TCEQ Interoffice Memorandum

To: Tony Walker
Director, TCEQ Region 4, Dallas/Fort Worth
Alyssa Taylor
Special Assistant to the Regional Director, TCEQ Region 4, Dallas/Fort Worth

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

Date: May 2, 2014

Subject: Toxicological Evaluation of Results from an Ambient Air Sample for Volatile Organic Compounds Collected Downwind of the Premier Natural Resources II, LLC, Rice Ranch Pad (Latitude 33.064444, Longitude -97.144482) in Bartonville, Denton County, Texas

Sample Collected on February 24, 2014, Request Number 1403002 (Lab Sample 1403002-001)

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

On February 24, 2014, a Texas Commission on Environmental Quality (TCEQ) Region 4 air investigator collected a 30-minute canister sample (Lab Sample 1403002-001) downwind of the Premier Natural Resources II, LLC, Rice Ranch Pad (Latitude 33.064444, Longitude -97.144482) in Bartonville, Denton County, Texas. The sample was collected as a follow-up to a previous investigation. The investigator did not experience odors or health effects while sampling. Meteorological conditions measured at the site or nearest stationary ambient air monitoring site indicated that the ambient temperature was 49.5°F with a relative humidity of 66%, and winds were from the north (5°) at 0.5 to 4.5 miles per hour. The sampling site was approximately 101 to 300 feet from the possible emission source (compressor). The nearest location where the public could have access was approximately 301 to 500 feet from the possible emission source. 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 are provided in Attachment A. The VOC concentrations were reported in parts per billion by volume (ppbv) (Attachment B and Table 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) (Table 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 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) 239-1822 if 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

3/20/2014

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: 1403002

Request Lead: Region: T04 Date Received: 3/3/2014
Project(s): Barnett Shale

Facility(ies) Sampled	City	County	Facility Type
Premier Natural Resources II, LLC.	Bartonville	Denton	

Sample(s) Received

Field ID Number: N1084-022414 Laboratory Sample Number: 1403002-001 Sampled by: Robin Pugh
Sampling Site: Date & Time Sampled: 02/24/14 12:55:00 Valid Sample: Yes
Comments: Canister N1084 was used to collect a 30-minute downwind sample using OPC-027. Sample failed leak check in the field prior to analysis. Per customer request, the data was qualified.

Requested Laboratory Procedure(s):

Analysis: AP001VOC
Determination of VOC 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: 03/20/14
Jaydeep Patel

