

Aquatic Life Criteria for Toxic Substances

Rules

Numeric Criteria for Toxic Substances for Waters Designated for Aquatic Life, Recreation, or Domestic Water Supply Use (IDAPA 58.01.02.210)

01. Criteria for Toxic Substances. The criteria of Section 210 apply to surface waters of the state as follows.

- a. Columns B1, B2, and C2 of the following table apply to waters designated for aquatic life use.*
- b. Column C2 of the following table applies to waters designated for recreation use.*
- c. Column C1 of the following table applies to waters designated for domestic water supply use.*

[Note: this is an excerpt of the full table of criteria]

A		B Aquatic life		Human health for consumption of:	
(Number) Compound	^a CAS Number	^b CMC (µg/L)	^b CCC (µg/L)	Water & organisms (µg/L)	Organisms only (µg/L)
		B1	B2	C1	C2
2 Arsenic	7440382	340 e	150 e	10 d	10 d
6 Copper	7440508	17 i	11 i		
8a Mercury	7439976	g	g		
8b Methylmercury	22967926				0.3 mg/kg p
10 Selenium	7782492	20 f	5 f	170	4200
14 Cyanide	57125	22 j	5.2 j	140 c	140 c
Table Footnotes					

a.	Chemical Abstracts Service (CAS) registry numbers which provide a unique identification for each chemical.
b.	See definitions of Acute Criteria (CMC) and Chronic Criteria (CCC), Section 010 of these rules.
e.	Criteria for these metals are expressed as a function of the water effect ratio, WER, as defined in Subsection 210.03.c.iii. CMC = column B1 value X WER. CCC = column B2 value X WER.
f.	Criterion expressed as total recoverable (unfiltered) concentrations.
g.	No aquatic life criterion is adopted for inorganic mercury. However, the narrative criteria for toxics in Section 200 of these rules applies. The Department believes application of the human health criterion for methylmercury will be protective of aquatic life in most situations.
i.	Aquatic life criteria for these metals are a function of total hardness (mg/L as calcium carbonate), the pollutant's water effect ratio (WER) as defined in Subsection 210.03.c.iii. and multiplied by an appropriate dissolved conversion factor as defined in Subsection 210.02. For comparative purposes only, the example values displayed in this table are shown as dissolved metal and correspond to a total hardness of one hundred (100) mg/L and a water effect ratio of one (1.0).
j.	Criteria are expressed as weak acid dissociable (WAD) cyanide.
p.	This fish tissue residue criterion (TRC) for methylmercury is based on a human health reference dose (RfD) of 0.0001 mg/kg body weight-day; a relative source contribution (RSC) estimated to be 27% of the RfD; a human body weight (BW) of 70 kg (for adults); and a total fish consumption rate of 0.0175 kg/day for the general population, summed from trophic level (TL) breakdown of TL2 = 0.0038 kg fish/day + TL3 = 0.0080 kg fish/day + TL4 = 0.0057 kg fish/day. This is a criterion that is protective of the general population. A site-specific criterion or a criterion for a particular subpopulation may be calculated by using local or regional data, rather than the above default values, in the formula: $TRC = [BW \times \{RfD - (RSC \times RfD)\}] / \sum TL$. In waters inhabited by species listed as threatened or endangered under the Endangered Species Act or designated as their critical habitat, the Department will apply the human health fish tissue residue criterion for methylmercury to the highest trophic level available for sampling and analysis.

02. Factors for Calculating Hardness Dependent Metals Criteria. *Hardness dependent metals criteria are calculated using values from the following table in the equations:*

...

c. Application of metals criteria.

For metals other than cadmium, for purposes of calculating hardness dependent aquatic life criteria from the equations in Subsection 210.02, the minimum hardness allowed for use in those equations shall not be less than twenty-five (25) mg/l, as calcium carbonate, even if the actual ambient hardness is less than twenty-five (25) mg/l as calcium carbonate. For cadmium, the minimum hardness for use in those equations shall not be less than ten (10) mg/l, as calcium carbonate. The maximum hardness allowed for use in those equations shall not be greater than four hundred (400) mg/l, as calcium carbonate, except as specified in Subsections 210.03.c.ii. and 210.03.c.iii., even if the actual ambient hardness is greater than four hundred (400) mg/l as calcium carbonate.

