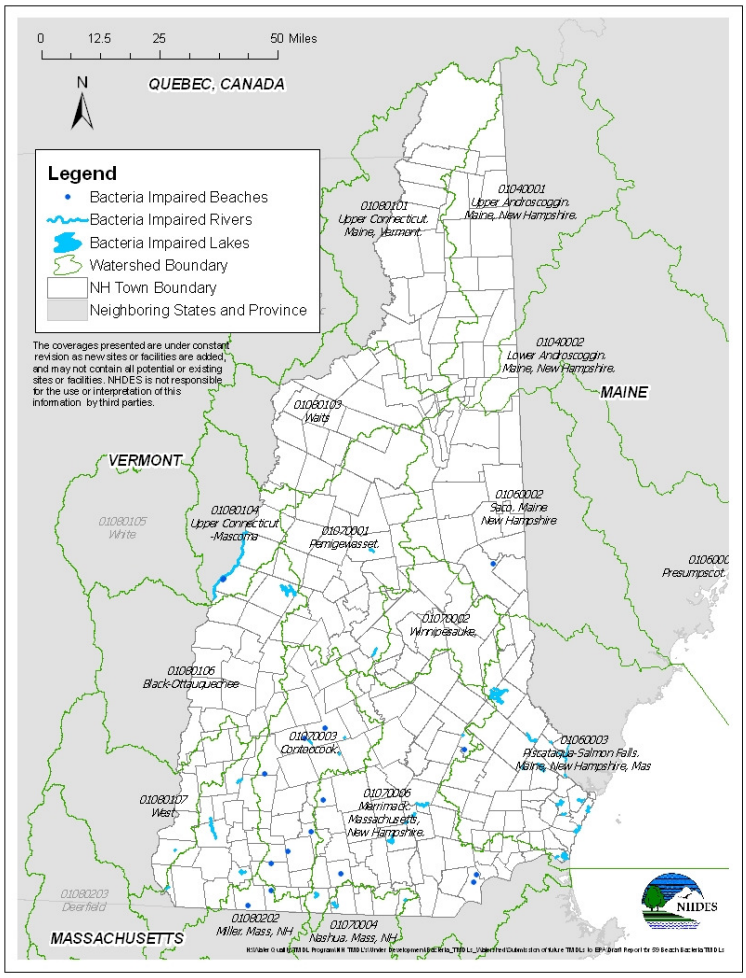
Final Report

Total Maximum Daily Load (TMDL) Report for 58 Bacteria Impaired Waters in New Hampshire



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State of New Hampshire

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Water Division

Watershed Management Bureau

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NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Final Report

Total Maximum Daily Load (TMDL) Report for 58 Bacteria Impaired Waters in New Hampshire

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1. INTRODUCTION

1.1 Overview of 303(d) List and TMDLs

Section 303(d) of the Federal Clean Water Act (CWA) and Federal Water Quality Planning and Management Regulations (40 CFR Part 130) require states to place waterbodies that do not meet established water quality standards (WQS) on a list of impaired waterbodies, commonly referred to as the 303(d) List. In New Hampshire, the Department of Environmental Services (DES) is responsible for the 303(d) Listing process. The 303(d) List is updated, issued for public comment and submitted to the U.S. Environmental Protection Agency (USEPA) for approval every two years. The 303(d) List includes surface waters that: (1) are impaired or threatened by one or more pollutants; (2) are not expected to meet water quality standards even after implementation of technology-based controls; and (3) require a Total Maximum Daily Load (TMDL) study for the pollutant(s) causing the impaired or threatened status. In general, surface waters on the 303(d) list can only be removed once a TMDL is conducted and approved by the USEPA, if there is sufficient evidence showing the waterbody is meeting water quality standards or if the reasons for listing the waterbody as impaired were found to be in error.

A TMDL establishes the allowable loadings for specific pollutants that a waterbody can receive without exceeding water quality standards. Water quality standards include numeric and narrative criteria that must be met to protect the uses of the surface water such as swimming, boating, aquatic life, and fish/ shellfish consumption. The TMDL process maps a course for states and watershed stakeholders to follow that should lead to restoration of the impaired water and its uses.

1.2 Purpose of this Report

On September 21, 2010 the New Hampshire Department of Environmental Services (DES) received approval from the (USEPA) of a statewide total maximum daily load (TMDL) report for bacteria impaired waters[1] (the Statewide Bacteria TMDL). Bacterial contamination can render surface waters[2] unsuitable for uses such as swimming and shellfish consumption and may result from a variety of sources including human waste, excrement from barnyard animals, pet feces, and agricultural applications of manure.

The purpose of the Statewide Bacteria TMDL was to :

1. Provide documentation of impairment in each impaired waterbody segment;

2. Determine the TMDLs that will achieve water quality standards;

3. Provide an estimate of the reductions necessary to achieve the TMDLs;

[1] Final Report New Hampshire Statewide Total Maximum Daily Load . Prepared by F.B. Environmental Associates, Inc. for the New Hampshire Department of Environmental Services. September, 2010. A copy may downloaded from http://des.nh.gov/organization/divisions/water/wmb/tmdl/categories/publications.htm.

[2] Surface waters are defined in Env-Wq 1702.46 (http://des.nh.gov/organization/commissioner/legal/rules/index.htm#waterq). Examples of surface waters include rivers, streams, lakes, ponds, tidal waters and certain wetlands.

4. Provide a framework and tools to help communities, watershed groups, and other stakeholders to implement the TMDL in a phased approach that will ultimately result in attainment of water quality standards.

5. Provide a framework for future bacteria TMDLs.

The Statewide Bacteria TMDL specifically addressed 379 bacteria impaired surface water segments (called assessment units or AUs) that were on the 2008 303(d) List of impaired waters. Since then, the 2010 303(d) list has been prepared which includes an additional 58 bacteria impaired AUs. The purpose of this document is to provide TMDLs for the 58 bacteria impaired AUs. A complete list of all 58 impaired AUs on the 2010 303(d) List is provided in Table 2-1 of this report.

