

TCEQ Interoffice Memorandum

To: Kathryn Saucedo
Director, TCEQ Region 10, Beaumont

From: Tracie Phillips, PhD *TP*
Toxicology Division, Office of the Executive Director

Date: October 5, 2017

Subject: Toxicological Evaluation of Results from an Ambient Air Sample for Volatile Organic Compounds Collected near the KMTEX Facility (Latitude 29.82685, Longitude -93.961983) in Port Arthur, Jefferson County, Texas

Sample Collected on September 12, 2017, Request Number 1709007 (Lab Sample 1709007-001)

Key Points

- Reported concentrations of target volatile organic compounds (VOCs) were either not detected or were detected below levels of short-term health and/or welfare concern.

Background

Citizen Collected Evidence

On September 9, 2017, a private company, Entanglement Technologies, Inc. (Entanglement), in partnership with the Environmental Defense Fund, conducted post-Hurricane Harvey mobile and static sampling in the Port Arthur area. Two 60-second static samples collected just outside the KMTEX Port Arthur Facility property line (to the west-southwest of the facility) by Entanglement measured benzene concentrations of 77 and 62 ppb, with winds from the north-northeast at 5 mph. Once TCEQ became aware of these data, management requested a Regional investigation. As part of the investigation, the Regional investigator collected a 30-minute canister sample on September 12, 2017 (as described below).

It is important to note that there are typically two types of ambient air data collected: (1) grab samples and (2) time-integrated samples. Grab samples provide data that are used for source identification. The short nature of the sample (generally with a duration measured in seconds), in conjunction with meteorological data, aids in the identification of potential sources of a contaminant plume. Time-integrated samples provide data that can be used not only for source identification, but also for health effects evaluations. This method allows for a sample to be collected over a longer period of time (generally with a duration of 30 minutes or greater). A longer sample duration provides data that are sufficiently similar to the durations used to derive safe levels, such as AMCVs, for comparison.

The Entanglement data are classified as grab samples since their duration was 60-seconds. While these samples cannot be reliably used in human health assessment, they are useful for attempting

October 5, 2017

to identify any potential sources of pollutants. As a result of these data, the TCEQ collected a 30-minute time-integrated sample in the same area, which allows for a health effects evaluation.

TCEQ Ambient Air Sample Collection

On September 12, 2017, a Texas Commission on Environmental Quality (TCEQ) Region 10 air investigator collected a 30-minute canister sample (Lab Sample 1709007-001) on a boat near the KMTEX Facility (Latitude 29.82685, Longitude -93.961983) in Port Arthur, Jefferson County, Texas. The investigators did not report any odors or health effects during sampling.

Meteorological conditions measured at the site or nearest stationary ambient air monitoring site indicated that the ambient temperature was 78.1°F with winds from the east-southeast at 3.9 miles per hour. The nearest residential property was approximately 2.19 miles north-northeast of the sampling site. The nearest possible emission source (a chemical manufacturing facility) was approximately 215.8 yards west-northwest of the sampling site. The sample was sent to the TCEQ laboratory in Austin, Texas, and analyzed for a range of VOCs. The list of the target analytes that were evaluated in this review is provided in Attachment A. The VOC concentrations were reported in parts per billion by volume (ppbv) (Attachment B and Tables 1). Please note that the available canister technology and analysis method cannot capture and/or analyze for all chemicals.

Results and Evaluation

Reported VOC concentrations were compared to TCEQ's short-term health- and/or welfare-based air monitoring comparison values (AMCVs) (Tables 1). Short-term AMCVs are guidelines used to evaluate ambient concentrations of a chemical in air and to determine its potential to result in adverse health effects, adverse vegetative effects, or odors. Health AMCVs are set to provide a margin of safety and are set well below levels at which adverse health effects are reported in the scientific literature. If a chemical concentration in ambient air is less than its comparison value, no adverse health effects are expected to occur. If a chemical concentration exceeds its comparison value it does not necessarily mean that adverse effects will occur, but rather that further evaluation is warranted.

