EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-10976**	NAME/DESCRIP :	**FEDERAL #2S-95-15-42BP**
LEASE #:	**05-103-10976**		**RIO BLANCO COUNTY #103**
FIELD/AREA:	**PICEANCE CREEK - #68800**		**CASING**
PROJECT NO. :	**202306008**	ANALYSIS NO. :	**01**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	JUNE 04, 2023 10:57
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MAY 10, 2023 14:30
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	2000	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-805
LAB PRES:		psig	SAMPLED BY :	NICK CROY
SAMPLE TEMP. :	64	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
ALCOHOLS	0.0117	0.0158	0.0020	0.0020
HELIUM	0.00	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.09	0.09	---	---
CARBON DIOXIDE	4.13	6.84	---	---
METHANE	70.4792	42.5375	---	---
ETHANE	9.6080	10.8691	2.5660	2.5800
PROPANE	4.3386	7.1975	1.1934	1.1999
I-BUTANE	1.6652	3.6413	0.5446	0.5476
N-BUTANE	1.6704	3.6526	0.5256	0.5285
I-PENTANE	1.5182	4.1163	0.5516	0.5547
N-PENTANE	1.0330	2.8040	0.3734	0.3755
HEXANES PLUS	5.4557	18.2359	2.1784	2.1903
TOTALS	100.00000	100.00000	7.9350	7.9785

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.2921	0.8584
TOLUENE	0.1164	0.4035
ETHYLBENZENE	0.0003	0.0012
XYLENES	0.0032	0.0128
TOTAL BTEX	0.4120	1.2759

**(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 :	1337.2 /scf	1344.5 /scf
	NET WET REAL :	1313.8 /scf	1321.1 /scf
HHV	GROSS DRY REAL :	1466.2 /scf	1474.2 /scf
	GROSS WET REAL :	1440.6 /scf	1448.6 /scf

NET HEATING VALUE (60 °F ideal reaction):	19095.2 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	20934.2 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.9172
DENSITY	0.07004 **lbm/scf**
COMPRESSIBILITY FACTOR :	0.9957
REGULAR WOBBE INDEX	1529.2

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202306008	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	JUNE 04, 2023 10:57
ACCOUNT NO. :		SAMPLE DATE :	MAY 10, 2023 14:30
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	ECA-805
LEASE NO. :	05-103-10976	SAMPLED BY :	NICK CROY
NAME/DESCRIP :	FEDERAL #2S-95-15-42BP RIO BLANCO COUNTY #103 CASING		
FIELD DATA		SAMPLE TEMP. :	64
SAMPLE PRES. :	2000	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT* *NO PROBE*		

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	4.13	6.84
Nitrogen	0.09	0.09
Methane	70.4792	42.5375
Ethane	9.6080	10.8691
Propane	4.3386	7.1975
Isobutane	1.6652	3.6413
n-Butane	1.6704	3.6526
Isopentane	1.4547	3.9487
n-Pentane	1.0330	2.8040
Cyclopentane	0.0635	0.1676
n-Hexane	1.1477	3.7210
Cyclohexane	0.4865	1.5404
Other Hexanes	2.0806	6.7125
Heptanes	1.0298	3.8627
Methylcyclohexane	0.2685	0.9918
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.2921	0.8584
Toluene	0.1164	0.4035
Ethylbenzene	0.0003	0.0012
Xylenes	0.0032	0.0128
C8+ Heavies	0.0306	0.1316
Subtotal	99.98830	99.98420
Oxygen/Argon	0.00	0.00
Alcohols	0.0117	0.0158
Total	100.00000	100.00000

