



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

**MAIN PAGE**

PRIMARY DB KEY: **05-045-19135** NAME/DESCRIP : **SGV FEDERAL #8-12A (8D)**  
 LEASE #: **300115266, COC-58670** CASING  
 FIELD/AREA: **PARACHUTE - #67350**

PROJECT NO. : **202405084** ANALYSIS NO. : **01**  
 COMPANY NAME : **CAERUS OIL & GAS LLC** ANALYSIS DATE: **MAY 20, 2024 12:51**  
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **MAY 9, 2024 9:00**  
 CUSTOMER REF: TO:  
 PRODUCER : **CAERUS PICEANCE LLC** EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: **SPOT**  
 SAMPLE PRES. : 290 psig PROBE : **NO**  
 FLOW PRES. : psig CYLINDER NO. : **ECA-807**  
 LAB PRES: psig SAMPLED BY : **ALEX GALLEGOS**  
 SAMPLE TEMP. : 50 °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	MOLE %	MASS %	GPM @	
			14.65	14.73
ALCOHOLS	0.0078	0.0134	0.0010	0.0010
HELIUM	0.01	0.00	---	---
HYDROGEN	0.25	0.03	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.07	0.11	---	---
CARBON DIOXIDE	1.73	4.09	---	---
METHANE	88.6791	76.3734	---	---
ETHANE	5.9054	9.5327	1.5742	1.5828
PROPANE	1.9162	4.5361	0.5267	0.5296
I-BUTANE	0.3575	1.1155	0.1169	0.1176
N-BUTANE	0.4314	1.3461	0.1359	0.1367
I-PENTANE	0.1683	0.6509	0.0600	0.0603
N-PENTANE	0.1309	0.5070	0.0470	0.0472
HEXANES PLUS	0.3434	1.6949	0.1320	0.1323
<b>TOTALS</b>	<b>100.00000</b>	<b>100.00000</b>	<b>2.5937</b>	<b>2.6075</b>

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0124	0.0520
TOLUENE	0.0176	0.0871
ETHYLBENZENE	0.0003	0.0017
XYLENES	0.0004	0.0023
<b>TOTAL BTEX</b>	<b>0.0307</b>	<b>0.1431</b>

	CALCULATED VALUES**	
	14.65	14.73
<b>LHV NET DRY REAL :</b>	<b>996.5 /scf</b>	<b>1001.9 /scf</b>
<b>NET WET REAL :</b>	<b>979.1 /scf</b>	<b>984.5 /scf</b>
<b>HHV GROSS DRY REAL :</b>	<b>1102.9 /scf</b>	<b>1108.9 /scf</b>
<b>GROSS WET REAL :</b>	<b>1083.6 /scf</b>	<b>1089.6 /scf</b>
<b>NET HEATING VALUE (60 °F ideal reaction):</b>	<b>20330.6 Btu/lbm</b>	<b>20330.6 Btu/lbm</b>
<b>GROSS HEATING VALUE (60°F ideal reaction):</b>	<b>22494.8 Btu/lbm</b>	<b>22494.8 Btu/lbm</b>
<b>RELATIVE DENSITY (AIR=1):</b>	<b>0.6430</b>	<b>0.6430</b>
<b>DENSITY</b>	<b>0.04908 lbm/scf</b>	<b>0.04908 lbm/scf</b>
<b>COMPRESSIBILITY FACTOR :</b>	<b>0.9974</b>	<b>0.9974</b>
<b>REGULAR WOBBE INDEX</b>	<b>1376.2</b>	<b>1376.2</b>

\*(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. :	202405084	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	MAY 20, 2024 12:51
ACCOUNT NO. :		SAMPLE DATE :	MAY 9, 2024 9:00
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	ECA-807
LEASE NO. :	300115266, COC-58670	SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	SGV FEDERAL #8-12A (8D) CASING		

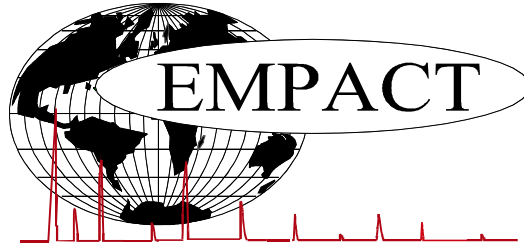
***FIELD DATA***		SAMPLE TEMP. :	50
SAMPLE PRES. :	290	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	<i>SPOT</i>		<i>NO PROBE</i>

