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

September 20, 2012

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 **A Statewide Total Maximum Daily Load Analysis for Bacteria Impaired Waters** for indicator bacteria (Enterococcus, *Escherichia coli*, and fecal coliform). These 180 bacteria impaired waterbodies were included on Connecticut's 2010 303(d) List as priority waters for TMDL development. 183 TMDL analyses for the 180 segments were submitted to EPA for approval.

The U.S. Environmental Protection Agency (EPA) hereby approves Connecticut's TMDL submission. The TMDL package was submitted to EPA via Email on September 19, 2012. A number of comments were received by CTDEEP during the public participation process, and the State's responses to them are included in the TMDL report. 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.

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 Steve Silva at (617) 918-1561 or have your staff contact Steven Winnett at (617) 918-1687. Thank you very much.

Sincerely,

/s/

Stephen S. Perkins, Director
Office of Ecosystem Protection

cc with attachment:
Denise Ruzicka, CT DEEP
Rob Hust, CT DEEP
Traci Iott, CT DEEP
Chris Sullivan, CT DEEP
Steve Silva, EPA
Steven Winnett, EPA
Mary Garren, EPA

Table 4-1: Freshwater Segments Included in this TMDL Report (reproduced from CT's Statewide Bacteria TMDL with permission of CT DEEP).

Waterbody Segment ID #	Waterbody	WQ Class	Waterbody Towns
CT1004-00_01	Shunock River	A	North Stonington
CT2000-30_01	Fenger Brook	A	New London
CT2206-00_01	Bride Brook	A	East Lyme
CT2206-00_02	Bride Brook	A	East Lyme
CT2206-03_01	Bride Brook	A	East Lyme
CT3000-08_01	Thames River / Flat Brook	A	Ledyard
CT3004-00_01	Oxoboxo Brook	B	Montville
CT3100-00_06	Willimantic River	B	Stafford
CT3100-17_03	Willimantic River / Cedar Swamp Brook	A	Mansfield
CT3100-19_02	Willimantic River / Eagleville Brook	A	Mansfield
CT3102-00_01	Middle River	B	Stafford
CT3102-00_02	Middle River	A	Stafford
CT3103-00_01	Furnace Brook	B	Stafford
CT3103-00_02	Furnace Brook	B	Stafford
CT3106-00_01b	Skungamaug River	A	Tolland
CT3106-06-1-L2_01	Skungamaug River / Crandall Pond	A	Tolland
CT3108-00_01b	Hop River	A	Andover, Coventry, Bolton
CT3110-00_01	Tenmile River	A	Lebanon
CT3200-00_01	Natchaug River / Lauter Park Beach	A	Windham, Chaplin, Eastford
CT3206-00_02	Mount Hope River	AA	Ashford, Mansfield
CT3207-16-1-L1_01	Fenton River / Bicentennial Pond	A	Mansfield
CT3300-00_01	French River / Long Branch Brook	B	Thompson
CT3500-00_03	Moosup River	B	Plainfield, Sterling
CT3708-01_01	Little River / Muddy Brook	AA	Woodstock
CT3708-08_01	Little River / Peckham Brook	AA	Woodstock
CT3710-00_02	Mashamoquet Brook	A	Pomfret
CT3710-00_01	Mashamoquet Brook	A	Pomfret
CT3710-11_01	Mashamoquet Brook / Abington Brook	A	Pomfret
CT3710-13_01	Mashamoquet Brook / Sap Tree Run	A	Pomfret
CT3710-18_01	Mashamoquet Brook / White Brook	A	Pomfret, Brooklyn
CT3716-00_01	Broad Brook	A	Preston
CT3800-00_05	Shetucket River	B	Norwich, Scotland, Sprague, Windham
CT3800-02_01	Shetucket River / Obwebetuck Brook	A	Windham, Lebanon
CT4000-00_01	Connecticut River	B	Suffield, Enfield, Windsor, Windsor Locks, South Windsor, East Hartford
CT4000-00_03	Connecticut River	B	Glastonbury, Wethersfield, Hartford
CT4009-00-2-L4_01	Roaring Brook / Angus Park Pond	A	Glastonbury

