen mitigation and management plan with respect to watersheds and sets the groundwork for a regional approach among four municipalities. It also embraces the use of non-traditional approaches while at the same time recognizing the need for core areas of traditional infrastructure. The DEIR clearly lays out an adaptive timeline with decision points allowing the plan to pivot to various options as needed. Through the 208 process, the Cape Cod Commission has developed watershed tools to help assess proposed nitrogen load reductions, assign and select priorities, and take advantage of regional efforts. MassDEP recommends that Mashpee coordinate closely with the Commission as the FEIR is developed.

Specific Comments

Table 1-1 does not reference removal requirements for the Child's River subwatershed. However, Phase 5 does reference nitrogen management in the Child's River portion of Subarea H. The Final EIR should clarify or reconcile the level of removal anticipated for this subwatershed.

Section 4.2 discusses various options for source removal. As part of the discussion an existing town policy for eco-toilets is mentioned. The Final EIR should provide a brief synopsis of the policy or, alternatively, provide the policy as an appendix.

Section 4.52.2 references construction of wastewater treatment facilities initially designed to treat to 6 to 10 mg/L of total nitrogen (TN) with the capability of adding denitrification filters to achieve a level of 3 mg/L. It is unclear if the TMDL compliance is achievable at the 6 to 10 mg/L TN level or if it is necessary to treat to 3 mg/L. Perhaps

the different levels of treatment relate to the effectiveness of the shellfish propagation program. The Final EIR should clarify this point.

Section 4.5.2.6 references BMPs for stormwater. The Final EIR should clarify if Mashpee intends to require BMPs for new development or redevelopment only or if it will embark on a program of retrofits for existing stormwater structures.

Section 5.4 and Table 5-2 reference wastewater treatment for Briarwood/Otis trailer Village and Tri-Town Circle which are in areas ostensibly not requiring nitrogen removal. MassDEP understand that inclusion of these areas is in anticipation of future build-out loads. The Final EIR should clarify this point.

Table 5-17 suggests that shellfish aquaculture may account for 100% or the required nitrogen removal in some subwatersheds. MassDEP acknowledges that these are projections and will be evaluated for verification as part of adaptive management; however, MassDEP cautions against over optimistic expectations for effectiveness.

Section 5.9 references the extension of the Wampanoag Village wastewater treatment facility to pick up an additional 7,000 gpd from adjacent areas. It is not clear if this 7,000 gpd is in addition to the offset required under the existing GWDP. The Final EIR should clarify this point.

Section 6.2.1 discusses shellfish aquaculture and references Appendix 5-1. The figures presented in the Appendix are presented in kg/d. In looking at total loads incorporating benthic flux, it should be recognized that benthic flux is not exerted throughout the entire year. It is not clear if the values are annualized. This should be clarified in the Final EIR.

Section 6.2.2 discusses the use of JBCC relative to this DEIR. As discussions with JBCC proceed, considerations for all potential future needs for Barnstable, Bourne, Falmouth, and Sandwich should be considered.

Section 6.2.3 discusses wastewater treatment alternatives including effluent recharge. Proposals for the use of drip irrigation at the New Seabury and Willowbend golf courses are good ideas, but the specifics of design, location loading rates, etc. will have to be evaluated during the permitting process.

Section 6.2.4 discusses improvements to existing wastewater treatment facilities. In addition to securing agreements with the facilities not under Mashpee's control, a complete evaluation of capacity for expansion will have to be conducted.

Section 6.2.7 discusses management of onsite I/A systems. MassDEP agrees that a management entity is required and suggests that the entity could be developed as a municipal function or within the water and sewer district. It may not necessarily require a separate management district.

Section 6.3.1 discusses stormwater management. It appears that the DEIR is not seeking credit for nitrogen removal from stormwater BMPs.

Section 6.3.3 discusses future demonstration projects. MassDEP encourages the town to keep its options open as various non-traditional approaches are piloted and based on results, these could be incorporated into the recommended plan as part of the adaptive management process.

Section 7.2.2 makes reference to the hydrogeologic investigations at Site 4. Further evaluation of these findings will be part of the groundwater discharge permitting process.

Summary Remarks

The DEIR is a solid mix of traditional planning with an openness to new ideas. MassDEP believes that through adaptive management, regional cooperation, public/private partnerships and a watershed focus the recommended plan can serve as a model for future nitrogen mitigation planning for all of Cape Cod. These comments have identified areas that require further investigation where Mashpee needs further consultation with MassDEP. Furthermore, where contingency plans rely on facilities outside Mashpee's control, those issues should be more fully explored and documented for inclusion in the Final EIR. In relation to this option, the feasibility of an ocean outfall should be evaluated.

Given the magnitude and complexity of the issues addressed in the DEIR, MassDEP commends the Town of Mashpee for developing a coherent, well thought out plan and looks forward to working with the town to make it come to fruition.

Municipal Facilities

The CWNMP/DEIR presents recommendations to address the Total Maximum Daily Loads (TMDLs) as established for Popponesset Bay and eastern Waquoit Bay through the Massachusetts Estuaries Project (MEP) in 2006. The Town of Mashpee initiated their work on a Watershed Nitrogen Management Plan in 1999 to address the nitrogen impacts to their coastal embayments and evaluate options for restoring them through the development of a Comprehensive Wastewater Management Plan (CWMP). The task was complex, as the watersheds to these embayments include portions of the adjacent communities of Barnstable, Falmouth and Sandwich. The Town had eight previous scenarios/options for nitrogen removal modeled through MEP to produce the resulting plan, which will address implementation in 5 phases over a 20 year plus scenario. The plan reflects a multiple approach to reducing nitrogen in the Town's two primary salt water embayments. The identified possible components include shellfish aquaculture; sending additional flow and expanding the capacity at the WWTF for treatment at Joint Base Cape Cod; construction of new wastewater treatment as well as recharge facilities at the New Seabury and Willowbend Golf Courses; improvements/expansions and modifications to accommodate additional flows at the existing WWTFs at Mashpee Commons, New Seabury, Willowbend Golf Course, Mashpee High School, Cotuit Meadows and Wampanoag Village; continued use of existing smaller wastewater

treatment facilities; coordination and regional assistance with neighboring communities of Barnstable, Falmouth and Sandwich in addressing nitrogen sources within their town boundaries; developing a management structure for areas where on-site septic systems and alternative/innovative (I/A) systems will remain in use; non-wastewater management components, i.e. stormwater and fertilizer management; and possible future demonstration projects like permeable reactive barriers, wetlands restoration projects and eco-toilets and advancement of the Cape Cod Commission's 208 planning efforts. The Town has clearly put many years worth of time and effort in refining the possible approaches to meeting the TMDLs in Popponesset and Waquoit Bays. Regional approaches are a large part of the planning efforts, which makes sense as watersheds do not follow political boundaries. Use of neighboring communities and their cooperation to reduce nitrogen levels are a creative way to approach a solution that cannot be obtained wholly within Mashpee town lines. MassDEP has been encouraging this "outside of the box" solution thinking for long term wastewater planning. The Town of Easton recently utilized this innovative approach with their Final CWMP. The Town of Falmouth's recent CWMP has also taken a multi-faceted approach to their long term wastewater needs. In particular, Mashpee will be watching closely the Town of Falmouth's pilot projects and adaptive management approaches, i.e. permeable reactive barriers, wetland restoration projects and eco-toilets, and how successful they are in reducing nitrogen in embayments, before making any final decision on their use.

Final implementation of the plan addresses three major categories:

- 1) Short term initiatives: Current/2014. This includes completion of the CWMP/FEIR, establishment of a Mashpee Water & Sewer District, current shellfish propagation project, WWTF ownership discussions, development of regional Memorandums of Understanding and local fertilizer management bylaw and stormwater BMPs.
- 2) Phase 1 implementation: 2016-2020. This includes a long list of specific projects to design and construct to connect collection systems to various WWTFs and expand shellfish propagation areas.
- 3) Long Term Implementation and Adaptive Management, Phases 2 through 5: 2020 to 2040 and beyond.

The CWNMP/DEIR is a thorough and thoughtful plan to address the nitrogen impacts, and long term remediation of the nitrogen impacts to Mashpee's embayments to achieve their TMDLs. MassDEP-SERO recommends that this document proceed to completion of the CWMP/FEIR.

Construction Stormwater Permit

The project construction activities may disturb one or more acres of land and therefore, may require a NPDES Stormwater Permit for Construction Activities. The proponent can access information regarding the NPDES Stormwater requirements and an application for the Construction General Permit at the EPA website:

<http://cfpub.epa.gov/npdes/stormwater/cgp.cfm>

Bureau of Waste Site Cleanup

Based upon the information provided, the Bureau of Waste Site Cleanup (BWSC) searched its databases for disposal sites and release notifications located within and near the proposed project area. A disposal site is a location where there has been a release to the environment of oil and/or hazardous material that is regulated under M.G. L. c. 21E, and the Massachusetts Contingency Plan [MCP – 310 CMR 40.0000].

The proposed project involves development of a town-wide comprehensive watershed nitrogen management plan for the Town of Mashpee. The project area includes the watersheds of Popponesset Bay and Waquoit Bay-East.

Please be advised that there are many BWSC disposal sites located within and near the proposed planning area. Many of the sites have been closed under the MCP, but many other disposal sites are open, and require continued environmental response actions under the MCP. A listing and discussion of the status of these MCP sites will not be presented here. The Project Proponent is encouraged to consult the BWSC Waste Sites/Reportable Release Lookup at: <http://public.dep.state.ma.us/SearchableSites2/Search.aspx>. In addition, the Project Proponent can view a map showing BWSC disposal sites located within and near the proposed planning area using the MassGIS online data viewer (Oliver) at: http://maps.massgis.state.ma.us/map_ol/oliver.php. Under “Available Data Layers” select “Regulated Areas”, and then “DEP Tier Classified 21E Sites”.

The Project Proponent is advised that if oil and/or hazardous material are identified during the implementation of this project, notification pursuant to the Massachusetts Contingency Plan (310 CMR 40.0000) must be made to MassDEP, if necessary. A Licensed Site Professional (LSP) should be retained to determine if notification is required and, if need be, to render appropriate opinions. The LSP may evaluate whether risk reduction measures are necessary or prudent if contamination is present. The BWSC may be contacted for guidance if questions arise regarding cleanup.

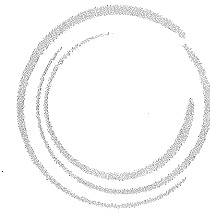
Proposed s.61 Findings

The “Certificate of the Secretary of Energy and Environmental Affairs on the Draft Environmental Impact Report” may indicate that this project requires further MEPA review and the preparation of a Final Environmental Impact Report. Pursuant to MEPA Regulations 301 CMR 11.12(5)(d), the Proponent will prepare Proposed Section 61 Findings to be included in the EIR in a separate chapter updating and summarizing proposed mitigation measures. In accordance with 301 CMR 11.07(6)(k), this chapter should also include separate updated draft Section 61 Findings for each State agency that will issue permits for the project. The draft Section 61 Findings should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation.

