

**Written comment deadline for this draft – November 9, 2015**

**210. NUMERIC CRITERIA FOR TOXIC SUBSTANCES FOR WATERS DESIGNATED FOR AQUATIC LIFE, RECREATION, OR DOMESTIC WATER SUPPLY USE.**

**01. Criteria for Toxic Substances.** The criteria of Section 210 apply to surface waters of the state as follows. (5-3-03)

**a.** Columns B1, B2, and C2 of the following table apply to waters designated for aquatic life use. (5-3-03)

**b.** Column C2 of the following table applies to waters designated for recreation use. (5-3-03)

**c.** Column C1 of the following table applies to waters designated for domestic water supply use.

Note: In 2006, Idaho updated 167 human health criteria for 88 chemicals. On May 10, 2012, EPA disapproved Idaho's 2006 update of 167 human health criteria for toxic substances and the use of 17.5 g/day fish consumption rate for human health criteria (see IDAPA 58.01.02.210.05.b.i). This action was based on EPA's judgment that the fish consumption rate used in criteria derivation was not adequately protective. As a result of this action, the human health criteria published in the 2005 version of IDAPA 58.01.02.210.01 continue to apply and are effective for federal Clean Water Act purposes. These criteria are summarized in "Numeric Criteria for Toxic Substances (2005)" located at [http://www.deq.idaho.gov/media/451725-human\\_health\\_criteria.pdf](http://www.deq.idaho.gov/media/451725-human_health_criteria.pdf).

For more information regarding this EPA disapproval, go to <http://www.deq.idaho.gov/epa-actions-on-proposed-standards>.

A		B Aquatic life		Human health for consumption of:	
(Number) Compound	a	b	b	Water & organisms (µg/L)	Organisms only (µg/L)
	CAS Number	CMC (µg/L) B1	CCC (µg/L) B2	C1	C2
6 Copper	7440508	<del>171</del> <del>ix</del> <u>9.4</u> <u>x</u>	<del>112.0</del> <del>ixx</del>		
Table Footnotes					

<b>a.</b>	Chemical Abstracts Service (CAS) registry numbers which provide a unique identification for each chemical.
<b>b.</b>	See definitions of Acute Criteria (CMC) and Chronic Criteria (CCC), Section 010 of these rules.
<b>c.</b>	This criterion has been revised to reflect The Environmental Protection Agency's q1* or RfD, as contained in the Integrated Risk Information System (IRIS) as of May 17, 2002. The fish tissue bioconcentration factor (BCF) from the 1980 Ambient Water Quality Criteria document was retained in each case.
<b>d.</b>	Inorganic form only.
<b>e.</b>	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.
<b>f.</b>	Criterion expressed as total recoverable (unfiltered) concentrations.
<b>g.</b>	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.
<b>h.</b>	No numeric human health criteria has been established for this contaminant. However, permit authorities should address this contaminant in NPDES permit actions using the narrative criteria for toxics from Section 200 of these rules.
<b>xx.</b>	<u>Aquatic life criteria for copper are derived from the Biotic Ligand Model, Version 2.2.3 (June 2007), For comparative purposes only, the example values displayed in this table correspond to the model output based on the following inputs: temperature = 15.2°C, pH = 7.9, dissolved organic carbon = 1.9 mg/L, humic acid fraction = 10%, Calcium = 68.9 mg/L, Magnesium = 44.2 mg/L, Sodium = 65.5 mg/L, Potassium = 1.9 mg/L, Sulfate = 72.6 mg/L, Chlorine = 54.5 mg/L, and alkalinity = 280 mg/L CaCO<sub>3</sub>.</u>
<b>i.</b>	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).
<b>j.</b>	Criteria are expressed as weak acid dissociable (WAD) cyanide.
<b>k.</b>	Total chlorine residual concentrations.
<b>l.</b>	EPA guidance allows states to choose a risk factor of 10 <sup>-4</sup> to 10 <sup>-6</sup> . Idaho has chosen to base this criterion on carcinogenicity of 10 <sup>-6</sup> risk.
<b>m.</b>	Aquatic life criteria for pentachlorophenol are expressed as a function of pH, and are calculated as follows. Values displayed above in the table correspond to a pH of seven and eight tenths (7.8). CMC = exp(1.005(pH)-4.830) CCC = exp(1.005(pH)-5.290)
<b>n.</b>	PCBs are a class of chemicals which include Aroclors, 1242, 1254, 1221, 1232, 1248, 1260, and 1016, CAS numbers 53469219, 11097691, 11104282, 11141165, 12672296, 11096825 and 12674112 respectively. The aquatic life criteria apply to this set of PCBs.
<b>o.</b>	This criterion applies to total PCBs, (e.g. the sum of all congener, isomer, or Aroclor analyses).

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.

(3-29-10)

**02. Factors for Calculating Hardness Dependent Metals Criteria.** Hardness dependent metals criteria are calculated using values from the following table in the equations: (5-3-03)

a.  $CMC = WER \exp\{mA[\ln(\text{hardness})] + bA\}$  X Acute Conversion Factor. (5-3-03)

b.  $CCC = WER \exp\{mc[\ln(\text{hardness})] + bc\}$  X Chronic Conversion Factor.

Metal	mA	bA	mc	bc	aAcute Conversion Factor	aChronic Conversion Factor
Arsenic	b	b	b	b	1.0	1.0
Cadmium	0.8367	-3.560	0.6247	-3.344	0.944 see footnote a	0.909
Chromium (III)	0.819	3.7256	0.8190	0.6848	0.316	0.860
Chromium (VI)	b	b	b	b	0.982	0.962
Copper	<del>0.9422</del>	<del>-1.464</del>	<del>0.8545</del>	<del>-1.465</del>	<del>0.960</del>	<del>0.960</del>
Lead	1.273	-1.460	1.273	-4.705	0.791	0.791
Mercury	b	b	b	b	0.85	0.85
Nickel	0.846	2.255	0.8460	0.0584	0.998	0.997
Silver	1.72	-6.52	c	c	0.85	c
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986

Note to table: The term “exp” represents the base e exponential function.

Footnotes to table:

- a.** Conversion factors (CF) are from “Stephan, C. E. 1995. Derivation of conversion factors for the calculation of dissolved freshwater aquatic life criteria for metals. U.S. Environmental Protection Agency, Environmental Research Laboratory – Duluth.” The conversion factors for cadmium and lead are hardness-dependent and can be calculated for any hardness (see limitations in Subsection 210.03.b.i.) using the following equations. For comparative purposes, the conversion factors for a total hardness of one hundred (100) mg/L are shown in the table. The conversion factor shall not exceed one (1).

Cadmium

Acute:  $CF=1.136672-[(\ln \text{hardness})(0.041838)]$  NOTE: The cadmium acute criterion equation was derived from dissolved metals toxicity data and thus requires no conversion; this conversion factor may be used to back calculate an equivalent total recoverable concentration.

Chronic:  $CF=1.101672-[(\ln \text{hardness})(0.041838)]$

Lead (Acute and Chronic):  $CF=1.46203-[(\ln \text{hardness})(0.145712)]$

- b.** Not applicable

- c.** No chronic criteria are available for silver.

(3-29-10)