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

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201209076	ANALYSIS NO. :	04
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	SEPTEMBER 15, 2012
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 13, 2012
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SEPARATOR @ 4:15 P.M. HEMBERGER 3-26-34-8-60		EMPACT
FIELD DATA		SAMPLE TEMP. :	142
SAMPLE PRES. :	23	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	MOLE %	MASS %	VOL %
NITROGEN (AIR)	0.0644	0.0169	0.0155
CARBON DIOXIDE	0.0220	0.0090	0.0082
METHANE	0.0915	0.0137	0.0339
ETHANE	0.3221	0.0905	0.1885
PROPANE	1.0666	0.4396	0.6433
I-BUTANE	0.2674	0.1453	0.1915
N-BUTANE	1.3537	0.7353	0.9342
I-PENTANE	0.6503	0.4385	0.5212
N-PENTANE	1.0794	0.7279	0.8557
HEXANES PLUS	95.0826	97.3833	96.6080
TOTALS	100.0000	100.0000	100.0000

BTEX COMPONENTS	MOLE%	MASS%
BENZENE	1.9097	1.3942
TOLUENE	3.3020	2.8436
ETHYLBENZENE	0.8109	0.8047
XYLENE	2.3345	2.3165
TOTAL BTEX	8.3571	7.3590

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

	TOTAL SAMPLE	C6+ FRACTION	
Specific Gravity (H2O=1) =	0.7417	0.7476	60/60
API Gravity =	59.28	57.77	60/60
Molecular Weight =	106.99	110.296	
Absolute Density =	6.18	6.23	LBS/GAL
Heating Value Liq. Idl Gas=	125914	126934	BTU/GAL
Vapor/Liquid =	22.03	21.57	CUFT/GAL
Vapor Pressure =	12.24	1.94	PSIA @100 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 ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201209076	ANALYSIS NO. :	04
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	SEPTEMBER 15, 2012
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 13, 2012
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	GALE MCENDREE EMPACT
NAME/DESCRIP :	SEPARATOR @ 4:15 P.M. HEMBERGER 3-26-34-8-60		
FIELD DATA		SAMPLE TEMP. :	142
SAMPLE PRES. :	23	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0220		0.0090		0.0082	
NITROGEN (AIR)	0.0644		0.0169		0.0155	
METHANE	0.0915		0.0137		0.0339	
ETHANE	0.3221		0.0905		0.1885	
PROPANE	1.0666		0.4396		0.6433	
I-BUTANE	0.2674		0.1453		0.1915	
N-BUTANE	1.3537		0.7353		0.9342	
I-PENTANE	0.6503		0.4385		0.5212	
N-PENTANE	1.0794		0.7279		0.8557	
CYCLOPENTANE (N-C5)	1.6795		1.1008		1.0744	
N-HEXANE	8.0770		6.5059		7.2711	
CYCLOHEXANE (OTHER C6)	3.2837		2.5829		2.4460	
OTHER HEXANES	12.3925		9.8838		10.5197	
OTHER HEPTANES	14.3375		13.3372		13.9332	
METHYLCYCLOHEXANE (OTHER C7)	4.5586		4.1835		4.0065	
2,2,4 TRIMETHYLPENTANE	0.8514		0.7813		0.7693	
BENZENE	1.9097		1.3942		1.1716	
TOLUENE	3.3020		2.8436		2.4132	
ETHYLBENZENE	0.8109		0.8047		0.6828	
XYLENES	2.3345		2.3165		1.9653	
OTHER OCTANES	11.6905		12.5073		12.6046	
OCTANES PLUS	----	45.5421	----	55.5514	----	53.7723
NONANES	12.4893		14.8020		14.4575	
DECANES PLUS	17.3655		24.3396		23.2928	
SUB TOTAL	100.0000		100.0000		100.0000	
TOTAL	100.0000		100.0000		100.0000	

API Gravity	=	59.28 60/60
Vapor Pressure	=	12.24 PSIA & 100 F
Average Molecular Weight of Decanes plus	=	149.97
Average Specific Gravity of Decanes plus	=	0.7780

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EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

