EPA NEW ENGLAND'S TMDL REVIEW

DATE: October 24, 2007

TMDL: Pleasant Bay System TMDLs for Total Nitrogen

STATUS: Final

IMPAIRMENT/POLLUTANT: 19 TMDLs - 16 Total Nitrogen TMDLs and 3 Pollution Prevention TMDLs; (See Attachment 1)

BACKGROUND:

The Massachusetts Department of Environmental Protection (MassDEP) released a draft TMDL on September 11, 2006 for public review. Key stakeholders received copies of the document in the mail. The draft TMDL was posted on the Department's web site on that date as well. In addition, a public meeting was held in the Town of Orleans on September 21, 2006. The public comment period was extended and comments accepted until October 20, 2006. Mass DEP prepared a response to public comment which was submitted along with the final TMDL to EPA. All comments from the public were taken into account in the Response to Comments and the final TMDL submission. The final submission to EPA was sent on July 3, 2007. In addition to the TMDL itself, the submittal included numerous supporting documents, either directly or by reference, including:

- Pleasant Bay System Total Maximum Daily Loads For Total Nitrogen, May 2007. (Report #96-TMDL-12, Control #244.0)
- Response to Comments, Draft TMDL Report For The Pleasant Bay System dated July 28, 2006.
- Massachusetts Estuaries Project, Linked Watershed-Embayment Nitrogen Management Model. http://www.oceanscience.net/estuaries/Pleasant_Bay.htm
- Massachusetts Year 2006 Integrated List of Waters, proposed listing of the condition of Massachusetts' waters pursuant to Sections 303(d) and 305(b) of the Clean Water Act (CN 262.20), April 2006. http://www.mass.gov/dep/water/resources/tmdls.htm
- Massachusetts Estuaries Project Embayment Restoration Guidance for Implementation Strategies. http://www.mass.gov/dep/water/resources/restore.htm

The following review explains how the TMDL submission meets the statutory and regulatory requirements of TMDLs in accordance with §303(d) of the Clean Water Act and EPA's implementing regulations in 40 CFR Part 130.

REVIEWER: Beth Edwards, telephone number: 617-918-1840

REVIEW ELEMENTS OF TMDLs

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. § 130 describe the statutory and regulatory requirements for approvable TMDLs. The following information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation.

1. Description of Waterbody, Pollutant of Concern, Pollutant Sources and Priority Ranking

The TMDL analytical document must identify the waterbody as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the waterbody. The TMDL submittal must include a description of the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and, (4) explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments, or chlorophyl a and phosphorus loadings for excess algae.

The document for the Pleasant Bay System TMDLs for Total Nitrogen describes the water body segments, nature and cause or threat of the impairments. Impairments include loss of eelgrass beds, undesirable increases in macro algae, periodic extreme decreases in dissolved oxygen concentrations, reduced benthic animal diversity, and periodic algae blooms. The TMDLs identify excess total nitrogen originating primarily from on-site wastewater disposal (e.g., conventional septic systems) as the cause of the impairments. The document identifies 16 segments needing a TMDL for Total Nitrogen and 3 segments that need a Pollution Prevention TMDL (i.e., the segments are not impaired for total nitrogen but need a TMDL since the embayment's are linked). Four of the impaired segments for total nitrogen are included on Massachusetts' 2004 Clean Water Act (CWA) §303(d) and 305(b) list (Integrated List). These four impaired segments are Crows Pond, Frostfish Creek, Ryder Cove, and Muddy Creek. Crows Pond, although listed as a Category 5 water body segment, was found not to be impaired for nutrients as part of this TMDL effort. Three of the four waters are also impaired for pathogens, Frostfish Creek, Ryder Cove, and Muddy Creek. Pages 1 to 10 of the Pleasant Bay System TMDL for total nitrogen provide a good overview of the description and priority ranking of the waterbodies, pollutant of concern and pollutant sources.

MassDEP has determined that all nutrient impaired segments in the Commonwealth are a high priority (see Massachusetts Integrated List of Waters at: http://www.mass.gov/dep/water/priorities/priorities.htm).

