



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: 05-103-10457	NAME/DESCRIP : PCU T78X-12G3
LEASE #:	INTER CSG
FIELD/AREA:	
PROJECT NO. : 202505076	ANALYSIS NO. : 01
COMPANY NAME : QB ENERGY OPERATING, LLC	ANALYSIS DATE: MAY 19, 2025 14:40
OFFICE / BRANCH: PARACHUTE, CO	SAMPLE DATE : MAY 1, 2025
CUSTOMER REF:	TO:
PRODUCER : QB ENERGY OPERATING LLC	EFFECTIVE DATE:

*****FIELD DATA*****

SAMPLE CYCLE:	SAMPLE TYPE:
SAMPLE PRES. : 902 psig	PROBE :
FLOW PRES. : psig	CYLINDER NO. : 149
LAB PRES: psig	SAMPLED BY : NICK CROY
SAMPLE TEMP. : °f	SAMPLING COMPANY: QB ENERGY
AMBIENT TEMP.: °f	H2S BY STAIN TUBE: - ppm mol
H2O BY STAIN TUBE: - #/mmcf	CO2 BY STAIN TUBE: - Mol %
FIELD COMMENTS:	
LAB COMMENTS:	

<u>COMPONENT</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>GPM @ 14.65</u>	<u>GPM @ 14.73</u>
HELIUM	0.00	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.07	0.10	---	---
CARBON DIOXIDE	4.76	11.03	---	---
METHANE	88.0771	74.4211	---	---
ETHANE	4.8210	7.6351	1.2852	1.2922
PROPANE	1.1842	2.7503	0.3248	0.3266
I-BUTANE	0.2998	0.9178	0.0979	0.0985
N-BUTANE	0.2452	0.7506	0.0770	0.0774
I-PENTANE	0.1336	0.5072	0.0480	0.0482
N-PENTANE	0.0794	0.3017	0.0290	0.0291
HEXANES PLUS	0.3297	1.5862	0.1300	0.1304
TOTALS	100.0000	100.0000	1.9919	2.0024

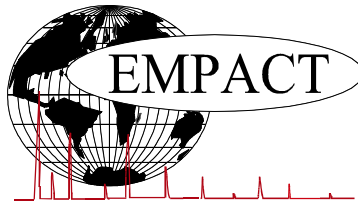
<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>	<u>CALCULATED VALUES**</u>	
			<u>BTU @ 14.65</u>	<u>14.73</u>
BENZENE	0.0173	0.0712	LHV NET DRY REAL :	944.9 /scf
TOLUENE	0.0039	0.0189		950.1 /scf
ETHYLBENZENE	0.0000	0.0000	NET WET REAL :	928.4 /scf
XYLENES	0.0002	0.0011	HHV GROSS DRY REAL :	1046.5 /scf
TOTAL BTEX	0.0214	0.0912	GROSS WET REAL :	1052.2 /scf
				1033.9 /scf
			NET HEATING VALUE (60 °F ideal reaction):	18905.4 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):	20933.5 Btu/lbm
			RELATIVE DENSITY (AIR=1):	0.6552
			DENSITY	0.05003 lbm/scf
			COMPRESSIBILITY FACTOR :	0.9975
			REGULAR WOBBE INDEX	1293.7

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993)*

Mod ASTM D6730,GPA 2261 & GPA 2286.

*** (CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)*

The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc. Results of the analysis can be affected by the sampling conditions, therefore, are only warranted through proper lab protocol. EMPACT assumes no responsibility for interpretation or any consequences from application of the reported information and is the sole liability of the user. The reproduction in any media of this reported information may not be made, in portion or as a whole, without the written permission of EMPACT Analytical Systems, Inc.



**EXTENDED NATURAL GAS ANALYSIS (*DHA)
GLYCALC INFORMATION**

PROJECT NO. :	202505076	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	MAY 19, 2025 14:40
ACCOUNT NO. :		SAMPLE DATE :	MAY 1, 2025
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	149
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	PCU T78X-12G3 INTER CSG		

FIELD DATA

SAMPLE PRES. : 902
H2S BY STAIN TUBE: — ppm mol
COMMENTS :

SAMPLE TEMP. :
AMBIENT TEMP.:

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.00	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	4.76	11.03
Nitrogen	0.07	0.10
Methane	88.0771	74.4211
Ethane	4.8210	7.6351
Propane	1.1842	2.7503
Isobutane	0.2998	0.9178
n-Butane	0.2452	0.7506
Isopentane	0.1289	0.4898
n-Pentane	0.0794	0.3017
Cyclopentane	0.0047	0.0174
n-Hexane	0.0456	0.2070
Cyclohexane	0.0255	0.1130
Other Hexanes	0.0967	0.4365
Heptanes	0.0851	0.4474
Methylcyclohexane	0.0519	0.2684
2,2,4 Trimethylpentane	0.0002	0.0012
Benzene	0.0173	0.0712
Toluene	0.0039	0.0189
Ethylbenzene	0.0000	0.0000
Xylenes	0.0002	0.0011
C8+ Heavies	0.0033	0.0215
<u>Subtotal</u>	<u>100.00000</u>	<u>100.00000</u>
<u>Oxygen/Argon</u>	<u>0.00</u>	<u>0.00</u>
Total	100.00000	100.00000

