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

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201406094	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	JUNE 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	JUNE 13, 2014
PRODUCER :		CYLINDER NO. :	2821
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER @ 12:10		EMPACT
	BRINGELSON RANCH 10-20-9-58		
FIELD DATA		SAMPLE TEMP. :	133
SAMPLE PRES. :	25	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	MOLE %	MASS %	VOL %
ALCOHOLS	0.0056	0.0032	0.0030
NITROGEN (AIR)	0.0100	0.0025	0.0023
CARBON DIOXIDE	0.0230	0.0092	0.0083
METHANE	0.0970	0.0141	0.0349
ETHANE	0.4350	0.1188	0.2475
PROPANE	1.7400	0.6968	1.0202
I-BUTANE	0.4240	0.2238	0.2951
N-BUTANE	2.1750	1.1479	1.4590
I-PENTANE	0.9116	0.5973	0.7102
N-PENTANE	1.5170	0.9939	1.1689
HEXANES PLUS	92.6618	96.1925	95.0506
TOTALS	100.0000	100.0000	100.0000

BTEX COMPONENTS	**MOLE%**	**MASS%**
BENZENE	1.1273	0.7996
TOLUENE	2.5220	2.1101
ETHYLBENZENE	0.7724	0.7447
XYLENE	2.3558	2.2712
TOTAL BTEX	6.7775	5.9256

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

	TOTAL SAMPLE	**C6+ FRACTION**	
Specific Gravity (H2O=1) =	0.7428	0.7512	60/60
API Gravity =	59	56.87	60/60
Molecular Weight =	110.12	114.965	
Absolute Density =	6.19	6.26	LBS/GAL
Heating Value Liq. Idl Gas=	125915	127391	BTU/GAL
Vapor/Liquid =	21.41	20.79	CUFT/GAL
Vapor Pressure =	15.10	1.75	PSIA @100 F

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

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E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201406094	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	JUNE 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	JUNE 13, 2014
PRODUCER :		CYLINDER NO. :	2821
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER @ 12:10 BRINGELSON RANCH 10-20-9-58		EMPACT
FIELD DATA		SAMPLE TEMP. :	133
SAMPLE PRES. :	25	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0230		0.0092		0.0083	
NITROGEN (AIR)	0.0100		0.0025		0.0023	
METHANE	0.0970		0.0141		0.0349	
ETHANE	0.4350		0.1188		0.2475	
PROPANE	1.7400		0.6968		1.0202	
I-BUTANE	0.4240		0.2238		0.2951	
N-BUTANE	2.1750		1.1479		1.4590	
I-PENTANE	0.9116		0.5973		0.7102	
N-PENTANE	1.5170		0.9939		1.1689	
CYCLOPENTANE (N-C5)	1.3359		0.8507		0.8307	
N-HEXANE	6.7233		5.2613		5.8849	
CYCLOHEXANE (OTHER C6)	2.8575		2.1838		2.0690	
OTHER HEXANES	10.6180		8.2280		8.7615	
OTHER HEPTANES	14.1600		12.7949		13.3617	
METHYLCYCLOHEXANE (OTHER C7)	4.9247		4.3910		4.2073	
2,2,4 TRIMETHYLPENTANE	0.9194		0.8198		0.8076	
BENZENE	1.1273		0.7996		0.6723	
TOLUENE	2.5220		2.1101		1.7916	
ETHYLBENZENE	0.7724		0.7447		0.6322	
XYLENES	2.3558		2.2712		1.9316	
OTHER OCTANES	11.8652		12.3372		12.4258	
OCTANES PLUS	----	48.3931	----	59.5731	----	57.4716
NONANES	10.2347		11.7621		11.4879	
DECANES PLUS	22.2456		31.6381		30.1865	
SUB TOTAL	99.9944		99.9968		99.9970	
ALCOHOLS	0.0056		0.0032		0.0030	
TOTAL	100.0000		100.0000		100.0000	

API Gravity	=	**59.00**	60/60
Vapor Pressure	=	**15.10**	PSIA & 100 F
Average Molecular Weight of Decanes plus	=	**156.62**	
Average Specific Gravity of Decanes plus	=	**0.7790**	