Table 1-1 and Figure 1-1 show the number of bacteria impaired surface waters in each HUC-8 (Hydrologic Unit Code 8) watershed. As shown, the 58 impaired AUs are spread among 11 of the 16 HUC 8 watersheds in New Hampshire. In the Salmon Falls-Piscataqua Rivers Watershed, one of the 58 segments is impaired due to two different types of bacteria and is listed twice in Table 2-1. Therefore, the total number of water quality impairments (and therefore TMDLs) addressed by this document is 59.

Table 1-1: Number of Bacteria Impaired AUs on the NH 2010 303(d) List

HUC 8 Watershed ID Number	HUC 8 Watershed Name	Number of Impaired Beach AUs	Number of Impairments
01060002	Saco River	1	1
01060003	Salmon Falls-Piscataqua Rivers	21	22
01070001	Pemigewasset River	2	2
01070003	Contoocook River	9	9
01070004	Nashua River	2	2
01070006	Merrimack River	12	12
01080104	Connecticut River-Waits River to White River	3	3
01080106	Connecticut-White River to Bellows Falls	1	1
01080107	Connecticut-Bellows Falls To Vernon Dam	1	1
01080201	Connecticut-Ashuelot River-Vernon Dam to Millers River	4	4
01080202	Connecticut River-Millers River	2	2
TOTAL		**58**	**59**

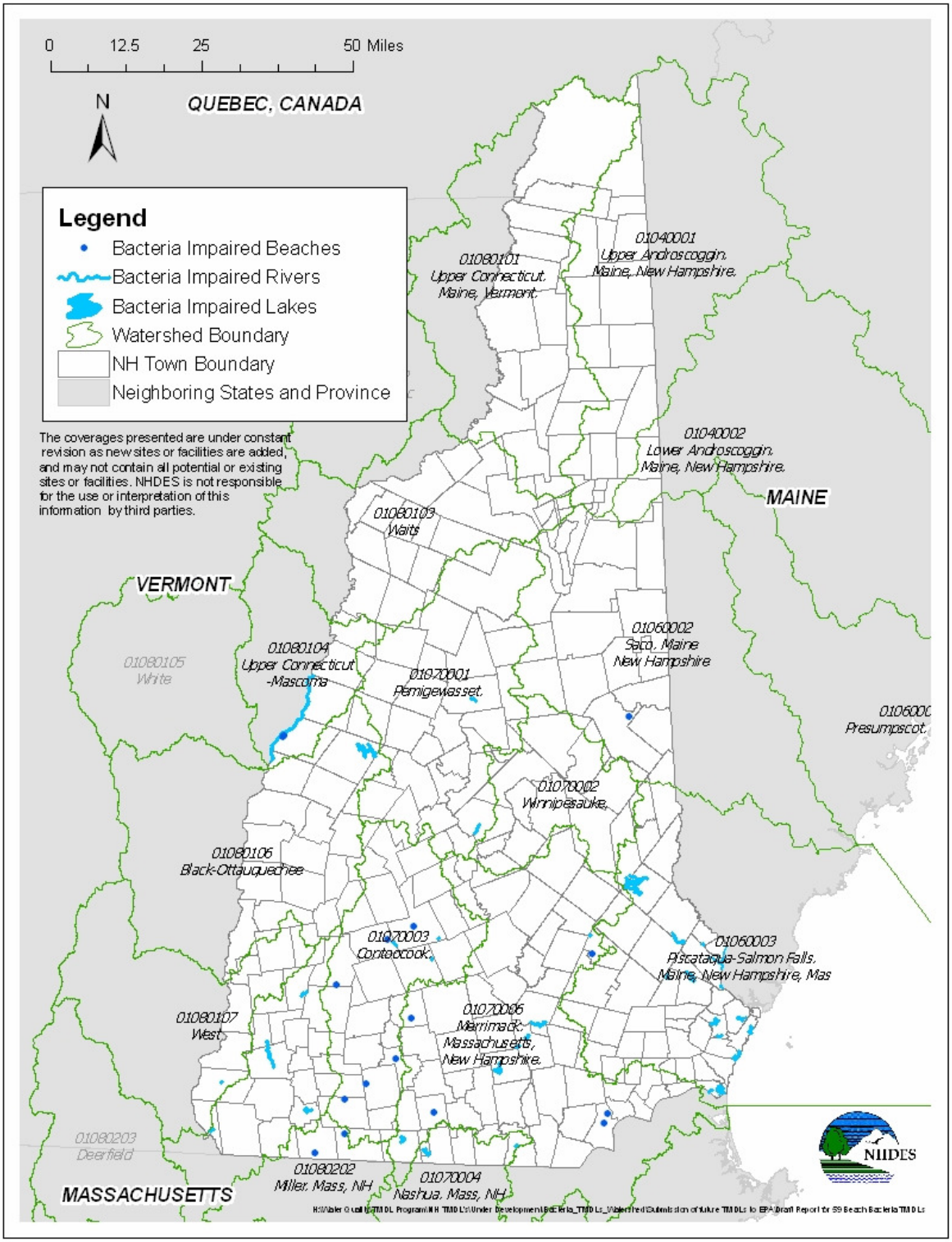

Figure 1-1: Map of 2010 Bacteria Impaired Waters on the NH 2010 303(d) List by HUC 8 Watershed.

1.3 Where to Find TMDL Information for the 58 Impaired AUs

This report for 59 bacteria TMDLs on 58 bacteria impaired AUs serves as an extension of the approved Statewide Bacteria TMDL. As such it relies, in part, on portions of the Statewide Bacteria TMDL to satisfy federal TMDL requirements. A list of the various TMDL elements and where they are addressed is provided in Table 1-2.

