



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

PROJECT NO. :	202509066	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	SEPTEMBER 19, 2025 14:09
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 09, 2025
PRODUCER :		CYLINDER NO. :	ECA-770
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	PCU 296-7A4 INTERMEDIATE CASING		

FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	1940	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	— ppm mol		
COMMENTS :			

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.00	0.00
Hydrogen	0.81	0.10
Carbon Dioxide	0.01	0.03
Nitrogen	0.10	0.17
Methane	95.5603	91.6825
Ethane	2.3057	4.1463
Propane	0.4161	1.0973
Isobutane	0.0960	0.3337
n-Butane	0.0740	0.2572
Isopentane	0.0380	0.1639
n-Pentane	0.0220	0.0949
Cyclopentane	0.0012	0.0050
n-Hexane	0.0132	0.0681
Cyclohexane	0.0066	0.0332
Other Hexanes	0.0279	0.1430
Heptanes	0.0280	0.1674
Methylcyclohexane	0.0158	0.0928
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0045	0.0210
Toluene	0.0056	0.0309
Ethylbenzene	0.0006	0.0038
Xylenes	0.0036	0.0228
C8+ Heavies	0.0781	0.6010
<u>Subtotal</u>	<u>99.61720</u>	<u>99.26480</u>
Oxygen/Argon	0.01	0.02
Alcohols	0.3728	0.7152
Total	100.00000	100.00000

Calculated Values BTU @		Total	C6+	C8+	C10+
LHV	Net Dry Real:	936.3	5407.5	6387.5	7399.5 Btu/scf
	Net Wet Real:	919.9	5313.0	6275.8	7270.1 Btu/scf
HHV	Gross Dry Real:	1038.4	5819.7	6885.7	8014.1 Btu/scf
	Gross Wet Real:	1020.2	5718.0	6765.3	7874.0 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*	1370.1	3015.9	3288.5	3568.3	Btu/scf
Net Heating Value (60 °F ideal reaction):	21299.4	19208.5	19247.9	18962.4	Btu/lbm
Gross Heating Value (60°F ideal reaction):	23630.0	20673.7	20748.0	20531.1	Btu/lbm
Molar Mass (MW):	16.71935	107.601	127.451	146.92	g/mol
Relative Density (AIR=1):	0.5755	3.7145	4.4006	5.0729	SG
Density:	0.04405	0.28356	0.33586	0.38716	lbm/scf
Compressibility Factor:	0.9978	0.9956	0.9987	0.9997	Z
Liquid Volume real gas @:	17.1192	0.0748	0.0359	0.013	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.

