EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:		NAME/DESCRIP :	**UNOCAL 5 LOCATON 335618 23A-4D**
LEASE #:	**05-045-13234**		**WELLHEAD**
FIELD/AREA:			
PROJECT NO. :	**202509064**	ANALYSIS NO. :	**01**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	SEPTEMBER 18, 2025 07:43
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	AUGUST 15, 2025
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
*****FIELD DATA*****			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	1L TEDLAR
LAB PRES:	psig	SAMPLED BY :	DEREK HORN
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	0.0008	0.0014	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	6.67	10.35	---	---
NITROGEN	22.33	30.32	---	---
CARBON DIOXIDE	0.05	0.11	---	---
METHANE	67.2902	52.3248	---	---
ETHANE	2.3382	3.4078	0.6230	0.6264
PROPANE	0.7174	1.5333	0.1967	0.1978
I-BUTANE	0.1557	0.4387	0.0509	0.0512
N-BUTANE	0.1850	0.5212	0.0579	0.0582
I-PENTANE	0.0794	0.2774	0.0290	0.0291
N-PENTANE	0.0563	0.1969	0.0200	0.0201
HEXANES PLUS	0.1164	0.5194	0.0470	0.0470
TOTALS	100.00000	100.00000	1.0245	1.0298

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0003	0.0011
TOLUENE	0.0001	0.0004
ETHYLBENZENE	0.0001	0.0005
XYLENES	0.0001	0.0005
TOTAL BTEX	0.0006	0.0025

**(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 :	685.7 **/scf**	689.5 **/scf**
	NET WET REAL :	673.7 **/scf**	677.5 **/scf**
HHV	GROSS DRY REAL :	760.0 **/scf**	764.2 **/scf**
	GROSS WET REAL :	746.7 **/scf**	750.9 **/scf**
	NET HEATING VALUE (60 °F ideal reaction):		12638.8 **Btu/lbm**
	GROSS HEATING VALUE (60°F ideal reaction):		14006.8 **Btu/lbm**
	RELATIVE DENSITY (AIR=1):		0.7118
	DENSITY		0.05436 **lbm/scf**
	COMPRESSIBILITY FACTOR :		0.9984
	REGULAR WOBBE INDEX		902.2

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202509064	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	SEPTEMBER 18, 2025 07:43
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 15, 2025
PRODUCER :		CYLINDER NO. :	1L TEDLAR
LEASE NO. :	05-045-13234	SAMPLED BY :	DEREK HORN
NAME/DESCRIP :	UNOCAL 5 LOCATON 335618 23A-4D WELLHEAD		

FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT*		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	0.05	0.11
Nitrogen	22.33	30.32
Methane	67.2902	52.3248
Ethane	2.3382	3.4078
Propane	0.7174	1.5333
Isobutane	0.1557	0.4387
n-Butane	0.1850	0.5212
Isopentane	0.0765	0.2676
n-Pentane	0.0563	0.1969
Cyclopentane	0.0029	0.0098
n-Hexane	0.0192	0.0802
Cyclohexane	0.0083	0.0339
Other Hexanes	0.0439	0.1825
Heptanes	0.0235	0.1136
Methylcyclohexane	0.0112	0.0533
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0003	0.0011
Toluene	0.0001	0.0004
Ethylbenzene	0.0001	0.0005
Xylenes	0.0001	0.0005
C8+ Heavies	0.0097	0.0534
Subtotal	93.32920	89.64860
Oxygen/Argon	6.67	10.35
Alcohols	0.0008	0.0014
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	685.7	4695.3	5777.6	7170.4	**Btu/scf**
	Net Wet Real:	673.7	4613.2	5676.6	7045.1	**Btu/scf**
HHV	Gross Dry Real:	760.0	5059.2	6223.9	7721.8	**Btu/scf**
	Gross Wet Real:	746.7	4970.8	6115.1	7586.8	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		902.2	2818.0	3121.8	3493.4	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		12638.8	19399.0	19922.0	19176.4	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		14006.8	20903.7	21461.6	20651.0	**Btu/lbm**
Molar Mass (MW):		20.63023	92.225	115.175	142.282	**g/mol**
Relative Density (AIR=1):		0.7118	3.1842	3.9761	4.9126	**SG**
Density:		0.05436	0.24305	0.30350	0.37493	**lbm/scf**
Compressiblity Factor:		0.9984	0.9908	0.9971	0.9996	**Z**
Liquid Volume real gas @:	**14.65**	15.4066	0.0469	0.003	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.

EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:		NAME/DESCRIP :	**UNOCAL 5 LOCATON 335618 23A-4D**
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OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	AUGUST 15, 2025
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	1L TEDLAR
LAB PRES:	psig	SAMPLED BY :	DEREK HORN
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**
Helium	---	0.01	0.00	---	---
Oxygen/Argon	---	6.67	10.35	---	---
Nitrogen	---	22.33	30.32	---	---
Carbon Dioxide	---	0.05	0.11	---	---
Methane	P1	67.2902	52.3248	---	---
Ethane	P2	2.3382	3.4078	0.623	0.626
Propane	P3	0.7174	1.5333	0.197	0.198
i-Butane	I4	0.1557	0.4387	0.051	0.051
Methanol	X1	0.0007	0.0011	0.000	0.000
n-Butane	P4	0.1849	0.5209	0.058	0.058
2,2-Dimethylpropane	I5	0.0021	0.0074	0.001	0.001
i-Pentane	I5	0.0744	0.2602	0.027	0.027
Acetone	X3	0.0001	0.0003	0.000	0.000
UnknownC4s	U4	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.0563	0.1969	0.020	0.020
2,2-Dimethylbutane	I6	0.0024	0.0100	0.001	0.001
Cyclopentane	N5	0.0029	0.0098	0.001	0.001
2,3-Dimethylbutane	I6	0.0041	0.0171	0.002	0.002
2-Methylpentane	I6	0.0186	0.0777	0.008	0.008
3-Methylpentane	I6	0.0101	0.0422	0.004	0.004
n-Hexane	P6	0.0192	0.0802	0.008	0.008
2,2-Dimethylpentane	I7	0.0006	0.0029	0.000	0.000
Methylcyclopentane	N6	0.0087	0.0355	0.003	0.003
2,4-Dimethylpentane	I7	0.0010	0.0048	0.000	0.000
2,2,3-Trimethylbutane	I7	0.0002	0.0010	0.000	0.000
Benzene	A6	0.0003	0.0011	0.000	0.000
3,3-Dimethylpentane	I7	0.0003	0.0014	0.000	0.000
Cyclohexane	N6	0.0083	0.0339	0.003	0.003

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2-Methylhexane	I7	0.0042	0.0204	0.002	0.002
2,3-Dimethylpentane	I7	0.0013	0.0063	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0008	0.0038	0.000	0.000
3-Methylhexane	I7	0.0038	0.0185	0.002	0.002
1c,3-Dimethylcyclopentane	N7	0.0012	0.0057	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0011	0.0052	0.001	0.001
3-Ethylpentane	I7	0.0002	0.0010	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0019	0.0091	0.001	0.001
n-Heptane	P7	0.0062	0.0301	0.003	0.003
1c,2-Dimethylcyclopentane	N7	0.0002	0.0010	0.000	0.000
Methylcyclohexane	N7	0.0112	0.0533	0.004	0.004
2,2-Dimethylhexane	I8	0.0004	0.0022	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0005	0.000	0.000
Ethylcyclopentane	N7	0.0004	0.0019	0.000	0.000
2,5-Dimethylhexane	I8	0.0003	0.0016	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0003	0.0016	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0003	0.0016	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0005	0.000	0.000
Toluene	A7	0.0001	0.0004	0.000	0.000
2,3-Dimethylhexane	I8	0.0003	0.0016	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0005	0.000	0.000
2-Methylheptane	I8	0.0011	0.0061	0.001	0.001
4-Methylheptane	I8	0.0003	0.0016	0.000	0.000
3-Methylheptane	I8	0.0007	0.0039	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0012	0.0065	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0005	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0005	0.0027	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0002	0.0011	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0004	0.0022	0.000	0.000
n-Octane	P8	0.0012	0.0066	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0002	0.0011	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0002	0.0012	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0006	0.000	0.000
Ethylcyclohexane	N8	0.0003	0.0016	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0005	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
2,5-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
Ethylbenzene	I8	0.0001	0.0005	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0001	0.0005	0.000	0.000
4-Methyloctane	I9	0.0001	0.0006	0.000	0.000
2-Methyloctane	I9	0.0001	0.0006	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0006	0.000	0.000
n-Nonane	P9	0.0001	0.0006	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
UnknownC9s	U9	0.0001	0.0006	0.000	0.000
UnknownC10s	U10	0.0001	0.0007	0.000	0.000
TOTAL		100.00000	100.00000	1.0245	1.0298

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BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0003	0.0011
TOLUENE	0.0001	0.0004
ETHYLBENZENE	0.0001	0.0005
XYLENES	0.0001	0.0005
TOTAL BTEX	0.0006	0.0025

*(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 :	685.7 /scf	689.5 /scf
	NET WET REAL :	673.7 /scf	677.5 /scf
HHV	GROSS DRY REAL :	760.0 /scf	764.2 /scf
	GROSS WET REAL :	746.7 /scf	750.9 /scf
	NET HEATING VALUE (60 °F ideal reaction):		12638.8 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		14006.8 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.7118
	DENSITY		0.05436 lb/scf
	COMPRESSIBILITY FACTOR :		0.9984
	REGULAR WOBBE INDEX		902.2

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

Net Dry Ideal BTU	4666.8 /scf	Relative Density - SG (Air=1)	3.1842		***C6+factors***
Gross Dry Ideal BTU	5028.5 /scf	**Z** Compressiblity Factor	0.99082		0.99025
Net Dry Ideal BTU	19399 /lb	Density Factor	243.051	lbm/1000 ft3	
Gross Dry Ideal BTU	20903.7 /lb	Molar Mass or MW	92.225	g/mol	
		Volume Liquid Ideal gas	0.047	scf/gal	24

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.