TCEQ Interoffice Memorandum

To: Ashley Wadick
Director, TCEQ Region 12, Houston
Nicole Bealle
Special Assistant to the Regional Director, TCEQ Region 12, Houston

From: Heather Reddick Schaefer, DrPH HR
Toxicology Division, Office of the Executive Director

Date: September 14, 2017

Subject: Toxicological Evaluation of Results from Ambient Air Samples for Volatile Organic Compounds Collected near the Intersection of Manchester St. & 97th St. (Latitude 29.71835, Longitude - 95.25377) in Houston, Harris County, Texas

Samples Collected on September 6, 2017, Request Number 1709002 (Lab Samples 1709002-001 and 002)

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

On September 6, 2017, a Texas Commission on Environmental Quality (TCEQ) Region 12 air investigator collected two 30-minute canister samples (Lab Sample 1709002-001 and 002) near the intersection of Manchester St. and 97th St. (Latitude 29.71835, Longitude - 95.25377) in Houston, Harris County, Texas. The samples were collected based on information received from Hurricane Harvey reconnaissance efforts in the Manchester area. The investigator detected a very light to light gasoline odor but did not experience health effects while sampling. Meteorological conditions measured at the site or nearest stationary ambient air monitoring site indicated that the ambient temperature was 84°F with a relative humidity of 33%, and winds were from the northeast at 11.5 miles per hour. The nearest residential property was approximately 400 feet southwest of the sampling site. The nearest possible emission source (tanks) was approximately 170 feet northeast 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 and 2). 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 and 2). 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 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.

Please call me at (512) 239-0154 you have any questions regarding this evaluation.

Attachment A

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

Attachment B

9/11/2017

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: 1709002

Request Lead:Frank Martinez Region: T12 Date Received: 9/8/2017

Facility(ies) Sampled	City	County	Facility Type
Refining Plant	Houston	Harris	

Sample(s) Received

Field ID Number: N0506-20170906 Laboratory Sample Number: 1709002-001 Sampled by: Gabrielle Lamoreaux
Sampling Site: Near intersection of Manchester St. & 97th St. Date & Time Sampled: 09/06/17 17:48:00 Valid Sample: Yes
Comments: Canister N0506 was used to collect a 30-minute sample using OFC-187.

Field ID Number: N0538-20170906 Laboratory Sample Number: 1709002-002 Sampled by: Gabrielle Lamoreaux
Sampling Site: Near intersection of Manchester St. & 97th St. Date & Time Sampled: 09/06/17 17:54:00 Valid Sample: Yes
Comments: Canister N0538 was used to collect a 30-minute sample using OFC-088.

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: Jaydeep Patel Date: 09/11/17
Jaydeep Patel

