

February 16, 2006

Ms. Yvonne Bolton, Chief  
Bureau of Water Management  
Connecticut Department of Environmental Protection  
79 Elm Street  
Hartford, CT 06106

Dear Ms. Bolton:

Thank you for submitting the final **A Total Maximum Daily Load Analysis for the Norwalk River Regional Basin** for indicator bacteria (*Escherichia coli*). The Norwalk River, Ridgefield Brook and Silvermine River are waters within the basin included on Connecticut's 2004 303(d) list. The Norwalk River and Ridgefield Brook were under study by DEP and prioritized for TMDL development within 2 years. Silvermine River was assessed as a high priority warranting TMDL development within 3-5 years if necessary. Data from eight waterbody segments were used to calculate ten TMDLs for locations within the Norwalk basin. The U.S. Environmental Protection Agency (EPA) hereby approves Connecticut's TMDL dated November 29 2005 and received by EPA on December 12, 2005. EPA has determined that this TMDL meets 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.

DEP has been responsive to public comment received on this TMDL. More conservative indicator bacteria criteria were used for three segments on the Norwalk River that the public reported are used for swimming. The disinfection period for three municipal treatment plants will also be extended by two months a year during the next permit renewals. DEP will require these extensions based upon reports of common fishing and wading in the Norwalk River during April and October. Other additional changes were made in the final TMDL document in response to public comment.

This TMDL analysis is based upon CT's cumulative distribution function method. The methodology is detailed in Appendix B of the TMDL, *Development of TMDLs for Indicator Bacteria Using the Cumulative Distribution Function Method*. The methodology has been revised since its submission with the TMDL for the

Mattabeset River Regional Basin. EPA has reviewed the new approach presented in Appendix B and approves its use for indicator bacteria in the Norwalk River Regional Basin. This approach to calculating the TMDL does not alter CT's standing policy to conduct representative ambient monitoring and comparison to Water Quality Standards (WQS) bacteria criteria as the final test for determining compliance with WQS.

My staff and I continue to look forward to working with CTDEP in exercising our shared responsibility of implementing the requirements under Section 303(d) of the CWA. If you would like to discuss or have any questions regarding this approval, please contact Steve Silva at (617) 918-1561 or have your staff contact Mary Garren at (617) 918-1322. Thank you very much.

Sincerely,

Linda M. Murphy, Director  
Office of Ecosystem Protection

Attachment

cc with Attachment:

Betsey Wingfield, CT DEP

Lee Dunbar, CT DEP

Mary Kozlak, CT DEP

Steve Silva, EPA

Lynne Hamjian, EPA

Mary Garren, EPA

## EPA NEW ENGLAND'S TMDL REVIEW

**TMDL:** A Total Maximum Daily Load Analysis for the Norwalk River Regional Basin

CT Waterbody Segments on the State of Connecticut 2004 List of Connecticut Water Bodies Not Meeting Water Quality Standards (303(d) of the Federal Clean Water Act):

### **Norwalk River Regional Basin Waterbody Name (Segment ID)**

Norwalk River (CT7300-00\_01, CT7300-00\_02, CT7300-00\_03, CT7300-00\_04, and CT7300-00\_05)

Ridgefield Brook (CT7300-02\_01 and CT7300-02\_02)

Silvermine River (CT7302-00\_01)

### **Location of the Norwalk River Regional Basin**

Fairfield County, including the municipalities of Norwalk, Wilton, Weston, Reading, Ridgefield, and New Canaan

**STATUS:** Final

**IMPAIRMENT/POLLUTANT:** Impairment of primary contact recreation due to indicator bacteria. The Total Daily Maximum Loads (TMDLs) are proposed for indicator bacteria - *Escherichia coli*.

### **BACKGROUND:**

The Connecticut Department of Environmental Protection (CTDEP) submitted to EPA New England the final Norwalk River Regional Basin TMDL Analysis for indicator bacteria with a transmittal letter dated December 5, 2005 and received by EPA on December 12, 2005. EPA New England concurs with the content of the TMDL analysis.

