



Company/Rig: Noble Energy Inc/Production  
WELL/API#: Agricultural Products Fed 32-07F/05-123-15577

DECLINATION: 8.36 Degrees

TD AS DRILLED: 7426 Feet

COUNTY/STATE: Weld/Colorado

VS-Azi: 0.000 Degrees

Latitude: 40.26949, Longitude: -104.79944

Grid North = True North -0.45 degs (NAD 27)

Grid Correction Applied = -0.45 degs



DEPTH REFERENCE : RKB=GL/Elevation=4770'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 2/15/2016 / 11:42

Lat/Long Obtained By Handheld GPS at Wellhead

North Reference: Grid

Denver, Colorado

303-853-4976

Surveyor: Jason Kinchelow / Agricultural Products Federal 32-07 F

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	0.474	97.280	99.999	-0.052	0.410	-0.052	0.414	97.280	0.474
200.000	0.452	161.396	199.996	-0.479	0.946	-0.479	1.061	116.839	0.492
300.000	0.365	191.999	299.994	-1.164	1.006	-1.164	1.539	139.175	0.231
400.000	0.405	171.263	399.992	-1.825	0.993	-1.825	2.078	151.441	0.144
500.000	0.306	195.453	499.990	-2.431	0.976	-2.431	2.620	158.129	0.178
600.000	0.178	338.333	599.989	-2.544	0.848	-2.544	2.682	161.574	0.460
700.000	0.102	183.299	699.989	-2.488	0.785	-2.488	2.609	162.488	0.273
800.000	0.141	256.606	799.989	-2.605	0.660	-2.605	2.688	165.775	0.148
900.000	0.051	76.767	899.989	-2.624	0.584	-2.624	2.688	167.441	0.192
1000.000	0.324	213.497	999.988	-2.849	0.472	-2.849	2.888	170.595	0.363
1100.000	0.293	247.989	1099.987	-3.181	0.079	-3.181	3.182	178.574	0.185
1200.000	0.248	249.187	1199.986	-3.353	-0.360	-3.353	3.373	186.129	0.044
1300.000	0.413	239.477	1299.984	-3.613	-0.873	-3.613	3.717	193.582	0.173
1400.000	0.227	306.995	1399.983	-3.677	-1.342	-3.677	3.914	200.045	0.388
1500.000	0.196	298.532	1499.982	-3.476	-1.650	-3.476	3.848	205.399	0.044
1600.000	0.277	286.278	1599.981	-3.326	-2.033	-3.326	3.898	211.426	0.095
1700.000	0.236	256.093	1699.980	-3.308	-2.464	-3.308	4.125	216.682	0.139
1800.000	0.483	223.962	1799.978	-3.661	-2.956	-3.661	4.706	218.924	0.309

