

LEASE #: NAME/DESCRIP : KAUFMAN #4
WELL CASING GAS

PROJECT NO. : 201705001 ANALYSIS NO. : 01
COMPANY NAME : FOUNDATION ENERGY ANALYSIS DATE: May 10, 2107
OFFICE / BRANCH: DENVER SAMPLE DATE : APRIL 27, 2017
CUSTOMER REF: TO:
PRODUCER : EFFECTIVE DATE:

FIELD DATA

SAMPLE CYCLE: SAMPLE TYPE: SPOT
SAMPLE PRES. : 50 psig CYLINDER NO. : 1023
LAB PRES: psig SAMPLED BY : JOHN MOSER
SAMPLE TEMP. : 52 °f SAMPLING COMPANY: EMPACT
AMBIENT TEMP.: °f H2S BY STAIN TUBE: - ppm
H2O BY STAIN TUBE: - #/mmcf CO2 BY STAIN TUBE: - Mol %
FIELD COMMENTS: NO PROBE
LAB COMMENTS:

COMPONENTS	NORM. MOLE%	GPM @ 14.73	d13C ‰ VPDB	dD ‰ VSMOW
HELIUM	0.00	-	-	-
HYDROGEN	0.01	-	-	-
OXYGEN/ARGON	0.03	-	-	-
NITROGEN	0.43	-	-	-
CO2	2.49	-	-1.6	-
METHANE	52.97	-	-49.0	-281.0
ETHANE	19.10	5.1407	-33.3	-
PROPANE	13.25	3.6737	-28.6	-
ISOBUTANE	1.93	0.6357	-30.9	-
N-BUTANE	4.97	1.5770	-27.6	-
ISOPENTANE	1.48	0.5448	-28.3	-
N-PENTANE	1.61	0.5872	-27.6	-
HEXANES+	1.73	0.7557	-	-
TOTAL	100.00	12.9148		

BTU @ 60 DEG F **14.73**
GROSS DRY REAL = 1658.7 /scf
GROSS SATURATED REAL = 1629.9 /scf

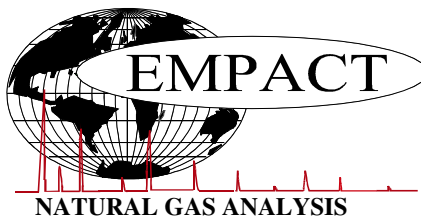
RELATIVE DENSITY (AIR=1 @ 14.696 PSIA 60F) 1.0069
GRAVITY (LB/SCF) 0.07685
COMPRESSIBILITY FACTOR : 0.99340

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

Reference: Per GPA 2261 sec 7.3.6 **The C6+ is derived from the following ratios of C6, C7 & C8+ respectively: 60% 30% 10%**

Note: Stable isotope results based on multi-point laboratory calibration
Error d13C < 0.5 ‰ Error dD < 5.0 ‰
Values in red represent low peak heights. Interpret with caution.

Isotopic & composition methodology on this sample performed by DIG. Calculated values based upon GPA and applied by EMPACT.
The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc.
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LEASE #: NAME/DESCRIP : KAUFMAN #4
BRADENHEAD GAS

PROJECT NO. : 201705001 ANALYSIS NO. : 02
COMPANY NAME : FOUNDATION ENERGY ANALYSIS DATE: May 10, 2107
OFFICE / BRANCH: DENVER SAMPLE DATE : APRIL 27, 2017
CUSTOMER REF: TO:
PRODUCER : EFFECTIVE DATE:

FIELD DATA

SAMPLE CYCLE: SAMPLE TYPE: SPOT
SAMPLE PRES. : 45 psig CYLINDER NO. : 0773
LAB PRES: psig SAMPLED BY : JOHN MOSER
SAMPLE TEMP. : 50 °f SAMPLING COMPANY: EMPACT
AMBIENT TEMP.: °f H2S BY STAIN TUBE: - ppm
H2O BY STAIN TUBE: - #/mmcf CO2 BY STAIN TUBE: - Mol %
FIELD COMMENTS: NO PROBE
LAB COMMENTS:

COMPONENTS	NORM. MOLE%	GPM @ 14.73	d13C ‰ VPDB	dD ‰ VSMOW
HELIUM	0.00	-	-	-
HYDROGEN	0.00	-	-	-
OXYGEN/ARGON	0.05	-	-	-
NITROGEN	0.69	-	-	-
CO2	2.19	-	-0.2	-
METHANE	56.79	-	-48.5	-272.0
ETHANE	18.09	4.8669	-33.2	-
PROPANE	12.23	3.3895	-28.6	-
ISOBUTANE	1.79	0.5889	-30.5	-
N-BUTANE	4.60	1.4582	-27.4	-
ISOPENTANE	1.39	0.5113	-28.3	-
N-PENTANE	1.46	0.5325	-27.5	-
HEXANES+	0.72	0.3146	-	-
TOTAL	100.00	11.6619		

BTU @ 60 DEG F **14.73**
GROSS DRY REAL = 1573.8 /scf
GROSS SATURATED REAL = 1546.4 /scf

RELATIVE DENSITY (AIR=1 @ 14.696 PSIA 60F) 0.9515
GRAVITY (LB/SCF) 0.07261
COMPRESSIBILITY FACTOR : 0.99390

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

Reference: Per GPA 2261 sec 7.3.6 **The C6+ is derived from the following ratios of C6, C7 & C8+ respectively: 60% 30% 10%**

Note: Stable isotope results based on multi-point laboratory calibration
Error d13C < 0.5 ‰ Error dD < 5.0 ‰
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Isotopic & composition methodology on this sample performed by DIG. Calculated values based upon GPA and applied by EMPACT.
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