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.25	0.03
Carbon Dioxide	1.73	4.09
Nitrogen	0.07	0.11
Methane	88.6791	76.3734
Ethane	5.9054	9.5327
Propane	1.9162	4.5361
Isobutane	0.3575	1.1155
n-Butane	0.4314	1.3461
Isopentane	0.1602	0.6204
n-Pentane	0.1309	0.5070
Cyclopentane	0.0081	0.0305
n-Hexane	0.0566	0.2619
Cyclohexane	0.0275	0.1242
Other Hexanes	0.1055	0.4851
Heptanes	0.0547	0.2927
Methylcyclohexane	0.0379	0.1998
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0124	0.0520
Toluene	0.0176	0.0871
Ethylbenzene	0.0003	0.0017
Xylenes	0.0004	0.0023
C8+ Heavies	0.0305	0.1881
<u>Subtotal</u>	<u>99.99220</u>	<u>99.98660</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0078	0.0134
<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 @ <u>14.65</u></b>	<b>Sample</b>	<b>Fraction</b>	<b>Fraction</b>	<b>Fraction</b>
LHV Net Dry Real:	996.5	4640.6	5796.5	8527.5 Btu/scf
Net Wet Real:	979.1	4559.5	5695.2	8378.4 Btu/scf
HHV Gross Dry Real:	1102.9	4987.1	6244.1	9149.4 Btu/scf
Gross Wet Real:	1083.6	4899.9	6134.9	8989.5 Btu/scf
<b>Other Calculated Values</b>				
Regualr Wobbe Index*	1376.2	2785.0	3137.2	3867.5 Btu/scf
Net Heating Value (60 °F ideal reaction):	20330.6	19228.0	19904.7	19171.7 Btu/lbm
Gross Heating Value (60°F ideal reaction):	22494.8	20667.1	21443.7	20569.8 Btu/lbm
Molar Mass (MW):	18.62587	91.942	114.801	163.097 g/mol
Relative Density (AIR=1):	0.6430	3.1740	3.9633	5.6314 SG
Density:	0.04908	0.24228	0.30252	0.42979 lbm/scf
Compressibility Factor:	0.9974	0.9918	0.9971	1.0000 Z
Liquid Volume real gas @: <u>14.65</u>	17.8589	0.1316	0.011	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:	<b>05-045-19135</b>	NAME/DESCRIP :	<b>SGV FEDERAL #8-12A (8D)</b>
LEASE #:	<b>300115266, COC-58670</b>		<b>CASING</b>
FIELD/AREA:	<b>PARACHUTE - #67350</b>		
PROJECT NO. :	<b>202405084</b>	ANALYSIS NO. :	<b>01</b>
COMPANY NAME :	<b>CAERUS OIL &amp; GAS LLC</b>	ANALYSIS DATE:	<b>MAY 20, 2024 12:51</b>
OFFICE / BRANCH:	<b>PARACHUTE, CO</b>	SAMPLE DATE :	<b>MAY 9, 2024 9:00</b>
CUSTOMER REF:		TO:	
PRODUCER :	<b>CAERUS PICEANCE LLC</b>	EFFECTIVE DATE:	
<b>***FIELD DATA***</b>			
SAMPLE CYCLE:		SAMPLE TYPE:	<b>SPOT</b>
SAMPLE PRES. :	<b>290</b>	PROBE :	<b>NO</b>
FLOW PRES. :		CYLINDER NO. :	<b>ECA-807</b>
LAB PRES:		SAMPLED BY :	<b>ALEX GALLEGOS</b>
SAMPLE TEMP. :	<b>50</b>	SAMPLING COMPANY:	<b>CAERUS OIL &amp; GAS LLC</b>
AMBIENT TEMP.:		H2S BY STAIN TUBE:	<b>- ppm mol</b>
H2O BY STAIN TUBE:	<b>-</b>	CO2 BY STAIN TUBE:	<b>- Mol %</b>
FIELD COMMENTS:			
LAB COMMENTS:			

