MAY 2 2 2019

Ms. Linda Culpepper
Director
Division of Water Resources
North Carolina Department of Environmental Quality
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

Dear Ms. Culpepper:

The U.S. Environmental Protection Agency, Region 4 has completed its review of the North Carolina Department of Environmental Quality's Final 2018 Clean Water Act (CWA) section 303(d) List of water quality limited segments. The EPA has determined that each of the water quality limited segments still requiring Total Maximum Daily Loads identified on the State's 2018 List meets the requirements of the CWA section 303(d) and its implementing regulations at 40 C.F.R. section 130.7. The EPA hereby approves the state of North Carolina's decision to include each of the waters designated by the State in its 2018 303(d) List. Enclosed for your information is the accompanying decision document for this approval action.

If you have questions concerning this matter, please feel free to contact me at (404) 562-9345 or Ms. Gracy R. Danois, Chief, Monitoring, Assessment, Listing, and TMDL Section at (404) 562-9119.

Sincerely,

Jeaneanne M. Gettle, Director
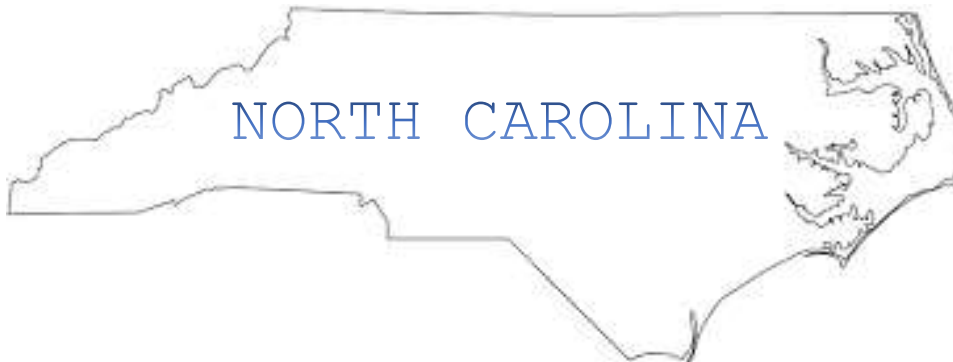Water Division

Enclosure

DECISION DOCUMENT

FOR THE
APPROVAL OF THE

NORTH CAROLINA

DEPARTMENT OF ENVIRONMENTAL QUALITY
2018 SECTION 303(d) LIST

Submitted on April 2, 2019

NORTH CAROLINA

Prepared by the
Environmental Protection Agency, Region 4
Water Division

May 22, 2019

Table of Contents

I. Executive Summary

The purpose of this document is to describe the rationale for the U.S. Environmental Protection Agency's approval of the North Carolina Department of Environmental Quality's (NCDEQ) 2018 section 303(d) List. The EPA has conducted a complete review of the State's List and supporting documentation and information, including changes to the previous List. Specific additions and delistings are identified in Appendices A and B of this document. Based on this review, the EPA has determined that the State's List of water quality limited segments still requiring Total Daily Maximum Loads meets the requirements of section 303(d) of the Clean Water Act and the EPA's implementing regulations. The EPA Region 4 Water Quality Planning Branch staff therefore recommend approval of the current section 303(d) List. This document summarizes the EPA's review and the basis for this recommendation.

State / Organization:	**North Carolina Department of Environmental Quality**
Current Listing Cycle:	**2018**
Public Comment Period:	November 16, 2018 – January 18, 2019
Organization Final Section 303(d) Submittal Date:	April 2, 2019
Current List Status:	**EPA APPROVAL** on May 22, 2019
Listing Cycle and Approval Date of Most Recent Approved Section 303(d) List:	2016 section 303(d) List Partially approved by the EPA on December 8, 2016
Government to Government Consultation Period	April 8, 2019 – May 6, 2019

II. Statutory and Regulatory Background

A. Identification of Water Quality Limited Segments for Inclusion on the 303(d) List

Section 303(d) of the Clean Water Act (CWA, or the Act) and the EPA's implementing regulations in the Code of Federal Regulations at 40 C.F.R. section 130.7, require states to identify water quality limited segments (WQLS) still requiring Total Maximum Daily Loads (TMDLs) within their jurisdictions. The resulting list of WQLSs is the State's section 303(d) List. TMDLs establish the maximum amount of a pollutant allowed in a waterbody and serve as the starting point or planning tool for restoring water quality. State section 303(d) Lists and TMDLs are submitted to the EPA for approval or disapproval. See 40 C.F.R. section 130.7(d)(1).

WQLS are defined in 40 C.F.R. section 130.2(j) as "[a]ny segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by sections 301(b) and 306 of the Act." The WQLS listing requirement applies to waters impaired by point and/or nonpoint sources, under the EPA's long-standing interpretation of section 303(d). Note: The term WQLS may also be referred to as "listed waters," "waterbody/pollutant combination," "impaired waterbodies" or "impairments" throughout this decision document.

B. Water Quality Standards

For purposes of listing waters under 40 C.F.R. section 130.7(b), the term 'water quality standard applicable to such waters' and 'applicable water quality standards' refer to those water quality standards (WQS) established under section 303 of the Act, including designated uses, water quality criteria (WQC) and antidegradation requirements. See 40 C.F.R. section 130.7(b)(3).

The designated uses of a water body are an expression of goals for the water, such as supporting aquatic life and human activities, including recreation and use as a public water supply. "Each State must specify appropriate water uses to be achieved and protected. The classification of the waters of the State must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation." See 40 C.F.R. section 131.10.

WQC can be expressed either as narrative or numeric criteria. Numeric criteria typically establish either a maximum level or a range of levels of a pollutant which can be present in the waterbody while still protecting the designated use. Narrative criteria typically describe a condition (e.g., no imbalance of flora or fauna) which must be met for the waterbody to protect the use. The EPA defers to the state's interpretation of its WQS, including how narrative criteria should be interpreted, when that interpretation is consistent with and is a reasonable translation of the underlying criteria. In general, "(s)uch criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. For waters with multiple use designations, the criteria shall support the most sensitive use." See 40 C.F.R. section 131.11(a) and (b).

C. The Integrated Report and the Assessment and TMDL Tracking and Implementation System

Section 305(b) of the CWA directs states to report on the overall condition of aquatic resources in their jurisdictions at the same time as the section 303(d) List submittal (by April 1 of all even numbered years). States are encouraged to merge these reports into a single Integrated Report (IR). While the section 305(b) submission is required, the CWA does not specify Agency approval of the 305(b) report. See 40 C.F.R. section 130.8.

The EPA's 2006 IR Guidance[1] recommends the use of five categories, described below, to classify the WQS attainment status for individual waterbody segments, or Assessment Units (AU). Note that North Carolina has added sub-categories beyond the EPA guidance to help clarify assessments, as described in the State's submission in the *2018 Integrated Report Category Assignment Procedure.*[2]

- o Category 1: All designated uses are supported, no use is threatened

- o Category 2: Available data and/or information indicate that some, but not all the designated uses are supported

- o Category 3: There is insufficient available data and/or information to make a use support determination

- o Category 4: Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed because:

  - ▪ 4a - A TMDL to address a specific waterbody/pollutant combination has been approved or established by the EPA

  - ▪ 4b – An impairment caused by a pollutant is being addressed by the State through other pollution control requirements

  - ▪ 4c - A designated use is impaired, but the impairment is not caused by a pollutant

- o Category 5: Available data and/or information indicate that at least one designated use is not being supported or is threatened and a TMDL is needed. AUs listed in this Category are those considered to be on the section 303(d) List.

