



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: 05-045-15209	NAME/DESCRIP : 110165620 NP N30 EF 08C-31 595
LEASE #:	PRODUCTION CASING
FIELD/AREA:	
PROJECT NO. : 202508083	ANALYSIS NO. : 01
COMPANY NAME : QB ENERGY OPERATING, LLC	ANALYSIS DATE: AUGUST 24, 2025 13:36
OFFICE / BRANCH: PARACHUTE, CO	SAMPLE DATE : AUGUST 11, 2025 08:30
CUSTOMER REF:	TO:
PRODUCER :	EFFECTIVE DATE:

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

SAMPLE CYCLE:	SAMPLE TYPE:	SPOT
SAMPLE PRES. : 421 psig	PROBE :	NO
FLOW PRES. : psig	CYLINDER NO. :	ECA-745
LAB PRES: psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. : 70 °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>
ALCOHOLS	0.1288	0.2213	0.0160	0.0161
HELIUM	0.00	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.08	0.12	---	---
CARBON DIOXIDE	2.99	7.04	---	---
METHANE	89.1025	76.4568	---	---
ETHANE	5.2606	8.4608	1.4021	1.4098
PROPANE	1.2212	2.8803	0.3358	0.3376
I-BUTANE	0.3075	0.9560	0.0999	0.1005
N-BUTANE	0.2264	0.7038	0.0710	0.0713
I-PENTANE	0.1463	0.5641	0.0530	0.0532
N-PENTANE	0.0781	0.3014	0.0280	0.0281
HEXANES PLUS	0.4487	2.2955	0.1830	0.1834
TOTALS	100.0000	100.0000	2.1888	2.2000

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0155	0.0648
TOLUENE	0.0229	0.1129
ETHYLBENZENE	0.0012	0.0068
XYLENES	0.0079	0.0447
TOTAL BTEX	0.0475	0.2292

	<u>CALCULATED VALUES**</u>	
<u>BTU @</u>	<u>14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	969.5 /scf	974.8 /scf
NET WET REAL :	952.6 /scf	957.9 /scf
HHV GROSS DRY REAL :	1072.8 /scf	1078.7 /scf
GROSS WET REAL :	1054.0 /scf	1059.9 /scf
NET HEATING VALUE (60 °F ideal reaction):		19704.1 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		21811.8 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6445
DENSITY		0.04926 lbm/scf
COMPRESSIBILITY FACTOR :		0.9975
REGULAR WOBBE INDEX		1337.2

**(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. :	202508083	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 24, 2025 13:36
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 11, 2025 08:30
PRODUCER :		CYLINDER NO. :	ECA-745
LEASE NO. :		SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	110165620 NP N30 EF 08C-31 595 PRODUCTION CASING		

FIELD DATA		SAMPLE TEMP. :	70
SAMPLE PRES. :	421	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	—		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.00	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	2.99	7.04
Nitrogen	0.08	0.12
Methane	89.1025	76.4568
Ethane	5.2606	8.4608
Propane	1.2212	2.8803
Isobutane	0.3075	0.9560
n-Butane	0.2264	0.7038
Isopentane	0.1419	0.5476
n-Pentane	0.0781	0.3014
Cyclopentane	0.0044	0.0165
n-Hexane	0.0441	0.2032
Cyclohexane	0.0262	0.1179
Other Hexanes	0.1130	0.5179
Heptanes	0.0930	0.4964
Methylcyclohexane	0.0541	0.2841
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0155	0.0648
Toluene	0.0229	0.1129
Ethylbenzene	0.0012	0.0068
Xylenes	0.0079	0.0447
C8+ Heavies	0.0707	0.4462
<u>Subtotal</u>	<u>99.87120</u>	<u>99.77870</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.1288	0.2213
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
	14.65				
LHV	Net Dry Real:	969.5	4810.9	5827.5	7060.4 Btu/scf
	Net Wet Real:	952.6	4726.8	5725.6	6937.0 Btu/scf
HHV	Gross Dry Real:	1072.8	5170.7	6264.6	7636.4 Btu/scf
	Gross Wet Real:	1054.0	5080.3	6155.1	7502.9 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*		1337.2	2833.1	3121.5	3458.4 Btu/scf
Net Heating Value (60 °F ideal reaction):		19704.1	19232.3	19544.6	19100.6 Btu/lbm
Gross Heating Value (60°F ideal reaction):		21811.8	20664.3	21013.6	20655.7 Btu/lbm
Molar Mass (MW):		18.69591	95.699	116.834	141.988 g/mol
Relative Density (AIR=1):		0.6445	3.3051	4.0341	4.9022 SG
Density:		0.04926	0.25218	0.30787	0.37416 lbm/scf
Compressibility Factor:		0.9975	0.9930	0.9977	0.9996 Z
Liquid Volume real gas @:	14.65	17.7204	0.1824	0.0339	0.001 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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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