CT4101-00_01	Muddy Brook	A	Suffield
CT4205-00_01	Buckhorn Brook	A	Enfield
CT4206-00_01	Broad Brook	A	East Windsor
CT4206-00_02	Broad Brook	A	East Windsor, Ellington
CT4300-00_02	Farmington River	B	East Granby, Simsbury, Avon, Farmington
CT4300-32_01	Farmington River / Minister Brook	A	Simsbury
CT4300-33_01	Farmington River / Russell Brook	A	Simsbury
CT4300-39_01	Farmington River / Owens Brook	A	Simsbury
CT4300-44_01	Farmington River / Munnisunk Brook	A	Simsbury, Granby
CT4302-00_01	Mad River	B	Winchester, Norfolk
CT4302-00_02a	Mad River	A	Winchester, Norfolk
CT4302-00_03	Mad River	AA	Winchester, Norfolk
CT4303-00_02	Still River	B	Winchester, Colebrook, Torrington
CT4303-00_03	Still River	B	Winchester, Colebrook, Torrington
CT4303-00_04	Still River	A	Winchester, Colebrook, Torrington
CT4304-00_01a	Sandy Brook	B	Colebrook, Norfolk
CT4305-00_01	Morgan Brook	A	Barkhamsted
CT4305-00_02	Morgan Brook	A	Barkhamsted
CT4305-00_04	Morgan Brook	A	Barkhamsted
CT4309-00_01	Cherry Brook	A	Canton
CT4309-00_02	Cherry Brook	A	Canton
CT4316-00_02	Thompson Brook	A	Avon
CT4317-00_01	Nod Brook	A	Avon, Simsbury
CT4318-00_01	Hop Brook	A	Simsbury
CT4319-00_01a	West Branch Salmon Brook	A	Granby, Hartland
CT4319-00_01b	West Branch Salmon Brook	A	Granby, Hartland
CT4321-00_01	Mill Brook	A	Windsor, Bloomfield
CT4400-00_01	Park River	B	Hartford
CT4400-01_01	S Branch Park River	B	Hartford
CT4400-01_02	S Branch Park River	B	Hartford
CT4402-00_01	Piper Brook	B	West Hartford
CT4402-00_02	Piper Brook	B	West Hartford, New Britain
CT4403-00_01	Trout Brook	A	West Hartford
CT4403-00_02	Trout Brook	A	West Hartford
CT4403-00_03	Trout Brook	A	West Hartford
CT4404-00_01	N Branch Park River	A	Hartford
CT4404-00_02	N Branch Park River	A	Bloomfield, Hartford, West Hartford
CT4600-27_trib_01	Mattabesset River/ Willow Brook East Branch	A	Cromwell
CT4607-00-UL_pond_01	Coginchaug River / Wadsworth Falls SP pond	A	Middletown, Middlefield
CT4607-08_01	Coginchaug River / Lyman Meadows Brook	A	Middletown, Middlefield