Assessment:

EPA Region 1 concludes that the TMDL document meets the requirements for describing the TMDL water body segment, pollutants of concern, identifying and characterizing sources of impairment, and priority ranking.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribe water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable water quality standard is attained) must be identified. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, usually site specific, must be developed from a narrative criterion and a description of the process used to derive the target must be included in the submittal.

The TMDL document identifies several provisions of the Commonwealth's water quality standards that are relevant to the cultural eutrophication in these waters, including numeric criteria for dissolved oxygen and narrative criteria for aesthetics and nutrients. As stated on page 11 of the TMDL document and in EPA guidance, individual estuarine and costal marine waters tend to have unique characteristics and therefore, individual water body criteria are typically required. For example, the loading of nitrogen that a specific water body can handle without becoming impaired varies. Factors that influence the effect of nitrogen include: flow velocity, tidal hydraulics, dissolved oxygen, and sediment adsorption and desorption of nitrogen.

The Massachusetts Estuaries Project analytical method is the Linked Watershed-Embayment Management Model (Linked Model). The Model is discussed on pages 12-19 of the TMDL document. The model links watershed inputs with embayment circulation and nitrogen characteristics, and:

- requires site-specific measurements within each watershed and embayment;
- uses realistic "best-estimates" of nitrogen loads from each specific type of land-use;
- spatially distributes the watershed nitrogen loading to the embayment;
- accounts for nitrogen attenuation during transport to the embayment;
- includes a 2D or 3D embayment circulation model depending on embayment structure;
- accounts for basin structure, tidal variations, and dispersion within the embayment;
- includes nitrogen regenerated within the embayment;
- is validated by both independent hydrodynamic, nitrogen concentration, and ecological data; and
- is calibrated and validated with field data prior to generation of additional scenarios.

The target threshold nitrogen concentrations which have been determined to be protective for each embayment system, as measured at the appropriate sentinel stations, are presented in Table

2 (page 15 of the TMDL document) and range from 0.16 – 0.25 mg/L. These concentrations, which represent the average water column concentration of nitrogen, will restore or maintain high habitat quality in these embayments.

Assessment:

EPA Region 1 concludes that MassDEP has properly presented its water quality standards, and has made a reasonable interpretation of its water quality standards for the designated uses of the Pleasant Bay embayment system. The use of the Linked Model, the description of the process in the TMDL document and the companion Technical Report to this TMDL document (Report #96-TMDL-12, Control # 244.0) adequately demonstrate the basis for deriving the target nitrogen loads and demonstrating that the targets will achieve water quality standards. EPA concludes that Massachusetts has properly presented its numeric water quality standards and has made a reasonable and appropriate interpretation of its narrative water quality criteria for the designated uses of the Pleasant Bay embayment system.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

As described in EPA guidance, a TMDL identifies the loading capacity of a waterbody for a particular pollutant. EPA regulations define loading capacity as the greatest amount of loading that a water can receive without violating water quality standards (40 C.F.R. § 130.2(f)). The loadings are required to be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. § 130.2(i)). The TMDL submittal must identify the waterbody's loading capacity for the applicable pollutant and describe the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In most instances, this method will be a water quality model. Supporting documentation for the TMDL analysis must also be contained in the submittal, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation.

In many circumstances, a critical condition must be described and related to physical conditions in the waterbody as part of the analysis of loading capacity (40 C.F.R. § 130.7(c)(1)). The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet water quality standards. Critical conditions are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards.

The Linked Model, as stated in the TMDL document, is a robust and fairly complicated model that determines an embayment's nitrogen sensitivity, nitrogen threshold loading levels (TMDLs) and response to changes in the loading rate. A key feature of the approach involves the selection of sentinel sub-embayments that have the poorest water quality in the embayment system. If these degraded areas come into compliance with the TMDL, other areas will also achieve water quality standards for nitrogen in the system. This approach captures the critical targets needed to address the impaired segments.

Percent reductions of existing nitrogen loads necessary to meet the target threshold loads range from 0% in Crows Pond, Bassing Harbor, and Chatham Harbor, to 25% in Pleasant Bay and 83%

in Meetinghouse Pond. These loads represent one scenario using the Linked Model. The TMDL value for each sub-embayment represents the sum of the calculated target threshold load (from controllable watershed sources), atmospheric deposition load, and benthic flux load from sediment sources. TMDLs range from 1 kg/day in Frost Fish Creek to 155 kg/day in Pleasant Bay (pages 19 -20 and page 33 of the TMDL document).