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BY CARBON NUMBER

PROJECT NO. :	201406094	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	JUNE 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	JUNE 13, 2014
PRODUCER :		CYLINDER NO. :	2821
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER @ 12:10		EMPACT
	BRINGELSON RANCH 10-20-9-58		
FIELD DATA		SAMPLE TEMP. :	133
SAMPLE PRES. :	25	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT / CARBON NUMBER		MOLE%	MASS %	VOLUME %
ALCOHOLS		0.0056	0.0032	0.0030
NITROGEN		0.0100	0.0025	0.0023
CARBON DIOXIDE		0.0230	0.0092	0.0083
	C1	0.0970	0.0141	0.0349
	C2	0.4350	0.1188	0.2475
	C3	1.7400	0.6968	1.0202
	C4	2.5990	1.3717	1.7541
	C5	3.7645	2.4419	2.7098
	C6	21.3261	16.4727	17.3877
	C7	21.6067	19.2960	19.3606
	C8	15.9128	16.1729	15.7972
	C9	10.2347	11.7621	11.4879
	C10	9.1503	11.3880	10.8911
	C11	4.8660	6.5447	6.0928
	C12	2.9004	4.2450	4.0697
	C13	2.2106	3.5998	3.4721
	C14	1.5594	2.8093	2.7320
	C15	1.2206	2.3545	2.2634
	C16	0.3299	0.6784	0.6479
	C17	0.0080	0.0175	0.0166
	C18	0.0004	0.0009	0.0009
	C19	0.0000	0.0000	0.0000
	C20	0.0000	0.0000	0.0000
	C21	0.0000	0.0000	0.0000
	C22	0.0000	0.0000	0.0000
	C23	0.0000	0.0000	0.0000
	C24	0.0000	0.0000	0.0000
	C25	0.0000	0.0000	0.0000
	C26	0.0000	0.0000	0.0000
	C27	0.0000	0.0000	0.0000
	C28	0.0000	0.0000	0.0000
	C29	0.0000	0.0000	0.0000
	C30+	0.0000	0.0000	0.0000
	Total	100.0000	100.0000	100.0000

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EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201406094	ANALYSIS NO. :	01
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	JUNE 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	JUNE 13, 2014
PRODUCER :		CYLINDER NO. :	2821
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER @ 12:10		EMPACT
	BRINGELSON RANCH 10-20-9-58		
FIELD DATA		SAMPLE TEMP. :	133
SAMPLE PRES. :	25	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Nitrogen	NHC	0.0100	0.0025	0.0023
Carbon Dioxide	NHC	0.0230	0.0092	0.0083
Methane	P1	0.0970	0.0141	0.0349
Ethane	P2	0.4350	0.1188	0.2475
Propane	P3	1.7400	0.6968	1.0202
i-Butane	I4	0.4240	0.2238	0.2951
n-Butane	P4	2.1750	1.1479	1.4590
2,2-Dimethylpropane	I5	0.0126	0.0083	0.0103
Ethanol	X2	0.0012	0.0005	0.0005
i-Pentane	I5	0.8990	0.5890	0.6999
i-Propanol	X3	0.0019	0.0010	0.0009
n-Pentane	P5	1.5170	0.9939	1.1689
t-Butanol	X4	0.0025	0.0017	0.0016
2,2-Dimethylbutane	I6	0.0584	0.0457	0.0519
Cyclopentane	N5	1.3359	0.8507	0.8307
2,3-Dimethylbutane	I6	0.4091	0.3201	0.3562
2-Methylpentane	I6	3.5735	2.7965	3.1559
3-Methylpentane	I6	2.1457	1.6792	1.8634
n-Hexane	P6	6.7233	5.2613	5.8849
2,2-Dimethylpentane	I7	0.0102	0.0093	0.0101
Methylcyclopentane	N6	4.4313	3.3865	3.3341
2,4-Dimethylpentane	I7	0.2769	0.2519	0.2765
2,2,3-Trimethylbutane	I7	0.0294	0.0268	0.0286
Benzene	A6	1.1273	0.7996	0.6723
3,3-Dimethylpentane	I7	0.0333	0.0303	0.0323
Cyclohexane	N6	2.8575	2.1838	2.0690
2-Methylhexane	I7	1.3301	1.2102	1.3165
2,3-Dimethylpentane	I7	0.6772	0.6162	0.6512
1,1-Dimethylcyclopentane	N7	0.4541	0.4049	0.3959
3-Methylhexane	I7	1.7831	1.6224	1.7383
1c,3-Dimethylcyclopentane	N7	0.9689	0.8639	0.8556
1t,3-Dimethylcyclopentane	N7	0.9194	0.8198	0.8076
3-Ethylpentane	I7	0.1473	0.1340	0.1413
1t,2-Dimethylcyclopentane	N7	1.8543	1.6534	1.6232
2,2,4-Trimethylpentane	I8	0.0265	0.0275	0.0292

