EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201310005	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 2, 2103
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 30, 2013
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	SEPARATOR @ 17:50		EMPACT
	BRINGLESON 2-20-11-9-58		
FIELD DATA		SAMPLE TEMP. :	178
SAMPLE PRES. :	18	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	MOLE %	MASS %	VOL %
NITROGEN (AIR)	0.0566	0.0153	0.0138
CARBON DIOXIDE	0.0077	0.0033	0.0030
METHANE	0.0598	0.0093	0.0227
ETHANE	0.2683	0.0779	0.1602
PROPANE	1.3481	0.5743	0.8300
I-BUTANE	0.4141	0.2325	0.3027
N-BUTANE	2.1623	1.2141	1.5234
I-PENTANE	1.0645	0.7419	0.8734
N-PENTANE	1.6664	1.1615	1.3485
HEXANES PLUS	92.9522	95.9699	94.9223
TOTALS	100.0000	100.0000	100.0000

BTEX COMPONENTS	**MOLE%**	**MASS%**
BENZENE	1.5820	1.1937
TOLUENE	2.8532	2.5397
ETHYLBENZENE	0.5320	0.5456
XYLENE	2.1629	2.2183
TOTAL BTEX	7.1301	6.4973

(CALC: GPA STD 2145-94 & TP-17 @14.696 & 60 F)

	TOTAL SAMPLE	**C6+ FRACTION**	
Specific Gravity (H2O=1) =	0.7331	0.7409	60/60
API Gravity =	61.52	59.48	60/60
Molecular Weight =	103.52	107.542	
Absolute Density =	6.11	6.17	LBS/GAL
Heating Value Liq. Idl Gas=	124880	126006	BTU/GAL
Vapor/Liquid =	22.48	21.87	CUFT/GAL
Vapor Pressure =	11.73	2.24	PSIA @100 F

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

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EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201310005	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 2, 2103
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 30, 2013
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	SEPARATOR @ 17:50 BRINGLESON 2-20-11-9-58		EMPACT
FIELD DATA		SAMPLE TEMP. :	178
SAMPLE PRES. :	18	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0077		0.0033		0.0030	
NITROGEN (AIR)	0.0566		0.0153		0.0138	
METHANE	0.0598		0.0093		0.0227	
ETHANE	0.2683		0.0779		0.1602	
PROPANE	1.3481		0.5743		0.8300	
I-BUTANE	0.4141		0.2325		0.3027	
N-BUTANE	2.1623		1.2141		1.5234	
I-PENTANE	1.0645		0.7419		0.8734	
N-PENTANE	1.6664		1.1615		1.3485	
CYCLOPENTANE (N-C5)	1.6638		1.1272		1.0865	
N-HEXANE	9.2349		7.6887		8.4880	
CYCLOHEXANE (OTHER C6)	3.5306		2.8704		2.6847	
OTHER HEXANES	14.8087		12.2261		12.9547	
OTHER HEPTANES	15.2998		14.7145		15.2024	
METHYLCYCLOHEXANE (OTHER C7)	4.9669		4.7114		4.4563	
2,2,4 TRIMETHYLPENTANE	0.8780		0.8328		0.8099	
BENZENE	1.5820		1.1937		0.9907	
TOLUENE	2.8532		2.5397		2.1287	
ETHYLBENZENE	0.5320		0.5456		0.4572	
XYLENES	2.1629		2.2183		1.8641	
OTHER OCTANES	11.3077		12.5074		12.4325	
OCTANES PLUS	----	39.0123	----	48.8982	----	46.9303
NONANES	9.3752		11.5130		11.2109	
DECANES PLUS	14.7565		21.2811		20.1557	
SUB TOTAL	100.0000		100.0000		100.0000	
TOTAL	100.0000		100.0000		100.0000	

API Gravity =	**61.52**	60/60
Vapor Pressure =	**11.73**	PSIA & 100 F
Average Molecular Weight of Decanes plus =	**149.28**	
Average Specific Gravity of Decanes plus =	**0.7760**	

EMPACT ANALYTICAL SYSTEMS INC.
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EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

