EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-10152**	NAME/DESCRIP :	**120280014 FIGURE FOUR 8011D K18 498 PRODUCTION CASING**
LEASE #:			
FIELD/AREA:			
PROJECT NO. :	**202503106**	ANALYSIS NO. :	**03**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	MARCH 31, 2025 17:25
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MARCH 13, 2025 13:10
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT	
SAMPLE PRES. :	219	psig	PROBE :	NO	
FLOW PRES. :		psig	CYLINDER NO. :	4	
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	0.0558	0.0917	0.0070	0.0070
HELIUM	0.01	0.00	---	---
HYDROGEN	0.06	0.01	---	---
OXYGEN/ARGON	0.01	0.02	---	---
NITROGEN	0.37	0.53	---	---
CARBON DIOXIDE	2.54	5.73	---	---
METHANE	85.4835	70.3300	---	---
ETHANE	6.8443	10.5545	1.8254	1.8354
PROPANE	2.6347	5.9582	0.7238	0.7277
I-BUTANE	0.5384	1.6049	0.1759	0.1769
N-BUTANE	0.6602	1.9679	0.2079	0.2091
I-PENTANE	0.2641	0.9761	0.0960	0.0965
N-PENTANE	0.2083	0.7708	0.0750	0.0754
HEXANES PLUS	0.3207	1.4559	0.1270	0.1275
TOTALS	100.00000	100.00000	3.2380	3.2555

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0095	0.0380
TOLUENE	0.0079	0.0373
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0174	0.0753

**(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 :	1017.2 /scf	1022.7 /scf
	NET WET REAL :	999.4 /scf	1004.9 /scf
HHV	GROSS DRY REAL :	1124.3 /scf	1130.4 /scf
	GROSS WET REAL :	1104.6 /scf	1110.7 /scf

NET HEATING VALUE (60 °F ideal reaction):	19806.8	**Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	21894.4	**Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.6732	
DENSITY	0.05138	**lbm/scf**
COMPRESSIBILITY FACTOR :	0.9972	
REGULAR WOBBE INDEX	1370.6	

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202503106	ANALYSIS NO. :	03
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	MARCH 31, 2025 17:25
ACCOUNT NO. :		SAMPLE DATE :	MARCH 13, 2025 13:10
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	4
LEASE NO. :		SAMPLED BY :	NICK SMITH
NAME/DESCRIP :	120280014 FIGURE FOUR 8011D K18 498 PRODUCTION CASING		
FIELD DATA		SAMPLE TEMP. :	30
SAMPLE PRES. :	219	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT* *NO PROBE*		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.06	0.01
Carbon Dioxide	2.54	5.73
Nitrogen	0.37	0.53
Methane	85.4835	70.3300
Ethane	6.8443	10.5545
Propane	2.6347	5.9582
Isobutane	0.5384	1.6049
n-Butane	0.6602	1.9679
Isopentane	0.2521	0.9329
n-Pentane	0.2083	0.7708
Cyclopentane	0.0120	0.0432
n-Hexane	0.0698	0.3085
Cyclohexane	0.0287	0.1238
Other Hexanes	0.1376	0.6051
Heptanes	0.0426	0.2177
Methylcyclohexane	0.0226	0.1138
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0095	0.0380
Toluene	0.0079	0.0373
Ethylbenzene	0.0000	0.0000
Xylenes	0.0000	0.0000
C8+ Heavies	0.0019	0.0111
Subtotal	99.93420	99.88830
Oxygen/Argon	0.01	0.02
Alcohols	0.0558	0.0917
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	1017.2	4496.1	5623.1	#DIV/0!	**Btu/scf**
	Net Wet Real:	999.4	4417.5	5524.8	#DIV/0!	**Btu/scf**
HHV	Gross Dry Real:	1124.3	4837.9	6064.1	#DIV/0!	**Btu/scf**
	Gross Wet Real:	1104.6	4753.3	5958.1	#DIV/0!	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1370.6	2747.7	3060.6	#DIV/0!	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		19806.8	19232.1	20064.0	#DIV/0!	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		21894.4	20697.5	21636.4	#DIV/0!	**Btu/lbm**
Molar Mass (MW):		19.49875	88.528	113.528	#DIV/0!	**g/mol**
Relative Density (AIR=1):		0.6732	3.0565	3.9195	#DIV/0!	**SG**
Density:		0.05138	0.23328	0.29915	#DIV/0!	**lbm/scf**
Compressiblity Factor:		0.9972	0.9899	0.9961	#DIV/0!	**Z**
Liquid Volume real gas @:	**14.65**	18.1171	0.1266	0	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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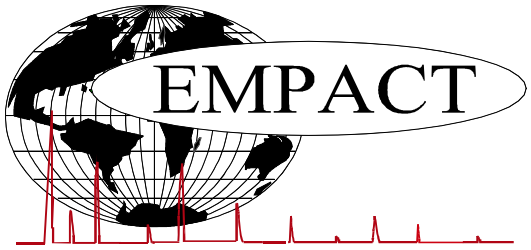

EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

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PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	
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SAMPLE PRES. :	219 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	4
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**
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.06	0.01	---	---
Oxygen/Argon	---	0.01	0.02	---	---
Nitrogen	---	0.37	0.53	---	---
Carbon Dioxide	---	2.54	5.73	---	---
Methane	P1	85.4835	70.3300	---	---
Ethane	P2	6.8443	10.5545	1.825	1.835
Propane	P3	2.6347	5.9582	0.724	0.728
i-Butane	I4	0.5384	1.6049	0.176	0.177
Methanol	X1	0.0558	0.0917	0.007	0.007
n-Butane	P4	0.6602	1.9679	0.208	0.209
2,2-Dimethylpropane	I5	0.0045	0.0167	0.002	0.002
i-Pentane	I5	0.2476	0.9162	0.090	0.091
n-Pentane	P5	0.2083	0.7708	0.075	0.075
2,2-Dimethylbutane	I6	0.0064	0.0283	0.003	0.003
Cyclopentane	N5	0.0120	0.0432	0.004	0.004
2,3-Dimethylbutane	I6	0.0126	0.0557	0.005	0.005
2-Methylpentane	I6	0.0583	0.2577	0.024	0.024
3-Methylpentane	I6	0.0302	0.1335	0.012	0.012
n-Hexane	P6	0.0698	0.3085	0.029	0.029
2,2-Dimethylpentane	I7	0.0005	0.0026	0.000	0.000
Methylcyclopentane	N6	0.0301	0.1299	0.011	0.011
2,4-Dimethylpentane	I7	0.0022	0.0113	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0004	0.0020	0.000	0.000
Benzene	A6	0.0095	0.0380	0.003	0.003
3,3-Dimethylpentane	I7	0.0005	0.0026	0.000	0.000

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Cyclohexane	N6	0.0287	0.1238	0.010	0.010
2-Methylhexane	I7	0.0060	0.0308	0.003	0.003
2,3-Dimethylpentane	I7	0.0033	0.0170	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0021	0.0106	0.001	0.001
3-Methylhexane	I7	0.0062	0.0318	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0027	0.0136	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0024	0.0121	0.001	0.001
3-Ethylpentane	I7	0.0002	0.0010	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0037	0.0186	0.002	0.002
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0115	0.0591	0.005	0.005
1c,2-Dimethylcyclopentane	N7	0.0003	0.0015	0.000	0.000
Methylcyclohexane	N7	0.0226	0.1138	0.009	0.009
2,2-Dimethylhexane	I8	0.0003	0.0017	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0005	0.0025	0.000	0.000
2,5-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
Toluene	A7	0.0079	0.0373	0.003	0.003
2-Methylheptane	I8	0.0002	0.0012	0.000	0.000
4-Methylheptane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0001	0.0006	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0003	0.0017	0.000	0.000
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0002	0.0012	0.000	0.000
TOTAL		100.00000	100.00000	3.2380	3.2555

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0095	0.0380
TOLUENE	0.0079	0.0373
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0174	0.0753

*(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 :	1017.2 /scf	1022.7	/scf
	NET WET REAL :	999.4 /scf	1004.9	/scf
HHV	GROSS DRY REAL :	1124.3 /scf	1130.4	/scf
	GROSS WET REAL :	1104.6 /scf	1110.7	/scf
	NET HEATING VALUE (60 °F ideal reaction):		19806.8	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		21894.4	Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6732	
	DENSITY		0.05138	lb/scf
	COMPRESSIBILITY FACTOR :		0.9972	
	REGULAR WOBBE INDEX		1370.6	

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

Net Dry Ideal BTU	4464.4 /scf	Relative Density - SG (Air=1)	3.0565	***C6+factors***
Gross Dry Ideal BTU	4803.8 /scf	**Z** Compressiblity Factor	0.98985	0.98937
Net Dry Ideal BTU	19232.1 /lb	Density Factor	233.282 lbm/1000 ft3	
Gross Dry Ideal BTU	20697.5 /lb	Molar Mass or MW	88.528 g/mol	
		Volume Liquid Ideal gas	0.127 scf/gal	25.2

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.

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