EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-15105**	NAME/DESCRIP :	**110165731 NP I30A EFO1C-31 595**
LEASE #:			**PRODUCTION CASING**
FIELD/AREA:			

PROJECT NO. :	**202508032**	ANALYSIS NO. :	**01**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	AUGUST 11, 2025 17:51
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	JULY 31, 2025 11:30
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	418	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	F2319
LAB PRES:		psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	72	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	0.1311	0.2243	0.0170	0.0171
HELIUM	0.00	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.08	0.12	---	---
CARBON DIOXIDE	4.02	9.45	---	---
METHANE	89.0796	76.3109	---	---
ETHANE	4.6714	7.5006	1.2452	1.2519
PROPANE	1.0257	2.4152	0.2818	0.2833
I-BUTANE	0.2753	0.8544	0.0899	0.0904
N-BUTANE	0.1849	0.5739	0.0580	0.0583
I-PENTANE	0.1152	0.4435	0.0420	0.0422
N-PENTANE	0.0616	0.2373	0.0220	0.0221
HEXANES PLUS	0.3550	1.8701	0.1420	0.1423
TOTALS	100.00000	100.00000	1.8979	1.9076

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0147	0.0613
TOLUENE	0.0195	0.0960
ETHYLBENZENE	0.0011	0.0062
XYLENES	0.0086	0.0488
TOTAL BTEX	0.0439	0.2123

**(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 :	947.2 /scf	952.3 /scf
	NET WET REAL :	930.6 /scf	935.7 /scf
HHV	GROSS DRY REAL :	1048.8 /scf	1054.5 /scf
	GROSS WET REAL :	1030.5 /scf	1036.2 /scf

NET HEATING VALUE (60 °F ideal reaction):	19220.5 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	21285.6 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.6453
DENSITY	0.04934 **lbm/scf**
COMPRESSIBILITY FACTOR :	0.9976
REGULAR WOBBE INDEX	1306.5

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202508032	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 11, 2025 17:51
ACCOUNT NO. :		SAMPLE DATE :	JULY 31, 2025 11:30
PRODUCER :		CYLINDER NO. :	F2319
LEASE NO. :		SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	110165731 NP I30A EFO1C-31 595 PRODUCTION CASING		
FIELD DATA		SAMPLE TEMP. :	72
SAMPLE PRES. :	418	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	4.02	9.45
Nitrogen	0.08	0.12
Methane	89.0796	76.3109
Ethane	4.6714	7.5006
Propane	1.0257	2.4152
Isobutane	0.2753	0.8544
n-Butane	0.1849	0.5739
Isopentane	0.1121	0.4319
n-Pentane	0.0616	0.2373
Cyclopentane	0.0031	0.0116
n-Hexane	0.0317	0.1459
Cyclohexane	0.0177	0.0796
Other Hexanes	0.0842	0.3856
Heptanes	0.0662	0.3523
Methylcyclohexane	0.0332	0.1741
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0147	0.0613
Toluene	0.0195	0.0960
Ethylbenzene	0.0011	0.0062
Xylenes	0.0086	0.0488
C8+ Heavies	0.0781	0.5203
Subtotal	99.86890	99.77570
Oxygen/Argon	0.00	0.00
Alcohols	0.1311	0.2243
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	947.2	4952.7	6124.8	7282.5	**Btu/scf**
	Net Wet Real:	930.6	4866.1	6017.7	7155.2	**Btu/scf**
HHV	Gross Dry Real:	1048.8	5321.8	6585.3	7862.4	**Btu/scf**
	Gross Wet Real:	1030.5	5228.8	6470.2	7725.0	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1306.5	2874.0	3201.8	3514.7	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		19220.5	19182.3	19345.3	19106.7	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		21285.6	20606.5	20801.7	20625.1	**Btu/lbm**
Molar Mass (MW):		18.72645	98.697	122.882	145.749	**g/mol**
Relative Density (AIR=1):		0.6453	3.4072	4.2431	5.0321	**SG**
Density:		0.04934	0.26008	0.32381	0.38407	**lbm/scf**
Compressiblity Factor:		0.9976	0.9937	0.9984	0.9997	**Z**
Liquid Volume real gas @:	**14.65**	17.5997	0.1416	0.0379	0.007	**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