The following review explains how the TMDL submission meets the statutory and regulatory requirements of TMDLs in accordance with Section 303(d) of the Clean Water Act, and 40 CFR Part 130.

**REVIEWER:** Mary Garren (617-918-1322) [garren.mary@epa.gov](mailto: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.*

## 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 that 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.*

### **Assessment:**

TMDLs are established for three waterbodies within the Norwalk River Regional Basin. Five segments of the Norwalk River, two segments of Ridgefield Brook, and one segment of the Silvermine River are addressed in the TMDL document. Each is impaired for contact recreational use due to the presence of elevated levels of indicator bacteria (*E. coli*). The eight segments within the Regional Basin were identified as impaired on the State of Connecticut 2004 List of Connecticut Water Bodies Not Meeting Water Quality Standards (2004 303(d) List) (page 1 and Table 1). CTDEP prioritized the Norwalk River and Ridgefield Brook for TMDL development within two years if warranted. Preparation of a TMDL for the Silvermine River was planned within 3-5 years of the 2004 303(d) listing (Table 1). CTDEP addressed all three waterbodies together using this regional basin approach.

A number of different kinds of point source discharges are located in the watershed. There are three individually-permitted municipal point source discharges in the watershed (pages 3 and 7). The discharge points of treated and disinfected domestic wastewater into the Norwalk River are at the Redding-Georgetown Water Pollution Control Facility (WPCF) and Ridgefield Route 7 WPCF. The Ridgefield Main WPCF discharges to Ridgefield Brook. There are also two industrial wastewater discharges in the Norwalk River (page 3). The PE Corp. in Ridgefield is permitted to discharge clean groundwater. The Elinco-Kellogg Deering Wellfield in Norwalk has a groundwater remediation emergency authorization discharge. Both industrial discharges were determined not to contain significant levels of bacteria and therefore the NPDES permits have no limits for indicator bacteria. All of the communities within the watersheds are MS4 urban communities subject to the Phase II Stormwater General Permit (see Watershed descriptions in Appendices A-1, A-2, and A-3). All urban stormwater discharges are therefore regulated under NPDES Phase II. Point sources of indicator bacteria in the watershed are summarized as regulated urban runoff, storm sewers, wastewater treatment plants and illicit discharges (Table 2).

The first page in Appendices A-1, A-2, and A-3 of the TMDL document provides detailed identifying information on each of the three waterbodies. The Norwalk River Regional Basin is located in the southwestern corner of the State. The designated use that is being impaired is identified as contact recreation in all of the waters. There are, however, no "designated

swimming areas”. Designated swimming areas are locations designated by State and local authorities for public swimming and the water quality is monitored weekly during the recreational season. Non-designated swimming areas are waters suitable for swimming, but not designated by authorities nor monitored as frequently. CTDEP is applying the “non-designated” swimming criteria to three segments of the Norwalk River and the “all other recreational uses” criteria to each of the other segments (page 4). The decision criteria for contact recreational use support are presented on pages 13-15 of CTDEP’s 2004 guidance document, Connecticut Consolidated Assessment and Listing Methodology (CALM).

The waters of the Norwalk River Regional Basin have two indicator bacteria criteria (pages 2 and 3), a geometric mean and a single sample maximum, to meet in order to fully support their contact recreational designated uses. Sanitary surveys of the water must indicate that no significant source of fecal contamination is present and data obtained by CTDEP and/or USGS must show no exceedances of the indicator bacteria criteria. The applicable season for these TMDLs will be extended by two months beyond the standard recreational season in response to public comments (page 6). These particular TMDLs are applicable from April 1<sup>st</sup> to October 31<sup>st</sup>. The designated use of contact recreation would not be impaired during the cold months when enteric bacteria die off in cold temperatures and the potential human exposure is greatly reduced (page 3, Appendix B). Surface water classifications for each of the impacted waters are as defined by the CTDEP Water Quality Standards (WQS), effective December 17, 2002 (page 5).

