EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-13000**	NAME/DESCRIP :	**UNOCAL 2 LOCATION: 335687, 13D-9D**
LEASE #:			**SURFACE SAMPLE AT WELLHEAD**
FIELD/AREA:			
PROJECT NO. :	**202506130**	ANALYSIS NO. :	**02**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	JUNE 28, 2025 18:03
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	JUNE 23, 2025 10:16
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING, LLC	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 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	0.0003	0.0009	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	1.20	2.17	---	---
NITROGEN	3.50	5.54	---	---
CARBON DIOXIDE	0.07	0.17	---	---
METHANE	90.8942	82.4529	---	---
ETHANE	2.7160	4.6178	0.7233	0.7273
PROPANE	0.8451	2.1071	0.2318	0.2330
I-BUTANE	0.1706	0.5607	0.0559	0.0563
N-BUTANE	0.2615	0.8594	0.0819	0.0824
I-PENTANE	0.1048	0.4272	0.0380	0.0382
N-PENTANE	0.0848	0.3459	0.0310	0.0311
HEXANES PLUS	0.1427	0.7475	0.0550	0.0550
TOTALS	100.00000	100.00000	1.2169	1.2233

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0016	0.0071
TOLUENE	0.0004	0.0021
ETHYLBENZENE	0.0001	0.0006
XYLENES	0.0002	0.0012
TOTAL BTEX	0.0023	0.0110

**(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 :	915.4 **/scf**	920.4 **/scf**
	NET WET REAL :	899.4 **/scf**	904.4 **/scf**
HHV	GROSS DRY REAL :	1014.6 **/scf**	1020.2 **/scf**
	GROSS WET REAL :	996.9 **/scf**	1002.5 **/scf**
	NET HEATING VALUE (60 °F ideal reaction):		19673.2 **Btu/lbm**
	GROSS HEATING VALUE (60°F ideal reaction):		21807.4 **Btu/lbm**
	RELATIVE DENSITY (AIR=1):		0.6103
	DENSITY		0.04660 **lbm/scf**
	COMPRESSIBILITY FACTOR :		0.9978
	REGULAR WOBBE INDEX		1300.0

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202506130	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JUNE 28, 2025 18:03
ACCOUNT NO. :		SAMPLE DATE :	JUNE 23, 2025 10:16
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	1L TEDLAR
LEASE NO. :		SAMPLED BY :	DEREK HORN
NAME/DESCRIP :	UNOCAL 2 LOCATION: 335687, 13D-9D SURFACE SAMPLE AT 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	0.07	0.17
Nitrogen	3.50	5.54
Methane	90.8942	82.4529
Ethane	2.7160	4.6178
Propane	0.8451	2.1071
Isobutane	0.1706	0.5607
n-Butane	0.2615	0.8594
Isopentane	0.1014	0.4137
n-Pentane	0.0848	0.3459
Cyclopentane	0.0034	0.0135
n-Hexane	0.0250	0.1218
Cyclohexane	0.0082	0.0390
Other Hexanes	0.0532	0.2580
Heptanes	0.0276	0.1559
Methylcyclohexane	0.0114	0.0633
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0016	0.0071
Toluene	0.0004	0.0021
Ethylbenzene	0.0001	0.0006
Xylenes	0.0002	0.0012
C8+ Heavies	0.0150	0.0985
Subtotal	98.79970	97.82910
Oxygen/Argon	1.20	2.17
Alcohols	0.0003	0.0009
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	915.4	4718.5	5862.9	7516.5	**Btu/scf**
	Net Wet Real:	899.4	4636.0	5760.4	7385.1	**Btu/scf**
HHV	Gross Dry Real:	1014.6	5084.0	6314.2	8093.2	**Btu/scf**
	Gross Wet Real:	996.9	4995.1	6203.8	7951.7	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1300.0	2824.2	3147.9	3574.8	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		19673.2	19394.5	19857.8	19159.3	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		21807.4	20896.3	21388.1	20629.3	**Btu/lbm**
Molar Mass (MW):		17.68704	92.731	116.644	149.297	**g/mol**
Relative Density (AIR=1):		0.6103	3.2020	4.0271	5.1548	**SG**
Density:		0.04660	0.24436	0.30738	0.39342	**lbm/scf**
Compressiblity Factor:		0.9978	0.9909	0.9973	0.9997	**Z**
Liquid Volume real gas @:	**14.65**	17.0375	0.0548	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.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY: **05-045-13000** NAME/DESCRIP : **UNOCAL 2 LOCATION: 335687, 13D-9D**
LEASE #: **SURFACE SAMPLE AT WELLHEAD**
FIELD/AREA:

PROJECT NO. : **202506130** ANALYSIS NO. : **02**
COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: JUNE 28, 2025 18:03
OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : JUNE 23, 2025 10:16
CUSTOMER REF: TO:
PRODUCER : QB ENERGY OPERATING, LLC 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 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	---	---
Oxygen/Argon	---	1.20	2.17	---	---
Nitrogen	---	3.50000	5.54060	---	---
Carbon Dioxide	---	0.07000	0.17000	---	---
Methane	P1	90.89420	82.45290	---	---
Ethane	P2	2.7160	4.6178	0.723	0.727
Propane	P3	0.8451	2.1071	0.232	0.233
i-Butane	I4	0.1706	0.5607	0.056	0.056
Methanol	X1	0.0001	0.0002	0.000	0.000
n-Butane	P4	0.2615	0.8594	0.082	0.082
2,2-Dimethylpropane	I5	0.0025	0.0102	0.001	0.001
Ethanol	X2	0.0001	0.0003	0.000	0.000
i-Pentane	I5	0.0989	0.4035	0.036	0.036
n-Pentane	P5	0.0848	0.3459	0.031	0.031
t-Butanol	X4	0.0001	0.0004	0.000	0.000
2,2-Dimethylbutane	I6	0.0025	0.0122	0.001	0.001
Cyclopentane	N5	0.0034	0.0135	0.001	0.001
2,3-Dimethylbutane	I6	0.0044	0.0214	0.002	0.002
2-Methylpentane	I6	0.0240	0.1169	0.010	0.010
3-Methylpentane	I6	0.0126	0.0614	0.005	0.005
n-Hexane	P6	0.0250	0.1218	0.010	0.010
2,2-Dimethylpentane	I7	0.0002	0.0011	0.000	0.000
Methylcyclopentane	N6	0.0097	0.0461	0.003	0.003
2,4-Dimethylpentane	I7	0.0011	0.0062	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0003	0.0017	0.000	0.000
Benzene	A6	0.0016	0.0071	0.000	0.000
3,3-Dimethylpentane	I7	0.0003	0.0017	0.000	0.000
Cyclohexane	N6	0.0082	0.0390	0.003	0.003
2-Methylhexane	I7	0.0037	0.0210	0.002	0.002

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2,3-Dimethylpentane	I7	0.0028	0.0159	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0010	0.0055	0.000	0.000
3-Methylhexane	I7	0.0046	0.0261	0.002	0.002
1c,3-Dimethylcyclopentane	N7	0.0013	0.0072	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0012	0.0067	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0017	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0020	0.0111	0.001	0.001
n-Heptane	P7	0.0080	0.0453	0.004	0.004
1c,2-Dimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Methylcyclohexane	N7	0.0114	0.0633	0.005	0.005
2,2-Dimethylhexane	I8	0.0003	0.0019	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0003	0.0019	0.000	0.000
Ethylcyclopentane	N7	0.0004	0.0022	0.000	0.000
2,5-Dimethylhexane	I8	0.0004	0.0026	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0004	0.0026	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0003	0.0019	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0004	0.0021	0.000	0.000
2,3-Dimethylhexane	I8	0.0003	0.0019	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0017	0.0110	0.001	0.001
4-Methylheptane	I8	0.0005	0.0032	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0005	0.0032	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0018	0.0114	0.001	0.001
3-Ethylhexane	I8	0.0003	0.0019	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0006	0.0038	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0003	0.0019	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
1t,2-Dimethylcyclohexane	N8	0.0004	0.0025	0.000	0.000
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0020	0.0129	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0005	0.0032	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0003	0.0022	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0002	0.0015	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0004	0.0025	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	0.0022	0.000	0.000
3,3-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	0.0002	0.0012	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0007	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0002	0.0015	0.000	0.000
2-Methyloctane	I9	0.0002	0.0015	0.000	0.000
3-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0002	0.0014	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
n-Nonane	P9	0.0005	0.0036	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0001	0.0007	0.000	0.000
n-Decane	P10	0.0001	0.0008	0.000	0.000
UnknownC11s	U11	0.0001	0.0009	0.000	0.000
TOTAL		100.00000	100.00000	1.2169	1.2233

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0016	0.0071
TOLUENE	0.0004	0.0021
ETHYLBENZENE	0.0001	0.0006
XYLENES	0.0002	0.0012
TOTAL BTEX	0.0023	0.0110

**(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 :	915.4 /scf	920.4 /scf
	NET WET REAL :	899.4 /scf	904.4 /scf
HHV	GROSS DRY REAL :	1014.6 /scf	1020.2 /scf
	GROSS WET REAL :	996.9 /scf	1002.5 /scf

NET HEATING VALUE (60 °F ideal reaction):	19673.2 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	21807.4 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6103
DENSITY	0.04660 lb/scf
COMPRESSIBILITY FACTOR :	0.9978
REGULAR WOBBE INDEX	1300.0

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

Net Dry Ideal BTU	4690.4 /scf	Relative Density - SG (Air=1)	3.202	***C6+factors***
Gross Dry Ideal BTU	5053.7 /scf	**Z** Compressiblity Factor	0.99093	0.99025
Net Dry Ideal BTU	19394.5 /lb	Density Factor	244.362 lbm/1000 ft3	
Gross Dry Ideal BTU	20896.3 /lb	Molar Mass or MW	92.731 g/mol	
		Volume Liquid Ideal gas	0.055 scf/gal	23.6

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.