n-Heptane	P7	4.8715	4.4325	4.7807
1c,2-Dimethylcyclopentane	N7	0.1324	0.1180	0.1127
Methylcyclohexane	N7	4.9247	4.3910	4.2073
2,2-Dimethylhexane	I8	0.5762	0.5977	0.6337
Ethylcyclopentane	N7	0.5539	0.4939	0.4754
2,5-Dimethylhexane	I8	0.1408	0.1461	0.1553
2,2,3-Trimethylpentane	I8	0.0416	0.0432	0.0445
2,4-Dimethylhexane	I8	0.2358	0.2446	0.2588
1c,2t,4-Trimethylcyclopentane	N8	0.4497	0.4582	0.4429
3,3-Dimethylhexane	I8	0.0654	0.0678	0.0705
2,3,4-Trimethylpentane	I8	0.1033	0.1072	0.1099
2,3,3-Trimethylpentane	I8	0.0070	0.0073	0.0074
Toluene	A7	2.5220	2.1101	1.7916
2,3-Dimethylhexane	I8	0.2475	0.2567	0.2661
2-Methyl-3-ethylpentane	I8	0.1336	0.1386	0.1421
1,1,2-Trimethylcyclopentane	N8	0.0040	0.0041	0.0039
2-Methylheptane	I8	1.3961	1.4482	1.5279
4-Methylheptane	I8	0.4175	0.4331	0.4459
3-Methyl-3-ethylpentane	I8	0.0791	0.0821	0.0833
3,4-Dimethylhexane	I8	0.0902	0.0936	0.0959
1c,2c,4-Trimethylcyclopentane	N8	0.0365	0.0372	0.0356
1c,3-Dimethylcyclohexane	N8	0.0295	0.0301	0.0290
3-Methylheptane	I8	0.6606	0.6852	0.7167
1c,2t,3-Trimethylcyclopentane	N8	1.2183	1.2414	1.1891
3-Ethylhexane	I8	0.1492	0.1548	0.1602
1t,4-Dimethylcyclohexane	N8	0.5553	0.5658	0.5475
1,1-Dimethylcyclohexane	N8	0.1405	0.1432	0.1353
3c-Ethylmethylcyclopentane	N8	0.0072	0.0073	0.0070
3t-Ethylmethylcyclopentane	N8	0.1912	0.1948	0.1875
2t-Ethylmethylcyclopentane	N8	0.1606	0.1636	0.1570
1,1-Methylethylcyclopentane	N8	0.5224	0.5323	0.5031
2,2,4-Trimethylhexane	I9	0.0507	0.0591	0.0610
1t,2-Dimethylcyclohexane	N8	0.6688	0.6815	0.6484
1t,3-Dimethylcyclohexane	N8	0.0005	0.0005	0.0005
UnknownC7s	U7	0.1180	0.1074	0.1158
n-Octane	P8	2.6665	2.7659	2.9042
1c,4-Dimethylcyclohexane	N8	0.6201	0.6318	0.5957
i-Propylcyclopentane	I8	0.0739	0.0753	0.0716
2,4,4-Trimethylhexane	I9	0.0255	0.0297	0.0304
2,2,3,4-Tetramethylpentane	I9	0.0210	0.0245	0.0251
2,3,4-Trimethylhexane	I9	0.0310	0.0361	0.0369
1c,2-Dimethylcyclohexane	N8	0.2276	0.2319	0.2150
2,3,5-Trimethylhexane	I9	0.0831	0.0968	0.0990
2,2-Dimethylheptane	I9	0.0192	0.0224	0.0233
1,1,4-Trimethylcyclohexane	N9	0.9788	1.1221	1.0730
2,2,3-Trimethylhexane	I9	0.4402	0.5127	0.5188
2,4-Dimethylheptane	I9	0.0476	0.0554	0.0571
4,4-Dimethylheptane	I9	0.0490	0.0571	0.0589
Ethylcyclohexane	N8	0.5568	0.5674	0.5317
n-Propylcyclopentane	N8	0.2415	0.2461	0.2339
1c,3c,5-Trimethylcyclohexane	N9	0.0425	0.0487	0.0466
2,5-Dimethylheptane	I9	0.0693	0.0807	0.0831
3,3-Dimethylheptane	I9	0.0817	0.0952	0.0980
3,5-Dimethylheptane	I9	0.0554	0.0645	0.0664
2,6-Dimethylheptane	I9	0.0505	0.0588	0.0612
1,1,3-Trimethylcyclohexane	N9	0.1481	0.1698	0.1624
Ethylbenzene	A8	0.7724	0.7447	0.6322
1c,2t,4t-Trimethylcyclohexane	N9	0.0953	0.1092	0.1024
2,3-Dimethylheptane	I9	0.1058	0.1232	0.1252
1,3-Dimethylbenzene (m-Xylene)	A8	1.3700	1.3208	1.1278
1,4-Dimethylbenzene (p-Xylene)	A8	0.3796	0.3660	0.3135
3,4-Dimethylheptane	I9	0.0410	0.0478	0.0482
3,4-Dimethylheptane (2)	I9	0.1346	0.1568	0.1582
4-Ethylheptane	I9	0.0314	0.0366	0.0378
4-Methyloctane	I9	0.2814	0.3277	0.3356
2-Methyloctane	I9	0.3946	0.4596	0.4753
1c,2t,4c-Trimethylcyclohexane	I9	0.0466	0.0543	0.0552

