MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

JULY 25, 1994

TO: File for Diisodecyl Ester Phthalate (CAS# 26761-40-0)

FROM: Michael Depa, Toxics Unit

SUBJECT: Screening Level Determination

The initial threshold screening level (ITSL) for diisodecyl ester phthalate 30 is $\mu g/m^3$ based on an annual averaging time.

The following references or databases were searched to identify data to determine the ITSL: IRIS, RTECS, ACGIH Threshold Limit Values, NIOSH Pocket Guide to Hazardous Chemicals, Environmental Protection Bureau Library, IARC Monographs, CAS Online (1967-April 2, 1994), National Library of Medicine, Health Effects Assessment Summary Tables, and NTP Status Report. Review of these sources found that EPA has not established an RfC or RfD for diisodecyl ester phthalate. Occupational exposure limits were not available for diisodecyl ester phthalate. There was no inhalation data available for diisodecyl ester phthalate. A 28 day feed study was available through the Environmental Protection Agency Office of Technical Support (Exxon, 1991). Groups of 5 male Fischer 344 rats were fed diets containing 0, 0.02, 0.05, 0.1, 0.3, and 1% diisodecyl phthalate for 28 days. Body weight and food intake were measured during this time. Liver and testes weights were measured along with total liver protein and liver palmitoyl -CoA oxidation. Absolute liver weight was significantly increased ($p < 0.05$) over control rats at 0.3 and 1.0%. Relative liver weight was significantly increased ($p < 0.05$) at 0.1, 0.3, and 1.0%. The testes were no different from control. The palmitoyl-CoA oxidation was significantly increased ($p < 0.05$) at 0.1 % and higher. A NOAEL was identified from this study as 0.05% diisodecyl phthalate. This corresponds to 57 mg/kg/day.

$$ITSL = \frac{NOAEL(mg / kg / day)}{UF_1 \times UF_2 \times UF_3} \times \frac{W_a}{I_a}$$

Where:

W_a = Body weight of the experimental animal in kilograms (kg) (EPA, 1988).

I_a = Daily inhalation rate of experimental animal in cubic meters/day (EPA, 1988).

UF_1 = Uncertainty factor of 10 to account for differences between humans and experimental species.

UF_2 = Uncertainty factor of 10 to account for individual differences within the human population.

UF_3 = Uncertainty factor of 20 to account for experimental conditions that are less than chronic but more than 7 days.

Using the NOAEL of 57 mg/kg/day the ITSL was determined as follows:

$$ITSL = \frac{57 mg / kg / day}{10 \times 10 \times 20} \times \frac{0.4 \text{ kg}}{0.37 \text{ m}^3}$$

$$ITSL = 3.08 \times 10^{-2} mg / m^3$$

$$ITSL = 30 \ \mu g / m^3$$

The ITSL for diisodecyl ester phthalate is 30 $\mu g/m^3$ based on an annual averaging time.

EPA. 1988. Recommendations for and documantation of biological values for use in risk assessment. PB 88-179874.

Exxon Chemicals Americas. 1991. TSCA Section 8(d) Health and Safety Study. Diisodecyl Ester Phthalate (DIDP). Study No. 6125-107 and 108. EPA/OTS #86-9100000730.