**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY**

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**INTEROFFICE COMMUNICATION**

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January 20, 2016

TO: File for Acenaphthylene (CAS #208-96-8)

FROM: Mike Depa, Toxics Unit, Air Quality Division

SUBJECT: Initial Threshold Screening Level

The Initial Threshold Screening Level (ITSL) for acenaphthylene is 35 µg/m$^3$, with annual averaging time.

Previously, the averaging time (AT) assigned to acenaphthylene was 24 hours, as per the default methodology (see attached memo from Robert Sills dated July 23, 1993). The current file review concludes that the AT may appropriately be set at annual, based on the nature and duration of the key study and the ITSL value derivation, as allowed under Rule 229(2)(b). Therefore, the AT is set to annual.

*Attachment*

**MICHIGAN DEPARTMENT OF NATURAL RESOURCES**

INTEROFFICE COMNUNICATION

July 23, 1993

TO: File for Acenaphthylene (CAS #208-96-8)

FROM: Robert Sills, Surface Water Quality Division

SUBJECT: Screening Level Derivation for AQD

There is a lack of an occupational exposure level, EPA RfD, or EPA RfC for acenaphthylene. The EPA (1992) IRIS database states that the oral RfD assessment is "under review," and that acenaphthylene is classified in carcinogenicity group "D," "not classifiable." The EPA (1987) literature review concluded that risk assessment values cannot be derived for this substance. EPA (1991) similarly concluded that the available data were insufficient for derivation of 1-day or 10—day health advisories or longer—term criteria. Both of these reviews noted the availability of LD50 and repeated—dose oral and inhalation studies from Eastern Europe and Russia, but these suffered from overriding deficiencies in study protocols and reporting.

EPA (1991) described a recent subchronic oral study (Hazelton Laboratories, 1989) in which groups of 20 male and female CD—1 mice received acenaphthylene by gavage. Dose levels were 0, 100, 200 and 400 mg/kg-day for at least 90 days. Based on liver and kidney changes and deaths in females the LOAEL was 100 mg/kg-day; no NOAEL was determined. Due to the elevated mortality rate, EPA (1991) considered the LOAEL insufficient for the derivation of criteria. There was no increase in mortality among males tested. The incidences of treatment—related deaths in females were 0% (0/20), 15% (3/20), 25% (5/20) and 40% (8/20) for the control, low—, mid—, and high—dose groups, respectively (EPA, 1991).

Although the data may be considered insufficient for ITSL derivation, the Hazelton Laboratories (1989) study conducted for EPA was of acceptable quality and provides sufficient information to derive a useful comparison to Predicted Ambient Impact (PAI) levels. If the LOAEL is adjusted by uncertainty factors including l0x for each LOAEL-to—NOAEL and subchronic—to—chronic conversions, and applied to the ITSL equation for an oral RfD, an ITSL of 35 µg/m (24 hr. averaging) is obtained. It should be noted that extrapolation from a LOAEL for mortality to an RfD is not generally acceptable. For the permit of current interest (Marquette County), the PAI is 0.005 µg/m³ for total PAHs. This PAI is considerably lower than the ITSL for acenaphthylene.

LOAEL (for mortality) = 100 mg/kg—day.

UF = 10,000, composed of: l0X for each interspecies and intraspecies variability, l0X for LOAEL-to-NOAEL adjustment, and l0X for subchronic—to—chronic adjustment.

*Attachment*

Estimated RfD = (100mg/kg-day)/10,000 = 0.01 mg/kg-day

ITSL = (0.01 mg/kg-day) x 70kg/20 $m^3$ = 0.035 $mg/m^3$ = 35 $\mu g/m^3$,
averaging time is 24 hrs

REFERENCES

EPA. 1987. Health Effects Assessment for Acenaphthylene. PB88-179510. EPA. 1991. Drinking Water Criteria Document for Polycyclic Aromatic Hydrocarbons (PAHa). ECAO/OHEA. P892-173459.

Hazelton Laboratories America, Inc. 1989. Subchronic toxicity study in mice with acenaphthylene. HLA Study No. 2399—129, sponsored by Dynamac Corporation, Rockville, MD, for the Office of Solid Waste and Emergency Response, U.S. EPA, Washington, DC. As cited in: EPA, 1991.

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