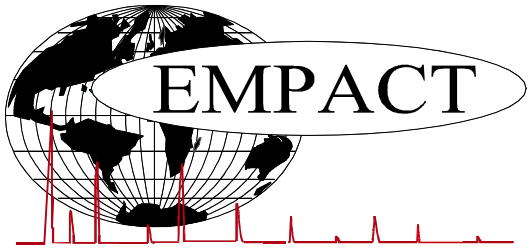
Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	1337.2	4507.2	5579.0	6335.0	**Btu/scf**
	Net Wet Real:	1313.8	4428.4	5481.5	6224.3	**Btu/scf**
HHV	Gross Dry Real:	1466.2	4848.2	6000.1	6686.2	**Btu/scf**
	Gross Wet Real:	1440.6	4763.4	5895.2	6569.3	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1529.2	2749.7	3032.3	3114.1	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		19095.2	19247.7	19621.3	17958.2	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		20934.2	20705.8	21105.7	18953.7	**Btu/lbm**
Molar Mass (MW):		26.58088	88.837	113.335	134.221	**g/mol**
Relative Density (AIR=1):		0.9172	3.0672	3.9137	4.6343	**SG**
Density:		0.07004	0.23412	0.29865	0.35369	**lbm/scf**
Compressiblity Factor:		0.9957	0.9902	0.9967	0.9995	**Z**
Liquid Volume real gas @:	**14.65**	20.4927	2.1692	0.012	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.

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:	**05-103-10976**	NAME/DESCRIP :	**FEDERAL #2S-95-15-42BP**
LEASE #:	**05-103-10976**		**RIO BLANCO COUNTY #103**
FIELD/AREA:	**PICEANCE CREEK - #68800**		**CASING**
PROJECT NO. :	**202306008**	ANALYSIS NO. :	**01**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	JUNE 04, 2023 10:57
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MAY 10, 2023 14:30
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	2000 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-805
LAB PRES:	psig	SAMPLED BY :	NICK CROY
SAMPLE TEMP. :	64 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	---	0.00	0.00	---	---
Oxygen/Argon	---	0.00	0.00	---	---
Nitrogen	---	0.09	0.09	---	---
Carbon Dioxide	---	4.13	6.84	---	---
Methane	P1	70.4792	42.5375	---	---
Ethane	P2	9.6080	10.8691	2.566	2.580
Propane	P3	4.3386	7.1975	1.193	1.200
i-Butane	I4	1.6652	3.6413	0.545	0.548
Methanol	X1	0.0102	0.0123	0.001	0.001
n-Butane	P4	1.6704	3.6526	0.526	0.529
2,2-Dimethylpropane	I5	0.0302	0.0820	0.012	0.012
i-Pentane	I5	1.4245	3.8667	0.521	0.524
i-Propanol	X3	0.0014	0.0032	0.001	0.001
n-Pentane	P5	1.0330	2.8040	0.373	0.376
2,2-Dimethylbutane	I6	0.0848	0.2749	0.035	0.035
Cyclopentane	N5	0.0635	0.1676	0.019	0.019
2,3-Dimethylbutane	I6	0.1984	0.6433	0.081	0.082
2-Methylpentane	I6	0.8247	2.6738	0.341	0.343
3-Methylpentane	I6	0.5354	1.7359	0.218	0.219
n-Hexane	P6	1.1477	3.7210	0.472	0.474
2,2-Dimethylpentane	I7	0.0275	0.1037	0.013	0.013
Methylcyclopentane	N6	0.4373	1.3846	0.154	0.155
2,4-Dimethylpentane	I7	0.0524	0.1976	0.025	0.025
2,2,3-Trimethylbutane	I7	0.0133	0.0502	0.006	0.006
n-Butanol	X4	0.0001	0.0003	0.000	0.000
Benzene	A6	0.2921	0.8584	0.082	0.083
3,3-Dimethylpentane	I7	0.0166	0.0626	0.008	0.008
Cyclohexane	N6	0.4865	1.5404	0.165	0.166
2-Methylhexane	I7	0.1922	0.7246	0.089	0.090