Table 1-2: Where to Find Information for Each TMDL Element

TMDL Element	Where to find this information
Water Quality Standards for Bacteria **-** Includes an overview of potential pathogenic impacts of bacteria; the selection of indicator bacteria to assess pathogen levels in waterbodies and a brief summary of New Hampshire bacteria standards for surface waters.	Statewide Bacteria TMDL - section 2
Bacteria Pollution Sources– Defines point and non-point sources of bacteria pollution and provides examples of bacteria sources that affect New Hampshire's waterbodies	Statewide Bacteria TMDL - section 3 and Appendix N of this Report
Bacteria Impaired Waters - Provides a brief introduction to all bacteria impaired waters in New Hampshire (based on the *2008 303(d) List*). This section also includes an overview of the 303(d) listing process; a summary of agencies that collect bacteria data in New Hampshire; and a description of the TMDL prioritization process.	Statewide Bacteria TMDL - section 4
TMDL Development - Provides a description of the TMDL calculation process including the key required elements for TMDL development and includes concentration based TMDLs and associated wasteload and load allocations for freshwaters (primary contact recreation) and tidal waters (primary contact recreation and shellfish consumption).	Statewide Bacteria TMDL – section 5
Implementation Plan - Provides a description of the implementation process, including coordination with local stakeholders and development of watershed based plans, and a menu of mitigative actions (organized by type of source) to reduce bacteria loadings.	Statewide Bacteria TMDL- section 6
Funding and Community Resources – Provides a description of funding sources available to address impaired waters in New Hampshire.	Statewide Bacteria TMDL- section 7
Watershed-Specific Bacteria Data Summaries and Reductions – For each HUC * watershed this section includes available bacteria data, reductions needed for each impaired segment, GIS maps of HUC watersheds and land cover.	This document - section 2 and Appendices A through K
Public Participation – Includes a review of the process used to solicit public comment and DES' response to comments	This document - section 3 and Appendix M
TMDL Expressed as a Daily Load	This document – Appendix L
Examples of Detailed Implementation Plans to address bacteria impairment. One example is a Watershed-based Restoration Plan and the other is a Storm Drain Illicit Discharge Detention and Elimination Investigation.	Statewide Bacteria TMDL- section 9 and Appendices Q and R.

2. WATERSHED-SPECIFIC BACTERIA DATA SUMMARIES AND REDUCTION ESTIMATES

2.1 Overview

As discussed in section 1.3 and as shown in Table 1-2, this TMDL document relies on many sections in the Statewide Bacteria TMDL approved in 2010 to address many of the federally required TMDL elements. However, specific bacteria information for each of the 58 impaired AUs are provided herein in Appendices A through K. Also included in this document is a description of the methodology used to estimate load reductions (see section 2.2), a summary of the estimated load reductions in each impaired AU (see Table 2-1), and expression of the TMDL in terms of a daily Load (see Appendix L).

The bacteria data in appendices A through K are organized by watershed with each appendix representing one of 11 HUC 8 watersheds in the State as shown below.

Appendix A: Saco River Watershed

Appendix B: Salmon Falls-Piscataqua River Watershed

Appendix C: Pemigewasset River Watershed

Appendix D: Contoocook River Watershed

Appendix E: Nashua River Watershed

Appendix F: Merrimack River Watershed

Appendix G: Connecticut River Watershed from Waits River to White River

Appendix H: Connecticut River Watershed from White River to Bellows Falls

Appendix I: Connecticut River Watershed from Bellows Falls to Vernon Dam

Appendix J: Connecticut River-Ashuelot RiverWatershed from Vernon to Millers River

Appendix K: Connecticut River to Millers River

Each watershed-specific appendix contains:

1. A description of the HUC 8 watershed (size, location, and major features).
2. A watershed map, showing the locations of the impaired segments within the HUC 8 watershed.
3. A land cover map, showing land cover types within the HUC 8 watershed.
4. Data tables with recent (within 10 years) bacteria data for each impaired segment (when available) and estimates of reductions needed to meet water quality standards.

2.2 Estimated Load Reductions for each Impaired AU

TMDL reductions necessary to meet water quality standards were calculated for a rough estimation of pollution abatement action needed. The estimate of percent (%) reduction needed is calculated based on the difference between measured ambient bacteria data and the water quality criteria for bacteria. In a few cases, where segments were listed based on the presence of known sources rather than monitoring data, percent reductions were calculated based on presumed concentrations associated with the known sources. For each segment in Table 2-1, the basis for the calculation of the percent reduction (along with available monitoring data) is explained in the applicable appendix report.

For segments impaired by *E. coli* or enterococci, the estimated % reduction was calculated based on both single sample and geometric mean water quality standards; for segments impaired by fecal coliform, the estimated % reduction was based on water quality standards for 90th percentile and geometric mean fecal coliform data. The following process was used to estimate the % reduction necessary to achieve the water quality standard in each impaired segment:

1. ***For E. coli and enterococci impaired segments:*** Select highest concentration level of single sample indicator bacteria among all current samples (both dry and wet conditions) taken within an impaired segment. For the highest concentration of bacteria for the impaired segment, calculate the % reduction in bacteria levels needed to meet the appropriate single sample water quality criteria.
2. ***For fecal coliform impaired segments:*** Select the 90th percentile value, calculated from all current samples within an impaired segment. For the 90th percentile value, calculate the % reduction in bacteria levels needed to meet the appropriate 90th percentile water quality criteria.

For all impaired segments: Select highest geometric mean value, based on a rolling average of at least 3 independent samples within an impaired segment collected within 60 consecutive days, or at least 3 samples collected at the same location within the impaired segment provided at least 2 of the samples are separated by a period of at least one day (for more information on geometric mean calculation refer to the 2010 New Hampshire Consolidated Assessment and Listing Methodology report at: http://des.nh.gov/organization/divisions/water/wmb/swqa/documents/2010calm.pdf.). For the highest geometric mean value, calculate the % reduction in bacteria levels needed to meet the appropriate geometric mean water quality criteria.

For example, if the highest single sample value from a Class B impaired tidal segment is 1,000 enterococci/100mL, the % reduction needed to meet the single sample criterion is [(1000 – 104)/1000] x 100 = 89.6% reduction).