BY CARBON NUMBER

PROJECT NO. :	201209076	ANALYSIS NO. :	04
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	SEPTEMBER 15, 2012
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 13, 2012
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	GALE MCENDREE EMPACT
NAME/DESCRIP :	SEPARATOR @ 4:15 P.M. HEMBERGER 3-26-34-8-60		
FIELD DATA		SAMPLE TEMP. :	142
SAMPLE PRES. :	23	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT / CARBON NUMBER	MOLE%	MASS %	VOLUME %
NITROGEN	0.0644	0.0169	0.0155
CARBON DIOXIDE	0.0220	0.0090	0.0082
C1	0.0915	0.0137	0.0339
C2	0.3221	0.0905	0.1885
C3	1.0666	0.4396	0.6433
C4	1.6211	0.8806	1.1257
C5	3.4092	2.2672	2.4513
C6	25.6629	20.3668	21.4084
C7	22.1981	20.3643	20.3529
C8	15.6873	16.4098	16.0220
C9	12.4893	14.8020	14.4575
C10	9.5330	12.2143	11.7025
C11	3.6430	5.0948	4.8063
C12	2.0291	3.0725	2.9610
C13	0.9634	1.6287	1.5753
C14	0.6170	1.1441	1.1121
C15	0.3878	0.7699	0.7397
C16	0.1484	0.3140	0.2997
C17	0.0255	0.0573	0.0545
C18	0.0159	0.0378	0.0359
C19	0.0012	0.0030	0.0028
C20	0.0008	0.0021	0.0020
C21	0.0004	0.0011	0.0010
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. :	201209076	ANALYSIS NO. :	04
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	SEPTEMBER 15, 2012
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 13, 2012
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SEPARATOR @ 4:15 P.M. HEMBERGER 3-26-34-8-60		EMPACT
FIELD DATA		SAMPLE TEMP. :	142
SAMPLE PRES. :	23	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Nitrogen	NHC	0.0644	0.0169	0.0155
Carbon Dioxide	NHC	0.0220	0.0090	0.0082
Methane	P1	0.0915	0.0137	0.0339
Ethane	P2	0.3221	0.0905	0.1885
Propane	P3	1.0666	0.4396	0.6433
i-Butane	I4	0.2674	0.1453	0.1915
n-Butane	P4	1.3537	0.7353	0.9342
2,2-Dimethylpropane	I5	0.0103	0.0069	0.0086
i-Pentane	I5	0.6400	0.4316	0.5126
n-Pentane	P5	1.0794	0.7279	0.8557
2,2-Dimethylbutane	I6	0.0450	0.0362	0.0411
Cyclopentane	N5	1.6795	1.1008	1.0744
2,3-Dimethylbutane	I6	0.4659	0.3753	0.4175
2-Methylpentane	I6	4.2876	3.4535	3.8954
3-Methylpentane	I6	2.4103	1.9414	2.1533
n-Hexane	P6	8.0770	6.5059	7.2711
2,2-Dimethylpentane	I7	0.0341	0.0319	0.0347
Methylcyclopentane	N6	5.1837	4.0774	4.0124
2,4-Dimethylpentane	I7	0.2769	0.2593	0.2844
2,2,3-Trimethylbutane	I7	0.0091	0.0085	0.0091
Benzene	A6	1.9097	1.3942	1.1716
3,3-Dimethylpentane	I7	0.0326	0.0305	0.0325
Cyclohexane	N6	3.2837	2.5829	2.4460
2-Methylhexane	I7	1.4191	1.3290	1.4451
2,3-Dimethylpentane	I7	0.7454	0.6981	0.7374
1,1-Dimethylcyclopentane	N7	0.3594	0.3298	0.3223
3-Methylhexane	I7	1.8537	1.7360	1.8592
1c,3-Dimethylcyclopentane	N7	0.9271	0.8508	0.8422
1t,3-Dimethylcyclopentane	N7	0.8514	0.7813	0.7693
3-Ethylpentane	I7	0.1434	0.1343	0.1415
1t,2-Dimethylcyclopentane	N7	1.8206	1.6708	1.6395
2,2,4-Trimethylpentane	I8	0.0351	0.0375	0.0398
n-Heptane	P7	5.0439	4.7236	5.0922
1c,2-Dimethylcyclopentane	N7	0.1452	0.1333	0.1273
Methylcyclohexane	N7	4.5586	4.1835	4.0065

