

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: 05-045-15202	NAME/DESCRIP : 110165536 NP N30 EF02C-31 595
LEASE #:	PRODUCTION CASING
FIELD/AREA	
PROJECT NO. : 202507057	ANALYSIS NO. : 01
COMPANY NAME : QB ENERGY OPERATING, LLC	ANALYSIS DATE: AUGUST 03, 2025 15:26
OFFICE / BRANCH: PARACHUTE, CO	SAMPLE DATE : JULY 2, 2025 11:00
CUSTOMER REF:	TO:
PRODUCER : QB ENERGY OPERATING, LLC	EFFECTIVE DATE:

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

SAMPLE CYCLE:	SAMPLE TYPE: SPOT
SAMPLE PRES. : 526 psig	PROBE : NO PROBE
FLOW PRES. : psig	CYLINDER NO. : ECA-727
LAB PRES: psig	SAMPLED BY : MIKE HARVEY
SAMPLE TEMP. : 84 °f	SAMPLING COMPANY: QB ENERGY OPERATING, LLC
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	0.0288	0.0492	0.0040	0.0040
HELIUM	0.00	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.07	0.10	---	---
CARBON DIOXIDE	4.02	9.42	---	---
METHANE	89.1172	76.1457	---	---
ETHANE	4.6711	7.4808	1.2451	1.2519
PROPANE	1.0086	2.3688	0.2768	0.2783
I-BUTANE	0.2691	0.8331	0.0879	0.0884
N-BUTANE	0.1818	0.5628	0.0570	0.0573
I-PENTANE	0.1157	0.4443	0.0420	0.0422
N-PENTANE	0.0596	0.2290	0.0220	0.0221
HEXANES PLUS	0.4480	2.3657	0.1850	0.1855
TOTALS	100.0000	100.0000	1.9198	1.9297

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0158	0.0657
TOLUENE	0.0312	0.1531
ETHYLBENZENE	0.0034	0.0192
XYLENES	0.0286	0.1617
TOTAL BTEX	0.0790	0.3997

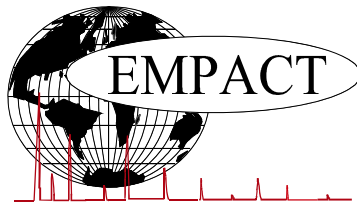
	<u>CALCULATED VALUES**</u>	
	<u>14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	950.9 /scf	956.1 /scf
NET WET REAL :	934.3 /scf	939.5 /scf
HHV GROSS DRY REAL :	1052.3 /scf	1058.0 /scf
GROSS WET REAL :	1033.9 /scf	1039.6 /scf
NET HEATING VALUE (60 °F ideal reaction):	19241.5 Btu/lbm	19241.5 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	21305.4 Btu/lbm	21305.4 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6476	0.6476
DENSITY	0.04948 lbm/scf	0.04948 lbm/scf
COMPRESSIBILITY FACTOR :	0.9976	0.9976
REGULAR WOBBE INDEX	1308.5	1308.5

**(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. :	202507057	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 03, 2025 15:26
ACCOUNT NO. :		SAMPLE DATE :	JULY 2, 2025 11:00
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-727
LEASE NO. :		SAMPLED BY :	MIKE HARVEY
NAME/DESCRIP :	110165536 NP N30 EF02C-31 595 PRODUCTION CASING		

FIELD DATA		SAMPLE TEMP. :	84
SAMPLE PRES. :	526	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	—		

— ppm mol
 SPOT NO PROBE

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	4.02	9.42
Nitrogen	0.07	0.10
Methane	89.1172	76.1457
Ethane	4.6711	7.4808
Propane	1.0086	2.3688
Isobutane	0.2691	0.8331
n-Butane	0.1818	0.5628
Isopentane	0.1125	0.4324
n-Pentane	0.0596	0.2290
Cyclopentane	0.0032	0.0119
n-Hexane	0.0313	0.1437
Cyclohexane	0.0187	0.0838
Other Hexanes	0.0828	0.3781
Heptanes	0.0754	0.4010
Methylcyclohexane	0.0487	0.2547
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0158	0.0657
Toluene	0.0312	0.1531
Ethylbenzene	0.0034	0.0192
Xylenes	0.0286	0.1617
C8+ Heavies	0.1121	0.7047
<u>Subtotal</u>	<u>99.97120</u>	<u>99.95080</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0288	0.0492
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @	Total	C6+	C8+	C10+				
					Sample	Fraction	Fraction	Fraction
LHV Net Dry Real:	14.65	950.9	4946.9	5714.8	7541.7	Btu/scf		
Net Wet Real:		934.3	4860.4	5614.9	7409.9	Btu/scf		
HHV Gross Dry Real:		1052.3	5307.4	6128.9	8153.9	Btu/scf		
Gross Wet Real:		1033.9	5214.6	6021.8	8011.4	Btu/scf		

