

CRUDE OIL ASSAY

PROJECT NO. :	201310129	ANALYSIS NO. :	07
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	OCTOBER 28, 2013
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 18, 2013
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	TANK BATTERY @ 14:10		EMPACT
	SHULL 4-25-9-60; TK #116017		
FIELD DATA		SAMPLE TEMP. :	101
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		

<u>SPECIFICATION</u>	<u>TEST METHOD</u>	<u>UNITS</u>	<u>RESULTS</u>
API GRAVITY		API 60/60	34.8
RVP @100 DEG F	D323	PSIG	6.6
TOTAL SULFUR	D2622	WT %	0.425
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			VISCOUS, DARK BROWN
<u>BS&W</u>	D96		
Crude Oil		VOL %	N/A
Water		VOL %	N/A
Emulsion		VOL %	N/A
Sediment		VOL %	N/A
<u>DISTILLATION:</u>	D86		
INITIAL POINT		DEG F	N/A
50%		DEG F	N/A
90%		DEG F	N/A
END POINT		DEG F	N/A
<u>DISTILLATION:</u>	@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 PERFORMED FOR THIS PARAMETER

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303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201310129	ANALYSIS NO. :	08
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	OCTOBER 22, 2013
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 18, 2013
PRODUCER :		CYLINDER NO. :	11116
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SEPARATOR @ 13:40		EMPACT
	SHULL 4-25-9-60		
FIELD DATA		SAMPLE TEMP. :	180
SAMPLE PRES. :	20	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	MOLE %	MASS %	VOL %
NITROGEN (AIR)	0.0185	0.0049	0.0045
CARBON DIOXIDE	0.0120	0.0049	0.0044
METHANE	0.0000	0.0000	0.0000
ETHANE	0.1904	0.0537	0.1115
PROPANE	1.3873	0.5735	0.8364
I-BUTANE	0.4189	0.2282	0.2998
N-BUTANE	2.2375	1.2191	1.5435
I-PENTANE	0.9712	0.6569	0.7776
N-PENTANE	1.6180	1.0943	1.2820
HEXANES PLUS	93.1462	96.1645	95.1403
TOTALS	100.0000	100.0000	100.0000

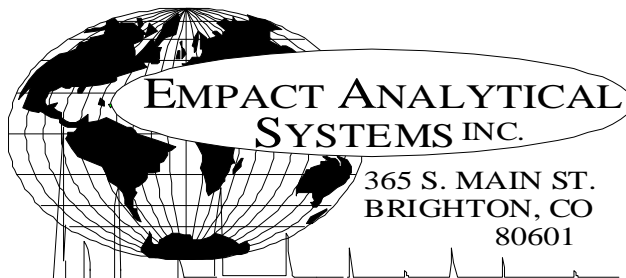
BTEX COMPONENTS	MOLE%	MASS%
BENZENE	1.6085	1.1778
TOLUENE	3.1748	2.7422
ETHYLBENZENE	0.6572	0.6541
XYLENE	2.0777	2.0678
TOTAL BTEX	7.5182	6.6419

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

	TOTAL SAMPLE	C6+ FRACTION
Specific Gravity (H2O=1) =	0.7396	0.7482 60/60
API Gravity =	59.82	57.62 60/60
Molecular Weight =	106.67	110.847
Absolute Density =	6.17	6.23 LBS/GAL
Heating Value Liq. Idl Gas=	125551	127019 BTU/GAL
Vapor/Liquid =	21.94	21.40 CUFT/GAL
Vapor Pressure =	7.87	1.90 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.
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303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201310129	ANALYSIS NO. :	08
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	OCTOBER 22, 2013
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 18, 2013
PRODUCER :		CYLINDER NO. :	11116
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SEPARATOR @ 13:40		EMPACT
	SHULL 4-25-9-60		
FIELD DATA		SAMPLE TEMP. :	180
SAMPLE PRES. :	20	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	Mole %	Wt %	LV %
CARBON DIOXIDE	0.0120	0.0049	0.0044
NITROGEN (AIR)	0.0185	0.0049	0.0045
METHANE	0.0000	0.0000	0.0000
ETHANE	0.1904	0.0537	0.1115
PROPANE	1.3873	0.5735	0.8364
I-BUTANE	0.4189	0.2282	0.2998
N-BUTANE	2.2375	1.2191	1.5435
I-PENTANE	0.9712	0.6569	0.7776
N-PENTANE	1.6180	1.0943	1.2820
CYCLOPENTANE (N-C5)	1.6288	1.0708	1.0415
N-HEXANE	7.6276	6.1633	6.8656
CYCLOHEXANE (OTHER C6)	3.0647	2.4179	2.2820
OTHER HEXANES	11.8313	9.4613	10.0176
OTHER HEPTANES	14.6327	13.6468	14.1743
METHYLCYCLOHEXANE (OTHER C7)	4.2842	3.9434	3.7638
2,2,4 TRIMETHYLPENTANE	0.8696	0.8004	0.7855
BENZENE	1.6085	1.1778	0.9864
TOLUENE	3.1748	2.7422	2.3193
ETHYLBENZENE	0.6572	0.6541	0.5531
XYLENES	2.0777	2.0678	1.7509
OTHER OCTANES	11.5079	12.3378	12.3072
OCTANES PLUS	----	45.2936	----
NONANES	11.5893	13.7759	13.4854
DECANES PLUS	18.5919	25.9050	24.8077
SUB TOTAL	100.0000	100.0000	100.0000
TOTAL	100.0000	100.0000	100.0000

