

# Texas Commission on Environmental Quality

## INTEROFFICE MEMORANDUM

**To:** Archie Clouse, Regional Director  
TCEQ Region 6 - El Paso  
Carlos Rubinstein, Texas Border Area  
Director

**Date:** October 5, 2007

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

**Subject:** Health Effects Review of 2006 Data Collected from Ambient Air Network Monitoring Sites in Region 6 - El Paso

### Conclusions:

- In TCEQ region 6 - El Paso during 2006 air monitoring was conducted for volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and metals. Exposure to the reported short-term and annual average concentrations of these chemicals would not be expected to cause adverse health effects.
- Numerous hydrogen sulfide (H<sub>2</sub>S) concentrations have been reported above the state regulatory standard as well as the odor threshold since 2004 at Community Air Monitoring Station (CAMS) 36. Previous investigations have shown that the Juarez North Wastewater Treatment Plant is the primary H<sub>2</sub>S source. Exposure to the measured levels would be expected to be odorous and could potentially cause health effects (such as eye irritation, decreased lung function, headaches) in sensitive individuals.

### Background Information

This memorandum conveys the Toxicology Section's (TS) evaluation of ambient air sampling conducted at network monitoring sites in Region 6 - El Paso during 2006. Table 1 contains information regarding the seven air toxics monitoring sites located in Region 6 - El Paso. The TS reviewed air monitoring summary results for VOCs and carbonyls from one-hour and/or 24-hour samples collected continuously and/or every sixth day. In addition, hourly VOC samples collected on forecasted high ozone days were reviewed. Speciated metals from 24-hour particulate matter less than or equal to 2.5 microns (PM<sub>2.5</sub>) samples collected every third or sixth day were also reviewed by TS. For a complete list of all chemicals evaluated, please see Table 2.

The TCEQ Monitoring Operations Division reported the data for all chemicals evaluated. This memorandum evaluates air monitoring data on a chemical-by-chemical basis. All

VOCs, PAHs, and PM<sub>2.5</sub> data highlighted in this evaluation met TCEQ's data completeness objective of 75 percent data return. One-hour air samples were compared to short-term TCEQ (effects screening levels) ESLs. Twenty-four-hour air samples collected every sixth day on an annual basis are designed to provide representative long-term average concentrations. The TS evaluated the reported annual average concentrations for each target analyte for potential chronic health and vegetation concerns by comparing measured chemical concentrations to their respective TCEQ long-term ESLs. Information on the ESLs can be obtained by contacting the TS at 512-239-1795 or by visiting the TCEQ website:

<http://www.tceq.state.tx.us/implementation/tox/esl/ESLMain.html>

## **Evaluation**

All reported one-hour concentrations of VOCs were below levels that would cause acute health effects or odors. The annual average concentrations for 111 of the 113 reported VOCs, 15 of the 16 PAHs, and all 14 metals at the noted monitoring sites for 2006 were less than their respective long-term, health-based ESLs and do not present a long-term health concern. Reported annual average concentrations for benzene, formaldehyde, and phenanthrene had reported annual average concentrations that exceeded their respective long-term ESLs. Additionally, elevated hourly H<sub>2</sub>S levels that have the potential for acute health effects and odors were reported at the Community Air Monitoring Station (CAMS) monitoring site, El Paso-CAMS 36. All exceedances are discussed below.

### **Benzene**

#### ***Womble***

The 2006 annual average benzene concentration at the Womble site, 1.3 parts per billion by volume (ppb<sub>v</sub>), slightly exceeded its long-term ESL (1.0 ppb<sub>v</sub>). The 2005 annual average benzene concentration was 1.1 ppb<sub>v</sub>. These benzene levels would not be expected to cause long-term adverse health effects. Because benzene is a human carcinogen, the TCEQ is continuing efforts to characterize its impact on ambient air quality and reduce the potential for public exposure.

### **Formaldehyde**

#### ***Chamizal***

The annual average formaldehyde concentration (3.38 ppb<sub>v</sub>) exceeded the formaldehyde long-term ESL of 1.2 ppb<sub>v</sub>. However, based on the United States Environmental Protection Agency's review of the best available science, exposure to the reported formaldehyde concentrations would not be expected to cause long-term adverse health effects.

