EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-13539**	NAME/DESCRIP :	**CP11A-16 E16 596**
LEASE #:	**05-045-13539**		**INTERMEDIATE CASING**
FIELD/AREA:	**GRAND VALLEY**		
PROJECT NO. :	**202512131**	ANALYSIS NO. :	**02**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	JANUARY 09, 2026 12:46
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	DECEMBER 29, 2025
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	
SAMPLE PRES. :	500 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-823
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	0.0004	0.0007	0.0000	0.0000
HELIUM	0.00	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.07	0.10	---	---
CARBON DIOXIDE	6.04	14.11	---	---
METHANE	88.4244	75.2754	---	---
ETHANE	4.2132	6.7227	1.1232	1.1293
PROPANE	0.6634	1.5523	0.1819	0.1829
I-BUTANE	0.1772	0.5465	0.0580	0.0583
N-BUTANE	0.0820	0.2529	0.0260	0.0261
I-PENTANE	0.0784	0.2999	0.0280	0.0281
N-PENTANE	0.0415	0.1589	0.0150	0.0151
HEXANES PLUS	0.1995	0.9807	0.0790	0.0791
TOTALS	100.00000	100.00000	1.5111	1.5189

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0112	0.0464
TOLUENE	0.0148	0.0724
ETHYLBENZENE	0.0001	0.0006
XYLENES	0.0013	0.0074
TOTAL BTEX	0.0274	0.1268

**(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 :	907.9	/scf	912.9	/scf
	NET WET REAL :	892.0	/scf	897.0	/scf
HHV	GROSS DRY REAL :	1006.4	/scf	1011.9	/scf
	GROSS WET REAL :	988.8	/scf	994.3	/scf

NET HEATING VALUE (60 °F ideal reaction):	18308.5	Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	20290.0	Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6503	
DENSITY	0.04965	lbm/scf
COMPRESSIBILITY FACTOR :	0.9976	
REGULAR WOBBE INDEX	1249.0	

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202512131	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JANUARY 09, 2026 12:46
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 29, 2025
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-823
LEASE NO. :	05-045-13539	SAMPLED BY :	NICK CROY
NAME/DESCRIP :	CP11A-16 E16 596 INTERMEDIATE CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	500	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :			

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	6.04	14.11
Nitrogen	0.07	0.10
Methane	88.4244	75.2754
Ethane	4.2132	6.7227
Propane	0.6634	1.5523
Isobutane	0.1772	0.5465
n-Butane	0.0820	0.2529
Isopentane	0.0768	0.2940
n-Pentane	0.0415	0.1589
Cyclopentane	0.0016	0.0059
n-Hexane	0.0205	0.0938
Cyclohexane	0.0069	0.0308
Other Hexanes	0.0717	0.3270
Heptanes	0.0396	0.2099
Methylcyclohexane	0.0165	0.0860
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0112	0.0464
Toluene	0.0148	0.0724
Ethylbenzene	0.0001	0.0006
Xylenes	0.0013	0.0074
C8+ Heavies	0.0169	0.1064
Subtotal	99.99960	99.99930
Oxygen/Argon	0.00	0.00
Alcohols	0.0004	0.0007
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	907.9	4662.4	5858.7	8864.2	**Btu/scf**
	Net Wet Real:	892.0	4580.9	5756.3	8709.2	**Btu/scf**
HHV	Gross Dry Real:	1006.4	5007.8	6303.3	9538.6	**Btu/scf**
	Gross Wet Real:	988.8	4920.3	6193.1	9371.9	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1249.0	2785.4	3133.2	3875.0	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		18308.5	19143.6	19613.9	19286.4	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		20290.0	20565.2	21105.2	20753.7	**Btu/lbm**
Molar Mass (MW):		18.84482	92.591	117.297	176.571	**g/mol**
Relative Density (AIR=1):		0.6503	3.1966	4.0501	6.0965	**SG**
Density:		0.04965	0.24400	0.30910	0.46529	**lbm/scf**
Compressiblity Factor:		0.9976	0.9914	0.9972	0.9999	**Z**
Liquid Volume real gas @:	**14.65**	17.4462	0.0788	0.006	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:	**05-045-13539**	NAME/DESCRIP :	**CP11A-16 E16 596**
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OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	DECEMBER 29, 2025
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	
SAMPLE PRES. :	500 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-823
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**
Hydrogen	---	0.01	0.00	---	---
Nitrogen	---	0.07	0.10	---	---
Carbon Dioxide	---	6.04	14.11	---	---
Methane	P1	88.4244	75.2754	---	---
Ethane	P2	4.2132	6.7227	1.123	1.129
Propane	P3	0.6634	1.5523	0.182	0.183
i-Butane	I4	0.1772	0.5465	0.058	0.058
Methanol	X1	0.0004	0.0007	0.000	0.000
n-Butane	P4	0.0820	0.2529	0.026	0.026
2,2-Dimethylpropane	I5	0.0029	0.0111	0.001	0.001
i-Pentane	I5	0.0739	0.2829	0.027	0.027
n-Pentane	P5	0.0415	0.1589	0.015	0.015
2,2-Dimethylbutane	I6	0.0088	0.0402	0.004	0.004
Cyclopentane	N5	0.0016	0.0059	0.000	0.000
2,3-Dimethylbutane	I6	0.0091	0.0416	0.004	0.004
2-Methylpentane	I6	0.0295	0.1349	0.012	0.012
3-Methylpentane	I6	0.0163	0.0746	0.007	0.007
n-Hexane	P6	0.0205	0.0938	0.008	0.008
2,2-Dimethylpentane	I7	0.0017	0.0090	0.001	0.001
Methylcyclopentane	N6	0.0080	0.0357	0.003	0.003
2,4-Dimethylpentane	I7	0.0021	0.0111	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0007	0.0037	0.000	0.000
Benzene	A6	0.0112	0.0464	0.003	0.003
3,3-Dimethylpentane	I7	0.0008	0.0043	0.000	0.000
Cyclohexane	N6	0.0069	0.0308	0.002	0.002
2-Methylhexane	I7	0.0076	0.0404	0.004	0.004
2,3-Dimethylpentane	I7	0.0021	0.0111	0.001	0.001

