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

November 21, 2018

Martin Suuberg, Commissioner
Department of Environmental Protection
One Winter Street
Boston, MA 02108

Re: Approval of the Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds

Dear Commissioner Suuberg:

Thank you for your Department's submittal of the TMDL analysis for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds on October 9, 2018. We appreciate your efforts and involvement with our office to finalize these TMDLs. The U.S. Environmental Protection Agency (EPA) has reviewed the document entitled "Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds", Control #157.1, October 2018, and it is my pleasure to approve the 52 Pathogen TMDLs and protective TMDLs to apply to the additional surface waters of the watersheds as described in the TMDL document. EPA has determined, as set forth in the enclosed review document, that these TMDLs meet the requirements of Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 Code of Federal Regulations (CFR) Part 130.

MassDEP's efforts will help restore water quality and prevent further degradation of these, and adjacent, waterbody segments. My staff and I look forward to continued cooperation with the Massachusetts DEP in exercising our shared responsibility of implementing the requirements under Section 303(d) of the CWA. If you have any questions regarding this approval, please contact Ralph Abele at (617) 918-1629 or have your staff contact Bryan Dore of my staff at (617) 918-1211.

Sincerely,

/s/

Kenneth Moraff, Director
Office of Ecosystem Protection

Enclosure

cc:
Douglas Fine, MassDEP
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EPA NEW ENGLAND'S TMDL REVIEW

DATE: November 21, 2018

TMDL: Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds

STATUS: Final

IMPAIRMENT/POLLUTANT: 52 Pathogen TMDLs (See Table 4-4, TMDL document)

BACKGROUND: EPA Region 1 received the *Final Pathogen Total Maximum Daily Loads for Boston Harbor, Weymouth-Weir, and Mystic Watersheds* (Control Number: CN 157.1) with a transmittal letter dated October 9, 2018. In addition to the Final Pathogen TMDL itself, the submittal included, either directly or in reference, the following documents:

- Public Meeting Information and Response to Comments, Appendix B
- Massachusetts Surface Water Quality Standards (WQS)
- Massachusetts Year 2014 Integrated List of Waters: Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act (CN 450.1), December 2015. http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf
- U.S. EPA Memorandum: *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Stormwater Sources and NPDES Permit Requirements Based on Those WLAs*
- U.S. EPA November 26, 2014 Memorandum: *Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Stormwater Sources and NPDES Permit Requirements Based on Las"*

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: Bryan Dore (617-918-1211) e-mail: dore.bryan@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

As described in the TMDL document, the Boston Harbor Watershed encompasses 293 square miles of land area, including all or part of 45 municipalities, as well as downtown Boston. The watershed is highly urbanized, with approximately 65% of its land use characterized as developed (i.e. residential, commercial/industry). The Boston Harbor watershed includes four subwatersheds – Boston Harbor proper, the Mystic Watershed to the north, the Neponset, and the Weymouth and Weir River Watersheds to the south. This TMDL document includes information regarding each of these sub-basins with the exception of the Neponset River sub-basin, as MassDEP prepared a TMDL for the Neponset River sub-basin in 2002 and an addendum in 2012. The TMDLs in this document do not include fresh water lakes or ponds.

The Boston Harbor Proper Watershed is approximately 176 square miles and includes estuary segments totaling 40.65 mi^2. This area is highly urbanized and includes the shoreline towns and cities of Boston, Quincy, Hull, and Chelsea, and the watershed communities of Winthrop, Hingham, and Weymouth. Subwatersheds in Boston Harbor include Boston Inner Harbor, Dorchester Bay, Quincy Bay, Hull Bay, Hingham Bay, Winthrop Bay, Pleasure Bay, and Boston Harbor. The waters in this basin are used for primary and secondary contract recreation, habitat for aquatic life, and shellfishing. This TMDL includes ten impaired estuarine segments, or 100% of the estuaries within Boston Harbor proper.

The Weymouth and Weir River Basin is located in the southeast region of the Boston Harbor Watershed. The subwatershed includes roughly 38.2 river miles, 23.7 miles are pathogen impaired. The subwatershed includes Weymouth Fore and Back Rivers, Weir River, Monatiquot River, Old Swamp River, and Mill River, and includes the estuarine segments Hingham Harbor and Town River Bay. The waters in these watersheds are commonly used for primary and secondary contact recreation, fishing, habitat for aquatic life, and shellfishing. This TMDL covers five estuarine and seven impaired

river segments.

The Mystic watershed is located in the northeast region of the Boston Harbor Watershed. The subwatershed includes roughly 24 impaired river miles out of a total of 27.6 river miles, including the Aberjona River, Alewife Brook, Malden River, Chelsea River, and the main stem of the Mystic River. The Amelia Earhard Dam restricts the Mystic's flow downstream of its confluence with the Malden River. The waters are commonly used for primary and secondary contact recreation, fishing, habitat for aquatic life, and shellfishing. Four out of a total of five estuaries are impaired in the subwatershed. This TMDL covers four estuarine and seven impaired river segments.