PRIMARY DB KEY:	**05-045-15105**	NAME/DESCRIP :	**110165731 NP I30A EFO1C-31 595**
LEASE #:			**PRODUCTION CASING**
FIELD/AREA:			
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OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	JULY 31, 2025 11:30
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PRODUCER :		EFFECTIVE DATE:	
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SAMPLE PRES. :	418 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	F2319
LAB PRES:	psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	72 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**
Nitrogen	---	0.08	0.12	---	---
Carbon Dioxide	---	4.02	9.45	---	---
Methane	P1	89.0796	76.3109	---	---
Ethane	P2	4.6714	7.5006	1.245	1.252
Propane	P3	1.0257	2.4152	0.282	0.283
i-Butane	I4	0.2753	0.8544	0.090	0.090
Methanol	X1	0.1311	0.2243	0.017	0.017
n-Butane	P4	0.1849	0.5739	0.058	0.058
2,2-Dimethylpropane	I5	0.0048	0.0185	0.002	0.002
i-Pentane	I5	0.1073	0.4134	0.039	0.039
n-Pentane	P5	0.0616	0.2373	0.022	0.022
2,2-Dimethylbutane	I6	0.0069	0.0318	0.003	0.003
Cyclopentane	N5	0.0031	0.0116	0.001	0.001
2,3-Dimethylbutane	I6	0.0088	0.0405	0.004	0.004
2-Methylpentane	I6	0.0321	0.1477	0.013	0.013
3-Methylpentane	I6	0.0184	0.0847	0.007	0.007
n-Hexane	P6	0.0317	0.1459	0.013	0.013
2,2-Dimethylpentane	I7	0.0019	0.0101	0.001	0.001
Methylcyclopentane	N6	0.0180	0.0809	0.006	0.006
2,4-Dimethylpentane	I7	0.0027	0.0145	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0009	0.0048	0.000	0.000
Benzene	A6	0.0147	0.0613	0.004	0.004
3,3-Dimethylpentane	I7	0.0011	0.0059	0.000	0.000
Cyclohexane	N6	0.0177	0.0796	0.006	0.006
2-Methylhexane	I7	0.0113	0.0604	0.005	0.005
2,3-Dimethylpentane	I7	0.0028	0.0150	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0022	0.0115	0.001	0.001
3-Methylhexane	I7	0.0100	0.0535	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0030	0.0157	0.001	0.001

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1t,3-Dimethylcyclopentane	N7	0.0027	0.0141	0.001	0.001
3-Ethylpentane	I7	0.0006	0.0032	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0042	0.0220	0.002	0.002
n-Heptane	P7	0.0182	0.0974	0.008	0.008
1c,2-Dimethylcyclopentane	N7	0.0033	0.0173	0.002	0.002
Methylcyclohexane	N7	0.0332	0.1741	0.013	0.013
2,2-Dimethylhexane	I8	0.0011	0.0067	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	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	0.0011	0.0067	0.001	0.001
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0006	0.0036	0.000	0.000
3,3-Dimethylhexane	I8	0.0004	0.0025	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0195	0.0960	0.007	0.007
2,3-Dimethylhexane	I8	0.0009	0.0055	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0046	0.0280	0.002	0.002
4-Methylheptane	I8	0.0015	0.0091	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0002	0.0012	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0037	0.0226	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0049	0.0294	0.003	0.003
3-Ethylhexane	I8	0.0002	0.0012	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0021	0.0126	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0009	0.0054	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0002	0.0014	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
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0015	0.0090	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0006	0.0036	0.000	0.000
n-Octane	P8	0.0083	0.0506	0.004	0.004
1c,4-Dimethylcyclohexane	N8	0.0010	0.0060	0.001	0.001
2,3,5-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
2,2-Dimethylheptane	I9	0.0006	0.0041	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0012	0.0081	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
Ethylcyclohexane	N8	0.0011	0.0066	0.000	0.000
n-Propylcyclopentane	N8	0.0004	0.0024	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0004	0.0027	0.000	0.000
2,5-Dimethylheptane	I9	0.0009	0.0061	0.001	0.001
3,3-Dimethylheptane	I9	0.0002	0.0014	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	0.0011	0.0062	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0058	0.0329	0.002	0.002
1,4-Dimethylbenzene (p-Xylene)	A8	0.0018	0.0102	0.001	0.001
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	0.0009	0.0061	0.001	0.001
2-Methyloctane	I9	0.0013	0.0089	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	0.0013	0.0088	0.001	0.001
1,1,2-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0010	0.0057	0.000	0.000

