



Draft 2020 Listing Methodology Document
Responses to Public Comments

Public Notice
July 1, 2017 – October 13, 2017

Missouri Department of Natural Resources
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Introduction

Pursuant to 40 CFR 130.7, States, Territories and authorized Tribes must submit biennially to the U.S. Environmental Protection Agency (EPA) a list of water-quality limited (impaired) segments, pollutants causing impairment, and the priority ranking of waters targeted for Total Maximum Daily Load (TMDL) development. Federal regulation at 40 CFR 130.7 also requires States, Territories, and authorized Tribes to submit to EPA a written methodology describing the state's approach in considering and evaluating existing and readily available data used to develop its 303(d) List of impaired waters. The listing methodology must be submitted to EPA each year the Section 303(d) List is due. While EPA does not approve or disapprove the listing methodology, the agency considers the methodology during its review of the state's 303(d) impaired waters list and the determination to list or not to list waters.

The Missouri Department of Natural Resources (department) placed the draft 2020 Listing Methodology Document (Listing Methodology Document) on public notice from July 1, 2017 to October 13, 2017. All original comments received during this public notice period are available online on the department's website at <http://dnr.mo.gov/env/wpp/waterquality/303d/303d.htm>. Comments were received from the following groups or individuals:

- I. [Missouri Farm Bureau](#)
- II. [City of Springfield](#)
- III. [Newman, Comley and Ruth, P.C. Law Firm](#)
- IV. [Association of Missouri Cleanwater Agencies](#)
- V. [Metropolitan St. Louis Sewer District \(Listing Methodology Document\)](#)

This document summarizes and paraphrases the comments received, provides the department's responses to those comments, and notes any changes made to the final draft 2020 Listing Methodology Document resulting from these comments.

Summary of department actions as a result of public comments

1. Amend 2020 Listing Methodology Document to include a statement indicating if a water has not been listed previously and all data indicating an impairment is older than 7 years, then the water shall be placed into Category 2B or 3B and prioritized for future sampling.
2. Amend 2020 Listing Methodology Document to include language that is flexible to future improvements to our data systems, but also include the ability of stakeholders to discuss the department's reasons for determining a change in the size of the assessment unit, until a better process has been vetted by the stakeholders.
3. Amend 2020 Listing Methodology Document to change the significance level for listing and delisting to be the same.
4. Amend 2020 Listing Methodology Document to add a minimum sample size of ten for water chemistry samples pertaining to dissolved oxygen, water temperature, pH, total dissolved gases, and oil and grease within the assessment period outlined in the proposed 2020 Listing Methodology Document (i.e. within 7 years of available data).
5. Amend 2020 Listing Methodology Document to add language describing the department's handling of data qualifiers such as less than, greater than, and estimated values.
6. Amend 2020 Listing Methodology Document to add language describing how dissolved oxygen readings taken either without associated flow data, or taken during non-flowing conditions, are handled.
7. Amend 2020 Listing Methodology Document to add language describing how the department will assess pH based on what type of data is collected (i.e. continuous vs grab samples).

I. Missouri Farm Bureau comments

1. Data Age

Missouri Farm Bureau provided comments during the October 4, 2017 Clean Water Commission Hearing regarding the age of data and how it is used. The Missouri Farm Bureau requested clarification in the Listing Methodology Document.

Department Response

The department agrees that the age of data used to list a water can be a concern. The department will update the proposed 2020 Listing Methodology Document to state that if a water has not been listed previously and all data indicating an impairment is older than 7 years, then the water shall be placed into Category 2B or 3B and prioritized for future sampling.

2. Timing of Sampling

Missouri Farm Bureau provided comments during the October 4, 2017 Clean Water Commission Hearing regarding the timing of sampling and the representativeness of short duration intensive sampling.

Department Response

The department uses short duration, intensive studies to identify waters that are not meeting water quality standards during critical time(s) of the year. An example of this are the 24-48 hour waste load allocation studies conducted during the summer months when stream flows are lower and assimilative capacity may be reduced. Studies conducted during these critical low flow conditions ensure that effluent limitations and conditions of a discharge are protective of water quality. When the water chemistry of discharge from a waste water treatment facility, or from nonpoint source run-off, mixes with water chemistry and temperatures typically observed during summer months, conditions that cause stress to aquatic life can exist. The department believes that the conditions observed during these short duration studies are prevalent throughout the summer months, but are likely not causing the same amount of stress the rest of the year. Since these are season specific issues, the department collects data and assesses those data based on the season using the Listing Methodology Document. Another example of seasonal analyses are recreational uses and *Escherichia coli* which only apply during the recreational season (April 1 until October 31). Outside of this time period water could be meeting WQS, but the critical time for the use is during the established recreation season. Therefore, the department only samples and assesses based on conditions observed during the recreational season.