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FIELD DATA

SAMPLE CYCLE: SAMPLE TYPE: SPOT
 SAMPLE PRES. : 421 psig PROBE : NO
 FLOW PRES. : psig CYLINDER NO. : ECA-745
 LAB PRES: psig SAMPLED BY : ALEX GALLEGOS
 SAMPLE TEMP. : 70 °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	---	0.08	0.12	---	---
Carbon Dioxide	---	2.99	7.04	---	---
Methane	P1	89.1025	76.4568	---	---
Ethane	P2	5.2606	8.4608	1.402	1.410
Propane	P3	1.2212	2.8803	0.336	0.338
i-Butane	I4	0.3075	0.9560	0.100	0.101
Methanol	X1	0.1284	0.2200	0.016	0.016
n-Butane	P4	0.2264	0.7038	0.071	0.071
2,2-Dimethylpropane	I5	0.0054	0.0209	0.002	0.002
i-Pentane	I5	0.1365	0.5267	0.050	0.050
i-Propanol	X3	0.0004	0.0013	0.000	0.000
n-Pentane	P5	0.0781	0.3014	0.028	0.028
2,2-Dimethylbutane	I6	0.0081	0.0373	0.003	0.003
Cyclopentane	N5	0.0044	0.0165	0.001	0.001
2,3-Dimethylbutane	I6	0.0115	0.0530	0.005	0.005
2-Methylpentane	I6	0.0424	0.1954	0.018	0.018
3-Methylpentane	I6	0.0245	0.1129	0.010	0.010
n-Hexane	P6	0.0441	0.2032	0.018	0.018
2,2-Dimethylpentane	I7	0.0026	0.0140	0.001	0.001
Methylcyclopentane	N6	0.0265	0.1193	0.009	0.009
2,4-Dimethylpentane	I7	0.0037	0.0198	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0012	0.0064	0.001	0.001
Benzene	A6	0.0155	0.0648	0.004	0.004
3,3-Dimethylpentane	I7	0.0015	0.0080	0.001	0.001
Cyclohexane	N6	0.0262	0.1179	0.009	0.009
2-Methylhexane	I7	0.0163	0.0873	0.008	0.008
2,3-Dimethylpentane	I7	0.0043	0.0230	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0032	0.0168	0.001	0.001

