

# TCEQ Interoffice Memorandum

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**To:** Eddy Vance, Regional Director, R1  
Guy Wilkins, Water/Pantex Manager, R1

**From:** Angela Curry, MS *AC*  
Toxicology, Risk Assessment, and Research Division  
Office of the Executive Director

**Date:** March 7, 2022

**Subject:** Toxicological Evaluation of 2020 Ambient Air Network and Department of Energy (DOE) Pantex Facility Volatile Organic Compound (VOC) Monitoring Data in Region 1, Amarillo

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## Conclusions

- All 24-hour and annual average concentrations of reported volatile organic compound (VOCs) were below their respective air monitoring comparison values (AMCVs) and would not be expected to cause adverse health effects.

## Background

The Texas Commission on Environmental Quality (TCEQ) Monitoring Division in conjunction with the TCEQ Region 1-Amarillo staff conducts air monitoring at the Department of Energy (DOE) Pantex Facility, Amarillo, for VOCs. Currently, there are three Pantex-related air monitors in Region 1, two monitors on-site, and one off-site. Air samples collected at the two monitors on-site at Pantex are not representative of ambient air. This memorandum evaluates air monitoring data on a chemical-by-chemical basis. Information about the monitoring sites is presented in Table 1.

Two samples were collected at Pantex Site 5 from January 2020 through December 2020. No samples were collected at the Pantex 4 monitoring site during 2020 since this site is located next to a Pantex firing station which underwent a major electrical overhaul (which began sometime in 2018) and power to the site was shut off. The Pantex 5 monitoring site is located predominantly downwind of the Pantex burning grounds. One additional VOC monitoring site, Pantex Site 7, collects event-triggered one-hour VOC samples; no samples were collected from Pantex Site 7 in 2020. The sampling schedule goal for Pantex 4 and 5 is to collect 25 samples over the course of the year. Annual averages can be calculated if there are at least 19 samples, which would meet 75% completeness.

Results for VOCs were reported in parts per billion by volume (ppb<sub>v</sub>). The specific VOCs evaluated are listed in Attachment A. The Request Report number for samples that were

reviewed in this evaluation are listed in Table 2 in Attachment A. VOC samples collected at all Pantex-related sites are typically collected during an emission event or other triggered event and are believed to represent worst-case conditions. The number of samples collected in 2020 is less than what the TCEQ considers a minimum number of samples required to meet data completeness objectives in order to calculate an accurate and representative annual average concentration; however, since sample concentrations are believed to represent worst-case conditions, annual average concentrations based on these 24-hour samples are calculated for each chemical using available data and are assumed to be representative of the year and are conservatively biased high.

In order to evaluate 24-hour monitoring data more fully, TCEQ has developed 24-hour AMCVs for 1,3-butadiene; 2,2-dimethylbutane; 2,3-dimethylbutane; 2-methylpentane; 3-methylpentane; benzene; ethylene dibromide; ethylene dichloride; and n-hexane. As such, 24-hour samples were compared to the available TCEQ 24-hour AMCVs for these 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.

More information about AMCVs is available online at:

<http://www.tceq.texas.gov/toxicology/AirToxics.html#amcv>.

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

City and Site Location	County	EPA Site ID	Monitored Compounds
<a href="#">Pantex 4</a> , SW of FM 293 and FM 2373 Intersection	Carson	480650004	24-hour VOCs
<a href="#">Pantex 5</a> , W of FM 293 and 2373 Intersection	Carson	480650005	24-hour VOCs
<a href="#">Pantex 7</a> , Masterson Pump Station	Carson	480650007	1-hour VOCs (event triggered)

## Evaluation

### Short-Term Data

Two 24-hour samples were collected at Pantex Site 5 from January 2020 through December 2020. Table 2 (in Attachment A) lists the Request Report numbers for VOC samples received from January 2020 through December 2020 from the Pantex Site 5. All 24-hour VOC

Eddy Vance, et al.

March 7, 2022

Page 3 of 5

concentrations were below their respective short-term AMCVs and would not be expected to cause short-term adverse health effects or odors.

### **Long-Term Data**

The calculated annual average of the 24-hour VOC results was assumed to represent average or above-average conditions based on sampling practices as discussed above. The calculated annual average concentrations of all VOCs were well below their respective long-term AMCVs. Adverse health effects would not be expected to occur from exposure to the monitored levels of VOCs.

If you have any questions regarding the contents of this review, please do not hesitate to contact me via email at [angela.curry@tceq.texas.gov](mailto:angela.curry@tceq.texas.gov).

## Attachment A

### Target VOC Analytes in Canister Samples

1,1,1-trichloroethane	4-methyl-1-pentene	methylene chloride
1,1,2,2-tetrachloroethane	acetylene	m-ethyltoluene
1,1,2-trichloroethane	benzene	n-butane
1,1-dichloroethane	bromomethane	n-decane
1,1-dichloroethylene	carbon tetrachloride	n-heptane
1,2,3-trimethylbenzene	chlorobenzene	n-hexane
1,2,4-trimethylbenzene	chloroform	n-nonane
1,2-dichloropropane	chloromethane	n-octane
1,3,5-trimethylbenzene	cis-1,3-dichloropropylene	n-pentane
1,3-butadiene	cis-2-butene	n-propylbenzene
1-butene	cis-2-hexene	n-undecane
1-hexene and 2-methyl-1-pentene	cis-2-pentene	o-ethyltoluene
1-pentene	cumene	o-xylene
2,2,4-trimethylpentane	cyclohexane	p-diethylbenzene
2,2-dimethylbutane	cyclopentane	p-ethyltoluene
2,3,4-trimethylpentane	cyclopentene	propane
2,3-dimethylbutane	dichlorodifluoromethane	propylene
2,3-dimethylpentane	ethane	styrene
2,4-dimethylpentane	ethylbenzene	tetrachloroethylene
2-chloropentane	ethylene	toluene
2-methyl-2-butene	ethylene dibromide	trans-1,3-dichloropropylene
2-methylheptane	ethylene dichloride	trans-2-butene
2-methylhexane	isobutane	trans-2-hexene
2-methylpentane	isopentane	trans-2-pentene
3-methyl-1-butene	isoprene	trichloroethylene
3-methylheptane	m/p-xylene	trichlorofluoromethane
3-methylhexane	m-diethylbenzene	vinyl chloride
3-methylpentane	methylcyclohexane	
	methylcyclopentane	

**Table 2. Request Report Numbers for 24-hour and 1 hour VOC Canister Samples Collected from January 2020 through December 2020 at Pantex Site 5.**

<b>Request Report Number</b>	<b>Sample Date</b>	<b>Pantex Site Names</b>
2002006	1/31/2020	5
2002007	1/23/2020	5