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

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201210170	ANALYSIS NO. :	04
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 30, 2012
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 29, 2012
PRODUCER :		CYLINDER NO. :	5984
LEASE NO. :		SAMPLED BY :	BURL MCENDREE
NAME/DESCRIP :	TREATOR; PRE OIL PUMP SEPARATOR HEMBERGER 2-25-34-8-60		EMPACT
FIELD DATA		SAMPLE TEMP. :	148
SAMPLE PRES. :	~20	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT SAMPLE PORT PLUGGED; FIXED		

COMPONENT	MOLE %	MASS %	VOL %
NITROGEN (AIR)	0.0468	0.0118	0.0109
CARBON DIOXIDE	0.0214	0.0084	0.0077
METHANE	0.0691	0.0099	0.0246
ETHANE	0.2572	0.0693	0.1449
PROPANE	1.1253	0.4449	0.6538
I-BUTANE	0.3073	0.1601	0.2119
N-BUTANE	1.6195	0.8438	1.0765
I-PENTANE	0.7596	0.4914	0.5865
N-PENTANE	1.3635	0.8820	1.0412
HEXANES PLUS	94.4303	97.0784	96.2420
TOTALS	100.0000	100.0000	100.0000

BTEX COMPONENTS	**MOLE%**	**MASS%**
BENZENE	1.5816	1.1075
TOLUENE	2.9525	2.4389
ETHYLBENZENE	0.7490	0.7129
XYLENE	2.1326	2.0298
TOTAL BTEX	7.4157	6.2891

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

	TOTAL SAMPLE	**C6+ FRACTION**	
Specific Gravity (H2O=1) =	0.7452	0.7518	60/60
API Gravity =	58.38	56.71	60/60
Molecular Weight =	111.54	115.407	
Absolute Density =	6.21	6.27	LBS/GAL
Heating Value Liq. Idl Gas=	126017	127440	BTU/GAL
Vapor/Liquid =	21.18	20.73	CUFT/GAL
Vapor Pressure =	10.74	1.74	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. :	201210170	ANALYSIS NO. :	04
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 30, 2012
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 29, 2012
PRODUCER :		CYLINDER NO. :	5984
LEASE NO. :		SAMPLED BY :	BURL MCENDREE
NAME/DESCRIP :	TREATOR; PRE OIL PUMP SEPARATOR HEMBERGER 2-25-34-8-60		EMPACT
FIELD DATA		SAMPLE TEMP. :	148
SAMPLE PRES. :	~20	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT SAMPLE PORT PLUGGED; FIXED		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0214		0.0084		0.0077	
NITROGEN (AIR)	0.0468		0.0118		0.0109	
METHANE	0.0691		0.0099		0.0246	
ETHANE	0.2572		0.0693		0.1449	
PROPANE	1.1253		0.4449		0.6538	
I-BUTANE	0.3073		0.1601		0.2119	
N-BUTANE	1.6195		0.8438		1.0765	
I-PENTANE	0.7596		0.4914		0.5865	
N-PENTANE	1.3635		0.8820		1.0412	
CYCLOPENTANE (N-C5)	1.5299		0.9619		0.9427	
N-HEXANE	7.3074		5.6447		6.3362	
CYCLOHEXANE (OTHER C6)	2.7530		2.0771		1.9753	
OTHER HEXANES	11.0179		8.4331		9.0369	
OTHER HEPTANES	12.6541		11.2939		11.8611	
METHYLCYCLOHEXANE (OTHER C7)	3.7574		3.3075		3.1809	
2,2,4 TRIMETHYLPENTANE	0.7004		0.6165		0.6096	
BENZENE	1.5816		1.1075		0.9346	
TOLUENE	2.9525		2.4389		2.0785	
ETHYLBENZENE	0.7490		0.7129		0.6075	
XYLENES	2.1326		2.0298		1.7296	
OTHER OCTANES	10.8733		11.1470		11.2857	
OCTANES PLUS	----	50.8765	----	61.8138	----	59.8958
NONANES	12.4713		14.1703		13.8869	
DECANES PLUS	23.9499		33.1373		31.7765	
SUB TOTAL	100.0000		100.0000		100.0000	
TOTAL	100.0000		100.0000		100.0000	

API Gravity	=	**58.38**	60/60
Vapor Pressure	=	**10.74**	PSIA & 100 F
Average Molecular Weight of Decanes plus	=	**154.33**	
Average Specific Gravity of Decanes plus	=	**0.7740**	

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EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

