



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-103-10975** NAME/DESCRIP : **YCF XOM 2-22-1**
 LEASE #: **PRODUCTION CASING**
 FIELD/AREA:

PROJECT NO. : **202508022** ANALYSIS NO. : **01**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **AUGUST 10, 2025 12:30**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **AUGUST 04, 2025**
 CUSTOMER REF: TO:
 PRODUCER : EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE:
 SAMPLE PRES. : 860 psig PROBE :
 FLOW PRES. : psig CYLINDER NO. : ECA-816
 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>
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.17	0.24	---	---
CARBON DIOXIDE	3.55	8.02	---	---
METHANE	87.2373	71.8557	---	---
ETHANE	5.5803	8.6152	1.4882	1.4963
PROPANE	1.6038	3.6311	0.4408	0.4432
I-BUTANE	0.3825	1.1415	0.1249	0.1256
N-BUTANE	0.3566	1.0642	0.1119	0.1125
I-PENTANE	0.1732	0.6411	0.0630	0.0633
N-PENTANE	0.1156	0.4282	0.0420	0.0422
HEXANES PLUS	0.8206	4.3625	0.3520	0.3531
TOTALS	100.0000	100.0000	2.6228	2.6362

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0199	0.0798
TOLUENE	0.0393	0.1859
ETHYLBENZENE	0.0047	0.0256
XYLENES	0.0364	0.1984
TOTAL BTEX	0.1003	0.4897

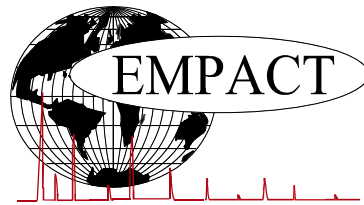
	<u>BTU @ 14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	993.6 /scf	999.0 /scf
NET WET REAL :	976.2 /scf	981.6 /scf
HHV GROSS DRY REAL :	1098.8 /scf	1104.8 /scf
GROSS WET REAL :	1079.6 /scf	1085.6 /scf
NET HEATING VALUE (60 °F ideal reaction):		19418.2 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		21473.0 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6710
DENSITY		0.05132 lbm/scf
COMPRESSIBILITY FACTOR :		0.9974
REGULAR WOBBE INDEX		1342.1

**(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. :	202508022	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 10, 2025 12:30
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 04, 2025
PRODUCER :		CYLINDER NO. :	ECA-816
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	YCF XOM 2-22-1 PRODUCTION CASING		

FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	860	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	— ppm mol		
COMMENTS :			

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	3.55	8.02
Nitrogen	0.17	0.24
Methane	87.2373	71.8557
Ethane	5.5803	8.6152
Propane	1.6038	3.6311
Isobutane	0.3825	1.1415
n-Butane	0.3566	1.0642
Isopentane	0.1673	0.6198
n-Pentane	0.1156	0.4282
Cyclopentane	0.0059	0.0213
n-Hexane	0.0638	0.2823
Cyclohexane	0.0451	0.1949
Other Hexanes	0.1243	0.5468
Heptanes	0.1432	0.7324
Methylcyclohexane	0.0790	0.3983
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0199	0.0798
Toluene	0.0393	0.1859
Ethylbenzene	0.0047	0.0256
Xylenes	0.0364	0.1984
C8+ Heavies	0.2649	1.7181
<u>Subtotal</u>	<u>100.00000</u>	<u>100.00000</u>
<u>Oxygen/Argon</u>	<u>0.00</u>	<u>0.00</u>
Total	100.00000	100.00000

