



Company: Noble Energy
Well: Petrikin A 34-13
API: 05-123-13477
Rig Name: Production/Lightning Wireline
State/County: Colorado/Weld
Latitude: 40.437, Longitude: -104.543
GRID North is 0.620 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-de_01.ut

Minimum Curvature Method

Report Date/Time: 1/22/2013 / 22:37

Vaughn Energy Services
Henderson, CO
303-853-4976
Levi Sheldon

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	0.379	89.523	99.999	0.003	0.331	0.003	0.331	89.523	0.379
200.000	0.519	114.134	199.996	-0.180	1.075	-0.180	1.090	99.492	0.235
300.000	0.160	164.549	299.994	-0.500	1.526	-0.500	1.606	108.134	0.435
400.000	0.427	110.855	399.993	-0.767	1.911	-0.767	2.059	111.869	0.356
500.000	0.514	143.157	499.990	-1.258	2.528	-1.258	2.823	116.464	0.275
600.000	0.457	159.522	599.986	-1.990	2.936	-1.990	3.547	124.136	0.149
700.000	0.185	167.968	699.985	-2.522	3.109	-2.522	4.003	129.047	0.275
800.000	0.495	126.367	799.983	-2.936	3.491	-2.936	4.561	130.067	0.378
900.000	0.496	171.414	899.980	-3.620	3.903	-3.620	5.324	132.844	0.380
1000.000	0.638	132.677	999.975	-4.425	4.377	-4.425	6.224	135.312	0.399
1100.000	0.739	154.826	1099.968	-5.386	5.060	-5.386	7.390	136.784	0.283
1200.000	0.850	168.382	1199.959	-6.696	5.484	-6.696	8.655	140.681	0.217
1300.000	0.907	167.245	1299.947	-8.194	5.808	-8.194	10.044	144.670	0.060
1400.000	0.967	165.195	1399.933	-9.782	6.199	-9.782	11.581	147.639	0.069
1500.000	0.647	154.103	1499.923	-11.106	6.661	-11.106	12.950	149.047	0.355
1600.000	0.609	158.500	1599.917	-12.108	7.102	-12.108	14.037	149.606	0.061
1700.000	0.619	183.420	1699.912	-13.141	7.264	-13.141	15.016	151.067	0.265
1800.000	0.809	200.426	1799.904	-14.342	6.986	-14.342	15.953	154.030	0.282
1900.000	0.846	193.908	1899.894	-15.720	6.562	-15.720	17.035	157.343	0.101
2000.000	0.759	213.613	1999.884	-16.988	6.018	-16.988	18.023	160.493	0.288
2100.000	0.488	196.669	2099.878	-17.948	5.529	-17.948	18.780	162.877	0.325
2200.000	0.358	156.175	2199.876	-18.642	5.533	-18.642	19.446	163.469	0.317
2300.000	0.341	175.105	2299.874	-19.224	5.685	-19.224	20.047	163.527	0.116
2400.000	0.501	134.073	2399.871	-19.825	6.024	-19.825	20.720	163.098	0.331
2500.000	0.401	98.758	2499.868	-20.183	6.684	-20.183	21.261	161.676	0.290
2600.000	0.292	139.142	2599.867	-20.429	7.197	-20.429	21.659	160.593	0.260
2700.000	0.375	62.370	2699.865	-20.470	7.653	-20.470	21.854	159.500	0.419
2800.000	0.458	67.561	2799.863	-20.165	8.313	-20.165	21.812	157.597	0.091
2900.000	0.472	102.663	2899.860	-20.103	9.084	-20.103	22.060	155.682	0.281
3000.000	0.299	53.659	2999.858	-20.039	9.697	-20.039	22.262	154.177	0.356
3100.000	0.619	104.177	3099.855	-20.016	10.431	-20.016	22.571	152.474	0.487
3200.000	0.733	118.443	3199.848	-20.453	11.518	-20.453	23.474	150.615	0.203
3300.000	0.969	142.109	3299.837	-21.426	12.600	-21.426	24.856	149.541	0.418
3400.000	1.506	153.137	3399.813	-23.265	13.713	-23.265	27.006	149.483	0.585