BY CARBON NUMBER

PROJECT NO. :	201210170	ANALYSIS NO. :	04
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 30, 2012
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 29, 2012
PRODUCER :		CYLINDER NO. :	5984
LEASE NO. :		SAMPLED BY :	BURL MCENDREE
NAME/DESCRIP :	TREATOR; PRE OIL PUMP SEPARATOR		EMPACT
	HEMBERGER 2-25-34-8-60		
FIELD DATA		SAMPLE TEMP. :	148
SAMPLE PRES. :	~20	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		
	SAMPLE PORT PLUGGED; FIXED		

COMPONENT / CARBON NUMBER		MOLE%	MASS %	VOLUME %
NITROGEN		0.0468	0.0118	0.0109
CARBON DIOXIDE		0.0214	0.0084	0.0077
	C1	0.0691	0.0099	0.0246
	C2	0.2572	0.0693	0.1449
	C3	1.1253	0.4449	0.6538
	C4	1.9268	1.0039	1.2884
	C5	3.6530	2.3353	2.5704
	C6	22.6599	17.2624	18.2830
	C7	19.3640	17.0403	17.1205
	C8	14.4553	14.5062	14.2324
	C9	12.4713	14.1703	13.8869
	C10	11.2222	13.8136	13.2393
	C11	5.3999	7.2296	6.8314
	C12	2.9357	4.2461	4.1003
	C13	1.7638	2.8653	2.7848
	C14	1.2146	2.1603	2.1087
	C15	0.7776	1.4809	1.4288
	C16	0.3618	0.7345	0.7041
	C17	0.1637	0.3529	0.3372
	C18	0.1000	0.2281	0.2173
	C19	0.0080	0.0193	0.0183
	C20	0.0017	0.0043	0.0041
	C21	0.0009	0.0024	0.0022
	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

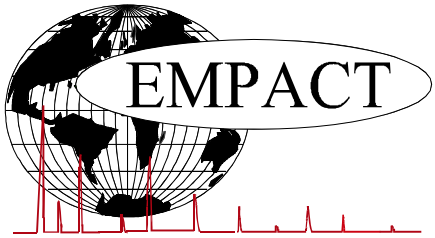
PROJECT NO. :	201210170	ANALYSIS NO. :	04
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 30, 2012
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 29, 2012
PRODUCER :		CYLINDER NO. :	5984
LEASE NO. :		SAMPLED BY :	BURL MCENDREE
NAME/DESCRIP :	TREATOR; PRE OIL PUMP SEPARATOR HEMBERGER 2-25-34-8-60		EMPACT
FIELD DATA		SAMPLE TEMP. :	148
SAMPLE PRES. :	~20	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT SAMPLE PORT PLUGGED; FIXED		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Nitrogen	NHC	0.0468	0.0118	0.0109
Carbon Dioxide	NHC	0.0214	0.0084	0.0077
Methane	P1	0.0691	0.0099	0.0246
Ethane	P2	0.2572	0.0693	0.1449
Propane	P3	1.1253	0.4449	0.6538
i-Butane	I4	0.3073	0.1601	0.2119
n-Butane	P4	1.6195	0.8438	1.0765
2,2-Dimethylpropane	I5	0.0092	0.0060	0.0075
i-Pentane	I5	0.7504	0.4854	0.5790
n-Pentane	P5	1.3635	0.8820	1.0412
2,2-Dimethylbutane	I6	0.0412	0.0318	0.0362
Cyclopentane	N5	1.5299	0.9619	0.9427
2,3-Dimethylbutane	I6	0.3998	0.3089	0.3451
2-Methylpentane	I6	3.9539	3.0548	3.4602
3-Methylpentane	I6	2.2397	1.7304	1.9273
n-Hexane	P6	7.3074	5.6447	6.3362
2,2-Dimethylpentane	I7	0.0274	0.0246	0.0269
Methylcyclopentane	N6	4.3833	3.3072	3.2681
2,4-Dimethylpentane	I7	0.2664	0.2393	0.2636
2,2,3-Trimethylbutane	I7	0.0196	0.0176	0.0189
Benzene	A6	1.5816	1.1075	0.9346
3,3-Dimethylpentane	I7	0.0350	0.0314	0.0336
Cyclohexane	N6	2.7530	2.0771	1.9753
2-Methylhexane	I7	1.2263	1.1016	1.2028
2,3-Dimethylpentane	I7	0.6676	0.5997	0.6361
1,1-Dimethylcyclopentane	N7	0.2930	0.2579	0.2531
3-Methylhexane	I7	1.6553	1.4869	1.5991
1c,3-Dimethylcyclopentane	N7	0.7749	0.6821	0.6780
1t,3-Dimethylcyclopentane	N7	0.7004	0.6165	0.6096
3-Ethylpentane	I7	0.1323	0.1188	0.1257
1t,2-Dimethylcyclopentane	N7	1.5488	1.3634	1.3434
2,2,4-Trimethylpentane	I8	0.0575	0.0589	0.0628
n-Heptane	P7	4.5694	4.1047	4.4436
1c,2-Dimethylcyclopentane	N7	0.1095	0.0964	0.0924
Methylcyclohexane	N7	3.7574	3.3075	3.1809

