

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-045-15202** NAME/DESCRIP : **110165536 NP N30 EF02C-31 595**
 LEASE #: **BRADEN HEAD**
 FIELD/AREA

PROJECT NO. : **202507057** ANALYSIS NO. : **02**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **AUGUST 04, 2025 06:45**
 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. : **508** psig PROBE : **NO PROBE**
 FLOW PRES. : psig CYLINDER NO. : **ECA-746**
 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	MOLE %	MASS %	GPM @	GPM @
			14.65	14.73
HELIUM	0.03	0.01	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.68	1.16	---	---
CARBON DIOXIDE	0.02	0.05	---	---
METHANE	97.6439	95.2741	---	---
ETHANE	1.3297	2.4319	0.3546	0.3566
PROPANE	0.1460	0.3916	0.0400	0.0402
I-BUTANE	0.0318	0.1124	0.0100	0.0100
N-BUTANE	0.0328	0.1159	0.0100	0.0100
I-PENTANE	0.0176	0.0772	0.0060	0.0060
N-PENTANE	0.0119	0.0523	0.0040	0.0040
HEXANES PLUS	0.0463	0.3246	0.0170	0.0170
TOTALS	100.0000	100.0000	0.4416	0.4438

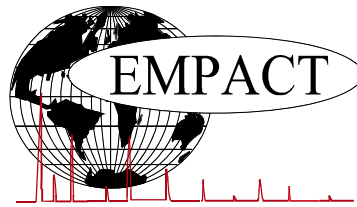
BTEX COMPONENTS	MOLE%	WT%	CALCULATED VALUES**	
			BTU @	BTU @
			14.65	14.73
BENZENE	0.0024	0.0114		
TOLUENE	0.0004	0.0023	LHV NET DRY REAL :	916.9 /scf
ETHYLBENZENE	0.0001	0.0007	NET WET REAL :	900.9 /scf
XYLENES	0.0001	0.0007	HHV GROSS DRY REAL :	1017.6 /scf
TOTAL BTEX	0.0030	0.0151	GROSS WET REAL :	999.8 /scf
			NET HEATING VALUE (60 °F ideal reaction):	21202.6 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):	23534.8 Btu/lbm
			RELATIVE DENSITY (AIR=1):	0.5671
			DENSITY	0.04332 lbm/scf
			COMPRESSIBILITY FACTOR :	0.9979
			REGULAR WOBBE INDEX	1352.7

*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730, GPA 2261 & GPA 2286.

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

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

PROJECT NO. :	202507057	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 04, 2025 06:45
ACCOUNT NO. :		SAMPLE DATE :	JULY 2, 2025 11:00
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-746
LEASE NO. :		SAMPLED BY :	MIKE HARVEY
NAME/DESCRIP :	110165536 NP N30 EF02C-31 595 BRADEN HEAD		

FIELD DATA

SAMPLE PRES. :	508	SAMPLE TEMP. :	84
H2S BY STAIN TUBE:	—	AMBIENT TEMP.:	
COMMENTS :	—		

ppm mol
SPOT NO PROBE

Componet	Mole %	Wt %
Helium	0.03	0.01
Hydrogen	0.01	0.00
Carbon Dioxide	0.02	0.05
Nitrogen	0.68	1.16
Methane	97.6439	95.2741
Ethane	1.3297	2.4319
Propane	0.1460	0.3916
Isobutane	0.0318	0.1124
n-Butane	0.0328	0.1159
Isopentane	0.0169	0.0742
n-Pentane	0.0119	0.0523
Cyclopentane	0.0007	0.0030
n-Hexane	0.0052	0.0273
Cyclohexane	0.0025	0.0128
Other Hexanes	0.0102	0.0531
Heptanes	0.0078	0.0473
Methylcyclohexane	0.0034	0.0203
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0024	0.0114
Toluene	0.0004	0.0023
Ethylbenzene	0.0001	0.0007
Xylenes	0.0001	0.0007
C8+ Heavies	0.0142	0.1487
Subtotal	100.00000	100.00000
Oxygen/Argon	0.00	0.00
Total	100.00000	100.00000

