

STATE OF NEW HAMPSHIRE

# Removal of Water Quality Impairments: Data and Documentation Considerations

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## Introduction

### Assessment Cycle

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 two surface water quality documents to the US Environmental Protection Agency (EPA) every two years. NHDES currently submits these documents on even years (*e.g.*, 2016, 2018, etc.).

### Impairments - 303(d) vs 305(b)

The most familiar impairments are of Clean Water Act Section 303(d) waters, also known as ‘the List’ or Category 5 impairments. Category 5 waters are impaired or threatened by a pollutant, and require a Total Maximum Daily Load (TMDL) to be developed. However, other categories of impairments should be considered; these categories comprise the impairments under Section 305(b) of the Clean Water Act.

*Category 4A:* Impaired or threatened waters for which development of a TMDL is not required because a TMDL has been completed.

*Category 4B:* Impaired or threatened waters for which development of a TMDL is not required because other pollution control requirements are reasonably expected to result in attainment of the water quality standard in the near future.

*Category 4C:* Impaired or threatened waters for which development of a TMDL is not required because the impairment is not caused by a pollutant.

This document is not intended to replace the Consolidated Assessment & Listing Methodology (CALM), but rather to address some of the common questions that arise when a group is interested in removing an impairment of any category.

### The CALM

The Consolidated Assessment & Listing Methodology (CALM) establishes how NHDES evaluates available data relative to New Hampshire’s Surface Water Quality (SWQ) Standards. It essentially is a translator document for how available water quality data will be used to make SWQ attainment decisions based on designated uses consistent with SWQ standards.

What is in the CALM?

- Core parameters for each designated use (*e.g.*, bacteria for swimming use).
- Minimum number of samples.
- Maximum age of samples.
- How older data is treated.
- When samples must be taken (seasonality, time of day, flow, *etc.*).
- Where samples are collected to make them useful (location, depth profiles, *etc.*).
- How multiple samples will be treated.
- ...and much more...

Before undertaking a sampling effort to support the removal of an impairment, the reader is encouraged to review the most recent CALM (available online at <https://www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>).

## **Sampling Data QA/QC**

Data used to make final assessment decisions must be defensible. Consequently, it is extremely important that the quality of the data is known. Information about the procedures used for sample collection, sample analysis, data analysis, and data reporting must be collected and submitted with the data if the data is to be included in the assessment process.

## **QAPP**

Projects spending federal dollars are required by the federal government to have an approved Quality Assurance Project Plan (QAPP). That QAPP provides the information necessary to determine if the data collected is robust enough to be used in final assessment decisions. An example of a robust sampling QAPP can be found in the Volunteer Rivers Assessment Program (VRAP) publications directory (<http://www.des.nh.gov/organization/divisions/water/wmb/vrap/categories/publications.htm>). Tools and information to assist in the development of a QAPP can be found on EPA's website at <https://www.epa.gov/quality/quality-assurance-project-plan-development-tool>

## **SOPs**

For projects for which a QAPP is not prepared, data can still be used in final assessment decisions if a comprehensive set of Standard Operation Procedures (SOPs) is developed and applied. The SOPs must extend beyond basic field activities to describe the projects data quality objectives (e.g., duplicates, replicates, accuracy checks) and processes used to accept or reject data as valid.

## **Submitting your data**

Assessments are by their nature a public process. NHDES strives to make all data used in the assessments public through the assessment data viewer and the Environmental Monitoring Database (EMD). While formal written reports are helpful to understand an individual's interpretation of the data, having that data readily available in an electronic format for any interested party is of much broader utility. To that end, NHDES requests that data be submitted to the EMD. By that mechanism, data is available to the public and will be in the format that can be readily used in the assessment process.

The EMD was first developed in March 2003 to store lake, river, estuary and ocean data. The goal was to standardize the wide variety of data sets into one database system built according to existing national data standards for use in SWQ assessments. Ultimately, the database was needed to meet EPA's STORET reporting requirements and the subsequent Water Quality Exchange (WQX). The EMD is constantly evolving and over the years has expanded to store biological data as well as complaint and inspection information.

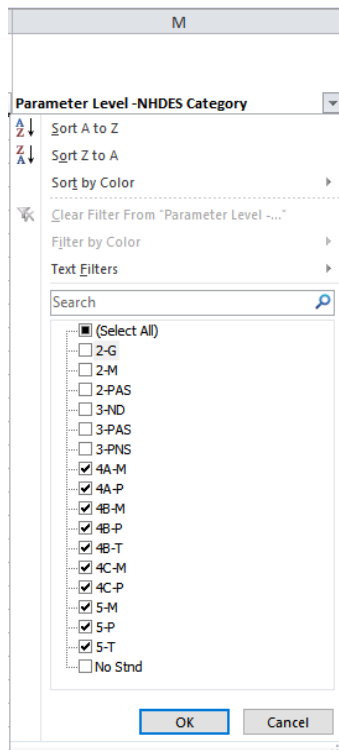
Data can be submitted through the OneStop Provider web page (<https://www2.des.state.nh.us/OnestopDataProviders/DESLogin.aspx>). Providers must pre-register and obtain approval to upload data. Typically, this approval process takes no more than two days. Data is

submitted for stations and activities using Microsoft Excel templates. These templates contain information on the required format and domain lists as well an example of a data record. When templates are uploaded via a web interface, the data is automatically checked for validity, and error messages (if any) are displayed detailing the row, column and problem. Once a file passes validation, it is further reviewed by NHDES data management staff using project specific acceptance measures to ensure data usability. If accepted, the data is incorporated into the database and the provider is notified of the inclusion. If a problem is identified, the file is rejected and the provider is notified of what is needed to correct the file and encouraged to resubmit. If an organization would like to contribute data but is lacking resources to use the templates or needs assistance, please contact Melanie Cofrin at (603) 271-8803 or [Melanie.Cofrin@des.nh.gov](mailto:Melanie.Cofrin@des.nh.gov).