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2-Methylhexane	I7	0.0046	0.0276	0.002	0.002
2,3-Dimethylpentane	I7	0.0011	0.0066	0.000	0.000
1,1-Dimethylcyclopentane	N7	0.0008	0.0047	0.000	0.000
3-Methylhexane	I7	0.0041	0.0246	0.002	0.002
1c,3-Dimethylcyclopentane	N7	0.0013	0.0077	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0012	0.0071	0.001	0.001
3-Ethylpentane	I7	0.0002	0.0012	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0018	0.0106	0.001	0.001
n-Heptane	P7	0.0099	0.0593	0.005	0.005
1c,2-Dimethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
Methylcyclohexane	N7	0.0158	0.0928	0.006	0.006
2,2-Dimethylhexane	I8	0.0006	0.0041	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0007	0.000	0.000
Ethylcyclopentane	N7	0.0005	0.0029	0.000	0.000
2,5-Dimethylhexane	I8	0.0007	0.0048	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0007	0.0048	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0007	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0004	0.0027	0.000	0.000
3,3-Dimethylhexane	I8	0.0002	0.0014	0.000	0.000
Toluene	A7	0.0056	0.0309	0.002	0.002
2,3-Dimethylhexane	I8	0.0005	0.0034	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0007	0.000	0.000
2-Methylheptane	I8	0.0035	0.0239	0.002	0.002
4-Methylheptane	I8	0.0011	0.0075	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0001	0.0007	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0007	0.000	0.000
3-Methylheptane	I8	0.0027	0.0184	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0032	0.0215	0.002	0.002
3-Ethylhexane	I8	0.0001	0.0007	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0014	0.0094	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0005	0.0033	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0007	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0007	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0009	0.0060	0.000	0.000
1t,3-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
n-Octane	P8	0.0086	0.0587	0.004	0.004
1c,4-Dimethylcyclohexane	N8	0.0007	0.0047	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0016	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
2,2-Dimethylheptane	I9	0.0004	0.0030	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0009	0.0068	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0002	0.0016	0.000	0.000
2,4-Dimethylheptane	I9	0.0002	0.0016	0.000	0.000
Ethylcyclohexane	N8	0.0015	0.0100	0.001	0.001
n-Propylcyclopentane	N8	0.0004	0.0027	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0003	0.0023	0.000	0.000
2,5-Dimethylheptane	I9	0.0012	0.0092	0.001	0.001
3,3-Dimethylheptane	I9	0.0003	0.0023	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
Ethylbenzene	I8	0.0006	0.0038	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0025	0.0158	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0008	0.0051	0.000	0.000
3,4-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0016	0.000	0.000
4-Methyloctane	I9	0.0011	0.0084	0.001	0.001
2-Methyloctane	I9	0.0018	0.0138	0.001	0.001
3-Ethylheptane	I9	0.0001	0.0008	0.000	0.000
3-Methyloctane	I9	0.0002	0.0016	0.000	0.000

1c,2t,4c-Trimethylcyclohexane	I9	0.0016	0.0121	0.001	0.001
1,2-Dimethylbenzene (o-Xylene)	A8	0.0003	0.0019	0.000	0.000
i-Butylcyclopentane	N9	0.0005	0.0038	0.000	0.000
n-Nonane	P9	0.0076	0.0583	0.004	0.004
1,1-Methylethylcyclohexane	N9	0.0002	0.0015	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0008	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
2,4-Dimethyloctane	I10	0.0002	0.0017	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0007	0.0053	0.000	0.000
3,3-Dimethyloctane	I10	0.0002	0.0017	0.000	0.000
n-Propylbenzene	A9	0.0012	0.0086	0.001	0.001
3,6-Dimethyloctane	I10	0.0003	0.0026	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0006	0.0043	0.000	0.000
1,4-Methylethylbenzene	A9	0.0003	0.0021	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0008	0.0057	0.000	0.000
2,3-Dimethyloctane	I10	0.0004	0.0034	0.000	0.000
5-Methylnonane	I10	0.0009	0.0077	0.001	0.001
1,2-Methylethylbenzene	A9	0.0013	0.0093	0.001	0.001
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Ethylheptane	I10	0.0002	0.0017	0.000	0.000
3-Methylnonane	I10	0.0009	0.0077	0.001	0.001
1,2,4-Trimethylbenzene	A9	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0006	0.0048	0.000	0.000
i-Butylcyclohexane	N10	0.0002	0.0017	0.000	0.000
1t-Methyl-2-n-propylcyclohexane	I10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0007	0.0054	0.000	0.000
n-Decane	P10	0.0058	0.0493	0.004	0.004
1,3-Methyl-i-propylbenzene	A10	0.0001	0.0008	0.000	0.000
1,4-Methyl-i-propylbenzene	A10	0.0001	0.0008	0.000	0.000
Sec-Butylcyclohexane	A10	0.0001	0.0008	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0008	0.000	0.000
3-Ethylnonane	I10	0.0003	0.0028	0.000	0.000
1,3-Diethylbenzene	A10	0.0010	0.0080	0.001	0.001
1,3-Methyl-n-propylbenzene	A10	0.0004	0.0032	0.000	0.000
1,4-Diethylbenzene	A10	0.0002	0.0016	0.000	0.000
n-Butylbenzene	A10	0.0003	0.0024	0.000	0.000
1,3-Dimethyl-5-ethylbenzene	A10	0.0001	0.0008	0.000	0.000
1,2-Diethylbenzene	A10	0.0002	0.0016	0.000	0.000
t-Decahydronaphthalene	A9	0.0001	0.0009	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0003	0.0024	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0005	0.0040	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0008	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0004	0.0032	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0001	0.0008	0.000	0.000
1,2-Ethyl-i-propylbenzene	A10	0.0001	0.0009	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0002	0.0018	0.000	0.000
UnknownC10s	U10	0.0024	0.0204	0.001	0.001
n-Undecane	P11	0.0028	0.0262	0.002	0.002
1,4-Ethyl-i-propylbenzene	A11	0.0002	0.0018	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0002	0.0016	0.000	0.000
1,2-Methyl-n-butylbenzene	A11	0.0001	0.0009	0.000	0.000
1,2,3,5-Tetramethylbenzene	A11	0.0001	0.0008	0.000	0.000
5-Methylindan	A11	0.0002	0.0016	0.000	0.000
1,2-Ethyl-n-propylbenzene	A11	0.0001	0.0009	0.000	0.000
1,3-Methyl-n-butylbenzene	A11	0.0001	0.0009	0.000	0.000
1,3-Di-i-propylbenzene	A11	0.0001	0.0010	0.000	0.000
sec-Pentylbenzene	A11	0.0001	0.0009	0.000	0.000
n-Pentylbenzene	A11	0.0001	0.0009	0.000	0.000