Laboratory Manager: Ken Lancaster Date: 3/20/14
Ken Lancaster

Laboratory Analysis Results

Request Number: 1403002

Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1403002-001									
Field ID	N1084-022414									
Canister ID	N1084									
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
ethane	12	1.0	2.4	3/5/2014	T,F,X,D1					
ethylene	0.90	1.0	2.4	3/5/2014	J,T,F,X,D1					
acetylene	0.67	1.0	2.4	3/5/2014	J,T,F,X,D1					
propane	3.0	1.0	2.4	3/5/2014	T,F,X,D1					
propylene	ND	1.0	2.4	3/5/2014	T,F,X,D1					
dichlorodifluoromethane	0.53	0.40	1.2	3/5/2014	L,F,X,D1					
methyl chloride	0.73	0.40	1.2	3/5/2014	L,F,X,D1					
isobutane	0.68	0.46	2.4	3/5/2014	L,F,X,D1					
vinyl chloride	ND	0.34	1.2	3/5/2014	F,X,D1					
1-butene	0.40	0.40	1.2	3/5/2014	L,F,X,D1					
1,3-butadiene	ND	0.54	1.2	3/5/2014	F,X,D1					
n-butane	1.3	0.40	2.4	3/5/2014	L,F,X,D1					
t-2-butene	ND	0.36	1.2	3/5/2014	F,X,D1					
bromomethane	ND	0.54	1.2	3/5/2014	F,X,D1					
c-2-butene	ND	0.54	1.2	3/5/2014	F,X,D1					
3-methyl-1-butene	ND	0.46	1.2	3/5/2014	F,X,D1					
isopentane	0.29	0.54	4.8	3/5/2014	J,F,X,D1					
trichlorofluoromethane	0.25	0.58	1.2	3/5/2014	J,F,X,D1					
1-pentene	ND	0.54	1.2	3/5/2014	F,X,D1					
n-pentane	0.18	0.54	4.8	3/5/2014	J,F,X,D1					
isoprene	0.01	0.54	1.2	3/5/2014	J,F,X,D1					
t-2-pentene	ND	0.54	2.4	3/5/2014	F,X,D1					
1,1-dichloroethylene	ND	0.36	1.2	3/5/2014	F,X,D1					
c-2-pentene	ND	0.50	2.4	3/5/2014	F,X,D1					
methylene chloride	0.11	0.28	1.2	3/5/2014	J,F,X,D1					
2-methyl-2-butene	ND	0.46	1.2	3/5/2014	F,X,D1					
2,2-dimethylbutane	0.01	0.42	1.2	3/5/2014	J,F,X,D1					
cyclopentene	ND	0.40	1.2	3/5/2014	F,X,D1					
4-methyl-1-pentene	ND	0.44	2.4	3/5/2014	F,X,D1					
1,1-dichloroethane	ND	0.38	1.2	3/5/2014	F,X,D1					
cyclopentane	ND	0.54	1.2	3/5/2014	F,X,D1					
2,3-dimethylbutane	ND	0.56	2.4	3/5/2014	F,X,D1					
2-methylpentane	0.06	0.54	1.2	3/5/2014	J,F,X,D1					
3-methylpentane	0.04	0.46	1.2	3/5/2014	J,F,X,D1					
2-methyl-1-pentene + 1-hexene	ND	0.40	4.8	3/5/2014	F,X,D1					
n-hexane	0.43	0.40	2.4	3/5/2014	L,F,X,D1					
chloroform	ND	0.42	1.2	3/5/2014	F,X,D1					
t-2-hexene	ND	0.54	2.4	3/5/2014	F,X,D1					
c-2-hexene	ND	0.54	2.4	3/5/2014	F,X,D1					
1,2-dichloroethane	0.01	0.54	1.2	3/5/2014	J,F,X,D1					
methylcyclopentane	ND	0.54	2.4	3/5/2014	F,X,D1					
2,4-dimethylpentane	ND	0.54	2.4	3/5/2014	F,X,D1					
1,1,1-trichloroethane	ND	0.52	1.2	3/5/2014	F,X,D1					
benzene	0.28	0.54	1.2	3/5/2014	J,F,X,D1					
carbon tetrachloride	0.10	0.54	1.2	3/5/2014	J,F,X,D1					
cyclohexane	ND	0.48	1.2	3/5/2014	F,X,D1					
2-methylhexane	ND	0.54	1.2	3/5/2014	F,X,D1					
2,3-dimethylpentane	ND	0.52	1.2	3/5/2014	F,X,D1					