Laboratory Manager: Frank Martinez Date: 9/11/17
Frank Martinez

Laboratory Analysis Results

Request Number: 1709002

Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1709002-001					1709002-002				
Field ID	N0506-20170906					N0538-20170906				
Canister ID	N0506					N0538				
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
ethane	2.4	1.0	2.4	9/9/2017	T,D1	2.4	1.0	2.4	9/9/2017	T,D2
ethylene	ND	1.0	2.4	9/9/2017	T,D1	ND	1.0	2.4	9/9/2017	T,D2
acetylene	ND	1.0	2.4	9/9/2017	T,D1	ND	1.0	2.4	9/9/2017	T,D2
propane	2.7	1.0	2.4	9/9/2017	T,D1	2.9	1.0	2.4	9/9/2017	T,D2
propylene	1.2	1.0	2.4	9/9/2017	L,T,D1	1.3	1.0	2.4	9/9/2017	L,T,D2
dichlorodifluoromethane	0.48	0.40	1.2	9/9/2017	L,D1	0.49	0.40	1.2	9/9/2017	L,D2
methyl chloride	0.45	0.40	1.2	9/9/2017	L,D1	0.45	0.40	1.2	9/9/2017	L,D2
isobutane	0.72	0.46	2.4	9/9/2017	L,D1	0.60	0.46	2.4	9/9/2017	L,D2
vinyl chloride	ND	0.34	1.2	9/9/2017	D1	ND	0.34	1.2	9/9/2017	D2
1-butene	0.25	0.40	1.2	9/9/2017	J,D1	ND	0.40	1.2	9/9/2017	D2
1,3-butadiene	ND	0.54	1.2	9/9/2017	D1	ND	0.54	1.2	9/9/2017	D2
n-butane	3.5	0.40	2.4	9/9/2017	D1	3.8	0.40	2.4	9/9/2017	D2
t-2-butene	0.29	0.36	1.2	9/9/2017	J,D1	0.32	0.36	1.2	9/9/2017	J,D2
bromomethane	ND	0.54	1.2	9/9/2017	D1	0.01	0.54	1.2	9/9/2017	J,D2
c-2-butene	ND	0.54	1.2	9/9/2017	D1	0.29	0.54	1.2	9/9/2017	J,D2
3-methyl-1-butene	ND	0.46	1.2	9/9/2017	D1	0.28	0.46	1.2	9/9/2017	J,D2
isopentane	20	0.54	4.8	9/9/2017	D1	22	0.54	4.8	9/9/2017	D2
trichlorofluoromethane	0.23	0.58	1.2	9/9/2017	J,D1	0.23	0.58	1.2	9/9/2017	J,D2
1-pentene	0.69	0.54	1.2	9/9/2017	L,D1	0.73	0.54	1.2	9/9/2017	L,D2
n-pentane	17	0.54	4.8	9/9/2017	D1	18	0.54	4.8	9/9/2017	D2
isoprene	0.45	0.54	1.2	9/9/2017	J,D1	0.47	0.54	1.2	9/9/2017	J,D2
t-2-pentene	2.6	0.54	2.4	9/9/2017	D1	2.6	0.54	2.4	9/9/2017	D2
1,1-dichloroethylene	ND	0.36	1.2	9/9/2017	D1	ND	0.36	1.2	9/9/2017	D2
c-2-pentene	1.0	0.50	2.4	9/9/2017	L,D1	1.1	0.50	2.4	9/9/2017	L,D2
methylene chloride	ND	0.28	1.2	9/9/2017	D1	ND	0.28	1.2	9/9/2017	D2
2-methyl-2-butene	4.3	0.46	1.2	9/9/2017	D1	4.5	0.46	1.2	9/9/2017	D2
2,2-dimethylbutane	0.33	0.42	1.2	9/9/2017	J,D1	0.34	0.42	1.2	9/9/2017	J,D2
cyclopentene	0.34	0.40	1.2	9/9/2017	J,D1	0.35	0.40	1.2	9/9/2017	J,D2
4-methyl-1-pentene	ND	0.44	2.4	9/9/2017	D1	ND	0.44	2.4	9/9/2017	D2
1,1-dichloroethane	ND	0.38	1.2	9/9/2017	D1	ND	0.38	1.2	9/9/2017	D2
cyclopentane	1.4	0.54	1.2	9/9/2017	D1	1.4	0.54	1.2	9/9/2017	D2
2,3-dimethylbutane	1.5	0.56	2.4	9/9/2017	L,D1	1.4	0.56	2.4	9/9/2017	L,D2
2-methylpentane	9.2	0.54	1.2	9/9/2017	D1	8.6	0.54	1.2	9/9/2017	D2
3-methylpentane	5.9	0.46	1.2	9/9/2017	D1	5.5	0.46	1.2	9/9/2017	D2
2-methyl-1-pentene + 1-hexene	0.53	0.40	4.8	9/9/2017	L,D1	0.50	0.40	4.8	9/9/2017	L,D2
n-hexane	10	0.40	2.4	9/9/2017	D1	9.4	0.40	2.4	9/9/2017	D2
chloroform	ND	0.42	1.2	9/9/2017	D1	ND	0.42	1.2	9/9/2017	D2
t-2-hexene	0.45	0.54	2.4	9/9/2017	J,D1	0.44	0.54	2.4	9/9/2017	J,D2
c-2-hexene	ND	0.54	2.4	9/9/2017	D1	0.22	0.54	2.4	9/9/2017	J,D2
1,2-dichloroethane	ND	0.54	1.2	9/9/2017	D1	ND	0.54	1.2	9/9/2017	D2
methylcyclopentane	6.4	0.54	2.4	9/9/2017	D1	5.8	0.54	2.4	9/9/2017	D2
2,4-dimethylpentane	0.69	0.54	2.4	9/9/2017	L,D1	0.62	0.54	2.4	9/9/2017	L,D2
1,1,1-trichloroethane	0.01	0.52	1.2	9/9/2017	J,D1	ND	0.52	1.2	9/9/2017	D2
benzene	2.5	0.54	1.2	9/9/2017	D1	2.4	0.54	1.2	9/9/2017	D2
carbon tetrachloride	0.09	0.54	1.2	9/9/2017	J,D1	ND	0.54	1.2	9/9/2017	D2
cyclohexane	6.0	0.48	1.2	9/9/2017	D1	5.4	0.48	1.2	9/9/2017	D2
2-methylhexane	2.7	0.54	1.2	9/9/2017	D1	2.5	0.54	1.2	9/9/2017	D2
2,3-dimethylpentane	0.97	0.52	1.2	9/9/2017	L,D1	0.89	0.52	1.2	9/9/2017	L,D2

