

**EXTENDED NATURAL GAS ANALYSIS (\*DHA)**

**MAIN PAGE**

PRIMARY DB KEY:	<b>05-103-11059</b>	NAME/DESCRIP :	<b>YELLOW CREEK FEDERAL XOM 2-22-0246</b>
LEASE #:			<b>PRODUCTION CASING</b>
FIELD/AREA:	<b>YELLOW CREEK, COC62048</b>		
PROJECT NO. :	<b>202404020</b>	ANALYSIS NO. :	<b>04</b>
COMPANY NAME :	<b>CAERUS OIL &amp; GAS LLC</b>	ANALYSIS DATE:	<b>APRIL 11, 2024 10:40</b>
OFFICE / BRANCH:	<b>PARACHUTE, CO</b>	SAMPLE DATE :	<b>MARCH 28, 2024 9:00</b>
CUSTOMER REF:		TO:	
PRODUCER :	<b>CAERUS PICEANCE, LLC</b>	EFFECTIVE DATE:	

**\*\*\*FIELD DATA\*\*\***

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	204 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-719
LAB PRES:	psig	SAMPLED BY :	JUSTIN STEELE
SAMPLE TEMP. :	43 °f	SAMPLING COMPANY:	CAERUS
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	0.1724	0.2853	0.0220	0.0221
HELIUM	0.02	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.23	0.33	---	---
CARBON DIOXIDE	1.52	3.46	---	---
METHANE	85.5530	70.8928	---	---
ETHANE	7.7911	12.1007	2.0774	2.0888
PROPANE	2.8013	6.3805	0.7698	0.7740
I-BUTANE	0.6027	1.8094	0.1969	0.1980
N-BUTANE	0.5690	1.7083	0.1790	0.1799
I-PENTANE	0.2344	0.8728	0.0850	0.0854
N-PENTANE	0.1509	0.5623	0.0550	0.0553
HEXANES PLUS	0.3452	1.5979	0.1370	0.1376
<b>TOTALS</b>	<b>100.00000</b>	<b>100.00000</b>	<b>3.5221</b>	<b>3.5411</b>

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0126	0.0508
TOLUENE	0.0080	0.0381
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0003	0.0017
<b>TOTAL BTEX</b>	<b>0.0209</b>	<b>0.0906</b>

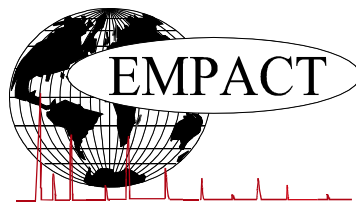
	<u>CALCULATED VALUES**</u>	
	<u>14.65</u>	<u>14.73</u>
<b>LHV NET DRY REAL :</b>	1034.7 /scf	1040.4 /scf
<b>NET WET REAL :</b>	1016.6 /scf	1022.3 /scf
<b>HHV GROSS DRY REAL :</b>	1143.9 /scf	1150.1 /scf
<b>GROSS WET REAL :</b>	1123.9 /scf	1130.1 /scf
<b>NET HEATING VALUE (60 °F ideal reaction):</b>		20296.1 Btu/lbm
<b>GROSS HEATING VALUE (60°F ideal reaction):</b>		22431.5 Btu/lbm
<b>RELATIVE DENSITY (AIR=1):</b>		0.6681
<b>DENSITY</b>		0.05101 lbm/scf
<b>COMPRESSIBILITY FACTOR :</b>		0.9971
<b>REGULAR WOBBE INDEX</b>		1399.8

\*(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.



**EXTENDED NATURAL GAS ANALYSIS (\*DHA)  
GLYCALC INFORMATION**

PROJECT NO. :	202404020	ANALYSIS NO. :	04
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	APRIL 11, 2024 10:40
ACCOUNT NO. :		SAMPLE DATE :	MARCH 28, 2024 9:00
PRODUCER :	CAERUS PICEANCE, LLC	CYLINDER NO. :	ECA-719
LEASE NO. :		SAMPLED BY :	JUSTIN STEELE
NAME/DESCRIP :	YELLOW CREEK FEDERAL XOM 2-22-0246 PRODUCTION CASING		