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	1.532	148.859	3499.778	-25.582	14.999	-25.582	29.654	149.617	0.116
3600.000	1.702	154.525	3599.738	-28.067	16.329	-28.067	32.471	149.810	0.233
3700.000	1.854	152.686	3699.690	-30.845	17.710	-30.845	35.568	150.137	0.162
3800.000	1.804	142.837	3799.640	-33.537	19.403	-33.537	38.745	149.948	0.318
3900.000	1.410	128.925	3899.600	-35.564	21.311	-35.564	41.460	149.069	0.552
4000.000	1.473	103.703	3999.570	-36.641	23.517	-36.641	43.539	147.307	0.632
4100.000	1.380	98.606	4099.539	-37.126	25.956	-37.126	45.300	145.041	0.157
4200.000	1.314	91.071	4199.511	-37.328	28.293	-37.328	46.839	142.839	0.189
4300.000	1.441	88.798	4299.482	-37.323	30.697	-37.323	48.325	140.564	0.139
4400.000	1.151	99.184	4399.457	-37.457	32.946	-37.457	49.884	138.666	0.372
4500.000	0.767	105.402	4499.443	-37.795	34.583	-37.795	51.229	137.541	0.397
4600.000	0.829	97.132	4599.433	-38.062	35.946	-38.062	52.354	136.638	0.131
4700.000	0.633	65.427	4699.425	-37.922	37.167	-37.922	53.099	135.577	0.442
4800.000	0.873	48.174	4799.417	-37.184	38.237	-37.184	53.336	134.200	0.328
4900.000	1.259	57.518	4899.399	-36.087	39.731	-36.087	53.673	132.248	0.421
5000.000	1.002	51.275	4999.380	-34.950	41.340	-34.950	54.134	130.212	0.285
5100.000	0.908	52.791	5099.366	-33.924	42.652	-33.924	54.498	128.498	0.097
5200.000	0.942	38.952	5199.353	-32.807	43.799	-32.807	54.724	126.834	0.225
5300.000	1.063	45.287	5299.338	-31.515	44.975	-31.515	54.918	125.020	0.164
5400.000	0.930	63.045	5399.323	-30.494	46.358	-30.494	55.488	123.337	0.335
5500.000	0.951	78.395	5499.309	-29.959	47.895	-29.959	56.493	122.027	0.252
5600.000	1.002	100.706	5599.295	-29.955	49.567	-29.955	57.915	121.146	0.381
5700.000	0.990	108.688	5699.280	-30.394	51.244	-30.394	59.580	120.673	0.139
5800.000	1.101	102.447	5799.263	-30.878	53.001	-30.878	61.339	120.225	0.159
5900.000	0.846	137.537	5899.250	-31.630	54.437	-31.630	62.959	120.158	0.635
6000.000	0.567	157.555	5999.242	-32.632	55.125	-32.632	64.059	120.624	0.369
6100.000	0.397	195.552	6099.239	-33.423	55.221	-33.423	64.548	121.185	0.353
6200.000	0.218	211.240	6199.237	-33.919	55.029	-33.919	64.643	121.649	0.196
6300.000	0.630	238.558	6299.235	-34.368	54.462	-34.368	64.399	122.254	0.448
6400.000	0.583	276.139	6399.229	-34.600	53.487	-34.600	63.703	122.899	0.393
6500.000	0.711	242.401	6499.223	-34.833	52.431	-34.833	62.948	123.599	0.395
6600.000	0.812	256.046	6599.215	-35.291	51.194	-35.291	62.180	124.581	0.207
6700.000	0.309	293.939	6699.210	-35.353	50.260	-35.353	61.448	125.122	0.599
6800.000	0.391	302.794	6799.208	-35.058	49.727	-35.058	60.843	125.185	0.098
<div> <div>HORIZONTAL DISPLACEMENT IS</div> <div>60.843 FEET AT 125.185 DEGREES</div> </div>									