CRUDE OIL ASSAY

PROJECT NO. :	201312083	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	DECEMBER 18, 2013
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 17, 2013
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	TANK BATTERY @ 11:40 NELSON RANCHES 1-33-10-59		EMPACT
FIELD DATA		SAMPLE TEMP. :	87
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; TK#33102		

SPECIFICATION		TEST METHOD	UNITS	RESULTS
API GRAVITY			API 60/60	34.7
RVP @100 DEG F		D323	PSIG	5.4
TOTAL SULFUR		D2622	WT %	0.419
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				DARK BROWN
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

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

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201312083	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	DECEMBER 19, 2013
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 17, 2013
PRODUCER :	NELSON RANCHES 33CTB	CYLINDER NO. :	5600
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SEPARATOR @ 10:30		EMPACT
	NELSON RANCHES 1-33-10-59		
FIELD DATA		SAMPLE TEMP. :	140
SAMPLE PRES. :	35	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		

COMPONENT	MOLE %	MASS %	VOL %
NITROGEN (AIR)	0.0274	0.0073	0.0068
CARBON DIOXIDE	0.0376	0.0158	0.0145
METHANE	0.2650	0.0406	0.1014
ETHANE	0.3629	0.1042	0.2191
PROPANE	1.1042	0.4652	0.6871
I-BUTANE	0.2615	0.1452	0.1932
N-BUTANE	1.5234	0.8458	1.0846
I-PENTANE	0.7470	0.5148	0.6179
N-PENTANE	1.3223	0.9114	1.0814
HEXANES PLUS	94.3487	96.9497	95.9940
TOTALS	100.0000	100.0000	100.0000

BTEX COMPONENTS	MOLE%	MASS%
BENZENE	1.7446	1.3018
TOLUENE	8.4993	7.4811
ETHYLBENZENE	0.3865	0.3920
XYLENE	5.6191	5.6991
TOTAL BTEX	16.2495	14.8740

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

	TOTAL SAMPLE	C6+ FRACTION	
Specific Gravity (H2O=1) =	0.7491	0.7569	60/60
API Gravity =	57.39	55.45	60/60
Molecular Weight =	104.68	107.687	
Absolute Density =	6.25	6.31	LBS/GAL
Heating Value Liq. Idl Gas=	126200	127531	BTU/GAL
Vapor/Liquid =	22.65	22.28	CUFT/GAL
Vapor Pressure =	20.97	1.50	PSIA @100 F

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

EMPACT ANALYTICAL SYSTEMS INC.
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303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201312083	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	DECEMBER 19, 2013
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 17, 2013
PRODUCER :	NELSON RANCHES 33CTB	CYLINDER NO. :	5600
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SEPARATOR @ 10:30		EMPACT
	NELSON RANCHES 1-33-10-59		
FIELD DATA		SAMPLE TEMP. :	140
SAMPLE PRES. :	35	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0376		0.0158		0.0145	
NITROGEN (AIR)	0.0274		0.0073		0.0068	
METHANE	0.2650		0.0406		0.1014	
ETHANE	0.3629		0.1042		0.2191	
PROPANE	1.1042		0.4652		0.6871	
I-BUTANE	0.2615		0.1452		0.1932	
N-BUTANE	1.5234		0.8458		1.0846	
I-PENTANE	0.7470		0.5148		0.6179	
N-PENTANE	1.3223		0.9114		1.0814	
CYCLOPENTANE (N-C5)	0.3025		0.2027		0.1997	
N-HEXANE	3.6747		3.0253		3.4132	
CYCLOHEXANE (OTHER C6)	2.9824		2.3978		2.2919	
OTHER HEXANES	5.8965		4.8117		5.1960	
OTHER HEPTANES	14.1621		13.5372		14.3654	
METHYLCYCLOHEXANE (OTHER C7)	10.7018		10.0384		9.7039	
2,2,4 TRIMETHYLPENTANE	0.6226		0.5840		0.5804	
BENZENE	1.7446		1.3018		1.1042	
TOLUENE	8.4992		7.4811		6.4082	
ETHYLBENZENE	0.3865		0.3920		0.3357	
XYLENES	5.6191		5.6991		4.9035	
OTHER OCTANES	17.2772		18.7606		18.8434	
OCTANES PLUS	----	46.3849	----	54.1537	----	53.3115
NONANES	13.4100		16.2988		16.3731	
DECANES PLUS	9.0695		12.4192		12.2754	
SUB TOTAL	100.0000		100.0000		100.0000	
TOTAL	100.0000		100.0000		100.0000	

