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National Recommended Water Quality Criteria - Aquatic Life Criteria Table

Related Information

- [Aquatic Life Criteria and Methods for Toxics](#)
- [Human Health Criteria Table](#)
- [Organoleptic Effects Criteria Table](#)

This table contains the most up to date criteria for aquatic life ambient water quality criteria. Aquatic life criteria for toxic chemicals are the highest concentration of specific pollutants or parameters in water that are not expected to pose a significant risk to the majority of species in a given environment or a narrative description of the desired conditions of a water body being "free from" certain negative conditions. The table below lists EPA's recommended aquatic life criteria. State and tribal governments may use these criteria or use them as guidance in developing their own.

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National Recommended Aquatic Life Criteria table

Pollutant (P = Priority Pollutant)	CAS (Chemical Abstracts Service) Number	Freshwater CMC (Criteria Maximum Concentration) ¹ (acute) (µg/L)	Freshwater CCC (Criterion Continuous Concentration) ² (chronic) (µg/L)	Saltwater CMC (Criteria Maximum Concentration) ¹ (acute) (µg/L)	Saltwater CCC (Criterion Continuous Concentration) ² (chronic) (µg/L)	Publication Year	Notes
<u>Acrolein</u> (P)	107028	3ug/L	3ug/L	—	—	2009	
<u>Aesthetic Qualities</u>	—	—	—	—	—	1986	Refer to <u>Criteria for Wa ("Gold narrati statem</u>
<u>Aldrin</u> (P)	309002	3.0	—	1.3	—	1980	These based c <u>criteria</u> differe Data R and de proced the <u>198</u> <u>Guidel</u> evalua done u averag the acu values should by 2 to value t compa CMC c using t Guidel

Alkalinity	—	—	20000	—	—	1986	The CC 20mg/l minim except alkalin natural which criteric lower t the nat
alpha-Endosulfan (P)	959988	0.22	0.056	0.034	0.0087	1980	These c based c criteria differe Data R and de proced the 198 Guidel evaluat done u averag the acu values should by 2 to value t compa CMC c using t Guidel This va derivec for end is most approp applic of alph endosu beta-cr

<u>Aluminum</u> pH 5.0 - 10.5	7429905	--	--	—	—	2018	The cri based c chemis pH, ha DOC) the crit calcula given l
<u>Ammonia</u>	7664417	—	—	—	—	2013 (Freshwater), 1989 (Saltwater)	<u>Freshw</u> are ph, and lif ^e depend ^{ent} <u>Saltwa</u> are pH temper depend ^{ent}
Arsenic	7440382	340	150	69	36	1995	This re water c criteric derive ^d for arse but is a to total Freshw saltwat for me: expres: of the c metal i colum ⁿ <u>Office</u> <u>Policy</u> <u>Techni</u> <u>Guidar</u> <u>Interpr</u> <u>Implem</u> <u>Aquati</u> <u>Metals</u>
Atrazine	1912249						

Bacteria	—	—	—	—	—	1986	Refer to <u>Criteria for Water Quality</u> ("Gold standard" narrative statement)
beta-Endosulfan (P)	33213659	0.22	0.056	0.034	0.0087	1980	<p>These criteria are based on the <u>Criteria for Water Quality</u> and differ from the Data Review and Development procedures used in the 1985 <u>Guidelines for Deriving Water Quality Criteria</u> evaluation. The evaluation was done using an averaging procedure. The acute values should be multiplied by 2 to compare to the CMC criteria using the <u>Guidelines for Deriving Water Quality Criteria</u>.</p> <p>This value is derived from the <u>Guidelines for Deriving Water Quality Criteria</u> for endosulfan. It is the most appropriate value for application of alpha-endosulfan and beta-endosulfan.</p>