	Total	C6+	C8+	C10+
Calculated Values BTU @	Sample	Fraction	Fraction	Fraction
14.65				
LHV Net Dry Real:	993.6	5183.4	6148.9	7464.6 Btu/scf
Net Wet Real:	976.2	5092.8	6041.4	7334.1 Btu/scf
HHV Gross Dry Real:	1098.8	5568.9	6609.6	8062.3 Btu/scf
Gross Wet Real:	1079.6	5471.5	6494.1	7921.4 Btu/scf
Other Calculated Values				
Regualr Wobbe Index*	1342.1	2940.7	3205.3	3564.0 Btu/scf
Net Heating Value (60 °F ideal reaction):	19418.2	19199.1	19305.0	18968.3 Btu/lbm
Gross Heating Value (60°F ideal reaction):	21473.0	20625.0	20749.2	20482.6 Btu/lbm
Molar Mass (MW):	19.47786	103.524	123.574	149.069 g/mol
Relative Density (AIR=1):	0.6710	3.5741	4.2661	5.1467 SG
Density:	0.05132	0.27281	0.32563	0.39282 lbm/scf
Compressibility Factor:	0.9974	0.9952	0.9985	0.9997 Z
Liquid Volume real gas @:	14.65	17.9427	0.3509	0.1445
				0.0319 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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1c,3-Dimethylcyclopentane	N7	0.0058	0.0293	0.003	0.003
1t,3-Dimethylcyclopentane	N7	0.0054	0.0272	0.002	0.002
3-Ethylpentane	I7	0.0009	0.0046	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0087	0.0438	0.004	0.004
n-Heptane	P7	0.0462	0.2377	0.021	0.021
1c,2-Dimethylcyclopentane	N7	0.0189	0.0953	0.009	0.009
Methylcyclohexane	N7	0.0790	0.3983	0.032	0.032
2,2-Dimethylhexane	I8	0.0021	0.0123	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0006	0.0034	0.000	0.000
Ethylcyclopentane	N7	0.0030	0.0152	0.001	0.001
2,5-Dimethylhexane	I8	0.0026	0.0153	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0020	0.0117	0.001	0.001
2,4-Dimethylhexane	I8	0.0006	0.0035	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0017	0.0098	0.001	0.001
3,3-Dimethylhexane	I8	0.0008	0.0047	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	0.0393	0.1859	0.013	0.013
2,3-Dimethylhexane	I8	0.0021	0.0123	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0003	0.0018	0.000	0.000
2-Methylheptane	I8	0.0124	0.0727	0.006	0.006
4-Methylheptane	I8	0.0039	0.0229	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0003	0.0018	0.000	0.000
3,4-Dimethylhexane	I8	0.0003	0.0018	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0095	0.0557	0.005	0.005
1c,2t,3-Trimethylcyclopentane	N8	0.0151	0.0870	0.008	0.008
3-Ethylhexane	I8	0.0012	0.0070	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0067	0.0386	0.003	0.003
1,1-Dimethylcyclohexane	N8	0.0024	0.0138	0.001	0.001
2,2,5-Trimethylhexane	I9	0.0003	0.0020	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0006	0.0034	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0005	0.0029	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0006	0.0034	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0003	0.0020	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0055	0.0317	0.003	0.003
1t,3-Dimethylcyclohexane	N8	0.0119	0.0685	0.006	0.006
n-Octane	P8	0.0227	0.1331	0.012	0.012
1c,4-Dimethylcyclohexane	N8	0.0033	0.0190	0.002	0.002
i-Propylcyclopentane	I8	0.0003	0.0018	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0006	0.0040	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0001	0.0007	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0002	0.0013	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
2,2-Dimethylheptane	I9	0.0017	0.0112	0.001	0.001
1,1,4-Trimethylcyclohexane	N9	0.0053	0.0344	0.003	0.003
2,2,3-Trimethylhexane	I9	0.0021	0.0138	0.001	0.001
2,4-Dimethylheptane	I9	0.0005	0.0033	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0047	0.0271	0.002	0.002
n-Propylcyclopentane	N8	0.0018	0.0104	0.001	0.001
1c,3c,5-Trimethylcyclohexane	N9	0.0007	0.0045	0.000	0.000
2,5-Dimethylheptane	I9	0.0038	0.0250	0.002	0.002
3,3-Dimethylheptane	I9	0.0007	0.0046	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0003	0.0020	0.000	0.000
Ethylbenzene	I8	0.0047	0.0256	0.002	0.002