While both single sample and geometric mean percent reductions are presented, it is recommended that the reductions needed to attain the geometric mean be used (when available) for implementation planning

purposes in most cases. Bacteria sampling results can be highly variable and the geometric mean helps to reduce undue influence of any one data point.

Table 2-1: Summary of Estimated Percent Reductions for Bacteria Impaired Segments.

Watershed	Assessment Unit #	Waterbody Name	Primary Town	Impairment	% Reduction to meet TMDL	
					Geometric Mean	90th Percentile
Salmon Falls-Piscataqua Rivers	NHEST600030406-01	SALMON FALLS RIVER	DOVER	Fecal coliform	46%	81%
	NHEST600030608-01	COCHECO RIVER	DOVER	Fecal coliform	62%	81%
	NHEST600030904-01	WINNICUT RIVER	GREENLAND	Fecal coliform	complies	27%
	NHEST600031001-01-01	UPPER PISCATAQUA RIVER-NH-NORTH	DOVER	Fecal coliform	62%	81%
	NHEST600031001-01-03	UPPER PISCATAQUA RIVER-NH-SOUTH	DOVER	Fecal coliform	11%	70%
	NHEST600031001-03	UPPER SAGAMORE CREEK	PORTSMOUTH	Fecal coliform	22%	69%
	NHEST600031002-03	CHAPEL BROOK	NORTH HAMPTON	Fecal coliform	no data	7%
	NHEST600031002-04	UNNAMED BROOK TO BASS BEACH	RYE	Fecal coliform	no data	85%
	NHEST600031002-05	PARSONS CREEK	RYE	Fecal coliform	no data	80%
	NHEST600031004-10	LITTLE RIVER	NORTH HAMPTON	Fecal coliform	no data	91%
Watershed	Assessment Unit #	Waterbody Name	Primary Town	Impairment	% Reduction to meet TMDL	
					Geometric Mean	Single Sample
Salmon Falls-Piscataqua Rivers	NHEST600031001-03	UPPER SAGAMORE CREEK	PORTSMOUTH	Enterococcus	no data	100%
	NHEST600031004-07	MILL CREEK	SEABROOK	Enterococcus	55%	65%
	NHEST600031004-08-04	BLACKWATER RIVER	SEABROOK	Enterococcus	complies	29%

Table 2-1: Summary of Estimated Percent Reductions for Bacteria Impaired Segments (cont.)

Watershed	Assessment Unit #	Waterbody Name	Primary Town	Impairment	% Reduction to meet TMDL	
					Geometric Mean	Single Sample
Saco River	NHLAK600020802-04-05	OSSIPEE LAKE - OSSIPEE LAKE NATURAL AREA	FREEDOM	E coli	complies	27%
Salmon Falls-Piscataqua Rivers	NHIMP600031004-06	CAINS BROOK - NOYES POND	SEABROOK	E coli	5%	37%
	NHLAK600030405-03	WILLAND POND	SOMERSWORTH	E coli	34%	98%
	NHRIV600030601-08	MAD RIVER	FARMINGTON	E coli	complies	31%
	NHRIV600030607-10	ISINGLASS RIVER	ROCHESTER	E coli	41%	30%
	NHRIV600030901-06	NORTON BROOK	GREENLAND	E coli	no data	83%
	NHRIV600030902-11	LITTLEHOLE CREEK	DURHAM	E coli	60%	42%
	NHRIV600030902-16	WENDYS BROOK	LEE	E coli	98%	99%
	NHRIV600030904-05	FOSS BROOK	GREENLAND	E coli	no data	95%
	NHRIV600031004-21	UNNAMED BROOK TO CAINS MILL POND	SEABROOK	E coli	no data	97%
Pemigewasset River	NHRIV700010402-12	UNNAMED BROOK TO BEEBE RIVER	CAMPTON	E coli	57%	94%
	NHRIV700010802-10	SALMON BROOK	SANBORNTON	E coli	70%	48%
Contoocook River	NHIMP700030304-04-02	SILVER LAKE RESERVOIR BEACH	WARNER	E coli	31%	78%
	NHLAK700030102-01-02	THORNDIKE POND - TOWN BEACH	JAFFREY	E coli	complies	78%
	NHLAK700030103-06-02	MACDOWELL RESERVOIR BEACH	PETERBOROUGH	E coli	complies	51%
	NHLAK700030105-02-05	OTTER LAKE - GREENFIELD SP CAMPING BEACH	GREENFIELD	E coli	complies	83%
	NHLAK700030201-03-02	HIGHLAND LAKE BOAT LAUNCH	STODDARD	E coli	complies	78%
	NHLAK700030302-04-03	LAKE MASSASECUM FRENCH'S PARK TOWN BEACH	BRADFORD	E coli	complies	45%
	NHRIV700030302-08	DAVIS BROOK	BRADFORD	E coli	41%	23%
	NHRIV700030304-31	UNNAMED BROOK PLEASANT POND TO TOM POND	WARNER	E coli	no data	86%
	NHRIV700030504-14	FRENCH BROOK	HENNIKER	E coli	90%	98%

Table 2-1: Summary of Estimated Percent Reductions for Bacteria Impaired Segments (cont.)

