EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-09022**	NAME/DESCRIP :	**GG3 CHEVRON 33-7D**
LEASE #:	**110170021**		**BRAIDEN HEAD**
FIELD/AREA:	**GRAND VALLEY - #31290**		
PROJECT NO. :	**202405125**	ANALYSIS NO. :	**02**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	MAY 30, 2024 14:38
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MAY 23, 2024 7:30
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	111	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-743
LAB PRES:		psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	43	ºf	SAMPLING COMPANY:	CAERUS OIL & GAS 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
HELIUM	0.00	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.25	0.38	---	---
CARBON DIOXIDE	0.35	0.84	---	---
METHANE	91.4210	80.1488	---	---
ETHANE	4.0405	6.6395	1.0774	1.0833
PROPANE	2.1406	5.1583	0.5877	0.5909
I-BUTANE	0.3450	1.0958	0.1129	0.1136
N-BUTANE	0.6264	1.9896	0.1969	0.1980
I-PENTANE	0.2049	0.8068	0.0750	0.0753
N-PENTANE	0.1859	0.7329	0.0670	0.0673
HEXANES PLUS	0.4257	2.2083	0.1720	0.1723
TOTALS	100.00000	100.00000	2.2889	2.3007

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0350	0.1494
TOLUENE	0.0276	0.1390
ETHYLBENZENE	0.0055	0.0319
XYLENES	0.0158	0.0917
TOTAL BTEX	0.0839	0.4120

CALCULATED VALUES**

	BTU @	14.65	14.73
LHV	NET DRY REAL :	1009.3 /scf	1014.8 /scf
	NET WET REAL :	991.7 /scf	997.2 /scf
HHV	GROSS DRY REAL :	1116.5 /scf	1122.5 /scf
	GROSS WET REAL :	1097.0 /scf	1103.0 /scf
	NET HEATING VALUE (60 °F ideal reaction):		20951.8 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		23181.1 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6310
	DENSITY		0.04822 lbm/scf
	COMPRESSIBILITY FACTOR :		0.9975
	REGULAR WOBBE INDEX		1406.3

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993)*

Mod ASTM D6730,GPA 2261 & GPA 2286.

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

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.

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202405125	ANALYSIS NO. :	02
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	MAY 30, 2024 14:38
ACCOUNT NO. :		SAMPLE DATE :	MAY 23, 2024 7:30
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	ECA-743
LEASE NO. :	110170021	SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	GG3 CHEVRON 33-7D BRAIDEN HEAD		
FIELD DATA		SAMPLE TEMP. :	43
SAMPLE PRES. :	111	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	***SPOT*** ***NO PROBE***		

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	0.35	0.84
Nitrogen	0.25	0.38
Methane	91.4210	80.1488
Ethane	4.0405	6.6395
Propane	2.1406	5.1583
Isobutane	0.3450	1.0958
n-Butane	0.6264	1.9896
Isopentane	0.1954	0.7704
n-Pentane	0.1859	0.7329
Cyclopentane	0.0095	0.0364
n-Hexane	0.0511	0.2407
Cyclohexane	0.0219	0.1007
Other Hexanes	0.0991	0.4641
Heptanes	0.0684	0.3730
Methylcyclohexane	0.0348	0.1867
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0350	0.1494
Toluene	0.0276	0.1390
Ethylbenzene	0.0055	0.0319
Xylenes	0.0158	0.0917
C8+ Heavies	0.0665	0.4311
Subtotal	100.00000	100.00000
Oxygen/Argon	0.00	0.00
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	1009.3	4737.4	5701.3	7064.3	**Btu/scf**
	Net Wet Real:	991.7	4654.6	5601.6	6940.8	**Btu/scf**
HHV	Gross Dry Real:	1116.5	5077.7	6107.5	7599.3	**Btu/scf**
	Gross Wet Real:	1097.0	4988.9	6000.7	7466.5	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1406.3	2794.8	3060.4	3443.9	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		20951.8	19095.5	19256.0	19092.0	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23181.1	20470.0	20634.7	20539.5	**Btu/lbm**
Molar Mass (MW):		18.29975	94.911	115.597	141.746	**g/mol**
Relative Density (AIR=1):		0.6310	3.2775	3.9914	4.8941	**SG**
Density:		0.04822	0.25013	0.30463	0.37352	**lbm/scf**
Compressiblity Factor:		0.9975	0.9933	0.9980	0.9994	**Z**
Liquid Volume real gas @:	**14.65**	17.7812	0.1715	0.0389	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.

