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Resources Authority
Boston, MA

EXECUTIVE DIRECTOR

Ken Kirk

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Attention Docket ID No. OW-2004-0019

Water Docket
Environmental Protection Agency

Mail Code: 4101T
1200 Pennsylvania Avenue, NW

Washington, DC 20460

ow-docket@epa.gov

VIA EMAIL

Dear Sir or Madam:

The National Association of Clean Water Agencies (NACWA) is pleased to provide its views and additional scientific information on the U.S. Environmental Protection Agency's (EPA or Agency) draft revisions to the aquatic life criteria for selenium (December 17, 2004; 69 *Fed. Reg.* 75541). NACWA believes the draft criteria values are more scientifically defensible than the existing values, but does have some concerns with regard to the chronic criterion fish tissue value and its implementation.

The draft chronic criterion would be the first chronic tissue-based criterion derived to protect aquatic life. Therefore, it deserves additional scrutiny with regard to its scientific basis and implementation. Methylmercury is presently the only contaminant with an EPA-approved tissue-based criterion. That criterion was developed for human health protection and four years after its publication the regulated community still awaits guidance on how to implement it. The issues surrounding the implementation of fish tissue-based criteria are complex and NACWA continues to believe that EPA must clarify how these criteria can be implemented before issuing the criteria.

NACWA strongly believes that tissue-based criteria are the most scientifically defensible measures of chronic toxicity for bioaccumulative contaminants such as methylmercury and selenium. However, NACWA disagrees that such tissue-based criteria must be converted, via a bioaccumulation factor, to a water column concentration for implementation and permitting purposes. The problems associated with such conversions are acutely evident in the case of selenium as discussed below.

The Colorado Wastewater Utility Council, which is comprised of 43 municipal and special district wastewater treatment entities including many NACWA members, commissioned a report, "Technical Review of the 2004 U.S. EPA Draft Selenium Criteria Document, May 2005." NACWA is submitting this report (Attachment 1) as a part of its comments, but also offers the following comments and concerns based on the findings of the report.

Acute Criteria

NACWA supports the draft acute criteria which acknowledge the differential toxicity of the two dominant species of selenium – selenite and selenate – to aquatic life and include a sulfate correction for the selenate criterion. The new criteria for selenite and selenate are more scientifically defensible than the existing criterion of 20 µg/L. As noted in Attachment 1, there are additional toxicity data available that were not used by EPA in its database. Nevertheless, the criteria values would not change with the addition of these data and NACWA supports EPA's proposed revision.

Chronic Criteria

While NACWA believes that the current chronic criterion of 5µg/L in the water column lacks sufficient scientific basis and should be changed, it is concerned with EPA's methodology for selecting the new fish tissue-based value of 7.91 µg/g and the lack of data demonstrating a link between whole body fish tissue concentrations and chronic effects in fish.

EPA did not use its own approaches for criteria derivation when selecting the new fish tissue value and instead defaulted to a single value from one study (Lemly, 1993; See Attachment 1) of 7.91 ug/g, which is based on the combined effects of winter stress (i.e., low temperature) and tissue selenium concentrations on fish mortality. The study has not been replicated and NACWA feels strongly that national criteria should only be derived from multiple, reproducible studies that clearly show differences in whole body selenium concentrations between fish that were affected and fish that were not affected. Singling out this particular study as the most important and protective value goes against EPA's own criteria derivation guidance. NACWA recommends that EPA consider using the 5th percentile of species mean chronic values approach detailed in Attachment 1.

In developing the database for this criterion, whole body concentrations, when only other tissue data were available, were generated using regression analyses. However, the regression equations were based on data that were predominantly (over 90%) from one species, bluegill. NACWA questions the appropriateness of applying these equations to all fish species (whether warm water or cold water, etc.) even though they were derived overwhelmingly from one species.

