September 29, 2014

Betsey Wingfield, Chief
Bureau of Water Protection and Land Reuse
Connecticut Department of Energy & Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Dear Ms. Wingfield:

Thank you for the final submission of the *Additional Appendices to the Statewide Total Maximum Daily Load for Bacteria Impaired Waters* for the estuaries of Old Saybrook/Old Lyme and East Lyme/Waterford, Connecticut. The two appendices provide the TMDL analyses for 23 waterbody segments that are impaired for indicator bacteria (fecal coliform and/or enterococcus). These estuarine waterbody segments were included on Connecticut's 2012 303(d) list as priority waters for TMDL development.

The U.S. Environmental Protection Agency (EPA) hereby approves Connecticut's TMDL submission. The TMDL package was submitted to EPA for approval via electronic mail on September 12, 2014. No comments were received by CT DEEP during the public participation process. EPA has determined that these TMDLs meet the requirements of Section 303(d) of the Clean Water Act (CWA) and 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 CT DEEP 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 Mary Garren of my staff at (617) 918-1322. Thank you very much.

Sincerely,

/s/

Ken Moraff, Director
Office of Ecosystem Protection

cc with attachment:
Denise Ruzicka, CT DEEP
Rob Hust, CT DEEP
Traci Iott, CT DEEP
Chris Sullivan, CT DEEP
Ralph Abele, EPA

EPA NEW ENGLAND'S TMDL REVIEW

DATE: September 29, 2014

TMDL: *Additional Appendices to the Statewide TMDL for Bacteria Impaired Waters* for the estuaries of Old Saybrook/Old Lyme and East Lyme/Waterford, Connecticut

STATUS: Final

IMPAIRMENT/POLLUTANT: Twenty-four Total Daily Maximum Loads (TMDLs) are being approved for the twenty-three waterbody segments of the Old Saybrook/Old Lyme and East Lyme/Waterford estuaries. Twenty-two Total Daily Maximum Loads (TMDLs) are established in terms of concentrations and daily loads for the indicator bacteria, fecal coliform, to address shellfishing impairments. Two TMDLs are established in terms of concentrations and daily loads for the indicator bacteria, enterococci, to address recreational impairments.

BACKGROUND: The Connecticut Department of Energy and Environmental Protection (CT DEEP) submitted draft TMDLs for 23 bacteria impaired estuarine waters to EPA New England on July 31, 2014. The 23 estuarine segments addressed in this approval are listed in Attachments 1 and 2 of this approval document. A public comment period was held by CT DEEP from July 29, 2014 to August 30, 2014. CT DEEP submitted to EPA New England the final *Additional Appendices to the Statewide TMDL for Bacteria Impaired Waters* ("the Appendices") with a transmittal letter dated September 12, 2014. In addition to the Appendices, the submittal included, either attached or by reference, the following documents:

- Notice of Public Comment, CT DEEP, July 29, 2014
- *A Statewide Total Maximum Daily Load Analysis for Bacteria Impaired Waters*, CT DEEP, Final, September 19, 2012. (hereafter referred to as the Statewide Bacteria TMDL)
- EPA New England's TMDL Approval of Connecticut's document: *A Statewide Total Maximum Daily Load Analysis for Bacteria Impaired Waters*, September 20, 2012.
- State of Connecticut Regulations for Connecticut Water Quality Standards, CT DEEP, October 10, 2013
- 2012 State of Connecticut Integrated Water Quality Report, CT DEEP, Final, December 19, 2012

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

REVIEWER: Mary Garren (617-918-1322), e-mail: garren.mary@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.