Watershed	Assessment Unit #	Waterbody Name	Primary Town	Impairment	% Reduction to meet TMDL	
					Geometric Mean	Single Sample
Nashua River	NHIMP700040402-03	NASHUA RIVER - NASHUA CANAL DIKE	NASHUA	E coli	complies	50%
	NHRIV700040301-03	WALKER BROOK	GREENVILLE	E coli	52%	64%
Merrimack River	NHIMP700060902-13-02	CAMP ANN JACKSON GIRL SCOUT POND SWIMMING AREA	WILTON	E coli	80%	78%
	NHLAK700060502-08-04	NORTHWOOD LAKE - LYNN GROVE ASSOCIATION BEACH	NORTHWOOD	E coli	complies	56%
	NHLAK700060601-01-02	DEERING RESERVOIR - DEERING LAKE BEACH	DEERING	E coli	complies	78%
	NHLAK700061101-04-02	ARLINGTON MILL RESERVOIR-SECOND ST BEACH	SALEM	E coli	complies	65%
	NHLAK700061102-06-02	MILLVILLE LAKE - TOWN BEACH	SALEM	E coli	25%	63%
	NHRIV700060502-20	UNNAMED BROOK - TO JENNESS POND	NORTHWOOD	E coli	3%	98%
	NHRIV700060607-35	UNNAMED BROOK - TO PISCATAQUOG RIVER	MANCHESTER	E coli	94%	98%
	NHRIV700060802-09	MESSER BROOK	HOOKSETT	E coli	52%	59%
	NHRIV700060802-15	RAYS BROOK	MANCHESTER	E coli	no data	92%
	NHRIV700060901-08	FURNACE BROOK	NEW IPSWICH	E coli	22%	95%
	NHRIV700060901-17	APPLETON-GIBBS BROOK	NEW IPSWICH	E coli	complies	66%
	NHRIV700060905-13	MCQUADE BROOK	BEDFORD	E coli	complies	98%
Connecticut River-Waits River to White River	NHLAK801040402-02-02	STORRS POND - RECREATION AREA BEACH	HANOVER	E coli	complies	58%
	NHLAK801040402-02-03	STORRS POND - ADULT BEACH	HANOVER	E coli	complies	32%
	NHLAK801040402-03	WILDER LAKE	LYME	E coli	24%	22%
Connecticut-White River to Bellows Falls	NHRIV801060102-03	INDIAN RIVER - UNNAMED BROOK	CANAAN	E coli	33%	70%
Connecticut-Bellows Falls To Vernon Dam	NHRIV801070503-10	SEAMANS INLET	CHESTERFIELD	E coli	76%	92%
Connecticut-Ashuelot River-Vernon Dam to Millers River	NHRIV802010102-11	ASHUELOT RIVER - UNNAMED BROOK	MARLOW	E coli	17%	complies
	NHRIV802010301-04	ASHUELOT RIVER - ACOE DAM TO ASHUELOT RIVER DAM POND	KEENE	E coli	complies	12%
	NHRIV802010303-13	SOUTH BRANCH ASHUELOT RIVER - UNNAMED BROOK	TROY	E coli	54%	36%
	NHRIV802010403-19	ASHUELOT RIVER	HINSDALE	E coli	89%	74%
Connecticut River-Millers River	NHLAK802020103-08-02	PEARLY LAKE-PEARLY LAKE BEACH	RINDGE	E coli	46%	70%
	NHLAK802020202-02-02	LAUREL LAKE - TOWN BEACH	FITZWILLIAM	E coli	complies	74%

3. PUBLIC PARTICIPATION

3.1 Public Notice

EPA regulations [40 CFR 130.7 (c) (ii)] require that calculations to establish TMDLs be subject to public review. The Draft Report was released for public review and comment on June 15, 2011 and written comments were accepted through 4pm on July 22, 2011 (45 days). The Draft Report and public notice announcing the availability of the draft report for public comment was posted on the DES TMDL website at: http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm. A copy of the public notice is provided at the end of this section. In addition, the following were notified directly by email or mail:

The 41 cities/towns where impaired waterbodies in this TMDL are located.
Lake and/or watershed associations on the impaired waterbodies
Appalachian Mountain Club
Audubon Society
Connecticut River Joint Commissions
Conservation Law Foundation
County Conservation Districts
Lake and River Local Management Advisory Committees
Maine Department of Environmental Protection
Manchester Conservation Commission
Merrimack River Watershed Council
Natural Resources Conservation Service
New England Interstate Water Pollution Control Commission
NH Association of Conservation Commissions
NH Coastal Program
NH Department of Health and Human Services
NH Department of Fish and Game
NH Department of Resources and Economic Development
NH Department of Transportation
NH Fish and Game Commission
NH Lakes Association
NH Office of Energy and Planning
NH Planning Commision
NH Rivers Council
NH Sierra Club
NH Wildlife Federation
North Country Council
Regional Planning Commissions
Society for the Protection of New Hampshire Forests
The Nature Conservancy
Trout Unlimited
Upper Merrimack River Local Advisory Committee
US Environmental Protection Agency
Vermont Department of Environmental Conservation
Volunteer Lakes Assessment Program (VLAP) representatives
Volunteer Rivers Assessment Program (VRAP) repesentatives
Water Quality Standards Advisory Committee members which, in addition to many of the organizations listed above also includes representatives from the following organizations:
NH Farm Bureau

Consulting Engineers of NH
NH Business and Industry Association (BIA)
T.F. Moran, Inc.
NH Association of Conservation Districts
NH Fish and Game Department
GZA Geoenvironmeantal, Inc.
Monadnock Paper Company
City of Portsmouth
City of Concord, General Services Department

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Date: June 15, 2011

Subject: **PUBLIC NOTICE–New Hampshire Statewide Total Maximum Daily Load (TMDL) Report for Bacteria Impaired Waters Available for Public Comment**

PUBLIC COMMENTS WILL BE ACCEPTED UNTIL 4 PM ON July 22, 2011

Dear Interested Party or Stakeholder:

The Draft Statewide Total Maximum Daily Load (TMDL) Study for Bacteria Impaired Waters is now available for public review and comment on the New Hampshire Department of Environmental Services website at: http://des.nh.gov/organization/divisions/water/wmb/tmdl/categories/publications.htm.

High levels of bacteria can indicate the presence of waterborne disease organisms, known as pathogens, which can pose a public health risk and render a surface water unsuitable for uses such as swimming and shellfishing (in tidal waters). Surface waters include rivers, streams, lakes, ponds, wetlands and tidal waters. Examples of bacteria sources include improperly treated human waste and storm water runoff that has come in contact with feces from domesticated animals (pets, barnyard animals, etc.) and wildlife.

