EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-103-10862** NAME/DESCRIP : **PICEANCE CREEK UNIT 297-11A6**
LEASE #: **PRODUCTION CASING**
FIELD/AREA:

PROJECT NO. : **202509073** ANALYSIS NO. : **01**
COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: SEPTEMBER 20, 2025 12:08
OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : SEPTEMBER 08, 2025
CUSTOMER REF: TO:
PRODUCER : EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE:
SAMPLE PRES. : 786 psig PROBE :
FLOW PRES. : psig CYLINDER NO. : 0430
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:

COMPONENT	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
ALCOHOLS	0.1118	0.1877	0.0140	0.0141
HELIUM	0.00	0.00	---	---
HYDROGEN	0.32	0.03	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.06	0.09	---	---
CARBON DIOXIDE	4.90	11.19	---	---
METHANE	86.5949	72.0666	---	---
ETHANE	5.2669	8.2157	1.4042	1.4119
PROPANE	1.3619	3.1154	0.3738	0.3758
I-BUTANE	0.3498	1.0547	0.1139	0.1146
N-BUTANE	0.3045	0.9181	0.0959	0.0965
I-PENTANE	0.1847	0.6907	0.0670	0.0673
N-PENTANE	0.1236	0.4626	0.0450	0.0452
HEXANES PLUS	0.4219	1.9785	0.1630	0.1636
TOTALS	100.00000	100.00000	2.2768	2.2890

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0253	0.1025
TOLUENE	0.0125	0.0598
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0003	0.0017
TOTAL BTEX	0.0381	0.1640

**(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 :	955.4 /scf	960.6 /scf
	NET WET REAL :	938.7 /scf	943.9 /scf
HHV	GROSS DRY REAL :	1057.1 /scf	1062.9 /scf
	GROSS WET REAL :	1038.6 /scf	1044.4 /scf
	NET HEATING VALUE (60 °F ideal reaction):		18823.8 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		20833.8 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6646
	DENSITY		0.05079 lbm/scf
	COMPRESSIBILITY FACTOR :		0.9974
	REGULAR WOBBE INDEX		1297.4

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202509073	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	SEPTEMBER 20, 2025 12:08
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 08, 2025
PRODUCER :		CYLINDER NO. :	0430
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	PICEANCE CREEK UNIT 297-11A6 PRODUCTION CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	786	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :			

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.32	0.03
Carbon Dioxide	4.90	11.19
Nitrogen	0.06	0.09
Methane	86.5949	72.0666
Ethane	5.2669	8.2157
Propane	1.3619	3.1154
Isobutane	0.3498	1.0547
n-Butane	0.3045	0.9181
Isopentane	0.1774	0.6641
n-Pentane	0.1236	0.4626
Cyclopentane	0.0073	0.0266
n-Hexane	0.0736	0.3291
Cyclohexane	0.0360	0.1572
Other Hexanes	0.1505	0.6691
Heptanes	0.0756	0.3912
Methylcyclohexane	0.0331	0.1686
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0253	0.1025
Toluene	0.0125	0.0598
Ethylbenzene	0.0000	0.0000
Xylenes	0.0003	0.0017
C8+ Heavies	0.0150	0.0993
Subtotal	99.88820	99.81230
Oxygen/Argon	0.00	0.00
Alcohols	0.1118	0.1877
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	955.4	4554.5	5951.2	7058.4	**Btu/scf**
	Net Wet Real:	938.7	4474.9	5847.2	6935.0	**Btu/scf**
HHV	Gross Dry Real:	1057.1	4894.8	6372.4	7530.4	**Btu/scf**
	Gross Wet Real:	1038.6	4809.2	6261.0	7398.8	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1297.4	2754.4	3045.9	3377.2	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		18823.8	19100.7	17609.6	18103.6	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		20833.8	20527.6	18855.4	19307.5	**Btu/lbm**
Molar Mass (MW):		19.27603	90.393	127.269	144.792	**g/mol**
Relative Density (AIR=1):		0.6646	3.1209	4.3945	4.9994	**SG**
Density:		0.05079	0.23821	0.33538	0.38155	**lbm/scf**
Compressiblity Factor:		0.9974	0.9910	0.9989	0.9996	**Z**
Liquid Volume real gas @:	**14.65**	17.7353	0.1625	0.004	0.001	**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.

EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

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SAMPLE PRES. : 786 psig PROBE :
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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:

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ **14.65**	GPM @ **14.73**
Hydrogen	---	0.32	0.03	---	---
Nitrogen	---	0.06	0.09	---	---
Carbon Dioxide	---	4.90	11.19	---	---
Methane	P1	86.5949	72.0666	---	---
Ethane	P2	5.2669	8.2157	1.404	1.412
Propane	P3	1.3619	3.1154	0.374	0.376
i-Butane	I4	0.3498	1.0547	0.114	0.115
Methanol	X1	0.1105	0.1837	0.014	0.014
n-Butane	P4	0.3045	0.9181	0.096	0.097
2,2-Dimethylpropane	I5	0.0045	0.0169	0.002	0.002
Ethanol	X2	0.0001	0.0003	0.000	0.000
i-Pentane	I5	0.1729	0.6472	0.063	0.063
Acetone	X3	0.0001	0.0003	0.000	0.000
i-Propanol	X3	0.0011	0.0034	0.000	0.000
n-Pentane	P5	0.1236	0.4626	0.045	0.045
2,2-Dimethylbutane	I6	0.0081	0.0362	0.003	0.003
Cyclopentane	N5	0.0073	0.0266	0.002	0.002
2,3-Dimethylbutane	I6	0.0148	0.0661	0.006	0.006
2-Methylpentane	I6	0.0596	0.2664	0.025	0.025
3-Methylpentane	I6	0.0343	0.1533	0.014	0.014
n-Hexane	P6	0.0736	0.3291	0.030	0.030
2,2-Dimethylpentane	I7	0.0025	0.0130	0.001	0.001
Methylcyclopentane	N6	0.0337	0.1471	0.012	0.012
2,4-Dimethylpentane	I7	0.0040	0.0208	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0009	0.0047	0.000	0.000
Benzene	A6	0.0253	0.1025	0.007	0.007
3,3-Dimethylpentane	I7	0.0012	0.0062	0.001	0.001
Cyclohexane	N6	0.0360	0.1572	0.012	0.012

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2-Methylhexane	I7	0.0140	0.0728	0.006	0.006
2,3-Dimethylpentane	I7	0.0036	0.0187	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0034	0.0173	0.001	0.001
3-Methylhexane	I7	0.0117	0.0608	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0044	0.0224	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0039	0.0199	0.002	0.002
3-Ethylpentane	I7	0.0005	0.0026	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0060	0.0306	0.003	0.003
n-Heptane	P7	0.0184	0.0957	0.008	0.008
1c,2-Dimethylcyclopentane	N7	0.0002	0.0010	0.000	0.000
Methylcyclohexane	N7	0.0331	0.1686	0.013	0.013
2,2-Dimethylhexane	I8	0.0006	0.0036	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0008	0.0041	0.000	0.000
2,5-Dimethylhexane	I8	0.0004	0.0024	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0004	0.0024	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0125	0.0598	0.004	0.004
2,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0004	0.0024	0.000	0.000
4-Methylheptane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0002	0.0012	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0005	0.0029	0.000	0.000
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0003	0.0018	0.000	0.000
1,1-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	0.0001	0.0006	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0001	0.0006	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0002	0.0011	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
3,6-Dimethyloctane	I10	0.0006	0.0044	0.000	0.000
1,3-Methylethylbenzene	A9	0.0024	0.0149	0.001	0.001
1,4-Methylethylbenzene	A9	0.0011	0.0068	0.001	0.001
1,3,5-Trimethylbenzene	A9	0.0011	0.0068	0.000	0.000
1,2-Methylethylbenzene	A9	0.0009	0.0056	0.001	0.001
t-Butylbenzene	A10	0.0030	0.0209	0.001	0.001
1,3-Methyl-i-propylbenzene	A10	0.0004	0.0028	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0008	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Dimethyl-5-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0001	0.0007	0.000	0.000
UnknownC11s	U11	0.0002	0.0016	0.000	0.000
1,2,4-Triethylbenzene	A12	0.0001	0.0008	0.000	0.000
1,4-Methyl-n-pentylbenzene	A12	0.0001	0.0008	0.000	0.000
n-Hexylbenzene	A12	0.0001	0.0008	0.000	0.000
UnknownC14s	U14	0.0006	0.0062	0.000	0.000
TOTAL		100.00000	100.00000	2.2768	2.2890

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0253	0.1025
TOLUENE	0.0125	0.0598
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0003	0.0017
TOTAL BTEX	0.0381	0.1640

*(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 :	955.4 /scf	960.6 /scf
	NET WET REAL :	938.7 /scf	943.9 /scf
HHV	GROSS DRY REAL :	1057.1 /scf	1062.9 /scf
	GROSS WET REAL :	1038.6 /scf	1044.4 /scf

NET HEATING VALUE (60 °F ideal reaction):	18823.8 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	20833.8 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6646
DENSITY	0.05079 lb/scf
COMPRESSIBILITY FACTOR :	0.9974
REGULAR WOBBE INDEX	1297.4

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

Net Dry Ideal BTU	4527.6 /scf	Relative Density - SG (Air=1)	3.1209		***C6+factors***
Gross Dry Ideal BTU	4865.9 /scf	**Z** Compressiblity Factor	0.99098		0.99039
Net Dry Ideal BTU	19100.7 /lb	Density Factor	238.21	lbm/1000 ft3	
Gross Dry Ideal BTU	20527.6 /lb	Molar Mass or MW	90.393	g/mol	
		Volume Liquid Ideal gas	0.163	scf/gal	24.9

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.

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