



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: 05-103-10649	NAME/DESCRIP :	PICEANCE CREEK UNIT T35X-2G6
LEASE #:		SURFACE CASING
FIELD/AREA:		
PROJECT NO. : 202412022	ANALYSIS NO. :	03
COMPANY NAME : QB ENERGY OPERATING, LLC	ANALYSIS DATE:	DECEMBER 14, 2024 12:10
OFFICE / BRANCH: PARACHUTE, CO	SAMPLE DATE :	DECEMBER 3, 2024
CUSTOMER REF:	TO:	
PRODUCER : QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. : 234 psig		PROBE :	
FLOW PRES. : psig		CYLINDER NO. :	ECA-800
LAB PRES: psig		SAMPLED BY :	SHANE COLLETT
SAMPLE TEMP. : °f		SAMPLING COMPANY:	QB ENERGY
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	0.0003	0.0006	0.0000	0.0000
HELIUM	0.04	0.01	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	1.34	2.25	---	---
CARBON DIOXIDE	0.02	0.05	---	---
METHANE	96.6925	93.1471	---	---
ETHANE	1.2928	2.3343	0.3446	0.3465
PROPANE	0.2843	0.7528	0.0779	0.0783
I-BUTANE	0.0567	0.1979	0.0190	0.0191
N-BUTANE	0.0948	0.3309	0.0300	0.0301
I-PENTANE	0.0408	0.1767	0.0150	0.0151
N-PENTANE	0.0361	0.1564	0.0130	0.0131
HEXANES PLUS	0.1017	0.5933	0.0340	0.0340
<u>TOTALS</u>	<u>100.0000</u>	<u>100.0000</u>	<u>0.5335</u>	<u>0.5362</u>

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0006	0.0028
TOLUENE	0.0001	0.0005
ETHYLBENZENE	0.0002	0.0013
XYLENES	0.0004	0.0026
<u>TOTAL BTEX</u>	<u>0.0013</u>	<u>0.0072</u>

	<u>CALCULATED VALUES**</u>	
	<u>14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	917.1 /scf	922.1 /scf
NET WET REAL :	901.1 /scf	906.1 /scf
HHV GROSS DRY REAL :	1018.1 /scf	1023.7 /scf
GROSS WET REAL :	1000.3 /scf	1005.9 /scf
NET HEATING VALUE (60 °F ideal reaction):		20948.1 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		23246.0 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.5743
DENSITY		0.04388 lbm/scf
COMPRESSIBILITY FACTOR :		0.9979
REGULAR WOBBE INDEX		1344.9

*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730, GPA 2261 & GPA 2286.

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

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

PROJECT NO. :	202412022	ANALYSIS NO. :	03
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	DECEMBER 14, 2024 12:10
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 3, 2024
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-800
LEASE NO. :		SAMPLED BY :	SHANE COLLETT
NAME/DESCRIP :	PICEANCE CREEK UNIT T35X-2G6 SURFACE CASING		

FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	234	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	<i>SPOT</i>		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.04	0.01
Hydrogen	0.00	0.00
Carbon Dioxide	0.02	0.05
Nitrogen	1.34	2.25
Methane	96.6925	93.1471
Ethane	1.2928	2.3343
Propane	0.2843	0.7528
Isobutane	0.0567	0.1979
n-Butane	0.0948	0.3309
Isopentane	0.0401	0.1738
n-Pentane	0.0361	0.1564
Cyclopentane	0.0007	0.0029
n-Hexane	0.0158	0.0818
Cyclohexane	0.0044	0.0222
Other Hexanes	0.0283	0.1462
Heptanes	0.0213	0.1278
Methylcyclohexane	0.0092	0.0542
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0006	0.0028
Toluene	0.0001	0.0005
Ethylbenzene	0.0002	0.0013
Xylenes	0.0004	0.0026
C8+ Heavies	0.0214	0.1539
<u>Subtotal</u>	<u>99.99970</u>	<u>99.99940</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0003	0.0006
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
LHV	Net Dry Real:	917.1	4920.7	5926.1	7054.6 Btu/scf
	Net Wet Real:	901.1	4834.7	5822.5	6931.3 Btu/scf
HHV	Gross Dry Real:	1018.1	5302.9	6389.3	7691.2 Btu/scf
	Gross Wet Real:	1000.3	5210.2	6277.6	7556.7 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*	1344.9	2882.7	3154.8	3475.1	Btu/scf
Net Heating Value (60 °F ideal reaction):	20948.1	19355.9	19528.0	18980.3	Btu/lbm
Gross Heating Value (60°F ideal reaction):	23246.0	20862.8	21050.1	20679.7	Btu/lbm
Molar Mass (MW):	16.65415	97.076	119.003	142.648	g/mol
Relative Density (AIR=1):	0.5743	3.3525	4.1086	4.9251	SG
Density:	0.04388	0.25583	0.31359	0.37591	lbm/scf
Compressibility Factor:	0.9979	0.9922	0.9977	0.9996	Z
Liquid Volume real gas @:	14.65	16.9847	0.0339	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 underscore) indicates there was no tube pulled for H2S.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY: **05-103-10649** NAME/DESCRIP : **PICEANCE CREEK UNIT T35X-2G6**
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 PROJECT NO. : **202412022** ANALYSIS NO. : **03**
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*****FIELD DATA*****

SAMPLE CYCLE: SAMPLE TYPE: SPOT
 SAMPLE PRES. : 234 psig PROBE :
 FLOW PRES. : psig CYLINDER NO. : ECA-800
 LAB PRES: psig SAMPLED BY : SHANE COLLETT
 SAMPLE TEMP. : °f SAMPLING COMPANY: QB ENERGY
 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	---	0.04	0.01	---	---
Nitrogen	---	1.34	2.25	---	---
Carbon Dioxide	---	0.02	0.05	---	---
Methane	P1	96.6925	93.1471	---	---
Ethane	P2	1.2928	2.3343	0.345	0.347
Propane	P3	0.2843	0.7528	0.078	0.078
i-Butane	I4	0.0567	0.1979	0.019	0.019
Methanol	X1	0.0003	0.0006	0.000	0.000
n-Butane	P4	0.0948	0.3309	0.030	0.030
2,2-Dimethylpropane	I5	0.0020	0.0087	0.001	0.001
i-Pentane	I5	0.0381	0.1651	0.014	0.014
n-Pentane	P5	0.0361	0.1564	0.013	0.013
2,2-Dimethylbutane	I6	0.0021	0.0109	0.001	0.001
Cyclopentane	N5	0.0007	0.0029	0.000	0.000
2,3-Dimethylbutane	I6	0.0024	0.0124	0.001	0.001
2-Methylpentane	I6	0.0139	0.0719	0.006	0.006
3-Methylpentane	I6	0.0076	0.0393	0.003	0.003
n-Hexane	P6	0.0158	0.0818	0.006	0.006
2,2-Dimethylpentane	I7	0.0006	0.0036	0.000	0.000
Methylcyclopentane	N6	0.0023	0.0117	0.001	0.001
2,4-Dimethylpentane	I7	0.0009	0.0054	0.000	0.000
2,2,3-Trimethylbutane	I7	0.0003	0.0018	0.000	0.000
Benzene	A6	0.0006	0.0028	0.000	0.000
3,3-Dimethylpentane	I7	0.0005	0.0030	0.000	0.000
Cyclohexane	N6	0.0044	0.0222	0.001	0.001
2-Methylhexane	I7	0.0046	0.0277	0.002	0.002
2,3-Dimethylpentane	I7	0.0014	0.0084	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0008	0.0047	0.000	0.000