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1,1-Dimethylcyclopentane	N7	0.0012	0.0063	0.000	0.000
3-Methylhexane	I7	0.0069	0.0367	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0013	0.0068	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0012	0.0063	0.001	0.001
3-Ethylpentane	I7	0.0004	0.0021	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0019	0.0099	0.001	0.001
n-Heptane	P7	0.0104	0.0553	0.005	0.005
1c,2-Dimethylcyclopentane	N7	0.0005	0.0026	0.000	0.000
Methylcyclohexane	N7	0.0165	0.0860	0.007	0.007
2,2-Dimethylhexane	I8	0.0007	0.0043	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
Ethylcyclopentane	N7	0.0006	0.0031	0.000	0.000
2,5-Dimethylhexane	I8	0.0010	0.0061	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0010	0.0061	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
3,3-Dimethylhexane	I8	0.0003	0.0018	0.000	0.000
Toluene	A7	0.0148	0.0724	0.005	0.005
2,3-Dimethylhexane	I8	0.0005	0.0030	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0023	0.0140	0.001	0.001
4-Methylheptane	I8	0.0008	0.0048	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0018	0.0109	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0017	0.0101	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0007	0.0042	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0003	0.0018	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0004	0.0024	0.000	0.000
1t,3-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
n-Octane	P8	0.0016	0.0097	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0003	0.0018	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,5-Dimethylheptane	I9	0.0001	0.0007	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	0.0009	0.0051	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0003	0.0017	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	0.0001	0.0006	0.000	0.000
n-Nonane	P9	0.0004	0.0027	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
UnknownC9s	U9	0.0001	0.0007	0.000	0.000
n-Decane	P10	0.0002	0.0015	0.000	0.000
n-Undecane	P11	0.0002	0.0017	0.000	0.000
n-Dodecane	P12	0.0001	0.0009	0.000	0.000
n-Tridecane	P13	0.0001	0.0010	0.000	0.000
n-Tetradecane	P14	0.0001	0.0011	0.000	0.000
n-Pentadecane	P15	0.0001	0.0011	0.000	0.000
n-Hexadecane	P16	0.0001	0.0012	0.000	0.000
TOTAL		100.00000	100.00000	1.5111	1.5189

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0112	0.0464
TOLUENE	0.0148	0.0724
ETHYLBENZENE	0.0001	0.0006
XYLENES	0.0013	0.0074
TOTAL BTEX	0.0274	0.1268

**(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 :	907.9	/scf	912.9	/scf
	NET WET REAL :	892.0	/scf	897.0	/scf
HHV	GROSS DRY REAL :	1006.4	/scf	1011.9	/scf
	GROSS WET REAL :	988.8	/scf	994.3	/scf
	NET HEATING VALUE (60 °F ideal reaction):			18308.5	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):			20290.0	Btu/lbm
	RELATIVE DENSITY (AIR=1):			0.6503	
	DENSITY			0.04965	lb/scf
	COMPRESSIBILITY FACTOR :			0.9976	
	REGULAR WOBBE INDEX			1249.0	

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

Net Dry Ideal BTU	4636.6 /scf	Relative Density - SG (Air=1)	3.1966	***C6+factors***
Gross Dry Ideal BTU	4980.1 /scf	**Z** Compressiblity Factor	0.99135	0.99056
Net Dry Ideal BTU	19143.6 /lb	Density Factor	243.997 lbm/1000 ft3	
Gross Dry Ideal BTU	20565.2 /lb	Molar Mass or MW	92.591 g/mol	
		Volume Liquid Ideal gas	0.079 scf/gal	24.3

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.