

VALUE(S) ADDED 7-24-85

FACT SHEET REVISED -----

VALUE(S) REMOVED -----

Date: October 10, 1984

Surface Water Quality  
Standard Documentation

Chemical: Cobalt

C.A.S. No.(s): NA

Basis (Human/Aquatic): Aquatic

Standard by Water Classification:

	<u>ug/l</u>	<u>Notes</u>
Classes AA,AA-s;A;A-s;B;C	5	I
Class D	110	K
Classes SA;SB;SC;I		
Class SD		

Remarks:

Summary of Information

1. Biesinger, K.E., and G.M. Christensen. 1972. Effects of various metals on survival, growth, reproduction, and metabolism of Daphnia magna. J. Fish. Res. Bd. Canada. 29:1691-1700.

-tested cobalt chloride.

-found a 16% reproductive impairment after 21 days at 0.01 mg/l.

-48hr LC<sub>50</sub> with and without food were 1.62 and 1.11 mg/l, respectively.

2. Birge, W.J. 1978. Aquatic toxicology of trace elements of coal and flyash. In: J.H. Thrope and J.W. Gibbons, eds. Energy and environmental stress in aquatic systems, pp 219-240. DOE symposium series (CONF - 77114). GPO, Wash, D.C.

-determined LC<sub>50</sub> and LC<sub>1</sub> for three species in an early life stage test: rainbow trout, 470 and 34.2 ug/l; goldfish, 810 and 6.8 ug/l; and toad 50 and 0.9 ug/l, respectively.

3. Curtis, N.W. and C.H. Ward. 1981. Aquatic toxicity of 40 industrial chemicals - testing in support of hazardous substances spill prevention regulation. J. Hydrol. 51:359. (In J. Wat. Poll. Cont. Fed. 54(6); (886,1982).

-report 96hr LC<sub>50</sub> for fathead minnow with cobaltous bromide and cobaltous formate of 91.9 mg/l and 32.2 mg/l, respectively.

4. Durum, W.H. J.D. Hem and S.G. Heidel. 1971. Reconnaissance of selected minor elements in surface waters of the United States, Oct. 1970. US geological survey circular 643. GPO, Washington D.C. 49 pp.

-in a survey of US surface waters noted that 63% of 720 samples analyzed contained cobalt at concentrations less than 0.001 mg/l: only five samples contained cobalt of 0.05 mg/l or above.

5. a. U.S. Geological Survey. 1976. Water resources data for New York. Water year 1975. Water-data report NY-75-1. US Geological Survey, Albany, NY 735 pp.
- b. U.S.D.I., Geological Survey. 1977. Chemical quality of water in community systems in New York, May 1974 - May 1975. Open file report 77-731. U.S. Department of the Interior, Geological Survey, Albany, NY 93 pp.

-noted in these two reports that in only two instances did cobalt equal or exceed 0.005 mg/l in raw surface water: these readings were at Dunkirk in Lake Erie, 6 ug/l; and at Geneva in Seneca Lake less than 9 ug/l.

#### Standard Derivation

Applying a factor of 0.2 to the chronic effect reported by Bieseinger and Christenson (1972) results in a value of 2 ug/l. The geometric mean of 2 ug/l and the three LC<sub>1</sub> reported by Birge (1978) results in a value of 5 ug/l. This concentration is recommended as the standard for cobalt in all freshwater classes except class D.

Applying a factor of 0.1 to the LC<sub>50</sub> of 1.1 (Bieseinger and Christenson, 1972) results in a value of 110 ug/l. This value is recommended as the standard for Class D waters.