API Gravity	=	59.82	60/60
Vapor Pressure	=	7.87	PSIA & 100 F
Average Molecular Weight of Decanes plus	=	148.63	
Average Specific Gravity of Decanes plus	=	0.7730	

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF ITS APPLICATION.



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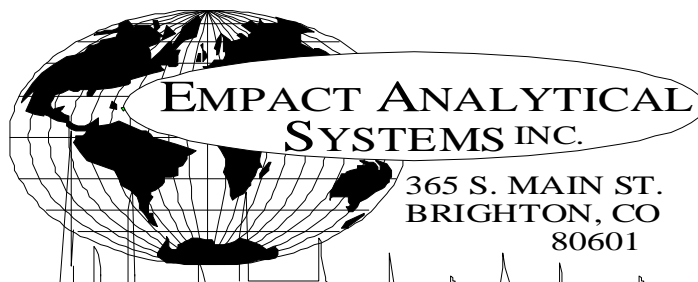
EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

BY CARBON NUMBER

PROJECT NO. :	201310129	ANALYSIS NO. :	08
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	OCTOBER 22, 2013
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 18, 2013
PRODUCER :		CYLINDER NO. :	11116
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SEPARATOR @ 13:40		EMPACT
	SHULL 4-25-9-60		
FIELD DATA		SAMPLE TEMP. :	180
SAMPLE PRES. :	20	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT / CARBON NUMBER	MOLE%	MASS %	VOLUME %
NITROGEN	0.0185	0.0049	0.0045
CARBON DIOXIDE	0.0120	0.0049	0.0044
C1	0.0000	0.0000	0.0000
C2	0.1904	0.0537	0.1115
C3	1.3873	0.5735	0.8364
C4	2.6564	1.4473	1.8433
C5	4.2180	2.8220	3.1011
C6	24.1321	19.2203	20.1516
C7	22.0917	20.3324	20.2574
C8	15.1124	15.8601	15.3967
C9	11.5893	13.7759	13.4854
C10	9.4408	12.1610	11.7427
C11	4.8306	6.7811	6.3899
C12	2.5323	3.7855	3.6093
C13	0.9618	1.6258	1.5653
C14	0.7222	1.3431	1.3010
C15	0.0961	0.1913	0.1831
C16	0.0081	0.0172	0.0164
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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303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201310129	ANALYSIS NO. :	08
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	OCTOBER 22, 2013
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 18, 2013
PRODUCER :		CYLINDER NO. :	11116
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SEPARATOR @ 13:40		IMPACT
	SHULL 4-25-9-60		
FIELD DATA		SAMPLE TEMP. :	180
SAMPLE PRES. :	20	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Nitrogen	NHC	0.0185	0.0049	0.0045
Carbon Dioxide	NHC	0.0120	0.0049	0.0044
Methane	P1	0.0000	0.0000	0.0000
Ethane	P2	0.1904	0.0537	0.1115
Propane	P3	1.3873	0.5735	0.8364
i-Butane	I4	0.4189	0.2282	0.2998
n-Butane	P4	2.2375	1.2191	1.5435
i-Pentane	I5	0.9712	0.6569	0.7776
n-Pentane	P5	1.6180	1.0943	1.2820
2,2-Dimethylbutane	I6	0.0881	0.0712	0.0805
Cyclopentane	N5	1.6288	1.0708	1.0415
2,3-Dimethylbutane	I6	0.3522	0.2845	0.3154
2-Methylpentane	I6	3.9243	3.1703	3.5638
3-Methylpentane	I6	2.3540	1.9017	2.1021
n-Hexane	P6	7.6276	6.1633	6.8656
2,2-Dimethylpentane	I7	0.0082	0.0077	0.0083
Methylcyclopentane	N6	5.1127	4.0336	3.9558
2,4-Dimethylpentane	I7	0.2796	0.2626	0.2871
2,2,3-Trimethylbutane	I7	0.0389	0.0365	0.0388
Benzene	A6	1.6085	1.1778	0.9864
3,3-Dimethylpentane	I7	0.0221	0.0208	0.0221
Cyclohexane	N6	3.0647	2.4179	2.2820
2-Methylhexane	I7	1.1345	1.0656	1.1547
2,3-Dimethylpentane	I7	0.8603	0.8081	0.8507
1,1-Dimethylcyclopentane	N7	0.3670	0.3378	0.3290
3-Methylhexane	I7	1.8640	1.7509	1.8687
1c,3-Dimethylcyclopentane	N7	0.9585	0.8823	0.8704
1t,3-Dimethylcyclopentane	N7	0.8696	0.8004	0.7855
3-Ethylpentane	I7	0.1135	0.1066	0.1119
1t,2-Dimethylcyclopentane	N7	2.0207	1.8600	1.8189
2,2,4-Trimethylpentane	I8	0.1233	0.1320	0.1396
n-Heptane	P7	5.1282	4.8169	5.1752
1c,2-Dimethylcyclopentane	N7	0.1453	0.1337	0.1272
Methylcyclohexane	N7	4.2842	3.9434	3.7638
2,2-Dimethylhexane	I8	0.4533	0.4854	0.5127

