

**Virginia Department of Environmental Quality**  
Draft 2016 Water Quality Assessment Guidance Manual  
Public Comment-Response Document

Comments received  
June 27, 2016 to July 27, 2016

## Table of Contents

Comments from EPA Region III.....	1
DEQ Response.....	5



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029

Tish Robertson, Ph.D.  
Virginia Department of Environmental Quality  
Water Quality Assessment Coordinator  
P.O. Box 1105  
Richmond, Virginia 23218

JUL 27 2016

Dear Dr. Robertson:

The U.S. Environmental Protection Agency (EPA) thanks you for the opportunity to provide comments on Virginia Department of Environmental Quality's (VADEQ) draft *Water Quality Assessment Guidance Manual for 2016 305(b)/303(d) Integrated Water Quality Report*. EPA supports VADEQ's efforts to provide transparency by publishing its methodologies and allowing public comment. Please be aware, however, that EPA does not approve or disapprove methodologies. EPA will review Virginia's 2016 Section 303(d) list when it is submitted based upon all existing and readily available information. Application of assessment methodologies assists in consistency and transparency when developing Section 303(d) lists. Where, however, existing and readily available information exists, the unavailability of an assessment methodology alone is not a basis for not evaluating that information. Outlined below are EPA's comments on VADEQ's 2016 assessment methodology.

### **Part III. Federal and Virginia Assessment Categories**

EPA Category 4C: Please revise to say: "water is impaired or threatened for one or more designated uses but does not require a TMDL because the impairment is not caused by a pollutant. This category includes Virginia waters that are suspected swampwaters awaiting applicable aquatic life criteria because the impairment is determined to be caused by natural conditions." This is more consistent with EPA's definition and expectation of Category 4C and VADEQ's specific application of this category for swampwaters.

### **Part IV. General Rules of Water Quality Assessment**

Rule 1: EPA requests revising the first sentence to "Impaired waters are defined as those with exceedances of recurring or human health-related water quality standards as documented by

QA/QC-approved monitoring data.” Removing “chronic” with this statement helps avoid confusion regarding assessment of acute criteria.

In addition, EPA’s 2002 *Consolidated Assessment and Listing Methodology* (CALM) recommends an allowable exceedance rate of 10% for conventional parameters which should be interpreted as 10.0% not the 10.5% noted in VADEQ’s assessment guidance. EPA recommends VADEQ utilize the 10% rule as intended as 10.0%.

## **Part V. Assessment Methodology**

Wildlife Use: Please clarify the difference in the methodology narrative (page 12) that identifies waters with **one** or more samples and no exceedances (for toxics) would be fully supporting, to summary Table 2 (page 16) that identifies “ $n \geq 2$ , no exceedances” for fully supporting wildlife use. VADEQ agreed with EPA’s comment on the 2014 draft assessment methodology that a minimum of two independent samples is required, for consistency to determine if toxic-related designated uses are fully supporting or impaired.

Wildlife and Aquatic Life Use toxics assessments: (page 12 and 13), the word acute was removed from language describing how assessments of toxic criteria would be conducted. For example, the following change appeared between 2014 and 2016: “For toxic pollutant assessment in free-flowing streams, waters where there are two or more exceedances of the same WQS **acute** aquatic life toxic criteria in a running 3-year period using grab samples or SPMD data are considered impaired for aquatic life use.” EPA’s interpretation of this change is that two or more exceedances of the same toxic WQS in a 3-year period using grab samples or SPMD data would be applied to both acute and chronic toxic criteria. If that understanding is incorrect please clarify.

Table 2: (pages 16-17), to establish toxics observed effects for Aquatic Life and Wildlife uses, should “chronic” be removed and the statement revised to “single water column grab or SPMD sample exceedance of aquatic life use criteria in 3-year period” to be consistent with the methodology narrative on page 13?