CT4607-13_01	Coginchaug River / Laurel Brook	A	Middletown, Middlefield
CT4800-00_01	Eightmile River	A	Lyme, East Haddam
CT5105-00_01	Chatfield Hollow Brook	A	Killingworth
CT5107-00_01	Neck River	A	Madison
CT5108-00_01	East River	A	Guilford
CT5112-00_01	Farm River	A	East Haven, North Branford
CT5112-00_02	Farm River	AA	East Haven, North Branford
CT5202-00-1-L3_01	Tenmile River / Mixville Pond	A	Cheshire
CT5302-00_02	Mill River	AA	Hamden, Cheshire, North Haven
CT5302-06_01	Mill River / Shepard Brook	AA	Hamden, Cheshire, North Haven
CT5305-00_01	West River	A	New Haven
CT5305-00-3-L1_01	Edgewood Park Pond	A	New Haven
CT5307-00_01	Wepawaug River	A	Milford, Orange, Woodbridge
CT5307-00_02	Wepawaug River	A	Milford, Orange, Woodbridge
CT5307-00_03	Wepawaug River	A	Milford, Orange, Woodbridge
CT5307-00_04	Wepawaug River	AA	Milford, Orange, Woodbridge
CT5307-00_05	Wepawaug River	AA	Milford, Orange, Woodbridge
CT6000-00_06	Housatonic River	B	Cornwall, Kent, Salisbury
CT6000-00-5+L2_01	Housatonic River /Lake Zoar	B	Southbury
CT6000-00-5+L4_01	Housatonic River / Lake Housatonic	B	Shelton
CT6000-73_01	Housatonic River / Curtiss Brook	AA	Shelton
CT6025-00_02	Farmill River	B	Stratford, Shelton
CT6100-00_02a	Blackberry River	B	North Canaan, Norfolk
CT6200-00_01	Hollenbeck River	A	Canaan
CT6302-00_02	Mill Brook	A	Sharon
CT6700-20_01	Shepaug River / Walker Brook	AA	Washington, Roxbury, New Milford
CT6705-00_01	Bantam River	AA	Morris, Litchfield
CT6800-00_03	Pomperaug River	A	Southbury, Woodbury
CT6800-01_01	Pomperaug River	B	Southbury, Woodbury
CT6804-00_01	Weekeepeemee River	A	Woodbury, Bethlehem
CT6900-28_01	Naugatuck River / Hockanum Brook	A	Beacon Falls
CT6914-06-1-L1_01	Mad River / Hitchcock Lake	A	Waterbury, Wolcott
CT6914-06_01	Mad River / Lilly Brook	A	Waterbury
CT7000-22_01	Indian River	A	Westport
CT7000-22_02	Indian River	A	Westport
CT7102-00_02	Bruce Brook	B	Stratford, Bridgeport
CT7105-00_05	Pequonnock River	A	Bridgeport, Trumbull
CT7105-00_02	Pequonnock River	A	Bridgeport, Trumbull
CT7105-00_03	Pequonnock River	A	Bridgeport, Trumbull
CT7105-00_04	Pequonnock River	A	Bridgeport, Trumbull
CT7105-01_01	West Branch Pequonnock River	A	Bridgeport, Trumbull

CT7109-00-trib_01	Sasco Brook / Great Brook	A	Fairfield
CT7109-06_01	Sasco Brook / Great Brook	A	Fairfield
CT7109-02_01	Sasco Brook / Unnamed Tributary	A	Fairfield
CT7109-06_02	Sasco Brook / Great Brook	A	Fairfield
CT7200-22_01	Saugatuck River / Beaver Brook	A	Weston
CT7200-24_01	Saugatuck River / Kettle Creek	A	Weston
CT7200-26_01	Saugatuck River / Poplar Plain Brook	A	Westport
CT7203-04_01	West Branch Saugatuck River / Cobbs Mill Brook	A	Weston
CT7302-00_02	Silvermine River	A	Norwalk
CT7401-00_02	Fivemile River	B	New Canaan
CT7401-00_01	Fivemile River	B	New Canaan
CT7401-00_03	Fivemile River	A	New Canaan
CT7401-02_01	Fivemile River / Unnamed Tributary	A	New Canaan
CT7401-05_01	Fivemile River / Holy Ghost Father's Brook	A	Norwalk
CT7401-06_01	Fivemile River / Keelers Brook	A	Norwalk
CT7401-07_01	Fivemile River / Unnamed Tributary to Keelers Brook	A	Norwalk
CT7411-00_01	Byram River	B	Greenwich

Table 4-2: Saltwater Segments Included in this TMDL Report (reproduced from CT's Statewide Bacteria TMDL with permission of CT DEEP).

Waterbody Segment ID #	Waterbody	WQ Class	Waterbody Towns
CT-W1_013-SB	LIS WB Inner - Norwalk Harbor (Marvin Beach)	SB	Norwalk
CT-W2_011	LIS WB Shore - Canfield Island	SA	Westport
CT-W2_012	LIS WB Shore - Outer Norwalk Harbor(East)	SA	Norwalk
CT-W2_013	LIS WB Shore - Outer Norwalk Harbor(West)	SA	Norwalk
CT-W2_014	LIS WB Shore - Wilson Cove, Farm Creek	SA	Norwalk
CT-W3_008-I	LIS WB Midshore - Norwalk Islands	SA	Westport, Norwalk
CT-W1_022-SB	LIS WB Inner - Byram River	SB	Greenwich
CT-W2_018	LIS WB Shore - Westcott Cove	SA	Stamford
CT-W2_019	LIS WB Shore - Stamford Harbor	SA	Stamford
CT-W2_020	LIS WB Shore - Stamford Harbor (West)	SA	Stamford
CT-W2_021	LIS WB Shore - Greenwich Cove	SA	Greenwich
CT-W2_022	LIS WB Shore - Cos Cob Harbor	SA	Greenwich
CT-W2_024	LIS WB Shore - Byram Harbor	SA	Greenwich