2,2-Dimethylhexane	I8	0.3348	0.3429	0.3649
Ethylcyclopentane	N7	0.6282	0.5530	0.5343
2,5-Dimethylhexane	I8	0.1321	0.1353	0.1444
2,2,3-Trimethylpentane	I8	0.0192	0.0197	0.0204
2,4-Dimethylhexane	I8	0.2290	0.2345	0.2490
1c,2t,4-Trimethylcyclopentane	N8	0.3486	0.3507	0.3402
3,3-Dimethylhexane	I8	0.0366	0.0375	0.0391
2,3,4-Trimethylpentane	I8	0.1089	0.1115	0.1147
2,3,3-Trimethylpentane	I8	0.0062	0.0063	0.0064
Toluene	A7	2.9525	2.4389	2.0785
2,3-Dimethylhexane	I8	0.2108	0.2159	0.2246
2-Methyl-3-ethylpentane	I8	0.1439	0.1474	0.1517
1,1,2-Trimethylcyclopentane	N8	0.0074	0.0074	0.0071
2-Methylheptane	I8	1.2750	1.3057	1.3827
4-Methylheptane	I8	0.4335	0.4439	0.4587
3-Methyl-3-ethylpentane	I8	0.0473	0.0484	0.0493
3,4-Dimethylhexane	I8	0.0727	0.0745	0.0766
1c,2c,4-Trimethylcyclopentane	N8	0.0233	0.0234	0.0225
1c,3-Dimethylcyclohexane	N8	0.0381	0.0383	0.0370
3-Methylheptane	I8	0.6369	0.6522	0.6847
1c,2t,3-Trimethylcyclopentane	N8	0.8346	0.8396	0.8072
3-Ethylhexane	I8	0.1209	0.1238	0.1286
1t,4-Dimethylcyclohexane	N8	0.3726	0.3748	0.3641
1,1-Dimethylcyclohexane	N8	0.1166	0.1173	0.1113
3c-Ethylmethylcyclopentane	N8	0.0059	0.0059	0.0057
3t-Ethylmethylcyclopentane	N8	0.2158	0.2171	0.2097
2t-Ethylmethylcyclopentane	N8	0.1909	0.1920	0.1850
1,1-Methylethylcyclopentane	N8	0.6340	0.6378	0.6051
2,2,4-Trimethylhexane	I9	0.0552	0.0635	0.0657
1t,2-Dimethylcyclohexane	N8	0.5400	0.5432	0.5187
1t,3-Dimethylcyclohexane	N8	0.0153	0.0154	0.0145
n-Octane	P8	2.8001	2.8675	3.0221
1c,4-Dimethylcyclohexane	N8	0.4049	0.4073	0.3854
i-Propylcyclopentane	I8	0.0825	0.0830	0.0792
2,4,4-Trimethylhexane	I9	0.0224	0.0258	0.0265
2,2,3,4-Tetramethylpentane	I9	0.0206	0.0237	0.0244
2,3,4-Trimethylhexane	I9	0.0236	0.0271	0.0278
1c,2-Dimethylcyclohexane	N8	0.2547	0.2562	0.2384
2,3,5-Trimethylhexane	I9	0.0396	0.0455	0.0467
2,2-Dimethylheptane	I9	0.0162	0.0186	0.0194
1,1,4-Trimethylcyclohexane	N9	1.0773	1.2193	1.1703
2,2,3-Trimethylhexane	I9	0.4479	0.5150	0.5231
2,4-Dimethylheptane	I9	0.0085	0.0098	0.0101
4,4-Dimethylheptane	I9	0.0600	0.0690	0.0714
Ethylcyclohexane	N8	0.5895	0.5930	0.5578
n-Propylcyclopentane	N8	0.2210	0.2223	0.2121
1c,3c,5-Trimethylcyclohexane	N9	0.0482	0.0546	0.0524
2,5-Dimethylheptane	I9	0.0845	0.0972	0.1005
3,3-Dimethylheptane	I9	0.0872	0.1003	0.1037
3,5-Dimethylheptane	I9	0.0793	0.0912	0.0943
2,6-Dimethylheptane	I9	0.0606	0.0697	0.0728
1,1,3-Trimethylcyclohexane	N9	0.1652	0.1870	0.1795
Ethylbenzene	A8	0.7490	0.7129	0.6075
1c,2t,4t-Trimethylcyclohexane	N9	0.2775	0.3141	0.2957
2,3-Dimethylheptane	I9	0.0619	0.0712	0.0727
1,3-Dimethylbenzene (m-Xylene)	A8	0.7256	0.6906	0.5919
1,4-Dimethylbenzene (p-Xylene)	A8	0.5907	0.5622	0.4834
3,4-Dimethylheptane	I9	0.0720	0.0828	0.0839
3,4-Dimethylheptane (2)	I9	0.1295	0.1489	0.1508
4-Ethylheptane	I9	0.0479	0.0551	0.0570
4-Methyloctane	I9	0.3319	0.3816	0.3923
2-Methyloctane	I9	0.4035	0.4640	0.4817
1c,2t,4c-Trimethylcyclohexane	I9	0.0553	0.0636	0.0649
3-Ethylheptane	I9	0.0912	0.1049	0.1069
3-Methyloctane	I9	0.5266	0.6055	0.6223
3,3-Diethylpentane	I9	0.0855	0.0983	0.0965
1c,2t,3-Trimethylcyclohexane	N9	0.0900	0.1019	0.0959

