

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Jed Barker, Director
Alice Cone, Air Section Manager
TCEQ Region 7–Midland

Date: September 16, 2004

From: Angela Curry, M.S.
Toxicology Section
Chief Engineer's Office

Subject: Health Effects Review of 2003 Data Collected from Ambient Air Network
Monitoring Sites in Region 7, Midland

Conclusions

- One-hour concentrations of all VOCs monitored at the Odessa Gonzales monitoring site were less than their respective health-based ESLs.
- Except for ethylene and t-2-pentene, one-hour concentrations of all VOCs monitored at the Odessa Hayes monitoring site were less than their respective health-based ESLs.

Background

This memorandum conveys the Toxicology Section's evaluation of ambient air sampling conducted at two monitoring network sites in Region 7–Midland during 2003. We reviewed air monitoring summary results for VOCs from 40-minute samples collected each hour by automatic gas chromatographs. This memorandum evaluates air monitoring data on a chemical-by-chemical basis.

The measured chemical concentrations were compared to TCEQ health-based Effects Screening Levels (ESLs). An ESL is a guideline concentration which is protective of the general public including sensitive members of the population, such as the elderly, children, and persons with pre-existing health conditions. Health-based ESLs are guideline comparison levels set well below levels at which adverse health effects have been reported in the scientific literature. If an air concentration of a pollutant is below the ESL, we do not expect adverse health effects to occur. If an air concentration of a pollutant is above the health-based ESL, it is not indicative that adverse effects will necessarily occur, but rather, that further evaluation may be warranted. This memorandum evaluates air monitoring data on a chemical-by-chemical basis. Evaluation of the potential for cumulative effects will be presented in a later report.

Evaluation

One-Hour Data

All one-hour concentrations of all monitored VOCs, except for ethylene and t-2-pentene, were less than their respective health-based ESLs and odor thresholds and, therefore, would not be expected to cause adverse health effects or odors. Ethylene and t-2 pentene are discussed below.

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Ethylene

Two hourly ethylene concentrations exceeded the 1-hour ESL (1,022 ppb_v) during 2003. The highest hourly ethylene concentration was 1,600 ppb_v. Exposure to these ethylene concentrations would not cause adverse health effects or odors in humans. However, sensitive plants such as tomatoes, peppers, carnations, and orchids, can be damaged by exposure to the higher measured ethylene levels. Some observed field effects of ethylene are loss of leaves, and early, profuse flower budding accompanied by premature loss of fruit which leads to reduced crop yields. Ambient ethylene levels in this area should be reduced to prevent potential vegetative damage.

t-2-Pentene

A single t-2-pentene concentration (64.4 ppb_v) slightly exceeded the 1-hour odor based ESL (30 ppb_v) during 2003. Exposure to this pentene concentration could result in odorous conditions, or indirect health effects (e.g., headache and nausea) for certain individuals with increased sensitivity.

Annual Average Data

Annual average VOC concentrations were calculated from the hourly data. Annual average levels of all VOCs were below their respective long-term ESLs. Exposure to the annual average VOC levels measured at these two locations would not be expected to cause adverse health effects.

If you have any questions about this evaluation, please call me at (512) 239-1306.

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