All of the 84 VOCs analyzed in the canister sample were either not detected or were detected below their respective short-term AMCVs. Exposure to levels of VOCs measured in this sample would not be expected to cause short-term adverse health effects, adverse vegetative effects, or odors.

Benzene

Benzene was detected at a concentration of 18 ppb in the 30-minute canister sample, which is 10 times lower than the benzene 1-hour health-based AMCV of 180 ppb. While this level is elevated above typical background benzene concentrations, exposure to this level would not be expected to cause short-term adverse health or vegetation effects.

In the case of benzene, the TCEQ short-term AMCV is set to protect against adverse blood changes, which was the most sensitive critical effect observed in the scientific literature. Effects associated with this critical effect were observed at concentrations of 10,200 ppb benzene in mice exposed for 6 hours a day over the course of 6 days. Adjusting just one of the 6-hour exposures to a 1-hour exposure results in a human equivalent concentration of 18,500 ppb. To put this into perspective, the health-based 1-hour AMCV for benzene is approximately 103 times

Kathryn Saucedo

Page 3

October 5, 2017

lower than this level. In the context of hurricane damage, it is also noted that the 1-hour AMCV is approximately 290 times lower than the EPA 1-hour Acute Exposure Guideline Level (AEG) of 52,000 ppb for emergency situations. Acute, transient, exposures to elevated levels are not of a health concern, as long as they are not of sufficient duration and magnitude to produce adverse health effects.

Conclusions

Concentrations from the 30-minute canister sample were all well below their respective health-based AMCVs. Based on these data, we would not expect adverse effects to occur as a result of exposure to these concentrations.

Please call me at (512) 239-2269 you have any questions regarding this evaluation.

List of Target Analytes for Canister Samples

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

9/28/2017

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087, MC-165
Austin, Texas 78711-3087
(512) 239-1716

Laboratory Analysis Results

Request Number: 1709007

Request Lead: Frank Martinez

Region: T10

Date Received: 9/21/2017

Project(s): NA

Facility(ies) Sampled	City	County	Facility Type
KMTEX Facility	Port Arthur	Jefferson	

Sample(s) Received

Field ID Number: Sample 1

Laboratory Sample Number: 1709007-001

Sampled by: Tyler Toups

Sampling Site: South of KMTEX facility

Date & Time Sampled: 09/12/17 18:06:00 Valid Sample: Yes

Comments: Canister N0473 was used to collect a 30-minute sample using OFC-025.

Requested Laboratory Procedure(s):

Analysis: AP001VOC


Determination of VOCs in Canisters by GC/MS Using Modified Method TO-15

Please note that this analytical technique is not capable of measuring all compounds which might have adverse health effects. For questions on the analytical procedures please contact the laboratory manager at (512) 239-1716. For an update on the health effects evaluation of these data, please contact the Toxicology Division at (512) 239-1795.

Analyst: 

Aaron Bluhm

Date: 9/28/17

Laboratory Manager: 