The MassDEP Southeast Regional Office appreciates the opportunity to comment on this

proposed project. If you have any questions regarding these comments, please contact Sharon Stone at (508) 946-2846.

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CAPE COD
COMMISSION

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Via EMAIL

September 5, 2014

Secretary Maeve Valley Bartlett
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office, Deirdre Buckley, Project Analyst
100 Cambridge Street, Suite 900
Boston MA 02114

Re: Comment Letter EENF/ DEIR
EEA No. 12615
Mashpee Comprehensive Watershed Nitrogen Management Plan

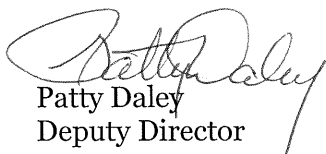
Dear Secretary Bartlett:

On June 27, 2014, the Cape Cod Commission (Commission) received a copy of an Expanded Environmental Notification Form (EENF)/Draft Environmental Impact Report (DEIR) prepared by GHD for the above-referenced project. As described in the EENF/DEIR, the project proposes a comprehensive wastewater and nitrogen management plan for the Town of Mashpee, intended to achieve reductions of wastewater nitrogen loading and meet Total Maximum Daily Loads (TMDLs) for nitrogen loading to the Town's coastal embayments, including Popponesset Bay and Waquoit Bay's eastern basin.

Commission staff reviewed the EENF/DEIR, and held a public hearing thereon at the Mashpee Town Hall on August 26, 2014, pursuant to the MOU between the Commission and EEA. Please find attached a copy of the staff report prepared for the hearing, which serves as the Commission's comment letter on the EENF/ DEIR.

Please feel free to contact Commission staff with any questions on this comment letter.

Sincerely,



Patty Daley
Deputy Director

ENC

Cc: Project File
Tom Fudala, Mashpee Town Planner by email
Paul R. Gobell, Mashpee Sewer Commission Administrator by email
J. Jefferson Gregg, GHD, by email

STAFF



REPORT

PROJECT: **Comprehensive Wastewater Management Plan/Draft
Recommended Plan/Draft Environmental Impact Report**
Town of Mashpee for a Watershed Nitrogen Management Plan for
the Town of Mashpee
(Commission Project: JR20076, MEPA EEA Project No.: 12615)

TO: Jonathon Idman, Chief Regulatory Officer (Hearing Officer)

STAFF: Caroline Harper, Energy Specialist
Jeffrey Ribeiro, Regulatory Officer
Garry Meus, Regulatory Officer
Glenn Cannon, Technical Services Director
Heather McElroy, Natural Resources Specialist
Lev Malakhoff, Senior Transportation Engineer
Patty Daley, Deputy Director
Sarah Korjeff, Planner & Historic Preservation Specialist
Scott Michaud, Hydrologist
Sharon Rooney, Chief Planner
Tom Cambareri, Water Resources Program Manager

DATE: September 5, 2014

INTRODUCTION

The Cape Cod Commission (Commission) has received a Comprehensive Wastewater Management Plan (CWMP), Draft Recommended Plan/ Draft Environmental Impact Report (DEIR), from the Town of Mashpee Sewer Commission (Applicant). The CWMP/DEIR proposes to achieve reductions of wastewater nitrogen loading and meet Total Maximum Daily Loads (TMDLs) for nitrogen loading to the Town's coastal embayments including Popponesset Bay and Waquoit Bay's eastern basin and has been noticed in the Massachusetts Environmental Policy Act (MEPA) Environmental Monitor. As the project will require the preparation of an Environmental Impact Report (EIR), it is also subject to Commission Development of Regional Impact (DRI) review pursuant to the Cape Cod Commission Act and Section 2(d)(i) of the Commission's DRI Enabling Regulations (revised March 2013) as "[a]ny proposed development for which an Environmental Impact Report (EIR) is required to be prepared under the provisions of MEPA shall be deemed a DRI."

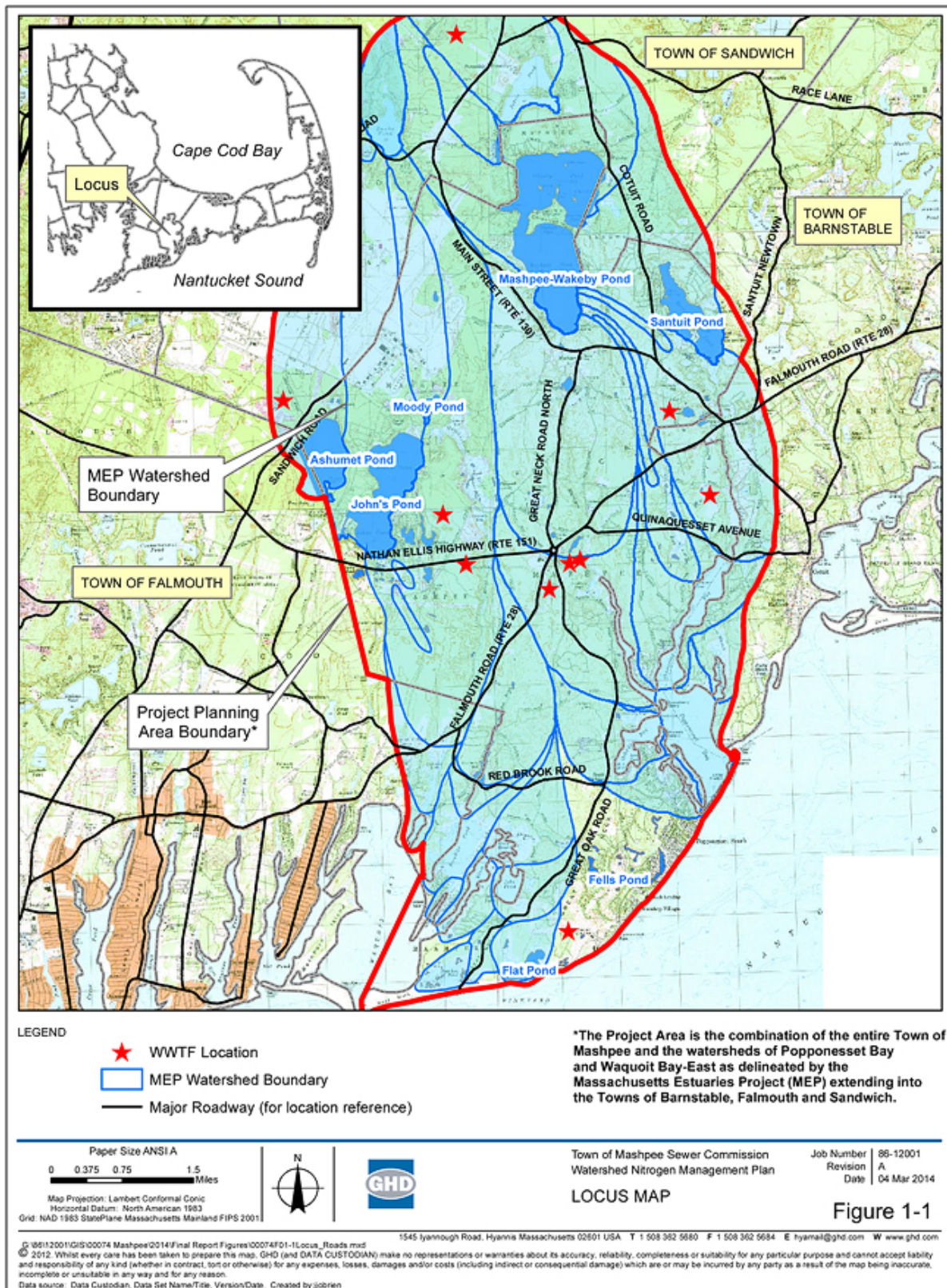


Figure 1.1: Project Planning Area depicting watershed boundaries for the Mashpee Comprehensive Wastewater Management Plan (CWMP) as provided by the Town of Mashpee.

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and section 11.03 of the MEPA regulations (301 CMR 11.00), the Secretary of Energy and Environmental Affairs (Secretary) issued a Certificate on November 9, 2001 on the Environmental Notification Form (ENF) for the Comprehensive Nitrogen and Wastewater Management Plan for the Town of Mashpee, requiring the preparation of an EIR. The Secretary then issued a Certificate on November 26, 2007 on an initial Notice of Project Change following the Applicant's submittal of a final Needs Assessment report in October 2007 in accordance with the MEPA regulations for a lapse of time, at 301 CMR acknowledging that the project was under a joint MEPA/Cape Cod Commission review. The Secretary then issued a Certificate on a second Notice of Project Change on July 6, 2012 in accordance with the MEPA regulations for a second lapse of time, according to 301 CMR 11.10(2). The Secretary issued a Certificate on November 1, 2013 following the Phase 2 Submittal of the Final Alternatives Screening Analysis Report.

The Commission received the Draft Environmental Impact Report (DEIR) on June 24, 2014 from the Applicant's representative, J. Jefferson Gregg, P.E., BCEE, of GHD. A Joint MEPA/DEIR public hearing was held on August 26th at the Waquoit Meeting Room at Mashpee Town Hall for the purpose of gathering information and public comment on the DEIR and to recommend a scope for the Final EIR (FEIR).

PROJECT DESCRIPTION

The Town of Mashpee's proposed CWMP is intended to achieve reductions of wastewater nitrogen loading and meet Total Maximum Daily Loads (TMDLs) for nitrogen loading to the Town's coastal embayments including Popponesset Bay and portions of Waquoit Bay. The project involves the development of a comprehensive nitrogen and wastewater management plan for the Town of Mashpee including the entire watershed of Popponesset Bay and the eastern Waquoit Bay basin. The DEIR/CWMP addresses those portions of the watershed in the adjacent towns of Barnstable, Falmouth and Sandwich.

The CWMP/DEIR includes a summary of the Town's identification and screening of alternative solutions to meet its wastewater needs and summaries of its detailed evaluations of scenarios for wastewater and nitrogen management. As indicated in the CWMP/DEIR, the Mashpee Sewer Commission identified eight different scenarios for evaluation and analysis to develop the Recommended Plan.

The initial scenarios developed in 2008 include:

- Scenario 1 – No expansion of existing wastewater treatment facilities.
- Scenario 2 – Upgrade and expansion of existing facilities to practical extent.
- Scenario 3/3R – Cluster scenario (prepared by Lombardo Associates, Inc.).
- Scenario 4 – Fair Share.
- Scenario 5 – Centralized approach.

The initial 5 (five) scenarios were fine-tuned through significant additional work resulting in the following three options as submitted in 2013:

- Option 1A – maximization of recharge outside the watersheds of the project planning area
- Option 1B – recharge within the watersheds and addressing flows from outside the community within Mashpee
- Option 1C – a modification of Option 1A – outside communities handled the same, all Mashpee flows recharged within the watersheds

The proposed 2014 recommended plan was then constructed from Option 1A with additional considerations and evaluations including use of a Regional facility at Joint Base Cape Cod and shellfish aquaculture in several of the projects subwatersheds.