Towns and cities located within the watershed are Norwalk, Wilton, Weston, Redding, Ridgefield, and New Cannan (Appendices A-1, A2 and A-3). Specific location information is provided for each segment. The appendices list the linear mileage of each segment and the square mileage of each drainage basin. Land use categories and their percentages are presented for each watershed. The each watershed is broken down into appropriate land use categories, e.g. forested, urban/developed, open space, water/wetland and agricultural.

EPA concludes that the TMDL report sufficiently describes the pollutants of concern, pollutant sources, and priority rankings for waters of the Norwalk River Regional Basin.

## **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 anti-degradation policy. Such information is necessary for EPA’s review of the load and wasteload allocations that 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.*

### **Assessment:**

Appendix B of the TMDL is entitled “Development of TMDLs for Indicator Bacteria using the Cumulative Distribution Function Method.” Waters not designated for swimming by the State must have a geometric mean density of indicator bacteria less than 126 colonies/100 ml and the

single sample maximum limited to 410 colonies/100 ml to comply with the indicator bacteria criteria (pages 2 and 3, Appendix B). CTDEP applies these criteria to following segments: Norwalk River CT7300-00\_01 (at sampling sites 435, 704, and 990), Norwalk River CT7300-00\_04, and Norwalk River CT7300-00\_05. A geometric mean density of indicator bacteria less than 126 colonies/100 ml and the single sample maximum of 576 colonies/100 ml is the standard for “all other recreational uses.” The segments that CTDEP applies these criteria to are: Norwalk River CT7300-00\_02, Norwalk River CT7300-00\_03, Ridgefield Brook CT7300-02\_01, Ridgefield Brook CT7300-02\_02 and Silvermine River CT7302-00\_01 (pages 3 and 4). Refer to the cumulative distribution function graphs in Appendices A and B for a graphical presentation of the indicator bacteria criteria applications.

EPA New England approved two other TMDL submissions using the cumulative distribution function method in May and July of 2005. Mill River, Rooster River, Sasco Brook, and the Mattabeset River Regional Basin are waters in urban watersheds identified as having impaired recreational uses, other than swimming, caused by the presence of excess indicator bacteria (*E. coli*). The method document appended to the Norwalk River Regional Basin submission has been revised and its use expanded since those earlier approvals. The initial method document was dated July 21, 2004 and was not applicable to waters where the public swim. Appendix B of the current TMDL submission is entitled, “Development of TMDLs for Indicator Bacteria in Contact Recreation Areas using the Cumulative Distribution Function Method” and dated November 8, 2005. The revised method is being used for non-designated swimming areas.

Much of the revised method remains the same as in the previous 2004 document. Representative ambient water quality monitoring data taken on a minimum of 21 sampling dates from May 1–September 31 is a requirement for use of this method. Indicator bacteria density and precipitation data are necessary. Decisions regarding to listing or delisting of a waterbody pursuant to Section 303(d) of the Clean Water Act will not be made based on this methodology. CTDEP will continue to make an assessment as to whether a waterbody is supporting its designated use according to its 2004 CALM (page 1, Appendix B).

This TMDL analysis proposes using a cumulative distribution function method to determine the reduction in the density of bacteria needed to allow the waterbody to meet its indicator bacteria criteria. CT’s Water Quality Criteria for Bacterial Indicators for all fresh waters are presented statistically as a distribution with a geometric mean of 126 colonies/100 ml and a log standard deviation of 0.4. The three recreational use categories (“designated swimming”, “non-designated swimming” and “all other recreational uses”) however have different single sample maximum criteria (256 col./100 ml, 410 col/100 ml, and 576 col/100 ml, respectively.) Appendix B (page 2-5) contains a detailed explanation of this cumulative frequency distribution curves, or criteria curves as they are called. The cumulative frequency distribution curve expressing the indicator bacteria criteria is shown graphically in Figures 1a, 1b, and 1c (Appendix B). Analytical data from an unidentified waterbody is also plotted on the same graphs (Figures 2a, 2b, and 2c, Appendix B) to form an example of a second cumulative relative frequency curve. The average reduction in *E. coli* needed to move the data points from the sample data curve to the criteria curve determines the necessary average percent reduction of indicator bacteria. This percentage of needed reduction becomes the TMDL. Connecticut’s anti-degradation policy (Appendix E of

the State's 2002 WQS) is referenced (page 11) in the context that this and any future modification of the TMDL must be consistent with that policy.