NACWA believes that a tissue-based chronic criterion is the most direct way to quantify the chronic toxicity of a bioaccumulative contaminant like selenium, but believes that there may not yet be enough scientifically reliable studies to derive an ecologically relevant and protective criterion based on whole-body selenium concentrations. The findings in Attachment 1 show no measurable impact of elevated tissue levels on fish communities, even when the whole body concentrations are in excess of the EPA value or the higher chronic value proposed by the report's authors. NACWA agrees with the findings in Attachment 1 (and referenced studies) that the selenium content of the eggs or ovaries may better reflect the potential chronic effects to fish, but understands that implementing such an approach nationally may present added challenges. Still, NACWA recommends that EPA consider allowing a tissue-specific approach on a site-specific basis.

Criteria Implementation

In addition to the complexities associated with implementing a fish tissue criterion, other factors unique to selenium, including its presence at naturally high background concentrations in some areas, also weigh heavily on implementation of the criteria.

Attachment 1 details a number of compounding factors related to geographic differences in surface water concentration and fish tissue concentration that are sure to complicate implementation of a national criterion. Colorado provides just one example where site-specific considerations must be taken into consideration:

- Like many regions in the western U.S., many areas in Colorado have significant deposits of selenium-rich surface materials (e.g., marine shales) that naturally elevate selenium concentrations in aquatic ecosystems;
- Despite elevated background levels, there is no empirical field evidence that selenium is impacting fish in the Colorado River basin;
- Given the high natural levels of selenium, native Colorado fish undoubtedly have a different exposure and evolutionary history with regard to selenium, and it is reasonable to hypothesize that natural populations in Colorado may have acclimated to or are otherwise more tolerant of elevated selenium concentrations.

While the regulated community awaits EPA's guidance on implementing the fish-tissue based criterion for methylmercury, the debate over whether to convert that number into a water column concentration for ease of determining permit compliance continues to intensify. In the notice detailing the new selenium criteria, EPA requests input on deriving localized bioaccumulation factors (BAF) for translating the tissue concentrations to water concentrations. NACWA continues to believe that using BAFs to convert fish-tissue values to water concentrations is inappropriate. For selenium, the reasons to avoid this conversion are more than obvious given the inverse relationship between exposure concentration and BAF (the BAF decreases as the water concentration increases) and the fact that this inverse relationship between BAF and exposure concentration varies depending on a variety of site-specific factors, as detailed in Attachment 1.

The key to implementing this and other fish-tissue based criteria is ensuring that states have sufficient flexibility and guidance to select an appropriate method. NACWA recommends that EPA review the approaches outlined on pages 59 and 60 of Attachment 1 for estimating the water selenium concentration that would result in the same protection afforded by a fish tissue-based criterion. Further, NACWA recommends that EPA also consider the information presented in the January 24, 2003, report "Implementation of EPA's Methylmercury Criterion for Fish Tissue" (Attachment 2), which contemplates determining compliance with the criterion by actual measurement of average fish tissue concentration.

Conclusion

NACWA supports EPA's proposed revisions to the acute selenium criteria to acknowledge the differential toxicity of the two dominant species of selenium. While the Association strongly supports the use of a fish tissue-based criterion for chronic effects, the Association has concerns about the scientific defensibility of the 7.91 µg/g criterion value, how it was derived, and how it will be implemented.

NACWA encourages EPA to work on resolving the issues associated with implementing a fish tissue-based criterion while they consider the data and information submitted on the proposed criteria revision so it can issue implementation guidance concurrent with its criteria recommendations.

Please let me know if you have any questions about our comments or if you would like to discuss these issues further.

Sincerely,



Chris Hornback

Director, Regulatory Affairs

ATTACHMENTS:

- Link to Attachment 1 ([click here](http://www.nacwa.org/advocacy/comments/OW-2004-0019NACWACmtsAttach1.pdf))
<http://www.nacwa.org/advocacy/comments/OW-2004-0019NACWACmtsAttach1.pdf>
- Link to Attachment 2 ([click here](http://www.nacwa.org/advocacy/comments/OW-2004-0019NACWACmtsAttach2.pdf))
<http://www.nacwa.org/advocacy/comments/OW-2004-0019NACWACmtsAttach2.pdf>