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

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201305146	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	MAY 29, 2013
ACCOUNT NO. :		SAMPLE DATE :	MAY 24, 2013
PRODUCER :		CYLINDER NO. :	10411
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	SEPARATOR @ 14:25		EMPACT
	BRINGLESON 2-34-9-58		
FIELD DATA		SAMPLE TEMP. :	170
SAMPLE PRES. :	19.5	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	MOLE %	MASS %	VOL %
ALCOHOLS	0.0099	0.0043	0.0040
NITROGEN (AIR)	0.0218	0.0058	0.0053
CARBON DIOXIDE	0.0198	0.0083	0.0075
METHANE	0.0262	0.0040	0.0099
ETHANE	0.1741	0.0497	0.1031
PROPANE	0.9809	0.4106	0.5986
I-BUTANE	0.3095	0.1707	0.2242
N-BUTANE	1.6370	0.9030	1.1429
I-PENTANE	0.8495	0.5817	0.6893
N-PENTANE	1.4120	0.9669	1.1324
HEXANES PLUS	94.5593	96.8950	96.0828
TOTALS	100.0000	100.0000	100.0000

BTEX COMPONENTS	**MOLE%**	**MASS%**
BENZENE	1.7501	1.2975
TOLUENE	4.4608	3.9011
ETHYLBENZENE	0.6330	0.6379
XYLENE	3.5260	3.5531
TOTAL BTEX	10.3699	9.3896

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

	TOTAL SAMPLE	**C6+ FRACTION**	
Specific Gravity (H2O=1) =	0.7392	0.7453	60/60
API Gravity =	59.92	58.36	60/60
Molecular Weight =	105.36	108.413	
Absolute Density =	6.16	6.21	LBS/GAL
Heating Value Liq. Idl Gas=	125540	126468	BTU/GAL
Vapor/Liquid =	22.27	21.83	CUFT/GAL
Vapor Pressure =	7.90	1.98	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. :	201305146	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	MAY 29, 2013
ACCOUNT NO. :		SAMPLE DATE :	MAY 24, 2013
PRODUCER :		CYLINDER NO. :	10411
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	SEPARATOR @ 14:25 BRINGLESON 2-34-9-58		EMPACT
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SAMPLE PRES. :	19.5	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0198		0.0083		0.0075	
NITROGEN (AIR)	0.0218		0.0058		0.0053	
METHANE	0.0262		0.0040		0.0099	
ETHANE	0.1741		0.0497		0.1031	
PROPANE	0.9809		0.4106		0.5986	
I-BUTANE	0.3095		0.1707		0.2242	
N-BUTANE	1.6370		0.9030		1.1429	
I-PENTANE	0.8495		0.5817		0.6893	
N-PENTANE	1.4120		0.9669		1.1324	
CYCLOPENTANE (N-C5)	1.1191		0.7449		0.7243	
N-HEXANE	8.0504		6.5858		7.3344	
CYCLOHEXANE (OTHER C6)	3.1932		2.5507		2.4065	
OTHER HEXANES	11.7648		9.5436		10.2041	
OTHER HEPTANES	15.5837		14.7401		15.4388	
METHYLCYCLOHEXANE (OTHER C7)	5.2605		4.9026		4.6778	
2,2,4 TRIMETHYLPENTANE	0.8124		0.7571		0.7427	
BENZENE	1.7501		1.2975		1.0863	
TOLUENE	4.4608		3.9011		3.2984	
ETHYLBENZENE	0.6330		0.6379		0.5393	
XYLENES	3.5260		3.5531		3.0135	
OTHER OCTANES	13.0941		14.2143		14.3247	
OCTANES PLUS	----	43.3767	----	52.6287	----	50.9122
NONANES	10.9997		13.2416		12.9156	
DECANES PLUS	14.3115		20.2247		19.3764	
SUB TOTAL	99.9901		99.9957		99.9960	
ALCOHOLS	0.0099		0.0043		0.0040	
TOTAL	100.0000		100.0000		100.0000	

API Gravity =	**59.92**	60/60
Vapor Pressure =	**7.90**	PSIA & 100 F
Average Molecular Weight of Decanes plus =	**148.89**	
Average Specific Gravity of Decanes plus =	**0.7750**	

