EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-15208**	NAME/DESCRIP :	**110165535 NP N30 EF 08A-31 595**
LEASE #:			**PRODUCTION CASING**
FIELD/AREA:			

PROJECT NO. :	**202508082**	ANALYSIS NO. :	**01**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	AUGUST 24, 2025 10:02
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	AUGUST 11, 2025 09:30
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	197	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-734
LAB PRES:		psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	75	ºf	SAMPLING COMPANY:	QB ENERGY
AMBIENT TEMP.:		ºf	H2S BY STAIN TUBE:	ppm mol
H2O BY STAIN TUBE:		#/mmcf	CO2 BY STAIN TUBE:	Mol %

FIELD COMMENTS:

LAB COMMENTS:

COMPONENT	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
ALCOHOLS	0.3776	0.6799	0.0480	0.0482
HELIUM	0.00	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.12	0.19	---	---
CARBON DIOXIDE	1.45	3.58	---	---
METHANE	92.1471	82.8504	---	---
ETHANE	4.1573	7.0060	1.1082	1.1142
PROPANE	0.9036	2.2331	0.2478	0.2492
I-BUTANE	0.2140	0.6971	0.0699	0.0703
N-BUTANE	0.1773	0.5775	0.0560	0.0563
I-PENTANE	0.0945	0.3818	0.0350	0.0352
N-PENTANE	0.0525	0.2123	0.0190	0.0191
HEXANES PLUS	0.2960	1.5922	0.1160	0.1163
TOTALS	100.00000	100.00000	1.6999	1.7088

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0146	0.0639
TOLUENE	0.0148	0.0764
ETHYLBENZENE	0.0007	0.0041
XYLENES	0.0037	0.0221
TOTAL BTEX	0.0338	0.1665

**(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 :	959.1 **/scf**	964.3 **/scf**
	NET WET REAL :	942.3 **/scf**	947.5 **/scf**
HHV	GROSS DRY REAL :	1062.9 **/scf**	1068.7 **/scf**
	GROSS WET REAL :	1044.3 **/scf**	1050.1 **/scf**

NET HEATING VALUE (60 °F ideal reaction):	20431.8 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	22637.7 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.6154
DENSITY	0.04701 **lbm/scf**
COMPRESSIBILITY FACTOR :	0.9976
REGULAR WOBBE INDEX	1355.9

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.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202508082	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 24, 2025 10:02
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 11, 2025 09:30
PRODUCER :		CYLINDER NO. :	ECA-734
LEASE NO. :		SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	110165535 NP N30 EF 08A-31 595 PRODUCTION CASING		
FIELD DATA		SAMPLE TEMP. :	75
SAMPLE PRES. :	197	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	***SPOT*** ***NO PROBE***		

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	1.45	3.58
Nitrogen	0.12	0.19
Methane	92.1471	82.8504
Ethane	4.1573	7.0060
Propane	0.9036	2.2331
Isobutane	0.2140	0.6971
n-Butane	0.1773	0.5775
Isopentane	0.0915	0.3700
n-Pentane	0.0525	0.2123
Cyclopentane	0.0030	0.0118
n-Hexane	0.0290	0.1401
Cyclohexane	0.0180	0.0849
Other Hexanes	0.0571	0.2758
Heptanes	0.0775	0.4338
Methylcyclohexane	0.0352	0.1937
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0146	0.0639
Toluene	0.0148	0.0764
Ethylbenzene	0.0007	0.0041
Xylenes	0.0037	0.0221
C8+ Heavies	0.0454	0.2974
Subtotal	99.62240	99.32010
Oxygen/Argon	0.00	0.00
Alcohols	0.3776	0.6799
Total	100.00000	100.00000

Calculated Values BTU @ 14.65	**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV Net Dry Real:	959.1	4826.2	5781.0	6647.1	**Btu/scf**
Net Wet Real:	942.3	4741.8	5679.9	6530.9	**Btu/scf**
HHV Gross Dry Real:	1062.9	5185.7	6215.3	7073.4	**Btu/scf**
Gross Wet Real:	1044.3	5095.0	6106.6	6949.7	**Btu/scf**
Other Calculated Values					
Regualr Wobbe Index*	1355.9	2837.5	3106.6	3258.0	**Btu/scf**
Net Heating Value (60 °F ideal reaction):	20431.8	19232.9	19552.9	18425.8	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):	22637.7	20666.3	21025.8	19607.0	**Btu/lbm**
Molar Mass (MW):	17.84215	95.999	116.067	137.244	**g/mol**
Relative Density (AIR=1):	0.6154	3.3150	4.0079	4.7387	**SG**
Density:	0.04701	0.25298	0.30585	0.36166	**lbm/scf**
Compressiblity Factor:	0.9976	0.9931	0.9975	0.9995	**Z**
Liquid Volume real gas @: **14.65**	17.4891	0.1156	0.0179	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 uderscore) indicates there was no tube pulled for H2S.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

