

February 16, 2006

Alicia Good, Assistant Director of Water Resources
Rhode Island Department of Environmental Management
Office of Water Resources
235 Promenade Street
Providence, RI 02908

SUBJECT: Notification of Approval of Greenwich Bay Waters TMDL

Dear Ms. Good:

Thank you for Rhode Island's submittal of the Upper Greenwich Bay Waters Total Maximum Daily Load (TMDL), Warwick, East Greenwich, and West Warwick, RI, for bacteria and pathogens. These water bodies are included on Rhode Island's 2002 303(d) list and were prioritized for TMDL development. The purpose of the TMDL is to address impairments of primary and secondary contact recreation, fish and wildlife habitat, and shellfish harvesting due to pathogens from point and nonpoint source pollution.

The U.S. Environmental Protection Agency (EPA) hereby approves Rhode Island's December 16, 2005 Greenwich Bay Waters TMDL, received by EPA on December 22, 2005. EPA has determined that this TMDL meets the requirements of §303(d) of the Clean Water Act (CWA), and of EPA's implementing regulations (40 CFR Part 130). Attached is a copy of our approval documentation.

My staff and I look forward to continued cooperation with the RI DEM in exercising our shared responsibility of implementing the requirements under Section 303(d) of the CWA.

If you have any questions, please contact Stephen Silva (617-918-1561) or Steven Winnett (617-918-1687) of my staff.

Sincerely,

/s/

Linda M. Murphy, Director
Office of Ecosystem Protection

cc Angelo Liberti, RI DEM
Elizabeth Scott, RI DEM
Heidi Travers, RI DEM
Stephen Silva, EPA
Steven Winnett, EPA
Ann Williams, EPA/ORC

EPA NEW ENGLAND'S TMDL REVIEW

TMDL: Greenwich Bay Waters:

Brush Neck Cove	RI0007025E-02
Buttonwoods Cove	RI0007025E-03
Greenwich Bay	RI0007025E-04A
Greenwich Bay	RI0007025E-04B
Warwick Cove	RI0007025E-06B
Apponaug Cove	RI0007025E-01 *
Greenwich Cove	RI0007025E-05A *
Warwick Cove	RI0007025E-06A *
Tuscatucket Brook	RI0007025R-05
Baker Creek	RI0007025R-06
Southern Creek	RI0007025R-09 *†
Hardig Brook	RI0007025R-01
Maskerchugg River	RI0007025R-03 *
Dark Entry Brook	RI0007025R-04 *
Greenwood Creek	RI0007025R-11 *†
Gorton Pond Tributary	RI0007025R-13 *†
Mill Brook	RI0007025R-14 *†
Saddle Brook	RI0007025R-16 †‡

*Impairments found during course of TMDL assessment and added to draft '04 303(d) list (except RI0007025E-05B Greenwich Cove)

† Water body ID added to the 2004 303(d) list

‡ Not included in Table 1.1 of TMDL, but included on Table 4.4 and '04 list

Location: City of Warwick, towns of East Greenwich and West Warwick, Rhode Island.

STATUS: Final

IMPAIRMENT/POLLUTANT: Eighteen water body segments of Greenwich Bay are not meeting criteria for fecal coliform concentration and are not supporting designated uses of contact recreation, and in Class SA segments, shellfish harvesting. The major factors are bacteria impairments directly following wet weather events, however, several segments exceed the criteria in dry and wet weather (both point and nonpoint sources are present in the watershed). A year-around TMDL submission is presented for fecal coliform.

BACKGROUND: The Rhode Island Department of Environmental Management (RI DEM) submitted to EPA New England the final Total Maximum Daily Load Analysis for *Greenwich Bay Waters* (the "TMDL" or "Report") with a transmittal letter dated December 16, 2005, and it was received by EPA on December 22, 2005. RI DEM addressed EPA's March 16, 2004 and

December 5, 2005 written comments. RI DEM also addressed some additional EPA questions in a letter to the file on February 13, 2006

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.

REVIEWERS: Steven Winnett (617-918-1687) E-mail: winnett.steven@epa.gov

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 Water Body, Pollutant of Concern, Pollutant Sources and Priority Ranking

*The TMDL analytical document must identify the water body as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the water body. 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.*

The Greenwich Bay watershed is located in the City of Warwick and the Towns of East Greenwich and West Warwick, Rhode Island. The Report describes the pollutant of concern (fecal coliform bacteria), a surrogate for pathogen-caused impairment of the designated uses for primary and secondary contact recreation, fish and wildlife habitat, and shellfish harvesting for those waters classified as SA (TMDL pp. 1 and 4). It lists the water bodies as they appear on the State's 2002 303(d) list (TMDL p.2), and explains that waters have the highest priority for TMDL development (TMDL p.4).

