

OHIO EPA SURFACE WATER QUALITY CRITERION FACT SHEET

Page 1 of 3

Chemical Name: Boron Developed by: Chris J. SkalskiCAS # 7440-42-8 Data Retrieval Date: 2-12-98Internal Code # Fact Sheet Preparation Date: 3-01-06ACUTE DATA

<u>SPECIES</u>	<u>EC₅₀/LC₅₀</u> <u>(µg/l)</u>	<u>TEST TYPE^a</u>	<u>DURATION</u> <u>(HOURS)</u>	<u>SMAV^b</u> <u>(µg/l)</u>	<u>GMAV^b</u> <u>(µg/l)</u>	<u>REFERENCE</u> <u>NUMBER</u>
Cladoceran	141,000	R,U	48	161,830	161,830	1
<i>Daphnia magna</i>	133,000	S,U	48			2
	226,000	S,U	48			3
Midge	1,376,000	R,U	48	1,376,000	1,376,000	1
<i>Chironomus decorus</i>						
Mosquitofish	104,000	S,U	96	104,000	104,000	4
<i>Gambusia affinis</i>						
Coho Salmon	447,000	S,U	96	447,000	535,109	5
<i>Oncorhynchus kisutch</i>						
Chinook Salmon	566,000	S,U	96	640,586		5
<i>Oncorhynchus tshawytscha</i>	725,000	S,U	96			5
Colorado Squafish	279,000	S,U	96	383,449	383,449	6
<i>Ptychocheilus lucius</i>	527,000	S,U	96			6
	>100,000	S,U	96			6
Razorback Sucker	>100,000	S,U	96	254,965	254,965	6
<i>Xyrauchen texanus</i>	233,000	S,U	96			6
	279,000	S,U	96			6

^a S = static; R = renewal; U = unmeasured.^b SMAV = Species Mean Acute Value; GMAV = Genus Mean Acute Value.CHRONIC DATA

<u>SPECIES</u>	<u>CHRONIC VALUE</u> <u>(µg/l)</u>	<u>METHOD</u>	<u>SMCV^a</u> <u>(µg/l)</u>	<u>GMCV^a</u> <u>(µg/l)</u>	<u>REFERENCE</u> <u>NUMBER</u>
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No Chronic Data

^a SMCV = Species Mean Chronic Value; GMCV = Genus Mean Chronic Value.

OHIO EPA SURFACE WATER QUALITY CRITERION FACT SHEET

Page 2 of 3

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REFERENCES

1. Maier, K.J. and A.W. Knight. 1991. The Toxicity of Waterborne Boron to *Daphnia magna* and *Chironomus decorus* and the Effects of Hardness and Sulfate on Boron Toxicity. Arch. Environ. Contam. Toxicol. 20:282-287.
2. Gersich, F.M. 1984. Evaluation of a Static Renewal Chronic Toxicity Test Method for *Daphnia magna* Straus Using Boric Acid. Environ. Toxicol Chem. 3(1):89-94.
3. Lewis, M.A. and L.C. Valentine. 1981. Acute and Chronic Toxicities of Boric Acid to *Daphnia magna* Straus. Bull. Environ. Contam. Toxicol. 27(3):309-315.
4. Wallen, I.E., W.C. Greer and R. Lasater. 1957. Toxicity to *Gambusia affinis* of Certain Pure Chemicals in Turbid Waters. Sewage Ind. Wastes 29(6):695-711.
5. Hamilton, S.J. and K.J. Buhl. 1990. Acute Toxicity of Boron, Molybdenum, and Selenium to Fry of Chinook Salmon and Coho Salmon. Arch. Environ. Contam. Toxicol. 19(3):366-373.
6. Hamilton, S.J. 1995. Hazard Assessment of Inorganics to Three Endangered Fish in the Green River, Utah. Ecotoxicol. Environ. Saf. 30(2): 134-142.

OHIO EPA SURFACE WATER QUALITY CRITERION FACT SHEET

Page 3 of 3

Chemical Name: Boron Developed by: Chris J. SkalskiCAS # 7440-42-8 Data Retrieval Date: 2-12-98Internal Code # Fact Sheet Preparation Date: 3-01-06CALCULATION OF ACUTE AQUATIC VALUE (AAV)^a

<u>Data Requirement</u> <u>OAC 3745-1-36(A)(1)</u>	<u>SPECIES</u>	<u>GMAV</u> <u>(µg/l)</u>
(a)	Salmonid	535,109
(b)	Mosquitofish	104,000
(c)	Razorback Sucker	254,965
(d)	<i>Daphnia magna</i>	161,830
(f)	Midge	1,376,000

Secondary Acute Factor (SAF) = 6.1

Secondary Acute Value (SAV) = Lowest GMAV ÷ SAF
 = 104,000 ÷ 6.1
 = 17,049 = 17,000 µg/l

Tier II Acute Aquatic Value (AAV) = SAV ÷ 2
 = 17,049 ÷ 2
 = 8,525 = 8,500 µg/l

CALCULATION OF CHRONIC AQUATIC VALUE (CAV)^a

Experimentally determined Acute-Chronic Ratios (ACRs):

<u>SPECIES</u>	<u>ACUTE VALUE</u> <u>(µg/l)</u>	<u>CHRONIC VALUE</u> <u>(µg/l)</u>	<u>ACUTE-CHRONIC</u> <u>RATIO</u>	<u>SPECIES MEAN</u> <u>ACR</u>
None Available				

Secondary Acute-Chronic Ratio (SACR) = $\sqrt[3]{(18)(18)(18)} = 18$

Chronic Aquatic Value (CAV) = SAV ÷ SACR
 = 17,049 ÷ 18
 = 947 = 950 µg/l

OHIO EPA SURFACE WATER QUALITY CRITERION FACT SHEET

Page 4 of 3

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^aSee Ohio Administrative Code 3745-1-36 effective February 22, 2002.