EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-15099**	NAME/DESCRIP :	**110165736 NP I30A EF 06A-30 595**
LEASE #:	**05-045-15099**		**BRADEN HEAD**
FIELD/AREA:	**GRAND VALLEY**		
PROJECT NO. :	**202512053**	ANALYSIS NO. :	**02**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	DECEMBER 22, 2025 09:40
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	NOVEMBER 20, 2025 7:30 AM
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	28	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-724
LAB PRES:		psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	35	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	0.0005	0.0009	0.0000	0.0000
HELIUM	0.02	0.00	---	---
HYDROGEN	0.60	0.07	---	---
OXYGEN/ARGON	0.01	0.02	---	---
NITROGEN	0.62	1.00	---	---
CARBON DIOXIDE	0.02	0.05	---	---
METHANE	93.2312	86.4372	---	---
ETHANE	3.4387	5.9756	0.9162	0.9212
PROPANE	1.2970	3.3053	0.3557	0.3576
I-BUTANE	0.2288	0.7685	0.0749	0.0753
N-BUTANE	0.2015	0.6769	0.0629	0.0633
I-PENTANE	0.0755	0.3145	0.0270	0.0271
N-PENTANE	0.0436	0.1818	0.0160	0.0161
HEXANES PLUS	0.2132	1.1993	0.0880	0.0880
TOTALS	100.00000	100.00000	1.5407	1.5486

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0124	0.0560
TOLUENE	0.0054	0.0288
ETHYLBENZENE	0.0011	0.0068
XYLENES	0.0067	0.0411
TOTAL BTEX	0.0256	0.1327

**(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 :	961.6	/scf	966.8	/scf
	NET WET REAL :	944.8	/scf	950.0	/scf
HHV	GROSS DRY REAL :	1065.6	/scf	1071.4	/scf
	GROSS WET REAL :	1047.0	/scf	1052.8	/scf

NET HEATING VALUE (60 °F ideal reaction):	21120.2	Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	23404.6	Btu/lbm
RELATIVE DENSITY (AIR=1):	0.5963	
DENSITY	0.04560	lbm/scf
COMPRESSIBILITY FACTOR :	0.9977	
REGULAR WOBBE INDEX	1381.1	

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202512053	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	DECEMBER 22, 2025 09:40
ACCOUNT NO. :		SAMPLE DATE :	NOVEMBER 20, 2025 7:30 AM
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	ECA-724
LEASE NO. :	05-045-15099	SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	110165736 NP I30A EF 06A-30 595 BRADEN HEAD		
FIELD DATA		SAMPLE TEMP. :	35
SAMPLE PRES. :	28	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT* *NO PROBE*		

Componet	Mole %	Wt %
Helium	0.02	0.00
Hydrogen	0.60	0.07
Carbon Dioxide	0.02	0.05
Nitrogen	0.62	1.00
Methane	93.2312	86.4372
Ethane	3.4387	5.9756
Propane	1.2970	3.3053
Isobutane	0.2288	0.7685
n-Butane	0.2015	0.6769
Isopentane	0.0733	0.3056
n-Pentane	0.0436	0.1818
Cyclopentane	0.0022	0.0089
n-Hexane	0.0199	0.0991
Cyclohexane	0.0100	0.0487
Other Hexanes	0.0521	0.2584
Heptanes	0.0396	0.2282
Methylcyclohexane	0.0203	0.1152
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0124	0.0560
Toluene	0.0054	0.0288
Ethylbenzene	0.0011	0.0068
Xylenes	0.0067	0.0411
C8+ Heavies	0.0457	0.3170
Subtotal	99.98950	99.97910
Oxygen/Argon	0.01	0.02
Alcohols	0.0005	0.0009
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	961.6	4884.6	5858.3	7062.8	**Btu/scf**
	Net Wet Real:	944.8	4799.2	5755.9	6939.3	**Btu/scf**
HHV	Gross Dry Real:	1065.6	5246.6	6289.6	7595.1	**Btu/scf**
	Gross Wet Real:	1047.0	5154.9	6179.7	7462.3	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1381.1	2852.4	3119.7	3439.5	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		21120.2	19227.3	19415.4	19292.8	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23404.6	20652.3	20844.2	20747.9	**Btu/lbm**
Molar Mass (MW):		17.30463	97.305	117.967	141.971	**g/mol**
Relative Density (AIR=1):		0.5963	3.3592	4.0733	4.9020	**SG**
Density:		0.04560	0.25641	0.31086	0.37411	**lbm/scf**
Compressiblity Factor:		0.9977	0.9933	0.9980	0.9995	**Z**
Liquid Volume real gas @:	**14.65**	17.3804	0.0877	0.0229	0.001	**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