BY CARBON NUMBER

PROJECT NO. :	201310005	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 2, 2103
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 30, 2013
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	SEPARATOR @ 17:50		EMPACT
	BRINGLESON 2-20-11-9-58		
FIELD DATA		SAMPLE TEMP. :	178
SAMPLE PRES. :	18	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT / CARBON NUMBER		MOLE%	MASS %	VOLUME %
NITROGEN		0.0566	0.0153	0.0138
CARBON DIOXIDE		0.0077	0.0033	0.0030
	C1	0.0598	0.0093	0.0227
	C2	0.2683	0.0779	0.1602
	C3	1.3481	0.5743	0.8300
	C4	2.5764	1.4466	1.8261
	C5	4.3947	3.0306	3.3084
	C6	29.1562	23.9789	25.1181
	C7	23.1199	21.9656	21.7874
	C8	14.8806	16.1041	15.5637
	C9	9.3752	11.5130	11.2109
	C10	7.9807	10.6143	10.1137
	C11	3.3660	4.8528	4.5259
	C12	1.6930	2.5809	2.4253
	C13	0.7675	1.3506	1.2935
	C14	0.5908	1.1323	1.0870
	C15	0.2654	0.5446	0.5168
	C16	0.0862	0.1885	0.1777
	C17	0.0025	0.0058	0.0054
	C18	0.0023	0.0057	0.0053
	C19	0.0011	0.0028	0.0026
	C20	0.0008	0.0022	0.0020
	C21	0.0002	0.0006	0.0005
	C22	0.0000	0.0000	0.0000
	C23	0.0000	0.0000	0.0000
	C24	0.0000	0.0000	0.0000
	C25	0.0000	0.0000	0.0000
	C26	0.0000	0.0000	0.0000
	C27	0.0000	0.0000	0.0000
	C28	0.0000	0.0000	0.0000
	C29	0.0000	0.0000	0.0000
	C30+	0.0000	0.0000	0.0000
	Total	100.0000	100.0000	100.0000

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EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201310005	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 2, 2103
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 30, 2013
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	SEPARATOR @ 17:50 BRINGLESON 2-20-11-9-58		EMPACT
FIELD DATA		SAMPLE TEMP. :	178
SAMPLE PRES. :	18	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Nitrogen	NHC	0.0566	0.0153	0.0138
Carbon Dioxide	NHC	0.0077	0.0033	0.0030
Methane	P1	0.0598	0.0093	0.0227
Ethane	P2	0.2683	0.0779	0.1602
Propane	P3	1.3481	0.5743	0.8300
i-Butane	I4	0.4141	0.2325	0.3027
n-Butane	P4	2.1623	1.2141	1.5234
2,2-Dimethylpropane	I5	0.0824	0.0574	0.0704
i-Pentane	I5	0.9821	0.6845	0.8030
n-Pentane	P5	1.6664	1.1615	1.3485
2,2-Dimethylbutane	I6	0.1724	0.1435	0.1608
Cyclopentane	N5	1.6638	1.1272	1.0865
2,3-Dimethylbutane	I6	0.7019	0.5844	0.6420
2-Methylpentane	I6	5.4933	4.5734	5.0949
3-Methylpentane	I6	3.1778	2.6456	2.8981
n-Hexane	P6	9.2349	7.6887	8.4880
2,2-Dimethylpentane	I7	0.0483	0.0468	0.0503
Methylcyclopentane	N6	5.2633	4.2792	4.1589
2,4-Dimethylpentane	I7	0.4285	0.4148	0.4494
2,2,3-Trimethylbutane	I7	0.0948	0.0918	0.0967
Benzene	A6	1.5820	1.1937	0.9907
3,3-Dimethylpentane	I7	0.0528	0.0511	0.0538
Cyclohexane	N6	3.5306	2.8704	2.6847
2-Methylhexane	I7	1.4517	1.4052	1.5090
2,3-Dimethylpentane	I7	0.8706	0.8427	0.8792
1,1-Dimethylcyclopentane	N7	0.5389	0.5112	0.4934
3-Methylhexane	I7	2.0282	1.9632	2.0765
1c,3-Dimethylcyclopentane	N7	0.9843	0.9337	0.9128
1t,3-Dimethylcyclopentane	N7	0.8780	0.8328	0.8099
3-Ethylpentane	I7	0.1463	0.1416	0.1474
1t,2-Dimethylcyclopentane	N7	1.8717	1.7754	1.7206
2,2,4-Trimethylpentane	I8	0.0702	0.0775	0.0812
n-Heptane	P7	5.2681	5.0994	5.4294
1c,2-Dimethylcyclopentane	N7	0.1175	0.1115	0.1052
Methylcyclohexane	N7	4.9669	4.7114	4.4563
2,2-Dimethylhexane	I8	0.7087	0.7821	0.8186
Ethylcyclopentane	N7	0.5201	0.4933	0.4688
2,5-Dimethylhexane	I8	0.1673	0.1846	0.1937
2,2,3-Trimethylpentane	I8	0.0329	0.0363	0.0369
2,4-Dimethylhexane	I8	0.2952	0.3258	0.3402
1c,2t,4-Trimethylcyclopentane	N8	0.3944	0.4275	0.4079