3-Ethylheptane	I9	0.0674	0.0785	0.0797
3-Methyloctane	I9	0.4614	0.5374	0.5503
3,3-Diethylpentane	I9	0.0435	0.0507	0.0496
1c,2t,3-Trimethylcyclohexane	N9	0.0701	0.0804	0.0754
1,1,2-Trimethylcyclohexane	N9	0.0314	0.0360	0.0338
1,2-Dimethylbenzene (o-Xylene)	A8	0.6062	0.5844	0.4903
i-Butylcyclopentane	N9	0.2848	0.3265	0.3086
UnknownC8s	U8	0.0433	0.0449	0.0471
n-Nonane	P9	1.8102	2.1083	2.1681
1,1-Methylethylcyclohexane	N9	0.4016	0.4677	0.4824
i-Propylbenzene	A9	0.3457	0.3773	0.3225
i-Propylcyclohexane	N9	0.1124	0.1288	0.1186
2,2-Dimethyloctane	I10	0.0716	0.0925	0.0923
2,4-Dimethyloctane	I10	0.0983	0.1270	0.1268
2,6-Dimethyloctane	I10	0.0122	0.0158	0.0163
2,5-Dimethyloctane	I10	0.0450	0.0581	0.0580
n-Butylcyclopentane	N9	0.2178	0.2774	0.2563
3,3-Dimethyloctane	I10	0.1055	0.1363	0.1361
n-Propylbenzene	A9	0.4126	0.4503	0.3850
3,6-Dimethyloctane	I10	0.2380	0.3075	0.3069
3-Methyl-5-ethylheptane	I10	0.4071	0.4741	0.4822
1,3-Methylethylbenzene	A9	0.2838	0.3098	0.2626
1,4-Methylethylbenzene	A9	0.2043	0.2230	0.1891
1,3,5-Trimethylbenzene	A9	0.1241	0.1354	0.1156
2,3-Dimethyloctane	I10	0.0681	0.0880	0.0878
5-Methylnonane	I10	0.2280	0.2946	0.2968
1,2-Methylethylbenzene	A9	0.3859	0.4212	0.3552
2-Methylnonane	I10	0.0603	0.0779	0.0791
3-Ethyloctane	I10	0.0623	0.0805	0.0804
3-Methylnonane	I10	0.2436	0.3147	0.3167
1,2,4-Trimethylbenzene	A9	0.0490	0.0535	0.0451
t-Butylbenzene	A10	0.4103	0.5001	0.4264
i-Butylcyclohexane	N10	0.2076	0.2644	0.2405
1t-Methyl-2-n-propylcyclohexane	I10	0.0479	0.0558	0.0568
i-Butylbenzene	A10	0.0792	0.0965	0.0835
sec-Butylbenzene	A10	0.0364	0.0444	0.0381
UnknownC9s	U9	1.3657	1.5906	1.6357
n-Decane	P10	1.2961	1.6746	1.6931
1,2,3-Trimethylbenzene	A9	0.2387	0.2605	0.2152
1,3-Methyl-i-propylbenzene	A10	0.0723	0.0789	0.0665
1,4-Methyl-i-propylbenzene	A10	0.0874	0.0954	0.0805
Sec-Butylcyclohexane	N10	0.3447	0.4391	0.3989
1,2-Methyl-i-propylbenzene	A10	0.1735	0.2115	0.1782
3-Ethylnonane	I10	0.0351	0.0453	0.0460
1,3-Diethylbenzene	A10	0.1409	0.1717	0.1468
1,3-Methyl-n-propylbenzene	A10	0.0549	0.0669	0.0574
1,4-Diethylbenzene	A10	0.1577	0.1922	0.1647
1,4-Methyl-n-propylbenzene	A10	0.1310	0.1597	0.1374
n-Butylbenzene	A10	0.0580	0.0707	0.0606
1,3-Dimethyl-5-ethylbenzene	A10	0.1301	0.1586	0.1354
1,2-Diethylbenzene	A10	0.0395	0.0481	0.0404
1,2-Methyl-n-propylbenzene	A10	0.1173	0.1430	0.1209
1,4-Dimethyl-2-ethylbenzene	A10	0.1631	0.1988	0.1674
1,3-Dimethyl-4-ethylbenzene	A10	0.0070	0.0085	0.0072
1,2-Dimethyl-4-ethylbenzene	A10	0.2103	0.2563	0.2165
1,3-Dimethyl-2-ethylbenzene	A10	0.1179	0.1437	0.1192
1t,2c,4-Trimethylcyclopentane	A10	0.5276	0.5376	0.5308
1,2-Dimethyl-3-ethylbenzene	A10	0.0844	0.1029	0.0852
1,2-Ethyl-i-propylbenzene	A10	0.1128	0.1375	0.1158
1,4-Methyl-t-butylbenzene	A11	0.2024	0.2467	0.2079
UnknownC10s	U10	2.3747	3.0681	3.1021
n-Undecane	P11	1.1031	1.5657	1.5611
1,4-Ethyl-i-propylbenzene	A11	0.0582	0.0709	0.0597
1,2,4,5-Tetramethylbenzene	A11	0.1353	0.1649	0.1375
1,2-Methyl-n-butylbenzene	A11	0.0729	0.0889	0.0749
1,2,3,5-Tetramethylbenzene	A11	0.1410	0.1719	0.1426
1,2-Methyl-t-butylbenzene	A11	0.0980	0.1194	0.1006

