EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-10405**	NAME/DESCRIP :	**YCF 34-44-1**
LEASE #:	**COC - 059394**		**INTERMEDIATE CASING**
FIELD/AREA:			

PROJECT NO. :	**202409057**	ANALYSIS NO. :	**02**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	SEPTEMBER 20, 2024 11:52
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	SEPTEMBER 9, 2024 12:10
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	300	psig	PROBE :	
FLOW PRES. :		psig	CYLINDER NO. :	ECA-724
LAB PRES:		psig	SAMPLED BY :	JUSTIN STEELE
SAMPLE TEMP. :	60	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	0.0002	0.0005	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.40	0.62	---	---
CARBON DIOXIDE	0.01	0.02	---	---
METHANE	90.4697	80.1933	---	---
ETHANE	6.0620	10.0715	1.6161	1.6249
PROPANE	1.7719	4.3171	0.4867	0.4894
I-BUTANE	0.3485	1.1192	0.1139	0.1146
N-BUTANE	0.3858	1.2390	0.1209	0.1216
I-PENTANE	0.1501	0.5978	0.0540	0.0542
N-PENTANE	0.1108	0.4417	0.0400	0.0402
HEXANES PLUS	0.2710	1.3799	0.1040	0.1043
TOTALS	100.00000	100.00000	2.5356	2.5492

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0105	0.0453
TOLUENE	0.0054	0.0275
ETHYLBENZENE	0.0005	0.0029
XYLENES	0.0017	0.0100
TOTAL BTEX	0.0181	0.0857

**(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 :	1005.0 /scf	1010.5 /scf
	NET WET REAL :	987.4 /scf	992.9 /scf
HHV	GROSS DRY REAL :	1112.3 /scf	1118.3 /scf
	GROSS WET REAL :	1092.9 /scf	1098.9 /scf

NET HEATING VALUE (60 °F ideal reaction):	21098.3	**Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	23348.9	**Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.6242	
DENSITY	0.04769	**lbm/scf**
COMPRESSIBILITY FACTOR :	0.9975	
REGULAR WOBBE INDEX	1408.6	

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202409057	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	SEPTEMBER 20, 2024 11:52
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 9, 2024 12:10
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-724
LEASE NO. :	COC - 059394	SAMPLED BY :	JUSTIN STEELE
NAME/DESCRIP :	YCF 34-44-1 INTERMEDIATE CASING		
FIELD DATA		SAMPLE TEMP. :	60
SAMPLE PRES. :	300	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT*		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	0.01	0.02
Nitrogen	0.40	0.62
Methane	90.4697	80.1933
Ethane	6.0620	10.0715
Propane	1.7719	4.3171
Isobutane	0.3485	1.1192
n-Butane	0.3858	1.2390
Isopentane	0.1452	0.5788
n-Pentane	0.1108	0.4417
Cyclopentane	0.0049	0.0190
n-Hexane	0.0415	0.1976
Cyclohexane	0.0281	0.1307
Other Hexanes	0.0838	0.3967
Heptanes	0.0443	0.2439
Methylcyclohexane	0.0310	0.1682
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0105	0.0453
Toluene	0.0054	0.0275
Ethylbenzene	0.0005	0.0029
Xylenes	0.0017	0.0100
C8+ Heavies	0.0241	0.1565
Subtotal	99.99980	99.99950
Oxygen/Argon	0.00	0.00
Alcohols	0.0002	0.0005
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	1005.0	4656.5	5833.7	8764.3	**Btu/scf**
	Net Wet Real:	987.4	4575.1	5731.7	8611.1	**Btu/scf**
HHV	Gross Dry Real:	1112.3	5007.6	6272.9	9407.9	**Btu/scf**
	Gross Wet Real:	1092.9	4920.1	6163.2	9243.4	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1408.6	2792.3	3125.9	3827.8	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		21098.3	19235.1	19677.2	18961.7	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23348.9	20683.4	21161.7	20356.3	**Btu/lbm**
Molar Mass (MW):		18.0996	92.199	116.779	176.008	**g/mol**
Relative Density (AIR=1):		0.6242	3.1833	4.0320	6.0772	**SG**
Density:		0.04769	0.24297	0.30773	0.46381	**lbm/scf**
Compressiblity Factor:		0.9975	0.9918	0.9975	0.9999	**Z**
Liquid Volume real gas @:	**14.65**	17.827	0.1037	0.008	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

