

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for Cyclohexane (CAS # 110-82-7)  
FROM: Robert Sills, AQD Toxics Unit Supervisor  
SUBJECT: Cyclohexane ITSL justification  
DATE: February 7, 2017

The current ITSL for Cyclohexane is 6000 ug/m<sup>3</sup>, with 24 hr averaging time (AT).

This ITSL was established on September 11, 2003. The basis for the ITSL was the EPA (2003) Reference Concentration (RfC) = 6000, which was based on a 2-generation rat reproductive/developmental toxicity bioassay. The NOAEL = 6886 mg/m<sup>3</sup>, NOAEL(HEC) = 1722 mg/m<sup>3</sup>, and LOAEL (HEC) = 6025 mg/m<sup>3</sup>. The point of departure (POD) was BMCL(1sd)(HEC) = 1822 mg/m<sup>3</sup>. The critical effect was reduced pup weights in the F1 and F2 generations. EPA (2003) applied a total uncertainty factor (UF<sub>T</sub>) = 300, consisting of UF = 10 for intraspecies extrapolation, UF = 3 for interspecies extrapolation (with dosimetric adjustment), and a UF = 10 for database deficiencies, which included deficiencies in the developmental neurotoxicity testing and insufficient data on the liver toxicity endpoint which may be a critical effect. The current file review concurs with EPA's utilization of the database gaps UF to address chemical-specific concerns.

The averaging time (AT) assigned to the ITSL in 2003 was 24 hours, as per the default methodology at that time (Rule 232(2)(b)). The current file review concludes that the AT should continue to be appropriately set at 24 hours due to the nature of the critical effect, as allowed under Rule 229(2)(b).

The ITSL and RfC are calculated as follows:

$$\text{POD} = 1822 \text{ mg/m}^3 = 1822000 \text{ ug/m}^3$$

$$\text{ITSL} = \frac{1822000 \text{ ug/m}^3}{\text{UF}_T = 300} = 6073 \text{ ug/m}^3 \sim 6000 \text{ ug/m}^3 \text{ (24 hrs AT)}$$

Reference:

EPA. 2003. Integrated Risk Information System (IRIS database). Chemical file for Cyclohexane. Last revised 9/11/03. Still current as of 2/7/17.