

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for Propylene dichloride (1,2-dichloropropane) (CAS # 78-87-5)

FROM: Robert Sills, AQD Toxics Unit Supervisor

SUBJECT: Screening levels for Propylene dichloride (1,2-dichloropropane)

DATE: September 15, 2015

The Initial Threshold Screening Level (ITSL) for propylene dichloride (1,2-dichloropropane) is 4 ug/m³ with annual averaging time (AT). This ITSL value was originally established on 7/17/91 based on the EPA (1991) RfC, and this continues to be the ITSL basis. The averaging time (AT) assigned originally on 7/17/91 was 24 hours, as per the default methodology (Rule 232(2)(b)). The current file review concludes that the AT may appropriately be set at annual, based on the nature and duration of the key study and the ITSL value derivation, as allowed under Rule 229(2)(b). Therefore, the AT is being changed from 24 hours to annual at this time. The justification for the cancer risk-based screening levels (IRSL and SRSL) is provided in a separate memo dated 9/18/13.

EPA (1991) developed an RfC = 4 ug/m³ based on the key study by Nitschke et al. (1988), involving inhalation exposure to 0, 15, 50, or 150 ppm dichloropropane for 6 hrs/d, 5 d/wk for 13 weeks. "A LOAEL of 15 ppm [LOAEL(HEC) = 1.3 mg/cu.m] can be estimated for this study, based on nasal epithelial hyperplasia in female rats. This LOAEL should be considered minimal because of the low incidence and severity of the lesion seen at this concentration. Despite the minimal nature of the effects, they are considered to be adverse because of the increase in incidence and severity with increasing exposure concentration. This relationship is additionally supported by the short-term data (described later). Based on the exposure concentrations used in this study, rats are more than 10 times more sensitive than mice and 100 times more sensitive than rabbits to the nasal effects." (EPA, 1991). Further details are available from EPA (1991).

EPA derived the RfC from the above LOAEL (HEC) divided by a total uncertainty factor of 300: "UF — The uncertainty factor of 300 reflects a factor of 10 to protect sensitive individuals. A factor of 3 is used for extrapolation from a subchronic study, since study of the critical effect shows little progression with exposure time. A factor of 3 is used for the use of a minimal LOAEL due to the minimal nature of the effect. A factor of 3 is used for interspecies extrapolation due to the use of dosimetric adjustments. The factors of 3 represent operational application of a geometric half of the standard factor of 10, rounded to a single significant figure. As a result, multiplication of 3 factors of 3 results in a composite factor of 30." (EPA, 1991).

References

EPA. 1991. IRIS database. Chemical entry for 1,2-dichloropropane. RfC assessment; last revised 12/1/91. Still current as of 9/15/15.

Nitschke K.D., K.A. Johnson, D.L. Wackerle, J.E. Phillips and D.A. Dittenber. 1988. Propylene dichloride: A 13-week inhalation toxicity study with rats, mice, and rabbits. Dow Chemical Company, Mammalian and Environmental Toxicology Research Laboratory, Midland, MI. OTS Doc. #86-870001397