

Angelo S. Liberti, Chief
Surface Water Protection
Office of Water Resources
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908-5767

Dear Mr. Liberti,

Thank you for your final submittal of a fecal coliform bacteria Total Maximum Daily Load (TMDL) for Crooked Brook, dated September 30, 2002. The U.S. Environmental Protection Agency (EPA) has determined that this TMDL meets the requirements of Section 303(d) of the federal Clean Water Act (CWA) and EPA's implementing regulations (40 CFR Part 130). With this letter, EPA hereby approves the Crooked Brook TMDL for fecal coliform bacteria. Enclosed is a copy of EPA's review documentation for this TMDL.

The completion of this TMDL is a positive step toward on-the-ground measures to improve water quality in Crooked Brook and the Narrow River watershed. I continue to be encouraged by the State's commitment to implementation and follow-up monitoring to evaluate the effectiveness of management actions and to determine whether additional actions are necessary to attain water quality standards throughout the waterbody.

As noted in the review documentation, RI has acknowledged that NPDES-regulated discharges of storm water are included within the waste load allocation portion of the TMDL. Further, it is clear in the TMDL that the State intends to treat allocations for storm water discharges associated with industrial activities (including construction site storm water discharges) and phase 2 municipal separate storm sewer systems (MS4s) as WLAs during implementation of the TMDL.

As discussed in more detail in the review documentation, discharges of NPDES-regulated storm water must be addressed by the waste load allocation component of a TMDL (40 C.F.R. §130.2 (h)). EPA's regulations also require separate waste load and load allocations in circumstances where both point sources (subject to NPDES regulations) and non-point sources contribute to the impairment. We expect that in the future, DEM will submit TMDLs that more clearly separate WLAs and LAs. We recognize that there are circumstances where it is not possible using actual data, land use or other information to distinguish between allocations for storm water sources that require NPDES permits from storm water sources that are not subject to the NPDES

program. In this situation, states have the discretion to include discharges from point sources that do not need NPDES permits and nonpoint sources in the waste load allocation.

My staff and I look forward to continuing to work with the RIDEM in our shared responsibility to implement the requirements of Section 303(d) of the CWA. Please feel free to contact me or my staff if you have any questions or comments on our review.

Sincerely,

dated and signed February 19, 2003

Linda Murphy, Director
Office of Ecosystem Protection

Enclosure

cc: Alicia Good, DEM
Elizabeth Scott, DEM
David Turin, EPA

TMDL: Crooked Brook, Rhode Island (Fecal Coliform)
Final Submittal, September 30, 2002

Review Date: February 12, 2003

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 chlorophyll *a* and phosphorus loadings for excess algae.

This document provides a TMDL for the Crooked Brook Watershed (Crooked Brook and Sprague Brook). Crooked Brook is listed in Group 1 on Rhode Island's 2000 303(d) List (Page 8). Sprague Brook is not currently listed on Rhode Island's 303(d) list. The TMDL document reasonably describes the waterbody and watershed setting (pages 9 and 14), identifies fecal coliform bacteria as the pollutant of concern (page 8), and assigns the waterbody to Group 1, the highest priority for TMDL development (page 8). The TMDL document includes a description of the point and nonpoint sources contributing to the water quality impairments (pages 17-18).

Minor comment: The 2000 303(d) list is erroneously identified as "draft" in the text on page 14.

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 Crooked Brook as a Class A waterbody and describes the associated designated uses (page 8), and applicable numeric water quality criteria (page 8). The TMDL also describes the need for water quality in the Crooked Brook watershed to meet the more stringent criteria at its mouth to support designated uses in Class A Pettaquamscutt Cove, downstream. Numeric water quality targets reflect the need to meet both Class A and SA numeric criteria (page 8). The State antidegradation policy is also described (page 8).

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.

