



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

PROJECT NO. :	202509091	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	SEPTEMBER 29, 2025 09:54
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 08, 2025
PRODUCER :		CYLINDER NO. :	ECA-734
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	PICEANCE CREEK UNIT 297-11B7 INTERMEDIATE CASING		

FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	10	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	—		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	10.29	1.22
Carbon Dioxide	0.06	0.16
Nitrogen	4.88	8.07
Methane	78.7262	74.5803
Ethane	2.7056	4.8042
Propane	0.7066	1.8400
Isobutane	0.1473	0.5056
n-Butane	0.2285	0.7843
Isopentane	0.1227	0.5228
n-Pentane	0.1185	0.5049
Cyclopentane	0.0054	0.0224
n-Hexane	0.0662	0.3369
Cyclohexane	0.0348	0.1730
Other Hexanes	0.1113	0.5636
Heptanes	0.1467	0.8652
Methylcyclohexane	0.1110	0.6436
2,2,4 Trimethylpentane	0.0002	0.0014
Benzene	0.0085	0.0392
Toluene	0.0104	0.0566
Ethylbenzene	0.0025	0.0157
Xylenes	0.0069	0.0434
C8+ Heavies	0.2743	1.9191
<u>Subtotal</u>	<u>98.77360</u>	<u>97.67300</u>
Oxygen/Argon	1.20	2.27
Glycols	0.0001	0.0005
Alcohols	0.0263	0.0565
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

	Total	C6+	C8+	C10+
Calculated Values BTU @	Sample	Fraction	Fraction	Fraction
LHV Net Dry Real:	862.9	5146.1	5933.2	7168.2 Btu/scf
Net Wet Real:	847.8	5056.1	5829.5	7042.9 Btu/scf
HHV Gross Dry Real:	957.1	5537.7	6386.4	7714.5 g/mol
Gross Wet Real:	940.4	5440.9	6274.8	7579.6 Btu/scf

Other Calculated Values

Regualr Wobbe Index*	1254.6	2943.3	3165.7	3471.5 Btu/scf
Net Heating Value (60 °F ideal reaction):	19390.4	19423.8	19698.3	19272.8 Btu/lbm
Gross Heating Value (60°F ideal reaction):	21513.2	20902.3	21205.2	20742.0 Btu/lbm
Molar Mass (MW):	16.93453	102.058	118.055	143.79 g/mol
Relative Density (AIR=1):	0.5836	3.5235	4.0766	4.9650 SG
Density:	0.04462	0.26893	0.31111	0.37891 lbm/scf
Compressibility Factor:	0.9983	0.9946	0.9977	0.9996 Z
Liquid Volume real gas @:	16.3088	0.3419	0.1406	0.004 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: **05-103-11372** NAME/DESCRIP : **PICEANCE CREEK UNIT 297-11B7**
 LEASE #: INTERMEDIATE CASING
 FIELD/AREA:

PROJECT NO. : **202509091** ANALYSIS NO. : **02**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **SEPTEMBER 29, 2025 09:54**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **SEPTEMBER 08, 2025**
 CUSTOMER REF: TO:
 PRODUCER : EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE:
 SAMPLE PRES. : 10 psig PROBE :
 FLOW PRES. : psig CYLINDER NO. : **ECA-734**
 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
Helium	---	0.01	0.00	---	---
Hydrogen	---	10.29	1.22	---	---
Oxygen/Argon	---	1.20	2.27	---	---
Nitrogen	---	4.88	8.07	---	---
Carbon Dioxide	---	0.06	0.16	---	---
Methane	P1	78.7262	74.5803	---	---
Ethane	P2	2.7056	4.8042	0.721	0.725
Propane	P3	0.7066	1.8400	0.194	0.195
i-Butane	I4	0.1473	0.5056	0.048	0.048
Methanol	X1	0.0221	0.0418	0.003	0.003
n-Butane	P4	0.2281	0.7829	0.072	0.072
2,2-Dimethylpropane	I5	0.0053	0.0226	0.002	0.002
i-Pentane	I5	0.1174	0.5002	0.043	0.043
Acetone	X3	0.0033	0.0113	0.001	0.001
i-Propanol	X3	0.0006	0.0021	0.000	0.000
UnknownC4s	U4	0.0004	0.0014	0.000	0.000
n-Pentane	P5	0.1185	0.5049	0.043	0.043
2,2-Dimethylbutane	I6	0.0063	0.0321	0.003	0.003
n-Propanol	X3	0.0001	0.0004	0.000	0.000
Cyclopentane	N5	0.0054	0.0224	0.002	0.002
2,3-Dimethylbutane	I6	0.0088	0.0448	0.004	0.004
2-Methylpentane	I6	0.0462	0.2351	0.019	0.019
3-Methylpentane	I6	0.0259	0.1318	0.011	0.011
n-Hexane	P6	0.0662	0.3369	0.027	0.027
2-Butanol	X4	0.0002	0.0009	0.000	0.000
2,2-Dimethylpentane	I7	0.0021	0.0124	0.001	0.001
Methylcyclopentane	N6	0.0240	0.1193	0.008	0.008
2,4-Dimethylpentane	I7	0.0033	0.0196	0.002	0.002

