EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-103-10519** NAME/DESCRIP : **FF UNIT 8010D J11 498**
LEASE #: **PRODUCTION CASING**
FIELD/AREA:

PROJECT NO. : **202509082** ANALYSIS NO. : **01**
COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: SEPTEMBER 23, 2025 00:02
OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : SEPTEMBER 11, 2025
CUSTOMER REF: TO:
PRODUCER : EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE:
SAMPLE PRES. : psig PROBE :
FLOW PRES. : psig CYLINDER NO. : 1916
LAB PRES: psig SAMPLED BY : NICK CROY
SAMPLE TEMP. : ºf SAMPLING COMPANY: QB ENERGY
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	0.0051	0.0086	0.0010	0.0010
HELIUM	0.00	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.08	0.12	---	---
CARBON DIOXIDE	4.63	10.70	---	---
METHANE	87.2723	73.5182	---	---
ETHANE	5.8457	9.2300	1.5580	1.5666
PROPANE	1.2027	2.7849	0.3298	0.3316
I-BUTANE	0.2685	0.8195	0.0879	0.0884
N-BUTANE	0.1971	0.6016	0.0620	0.0623
I-PENTANE	0.1023	0.3872	0.0370	0.0372
N-PENTANE	0.0623	0.2360	0.0230	0.0231
HEXANES PLUS	0.3340	1.5940	0.1280	0.1285
TOTALS	100.00000	100.00000	2.2267	2.2387

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0196	0.0804
TOLUENE	0.0123	0.0595
ETHYLBENZENE	0.0001	0.0006
XYLENES	0.0016	0.0089
TOTAL BTEX	0.0336	0.1494

**(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 :	950.1 **/scf**	955.3 **/scf**
	NET WET REAL :	933.5 **/scf**	938.7 **/scf**
HHV	GROSS DRY REAL :	1052.1 **/scf**	1057.8 **/scf**
	GROSS WET REAL :	1033.7 **/scf**	1039.4 **/scf**

NET HEATING VALUE (60 °F ideal reaction):	18961.1 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	20991.3 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.6571
DENSITY	0.05018 **lbm/scf**
COMPRESSIBILITY FACTOR :	0.9975
REGULAR WOBBE INDEX	1298.6

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202509082	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	SEPTEMBER 23, 2025 00:02
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 11, 2025
PRODUCER :		CYLINDER NO. :	1916
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	FF UNIT 8010D J11 498 PRODUCTION CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :			

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	4.63	10.70
Nitrogen	0.08	0.12
Methane	87.2723	73.5182
Ethane	5.8457	9.2300
Propane	1.2027	2.7849
Isobutane	0.2685	0.8195
n-Butane	0.1971	0.6016
Isopentane	0.0985	0.3732
n-Pentane	0.0623	0.2360
Cyclopentane	0.0038	0.0140
n-Hexane	0.0522	0.2362
Cyclohexane	0.0388	0.1714
Other Hexanes	0.0896	0.4022
Heptanes	0.0762	0.3989
Methylcyclohexane	0.0342	0.1763
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0196	0.0804
Toluene	0.0123	0.0595
Ethylbenzene	0.0001	0.0006
Xylenes	0.0016	0.0089
C8+ Heavies	0.0094	0.0596
Subtotal	99.99490	99.99140
Oxygen/Argon	0.00	0.00
Alcohols	0.0051	0.0086
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	950.1	4579.4	5883.8	8165.1	**Btu/scf**
	Net Wet Real:	933.5	4499.3	5780.9	8022.4	**Btu/scf**
HHV	Gross Dry Real:	1052.1	4919.0	6317.5	8776.0	**Btu/scf**
	Gross Wet Real:	1033.7	4833.0	6207.1	8622.6	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1298.6	2762.7	3127.0	3730.8	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		18961.1	19172.6	19259.3	17356.1	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		20991.3	20595.2	20680.5	18651.4	**Btu/lbm**
Molar Mass (MW):		19.0434	90.899	118.403	161.22	**g/mol**
Relative Density (AIR=1):		0.6571	3.1384	4.0881	5.5665	**SG**
Density:		0.05018	0.23953	0.31202	0.42484	**lbm/scf**
Compressiblity Factor:		0.9975	0.9919	0.9977	0.9999	**Z**
Liquid Volume real gas @:	**14.65**	17.7263	0.1276	0.002	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: **05-103-10519** NAME/DESCRIP : **FF UNIT 8010D J11 498**
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FIELD DATA
SAMPLE CYCLE: SAMPLE TYPE:
SAMPLE PRES. : psig PROBE :
FLOW PRES. : psig CYLINDER NO. : 1916
LAB PRES: psig SAMPLED BY : NICK CROY
SAMPLE TEMP. : ºf SAMPLING COMPANY: QB ENERGY
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**
Nitrogen	---	0.08	0.12	---	---
Carbon Dioxide	---	4.63	10.70	---	---
Methane	P1	87.2723	73.5182	---	---
Ethane	P2	5.8457	9.2300	1.558	1.567
Propane	P3	1.2027	2.7849	0.330	0.332
i-Butane	I4	0.2685	0.8195	0.088	0.088
Methanol	X1	0.0051	0.0086	0.001	0.001
n-Butane	P4	0.1971	0.6016	0.062	0.062
2,2-Dimethylpropane	I5	0.0040	0.0152	0.002	0.002
i-Pentane	I5	0.0945	0.3580	0.034	0.034
n-Pentane	P5	0.0623	0.2360	0.023	0.023
2,2-Dimethylbutane	I6	0.0047	0.0213	0.002	0.002
Cyclopentane	N5	0.0038	0.0140	0.001	0.001
2,3-Dimethylbutane	I6	0.0069	0.0312	0.003	0.003
2-Methylpentane	I6	0.0295	0.1335	0.012	0.012
3-Methylpentane	I6	0.0182	0.0823	0.007	0.007
n-Hexane	P6	0.0522	0.2362	0.021	0.021
2,2-Dimethylpentane	I7	0.0023	0.0121	0.001	0.001
Methylcyclopentane	N6	0.0303	0.1339	0.011	0.011
2,4-Dimethylpentane	I7	0.0038	0.0200	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0009	0.0047	0.000	0.000
Benzene	A6	0.0196	0.0804	0.005	0.005
3,3-Dimethylpentane	I7	0.0012	0.0063	0.001	0.001
Cyclohexane	N6	0.0388	0.1714	0.013	0.013
2-Methylhexane	I7	0.0142	0.0747	0.007	0.007
2,3-Dimethylpentane	I7	0.0038	0.0200	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0033	0.0170	0.001	0.001
3-Methylhexane	I7	0.0118	0.0621	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0046	0.0237	0.002	0.002

