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Adam Krantz

April 24, 2017

Ms. Colleen Flaherty
Health and Ecological Criteria Division
Office of Water (4304T)
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Submitted Via the Federal eRulemaking Portal: <http://www.regulations.gov>

Re: Comments on EPA's *Draft Field-Based Methods for Developing Aquatic Life Criteria for Specific Conductivity* (EPA-HQ-OW-2016-0353)

Dear Ms. Colleen Flaherty:

The National Association of Clean Water Agencies (NACWA) appreciates the opportunity to comment on the *Draft Field-Based Methods for Developing Aquatic Life Criteria for Specific Conductivity* (hereinafter *Draft Field-Based Methods*).

NACWA represents the interests of nearly 300 public clean water utilities across the country who are helping ensure a strong, sustainable clean water future. NACWA's public clean water agencies treat and reclaim the majority of the wastewater generated each day nationwide, providing an essential service that protects human health and the environment.

NACWA understands the importance of stream function and the benefits of ecosystem health. Our members recognize that salinity, as measured by specific conductivity, can play an important role in overall water quality. However, NACWA does not support the proposed *Draft Field-Based Methods* as a mechanism for establishing water quality criteria to protect aquatic life. The *Draft Field-Based Methods* take a serious deviation from traditional and standard science-based toxicological analysis in determining the toxic concentration thresholds for aquatic macroinvertebrates exposed to certain chemicals or pollutants and should not be used where there may be compliance implications. In addition, EPA's proposed *Draft Field-Based Methods* rely solely on unreliable field observations and statistical modeling as a mechanism to predict the causal effects of specific conductivity on macroinvertebrate species tolerance.

The clean water community will be disproportionately impacted if EPA determines its *Draft Field-Based Methods* are an appropriate means of establishing water quality criteria. Based on their initial review, NACWA's members will also face significant

implementation challenges, with no subsequent guarantee of water quality improvement or greater protection of aquatic life, if these water quality criteria are used as the basis for wastewater treatment permit limits.

EPA Should Not Deviate from Traditional Toxicity Studies for Conductivity

For more than three decades, EPA has “typically relie[d] on laboratory toxicity test data for surrogate species” for developing aquatic life criteria as set forth in the Agency’s *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*. As published, EPA’s *Draft Field-Based Methods* takes a considerable deviation from traditional aquatic toxicology methods and instead uses an unnecessary and overly complicated statistical modelling approach to estimate the cause and effects of specific conductivity on macroinvertebrate species presence/absence as an indicator of overall stream health.

NACWA’s members have expressed concern with the suggested field-based observations not only because the method strays from the standardized scientific approach in place today, but it also ignores established laboratory methods and replaces them with a new technique that appears contrary to sound science.

Today’s toxicological method, even with its inherent flaws, uses empirical data captured through dose-response regressions to measure acute and chronic aquatic life survivorship with corresponding toxicity concentrations. The new technique, as proposed in EPA’s *Draft Field-Based Methods*, replaces today’s accepted scientific approach and *estimates* the cause and effect of specific conductivity concentration on macroinvertebrate tolerance thresholds across variable ecoregions using unreliable field observations and sophisticated statistical modeling. *Estimating* toxic concentrations of specific conductivity on aquatic life as a means to establish water quality criteria is unacceptable for clean water utilities, especially if it leads to Clean Water Act permit conditions. Rather, EPA should continue to conduct research and develop robust laboratory and mesocosm experiments that yield statistically confident data and can be quantitatively and qualitatively replicated.

Municipal Clean Water Community Unfairly Burdened

EPA’s *Draft Field-Based Methods* identifies the municipal clean water community as a significant source of increased ion contribution to streams and lakes from its discharge of treated wastewater. While not necessarily false, this conclusion misrepresents that utilities have control over their ion discharges and that there is a one to one relationship between these ion discharges and instream impacts. The peer-reviewed scientific studies that EPA cites in the *Draft Field-Based Methods* demonstrate the complexities of measuring specific conductivity in the field and the difficult nature of untangling confounding factors. For example, confounding factors such as high surface water temperatures, low stream flow, and poor mixing conditions can lead to elevated conductivity. Further, stream order, vegetative canopy cover, substrate composition, as well as other abiotic and biotic conditions can influence the macroinvertebrate species densities. These confounding factors hinder EPA’s ability to definitively demonstrate a causal effect of specific conductivity on macroinvertebrate species tolerance.

