EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-11266**	NAME/DESCRIP :	**120196002 YCF XOM 2-42-1**
LEASE #:	**COC-68957A**		**BRADEN HEAD**
FIELD/AREA:	**YELLOW CREEK**		

PROJECT NO. :	**202603075**	ANALYSIS NO. :	**01**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	APRIL 09, 2026 06:49
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MARCH 4, 2026
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	545	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-815
LAB PRES:		psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	57	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
HELIUM	0.01	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.01	0.02	---	---
NITROGEN	0.33	0.53	---	---
CARBON DIOXIDE	0.05	0.12	---	---
METHANE	91.9984	83.8398	---	---
ETHANE	5.4196	9.2573	1.4450	1.4529
PROPANE	1.3668	3.4237	0.3757	0.3778
I-BUTANE	0.2800	0.9245	0.0909	0.0914
N-BUTANE	0.3559	1.1751	0.1119	0.1125
I-PENTANE	0.0990	0.4058	0.0360	0.0362
N-PENTANE	0.0546	0.2238	0.0200	0.0201
HEXANES PLUS	0.0157	0.0800	0.0060	0.0060
TOTALS	100.00000	100.00000	2.0855	2.0969

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0000	0.0000
TOLUENE	0.0000	0.0000
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0000	0.0000

CALCULATED VALUES**

	BTU @	14.65		14.73	
LHV	NET DRY REAL :	980.6	/scf	986.0	/scf
	NET WET REAL :	963.5	/scf	968.9	/scf
HHV	GROSS DRY REAL :	1086.4	/scf	1092.4	/scf
	GROSS WET REAL :	1067.4	/scf	1073.4	/scf

NET HEATING VALUE (60 °F ideal reaction):	21158.4	Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	23435.7	Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6078	
DENSITY	0.04639	lbm/scf
COMPRESSIBILITY FACTOR :	0.9976	
REGULAR WOBBE INDEX	1394.5	

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993)*

Mod ASTM D6730,GPA 2261 & GPA 2286.

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

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202603075	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	APRIL 09, 2026 06:49
ACCOUNT NO. :		SAMPLE DATE :	MARCH 4, 2026
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	ECA-815
LEASE NO. :	COC-68957A	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	120196002 YCF XOM 2-42-1 BRADEN HEAD		
FIELD DATA		SAMPLE TEMP. :	57
SAMPLE PRES. :	545	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	***SPOT*** ***NO PROBE***		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	0.05	0.12
Nitrogen	0.33	0.53
Methane	91.9984	83.8398
Ethane	5.4196	9.2573
Propane	1.3668	3.4237
Isobutane	0.2800	0.9245
n-Butane	0.3559	1.1751
Isopentane	0.0989	0.4054
n-Pentane	0.0546	0.2238
Cyclopentane	0.0001	0.0004
n-Hexane	0.0033	0.0161
Cyclohexane	0.0001	0.0005
Other Hexanes	0.0111	0.0544
Heptanes	0.0004	0.0024
Methylcyclohexane	0.0001	0.0006
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0000	0.0000
Toluene	0.0000	0.0000
Ethylbenzene	0.0000	0.0000
Xylenes	0.0000	0.0000
C8+ Heavies	0.0007	0.0060
Subtotal	99.99000	99.98000
Oxygen/Argon	0.01	0.02
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	980.6	4602.8	7566.1	7747.4	**Btu/scf**
	Net Wet Real:	963.5	4522.3	7433.8	7612.0	**Btu/scf**
HHV	Gross Dry Real:	1086.4	4968.8	8146.6	8340.9	**Btu/scf**
	Gross Wet Real:	1067.4	4881.9	8004.2	8195.1	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1394.5	2798.6	3586.3	3628.0	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		21158.4	19329.1	19156.4	19149.3	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23435.7	20867.7	20626.1	20616.0	**Btu/lbm**
Molar Mass (MW):		17.60383	89.429	150.299	153.974	**g/mol**
Relative Density (AIR=1):		0.6078	3.0878	5.1894	5.3163	**SG**
Density:		0.04639	0.23567	0.39606	0.40574	**lbm/scf**
Compressiblity Factor:		0.9976	0.9866	0.9997	0.9998	**Z**
Liquid Volume real gas @:	**14.65**	17.6366	0.006	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.

