

## Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section

P.O. Box 13087

Austin, Texas 78711

(512) 239-1716

### Laboratory Analysis Results

**ACL Number: 100670**

ACL Lead: Karen Bachtel

Region: T04

Date Received: 6/30/2010

Project(s): Barnett Shale

Facility(ies) Sampled	City	County	Facility Type
XTO Energy's Mary Ann White B 1H Well	Weatherford	Parker	Natural Gas

#### Laboratory Procedure(s) Performed:

Analysis: AMOR006

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

Procedure:

Prior to analysis, subatmospheric samples are pressurized to twice the collected volume using a sample dilution system. For analysis, a known volume of a sample is directed from the canister into a multitrap cryogenic concentrator. Internal standards are added to the sample stream prior to the trap. The concentrated sample is thermally desorbed and carried onto a GC column for separation. The analytical strategy involves using a GC with dual columns that are coupled to a mass selective detector (MSD) and a flame ionization detector (FID). Mass spectra for individual peaks in the total ion chromatogram are then used for target compound identification and quantitation. The fragmentation pattern is compared with stored spectra taken under similar conditions in order to identify the compound. For any given compound, the intensity of the quantitation fragment is compared with the system response to the fragment for known amounts of the compound. This establishes the compound concentration in the sample. For non-target compound peaks which are at least one-half the height of the internal standard, a library search is performed in an attempt to identify the compound solely upon fracture patterns. These tentatively identified compounds (TIC's) are reported as a sample specific footnote. Accurate quantitation of TICs is not possible. The FID is used for the quantitation of ethane, ethylene, acetylene, propylene and propane and identification is based on matching retention times of standards containing known analytes.

#### Sample(s) Received

Field ID Number: 20081

Laboratory Sample Number: 100670-0001

Sampled by: John Pellegrine

Sampling Site: 260 feet downwind of East tank.

Date & Time Sampled: 06/26/10 19:48:00 Valid Sample: Yes

Comments:

Canister #20081 was used to collect a 30 minute sample using critical orifice (CO-123).

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)-239-4894. For an update on the health effects evaluation of these data, please contact the Toxicology Division at (512) 239-1795.

Analyst: Jaydeep Patel  
Jaydeep Patel

Date: 07/06/10

Reviewed By: Karen Bachtel  
Karen Bachtel

Date: 7/7/2010

Technical Specialist: David Manis  
David Manis

Date: 7/8/10

# Laboratory Analysis Results

ACL Number: 100670

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID		100670-0001					
Field ID		20081					
Canister ID		20081					
Analysis Date		07/02/10					
Compound	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
ethane	0.50	2400	10	T,D1			
ethylene	0.50	3.3	10	J,T,D1			
acetylene	0.50	ND	10	T,D1			
propane	0.50	970	10	T,D1			
propylene	0.50	ND	10	T,D1			
dichlorodifluoromethane	0.20	0.68	4.0	J,D1			
methyl chloride	0.20	1.2	4.0	J,D1			
isobutane	0.23	160	4.6	D1			
vinyl chloride	0.17	ND	3.4	D1			
1-butene	0.20	0.83	4.0	J,D1			
1,3-butadiene	0.27	ND	5.4	D1			
n-butane	0.20	260	4.0	D1			
t-2-butene	0.18	ND	3.6	D1			
bromomethane	0.27	ND	5.4	D1			
c-2-butene	0.27	ND	5.4	D1			
3-methyl-1-butene	0.23	ND	4.6	D1			
isopentane	0.27	79	5.4	D1			
trichlorofluoromethane	0.29	0.47	5.8	J,D1			
1-pentene	0.27	ND	5.4	D1			
n-pentane	0.27	74	5.4	D1			
isoprene	0.27	2.3	5.4	J,D1			
t-2-pentene	0.27	ND	5.4	D1			
1,1-dichloroethylene	0.18	ND	3.6	D1			
c-2-pentene	0.25	ND	5.0	D1			
methylene chloride	0.14	ND	2.8	D1			
2-methyl-2-butene	0.23	ND	4.6	D1			
2,2-dimethylbutane	0.21	1.6	4.2	J,D1			
cyclopentene	0.20	ND	4.0	D1			
4-methyl-1-pentene	0.22	ND	4.4	D1			
1,1-dichloroethane	0.19	ND	3.8	D1			
cyclopentane	0.27	1.6	5.4	J,D1			
2,3-dimethylbutane	0.28	2.1	5.6	J,D1			
2-methylpentane	0.27	19	5.4	D1			
3-methylpentane	0.23	12	4.6	L,D1			
2-methyl-1-pentene + 1-hexene	0.20	ND	4.0	D1			
n-hexane	0.20	35	4.0	D1			
chloroform	0.21	ND	4.2	D1			
t-2-hexene	0.27	ND	5.4	D1			
c-2-hexene	0.27	ND	5.4	D1			
1,2-dichloroethane	0.27	ND	5.4	D1			
methylcyclopentane	0.27	7.6	5.4	L,D1			
2,4-dimethylpentane	0.27	1.5	5.4	J,D1			
1,1,1-trichloroethane	0.26	ND	5.2	D1			
benzene	0.27	3.3	5.4	J,D1			
carbon tetrachloride	0.27	ND	5.4	D1			
cyclohexane	0.24	11	4.8	L,D1			
2-methylhexane	0.27	20	5.4	D1			
2,3-dimethylpentane	0.26	3.0	5.2	J,D1			