Assessment:

The TMDL document explains and EPA concurs with the approach for applying the Linked Model to specific embayments for the purpose of developing target nitrogen loading rates and in identifying sources of needed nitrogen load reduction. EPA believes that this approach is reasonable because the factors influencing and controlling nutrient impairment were well justified.

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity allocated to existing and future nonpoint sources and to natural background (40 C.F.R. § 130.2(g)). Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. § 130.2(g)). Where it is possible to separate natural background from nonpoint sources, load allocations should be described separately for background and for nonpoint sources.

If the TMDL concludes that there are no nonpoint sources and/or natural background, or the TMDL recommends a zero load allocation, the LA must be expressed as zero. If the TMDL recommends a zero LA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero LA implies an allocation only to point sources will result in attainment of the applicable water quality standard, and all nonpoint and background sources will be removed.

Using the Linked Model, MassDEP has identified the portion of the loading capacity allocated to existing and future non-point sources necessary to meet water quality standards. These non-point sources are primarily septic systems. Additional nitrogen sources include natural background, stormwater runoff (including nitrogen from fertilizers), atmospheric deposition, and nutrient-rich sediments.

Mass DEP adequately describes and sets forth the load allocations for cultural and natural background sources (See pages 17-22, and Appendix B of the TMDL document). EPA concludes that the load allocations are adequately specified for the TMDLs at levels necessary to attain water quality standards.

The TMDL states that the load allocations represent one loading alternative, and that other alternatives may be possible that could reduce nitrogen concentrations in both the sentinel systems and sub-embayments. Adjustments to loading scenarios would not require submission to EPA for review and approval of a revised TMDL, provided that such adjustments remain fully protective of all impaired segments, the sum of any adjusted LAs is less than or equal to the approved TMDL, and there is an opportunity for public review and comment. Any reallocations from LAs to WLAs (based on additional assumed reductions in LAs) must be reflected in a

revised TMDL, submitted to EPA for review and approval, to ensure that there is a reasonable assurance that the modified LAs could be achieved.

Assessment:

EPA concludes that the TMDL document sufficiently addresses the calculation of the load allocations.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 C.F.R. § 130.2(h)). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable water quality standard, and all point sources will be removed.

In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. But it is necessary to allocate the loading capacity among individual point sources as necessary to meet the water quality standard.

The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the State/Tribe will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.

EPA interprets 40 CFR 130.2(h) to require that allocations for NPDES regulated discharges of storm water be included in the waste load component of the TMDL. On Cape Cod the vast majority of storm water percolates into the ground and aquifer and proceeds into the embayment systems through groundwater migration. The Linked Model used in the development of the TMDLs accounts for storm water loadings, most of which infiltrates, and groundwater loading, such as septic systems, in one aggregate load as a non-point source – combining the assessments of wastewater and storm water (including storm water that infiltrates into the soil and direct discharge pipes into water bodies) for the purpose of developing control strategies.

Although the vast majority of storm water percolates into the ground, there are some storm water pipes or other conveyances that discharge directly to water bodies and are subject to the requirements of the Phase II Storm Water NPDES Program. The Towns of Brewster, Chatham, Harwich, and Orleans are covered under the NPDES Phase II General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The loadings allocated to such storm water discharges must be treated as a waste load allocation. Since the majority of the nitrogen loading comes from septic systems, fertilizer and storm water that infiltrates into the groundwater, the allocation of nitrogen for any storm water pipes that discharge directly to any of the embayments is insignificant as compared to the overall groundwater load.

Based on land use, the Linked Model accounts for loading of storm water, but does not explicitly breakout storm water into a load and waste load allocation. Based on the fact that there are few storm water discharge pipes within NPDES Phase II areas that discharge directly to embayments or waters that are connected to the embayments, the total waste load allocation for these sources is estimated to be insignificant (0.01 – 3.29% compared to the total nitrogen load to each sub-embayment). The WLA is derived from the percent of impervious surface within 200 feet of the water bodies and the relative load from this area compared to the overall load within each sub-embayment. Although most stormwater infiltrates into the ground on Cape Cod, some impervious areas within approximately 200 feet of the shoreline may discharge stormwater via pipes directly to the water body. For the purposes of waste load allocation, it was assumed that all impervious surfaces within 200 feet of the shoreline discharge directly to the water body whether or not they actually do so. The specific WLA are set forth in Appendix C and on pages 20 and 21 of the TMDL document.

