

BCMOE GUIDELINES FOR PARAMETERS DEPENDANT ON OTHER FACTORS

PHYSICAL PARAMETERS

Temperature	Fish Dependent	
<u>Aquatic Life Short Term</u>	streams with bull trout and/or Dolly Varden	15 °C
	streams with unknown fish distribution	19 °C
<u>Aquatic Life Mean Weekly Maximum*</u>	streams with bull trout and/or Dolly Varden	N/A
	streams with unknown fish distribution	18 °C
Dissolved Oxygen	Life Stage Dependent	
<u>Aquatic Life Short Term</u>	all life stages other than buried embryo / alevin	5000 ug/L O ² minimum
	buried embryo / alevin	9000 ug/L O ² minimum
<u>Aquatic Life Long Term</u>	all life stages other than buried embryo / alevin	8000 ug/L O ²
	buried embryo / alevin	1100 ug/L O ²
Total Suspended Solids (TSS)	Background Concentration Dependent	
<u>Aquatic Life Short Term</u>	clear flows or clear waters	25000* ug/L change from background for 24hrs
	high flows or in turbid waters - TSS = 25 to 100 mg/L	10000 ug/L change from background
	high flows or in turbid waters - TSS > 100 mg/L	10% change from background
<u>Aquatic Life Long Term</u>	clear flows or clear waters	5000 ug/L change from background
<u>Livestock Short Term</u>	TSS ≤ 100 mg/L	10000 ug/L change from background
	TSS > 100 mg/L	10% change from background
<u>Irrigation Short Term</u>	TSS ≤ 100 mg/L	20000 ug/L change from background
	TSS > 100 mg/L	20% change from background
<u>Wildlife Short Term</u>	TSS ≤ 100 mg/L	20000 ug/L change from background
	TSS > 100 mg/L	20% change from background

PHYSICAL PARAMETERS (continued)

Turbidity	Background Concentration Dependent	
<u>Aquatic Life Short Term</u>	clear flows or clear waters	8* NTU change from background for 24hrs
	high flows or in turbid waters - 8 to 50 NTU	5 NTU change from background
	high flows or in turbid waters - > 50 NTU	10% change from background
<u>Aquatic Life Long Term</u>	clear flows or clear waters	2 NTU change from background
<u>Livestock Short Term</u>	≤ 50 NTU	5 NTU change from background
	> 50 NTU	10% change from background
<u>Irrigation Short Term</u>	≤ 50 NTU	10 NTU change from background
	> 50 NTU	20% change from background
<u>Wildlife Short Term</u>	≤ 50 NTU	10 NTU change from background
	> 50 NTU	20% change from background
<u>Recreational Short Term</u>	≤ 50 NTU	5 NTU change from background
	> 50 NTU	10% change from background
<u>Drinking Water Short Term</u>	≤ 50 NTU and with treatment to remove particulates	5 NTU change from background
	> 50 NTU and with treatment to remove particulates	10% change from background
	≤ 5 NTU and without treatment to remove particulates	1 NTU change from background
	without treatment to remove particulates	5 NTU change from background

NUTRIENTS

Ammonia	Temperature and pH Dependent
<u>Aquatic Life Short Term</u>	See approved guideline table 3 and 5
<u>Aquatic Life Long Term</u>	See approved guideline table 3 and 4

NUTRIENTS (continued)