The TMDL document presents a sound overview of the Boston Harbor, Weymouth-Weir, and Mystic watersheds, outlining the 52 segments currently listed as impaired for pathogens by MassDEP on the 2014 Integrated Report that this TMDL will apply to. Additionally, the analyses performed for the impaired segments will apply to the non-impaired segments, since the sources and their characteristics are equivalent, and will therefore receive pollution prevention TMDLs. In appropriate circumstances, this TMDL may also apply to segments in these watersheds that become listed for pathogen impairments in subsequent Integrated Reports proposed by MassDEP and approved by EPA.

See the Massachusetts 2014 Integrated List of Waters at:
http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf

B. Pollutant of Concern

In this TMDL covering Boston Harbor, Weymouth-Weir, and Mystic watersheds, pathogens are the pollutants of concern. While not all bacteria are pathogenic, the words "pathogens" and "bacteria" were used interchangeably in the TMDL document and refer to bacteriological data collected and analyzed for Fecal coliform, E. coli, or Enterococci. Massachusetts Surface Water Quality Standards (WQS), 314 CMR 4.00 were revised in 2007, replacing Fecal coliform as the water quality indicator for both fresh and marine waters with E. coli for fresh water and Enterococci for fresh and marine waters (MassDEP 2007). MWRA and MyRWA also follow the Massachusetts WQS. Fecal coliform is the water quality indicator used by Division of Marine Fisheries (DMF) for shellfish harvesting in coastal-estuarine segments.

C. Pollutant Sources

The TMDL document identifies several possible sources, both point source and non-point source, of indicator bacteria within the Boston Harbor watershed, though, as MassDEP asserts, within a densely population urban environment, it is difficult to provide accurate quantitative estimates of pathogen contributions because sources are often diffuse and intermittent, and therefore difficult to monitor and/or model. Primary contributors in general are combined sewer overflows (CSOs), sanitary sewer overflows (SSOs), and overland stormwater flows (page 67 of TMDL document). Additional dry-weather sources may include leaking sewer pipes, illicit sanitary sewer connections, failing septic systems, wildlife, recreational activities, and illicit boat discharges. Additional wet-weather sources may also include wildlife and domesticated animals, such as pets. Possible sources are described in Table ES 1-4 of the TMDL document, as well as thoroughly discussed in Section 5.0 and Section 6.0.

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

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribe water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable water quality standard is attained) must be identified. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, usually site specific, must be developed from a narrative criterion and a description of the process used to derive the target must be included in the submittal.

Section 3.0 of the TMDL document describes the water quality classifications for the Boston Harbor, Weymouth-Weir, and Mystic watersheds. They contain waterbodies classified as Class A (tributaries), B, SA, and SB, SB/CSO and Class B CSO Variance. The water quality standards for these classifications are included in the TMDL document in Section 3.0. As classified, when meeting Massachusetts water quality standards these waters should be suitable for (1) habitat for fish, other aquatic life, wildlife, (2) primary and secondary contact recreation, (3) shellfish harvesting in approved areas, and (4) should have consistently good aesthetic value (A and SA should be excellent) (page 15, TMDL document).

In 2007, Massachusetts revised its freshwater standards by replacing fecal coliform with E. coli and Enterococci as the regulated indicator bacteria in freshwater systems, as recommended by the EPA in the "Ambient Water Quality Criteria for Bacteria – 1986" and "2012 Recreational Water Quality Criteria" documents (US EPA 1986 and US EPA 2012). Fecal coliform remains the indicator organism for shellfishing areas, which are classified by the Massachusetts Division of Marine Fisheries (pgs. 16-17, TMDL document). Additionally, the Massachusetts Department of Public Health has established minimum standards for bathing beaches, which have been adopted by the MassDEP as state surface WQS for fresh water and will apply to this TMDL.

The TMDL document discusses the impaired segments of the Boston Harbor watershed in tables 4-4 (Boston Harbor proper), 4-5 (Weymouth-Weir), and 4-6 (Mystic River), Section 4.0 of the TMDL document on pages 22-24. These tables also indicate the water quality classification for each segment, as well as waterbody type, size, and description. The water quality criteria applicable to the relevant surface water classifications are included in the TMDL document in Table ES 1-4. The EPA-approved numeric water quality criteria for each segment are the targets upon which both the daily concentration and load TMDL targets of the Boston Harbor, Weymouth-Weir, and Mystic Watersheds TMDL are based.

The TMDL document is based on water quality standards current as of the publication date of these TMDLs. If the pathogen criteria change in the future, MassDEP intends to revise the TMDL by addendum to reflect the revised criteria.

Assessment: EPA concludes that MassDEP has properly described and interpreted the applicable water quality standards to set the TMDL targets as indicated in Section 3.0 of the TMDL document. Section 4.0 describes each water body segment -- including the water body's designated use, applicable WQS, summary of data. Section 5.0 and 6.0 discuss sources of pathogens when available and other characteristics such as which segments and sources of pathogens are a priority. MassDEP is directly applying the numeric criteria in its WQS to derive 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.

The TMDL document developed TMDL daily targets as both daily concentration for all potential pathogen sources by category and surface water classification, as well as by estimating the total maximum daily load for each river segment as a function of flow and embayments through the calculation of long-term average runoff values. This is a similar approach as used in the Charles River TMDL for pathogens. As discussed in Section 7.2 (Waste Loads Allocations and Load Allocations as Daily Concentration), MassDEP believes that the simplest and most readily understood method of meeting the TMDL is to meet the water quality standards at the point of discharge. These approaches have been used by states for TMDL development and approved by EPA in the past. Water quality targets for the Boston Harbor watershed are displayed in Table 7-2 of the TMDL.

