



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	05-045-11737	NAME/DESCRIP :	CHEVRON #8C-5D
LEASE #:	05-045-11737		GARFIELD COUNTY #045
FIELD/AREA:	GRAND VALLEY - #31290		BRAIDEN HEAD
PROJECT NO. :	202306012	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	JUNE 12, 2023 11:00
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MAY 31, 2023 14:40
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	255 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-784
LAB PRES:	psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	69 °f	SAMPLING COMPANY:	CAERUS OIL & GAS LLC
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	0.0023	0.0040	0.0000	0.0000
HELIUM	0.00	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.10	0.15	---	---
CARBON DIOXIDE	2.04	4.81	---	---
METHANE	88.8315	76.3748	---	---
ETHANE	6.1317	9.8813	1.6351	1.6440
PROPANE	1.5633	3.6945	0.4298	0.4321
I-BUTANE	0.3809	1.1865	0.1239	0.1246
N-BUTANE	0.3063	0.9541	0.0959	0.0965
I-PENTANE	0.1630	0.6298	0.0590	0.0593
N-PENTANE	0.0945	0.3654	0.0340	0.0342
HEXANES PLUS	0.3865	1.9496	0.1510	0.1515
TOTALS	100.00000	100.00000	2.5287	2.5422

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0130	0.0544
TOLUENE	0.0684	0.3377
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0814	0.3921

	<u>CALCULATED VALUES**</u>	
	<u>14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	990.1 /scf	995.6 /scf
NET WET REAL :	972.8 /scf	978.3 /scf
HHV GROSS DRY REAL :	1095.9 /scf	1101.9 /scf
GROSS WET REAL :	1076.7 /scf	1082.7 /scf
NET HEATING VALUE (60 °F ideal reaction):		20166.0 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		22313.6 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6439
DENSITY		0.04917 lbm/scf
COMPRESSIBILITY FACTOR :		0.9974
REGULAR WOBBE INDEX		1366.5

*(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. :	202306012	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	JUNE 12, 2023 11:00
ACCOUNT NO. :		SAMPLE DATE :	MAY 31, 2023 14:40
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	ECA-784
LEASE NO. :	05-045-11737	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	CHEVRON #8C-5D GARFIELD COUNTY #045 BRAIDEN HEAD		

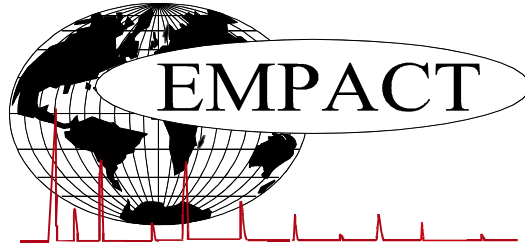
FIELD DATA		SAMPLE TEMP. :	69
SAMPLE PRES. :	255	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	<i>SPOT</i> <i>ppm mol</i> <i>NO PROBE</i>		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.00	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	2.04	4.81
Nitrogen	0.10	0.15
Methane	88.8315	76.3748
Ethane	6.1317	9.8813
Propane	1.5633	3.6945
Isobutane	0.3809	1.1865
n-Butane	0.3063	0.9541
Isopentane	0.1585	0.6129
n-Pentane	0.0945	0.3654
Cyclopentane	0.0045	0.0169
n-Hexane	0.0396	0.1829
Cyclohexane	0.0165	0.0744
Other Hexanes	0.1066	0.4899
Heptanes	0.0595	0.3184
Methylcyclohexane	0.0502	0.2642
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0130	0.0544
Toluene	0.0684	0.3377
Ethylbenzene	0.0000	0.0000
Xylenes	0.0000	0.0000
C8+ Heavies	0.0327	0.2277
<u>Subtotal</u>	<u>99.99770</u>	<u>99.99600</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0023	0.0040
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