Introduction

The Statewide Bacteria TMDL was approved by EPA in 2012. The Statewide Bacteria TMDL is the main TMDL document with the segment-specific information and the bacteria data included in the Appendices. The TMDL was designed to support reduction of waterborne disease-causing organisms, known as bacteria or pathogens, to reduce public health risk. Waterborne pathogens enter surface waters from a variety of sources including sewage, the feces of warm-blooded wildlife such as barn-yard animals, pets, geese, and gulls, illicit discharges of boat wastes, and agricultural applications of manure. These pathogens can pose a risk to human health due to gastrointestinal illness through exposure via ingestion and contact with recreational waters, ingestion of drinking water, and consumption of filter-feeding shellfish. Since the time the Statewide Bacteria TMDL was approved in 2012, CT DEEP has prepared TMDLs for additional estuarine waterbody segments. The 23 estuarine waterbody segments are impaired for their shellfishing use due to the presence of indicator bacteria, fecal coliform and/or recreation due to the presence of enterococci. The Appendices were developed by CT DEEP with the intention of adding these segments to the Statewide Bacteria TMDL. The Statewide Bacteria TMDL was constructed to allow for this.

In its September 20, 2012 approval of the Statewide Bacteria TMDL, EPA specified a process by which CT DEEP could add more impaired waters to the TMDL. CT DEEP has submitted the 2 Appendices to EPA for 23 waterbody segments to be added for coverage under the Statewide Bacteria TMDL. Each of the estuaries, which collectively include the 23 impaired waterbody segments, are addressed in a separate Appendix. The State has provided public notice for review of the Appendices, in addition to the public notice that was provided in 2012 on the Statewide Bacteria TMDL. The Appendices provide the level of detailed waterbody-specific information on the impaired waterbodies and their TMDLs as was required in the Statewide Bacteria TMDL. CT DEEP has submitted the two Appendices for EPA approval under the Statewide Bacteria TMDL.

The Appendices therefore present information related to new segments being added under the Statewide Bacteria TMDL only; all other Sections of the Statewide Bacteria TMDL that were approved in 2012 are incorporated by reference and remain applicable to the Appendices.

1. Description of Waterbody, Pollutant of Concern, Pollutant Sources and Priority Ranking

The TMDL analytical document must identify the waterbody as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the waterbody. The TMDL submittal must include a description of

the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and, (4) explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments, or chlorophyll __a__ and phosphorus loadings for excess algae.

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

The Appendices address a total of 23 bacteria-impaired estuarine segments either listed on Connecticut's 2012 303(d) list or determined during TMDL development to be impaired. The estuarine segments are not meeting their designated use for shellfishing and/or recreation. These 23 segments are located in two of Connecticut's coastal estuaries (Attachments 1 and 2 to this document). Each of the estuaries is presented in a separate Appendix. The two Appendices, in which the TMDLs for the 23 estuarine segments are presented, were submitted to EPA for approval under the Statewide Bacteria TMDL. The two estuaries are Old Saybrook/Old Lyme and East Lyme/Waterford.

Twelve bacteria-impaired estuarine segments are located in the Old Saybrook/Old Lyme estuary. The shellfishing use of all twelve segments is impaired due to the presence of fecal coliform. Nine of the segments are classified as coastal and marine surface water quality classification SA and three of the segments are classification SB.

Eleven bacteria-impaired estuarine segments are located in the East Lyme/Waterford estuary. The shellfishing use of nine segments is impaired due to the presence of fecal coliform. One segment is impaired for both its shellfishing and recreational uses due to the presence of fecal coliform and enterococci, respectively. One additional segment is impaired for its recreational use due to the presence of enterococci. All eleven segments are classified as coastal and marine surface water quality classification SA.

Each Appendix lists the impaired water segments within that estuary, including each waterbody's name, location, assessment unit identifier, classification, and size. Details on the designated uses of the segments, including shellfish bed classifications, are presented. Site-specific maps and data are provided in the Appendices. Connecticut's 2012 303(d) list indicates priority dates for development of TMDLs for these waterbodies in 2013.

B. Pollutant of Concern
The twenty-one estuarine waterbody segments are impaired for shellfish use based upon data from indicator bacteria, fecal coliform. One segment is impaired for both its shellfishing and recreational uses due to the presence of fecal coliform and enterococci, respectively. One segment is impaired for its recreational use due to the presence of enterococci.

