



Company: Noble Energy  
 Well: Steve J18-15  
 API #: 05-123-23641  
 Rig Name: Production/Lightning  
 State/County: Colorado/Weld  
 Latitude: 40.393, Longitude: -104.822  
 GRID North is 0.440 Degrees East of True North  
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01\_ed.ut

Minimum Curvature Method

Report Date/Time: 8/18/2012 / 18:49

Vaughn Energy Services  
 Henderson, Colorado  
 866-835-8333  
 Randy Holcomb  
 RKB=Ground Level

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	1.413	335.110	99.990	1.118	-0.519	1.118	1.233	335.110	1.413
200.000	1.550	326.299	199.957	3.362	-1.788	3.362	3.808	331.992	0.265
300.000	1.586	324.716	299.919	5.616	-3.338	5.616	6.533	329.278	0.056
400.000	1.981	316.313	399.871	7.996	-5.331	7.996	9.610	326.308	0.473
500.000	2.322	319.493	499.800	10.786	-7.840	10.786	13.334	323.986	0.361
600.000	2.683	325.236	599.705	14.249	-10.491	14.249	17.695	323.637	0.440
700.000	2.654	326.148	699.596	18.095	-13.116	18.095	22.348	324.065	0.052
800.000	2.589	328.723	799.492	21.948	-15.578	21.948	26.915	324.634	0.134
900.000	2.578	328.611	899.390	25.798	-17.922	25.798	31.412	325.213	0.012
1000.000	2.575	330.320	999.289	29.669	-20.205	29.669	35.896	325.745	0.077
1100.000	2.407	353.460	1099.197	33.707	-21.557	33.707	40.011	327.400	1.012
1200.000	2.241	12.993	1199.116	37.699	-21.356	37.699	43.328	330.468	0.805
1300.000	2.271	32.075	1299.040	41.283	-19.864	41.283	45.814	334.304	0.748
1400.000	2.255	45.594	1398.963	44.338	-17.407	44.338	47.633	338.565	0.533
1500.000	3.301	53.691	1498.844	47.419	-13.682	47.419	49.354	343.906	1.115
1600.000	4.348	59.227	1598.621	51.064	-8.105	51.064	51.703	350.981	1.110
1700.000	6.046	62.109	1698.206	55.467	-0.192	55.467	55.468	359.801	1.717
1800.000	8.024	64.356	1797.448	60.952	10.755	60.952	61.893	10.007	1.996
1900.000	9.092	63.175	1896.334	67.538	24.098	67.538	71.708	19.637	1.083
2000.000	10.825	64.565	1994.823	75.137	39.630	75.137	84.948	27.809	1.750
2100.000	11.789	64.603	2092.881	83.551	57.339	83.551	101.334	34.461	0.964
2200.000	12.199	69.610	2190.701	91.614	76.471	91.614	119.336	39.852	1.118
2300.000	12.641	68.986	2288.360	99.219	96.589	99.219	138.470	44.231	0.462
2400.000	11.665	63.727	2386.121	107.618	115.870	107.618	158.138	47.115	1.475
2500.000	10.739	61.423	2484.215	116.550	133.118	116.550	176.930	48.797	1.028
2600.000	11.328	57.985	2582.367	126.213	149.627	126.213	195.750	49.852	0.882
2700.000	11.809	57.914	2680.336	136.855	166.624	136.855	215.622	50.602	0.481
2800.000	12.907	57.777	2778.017	148.247	184.743	148.247	236.869	51.255	1.099
2900.000	13.691	57.704	2875.334	160.525	204.195	160.525	259.738	51.828	0.784
3000.000	12.168	57.715	2972.796	172.478	223.109	172.478	282.005	52.294	1.523
3100.000	12.337	59.213	3070.519	183.576	241.197	183.576	303.111	52.725	0.360
3200.000	12.371	63.441	3168.205	193.834	259.956	193.834	324.267	53.290	0.905
3300.000	11.986	61.453	3265.955	203.586	278.659	203.586	345.106	53.849	0.569
3400.000	11.403	57.705	3363.880	213.830	296.138	213.830	365.268	54.168	0.957

