

Chemical Name: 1,4-Dioxane Developed by: Bob HeitzmanCAS # 123-91-1 IRIS Data Retrieval Date: 4-21-03Internal Code # Fact Sheet Preparation Date: 4-21-03

CRITERIA SUMMARY

Lake Erie Basin			
Tier I HNC ($\mu\text{g/l}$)		Tier I HCC ($\mu\text{g/l}$)	
Drinking	Nondrinking	Drinking	Nondrinking
ID	ID	32	2,500

EXPOSURE AND TOXICITY DATA

Human health trophic level 3 bioaccumulation factor ($\text{BAFHH}_{\text{TL3}}$) = 1.0 l/kg (MDEQ)Human health trophic level 4 bioaccumulation factor ($\text{BAFHH}_{\text{TL4}}$) = 1.0 l/kg (MDEQ)

Acceptable daily exposure (ADE) = Not available (IRIS)

Carcinogen assessment: Class B2; probable human carcinogen (IRIS, 09/01/1990)

Cancer slope factor (q_1^*) = 1.1E-2 per mg/kg-day (IRIS, 09/01/1990)

Body weight of average human (BW) = 70 kg (OAC 3745-1-38)

Relative source contribution factor (RSC) = 0.8 (OAC 3745-1-38)

Per capita water consumption (WC) = 2.0 l/day for drinking water criteria (OAC 3745-1-38)

= 0.01 l/day for nondrinking water criteria (OAC 3745-1-38)

Mean consumption of trophic level three fish (FC_{TL3}) = 0.0036 kg/day (OAC 3745-1-38)Mean consumption of trophic level four fish (FC_{TL4}) = 0.0114 kg/day (OAC 3745-1-38)Risk associated dose (RAD) = Risk level \div q_1^* = 1E-5 \div 1.1E-2 per mg/kg-day

= 9.091E-4 mg/kg-day

REFERENCES

Integrated Risk Information System. USEPA Office of Research and Development, National Center for Environmental Assessment.

Michigan Department of Environmental Quality, Surface Water Quality Division. 1998. Bioaccumulation Factor Worksheet for 1,4-Dioxane. Verification Date: 6/19/98.

Ohio Administrative Code rule 3745-1-38: Methodologies for Development of Human Health Criteria and Values for the Lake Erie Drainage Basin. Effective 10/31/97.

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CALCULATION OF HUMAN NONCARCINOGENIC CRITERION (HNC) ^a

$$\text{HNC} = \frac{\text{ADE} \times \text{BW} \times \text{RSC}}{\text{WC} + [(\text{FC}_{\text{TL3}} \times \text{BAFH}_{\text{TL3}}) + (\text{FC}_{\text{TL4}} \times \text{BAFH}_{\text{TL4}})]}$$

Insufficient data (no ADE).

CALCULATION OF HUMAN CARCINOGENIC CRITERION (HCC) ^a

$$\text{HCC} = \frac{\text{RAD} \times \text{BW}}{\text{WC} + [(\text{FC}_{\text{TL3}} \times \text{BAFH}_{\text{TL3}}) + (\text{FC}_{\text{TL4}} \times \text{BAFH}_{\text{TL4}})]}$$

$$\begin{aligned} \text{Drinking Water HCC} &= \frac{9.091\text{E-}4 \text{ mg/kg-day} \times 70 \text{ kg}}{2.0 \text{ l/day} + [(0.0036 \text{ kg/day} \times 1.0 \text{ l/kg}) + (0.0114 \text{ kg/day} \times 1.0 \text{ l/kg})]} \\ &= 3.2\text{E-}2 \text{ mg/l} = 32 \text{ }\mu\text{g/l} \end{aligned}$$

$$\begin{aligned} \text{Nondrinking Water HCC} &= \frac{9.091\text{E-}4 \text{ mg/kg-day} \times 70 \text{ kg}}{0.01 \text{ l/day} + [(0.0036 \text{ kg/day} \times 1.0 \text{ l/kg}) + (0.0114 \text{ kg/day} \times 1.0 \text{ l/kg})]} \\ &= 2.5 \text{ mg/l} = 2,500 \text{ }\mu\text{g/l} \end{aligned}$$

^a See Ohio Administrative Code 3745-1-38 effective October 31, 1997.