EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-10499**	NAME/DESCRIP :	**PICEANCE CREEK UNIT T87X-3G SURFACE CASING**
LEASE #:			
FIELD/AREA:			
PROJECT NO. :	**202507032**	ANALYSIS NO. :	**03**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	JULY 20, 2025 15:27
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	JUNE 30, 2025
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	
SAMPLE PRES. :	1075 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-822
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	0.0004	0.0007	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.10	0.15	---	---
CARBON DIOXIDE	2.03	4.70	---	---
METHANE	87.6765	74.0215	---	---
ETHANE	6.2112	9.8287	1.6563	1.6653
PROPANE	2.2461	5.2123	0.6167	0.6201
I-BUTANE	0.4917	1.5040	0.1599	0.1608
N-BUTANE	0.5261	1.6092	0.1649	0.1658
I-PENTANE	0.2078	0.7884	0.0750	0.0754
N-PENTANE	0.1548	0.5878	0.0560	0.0563
HEXANES PLUS	0.3357	1.5974	0.1320	0.1325
TOTALS	100.00000	100.00000	2.8608	2.8762

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0101	0.0415
TOLUENE	0.0119	0.0577
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0220	0.0992

*(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 :	1008.5 /scf	1014.0 /scf
	NET WET REAL :	990.9 /scf	996.4 /scf
HHV	GROSS DRY REAL :	1115.3 /scf	1121.4 /scf
	GROSS WET REAL :	1095.8 /scf	1101.9 /scf
	NET HEATING VALUE (60 °F ideal reaction):		20155.0 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		22290.4 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6559
	DENSITY		0.05007 lbm/scf
	COMPRESSIBILITY FACTOR :		0.9973
	REGULAR WOBBE INDEX		1377.7

The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc. Results of the analysis can be affected by the sampling conditions, therefore, are only warranted through proper lab protocol. EMPACT assumes no responsibility for interpretation or any consequences from application of the reported information and is the sole liability of the user. The reproduction in any media of this reported information may not be made, in portion or as a whole, without the written permission of EMPACT Analytical Systems, Inc.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202507032	ANALYSIS NO. :	03
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JULY 20, 2025 15:27
ACCOUNT NO. :		SAMPLE DATE :	JUNE 30, 2025
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-822
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	PICEANCE CREEK UNIT T87X-3G SURFACE CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	1075	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :			

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	2.03	4.70
Nitrogen	0.10	0.15
Methane	87.6765	74.0215
Ethane	6.2112	9.8287
Propane	2.2461	5.2123
Isobutane	0.4917	1.5040
n-Butane	0.5261	1.6092
Isopentane	0.2030	0.7707
n-Pentane	0.1548	0.5878
Cyclopentane	0.0048	0.0177
n-Hexane	0.0603	0.2734
Cyclohexane	0.0273	0.1209
Other Hexanes	0.1123	0.5066
Heptanes	0.0657	0.3449
Methylcyclohexane	0.0435	0.2248
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0101	0.0415
Toluene	0.0119	0.0577
Ethylbenzene	0.0000	0.0000
Xylenes	0.0000	0.0000
C8+ Heavies	0.0046	0.0276
Subtotal	99.99960	99.99930
Oxygen/Argon	0.00	0.00
Alcohols	0.0004	0.0007
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	1008.5	4574.5	5565.1	#DIV/0!	**Btu/scf**
	Net Wet Real:	990.9	4494.5	5467.8	#DIV/0!	**Btu/scf**
HHV	Gross Dry Real:	1115.3	4920.2	6000.8	#DIV/0!	**Btu/scf**
	Gross Wet Real:	1095.8	4834.2	5895.9	#DIV/0!	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1377.7	2768.1	3027.2	#DIV/0!	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		20155.0	19207.6	19717.3	#DIV/0!	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		22290.4	20658.3	21261.9	#DIV/0!	**Btu/lbm**
Molar Mass (MW):		19.00225	90.419	113.571	#DIV/0!	**g/mol**
Relative Density (AIR=1):		0.6559	3.1224	3.9210	#DIV/0!	**SG**
Density:		0.05007	0.23828	0.29928	#DIV/0!	**lbm/scf**
Compressiblity Factor:		0.9973	0.9910	0.9958	#DIV/0!	**Z**
Liquid Volume real gas @:	**14.65**	17.9905	0.1316	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.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY: **05-103-10499** NAME/DESCRIP : **PICEANCE CREEK UNIT T87X-3G**
LEASE #: **SURFACE CASING**
FIELD/AREA:

PROJECT NO. : **202507032** ANALYSIS NO. : **03**
COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: JULY 20, 2025 15:27
OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : JUNE 30, 2025
CUSTOMER REF: TO:
PRODUCER : QB ENERGY OPERATING, LLC EFFECTIVE DATE:
FIELD DATA
SAMPLE CYCLE: SAMPLE TYPE:
SAMPLE PRES. : 1075 psig PROBE :
FLOW PRES. : psig CYLINDER NO. : ECA-822
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**
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.01	0.00	---	---
Nitrogen	---	0.10	0.15	---	---
Carbon Dioxide	---	2.03	4.70	---	---
Methane	P1	87.6765	74.0215	---	---
Ethane	P2	6.2112	9.8287	1.656	1.665
Propane	P3	2.2461	5.2123	0.617	0.620
i-Butane	I4	0.4917	1.5040	0.160	0.161
Methanol	X1	0.0004	0.0007	0.000	0.000
n-Butane	P4	0.5261	1.6092	0.165	0.166
2,2-Dimethylpropane	I5	0.0047	0.0178	0.002	0.002
i-Pentane	I5	0.1983	0.7529	0.072	0.072
n-Pentane	P5	0.1548	0.5878	0.056	0.056
2,2-Dimethylbutane	I6	0.0057	0.0258	0.002	0.002
Cyclopentane	N5	0.0048	0.0177	0.001	0.001
2,3-Dimethylbutane	I6	0.0106	0.0481	0.004	0.004
2-Methylpentane	I6	0.0465	0.2109	0.019	0.019
3-Methylpentane	I6	0.0244	0.1107	0.010	0.010
n-Hexane	P6	0.0603	0.2734	0.025	0.025
2,2-Dimethylpentane	I7	0.0014	0.0074	0.001	0.001
Methylcyclopentane	N6	0.0251	0.1111	0.009	0.009
2,4-Dimethylpentane	I7	0.0025	0.0132	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0005	0.0026	0.000	0.000
Benzene	A6	0.0101	0.0415	0.003	0.003
3,3-Dimethylpentane	I7	0.0007	0.0037	0.000	0.000
Cyclohexane	N6	0.0273	0.1209	0.009	0.009
2-Methylhexane	I7	0.0103	0.0543	0.005	0.005
2,3-Dimethylpentane	I7	0.0026	0.0137	0.001	0.001

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1,1-Dimethylcyclopentane	N7	0.0021	0.0108	0.001	0.001
3-Methylhexane	I7	0.0089	0.0469	0.004	0.004
1c,3-Dimethylcyclopentane	N7	0.0034	0.0176	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0031	0.0160	0.001	0.001
3-Ethylpentane	I7	0.0004	0.0021	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0049	0.0253	0.002	0.002
n-Heptane	P7	0.0230	0.1213	0.011	0.011
1c,2-Dimethylcyclopentane	N7	0.0004	0.0021	0.000	0.000
Methylcyclohexane	N7	0.0435	0.2248	0.017	0.017
2,2-Dimethylhexane	I8	0.0009	0.0054	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
Ethylcyclopentane	N7	0.0013	0.0067	0.001	0.001
2,5-Dimethylhexane	I8	0.0006	0.0036	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0006	0.0036	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0005	0.0030	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0119	0.0577	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	0.0030	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0002	0.0012	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
1c,4-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
TOTAL		100.00000	100.00000	2.8608	2.8762

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0101	0.0415
TOLUENE	0.0119	0.0577
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0220	0.0992

**(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 :	1008.5 **/scf**	1014.0 **/scf**
NET WET REAL :	990.9 **/scf**	996.4 **/scf**
HHV GROSS DRY REAL :	1115.3 **/scf**	1121.4 **/scf**
GROSS WET REAL :	1095.8 **/scf**	1101.9 **/scf**
NET HEATING VALUE (60 °F ideal reaction):		20155.0 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):		22290.4 **Btu/lbm**
RELATIVE DENSITY (AIR=1):		0.6559
DENSITY		0.05007 **lb/scf**
COMPRESSIBILITY FACTOR :		0.9973
REGULAR WOBBE INDEX		1377.7

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

Net Dry Ideal BTU	4547.6 **/scf**	Relative Density - SG (Air=1)	3.1224	***C6+factors***
Gross Dry Ideal BTU	4891.3 **/scf**	**Z** Compressiblity Factor	0.99101	0.99049
Net Dry Ideal BTU	19207.6 **/lb**	Density Factor	238.283 **lbm/1000 ft3**	
Gross Dry Ideal BTU	20658.3 **/lb**	Molar Mass or MW	90.419 **g/mol**	
		Volume Liquid Ideal gas	0.132 **scf/gal**	25

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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