API Gravity =	**57.39**	60/60
Vapor Pressure =	**20.97**	PSIA & 100 F
Average Molecular Weight of Decanes plus =	**143.34**	
Average Specific Gravity of Decanes plus =	**0.7540**	

EMPACT ANALYTICAL SYSTEMS INC.
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303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

BY CARBON NUMBER

PROJECT NO. :	201312083	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	DECEMBER 19, 2013
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 17, 2013
PRODUCER :	NELSON RANCHES 33CTB	CYLINDER NO. :	5600
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SEPARATOR @ 10:30		EMPACT
	NELSON RANCHES 1-33-10-59		
FIELD DATA		SAMPLE TEMP. :	140
SAMPLE PRES. :	35	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		

COMPONENT / CARBON NUMBER		MOLE%	MASS %	VOLUME %
NITROGEN		0.0274	0.0073	0.0068
CARBON DIOXIDE		0.0376	0.0158	0.0145
	C1	0.2650	0.0406	0.1014
	C2	0.3629	0.1042	0.2191
	C3	1.1042	0.4652	0.6871
	C4	1.7849	0.9910	1.2778
	C5	2.3718	1.6289	1.8990
	C6	14.2982	11.5366	12.0053
	C7	33.3631	31.0567	30.4775
	C8	23.9054	25.4357	24.6630
	C9	13.4100	16.2988	16.3731
	C10	7.1110	9.4843	9.4002
	C11	1.4718	2.1449	2.1011
	C12	0.3457	0.5414	0.5302
	C13	0.1295	0.2268	0.2225
	C14	0.0115	0.0218	0.0214
	C15	0.0000	0.0000	0.0000
	C16	0.0000	0.0000	0.0000
	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

EMPACT ANALYTICAL SYSTEMS INC.
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303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201312083	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	DECEMBER 19, 2013
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 17, 2013
PRODUCER :	NELSON RANCHES 33CTB	CYLINDER NO. :	5600
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SEPARATOR @ 10:30		EMPACT
	NELSON RANCHES 1-33-10-59		
FIELD DATA		SAMPLE TEMP. :	140
SAMPLE PRES. :	35	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Nitrogen	NHC	0.0274	0.0073	0.0068
Carbon Dioxide	NHC	0.0376	0.0158	0.0145
Methane	P1	0.2650	0.0406	0.1014
Ethane	P2	0.3629	0.1042	0.2191
Propane	P3	1.1042	0.4652	0.6871
i-Butane	I4	0.2615	0.1452	0.1932
n-Butane	P4	1.5234	0.8458	1.0846
2,2-Dimethylpropane	I5	0.0195	0.0134	0.0168
i-Pentane	I5	0.7275	0.5014	0.6011
n-Pentane	P5	1.3223	0.9114	1.0814
2,2-Dimethylbutane	I6	0.1133	0.0933	0.1068
Cyclopentane	N5	0.3025	0.2027	0.1997
2,3-Dimethylbutane	I6	0.3601	0.2965	0.3329
2-Methylpentane	I6	1.9595	1.6132	1.8367
3-Methylpentane	I6	1.2493	1.0285	1.1514
n-Hexane	P6	3.6747	3.0253	3.4132
2,2-Dimethylpentane	I7	0.0571	0.0547	0.0601
Methylcyclopentane	N6	2.2143	1.7802	1.7682
2,4-Dimethylpentane	I7	0.2870	0.2747	0.3042
2,2,3-Trimethylbutane	I7	0.0611	0.0585	0.0630
Benzene	A6	1.7446	1.3018	1.1042
3,3-Dimethylpentane	I7	0.0817	0.0782	0.0841
Cyclohexane	N6	2.9824	2.3978	2.2919
2-Methylhexane	I7	1.5637	1.4968	1.6427
2,3-Dimethylpentane	I7	0.7165	0.6858	0.7312
1,1-Dimethylcyclopentane	N7	0.4634	0.4347	0.4288
3-Methylhexane	I7	1.8700	1.7900	1.9349
1c,3-Dimethylcyclopentane	N7	0.6712	0.6296	0.6291
1t,3-Dimethylcyclopentane	N7	0.6226	0.5840	0.5804
3-Ethylpentane	I7	0.0412	0.0394	0.0419
1t,2-Dimethylcyclopentane	N7	1.0658	0.9997	0.9901
2,2,4-Trimethylpentane	I8	0.0676	0.0738	0.0791
n-Heptane	P7	5.7090	5.4647	5.9462
1c,2-Dimethylcyclopentane	N7	0.0888	0.0833	0.0803
Methylcyclohexane	N7	10.7018	10.0384	9.7039

