

# 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:** August 22, 2016

**Subject:** Health Effects Review of 2015 Ambient Air Network Monitoring Data in Region 6, El Paso

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## Conclusions

- Reported short-term concentrations of volatile organic compounds (VOCs) were below their respective air monitoring comparison values (AMCV) values and would not be expected to cause adverse acute health effects, vegetation effects, or odors.
- Twenty-four hour concentrations of benzene, 1,3-butadiene, ethylene dichloride, formaldehyde, acrolein, and chromium were below their 24-hour AMCVs and would not be expected to cause adverse health effects.
- Reported concentrations of lead, reported as total suspended particulate (TSP) or particulate matter with aerodynamic diameter of 2.5 microns or less (PM<sub>2.5</sub>), were below the comparison value of 0.15 µg/m<sup>3</sup> at monitors that met data completeness requirements.
- Reported annual concentrations of VOCs, polycyclic aromatic hydrocarbons (PAHs), carbonyls, and metals reported as PM<sub>2.5</sub> or TSP were below their respective AMCVs and would not be expected to cause long-term adverse human health or vegetation effects.
- Reported concentrations of hydrogen sulfide (H<sub>2</sub>S) collected at the El Paso Lower Valley monitor exceeded the state 30-min H<sub>2</sub>S standard 450 times (based upon rolling averages of 5 minute samples); it is likely that conditions would have been odorous at times. This area of El Paso is currently on the Air Pollutant Watch List (APWL0601) for H<sub>2</sub>S.

## 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 2015. 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 the monitoring sites. 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, 24-hour metals samples (PM<sub>2.5</sub> or TSP), 24-hour carbonyl samples, 24-hour PAH samples, and 30 minute H<sub>2</sub>S rolling average 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: 84 VOCs from canister samples, 46 VOCs from autoGC, 17 carbonyls, 15 PM<sub>2.5</sub> metals and 2

TSP metals, 16 PAHs, and H<sub>2</sub>S. Table 2 summarizes the site data completeness, an objective that is met when there is 75 percent data return. In order to be able to evaluate 24-hour monitoring data more fully, TCEQ has developed 24-hour AMCVs for 1,3-butadiene, benzene, ethylene dichloride, acrolein, chromium, and formaldehyde. As such, 24-hour samples were compared to the available TCEQ 24-hour AMCVs.

As PM<sub>10</sub> and lead are a criteria pollutants, applicable PM<sub>10</sub> and lead levels (i.e., 24-hour values and rolling three-month averages, respectively) were compared to the appropriate comparison values (i.e., 150 ug/m<sup>3</sup> and 0.15 µg/m<sup>3</sup>, respectively); however, annual average lead concentrations were also evaluated since they are more representative of long-term lead exposure from a health perspective.

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 (collected via autoGC and canister samples), were compared to their respective long-term AMCVs. Additional information regarding the derivation and application of AMCVs is available [online](#).

The El Paso Lower Valley monitor measures ambient concentrations of H<sub>2</sub>S and elevated levels of this chemical have been reported annually at this monitoring site since 2004. Further information regarding historical data collected at this monitoring site 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	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="#">250 Rim Road</a> (El Paso UTEP)	El Paso	48-141-0037	Lead (TSP)
<a href="#">8470 Plant Rd</a> (El Paso Lower Valley)	El Paso	48-141-0054	H <sub>2</sub> S
<a href="#">6767 Ojo De Agua</a> (Ojo De Agua)	El Paso	48-141-1021	Lead (TSP)
<a href="#">320 Old Hueco Tanks Road</a> (Socorro Hueco)	El Paso	48-141-0057	VOCs <sup>a</sup> , PAHs
<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?
Ascarate Park SE	Carbonyl	Yes
Ascarate Park SE	Lead and Arsenic (TSP)	Yes
El Paso Chamizal	VOCs <sup>b</sup>	No*
El Paso Chamizal	Metals (PM <sub>2.5</sub> )	Yes
El Paso Lower Valley	H <sub>2</sub> S	Yes
El Paso UTEP	Lead (TSP)	No
Ojo De Agua	Lead (TSP)	No
Socorro Hueco	VOCs <sup>a</sup>	Yes
Womble	VOCs <sup>a</sup>	Yes

- <sup>a</sup> 24-hour canister only; <sup>b</sup> one-hour autoGC
- Specific compounds did not meet data completeness goals: 1,2,3-trimethylbenzene, 1, 3, 4-trimethylbenzene, 1,3,5-trimethylbenzene, n-decane, isoprene, and acetylene

## Evaluation

### VOCs

Hourly average concentrations of the 46 VOCs collected at the Chamizal autoGC monitoring site 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 and ethylene dichloride were below their 24-hour AMCVs and would not be expected to cause adverse health effects.