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BY CARBON NUMBER

PROJECT NO. :	201305146	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	MAY 29, 2013
ACCOUNT NO. :		SAMPLE DATE :	MAY 24, 2013
PRODUCER :		CYLINDER NO. :	10411
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	SEPARATOR @ 14:25		EMPACT
	BRINGLESON 2-34-9-58		
FIELD DATA		SAMPLE TEMP. :	170
SAMPLE PRES. :	19.5	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT / CARBON NUMBER		MOLE%	MASS %	VOLUME %
ALCOHOLS		0.0099	0.0043	0.0040
NITROGEN		0.0218	0.0058	0.0053
CARBON DIOXIDE		0.0198	0.0083	0.0075
	C1	0.0262	0.0040	0.0099
	C2	0.1741	0.0497	0.1031
	C3	0.9809	0.4106	0.5986
	C4	1.9465	1.0737	1.3671
	C5	3.3806	2.2935	2.5460
	C6	24.7585	19.9776	21.0313
	C7	25.3050	23.5438	23.4150
	C8	18.0655	19.1624	18.6202
	C9	10.9997	13.2416	12.9156
	C10	7.9202	10.3332	9.8815
	C11	3.2179	4.6270	4.4351
	C12	1.7159	2.6086	2.4961
	C13	0.7290	1.2578	1.2142
	C14	0.5438	1.0240	0.9917
	C15	0.1721	0.3470	0.3321
	C16	0.0126	0.0271	0.0257
	C17	0.0000	0.0000	0.0000
	C18	0.0000	0.0000	0.0000
	C19	0.0000	0.0000	0.0000
	C20	0.0000	0.0000	0.0000
	C21	0.0000	0.0000	0.0000
	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. :	201305146	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	MAY 29, 2013
ACCOUNT NO. :		SAMPLE DATE :	MAY 24, 2013
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LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	SEPARATOR @ 14:25 BRINGLESON 2-34-9-58		EMPACT
FIELD DATA		SAMPLE TEMP. :	170
SAMPLE PRES. :	19.5	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Nitrogen	NHC	0.0218	0.0058	0.0053
Carbon Dioxide	NHC	0.0198	0.0083	0.0075
Methane	P1	0.0262	0.0040	0.0099
Ethane	P2	0.1741	0.0497	0.1031
Propane	P3	0.9809	0.4106	0.5986
i-Butane	I4	0.3095	0.1707	0.2242
n-Butane	P4	1.6370	0.9030	1.1429
2,2-Dimethylpropane	I5	0.0272	0.0186	0.0230
Ethanol	X2	0.0099	0.0043	0.0040
i-Pentane	I5	0.8223	0.5631	0.6663
n-Pentane	P5	1.4120	0.9669	1.1324
2,2-Dimethylbutane	I6	0.1317	0.1077	0.1217
Cyclopentane	N5	1.1191	0.7449	0.7243
2,3-Dimethylbutane	I6	0.5195	0.4249	0.4709
2-Methylpentane	I6	4.3822	3.5845	4.0282
3-Methylpentane	I6	2.5812	2.1113	2.3331
n-Hexane	P6	8.0504	6.5858	7.3344
2,2-Dimethylpentane	I7	0.1155	0.1098	0.1190
Methylcyclopentane	N6	4.1502	3.3152	3.2502
2,4-Dimethylpentane	I7	0.3699	0.3518	0.3845
2,2,3-Trimethylbutane	I7	0.0238	0.0226	0.0240
Benzene	A6	1.7501	1.2975	1.0863
3,3-Dimethylpentane	I7	0.0756	0.0719	0.0763
Cyclohexane	N6	3.1932	2.5507	2.4065
2-Methylhexane	I7	1.8629	1.7717	1.9193
2,3-Dimethylpentane	I7	0.7413	0.7050	0.7419
1,1-Dimethylcyclopentane	N7	0.4737	0.4415	0.4298
3-Methylhexane	I7	2.1404	2.0356	2.1719
1c,3-Dimethylcyclopentane	N7	0.8785	0.8187	0.8074
1t,3-Dimethylcyclopentane	N7	0.8124	0.7571	0.7427
3-Ethylpentane	I7	0.1531	0.1456	0.1528
1t,2-Dimethylcyclopentane	N7	1.4973	1.3954	1.3642
2,2,4-Trimethylpentane	I8	0.0533	0.0578	0.0611
n-Heptane	P7	5.8802	5.5923	6.0063
1c,2-Dimethylcyclopentane	N7	0.1118	0.1042	0.0991
Methylcyclohexane	N7	5.2605	4.9026	4.6778
2,2-Dimethylhexane	I8	0.5954	0.6455	0.6815
Ethylcyclopentane	N7	0.4473	0.4169	0.3996
2,5-Dimethylhexane	I8	0.1916	0.2077	0.2199
2,2,3-Trimethylpentane	I8	0.0333	0.0361	0.0371
2,4-Dimethylhexane	I8	0.3096	0.3357	0.3537

