UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

September 22, 2011

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

Dear Ms. Good:

Thank you for submitting the final *Rhode Island Statewide Bacteria TMDL* (Total Maximum Daily Load) document. The purpose of these TMDLs is to address the impaired recreational use in freshwaters in Rhode Island. The report covers 57 distinct bacteria impairments on Rhode Island's 2010 303(d) list for *Enterococcus*, fecal coliform, and *E.coli* bacteria.

The U.S. Environmental Protection Agency hereby approves Rhode Island's September 2011 Statewide Bacteria TMDLs, submitted with a cover letter dated September 16, 2011. EPA has determined that these TMDLs meet the requirements of Section 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.

We commend your staff's efforts and involvement with our office to develop and finalize these TMDLs. We believe the information, maps, data and references provided in the main TMDL document and appendices will educate, motivate, and assist stakeholders in tackling bacteria impairments at the local level. My staff and I look forward to continued cooperation with the Rhode Island 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/

Stephen S. Perkins, Director
Office of Ecosystem Protection

cc: Angelo Liberti, RI DEM
Elizabeth Scott, RI DEM
Heidi Travers, RI DEM
Stephen Silva, EPA
StevenWinnett,EPA

Table 1: Bacteria Impaired Segments Included in the RI Statewide Bacteria TMDL (reprinted with permission of RI DEM)

Waterbody Name	Waterbody ID	Class	Towns	Impairment
WPA 1: Aquidneck Island				
Bailey's Brook	RI0007035R-01	AA	Middletown	Enterococci
Maidford River	RI0007035R-02A	AA	Middletown	Fecal Coliform
Maidford River	RI0007035R-02B	AA	Middletown	Fecal Coliform
Paradise Brook	RI0007035R-03	AA	Middletown	Fecal Coliform
WPA 6: Hunt River				
Frenchtown Brook	RI0007028R-01	A	East Greenwich, West Greenwich	Enterococci
Hunt River	RI0007028R-03D	B	North Kingstown, Warwick	Enterococci
Sandhill Brook	RI0007028R-05	B	North Kingstown	Fecal Coliform
WPA 7: Jamestown				
Jamestown Brook	RI0007036R-01	AA	Jamestown	Fecal Coliform
WPA 8: Branch - Blackstone				
Branch River	RI0001002R-01A	B	Burrillville	Enterococci
Branch River	RI0001002R-01B	B	North Smithfield	Enterococci
Chepachet River	RI0001002R-03	B	Burrillville, Glocester	Enterococci
Clear River	RI0001002R-05C	B	Burrillville	Enterococci
Clear River	RI0001002R-05D	B1	Burrillville	Enterococci
Pascoag River	RI0001002R-09	B	Burrillville	Enterococci
Tarkiln Brook	RI0001002R-13B	B	Burrillville, North Smithfield	Enterococci
Crookfall Brook	RI0001004R-01	AA	Lincoln, North Smithfield, Smithfield	Enterococci
Long Brook	RI0001006R-02	AA	Cumberland	Enterococci
East Sneech Brook	RI0001006R-03	AA	Cumberland	Enterococci
Burnt Swamp Brook	RI0001006R-06	AA	Cumberland	Enterococci
WPA 9: Moshassuck				
Moshassuck River	RI0003008R-01A	B	Lincoln	Enterococci
Moshassuck River	RI0003008R-01B	B	Lincoln, Pawtucket, Central Falls	Enterococci
West River	RI0003008R-03B	B	Lincoln, North Providence, Providence, Smithfield	Enterococci
WPA 12: Pawtuxet				
Nooseneck River	RI0006012R-05	A	Coventry, West Greenwich	Enterococci
Boyd Brook	RI0006013R-01	B	Scituate, Coventry	Enterococci
South Branch Pawtuxet River	RI0006014R-04B	B1	Coventry, West Warwick	Enterococci
Tiogue Tribs	RI0006014R-05	B	Coventry	Enterococci
Huntinghouse Brook	RI0006015R-11	AA	Glocsester, Scituate	Enterococci
Moswansicut Stream	RI0006015R-16	AA	Scituate	*E.coli*
Winsor Brook	RI0006015R-30	AA	Foster	Enterococci
Meshanticut Brook	RI0006017R-02	B	Cranston, West Warwick, Warwick	Enterococci
Dry Brook	RI0006018R-02A	B	Johnston	Enterococci
Simmons Brook	RI0006018R-04	B	Johnston, Cranston	Enterococci
Roger Williams Park Ponds	RI00006017L-05	B	Providence	Fecal Coliform
Mashapaug Pond	RI00006017L-06	B	Providence	Fecal Coliform

