EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

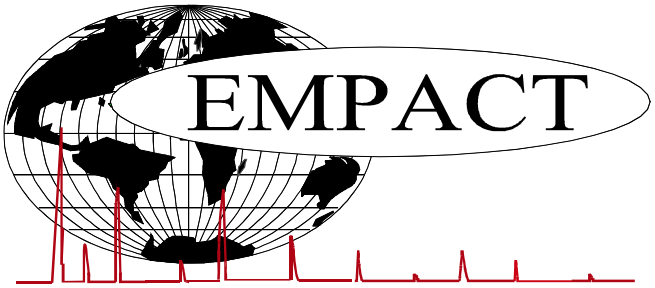
PRIMARY DB KEY:		NAME/DESCRIP :	**ELLIOT NESS 22-17**
LEASE #:			**WELLHEAD GAS**
FIELD/AREA:			
PROJECT NO. :	**201905052**	ANALYSIS NO. :	**02**
COMPANY NAME :	**FREMONT PETROLEUM CORP**	ANALYSIS DATE:	MAY 10, 2019 14:39
OFFICE / BRANCH:	FLORENCE, CO	SAMPLE DATE :	MAY 8, 2019 09:20
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
*****FIELD DATA*****			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	1 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	1050
LAB PRES:	psig	SAMPLED BY :	GALE MCENDREE
SAMPLE TEMP. :	67 ºf	SAMPLING COMPANY:	EMPACT
AMBIENT TEMP.:	ºf	H2S BY STAIN TUBE:	**BDL** ppm
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

COMPONENT	MOLE %	MASS %	GPM @ 14.73	GPM @ 14.65
HELIUM	0.07	0.01	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.02	0.03	---	---
NITROGEN	1.48	2.09	---	---
CARBON DIOXIDE	1.59	3.54	---	---
METHANE	87.26810	70.72980	---	---
ETHANE	3.3923	5.1534	0.9096	0.9046
PROPANE	3.0134	6.7132	0.8322	0.8277
I-BUTANE	0.5806	1.7049	0.1910	0.1899
N-BUTANE	0.9556	2.8061	0.3015	0.2999
I-PENTANE	0.3993	1.4523	0.1437	0.1429
N-PENTANE	0.2820	1.0279	0.1025	0.1020
HEXANES PLUS	0.9487	4.7424	0.4104	0.4090
TOTALS	100.00000	100.00000	2.8909	2.8760

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0061	0.0241
TOLUENE	0.0048	0.0223
ETHYLBENZENE	0.0017	0.0091
XYLENES	0.0049	0.0264
TOTAL BTEX	0.0175	0.0819

BTU @		14.73	14.65
LOW	NET DRY REAL :	1040.4 /scf	1034.8 /scf
	NET WET REAL :	1022.3 /scf	1016.7 /scf
HIGH	GROSS DRY REAL :	1149.0 /scf	1142.7 /scf
	GROSS WET REAL :	1129.0 /scf	1122.8 /scf
	NET DRY REAL :	20001.1 /lb	19892.5 /lb
	GROSS DRY REAL :	22093.6 /lb	21973.6 /lb
	RELATIVE DENSITY (AIR=1):		0.6824
	DENSITY		0.05216 lb/scf
	COMPRESSIBILITY FACTOR :		0.99727
	REGULAR WOBBE INDEX		1387.7

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993)*
Mod ASTM D6730,GPA 2261 & GPA 2286.
(CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