Frank Martinez

Date: 9/28/17

Laboratory Analysis Results
Request Number: 1709007
Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1709007-001									
Field ID	Sample 1									
Canister ID	n0473									
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
ethane	8.0	1.0	2.4	9/26/2017	T,D1					
ethylene	5.7	1.0	2.4	9/26/2017	T,D1					
acetylene	ND	1.0	2.4	9/26/2017	T,D1					
propane	6.2	1.0	2.4	9/26/2017	T,D1					
propylene	3.2	1.0	2.4	9/26/2017	T,D1					
dichlorodifluoromethane	0.51	0.40	1.2	9/26/2017	L,D1					
methyl chloride	0.50	0.40	1.2	9/26/2017	L,D1					
isobutane	4.7	0.46	2.4	9/26/2017	D1					
vinyl chloride	ND	0.34	1.2	9/26/2017	D1					
1-butene	4.6	0.40	1.2	9/26/2017	D1					
1,3-butadiene	4.1	0.54	1.2	9/26/2017	D1					
n-butane	6.7	0.40	2.4	9/26/2017	D1					
1-2-butene	2.3	0.36	1.2	9/26/2017	D1					
bromomethane	ND	0.54	1.2	9/26/2017	D1					
c-2-butene	1.5	0.54	1.2	9/26/2017	D1					
3-methyl-1-butene	0.77	0.46	1.2	9/26/2017	L,D1					
isopentane	14	0.54	4.8	9/26/2017	D1					
trichlorofluoromethane	0.22	0.58	1.2	9/26/2017	J,D1					
1-pentene	3.0	0.54	1.2	9/26/2017	D1					
n-pentane	6.5	0.54	4.8	9/26/2017	D1					
isoprene	1.9	0.54	1.2	9/26/2017	D1					
1-2-pentene	2.5	0.54	2.4	9/26/2017	D1					
1,1-dichloroethylene	ND	0.36	1.2	9/26/2017	D1					
c-2-pentene	0.88	0.50	2.4	9/26/2017	L,D1					
methylene chloride	0.06	0.28	1.2	9/26/2017	J,D1					
2-methyl-2-butene	1.1	0.46	1.2	9/26/2017	L,D1					
2,2-dimethylbutane	0.64	0.42	1.2	9/26/2017	L,D1					
cyclopentene	1.8	0.40	1.2	9/26/2017	D1					
4-methyl-1-pentene	ND	0.44	2.4	9/26/2017	D1					
1,1-dichloroethane	ND	0.38	1.2	9/26/2017	D1					
cyclopentane	0.79	0.54	1.2	9/26/2017	L,D1					
2,3-dimethylbutane	0.87	0.56	2.4	9/26/2017	L,D1					
2-methylpentane	5.8	0.54	1.2	9/26/2017	D1					
3-methylpentane	4.4	0.46	1.2	9/26/2017	D1					
2-methyl-1-pentene + 1-hexene	4.9	0.40	4.8	9/26/2017	D1					
n-hexane	8.2	0.40	2.4	9/26/2017	D1					
chloroform	ND	0.42	1.2	9/26/2017	D1					
1-2-hexene	1.3	0.54	2.4	9/26/2017	L,D1					
c-2-hexene	0.69	0.54	2.4	9/26/2017	L,D1					
1,2-dichloroethane	ND	0.54	1.2	9/26/2017	D1					
methylcyclopentane	2.2	0.54	2.4	9/26/2017	L,D1					
2,4-dimethylpentane	0.13	0.54	2.4	9/26/2017	J,D1					
1,1,1-trichloroethane	0.01	0.52	1.2	9/26/2017	J,D1					
benzene	18	0.54	1.2	9/26/2017	D1					
carbon tetrachloride	0.09	0.54	1.2	9/26/2017	J,D1					
cyclohexane	4.7	0.48	1.2	9/26/2017	D1					
2-methylhexane	0.59	0.54	1.2	9/26/2017	L,D1					
2,3-dimethylpentane	0.18	0.52	1.2	9/26/2017	J,D1					