Laboratory Analysis Results

Request Number: 1709002

Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1709002-001					1709002-002				
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
3-methylhexane	3.2	0.40	1.2	9/9/2017	D1	2.9	0.40	1.2	9/9/2017	D2
1,2-dichloropropane	ND	0.34	1.2	9/9/2017	D1	ND	0.34	1.2	9/9/2017	D2
trichloroethylene	ND	0.58	1.2	9/9/2017	D1	ND	0.58	1.2	9/9/2017	D2
2,2,4-trimethylpentane	2.2	0.48	1.2	9/9/2017	D1	2.0	0.48	1.2	9/9/2017	D2
2-chloropentane	ND	0.54	1.2	9/9/2017	D1	ND	0.54	1.2	9/9/2017	D2
n-heptane	5.8	0.50	2.4	9/9/2017	D1	4.9	0.50	2.4	9/9/2017	D2
c-1,3-dichloropropylene	ND	0.40	1.2	9/9/2017	D1	ND	0.40	1.2	9/9/2017	D2
methylcyclohexane	6.9	0.52	2.4	9/9/2017	D1	6.0	0.52	2.4	9/9/2017	D2
t-1,3-dichloropropylene	ND	0.40	1.2	9/9/2017	D1	ND	0.40	1.2	9/9/2017	D2
1,1,2-trichloroethane	ND	0.42	1.2	9/9/2017	D1	ND	0.42	1.2	9/9/2017	D2
2,3,4-trimethylpentane	0.54	0.48	2.4	9/9/2017	L,D1	0.47	0.48	2.4	9/9/2017	J,D2
toluene	3.2	0.54	1.2	9/9/2017	D1	2.9	0.54	1.2	9/9/2017	D2
2-methylheptane	1.2	0.40	2.4	9/9/2017	L,D1	1.0	0.40	2.4	9/9/2017	L,D2
3-methylheptane	0.68	0.46	2.4	9/9/2017	L,D1	0.58	0.46	2.4	9/9/2017	L,D2
1,2-dibromoethane	ND	0.40	1.2	9/9/2017	D1	ND	0.40	1.2	9/9/2017	D2
n-octane	1.8	0.38	2.4	9/9/2017	L,D1	1.6	0.38	2.4	9/9/2017	L,D2
tetrachloroethylene	ND	0.48	1.2	9/9/2017	D1	0.01	0.48	1.2	9/9/2017	J,D2
chlorobenzene	ND	0.54	1.2	9/9/2017	D1	ND	0.54	1.2	9/9/2017	D2
ethylbenzene	0.38	0.54	2.4	9/9/2017	J,D1	ND	0.54	2.4	9/9/2017	D2
m & p-xylene	1.0	0.54	4.8	9/9/2017	L,D1	0.89	0.54	4.8	9/9/2017	L,D2
styrene	ND	0.54	2.4	9/9/2017	D1	ND	0.54	2.4	9/9/2017	D2
1,1,2,2-tetrachloroethane	ND	0.40	1.2	9/9/2017	D1	ND	0.40	1.2	9/9/2017	D2
o-xylene	0.24	0.54	2.4	9/9/2017	J,D1	0.22	0.54	2.4	9/9/2017	J,D2
n-nonane	0.48	0.44	1.2	9/9/2017	L,D1	0.40	0.44	1.2	9/9/2017	J,D2
isopropylbenzene	ND	0.48	1.2	9/9/2017	D1	ND	0.48	1.2	9/9/2017	D2
n-propylbenzene	ND	0.54	1.2	9/9/2017	D1	ND	0.54	1.2	9/9/2017	D2
m-ethyltoluene	ND	0.22	1.2	9/9/2017	D1	ND	0.22	1.2	9/9/2017	D2
p-ethyltoluene	ND	0.32	2.4	9/9/2017	D1	ND	0.32	2.4	9/9/2017	D2
1,3,5-trimethylbenzene	ND	0.50	2.4	9/9/2017	D1	ND	0.50	2.4	9/9/2017	D2
o-ethyltoluene	ND	0.26	2.4	9/9/2017	D1	ND	0.26	2.4	9/9/2017	D2
1,2,4-trimethylbenzene	ND	0.54	1.2	9/9/2017	D1	ND	0.54	1.2	9/9/2017	D2
n-decane	ND	0.54	2.4	9/9/2017	D1	ND	0.54	2.4	9/9/2017	D2
1,2,3-trimethylbenzene	ND	0.54	1.2	9/9/2017	D1	ND	0.54	1.2	9/9/2017	D2
m-diethylbenzene	ND	0.54	2.4	9/9/2017	D1	ND	0.54	2.4	9/9/2017	D2
p-diethylbenzene	ND	0.54	1.2	9/9/2017	D1	ND	0.54	1.2	9/9/2017	D2
n-undecane	ND	0.54	2.4	9/9/2017	D1	ND	0.54	2.4	9/9/2017	D2