**Phenanthrene**

***Sun Metro***

The reported annual average phenanthrene concentration (85.32 ng/m<sup>3</sup>) exceeded the long-term ESL of 50 ng/m<sup>3</sup>. However, this annual average concentration would not be expected to cause long-term adverse health effects.

**H<sub>2</sub>S**

***El Paso -CAMS 36***

This monitoring site is located within a current TCEQ [Air Pollutant Watch List](#) area, APWL0601, because numerous H<sub>2</sub>S concentrations have been reported above the state regulatory standard (80 ppbv) as well as the odor threshold (5 ppbv) since 2004. Previous investigations have shown that the Juarez North Wastewater Treatment Plant is the primary H<sub>2</sub>S source. The Texas Department of State Health Services (DSHS) prepared a Health Consultation, dated December 28, 2005, which details the methods, findings, and conclusions of their evaluation of H<sub>2</sub>S levels associated with the wastewater treatment plant. According to the DSHS, exposure to the measured levels could potentially cause health effects (e.g., eye irritation, decreased lung function, headache) in sensitive individuals. For more information on the findings of this report, visit [http://www.dshs.state.tx.us/epitox/consults/elpaso\\_juarez\\_final.pdf](http://www.dshs.state.tx.us/epitox/consults/elpaso_juarez_final.pdf).

Please contact me at 512-239-1306 or [acurry@tceq.state.tx.us](mailto:acurry@tceq.state.tx.us) if you have any questions regarding this memorandum.

cc (via e-mail):

Casso, Ruben – EPA Region 6, Dallas

Prosperie, Susan – Department of State Health Services

<b>Table 1. Monitoring Site Locations in TCEQ Region 6</b>			
<b>County</b>	<b>Site Location</b>	<b>EPA Site ID</b>	<b>Monitored Compounds</b>
<b>El Paso</b>	<a href="#">650 R E Thomason Loop</a> (Ascarte Park)	48-141-0055	VOCs <sup>a</sup>
	<a href="#">800 S. San Marcial Street</a> (Chamizal)	48-141-0044	VOCs <sup>b</sup> , Carbonyls, Metals (PM <sub>2.5</sub> )
	<a href="#">700 San Francisco Ave</a> (Sun Metro)	48-141-0053	VOCs <sup>a</sup> , PAHs, Metals (PM <sub>2.5</sub> )
	<a href="#">250 Rim Rd.</a> (UTEP)	48-141-0037	VOCs <sup>a</sup>
	<a href="#">Clark &amp; Cleveland Streets</a> (Womble)	48-141-0047	VOCs <sup>a</sup>
	<a href="#">8470 Plant Road</a> (CAMS 36)	48-141-0054	H <sub>2</sub> S
<b>Brewster</b>	<a href="#">Rt. 12 and K-Bar Rd.</a> (Big Bend)	48-043-0101	Metals (PM <sub>2.5</sub> )

<sup>a</sup>24-hour Canister only; <sup>b</sup>24-hour Canister and One-hour AutoGC

