

STATE OF NEW HAMPSHIRE

2020/2022 Section 303(d) Surface Water Quality List

February 18, 2022



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CHAPTER 1 INTRODUCTION

1.1 PURPOSE

The Federal Water Pollution Control Act [PL92-500, commonly called the Clean Water Act (CWA)], as last reauthorized by the Water Quality Act of 1987, requires each state to submit a list of impaired waters to the US Environmental Protection Agency (USEPA) every two years. The document is typically called the “303(d) List,” so named because it is a requirement of Section 303(d) of the CWA. The 303(d) List includes surface waters that are:

- Impaired or threatened by a pollutant or pollutant(s).
- Not expected to meet water quality standards within a reasonable time even after application of best available technology standards for point sources or best management practices for nonpoint sources.
- Require the development of a comprehensive water quality study (i.e., called a Total Maximum Daily Load or TMDL study) that is designed to meet water quality standards.

On October 16, 2020, the New Hampshire Department of Environmental Services (NHDES) released the Draft 2020 303(d) List of impaired waters and the Draft Consolidated Assessment and Listing Methodology (CALM) for public comments. Downloadable copies of the draft 303(d) list and CALM were made available on the NHDES website for review. Public comments were accepted through the close of business on November 23, 2020. In addition to posting the notice of comment opportunity at multiple locations on the NHDES website, direct notification by email was sent to nearly 2,000 stakeholders including but not limited to:

Federal agencies
State agencies in New Hampshire and abutting states
Municipal officials
DPW Directors of the MS4 Communities
County Conservation Districts
Regional Planning Commissions
Nonprofit interest groups
Volunteer monitoring groups
New England Interstate Water Pollution Control Commission
University of New Hampshire

EPA issued a [memo and milestone template](#) on January 25, 2021 to facilitate timely submission of the 2022 Section 303(d) and 305(b) integrated report. The intent of the memo and template were to facilitate nationwide reporting of water quality data, successes, and challenges to the public for the Clean Water Act (CWA) 50th anniversary. If states determined that meeting the deadline was particularly challenging or potentially unachievable they were asked to identify potential actions to address the challenges, which included the option of submitting a

combined cycle. After careful review of our assessment process and key milestones, NHDES concluded that the only way to guarantee submittal of our integrated report by April 1, 2022 would be to submit a combined 2020/2022 Section 303(d) and 305(b) Integrated Report. On April 12, 2021 NHDES sent a [letter to EPA](#) to request consideration on the submittal of a combined 2020/2022 Integrated Report.

EPA accepted NHDES' request for submittal of a combined 2020/2022 Integrated Report in a [letter](#) dated April 29, 2021. As a result of this decision future references to the 2020 assessments and accompanying documents will now be denoted as the 2020/2022 assessments.

1.2 ASSESSMENT METHODOLOGY AND TERMS

The 2020/2022 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology (CALM) describes in detail how surface water quality assessment decisions were made in fulfillment of 40 CFR 130.7(b)(6). The [CALM](#) also includes descriptions and definitions of the many terms used to assess surface waters. Readers are strongly encouraged to read the CALM before reviewing assessments as it will help one to better understand and interpret assessment results.

1.3 DATA

The 2020/2022 assessments are supported by more than 1 million grab samples and several million datalogger results. These data records were collected from more than 2,000 stream sites, 2,500 lake sites, and 640 marine sites and include over 180 water-quality and ecological parameters. Most of the data are available from the [NHDES data warehouse](#) or by contacting NHDES.

Additionally, a new [Surface Water Quality Assessment Viewer](#) has been created for the 2020/2022 assessment cycle. This tool was developed for users to:

- 1) View the spatial extent of assessment units.
- 2) Identify where sampling data was collected.
- 3) Access the watershed report cards.
- 4) Run reports to access the base data and water quality data summaries for the Aquatic Life and Primary Contact (i.e. Swimming) designated uses in the 2020/2022 assessment cycle.
- 5) See what waterbodies are impaired in the 2020/2022 assessment cycle.
- 6) View the extent of the USEPA 2017 MS4 General Permit Areas.

