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Submitted via email: [paula.wilson@deq.idaho.gov](mailto:paula.wilson@deq.idaho.gov) and [jason.pappani@deq.idaho.gov](mailto:jason.pappani@deq.idaho.gov)

RE:Water Quality: Docket No. 58-0102-1801 – Update to Human Health Criteria for Arsenic

Dear Ms. Wilson and Mr. Pappani,

Thank you for the opportunity to comment on the draft of Docket No. 58-0102-1801 - Negotiated Rulemaking on updating the human health criteria (HHC) for Arsenic.

Since 1973, the Idaho Conservation League has had a history of involvement with water quality issues. As Idaho's largest state-based conservation organization, we represent over 30,000 supporters who have a deep personal interest in ensuring that our water quality is protected throughout the state.

We thank you for the opportunity to submit comments. We look forward to continuing to work with the Department of Environmental Quality on this project and others in the future. Please feel free to contact us if you have any questions or require additional information.

Sincerely,

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RE:Water Quality: Docket No. 58-0102-1801 – Update to Human Health Criteria for Arsenic

## **Concerns regarding the limited understanding of arsenic biochemistry**

The development of accurate water quality criteria is a process that should, at a fundamental level, be based on science. Right now, it is not evident that the Idaho Department of Environmental Quality (DEQ) has collected sufficient scientific data to support the determination of an arsenic criteria (see arsenic data section below). In fact, DEQ has used the lack of scientific understanding of arsenic biochemistry to justify the omission of bioaccumulation factors (BAFs) and to justify the decision to exclusively rely on an arbitrary fish tissue criteria. Instead, ICL believes the limited understanding of arsenic behavior should signify that more science is needed before this criteria can be accurately quantified. As such, DEQ should consider taking additional time to obtain a comprehensive understanding of the science, and possibly collect more data, before proposing an arsenic criteria.

In the alternative, if DEQ decides to proceed without developing a more comprehensive dataset, the following comments outline our concerns regarding the current dataset and proposed criteria.

## **Concerns regarding Idaho arsenic data for deriving a fish only criteria**

ICL strongly encourages DEQ to develop a water column criteria in addition to the fish tissue criteria for fish only waters. DEQ and ARCADIS concluded that a direct relationship between arsenic in water and arsenic in fish does not exist and therefore, an arsenic BAF cannot be determined. However, it is fundamentally incorrect to infer from the results that the two variables are independent of one another; rather it simply implies that a relationship was not detected based on the current dataset, the specific sampling protocol, and the methods DEQ used to analyze the data. Therefore, ICL requests that DEQ provide a thorough analysis of the existing arsenic data before concluding that a BAF cannot be determined. For example;

1. It is important to consider that the route of exposure to arsenic may not be directly related to water concentrations and instead related to food-web transfers [1]. Has DEQ explored the distribution of arsenic between concentrations in water, particulate matter, and trophic levels of fish? In other words, has the dietary exposure of arsenic and its impact on accumulation and toxicity in fish been considered?
2. The different oxidation states of arsenic (i.e. As (III) vs As (V)) will likely accumulate differently in fish tissue compared to total inorganic arsenic. Has DEQ looked at the different species of arsenic in water and fish and determined a BAF for As (III) vs As (V)? Is this type of speciation data available for fish tissue or only water? If not, ICL suggests this type of data is collected and BAFs are determined as a function of oxidation state.
3. The data provided in the excel sheet on the [DEQ negotiated rulemaking site](#) seems to indicate that lower trophic levels may have a more direct relationship between arsenic concentrations in

the water vs fish (Figure. 1). Has DEQ analyzed the BAF data as a function of trophic level? Have these sorts of trends been analyzed to determine their relevance?