2,2-Dimethylhexane	I8	0.3550	0.3790	0.4016
Ethylcyclopentane	N7	0.6756	0.6200	0.5965
2,5-Dimethylhexane	I8	0.1539	0.1643	0.1746
2,2,3-Trimethylpentane	I8	0.0097	0.0104	0.0107
2,4-Dimethylhexane	I8	0.2386	0.2547	0.2693
1c,2t,4-Trimethylcyclopentane	N8	0.4138	0.4340	0.4193
3,3-Dimethylhexane	I8	0.0342	0.0365	0.0379
2,3,4-Trimethylpentane	I8	0.1160	0.1238	0.1269
2,3,3-Trimethylpentane	I8	0.0077	0.0082	0.0083
Toluene	A7	3.3020	2.8436	2.4132
2,3-Dimethylhexane	I8	0.2336	0.2494	0.2584
2-Methyl-3-ethylpentane	I8	0.1565	0.1671	0.1712
1,1,2-Trimethylcyclopentane	N8	0.0031	0.0033	0.0031
2-Methylheptane	I8	1.4280	1.5246	1.6077
4-Methylheptane	I8	0.4286	0.4576	0.4709
3-Methyl-3-ethylpentane	I8	0.0598	0.0638	0.0647
3,4-Dimethylhexane	I8	0.0654	0.0698	0.0715
1c,2c,4-Trimethylcyclopentane	N8	0.0295	0.0309	0.0295
1c,3-Dimethylcyclohexane	N8	0.0297	0.0312	0.0301
3-Methylheptane	I8	0.7013	0.7487	0.7827
1c,2t,3-Trimethylcyclopentane	N8	0.9961	1.0447	1.0002
3-Ethylhexane	I8	0.1236	0.1320	0.1365
1t,4-Dimethylcyclohexane	N8	0.3990	0.4185	0.4048
1,1-Dimethylcyclohexane	N8	0.1314	0.1378	0.1302
3c-Ethylmethylcyclopentane	N8	0.0032	0.0034	0.0033
3t-Ethylmethylcyclopentane	N8	0.2312	0.2425	0.2333
2t-Ethylmethylcyclopentane	N8	0.2041	0.2141	0.2054
1,1-Methylethylcyclopentane	N8	0.6736	0.7064	0.6673
2,2,4-Trimethylhexane	I9	0.0529	0.0634	0.0654
1t,2-Dimethylcyclohexane	N8	0.6249	0.6554	0.6232
1t,3-Dimethylcyclohexane	N8	0.0120	0.0126	0.0118
n-Octane	P8	2.9875	3.1896	3.3475
1c,4-Dimethylcyclohexane	N8	0.3817	0.4003	0.3772
i-Propylcyclopentane	I8	0.0731	0.0767	0.0729
2,4,4-Trimethylhexane	I9	0.0247	0.0296	0.0302
2,2,3,4-Tetramethylpentane	I9	0.0231	0.0277	0.0284
2,3,4-Trimethylhexane	I9	0.0258	0.0309	0.0316
1c,2-Dimethylcyclohexane	N8	0.2825	0.2963	0.2746
2,3,5-Trimethylhexane	I9	0.0566	0.0678	0.0693
2,2-Dimethylheptane	I9	0.0150	0.0180	0.0187
1,1,4-Trimethylcyclohexane	N9	1.2026	1.4190	1.3563
2,2,3-Trimethylhexane	I9	0.4626	0.5545	0.5608
2,4-Dimethylheptane	I9	0.0216	0.0259	0.0267
4,4-Dimethylheptane	I9	0.0485	0.0581	0.0599
Ethylcyclohexane	N8	0.6594	0.6915	0.6477
n-Propylcyclopentane	N8	0.2463	0.2583	0.2454
1c,3c,5-Trimethylcyclohexane	N9	0.0459	0.0542	0.0518
2,5-Dimethylheptane	I9	0.0868	0.1041	0.1071
3,3-Dimethylheptane	I9	0.1059	0.1270	0.1307
3,5-Dimethylheptane	I9	0.0746	0.0894	0.0920
2,6-Dimethylheptane	I9	0.0695	0.0833	0.0867
1,1,3-Trimethylcyclohexane	N9	0.1760	0.2077	0.1985
Ethylbenzene	A8	0.8109	0.8047	0.6828
1c,2t,4t-Trimethylcyclohexane	N9	0.2455	0.2897	0.2716
2,3-Dimethylheptane	I9	0.0098	0.0117	0.0119
1,3-Dimethylbenzene (m-Xylene)	A8	0.8949	0.8880	0.7579
1,4-Dimethylbenzene (p-Xylene)	A8	0.5450	0.5408	0.4630
3,4-Dimethylheptane	I9	0.0529	0.0634	0.0639
3,4-Dimethylheptane (2)	I9	0.1407	0.1687	0.1702
4-Ethylheptane	I9	0.0366	0.0439	0.0453
4-Methyloctane	I9	0.3477	0.4168	0.4266
2-Methyloctane	I9	0.4162	0.4989	0.5157
1c,2t,4c-Trimethylcyclohexane	I9	0.0459	0.0550	0.0559
3-Ethylheptane	I9	0.0946	0.1134	0.1151
3-Methyloctane	I9	0.5054	0.6059	0.6201
3,3-Diethylpentane	I9	0.0796	0.0954	0.0933
1c,2t,3-Trimethylcyclohexane	N9	0.0968	0.1142	0.1071