	Total	C6+	C8+	C10+
Calculated Values BTU @	Sample	Fraction	Fraction	Fraction
14.65				
LHV Net Dry Real:	944.9	4616.6	5865.6	7791.2 Btu/scf
Net Wet Real:	928.4	4535.9	5763.1	7655.0 Btu/scf
HHV Gross Dry Real:	1046.5	4963.6	6299.6	8317.7 Btu/scf
Gross Wet Real:	1028.2	4876.8	6189.5	8172.3 Btu/scf
Other Calculated Values				
Regualr Wobbe Index*	1293.7	2780.1	3070.2	3557.0 Btu/scf
Net Heating Value (60 °F ideal reaction):	18905.4	19207.8	18850.8	18615.7 Btu/lbm
Gross Heating Value (60°F ideal reaction):	20933.5	20654.8	20248.0	19874.3 Btu/lbm
Molar Mass (MW):	18.98759	91.336	122.124	159.293 g/mol
Relative Density (AIR=1):	0.6552	3.1537	4.2166	5.5001 SG
Density:	0.05003	0.24069	0.32181	0.41976 lbm/scf
Compressibility Factor:	0.9975	0.9915	0.9976	0.9998 Z
Liquid Volume real gas @:	14.65	17.6486	0.1296	0 gal/1000 scf

* The Wobbe pressure base in the number considered is based upon the given Pb of the HHV above.
#DIV/0 or 0 (zero) will appear in the Calculated Value Section when there is no C6+, C8+ or C10+ in the sample to calculate these factors.
BDL - Below Detection Limit. The H2S LOS has a detection limit of 0.25 ppm. A _ (an underscore) indicates there was no tube pulled for H2S.

The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc. Results of the analysis can be affected by the sampling conditions, therefore, are only warranted through proper lab protocol. EMPACT assumes no responsibility for interpretation or any consequences from application of the reported information and is the sole liability of the user. The reproduction in any media of this reported information may not be made, in portion or as a whole, without the written permission of EMPACT Analytical Systems, Inc.

1c,3-Dimethylcyclopentane	N7	0.0042	0.0217	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0039	0.0202	0.002	0.002
3-Ethylpentane	I7	0.0010	0.0053	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0056	0.0290	0.003	0.003
2,2,4-Trimethylpentane	I8	0.0002	0.0012	0.000	0.000
n-Heptane	P7	0.0290	0.1531	0.013	0.013
1c,2-Dimethylcyclopentane	N7	0.0009	0.0046	0.000	0.000
Methylcyclohexane	N7	0.0519	0.2684	0.021	0.021
2,2-Dimethylhexane	I8	0.0006	0.0036	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
Ethylcyclopentane	N7	0.0010	0.0052	0.000	0.000
2,5-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0039	0.0189	0.001	0.001
2-Methylheptane	I8	0.0002	0.0012	0.000	0.000
4-Methylheptane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0001	0.0006	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0003	0.0018	0.000	0.000
1c,4-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0002	0.0011	0.000	0.000
n-Nonane	P9	0.0001	0.0007	0.000	0.000
1,3-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
2-Methylnonane	I10	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0003	0.0021	0.000	0.000
n-Tetradecane	P14	0.0001	0.0011	0.000	0.000
n-Pentadecane	P15	0.0001	0.0011	0.000	0.000
TOTAL		100.00000	100.00000	1.9919	2.0024

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0173	0.0712	LHV NET DRY REAL :	944.9 /scf	950.1 /scf
TOLUENE	0.0039	0.0189	NET WET REAL :	928.4 /scf	933.6 /scf
ETHYLBENZENE	0.0000	0.0000	HHV GROSS DRY REAL :	1046.5 /scf	1052.2 /scf
XYLENES	0.0002	0.0011	GROSS WET REAL :	1028.2 /scf	1033.9 /scf
TOTAL BTEX	0.0214	0.0912	NET HEATING VALUE (60 °F ideal reaction):		18905.4 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		20933.5 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6552
			DENSITY		0.05003 lb/scf
			COMPRESSIBILITY FACTOR :		0.9975
			REGULAR WOBBE INDEX		1293.7

*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730, GPA 2261 & GPA 2286.

** (CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

C6+ Fraction of DHA Gas Analysis @60°F, 14.696 psia

Net Dry Ideal BTU	4591.8 /scf	Relative Density - SG (Air=1)	3.1537	C6+ factors
Gross Dry Ideal BTU	4937 /scf	Z Compressibility Factor	0.99152	0.99095
Net Dry Ideal BTU	19207.8 /lb	Density Factor	240.694 lbm/1000 ft3	
Gross Dry Ideal BTU	20654.8 /lb	Molar Mass or MW	91.336 g/mol	
		Volume Liquid Ideal gas	0.13 scf/gal	25

This hexanes plus fraction may be applied in place of published C6+ factors. The Z & GPM need additional calc for C6+ factors. #DIV/0 or 0 (zero) will appear in this section when there is no hexanes plus in the sample to calculate C6+ factors.

The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc. Results of the analysis can be affected by the sampling conditions, therefore, are only warranted through proper lab protocol. EMPACT assumes no responsibility for interpretation or any consequences from application of the reported information and is the sole liability of the user. The reproduction in any media of this reported information may not be made, in portion or as a whole, without the written permission of EMPACT Analytical Systems, Inc.