

# TCEQ Interoffice Memorandum

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**To:** Brad Jones, Regional Director  
Jim McWilliams, Air Section Manager  
Randy Ammons, Area Director

**From:** Shannon Ethridge, M.S., D.A.B.T. *SE*  
Toxicology Division, Office of the Executive Director

**Date:** July 21, 2014

**Subject:** Toxicological Evaluation of 2013 Ambient Air Monitoring Data for Volatile Organic Compounds, Respirable Particulate Matter, and Lead in Region 1, Amarillo

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## Conclusions

- Annual average concentrations of all reported volatile organic compound (VOCs) were below their long-term air monitoring comparison values (AMCVs) and would not be expected to cause adverse health effects or odors.
- Twenty-four hour concentrations of benzene and 1,3-butadiene were below their 24-hour AMCVs and would not be expected to cause adverse health effects.
- With the exception of two samples, 24-hour concentrations of respirable particulate matter (PM<sub>10</sub>) were below the comparison value of 150 µg/m<sup>3</sup>.
- Twenty-four hour concentrations of lead, reported as total suspended particulate (TSP), were below the comparison value of 0.15 µg/m<sup>3</sup>.

## Background

Ambient air sampling data collected at three monitoring sites in Region 1-Amarillo during 2013 were evaluated by the Toxicology Division (TD). Table 1 indicates the location and monitored compounds at three monitoring sites in Region 1. One event-triggered monitoring site is located in Region 1 but didn't collect samples in 2013 (Table 1). Hyperlinks are provided in Table 1 for more detailed information on each monitoring site. The TD reviewed air monitoring summary results for VOCs and metals data from 24-hour TSP and PM<sub>10</sub> samples collected every sixth day. For a complete list of all examined chemicals, please see Lists 1 and 2 in Attachment A. Air monitors associated with the Pantex facility are not TCEQ network monitors and the TD receives data collected from these monitors in the form of Request Reports. Request Report Numbers for samples that were reviewed in this evaluation are listed in Table 2 in Attachment A.

The TCEQ Monitoring Division reported the data for all chemicals evaluated in this memorandum. From January 2013 through December 2013, 23 valid 24-hour samples for PM<sub>10</sub> and 23 valid 24-hour samples for VOCs were collected at the Pantex 4 monitoring site located predominantly upwind of the burning grounds. During this same time period, 23 valid 24-hour samples for PM<sub>10</sub> and 13 valid 24-hour samples for VOCs were collected at the Pantex 5/5Q monitoring site located predominantly downwind of the burning grounds. An additional 10 quality assurance samples for PM<sub>10</sub> and 17 quality assurance samples for VOCs were collected at the Pantex 5/5Q downwind monitoring site. One additional VOC monitoring site, Pantex Site 7, can collect event-triggered, one-hour VOC samples; however, no samples were collected at Site 7 during 2013. Results for PM<sub>10</sub> were reported in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ), and results for VOCs were reported in parts per billion by volume (ppb<sub>v</sub>). The 24-hour PM<sub>10</sub> and VOC results were assumed to represent average or above-average ambient conditions based on sampling practices.

TSP data collected at the Amarillo SH136 monitor did not meet the TCEQ data completeness objective of 75% data return. A total of 37 valid 24-hour samples for TSP were collected in 2013, and analyzed for lead.

## Evaluation

In order to be able to evaluate 24-hour monitoring data more fully, TCEQ has developed 24-hour AMCVs for 1,3-butadiene and benzene. As such, 24-hour samples were compared to the available TCEQ 24-hour AMCVs for these two chemicals. Because short-term or peak concentrations are not necessarily captured by 24-hour samples, daily concentrations have limited use in evaluating the potential for acute health effects. The TD evaluated the reported annual average concentrations from 24-hour samples for each target analyte for potential chronic health and vegetation concerns by comparing measured chemical concentrations to long-term AMCVs. Measured PM<sub>10</sub> concentrations were compared to the level of the 24-hour PM<sub>10</sub> NAAQS (i.e., 150  $\mu\text{g}/\text{m}^3$ ). Measured TSP lead levels were compared to the level of the lead NAAQS (i.e., rolling three month average of 0.15  $\mu\text{g}/\text{m}^3$ ). This memorandum evaluates air monitoring data on a chemical-by-chemical basis.

More information about AMCVs is available online at:  
<http://www.tceq.state.tx.us/implementation/tox/AirToxics.html#amcv>.

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

Site Name	Site Location	EPA Site ID	Monitored Compounds
<a href="#">Pantex 4</a>	SW of FM 293 and FM 2373 Intersection	48-065-0004	24-hour VOCs and PM <sub>10</sub>

Site Name	Site Location	EPA Site ID	Monitored Compounds
<a href="#">Pantex 5/5Q</a>	W of FM 293 and 2373 Intersection	48-065-0005	24-hour VOCs and PM <sub>10</sub>
<a href="#">Pantex 7</a>	Masterson Pump Station	48-065-0007	1-hour VOCs (event-triggered)  <b>*No samples were collected at Site 7 during 2013</b>
<a href="#">Amarillo SH136</a>	7100 State Highway 136	48-375-0024	24-hour TSP (Lead)

### VOCs

No one-hour VOC samples were collected at Pantex Site 7 during 2013. 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. Of the 84 target VOCs detected, concentrations were well below their respective long-term AMCVs, and would not be expected to cause chronic adverse health or vegetation effects.