Bacteria impairments arise primarily following wet weather events, and DEM discusses water quality trends and the largest bacteria sources in the various bays, coves and tributaries (TMDL pp. 13-24). The submission includes a general description of the point and nonpoint sources that

contribute to the water quality impairments (TMDL pp. 16-23). As summarized on page 24, data analyses for these TMDLs found that every segment of the Bay and its five coves violated one or both parts of the water quality standard for bacteria during wet weather. During dry weather, the 90th percentile component of the criteria is violated in Brush Neck Cove, Buttonwoods Cove, Apponaug Cove and Greenwich Bay waters adjacent to Apponaug Cove. The largest violations are generally found in the five coves addressed in the Report (Brush Neck, Apponaug, Warwick, Greenwich and Buttonwoods); however, bacteria violations are pervasive throughout all of Greenwich Bay. Most of the Greenwich Bay tributaries show violations during wet weather and many violate water quality standards during dry and wet weather. Direct harvesting of shellfish in Greenwich Bay is halted for seven days after a rain event of 0.5 inches or more within the previous 24 hours. Over the last ten years, Greenwich Bay has been closed for harvesting shellfish (i.e. under wet conditions) approximately fifty percent of the year.

RI DEM also points out that it was not possible to determine natural background concentrations that would exist in the area in the absence of human-induced sources. In this case, not separating natural background is reasonable because of the limited and general nature of the information available (land use data) related to potential sources of bacteria. Without more detailed site-specific information on nonpoint source loading, it would be very difficult to separate natural background from the total nonpoint source load, and attempting to do so would add little value to the analysis.

Assessment: RI DEM has adequately identified the water bodies, the pollutant of concern, the magnitude and location of the sources of pollution. The TMDL also includes an adequate description of important assumptions made in developing the TMDL.

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 water body, 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 numeric water quality target is set for all waters at the appropriate numeric water quality standard for bacteria. RI DEM explains that the applicable water quality standards (and therefore, TMDL targets) vary depending on the classification of each water body, and that Greenwich Bay, its coves and tributaries are composed of five different water quality classifications, as shown in Table 1.1 (TMDL p. 2). Designated uses, numeric water quality criteria, and anti-degradation are all addressed (TMDL pp. 4-5). Table 1.2 provides a useful summary of the classes, criteria, and applicable water bodies.

Assessment: EPA New England concludes that RI DEM has properly presented its water quality standards when setting a numeric water quality target.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

As described in EPA guidance, a TMDL identifies the loading capacity of a water body 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 water body'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 water body 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 water body 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.

This TMDL is based on a "percent reduction" approach. Rather than loadings and allocations being calculated for individual sources, pollutant measurements at ambient locations are used to calculate the reductions necessary to meet the applicable water quality criteria. RI DEM sets the numeric water quality targets at the applicable water quality criteria or standard for each segment of Greenwich Bay, its coves, and its tributaries. The TMDL targets or loading capacities are expressed as the appropriate fecal coliform concentrations necessary to restore designated uses, depending on each water segment's classification, as outlined in the TMDL report (Table 1.2, p. 5 and pp. 25-26).

RI DEM describes the rationale for the methods used to establish the cause-and-effect relationship between the numeric targets (WQS) and the identified pollutant sources. RI DEM sets a reduction goal for each impaired water body area or segment (as a whole) by comparing current fecal coliform concentrations to the applicable water quality target, then calculating the percent reduction required to reach that target (TMDL p. 26, and tables on pp. 28 & 30). Since the water quality standards specify both geometric mean and 90th percentile criteria (the 80th percentile is the applicable criteria in Class B waters), the higher percent reduction is used to set each segment's necessary percent reduction. RI DEM explains the three-step process for calculating the reduction goals (TMDL pp. 26-27) and provides a discussion of the strengths and weakness in the analytical process for linking water quality to sources of pollutants (TMDL p. 31).

Assessment: EPA New England concludes that the loading capacities, having been set equal to the WQs, have been appropriately set at levels necessary to attain and maintain applicable water quality standards. The TMDL is based on a reasonable approach for establishing the relationship between pollutant loading and water quality in the bay, coves, and tributaries.

EPA New England also concurs with expressing the bacteria TMDLs as concentrations in lieu of mass-per time because these units are the same as the state water quality standards. In addition, concentration is mathematically related to per time loading (concentration multiplied by storm water flow volume per time results in mass per time).

