EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-103-08340** NAME/DESCRIP : **PICEANCE CREEK UNIT F23-18G**
LEASE #: **PRODUCTION CASING**
FIELD/AREA:

PROJECT NO. : **202507022** ANALYSIS NO. : **01**
COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: JULY 10, 2025 16:33
OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : JUNE 25, 2025 15:00
CUSTOMER REF: TO:
PRODUCER : QB ENERGY OPERATING, LLC EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE:
SAMPLE PRES. : 48 psig PROBE :
FLOW PRES. : psig CYLINDER NO. : ECA-768
LAB PRES: psig SAMPLED BY : NICK CROY
SAMPLE TEMP. : ºf SAMPLING COMPANY: QB ENERGY OPERATING, LLC
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	0.0006	0.0019	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.24	0.36	---	---
CARBON DIOXIDE	1.86	4.36	---	---
METHANE	89.6445	76.6846	---	---
ETHANE	4.8805	7.8252	1.3012	1.3083
PROPANE	1.6127	3.7920	0.4427	0.4452
I-BUTANE	0.3811	1.1811	0.1239	0.1246
N-BUTANE	0.3962	1.2279	0.1249	0.1256
I-PENTANE	0.1935	0.7436	0.0700	0.0703
N-PENTANE	0.1344	0.5171	0.0490	0.0492
HEXANES PLUS	0.6465	3.3065	0.2620	0.2629
TOTALS	100.00000	100.00000	2.3737	2.3861

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0321	0.1337
TOLUENE	0.0413	0.2029
ETHYLBENZENE	0.0027	0.0153
XYLENES	0.0181	0.1025
TOTAL BTEX	0.0942	0.4544

**(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 :	996.8 **/scf**	1002.3 **/scf**
	NET WET REAL :	979.4 **/scf**	984.9 **/scf**
HHV	GROSS DRY REAL :	1102.2 **/scf**	1108.3 **/scf**
	GROSS WET REAL :	1082.9 **/scf**	1089.0 **/scf**

NET HEATING VALUE (60 °F ideal reaction):	20202.5 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	22348.8 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.6466
DENSITY	0.04942 **lbm/scf**
COMPRESSIBILITY FACTOR :	0.9975
REGULAR WOBBE INDEX	1371.6

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202507022	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JULY 10, 2025 16:33
ACCOUNT NO. :		SAMPLE DATE :	JUNE 25, 2025 15:00
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-768
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	PICEANCE CREEK UNIT F23-18G PRODUCTION CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	48	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :			