Although the loading contribution from the point source discharges is insignificant (0.27% or 508.17 kg/year) compared to the total nitrogen load of 83,198 kg/year, the point source discharges are subject to the Phase II Storm Water NPDES Program and their collective estimated load is treated as a WLA. In the absence of site specific information on direct discharge sources, EPA believes the approach set out in the TMDL for WLA derivation is reasonable.

Assessment:

EPA concludes that the TMDL document sufficiently addresses the calculation of the waste load allocations.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)). EPA guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

The implicit margin of safety is set out in the TMDL document on pages 22 to 24. There are several factors that contribute to the margin of safety inherent in the approach used to develop these TMDLs including:

1) **Use of conservative data in the Linked Model as follows:**
   - Conservative estimate of loading – 100% of load enters embayment;
   - Hydrodynamic and water quality models have been demonstrated to have a high level of accuracy and a high degree of confidence;
   - Lawn fertilization rates for residential lawns are based on an actual survey;

- Nitrogen loading based on assumption that 90% of water use is converted to wastewater;
- Conservative (i.e., high) estimate of water use where there is no metered water use compared to actual water use in the metered sections of the watershed;
- Water column nitrogen validation dataset is conservative. High or low measurements are marked as outliers;
- Reductions in benthic regeneration of nitrogen are most likely underestimates. The reduction is based solely on a reduced deposition of particulate organic nitrogen (PON), due to lower primary production rates under the reduced nitrogen loading in these systems. As the nitrogen loading decreases and organic inputs are reduced, it is likely that rates of coupled remineralization-nitrification, denitrification and sediment oxidation will increase. This proportional reduction assumes that the proportion of remineralized nitrogen will be the same as under present conditions, which results in an underestimate. As a result, future nitrogen regeneration rates are overestimated which adds to the margin of safety.

2) **Conservative sentinel station/target threshold nitrogen concentrations.** Sites were chosen that had stable eelgrass or benthic (infaunal) communities, not those starting to show impairment, which would have resulted in higher nitrogen concentrations.

3) **Conservative approach.** Target loads were based on averaged nitrogen concentrations on the outgoing tide. This is the worst case scenario because this is when the nitrogen concentrations are highest. Nitrogen concentrations will be lower on the flood tides, due to dilution from the incoming tide.

Assessment:

EPA concludes that the implicit margin of safety for the TMDL is acceptable.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The method chosen for including seasonal variations in the TMDL must be described (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)).

The TMDLs for the water body segments identified in the document are based on achieving the nitrogen loads during the most critical time period, i.e., the summer growing season (see page 24 of the TMDL document).

Assessment:

Since the other seasons are less sensitive to nitrogen loading, EPA concludes that the TMDLs are protective of all seasons throughout the year.

8. Monitoring Plan for TMDLs Developed Under the Phased Approach

EPA's 1991 document, Guidance for Water Quality-Based Decisions: The TMDL Process (EPA 440/4-91-001), and EPA's 2006 guidance, Clarification Regarding "Phased" Total Maximum Daily Loads, recommend a monitoring plan when a TMDL is developed using the phased approach. The guidance indicates that a State may use the phased approach for situations where TMDLs need to be developed despite significant data uncertainty and where the State expects that the loading capacity and allocation scheme will be revised in the near future. EPA's guidance provides that a TMDL developed under the phased approach should include, in addition to the other TMDL elements, a monitoring plan that describes the additional data to be collected and a scheduled timeframe for revision of the TMDL.

Because these TMDLs are not "phased" TMDLs, a monitoring plan is not required. Nevertheless, in order to assess the progress in obtaining the TMDLs' water quality goals, MassDEP has recommended that the Towns of Brewster, Chatham, Harwich, and Orleans establish a detailed post-TMDL monitoring plan as set out on page 27 of the TMDL document. In addition, MassDEP is committed to monitoring the Towns estuaries every 3-5 years as part of conducting its ongoing water quality assessments in each watershed in Massachusetts.