The purpose of a TMDL is to calculate the amount of pollutant (such as bacteria) that a surface water can assimilate without exceeding State surface water quality standards. The allowable pollutant load is then allocated to specific sources. Another important goal of the TMDL process is to promote, encourage, and inform local community action for water quality improvement and protection of public health by addressing sources of bacterial contamination. To this end this report also provides valuable information to help communities, watershed groups and stakeholders to implement the TMDL in a phased, community-based approach that will ultimately result in attainment of water quality standards

This TMDL specifically addresses 58 bacteria impaired surface waters in 40 New Hampshire communities. Estimates of the percent reduction needed to meet water quality standards for bacteria in each impaired waterbody are provided in Table 2-1. Bacteria data for the impaired segments are provided in the appendices on a watershed basis. Recommendations regarding watershed remediation activities to reduce bacteria inputs to waterbodies are provided in Chapter 6 (Implementation Plans) of the New Hampshire Statewide TMDL for Bacteria Impaired Waters Report, which has was approved by EPA on September 21, 2010. Examples of detailed implementation plans to restore impaired waters are included in appendices Q and R of that report and can be found at: http://des.nh.gov/organization/divisions/water/wmb/tmdl/categories/publications.htm.

Comments will be accepted until 4 pm on July 22, 2011. Only written comments will be accepted. All comments must include the name of the TMDL, the date and contact information (your name, address, phone, e-mail, and organization).

Comments can be mailed to:	TMDL Program NHDES Watershed Management Bureau 29 Hazen Drive, P.O. Box 95 Concord, NH 03301 Attention Margaret P. Foss, TMDL Coordinator
or sent by email to:	TMDL@des.nh.gov

For convenience, a public comment cover sheet for submitting comments is available at http://des.nh.gov/organization/divisions/water/wmb/tmdl/documents/commentform.pdf. Use of the cover sheet is optional. If you have any questions about the report, please contact Margaret Foss, NHDES TMDL Coordinator at (603) 271-5448 or via email at mfoss@des.state.nh.us.

3.2 Public Comments Received and DES Response to Comments

The public comment period for the Draft Report ended on July 22 , 2011. DES received one comment letter from the City of Manchester concerning the Statewide Bacterica TMDL, a copy of which is provided in Appendix M. Since this report serves as an extension of the Statewide Bacteria TMDL Report, the City's comments are appropriate. The main text of the City's letter with DES's response (in bold italics) are provided below.

Excerpts from the City of Manchester's Comment Letter dated July 21, 2011 and DES's Response

The City of Manchester, New Hampshire is commenting on the Final Report, New Hampshire's Statewide Total Maximum Daily Load (TMDL) for Bacteria Impaired Waters.

The last sentence of the second paragraph in the introduction states that the report will help various entities who implement the TMDL in a phased, community based approach that will ultimately result in attainment of water quality standards. The word "will" implies certainty and regardless of what measures a community may legally take they can not achieve the TMDL proposed standards as outlined in Table 2-2 (pg 16) without the intervention of the EPA on the exempt agricultural runoff or support from the State regarding suggested wildlife intervention and failing septic system measures. The document alludes to the capability of the communities taking on the full burden to resolve this issue; we believe that if it is not a cooperative effort by EPA, DES, and the community the goals of the TMDL will not be attained.

1. DES Response: ***The intent of the report was not to suggest that communities take on the full burden. DES agrees that in accordance with applicable laws and regulations, restoration efforts should be a cooperative effort between communities, other stakeholders and regulatory agencies. To assist stakeholders, potential sources of funding and contact information are provided in section 7 of the report.***

The first indication that communities will carry the financial burden for implementation is in the second paragraph under the background section, item (2). "*Surface waters that are not expected to meet water quality standards even after implementation of technology-based controls*." All of the measures outlined in the document are the establishment of watershed management plans, phased implementation of these plans, and continued monitoring of waterways to determine if the plans are working. Table 5-1 includes a listing of Waste Load Allocation for freshwater and allows an exemption for "*as naturally occurs*" if the only source is wildlife. There is no mention of "*as legally occurs as a result of agricultural exemption.*" Agricultural pollution is a very large source of bacterial contamination within New Hampshire rivers.

2. DES Response: ***See response No. 1 above. Also, the purpose of a TMDL is to calculate the amount of a pollutant that receiving waters can assimilate without exceeding water quality standards or designated uses (section 1.2, page 5 of the report). New Hampshire's surface water quality criteria for bacteria in Class A and B waters are included in RSA 485-A:8, I, II and V and the New Hampshire surface water***

quality regulations (Env-Wq 1700) (section 2.2.2, page 16). Numeric surface water criteria for bacteria can only be exceeded if they are due entirely to naturally occurring conditions (RSA 485-A:8, I , II and V). There are no exemptions for agricultural sources. This is made further evident by RSA 485-A:12, I. and II.[3]

Based on the above, it is evident that state surface water quality standards for bacteria do not include an exemption for agricultural sources. Consequently, Table 5-1 does not include a separate allocation for agricultural sources.

With regards to financing restoration efforts, section 7 of the Statewide Bacteria report provides an overview of financial assistance programs that are available to stakeholders. Our records indicate that over the last 10 years, Manchester has received nearly half a million dollars ($481,901) in federal grants (such as section 319) for current and completed watershed planning and surface water restoration projects. These projects have resulted in restoration of Maxwell Pond which was impaired for low dissolved oxygen and restoration of Crystal Lake which was impaired for recreation due to sedimentation/siltation. DES applauds the accomplishments that have occurred in Manchester over the last ten years and will continue to assist stakeholders with securing funds for future projects.

