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Ms. Diana Eignor  
Health & Ecological Criteria Division  
Office of Water, Mail Code 4304T  
Environmental Protection Agency  
1200 Pennsylvania Avenue NW  
Washington, DC 20460

*Submitted via Regulations.gov*

RE Docket ID No. EPA-HQ-OW-2017-0260  
FRL-9965-39-OW  
Request for Scientific Views: Draft Updated Aquatic Life Ambient Water Quality  
Criteria for Aluminum in Freshwater

Dear Ms. Eignor,

The Kentucky Division of Water appreciates the opportunity to comment on the Draft Updated Aquatic Life Ambient Water Quality Criteria for Aluminum in Freshwater (EPA-HQ-OW-2017-0260).

A review of the materials raises several concerns regarding the draft criteria. The document narrative indicates that the duration of the recommended acute limit is one hour, however, the table in the Executive Summary and Table 9 both indicate a duration of one day. The division urges the EPA to resolve this discrepancy in amount of time recommended for the acute limit.

As stated in Multiple Linear Regression (MLR) Models For Predicting Chronic Aluminum Toxicity To Freshwater Aquatic Organisms and Developing Water Quality Guidelines, *Environ Toxicol Chem.*, (DOI: 10.1002/etc.3922), p. 20:

“... although the Al toxicity data used to develop the MLR models and HC5s described in this evaluation are based on total Al concentrations in laboratory waters, it is inappropriate to analyze total Al concentrations in natural waters for comparison. This is because many natural waters contain Al in mineral forms, such as clays and other suspended particles, which are non-bioavailable ...”



However, the EPA draft criteria does not address how these recommended criteria apply in areas where much of the aluminum exists in mineral form and is therefore non-bioavailable. The DOW believes that further clarity and guidance is needed in this respect.

The pH for the draft recommended aluminum criteria is bound in the 5.0 to 9.0 pH range, however, Some waters, especially in areas with historical resource extraction activities, will experience pH outside of this range. The draft does not indicate how the recommended criteria apply when the stream pH is outside of the range. The division believes that further clarity or guidance is needed for these conditions.

The EPA recommends numeric criteria for aluminum at pH = 7, total hardness = 100 mg/L as CaCO<sub>3</sub>, and DOC = 1 mg/L. However, the recommended criteria vary as these three constituents change. States may find it impractical, or may even be prohibited by state administrative regulatory requirements to codify a model as a state water quality standard.

Finally, the toxicity data for green algae, for which the most data is available, appears to indicate that these plants are sensitive to aluminum. The Hornstrom et al. 1995 four-day toxicity studies (Appendix E of the supplemental materials), at pH 6.8 and hardness 14.9, indicate a LOEC of 200 µg/L and 100 µg/L for *Monoraphidium dybowskii* and *Monoraphidium griffithii*, respectively. Section 5.2 acknowledges that aluminum effect concentrations for freshwater algae ranged from 50 µg/L to 6,477 µg/L, with most values below 1,000 µg/L. Table 7 shows that the four most sensitive aquatic animal genera for chronic toxicity have GMCVs of 508.5 µg/L to 1,102 µg/L. This appears to indicate that green algae are at least as sensitive, if not more sensitive, to aluminum toxicity as aquatic animals, and should be explained more thoroughly in Section 5.2 and 5.3.

The Division of Water appreciates the opportunity to provide comments on this important matter. Please feel free to contact me at (502 782-6956 or at [peter.goodmann@ky.gov](mailto:peter.goodmann@ky.gov) should you have any questions or if the division can provide further information.

Sincerely,



Peter T. Goodman, Director  
Division of Water