1.4 ASSESSMENT UNITS

Assessment Units (AU) are the basic unit of record for conducting and reporting water quality assessments.

To help determine the extent and/or location of each AU, visual aids such as maps are useful. To that end, a [web mapping application](#) was built.

For those wishing to download the base GIS for use with the more common GIS software products, AUs are available in Geodatabase format. All GIS layers may be accessed through the Department's FTP site by using the following instructions:

- 1) Go to this address using a web browser:
<ftp://PUBFTP.nh.gov/DES/WMB/WaterQuality/SWQA/2020-2022/>
(some browsers may require you to cut and paste this link directly).
- 2) At the login window, click on the box in the lower left hand corner labeled "Login Anonymously."
- 3) The user name will then be automatically filled in with the word "Anonymous."
- 4) Type in your email address in the Email Address block.
- 5) Then click on the Log On button.
- 6) The [GIS] folder should appear containing the files described above.

1.5 THE GREAT BAY ESTUARY

The complexity of the Great Bay estuary presents a number of assessment challenges. In addition to the CALM (see section 1.2 above) a Technical Support Document for the Great Bay Estuary Aquatic Life Use Support Assessments, 2020/2022 305(b) Report/303(d) List has been prepared to provide supplemental information regarding New Hampshire's 305(b)/303(d) assessments of the Great Bay estuary. This document is meant to provide additional information about how the water quality status of each of the 19 assessment zones was determined. Specifically, this document addresses the water quality data used to determine if the estuary meets the Aquatic Life designated use.

Per the letter signed by Tom O'Donovan on January 17, 2020, NHDES retracted certain Assessment Units from consideration in the 2018 303(d) list of impaired surface waters, including Little Bay, Bellamy River, Upper Piscataqua River, Portsmouth Harbor, Little Harbor/Back Channel and Great Bay assessment zones. These are the same Assessment Units that were proposed for deimpairment in the 2014 303(d) list and not included on the 2016 303(d) list, decisions on which were deferred by EPA.

As noted in the January letter, NHDES has made a detailed evaluation of those assessment units in the 2020/2022 303(d) listing. Given that EPA deferred the decision on these Assessment Units in both 2014 and 2016 and agreed not to consider them in 2018, it makes sense to describe in some detail the difference in the methodology used to determine compliance with the state's narrative nutrients water quality criteria, since it has changed since the 2012 303(d) when the assessment status of these waters was last visited and approved by EPA.

| Assessment Zone | 2012 | 2014 | 2016 | 2018 | 2020/2022 |
|----------------------------|-----------------------------|-------------------------------|-------------------------------|----------------------------------|--------------------------|
| Great Bay | NHDES: 5-M EPA: Approved | NHDES: 3-PNS EPA: Deferred | NHDES: 3-PNS EPA: Deferred | NHDES: Assess. Zone Withdrawn | NHDES: 5-M EPA: TBD |
| Bellamy | NHDES: 5-P EPA: Approved | NHDES: 3-PNS EPA: Deferred | NHDES: 3-ND EPA: Deferred | NHDES: Assess. Zone Withdrawn | NHDES: 5-P EPA: TBD |
| Little Bay | NHDES: 5-M EPA: Approved | NHDES: 3-PNS EPA: Deferred | NHDES: 3-PNS EPA: Deferred | NHDES: Assess. Zone Withdrawn | NHDES: 3-PNS EPA: TBD |
| Cocheco River | NHDES: 5-P EPA: Approved | NHDES: 3-PNS EPA: Deferred | NHDES: 5-M EPA: Approved | NHDES: 5-M EPA: Approved | NHDES: 5-M EPA: TBD |
| Upper Piscataqua River | NHDES: 5-P EPA: Approved | NHDES: 3-PNS EPA: Deferred | NHDES: 3-PNS EPA: Deferred | NHDES: Assess. Zone Withdrawn | NHDES: 3-PNS EPA: TBD |
| Portsmouth Harbor | NHDES: 5-M EPA: Approved | NHDES: 3-PNS EPA: Deferred | NHDES: 2-M EPA: Deferred | NHDES: Assess. Zone Withdrawn | NHDES: 2-M EPA: TBD |
| Little Harbor/Back Channel | NHDES: 5-M EPA: Approved | NHDES: 3-PNS EPA: Deferred | NHDES: 3-ND EPA: Deferred | NHDES: Assess. Zone Withdrawn | NHDES: 3-ND EPA: TBD |