2,2-Dimethylhexane	I8	0.2877	0.3139	0.3358
1,1,3-Trimethylcyclopentane	N7	0.3998	0.4286	0.4264
Ethylcyclopentane	N7	0.4632	0.4345	0.4220
2,5-Dimethylhexane	I8	0.1942	0.2119	0.2272
2,2,3-Trimethylpentane	I8	0.1229	0.1341	0.1394
2,4-Dimethylhexane	I8	0.3767	0.4111	0.4388
1c,2t,4-Trimethylcyclopentane	N8	0.2709	0.2904	0.2832
3,3-Dimethylhexane	I8	0.1178	0.1285	0.1347
2,3,4-Trimethylpentane	I8	0.0092	0.0100	0.0103
2,3,3-Trimethylpentane	I8	0.0183	0.0200	0.0205
Toluene	A7	8.4992	7.4811	6.4082
2,3-Dimethylhexane	I8	0.2313	0.2524	0.2639
2-Methyl-3-ethylpentane	I8	0.1290	0.1408	0.1456
1,1,2-Trimethylcyclopentane	N8	0.0369	0.0396	0.0382
2-Methylheptane	I8	1.8015	1.9659	2.0925
4-Methylheptane	I8	0.6737	0.7352	0.7637
3-Methyl-3-ethylpentane	I8	0.1202	0.1312	0.1343
3,4-Dimethylhexane	I8	0.1163	0.1269	0.1312
1c,2c,4-Trimethylcyclopentane	N8	0.0271	0.0291	0.0281
1c,3-Dimethylcyclohexane	N8	0.0272	0.0292	0.0284
3-Methylheptane	I8	0.2012	0.2196	0.2317
1c,2t,3-Trimethylcyclopentane	N8	2.1215	2.2741	2.1976
3-Ethylhexane	I8	1.2167	1.3277	1.3862
1t,4-Dimethylcyclohexane	N8	1.6531	1.7720	1.7301
1,1-Dimethylcyclohexane	N8	0.3765	0.4036	0.3848
3c-Ethylmethylcyclopentane	N8	0.0133	0.0143	0.0139
3t-Ethylmethylcyclopentane	N8	0.1244	0.1334	0.1295
2t-Ethylmethylcyclopentane	N8	0.0903	0.0968	0.0937
1,1-Methylethylcyclopentane	N8	0.1640	0.1758	0.1676
2,2,4-Trimethylhexane	I9	0.0331	0.0406	0.0423
1t,2-Dimethylcyclohexane	N8	0.8678	0.9302	0.8928
1t,3-Dimethylcyclohexane	N8	0.0011	0.0012	0.0011
n-Octane	P8	2.3814	2.5987	2.7529
1c,4-Dimethylcyclohexane	N8	2.7887	2.9893	2.8434
i-Propylcyclopentane	I8	0.0183	0.0196	0.0188
2,4,4-Trimethylhexane	I9	0.0158	0.0194	0.0200
2,2,3,4-Tetramethylpentane	I9	0.0173	0.0212	0.0219
2,3,4-Trimethylhexane	I9	0.0238	0.0292	0.0301
1c,2-Dimethylcyclohexane	N8	0.2156	0.2311	0.2162
2,3,5-Trimethylhexane	I9	0.0337	0.0413	0.0426
2,2-Dimethylheptane	I9	0.0144	0.0176	0.0184
1,1,4-Trimethylcyclohexane	N9	1.0148	1.2238	1.1807
2,2,3-Trimethylhexane	I9	0.6723	0.8237	0.8409
2,4-Dimethylheptane	I9	0.0642	0.0787	0.0819
4,4-Dimethylheptane	I9	0.1578	0.1933	0.2012
Ethylcyclohexane	N8	0.4092	0.4386	0.4147
n-Propylcyclopentane	N8	0.5634	0.6039	0.5790
1c,3c,5-Trimethylcyclohexane	N9	0.1508	0.1819	0.1755
2,5-Dimethylheptane	I9	0.0884	0.1083	0.1125
3,3-Dimethylheptane	I9	0.0629	0.0771	0.0801
3,5-Dimethylheptane	I9	0.0292	0.0358	0.0372
2,6-Dimethylheptane	I9	0.0086	0.0105	0.0110
1,1,3-Trimethylcyclohexane	N9	0.0078	0.0094	0.0091
Ethylbenzene	A8	0.3865	0.3920	0.3357
1c,2t,4t-Trimethylcyclohexane	N9	0.3892	0.4694	0.4442
2,3-Dimethylheptane	I9	0.0065	0.0080	0.0082
1,3-Dimethylbenzene (m-Xylene)	A8	3.2738	3.3204	2.8603
1,4-Dimethylbenzene (p-Xylene)	A8	1.6627	1.6864	1.4573
3,4-Dimethylheptane	I9	0.6717	0.8230	0.8379
3,4-Dimethylheptane (2)	I9	0.3557	0.4358	0.4437
4-Ethylheptane	I9	0.0949	0.1163	0.1210
4-Methyloctane	I9	0.3473	0.4255	0.4396
2-Methyloctane	I9	0.4672	0.5724	0.5972
1c,2t,4c-Trimethylcyclohexane	I9	0.0618	0.0757	0.0777
3-Ethylheptane	I9	0.0855	0.1048	0.1074
3-Methyloctane	I9	0.3934	0.4820	0.4979