This categorization scheme is the basis for the updated national electronic system, the Assessment and TMDL Tracking and Implementation System (ATTAINS). The electronic IR submission will allow the EPA and states to process information in a timely manner for use in the *National Water Quality Inventory Report to Congress*; the formula used for state grant allocations; water quality listing

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[1] Guidance for 2006 Assessment, Listing, and Reporting Requirements Pursuant to Sections 303(d), 305(b), and 314 of the Clean Water Act, July 29, 2005, at https://www.epa.gov/sites/production/files/2015-10/documents/2006irg-report.pdf.
[2] https://files.nc.gov/ncdeq/Water%20Quality/Planning/IR-Assessment-Process-2018.pdf

decisions; and analyses supporting actions to protect and restore waters and track progress toward that goal.[3]

D. Public Participation

The EPA regulations require states to describe in their Continuing Planning Processes the process for involving the public and other stakeholders in the development of the section 303(d) List. See 40 C.F.R. Part 25 and 40 C.F.R. section 130.7(a). The EPA encourages the states to provide opportunities for public participation in the development of the IR and demonstrate how it considered public comments in its final decisions.

E. Existing and Readily Available Water Quality-Related Data and Information

In developing section 303(d) Lists, states are required to assemble, evaluate and consider all existing and readily available water quality-related data and information about, at a minimum, the following categories of waters: (1) waters identified as partially meeting or not meeting designated uses, or as threatened, in the state's most recent section 305(b) report; (2) waters for which dilution calculations or predictive modeling indicate nonattainment of applicable standards; (3) waters for which water quality problems have been reported by governmental agencies, members of the public, or academic institutions; and (4) waters identified as impaired or threatened in any CWA section 319 nonpoint assessment submitted to the EPA. See 40 C.F.R. section 130.7(b)(5).

In addition to these minimum categories, states are required to consider any other water quality-related data and information that is existing and readily available. The EPA's 1991 *Guidance for Water Quality-Based Decisions: The TMDL Process*[4] includes a list, provided in Appendix C, of water quality-related data and information that may be considered existing and readily available. States have certain flexibility in deciding which data or information they will use to list waters.

F. Assessment and Listing Methodology

The EPA regulations at 40 C.F.R. section 130.7(b)(6) also require states to include, as part of their section 303(d) List submissions to the EPA, documentation to support decisions to list or not list waters. Such documentation should include a description of the methodology used to develop the List. The methodology, often referred to as an assessment methodology or a listing methodology, should describe how the state collects or obtains data and information relevant to applicable WQS, how it evaluates the suitability of the data or information for decision making, and how it analyzes and interprets data to make attainment or impairment decisions. The List submittal should also include a description of the data and information used to identify waters; a rationale for any decision to not use any existing and readily available data and information; and any other reasonable information requested by the EPA. See 40 C.F.R. section 130.7(b)(6).

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[3] Information Concerning 2018 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions, December 22, 2017, at https://www.epa.gov/sites/production/files/2018-01/documents/final_2018_ir_memo.pdf
[4] Guidance for Water Quality-Based Decisions: The TMDL Process, EPA Office of Water, EPA 440/4-91-001, April 1991.

The methodology is not an item for approval under 40 C.F.R. section 130.7(d)(1). The methodology is an item specifically mentioned as documentation to support the assessment decisions as described above. Although the EPA reviews North Carolina's methodology as part of the List submittal review, the EPA's approval of the State's section 303(d) List should not be construed as agreement with or approval of the listing methodology.

G. Priority Ranking and Two Year TMDL Development Schedule

The EPA regulations also codify and interpret the requirement in section 303(d)(1)(A) of the CWA that states establish a priority ranking for listed waters. See 40 C.F.R. section 130.7(b)(4). States are required to prioritize waters on their section 303(d) Lists for TMDL development, and to identify those WQLS targeted for TMDL development in the next two years. In prioritizing and targeting waters, states must, at a minimum, consider the severity of the pollution and the uses to be made of such waters. States may consider additional factors relevant to prioritizing waters for TMDL development, including immediate programmatic needs; vulnerability of waters as aquatic habitats; recreational, economic, and aesthetic importance of particular waters; degree of public interest and support; and state or national policies and priorities.

In 2013, the EPA announced a new collaborative framework for implementing the section 303(d) program with states: *A Long-Term Vision for Assessment, Restoration and Protection under the Clean Water Act Section 303(d) Program* ("the Vision").[5] Under the Vision, states are expected to develop tailored strategies to implement their section 303(d) program responsibilities in the context of their overall water quality goals and individual state priorities. Although the State's long-term priorities should be included, or referenced, in the IR, the EPA's formal decision on North Carolina's section 303(d) List will not include action on the State's long-term priorities identified under the Vision.

III. Review of the State Submission

The EPA Region 4 Water Quality Planning Branch recommends approval of North Carolina's 2018 section 303(d) List. In reviewing the State's submittal, the EPA first examined the assessment and listing methodology used to develop the List in light of the State's approved WQS. The State's 2018 303(d) Listing and Delisting Methodology, hereafter referred to as the State's 2018 Methodology, was approved by the North Carolina Environmental Management Commission on March 8, 2018. The EPA's review was further based on its analysis of whether the State reasonably considered existing and readily available water quality related data and information, reasonably identified waters required to be listed, assigned a priority ranking, provided a list of TMDLs to be developed in the next two years and provided adequate public participation. This section describes all the factors involved in the EPA's review.

The EPA received North Carolina's final 2018 section 303(d) List package by electronic mail and anticipates receiving assessment data through the Assessment, TMDL Tracking and Implementation System (ATTAINS), which is the EPA's new electronic system to accept and track section 303(d)

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[5] A Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303(d) Program, December 2013, at https://www.epa.gov/sites/production/files/2015-07/documents/vision_303d_program_dec_2013.pdf

submissions and actions. The EPA's action applies to the assessment data to be entered in ATTAINS as well as the narrative report attached to the submission.

A. Review of State's Identification of Waters

1. North Carolina's WQS and Section 303(d) List Development

According to the State's 2018 Methodology, North Carolina's WQS are "state regulations as rules that form the foundation of controls that protect lakes, rivers, streams and other waterbodies from pollution." Surface waters are protected based on their designated uses as defined in the surface water classifications established in Title 15A of the North Carolina Administrative Code subchapter 02B. The designated uses include recreation, water supply, fish and shellfish consumption, and aquatic life. All surface waters in North Carolina must at least meet the WQC for fishable and swimmable waters which are classified as Class C.[6]

The State developed its section 303(d) List in light of the State's EPA-approved WQS. The State reported using all readily available information and assessed this information to determine compliance with the WQS in the manner described in the 2018 Methodology. The EPA's review of the State's section 303(d) List ensured that the List identifies WQLS consistent with existing state WQS.

