April 17, 2014

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

SUBJECT: **Approval of Ten Mile River Watershed TMDLs**

Dear Ms. Good:

Thank you for your submission of Rhode Island's Total Maximum Daily Loads (TMDLs) for the five water bodies of the *Ten Mile River Watershed*, for cadmium, lead, aluminum, iron, fecal coliform and enterococci bacteria, and phosphorus. The five water bodies were included on the State's 2012 303(d) list and were prioritized for TMDL development. The purpose of these TMDLs for Rhode Island waters is to address nutrient, metals and bacteria-related impairments to aquatic life use and fish and wildlife habitat from point and nonpoint source pollution.

The U.S. Environmental Protection Agency (EPA) hereby approves Rhode Island's TMDLs for the Ten Mile River Watershed, received by EPA on March 17, 2014. EPA has determined that these TMDLs meet 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 Steven Winnett (617-918-1687) of my staff.

Sincerely,

/s/

Ken Moraff, Director
Office of Ecosystem Protection

cc Angelo Liberti, RI DEM
Elizabeth Scott, RI DEM
Brian Zalewsky, RI DEM
Ralph Abele, EPA
Steven Winnett, EPA

EPA NEW ENGLAND'S TMDL REVIEW

TMDL: Ten Mile River Watershed

Ten Mile River	RI0004009-10A	Aluminum, Cadmium, Iron, Lead, Enterococcus, Fecal Coliform, Total Phosphorus
Ten Mile River	RI0004009-10B	Aluminum, Cadmium, Enterococcus
Central Pond	RI0004009L-01A	Aluminum, Cadmium, Total Phosphorus
Turner Reservoir	RI0004009L-01B	Aluminum, Cadmium, Total Phosphorus
Omega Pond	RI0004009L-03	Aluminum, Cadmium, Fecal coliform, Total Phosphorus

Location: Towns of East Providence and Pawtucket, Rhode Island.

STATUS: Final

IMPAIRMENT/POLLUTANT: Two water body segments of the Ten Mile River and three of its impoundments are not meeting criteria for combinations of enterococcus and fecal coliform bacteria, aluminum, cadmium, iron, and lead, and dissolved oxygen and total phosphorus, and are not supporting designated uses of contact recreation and fish and wildlife habitat. The major factors are bacteria, metals and nutrient impairments associated with both dry and wet weather, depending on the segment. A year-around TMDL submission is presented for enterococcus and fecal coliform bacteria, dissolved metals, and total phosphorus.

BACKGROUND: The Rhode Island Department of Environmental Management (DEM) sent EPA New England an early development draft of its total maximum daily load (TMDL) analyses for the Ten Mile River in June 2013. DEM released the public review draft of its Total Maximum Daily Load Analysis for the *Ten Mile River Watershed* (the "TMDL" or "Report") onto its website, with an email notice to EPA New England and others, on December 23, 2013, and EPA replied with comments on the document to DEM on February 3, 2014. Following a public comment period, DEM submitted the final TMDL to EPA with a transmittal letter dated March 14, 2014. The submission included:

- Final TMDL report for pathogens, metals and nutrients in the Ten Mile River and impoundments;
- Implementation plan for achieving TMDL reductions, Chapter 8, pp. 146-173;
- Water quality data, Appendices A-C;
- Public comments and response to comments, Appendix L; and
- References set out in Chapter 11, pp. 176-182.

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 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.

The Ten Mile River is located in the Towns of East Providence and Pawtucket, Rhode Island. The Report describes the pollutants of concern (enterococcus and fecal coliform bacteria, the metals aluminum, cadmium, iron, and lead, and total phosphorus), which impair contact recreation and fish and wildlife habitat (TMDL pp. 12-14). It lists the water bodies as they appear on the State's 2012 303(d) lists (TMDL p. 14). Four of the five water body segments are also listed with a dissolved oxygen impairment. The total phosphorus target is used as a surrogate for the dissolved oxygen impairments as DEM believes that low dissolved oxygen results largely from excess phosphorus, and that reducing phosphorus to criteria levels will solve the dissolved oxygen impairment.

The submission includes a description of the point and nonpoint sources, including upstream sources in Massachusetts, that contribute to the water quality impairments (TMDL pp. 54-86), as well as in-depth discussions of the water monitoring and data that indicate the condition of the water bodies (TMDL pp. 28-53). Bacteria, metals, and nutrient impairments arise both from wet and dry weather discharges, and bacteria levels in particular increase markedly during wet weather events. Sources of these pollutants include stormwater discharges and urban/commercial runoff, NPDES permitted discharges, illegal discharges and failing septic systems, lawns and golf courses, wildlife and domestic animal wastes, sediment resuspension and embankment sloughing, groundwater contamination, and other waste sites. For phosphorus, internal cycling from sediments is an important pollutant source. Two waste water treatment plants (WWTFs) and a fish hatchery in Massachusetts are identified as likely, important sources, along with urbanized sources in Attleboro and North Attleborough, MA.