Laboratory Analysis Results
Request Number: 1709002
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 recevied with insufficient preservation.

Quality control notes for AP001VOC samples.

D1-Sample concentration was calculated using a dilution factor of 4.01.
D2-Sample concentration was calculated using a dilution factor of 4.

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

Table 1. Comparison of Monitored Concentrations in Lab Sample 1709002-001 to TCEQ Short-Term AMCVs

Lab Sample ID	1709002-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
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	ND	D1	0.54
1,2,4-Trimethylbenzene	--	3000	1.2	ND	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	ND	D1	0.34
1,3,5-Trimethylbenzene	--	3000	2.4	ND	D1	0.5
1,3-Butadiene	230	1,700	1.2	ND	D1	0.54
1-Butene	--	27,000	1.2	0.25	J,D1	0.4
1-Pentene	100	12,000	1.2	0.69	L,D1	0.54
2,2,4-Trimethylpentane	--	4,100	1.2	2.2	D1	0.48
2,2-Dimethylbutane (Neohexane)	--	5,400	1.2	0.33	J,D1	0.42
2,3,4-Trimethylpentane	--	4,100	2.4	0.54	L,D1	0.48
2,3-Dimethylbutane	--	5,400	2.4	1.5	L,D1	0.56
2,3-Dimethylpentane	--	8,300	1.2	0.97	L,D1	0.52
2,4-Dimethylpentane	--	8,300	2.4	0.69	L,D1	0.54
2-Chloropentane (as chloroethane)	--	240	1.2	ND	D1	0.54
2-Methyl-1-Pentene +1-Hexene	--	490	4.8	0.53	L,D1	0.4
2-Methyl-2-Butene	--	12,000	1.2	4.3	D1	0.46
2-Methylheptane	--	4,100	2.4	1.2	L,D1	0.4

Lab Sample ID	1709002-001					
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	2.7	D1	0.54
2-Methylpentane (Isohexane)	--	5,400	1.2	9.2	D1	0.54
3-Methyl-1-Butene	100	7,700	1.2	ND	D1	0.46
3-Methylheptane	--	4,100	2.4	0.68	L,D1	0.46
3-Methylhexane	--	8,300	1.2	3.2	D1	0.4
3-Methylpentane	--	5,400	1.2	5.9	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	2.5	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	ND	D1	0.54
c-2-Hexene	--	490	2.4	ND	D1	0.54
c-2-Pentene	--	12,000	2.4	1	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	6	D1	0.48
Cyclopentane	--	5,900	1.2	1.4	D1	0.54
Cyclopentene	--	2,900	1.2	0.34	J,D1	0.4
Dichlorodifluoromethane	--	10,000	1.2	0.48	L,D1	0.4
Ethane	--	*Simple Asphyxiant	2.4	2.4	T,D1	1
Ethylbenzene	--	20,000	2.4	0.38	J,D1	0.54
Ethylene	--	500,000	2.4	ND	T,D1	1
Isobutane	--	33,000	2.4	0.72	L,D1	0.46