Ethylcyclopentane	N7	0.8223	0.7569	0.7258
2,5-Dimethylhexane	I8	0.1177	0.1260	0.1334
2,2,3-Trimethylpentane	I8	0.0411	0.0440	0.0452
2,4-Dimethylhexane	I8	0.2572	0.2754	0.2902
1c,2t,4-Trimethylcyclopentane	N8	0.4129	0.4343	0.4181
3,3-Dimethylhexane	I8	0.0475	0.0509	0.0527
2,3,4-Trimethylpentane	I8	0.1064	0.1139	0.1163
2,3,3-Trimethylpentane	I8	0.0182	0.0195	0.0198
Toluene	A7	3.1748	2.7422	2.3193
2,3-Dimethylhexane	I8	0.1961	0.2100	0.2168
2-Methyl-3-ethylpentane	I8	0.1985	0.2126	0.2171
1,1,2-Trimethylcyclopentane	N8	0.0477	0.0502	0.0478
2-Methylheptane	I8	1.2657	1.3553	1.4243
4-Methylheptane	I8	0.4930	0.5279	0.5414
3-Methyl-3-ethylpentane	I8	0.0740	0.0792	0.0801
3,4-Dimethylhexane	I8	0.1122	0.1202	0.1227
1c,2c,4-Trimethylcyclopentane	N8	0.0332	0.0349	0.0333
1c,3-Dimethylcyclohexane	N8	0.0480	0.0505	0.0485
3-Methylheptane	I8	0.4241	0.4541	0.4731
1c,2t,3-Trimethylcyclopentane	N8	1.0323	1.0859	1.0361
3-Ethylhexane	I8	0.1857	0.1989	0.2050
1t,4-Dimethylcyclohexane	N8	0.5660	0.5954	0.5740
1,1-Dimethylcyclohexane	N8	0.1391	0.1463	0.1377
3t-Ethylmethylcyclopentane	N8	0.2590	0.2724	0.2612
2t-Ethylmethylcyclopentane	N8	0.1889	0.1987	0.1900
1,1-Methylethylcyclopentane	N8	0.8058	0.8476	0.7980
2,2,4-Trimethylhexane	I9	0.0666	0.0801	0.0823
1t,2-Dimethylcyclohexane	N8	0.6156	0.6475	0.6136
1t,3-Dimethylcyclohexane	N8	0.0082	0.0086	0.0081
n-Octane	P8	2.1470	2.2991	2.4047
1c,4-Dimethylcyclohexane	N8	0.8964	0.9429	0.8855
i-Propylcyclopentane	I8	0.0432	0.0454	0.0430
2,4,4-Trimethylhexane	I9	0.0266	0.0320	0.0326
2,2,3,4-Tetramethylpentane	I9	0.0173	0.0208	0.0213
2,3,4-Trimethylhexane	I9	0.0189	0.0227	0.0231
1c,2-Dimethylcyclohexane	N8	0.1942	0.2043	0.1887
2,3,5-Trimethylhexane	I9	0.0620	0.0745	0.0759
2,2-Dimethylheptane	I9	0.0192	0.0231	0.0239
1,1,4-Trimethylcyclohexane	N9	0.9771	1.1563	1.1014
2,2,3-Trimethylhexane	I9	0.4535	0.5453	0.5497
2,4-Dimethylheptane	I9	0.0448	0.0539	0.0554
4,4-Dimethylheptane	I9	0.1045	0.1256	0.1290
Ethylcyclohexane	N8	0.6222	0.6545	0.6110
n-Propylcyclopentane	N8	0.2038	0.2144	0.2030
1c,3c,5-Trimethylcyclohexane	N9	0.0530	0.0627	0.0597
2,5-Dimethylheptane	I9	0.1008	0.1212	0.1243
3,3-Dimethylheptane	I9	0.1040	0.1250	0.1282
3,5-Dimethylheptane	I9	0.0653	0.0785	0.0805
2,6-Dimethylheptane	I9	0.0676	0.0813	0.0843
1,1,3-Trimethylcyclohexane	N9	0.0703	0.0832	0.0793
Ethylbenzene	A8	0.6572	0.6541	0.5531
1c,2t,4t-Trimethylcyclohexane	N9	0.3632	0.4298	0.4016
2,3-Dimethylheptane	I9	0.0032	0.0038	0.0038
1,3-Dimethylbenzene (m-Xylene)	A8	0.5225	0.5200	0.4423
1,4-Dimethylbenzene (p-Xylene)	A8	0.8617	0.8576	0.7318
3,4-Dimethylheptane	I9	0.3703	0.4452	0.4475
3,4-Dimethylheptane (2)	I9	0.2110	0.2537	0.2550
4-Ethylheptane	I9	0.1015	0.1220	0.1253
4-Methyloctane	I9	0.2613	0.3142	0.3205
2-Methyloctane	I9	0.3950	0.4749	0.4892
1c,2t,4c-Trimethylcyclohexane	I9	0.1250	0.1503	0.1523
3-Ethylheptane	I9	0.0852	0.1024	0.1036
3-Methyloctane	I9	0.3930	0.4725	0.4819
3,3-Diethylpentane	I9	0.0587	0.0706	0.0688
1c,2t,3-Trimethylcyclohexane	N9	0.1377	0.1630	0.1523
1,1,2-Trimethylcyclohexane	N9	0.0451	0.0534	0.0499
1,2-Dimethylbenzene (o-Xylene)	A8	0.6935	0.6902	0.5768