Waterbody Name	Waterbody ID	Class	Towns	Impairment
WPA 15: Quinebaug				
Moosup River	RI0005011R-03	A	Foster, Coventry	Enterococci
WPA 17: Saugatucket				
Fresh Meadow Brook	RI0010045R-01	B	North Kingstown, South Kingstown	Enterococci
WPA 20: Stafford Pond				
Sucker Brook	RI0007037R-01	A	Tiverton	Enterococci
WPA 22: West Passage				
Belleville Upper Pond Inlet	RI0007027R-02	B	North Kingstown	Enterococci
WPA 23: Wood - Pawcatuck				
Ashaway River	RI0008039R-02A	A	Hopkinton	Enterococci
Chickasheen Brook	RI0008039R-05A	A	Exeter	Enterococci
Meadow Brook	RI0008039R-13	A	Richmond	Enterococci
Mile Brook	RI0008039R-14	B	Hopkinton	Enterococci
Pawcatuck River	RI0008039R-18B	B1	Charlestown, Richmond	Enterococci
Pawcatuck River	RI0008039R-18C	B	Charlestown, Richmond, Hopkinton, Westerly	Enterococci
Taney Brook	RI0008039R-23	B	Richmond	Enterococci
Tomaquag Brook	RI0008039R-24	A	Hopkinton	Enterococci
White Horn Brook	RI0008039R-27B	B	South Kingstown	Enterococci
Dutemple Brook	RI0008039R-30	A	Exeter	Enterococci
Parmenter Brook	RI0008039R-37	A	Hopkinton	Enterococci
Breakheart Brook	RI0008040R-02	A	West Greenwich, Exeter	Enterococci
Brushy Brook	RI0008040R-03B	B	Hopkinton	Fecal Coliform
Canonchet Brook	RI0008040R-04B	B	Hopkinton	Enterococci
Phillips Brook	RI0008040R-14	A	West Greenwich	Enterococci
Wood River	RI0008040R-16A	A	Exeter, Richmond, Hopkinton	Enterococci
WPA 24: Woonasquatucket				
Cutler Brook	RI0002007R-02	B	Glocester	Enterococci
Latham Brook	RI0002007R-05	B	Smithfield	Enterococci
Stillwater River	RI0002007R-09	B	Smithfield	Enterococci

EPA NEW ENGLAND'S TMDL REVIEW

TMDL: Rhode Island Statewide Bacteria TMDL

STATUS: Final

IMPAIRMENT/POLLUTANT: These fifty seven (57) water body segments are not meeting their designated uses of recreational use based on violations of the State's water quality criteria for freshwater Classes AA, A, and B, and B1. Sources include both point and nonpoint sources. TMDLs are established in terms of concentrations and daily loads for *Enterococcus* and fecal coliform bacteria, depending on resource type, waterbody classification, and the data available. *Escherichia coli* (*E.coli*) are used in a limited number of cases.