5-Methylindan	A11	0.0201	0.0311	0.0307
4-Methylindan	A11	0.0104	0.0161	0.0159
1,2-Ethyl-n-propylbenzene	A11	0.1643	0.2003	0.1688
2-Methylindan	A11	0.0782	0.1210	0.1193
1,3-Methyl-n-butylbenzene	A11	0.0842	0.1026	0.0864
1,3-Di-i-propylbenzene	A11	0.0835	0.1018	0.0858
sec-Pentylbenzene	A11	0.1028	0.1253	0.1056
n-Pentylbenzene	A11	0.0698	0.0940	0.0809
1t-M-2-(4MP)cyclopentane	P12	0.0734	0.1135	0.1119
1,2-Di-n-propylbenzene	A11	0.1113	0.1357	0.1143
1,4-Di-i-propylbenzene	A11	0.1975	0.2407	0.2028
Tetrahydronaphthalene	A10	0.0279	0.0340	0.0286
t-Decahydronaphthalene	A10	0.1562	0.1904	0.1604
Naphthalene	A10	0.1085	0.1263	0.1064
1-t-Butyl-3,5-dimethylbenzene	A12	0.0687	0.0837	0.0705
1,4-Ethyl-t-butylbenzene	A11	0.1056	0.1287	0.1084
UnknownC11s	U11	1.5692	2.2273	2.2207
n-Dodecane	P12	0.9276	1.4348	1.4148
1,3-Di-n-propylbenzene	A12	0.0821	0.1001	0.0843
1,3,5-Triethylbenzene	A12	0.0343	0.0374	0.0319
1,2,4-Triethylbenzene	A12	0.3263	0.3561	0.3002
1,4-Methyl-n-pentylbenzene	A12	0.0546	0.0665	0.0560
n-Hexylbenzene	A12	0.1315	0.1938	0.1669
1,2,3,4,5-Pentamethylbenzene	A13	0.2219	0.2705	0.2279
2-Methylnaphthalene	A11	0.2646	0.3417	0.2879
1-Methylnaphthalene	A11	0.1936	0.2500	0.1810
UnknownC12s	U12	1.2019	1.8591	1.8332
n-Tridecane	P13	0.7522	1.2593	1.2271
UnknownC13s	U13	1.2365	2.0700	2.0171
n-Tetradecane	P14	0.4040	0.7278	0.7078
UnknownC14s	U14	1.1554	2.0815	2.0242
n-Pentadecane	P15	0.1649	0.3181	0.3058
UnknownC15s	U15	1.0557	2.0364	1.9576
n-Hexadecane	P16	0.0050	0.0103	0.0098
UnknownC16s	U16	0.3249	0.6681	0.6381
n-Heptadecane	P17	0.0015	0.0033	0.0031
UnknownC17s	U17	0.0065	0.0142	0.0135
n-Octadecane	P18	0.0004	0.0009	0.0009
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. :	201406094	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	JUNE 18, 2014
ACCOUNT NO. :		SAMPLE DATE :	JUNE 13, 2014
PRODUCER :		CYLINDER NO. :	1179
LEASE NO. :		SAMPLED BY :	JOHN MOSER-EMPACT
NAME/DESCRIP :	SALES GAS @ 11:25 BRINGELSON RANCH 10-20-9-58		
FIELD DATA		SAMPLE TEMP. :	118
SAMPLE PRES. :	103	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; LENGTH OF H2S STAIN @ 2.0 PPM (1-7 PPM) @ 11:30		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0021	0.0047		
HELIUM	0.01	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.01	0.01	---	---
NITROGEN	0.74	0.77	---	---
CARBON DIOXIDE	2.44	4.01	---	---
METHANE	60.66850	36.35070	---	---
ETHANE	14.6013	16.3979	3.9043	3.9256
PROPANE	12.9094	21.2609	3.5555	3.5749
I-BUTANE	1.2647	2.7454	0.4140	0.4162
N-BUTANE	4.2907	9.3143	1.3522	1.3596
I-PENTANE	0.8683	2.3333	0.3108	0.3124
N-PENTANE	1.0125	2.7284	0.3669	0.3689
HEXANES PLUS	1.1725	4.0744	0.4749	0.4773
TOTALS	100.00000	100.00000	10.3786	10.4349

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0335	0.0977
TOLUENE	0.0233	0.0802
ETHYLBENZENE	0.0031	0.0123
XYLENES	0.0084	0.0333
TOTAL BTEX	0.0683	0.2235

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1381.2 **/scf**	1388.7 **/scf**
	NET WET REAL :	1357.1 **/scf**	1364.6 **/scf**
HIGH	GROSS DRY REAL :	1514.2 **/scf**	1522.5 **/scf**
	GROSS WET REAL :	1487.7 **/scf**	1496.0 **/scf**
	NET DRY REAL :	19596.8 **/lb**	19703.8 **/lb**
	GROSS DRY REAL :	21484.7 **/lb**	21602.0 **/lb**
	RELATIVE DENSITY (AIR=1):		0.9232
	COMPRESSIBILITY FACTOR :		0.99449