i-Butylcyclopentane	N9	0.2759	0.3265	0.3074
n-Nonane	P9	1.4311	1.7207	1.7627
1,1-Methylethylcyclohexane	N9	0.6650	0.7996	0.8216
i-Propylbenzene	A9	0.4313	0.4859	0.4137
i-Propylcyclohexane	N9	0.1318	0.1560	0.1430
2,2-Dimethyloctane	I10	0.0252	0.0336	0.0334
2,4-Dimethyloctane	I10	0.0818	0.1091	0.1085
2,6-Dimethyloctane	I10	0.0120	0.0160	0.0164
2,5-Dimethyloctane	I10	0.0364	0.0485	0.0482
n-Butylcyclopentane	N9	0.1977	0.2600	0.2393
3,3-Dimethyloctane	I10	0.1633	0.2178	0.2167
n-Propylbenzene	A9	0.3467	0.3906	0.3326
3,6-Dimethyloctane	I10	0.2560	0.3415	0.3396
3-Methyl-5-ethylheptane	I10	0.5051	0.6073	0.6152
1,3-Methylethylbenzene	A9	0.3521	0.3967	0.3350
1,4-Methylethylbenzene	A9	0.0736	0.0829	0.0700
1,3,5-Trimethylbenzene	A9	0.1288	0.1451	0.1234
2,3-Dimethyloctane	I10	0.0770	0.1027	0.1021
5-Methylnonane	I10	0.1805	0.2408	0.2417
1,2-Methylethylbenzene	A9	0.3372	0.3799	0.3191
2-Methylnonane	I10	0.1280	0.1707	0.1728
3-Ethyloctane	I10	0.0537	0.0716	0.0712
3-Methylnonane	I10	0.1961	0.2616	0.2623
1,2,4-Trimethylbenzene	A9	0.0339	0.0382	0.0321
t-Butylbenzene	A10	0.1147	0.1443	0.1225
i-Butylcyclohexane	N10	0.2393	0.3147	0.2851
1t-Methyl-2-n-propylcyclohexane	I10	0.1044	0.1255	0.1271
i-Butylbenzene	A10	0.0620	0.0780	0.0673
sec-Butylbenzene	A10	0.0337	0.0424	0.0362
UnknownC9s	U9	2.2131	2.6609	2.7258
n-Decane	P10	1.1276	1.5040	1.5147
1,2,3-Trimethylbenzene	A9	0.1694	0.1909	0.1571
1,3-Methyl-i-propylbenzene	A10	0.0843	0.0950	0.0798
1,4-Methyl-i-propylbenzene	A10	0.0939	0.1058	0.0889
Sec-Butylcyclohexane	N10	0.2092	0.2751	0.2489
1,2-Methyl-i-propylbenzene	A10	0.1478	0.1860	0.1561
3-Ethylnonane	I10	0.0866	0.1155	0.1169
1,3-Diethylbenzene	A10	0.1300	0.1636	0.1393
1,3-Methyl-n-propylbenzene	A10	0.0748	0.0941	0.0804
1,4-Diethylbenzene	A10	0.1249	0.1572	0.1342
1,4-Methyl-n-propylbenzene	A10	0.0468	0.0589	0.0505
n-Butylbenzene	A10	0.1167	0.1468	0.1253
1,3-Dimethyl-5-ethylbenzene	A10	0.0709	0.0892	0.0759
1,2-Diethylbenzene	A10	0.1098	0.1381	0.1155
1,2-Methyl-n-propylbenzene	A10	0.0752	0.0946	0.0797
1,4-Dimethyl-2-ethylbenzene	A10	0.0969	0.1219	0.1022
1,3-Dimethyl-4-ethylbenzene	A10	0.0301	0.0379	0.0318
1,2-Dimethyl-4-ethylbenzene	A10	0.1238	0.1558	0.1311
1,3-Dimethyl-2-ethylbenzene	A10	0.1325	0.1667	0.1378
1t,2c,4-Trimethylcyclopentane	A10	0.5592	0.5882	0.5785
1,2-Dimethyl-3-ethylbenzene	A10	0.0784	0.0986	0.0813
1,2-Ethyl-i-propylbenzene	A10	0.1049	0.1320	0.1108
1,4-Methyl-t-butylbenzene	A11	0.1975	0.2485	0.2086
UnknownC10s	U10	3.3220	4.4308	4.4625
n-Undecane	P11	0.8167	1.1967	1.1886
1,4-Ethyl-i-propylbenzene	A11	0.0726	0.0913	0.0766
1,2,4,5-Tetramethylbenzene	A11	0.1090	0.1371	0.1139
1,2-Methyl-n-butylbenzene	A11	0.0656	0.0825	0.0692
1,2,3,5-Tetramethylbenzene	A11	0.1085	0.1365	0.1128
1,2-Methyl-t-butylbenzene	A11	0.0666	0.0838	0.0703
5-Methylindan	A11	0.0126	0.0201	0.0197
4-Methylindan	A11	0.0150	0.0240	0.0236
1,2-Ethyl-n-propylbenzene	A11	0.0773	0.0973	0.0817
2-Methylindan	A11	0.0775	0.1238	0.1216
1,3-Methyl-n-butylbenzene	A11	0.0918	0.1155	0.0969
1,3-Di-i-propylbenzene	A11	0.0777	0.0978	0.0821
sec-Pentylbenzene	A11	0.1680	0.2114	0.1774