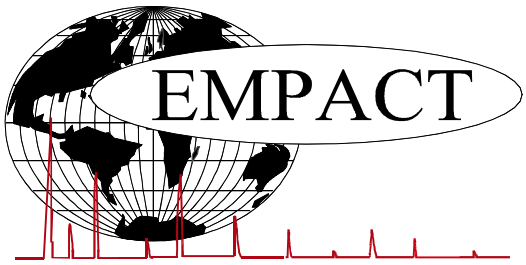


EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201905052	ANALYSIS NO. :	02
COMPANY NAME :	FREMONT PETROLEUM CORP	ANALYSIS DATE:	MAY 14, 2019 09:58
ACCOUNT NO. :		SAMPLE DATE :	MAY 8, 2019 09:20
PRODUCER :		CYLINDER NO. :	1050
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	ELLIOT NESS 22-17 WELLHEAD GAS		
FIELD DATA		SAMPLE TEMP. :	67
SAMPLE PRES. :	1	AMBIENT TEMP.:	
COMMENTS :	***SPOT, NO PROBE***		

Componet	Mole %	Wt %
Helium	0.07	0.01
Hydrogen	0.00	0.00
Carbon Dioxide	1.59	3.54
Nitrogen	1.48	2.09
Methane	87.26810	70.72980
Ethane	3.3923	5.1534
Propane	3.0134	6.7132
Isobutane	0.5806	1.7049
n-Butane	0.9556	2.8061
Isopentane	0.3688	1.3442
n-Pentane	0.2820	1.0279
Cyclopentane	0.0305	0.1081
n-Hexane	0.1048	0.4563
Cyclohexane	0.0394	0.1675
Other Hexanes	0.2646	1.1429
Heptanes	0.2147	1.0783
Methylcyclohexane	0.0595	0.2951
2,2,4 Trimethylpentane	0.0004	0.0023
Benzene	0.0061	0.0241
Toluene	0.0048	0.0223
Ethylbenzene	0.0017	0.0091
Xylenes	0.0049	0.0264
C8+ Heavies	0.2478	1.5181
Subtotal	99.98000	99.97000
Oxygen/Argon	0.02	0.03
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:
LEASE #:
FIELD/AREA:

NAME/DESCRIP : **ELLIOT NESS 22-17**
WELLHEAD GAS

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

ANALYSIS NO. : **02**
ANALYSIS DATE: MAY 10, 2019 14:39
SAMPLE DATE : MAY 8, 2019 09:20
TO:
EFFECTIVE DATE

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

SAMPLE CYCLE:
SAMPLE PRES. : 1 psig
FLOW PRES. : psig
LAB PRES: psig
SAMPLE TEMP. : 67 ºf
AMBIENT TEMP.: ºf
H2O BY STAIN TUBE: - #/mmcf
FIELD COMMENTS:
LAB COMMENTS:

SAMPLE TYPE: SPOT
PROBE : NO
CYLINDER NO. : 1050
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	---	0.07	0.01	---	---
Oxygen/Argon	---	0.02	0.03	---	---
Nitrogen	---	1.48	2.09	---	---
Carbon Dioxide	---	1.59	3.54	---	---
Methane	P1	87.26810	70.72980	---	---
Ethane	P2	3.3923	5.1534	0.910	0.905
Propane	P3	3.0134	6.7132	0.832	0.828
i-Butane	I4	0.5806	1.7049	0.191	0.190
n-Butane	P4	0.9555	2.8058	0.302	0.300
2,2-Dimethylpropane	I5	0.0010	0.0036	0.000	0.000
i-Pentane	I5	0.3678	1.3406	0.135	0.134
UnknownC4s	U4	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.2817	1.0268	0.103	0.102
2,2-Dimethylbutane	I6	0.0013	0.0057	0.001	0.001
Cyclopentane	N5	0.0305	0.1081	0.009	0.009
2,3-Dimethylbutane	I6	0.0129	0.0562	0.005	0.005
2-Methylpentane	I6	0.0996	0.4336	0.041	0.041
3-Methylpentane	I6	0.0602	0.2621	0.025	0.025
UnknownC5s	U5	0.0003	0.0011	0.000	0.000
n-Hexane	P6	0.1048	0.4563	0.043	0.043
2,2-Dimethylpentane	I7	0.0004	0.0020	0.000	0.000
Methylcyclopentane	N6	0.0904	0.3844	0.032	0.032
2,4-Dimethylpentane	I7	0.0062	0.0314	0.003	0.003
2,2,3-Trimethylbutane	I7	0.0003	0.0015	0.000	0.000
Benzene	A6	0.0061	0.0241	0.002	0.002
3,3-Dimethylpentane	I7	0.0002	0.0010	0.000	0.000