Laboratory Analysis Results
Request Number: 1709007
Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1709007-001					Conc.	SDL	SQL	Analysis Date	Flags**
	Compound	Conc.	SDL	SQL	Analysis Date					
	3-methylhexane	0.86	0.40	1.2	9/26/2017	L,DI				
	1,2-dichloropropane	0.01	0.34	1.2	9/26/2017	J,DI				
	trichloroethylene	ND	0.58	1.2	9/26/2017	D1				
	2,2,4-trimethylpentane	0.14	0.48	1.2	9/26/2017	J,DI				
	2-chloropentane	ND	0.54	1.2	9/26/2017	D1				
	n-heptane	0.67	0.50	2.4	9/26/2017	L,DI				
	c-1,3-dichloropropylene	ND	0.40	1.2	9/26/2017	D1				
	methylcyclohexane	ND	0.52	2.4	9/26/2017	D1				
	t-1,3-dichloropropylene	ND	0.40	1.2	9/26/2017	D1				
	1,1,2-trichloroethane	ND	0.42	1.2	9/26/2017	D1				
	2,3,4-trimethylpentane	0.04	0.48	2.4	9/26/2017	J,DI				
	toluene	6.6	0.54	1.2	9/26/2017	D1				
	2-methylheptane	0.18	0.40	2.4	9/26/2017	J,DI				
	3-methylheptane	0.20	0.46	2.4	9/26/2017	J,DI				
	1,2-dibromoethane	ND	0.40	1.2	9/26/2017	D1				
	n-octane	0.44	0.38	2.4	9/26/2017	L,DI				
	tetrachloroethylene	ND	0.48	1.2	9/26/2017	D1				
	chlorobenzene	ND	0.54	1.2	9/26/2017	D1				
	ethylbenzene	1.2	0.54	2.4	9/26/2017	L,DI				
	m & p-xylene	4.3	0.54	4.8	9/26/2017	L,DI				
	styrene	0.14	0.54	2.4	9/26/2017	J,DI				
	1,1,2,2-tetrachloroethane	ND	0.40	1.2	9/26/2017	D1				
	o-xylene	1.3	0.54	2.4	9/26/2017	L,DI				
	n-nonane	0.16	0.44	1.2	9/26/2017	J,DI				
	isopropylbenzene	0.10	0.48	1.2	9/26/2017	J,DI				
	n-propylbenzene	0.36	0.54	1.2	9/26/2017	J,DI				
	m-ethyltoluene	0.91	0.22	1.2	9/26/2017	L,DI				
	p-ethyltoluene	0.43	0.32	2.4	9/26/2017	L,DI				
	1,3,5-trimethylbenzene	0.35	0.50	2.4	9/26/2017	J,DI				
	o-ethyltoluene	0.33	0.26	2.4	9/26/2017	L,DI				
	1,2,4-trimethylbenzene	1.7	0.54	1.2	9/26/2017	D1				
	n-decane	ND	0.54	2.4	9/26/2017	D1				
	1,2,3-trimethylbenzene	0.35	0.54	1.2	9/26/2017	J,DI				
	m-diethylbenzene	ND	0.54	2.4	9/26/2017	D1				
	p-diethylbenzene	0.20	0.54	1.2	9/26/2017	J,DI				
	n-undecane	0.03	0.54	2.4	9/26/2017	J,DI				

Laboratory Analysis Results

Request Number: 1709007

Analysis Code: AP001VOC

Qualifier Notes:

ND - not detected
NQ - concentration can not be quantified due to possible interferences or coelutions.
SDL - Sample Detection Limit (Limit of Detection adjusted for dilutions).
SQL - Sample Quantitation Limit (Limit of Quantitation adjusted for dilution).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.
T - Data was not confirmed by a confirmational analysis. Compound and/or results is tentatively identified.
F - Established acceptance criteria was not met due to factors outside the laboratory's control.
H - Not all associated hold time specifications were met. Data may be biased.
C - Sample received with a missing or broken custody seal.
R - Sample received with a missing or incomplete chain of custody.
I - Sample received without a legible unique identifier.
G - Sample received in an improper container.
U - Sample received with insufficient sample volume.
W - Sample received with insufficient preservation.

Quality control notes for AP001VOC samples.

D1-Sample concentration was calculated using a dilution factor of 4.01.

TCEQ laboratory customer support may be reached at Frank.Martinez@tceq.texas.gov

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Table 1. Comparison of Monitored Concentrations in Lab Sample 1709007-001 to TCEQ Short-Term AMCVs