CT-W2_025	LIS WB Shore - Byram Harbor (West)	SA	Greenwich
CT-W3_011	LIS WB Midshore - Outer Westcott Cove	SA	Stamford
CT-W3_012	LIS WB Midshore - Outer Stamford Harbor	SA	Stamford, Greenwich
CT-W3_015-I	LIS WB Midshore - Captain Harbor	SA	Greenwich
CT-W2_015	LIS WB Shore - Fivemile River Estuary	SA	Norwalk, Darien
CT-W2_016	LIS WB Shore - Scott Cove	SA	Darien
CT-W2_017	LIS WB Shore - Darien Cove	SA	Darien, Stamford
CT-W3_009	LIS WB Midshore - Outer Fivemile River Estuary	SA	Norwalk, Darien
CT-W3_010	LIS WB Midshore - Outer Cove Harbor	SA	Darien, Stamford
CT-W1_005	LIS WB Inner - Southport Harbor	SA	Fairfield
CT-W1_008	LIS WB Inner - Sherwood Millpond	SA	Westport
CT-W1_010-SB	LIS WB Inner - Saugatuck River (Mouth)	SB	Westport
CT-W2_006	LIS WB Shore - Southport Harbor (East)	SA	Fairfield
CT-W2_007	LIS WB Shore - Southport Harbor (West)	SA	Fairfield
CT-W2_009	LIS WB Shore - Compo Cove, SISP	SA	Westport
CT-W2_010	LIS WB Shore - Compo Beach, Cedar Point	SA	Westport
CT-W3_005	LIS WB Midshore - Southport Harbor	SA	Fairfield, Westport
CT-W3_006	LIS WB Midshore - Sherwood Point	SA	Westport
CT-C1_018-SB	LIS CB Inner - Milford Harbor & Gulf Pond	SB	Milford
CT-C1_019-SB	LIS CB Inner - Housatonic River (Mouth)	SB	Milford
CT-C2_023	LIS CB Shore - Walnut Beach	SA	Milford
CT-C3_017	LIS CB Midshore - Milford	SA	Milford, West Haven
CT-C3_019-I	LIS CB Midshore - Outer Silver Sand Beach	SA	Milford

CT-C3_020	LIS CB Midshore - Milford Point	SA	Milford
CT-C1_013-SB	LIS CB Inner - New Haven Harbor	SB	New Haven
CT-W1_001-SB	LIS WB Inner - Bridgeport Harbor	SB	Bridgeport
CT-W1_002-SB	LIS WB Inner - Black Rock Harbor	SB	Bridgeport
CT-W2_004	LIS WB Shore - Outer Bridgeport Harbor	SA	Fairfield
CT-W3_001	LIS WB Midshore - Lordship	SA	Stratford
CT-W3_002	LIS WB Midshore - Bridgeport Harbor (East)	SA	Stratford, Bridgeport
CT-W3_003	LIS WB Midshore - Bridgeport Harbor (West)	SA	Bridgeport
CT-W3_004	LIS WB Midshore - Shoal Point	SA	Bridgeport, Fairfield

The Connecticut Statewide Bacteria TMDL documents, including the 78 segment-specific appendices, can be found at the following address:

http://www.ct.gov/dep/cwp/view.asp?a=2719&q=505808&depNav_GID=1654

EPA NEW ENGLAND'S TMDL REVIEW

TMDL: Connecticut Statewide Bacteria TMDL

STATUS: Final

IMPAIRMENT/POLLUTANT: These one hundred eighty (180) water body segments are not meeting their designated uses of recreational use based on violations of the State's water quality criteria for freshwater Classes AA, A, B, SA and SB. Sources include both point and nonpoint sources. One hundred eighty three (183) TMDLs are established in terms of concentrations and daily loads for *Escherichia coli* (*E.coli*), *Enterococcus* and fecal coliform bacteria, depending on resource type, waterbody classification, and the data available.