3,3-Diethylpentane	I9	0.0444	0.0544	0.0537
1c,2t,3-Trimethylcyclohexane	N9	0.0900	0.1085	0.1027
1,1,2-Trimethylcyclohexane	N9	0.0636	0.0767	0.0726
1,2-Dimethylbenzene (o-Xylene)	A8	0.6826	0.6923	0.5859
i-Butylcyclopentane	N9	0.2575	0.3105	0.2961
UnknownC8s	U8	0.0648	0.0707	0.0749
n-Nonane	P9	1.9541	2.3943	2.4841
1,1-Methylethylcyclohexane	N9	0.9659	1.1835	1.2316
i-Propylbenzene	A9	0.1168	0.1341	0.1156
i-Propylcyclohexane	N9	0.0526	0.0634	0.0589
2,2-Dimethyloctane	I10	0.0547	0.0744	0.0749
2,4-Dimethyloctane	I10	0.0632	0.0859	0.0865
2,6-Dimethyloctane	I10	0.0113	0.0154	0.0160
2,5-Dimethyloctane	I10	0.0266	0.0362	0.0365
n-Butylcyclopentane	N9	0.1102	0.1477	0.1377
3,3-Dimethyloctane	I10	0.0786	0.1068	0.1076
n-Propylbenzene	A9	0.2021	0.2320	0.2001
3,6-Dimethyloctane	I10	0.0741	0.1007	0.1014
3-Methyl-5-ethylheptane	I10	0.0782	0.0958	0.0983
1,3-Methylethylbenzene	A9	0.3021	0.3469	0.2967
1,4-Methylethylbenzene	A9	0.1924	0.2209	0.1889
1,3,5-Trimethylbenzene	A9	0.1556	0.1787	0.1539
2,3-Dimethyloctane	I10	0.0784	0.1066	0.1074
5-Methylnonane	I10	0.1183	0.1608	0.1635
1,2-Methylethylbenzene	A9	0.2706	0.3107	0.2643
2-Methylnonane	I10	0.0526	0.0715	0.0733
3-Ethyloctane	I10	0.0571	0.0776	0.0781
3-Methylnonane	I10	0.1472	0.2001	0.2032
1,2,4-Trimethylbenzene	A9	0.0151	0.0173	0.0147
t-Butylbenzene	A10	0.2863	0.3671	0.3158
i-Butylcyclohexane	N10	0.1129	0.1513	0.1388
1t-Methyl-2-n-propylcyclohexane	I10	0.0342	0.0419	0.0430
i-Butylbenzene	A10	0.0279	0.0358	0.0313
sec-Butylbenzene	A10	0.0329	0.0422	0.0365
UnknownC9s	U9	3.2347	3.9634	4.1120
n-Decane	P10	1.2736	1.7311	1.7658
1,2,3-Trimethylbenzene	A9	0.1142	0.1311	0.1093
1,3-Methyl-i-propylbenzene	A10	0.0500	0.0574	0.0488
1,4-Methyl-i-propylbenzene	A10	0.0283	0.0325	0.0277
Sec-Butylcyclohexane	N10	0.1477	0.1979	0.1814
1,2-Methyl-i-propylbenzene	A10	0.0759	0.0973	0.0827
3-Ethylnonane	I10	0.0277	0.0376	0.0385
1,3-Diethylbenzene	A10	0.0300	0.0385	0.0332
1,3-Methyl-n-propylbenzene	A10	0.0315	0.0404	0.0350
1,4-Diethylbenzene	A10	0.0415	0.0532	0.0460
1,4-Methyl-n-propylbenzene	A10	0.0273	0.0350	0.0304
n-Butylbenzene	A10	0.0297	0.0381	0.0329
1,3-Dimethyl-5-ethylbenzene	A10	0.0830	0.1064	0.0917
1,2-Diethylbenzene	A10	0.0341	0.0437	0.0370
1,2-Methyl-n-propylbenzene	A10	0.0327	0.0419	0.0357
1,4-Dimethyl-2-ethylbenzene	A10	0.0313	0.0401	0.0341
1,3-Dimethyl-4-ethylbenzene	A10	0.0414	0.0531	0.0451
1,2-Dimethyl-4-ethylbenzene	A10	0.0761	0.0976	0.0832
1,3-Dimethyl-2-ethylbenzene	A10	0.0166	0.0213	0.0178
1t,2c,4-Trimethylcyclopentane	A10	0.2331	0.2499	0.2489
1,2-Dimethyl-3-ethylbenzene	A10	0.0500	0.0641	0.0535
1,2-Ethyl-i-propylbenzene	A10	0.0202	0.0259	0.0220
1,4-Methyl-t-butylbenzene	A11	0.0202	0.0259	0.0220
UnknownC10s	U10	3.3626	4.5704	4.6620
n-Undecane	P11	0.3738	0.5582	0.5615
1,4-Ethyl-i-propylbenzene	A11	0.0871	0.1117	0.0949
1,2,4,5-Tetramethylbenzene	A11	0.0243	0.0312	0.0262
1,2,3,5-Tetramethylbenzene	A11	0.0252	0.0323	0.0270
1,2-Methyl-t-butylbenzene	A11	0.0128	0.0164	0.0139
5-Methylindan	A11	0.0045	0.0073	0.0073
4-Methylindan	A11	0.0052	0.0085	0.0085