The CWMP/DEIR also identifies Subareas to be addressed for nitrogen removal, monitoring and modeling, and a preliminary implementation schedule establishing five year planning and implementation increments. It also describes estimated costs of the recommended Plan including Phase 1 of Implementation with shellfish aquaculture, as well as environmental evaluations on impacted resources.

The Town of Mashpee CWMP presents recommendations to address the nitrogen TMDLs established for Popponesset Bay and Waquoit Bay's eastern basin. The EENF/ DEIR delineates a planning area boundary for the CWMP, within which the location of existing discharge sites and wastewater treatment facilities (WWTFs), and proposed locations for new treatment and discharge sites, are detailed.

COMMENTS ON THE DEIR

Commission staff has reviewed the DEIR for consistency with the 2009 Regional Policy Plan (RPP), as amended in August 2012, and offers the following comments on the project and DEIR. These comments are intended to inform future Development of Regional Impact (DRI) review of the CWMP.

LAND USE

RPP Land Use Goal LU1 is *to minimize adverse impacts on the land by using land efficiently and protecting sensitive resources, and to create vibrant communities by directing growth and redevelopment to appropriate locations*. The Regional Land Use Vision Map (RLUVM) adopted as part of the 2009 RPP identifies the town's vision for desired land uses. The Town of Mashpee has not adopted a Land Use Vision Map and therefore MPS LU1.1 does not apply. Goal LU2 is *to use capital facilities and infrastructure efficiently and in a manner that is consistent with Cape Cod's environment, character, and economic strengths, and that reinforces traditional village-centered development patterns*. MPS LU2.1 states that *proposed or expanded infrastructure shall support compact development patterns*. It is recommended that the FEIR include a more detailed discussion of how proposed wastewater infrastructure will support compact development patterns in the Town consistent with RPP Land Use goals, local planning goals and current Mashpee zoning which includes but is not limited to mandatory cluster, transfer of development rights (TDR), and two acre zoning.

Buildout Analysis

In order to obtain a Town-wide, long range view of the nitrogen and other issues in Mashpee, a buildout analysis was performed by the Mashpee Planning Department in 2009 for use in the CWMP assessment. The buildout analysis was completed on a parcel basis based on existing building permits, known (proposed) projects, zoning, and numerous other aspects that impact development. The Town's analysis also provided estimates of possible future uses (retail, office, warehouse, etc.) and potential building sizes. Both the MEP analysis (to an extent) and the 2011 analysis used the Town's buildout estimates to determine future wastewater flows and nitrogen loads. Buildout for Falmouth and Sandwich were based on MEP efforts associated with those towns; Barnstable buildout estimates were based on information from the Barnstable Town Planner.¹ The town has provided Commission staff further details from the 2009 buildout and

¹ Mashpee Sewer Commission, Final Needs Assessment Report. 00074.7 7-2

about potential buildout for residential and commercial development within the Town of Mashpee, which staff will analyze and address in its subsequent comments on the FEIR.

Land Use Control Mechanisms

The Secretary's Phase 2 Certificate dated November 1, 2013 stated that the DEIR should include a detailed discussion of potential land use control mechanisms that can be employed to limit secondary growth impacts associated with implementation of the CWMP. The DEIR includes a brief discussion of potential and ongoing land management strategies to reduce future growth potential in Section 4.4 including:

- Growth Neutral/flow neutral policy (to be adopted)
- Purchase of open space/development buildout properties
- Potential well and/or treatment and disposal sites
- Phasing that targets year-round developments and applies near-term solutions to seasonal areas
- Nutrient Management/ Fertilizer Control By-law

As these strategies are a key component of reducing future growth potential, the FEIR should either include those not currently in existence (i.e. Growth Neutral) or elaborate on how they are already included in the proposed phasing plan for implementation and provide additional information on each of the proposed strategies, including a description of near-term solutions for seasonal areas. It would also be helpful to provide a summary of past and ongoing land management activities (e.g. past land acquisitions protective of the Mashpee River, adoption of mandatory cluster and TDR bylaws, etc.) as well as a characterization of the how close the town is to reaching buildout.

Joint Base Cape Cod

The Final Alternatives Screening Analysis report includes discussion of potential use of Joint Base Cape Cod (JBCC), formerly Massachusetts Military Reservation (MMR) for wastewater disposal and treatment. The DEIR includes a letter from the Board of Selectmen dated March 27, 2013 stating the Town's interest in the use of facilities at JBCC. The DEIR acknowledges that because a local/regional plan has yet to be developed or agreed upon with JBCC, the details of its use may need to be addressed as part of the adaptive management approach with the neighboring towns of Falmouth and Sandwich.

Staff supports continued efforts by the Town to work with the 102nd Intelligence Wing and neighboring towns to pursue planning efforts for shared wastewater services. The Commission has applied for funding from the Department of Defense, Office of Economic Adjustment, to examine the feasibility of long-term potential transfer of the wastewater and water supply systems to a regional or other public entity. OEA funding is also being sought to conduct a business case analysis for future ownership and operation of the wastewater and water supply systems at JBCC by MassDevelopment. The Upper Cape towns, including Mashpee, will be key stakeholders in these joint planning efforts as this project proceeds.

Additional discussion of the JBCC facility is discussed below in the Water Resources section.

WATER RESOURCES

The Mashpee DEIR/CWMP presents a mosaic of both traditional and non-traditional solutions that will be implemented over the course of 25 years to attain compliance with the required nitrogen removal to restore water quality in Popponesset Bay, and eastern Waquoit Bay,

consisting of Hamblin Pond, Jehu Pond and the Quashnet/ Moonakis River. The Plan is a town-wide plan and strives to address water quality restoration in the shared Popponesset and Waquoit embayments, but could be construed as a Targeted Watershed Management Plan (TWMP) because it does not completely address Waquoit Bay (eastern Waquoit is segmented from west Waquoit because west Waquoit is to a large degree within the boundaries of the Town of Falmouth). Because shellfish aquaculture has a significant nitrogen reduction potential, the immediate traditional infrastructure components of the plan are targeted to supplement the proposed aquaculture projects to specifically meet TMDLs in the Mashpee River and Quashnet River watersheds. Otherwise, traditional infrastructure solutions are deferred over a 25 year period with five year milestones of review of shellfish aquaculture performance review under an adaptive management plan.

The Mashpee CWMP includes innovative aspects that the Commission finds consistent with the draft 208 Plan Update and could be found as consistent with the Regional Policy Plan. However, additional work is needed to better characterize the incremental nitrogen reduction of the Phased plan and its prioritization. The Commission can provide technical assistance for these characterizations and will devote staff and new tools, including the WatershedMVP, to assist the town upon request.

The Alternatives Screening Assessment Report presented Options 1A, B and 1C. These options were run by the MEP to confirm the ability of the option to reduce nitrogen by the required amount to restore water quality. They are briefly summarized by the following:

Option 1A – Collect and treat 2.7 MGD of wastewater. Send a majority of wastewater flow (1.03 MGD) to the outside of the watersheds (multiple sites were considered) for disposal. One of the sites initially considered was Rock Landing under the assumption that the public supply wells could be relocated in the future. Continued and expanded use of four existing WWTFs, and use of two proposed WWTFs. Assumption that wastewater from portions of Falmouth, Sandwich and Barnstable would be treated by those towns out-of – watershed. A component of Falmouth is treated within Mashpee.

Option 1B – Collect and treat 2.7 MGD of wastewater. Manage wastewater flow within the watersheds that generate the flow. This option assumes that 4 new WWTF sites would receive 1.67 MGD with the majority of discharge in the eastern portion of town going to Willowbend. This option includes Sandwich and Barnstable flows remaining in the Popponessett watershed, with the latter flows being treated at Willowbend (except for the Barn-39 sector) and Falmouth flows being addressed the same way as Option 1A. Less flow remains to be treated with Title 5 system in this alternative.

Option 1C – This is similar to Option 1A but includes wastewater in the neighboring towns being managed like Option 1B.

These three scenarios were modeled by the MEP to confirm their ability to achieve the required nitrogen reductions and appropriate nitrogen concentration at the Sentinel stations. The MEP used the “universal database of 2009” within the previous Linked Water Quality Models. The Town had the MEP use the nitrogen load from the 2009 estimated buildout conditions to model achievement of the water quality goals at buildout. The scenarios achieved the sentinel station required nitrogen concentrations in the Popponesset system and its embayments, but they were not reached for the Waquoit subembayments. The MEP scenario report indicates that the more recent whole Waquoit Bay MEP Technical report shows that the loading throughout the entire watershed contributes more than can be reduced by the scenarios in the watersheds to just the

eastern embayments. The MEP report indicates that the solution for Waquoit Bay will require targeted reductions throughout the watershed. Since buildout will not occur until an undetermined future date, and the Modeling did not account for any other reductions in the western parts of Waquoit Bay, it is possible that the scenarios might be closer to achieving the targets under present conditions. These MEP results are applied to the Modified and default Option 1A below

The DEIR/CWMP retains and modifies Option 1A, which continues to propose Site 7 and additional areas of New Seabury and no longer proposes use of the Rock Landing well site for wastewater disposal, as the default traditional plan. Because this option rests on the results of the 2012 MEP results, it is assumed that the previous discharge distribution conceptually conforms to the new discharge configuration of the 2014 Modified Option 1A below, but the FEIR should clarify.

- 2014 Modified Option 1A Use of existing private and public WWTF (< 3 ppm NO3) at:
 - South Cape Village
 - New Seabury
 - Willowbend
 - Windchime Point
 - Stratford Ponds
 - Mashpee High School
 - Southport
 - Mashpee Commons
- Use and expansion of private and public collection area to the WWTFs at:
 - Cotuit Village
 - Wampanoag Village
- Three new WWTF (1.2 MG combined @ < 10 ppm NO3) to be located at:
 - Site 4 – Transfer Station
 - Site 6 – Red Brook Road
 - Site Bk Rd 1 – Back Road (< 3 ppm NO3)
- New Effluent Disposal Sites (1.48 MGD combined) at:
 - Site 7 – New Seabury (1.0 MGD)
 - Site 4- Transfer Station (0.1 MGD)
 - BkRd – Back Road Site (0.3 MGD)
- Neighboring Towns
 - Falmouth – collected and treated out of watershed (50,000 gpd)
 - Barnstable – collected and treated out of watershed (80,000 gpd)
 - Sandwich – collected and treated out of watershed (300,000 gpd)
- Title 5 and Innovative Alternative Septic Systems
 - Existing IAs to continue
 - Title 5 to continue ~0.5 MGD

DEIR/CWMP Evaluations and Recommended Plan Development

In the FEIR, components of the Modified 2014 Option 1A are compared to several potential alternatives including: Centralized vs Cluster Solutions, Regional solutions involving the WWTF at Joint Base Cape Cod (JBCC), and the use of non-traditional technologies including Shellfish aquaculture, Permeable Reactive Barriers and Bog/Wetland restoration. The results of these evaluations are used to form the draft Recommended Plan.

Centralized vs Clustered Assessment

Centralized vs cluster treatment was evaluated for the five areas listed below.

