

NOVEMBER 19, 2020

TO: Idaho Department of Environmental Quality

FROM: Brad Barnhart, Ph.D., Senior Research Scientist

SUBJECT: Human health water quality criteria rulemaking for arsenic

Idaho's Department of Environmental Quality (IDEQ) has requested comments regarding the current rulemaking for arsenic human health water quality criteria (HHWQC) to protect recreation and domestic water supply designated uses. NCASI appreciates the opportunity to comment on this important rulemaking, and we respectfully submit these comments that evaluate the criteria alternatives suggested by IDEQ during the November 5, 2020 rulemaking meeting (IDEQ 2020).

NCASI is an independent, non-profit research institute that focuses on environmental topics of interest to the forest products industry. Members of NCASI represent more than 80% of the pulp and paper production in the United States. In its capacity as a research organization, NCASI has a long history of working to contribute to the science needed to address numerous environmental topics related to the forest products industry including effluent regulation, water quality management, and relationships between human and natural stressors on aquatic ecosystems. NCASI also has a long history of collaboration with state agencies and EPA on the use of sound science needed for the development and implementation of responsible environmental management practices.

Overview of Criteria Alternatives

During the November 5, 2020 rulemaking meeting, IDEQ outlined several alternative approaches for deriving inorganic arsenic criteria intended to protect recreational and domestic water supply uses (IDEQ 2020). They are summarized below.

Recreational Use (Fish Consumption Only)

1. Water criterion with Idaho-specific BAF (7.16 ug/L criteria with BAF=1.12 L/kg)
2. Fish tissue criterion: 8 ug/kg
3. Water screening level (7.16 ug/L) to trigger fish tissue sampling
4. Both fish tissue (8 ug/kg) and water (7.16 ug/L) criteria, where fish tissue supersedes water

Domestic Water Supply Use (Water + Fish Consumption)

1. Water criterion with Idaho-specific BAF (0.22 ug/L criteria with BAF=1.12 L/kg)
2. Narrative criteria

Feedback on Criteria Alternatives

Recreational Use (Fish Consumption Only)

As noted by IDEQ and described in our previous comments (submitted to IDEQ on 2020-04-10), Idaho's extensive monitoring data showed no clear relationship between concentrations of inorganic arsenic in fish tissues and water column concentrations. These data demonstrate that the concentration of inorganic arsenic to which humans would be exposed through fish consumption is unrelated to water column concentrations. Based on these findings, the only scientifically defensible alternative that is protective of human health is to establish a fish tissue criterion of 8 ug/kg (Alternative #2). We recognize that tissue-only criteria present implementation challenges. However, the robust dataset generated through statewide monitoring initiatives clearly demonstrates that using water column concentrations to infer human exposure to inorganic arsenic through fish consumption is inappropriate. Further details regarding implementation of a fish tissue criterion could be evaluated through continued stakeholder discussion.

Domestic Water Supply Use (Water + Fish Consumption)

In line with the above recommendation, if IDEQ chooses to proceed with Alternative #1 for setting criteria values protective of the domestic water supply designated use, we recommend that the BAF value be omitted from the exposure portion of the criterion equation:

$$\begin{array}{l} \text{Exposure Portion of Domestic} \\ \text{Water Supply Use Criterion} \\ \text{Equation} \end{array} : \frac{BW}{DI + \sum_{i=2}^4 (FI_i * BAF_i)} \longrightarrow \frac{BW}{DI} \quad (1)$$

where BW is the body weight (kg), DI is the untreated drinking water intake (L/day), FI is the fish intake or fish consumption rate (total=0.066 kg/day), and BAF is the bioaccumulation factor, where the summation refers to summing over trophic levels 2, 3, and 4.

However, the resulting 0.22 ug/L water concentration criterion falls well below the geometric mean of monthly samples collected from August 2019 – February 2020, which suggests that, for many locations, the natural background of inorganic arsenic concentrations in water exceeds the calculated water criterion. Note that IDAPA 58.0102.200.09 states, "When natural background conditions exceed any applicable water quality criteria set forth in Sections 210, 250, 251, 252, or 253, the applicable water quality criteria shall not apply; instead, there shall be no lowering of water quality from natural background conditions." Therefore, in this case, a narrative criterion for water column concentrations that is consistent with drinking water goals is preferable to establishing an unachievable numeric criterion and requiring evaluations of background conditions during implementation. The narrative criteria suggested by IDEQ, which states that "inorganic arsenic must not exceed concentrations that would require additional treatment or removal prior to delivery as public drinking water", is both rational and scientifically defensible from a health protection standpoint.

References

IDEQ. 2020. Revision of Idaho's Human Health Criteria for Arsenic – DEQ PowerPoint Presentation. Docket No. 58-0102-1801. Presented November 5, 2020. <https://cloud.deq.idaho.gov/s/9BCNk5RYp3nDqqX>