EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-10152**	NAME/DESCRIP :	**120280014 FIGURE FOUR 8011D K18 498**
LEASE #:			**BRADEN HEAD**
FIELD/AREA:			
PROJECT NO. :	**202503106**	ANALYSIS NO. :	**01**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	MARCH 31, 2025 13:29
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MARCH 13, 2025 12:50
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	1	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-770
LAB PRES:		psig	SAMPLED BY :	NICK SMITH
SAMPLE TEMP. :	30	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	0.0023	0.0036	0.0000	0.0000
HELIUM	0.00	0.00	---	---
HYDROGEN	0.35	0.03	---	---
OXYGEN/ARGON	0.11	0.17	---	---
NITROGEN	7.67	10.48	---	---
CARBON DIOXIDE	0.03	0.06	---	---
METHANE	77.8576	60.9282	---	---
ETHANE	7.9586	11.6732	2.1221	2.1337
PROPANE	3.2240	6.9347	0.8856	0.8905
I-BUTANE	0.6662	1.8888	0.2169	0.2181
N-BUTANE	0.7864	2.2296	0.2469	0.2482
I-PENTANE	0.3158	1.1103	0.1150	0.1156
N-PENTANE	0.2400	0.8447	0.0870	0.0874
HEXANES PLUS	0.7891	3.6469	0.3230	0.3244
TOTALS	100.00000	100.00000	3.9965	4.0179

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0031	0.0118
TOLUENE	0.0029	0.0130
ETHYLBENZENE	0.0001	0.0005
XYLENES	0.0005	0.0026
TOTAL BTEX	0.0066	0.0279

**(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 :	1012.9 /scf	1018.4 /scf
	NET WET REAL :	995.2 /scf	1000.7 /scf
HHV	GROSS DRY REAL :	1117.7 /scf	1123.8 /scf
	GROSS WET REAL :	1098.2 /scf	1104.3 /scf

NET HEATING VALUE (60 °F ideal reaction):	18785.4 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	20734.0 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.7073
DENSITY	0.05402 **lbm/scf**
COMPRESSIBILITY FACTOR :	0.9973
REGULAR WOBBE INDEX	1329.6

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202503106	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	MARCH 31, 2025 13:29
ACCOUNT NO. :		SAMPLE DATE :	MARCH 13, 2025 12:50
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-770
LEASE NO. :		SAMPLED BY :	NICK SMITH
NAME/DESCRIP :	120280014 FIGURE FOUR 8011D K18 498 BRADEN HEAD		
FIELD DATA		SAMPLE TEMP. :	30
SAMPLE PRES. :	1	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT* *NO PROBE*		