<u>Boron</u>	—	—	—	—	—	1986	Refer to Criteria for Water Quality ("Gold Standard" narrative statement)
<u>Cadmium (P)</u>	7440439	1.8	0.72	33	7.9	2016	Freshwater and chronic criteria are hard to derive because they were not based on a hard water. The criteria are expressed in mg/L and allow for the presence of representative criteria. Freshwater and saltwater criteria for metals are expressed in terms of the concentration of the metal in columnar water. Office of Water Policy and Technical Guidance Implementation Aquatic Life Metals
<u>Carbaryl</u>	63252	2.1	2.1	1.6	—	2012	

<u>Chlordane (P)</u>	57749	2.4	0.0043	0.09	0.004	1980	These criteria are based on data from the 1980s. The criteria differ from the Data Review and Description procedures in the 1980s <u>Guideline</u> evaluation. The evaluation was done using the average of the acute values. The values should be multiplied by 2 to get the value that compares to the CMC criteria using the <u>Guideline</u> .
<u>Chloride</u>	16887006	860000	230000	—	—	1988	
<u>Chlorine</u>	7782505	19	11	13	7.5	1986	
<u>Chlorpyrifos</u>	2921882	0.083	0.041	0.011	0.0056	1986	

<p><u>Chromium (III) (P)</u></p>	<p>16065831</p>	<p>570</p>	<p>74</p>	<p>—</p>	<p>—</p>	<p>1995</p>	<p>Freshw saltwat for me: expres: of the c metal i column Office Policy Techni Guidar Interpr Implem Aquati Metals</p> <p>The fre criteric metal i as a fu hardne The va here cc a hardr mg/L.</p>
<p><u>Chromium (VI) (P)</u></p>	<p>18540299</p>	<p>16</p>	<p>11</p>	<p>1,100</p>	<p>50</p>	<p>1995</p>	<p>Freshw saltwat for me: expres: of the c metal i column Office Policy Techni Guidar Interpr Implem Aquati Metals</p>

<u>Color</u>	—	—	—	—	—	1986	Refer t <u>Criteria</u> for Wa ("Gold narrati stateme
<u>Copper (P)</u>	7440508	—	—	4.8	3.1	2007	Freshw calcula the Bic Model Freshw saltwat for me expres of the c metal i column <u>Office</u> <u>Policy</u> <u>Techni</u> <u>Guidar</u> <u>Interpr</u> <u>Imple</u> <u>Aquati</u> <u>Metals</u>
<u>Cyanide (P)</u>	57125	22	5.2	1	1	1985	These recom water c criteria expres free cy (CN/L
<u>Demeton</u>	8065483	—	0.1	—	0.1	1985	
<u>Diazinon</u>	333415	0.17ug/L	0.17ug/L	0.82ug/L	0.82ug/L	2005	

<u>Dieldrin</u> (P)	60571	0.24	0.056	0.71	0.0019	1995	The fre CCC c both S: criteria are bas the 198 criteria differe Data R and de: proced the 198 Guidel evalua done u averag the acu values should by 2 to value t compa CMC c using t Guidel
<u>Endrin</u> (P)	72208	0.086	0.036	0.037	0.0023	1995	The de the CC polluta consid through which import aquatic occupy trophic

<u>gamma-BHC (Lindane) (P)</u>	58899	0.95	—	0.16	—	1995	The Sa criteric on the <u>criteria</u> differe: Data R and de: proced the 198 <u>Guidel</u> evaluat done u averag the acu values should by 2 to value t compa CMC c using t Guidel
<u>Gases, Total Dissolved</u>	—	—	—	—	—	1986	Refer t <u>Criteria:</u> for Wa ("Gold narrati statem
<u>Guthion</u>	86500	—	0.01	—	0.01	1986	Refer t <u>Criteria:</u> for Wa ("Gold narrati statem
<u>Hardness</u>	—	—	—	—	—	1986	Refer t <u>Criteria:</u> for Wa ("Gold narrati statem