# Laboratory Analysis Results

**ACL Number: 100670**

**Analysis Code: AMOR006**

Note: Results are reported in units of parts per billion by volume (ppbv)							
Lab ID	100670-0001						
Compound	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
3-methylhexane	0.20	18	4.0	D1			
1,2-dichloropropane	0.17	ND	3.4	D1			
trichloroethylene	0.29	ND	5.8	D1			
2,2,4-trimethylpentane	0.24	ND	4.8	D1			
2-chloropentane	0.27	ND	5.4	D1			
n-heptane	0.25	26	5.0	D1			
c-1,3-dichloropropylene	0.20	ND	4.0	D1			
methylcyclohexane	0.26	16	5.2	D1			
t-1,3-dichloropropylene	0.20	ND	4.0	D1			
1,1,2-trichloroethane	0.21	ND	4.2	D1			
2,3,4-trimethylpentane	0.24	ND	4.8	D1			
toluene	0.27	12	5.4	L,D1			
2-methylheptane	0.20	16	4.0	D1			
3-methylheptane	0.23	14	4.6	D1			
1,2-dibromoethane	0.20	0.12	4.0	J,D1			
n-octane	0.19	26	3.8	D1			
tetrachloroethylene	0.24	ND	4.8	D1			
chlorobenzene	0.27	ND	5.4	D1			
ethylbenzene	0.27	1.3	5.4	J,D1			
m & p-xylene	0.27	15	5.4	L,D1			
styrene	0.27	ND	5.4	D1			
1,1,2,2-tetrachloroethane	0.20	ND	4.0	D1			
o-xylene	0.27	2.7	5.4	J,D1			
n-nonane	0.22	12	4.4	L,D1			
isopropylbenzene	0.24	ND	4.8	D1			
n-propylbenzene	0.27	ND	5.4	D1			
m-ethyltoluene	0.11	0.57	2.2	J,D1			
p-ethyltoluene	0.16	0.19	3.2	J,D1			
1,3,5-trimethylbenzene	0.25	0.71	5.0	J,D1			
o-ethyltoluene	0.13	ND	2.6	D1			
1,2,4-trimethylbenzene	0.27	1.3	5.4	J,D1			
n-decane	0.27	2.3	5.4	J,D1			
1,2,3-trimethylbenzene	0.27	ND	5.4	D1			
m-diethylbenzene	0.27	ND	5.4	D1			
p-diethylbenzene	0.27	ND	5.4	D1			
n-undecane	0.27	1.6	5.4	J,D1			

## Laboratory Analysis Results

ACL Number: 100670

Analysis Code: AMOR006

---

Note: Results are reported in units of parts per billion by volume ( ppbv)

LOD - Limit of Detection.

ND - not detected

NQ - concentration can not be quantified.

SDL - Sample Detection Limit (LOD adjusted for dilutions).

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.

\* SDL is equal to LOD

\*\* Quality control flags explanations are listed on the last page of this report.

TCEQ laboratory customer support may be reached at [kbachtel@tceq.state.tx.us](mailto:kbachtel@tceq.state.tx.us)

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.

## Laboratory Analysis Results

ACL Number: 100670

Analysis Code: AMOR006

---

### Quality Control Notes:

D1-sample concentration was calculated using a dilution factor of 40.27.

TCEQ laboratory customer support may be reached at [kbachtel@tceq.state.tx.us](mailto:kbachtel@tceq.state.tx.us)

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.