Lab Sample ID	1709002-001					
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	20	D1	0.54
Isoprene	47	20	1.2	0.45	J,D1	0.54
Isopropylbenzene (cumene)	130	510	1.2	ND	D1	0.48
m & p-Xylene (as mixed isomers)	--	1,700	4.8	1	L,D1	0.54
m-Diethylbenzene	--	450	2.4	ND	D1	0.54
Methyl Chloride (chloromethane)	--	500	1.2	0.45	L,D1	0.4
Methylcyclohexane	--	4,000	2.4	6.9	D1	0.52
Methylcyclopentane	--	750	2.4	6.4	D1	0.54
Methylene Chloride (dichloromethane)	--	3,400	1.2	ND	D1	0.28
m-Ethyltoluene	--	250	1.2	ND	D1	0.22
n-Butane	--	92,000	2.4	3.5	D1	0.4
n-Decane	--	1,000	2.4	ND	D1	0.54
n-Heptane	--	8,300	2.4	5.8	D1	0.5
n-Hexane	--	5,400	2.4	10	D1	0.4
n-Nonane	--	3,000	1.2	0.48	L,D1	0.44
n-Octane	--	4,100	2.4	1.8	L,D1	0.38
n-Pentane	--	68,000	4.8	17	D1	0.54
n-Propylbenzene	--	510	1.2	ND	D1	0.54
n-Undecane	--	550	2.4	ND	D1	0.54
o-Ethyltoluene	--	250	2.4	ND	D1	0.26
o-Xylene	--	1,700	2.4	0.24	J,D1	0.54
p-Diethylbenzene	--	450	1.2	ND	D1	0.54
p-Ethyltoluene	--	250	2.4	ND	D1	0.32
Propane	--	*Simple Asphyxiant	2.4	2.7	T,D1	1
Propylene	--	*Simple Asphyxiant	2.4	1.2	L,T,D1	1

Lab Sample ID	1709002-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
Styrene	26	5,200	2.4	ND	D1	0.54
t-1,3-Dichloropropylene	--	9.9	1.2	ND	D1	0.4
t-2-Butene	--	15,000	1.2	0.29	J,D1	0.36
t-2-Hexene	--	490	2.4	0.45	J,D1	0.54
t-2-Pentene	--	12,000	2.4	2.6	D1	0.54
Tetrachloroethylene	--	1,000	1.2	ND	D1	0.48
Toluene	--	4,000	1.2	3.2	D1	0.54
Trichloroethylene	--	100	1.2	ND	D1	0.58
Trichlorofluoromethane	--	10,000	1.2	0.23	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.

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.
D2 - Sample concentration was calculated using a dilution factor of 4.

Table 2. Comparison of Monitored Concentrations in Lab Sample 1709002-002 to TCEQ Short-Term AMCVs

Lab Sample ID	1709002-002					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
1,1,1-Trichloroethane	--	1,700	1.2	ND	D2	0.52
1,1,2,2-Tetrachloroethane	--	10	1.2	ND	D2	0.4
1,1,2-Trichloroethane	--	100	1.2	ND	D2	0.42
1,1-Dichloroethane	--	1,000	1.2	ND	D2	0.38
1,1-Dichloroethylene	--	180	1.2	ND	D2	0.36
1,2,3-Trimethylbenzene	--	3000	1.2	ND	D2	0.54
1,2,4-Trimethylbenzene	--	3000	1.2	ND	D2	0.54
1,2-Dibromoethane	--	0.5	1.2	ND	D2	0.4
1,2-Dichloroethane	--	540	1.2	ND	D2	0.54
1,2-Dichloropropane	--	100	1.2	ND	D2	0.34
1,3,5-Trimethylbenzene	--	3000	2.4	ND	D2	0.5
1,3-Butadiene	230	1,700	1.2	ND	D2	0.54
1-Butene	--	27,000	1.2	ND	D2	0.4
1-Pentene	100	12,000	1.2	0.73	L,D2	0.54
2,2,4-Trimethylpentane	--	4,100	1.2	2	D2	0.48
2,2-Dimethylbutane (Neohexane)	--	5,400	1.2	0.34	J,D2	0.42
2,3,4-Trimethylpentane	--	4,100	2.4	0.47	J,D2	0.48
2,3-Dimethylbutane	--	5,400	2.4	1.4	L,D2	0.56
2,3-Dimethylpentane	--	8,300	1.2	0.89	L,D2	0.52
2,4-Dimethylpentane	--	8,300	2.4	0.62	L,D2	0.54
2-Chloropentane (as chloroethane)	--	240	1.2	ND	D2	0.54
2-Methyl-1-Pentene +1-Hexene	--	490	4.8	0.5	L,D2	0.4
2-Methyl-2-Butene	--	12,000	1.2	4.5	D2	0.46
2-Methylheptane	--	4,100	2.4	1	L,D2	0.4