EPA concludes that the TMDL report sufficiently describes the applicable water quality standards and 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 that 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 result in attaining and maintaining the water quality criterion and have 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.*

#### **Assessment:**

The TMDLs are calculated using the detailed methodology in Appendix B of the document. All TMDLs are calculated using a geometric mean of 126 col/100 ml, a log standard deviation of 0.4, and either the single sample maximum of 410 col/100 ml or 576 col/100 ml (Table 3). The single sample maximum is 410 col/100 ml for non-designated swimming waters. This bacteria count is the value used for the Norwalk River CT7300-00\_01 (at sampling sites 435, 704, and 990), Norwalk River CT7300-00\_04, and Norwalk River CT7300-00\_05. The public has reported that these "non-designated swimming" waters are segments where swimming occurs at locations other than a designated beach (page 4). TMDLs for segments 7300-00\_01, 7300-00\_04, and 7300-00\_05 of the Norwalk River are consequently calculated with a single sample maximum of 410 col/ml (Appendices A-1 through A-3).

A geometric mean density of indicator bacteria less than 126 col/100 ml and the single sample maximum of 576 col/100 ml is the standard for waters designated for "all other recreational uses." The segments that CTDEP applies these criteria to are: Norwalk River CT7300-00\_02, Norwalk River CT7300-00\_03, Ridgefield Brook CT7300-02\_01, Ridgefield Brook CT7300-02\_02, and Silvermine River CT7302-00\_01 (Table 3). TMDLs for segments CT7300-00\_02, CT7300-00\_03, CT7300-02\_01, CT7300-02\_02, and CT7302-00\_01 are consequently calculated with a single sample maximum of 576 col/ml (Appendices A-1 through A-3).

The TMDLs are average percent reductions of indicator bacteria (E. coli) needed to meet the applicable indicator bacteria criteria. The numeric water quality end points are the indicator bacteria criteria. The TMDLs (Table 4) are:

<u>Waterbody</u>	<u>Segment ID Number</u>	<u>TMDL - Avg. % Reduction needed in indicator bacteria</u>
Norwalk River	CT7300-00_01 (at location 435)	72%
	CT7300-00_01 (at location 704)	76%
	CT7300-00_01 (at location 990)	58%
	CT7300-00_02	38%
	CT7300-00_03	5%
	CT7300-00_04	54%
	CT7300-00_05	39%
Ridgefield Brook	CT7300-02_01	51%
	CT7300-02_02	51%
Silvermine River	CT7302-00_01	66%

Appendices A-1, A-2 and A-3 each conclude with a TMDL summary for the waterbody. These summaries are very helpful in understanding the specifics of each TMDL calculation. Two TMDLs were calculated for Ridgefield Brook, however there was sampling data available for only one of the two segments. The summary in Appendix A-2 explains that segment CT7300-02\_01 is one linear mile long and located between two other segments with data. CTDEP has identified a conservative percent reduction for segment CT7300-02\_01 based on the reduction needed in the upstream segment CT7300-02\_02.

Connecticut DEP's cumulative distribution function method for TMDL development calls for data from 21 sampling dates during the recreational season (page 9, Appendix B). All data must be less than five years old (page 10, Appendix B). These TMDL calculations all rely upon much more ambient water quality monitoring data than required by the method (tabular data tables in Appendices A-1 through A-3), with the exception of segment CT7300-02\_01 as described above.

Critical conditions for these sub-watersheds are identified (page 6, main document). Warm weather during the recreational season is closely tied to periods of high densities of bacteria due to increased survival rates. The TMDL is consequently applicable during the critical season of April 1 to October 1 each year.

Appendix B (page 8) identifies factors that generally contribute to critical conditions. Dry weather flows from stormwater collection systems, illegal storm-sewer connections, and combined sewer overflows would contribute to critical conditions. Critical conditions could also be influenced by inadequate disinfection of NPDES discharges, improper wildlife and pet waste management and poorly functioning septic systems. The management goal for these potential sources is elimination or adequate control as appropriate. Table 2 (main document) clarifies which of these types of sources could be contributing factors for these specific waterbodies.