1,1,2-Trimethylcyclohexane	N9	0.0321	0.0363	0.0342
1,2-Dimethylbenzene (o-Xylene)	A8	0.8163	0.7770	0.6543
i-Butylcyclopentane	N9	0.3178	0.3597	0.3413
UnknownC8s	U8	0.0126	0.0129	0.0136
n-Nonane	P9	2.0674	2.3772	2.4537
1,1-Methylethylcyclohexane	N9	0.3573	0.4108	0.4253
i-Propylbenzene	A9	0.3120	0.3362	0.2884
i-Propylcyclohexane	N9	0.0974	0.1102	0.1018
2,2-Dimethyloctane	I10	0.0884	0.1128	0.1130
2,4-Dimethyloctane	I10	0.0957	0.1221	0.1223
2,6-Dimethyloctane	I10	0.0139	0.0177	0.0183
2,5-Dimethyloctane	I10	0.0394	0.0503	0.0504
n-Butylcyclopentane	N9	0.4110	0.5168	0.4793
3,3-Dimethyloctane	I10	0.1747	0.2228	0.2234
n-Propylbenzene	A9	0.4887	0.5266	0.4519
3,6-Dimethyloctane	I10	0.3548	0.4526	0.4535
3-Methyl-5-ethylheptane	I10	0.5692	0.6545	0.6681
1,3-Methylethylbenzene	A9	0.4675	0.5038	0.4287
1,4-Methylethylbenzene	A9	0.1920	0.2069	0.1761
1,3,5-Trimethylbenzene	A9	0.2594	0.2795	0.2395
2,3-Dimethyloctane	I10	0.0772	0.0985	0.0987
5-Methylnonane	I10	0.3071	0.3917	0.3961
1,2-Methylethylbenzene	A9	0.4307	0.4641	0.3928
2-Methylnonane	I10	0.0560	0.0714	0.0728
3-Ethyloctane	I10	0.1062	0.1355	0.1358
3-Methylnonane	I10	0.2736	0.3490	0.3526
1,2,4-Trimethylbenzene	A9	0.0196	0.0211	0.0179
t-Butylbenzene	A10	0.5941	0.7149	0.6118
i-Butylcyclohexane	N10	0.2488	0.3129	0.2857
1t-Methyl-2-n-propylcyclohexane	I10	0.1228	0.1412	0.1441
i-Butylbenzene	A10	0.0736	0.0886	0.0770
sec-Butylbenzene	A10	0.1281	0.1541	0.1326
UnknownC9s	U9	2.2802	2.6219	2.7063
n-Decane	P10	1.5077	1.9231	1.9516
1,2,3-Trimethylbenzene	A9	0.2691	0.2900	0.2405
1,3-Methyl-i-propylbenzene	A10	0.1293	0.1393	0.1179
1,4-Methyl-i-propylbenzene	A10	0.1154	0.1244	0.1053
Sec-Butylcyclohexane	N10	0.3842	0.4831	0.4405
1,2-Methyl-i-propylbenzene	A10	0.1899	0.2285	0.1932
3-Ethylnonane	I10	0.0711	0.0907	0.0925
1,3-Diethylbenzene	A10	0.1701	0.2047	0.1756
1,3-Methyl-n-propylbenzene	A10	0.1009	0.1214	0.1045
1,4-Diethylbenzene	A10	0.2253	0.2711	0.2332
1,4-Methyl-n-propylbenzene	A10	0.1631	0.1963	0.1695
n-Butylbenzene	A10	0.0777	0.0935	0.0804
1,3-Dimethyl-5-ethylbenzene	A10	0.1109	0.1334	0.1143
1,2-Diethylbenzene	A10	0.1644	0.1978	0.1667
1,2-Methyl-n-propylbenzene	A10	0.1158	0.1393	0.1182
1,4-Dimethyl-2-ethylbenzene	A10	0.1370	0.1648	0.1393
1,3-Dimethyl-4-ethylbenzene	A10	0.0268	0.0322	0.0272
1,2-Dimethyl-4-ethylbenzene	A10	0.2086	0.2510	0.2128
1,3-Dimethyl-2-ethylbenzene	A10	0.1235	0.1486	0.1237
1t,2c,4-Trimethylcyclopentane	A10	0.4249	0.4274	0.4236
1,2-Dimethyl-3-ethylbenzene	A10	0.1028	0.1237	0.1028
1,2-Ethyl-i-propylbenzene	A10	0.0524	0.0631	0.0534
1,4-Methyl-t-butylbenzene	A11	0.1436	0.1728	0.1461
UnknownC10s	U10	2.8467	3.6311	3.6849
n-Undecane	P11	1.1101	1.5556	1.5568
1,4-Ethyl-i-propylbenzene	A11	0.1013	0.1219	0.1031
1,2,4,5-Tetramethylbenzene	A11	0.1208	0.1454	0.1217
1,2-Methyl-n-butylbenzene	A11	0.0721	0.0868	0.0734
1,2,3,5-Tetramethylbenzene	A11	0.1218	0.1466	0.1221
1,2-Methyl-t-butylbenzene	A11	0.0959	0.1154	0.0976
5-Methylindan	A11	0.0263	0.0402	0.0398
4-Methylindan	A11	0.0223	0.0341	0.0338
1,2-Ethyl-n-propylbenzene	A11	0.1337	0.1609	0.1361
2-Methylindan	A11	0.0906	0.1384	0.1370