1c,2t,4-Trimethylcyclopentane	N8	0.4122	0.4390	0.4225
3,3-Dimethylhexane	I8	0.0807	0.0875	0.0906
2,3,4-Trimethylpentane	I8	0.0716	0.0776	0.0792
2,3,3-Trimethylpentane	I8	0.0069	0.0075	0.0076
Toluene	A7	4.4608	3.9011	3.2984
2,3-Dimethylhexane	I8	0.3299	0.3577	0.3692
2-Methyl-3-ethylpentane	I8	0.0920	0.0997	0.1018
1,1,2-Trimethylcyclopentane	N8	0.0112	0.0119	0.0113
2-Methylheptane	I8	1.7070	1.8507	1.9443
4-Methylheptane	I8	0.5122	0.5553	0.5693
3-Methyl-3-ethylpentane	I8	0.0793	0.0860	0.0869
3,4-Dimethylhexane	I8	0.0968	0.1049	0.1071
1c,2c,4-Trimethylcyclopentane	N8	0.0298	0.0317	0.0302
1c,3-Dimethylcyclohexane	N8	0.0235	0.0250	0.0240
3-Methylheptane	I8	0.9388	1.0178	1.0601
1c,2t,3-Trimethylcyclopentane	N8	1.2496	1.3309	1.2695
3-Ethylhexane	I8	0.1640	0.1778	0.1832
1t,4-Dimethylcyclohexane	N8	0.5359	0.5707	0.5500
1,1-Dimethylcyclohexane	N8	0.1787	0.1903	0.1791
3c-Ethylmethylcyclopentane	N8	0.0068	0.0072	0.0069
3t-Ethylmethylcyclopentane	N8	0.1291	0.1375	0.1318
2t-Ethylmethylcyclopentane	N8	0.1125	0.1198	0.1145
1,1-Methylethylcyclopentane	N8	0.3655	0.3893	0.3664
2,2,4-Trimethylhexane	I9	0.0376	0.0458	0.0470
1t,2-Dimethylcyclohexane	N8	0.5948	0.6335	0.6002
1t,3-Dimethylcyclohexane	N8	0.0039	0.0042	0.0039
n-Octane	P8	3.1156	3.3779	3.5320
1c,4-Dimethylcyclohexane	N8	0.6647	0.7079	0.6646
i-Propylcyclopentane	I8	0.0718	0.0765	0.0724
2,4,4-Trimethylhexane	I9	0.0265	0.0323	0.0329
2,2,3,4-Tetramethylpentane	I9	0.0233	0.0284	0.0290
2,3,4-Trimethylhexane	I9	0.0733	0.0892	0.0908
1c,2-Dimethylcyclohexane	N8	0.2859	0.3045	0.2811
2,3,5-Trimethylhexane	I9	0.0658	0.0801	0.0815
2,2-Dimethylheptane	I9	0.0168	0.0205	0.0212
1,1,4-Trimethylcyclohexane	N9	0.9782	1.1721	1.1161
2,2,3-Trimethylhexane	I9	0.4905	0.5971	0.6017
2,4-Dimethylheptane	I9	0.0219	0.0267	0.0274
4,4-Dimethylheptane	I9	0.0449	0.0547	0.0562
Ethylcyclohexane	N8	0.4942	0.5263	0.4911
n-Propylcyclopentane	N8	0.3414	0.3636	0.3441
1c,3c,5-Trimethylcyclohexane	N9	0.0813	0.0974	0.0928
2,5-Dimethylheptane	I9	0.0579	0.0705	0.0723
3,3-Dimethylheptane	I9	0.0682	0.0830	0.0851
3,5-Dimethylheptane	I9	0.0444	0.0541	0.0555
2,6-Dimethylheptane	I9	0.0324	0.0394	0.0408
1,1,3-Trimethylcyclohexane	N9	0.0398	0.0477	0.0454
Ethylbenzene	A8	0.6330	0.6379	0.5393
1c,2t,4t-Trimethylcyclohexane	N9	0.2663	0.3191	0.2981
2,3-Dimethylheptane	I9	0.0191	0.0233	0.0236
1,3-Dimethylbenzene (m-Xylene)	A8	1.4838	1.4952	1.2713
1,4-Dimethylbenzene (p-Xylene)	A8	1.2980	1.3080	1.1157
3,4-Dimethylheptane	I9	0.1366	0.1663	0.1671
3,4-Dimethylheptane (2)	I9	0.1764	0.2147	0.2157
4-Ethylheptane	I9	0.0654	0.0796	0.0818
4-Methyloctane	I9	0.3536	0.4305	0.4390
2-Methyloctane	I9	0.4396	0.5352	0.5512
1c,2t,4c-Trimethylcyclohexane	I9	0.0450	0.0548	0.0555
3-Ethylheptane	I9	0.0870	0.1059	0.1071
3-Methyloctane	I9	0.5334	0.6493	0.6621
3,3-Diethylpentane	I9	0.0673	0.0819	0.0798
1c,2t,3-Trimethylcyclohexane	N9	0.0563	0.0675	0.0631
1,1,2-Trimethylcyclohexane	N9	0.0284	0.0340	0.0318
1,2-Dimethylbenzene (o-Xylene)	A8	0.7442	0.7499	0.6265
i-Butylcyclopentane	N9	0.2937	0.3519	0.3313
UnknownC8s	U8	0.0170	0.0184	0.0192
n-Nonane	P9	1.9296	2.3490	2.4055
1,1-Methylethylcyclohexane	N9	0.4460	0.5429	0.5576
i-Propylbenzene	A9	0.1899	0.2166	0.1844
i-Propylcyclohexane	N9	0.0877	0.1051	0.0963
2,2-Dimethyloctane	I10	0.0454	0.0613	0.0609
2,4-Dimethyloctane	I10	0.1026	0.1386	0.1378
2,6-Dimethyloctane	I10	0.0173	0.0234	0.0240