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Cyclohexane	N6	0.0394	0.1675	0.013	0.013
2-Methylhexane	I7	0.0245	0.1240	0.011	0.011
2,3-Dimethylpentane	I7	0.0134	0.0679	0.006	0.006
1,1-Dimethylcyclopentane	N7	0.0064	0.0317	0.003	0.003
3-Methylhexane	I7	0.0306	0.1549	0.014	0.014
1c,3-Dimethylcyclopentane	N7	0.0169	0.0838	0.008	0.008
1t,3-Dimethylcyclopentane	N7	0.0191	0.0947	0.009	0.009
3-Ethylpentane	I7	0.0025	0.0127	0.001	0.001
1t,2-Dimethylcyclopentane	N7	0.0316	0.1568	0.015	0.015
2,2,4-Trimethylpentane	I8	0.0004	0.0023	0.000	0.000
UnknownC6s	U6	0.0002	0.0009	0.000	0.000
n-Heptane	P7	0.0533	0.2698	0.025	0.025
1c,2-Dimethylcyclopentane	N7	0.0026	0.0129	0.001	0.001
Methylcyclohexane	N7	0.0595	0.2951	0.024	0.024
2,2-Dimethylhexane	I8	0.0089	0.0514	0.004	0.004
Ethylcyclopentane	N7	0.0067	0.0332	0.003	0.003
2,5-Dimethylhexane	I8	0.0021	0.0121	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0004	0.0023	0.000	0.000
2,4-Dimethylhexane	I8	0.0039	0.0225	0.002	0.002
1c,2t,4-Trimethylcyclopentane	N8	0.0074	0.0419	0.003	0.003
3,3-Dimethylhexane	I8	0.0006	0.0035	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0113	0.0641	0.005	0.005
2,3,4-Trimethylpentane	I8	0.0017	0.0098	0.001	0.001
Toluene	A7	0.0048	0.0223	0.002	0.002
2,3-Dimethylhexane	I8	0.0035	0.0202	0.002	0.002
2-Methyl-3-ethylpentane	I8	0.0022	0.0127	0.001	0.001
1,1,2-Trimethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2-Methylheptane	I8	0.0173	0.0998	0.009	0.009
4-Methylheptane	I8	0.0040	0.0231	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0008	0.0046	0.000	0.000
3,4-Dimethylhexane	I8	0.0008	0.0046	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0003	0.0017	0.000	0.000
3-Methylheptane	I8	0.0069	0.0398	0.004	0.004
1c,2t,3-Trimethylcyclopentane	N8	0.0142	0.0805	0.007	0.007
3-Ethylhexane	I8	0.0012	0.0069	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0052	0.0295	0.003	0.003
1,1-Dimethylcyclohexane	N8	0.0013	0.0074	0.001	0.001
3t-Ethylmethylcyclopentane	N8	0.0027	0.0153	0.001	0.001
2t-Ethylmethylcyclopentane	N8	0.0021	0.0119	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0070	0.0397	0.004	0.004
2,2,4-Trimethylhexane	I9	0.0004	0.0026	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0077	0.0437	0.004	0.004
n-Octane	P8	0.0261	0.1506	0.013	0.013
1c,4-Dimethylcyclohexane	N8	0.0013	0.0074	0.001	0.001
i-Propylcyclopentane	I8	0.0003	0.0017	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0016	0.0104	0.001	0.001
2,2,3,4-Tetramethylpentane	I9	0.0004	0.0026	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0007	0.0046	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0013	0.0074	0.001	0.001
2,2-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0079	0.0504	0.004	0.004
2,2,3-Trimethylhexane	I9	0.0041	0.0266	0.002	0.002
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
4,4-Dimethylheptane	I9	0.0005	0.0032	0.000	0.000
Ethylcyclohexane	N8	0.0059	0.0334	0.003	0.003
n-Propylcyclopentane	N8	0.0027	0.0153	0.001	0.001
1c,3c,5-Trimethylcyclohexane	N9	0.0004	0.0025	0.000	0.000
2,5-Dimethylheptane	I9	0.0010	0.0065	0.001	0.001

