UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
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BOSTON, MASSACHUSETTS 02114-2023

SEP 13 2002

September 12, 2002

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

Dear Commissioner Liss: Lauren

It is my pleasure to approve 16 Total Maximum Daily Loads (TMDLs) for the river and stream segments in the Shawsheen River Basin known to have recreational use impairments due to bacterial contamination. The TMDL report identifies the seven waterbody segments that were included in the Massachusetts 1998 303(d) list for pathogens and an additional 9 segments that were identified as impaired by MADEP during the preparation of the TMDLs.

EPA has determined, as set forth in the enclosed review document, that the bacteria TMDLs for the Shawsheen 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 M. Murphy

Linda Murphy, Director
Office of Ecosystem Protection

cc: Cynthia Giles
Glenn Haas
Rick Dunn
Russ Isaac

Great example of coordination w/ N.W.F. and Merrimack Watershed Council. We at EPA appreciate all the hard work of your staff. Thanks! Linda

TMDL:	Shawsheen River Basin, MA - Final August 30, 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 of Bacteria for Shawsheen River Basin, dated August, 2002.* The TMDL was submitted under a cover letter dated August 30, 2002 requesting review and approval by EPA - New England. The submittal was received by EPA - New England on August 30, 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 Shawsheen 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 16 impaired segments, seven of which are included on Massachusetts' 1998 303(d) list (see Table 1, page 6) and an additional 9 segments that are anticipated to be included on Massachusetts' 2002 integrated 305b/303(d) list (see Table 2,

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 Shawsheen River and tributary streams on page 53. 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 Shawsheen 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. 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.

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

The TMDL sets wasteload allocations for point sources (e.g. WWTF and 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 Shawsheen 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 56). 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 56. 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

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."

In this TMDL, no point sources are given less stingent WLAs based on an assumption that NPS load reductions will occur. Therefore reasonable assurance that NPS load reductions will occur is not necessary for TMDL approval.

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.

Public participation for the Shawsheen River Basin bacteria TMDL consisted of posting the draft TMDL document on MADEP's website (www.gov/dep/brp/wm/wmpubs.htm), an extensive mailing to key departments (Conservation Commissions, Board of Healths, and Departments of Public Works) in all thirteen watershed communities, and a public meeting on March 12, 2002. In addition, the Shawsheen River Basin Team consisting of numerous watershed stakeholder groups were informed of the availability of the draft TMDL document for comment. Appendix 1 of the TMDL report provides the public meeting attendees and a summary of oral comments received at the meeting and MADEP's responses. 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 the summary of oral comments and concludes that MADEP has adequately responded to all public comments.

Data for entry into EPA's National TMDL Tracking System

TMDL Name	Total Maximum Daily Loads of Bacteria for the Shawsheen River Basin
Lead State	Massachusetts
TMDL Status	Final
Pollutant ID	fecal coliform
TMDL End Point	geometric mean $\leq$ 200 org./100ml and no more than 10% of the samples > 400 org. 100ml
TMDL Type	PS/NPS
Total WLA (PS)	one PS (MA0031658) with concentration limits set equal to criteria in Water Quality Standards.
Load Allocation (NPS)	geometric mean $\leq$ 200 org./100ml and no more than 10% of the samples > 400 org. 100ml
Margin of Safety	implicit - conservative assumptions
Units for WLA, LA, MOS	concentration equal to criteria (geometric mean $\leq$ 200 org./100ml and no more than 10% of the samples > 400 org. 100ml)
List ID	MA83-01, MA83-02, MA83-03, MA83-04, MA83-05, MA83-06, MA83-07, MA83-08, MA83-09, MA83-10, MA83-11, MA83-12, MA83-13, MA83-14, MA83-15, and MA83-16
Impairment ID	pathogen
Cycle (list date)	1998, 2002
Est. Date (approval)	September 12, 2002
EPA developed	No