2,5-Dimethyloctane	I10	0.0321	0.0433	0.0430
n-Butylcyclopentane	N9	0.3225	0.4294	0.3951
3,3-Dimethyloctane	I10	0.0340	0.0459	0.0457
n-Propylbenzene	A9	0.3612	0.4120	0.3508
3,6-Dimethyloctane	I10	0.1909	0.2578	0.2563
3-Methyl-5-ethylheptane	I10	0.2559	0.3115	0.3155
1,3-Methylethylbenzene	A9	0.3406	0.3886	0.3281
1,4-Methylethylbenzene	A9	0.1461	0.1667	0.1407
1,3,5-Trimethylbenzene	A9	0.3431	0.3914	0.3327
2,3-Dimethyloctane	I10	0.0686	0.0926	0.0920
5-Methylnonane	I10	0.2658	0.3589	0.3601
1,2-Methylethylbenzene	A9	0.3953	0.4510	0.3787
2-Methylnonane	I10	0.0602	0.0813	0.0823
3-Ethyloctane	I10	0.1146	0.1548	0.1539
3-Methylnonane	I10	0.2454	0.3314	0.3321
1,2,4-Trimethylbenzene	A9	0.0060	0.0068	0.0057
t-Butylbenzene	A10	0.5196	0.6619	0.5619
i-Butylcyclohexane	N10	0.1899	0.2528	0.2290
1t-Methyl-2-n-propylcyclohexane	I10	0.0585	0.0712	0.0721
i-Butylbenzene	A10	0.0573	0.0730	0.0629
sec-Butylbenzene	A10	0.0618	0.0787	0.0672
UnknownC9s	U9	1.5725	1.9143	1.9604
n-Decane	P10	1.1100	1.4990	1.5092
1,2,3-Trimethylbenzene	A9	0.1883	0.2148	0.1767
1,3-Methyl-i-propylbenzene	A10	0.0903	0.1030	0.0865
1,4-Methyl-i-propylbenzene	A10	0.0412	0.0470	0.0395
Sec-Butylcyclohexane	N10	0.2465	0.3282	0.2969
1,2-Methyl-i-propylbenzene	A10	0.1256	0.1600	0.1342
3-Ethylnonane	I10	0.0450	0.0608	0.0615
1,3-Diethylbenzene	A10	0.0651	0.0829	0.0706
1,3-Methyl-n-propylbenzene	A10	0.0517	0.0659	0.0563
1,4-Diethylbenzene	A10	0.1007	0.1283	0.1095
1,4-Methyl-n-propylbenzene	A10	0.1017	0.1296	0.1110
n-Butylbenzene	A10	0.0405	0.0516	0.0440
1,3-Dimethyl-5-ethylbenzene	A10	0.0728	0.0927	0.0788
1,2-Diethylbenzene	A10	0.0758	0.0966	0.0808
1,2-Methyl-n-propylbenzene	A10	0.0672	0.0856	0.0721
1,4-Dimethyl-2-ethylbenzene	A10	0.1120	0.1427	0.1197
1,3-Dimethyl-4-ethylbenzene	A10	0.0365	0.0465	0.0390
1,2-Dimethyl-4-ethylbenzene	A10	0.1708	0.2176	0.1830
1,3-Dimethyl-2-ethylbenzene	A10	0.0518	0.0660	0.0545
1t,2c,4-Trimethylcyclopentane	A10	0.4484	0.4776	0.4696
1,2-Dimethyl-3-ethylbenzene	A10	0.1342	0.1710	0.1410
1,2-Ethyl-i-propylbenzene	A10	0.0454	0.0578	0.0485
1,4-Methyl-t-butylbenzene	A11	0.0280	0.0357	0.0300
UnknownC10s	U10	2.2368	3.0206	3.0412
n-Undecane	P11	0.6427	0.9535	0.9467
1,4-Ethyl-i-propylbenzene	A11	0.0949	0.1209	0.1014
1,2,4,5-Tetramethylbenzene	A11	0.0530	0.0675	0.0560
1,2-Methyl-n-butylbenzene	A11	0.0522	0.0665	0.0558
1,2,3,5-Tetramethylbenzene	A11	0.0452	0.0576	0.0476
1,2-Methyl-t-butylbenzene	A11	0.0544	0.0693	0.0581
5-Methylindan	A11	0.0156	0.0252	0.0247
4-Methylindan	A11	0.0044	0.0071	0.0070
1,2-Ethyl-n-propylbenzene	A11	0.0494	0.0629	0.0528
2-Methylindan	A11	0.0087	0.0141	0.0138
1,3-Methyl-n-butylbenzene	A11	0.0294	0.0375	0.0315
1,3-Di-i-propylbenzene	A11	0.0168	0.0214	0.0180
sec-Pentylbenzene	A11	0.0752	0.0958	0.0804
n-Pentylbenzene	A11	0.0224	0.0315	0.0270
1t-M-2-(4MP)cyclopentane	P12	0.0152	0.0246	0.0242
1,2-Di-n-propylbenzene	A11	0.0395	0.0503	0.0422
1,4-Di-i-propylbenzene	A11	0.0664	0.0846	0.0710
Tetrahydronaphthalene	A10	0.0145	0.0185	0.0155
t-Decahydronaphthalene	A10	0.0767	0.0977	0.0820
Naphthalene	A10	0.0391	0.0476	0.0399
1-t-Butyl-3,5-dimethylbenzene	A12	0.0193	0.0246	0.0206
1,4-Ethyl-t-butylbenzene	A11	0.0494	0.0629	0.0528
UnknownC11s	U11	1.7805	2.6415	2.6227
n-Dodecane	P12	0.3810	0.6160	0.6049
1,3-Di-n-propylbenzene	A12	0.0496	0.0632	0.0530
1,3,5-Triethylbenzene	A12	0.0676	0.0771	0.0655
1,2,4-Triethylbenzene	A12	0.2037	0.2324	0.1951

