EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-10719**	NAME/DESCRIP :	**PICEANCE CREEK UNIT T87X-3G5**
LEASE #:			**SURFACE CASING**
FIELD/AREA:			
PROJECT NO. :	**202507027**	ANALYSIS NO. :	**03**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	JULY 14, 2025 09:37
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	JULY 1, 2025
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	
*****FIELD DATA*****			
SAMPLE CYCLE:		SAMPLE TYPE:	
SAMPLE PRES. :	1262 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-769
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	0.0009	0.0017	0.0000	0.0000
HELIUM	0.00	0.00	---	---
HYDROGEN	0.05	0.01	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.07	0.10	---	---
CARBON DIOXIDE	4.18	9.36	---	---
METHANE	87.0215	70.9880	---	---
ETHANE	5.1536	7.8798	1.3742	1.3817
PROPANE	1.4482	3.2472	0.3978	0.4000
I-BUTANE	0.3588	1.0604	0.1169	0.1176
N-BUTANE	0.3457	1.0217	0.1089	0.1095
I-PENTANE	0.1898	0.6960	0.0690	0.0693
N-PENTANE	0.1306	0.4792	0.0470	0.0472
HEXANES PLUS	1.0504	5.1570	0.4330	0.4348
TOTALS	100.00000	100.00000	2.5468	2.5601

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0296	0.1176
TOLUENE	0.1089	0.5102
ETHYLBENZENE	0.0020	0.0108
XYLENES	0.0174	0.0939
TOTAL BTEX	0.1579	0.7325

**(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 :	991.1 **/scf**	996.5 **/scf**
	NET WET REAL :	973.8 **/scf**	979.2 **/scf**
HHV	GROSS DRY REAL :	1095.4 **/scf**	1101.4 **/scf**
	GROSS WET REAL :	1076.3 **/scf**	1082.3 **/scf**
	NET HEATING VALUE (60 °F ideal reaction):		19159.9 **Btu/lbm**
	GROSS HEATING VALUE (60°F ideal reaction):		21181.9 **Btu/lbm**
	RELATIVE DENSITY (AIR=1):		0.6783
	DENSITY		0.05181 **lbm/scf**
	COMPRESSIBILITY FACTOR :		0.9974
	REGULAR WOBBE INDEX		1330.8

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202507027	ANALYSIS NO. :	03
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JULY 14, 2025 09:37
ACCOUNT NO. :		SAMPLE DATE :	JULY 1, 2025
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-769
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	PICEANCE CREEK UNIT T87X-3G5 SURFACE CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	1262	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :			

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.05	0.01
Carbon Dioxide	4.18	9.36
Nitrogen	0.07	0.10
Methane	87.0215	70.9880
Ethane	5.1536	7.8798
Propane	1.4482	3.2472
Isobutane	0.3588	1.0604
n-Butane	0.3457	1.0217
Isopentane	0.1864	0.6839
n-Pentane	0.1306	0.4792
Cyclopentane	0.0034	0.0121
n-Hexane	0.0892	0.3909
Cyclohexane	0.0531	0.2273
Other Hexanes	0.1677	0.7304
Heptanes	0.2276	1.1548
Methylcyclohexane	0.1741	0.8692
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0296	0.1176
Toluene	0.1089	0.5102
Ethylbenzene	0.0020	0.0108
Xylenes	0.0174	0.0939
C8+ Heavies	0.1807	1.0513
Subtotal	99.99910	99.99830
Oxygen/Argon	0.00	0.00
Alcohols	0.0009	0.0017
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	991.1	4831.1	5691.8	7141.6	**Btu/scf**
	Net Wet Real:	973.8	4746.6	5592.3	7016.8	**Btu/scf**
HHV	Gross Dry Real:	1095.4	5183.3	6121.7	7663.3	**Btu/scf**
	Gross Wet Real:	1076.3	5092.7	6014.7	7529.3	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1330.8	2830.5	3091.9	3452.6	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		19159.9	19203.2	19795.8	18932.3	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		21181.9	20606.2	21294.6	20311.8	**Btu/lbm**
Molar Mass (MW):		19.66415	96.544	113.58	143.475	**g/mol**
Relative Density (AIR=1):		0.6783	3.3334	3.9215	4.9538	**SG**
Density:		0.05181	0.25442	0.29933	0.37808	**lbm/scf**
Compressiblity Factor:		0.9974	0.9939	0.9971	0.9996	**Z**
Liquid Volume real gas @:	**14.65**	17.9307	0.4316	0.0947	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: **05-103-10719** NAME/DESCRIP : **PICEANCE CREEK UNIT T87X-3G5**
LEASE #: **SURFACE CASING**
FIELD/AREA:

PROJECT NO. : **202507027** ANALYSIS NO. : **03**
COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: JULY 14, 2025 09:37
OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : JULY 1, 2025
CUSTOMER REF: TO:
PRODUCER : QB ENERGY OPERATING, LLC EFFECTIVE DATE:
FIELD DATA
SAMPLE CYCLE: SAMPLE TYPE:
SAMPLE PRES. : 1262 psig PROBE :
FLOW PRES. : psig CYLINDER NO. : ECA-769
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	PIANO #	MOLE %	MASS %	GPM @ **14.65**	GPM @ **14.73**
Hydrogen	---	0.05	0.01	---	---
Nitrogen	---	0.07	0.10	---	---
Carbon Dioxide	---	4.18	9.36	---	---
Methane	P1	87.0215	70.9880	---	---
Ethane	P2	5.1536	7.8798	1.374	1.382
Propane	P3	1.4482	3.2472	0.398	0.400
i-Butane	I4	0.3588	1.0604	0.117	0.118
Methanol	X1	0.0008	0.0013	0.000	0.000
n-Butane	P4	0.3457	1.0217	0.109	0.110
2,2-Dimethylpropane	I5	0.0045	0.0165	0.002	0.002
i-Pentane	I5	0.1819	0.6674	0.066	0.066
n-Pentane	P5	0.1306	0.4792	0.047	0.047
t-Butanol	X4	0.0001	0.0004	0.000	0.000
2,2-Dimethylbutane	I6	0.0084	0.0368	0.003	0.003
Cyclopentane	N5	0.0034	0.0121	0.001	0.001
2,3-Dimethylbutane	I6	0.0152	0.0666	0.006	0.006
2-Methylpentane	I6	0.0639	0.2800	0.026	0.026
3-Methylpentane	I6	0.0372	0.1630	0.015	0.015
n-Hexane	P6	0.0892	0.3909	0.037	0.037
2,2-Dimethylpentane	I7	0.0036	0.0184	0.002	0.002
Methylcyclopentane	N6	0.0430	0.1840	0.015	0.015
2,4-Dimethylpentane	I7	0.0058	0.0295	0.003	0.003
2,2,3-Trimethylbutane	I7	0.0013	0.0066	0.001	0.001
Benzene	A6	0.0296	0.1176	0.008	0.008
3,3-Dimethylpentane	I7	0.0022	0.0112	0.001	0.001
Cyclohexane	N6	0.0531	0.2273	0.018	0.018
2-Methylhexane	I7	0.0334	0.1702	0.015	0.015
2,3-Dimethylpentane	I7	0.0082	0.0418	0.004	0.004