Nitrite	Chloride Dependent	
<u>Aquatic Life Short Term</u>	Chloride concentration is <2 mg/L	0.06 mg/L
	Chloride concentration is 2 - 4 mg/L	0.12 mg/L
	Chloride concentration is 4 - 6 mg/L	0.18 mg/L
	Chloride concentration is 6 - 8 mg/L	0.24 mg/L
	Chloride concentration is 8 - 10 mg/L	0.3 mg/L
	Chloride concentration is >10 mg/L	0.6 mg/L
<u>Aquatic Life Long Term</u>	Chloride concentration is <2 mg/L	0.02 mg/L
	Chloride concentration is 2 - 4 mg/L	0.04 mg/L
	Chloride concentration is 4 - 6 mg/L	0.06 mg/L
	Chloride concentration is 6 - 8 mg/L	0.08 mg/L
	Chloride concentration is 8 - 10 mg/L	0.1 mg/L
	Chloride concentration is >10 mg/L	0.2 mg/L
Chlorate	Body Weight Dependent	
<u>Drinking Water Short Term</u>	5 kg	2.4 ug/L
	10 kg	4.8 ug/L
	20 kg	9.6 ug/L
	30 kg	14.4 ug/L
	50 kg	24 ug/L
	70 kg	33.6 ug/L
	90 kg	43.2 ug/L

MISCELLANEOUS

Total Mercury (Hg)	Methyl Mercury Dependent	
<u>Aquatic Life Long Term</u>	% Methyl Mercury = Methyl Mercury / Total Mercury	BC WQG (µg/L) = 0.1 ÷ (% Methyl Mercury)
<u>Wildlife Long Term</u>	% Methyl Mercury = Methyl Mercury / Total Mercury	BC WQG (µg/L) = 0.1 ÷ (% Methyl Mercury)

MAJOR IONS

Sulphate	Hardness Dependent	
<u>Aquatic Life Long Term</u>	hardness < 30 mg/L CaCO ₃	128 mg/L
	hardness between 31 - 75 mg/L CaCO ₃	218 mg/L
	hardness between 76 - 180 mg/L CaCO ₃	309 mg/L
	hardness between 181 - 250 mg/L CaCO ₃	429 mg/L
	hardness > 250 mg/L CaCO ₃	site specific assessment

MINOR IONS

Fluoride	Multiple Dependencies	
<u>Aquatic Life Short Term</u> (Hardness dependent)	hardness < 10 mg/L CaCO ₃	0.4 mg/L
	otherwise	$WQG(\text{mg/L}) = 0.01 * [-51.73 + 92.57 * \log_{10}(\text{hardness})]$
<u>Livestock Short Term</u> (Livestock diet dependent)	dairy cows, breeding stock - long-lived animals	1500 ug/L
	high fluoride diets - mineral or bone meal feed additives	2000 ug/L
	animals with normal diet	4000 ug/L
<u>Livestock Long Term</u> (Livestock diet dependent)	dairy cows, breeding stock - long-lived animals	1000 ug/L
	high fluoride diets - mineral or bone meal feed additives	1000 ug/L
	animals with normal diet	2000 ug/L

METALS

Dissolved Aluminum (Al)	pH Dependent	
<u>Aquatic Life Short Term</u>	<6.5	$WQG(\text{mg/L}) = e^{(1.209 - 2.426(\text{pH}) + 0.286(\text{pH}^2))}$
	≥6.5	0.1 mg/L
<u>Aquatic Life Long Term</u>	<6.5	$WQG(\text{mg/L}) = e^{(1.6 - 3.327(\text{median pH}) + 0.402(\text{median pH}^2))}$
	≥6.5	0.05 mg/L

METALS (continued)

