



Company/Rig: Noble Energy/ VES  
WELL/API#: Rothe State B 36-7/05-123-16704  
DECLINATION: 8.17 Degrees  
TD AS DRILLED: 6822 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.35774, Longitude: -104.49474  
Grid North = True North -0.65 degs (NAD 27)  
Grid Correction Applied = -0.65 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4589 Feet

DRILLOG GYRO SURVEY CALCULATIONS

Filename: survey.ut

Minimum Curvature Method

Report Date/Time: 6/15/2016 / 15:29

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Rothe State B 36-7

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	0.910	252.725	99.996	-0.236	-0.758	-0.236	0.794	252.725	0.910
200.000	0.793	229.926	199.985	-0.917	-2.046	-0.917	2.242	245.851	0.355
300.000	0.307	224.440	299.980	-1.554	-2.763	-1.554	3.171	240.642	0.489
400.000	0.111	202.976	399.979	-1.835	-2.989	-1.835	3.507	238.453	0.208
500.000	0.234	246.263	499.979	-2.006	-3.214	-2.006	3.788	238.023	0.171
600.000	0.125	204.923	599.979	-2.188	-3.447	-2.188	4.082	237.596	0.163
700.000	0.151	349.473	699.978	-2.157	-3.517	-2.157	4.126	238.472	0.263
800.000	0.152	300.705	799.978	-1.960	-3.655	-1.960	4.147	241.794	0.125
900.000	0.158	232.096	899.978	-1.977	-3.878	-1.977	4.353	242.983	0.175
1000.000	0.124	1.878	999.978	-1.954	-3.983	-1.954	4.437	243.865	0.256
1100.000	0.155	242.449	1099.977	-1.909	-4.100	-1.909	4.523	245.028	0.241
1200.000	0.175	294.428	1199.977	-1.909	-4.360	-1.909	4.759	246.354	0.146
1300.000	0.140	196.640	1299.977	-1.962	-4.534	-1.962	4.940	246.596	0.239
1400.000	0.184	312.991	1399.977	-1.970	-4.686	-1.970	5.083	247.204	0.276
1500.000	0.028	134.530	1499.977	-1.877	-4.786	-1.877	5.141	248.587	0.212
1600.000	0.121	259.169	1599.976	-1.914	-4.873	-1.914	5.235	248.557	0.139
1700.000	0.149	307.024	1699.976	-1.855	-5.081	-1.855	5.409	249.939	0.113
1800.000	0.308	287.737	1799.975	-1.695	-5.441	-1.695	5.699	252.696	0.175

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	0.326	45.559	1899.975	-1.414	-5.494	-1.414	5.673	255.570	0.544
2000.000	0.579	49.657	1999.971	-0.887	-4.906	-0.887	4.985	259.748	0.254
2100.000	0.694	2.745	2099.966	0.044	-4.492	0.044	4.492	270.567	0.517
2200.000	0.983	44.216	2199.956	1.264	-3.865	1.264	4.066	288.106	0.652
2300.000	1.128	28.445	2299.939	2.744	-2.798	2.744	3.919	314.438	0.323
2400.000	1.103	42.124	2399.920	4.323	-1.684	4.323	4.639	338.716	0.267
2500.000	1.300	17.731	2499.899	6.116	-0.693	6.116	6.156	353.533	0.543
2600.000	1.299	48.507	2599.875	7.948	0.501	7.948	7.963	3.608	0.690
2700.000	1.228	41.438	2699.850	9.502	2.059	9.502	9.723	12.229	0.171
2800.000	1.211	53.851	2799.828	10.929	3.622	10.929	11.513	18.336	0.264
2900.000	0.836	16.168	2899.813	12.253	4.678	12.253	13.116	20.897	0.750
3000.000	0.745	67.036	2999.804	13.208	5.480	13.208	14.300	22.535	0.684
3100.000	0.606	89.049	3099.798	13.470	6.608	13.470	15.004	26.129	0.292
3200.000	1.125	119.707	3199.786	12.992	7.989	12.992	15.252	31.587	0.678
3300.000	1.489	118.143	3299.760	11.893	9.987	11.893	15.530	40.022	0.365
3400.000	1.793	117.519	3399.719	10.557	12.521	10.557	16.378	49.862	0.305
3500.000	1.906	108.024	3499.667	9.320	15.489	9.320	18.077	58.965	0.326
3600.000	1.975	127.621	3599.611	7.754	18.435	7.754	20.000	67.189	0.664
3700.000	1.958	120.823	3699.552	5.827	21.267	5.827	22.051	74.679	0.234
3800.000	2.021	136.089	3799.493	3.681	23.956	3.681	24.238	81.264	0.532
3900.000	1.798	120.307	3899.438	1.619	26.534	1.619	26.583	86.507	0.569
4000.000	2.045	116.119	3999.381	0.042	29.490	0.042	29.490	89.918	0.284
4100.000	2.439	115.576	4099.305	-1.662	33.011	-1.662	33.053	92.882	0.395
4200.000	2.672	127.219	4199.206	-3.990	36.787	-3.990	37.003	96.191	0.568
4300.000	3.413	114.889	4299.065	-6.653	41.344	-6.653	41.875	99.142	0.984
4400.000	3.800	114.067	4398.867	-9.257	47.069	-9.257	47.971	101.126	0.391
4500.000	3.680	113.376	4498.654	-11.882	53.040	-11.882	54.355	102.626	0.128
4600.000	3.577	107.099	4598.454	-14.072	58.967	-14.072	60.623	103.422	0.410
4700.000	3.388	108.811	4698.269	-15.942	64.745	-15.942	66.679	103.832	0.215
4800.000	3.125	111.571	4798.108	-17.896	70.076	-17.896	72.326	104.326	0.306
4900.000	2.793	122.816	4897.975	-20.219	74.659	-20.219	77.348	105.153	0.667
5000.000	1.956	134.876	4997.889	-22.743	77.915	-22.743	81.167	106.272	0.970
5100.000	1.557	141.874	5097.842	-25.016	79.964	-25.016	83.785	107.372	0.452
5200.000	1.517	136.801	5197.806	-27.050	81.708	-27.050	86.070	108.317	0.142
5300.000	1.050	147.133	5297.781	-28.784	83.112	-28.784	87.955	109.103	0.520
5400.000	1.080	166.168	5397.764	-30.468	83.834	-30.468	89.199	109.973	0.353
5500.000	0.909	170.441	5497.749	-32.165	84.191	-32.165	90.126	110.909	0.186
5600.000	0.565	144.563	5597.741	-33.349	84.608	-33.349	90.943	111.512	0.470
5700.000	0.545	177.679	5697.736	-34.226	84.914	-34.226	91.552	111.953	0.317
5800.000	0.180	160.468	5797.734	-34.849	84.986	-34.849	91.853	112.297	0.376

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	0.163	242.136	5897.734	-35.064	84.912	-35.064	91.867	112.438	0.225
6000.000	0.243	169.713	5997.733	-35.339	84.825	-35.339	91.892	112.617	0.249
6100.000	0.191	296.930	6097.733	-35.473	84.714	-35.473	91.841	112.721	0.390
6200.000	0.145	18.291	6197.733	-35.278	84.605	-35.278	91.665	112.635	0.222
6300.000	0.371	22.978	6297.732	-34.860	84.771	-34.860	91.658	112.354	0.227
6400.000	0.110	317.330	6397.731	-34.491	84.832	-34.491	91.575	112.126	0.340
6500.000	0.331	39.315	6497.730	-34.197	84.949	-34.197	91.574	111.928	0.334