1,1,2-Trimethylcyclohexane	N9	0.0261	0.0308	0.0289
1,2-Dimethylbenzene (o-Xylene)	A8	0.8946	0.8877	0.7444
i-Butylcyclopentane	N9	0.3171	0.3741	0.3535
UnknownC8s	U8	0.0128	0.0137	0.0144
n-Nonane	P9	2.0929	2.5089	2.5788
1,1-Methylethylcyclohexane	N9	0.3589	0.4302	0.4435
i-Propylbenzene	A9	0.3343	0.3755	0.3208
i-Propylcyclohexane	N9	0.1062	0.1253	0.1153
2,2-Dimethyloctane	I10	0.0650	0.0864	0.0862
2,4-Dimethyloctane	I10	0.1051	0.1398	0.1395
2,6-Dimethyloctane	I10	0.0161	0.0214	0.0221
2,5-Dimethyloctane	I10	0.0425	0.0565	0.0564
n-Butylcyclopentane	N9	0.4311	0.5652	0.5220
3,3-Dimethyloctane	I10	0.1811	0.2408	0.2404
n-Propylbenzene	A9	0.4851	0.5449	0.4656
3,6-Dimethyloctane	I10	0.3503	0.4658	0.4647
3-Methyl-5-ethylheptane	I10	0.5779	0.6928	0.7043
1,3-Methylethylbenzene	A9	0.4529	0.5088	0.4311
1,4-Methylethylbenzene	A9	0.1795	0.2016	0.1708
1,3,5-Trimethylbenzene	A9	0.2288	0.2570	0.2193
2,3-Dimethyloctane	I10	0.0689	0.0916	0.0914
5-Methylnonane	I10	0.2749	0.3656	0.3682
1,2-Methylethylbenzene	A9	0.3894	0.4374	0.3687
2-Methylnonane	I10	0.0383	0.0509	0.0517
3-Ethyloctane	I10	0.0799	0.1063	0.1061
3-Methylnonane	I10	0.2406	0.3200	0.3219
1,2,4-Trimethylbenzene	A9	0.0215	0.0242	0.0204
t-Butylbenzene	A10	0.5424	0.6804	0.5798
i-Butylcyclohexane	N10	0.2275	0.2983	0.2712
1t-Methyl-2-n-propylcyclohexane	I10	0.0583	0.0699	0.0711
i-Butylbenzene	A10	0.0772	0.0968	0.0838
sec-Butylbenzene	A10	0.1319	0.1655	0.1418
UnknownC9s	U9	2.2568	2.7054	2.7808
n-Decane	P10	1.2572	1.6718	1.6895
1,2,3-Trimethylbenzene	A9	0.2449	0.2751	0.2272
1,3-Methyl-i-propylbenzene	A10	0.1139	0.1280	0.1079
1,4-Methyl-i-propylbenzene	A10	0.0723	0.0812	0.0684
Sec-Butylcyclohexane	N10	0.3191	0.4183	0.3798
1,2-Methyl-i-propylbenzene	A10	0.1731	0.2172	0.1829
3-Ethylnonane	I10	0.0275	0.0366	0.0372
1,3-Diethylbenzene	A10	0.1191	0.1494	0.1277
1,3-Methyl-n-propylbenzene	A10	0.0700	0.0878	0.0753
1,4-Diethylbenzene	A10	0.1808	0.2268	0.1943
1,4-Methyl-n-propylbenzene	A10	0.1151	0.1444	0.1242
n-Butylbenzene	A10	0.1019	0.1278	0.1095
1,3-Dimethyl-5-ethylbenzene	A10	0.0802	0.1006	0.0859
1,2-Diethylbenzene	A10	0.1212	0.1520	0.1276
1,2-Methyl-n-propylbenzene	A10	0.0934	0.1172	0.0990
1,4-Dimethyl-2-ethylbenzene	A10	0.1200	0.1505	0.1267
1,3-Dimethyl-4-ethylbenzene	A10	0.0066	0.0083	0.0070
1,2-Dimethyl-4-ethylbenzene	A10	0.1442	0.1809	0.1527
1,3-Dimethyl-2-ethylbenzene	A10	0.1047	0.1313	0.1089
1t,2c,4-Trimethylcyclopentane	A10	0.4930	0.5170	0.5102
1,2-Dimethyl-3-ethylbenzene	A10	0.0672	0.0843	0.0698
1,2-Ethyl-i-propylbenzene	A10	0.0544	0.0682	0.0574
1,4-Methyl-t-butylbenzene	A11	0.1330	0.1668	0.1405
UnknownC10s	U10	2.4163	3.2132	3.2472
n-Undecane	P11	0.7787	1.1376	1.1337
1,4-Ethyl-i-propylbenzene	A11	0.0675	0.0847	0.0713
1,2,4,5-Tetramethylbenzene	A11	0.0753	0.0945	0.0788
1,2-Methyl-n-butylbenzene	A11	0.0512	0.0642	0.0541
1,2,3,5-Tetramethylbenzene	A11	0.0412	0.0517	0.0429
1,2-Methyl-t-butylbenzene	A11	0.0757	0.0950	0.0800
5-Methylindan	A11	0.0202	0.0322	0.0317
4-Methylindan	A11	0.0125	0.0199	0.0196
1,2-Ethyl-n-propylbenzene	A11	0.1003	0.1258	0.1059
2-Methylindan	A11	0.0607	0.0966	0.0952

