

# TCEQ Interoffice Memorandum

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**To:** Lorinda Gardner, Regional Director

**From:** Tiffany Bredfeldt, Ph.D. TB  
Toxicology Division, Office of the Executive Director

**Date:** October 24, 2014

**Subject:** Health Effects Review of 2013 Ambient Air Network Monitoring Data in Region 6, El Paso

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## Conclusions

- Reported short-term concentrations of volatile organic compounds (VOCs) as detected by 1-hour automated gas chromatography (autoGC) samplers were below their respective air monitoring comparison values (AMCVs) and would not be expected to cause adverse acute health effects, vegetation effects, or odors.
- Twenty-four hour concentrations of benzene, 1, 3-butadiene, and formaldehyde were below their 24-hour AMCVs and would not be expected to cause adverse health effects.
- Twenty-four hour concentrations of lead, reported as total suspended particulate or particulate matter with aerodynamic diameter of 2.5 microns or less (TSP or PM<sub>2.5</sub>), were below the comparison value of 0.15 µg/m<sup>3</sup>.
- Reported annual concentrations of VOCs, polycyclic aromatic hydrocarbons (PAHs), carbonyls, and metals reported as PM<sub>2.5</sub> and for one metal measured also in TSP would not be expected to cause long-term adverse human health or vegetation effects.

## Background

This memorandum conveys the Toxicology Division's (TD) evaluation of ambient air sampling conducted at seven monitoring sites in Region 6, El Paso during 2013. TCEQ Region 6 monitoring site information is presented in Table 1 along with hyperlinks to detailed information regarding the monitoring sites and their maps. Lists 1-5, which can be found in Attachment A, display the target analytes for five types of samplers evaluated in this memorandum. Three additional sites, El Paso UTEP, Ojo de Agua, and Skyline Park, listed in Table 1 are the locations where lead TSP data were collected. The TD reviewed air monitoring summary results from 1-hour autoGC VOC samples, VOC canister samples collected on a 24-hour every sixth-day schedule at Community Air Toxics Monitoring Network (CATMN) monitors, 24-hour metals samples (PM<sub>2.5</sub> or TSP), 24-hour carbonyl samples, and 24-hour PAH or semivolatile organic compound (SVOC) samples.

The TCEQ Monitoring Division reported the data for all chemicals evaluated in this memorandum. Data discussed in this evaluation for all monitoring sites includes the following: up to 85 VOCs from canister samples, 46 VOCs from autoGC, 17 carbonyls, 15 metals, and 16 PAHs. Table 2 summarizes the sites data completeness, an objective that is met when 75 percent data are returned. Short-term samples collected over a 1-hour duration were compared to their

respective chemical-specific AMCVs for the potential to adversely affect human health or welfare during an acute exposure duration. In order to be able to evaluate 24-hour monitoring data more fully, TCEQ has developed 24-hour AMCVs for 1,3-butadiene, benzene, and formaldehyde. As such, 24-hour samples were compared to the available TCEQ 24-hour AMCVs for these chemicals.

Since 24-hour samples collected using the every sixth day schedule are designed to provide a representative long-term, ambient concentration for chemicals of concern, annual averages from all 24-hour samples were evaluated using appropriate long-term AMCVs for the potential to adversely impact long-term human health and vegetation effects. Thus, annual average concentrations of carbonyls, metals, PAHs, and VOCs, were compared to their respective long-term AMCVs or, for lead, the applicable comparison value. Additional information regarding the derivation and application of AMCVs is available [online](#).

The El Paso Lower Valley monitor measures ambient concentrations of hydrogen sulfide (H<sub>2</sub>S) and elevated levels of this chemical have been reported annually at this monitoring station since 2004. Further information regarding historical data collected at this monitoring station and subsequent evaluations of collected data are available from the Air Pollutant Watch List [website](#).

**Table 1. Monitoring Sites Located in TCEQ Region 6**

City and Site Location	County	Monitor ID	Monitored Compounds
<a href="#">650 R.E. Thomason Loop</a> (Ascarate Park SE)	El Paso	48-141-0055	VOCs <sup>a</sup> , Carbonyls, Lead and Arsenic (TSP)
<a href="#">800 S. San Marcial Street</a> (El Paso Chamizal)	El Paso	48-141-0044	VOCs <sup>b</sup> , Metals (PM <sub>2.5</sub> )
<a href="#">6700 Delta Drive</a> (El Paso Delta)	El Paso	48-141-1011	VOCs <sup>b</sup>
<a href="#">250 Rim Road</a> (El Paso UTEP)	El Paso	48-141-0037	Lead (TSP)
<a href="#">6767 Ojo De Agua</a> (Ojo De Agua)	El Paso	48-141-1021	Lead (TSP)
<a href="#">5050 A Yvette Drive</a> (Skyline Park)	El Paso	48-141-0058	Lead (TSP)
<a href="#">320 Old Hueco Tanks Road</a> (Socorro Hueco)	El Paso	48-141-0057	VOCs <sup>a</sup> , SVOCs
<a href="#">J. Harold Tillman HLT CT 222 S Campbell S</a> (Tillman)	El Paso	48-141-0002	Lead (TSP)
<a href="#">Clark &amp; Cleveland Streets</a> (Womble)	El Paso	48-141-0047	VOCs <sup>a</sup>

