

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Lorinda Gardner, Regional Director
Kent Waggoner, Air Section Manager
Ramiro Garcia, Border and South
Central Texas Area Director
TCEQ Region 6 - El Paso

Date: December 18, 2009

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

Subject: Health Effects Review of 2008 Data Collected from Ambient Air Network
Monitoring Sites in Region 6 - El Paso

Conclusions:

- Exposure to the reported short-term concentrations of volatile organic compounds (VOCs) would not be expected to cause adverse acute health effects or odors. Reported annual average concentrations of VOCs, polycyclic aromatic hydrocarbons (PAHs), carbonyls, and metals would not be expected to cause adverse chronic health effects.
- Several hydrogen sulfide (H₂S) concentrations were reported above the state regulatory standard as well as the odor threshold in 2008 at Community Air Monitoring Station (CAMS) 36. Elevated H₂S concentrations have been reported at that monitoring station since 2004. Prior investigations have shown that the Juarez North Wastewater Treatment Plant is the primary H₂S 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 Division's (TD) evaluation of ambient air sampling conducted at network monitoring sites in Region 6 - El Paso during 2008. Table 1 contains information regarding the five air toxics monitoring sites located in Region 6 - El Paso as well as the chemicals evaluated at each site. The TD reviewed air monitoring summary results for VOCs from 24-hour canister samples, 1-hour automated gas-chromatography (autoGC) VOC samples, 24-hour carbonyl samples, 24-hour PAH/semivolatile organic compound (SVOC) samples, and 24-hour metals samples from filters designed to collect particulate matter with an aerodynamic diameter of 2.5 microns or less (PM_{2.5}).

County	Site Location	EPA Site ID	Monitored Compounds
EL Paso	800 S. San Marcial Street (Chamizal)	48-141-0044	VOCs ^b , Carbonyls, Metals (PM _{2.5})
	700 San Francisco Ave (Sun Metro)	48-141-0053	VOCs ^a , PAHs, Metals (PM _{2.5})
	Clark & Cleveland Streets (Womble)	48-141-0047	VOCs ^a
	8470 Plant Road (El Paso Lower Valley Sounder, CAMS 36)	48-141-0054	H ₂ S
Brewster	Rt.12 and K-Bar Rd. (Big Bend)	48-043-0101	Metals (PM _{2.5})

^a24-hour Canister only; ^b24-hour Canister and One-hour AutoGC

The TCEQ Monitoring Operations Division reported the data for all chemicals evaluated. For a complete list of all chemicals evaluated, please see Table 2. The target analyte list of 95 VOCs for Community Air Toxics Monitoring Network (CATMN) VOCs was changed in the third quarter of 2008. Eleven oxygenated compounds were dropped from the list due to water issues in the laboratory analysis; therefore, those compounds did not meet the data completeness objective of 75 percent data return, or 45 valid samples per year. Those eleven compounds are identified by an asterisk on the target analyte table (Table 2). All other data collected (84 VOCs, 16 PAHs, 17 carbonyls, and 14 PM_{2.5} metals) at the monitoring sites met the data completeness objective of 75 percent data return except the 46 VOCs reported at the single autoGC site.

The TD 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 long-term appropriate comparison values. Because 24-hour air samples are designed to provide representative long-term average concentrations, annual averages from 24-hour samples were evaluated for potential chronic health concerns. Short-term or peak concentrations are not captured by 24-hour samples; therefore, daily maximum concentrations have limited use in evaluating the potential for acute health effects.

Evaluation

VOCs

Reported hourly average concentrations of the 46 VOCs reported at the Chamizal monitoring site were below their respective short-term, health-based comparison values and odor thresholds. Exposures to the reported hourly average concentrations would not be expected to cause adverse short-term health effects or odor concerns.

Reported annual average concentrations of the 84 VOCs reported at each 24-hour canister monitoring site and the 46 VOCs reported at the single autoGC monitoring site for 2008 were below their respective long-term appropriate comparison values and do not present a long-term health concern.

Carbonyls

Reported annual average concentrations of the 17 carbonyls reported at the Chazimal monitoring site were below long-term appropriate comparison values and do not present a long-term health concern.

Metals

At the sites reporting speciated PM_{2.5} metals data, annual average concentrations of all 14 metals were below their respective long-term, health-based comparison values and do not present a long-term health concern.