3,3-Dimethylhexane	I8	0.0931	0.1027	0.1054
2,3,4-Trimethylpentane	I8	0.0890	0.0982	0.0994
2,3,3-Trimethylpentane	I8	0.0009	0.0010	0.0010
Toluene	A7	2.8532	2.5397	2.1287
2,3-Dimethylhexane	I8	0.2424	0.2675	0.2737
2-Methyl-3-ethylpentane	I8	0.1226	0.1353	0.1369
1,1,2-Trimethylcyclopentane	N8	0.0084	0.0091	0.0086
2-Methylheptane	I8	1.2196	1.3458	1.4016
4-Methylheptane	I8	0.4738	0.5228	0.5314
3-Methyl-3-ethylpentane	I8	0.0977	0.1078	0.1080
3,4-Dimethylhexane	I8	0.1185	0.1308	0.1323
1c,2c,4-Trimethylcyclopentane	N8	0.0322	0.0349	0.0330
1c,3-Dimethylcyclohexane	N8	0.0381	0.0413	0.0393
3-Methylheptane	I8	0.5704	0.6294	0.6499
1c,2t,3-Trimethylcyclopentane	N8	1.0585	1.1474	1.0850
3-Ethylhexane	I8	0.1887	0.2082	0.2127
1t,4-Dimethylcyclohexane	N8	0.6905	0.7485	0.7151
1,1-Dimethylcyclohexane	N8	0.1600	0.1734	0.1618
3c-Ethylmethylcyclopentane	N8	0.0106	0.0115	0.0109
3t-Ethylmethylcyclopentane	N8	0.1700	0.1843	0.1751
2t-Ethylmethylcyclopentane	N8	0.1270	0.1377	0.1305
1,1-Methylethylcyclopentane	N8	0.4705	0.5100	0.4758
2,2,4-Trimethylhexane	I9	0.0626	0.0776	0.0790
1t,2-Dimethylcyclohexane	N8	0.5844	0.6335	0.5950
1t,3-Dimethylcyclohexane	N8	0.0022	0.0024	0.0022
n-Octane	P8	2.1927	2.4197	2.5081
1c,4-Dimethylcyclohexane	N8	0.8349	0.9050	0.8423
i-Propylcyclopentane	I8	0.0305	0.0331	0.0311
2,4,4-Trimethylhexane	I9	0.0277	0.0343	0.0346
2,2,3,4-Tetramethylpentane	I9	0.0199	0.0247	0.0250
2,3,4-Trimethylhexane	I9	0.0327	0.0405	0.0409
1c,2-Dimethylcyclohexane	N8	0.2017	0.2186	0.2001
2,3,5-Trimethylhexane	I9	0.0692	0.0857	0.0865
2,2-Dimethylheptane	I9	0.0087	0.0108	0.0111
1,1,4-Trimethylcyclohexane	N9	0.7911	0.9648	0.9108
2,2,3-Trimethylhexane	I9	0.4641	0.5750	0.5744
2,4-Dimethylheptane	I9	0.0495	0.0613	0.0624
4,4-Dimethylheptane	I9	0.0600	0.0743	0.0757
Ethylcyclohexane	N8	0.4327	0.4690	0.4339
n-Propylcyclopentane	N8	0.2236	0.2424	0.2274
1c,3c,5-Trimethylcyclohexane	N9	0.0674	0.0822	0.0776
2,5-Dimethylheptane	I9	0.0707	0.0876	0.0890
3,3-Dimethylheptane	I9	0.0675	0.0836	0.0850
3,5-Dimethylheptane	I9	0.0470	0.0582	0.0592
2,6-Dimethylheptane	I9	0.0402	0.0498	0.0512
1,1,3-Trimethylcyclohexane	N9	0.0358	0.0437	0.0413
Ethylbenzene	A8	0.5320	0.5456	0.4572
1c,2t,4t-Trimethylcyclohexane	N9	0.2948	0.3595	0.3329
2,3-Dimethylheptane	I9	0.0056	0.0069	0.0069
1,3-Dimethylbenzene (m-Xylene)	A8	0.6216	0.6375	0.5373
1,4-Dimethylbenzene (p-Xylene)	A8	0.9861	1.0114	0.8552
3,4-Dimethylheptane	I9	0.1856	0.2300	0.2291
3,4-Dimethylheptane (2)	I9	0.1892	0.2344	0.2335
4-Ethylheptane	I9	0.0453	0.0561	0.0571
4-Methyloctane	I9	0.2138	0.2649	0.2678
2-Methyloctane	I9	0.3153	0.3907	0.3989
1c,2t,4c-Trimethylcyclohexane	I9	0.0896	0.1110	0.1114
3-Ethylheptane	I9	0.0768	0.0952	0.0955
3-Methyloctane	I9	0.3612	0.4475	0.4523
1c,2t,3-Trimethylcyclohexane	N9	0.0682	0.0832	0.0770
1,1,2-Trimethylcyclohexane	N9	0.0251	0.0306	0.0283
1,2-Dimethylbenzene (o-Xylene)	A8	0.5552	0.5694	0.4716
i-Butylcyclopentane	N9	0.2364	0.2883	0.2690
UnknownC8s	U8	0.0318	0.0351	0.0364
n-Nonane	P9	1.5434	1.9123	1.9413
1,1-Methylethylcyclohexane	N9	0.4436	0.5496	0.5596
i-Propylbenzene	A9	0.2085	0.2421	0.2043
i-Propylcyclohexane	N9	0.0793	0.0967	0.0879
2,2-Dimethyloctane	I10	0.0539	0.0741	0.0730
2,4-Dimethyloctane	I10	0.0799	0.1098	0.1082
2,6-Dimethyloctane	I10	0.0151	0.0208	0.0212
2,5-Dimethyloctane	I10	0.0260	0.0357	0.0352
n-Butylcyclopentane	N9	0.2508	0.3399	0.3100