In the first approach utilized, MassDEP chose to express the loading capacity in terms of concentrations. These can be seen in Table 7-1 in the TMDL document (and included in this document as Attachment 1). MassDEP believes that expressing a loading capacity for bacteria in terms of concentrations set equal to the Commonwealth's adopted criteria provides the clearest and most understandable expression of water quality goals to the public and to groups that conduct water quality monitoring. The TMDL document describes the general source reductions needed to achieve WQS by land use type as an example, as indicated in Table 5-3 of the TMDL document. In addition, specific water body segment data are provided that indicate the range in magnitude of the pathogen concentrations for each impaired segment. These can be found by watershed grouping in Section 4.0. Based on the data available, MassDEP prioritized the water body segments in need of in Tables 6-1, 6-2, and 6-3.

Loading capacity for the Boston Harbor watershed rivers was expressed based on flow, however MassDEP is of the opinion that this method is more difficult for the public to understand because the "allowable" loading number varies with flow over time and season. This method also yields loading number that are often in the billions and trillions of bacteria per day and therefore do not directly

relate to Water Quality Standards, further making them difficult to interpret. The TMDL document summarizes the TMDL for each of the 14 river segments in Table 7-3.

The approach used to determine estuary and embayment segment loading capacity based on flow is based on the method used in the North and South Coastal and Buzzards Bay Pathogen TMDL. These were calculated using the concentration allowed by the appropriate Water Quality Standard and the estimate volume of runoff entering the embayment from its contributing watershed. The TMDL document summarizes the TMDLs for each of the 19 marine segments in Table 7-4. For the detailed methodology, please refer to Section 7.3 of the TMDL document.

Assessment: TMDLs can be expressed in various ways, including in terms of multiple TMDL targets, 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 loading based on meeting ambient water quality criteria). The concentration loading capacity is based on the concentration criteria for each water body. If all sources of pathogens are below the water quality criteria then it follows that the receiving water will meet the WQS for bacteria.

The daily maximum load for river segments was calculated by multiplying the daily load by the percent impervious for the WLA, and by multiplying the daily load by the percent impervious for the contributing watershed for the LA. Estuary and embayment daily maximums were derived by multiplying the daily load by the percent impervious for the contributing watersheds.

All of the loading capacity targets are directly linked to the Commonwealth's WQS' bacteria criteria and the bacteria levels (pollutants) that must be reduced to achieve full primary contact recreation of the water bodies covered by this TMDL.

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 Boston Harbor, Weymouth-Weir, and Mystic watershed TMDL sets the target load allocations equal to the water quality standards at the receiving water or aims for elimination of the source where it is prohibited, such as illicit connections. Maximum daily loads as a function of stream flow by waterbody classifications (Figure 7-1), and aggregate LA and WLAs (Table 7-3 for river segments, 7-4 for embayment segments) are provided.

For River segments the TMDL is proportioned between the WLA and LA by multiplying the daily load by the percent impervious for the WLA, and by multiplying the daily load by the percent pervious for the contributing watershed for the LA. Table 7-3 summarizes the TMDL for the 14 fresh water

segments (rivers) in the Boston Harbor Watershed.

Similar to the River TMDL calculation the Embayment TMDL is proportioned between the WLA and LA by multiplying the daily load by the percent impervious for the WLA, and by multiplying the daily load by the percent pervious for the contributing watershed for the LA. Table 7-4 summarizes the TMDL for the marine segments in the Boston Harbor Watershed.

Assessment: EPA concludes that the TMDL document sufficiently addresses the calculation of the load allocations, as demonstrated by the foregoing and by the TMDL's administrative record.

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 Commonwealth, pursuant to 40 C.F.R. § 130.2(h), assigned to the WLA those point sources (1) that "discharge" pollutants to waters of the United States within the meaning of the Act *and* (2) that are subject to the NPDES permitting program (existing and future); it allocated sources that did not meet these two criteria to the LA. All piped sources within the Boston Harbor watershed are then point sources, regardless of whether they are subject to NPDES permitting. For point sources within the Boston Harbor watershed, the WLA has been set equal to the applicable water quality standards at the point of discharge to surface water. In cases where the source is prohibited (i.e. illicit connections), the goal is complete elimination of the source, or a 100% reduction.

Storm water discharges are less amenable to individual WLAs. In recognition of this fact, EPA's November 22, 2002 guidance entitled "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Stormwater Sources and NPDES Permit Requirements Based on Those WLAs," included as an appendix to the TMDL, provides that it is reasonable to express allocations for NPDES-regulated storm water discharges from multiple point sources as a single categorical or aggregate wasteload allocation when data and information are insufficient to assign each source or outfall individual WLAs. In the case of this pathogen TMDL, MassDEP did establish concentration (colonies/100ml) TMDL targets on the basis of surface water classification, but daily loads (colonies/day) were established on an aggregate basis by segment.