C. Pollutant Sources
Bacteria impairments in these waterbodies arise from both dry and wet weather events, year round. Potential point sources of bacterial pollution include: wastewater discharges from treatment facilities, NPDES-regulated stormwater runoff including stormwater discharges

authorized by the State's MS4 permits, accidental and illicit discharges, combined sewer overflows, and discharges from boats. Potential non-point sources of bacterial pollution include stormwater not regulated under the NPDES program, septic systems, pet waste, wildlife wastes, agriculture, and recreational uses (swimmers). Actual segment-specific sources of bacterial pollution are identified in the Appendices when these sources are known (the Appendices, Potential Bacteria Sources).

Assessment: EPA New England concludes that the Appendices meet the requirements for describing the TMDL waterbody segments, pollutant of concern, and priority ranking, and identifying and characterizing sources of impairment.

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

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

The Appendices define the appropriate water quality criteria for protecting designated shellfishing and recreational uses and for implementing the antidegradation policy. The water quality criteria for fecal coliform and enterococci that are applicable to an individual waterbody segment are found in the segment specific table in the corresponding Appendix. Additional details regarding applicable water quality criteria are found in Section 3 of the Statewide Bacteria TMDL.

Water quality classification and water quality standards of all surface waters of the State of Connecticut have been established pursuant to Connecticut General Statutes Section 22a-426. According to Connecticut's water classification program, marine waters are classified as SA and SB. Class SA waters are designated for shellfish harvesting for direct human consumption, among other uses. Class SB waters are designated for commercial shellfish harvesting, among other uses. Fecal coliform is the indicator organism for shellfish growing and harvesting areas (tidal waters) following the standards developed under the National Shellfishing Sanitation Program (NSSP) by the United States Food and Drug Administration. The geometric mean established as the water quality criteria for fecal coliform, is set at less than 14 colonies/100mL with 90% of samples less than 31 colonies/100 mL in Class SA waters. In Class SB waters the geometric mean for fecal coliform is less than 88 colonies/100 mL with 90% of the samples less than 260 colonies/100 mL. *Enterococcus* is the indicator bacterium for recreational use in salt waters. The geometric mean established as the water quality criteria for enterococci, is set at less than 35 colonies/100mL with 90% of samples less than 500 colonies/100 mL in Class SA and SB waters that are not designated bathing beaches. No bathing beaches are located in either of the two SA waterbody segments impaired for recreation.

Connecticut's water quality criteria for bacteria are used as the numeric water quality targets for the bacteria TMDLs (Statewide Bacteria TMDL, Section 3 and the Appendices). The numeric

targets vary depending on the specific waterbody's use for shellfish consumption and recreation and the waterbody classification (SA or SB). The water quality criteria for Class SA or SB waters, as appropriate, are the numeric water quality targets for the waterbodies.

Assessment: EPA concludes that CT DEEP has properly described and interpreted the applicable water quality standards to set the numeric water quality targets. CT DEEP is directly applying the numeric bacteria criteria in its water quality standards as the 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.

Connecticut's bacteria TMDLs consist of two formats for the loading capacity of allowable levels of bacteria: (1) concentrations of bacteria, expressed as bacteria counts/100 ml of water, and (2) loads of bacteria, expressed as billions of bacteria/day (Statewide Bacteria TMDL, Section 5.1, Appendix 1). CT DEEP considers both formats to be daily targets because they apply on any given day whenever the water quality standards are in effect in order to assure achievement of bacteria water quality criteria. Both formats express targets designed to attain the designated uses of shellfishing and recreation, and to meet the associated criteria in Connecticut's water quality standards. CT DEEP considers the concentration-based targets to be most useful for guiding implementation of bacteria controls because those targets are easy to understand, and achievement of those targets is more readily assessed by groups with limited resources.

Connecticut's water quality criteria for bacteria apply year round at all times. By setting the water quality targets equal to the numeric bacteria criteria; the TMDLs are applicable at all times and are therefore protective of water quality under all conditions and seasons. These TMDLs set a goal of meeting bacteria water quality criteria at the point of discharge for all sources in order to meet water quality standards throughout each waterbody. Achievement of those water quality goals will be assessed by ambient water quality monitoring.