EPA concludes that the TMDL report sufficiently determines the loading capacity and links water quality and pollutant sources

#### 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.*

#### Assessment:

Load Allocations (LAs) for the eight segments that make up the Norwalk River, Ridgefield Brook and Silvermine River are summarized in Table 4 and calculated in the appendices (A-1 through A-3). Using the cumulative distribution function method, the percent reduction needed to achieve indicator bacteria criteria from nonpoint sources during dry weather is assigned to the LA (page 8, Appendix B). “Dry” data is collected at any time when precipitation is less than 0.1” per 24 hours, 0.25” per 48 hours, or 2.0” per 96 hours (footnote in the tabular data tables in Appendices A-1 through A-3). The TMDL summaries for the three water bodies (Appendices A-1 through A-3) identify improperly functioning septic systems, domestic animal waste, and wildlife as nonpoint sources possibly contributing to the LA. Pet/horse farms are also identified as a factor in the LA for the Silvermine River. The LA is based on the average bacteria loading reduction needed in nonpoint sources to comply with the criteria. The nonpoint source Load Allocations (Table 4) are:

<u>Waterbody</u>	<u>Segment ID Number</u>	<u>Load Allocation</u> <u>Avg. % Reduction</u>	<u># of Samples</u> <u>used for LA</u>
Norwalk River	CT7300-00_01 (at location 435)	70 %	52
	CT7300-00_01 (at location 704)	76%	51
	CT7300-00_01 (at location 990)	56%	52
	CT7300-00_02	38%	52
	CT7300-00_03	3%	52
	CT7300-00_04	55%	52
	CT7300-00_05	37%	52
Ridgefield Brook	CT7300-02_01 (both segments)	45%	--
	CT7300-02_02 (based one data set)	45%	52
Silvermine River	CT7302-00_01	65%	33

EPA concludes that the TMDL report sufficiently addresses the calculation of a load allocation.

## 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.*

### **Assessment:**

Waste Load Allocations (WLAs) for the water bodies are summarized in Table 4 and calculated in the appendices (A-1 through A-3). Using the cumulative distribution function method, the percent reduction needed to achieve indicator bacteria criteria from point sources during wet weather is assigned to the WLA (page 8, Appendix B). “Wet” data is collected when precipitation is greater than 0.1” per 24 hours, 0.25” per 48 hours, or 2.0” per 96 hours (footnote in the tabular data tables in Appendices A-1 through A-3). All waters in the Mattabeset River Regional Basin are located in MS4 urban communities subject to the Phase II Stormwater General Permit (page 1, TMDL document). The WLAs in these urban communities can be assessed using wet weather data from regulated urban runoff/storm sewers. Combined sewer overflows are not allowed in MS4 communities so therefore are not a contributing factor.

Another component of the WLA is the contribution of wastewater treatment plants (WWTPs). This contribution is assessed using data obtained during dry weather (page 8, Appendix B). Data from WWTP discharges are accounted for as a dry weather component of the WLA (Table 2, Appendix B). Two municipal WWTPs discharge to the Norwalk River and one to Ridgefield Brook (page 3). These municipal WWTPs are required to disinfect their effluent to lower bacteria counts to below levels of concern. Two industrial wastewater discharges also discharge to the Norwalk River (page 3). Both industries discharge clean groundwater that CTDEP has determined do not contain significant levels of bacteria. These five permitted discharges are allocated zero percent reductions since indicator bacteria counts are below levels of concern.