Aggregate mass WLAs were established for the stormwater sources because variability in rainfall and local events make it unrealistic to determine the actual or projected loading from individual discharges

with precision and accuracy. MassDEP divided the aggregate storm water loading targets into WLA and LA components as a function of impervious cover, which is reasonable assuming runoff from impervious cover is more likely to reach regulated MS4s. EPA's November 22, 2002 TMDL guidance suggests that it is acceptable in such cases to allocate storm water by gross allotments.

Assessment: EPA concludes that the TMDL document sufficiently addresses the calculation of the waste load allocations, as demonstrated by the foregoing and by the TMDL's administrative record.

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.

MassDEP employs an implicit MOS in the Boston Harbor watershed TMDLs, described in the TMDL document on pages 91-92. There are three factors that contribute to the margin of safety inherent in the approach used to develop this TMDL including:

1) The TMDL does not account for mixing in the receiving waters and assumes that zero dilution is available. This is a conservative measure because generally, influent waters mix with receiving waters and dilute below the water quality standard where the receiving water concentration does not exceed the TMDL concentration.

2) Attaining WQS at the point of discharge does not account for losses due to die-off and settling of indicator bacteria that are known to occur; and

3) The TMDL assumes all runoff from impervious areas from the contributing watershed will enter the impaired segments and does not consider areas of disconnected areas or places where the impervious surfaces are not continually connected.

Assessment: EPA concludes that the approach used in developing the TMDL provides for an adequate implicit MOS, as demonstrated by the foregoing and by the TMDL's administrative record.

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).

TMDLs must account for season variation, and pathogen sources may be driven by a mixture of continuous and wet-weather driven sources such that no single critical condition will be protective for all other conditions. To ensure attainment independently of seasonal and climatic conditions, the TMDL has set the target equal to water quality standards for all known and suspected source categories. This will be protective of the surface water quality regardless of season or weather event.

Assessment: The pathogen TMDL applies across all seasons and weather events such that, when implemented, the TMDL targets will reduce pathogen concentrations equal to water quality standards.

EPA concludes that the TMDL documents be 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 pathogen TMDL for the Boston Harbor watershed is not a phased TMDL, therefore a monitoring plan is not required in order to assure that data is available for updating the TMDL in the near future. However, the document does include the outline of a long-term monitoring plan. Components as stated in the TMDL in Section 9.0 include:

1. continue with the current monitoring of the Boston Harbor watershed (MyRWA and other stakeholders),
2. monitor areas within the watershed where data are lacking or absent to determine if the waterbody meets the use criteria,
3. monitor areas where BMPs and other control strategies have been implemented or discharges have been removed to assess the effectiveness of the modification or elimination,
4. assemble data collected by each monitoring entity to formulate a concise report where the basin is assessed as a whole and an evaluation of BMPs can be made, and
5. add/ remove/modify BMPs as needed based on monitoring results.

Assessment: EPA concludes that the anticipated monitoring is sufficient to evaluate the adequacy of the TMDL and attainment of water quality standards, although 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 document sets forth an approach for addressing pathogen-impaired segments in the Boston Harbor, Weymouth-Weir, and Mystic watersheds, and asserts that in the stormwater-driven impairment, the current level of control is inadequate to achieve water quality standards and use attainment. In a detailed discussion in Section 8 of the TMDL, MassDEP suggests a basin-wide implementation strategy that it asserts should include a mandatory program for implementing

stormwater BMPs and eliminating illicit discharges. These implementation tasks are outlined in Table 8-1 of the TMDL document and discusses entities likely responsible for taking action. Table 6-1 in the TMDL sets levels of priority for restoration of each impaired segment in the Boston Harbor watershed, which will aid in focusing efforts over time.

As Section 8.2 asserts, "[eliminating] illicit sewer connections, repairing failing infrastructure, and controlling impacts associated with CSOs and SSOs are of extreme importance in eliminating and preventing bacterial pollution." There has been a long-term effort to address these issues by various groups in the Boston Harbor watershed, including EPA, MassDEP, USGS, Metropolitan District Commission, Massachusetts Water Resources Authority, Boston Water and Sewer Commission, and the Mystic River Watershed Association. The TMDL discusses how some of these implementation measures have been completed and have lead to water quality improvements in Boston Harbor. These are displayed in Figures 8-1 through 8-7.

MassDEP and EPA have historically required wastewater treatment plants to meet criteria based concentration effluent limits at the point of discharge and will continue to do so, consistent with the TMDL. Phase I and II storm water communities are required to implement aggressive illicit discharge detection and elimination programs, designed to reduce the discharge of pollutants to the maximum extent practicable, protect water quality, and satisfy the applicable water quality requirements of the CWA. Watershed stakeholders are also providing valuable assistance in defining hot spots and sources of pathogen contamination as well as with the implementation of mitigation or preventative measures.

Through Phase I and II NPDES regulations, EPA has the authority to 1) require general and/or individual permits for many types of storm water discharges and 2) enforce storm water permits to assure adequate progress in storm water pollution abatement is being made. In addition, EPA has the authority to require non-regulated point source storm water discharges to obtain NPDES permits if it determines that such storm water discharge causes or contributes to a water quality violation, or is a significant contributor of pollutants, or where controls are needed based on a waste load in an EPA approved TMDL. MassDEP has similar authority under the Commonwealth's law. Stormwater Phase II Annual Reports from 2015 indicate that progress is being made in the Boston Harbor watershed. These communities' reports are summarized in Section 8.4 of the TMDL.