BACKGROUND: The Connecticut Department of Energy and Environmental Protection (DEEP) submitted a draft TMDL to EPA Region 1 and the public on June 29, 2012. A public comment period was held from July 2 to August 2, 2012. EPA sent DEEP comments on July 23 and August 2, 2012. DEEP submitted to EPA Region 1 the final *Connecticut Statewide Bacteria TMDL* with a transmittal letter dated September 19, 2012. In addition to the main TMDL report itself ("Core" document), the submittal included the following documents:

- TMDL report Appendices 2-79, Waterbody Reports (segment-specific information and bacteria data).
- TMDL report Appendix 1, *TMDLs Expressed as Daily Loads.*
- TMDL report, *Response to Comments Document*.
- Extensive list of best management practices for stormwater management and source-specific discharges (TMDL, Section 6).

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

REVIEWER: Steven Winnett (617-918-1687) e-mail: winnett.steven@epa.gov

REVIEW ELEMENTS OF TMDLs

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. § 130 describe the statutory and regulatory requirements for approvable TMDLs. The following information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation.

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

The TMDL analytical document must identify the waterbody as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the waterbody. The TMDL submittal must include a description of the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and, (4) explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments, or chlorophyll a and phosphorus loadings for excess algae.

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

The TMDL document addresses a total of 180 bacteria-impaired segments listed in Connecticut's 2010 303(d) list, including 125 river and stream segments, 9 lakes and ponds, and 46 saltwater segments. These 180 segments are located in 7 of Connecticut's 8 major watersheds (TMDL, Figure 4-1 and Table 8-1). Tables 4-1 and 4-2 of the TMDL document list each impaired water segment, including each waterbody's name and assessment unit identifier, classification, location, and size. Their impairments and location by major watershed are given in Table 8-2.

A state-wide map, as well as the lists of impaired waterbodies and locations, are presented in the main body of the TMDL report, and site-specific maps and data are provided in the appendices (appendices are organized by subregional basin). Connecticut's 2010 303(d) list indicates priority dates for development of TMDLs for these water bodies in 2012.

B. Pollutant of Concern

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

C. Pollutant Sources

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

sector industrial permit), accidental and illicit discharges, combined sewer overflows, and discharges from boats. Potential non-point sources of bacterial pollution include stormwater not regulated under the NPDES program, septic systems, pet waste, wildlife wastes, agriculture, and recreational uses (swimmers). Actual segment-specific sources of bacterial pollution are identified in the watershed appendices when these sources are known.

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

In addition, EPA notes that this TMDL document may apply to waters found to be impaired by bacteria in the future, provided that DEEP's intent to add more impaired waters to the TMDL is made clear, the public has an opportunity to provide comments, and EPA approves the proposed additional TMDLs. In appropriate circumstances in the future, DEEP may submit additional TMDLs to EPA for specific waterbodies to be added for coverage under the statewide bacteria TMDL document. The State will need to either provide public notice for review of the additional TMDLs alone, or as part of the public notice process associated with the biannual review of the State's Section 303(d) list in its *Integrated Water Quality Report* (as suggested in Section 5.4 of the TMDL document). Within the Integrated Report and in its public notice requesting review and comment, DEEP will need to clearly state its intent to list the newly assessed waterbodies as impaired and to apply the appropriate waterbody-specific bacteria TMDLs. The State will not need to resubmit the approved Core document at such times. Rather, it should reference the document and update certain waterbody-specific information contained in this original Core document in the introductory materials of its submission. DEEP should also provide the same type of detailed information on the additional impaired waterbodies and their TMDLs as are contained in the appendices that accompany this original submission.