	Total	C6+	C8+	C10+
Calculated Values BTU @	Sample	Fraction	Fraction	Fraction
LHV Net Dry Real:	916.9	5789.4	8533.2	10897.2 Btu/scf
Net Wet Real:	900.9	5688.2	8384.0	10706.7 Btu/scf
HHV Gross Dry Real:	1017.6	6226.5	9179.7	11718.8 Btu/scf
Gross Wet Real:	999.8	6117.7	9019.2	11513.9 Btu/scf

Other Calculated Values

Regualr Wobbe Index*	1352.7	3117.1	3792.8	4288.5 Btu/scf
Net Heating Value (60 °F ideal reaction):	21202.6	19590.3	20064.7	20273.6 Btu/lbm
Gross Heating Value (60°F ideal reaction):	23534.8	21066.2	21582.9	21801.9 Btu/lbm
Molar Mass (MW):	16.44146	115.032	170.51	217.635 g/mol
Relative Density (AIR=1):	0.5671	3.9721	5.8877	7.5141 SG
Density:	0.04332	0.30314	0.44932	0.57350 lbm/scf
Compressibility Factor:	0.9979	0.9946	0.9994	1.0000 Z
Liquid Volume real gas @:	14.65	16.9817	0.0169	0.005 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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DHA COMPONENT LIST

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 LAB PRES: psig SAMPLED BY : **MIKE HARVEY**
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 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	---	0.03	0.01	---	---
Hydrogen	---	0.01	0.00	---	---
Nitrogen	---	0.68	1.16	---	---
Carbon Dioxide	---	0.02	0.05	---	---
Methane	P1	97.6439	95.2741	---	---
Ethane	P2	1.3297	2.4319	0.355	0.357
Propane	P3	0.1460	0.3916	0.040	0.040
i-Butane	I4	0.0318	0.1124	0.010	0.010
n-Butane	P4	0.0328	0.1159	0.010	0.010
2,2-Dimethylpropane	I5	0.0020	0.0088	0.001	0.001
i-Pentane	I5	0.0149	0.0654	0.005	0.005
n-Pentane	P5	0.0119	0.0523	0.004	0.004
2,2-Dimethylbutane	I6	0.0010	0.0052	0.000	0.000
Cyclopentane	N5	0.0007	0.0030	0.000	0.000
2,3-Dimethylbutane	I6	0.0009	0.0047	0.000	0.000
2-Methylpentane	I6	0.0040	0.0210	0.002	0.002
3-Methylpentane	I6	0.0023	0.0120	0.001	0.001
n-Hexane	P6	0.0052	0.0273	0.002	0.002
2,2-Dimethylpentane	I7	0.0002	0.0012	0.000	0.000
Methylcyclopentane	N6	0.0020	0.0102	0.001	0.001
2,4-Dimethylpentane	I7	0.0003	0.0018	0.000	0.000
2,2,3-Trimethylbutane	I7	0.0001	0.0006	0.000	0.000
Benzene	A6	0.0024	0.0114	0.001	0.001
3,3-Dimethylpentane	I7	0.0002	0.0012	0.000	0.000
Cyclohexane	N6	0.0025	0.0128	0.001	0.001
2-Methylhexane	I7	0.0014	0.0085	0.001	0.001
2,3-Dimethylpentane	I7	0.0005	0.0030	0.000	0.000
1,1-Dimethylcyclopentane	N7	0.0003	0.0018	0.000	0.000