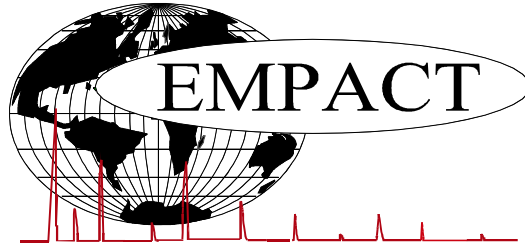
***FIELD DATA***		SAMPLE TEMP. :	43
SAMPLE PRES. :	204	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	<i>SPOT</i>		<i>NO PROBE</i>

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.02	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	1.52	3.46
Nitrogen	0.23	0.33
Methane	85.5530	70.8928
Ethane	7.7911	12.1007
Propane	2.8013	6.3805
Isobutane	0.6027	1.8094
n-Butane	0.5690	1.7083
Isopentane	0.2275	0.8478
n-Pentane	0.1509	0.5623
Cyclopentane	0.0069	0.0250
n-Hexane	0.0630	0.2804
Cyclohexane	0.0355	0.1543
Other Hexanes	0.1245	0.5511
Heptanes	0.0654	0.3371
Methylcyclohexane	0.0332	0.1684
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0126	0.0508
Toluene	0.0080	0.0381
Ethylbenzene	0.0000	0.0000
Xylenes	0.0003	0.0017
C8+ Heavies	0.0027	0.0160
<u>Subtotal</u>	<u>99.82760</u>	<u>99.71470</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.1724	0.2853
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

	<u>Total</u>	<u>C6+</u>	<u>C8+</u>	<u>C10+</u>	
<b>Calculated Values BTU @</b> <b>14.65</b>	<b>Sample</b>	<b>Fraction</b>	<b>Fraction</b>	<b>#DIV/0!</b>	
LHV Net Dry Real:	1034.7	4538.5	5503.3	#DIV/0!	Btu/scf
Net Wet Real:	1016.6	4459.2	5407.1	#DIV/0!	Btu/scf
HHV Gross Dry Real:	1143.9	4881.7	5921.2	#DIV/0!	Btu/scf
Gross Wet Real:	1123.9	4796.4	5817.7	#DIV/0!	Btu/scf
<b>Other Calculated Values</b>					
Regualr Wobbe Index*	1399.8	2758.6	2997.5	#DIV/0!	Btu/scf
Net Heating Value (60 °F ideal reaction):	20296.1	19231.6	19647.4	#DIV/0!	Btu/lbm
Gross Heating Value (60°F ideal reaction):	22431.5	20687.6	21141.5	#DIV/0!	Btu/lbm
Molar Mass (MW):	19.3605	89.584	112.886	#DIV/0!	g/mol
Relative Density (AIR=1):	0.6681	3.0928	3.8976	#DIV/0!	SG
Density:	0.05101	0.23607	0.29747	#DIV/0!	lbm/scf
Compressibility Factor:	0.9971	0.9907	0.9963	#DIV/0!	Z
Liquid Volume real gas @:	<b>14.65</b>	18.2198	0.1366	0	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 underscore) indicates there was no tube pulled for H2S.

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**EXTENDED NATURAL GAS ANALYSIS (\*DHA)**

**DHA COMPONENT LIST**

PRIMARY DB KEY: **05-103-11059** NAME/DESCRIP : **YELLOW CREEK FEDERAL XOM 2-22-0246**  
 LEASE #: **PRODUCTION CASING**  
 FIELD/AREA: **YELLOW CREEK, COC62048**

PROJECT NO. : **202404020** ANALYSIS NO. : **04**  
 COMPANY NAME : **CAERUS OIL & GAS LLC** ANALYSIS DATE: **APRIL 11, 2024 10:40**  
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **MARCH 28, 2024 9:00**  
 CUSTOMER REF: **TO:**  
 PRODUCER : **CAERUS PICEANCE, LLC** EFFECTIVE DATE:

**\*\*\*FIELD DATA\*\*\***

SAMPLE CYCLE: **SAMPLE TYPE: SPOT**  
 SAMPLE PRES. : **204 psig** PROBE : **NO**  
 FLOW PRES. : **psig** CYLINDER NO. : **ECA-719**  
 LAB PRES: **psig** SAMPLED BY : **JUSTIN STEELE**  
 SAMPLE TEMP. : **43 °f** SAMPLING COMPANY: **CAERUS**  
 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	---	0.02	0.00	---	---
Hydrogen	---	0.01	0.00	---	---
Oxygen/Argon	---	0.00	0.00	---	---
Nitrogen	---	0.23	0.33	---	---
Carbon Dioxide	---	1.52	3.46	---	---
Methane	P1	85.5530	70.8928	---	---
Ethane	P2	7.7911	12.1007	2.077	2.089
Propane	P3	2.8013	6.3805	0.770	0.774
i-Butane	I4	0.6027	1.8094	0.197	0.198
Methanol	X1	0.1724	0.2853	0.022	0.022
n-Butane	P4	0.5690	1.7083	0.179	0.180
2,2-Dimethylpropane	I5	0.0051	0.0190	0.002	0.002
i-Pentane	I5	0.2224	0.8288	0.081	0.081
n-Pentane	P5	0.1509	0.5623	0.055	0.055
2,2-Dimethylbutane	I6	0.0061	0.0272	0.003	0.003
Cyclopentane	N5	0.0069	0.0250	0.002	0.002
2,3-Dimethylbutane	I6	0.0117	0.0521	0.005	0.005
2-Methylpentane	I6	0.0489	0.2177	0.020	0.020
3-Methylpentane	I6	0.0271	0.1206	0.011	0.011
n-Hexane	P6	0.0630	0.2804	0.026	0.026
2,2-Dimethylpentane	I7	0.0017	0.0088	0.001	0.001
Methylcyclopentane	N6	0.0307	0.1335	0.011	0.011
2,4-Dimethylpentane	I7	0.0031	0.0161	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0008	0.0041	0.000	0.000
Benzene	A6	0.0126	0.0508	0.004	0.004
3,3-Dimethylpentane	I7	0.0009	0.0047	0.000	0.000
Cyclohexane	N6	0.0355	0.1543	0.012	0.012
2-Methylhexane	I7	0.0123	0.0637	0.006	0.006
2,3-Dimethylpentane	I7	0.0031	0.0161	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0027	0.0137	0.001	0.001

3-Methylhexane	I7	0.0104	0.0538	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0040	0.0203	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0035	0.0178	0.002	0.002
3-Ethylpentane	I7	0.0004	0.0021	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0055	0.0279	0.003	0.003
n-Heptane	P7	0.0158	0.0818	0.007	0.007
1c,2-Dimethylcyclopentane	N7	0.0004	0.0020	0.000	0.000
Methylcyclohexane	N7	0.0332	0.1684	0.013	0.013
2,2-Dimethylhexane	I8	0.0006	0.0036	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0007	0.0036	0.000	0.000
2,5-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0002	0.0012	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
2,3,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0080	0.0381	0.003	0.003
2,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0002	0.0012	0.000	0.000
4-Methylheptane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0001	0.0006	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0002	0.0011	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0002	0.0012	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0002	0.0011	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0006	0.000	0.000
<b>TOTAL</b>		<b>100.0000</b>	<b>100.0000</b>	<b>3.5221</b>	<b>3.5411</b>

**CALCULATED VALUES\*\***

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0126	0.0508	LHV NET DRY REAL :	1034.7 /scf	1040.4 /scf
TOLUENE	0.0080	0.0381	NET WET REAL :	1016.6 /scf	1022.3 /scf
ETHYLBENZENE	0.0000	0.0000	HHV GROSS DRY REAL :	1143.9 /scf	1150.1 /scf
XYLENES	0.0003	0.0017	GROSS WET REAL :	1123.9 /scf	1130.1 /scf
TOTAL BTEX	0.0209	0.0906	NET HEATING VALUE (60 °F ideal reaction):		20296.1 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		22431.5 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6681
			DENSITY		0.05101 lb/scf
			COMPRESSIBILITY FACTOR :		0.9971
			REGULAR WOBBE INDEX		1399.8

\*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730, GPA 2261 & GPA 2286.