Assessment: 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 (WQSs) 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 numeric water quality target is set for all waters at the appropriate numeric water quality standard for the pollutants. For bacteria, the standard for these waters is a combination of Class B and B1 criteria, depending on the segment (TMDL pp. 15-16). Rhode Island's fecal coliform water quality standard for Class B and B1 waters state the bacteria concentrations are not to exceed a geometric mean value of 200 fc/100 ml, and not more than 10% of the samples can exceed a value of 400 fc/100 ml. The State's enterococcus water quality standard for Class B and B1 is a geometric mean of 54 colonies/100 ml. For dissolved metals, the numeric water quality target is set at the appropriate water quality criteria, which for cadmium and lead is calculated based on each waters' hardness values (TMDL Table 3, p. 17, and below). Aluminum and iron criteria are independent of hardness.

Range of Metals Water Quality Criteria for the Blackstone River Watershed

Hardness as $CaCO_3$ (mg/L)	**Cadmium (µg/L)**		**Lead (µg/L)**			
	Acute Criteria	**Chronic Criteria**	**Acute Criteria**	**Chronic Criteria**	**Aluminum (µg/L)**	**Iron (µg/L)**
5.00	0.11	0.03	1.80	0.07	Acute: 750 Chronic: 87	Chronic: 1000
30.00	0.62	0.11	17.0	0.66		
50.00	1.03	0.15	30.1	1.17		
70.00	1.42	0.19	43.7	1.70		
90.00	1.82	0.23	57.6	2.24		

Reproduced with permission from the RI DEM Blackstone River TMDL, March 2013, and updated for aluminum and iron from the Ten Mile River TMDL, March 2014.

RI DEM established the dissolved metals criteria targets for cadmium and lead by using the hardness values from the monitoring stations on each segment, for each sampling event, and calculating the criteria using the hardness for each day and the metals-specific equations from the standards (Table 3, page 17). There is therefore a range of water quality target for the two metals, for each water body, depending on the measured hardness.

For phosphorus, RI DEM used its lakes/ponds criteria of 0.025 mg/l for the three impoundments of the Ten Mile River system (TMDL p.16). In the absence of approved phosphorus criteria for flowing

waters, DEM appropriately interpreted its narrative nutrient criteria to set a numeric phosphorus criterion of 0.025 mg/l for the Upper Ten Mile River segment (TMDL pp. 116-118).

Assessment: EPA New England concludes that DEM has properly presented and used its water quality standards when setting numeric water quality 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.

DEM describes the rationale for the methods used to establish the cause-and-effect relationship between the numeric targets (WQSs) and the identified pollutant sources. In the bacteria TMDLs, the TMDL targets are the instream concentrations at criteria levels for each bacteria indicator (fecal coliform and enterococcus). DEM also provides percent reductions necessary to achieve the TMDLs as additional information to guide implementation, based on ambient data for each segment.

DEM sets the bacteria reduction goal for each impaired water body segment by comparing current fecal coliform and enterococcus concentrations to the applicable water quality concentration, then calculates the percent reduction required to reach that target (TMDL p. 92, Table 25). For fecal coliform bacteria, the water quality standards specify both geometric mean and 90^{th} percentile criteria and the higher percent reduction is used to set each segment's necessary percent reduction for that indicator.

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. DEM has said that it considers the pollutant concentrations and loads in these TMDLs to apply daily. For bacteria, the allowable daily load is the criteria concentration times the daily flow in the receiving water.

Both high and low flow conditions characterize when the highest metals concentrations are found, depending on the metal and location. Consequently, DEM examined a range of critical conditions including high flows, base flows, and the lowest, 7Q10 conditions, in setting the TMDL targets for dissolved metals. Because the identification of cadmium and lead criteria depend on water hardness

values, DEM calculated the acute and chronic criteria for those metals samples using the hardness measures taken at the time of sampling. The chronic criteria for aluminum and iron are independent of hardness and are therefore the same across all hardness conditions. DEM used the resulting chronic criteria with the measured flow to calculate the allowable loads (the TMDLs), which are expressed as a range, depending on the hardness and/or flow conditions arising in each water body segment.