1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,3-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0245	0.1336	0.009	0.009
1,4-Dimethylbenzene (p-Xylene)	A8	0.0072	0.0392	0.003	0.003
3,4-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0004	0.0026	0.000	0.000
4-Ethylheptane	I9	0.0005	0.0033	0.000	0.000
4-Methyloctane	I9	0.0032	0.0211	0.002	0.002
2-Methyloctane	I9	0.0038	0.0250	0.002	0.002
1c,2t,3-Trimethylcyclohexane	N9	0.0003	0.0020	0.000	0.000
3-Ethylheptane	I9	0.0003	0.0020	0.000	0.000
3-Methyloctane	I9	0.0006	0.0040	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0045	0.0292	0.003	0.003
1,1,2-Trimethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
3,3-Diethylpentane	I9	0.0003	0.0020	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0047	0.0256	0.002	0.002
i-Butylcyclopentane	N9	0.0029	0.0188	0.001	0.001
n-Nonane	P9	0.0237	0.1561	0.013	0.013
1,1-Methylethylcyclohexane	N9	0.0015	0.0097	0.001	0.001
i-Propylbenzene	A9	0.0005	0.0031	0.000	0.000
i-Propylcyclohexane	N9	0.0006	0.0039	0.000	0.000
2,2-Dimethyloctane	I10	0.0002	0.0014	0.000	0.000
2,4-Dimethyloctane	I10	0.0008	0.0059	0.000	0.000
2,6-Dimethyloctane	I10	0.0003	0.0022	0.000	0.000
2,5-Dimethyloctane	I10	0.0002	0.0014	0.000	0.000
n-Butylcyclopentane	N9	0.0022	0.0143	0.001	0.001
3,3-Dimethyloctane	I10	0.0012	0.0088	0.001	0.001
n-Propylbenzene	A9	0.0029	0.0179	0.001	0.001
3,6-Dimethyloctane	I10	0.0003	0.0022	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0009	0.0066	0.001	0.001
1,3-Methylethylbenzene	A9	0.0030	0.0185	0.002	0.002
1,4-Methylethylbenzene	A9	0.0010	0.0062	0.001	0.001
1,3,5-Trimethylbenzene	A9	0.0044	0.0272	0.002	0.002
2,3-Dimethyloctane	I10	0.0006	0.0044	0.000	0.000
5-Methylnonane	I10	0.0017	0.0124	0.001	0.001
1,2-Methylethylbenzene	A9	0.0022	0.0136	0.001	0.001
2-Methylnonane	I10	0.0005	0.0037	0.000	0.000
3-Ethylloctane	I10	0.0004	0.0029	0.000	0.000
3-Methylnonane	I10	0.0016	0.0117	0.001	0.001
1,2,4-Trimethylbenzene	A9	0.0002	0.0012	0.000	0.000
t-Butylbenzene	A10	0.0042	0.0290	0.002	0.002
i-Butylcyclohexane	N10	0.0007	0.0050	0.000	0.000
1t-Methyl-2-n-propylcyclohexane	I10	0.0003	0.0022	0.000	0.000
i-Butylbenzene	A10	0.0002	0.0014	0.000	0.000
sec-Butylbenzene	A10	0.0002	0.0014	0.000	0.000
UnknownC9s	U9	0.0049	0.0322	0.003	0.003
n-Decane	P10	0.0128	0.0935	0.008	0.008
1,2,3-Trimethylbenzene	A9	0.0005	0.0031	0.000	0.000
1,3-Methyl-i-propylbenzene	A10	0.0003	0.0021	0.000	0.000
1,4-Methyl-i-propylbenzene	A10	0.0001	0.0007	0.000	0.000
Sec-Butylcyclohexane	A10	0.0002	0.0014	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0007	0.0048	0.000	0.000
3-Ethylnonane	I10	0.0016	0.0128	0.001	0.001
1,3-Diethylbenzene	A10	0.0010	0.0069	0.001	0.001
1,3-Methyl-n-propylbenzene	A10	0.0002	0.0014	0.000	0.000
1,4-Diethylbenzene	A10	0.0004	0.0028	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Butylbenzene	A10	0.0008	0.0055	0.000	0.000
1,3-Dimethyl-5-ethylbenzene	A10	0.0002	0.0014	0.000	0.000
1,2-Diethylbenzene	A10	0.0006	0.0042	0.000	0.000
t-Decahydronaphthalene	A9	0.0003	0.0024	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0005	0.0034	0.000	0.000