Freshwater Toxics Evaluation (Water Column): It appears the following statement (page 27) should be revised to say “Virginia will declare waters impaired for aquatic life use and included in Category 5A if a 30-day semi-permeable membrane device (SPMD) or grab sampled parameter exceeds a water quality criteria two or more times within a 3-year period.” Including the grab sample is consistent with summary Table 2.

Section 5.6 Naturally Low DO and pH Evaluation in Swamp Waters: EPA provided comments during the 2014 Integrated Report to VADEQ for suggested revisions to the methodology for natural condition assessments occurring after the 2014 IR. The suggested revisions highlighted updated science to incorporate into the methodology. EPA is reminding VADEQ to consider the following in updating its natural conditions assessment methodology:

- Part two of the current four-part methodology compares ambient nutrient concentrations to the background nutrient concentration levels in the 1999 USGS report National Background Nutrient Concentrations in Streams from Undeveloped Areas. In 2010, USGS updated the background nutrient concentration levels. The updated background concentration value for total nitrogen (TN) is 0.58 mg/L, total phosphorus (TP) is 0.034 mg/L, ammonia is 0.025 mg/L, and nitrate (NO<sub>3</sub>) is 0.24 mg/L. If Virginia continues to use the USGS background nutrient concentration values as a screening for levels below anthropogenic sources, the most recent 2010 values should be used.
- During our recent conference calls, VADEQ expressed concerns that USGS values do not provide an accurate representation for Virginia swamp waters because they are based on data of waters that are not swamps. EPA encourages VADEQ to develop background nutrient concentrations that are representative of unimpaired Virginia swamp waters. Until Virginia-specific natural backgrounds levels of nutrients can be determined, EPA recommends VADEQ utilize USGS most recent background data from 2010.
- Step 3 of the methodology for evaluating seasonal dissolved oxygen (DO) fluctuations should also be reconsidered. The current methodology looks for an inverse relationship between dissolved oxygen and temperature (seasonality) from grab samples. However, this demonstrates the natural physical properties of water and does not demonstrate attainment. EPA recommends VA incorporate a procedure to ensure the low DO values are not due to algal respiration commonly found during night time or early morning hours in eutrophic waters (e.g., continuous monitoring of DO to evaluate daily diel changes).
- In addition, EPA has recently developed a “Framework for Defining and Documenting Natural Conditions for Development of Site-Specific Natural Background Water Quality Criteria for Temperature, Dissolved Oxygen, and pH to Protect Aquatic Life Uses: Interim Document.” It may be useful in informing our conversations regarding Virginia’s natural condition assessment methodology. The final framework can be found at:  
[http://water.epa.gov/scitech/swguidance/standards/library/upload/natural\\_conditions\\_framework.pdf](http://water.epa.gov/scitech/swguidance/standards/library/upload/natural_conditions_framework.pdf)

## **Part VII. 303(d) Listing/Delisting and TMDL Priority Ranking**

Part 5.12 Continuous Monitoring Assessment Methodology: EPA supports VADEQ use of continuous monitoring data to make aquatic life use attainment decisions. EPA encourages VADEQ to consider additional continuous monitoring data rules that evaluate critical conditions independent of larger datasets for summer low flow periods, wet weather events, and/or fish spawning and nursery times.

Delisting Rule 3: Please revise this section to say: “Bacteria impairments within the existing TMDL watershed or within the ‘tidal range’ of the existing TMDL boundary can be immediately nested when land uses in the existing TMDL and newly impaired segment are comparable and



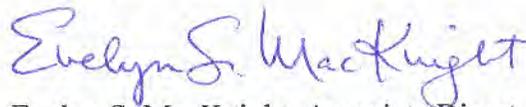
*Printed on 100% recycled/recyclable paper with 100% post-consumer fiber and process chlorine free.  
 Customer Service Hotline: 1-800-438-2474*

all existing sources are accounted for in the TMDL. A narrative nesting memo is not necessary for these impairments. To show the nested impairments spatially within the existing TMDL watershed, a GIS-based analysis and supporting spreadsheet identifying the waterbody, TMDL name and ID, EPA approval date should be submitted to EPA as delisting materials.” VADEQ supplied EPA with these nesting delisting materials during the 2014 Integrated Report.

