June 21, 2002

Lauren A. Liss, Commissioner
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Dear Commissioner Liss:

It is my pleasure to approve 20 Total Maximum Daily Loads (TMDL's) for the river and stream segments in the Neponset River Basin known to have recreational and shellfish harvesting use impairments due to bacterial contamination. Most of these waterbody segments (16 of 20) were included in Massachusetts' 1998 303(d) list. The remaining four segments were identified as impaired during the development of the original TMDLs.

EPA has determined, as set forth in the enclosed review document, that the bacteria TMDLs for the Neponset River Basin meet the requirements of Section 303(d) of the Clean Water Act, and EPA's implementing regulations (40 CFR part 130).

I want to congratulate you and the Division of Watershed Management staff for the excellent work in developing these TMDLs.

Sincerely,

Linda Murphy, Director
Office of Ecosystem Protection

cc: Cynthia Giles
Glenn Haas
Rick Dunn
Russ Isaac

TMDL: Neponset River Basin, MA - Final May 31, 2002
Pollutant: Bacteria
Reviewer: Mark Voorhees. Tel. (617)918-1537. EMAIL (Voorhees.Mark@epa.gov)

BACKGROUND: The Massachusetts Department of Environmental Protection (MADEP) submitted to EPA-New England the *Final Total Maximum Daily Loads for bacteria for the Neponset River Basin, dated may 2002.* The TMDL was submitted under a cover letter dated May 31, 2002 requesting review and approval by EPA - New England. The submittal was received by EPA - New England on June 3, 2002 Following is a summary of EPA's review which explains how the TMDL submission satisfies the statutory and regulatory requirements of TMDLs in accordance with Section 303(d) and 40 CFR Part 130.

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 TMDL document describes the Neponset River Basin and identifies those segments that are not attaining the primary contact use due to exceedences of Massachusetts' adopted fecal coliform (indicator bacteria) criteria. The TMDL identifies a total of twenty impaired segments, sixteen of which are included on Massachusetts' 1998 303(d) list (see Table 2, page 15) and an additional four segments that are anticipated to be included on Massachusetts' 2002 303(d) list (see Table 3, page 16). The additional four segments have been determined to be not attaining primary contact uses based on post-1998 ambient bacteria monitoring data. Bacteria monitoring data for all monitoring

locations are summarized in Tables 4, 5, 6, and 7and indicate the magnitude of the exceedences, as well as those waterbody segments currently assessed as attaining the primary contact use. All monitoring station locations and whether or not bacteria criteria are exceeded are depicted in Figures 4 and 5 on pages 19 and 20.

The TMDL document adequately describes the nonpoint and point sources of bacteria that are present within the Neponset River Basin and that contribute to exceedences of the Massachusetts' adopted fecal coliform criteria in the Neponset River and tributaries. Known and suspected sources for different river segments and tributary streams are identified in Table 8, page 30. The TMDL provides a general description of bacteria contributions from bacteria source categories (e.g., storm water runoff, illicit sources of sewage, etc.). EPA concurs with MADEP's approach for this TMDL because of the highly variable and site-specific nature of bacteria sources in urban/suburban watersheds like the Neponset River Basin which make it difficult to accurately estimate the magnitude of bacteria sources entering receiving waters. However, ambient data collected throughout the Neponset Basin during both dry and wet weather conditions provide an insight into the overall magnitude of sources contributing to the Neponset River Basin.

The magnitude of natural background bacteria levels is briefly discussed on page 17 in relation to ambient monitoring results from monitoring stations located in the less developed portions of the Neponset River Watershed. Data from these locations consistently were well below fecal coliform criteria during both dry and wet weather conditions.

EPA concludes that the TMDL document has adequately characterized the Neponset River Basin, the nature of the primary contact use impairment and its cause. MA has relied on best available information including extensive ambient monitoring of the Basin during both dry and wet weather conditions, source monitoring, and information from other studies and references to characterize the source categories. EPA believes that the approach used by MA effectively documents the extent and magnitudes of the impairments due to bacteria contamination, as well as the types of sources that are likely to be present in the Neponset River watershed and that are in need of abatement.

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 presents the applicable Massachusetts Water Quality Standards on page 16 which include fecal coliform criteria to protect both primary contact uses throughout the Basin and restricted shellfish harvesting in the estuary. The fecal coliform criteria are used as the numeric water quality target for the TMDL. EPA concludes that MADEP has properly presented the

applicable Water Quality Standards.

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 TMDL document identifies the bacteria loading capacity for the Neponset River, tributary streams, and the Neponset River Estuary on pages 34 and 35. MADEP chose to express the loading capacities in terms of concentrations set equal to the criteria in Massachusetts' Water Quality Standards for several reasons. First, MA believes that expressing a loading capacity for bacteria in terms of concentrations set equal to the State adopted criteria provides a very clear and understandable expression of water quality goals to the public and to groups that conduct water quality monitoring in the Neponsit River Basin. MA believes that expressing the loading capacity for bacteria in terms of loadings (e.g., numbers of organisms per day) would be difficult for the public to interpret and understand because the "allowable" loading number would be very large (i.e billions of organisms per day). Additionally, the number would vary according to flow rate since the loading capacity is dependent on stream flow rates which are constantly changing. Also, to ensure attainment with Water Quality Standards throughout the waterbody MA believes the goals of the TMDL should be clear that bacteria sources should not exceed the criteria at the point of discharge. Loading numbers calculated on a daily basis would not ensure compliance with water quality standards throughout the day since it is conceivable that a large number of bacteria could be discharged during a brief period (e.g., few hours) resulting in temporary exceedences of the criteria but meeting the daily load.