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FLOW PRES. :	psig	CYLINDER NO. :	ECA-734
LAB PRES:	psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	75 ºf	SAMPLING COMPANY:	QB ENERGY
AMBIENT TEMP.:	ºf	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	---	0.12	0.19	---	---
Carbon Dioxide	---	1.45	3.58	---	---
Methane	P1	92.1471	82.8504	---	---
Ethane	P2	4.1573	7.0060	1.108	1.114
Propane	P3	0.9036	2.2331	0.248	0.249
i-Butane	I4	0.2140	0.6971	0.070	0.070
Methanol	X1	0.3765	0.6761	0.048	0.048
n-Butane	P4	0.1773	0.5775	0.056	0.056
2,2-Dimethylpropane	I5	0.0043	0.0174	0.002	0.002
i-Pentane	I5	0.0872	0.3526	0.032	0.032
i-Propanol	X3	0.0009	0.0030	0.000	0.000
n-Pentane	P5	0.0525	0.2123	0.019	0.019
t-Butanol	X4	0.0002	0.0008	0.000	0.000
2,2-Dimethylbutane	I6	0.0057	0.0275	0.002	0.002
Cyclopentane	N5	0.0030	0.0118	0.001	0.001
2,3-Dimethylbutane	I6	0.0074	0.0358	0.003	0.003
2-Methylpentane	I6	0.0278	0.1343	0.012	0.012
3-Methylpentane	I6	0.0162	0.0782	0.007	0.007
n-Hexane	P6	0.0290	0.1401	0.012	0.012
2,2-Dimethylpentane	I7	0.0018	0.0101	0.001	0.001
2,4-Dimethylpentane	I7	0.0025	0.0141	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0008	0.0045	0.000	0.000
Benzene	A6	0.0146	0.0639	0.004	0.004
3,3-Dimethylpentane	I7	0.0011	0.0062	0.000	0.000
Cyclohexane	N6	0.0180	0.0849	0.006	0.006
2-Methylhexane	I7	0.0109	0.0612	0.005	0.005
2,3-Dimethylpentane	I7	0.0029	0.0163	0.001	0.001

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1,1-Dimethylcyclopentane	N7	0.0021	0.0115	0.001	0.001
3-Methylhexane	I7	0.0100	0.0562	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0030	0.0165	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0028	0.0154	0.001	0.001
3-Ethylpentane	I7	0.0006	0.0034	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0043	0.0236	0.002	0.002
n-Heptane	P7	0.0174	0.0977	0.008	0.008
1c,2-Dimethylcyclopentane	N7	0.0008	0.0044	0.000	0.000
Methylcyclohexane	N7	0.0352	0.1937	0.014	0.014
2,2-Dimethylhexane	I8	0.0010	0.0064	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0003	0.0019	0.000	0.000
Ethylcyclopentane	N7	0.0012	0.0066	0.000	0.000
2,5-Dimethylhexane	I8	0.0012	0.0077	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0010	0.0064	0.001	0.001
2,4-Dimethylhexane	I8	0.0002	0.0013	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0006	0.0038	0.000	0.000
3,3-Dimethylhexane	I8	0.0004	0.0026	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0148	0.0764	0.005	0.005
2,3-Dimethylhexane	I8	0.0008	0.0051	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0044	0.0282	0.002	0.002
4-Methylheptane	I8	0.0015	0.0096	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3,4-Dimethylhexane	I8	0.0002	0.0013	0.000	0.000
3-Methylheptane	I8	0.0036	0.0230	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0044	0.0277	0.002	0.002
3-Ethylhexane	I8	0.0003	0.0019	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0020	0.0125	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0007	0.0044	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	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0013	0.0082	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
UnknownC7s	U7	0.0150	0.0842	0.007	0.007
n-Octane	P8	0.0073	0.0467	0.004	0.004
1c,4-Dimethylcyclohexane	N8	0.0009	0.0057	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0015	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0001	0.0007	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0004	0.0029	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0011	0.0078	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0002	0.0015	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0008	0.0050	0.000	0.000
n-Propylcyclopentane	N8	0.0004	0.0025	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0004	0.0028	0.000	0.000
2,5-Dimethylheptane	I9	0.0007	0.0050	0.000	0.000
3,3-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000
3,5-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	0.0007	0.0041	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0026	0.0155	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0008	0.0048	0.000	0.000
3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000

4-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0006	0.0043	0.000	0.000
2-Methyloctane	I9	0.0008	0.0058	0.000	0.000
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	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0008	0.0057	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0003	0.0018	0.000	0.000
i-Butylcyclopentane	N9	0.0003	0.0021	0.000	0.000
n-Nonane	P9	0.0016	0.0115	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0002	0.0014	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0003	0.0020	0.000	0.000
1,4-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0005	0.0038	0.000	0.000
UnknownC9s	U9	0.0004	0.0029	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0002	0.0016	0.000	0.000
TOTAL		100.00000	100.00000	1.6999	1.7088

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0146	0.0639
TOLUENE	0.0148	0.0764
ETHYLBENZENE	0.0007	0.0041
XYLENES	0.0037	0.0221
TOTAL BTEX	0.0338	0.1665

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HHV	GROSS DRY REAL :	1062.9 /scf	1068.7 /scf
	GROSS WET REAL :	1044.3 /scf	1050.1 /scf
	NET HEATING VALUE (60 °F ideal reaction):		20431.8 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		22637.7 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6154
	DENSITY		0.04701 lb/scf
	COMPRESSIBILITY FACTOR :		0.9976
	REGULAR WOBBE INDEX		1355.9

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

Net Dry Ideal BTU	4808 /scf	Relative Density - SG (Air=1)	3.315	***C6+factors***
Gross Dry Ideal BTU	5166.2 /scf	**Z** Compressiblity Factor	0.99312	0.99246
Net Dry Ideal BTU	19232.9 /lb	Density Factor	252.979 lbm/1000 ft3	
Gross Dry Ideal BTU	20666.3 /lb	Molar Mass or MW	95.999 g/mol	
		Volume Liquid Ideal gas	0.116 scf/gal	23.8

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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