1,2-Ethyl-n-propylbenzene	A11	0.0180	0.0231	0.0196
2-Methylindan	A11	0.0035	0.0057	0.0057
1,3-Methyl-n-butylbenzene	A11	0.0043	0.0055	0.0047
1,3-Di-i-propylbenzene	A11	0.0026	0.0033	0.0028
sec-Pentylbenzene	A11	0.0159	0.0204	0.0173
n-Pentylbenzene	A11	0.0075	0.0106	0.0092
1t-M-2-(4MP)cyclopentane	P12	0.0035	0.0057	0.0057
1,2-Di-n-propylbenzene	A11	0.0120	0.0154	0.0131
1,4-Di-i-propylbenzene	A11	0.0209	0.0268	0.0228
Tetrahydronaphthalene	A10	0.0083	0.0106	0.0090
t-Decahydronaphthalene	A10	0.0161	0.0206	0.0175
Naphthalene	A10	0.0078	0.0096	0.0082
1-t-Butyl-3,5-dimethylbenzene	A12	0.0058	0.0074	0.0063
UnknownC11s	U11	0.8134	1.2146	1.2218
n-Dodecane	P12	0.0714	0.1162	0.1156
1,3,5-Triethylbenzene	A12	0.0025	0.0029	0.0025
1,2,4-Triethylbenzene	A12	0.0333	0.0382	0.0325
1,4-Methyl-n-pentylbenzene	A12	0.0055	0.0071	0.0060
n-Hexylbenzene	A12	0.0018	0.0028	0.0024
1,2,3,4,5-Pentamethylbenzene	A13	0.0028	0.0036	0.0031
2-Methylnaphthalene	A11	0.0145	0.0197	0.0167
1-Methylnaphthalene	A11	0.0061	0.0083	0.0061
UnknownC12s	U12	0.2219	0.3611	0.3592
n-Tridecane	P13	0.0341	0.0601	0.0591
UnknownC13s	U13	0.0926	0.1631	0.1603
n-Tetradecane	P14	0.0115	0.0218	0.0214
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. :	201312083	ANALYSIS NO. :	03
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	DECEMBER 20, 2013
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 17, 2013
PRODUCER :	NELSON RANCHES 33CTB	CYLINDER NO. :	0096
LEASE NO. :		SAMPLED BY :	GALE MCENDREE-EMPACT
NAME/DESCRIP :	SALES GAS @ 9:40 NELSON RANCHES 1-33-10-59		
FIELD DATA		SAMPLE TEMP. :	140
SAMPLE PRES. :	35	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; LENGTH OF H2S STAIN @ MAX (1-7PPM) @11:05 LENGTH OF H2S STAIN @ 20PPM (2.5-60PPM) @ 11:10		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0031	0.0065		
HELIUM	0.01	0.00	---	---
HYDROGEN	0.02	0.00	---	---
OXYGEN/ARGON	0.02	0.02	---	---
NITROGEN	0.90	0.88	---	---
CARBON DIOXIDE	2.44	3.73	---	---
METHANE	57.79150	32.17710	---	---
ETHANE	12.5057	13.0508	3.3467	3.3650
PROPANE	13.6730	20.9252	3.7691	3.7896
I-BUTANE	1.5952	3.2179	0.5227	0.5255
N-BUTANE	5.9409	11.9841	1.8740	1.8842
I-PENTANE	1.4256	3.5583	0.5107	0.5134
N-PENTANE	1.7565	4.3983	0.6370	0.6405
HEXANES PLUS	1.9185	6.0518	0.7761	0.7804
TOTALS	100.00000	100.00000	11.4363	11.4986