1,4-Methyl-n-pentylbenzene	A12	0.0339	0.0432	0.0362
n-Hexylbenzene	A12	0.0171	0.0263	0.0225
1,2,3,4,5-Pentamethylbenzene	A13	0.0375	0.0478	0.0401
2-Methylnaphthalene	A11	0.0512	0.0691	0.0580
1-Methylnaphthalene	A11	0.0386	0.0521	0.0376
UnknownC12s	U12	0.9285	1.5012	1.4741
n-Tridecane	P13	0.1503	0.2630	0.2552
UnknownC13s	U13	0.5412	0.9470	0.9189
n-Tetradecane	P14	0.0743	0.1399	0.1355
UnknownC14s	U14	0.4695	0.8841	0.8562
n-Pentadecane	P15	0.0134	0.0270	0.0258
UnknownC15s	U15	0.1587	0.3200	0.3063
n-Hexadecane	P16	0.0007	0.0015	0.0014
UnknownC16s	U16	0.0119	0.0256	0.0243
TOTAL		100.0000	100.0000	100.0000

EMPACT ANALYTICAL SYSTEMS INC.
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BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201305146	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	MAY 28, 2013
ACCOUNT NO. :		SAMPLE DATE :	MAY 24, 2013
PRODUCER :		CYLINDER NO. :	0930
LEASE NO. :		SAMPLED BY :	JOHN MOSER - EMPACT
NAME/DESCRIP :	SALES GAS @ 15:05 BRINGLESON 2-34-9-58		
FIELD DATA		SAMPLE TEMP. :	170
SAMPLE PRES. :	50	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; LENGTH OF H2S STAIN @ 0.0 PPM @ 15:10 O2>0.1%		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0043	0.0079		
HELIUM	0.01	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.12	0.13	---	---
NITROGEN	1.17	1.12	---	---
CARBON DIOXIDE	2.22	3.34	---	---
METHANE	56.21690	30.86180	---	---
ETHANE	13.0575	13.4358	3.4946	3.5137
PROPANE	14.3583	21.6663	3.9591	3.9808
I-BUTANE	1.6453	3.2724	0.5388	0.5417
N-BUTANE	6.0199	11.9734	1.8993	1.9097
I-PENTANE	1.4274	3.5133	0.5127	0.5155
N-PENTANE	1.7038	4.2066	0.6181	0.6214
HEXANES PLUS	2.0366	6.4725	0.8382	0.8425
TOTALS	100.00000	100.00000	11.8608	11.9253

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0667	0.1783
TOLUENE	0.0418	0.1318
ETHYLBENZENE	0.0057	0.0207
XYLENES	0.0086	0.0313
TOTAL BTEX	0.1228	0.3621

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1500.6 **/scf**	1508.8 **/scf**
	NET WET REAL :	1474.4 **/scf**	1482.6 **/scf**
HIGH	GROSS DRY REAL :	1641.9 **/scf**	1650.8 **/scf**
	GROSS WET REAL :	1613.2 **/scf**	1622.1 **/scf**
	NET DRY REAL :	19521.4 **/lb**	19628.0 **/lb**
	GROSS DRY REAL :	21359.2 **/lb**	21475.9 **/lb**
	RELATIVE DENSITY (AIR=1):		1.0083
	COMPRESSIBILITY FACTOR :		0.99356