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.

EMPACT Analytical Systems Inc. 365 S Main St Brighton, CO 80601 303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:	**05-045-09022**	NAME/DESCRIP :	**GG3 CHEVRON 33-7D**
LEASE #:	**110170021**		**BRAIDEN HEAD**
FIELD/AREA:	**GRAND VALLEY - #31290**		
PROJECT NO. :	**202405125**	ANALYSIS NO. :	**02**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	MAY 30, 2024 14:38
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MAY 23, 2024 7:30
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	111 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-743
LAB PRES:	psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	43 ºf	SAMPLING COMPANY:	CAERUS OIL & GAS 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	---	0.00	0.00	---	---
Hydrogen	---	0.01	0.00	---	---
Oxygen/Argon	---	0.00	0.00	---	---
Nitrogen	---	0.25	0.38	---	---
Carbon Dioxide	---	0.35	0.84	---	---
Methane	P1	91.4210	80.1488	---	---
Ethane	P2	4.0405	6.6395	1.077	1.083
Propane	P3	2.1406	5.1583	0.588	0.591
i-Butane	I4	0.3450	1.0958	0.113	0.114
n-Butane	P4	0.6264	1.9896	0.197	0.198
2,2-Dimethylpropane	I5	0.0015	0.0059	0.001	0.001
i-Pentane	I5	0.1939	0.7645	0.071	0.071
n-Pentane	P5	0.1859	0.7329	0.067	0.067
2,2-Dimethylbutane	I6	0.0018	0.0085	0.001	0.001
Cyclopentane	N5	0.0095	0.0364	0.003	0.003
2,3-Dimethylbutane	I6	0.0066	0.0311	0.003	0.003
2-Methylpentane	I6	0.0437	0.2058	0.018	0.018
3-Methylpentane	I6	0.0228	0.1074	0.009	0.009
n-Hexane	P6	0.0511	0.2407	0.021	0.021
2,2-Dimethylpentane	I7	0.0006	0.0033	0.000	0.000
Methylcyclopentane	N6	0.0242	0.1113	0.009	0.009
2,4-Dimethylpentane	I7	0.0017	0.0093	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0003	0.0016	0.000	0.000
Benzene	A6	0.0350	0.1494	0.010	0.010
3,3-Dimethylpentane	I7	0.0004	0.0022	0.000	0.000
Cyclohexane	N6	0.0219	0.1007	0.007	0.007
2-Methylhexane	I7	0.0107	0.0586	0.005	0.005
2,3-Dimethylpentane	I7	0.0039	0.0214	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0017	0.0091	0.001	0.001
3-Methylhexane	I7	0.0106	0.0580	0.005	0.005