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0718	0.1947
TOLUENE	0.0416	0.1330
ETHYLBENZENE	0.0036	0.0133
XYLENES	0.0066	0.0244
TOTAL BTEX	0.1236	0.3654

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1481.1 **/scf**	1489.2 **/scf**
	NET WET REAL :	1455.2 **/scf**	1463.3 **/scf**
HIGH	GROSS DRY REAL :	1620.7 **/scf**	1629.5 **/scf**
	GROSS WET REAL :	1592.4 **/scf**	1601.2 **/scf**
	NET DRY REAL :	19527.3 **/lb**	19633.9 **/lb**
	GROSS DRY REAL :	21373.5 **/lb**	21490.2 **/lb**
	RELATIVE DENSITY (AIR=1):		0.9937
	COMPRESSIBILITY FACTOR :		0.99368

(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

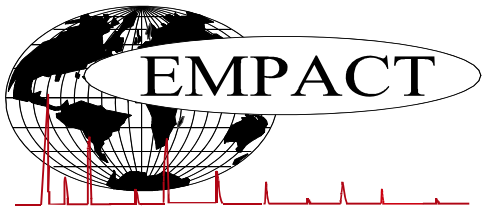
303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201312083	ANALYSIS NO. :	03
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	DECEMBER 20, 2013
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 17, 2013
PRODUCER :	NELSON RANCHES 33CTB	CYLINDER NO. :	0096
LEASE NO. :		SAMPLED BY :	GALE MCENDREE-EMPACT
NAME/DESCRIP :	SALES GAS @ 9:40 NELSON RANCHES 1-33-10-59		
FIELD DATA		SAMPLE TEMP. :	140
SAMPLE PRES. :	35	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; LENGTH OF H2S STAIN @ MAX (1-7PPM) @11:05 LENGTH OF H2S STAIN @ 20PPM (2.5-60) @ 11:10		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.02	0.00
Carbon Dioxide	2.44	3.73
Nitrogen	0.90	0.88
Methane	57.79150	32.17710
Ethane	12.5057	13.0508
Propane	13.6730	20.9252
Isobutane	1.5952	3.2179
n-Butane	5.9409	11.9841
Isopentane	1.2613	3.1584
n-Pentane	1.7565	4.3983
Cyclopentane	0.1643	0.3999
n-Hexane	0.4085	1.2218
Cyclohexane	0.1066	0.3114
Other Hexanes	0.7178	2.1297
Heptanes	0.3427	1.1830
Methycyclohexane	0.0774	0.2638
2,2,4 Trimethylpentane	0.0006	0.0024
Benzene	0.0718	0.1947
Toluene	0.0416	0.1330
Ethylbenzene	0.0036	0.0133
Xylenes	0.0066	0.0244
C8+ Heavies	0.1413	0.5743
Subtotal	99.97690	99.97350
Oxygen/Argon	0.02	0.02
Alcohols	0.0031	0.0065
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201312083	ANALYSIS NO. :	03
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	DECEMBER 20, 2013
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 17, 2013
PRODUCER :	NELSON RANCHES 33CTB	CYLINDER NO. :	0096
LEASE NO. :		SAMPLED BY :	GALE MCENDREE-EMPACT
NAME/DESCRIP :	SALES GAS @ 9:40 NELSON RANCHES 1-33-10-59		
FIELD DATA		SAMPLE TEMP. :	140
SAMPLE PRES. :	35	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; LENGTH OF H2S STAIN @ MAX (1-7PPM) @11:05 LENGTH OF H2S STAIN @ 20PPM (2.5-60PPM) @ 11:10		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.02	0.00	---	---
Oxygen/Argon	---	0.02	0.02	---	---
Nitrogen	---	0.90	0.88	---	---
Carbon Dioxide	---	2.44	3.73	---	---
Methane	P1	57.79150	32.17710	---	---
Ethane	P2	12.5057	13.0508	3.347	3.365
Propane	P3	13.6730	20.9252	3.769	3.790
i-Butane	I4	1.5952	3.2179	0.523	0.526
n-Butane	P4	5.9409	11.9841	1.874	1.884
2,2-Dimethylpropane	I5	0.0045	0.0113	0.002	0.002
i-Pentane	I5	1.2568	3.1471	0.460	0.462
Acetone	X3	0.0021	0.0042	0.001	0.001
i-Propanol	X3	0.0004	0.0008	0.000	0.000
n-Pentane	P5	1.7564	4.3981	0.637	0.641
t-Butanol	X4	0.0006	0.0015	0.000	0.000
2,2-Dimethylbutane	I6	0.0040	0.0120	0.002	0.002
Cyclopentane	N5	0.1643	0.3999	0.049	0.049
2,3-Dimethylbutane	I6	0.0232	0.0694	0.009	0.009
2-Methylpentane	I6	0.2915	0.8719	0.121	0.122
3-Methylpentane	I6	0.1529	0.4573	0.062	0.063
UnknownC5s	U5	0.0001	0.0002	0.000	0.000
n-Hexane	P6	0.4085	1.2218	0.169	0.170
2,2-Dimethylpentane	I7	0.0015	0.0052	0.001	0.001
Methylcyclopentane	N6	0.2462	0.7191	0.087	0.088
2,4-Dimethylpentane	I7	0.0095	0.0330	0.004	0.004
2,2,3-Trimethylbutane	I7	0.0003	0.0010	0.000	0.000
Benzene	A6	0.0718	0.1947	0.020	0.020
3,3-Dimethylpentane	I7	0.0009	0.0031	0.000	0.000
Cyclohexane	N6	0.1066	0.3114	0.036	0.036
2-Methylhexane	I7	0.0400	0.1391	0.019	0.019
2,3-Dimethylpentane	I7	0.0203	0.0706	0.009	0.009
1,1-Dimethylcyclopentane	N7	0.0100	0.0341	0.004	0.004
3-Methylhexane	I7	0.0474	0.1649	0.022	0.022
1c,3-Dimethylcyclopentane	N7	0.0270	0.0920	0.012	0.012
1t,3-Dimethylcyclopentane	N7	0.0240	0.0818	0.011	0.011
3-Ethylpentane	I7	0.0018	0.0062	0.001	0.001
1t,2-Dimethylcyclopentane	N7	0.0492	0.1677	0.023	0.023
2,2,4-Trimethylpentane	I8	0.0006	0.0024	0.000	0.000
n-Heptane	P7	0.0957	0.3328	0.044	0.044
1c,2-Dimethylcyclopentane	N7	0.0022	0.0075	0.001	0.001
Methylcyclohexane	N7	0.0774	0.2638	0.031	0.031

