

Company: Noble Energy

Lease/Well: Trinity / 43-7

API: 05-123-22973

Rig Name: Production / Lightning Wireline

State/County: Colorado / Weld County

Latitude: 40.498, Longitude: -104.473

GRID North is 0.660 Degrees East of True North

VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01_ed.ut

Minimum Curvature Method

Report Date/Time: 9/2/2011 / 15:43

Vaughn Energy Services

Henderson Colorado

866-835-8333

RKB = Ground Level

Norman Cowan

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	0.229	294.479	100.000	0.083	-0.182	0.083	0.200	294.479	0.229
200.000	0.253	247.254	199.999	0.080	-0.567	0.080	0.573	278.059	0.194
300.000	0.356	156.785	299.998	-0.291	-0.648	-0.291	0.710	245.857	0.438
400.000	0.391	159.204	399.996	-0.895	-0.405	-0.895	0.982	204.331	0.038
500.000	1.195	136.279	499.986	-1.968	0.437	-1.968	2.016	167.472	0.849
600.000	1.262	139.076	599.963	-3.554	1.879	-3.554	4.020	152.126	0.090
700.000	1.304	135.804	699.938	-5.201	3.394	-5.201	6.211	146.875	0.085
800.000	1.298	138.642	799.912	-6.868	4.936	-6.868	8.457	144.294	0.065
900.000	1.259	143.771	899.887	-8.604	6.334	-8.604	10.684	143.642	0.121
1000.000	1.342	141.462	999.861	-10.406	7.712	-10.406	12.952	143.456	0.098
1100.000	1.359	137.259	1099.833	-12.193	9.247	-12.193	15.302	142.824	0.101
1200.000	1.267	137.711	1199.807	-13.882	10.796	-13.882	17.585	142.128	0.092
1300.000	1.373	138.220	1299.781	-15.593	12.338	-15.593	19.884	141.648	0.106
1400.000	1.281	135.970	1399.754	-17.291	13.913	-17.291	22.193	141.177	0.106
1500.000	1.313	138.002	1499.728	-18.946	15.457	-18.946	24.451	140.791	0.056
1600.000	1.275	136.445	1599.703	-20.604	16.990	-20.604	26.705	140.490	0.052
1700.000	1.346	137.825	1699.677	-22.280	18.545	-22.280	28.989	140.227	0.078
1800.000	1.298	135.467	1799.650	-23.958	20.128	-23.958	31.291	139.965	0.073
1900.000	0.880	141.570	1899.632	-25.366	21.399	-25.366	33.187	139.849	0.433
2000.000	0.272	150.999	1999.626	-26.176	21.992	-26.176	34.188	139.964	0.613
2100.000	0.317	158.265	2099.625	-26.641	22.210	-26.641	34.684	140.183	0.058
2200.000	0.404	138.194	2199.623	-27.161	22.547	-27.161	35.300	140.303	0.152
2300.000	0.627	144.694	2299.619	-27.870	23.098	-27.870	36.197	140.349	0.230
2400.000	0.659	133.792	2399.613	-28.714	23.829	-28.714	37.314	140.312	0.126
2500.000	0.732	143.884	2499.605	-29.629	24.621	-29.629	38.524	140.274	0.143
2600.000	0.574	170.556	2599.599	-30.639	25.080	-30.639	39.595	140.697	0.338
2700.000	0.219	199.244	2699.596	-31.314	25.099	-31.314	40.131	141.286	0.396
2800.000	0.193	289.249	2799.596	-31.439	24.877	-31.439	40.091	141.646	0.292
2900.000	0.218	323.771	2899.595	-31.230	24.605	-31.230	39.758	141.766	0.124
3000.000	0.066	255.912	2999.595	-31.090	24.437	-31.090	39.545	141.832	0.203
3100.000	0.195	263.540	3099.595	-31.123	24.213	-31.123	39.432	142.118	0.130
3200.000	0.259	329.644	3199.594	-30.947	23.930	-30.947	39.120	142.288	0.253
3300.000	0.160	316.052	3299.593	-30.652	23.719	-30.652	38.757	142.267	0.110
3400.000	0.324	299.527	3399.593	-30.412	23.376	-30.412	38.358	142.453	0.177