Assessment: MassDEP has addressed the implementation plan. Although EPA is not approving the implementation plan, EPA has concluded that it outlines a reasonable approach to implementation, as demonstrated by the foregoing and by the TMDL's administrative record.

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 this TMDL are not less stringent based on any assumed nonpoint source reductions in the future, so documentation of reasonable assurance in the TMDL is not a requirement. However, MassDEP addresses the concept of reasonable assurance insofar as it relates to overall TMDL implementation in Section 10.0 of the TMDL. Through the application and enforcement of current regulations, availability of financial incentives – including low or no-interest loans to communities for wastewater treatment facilities through the State Revolving Fund – as well as eligibility for various local, state, and federal programs offering assistance for restoration and pollution control. Municipal discharge sources will be addressed through NPDES permit cover, and non-point sources may be addressed through the application of regulatory programs, including the state's Wetlands Protection Act, River Protection Act, and Title 5 regulations for septic systems. Financial incentives are also available, and include Federal funds made available Clean Water Act Section 319 NPS program, as well as the CWA Section 604b and 104b programs. These programs are provided as part of the Performance Partnership Agreement between MassDEP and EPA. The 319 program does restrict funds from addressing point source remediation, and so do not apply to NPDES stormwater permits. Additional financial incentives for Title 5 upgrades and coastal water quality improvement are discussed in Section 10.0

The several regulatory tools, provided to MassDEP through its authority to address point and non-point sources of pollution through the Massachusetts Clean Water Act: The MA Clean Water Act (M.G.L. Chapter 21, sections 26-53) are discussed in depth in Section 10.1 These include MassDEP's Surface Water Quality Standards (314 CMR 4.00), Ground Water Discharge Permit Program (314 CMR 5.00), River Protection Act (MGL c 258 Acts of 1996, and Regulation of Plant Nutrients (330 CMR 31.00).

In Section 10.2, Additional Tools to Address Combined Sewer Overflows, MassDEP discusses their CSO program and policy to regulate discharges in several ways. These include NPDES/MA Surface Water Discharge permits, Massachusetts Environmental Policy Act (MEPA) regulations (301 CMR 11.00), and the requirement to comply with Massachusetts Surface Water Quality Standards (314 CMR 4.00). Minimum control measures for meet technology-based limitations for NPDES/MA permits are also in place with a goal to eliminate CSO's adverse impacts, and separation or relocation of CSOs should be achieved wherever economically and technically feasible.

Septic systems are in important consideration in TMDL development. Section 10.3 discusses Septic System Regulations, known as Title 5 (310 CMR 15.00). The regulations provide minimum standards for septic system installation, replacement, and inadequate systems, as well as the requirements to have an inspection when property is sold or transferred.

In the Boston Harbor watershed, stormwater is a main driver of pathogen issues. Section 10.4 of the TMDL discusses in detail the several programs available to regulate and address stormwater. These programs include the federal and state Phase I and Phase II NDPES stormwater programs. Massachusetts has two Phase I communities, Worcester and Boston, and an additional 20 Phase II communities in the Boston Harbor watershed. As stated in the TMDL, "Phase II is intended to further reduce adverse impacts to water quality and aquatic habitat by instituting use controls on the unregulated sources of stormwater discharges that have the greatest likelihood of causing continued environmental degradation including those from municipal separate storm sewer systems (MS4s) and discharges from construction activity. Any new construction that complies with state stormwater

standards and permits is presumed to comply with antidegradation requirements of the state water quality standards." In-depth discussion of the MS4 permit are available in the TMDL document, including the recently-reissued permit that became effective July 1, 2018.

Financing important BMP and source control work is a hurdle to overcome for communities working to meet the TMDL. Section 10.5 of the TMDL document discusses some of the financial tools available to offer assistance in meeting water quality standards, including the Nonpoint Source Management Program Plan, as specified for in the Clean Water Act Section 319. The provides an implementation strategy for BMPs with an emphasis on funding sources and schedules. The state also partners with outside entities to provide support in efforts such as a partnership with the Natural Resource Conservation Service implemented through the national Farm Bill, which provides funding through its Environmental Quality Incentive Program (EQIP). In addition, MassDEP together with EPA provides Section 319 funding to address needed implementation measures. The program provides high priority points when considering projects that will address waters listed in the state's 303(d) list, though does restrict funds from being used to address the requirements of NPDES permits. Other tools discussed in this section include the Massachusetts Clean Water Toolkit, the State Revolving Fund, and local incentive and loan programs to address failed Title 5 systems.

Assessment: Because MassDEP did not increase WLAs based on expected LA reductions, reasonable assurance is not required. However, EPA acknowledges MassDEP's reasonable assurance discussion for the record.