<sup>a</sup>24-hour canister only; <sup>b</sup>one-hour autoGC

**Table 2. Data Completeness TCEQ Region 6**

Site Name	Parameter	Complete?	Notes
Ascarate Park SE	Carbonyl	Yes	
Ascarate Park SE	VOCs <sup>a</sup>	No	Deactivated 05/31/2013
Ascarate Park SE	Lead and Arsenic (TSP)	Yes	
El Paso Chamizal	VOCs <sup>b</sup>	Yes	
El Paso Chamizal	Metals (PM2.5)	Yes	
El Paso Delta	VOCs <sup>b</sup>	No	Deactivated 08/13/2013
El Paso UTEP	Lead (TSP)	Yes	
Ojo De Agua	Lead (TSP)	No	Activated 04/15/2013
Skyline Park	Lead (TSP)	Yes	Deactivated 12/31/2013
Socorro Hueco	VOCs <sup>a</sup>	Yes	
Tillman	Lead (TSP)	No	Deactivated 04/11/2013
Womble	VOCs <sup>a</sup>	Yes	

<sup>a</sup>24-hour canister only; <sup>b</sup>one-hour autoGC

## Evaluation

### VOCs

Hourly average concentrations of the 46 VOCs collected at the Chamizal and Delta autoGC monitoring sites were below their respective short-term health-, odor-, and vegetation-based AMCVs. Thus, exposure to the reported hourly average concentrations would not be expected to cause adverse human health or welfare effects.

All 24-hour VOC concentrations of benzene and 1,3-butadiene were below their 24-hour AMCVs and would not be expected to cause adverse health effects.

The Delta autoGC and Ascarate Park canister sampler were deactivated in 2013, and data collected at these sites were not evaluated from a long-term perspective because they did not meet data completeness objectives. The 2013 annual average concentrations for all 84 VOCs collected as 24-hour canister samples at the Socorro Huecco, and Womble monitoring sites were well below their respective long-term AMCVs. Annual average concentrations for the 46 VOCs

collected at the Chamizal autoGC monitoring site were also below their long-term AMCVs. Adverse human health or vegetation effects would not be expected to occur as a result of long-term exposure to the reported levels of these chemicals at these monitoring sites.

### **Carbonyls**

Reported annual average concentrations of the 17 carbonyls measured at the Ascarate Park SE monitoring site were below their respective short- and long-term and 24-hour AMCVs and would not be expected to cause adverse human health effects.

### **Metals**

Reported annual average concentrations for all 14 metals (PM<sub>2.5</sub>) measured at the Chamizal monitoring site were below their respective short- and long-term AMCVs and would not be considered of concern to human health. In the case of lead (PM<sub>2.5</sub> or TSP), reported annual average concentrations collected at the Ascarate Park SE, Chamizal, Skyline Park, and Tillman monitoring sites were below the lead comparison value. Thus, none of the reported annual average concentrations for these 15 metals (PM<sub>2.5</sub> or TSP) would be of concern to human health.

### **PAHs**

The reported annual average concentrations for all of the 16 PAHs reported at the Socorro Hueco monitoring site in 2013 were well below their short and long-term AMCVs and would not be expected to cause adverse human health effects.

If you have any questions or comments regarding this evaluation, please feel free to contact me at (512) 239-1799 or [tiffany.bredfeldt@tceq.texas.gov](mailto:tiffany.bredfeldt@tceq.texas.gov).

cc (via email):