### Lead (TSP)

Lead was only detected in one out of 37, 24-hour TSP metals samples and the detected level was below a level of health concern.

### PM<sub>10</sub>

The sample concentrations of 325 µg/m<sup>3</sup> and 272 µg/m<sup>3</sup> collected at Pantex Sites 5 and 5Q on May 1, 2013, respectively, both exceeded the 24-hour PM<sub>10</sub> comparison value of 150 µg/m<sup>3</sup>. All other 24-hour PM<sub>10</sub> concentrations were below this comparison value.

If you have any questions regarding the contents of this review, please do not hesitate to contact me at 512-239-1822 or via email at [Shannon.Ethridge@tceq.texas.gov](mailto:Shannon.Ethridge@tceq.texas.gov).

cc (via email):

Casso, Ruben- EPA Region 6, Dallas  
Beauchamp, Richard- Department of State Health Services  
Bradford, Carrie -Department of State Health Services

**Attachment A**

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

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

**List 2. Target Metal Analytes**

Lead (TSP)	PM <sub>10</sub>
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**Table 2. Request Report Numbers for 24-hour VOC Canister and PM<sub>10</sub> Samples Collected from January 2013 through December 2013 at the DOE Pantex Facility**

Request Report Number	Sample Date	Pantex Site(s) Name	Analytes
1302022	1/17/2013	4, 5, 5Q	VOC
1302023	1/17/2013	4, 5, 5Q	PM <sub>10</sub>
1303013	2/20/2013	4, 5	PM <sub>10</sub>
1303020	2/20/2013	4, 5	VOC
1303034	3/7/2013	4, 5, 5Q	VOC
1303035	3/7/2013	4, 5, 5Q	PM <sub>10</sub>
1303044	3/12/2013	4, 5, 5Q	VOC
1303050	3/12/2013	4, 5	PM <sub>10</sub>
1304001	3/21/2013	4, 5	PM <sub>10</sub>
1304003	3/21/2013	4, 5	VOC
1304017	4/10/2013	4, 5, 5Q	PM <sub>10</sub>
1304018	4/10/2013	4, 5, 5Q	VOC
1305016	4/25/2013	4, 5	VOC
1305017	4/25/2013	4, 5	PM <sub>10</sub>
1305020	5/1/2013	4, 5, 5Q	PM <sub>10</sub>
1305021	5/1/2013	4, 5, 5Q	VOC
1305026	5/8/2013	4, 5Q	VOC
1305027	5/8/2013	4, 5	PM <sub>10</sub>
1306023	5/23/2013	4	VOC
1306024	5/23/2013	4, 5	PM <sub>10</sub>

1306025	5/30/2013	4	VOC
1306028	5/30/2013	4, 5	PM <sub>10</sub>
1306030	5/30/2013	4, 5Q	VOC
1306035	6/6/2013	4, 5	PM <sub>10</sub>
1307004	6/10/2013	4, 5Q	VOC
1307005	6/10/2013	4, 5	PM <sub>10</sub>
1307006	6/24/2013	4, 5, 5Q	PM <sub>10</sub>
1307016	6/24/2013	4, 5, 5Q	VOC
1308002	7/2/2013	4, 5, 5Q	PM <sub>10</sub>
1308003	7/2/2013	4, 5, 5Q	VOC
1308028	8/5/2013	4, 5, 5Q	PM <sub>10</sub>
1308034	8/20/2013	4, 5, 5Q	VOC
1308038	8/20/2013	4, 5, 5Q	PM <sub>10</sub>
1309028	9/19/2013	4, 5, 5Q	VOC
1310001	9/19/2013	4, 5, 5Q	PM <sub>10</sub>
1310043	9/26/2013	4, 5	VOC
1310046	9/26/2013	4, 5	PM <sub>10</sub>
1311006	10/9/2013	4, 5Q	VOC
1311007	10/9/2013	4, 5, 5Q	PM <sub>10</sub>
1311034	11/14/2013	4, 5Q	VOC
1312002	11/14/2013	4, 5	PM <sub>10</sub>
1312010	11/20/2013	4, 5Q	VOC

1312012	11/20/2013	4, 5	PM <sub>10</sub>
1312021	12/3/2013	4, 5Q	VOC
1312023	12/3/2013	4, 5	PM <sub>10</sub>
1401015	12/11/2013	4, 5Q	VOC
1401016	12/11/2013	4, 5, 5Q	PM <sub>10</sub>