(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

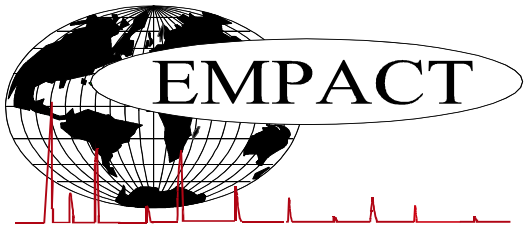
303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201406094	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	JUNE 18, 2014
ACCOUNT NO. :		SAMPLE DATE :	JUNE 13, 2014
PRODUCER :		CYLINDER NO. :	1179
LEASE NO. :		SAMPLED BY :	JOHN MOSER-EMPACT
NAME/DESCRIP :	SALES GAS @ 11:25 BRINGELSON RANCH 10-20-9-58		
FIELD DATA		SAMPLE TEMP. :	118
SAMPLE PRES. :	103	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; LENGTH OF H2S STAIN @ 2.0 PPM (1-7 PPM) @ 11:30		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	2.44	4.01
Nitrogen	0.74	0.77
Methane	60.66850	36.35070
Ethane	14.6013	16.3979
Propane	12.9094	21.2609
Isobutane	1.2647	2.7454
n-Butane	4.2907	9.3143
Isopentane	0.7824	2.1083
n-Pentane	1.0125	2.7284
Cyclopentane	0.0859	0.2250
n-Hexane	0.2278	0.7332
Cyclohexane	0.0608	0.1911
Other Hexanes	0.4056	1.2952
Heptanes	0.2171	0.8064
Methycyclohexane	0.0530	0.1944
2,2,4 Trimethylpentane	0.0002	0.0009
Benzene	0.0335	0.0977
Toluene	0.0233	0.0802
Ethylbenzene	0.0031	0.0123
Xylenes	0.0084	0.0333
C8+ Heavies	0.1397	0.6297
Subtotal	99.98790	99.98530
Oxygen/Argon	0.01	0.01
Alcohols	0.0021	0.0047
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201406094	ANALYSIS NO. :	02
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	JUNE 18, 2014
ACCOUNT NO. :		SAMPLE DATE :	JUNE 13, 2014
PRODUCER :		CYLINDER NO. :	1179
LEASE NO. :		SAMPLED BY :	JOHN MOSER-EMPACT
NAME/DESCRIP :	SALES GAS @ 11:25 BRINGELSON RANCH 10-20-9-58		
FIELD DATA		SAMPLE TEMP. :	118
SAMPLE PRES. :	103	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; LENGTH OF H2S STAIN @ 2.0 PPM (1-7 PPM) @ 11:30		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.01	0.00	---	---
Oxygen/Argon	---	0.01	0.01	---	---
Nitrogen	---	0.74	0.77	---	---
Carbon Dioxide	---	2.44	4.01	---	---
Methane	P1	60.66850	36.35070	---	---
Ethane	P2	14.6013	16.3979	3.904	3.926
Propane	P3	12.9094	21.2609	3.556	3.575
i-Butane	I4	1.2647	2.7454	0.414	0.416
n-Butane	P4	4.2907	9.3143	1.352	1.360
2,2-Dimethylpropane	I5	0.0033	0.0089	0.001	0.001
i-Pentane	I5	0.7791	2.0994	0.285	0.286
Acetone	X3	0.0018	0.0039	0.001	0.001
n-Pentane	P5	1.0124	2.7281	0.367	0.369
t-Butanol	X4	0.0003	0.0008	0.000	0.000
2,2-Dimethylbutane	I6	0.0025	0.0080	0.001	0.001
Cyclopentane	N5	0.0859	0.2250	0.025	0.025
2,3-Dimethylbutane	I6	0.0155	0.0499	0.006	0.006
2-Methylpentane	I6	0.1647	0.5301	0.068	0.069
3-Methylpentane	I6	0.0865	0.2784	0.035	0.035
UnknownC5s	U5	0.0001	0.0003	0.000	0.000
n-Hexane	P6	0.2278	0.7332	0.093	0.094
2,2-Dimethylpentane	I7	0.0002	0.0008	0.000	0.000
Methylcyclopentane	N6	0.1364	0.4288	0.048	0.048
2,4-Dimethylpentane	I7	0.0057	0.0213	0.003	0.003
2,2,3-Trimethylbutane	I7	0.0002	0.0008	0.000	0.000
Benzene	A6	0.0335	0.0977	0.009	0.009
3,3-Dimethylpentane	I7	0.0003	0.0011	0.000	0.000
Cyclohexane	N6	0.0608	0.1911	0.021	0.021
2-Methylhexane	I7	0.0246	0.0921	0.011	0.011
2,3-Dimethylpentane	I7	0.0110	0.0412	0.005	0.005
1,1-Dimethylcyclopentane	N7	0.0088	0.0323	0.004	0.004
3-Methylhexane	I7	0.0294	0.1100	0.013	0.013
1c,3-Dimethylcyclopentane	N7	0.0179	0.0657	0.008	0.008
1t,3-Dimethylcyclopentane	N7	0.0158	0.0579	0.007	0.007
3-Ethylpentane	I7	0.0015	0.0056	0.001	0.001