EPA concludes that loading capacities expressed in the TMDL document are set at levels that would result in attainment with water quality standards since they are set directly equal to the fecal

coliform criteria in the water quality standards.. EPA believes that the approach and rationale used by MADEP to express the loading capacities as concentrations is reasonable and consistent with 40 C.F.R. 130.2(i) which allows for TMDLs to be expressed as either mass per time, toxicity, or other appropriate measure.

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.

The TMDL sets load allocations for nonpoint sources (e.g. diffuse storm water runoff) equal to either the applicable fecal coliform criteria of the receiving water or to zero if the origin of the source is prohibited (e.g., failing septic systems.) EPA-New England concludes that load allocations are adequately specified in the TMDL at levels necessary to attain and maintain water quality standards.

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.

The TMDL sets wasteload allocations for point sources (e.g. discharges from storm water drainage systems) equal to either the applicable fecal coliform criteria of the receiving water or to zero if the origin of the source is prohibited (e.g., sanitary sewer overflows.) In the Neponset River Watershed. most storm water discharge points will be subject to Phase II NPDES Storm Water permitting and therefore must be categorized in the WLA portion of the TMDL. In addition, States have discretion to include non-NPDES Storm Water discharges in the WLA portion and this TMDL may include some non-NPDES regulated storm water point sources in the WLA. EPA-New England concludes that wasteload allocations are adequately specified in the TMDL at levels necessary to attain and maintain water quality standards.

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.

This TMDL provides for a very conservative implicit MOS (see page 37). Since the TMDL sets the loading capacity, load allocations, and wasteload allocation equal to either the applicable fecal coliform criteria of the receiving water or zero if the sources are prohibited, there is a high level of confidence that the TMDL is established at levels that are consistent with the water quality standards. The approach used by MA assumes zero dilution is available and does not account for in-stream processes such as bacteria die-off and settling which are known to reduce in-stream bacteria concentrations.

EPA-New England concludes that the environmentally conservative approach used in developing this TMDL provides for adequate implicit MOS.

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 TMDL document addresses seasonal variability on page 37. Since the loading capacity is set equal to the applicable fecal coliform criteria regardless of environmental conditions the TMDL automatically addresses water quality for all seasonal conditions. Furthermore, LAs and WLAs set equal to the applicable fecal coliform criteria or zero if the sources are prohibited are applicable year round.

EPA concludes that the TMDL document has adequately addressed seasonal variability.

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), recommends a monitoring plan when a TMDL is developed under the phased approach. The guidance recommends that a TMDL developed under the phased approach also should provide assurances that nonpoint source controls will achieve expected load reductions. The phased approach is appropriate when a TMDL involves both point and nonpoint sources and the point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. EPA's guidance provides that a TMDL developed under the phased approach should include a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of water quality standards.

The TMDL document describes post -TMDL monitoring activities which will include monitoring by the Neponset River Watershed Association, MADEP, and the watershed communities (NPDES Storm Water Phase II requirements to identify illicit sanitary sewer discharges). The monitoring will be conducted to continue to identify bacteria sources requiring control and track improvements in water quality.

EPA a concludes that the extensive on-going monitoring program by the Neponset River Watershed Association, Phase II storm water requirements for communities to develop programs to identify and eliminate illicit discharges, and DEP's commitment for monitoring in 2004 and every five years thereafter is adequate to identify and eliminate specific sources and track improvements in water quality.

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 Neponset River Basin bacteria TMDL is described in pages 38-41. The plan outlines a process for collecting additional information to identify bacteria sources, and implement existing and imminent regulatory programs (Title 5 and Phase II Storm Water requirements). Implementation tasks and responsible parties are identified in Table 15 (see page 41).

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."

A general discussion of reasonable assurances are provided on page 42 that relates to existing and imminent regulatory programs that are and will address many of the bacteria sources present in the Neponset Basin. Also, the TMDL discusses available financial incentives to assist communities and interested groups at implementing controls.

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.

The public participation process for Neponset River Basin bacteria TMDL is described on pages 43-45 of the document. MADEP provided ample opportunity for public to comment on the TMDL and held two public meetings on December 18, 2001 and February 12, 2002. MADEP received one set of written comments on the TMDL from the Neponset River Watershed association. These comments were addressed in preparation of the Final TMDL.

EPA-New England concludes that MADEP has made a sincere effort to involve the public during the development of the TMDL, and has provided adequate opportunities for the public to comment on the TMDL. EPA has reviewed both written and oral comments and concludes that MADEP has adequately responded to all 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.