1,3-Dimethyl-4-ethylbenzene	A10	0.0011	0.0076	0.001	0.001
1,2-Dimethyl-4-ethylbenzene	A10	0.0003	0.0021	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0006	0.0042	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0002	0.0014	0.000	0.000
1,2-Ethyl-i-propylbenzene	A10	0.0002	0.0015	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0003	0.0023	0.000	0.000
UnknownC10s	U10	0.0072	0.0526	0.004	0.004
n-Undecane	P11	0.0058	0.0466	0.004	0.004
1,4-Ethyl-i-propylbenzene	A11	0.0001	0.0008	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0002	0.0014	0.000	0.000
1,2-Methyl-n-butylbenzene	A11	0.0001	0.0008	0.000	0.000
1,2,3,5-Tetramethylbenzene	A11	0.0002	0.0014	0.000	0.000
1,2-Methyl-t-butylbenzene	A11	0.0001	0.0008	0.000	0.000
5-Methylindan	A11	0.0003	0.0021	0.000	0.000
1,2-Ethyl-n-propylbenzene	A11	0.0003	0.0023	0.000	0.000
2-Methylindan	A11	0.0001	0.0007	0.000	0.000
1,3-Methyl-n-butylbenzene	A11	0.0001	0.0008	0.000	0.000
1,3-Di-i-propylbenzene	A11	0.0002	0.0016	0.000	0.000
sec-Pentylbenzene	A11	0.0002	0.0015	0.000	0.000
n-Pentylbenzene	A11	0.0002	0.0015	0.000	0.000
1,2-Di-n-propylbenzene	A11	0.0002	0.0016	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0001	0.0008	0.000	0.000
Tetrahydronaphthalene	A10	0.0002	0.0013	0.000	0.000
Naphthalene	A10	0.0004	0.0026	0.000	0.000
1-t-Butyl-3,5-dimethylbenzene	A12	0.0001	0.0008	0.000	0.000
UnknownC11s	U11	0.0023	0.0185	0.002	0.002
n-Dodecane	P12	0.0026	0.0227	0.002	0.002
1,3,5-Triethylbenzene	A12	0.0004	0.0033	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	0.0002	0.0016	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0005	0.0038	0.000	0.000
2-Methylnaphthalene	A11	0.0002	0.0014	0.000	0.000
1-Methylnaphthalene	A11	0.0001	0.0007	0.000	0.000
UnknownC12s	U12	0.0019	0.0153	0.001	0.001
n-Tridecane	P13	0.0012	0.0114	0.001	0.001
UnknownC13s	U13	0.0013	0.0123	0.001	0.001
n-Tetradecane	P14	0.0006	0.0061	0.000	0.000
UnknownC14s	U14	0.0004	0.0041	0.000	0.000
n-Pentadecane	P15	0.0002	0.0022	0.000	0.000
UnknownC15s	U15	0.0005	0.0054	0.000	0.000
n-Hexadecane	P16	0.0001	0.0012	0.000	0.000
UnknownC16s	U16	0.0002	0.0023	0.000	0.000
n-Heneicosane	P21	0.0003	0.0046	0.000	0.000
TOTAL		100.00000	100.00000	2.6228	2.6362

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0199	0.0798
TOLUENE	0.0393	0.1859
ETHYLBENZENE	0.0047	0.0256
XYLENES	0.0364	0.1984
TOTAL BTEX	0.1003	0.4897

*(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 :	993.6 /scf	999.0 /scf
NET WET REAL :	976.2 /scf	981.6 /scf
HHV GROSS DRY REAL :	1098.8 /scf	1104.8 /scf
GROSS WET REAL :	1079.6 /scf	1085.6 /scf
NET HEATING VALUE (60 °F ideal reaction):		19418.2 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		21473.0 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6710
DENSITY		0.05132 lb/scf
COMPRESSIBILITY FACTOR :		0.9974
REGULAR WOBBE INDEX		1342.1

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

Net Dry Ideal BTU	<u>5174.6</u> /scf	Relative Density - SG (Air=1)	<u>3.5741</u>	C6+ factors
Gross Dry Ideal BTU	<u>5559.4</u> /scf	Z Compressibility Factor	<u>0.99517</u>	<u>0.99417</u>
Net Dry Ideal BTU	<u>19199.1</u> /lb	Density Factor	<u>272.813</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20625</u> /lb	Molar Mass or MW	<u>103.524</u> g/mol	
		Volume Liquid Ideal gas	<u>0.352</u> scf/gal	<u>21.9</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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