EPA's regulations at 40 C.F.R. §130.7(c)(1) require that TMDLs identify water quality targets that are consistent with all applicable water quality standards. EPA New England has accepted the percent reduction approach for bacteria TMDLs in some rivers and streams under an assumption that the reductions needed to meet applicable water quality standards (WQS) at ambient stations are representative of the reductions needed to meet the applicable standards throughout the water body.

In comments on the draft TMDLs, EPA expressed the concern that for larger systems, such as for Greenwich Bay (segments RI0007025E-04A and B), the ambient stations used to calculate the reduction targets were located too far off shore to be "representative" of water quality throughout the segment. Rhode Island responded in two ways. It noted that addressing the pollutant loads in the coves and tributaries will assure attainment of standards throughout Greenwich Bay, as the coves and tributaries are the major stormwater sources for the study area. It also acknowledged that shore line surveys and additional monitoring closer to sources are necessary to assure that standards are met as controls are implemented, and that non-shellfish program information (such as beach data and volunteer monitoring) will be considered and followed up with as appropriate. This language is discussed in more detail, below at **8. Monitoring Plan for TMDLs Developed Under the Phased Approach.**

In EPA's judgment, this follow-up data will be needed as progress is made toward controlling sources to confirm the attainment of water quality standards throughout the water body. **The fact that this document requires a high level of fecal coliform reductions in the Bay's tributaries and coves, where the majority of the pollutants causing use impairments of Greenwich Bay are believed to originate, provides the basis for this approval.** Given RI DEM's explanation that TMDL implementation is driven by shoreline surveys and watershed-wide BMP implementation to achieve stringent removal estimates (some greater than 90%), it is EPA's expectation that the level of pollutant removal required in the tributaries and coves will, as a matter of course, result in the attainment of applicable water quality criteria and support for designated uses throughout the Bay as well.

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.

RI's submission contains a load allocation for each segment (or tributary station) that is expressed as the percent reduction required to meet the applicable water quality criteria. Because information to support the development of separate allocations for load and wasteload allocations do not exist, the LA is included in the WLA for each segment. For informational purposes, the State used the ratio of undeveloped to developed land in the watershed to estimate the percentage of the reductions that may in fact be associated with the LA versus the WLA. As RI DEM explains, "For the purposes of allocating the required reductions between point and nonpoint sources only, it is assumed that stormwater generated on developed land is a point source and stormwater generated on undeveloped land is a nonpoint source. Using this assumption, an evaluation of Greenwich Bay watershed land use and pollution source data finds two-thirds of the required reduction is allocated to point sources and one-third is allocated to nonpoint sources" (TMDL p. 27).

Note that this approach does not affect the regulation of storm water that is subject to Phases I or II of EPA's storm water program.

Assessment: EPA New England concludes that load allocations are adequately specified in the TMDLs for the coves and tributaries, for which the required reductions drive attainment for the study area as a whole.

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 submission contains a wasteload allocation for each segment (or tributary station) that is expressed as the percent reduction required to meet the water quality standard. As mentioned in the LA review (section 4 above) because information to support the development of separate allocations for load and wasteload allocations do not exist, the LA is included in the WLA for each segment. As also discussed above, based on the proportion of developed and undeveloped land in the watershed, it is estimated that two-thirds (2/3) of the required reductions are allocated to point sources (TMDL p. 27).

For the East Greenwich WWTP (RI0100030), the one individually-permitted discharge, the TMDL establishes an allocation of 200 fecal coliform per 100 ml. RIDEM has determined that a 200 per 100 ml WLA will meet the receiving water ambient criterion of 50 fecal coliform per 100 ml due to mixing of effluent and Bay water in the turbulent boil of the effluent. RIDEM has determined through dye studies and modeling that dilution within the boil of the discharge provides approximately a 20 to 1 reduction in bacteria concentration before the plume surfaces. This reduction significantly exceeds the nominal 4 to 1 reduction (200 divided by 50) required to meet standards.

Assessment: EPA New England concludes that the WLAs for this submission are acceptable and reasonable for the coves and tributaries, for which the required reductions drive attainment for the study area as a whole.

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.

