



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

PROJECT NO. :	202508080	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 23, 2025 11:10
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 08, 2025 09:30
PRODUCER :		CYLINDER NO. :	ECA-795
LEASE NO. :		SAMPLED BY :	NICK COY
NAME/DESCRIP :	YCF 33-43-1 PRODUCTION CASING		

FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	867	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	—		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	5.77	13.10
Nitrogen	0.09	0.13
Methane	85.9329	71.0959
Ethane	5.5238	8.5659
Propane	1.5083	3.4300
Isobutane	0.3538	1.0605
n-Butane	0.2952	0.8849
Isopentane	0.1222	0.4547
n-Pentane	0.0829	0.3085
Cyclopentane	0.0028	0.0101
n-Hexane	0.0229	0.1017
Cyclohexane	0.0106	0.0460
Other Hexanes	0.0533	0.2361
Heptanes	0.0246	0.1265
Methylcyclohexane	0.0124	0.0628
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0034	0.0137
Toluene	0.0046	0.0219
Ethylbenzene	0.0003	0.0016
Xylenes	0.0020	0.0109
C8+ Heavies	0.0127	0.0779
<u>Subtotal</u>	<u>99.84800</u>	<u>99.73930</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.1520	0.2607
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
	14.65				
LHV	Net Dry Real:	940.1	4673.9	5808.1	7941.8 Btu/scf
	Net Wet Real:	923.7	4592.2	5706.6	7803.0 Btu/scf
HHV	Gross Dry Real:	1041.0	5028.8	6235.2	8529.1 Btu/scf
	Gross Wet Real:	1022.8	4940.9	6126.2	8380.0 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*		1273.6	2800.0	3106.8	3649.1 Btu/scf
Net Heating Value (60 °F ideal reaction):		18420.0	19245.5	19453.3	18985.3 Btu/lbm
Gross Heating Value (60°F ideal reaction):		20392.6	20703.9	20886.9	20387.5 Btu/lbm
Molar Mass (MW):		19.38999	92.358	116.839	159.166 g/mol
Relative Density (AIR=1):		0.6689	3.1889	4.0345	5.4956 SG
Density:		0.05109	0.24338	0.30788	0.41943 lbm/scf
Compressibility Factor:		0.9974	0.9912	0.9977	0.9998 Z
Liquid Volume real gas @:	14.65	17.7164	0.0558	0.004	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.



**EXTENDED NATURAL GAS ANALYSIS (*DHA)
DHA COMPONENT LIST**

PRIMARY DB KEY: **05-103-10403** NAME/DESCRIP : **YCF 33-43-1**
 LEASE #: **PRODUCTION CASING**
 FIELD/AREA:
 PROJECT NO. : **202508080** ANALYSIS NO. : **01**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **AUGUST 23, 2025 11:10**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **AUGUST 08, 2025 09:30**
 CUSTOMER REF: **TO:**
 PRODUCER : **EFFECTIVE DATE:**

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

SAMPLE CYCLE: SAMPLE TYPE:
 SAMPLE PRES. : 867 psig PROBE :
 FLOW PRES. : psig CYLINDER NO. : ECA-795
 LAB PRES: psig SAMPLED BY : NICK COY
 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:

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.01	0.00	---	---
Nitrogen	---	0.09	0.13	---	---
Carbon Dioxide	---	5.77	13.10	---	---
Methane	P1	85.9329	71.0959	---	---
Ethane	P2	5.5238	8.5659	1.472	1.480
Propane	P3	1.5083	3.4300	0.414	0.416
i-Butane	I4	0.3538	1.0605	0.115	0.116
Methanol	X1	0.1453	0.2401	0.018	0.018
n-Butane	P4	0.2952	0.8849	0.093	0.094
2,2-Dimethylpropane	I5	0.0029	0.0108	0.001	0.001
Ethanol	X2	0.0004	0.0009	0.000	0.000
i-Pentane	I5	0.1193	0.4439	0.044	0.044
Acetone	X3	0.0001	0.0003	0.000	0.000
i-Propanol	X3	0.0060	0.0186	0.002	0.002
n-Pentane	P5	0.0829	0.3085	0.030	0.030
t-Butanol	X4	0.0002	0.0008	0.000	0.000
2,2-Dimethylbutane	I6	0.0035	0.0156	0.001	0.001
Cyclopentane	N5	0.0028	0.0101	0.001	0.001
2,3-Dimethylbutane	I6	0.0055	0.0244	0.002	0.002
2-Methylpentane	I6	0.0244	0.1085	0.010	0.010
3-Methylpentane	I6	0.0119	0.0529	0.005	0.005
n-Hexane	P6	0.0229	0.1017	0.009	0.009
2,2-Dimethylpentane	I7	0.0008	0.0041	0.000	0.000
Methylcyclopentane	N6	0.0080	0.0347	0.003	0.003
2,4-Dimethylpentane	I7	0.0013	0.0067	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0003	0.0015	0.000	0.000
Benzene	A6	0.0034	0.0137	0.001	0.001

