



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: 05-045-13083	NAME/DESCRIP : 110170169 U2 UNOCAL 14B-9D
LEASE #:	CASING
FIELD/AREA: GRAND VALLEY	
PROJECT NO. : 202511011	ANALYSIS NO. : 02
COMPANY NAME : QB ENERGY OPERATING, LLC	ANALYSIS DATE: NOVEMBER 14, 2025 07:32
OFFICE / BRANCH: PARACHUTE, CO	SAMPLE DATE : OCTOBER 29, 2025
CUSTOMER REF:	TO:
PRODUCER : QB ENERGY OPERATING LLC	EFFECTIVE DATE:

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

SAMPLE CYCLE:	SAMPLE TYPE:	SPOT
SAMPLE PRES. : 614 psig	PROBE :	NO
FLOW PRES. : psig	CYLINDER NO. :	ECA-766
LAB PRES: psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. : 52 °f	SAMPLING COMPANY:	QB ENERGY
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>
ALCOHOLS	0.0246	0.0449	0.0030	0.0030
HELIUM	0.01	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.22	0.35	---	---
CARBON DIOXIDE	0.31	0.76	---	---
METHANE	92.6374	83.2405	---	---
ETHANE	3.7345	6.2897	0.9953	1.0008
PROPANE	1.6950	4.1864	0.4657	0.4682
I-BUTANE	0.2931	0.9542	0.0959	0.0965
N-BUTANE	0.4911	1.5988	0.1539	0.1547
I-PENTANE	0.1669	0.6735	0.0600	0.0603
N-PENTANE	0.1406	0.5682	0.0510	0.0512
HEXANES PLUS	0.2668	1.3338	0.1010	0.1012
TOTALS	100.0000	100.0000	1.9258	1.9359

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0224	0.0980
TOLUENE	0.0058	0.0299
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0002	0.0012
TOTAL BTEX	0.0284	0.1291

	<u>CALCULATED VALUES**</u>	
	<u>14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	988.1 /scf	993.5 /scf
NET WET REAL :	970.8 /scf	976.2 /scf
HHV GROSS DRY REAL :	1094.0 /scf	1099.9 /scf
GROSS WET REAL :	1074.9 /scf	1080.8 /scf
NET HEATING VALUE (60 °F ideal reaction):		21027.6 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		23282.1 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6162
DENSITY		0.04704 lbm/scf
COMPRESSIBILITY FACTOR :		0.9975
REGULAR WOBBE INDEX		1394.6

*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730, GPA 2261 & GPA 2286.

** (CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

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**EXTENDED NATURAL GAS ANALYSIS (*DHA)
GLYCALC INFORMATION**

PROJECT NO. :	202511011	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	NOVEMBER 14, 2025 07:32
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 29, 2025
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	ECA-766
LEASE NO. :		SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	110170169 U2 UNOCAL 14B-9D CASING		

FIELD DATA		SAMPLE TEMP. :	52
SAMPLE PRES. :	614	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	<i>SPOT</i> <i>ppm mol</i> <i>NO PROBE</i>		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	0.31	0.76
Nitrogen	0.22	0.35
Methane	92.6374	83.2405
Ethane	3.7345	6.2897
Propane	1.6950	4.1864
Isobutane	0.2931	0.9542
n-Butane	0.4911	1.5988
Isopentane	0.1587	0.6413
n-Pentane	0.1406	0.5682
Cyclopentane	0.0082	0.0322
n-Hexane	0.0490	0.2365
Cyclohexane	0.0207	0.0976
Other Hexanes	0.0985	0.4729
Heptanes	0.0464	0.2591
Methylcyclohexane	0.0170	0.0935
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0224	0.0980
Toluene	0.0058	0.0299
Ethylbenzene	0.0000	0.0000
Xylenes	0.0002	0.0012
C8+ Heavies	0.0068	0.0451
<u>Subtotal</u>	<u>99.97540</u>	<u>99.95510</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0246	0.0449
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

	Total	C6+	C8+	C10+
Calculated Values BTU @ 14.65	Sample	Fraction	Fraction	Fraction
LHV Net Dry Real:	988.1	4504.1	5629.1	6610.6 Btu/scf
Net Wet Real:	970.8	4425.4	5530.7	6495.0 Btu/scf
HHV Gross Dry Real:	1094.0	4840.1	6042.3	7028.8 Btu/scf
Gross Wet Real:	1074.9	4755.5	5936.7	6905.9 Btu/scf

Other Calculated Values				
Regualr Wobbe Index*	1394.6	2739.3	2988.7	3241.3 Btu/scf
Net Heating Value (60 °F ideal reaction):	21027.6	19127.6	18418.7	18372.7 Btu/lbm
Gross Heating Value (60°F ideal reaction):	23282.1	20554.0	19772.4	19535.3 Btu/lbm
Molar Mass (MW):	17.85407	89.286	118.565	136.909 g/mol
Relative Density (AIR=1):	0.6162	3.0831	4.0938	4.7271 SG
Density:	0.04704	0.23529	0.31244	0.36078 lbm/scf
Compressibility Factor:	0.9975	0.9906	0.9977	0.9995 Z
Liquid Volume real gas @:	14.65	17.6157	0.1007	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 underscore) indicates there was no tube pulled for H2S.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY: **05-045-13083** NAME/DESCRIP : **110170169 U2 UNOCAL 14B-9D**
 LEASE #: CASING
 FIELD/AREA: **GRAND VALLEY**