3-Methylhexane	I7	0.0013	0.0079	0.001	0.001
1c,3-Dimethylcyclopentane	N7	0.0003	0.0018	0.000	0.000
1t,3-Dimethylcyclopentane	N7	0.0003	0.0018	0.000	0.000
3-Ethylpentane	I7	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0005	0.0030	0.000	0.000
n-Heptane	P7	0.0018	0.0110	0.001	0.001
1c,2-Dimethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
Methylcyclohexane	N7	0.0034	0.0203	0.001	0.001
2,2-Dimethylhexane	I8	0.0001	0.0007	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0007	0.000	0.000
Ethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
2,5-Dimethylhexane	I8	0.0002	0.0014	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0001	0.0007	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0001	0.0007	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0007	0.000	0.000
Toluene	A7	0.0004	0.0023	0.000	0.000
2,3-Dimethylhexane	I8	0.0002	0.0014	0.000	0.000
2-Methylheptane	I8	0.0007	0.0049	0.000	0.000
4-Methylheptane	I8	0.0002	0.0014	0.000	0.000
3-Methylheptane	I8	0.0004	0.0028	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0005	0.0034	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0002	0.0013	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0001	0.0007	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	0.0001	0.0007	0.000	0.000
n-Octane	P8	0.0005	0.0035	0.000	0.000
1c,4-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0003	0.0023	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
Ethylcyclohexane	N8	0.0003	0.0021	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0007	0.000	0.000
2,5-Dimethylheptane	I9	0.0002	0.0016	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
Ethylbenzene	I8	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0001	0.0008	0.000	0.000
2-Methyloctane	I9	0.0001	0.0008	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0002	0.0015	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0008	0.000	0.000
n-Nonane	P9	0.0002	0.0016	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
5-Methylnonane	I10	0.0001	0.0009	0.000	0.000
3-Methylnonane	I10	0.0001	0.0009	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0004	0.0031	0.000	0.000
n-Decane	P10	0.0001	0.0009	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0008	0.000	0.000
3-Ethylonane	I10	0.0001	0.0010	0.000	0.000
UnknownC10s	U10	0.0001	0.0009	0.000	0.000
n-Undecane	P11	0.0001	0.0010	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0001	0.0009	0.000	0.000
n-Tridecane	P13	0.0001	0.0011	0.000	0.000
n-Tetradecane	P14	0.0004	0.0048	0.000	0.000

n-Pentadecane	P15	0.0003	0.0039	0.000	0.000
UnknownC15s	U15	0.0001	0.0013	0.000	0.000
n-Hexadecane	P16	0.0002	0.0027	0.000	0.000
UnknownC16s	U16	0.0036	0.0496	0.003	0.003
UnknownC17s	U17	0.0020	0.0293	0.002	0.002
TOTAL		100.00000	100.00000	0.4416	0.4438

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @		
			14.65	14.73	
BENZENE	0.0024	0.0114	LHV NET DRY REAL :	916.9 /scf	921.9 /scf
TOLUENE	0.0004	0.0023	NET WET REAL :	900.9 /scf	905.9 /scf
ETHYLBENZENE	0.0001	0.0007	HHV GROSS DRY REAL :	1017.6 /scf	1023.2 /scf
XYLENES	0.0001	0.0007	GROSS WET REAL :	999.8 /scf	1005.4 /scf
TOTAL BTEX	0.0030	0.0151	NET HEATING VALUE (60 °F ideal reaction):		21202.6 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		23534.8 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.5671
			DENSITY		0.04332 lb/scf
			COMPRESSIBILITY FACTOR :		0.9979
			REGULAR WOBBE INDEX		1352.7

*(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>5776.4</u> /scf	Relative Density - SG (Air=1)	<u>3.9721</u>	<u>C6+ factors</u>
Gross Dry Ideal BTU	<u>6212.5</u> /scf	Z Compressibility Factor	<u>0.99463</u>	<u>0.99307</u>
Net Dry Ideal BTU	<u>19590.3</u> /lb	Density Factor	<u>303.145</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>21066.2</u> /lb	Molar Mass or MW	<u>115.032</u> g/mol	
		Volume Liquid Ideal gas	<u>0.017</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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