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 Boston Harbor, Weymouth-Weir, and Mystic watershed pathogen TMDL is described in Section 11.0 of the TMDL document. MassDEP publicly announced the draft TMDL and copies were distributed to key stakeholders. Two public meetings to present the results of and answer questions on this TMDL were held on August 30, 2005 at 2 p.m. and 7 p.m. at Tufts University, Medford, MA for all interested parties. Comments received at the public meetings and received in writing within a 30-day comment period following the public meeting were considered by MassDEP. The attendance list, public comments from the meeting, written comments received by MassDEP, and the MassDEP responses are included in Appendix B of the TMDL document. MassDEP fully addressed all comments received in Appendix B of the TMDL document.

Assessment: EPA concludes that MassDEP has done a sufficient job of involving the public in the development of the TMDL, provided adequate opportunities for the public to comment and has

addressed the comments received as set forth in the response to comment section of the TMDL document.

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 October 8, 2018, MassDEP submitted the Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds (Control #157.1) and associated documents for EPA approval. The documents contained all the elements necessary to approve the TMDL

Attachment 1: **TMDL document Table --1 Waste Load Allocations (WLAs) and Load Allocations (LAs) As Daily Concentrations (CFU/100ml).**

Surface Water Classification	**Pathogen Source**	**Waste Load Allocation Indicator Bacteria (cfu/100 mL)[1]**	**Load Allocation Indicator Bacteria (cfu/100 mL)[1]**
A, B, SA, SB (prohibited)	Illicit discharges to storm drains	0	Not Applicable
	Leaking sanitary sewer lines	0	Not Applicable
	Failing septic systems	Not Applicable	0
A (Includes filtered water supply) & **B**	Any regulated discharge- including stormwater runoff[4] subject to Phase I or II NPDES permits, NPDES wastewater treatment plant discharges [7,9].	Either; *E. coli* <=geometric mean[5] 126 colonies per 100 mL; single sample <=235 colonies per 100 mL[11]; or b) Enterococci geometric mean[5] <= 33 colonies per 100 mL and single sample <= 61 colonies per 100 mL[11]	Not Applicable
	Nonpoint source stormwater runoff[4]	Not Applicable	Either *E. coli* <=geometric mean[5] 126 colonies per 100 mL; single sample <=235 colonies per 100 mL; or Enterococci geometric mean[5]<= 33 colonies per 100 mL and single sample <= 61 colonies per 100 mL
SA (Approved for shellfishing)	Any regulated discharge - including stormwater runoff[4] subject to Phase I or II NPDES permits, NPDES wastewater treatment plant discharges[7,9].	Fecal Coliform <= geometric mean, MPN, of 14 organisms per 100 mL nor shall 10% of the samples be >=28 organisms per 100 mL	Not Applicable
	Nonpoint Source Stormwater Runoff[4]	Not Applicable	Fecal Coliform <= geometric mean, MPN, of 14 organisms per 100 mL nor shall 10% of the samples be >=28 organisms per 100 mL
SA & SB[10] (Beaches[8] and non-designated shellfish areas)	Any regulated discharge - including stormwater runoff[4] subject to Phase I or II NPDES permits, NPDES wastewater treatment plant discharges[7,9].	Enterococci - geometric mean[5] <= 35 colonies per 100 mL and single sample <= 104 colonies per 100 mL[11]	Not Applicable
	Nonpoint Source Stormwater Runoff[4]	Not Applicable	Enterococci -geometric mean[5] <= 35 colonies per 100 mL and single sample <= 104 colonies per 100 mL

Surface Water Classification	Pathogen Source	Waste Load Allocation Indicator Bacteria (cfu/100 mL)[1]	Load Allocation Indicator Bacteria (cfu/100 mL)[1]
SB (Approved for shellfishing w/depuration)	Any regulated discharge - including stormwater runoff[4] subject to Phase I or II NPDES permits, NPDES wastewater treatment plant discharges[7,9].	Fecal Coliform <= median or geometric mean, MPN, of 88 organisms per 100 mL nor shall 10% of the samples be >=260 organisms per 100 mL[11]	Not Applicable
	Nonpoint Source Stormwater Runoff[4]	Not Applicable	Fecal Coliform <= median or geometric mean, MPN, of 88 organisms per 100 mL nor shall 10% of the samples be >=260 organisms per 100 mL
SB/CSO (segments Boston Inner Harbor(MA 71-02)[12], Chelsea River (MA 71-06), Mystic River (MA 71-03)[12]	Any regulated discharge - including stormwater runoff[4] subject to Phase I or II NPDES permits, NPDES wastewater treatment plant discharges[7,9], and combined sewer overflows[6].	**For Non-CSO Discharges:** Enterococci - geometric mean[5] <= 35 colonies per 100 mL and single sample <= 104 colonies per 100 mL[11] **For CSO Discharges**: CSO activations and volumes limited to those included and identified in permitted MWRA Long-Term CSO Control Plans.[12]	Not Applicable
	Nonpoint Source Stormwater Runoff[4]	Not Applicable	Enterococci -geometric mean[5] <= 35 colonies per 100 mL and single sample <= 104 colonies per 100 mL
B/CSO Variance Alewife Brook (MA 71-04), Upper Mystic (MA71-02)	Combined Sewer Overflows	CSO activations and volumes limited to those included and identified in the permitted MWRA Long-Term CSO Control Plan.[12]	Not applicable

[1] Waste Load Allocation (WLA) and Load Allocation (LA) refer to fecal coliform densities unless specified in table.

