MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

January 3, 1994

TO: t-Butylamine File (CAS # 75-64-9)

FROM: Gary Butterfield

SUBJECT: ITSL for t-Butylamine

There is no ACGIH TLV or NIOSH REL for t-butylamine. EPA has no RfC or RfD for this material. A December 15, 1993 CAS-on-line and NLM literature search found a couple of acute studies. No long term toxicity studies have been published. The Monsanto MSDS for t-butylamine very briefly describes a 4 week and a 13 week study that are unpublished.

The acute oral study in monobutylamines conducted by Cheever et al (1982) allows for a comparison of the toxicity for t-butylamine to the other isomers. This was investigated to determine if the TLV for n-butylamine might be used to derive the ITSL for t-butylamine. The Cheever et al article found t-butylamine to be the most toxic of the four monobutylamine isomers tested (n-, iso- and sec-). This throws some doubt into the ability to use the TLV for n-butylamine as a basis for the ITSL for tbutylamine.

On December 27, 1993 a copy of an LC50 determination and the 4 week unpublished Monsanto inhalation study was received by the AQD (the 13 week study was not available). An LC50 of 3800 mg/m3 was identified for male Sprague-Dawley rats, Monsanto (1980). In the 4 week study Monsanto (1981), male and female Sprague-Dawley rats were exposed to 0, 0.2, 0.5 or 1.98 mg/L for 6 hours a day, 5 days per week for a total of 20 exposures in 28 days. Rats in the high dose group had reduced body weight gains; nasal irritation; respiratory difficulty; increased organ weight of the brain, adrenal, and testes. Exposure related microscopic pathology changes were observed in the high dose group only. Those changes were present as keratitis in the eyes and rhinitis of the nasal turbinates of 8/14 male and 9/15 female high dose rats. A NOAEL of 0.5 mg/L was identified from this study.

The best available toxicity data upon which to base the ITSL is the 4 week rat NOAEL of 0.5 mg/L from Monsanto (1981). Using the equation from Rule 232(1)(d) the ITSL is calculated as follows.

ITSL = (500 mg/m3)/[20 x 100] x 6/24 = 60 ug/m3 annual average

where the uncertainty factor of 20 is a reduction from 35 used for 7 day studies.

References:

ACGIH. 1992. Documentation of the TLV and BEI.

Cheever et al. 1982. The acute oral toxicity of isomer monobutylamines in the adult male and female rat. Toxicol Appl Pharmacol 63:150-152.

EPA. 1993. IRIS.

Monsanto. 1980. Determination of LC50 of tertiary butylamine administered by inhalation to male Sprague-Dawley rats. Monsanto Environmental Health Laboratory Report # R000014, Study # 790121.

Monsanto. 1981. Four week inhalation toxicity study of tertiary butylamine to male and female rats. Monsanto Environmental Health Laboratory Final Report, Study # 790135.