

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Archie Clouse, Director
Kevin Smith, Air Section Manager
TCEQ Region 6--El Paso

Date: September 17, 2004

From: Darrell D. McCant, Toxicology Section, Chief Engineer Office

Subject: Health Effects Review of 2003 Data Collected from Ambient Air Network Monitoring Sites in Region 6, El Paso

Conclusions

- Except benzene at Womble Subdivision, and both formaldehyde and MEK/Methacrolein at Chamizal, all reported VOC and metals annual average concentrations were below their long-term ESLs.
- All reported VOC and metals annual average concentrations, including benzene, formaldehyde, MEK/Methacrolein, and phenanthrene that exceeded their long-term ESLs, were not of a health concern.

Background Information

This memorandum conveys the Toxicology Section's evaluation of ambient air sampling conducted at monitoring network sites in Region 6--El Paso during 2003. We reviewed annual summary results for 24- and/or 1-hour Volatile Organic Compounds (VOCs) including Carbonyls, and Polycyclic Aromatic Hydrocarbons (PAHs). In addition, we reviewed summary results for speciated metals from 24-hour PM_{2.5}, PM₁₀, & TSP filter samples collected every third and/or sixth day. Please see Table 1 which list the El Paso ambient air monitoring sites referred to in this memorandum.

Table 1. Ambient Air Network Monitoring Sites in El Paso

County	AIRS No.	El Paso Air Monitoring Sites	VOCs				Speciated Metals ^d
			CATMN ^a	AutoGC ^b	MCAN ^c	Carbonyls	
Brewster	48-043-0002	Sul Ross University					X
	48-043-0101	Big Bend National Park					X
El Paso	48-141-0002	Tillman					X
	48-141-0058	Skyline Park					X ^e
	48-141-0033	Kern					X ^e
	48-141-0041	Vilas					X ^e
	48-141-0055	Ascarate Park Southwest	X		X		
	48-141-0044	Chamizal	X	X		X	X
	48-141-0053	Sun Metro	X				X
	48-141-0037	UTEP	X		X		
	48-141-0047	Womble Subdivision	X				
Jeff Davis	48-243-0004	McDonald Observatory					X

a: CATMN: Community Air Toxic Monitoring Network
b: Auto GC: Automated Gas Chromatography
c: MCAN : Multicanister
d: Speciated metals from TSP, PM10, and/or PM2.5
e: Below 75% completeness

It should be noted that 24-hour air samples are designed to provide representative long-term average concentrations and 1-hour autoGC as well as carbonyl air samples are designed to provide representative short-term concentrations. Therefore, annual averages from 24-hour samples were evaluated for potential chronic health concern and 1-hour for potential 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 Womble Subdivision, and both formaldehyde and MEK/Methacrolein at Chamizal, all reported VOC and metals annual average concentrations were below their long-term ESLs. It must be mentioned that because data collected at three metals related sites (see Table 1) did not meet USEPA data completeness requirements annual arsenic, cadmium, and lead levels could not be evaluated. All PAHs, except phenanthrene, were below their long-term ESLs and are not a health concern. In addition, 24- & 1-hour concentrations for all reported VOCs (including carbonyls) 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 Womble Subdivision, formaldehyde and MEK/methacrolein at Chamizal, as well as phenanthrene at Sun Metro are discussed further below.

Benzene

Womble Subdivision

The annual average benzene concentration (1.3 ppbv) exceeded the long-term ESL of 1 ppbv. This annual average benzene concentration is within the acceptable risk range as defined by the U.S. Environmental Protection Agency and is generally typical of urban areas across the United States. However, because benzene is a human carcinogen, the TCEQ is continuing its efforts to characterize ambient air quality and reduce potential public exposures.

Formaldehyde and MEK/Methacrolein

Chamizal

The annual average formaldehyde concentration (1.3 ppbv) exceeded the long-term ESL of 1.2 ppbv. This annual average is not expected to pose unacceptable long-term health risks. The reported MEK/methacrolein annual average concentration (0.26 ppbv) was slightly above the methacrolein long-term ESL of 0.13 ppbv and would not be expected to cause long-term health effects.

Phenanthrene

Sun Metro

Reported phenanthrene annual average concentration (86.9 ppbv) exceed the long-term ESL of 50 ppbv. This annual average concentration would not be expected to cause long-term health effects.

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