



COMPANY/RIG: Noble Energy/Production/CoreTech  
WELL/API: Gemini B 29-19/05-123-23064  
DECLINATION: 8.2 Degrees  
TD AS DRILLED: 7093 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.37309, Longitude: -104.57847  
Grid North = True North -0.60 degs (NAD 27)  
Grid Correction Applied = -0.60 degs



DEPTH REFERENCE : RKB = GL Elevation = 4685

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 7/18/2016 / 08:47

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / Gemini B 29-19

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	0.164	175.253	100.000	-0.142	0.012	-0.142	0.143	175.253	0.164
200.000	0.316	130.934	199.999	-0.465	0.232	-0.465	0.520	153.502	0.229
300.000	0.211	117.493	299.998	-0.731	0.603	-0.731	0.947	140.452	0.121
400.000	0.316	116.197	399.997	-0.937	1.014	-0.937	1.380	132.753	0.105
500.000	0.352	101.830	499.995	-1.122	1.562	-1.122	1.923	125.690	0.091
600.000	0.343	103.370	599.993	-1.254	2.154	-1.254	2.492	120.207	0.013
700.000	0.311	102.030	699.992	-1.380	2.711	-1.380	3.042	116.976	0.033
800.000	0.264	92.167	799.990	-1.445	3.206	-1.445	3.517	114.261	0.068
900.000	0.230	93.639	899.990	-1.467	3.637	-1.467	3.922	111.962	0.034
1000.000	0.297	88.015	999.989	-1.470	4.096	-1.470	4.352	109.747	0.071
1100.000	0.183	33.522	1099.988	-1.328	4.443	-1.328	4.637	106.646	0.242
1200.000	0.135	35.815	1199.987	-1.100	4.600	-1.100	4.729	103.449	0.049
1300.000	0.158	16.915	1299.987	-0.873	4.709	-0.873	4.789	100.503	0.053
1400.000	0.238	31.241	1399.986	-0.564	4.856	-0.564	4.889	96.625	0.093
1500.000	0.130	30.780	1499.986	-0.289	5.022	-0.289	5.030	93.296	0.107
1600.000	0.059	37.737	1599.986	-0.151	5.112	-0.151	5.114	91.688	0.071
1700.000	0.061	114.045	1699.986	-0.131	5.192	-0.131	5.194	91.448	0.074
1800.000	0.168	180.940	1799.986	-0.299	5.238	-0.299	5.247	93.271	0.154