CT DEEP has calculated the percent reduction based upon bacteria data for a segment that will be needed to meet the applicable annual geometric mean (Statewide Bacteria TMDL, Section 8.1.2 and Appendices). The percent reduction goals provide useful information to guide implementation of the TMDL. The TMDLs of bacteria, expressed as billions of bacteria/day, are calculated using the daily replacement volume of an estuarine segment multiplied by the water quality criteria.

Assessment: 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 loading capacities expressed in the Appendices are set at levels which assure WQS will be met (criteria at point of discharge). The loading capacity is based on the water quality criteria for each waterbody. If all sources of pathogens are at or below the water quality criteria, then it follows that the receiving water will meet the water quality standards. Attainment of the concentration-based loading capacity will achieve water quality criteria for both dry and wet weather and for all storm events whenever they occur (i.e., on any given day). Loading capacity targets are listed for each impaired waterbody in the Appendix for the estuary in which it is located, as are the estimated percent reductions needed to reach the water quality target for each waterbody segment.

EPA's November 15, 2006 guidance entitled "Establishing TMDL 'Daily' Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in <u>Friends of the Earth, Inc. v. EPA</u>, et al., No.05-5015, (April 25, 2006) and Implications for NPDES Permits," recommends that TMDL submittals express allocations in terms of daily time increments. CT DEEP expresses loading capacity targets on a daily basis. The total daily maximum loads of bacteria, expressed as billions of bacteria/day, are calculated using the daily replacement volume of an estuarine segment multiplied by the water quality criteria. In addition the water quality targets apply on any given day whenever the water quality standards are in effect.

In summary, the targets (both concentration and load-based) are directly linked to Connecticut's water quality standards' bacteria criteria to achieve the designated uses of the waterbodies. In addition, EPA concludes that the loading capacity targets address critical conditions and are consistent with EPA guidance on the daily time increment.

4.   Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity allocated to existing and future nonpoint sources and to natural background (40 C.F.R. § 130.2(g)). Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. § 130.2(g)). Where it is possible to separate natural background from nonpoint sources, load allocations should be described separately for background and for nonpoint sources.

If the TMDL concludes that there are no nonpoint sources and/or natural background, or the TMDL recommends a zero load allocation, the LA must be expressed as zero. If the TMDL recommends a zero LA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero LA implies an allocation only to point sources will result in attainment of the applicable water quality standard, and all nonpoint and background sources will be removed.

The load allocation (LA) relates to existing and future nonpoint sources, natural background, and stormwater runoff not subject to NPDES permitting. LAs are set based on the criteria established

by Connecticut's water quality standards, or are set at zero for prohibited discharges (Statewide Bacteria TMDL, Section 5.2.1, Table 5-3 and the Appendices). The LAs for stormwater (non-MS4), wildlife direct discharge, human or domestic animal direct discharge are set equal to the applicable water quality criteria. Prohibited discharges are given an allocation of zero. LAs, consistent with the applicable numeric water quality criteria, are set based upon the SA or SB classification of the waterbody segment. The LAs for each impaired waterbody are listed in the Appendix for the estuary in which it is located, as are the estimated percent reductions needed to reach the water quality concentration target for each waterbody.

Assessment: As discussed in Section 5 of the Statewide Bacteria TMDL (under loading capacity), CT DEEP used the applicable numeric water quality criteria directly related to the use-impairment which the TMDL is designed to address. CT DEEP set conservative LA targets based on meeting criteria at the location of the discharge. EPA concludes that the LAs for bacteria are adequately specified in the TMDLs at levels necessary to attain and maintain water quality standards. Load allocations, consistent with the applicable numeric water quality criteria, are set based upon the SA or SB classification of the estuarine waterbody segment.

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 waste load allocations (WLAs) relate to existing and future point sources. WLAs are allocated based on the criteria established by Connecticut's water quality standards, or are set at zero for prohibited discharges (Statewide Bacteria TMDL, Section 5.2.1, Table 5-3 and the Appendices). The WLAs for non-stormwater NPDES in SB waters, combined sewer overflows in SA or SB waters, and stormwater (MS4) in SA or SB waters are set equal to the applicable water quality criteria. Prohibited discharges are given an allocation of zero. WLAs, consistent with the applicable numeric water quality criteria, are set based upon the SA or SB classification of the waterbody segment. The WLAs for each impaired waterbody are listed in the Appendix for the estuary in which it is located, as are the estimated percent reductions needed to reach the water quality concentration target for each waterbody.

