# Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Jed Barker, Director Date: March16, 2005

Alice Cone, Air Section Manager

TCEQ Region 7- Midland

From: Neeraja Erraguntla, Ph.D.

Toxicology Section Chief Engineer's Office

**Subject:** Health Effects Review of 2004 Data Collected from Ambient Air Network

Monitoring Sites in Region 7, Midland (Odessa-Gonzales-AIRS No. 481351014

and Odessa-Hays-AIRS No. 481350003)

#### **Conclusions**

• One-hour concentrations of all monitored Volatile Organic Compounds (VOCs) at the Odessa-Gonzales and Odessa-Hays monitoring sites were less than their respective health-based ESLs and odor thresholds. Exposures to these concentrations would not be expected to cause adverse human health effects or odorous conditions.

• One-hour concentrations of ethylene at both the Odessa-Gonzales and Odessa-Hays monitoring sites exceeded the 1-hour vegetation-based ESL (1,022 ppb<sub>v</sub>). Sensitive plant species can undergo vegetative damage on exposure to these concentrations.

#### **Background**

This memorandum conveys the Toxicology Section's evaluation of ambient air sampling conducted at two monitoring network sites in Region 7-Midland from January 1 to December 31, 2004. We reviewed air monitoring summary results for sixty-seven VOCs from 40-minute samples collected each hour by automated gas chromatographs at the Odessa-Gonzales and Odessa-Hays sites.

We evaluated the reported VOCs expressed in parts per billion by volume ( $ppb_v$ ) for their potential to cause short-term adverse health effects, odorous conditions, and vegetative damage. We also evaluated annual average VOC concentrations for chronic health effects. The measured chemical concentrations were compared to the TCEQ Effects Screening Levels (ESLs) that are estimated for human health, odor thresholds, and vegetative damage.

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**

# **One-Hour Data** (Odessa-Gonzales and Odessa-Hays)

All one-hour VOC concentrations were less than their respective health-based ESLs and odor thresholds and would not be expected to cause adverse health effects or odors. However, ethylene concentrations exceeded the 1- hour vegetation-based ESL at both the Odessa-Gonzales and Odessa-Hays monitoring sites. Ethylene is discussed below.

### **Ethylene**

At the Odessa-Gonzales site, a single hourly ethylene concentration (1151.50 ppb<sub>v</sub>) exceeded the 1-hour vegetation-based ESL (1,022 ppb<sub>v</sub>) in 2004. At the Odessa-Hays site, two hourly ethylene concentrations exceeded the 1-hour vegetation-based ESL (1,022 ppb<sub>v</sub>) during 2004. The highest hourly ethylene concentration at the Odessa-Hays site in the year 2004 was 2051 ppb<sub>v</sub>.

Exposure to these ethylene concentrations would not be expected to cause adverse human health effects or odorous conditions. However, exposure to the measured ethylene levels can damage sensitive plant species. Examples of effects of ethylene are loss of leaves, early and profuse flower budding accompanied by premature loss of fruit which leads to reduced crop yields.

# **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 512-239-2492.

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