3-Methylhexane	I7	0.0046	0.0277	0.002	0.002
1c,3-Dimethylcyclopentane	N7	0.0004	0.0023	0.000	0.000
1t,3-Dimethylcyclopentane	N7	0.0004	0.0023	0.000	0.000
3-Ethylpentane	I7	0.0002	0.0012	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0010	0.0059	0.000	0.000
n-Heptane	P7	0.0052	0.0313	0.002	0.002
1c,2-Dimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Methylcyclohexane	N7	0.0092	0.0542	0.004	0.004
2,2-Dimethylhexane	I8	0.0006	0.0041	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0007	0.000	0.000
Ethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
2,5-Dimethylhexane	I8	0.0005	0.0034	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0005	0.0034	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0002	0.0013	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0007	0.000	0.000
Toluene	A7	0.0001	0.0005	0.000	0.000
2,3-Dimethylhexane	I8	0.0004	0.0028	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0007	0.000	0.000
2-Methylheptane	I8	0.0025	0.0172	0.001	0.001
4-Methylheptane	I8	0.0007	0.0048	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0007	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0007	0.000	0.000
3-Methylheptane	I8	0.0016	0.0110	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0016	0.0108	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0007	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0007	0.0047	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0007	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0006	0.0040	0.000	0.000
1t,3-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
n-Octane	P8	0.0016	0.0110	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0003	0.0020	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0002	0.0016	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0005	0.0038	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
Ethylcyclohexane	N8	0.0009	0.0061	0.000	0.000
n-Propylcyclopentane	N8	0.0003	0.0020	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
2,5-Dimethylheptane	I9	0.0004	0.0031	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
Ethylbenzene	I8	0.0002	0.0013	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0003	0.0019	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0008	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0008	0.000	0.000
4-Methyloctane	I9	0.0003	0.0023	0.000	0.000
2-Methyloctane	I9	0.0002	0.0016	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0004	0.0030	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0008	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0008	0.000	0.000
UnknownC8s	U8	0.0006	0.0041	0.000	0.000
n-Nonane	P9	0.0006	0.0046	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0008	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000

2,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0008	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0002	0.0014	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0007	0.000	0.000
5-Methylnonane	I10	0.0001	0.0008	0.000	0.000
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0002	0.0016	0.000	0.000
n-Decane	P10	0.0003	0.0026	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0008	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0010	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0001	0.0008	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0008	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0001	0.0008	0.000	0.000
UnknownC10s	U10	0.0003	0.0026	0.000	0.000
n-Undecane	P11	0.0001	0.0010	0.000	0.000
1,4-Ethyl-i-propylbenzene	A11	0.0001	0.0009	0.000	0.000
1,3-Methyl-n-butylbenzene	A11	0.0001	0.0009	0.000	0.000
TOTAL		100.00000	100.00000	0.5335	0.5362

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @		
			14.65	14.73	
BENZENE	0.0006	0.0028	LHV NET DRY REAL :	917.1 /scf	922.1 /scf
TOLUENE	0.0001	0.0005	NET WET REAL :	901.1 /scf	906.1 /scf
ETHYLBENZENE	0.0002	0.0013	HHV GROSS DRY REAL :	1018.1 /scf	1023.7 /scf
XYLENES	0.0004	0.0026	GROSS WET REAL :	1000.3 /scf	1005.9 /scf
TOTAL BTEX	0.0013	0.0072	NET HEATING VALUE (60 °F ideal reaction):		20948.1 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		23246.0 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.5743
			DENSITY		0.04388 lb/scf
			COMPRESSIBILITY FACTOR :		0.9979
			REGULAR WOBBE INDEX		1344.9

*(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	<u>4897.7</u> /scf	Relative Density - SG (Air=1)	<u>3.3525</u>	C6+ factors
Gross Dry Ideal BTU	<u>5278.1</u> /scf	Z Compressibility Factor	<u>0.99221</u>	<u>0.99127</u>
Net Dry Ideal BTU	<u>19355.9</u> /lb	Density Factor	<u>255.826</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20862.8</u> /lb	Molar Mass or MW	<u>97.076</u> g/mol	
		Volume Liquid Ideal gas	<u>0.034</u> scf/gal	<u>22.2</u>

**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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