Laboratory Analysis Results

Request Number: 1403002

Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1403002-001									
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
3-methylhexane	ND	0.40	1.2	3/5/2014	F,X,D1					
1,2-dichloropropane	ND	0.34	1.2	3/5/2014	F,X,D1					
trichloroethylene	ND	0.58	1.2	3/5/2014	F,X,D1					
2,2,4-trimethylpentane	0.03	0.48	1.2	3/5/2014	J,F,X,D1					
2-chloropentane	ND	0.54	1.2	3/5/2014	F,X,D1					
n-heptane	0.04	0.50	2.4	3/5/2014	J,F,X,D1					
c-1,3-dichloropropylene	ND	0.40	1.2	3/5/2014	F,X,D1					
methylcyclohexane	0.02	0.52	2.4	3/5/2014	J,F,X,D1					
t-1,3-dichloropropylene	ND	0.40	1.2	3/5/2014	F,X,D1					
1,1,2-trichloroethane	ND	0.42	1.2	3/5/2014	F,X,D1					
2,3,4-trimethylpentane	ND	0.48	2.4	3/5/2014	F,X,D1					
toluene	0.10	0.54	1.2	3/5/2014	J,F,X,D1					
2-methylheptane	ND	0.40	2.4	3/5/2014	F,X,D1					
3-methylheptane	ND	0.46	2.4	3/5/2014	F,X,D1					
1,2-dibromoethane	ND	0.40	1.2	3/5/2014	F,X,D1					
n-octane	0.02	0.38	2.4	3/5/2014	J,F,X,D1					
tetrachloroethylene	0.01	0.48	1.2	3/5/2014	J,F,X,D1					
chlorobenzene	ND	0.54	1.2	3/5/2014	F,X,D1					
ethylbenzene	ND	0.54	2.4	3/5/2014	F,X,D1					
m & p-xylene	0.07	0.54	4.8	3/5/2014	J,F,X,D1					
styrene	ND	0.54	2.4	3/5/2014	F,X,D1					
1,1,2,2-tetrachloroethane	ND	0.40	1.2	3/5/2014	F,X,D1					
o-xylene	ND	0.54	2.4	3/5/2014	F,X,D1					
n-nonane	ND	0.44	1.2	3/5/2014	F,X,D1					
isopropylbenzene	ND	0.48	1.2	3/5/2014	F,X,D1					
n-propylbenzene	ND	0.54	1.2	3/5/2014	F,X,D1					
m-ethyltoluene	ND	0.22	1.2	3/5/2014	F,X,D1					
p-ethyltoluene	ND	0.32	2.4	3/5/2014	F,X,D1					
1,3,5-trimethylbenzene	ND	0.50	2.4	3/5/2014	F,X,D1					
o-ethyltoluene	ND	0.26	2.4	3/5/2014	F,X,D1					
1,2,4-trimethylbenzene	ND	0.54	1.2	3/5/2014	F,X,D1					
n-decane	ND	0.54	2.4	3/5/2014	F,X,D1					
1,2,3-trimethylbenzene	ND	0.54	1.2	3/5/2014	F,X,D1					
m-diethylbenzene	ND	0.54	2.4	3/5/2014	F,X,D1					
p-diethylbenzene	ND	0.54	1.2	3/5/2014	F,X,D1					
n-undecane	ND	0.54	2.4	3/5/2014	F,X,D1					

Laboratory Analysis Results

Request Number: 1403002

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.

X - Pre-sampling canister leak check did not meet acceptance criteria.

TCEQ laboratory customer support may be reached at Ken.Lancaster@tceq.texas.gov

The TCEQ is an equal opportunity/affirmative action employer. The agency does not allow discrimination on the basis of race, color, religion, national origin, sex, disability, age, sexual orientation or veteran status. In compliance with the Americans With Disabilities Act, this document may be requested in alternate formats by contacting the TCEQ at (512) 239-0010, (Fax 512-239 -0055), or 1-800-RELAY-TX (TDD), or by writing P.O. Box 13087, Austin, Texas 78711-3087.

Table 1. Comparison of Monitored Concentrations in Lab Sample 1403002-001 to TCEQ Short-Term AMCVs

Lab Sample ID	1403002-001					
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	380,000	1,700	1.2	ND	F,X,D1	0.52
1,1,2,2-Tetrachloroethane	7,300	10	1.2	ND	F,X,D1	0.4
1,1,2-Trichloroethane	Not Available	100	1.2	ND	F,X,D1	0.42
1,1-Dichloroethane	Not Available	1,000	1.2	ND	F,X,D1	0.38
1,1-Dichloroethylene	Not Available	180	1.2	ND	F,X,D1	0.36
1,2,3-Trimethylbenzene	Not Available	250	1.2	ND	F,X,D1	0.54
1,2,4-Trimethylbenzene	140	250	1.2	ND	F,X,D1	0.54
1,2-Dibromoethane	Not Available	0.5	1.2	ND	F,X,D1	0.4
1,2-Dichloroethane	6,000	40	1.2	0.01	J,F,X,D1	0.54
1,2-Dichloropropane	250	100	1.2	ND	F,X,D1	0.34
1,3,5-Trimethylbenzene	Not Available	250	2.4	ND	F,X,D1	0.5
1,3-Butadiene	230	1,700	1.2	ND	F,X,D1	0.54
1-Butene	360	27,000	1.2	0.4	L,F,X,D1	0.4
1-Pentene	100	2,600	1.2	ND	F,X,D1	0.54
2,2,4-Trimethylpentane	670	750	1.2	0.03	J,F,X,D1	0.48
2,2-Dimethylbutane (Neohexane)	Not Available	1,000	1.2	0.01	J,F,X,D1	0.42
2,3,4-Trimethylpentane	Not Available	750	2.4	ND	F,X,D1	0.48
2,3-Dimethylbutane	420	990	2.4	ND	F,X,D1	0.56
2,3-Dimethylpentane	4,500	850	1.2	ND	F,X,D1	0.52
2,4-Dimethylpentane	940	850	2.4	ND	F,X,D1	0.54
2-Chloropentane (as chloroethane)	Not Available	240	1.2	ND	F,X,D1	0.54
2-Methyl-1-Pentene +1-Hexene	140	500	4.8	ND	F,X,D1	0.4
2-Methyl-2-Butene	Not Available	2,600	1.2	ND	F,X,D1	0.46
2-Methylheptane	110	750	2.4	ND	F,X,D1	0.4