3. Listing Length

Missouri Farm Bureau provided comments during the October 4, 2017 Clean Water Commission Hearing asking the department and USEPA to allow states to list only the impaired portion.

Department Response

The department agrees that impaired segments should be more narrowly defined when data reasonably shows justification to do so. In the past, the department has been limited by technology and has lacked the ability to split Water Body Identification numbers (WBIDs) for assessment purposes. The extent and associated uses determined by the Water Quality Standards (WQS) form the baseline for waters to be assessed. The inability of the department to assess and track sub-segments of the WBID resulted in the department listing the entire length of the WBID as impaired. When the 303(d) list is submitted to EPA for approval, the entire WBID, the assessment unit in this case, is approved as impaired. When the department gains the technological ability to geospatially track individual assessment units, while maintaining a link to the WBIDs defined by WQS, the listing process will be revised to allow for such refinement.

The department believes it is necessary for interested stakeholders to be involved in the process of determining the criteria for splitting of a stream into multiple assessment units. The department will add language to the 2020 Listing Methodology Document that is flexible enough to incorporate future improvements to our data systems, but also include the ability of stakeholders to discuss the department's reasons for determining a change in the size of the assessment unit, until a better process has been vetted through the stakeholder process.

II. City of Springfield comments

1. Carbon-normalization should be allowed in the Listing Methodology Document

The City of Springfield provided comments to allow the normalization of sediment contaminants (metals or Polycyclic Aromatic Hydrocarbons, PAHs) to the percent total organic carbon (TOC). Additionally the City provided comments that the department takes issue with using a default assumption regarding TOC. The City requested that the department use site specific TOC data to normalize the contaminants. The City also requested that the department clarify that the 1% TOC assumption shall be used for carbon-normalizing the PAH Probable Effects Concentration (PEC) values.

Department Response

The department takes issue with blanket normalization to total organic carbon (TOC) content without citing the true relationship of TOC to contaminants. The Probable Effects

Concentrations (PECs) referenced by the department in the Listing Methodology Document are levels at which it is assumed that the sediment contains 1% TOC (default assumption of 1% TOC content). TOC can be important for consideration since organic carbon provides a binding capacity for contaminants making them essentially non-bioavailable. In talking to the authors of the article referenced in the Listing Methodology Document (McDonald et.al 2000), the authors looked at the data used for developing the PECs and found the data on average had 1% TOC. There is potential for streams in Missouri to have more or less than 1% TOC. It has been suggested that one way to account for this difference is to normalize the data to the amount of TOC in the sediment. Normalizing is the mathematical process of dividing the concentration of contaminant in the sediment by the fraction or percent of TOC. For example, consider the two separate sediment samples below:

Sample 1 – 50 mg/kg of lead and 0.25% TOC

Sample 2 – 50 mg/kg of lead and 4% TOC

To normalize the lead concentrations to the amount of TOC, one must now divide 50 by 0.25 for Sample 1 and divide 50 by 4 for Sample 2. This results in the normalized concentrations below:

Sample 1 – 200 mg/kg of lead

Sample 2 – 12.5 mg/kg of lead

Sample 1 normalized for TOC exceeds the 150% PEC for lead, but sample 2 does not. As the hypothetical example above illustrates, the amount of TOC in a sample can greatly change the normalized concentration of the contaminant. While this change can seem mathematically sound, it extrapolates the concentration without knowing the true relationship.

Additionally Table 5 of the *McDonald et. al. 2000* article, referenced in the 2020 Listing Methodology Document, shows the accuracy of the PECs in regard to their ability to predict toxicity. With the exception of arsenic and lead, the PECs correctly identified toxicity in greater than 90% of the samples predicted to be toxic. The department has agreed with stakeholders in past Listing Methodology Document meetings to use 150% of the PEC values which provides some additional room for uncertainty. In a general sense, using 150% of the PEC value could be considered as the equivalent of normalizing the PECs to 1.5% TOC (defaulting to 1.5% TOC content).

The department is not aware of any recent research documenting the normalization relationship with metals or PAHs and it is not clear if there is a strict linear relationship. If the relationship is not linear, the range of binding capacity is unknown and adds additional uncertainty to the analysis. Additionally, the spatial and seasonal variability of TOC is not known and adds further uncertainty. The department addressed some of these concerns in the Biological Workgroup meeting held May 9th, 2017. During that meeting the department provided data showing that TOC data is quite variable within the state,

among individual waters, as well as among sampling sites. This variability was high enough to add uncertainty, not reduce it. The department is open to further discussions on this topic, but in order for the department to use carbon normalization in assessments many variables will need to be accounted for.

At this time the department does not propose changes to the proposed 2020 Listing Methodology Document to allow for carbon normalization.