BACKGROUND: The Rhode Island Department of Environmental Management (DEM) submitted a draft TMDL to EPA Region 1 and the public on June 15, 2011. A public comment period was held from June 28 to August 1, 2011. DEM submitted to EPA Region 1 the final *Rhode Island Statewide Bacteria TMDL* with a transmittal letter dated September 16, 2011. In addition to the main TMDL report itself ("Core" document), the submittal included the following documents:

- TMDL report Appendices A – L, Waterbody Reports (segment-specific information and bacteria data).
- TMDL report Appendix M, *TMDLs Expressed as Daily Loads.*
- TMDL report Appendix N, *Response to Comments Received During the Public Comment Period*.
- Extensive list of best management practices and educational resources for stormwater management and source-specific discharges (TMDL, Sections 6 and 7).

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

REVIEWER: 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 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.

A. Description of Waterbody, Priority Ranking, and Background Information

The TMDL document addresses a total of 57 bacteria-impaired segments listed in Rhode Island's 2010 303(d) list, including 55 river and stream segments and 2 lake and ponds. These 57 segments are located in 12 of Rhode Island's 17 Watershed Planning Areas (TMDL, Figure 1.1 and Table 1.1). Table 1-2 of the TMDL document lists each impaired water segment (organized by watershed planning area), including each waterbody's name and assessment unit identifier, classification, location, and type of impairment.

A state-wide map as well as the lists of impaired waterbodies and locations are presented in the main body of the TMDL report, and site-specific maps and data are provided in the appendices (appendices are organized by Watershed Planning Area). Rhode Island's 2010 303(d) list indicates priority dates for development of TMDLs for these water bodies in 2011.

B. Pollutant of Concern

The bacteria impairment listings are based on monitoring data for various indicator organisms, depending on the resource type, and classification of the waterbody. The segments are listed for the presence of *Enterococci* or fecal coliform bacteria, and in one case, *E. coli*.

C. Pollutant Sources

Bacteria impairments in these water bodies arise from both dry and wet weather events, year round. Potential point sources of bacterial pollution include: wastewater discharges from treatment facilities, RIPDES-regulated stormwater runoff (including stormwater discharges authorized by the State's MS4 permits, construction general permit, RIDOT permit, and multi-sector general permit), accidental and illicit discharges, combined sewer overflows, and

discharges from boats. Potential non-point sources of bacterial pollution include stormwater not regulated under the RIPDES program, septic systems, pet waste, wildlife wastes, agriculture, and recreational uses (swimmers). Actual segment-specific sources of bacterial pollution are identified in the watershed appendices (in some cases) when these sources are known.

Assessment: EPA Region 1 concludes that the TMDL document meets the requirements for describing the TMDL waterbody segments, pollutants of concern, and priority ranking, and identifying and characterizing sources of impairment.

In addition, EPA notes that this TMDL document may apply to waters found to be impaired by bacteria in the future, provided that DEM's intent to add more impaired waters to the TMDL is made clear, the public has an opportunity to provide comments, and EPA approves the proposed additional TMDLs. In appropriate circumstances in the future, DEM may submit additional TMDLs to EPA for specific waterbodies to be added for coverage under the statewide bacteria TMDL document. The State will need to either provide public notice for review of the additional TMDLs alone, or as part of the public notice process associated with the biannual review of the State's Section 303(d) list in its *Integrated Water Quality Report* (as suggested on page 5 of the TMDL document). Within the Integrated Report and in its public notice requesting review and comment, DEM will need to clearly state its intent to list the newly assessed waterbodies as impaired and to apply the appropriate waterbody-specific bacteria TMDLs. The State will not need to resubmit the approved Core document at such times. Rather, it should reference the document and update certain waterbody-specific information contained in this original Core document in the introductory materials of its submission. DEM should also provide the same type of detailed information on the additional impaired waterbodies and their TMDLs as are contained in the appendices that accompany this original submission.

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 DEMignated 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 report defines the appropriate water quality criteria for reducing public health risk from waterborne disease-causing organisms, for protecting designated recreation and shellfishing uses, and for implementing the antidegradation policy (TMDL, pp. 13-21). Water quality classification and water quality standards of all surface waters of the State of Rhode Island have been established by the Rhode Island Legislature in General Laws Chapter 46-12. and the Rhode Island Water Quality Regulations Rule 8.B.