Lab Sample ID	1403002-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
2-Methylhexane	420	750	1.2	ND	F,X,D1	0.54
2-Methylpentane (Isohexane)	7,000	850	1.2	0.06	J,F,X,D1	0.54
3-Methyl-1-Butene	250	8,000	1.2	ND	F,X,D1	0.46
3-Methylheptane	1,500	750	2.4	ND	F,X,D1	0.46
3-Methylhexane	840	750	1.2	ND	F,X,D1	0.4
3-Methylpentane	8,900	1,000	1.2	0.04	J,F,X,D1	0.46
4-Methyl-1-Pentene (as hexene)	140	500	2.4	ND	F,X,D1	0.44
Acetylene	Not Available	25,000	2.4	0.67	J,T,F,X,D1	1
Benzene	2,700	180	1.2	0.28	J,F,X,D1	0.54
Bromomethane (methyl bromide)	Not Available	30	1.2	ND	F,X,D1	0.54
c-1,3-Dichloropropylene	Not Available	10	1.2	ND	F,X,D1	0.4
c-2-Butene	2,100	15,000	1.2	ND	F,X,D1	0.54
c-2-Hexene	140	500	2.4	ND	F,X,D1	0.54
c-2-Pentene	Not Available	2,600	2.4	ND	F,X,D1	0.5
Carbon Tetrachloride	4,600	20	1.2	0.1	J,F,X,D1	0.54
Chlorobenzene (phenyl chloride)	1,300	100	1.2	ND	F,X,D1	0.54
Chloroform (trichloromethane)	3,800	20	1.2	ND	F,X,D1	0.42
Cyclohexane	2,500	1,000	1.2	ND	F,X,D1	0.48
Cyclopentane	Not Available	1,200	1.2	ND	F,X,D1	0.54
Cyclopentene	Not Available	2,900	1.2	ND	F,X,D1	0.4
Dichlorodifluoromethane	Not Available	10,000	1.2	0.53	L,F,X,D1	0.4
Ethane	Not Available	Simple Asphyxiant*	2.4	12	T,F,X,D1	1
Ethylbenzene	170	20,000	2.4	ND	F,X,D1	0.54
Ethylene	270,000	500,000	2.4	0.9	J,T,F,X,D1	1

Lab Sample ID	1403002-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
Isobutane	Not Available	33,000	2.4	0.68	L,F,X,D1	0.46
Isopentane (2-methylbutane)	1,300	68,000	4.8	0.29	J,F,X,D1	0.54
Isoprene	48	20	1.2	0.01	J,F,X,D1	0.54
Isopropylbenzene (cumene)	48	500	1.2	ND	F,X,D1	0.48
m & p-Xylene (as mixed isomers)	80	1,700	4.8	0.07	J,F,X,D1	0.54
m-Diethylbenzene	70	460	2.4	ND	F,X,D1	0.54
Methyl Chloride (chloromethane)	Not Available	500	1.2	0.73	L,F,X,D1	0.4
Methylcyclohexane	150	4,000	2.4	0.02	J,F,X,D1	0.52
Methylcyclopentane	1,700	750	2.4	ND	F,X,D1	0.54
Methylene Chloride (dichloromethane)	160,000	3,500	1.2	0.11	J,F,X,D1	0.28
m-Ethyltoluene	18	250	1.2	ND	F,X,D1	0.22
n-Butane	1,200,000	92,000	2.4	1.3	L,F,X,D1	0.4
n-Decane	620	1,750	2.4	ND	F,X,D1	0.54
n-Heptane	670	850	2.4	0.04	J,F,X,D1	0.5
n-Hexane	1,500	1,800	2.4	0.43	L,F,X,D1	0.4
n-Nonane	Not Available	2,000	1.2	ND	F,X,D1	0.44
n-Octane	1,700	750	2.4	0.02	J,F,X,D1	0.38
n-Pentane	1,400	68,000	4.8	0.18	J,F,X,D1	0.54
n-Propylbenzene	48	500	1.2	ND	F,X,D1	0.54
n-Undecane	870	550	2.4	ND	F,X,D1	0.54
o-Ethyltoluene	74	250	2.4	ND	F,X,D1	0.26
o-Xylene	380	1,700	2.4	ND	F,X,D1	0.54
p-Diethylbenzene	70	460	1.2	ND	F,X,D1	0.54
p-Ethyltoluene	8.1	250	2.4	ND	F,X,D1	0.32
Propane	1,500,000	Simple Asphyxiant*	2.4	3	T,F,X,D1	1
Propylene	13,000	Simple Asphyxiant*	2.4	ND	T,F,X,D1	1

