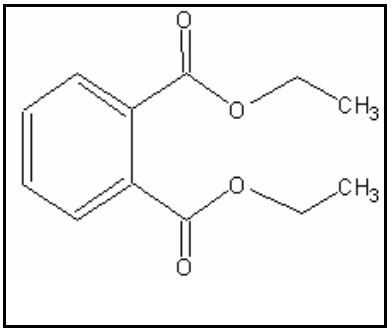
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER I HUMAN HEALTH NONCANCER CRITERIA

DIETHYL PHTHALATE

CAS RN:	84-66-2
Water Solubility:	896 mg/L
Log K_{ow}:	3.15
Reference Dose:	0.75 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class D; Not Classifiable



Standard

The human health noncancer diethyl phthalate criterion for drinking water sources is 21,000 µg/L. The human health noncancer criterion for nondrinking water sources is 1,200,000 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} and measured BCF (from Stephan 1993)
Log K_{ow} = 3.15 (RPLC), K_{ow} = 1413, BCF = 117, Percent lipid = 4.8
Trophic level 3 FCM = 1.042; trophic level 4 FCM = 1.009

$f_{fd} = 1/(1+(0.00000024\ kg/L)(K_{ow})) = 0.9997$

Baseline $BAF_{T3} = (1.042)[(117/0.9997)-1](1/0.048) = 25.19$

Baseline $BAF_{T4} = (1.009)[(117/0.9997)-1](1/0.048) = 24.39$

Human health BAF_{T3} = [(25.19)(0.0182)+1](0.9997) = 1.458

Human health BAF_{T4} = [(24.39)(0.0310)+1](0.9997) = 1.756

Acceptable Daily Exposure:

From the IRIS database:

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

$$ADE = \frac{NOAEL}{UF} = \frac{750\ mg/kg\text{-}day}{1000} = 0.75\ mg/kg/d$$

Calculation of Criteria:

Non Drinking Water HNC =[(0.75)(70)(0.8)]/0.01+[(0.0036)(1.458)+(0.0114)(1.756)]

= **1,200,000 μg/L**

Drinking Water HNC = [(0.75)(70)(0.8)]/2+[(0.0036)(1.458)+(0.0114)(1.756)]

= **21,000 μg/L**

References

1. USEPA 1993. Integrated Risk Information System (IRIS database) chemical file diethyl phthalate (84-66-2).

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 7, 2000 - Criteria first developed

Contact Information

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