3,3-Dimethylheptane	I9	0.0010	0.0065	0.001	0.001
3,5-Dimethylheptane	I9	0.0007	0.0046	0.000	0.000
2,6-Dimethylheptane	I9	0.0007	0.0046	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0018	0.0115	0.001	0.001
Ethylbenzene	I8	0.0017	0.0091	0.001	0.001
1c,2t,4t-Trimethylcyclohexane	N9	0.0017	0.0109	0.001	0.001
2,3-Dimethylheptane	I9	0.0032	0.0207	0.002	0.002
1,3-Dimethylbenzene (m-Xylene)	A8	0.0009	0.0049	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0027	0.0145	0.001	0.001
3,4-Dimethylheptane	I9	0.0005	0.0032	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0010	0.0065	0.001	0.001
4-Ethylheptane	I9	0.0004	0.0026	0.000	0.000
4-Methyloctane	I9	0.0020	0.0130	0.001	0.001
2-Methyloctane	I9	0.0029	0.0188	0.002	0.002
1c,2t,3-Trimethylcyclohexane	N9	0.0006	0.0038	0.000	0.000
3-Ethylheptane	I9	0.0007	0.0046	0.000	0.000
3-Methyloctane	I9	0.0032	0.0207	0.002	0.002
1c,2t,4c-Trimethylcyclohexane	I9	0.0002	0.0013	0.000	0.000
1,1,2-Trimethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
3,3-Diethylpentane	I9	0.0002	0.0013	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0013	0.0070	0.000	0.000
i-Butylcyclopentane	N9	0.0022	0.0140	0.001	0.001
n-Nonane	P9	0.0093	0.0603	0.005	0.005
1,1-Methylethylcyclohexane	N9	0.0014	0.0089	0.001	0.001
i-Propylbenzene	A9	0.0020	0.0121	0.001	0.001
i-Propylcyclohexane	N9	0.0007	0.0045	0.000	0.000
2,2-Dimethyloctane	I10	0.0003	0.0022	0.000	0.000
2,4-Dimethyloctane	I10	0.0006	0.0043	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
2,5-Dimethyloctane	I10	0.0002	0.0014	0.000	0.000
n-Butylcyclopentane	N9	0.0018	0.0115	0.001	0.001
3,3-Dimethyloctane	I10	0.0005	0.0036	0.000	0.000
n-Propylbenzene	A9	0.0023	0.0139	0.001	0.001
3,6-Dimethyloctane	I10	0.0006	0.0043	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0021	0.0151	0.001	0.001
1,3-Methylethylbenzene	A9	0.0004	0.0024	0.000	0.000
1,4-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	0.0002	0.0014	0.000	0.000
5-Methylnonane	I10	0.0010	0.0072	0.001	0.001
1,2-Methylethylbenzene	A9	0.0013	0.0079	0.001	0.001
2-Methylnonane	I10	0.0001	0.0007	0.000	0.000
3-Ethyloctane	I10	0.0002	0.0014	0.000	0.000
3-Methylnonane	I10	0.0006	0.0043	0.000	0.000
1,2,4-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
t-Butylbenzene	A10	0.0005	0.0034	0.000	0.000
i-Butylcyclohexane	N10	0.0006	0.0042	0.000	0.000
1t-Methyl-2-n-propylcyclohexane	I10	0.0001	0.0007	0.000	0.000
i-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
sec-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0084	0.0544	0.005	0.005
n-Decane	P10	0.0025	0.0180	0.002	0.002
1,2,3-Trimethylbenzene	A9	0.0003	0.0018	0.000	0.000
1,3-Methyl-i-propylbenzene	A10	0.0006	0.0041	0.000	0.000
1,4-Methyl-i-propylbenzene	A10	0.0001	0.0007	0.000	0.000
Sec-Butylcyclohexane	A10	0.0002	0.0014	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0002	0.0014	0.000	0.000
1,3-Diethylbenzene	A10	0.0008	0.0054	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0002	0.0014	0.000	0.000