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1t,2-Dimethylcyclopentane	N7	0.0309	0.1133	0.014	0.014
2,2,4-Trimethylpentane	I8	0.0002	0.0009	0.000	0.000
n-Heptane	P7	0.0618	0.2313	0.028	0.028
1c,2-Dimethylcyclopentane	N7	0.0023	0.0084	0.001	0.001
Methylcyclohexane	N7	0.0530	0.1944	0.021	0.021
2,2-Dimethylhexane	I8	0.0054	0.0230	0.002	0.002
Ethylcyclopentane	N7	0.0067	0.0246	0.003	0.003
2,5-Dimethylhexane	I8	0.0010	0.0043	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0004	0.0017	0.000	0.000
2,4-Dimethylhexane	I8	0.0024	0.0102	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0047	0.0197	0.002	0.002
3,3-Dimethylhexane	I8	0.0004	0.0017	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0052	0.0218	0.002	0.002
2,3,4-Trimethylpentane	I8	0.0009	0.0039	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0004	0.000	0.000
Toluene	A7	0.0233	0.0802	0.008	0.008
2,3-Dimethylhexane	I8	0.0021	0.0090	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0011	0.0047	0.001	0.001
1,1,2-Trimethylcyclopentane	N8	0.0001	0.0004	0.000	0.000
2-Methylheptane	I8	0.0108	0.0461	0.006	0.006
4-Methylheptane	I8	0.0028	0.0120	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0004	0.0017	0.000	0.000
3,4-Dimethylhexane	I8	0.0005	0.0021	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0003	0.0013	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0002	0.0008	0.000	0.000
3-Methylheptane	I8	0.0046	0.0196	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0083	0.0348	0.004	0.004
3-Ethylhexane	I8	0.0011	0.0047	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0030	0.0126	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0009	0.0038	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0013	0.0055	0.001	0.001
2t-Ethylmethylcyclopentane	N8	0.0011	0.0046	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0036	0.0151	0.002	0.002
2,2,4-Trimethylhexane	I9	0.0003	0.0014	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0040	0.0168	0.002	0.002
n-Octane	P8	0.0136	0.0580	0.007	0.007
1c,4-Dimethylcyclohexane	N8	0.0042	0.0176	0.002	0.002
i-Propylcyclopentane	I8	0.0002	0.0008	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0010	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	0.0010	0.0042	0.001	0.001
2,2-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0045	0.0212	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0016	0.0077	0.001	0.001
2,4-Dimethylheptane	I9	0.0005	0.0024	0.000	0.000
4,4-Dimethylheptane	I9	0.0002	0.0010	0.000	0.000
Ethylcyclohexane	N8	0.0024	0.0101	0.001	0.001
n-Propylcyclopentane	N8	0.0009	0.0038	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0002	0.0009	0.000	0.000
2,5-Dimethylheptane	I9	0.0003	0.0014	0.000	0.000
3,3-Dimethylheptane	I9	0.0004	0.0019	0.000	0.000
3,5-Dimethylheptane	I9	0.0002	0.0010	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0010	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0003	0.0014	0.000	0.000
Ethylbenzene	I8	0.0031	0.0123	0.001	0.001
1c,2t,4t-Trimethylcyclohexane	N9	0.0008	0.0038	0.000	0.000
2,3-Dimethylheptane	I9	0.0003	0.0014	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0033	0.0131	0.001	0.001

1,4-Dimethylbenzene (p-Xylene)	A8	0.0029	0.0115	0.001	0.001
3,4-Dimethylheptane	I9	0.0003	0.0014	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0006	0.0029	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0005	0.000	0.000
4-Methyloctane	I9	0.0010	0.0048	0.001	0.001
2-Methyloctane	I9	0.0013	0.0062	0.001	0.001
1c,2t,3-Trimethylcyclohexane	N9	0.0002	0.0009	0.000	0.000
3-Ethylheptane	I9	0.0003	0.0014	0.000	0.000
3-Methyloctane	I9	0.0015	0.0072	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	0.0010	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0022	0.0087	0.001	0.001
i-Butylcyclopentane	N9	0.0009	0.0043	0.000	0.000
UnknownC8s	U8	0.0001	0.0004	0.000	0.000
n-Nonane	P9	0.0048	0.0230	0.003	0.003
1,1-Methylethylcyclohexane	N9	0.0006	0.0028	0.000	0.000
i-Propylbenzene	A9	0.0012	0.0054	0.001	0.001
i-Propylcyclohexane	N9	0.0002	0.0009	0.000	0.000
2,2-Dimethyloctane	I10	0.0002	0.0011	0.000	0.000
2,4-Dimethyloctane	I10	0.0002	0.0011	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
n-Butylcyclopentane	N9	0.0009	0.0043	0.001	0.001
3,3-Dimethyloctane	I10	0.0002	0.0011	0.000	0.000
n-Propylbenzene	A9	0.0009	0.0040	0.000	0.000
3,6-Dimethyloctane	I10	0.0006	0.0032	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0007	0.0037	0.000	0.000
1,3-Methylethylbenzene	A9	0.0007	0.0031	0.000	0.000
1,4-Methylethylbenzene	A9	0.0003	0.0013	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0004	0.0018	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
5-Methylnonane	I10	0.0004	0.0021	0.000	0.000
1,2-Methylethylbenzene	A9	0.0009	0.0040	0.001	0.001
2-Methylnonane	I10	0.0001	0.0005	0.000	0.000
3-Ethyloctane	I10	0.0001	0.0005	0.000	0.000
3-Methylnonane	I10	0.0003	0.0016	0.000	0.000
1,2,4-Trimethylbenzene	A9	0.0001	0.0005	0.000	0.000
t-Butylbenzene	A10	0.0008	0.0040	0.000	0.000
i-Butylcyclohexane	N10	0.0003	0.0016	0.000	0.000
1t-Methyl-2-n-propylcyclohexane	I10	0.0001	0.0005	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	0.0043	0.0206	0.002	0.002
n-Decane	P10	0.0016	0.0085	0.001	0.001
1,2,3-Trimethylbenzene	A9	0.0003	0.0013	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	0.0004	0.0021	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0002	0.0010	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0006	0.000	0.000
1,3-Diethylbenzene	A10	0.0002	0.0010	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0005	0.000	0.000
1,4-Diethylbenzene	A10	0.0002	0.0010	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
1,3-Dimethyl-4-ethylbenzene	A10	0.0001	0.0005	0.000	0.000