Heptachlor (P)	76448	0.52	0.0038	0.053	0.0036	1980	<p>These criteria are based on the 1985 Data Review and derived procedures in the 1985 Guidelines. The evaluation was done using the average of the acute values should be multiplied by 2 to value the comparison. CMC criteria are using the Guidelines.</p>
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<p><u>Heptachlor Epoxide (P)</u></p>	<p>1024573</p>	<p>0.52</p>	<p>0.0038</p>	<p>0.053</p>	<p>0.0036</p>	<p>1981</p>	<p>These criteria are based on different Data R and derived from the 1981 <u>Guideline</u> evaluation done using the average values should be multiplied by 2 to compare CMC values using the <u>Guideline</u></p> <p>This value is derived for heptachlor there was insufficient data to determine toxicity of heptachlor epoxide</p>
<p><u>Iron</u></p>	<p>7439896</p>	<p>—</p>	<p>1000</p>	<p>—</p>	<p>—</p>	<p>1986</p>	<p>Refer to <u>Criteria for Water Quality</u> ("Gold standard" narrative statement)</p>

<p><u>Lead (P)</u></p>	<p>7439921</p>	<p>65</p>	<p>2.5</p>	<p>140</p>	<p>5.6</p>	<p>1984</p>	<p>Freshw saltwat for me expres of the metal i column <u>Office</u> <u>Policy</u> <u>Techni</u> <u>Guidar</u> <u>Interpr</u> <u>Implem</u> <u>Aquati</u> <u>Metals</u></p> <p>The fre criteric metal i as a fu hardne The va here cc a hardr mg/L.</p>
<p><u>Malathion</u></p>	<p>121755</p>	<p>—</p>	<p>0.1</p>	<p>—</p>	<p>0.1</p>	<p>1986</p>	<p>Refer t <u>Criteri</u> <u>for Wa</u> <u>("Gold</u> <u>narrati</u> <u>statem</u></p>

<u>Mercury (P)</u>	7439976 22967926	1.4	0.77	1.8	0.94	1995	Freshw saltwat for me: expres: of the c metal i column <u>Office</u> <u>Policy</u> <u>Techni</u> <u>Guidar</u> <u>Interpr</u> <u>Implem</u> <u>Aquati</u> <u>Metals</u>
<u>Methoxychlor</u>	72435	—	0.03	—	0.03	1986	Refer t <u>Criteria</u> <u>for Wa</u> <u>("Gold</u> <u>narrati</u> <u>statem</u>
<u>Methyl Tertiary-Butyl Ether (MTBE)</u>							
<u>Mirex</u>	2385855	—	0.001	—	0.001	1986	Refer t <u>Criteria</u> <u>for Wa</u> <u>("Gold</u> <u>narrati</u> <u>statem</u>

<u>Nickel (P)</u>	7440020	470	52	74	8.2	1995	<p>Fresh saltwater for metals expressed as the metal ion column.</p> <p>Office Policy Technical Guidance Interpretation Aquatic Metals</p> <p>The freshwater criterion metal ion as a function of hardness. The value here is a hardness of 100 mg/L.</p>
<u>Nonylphenol</u>	84852153	28 ug/L	6.6 ug/L	7 ug/L	1.7 ug/L	2005	
<u>Nutrients</u>	—	—	—	—	—	—	<p>Refer to EPA's Water Quality Criteria for Phosphorus, Nitrogen, and Chlorophyll a (Secchi disk, stream, and Lake Ecological criteria).</p>

<u>Oil and Grease</u>	—	—	—	—	—	1986	Refer to <u>Criteria for Water</u> ("Gold Standard" narrative statement)
<u>Oxygen, Dissolved</u> Freshwater <u>Oxygen, Dissolved</u> Saltwater	7782447	—	—	—	—	1986	Refer to <u>Criteria for Water</u> ("Gold Standard" freshwater and saltwater <u>Aquatic Life Criteria</u> ; <u>Dissolved Oxygen</u> ; <u>Cape Cod Hatteras</u>)
<u>Parathion</u>	56382	0.065	0.013	—	—	1995	
<u>Pentachlorophenol (P)</u>	87865	19	15	13	7.9	1995	Freshwater and saltwater life values are expected to be protective of functional values table and a pH of 6.5

pH	—	—	6.5 – 9	—	6.5 – 8.5	1986	<p>Refer to <u>Criteria for Water Quality</u> ("Gold Standard" narrative statement).</p> <p>For open waters, depth is substantial greater euphotic pH should change 0.2 units natural variability case or range of. For shallow produce and est where occur variability the left some should but in a should the limit establish fresh water 6.5-9.0</p>
<u>Phosphorus Elemental</u>	7723140	—	—	—	—	1986	