According to Rhode Island's water classification program, bacteria-impaired waters are classified as AA, A, B, B1, and B1{a}for fresh waters, and SA, SA{b}, SB, SB1, SB{a}, and SB1{a} for salt waters. *Enterococcus* bacteria is the indicator organism for fresh water and for recreational use in salt waters, and fecal coliform is the indicator organism for shellfish growing

and harvesting areas (tidal waters) following the standards developed under the National Shellfishing Sanitation Program (NSSP) by the United States Food and Drug Administration. In addition, fecal coliform bacteria is used for a small number of fresh water bodies as the State transitions to *Enterococcus* as the indicator for fresh waters and salt water recreation use, and *E. coli* bacteria is used for a very limited number of water bodies as the indicator species when no other data are available.

Rhode Island's water quality criteria for bacteria are used as the numeric water quality targets for the bacteria TMDLs (TMDL, p. 21). The numeric targets vary depending on the specific waterbody's use (e.g., recreation or shellfish consumption), waterbody classification (AA, A, B, B1, SA, SB), whether it has a designated beach, and whether it is fresh or salt water. The criteria used as water quality targets are listed in Table 2-2 of the TMDL report. All the waters in these initial TMDL report are freshwaters, and so the saltwater classifications are not used.

Assessment: EPA concludes that DEM has properly described and interpreted the applicable water quality standards (TMDL, pp. 11-21) to set the TMDL targets. Rhode Island DEM is directly applying the numeric criteria in its water quality standards as the TMDL targets.

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.

Rhode Island's bacteria TMDLs consist of two formats of targets for allowable levels of bacteria: (1) concentrations of bacteria, expressed as bacteria counts/100 ml of water, and (2) loads of bacteria, expressed as billions of bacteria/day (TMDL, pp. 32-34 and Appendix M). DEM considers both formats to be daily targets because the targets apply on any given day whenever the water quality standards are in effect in order to assure achievement of bacteria water quality criteria. Both formats express targets designed to attain the designated uses of recreation and shellfishing, and to meet the associated criteria in Rhode Island's water quality standards. Rhode Island DEM considers the concentration-based TMDL targets to be most useful for guiding implementation of bacteria controls because those targets are easy to understand, and achievement of those targets is more readily assessed by groups with limited resources (TMDL, pp. 33-34).

DEM compared the current conditions for each of the water bodies to the appropriate criteria components (geomean component for the *Enterococcus* and *E.coli* criteria and geomean and 90th percentile components for the fecal coliform criteria,). The station data-component combination with the largest violation of the criteria were used to conservatively estimate the current conditions for each segment, and percent pollution reductions necessary to meet the TMDL targets.

Rhode Island's water quality criteria for bacteria apply year round at all times. By setting the TMDL targets equal to the bacteria criteria, the TMDLs are applicable at all times and are therefore protective of water quality under all conditions and seasons. Achievement of those water quality goals will be assessed by ambient water quality monitoring.

Assessment: There is nothing in EPA's regulations that forbids expression of a TMDL in terms of multiple TMDL targets. TMDLs can be expressed in various ways, including in terms of toxicity, which is a characteristic of one or more pollutants, or by some "other appropriate measure" (40 C.F.R. §130.2(i)). The target loading capacities expressed in the TMDL document are set at levels which assure WQS will be met (criteria concentration and loading based on meeting ambient water quality criteria). The concentration loading capacity is based on the concentration criteria for each water body.

Both formats (concentration and load) express targets designed to attain the designated use of each waterbody segment based on a straightforward derivation of TMDL targets from the water quality criteria adopted by Rhode Island. Both formats will achieve water quality criteria for both dry and wet weather and for all storm events whenever they occur (i.e., on any given day). These approaches have been used by states for TMDL development and approved by EPA in the past.