1,2-Dimethyl-4-ethylbenzene	A10	0.0002	0.0010	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0001	0.0005	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0001	0.0005	0.000	0.000
1,2-Ethyl-i-propylbenzene	A10	0.0001	0.0006	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0001	0.0006	0.000	0.000
UnknownC10s	U10	0.0035	0.0186	0.002	0.002
n-Undecane	P11	0.0007	0.0041	0.000	0.000
1,4-Ethyl-i-propylbenzene	A11	0.0001	0.0006	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
1,2-Ethyl-n-propylbenzene	A11	0.0001	0.0006	0.000	0.000
2-Methylindan	A11	0.0001	0.0005	0.000	0.000
1,3-Methyl-n-butylbenzene	A11	0.0001	0.0006	0.000	0.000
1,3-Di-i-propylbenzene	A11	0.0001	0.0006	0.000	0.000
sec-Pentylbenzene	A11	0.0001	0.0006	0.000	0.000
n-Pentylbenzene	A11	0.0001	0.0006	0.000	0.000
1,2-Di-n-propylbenzene	A11	0.0001	0.0006	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0001	0.0006	0.000	0.000
Tetrahydronaphthalene	A10	0.0001	0.0005	0.000	0.000
Naphthalene	A10	0.0001	0.0005	0.000	0.000
1-t-Butyl-3,5-dimethylbenzene	A12	0.0001	0.0006	0.000	0.000
1,4-Ethyl-t-butylbenzene	A11	0.0001	0.0006	0.000	0.000
UnknownC11s	U11	0.0013	0.0076	0.001	0.001
n-Dodecane	P12	0.0004	0.0025	0.000	0.000
1,2,4-Triethylbenzene	A12	0.0001	0.0006	0.000	0.000
2-Methylnaphthalene	A11	0.0001	0.0005	0.000	0.000
UnknownC12s	U12	0.0011	0.0064	0.001	0.001
n-Tridecane	P13	0.0001	0.0007	0.000	0.000
UnknownC13s	U13	0.0002	0.0014	0.000	0.000
n-Tetradecane	P14	0.0001	0.0008	0.000	0.000
TOTAL		100.00000	100.00000	10.3796	10.4359

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0335	0.0977
TOLUENE	0.0233	0.0802
ETHYLBENZENE	0.0031	0.0123
XYLENES	0.0084	0.0333
TOTAL BTEX	0.0683	0.2235

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1381.2 **/scf**	1388.7 **/scf**
	NET WET REAL :	1357.1 **/scf**	1364.6 **/scf**
HIGH	GROSS DRY REAL :	1514.2 **/scf**	1522.5 **/scf**
	GROSS WET REAL :	1487.7 **/scf**	1496.0 **/scf**
	NET DRY REAL :	19596.8 **/lb**	19703.8 **/lb**
	GROSS DRY REAL :	21484.7 **/lb**	21602.0 **/lb**
	RELATIVE DENSITY (AIR=1):		0.9232
	COMPRESSIBILITY FACTOR :		0.99449

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

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

THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBLITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBLITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

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

CRUDE OIL ASSAY

PROJECT NO. :	201406094	ANALYSIS NO. :	03
COMPANY NAME :	CARRIZO OIL & GAS	ANALYSIS DATE:	JUNE 18, 2014
ACCOUNT NO. :		SAMPLE DATE :	JUNE 13, 2014
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	PRODUCTION TANK @ 12:20 BRINGELSON RANCH @ 10-20-9-58		EMPACT
FIELD DATA		SAMPLE TEMP. :	102
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		

SPECIFICATION	TEST METHOD	UNITS	RESULTS
API GRAVITY		API 60/60	35.7
RVP @100 DEG F	D323	PSIG	6.8
TOTAL SULFUR	D2622	WT %	0.316
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			BLACK
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