Location	Flow	Parcels	MVP Flow through
Briarwood/Otis Trailer Park	34K	320	44%
Pickerel Cove	6.2K	60	25%
Pirates Cove	13K	150	100%
Tri-Town Circle	6.3K	90	20%
Santuit Pond	29K	180	26%

The DEIR includes a comparative analysis that evaluates cost, collection, treatment, and a range of various treatment locations and discharge sites from an individual cluster facility to one where the wastewater flow is combined into a larger Option 1A treatment scheme. From a cost per kilogram of nitrogen removal perspective the lowest cost option is always the larger facility. However, in a plan that will be incrementally implemented, a cost premium for an independent facility may be desirable. The plan compares potential advantages and disadvantages of both approaches but does not conclude which may be the best option. An additional detail that should be considered is the total nitrogen contribution to the overall and sub-embayment load of the watershed. Staff used the Watershed/MVP tool to list the nitrogen flow through factor associated with each of these areas accounting for natural attenuation. In some cases like Tri-Town, only 20% of the nitrogen will get to the embayment. In the case of Pirates Cove 100% of the nitrogen load gets to the embayment. Use of the Commission's tools provides an ability to rank explicit nitrogen reduction benefits for making decisions on priorities and staff is available to work with the town to further explore these options.

Joint Base Cape Cod

The DEIR/CWMP includes several options for use of the JBCC WWTF and its disposal capacity near the Cape Cod Canal. The options include the Back Road areas, Area H and G near Johns and Ashumet Pond and several Sandwich areas in the vicinity of Snake Pond. The main advantage to this regional solution is that it gets nitrogen load and flow out of the watershed completely allowing for more flexibility for remaining watershed solutions. The disadvantage is the uncertainty of dealing with the military on issues of ownership and allocation. Sharing of military infrastructure continues to be evaluated by the JBCC. The DEIR indicates that the areas to be connected will generate 310,000 gpd of wastewater flow. When added to the existing JBCC flow of 200,000 gpd, the flow exceeds the existing capacity. The DEIR/CWMP provides a cost evaluation of the necessary upgrades for the JBCC to accommodate the additional proposed flow. Based on an analysis the watershed MVP tool, Staff believes additional refinements could be made to reduce anticipated need in the watershed. For example, in the case of the Sandwich Areas, 1, 2, and 3, nearly half the load is derived from 20% of the parcels which occur in Area 3, the upper Quashnet River watershed, which is approximately 560 kilograms. Other Sandwich 1, 2, and 3 areas are contributing less than 20% to 44% of their load to either Mashpee River or Waquoit Bay. These differences are also evident in the matrix. Also half of Area H to the southwest of John's Pond is in the Childs River watershed, not the prioritized Quashnet River.

Several of the proposed discharge sites of the DEIR/CWMP will require further negotiations and agreements; contingencies within the plan for alternative sites may have an effect on nitrogen reduction targets and anticipated treatment levels. Given the uncertainty of New Seabury as a

major discharge site further evaluation of expanding the potential for use of JBCC for regional discharge is warranted. The site characterizations appear to indicate the suitability of the discharge sites. Discharge sites located north of the John's Ponds area should be further evaluated for potential impacts on the downgradient fresh water ponds.

Shellfish Aquaculture

The non-traditional assessments evaluated PRBs, bog and wetlands restoration and shellfish aquaculture. The plan defers to the PRB effort in Falmouth to provide additional data prior to further consideration of this technology. The DEIR/CWMP indicates the use of shellfish aquaculture promises to remove a substantial amount of the nitrogen from the embayment water column (in the form of algae). The DEIR/CWMP indicates the number of required shellfish at 35.5 million with distribution being approximately 16 million in Popponesset and 19 million in the eastern portion of Waquoit. The Mashpee DEIR/CWMP has provided a detailed conceptual plan to implement a shellfish aquaculture project in multiple embayments. In many cases the use of shellfish is indicated as removing 100% of the required nitrogen. Where removal is only 50% for Mashpee River and Shoestring Bay, the Plan prioritizes those areas for additional removal by traditional means. The more recent Waquoit Bay MEP report treats the eastern and western portions together as one complete embayment system indicates that additional options should be investigated, such as potential improvements to tidal flushing for the Quashnet River.

Shell fish Removal Estimates by percent:

Mashpee River	50%
Popponesset Bay	100%
Ockway Bay	100%
Shoestring Bay	50%
Great River	100%
Jehu Pond	100%
Hamblin Pond	100%
Quashnet	0% (not estimated)

Following these evaluations a Draft Recommended Plan is established as outlined as follows. Because this option rests on the results of the 2012 MEP results, it is assumed that the previous discharge distribution conceptually conforms to the new discharge configuration of the Recommended Plan as outlined below, but the FEIR should clarify.

Following the evaluations the Draft Recommended Plan as proposed is summarized below:

- Shellfish Aquaculture
- Wastewater Treatment and disposal at Joint Base Cape Cod for Quashnet Areas H, G and Sandwich 1,2,&3)
- Wastewater Treatment at Existing WWTF with needed improvement/expansion/modification
 - New Seabury (0.3 mgd treatment approx~ 1.0 mgd recharge), <10 mg/L TN
 - Willowbend (treatment at 0.18 mgd, recharge of up to 0.8 mgd), <3 mg/L TN
 - Mashpee Commons (treatment and recharge approx~ 0.5 mgd), <5 mg/L TN
 - Mashpee High School – treatment and recharge to JBCC or Back Road Site (fallback)
 - Cotuit Meadows – pick up additional service area
 - Wampanoag Village – pick up additional service area
- Wastewater Treatment at Existing WWTF (potential future upgrade to improve performance – shellfish dependent) – 3 to 6 mg/L TN

- Forestdale School
- Mashpee Village
- Southport (if JBCC is not an option)
- Stratford Ponds
- Windchime Point
- Coordination with Adjoining Towns
 - Barnstable (0.08 mgd)
 - Falmouth (0.05 mgd)
 - Sandwich (0.19 mgd)

Total Plan Cost and Phasing

The town submitted a matrix of parameters as a supplement to the EENF/ DEIR that compares and selects potential sewer areas for collection and accumulated wastewater treatment flows for existing and proposed WWTF. The matrix ranks the priority of the previously delineated Planning Areas. It is not clear how the matrix assigned nitrogen loads, either existing or attenuated, to the areas. Commission will review and comment more fully on this matrix pursuant to the FEIR.

The DEIR/CWMP includes the total capital cost of the Default plan at \$260 Million for Mashpee and additional \$97 Million for the 3 neighboring towns for a total of \$360 million dollars. The total aquaculture based recommended plan cost is estimated at \$140 Million for Mashpee and \$35 Million for the three neighboring towns for a total capital cost of \$180 million dollars. The aquaculture-based non-traditional technology results in a 50% cost reduction of traditional infrastructure.

The DEIR/CWMP also provides a Phase 1 cost of the aquaculture modified plan of \$49 Million with a present worth estimate of \$92 Million over 20 years at 3% interest. The Phases of the DEIR/CWMP are summarized below.

Phase 1: 2016-2020

Shellfish propagation in Popponesset Bay (including its subwatersheds of Mashpee River, Shoestring Bay, Ockway Bay), and in Jehu Pond and Hamblin Pond (including Great River) Quashnet and Combs schools to Mashpee Commons
 Design/Construction of Back Road or JBCC for Area H 0.2 MGD
 Design / Construction of Site 4 for Subarea S2 0.1 MGD

Phase 2: 2021-2025

Continued Shellfish propagation
 If JBCC, then Sand 1, 2 & 3 should be collected
 If shellfish not performing:

- Site 4 expansion -recharge to Willowbend
- Upgrade PWWTF Stratford Ponds, South Cape Village, Windchime Point
- Sewer S1 P1 south of Rt28

Phase 3: 2026 to 2030

Continued Shellfish propagation
 If shell fish does not perform:

- Upgrade Southport
- Site 4 expansion up to 0.39 MGD
- Expand Willowbend service area
- Site 6 design/construction Ockway Bay Area 0.27 MGD

- New Seabury Disposal construction for Mashpee Commons and Site 6 effluent. 0.71 MGD
- Barnstable and Sandwich to address

Phase 4: 2031 to 2035

Upgrade Cotuit Meadows and Wampanoag WWTF

If shell fish does not perform:

- Site 6 expansion for Hamblin Pond and Jehu Pond
- Collection expansion to Site 4
- Collection expansion of Great Neck
- Collection expansion of Hamblin and Jehu D2 and B
- Upgrade and Expand New Seabury WWTF

Phase 5: 2036 to 2040

If shellfish does not perform:

- Barnstable and Sandwich treatment and recharge out of watershed
- Collection Main St/ Rt 130 Area T to Site 4
- Collection expansion to Area A and C
- Childs River Subarea H

The use of shellfish aquaculture on such a wide spread scale to achieve the measure of significant required nitrogen removal anticipated in this plan has not been attempted on Cape Cod. Aquaculture is a non-traditional technology that several towns including Wellfleet and Falmouth are pursuing. The Mashpee aquaculture plan makes use of actual shellfish planting and harvest data and associated costs combined with researched nitrogen uptake amounts to formulate a program and budget. The Plan also targets nitrogen removal on sectors of critical embayments that have the characteristics that make success more probable. The program will require further details and review in the FEIR. The Commission will provide further comments from the 208 Monitoring Subcommittee on the proposed aquaculture project in the interim, and through the DRI process.

Adaptive Management

The DEIR/CWMP incorporates the elements of an Adaptive Management Plan for monitoring, and reviewing data and making adjustments and modifications of the plan. The Commission will provide additional comments and direction on the proposed adaptive management plan for the Phase 1 Plan in the DRI review. It is suggested that the Town appropriately budget for the necessary evaluations and adaptive management provisions within the aquaculture component of the Phase 1 project.

Conclusion

The traditional components of the Modified 2014 Option 1A plan is a reasonable fallback if shellfish aquaculture underperforms and comprehensively ties many years of the Town's effort together, but its later phases can benefit by further evaluation from using the Commission's 208 watershed tools to better account for proposed nitrogen load reductions, assign and select priorities and take advantage of additional regional efforts.

Additionally, Commission staff suggests that the town continue to participate in a regional strategy for addressing nitrogen load in the entirety of Waquoit Bay prior to prioritizing a traditional infrastructure approach for areas G and H in Phase 1.

COASTAL RESOURCES/ NATURAL RESOURCES

The Mashpee CWMP presents four general elements of or actions for a proposed approach to managing wastewater and/or nitrogen loading, including expanded shellfish aquaculture in Popponesset and Waquoit Bays; use of the wastewater treatment facilities at Joint Base Cape Cod; use of existing facilities within the project planning area (for collection/treatment/effluent disposal); and potential development of new facilities (for collection/treatment/effluent disposal) at one or two sites. The following comments address considerations to reduce impacts to wetlands, wildlife, open space, and coastal resources as the town proceeds with alternatives analyses.