n-Pentylbenzene	A11	0.0416	0.0578	0.0495
1t-M-2-(4MP)cyclopentane	P12	0.0210	0.0335	0.0329
1,2-Di-n-propylbenzene	A11	0.0540	0.0679	0.0570
1,4-Di-i-propylbenzene	A11	0.1962	0.2469	0.2072
Tetrahydronaphthalene	A10	0.0230	0.0289	0.0243
t-Decahydronaphthalene	A10	0.1255	0.1579	0.1325
Naphthalene	A10	0.0768	0.0923	0.0775
1-t-Butyl-3,5-dimethylbenzene	A12	0.0991	0.1247	0.1047
1,4-Ethyl-t-butylbenzene	A11	0.0413	0.0520	0.0436
UnknownC11s	U11	2.2892	3.3544	3.3316
n-Dodecane	P12	0.5866	0.9367	0.9201
1,3-Di-n-propylbenzene	A12	0.0480	0.0604	0.0507
1,3,5-Triethylbenzene	A12	0.1097	0.1236	0.1051
1,2,4-Triethylbenzene	A12	0.2751	0.3100	0.2603
1,4-Methyl-n-pentylbenzene	A12	0.0695	0.0874	0.0734
n-Hexylbenzene	A12	0.0512	0.0779	0.0668
1,2,3,4,5-Pentamethylbenzene	A13	0.0777	0.0978	0.0821
2-Methylnaphthalene	A11	0.1003	0.1337	0.1122
1-Methylnaphthalene	A11	0.1516	0.2021	0.1458
UnknownC12s	U12	1.2721	2.0313	1.9953
n-Tridecane	P13	0.1385	0.2394	0.2324
UnknownC13s	U13	0.7456	1.2886	1.2508
n-Tetradecane	P14	0.0165	0.0307	0.0297
UnknownC14s	U14	0.7057	1.3124	1.2713
n-Pentadecane	P15	0.0101	0.0201	0.0192
UnknownC15s	U15	0.0860	0.1712	0.1639
n-Hexadecane	P16	0.0081	0.0172	0.0164
TOTAL		100.0000	100.0000	100.0000