3,3-Dimethyloctane	I10	0.0903	0.1241	0.1224
n-Propylbenzene	A9	0.1773	0.2059	0.1738
3,6-Dimethyloctane	I10	0.1612	0.2216	0.2184
3-Methyl-5-ethylheptane	I10	0.2666	0.3303	0.3316
1,3-Methylethylbenzene	A9	0.1973	0.2291	0.1917
1,4-Methylethylbenzene	A9	0.0838	0.0973	0.0814
1,3,5-Trimethylbenzene	A9	0.1672	0.1941	0.1636
2,3-Dimethyloctane	I10	0.0487	0.0669	0.0659
5-Methylnonane	I10	0.1897	0.2607	0.2593
1,2-Methylethylbenzene	A9	0.3314	0.3848	0.3203
2-Methylnonane	I10	0.0697	0.0958	0.0961
3-Ethyloctane	I10	0.0697	0.0958	0.0944
3-Methylnonane	I10	0.1214	0.1669	0.1658
1,2,4-Trimethylbenzene	A9	0.0082	0.0095	0.0079
t-Butylbenzene	A10	0.2672	0.3465	0.2916
i-Butylcyclohexane	N10	0.2047	0.2774	0.2491
1t-Methyl-2-n-propylcyclohexane	I10	0.0404	0.0501	0.0503
i-Butylbenzene	A10	0.0588	0.0762	0.0651
sec-Butylbenzene	A10	0.0216	0.0280	0.0237
UnknownC9s	U9	1.7405	2.1566	2.1893
n-Decane	P10	1.2710	1.7470	1.7437
1,2,3-Trimethylbenzene	A9	0.1229	0.1427	0.1164
1,3-Methyl-i-propylbenzene	A10	0.0840	0.0975	0.0812
1,4-Methyl-i-propylbenzene	A10	0.0495	0.0575	0.0479
Sec-Butylcyclohexane	N10	0.2492	0.3377	0.3028
1,2-Methyl-i-propylbenzene	A10	0.0942	0.1221	0.1016
3-Ethylnonane	I10	0.0615	0.0845	0.0848
1,3-Diethylbenzene	A10	0.0872	0.1131	0.0955
1,3-Methyl-n-propylbenzene	A10	0.0501	0.0650	0.0550
1,4-Diethylbenzene	A10	0.0770	0.0998	0.0844
1,4-Methyl-n-propylbenzene	A10	0.0339	0.0440	0.0374
n-Butylbenzene	A10	0.0871	0.1129	0.0955
1,3-Dimethyl-5-ethylbenzene	A10	0.0517	0.0670	0.0565
1,2-Diethylbenzene	A10	0.0842	0.1092	0.0905
1,2-Methyl-n-propylbenzene	A10	0.0744	0.0965	0.0805
1,4-Dimethyl-2-ethylbenzene	A10	0.0830	0.1076	0.0894
1,3-Dimethyl-4-ethylbenzene	A10	0.0404	0.0524	0.0436
1,2-Dimethyl-4-ethylbenzene	A10	0.1395	0.1809	0.1508
1,3-Dimethyl-2-ethylbenzene	A10	0.1193	0.1547	0.1267
1t,2c,4-Trimethylcyclopentane	A10	0.4595	0.4981	0.4855
1,2-Dimethyl-3-ethylbenzene	A10	0.1040	0.1348	0.1102
1,2-Ethyl-i-propylbenzene	A10	0.0680	0.0882	0.0734
1,4-Methyl-t-butylbenzene	A11	0.0962	0.1247	0.1037
UnknownC10s	U10	2.5910	3.5613	3.5545
n-Undecane	P11	0.8292	1.2521	1.2324
1,4-Ethyl-i-propylbenzene	A11	0.0714	0.0926	0.0770
1,2,4,5-Tetramethylbenzene	A11	0.1112	0.1442	0.1187
1,2-Methyl-n-butylbenzene	A11	0.0824	0.1068	0.0888
1,2,3,5-Tetramethylbenzene	A11	0.0579	0.0751	0.0615
1,2-Methyl-t-butylbenzene	A11	0.0879	0.1140	0.0948
5-Methylindan	A11	0.0155	0.0255	0.0248
4-Methylindan	A11	0.0057	0.0094	0.0092
1,2-Ethyl-n-propylbenzene	A11	0.1097	0.1422	0.1183
2-Methylindan	A11	0.0621	0.1022	0.0995
1,3-Methyl-n-butylbenzene	A11	0.0547	0.0709	0.0590
1,3-Di-i-propylbenzene	A11	0.0535	0.0694	0.0577
sec-Pentylbenzene	A11	0.0434	0.0563	0.0468
n-Pentylbenzene	A11	0.0381	0.0546	0.0464
1t-M-2-(4MP)cyclopentane	P12	0.0528	0.0869	0.0846
1,2-Di-n-propylbenzene	A11	0.0795	0.1031	0.0858
1,4-Di-i-propylbenzene	A11	0.1032	0.1338	0.1113
Tetrahydronaphthalene	A10	0.0640	0.0830	0.0690
t-Decahydronaphthalene	A10	0.0970	0.1258	0.1046
Naphthalene	A10	0.0751	0.0930	0.0774
1-t-Butyl-3,5-dimethylbenzene	A12	0.0381	0.0494	0.0411
1,4-Ethyl-t-butylbenzene	A11	0.0887	0.1150	0.0956
UnknownC11s	U11	1.2551	1.8952	1.8654
n-Dodecane	P12	0.4586	0.7547	0.7347
1,3-Di-n-propylbenzene	A12	0.1193	0.1547	0.1287
1,3,5-Triethylbenzene	A12	0.0775	0.0900	0.0758
1,2,4-Triethylbenzene	A12	0.1982	0.2301	0.1915
1,4-Methyl-n-pentylbenzene	A12	0.0403	0.0523	0.0435
n-Hexylbenzene	A12	0.0336	0.0527	0.0448