A direct cause of increased specific conductivity to streams and rivers is from the application of road salt to deice roadways during winter storm events. As cited in the *Draft Field-Based Methods*, Kaushal et. al (2005) found road salt applications to northern impervious surfaces caused significant increases in chloride concentrations in streams and rivers—not wastewater treatment facilities. These land use changes and seasonal management decisions alter the hydrology and geomorphology of streams and consequently impact aquatic life, but are largely if not entirely unregulated by the Clean Water Act’s permitting program.

The *Draft Field-Based Methods* pinpoints a variety of ion contributing sources, such as surface mining techniques, brine discharges, and other industrial discharges as well as agricultural nonpoint sources. In addition, climatic factors like salt water intrusion of groundwater aquifers can contribute to increased specific conductivity in

freshwater systems. EPA must consider all of these factors and every anthropogenic ion contributor when establishing baseline specific conductivity values. Otherwise, if states use the *Draft Field-Based Methods* to develop water quality criteria and impose effluent limits, the municipal clean water community will be unfairly burdened as one of the few sources holding a Clean Water Act permit.

Further, EPA's *Draft Field-Based Methods* do not consider how regulators will implement or execute water quality criteria that are established for specific conductivity. Although EPA's *Fact Sheet* and the *Draft Field-Based Methods* indicate that the methods are "not a regulation," and "do not impose legally binding requirements" per se, NACWA members are concerned that authorized states may use the methods to develop water quality criteria and impose stringent effluent limits on the municipal clean water community for specific conductivity while allowing other ion contributors, that may not have Clean Water Act permits, off the hook.

More Peer-Reviewed Scientific Studies are Needed

NACWA believes that EPA's *Draft Field-Based Method* is an interesting approach to assessing specific conductivity in the nation's streams and is worthy of more study. However, NACWA firmly believes that more peer-reviewed, traditional scientific studies are warranted before this method is even considered for use in a context that may have compliance implications for several reasons.

First, toxicity is often difficult to predict because of the variability of individual ions. To complicate matters, scientific studies have found that mixtures of two or more ions can ultimately mitigate aquatic toxicity. It is unclear from EPA's *Draft Field-Based Methods*, how field observations can control for these complex ion mixtures and make subsequent statistical findings that correlate macroinvertebrate toxicity based on a single derivation of a specific conductivity measurement. Therefore, more robust scientific studies are needed to observe the direct role different ion mixtures have on acute and chronic aquatic animal toxicity and life histories.

Second, toxicity can be highly variable within aquatic systems and between organisms. Some aquatic organisms within the same reach of stream may be more salt-tolerant or salt-intolerant depending on the chemical composition of the substrate and other abiotic factors such as temperature, stream flow, and pH. For example, authors of a recent toxicological study¹, not cited in EPA's *Draft Field-Based Methods*, found no significant causal-relationship between increased conductivity and survival or life histories of *Ceriodaphnia dubia*—an important filter feeding animal in stream function and health. Although this data is more cumbersome and expensive to obtain, the *Draft Field-Based Methods* must increase the number of grab samples testing specific conductivity in addition to other water quality parameters while simultaneously collecting a paired macroinvertebrate sample. In doing so, these strong scientific observations can help separate cloudy interpretations stemming from a multitude of confounding factors.

Conclusion

NACWA recommends that EPA abandon the *Draft Field-Based Methods* for determining water quality criteria to protect aquatic life because it relies on *estimating* appropriate specific conductivity limits for each ecoregion. In the absence of specific water measurements and aquatic life data, EPA is relying on mere estimates to determine water quality criteria. This approach completely deviates from the methods in which other water quality criteria for the protection of aquatic life are developed and implemented. The use of estimated specific conductivity data to establish water quality criteria is unacceptable if it leads to Clean Water Act permitting schemes.

¹ See Armstead, M., Bitzer-Creathers, L., & Wilson, M. *The Effects of Specific Conductivity on the Chronic Toxicity of Mining Influenced Streams Using Ceriodaphnia dubia*. 11 PLOS ONE 11 (2016).

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NACWA believes that the municipal clean water community will be unfairly burdened if water quality criteria are developed from EPA's *Draft Field-Based Methods* because states may incorporate effluent limits for specific conductivity in permits, leaving the unpermitted sources likely contributing the most to the problem largely unaffected.

NACWA further suggests that EPA continue to expand traditional laboratory toxicity tests and research for developing aquatic life criteria for specific conductivity and only use the *Draft Field-Based Methods* for supplementary field observations.

Thank you for your consideration of these comments. Please contact me by phone at 202/533-1839 or by email at eremmel@nacwa.org with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Emily Remmel". The signature is fluid and cursive, with a large loop at the end.

Emily Remmel
Director, Regulatory Affairs