1,3-Methyl-n-butylbenzene	A11	0.0739	0.0889	0.0752
1,3-Di-i-propylbenzene	A11	0.1066	0.1283	0.1085
sec-Pentylbenzene	A11	0.2046	0.2462	0.2082
n-Pentylbenzene	A11	0.0883	0.1174	0.1014
1t-M-2-(4MP)cyclopentane	P12	0.0166	0.0254	0.0251
1,2-Di-n-propylbenzene	A11	0.1154	0.1389	0.1175
1,4-Di-i-propylbenzene	A11	0.1618	0.1947	0.1647
Tetrahydronaphthalene	A10	0.1518	0.1827	0.1545
t-Decahydronaphthalene	A10	0.1663	0.2001	0.1692
Naphthalene	A10	0.1320	0.1517	0.1283
1-t-Butyl-3,5-dimethylbenzene	A12	0.0316	0.0380	0.0321
1,4-Ethyl-t-butylbenzene	A11	0.0979	0.1178	0.0996
UnknownC11s	U11	2.1801	3.0550	3.0573
n-Dodecane	P12	0.6656	1.0164	1.0060
1,3-Di-n-propylbenzene	A12	0.1089	0.1310	0.1108
1,3,5-Triethylbenzene	A12	0.0817	0.0880	0.0754
1,2,4-Triethylbenzene	A12	0.2918	0.3144	0.2660
1,4-Methyl-n-pentylbenzene	A12	0.0594	0.0715	0.0605
n-Hexylbenzene	A12	0.0595	0.0866	0.0749
1,2,3,4,5-Pentamethylbenzene	A13	0.1109	0.1334	0.1128
2-Methylnaphthalene	A11	0.1524	0.1943	0.1643
1-Methylnaphthalene	A11	0.1804	0.2300	0.1672
UnknownC12s	U12	1.6206	2.4748	2.4495
n-Tridecane	P13	0.4343	0.7178	0.7021
UnknownC13s	U13	1.2186	2.0141	1.9699
n-Tetradecane	P14	0.1983	0.3527	0.3443
UnknownC14s	U14	1.0163	1.8076	1.7644
n-Pentadecane	P15	0.0967	0.1842	0.1777
UnknownC15s	U15	0.6809	1.2967	1.2511
n-Hexadecane	P16	0.0817	0.1659	0.1590
UnknownC16s	U16	0.2801	0.5686	0.5451
n-Heptadecane	P17	0.0634	0.1367	0.1306
UnknownC17s	U17	0.1003	0.2162	0.2066
n-Octadecane	P18	0.0157	0.0358	0.0341
UnknownC18s	U18	0.0843	0.1923	0.1832
n-Nonadecane	P19	0.0048	0.0116	0.0110
UnknownC19s	U19	0.0032	0.0077	0.0073
n-Eicosane	P20	0.0017	0.0043	0.0041
n-Heneicosane	P21	0.0009	0.0024	0.0022
TOTAL		100.0000	100.0000	100.0000



