



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

PROJECT NO. :	202508079	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 23, 2025 09:25
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 08, 2028 08:30
PRODUCER :		CYLINDER NO. :	ECA-749
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	YCF 27-32-1 PRODUCTION CASING		

FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	80	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	— ppm mol		
COMMENTS :			

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.00	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	0.09	0.25
Nitrogen	0.02	0.03
Methane	99.8604	99.6621
Ethane	0.0093	0.0174
Propane	0.0042	0.0115
Isobutane	0.0021	0.0076
n-Butane	0.0010	0.0036
Isopentane	0.0010	0.0045
n-Pentane	0.0000	0.0000
Cyclopentane	0.0000	0.0000
n-Hexane	0.0001	0.0006
Cyclohexane	0.0001	0.0005
Other Hexanes	0.0002	0.0012
Heptanes	0.0000	0.0000
Methylcyclohexane	0.0001	0.0006
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0000	0.0000
Toluene	0.0001	0.0006
Ethylbenzene	0.0000	0.0000
Xylenes	0.0000	0.0000
C8+ Heavies	0.0007	0.0072
<u>Subtotal</u>	<u>99.99920</u>	<u>99.99740</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0008	0.0026
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
	14.65				
LHV	Net Dry Real:	907.5	6548.1	8358.0	8358.0 Btu/scf
	Net Wet Real:	891.6	6433.6	8211.9	8211.9 Btu/scf
HHV	Gross Dry Real:	1007.9	7039.0	8995.5	8995.5 Btu/scf
	Gross Wet Real:	990.3	6915.9	8838.2	8838.2 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*		1354.5	3318.0	3765.1	3765.1 Btu/scf
Net Heating Value (60 °F ideal reaction):		21449.7	19050.9	19126.7	19126.7 Btu/lbm
Gross Heating Value (60 °F ideal reaction):		23823.6	20480.1	20586.1	20586.1 Btu/lbm
Molar Mass (MW):		16.07477	130.565	166.331	166.331 g/mol
Relative Density (AIR=1):		0.5549	4.5081	5.7430	5.7430 SG
Density:		0.04236	0.34406	0.43830	0.43830 lbm/scf
Compressibility Factor:		0.9980	0.9977	0.9999	0.9999 Z
Liquid Volume real gas @:	14.65	16.8551	0	0	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 part or as a whole, without the written permission of EMPACT Analytical Systems, Inc.



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY: **05-103-11104** NAME/DESCRIP : **YCF 27-32-1**
 LEASE #: **PRODUCTION CASING**
 FIELD/AREA:
 PROJECT NO. : **202508079** ANALYSIS NO. : **02**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **AUGUST 23, 2025 09:25**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **AUGUST 08, 2028 08:30**
 CUSTOMER REF: **TO:**
 PRODUCER : **EFFECTIVE DATE:**

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

SAMPLE CYCLE: SAMPLE TYPE:
 SAMPLE PRES. : 80 psig PROBE :
 FLOW PRES. : psig CYLINDER NO. : **ECA-749**
 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:

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
Hydrogen	---	0.01	0.00	---	---
Nitrogen	---	0.02	0.03	---	---
Carbon Dioxide	---	0.09	0.25	---	---
Methane	P1	99.8604	99.6621	---	---
Ethane	P2	0.0093	0.0174	0.002	0.002
Propane	P3	0.0042	0.0115	0.001	0.001
i-Butane	I4	0.0021	0.0076	0.001	0.001
Methanol	X1	0.0002	0.0004	0.000	0.000
n-Butane	P4	0.0010	0.0036	0.000	0.000
i-Pentane	I5	0.0010	0.0045	0.000	0.000
Acetone	X3	0.0006	0.0022	0.000	0.000
2-Methylpentane	I6	0.0001	0.0006	0.000	0.000
3-Methylpentane	I6	0.0001	0.0006	0.000	0.000
n-Hexane	P6	0.0001	0.0006	0.000	0.000
Cyclohexane	N6	0.0001	0.0005	0.000	0.000
Methylcyclohexane	N7	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0001	0.0006	0.000	0.000
n-Decane	P10	0.0001	0.0009	0.000	0.000
n-Undecane	P11	0.0002	0.0019	0.000	0.000
UnknownC11s	U11	0.0001	0.0010	0.000	0.000
n-Dodecane	P12	0.0001	0.0011	0.000	0.000
n-Tridecane	P13	0.0001	0.0011	0.000	0.000
n-Tetradecane	P14	0.0001	0.0012	0.000	0.000
TOTAL		100.0000	100.0000	0.0040	0.0040

BTEX COMPONENTS	MOLE%	WT%	CALCULATED VALUES**		
			BTU @	14.65	14.73
BENZENE	0.0000	0.0000	LHV NET DRY REAL :	907.5 /scf	912.4 /scf
TOLUENE	0.0001	0.0006	NET WET REAL :	891.6 /scf	896.5 /scf
ETHYLBENZENE	0.0000	0.0000	HHV GROSS DRY REAL :	1007.9 /scf	1013.4 /scf
XYLENES	0.0000	0.0000	GROSS WET REAL :	990.3 /scf	995.8 /scf
TOTAL BTEX	0.0001	0.0006	NET HEATING VALUE (60 °F ideal reaction):		21449.7 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		23823.6 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.5549
			DENSITY		0.04236 lb/scf
			COMPRESSIBILITY FACTOR :		0.9980
			REGULAR WOBBE INDEX		1354.5

*(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>6553.6</u> /scf	Relative Density - SG (Air=1)	<u>4.5081</u>	C6+ factors
Gross Dry Ideal BTU	<u>7044.9</u> /scf	Z Compressibility Factor	<u>0.99771</u>	<u>0.99572</u>
Net Dry Ideal BTU	<u>19050.9</u> /lb	Density Factor	<u>344.057</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20480.1</u> /lb	Molar Mass or MW	<u>130.565</u> g/mol	
		Volume Liquid Ideal gas	<u>0</u> scf/gal	<u>20</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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