Regulated urban runoff/storm sewers therefore form the basis for the WLA in these TMDLs. Wastewater treatment plants are regulated to the extent that they are not contributing factors. The WLA is based on the average bacteria loading reduction needed in point source stormwater loadings to comply with the criteria (pages 7 and 8, Appendix B). The regulated stormwater Waste Load Allocations (Table 4) are:

<u>Waterbody</u>	<u>Segment ID Number</u>	<u>Waste Load Allocation Avg. % Reduction</u>	<u># of Samples used for WLA</u>
Norwalk River	CT7300-00_01 (at location 435)	74%	35
	CT7300-00_01 (at location 704)	76%	35
	CT7300-00_01 (at location 990)	60%	35
	CT7300-00_02	38%	35
	CT7300-00_03	9%	35
	CT7300-00_04	53%	35
	CT7300-00_05	42%	35
Ridgefield Brook	CT7300-02_01	60%	--
	CT7300-02_02	60%	35
	* both segments of Ridgefield Brook are based on one data set		
Silvermine River	CT7302-00_01	67%	22

EPA concludes that the TMDL report sufficiently addresses the calculation of a wasteload allocation.

## 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.*

### Assessment:

An implicit Margin of Safety (MOS) is relied upon in the TMDL report (Table 4). Appendix B (page 9) presents the factors contributing to a MOS that are inherent to the cumulative distribution function method. Sample results from waters with lower level of bacteria as compared to bacteria criteria are assigned a percent reduction equal to zero. A negative reduction would suggest that the water could assimilate additional bacteria and still meet the criteria. Assigning a zero percent reduction is more conservative because it does not allow for that assimilative capacity in the calculation of the TMDL. Another factor is that compliance with CT's MS4 Permit requires elimination of high loading sources (illegal connections, dry weather storm sewer overflows, etc). This permit, separate from the TMDL, will greatly reduce bacteria loading to these waters. Best Management Practices (BMPs), whether implemented for wet or dry weather sources, will also reduce loading. BMPs designed to target a particular weather condition, most often contribute to load reductions during all conditions.

CTDEP also makes note that EPA's indicator bacteria criteria, adopted by CT and used in this TMDL analysis, were developed from data taken at high use bathing beaches with known human fecal contamination (page 6). Waters within the Norwalk River Regional Basin are urban waters

without “designated” beaches. CT DEP notes that reliance upon data from high use swimming beaches to assess the data from these non-designated CT waters is a conservative comparison.

EPA concludes that the TMDL report sufficiently addresses the need for a 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)).*

### **Assessment:**

TMDLs using the Cumulative Distribution Function Method rely upon samples obtained during the summer recreational season (May 1-September 30) (Appendix A data tables and Appendix B, page 9). Bacteria densities are highest during warm months in waters impacted only by stormwater and nonpoint sources. Data taken during the recreational season represents “worst-case” conditions. Restricting data to samples taken during the warm months is therefore conservative and an acceptable approach to considering seasonal variation (page 6).

In response to public comments stating that the season for recreational use of the Norwalk River is longer than May to September, CTDEP has extended the implementation of this particular TMDL to April 1 – October 31 (page 6). The Norwalk River is a heavily stocked trout stream with a longer fishing and wading season. CTDEP has taken this action to ensure the full support of recreational use in the Norwalk River Regional Basin during the entire recreational season.

EPA concludes that the TMDL report sufficiently considers season variation.

## 8. Monitoring Plan for TMDLs Developed Under the Phased Approach

*EPA’s 1991 document, Guidance for Water Quality-Based Decisions: The TMDL Process (EPA 440/4-91-001) recommends a monitoring plan when a TMDL is developed under the phased approach. The guidance recommends that a TMDL developed under the phased approach also should provide assurances that nonpoint source controls will achieve expected load reductions. The phased approach is appropriate when a TMDL involves both point and nonpoint sources and the point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. EPA’s guidance provides that a TMDL developed under the phased approach should include a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of water quality standards.*

### **Assessment:**

A comprehensive monitoring plan for improvements in water quality is presented for Norwalk River Regional Basin (pages 9-10). The TMDL presents recommendations for how these communities can implement successful water quality monitoring programs. Analytical parameters and methods required by the MS4 Permit are listed in the TMDL (page 10). Stormwater monitoring has been a requirement for MS4 communities since 2004 (page 9). The required monitoring is scheduled to take place during stormwater runoff events. Municipalities have the option, however, to request that CTDEP approve an alternate sampling plan of

equivalent or greater scope. A fixed station ambient water quality monitoring program is recommended to most effectively assess BMP implementation (page 9).