2. State's Consideration of Existing and Readily Available Water Quality Related Data and Information

The NCDEQ collects a variety of biological, chemical and physical data, including benthic macroinvertebrates, fish community, fish tissue, lake assessment, ambient monitoring and aquatic toxicity monitoring. Sources of data and information include the following: previous section 303(d) Lists; waterbodies where specific fishing or shellfish bans and/or advisories are currently in effect; as well as data, information and water quality problems reported from local, State, or Federal agencies, Tribal governments, members of the public and academic institutions.

The NCDEQ maintains a standing solicitation for data on their website at https://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment. For data to be used for impairment determinations, data must meet specific submission criteria, including quality assurance and quality control of the collection and analysis of the data.

Use support is assessed for all basins statewide. The 2018 List is based on data collected in calendar years 2012 through 2016. According to the State's 2018 Methodology, "assessments based on older data are carried forward if newer data or information were not available to change the previous assessment decision." In previous section 303(d) listing cycles, the EPA expressed concerns about the NCDEQ's treatment of small data sets (fewer than the minimum required ten samples) which might indicate overwhelming evidence of impairment. The NCDEQ's monitoring program routinely collects at least ten samples at each monitoring site for most parameters, except for some lakes. For this listing cycle, the 2018 Methodology indicates that "the state will augment small sets of current data (i.e., when n<10)

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[6] https://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications

with the previous five years of data (2007 – 2011) where available." This provision addressed earlier concerns about limiting the use of data based on age of data and sample size.

Supporting information for specific waterbody assessment decisions can generally be found in the NCDEQ Basin Assessment Reports[7] and Basin Water Quality Plan Reports[8] available online. The EPA recommends that North Carolina ensure that these Reports continue to be updated and relevant to support the State's assessment decisions.

3. North Carolina's 2018 303(d) Listing and Delisting Methodology

According to the State's 2018 Methodology, there are five different assessment methods for WQS assessment:

a) Ten percent exceedance with 90 percent statistical confidence, used for most numeric WQS
b) Biological rating used to assess benthic and fish communities
c) Pathogen criteria to assess recreation standards
d) Shellfish growing area assessment
e) Fish advisories with fish tissue data to assess fish consumption

Each method, described in detail below, provides for assessment of the various beneficial use designations. In North Carolina, those uses include aquatic life, recreation, fish and shellfish consumption, and water supply. More than one method could be used on any individual AU depending on the data available and the water quality classification.

a) Ten percent exceedance with 90 percent statistical confidence

(1) Naturally Variable Parameters

Naturally variable parameters are those that fluctuate in a waterbody due to non-anthropogenic influences such as rainfall/flow, depth, time of day, salinity, etc. Naturally variable parameters reviewed for this listing cycle included chlorophyll a, nitrate/nitrite, dissolved oxygen, temperature, turbidity and pH. Generally, toxic parameters are not naturally variable and so are addressed separately.

Many states' WQC, including North Carolina's, do not explicitly specify an allowable percent of ambient measurement samples above numeric criteria magnitude values for determining impairment. The State's general use of a ten percent frequency of exceedance threshold for making attainment decisions for naturally variable parameters is consistent with the EPA guidance.

The EPA's IR guidance recommends making nonattainment decisions for pollutants other than toxic pollutants where more than ten percent of samples exceed applicable WQC. This method, referred to as a ten percent raw score approach, was intended to provide a simple "rule of thumb" in evaluating data

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[7] https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/reports-publications-data
[8] https://deq.nc.gov/about/divisions/water-resources/planning/basin-planning

sets of limited size for assessment purposes and is intended to account for measurement error, naturally variable pollutant concentrations, and the potential that small data sets may not be fully representative of receiving water conditions. Use of this rule when addressing dissolved oxygen, temperature, turbidity, and pH is considered appropriate.

States may take statistical variability into account when determining the appropriate allowable percent of ambient measurement samples that can be above the numeric criteria magnitude. Statistical variability seeks to account for sampling and analytical error and other factors that produce uncertainty in the accuracy, precision, and representativeness of sample data. Generally, the smaller the sample size, the greater the uncertainty that "true" conditions are accurately represented. Statistical variability can be mathematically expressed as a confidence level, and the desired confidence level is a risk management decision left to the discretion of the state in interpreting its available data.

In the Methodology for the 2014 listing cycle, North Carolina added to their use of a ten percent raw score approach "a nonparametric hypothesis testing approach based on the binomial distribution." The State chose a level of statistical confidence of 90 percent for listing decisions to decrease the probability of listing an unimpaired water. For water quality assessments, the binomial method begins with the assumption (or hypothesis) that the waterbody is not impaired. Use of the binomial method in this manner, in practice, requires more exceedances for an impairment decision than the ten percent raw score method. The resulting List of impaired waters should be considered those waters for which the State has a high level of confidence of "true" impairment.

To have confidence that these impaired waters are no longer impaired and should be removed from the section 303(d) List (i.e., delisted), a different test is demanded by the statistics.[9] In general, a delisting method should require more non-exceedances to ensure a high level of confidence of "true" non-impairment. Using the same test for delisting as for listing can result in a much lower confidence that a waterbody is meeting WQS.

For the 2014 listing cycle, the EPA gave deference to the State in using the new Methodology for delisting of naturally variable pollutants. The EPA guidance provides for removing waters from the section 303(d) List based on reevaluation with a new methodology. North Carolina's new Methodology in 2014 allowed the State to revisit the impairment status of all its waters using the statistical assumption that all waters were considered not impaired. The EPA requested that the State develop a procedure for the 2016 Methodology to ensure that delistings were handled appropriately in the future.

In 2016, the EPA determined that the State's 2016 Methodology, unchanged from the 2014 Methodology, did not differentiate between listing and delisting, resulting in low confidence that delisted waterbodies were truly unimpaired. The EPA conducted an independent assessment of water quality data and determined that seventeen WQLS should not have been delisted and were therefore included on the 2016 section 303(d) List as impairments to aquatic life, based on failure to demonstrate good cause to delist.

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[9] Helsel, D.R. and R. M. Hirsch, 2002. Statistical Methods in Water Resources, Techniques of Water Resources Investigations, Book 4, chapter A3. U.S. Geological Survey.

The 2018 Methodology, approved by the North Carolina Environmental Management Commission in March 2018, incorporates a new delisting procedure, as follows:

> NC will apply a combination of nonparametric hypotheses testing based on the binomial distribution as well as an analysis of the dates of excursions to determine if there is good cause to delist a water. An analysis of newer data that have not been previously assessed is included in the delisting procedure to allow the State to determine if criterion excursions are more recent.
>
> For delisting waters, if the 2018 assessment results in greater than 10% exceedance rate with less than 90% statistical confidence and the water was on the 2016 303(d) list, the water will be delisted if there are less than 2 excursions of the criterion in newer data that have not been previously assessed. If the 2018 assessment results in less than 10% exceedance rate and the water was on the 2016 303(d) list, the water will be delisted if there is greater than 40% statistical confidence that there is less than a 10% exceedance of the criterion or if there are less than 3 excursions of the criterion in newer data that have not been previously assessed.

The EPA is satisfied that the NCDEQ has provided an appropriate rationale for delisting waterbody impairments indicated by naturally variable pollutants. As stated in the NCDEQ's responsiveness summary, the new methodology produced "a listing and delisting process for 2018 that maintained the overall integrity of the section 303(d) listing methodology but corrected the imbalance between statistical requirements for listing and delisting decisions, and put more emphasis on more current data for listing decisions rather than older data that might not be reflective of current conditions." The EPA concludes that waters impaired by naturally variable parameters are appropriately included on the State's 2018 section 303(d) List.