2. The assessment methods used to delist a water should be the same as those used to list the same water.

The City of Springfield provided comments regarding the use of different significance levels for certain data types in regards to listing and de-listing waters.

Department Response

The department agrees with the City's comment and will make the associated changes in the proposed 2020 Listing Methodology Document.

III. Newman, Comley, and Ruth, P.C. Law Firm comments

1. Assessing Small Streams

Newman, Comley, and Ruth, P.C. provided comments asking the department to add additional language to the bottom of page 28. Language to be added:

“Stream Size including watershed size should be similar to test streams. Similarly, small candidate reference stream flow should be similar to a test stream’s flow under natural conditions (not augmented by effluent). Additionally, small candidate reference streams should have the same or similar land use as the test stream.”

A proposed deletion from the 2018 Listing Methodology Document was also requested to be maintained.

Department Response

The department appreciates the suggested language provided in the comment. The department believes the current process outlined in the draft 2020 Listing Methodology Document (pages 26-29) is the best process for conducting assessments until robust criteria for small streams is developed. Watershed size is one of a number of considerations under the current process for selecting candidate reference streams. Because flow conditions may be heterogeneous in certain watersheds, e.g., those with well-developed karst, stream flow is another factor considered in the evaluation. Land use

is also a consideration in candidate reference stream selection under the current process to ensure the best candidate reference is selected for the assessment.

In regards to comment on a proposed deletion, the department will maintain the discussion of the MSCI failure rates in some form in the 2020 Listing Methodology Document.

2. Stream Segment Size

Newman, Comley, and Ruth, P.C. Law Firm provided comments asking the department to add a description of how impaired segments can be more narrowly defined.

Department Response

The department agrees that impaired segments should be more narrowly defined when data reasonably shows justification to do so. In the past, the department has been limited by technology and has lacked the ability to split Water Body Identification numbers (WBIDs) for assessment purposes. The extent and associated uses were determined by the Water Quality Standards (WQS) form the baseline for waters to be assessed. The inability of the department to assess and track sub-segments of the WBID resulted in the department listing the entire length of the WBID as impaired. When the 303(d) list is submitted to EPA for approval, the entire WBID, the assessment unit in this case, is approved as impaired. When the department gains the technological ability to geospatially track individual assessment units, while maintaining a link to the WBIDs defined by WQS, the listing process will be revised to allow for such refinement.

The department believes it is necessary for interested stakeholders to be involved in the process of determining the criteria for splitting of a stream into multiple assessment units. The department will add language to the 2020 Listing Methodology Document that is flexible enough to incorporate future improvements to our data systems, but also include the ability of stakeholders to question the department's reasons for determining a change in the size of the assessment unit, until a better process has been vetted through the stakeholder process.

3. Burden of Proof to List and De-List

Newman, Comley, and Ruth, P.C. Law Firm provided comments regarding the use of different significance levels for certain data types in regards to listing and de-listing waters.

Department Response

The department agrees with the comment and will make the associated changes in the proposed 2020 Listing Methodology Document.

IV. Association of Missouri Cleanwater Agencies comments

1. The “>1-in-3” Methodology is Not Required, is Inaccurate and Should Not Be Used; Explanation of Binomial Distribution Method and Comparison to the >1-in-3 Method and the Raw Score Method; A minimum Sample Size of Ten is Both Warranted and Appropriate; Alternatively, DNR Should Use the Raw Score Method Rather Than EPA’s >1-in-3 Method

The Association of Cleanwater Agencies (AMCA) provided comments regarding the methodology of impairing a stream when an acute or chronic criterion is exceeded more than once in the last three years of available data. AMCA also provided comments suggesting a minimum sample size of ten be added to the Listing Methodology Document. AMCA provided comments on data quality and the use of binomial probability for toxics and non-conventional pollutants.

Department Response

The one-in-three year assessment method is consistent with EPA IR Guidance and state implementation of water quality standards. As stated in the guidance, “For toxic (priority pollutants) and protection of freshwater aquatic life, EPA IR guidance recommends use of a one-in-three year maximum allowable excursion recurrence frequency.” The guidance also recommends making non-attainment decisions for “conventional pollutants” and has not encouraged the use of the 10 percent rule with other pollutants, including toxics. Development and implementation of acute and chronic water quality criteria are based on the concept that toxicity criteria contain components of magnitude, duration and frequency protective of aquatic life. The not to exceed more than “once every three years” frequency can be found in both criteria development guidelines (e.g., *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection Of Aquatic Organisms and Their Uses*, (p.34, PB85-227049) and *Water Quality Standards Handbook*, (Chapter 3, p.4, EPA 823-B-94-005a) as well as criteria implementation guidance (e.g., *Technical Support Document for Water Quality-based Toxics Control*, p. 36, EPA 505-2-90-001). Water quality assessments using the once every three year return interval frequency ensures consistency with toxicity criteria development and water quality standards implementation. It also ensures that aquatic communities impacted by pollutants are identified and provide opportunity for ecological recovery from toxic stressors in an expeditious manner. The department is open to discussion of this topic in regards to chronic criteria at the January 18, 2018 meeting. However the department will maintain the current policy. The department will, however, add a minimum sample size of ten water chemistry samples within the time range outlined in the proposed 2020 Listing Methodology Document (i.e. within the most recent 7 years of available data) in response to the comment.