Lab Sample ID	1709007-001					
Compound	Odor AMCV (ppbv)	Short-Term Health AMCV (ppbv)	SQL (ppbv)	Concentrations (ppbv)	Flags	SDL (ppbv)
1,1,1-Trichloroethane	--	1,700	1.2	0.01	J,D1	0.52
1,1,2,2-Tetrachloroethane	--	10	1.2	ND	D1	0.4
1,1,2-Trichloroethane	--	100	1.2	ND	D1	0.42
1,1-Dichloroethane	--	1,000	1.2	ND	D1	0.38
1,1-Dichloroethylene	--	180	1.2	ND	D1	0.36
1,2,3-Trimethylbenzene	--	3000	1.2	0.35	J,D1	0.54
1,2,4-Trimethylbenzene	--	3000	1.2	1.7	D1	0.54
1,2-Dibromoethane	--	0.5	1.2	ND	D1	0.4
1,2-Dichloroethane	--	540	1.2	ND	D1	0.54
1,2-Dichloropropane	--	100	1.2	0.01	J,D1	0.34
1,3,5-Trimethylbenzene	--	3000	2.4	0.35	J,D1	0.5
1,3-Butadiene	230	1,700	1.2	4.1	D1	0.54
1-Butene	--	27,000	1.2	4.6	D1	0.4
1-Pentene	100	12,000	1.2	3	D1	0.54
2,2,4-Trimethylpentane	--	4,100	1.2	0.14	J,D1	0.48
2,2-Dimethylbutane (Neohexane)	--	5,400	1.2	0.64	L,D1	0.42
2,3,4-Trimethylpentane	--	4,100	2.4	0.04	J,D1	0.48
2,3-Dimethylbutane	--	5,400	2.4	0.87	L,D1	0.56
2,3-Dimethylpentane	--	8,300	1.2	0.18	J,D1	0.52
2,4-Dimethylpentane	--	8,300	2.4	0.13	J,D1	0.54
2-Chloropentane (as chloroethane)	--	240	1.2	ND	D1	0.54
2-Methyl-1-Pentene +1-Hexene	--	490	4.8	4.9	D1	0.4
2-Methyl-2-Butene	--	12,000	1.2	1.1	L,D1	0.46
2-Methylheptane	--	4,100	2.4	0.18	J,D1	0.4

Lab Sample ID		1709007-001				
Compound	Odor AMCV (ppb _v)	Short-Term Health AMCV (ppb _v)	SQL (ppb _v)	Concentrations (ppb _v)	Flags	SDL (ppb _v)
2-Methylhexane	--	8,300	1.2	0.59	L,D1	0.54
2-Methylpentane (Isohexane)	--	5,400	1.2	5.8	D1	0.54
3-Methyl-1-Butene	100	7,700	1.2	0.77	L,D1	0.46
3-Methylheptane	--	4,100	2.4	0.2	J,D1	0.46
3-Methylhexane	--	8,300	1.2	0.86	L,D1	0.4
3-Methylpentane	--	5,400	1.2	4.4	D1	0.46
4-Methyl-1-Pentene (as hexene)	--	490	2.4	ND	D1	0.44
Acetylene	--	25,000	2.4	ND	T,D1	1
Benzene	--	180	1.2	18	D1	0.54
Bromomethane (methyl bromide)	--	30	1.2	ND	D1	0.54
c-1,3-Dichloropropylene	--	9.9	1.2	ND	D1	0.4
c-2-Butene	--	15,000	1.2	1.5	D1	0.54
c-2-Hexene	--	490	2.4	0.69	L,D1	0.54
c-2-Pentene	--	12,000	2.4	0.88	L,D1	0.5
Carbon Tetrachloride	--	20	1.2	0.09	J,D1	0.54
Chlorobenzene (phenyl chloride)	--	100	1.2	ND	D1	0.54
Chloroform (trichloromethane)	--	20	1.2	ND	D1	0.42
Cyclohexane	--	1,000	1.2	4.7	D1	0.48
Cyclopentane	--	5,900	1.2	0.79	L,D1	0.54
Cyclopentene	--	2,900	1.2	1.8	D1	0.4
Dichlorodifluoromethane	--	10,000	1.2	0.51	L,D1	0.4
Ethane	--	*Simple Asphyxiant	2.4	8	T,D1	1
Ethylbenzene	--	20,000	2.4	1.2	L,D1	0.54
Ethylene	--	500,000	2.4	5.7	T,D1	1
Isobutane	--	33,000	2.4	4.7	D1	0.46