## Understand the Original Listing

### What is Impaired?

As noted above, Category 5 impairments are on the 303(d) while Category 4A, 4B, and 4C impairments are part of the 305(b) report. NHDES places a file of assessments for the corresponding waterbodies on the assessment website in each assessment cycle. Filtering that list to just those parameter categories that start with '4' or '5' (example below) will give you the full list of impairments while filtering out all of the parameters that have been documented as being in good condition (aka Category 2) or have an indeterminate condition (aka Category 3). As an example, for the 2016 assessment cycle, the file was titled "2016 Status of Each Assessment Unit."



## Past Water Quality Data

Understanding the data used in the original listing is critical to collecting data for a possible delisting. In order to be useful, the data collected to show an improvement must be comparable to the original data in as many ways as possible. That is, it must be collected under the same (or more limiting) conditions as the original data that showed problems. While every situation will have its own set of circumstances, NHDES typically looks at least at the following factors:

- Sampling Station(s) – Were the samples taken at the same station(s) as the originals? If not, were the samples taken at a station originally having lower water quality?
- Sampling conditions
  - Flow – Are the flow conditions of the new samples the same as for the original samples? If not, how similar are they and what effect does that have on the parameter being measured?
  - Water Temperature - Are the temperatures of the new samples the same as for the original samples? If not, how close are they and what effect does that have on the parameter being measured?
  - Preceding Weather - Were original samples preceded by rainfall or other weather events? Were the new samples taken the same amount of time after a similar event? If not, how close are they and what effect does that have on the parameter being measured?
  - Time of day – Were the new samples taken at the same time of day as the original samples? If not, how close are they and what effect does that have on the parameter being measured?
  - Sample Type – Were the original samples taken by a continuous data logger or as discrete grab samples? Were the new samples taken the same way? If not, what effect does that have on the parameter being measured?
  - Sample Depth – Where in the water column were the older samples collected? Were the new samples taken at the same depth? If not, how close are they and what effect does that have on the parameter being measured?
  - Tide Stage – For samples of tidal waters, were the new samples taken at the same stage of the tidal cycle as the older samples? If not, how close are they and what effect does that have on the parameter being measured?
- What other variables are pertinent to the waterbody?

## Get the Data Used in the Original Assessment

The quickest way to get the data used in the original assessment is to use the Surface Water Quality Assessment Viewer for the assessment cycle of interest, online at <https://www.des.nh.gov/organization/divisions/water/wmb/swqa/assessment-viewers.htm>

This mapping tool was developed for users to:

- 1) see the spatial extent of assessment units,

- 2) see where sampling data was collected,
- 3) access the watershed report cards (a.k.a. 305(b)/303(d) assessment info.),
- 4) run reports to access the water quality data summaries used in the assessment cycle, and
- 5) view the extent of the EPA 2017 MS4 General Permit Areas.

The water quality data summaries covering the most recent assessment cycle will be of the greatest use when researching the original impairment. The tool produces an Excel® file that contains the data used in the assessment of the primary contact and aquatic life designated uses in the current assessment cycle for the selected Assessment Unit ID (AU). While the "current" data is defined in the CALM, this tool extracts all available data back to 1990 to help understand the context of the "current" data. As the data in the file was used with the SWQ Standards and the CALM to make final assessments, a strong understanding of those two documents will greatly aid the review of the data provided.

The spreadsheet contains four tabs that have been created for the AU of interest. In some cases, the tabs are blank because a particular data type does not exist.

1. Sum\_Final\_Table – This tab contains the cycle level assessment and any additional notes on the waterbody/designated use/parameter.
2. Used\_Data\_by\_Cycle – This tab contains all of the raw water quality data points as well as several calculated values that are used in the assessment process. Not all fields will be populated for every row and many fields only apply to a particular sample type/designated use/parameter combinations.
3. SpC\_Logger\_Stats\_Acute - Where a specific conductance datalogger was deployed on one of the assessment units from 2004 to present, this tab presents the 1-hour average statistics as compared to the specific conductance indicator for chloride concentration.
4. SpC\_Logger\_Stats\_Chronic - Where a specific conductance datalogger was deployed on one of the assessment units from 2004 to present, this tab presents the 4-day average statistics as compared to the specific conductance indicator for chloride concentration.

## **Has anything changed?**

Every waterbody has a story to tell. Data showing that conditions have improved is necessary to support removing an impairment from the 303(d) or 305(b) list. Information regarding changes in the development or use of the surrounding watershed that contributed to the water quality improvements, such as installation of a municipal sewer to replace individual septic systems leading to a reduction in bacteria, strengthens the case that the impairment should be removed.