Point sources, which all have secondary wastewater treatment plants (WWTP), and use either ultra violet disinfection or chlorine to reduce bacteria are given a discharge limit of 406 count in class B waters with no designated beach area. WWTPs use the best available technology-based controls, yet can still not achieve the 406 criteria 365 days a year. It is safe to say that point-source pollution is controlled in excess of 99% of the time and **that non-point source pollution is the cause of the bacterial contamination within the watersheds of New Hampshire.**

3. DES Response: *As stated in section 3.1, page 21 of the report, bacteria point sources of pollution can be grouped as follows:*

- *NPDES Non-stormwater (i.e., WWTFs, CSOs, CAFOs)*
- *NPDES Stormwater (MS4, CGP, MSGP)*
- *Unauthorized Point Source Discharges of Untreated Wastewater (i.e., SSOs, Illicit Discharges, Boats)*

[3] ***RSA 485-A:12 I. states that " it shall be unlawful for any person or persons to dispose of any sewage, industrial, or other wastes, either alone or in conjunction with any other person or persons, in such a manner as will lower the quality of the waters of the stream, lake, pond, tidal water, or section of such water below the minimum requirements of the adopted classification". RSA 485-A:12, II., states that "If, after adoption of a classification of any stream, lake, pond, or tidal water, or section of such water, including those classified by RSA 485-A:11, it is found that there is a source or sources of pollution which lower the quality of the waters in question below the minimum requirements of the classification so established, the person or persons responsible for the discharging of such pollution shall be required to abate such pollution within a time to be fixed by the department".***

DES applauds the efforts of communities and others who are complying with their NPDES permits. In such cases where NPDES permit compliance is being consistently achieved but receiving waters are still impaired for bacteria and it is evident the source is not natural, DES agrees that restoration efforts should focus on identifying and reducing nonpoint sources of bacteria.

CSOs are problematic during wet-weather events, but most communities are under administrative orders to close these as time progresses. Unauthorized discharges as outlined in 3.1.3 have all but been eliminated in the larger communities who have stormwater management programs. The investigation and detection into sanitary sewer overflows and illicit discharges were all major components during the first five-year implementation of these programs.

4. DES Response: ***See response No. 3 above.***

Section 3.2, Non-point Source Pollution outlines five sources of pollution. These are failing septic systems, pet wastes, wildlife waste, agriculture and contact recreation.

Failing Septic Systems - enforcement is currently being done by the NHDES (pg 61) in order to ensure strict compliance with approved plans and investigating complaints relative to subsurface systems which are, or may be causing, degradation of the state's waters. Cities and town's respond to local complaints and either enforce the criteria of their adopted ordinance or refer enforcement to the NHDES.

5. DES Response: ***DES appreciates the assistance of communities in identifying and correcting bacterial pollution from failed septic systems.***

Pet Waste - Pet wastes are currently being addressed by stormwater communities. An interesting statistic is provided in the TMDL document in that a dog can produce 200 grams of feces (almost ½ pound) which contains up to 23,000,000 fecal coliform colonies per gram. That's four billion, 600 million fecal colonies per dog per day. That would require an eleven million, three-hundred and thirty thousand to one dilution to achieve the 406 fecal colony counts in a non-beach designated stretch of river. Quite a staggering number when you look at it statistically.

6. DES Response: ***The calculations above assume that all of the dog waste is fresh (i.e., none of the bacteria has died) and is directly deposited in a surface water at one time. This is not usually the case. Nevertheless, the statistics provided emphasize the significant impact that pet waste may have on bacteria levels in surface waters and the need to control pet waste as much as possible.***

All the stormwater communities are currently in various stages of implementing their stormwater management programs and implementing the control measures as outlined on page 51, BMPs for Stormwater. Certainly, over the past five years they have implemented pet waste programs, increased the level of street sweeping and can give an account of better catch basin cleaning and sewer line inspection programs which has significantly reduced fecal pollutants to the receiving waters via these

non-point source routes. This increased diligence is outlined in their annual storm water reports. Yet, we still see non-attainment of receiving water TMDLs for bacteria in these communities.

7. DES Response: ***See response No. 3 above.***

Wildlife Waste - The TMDL Document has dedicated seven pages (pg 66 to 72) to Wildlife Waste and Agricultural Waste. Wildlife measures are outlined on pages 66 and 67. One section outlines behavioral modification for wildlife by scaring wildlife (with trained dogs and loud noises) introducing physical barriers (fencing is mentioned) and to reduce the attractiveness to certain wildlife (changing landscape to reduce wildlife congregation near water). This same section talks about Population Control by expansion of the hunting season, culling, relocation or the prevention of egg hatching. Many of these measures are within the enforcement realm of the NHF&G rather than a community activity. Any changing of landscape would have to go through the rigorous scrutiny of the State's wetlands bureau, NHF&G and other agencies along with the requirement for an extensive environmental impact statement to gain final approval. It is estimated that 4.6 billion fecal colony is attributed to one dog each day! As residents witness dead deer along the sides of the highways at greater frequencies, see more foxes, raccoons, deer and even bear in their neighborhoods and notice the ever increasing amount of water fowl that fly overhead it is easy to see a cause and effect relationship of increased wildlife – increased bacterial TMDL. The contribution from wildlife is countless trillions of fecal colonies on a daily basis.

8. DES Response: ***DES agrees that prior to implementing reduction measures, one should be sure that all applicable permits and approvals (including those from NHF&G) are first obtained. DES also agrees that in some surface waters, natural wildlife may be the primary source of bacteria. As stated in response 2. above, state statute allows bacteria levels to exceed numeric criteria if they are due to natural sources. Consequently, if it can be proven to the satisfication of the USEPA (who approves the section 303(d) list of impaired waters) that exceedances of bacteria levels are due to natural sources such as wildlife, then it would no longer be considered a violation of state bacteria surface water quality standards and could be removed from the 303(d)list of bacteria impaired waters. In surface waters where wildlife is suspected of being the source of bacteria exceedances, the first step should be to try to prove this is the case. Pending resources, DES stands ready to assist with these efforts.***

