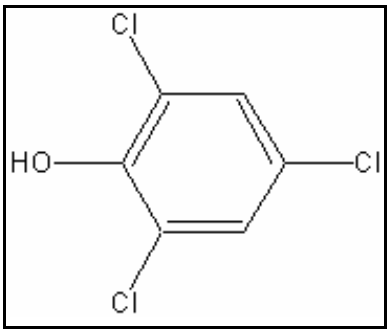
Indiana Department of Environmental Management
Office of Water – Water Quality Standards Section

TIER I HUMAN HEALTH CANCER CRITERIA

2,4,6-TRICHLOROPHENOL

CAS RN:	88-06-2
Water Solubility:	0.08 g/100 mL
Log K_{ow}:	3.37^{P}
Risk Associated Dose:	0.011 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class B2; Probable human Carcinogen



Standard

The human health cancer 2,4,6-trichlorophenol criterion for drinking water sources is 27 µg/L.
The human health cancer criterion for nondrinking water sources is 200 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} and measured BCF (from Stephan 1993)
Log K_{ow} = 3.37 (CLOGP method), K_{ow} = 2344, BCF = 88, Percent lipid = 12.4
Trophic level 3 FCM = 1.067; trophic level 4 FCM = 1.014

$f_{fd} = 1/(1+(0.00000024\ kg/L)(K_{ow})) = 0.9994$

Baseline $BAF_{T3} = (1.067)[(88/0.9994)-1](1/0.124) = 749.0$

Baseline $BAF_{T4} = (1.014)[(88/0.9994)-1](1/0.124) = 711.8$

Human health BAF_{T3} = [(749.0)(0.0182)+1](0.9994) = 14.62

Human health BAF_{T4} = [(711.8)(0.0310)+1](0.9994) = 23.05

Risk Associated Dose:

From the IRIS database:

Critical Effect: Liver and kidney pathology

$RAD = 0.00001/q1^* = 0.00001/ 0.011$
$= 0.000909$ mg/kg/day

Where:

RAD = Risk Associated Dose (mg/kg/day)
$q1^*$ = Cancer Slope Factor

Calculation of Criteria:

Non Drinking Water HCC =[(0.000909)(70)]/0.01+[(0.0036)(14.62)+(0.0114)(23.05)]

= 27 μg/L

Drinking Water HCC = [(0.000909)(70)]/2+[(0.0036)(14.62)+(2.698)(23.05)]

= 200 μg/L

References

1. USEPA 1987. Integrated Risk Information System (IRIS database) chemical file 2,4,6-trichlorophenol (95-95-4).

2. 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
UF	Uncertainty factor

Revision History

February 24, 2000 - Criteria first developed

Contact Information

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