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

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

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BRIGHTON, CO
80601

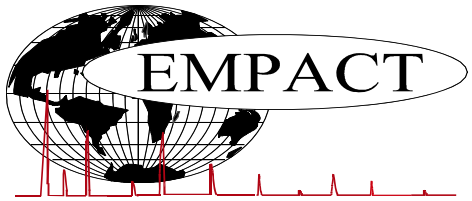
303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201305146	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	MAY 28, 2013
ACCOUNT NO. :		SAMPLE DATE :	MAY 24, 2013
PRODUCER :		CYLINDER NO. :	0930
LEASE NO. :		SAMPLED BY :	JOHN MOSER - EMPACT
NAME/DESCRIP :	SALES GAS @ 15:05 BRINGLESON 2-34-9-58		
FIELD DATA		SAMPLE TEMP. :	170
SAMPLE PRES. :	50	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; LENGTH OF H2S STAIN @ 0.0 PPM @ 15:10 O2>0.1%		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	2.22	3.34
Nitrogen	1.17	1.12
Methane	56.21690	30.86180
Ethane	13.0575	13.4358
Propane	14.3583	21.6663
Isobutane	1.6453	3.2724
n-Butane	6.0199	11.9734
Isopentane	1.2696	3.1346
n-Pentane	1.7038	4.2066
Cyclopentane	0.1578	0.3787
n-Hexane	0.3988	1.1761
Cyclohexane	0.1062	0.3059
Other Hexanes	0.7247	2.1199
Heptanes	0.3775	1.2846
Methycyclohexane	0.0907	0.3047
2,2,4 Trimethylpentane	0.0003	0.0012
Benzene	0.0667	0.1783
Toluene	0.0418	0.1318
Ethylbenzene	0.0057	0.0207
Xylenes	0.0086	0.0313
C8+ Heavies	0.2156	0.9180
Subtotal	99.87570	99.86210
Oxygen/Argon	0.12	0.13
Alcohols	0.0043	0.0079
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201305146	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	MAY 28, 2013
ACCOUNT NO. :		SAMPLE DATE :	MAY 24, 2013
PRODUCER :		CYLINDER NO. :	0930
LEASE NO. :		SAMPLED BY :	JOHN MOSER - EMPACT
NAME/DESCRIP :	SALES GAS @ 15:05 BRINGLESON 2-34-9-58		
FIELD DATA		SAMPLE TEMP. :	170
SAMPLE PRES. :	50	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; LENGTH OF H2S STAIN @ 0.0 PPM @ 15:10 O2>0.1%		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.01	0.00	---	---
Oxygen/Argon	---	0.12	0.13	---	---
Nitrogen	---	1.17	1.12	---	---
Carbon Dioxide	---	2.22	3.34	---	---
Methane	P1	56.21690	30.86180	---	---
Ethane	P2	13.0575	13.4358	3.495	3.514
Propane	P3	14.3583	21.6663	3.959	3.981
i-Butane	I4	1.6453	3.2724	0.539	0.542
n-Butane	P4	6.0199	11.9734	1.899	1.910
2,2-Dimethylpropane	I5	0.0044	0.0109	0.002	0.002
Ethanol	X2	0.0024	0.0038	0.000	0.000
i-Pentane	I5	1.2652	3.1237	0.464	0.466
Acetone	X3	0.0010	0.0020	0.000	0.000
i-Propanol	X3	0.0004	0.0008	0.000	0.000
n-Pentane	P5	1.7037	4.2064	0.618	0.621
t-Butanol	X4	0.0005	0.0013	0.000	0.000
2,2-Dimethylbutane	I6	0.0042	0.0124	0.002	0.002
Cyclopentane	N5	0.1578	0.3787	0.047	0.047
2,3-Dimethylbutane	I6	0.0268	0.0790	0.011	0.011
2-Methylpentane	I6	0.2891	0.8526	0.120	0.121
3-Methylpentane	I6	0.1541	0.4544	0.063	0.064
UnknownC5s	U5	0.0001	0.0002	0.000	0.000
n-Hexane	P6	0.3988	1.1761	0.165	0.165
2,2-Dimethylpentane	I7	0.0013	0.0045	0.001	0.001
Methylcyclopentane	N6	0.2504	0.7212	0.088	0.089
2,4-Dimethylpentane	I7	0.0097	0.0333	0.005	0.005
2,2,3-Trimethylbutane	I7	0.0003	0.0010	0.000	0.000
Benzene	A6	0.0667	0.1783	0.019	0.019
3,3-Dimethylpentane	I7	0.0009	0.0031	0.000	0.000
Cyclohexane	N6	0.1062	0.3059	0.036	0.036
2-Methylhexane	I7	0.0442	0.1516	0.020	0.020
2,3-Dimethylpentane	I7	0.0199	0.0682	0.009	0.009
1,1-Dimethylcyclopentane	N7	0.0130	0.0437	0.005	0.005
3-Methylhexane	I7	0.0511	0.1752	0.023	0.023
1c,3-Dimethylcyclopentane	N7	0.0319	0.1072	0.015	0.015
1t,3-Dimethylcyclopentane	N7	0.0286	0.0961	0.013	0.013
3-Ethylpentane	I7	0.0024	0.0082	0.001	0.001
1t,2-Dimethylcyclopentane	N7	0.0544	0.1828	0.025	0.025
2,2,4-Trimethylpentane	I8	0.0003	0.0012	0.000	0.000
UnknownC6s	U6	0.0001	0.0003	0.000	0.000
n-Heptane	P7	0.1042	0.3573	0.048	0.048
1c,2-Dimethylcyclopentane	N7	0.0034	0.0114	0.002	0.002
Methylcyclohexane	N7	0.0907	0.3047	0.036	0.036

