SCWQA

Water Quality Through Sound Science

June 24, 2025

Mr. Andrew Edwards
Water Quality Standards Coordinator
South Carolina Department of Environmental Services
Bureau of Water
2600 Bull Street
Columbia, SC 29201

Re: Triennial Review Proposals to:
Use Harmonic Mean for Non-Carcinogens (EPA Recommendation)
Clarify Bacteria Implementation Provisions
Clarify MS4 Compliance Requirement

Dear Mr. Edwards:

I hope you are doing well.

I am writing on behalf of the South Carolina Water Quality Association (WQA) to propose three changes for the upcoming triennial review of DES' Water Quality Standards Regulation. The changes relate to implementation language found in 61-68 Sections E.14.c(5), E.14.c(8)-(12), and E.14.d(13).

The SCWQA comprises public water, sewer, and stormwater utilities statewide. Our members strive to protect public health and the environment in the most affordable and cost-effective manner. Our members serve a majority of sewered population of the State.

Annual Average or Harmonic Mean Flow for Non-Carcinogens.

The Department's current water quality standards regulation provides that "the applicable critical flow conditions for human health [are] annual average flow for carcinogens, 7Q10 (or 30Q5 if provided by the applicant) for noncarcinogens . . . ." *Id*. §61-68 E.14.c(5). The specification of an average flow statistic for carcinogens is appropriate because the criteria are derived under the assumption that the target human health effects occur because of a long-term exposure to low concentrations of a pollutant (e.g. EPA's assumptions being based on human consumption of two liters per day of water for a seventy-year lifetime). Logically, the same assumptions are also appropriate for noncarcinogens.

Thus, rather than the current specification of the 7Q10, DHEC should use the annual average or harmonic mean flow. This recommendation is consistent with EPA's Water Quality Standards Handbook, Chapter 5 on General Policies, describes these water quality standards and application concepts at page 13. EPA 820-B-14-004 (2014) (emphasis added):

> "The EPA recommends the harmonic mean flow for implementing human health criteria. The concept of a harmonic mean is a standard statistical data analysis technique. The EPA's model for human health effects assumes that such effects occur because of a long-term exposure to low concentrations of a toxic pollutant (e.g. two liters of water per day for seventy years). The harmonic mean flow allows for estimating the concentration of toxic pollutant contained in those two liters of water per day when the daily variation in the flow rate is high. Therefore, the EPA recommends use of the harmonic mean flow in computing critical low flows for human health criteria rather than using other averaging techniques.
>
> *What Design Stream Flow Should Be Used to Implement Human Health Criteria?*
>
> Human health criteria represent ambient pollutant concentrations that are acceptable based on a lifetime (70 years) of exposure. Accordingly, discharges of pollutants should be regulated such that criteria will not be exceeded under stream conditions that represent long-term average conditions . . . With today's Human Health Methodology, EPA is revising its guidance to recommend harmonic mean flow be used to implement both carcinogen and noncarcinogen human health criteria. Harmonic mean flow should be used to implement human health criteria because, by and large, human health criteria are designed to protect an individual over a lifetime of exposure. … Therefore, we have attempted to match the longest stream flow averaging period (using harmonic mean) with the criterion which is protective over a human lifetime.

Accordingly, we urge the Department to modify R.61-68 to specify the use of either an annual average or harmonic mean flow for both carcinogens and noncarcinogens. Our specific recommended revisions are provided in Attachment A hereto.

Clarify POTW Bacteria Permit Implementation Provisions.

We question why NPDES Permit implementation procedures are included in the Department's water quality standards regulation. We suggest the Department move these procedures to the NPDES permit regulation at a convenient point in the future.

In the interim, we ask the Department to clarify implementation of bacteria effluent limits in permits for POTWs. Specifically, as shown in Appendix B hereto, we ask the Department to clarify in the regulation that monthly average limits are actually implemented as monthly geometric mean limits in accordance the Department's decades-old practice and EPA's criteria development and recommendations. At

smaller facilities where only one sample may be taken in a month, the effluent limit will be a monthly average (because a geometric mean cannot be calculated from one sample).