(2) Toxic Pollutants

Many pollutants which exert a toxic effect in water react and behave differently in the environment than the naturally variable pollutants discussed above. Unlike the naturally variable pollutants, toxic pollutants, such as metals, do not generally have wide variability in concentration under natural conditions that would still be protective of the designated use. Also, while it is common knowledge that metals occur naturally in aquatic environments, the natural contribution is often negligible compared to the WQC. Metals such as copper and zinc are well known as minor constituents (present in water with concentrations typically less than 1,000 micrograms per liter).[10,11] Natural variability relates to the degree that conditions in nature vary as a function of time and space based on physical, chemical, biological, hydrological, and geomorphological factors. Natural variability is generally not a factor for consideration in evaluating ambient measurement of toxics that exceed WQC magnitude values.[12]

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[10] Caldwell, W.S., 1993, *Selected water-quality and biological characteristics of streams in some forested basins of North Carolina, 1985-88*: U.S. Geological Survey Water Resources Investigations Report 92-4129.

[11] Hem, J.D., 1995, *Study and interpretation of the chemical characteristics of natural water*: U.S. Geological Survey Water Supply Paper 2254, p. 129-130.

[12] EPA Determination Upon Review of Amended Florida Administrative Code Chapter 62-303, Identification of Impaired Surface Waters, Appendix A *Detailed Review of the Impaired Waters Rule Binomial Statistical Test.* (February 19, 2008)

In 2014, the NCDEQ (at the time the North Carolina Department of Environment and Natural Resources, or NCDENR) published a report on total and dissolved metals data in North Carolina freshwater streams and found that most metals were below the total metals WQC in place at the time as well as below the proposed dissolved WQC (now approved; see below). The Random Ambient Monitoring System (RAMS), started in January 2007, is a probabilistic component of the State's Ambient Monitoring System which allows the State "to collect data on water quality parameters that are rarely examined and to answer broad questions about the water quality of North Carolina streams with a statistical rigor that had not been possible before." According to this report, "While some individual results were higher than standards, the overall results from the majority (98/120) of RAMS stations were not higher than standards for any total or dissolved metals."[13] New data collected for the 2018 section 303(d) listing cycle appears to support this finding as it indicates very few exceedances of the new dissolved criteria for toxic metals. The RAMS report also supports the assertion that natural variability is generally not a factor for consideration in evaluating ambient measurement samples that exceed WQC magnitude values. In cases where metals exceedances may be naturally occurring, a site-specific approach to the assessment of metals would be appropriate.

According to EPA guidance, a criteria magnitude for toxic pollutants that cause an acute or chronic toxic effect on aquatic life should not be exceeded more than once every three years (referred to as the 1-in-3 method). This allows aquatic resources time to recover from the impacts of a toxic event. Many states incorporate the 1-in-3 method in their assessment methodology, in keeping with their specific EPA-approved WQC, which typically include this exceedance frequency. Many also consider site-specific factors or develop decision rules that address issues such as limited data, data quality, effects of marginal excursions, data representativeness and overwhelming evidence of impairment.

North Carolina's assessment methodology for toxics includes assigning impairment to waters with a greater than ten percent exceedance frequency of the criteria. This implies that the water quality for a waterbody would be considered protective of aquatic life if the criterion truly were exceeded up to ten percent of the time. This one-size-fits-all statistical approach ignores the principle that exceedance frequencies associated with toxic pollutants should be based on biological endpoints and exposure-response relationships. North Carolina has provided no data, supporting science, or underlying rationale to demonstrate that this exceedance rate is reflective of their WQC, is protective or is scientifically defensible for toxics. Nor have they suggested a site-specific type of approach or decision rules as described above.

The addition of a statistical confidence level to the ten percent method in the 2014 section 303(d) listing cycle caused the State to delist numerous metals impairments. In the disapproval of the metals delistings in 2014 and again in the 2016 listing cycle, the EPA conducted an independent assessment of the data, applying the 1-in-3 method. This method considers the amount of time a normal, unstressed system is likely to take to recover from a toxic exceedance. In its independent assessment, the Agency noted that most of the delisted waters are, or have been in the past, identified as impaired for other pollutants and they would be considered stressed systems. The Agency also took into consideration that many of the

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[13] *Total and Dissolved Metals in North Carolina Surface Waters: RAMS Data Exploration January 2007 to June 2013.* November 7, 2014. NCDENR, Division of Water Resources, Water Sciences Section. https://files.nc.gov/ncdeq/Water%20Quality/Environmental%20Sciences/ECO/RAMS-Metals-Summary-11-07-2014.pdf

exceedances were more than double the WQC.

The North Carolina Environmental Management Commission adopted revisions to the State's toxics WQS and the EPA issued a partial approval on April 6, 2016. The EPA-approved portion of the WQS includes upgrades to toxic WQC to meet national recommendations for arsenic, chromium III, chromium VI, copper, lead, nickel, silver and zinc and a scientifically defensible alternative for cadmium for non-trout waters. The revised WQC are the criteria used for assessment of new dissolved metals data in the North Carolina 2018 section 303(d) List. The NCDEQ Division of Water Resources (DWR) stated in their responsiveness summary, "[t]he 2018 303(d) Listing and Delisting Methodology does not directly address legacy assessments for total metals that have a new dissolved water quality standard. DWR is delisting Category 5 or 5e assessments for total metals only when current dissolved metals data are available for assessment. Other legacy total metals assessments will be reassessed as dissolved data become available." IR Category 5e is assigned to those waters for which the EPA disapproved a metals impairment delisting.

The State's revised WQC for toxic metals do not define a frequency of exceedance. The State continues to assess for toxics by assigning impairment to waters with a greater than ten percent exceedance frequency, with at least 90 percent statistical confidence level. As North Carolina has yet to provide supporting evidence that this exceedance rate is reflective of their WQC, the EPA cannot determine that it is a reasonable method for the NCDEQ to assess toxic pollutants consistent with the State's revised, EPA-approved WQC. Whenever the EPA cannot conclude that an assessment methodology is appropriate, an independent review of data is done to determine whether all waterbody impairments are properly identified. The EPA's review of North Carolina's 2018 section 303(d) List included an assessment of all new dissolved metals data and all delistings using the EPA recommended 1-in-3 method.

As noted above, the NCDEQ is only delisting waters with "legacy" metal impairments (listings based on total metals monitoring data) when more recent dissolved metals data indicates no impairment. In this listing cycle, the NCDEQ proposed forty-one delistings of legacy metals assessments. The EPA's independent review determined that these delistings were appropriate whether using the State's ten percent exceedance approach or the Agency's recommended 1-in-3 method. Also based on the new dissolved metals data, the State confirmed four previous metals impairments and added one new impairment for dissolved copper.

In their responsiveness summary, the NCDEQ stated that they will work with the North Carolina Environmental Management Commission "to add language to the 2020 303(d) Listing and Delisting Methodology to clarify the process for delisting total metals in cases where there is new dissolved metals data available." The EPA will continue to work with the State to reach an agreement on a defensible assessment methodology for metals.

