EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-11059**	NAME/DESCRIP :	**YCF 2-22-0246**
LEASE #:			**PRODUCTION CASING**
FIELD/AREA:	**YELLOW CREEK**		
PROJECT NO. :	**202511012**	ANALYSIS NO. :	**01**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	NOVEMBER 18, 2025 07:38
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	OCTOBER 13, 2025
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	
SAMPLE PRES. :	160 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	EPR-1179
LAB PRES:	psig	SAMPLED BY :	NICK CROY
SAMPLE TEMP. :	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: ***Low sample volume.***

COMPONENT	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
ALCOHOLS	0.4185	0.6356	0.0530	0.0533
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	2.70	4.08	---	---
NITROGEN	10.14	13.42	---	---
CARBON DIOXIDE	0.90	1.87	---	---
METHANE	74.1926	56.2294	---	---
ETHANE	6.1775	8.7753	1.6471	1.6561
PROPANE	2.5109	5.2307	0.6896	0.6934
I-BUTANE	0.6828	1.8749	0.2229	0.2241
N-BUTANE	0.7878	2.1632	0.2479	0.2492
I-PENTANE	0.4191	1.4271	0.1519	0.1527
N-PENTANE	0.3001	1.0229	0.1089	0.1095
HEXANES PLUS	0.7607	3.2709	0.3040	0.3052
TOTALS	100.00000	100.00000	3.4253	3.4435

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0296	0.1092
TOLUENE	0.0351	0.1528
ETHYLBENZENE	0.0001	0.0005
XYLENES	0.0005	0.0025
TOTAL BTEX	0.0653	0.2650

**(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 :	940.8 /scf	945.9 /scf
	NET WET REAL :	924.4 /scf	929.5 /scf
HHV	GROSS DRY REAL :	1038.4 /scf	1044.1 /scf
	GROSS WET REAL :	1020.2 /scf	1025.9 /scf
	NET HEATING VALUE (60 °F ideal reaction):		16885.4 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		18641.9 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.7304
	DENSITY		0.05578 lbm/scf
	COMPRESSIBILITY FACTOR :		0.9974
	REGULAR WOBBE INDEX		1215.7

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202511012	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	NOVEMBER 18, 2025 07:38
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 13, 2025
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	EPR-1179
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	YCF 2-22-0246 PRODUCTION CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	160	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*Low sample volume.*		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	0.90	1.87
Nitrogen	10.14	13.42
Methane	74.1926	56.2294
Ethane	6.1775	8.7753
Propane	2.5109	5.2307
Isobutane	0.6828	1.8749
n-Butane	0.7878	2.1632
Isopentane	0.4045	1.3787
n-Pentane	0.3001	1.0229
Cyclopentane	0.0146	0.0484
n-Hexane	0.1208	0.4918
Cyclohexane	0.0650	0.2584
Other Hexanes	0.2508	1.0156
Heptanes	0.1495	0.7043
Methylcyclohexane	0.0906	0.4203
2,2,4 Trimethylpentane	0.0001	0.0005
Benzene	0.0296	0.1092
Toluene	0.0351	0.1528
Ethylbenzene	0.0001	0.0005
Xylenes	0.0005	0.0025
C8+ Heavies	0.0186	0.1150
Subtotal	96.88150	95.28440
Oxygen/Argon	2.70	4.08
Alcohols	0.4185	0.6356
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	940.8	4596.3	6456.8	10219.7	**Btu/scf**
	Net Wet Real:	924.4	4516.0	6343.9	10041.0	**Btu/scf**
HHV	Gross Dry Real:	1038.4	4939.7	6950.3	10984.4	**Btu/scf**
	Gross Wet Real:	1020.2	4853.3	6828.8	10792.4	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1215.7	2771.0	3283.3	4146.6	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		16885.4	19200.5	19896.9	19762.5	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		18641.9	20639.2	21416.5	21241.4	**Btu/lbm**
Molar Mass (MW):		21.16837	91.023	129.974	204.518	**g/mol**
Relative Density (AIR=1):		0.7304	3.1423	4.4873	7.0614	**SG**
Density:		0.05578	0.23985	0.34250	0.53894	**lbm/scf**
Compressiblity Factor:		0.9974	0.9913	0.9976	1.0000	**Z**
Liquid Volume real gas @:	**14.65**	17.4243	0.303	0.009	0.003	**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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CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	
SAMPLE PRES. :	160 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	EPR-1179
LAB PRES:	psig	SAMPLED BY :	NICK CROY
SAMPLE TEMP. :	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:	***Low sample volume.***		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ **14.65**	GPM @ **14.73**
Helium	---	0.01	0.00	---	---
Oxygen/Argon	---	2.70	4.08	---	---
Nitrogen	---	10.14	13.42	---	---
Carbon Dioxide	---	0.90	1.87	---	---
Methane	P1	74.1926	56.2294	---	---
Ethane	P2	6.1775	8.7753	1.647	1.656
Propane	P3	2.5109	5.2307	0.690	0.693
i-Butane	I4	0.6828	1.8749	0.223	0.224
Methanol	X1	0.4173	0.6317	0.053	0.053
n-Butane	P4	0.7878	2.1632	0.248	0.249
2,2-Dimethylpropane	I5	0.0079	0.0269	0.003	0.003
i-Pentane	I5	0.3966	1.3518	0.145	0.146
Acetone	X3	0.0005	0.0014	0.000	0.000
n-Pentane	P5	0.3001	1.0229	0.109	0.110
t-Butanol	X4	0.0007	0.0025	0.000	0.000
2,2-Dimethylbutane	I6	0.0129	0.0525	0.005	0.005
Cyclopentane	N5	0.0146	0.0484	0.004	0.004
2,3-Dimethylbutane	I6	0.0248	0.1010	0.010	0.010
2-Methylpentane	I6	0.1012	0.4120	0.042	0.042
3-Methylpentane	I6	0.0552	0.2247	0.022	0.022
n-Hexane	P6	0.1208	0.4918	0.050	0.050
2,2-Dimethylpentane	I7	0.0037	0.0175	0.002	0.002
Methylcyclopentane	N6	0.0567	0.2254	0.020	0.020
2,4-Dimethylpentane	I7	0.0061	0.0289	0.003	0.003
2,2,3-Trimethylbutane	I7	0.0014	0.0066	0.001	0.001
Benzene	A6	0.0296	0.1092	0.008	0.008