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

The TMDL submittal must include a description of the applicable State/Tribe water quality standard, including the 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 TMDL report defines the appropriate water quality criteria for reducing public health risk from waterborne disease-causing organisms, for protecting designated recreation, shellfishing and drinking water uses, and for implementing the antidegradation policy (TMDL, Section 3). 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, bacteria-impaired waters are classified as AA, A, and B for fresh waters, and SA and SB for salt waters. *E.coli* bacteria is the indicator organism for fresh water, *Enterococcus* bacteria for recreational use in salt waters, and fecal coliform is the indicator organism for shellfish growing and harvesting areas (tidal waters)

following the standards developed under the National Shellfishing Sanitation Program (NSSP) by the United States Food and Drug Administration. Total coliform bacteria are used as the indicator for drinking water.

Connecticut's water quality criteria for bacteria are used as the numeric water quality targets for the bacteria TMDLs (TMDL, Section 3). The numeric targets vary depending on the specific waterbody's use (i.e., recreation, shellfish consumption, or drinking water), waterbody classification (AA, A, B, SA, SB), whether it has a designated beach, and whether it is fresh or salt water. The criteria used as water quality targets are listed in Table 3-2 of the TMDL report.

Assessment: EPA concludes that DEEP has properly described and interpreted the applicable water quality standards (TMDL, Section 3) to set the TMDL targets. Connecticut DEEP is directly applying the numeric criteria in its water quality standards as the TMDL targets.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

As described in EPA guidance, a TMDL identifies the loading capacity of a waterbody for a particular pollutant. EPA regulations define loading capacity as the greatest amount of loading that a water can receive without violating water quality standards (40 C.F.R. § 130.2(f)). The loadings are required to be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. § 130.2(i)). The TMDL submittal must identify the waterbody's loading capacity for the applicable pollutant and describe the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In most instances, this method will be a water quality model. Supporting documentation for the TMDL analysis must also be contained in the submittal, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation.

In many circumstances, a critical condition must be described and related to physical conditions in the waterbody as part of the analysis of loading capacity (40 C.F.R. § 130.7(c)(1)). The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet water quality standards. Critical conditions are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards.

Connecticut's bacteria TMDLs consist of two formats of targets for allowable levels of bacteria: (1) concentrations of bacteria, expressed as bacteria counts/100 ml of water, and (2) loads of bacteria, expressed as billions of bacteria/day (TMDL, Section 5.1 and Appendix 1). DEEP considers both formats to be daily targets because the targets apply on any given day whenever the water quality standards are in effect in order to assure achievement of bacteria water quality criteria. Both formats express targets designed to attain the designated uses of recreation and shellfishing, and to meet the associated criteria in Connecticut's water quality standards. Connecticut DEEP considers the concentration-based TMDL targets to be most useful for guiding implementation of bacteria controls because those targets are easy to understand, and achievement of those targets is more readily assessed by groups with limited resources (TMDL, Section 5.2).

Connecticut's water quality criteria for bacteria apply year round at all times. By setting the TMDL targets equal to the bacteria criteria, the TMDLs are applicable at all times and are therefore protective of water quality under all conditions and seasons. Achievement of those

water quality goals will be assessed by ambient water quality monitoring.

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 the goal will be assessed by ambient water quality monitoring.

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 target loading capacities expressed in the TMDL document are set at levels which assure WQS will be met (criteria at point of discharge). The concentration loading capacity is based on the concentration criteria for each water body. If all sources of pathogens are at or below the water quality criteria, then it follows that the receiving water will meet the WQS for bacteria. 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).

EPA's November 15, 2006 guidance entitled "Establishing TMDL 'Daily' Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, et al., No.05-5015, (April 25, 2006) and Implications for NPDES Permits," recommends that TMDL submittals express allocations in terms of daily time increments. While this decision provides some flexibility on the use of the daily time increment, EPA believes that the Connecticut statewide bacteria TMDL document nevertheless expresses TMDL targets on a daily basis. This is because the TMDL targets apply on any given day whenever the water quality standards are in effect.

In summary, the loading capacity 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 addressed by this TMDL report. In addition, EPA concludes that the TMDL 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 allocated based on the criteria established by Connecticut's water quality standards, or are set at zero for prohibited discharges (TMDL Section 5.2.1, Tables 5-1, 5-2, and 5-3).