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	0.407	202.888	1899.984	-0.773	5.097	-0.773	5.156	98.627	0.260
2000.000	0.657	227.879	1999.980	-1.486	4.534	-1.486	4.771	108.145	0.336
2100.000	0.864	228.582	2099.971	-2.369	3.542	-2.369	4.262	123.777	0.207
2200.000	1.215	204.818	2199.955	-3.831	2.532	-3.831	4.592	146.536	0.549
2300.000	1.542	197.300	2299.926	-6.078	1.687	-6.078	6.307	164.490	0.374
2400.000	1.697	199.521	2399.886	-8.759	0.792	-8.759	8.794	174.836	0.167
2500.000	1.660	194.718	2499.843	-11.556	-0.071	-11.556	11.556	180.354	0.145
2600.000	1.605	193.221	2599.802	-14.320	-0.760	-14.320	14.340	183.037	0.070
2700.000	1.553	191.717	2699.764	-17.010	-1.355	-17.010	17.064	184.555	0.067
2800.000	1.557	189.994	2799.728	-19.675	-1.866	-19.675	19.763	185.418	0.047
2900.000	1.650	193.969	2899.689	-22.410	-2.449	-22.410	22.544	186.238	0.144
3000.000	1.591	189.455	2999.649	-25.177	-3.025	-25.177	25.358	186.851	0.140
3100.000	1.536	192.804	3099.611	-27.853	-3.550	-27.853	28.079	187.264	0.106
3200.000	1.692	182.493	3199.572	-30.635	-3.912	-30.635	30.884	187.276	0.329
3300.000	1.848	182.933	3299.524	-33.720	-4.058	-33.720	33.964	186.863	0.156
3400.000	2.058	188.849	3399.466	-37.105	-4.417	-37.105	37.367	186.789	0.291
3500.000	2.232	190.250	3499.396	-40.796	-5.040	-40.796	41.106	187.042	0.182
3600.000	1.941	184.457	3599.330	-44.401	-5.518	-44.401	44.743	187.084	0.359
3700.000	1.851	178.686	3699.275	-47.704	-5.613	-47.704	48.033	186.710	0.211
3800.000	1.822	173.632	3799.224	-50.899	-5.399	-50.899	51.184	186.055	0.164
3900.000	2.005	168.275	3899.168	-54.192	-4.867	-54.192	54.410	185.133	0.255
4000.000	2.393	159.166	3999.094	-57.855	-3.770	-57.855	57.978	183.728	0.521
4100.000	2.799	164.389	4098.992	-62.158	-2.370	-62.158	62.203	182.184	0.470
4200.000	3.276	154.511	4198.852	-67.089	-0.483	-67.089	67.091	180.413	0.706
4300.000	3.560	156.951	4298.674	-72.525	1.962	-72.525	72.551	178.451	0.319
4400.000	3.339	154.417	4398.493	-78.008	4.435	-78.008	78.134	176.746	0.268
4500.000	3.270	156.374	4498.326	-83.248	6.835	-83.248	83.528	175.306	0.132
4600.000	3.073	156.000	4598.173	-88.310	9.069	-88.310	88.775	174.137	0.198
4700.000	2.947	169.279	4698.036	-93.285	10.637	-93.285	93.890	173.495	0.707
4800.000	2.613	174.953	4797.919	-98.082	11.316	-98.082	98.732	173.419	0.432
4900.000	1.938	170.443	4897.839	-102.020	11.797	-102.020	102.700	173.404	0.698
5000.000	1.442	177.901	4997.796	-104.945	12.124	-104.945	105.643	173.410	0.542
5100.000	1.449	190.742	5097.764	-107.444	11.935	-107.444	108.104	173.662	0.323
5200.000	1.451	201.501	5197.732	-109.864	11.235	-109.864	110.437	174.161	0.272
5300.000	1.402	215.743	5297.702	-112.035	10.056	-112.035	112.485	174.871	0.357
5400.000	1.499	226.080	5397.670	-113.934	8.400	-113.934	114.244	175.783	0.278
5500.000	1.771	238.752	5497.629	-115.643	6.137	-115.643	115.806	176.962	0.451
5600.000	2.000	244.984	5597.575	-117.183	3.235	-117.183	117.227	178.419	0.307
5700.000	2.358	249.955	5697.503	-118.625	-0.279	-118.625	118.626	180.135	0.405
5800.000	2.719	254.367	5797.405	-119.970	-4.496	-119.970	120.054	182.146	0.411

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	2.891	262.130	5897.285	-120.954	-9.278	-120.954	121.310	184.387	0.416
6000.000	2.994	259.667	5997.153	-121.768	-14.346	-121.768	122.610	186.719	0.163
6100.000	2.897	270.544	6097.022	-122.213	-19.442	-122.213	123.749	189.039	0.566
6200.000	2.640	269.069	6196.905	-122.226	-24.272	-122.226	124.613	191.232	0.266
6300.000	2.393	272.403	6296.809	-122.176	-28.661	-122.176	125.493	193.202	0.287
6400.000	2.148	273.590	6396.730	-121.971	-32.617	-121.971	126.257	194.971	0.250
6500.000	2.132	280.170	6496.660	-121.525	-36.318	-121.525	126.836	196.639	0.246
6600.000	2.088	283.972	6596.593	-120.757	-39.917	-120.757	127.183	198.292	0.147
6700.000	2.371	286.511	6696.517	-119.729	-43.669	-119.729	127.444	200.038	0.300
6800.000	2.610	300.000	6796.423	-118.003	-47.624	-118.003	127.250	201.978	0.631