1,2-Di-n-propylbenzene	A11	0.0001	0.0010	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0001	0.0010	0.000	0.000
Tetrahydronaphthalene	A10	0.0001	0.0008	0.000	0.000
Naphthalene	A10	0.0002	0.0016	0.000	0.000
UnknownC11s	U11	0.0008	0.0075	0.001	0.001
n-Dodecane	P12	0.0008	0.0081	0.001	0.001
1,3,5-Triethylbenzene	A12	0.0002	0.0019	0.000	0.000
n-Hexylbenzene	A12	0.0001	0.0010	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0002	0.0018	0.000	0.000
UnknownC12s	U12	0.0009	0.0084	0.001	0.001
n-Tridecane	P13	0.0003	0.0033	0.000	0.000
UnknownC13s	U13	0.0005	0.0055	0.000	0.000
n-Tetradecane	P14	0.0001	0.0012	0.000	0.000
UnknownC14s	U14	0.0002	0.0024	0.000	0.000
n-Pentadecane	P15	0.0001	0.0013	0.000	0.000
TOTAL		100.00000	100.00000	0.9263	0.9308

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0045	0.0210	LHV NET DRY REAL :	936.3 /scf	941.4 /scf
TOLUENE	0.0056	0.0309	NET WET REAL :	919.9 /scf	925.0 /scf
ETHYLBENZENE	0.0006	0.0038	HHV GROSS DRY REAL :	1038.4 /scf	1044.1 /scf
XYLENES	0.0036	0.0228	GROSS WET REAL :	1020.2 /scf	1025.9 /scf
TOTAL BTEX	0.0143	0.0785	NET HEATING VALUE (60 °F ideal reaction):		21299.4 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		23630.0 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.5755
			DENSITY		0.04405 lb/scf
			COMPRESSIBILITY FACTOR :		0.9978
			REGULAR WOBBE INDEX		1370.1

*(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>5400.8</u> /scf	Relative Density - SG (Air=1)	<u>3.7145</u>	C6+ factors
Gross Dry Ideal BTU	<u>5812.5</u> /scf	Z Compressibility Factor	<u>0.99563</u>	<u>0.99443</u>
Net Dry Ideal BTU	<u>19208.5</u> /lb	Density Factor	<u>283.562</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20673.7</u> /lb	Molar Mass or MW	<u>107.601</u> g/mol	
		Volume Liquid Ideal gas	<u>0.075</u> scf/gal	<u>21</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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