EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

LEASE #:		NAME/DESCRIP :	**HUNGENBERG #5-20 BRADEN HEAD**
PROJECT NO. :	**201606078**	ANALYSIS NO. :	**01**
COMPANY NAME :	**PDC ENERGY, INC**	ANALYSIS DATE:	JUNE 22, 2016 11:39
OFFICE / BRANCH:	EVANS, CO	SAMPLE DATE :	JUNE 16, 2016
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT	
SAMPLE PRES. :	10.0	psig	CYLINDER NO. :	1891	
LAB PRES:		psig	SAMPLED BY :	JOHN MOSER	
SAMPLE TEMP. :	88.0	ºf	SAMPLING COMPANY:	EMPACT	
AMBIENT TEMP.:		ºf	H2S BY STAIN TUBE:	-	ppm
H2O BY STAIN TUBE:	-	#/mmcf	CO2 BY STAIN TUBE:	-	Mol %
FIELD COMMENTS:	NO PROBE				
LAB COMMENTS:					

COMPONENT	MOLE %	MASS %	GPM @ 14.730	GPM @ 14.650
HELIUM	0.01	0.00	---	---
HYDROGEN	0.02	0.00	---	---
OXYGEN/ARGON	0.05	0.07	---	---
NITROGEN	2.6000	3.0700	---	---
CARBON DIOXIDE	0.08	0.15	---	---
METHANE	72.89940	49.31020	---	---
ETHANE	10.9114	13.8341	2.9298	2.9139
PROPANE	5.5621	10.3415	1.5379	1.5295
I-BUTANE	0.9205	2.2559	0.3019	0.3003
N-BUTANE	2.5487	6.2462	0.8062	0.8018
I-PENTANE	1.1532	3.5013	0.4167	0.4144
N-PENTANE	1.4533	4.4212	0.5284	0.5255
HEXANES PLUS	1.7914	6.7996	0.7273	0.7235
TOTALS	100.00000	100.00000	7.2482	7.2089

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0452	0.1489
TOLUENE	0.0474	0.1841
ETHYLBENZENE	0.0008	0.0036
XYLENES	0.0038	0.0171
TOTAL BTEX	0.0972	0.3537

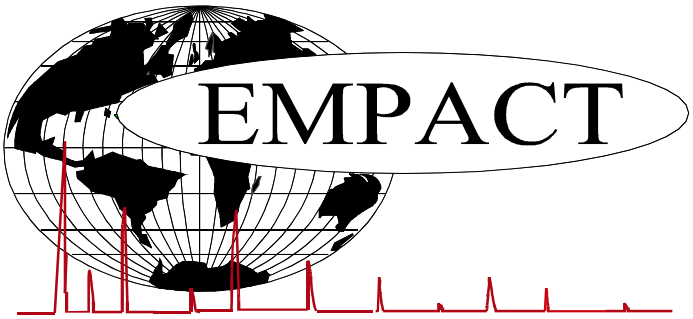
BTU @		14.730	14.650
LOW	NET DRY REAL :	1257.6 /scf	1250.8 /scf
	NET WET REAL :	1235.7 /scf	1228.9 /scf
HIGH	GROSS DRY REAL :	1382.3 /scf	1374.8 /scf
	GROSS WET REAL :	1358.3 /scf	1350.8 /scf
	NET DRY REAL :	20145.6 /lb	20036.2 /lb
	GROSS DRY REAL :	22139.2 /lb	22019.0 /lb

(CALC: GPA STD 2145 & TP-17 @14.696 & 60 F)