CRUDE OIL ASSAY

PROJECT NO. :	201210170	ANALYSIS NO. :	05
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 31, 2012
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 29, 2012
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	BURL MCENDREE
NAME/DESCRIP :	PRODUCTION TANK #115864		EMPACT
	HEMBERGER 2-25-34-8-60		
FIELD DATA		SAMPLE TEMP. :	95
SAMPLE PRES. :	~20	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		

SPECIFICATION	TEST METHOD	UNITS	RESULTS
API GRAVITY		API 60/60	35.8
RVP @100 DEG F	D323	PSIG	5.7
SULFUR	D2622	WT %	0.374
VISUAL APPEARANCE			BROWN

BDL: BELOW DETECTION LIMIT

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

303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201210170	ANALYSIS NO. :	06
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 31, 2012
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 29, 2012
PRODUCER :		CYLINDER NO. :	0966
LEASE NO. :		SAMPLED BY :	BURL MCENDREE - EMPACT
NAME/DESCRIP :	METER RUN; SALES GAS HEMBERGER 2-25-34-8-60		
FIELD DATA		SAMPLE TEMP. :	103.5
SAMPLE PRES. :	103.4	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE LENGTH OF H2S STAIN @ 7PPM		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0011	0.0022		
HELIUM	0.02	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.01	0.01	---	---
NITROGEN	0.93	1.06	---	---
CARBON DIOXIDE	2.37	4.26	---	---
METHANE	68.15800	44.61240	---	---
ETHANE	12.4452	15.2682	3.3248	3.3429
PROPANE	9.4439	16.9908	2.5987	2.6129
I-BUTANE	0.9618	2.2808	0.3145	0.3162
N-BUTANE	3.2358	7.6735	1.0195	1.0250
I-PENTANE	0.6876	2.0179	0.2463	0.2477
N-PENTANE	0.8142	2.3968	0.2944	0.2960
HEXANES PLUS	0.9124	3.4274	0.3723	0.3743
TOTALS	100.00000	100.00000	8.1705	8.2150

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0384	0.1224
TOLUENE	0.0234	0.0880
ETHYLBENZENE	0.0030	0.0130
XYLENES	0.0052	0.0226
TOTAL BTEX	0.0700	0.2460

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1264.7 **/scf**	1271.6 **/scf**
	NET WET REAL :	1242.6 **/scf**	1249.5 **/scf**
HIGH	GROSS DRY REAL :	1389.4 **/scf**	1397.0 **/scf**
	GROSS WET REAL :	1365.1 **/scf**	1372.7 **/scf**
	NET DRY REAL :	19605.8 **/lb**	19712.9 **/lb**
	GROSS DRY REAL :	21537.8 **/lb**	21655.4 **/lb**
	RELATIVE DENSITY (AIR=1):		0.8452
	COMPRESSIBILITY FACTOR :		0.99544

(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

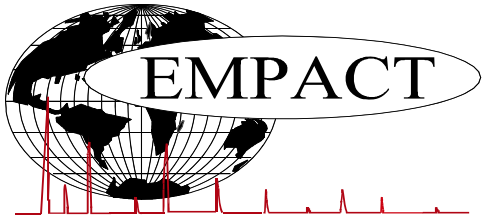
303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201210170	ANALYSIS NO. :	06
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 31, 2012
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 29, 2012
PRODUCER :		CYLINDER NO. :	0966
LEASE NO. :		SAMPLED BY :	BURL MCENDREE - EMPACT
NAME/DESCRIP :	METER RUN; SALES GAS HEMBERGER 2-25-34-8-60		
FIELD DATA		SAMPLE TEMP. :	103.5
SAMPLE PRES. :	103.4	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE LENGTH OF H2S STAIN @ 7PPM		