In addition, EPA commends VADEQ on your April 18, 2016 commitment to develop a field monitoring program and assessment methodology to evaluate algal impacts to the recreation designated use. EPA recommends VADEQ include language in the 2016 Water Quality Assessment Guidance Manual that details VADEQ’s plans to develop an algal assessment methodology for Virginia’s 2018 guidance manual to help inform the public of future plans. Based on recent conversations between VADEQ and EPA staff, it appears algae monitoring is well underway on the Shenandoah River and VADEQ is making progress towards meeting the algae related goals outlined in VADEQ’s 2014 Integrated Report.

If you have any further question, please contact Bill Richardson at 214-814-5675.

Sincerely,



Evelyn S. MacKnight, Associate Director  
Office of Standards, Assessment and TMDLs



*Printed on 100% recycled/recyclable paper with 100% post-consumer fiber and process chlorine free.*

*Customer Service Hotline: 1-800-438-2474*

### Comment 1#

**EPA Category 4C: Please revise to say: "water is impaired or threatened for one or more designated uses but does not require a TMDL because the impairment is not caused by a pollutant. This category includes Virginia waters that are suspected swampwaters awaiting applicable aquatic life criteria because the impairment is determined to be caused by natural conditions." This is more consistent with EPA's definition and expectation of Category 4C and VADEQ's specific application of this category for swampwaters.**

The text has been revised as suggested.

### Comment 2#

**Rule 1: EPA requests revising the first sentence to "Impaired waters are defined as those with exceedances of recurring or human health-related water quality standards as documented by QA/QC-approved monitoring data." Removing "chronic" with this statement helps avoid confusion regarding assessment of acute criteria.**

The text has been revised as suggested.

### Comment 3#

**In addition, EPA's 2002 *Consolidated Assessment and Listing Methodology* (CALM) recommends an allowable exceedance rate of 10% for conventional parameters which should be interpreted as 10.0% not the 10.5% noted in VADEQ's assessment guidance. EPA recommends VADEQ utilize the 10% rule as intended as 10.0%.**

EPA's CALM guidance consistently uses the term "10%", including "<10%" or ">10%". This usage implies that the precision associated with the allowable exceedance rate is two significant digits (e.g., values should be rounded to the nearest whole number). DEQ's "10.5% rule" simply expresses this explicitly. It is consistent with long established, standard rounding conventions for large datasets. DEQ has consistently used the 10.5% rule since EPA's issuance of the CALM guidance in 2002 and will consider incorporating any amendments or clarifications to EPA CALM guidance once that guidance is finalized and released.

#### Comment 4#

**Wildlife Use: Please clarify the difference in the methodology narrative (page 12) that identifies waters with one or more samples and no exceedances (for toxics) would be fully supporting, to summary Table 2 (page 16) that identifies "n > 2, no exceedances" for fully supporting wildlife use. VADEQ agreed with EPA's comment on the 2014 draft assessment methodology that a minimum of two independent samples is required, for consistency to determine if toxic-related designated uses are fully supporting or impaired.**

As with other designated uses, two samples are required for determining support of the wildlife use. Text has been revised to "two or more samples."

#### Comment 5#

**Wildlife and Aquatic Life Use toxics assessments: (page 12 and 13), the word acute was removed from language describing how assessments of toxic criteria would be conducted. For example, the following change appeared between 2014 and 2016: "For toxic pollutant assessment in free-flowing streams, waters where there are two or more exceedances of the same WQS acute aquatic life toxic criteria in a running 3-year period using grab samples or SPMD data are considered impaired for aquatic life use." EPA's interpretation of this change is that two or more exceedances of the same toxic WQS in a 3-year period using grab samples or SPMD data would be applied to both acute and chronic toxic criteria. If that understanding is incorrect please clarify.**

"Acute" was removed and the language on page 13 has been revised as follows to eliminate any doubt that both chronic and acute criteria can be assessed whenever sufficient data are available: "For toxic pollutant assessment in free-flowing streams, both chronic and acute criteria can be assessed whenever sufficient data are available. Chronic criteria are to be assessed when multiple grab samples are collected within two separate four-day periods within a three-year period, or when there are two or more separate 30-day SPMD deployments within a three-year period. Two samples (either grab or SPMD) taken within three consecutive years are sufficient to assess acute criteria." Typically, DEQ has a sufficient dataset to only evaluate acute criteria at a particular site.