Lab Sample ID	1403002-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
Styrene	25	5,100	2.4	ND	F,X,D1	0.54
t-1,3-Dichloropropylene	Not Available	10	1.2	ND	F,X,D1	0.4
t-2-Butene	2,100	15,000	1.2	ND	F,X,D1	0.36
t-2-Hexene	140	500	2.4	ND	F,X,D1	0.54
t-2-Pentene	Not Available	2,600	2.4	ND	F,X,D1	0.54
Tetrachloroethylene	770	1,000	1.2	0.01	J,F,X,D1	0.48
Toluene	920	4,000	1.2	0.1	J,F,X,D1	0.54
Trichloroethylene	3,900	100	1.2	ND	F,X,D1	0.58
Trichlorofluoromethane	5,000	10,000	1.2	0.25	J,F,X,D1	0.58
Vinyl Chloride	Not Available	26,000	1.2	ND	F,X,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.
X - Pre-sampling canister leak check did not meet acceptance criteria.

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	940	Cyclopentane	120
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	450
1,2,3-Trimethylbenzene	25	Ethylene**	5,300
1,2,4-Trimethylbenzene	25	Isobutane	2,400
1,2-Dibromoethane	0.05	Isopentane (2-methylbutane)	8,000
1,2-Dichloroethane	1	Isoprene	2
1,2-Dichloropropane	10	Isopropylbenzene (cumene)	50
1,3,5-Trimethylbenzene	25	m & p-Xylene (as mixed isomers)	140
1,3-Butadiene	9.1	m-Diethylbenzene	46
1-Butene	2,300	Methyl Chloride (chloromethane)	50
1-Pentene	Not Available	Methylcyclohexane	400
2,2,4-Trimethylpentane	75	Methylcyclopentane	75
2,2-Dimethylbutane (Neohexane)	100	Methylene Chloride (dichloromethane)	100
2,3,4-Trimethylpentane	75	m-Ethyltoluene	25
2,3-Dimethylbutane	99	n-Butane	2,400
2,3-Dimethylpentane	85	n-Decane	175
2,4-Dimethylpentane	85	n-Heptane	85
2-Chloropentane (as chloroethane)	24	n-Hexane	190
2-Methyl-1-Pentene +1-Hexene	50	n-Nonane	200

Compound	Long-Term Health AMCV (ppb_v)	Compound	Long-Term Health AMCV (ppb_v)
2-Methyl-2-Butene	Not Available	n-Octane	75
2-Methylheptane	75	n-Pentane	8,000
2-Methylhexane	75	n-Propylbenzene	50
2-Methylpentane (Isohexane)	85	n-Undecane	55
3-Methyl-1-Butene	800	o-Ethyltoluene	25
3-Methylheptane	75	o-Xylene	140
3-Methylhexane	75	p-Diethylbenzene	46
3-Methylpentane	100	p-Ethyltoluene	25
4-Methyl-1-Pentene (as hexene)	50	Propane	Simple Asphyxiant*
Acetylene	2,500	Propylene	Simple Asphyxiant*
Benzene	1.4	Styrene	110
Bromomethane (methyl bromide)	3	t-1,3-Dichloropropylene	1
c-1,3-Dichloropropylene	1	t-2-Butene	690
c-2-Butene	690	t-2-Hexene	50
c-2-Hexene	50	t-2-Pentene	Not Available
c-2-Pentene	Not Available	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	0.45

*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.