The 2015 annual average concentrations for all 84 VOCs collected as 24-hour canister samples at the Socorro Hueco 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. Thus, 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 long-term AMCVs and would not be expected to cause adverse human health effects. Likewise, 24-h concentrations of acrolein and formaldehyde were below their respective 24-h AMCVs, indicating that the measured 24-h concentrations would not be of concern to human health.

## **Metals**

Reported annual average concentrations for all 15 metals (PM<sub>2.5</sub>) measured at the Chamizal monitoring site were below their respective long-term AMCVs and would not be considered of concern to human health. All chromium (PM<sub>2.5</sub>) levels were below their 24-h AMCV and would not be of concern to human health at this site. In the case of lead (TSP), reported concentrations collected at the Ascarate Park SE site were below the applicable 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.

The lead data (TSP or PM<sub>2.5</sub>) collected at Ojo De Agua and El Paso UTEP monitoring sites were subjected to re-analysis for quality control reasons. After re-analysis data will be evaluated and this memo will be updated via an additional appendix to address the findings of this analysis.

## **PAHs**

The reported annual average concentrations for the 16 PAHs reported at the Socorro Hueco monitoring site in 2015 were well below their long-term AMCVs and would not be expected to cause adverse human health effects.

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

Of the H<sub>2</sub>S samples collected at the El Paso Lower Valley site, 450 30-minute rolling averages exceeded the state regulatory standard for H<sub>2</sub>S in 2015 (80.1-512.5 ppb). The measured levels of H<sub>2</sub>S were likely odorous at times given that the odor threshold for H<sub>2</sub>S is [0.5 to 300 ppb](#). It appears that the majority of these exceedances occurred during the months of December and November, indicating that possible meteorological conditions or operations at the facility that is the source of these emissions were such that the number of exceedances of the state standard was higher in that particular month than any other. Overall, the exceedances of the state regulatory standard do not represent an immediate threat to human health or wellness.

### **El Paso Lower Valley APWL0601 Area for Hydrogen Disulfide (H<sub>2</sub>S)**

The data at the El Paso Lower Valley H<sub>2</sub>S monitor met data completeness objectives, and in 2015, 450 exceedances of the 30-min H<sub>2</sub>S state standard (80 ppb) were reported. Concentrations above the state standard as described above would be likely odorous to the public. While these exceedances do not represent an immediate threat to human health, they may cause impacts on the public by creating odorous conditions. It is our understanding that the primary source of H<sub>2</sub>S detections is a wastewater treatment plant located in the Ciudad Juarez, making remedial or

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enforcement actions complex for many reasons. The TD encourages H<sub>2</sub>S reductions in the area, if possible.

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).

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

**List 3. Target Metal Analytes**

Aluminum (PM<sub>2.5</sub>)  
Antimony (PM<sub>2.5</sub>)  
Arsenic (PM<sub>2.5</sub>)  
Barium (PM<sub>2.5</sub>)  
Cadmium (PM<sub>2.5</sub>)

Chromium (PM<sub>2.5</sub>)  
Cobalt (PM<sub>2.5</sub>)  
Copper (PM<sub>2.5</sub>)  
Lead (PM<sub>2.5</sub> or TSP)  
Manganese (PM<sub>2.5</sub>)

Molybdenum (PM<sub>2.5</sub>)  
Nickel (PM<sub>2.5</sub>)  
Selenium (PM<sub>2.5</sub>)  
Tin (PM<sub>2.5</sub>)  
Zinc (PM<sub>2.5</sub>)

#### List 4. Target PAH Analytes

Acenaphthene  
Acenaphthylene  
Anthracene  
Benzo (a) anthracene  
Benzo (a) pyrene  
Benzo (b) fluoranthene

Benzo (ghi) perylene  
Benzo (k) fluoranthene  
Chrysene  
Dibenzo (a,h) anthracene  
Fluoranthene  
Fluorene

Indeno (1,2,3-cd) pyrene  
Naphthalene  
Phenanthrene  
Pyrene

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

1-Butene  
1-Pentene  
1,2,3-Trimethylbenzene  
1,2,4-Trimethylbenzene  
1,3-Butadiene  
1,3,5-Trimethylbenzene  
2-Methylheptane  
2-Methylhexane  
2,2-Dimethylbutane  
2,2,4-Trimethylpentane  
2,3-Dimethylpentane  
2,3,4-Trimethylpentane  
2,4-Dimethylpentane  
3-Methylheptane  
3-Methylhexane  
Acetylene

Benzene  
c-2-Butene  
c-2-Pentene  
Cyclohexane  
Cyclopentane  
Ethane  
Ethyl Benzene  
Ethylene  
Isobutane  
Isopentane  
Isoprene  
Isopropyl Benzene - Cumene  
Methylcyclohexane  
Methylcyclopentane  
n-Butane  
n-Decane

n-Heptane  
n-Hexane  
n-Nonane  
n-Octane  
n-Pentane  
n-Propylbenzene  
o-Xylene  
p-Xylene + m-Xylene  
Propane  
Propylene  
Styrene  
t-2-Butene  
t-2-Pentene  
Toluene