2,2,3-Trimethylbutane	I7	0.0008	0.0047	0.000	0.000
Benzene	A6	0.0085	0.0392	0.002	0.002
3,3-Dimethylpentane	I7	0.0014	0.0083	0.001	0.001
Cyclohexane	N6	0.0348	0.1730	0.012	0.012
2-Methylhexane	I7	0.0214	0.1266	0.010	0.010
2,3-Dimethylpentane	I7	0.0056	0.0331	0.003	0.003
1,1-Dimethylcyclopentane	N7	0.0039	0.0226	0.002	0.002
3-Methylhexane	I7	0.0211	0.1248	0.010	0.010
1c,3-Dimethylcyclopentane	N7	0.0056	0.0325	0.003	0.003
1t,3-Dimethylcyclopentane	N7	0.0052	0.0302	0.002	0.002
3-Ethylpentane	I7	0.0012	0.0071	0.001	0.001
1t,2-Dimethylcyclopentane	N7	0.0091	0.0528	0.004	0.004
2,2,4-Trimethylpentane	I8	0.0002	0.0014	0.000	0.000
UnknownC6s	U6	0.0001	0.0005	0.000	0.000
n-Heptane	P7	0.0605	0.3580	0.028	0.028
1c,2-Dimethylcyclopentane	N7	0.0010	0.0058	0.000	0.000
Methylcyclohexane	N7	0.1110	0.6436	0.045	0.045
2,2-Dimethylhexane	I8	0.0031	0.0209	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0008	0.0053	0.000	0.000
Propylene Glycol	GL3	0.0001	0.0005	0.000	0.000
Ethylcyclopentane	N7	0.0037	0.0214	0.001	0.001
2,5-Dimethylhexane	I8	0.0037	0.0250	0.002	0.002
2,2,3-Trimethylpentane	I8	0.0035	0.0236	0.002	0.002
2,4-Dimethylhexane	I8	0.0002	0.0014	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0025	0.0166	0.001	0.001
3,3-Dimethylhexane	I8	0.0013	0.0087	0.001	0.001
2,3,4-Trimethylpentane	I8	0.0001	0.0007	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0002	0.0014	0.000	0.000
Toluene	A7	0.0104	0.0566	0.003	0.003
2,3-Dimethylhexane	I8	0.0034	0.0229	0.002	0.002
2-Methyl-3-ethylpentane	I8	0.0006	0.0041	0.000	0.000
2-Methylheptane	I8	0.0224	0.1511	0.012	0.012
4-Methylheptane	I8	0.0066	0.0445	0.003	0.003
3-Methyl-3-ethylpentane	I8	0.0005	0.0034	0.000	0.000
3,4-Dimethylhexane	I8	0.0006	0.0041	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0002	0.0013	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
3-Methylheptane	I8	0.0163	0.1100	0.008	0.008
1c,2t,3-Trimethylcyclopentane	N8	0.0251	0.1663	0.013	0.013
3-Ethylhexane	I8	0.0011	0.0074	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0107	0.0709	0.005	0.005
1,1-Dimethylcyclohexane	N8	0.0037	0.0245	0.002	0.002
2,2,5-Trimethylhexane	I9	0.0005	0.0038	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0009	0.0060	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0008	0.0053	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0010	0.0066	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0002	0.0013	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0003	0.0022	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0081	0.0537	0.004	0.004
1t,3-Dimethylcyclohexane	N8	0.0014	0.0093	0.001	0.001
n-Octane	P8	0.0531	0.3582	0.027	0.027
1c,4-Dimethylcyclohexane	N8	0.0053	0.0351	0.003	0.003
i-Propylcyclopentane	I8	0.0004	0.0027	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0009	0.0068	0.001	0.001
2,2,3,4-Tetramethylpentane	I9	0.0002	0.0015	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0003	0.0022	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0023	0.0174	0.001	0.001
1,1,4-Trimethylcyclohexane	N9	0.0070	0.0522	0.004	0.004
2,2,3-Trimethylhexane	I9	0.0022	0.0167	0.001	0.001
2,4-Dimethylheptane	I9	0.0007	0.0053	0.000	0.000