3-Methylhexane	I7	0.0147	0.0788	0.007	0.007
1c,3-Dimethylcyclopentane	N7	0.0045	0.0236	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0041	0.0216	0.002	0.002
3-Ethylpentane	I7	0.0008	0.0043	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0064	0.0336	0.003	0.003
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0267	0.1431	0.012	0.012
1c,2-Dimethylcyclopentane	N7	0.0008	0.0042	0.000	0.000
Methylcyclohexane	N7	0.0541	0.2841	0.022	0.022
2,2-Dimethylhexane	I8	0.0015	0.0091	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0004	0.0024	0.000	0.000
Ethylcyclopentane	N7	0.0018	0.0095	0.001	0.001
2,5-Dimethylhexane	I8	0.0018	0.0110	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0016	0.0098	0.001	0.001
2,4-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0009	0.0054	0.000	0.000
3,3-Dimethylhexane	I8	0.0005	0.0030	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0229	0.1129	0.008	0.008
2,3-Dimethylhexane	I8	0.0011	0.0067	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0064	0.0391	0.003	0.003
4-Methylheptane	I8	0.0021	0.0128	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0002	0.0012	0.000	0.000
3,4-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0053	0.0324	0.003	0.003
1c,2t,3-Trimethylcyclopentane	N8	0.0068	0.0408	0.003	0.003
3-Ethylhexane	I8	0.0004	0.0025	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0030	0.0180	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0011	0.0066	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0020	0.0120	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0004	0.0024	0.000	0.000
n-Octane	P8	0.0110	0.0672	0.006	0.006
1c,4-Dimethylcyclohexane	N8	0.0014	0.0084	0.001	0.001
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0005	0.0034	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0014	0.0095	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0004	0.0027	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0011	0.0066	0.000	0.000
n-Propylcyclopentane	N8	0.0005	0.0030	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0004	0.0027	0.000	0.000
2,5-Dimethylheptane	I9	0.0011	0.0075	0.001	0.001
3,3-Dimethylheptane	I9	0.0003	0.0020	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0012	0.0068	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0054	0.0306	0.002	0.002
1,4-Dimethylbenzene (p-Xylene)	A8	0.0017	0.0096	0.001	0.001

3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0007	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0014	0.000	0.000
4-Methyloctane	I9	0.0008	0.0055	0.000	0.000
2-Methyloctane	I9	0.0012	0.0082	0.001	0.001
3-Ethylheptane	I9	0.0002	0.0014	0.000	0.000
3-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0011	0.0074	0.001	0.001
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0008	0.0045	0.000	0.000
i-Butylcyclopentane	N9	0.0005	0.0034	0.000	0.000
n-Nonane	P9	0.0035	0.0240	0.002	0.002
1,1-Methylethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0003	0.0020	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Propylbenzene	A9	0.0003	0.0019	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
1,3-Methylethylbenzene	A9	0.0003	0.0019	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0005	0.0032	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
5-Methylnonane	I10	0.0002	0.0015	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
2-Methylnonane	I10	0.0001	0.0007	0.000	0.000
3-Methylnonane	I10	0.0002	0.0015	0.000	0.000
t-Butylbenzene	A10	0.0003	0.0021	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0007	0.0048	0.000	0.000
n-Decane	P10	0.0009	0.0068	0.001	0.001
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0007	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0009	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC10s	U10	0.0008	0.0061	0.000	0.000
n-Undecane	P11	0.0002	0.0017	0.000	0.000
UnknownC11s	U11	0.0001	0.0009	0.000	0.000
TOTAL		100.00000	100.00000	2.1888	2.2000

BTEX COMPONENTS	MOLE%	WT%	CALCULATED VALUES**		
			BTU @	14.65	14.73
BENZENE	0.0155	0.0648	LHV NET DRY REAL :	969.5 /scf	974.8 /scf
TOLUENE	0.0229	0.1129	NET WET REAL :	952.6 /scf	957.9 /scf
ETHYLBENZENE	0.0012	0.0068	HHV GROSS DRY REAL :	1072.8 /scf	1078.7 /scf
XYLENES	0.0079	0.0447	GROSS WET REAL :	1054.0 /scf	1059.9 /scf
TOTAL BTEX	0.0475	0.2292	NET HEATING VALUE (60 °F ideal reaction):		19704.1 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		21811.8 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6445
			DENSITY		0.04926 lb/scf
			COMPRESSIBILITY FACTOR :		0.9975
			REGULAR WOBBE INDEX		1337.2

*(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>4792.1</u> /scf	Relative Density - SG (Air=1)	<u>3.3051</u>	C6+ factors
Gross Dry Ideal BTU	<u>5150.5</u> /scf	Z Compressibility Factor	<u>0.99298</u>	<u>0.99214</u>
Net Dry Ideal BTU	<u>19232.3</u> /lb	Density Factor	<u>252.182</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20664.3</u> /lb	Molar Mass or MW	<u>95.699</u> g/mol	
		Volume Liquid Ideal gas	<u>0.183</u> scf/gal	<u>23.5</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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