#### Comment 6#

**Table 2: (pages 16-17), to establish toxics observed effects for Aquatic Life and Wildlife uses, should "chronic" be removed and the statement revised to "single water column grab or SPMD sample exceedance of aquatic life use criteria in 3-year period" to be consistent with the methodology narrative on page 13?**

The statement has been revised to "a single exceedance of a chronic aquatic life use criterion using temporally aggregated water column grab samples in a 3-year period or one SPMD sample exceedance of a chronic aquatic life use criterion in a 3-year period". DEQ's

policy has always been to classify a single exceedence of a chronic (via temporally aggregated samples) or acute toxic criterion as an observed effect for the aquatic life and wildlife designated uses.

#### Comment 7#

**Freshwater Toxics Evaluation (Water Column): It appears the following statement (page 27) should be revised to say "Virginia will declare waters impaired for aquatic life use and included in Category 5A if a 30-day semi-permeable membrane device (SPMD) or grab sampled parameter exceeds a water quality criteria two or more times within a 3-year period." Including the grab sample is consistent with summary Table 2.**

The statement has been revised as follows: "Virginia will declare waters impaired for aquatic life use and included in Category 5A if 1) an acute criterion is exceeded two or more times within a three-year period based on either grab samples or samples collected with a 30-day semi-permeable membrane device (SPMD) or if 2) a chronic criterion is exceeded two or more times within a three-year period based on either multiple grab samples collected within two separate four-day periods or multiple samples collected with a 30-day semi-permeable membrane device (SPMD)".

#### Comment 8#

**Section 5.6 Naturally Low DO and pH Evaluation in Swamp Waters: EPA provided comments during the 2014 Integrated Report to VADEQ for suggested revisions to the methodology for natural condition assessments occurring after the 2014 IR. The suggested revisions highlighted updated science to incorporate into the methodology. EPA is reminding VADEQ to consider the following in updating its natural conditions assessment methodology: Part two of the current four-part methodology compares ambient nutrient concentrations to the background nutrient concentration levels in the 1999 USGS report National Background Nutrient Concentrations in Streams from Undeveloped Areas. In 2010, USGS updated the background nutrient concentration levels. The updated background concentration value for total nitrogen (TN) is 0.58 mg/L, total phosphorus (TP) is 0.034 mg/L, ammonia is 0.025 mg/L, and nitrate (NO<sub>3</sub>) is 0.24 mg/L. If Virginia continues to use the USGS background nutrient concentration values as a screening for levels below anthropogenic sources, the most recent 2010 values should be used.**

- **During our recent conference calls, VADEQ expressed concerns that USGS values do not provide an accurate representation for Virginia swamp waters because they are based on data of waters that are not swamps. EPA encourages VADEQ to develop background nutrient concentrations that are representative of unimpaired Virginia swamp waters. Until Virginia-specific natural backgrounds levels of nutrients can be determined, EPA recommends VADEQ utilize USGS most recent background data from 2010.**
- **Step 3 of the methodology for evaluating seasonal dissolved oxygen (DO)**

**fluctuations should also be reconsidered. The current methodology looks for an inverse relationship between dissolved oxygen and temperature (seasonality) from grab samples. However, this demonstrates the natural physical properties of water and does not demonstrate attainment. EPA recommends VA incorporate a procedure to ensure the low DO values are not due to algal respiration commonly found during night time or early morning hours in eutrophic waters (e.g., continuous monitoring of DO to evaluate daily diel changes).**

