



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-045-13080** NAME/DESCRIP : **Unocal Encana 14D-9D**
 LEASE #: **05-045-13080** **U2 Pad**
 FIELD/AREA: **Surface Casing**

PROJECT NO. : **202103020** ANALYSIS NO. : **04**
 COMPANY NAME : **CAERUS OIL & GAS LLC** ANALYSIS DATE: **MARCH 03, 2021 12:43**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **MARCH 1, 2021 14:15**
 CUSTOMER REF: TO:
 PRODUCER : EFFECTIVE DATE:

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

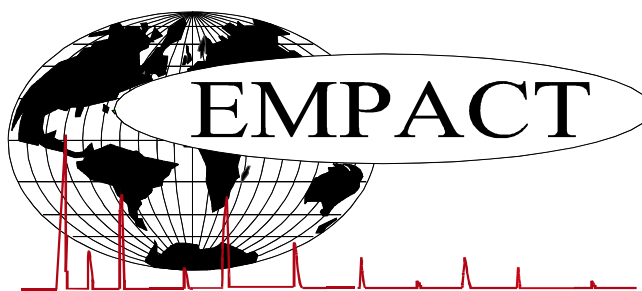
SAMPLE CYCLE: SAMPLE TYPE: **SPOT**
 SAMPLE PRES. : **psig** PROBE :
 FLOW PRES. : **psig** CYLINDER NO. : **1L TEDLAR**
 LAB PRES: **psig** SAMPLED BY : **BRETT MIDDLETON**
 SAMPLE TEMP. : **°f** SAMPLING COMPANY: **CAERUS OIL & GAS LLC**
 AMBIENT TEMP.: **°f** H2S BY STAIN TUBE: **- ppm**
 H2O BY STAIN 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>
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	16.07	20.07	---	---
NITROGEN	57.35	62.72	---	---
CARBON DIOXIDE	0.03	0.05	---	---
METHANE	25.8138	16.1706	---	---
ETHANE	0.5606	0.6582	0.1496	0.1505
PROPANE	0.1085	0.1868	0.0299	0.0301
I-BUTANE	0.0169	0.0383	0.0060	0.0060
N-BUTANE	0.0219	0.0497	0.0070	0.0070
I-PENTANE	0.0065	0.0184	0.0020	0.0020
N-PENTANE	0.0050	0.0141	0.0020	0.0020
HEXANES PLUS	0.0068	0.0239	0.0010	0.0010
TOTALS	100.00000	100.00000	0.1975	0.1986

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>	<u>BTU @ 14.65</u>	<u>14.73</u>
BENZENE	0.0003	0.0009	LHV NET DRY REAL : 247.5 /scf	248.9 /scf
TOLUENE	0.0001	0.0004	NET WET REAL : 243.2 /scf	244.6 /scf
ETHYLBENZENE	0.0000	0.0000	HHV GROSS DRY REAL : 274.5 /scf	276.0 /scf
XYLENES	0.0000	0.0000	GROSS WET REAL : 269.7 /scf	271.2 /scf
TOTAL BTEX	0.0004	0.0013	NET HEATING VALUE (60 °F ideal reaction):	3678.8 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):	4081.8 Btu/lbm
			RELATIVE DENSITY (AIR=1):	0.8840
			DENSITY	0.06750 lbm/scf
			COMPRESSIBILITY FACTOR :	0.9993
			REGULAR WOBBE INDEX	292.7

*(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.



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GLYCALC INFORMATION

PROJECT NO. :	202103020	ANALYSIS NO. :	04
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	MARCH 03, 2021 12:43
ACCOUNT NO. :		SAMPLE DATE :	MARCH 1, 2021 14:15
PRODUCER :		CYLINDER NO. :	1L TEDLAR
LEASE NO. :	05-045-13080	SAMPLED BY :	BRETT MIDDLETON
NAME/DESCRIP :	Unocal Encana 14D-9D U2 Pad Surface Casing		

FIELD DATA

SAMPLE PRES. :		SAMPLE TEMP. :	
H2S BY STAIN TUBE:	- ppm	AMBIENT TEMP.:	
COMMENTS :	<i>SPOT</i>		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	0.03	0.05
Nitrogen	57.35	62.72
Methane	25.8138	16.1706
Ethane	0.5606	0.6582
Propane	0.1085	0.1868
Isobutane	0.0169	0.0383
n-Butane	0.0219	0.0497
Isopentane	0.0063	0.0178
n-Pentane	0.0050	0.0141
Cyclopentane	0.0002	0.0006
n-Hexane	0.0011	0.0037
Cyclohexane	0.0005	0.0016
Other Hexanes	0.0029	0.0097
Heptanes	0.0012	0.0048
Methylcyclohexane	0.0004	0.0015
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0003	0.0009
Toluene	0.0001	0.0004
Ethylbenzene	0.0000	0.0000
Xylenes	0.0000	0.0000
C8+ Heavies	0.0003	0.0013
<u>Subtotal</u>	<u>83.93000</u>	<u>79.93000</u>
<u>Oxygen/Argon</u>	<u>16.07</u>	<u>20.07</u>
Total	100.00000	100.00000