1,2,3,4,5-Pentamethylbenzene	A13	0.0338	0.0438	0.0364
2-Methylnaphthalene	A11	0.0664	0.0912	0.0759
1-Methylnaphthalene	A11	0.0542	0.0745	0.0533
UnknownC12s	U12	0.6746	1.1101	1.0806
n-Tridecane	P13	0.1422	0.2533	0.2437
UnknownC13s	U13	0.5915	1.0535	1.0134
n-Tetradecane	P14	0.1195	0.2290	0.2198
UnknownC14s	U14	0.4713	0.9033	0.8672
n-Pentadecane	P15	0.0546	0.1120	0.1063
UnknownC15s	U15	0.2108	0.4326	0.4105
n-Hexadecane	P16	0.0028	0.0061	0.0057
UnknownC16s	U16	0.0834	0.1824	0.1720
n-Heptadecane	P17	0.0025	0.0058	0.0054
n-Octadecane	P18	0.0023	0.0057	0.0053
n-Nonadecane	P19	0.0011	0.0028	0.0026
n-Eicosane	P20	0.0008	0.0022	0.0020
n-Heneicosane	P21	0.0002	0.0006	0.0005
TOTAL		100.0000	100.0000	100.0000

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201310005	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 3, 2013
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 30, 2013
PRODUCER :		CYLINDER NO. :	1039
LEASE NO. :		SAMPLED BY :	JOHN MOSER - EMPACT
NAME/DESCRIP :	SALES GAS @ 18:00 BRINGLESON 2-20-11-9-58		
FIELD DATA		SAMPLE TEMP. :	80
SAMPLE PRES. :	75	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; LENGTH OF H2S STAIN @ 8.0 PPM @ 18:05		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0005	0.0013		
HELIUM	0.01	0.00	---	---
OXYGEN/ARGON	0.01	0.01	---	---
NITROGEN	0.97	1.11	---	---
CARBON DIOXIDE	2.53	4.57	---	---
METHANE	68.09460	44.81190	---	---
ETHANE	12.3502	15.2338	3.2987	3.3167
PROPANE	9.8814	17.8743	2.7189	2.7337
I-BUTANE	0.9450	2.2531	0.3084	0.3101
N-BUTANE	3.1877	7.6004	1.0034	1.0089
I-PENTANE	0.6126	1.8082	0.2193	0.2205
N-PENTANE	0.7128	2.1097	0.2584	0.2598
HEXANES PLUS	0.6952	2.6173	0.2782	0.2796
TOTALS	100.00000	100.00000	8.0853	8.1293

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0237	0.0759
TOLUENE	0.0145	0.0548
ETHYLBENZENE	0.0018	0.0078
XYLENES	0.0031	0.0135
TOTAL BTEX	0.0431	0.1520

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1254.2 /scf	1261.0 /scf
	NET WET REAL :	1232.3 /scf	1239.1 /scf
HIGH	GROSS DRY REAL :	1378.0 /scf	1385.5 /scf
	GROSS WET REAL :	1353.9 /scf	1361.4 /scf
	NET DRY REAL :	19545.2 /lb	19652.0 /lb
	GROSS DRY REAL :	21476.6 /lb	21593.9 /lb
	RELATIVE DENSITY (AIR=1):		0.8409
	COMPRESSIBILITY FACTOR :		0.99545

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

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

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

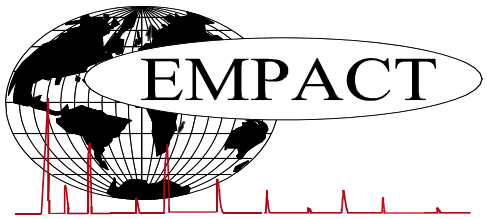
303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201310005	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 3, 2013
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 30, 2013
PRODUCER :		CYLINDER NO. :	1039
LEASE NO. :		SAMPLED BY :	JOHN MOSER - EMPACT
NAME/DESCRIP :	SALES GAS @ 18:00 BRINGLESON 2-20-11-9-58		
FIELD DATA		SAMPLE TEMP. :	80
SAMPLE PRES. :	75	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; LENGTH OF H2S STAIN @ 8.0 PPM @ 18:05		