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730*

RELATIVE DENSITY (AIR=1): 0.8183

COMPRESSIBILITY FACTOR : 0.99587

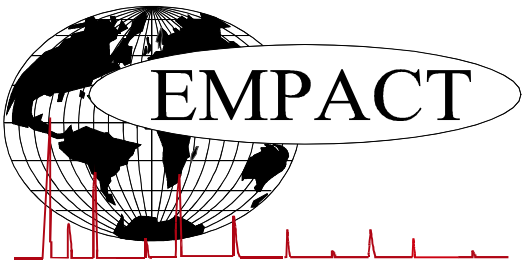


EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201606078	ANALYSIS NO. :	01
COMPANY NAME :	PDC ENERGY, INC	ANALYSIS DATE:	JUNE 22, 2016 11:39
ACCOUNT NO. :		SAMPLE DATE :	JUNE 16, 2016
PRODUCER :		CYLINDER NO. :	1891
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	HUNGENBERG #5-20 BRADEN HEAD		
FIELD DATA		SAMPLE TEMP. :	88.0
SAMPLE PRES. :	10.0	AMBIENT TEMP.:	
COMMENTS :	NO PROBE SPOT		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.02	0.00
Carbon Dioxide	0.08	0.15
Nitrogen	2.60	3.07
Methane	72.89940	49.31020
Ethane	10.9114	13.8341
Propane	5.5621	10.3415
Isobutane	0.9205	2.2559
n-Butane	2.5487	6.2462
Isopentane	1.0710	3.2582
n-Pentane	1.4533	4.4212
Cyclopentane	0.0822	0.2431
n-Hexane	0.4087	1.4850
Cyclohexane	0.1228	0.4358
Other Hexanes	0.6871	2.4836
Heptanes	0.3053	1.2868
Methycyclohexane	0.1013	0.4194
2,2,4 Trimethylpentane	0.0016	0.0077
Benzene	0.0452	0.1489
Toluene	0.0474	0.1841
Ethylbenzene	0.0008	0.0036
Xylenes	0.0038	0.0171
C8+ Heavies	0.0674	0.3276
Subtotal	99.95000	99.93000
Oxygen/Argon	0.05	0.07
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201606078	ANALYSIS NO. :	01
COMPANY NAME :	PDC ENERGY, INC	ANALYSIS DATE:	JUNE 22, 2016 11:39
ACCOUNT NO. :		SAMPLE DATE :	JUNE 16, 2016
PRODUCER :		CYLINDER NO. :	1891
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	HUNGENBERG #5-20 BRADEN HEAD		
FIELD DATA		SAMPLE TEMP. :	88.0
SAMPLE PRES. :	10.0	AMBIENT TEMP.:	
COMMENTS :	NO PROBE SPOT		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.730	GPM @ 14.650
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.02	0.00	---	---
Oxygen/Argon	---	0.05	0.07	---	---
Nitrogen	---	2.60	3.07	---	---
Carbon Dioxide	---	0.08	0.15	---	---
Methane	P1	72.89940	49.31020	---	---
Ethane	P2	10.9114	13.8341	2.930	2.914
Propane	P3	5.5621	10.3415	1.538	1.530
i-Butane	I4	0.9205	2.2559	0.302	0.300
n-Butane	P4	2.5487	6.2462	0.806	0.802
2,2-Dimethylpropane	I5	0.0065	0.0198	0.002	0.002
i-Pentane	I5	1.0645	3.2384	0.391	0.388
n-Pentane	P5	1.4533	4.4212	0.528	0.526
2,2-Dimethylbutane	I6	0.0123	0.0447	0.005	0.005
Cyclopentane	N5	0.0822	0.2431	0.024	0.024
2,3-Dimethylbutane	I6	0.0341	0.1239	0.014	0.014
2-Methylpentane	I6	0.3241	1.1777	0.135	0.134
3-Methylpentane	I6	0.1573	0.5716	0.064	0.064
n-Hexane	P6	0.4087	1.4850	0.169	0.168
2,2-Dimethylpentane	I7	0.0001	0.0004	0.000	0.000
Methylcyclopentane	N6	0.1552	0.5508	0.055	0.055
2,4-Dimethylpentane	I7	0.0130	0.0549	0.006	0.006
2,2,3-Trimethylbutane	I7	0.0009	0.0038	0.000	0.000
Benzene	A6	0.0452	0.1489	0.013	0.013
3,3-Dimethylpentane	I7	0.0008	0.0034	0.000	0.000
Cyclohexane	N6	0.1228	0.4358	0.042	0.042
2-Methylhexane	I7	0.0411	0.1736	0.019	0.019
2,3-Dimethylpentane	I7	0.0083	0.0351	0.004	0.004
1,1-Dimethylcyclopentane	N7	0.0169	0.0700	0.007	0.007
3-Methylhexane	I7	0.0457	0.1931	0.021	0.021
1c,3-Dimethylcyclopentane	N7	0.0145	0.0600	0.007	0.007
1t,3-Dimethylcyclopentane	N7	0.0112	0.0464	0.005	0.005
3-Ethylpentane	I7	0.0032	0.0135	0.001	0.001
1t,2-Dimethylcyclopentane	N7	0.0237	0.0981	0.011	0.011
2,2,4-Trimethylpentane	I8	0.0016	0.0077	0.001	0.001