DEM set reduction goals for each metal-impaired segment by comparing the observed metals loads to the allowable loads, then calculated the percent reduction required to reach that target (TMDL pp. 113-114, Tables 41-43).

DEM used its phosphorus criteria of 0.025 mg/l for lakes/ponds/impoundments and interpreted its narrative criteria to set a similar numeric criteria (0.025 mg/l) for the upper Ten Mile River segment in developing the allowable loads for these water bodies. The TMDL target loads are the criteria times the flow at the critical condition for the water bodies. DEM considers the growing season to be the critical condition for nutrients in these water bodies as there is minimal flow and dilution; this is when high nutrient loads lead to eutrophication and impaired fish and wildlife habitat and recreational use. DEM calculated the average growing season flow for each water body segment to develop the allowable loads, and used the U.S. Army Corps of Engineers FLUX loading model to calculate the existing and allowable phosphorus loads for each Rhode Island water body segment (TMDL pp. 123-128).

They also set a load target at the upstream border with Massachusetts using the 7Q10 conditions, which is responsive to the use of 7Q10 as the critical condition for the permitting of the two waste water treatment plants in Massachusetts, which DEM considers the dominant source of phosphorus in the RI part of the watershed. DEM believes that because there are only minor sources of phosphorus in the Rhode Island part of the river system, its river system will meet its water quality targets if the target is met at the border and the target loads are met within the TMDL segments.

Assessment*:* EPA New England concludes that the loading capacities have been appropriately set at levels necessary to attain and maintain applicable water quality standards. The TMDLs are based on a reasonable approach for establishing the relationship between pollutant loading and water quality in the river and its tributaries.

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. 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 at point of discharge and meeting ambient water quality criteria).

RI DEM states that the daily maximum load may be calculated by multiplying the concentration criterion by stream flow to calculate a daily mass loading. The loading capacity expressed in this way is mathematically derived to assure that the sum of the loads to the receiving water diluted by the stream flow will result in an ambient concentration at the water quality standard.

All of the above loading capacity targets are directly linked to the State's WQS' bacteria, metals, and nutrient criteria, and the pollutant levels that must be reduced to achieve full primary contact recreation use and/or fish and wildlife in the water bodies covered by these TMDLs.

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.

Because information to support the development of separate allocations of metals and bacteria for load and wasteload allocations for wet weather discharges do not exist, the LA is included in the WLA for each segment for those pollutants. For phosphorus, DEM used the Reckow Land Use Model (RLUM) (TMDL pp. 129-135) with export coefficients from the New England SPARROW model (TMDL pp. 132-133) to calculate the existing and allowable phosphorus loads from each of the few, major phosphorus sources to the watershed. DEM then allocated the non-permitted Rhode Island sources (two golf courses) to the load allocations for the various watershed segments (TMDL pp. 135-141).

***Assessment**:* EPA New England concludes that it is unnecessary to include a specific load allocation for metals and pathogens, as the information to support separate load and wasteload allocations for those pollutants does not exist. Consequently, the load allocation is included in the wasteload allocation for those pollutants, below. EPA New England concludes that the load allocation for phosphorus was properly set using reasonable calculations of the allowable loads from the golf courses in the Rhode Island portion of the watershed.

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 wasteload allocations for each segment, and load targets for the flows entering the State from Massachusetts (upstream) for the Ten Mile River segments and its impoundments, that are expressed as the criteria concentration for bacteria and mass loads for metals and phosphorus that are required to meet the water quality standards. DEM is not proposing WLAs for any specific sources in Massachusetts although it identifies major individual and general permitted sources (two WWTFs and MS4s, respectively) and unpermitted sources in Massachusetts, and sets a water quality targets for water flowing into Rhode Island across the state line. As mentioned in the LA review (section 4, above) because information to support the development of separate allocations for load and wasteload allocations for metals and pathogens do not exist, the LA is included in the WLA for each segment for those pollutants.

Aside from permitted stormwater discharges from the MS4 communities in the watershed, there are no other legal or permitted discharges in Rhode Island (such as multi-sector general permitted facilities or permitted industrial stormwater dischargers). Therefore, permitted stormwater runoff is given the entire WLA for phosphorus, as determined by the use of the RLUM model. The other few, identified phosphorus sources are assigned to the load allocation as discussed in Section 4, and as indicated by the RLUM model.

Assessment: RI DEM established concentration-based bacteria WLAs and load-based metal WLAs for the impaired Ten Mile River watershed segments. Aggregate WLAs were established by segment for all sources of these pollutants because it is impossible to determine with any precision or certainty the actual and projected loadings for individual discharges or groups of discharges for them. EPA's November 22, 2002 TMDL guidance suggests that it is acceptable in such cases to allocate storm water by gross allotments. DEM was able to calculate separate WLAs and LAs for phosphorus due to the clarity of the limited sources of that pollutant.