The RPP generally prohibits impacts to wetlands and the 100ft buffer to wetland resources, though utility infrastructure installation may be allowed where there is no other feasible alternative. During CWMP implementation, project planners should avoid direct and indirect wetland and buffer impacts wherever possible. Indirect impacts could include actions that may be expected to alter the natural functions of the wetland. At the same time, alterations that include associated wetland restoration are supported in the RPP.

The RPP also generally prohibits activities that would impact rare species or their habitats. According to the DEIR, three of the plan's potential "greenfield" sites (Sites 4, 2, and 6) are located in mapped habitat of two state listed species, the Eastern Box Turtle and the Grasshopper Sparrow. The Natural Heritage and Endangered Species Program indicated in correspondence on the project in 2008 that efforts to minimize impacts to these habitats should be addressed during the design phase of the project. As the town moves forward with selecting sites for wastewater implementation they will need to coordinate with the NHESP for additional guidance on avoiding or mitigating impacts to rare species.

With the exception of the shellfish restoration aspects of the proposal, the Mashpee CWMP appears to propose limited impacts to coastal resources (section 8.3.2. To the greatest extent feasible, collection system components should be located within existing roadways or disturbed areas wherever feasible in coastal resource areas. In addition, the RPP permits new non water-dependent public infrastructure within land subject to coastal storm flowage where there is no feasible alternative, a public benefit is demonstrated, and provided that the infrastructure will not promote new growth and development in flood hazard areas. The staff recognizes the public benefit of nitrogen reduction activities and suggests that the FEIR address how new growth and development will be controlled in flood hazard areas.

Commission staff sought comments from the Cape Cod Cooperative Extension/WHOI SeaGrant staff with regard to the shellfish restoration components of the plan. CCCE staff commented that the proposed sites are feasible, but that it would be advisable to pre-identify actual areal coverage of bottom habitat suitable for planting shellfish in order to accurately assess available space for the proposed shellfish densities. Potential concerns raised by CCCE staff deal with the availability of appropriate shellfish seed to undertake the aquaculture project. Commission staff assumes that consideration for location/design of shellfish proposals will not conflict with vessel navigation.

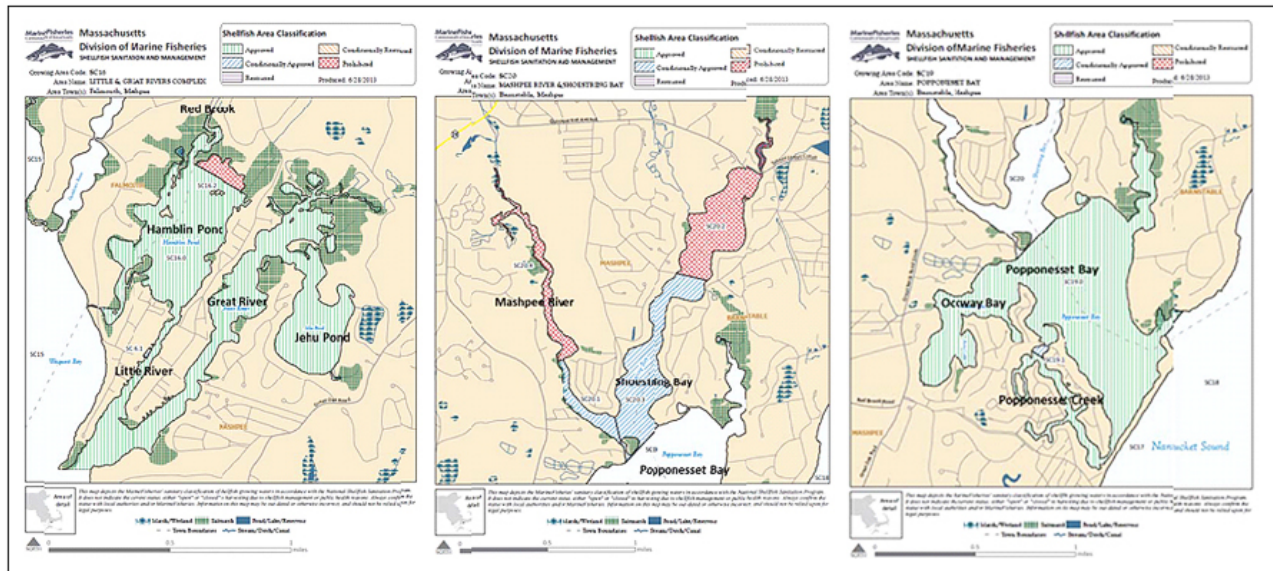


Figure 1.2: Provided by CCCE staff, the locations are feasible and identified as approved shellfish growing/harvest areas by the MA Division of Marine Fisheries. Exceptions include the upper reaches of Hamblin Pond, Mashpee River, and Shoestring Bay which are designated prohibited areas.

Effluent Recharge Sites

The potential new effluent discharge sites 4 and 6 are all mapped for rare species habitat, as noted above, and are greenfield sites. However, they are not mapped for other sensitive resources, including wetlands, certified or potential vernal pools, or BioMap2 Core Habitat. Additionally, selection of these parcels for development over others within the town will serve to minimize additional fragmentation of habitat in Mashpee, as these parcels are already disconnected from large contiguous open space tracts, and/or are adjacent to existing development. Commission staff recommend that fragmentation of habitat and open space at all of the sites considered should be minimized by siting the disposal beds as close to existing development as is feasible, given other land use values, concerns and interests.

Collection System

To the extent possible, pump stations should be located near roads and away from wetlands and wetland buffer areas, to minimize the footprint of additional disturbance. Also, as a general matter, the collection system network should be installed within existing road networks to the extent feasible, and avoid “overland” installations that will result in large, new additional areas of disturbance and habitat fragmentation where economically feasible.

ECONOMIC DEVELOPMENT

Commission staff reserves comment on Economic Development issues, particularly with respect to RPP MPS ED4.1, until a DEIR certificate issues.

ENERGY RESOURCES

The Energy Section of the Regional Policy Plan (RPP) focuses attention on energy intensive building and land use practices that contribute to climate change. Thus, the goal of the Energy Section is to “promote a healthy and sustainable environment by reducing greenhouse gas emissions and energy consumption through design and construction practices that increase energy conservation, promote energy efficiency, and promote self-efficiency through the use of

locally distributed renewable energy” (Technical Bulletin 09-002, available on Cape Cod Commission website).

To meet this goal, the Regional Policy Plan Energy section provides minimum performance standards for several different types of development projects. Though the RPP specifically provides that the Energy MPS’s do not apply to wastewater treatment facilities (and thus, in the Commission’s practice, to CWMP’s), the DEIR does contain a discussion of renewable energy systems associated with the CWMP in Section 8.3.5 therein. Specifically, the applicant has already considered options to improve energy efficiency, such as energy recovery systems, hydroelectric potential, and lighting optimization. These options are consistent with the goals set out in the Energy section of the RPP.

Climate Change Mitigation

In the DEIR, the applicant expressed interest in protecting infrastructure in the Proposed Planning Area (PPA) against sea level rise and flooding. Staff suggests that there are several research tools available to the applicant to model the effect of water level rise (in the form of sea level rise or flooding) on the PPA:

- The Cape Cod Commission’s Sea Level Rise Viewer available on the Commission website
- Dynamic models created by the Woods Hole Group in Falmouth, MA

The RPP does not contain an issue area specific to Climate Change, though there are goals, standards and practices in the Coastal and Marine Resource sections of the RPP that relate directly or indirectly to sea level rise, which is associated with Climate Change. Best practices for climate change mitigation efforts are described in several other public documents as well:

- Cape Cod Commission Energy Technical Bulletin 09-002
- Multi-Hazard Mitigation Plan for the Town of Mashpee
 - o Beginning in March 2014, the Town of Mashpee started a 24-month process to update their Multi-Hazard Mitigation Plan. The previous hazard plan and update will be a valuable resource to the applicant because it contains research on climate change for the Town of Mashpee as well as risks, extent, impacts, and mitigation efforts for climate change in the PPA:
- National Climate Assessment (<http://nca2014.globalchange.gov/report>) Chapter 27 on Mitigation
- Climate Change Adaptation Resources available through the MA office of Coastal Zone Management (CZM)

Staff would be available to assist the Town in ensuring that proposed wastewater infrastructure addresses potential impacts from climate change.

AFFORDABLE HOUSING

This is a Town-sponsored wastewater planning and infrastructure project. As this is not a residential project, Commission staff suggests that none of the RPP Minimum Performance Standards under Goal AH1 and Goal AH2 would apply. As this is a Town project and not a commercial DRI, staff also suggests that none of the Minimum Performance Standards under Goal AH3 would apply. Therefore, staff suggests the Regional Policy Plan’s Affordable Housing issue area would not apply to the CWMP, and ultimately, to the Development of Regional Impact review of the CWMP.

TRANSPORTATION RESOURCES

The potential transportation impacts that may arise from development of projects identified in the CWMP/DEIR are related to new trip generation from potentially new or expanded

Wastewater Treatment Facility(s) (WWTF). Once the Town determine whether it will pursue new or expanded facilities, staff can conduct an analysis of whether the trip generation from the facility will warrant additional review and/or potential conditions.

Regardless of any new facility's(s) trip generation, MPS TR1.8 requires acceptable sight distances at all access and/or egress locations for DRIs. With a special concern to a site with a high percentage of truck traffic, it is recommended that the Town confirm to the Commission that any new treatment facility(s) be sited such that any new site driveway provides sight distances that meet the stricter of the Massachusetts Department of Transportation and American Association of State Highway Transportation Officials guidelines for safe stopping sight distances.

HISTORIC PRESERVATION/COMMUNITY CHARACTER

The Comprehensive Watershed Nitrogen Management Plan for Mashpee includes a variety of methods to address nitrogen. Several of the proposed methods are unlikely to affect historic or archaeological resources due to their limited ground disturbance or their location in previously disturbed areas. None of the proposed methods appear to impact structures within the Mashpee Historic District. In order to be consistent with RPP Standards HPCC1.1 (Historic Resources) and HPCC1.2 (Cultural Landscapes), the town will need to work with Massachusetts Historical Commission (MHC) and local historic boards to insure that final design plans for new infrastructure will avoid impacts to these resources.

Potential new facilities proposed at Site 4 and Site 6 appear to be located outside of highly sensitive archaeological resource areas, but additional archaeological reconnaissance survey work will be necessary if construction (treatment facilities, pumping stations, and collection systems) is proposed beyond already surveyed areas. The same is true of other undisturbed sites being considered for construction of new treatment facilities. Installation of sewer lines and ground-disturbing infrastructure should occur in previously disturbed areas as much as possible in order to avoid possible impacts to historic and archaeological features. As the final design of other project elements is completed, MHC review is needed to assess areas where ground disturbance is proposed and to determine whether additional archaeological survey work is needed, consistent with RPP Standard HPCC1.3 (archaeological sites).