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

EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:	**05-103-11266**	NAME/DESCRIP :	**120196002 YCF XOM 2-42-1**
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FIELD/AREA:	**YELLOW CREEK**		
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PRODUCER :	QB ENERGY OPERATING LLC	EFFECTIVE DATE:	
FIELD DATA			
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SAMPLE PRES. :	545 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-815
LAB PRES:	psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	57 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	---	0.01	0.00	---	---
Oxygen/Argon	---	0.01	0.02	---	---
Nitrogen	---	0.33	0.53	---	---
Carbon Dioxide	---	0.05	0.12	---	---
Methane	P1	91.9984	83.8398	---	---
Ethane	P2	5.4196	9.2573	1.445	1.453
Propane	P3	1.3668	3.4237	0.376	0.378
i-Butane	I4	0.2800	0.9245	0.091	0.091
n-Butane	P4	0.3558	1.1748	0.112	0.113
2,2-Dimethylpropane	I5	0.0039	0.0160	0.001	0.001
i-Pentane	I5	0.0950	0.3894	0.035	0.035
UnknownC4s	U4	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.0546	0.2238	0.020	0.020
2,2-Dimethylbutane	I6	0.0015	0.0073	0.001	0.001
Cyclopentane	N5	0.0001	0.0004	0.000	0.000
2,3-Dimethylbutane	I6	0.0013	0.0064	0.001	0.001
2-Methylpentane	I6	0.0058	0.0284	0.002	0.002
3-Methylpentane	I6	0.0023	0.0113	0.001	0.001
n-Hexane	P6	0.0033	0.0161	0.001	0.001
Methylcyclopentane	N6	0.0002	0.0010	0.000	0.000
2,4-Dimethylpentane	I7	0.0001	0.0006	0.000	0.000
Cyclohexane	N6	0.0001	0.0005	0.000	0.000
2-Methylhexane	I7	0.0001	0.0006	0.000	0.000
3-Methylhexane	I7	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0001	0.0006	0.000	0.000
Methylcyclohexane	N7	0.0001	0.0006	0.000	0.000

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n-Nonane	P9	0.0001	0.0007	0.000	0.000
n-Decane	P10	0.0001	0.0008	0.000	0.000
UnknownC10s	U10	0.0001	0.0008	0.000	0.000
n-Undecane	P11	0.0002	0.0018	0.000	0.000
UnknownC11s	U11	0.0001	0.0009	0.000	0.000
n-Dodecane	P12	0.0001	0.0010	0.000	0.000
TOTAL		100.00000	100.00000	2.0855	2.0969

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0000	0.0000
TOLUENE	0.0000	0.0000
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0000	0.0000

**(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 :	980.6 /scf	986.0 /scf
	NET WET REAL :	963.5 /scf	968.9 /scf
HHV	GROSS DRY REAL :	1086.4 /scf	1092.4 /scf
	GROSS WET REAL :	1067.4 /scf	1073.4 /scf

NET HEATING VALUE (60 °F ideal reaction):	21158.4 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	23435.7 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6078
DENSITY	0.04639 lb/scf
COMPRESSIBILITY FACTOR :	0.9976
REGULAR WOBBE INDEX	1394.5

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

Net Dry Ideal BTU	4555.5 /scf	Relative Density - SG (Air=1)	3.0878	***C6+factors***
Gross Dry Ideal BTU	4917.8 /scf	**Z** Compressiblity Factor	0.98663	0.98605
Net Dry Ideal BTU	19329.1 /lb	Density Factor	235.666 lbm/1000 ft3	
Gross Dry Ideal BTU	20867.7 /lb	Molar Mass or MW	89.429 g/mol	
		Volume Liquid Ideal gas	0.006 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.