CTDEP commits to exploring funding sources for local communities and to providing educational and technical assistance (page 10). The cumulative distribution function method will not be used as a tool to assess the use attainment status of a water as it relates to listing or delisting of the waterbody on the 303(d) List (page 1, Appendix B). Connecticut's 2004 CALM details how a use attainment determination is made.

EPA concludes that the TMDL report provides sufficient detail in the monitoring plan.

## 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.*

### **Assessment:**

CTDEP presents a plan for how these TMDLs will be effectively implemented (pages 6 through 9). Effective nonpoint source watershed management and NPDES stormwater management plans are highlighted as the primary mechanisms by which nonpoint and point sources of *E. coli* will be reduced. DEP's watershed coordinator will provide technical and educational assistance for nonpoint source management, as well as help investigate funding sources for local communities. Stormwater Management Plans required by Connecticut's NPDES MS4 Permit will address minimum control measures and BMPs appropriate to regulated stormwater management. Municipalities are required by Section 6 (K) of the MS4 permit to amend their Stormwater Management Plans within four months of this EPA approval to implement the TMDL (page 8). References to specific EPA and CTDEP guidance on BMP implementation are suggested to assist the municipalities.

EPA acknowledges that the TMDL report includes an implementation plan. EPA does not approve this component of any TMDL submission.

## 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.”*

**Assessment:**

The waters of the Norwalk River Regional Watershed are potentially impaired by a variety of point and nonpoint sources (Table 2, TMDL document and Appendices A-1, A-2 and A-3). Urban point sources of stormwater were not given a less stringent wasteload allocation (WLA) based on an assumption that nonpoint source load reductions (LA) would occur, so a reasonable assurance is not required. However, CTDEP addresses reasonable assurances that point and NPS reductions will occur by providing the following information.

The three municipal wastewater treatment plants are located within the Norwalk River Regional Basin. The municipal treatment plants point sources are currently regulated by NPDES permits that require disinfection of their effluent to reduce indicator bacteria below levels of concern (pages 3 and 7). The municipal discharges of treated and disinfected wastewater are allocated no reduction in the Waste Load Analysis, as present NPDES regulations are in effect. The current disinfection period for the three plants will be extended to include the months of April and October. This change will be made during the next permit renewal for each of the municipal treatment plants. The extension of the disinfection period will be a result of CTDEP’s response to public comment. TMDLs will apply from April 1 to October 31 to account for the public’s recreational use of these waters (page 6). The municipalities will, after permit revisions, be required to disinfect their wastewater to bring indicator bacteria below levels of concern for an additional two months a year.

The two industrial wastewater point sources discharge clean groundwater that was determined not to contain bacteria at levels of concern (page 3). These discharges are not considered potential sources of indicator bacteria and consequently are not allocated a reduction in the Waste Load Analysis. This assessment would be reevaluated if future monitoring data were to suggest the presence of indicator bacteria in these effluents.

Connecticut’s MS4 Permit provides assurance that reductions in *E. coli* loading will occur in urban point sources of stormwater through continued implementation of the NPDES Program. These point sources are reflected in the TMDL analysis within the WLA. The MS4 permit for regulated stormwater discharges requires that communities identify minimum control measures in a Stormwater Management Plan that is submitted to CTDEP. The control measures must include identification of appropriate BMPs and a schedule for implementation before January 8, 2009 (pages 7 and 8). The MS4 permit is a legally enforceable mechanism by which CTDEP can mandate, if necessary, that communities reduce stormwater point source discharges of bacteria (page 11).

Nonpoint source loading from unregulated sources are partitioned into the LA for these TMDLs (page 8, Appendix B). The TMDL report states that DEP’s watershed coordinator will provide assistance to local municipalities and stakeholders as part of the DEP’s nonpoint source program.

BMPs that address nonpoint sources are highlighted for consideration within local watershed management plans (page 9). Suggested BMPs for the Norwalk River Regional Watershed are nuisance wildlife control plans, pet waste ordinances, and septic system testing and maintenance. The Norwalk River Watershed Initiative is an active watershed group that remains active in BMP implementation. Appendix C provides details on the Initiative's accomplishments.