Other Calculated Values				
Regualr Wobbe Index*	1308.5	2861.6	3074.2	3603.4 Btu/scf
Net Heating Value (60 °F ideal reaction):	19241.5	19138.7	19283.1	18670.1 Btu/lbm
Gross Heating Value (60°F ideal reaction):	21305.4	20529.0	20682.1	20179.3 Btu/lbm
Molar Mass (MW):	18.77675	99.122	115.343	149.146 g/mol
Relative Density (AIR=1):	0.6476	3.4225	3.9822	5.1498 SG
Density:	0.04948	0.26119	0.30395	0.39302 lbm/scf
Compressibility Factor:	0.9976	0.9944	0.9978	0.9997 Z
Liquid Volume real gas @:	14.65	17.6277	0.1844	0.0658
				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.

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

PRIMARY DB KEY: 05-045-1520 NAME/DESCRIP : 110165536 NP N30 EF02C-31 595
 LEASE #: PRODUCTION CASING
 FIELD/AREA:
 PROJECT NO. : 202507057 ANALYSIS NO. : 01
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 OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : JULY 2, 2025 11:00
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 PRODUCER : QB ENERGY OPERATING, LLC EFFECTIVE DATE:

FIELD DATA

SAMPLE CYCLE: SAMPLE TYPE: SPOT
 SAMPLE PRES. : 526 psig PROBE : NO PROBE
 FLOW PRES. : psig CYLINDER NO. : ECA-727
 LAB PRES: psig SAMPLED BY : MIKE HARVEY
 SAMPLE TEMP. : 84 °f SAMPLING COMPANY: QB ENERGY OPERATING, LLC
 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	---	0.07	0.10	---	---
Carbon Dioxide	---	4.02	9.42	---	---
Methane	P1	89.1172	76.1457	---	---
Ethane	P2	4.6711	7.4808	1.245	1.252
Propane	P3	1.0086	2.3688	0.277	0.278
i-Butane	I4	0.2691	0.8331	0.088	0.088
Methanol	X1	0.0288	0.0492	0.004	0.004
n-Butane	P4	0.1818	0.5628	0.057	0.057
2,2-Dimethylpropane	I5	0.0047	0.0181	0.002	0.002
i-Pentane	I5	0.1078	0.4143	0.039	0.039
n-Pentane	P5	0.0596	0.2290	0.022	0.022
2,2-Dimethylbutane	I6	0.0067	0.0307	0.003	0.003
Cyclopentane	N5	0.0032	0.0119	0.001	0.001
2,3-Dimethylbutane	I6	0.0086	0.0395	0.004	0.004
2-Methylpentane	I6	0.0313	0.1437	0.013	0.013
3-Methylpentane	I6	0.0180	0.0826	0.007	0.007
n-Hexane	P6	0.0313	0.1437	0.013	0.013
2,2-Dimethylpentane	I7	0.0019	0.0101	0.001	0.001
Methylcyclopentane	N6	0.0182	0.0816	0.006	0.006
2,4-Dimethylpentane	I7	0.0026	0.0139	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0009	0.0048	0.000	0.000
Benzene	A6	0.0158	0.0657	0.004	0.004
3,3-Dimethylpentane	I7	0.0011	0.0059	0.000	0.000
Cyclohexane	N6	0.0187	0.0838	0.006	0.006
2-Methylhexane	I7	0.0126	0.0673	0.006	0.006
2,3-Dimethylpentane	I7	0.0032	0.0171	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0024	0.0126	0.001	0.001