PERMITTEE RESPONSIBILITIES

The Town of Mashpee filed this CWMP/DEIR with the MEPA Unit. The Sewer Commission may be absorbed into a new entity if a town referendum passes next spring to create a new Mashpee Water and Sewer Commission. The town should explain who will be the responsible party for future permitting, implementation, operation and management, and provide details about how Sewer Commission activities might be succeeded via the new entity. In addition, it is staff's understanding that the existing and potential new commission will control traditional collection, treatment and disposal facilities. The FEIR should address how the town will be responsible for implementing traditional and non-traditional proposals contained in the CWMP/DEIR whether or not the new entity is approved in the Spring of 2015.

Consistency with 208 Plan Update

The approach taken in the DEIR is consistent with the spirit and intent of the Draft 208 Plan Update in that it seeks lower cost solutions through the selection of alternative technologies and proposes an adaptive management approach phased in over five year increments. The Commission reserves the right to conduct additional consistency analysis as local plans develop and the 208 Plan Update is finalized.



Paul J. Diodati
Director

Commonwealth of Massachusetts

Division of Marine Fisheries

251 Causeway Street, Suite 400

Boston, Massachusetts 02114

(617)626-1520

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Deval Patrick
Governor
Maeve Valley Bartlett
Secretary
Mary B. Griffin
Commissioner

September 5, 2014

Secretary Maeve Valley Bartlett
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Deirdre Buckley, EEA No. 12615
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Secretary Bartlett:

The Division of Marine Fisheries (*Marine Fisheries*) has reviewed the Draft Recommended Plan/Draft Environmental Impact Report by the Town of Mashpee Sewer Commission. The proposed Recommended Plan includes shellfish aquaculture, wastewater treatment at existing and new facilities, coordination with adjoining towns, continued use of septic systems, development of future demonstration projects, and coordination with the Cape Cod 208 planning efforts. Future demonstration projects include permeable reactive barriers, wetlands restoration, and eco-toilets. The project area comprises Hamblin Pond, Jehu Pond, Popponesset Bay, Ockway Bay, Shoestring Bay, the Great River, the Little River, the Mashpee River, John's Pond, Mashpee-Wakeby Pond, Santuit Pond, and the Quashnet River. Existing marine fisheries resources and potential project impacts to these resources are outlined in the following paragraphs.

The rivers and embayments within the Popponesset Bay and Waquoit Bay East watersheds provide foraging, spawning, and/or nursery habitat for a variety of diadromous fish species, winter flounder, horseshoe crabs, and shellfish [1]. These areas also contain mapped eelgrass (*Zostera marina*) beds, one of the most productive habitats for numerous marine species [2,3]. Mapping of eelgrass in these regions has demonstrated significant reductions in eelgrass bed area in Hamblin and Jehu Ponds as well as the Great/Little River system over the past decade [4]. These declines are likely due to nitrogen loading to these systems [5].

Marine Fisheries offers the following comments for your consideration:

- *Marine Fisheries* commends the proponent for designing a shellfish remediation plan that is consistent with the *Marine Fisheries* Shellfish Planting Guidelines [6]. The proposed shellfish planting regions are all in areas currently listed as Approved for shellfish harvest, thus avoiding potential health risks associated with illegal harvest.

Marine Fisheries is supportive of shellfish restoration and the inclusion of shellfish aquaculture and propagation in nitrogen remediation efforts. The town will need to modify their existing municipal propagation permit with *Marine Fisheries* to conduct these activities.

- While we are supportive of shellfish propagation for the purposes of augmenting harvest opportunities and maintaining and increasing local populations, we caution against relying on shellfish as a primary nutrient remediation technique. Past research has demonstrated that nitrogen removal varies among estuaries and years due to differences in environmental conditions (e.g., food availability, temperature, nitrogen loading) [7,8]. Nitrogen removal from shellfish propagation can be negatively impacted by factors leading to reduced growth rates or increased mortality (e.g., hypoxia events, reduced food availability). Given the ambitious scale of the shellfish remediation component, *Marine Fisheries* requests further information on this component and also provides comments below on the approach outlined in the DEIR:
 - The general approach of quantifying nitrogen removal through shellfish harvest consists of multiplying total shellfish harvest by an average estimate of individual shellfish nitrogen content. The former will be based on both commercial and recreational harvest data. While collection of commercial data involves a relatively straightforward use of DMF catch reports, non-commercial harvest will likely be more challenging to quantify. Particularly given the ambitious scope of the shellfish component, proposed recreational harvest data collection methods should be explained in greater detail.
 - Since the seed to be used in this effort will be coming from outside sources, the initial weight of the seed shellfish should be subtracted from the harvest weight used to calculate nitrogen removal. While individual initial seed weight will be quite small, this overall weight for all shellfish seed could be relevant at the proposed scope of planting and removal.
 - Shellfish aquaculture and propagation is proposed as a tool to address 50% (Mashpee River, Shoestring Bay) to 100% (Popponesset Bay, Ockway Bay, Great River, Jehu Pond, Hamblin Pond) of the of the nitrogen load exceeding the threshold set through the Massachusetts Estuaries Project (MEP). A recent study on Cape Cod concluded that the likely range of land-derived nitrogen that could be removed by shellfish bioremediation was 1-15% [7]. Proposed nitrogen removal by shellfish should be reported in terms of total estimated nitrogen load to these systems. The approximate numbers of shellfish required to reach the MEP thresholds are included in the report. The estimated total area required to house these numbers of shellfish, associated shellfish densities, and the planting area locations should also be included in the report. This information is needed to better understand the likelihood of attaining nitrogen removal goals through the proposed intensive shellfish bioremediation approach.
 - The “nitrogen removal” section of the Shellfish Aquaculture/Fisheries for Water Quality Restoration component of the DEIR refers to higher historic shellfish carrying capacities. If habitat conditions have declined, these historic densities may no longer be supported in the current environments of these systems. Consequently, intensive planting may have high rates of mortality if seed shellfish are being introduced to areas that no longer can sustain high shellfish densities.
 - Both oysters and quahogs are proposed for use in the nitrogen remediation plan. For more eutrophic water bodies where food supply to filter feeders tends to be

higher, shellfish growth tends to increase. However, mortality rates can also increase under these conditions, likely due to hypoxia. Oysters, which have high feeding and assimilation rates as well as high survivorship in hypoxic conditions, would be better suited than quahogs for nitrogen remediation in such areas [7,8].

Questions regarding this review may be directed to John Logan in our New Bedford office at (508) 990-2860 ext. 141.

Sincerely,



Paul J. Diodati
Director

cc: Mashpee Conservation Commission
Christopher Boelke, Alison Verkade, NMFS
Rick York, Shellfish Constable
Robert Boeri, CZM
Ed Reiner, EPA
Ken Chin, DEP
Richard Lehan, DFG
Kathryn Ford, Tom Shields, John Mendes, Christian Petitpas, DMF

References

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3. Heck KL, Jr., Carruthers TJB, Duarte CM, Hughes AR, Kendrick G, et al. (2008) Trophic transfers from seagrass meadows subsidize diverse marine and terrestrial consumers. *Ecosystems* 11: 1198-1210.
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PD/JL/sd



MassWildlife

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

September 3, 2014

Maeve Valley Bartlett, Secretary
Executive Office of Energy and Environmental Affairs
Attention: MEPA Office
Nicholas Zavolas, EEA No. 12615
100 Cambridge St.
Boston, Massachusetts 02114

<i>Project Name:</i>	<i>Comprehensive Watershed Nitrogen Management Plan</i>
<i>Proponent:</i>	<i>Sewer Commission, Town of Mashpee</i>
<i>Location:</i>	<i>Town of Mashpee</i>
<i>Document Reviewed:</i>	<i>Draft Recommended Plan / Draft Environmental Impact Report</i>
<i>EEA No.:</i>	<i>12615</i>
<i>NHESP No.:</i>	<i>12-31134 (formerly 01-9528)</i>

Dear Secretary Bartlett:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") has received and reviewed the proposed the *Draft Recommended Plan / Draft Environmental Impact Report* (DEIR) for the Town of Mashpee Sewer Commission's Comprehensive Watershed Nitrogen Management Plan and would like to offer the following comments regarding state-listed species and their habitats.

The ponds, bays, and estuarine waters of the Town of Mashpee provide critical foraging, breeding, migration, and over-wintering habitats for a suite of state-listed species that rely on aquatic and/or marine habitats for at least one stage of their life cycle. These species and their habitats may directly benefit from reduced levels of dissolved nitrogen and improved water quality, and we commend the Town for its efforts to improve water quality within these critical habitats.

Portions of the Town of Mashpee are mapped as *Priority* and *Estimated Habitat* for twenty-seven (27) state-listed rare species, in accordance with the 13th Edition of the *MA Natural Heritage Atlas*, including but not limited to the Eastern Box Turtle (*Terrapene carolina*, state-listed as "Special Concern") and Grasshopper Sparrow (*Ammodramus savannarum*, state-listed as "Threatened") provided in Section 7.2.5 of the DIR. All projects proposed within *Priority* and *Estimated Habitat*, which are not otherwise exempt pursuant to 321 CMR 10.14, will require review through a direct filing with the Division for compliance with the Massachusetts Endangered species Act (MGL c. 131A) and its implementing regulations (MESA; 321 CMR 10.18) and/or the rare species provisions of the Wetlands Protection Act Regulations (WPA; 310 CMR 10.37 & 10.59).

The Division would encourage the Town to incorporate design and implementation alternatives that avoid and minimize impacts to state-listed species and their habitats, and to initiate consultations with

www.mass.gov/nhesp

Division of Fisheries and Wildlife

Temporary Correspondence: 100 Hartwell Street, Suite 230, West Boylston, MA 01583

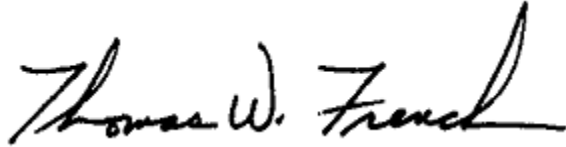
Permanent: Field Headquarters, North Drive, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-7890

An Agency of the Department of Fish and Game

the Division during the design phase. Division staff are available to evaluate alternatives and work proactively with the Town to address any concerns related to state-listed species prior to submission of a formal MESA filing.

We appreciate the opportunity to comment on this project and look forward to working with the Town to proactively address any potential concerns related to state-listed species and their habitats. If you have any questions about this letter, please contact Jesse Leddick, Endangered Species Review Biologist, at 508-389-6386 or jesse.lednick@state.ma.us.

Sincerely,

A handwritten signature in black ink that reads "Thomas W. French". The signature is fluid and cursive, with the first name "Thomas" and last name "French" being more prominent than the middle initial "W".

