International Lead Association

Please find comments in the attached document. Thanks.

International Lead Association

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Date: May 2, 2024

To: Marla Koberstein
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PO Box 47696
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Subject: Comments on proposed update to aquatic life toxics criteria for lead (WAC 173-201A-240)

Dear Ms. Koberstein,

On behalf of the International Lead Association (ILA), this letter provides comments in response to the updated aquatic life toxics criteria for lead, as described in the technical support document (TSD) released for public comment in February 2024 (Publication 24-10-007). In general, ILA supports the proposed aquatic life toxics criteria for lead as being protective in fresh waters under high lead bioavailability conditions (e.g., low hardness). However, as noted in the general comment letter submitted on behalf of the metals associations collaborating with the U.S. Environmental Protection Agency (USEPA) in developing updated metals criteria under a Cooperative Research and Development Agreement (CRADA), ILA encourages Ecology to consider updated methods for considering the bioavailability of lead in developing updated freshwater criteria.

Ecology's proposed lead criteria for freshwater are based on a hardness model. These criteria are unchanged from Ecology's current lead criteria (last updated in 1992) and are consistent with the USEPA's currently recommended lead criteria (last updated in 1984). Based on the information provided in Ecology's TSD, it is ILA's understanding that Ecology developed updated lead criteria based on consideration of more recent lead toxicity data and use of the 1st percentile of the genus sensitivity distribution instead of the 5th percentile that is typically used following USEPA procedures. Because the acute and chronic lead criteria based on updated toxicity data and the 1st percentile of the genus sensitivity distribution were greater than the current criteria, the current criteria were determined to be protective of aquatic life and updated lead criteria were not proposed. As such, ILA agrees with Ecology's decision that the aquatic life criteria for lead did not need to be lowered to ensure aquatic life protection.

There are, however, factors other than hardness that influence lead bioavailability. Dissolved organic carbon (DOC), for example, has a stronger influence on lead bioavailability than hardness, with hardness being more important in low DOC conditions and pH having a moderate effect (Adams and Garman 2023; DeForest et al. 2017, 2020). As part of the CRADA collaboration with the USEPA, acute and chronic multiple linear regression (MLR) models were developed to account for the influence of hardness, DOC, and pH on lead bioavailability (DeForest et al. 2020). These MLR models performed similarly to the lead biotic ligand model (BLM) previously described in DeForest et al. (2017). Additionally, both the lead MLR models and lead BLM were used to derive acute and chronic water quality criteria following USEPA (1985) guidelines, which likewise resulted in acute and chronic lead criteria that responded similarly to changes in hardness, DOC,

and pH (DeForest et al. 2020). Environment and Climate Change Canada also adopted MLR-based water quality guidelines for lead following similar procedures (ECCC 2020; Adams and Garman 2023).

The important influence of DOC on lead bioavailability is illustrated in Figure 1. In this example, a hardness concentration of 100 mg/L and pH of 7 are assumed, with chronic lead criteria plotted as a function of DOC concentration. The hardness criteria are Ecology's currently proposed chronic lead criteria, which are of course constant as a function of DOC since the criteria are only based on the hardness of 100 mg/L assumed. The chronic lead criteria based on the MLR model consider the combined influence of the assumed hardness and pH along with the increasing DOC concentrations plotted. As shown, the chronic lead criteria derived from these two approaches are comparable when DOC is low, but the MLR-based criteria increase with increasing DOC. This reflects decreasing lead bioavailability with increasing DOC.

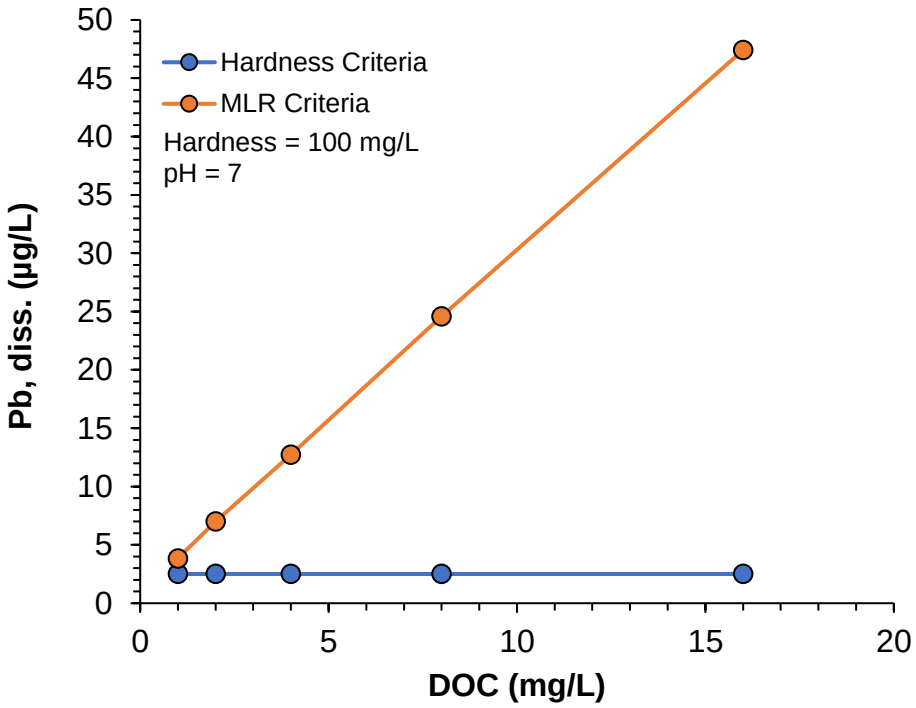

Figure 1. Comparison of Ecology's proposed hardness-based chronic lead criteria to multiple linear regression (MLR)-based chronic lead criteria as a function of DOC. Note that this example is for waters with a constant hardness of 100 mg/L and pH of 7. The MLR models are described in DeForest et al. (2020) and summarized in Table 2 of Adams and Garman (2023). The criteria are based on the chronic genus sensitivity distribution compiled in DeForest et al. (2017).

Consideration of bioavailability parameters beyond just hardness would result in lead criteria that are more relevant to the targeted level of protection over a broader range of water chemistry conditions, as well as criteria that are developed following the state-of-the-science and consistent with the direction the USEPA is heading for metals criteria under CRADA.

Thank you for the opportunity to submit these comments. Please do not hesitate to let me know if you would like to discuss these comments or lead criteria further.

Sincerely,

Jasim Chowdhury

M. Jasim Chowdhury, Ph.D.
Director of Environmental Science

References

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