1,3-Methyl-n-butylbenzene	A11	0.0544	0.0682	0.0574
1,3-Di-i-propylbenzene	A11	0.0555	0.0696	0.0586
sec-Pentylbenzene	A11	0.1062	0.1332	0.1122
n-Pentylbenzene	A11	0.0631	0.0874	0.0752
1t-M-2-(4MP)cyclopentane	P12	0.0114	0.0182	0.0179
1,2-Di-n-propylbenzene	A11	0.0662	0.0830	0.0699
1,4-Di-i-propylbenzene	A11	0.1111	0.1394	0.1174
Tetrahydronaphthalene	A10	0.0159	0.0199	0.0168
t-Decahydronaphthalene	A10	0.1341	0.1682	0.1416
Naphthalene	A10	0.0539	0.0646	0.0544
1-t-Butyl-3,5-dimethylbenzene	A12	0.0241	0.0302	0.0254
1,4-Ethyl-t-butylbenzene	A11	0.0684	0.0858	0.0723
UnknownC11s	U11	1.4970	2.1870	2.1795
n-Dodecane	P12	0.4535	0.7220	0.7116
1,3-Di-n-propylbenzene	A12	0.0754	0.0946	0.0797
1,3,5-Triethylbenzene	A12	0.0471	0.0529	0.0451
1,2,4-Triethylbenzene	A12	0.1929	0.2167	0.1826
1,4-Methyl-n-pentylbenzene	A12	0.0276	0.0346	0.0291
n-Hexylbenzene	A12	0.0335	0.0508	0.0437
1,2,3,4,5-Pentamethylbenzene	A13	0.0668	0.0838	0.0706
2-Methylnaphthalene	A11	0.0829	0.1102	0.0928
1-Methylnaphthalene	A11	0.1219	0.1620	0.1173
UnknownC12s	U12	1.1636	1.8525	1.8259
n-Tridecane	P13	0.2682	0.4621	0.4501
UnknownC13s	U13	0.6284	1.0828	1.0546
n-Tetradecane	P14	0.1216	0.2255	0.2192
UnknownC14s	U14	0.4954	0.9186	0.8929
n-Pentadecane	P15	0.0559	0.1110	0.1066
UnknownC15s	U15	0.3319	0.6589	0.6331
n-Hexadecane	P16	0.0270	0.0571	0.0545
UnknownC16s	U16	0.1214	0.2569	0.2452
n-Heptadecane	P17	0.0124	0.0279	0.0265
UnknownC17s	U17	0.0131	0.0294	0.0280
n-Octadecane	P18	0.0027	0.0064	0.0061
UnknownC18s	U18	0.0132	0.0314	0.0298
n-Nonadecane	P19	0.0012	0.0030	0.0028
n-Eicosane	P20	0.0008	0.0021	0.0020
n-Heneicosane	P21	0.0004	0.0011	0.0010
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. :	201209076	ANALYSIS NO. :	05
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	SEPTEMBER 16, 2012
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 13, 2012
PRODUCER :		CYLINDER NO. :	1251
LEASE NO. :		SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	SALES GAS @ 4:40 P.M. HEMBERGER 3-26-34-8-60		
FIELD DATA		SAMPLE TEMP. :	88
SAMPLE PRES. :	21	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE LENGTH OF H2S STAIN @ 2.0PPM @ 4:50 P.M.		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0017	0.0036		
HELIUM	0.02	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.01	0.01	---	---
NITROGEN	1.02	1.18	---	---
CARBON DIOXIDE	2.44	4.44	---	---
METHANE	70.18300	46.60660	---	---
ETHANE	11.3637	14.1440	3.0347	3.0513
PROPANE	8.2966	15.1436	2.2828	2.2953
I-BUTANE	0.8969	2.1578	0.2934	0.2950
N-BUTANE	3.0771	7.4032	0.9692	0.9745
I-PENTANE	0.7248	2.1578	0.2593	0.2608
N-PENTANE	0.8679	2.5920	0.3144	0.3161
HEXANES PLUS	1.0883	4.1614	0.4383	0.4404
TOTALS	100.00000	100.00000	7.5921	7.6334

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0423	0.1368
TOLUENE	0.0275	0.1049
ETHYLBENZENE	0.0034	0.0149
XYLENES	0.0087	0.0383
TOTAL BTEX	0.0819	0.2949

BTU @		14.650	14.730
LOW	NET DRY REAL :	1244.1 /scf	1250.9 /scf
	NET WET REAL :	1222.4 /scf	1228.2 /scf
HIGH	GROSS DRY REAL :	1367.0 /scf	1374.4 /scf
	GROSS WET REAL :	1343.1 /scf	1350.5 /scf
	NET DRY REAL :	19562.6 /lb	19669.5 /lb
	GROSS DRY REAL :	21498.1 /lb	21615.5 /lb
	RELATIVE DENSITY (AIR=1):		0.8335
	COMPRESSIBILITY FACTOR :		0.99565

