

EXTENDED NATURAL GAS ANALYSIS ("DHA")

MAIN PAGE

PRIMARY DB KEY:
LEASE #:
FIELD/AREA:

NAME/DESCRIP : **BUCK GARRETT 12-9
WELLHEAD GAS**

PROJECT NO. : **201905052**
COMPANY NAME : **FREMONT PETROLEUM CORP**
OFFICE / BRANCH: **FLORENCE, CO**
CUSTOMER REF:
PRODUCER :

ANALYSIS NO. : **01**
ANALYSIS DATE: **MAY 10, 2019 14:14**
SAMPLE DATE : **MAY 8, 2019 08:20**
TO:
EFFECTIVE DATE:

FIELD DATA

SAMPLE CYCLE:
SAMPLE PRES. : 3 psig
FLOW PRES. : psig
LAB PRES: psig
SAMPLE TEMP. : 65 °f
AMBIENT TEMP.: °f
H2O BY STAIN TUBE: - #/mmcf
FIELD COMMENTS:
LAB COMMENTS:

SAMPLE TYPE: SPOT
PROBE : NO
CYLINDER NO. : 0873
SAMPLED BY : GALE MCENDREE
SAMPLING COMPANY: EMPACT
H2S BY STAIN TUBE: **BDL** ppm
CO2 BY STAIN TUBE: - Mol %

COMPONENT	MOLE %	MASS %	GPM @ 14.73	GPM @ 14.65
HELIUM	0.06	0.01	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.01	0.02	---	---
NITROGEN	1.05	1.42	---	---
CARBON DIOXIDE	1.44	3.07	---	---
METHANE	85.13100	66.15790	---	---
ETHANE	3.8982	5.6783	1.0456	1.0399
PROPANE	4.1097	8.7789	1.1351	1.1289
I-BUTANE	0.7224	2.0340	0.2373	0.2360
N-BUTANE	1.4268	4.0173	0.4514	0.4490
I-PENTANE	0.5959	2.0785	0.2152	0.2140
N-PENTANE	0.4153	1.4515	0.1508	0.1500
HEXANES PLUS	1.1307	5.2836	0.4768	0.4750
TOTALS	100.00000	100.00000	3.7122	3.6928

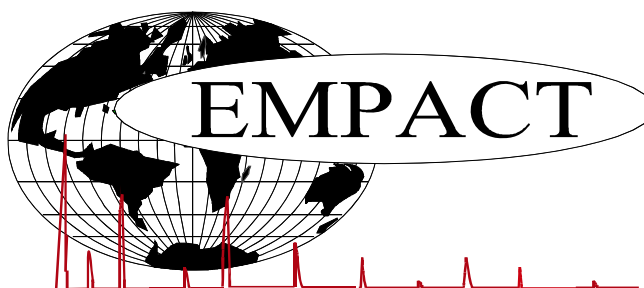
BTEX COMPONENTS	MOLE%	WT%	BTU @	14.73	14.65
BENZENE	0.0069	0.0261	LOW NET DRY REAL :	1093.9 /scf	1088.0 /scf
TOLUENE	0.0040	0.0179	NET WET REAL :	1074.9 /scf	1069.0 /scf
ETHYLBENZENE	0.0020	0.0103	HIGH GROSS DRY REAL :	1206.9 /scf	1200.4 /scf
XYLENES	0.0048	0.0247	GROSS WET REAL :	1185.9 /scf	1179.4 /scf
TOTAL BTEX	0.0177	0.0790	NET DRY REAL :	20156.7 /lb	20047.2 /lb
			GROSS DRY REAL :	22238.0 /lb	22117.2 /lb
			RELATIVE DENSITY (AIR=1):		0.7123
			DENSITY		0.05440 lb/scf
			COMPRESSIBILITY FACTOR :		0.99696
			REGULAR WOBBE INDEX		1426.8

*(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. :	201905052	ANALYSIS NO. :	01
COMPANY NAME :	FREMONT PETROLEUM CORP	ANALYSIS DATE:	MAY 14, 2019 07:54
ACCOUNT NO. :		SAMPLE DATE :	MAY 8, 2019 08:20
PRODUCER :		CYLINDER NO. :	0873
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	BUCK GARRETT 12-9 WELLHEAD GAS		

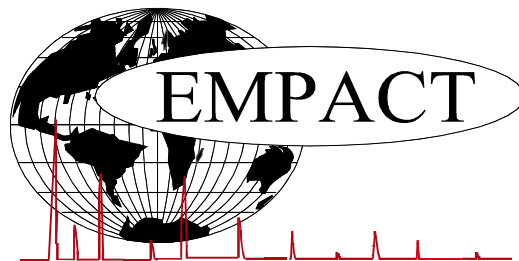
*****FIELD DATA*****

SAMPLE PRES. : 3
COMMENTS : SPOT, NO PROBE

SAMPLE TEMP. : 65
AMBIENT TEMP.:

Componet	Mole %	Wt %
Helium	0.06	0.01
Hydrogen	0.01	0.00
Carbon Dioxide	1.44	3.07
Nitrogen	1.05	1.42
Methane	85.13100	66.15790
Ethane	3.8982	5.6783
Propane	4.1097	8.7789
Isobutane	0.7224	2.0340
n-Butane	1.4268	4.0173
Isopentane	0.5514	1.9273
n-Pentane	0.4153	1.4515
Cyclopentane	0.0445	0.1512
n-Hexane	0.1427	0.5957
Cyclohexane	0.0495	0.2018
Other Hexanes	0.3730	1.5452
Heptanes	0.2414	1.1628
Methylcyclohexane	0.0623	0.2963
2,2,4 Trimethylpentane	0.0005	0.0028
Benzene	0.0069	0.0261
Toluene	0.0040	0.0179
Ethylbenzene	0.0020	0.0103
Xylenes	0.0048	0.0247
C8+ Heavies	0.2436	1.4000
<u>Subtotal</u>	<u>99.99000</u>	<u>99.98000</u>
Oxygen/Argon	0.01	0.02
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:
LEASE #:
FIELD/AREA:

NAME/DESCRIP : **BUCK GARRETT 12-9**
WELLHEAD GAS

PROJECT NO. : **201905052**
COMPANY NAME : **FREMONT PETROLEUM CORP**
OFFICE / BRANCH: **FLORENCE, CO**
CUSTOMER REF:
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*****FIELD DATA*****

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FLOW PRES. : psig
LAB PRES: psig
SAMPLE TEMP. : 65 °f
AMBIENT TEMP.: °f
H2O BY STAIN TUBE: - #/mmcf
FIELD COMMENTS:
LAB COMMENTS:

SAMPLE TYPE: SPOT
PROBE : NO
CYLINDER NO. : 0873
SAMPLED BY : GALE MCENDREE
SAMPLING COMPANY: EMPACT
H2S BY STAIN TUBE: **BDL** ppm
CO2 BY STAIN TUBE: - Mol %

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.73	GPM @ 14.65
Helium	---	0.06	0.01	---	---
Hydrogen	---	0.01	0.00	---	---
Oxygen/Argon	---	0.01	0.02	---	---
Nitrogen	---	1.05	1.42	---	---
Carbon Dioxide	---	1.44	3.07	---	---
Methane	P1	85.13100	66.15790	---	---
Ethane	P2	3.8982	5.6783	1.046	1.040
Propane	P3	4.1097	8.7789	1.135	1.129
i-Butane	I4	0.7224	2.0340	0.237	0.236
n-Butane	P4	1.4267	4.0170	0.451	0.449
2,2-Dimethylpropane	I5	0.0013	0.0046	0.000	0.000
i-Pentane	I5	0.5501	1.9227	0.202	0.201
UnknownC4s	U4	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.4151	1.4508	0.151	0.150
2,2-Dimethylbutane	I6	0.0020	0.0083	0.001	0.001
Cyclopentane	N5	0.0445	0.1512	0.013	0.013
2,3-Dimethylbutane	I6	0.0188	0.0785	0.008	0.008
2-Methylpentane	I6	0.1434	0.5987	0.059	0.059
3-Methylpentane	I6	0.0863	0.3603	0.035	0.035
UnknownC5s	U5	0.0002	0.0007	0.000	0.000
n-Hexane	P6	0.1427	0.5957	0.059	0.059
2,2-Dimethylpentane	I7	0.0001	0.0005	0.000	0.000
Methylcyclopentane	N6	0.1223	0.4986	0.043	0.043
2,4-Dimethylpentane	I7	0.0079	0.0384	0.004	0.004
2,2,3-Trimethylbutane	I7	0.0005	0.0024	0.000	0.000
Benzene	A6	0.0069	0.0261	0.002	0.002