Componet	Mole %	Wt %
Helium	0.01	0.00
Carbon Dioxide	2.53	4.57
Nitrogen	0.97	1.11
Methane	68.09460	44.81190
Ethane	12.3502	15.2338
Propane	9.8814	17.8743
Isobutane	0.9450	2.2531
n-Butane	3.1877	7.6004
Isopentane	0.5540	1.6396
n-Pentane	0.7128	2.1097
Cyclopentane	0.0586	0.1686
n-Hexane	0.1421	0.5024
Cyclohexane	0.0368	0.1270
Other Hexanes	0.2544	0.8925
Heptanes	0.1229	0.5013
Methycyclohexane	0.0293	0.1180
2,2,4 Trimethylpentane	0.0001	0.0005
Benzene	0.0237	0.0759
Toluene	0.0145	0.0548
Ethylbenzene	0.0018	0.0078
Xylenes	0.0031	0.0135
C8+ Heavies	0.0665	0.3236
Subtotal	99.98950	99.98870
Oxygen/Argon	0.01	0.01
Alcohols	0.0005	0.0013
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201310005	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 3, 2013
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 30, 2013
PRODUCER :		CYLINDER NO. :	1039
LEASE NO. :		SAMPLED BY :	JOHN MOSER - EMPACT
NAME/DESCRIP :	SALES GAS @ 18:00 BRINGLESON 2-20-11-9-58		
FIELD DATA		SAMPLE TEMP. :	80
SAMPLE PRES. :	75	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; LENGTH OF H2S STAIN @ 8.0 PPM @ 18:05		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Helium	---	0.01	0.00	---	---
Oxygen/Argon	---	0.01	0.01	---	---
Nitrogen	---	0.97	1.11	---	---
Carbon Dioxide	---	2.53	4.57	---	---
Methane	P1	68.09460	44.81190	---	---
Ethane	P2	12.3502	15.2338	3.299	3.317
Propane	P3	9.8814	17.8743	2.719	2.734
i-Butane	I4	0.9450	2.2531	0.308	0.310
n-Butane	P4	3.1877	7.6004	1.003	1.009
2,2-Dimethylpropane	I5	0.0024	0.0071	0.001	0.001
i-Pentane	I5	0.5516	1.6325	0.201	0.202
i-Propanol	X3	0.0003	0.0007	0.000	0.000
n-Pentane	P5	0.7128	2.1097	0.258	0.260
t-Butanol	X4	0.0002	0.0006	0.000	0.000
2,2-Dimethylbutane	I6	0.0016	0.0057	0.001	0.001
Cyclopentane	N5	0.0586	0.1686	0.017	0.017
2,3-Dimethylbutane	I6	0.0089	0.0315	0.004	0.004
2-Methylpentane	I6	0.1064	0.3761	0.044	0.044
3-Methylpentane	I6	0.0546	0.1930	0.022	0.022
n-Hexane	P6	0.1421	0.5024	0.058	0.058
2,2-Dimethylpentane	I7	0.0006	0.0025	0.000	0.000
Methylcyclopentane	N6	0.0829	0.2862	0.029	0.029
2,4-Dimethylpentane	I7	0.0034	0.0140	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0001	0.0004	0.000	0.000
Benzene	A6	0.0237	0.0759	0.007	0.007
3,3-Dimethylpentane	I7	0.0003	0.0012	0.000	0.000
Cyclohexane	N6	0.0368	0.1270	0.012	0.012
2-Methylhexane	I7	0.0146	0.0600	0.007	0.007
2,3-Dimethylpentane	I7	0.0066	0.0271	0.003	0.003
1,1-Dimethylcyclopentane	N7	0.0040	0.0161	0.002	0.002
3-Methylhexane	I7	0.0168	0.0690	0.008	0.008
1c,3-Dimethylcyclopentane	N7	0.0098	0.0395	0.005	0.005
1t,3-Dimethylcyclopentane	N7	0.0088	0.0354	0.004	0.004
3-Ethylpentane	I7	0.0011	0.0045	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0170	0.0685	0.008	0.008
2,2,4-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
n-Heptane	P7	0.0347	0.1426	0.016	0.016
1c,2-Dimethylcyclopentane	N7	0.0010	0.0040	0.000	0.000
Methylcyclohexane	N7	0.0293	0.1180	0.012	0.012
2,2-Dimethylhexane	I8	0.0025	0.0117	0.001	0.001
Ethylcyclopentane	N7	0.0041	0.0165	0.002	0.002
2,5-Dimethylhexane	I8	0.0008	0.0037	0.000	0.000
2,4-Dimethylhexane	I8	0.0012	0.0056	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0025	0.0115	0.001	0.001
3,3-Dimethylhexane	I8	0.0002	0.0009	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0028	0.0129	0.001	0.001
2,3,4-Trimethylpentane	I8	0.0005	0.0023	0.000	0.000
Toluene	A7	0.0145	0.0548	0.005	0.005

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2,3-Dimethylhexane	I8	0.0012	0.0056	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0005	0.0023	0.000	0.000
2-Methylheptane	I8	0.0058	0.0272	0.003	0.003
