

TCEQ Interoffice Memorandum

To: Brad Jones, Regional Director, R1
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From: Shannon Ethridge, MS, DABT *SE.*
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Date: July 22, 2015

Subject: Health Effects Review of 2014 Ambient Air Network Monitoring Data for Lead and 2014 Ambient Air Monitoring Data for Volatile Organic Compounds, Department of Energy (DOE) Pantex Facility, TCEQ Region 1, Amarillo

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 VOC concentrations of benzene and 1,3-butadiene were below their 24-hour AMCVs and would not be expected to cause adverse health effects.
- Rolling 3-month average and annual average concentrations of lead measured as total suspended particulate (TSP) were below the appropriate health comparison value and would not be expected to cause chronic adverse health effects.

Background

The Texas Commission on Environmental Quality (TCEQ) Monitoring Division in conjunction with the TCEQ Region 1-Amarillo staff conducts ambient air monitoring at the Department of Energy (DOE) Pantex Facility, Amarillo, for VOCs. Currently, there are three Pantex-related air monitors in Region 1. In addition to Pantex-related air monitors, the TCEQ conducts ambient air monitoring at one lead TSP monitor in Region 1. This memorandum evaluates air monitoring data on a chemical-by-chemical basis.

From January 2014 through December 2014, 25 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, 20 24-hour samples for VOCs were collected at the Pantex 5/5Q monitoring site located predominantly downwind of the Pantex burning grounds. An additional eight 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; eleven samples were collected at Site 7 during 2014. Results for VOCs were reported in parts per billion by volume (ppb_v). Information about the monitoring sites is presented in Table 1. The specific VOCs evaluated are listed in List 1 in Attachment A. The Request Report numbers for samples that were reviewed in this evaluation are listed in Table 2 in Attachment A. VOC samples collected at Pantex-related monitors are typically collected during

an emission event or other triggered event and are believed to represent worst-case conditions. The number of samples collected at each monitor 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 24-hour VOC concentrations are calculated for each chemical using available data and annual average VOC concentrations are assumed to be representative of the year or conservatively biased high.

In addition to the Pantex-related VOC air monitors, one lead TSP air monitor is located in Region 1. Results for TSP were reported in $\mu\text{g}/\text{m}^3$.

In order 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.

More information about AMCVs is available online at:
<http://www.tceq.texas.gov/toxicology/AirToxics.html#amcv>.

As lead is a criteria pollutant, applicable lead TSP levels (i.e., rolling three-month averages) were compared to the appropriate comparison values (i.e., $0.15 \mu\text{g}/\text{m}^3$); however, annual average lead TSP concentrations were also evaluated since they are more representative of long-term lead exposure from a health perspective.

Table 1. Monitoring Sites Located in TCEQ Region 1

City and Site Location	County	EPA Site ID	Monitored Compounds
Pantex 4 , SW of FM 293 and FM 2373 Intersection	Carson	480650004	24-hour VOCs
Pantex 5/5Q , W of FM 293 and 2373 Intersection	Carson	480650005	24-hour VOCs
Pantex 7 , Masterson Pump Station	Carson	480650007	1-hour VOCs (event-triggered)
Amarillo SH 136 , 7100 State Highway 136	Potter	483750024	Lead (TSP)

Evaluation

Short-Term Data

Eleven one-hour VOC samples were collected at Site 7 during 2014, and all VOC concentrations were below their one-hour AMCVs and would not be expected to cause adverse health effects. Twenty-four hour VOC concentrations of benzene and 1,3-butadiene measured at all sites were below their 24-hour AMCVs and would not be expected to cause adverse health effects.

Long-Term Data

All reported analytical limits were adequate to evaluate 24-hour VOC concentrations from a health effects perspective. The 24-hour VOC results were assumed to represent average or above-average ambient conditions based on sampling practices as discussed above. The reported 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.

Lead

On November 12, 2008, the U.S. Environmental Protection Agency (EPA) finalized the $0.15 \mu\text{g}/\text{m}^3$ NAAQS for lead based on a rolling three-month average concentration (73 Federal Register 66964). In general, the rule requires source-oriented ambient air lead monitoring at sites with actual annual lead emissions of one or more tons per year. In December of 2014, the rolling three-month average of lead TSP at the Amarillo SH 136 monitor was reported as $0.002 \mu\text{g}/\text{m}^3$, which is well below the $0.15 \mu\text{g}/\text{m}^3$ comparison value for lead. The annual average lead concentration, which is more representative of long-term exposure, was also below the 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.

Attachment A

List 1. Target VOC Analytes in Canister Samples

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

List 2. Target Metal Analyte

Lead (TSP)

Table 2. Request Report Numbers for 24-hour VOC Canister Samples Collected from January 2014 through December 2014 at the DOE Pantex Facility

Request Report Number	Sample Date	Pantex Site Names
1402003	1/14/2014	4, 5Q
1403003	2/13/2014	4, 5Q
1403009	2/20/2014	4, 5Q
1403012	2/24/2014	4, 5Q
1404019	3/31/2014	4, 5, 5Q
1404021	4/14/2014	4, 5, 5Q
1405004	4/21/2014	4, 5
1405020	4/28/2014	4, 5
1405030	5/7/2014	4, 5
1406001	5/15/2014	4, 5
1406017	5/22/2014	4, 5, 5Q
1406019	5/29/2014	4, 5
1407021	6/12/2014	4, 5
1407028	7/1/2014	4, 5
1408008	7/24/2014	4, 5, 5Q
1408015	7/31/2014	4, 5
1408023	8/12/2014	4, 5
1409014	8/29/2014	4, 5
1409021	9/17/2014	4, 5
1409022	8/31/2014	7

1410002	9/25/2014	4, 5
1410003	9/15/2014	7
1410016	9/24/2014	7
1411007	10/12/2014	7
1411022	10/27/2014	4, 5
1412005	11/10/2014	4, 5
1412006	11/15/2014	7
1412010	11/20/2014	4
1412011	11/18/2014	7
1412020	12/2/2014	7
1412021	12/4/2014	4, 5
1501002	12/11/2014	4, 5