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2,2-Dimethylhexane	I8	0.0096	0.0375	0.004	0.004
Ethylcyclopentane	N7	0.0120	0.0403	0.005	0.005
2,5-Dimethylhexane	I8	0.0021	0.0082	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0005	0.0020	0.000	0.000
2,4-Dimethylhexane	I8	0.0037	0.0145	0.002	0.002
1c,2t,4-Trimethylcyclopentane	N8	0.0084	0.0323	0.004	0.004
3,3-Dimethylhexane	I8	0.0005	0.0020	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0092	0.0353	0.004	0.004
2,3,4-Trimethylpentane	I8	0.0014	0.0055	0.001	0.001
2,3,3-Trimethylpentane	I8	0.0001	0.0004	0.000	0.000
Toluene	A7	0.0418	0.1318	0.014	0.014
2,3-Dimethylhexane	I8	0.0041	0.0160	0.002	0.002
2-Methyl-3-ethylpentane	I8	0.0015	0.0059	0.001	0.001
2-Methylheptane	I8	0.0180	0.0704	0.009	0.009
4-Methylheptane	I8	0.0048	0.0188	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0003	0.0012	0.000	0.000
3,4-Dimethylhexane	I8	0.0006	0.0024	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0004	0.0015	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0005	0.0019	0.000	0.000
3-Methylheptane	I8	0.0068	0.0266	0.003	0.003
1c,2t,3-Trimethylcyclopentane	N8	0.0142	0.0545	0.007	0.007
3-Ethylhexane	I8	0.0021	0.0082	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0050	0.0192	0.003	0.003
1,1-Dimethylcyclohexane	N8	0.0016	0.0062	0.001	0.001
3t-Ethylmethylcyclopentane	N8	0.0022	0.0085	0.001	0.001
2t-Ethylmethylcyclopentane	N8	0.0019	0.0073	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0059	0.0227	0.003	0.003
2,2,4-Trimethylhexane	I9	0.0005	0.0022	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0068	0.0261	0.003	0.003
1t,3-Dimethylcyclohexane	N8	0.0001	0.0004	0.000	0.000
UnknownC7s	U7	0.0002	0.0007	0.000	0.000
n-Octane	P8	0.0231	0.0903	0.012	0.012
1c,4-Dimethylcyclohexane	N8	0.0048	0.0184	0.002	0.002
i-Propylcyclopentane	I8	0.0004	0.0015	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0002	0.0009	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0004	0.0018	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0002	0.0009	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0002	0.0009	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0013	0.0050	0.001	0.001
2,2-Dimethylheptane	I9	0.0001	0.0004	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0077	0.0333	0.004	0.004
2,2,3-Trimethylhexane	I9	0.0026	0.0114	0.001	0.001
2,4-Dimethylheptane	I9	0.0002	0.0009	0.000	0.000
4,4-Dimethylheptane	I9	0.0002	0.0009	0.000	0.000
Ethylcyclohexane	N8	0.0039	0.0150	0.002	0.002
n-Propylcyclopentane	N8	0.0013	0.0050	0.001	0.001
2,5-Dimethylheptane	I9	0.0004	0.0018	0.000	0.000
3,3-Dimethylheptane	I9	0.0006	0.0026	0.000	0.000
3,5-Dimethylheptane	I9	0.0003	0.0013	0.000	0.000
2,6-Dimethylheptane	I9	0.0003	0.0013	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0004	0.000	0.000
Ethylbenzene	I8	0.0057	0.0207	0.002	0.002
1c,2t,4t-Trimethylcyclohexane	N9	0.0018	0.0078	0.001	0.001
2,3-Dimethylheptane	I9	0.0001	0.0004	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0045	0.0164	0.002	0.002
1,4-Dimethylbenzene (p-Xylene)	A8	0.0010	0.0036	0.000	0.000
3,4-Dimethylheptane	I9	0.0035	0.0154	0.002	0.002
3,4-Dimethylheptane (2)	I9	0.0009	0.0039	0.000	0.000
4-Ethylheptane	I9	0.0003	0.0013	0.000	0.000
4-Methyloctane	I9	0.0014	0.0062	0.001	0.001
2-Methyloctane	I9	0.0016	0.0070	0.001	0.001