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

2,3-Dimethylpentane	I7	0.1021	0.3849	0.046	0.046
1,1-Dimethylcyclopentane	N7	0.0475	0.1755	0.019	0.019
3-Methylhexane	I7	0.1885	0.7106	0.086	0.087
1c,3-Dimethylcyclopentane	N7	0.0654	0.2416	0.030	0.030
1t,3-Dimethylcyclopentane	N7	0.0557	0.2058	0.026	0.026
3-Ethylpentane	I7	0.0040	0.0151	0.002	0.002
1t,2-Dimethylcyclopentane	N7	0.0893	0.3299	0.041	0.041
n-Heptane	P7	0.1661	0.6262	0.076	0.077
1c,2-Dimethylcyclopentane	N7	0.0030	0.0111	0.001	0.001
Methylcyclohexane	N7	0.2685	0.9918	0.108	0.109
2,2-Dimethylhexane	I8	0.0032	0.0138	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0007	0.0030	0.000	0.000
Ethylcyclopentane	N7	0.0055	0.0203	0.002	0.002
2,5-Dimethylhexane	I8	0.0025	0.0108	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0025	0.0108	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0017	0.0072	0.001	0.001
3,3-Dimethylhexane	I8	0.0006	0.0026	0.000	0.000
2,3,4-Trimethylpentane	I8	0.0001	0.0004	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0003	0.0013	0.000	0.000
Toluene	A7	0.1164	0.4035	0.039	0.039
2,3-Dimethylhexane	I8	0.0009	0.0039	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0004	0.000	0.000
2-Methylheptane	I8	0.0031	0.0133	0.002	0.002
4-Methylheptane	I8	0.0009	0.0039	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0002	0.0009	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0004	0.000	0.000
3-Methylheptane	I8	0.0017	0.0073	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0037	0.0156	0.002	0.002
3-Ethylhexane	I8	0.0005	0.0021	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0018	0.0076	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0006	0.0025	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0004	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0004	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0004	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0001	0.0004	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0009	0.0038	0.000	0.000
n-Octane	P8	0.0025	0.0108	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0006	0.0025	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0004	0.0019	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
Ethylcyclohexane	N8	0.0002	0.0008	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0004	0.000	0.000
Ethylbenzene	I8	0.0003	0.0012	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0021	0.0084	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0008	0.0032	0.000	0.000
2-Methyloctane	I9	0.0001	0.0005	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0003	0.0012	0.000	0.000
n-Nonane	P9	0.0001	0.0005	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0005	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0005	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0005	0.000	0.000
UnknownC9s	U9	0.0001	0.0005	0.000	0.000
TOTAL		100.00000	100.00000	7.9350	7.9785

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.2921	0.8584
TOLUENE	0.1164	0.4035
ETHYLBENZENE	0.0003	0.0012
XYLENES	0.0032	0.0128

CALCULATED VALUES**

BTU @		14.65	14.73
LHV	NET DRY REAL :	1337.2 /scf	1344.5 /scf
	NET WET REAL :	1313.8 /scf	1321.1 /scf
HHV	GROSS DRY REAL :	1466.2 /scf	1474.2 /scf
	GROSS WET REAL :	1440.6 /scf	1448.6 /scf

TOTAL BTEX	0.4120	1.2759	NET HEATING VALUE (60 °F ideal reaction):	19095.2	**Btu/lbm**
			GROSS HEATING VALUE (60°F ideal reaction):	20934.2	**Btu/lbm**
**(DETAILED HYDROCARBON ANALYSIS/NJ 1993)*			RELATIVE DENSITY (AIR=1):	0.9172	
Mod ASTM D6730,GPA 2261 & GPA 2286.			DENSITY	0.07004	**lb/scf**
			COMPRESSIBILITY FACTOR :	0.9957	
***(CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)*			REGULAR WOBBE INDEX	1529.2	

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

Net Dry Ideal BTU	4476.9 **/scf**	Relative Density - SG (Air=1)	3.0672		***C6+factors***
Gross Dry Ideal BTU	4815.6 **/scf**	**Z** Compressiblity Factor	0.99017		0.98969
Net Dry Ideal BTU	19247.7 **/lb**	Density Factor	234.115	**lbm/1000 ft3**	
Gross Dry Ideal BTU	20705.8 **/lb**	Molar Mass or MW	88.837	**g/mol**	
		Volume Liquid Ideal gas	2.176	**scf/gal**	25.4

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.