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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	---	0.02	0.00	---	---
Hydrogen	---	0.60	0.07	---	---
Oxygen/Argon	---	0.01	0.02	---	---
Nitrogen	---	0.62	1.00	---	---
Carbon Dioxide	---	0.02	0.05	---	---
Methane	P1	93.2312	86.4372	---	---
Ethane	P2	3.4387	5.9756	0.916	0.921
Propane	P3	1.2970	3.3053	0.356	0.358
i-Butane	I4	0.2288	0.7685	0.075	0.075
Methanol	X1	0.0005	0.0009	0.000	0.000
n-Butane	P4	0.2015	0.6769	0.063	0.063
2,2-Dimethylpropane	I5	0.0034	0.0142	0.001	0.001
i-Pentane	I5	0.0699	0.2914	0.025	0.025
n-Pentane	P5	0.0435	0.1814	0.016	0.016
2,2-Dimethylbutane	I6	0.0046	0.0229	0.002	0.002
Cyclopentane	N5	0.0022	0.0089	0.001	0.001
2,3-Dimethylbutane	I6	0.0053	0.0264	0.002	0.002
2-Methylpentane	I6	0.0206	0.1026	0.009	0.009
3-Methylpentane	I6	0.0116	0.0578	0.005	0.005
UnknownC5s	U5	0.0001	0.0004	0.000	0.000
n-Hexane	P6	0.0199	0.0991	0.008	0.008
2,2-Dimethylpentane	I7	0.0012	0.0069	0.001	0.001
Methylcyclopentane	N6	0.0100	0.0487	0.004	0.004
2,4-Dimethylpentane	I7	0.0016	0.0093	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0005	0.0029	0.000	0.000
Benzene	A6	0.0124	0.0560	0.003	0.003
3,3-Dimethylpentane	I7	0.0007	0.0041	0.000	0.000

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Cyclohexane	N6	0.0100	0.0487	0.003	0.003
2-Methylhexane	I7	0.0072	0.0417	0.003	0.003
2,3-Dimethylpentane	I7	0.0021	0.0121	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0013	0.0074	0.001	0.001
3-Methylhexane	I7	0.0067	0.0388	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0018	0.0102	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0016	0.0091	0.001	0.001
3-Ethylpentane	I7	0.0004	0.0023	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0026	0.0147	0.001	0.001
n-Heptane	P7	0.0100	0.0579	0.005	0.005
1c,2-Dimethylcyclopentane	N7	0.0011	0.0062	0.001	0.001
Methylcyclohexane	N7	0.0203	0.1152	0.008	0.008
2,2-Dimethylhexane	I8	0.0008	0.0053	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0007	0.0040	0.000	0.000
2,5-Dimethylhexane	I8	0.0010	0.0066	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0009	0.0060	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0005	0.0032	0.000	0.000
3,3-Dimethylhexane	I8	0.0003	0.0020	0.000	0.000
Toluene	A7	0.0054	0.0288	0.002	0.002
2,3-Dimethylhexane	I8	0.0007	0.0046	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0038	0.0251	0.002	0.002
4-Methylheptane	I8	0.0013	0.0086	0.001	0.001
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	0.0031	0.0205	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0037	0.0240	0.002	0.002
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0015	0.0097	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0006	0.0039	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0002	0.0013	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
1,1-Methylethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0011	0.0071	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0046	0.0303	0.002	0.002
1c,4-Dimethylcyclohexane	N8	0.0009	0.0058	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0015	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
2,2-Dimethylheptane	I9	0.0005	0.0037	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0012	0.0087	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0003	0.0022	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
Ethylcyclohexane	N8	0.0012	0.0078	0.001	0.001
n-Propylcyclopentane	N8	0.0004	0.0026	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0003	0.0022	0.000	0.000
2,5-Dimethylheptane	I9	0.0009	0.0067	0.001	0.001
3,3-Dimethylheptane	I9	0.0003	0.0022	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
Ethylbenzene	I8	0.0011	0.0068	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0044	0.0270	0.002	0.002
1,4-Dimethylbenzene (p-Xylene)	A8	0.0013	0.0080	0.001	0.001
3,4-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0008	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0015	0.000	0.000

4-Methyloctane	I9	0.0009	0.0067	0.001	0.001
2-Methyloctane	I9	0.0010	0.0074	0.001	0.001
3-Ethylheptane	I9	0.0002	0.0015	0.000	0.000
3-Methyloctane	I9	0.0001	0.0008	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0013	0.0095	0.001	0.001
1,2-Dimethylbenzene (o-Xylene)	A8	0.0010	0.0061	0.000	0.000
i-Butylcyclopentane	N9	0.0006	0.0044	0.000	0.000
n-Nonane	P9	0.0020	0.0149	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0003	0.0022	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0008	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0004	0.0029	0.000	0.000
3,3-Dimethyloctane	I10	0.0002	0.0016	0.000	0.000
n-Propylbenzene	A9	0.0005	0.0035	0.000	0.000
3,6-Dimethyloctane	I10	0.0002	0.0016	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0005	0.0035	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0006	0.0042	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
5-Methylnonane	I10	0.0003	0.0025	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0014	0.000	0.000
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Ethyloctane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0002	0.0016	0.000	0.000
t-Butylbenzene	A10	0.0003	0.0023	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0008	0.0060	0.000	0.000
n-Decane	P10	0.0003	0.0025	0.000	0.000
UnknownC10s	U10	0.0016	0.0132	0.001	0.001
UnknownC11s	U11	0.0001	0.0009	0.000	0.000
TOTAL		100.00000	100.00000	1.5407	1.5486

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0124	0.0560
TOLUENE	0.0054	0.0288
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	NET HEATING VALUE (60 °F ideal reaction):		21120.2 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		23404.6 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.5963
	DENSITY		0.04560 lb/scf
	COMPRESSIBILITY FACTOR :		0.9977
	REGULAR WOBBE INDEX		1381.1

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

Net Dry Ideal BTU	4867.3 /scf	Relative Density - SG (Air=1)	3.3592	***C6+factors***
Gross Dry Ideal BTU	5228 /scf	**Z** Compressiblity Factor	0.99333	0.99247
Net Dry Ideal BTU	19227.3 /lb	Density Factor	256.413 lbm/1000 ft3	
Gross Dry Ideal BTU	20652.3 /lb	Molar Mass or MW	97.305 g/mol	
		Volume Liquid Ideal gas	0.088 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.