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	1.86	4.36
Nitrogen	0.24	0.36
Methane	89.6445	76.6846
Ethane	4.8805	7.8252
Propane	1.6127	3.7920
Isobutane	0.3811	1.1811
n-Butane	0.3962	1.2279
Isopentane	0.1859	0.7152
n-Pentane	0.1344	0.5171
Cyclopentane	0.0076	0.0284
n-Hexane	0.0672	0.3088
Cyclohexane	0.0402	0.1804
Other Hexanes	0.1370	0.6259
Heptanes	0.1209	0.6431
Methylcyclohexane	0.0796	0.4168
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0321	0.1337
Toluene	0.0413	0.2029
Ethylbenzene	0.0027	0.0153
Xylenes	0.0181	0.1025
C8+ Heavies	0.1074	0.6771
Subtotal	99.99940	99.99810
Oxygen/Argon	0.00	0.00
Alcohols	0.0006	0.0019
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	996.8	4801.9	5772.4	7201.6	**Btu/scf**
	Net Wet Real:	979.4	4718.0	5671.5	7075.7	**Btu/scf**
HHV	Gross Dry Real:	1102.2	5153.7	6196.5	7753.0	**Btu/scf**
	Gross Wet Real:	1082.9	5063.6	6088.2	7617.5	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1371.6	2822.3	3096.4	3464.1	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		20202.5	19172.1	19456.3	19189.8	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		22348.8	20575.2	20888.4	20662.2	**Btu/lbm**
Molar Mass (MW):		18.75457	95.899	116.179	145.86	**g/mol**
Relative Density (AIR=1):		0.6466	3.3118	4.0120	5.0362	**SG**
Density:		0.04942	0.25270	0.30615	0.38436	**lbm/scf**
Compressiblity Factor:		0.9975	0.9935	0.9978	0.9996	**Z**
Liquid Volume real gas @:	**14.65**	17.822	0.2612	0.0558	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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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	---	---
Nitrogen	---	0.24	0.36	---	---
Carbon Dioxide	---	1.86	4.36	---	---
Methane	P1	89.6445	76.6846	---	---
Ethane	P2	4.8805	7.8252	1.301	1.308
Propane	P3	1.6127	3.7920	0.443	0.445
i-Butane	I4	0.3811	1.1811	0.124	0.125
n-Butane	P4	0.3962	1.2279	0.125	0.126
2,2-Dimethylpropane	I5	0.0044	0.0169	0.002	0.002
i-Pentane	I5	0.1815	0.6983	0.066	0.066
Acetone	X3	0.0006	0.0019	0.000	0.000
n-Pentane	P5	0.1344	0.5171	0.049	0.049
2,2-Dimethylbutane	I6	0.0068	0.0313	0.003	0.003
Cyclopentane	N5	0.0076	0.0284	0.002	0.002
2,3-Dimethylbutane	I6	0.0122	0.0560	0.005	0.005
2-Methylpentane	I6	0.0539	0.2477	0.022	0.022
3-Methylpentane	I6	0.0306	0.1406	0.012	0.012
n-Hexane	P6	0.0672	0.3088	0.028	0.028
2,2-Dimethylpentane	I7	0.0023	0.0123	0.001	0.001
Methylcyclopentane	N6	0.0335	0.1503	0.012	0.012
2,4-Dimethylpentane	I7	0.0037	0.0198	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0009	0.0048	0.000	0.000
Benzene	A6	0.0321	0.1337	0.009	0.009
3,3-Dimethylpentane	I7	0.0013	0.0069	0.001	0.001
Cyclohexane	N6	0.0402	0.1804	0.014	0.014
2-Methylhexane	I7	0.0186	0.0994	0.009	0.009
2,3-Dimethylpentane	I7	0.0051	0.0273	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0039	0.0204	0.002	0.002

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3-Methylhexane	I7	0.0174	0.0930	0.008	0.008
1c,3-Dimethylcyclopentane	N7	0.0062	0.0325	0.003	0.003
1t,3-Dimethylcyclopentane	N7	0.0057	0.0299	0.003	0.003
3-Ethylpentane	I7	0.0010	0.0053	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0094	0.0492	0.004	0.004
n-Heptane	P7	0.0402	0.2148	0.018	0.018
1c,2-Dimethylcyclopentane	N7	0.0020	0.0105	0.001	0.001
Methylcyclohexane	N7	0.0796	0.4168	0.032	0.032
2,2-Dimethylhexane	I8	0.0021	0.0128	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0004	0.0024	0.000	0.000
Ethylcyclopentane	N7	0.0027	0.0141	0.001	0.001
2,5-Dimethylhexane	I8	0.0020	0.0122	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0019	0.0116	0.001	0.001
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0017	0.0102	0.001	0.001
3,3-Dimethylhexane	I8	0.0006	0.0037	0.000	0.000
2,3,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0413	0.2029	0.014	0.014
2,3-Dimethylhexane	I8	0.0016	0.0098	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0002	0.0012	0.000	0.000
2-Methylheptane	I8	0.0089	0.0542	0.005	0.005
4-Methylheptane	I8	0.0026	0.0158	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0002	0.0012	0.000	0.000
3,4-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0063	0.0384	0.003	0.003
1c,2t,3-Trimethylcyclopentane	N8	0.0114	0.0682	0.006	0.006
3-Ethylhexane	I8	0.0002	0.0012	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0048	0.0287	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0017	0.0102	0.001	0.001
2,2,5-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0005	0.0030	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0004	0.0024	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0007	0.0042	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0036	0.0215	0.002	0.002
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
UnknownC7s	U7	0.0001	0.0005	0.000	0.000
n-Octane	P8	0.0184	0.1121	0.009	0.009
1c,4-Dimethylcyclohexane	N8	0.0024	0.0143	0.001	0.001
i-Propylcyclopentane	I8	0.0002	0.0012	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0003	0.0020	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
2,2-Dimethylheptane	I9	0.0008	0.0055	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0032	0.0215	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0008	0.0055	0.000	0.000
2,4-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
Ethylcyclohexane	N8	0.0025	0.0150	0.001	0.001
n-Propylcyclopentane	N8	0.0012	0.0072	0.001	0.001
1c,3c,5-Trimethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
2,5-Dimethylheptane	I9	0.0018	0.0123	0.001	0.001
3,3-Dimethylheptane	I9	0.0003	0.0020	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
Ethylbenzene	I8	0.0027	0.0153	0.001	0.001
1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000