Assessment: As discussed in Section 5 of this document (under loading capacity), DEEP used the applicable numeric water quality criteria directly related to the use-impairment which the TMDL is designed to address. As discussed in Section 5.2.1 of this document (under Concentration TMDLs), DEEP set conservative targets based on meeting criteria at the point of source discharge. EPA concludes that the load allocations for bacteria are adequately specified in the TMDLs at levels necessary to attain and maintain water quality standards.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 C.F.R. § 130.2(h)). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable water quality standard, and all point sources will be removed.

In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. But it is necessary to allocate the loading capacity among individual point sources as necessary to meet the water quality standard.

The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the State/Tribe will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.

As with the load allocations (LAs), the wasteload allocations (WLAs) are allocated based on the criteria established by Connecticut's water quality standards (TMDL Section 5.2.1, Tables 5-1, 5-2, and 5-3). For example, point sources such as stormwater regulated under the NPDES program ("NPDES-stormwater") are allocated at a geomean of 126 colonies/100 ml *E. coli* for Class B freshwaters, and discharges of untreated wastewater are given an allocation of zero because these discharges are prohibited. Specific TMDL end point targets are listed for each impaired waterbody in Table 8.2 of the core TMDL document and Appendices 2-79, as are the estimated percent reductions needed to reach the TMDL target for each waterbody.

Assessment: 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 EPA concludes that the wasteload allocation components of the TMDLs are adequately specified at levels necessary to attain and maintain water quality standards in all the waterbodies.

6. Margin of Safety (MOS)

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

the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

The Connecticut bacteria TMDLs provide implicit margins of safety based on conservative assumptions incorporated into the TMDL analysis (Section 5.2 of the TMDL document). The TMDL 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 TMDL 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.

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

Assessment: EPA concludes that the approach used in developing the concentration-based TMDLs provides for an adequate implicit MOS. There is not a lack of knowledge concerning the relationship between allocations and water quality in this case, where the TMDL applies the criteria as allocations for each source. Setting the concentration TMDL targets at the water quality criteria, with the goal of meeting those criteria at the point of discharge with no allowance for in-stream 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)).

Connecticut DEEP considered seasonal variations when developing the TMDL document. Because the TMDLs are set equal to the bacteria criteria, and the criteria are applicable at all times of year, the TMDLs are also applicable at all times of year and protective during all conditions (TMDL, 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 Connecticut statewide bacteria TMDL report is not a phased TMDL document, but the document includes recommendations for monitoring by permittees as part of their permit obligations to conduct sampling data designed to measure attainment of water quality standards (TMDL, Section 5.6). DEEP will continue to monitor rivers and streams through its probabilistic monitoring program and its beaches through its HEALTH Bathing Beach Inspection Program, which collects bacteria samples from recreational beaches to determine safe swimming conditions. DEEP will also continue to do some targeted monitoring and sampling trips. The section also contains recommendations for other agencies and groups who may be interested in conduction monitoring in the state.

Assessment: EPA concludes that the anticipated monitoring by and in cooperation with 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 TMDL report provides implementation guidance and identifies existing informational resources on BMPs to address the various sources of 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 Appendices 2-79 to inform stakeholders on the location of known impairments. 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, 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, Connecticut 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 (TMDL, Section 5.7).

Assessment: Although not required, because DEEP did not increase WLAs based on expected LA reductions, 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.

The public participation process for the bacteria TMDLs is described on Section 5.8 and the Response to Public Comments section of the TMDL report. On June 29, 2012, a public notice was released announcing the availability of the draft TMDL for public review and notice was posted on the DEEP website, and emails were sent to a list of agencies, towns, and stakeholders. DEEP held a public meeting on July 17, 2012 to present the draft TMDLs to the public, attended by approximately 45 people. The public comment period began on July 2, 2012 and ended on August 2, 2012. Comments were received from five Connecticut towns, two local river and watershed groups, CT's Department of Public Health, CT DEEP's Water Permitting and

Enforcement Division, and EPA Region 1. A complete list of all comments received and the DEEP responses to those comments can be found in Response to Comments Document included in the TMDL report.

Assessment: EPA concludes that 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 19, 2012, DEEP submitted Connecticut's final Statewide Bacteria TMDL and associated appendices for EPA approval. The final documents contained all of the elements necessary to approve the TMDL.