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FIELD/AREA:			
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PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	300 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-724
LAB PRES:	psig	SAMPLED BY :	JUSTIN STEELE
SAMPLE TEMP. :	60 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	---	---
Oxygen/Argon	---	0.00	0.00	---	---
Nitrogen	---	0.40	0.62	---	---
Carbon Dioxide	---	0.01	0.02	---	---
Methane	P1	90.4697	80.1933	---	---
Ethane	P2	6.0620	10.0715	1.616	1.625
Propane	P3	1.7719	4.3171	0.487	0.489
i-Butane	I4	0.3485	1.1192	0.114	0.115
n-Butane	P4	0.3858	1.2390	0.121	0.122
2,2-Dimethylpropane	I5	0.0052	0.0207	0.002	0.002
Ethanol	X2	0.0002	0.0005	0.000	0.000
i-Pentane	I5	0.1400	0.5581	0.051	0.051
n-Pentane	P5	0.1108	0.4417	0.040	0.040
2,2-Dimethylbutane	I6	0.0050	0.0238	0.002	0.002
Cyclopentane	N5	0.0049	0.0190	0.001	0.001
2,3-Dimethylbutane	I6	0.0078	0.0371	0.003	0.003
2-Methylpentane	I6	0.0334	0.1590	0.014	0.014
3-Methylpentane	I6	0.0177	0.0843	0.007	0.007
n-Hexane	P6	0.0415	0.1976	0.017	0.017
2,2-Dimethylpentane	I7	0.0010	0.0055	0.000	0.000
Methylcyclopentane	N6	0.0199	0.0925	0.007	0.007
2,4-Dimethylpentane	I7	0.0017	0.0094	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0004	0.0022	0.000	0.000
Benzene	A6	0.0105	0.0453	0.003	0.003
3,3-Dimethylpentane	I7	0.0006	0.0033	0.000	0.000
Cyclohexane	N6	0.0281	0.1307	0.010	0.010
2-Methylhexane	I7	0.0071	0.0393	0.003	0.003
2,3-Dimethylpentane	I7	0.0018	0.0099	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0014	0.0076	0.001	0.001

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3-Methylhexane	I7	0.0062	0.0343	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0023	0.0125	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0020	0.0108	0.001	0.001
3-Ethylpentane	I7	0.0002	0.0011	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0031	0.0168	0.001	0.001
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0147	0.0814	0.007	0.007
1c,2-Dimethylcyclopentane	N7	0.0007	0.0038	0.000	0.000
Methylcyclohexane	N7	0.0310	0.1682	0.012	0.012
2,2-Dimethylhexane	I8	0.0007	0.0044	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0010	0.0054	0.000	0.000
2,5-Dimethylhexane	I8	0.0006	0.0038	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0005	0.0032	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0004	0.0025	0.000	0.000
3,3-Dimethylhexane	I8	0.0002	0.0013	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0054	0.0275	0.002	0.002
2,3-Dimethylhexane	I8	0.0004	0.0025	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0021	0.0133	0.001	0.001
4-Methylheptane	I8	0.0006	0.0038	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0014	0.0088	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0027	0.0167	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0011	0.0068	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0004	0.0025	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	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	0.0010	0.0062	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0041	0.0259	0.002	0.002
1c,4-Dimethylcyclohexane	N8	0.0005	0.0031	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	0.0002	0.0014	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0009	0.0063	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0005	0.0031	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0012	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,5-Dimethylheptane	I9	0.0003	0.0021	0.000	0.000
Ethylbenzene	I8	0.0005	0.0029	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0012	0.0070	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0002	0.0012	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0002	0.0014	0.000	0.000
2-Methyloctane	I9	0.0002	0.0014	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0003	0.0021	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0003	0.0018	0.000	0.000
i-Butylcyclopentane	N9	0.0002	0.0014	0.000	0.000
UnknownC8s	U8	0.0001	0.0006	0.000	0.000
n-Nonane	P9	0.0009	0.0064	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0007	0.000	0.000

i-Propylcyclohexane	N9	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0003	0.0021	0.000	0.000
n-Decane	P10	0.0001	0.0008	0.000	0.000
UnknownC10s	U10	0.0001	0.0008	0.000	0.000
n-Pentadecane	P15	0.0003	0.0035	0.000	0.000
TOTAL		100.00000	100.00000	2.5356	2.5492

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0105	0.0453
TOLUENE	0.0054	0.0275
ETHYLBENZENE	0.0005	0.0029
XYLENES	0.0017	0.0100
TOTAL BTEX	0.0181	0.0857

**(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 :	1005.0 /scf	1010.5 /scf
	NET WET REAL :	987.4 /scf	992.9 /scf
HHV	GROSS DRY REAL :	1112.3 /scf	1118.3 /scf
	GROSS WET REAL :	1092.9 /scf	1098.9 /scf
	NET HEATING VALUE (60 °F ideal reaction):		21098.3 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		23348.9 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6242
	DENSITY		0.04769 lb/scf
	COMPRESSIBILITY FACTOR :		0.9975
	REGULAR WOBBE INDEX		1408.6

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

Net Dry Ideal BTU	4632.6 /scf	Relative Density - SG (Air=1)	3.1833	***C6+factors***
Gross Dry Ideal BTU	4981.9 /scf	**Z** Compressiblity Factor	0.99175	0.99116
Net Dry Ideal BTU	19235.1 /lb	Density Factor	242.965 lbm/1000 ft3	
Gross Dry Ideal BTU	20683.4 /lb	Molar Mass or MW	92.199 g/mol	
		Volume Liquid Ideal gas	0.104 scf/gal	24.4

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.