EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-10501**	NAME/DESCRIP :	**PIEANCE CREEK UNIT T87X-3G2**
LEASE #:			**SURFACE CASING**
FIELD/AREA:			
PROJECT NO. :	**202507033**	ANALYSIS NO. :	**03**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	JULY 20, 2025 20:38
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. :	483 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-716
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	0.0013	0.0024	0.0000	0.0000
HELIUM	0.00	0.00	---	---
HYDROGEN	0.13	0.02	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.08	0.13	---	---
CARBON DIOXIDE	0.02	0.05	---	---
METHANE	93.4067	85.9866	---	---
ETHANE	4.3513	7.5079	1.1601	1.1665
PROPANE	1.1400	2.8845	0.3128	0.3145
I-BUTANE	0.2761	0.9209	0.0899	0.0904
N-BUTANE	0.2244	0.7484	0.0709	0.0713
I-PENTANE	0.1079	0.4463	0.0390	0.0392
N-PENTANE	0.0665	0.2753	0.0240	0.0241
HEXANES PLUS	0.1958	1.0278	0.0770	0.0771
TOTALS	100.00000	100.00000	1.7737	1.7831

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0087	0.0390
TOLUENE	0.0016	0.0084
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0004	0.0024
TOTAL BTEX	0.0107	0.0498

**(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 :	976.3 **/scf**	981.6 **/scf**
	NET WET REAL :	959.2 **/scf**	964.5 **/scf**
HHV	GROSS DRY REAL :	1081.3 **/scf**	1087.2 **/scf**
	GROSS WET REAL :	1062.4 **/scf**	1068.3 **/scf**

NET HEATING VALUE (60 °F ideal reaction):	21281.4 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	23576.8 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.6016
DENSITY	0.04592 **lbm/scf**
COMPRESSIBILITY FACTOR :	0.9976
REGULAR WOBBE INDEX	1395.1

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202507033	ANALYSIS NO. :	03
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JULY 20, 2025 20:38
ACCOUNT NO. :		SAMPLE DATE :	JUNE 30, 2025
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-716
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	PIEANCE CREEK UNIT T87X-3G2 SURFACE CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	483	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :			

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.13	0.02
Carbon Dioxide	0.02	0.05
Nitrogen	0.08	0.13
Methane	93.4067	85.9866
Ethane	4.3513	7.5079
Propane	1.1400	2.8845
Isobutane	0.2761	0.9209
n-Butane	0.2244	0.7484
Isopentane	0.1048	0.4339
n-Pentane	0.0665	0.2753
Cyclopentane	0.0031	0.0124
n-Hexane	0.0316	0.1563
Cyclohexane	0.0158	0.0763
Other Hexanes	0.0631	0.3104
Heptanes	0.0425	0.2430
Methylcyclohexane	0.0197	0.1110
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0087	0.0390
Toluene	0.0016	0.0084
Ethylbenzene	0.0000	0.0000
Xylenes	0.0004	0.0024
C8+ Heavies	0.0123	0.0804
Subtotal	99.99870	99.99760
Oxygen/Argon	0.00	0.00
Alcohols	0.0013	0.0024
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	976.3	4640.5	5761.1	6335.0	**Btu/scf**
	Net Wet Real:	959.2	4559.4	5660.4	6224.3	**Btu/scf**
HHV	Gross Dry Real:	1081.3	4992.6	6204.3	6686.2	**Btu/scf**
	Gross Wet Real:	1062.4	4905.3	6095.8	6569.3	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1395.1	2791.4	3113.4	3114.1	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		21281.4	19280.2	19738.9	17958.2	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23576.8	20745.2	21259.1	18953.7	**Btu/lbm**
Molar Mass (MW):		17.4261	91.602	115.035	134.221	**g/mol**
Relative Density (AIR=1):		0.6016	3.1631	3.9722	4.6343	**SG**
Density:		0.04592	0.24139	0.30315	0.35369	**lbm/scf**
Compressiblity Factor:		0.9976	0.9913	0.9970	0.9995	**Z**
Liquid Volume real gas @:	**14.65**	17.5389	0.0768	0.004	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:	**05-103-10501**	NAME/DESCRIP :	**PIEANCE CREEK UNIT T87X-3G2 SURFACE CASING**
LEASE #:			
FIELD/AREA:			
PROJECT NO. :	**202507033**	ANALYSIS NO. :	**03**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	JULY 20, 2025 20:38
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. :	483 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-716
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	---	0.13	0.02	---	---
Nitrogen	---	0.08	0.13	---	---
Carbon Dioxide	---	0.02	0.05	---	---
Methane	P1	93.4067	85.9866	---	---
Ethane	P2	4.3513	7.5079	1.160	1.167
Propane	P3	1.1400	2.8845	0.313	0.315
i-Butane	I4	0.2761	0.9209	0.090	0.090
Methanol	X1	0.0013	0.0024	0.000	0.000
n-Butane	P4	0.2244	0.7484	0.071	0.071
2,2-Dimethylpropane	I5	0.0035	0.0145	0.001	0.001
i-Pentane	I5	0.1013	0.4194	0.037	0.037
n-Pentane	P5	0.0665	0.2753	0.024	0.024
2,2-Dimethylbutane	I6	0.0038	0.0188	0.002	0.002
Cyclopentane	N5	0.0031	0.0124	0.001	0.001
2,3-Dimethylbutane	I6	0.0060	0.0297	0.002	0.002
2-Methylpentane	I6	0.0246	0.1217	0.010	0.010
3-Methylpentane	I6	0.0140	0.0692	0.006	0.006
n-Hexane	P6	0.0316	0.1563	0.013	0.013
2,2-Dimethylpentane	I7	0.0011	0.0063	0.001	0.001
Methylcyclopentane	N6	0.0146	0.0705	0.005	0.005
2,4-Dimethylpentane	I7	0.0019	0.0109	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0004	0.0023	0.000	0.000
Benzene	A6	0.0087	0.0390	0.002	0.002
3,3-Dimethylpentane	I7	0.0006	0.0034	0.000	0.000
Cyclohexane	N6	0.0158	0.0763	0.005	0.005
2-Methylhexane	I7	0.0073	0.0419	0.003	0.003
2,3-Dimethylpentane	I7	0.0019	0.0109	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0016	0.0090	0.001	0.001