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303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201310129	ANALYSIS NO. :	09
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	OCTOBER 25, 2013
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 18, 2013
PRODUCER :		CYLINDER NO. :	1161
LEASE NO. :		SAMPLED BY :	GALE MCENDREE-EMPACT
NAME/DESCRIP :	SALES GAS @ 13:50 SHULL 4-25-9-60		
FIELD DATA		SAMPLE TEMP. :	58
SAMPLE PRES. :	128	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; LENGTH OF H2S STAIN (1-7) @ >7PPM @ 13:55 LENGTH OF H2S STAIN (1-7) @ 7PPM @ 14:00		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0002	0.0006		
HELIUM	0.02	0.00	---	---
OXYGEN/ARGON	0.01	0.01	---	---
NITROGEN	1.04	1.23	---	---
CARBON DIOXIDE	2.92	5.45	---	---
METHANE	69.71710	47.40220	---	---
ETHANE	12.1578	15.4946	3.2466	3.2643
PROPANE	9.3636	17.5002	2.5758	2.5899
I-BUTANE	0.8309	2.0469	0.2713	0.2728
N-BUTANE	2.5785	6.3521	0.8119	0.8163
I-PENTANE	0.4365	1.3313	0.1572	0.1580
N-PENTANE	0.4875	1.4908	0.1762	0.1772
HEXANES PLUS	0.4379	1.6913	0.1720	0.1728
TOTALS	100.00000	100.00000	7.4110	7.4513

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.650	14.730
BENZENE	0.0155	0.0513	LOW NET DRY REAL :	1205.4 /scf	1212.0 /scf
TOLUENE	0.0098	0.0383	NET WET REAL :	1184.3 /scf	1190.9 /scf
ETHYLBENZENE	0.0010	0.0045	HIGH GROSS DRY REAL :	1325.3 /scf	1332.5 /scf
XYLENES	0.0024	0.0108	GROSS WET REAL :	1302.1 /scf	1309.3 /scf
TOTAL BTEX	0.0287	0.1049	NET DRY REAL :	19396.4 /lb	19502.3 /lb
			GROSS DRY REAL :	21332.2 /lb	21448.7 /lb

