

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

May 31, 1994

TO: File for Diethylene Glycol Monoethyl Ether Acetate  
(CAS # 112-15-2)

FROM: Marco Bianchi

SUBJECT: Initial Threshold Screening Level

*monoethyl*

The initial threshold screening level (ITSL) for diethylene glycol monomethyl ether acetate (DGMEA) is  $18 \mu\text{g}/\text{m}^3$  based on an annual averaging time.

The following references or databases were searched to identify data to determine the ITSL: IRIS, HEAST, NTP Management Status Report, RTECS, EPB-CCD, EPB library, CAS-online, NLM-online, IARC, NIOSH Pocket Guide, and ACGIH Guide.

RTECS identified an oral guinea pig LD50 study with a value of 3930 mg/kg. This study would have provided enough information to establish an ITSL were it not for a two-week range-finding inhalation study of DGMEA from Mobil Oil Co.

In the Mobil Oil study, three groups of rats (10/sex) were dosed with DGMEA generated as an aerosol. Group 1 was sham exposed; Group 2 was exposed to 0.26 mg/L; and Group 3 to 0.48 mg/L. Exposures were 6 hr/day, 5 days/wk, for 2 weeks. Following the last exposure, all rats were sacrificed, necropsied, and tissues microscopically examined. Body weights were not affected by exposures to the aerosol, and no treatment-related lesions were seen during necropsy. The only treatment-related effect was the accumulation of foamy macrophages (1 to 2/alveoli) in 45% of the alveoli in the lung. These macrophages were described as "foamy" because of vacuoles in the cells resulting from ingestion of lipophilic DGMEA. The authors partially attribute this effect to a significant increase in the dry and wet weight of lung tissue for females, and dry weight for males over controls in the high dose group. This high-dose group effect is the LOAEL for this study. The NOAEL occurred in the low dose group, with non-significant dry and wet lung weights from a smaller accumulation of macrophages found in lung alveoli. According to the authors, there was no tissue damage to alveoli due to the deposition of the test material, or from enzymatic activity of the macrophages. The NOAEL will therefore be set at 0.26 mg/L which equates to  $260 \text{ mg}/\text{m}^3$ .

The ITSL was determined as follows:

$$\text{NOAEL} = 0.26 \text{ mg/L} \times \frac{1000 \text{ L}}{\text{M}^3} = 260 \text{ mg/m}^3$$

$$\frac{260 \text{ mg/m}^3}{35 \times 100} \times \frac{6}{24} = 0.018 \text{ mg/m}^3$$

$$0.018 \text{ mg/m}^3 \times 1000 = 18 \text{ } \mu\text{g/m}^3$$

The ITSL for DGMEA = 18  $\mu\text{g/m}^3$  based on annual averaging.

References:

Mobil Oil Company, 1990. Final Report Range-Finding Inhalation Toxicity Study of Mobil Study No. 62684, 62684I, 62684B. Mobil Environmental and Health Science Laboratory.

MB:ma