Polychlorinated Biphenyls (PCBs) (P)	—	—	0.014	—	0.03	—	This cr applies PCBs, sum of congener isomer or Aro analysis
<u>Selenium (P)</u>	7782492	—	---	290	71	2016 Freshwater 1999 Saltwater	Refer t <u>Life A</u> <u>Water t</u> <u>Criteria</u> <u>Seleni</u> <u>Freshw</u> for nar statem
<u>Silver (P)</u>	7440224	3.2	—	1.9	—	1980	
<u>Solids Suspended and Turbidity</u>	—	—	—	—	—	1986	Refer t <u>Criteria</u> <u>for Wa</u> ("Gold narrati statem
<u>Sulfide-Hydrogen Sulfide</u>	7783064	—	2.0	—	2.0	1986	
<u>Tainting Substances</u>	—	—	—	—	—	1986	Refer t <u>Criteria</u> <u>for Wa</u> ("Gold narrati statem
<u>Temperature</u>	—	—	—	—	—	1986	Criteria: depend <u>Quality</u> <u>for Wa</u> ("Gold

<u>Toxaphene (P)</u>	8001352	0.73	0.0002	0.21	0.0002	1986	
<u>Tributyltin (TBT)</u>	—	0.46	0.072	0.42	0.0074	2004	
<u>Zinc (P)</u>	7440666	120	120	90	81	1995	
<u>4,4'-DDT (P)</u>	50293	1.1	0.001	0.13	0.001	1980	

Appendix A

Conversion Factors for Dissolved Metals

Metal	Freshwater CMC	Freshwater CCC	Saltwater CMC	Saltwater CCC
Arsenic	1.000	1.000	1.000	1.000
Cadmium	$1.136672 - [(\ln \text{hardness})(0.041838)]$	$1.101672 - [(\ln \text{hardness})(0.041838)]$	0.994	0.994
Chromium III	0.316	0.860	—	—
Chromium VI	0.982	0.962	0.993	0.993
Copper	0.960	0.960	0.83	0.83
Lead	$1.46203 - [(\ln \text{hardness})(0.145712)]$	$1.46203 - [(\ln \text{hardness})(0.145712)]$	0.951	0.951
Mercury	0.85	0.85	0.85	0.85
Nickel	0.998	0.997	0.990	0.990
Selenium	—	—	0.998	0.998
Silver	0.85	—	0.85	—

Metal	Freshwater CMC	Freshwater CCC	Saltwater CMC	Saltwater CCC
Zinc	0.978	0.986	0.946	0.946

Appendix B

Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness-Dependent

Chemical	mA	bA	mC	bC	Freshwater Conversion Factors (CF)	
					CMC	CCC
Cadmium	0.9789	-3.866	0.7977	-3.909	$1.136672 - [\ln(\text{hardness})(0.041838)]$	$1.101672 - [\ln(\text{hardness})(0.041838)]$
Chromium III	0.8190	3.7256	0.8190	0.6848	0.316	0.860
Lead	1.273	-1.460	1.273	-4.705	$1.46203 - [\ln(\text{hardness})(0.145712)]$	$1.46203 - [\ln(\text{hardness})(0.145712)]$
Nickel	0.8460	2.255	0.8460	0.0584	0.998	0.997
Silver	1.72	-6.59	—	—	0.85	—
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986

Hardness-dependant metals' criteria may be calculated from the following:

$$\text{CMC (dissolved)} = \exp\{mA [\ln(\text{hardness})] + bA\} (\text{CF})$$

$$\text{CCC (dissolved)} = \exp\{mC [\ln(\text{hardness})] + bC\} (\text{CF})$$

1/ CMC: Criterion Maximum Concentration

2/ CCC: Criterion Continuous Concentration

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