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.35	0.03
Carbon Dioxide	0.03	0.06
Nitrogen	7.67	10.48
Methane	77.8576	60.9282
Ethane	7.9586	11.6732
Propane	3.2240	6.9347
Isobutane	0.6662	1.8888
n-Butane	0.7864	2.2296
Isopentane	0.3052	1.0741
n-Pentane	0.2400	0.8447
Cyclopentane	0.0106	0.0362
n-Hexane	0.1098	0.4615
Cyclohexane	0.0602	0.2471
Other Hexanes	0.1980	0.8275
Heptanes	0.1832	0.8918
Methylcyclohexane	0.1367	0.6547
2,2,4 Trimethylpentane	0.0002	0.0011
Benzene	0.0031	0.0118
Toluene	0.0029	0.0130
Ethylbenzene	0.0001	0.0005
Xylenes	0.0005	0.0026
C8+ Heavies	0.0944	0.5353
Subtotal	99.88770	99.82640
Oxygen/Argon	0.11	0.17
Alcohols	0.0023	0.0036
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	1012.9	4801.2	5841.1	8846.7	**Btu/scf**
	Net Wet Real:	995.2	4717.3	5739.0	8692.0	**Btu/scf**
HHV	Gross Dry Real:	1117.7	5171.2	6294.5	9510.4	**Btu/scf**
	Gross Wet Real:	1098.2	5080.8	6184.5	9344.1	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1329.6	2846.1	3143.0	3886.7	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		18785.4	19419.4	20076.6	19346.6	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		20734.0	20910.1	21634.1	20799.1	**Btu/lbm**
Molar Mass (MW):		20.50262	94.747	116.19	174.467	**g/mol**
Relative Density (AIR=1):		0.7073	3.2717	4.0120	6.0242	**SG**
Density:		0.05402	0.24969	0.30618	0.45975	**lbm/scf**
Compressiblity Factor:		0.9973	0.9924	0.9970	0.9999	**Z**
Liquid Volume real gas @:	**14.65**	17.9945	0.322	0.0399	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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FIELD/AREA:			
PROJECT NO. :	**202503106**	ANALYSIS NO. :	**01**
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OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MARCH 13, 2025 12:50
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	1 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-770
LAB PRES:	psig	SAMPLED BY :	NICK SMITH
SAMPLE TEMP. :	30 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	---	0.35	0.03	---	---
Oxygen/Argon	---	0.11	0.17	---	---
Nitrogen	---	7.67	10.48	---	---
Carbon Dioxide	---	0.03	0.06	---	---
Methane	P1	77.8576	60.9282	---	---
Ethane	P2	7.9586	11.6732	2.122	2.134
Propane	P3	3.2240	6.9347	0.886	0.891
i-Butane	I4	0.6662	1.8888	0.217	0.218
Methanol	X1	0.0023	0.0036	0.000	0.000
n-Butane	P4	0.7862	2.2290	0.247	0.248
2,2-Dimethylpropane	I5	0.0046	0.0162	0.002	0.002
i-Pentane	I5	0.3006	1.0579	0.110	0.111
UnknownC4s	U4	0.0002	0.0006	0.000	0.000
n-Pentane	P5	0.2400	0.8447	0.087	0.087
2,2-Dimethylbutane	I6	0.0075	0.0315	0.003	0.003
Cyclopentane	N5	0.0106	0.0362	0.003	0.003
2,3-Dimethylbutane	I6	0.0166	0.0698	0.007	0.007
2-Methylpentane	I6	0.0804	0.3380	0.033	0.033
3-Methylpentane	I6	0.0441	0.1854	0.018	0.018
n-Hexane	P6	0.1098	0.4615	0.045	0.045
2,2-Dimethylpentane	I7	0.0006	0.0029	0.000	0.000
Methylcyclopentane	N6	0.0494	0.2028	0.017	0.017
2,4-Dimethylpentane	I7	0.0052	0.0254	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0009	0.0044	0.000	0.000
Benzene	A6	0.0031	0.0118	0.001	0.001
3,3-Dimethylpentane	I7	0.0015	0.0073	0.001	0.001
Cyclohexane	N6	0.0602	0.2471	0.020	0.020
2-Methylhexane	I7	0.0230	0.1124	0.011	0.011
2,3-Dimethylpentane	I7	0.0110	0.0538	0.005	0.005
1,1-Dimethylcyclopentane	N7	0.0065	0.0311	0.003	0.003
3-Methylhexane	I7	0.0253	0.1237	0.012	0.012
1c,3-Dimethylcyclopentane	N7	0.0097	0.0464	0.004	0.004

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1t,3-Dimethylcyclopentane	N7	0.0090	0.0431	0.004	0.004
3-Ethylpentane	I7	0.0004	0.0020	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0156	0.0747	0.007	0.007
2,2,4-Trimethylpentane	I8	0.0002	0.0011	0.000	0.000
n-Heptane	P7	0.0681	0.3329	0.031	0.031
1c,2-Dimethylcyclopentane	N7	0.0007	0.0034	0.000	0.000
Methylcyclohexane	N7	0.1367	0.6547	0.055	0.055
2,2-Dimethylhexane	I8	0.0027	0.0150	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0015	0.0082	0.001	0.001
Ethylcyclopentane	N7	0.0042	0.0201	0.002	0.002
2,5-Dimethylhexane	I8	0.0027	0.0150	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0024	0.0134	0.001	0.001
2,4-Dimethylhexane	I8	0.0004	0.0022	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0030	0.0164	0.001	0.001
3,3-Dimethylhexane	I8	0.0008	0.0044	0.000	0.000
2,3,4-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
Toluene	A7	0.0029	0.0130	0.001	0.001
2,3-Dimethylhexane	I8	0.0016	0.0089	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0009	0.0050	0.000	0.000
1,1,2-Trimethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
2-Methylheptane	I8	0.0103	0.0574	0.005	0.005
4-Methylheptane	I8	0.0031	0.0173	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0005	0.0028	0.000	0.000
3,4-Dimethylhexane	I8	0.0003	0.0017	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0005	0.000	0.000
3-Methylheptane	I8	0.0051	0.0284	0.003	0.003
1c,2t,3-Trimethylcyclopentane	N8	0.0130	0.0712	0.007	0.007
3-Ethylhexane	I8	0.0042	0.0234	0.002	0.002
1t,4-Dimethylcyclohexane	N8	0.0068	0.0372	0.003	0.003
1,1-Dimethylcyclohexane	N8	0.0021	0.0115	0.001	0.001
2,2,5-Trimethylhexane	I9	0.0002	0.0013	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0007	0.0039	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0006	0.0033	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0007	0.0039	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0002	0.0013	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0041	0.0224	0.002	0.002
1t,3-Dimethylcyclohexane	N8	0.0002	0.0011	0.000	0.000
n-Octane	P8	0.0109	0.0607	0.006	0.006
1c,4-Dimethylcyclohexane	N8	0.0050	0.0274	0.003	0.003
i-Propylcyclopentane	I8	0.0002	0.0011	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0002	0.0013	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0013	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0002	0.0013	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0006	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0005	0.000	0.000
2,2-Dimethylheptane	I9	0.0003	0.0019	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0019	0.0117	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0006	0.0038	0.000	0.000
2,4-Dimethylheptane	I9	0.0004	0.0025	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
Ethylcyclohexane	N8	0.0009	0.0049	0.000	0.000
n-Propylcyclopentane	N8	0.0004	0.0022	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
2,5-Dimethylheptane	I9	0.0004	0.0025	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
Ethylbenzene	I8	0.0001	0.0005	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0004	0.0021	0.000	0.000