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

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

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BRIGHTON, CO
80601

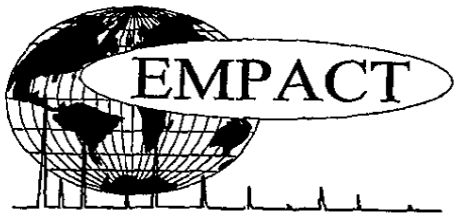
303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201209076	ANALYSIS NO. :	05
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	SEPTEMBER 16, 2012
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 13, 2012
PRODUCER :		CYLINDER NO. :	1251
LEASE NO. :		SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	SALES GAS @ 4:40 P.M. HEMBERGER 3-26-34-8-60		
FIELD DATA		SAMPLE TEMP. :	88
SAMPLE PRES. :	21	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE LENGTH OF H2S STAIN @ 2.0PPM @ 4:50 P.M.		

Componet	Mole %	Wt %
Helium	0.02	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	2.44	4.44
Nitrogen	1.02	1.18
Methane	70.18300	46.60660
Ethane	11.3637	14.1440
Propane	8.2966	15.1436
Isobutane	0.8969	2.1576
n-Butane	3.0771	7.4032
Isopentane	0.6425	1.9189
n-Pentane	0.8679	2.5920
Cyclopentane	0.0823	0.2389
n-Hexane	0.2161	0.7709
Cyclohexane	0.0607	0.2115
Other Hexanes	0.3723	1.3176
Heptanes	0.1948	0.8025
Methycyclohexane	0.0474	0.1926
2,2,4 Trimethylpentane	0.0001	0.0005
Benzene	0.0423	0.1368
Toluene	0.0275	0.1049
Ethylbenzene	0.0034	0.0149
Xylenes	0.0087	0.0383
C8+ Heavies	0.1150	0.5709
Subtotal	99.98830	99.98640
Oxygen/Argon	0.01	0.01
Alcohols	0.0017	0.0036
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201209076	ANALYSIS NO. :	05
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	SEPTEMBER 16, 2012
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 13, 2012
PRODUCER :		CYLINDER NO. :	1251
LEASE NO. :		SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	SALES GAS @ 4:40 P.M. HEMBERGER 3-26-34-8-60		
FIELD DATA		SAMPLE TEMP. :	88
SAMPLE PRES. :	21	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE LENGTH OF H2S STAIN @ 2.0PPM @ 4:50 P.M.		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Helium	---	0.02	0.00	---	---
Hydrogen	---	0.01	0.00	---	---
Oxygen/Argon	---	0.01	0.01	---	---
Nitrogen	---	1.02	1.18	---	---
Carbon Dioxide	---	2.44	4.44	---	---
Methane	P1	70.18300	46.60660	---	---
Ethane	P2	11.3637	14.1440	3.035	3.051
Propane	P3	8.2966	15.1436	2.283	2.295
i-Butane	I4	0.8969	2.1578	0.293	0.295
n-Butane	P4	3.0771	7.4032	0.969	0.975
2,2-Dimethylpropane	I5	0.0023	0.0069	0.001	0.001
Ethanol	X2	0.0014	0.0027	0.000	0.000
i-Pentane	I5	0.6402	1.9120	0.234	0.236
n-Pentane	P5	0.8679	2.5920	0.314	0.316
t-Butanol	X4	0.0002	0.0006	0.000	0.000
2,2-Dimethylbutane	I6	0.0022	0.0079	0.001	0.001
Cyclopentane	N5	0.0823	0.2389	0.024	0.024
2,3-Dimethylbutane	I6	0.0132	0.0471	0.005	0.005
2-Methylpentane	I6	0.1532	0.5465	0.063	0.063
3-Methylpentane	I6	0.0780	0.2782	0.032	0.032
n-Hexane	P6	0.2161	0.7709	0.089	0.090
2-Butanol	X4	0.0001	0.0003	0.000	0.000
2,2-Dimethylpentane	I7	0.0007	0.0029	0.000	0.000
Methylcyclopentane	N6	0.1257	0.4379	0.044	0.044
2,4-Dimethylpentane	I7	0.0054	0.0224	0.003	0.003
2,2,3-Trimethylbutane	I7	0.0001	0.0004	0.000	0.000
Benzene	A6	0.0423	0.1368	0.012	0.012
3,3-Dimethylpentane	I7	0.0005	0.0021	0.000	0.000
Cyclohexane	N6	0.0607	0.2115	0.021	0.021
2-Methylhexane	I7	0.0235	0.0975	0.011	0.011
2,3-Dimethylpentane	I7	0.0110	0.0456	0.005	0.005
1,1-Dimethylcyclopentane	N7	0.0056	0.0228	0.002	0.002
3-Methylhexane	I7	0.0270	0.1120	0.012	0.012
1c,3-Dimethylcyclopentane	N7	0.0140	0.0569	0.006	0.006
1t,3-Dimethylcyclopentane	N7	0.0125	0.0508	0.006	0.006
3-Ethylpentane	I7	0.0019	0.0079	0.001	0.001
1t,2-Dimethylcyclopentane	N7	0.0262	0.1065	0.012	0.012