3,3-Dimethylpentane	I7	0.0004	0.0021	0.000	0.000
Cyclohexane	N6	0.0106	0.0460	0.004	0.004
2-Methylhexane	I7	0.0046	0.0238	0.002	0.002
2,3-Dimethylpentane	I7	0.0011	0.0057	0.000	0.000
1,1-Dimethylcyclopentane	N7	0.0009	0.0045	0.000	0.000
3-Methylhexane	I7	0.0036	0.0186	0.002	0.002
1c,3-Dimethylcyclopentane	N7	0.0011	0.0056	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0010	0.0050	0.000	0.000
3-Ethylpentane	I7	0.0002	0.0010	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0016	0.0081	0.001	0.001
n-Heptane	P7	0.0071	0.0367	0.003	0.003
1c,2-Dimethylcyclopentane	N7	0.0001	0.0005	0.000	0.000
Methylcyclohexane	N7	0.0124	0.0628	0.005	0.005
2,2-Dimethylhexane	I8	0.0003	0.0017	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0004	0.0020	0.000	0.000
2,5-Dimethylhexane	I8	0.0003	0.0017	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0002	0.0012	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0046	0.0219	0.002	0.002
2,3-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
2-Methylheptane	I8	0.0011	0.0065	0.001	0.001
4-Methylheptane	I8	0.0004	0.0024	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0008	0.0047	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0014	0.0081	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0006	0.0035	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0002	0.0011	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0004	0.0023	0.000	0.000
n-Octane	P8	0.0021	0.0124	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0002	0.0011	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0003	0.0020	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0003	0.0017	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0011	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,5-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0003	0.0016	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0013	0.0071	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0005	0.0027	0.000	0.000
4-Methyloctane	I9	0.0001	0.0007	0.000	0.000
2-Methyloctane	I9	0.0002	0.0013	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0002	0.0011	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
n-Nonane	P9	0.0006	0.0040	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0001	0.0007	0.000	0.000

n-Decane	P10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0002	0.0014	0.000	0.000
n-Dodecane	P12	0.0001	0.0009	0.000	0.000
n-Tridecane	P13	0.0001	0.0009	0.000	0.000
n-Tetradecane	P14	0.0001	0.0010	0.000	0.000
TOTAL		100.00000	100.00000	2.2458	2.2577

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @		
			14.65	14.73	
BENZENE	0.0034	0.0137	LHV NET DRY REAL :	940.1 /scf	945.2 /scf
TOLUENE	0.0046	0.0219	NET WET REAL :	923.7 /scf	928.8 /scf
ETHYLBENZENE	0.0003	0.0016	HHV GROSS DRY REAL :	1041.0 /scf	1046.7 /scf
XYLENES	0.0020	0.0109	GROSS WET REAL :	1022.8 /scf	1028.5 /scf
TOTAL BTEX	0.0103	0.0481	NET HEATING VALUE (60 °F ideal reaction):		18420.0 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		20392.6 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6689
			DENSITY		0.05109 lb/scf
			COMPRESSIBILITY FACTOR :		0.9974
			REGULAR WOBBE INDEX		1273.6

*(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	<u>4647.3</u> /scf	Relative Density - SG (Air=1)	<u>3.1889</u>	C6+ factors
Gross Dry Ideal BTU	<u>5000.1</u> /scf	Z Compressibility Factor	<u>0.99119</u>	<u>0.99043</u>
Net Dry Ideal BTU	<u>19245.5</u> /lb	Density Factor	<u>243.377</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20703.9</u> /lb	Molar Mass or MW	<u>92.358</u> g/mol	
		Volume Liquid Ideal gas	<u>0.056</u> scf/gal	<u>23.9</u>

**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.**

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