Based on the available information as described above, the EPA concludes that waters impaired by metals have been appropriately included on the State's 2018 section 303(d) List.

b) Biological rating used to assess benthic and fish communities

The EPA reviewed the State's 2018 Methodology for assessment of designated use support indicated by biological monitoring. North Carolina's WQS include a narrative for biological integrity applicable to all Class C waters, "The waters shall be suitable for aquatic life propagation and maintenance of biological integrity, wildlife, secondary recreation and agriculture; sources of water pollution which preclude any of these uses on either a short-term or long-term basis shall be considered to be violating a water quality standard." Biological integrity is defined as "...the ability of an aquatic ecosystem to support and maintain a balanced and indigenous community of organisms having species composition, diversity, population densities and functional organization similar to that of reference conditions."

According to the NCDEQ Biological Assessment Unit (BAU) website, [14] to interpret the narrative WQS:

> Biocriteria have been developed using the diversity, abundance, and pollution sensitivity of the organisms that inhabit lotic (flowing) waterbodies in NC. One of five bioclassifications are typically assigned to each water body sampled: Excellent, Good, Good-Fair, Fair and Poor. These bioclassifications, which have been developed for major ecoregions, are used to assess the various impacts of both point source discharges and nonpoint source runoff. The resulting information is used to document both spatial and temporal changes in water quality, and to complement water chemistry analyses, ambient toxicity data, and habitat evaluations.

The BAU performs benthic macroinvertebrate and fish community assessments statewide. If both macroinvertebrate and fish community data are available, both are used to evaluate use support.

Recent comments on the State's IR process have raised concerns about possible gaps in the biological assessment process (e.g., sediment embeddedness, habitat or hydrologic alteration). The EPA encourages North Carolina to include in the assessment methodology the flexibility to consider all existing and readily available water quality related data and information which could be used to make scientifically defensible weight-of-evidence findings that designated aquatic life uses are not fully supported. See 40 C.F.R. section 130.7(b)(5). The EPA's 1991 *Guidance for Water Quality-Based Decisions: The TMDL Process* includes a list, provided in Appendix C, of water quality-related data and information that may be considered existing and readily available.

The EPA concluded through its evaluation that the State's methodology for assessing biological data and information is consistent with the State's narrative biological criteria. Using this methodology, the State has appropriately included all waters that are not meeting uses with respect to biology on its section 303(d) List.

c) Pathogen criteria to assess recreation standards

North Carolina bases its determination of recreation use support on the fecal coliform bacteria WQC for

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[14] NCDEQ Biological Assessment Unit website: http://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/biological-assessment-branch.

fresh water, and the enterococcus WQC for coastal waters. The State assesses pathogens for listing purposes using a geometric mean based on a minimum of five samples collected within a 30-day period.

The NCDEQ typically conducts monthly fecal coliform bacteria testing as part of its ambient monitoring program for fresh waters. This means that the data typically collected is not directly used to list impaired waters because at least five samples collected within a 30-day period are required. According to recent discussions with State staff and as stated in North Carolina's 2006 IR, "Locations with annual geometric means greater than 200 colonies per 100 mL, or when more than 20 percent of the samples are greater than 400 colonies per 100 mL, are identified for potential follow-up monitoring conducted five times within 30 days as specified by the state fecal coliform bacteria standard." Resource limitations may hinder immediate follow-up monitoring in locations not identified as Primary Recreation Use. When the five samples in 30 days requirement is not met but monthly data indicates possibility of impairment (annual geometric mean is greater than 200 colonies per 100 mL or greater than 20 percent exceed 400 colonies per 100 mL), waters are placed in IR Category 3. Many states in this scenario place these waters in IR Category 5.

New to the 2018 Methodology is a procedure for delisting waters impaired for pathogens. Whereas an impairment determination requires five samples within 30 days, the delisting procedure specifically states that "[f]ive samples in a 30-day period are not required to remove the assessment from category 5." The EPA is concerned that this method may not be scientifically defensible and requests that North Carolina explain the reasoning behind this requirement. Particularly where third-party data may indicate impairment, delisting based on insufficient data as allowed by the new delisting methodology may fail to properly identify true impairments. As stated in the responsiveness summary, the State "will continue to evaluate how best to sample and assess pathogen indicators in freshwaters." The EPA recommends that the State includes the Agency in this evaluation.

For the 2018 section 303(d) List, the EPA independently reviewed all fecal coliform data used by the State to delist impairments in light of the State's WQC and Listing Methodology. The EPA concluded that in all cases, annual geometric means were less than 200 colonies per 100 ml and less than 20 percent of the data exceeded 400 colonies per 100 mL.

Based on this review and on the available information with respect to the State's 2018 Methodology for assessing criteria for pathogens, the EPA concluded that all waters known to be impaired by pathogens have been included on the State's section 303(d) List.

d) Shellfish growing area assessment

The North Carolina Division of Environmental Health (DEH) operates a monitoring program under guidelines outlined in the National Shellfish Sanitation Program's Guide for the Control of Molluscan Shellfish. When a condition or event occurs that impacts the open status of waters, DEH closes those waters to protect public health.

According to the DEH website at http://portal.ncdenr.org/web/mf/shellfish-sanitation, Conditionally Approved "areas are generally open to shellfishing, but can be closed after a significant rainfall event

due to the resultant runoff. The area will then remain closed until water sampling indicates a return to acceptable bacteria levels." By definition, Conditionally Approved areas do not meet the WQC based on a sanitary survey involving detailed water quality assessments conducted under the national protocols.

The 2018 303(d) Listing Methodology states that an assessment unit is assessed as Impaired when the DEH growing area classification is "Not Approved." The EPA guidance provides that both Prohibited and Conditionally Approved classifications are considered "Not approved." The EPA's guidance advises, and the State's Listing Methodology appears to agree, that all Conditionally Approved areas be listed on the section 303(d) List.

The EPA agrees that North Carolina's Listing Methodology provides for the NCDEQ to make listing decisions based on bacteriological data and shellfish harvesting classification information and this is consistent with the State's currently applicable WQS and the EPA's regulations.

e) Fish advisories with fish tissue data to assess fish consumption

Fish consumption was assessed based on site-specific fish consumption advisories which are based on fish tissue data. The State's Monitoring Program Strategy describes fish tissue testing for mercury, selenium, cadmium, PCBs and pesticides (including dioxins). The North Carolina Department of Health and Human Services uses this data to develop advisories and advice. See http://epi.publichealth.nc.gov/fish/current.html. Waters are considered impaired if there is a fish consumption advisory in place and the AU has site specific fish tissue data.

The EPA agrees that North Carolina's listing methodology provides for the State to make listing decisions based on fish consumption information and in a manner consistent with the State's currently applicable WQS and the EPA's regulations.

4. Other Pollution Control Requirements – IR Category 4b

The EPA's regulations provide that TMDLs are not required for waterbodies where "[o]ther pollution control requirements (e.g., best management practices) required by local, State, or Federal authority are stringent enough to implement any water quality standards (WQS) applicable to such waters." See 40 C.F.R. section 130.7(b)(l)(iii). The EPA's 2006 IR Guidance acknowledges that the most effective method for achieving WQS for some WQLS may be through controls developed and implemented without TMDLs (known as a "4b alternative" in reference to IR Category 4b). The EPA evaluates on a case-by-case basis the state's decision to exclude certain waterbody/pollutant combinations from the section 303(d) List based on the 4b alternative. For all waterbodies identified in IR Category 4b, the state is required to demonstrate that other required regulatory controls (e.g., NPDES permit limits, Stormwater Program Rules, Nutrient Management Rules, etc.) will result in compliance with standards within a reasonable time.