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UnknownC6s	U6	0.0041	0.0149	0.002	0.002
n-Heptane	P7	0.1045	0.4415	0.048	0.048
1c,2-Dimethylcyclopentane	N7	0.0015	0.0062	0.001	0.001
Methylcyclohexane	N7	0.1013	0.4194	0.041	0.041
2,2-Dimethylhexane	I8	0.0007	0.0034	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0058	0.0275	0.003	0.003
Ethylcyclopentane	N7	0.0029	0.0120	0.001	0.001
2,5-Dimethylhexane	I8	0.0023	0.0111	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0002	0.0010	0.000	0.000
2,4-Dimethylhexane	I8	0.0037	0.0178	0.002	0.002
1c,2t,4-Trimethylcyclopentane	N8	0.0040	0.0189	0.002	0.002
3,3-Dimethylhexane	I8	0.0007	0.0034	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0029	0.0137	0.001	0.001
2,3,4-Trimethylpentane	I8	0.0004	0.0019	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0002	0.0010	0.000	0.000
Toluene	A7	0.0474	0.1841	0.016	0.016
2,3-Dimethylhexane	I8	0.0021	0.0101	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0006	0.0029	0.000	0.000
2-Methylheptane	I8	0.0101	0.0487	0.005	0.005
4-Methylheptane	I8	0.0031	0.0149	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0003	0.0014	0.000	0.000
3,4-Dimethylhexane	I8	0.0003	0.0014	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0002	0.0009	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0005	0.000	0.000
3-Methylheptane	I8	0.0037	0.0178	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0066	0.0312	0.003	0.003
3-Ethylhexane	I8	0.0014	0.0068	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0028	0.0132	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0010	0.0047	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0006	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0003	0.0014	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0009	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0005	0.0024	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0002	0.0011	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0018	0.0085	0.001	0.001
1c,2c,3-Trimethylcyclopentane	N8	0.0002	0.0009	0.000	0.000
UnknownC7s	U7	0.0112	0.0473	0.005	0.005
n-Octane	P8	0.0088	0.0424	0.004	0.004
1c,4-Dimethylcyclohexane	N8	0.0010	0.0047	0.001	0.001
i-Propylcyclopentane	I8	0.0001	0.0005	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0001	0.0006	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0006	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0003	0.0014	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0017	0.0091	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0003	0.0016	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
Ethylcyclohexane	N8	0.0004	0.0019	0.000	0.000
n-Propylcyclopentane	N8	0.0003	0.0014	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
Ethylbenzene	I8	0.0008	0.0036	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
2,3-Dimethylheptane	I9	0.0003	0.0016	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0022	0.0099	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0008	0.0036	0.000	0.000
3,4-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0003	0.0016	0.000	0.000
4-Methyloctane	I9	0.0002	0.0011	0.000	0.000
2-Methyloctane	I9	0.0002	0.0011	0.000	0.000
3-Methyloctane	I9	0.0002	0.0011	0.000	0.000

1,2-Dimethylbenzene (o-Xylene)	A8	0.0008	0.0036	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0006	0.000	0.000
UnknownC8s	U8	0.0002	0.0010	0.000	0.000
n-Nonane	P9	0.0003	0.0016	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0005	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0006	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0005	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0006	0.000	0.000
UnknownC9s	U9	0.0006	0.0033	0.000	0.000
n-Dodecane	P12	0.0001	0.0007	0.000	0.000
UnknownC17s	U17	0.0002	0.0020	0.000	0.000
TOTAL		100.00000	100.00000	7.2482	7.2089

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0452	0.1489
TOLUENE	0.0474	0.1841
ETHYLBENZENE	0.0008	0.0036
XYLENES	0.0038	0.0171
TOTAL BTEX	0.0972	0.3537

		14.730	14.650
	BTU @		
LOW	NET DRY REAL :	1257.6 **/scf**	1250.8 **/scf**
	NET WET REAL :	1235.7 **/scf**	1228.9 **/scf**
HIGH	GROSS DRY REAL :	1382.3 **/scf**	1374.8 **/scf**
	GROSS WET REAL :	1358.3 **/scf**	1350.8 **/scf**
	NET DRY REAL :	20145.6 **/lb**	20036.2 **/lb**
	GROSS DRY REAL :	22139.2 **/lb**	22019.0 **/lb**
	RELATIVE DENSITY (AIR=1):		0.8183
	COMPRESSIBILITY FACTOR :		0.99587

(CALC: GPA STD 2145 & TP-17 @14.696 & 60 F)

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730*