Lab Sample ID		1709007-001				
Compound	Odor AMCV (ppb _v)	Short-Term Health AMCV (ppb _v)	SQL (ppb _v)	Concentrations (ppb _v)	Flags	SDL (ppb _v)
Isopentane (2-methylbutane)	--	68,000	4.8	14	D1	0.54
Isoprene	47	20	1.2	1.9	D1	0.54
Isopropylbenzene (cumene)	130	510	1.2	0.1	J,D1	0.48
m & p-Xylene (as mixed isomers)	--	1,700	4.8	4.3	L,D1	0.54
m-Diethylbenzene	--	450	2.4	ND	D1	0.54
Methyl Chloride (chloromethane)	--	500	1.2	0.5	L,D1	0.4
Methylcyclohexane	--	4,000	2.4	ND	D1	0.52
Methylcyclopentane	--	750	2.4	2.2	L,D1	0.54
Methylene Chloride (dichloromethane)	--	3,400	1.2	0.06	J,D1	0.28
m-Ethyltoluene	--	250	1.2	0.91	L,D1	0.22
n-Butane	--	92,000	2.4	6.7	D1	0.4
n-Decane	--	1,000	2.4	ND	D1	0.54
n-Heptane	--	8,300	2.4	0.67	L,D1	0.5
n-Hexane	--	5,400	2.4	8.2	D1	0.4
n-Nonane	--	3,000	1.2	0.16	J,D1	0.44
n-Octane	--	4,100	2.4	0.44	L,D1	0.38
n-Pentane	--	68,000	4.8	6.5	D1	0.54
n-Propylbenzene	--	510	1.2	0.36	J,D1	0.54
n-Undecane	--	550	2.4	0.03	J,D1	0.54
o-Ethyltoluene	--	250	2.4	0.33	L,D1	0.26
o-Xylene	--	1,700	2.4	1.3	L,D1	0.54
p-Diethylbenzene	--	450	1.2	0.2	J,D1	0.54
p-Ethyltoluene	--	250	2.4	0.43	L,D1	0.32
Propane	--	*Simple Asphyxiant	2.4	6.2	T,D1	1
Propylene	--	*Simple Asphyxiant	2.4	3.2	T,D1	1

Lab Sample ID		1709007-001				
Compound	Odor AMCV (ppbv)	Short-Term Health AMCV (ppbv)	SQL (ppbv)	Concentrations (ppbv)	Flags	SDL (ppbv)
Styrene	26	5,200	2.4	0.14	J,D1	0.54
t-1,3-Dichloropropylene	--	9.9	1.2	ND	D1	0.4
t-2-Butene	--	15,000	1.2	2.3	D1	0.36
t-2-Hexene	--	490	2.4	1.3	L,D1	0.54
t-2-Pentene	--	12,000	2.4	2.5	D1	0.54
Tetrachloroethylene	--	1,000	1.2	ND	D1	0.48
Toluene	--	4,000	1.2	6.6	D1	0.54
Trichloroethylene	--	100	1.2	ND	D1	0.58
Trichlorofluoromethane	--	10,000	1.2	0.22	J,D1	0.58
Vinyl Chloride	--	27,000	1.2	ND	D1	0.34

*A simple asphyxiant displaces air, lowering the partial pressure of oxygen and causing hypoxia at sufficiently high concentrations.

ppbv - Parts per billion by volume.

ND - Not detected.

NQ - Concentration can not be quantified due to possible interferences or coelutions.

SDL - Sample Detection Limit (Limit of Detection adjusted for dilution).

SQL – Sample Quantitation Limit (Limit of Quantitation adjusted for dilution).

INV - Invalid.

J - Reported concentration is below SDL.

L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.

E - Reported concentration exceeds the upper limit of instrument calibration.

M - Result modified from previous result.

T - Data was not confirmed by a confirmational analysis. Data is tentatively identified.

F - Established acceptance criteria were not met due to factors outside the laboratory's control.

H – Not all associated hold time specifications were met. Data may be biased.

C - Sample received with a missing or broken custody seal.