CT DEEP established concentration-based WLAs by applying the numeric criteria directly to each discharge, or zero for prohibited discharges. Aggregate mass WLAs were established for the stormwater sources because it is impossible to determine with any precision or certainty the

actual and projected loadings for individual discharges or groups of discharges. EPA's November 22, 2002 TMDL guidance suggests that it is acceptable in such cases to allocate stormwater by gross allotments

Assessment:

As discussed in Section 5 of the Statewide Bacteria TMDL (under loading capacity), CT DEEP used the applicable numeric water quality criteria directly related to the use-impairment which the TMDL is designed to address. CT DEEP set conservative WLA targets based on meeting criteria at the point of source discharge. Waste load allocations, consistent with the applicable numeric water quality criteria established by Connecticut's water quality standards, are set based upon the SA or SB classification of the waterbody segment. EPA concludes that the WLAs for bacteria are adequately specified in the TMDLs at levels necessary to attain and maintain water quality standards.

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 TMDLs expressed in terms of daily loads include an explicit 5% MOS which is applied to the appropriate water quality criteria before calculating the allowable daily LAs and WLAs for bacteria (Statewide Bacteria TMDL, Section 5.2., Appendix 1). The mass-per-unit-time bacteria TMDLs are expressed in terms of billions of bacteria per day as a function of daily water outflow volume (for estuarine and marine waters). This 5% MOS is incorporated into the TMDLs in order to account for any uncertainty involved in measurements or estimations of volume exchange used in the daily load calculations.

When the loading capacity for the waterbody is set equal to the water quality standard, an implicit margin of safety is inherent based on conservative assumptions incorporated into the TMDL analysis (Statewide Bacteria TMDL, Section 5.2). The water quality targets are established at the same levels as the water quality standards for each waterbody, and include the goal of meeting bacteria water quality criteria at the point of discharge for all sources. Consequently, they do not rely on in-stream processes, such as bacteria die-off, dilution, and settling, which are known to reduce in-stream bacteria concentrations. Given this very conservative target-setting, there is a high level of confidence that the TMDLs established are consistent with water quality standards, and the entire loading capacity can be allocated among sources. The underlying assumption in establishing a concentration TMDL for bacteria is that if all sources are equal to or below the water quality standards, then the concentration of bacteria in the receiving water will attain standards.

Assessment: EPA concludes that the TMDLs expressed as daily loads incorporate an explicit MOS. The loading set-aside is therefore established as 5%. EPA also concludes that the approach used in developing the concentration-based TMDLs provides for an adequate implicit

MOS. Setting the concentration targets at the water quality criteria, with the goal of meeting those criteria at the point of discharge with no allowance for bacteria die-off and settling, provides an implicit margin of safety.

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)).

CT DEEP considered seasonal variations when developing the TMDLs. Because the loading capacities are set equal to the bacteria criteria, and the criteria are applicable at all times of year, the TMDLs are also applicable at all times of year and protective during all conditions (Statewide Bacteria TMDL, Section 5.3).

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

8.   Monitoring Plan

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

The TMDLs are not phased TMDLs. CT DEEP does, however, include recommendations for monitoring by permittees as part of their permit obligations to conduct sampling data designed to measure attainment of water quality standards (Statewide Bacteria TMDL, Section 5.6 and the Appendices, recommended next steps). There are also recommendations for other agencies and groups who may be interested in conducting monitoring in the state.