Agriculture - Agriculture controls are outlined from pages 67 through 72. Page 68 outlines agricultural practices must conform to RSA 431:35 "Best Management Practices." As agriculture is exempt under federal regulations, the State does have the right to reign in the exemption and require some form of management. The USDA estimates that more than 335 million tons of "dry matter" waste (the portion of waste remaining after water is removed) is produced annually on farms in the United States, representing almost a third of the total municipal and industrial waste produced every year. What's more, animal feeding operations annually produce about 100 times more manure than the amount of human sewage sludge processed in US municipal wastewater plants. One dairy farm with 2,500 cows produces as much waste as a city with around 411,000 residents (greater

than a third of the population of New Hampshire). Unlike human waste, however, in most cases the law does not require that livestock waste be treated. Riding along the back roads of New Hampshire it is not unusual to see alpaca farms, llama farms, goat farms, and homes with three to four horses roaming in the yards, chicken coops, pigs and other domesticated agricultural type animals. There are now alpaca farms selling Paca Poo in 20 pound bags as a fertilizer.

9. DES Response: ***See response No. 2 above regarding the fact that agricultural sources are not exempt from complying with state surface water quality standards.***

The point-source WWTPs are doing their part in bacteria reduction. The stormwater communities are doing their part regarding non-point source pollutants, pet waste, illicit discharges and sanitary sewer overflows to curb and reduce bacterial contamination. The outstanding balance of pollutants that are threatening the waters of the State of New Hampshire come from failing septic systems, wildlife feces and agricultural feces. This report outlines the State's responsibility in regards to failing septic systems, illustrates the curbs that can be initiated regarding wildlife (many of which are within the authority of the NHF&G) and outline RSA 431:35 as being a remedy for "Best Management Practices" regarding agricultural pollutants.

10. DES Response: ***See response No. 3 and 5 above.***

As the communities continue to implement their approved stormwater plans and assure bacterial limits set out in their NPDES are met, they are fulfilling a large portion of their obligation to the environment. Communities, as is the State of New Hampshire, are struggling financially and are also strapped for cash.

11. DES Response: ***See response No. 3 above. DES is very aware of the economic challenges facing many communities and the state as a whole.***

The State of New Hampshire, lacking the funding to assure the implementation of septic system compliance, falling behind in assuring agriculture has completed, submitted and implemented the BMPs as set out in RSA 431:35 and coordinating with the NHF&G for better wildlife controls, is abdicating its obligations as outlined in the plan. By requiring the communities to undertake actions that are the obligation of the State it is creating an unfunded mandate for all communities. Section 7, Funding and Community Resources outlines 319 and other grants that are available for eligible participants. The TMDL Final Report has clearly identified the "impaired waters" throughout New Hampshire.

12. DES Response: ***DES disagrees that it is abdicating its responsibilities by requiring communities to undertake actions that are the obligation of the State thereby creating an unfunded mandate for all communities. See DES response No. 1 with regards to implementation being a cooperative effort in accoardance with state law and regulation and DES response No. 2 regarding funding assistance.. With regards to unfunded mandates, the TMDL does not give the State any more authority to abate surface water quality violations than it***

has under existing state statutes and regulation. Current state law (RSA 485-A:12, I and II) requires the person or persons who are causing surface water quality standard violations to abate such pollution (see response No. 2 above)]. As stated in several parts of the report, the implementation plan is guidance and not a requirement [4]. In addition, with regards to the allocations shown for the sources in tables 5-1 through 5-3 of the report, note 1 in table 5-4 (which applies to all three tables) states that "Unless otherwise required by statute or regulation, compliance with this TMDL will be based on ambient concentrations and not end-of-pipe bacteria concentrations." Consequently since compliance with the TMDL will be based on compliance of surface water samples with current bacteria surface water quality standards (except for CSOs and WWTFs which are based on end-of-pipe measurements in accordance with existing state surface water quality regulations – see notes 2 and 3 in table 5-4 of the report) the TMDL is not imposing any new state requirements on communities.

In closing, we recommend that we delay implementation of this TMDL because it shifts the financial burden of compliance to the local communities and presents unrealistic mitigation measures which will greatly decrease its chance for success. I am confident that if all stakeholders continue to work together to develop a more equitable and realistic TMDL for bacteria, there will be a greater chance for success which will ultimately protect New Hampshire waters for generations to come.

13. DES Response: DES disagrees that implementation of the TMDL should be delayed because it shifts the financial burden on local communities and presents unrealistic mitigation measures. See DES response No. 2 regarding financial assistance. As explained in response No. 12 above, the TMDL does not give the State authority that it doesn't already have to restore impaired surface waters and the implementation plan is provided as guidance to give stakeholders a toolbox of typical BMPs to help reduce bacteria concentrations in our surface waters. Consequently the mitigation measures or goals of the TMDL are not considered unrealistic. Further, the TMDL report does not include a schedule for implementation but does recommend that the implementation be conducted in phases followed by monitoring to determine if bacteria water quality standards are met or if additional reductions are necessary. This phased approach makes sense especially considering the economic challenges we are now facing. Though a schedule is not specified, it is the goal of DES to make steady progress towards restoration at a pace that is in accordance with state statute and regulation, conscious to the and cognizant of other economic challenges that may be facing stakeholders.. To this end DES is committed to doing its part and assisting stakeholders where possible and as resources allow.

[4] ***Section 6 (page 43) of the report states that the implementation plan provides general guidance for addressing water pollution caused by pathogenic bacteria in New Hampshire's surface waters and provides a wide range of implementation techniques that may be applied to identify and eliminate various sources of bacterial pollution. Further, section 1.2, page 5 of the report states that the purpose of the implementation plan is to provide tools to help stakeholders implement the TMDL in a phased approach that will ultimately result in attainment of water quality standards.***

3.3 List of Changes Made Since Issuance of the Public Notice Draft Report

Appendix N was added to the report in order to provide a reference of NPDES sources that are likely to have a significant impact on the bacteria impaired AUs. No other substantive changes were made to the final report other than minor edits to the text and report document formatting.