Thomas W. French, Ph.D.
Assistant Director

cc: Thomas Fudala, Town of Mashpee, Sewer Commission Chair
Town of Mashpee, Department of Public Works
Town of Mashpee, Conservation Commission
DEP Southeastern Regional Office, Wetlands Program
J. Jefferson Gregg, GHD Engineering



via electronic delivery

September 5, 2014

Secretary Maeve Vallely Bartlett,
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office – Deirdre Buckley
100 Cambridge Street, Suite 900
Boston, MA 02114

**Re: Mashpee Comprehensive Watershed Nitrogen Management Plan
EEA No. 12615**

Dear Secretary Bartlett:

Mashpee's proposed Comprehensive Wastewater and Nitrogen Management Plan (CWMP) is the first CWMP from a town on Cape Cod the Secretary is reviewing since the release of the Draft Clean Water Act Section 208 Plan for Cape Cod. It is the Association to Preserve Cape Cod's (APCC) hope that the Secretary will accept the core principles of the 208 plan in evaluating CWMPs beginning with this Mashpee plan.

Founded in 1968 and representing more than 5,000 members, the mission of APCC is to promote policies and programs that enhance the protection of the natural resources of Cape Cod. Underlying all of the work that APCC does is the understanding that Cape Cod is a single geographic and hydrogeological unit, and that the Cape's natural resources and economic vitality cannot be adequately protected based on arbitrary political borders.

Mashpee must be applauded for its proactive approach addressing nutrient pollution in a multi-tiered approach that integrates conventional solutions (sewerage), existing infrastructure (Joint Base Cape Cod) and innovative technologies. Most importantly, Mashpee has fully committed itself to adaptive management. While the effort is overall quite laudable, APCC does have a number of comments and concerns we believe the Secretary should consider in allowing this plan to proceed toward permitting.

Targeted Watersheds- One of the core principles of the 208 Plan is a targeted watershed approach. While the Popponesset Bay portion of this plan is arguably a targeted approach (Barnstable remains missing), the portion of the plan addressing Waquoit Bay is anything but a targeted watershed approach. Falmouth has the largest contribution of nitrogen to Waquoit Bay

and is essentially absent from the plan.¹ This is simply not a watershed based plan, but is instead the usual plan based upon municipal boundaries and singular municipal action. Mashpee is not completely at fault here as Falmouth has been reluctant to address Waquoit Bay and has focused more in the central portion of that town. Additionally a Total Daily Maximum Load (TMDL) for Waquoit Bay came late in the Massachusetts Estuaries Program watershed evaluation process. Waquoit Bay is the one Area of Critical Environmental Concern (ACEC) covered by this plan and deserves a fully targeted plan involving Sandwich, Falmouth and Mashpee. The 208 plan and planning process identified both the need and the cost savings for towns to cooperate on a watershed basis as opposed to each town sticking to its municipal boundaries. The Secretary should require a targeted watershed approach for Waquoit Bay—making the three towns work toward a solution for this severely impaired ACEC.

Land use initiatives – The Secretary’s Certificate dated November 1, 2013 stated that “[t]he DEIR include a detailed discussion of potential land use control mechanisms that can be employed to limit secondary growth impacts associated with implementation of the CWMP.”

Mashpee has done a good job in dealing with new development. Currently, Mashpee has several growth management bylaws in place that do go beyond many towns in controlling the rate of growth and protecting natural resource areas. The challenge will be to bring redevelopment and expansion of existing structures and uses into a sound and equitable regulatory environment. Mashpee’s zoning should reflect the goal of directing compact development to targeted areas where infrastructure can support the growth, but at the same time, offset that growth with a balanced, growth-neutral reduction in development potential outside of the targeted growth areas.

The town adopted a permit phasing requirement that allows no more than 20 percent of the lots in a new subdivision to receive building permits each year. The town-wide limit is 90 building lot permits per year. Mashpee has an optional Open Space Incentive Development bylaw for subdivisions on 20 acres or more of land, and a mandatory cluster subdivision bylaw for subdivisions on five or more acres. Both bylaws require a special permit, as opposed to being by right. The minimum open space set-aside for both is 50 percent. A Transfer of Development Rights option is available with the Open Space Incentive Development bylaw.

While these bylaws are more progressive than cluster bylaws in many other Cape towns, there are innovative natural resource protection bylaws being used on the Cape and elsewhere in Massachusetts that are very effective in managing growth and protecting resources. APCC adds the following initiatives to the discussion of Mashpee’s growth management strategy:

Natural Resource Protection Zoning (NRPZ)

The town should consider adopting a modified Natural Resource Protection Zoning bylaw that protects large areas of open space, reduces density from what current zoning allows, and offers density bonuses based on the level of nitrogen removal from the new development’s wastewater

¹ APCC is aware that there has been discussion and good cooperation at the wastewater superintendent level but the towns do not have a targeted watershed plan at this point.

treatment. NRPZ is by right, while other types of development, including conventional grid-style subdivision, require a special permit. NRPZ includes a base density reduction from what current zoning allows, cluster development with no minimum lot size requirement, and significant open space preservation of the most environmentally important features of the land. Density bonuses are awarded as incentive for such things as utilization of an advanced wastewater treatment system, and connecting pre-existing neighboring development that currently uses Title 5 to the new development's advanced treatment system to achieve a net nitrogen load reduction for the area. NRPZ can be an effective offset to other regions in town where compact growth is being encouraged due to the presence of supporting infrastructure. A natural resource protection bylaw was adopted in the town of Brewster in 2009 for the purposes of protecting sensitive water resources.

Open Space Residential Design (OSRD)

Like NRPZ, Open Space Residential Design also relies on cluster and natural resource-based open space preservation. It places an emphasis on protecting natural resources in the design of the subdivision, but OSRD typically does not include a reduction in the current zoning's base density allowances.

Managing Expansion of New and Existing Uses

Mashpee has a 20 percent lot coverage maximum for residential uses, but this is not necessarily an effective tool for discouraging oversize residential units on very large lots. Potential options for addressing out-of-scale development, or mansionization, are discussed below.

Floor Area Ratio

Floor area ratio, or FAR, regulates the amount of gross floor area that can be built on a lot. It is a ratio of gross floor area to lot size, or:

$$\text{FAR} = \text{Total floor area of a building on a lot} / \text{lot size}$$

The purpose of FAR is to regulate the above-ground mass of a building that can be seen from the street or a neighboring property. It has been used increasingly in residential situations to discourage mansionization in communities. In regulating the mass, FAR may also help minimize the number of bedrooms that could be accommodated within a residence.

"Sliding Scale" FAR Hybrid (Wellfleet Example)

Wellfleet has adopted residential size restrictions in the National Seashore for the purpose of minimizing visual impacts. This "sliding scale" site coverage provision relies on several lot area and site coverage fixed thresholds to keep the size of development in balance with its surroundings. A maximum limit is placed on the size that a structure can reach. As an option for Mashpee, expansion beyond the maximum threshold could be made possible through a special permit. As with conventional FAR, a similar bylaw in Mashpee may help limit the number of bedrooms per residence. This could reduce the nitrogen load in unsewered areas, conserve sewer capacity in sewerred areas, and address tendencies for "mansionization" throughout the town.

Maximum Site Coverage in the National Seashore Park (Wellfleet)

Lot Area Maximum

Less than 10,500 sq. ft. (just under ¼ acre)
10,501 sq. ft. to 21,000 sq. ft. (\approx ¼ to .48 acre)

21,001 to 42,000 sq. ft. (.48 to .97 acre)

42,001 to 84,000 sq. ft. (.97 to 1.92 acre)

84,001 to 126,000 sq. ft. (1.92 to 2.89 acres)

126,001 sq. ft. (2.89 acres and above)

Site Coverage

5% Maximum Building Coverage

1,050 sq. ft. plus 7.4% of lot area over 10,500

1,825 sq. ft. plus 3.2% of lot area over 21,000

2,500 sq. ft. plus 1.43% of lot area over 42,000

3,100 sq. ft. plus 1.2% of lot area over 84,000

3,600 sq. ft.

Sewer Hookup Cap

Some Massachusetts towns have adopted or are considering regulations that place a ceiling on the number of allowable sewer hookups within a sewer district. If desired by the town, additional building permits may be allowed only through a special permit. These caps allow for targeted zones of contribution.

Growth Management Bylaw (Provincetown Example)

The purpose of this bylaw is to maintain a sustainable rate of residential and commercial development in the town in order to ensure that adequate infrastructure continues to be available to meet current and future demand without overburdening the town's natural resources or infrastructure capacity. A limited number of annual permits are issued for any new or expanding uses that will increase Title 5 flow. Issuance of these permits is based on a predetermined hierarchy of priority types of uses, with affordable housing being the highest priority. The types of uses that are higher in priority go to the top of the waiting list.

Wetland Setback Requirements

Mashpee has a 100-foot setback requirement for development along the Mashpee and Quashnet rivers, while development near other wetlands and water bodies in town must observe a 50-foot setback requirement. The town should consider expanding the 100-foot setback requirement to all ponds and other wetlands. In addition, the board of health should consider expanding the current 100-foot setback requirement for septic leaching systems near ponds and other fresh water bodies to 300 feet.

Special Permits

The town should evaluate whether the Board of Appeals should be required to make a specific finding of more or less nutrient loading in all special permits decisions related to redevelopment or existing structures and uses in determining whether or not a project is “substantially more detrimental,” with the goal being net reductions.

Mandatory Advanced Wastewater Treatment

Mashpee should consider a mandatory requirement for advanced wastewater treatment for all upgrades or replacement of existing systems, such as, all cluster or conventional subdivisions of four units or greater must be connected to an advanced wastewater treatment system if those

subdivisions are in areas that do not have sewer service, or that are in designated water protection districts. The Harwich board of health has adopted this requirement in its regulations.

Fertilizer Management

In addition to examining new growth management bylaw and regulation options, Mashpee hopefully will adopt the Cape Cod Commission's fertilizer management model bylaw at its fall town meeting. The Secretary should send a strong message of the value of adopting this proposed bylaw and its potential for inexpensive water quality improvement.

Reliance on aquaculture – Mashpee has assembled one of the best teams imaginable to carry out its aggressive shellfish program. The cooperation and collaboration of the Mashpee Wampanoag Tribe is an added bonus and an addition to the likelihood of success. Mashpee Shellfish Constable Rick York is regarded as one of the preeminent experts on shellfish management and has a track record of success of utilizing shellfish as a tool for water quality improvement. The plan has a heavy reliance upon this approach, which is subject to wide range of challenges from the environment including disease, predation, weather, ocean acidification and climate change. The town has embraced adaptive management and is prepared to move to a more conventional approach if shellfish efforts disappoint. However, how success or failure are to be quantified and determined is not established in the CWMP with the necessary degree of certainty.

That shellfish take up nitrogen and convert it into shell and tissue is not in question. However, the use of shellfish to take up and remove nitrogen from eutrophic coastal waters, on a scale that would provide noticeable improvement in water quality, is a new area of environmental management. It is critical that we advance this potentially important management tool with a clear understanding of the risks and benefits and a sound means of evaluating success and failure. APCC's main concerns relate to: 1) accurately estimating the concentration and amount of nitrogen removed by shellfish, 2) contingency planning to address limitations on nitrogen removal that may occur if shellfish are impacted by disease, predation, harmful algal blooms, climate change, ocean acidification, cessation or slowing of harvesting, 3) the reliability of this method of removing nitrogen from estuaries, and 4) monitoring to ensure performance.