Notes:

Assessment Category

| | |
|-------|--|
| 2-M | Full Support-Marginal |
| 3-ND | Insufficient Information – No Data |
| 3-PNS | Insufficient Information – Potentially Non-support |
| 5-M | Impaired-Marginal |
| 5-P | Impaired-Poor |

Assessment Status

| | |
|-----------------|---|
| EPA Approved | EPA approved 303(d) List for this assessment zone in this cycle. |
| EPA Deferred | EPA made no decision on approval or disapproval of the 303(d) for this assessment zone in this cycle. |
| NHDES Withdrawn | NHDES withdrew the assessment for this assessment zone recognizing that the 2020/2022 assessment was imminent and would provide a more comprehensive update using more recent data. |
| In Draft | NHDES has this assessment cycle out in draft for public comment. |

In 2009, NHDES published a set of numeric nutrient thresholds for the Great Bay Estuary¹ as numeric translators of the narrative standard to determine compliance with Env-Wq 1703.14.

The numeric thresholds for the Great Bay Estuary were used as part of a stressor–response decision matrix to determine which water body segments should be included on the 2008, 2010, and 2012 Section 303(d) lists of impaired waters for nutrients.

In March 2010, EPA initiated an independent peer review of the nutrient thresholds for the Great Bay estuary². The peer review process was administered by the environmental engineering consulting firm Tetra Tech through the Nutrient Scientific Technical Exchange Partnership and Support (N-Steps)

¹ NHDES, Numeric Nutrient Criteria for the Great Bay Estuary. New Hampshire Department of Environmental Services, Concord, NH. June 2009. (R-WD-09-12),

https://www.des.nh.gov/organization/divisions/water/wmb/wqs/documents/20090610_estuary_criteria.pdf

² Independent Peer Review of Nutrient Criteria Proposal for the Great Bay Estuary, June 29, 2010.

<https://www.des.nh.gov/organization/divisions/water/wmb/coastal/documents/20100629-peer-review.pdf>

program. The reviewers found the Great Bay nutrient thresholds were well explained and supported by appropriate literature and reasoning.

Due to a high level of interest from stakeholder communities, the nutrient thresholds were reviewed by another external peer review panel consisting of four independent specialists in the fields of estuarine water quality, modeling, dissolved oxygen, and eelgrass biology. The panel completed its work in February 2014.

The reviewers indicated that there was a reasonable basis for finding some parts of the Great Bay Estuary system impaired for eelgrass loss. The reviewers also agreed that nitrogen is an important factor related to eelgrass and other response variables in the estuary. However, they concluded that the NHDES 2009 report did not adequately demonstrate that nitrogen is the primary factor causing eelgrass decline in the Great Bay Estuary because the report did not explicitly consider all of the other potentially confounding factors in developing relationships between nitrogen and the presence of eelgrass.

Specially, the reviewers concluded that the statistical strength of the regression analyses used to create the TN numeric translator was not robust enough to use as a criterion. This is summed up best by a quote from one of the reviewers, “The statistical methods used to derive the numeric thresholds were not based on acceptable scientific methods and the results of these analyses are not reliable for predicting the complexity of responses to changes in nitrogen concentration in the system, including DO, transparency, eelgrass, macroalgae and phytoplankton.”³

As a result of a court approved settlement agreement, the department ceased using the total nitrogen concentration thresholds from the NHDES 2009 Report to assess nitrogen impairments as of its 2014 assessment.