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1t,3-Dimethylcyclopentane	N7	0.0040	0.0206	0.002	0.002
3-Ethylpentane	I7	0.0005	0.0026	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0062	0.0320	0.003	0.003
n-Heptane	P7	0.0184	0.0968	0.008	0.008
1c,2-Dimethylcyclopentane	N7	0.0001	0.0005	0.000	0.000
Methylcyclohexane	N7	0.0342	0.1763	0.014	0.014
2,2-Dimethylhexane	I8	0.0006	0.0036	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
Ethylcyclopentane	N7	0.0009	0.0046	0.000	0.000
2,5-Dimethylhexane	I8	0.0004	0.0024	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0004	0.0024	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0123	0.0595	0.004	0.004
2,3-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
2-Methylheptane	I8	0.0008	0.0048	0.000	0.000
4-Methylheptane	I8	0.0003	0.0018	0.000	0.000
3-Methylheptane	I8	0.0006	0.0036	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0011	0.0065	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0005	0.0029	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0003	0.0018	0.000	0.000
n-Octane	P8	0.0010	0.0060	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
Ethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
2,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0001	0.0006	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0010	0.0056	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0004	0.0022	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	0.0002	0.0011	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
n-Nonane	P9	0.0002	0.0014	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	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0001	0.0007	0.000	0.000
n-Undecane	P11	0.0002	0.0016	0.000	0.000
n-Dodecane	P12	0.0003	0.0027	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0001	0.0008	0.000	0.000
n-Tridecane	P13	0.0001	0.0009	0.000	0.000
n-Tetradecane	P14	0.0001	0.0010	0.000	0.000
TOTAL		100.00000	100.00000	2.2267	2.2387

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BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0196	0.0804
TOLUENE	0.0123	0.0595
ETHYLBENZENE	0.0001	0.0006
XYLENES	0.0016	0.0089
TOTAL BTEX	0.0336	0.1494

*(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 :	950.1 /scf	955.3 /scf
	NET WET REAL :	933.5 /scf	938.7 /scf
HHV	GROSS DRY REAL :	1052.1 /scf	1057.8 /scf
	GROSS WET REAL :	1033.7 /scf	1039.4 /scf

NET HEATING VALUE (60 °F ideal reaction):	18961.1 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	20991.3 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6571
DENSITY	0.05018 lb/scf
COMPRESSIBILITY FACTOR :	0.9975
REGULAR WOBBE INDEX	1298.6

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

Net Dry Ideal BTU	4556.4 /scf	Relative Density - SG (Air=1)	3.1384		***C6+factors***
Gross Dry Ideal BTU	4894.3 /scf	**Z** Compressiblity Factor	0.99187		0.99139
Net Dry Ideal BTU	19172.6 /lb	Density Factor	239.534	lbm/1000 ft3	
Gross Dry Ideal BTU	20595.2 /lb	Molar Mass or MW	90.899	g/mol	
		Volume Liquid Ideal gas	0.128	scf/gal	25.1

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.