EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-15107**	NAME/DESCRIP :	**110165726 NP I30A EF14D-19 595**
LEASE #:			**PRODUCTION CASING**
FIELD/AREA:			

PROJECT NO. :	**202508033**	ANALYSIS NO. :	**01**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	AUGUST 12, 2025 08:17
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	JULY 31, 2025 10:00
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	287	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	146
LAB PRES:		psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	68	ºf	SAMPLING COMPANY:	QB ENERGY OPERATING LLC
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	0.0417	0.0713	0.0050	0.0050
HELIUM	0.00	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.06	0.10	---	---
NITROGEN	0.32	0.48	---	---
CARBON DIOXIDE	3.95	9.26	---	---
METHANE	88.7604	75.8446	---	---
ETHANE	4.7385	7.5892	1.2631	1.2700
PROPANE	1.0613	2.4927	0.2918	0.2934
I-BUTANE	0.2899	0.8975	0.0949	0.0955
N-BUTANE	0.2055	0.6362	0.0650	0.0653
I-PENTANE	0.1362	0.5229	0.0490	0.0492
N-PENTANE	0.0705	0.2709	0.0250	0.0251
HEXANES PLUS	0.3659	1.8347	0.1410	0.1413
TOTALS	100.00000	100.00000	1.9348	1.9448

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0183	0.0761
TOLUENE	0.0210	0.1031
ETHYLBENZENE	0.0008	0.0045
XYLENES	0.0058	0.0327
TOTAL BTEX	0.0459	0.2164

**(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 :	947.4 **/scf**	952.5 **/scf**
	NET WET REAL :	930.8 **/scf**	935.9 **/scf**
HHV	GROSS DRY REAL :	1049.1 **/scf**	1054.8 **/scf**
	GROSS WET REAL :	1030.8 **/scf**	1036.5 **/scf**

NET HEATING VALUE (60 °F ideal reaction):	19175.6 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	21233.7 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.6471
DENSITY	0.04947 **lbm/scf**
COMPRESSIBILITY FACTOR :	0.9976
REGULAR WOBBE INDEX	1305.0

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202508033	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 12, 2025 08:17
ACCOUNT NO. :		SAMPLE DATE :	JULY 31, 2025 10:00
PRODUCER :		CYLINDER NO. :	146
LEASE NO. :		SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	110165726 NP I30A EF14D-19 595 PRODUCTION CASING		
FIELD DATA		SAMPLE TEMP. :	68
SAMPLE PRES. :	287	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	***SPOT*** ***NO PROBE***		

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	3.95	9.26
Nitrogen	0.32	0.48
Methane	88.7604	75.8446
Ethane	4.7385	7.5892
Propane	1.0613	2.4927
Isobutane	0.2899	0.8975
n-Butane	0.2055	0.6362
Isopentane	0.1324	0.5087
n-Pentane	0.0705	0.2709
Cyclopentane	0.0038	0.0142
n-Hexane	0.0386	0.1772
Cyclohexane	0.0214	0.0959
Other Hexanes	0.1026	0.4686
Heptanes	0.0782	0.4151
Methylcyclohexane	0.0339	0.1773
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0183	0.0761
Toluene	0.0210	0.1031
Ethylbenzene	0.0008	0.0045
Xylenes	0.0058	0.0327
C8+ Heavies	0.0453	0.2842
Subtotal	99.89830	99.82870
Oxygen/Argon	0.06	0.10
Alcohols	0.0417	0.0713
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	947.4	4736.0	5793.4	7115.6	**Btu/scf**
	Net Wet Real:	930.8	4653.2	5692.1	6991.2	**Btu/scf**
HHV	Gross Dry Real:	1049.1	5084.5	6222.9	7639.9	**Btu/scf**
	Gross Wet Real:	1030.8	4995.6	6114.1	7506.3	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1305.0	2807.3	3105.1	3430.3	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		19175.6	19205.2	19591.6	19060.5	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		21233.7	20627.6	21050.0	20466.7	**Btu/lbm**
Molar Mass (MW):		18.77446	94.176	116.497	144.449	**g/mol**
Relative Density (AIR=1):		0.6471	3.2518	4.0229	4.9875	**SG**
Density:		0.04947	0.24818	0.30701	0.38064	**lbm/scf**
Compressiblity Factor:		0.9976	0.9925	0.9977	0.9996	**Z**
Liquid Volume real gas @:	**14.65**	17.6017	0.1406	0.0189	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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SAMPLE TEMP. :	68 ºf	SAMPLING COMPANY:	QB ENERGY OPERATING LLC
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**
Oxygen/Argon	---	0.06	0.10	---	---
Nitrogen	---	0.32	0.48	---	---
Carbon Dioxide	---	3.95	9.26	---	---
Methane	P1	88.7604	75.8446	---	---
Ethane	P2	4.7385	7.5892	1.263	1.270
Propane	P3	1.0613	2.4927	0.292	0.293
i-Butane	I4	0.2899	0.8975	0.095	0.096
Methanol	X1	0.0416	0.0710	0.005	0.005
n-Butane	P4	0.2055	0.6362	0.065	0.065
2,2-Dimethylpropane	I5	0.0053	0.0203	0.002	0.002
i-Pentane	I5	0.1271	0.4884	0.046	0.046
i-Propanol	X3	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.0705	0.2709	0.025	0.025
2,2-Dimethylbutane	I6	0.0083	0.0381	0.003	0.003
Cyclopentane	N5	0.0038	0.0142	0.001	0.001
2,3-Dimethylbutane	I6	0.0108	0.0496	0.004	0.004
2-Methylpentane	I6	0.0392	0.1799	0.016	0.016
3-Methylpentane	I6	0.0224	0.1028	0.009	0.009
n-Hexane	P6	0.0386	0.1772	0.016	0.016
2,2-Dimethylpentane	I7	0.0023	0.0122	0.001	0.001
Methylcyclopentane	N6	0.0219	0.0982	0.008	0.008
2,4-Dimethylpentane	I7	0.0031	0.0166	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0010	0.0053	0.000	0.000
Benzene	A6	0.0183	0.0761	0.005	0.005
3,3-Dimethylpentane	I7	0.0013	0.0069	0.001	0.001
Cyclohexane	N6	0.0214	0.0959	0.007	0.007
2-Methylhexane	I7	0.0129	0.0689	0.006	0.006
2,3-Dimethylpentane	I7	0.0033	0.0176	0.001	0.001