4-Methylheptane	I8	0.0016	0.0075	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0001	0.0005	0.000	0.000
3,4-Dimethylhexane	I8	0.0002	0.0009	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0005	0.000	0.000
3-Methylheptane	I8	0.0023	0.0108	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0042	0.0193	0.002	0.002
3-Ethylhexane	I8	0.0006	0.0028	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0015	0.0069	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0005	0.0023	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0008	0.0037	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0007	0.0032	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0021	0.0097	0.001	0.001
2,2,4-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0020	0.0092	0.001	0.001
n-Octane	P8	0.0085	0.0398	0.004	0.004
1c,4-Dimethylcyclohexane	N8	0.0008	0.0037	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0005	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0011	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0001	0.0005	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0004	0.0019	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0027	0.0140	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0008	0.0042	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
Ethylcyclohexane	N8	0.0013	0.0060	0.001	0.001
n-Propylcyclopentane	N8	0.0004	0.0019	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0005	0.000	0.000
2,5-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
3,3-Dimethylheptane	I9	0.0002	0.0011	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0005	0.000	0.000
Ethylbenzene	I8	0.0018	0.0078	0.001	0.001
1c,2t,4t-Trimethylcyclohexane	N9	0.0005	0.0026	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0017	0.0074	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0003	0.0013	0.000	0.000
3,4-Dimethylheptane	I9	0.0012	0.0063	0.001	0.001
3,4-Dimethylheptane (2)	I9	0.0003	0.0016	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0005	0.000	0.000
4-Methyloctane	I9	0.0005	0.0026	0.000	0.000
2-Methyloctane	I9	0.0006	0.0032	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0005	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0005	0.000	0.000
3-Methyloctane	I9	0.0007	0.0037	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0005	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0011	0.0048	0.000	0.000
i-Butylcyclopentane	N9	0.0004	0.0021	0.000	0.000
n-Nonane	P9	0.0022	0.0116	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0002	0.0010	0.000	0.000
i-Propylbenzene	A9	0.0003	0.0015	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0005	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0006	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0006	0.000	0.000
n-Butylcyclopentane	N9	0.0004	0.0021	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0006	0.000	0.000
n-Propylbenzene	A9	0.0003	0.0015	0.000	0.000
3,6-Dimethyloctane	I10	0.0002	0.0012	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0003	0.0018	0.000	0.000
1,3-Methylethylbenzene	A9	0.0003	0.0015	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0005	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0005	0.000	0.000
5-Methylnonane	I10	0.0003	0.0018	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0010	0.000	0.000
3-Methylnonane	I10	0.0001	0.0006	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0011	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0006	0.000	0.000
sec-Butylbenzene	A10	0.0001	0.0005	0.000	0.000
UnknownC9s	U9	0.0020	0.0105	0.001	0.001