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1c,2t,3-Trimethylcyclohexane	N9	0.0003	0.0013	0.000	0.000
3-Ethylheptane	I9	0.0003	0.0013	0.000	0.000
3-Methyloctane	I9	0.0020	0.0088	0.001	0.001
1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0004	0.000	0.000
1,1,2-Trimethylcyclohexane	N9	0.0001	0.0004	0.000	0.000
3,3-Diethylpentane	I9	0.0003	0.0013	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0031	0.0113	0.001	0.001
i-Butylcyclopentane	N9	0.0014	0.0061	0.001	0.001
UnknownC8s	U8	0.0001	0.0004	0.000	0.000
n-Nonane	P9	0.0052	0.0228	0.003	0.003
1,1-Methylethylcyclohexane	N9	0.0013	0.0056	0.001	0.001
i-Propylbenzene	A9	0.0009	0.0037	0.000	0.000
i-Propylcyclohexane	N9	0.0004	0.0017	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
2,4-Dimethyloctane	I10	0.0003	0.0015	0.000	0.000
2,5-Dimethyloctane	I10	0.0002	0.0010	0.000	0.000
n-Butylcyclopentane	N9	0.0010	0.0043	0.001	0.001
3,3-Dimethyloctane	I10	0.0002	0.0010	0.000	0.000
n-Propylbenzene	A9	0.0008	0.0033	0.000	0.000
3,6-Dimethyloctane	I10	0.0005	0.0024	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0007	0.0034	0.000	0.000
1,3-Methylethylbenzene	A9	0.0007	0.0029	0.000	0.000
1,4-Methylethylbenzene	A9	0.0003	0.0012	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0003	0.0012	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
5-Methylnonane	I10	0.0003	0.0015	0.000	0.000
1,2-Methylethylbenzene	A9	0.0003	0.0012	0.000	0.000
3-Methylnonane	I10	0.0002	0.0010	0.000	0.000
1,2,4-Trimethylbenzene	A9	0.0001	0.0004	0.000	0.000
t-Butylbenzene	A10	0.0005	0.0023	0.000	0.000
i-Butylcyclohexane	N10	0.0002	0.0010	0.000	0.000
1t-Methyl-2-n-propylcyclohexane	I10	0.0001	0.0005	0.000	0.000
i-Butylbenzene	A10	0.0001	0.0004	0.000	0.000
sec-Butylbenzene	A10	0.0001	0.0004	0.000	0.000
UnknownC9s	U9	0.0068	0.0298	0.004	0.004
n-Decane	P10	0.0009	0.0044	0.001	0.001
1,2,3-Trimethylbenzene	A9	0.0002	0.0008	0.000	0.000
1,3-Methyl-i-propylbenzene	A10	0.0001	0.0004	0.000	0.000
1,4-Methyl-i-propylbenzene	A10	0.0001	0.0004	0.000	0.000
Sec-Butylcyclohexane	A10	0.0002	0.0010	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0004	0.000	0.000
1,3-Diethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,4-Diethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Diethylbenzene	A10	0.0001	0.0004	0.000	0.000
t-Decahydronaphthalene	A9	0.0001	0.0005	0.000	0.000
UnknownC10s	U10	0.0045	0.0219	0.003	0.003
n-Undecane	P11	0.0002	0.0011	0.000	0.000
UnknownC11s	U11	0.0004	0.0022	0.000	0.000
n-Dodecane	P12	0.0001	0.0006	0.000	0.000
UnknownC12s	U12	0.0002	0.0011	0.000	0.000
n-Tridecane	P13	0.0001	0.0006	0.000	0.000
n-Tetradecane	P14	0.0001	0.0007	0.000	0.000
n-Pentadecane	P15	0.0005	0.0036	0.000	0.000
UnknownC15s	U15	0.0002	0.0014	0.000	0.000
n-Hexadecane	P16	0.0017	0.0132	0.001	0.001
UnknownC16s	U16	0.0006	0.0047	0.001	0.001
n-Heptadecane	P17	0.0019	0.0156	0.002	0.002
UnknownC17s	U17	0.0013	0.0107	0.001	0.001
n-Octadecane	P18	0.0012	0.0104	0.001	0.001
UnknownC18s	U18	0.0019	0.0166	0.002	0.002
n-Nonadecane	P19	0.0006	0.0055	0.001	0.001
UnknownC19s	U19	0.0006	0.0055	0.001	0.001
n-Eicosane	P20	0.0002	0.0019	0.000	0.000
UnknownC20s	U20	0.0001	0.0010	0.000	0.000
n-Heneicosane	P21	0.0001	0.0010	0.000	0.000
TOTAL		100.00000	100.00000	11.8608	11.9253

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0667	0.1783
TOLUENE	0.0418	0.1318
ETHYLBENZENE	0.0057	0.0207
XYLENES	0.0086	0.0313
TOTAL BTEX	0.1228	0.3621

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1500.6 **/scf**	1508.8 **/scf**
	NET WET REAL :	1474.4 **/scf**	1482.6 **/scf**
HIGH	GROSS DRY REAL :	1641.9 **/scf**	1650.8 **/scf**
	GROSS WET REAL :	1613.2 **/scf**	1622.1 **/scf**
	NET DRY REAL :	19521.4 **/lb**	19628.0 **/lb**
	GROSS DRY REAL :	21359.2 **/lb**	21475.9 **/lb**

RELATIVE DENSITY (AIR=1): 1.0083

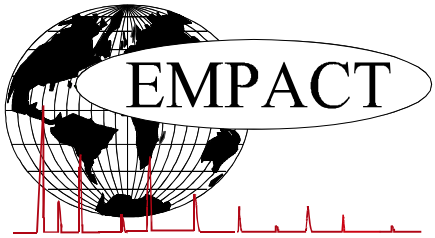
COMPRESSIBILITY FACTOR : 0.99356

(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. :	201305146	ANALYSIS NO. :	03
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	MAY 28, 2013
ACCOUNT NO. :		SAMPLE DATE :	MAY 24, 2013
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	PRODUCTION TANK @ 14:25 BRINGLESON 2-34-9-58		EMPACT
FIELD DATA		SAMPLE TEMP. :	133
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		

SPECIFICATION	TEST METHOD	UNITS	RESULTS
API GRAVITY		API 60/60	34.1
RVP @100 DEG F	D323	PSIG	4
SULFUR	D2622	WT %	0.331
VISUAL APPEARANCE			VISCOUS, DARK BROWN

ND: NOT DETECTED