

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Buddy Stanley, Director
David Turner, Air Section Manager
TCEQ Region 14–Corpus Christi

Date: September 13, 2004

From: Vincent Leopold, Toxicology Section, Chief Engineer’s Office

Subject: Health Effects Review of Air Monitoring Data Collected in TCEQ Region 14
Corpus Christi during 2003

Conclusions

- All reported concentrations of VOCs and metals are not expected to cause adverse health effects.
- The annual average benzene concentration at 3810 Huisache exceeded the long-term screening level. Further evaluation of the long-term benzene concentrations measured at the Huisache site indicates that lifetime exposure to these levels would be associated with an acceptable theoretical excess cancer risk.

Background

This memorandum conveys the Toxicology Section’s evaluation of ambient air sampling conducted at monitoring network sites in Region 14–Corpus Christi during 2003. We reviewed summary results for volatile organic compounds (VOCs) from 24-hour canister samples collected in your region as follows:

- 3810 Huisache St., AIRS No. 483550032, samples generally collected every day except from May through October when they are collected every sixth day
- 1804/1807 Nueces Bay Blvd., AIRS Nos. 483550029/483559029 co-located, samples generally collected every four to six days
- 5707 Up River Rd., AIRS No. 483550034, samples collected generally every sixth day

In addition, we reviewed summary results for speciated metals from 24-hour PM_{2.5} filter samples collected every sixth day at:

- 5707 Up River Rd., AIRS No. 483550034
- 20420 Park Rd., AIRS No. 482730314, Kleberg County

It should be noted that 24-hour air samples are designed to provide representative long-term average concentrations. Therefore, annual averages from 24-hour samples were evaluated for potential chronic health concern. Twenty-four-hour samples do not show short-term or peak concentrations, and therefore, have limited use in evaluating the potential for acute health effects or odors.

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

Except benzene at Huisache, all reported annual average concentrations of VOCs and PM_{2.5} metals were below their long-term ESLs. All annual average concentrations, including benzene, would not be expected to cause chronic health effects. In addition, 24-hour concentrations for all reported VOCs and metals were below levels that would cause acute health effects or odors. However, because 24-hour composite samples do not provide information about shorter-term and peak concentrations, potential for acute health effects and odors could not be fully evaluated. Benzene at Huisache is discussed further below.

An annual average benzene level of 2.29 ppbv was reported for Huisache. At this site, 24-hour samples were collected daily during months when north winds typically occur and every sixth day otherwise. A weighted annual average (i.e., average of the monthly averages) of 2.2 ppbv, which may be calculated to better accommodate the irregular sampling schedule, differs only slightly from the reported simple average. As shown in the figure below, the annual average benzene concentration in 2003 again exceeded the long-term ESL of 1 ppbv. However, further health effects evaluation of the long-term benzene concentrations measured at the Huisache site indicates that lifetime exposure to these levels would be associated with an acceptable theoretical excess cancer risk. It should also be noted that given the proximity of the Huisache monitor to industrial sources of benzene, it is expected that potential benzene exposures in the community would be significantly less than the monitored levels. Additional monitoring sites planned for Corpus Christi will provide better information about VOC (including benzene) levels in residential areas.

Please contact me at 512-239-1784 or vleopold@tceq.state.tx.us if you have any questions regarding this memorandum.

**Annual Average Benzene Concentrations (ppbv)
at TCEQ Air Toxics Monitoring Sites in Corpus Christi**