EPA New England concludes that the WLAs for this submission are acceptable and reasonable, and have sufficiently addressed both permitted and unpermitted sources of pollution.

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 (MOS) accounts for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality. The Rhode Island bacteria TMDLs set the wasteload allocation and load allocation at the applicable instream water quality criteria concentrations, 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 10% explicit margin of safety to this estimate (TMDL pp. 89-90). However, this percent reduction is only included for information purposes.

DEM has provided an explicit margin of safety of 10% for the metals TMDLs for the five TMDL segments, which is entirely sufficient (TMDL pp. 99-101). For phosphorus in the Ten Mile River and its impoundments, DEM identifies three conservative assumptions as providing an implicit margin of safety (TMDL p. 121).

- No attenuation of phosphorus is assumed in the downstream direction;
- TMDL calculations are based on total phosphorus and assume that all the total phosphorus from point and nonpoint sources is available for algal growth. Dissolved phosphorus as a portion of the total is generally more available for algal growth. Therefore the use of total phosphorus is conservative; and
- The assimilative capacity of the sediments in each reservoir was not included in the load assessment. Therefore, meeting the TMDL endpoints is not dependent on the sediments acting as a sink in the future.

Assessment: EPA concludes that the approach used in developing the concentration-based bacteria 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 concurs that an adequate MOS is provided by the conservative assumptions made in setting the Ten Mile River phosphorus TMDL targets, and by providing an explicit 10% MOS for the metals TMDLs.

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)).

DEM is establishing year-round bacteria TMDLs based on the observation that elevated bacteria levels occur in all seasons and all flow regimes, although standards violations tend to be greater and occur with greater frequency during wet weather. The TMDL analysis contains reduction targets for all seasons and weather conditions, and therefore, seasonality is not an issue. For metals, critical conditions occur during both dry and wet weather and in all seasons, as there can be exceedances of both chronic and acute standards during both high and low flow conditions, depending on the metal. The year-round allocations for metals account for all seasonality concerns because they are based on the more stringent of wet or dry weather calculated targets, which are based on the more stringent chronic criteria.

The phosphorus TMDLs address seasonality by basing the allowable loads on the growing season conditions, May to October, which are the critical conditions for phosphorus.

Assessment: EPA New England concludes that seasonal variations are not a concern for metals and pathogen impairments as flow regime and weather, rather than seasonality, are the important conditions, and have been adequately accounted for in the TMDLs. In addition, pollutant controls are expected to be in place through the year so that these controls will reduce pollution whenever sources are active. For phosphorus, seasonality has been adequately addressed by use of the growing season as the basis for the allowable loads.

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), 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.

This is not a phased TMDL. The document includes a description of monitoring to ensure that plans for implementing water quality improvement activities are adjusted as monitoring indicates changes in the water quality of the impaired segments. The State discusses its plans for monitoring as and after the TMDL is implemented (TMDL p. 175).

Assessment: EPA concludes that the anticipated monitoring by and in cooperation with RI DEM is sufficient to evaluate the adequacy of progress toward attainment of WQS, although 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.

A detailed implementation plan is provided in the submission (TMDL pp. 146-173) which specifically addresses the major identified sources of pollution. The plan discusses MS4 stormwater management in detail, and measures to reduce stormwater runoff to the area from identifiable (regulated) point and nonpoint sources, and the control of other nonpoint source runoff, especially that from farms, onsite waste water management systems, and wildlife, waterfowl, and pets.

It also discusses the specific MS4 projects and needs in the cities of Pawtucket and East Providence (TMDL pp. 158-160), and the obligations faced by the RI Department of Transportation (DOT) under their permits stemming from the approval of these TMDLs (TMDL pp. 160-161), and future permitted multi-sector general facilities and industrial sources of runoff (TMDL pp.161-162).

Assessment: RI DEM has included an outline of implementation plans, priorities and authorities, although not a required element of the TMDL approval. 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."

Reasonable assurance is not required for metals and pathogens because point sources are not given less stringent wasteload allocations based on the assumption of future nonpoint source load reductions. However, DEM addresses reasonable assurances that storm water runoff reductions will occur by providing a detailed implementation plan, which demonstrates a strong commitment, and existing investment, in improving water quality in the river (TMDL pp. 146-173).