Loadings are expressed as bacterial densities based on RI's water quality standards (page 20). EPA has determined that this approach is appropriate for pathogen TMDLs. Field surveys, water quality monitoring and reviews of aerial photos were used to establish a link between water quality and pollutant sources (page 20). The reduction goal for each segment is based on percent reductions needed to reduce ambient pollutant densities at the monitoring station with the highest densities to the numeric water quality targets. Source reductions are also weighted, based on a calculation of dry and wet weather-influenced conditions (page 20).

Establishing source load reduction targets proportional to instream reductions is a practical approach. Ultimately, however, any sources that contribute to violations of water quality standards need to be addressed.

An acceptable discussion of strengths and weaknesses in the analytical process are presented on pages 21 and 22. The critical condition was determined to be the summer, when fecal conditions are typically the highest (page 19).

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 provides a combined WLA and LA. The required fecal coliform reductions for both point and nonpoint sources are calculated from observed concentrations at instream stations. Allocations are presented by river segment as the percent reduction required to go from existing conditions to the water quality standard (page 21). These reductions are applicable to the composite of all point and nonpoint sources contributing to the water quality impairment.

EPA regulations, as explained in EPA's November 22, 2002 memorandum from Robert H. Wayland (then-director of EPA's Office of Wetlands, Oceans, and Watersheds) on storm water and TMDLs, require separate load and wasteload allocations. We believe the TMDL is approvable in this case because the text clearly identifies the point and nonpoint and explains the level of reduction required for all sources. In the future, however, we expect TMDLs to contain separate WLAs and LAs.

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.

Four storm water outfalls are identified and included in the composite calculations of the reductions needed for each stream segment. Although the WLA and LA are combined in this case, we are approving the TMDL because the NPDES-regulated point sources are identified and RI has acknowledged that NPDES-regulated discharges of storm water are included within the waste load allocation portion of the TMDL. It is clear in the TMDL that the State intends to treat allocations for storm water discharges associated with industrial activities (including construction site storm water discharges) and phase 2 municipal separate storm sewer systems (MS4s) as WLAs during implementation of the TMDL.

For future TMDLs, consistent with EPA regulations and as explained in the November 22, 2002 memorandum on storm water and TMDLs referenced above, discharges of NPDES-regulated storm water must be more clearly addressed by the waste load allocation component of a TMDL (40 C.F.R. §130.2 (h)). EPA's regulations also require separate waste load and load allocations in circumstances where both point sources (subject to NPDES regulations) and non-point sources contribute to the impairment.

We recognize that there are circumstances where it is not possible using actual data, land use or other information to distinguish between allocations for storm water sources that require NPDES permits and storm water sources that are not subject to the NPDES program. In this situation, states have the discretion to include discharges from point sources that do not need NPDES permits and nonpoint sources in the waste load allocation.

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.

MOS presented on page 19 of the TMDL report as follows:

- *The watershed was evaluated during the critical summer conditions when bacteria pollution contamination is most problematic.*
- *No allowances were made for bacteria decay.*
- *Conservative estimates of the amount of rainfall needed to produce runoff and recovery of the watershed were used in the weighted geometric mean calculations.*

The first and second bullets are not considered MOS. The last bullet is acceptable as implicit MOS for this TMDL.

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 Crooked Brook TMDL is protective of all seasons because the majority of data used in the TMDL was collected during the critical time period (the summer season) when bacteria levels are highest (Page 19).

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.

Future monitoring is discussed in the report (page 30), and a preliminary monitoring plan is included.

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.

An implementation plan is provided in the TMDL report.

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."

No point sources are given less stringent WLAs in this TMDL based on an assumption that nonpoint source load reductions will occur. Therefore, reasonable assurance is not a necessary element of the 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.

EPA reviewed and commented on a draft TMDL in June 2002. A 30-day public comment period on a final draft TMDL was initiated with a public meeting on August 21, 2002. Questions and issues raised during the public meeting are described in the final TMDL. There were no comments received during the subsequent public comment period.

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.

A submittal letter with appropriate information was included with the final submittal.

13. Other Comments:

None.