The Department should also adjust its short-term limits to conform to EPA's permitting regulation which specifies weekly geometric mean limits (again weekly average if only one sample is taken during the week). The NPDES regulations provide that limits for continuous discharges (such as POTW discharges) shall be expressed and necessarily limited to expression as average monthly and average weekly. See 40 C.F.R. § 122.45(d)(2).

We note that our suggested clarifications mirror North Carolina's approach and that a number of states (including nearby Virginia, Maryland, and the District of Columbia) only impose monthly geometric mean limits (consistent with the derivation of EPA's bacteria criteria). We also note the excellent performance of facilities in those states which demonstrates that EPA's required monthly/weekly bacteria limits are fully protective.

MS4 Permit Compliance Clarification

Finally, we ask the department to make the following clarification to 61-68 E.14.d(13) as follows:

> (13) For waters of the State, where a permit has been issued pursuant to R.61-9.122.26 and R.6109.122.34, the Department shall consider the permittee in compliance with the established bacterial (i.e., E.coli, enterococci, fecal coliform) criteria for recreational use of the waterbody if the permittee is in compliance with bacteria-related provisions in their permit.

Thank you for considering these requested clarifications. We are happy to provide any additional information you may require and are available to discuss these changes at your convenience.

Sincerely,

F. Paul Calamita
General Counsel

C: SCWQA Members
Mr. Henry Porter
Mr. Shawn Clark

Attachment A

Annual Average Flow for Non-Carcinogens

R. 61-68 C.4.b(1): b. Human health and organoleptic numeric criteria.

(1) The applicable critical flow conditions for human health shall be defined as annual average flow for carcinogens~~, 7Q10 (or 30Q5 if provided by the applicant) for~~ and noncarcinogens, or tidal conditions as determined by the Department… The numeric criteria of this regulation are not applicable to waters of the State when the flow rate is less than the annual average flow for carcinogens or ~~7Q10 (or 30Q5 if provided by the applicant) for~~ noncarcinogens, except as prescribed below….

R. 61-68 E.14.c(5) Human health and organoleptic numeric criteria.

(5) Except as provided herein, where application of MCLs or W/O numeric criteria using annual average flow for carcinogens, ~~7Q10 (or 30Q5 if provided by the applicant) for~~ and noncarcinogens, or comparable tidal conditions as determined by the Department results in permit effluent limitations more stringent than limitations derived from other applicable human health criteria (organism consumption only), aquatic life criteria, or organoleptic numeric values, MCLs or W/O shall be used in establishing permit effluent limitations for human health protection….

R. 61-68 Appendix: Priority Toxic Pollutants:

ee This criterion is a noncarcinogen. As prescribed in Section E of this regulation, application of this criterion for determining permit effluent limitations requires the use of ~~7Q10~~annual average or harmonic mean flow or comparable tidal condition as determined by the Department

Appendix to WQS Regulation: Non-Priority Toxic Pollutants:

L This criterion is a noncarcinogen. As prescribed in Section E of this regulation, application of this criterion for determining permit effluent limitations requires the use of ~~7Q10~~annual average or harmonic mean or comparable tidal condition as determined by the Department.

Attachment B

Clarifications to Bacteria Implementation Provisions

stringent than limitations derived from other applicable human health criteria (organism consumption only), aquatic life criteria, or organoleptic numeric values, MCLs or W/O shall be used in establishing permit effluent limitations for human health protection. The Department may, after Notice of Intent included in a notice of a proposed NPDES permit in accordance with R.61-9.124.10, Procedures for Decision Making, determine that drinking water MCLs or W/O shall not apply to discharges to those waterbodies where there is: no potential to affect an existing or proposed drinking water source and no state-approved source water protection area. For purposes of this section, a proposed drinking water source is one for which a complete permit application, including plans and specifications for the intake, is on file with the Department at the time of consideration of an NPDES permit application for a discharge that will affect or has the potential to affect the drinking water source.

(6) Except as provided herein, the Department may determine that an NPDES permitted discharge will not cause, have reasonable potential to cause, or contribute to an exceedance of the numeric criterion for turbidity under the following conditions:

i. The facility withdraws its surface intake water containing turbidity from the same body of water into which the discharge is made;

ii. The facility does not significantly concentrate or contribute additional turbidity to the discharged water; or

iii. The facility does not alter the turbidity through chemical or physical means that would cause adverse water quality impacts to occur.