RI DEM identifies several assumptions as providing an implicit margin of safety in the TMDL. While EPA does not agree that all of the assumptions contribute to the margin of safety, it is reasonable for RI DEM to rely on the following conservative factors for the reasons discussed below:

- Three of six wet weather samples from Greenwich Bay and coves were collected after a rain event greater than 3 inches; all tributaries (except the Maskerchugg River system)

were sampled intensively during and directly following storms of at least 1.5 inches (larger storms, with their higher bacteria levels, tend to generate more conservative percent reduction TMDL targets). EPA understands that 3-inch storm events are infrequent, with an occurrence interval of approximately one per year, and bring about very high levels of bacteria. Also, 1.5-inch storms are some of the heavier storms that occur with more frequency. Consequently, their contribution as half or more of the data (depending on the particular segment) used to characterize wet weather bacteria levels more heavily weights the TMDL toward greater required reductions to meet water quality standards.

- Wet weather conditions are considered to occur for seven days following a rainstorm (providing an opportunity for shellfish to purge themselves of bacteria). EPA understands that the final days of the seven day period is for depuration of bacteria from the shellfish themselves, and requires the water column itself be clean by the time the depuration period begins. Therefore, the final days constitute a margin of safety for water quality because in the calculation of the weighted geometric mean, bacteria levels for both wet and dry weather are weighted by the percent of the year they occur. Increasing the number of days per year during which wet weather conditions are happening further weights the wet weather bacteria levels (which are much higher than the dry weather levels) in the calculation of the geometric mean, thus increasing the mean, and increasing the TMDL's required reductions in bacteria levels to meet water quality standards. DEM's calculations indicate that this increases the weighting of the wet weather bacteria levels from 29% to 50% in the calculation of the weighted mean.

Finally, in some areas, a water body segment with higher allowable fecal coliform bacteria limits discharges to a water body segment with more stringent criteria. In these places, the target is set at the more stringent of the two standards at the point of discharge, resulting in an MOS for just these specific water body segments.

Assessment: For the reasons explained above, EPA New England concurs that an adequate MOS is provided by the conservative assumptions made in setting the TMDL target and in assigning load and wasteload allocations.

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).

RI DEM is establishing year-round bacteria TMDLs based on the observation that high values occur in all seasons. The submission states that wet weather and not seasonality define the critical conditions for these waters (TMDL p. 25). Since three of six wet weather samples were taken after a rain event of greater than 3 inches, DEM concludes that the variations in water quality for these waters is adequately addressed in the TMDL. The removal targets in the TMDL

(particularly for the five coves) are all fairly high (78-99%), making it unlikely that seasonal effects would make the estimated removal requirements considerably more stringent or significantly impact implementation programs until additional shoreline surveys, BMP implementation and ambient monitoring are conducted as outlined below.

Assessment: EPA New England concludes that seasonal variations have been adequately accounted for in the TMDLs because the TMDLs were developed to be protective during critical wet weather periods. In addition, bacteria controls are expected to be in place through the year so that these controls will reduce pollution whenever sources are active.

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.

In response to EPA's concern regarding application of the percent reduction approach in larger systems, such as Greenwich Bay itself, RI DEM has added the following language to its section on monitoring:

“Additional monitoring is required to ensure that water quality standards are met as remedial actions are accomplished. Monitoring by RIDEM will be the principle method of obtaining the data necessary to track water quality conditions in the watershed. Also, as proposed BMPs are installed in the watershed, post construction influent and effluent sampling may be required to assess the effectiveness of the selected technology.

“In accordance with National Shellfish Sanitation Program (NSSP) requirements, the RIDEM Shellfish Monitoring Program will monitor water quality and conduct shoreline surveys. RIDEM will ensure that ambient sampling stations are located adjacent to point sources and effectively evaluate all nonpoint sources of pollution, including the addition and/or modification of sampling locations, as necessary. Shoreline surveys entail the evaluation of the effect of each actual and potential source of pollution on shellfish waters including as necessary, the collection of ambient water quality samples. In addition, non-shellfish program data (such as information on potential sources, beach and volunteer monitoring) will be considered and followed up with confirmatory monitoring by RIDEM, following NSSP approved methods, as appropriate.

“The continued water quality monitoring and future shoreline surveys will be used to help evaluate the effectiveness of the recommendations of the TMDL in restoring

designated uses and attaining water quality standards. Ultimately, attainment of the designated shell fishing use requires compliance with the Rhode Island water quality standards including ambient water quality criteria and all NSSP requirements (including evaluation of non-shellfish program data/surveys, special sampling site data, beach and volunteer monitoring, as appropriate).” (TMDL p. 44)

Monitoring for the TMDL has detected water quality violations at stations as far away as 250 yards and more from shore. Pipe data collected by RI DEM through shoreline surveys that are required under the NSSP, while not reflecting ambient conditions, indicate that densities of bacteria in near shore waters may be significantly higher than data collected at ambient stations. For this reason, RI DEM intends to use shoreline surveys performed as part of its NSSP program as a primary tool for identifying problem areas for both correction and special priority ambient water near shore monitoring. RI DEM envisions implementing the TMDL on a bay-wide basis using an iterative process whereby water quality improvements are evaluated using shore line surveys and representative ambient near-source monitoring once the most significant pollution sources have been mitigated, with additional control measures implemented, on and as needed basis until water quality standards are achieved throughout the Bay. As problems identified by shoreline surveys and end-of-pipe monitoring are corrected, RI DEM will conduct near shore ambient monitoring and compare to water quality criteria to confirm water quality standard attainment.

