



Company: Noble Energy
Well: Dechant X 19-03
API: 05-123-25386
Rig Name: Production/Lightning Wireline
State/County: Colorado/ Weld
Latitude: 40.130, Longitude: -104.709
GRID North is 0.510 Degrees East of True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01_ed.ut

Minimum Curvature Method

Report Date/Time: 11/27/2012 / 13:57

Vaughn Energy Services
Henderson, Colorado
866-835-8333
Jason Kinchelow

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	0.470	236.239	99.999	-0.228	-0.341	-0.228	0.411	236.239	0.470
200.000	0.366	283.695	199.996	-0.381	-0.993	-0.381	1.064	249.026	0.350
300.000	0.415	316.587	299.994	-0.042	-1.553	-0.042	1.553	268.463	0.226
400.000	0.366	10.580	399.992	0.536	-1.743	0.536	1.824	287.081	0.357
500.000	0.747	41.530	499.988	1.338	-1.252	1.338	1.832	316.889	0.472
600.000	0.559	40.570	599.981	2.196	-0.503	2.196	2.253	347.100	0.189
700.000	0.461	18.867	699.977	2.947	-0.056	2.947	2.948	358.915	0.215
800.000	0.439	9.796	799.974	3.705	0.139	3.705	3.708	2.156	0.074
900.000	0.690	359.367	899.969	4.685	0.198	4.685	4.690	2.420	0.270
1000.000	1.381	13.961	999.952	6.457	0.482	6.457	6.475	4.270	0.734
1100.000	1.246	7.219	1099.926	8.705	0.909	8.705	8.753	5.964	0.205
1200.000	1.271	2.445	1199.902	10.893	1.093	10.893	10.947	5.732	0.108
1300.000	1.341	346.982	1299.876	13.141	0.877	13.141	13.170	3.819	0.358
1400.000	1.115	331.235	1399.854	15.133	0.146	15.133	15.134	0.551	0.404
1500.000	1.072	330.136	1499.835	16.797	-0.788	16.797	16.816	357.313	0.048
1600.000	1.046	328.677	1599.818	18.388	-1.729	18.388	18.469	354.629	0.038
1700.000	0.953	313.437	1699.803	19.739	-2.807	19.739	19.938	351.907	0.281
1800.000	0.925	310.687	1799.790	20.838	-4.023	20.838	21.222	349.073	0.053
1900.000	0.942	314.639	1899.777	21.942	-5.220	21.942	22.554	346.618	0.066
2000.000	1.020	307.879	1999.762	23.066	-6.507	23.066	23.966	344.245	0.139
2100.000	0.844	328.021	2099.749	24.237	-7.600	24.237	25.400	342.590	0.369
2200.000	0.711	1.483	2199.740	25.481	-7.974	25.481	26.700	342.624	0.465
2300.000	0.426	21.774	2299.735	26.446	-7.820	26.446	27.578	343.528	0.344
2400.000	0.696	44.146	2399.731	27.227	-7.259	27.227	28.178	345.072	0.343
2500.000	0.739	63.313	2499.723	27.953	-6.259	27.953	28.645	347.379	0.243
2600.000	0.649	77.026	2599.716	28.370	-5.131	28.370	28.830	349.748	0.189
2700.000	0.243	75.833	2699.712	28.549	-4.374	28.549	28.882	351.289	0.406
2800.000	0.164	209.988	2799.712	28.477	-4.240	28.477	28.791	351.531	0.376
2900.000	0.390	261.285	2899.711	28.302	-4.648	28.302	28.681	350.674	0.314
3000.000	0.343	273.971	2999.709	28.271	-5.282	28.271	28.760	349.417	0.093
3100.000	0.320	297.329	3099.707	28.420	-5.829	28.420	29.011	348.410	0.136
3200.000	0.250	300.137	3199.706	28.658	-6.266	28.658	29.335	347.666	0.071
3300.000	0.203	301.451	3299.705	28.860	-6.606	28.860	29.607	347.106	0.048
3400.000	0.242	321.408	3399.704	29.118	-6.890	29.118	29.922	346.688	0.086