PROJECT NO. : **202511011** ANALYSIS NO. : **02**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **NOVEMBER 14, 2025 07:32**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **OCTOBER 29, 2025**
 CUSTOMER REF: TO:
 PRODUCER : **QB ENERGY OPERATING LLC** EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: **SPOT**
 SAMPLE PRES. : **614** psig PROBE : **NO**
 FLOW PRES. : psig CYLINDER NO. : **ECA-766**
 LAB PRES: psig SAMPLED BY : **MIKE KELLEY**
 SAMPLE TEMP. : **52** °f SAMPLING COMPANY: **QB ENERGY**
 AMBIENT TEMP.: °f 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	---	---
Nitrogen	---	0.22	0.35	---	---
Carbon Dioxide	---	0.31	0.76	---	---
Methane	P1	92.6374	83.2405	---	---
Ethane	P2	3.7345	6.2897	0.995	1.001
Propane	P3	1.6950	4.1864	0.466	0.468
i-Butane	I4	0.2931	0.9542	0.096	0.097
Methanol	X1	0.0242	0.0434	0.003	0.003
n-Butane	P4	0.4911	1.5988	0.154	0.155
2,2-Dimethylpropane	I5	0.0023	0.0093	0.001	0.001
i-Pentane	I5	0.1564	0.6320	0.057	0.057
i-Propanol	X3	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.1406	0.5682	0.051	0.051
t-Butanol	X4	0.0001	0.0004	0.000	0.000
2,2-Dimethylbutane	I6	0.0035	0.0169	0.001	0.001
Cyclopentane	N5	0.0082	0.0322	0.002	0.002
2,3-Dimethylbutane	I6	0.0080	0.0386	0.003	0.003
2-Methylpentane	I6	0.0416	0.2008	0.017	0.017
i-Butanol	X4	0.0001	0.0004	0.000	0.000
3-Methylpentane	I6	0.0230	0.1110	0.009	0.009
n-Hexane	P6	0.0490	0.2365	0.020	0.020
2,2-Dimethylpentane	I7	0.0012	0.0067	0.001	0.001
Methylcyclopentane	N6	0.0223	0.1051	0.008	0.008
2,4-Dimethylpentane	I7	0.0022	0.0123	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0005	0.0028	0.000	0.000
n-Butanol	X4	0.0001	0.0004	0.000	0.000

Benzene	A6	0.0224	0.0980	0.006	0.006
3,3-Dimethylpentane	I7	0.0007	0.0039	0.000	0.000
Cyclohexane	N6	0.0207	0.0976	0.007	0.007
2-Methylhexane	I7	0.0087	0.0488	0.004	0.004
2,3-Dimethylpentane	I7	0.0028	0.0157	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0016	0.0088	0.001	0.001
3-Methylhexane	I7	0.0078	0.0438	0.004	0.004
1c,3-Dimethylcyclopentane	N7	0.0024	0.0132	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0021	0.0115	0.001	0.001
3-Ethylpentane	I7	0.0005	0.0028	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0034	0.0187	0.002	0.002
UnknownC6s	U6	0.0001	0.0005	0.000	0.000
n-Heptane	P7	0.0116	0.0651	0.005	0.005
1c,2-Dimethylcyclopentane	N7	0.0002	0.0011	0.000	0.000
Methylcyclohexane	N7	0.0170	0.0935	0.007	0.007
2,2-Dimethylhexane	I8	0.0004	0.0026	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0006	0.0033	0.000	0.000
2,5-Dimethylhexane	I8	0.0004	0.0026	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0003	0.0019	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0058	0.0299	0.002	0.002
2,3-Dimethylhexane	I8	0.0002	0.0013	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0006	0.0039	0.000	0.000
4-Methylheptane	I8	0.0002	0.0013	0.000	0.000
3-Methylheptane	I8	0.0004	0.0026	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0005	0.0031	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0004	0.0026	0.000	0.000
1c,4-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0001	0.0006	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0006	0.000	0.000
UnknownC8s	U8	0.0001	0.0006	0.000	0.000
3,6-Dimethyloctane	I10	0.0002	0.0016	0.000	0.000
1,3-Methylethylbenzene	A9	0.0006	0.0040	0.000	0.000
1,4-Methylethylbenzene	A9	0.0003	0.0020	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0003	0.0020	0.000	0.000
2-Methylnonane	I10	0.0002	0.0016	0.000	0.000
t-Butylbenzene	A10	0.0008	0.0060	0.000	0.000
TOTAL		100.00000	100.00000	1.9258	1.9359

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0224	0.0980	LHV NET DRY REAL :	988.1 /scf	993.5 /scf
TOLUENE	0.0058	0.0299	NET WET REAL :	970.8 /scf	976.2 /scf
ETHYLBENZENE	0.0000	0.0000	HHV GROSS DRY REAL :	1094.0 /scf	1099.9 /scf
XYLENES	0.0002	0.0012	GROSS WET REAL :	1074.9 /scf	1080.8 /scf
TOTAL BTEX	0.0284	0.1291	NET HEATING VALUE (60 °F ideal reaction):		21027.6 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		23282.1 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6162
			DENSITY		0.04704 lb/scf
			COMPRESSIBILITY FACTOR :		0.9975
			REGULAR WOBBE INDEX		1394.6

*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730, GPA 2261 & GPA 2286.

** (CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

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

Net Dry Ideal BTU	<u>4475.9</u> /scf	Relative Density - SG (Air=1)	<u>3.0831</u>	C6+ factors
Gross Dry Ideal BTU	<u>4809.8</u> /scf	Z Compressibility Factor	<u>0.99063</u>	<u>0.99008</u>
Net Dry Ideal BTU	<u>19127.6</u> /lb	Density Factor	<u>235.286</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20554</u> /lb	Molar Mass or MW	<u>89.286</u> g/mol	
		Volume Liquid Ideal gas	<u>0.101</u> scf/gal	<u>25.2</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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