EPA's November 15, 2006 guidance entitled "Establishing TMDL 'Daily' Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, et al., No.05-5015, (April 25, 2006) and Implications for NPDES Permits," recommends that TMDL submittals express allocations in terms of daily time increments. In this case, the daily maximum mass loads were calculated by multiplying the concentration criterion by stream flow or waterbody daily water outflow volume (lakes and estuaries) and are expressed in terms of billions of organisms per day.

In summary, the loading capacity targets (both concentration and load-based) are directly linked to Rhode Island's water quality standards' bacteria criteria to achieve the designated uses of the waterbodies addressed by this TMDL report.

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 load allocation (LA) relates to existing and future nonpoint sources, natural background, and stormwater runoff not subject to RIPDES permitting. LAs are allocated based on the criteria established by Rhode Island's water quality standards, or are set at zero for prohibited discharges (TMDL, Tables 5-1, 5-2, and 5-3).

Assessment: As discussed in Section 3 of this document (under loading capacity), DEM used the applicable numeric water quality criteria directly related to the use-impairment which the TMDL is designed to address. Rhode Island DEM set water quality targets based on meeting criteria in each water body; the aggregate mass load allocation is derived from the applicable criteria and flow. EPA concludes that the load allocations for bacteria are adequately specified in the TMDLs 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.

As with the load allocations (LAs), the wasteload allocations (WLAs) are allocated based on the criteria established by Rhode Island's water quality standards (TMDL, Tables 5-1, 5-2, and 5-3). As is its policy, DEM does not specify end of pipe limits for regulated stormwater. Rather, it relies on meeting water quality criteria instream, and uses the RIPDES general stormwater permitting process with its six minimum measures and additional authorities to implement the reductions that will lead to water quality restoration. Permitted wastewater facilities and applicable general permits are identified in the waterbody reports in Appendices A-L, Specific TMDL end points are listed for each impaired waterbody in Appendices A-L of the TMDL document, and percent reduction for each waterbody are listed in Table 8-1 of the core TMDL document.

Assessment: DEM established concentration-based WLAs by applying the numeric criteria directly to each water body. Aggregate mass WLAs were established for the stormwater sources because it is impossible to determine with any precision or certainty the actual and projected loadings for individual discharges or groups of discharges. EPA's November 22, 2002 TMDL

guidance suggests that it is acceptable in such cases to allocate stormwater by gross allotments EPA concludes that the wasteload allocation components of the TMDLs are adequately specified at levels necessary to attain and maintain water quality standards in all the waterbodies.

6. Margin of Safety (MOS)

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

The margin of safety accounts for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality. The Rhode Island bacteria TMDLs expressed as concentrations set the TMDL wasteload allocation and load allocation at the applicable instream water quality criteria, so there is no uncertainty between the water quality standard and its translation to a wasteload allocation and/or load. DEM, as guidance but not an approvable wasteload allocation or load allocation, provided an estimate of the percent reduction necessary to achieve the TMDL target. DEM chose to add a 5% margin of safety to this estimate. However, this percent reduction is only included for information purposes.

The TMDLs expressed in terms of daily loads include an explicit 5% MOS which is applied to the appropriate state water quality criteria (SWQC) before calculating the allowable daily load and wasteload allocations for bacteria. The mass-per-unit-time bacteria TMDLs are expressed in terms of billions of bacteria per day as a function of flow (for freshwater streams) or daily water outflow volume (for freshwater lakes, and estuarine and marine waters). This 5% MOS is incorporated into the TMDLs in order to account for any uncertainty involved in measurements or estimations of waterbody flow or volume exchange used in the daily load calculations.

Assessment: EPA concludes that the approach used in developing the concentration-based TMDLs provides for an adequate MOS. There is not a lack of knowledge concerning the relationship between allocations and water quality in this case, where the TMDL applies the criteria as allocations for each source. EPA also concludes that the approach used in developing the load-based TMDLs provides for an adequate explicit MOS in order to account for any uncertainty associated with measuring flows or estimating volume exchanges.

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)).

