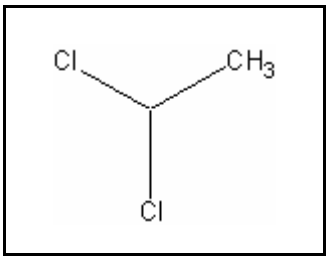
**Indiana Department of Environmental Management**
**Office of Water - Water Quality Standards Section**

# TIER II HUMAN HEALTH NONCANCER VALUES

## 1,1-DICHLOROETHANE

| | |
|---|---|
| CAS RN: | 75-34-3 |
| Water Solubility: | 5,060 mg/L |
| Log $K_{ow}$: | $3.70^{P}$ |
| Reference Dose: | 0.1 mg/kg/day |
| Carcinogenicity Weight-of-Evidence Classification: | Class C; Possible human carcinogen |




### Standard

The human health noncancer 1,1-dichloroethane values for drinking water sources is 1,100 µg/L. The human health noncancer criterion for nondrinking water sources is 27,000 µg/L.

### Calculations

Bioaccumulation Factor:

BAF predicted based on Log $K_{ow}$ (from Stephan 1993)
Log $K_{ow}$ = 1.778 (CLOGP), $K_{ow}$ = 59.98
Trophic level 3 FCM = 1.0; trophic level 4 FCM = 1.0

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

Baseline $BAF_{T3} = (FCM)(K_{ow}) = (1.0)(59.98) = 59.98$

Baseline $BAF_{T4} = (1.000)(59.98) = 59.98$

Human health $BAF_{T3} = [(59.98)(0.0182)+1](1.00) = 2.092$

Human health $BAF_{T4}$ = [(59.98)(0.0310)+1](1.00) = 2.859

Acceptable Daily Exposure:

From Hofmann et al. (1971):

$$ADE = \frac{LOAEL}{UF} = \frac{1000\ mg/kg\text{-}day}{1000} = 1.0\ mg/kg/d$$

Where UF:
10X for use of an LOAEL instead of an NOAEL
100X for inter- and intraspecies extrapolation

Calculation of Criteria:

**Non Drinking Water HNV** =[(1.0)(70)(0.8)]/0.01+[(0.0036)(2.092)+(0.0114)(2.859)]

= **27,000 μg/L**

**Drinking Water HNV** = [(1.0)(70)(0.8)]/2+[(0.0036)(2.092)+(0.0114)(2.859)]

= **1,100 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. Hofmann, H.T., H. Birnstiel, and P. Jobst 1971. The inhalation 1,1- and 1,2-dichloroethane. Archiv. Toxikol. 27: 248-265.

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/Abbreviations

| | |
|---|---|
| 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 |
| UF | Uncertainty factor |

## Revision History

November 24, 1998 - Values first developed
April 17, 2000 – Fact sheet updated. No modifications to criteria.

## Contact Information

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