<b>Table 2. Target Analytes: VOCs, Carbonyls, PAHs, and Metals (PM<sub>2.5</sub>)</b>		
<b>CATMN and MultiCan VOCs</b>		<b>Metals</b>
1,1,1-Trichloroethane	Ethyl Benzene	Aluminum (PM <sub>2.5</sub> )
1,1,2,2-tetrachloroethane	Ethylene	Antimony (PM <sub>2.5</sub> )
1,1,2-Trichloroethane	Isobutane	Arsenic (PM <sub>2.5</sub> )
1,1-Dichloroethylene	Isopentane	Barium (PM <sub>2.5</sub> )
1,2,3-Trimethylbenzene	Isoprene	Cadmium (PM <sub>2.5</sub> )
1,2,4-Trimethylbenzene	Isopropylbenzene	Chromium (PM <sub>2.5</sub> )
1,2-Dibromoethane	Methyl Butyl Ketone (MBK)	Cobalt (PM <sub>2.5</sub> )
1,2-Dichloroethane	Methyl t-Butyl ether	Copper (PM <sub>2.5</sub> )
1,2-Dichloropropane	Methylcyclohexane	Manganese (PM <sub>2.5</sub> )
1,3,5-Trimethylbenzene	Methylcyclopentane	Molybdenum (PM <sub>2.5</sub> )
1,3-Butadiene	Methylene Chloride	Nickel (PM <sub>2.5</sub> , TSP)
1-Butene	Methylisobutylketone	Selenium (PM <sub>2.5</sub> )
1-Hexene+2-methyl-1-pentene	Propane	Tin (PM <sub>2.5</sub> )
1-Pentene	Propylene	Zinc (PM <sub>2.5</sub> )
2,2,4-Trimethylpentane	Styrene	
2,2-Dimethylbutane - Neohexane	Tetrachloroethylene -	
2,3,4-Trimethylpentane	Perchloroethylene	
2,3-Dimethylbutane	Toluene	
2,3-Dimethylpentane	Trichloroethylene	
2,4-Dimethylpentane	Trichlorofluoromethane	
2-Butanone	Vinyl Chloride	
2-Chloropentane	c-2-Butene	
2-Methyl-2-Butene	c-2-Hexene	
2-Methylheptane	c-2-Pentene	
2-Methylhexane	dichlorodifluoromethane	
2-Methylpentane - Isohexane	isobutyraldehyde	
2-methyl-3-hexanone	m-Diethylbenzene	
3-Methyl-1-Butene	m-Ethyltoluene	
3-Methylheptane	methyl chloride	
3-Methylhexane	n-Butane	
3-Methylpentane	n-Decane	
3-hexanone	n-Heptane	
3-pentanone	n-Hexane	
4-Methyl-1-Pentene	n-Nonane	
Acetylene	n-Octane	
Benzene	n-Pentane	
Bromomethane	n-Propyl Acetate	
Butyl Acetate	n-Propylbenzene	
CIS 1,3-dichloropropylene	n-Undecane	
Carbon Tetrachloride	o-Ethyltoluene	
Chlorobenzene	o-Xylene	
Chloroform	p-Diethylbenzene	
Chloroprene	p-Ethyltoluene	
Cyclohexane	p-Xylene + m-Xylene	
Cyclopentane	t-2-Butene	
Cyclopentene	t-2-Hexene	
Ethane	t-2-Pentene	
Ethyl Acetate	trans-1-3-dichloropropylene	
		<b>PAHs</b>
		Acenaphthene
		Acenaphthylene
		Anthracene
		Benzo (a) anthracene
		Benzo (a) pyrene
		Benzo (b) fluoroanthene
		Benzo (g,h,i) perylene
		Benzo (k) fluoranthene
		Chrysene
		Dibenzo (a,h) anthracene
		Fluoranthene
		Fluorene
		Indeno (1,2,3-cd) pyrene
		Naphthalene
		Phenanthrene
		Pyrene

AutoGC VOCs		Carbonyls
1,2,3-Trimethylbenzene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3-Butadiene 1-Butene 1-Pentene 2,2,4-Trimethylpentane 2,2-Dimethylbutane 2,3,4-Trimethylpentane 2,3-Dimethylpentane 2,4-Dimethylpentane 2-Methylheptane 2-Methylhexane 3-Methylheptane 3-Methylhexane Acetylene Benzene Cyclohexane Cyclopentane Ethane Ethyl Benzene Ethylene Isobutane Isopentane Isoprene Isopropyl Benzene (Cumene) Methylcyclohexane Methylcyclopentane Propane Propylene Styrene Toluene c-2-Butene c-2-Pentene n-Butane	n-Decane n-Heptane n-Hexane n-Nonane n-Octane n-Pentane n-Propylbenzene o-Xylene p-Xylene + m-Xylene t-2-Butene t-2-Pentene	2,5-Dimethylbenzaldehyde Acetaldehyde Acetone Acrolein Benzaldehyde Butyraldehyde Crotonaldehyde (2-Butenal) Formaldehyde Heptaldehyde Hexanaldehyde Isovaleraldehyde m-Tolualdehyde MEK/Methacrolein o-Tolualdehyde p-Tolualdehyde Propanal (Propionaldehyde) Valeraldehyde