(7) Site-specific permit effluent limitations and alternate criteria less stringent than those derived in accordance with the above requirements may be derived where it is demonstrated that such limits and criteria shall maintain the existing and classified uses, adequate opportunity for public participation in such derivation process has occurred, and the effluent shall not cause human health criteria to be exceeded. Where a site-specific permit effluent limitation and alternate criterion has been derived, such derivation shall be subject to EPA review as appropriate. Also, at a minimum, opportunity for input in derivation of a site-specific permit effluent limitation and alternate criterion shall be provided via public notice in NPDES permit notices.

(8) In order to protect recreational uses in freshwaters (including FW, and all types of Trout Waters) of the State, NPDES permit effluent limitations shall be specified as indicated below:

i. Monthly ~~Average~~ (E. coli)	126 MPN per 100 mL (see c(12) below)
ii. ~~Daily Maximum~~ (E. coli)	349 MPN per 100 mL (see c(12) below)
iii. Shellfish protection	Class SFH requirements for fecal coliform (see c(11)i. and c(11)ii. below) may be specified (in addition to the limits above) for the protection of downstream waters (regardless of their individual classification) with shellfish uses.
iv. Municipal separate storm sewer systems	For municipal separate storm sewer systems (as described in R.61-9.122.26.a.), compliance with the bacterial standards shall be determined in accordance with c(13) below.

v. Protection of upstream and/or downstream waters	Permit limitations may include (in addition to the requirements listed in c(8)i. and c(8)ii. above) one or more bacterial limitations for fecal coliform, *E. coli*, and/or enterococci to protect both uses in the specific receiving waterbody and also to protect any upstream and/or downstream uses that may be required. If more than one bacterial limit is required, the conditions associated with each section below shall apply independently regardless of the water classification at the point of discharge.
vi. Class ORW or ONRW protection	For Class ORW or ONRW waters, the bacterial requirements shall be those applicable to the classification of the waterbody immediately prior to reclassification to either ORW or ONRW, including consideration of natural conditions. See G.5 and G.7 for prohibitions.

(9) In order to protect recreational uses in Class SA saltwaters of the State, NPDES permit effluent limitations shall be specified as indicated below:

i. Monthly ~~Average~~ Geomean (enterococci)	35 MPN per 100 mL (see c(12) below
ii. ~~Daily Maximum~~ Weekly Geomean (enterococci)	104 MPN per 100 mL (see c(12) below)
iii. Shellfish protection	Class SFH requirements for fecal coliform (see c(11)i. and c(11)ii. below) may be specified (in addition to the limits above) for the protection of upstream and/or downstream waters (regardless of their individual classification) with shellfish uses.
iv. Municipal separate storm sewer systems	For municipal separate storm sewer systems (as described in R.61-9.122.26.a.), compliance with the bacterial standards shall be determined in accordance with c(13) below.
v. Protection of upstream and/or downstream waters	Permit limitations may include (in addition to the requirements listed in c(9)i. and c(9)ii. above) one or more bacterial limitations for fecal coliform, E. coli, and /or enterococci to protect both uses in the specific receiving waterbody and also to protect any upstream or downstream uses that may be required. If more than one bacterial limit is required, the conditions associated with each section above or below shall apply independently regardless of the water classification at the point of discharge.
vi. Class ORW or ONRW protection	For Class ORW or ONRW waters, the bacterial requirements shall be those applicable to the classification of the waterbody immediately prior to reclassification to either ORW or ONRW, including consideration of natural conditions. See G.5 and G.7 for prohibitions.

(10) In order to protect recreational uses in Class SB saltwaters of the State, NPDES permit effluent limitations shall be specified as indicated below:

i. Monthly ~~Average~~ Geomean (enterococci)	35 MPN per 100 mL (see c(12) below)
ii. ~~Daily Maximum~~ Weekly Geomean (enterococci)	104 MPN per 100 mL (see c(12) below)
iii. Class SA recreational daily maximum and/or shellfish protection	Class SA daily maximum (see c(9)ii. above) recreational use requirements for enterococci and/or Class SFH requirements (see c(11)i. and c(11)ii. below) for fecal coliform may be specified (in addition to the limits above) for the protection of upstream and/or downstream waters (regardless of their individual classification).
iv. Municipal separate storm sewer systems	For municipal separate storm sewer systems (as described in R.61-9.122.26.a.), compliance with the bacterial standards shall be determined in accordance with c(13) below.
v. Protection of upstream and/or downstream waters	Permit limitations may include (in addition to the requirements listed in c(10)i. and c(10)ii. above) one or more bacterial limitations for fecal coliform, E. coli and /or enterococci to protect both uses in the specific receiving waterbody and also to protect any upstream or downstream uses that may be required. If more than one bacterial limit is required, the conditions associated with each section above or below shall apply independently regardless of the water classification at the point of discharge.
vi. Class ORW or ONRW protection	For Class ORW or ONRW waters, the bacterial requirements shall be those applicable to the classification of the waterbody immediately prior to reclassification to either ORW or ONRW, including consideration of natural conditions. See G.5 and G.7 for prohibitions.

(11) In order to protect for the consumption of shellfish, for any discharge either directly or indirectly in Class SFH waters or in Class SA, Class SB, ORW, or ONRW waters with existing and/or approved shellfish harvesting uses as described in Section C.7, including protection of shellfish upstream and/or downstream uses in all waters regardless of their classification, NPDES permit effluent limitations shall be specified as indicated below:

i. For protection of shellfish uses-Monthly Average (Fecal coliform)	14 MPN per 100 mL
ii. For protection of shellfish uses- Daily Maximum (Fecal coliform)	43 MPN per 100 mL (see c(12) below)
iii. For protection of recreational uses - Monthly Average (enterococci)	35 MPN per 100 mL
iv. For protection of recreational uses-Daily Maximum (enterococci)	104 MPN per 100 mL (see c(12) below)

v. Protection of upstream and/or downstream waters	Permit limitations may include (in addition to the requirements listed in c(11)i. through c(11)iv. above) one or more bacterial limitations for fecal coliform, E. coli and /or enterococci to protect both uses in the specific receiving waterbody and also to protect any upstream or downstream uses that may be required. If more than one bacterial limit is required, the conditions associated with each section above shall apply independently regardless of the water classification at the point of discharge.
vi. Municipal separate storm sewer systems	For municipal separate storm sewer systems (as described in R.61-9.122.26.a.), compliance with the bacterial standards shall be determined in accordance with c(13) below.

If only one sample is taken in any week or month, the limit is an average rather than a geometric mean.

(12) Provided the permittee verifies in writing to the Department that conditions (12)i. through (12)iv. below have been met, the permittee would be in compliance with the daily maximum bacterial requirement. However, nothing in this regulation precludes the Department from taking action, depending on the individual circumstances, to protect public health and/or the environment.

i. If the facility exceeds the permitted Daily Maximum bacterial limitation listed above (for E. coli, enterococci, or fecal coliform) but two (2) additional samples collected within forty-eight (48) hours of the original sample result do NOT exceed the required Daily Maximum limit; and

(A) For all waters not involving shellfish protection (regardless of the specific water classification), the individual bacterial sample result has not exceeded 800 MPN per 100 mL, and for those waters involving shellfish protection, the individual bacterial sample result for fecal coliform has not exceeded 200 MPN per 100 mL; and

(B) There is neither an existing Consent Order nor Administrative Order associated with the facilities operation of their disinfection system; and

(C) Either:

1. For facilities that routinely collect ten (10) bacterial samples per month (or one hundred twenty (120) or more samples per calendar year), there were no more than four (4) total bacteria samples exceeding the daily maximum limit in the previous twelve (12) months; or

2. For facilities other than those listed in (C)1. above (e.g., smaller facilities or those that do not routinely collect ten (10) samples or more per month), there was no more than one (1) bacterial sample exceeding the daily maximum limit in the previous twelve (12) months; and

ii. The permittee verifies that all disinfection equipment was fully functional, and the solids handling system was fully functional during that monitoring period; and

iii. Any additional bacterial sampling collected during the monthly monitoring period when the daily maximum exceedance occurred was reasonably distributed in time while maintaining representative sampling; and

iv. The permittee must provide sufficient laboratory data sensitivity (e.g., dilutions) to accurately represent the effluent bacterial concentration to utilize this procedure. Effluent bacterial results reported as greater than (>) do not meet this criteria, since the actual results are unknown.