APCC's staff scientists compared some of the Mashpee information with recent studies conducted in Cape Cod waters (Reitsma et al., 2014; Karplus and Falmouth Water Quality Management Committee, 2014 draft data from pilot test). Because of geographic differences in nitrogen uptake that are described in the literature, these Cape Cod studies are most relevant.

Mashpee's 2012 study is used as the basis for estimating N removal from estuaries by oysters.

Because estuaries have different characteristics, local pilot studies should be used as the basis for designing shellfish aquaculture projects to remove nitrogen (N), whether nitrogen is removed via uptake into shellfish tissue and shell, or through denitrification and other biogeochemical and microbial processes. In 2012 Mashpee conducted testing to measure weight, size, and nitrogen content of wild and cultured oysters at several locations (see data in the Table entitled "Shellfish Sample Data – Barnstable County Extension"). It appears that the results were used in the CWMP application to estimate the concentration of nitrogen in shellfish (e.g., percent of wet weight due to N in all shellfish tested averaged 0.5 % N), to estimate the amount of N in a 100-

gram oyster ($0.5\% \text{ N} \times 100 \text{ g/oyster} = 0.5 \text{ g N/oyster}$), and finally to estimate the amount of N that could be removed in an estuary. There are several concerns with using these numbers, as described below.

- 1) The 2012 study was performed over one growing season. Pilot tests should be conducted for at least two or more years in order to obtain enough data to yield robust estimates of the amount and concentration of N in shellfish. Two years is also preferable because older shellfish will generally be larger and contain more nitrogen than younger oysters.
- 2) The 2012 study was apparently not used to differentiate nitrogen uptake according to different size classes. Reitsma et al. (2014) and the Falmouth pilot study (Karplus, personal communication) showed that size class is an important factor in determining the percent of nitrogen in shellfish—generally the older the shellfish, the larger it is and the more nitrogen it contains. Using one number for the percent of N could result in over-estimating or under-estimating the amount of nitrogen removed by shellfish, particularly when extrapolated to five million shellfish.
- 3) Mashpee's assumption of 0.5 g of N removed per oyster assumes a 100-g oyster ($0.5\% \text{ N}$ times 100 g oyster = 0.5 g N per oyster). The 2012 study tested oysters whose whole weights ranged from 37.26 g wet weight to 97.46 g wet weight, with the average being 59 g. If harvested shellfish are smaller than 100 g, the town's assumptions may result in overestimating the amount of N removed. Again, characterization of N content based on size classes would help the town to more accurately estimate the amount of N that could potentially be removed. Reporting of N concentrations and amounts in terms of dry weight would facilitate comparison with published values.
- 4) Variation in N concentration and amount in shellfish should be characterized in order to bracket the upper and lower bounds of N-removal. Variation could occur due to seasonality, size classes (as indicated above), estuary conditions, species, shellfish health, and other factors. This is important for judging whether shellfish aquaculture will meet regulatory standards for N removal.
- 5) When N concentrations, amounts and estimates are being discussed, the narrative should be clear whether this refers to oysters, quahogs or a combination of both.

Recommendation 1:

Because there is much riding on using shellfish to remove nitrogen, Mashpee should conduct additional pilot testing for at least a second and probably a third year, to provide more accurate estimates of the amount of N to be removed. Additional testing should characterize the mean, median, variation (maximum, minimum, standard deviation) in nitrogen concentration and amount according to species, size class, estuary, seasonality, and growing configuration. The results should be used to re-estimate the amount of nitrogen that may be removed by oysters or shellfish.

Recommendation 2 Provide backup plan if shellfish cannot be harvested or populations are reduced (in addition to other contingencies).

Appendix 5.1 in the CWMP expresses confidence that shellfish diseases, storm damage, harmful algal blooms, and ocean acidification will not pose risks to shellfish aquaculture because Mashpee has not experienced these. Nevertheless, environmental conditions are changing throughout the world, locally and regionally. In the Pacific Northwest, beginning in 2007, ocean acidification affected oyster hatcheries and by 2008 the oyster harvest had declined by 80%. Accidents such as major oil spills and harmful algal blooms have occurred elsewhere on Cape Cod, causing closure of shellfish beds. The fact that such events have not happened in the past in Mashpee is no guarantee that they will not happen in the future. The town should develop a specific plan for addressing these potential risks and have a backup plan for removing nitrogen if such disasters were to reduce or eliminate shellfish populations or if harvesting were to be stopped or curtailed for some reason. The backup plan should specify concrete actions to provide backup removal of nitrogen if shellfish aquaculture or harvesting partially or completely halted for some reason. The town's Geographic Response Plan may serve as a basis for identifying appropriate response actions for spills or other disasters. In the event that shellfish are rendered unsafe to consume, backup plans for harvesting inedible shellfish and properly disposing of the inedible harvest should be implemented to prevent dead shellfish from re-entering the nitrogen cycle. Monitoring of suitable parameters should be conducted. The Cape Cod Commission is working with a subcommittee to develop recommendations for monitoring different N-removal alternatives, and Mashpee is urged to adopt these recommendations when they are published.

Adding to the mix is that there are other elements occurring in a changing world that might skew results and cloud the success or failure of aquaculture. Standardized measurements for the success or failure of shellfish aquaculture must be adopted for the region and state. Ultimately, the town must qualify/quantify its success or failure. It is unclear in the plan how Mashpee will determine or measure the success or failure of its proposed shellfish program. APCC recommends that the town create a decision matrix to guide adaptive management decisions and actions.

Stormwater – The nexus of stormwater management to edible, sustainable shellfish does not seem to be captured/appreciated in the plan. APCC believes that a successful shellfish program is dependent upon sound stormwater management. Moreover, protecting water quality is critical to maintaining the integrity of Cape Cod's public water supplies, swimming beaches, and recreational resources. While water pollution is often associated with industrial activities and maritime accidents, stormwater runoff from developed areas is a major contributor to the problem. Excess fertilizers and insecticides and the harmful chemicals that accumulate on roofs, pavement and other impervious surfaces, are transported by stormwater to surface and ground waters. This runoff severely degrades water quality, harming the ecology of coastal waters and threatening public health. While federal and state water quality standards require communities to treat and manage stormwater, municipal stormwater management requires an investment in trained staff, infrastructure improvements, maintenance, and management systems. Finding the

funding to manage stormwater runoff to meet water quality standards is often a challenge. Traditional sources of funding (state and federal grants) are typically not enough to address all of a community's stormwater management needs. In recent years, communities across the country have adopted stormwater utilities as a way to create adequate funding for comprehensive municipal stormwater management programs. These utilities have proven to be a successful way for cities and towns to fund stormwater programs that will bring communities into compliance with federal regulations for non-point source pollution under the Clean Water Act. APCC recommends that Mashpee evaluate the creation of a stormwater utility.

Failure of on-site systems – There is compelling evidence that some on-site septic systems are failing and not being detected as failing. The Silent Spring Institute, which is studying the levels and impacts of pharmaceuticals in the groundwater on Cape Cod, has noted that a functioning Title 5 system does an excellent job of breaking down acetaminophen. The Provincetown Center for Coastal Studies is currently monitoring bays and estuaries surrounding Cape Cod for pharmaceuticals, and has detected acetaminophen in our bays, estuaries and sounds. The only potential source for detectable acetaminophen is from failing on-site systems. There are a number of explanations including the failure of Title 5 to eliminate the use of cesspools. APCC has assembled anecdotal information that the majority of existing cesspools have a direct hydraulic connection with groundwater. APCC believes that CWMPs should address both cesspools and monitoring of on-site systems (which often escape inspection under current regulations). The Secretary can take a lead in this endeavor by ordering an update of Title 5 regulations that phase out cesspools and require periodic inspection of on-site systems (not just at sale or an identifiable problem like frequent pumping).

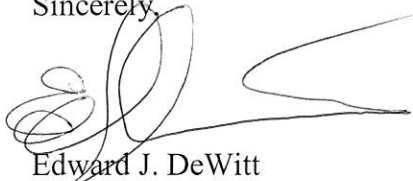
Sea level rise and the efficacy of on-site systems in low lying areas – While the plan addresses climate change, it overlooks some of the critical dynamics ultimately impacting wastewater decision making. APCC is coordinating a multi-level, multi-year modeling project to determine the impact of sea level rise on groundwater elevation and flow. One of the major climate challenges facing Cape Cod is sea level rise. Cape Cod is one of the global “hot spots” for sea level rise, meaning Cape Cod will face well-above global average sea level rise. This could be as much as a seven-foot increase over the next century. Cape Cod has a sole source aquifer that is significantly affected by sea level. On the outer Cape our freshwater floats entirely on top of salt water. On the upper Cape, sea level will have the same impact as if the fresh water were completely afloat: groundwater elevation will rise as sea level rises. As sea level rises it will impact a wide range of ecosystems and infrastructure. On-site septic systems work because of the separation of leaching fields from groundwater. According to the Department of Environmental Protection, the number one cause of on-site septic system failure is groundwater infiltration. Rising sea level will mean rising groundwater elevations and more on-site septic systems will fail. Working with the U.S. Geological Survey, and the Cape Cod Commission, work is underway in this modeling effort. The model will predict where sea level rise will have the greatest impact on the groundwater dynamic, which includes groundwater elevations, stream flow, pond size, and vernal pools, as well as human infrastructure (e.g. basements, septic systems, roads and underground utilities). Sea level rise will likely increase the rate of on-site

septic systems and add to the cost of all in-ground infrastructure. This reality needs to be better integrated into the plan and priorities may have to be readjusted.

Environmental Justice Issues – The plan should more formally address the affordability challenges facing an older demographic often living on fixed incomes and the low income community in Mashpee. These residents may not be able to carry the full cost of implementation. While the Commonwealth has made adjustments to the state revolving fund program which should benefit those least likely to afford the cost of improvements, the town must take a more creative approach. APCC recommends the town consider income from commercial shellfishing associated with the plan be used to offset some of the financial impacts on those least able to afford costs associated with wastewater improvements.

Thank you for providing an opportunity to review and comment on this important step forward for Cape Cod.

Sincerely,

A handwritten signature in black ink, appearing to read 'Edward J. DeWitt', with a long horizontal flourish extending to the right.

Edward J. DeWitt
Executive Director

cc: Mashpee Sewer Commission
Cape Cod Commission

Appendices 1-2 through 7-3 (on CD)

Appendix 1-2	Previous Stearns & Wheeler/GHD Reports
Appendix 1-3	USGS Model Runs
Appendix 3-1	Public Outreach
Appendix 4-1	BOS Letter Dated March 27, 2013
Appendix 4-2	Mashpee Eco-Toilet Regulations
Appendix 4-3	Stormwater and Fertilizer Bylaws and BMPs
Appendix 6-1	Shellfish Supporting Documents
Appendix 6-2	Hydraulic Load Test
Appendix 6-3	Special Permits and Privately Owned WWTF Letters
Appendix 7-1	Pond Monitoring Data
Appendix 7-2	NHESP Letters
Appendix 7-3	Massachusetts Historical Commission Letters and Public Archaeology Abstract

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