The EPA expects North Carolina to continue to evaluate the effectiveness of all IR Category 4b waters to determine whether the State can continue to support its original 4b demonstration. Any significant

change in the basis for approval of a "4b alternative" could result in the return of that waterbody to the section 303(d) List.

B. State's Additions to and Delistings from the Section 303(d) List

1. State's Addition of WQLS to the Section 303(d) List

The State identified 61 additional WQLS in its List submittal, consistent with section 303(d) and the EPA's implementing regulations. The EPA Region 4 Water Quality Planning Branch is recommending approval of the addition of those WQLS to the State's section 303(d) List. The newly listed waterbodies are identified in Appendix A of this document.

2. State's Removal of WQLS from the Section 303(d) List - Delistings

The State proposed to delist 82 WQLS in its List submittal, consistent with section 303(d) and the EPA's implementing regulations. For all the proposed delistings, the State provided a rationale and supporting documentation which the EPA fully considered as part of its review. The EPA Region 4 Water Quality Planning Branch has reviewed the good cause justification for all delisting requests and, based on EPA's independent review of the existing and readily available data, is recommending approval of the delisting of those WQLS from the State's section 303(d) List. All waterbody/pollutant combinations removed from the State's section 303(d) List are identified in Appendix B.

C. State's Public Participation Process

The State published its draft section 303(d) List for public review, accepted written comments and prepared a formal response to the comments received during the public comment period. This responsiveness summary was included in the State's submittal to the EPA. The EPA reviewed each of the responses and concluded that the State appropriately considered all comments, data, and information received during the public comment period. Based on information provided by the State, the EPA has concluded that public participation was conducted adequately to ensure compliance with federal requirements. See 40 C.F.R. Part 25.

D. State's Priority Ranking and Two Year TMDL Development Schedule

Consistent with 40 C.F.R. section 130.7(b)(4) and the *EPA's Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303(d) Program,* the State's TMDL prioritization strategy is fully described in its section 303(d) List submittal and the State has included a schedule of TMDL development for all the waters identified on its section 303(d) List.

IV. Government to Government Consultation

The EPA recognizes its unique legal relationship with federally recognized tribal governments as set forth in the United States Constitution, treaties, statutes, executive orders, and court decisions. Government-wide and EPA-specific policies call for regular and meaningful consultation with tribal

governments when developing policies and regulatory decisions on matters affecting their communities and resources. The EPA *Policy on Consultation and Coordination with Indian Tribes* (Policy)[15] was finalized on May 4, 2011, in accordance with the Presidential Memorandum issued November 5, 2009, directing agencies to develop a plan to implement fully Executive Order 13175. This Policy reflects the principles expressed in the 1984 EPA *Policy for the Administration of Environmental Programs on Indian Reservations* (1984 Policy). The 1984 Policy remains the cornerstone for the EPA's Indian program and "assure[s] that tribal concerns and interests are considered whenever the EPA's actions and/or decisions may affect" tribes (1984 Policy. p.3, principle no. 5).

The State's submittal of its final section 303(d) List to the EPA triggered the Agency's mandatory duty under section 303(d) of the CWA to review the List for consistency with the requirements of the CWA and to take action to approve or disapprove the List. The State's section 303(d) List and the EPA's decision on it will apply to waters in the State and will not apply to waters in Indian Country. Nonetheless, because some of the State waters are adjacent to tribal waters, tribal resources could be impacted by this action. As such, the EPA identified and offered government to government consultation to potentially impacted federally recognized tribal governments to ensure that tribal input was considered prior to final Agency action on the section 303(d) List.

By letter of April 8, 2019, the EPA formally offered consultation to the Eastern Band of Cherokee Indians and the Catawba Indian Nation. The consultation and coordination process were conducted in accordance with the EPA Policy. The process began on April 8, 2019 and ended on May 6, 2019. Neither the Eastern Band of Cherokee Indians nor the Catawba Indian Nation choose to consult on the section 303(d) List.

V. Final Recommendation on the State's Section 303(d) List Submittal

After careful review of the final section 303(d) List submittal package, the EPA Region 4 Water Quality Planning Branch recommends that the Division Director of the Water Division, EPA Region 4, **APPROVE** the state of North Carolina's 2018 section 303(d) List.

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[15] https://www.epa.gov/sites/production/files/2013-08/documents/cons-and-coord-with-indian-tribes-policy.pdf

Appendix A: Waterbody Impairments Added to the Section 303(d) List

Information in this table was assembled from files submitted by North Carolina as part of their final section 303(d) List submittal. Parameters (abbreviated PARAM in this table) refer to impairments.

ASSESSMENT_UNIT_ID	ASSESSMENT_UNIT_NAME	PARAM_NAME
9-53-(2.9)b	Buffalo Creek (Kings Mountain Reservoir)	Water Temperature
9-50-(28)	First Broad River	Turbidity
9-50-15	Hinton Creek	Benthos
9-54	Kings Creek	Benthos
9-46-(1)	Sandy Run Creek	Fish Community
16-19-8-3	Rock Creek	Chlorophyll *a*
16-14-(5.5)a	Stony Creek (Stony Creek Reservoir)	Chlorophyll *a*
17-(3.7)	Deep River	Benthos
17-43-(5.5)b	Rocky River	Chlorophyll *a*
17-16-(1)a	Sandy Creek	Chlorophyll *a*
17-16-(3.5)	Sandy Creek	Chlorophyll *a*
18-28ut3	Ut to Locks Creek	Copper Dissolved Chronic
18-77	Brunswick River	pH
18-46-7-1	Jones Lake	pH
18-64-7-2	Mill Creek	pH
18-74-24-1	Maxwell Creek	Fecal Coliform
18-74-24	Stockinghead Creek	Fecal Coliform
18-74-24ut4	UT to Stockinghead Creek 4	Fecal Coliform
18-74-24ut5	UT to Stockinghead Creek 5	Fecal Coliform
11-38-34-14-1	Hull Branch	pH
11-38-34	Wilson Creek	pH
11-138	Twelvemile Creek	Turbidity
6-79	Smith Mill Creek	Benthos
14-22b	Big Swamp	pH
14-2-6	Naked Creek	pH
15-17-1-(1)	Grissett Swamp (Lake Tabor)	Chlorophyll *a*