For phosphorus, DEM has provided reasonable assurance for the nonpoint sources of phosphorus in a detailed evaluation of nutrient reduction practices in place and the history of nutrient reductions already documented from the two Rhode Island golf courses in the watershed, who bear the entire responsibility for the nonpoint source load allocation (TMDL pp. 143-145).

Assessment: Although not required for metals and pathogens because RI DEM did not increase WLAs based on expected LA reductions, RI DEM has provided reasonable assurance that WQSs will be met. RI DEM has provided adequate reasonable assurance that the allocated nonpoint source reductions called for by the phosphorus TMDLs 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.

DEM provided a comment period from December 23, 2013 to February 7, 2014. Notice of this comment period and a public meeting on January 8, 2014 was sent via email on December 23, 2013 to the affected communities, key stakeholders, and others. DEM also publicized the meeting by posting its notice in public facilities and on its web site. The public meeting was attended by approximately 25 individuals, not counting DEM staff, and DEM received several comments during the comment period. DEM has

provided EPA with copies of all submitted comments and the Department's responses as an attachment to the final TMDL submission (TMDL App. L, pp. 234-255).

Assessment: EPA New England concludes that DEM involved the public during the development of the TMDL for the *Ten Mile River watershed*, 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 waterbody, the pollutant(s) of concern, and the priority ranking of the waterbody.

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

Data for entry in EPA's National TMDL Tracking System							
TMDL Name	**Ten Mile River Watershed (5 segments)**						
Number of TMDLs*	20						
Type of TMDLs*	Bacteria, Nutrients, Al, Cd, Fe, Pb [+]						
Number of listed causes (from 303(d) list)	23						
Lead State	Rhode Island (RI)						
TMDL Status	Final						
Individual TMDLs listed below							
TMDL Segment name	TMDL Segment ID #	TMDL Pollutant ID# & name	TMDL Impairment Cause(s)	Pollutant endpoint	Unlisted?	RIPDES Point Source & ID#	Listed for anything else?
Upper Ten Mile River	RI0004009-10A	500 (Fecal coliform bacteria)	500 (Fecal coliform bacteria)	B: 200 fc /100 ml; 400 fc /100 ml	RIPDES	Stormwater permits RIR040024 (Pawtucket), RIR040036 (RI DOT)	
		466 (Enterococci bacteria)	466 (Enterococci bacteria)	B: 54 colonies/100 ml, geomean			
		239 (Cadmium)	239 (Cadmium)	Chronic criteria			
		663 (Lead)	663 (Lead)	Chronic criteria			
		114 (Aluminum)	114 (Aluminum)	Chronic criteria			
		651 (Iron)	651 (Iron)	Chronic criteria			
		903 (Total Phosphorus)	903 (Total Phosphorus)	0.025 mg/l phosphorus			
Lower Ten Mile River	RI0004009-10B	239 (Cadmium)	239 (Cadmium)	Chronic criteria		RIPDES Stormwater permits RIR040030 (East Providence), RIR040036 (RI DOT)	Benthic-Macroinvertebrate Bioassessments,
		114 (Aluminum)	114 (Aluminum)	Chronic criteria			
		466 (Enterococci bacteria)	466 (Enterococci bacteria)	B: 54 colonies/100 ml, geomean			
Central Pond	RI0004009L-	239 (Cadmium)	239 (Cadmium)	Chronic criteria		RIPDES	

	01A	114 (Aluminum)	114 (Aluminum)	Chronic criteria		Stormwater permit RIR040030 (East Providence)	
		903 (Total Phosphorus)	903 (Total Phosphorus) 449 (Dissolved oxygen)	0.025 mg/l phosphorus			
Turner Reservoir	RI0004009L-01B	239 (Cadmium)	239 (Cadmium)	Chronic criteria			
		114 (Aluminum)	114 (Aluminum)	Chronic criteria			
		903 (Total Phosphorus)	903 (Total Phosphorus) 449 (Dissolved oxygen)	0.025 mg/l phosphorus			
Omega Pond	RI0004009L-03	500 (Fecal coliform bacteria)	500 (Fecal coliform bacteria)	B: 200 fc /100 ml; 400 fc /100 ml	RIPDES	Stormwater permit RIR040030 (East Providence)	
		239 (Cadmium)	239 (Cadmium)	Chronic criteria			
		114 (Aluminum)	114 (Aluminum)	Chronic criteria			
		903 (Total Phosphorus)	903 (Total Phosphorus) 449 (Dissolved oxygen)	0.025 mg/l phosphorus			

TMDL Type	Point & Nonpoint Sources
Establishment Date (approval)*	April 17, 2014
EPA Developed	No
Towns affected*	East Providence and Pawtucket, Rhode Island