MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

August 26, 1999

TO: Ethylene bisdithiocarbamate disodium file (CAS # 142-59-6)

FROM: Gary Butterfield

SUBJECT: Screening level for ethylene bisdithiocarbamate disodium

Ethylene bisdithiocarbamate disodium is an ethylene bisdithiocarbamate (EBDC) pesticide/fungicide, which is also known by the common names of Nabam and Dithane. The EBDC pesticides are commonly metabolized to ethylene thiourea (ETU) which causes concerns for the following toxicity endpoints: carcinogenicity, developmental toxicity, thyroid toxicity, and skin sensitization.

A June 9, 1999 CAS and NLM on-line literature search was conducted. A review of standard secondary references was also conducted. A few oral LD_{50} studies of nabam were located during the searching. A mouse LD_{50} study from Schafer and Bowles (1985) and a rat LD_{50} study by Blackwell-Smith, *et al.* (1953) were found in published articles. A few short-term (a week's exposure duration) oral studies that didn't have good pathology evaluation (for example, only looked at organ weight changes) conducted were also found. These studies were considered of too poor a quality on which to base the screening level.

The EPA pesticide program has reviewed many toxicity studies in the process of registering pesticides for use. The data available to EPA is summarized in the 1996 reregistration eligibility decision (RED) document for nabam. The RED is available from EPA's website. The RED document identifies many unpublished toxicity studies that have been conducted but are currently unavailable to AQD.

The best available toxicity data for calculating the ITSL at this time is the Blackwell-Smith, *et al.* (1953) rat LD_{50}, in which, the male rat oral LD_{50} was reported to be 395 mg/kg as calculated by the log-probit method. The screening level can be calculated from R 232(h) and this LD_{50} as follows.

$$\text{ITSL} = \frac{395\ \text{mg/kg}}{100 \times 40 \times 500 \times 0.167 \times 0.9} = 1\ \mu\text{g/m}^3\ \text{annual average}$$

Where the inhalation rate for rats is assumed to be 0.9 m^3/kg.

References:

Blackwell-Smith et al. 1953. Toxicological studies on zinc and disodium ethylene bisthiocarbamates. J Pharmacol Exp Therapy 109:159-66.

Schafer and Bowles. 1985. Acute oral toxicity and repellency of 933 chemicals to house and deer mice. Arch Env Contam Toxicol 14:111-129.

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