1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0005	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0006	0.000	0.000
4-Methyloctane	I9	0.0002	0.0013	0.000	0.000
2-Methyloctane	I9	0.0001	0.0006	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0002	0.0012	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0006	0.000	0.000
n-Nonane	P9	0.0003	0.0019	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0006	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0007	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
5-Methylnonane	I10	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0006	0.000	0.000
UnknownC9s	U9	0.0002	0.0013	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
Sec-Butylcyclohexane	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0001	0.0007	0.000	0.000
n-Undecane	P11	0.0001	0.0008	0.000	0.000
Tetrahydronaphthalene	A10	0.0001	0.0006	0.000	0.000
Naphthalene	A10	0.0001	0.0006	0.000	0.000
1-t-Butyl-3,5-dimethylbenzene	A12	0.0001	0.0008	0.000	0.000
1,4-Ethyl-t-butylbenzene	A11	0.0001	0.0008	0.000	0.000
1,3-Di-n-propylbenzene	A12	0.0001	0.0008	0.000	0.000
n-Dodecane	P12	0.0001	0.0008	0.000	0.000
UnknownC12s	U12	0.0003	0.0023	0.000	0.000
n-Tridecane	P13	0.0002	0.0018	0.000	0.000
n-Tetradecane	P14	0.0003	0.0029	0.000	0.000
UnknownC14s	U14	0.0003	0.0029	0.000	0.000
n-Pentadecane	P15	0.0002	0.0021	0.000	0.000
UnknownC15s	U15	0.0003	0.0031	0.000	0.000
n-Hexadecane	P16	0.0001	0.0011	0.000	0.000
TOTAL		100.00000	100.00000	3.9965	4.0179

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0031	0.0118
TOLUENE	0.0029	0.0130
ETHYLBENZENE	0.0001	0.0005
XYLENES	0.0005	0.0026
TOTAL BTEX	0.0066	0.0279

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

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	NET WET REAL :	995.2 /scf	1000.7 /scf
HHV	GROSS DRY REAL :	1117.7 /scf	1123.8 /scf
	GROSS WET REAL :	1098.2 /scf	1104.3 /scf
	NET HEATING VALUE (60 °F ideal reaction):		18785.4 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		20734.0 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.7073
	DENSITY		0.05402 lb/scf
	COMPRESSIBILITY FACTOR :		0.9973
	REGULAR WOBBE INDEX		1329.6

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

Net Dry Ideal BTU	4779.6 /scf	Relative Density - SG (Air=1)	3.2717	***C6+factors***
Gross Dry Ideal BTU	5147.9 /scf	**Z** Compressiblity Factor	0.99238	0.9918
Net Dry Ideal BTU	19419.4 /lb	Density Factor	249.688 lbm/1000 ft3	
Gross Dry Ideal BTU	20910.1 /lb	Molar Mass or MW	94.747 g/mol	
		Volume Liquid Ideal gas	0.323 scf/gal	23.4

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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