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1,1-Dimethylcyclopentane	N7	0.0026	0.0136	0.001	0.001
3-Methylhexane	I7	0.0115	0.0614	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0035	0.0183	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	0.0049	0.0256	0.002	0.002
n-Heptane	P7	0.0198	0.1057	0.009	0.009
1c,2-Dimethylcyclopentane	N7	0.0066	0.0345	0.003	0.003
Methylcyclohexane	N7	0.0339	0.1773	0.014	0.014
2,2-Dimethylhexane	I8	0.0010	0.0061	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0003	0.0018	0.000	0.000
Ethylcyclopentane	N7	0.0012	0.0063	0.000	0.000
2,5-Dimethylhexane	I8	0.0012	0.0073	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0010	0.0061	0.001	0.001
2,4-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0007	0.0042	0.000	0.000
3,3-Dimethylhexane	I8	0.0004	0.0024	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0210	0.1031	0.007	0.007
2,3-Dimethylhexane	I8	0.0008	0.0048	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0042	0.0256	0.002	0.002
4-Methylheptane	I8	0.0014	0.0085	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0034	0.0207	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0041	0.0245	0.002	0.002
3-Ethylhexane	I8	0.0006	0.0037	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0020	0.0119	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0007	0.0042	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	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0012	0.0072	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0023	0.0137	0.001	0.001
UnknownC7s	U7	0.0001	0.0005	0.000	0.000
n-Octane	P8	0.0047	0.0286	0.002	0.002
1c,4-Dimethylcyclohexane	N8	0.0009	0.0054	0.000	0.000
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	0.0004	0.0027	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0010	0.0067	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0003	0.0020	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0008	0.0048	0.000	0.000
n-Propylcyclopentane	N8	0.0005	0.0030	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0003	0.0020	0.000	0.000
2,5-Dimethylheptane	I9	0.0007	0.0048	0.000	0.000
3,3-Dimethylheptane	I9	0.0002	0.0014	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	0.0008	0.0045	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0039	0.0220	0.002	0.002
1,4-Dimethylbenzene (p-Xylene)	A8	0.0013	0.0073	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	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0005	0.0034	0.000	0.000
2-Methyloctane	I9	0.0007	0.0048	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	0.0006	0.0040	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0006	0.0034	0.000	0.000
i-Butylcyclopentane	N9	0.0003	0.0020	0.000	0.000
n-Nonane	P9	0.0015	0.0102	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Propylbenzene	A9	0.0002	0.0013	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0007	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
5-Methylnonane	I10	0.0001	0.0007	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
2-Methylnonane	I10	0.0001	0.0007	0.000	0.000
3-Methylnonane	I10	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0014	0.000	0.000
UnknownC9s	U9	0.0006	0.0041	0.000	0.000
n-Decane	P10	0.0004	0.0030	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0008	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0007	0.0053	0.000	0.000
n-Undecane	P11	0.0001	0.0008	0.000	0.000
n-Dodecane	P12	0.0001	0.0009	0.000	0.000
1,3,5-Triethylbenzene	A12	0.0001	0.0008	0.000	0.000
TOTAL		100.00000	100.00000	1.9348	1.9448

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0183	0.0761
TOLUENE	0.0210	0.1031
ETHYLBENZENE	0.0008	0.0045
XYLENES	0.0058	0.0327
TOTAL BTEX	0.0459	0.2164

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HHV	GROSS DRY REAL :	1049.1 /scf	1054.8	/scf
	GROSS WET REAL :	1030.8 /scf	1036.5	/scf
	NET HEATING VALUE (60 °F ideal reaction):		19175.6	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		21233.7	Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6471	
	DENSITY		0.04947	lb/scf
	COMPRESSIBILITY FACTOR :		0.9976	
	REGULAR WOBBE INDEX		1305.0	

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

Net Dry Ideal BTU	4715.3 /scf	Relative Density - SG (Air=1)	3.2518	***C6+factors***
Gross Dry Ideal BTU	5062.3 /scf	**Z** Compressiblity Factor	0.99251	0.99165
Net Dry Ideal BTU	19205.2 /lb	Density Factor	248.175 lbm/1000 ft3	
Gross Dry Ideal BTU	20627.6 /lb	Molar Mass or MW	94.176 g/mol	
		Volume Liquid Ideal gas	0.141 scf/gal	24.2

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.

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150