RELATIVE DENSITY (AIR=1):	0.8143
COMPRESSIBILITY FACTOR :	0.99577

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

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

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303-637-0150

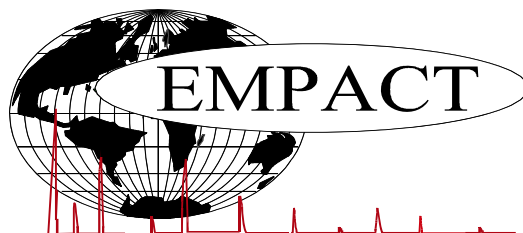
EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201310129	ANALYSIS NO. :	09
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	OCTOBER 25, 2013
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 18, 2013
PRODUCER :		CYLINDER NO. :	1161
LEASE NO. :		SAMPLED BY :	GALE MCENDREE-EMPACT
NAME/DESCRIP :	SALES GAS @ 13:50		
	SHULL 4-25-9-60		
FIELD DATA		SAMPLE TEMP. :	58
SAMPLE PRES. :	128	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; LENGTH OF H2S STAIN (1-7) @ >7PPM @ 13:55		
	LENGTH OF H2S STAIN (2.5-60) @ 7PPM @ 14:00		

Componet	Mole %	Wt %
Helium	0.02	0.00
Carbon Dioxide	2.92	5.45
Nitrogen	1.04	1.23
Methane	69.71710	47.40220
Ethane	12.1578	15.4946
Propane	9.3636	17.5002
Isobutane	0.8309	2.0469
n-Butane	2.5785	6.3521
Isopentane	0.3949	1.2076
n-Pentane	0.4875	1.4908
Cyclopentane	0.0416	0.1237
n-Hexane	0.0926	0.3382
Cyclohexane	0.0237	0.0846
Other Hexanes	0.1637	0.5932
Heptanes	0.0772	0.3259
Methycyclohexane	0.0176	0.0732
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0155	0.0513
Toluene	0.0098	0.0383
Ethylbenzene	0.0010	0.0045
Xylenes	0.0024	0.0108
C8+ Heavies	0.0344	0.1713
<i>Subtotal</i>	99.98980	99.98940
Oxygen/Argon	0.01	0.01
Alcohols	0.0002	0.0006
Total	100.00000	100.00000

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201310129	ANALYSIS NO. :	09
COMPANY NAME :	CARRIZO OIL & GAS, INC.	ANALYSIS DATE:	OCTOBER 25, 2013
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 18, 2013
PRODUCER :		CYLINDER NO. :	1161
LEASE NO. :		SAMPLED BY :	GALE MCENDREE-EMPACT
NAME/DESCRIP :	SALES GAS @ 13:50		
	SHULL 4-25-9-60		

FIELD DATA

SAMPLE PRES. :	128	SAMPLE TEMP. :	58
VAPOR PRES. :		AMBIENT TEMP.:	
COMMENTS :	SPOT; PROBE; LENGTH OF H2S STAIN (1-7) @ <7PPM @ 13:55		
	LENGTH OF H2S STAIN (2.5-60) @ 7PPM @ 14:00		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Helium	---	0.02	0.00	---	---
Oxygen/Argon	---	0.01	0.01	---	---
Nitrogen	---	1.04	1.23	---	---
Carbon Dioxide	---	2.92	5.45	---	---
Methane	P1	69.71710	47.40220	---	---
Ethane	P2	12.1578	15.4946	3.247	3.264
Propane	P3	9.3636	17.5002	2.576	2.590
i-Butane	I4	0.8309	2.0469	0.271	0.273
n-Butane	P4	2.5785	6.3521	0.812	0.816
2,2-Dimethylpropane	I5	0.0014	0.0043	0.001	0.001
i-Pentane	I5	0.3935	1.2033	0.144	0.145
i-Propanol	X3	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.4875	1.4908	0.176	0.177
t-Butanol	X4	0.0001	0.0003	0.000	0.000
2,2-Dimethylbutane	I6	0.0009	0.0033	0.000	0.000
Cyclopentane	N5	0.0416	0.1237	0.012	0.012
2,3-Dimethylbutane	I6	0.0034	0.0124	0.001	0.001
2-Methylpentane	I6	0.0688	0.2513	0.028	0.028
3-Methylpentane	I6	0.0362	0.1322	0.015	0.015
n-Hexane	P6	0.0926	0.3382	0.038	0.038
2,2-Dimethylpentane	I7	0.0003	0.0013	0.000	0.000
Methylcyclopentane	N6	0.0544	0.1940	0.019	0.019
2,4-Dimethylpentane	I7	0.0020	0.0085	0.001	0.001
Benzene	A6	0.0155	0.0513	0.004	0.004
3,3-Dimethylpentane	I7	0.0002	0.0009	0.000	0.000
Cyclohexane	N6	0.0237	0.0846	0.008	0.008
2-Methylhexane	I7	0.0091	0.0387	0.004	0.004
2,3-Dimethylpentane	I7	0.0044	0.0187	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0018	0.0075	0.001	0.001
3-Methylhexane	I7	0.0108	0.0459	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0058	0.0242	0.003	0.003
1t,3-Dimethylcyclopentane	N7	0.0052	0.0217	0.002	0.002
3-Ethylpentane	I7	0.0008	0.0034	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0111	0.0462	0.005	0.005
n-Heptane	P7	0.0218	0.0926	0.010	0.010
1c,2-Dimethylcyclopentane	N7	0.0008	0.0034	0.000	0.000
Methylcyclohexane	N7	0.0176	0.0732	0.007	0.007
2,2-Dimethylhexane	I8	0.0010	0.0048	0.000	0.000
Ethylcyclopentane	N7	0.0031	0.0129	0.001	0.001
2,5-Dimethylhexane	I8	0.0004	0.0020	0.000	0.000
2,4-Dimethylhexane	I8	0.0007	0.0034	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0014	0.0067	0.001	0.001