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2,2,4-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
n-Heptane	P7	0.0580	0.2406	0.027	0.027
1c,2-Dimethylcyclopentane	N7	0.0014	0.0057	0.001	0.001
Methylcyclohexane	N7	0.0474	0.1926	0.019	0.019
2,2-Dimethylhexane	I8	0.0030	0.0142	0.001	0.001
Ethylcyclopentane	N7	0.0070	0.0284	0.003	0.003
2,5-Dimethylhexane	I8	0.0013	0.0062	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
2,4-Dimethylhexane	I8	0.0021	0.0099	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0037	0.0172	0.002	0.002
3,3-Dimethylhexane	I8	0.0003	0.0014	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0042	0.0195	0.002	0.002
2,3,4-Trimethylpentane	I8	0.0009	0.0043	0.000	0.000
Toluene	A7	0.0275	0.1049	0.009	0.009
2,3-Dimethylhexane	I8	0.0018	0.0085	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0011	0.0052	0.001	0.001
2-Methylheptane	I8	0.0096	0.0454	0.005	0.005
4-Methylheptane	I8	0.0027	0.0128	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0002	0.0010	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	0.0002	0.0009	0.000	0.000
3-Methylheptane	I8	0.0041	0.0194	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0063	0.0293	0.003	0.003
3-Ethylhexane	I8	0.0006	0.0029	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0021	0.0098	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0008	0.0037	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0014	0.0065	0.001	0.001
2t-Ethylmethylcyclopentane	N8	0.0012	0.0056	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0039	0.0181	0.002	0.002
2,2,4-Trimethylhexane	I9	0.0003	0.0016	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0032	0.0149	0.002	0.002
n-Octane	P8	0.0144	0.0681	0.007	0.007
1c,4-Dimethylcyclohexane	N8	0.0013	0.0060	0.001	0.001
i-Propylcyclopentane	I8	0.0003	0.0014	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0003	0.0016	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0009	0.0042	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0047	0.0245	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0016	0.0085	0.001	0.001
4,4-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
Ethylcyclohexane	N8	0.0023	0.0107	0.001	0.001
n-Propylcyclopentane	N8	0.0007	0.0033	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0005	0.000	0.000
2,5-Dimethylheptane	I9	0.0003	0.0016	0.000	0.000
3,3-Dimethylheptane	I9	0.0004	0.0021	0.000	0.000
3,5-Dimethylheptane	I9	0.0002	0.0011	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0011	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0005	0.000	0.000
Ethylbenzene	I8	0.0034	0.0149	0.001	0.001
1c,2t,4t-Trimethylcyclohexane	N9	0.0007	0.0036	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0032	0.0141	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0033	0.0145	0.001	0.001
3,4-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0005	0.0027	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0011	0.000	0.000
4-Methyloctane	I9	0.0009	0.0048	0.001	0.001
2-Methyloctane	I9	0.0011	0.0058	0.001	0.001