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150

1c,3-Dimethylcyclopentane	N7	0.0039	0.0209	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0035	0.0188	0.002	0.002
3-Ethylpentane	I7	0.0005	0.0027	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0062	0.0333	0.003	0.003
n-Heptane	P7	0.0218	0.1194	0.010	0.010
1c,2-Dimethylcyclopentane	N7	0.0005	0.0027	0.000	0.000
Methylcyclohexane	N7	0.0348	0.1867	0.014	0.014
2,2-Dimethylhexane	I8	0.0011	0.0069	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0005	0.0031	0.000	0.000
Ethylcyclopentane	N7	0.0016	0.0086	0.001	0.001
2,5-Dimethylhexane	I8	0.0009	0.0056	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0009	0.0056	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0014	0.0086	0.001	0.001
3,3-Dimethylhexane	I8	0.0002	0.0013	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0276	0.1390	0.009	0.009
2,3-Dimethylhexane	I8	0.0011	0.0069	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0004	0.0025	0.000	0.000
2-Methylheptane	I8	0.0056	0.0350	0.003	0.003
4-Methylheptane	I8	0.0013	0.0081	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0002	0.0013	0.000	0.000
3,4-Dimethylhexane	I8	0.0003	0.0019	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0031	0.0193	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0046	0.0282	0.002	0.002
3-Ethylhexane	I8	0.0005	0.0031	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0021	0.0129	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0007	0.0043	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0004	0.0025	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0004	0.0025	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0006	0.0037	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0019	0.0116	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0093	0.0580	0.005	0.005
1c,4-Dimethylcyclohexane	N8	0.0011	0.0067	0.001	0.001
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0001	0.0007	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
2,2-Dimethylheptane	I9	0.0007	0.0049	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0032	0.0221	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0005	0.0035	0.000	0.000
2,4-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0029	0.0178	0.001	0.001
n-Propylcyclopentane	N8	0.0010	0.0061	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0003	0.0021	0.000	0.000
2,5-Dimethylheptane	I9	0.0014	0.0098	0.001	0.001
3,3-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0002	0.0014	0.000	0.000
Ethylbenzene	I8	0.0055	0.0319	0.002	0.002
1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0092	0.0534	0.004	0.004
1,4-Dimethylbenzene (p-Xylene)	A8	0.0021	0.0122	0.001	0.001

3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0005	0.0035	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0014	0.000	0.000
4-Methyloctane	I9	0.0010	0.0070	0.001	0.001
2-Methyloctane	I9	0.0016	0.0112	0.001	0.001
1c,2t,3-Trimethylcyclohexane	N9	0.0002	0.0014	0.000	0.000
3-Ethylheptane	I9	0.0002	0.0014	0.000	0.000
3-Methyloctane	I9	0.0003	0.0021	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0016	0.0110	0.001	0.001
1,1,2-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3,3-Diethylpentane	I9	0.0002	0.0014	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0045	0.0261	0.002	0.002
i-Butylcyclopentane	N9	0.0011	0.0076	0.001	0.001
n-Nonane	P9	0.0027	0.0189	0.002	0.002
1,1-Methylethylcyclohexane	N9	0.0005	0.0034	0.000	0.000
i-Propylbenzene	A9	0.0008	0.0053	0.000	0.000
i-Propylcyclohexane	N9	0.0003	0.0021	0.000	0.000
2,2-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	0.0027	0.000	0.000
3,6-Dimethyloctane	I10	0.0005	0.0039	0.000	0.000
1,3-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0022	0.0154	0.001	0.001
UnknownC10s	U10	0.0007	0.0055	0.000	0.000
TOTAL		100.00000	100.00000	2.2889	2.3007

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0350	0.1494
TOLUENE	0.0276	0.1390
ETHYLBENZENE	0.0055	0.0319
XYLENES	0.0158	0.0917
TOTAL BTEX	0.0839	0.4120

**(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 :	1009.3 /scf	1014.8 /scf
	NET WET REAL :	991.7 /scf	997.2 /scf
HHV	GROSS DRY REAL :	1116.5 /scf	1122.5 /scf
	GROSS WET REAL :	1097.0 /scf	1103.0 /scf
	NET HEATING VALUE (60 °F ideal reaction):		20951.8 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		23181.1 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6310
	DENSITY		0.04822 lb/scf
	COMPRESSIBILITY FACTOR :		0.9975
	REGULAR WOBBE INDEX		1406.3

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

Net Dry Ideal BTU	4720.5 /scf	Relative Density - SG (Air=1)	3.2775	***C6+factors***
Gross Dry Ideal BTU	5059.6 /scf	**Z** Compressiblity Factor	0.99331	0.99246
Net Dry Ideal BTU	19095.5 /lb	Density Factor	250.129 lbm/1000 ft3	
Gross Dry Ideal BTU	20470 /lb	Molar Mass or MW	94.911 g/mol	
		Volume Liquid Ideal gas	0.172 scf/gal	24.4

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.

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150