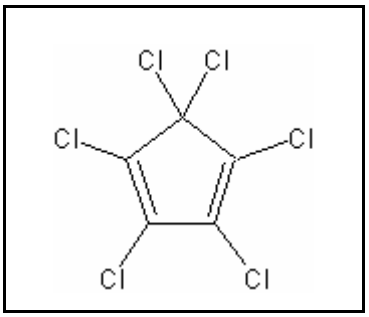
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER I HUMAN HEALTH NONCANCER CRITERIA

HEXACHLOROCYCLOPENTADIENE

CAS RN:	77-47-4
Water Solubility:	3.4 mg/L
Log K_{ow}:	4.645^{P}
Reference Dose:	0.007 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class D; Not Classifiable



Standard

The human health noncancer hexachlorocyclopentadiene criterion for drinking water sources is 170 µg/L. The human health noncancer criterion for nondrinking water sources is 1,500 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} and measured BCF (from Stephan 1993)
Log K_{ow} = 4.645 (CLOGP), K_{ow} = 44,157, BCF = 29, Percent lipid = 7.6
Trophic level 3 FCM = 1.950; trophic level 4 FCM = 1.459

$f_{fd} = 1/(1+(0.00000024\ kg/L)(K_{ow})) = 0.9895$

Baseline $BAF_{T3} = (1.950)[(29/0.9895)-1](1/0.076) = 726.3$

Baseline $BAF_{T4} = (1.459)[(29/0.9895)-1](1/0.076) = 543.4$

Human health BAF_{T3} = [(726.3)(0.0182)+1](0.9895) = 14.07

Human health BAF_{T4} = [(543.4)(0.0310)+1](0.9895) = 17.66

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: decreased growth rate, food consumption, and organ weights

$$ADE = \frac{NOAEL}{UF} = \frac{7\ mg/kg\text{-}day}{1000} = 0.007\ mg/kg/d$$

Calculation of Criteria:

Non Drinking Water HNC =[(0.007)(70)(0.8)]/0.01+[(0.0036)(14.07)+(0.0114)(17.66)]

= **1,500 μg/L**

Drinking Water HNC = [(0.007)(70)(0.8)]/2+[(0.0036)(14.07)+(0.0114)(17.66)]

= **170 μg/L**

References

1. USEPA 1990. Integrated Risk Information System (IRIS database) chemical file hexachlorocylopentadiene (77-47-4).

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

March 15, 2000 - Criteria first developed

Contact Information

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