4,4-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
Ethylcyclohexane	N8	0.0086	0.0570	0.004	0.004
n-Propylcyclopentane	N8	0.0025	0.0166	0.001	0.001
1c,3c,5-Trimethylcyclohexane	N9	0.0013	0.0097	0.001	0.001
2,5-Dimethylheptane	I9	0.0054	0.0409	0.003	0.003
3,3-Dimethylheptane	I9	0.0010	0.0076	0.001	0.001
3,5-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
2,6-Dimethylheptane	I9	0.0003	0.0022	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0004	0.0030	0.000	0.000
Ethylbenzene	I8	0.0025	0.0157	0.001	0.001
1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
2,3-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0053	0.0333	0.002	0.002
1,4-Dimethylbenzene (p-Xylene)	A8	0.0013	0.0082	0.001	0.001
3,4-Dimethylheptane	I9	0.0003	0.0022	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0003	0.0022	0.000	0.000
4-Ethylheptane	I9	0.0006	0.0046	0.000	0.000
4-Methyloctane	I9	0.0038	0.0288	0.002	0.002
2-Methyloctane	I9	0.0058	0.0439	0.003	0.003
1c,2t,3-Trimethylcyclohexane	N9	0.0002	0.0015	0.000	0.000
3-Ethylheptane	I9	0.0004	0.0030	0.000	0.000
3-Methyloctane	I9	0.0006	0.0046	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0053	0.0395	0.003	0.003
1,1,2-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
3,3-Diethylpentane	I9	0.0003	0.0022	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0003	0.0019	0.000	0.000
i-Butylcyclopentane	N9	0.0024	0.0179	0.001	0.001
UnknownC8s	U8	0.0001	0.0007	0.000	0.000
n-Nonane	P9	0.0207	0.1568	0.012	0.012
1,1-Methylethylcyclohexane	N9	0.0011	0.0082	0.001	0.001
i-Propylbenzene	A9	0.0004	0.0028	0.000	0.000
i-Propylcyclohexane	N9	0.0003	0.0022	0.000	0.000
2,2-Dimethyloctane	I10	0.0002	0.0017	0.000	0.000
2,4-Dimethyloctane	I10	0.0006	0.0050	0.000	0.000
2,6-Dimethyloctane	I10	0.0002	0.0017	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0016	0.0119	0.001	0.001
3,3-Dimethyloctane	I10	0.0003	0.0025	0.000	0.000
n-Propylbenzene	A9	0.0021	0.0149	0.001	0.001
3,6-Dimethyloctane	I10	0.0002	0.0017	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0003	0.0025	0.000	0.000
1,3-Methylethylbenzene	A9	0.0002	0.0014	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0005	0.0035	0.000	0.000
2,3-Dimethyloctane	I10	0.0002	0.0017	0.000	0.000
5-Methylnonane	I10	0.0007	0.0059	0.000	0.000
1,2-Methylethylbenzene	A9	0.0009	0.0064	0.001	0.001
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Ethylheptane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0005	0.0042	0.000	0.000
t-Butylbenzene	A10	0.0004	0.0032	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0032	0.0242	0.002	0.002
n-Decane	P10	0.0016	0.0135	0.001	0.001
1,3-Methyl-i-propylbenzene	A10	0.0001	0.0008	0.000	0.000
1,3-Diethylbenzene	A10	0.0002	0.0016	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0008	0.000	0.000
UnknownC10s	U10	0.0037	0.0311	0.002	0.002
UnknownC11s	U11	0.0017	0.0157	0.001	0.001
TOTAL		100.00000	100.00000	1.4712	1.4783

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0085	0.0392
TOLUENE	0.0104	0.0566
ETHYLBENZENE	0.0025	0.0157
XYLENES	0.0069	0.0434
TOTAL BTEX	0.0283	0.1549

*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730, GPA 2261 & GPA 2286.

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

CALCULATED VALUES**

BTU @	14.65	14.73
LHV NET DRY REAL :	862.9 /scf	867.6 /scf
NET WET REAL :	847.8 /scf	852.5 /scf
HHV GROSS DRY REAL :	957.1 /scf	962.3 /scf
GROSS WET REAL :	940.4 /scf	945.6 /scf
NET HEATING VALUE (60 °F ideal reaction):		19390.4 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		21513.2 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.5836
DENSITY		0.04462 lb/scf
COMPRESSIBILITY FACTOR :		0.9983
REGULAR WOBBE INDEX		1254.6

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

Net Dry Ideal BTU	<u>5134.2</u> /scf	Relative Density - SG (Air=1)	<u>3.5235</u>	C6+ factors
Gross Dry Ideal BTU	<u>5524.9</u> /scf	Z Compressibility Factor	<u>0.99457</u>	<u>0.99391</u>
Net Dry Ideal BTU	<u>19423.8</u> /lb	Density Factor	<u>268.929</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20902.3</u> /lb	Molar Mass or MW	<u>102.058</u> g/mol	
		Volume Liquid Ideal gas	<u>0.343</u> scf/gal	<u>22.1</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.

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.