



**EXTENDED NATURAL GAS ANALYSIS (\*DHA)**

**MAIN PAGE**

PRIMARY DB KEY: <b>05-103-11329</b>	NAME/DESCRIP :	<b>PICEANCE CREEK UNIT T25X-25G1</b>
LEASE #:		<b>INTERMEDIATE CASING</b>
FIELD/AREA:		
PROJECT NO. : <b>202507021</b>	ANALYSIS NO. :	<b>03</b>
COMPANY NAME : <b>QB ENERGY OPERATING, LLC</b>	ANALYSIS DATE:	JULY 10, 2025 14:51
OFFICE / BRANCH: PARACHUTE, CO	SAMPLE DATE :	JUNE 25, 2025 13:30
CUSTOMER REF:	TO:	
PRODUCER : <b>QB ENERGY OPERATING, LLC</b>	EFFECTIVE DATE:	

**\*\*\*FIELD DATA\*\*\***

SAMPLE CYCLE:		SAMPLE TYPE:	
SAMPLE PRES. :	psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-757
LAB PRES:	psig	SAMPLED BY :	NICK CROY
SAMPLE TEMP. :	°f	SAMPLING COMPANY:	QB ENERGY OPERATING, LLC
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	— ppm mol
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

<u>COMPONENT</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>GPM @ 14.65</u>	<u>GPM @ 14.73</u>
ALCOHOLS	0.0024	0.0040	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.03	0.00	---	---
OXYGEN/ARGON	0.01	0.02	---	---
NITROGEN	0.29	0.42	---	---
CARBON DIOXIDE	0.02	0.05	---	---
METHANE	87.3063	71.9500	---	---
ETHANE	5.9604	9.2068	1.5897	1.5984
PROPANE	3.2711	7.4097	0.8988	0.9037
I-BUTANE	0.6236	1.8619	0.2040	0.2051
N-BUTANE	1.0553	3.1509	0.3319	0.3337
I-PENTANE	0.4006	1.4825	0.1450	0.1457
N-PENTANE	0.3554	1.3172	0.1280	0.1287
HEXANES PLUS	0.6650	3.1271	0.2690	0.2700
<b>TOTALS</b>	<b>100.0000</b>	<b>100.0000</b>	<b>3.5664</b>	<b>3.5853</b>

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>	<u>CALCULATED VALUES**</u>	
			<u>BTU @ 14.65</u>	<u>14.73</u>
BENZENE	0.0190	0.0762		
TOLUENE	0.0082	0.0388	<b>LHV NET DRY REAL :</b>	1074.9 /scf
ETHYLBENZENE	0.0003	0.0016		1080.8 /scf
XYLENES	0.0010	0.0055	<b>NET WET REAL :</b>	1056.1 /scf
<b>TOTAL BTEX</b>	<b>0.0285</b>	<b>0.1221</b>	<b>HHV GROSS DRY REAL :</b>	1187.1 /scf
				1193.5 /scf
			<b>GROSS WET REAL :</b>	1166.3 /scf
				1172.7 /scf
			<b>NET HEATING VALUE (60 °F ideal reaction):</b>	20965.5 Btu/lbm
			<b>GROSS HEATING VALUE (60°F ideal reaction):</b>	23155.3 Btu/lbm
			<b>RELATIVE DENSITY (AIR=1):</b>	0.6714
			<b>DENSITY</b>	0.05129 lbm/scf
			<b>COMPRESSIBILITY FACTOR :</b>	0.9971
			<b>REGULAR WOBBE INDEX</b>	1449.0

*\*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)  
Mod ASTM D6730,GPA 2261 & GPA 2286.*

*\*\* (CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)*

*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.*



**EXTENDED NATURAL GAS ANALYSIS (\*DHA)  
GLYCALC INFORMATION**

PROJECT NO. :	202507021	ANALYSIS NO. :	03
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JULY 10, 2025 14:51
ACCOUNT NO. :		SAMPLE DATE :	JUNE 25, 2025 13:30
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-757
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	PICEANCE CREEK UNIT T25X-25G1 INTERMEDIATE CASING		

\*\*\*FIELD DATA\*\*\*

SAMPLE PRES. :		SAMPLE TEMP. :	
H2S BY STAIN TUBE:	— ppm mol	AMBIENT TEMP.:	
COMMENTS :			