- **In addition, EPA has recently developed a "Framework for Defining and Documenting Natural Conditions for Development of Site-Specific Natural Background Water Quality Criteria for Temperature, Dissolved Oxygen, and pH to Protect Aquatic Life Uses: Interim Document." It may be useful in informing our conversations regarding Virginia's natural condition assessment methodology. The final framework can be found at: [http://water.epa.gov/scitech/swguidance/standards/library/upload/natural\\_conditions\\_framework.pdf](http://water.epa.gov/scitech/swguidance/standards/library/upload/natural_conditions_framework.pdf)**

DEQ tries to inform its assessment procedures using best available science whenever possible. DEQ is currently working with the Virginia Institute of Marine Science to identify swamp waters, specifically those with minimal anthropogenic impacts. Additionally, for several years DEQ has been working with Virginia Commonwealth University biologists to develop a new biological assessment methodology that can identify indigenous, balanced fish communities characteristic of minimally impacted blackwater swamps, which are prevalent in much of southeastern Virginia. This will help DEQ identify both non-impaired blackwater swamps and the water quality conditions associated with these swamps. EPA's new interim framework for defining natural background conditions for temperature, DO and pH will also be reviewed and its recommendations will be considered in DEQ's ongoing efforts to better characterize normal conditions in Virginia's swamp waters.

EPA's comments will be considered as DEQ drafts and reviews swamp water determination reports, but DEQ believes no changes to the guidance manual are warranted at this time.

## Comment 9#

**Part 5.12 Continuous Monitoring Assessment Methodology: EPA supports VADEQ use of continuous monitoring data to make aquatic life use attainment decisions. EPA encourages VADEQ to consider additional continuous monitoring data rules that evaluate critical conditions independent of larger datasets for summer low flow periods, wet weather events, and/or fish spawning and nursery times.**

The science and policy of continuous monitoring are both still emerging. DEQ is committed to utilizing high-frequency datasets as much as possible, and we will continue to seek pertinent guidance from EPA.

## Comment 10#

**Delisting Rule 3: Please revise this section to say: "Bacteria impairments within the existing TMDL watershed or within the 'tidal range" of the existing TMDL boundary can be immediately nested when land uses in the existing TMDL and newly impaired segment are comparable and all existing sources are accounted for in the TMDL. A narrative nesting memo is not necessary for these impairments. To show the nested impairments spatially within the existing TMDL watershed, a GIS-based analysis and supporting spreadsheet identifying the waterbody, TMDL name and ID, EPA approval date should be submitted to EPA as delisting materials." VADEQ supplied EPA with these nesting delisting materials during the 2014 Integrated Report.**

The section will be revised as suggested.

## Comment 11#

**EPA recommends VADEQ include language in the 2016 Water Quality Assessment Guidance Manual that details VADEQ's plans to develop an algal assessment methodology for Virginia's 2018 guidance manual to help inform the public of future plans.**

The following language has been inserted into Section 5.2 under "Recreation/Swimming Uses":

### *Water Quality Impacts Due to Algal Growth*

DEQ received EPA's approval of the 2014 Integrated Water Quality Assessment Report on May 19, 2016. Action had been delayed due to citizen concerns raised about algae growth impacting recreation use in the Shenandoah River. DEQ responded by revising the Report to list 7 stream segments, totaling about 25 river miles, as having an observed effect, but with

insufficient data to determine whether or not the recreation use was supported. These segments have been prioritized for follow-up monitoring this summer and fall by DEQ to test field methods that are scientifically based, defensible and reproducible, for estimating the percent coverage of river bottom by filamentous algae. Other commitments have been agreed to for future activities, including decisions on thresholds for percent coverage that constitute impairment under the general narrative water quality standard, and inclusion of such thresholds in DEQ's guidance for the 2018 Assessment Report.