The 2020/2022 CALM has been updated to provide a robust assessment methodology as a translator for New Hampshire’s narrative nutrient criteria that differs from the stressor-response matrix previously used (2008, 2010, 2012) to determine total nitrogen impairment. In the 2020 assessment, the department continues to use the indicators listed above (criteria for dissolved oxygen criteria, thresholds for chlorophyll-a, light attenuation, and eelgrass cover in addition to total nitrogen) and now incorporates measures of macroalgae, dissolved oxygen super-saturation and daily swings, and additional assessments of healthy total nitrogen concentrations. Inherent in this evaluation is a consideration of the quality, currentness, representativeness, completeness, applicability, frequency, magnitude and duration of each indicator. Collectively, NHDES utilizes a “preponderance of evidence” approach that looks at a stressor-response relationship between total nitrogen and an enlarged set of indicators. It does not tie the impairment decision to a single TN number, rather it implicitly examines the relationship between the stressor and the responses based on the data for each particular

³Page 35, Bierman, V., Diaz, R., Kenworthy, W., & Reckhow, K. (2014). Joint Report of Peer Review Panel for Numeric Nutrient Criteria for the Great Bay Estuary New Hampshire Department of Environmental Services June, 2009. <https://www.des.nh.gov/organization/divisions/water/wmb/coastal/documents/20140213-peer-review.pdf>

Assessment Zone. It is not a ‘one size fits all’ number but rather appreciates the complexities of the site specific interaction between nutrients and biological activity across multiple important factors.

The CALM is a guidance document. As such, the assessment program utilizes the CALM to the extent it can, but often, additional datasets or professional judgment may yield assessment decisions outside of the CALM descriptions. Finally, the approved state water quality standards are the ultimate basis for assessment decisions, not the CALM. It is worth noting that the assessment process is different from the effluent permitting process. While both ultimately rely on surface water quality standards, the development of nutrient limits in permitting activities by permit writers may follow a different path as it requires the calculation of reasonable potential with all discharges discharging at design loads. It is foreseeable that situations may arise wherein the 305(b)/303(d) does not find a waterbody to be currently impaired, but based on reasonable potential analysis, nutrient limits are imposed to prevent impairments. In other words, the 305(b)/303(d) is a planning document that informs, but does not dictate, management decisions.

1.6 NHDES SURFACE WATER QUALITY ASSESSMENT WEBSITE

The department’s [surface water quality assessment website](#) contains the following materials helpful for review of the 303(d) List:

- Consolidated Assessment and Listing Methodology (CALM) (PDF)
- 2020/2022, 303(d) List Content Introduction (PDF)
 - Appendix A – 2020/2022, 303(d) List (EXCEL)
 - Waters Removed from the 303(d) List (PDF)
 - Waters Added Since the 2018 303(d) List (PDF)
 - Appendix B - New Hampshire’s Long-term 303(d) Vision (PDF)
- Response to Comments on the Draft 303(d) and CALM (PDF)
- Other related materials
 - Technical Support Document for the Great Bay Estuary Aquatic Life Use Support Assessments, 2020/2022 305(b) Report/303(d) List (PDF)
 - GIS Layers for the 2020/2022 Assessment (PDF)
 - Impairments Removed Since the 2018 305(b) (PDF)
 - Impairments Added to the 2020/2022 305(b) (PDF)
 - Surface Water Quality Mapper and Watershed Report Cards (Website)

SECTION 303(D) LIST FORMAT

1.7 OVERVIEW

The Section 303(d) List is provided in Appendix A. As previously mentioned, the Section 303(d) List only includes waters that are impaired or threatened by pollutants that require Total

Maximum Daily Load studies (TMDLs). Consequently, the 303(d) List represents a subset of all impaired waters as not all impairments require a TMDL.

The List is sorted by waterbody type and then Assessment Unit ID number or AUID (each waterbody has a unique AUID). Each record includes the impaired designated use in that assessment unit and an TMDL priority. Prior to reviewing the assessments, the reader is encouraged to review the 2020/2022 Consolidated Assessment and Listing Methodology, which includes detailed explanations of the various methods used to derive the results described below.

APPENDIX A: 2020/2022, 303(d) List (EXCEL)

APPENDIX B: 303(d) Long-Term Vision