3,3-Dimethylpentane	I7	0.0002	0.0010	0.000	0.000
Cyclohexane	N6	0.0495	0.2018	0.017	0.017
2-Methylhexane	I7	0.0283	0.1374	0.013	0.013
2,3-Dimethylpentane	I7	0.0160	0.0777	0.007	0.007
1,1-Dimethylcyclopentane	N7	0.0079	0.0376	0.003	0.003
3-Methylhexane	I7	0.0349	0.1694	0.016	0.016
1c,3-Dimethylcyclopentane	N7	0.0193	0.0918	0.009	0.009
1t,3-Dimethylcyclopentane	N7	0.0222	0.1056	0.010	0.010
3-Ethylpentane	I7	0.0035	0.0170	0.002	0.002
1t,2-Dimethylcyclopentane	N7	0.0359	0.1708	0.017	0.017
2,2,4-Trimethylpentane	I8	0.0005	0.0028	0.000	0.000
UnknownC6s	U6	0.0002	0.0008	0.000	0.000
n-Heptane	P7	0.0553	0.2684	0.025	0.025
1c,2-Dimethylcyclopentane	N7	0.0025	0.0119	0.001	0.001
Methylcyclohexane	N7	0.0623	0.2963	0.025	0.025
2,2-Dimethylhexane	I8	0.0094	0.0520	0.004	0.004
Ethylcyclopentane	N7	0.0068	0.0324	0.003	0.003
2,5-Dimethylhexane	I8	0.0016	0.0089	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0009	0.0050	0.000	0.000
2,4-Dimethylhexane	I8	0.0039	0.0216	0.002	0.002
1c,2t,4-Trimethylcyclopentane	N8	0.0075	0.0408	0.003	0.003
3,3-Dimethylhexane	I8	0.0005	0.0028	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0117	0.0636	0.005	0.005
2,3,4-Trimethylpentane	I8	0.0017	0.0094	0.001	0.001
Toluene	A7	0.0040	0.0179	0.001	0.001
2,3-Dimethylhexane	I8	0.0036	0.0199	0.002	0.002
2-Methyl-3-ethylpentane	I8	0.0023	0.0127	0.001	0.001
1,1,2-Trimethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2-Methylheptane	I8	0.0179	0.0991	0.009	0.009
4-Methylheptane	I8	0.0043	0.0238	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0009	0.0050	0.000	0.000
3,4-Dimethylhexane	I8	0.0007	0.0039	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0005	0.0027	0.000	0.000
3-Methylheptane	I8	0.0071	0.0393	0.004	0.004
1c,2t,3-Trimethylcyclopentane	N8	0.0146	0.0794	0.007	0.007
3-Ethylhexane	I8	0.0017	0.0094	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0054	0.0294	0.003	0.003
1,1-Dimethylcyclohexane	N8	0.0014	0.0076	0.001	0.001
3t-Ethylmethylcyclopentane	N8	0.0028	0.0152	0.001	0.001
2t-Ethylmethylcyclopentane	N8	0.0021	0.0114	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0076	0.0413	0.004	0.004
2,2,4-Trimethylhexane	I9	0.0005	0.0031	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0084	0.0457	0.004	0.004
1t,3-Dimethylcyclohexane	N8	0.0065	0.0353	0.003	0.003
UnknownC7s	U7	0.0001	0.0005	0.000	0.000
n-Octane	P8	0.0241	0.1334	0.012	0.012
i-Propylcyclopentane	I8	0.0006	0.0033	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0019	0.0118	0.001	0.001
2,2,3,4-Tetramethylpentane	I9	0.0004	0.0025	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0008	0.0050	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0018	0.0098	0.001	0.001
2,2-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0084	0.0514	0.004	0.004
2,2,3-Trimethylhexane	I9	0.0050	0.0311	0.003	0.003
2,4-Dimethylheptane	I9	0.0010	0.0062	0.001	0.001
4,4-Dimethylheptane	I9	0.0005	0.0031	0.000	0.000
Ethylcyclohexane	N8	0.0072	0.0391	0.003	0.003
n-Propylcyclopentane	N8	0.0033	0.0179	0.001	0.001

