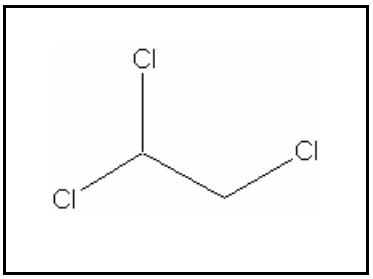
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER I HUMAN HEALTH NONCANCER CRITERIA

1,1,2-TRICHLOROETHANE

CAS RN:	79-00-5
Water Solubility:	0.442 g/100 mL
Log K_{ow}:	2.05^{P}
Reference Dose:	0.0039 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class D; Not Classifiable



Standard

The human health noncancer 1,1,2-trichloroethane criterion for drinking water sources is 110 µg/L. The human health noncancer criterion for nondrinking water sources is 3,000 µg/L.

Calculations

BAF predicted based on Log K_{ow} (from Stephan 1993)
Log K_{ow} = 2.05 (CLOGP), K_{ow} = 112.2
Trophic level 3 FCM = 1.005; trophic level 4 FCM = 1.000

$f_{fd} = 1/(1+(0.00000024\ kg/L)(K_{ow})) = 1.00$

Baseline $BAF_{T3} = (FCM)(K_{ow}) = (1.005)(112.2) = 112.8$

Baseline $BAF_{T4} = (1.000)(112.2) = 112.2$

Human health $BAF_{T3} = [(112.8)(0.0182)+1](1.00) = 3.052$

Human health $BAF_{T4} = [(112.2)(0.0310)+1](1.00) = 4.478$

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Decreased body weight gain

$$ADE = \frac{NOAEL}{UF} = \frac{3.9 \text{ mg/kg-day}}{1000} = 0.0039 \text{ mg/kg/day}$$

Calculation of Criteria:

Non Drinking Water HNC =[(0.0039)(70)(0.8)]/0.01+[(0.0036)(3.052)+(0.0114)(4.478)]

= **3,000 μg/L**

Drinking Water HNC = [(0.0039)(70)(0.8)]/2+[(0.0036)(3.052)+(0.0114)(4.478)]

= **110 μg/L**

References

1. Stephen, C.E. 1993. Derivation of Proposed Human Health and Wildlife Bioaccumulation Factors for the Great Lakes Initiative. Environmental Research Laboratory, Office of Research and Development, U.S. EPA, Duluth, MN.

2. USEPA 1996. Integrated Risk Information System (IRIS database) chemical file for 1,1,2-trichloroethane (79-00-5).

3. Leo,A. and D.Weininger 1997. Daylight Software CLogP Version 3.15+ for Unix Pomona Medical Chemistry Project, Pomona College, Claremont, CA. Distributed by Daylight Chemical Information Systems, Inc., 3952 Claremont St., Irving, CA 92714 (Reference for the Log K_{ow}).

Acronyms

ADE	Acceptable Daily Exposure
BAF	Bioaccumulation Factor
CAS RN	Chemical Abstract Service Registry Number
FCM	Food Chain Multiplier
IRIS	Integrated Risk Information System
K_{ow}	Octanol-Water Partition Coefficient
LOAEL	Lowest observed adverse effect level
NOAEL	No observed adverse effect level
P (superscript)	Predicted value
RPLC	Reverse-phase Liquid Chromatography
UF	Uncertainty factor

Revision History

October 27, 1998 - Criteria first developed
September 27, 2000 – Criteria rechecked (no modifications). Fact sheet updated.

Contact Information

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