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.03	0.00
Carbon Dioxide	0.02	0.05
Nitrogen	0.29	0.42
Methane	87.3063	71.9500
Ethane	5.9604	9.2068
Propane	3.2711	7.4097
Isobutane	0.6236	1.8619
n-Butane	1.0553	3.1509
Isopentane	0.3785	1.4029
n-Pentane	0.3554	1.3172
Cyclopentane	0.0221	0.0796
n-Hexane	0.1239	0.5485
Cyclohexane	0.0542	0.2344
Other Hexanes	0.2416	1.0637
Heptanes	0.1181	0.6048
Methylcyclohexane	0.0573	0.2890
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0190	0.0762
Toluene	0.0082	0.0388
Ethylbenzene	0.0003	0.0016
Xylenes	0.0010	0.0055
C8+ Heavies	0.0413	0.2640
<u>Subtotal</u>	<u>99.98760</u>	<u>99.97600</u>
Oxygen/Argon	0.01	0.02
Alcohols	0.0024	0.0040
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
	<b>14.65</b>				
LHV	Net Dry Real:	1074.9	4647.2	6230.2	8632.6 Btu/scf
	Net Wet Real:	1056.1	4566.0	6121.3	8481.7 Btu/scf
HHV	Gross Dry Real:	1187.1	5001.1	6707.7	9285.1 Btu/scf
	Gross Wet Real:	1166.3	4913.7	6590.4	9122.8 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*	1449.0	2796.5	3247.6	3865.9	Btu/scf
Net Heating Value (60 °F ideal reaction):	20965.5	19259.4	19144.0	16808.9	Btu/lbm
Gross Heating Value (60 °F ideal reaction):	23155.3	20730.3	20610.8	18077.3	Btu/lbm
Molar Mass (MW):	19.46525	91.529	123.767	168.104	g/mol
Relative Density (AIR=1):	0.6714	3.1606	4.2736	5.8042	SG
Density:	0.05129	0.24121	0.32616	0.44298	lbm/scf
Compressibility Factor:	0.9971	0.9910	0.9978	0.9999	Z
Liquid Volume real gas @:	<b>14.65</b>	18.3125	0.2682	0.0189	0.003 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 underscore) indicates there was no tube pulled for H2S.

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**EXTENDED NATURAL GAS ANALYSIS (\*DHA)**

**DHA COMPONENT LIST**

PRIMARY DB KEY: **05-103-11329** NAME/DESCRIP : **PICEANCE CREEK UNIT T25X-25G1**  
 LEASE #: INTERMEDIATE CASING  
 FIELD/AREA:

PROJECT NO. : **202507021** ANALYSIS NO. : **03**  
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **JULY 10, 2025 14:51**  
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **JUNE 25, 2025 13:30**  
 CUSTOMER REF: TO:  
 PRODUCER : **QB ENERGY OPERATING, LLC** EFFECTIVE DATE:

**\*\*\*FIELD DATA\*\*\***

SAMPLE CYCLE: SAMPLE TYPE:  
 SAMPLE PRES. : psig PROBE :  
 FLOW PRES. : psig CYLINDER NO. : **ECA-757**  
 LAB PRES: psig SAMPLED BY : **NICK CROY**  
 SAMPLE TEMP. : °f SAMPLING COMPANY: **QB ENERGY OPERATING, LLC**  
 AMBIENT TEMP.: °f 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	---	0.03	0.00	---	---
Oxygen/Argon	---	0.01	0.02	---	---
Nitrogen	---	0.29	0.42	---	---
Carbon Dioxide	---	0.02	0.05	---	---
Methane	P1	87.30630	71.95000	---	---
Ethane	P2	5.9604	9.2068	1.590	1.598
Propane	P3	3.2711	7.4097	0.899	0.904
i-Butane	I4	0.6236	1.8619	0.204	0.205
Methanol	X1	0.0024	0.0040	0.000	0.000
n-Butane	P4	1.0552	3.1506	0.332	0.334
2,2-Dimethylpropane	I5	0.0048	0.0178	0.002	0.002
i-Pentane	I5	0.3737	1.3851	0.136	0.137
UnknownC4s	U4	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.3554	1.3172	0.128	0.129
2,2-Dimethylbutane	I6	0.0064	0.0284	0.003	0.003
Cyclopentane	N5	0.0221	0.0796	0.007	0.007
2,3-Dimethylbutane	I6	0.0181	0.0801	0.007	0.007
2-Methylpentane	I6	0.1045	0.4626	0.043	0.043
3-Methylpentane	I6	0.0558	0.2470	0.023	0.023
n-Hexane	P6	0.1239	0.5485	0.051	0.051
2,2-Dimethylpentane	I7	0.0020	0.0103	0.001	0.001
Methylcyclopentane	N6	0.0568	0.2456	0.020	0.020
2,4-Dimethylpentane	I7	0.0043	0.0221	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0006	0.0031	0.000	0.000
Benzene	A6	0.0190	0.0762	0.005	0.005
3,3-Dimethylpentane	I7	0.0009	0.0046	0.000	0.000
Cyclohexane	N6	0.0542	0.2344	0.018	0.018