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3-Methylhexane	I7	0.0063	0.0362	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0021	0.0118	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0019	0.0107	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0017	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0030	0.0169	0.001	0.001
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
UnknownC6s	U6	0.0001	0.0005	0.000	0.000
n-Heptane	P7	0.0128	0.0736	0.006	0.006
1c,2-Dimethylcyclopentane	N7	0.0005	0.0028	0.000	0.000
Methylcyclohexane	N7	0.0197	0.1110	0.008	0.008
2,2-Dimethylhexane	I8	0.0005	0.0033	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0006	0.0034	0.000	0.000
2,5-Dimethylhexane	I8	0.0005	0.0033	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0004	0.0026	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0003	0.0019	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	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	0.0016	0.0084	0.001	0.001
2,3-Dimethylhexane	I8	0.0003	0.0019	0.000	0.000
2-Methylheptane	I8	0.0015	0.0098	0.001	0.001
4-Methylheptane	I8	0.0004	0.0026	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0010	0.0065	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0013	0.0084	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0006	0.0038	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0002	0.0013	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0004	0.0026	0.000	0.000
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
UnknownC7s	U7	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0020	0.0131	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0002	0.0013	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0003	0.0019	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0002	0.0012	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0006	0.000	0.000
4-Methyloctane	I9	0.0001	0.0007	0.000	0.000
2-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0006	0.000	0.000
n-Nonane	P9	0.0002	0.0015	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0002	0.0015	0.000	0.000
TOTAL		100.00000	100.00000	1.7737	1.7831

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0087	0.0390
TOLUENE	0.0016	0.0084
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0004	0.0024
TOTAL BTEX	0.0107	0.0498

**(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 :	976.3 /scf	981.6 /scf
	NET WET REAL :	959.2 /scf	964.5 /scf
HHV	GROSS DRY REAL :	1081.3 /scf	1087.2 /scf
	GROSS WET REAL :	1062.4 /scf	1068.3 /scf
	NET HEATING VALUE (60 °F ideal reaction):		21281.4 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		23576.8 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6016
	DENSITY		0.04592 lb/scf
	COMPRESSIBILITY FACTOR :		0.9976
	REGULAR WOBBE INDEX		1395.1

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

					C6+factors
Net Dry Ideal BTU	4614.4 /scf	Relative Density - SG (Air=1)	3.1631		0.99069
Gross Dry Ideal BTU	4964.6 /scf	Z Compressiblity Factor	0.99127		
Net Dry Ideal BTU	19280.2 /lb	Density Factor	241.386	lbm/1000 ft3	
Gross Dry Ideal BTU	20745.2 /lb	Molar Mass or MW	91.602	g/mol	
		Volume Liquid Ideal gas	0.077	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.