[2] In all samples taken during any 6 month period

[3] In 90% of the samples taken in any six month period;

[4] The expectation for WLAs and LAs for stormwater discharges is that they will be achieved through the implementation of BMPs and other controls.

[5] Geometric mean of the 5 most recent samples is used at bathing beaches. For all other waters and during the non-bathing season the geometric mean of all samples taken within the most recent six months, typically based on a minimum of five samples.

[6] Or other applicable water quality standards for CSO's

[7] Or shall be consistent with the Waste Water Treatment Plant (WWTP) National Pollutant Discharge Elimination System (NPDES) permit.

[8] Massachusetts Department of Public Health regulations (105 CMR Section 445)

[9] Seasonal disinfection may be allowed by the Department on a case-by-case basis.

[10] Segments designated as CSO have a long term control plan in place.

[11] Threshold for beach closure. Beaches Environmental Assessment and Coastal Health (BEACH) Act amended the Clean Water Act in 2000.
[12] See Second Stipulation of the United States and the Massachusetts Water Resources Authority on "Responsibility and Legal Liability for Combined Sewer Overflow Control" filed in US District Court on March 15, 2006. (MWRA 2006).

Note: This table represents waste load and load allocations based on water quality standards current as of the publication date of these TMDLs. If the pathogen criteria change in the future, MassDEP intends to revise the TMDL by addendum to reflect the revised criteria.

Data for entry in EPA's National TMDL Tracking System	
TMDL Name *	**Boston Harbor, Weymouth-Weir, Mystic Watersheds**
Number of TMDLs*	52
Type of TMDLs*	Bacteria
Number of listed causes/parameters (from 303(d) list)	52
Lead State	Massachusetts (MA)
TMDL Status	Final

Individual TMDLs listed below

TMDL ID#	TMDL Segment name	TMDL Segment ID	TMDL Pollutant ID# & name	TMDL Impairment PARAMETERS/ Cause ID and name	Pollutant endpoint	Unlisted ?	MassDEP Point Source & ID#	Listed for anything else?
R1_MA_2019_01	Winthrop Bay, Class SB	MA70-10	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MA0000787 MAS01000 MAR041084	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Boston Inner Harbor, Class SB/CSO	MA70-02	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MA0101192 MA0004731 MAG250019 MA0040142 MA0003832 MA0000787 MA0103284 MA0003123 MA0090671 MA0033928 MAS010001 MAR041077	862 (PCB in Fish Tissue), 449 (Dissolved Oxygen)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL, SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Pleasure Bay, Class SB	MA70-11	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MAG910128	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Dorchester Bay, Class SB	MA70-03	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <=88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MA0040304 MA0101192 MA0103284 MAR041081	862 (PCB in Fish Tissue), 1070 (Total Suspended Solids), 1110 (Turbidity)
R1_MA_2019_01			466 (Enterococcus),	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			

R1_MA_2019_01	Quincy Bay, Class SA	MA70-04	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 14 MPN/100 mL 10% not >=28 MPN/100 mL	N	MAR041081	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Quincy Bay, Class SB	MA70-05	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MAR041081	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Hingham Bay, Class SB	MA70-06	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MA0103284 MAR041081	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Hingham Bay, Class SB	MA70-07	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MAR041040 MAR041038 MAR041070	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Hull Bay, Class SB	MA70-09	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MAR041040	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Boston Harbor, Class SB	MA70-01	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MA0000787 MA0103284 MA0101231 MA0090433 MA0032751 MAS01000 MAR041040 MAR041081 MAR041084	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			

R1_MA_2019_01	Cochato River, Class B	MA74-06	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MAR041039 MAR041029	372 (DDT), 267 (Chlordane), 449 (Dissolved Oxygen)
R1_MA_2019_01	Monatiquot River, Class B	MA74-08	471 (Escherichia Coli (E. Coli)))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MAR041029	449 (Dissolved Oxygen), 135 (Aquatic Macroinvertebrate Bioassessments)
R1_MA_2019_01	Town Brook, Class B/SB	MA74-09	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MA0033987 MAR041081 MAR041029	135 (Aquatic Macroinvertebrate Bioassessments)
R1_MA_2019_01	Hingham Harbor, Class SA	MA74-18	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 14 MPN/100 mL, 10% not >=28 MPN/100 mL	N	MAR041038	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Town River Bay, Class SA	MA74-15	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 14 MPN/100 mL, 10% not >=28 MPN/100 mL	N	MA0004073 MA0020869 MA0028037 MAR041081	862 (PCB in Fish Tissue), 449 (Dissolved Oxygen)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Weymouth Fore River, Class B/SB	MA74-14	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MA0004782 MA0004073 MA0031551 MAR041081 MAR041029 MAR041070	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Old Swamp River, Class A (PWS Trib, ORW)	MA74-03	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MAR041058 MAR041070	
R1_MA_2019_01	Mill River, Class A (PWS Trib.)	MA74-04	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MAR041055 MAR041070	791 (Nutrient/Eutrophication Biological Indicators)