	<u>Total</u>	<u>C6+</u>	<u>C8+</u>	<u>C10+</u>
Calculated Values BTU @ 14.65	Sample	Fraction	Fraction	Fraction
LHV Net Dry Real:	990.1	4681.9	6396.8	9757.1 Btu/scf
Net Wet Real:	972.8	4600.1	6285.0	9586.5 Btu/scf
HHV Gross Dry Real:	1095.9	5016.3	6892.7	10492.1 Btu/scf
Gross Wet Real:	1076.7	4928.6	6772.2	10308.7 Btu/scf
Other Calculated Values				
Regualr Wobbe Index*	1366.5	2771.2	3257.3	4072.7 Btu/scf
Net Heating Value (60 °F ideal reaction):	20166.0	18896.1	18954.7	18032.0 Btu/lbm
Gross Heating Value (60°F ideal reaction):	22313.6	20245.7	20424.8	19388.2 Btu/lbm
Molar Mass (MW):	18.65928	94.108	129.752	193.424 g/mol
Relative Density (AIR=1):	0.6439	3.2496	4.4798	6.6784 SG
Density:	0.04917	0.24800	0.34193	0.50970 lbm/scf
Compressibility Factor:	0.9974	0.9928	0.9971	1.0000 Z
Liquid Volume real gas @:	14.65	17.8529	0.1505	0.014 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

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 LEASE #: 05-045-11737 GARFIELD COUNTY #045
 FIELD/AREA: GRAND VALLEY - #31290 BRAIDEN HEAD

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 PRODUCER : CAERUS PICEANCE LLC EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: SPOT
 SAMPLE PRES. : 255 psig PROBE : NO
 FLOW PRES. : psig CYLINDER NO. : ECA-784
 LAB PRES: psig SAMPLED BY : MIKE KELLEY
 SAMPLE TEMP. : 69 °f SAMPLING COMPANY: CAERUS OIL & GAS LLC
 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	---	0.00	0.00	---	---
Hydrogen	---	0.00	0.00	---	---
Oxygen/Argon	---	0.00	0.00	---	---
Nitrogen	---	0.10	0.15	---	---
Carbon Dioxide	---	2.04	4.81	---	---
Methane	P1	88.8315	76.3748	---	---
Ethane	P2	6.1317	9.8813	1.635	1.644
Propane	P3	1.5633	3.6945	0.430	0.432
i-Butane	I4	0.3809	1.1865	0.124	0.125
Methanol	X1	0.0023	0.0040	0.000	0.000
n-Butane	P4	0.3063	0.9541	0.096	0.097
2,2-Dimethylpropane	I5	0.0054	0.0209	0.002	0.002
i-Pentane	I5	0.1531	0.5920	0.056	0.056
n-Pentane	P5	0.0945	0.3654	0.034	0.034
2,2-Dimethylbutane	I6	0.0079	0.0365	0.003	0.003
Cyclopentane	N5	0.0045	0.0169	0.001	0.001
2,3-Dimethylbutane	I6	0.0114	0.0526	0.005	0.005
2-Methylpentane	I6	0.0417	0.1926	0.017	0.017
3-Methylpentane	I6	0.0231	0.1067	0.009	0.009
n-Hexane	P6	0.0396	0.1829	0.016	0.016
2,2-Dimethylpentane	I7	0.0003	0.0016	0.000	0.000
Methylcyclopentane	N6	0.0225	0.1015	0.008	0.008
2,4-Dimethylpentane	I7	0.0024	0.0129	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0007	0.0038	0.000	0.000
Benzene	A6	0.0130	0.0544	0.004	0.004
3,3-Dimethylpentane	I7	0.0007	0.0038	0.000	0.000
Cyclohexane	N6	0.0165	0.0744	0.006	0.006
2-Methylhexane	I7	0.0072	0.0386	0.003	0.003
2,3-Dimethylpentane	I7	0.0033	0.0177	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0018	0.0095	0.001	0.001