Assessment:

EPA Region 1 concludes that the anticipated monitoring by and in cooperation with MassDEP is sufficient to evaluate the adequacy of the TMDL and attainment of water quality standards, although not a required element for TMDL approval.

9. Implementation Plans

On August 8, 1997, Bob Perciasepe (EPA Assistant Administrator for the Office of Water) issued a memorandum, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)," that directs Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired solely or primarily by nonpoint sources. To this end, the memorandum asks that Regions assist States/Tribes in developing implementation plans that include reasonable assurances that the nonpoint source load allocations established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. The memorandum also includes a discussion of renewed focus on the public participation process and recognition of other relevant watershed management processes used in the TMDL process. Although implementation plans are not approved by EPA, they help establish the basis for EPA's approval of TMDLs.

The implementation plan for these estuarine TMDLs for total nitrogen is described on pages 26 and 27 of the TMDL document. MassDEP advised the Towns of Brewster, Chatham, Harwich, and Orleans to incorporate the nitrogen loading reduction strategies outlined in the Massachusetts Estuaries Implementation Guidance report (http://www.mass.gov/dep/water/resources/restore.htm) into the implementation plans. MassDEP also encouraged the Towns to explore other loading reduction scenarios through additional modeling as part of the Comprehensive Wastewater Management Plan (CWMP). The Towns have latitude in considering various implementation scenarios such as land use planning and controls, sewering and treatment for nitrogen control of sewage and septage, and storm water control and treatment. EPA concludes that this approach is reasonable.

Assessment:

MassDEP has addressed the implementation plan, although it is not required. EPA is taking no action on the implementation plan.

10. Reasonable Assurances

EPA guidance calls for reasonable assurances when TMDLs are developed for waters impaired by both point and nonpoint sources. In a water impaired by both point and nonpoint sources, where a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur, reasonable assurance that the nonpoint source reductions will happen must be explained in order for the TMDL to be approvable. This information is necessary for EPA to determine that the load and wasteload allocations will achieve water quality standards.

In a water impaired solely by nonpoint sources, reasonable assurances that load reductions will be achieved are not required in order for a TMDL to be approvable. However, for such nonpoint source-only waters, States/Tribes are strongly encouraged to provide reasonable assurances regarding achievement of load allocations in the implementation plans described in section 9, above. As described in the August 8, 1997 Perciasepe memorandum, such reasonable assurances should be included in State/Tribe implementation plans and "may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs."

The Commonwealth has statutory and regulatory authority to encourage implementation of these TMDLs, as explained on page 27 and 28 of the TMDL document. In addition, Brewster, Chatham, Harwich and Orleans have demonstrated their commitment to implement these TMDLs through the comprehensive wastewater planning that they initiated well before the generation of these TMDLs. The Towns expect to use the information in these TMDLs to generate support from their citizens to take the necessary steps to remedy existing problems related to nitrogen loading from on-site subsurface wastewater disposal systems, stormwater, and runoff (including fertilizers), and to prevent any future degradation of these valuable resources.

Assessment:

Reasonable assurance is not necessary for these TMDLs to be approvable, since the point sources are not given less stringent wasteload allocations based on projected nonpoint source load reductions. MassDEP has provided reasonable assurance that water quality standards will be met.

11. Public Participation

EPA policy is that there must be full and meaningful public participation in the TMDL development process. Each State/Tribe must, therefore, provide for public participation consistent with its own continuing planning process and public participation requirements (40 C.F.R. § 130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval must describe the State/Tribe's public participation process, including a summary of significant comments and the State/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. § 130.7(d)(2)).

Inadequate public participation could be a basis for disapproving a TMDL; however, where EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

MassDEP announced the draft TMDL on September 11, 2007 and copies were distributed to all key stakeholders. The draft TMDL was also posted on the Department's web site for public review on that date. A public meeting was held on September 21, 2006 to provide information and solicit comments. The public comment period closed on October 20, 2006. MassDEP submitted a Response to Comments to EPA along with the final TMDL submission on July 3, 2007.

Assessment:

EPA concludes that MassDEP has involved the public during the development of the TMDL, has provided adequate opportunities for the public to comment on the TMDL, and has provided reasonable responses to the public comments.