The Connecticut Department of Agriculture/Bureau of Aquaculture (CT DA/BA) is responsible for monitoring shellfish in Connecticut. All shellfish growing areas are classified by CT DA/BA in accordance with the Interstate Shellfish Sanitation Conference (ISSC) National Shellfish Sanitation Program Model Ordinance (NSSP-MO) and CT General Statutes Chapter 491, §26-192e. These classifications are based on fecal coliform bacteria standards as provided in the NSSP-MO (Interstate Shellfish Sanitation Conference, 2007). Connecticut DA/BA monitors shellfish beds for compliance with shellfish bacteria standards. CT's HEALTH Bathing Beach Inspection Program collects bacteria samples from recreational beaches using a different indicator species. While the indicator bacteria for shellfish impairment is different than the one for recreational impairment, sampling at beaches can help flag estuaries of potential concern.

CT DEEP will continue to monitor the water quality of riverine and estuarine segments through its probabilistic monitoring program. CT DEEP also conducts some targeted monitoring and sampling trips.

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

9. Implementation Plans

On August 8, 1997, Bob Perciasepe (EPA Assistant Administrator for the Office of Water) issued a memorandum, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)," that directs Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired solely or primarily by nonpoint sources. To this end, the memorandum asks that Regions assist States/Tribes in developing implementation plans that include reasonable assurances that the nonpoint source load allocations established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. The memorandum also includes a discussion of renewed focus on the public participation process and recognition of other relevant watershed management processes used in the TMDL process. Although implementation plans are not approved by EPA, they help establish the basis for EPA's approval of TMDLs.

The Statewide Bacteria TMDL provides implementation guidance and identifies existing informational resources on BMPs to address the various sources of bacteria (Statewide Bacteria TMDL, Section 6). It also includes an overall description of the implementation process, and information about the stormwater management program. Maps, waterbody-specific data summary tables, and other information specific to each watershed are presented in the Appendices to inform stakeholders on the location of known impairments in their estuary. Data were used to calculate percent reductions needed to meet the concentration-based targets, and to present wet weather and dry weather bacteria counts (where sufficient precipitation information was available). This wet/dry data analysis provides valuable indications of the sources of bacteria in order to guide implementation efforts to fix the problem.

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

10. Reasonable Assurances

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

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

The TMDL targets for point sources in these TMDLs are not less stringent based on any assumed nonpoint source reductions, so documentation of reasonable assurance in the TMDLs is not a requirement. Nonetheless, CT DEEP explains that a combination of regulatory and non-regulatory program support in Connecticut will provide reasonable assurances that both point and non-point allocations will be achieved, including regulatory enforcement, technical assistance, availability of financial incentives, and state, and federal programs for pollution control (Statewide Bacteria TMDL, Section 5.7).

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

11.   Public Participation

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

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

On July 29, 2014 a public notice was released announcing the availability of two draft appendices to the Statewide Bacteria TMDL for public review. Notice was posted on the CT DEEP website. The Notice was placed in the New London Day newspaper. Emails were sent to a list of interested agencies, towns, and stakeholders. The public comment period ran until August 30, 2014. No comments were received.

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

12.   Submittal Letter

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

Assessment: On September 12, 2014, CT DEEP submitted the *Additional Shellfish Appendices Statewide TMDL for Bacteria Impaired Waters* for EPA approval. The Appendices cover the estuaries of Old Saybrook/Old Lyme and East Lyme/Waterford. The submission package for the final Appendices contains all of the elements necessary to approve the TMDL.

Data for entry in EPA's National TMDL Tracking System	
TMDL Name	**Additional Appendices to Statewide Bacteria TMDL for Old Saybrook/Old Lyme and East Lyme/Waterford Estuaries**
Number of TMDLs*	24
Type of TMDLs*	Indicator Bacteria
Number of listed causes (from 303(d) list)	24
Lead State	Connecticut (CT)
TMDL Status	Final
Individual TMDLs listed below	