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3,3-Dimethylpentane	I7	0.0019	0.0090	0.001	0.001
Cyclohexane	N6	0.0650	0.2584	0.022	0.022
2-Methylhexane	I7	0.0250	0.1183	0.012	0.012
2,3-Dimethylpentane	I7	0.0069	0.0326	0.003	0.003
1,1-Dimethylcyclopentane	N7	0.0056	0.0260	0.002	0.002
3-Methylhexane	I7	0.0222	0.1051	0.010	0.010
1c,3-Dimethylcyclopentane	N7	0.0083	0.0385	0.004	0.004
1t,3-Dimethylcyclopentane	N7	0.0076	0.0352	0.003	0.003
3-Ethylpentane	I7	0.0010	0.0047	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0120	0.0557	0.006	0.006
2,2,4-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
n-Heptane	P7	0.0441	0.2088	0.020	0.020
1c,2-Dimethylcyclopentane	N7	0.0009	0.0042	0.000	0.000
Methylcyclohexane	N7	0.0906	0.4203	0.036	0.036
2,2-Dimethylhexane	I8	0.0017	0.0092	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0003	0.0016	0.000	0.000
Ethylcyclopentane	N7	0.0025	0.0116	0.001	0.001
2,5-Dimethylhexane	I8	0.0011	0.0060	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0010	0.0054	0.001	0.001
2,4-Dimethylhexane	I8	0.0002	0.0011	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0010	0.0053	0.000	0.000
3,3-Dimethylhexane	I8	0.0003	0.0016	0.000	0.000
Toluene	A7	0.0351	0.1528	0.012	0.012
2,3-Dimethylhexane	I8	0.0004	0.0022	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0005	0.000	0.000
2-Methylheptane	I8	0.0013	0.0070	0.001	0.001
4-Methylheptane	I8	0.0004	0.0022	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0005	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0005	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
3-Methylheptane	I8	0.0008	0.0043	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0022	0.0117	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0005	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0011	0.0058	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0003	0.0016	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0006	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0005	0.0027	0.000	0.000
n-Octane	P8	0.0006	0.0033	0.000	0.000
1c,4-Dimethylcyclohexane	N8	0.0002	0.0010	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
1,1,4-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	0.0003	0.0015	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0005	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0005	0.000	0.000
i-Butylcyclopentane	N9	0.0005	0.0030	0.000	0.000
UnknownC8s	U8	0.0001	0.0005	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0013	0.000	0.000
UnknownC10s	U10	0.0001	0.0007	0.000	0.000
n-Dodecane	P12	0.0001	0.0008	0.000	0.000
n-Tridecane	P13	0.0004	0.0035	0.000	0.000

n-Tetradecane	P14	0.0009	0.0085	0.001	0.001
n-Pentadecane	P15	0.0007	0.0070	0.001	0.001
n-Hexadecane	P16	0.0006	0.0064	0.001	0.001
n-Heptadecane	P17	0.0001	0.0011	0.000	0.000
n-Octadecane	P18	0.0003	0.0036	0.000	0.000
TOTAL		100.00000	100.00000	3.4253	3.4435

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0296	0.1092
TOLUENE	0.0351	0.1528
ETHYLBENZENE	0.0001	0.0005
XYLENES	0.0005	0.0025
TOTAL BTEX	0.0653	0.2650

*(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 :	940.8 /scf	945.9	/scf
	NET WET REAL :	924.4 /scf	929.5	/scf
HHV	GROSS DRY REAL :	1038.4 /scf	1044.1	/scf
	GROSS WET REAL :	1020.2 /scf	1025.9	/scf
	NET HEATING VALUE (60 °F ideal reaction):		16885.4	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		18641.9	Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.7304	
	DENSITY		0.05578	lb/scf
	COMPRESSIBILITY FACTOR :		0.9974	
	REGULAR WOBBE INDEX		1215.7	

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

Net Dry Ideal BTU	4570.6 /scf	Relative Density - SG (Air=1)	3.1423		***C6+factors***
Gross Dry Ideal BTU	4912.1 /scf	**Z** Compressiblity Factor	0.99129		0.99066
Net Dry Ideal BTU	19200.5 /lb	Density Factor	239.854	lbm/1000 ft3	
Gross Dry Ideal BTU	20639.2 /lb	Molar Mass or MW	91.023	g/mol	
		Volume Liquid Ideal gas	0.304	scf/gal	24.8

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.