1,3-Dimethylbenzene (m-Xylene)	A8	0.0121	0.0685	0.005	0.005
1,4-Dimethylbenzene (p-Xylene)	A8	0.0037	0.0210	0.001	0.001
3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0002	0.0014	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0014	0.000	0.000
4-Methyloctane	I9	0.0010	0.0068	0.001	0.001
2-Methyloctane	I9	0.0016	0.0109	0.001	0.001
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
3-Methyloctane	I9	0.0002	0.0014	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0015	0.0101	0.001	0.001
1,1,2-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3,3-Diethylpentane	I9	0.0002	0.0014	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0023	0.0130	0.001	0.001
i-Butylcyclopentane	N9	0.0009	0.0061	0.000	0.000
n-Nonane	P9	0.0056	0.0383	0.003	0.003
1,1-Methylethylcyclohexane	N9	0.0004	0.0027	0.000	0.000
i-Propylbenzene	A9	0.0002	0.0013	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,4-Dimethyloctane	I10	0.0002	0.0015	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0007	0.0047	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0005	0.0032	0.000	0.000
3,6-Dimethyloctane	I10	0.0003	0.0023	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0006	0.0038	0.000	0.000
1,4-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0008	0.0051	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
5-Methylnonane	I10	0.0002	0.0015	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0002	0.0015	0.000	0.000
t-Butylbenzene	A10	0.0006	0.0043	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0011	0.0075	0.001	0.001
n-Decane	P10	0.0008	0.0061	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0009	0.000	0.000
1,3-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0014	0.0106	0.001	0.001
n-Undecane	P11	0.0001	0.0009	0.000	0.000
1,3-Di-i-propylbenzene	A11	0.0001	0.0009	0.000	0.000
UnknownC11s	U11	0.0001	0.0009	0.000	0.000
n-Dodecane	P12	0.0001	0.0009	0.000	0.000
n-Tridecane	P13	0.0001	0.0010	0.000	0.000
UnknownC18s	U18	0.0001	0.0013	0.000	0.000
TOTAL		100.00000	100.00000	2.3737	2.3861

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BTEX COMPONENTS	MOLE%	WT%
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TOLUENE	0.0413	0.2029
ETHYLBENZENE	0.0027	0.0153
XYLENES	0.0181	0.1025
TOTAL BTEX	0.0942	0.4544

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	NET WET REAL :	979.4 /scf	984.9 /scf
HHV	GROSS DRY REAL :	1102.2 /scf	1108.3 /scf
	GROSS WET REAL :	1082.9 /scf	1089.0 /scf

NET HEATING VALUE (60 °F ideal reaction):	20202.5 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	22348.8 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6466
DENSITY	0.04942 lb/scf
COMPRESSIBILITY FACTOR :	0.9975
REGULAR WOBBE INDEX	1371.6

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

Net Dry Ideal BTU	4785.5 /scf	Relative Density - SG (Air=1)	3.3118		***C6+factors***
Gross Dry Ideal BTU	5136.1 /scf	**Z** Compressiblity Factor	0.99347		0.9926
Net Dry Ideal BTU	19172.1 /lb	Density Factor	252.696	lbm/1000 ft3	
Gross Dry Ideal BTU	20575.2 /lb	Molar Mass or MW	95.899	g/mol	
		Volume Liquid Ideal gas	0.262	scf/gal	24.1

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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