n-Decane	P10	0.0005	0.0029	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0001	0.0005	0.000	0.000
Sec-Butylcyclohexane	A10	0.0001	0.0006	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0005	0.000	0.000
UnknownC10s	U10	0.0015	0.0087	0.001	0.001
n-Undecane	P11	0.0002	0.0013	0.000	0.000
UnknownC11s	U11	0.0002	0.0013	0.000	0.000
n-Dodecane	P12	0.0001	0.0007	0.000	0.000
UnknownC12s	U12	0.0001	0.0007	0.000	0.000
TOTAL		100.00000	100.00000	8.0853	8.1293

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0237	0.0759
TOLUENE	0.0145	0.0548
ETHYLBENZENE	0.0018	0.0078
XYLENES	0.0031	0.0135
TOTAL BTEX	0.0431	0.1520

		BTU @	14.650	14.730
LOW	NET DRY REAL :		1254.2 **/scf**	1261.0 **/scf**
	NET WET REAL :		1232.3 **/scf**	1239.1 **/scf**
HIGH	GROSS DRY REAL :		1378.0 **/scf**	1385.5 **/scf**
	GROSS WET REAL :		1353.9 **/scf**	1361.4 **/scf**
	NET DRY REAL :		19545.2 **/lb**	19652.0 **/lb**
	GROSS DRY REAL :		21476.6 **/lb**	21593.9 **/lb**
	RELATIVE DENSITY (AIR=1):			0.8409
	COMPRESSIBILITY FACTOR :			0.99545

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

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

THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBLITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBLITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150

CRUDE OIL ASSAY

PROJECT NO. :	201310005	ANALYSIS NO. :	03
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 02, 2013
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 30, 2013
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	PRODUCTION TANK @ 18:15 BRINGLESON 2-20-11-9-58		EMPACT
FIELD DATA		SAMPLE TEMP. :	114
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		

SPECIFICATION		TEST METHOD	UNITS	RESULTS
API GRAVITY			API 60/60	34.6
RVP @100 DEG F		D323	PSIG	3.6
TOTAL SULFUR		D2622	WT %	N/A
TOTAL CHLORIDE		D4929	ug/g	N/A
ORGANIC CHLORIDE		D4929	ug/g	N/A
FLASH POINT		D93	° F	N/A
HEATING VALUE		D4809	BTU/ LB	N/A
VISUAL APPEARANCE				BLACK
BS&W		D96		
Crude Oil			VOL %	N/A
Water			VOL %	N/A
Emulsion			VOL %	N/A
Sediment			VOL %	N/A
DISTILLATION:		D86		
INITIAL POINT			DEG F	N/A
50%			DEG F	N/A
90%			DEG F	N/A
END POINT			DEG F	N/A
DISTILLATION:	@TEMP	D445		
Average Centipoise	20°C			N/A
Average Centipoise	30°C			N/A
Average Centipoise	80°C			N/A
Kinetic Viscosity	20°C		cSt (mm2/s)	N/A
Kinetic Viscosity	30°C		cSt (mm2/s)	N/A
Kinetic Viscosity	80°C		cSt (mm2/s)	N/A

ND: NOT DETECTED
N/A: NO TEST PREFORMED FOR THIS PARAMETER