12. Submittal Letter

A submittal letter should be included with the TMDL analytical document, and should specify whether the TMDL is being submitted for a technical review or is a final submittal. Each final TMDL submitted to EPA must be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final submittal, should contain such information as the name and location of the waterbody, the pollutant(s) of concern, and the priority ranking of the waterbody.

On July 3, 2007, DEP submitted a final TMDL for total nitrogen on the Pleasant Bay System for EPA approval.

Assessment:

MassDEP's letter of July 3, 2007 states that the TMDL is being formally submitted for EPA review and approval.

Attachment 1 (Appendix D in TMDL document)

16 Total Nitrogen TMDLs, 3 Pollution Prevention TMDLs

EMBAYMENT SYSTEMS AND SUB-EMBAYMENTS[2]	**SEGMENT ID**	**COMMENTS**	**TMDL Kg/Day** (See Table 5 on Page 25 of TMDL Document)
Meeting House Pond		Determined to be impaired for nutrients during the development of this TMDL.	10
The River			
The River – upper		The River was separated into two segments: Upper and Lower for this TMDL. Determined to be impaired for nutrients during the development of this TMDL. Separate TMDL necessary on The River-upper to achieve target threshold nitrogen load.	6
The River - lower		The River was separated into two segments: Upper and Lower for this TMDL. Determined to be impaired for nutrients during the development of this TMDL. Separate TMDL necessary on The River-lower to achieve target threshold nitrogen load.	13
Lonnies Pond		Determined to be impaired for nutrients during the development of this TMDL.	3
Areys Pond		Determined to be impaired for nutrients during the development of this TMDL.	6
Namequoit Pond		Determined to be impaired for nutrients during the development of this TMDL.	14
Paw Wah Pond		Determined to be impaired for nutrients during the development of this TMDL.	3
Pochet Neck		Determined to be impaired for nutrients during the development of this TMDL.	6
Little Pleasant Bay		Determined to be impaired for nutrients during the development of this TMDL.	66
Quanset Pond		Determined to be impaired for nutrients during the development of this TMDL.	6
Round Cove		Determined to be impaired for nutrients during the development of this TMDL.	10
Muddy Creek	MA96-51_2004	Outlet of small unnamed pond south of Countryside drive and North-northeast of Old Queen Ann Road to mouth at Pleasant Bay. Previously determined to be impaired for pathogens by MassDEP.	
Muddy Creek - upper		Muddy Creek was separated into two segments: Upper and Lower Muddy Creek for this TMDL. Determined to be impaired for nutrients during the development of this TMDL. Separate TMDL necessary on Upper Muddy Creek to achieve target threshold nitrogen load.	7
Muddy Creek - lower		Muddy Creek was separated into two segments: Upper and Lower Muddy Creek for this TMDL. Determined to be impaired for nutrients during the development of this TMDL. Separate TMDL necessary on Lower Muddy Creek to achieve target threshold nitrogen load.	2
Pleasant Bay		Determined to be impaired for nutrients during the development of this TMDL.	155
Bassing Harbor			
Ryder Cove[1]	MA96-50_2004	Chatham	12
Frost Fish Creek[1]	MA96-49_2004	Outlet from cranberry bog northwest of Stony Hill Road to confluence with Ryder Cove, Chatham.	1

EMBAYMENT SYSTEMS AND SUB-EMBAYMENTS[2]	**SEGMENT ID**	**COMMENTS**	**TMDL Kg/Day** (See Table 5 on Page 25 of TMDL Document)
Crows Pond[1]	MA96-47_2004	To Bassing Harbor, Chatham. Not impaired for total nitrogen, but TMDL needed since embayments are linked. **(Pollution Prevention TMDL)**	6
Bassing Harbor	MA96-48_2004	Excluding Crows Pond and Ryder Cove, Chatham. Not impaired for total nitrogen, but TMDL needed since embayments are linked. **(Pollution Prevention TMDL)**	3
Chatham Harbor	MA96-10_2004	Not impaired for total nitrogen, but TMDL needed since embayments are linked. **(Pollution Prevention TMDL)**	31
Pleasant Bay System Total			360

[1]Impaired for nutrients on 2002, 2004, and 2006 CWA §303(d) list.
[2]Embayments listed above are in bold type. Sub-embayments are not bolded.