3-Methylhexane	I7	0.0116	0.0619	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0034	0.0178	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0032	0.0167	0.001	0.001
3-Ethylpentane	I7	0.0006	0.0032	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0050	0.0262	0.002	0.002
n-Heptane	P7	0.0239	0.1276	0.011	0.011
1c,2-Dimethylcyclopentane	N7	0.0011	0.0058	0.001	0.001
Methylcyclohexane	N7	0.0487	0.2547	0.020	0.020
2,2-Dimethylhexane	I8	0.0016	0.0098	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
Ethylcyclopentane	N7	0.0017	0.0089	0.001	0.001
2,5-Dimethylhexane	I8	0.0020	0.0121	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0017	0.0103	0.001	0.001
2,4-Dimethylhexane	I8	0.0003	0.0018	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0010	0.0060	0.000	0.000
3,3-Dimethylhexane	I8	0.0006	0.0037	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0312	0.1531	0.010	0.010
2,3-Dimethylhexane	I8	0.0015	0.0091	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0097	0.0590	0.005	0.005
4-Methylheptane	I8	0.0031	0.0189	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0003	0.0018	0.000	0.000
3,4-Dimethylhexane	I8	0.0003	0.0018	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0084	0.0511	0.004	0.004
1c,2t,3-Trimethylcyclopentane	N8	0.0093	0.0556	0.005	0.005
3-Ethylhexane	I8	0.0013	0.0079	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0044	0.0263	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0016	0.0096	0.001	0.001
2,2,5-Trimethylhexane	I9	0.0003	0.0020	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0004	0.0024	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0003	0.0018	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	0.0032	0.0191	0.002	0.002
1t,3-Dimethylcyclohexane	N8	0.0005	0.0030	0.000	0.000
n-Octane	P8	0.0234	0.1424	0.012	0.012
1c,4-Dimethylcyclohexane	N8	0.0024	0.0143	0.001	0.001
i-Propylcyclopentane	I8	0.0002	0.0012	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0006	0.0041	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0001	0.0007	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
2,2-Dimethylheptane	I9	0.0014	0.0096	0.001	0.001
1,1,4-Trimethylcyclohexane	N9	0.0036	0.0242	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0006	0.0041	0.000	0.000
2,4-Dimethylheptane	I9	0.0003	0.0020	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0035	0.0209	0.002	0.002
n-Propylcyclopentane	N8	0.0013	0.0078	0.001	0.001
1c,3c,5-Trimethylcyclohexane	N9	0.0011	0.0074	0.001	0.001
2,5-Dimethylheptane	I9	0.0034	0.0232	0.002	0.002
3,3-Dimethylheptane	I9	0.0008	0.0055	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
Ethylbenzene	I8	0.0034	0.0192	0.001	0.001
1c,2t,4t-Trimethylcyclohexane	N9	0.0002	0.0013	0.000	0.000

2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0199	0.1125	0.008	0.008
1,4-Dimethylbenzene (p-Xylene)	A8	0.0060	0.0339	0.002	0.002
3,4-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0002	0.0014	0.000	0.000
4-Ethylheptane	I9	0.0003	0.0020	0.000	0.000
4-Methyloctane	I9	0.0011	0.0075	0.001	0.001
2-Methyloctane	I9	0.0012	0.0082	0.001	0.001
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
3-Methyloctane	I9	0.0002	0.0014	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0009	0.0061	0.001	0.001
1,2-Dimethylbenzene (o-Xylene)	A8	0.0027	0.0153	0.001	0.001
i-Butylcyclopentane	N9	0.0003	0.0020	0.000	0.000
n-Nonane	P9	0.0021	0.0143	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0001	0.0007	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
n-Butylcyclopentane	N9	0.0002	0.0013	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0002	0.0013	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0003	0.0019	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
5-Methylnonane	I10	0.0001	0.0008	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
3-Methylnonane	I10	0.0001	0.0008	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0014	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0030	0.0205	0.002	0.002
n-Decane	P10	0.0007	0.0053	0.000	0.000
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
1,3-Diethylbenzene	A10	0.0001	0.0007	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	0.0002	0.0014	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0007	0.0053	0.000	0.000
n-Undecane	P11	0.0004	0.0034	0.000	0.000
Naphthalene	A10	0.0001	0.0007	0.000	0.000
n-Dodecane	P12	0.0003	0.0027	0.000	0.000
1,3,5-Triethylbenzene	A12	0.0001	0.0009	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0001	0.0008	0.000	0.000
n-Tridecane	P13	0.0002	0.0020	0.000	0.000
n-Tetradecane	P14	0.0001	0.0011	0.000	0.000
n-Pentadecane	P15	0.0001	0.0011	0.000	0.000
TOTAL		100.00000	100.00000	1.9198	1.9297

BTEX COMPONENTS	MOLE%	WT%	CALCULATED VALUES**		
			BTU @	14.65	14.73
BENZENE	0.0158	0.0657	LHV NET DRY REAL :	950.9 /scf	956.1 /scf
TOLUENE	0.0312	0.1531	NET WET REAL :	934.3 /scf	939.5 /scf
ETHYLBENZENE	0.0034	0.0192	HHV GROSS DRY REAL :	1052.3 /scf	1058.0 /scf
XYLENES	0.0286	0.1617	GROSS WET REAL :	1033.9 /scf	1039.6 /scf
TOTAL BTEX	0.0790	0.3997	NET HEATING VALUE (60 °F ideal reaction):		19241.5 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		21305.4 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6476
			DENSITY		0.04948 lb/scf
			COMPRESSIBILITY FACTOR :		0.9976
			REGULAR WOBBE INDEX		1308.5

*(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>4934.4</u> /scf	Relative Density - SG (Air=1)	<u>3.4225</u>	C6+ factors
Gross Dry Ideal BTU	<u>5294</u> /scf	Z Compressibility Factor	<u>0.99436</u>	<u>0.99348</u>
Net Dry Ideal BTU	<u>19138.7</u> /lb	Density Factor	<u>261.192</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20529</u> /lb	Molar Mass or MW	<u>99.122</u> g/mol	
		Volume Liquid Ideal gas	<u>0.185</u> scf/gal	<u>23.7</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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