Componet	Mole %	Wt %
Helium	0.02	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	2.37	4.26
Nitrogen	0.93	1.06
Methane	68.15800	44.61240
Ethane	12.4452	15.2682
Propane	9.4439	16.9908
Isobutane	0.9618	2.2808
n-Butane	3.2358	7.6735
Isopentane	0.6134	1.8056
n-Pentane	0.8142	2.3968
Cyclopentane	0.0742	0.2123
n-Hexane	0.1840	0.6469
Cyclohexane	0.0505	0.1734
Other Hexanes	0.3191	1.1133
Heptanes	0.1589	0.6453
Methycyclohexane	0.0373	0.1494
2,2,4 Trimethylpentane	0.0001	0.0005
Benzene	0.0384	0.1224
Toluene	0.0234	0.0880
Ethylbenzene	0.0030	0.0130
Xylenes	0.0052	0.0226
C8+ Heavies	0.0925	0.4526
Subtotal	99.98890	99.98780
Oxygen/Argon	0.01	0.01
Alcohols	0.0011	0.0022
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201210170	ANALYSIS NO. :	06
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	OCTOBER 31, 2012
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 29, 2012
PRODUCER :		CYLINDER NO. :	0966
LEASE NO. :		SAMPLED BY :	BURL MCENDREE - EMPACT
NAME/DESCRIP :	METER RUN; SALES GAS HEMBERGER 2-25-34-8-60		
FIELD DATA		SAMPLE TEMP. :	103.5
SAMPLE PRES. :	103.4	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE LENGTH OF H2S STAIN @ 7PPM		

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	---	0.93	1.06	---	---
Carbon Dioxide	---	2.37	4.26	---	---
Methane	P1	68.15800	44.61240	---	---
Ethane	P2	12.4452	15.2682	3.325	3.343
Propane	P3	9.4439	16.9908	2.599	2.613
i-Butane	I4	0.9618	2.2808	0.315	0.316
n-Butane	P4	3.2358	7.6735	1.020	1.025
2,2-Dimethylpropane	I5	0.0028	0.0082	0.001	0.001
Ethanol	X2	0.0010	0.0019	0.000	0.000
i-Pentane	I5	0.6106	1.7974	0.223	0.225
n-Pentane	P5	0.8142	2.3968	0.294	0.296
t-Butanol	X4	0.0001	0.0003	0.000	0.000
2,2-Dimethylbutane	I6	0.0019	0.0067	0.001	0.001
Cyclopentane	N5	0.0742	0.2123	0.022	0.022
2,3-Dimethylbutane	I6	0.0120	0.0422	0.005	0.005
2-Methylpentane	I6	0.1323	0.4652	0.055	0.055
3-Methylpentane	I6	0.0669	0.2352	0.027	0.027
n-Hexane	P6	0.1840	0.6469	0.075	0.076
2,2-Dimethylpentane	I7	0.0002	0.0008	0.000	0.000
Methylcyclopentane	N6	0.1060	0.3640	0.037	0.037
2,4-Dimethylpentane	I7	0.0045	0.0184	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0001	0.0004	0.000	0.000
Benzene	A6	0.0384	0.1224	0.011	0.011
3,3-Dimethylpentane	I7	0.0003	0.0012	0.000	0.000
Cyclohexane	N6	0.0505	0.1734	0.017	0.017
2-Methylhexane	I7	0.0193	0.0789	0.009	0.009
2,3-Dimethylpentane	I7	0.0090	0.0368	0.004	0.004
1,1-Dimethylcyclopentane	N7	0.0043	0.0172	0.002	0.002
3-Methylhexane	I7	0.0223	0.0912	0.010	0.010
1c,3-Dimethylcyclopentane	N7	0.0112	0.0449	0.005	0.005
1t,3-Dimethylcyclopentane	N7	0.0101	0.0405	0.005	0.005
3-Ethylpentane	I7	0.0013	0.0053	0.001	0.001
1t,2-Dimethylcyclopentane	N7	0.0212	0.0849	0.010	0.010
2,2,4-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
n-Heptane	P7	0.0473	0.1934	0.022	0.022
1c,2-Dimethylcyclopentane	N7	0.0015	0.0060	0.001	0.001
Methylcyclohexane	N7	0.0373	0.1494	0.015	0.015
2,2-Dimethylhexane	I8	0.0018	0.0084	0.001	0.001