1,4-Diethylbenzene	A10	0.0002	0.0014	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Butylbenzene	A10	0.0003	0.0020	0.000	0.000
1,3-Dimethyl-5-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0002	0.0014	0.000	0.000
1,4-Dimethyl-2-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0002	0.0014	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0002	0.0014	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC10s	U10	0.0071	0.0510	0.004	0.004
n-Undecane	P11	0.0004	0.0032	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0001	0.0007	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC11s	U11	0.0015	0.0118	0.001	0.001
n-Dodecane	P12	0.0001	0.0009	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0001	0.0008	0.000	0.000
2-Methylnaphthalene	A11	0.0002	0.0014	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
n-Tridecane	P13	0.0004	0.0037	0.000	0.000
UnknownC13s	U13	0.0001	0.0009	0.000	0.000
n-Tetradecane	P14	0.0006	0.0060	0.000	0.000
UnknownC14s	U14	0.0003	0.0030	0.000	0.000
n-Pentadecane	P15	0.0005	0.0054	0.000	0.000
UnknownC15s	U15	0.0009	0.0097	0.001	0.001
n-Hexadecane	P16	0.0003	0.0034	0.000	0.000
UnknownC16s	U16	0.0002	0.0023	0.000	0.000
n-Heptadecane	P17	0.0001	0.0012	0.000	0.000
UnknownC18s	U18	0.0001	0.0013	0.000	0.000
TOTAL		100.00000	100.00000	2.8909	2.8760

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0061	0.0241
TOLUENE	0.0048	0.0223
ETHYLBENZENE	0.0017	0.0091
XYLENES	0.0049	0.0264
TOTAL BTEX	0.0175	0.0819

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993)*
Mod ASTM D6730,GPA 2261 & GPA 2286.
(CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

	BTU @	**14.73**	**14.65**
LOW	NET DRY REAL :	1040.4 **/scf**	1034.8 **/scf**
	NET WET REAL :	1022.3 **/scf**	1016.7 **/scf**
HIGH	GROSS DRY REAL :	1149.0 **/scf**	1142.7 **/scf**
	GROSS WET REAL :	1129.0 **/scf**	1122.8 **/scf**
	NET DRY REAL :	20001.1 **/lb**	19892.5 **/lb**
	GROSS DRY REAL :	22093.6 **/lb**	21973.6 **/lb**
	RELATIVE DENSITY (AIR=1):		0.6824
	DENSITY		0.05216 **lb/scf**
	COMPRESSIBILITY FACTOR :		0.99727
	REGULAR WOBBE INDEX		1387.7

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

Net Dry Ideal BTU	4982.3 **/scf**	Relative Density - SG (Air=1)	3.4157	***C6+factors***
Gross Dry Ideal BTU	5365.4 **/scf**	**Z** Compressiblity Factor	0.99324	0.99233
Net Dry Ideal BTU	19543.9 **/lb**	Density Factor	260.683 **lbm/1000 ft3**	
Gross Dry Ideal BTU	21046.9 **/lb**	Molar Mass or MW	98.925 **g/mol**	
		Volume Liquid Ideal gas	0.409 **scf/gal**	22.4

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.