R - Sample received with a missing or incomplete chain of custody.

Kathryn Saucedo

Page 13

October 5, 2017

I - Sample received without a legible unique identifier.

G - Sample received in an improper container.

U - Sample received with insufficient sample volume.

W - Sample received with insufficient preservation.

D1 - Sample concentration was calculated using a dilution factor of 4.01.

Table 2. TCEQ Long-Term Air Monitoring Comparison Values (AMCVs)

Please Note: The long-term AMCVs are provided for informational purposes only because it is scientifically inappropriate to compare short-term monitored values to the long-term AMCV.

Compound	Long-Term Health AMCV (ppb _v)	Compound	Long-Term Health AMCV (ppb _v)
1,1,1-Trichloroethane	930	Cyclopentane	590
1,1,2,2-Tetrachloroethane	1	Cyclopentene	290
1,1,2-Trichloroethane	10	Dichlorodifluoromethane	1,000
1,1-Dichloroethane	100	Ethane	*Simple Asphyxiant
1,1-Dichloroethylene	86	Ethylbenzene	440
1,2,3-Trimethylbenzene	37	Ethylene**	5,300
1,2,4-Trimethylbenzene	37	Isobutane	10,000
1,2-Dibromoethane	0.05	Isopentane (2-methylbutane)	8,100
1,2-Dichloroethane	0.72	Isoprene	2
1,2-Dichloropropane	10	Isopropylbenzene (cumene)	51
1,3,5-Trimethylbenzene	37	m & p-Xylene (as mixed isomers)	140
1,3-Butadiene	9	m-Diethylbenzene	45
1-Butene	2300	Methyl Chloride (chloromethane)	50
1-Pentene	560	Methylcyclohexane	400
2,2,4-Trimethylpentane	380	Methylcyclopentane	75
2,2-Dimethylbutane (Neohexane)	190	Methylene Chloride (dichloromethane)	100
2,3,4-Trimethylpentane	380	m-Ethyltoluene	25
2,3-Dimethylbutane	190	n-Butane	10,000
2,3-Dimethylpentane	2,200	n-Decane	190
2,4-Dimethylpentane	2,200	n-Heptane	2,200
2-Chloropentane (as chloroethane)	24	n-Hexane	190
2-Methyl-1-Pentene +1-Hexene	49	n-Nonane	280
2-Methyl-2-Butene	560	n-Octane	380

Compound	Long-Term Health AMCV (ppb _v)	Compound	Long-Term Health AMCV (ppb _v)
2-Methylheptane	380	n-Pentane	8,100
2-Methylhexane	2,200	n-Propylbenzene	51
2-Methylpentane (Isohexane)	190	n-Undecane	55
3-Methyl-1-Butene	770	o-Ethyltoluene	25
3-Methylheptane	380	o-Xylene	140
3-Methylhexane	2,200	p-Diethylbenzene	45
3-Methylpentane	190	p-Ethyltoluene	25
4-Methyl-1-Pentene (as hexene)	49	Propane	*Simple Asphyxiant
Acetylene	2,500	Propylene	*Simple Asphyxiant
Benzene	1.4	Styrene	110
Bromomethane (methyl bromide)	3	t-1,3-Dichloropropylene	0.99
c-1,3-Dichloropropylene	0.99	t-2-Butene	700
c-2-Butene	700	t-2-Hexene	49
c-2-Hexene	49	t-2-Pentene	560
c-2-Pentene	560	Tetrachloroethylene***	3.8
Carbon Tetrachloride	2	Toluene	1,100
Chlorobenzene (phenyl chloride)	10	Trichloroethylene	10
Chloroform (trichloromethane)	2	Trichlorofluoromethane	1,000
Cyclohexane	100	Vinyl Chloride	0.47

*A simple asphyxiant displaces air, lowering the partial pressure of oxygen and causing hypoxia at sufficiently high concentrations.

**Long-term vegetation AMCV for Ethylene is 30 ppb.

***Long-term vegetation AMCV for Tetrachloroethylene is 12 ppb.