PAHs

Reported annual average concentrations for 15 of 16 PAHs at the Sun Metro monitoring site for 2008 were less than their respective long-term appropriate comparison values and do not present a long-term health concern. The reported annual average concentration for phenanthrene at Sun Metro (55.1 ng/m³) slightly exceeded the long-term appropriate comparison value of 50 ng/m³. This long-term appropriate comparison value is set at a level well below levels reported in the literature that would be associated with adverse long-term health effects; therefore, this annual average concentration does not present a long-term health concern.

Air Pollutant Watch List Area (APWL0601, H₂S)

The Community Air Monitoring Station at the El Paso Lower Valley Souder-CAMS 36 monitoring site reported elevated hourly H₂S levels that have the potential for acute health effects and odors. The El Paso-CAMS 36 monitoring site is located within a current TCEQ [Air Pollutant Watch List](#) area, APWL0601, because numerous H₂S concentrations have been reported above the state regulatory standard (80 ppb_v) as well as the odor threshold (5 ppb_v) since 2004. Previous investigations have shown that the Juarez North Wastewater Treatment Plant is the primary H₂S 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 H₂S levels associated with the wastewater treatment plant. According to the DSHS, exposure to the measured levels could potentially cause adverse 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/el Paso_juarez_final.pdf.

Please contact me at 512-239-1306 or 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

Table 2. Target Analytes: VOCs, Metals (PM_{2.5}), PAHs, and Carbonyls

CATMN VOCs		Metals
1,1,1-Trichloroethane	Ethyl Benzene	Aluminum (PM _{2.5})
1,1,2,2-tetrachloroethane	Ethylene	Antimony (PM _{2.5})
1,1,2-Trichloroethane	Isobutane	Arsenic (PM _{2.5})
1,1-Dichloroethylene	Isopentane	Barium (PM _{2.5})
1,2,3-Trimethylbenzene	Isoprene	Cadmium (PM _{2.5})
1,2,4-Trimethylbenzene	Isopropylbenzene	Chromium (PM _{2.5})
1,2-Dibromoethane	Methyl Butyl Ketone (MBK)*	Cobalt (PM _{2.5})
1,2-Dichloroethane	Methyl t-Butyl ether*	Copper (PM _{2.5})
1,2-Dichloropropane	Methylcyclohexane	Manganese (PM _{2.5})
1,3,5-Trimethylbenzene	Methylcyclopentane	Molybdenum (PM _{2.5})
1,3-Butadiene	Methylene Chloride	Nickel (PM _{2.5})
1-Butene	Methyl Isobutyl Ketone*	Selenium (PM _{2.5})
1-Hexene+2-methyl-1-pentene	Propane	Tin (PM _{2.5})
1-Pentene	Propylene	Zinc (PM _{2.5})
2,2,4-Trimethylpentane	Styrene	
2,2-Dimethylbutane - Neohexane	Tetrachloroethylene - Perchloroethylene	
2,3,4-Trimethylpentane	Toluene	
2,3-Dimethylbutane	Trichloroethylene	
2,3-Dimethylpentane	Trichlorofluoromethane	
2,4-Dimethylpentane	Vinyl Chloride	
2-Butanone*	c-2-Butene	
2-Chloropentane	c-2-Hexene	
2-Methyl-2-Butene	c-2-Pentene	
2-Methylheptane	dichlorodifluoromethane	
2-Methylhexane	isobutyraldehyde*	
2-Methylpentane - Isohexane	m-Diethylbenzene	
2-methyl-3-hexanone*	m-Ethyltoluene	
3-Methyl-1-Butene	methyl chloride	
3-Methylheptane	n-Butane	
3-Methylhexane	n-Decane	
3-Methylpentane	n-Heptane	
3-hexanone*	n-Hexane	
3-pentanone*	n-Nonane	
4-Methyl-1-Pentene	n-Octane	
Acetylene	n-Pentane	
Benzene	n-Propyl Acetate*	
Bromomethane	n-Propylbenzene	
Butyl Acetate*	n-Undecane	
CIS 1,3-dichloropropylene	o-Ethyltoluene	
Carbon Tetrachloride	o-Xylene	
Chlorobenzene	p-Diethylbenzene	
Chloroform	p-Ethyltoluene	
Chloroprene	p-Xylene + m-Xylene	
Cyclohexane	t-2-Butene	
Cyclopentane	t-2-Hexene	
Cyclopentene	t-2-Pentene	
Ethane	trans-1-3-dichloropropylene	
Ethyl Acetate*		
		PAHs
		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

* Analytes did not meet the data completeness objective of 75 percent data return, or 45 valid samples per year.