15-25d	Intracoastal Waterway	Dissolved Oxygen
27-57-16-(3)b	Buffalo Creek (Wendell Lake)	Fish Community
27-10-(1)c	Ledge Creek (Lake Rogers)	Chlorophyll *a*
27-34-(4)a	Walnut Creek	Fish Community
27-72-(5)	Bear Creek	Benthos
27-86-(7)a	Contentnea Creek	Benthos
30c2a	Albemarle Sound	pH
30-3-(12)	Pasquotank River	Dissolved Oxygen
22-(1)b	Dan River (North Carolina portion)	Turbidity
22-(55.75)	Dan River (North Carolina portion)	Turbidity
23-10-3	Blue Mud Creek	Dissolved Oxygen
28-29-(2)b	Cedar Creek	Turbidity
28-79-25-7-1	Butterwood Creek	Dissolved Oxygen, Benthos
29-(1)	Pamlico River (Upper Pamilco Segment)	Dissolved Oxygen
29-(5)b3	Pamlico River (Pamlico Middle Segment)	Chlorophyll *a*
29-34-34-(2)	Pantego Creek	Chlorophyll *a*
29-34-35	Pungo Creek	pH
21-35-7-10-4ut1	Ditch to Broad Creek	Turbidity
12-119-(4.5)b	Abbotts Creek (including Lexington-Thomasville Water Supply Res. at normal reservoir elevation, Tom-A-Lex Lake)	Chlorophyll *a*
13-17-6-(1.5)b	Coddle Creek (including water supply reservoir for Concord)	pH
13-45-(2)a5	Marks Creek (Boyds Lake, City Lake, Everetts Lake)	Dissolved Oxygen
13-(1)b	Pee Dee River (including Lake Tillery below normal operating levels)	pH
13-17-36-(3.5)b3	Richardson Creek (Lake Lee)	Water Temperature, Dissolved Oxygen
12-72-8-(3)	Lovills Creek (Lovell Creek)	Benthos
12-(114)b2	Yadkin River (including lower portion of High Rock Lake)	pH
12-(124.5)a	Yadkin River (including lower portion of High Rock Lake)	pH
12-(124.5)c2	Yadkin River (including Tuckertown Lake, Badin Lake)	Chlorophyll *a*

12-(108.5)b1	Yadkin River (including upper portion of High Rock Lake below normal operating level)	Turbidity
12-(108.5)b3	Yadkin River (including upper portion of High Rock Lake below normal operating level)	pH
13-17-36-4-(2)	Little Richardson Creek (Lake Monroe)	pH, Water Temperature
13-17-5a	Mallard Creek	Turbidity
13-17-36-(5)a2	Richardson Creek	Copper Dissolved Chronic
13-17d	Rocky River	Copper Dissolved Chronic
13-(26.5)	Pee Dee River (including Blewett Falls Lake below normal operating levels)	Chlorophyll *a*
13-49-1	Polecat Creek	Dissolved Oxygen

Appendix B: Waterbody Impairments Delisted Since the Previous Cycle

Information in this table was assembled from files submitted by North Carolina as part of their final section 303(d) List submittal. Parameters (abbreviated PARAM in this table) refer to impairments.

ASSESSMENT UNIT ID	ASSESSMENT UNIT NAME	PARAM NAME	PARAM DELISTING REASON
25a2a	Chowan River	Cadmium	Previous listing was inconsistent with the methodology.
16-41-2-(9.5)	Morgan Creek (including the Morgan Creek Arm of New Hope River Arm of B. Everett Jordan Lake)	Turbidity	TMDL completed and approved by EPA
16-41-1-(14)	New Hope Creek (including New Hope Creek Arm of New Hope River Arm of B. Everett Jordan Lake)	Turbidity	TMDL completed and approved by EPA
16-11-(9)b	Reedy Fork (Hardys Mill Pond)	Zinc, Fecal Coliform	Zinc impairment: Previous listing was inconsistent with the methodology.; Fecal Coliform: TMDL completed and approved by EPA
16-11-(3.5)b1	Reedy Fork (including Lake Brandt and Lake Townsend	Chlorophyll a	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
16-11-14-2c	South Buffalo Creek	Copper, Zinc	Copper and zinc: Previous listing was inconsistent with the methodology.
16-41-1-12-(1)	Third Fork Creek	Copper, Zinc	Copper and zinc: Previous listing was inconsistent with the methodology.
16-41-1-12-(2)	Third Fork Creek	Dissolved Oxygen	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria

17-(1)	Deep River (including High Point Lake at normal pool elevation)	Chlorophyll a	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
17-43-(8)b2	Rocky River	Chlorophyll a	Water quality assessment criteria for Category 5 listing no longer applies due to a change in waterbody type
18-7-(11)	Buckhorn Creek (Harris Lake)	Dissolved Oxygen	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
18-(16.7)	Cape Fear River	Copper	Previous listing was inconsistent with the methodology.
18-27-(3)b	Cross Creek (Big Cross Creek)	pH	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
18-16-1-(2)	Kenneth Creek	Benthos, Dissolved Oxygen	Benthos impairment moved to Category 4s because pollutant causing impairment identified. Dissolved Oxygen impairment: The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
18-28ut3	Ut to Locks Creek	Zinc, Arsenic	Zinc impairment: Previous listing was inconsistent with the methodology. Arsenic: The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
18-(71)b	Cape Fear River	Nickel, Copper, Arsenic	Nickel and copper impairments: Previous listing was inconsistent with the methodology. Arsenic: The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
18-(87.5)a	Cape Fear River	Nickel, Copper, Arsenic	Nickel and copper impairments: Previous listing was inconsistent with the methodology. Arsenic: The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
18-74-(61)	Northeast Cape Fear River	Copper	Previous listing was inconsistent with the methodology.

11-38-34-14	Harper Creek	pH	TMDL completed and approved by EPA
11-29-22	Shooks Creek	pH	TMDL completed and approved by EPA
11-38-32-9ut3	UT to Frankum Creek	pH	TMDL completed and approved by EPA
11-129-5-(9.5)	Clark Creek	Copper	Previous listing was inconsistent with the methodology.
11-129-2-(4)	Jacob Fork	pH	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
11-137-1	Irwin Creek	Lead, Zinc, Copper	Lead, zinc and copper: Previous listing was inconsistent with the methodology.
11-137-8b	Little Sugar Creek	Copper	Previous listing was inconsistent with the methodology.
11-137-8c	Little Sugar Creek	Copper	Previous listing was inconsistent with the methodology.
11-137b	Sugar Creek	Copper	Previous listing was inconsistent with the methodology.
11-137c	Sugar Creek	Copper	Previous listing was inconsistent with the methodology.
11-138	Twelvemile Creek	Copper	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
6-34-(15.5)	Davidson River	pH	TMDL completed and approved by EPA
6-(54.75)b	French Broad River	Fecal Coliform	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
6-54-(1)b	Mills River	pH	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
5-16-(11.5)c	Richland Creek (Lake Junaluska)	Fecal Coliform	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
5-26-(7)ut15	UT to Jonathans Creek	Benthos	Flaws in the original analysis of data and information led to assessment being incorrectly listed in Category 5

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7-3-22	Bald Creek	Fecal Coliform	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
7-3-22-4	Elk Wallow Creek	Fecal Coliform	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
7-3-22-1	Fox Creek	Fecal Coliform	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
7-3-22-5	Lickskillet Branch	Fecal Coliform	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
7	Nolichucky River	Copper	Previous listing was inconsistent with the methodology.
7-2-(21.5)	North Toe River	Turbidity, Copper	Turbidity impairment: The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria. Copper: Previous listing was inconsistent with the methodology.
7-2-(27.7)b	North Toe River	Turbidity	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
7-3-22-7	Possumtrot Creek	Fecal Coliform	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
1-52c	Valley River	Fecal Coliform	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
15-(1)d	Waccamaw River	pH	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
2-27	Iotla Creek	Fish Community	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
2-57-45b	Whiteoak Creek	Benthos	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria

27-33-(10)b	Crabtree Creek	Benthos	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
27-33-(3.5)a1	Crabtree Creek (Crabtree Lake)	Benthos	Flaws in the original analysis of data and information led to assessment being incorrectly listed in Category 5
27-52-6a1	Hannah Creek	Dissolved Oxygen	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
27-43-15-(4)a1	Middle Creek	Fish Community	Flaws in the original analysis of data and information led to assessment being incorrectly listed in Category 5
27-(38.5)	Neuse River	Copper	Previous listing was inconsistent with the methodology.
27-(49.75)	Neuse River	Turbidity	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
27-23-(2)b	Smith Creek	Benthos	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
27-43-(8)a	Swift Creek	Benthos	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
27-34-(4)a	Walnut Creek	Benthos	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
27-150-3-1	Neal Creek	Shellfish Growing Area	Flaws in the original analysis of data and information led to assessment being incorrectly listed in Category 5
27-(104)a1	Neuse River Estuary	pH	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
27-(96)b2	Neuse River Estuary	Copper	Previous listing was inconsistent with the methodology.
27-150-3	South Prong Bay River	Shellfish Growing Area	Flaws in the original analysis of data and information led to assessment being incorrectly listed in Category 5

30c1	Albermarle Sound	pH	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
22-9	Big Creek	Fish Community	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
22-20	Snow Creek	Fish Community	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
22-58-12-6b	Marlowe Creek	Benthos,Copper, Zinc	Benthos impairment moved to Category 4s because pollutant causing impairment identified.copper and zinc: Previous listing was inconsistent with the methodology.
22-52	Rattlesnake Creek	Fish Community	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
28-79-(1)a1	Fishing Creek	Dissolved Oxygen	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
28-100a	Grindle Creek	pH	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
29-6-(5)	Chocowinity Bay	Copper	Previous listing was inconsistent with the methodology.
29-(27)	Pamlico River	Copper	Previous listing was inconsistent with the methodology.
21-32b	Calico Creek	Copper	Previous listing was inconsistent with the methodology.
19-14	Wilson Bay	Copper	Previous listing was inconsistent with the methodology.
12-94-(0.5)b2b	Muddy Creek	Turbidity, Zinc, Copper	Turbidity impairment: The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria. Copper and zinc: Previous listing was inconsistent with the methodology.
12-(38)b	Yadkin River	Copper	Previous listing was inconsistent with the methodology.

12-108-21a	Second Creek (North Second Creek)	Turbidity	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
12-108-21c	Second Creek (North Second Creek)	Turbidity	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
12-(124.5)c1	Yadkin River (including Tuckertown Lake, Badin Lake)	pH	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
12-(108.5)b4	Yadkin River (including upper portion of High Rock Lake below normal operating level)	pH	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
13-17-20	Crooked Creek	Benthos	The assessment and interpretation of more recent or more accurate data in the record demonstrate the parameter of interest is meeting criteria
13-17-9-(2)	Irish Buffalo Creek	Copper	Previous listing was inconsistent with the methodology.
13-17-5a	Mallard Creek	Copper	Previous listing was inconsistent with the methodology.
13-17-36-(5)a2	Richardson Creek	Copper	Previous listing was inconsistent with the methodology.
13-17c2	Rocky River	Copper	Previous listing was inconsistent with the methodology.
13-17d	Rocky River	Copper	Previous listing was inconsistent with the methodology.

Appendix C: Sources of Existing and Readily Available Water Quality-Related Data and Information for States to Consider

From the EPA's 1991 *Guidance for Water Quality-Based Decisions: The TMDL Process, Appendix C – Screening Categories,* pages 45-46.

This list of screening categories is based on categories promulgated as the minimum data set a state should consider when developing their list of impaired waters pursuant to section 304(1) of the Clean Water Act. When developing lists pursuant to this guidance and to meet the requirements of section 303(d), a state should, at a minimum, use these categories to identify their water quality-limited waters. States should also consider additional information, such as TRI data, streamflow information collected by USGS, locally available data, and public comments on proposed 303(d) lists.

1. Waters where fishing or shellfish bans and/or advisories are currently in effect or are anticipated.

2. Waters where there have been repeated fish kills or where abnormalities (cancers, lesions, tumors, etc.) have been observed in fish or other aquatic life during the last ten years.

3. Waters where there are restrictions on water sports or recreational contact.

4. Waters identified by the state in its most recent state section 305(b) report as either "partially achieving" or "not achieving" designated uses.

5. Waters listed under sections 304(1) and 319 of the CWA

6. Waters identified by the state as priority waterbodies (State Water Quality Management plans often include priority waterbody lists which are those waters that most need water pollution control decisions to achieve water quality standards or goals.)

7. Waters where ambient data indicate potential or actual exceedances or water quality criteria due to toxic pollutants from an industry classified as a primary industry in Appendix A of 40 C.F.R. Part 122.

8. Waters for which effluent toxicity test results indicate possible or actual exceedances of state water quality standards, including narrative "free from" water quality criteria or EPA water quality criteria where state criteria are not available.

9. Waters with primary industrial major dischargers where dilution analyses indicate exceedances of state narrative or numeric water quality criteria (or EPA water quality criteria where State standards are not available) for toxic pollutants, ammonia, or chlorine. These dilution analyses must be based on estimates of discharge levels derived from effluent guidelines development documents, NPDES permits or permit application data (e.g., Form 2C), Discharge Monitoring Reports (DMRs), or other available information.

10. Waters with POTW dischargers requiring local pretreatment programs where dilution analyses indicate exceedances of state water quality criteria (or EPA water quality criteria where state water quality criteria are not available) for toxic pollutants, ammonia, or chlorine. These dilution analyses must be based on estimates of discharge levels derived from effluent guidelines development documents, NPDES permits or permit application data (e.g., Form 2C), Discharge Monitoring Reports (DMRs), or other available information.

11. Waters with facilities not included in the previous two categories such as major POTWs, and industrial minor dischargers where dilution analyses indicate exceedances of state water quality criteria (or EPA water quality criteria where state water quality criteria are not available) for toxic pollutants, ammonia, or chlorine. These dilution analyses must be based on estimates of discharge levels derived from effluent guidelines development documents, NPDES permits or permit application data (e.g., Form 2C), Discharge Monitoring Reports (DMRs), or other available information.

12. Waters classified for uses that will not support the "fishable/swimmable" goals of the Clean Water Act.

13. Waters where ambient toxicity or adverse water quality conditions have been reported by local, state, EPA, or other federal agencies, the private sector, public interest groups, or universities. These organizations and groups should be actively solicited for research they may be conducting or reporting. For example, university researchers, the United States Department of Agriculture, the National Oceanic and Atmospheric Administration, the United States Geological Survey, and the United States Fish and Wildlife Service are good sources of field data and research.

14. Waters identified by the state as impaired in its most recent Clean Lake Assessments conducted under section 314 of the Clean Water Act.

15. Waters identified as impaired by nonpoint sources in *America's Clean Water: The States' Nonpoint Source Assessments* 1985 (Association of State and Interstate Water Pollution Control Administrators (ASIWPCA)) or waters identified as impaired or threatened in a nonpoint source assessment submitted by the state to EPA under section 319 of the Clean Water Act.

16. Surface waters impaired by pollutants from hazardous waste sites on the National Priority list prepared under section 105(8)(A) of CERCLA.