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1,1-Dimethylcyclopentane	N7	0.0067	0.0335	0.003	0.003
3-Methylhexane	I7	0.0311	0.1584	0.014	0.014
1c,3-Dimethylcyclopentane	N7	0.0108	0.0539	0.005	0.005
1t,3-Dimethylcyclopentane	N7	0.0101	0.0504	0.005	0.005
3-Ethylpentane	I7	0.0017	0.0086	0.001	0.001
1t,2-Dimethylcyclopentane	N7	0.0159	0.0794	0.007	0.007
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0900	0.4586	0.041	0.041
1c,2-Dimethylcyclopentane	N7	0.0006	0.0030	0.000	0.000
Methylcyclohexane	N7	0.1741	0.8692	0.070	0.070
2,2-Dimethylhexane	I8	0.0054	0.0314	0.002	0.002
1,1,3-Trimethylcyclopentane	N7	0.0005	0.0028	0.000	0.000
Ethylcyclopentane	N7	0.0057	0.0285	0.002	0.002
2,5-Dimethylhexane	I8	0.0055	0.0319	0.003	0.003
2,2,3-Trimethylpentane	I8	0.0052	0.0302	0.003	0.003
1c,2t,4-Trimethylcyclopentane	N8	0.0039	0.0223	0.002	0.002
3,3-Dimethylhexane	I8	0.0016	0.0093	0.001	0.001
2,3,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0002	0.0012	0.000	0.000
Toluene	A7	0.1089	0.5102	0.036	0.036
2,3-Dimethylhexane	I8	0.0041	0.0238	0.002	0.002
2-Methyl-3-ethylpentane	I8	0.0003	0.0017	0.000	0.000
2-Methylheptane	I8	0.0226	0.1313	0.012	0.012
4-Methylheptane	I8	0.0067	0.0389	0.003	0.003
3-Methyl-3-ethylpentane	I8	0.0005	0.0029	0.000	0.000
3,4-Dimethylhexane	I8	0.0006	0.0035	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0003	0.0017	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0002	0.0011	0.000	0.000
3-Methylheptane	I8	0.0159	0.0923	0.008	0.008
1c,2t,3-Trimethylcyclopentane	N8	0.0279	0.1592	0.014	0.014
3-Ethylhexane	I8	0.0006	0.0035	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0120	0.0685	0.006	0.006
1,1-Dimethylcyclohexane	N8	0.0037	0.0211	0.002	0.002
2,2,5-Trimethylhexane	I9	0.0004	0.0026	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0009	0.0051	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0008	0.0046	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0010	0.0057	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0003	0.0019	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0071	0.0405	0.004	0.004
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0341	0.1981	0.017	0.017
1c,4-Dimethylcyclohexane	N8	0.0045	0.0257	0.002	0.002
i-Propylcyclopentane	I8	0.0003	0.0017	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0003	0.0019	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0001	0.0007	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	0.0010	0.0065	0.001	0.001
1,1,4-Trimethylcyclohexane	N9	0.0030	0.0193	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0006	0.0039	0.000	0.000
2,4-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0021	0.0120	0.001	0.001
n-Propylcyclopentane	N8	0.0007	0.0040	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0003	0.0019	0.000	0.000
2,5-Dimethylheptane	I9	0.0013	0.0085	0.001	0.001
3,3-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0020	0.0108	0.001	0.001

1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0119	0.0642	0.005	0.005
1,4-Dimethylbenzene (p-Xylene)	A8	0.0043	0.0232	0.002	0.002
3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0007	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0004	0.0026	0.000	0.000
2-Methyloctane	I9	0.0006	0.0039	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0004	0.0025	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0012	0.0065	0.000	0.000
i-Butylcyclopentane	N9	0.0002	0.0013	0.000	0.000
n-Nonane	P9	0.0003	0.0019	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
t-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0004	0.0026	0.000	0.000
n-Decane	P10	0.0002	0.0014	0.000	0.000
UnknownC10s	U10	0.0001	0.0007	0.000	0.000
n-Undecane	P11	0.0001	0.0008	0.000	0.000
TOTAL		100.00000	100.00000	2.5468	2.5601

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0296	0.1176
TOLUENE	0.1089	0.5102
ETHYLBENZENE	0.0020	0.0108
XYLENES	0.0174	0.0939
TOTAL BTEX	0.1579	0.7325

**(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 :	991.1 /scf	996.5 /scf
	NET WET REAL :	973.8 /scf	979.2 /scf
HHV	GROSS DRY REAL :	1095.4 /scf	1101.4 /scf
	GROSS WET REAL :	1076.3 /scf	1082.3 /scf

NET HEATING VALUE (60 °F ideal reaction):	19159.9 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	21181.9 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6783
DENSITY	0.05181 lb/scf
COMPRESSIBILITY FACTOR :	0.9974
REGULAR WOBBE INDEX	1330.8

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

Net Dry Ideal BTU	4816.6 /scf	Relative Density - SG (Air=1)	3.3334	***C6+factors***
Gross Dry Ideal BTU	5167.8 /scf	**Z** Compressiblity Factor	0.99388	0.99317
Net Dry Ideal BTU	19203.2 /lb	Density Factor	254.419 lbm/1000 ft3	
Gross Dry Ideal BTU	20606.2 /lb	Molar Mass or MW	96.544 g/mol	
		Volume Liquid Ideal gas	0.433 scf/gal	24

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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