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N-S FT	+E-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
3500.000	11.748	53.097	3461.848	225.225	312.636	225.225	385.314	54.231	0.987
3600.000	11.500	55.198	3559.797	237.027	328.962	237.027	405.460	54.226	0.491
3700.000	10.431	52.994	3657.971	248.166	344.376	248.166	424.478	54.223	1.148
3800.000	10.207	54.369	3756.353	258.776	358.807	258.776	442.388	54.200	0.333
3900.000	10.826	54.717	3854.673	269.362	373.675	269.362	460.640	54.214	0.622
4000.000	11.483	55.045	3952.783	280.490	389.500	280.490	479.984	54.241	0.660
4100.000	12.156	55.042	4050.663	292.226	406.287	292.226	500.465	54.274	0.673
4200.000	12.464	54.628	4148.363	304.505	423.716	304.505	521.784	54.297	0.321
4300.000	11.554	55.678	4246.174	316.399	440.787	316.399	542.588	54.329	0.936
4400.000	11.438	56.579	4344.168	327.507	457.333	327.507	562.507	54.393	0.214
4500.000	12.055	55.694	4442.073	338.854	474.235	338.854	582.856	54.453	0.643
4600.000	12.257	52.877	4539.832	351.146	491.325	351.146	603.907	54.447	0.627
4700.000	13.187	52.579	4637.376	364.484	508.848	364.484	625.919	54.386	0.932
4800.000	12.865	55.345	4734.803	377.746	527.065	377.746	648.451	54.371	0.701
4900.000	12.061	56.425	4832.446	389.854	544.928	389.854	670.024	54.419	0.837
5000.000	11.349	55.939	4930.366	401.144	561.784	401.144	690.303	54.471	0.719
5100.000	10.457	55.832	5028.560	411.751	577.444	411.751	709.212	54.509	0.893
5200.000	8.944	53.812	5127.128	421.438	591.227	421.438	726.058	54.518	1.550
5300.000	6.068	51.364	5226.261	429.330	601.632	429.330	739.111	54.488	2.893
5400.000	3.971	50.271	5325.871	434.843	608.424	434.843	747.842	54.446	2.099
5500.000	1.573	52.068	5425.747	437.901	612.170	437.901	752.668	54.423	2.399
5600.000	0.590	130.829	5525.732	438.407	613.642	438.407	754.160	54.457	1.569
5700.000	0.640	248.413	5625.729	437.865	613.512	437.865	753.740	54.484	1.053
5800.000	0.876	281.163	5725.721	437.807	612.242	437.807	752.673	54.432	0.484
5900.000	0.998	358.987	5825.711	438.826	611.477	438.826	752.643	54.335	1.181
6000.000	0.755	31.241	5925.700	440.260	611.803	440.260	753.745	54.261	0.540
6100.000	0.708	32.409	6025.691	441.345	612.476	441.345	754.925	54.224	0.049
6200.000	0.709	30.417	6125.684	442.400	613.120	442.400	756.065	54.187	0.025
6300.000	0.559	32.687	6225.678	443.344	613.697	443.344	757.085	54.155	0.152
6400.000	0.450	61.956	6325.674	443.939	614.307	443.939	757.928	54.146	0.276
6500.000	0.389	90.145	6425.671	444.123	614.993	444.123	758.591	54.165	0.213
6600.000	0.399	91.525	6525.669	444.113	615.680	444.113	759.143	54.196	0.014
6700.000	0.350	101.886	6625.667	444.041	616.328	444.041	759.626	54.229	0.083
6800.000	0.367	126.313	6725.665	443.788	616.885	443.788	759.931	54.269	0.153
6900.000	0.378	138.099	6825.663	443.353	617.364	443.353	760.065	54.316	0.077
7000.000	0.366	161.446	6925.661	442.804	617.686	442.804	760.007	54.364	0.151
7100.000	0.592	164.209	7025.657	442.004	617.928	442.004	759.738	54.424	0.227
7200.000	0.591	156.716	7125.652	441.033	618.273	441.033	759.454	54.499	0.077
7300.000	0.603	158.799	7225.646	440.069	618.667	440.069	759.216	54.575	0.025
7400.000	0.513	138.118	7325.642	439.245	619.156	439.245	759.138	54.647	0.219
7500.000	0.502	134.956	7425.638	438.602	619.765	438.602	759.263	54.713	0.030
HORIZONTAL DISPLACEMENT IS 759.263 FEET AT 54.713 DEGREES									