Casso, Ruben – EPA Region 6, Dallas

Prosperie, Susan – Department of State Health Services

**Attachment A****List 1. Target VOC Analytes in Canister Samples**

1,1,2,2-Tetrachloroethane	Bromomethane	Methyl Chloroform (1,1,1-Trichloroethane)
1,1,2-Trichloroethane	Carbon Tetrachloride	Methylcyclohexane
1,1-Dichloroethane	Chlorobenzene	Methylcyclopentane
1,1-Dichloroethylene	Chloroform	N-Butane
1,2,3-Trimethylbenzene	Chloromethane (Methyl Chloride)	N-Decane
1,2,4-Trimethylbenzene	Cis 1,3-Dichloropropene	N-Heptane
1,2-Dichloropropane	Cis-2-Butene	N-Hexane
1,3,5-Trimethylbenzene	Cis-2-Hexene	N-Nonane
1,3-Butadiene	Cis-2-Pentene	N-Octane
1-Butene	Cyclohexane	N-Pentane
1-Hexene+2-Methyl-1-Pentene	Cyclopentane	N-Propylbenzene
1-Pentene	Cyclopentene	N-Undecane
2,2,4-Trimethylpentane	Dichlorodifluoromethane	O-Ethyltoluene
2,2-Dimethylbutane (Neohexane)	Dichloromethane (Methylene Chloride)	O-Xylene
2,3,4-Trimethylpentane	Ethane	P-Diethylbenzene
2,3-Dimethylbutane	Ethylbenzene	P-Ethyltoluene
2,3-Dimethylpentane	Ethylene	Propane
2,4-Dimethylpentane	Ethylene Dibromide (1,2-Dibromoethane)	Propylene
2-Chloropentane	Ethylene Dichloride (1,2-Dichloroethane)	Styrene
2-Methyl-2-Butene	Isobutane	Tetrachloroethylene
2-Methylheptane	Isopentane (2-Methylbutane)	Toluene
2-Methylhexane	Isoprene	Trans-1-3-Dichloropropylene
2-Methylpentane (Isohexane)	Isopropylbenzene (Cumene)	Trans-2-Butene
3-Methyl-1-Butene	M-Diethylbenzene	Trans-2-Hexene
3-Methylheptane	M-Ethyltoluene	Trans-2-Pentene
3-Methylhexane	M/P Xylene	Trichloroethylene
3-Methylpentane		Trichlorofluoromethane
4-Methyl-1-Pentene		Vinyl Chloride
Acetylene		
Benzene		

**List 2. Target Carbonyl Analytes**

2,5-Dimethylbenzaldehyde	Formaldehyde	o-Tolualdehyde
Acetaldehyde	Heptaldehyde	Propanal - Propionaldehyde
Acetone	Hexanaldehyde	p-Tolualdehyde
Acrolein	Isovaleraldehyde	Valeraldehyde
Benzaldehyde	Methyl Ethyl Ketone	
Butyraldehyde	(MEK)/Methacrolein	
Crotonaldehyde - 2-Butenal	m-Tolualdehyde	

**List 3. Target Metal Analytes**

Aluminum (PM <sub>2.5</sub> )	Antimony (PM <sub>2.5</sub> )	Arsenic (PM <sub>2.5</sub> )
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Barium (PM <sub>2.5</sub> )	Copper (PM <sub>2.5</sub> )	Nickel (PM <sub>2.5</sub> )
Cadmium (PM <sub>2.5</sub> )	Lead (PM <sub>2.5</sub> or TSP)	Selenium (PM <sub>2.5</sub> )
Chromium (PM <sub>2.5</sub> )	Manganese (PM <sub>2.5</sub> )	Tin (PM <sub>2.5</sub> )
Cobalt (PM <sub>2.5</sub> )	Molybdenum (PM <sub>2.5</sub> )	Zinc (PM <sub>2.5</sub> )

**List 4. Target PAH Analytes**

Acenaphthene	Benzo (ghi) perylene	Indeno (1,2,3-cd) pyrene
Acenaphthylene	Benzo (k) fluoranthene	Naphthalene
Anthracene	Chrysene	Phenanthrene
Benzo (a) anthracene	Dibenzo (a,h) anthracene	Pyrene
Benzo (a) pyrene	Fluoranthene	
Benzo (b) fluoranthene	Fluorene	

**List 5. Target VOC Analytes in AutoGC**

1-Butene	Benzene	n-Heptane
1-Pentene	c-2-Butene	n-Hexane
1,2,3-Trimethylbenzene	c-2-Pentene	n-Nonane
1,2,4-Trimethylbenzene	Cyclohexane	n-Octane
1,3-Butadiene	Cyclopentane	n-Pentane
1,3,5-Trimethylbenzene	Ethane	n-Propylbenzene
2-Methylheptane	Ethyl Benzene	o-Xylene
2-Methylhexane	Ethylene	p-Xylene + m-Xylene
2,2-Dimethylbutane	Isobutane	Propane
2,2,4-Trimethylpentane	Isopentane	Propylene
2,3-Dimethylpentane	Isoprene	Styrene
2,3,4-Trimethylpentane	Isopropyl Benzene - Cumene	t-2-Butene
2,4-Dimethylpentane	Methylcyclohexane	t-2-Pentene
3-Methylheptane	Methylcyclopentane	Toluene
3-Methylhexane	n-Butane	
Acetylene	n-Decane	