3-Methylhexane	I7	0.0078	0.0419	0.004	0.004
1c,3-Dimethylcyclopentane	N7	0.0025	0.0131	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0023	0.0121	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0016	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0037	0.0195	0.002	0.002
n-Heptane	P7	0.0229	0.1230	0.011	0.011
1c,2-Dimethylcyclopentane	N7	0.0006	0.0032	0.000	0.000
Methylcyclohexane	N7	0.0502	0.2642	0.020	0.020
2,2-Dimethylhexane	I8	0.0025	0.0153	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0005	0.0030	0.000	0.000
Ethylcyclopentane	N7	0.0025	0.0131	0.001	0.001
2,5-Dimethylhexane	I8	0.0071	0.0435	0.004	0.004
2,2,3-Trimethylpentane	I8	0.0075	0.0459	0.004	0.004
1c,2t,4-Trimethylcyclopentane	N8	0.0030	0.0181	0.001	0.001
3,3-Dimethylhexane	I8	0.0028	0.0172	0.001	0.001
2,3,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0684	0.3377	0.023	0.023
2,3-Dimethylhexane	I8	0.0008	0.0049	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0002	0.0012	0.000	0.000
1,1,2-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0004	0.0025	0.000	0.000
4-Methylheptane	I8	0.0002	0.0012	0.000	0.000
3-Methylheptane	I8	0.0002	0.0012	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0005	0.0030	0.000	0.000
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0003	0.0018	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
1,1,4-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
n-Undecane	P11	0.0001	0.0009	0.000	0.000
n-Dodecane	P12	0.0003	0.0027	0.000	0.000
1,3,5-Triethylbenzene	A12	0.0001	0.0009	0.000	0.000
1,4-Methyl-n-pentylbenzene	A12	0.0001	0.0009	0.000	0.000
n-Hexylbenzene	A12	0.0001	0.0009	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0004	0.0032	0.000	0.000
n-Tridecane	P13	0.0016	0.0158	0.001	0.001
UnknownC13s	U13	0.0002	0.0020	0.000	0.000
n-Tetradecane	P14	0.0014	0.0149	0.001	0.001
UnknownC14s	U14	0.0002	0.0021	0.000	0.000
n-Pentadecane	P15	0.0004	0.0046	0.000	0.000
UnknownC15s	U15	0.0010	0.0114	0.001	0.001
n-Hexadecane	P16	0.0001	0.0012	0.000	0.000
UnknownC16s	U16	0.0005	0.0061	0.000	0.000
TOTAL		100.0000	100.0000	2.5287	2.5422

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0130	0.0544	LHV NET DRY REAL :	990.1 /scf	995.6 /scf
TOLUENE	0.0684	0.3377	NET WET REAL :	972.8 /scf	978.3 /scf
ETHYLBENZENE	0.0000	0.0000	HHV GROSS DRY REAL :	1095.9 /scf	1101.9 /scf
XYLENES	0.0000	0.0000	GROSS WET REAL :	1076.7 /scf	1082.7 /scf
TOTAL BTEX	0.0814	0.3921	NET HEATING VALUE (60 °F ideal reaction):		20166.0 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		22313.6 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6439
			DENSITY		0.04917 lb/scf
			COMPRESSIBILITY FACTOR :		0.9974
			REGULAR WOBBE INDEX		1366.5

*(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>4662.6</u> /scf	Relative Density - SG (Air=1)	<u>3.2496</u>	C6+ factors
Gross Dry Ideal BTU	<u>4995.6</u> /scf	Z Compressibility Factor	<u>0.99276</u>	<u>0.99197</u>
Net Dry Ideal BTU	<u>18896.1</u> /lb	Density Factor	<u>247.997</u> lbm/1000 ft3	

Gross Dry Ideal BTU 20245.7 /lb

Molar Mass or MW 94.108 g/mol
Volume Liquid Ideal gas 0.151 scf/gal

24.9

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.

The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc. Results of the analysis can be affected by the sampling conditions, therefore, are only warranted through proper lab protocol. EMPACT assumes no responsibility for interpretation or any consequences from application of the reported information and is the sole liability of the user. The reproduction in any media of this reported information may not be made, in portion or as a whole, without the written permission of EMPACT Analytical Systems, Inc.