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	0.449	301.444	3499.590	-30.068	22.796	-30.068	37.733	142.834	0.126
3600.000	0.458	283.265	3599.587	-29.772	22.072	-29.772	37.062	143.448	0.144
3700.000	0.525	308.966	3699.584	-29.393	21.327	-29.393	36.315	144.036	0.228
3800.000	0.489	294.563	3799.580	-28.928	20.583	-28.928	35.503	144.566	0.132
3900.000	0.411	308.286	3899.577	-28.528	19.914	-28.528	34.791	145.083	0.133
4000.000	0.302	14.076	3999.575	-28.051	19.697	-28.051	34.276	144.924	0.398
4100.000	0.394	45.339	4099.573	-27.553	20.006	-27.553	34.050	144.017	0.208
4200.000	0.585	72.379	4199.570	-27.157	20.737	-27.157	34.169	142.635	0.295
4300.000	0.648	75.845	4299.564	-26.864	21.771	-26.864	34.579	140.978	0.073
4400.000	0.286	100.803	4399.561	-26.773	22.564	-26.773	35.013	139.875	0.407
4500.000	0.298	190.668	4499.560	-27.075	22.761	-27.075	35.371	139.947	0.412
4600.000	0.614	246.195	4599.557	-27.547	22.223	-27.547	35.393	141.106	0.509
4700.000	0.918	220.676	4699.548	-28.371	21.210	-28.371	35.423	143.218	0.450
4800.000	1.341	216.420	4799.528	-29.920	19.993	-29.920	35.985	146.248	0.432
4900.000	1.451	209.527	4899.499	-31.963	18.674	-31.963	37.019	149.705	0.200
5000.000	1.408	212.666	4999.468	-34.099	17.388	-34.099	38.276	152.982	0.089
5100.000	1.295	204.931	5099.440	-36.157	16.249	-36.157	39.640	155.802	0.214
5200.000	0.960	200.605	5199.420	-37.966	15.478	-37.966	40.999	157.821	0.345
5300.000	0.633	186.680	5299.411	-39.299	15.118	-39.299	42.106	158.958	0.378
5400.000	0.159	105.075	5399.409	-39.884	15.188	-39.884	42.678	159.152	0.630
5500.000	0.323	109.774	5499.408	-40.015	15.588	-40.015	42.944	158.716	0.165
5600.000	0.254	92.926	5599.406	-40.122	16.075	-40.122	43.223	158.166	0.109
5700.000	0.399	109.954	5699.405	-40.252	16.624	-40.252	43.550	157.560	0.173
5800.000	0.270	114.225	5799.403	-40.468	17.167	-40.468	43.958	157.013	0.131
5900.000	0.117	68.410	5899.402	-40.527	17.476	-40.527	44.135	156.673	0.207
6000.000	0.119	106.641	5999.402	-40.520	17.671	-40.520	44.205	156.438	0.077
6100.000	0.198	134.989	6099.402	-40.672	17.893	-40.672	44.434	156.253	0.109
6200.000	0.054	9.781	6199.402	-40.748	18.024	-40.748	44.556	156.139	0.234
6300.000	0.155	44.922	6299.402	-40.606	18.128	-40.606	44.468	155.943	0.116
6400.000	0.089	316.213	6399.401	-40.454	18.169	-40.454	44.347	155.813	0.177
6500.000	0.188	40.611	6499.401	-40.273	18.222	-40.273	44.204	155.655	0.200
6600.000	0.165	326.085	6599.401	-40.029	18.248	-40.029	43.992	155.493	0.214
6700.000	0.135	350.797	6699.400	-39.794	18.149	-39.794	43.737	155.483	0.071
HORIZONTAL DISPLACEMENT IS 43.737 FEET AT 155.483 DEGREES									