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2,2-Dimethylhexane	I8	0.0057	0.0226	0.003	0.003
Ethylcyclopentane	N7	0.0127	0.0433	0.005	0.005
2,5-Dimethylhexane	I8	0.0021	0.0083	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0001	0.0004	0.000	0.000
2,4-Dimethylhexane	I8	0.0031	0.0123	0.002	0.002
1c,2t,4-Trimethylcyclopentane	N8	0.0063	0.0245	0.003	0.003
3,3-Dimethylhexane	I8	0.0004	0.0016	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0071	0.0277	0.003	0.003
2,3,4-Trimethylpentane	I8	0.0012	0.0047	0.001	0.001
2,3,3-Trimethylpentane	I8	0.0001	0.0004	0.000	0.000
Toluene	A7	0.0416	0.1330	0.014	0.014
2,3-Dimethylhexane	I8	0.0028	0.0111	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0013	0.0051	0.001	0.001
2-Methylheptane	I8	0.0132	0.0523	0.007	0.007
4-Methylheptane	I8	0.0038	0.0151	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0002	0.0008	0.000	0.000
3,4-Dimethylhexane	I8	0.0005	0.0020	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0003	0.0012	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0003	0.0012	0.000	0.000
3-Methylheptane	I8	0.0047	0.0186	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0104	0.0405	0.005	0.005
3-Ethylhexane	I8	0.0010	0.0040	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0033	0.0128	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0011	0.0043	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0019	0.0074	0.001	0.001
2t-Ethylmethylcyclopentane	N8	0.0016	0.0062	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0053	0.0206	0.003	0.003
2,2,4-Trimethylhexane	I9	0.0003	0.0013	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0044	0.0171	0.002	0.002
1t,3-Dimethylcyclohexane	N8	0.0002	0.0008	0.000	0.000
UnknownC7s	U7	0.0002	0.0007	0.000	0.000
n-Octane	P8	0.0172	0.0682	0.009	0.009
1c,4-Dimethylcyclohexane	N8	0.0022	0.0086	0.001	0.001
i-Propylcyclopentane	I8	0.0006	0.0023	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0001	0.0004	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0009	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0001	0.0004	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0004	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0013	0.0051	0.001	0.001
2,2-Dimethylheptane	I9	0.0001	0.0004	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0053	0.0232	0.003	0.003
2,2,3-Trimethylhexane	I9	0.0016	0.0071	0.001	0.001
2,4-Dimethylheptane	I9	0.0001	0.0004	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0004	0.000	0.000
Ethylcyclohexane	N8	0.0025	0.0097	0.001	0.001
n-Propylcyclopentane	N8	0.0009	0.0035	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0004	0.000	0.000
2,5-Dimethylheptane	I9	0.0003	0.0013	0.000	0.000
3,3-Dimethylheptane	I9	0.0004	0.0018	0.000	0.000
3,5-Dimethylheptane	I9	0.0002	0.0009	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0009	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0007	0.0030	0.000	0.000
Ethylbenzene	I8	0.0036	0.0133	0.001	0.001
1c,2t,4t-Trimethylcyclohexane	N9	0.0007	0.0030	0.000	0.000
2,3-Dimethylheptane	I9	0.0016	0.0071	0.001	0.001
1,3-Dimethylbenzene (m-Xylene)	A8	0.0035	0.0129	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0011	0.0041	0.000	0.000
3,4-Dimethylheptane	I9	0.0005	0.0022	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0004	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0009	0.000	0.000
4-Methyloctane	I9	0.0008	0.0036	0.000	0.000
2-Methyloctane	I9	0.0010	0.0044	0.001	0.001
1c,2t,3-Trimethylcyclohexane	N9	0.0002	0.0009	0.000	0.000
3-Ethylheptane	I9	0.0002	0.0009	0.000	0.000
3-Methyloctane	I9	0.0012	0.0053	0.001	0.001