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.25	0.03	---	---
Oxygen/Argon	---	0.00	0.00	---	---
Nitrogen	---	0.07	0.11	---	---
Carbon Dioxide	---	1.73	4.09	---	---
Methane	P1	88.6791	76.3734	---	---
Ethane	P2	5.9054	9.5327	1.574	1.583
Propane	P3	1.9162	4.5361	0.527	0.530
i-Butane	I4	0.3575	1.1155	0.117	0.118
Methanol	X1	0.0078	0.0134	0.001	0.001
n-Butane	P4	0.4314	1.3461	0.136	0.137
2,2-Dimethylpropane	I5	0.0034	0.0131	0.001	0.001
i-Pentane	I5	0.1568	0.6073	0.057	0.057
n-Pentane	P5	0.1308	0.5066	0.047	0.047
2,2-Dimethylbutane	I6	0.0045	0.0208	0.002	0.002
Cyclopentane	N5	0.0081	0.0305	0.002	0.002
2,3-Dimethylbutane	I6	0.0090	0.0417	0.004	0.004
2-Methylpentane	I6	0.0417	0.1929	0.017	0.017
3-Methylpentane	I6	0.0222	0.1027	0.009	0.009
UnknownC5s	U5	0.0001	0.0004	0.000	0.000
n-Hexane	P6	0.0566	0.2619	0.023	0.023
2,2-Dimethylpentane	I7	0.0011	0.0059	0.001	0.001
Methylcyclopentane	N6	0.0281	0.1270	0.010	0.010
2,4-Dimethylpentane	I7	0.0020	0.0107	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0004	0.0021	0.000	0.000
Benzene	A6	0.0124	0.0520	0.003	0.003
3,3-Dimethylpentane	I7	0.0006	0.0032	0.000	0.000

Cyclohexane	N6	0.0275	0.1242	0.009	0.009
2-Methylhexane	I7	0.0085	0.0457	0.004	0.004
2,3-Dimethylpentane	I7	0.0023	0.0123	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0019	0.0100	0.001	0.001
3-Methylhexane	I7	0.0075	0.0404	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0032	0.0169	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0028	0.0148	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0016	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0044	0.0232	0.002	0.002
n-Heptane	P7	0.0181	0.0974	0.008	0.008
1c,2-Dimethylcyclopentane	N7	0.0003	0.0016	0.000	0.000
Methylcyclohexane	N7	0.0379	0.1998	0.015	0.015
2,2-Dimethylhexane	I8	0.0008	0.0049	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0012	0.0063	0.000	0.000
2,5-Dimethylhexane	I8	0.0006	0.0037	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0006	0.0037	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0005	0.0030	0.000	0.000
3,3-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
Toluene	A7	0.0176	0.0871	0.006	0.006
2,3-Dimethylhexane	I8	0.0005	0.0031	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0028	0.0172	0.001	0.001
4-Methylheptane	I8	0.0008	0.0049	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0019	0.0116	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0043	0.0259	0.002	0.002
3-Ethylhexane	I8	0.0003	0.0018	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0018	0.0108	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0005	0.0030	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0014	0.0084	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0094	0.0577	0.005	0.005
1c,4-Dimethylcyclohexane	N8	0.0008	0.0048	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0001	0.0007	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	0.0002	0.0014	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0007	0.0047	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
Ethylbenzene	I8	0.0003	0.0017	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0003	0.0017	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0006	0.000	0.000
n-Nonane	P9	0.0001	0.0007	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
n-Undecane	P11	0.0001	0.0009	0.000	0.000
2-Methylnaphthalene	A11	0.0001	0.0007	0.000	0.000
n-Tridecane	P13	0.0001	0.0010	0.000	0.000
n-Tetradecane	P14	0.0001	0.0011	0.000	0.000
<u>TOTAL</u>		<u>100.0000</u>	<u>100.00000</u>	<u>2.5937</u>	<u>2.6075</u>

BTEX COMPONENTS	MOLE%	WT%	CALCULATED VALUES**		
			BTU @	14.65	14.73
BENZENE	0.0124	0.0520	LHV NET DRY REAL :	996.5 /scf	1001.9 /scf
TOLUENE	0.0176	0.0871	NET WET REAL :	979.1 /scf	984.5 /scf
ETHYLBENZENE	0.0003	0.0017	HHV GROSS DRY REAL :	1102.9 /scf	1108.9 /scf
XYLENES	0.0004	0.0023	GROSS WET REAL :	1083.6 /scf	1089.6 /scf
TOTAL BTEX	0.0307	0.1431	NET HEATING VALUE (60 °F ideal reaction):		20330.6 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		22494.8 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6430
			DENSITY		0.04908 lb/scf
			COMPRESSIBILITY FACTOR :		0.9974
			REGULAR WOBBE INDEX		1376.2

\*(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>4617</u> /scf	Relative Density - SG (Air=1)	<u>3.174</u>	<b>C6+ factors</b>
Gross Dry Ideal BTU	<u>4961.7</u> /scf	Z Compressibility Factor	<u>0.9918</u>	<u>0.99112</u>
Net Dry Ideal BTU	<u>19228</u> /lb	Density Factor	<u>242.282</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20667.1</u> /lb	Molar Mass or MW	<u>91.942</u> g/mol	
		Volume Liquid Ideal gas	<u>0.132</u> scf/gal	<u>24.3</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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