V. Metropolitan St. Louis Sewer District (MSD) comments

1. MSD Supports comments submitted by the AMCA

The Metropolitan St. Louis Sewer District submitted comments in support of the comments submitted by the Association of Missouri Cleanwater Agencies.

Department Response

Please see the department's response to Association of Missouri Cleanwater Agencies' comments in section IV above.

2. MDNR should clarify how they use data collected when streamflow is zero or when stream flow is not reported with chemistry data.

The Metropolitan St. Louis Sewer District submitted comments regarding the use of data collected during non-flowing conditions or when streamflow is not reported.

Department Response

The department will add language to the 2020 Listing Methodology Document describing how dissolved oxygen readings taken either without associated flow data, or taken during non-flowing conditions are handled.

3. MDNR should clarify how they assign, track, and apply data quality codes.

The Metropolitan St. Louis Sewer District submitted comments asking the department to clarify how data quality codes are used.

Department Response

The 2020 Listing Methodology Document currently addresses data quality codes on pages 16 and 17. All data used for assessments falls into one of these categories. If there are questions or comments as to the quality or validity of the data for an individual water body, these can be discussed during the public availability meetings. The department is open to further discussions on this topic at the January 18, 2018 meeting.

4. MDNR should clarify their intended approach for evaluating pH as a chronic water quality criterion.

The Metropolitan St. Louis Sewer District submitted comments asking the department to clarify how it will assess evaluating pH as a chronic criterion.

Department Response

The department will add language to the 2020 Listing Methodology Document to address pH assessments based on what type of data is collected (i.e., continuous vs grab samples).

5. The assessment methods used to delist a water should be the same as those used to list the same water.

The Metropolitan St. Louis Sewer District submitted comments asking the department to have the same methods for listing and delisting waters.

Department Response

The department agrees with the comment and will make the associated changes in the proposed 2020 Listing Methodology Document.

6. MDNR should clarify the role that changing regulations, alternative restoration approaches, and waterbody assessment categorization have in the TMDL prioritization and development process.

The Metropolitan St. Louis Sewer District submitted comments that the department should clarify how changing regulations and future water quality standards will play into TMDL priorities and development.

Department Response

The department agrees that developing TMDL priorities is an important part of the 303(d) List development process. The department will hold a meeting on January 18, 2018 to discuss TMDL prioritization as well as 2020 Listing Methodology Document topics. The department invites stakeholders to be a part of this important process.

7. Data age, quality, and minimum sample sizes should be addressed when making impairment decisions

The Metropolitan St. Louis Sewer District submitted comments regarding data age, quality, and minimum sample size.

Department Response

In regards to data age, the department will update the proposed 2020 Listing Methodology Document to state that if a water has not been listed previously, and all data indicating an impairment is older than 7 years, then the water shall be placed into Category 2B or 3B and prioritized for future sampling. In regards to minimum sample size, the department will add a minimum sample size of ten within the time range outlined in the proposed 2020 Listing Methodology Document (i.e. within 7 years of

available data). In regards to data quality, this comment is already addressed in the 2020 Listing Methodology Document on pages 11, 12, and 15-17.

8. Biological data should have a greater weight than specific pollutant data.

The Metropolitan St. Louis Sewer District submitted comments stating that biological data should have greater weight than specific pollutant data.

Department Response

The 2020 Listing Methodology Document currently addresses this comment with regard to narrative criteria as well as numeric translators for narrative criteria. However, numeric criteria do not fall under the biological weight of evidence outlined in the Listing Methodology Document. Numeric criteria are based on biological responses and developed to be protective of designated uses (i.e., toxicity-based endpoints) and do not need associated biological data. Numeric criteria are set to be protective of sensitive species and designated uses. Indices of biological integrity are indicators of overall community health. Indices are based on the taxonomic groups found rather than species found. Many species can make up a taxonomic group, but the species have individual sensitivities. Numeric water quality criteria must be protective of the more sensitive species as well as the more tolerant.

9. The use of qualified data in water quality data sets should be clearly explained.

The Metropolitan St. Louis Sewer District submitted comments asking the department to clarify how data qualifiers are handled during assessments.

Department Response

The department will add language to the proposed 2020 Listing Methodology Document that addresses data qualifiers.