The following is a summary of future actions agreed upon by VADEQ and EPA in April 2016 to help address algal issues in the Shenandoah River and Commonwealth-wide:

#### **Field Estimation Methodology Development:**

- VADEQ will develop a quantifiable, repeatable state-wide field estimation methodology for evaluating the impacts of algal growth in Virginia's free-flowing waters.
- The Virginia-specific field estimation method will utilize as a foundation the EPA-funded Interstate Commission on the Potomac River Basin 2015 report, *Methods for Estimating Filamentous Algae Cover in Streams and Rivers of the Shenandoah River Basin*, and consider discussions during the Algae Summit<sup>1</sup>.
- The method will be validated by the Commonwealth within the next nine months in anticipation for its inclusion in VADEQ's future annual monitoring plans. VADEQ will have discussions with EPA and interested stakeholders to help with developing the final field estimation methodology.

#### **Development of Impairment Thresholds:**

- Concurrent to Shenandoah River algal monitoring, VADEQ plans to develop an impairment threshold for algal impacts to the recreation use in discussion with EPA, other Region III states and interested stakeholders.
- Depending on available resources, user surveys could be a key tool to establish defensible thresholds of what constitutes impairment, in line with the Interstate Commission on the Potomac River Basin report recommendations, as well as discussions during the Algae Summit.
- VADEQ will have discussions with EPA and interested stakeholders for any comment on the algae impairment thresholds.
- Proposed impairment thresholds will be included with VADEQ's *Draft 2018 Water Quality Assessment Guidance Manual* (anticipated in spring 2017).

#### **Integrated Report Assessment of Shenandoah River Segments:**

- Over the next two years, VADEQ plans to begin algal monitoring with a focus on the Shenandoah River to validate the algal field estimation method. Monitoring will begin during the 2016 recreation (summer) season and continue into 2017 with a

---

<sup>1</sup> A Region 3 EPA-States Algae Summit was held on April 27-28, 2016, consisting of an initial information exchange.

priority given to the five Shenandoah River segments moved to category 3C in Virginia's 2014 Integrated Report.

- Other portions of the Shenandoah River will be monitored for algal impacts using the validated methodology as VADEQ's resources allow, with monitoring updates provided in Virginia's biannual Integrated Reports, beginning with the 2018 Integrated Report. VADEQ is committed to evaluating the algal impacts to other priority sections of the Shenandoah River as quickly as possible and plans to update a timeline with planned monitoring activities in each biannual Integrated Report.
- Additional EPA grant funding is not a condition for moving forward with this monitoring and assessment process. However, it is acknowledged that resource constraints on Virginia's monitoring budget will impact the pace and scope of future activities.
- Virginia's *Draft 2018 Water Quality Assessment Guidance Manual* will include the identified impairment thresholds. It will also allow for VADEQ's use of citizen monitoring group data for recreation use attainment determinations, provided the group has developed a VADEQ approved Quality Assurance Project Plan and are determined to be a Level III data provider.
- EPA acknowledges VADEQ's desire for two years of monitoring data for making a recreational use attainment decision due to algal growth, and encourages early action should one year of data alone provide compelling information.
- Both VADEQ and EPA see the value in reporting results of VADEQ's 2016 and 2017 sampling efforts in Virginia's 2018 Integrated Report, even if the data are insufficient for a use attainment decision.
- Since VADEQ's current Integrated Report data submission deadlines may not allow a use attainment decision based on only one year of monitoring results, VADEQ will provide flexibility with assessing the Shenandoah River. More specifically:
  - VADEQ may opt to make a recreation use assessment using only the 2016 data set if the results are compelling.
  - VADEQ may consider a supplement to the 2016 Integrated Report with an off cycle 2017 update, or
  - VADEQ may allow for Shenandoah River algae-related data collected in 2017 to be used for 2018 Integrated Report decisions.

The preliminary monitoring plan outlines the agency's strategy for collecting data for the development of algal field methods. The agency will evaluate the need for ambient data above and beyond what is currently being collected as part of the 2016 monitoring plan following the first year of the algal field methods development and depending on available resources. More about the plan can be found here:

<http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/ShenandoahAlgae.aspx>.