TMDL Segment name	TMDL Segment ID #	TMDL Pollutant ID# & name	TMDL Impairment Cause(s)	Pollutant endpoint	Unlisted?	Point Source & ID#	Listed for anything else?
LIS EB Inner - Connecticut River (mouth)	(CT-E1_024-SB)	500 (fecal coliform)	500 (fecal coliform)	88 colonies/100 ml, geomean and 90% of samples less than 260 col/100ml		CTDEEP MS4 Permit for Old Lyme #GSM000037	PCBs
LIS EB Inner - Black Hall River (upper)	(CT-E1_026-SB)	500 (fecal coliform)	500 (fecal coliform)	88 colonies/100 ml, geomean and 90% of samples less than 260 col/100ml		CTDEEP MS4 Permit for Old Lyme #GSM000037	No
LIS EB Inner - Duck River	(CT-E1_027-SB)	500 (fecal coliform)	500 (fecal coliform)	88 colonies/100 ml, geomean and 90% of samples less than 260 col/100ml		CTDEEP MS4 Permit for Old Lyme #GSM000037	Enterococcus
LIS EB Inner - Fourmile River (mouth)	(CT-E1_023)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Old Lyme #GSM000037	No
LIS EB Inner - Oyster River Area	(CT-E1_032)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Old Saybrook #GSM000078	No

LIS EB Shore - Rocky Neck (Fourmile Rvr)	(CT-E2_017)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Old Lyme #GSM000037	No
LIS EB Shore - Soundview Beach	(CT-E2_018)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Old Lyme #GSM000037	No
LIS EB Shore - Willard Bay	(CT-E2_020)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Old Saybrook #GSM000078	No
LIS EB Shore - Indiantown Harbor	(CT-E2_022)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Old Saybrook #GSM000078	No
LIS EB Midshore - Old Lyme, CT River	(CT-E3_008)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEP MS4 Permit for Old Lyme #GSM000037	No
LIS EB Midshore - Old Saybrook	(CT-E3_010)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Old Saybrook #GSM000078	No
LIS EB Midshore - Old Saybrook, Indian Harbor	(CT-E3_011)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Old Saybrook #GSM000078	No

LIS EB Inner - Jordan Cove	(CT-E1_019)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Waterford #GSM000023	No
LIS EB Inner - Niantic River (mouth)	(CT-E1_020)	500 (fecal coliform) 466 (enterococci)	500 (fecal coliform) 466 (enterococci)	*Fecal coliform* (14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml) and *Enterococci* (35 col/100 ml, geomean and 500 col/100 ml, single sample maximum)		CTDEEP MS4 Permit for East Lyme #GSM000014 and CTDEEP MS4 Permit for Waterford #GSM000023	Cause Unknown, Estuarine Bioassessments, Nutrient/Eutrophi-cation Biological Indicators
LIS EB Inner - Pattagansett Rvr (mouth)	(CT-E1_021)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for East Lyme #GSM000014	No
LIS EB Shore - Outer Jordan Cove	(CT-E2_012)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Waterford #GSM000023	No
LIS EB Shore - Niantic Bay (East)	(CT-E2_013)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for Waterford #GSM000023	Cause Unknown
LIS EB Shore - Niantic Bay (West)	(CT-E2_014)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for East Lyme #GSM000014	Cause Unknown

LIS EB Shore - Niantic Bay (Black Pt)	(CT-E2_015)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for East Lyme #GSM000014	Cause Unknown

LIS EB Shore - Pattagansett River Mouth	(CT-E2_016)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for East Lyme #GSM000014	No
LIS EB Midshore - Niantic Bay	(CT-E3_006)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for East Lyme #GSM000014 and CTDEEP MS4 Permit for Waterford #GSM000023	Cause Unknown
LIS EB Midshore - East Lyme, Rocky Neck	(CT-E3_007)	500 (fecal coliform)	500 (fecal coliform)	14 colonies/100 ml, geomean and 90% of samples less than 31 col/100ml		CTDEEP MS4 Permit for East Lyme #GSM000014	No
LIS EB Inner – Bride Brook- East Lyme	(CT-E1_022)	466 (enterococci)	466 (enterococci)	35 col/100 ml, geomean and 500 col/100 ml, single sample maximum		CTDEEP MS4 Permit for East Lyme #GSM000014	Fecal coliform

TMDL Type	Point & Nonpoint Sources
Establishment Date (approval)*	September 29, 2014
EPA Developed	No
Towns affected*	Old Saybrook, Old Lyme, East Lyme, Waterford, CT