3,3-Dimethylhexane	I8	0.0001	0.0005	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0018	0.0086	0.001	0.001
2,3,4-Trimethylpentane	I8	0.0003	0.0014	0.000	0.000
Toluene	A7	0.0098	0.0383	0.003	0.003
2,3-Dimethylhexane	I8	0.0005	0.0024	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0004	0.0020	0.000	0.000
2-Methylheptane	I8	0.0033	0.0160	0.002	0.002
4-Methylheptane	I8	0.0010	0.0048	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0001	0.0005	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0005	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0005	0.000	0.000
3-Methylheptane	I8	0.0016	0.0078	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0021	0.0100	0.001	0.001
3-Ethylhexane	I8	0.0003	0.0014	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0007	0.0034	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0003	0.0014	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0005	0.0024	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0005	0.0024	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0016	0.0076	0.001	0.001
2,2,4-Trimethylhexane	I9	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0011	0.0052	0.001	0.001
n-Octane	P8	0.0047	0.0228	0.002	0.002
1c,4-Dimethylcyclohexane	N8	0.0004	0.0019	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0005	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0006	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0003	0.0014	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0014	0.0075	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0005	0.0027	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
Ethylcyclohexane	N8	0.0007	0.0034	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0009	0.000	0.000
2,5-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0002	0.0011	0.000	0.000
Ethylbenzene	I8	0.0010	0.0045	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0015	0.0067	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0003	0.0014	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0006	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0006	0.000	0.000
4-Methyloctane	I9	0.0002	0.0011	0.000	0.000
2-Methyloctane	I9	0.0003	0.0016	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
3-Methyloctane	I9	0.0003	0.0016	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0006	0.0027	0.000	0.000
i-Butylcyclopentane	N9	0.0002	0.0011	0.000	0.000
n-Nonane	P9	0.0009	0.0049	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
i-Propylbenzene	A9	0.0003	0.0015	0.000	0.000
n-Butylcyclopentane	N9	0.0002	0.0011	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0005	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0006	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0006	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0005	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0005	0.000	0.000
5-Methylnonane	I10	0.0001	0.0006	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0005	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0006	0.000	0.000
UnknownC9s	U9	0.0010	0.0054	0.001	0.001
n-Decane	P10	0.0001	0.0006	0.000	0.000
UnknownC10s	U10	0.0004	0.0024	0.000	0.000
TOTAL		100.00000	100.00000	7.4110	7.4513

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.650	14.730
BENZENE	0.0155	0.0513	LOW NET DRY REAL :	1205.4 /scf	1212.0 /scf

TOLUENE	0.0098	0.0383
ETHYLBENZENE	0.0010	0.0045
XYLENES	0.0024	0.0108
TOTAL BTX	0.0287	0.1049

NET WET REAL :	1184.3 /scf	1190.9 /scf
HIGH GROSS DRY REAL :	1325.3 /scf	1332.5 /scf
GROSS WET REAL :	1302.1 /scf	1309.3 /scf
NET DRY REAL :	19396.4 /lb	19502.3 /lb
GROSS DRY REAL :	21332.2 /lb	21448.7 /lb

RELATIVE DENSITY (AIR=1):	0.8143
COMPRESSIBILITY FACTOR :	0.99577

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

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

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