2-Methylhexane	I7	0.0195	0.1004	0.009	0.009
2,3-Dimethylpentane	I7	0.0067	0.0345	0.003	0.003
1,1-Dimethylcyclopentane	N7	0.0037	0.0186	0.002	0.002
3-Methylhexane	I7	0.0178	0.0916	0.008	0.008
1c,3-Dimethylcyclopentane	N7	0.0071	0.0358	0.003	0.003
1t,3-Dimethylcyclopentane	N7	0.0063	0.0318	0.003	0.003
3-Ethylpentane	I7	0.0011	0.0056	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0106	0.0535	0.005	0.005
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0337	0.1735	0.016	0.016
1c,2-Dimethylcyclopentane	N7	0.0013	0.0066	0.001	0.001
Methylcyclohexane	N7	0.0573	0.2890	0.023	0.023
2,2-Dimethylhexane	I8	0.0018	0.0106	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0003	0.0017	0.000	0.000
Ethylcyclopentane	N7	0.0022	0.0111	0.001	0.001
2,5-Dimethylhexane	I8	0.0011	0.0065	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0011	0.0065	0.001	0.001
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0015	0.0086	0.001	0.001
3,3-Dimethylhexane	I8	0.0003	0.0017	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0082	0.0388	0.003	0.003
2,3-Dimethylhexane	I8	0.0010	0.0059	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0002	0.0012	0.000	0.000
2-Methylheptane	I8	0.0043	0.0252	0.002	0.002
4-Methylheptane	I8	0.0010	0.0059	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	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
3-Methylheptane	I8	0.0023	0.0135	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0045	0.0259	0.002	0.002
3-Ethylhexane	I8	0.0002	0.0012	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0018	0.0104	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0005	0.0029	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0003	0.0017	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0003	0.0017	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	0.0014	0.0081	0.001	0.001
n-Octane	P8	0.0048	0.0281	0.002	0.002
1c,4-Dimethylcyclohexane	N8	0.0006	0.0034	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0010	0.0065	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0005	0.0029	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2,5-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
Ethylbenzene	I8	0.0003	0.0016	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0007	0.0038	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0002	0.0011	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	0.0001	0.0007	0.000	0.000
2-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0002	0.0013	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0006	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
n-Nonane	P9	0.0003	0.0019	0.000	0.000

i-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0007	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	0.0001	0.0007	0.000	0.000
n-Decane	P10	0.0003	0.0022	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0008	0.000	0.000
UnknownC10s	U10	0.0002	0.0014	0.000	0.000
n-Undecane	P11	0.0005	0.0040	0.000	0.000
1,2-Methyl-n-butylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC11s	U11	0.0001	0.0008	0.000	0.000
n-Dodecane	P12	0.0017	0.0149	0.001	0.001
1,3,5-Triethylbenzene	A12	0.0005	0.0042	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
1,2,3,4,5-Pentamethylbenzene	A13	0.0009	0.0068	0.001	0.001
2-Methylnaphthalene	A11	0.0001	0.0007	0.000	0.000
1-Methylnaphthalene	A11	0.0003	0.0022	0.000	0.000
n-Tridecane	P13	0.0010	0.0094	0.001	0.001
UnknownC13s	U13	0.0004	0.0038	0.000	0.000
n-Tetradecane	P14	0.0002	0.0020	0.000	0.000
UnknownC14s	U14	0.0003	0.0031	0.000	0.000
UnknownC15s	U15	0.0004	0.0044	0.000	0.000
<b>TOTAL</b>		<b>100.00000</b>	<b>100.00000</b>	<b>3.5664</b>	<b>3.5853</b>

**CALCULATED VALUES\*\***

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0190	0.0762	LHV NET DRY REAL :	1074.9 /scf	1080.8 /scf
TOLUENE	0.0082	0.0388	NET WET REAL :	1056.1 /scf	1062.0 /scf
ETHYLBENZENE	0.0003	0.0016	HHV GROSS DRY REAL :	1187.1 /scf	1193.5 /scf
XYLENES	0.0010	0.0055	GROSS WET REAL :	1166.3 /scf	1172.7 /scf
TOTAL BTEX	0.0285	0.1221	NET HEATING VALUE (60 °F ideal reaction):		20965.5 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		23155.3 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6714
			DENSITY		0.05129 lb/scf
			COMPRESSIBILITY FACTOR :		0.9971
			REGULAR WOBBE INDEX		1449.0

\*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)  
Mod ASTM D6730, GPA 2261 & GPA 2286.

\*\* (CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

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

Net Dry Ideal BTU	4619.8 /scf	Relative Density - SG (Air=1)	3.1606	<b>C6+ factors</b>
Gross Dry Ideal BTU	4971.6 /scf	Z Compressibility Factor	0.99099	0.99032
Net Dry Ideal BTU	19259.4 /lb	Density Factor	241.208 lbm/1000 ft3	
Gross Dry Ideal BTU	20730.3 /lb	Molar Mass or MW	91.529 g/mol	
		Volume Liquid Ideal gas	0.269 scf/gal	23.8

**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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