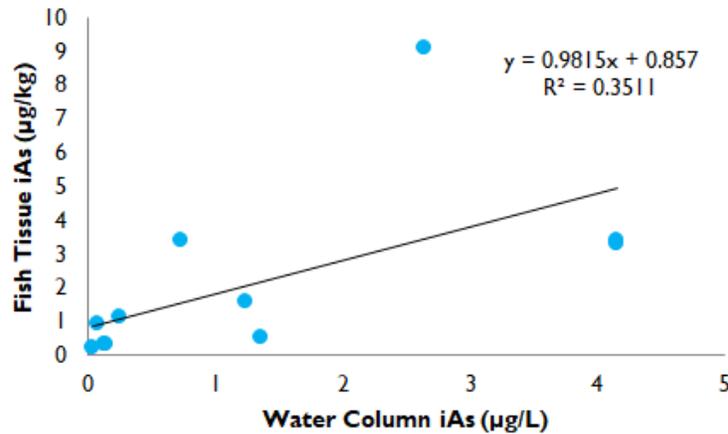


Figure. 1. Arsenic concentration in the water column and fish tissue for lower trophic levels (sculpin, dace, reidside shiner). Data collected and distributed by DEQ.

4. The data presented in *2019 Arsenic Accumulation in Fish Tissue* (Fig. 1 and 2) include data points that could be considered outliers. Have the causes of those outliers been determined? Has DEQ determined if the arsenic data has a normal distribution? If not, would other statistical tests be beneficial to use to more accurately describe the data?
5. Has DEQ determined the reasoning as to why the relative percent difference for fish tissue samples was highly variable (i.e. 0-60)? Does this kind of variability impact the distribution of the data and propagated uncertainty in a BAF?

## Concerns regarding current draft arsenic criteria

### *Implementing the draft fish tissue criteria*

ICL encourages DEQ to consider the fact that water quality criteria should be derived to be protective of human health and be implementable in regulatory frameworks such as IPDES permits and TMDLs. The current draft rule only includes a fish tissue criteria (8 µg/kg) for waters designated as fish only (i.e. primary and secondary recreation). It is unclear how DEQ plans to implement an arsenic fish tissue criteria without having an equivalent water column criteria. To help elucidate how this type of criteria could be successfully implemented, ICL requests that DEQ provide a hypothetical demonstration that outlines a step-by-step procedure for implementing the fish tissue criteria into IPDES permits. This demonstration should include: (1) what numerical data should be obtained and utilized to conduct

reasonable potential analysis, (2) how DEQ expects permit writers to determine effluent limits for arsenic using the fish tissue criteria, and (3) the expectations for dischargers to conduct monitoring (e.g. requirements for the number of samples, types of analytical techniques required, and frequency of sampling). ICL understands that these questions are still being addressed, however we feel that the implementation aspect requires much more thought before DEQ can seriously consider solely utilizing a fish tissue criteria.

#### *Fish + Water criteria*

ICL believes that the current draft arsenic criteria for Fish + Water does not appropriately consider risk from exposure. The narrative criteria ultimately relies on the maximum contaminant level (MCL) for arsenic under the Safe Drinking Water Act (SDWA) and is currently set at 10 µg/L. MCLs are developed with consideration given to the cost and technological feasibility of reducing contaminants whereas human health criteria are designed to protect humans from exposure to contaminants, regardless of cost and technological feasibility. Therefore, ICL does not agree with the decision to utilize an MCL as an equivalent to human health criteria and requests that DEQ reconsider this approach. Furthermore, in 2016, the EPA disapproved 10 µg/L because the criteria was not scientifically defensible. ICL requests DEQ provide, in detail, an explanation of why 10 µg/L is scientifically defensible now, even though it was not in 2016.

#### **References**

- [1] R. J. Erickson *et al.*, “Effects of copper, cadmium, lead, and arsenic in a live diet on juvenile fish growth,” *Can. J. Fish. Aquat. Sci.*, vol. 67, no. 11, pp. 1816–1826, Nov. 2010, doi: 10.1139/F10-098.