1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0004	0.000	0.000
1,1,2-Trimethylcyclohexane	N9	0.0002	0.0009	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0020	0.0074	0.001	0.001
i-Butylcyclopentane	N9	0.0007	0.0030	0.000	0.000
n-Nonane	P9	0.0035	0.0156	0.002	0.002
1,1-Methylethylcyclohexane	N9	0.0001	0.0004	0.000	0.000
i-Propylbenzene	A9	0.0005	0.0021	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0004	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
n-Butylcyclopentane	N9	0.0006	0.0026	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
n-Propylbenzene	A9	0.0005	0.0021	0.000	0.000
3,6-Dimethyloctane	I10	0.0004	0.0020	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0004	0.0020	0.000	0.000
1,3-Methylethylbenzene	A9	0.0004	0.0017	0.000	0.000
1,4-Methylethylbenzene	A9	0.0002	0.0008	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0002	0.0008	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
5-Methylnonane	I10	0.0002	0.0010	0.000	0.000
1,2-Methylethylbenzene	A9	0.0005	0.0021	0.000	0.000
3-Methylnonane	I10	0.0001	0.0005	0.000	0.000
1,2,4-Trimethylbenzene	A9	0.0001	0.0004	0.000	0.000
t-Butylbenzene	A10	0.0003	0.0014	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0005	0.000	0.000
sec-Butylbenzene	A10	0.0001	0.0004	0.000	0.000
UnknownC9s	U9	0.0032	0.0142	0.002	0.002
n-Decane	P10	0.0007	0.0035	0.000	0.000
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
Sec-Butylcyclohexane	A10	0.0001	0.0005	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0004	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0001	0.0004	0.000	0.000
1,3-Dimethyl-5-ethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0001	0.0004	0.000	0.000
UnknownC10s	U10	0.0022	0.0109	0.001	0.001
n-Undecane	P11	0.0002	0.0011	0.000	0.000
UnknownC11s	U11	0.0005	0.0027	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
TOTAL		100.00000	100.00000	11.4373	11.4996

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0718	0.1947
TOLUENE	0.0416	0.1330
ETHYLBENZENE	0.0036	0.0133
XYLENES	0.0066	0.0244
TOTAL BTEX	0.1236	0.3654

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1481.1 **/scf**	1489.2 **/scf**
	NET WET REAL :	1455.2 **/scf**	1463.3 **/scf**
HIGH	GROSS DRY REAL :	1620.7 **/scf**	1629.5 **/scf**
	GROSS WET REAL :	1592.4 **/scf**	1601.2 **/scf**
	NET DRY REAL :	19527.3 **/lb**	19633.9 **/lb**
	GROSS DRY REAL :	21373.5 **/lb**	21490.2 **/lb**
	RELATIVE DENSITY (AIR=1):		0.9937
	COMPRESSIBILITY FACTOR :		0.99368

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

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

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