Rhode Island DEM considered seasonal variations when developing the TMDL document. Because the TMDLs are set equal to the bacteria criteria, and the criteria are applicable at all times of year, the TMDLs are also applicable at all times of year and protective during all conditions (TMDL, p. 41).

Assessment: The bacteria TMDLs apply over the entire time that the bacteria criteria apply, which is year round in Rhode Island. The TMDL targets will reduce bacteria concentrations to water quality criteria levels in all seasons. EPA concludes that the TMDLs have adequately addressed seasonal variability.

8. Monitoring Plan

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

The Rhode Island statewide bacteria TMDL report is not a phased TMDL document, but the document includes a description of a monitoring plan designed to measure attainment of water quality standards (TMDL, pp. 42-43). DEM will continue to monitor rivers and streams through its Rotating Basin Assessment Program, and will continue the HEALTH Bathing Beach Inspection Program, which collects bacteria samples from recreational beaches to determine safe swimming conditions. The DEM Shellfish Growing Area Monitoring Program will continue year-round monitoring of shellfish areas to assure their proper classification. DEM will also continue to investigate complaints and inspect potential sources of bacteria. To supplement these efforts, DEM will continue to make use of the substantial bacteria data from quality assured volunteer monitoring programs to indicate problems and to evaluate progress towards attainment of standards.

Assessment: EPA concludes that the anticipated monitoring by and in cooperation with DEM is sufficient to evaluate the adequacy of the TMDL and attainment of water quality standards, although this is not a required element of EPA's TMDL approval process.

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 TMDL report provides implementation guidance and identifies existing informational resources on BMPs for the various sources of bacteria (TMDL, pp. 44-70). It also includes an overall description of the implementation process, and information about the stormwater management program. Maps, waterbody-specific data summary tables, and other information specific to each watershed are presented in Appendices A-L to inform stakeholders on the location of known impairments. Data were used to calculate percent reductions needed to meet

the concentration-based target, and to present wet weather and dry weather bacteria counts (where sufficient precipitation information was available). This wet/dry data analysis provides valuable indications of the sources of bacteria in order to guide implementation efforts to fix the problem.

Assessment: Although implementation plans are not a required element for TMDL approval, DEM has included implementation guidance and identified many resources to aid implementation. EPA is taking no action on the implementation plan.

10. Reasonable Assurances

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

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

The TMDL targets for point sources in these TMDLs are not less stringent based on any assumed nonpoint source reductions, so documentation of reasonable assurance in the TMDLs is not a requirement. Nonetheless, Rhode Island DEM explains that a combination of regulatory and non-regulatory program support in Rhode Island will provide reasonable assurances that both point and non-point allocations will be achieved, including regulatory enforcement, technical assistance, availability of financial incentives, and state, and federal programs for pollution control (TMDL, p. 43).

Assessment: Although not required, because DEM did not increase WLAs based on expected LA reductions, DEM has nevertheless described a number of programs that provide reasonable assurance that WQS will be met.

11. Public Participation

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

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

The public participation process for the bacteria TMDLs is described on pages 41-42 of the TMDL report. On June 14, 2010, a public notice announcing the availability of the draft TMDL for public review and comment was posted on the DEM website, and emails were sent to a list of agencies, towns, and stakeholders. DEM held two public meetings on June 28 and 29, 2011 to present the draft TMDLs to the public, and begin the public comment period. The public comment period ended on August 1, 2011. Comments were received from Save the Bay, two Rhode Island towns, and RI's Department of Transportation (DOT). A complete list of all comments received and the DEM responses to those comments can be found in Appendix N of the TMDL report.

Assessment: EPA concludes that DEM has provided sufficient opportunities for the public to comment on the TMDL, and has provided reasonable responses to the public comments.

12. Submittal Letter

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

Assessment*:* On September 16, 2011, DEM submitted Rhode Island's final Statewide Bacteria TMDL and associated appendices for EPA approval. The final documents contained all of the elements necessary to approve the TMDL.