



Company/Rig: NOBLE ENERGY/ CORETECH
WELL/API#: HAROLD CRAVEN UNIT 1/05-123-09107
DECLINATION: 8.31 Degrees
TD AS DRILLED: 4565'
COUNTY/STATE: WELD/COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.31692, Longitude: -104.69304
Grid North = True North -0.52 degs (NAD 27)
Grid Correction Applied = -0.52 degs



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4728

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: run2-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 12/17/2015 / 15:00

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JAY HINMAN / Harold Craven Unit 1

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	0.594	251.688	99.998	-0.163	-0.492	-0.163	0.518	251.688	0.594
200.000	0.462	278.293	199.994	-0.268	-1.383	-0.268	1.409	259.052	0.275
300.000	0.057	109.590	299.993	-0.226	-1.736	-0.226	1.751	262.583	0.518
400.000	0.697	177.433	399.991	-0.850	-1.662	-0.850	1.867	242.907	0.678
500.000	1.133	182.993	499.978	-2.445	-1.687	-2.445	2.971	214.597	0.444
600.000	1.446	201.635	599.953	-4.605	-2.204	-4.605	5.105	205.571	0.520
700.000	0.760	206.409	699.933	-6.373	-2.964	-6.373	7.028	204.944	0.692
800.000	1.258	177.494	799.918	-8.064	-3.211	-8.064	8.680	201.712	0.698
900.000	0.773	195.671	899.902	-9.811	-3.345	-9.811	10.365	198.829	0.577
1000.000	1.225	193.097	999.887	-11.502	-3.770	-11.502	12.104	198.147	0.454
1100.000	1.150	231.264	1099.867	-13.171	-4.795	-13.171	14.016	200.004	0.780
1200.000	1.124	256.612	1199.848	-14.026	-6.532	-14.026	15.472	204.972	0.500
1300.000	1.228	275.770	1299.827	-14.145	-8.552	-14.145	16.530	211.158	0.404
1400.000	1.353	278.131	1399.802	-13.870	-10.787	-13.870	17.571	217.872	0.136
1500.000	1.124	278.628	1499.778	-13.556	-12.925	-13.556	18.731	223.635	0.229
1600.000	1.081	288.812	1599.760	-13.105	-14.788	-13.105	19.759	228.453	0.200
1700.000	0.868	293.091	1699.746	-12.504	-16.378	-12.504	20.605	232.640	0.225
1800.000	0.804	298.273	1799.735	-11.874	-17.693	-11.874	21.308	236.133	0.099

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	0.725	289.595	1899.726	-11.330	-18.906	-11.330	22.041	239.068	0.140
2000.000	0.667	277.237	1999.719	-11.044	-20.079	-11.044	22.916	241.187	0.160
2100.000	0.849	275.908	2099.710	-10.895	-21.393	-10.895	24.008	243.012	0.183
2200.000	0.498	272.522	2199.703	-10.799	-22.565	-10.799	25.016	244.425	0.353
2300.000	0.870	300.338	2299.696	-10.397	-23.654	-10.397	25.838	246.273	0.488
2400.000	0.890	284.517	2399.684	-9.819	-25.061	-9.819	26.916	248.605	0.243
2500.000	0.657	321.463	2499.676	-9.176	-26.170	-9.176	27.732	250.678	0.537
2600.000	0.591	320.888	2599.670	-8.327	-26.852	-8.327	28.114	252.771	0.066
2700.000	0.522	323.769	2699.665	-7.559	-27.447	-7.559	28.469	254.601	0.075
2800.000	0.702	247.302	2799.661	-7.428	-28.281	-7.428	29.241	255.283	0.771
2900.000	0.579	220.828	2899.655	-8.047	-29.177	-8.047	30.266	254.581	0.317
3000.000	0.558	325.165	2999.652	-8.029	-29.785	-8.029	30.848	254.913	0.898
3100.000	0.287	291.690	3099.649	-7.536	-30.297	-7.536	31.220	256.031	0.356
3200.000	0.208	290.609	3199.648	-7.380	-30.699	-7.380	31.574	256.483	0.080
3300.000	0.216	353.743	3299.648	-7.129	-30.890	-7.129	31.702	257.005	0.222
3400.000	0.109	0.585	3399.647	-6.847	-30.909	-6.847	31.659	257.510	0.109
3500.000	0.225	239.191	3499.647	-6.852	-31.077	-6.852	31.823	257.565	0.296
3600.000	0.271	123.745	3599.646	-7.084	-31.048	-7.084	31.846	257.147	0.420
3700.000	0.286	141.619	3699.645	-7.412	-30.696	-7.412	31.579	256.425	0.088
3800.000	0.470	161.537	3799.643	-7.997	-30.412	-7.997	31.445	255.268	0.224
3900.000	0.690	169.262	3899.638	-8.978	-30.169	-8.978	31.477	253.428	0.233
4000.000	0.731	204.870	3999.631	-10.148	-30.325	-10.148	31.978	251.498	0.436
4100.000	1.199	232.520	4099.617	-11.363	-31.424	-11.363	33.415	250.120	0.648
4200.000	1.631	258.982	4199.587	-12.272	-33.651	-12.272	35.819	249.964	0.773
4300.000	1.563	254.745	4299.548	-12.903	-36.365	-12.903	38.586	250.465	0.136
4400.000	0.838	240.985	4399.526	-13.616	-38.320	-13.616	40.667	250.438	0.776