1c,3c,5-Trimethylcyclohexane	N9	0.0005	0.0031	0.000	0.000
2,5-Dimethylheptane	I9	0.0011	0.0068	0.001	0.001
3,3-Dimethylheptane	I9	0.0013	0.0081	0.001	0.001
3,5-Dimethylheptane	I9	0.0009	0.0056	0.001	0.001
2,6-Dimethylheptane	I9	0.0009	0.0056	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0023	0.0141	0.001	0.001
Ethylbenzene	I8	0.0020	0.0103	0.001	0.001
1c,2t,4t-Trimethylcyclohexane	N9	0.0021	0.0128	0.001	0.001
2,3-Dimethylheptane	I9	0.0044	0.0273	0.002	0.002
1,3-Dimethylbenzene (m-Xylene)	A8	0.0008	0.0041	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0026	0.0134	0.001	0.001
3,4-Dimethylheptane	I9	0.0009	0.0056	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0012	0.0075	0.001	0.001
4-Ethylheptane	I9	0.0003	0.0018	0.000	0.000
4-Methyloctane	I9	0.0022	0.0137	0.001	0.001
2-Methyloctane	I9	0.0032	0.0199	0.002	0.002
1c,2t,3-Trimethylcyclohexane	N9	0.0007	0.0043	0.000	0.000
3-Ethylheptane	I9	0.0008	0.0050	0.000	0.000
3-Methyloctane	I9	0.0032	0.0199	0.002	0.002
1c,2t,4c-Trimethylcyclohexane	I9	0.0004	0.0024	0.000	0.000
1,1,2-Trimethylcyclohexane	N9	0.0004	0.0024	0.000	0.000
3,3-Diethylpentane	I9	0.0003	0.0018	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0014	0.0072	0.001	0.001
i-Butylcyclopentane	N9	0.0022	0.0135	0.001	0.001
n-Nonane	P9	0.0061	0.0379	0.003	0.003
1,1-Methylethylcyclohexane	N9	0.0012	0.0073	0.001	0.001
i-Propylbenzene	A9	0.0019	0.0110	0.001	0.001
i-Propylcyclohexane	N9	0.0006	0.0037	0.000	0.000
2,2-Dimethyloctane	I10	0.0003	0.0021	0.000	0.000
2,4-Dimethyloctane	I10	0.0002	0.0014	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0010	0.0061	0.001	0.001
3,3-Dimethyloctane	I10	0.0002	0.0014	0.000	0.000
n-Propylbenzene	A9	0.0006	0.0035	0.000	0.000
3,6-Dimethyloctane	I10	0.0002	0.0014	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0005	0.0034	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
5-Methylnonane	I10	0.0001	0.0007	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0012	0.000	0.000
2-Methylnonane	I10	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0003	0.0019	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0094	0.0584	0.005	0.005
n-Decane	P10	0.0001	0.0007	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0006	0.0035	0.000	0.000
1,3-Methyl-i-propylbenzene	A10	0.0001	0.0006	0.000	0.000
1,4-Methyl-i-propylbenzene	A10	0.0001	0.0006	0.000	0.000
Sec-Butylcyclohexane	A10	0.0004	0.0027	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0002	0.0013	0.000	0.000
n-Butylbenzene	A10	0.0007	0.0046	0.000	0.000
1,3-Dimethyl-5-ethylbenzene	A10	0.0005	0.0033	0.000	0.000
1,2-Diethylbenzene	A10	0.0006	0.0039	0.000	0.000
t-Decahydronaphthalene	A9	0.0003	0.0022	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0005	0.0033	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0005	0.0033	0.000	0.000
1,2-Ethyl-i-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0008	0.0058	0.001	0.001

UnknownC10s	U10	0.0024	0.0165	0.001	0.001
n-Undecane	P11	0.0001	0.0008	0.000	0.000
1,4-Ethyl-i-propylbenzene	A11	0.0002	0.0015	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0003	0.0019	0.000	0.000
1,2,3,5-Tetramethylbenzene	A11	0.0001	0.0006	0.000	0.000
2-Methylindan	A11	0.0001	0.0006	0.000	0.000
1,3-Di-i-propylbenzene	A11	0.0001	0.0008	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC11s	U11	0.0005	0.0038	0.000	0.000
2-Methylnaphthalene	A11	0.0001	0.0007	0.000	0.000
1-Methylnaphthalene	A11	0.0001	0.0007	0.000	0.000
UnknownC12s	U12	0.0001	0.0008	0.000	0.000
UnknownC15s	U15	0.0001	0.0010	0.000	0.000
TOTAL		100.00000	100.00000	3.7122	3.6928

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.73	14.65
BENZENE	0.0069	0.0261	LOW NET DRY REAL :	1093.9 /scf	1088.0 /scf
TOLUENE	0.0040	0.0179	NET WET REAL :	1074.9 /scf	1069.0 /scf
ETHYLBENZENE	0.0020	0.0103	HIGH GROSS DRY REAL :	1206.9 /scf	1200.4 /scf
XYLENES	0.0048	0.0247	GROSS WET REAL :	1185.9 /scf	1179.4 /scf
TOTAL BTEX	0.0177	0.0790	NET DRY REAL :	20156.7 /lb	20047.2 /lb
			GROSS DRY REAL :	22238.0 /lb	22117.2 /lb
			RELATIVE DENSITY (AIR=1):		0.7123
			DENSITY		0.05440 lb/scf
			COMPRESSIBILITY FACTOR :		0.99696
			REGULAR WOBBE INDEX		1426.8

*(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>4862.8</u> /scf	Relative Density - SG (Air=1)	<u>3.3296</u>	C6+ factors
Gross Dry Ideal BTU	<u>5239.5</u> /scf	Z Compressibility Factor	<u>0.99247</u>	<u>0.99169</u>
Net Dry Ideal BTU	<u>19556</u> /lb	Density Factor	<u>254.141</u> lbm/1000 ft ³	
Gross Dry Ideal BTU	<u>21070.2</u> /lb	Molar Mass or MW	<u>96.448</u> g/mol	
		Volume Liquid Ideal gas	<u>0.475</u> scf/gal	<u>22.5</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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