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1c,2t,3-Trimethylcyclohexane	N9	0.0002	0.0010	0.000	0.000
3-Ethylheptane	I9	0.0002	0.0011	0.000	0.000
3-Methyloctane	I9	0.0013	0.0069	0.001	0.001
1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0005	0.000	0.000
1,1,2-Trimethylcyclohexane	N9	0.0001	0.0005	0.000	0.000
3,3-Diethylpentane	I9	0.0002	0.0011	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0022	0.0097	0.001	0.001
i-Butylcyclopentane	N9	0.0008	0.0042	0.000	0.000
n-Nonane	P9	0.0040	0.0212	0.002	0.002
1,1-Methylethylcyclohexane	N9	0.0002	0.0010	0.000	0.000
i-Propylbenzene	A9	0.0006	0.0030	0.000	0.000
i-Propylcyclohexane	N9	0.0002	0.0010	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0006	0.000	0.000
2,4-Dimethyloctane	I10	0.0002	0.0012	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0006	0.000	0.000
n-Butylcyclopentane	N9	0.0008	0.0042	0.000	0.000
3,3-Dimethyloctane	I10	0.0002	0.0012	0.000	0.000
n-Propylbenzene	A9	0.0007	0.0035	0.000	0.000
3,6-Dimethyloctane	I10	0.0004	0.0024	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0007	0.0041	0.000	0.000
1,3-Methylethylbenzene	A9	0.0006	0.0030	0.000	0.000
1,4-Methylethylbenzene	A9	0.0002	0.0010	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0003	0.0015	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0006	0.000	0.000
5-Methylnonane	I10	0.0003	0.0018	0.000	0.000
1,2-Methylethylbenzene	A9	0.0003	0.0015	0.000	0.000
3-Ethyloctane	I10	0.0001	0.0006	0.000	0.000
3-Methylnonane	I10	0.0002	0.0012	0.000	0.000
1,2,4-Trimethylbenzene	A9	0.0001	0.0005	0.000	0.000
t-Butylbenzene	A10	0.0005	0.0028	0.000	0.000
i-Butylcyclohexane	N10	0.0002	0.0012	0.000	0.000
1t-Methyl-2-n-propylcyclohexane	I10	0.0001	0.0006	0.000	0.000
i-Butylbenzene	A10	0.0001	0.0005	0.000	0.000
sec-Butylbenzene	A10	0.0001	0.0005	0.000	0.000
UnknownC9s	U9	0.0034	0.0181	0.002	0.002
n-Decane	P10	0.0011	0.0065	0.001	0.001
1,2,3-Trimethylbenzene	A9	0.0002	0.0010	0.000	0.000
1,3-Methyl-i-propylbenzene	A10	0.0001	0.0005	0.000	0.000
1,4-Methyl-i-propylbenzene	A10	0.0001	0.0005	0.000	0.000
Sec-Butylcyclohexane	A10	0.0003	0.0017	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0005	0.000	0.000
1,3-Diethylbenzene	A10	0.0001	0.0005	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0005	0.000	0.000
1,4-Diethylbenzene	A10	0.0001	0.0005	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0001	0.0005	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0005	0.000	0.000
1,3-Dimethyl-5-ethylbenzene	A10	0.0001	0.0005	0.000	0.000
1,2-Diethylbenzene	A10	0.0001	0.0005	0.000	0.000
t-Decahydronaphthalene	A9	0.0001	0.0006	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0001	0.0005	0.000	0.000
1,4-Dimethyl-2-ethylbenzene	A10	0.0001	0.0005	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0002	0.0011	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0001	0.0005	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0001	0.0006	0.000	0.000
UnknownC10s	U10	0.0032	0.0188	0.002	0.002
n-Undecane	P11	0.0005	0.0032	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0001	0.0005	0.000	0.000
1,2-Methyl-n-butylbenzene	A11	0.0001	0.0006	0.000	0.000
1,2,3,5-Tetramethylbenzene	A11	0.0001	0.0005	0.000	0.000
1,2-Methyl-t-butylbenzene	A11	0.0001	0.0006	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0001	0.0007	0.000	0.000

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Naphthalene	A10	0.0001	0.0005	0.000	0.000
UnknownC11s	U11	0.0010	0.0065	0.001	0.001
n-Dodecane	P12	0.0002	0.0014	0.000	0.000
1,2,4-Triethylbenzene	A12	0.0001	0.0007	0.000	0.000
2-Methylnaphthalene	A11	0.0001	0.0006	0.000	0.000
UnknownC12s	U12	0.0005	0.0032	0.000	0.000
n-Tridecane	P13	0.0001	0.0007	0.000	0.000
UnknownC13s	U13	0.0001	0.0007	0.000	0.000
n-Tetradecane	P14	0.0001	0.0008	0.000	0.000
n-Pentadecane	P15	0.0001	0.0009	0.000	0.000
TOTAL		100.00000	100.00000	7.5921	7.6334

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0423	0.1368
TOLUENE	0.0275	0.1049
ETHYLBENZENE	0.0034	0.0149
XYLENES	0.0087	0.0383
TOTAL BTEX	0.0819	0.2949

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1244.1 /scf	1250.9 /scf
	NET WET REAL :	1222.4 /scf	1229.2 /scf
HIGH	GROSS DRY REAL :	1367.0 /scf	1374.4 /scf
	GROSS WET REAL :	1343.1 /scf	1350.5 /scf
	NET DRY REAL :	19562.6 /lb	19669.5 /lb
	GROSS DRY REAL :	21498.1 /lb	21615.5 /lb

RELATIVE DENSITY (AIR=1): 0.8335

COMPRESSIBILITY FACTOR : 0.99565

(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 RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

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EMPACT

CRUDE OIL ASSAY

PROJECT NO. :	201209076	ANALYSIS NO. :	06
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	SEPTEMBER 15, 2012
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 13, 2012
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	GALE MCENDREE EMPACT
NAME/DESCRIP :	PRODUCTION TANK #115818 @ 5:05 P.M. HEMBERGER 3-26-34-8-60		
FIELD DATA		SAMPLE TEMP. :	97
SAMPLE PRES. :	23	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

SPECIFICATION	TEST METHOD	UNITS	RESULTS
API GRAVITY		API 60/60	35.6
RVP @100 DEG F	D323	PSIG	4.8
VISUAL APPEARANCE			DARK BROWN

BDL: BELOW DETECTION LIMIT

*The method was modified to accommodate the small sample size and volatility of the sample. A 15 ml graduated centrifuge tube was used in place of a 100ml. Also the sample was at ~75 deg. F instead of 140 deg. F.