

Company: Anadarko Petroleum Corp.  
 Well/API: HSR-Muhme 6-30A / 05-123-18851  
 Tool Type: North Seeking Rate Gyro  
 Rig Name: Production / VES  
 County/State: Weld / Colorado  
 Latitude: 40.199, Longitude: -104.934  
 Directions are relative to True North  
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Elevation = 4865 Feet

DRILLOG GYRO SURVEY CALCULATIONS

Filename: gyro-de\_01.ut  
 Minimum Curvature Method  
 Report Date/Time: 8/29/2014 / 13:10

Lat/Long & Elevation Obtained By Handheld GPS At Wellhead  
 Handheld GPS Reference: NAD83/Device Error: ±9 Feet  
 VES Survey International - Henderson CO  
 Norman Cowan  
 303-853-4976

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	1.278	304.851	99.992	0.637	-0.915	0.637	1.115	304.851	1.278
200.000	1.458	317.227	199.963	2.209	-2.695	2.209	3.484	309.340	0.345
300.000	1.013	315.360	299.940	3.772	-4.180	3.772	5.630	312.061	0.447
400.000	1.515	311.275	399.915	5.273	-5.795	5.273	7.835	312.301	0.510
500.000	0.952	321.256	499.892	6.793	-7.308	6.793	9.977	312.907	0.601
600.000	0.586	317.601	599.883	7.818	-8.172	7.818	11.310	313.730	0.369
700.000	1.463	313.629	699.866	9.076	-9.441	9.076	13.096	313.871	0.879
800.000	1.757	315.914	799.826	11.058	-11.431	11.058	15.905	314.049	0.301
900.000	1.774	311.706	899.779	13.189	-13.653	13.189	18.983	314.008	0.131
1000.000	1.844	332.755	999.730	15.649	-15.545	15.649	22.058	315.190	0.664
1100.000	1.732	335.652	1099.681	18.455	-16.905	18.455	25.027	317.511	0.144
1200.000	1.270	320.315	1199.647	20.685	-18.235	20.685	27.575	318.601	0.609
1300.000	1.455	318.061	1299.619	22.482	-19.791	22.482	29.952	318.642	0.192
1400.000	1.192	286.488	1399.593	23.721	-21.636	23.721	32.106	317.631	0.763
1500.000	1.222	296.238	1499.571	24.487	-23.590	24.487	34.002	316.070	0.207
1600.000	1.120	286.913	1599.550	25.243	-25.481	25.243	35.868	314.731	0.216
1700.000	1.059	292.145	1699.532	25.876	-27.272	25.876	37.594	313.495	0.117
1800.000	1.136	293.134	1799.514	26.613	-29.039	26.613	39.389	312.504	0.079
1900.000	0.801	302.080	1899.500	27.374	-30.542	27.374	41.014	311.869	0.366
2000.000	0.476	265.491	1999.494	27.713	-31.549	27.713	41.992	311.296	0.506
2100.000	0.854	245.985	2099.487	27.377	-32.644	27.377	42.604	309.985	0.436
2200.000	0.307	274.257	2199.482	27.093	-33.592	27.093	43.156	308.887	0.601
2300.000	0.415	322.705	2299.480	27.402	-34.079	27.402	43.729	308.801	0.312
2400.000	0.872	329.628	2399.473	28.346	-34.684	28.346	44.794	309.259	0.462
2500.000	0.901	276.800	2499.463	29.096	-35.849	29.096	46.171	309.064	0.789
2600.000	0.870	319.857	2599.452	29.770	-37.119	29.770	47.582	308.730	0.650
2700.000	0.751	311.376	2699.442	30.783	-38.100	30.783	48.982	308.937	0.169
2800.000	0.560	323.291	2799.435	31.608	-38.884	31.608	50.110	309.107	0.233
2900.000	0.586	321.985	2899.430	32.403	-39.491	32.403	51.084	309.369	0.029
3000.000	0.687	304.496	2999.424	33.146	-40.301	33.146	52.180	309.436	0.218
3100.000	0.674	265.485	3099.418	33.439	-41.381	33.439	53.203	308.941	0.454
3200.000	0.435	198.374	3199.414	33.032	-42.087	33.032	53.502	308.127	0.644
3300.000	0.493	145.765	3299.411	32.316	-41.964	32.316	52.966	307.600	0.414