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
1900.000	0.412	241.145	1899.975	-4.137	-3.563	-4.137	5.460	220.738	0.151
2000.000	0.349	229.028	1999.973	-4.511	-4.108	-4.511	6.101	222.328	0.101
2100.000	0.607	197.061	2099.970	-5.217	-4.494	-5.217	6.886	220.742	0.361
2200.000	0.688	189.211	2199.963	-6.316	-4.745	-6.316	7.900	216.919	0.120
2300.000	1.162	230.448	2299.951	-7.555	-5.624	-7.555	9.418	216.663	0.788
2400.000	1.151	229.064	2399.931	-8.859	-7.164	-8.859	11.393	218.964	0.030
2500.000	0.875	243.719	2499.915	-9.855	-8.607	-9.855	13.084	221.136	0.376
2600.000	0.804	251.304	2599.905	-10.418	-9.957	-10.418	14.410	223.704	0.132
2700.000	0.997	247.815	2699.892	-10.971	-11.427	-10.971	15.841	226.166	0.201
2800.000	0.824	245.350	2799.879	-11.600	-12.886	-11.600	17.338	228.008	0.178
2900.000	0.174	161.804	2899.876	-12.044	-13.492	-12.044	18.086	228.247	0.823
3000.000	0.328	177.740	2999.875	-12.474	-13.434	-12.474	18.332	227.121	0.167
3100.000	0.170	128.088	3099.874	-12.851	-13.306	-12.851	18.499	225.995	0.253
3200.000	0.352	109.584	3199.873	-13.046	-12.900	-13.046	18.346	224.678	0.198
3300.000	0.052	188.819	3299.872	-13.193	-12.618	-13.193	18.256	223.723	0.346
3400.000	0.072	216.320	3399.872	-13.288	-12.662	-13.288	18.355	223.617	0.035
3500.000	0.431	264.998	3499.871	-13.372	-13.073	-13.372	18.701	224.354	0.387
3600.000	0.326	252.433	3599.869	-13.490	-13.719	-13.490	19.241	225.482	0.133
3700.000	0.465	276.727	3699.867	-13.529	-14.393	-13.529	19.753	226.774	0.215
3800.000	0.508	249.418	3799.863	-13.637	-15.211	-13.637	20.429	228.124	0.233
3900.000	0.626	281.606	3899.858	-13.683	-16.161	-13.683	21.175	229.747	0.334
4000.000	1.196	258.301	3999.846	-13.784	-17.718	-13.784	22.449	232.118	0.669
4100.000	1.591	250.741	4099.816	-14.454	-20.051	-14.454	24.718	234.214	0.435
4200.000	1.853	246.926	4199.771	-15.546	-22.849	-15.546	27.636	235.770	0.286
4300.000	1.832	248.672	4299.719	-16.761	-25.826	-16.761	30.788	237.017	0.060
4400.000	1.926	246.938	4399.665	-18.000	-28.861	-18.000	34.014	238.049	0.110
4500.000	1.391	244.932	4499.623	-19.173	-31.506	-19.173	36.881	238.678	0.538
4600.000	0.989	257.021	4599.601	-19.881	-33.446	-19.881	38.909	239.273	0.471
4700.000	0.272	233.716	4699.595	-20.215	-34.479	-20.215	39.968	239.617	0.747
4800.000	0.713	18.752	4799.593	-19.766	-34.470	-19.766	39.736	240.169	0.949
4900.000	0.630	34.644	4899.586	-18.724	-33.958	-18.724	38.778	241.128	0.203
5000.000	0.551	41.666	4999.581	-17.913	-33.325	-17.913	37.834	241.742	0.107
5100.000	0.323	43.599	5099.578	-17.349	-32.811	-17.349	37.115	242.132	0.228
5200.000	0.263	329.373	5199.577	-16.947	-32.733	-16.947	36.860	242.628	0.357
5300.000	0.519	5.629	5299.574	-16.299	-32.806	-16.299	36.632	243.580	0.344
5400.000	0.539	71.406	5399.571	-15.698	-32.315	-15.698	35.927	244.091	0.575
5500.000	0.374	25.870	5499.568	-15.254	-31.727	-15.254	35.204	244.322	0.385
5600.000	0.550	53.377	5599.565	-14.675	-31.200	-14.675	34.479	244.810	0.278
5700.000	0.452	354.766	5699.562	-13.996	-30.851	-13.996	33.877	245.598	0.498
5800.000	0.412	354.132	5799.559	-13.246	-30.924	-13.246	33.641	246.813	0.041

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
5900.000	0.667	253.020	5899.556	-13.058	-31.517	-13.058	34.115	247.495	0.849
6000.000	0.619	243.729	5999.550	-13.467	-32.559	-13.467	35.234	247.528	0.114
6100.000	0.624	241.285	6099.544	-13.968	-33.521	-13.968	36.315	247.378	0.027
6200.000	0.952	252.792	6199.534	-14.475	-34.791	-14.475	37.683	247.410	0.363
6300.000	0.925	250.323	6299.521	-14.993	-36.345	-14.993	39.316	247.583	0.049
6400.000	1.075	252.626	6399.506	-15.545	-38.000	-15.545	41.057	247.752	0.156
6500.000	1.094	234.859	6499.488	-16.375	-39.677	-16.375	42.923	247.574	0.336
6600.000	1.679	206.469	6599.459	-18.236	-41.110	-18.236	44.973	246.079	0.885
6700.000	2.732	201.518	6699.384	-21.764	-42.638	-21.764	47.871	242.958	1.070
6800.000	1.846	193.873	6799.303	-25.546	-43.898	-25.546	50.790	239.803	0.935
6900.000	0.870	261.948	6899.279	-27.216	-45.037	-27.216	52.621	238.855	1.722
7000.000	1.272	312.667	6999.264	-26.570	-46.605	-26.570	53.647	240.312	0.987
7100.000	0.879	324.969	7099.246	-25.190	-47.861	-25.190	54.085	242.242	0.454
7200.000	0.955	26.016	7199.235	-23.813	-47.936	-23.813	53.525	243.584	0.934