Assessment: Addressed, though not required.

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 submission. In establishing the Narragansett Bay and Water Commission, the Governor of Rhode Island has established a goal that Greenwich Bay meet fishable/swimmable conditions by 2015. As mentioned above, DEM envisions a bay-wide implementation program guided by shoreline surveys followed by representative ambient (near source) monitoring once the most significant pollution sources have been mitigated, to guide problem identification, correction and ultimate water quality attainment confirmation. The plan recommends use of BMPs that both reduce the volume of storm water and the concentrations of bacteria in storm water. The document specifically gives preference to use of upland attenuation

techniques to infiltrate and treat runoff as close to the source as possible. A number of commenters expressed support for the implementation plan.

Assessment: Addressed, though not required.

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 body 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.”

Reasonable assurance is not required because point sources are not given less stringent wasteload allocations based on the assumption of future nonpoint source load reductions. However, RI DEM addresses reasonable assurances that storm water runoff reductions will occur by providing information past and current surveys and work in the watershed which point to a long term commitment to improving water quality. The report documents site-specific work done in the past while offering recommendations for future work needed (TMDL pp. 35-42).

Assessment: Addressed, though not required.

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.

RI DEM provided a comment period from February 11, 2004 to March 12, 2004. Notice of this comment period and a public meeting on February 11, 2004 was sent via faxes and letters to the affected communities and others, and posted its notice to a number of list serves on January 29,

2004. RI DEM also issued a press release on February 3, 2004, the date the draft document was made available on RI DEM's website. Fifty to 60 people attended the public meeting. RI DEM has provided EPA with copies of all submitted comments and the Department's responses as an attachment to the final TMDL submission.

Assessment: EPA New England concludes that RI DEM involved the public during the development of the TMDL for the *Greenwich Bay Waters*, 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 water body, the pollutant(s) of concern, and the priority ranking of the water body.

Assessment: A letter with appropriate information was included with the final submission.

Data for entry in EPA's National TMDL Tracking System

TMDL Name	Greenwich Bay Waters (individual segments listed below)
Number of TMDLs*	18
Lead State	Rhode Island (RI)
TMDL Status	Final
Pollutant ID	41 (Pathogens)
TMDL End Points	SA (14 fecal coliform/100 ml: 49 fecal coliform/100 ml): Brush Neck Cove RI0007025E-02 Buttonwoods Cove RI0007025E-03 Greenwich Bay RI0007025E-04A Greenwich Bay RI0007025E-04B Warwick Cove RI0007025E-06B SB (50 fecal coliform/100 ml: 500 fecal coliform/100 ml): Apponaug Cove RI0007025E-01 * ‡ Greenwich Cove RI0007025E-05A * Warwick Cove RI0007025E-06A * ‡ A (20 fecal coliform/100 ml: 200 fecal coliform/100 ml): Tuscatucket Brook RI0007025R-05 ‡ Baker Creek RI0007025R-06 ‡ Southern Creek RI0007025R-09 * ‡ † B (200 fecal coliform/100 ml: 500 fecal coliform/100 ml): Hardig Brook RI0007025R-01 ‡ Maskerchugg River RI0007025R-03 * ‡ Dark Entry Brook RI0007025R-04 * Greenwood Creek RI0007025R-11 * ‡ † Gorton Pond Tributary RI0007025R-13 * ‡ † Mill Brook RI0007025R-14 * ‡ † Saddle Brook RI0007025R-16 * †
TMDL Type	Point & Nonpoint Source
RIPDES number for Point Source	East Greenwich WWTF - RI0100030
List ID (from system)	See above
Impairment ID (from system)	Shellfishing, Primary Contact Recreation
Cycle (list date)	2002 and 2004
Establishment Date (approval)	February 16, 2006
EPA Developed	No
Towns affected*	Warwick, East Greenwich, West Warwick, RI

*Impairments found during course of TMDL assessment and added to draft '04 303(d) list

‡"downstream" station required to meet criteria of adjacent higher class segment

† Water body ID added to '04 list