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
3400.000	1.435	144.190	3399.396	30.945	-40.990	30.945	51.359	307.051	0.942
3500.000	0.866	110.688	3499.376	29.663	-39.550	29.663	49.438	306.870	0.858
3600.000	0.636	118.331	3599.368	29.133	-38.354	29.133	48.164	307.219	0.250
3700.000	1.090	113.551	3699.356	28.489	-36.993	28.489	46.692	307.600	0.459
3800.000	1.413	121.164	3799.332	27.471	-35.066	27.471	44.545	308.075	0.363
3900.000	1.228	132.026	3899.306	26.115	-33.215	26.115	42.252	308.176	0.311
4000.000	1.626	116.765	3999.275	24.759	-31.152	24.759	39.793	308.477	0.547
4100.000	1.753	122.467	4099.231	23.299	-28.595	23.299	36.886	309.172	0.211
4200.000	1.575	133.723	4199.190	21.528	-26.312	21.528	33.997	309.290	0.371
4300.000	1.461	112.392	4299.155	20.093	-24.140	20.093	31.408	309.772	0.573
4400.000	1.166	100.111	4399.129	19.428	-21.960	19.428	29.320	311.500	0.406
4500.000	1.188	64.337	4499.109	19.699	-20.023	19.699	28.089	314.532	0.723
4600.000	1.121	82.571	4599.089	20.274	-18.119	20.274	27.191	318.213	0.372
4700.000	0.711	62.037	4699.077	20.692	-16.601	20.692	26.528	321.260	0.519
4800.000	0.500	326.117	4799.073	21.345	-16.296	21.345	26.854	322.639	0.910
4900.000	0.446	340.919	4899.070	22.074	-16.666	22.074	27.659	322.947	0.133
5000.000	0.874	306.780	4999.063	22.899	-17.404	22.899	28.763	322.763	0.564
5100.000	1.368	328.875	5099.044	24.378	-18.632	24.378	30.683	322.608	0.647
5200.000	0.962	295.868	5199.024	25.765	-20.004	25.765	32.619	322.174	0.768
5300.000	1.142	284.675	5299.007	26.384	-21.723	26.384	34.176	320.534	0.272
5400.000	0.362	233.963	5398.999	26.450	-22.943	26.450	35.014	319.062	0.954
5500.000	1.129	219.876	5498.990	25.507	-23.830	25.507	34.907	316.947	0.783
5600.000	2.019	213.177	5598.951	23.277	-25.426	23.277	34.472	312.473	0.907
5700.000	1.081	219.389	5698.913	21.074	-26.989	21.074	34.241	307.984	0.951
5800.000	1.333	211.472	5798.891	19.352	-28.195	19.352	34.197	304.465	0.302
5900.000	1.271	200.030	5898.865	17.318	-29.182	17.318	33.934	300.687	0.267
6000.000	1.260	158.687	5998.843	15.251	-29.162	15.251	32.909	297.609	0.894
6100.000	0.788	137.996	6098.827	13.716	-28.302	13.716	31.451	295.856	0.593
6200.000	1.486	174.527	6198.808	11.915	-27.719	11.915	30.171	293.260	0.973
6300.000	2.144	161.780	6298.758	8.848	-27.010	8.848	28.422	288.137	0.768
6400.000	2.446	142.749	6398.679	5.373	-25.134	5.373	25.702	282.066	0.815
6500.000	1.701	141.099	6498.613	2.519	-22.910	2.519	23.048	276.275	0.748
6600.000	1.694	130.083	6598.569	0.413	-20.847	0.413	20.852	271.134	0.326
6700.000	2.232	126.896	6698.510	-1.708	-18.159	-1.708	18.239	264.625	0.549
6800.000	2.436	117.055	6798.427	-3.844	-14.709	-3.844	15.203	255.352	0.449
6900.000	2.271	127.437	6898.344	-6.015	-11.243	-6.015	12.751	241.851	0.456
7000.000	2.506	111.167	6998.258	-8.009	-7.631	-8.009	11.062	223.615	0.715
7100.000	2.260	105.624	7098.171	-9.329	-3.694	-9.329	10.034	201.601	0.337

HORIZONTAL DISPLACEMENT IS  
10.034 FEET AT 201.601 DEGREES