Lab Sample ID	1709002-002					
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	2.5	D2	0.54
2-Methylpentane (Isohexane)	--	5,400	1.2	8.6	D2	0.54
3-Methyl-1-Butene	100	7,700	1.2	0.28	J,D2	0.46
3-Methylheptane	--	4,100	2.4	0.58	L,D2	0.46
3-Methylhexane	--	8,300	1.2	2.9	D2	0.4
3-Methylpentane	--	5,400	1.2	5.5	D2	0.46
4-Methyl-1-Pentene (as hexene)	--	490	2.4	ND	D2	0.44
Acetylene	--	25,000	2.4	ND	T,D2	1
Benzene	--	180	1.2	2.4	D2	0.54
Bromomethane (methyl bromide)	--	30	1.2	0.01	J,D2	0.54
c-1,3-Dichloropropylene	--	9.9	1.2	ND	D2	0.4
c-2-Butene	--	15,000	1.2	0.29	J,D2	0.54
c-2-Hexene	--	490	2.4	0.22	J,D2	0.54
c-2-Pentene	--	12,000	2.4	1.1	L,D2	0.5
Carbon Tetrachloride	--	20	1.2	ND	D2	0.54
Chlorobenzene (phenyl chloride)	--	100	1.2	ND	D2	0.54
Chloroform (trichloromethane)	--	20	1.2	ND	D2	0.42
Cyclohexane	--	1,000	1.2	5.4	D2	0.48
Cyclopentane	--	5,900	1.2	1.4	D2	0.54
Cyclopentene	--	2,900	1.2	0.35	J,D2	0.4
Dichlorodifluoromethane	--	10,000	1.2	0.49	L,D2	0.4
Ethane	--	*Simple Asphyxiant	2.4	2.4	T,D2	1
Ethylbenzene	--	20,000	2.4	ND	D2	0.54
Ethylene	--	500,000	2.4	ND	T,D2	1
Isobutane	--	33,000	2.4	0.6	L,D2	0.46
Isopentane (2-methylbutane)	--	68,000	4.8	22	D2	0.54

Lab Sample ID	1709002-002					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
Isoprene	47	20	1.2	0.47	J,D2	0.54
Isopropylbenzene (cumene)	130	510	1.2	ND	D2	0.48
m & p-Xylene (as mixed isomers)	--	1,700	4.8	0.89	L,D2	0.54
m-Diethylbenzene	--	450	2.4	ND	D2	0.54
Methyl Chloride (chloromethane)	--	500	1.2	0.45	L,D2	0.4
Methylcyclohexane	--	4,000	2.4	6	D2	0.52
Methylcyclopentane	--	750	2.4	5.8	D2	0.54
Methylene Chloride (dichloromethane)	--	3,400	1.2	ND	D2	0.28
m-Ethyltoluene	--	250	1.2	ND	D2	0.22
n-Butane	--	92,000	2.4	3.8	D2	0.4
n-Decane	--	1,000	2.4	ND	D2	0.54
n-Heptane	--	8,300	2.4	4.9	D2	0.5
n-Hexane	--	5,400	2.4	9.4	D2	0.4
n-Nonane	--	3,000	1.2	0.4	J,D2	0.44
n-Octane	--	4,100	2.4	1.6	L,D2	0.38
n-Pentane	--	68,000	4.8	18	D2	0.54
n-Propylbenzene	--	510	1.2	ND	D2	0.54
n-Undecane	--	550	2.4	ND	D2	0.54
o-Ethyltoluene	--	250	2.4	ND	D2	0.26
o-Xylene	--	1,700	2.4	0.22	J,D2	0.54
p-Diethylbenzene	--	450	1.2	ND	D2	0.54
p-Ethyltoluene	--	250	2.4	ND	D2	0.32
Propane	--	*Simple Asphyxiant	2.4	2.9	T,D2	1
Propylene	--	*Simple Asphyxiant	2.4	1.3	L,T,D2	1
Styrene	26	5,200	2.4	ND	D2	0.54
t-1,3-Dichloropropylene	--	9.9	1.2	ND	D2	0.4

Lab Sample ID	1709002-002					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
t-2-Butene	--	15,000	1.2	0.32	J,D2	0.36
t-2-Hexene	--	490	2.4	0.44	J,D2	0.54
t-2-Pentene	--	12,000	2.4	2.6	D2	0.54
Tetrachloroethylene	--	1,000	1.2	0.01	J,D2	0.48
Toluene	--	4,000	1.2	2.9	D2	0.54
Trichloroethylene	--	100	1.2	ND	D2	0.58
Trichlorofluoromethane	--	10,000	1.2	0.23	J,D2	0.58
Vinyl Chloride	--	27,000	1.2	ND	D2	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).
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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.
D2 - Sample concentration was calculated using a dilution factor of 4.

Table 3. 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.