FACT SHEET DATE: 5/30/90

- AQUATIC LIFE FACT SHEET -
- Ambient Water Quality Value -

SUBSTANCE(S): Ethylene Glycol

CAS REGISTRY NUMBERS: 107-21-1

VALUE (mg/L)

BASIS	FRESHWATER	SALTWATER
Fish Propagation, Survival and Tainting	500	Not Available
Fish Survival and Tainting	1000	Not Available

REMARKS:

SUMMARY OF INFORMATION:

1. Survival: The available aquatic toxicological database on actue effects has been examined. Results from acute toxicity tests that employed acceptable procedures with appropriate controls and species occurring naturally in New York State were included in the toxicity evaluation. Test results for species that normally inhabit extreme environments (e.g. brine shrimp) were not included in the toxicity evaluation [1]. Results from more than 25 freshwater acute toxicity tests provided six genus mean acute values [1] that included representatives of sensitive vertebrate and invertebrate species naturally occurring in New York State waters, and are summarized in the following paragraph.

   Ethylene glycol LC50 values have been reported for goldfish (Carassius auratus), >5000 mg/l [2]; rainbow trout (Onchorhynchus mykiss), 41,000 mg/L [3]; fathead minnow (Pimephales promelas) fry, 53,000 mg/L, juvenile, 49,000 mg/L, and

subadult, 57,000 mg/L [4]; and Daphnia magna, 46,300 mg/L @ 20° C, 51,100 mg/L @ 24° C and Ceriodaphnia dubia/affinis, 25,800 mg/L @ 20° C, 10,000 mg/L @ 24° C [5].

No information on acute toxicity tests for saltwater species was found, therefore saltwater guidance values were not developed.

2. Propagation: No chronic toxicity data were found. Ethylene glycol demonstrates low toxicity in acute tests and is also classified into a group of chemicals that is relatively degradeable with half-lives ranging from 2 to 15 days [6]. Therefore chronic exposures are probably not warranted. The low toxicity of ethylene glycol coupled with its biodegradability suggest that the ambient water dissolved oxygen demand may enter the picture for control of the substance.

3. Tainting: No information on tainting of fish flesh was found.

DERIVATION OF AMBIENT WATER QUALITY VALUE:

1. Selection of Data: The acute LC50 value of 10,000 mg ethylene glycol/L for Ceriodaphnia was chosen to represent sensitive species found in New York State waters. Ceriodaphnia dubia is a sensitive species and Ceriodaphnia species inhabit New York State Waters.

2. Development of Value: The ambient water quality value to protect fish propagation and survival was derived by multiplying an appropriate acutely toxic concentration by an application factor, as required by Part 701.9(b) of the New York State Water Quality Regulations. The actuely toxic concentration of 10,00 mg ethylene glycol/L, judged to be representative of sensitive species, was multiplied by the application factor of 0.05.

Ambient Water Quality Value = 10,000 mg ethylene glycol/L . (0.05)
to Protect Fish Propagation.

Ambient Water Quality Value = 500 mg ethylene glycol/L
to Protect fish Propagation.

The ambient water quality value to protect fish survival was derived by multiplying an appropriate acutely toxic concentration by an application factor, as required by Part 701.10 of the New York State Water Quality Regulations. The acutely toxic concentration of 10,000 mg ethylene glycol/L, judged to be representative of sensitive species, was multiplied by an application factor of 0.1.

Ambient Water Quality Value = 10,000 mg ethylene glycol/L . (0.1)
to Protect Fish Survival.

Ambient Water Quality Value = 1,000 mg ethylene glycol/L
to Protect Fish Survival.

REFERENCES:

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[2] Bridie, A.L., C.J.M. Wolff and M. Winter. 1979. Acute toxicity of some petrochemicals to goldfish. Water Res. 13:23-626.

[3] Johnson, W.W. and M.T. Finley. 1980. Handbook of Acute Toxicity of Chemicals to Fish and Aquatic Invertebrates. U.S. Department of the Interior, Fish and Wildlife Service, Resource Publ. 137. Washington D.C.

[4] Mayes, M.A., H.C. Alexander and D.C. Dill. 1983. A study to assess the influence of age on the response of fathead minnows in static acute toxicity tests. Bull. Environ. Contam. Toxicol. 31:139-147.

[5] Cowgill, U.M., I.T. Takahashi and S.L. Applegath. 1985. A comparison of the effect of four benchmark chemicals on Daphnia magna and Ceriodaphnia dubia-affinis tested at two different temperatures. Environ. Toxicol. Chem. 4:415-422.

[6] QSAR Chemical Information System, Montana State University, Center for Data Systems and Analysis.

[7] U.S.E.P.A. 1985. Technical Support Document for Water Quality - based Toxics Control. Office of Water. U.S. Environmental Protection Agency, Washington, D.C.

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