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	0.296	36.483	3499.704	29.491	-6.868	29.491	30.280	346.891	0.331
3600.000	0.510	69.827	3599.701	29.852	-6.296	29.852	30.509	348.090	0.309
3700.000	0.980	108.653	3699.693	29.732	-5.068	29.732	30.161	350.327	0.665
3800.000	1.118	140.570	3799.677	28.705	-3.638	28.705	28.934	352.777	0.592
3900.000	1.093	146.843	3899.659	27.153	-2.497	27.153	27.267	354.746	0.124
4000.000	1.175	167.882	3999.639	25.351	-1.760	25.351	25.412	356.029	0.422
4100.000	0.857	186.185	4099.624	23.605	-1.625	23.605	23.661	356.062	0.451
4200.000	0.685	202.364	4199.615	22.308	-1.933	22.308	22.392	355.048	0.276
4300.000	0.809	271.441	4299.608	21.773	-2.866	21.773	21.961	352.501	0.853
4400.000	1.521	271.118	4399.587	21.817	-4.899	21.817	22.360	347.344	0.712
4500.000	1.591	278.787	4499.550	22.055	-7.599	22.055	23.327	340.990	0.220
4600.000	1.660	285.211	4599.510	22.647	-10.369	22.647	24.908	335.399	0.195
4700.000	1.484	296.360	4699.472	23.602	-12.927	23.602	26.910	331.290	0.352
4800.000	1.470	289.336	4799.439	24.602	-15.297	24.602	28.970	328.127	0.181
4900.000	1.686	287.229	4899.401	25.462	-17.913	25.462	31.132	324.874	0.223
5000.000	1.875	287.769	4999.353	26.397	-20.876	26.397	33.654	321.662	0.191
5100.000	2.118	301.054	5099.293	27.850	-24.017	27.850	36.775	319.226	0.521
5200.000	1.912	311.250	5199.231	29.903	-26.854	29.903	40.191	318.075	0.413
5300.000	1.510	327.734	5299.187	32.117	-28.811	32.117	43.146	318.105	0.632
5400.000	1.139	343.198	5399.160	34.182	-29.802	34.182	45.349	318.916	0.512
5500.000	1.028	353.278	5499.143	36.024	-30.194	36.024	47.004	320.031	0.220
5600.000	1.218	351.812	5599.123	37.966	-30.450	37.966	48.669	321.269	0.192
5700.000	1.009	357.865	5699.104	39.898	-30.635	39.898	50.303	322.482	0.239
5800.000	0.773	344.788	5799.092	41.429	-30.844	41.429	51.650	323.332	0.310
5900.000	0.896	326.010	5899.082	42.729	-31.459	42.729	53.060	323.638	0.298
6000.000	0.974	338.298	5999.069	44.167	-32.211	44.167	54.665	323.897	0.215
6100.000	1.088	339.929	6099.052	45.849	-32.851	45.849	56.403	324.379	0.118
6200.000	1.137	338.883	6199.034	47.667	-33.534	47.667	58.281	324.873	0.053
6300.000	1.246	347.194	6299.012	49.653	-34.133	49.653	60.253	325.494	0.204
6400.000	1.096	324.105	6398.992	51.488	-34.934	51.488	62.220	325.843	0.491
6500.000	1.142	326.399	6498.973	53.092	-36.046	53.092	64.172	325.826	0.064
6600.000	0.855	290.282	6598.958	54.180	-37.297	54.180	65.777	325.457	0.676
6700.000	1.218	258.305	6698.943	54.224	-39.038	54.224	66.814	324.248	0.669
6800.000	2.011	251.151	6798.902	53.441	-41.739	53.441	67.809	322.010	0.817
6900.000	2.243	240.782	6898.834	51.919	-45.107	51.919	68.777	319.016	0.448
7000.000	1.829	198.374	6998.776	49.450	-47.317	49.450	68.442	316.262	1.522
7100.000	2.433	178.177	7098.708	45.814	-47.753	45.814	66.176	313.813	0.955
7200.000	2.430	166.337	7198.618	41.632	-47.185	41.632	62.926	311.423	0.501
7300.000	0.930	195.165	7298.574	38.789	-46.896	38.789	60.859	309.595	1.676
7400.000	0.967	254.826	7398.562	37.784	-47.923	37.784	61.027	308.254	0.944
7500.000	1.484	294.284	7498.541	38.096	-49.918	38.096	62.795	307.350	0.960
7600.000	1.717	310.167	7598.502	39.595	-52.244	39.595	65.553	307.158	0.498
7700.000	1.712	310.843	7698.457	41.538	-54.518	41.538	68.539	307.304	0.021
7800.000	2.037	322.883	7798.404	43.932	-56.720	43.932	71.744	307.759	0.509

HORIZONTAL DISPLACEMENT IS 71.744 FEET AT 307.759 DEGREES
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