i-Butylcyclopentane	N9	0.0007	0.0047	0.000	0.000
n-Nonane	P9	0.0053	0.0363	0.003	0.003
1,1-Methylethylcyclohexane	N9	0.0004	0.0027	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
2,2-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
2,4-Dimethyloctane	I10	0.0002	0.0015	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0007	0.0047	0.000	0.000
3,3-Dimethyloctane	I10	0.0002	0.0015	0.000	0.000
n-Propylbenzene	A9	0.0009	0.0058	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0002	0.0015	0.000	0.000
1,3-Methylethylbenzene	A9	0.0007	0.0045	0.000	0.000
1,4-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0013	0.0083	0.001	0.001
2,3-Dimethyloctane	I10	0.0003	0.0023	0.000	0.000
5-Methylnonane	I10	0.0007	0.0053	0.000	0.000
1,2-Methylethylbenzene	A9	0.0008	0.0051	0.000	0.000
2-Methylnonane	I10	0.0002	0.0015	0.000	0.000
3-Ethyloctane	I10	0.0001	0.0007	0.000	0.000
3-Methylnonane	I10	0.0007	0.0053	0.000	0.000
t-Butylbenzene	A10	0.0011	0.0079	0.001	0.001
i-Butylcyclohexane	N10	0.0002	0.0015	0.000	0.000
1t-Methyl-2-n-propylcyclohexane	I10	0.0001	0.0007	0.000	0.000
i-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0012	0.0082	0.001	0.001
n-Decane	P10	0.0045	0.0342	0.003	0.003
1,2,3-Trimethylbenzene	A9	0.0004	0.0026	0.000	0.000
1,3-Methyl-i-propylbenzene	A10	0.0002	0.0014	0.000	0.000
Sec-Butylcyclohexane	A10	0.0001	0.0007	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0003	0.0021	0.000	0.000
3-Ethylnonane	I10	0.0006	0.0050	0.000	0.000
1,3-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Diethylbenzene	A10	0.0002	0.0014	0.000	0.000
n-Butylbenzene	A10	0.0003	0.0021	0.000	0.000
1,3-Dimethyl-5-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Diethylbenzene	A10	0.0002	0.0014	0.000	0.000
t-Decahydronaphthalene	A9	0.0001	0.0008	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0002	0.0014	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0004	0.0029	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0002	0.0014	0.000	0.000
1,2-Dimethyl-3-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	0.0024	0.0182	0.001	0.001
n-Undecane	P11	0.0016	0.0133	0.001	0.001
5-Methylindan	A11	0.0001	0.0007	0.000	0.000
1,2-Ethyl-n-propylbenzene	A11	0.0001	0.0008	0.000	0.000
Naphthalene	A10	0.0001	0.0007	0.000	0.000
UnknownC11s	U11	0.0016	0.0133	0.001	0.001
n-Dodecane	P12	0.0004	0.0036	0.000	0.000
1,3,5-Triethylbenzene	A12	0.0001	0.0008	0.000	0.000
UnknownC12s	U12	0.0002	0.0017	0.000	0.000
n-Tridecane	P13	0.0001	0.0010	0.000	0.000
n-Tetradecane	P14	0.0001	0.0011	0.000	0.000
UnknownC14s	U14	0.0001	0.0011	0.000	0.000
UnknownC15s	U15	0.0002	0.0022	0.000	0.000
TOTAL		100.00000	100.00000	1.8979	1.9076

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0147	0.0613
TOLUENE	0.0195	0.0960
ETHYLBENZENE	0.0011	0.0062
XYLENES	0.0086	0.0488
TOTAL BTEX	0.0439	0.2123

**(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 :	947.2 /scf	952.3 /scf
	NET WET REAL :	930.6 /scf	935.7 /scf
HHV	GROSS DRY REAL :	1048.8 /scf	1054.5 /scf
	GROSS WET REAL :	1030.5 /scf	1036.2 /scf
	NET HEATING VALUE (60 °F ideal reaction):		19220.5 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		21285.6 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6453
	DENSITY		0.04934 lb/scf
	COMPRESSIBILITY FACTOR :		0.9976
	REGULAR WOBBE INDEX		1306.5

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

Net Dry Ideal BTU	4937.1 /scf	Relative Density - SG (Air=1)	3.4072		***C6+factors***
Gross Dry Ideal BTU	5305 /scf	**Z** Compressiblity Factor	0.99373		0.99265
Net Dry Ideal BTU	19182.3 /lb	Density Factor	260.075	lbm/1000 ft3	
Gross Dry Ideal BTU	20606.5 /lb	Molar Mass or MW	98.697	g/mol	
		Volume Liquid Ideal gas	0.142	scf/gal	23.9

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.