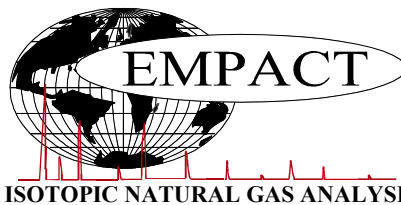
\*\* (CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

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

Net Dry Ideal BTU	<u>4510.4</u> /scf	Relative Density - SG (Air=1)	<u>3.0928</u>	<b>C6+ factors</b>
Gross Dry Ideal BTU	<u>4851.4</u> /scf	Z Compressibility Factor	<u>0.99069</u>	<u>0.99023</u>
Net Dry Ideal BTU	<u>19231.6</u> /lb	Density Factor	<u>236.071</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20687.6</u> /lb	Molar Mass or MW	<u>89.584</u> g/mol	
		Volume Liquid Ideal gas	<u>0.137</u> scf/gal	<u>25.1</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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PRIMARY DB KEY: **05-103-11059** NAME/DESCRIP : **YELLOW CREEK FEDERAL XOM 2-22-0246**  
 LEASE #: **PRODUCTION CASING**  
 FIELD/AREA: **YELLOW CREEK, COC62048**

PROJECT NO. : **202404020** ANALYSIS NO. : **04**  
 COMPANY NAME : **CAERUS OIL & GAS LLC** ANALYSIS DATE: **APRIL 17, 2024 00:00**  
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **MARCH 28, 2024 9:00**  
 CUSTOMER REF: **TO:**  
 PRODUCER : **CAERUS PICEANCE, LLC** EFFECTIVE DATE:

**\*\*\*FIELD DATA\*\*\***

SAMPLE CYCLE: SAMPLE TYPE: **SPOT**  
 SAMPLE PRES. : 204 psig PROBE : **NO**  
 FLOW PRES. : psig CYLINDER NO. : **ECA-719**  
 LAB PRES: psig SAMPLED BY : **JUSTIN STEELE**  
 SAMPLE TEMP. : 43 °f SAMPLING COMPANY: **CAERUS**  
 AMBIENT TEMP.: °f H2S BY STAIN TUBE: **-** ppm mol  
 H2O BY STAIN TUBE: **-** #/mmcf CO2 BY STAIN TUBE: **-** Mol %  
 FIELD COMMENTS:  
 LAB COMMENTS:

COMPONENTS	NORM. MOLE%	GPM @ 14.65	d13C ‰ VPDB	dD ‰ VSMOW
HELIUM	0.02	-	-	-
HYDROGEN	0.01	-	-	-
OXYGEN/ARGON	0.00	-	-	-
NITROGEN	0.23	-	-	-
CO2	1.52	-	-4.4	-
METHANE	85.55	-	-39.6	-187
ETHANE	7.79	2.0823	-28.3	-
PROPANE	2.80	0.7717	-26.0	-
ISOBUTANE	0.60	0.1989	-26.3	-
N-BUTANE	0.57	0.1789	-25.5	-
ISOPENTANE	0.23	0.0800	-26.3	-
N-PENTANE	0.15	0.0540	-25.1	-
HEXANES+	0.52	0.1510	-	-
<b>TOTAL</b>	<b>100.00</b>	<b>3.5168</b>		

BTU @ 60 DEG F

**14.65**  
 GROSS DRY REAL = 1145.3 /scf  
 GROSS SATURATED REAL = 1125.3 /scf

RELATIVE DENSITY (AIR=1 @14.696 PSIA 60F) 0.668  
 GRAVITY (LB/SCF) 0.05098  
 COMPRESSIBILITY FACTOR : 0.99720

NOTE: REFERENCE GPA 2261(ASTM D1945 & ASME-PTC), 2145, & 2172 CURRENT PUBLICATIONS

Reference: Per GPA 2172-14 sec 9 **The C6+ is derived from the following ratios of C6, C7 & C8+ respectively: 60% 30% 10%**

The NG Composition File #: **202404020-04-A-120**  
 The Isotopic Data File #: **DIG-035191**

Note: Stable isotope results based on multi-point laboratory calibration

Precision δ<sup>13</sup>C < 0.5 ‰ Precision δD < 5.0 ‰

Values in red represent low peak heights. Interpret with caution.

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