

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY**

---

**INTEROFFICE COMMUNICATION**

---

TO: File for Sulfur file (CAS # 7704-34-9)

FROM: Keisha Williams, Air Quality Division (AQD)

DATE: February 2, 2017

SUBJECT: Screening level update for sulfur

The AQD Toxics Unit has determined that it is appropriate to use the approach described in footnote #26 of the air toxics screening level list, where a toxic air contaminant (TAC) is regulated under the national ambient air quality standards (NAAQS) for particulate matter (PM). This will be done rather than use health-based screening levels for sulfur.

The AQD Toxics Unit conducted a thorough review of the toxicological literature for vinyl chloride-vinyl acetate in 2003 (see attached memo dated November 6, 2003). That assessment derived an initial threshold screening level (ITSL) based on an occupational exposure limit that has since been rescinded. This TAC is reasonably anticipated to appear in regulated air emissions as PM. So, to ensure health protection, this TAC will be regulated through the current, applicable PM NAAQS along with the combined ambient impact of all particulate emissions from a process.

# MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

## INTEROFFICE COMMUNICATION

November 6, 2003

TO: Sulfur file (CAS # 7704-34-9)

FROM: Gary Butterfield

SUBJECT: Screening level for sulfur

Elemental sulfur is a solid, yellow material that is not soluble in water, with a molecular weight of 32 g/mol. At ambient temperature sulfur is not chemically active; when heated it combines with oxygen to form sulfur oxides. Sulfur can be used as a pesticide to control mites, insects, fungi, and some vertebrates (rodents).

The following references or databases were searched to identify data to determine the screening level: U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS), National Institute for Occupational Safety and Health (NIOSH) Registry for Toxic Effects of Chemical Substances (RTECS), American Conference of Governmental and Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), Michigan Department of Environmental Quality (DEQ) library, International Agency for Research on Cancer (IARC) Monographs, Chemical Abstract Service (CAS) Online (1968 - May 2003), National Library of Medicine (NLM) - Toxline, and National Toxicology Program (NTP) Status Report.

The CAS and NLM on-line literature searches were conducted on May 5, 2003. The majority of hits from these searches were not for elemental sulfur, but for compounds of which a sulfur atom was only one atom of the many atoms in the whole compound. Therefore, those hits were of no use for establishing a screening level for elemental sulfur.

Due to sulfur's use as a pesticide, EPA has a registration eligibility document (RED) that considers many possible toxicity and environmental concerns for sulfur (EPA 1991). In this document, the EPA assigns sulfur a relatively low level of toxicity for both acute and chronic exposures, and posing very little risk to human health.

Elemental sulfur generally fits the ACGIH description of particulates (insoluble) not otherwise specified (PNOS). The ACGIH TLV for PNOS was set at a TWA of 3 mg/m<sup>3</sup> for respirable particles. Sulfur fits the PNOS description because it is (1) water insoluble, (2) no known toxicity or of relatively low toxicity, (3) generally considered to be a nuisance dust.

It is possible to establish a screening level based on the TLV or OEL using the methods from R232 (1)(c).

ITSL = (3 mg/m<sup>3</sup>)/100 = 30 µg/m<sup>3</sup> with 8 hour average

As a solid at ambient temperatures, sulfur would therefore be expected to be emitted to ambient air as a particulate. The contribution of airborne sulfur concentrations to ambient particulate levels should be considered when evaluating compliance with any of the national ambient air quality standards (NAAQS) for particulate matter.

References:

ACGIH. 1994. Documentation of Threshold Limit Values - particulates (insoluble) not otherwise specified (PNOS).

EPA. 1991. Registration eligibility document — sulfur. Case # 0031.