EPA concludes that the TMDL report offers reasonable assurances that the TMDLs will be implemented.

## 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.*

### **Assessment:**

Interested parties and communities were notified of the public comment period by a published Notice of Intent to Adopt A Total Daily Maximum Load Analysis for the Norwalk River Regional Basin located in Fairfield County, Connecticut. The notice was published in the Connecticut Post on July 11, 2005. Eight comment letters were received during the one-month comment period that closed on August 10, 2005. Comments were received from U.S. EPA New England, Town of Wilton, Norwalk River Watershed Association, Norwalk River Watershed Initiative, Mianus Chapter of Trout Unlimited, Vincent Giordano and Dick Harris, Liz Fulton, and Jack and Linda Maxwell. Copies of the comments, the detailed Response to Comments, the public notice and the mailing list were submitted along with the TMDL. Changes were made to the final TMDL in response to public comment. These changes are discussed in detail in CTDEP's Response to Public Comment document. CTDEP recognizes that participation by the public is a necessity when resolving water quality impairments in the State (page 2).

EPA concludes that CTDEP involved the public during the development of the TMDL for the Norwalk River Regional Basin, has provided adequate opportunities for the public to comment on the TMDL, and was responsive to comments from this Agency and the public. EPA concludes that the TMDL report documents a sufficient public participation process.

## 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:**

The letter of submission accompanying the final Mattabesset River Regional Basin TMDL document is dated December 5, 2005. The letter specifies that the TMDL report was established as final on December 1, 2005. CTDEP clearly states that the Final TMDL report has been submitted to EPA for approval in accordance with Section 303(d) of the Clean Water Act. The submittal letter along with the attached public notice provide all the required identifying information for Mattabesset River Regional Basin.

EPA concludes that the TMDL submittal letter provides all the necessary information.

**13. Other Comments:**

Appendix A provides all the identifying information and data relied upon to develop the TMDL for each waterbody. The data tables and graphs depict how the cumulative distribution function method (Appendix B) was applied for each of the 8 segments of two rivers and one brook in the Norwalk River Regional Basin.

**Data for entry in EPA's National TMDL Tracking System & Region 1 TMDL Webpage  
Version (6/27/05)**

TMDL Name *	A Total Maximum Daily Load Analysis for the Norwalk River Regional Basin	
Water body segment names(s)	<u>Norwalk River</u> (segment ID #s CT7300-00_01, CT7300-00_02, CT7300-00_03, CT7300-00_04, and CT7300-00_05) <u>Ridgefield Brook</u> (segment ID #s CT7300-02_01 and CT7300-02_02) <u>Silvermine River</u> (segment ID # CT7302-00_01)	
List ID (from system)		
Number of TMDLs *	10	
Lead State	Connecticut (CT)	
TMDL Status	Final	
Pollutant ID(s)	<i>E. coli</i> (227)	
TMDL End Point	<u>Norwalk River segment</u> <b>Average % reduction in <i>E.coli</i></b> CT7300-00_01 (at location 435) 72% CT7300-00_01 (at location 704) 76% CT7300-00_01 (at location 990) 58% CT7300-00_02 38% CT7300-00_03 5% CT7300-00_04 54% CT7300-00_05 39% <u>Ridgefield Brook</u> CT7300-02_01 51% CT7300-02_02 51% <u>Silvermine River</u> CT7302-00_01 66%	
TMDL Type	Nonpoint	
Point source ID (permit) #s	Redding-Georgetown CT0101770 Ridgefield Main CT0100854 Ridgefield Route 7 CT0101451 Elinco-Kellogg Deering CT0027111 P.E. Corporation CT0024457	
Impairment ID(s) (from system)	<i>E. coli</i> (227)	
Cycle (list date)	2004	
Establishment Date (approval) *	February 16, 2006	
EPA Developed	No	
Towns affected *	Norwalk, Wilton, Weston, Redding, Ridgefield, and New Canaan, Connecticut	

\* = data needed for Region 1 "Approved TMDLs" web page