Boron	Crop Dependent	
<u>Irrigation Short Term</u>	very sensitive	<0.5 mg/L
	sensitive	0.5-1.0 mg/L
	moderately sensitive	1.0-2.0 mg/L
	moderately tolerant	2.0-4.0 mg/L
	tolerant	4.0-6.0 mg/L
	very tolerant	6.0-15.0 mg/L
Dissolved Cadmium (Cd)	Hardness Dependent	
<u>Aquatic Life Short Term</u>	hardness between 7 - 455 mg/L CaCO ₃	$WQG(\text{ug/L}) = e^{(1.03 \cdot \ln(\text{hardness}) - 5.274)}$
<u>Aquatic Life Long Term</u>	hardness between 3.4 - 285 mg/L CaCO ₃	$WQG(\text{ug/L}) = e^{(0.736 \cdot \ln(\text{hardness}) - 4.943)}$
Copper (Cu)	Hardness Dependent	
<u>Aquatic Life Short Term</u>	hardness between 13 - 400 mg/L CaCO ₃	$WQG(\text{ug/L}) = 0.094 * \text{hardness} + 2$
<u>Aquatic Life Long Term</u>	hardness ≥ 37 and ≤ 50 mg/L CaCO ₃	2 ug/L
	hardness > 50 and ≤ 187 mg/L CaCO ₃	$WQG(\text{ug/L}) = 0.094 * \text{hardness} + 2$
Lead (Pb)	Multiple Dependencies	
<u>Aquatic Life Short Term</u> (Hardness dependent)	hardness between 8 - 360 mg/L CaCO ₃	$WQG(\text{ug/L}) = e^{(1.273 \cdot \ln(\text{hardness}) - 1.460)}$
<u>Aquatic Life Long Term</u> (Hardness dependent)	hardness ≤ 8 mg/L CaCO ₃	3 ug/L
	hardness between 8 - 360 mg/L CaCO ₃	$WQG(\text{ug/L}) = 3.31 + e^{(1.273 \cdot \ln(\text{mean hardness}) - 4.704)}$
<u>Irrigation Short Term</u> (Soil type dependent)	neutral and alkaline fine-textured soils	400 ug/L
	all other soils	200 ug/L

METALS (continued)

Lithium (Li)

Crop Dependent

Irrigation Short Term

citrus	750 ug/L
cereals	1000 ug/L
others	2500 ug/L

Manganese (Mn)

Hardness Dependent

Aquatic Life Short Term

hardness between 25 - 259 mg/L CaCO ₃	$WQG(\text{mg/L}) = 0.01102 * \text{hardness} + 0.54$
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Aquatic Life Long Term

hardness between 37 - 450 mg/L CaCO ₃	$WQG(\text{mg/L}) = 0.0044 * \text{hardness} + 0.605$
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Molybdenum (Mo)

Soil Drainage Dependent

Irrigation Short Term

poorly drained soil	0.05 mg/L
Cu:Mg ratio < 2:1 in irrigation water (forage crops)	
poorly drained soil	0.05 mg/L
Cu:Mo ratio > 2:1 in irrigation water (forage crops)	
well drained soil (forage crops)	0.05 mg/L

Irrigation Long Term

poorly drained soil	0.01 mg/L
Cu:Mg ratio < 2:1 in irrigation water (forage crops)	
poorly drained soil	0.02 mg/L
Cu:Mo ratio > 2:1 in irrigation water (forage crops)	
well drained soil (forage crops)	0.02 mg/L
all soils (non-forage crops)	0.03 mg/L

Silver (Ag)

Hardness Dependent

Aquatic Life Short Term

hardness ≤ 100 mg/L CaCO ₃	0.1 ug/L
hardness > 100 mg/L CaCO ₃	3 ug/L

Aquatic Life Long Term

hardness ≤ 100 mg/L CaCO ₃	0.05 ug/L
hardness > 100 mg/L CaCO ₃	1.5 ug/L

METALS (continued)

Zinc (Zn)

Multiple Dependencies

<u>Aquatic Life Short Term</u> (Hardness dependent)	hardness between 90 - 500 mg/L CaCO ₃	$WQG(\text{mg/L}) = 33 + 0.75(\text{hardness} - 90)$
<u>Aquatic Life Long Term</u> (Hardness dependent)	hardness between 90 - 330 mg/L CaCO ₃	$WQG(\text{mg/L}) = 7.5 + 0.75(\text{hardness} - 90)$
<u>Irrigation Short Term</u> (Soil pH dependent)	< 6 6-7 ≥ 7	1 mg/L 2 mg/L 5 mg/L