Discussion

Idaho water quality standards must be approved by EPA before they are effective. EPA's approval is a federal action and, as such, EPA is obligated to consult with agencies administering the Endangered Species Act (ESA) if species listed as endangered or threatened under the ESA, or their critical habitat, may be affected.

Idaho first adopted criteria to protect aquatic life on August 24, 1994. These toxics criteria were those recommended by EPA and federally promulgated as the National Toxics Rule (NTR) in 1992. In 1996 EPA approved of Idaho's adoption of the NTR criteria. Shortly thereafter, EPA began informal consultation and preparation of their biological assessment (BA). EPA's BA was completed and turned over to the National Marine Fisheries Service – National Oceanic and Atmospheric Administration (NOAA) and the US Fish and Wildlife Service (FWS) in 2000, thus initiating formal consultation (EPA, 2000). NOAA finalized their Biological Opinion (BiOp) on May 7, 2014 (NOAA, 2014). A companion BiOp from the FWS is still in preparation.

NOAA's 2014 BiOp concluded that several of Idaho's criteria, which EPA approved subject to subsequent consultation, would cause jeopardy to listed species and adverse modification of their habitat. Specifically, the BiOp calls out Idaho's:

- hardness floor of 25 mg/L for hardness dependent metals criteria;
- chronic criterion for arsenic (As);
- both acute and chronic criteria for copper (Cu);
- chronic criterion for mercury (Hg);
- chronic criterion for selenium (Se); and
- chronic criterion for cyanide (CN⁻).

The criteria in question are shaded in light orange in the excerpt of Idaho's toxic criteria table above.

In order to avoid jeopardy and adverse modification of habitat, NOAA prescribed several Reasonable and Prudent Alternatives (RPA's) for EPA:

- Hardness floor
 - Remove the low end hardness floor (minimum hardness) for calculating hardness dependent metals criteria within 3 years
- Arsenic
 - Adoption of protective criteria within 7 years. It is not currently known what criterion value would be considered protective.
- Copper

- Adoption within 3 years of criteria no less stringent than EPA's 2007 304(a) copper criteria. These criteria vary based on various other qualities of the water (e.g. dissolved organic carbon, pH, and alkalinity) and water body specific criteria are predicted based on the Biotic Ligand Model (BLM). This is similar to, but more complicated than, current hardness dependent criteria.
- Mercury
 - Adoption of protective criteria within 7 years. It is not currently known what criterion value would be considered protective. However, as an interim measure NOAA has suggested applying Idaho's fish tissue methylmercury criterion of 0.3 mg/Kg set to protect human health would protect aquatic life as well. NOAA also suggests that, in the absence of fish tissue data, a water column mercury value of 2 ng/L would indicate that the fish tissue criterion would be met, thus protecting aquatic life.
- Selenium
 - Adoption of protective criteria within 4 years. Updated 304(a) criteria for selenium that EPA proposed in May of 2014 and expects to finalize soon, will likely be considered protective. The proposed criteria are fish tissue based.
- Cyanide
 - Use a 25% mixing zone for new or reauthorized discharges OR, for existing discharges with >25% mixing zone, show passage is unlikely to be impeded AND conduct biological monitoring.

Because ESA consultation is between EPA and NOAA/FWS these remedies are directed toward EPA. However, the Clean Water Act sets up a partnership between EPA and the states whereby EPA is charged with developing criteria under section 304(a) that they recommend to states for adoption. States may adopt EPA's recommended 304(a) criteria or other criteria that they can show to be protective of uses in their waters. EPA must approve or disapprove state adopted criteria and, if they disapprove, promulgate federal criteria for the state. Thus EPA is deferring to the State of Idaho to adopt criteria as needed, and only if the state fails to adopt protective criteria will EPA step in.

References:

EPA. 2000. Biological Assessment of the Idaho Water Quality Standards for Numeric Water Quality Criteria for Toxic Pollutants (final 8-4-2000). U.S. Environmental Protection Agency, Seattle, WA. 208 pp.

NOAA. 2014. Biological Opinion: Final Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat

Consultation for Water Quality Toxics Standards for Idaho, dated May 7, 2014. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, West Coast Region, Seattle, WA. 528 pp.