

# Texas Commission on Environmental Quality (TCEQ) Comments on Draft Updated Aquatic Life Ambient Water Quality Criteria for Aluminum in Freshwater; Request for Scientific Views

Docket ID Number EPA-HQ-OW-2017-0260

## Background

On July 28, 2017, the EPA published in the *Federal Register* notice of proposed revisions to nationally-recommended acute and chronic criteria to protect aquatic life from aluminum in freshwater. The EPA is seeking public comment on the proposed draft criteria, which were updated to reflect the “latest science and to provide users the flexibility to develop site-specific criteria based on site-specific water chemistry.” In addition to general public comment, the EPA is soliciting additional scientific views, data, and information regarding the science and technical approach used in the derivation of the draft criteria. Federally-recommended criteria for aluminum were last updated by the EPA in 1988. The 1988 criteria were developed with a limited number of toxicity studies, expressed as a fixed value for waters between 6.5 and 9.0 pH units, and did not account for other site-specific factors.

The TCEQ offers the following comments:

## Comments on Proposed Standards

### *I. General Comments and Overview.*

#### **A. The TCEQ supports the development of criteria using site-specific water chemistry.**

It is appropriate to consider the impact of water chemistry on the toxicity of aluminum in freshwater to aquatic species. The TCEQ has adopted site-specific toxic criteria for aluminum in fresh water using Water-Effect Ratio (WER) procedures agreed upon by the EPA and the TCEQ. These procedures have allowed the TCEQ to recognize and incorporate the effects of local water chemistry on the bioavailability and toxicity of metals, including aluminum. Consideration of local water chemistry is particularly important to develop appropriate criteria for aluminum, due to its interactions with complexing ions and organic matter in freshwater.

#### **B. The TCEQ recommends expanding the range of possible measurement inputs in the proposed Multiple Linear Regression (MLR) model which has limited applicability in Texas waters.**

The MLR model as proposed by the EPA is not reflective of water chemistry observed in western surface waters, such as Texas. As currently proposed, the MLR model criteria outputs are constrained by total hardness of 150 mg/L as CaCO<sub>3</sub>, and Dissolved Organic Carbon (DOC) at 5.0 mg/L. These constraints limit the utility and applicability of the model in Texas, where total hardness values and DOC may exceed 1,525 and 270 mg/L, respectively. The EPA should adjust the model as needed to increase its applicability, or provide options for states to allow local water chemistry of surface waters to be incorporated. Adjustments may result in changes to the EPA's proposal.

**C. The TCEQ recommends EPA provide significant and detailed justification to address technical limitations in the proposal relating to development of acute toxicity criteria.**

Justification is needed to address the applicability of the MLR model, which was developed using results of chronic toxicity tests, to the development of acute toxic criteria. In the proposal, EPA states the “MLR equations applied to the acute toxicity data were developed through chronic tests, with the assumption that the effect of water chemistry on bioavailability remains the same.” Achieving a high degree of confidence in the results of acute and chronic toxicity tests is inherently difficult, due to the large amount of variability that may be introduced while conducting the test, including but not limited to: (1) source and condition of test organisms, (2) known quality and condition of test waters, (3) control of laboratory conditions to conduct the test, (4) instrument calibration, and (5) training of laboratory staff. Incorporating the results of acute toxicity tests into the MLR model, including any evaluation of the differences in bioavailability, is needed due to the high potential for uncertainty already inherent in toxicity tests, and since exposure scenarios and endpoints are not consistent among acute and chronic tests. Information such as results of validation tests, or detailed information regarding the assumptions in the model may also be beneficial. Additionally, the EPA should elaborate on the use of “acute studies [that] did not report a definitive LC<sub>50</sub> (i.e., yielded greater than values) because the highest concentration did not cause more than 50% mortality.”

Information such as the extent of censored data, and a rationale explaining the relative impact to the toxicity dataset should be provided to describe this technical limitation. Use of the censored results may not be appropriate, if the amount of censored data comprising the dataset is substantial.

**D. The TCEQ recommends EPA be clear and consistent regarding the speciation of aluminum.**

The speciation of aluminum in the 1988 criteria document is referenced inconsistently in EPA’s current proposal. EPA should clarify the speciation, and reference the information consistently. For example, the following citations in EPA’s current proposal inconsistently reference aluminum speciation of the 1988 criteria:

- Page xii: “The 1988 aluminum freshwater acute criterion was based on dissolved aluminum concentrations...”
- Page 20-21: “The 1988 AWQC criteria for aluminum were based on acid-soluble concentrations, and were subsequently expressed in terms of total recoverable aluminum.”
- Page 21: “The 1988 criteria considered use of dissolved aluminum, but instead recommended acid soluble aluminum for several reasons.”
- Page 74: Table 9, Summary Overview of 2017 Draft Aluminum Aquatic Life Criteria Compared to Current 1988 Criteria references aluminum concentrations for both criteria documents as “total aluminum”.

*II. Lack of Guidance for Incorporation of the Criteria into Water Quality Standards Programs of the Clean Water Act.*

**A. The TCEQ recommends that EPA coordinate with the states and tribes to develop guidance, and should postpone the adoption of the criteria until all the necessary information, including the guidance, receives public review and comment.**

The proposed criterion lacks guidance for the development of state water quality standards. Guidance is needed to assist states in the development of water quality standards. The following key areas need to be addressed in the guidance:

- Data needed to run the MLR model, such as DOC, may be limited in state surface water quality datasets. EPA should provide guidance to reliably estimate needed parameters when data are limited. The EPA has developed similar draft guidance to estimate parameters for use in the biotic ligand model (BLM) for copper, which may also be appropriate for aluminum. EPA should clarify if methods described in *Draft Technical Support Document: Recommended Estimates for Missing Water Quality Parameters for BLM* are appropriate.
- States, including Texas, have relied-upon procedures such as WERs to modify EPA's 1988 aluminum criteria to ensure that site-specific conditions affecting the bioavailability and toxicity of aluminum are incorporated. Guidance is needed to clarify how to address potentially-conflicting results between WERs and EPA's proposal, to assist states when considering the proposed criteria for adoption.

Given the complex nature of the proposal and the significant change to the approach, the EPA should postpone finalizing the proposed criteria and coordinate with states and tribes regarding the expectations for inclusion in triennial reviews. Informational material should be provided for review prior to finalization of the criteria. Without this additional information, stakeholders cannot completely evaluate the proposal and will miss the opportunity to provide proper feedback.