R1_MA_2019_01	Weymouth Back River, Class B (ORW)	MA74-05	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MAR041070	449 (Dissolved Oxygen)
R1_MA_2019_01	Weymouth Back River, Class SA	MA74-13	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 14 MPN/100 mL 10% not >=28 MPN/100 mL	N	MAR041070	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Weir River, Class B/SA	MA74-02	471 (Escherichia Coli (E. Coli)))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MA0040410 MAG640032 MAR041038 MAR041040	791 (Nutrient/Eutrophication Biological Indicators), 983 (Sedimentation/Siltation)
R1_MA_2019_01	Weir River, Class SA	MA74-11	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 14 MPN/100 mL 10% not >=28 MPN/100 mL	N	MAR041038 MAR041040	862 (PCB in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Aberjona River, Class B	MA71-01	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MAG250009 MAG910074 MAR041056 MAR041072	975 (Sediment Bioassay), 903 (Phosphorus, Total), 135 (Aquatic Macroinvertebrate Bioassessments), 125 (Ammonia, Un-Ionized), 145 (Arsenic), 449 (Dissolved Oxygen), 1110 (Turbidity)
R1_MA_2019_01	Alewife Brook, Class B CSO Variance	MA71-04	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MA0101974 MA0040321 MA0101982 MA0103284 MAR041074 MAR041072 MAR041082	1031 (Taste and Odor), 903 (Phosphorus, Total), 862 (PCB in Fish Tissue), 449 (Dissolved Oxygen), 345 (Copper), 663 (Lead), 975 (Sediment Bioassay), 973 (Secchi Disk Transparency),

								556 (Foam/Flocs/Scum/Oil Slicks)
R1_MA_2019_01	Malden River, Class B	MA71-05	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MAR041131 MAR041078	893 (PH, High), 1031 (Taste and Odor), 1070 (Total Suspended Solids), 973 (Secchi Disk Transparency), 450 (Dissolved Oxygen Saturation), 267 (Chlordane), 449 (Dissolved Oxygen), 556 (Foam/Flocs/Scum/Oil Slicks),), 975 (Sediment Bioassay), 372 (DDT), 862 (PCB in Fish Tissue), 903 (Phosphorus, Total)
R1_MA_2019_01	Mystic River, Class B CSO Variance	MA71-02	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MA0101982 MA0103284 MAR041027 MAR041049 MAR041082 MAR041078	372 (DDT), 267 (Chlordane), 975 (Sediment Bioassay), 291 (Chlorophyll a), 145 (Arsenic), 903 (Phosphorus, Total), 973 (Secchi Disk Transparency), 862 (PCB in Fish Tissue), 450 (Dissolved Oxygen Saturation)
R1_MA_2019_01	Chelsea River, Class SB/CSO	MA71-06	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MA0004006 MA0101877 MA0003280 MA0001091 MA0001929 MA0000825	889 (Petroleum Hydrocarbons), 862 (PCBs in Fish Tissue), 1110 (Turbidity), 125 (Ammonia, Un-Ionized), 980

R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL		MA0003425 MA0003298 MA0101192 MAR041077 MAR041057 MAR041173	(Sediment Screening Value - Exceedance), 449 (Dissolved Oxygen), 1031 (Taste and Odor).
R1_MA_2019_01	Mystic River, Class SB/CSO	MA71-03	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MA0101982 MA0103284 MA0101974 MA0004740 MA0101192	(Foam/ Flocs/ Scum/Oil Slicks), 980 (Sediment Screening Value – Exceedance), 889 (Petroleum Hydrocarbons), 449 (Dissolved Oxygen), 1031 (Taste and Odor), 125 (Ammonia, Un-Ionized), 862 (PCBs in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Mill Brook, Class B	MA71-07	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MAR041027	
R1_MA_2019_01	Mill Creek, Class SB	MA71-08	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 88 MPN/100 mL 10% not >=260 MPN/100 mL	N	MAR041077 MAR041057	862 (PCBs in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Winn Brook, Class B	MA71-09	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MAR041074	
R1_MA_2019_01	Belle Isle Inlet, Class SA	MA71-14	500 (Fecal Coliform)	500 (Fecal Coliform)	GM <= 14 MPN/100 mL 10% not >=28 MPN/100 mL	N	MAR041057 MAR051085	862 (PCBs in Fish Tissue)
R1_MA_2019_01			466 (Enterococcus)	466 (Enterococcus)	GM <= 35 cfu/100 mL SSM <= 104 cfu/100 mL			
R1_MA_2019_01	Unnamed Tributary, Class B	MA71-13	471 (Escherichia Coli (E. Coli))	471 (Escherichia Coli (E. Coli))	GM <= 126 cfu/100 mL SSM <=235 cfu/100 mL	N	MAR041049	

TMDL Type	Point and Nonpoint Sources
Establishment Date (approval)*	Nov 21, 2018
Completion (final submission) Date	Oct 8, 2018
Public Notice Date	Aug 10, 2005
EPA Developed	No
Towns affected*	Abington, Arlington, Avon, Belmont, Boston, Braintree, Brockton, Burlington, Cambridge, Canton, Charlestown, Chelsea, Cohasset, Everett, Hingham, Holbrook, Hull, Lexington, Malden, Medford, Melrose, Milton, Norwell, Quincy, Randolph, Reading, Revere, Rockland, Somerville, Stoughton, Wakefield, Weymouth, Wilmington, Winchester, Winthrop, Woburn