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

1,1,3-Trimethylcyclopentane	N7	0.0003	0.0014	0.000	0.000
Ethylcyclopentane	N7	0.0060	0.0240	0.002	0.002
2,5-Dimethylhexane	I8	0.0010	0.0047	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
2,4-Dimethylhexane	I8	0.0017	0.0079	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0029	0.0133	0.001	0.001
3,3-Dimethylhexane	I8	0.0002	0.0009	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0033	0.0151	0.002	0.002
2,3,4-Trimethylpentane	I8	0.0007	0.0033	0.000	0.000
Toluene	A7	0.0234	0.0880	0.008	0.008
2,3-Dimethylhexane	I8	0.0014	0.0065	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0009	0.0042	0.000	0.000
2-Methylheptane	I8	0.0078	0.0364	0.004	0.004
4-Methylheptane	I8	0.0022	0.0102	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0002	0.0009	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	0.0032	0.0149	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0049	0.0224	0.003	0.003
3-Ethylhexane	I8	0.0007	0.0033	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0016	0.0073	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0006	0.0027	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0011	0.0050	0.001	0.001
2t-Ethylmethylcyclopentane	N8	0.0010	0.0046	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0032	0.0147	0.002	0.002
2,2,4-Trimethylhexane	I9	0.0002	0.0011	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0025	0.0115	0.001	0.001
n-Octane	P8	0.0112	0.0522	0.006	0.006
1c,4-Dimethylcyclohexane	N8	0.0015	0.0069	0.001	0.001
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	0.0006	0.0031	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	0.0003	0.0014	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0037	0.0191	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0013	0.0068	0.001	0.001
4,4-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
Ethylcyclohexane	N8	0.0018	0.0082	0.001	0.001
n-Propylcyclopentane	N8	0.0006	0.0027	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	0.0003	0.0016	0.000	0.000
3,5-Dimethylheptane	I9	0.0002	0.0011	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0002	0.0010	0.000	0.000
Ethylbenzene	I8	0.0030	0.0130	0.001	0.001
1c,2t,4t-Trimethylcyclohexane	N9	0.0005	0.0026	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0026	0.0113	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0008	0.0035	0.000	0.000
3,4-Dimethylheptane	I9	0.0016	0.0084	0.001	0.001
3,4-Dimethylheptane (2)	I9	0.0004	0.0021	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0011	0.000	0.000
4-Methyloctane	I9	0.0007	0.0037	0.000	0.000
2-Methyloctane	I9	0.0009	0.0047	0.001	0.001
1c,2t,3-Trimethylcyclohexane	N9	0.0002	0.0010	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0005	0.000	0.000
3-Methyloctane	I9	0.0010	0.0052	0.001	0.001
1,2-Dimethylbenzene (o-Xylene)	A8	0.0018	0.0078	0.001	0.001
i-Butylcyclopentane	N9	0.0005	0.0026	0.000	0.000
n-Nonane	P9	0.0031	0.0162	0.002	0.002
1,1-Methylethylcyclohexane	N9	0.0003	0.0016	0.000	0.000
i-Propylbenzene	A9	0.0004	0.0020	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	0.0001	0.0006	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0006	0.000	0.000
n-Butylcyclopentane	N9	0.0007	0.0036	0.000	0.000
3,3-Dimethyloctane	I10	0.0002	0.0011	0.000	0.000
n-Propylbenzene	A9	0.0006	0.0029	0.000	0.000
3,6-Dimethyloctane	I10	0.0004	0.0023	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0006	0.0035	0.000	0.000
1,3-Methylethylbenzene	A9	0.0005	0.0025	0.000	0.000
1,4-Methylethylbenzene	A9	0.0002	0.0010	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0005	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0006	0.000	0.000
5-Methylnonane	I10	0.0005	0.0029	0.000	0.000
1,2-Methylethylbenzene	A9	0.0003	0.0015	0.000	0.000
3-Methylnonane	I10	0.0002	0.0011	0.000	0.000
t-Butylbenzene	A10	0.0004	0.0022	0.000	0.000
i-Butylcyclohexane	N10	0.0002	0.0011	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	0.0033	0.0173	0.002	0.002
n-Decane	P10	0.0009	0.0052	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	0.0002	0.0011	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
1,4-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
1,2-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
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0005	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	0.0028	0.0162	0.002	0.002
n-Undecane	P11	0.0003	0.0019	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0001	0.0005	0.000	0.000
1,2-Ethyl-n-propylbenzene	A11	0.0001	0.0006	0.000	0.000
UnknownC11s	U11	0.0008	0.0051	0.001	0.001
n-Dodecane	P12	0.0002	0.0014	0.000	0.000
UnknownC12s	U12	0.0001	0.0007	0.000	0.000
n-Tridecane	P13	0.0001	0.0007	0.000	0.000
TOTAL		100.00000	100.00000	8.1705	8.2150

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0384	0.1224
TOLUENE	0.0234	0.0880
ETHYLBENZENE	0.0030	0.0130
XYLENES	0.0052	0.0226
TOTAL BTEX	0.0700	0.2460

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1264.7 **/scf**	1271.6 **/scf**
	NET WET REAL :	1242.6 **/scf**	1249.5 **/scf**
HIGH	GROSS DRY REAL :	1389.4 **/scf**	1397.0 **/scf**
	GROSS WET REAL :	1365.1 **/scf**	1372.7 **/scf**
	NET DRY REAL :	19605.8 **/lb**	19712.9 **/lb**
	GROSS DRY REAL :	21537.8 **/lb**	21655.4 **/lb**
	RELATIVE DENSITY (AIR=1):		0.8452
	COMPRESSIBILITY FACTOR :		0.99544

(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.

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