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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DHA COMPONENT LIST

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 SAMPLE CYCLE: **SAMPLE TYPE: SPOT**
 SAMPLE PRES. : **psig** PROBE :
 FLOW PRES. : **psig** CYLINDER NO. : **1L TEDLAR**
 LAB PRES: **psig** SAMPLED BY : **BRETT MIDDLETON**
 SAMPLE TEMP. : **°f** SAMPLING COMPANY: **CAERUS OIL & GAS LLC**
 AMBIENT TEMP.: **°f** H2S BY STAIN TUBE: **- ppm**
 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	---	---
Oxygen/Argon	---	16.07	20.07	---	---
Nitrogen	---	57.35	62.72	---	---
Carbon Dioxide	---	0.03	0.05	---	---
Methane	P1	25.8138	16.1706	---	---
Ethane	P2	0.5606	0.6582	0.150	0.151
Propane	P3	0.1085	0.1868	0.030	0.030
i-Butane	I4	0.0169	0.0383	0.006	0.006
n-Butane	P4	0.0219	0.0497	0.007	0.007
2,2-Dimethylpropane	I5	0.0003	0.0009	0.000	0.000
i-Pentane	I5	0.0060	0.0169	0.002	0.002
n-Pentane	P5	0.0050	0.0141	0.002	0.002
2,2-Dimethylbutane	I6	0.0002	0.0007	0.000	0.000
Cyclopentane	N5	0.0002	0.0006	0.000	0.000
2,3-Dimethylbutane	I6	0.0003	0.0010	0.000	0.000
2-Methylpentane	I6	0.0013	0.0044	0.001	0.001
3-Methylpentane	I6	0.0006	0.0020	0.000	0.000
n-Hexane	P6	0.0011	0.0037	0.000	0.000
Methylcyclopentane	N6	0.0005	0.0016	0.000	0.000
2,4-Dimethylpentane	I7	0.0001	0.0004	0.000	0.000
Benzene	A6	0.0003	0.0009	0.000	0.000
Cyclohexane	N6	0.0005	0.0016	0.000	0.000
2-Methylhexane	I7	0.0001	0.0004	0.000	0.000
2,3-Dimethylpentane	I7	0.0002	0.0008	0.000	0.000
1,1-Dimethylcyclopentane	N7	0.0001	0.0004	0.000	0.000
3-Methylhexane	I7	0.0002	0.0008	0.000	0.000
1c,3-Dimethylcyclopentane	N7	0.0001	0.0004	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0001	0.0004	0.000	0.000
n-Heptane	P7	0.0003	0.0012	0.000	0.000

Methylcyclohexane	N7	0.0004	0.0015	0.000	0.000
Toluene	A7	0.0001	0.0004	0.000	0.000
2-Methylheptane	I8	0.0001	0.0004	0.000	0.000
n-Octane	P8	0.0001	0.0004	0.000	0.000
<u>1,2-Methylethylbenzene</u>	A9	<u>0.0001</u>	<u>0.0005</u>	<u>0.000</u>	<u>0.000</u>
TOTAL		100.00000	100.00000	0.1975	0.1986

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0003	0.0009
TOLUENE	0.0001	0.0004
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0004	0.0013

BTU @	14.65	14.73
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NET WET REAL :	243.2 /scf	244.6 /scf
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NET HEATING VALUE (60 °F ideal reaction):		3678.8 Btu/lbm
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RELATIVE DENSITY (AIR=1):		0.8840
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 (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>4559 /scf</u>	Relative Density - SG (Air=1)	<u>3.1087</u>	C6+factors
Gross Dry Ideal BTU	<u>4906.7 /scf</u>	Z Compressibility Factor	<u>0.99026</u>	<u>0.98961</u>
Net Dry Ideal BTU	<u>19284.3 /lb</u>	Density Factor	<u>237.248 lbm/1000 ft3</u>	
Gross Dry Ideal BTU	<u>20755.1 /lb</u>	Molar Mass or MW	<u>90.032 g/mol</u>	
		Volume Liquid Ideal gas	<u>0.001 scf/gal</u>	<u>25</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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