



Company: Anadarko Petroleum  
 Well: HSR-Pfister #3-18  
 API: 05-123-16868  
 Rig Name: Production/ Canary  
 State/County: Colorado/Weld  
 Latitude: 40.231, Longitude: -104.934  
 Directions are relative to True North  
 VS-Azi: 0.000 Degrees



**FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : RKB= Ground Level

**DRILLOG MS GYRO SURVEY CALCULATIONS**

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

Minimum Curvature Method

Report Date/Time: 11/15/2013 / 13:22

Vaughn Energy Services

Henderson, CO 80640

303-853-4976

Sean Bratt

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	0.284	9.647	100.000	0.245	0.042	0.245	0.248	9.647	0.284
200.000	0.158	328.580	199.999	0.607	0.011	0.607	0.607	1.067	0.195
300.000	0.146	259.992	299.999	0.702	-0.186	0.702	0.727	345.184	0.171
400.000	0.095	249.301	399.998	0.651	-0.388	0.651	0.758	329.184	0.056
500.000	0.219	198.254	499.998	0.440	-0.526	0.440	0.686	309.943	0.176
600.000	0.258	184.192	599.997	0.034	-0.602	0.034	0.603	273.188	0.070
700.000	0.207	184.825	699.996	-0.372	-0.634	-0.372	0.735	239.620	0.051
800.000	0.445	205.635	799.995	-0.902	-0.817	-0.902	1.217	222.178	0.262
900.000	0.577	228.941	899.991	-1.582	-1.364	-1.582	2.089	220.774	0.244
1000.000	0.647	198.306	999.985	-2.449	-1.922	-2.449	3.113	218.116	0.331
1100.000	0.543	212.157	1099.980	-3.387	-2.351	-3.387	4.123	214.770	0.177
1200.000	0.922	227.575	1199.972	-4.330	-3.197	-4.330	5.383	216.438	0.424
1300.000	0.654	215.564	1299.962	-5.337	-4.122	-5.337	6.744	217.684	0.313
1400.000	0.839	249.233	1399.954	-6.060	-5.139	-6.060	7.946	220.294	0.467
1500.000	1.005	237.164	1499.941	-6.796	-6.560	-6.796	9.445	223.989	0.255
1600.000	1.394	257.093	1599.920	-7.543	-8.482	-7.543	11.351	228.356	0.565
1700.000	1.386	249.040	1699.890	-8.247	-10.797	-8.247	13.586	232.626	0.195
1800.000	1.571	267.780	1799.858	-8.733	-13.296	-8.733	15.907	236.703	0.515
1900.000	1.719	268.086	1899.816	-8.836	-16.164	-8.836	18.421	241.337	0.149
2000.000	1.621	259.116	1999.774	-9.153	-19.052	-9.153	21.136	244.339	0.279
2100.000	1.629	258.960	2099.734	-9.692	-21.835	-9.692	23.890	246.065	0.010
2200.000	1.774	267.280	2199.690	-10.038	-24.776	-10.038	26.733	247.945	0.286
2300.000	1.541	263.327	2299.648	-10.267	-27.658	-10.267	29.502	249.633	0.260
2400.000	1.698	259.547	2399.608	-10.692	-30.450	-10.692	32.272	250.651	0.190
2500.000	1.503	255.064	2499.569	-11.299	-33.174	-11.299	35.045	251.191	0.232
2600.000	1.518	263.386	2599.534	-11.790	-35.757	-11.790	37.650	251.751	0.220
2700.000	1.594	262.656	2699.498	-12.120	-38.452	-12.120	40.317	252.505	0.078
2800.000	1.640	255.840	2799.458	-12.648	-41.219	-12.648	43.116	252.941	0.198
2900.000	1.944	259.210	2899.409	-13.316	-44.273	-13.316	46.232	253.261	0.322
3000.000	1.661	264.796	2999.359	-13.765	-47.383	-13.765	49.342	253.801	0.333
3100.000	1.427	232.303	3099.325	-14.658	-49.812	-14.658	51.923	253.603	0.893
3200.000	1.683	217.936	3199.288	-16.578	-51.700	-16.578	54.292	252.222	0.464
3300.000	1.941	204.543	3299.239	-19.276	-53.306	-19.276	56.684	250.120	0.494
3400.000	2.187	197.627	3399.174	-22.634	-54.587	-22.634	59.093	247.479	0.350

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
3500.000	2.386	196.923	3499.094	-26.444	-55.770	-26.444	61.722	244.632	0.201
3600.000	2.438	206.624	3599.006	-30.336	-57.329	-30.336	64.861	242.114	0.411
3700.000	2.189	193.301	3698.925	-34.096	-58.722	-34.096	67.903	239.859	0.591
3800.000	2.060	188.704	3798.856	-37.732	-59.433	-37.732	70.399	237.590	0.214
3900.000	1.864	196.429	3898.798	-41.069	-60.165	-41.069	72.846	235.682	0.329
4000.000	1.443	205.423	3998.756	-43.766	-61.166	-43.766	75.211	234.415	0.494
4100.000	1.220	212.391	4098.729	-45.802	-62.276	-45.802	77.306	233.667	0.275
4200.000	1.128	218.961	4198.708	-47.467	-63.466	-47.467	79.253	233.207	0.163
4300.000	0.496	190.313	4298.698	-48.658	-64.162	-48.658	80.526	232.825	0.733
4400.000	0.428	163.253	4398.695	-49.441	-64.132	-49.441	80.978	232.371	0.226
4500.000	0.662	157.948	4498.690	-50.334	-63.808	-50.334	81.271	231.732	0.239
4600.000	0.285	128.242	4598.687	-51.023	-63.396	-51.023	81.378	231.172	0.438
4700.000	0.484	138.574	4698.685	-51.494	-62.921	-51.494	81.306	230.703	0.210
4800.000	0.107	199.019	4798.683	-51.898	-62.672	-51.898	81.371	230.372	0.441
4900.000	0.066	213.304	4898.683	-52.034	-62.734	-52.034	81.505	230.326	0.046
5000.000	0.146	342.502	4998.683	-51.961	-62.804	-51.961	81.512	230.397	0.195
5100.000	0.135	318.375	5098.683	-51.751	-62.920	-51.751	81.468	230.563	0.060
5200.000	0.231	322.312	5198.682	-51.504	-63.121	-51.504	81.467	230.787	0.098
5300.000	0.244	3.294	5298.681	-51.131	-63.233	-51.131	81.319	231.040	0.167
5400.000	0.252	328.814	5398.681	-50.731	-63.334	-50.731	81.147	231.305	0.147
5500.000	0.955	337.116	5498.674	-49.775	-63.772	-49.775	80.897	232.028	0.707
5600.000	1.003	344.411	5598.660	-48.164	-64.331	-48.164	80.363	233.178	0.133
5700.000	0.981	35.436	5698.647	-46.623	-64.070	-46.623	79.238	233.957	0.855
5800.000	1.029	34.296	5798.631	-45.184	-63.068	-45.184	77.583	234.381	0.052
5900.000	1.701	57.621	5898.603	-43.648	-61.309	-43.648	75.259	234.552	0.859
6000.000	1.413	67.552	5998.566	-42.382	-58.915	-42.382	72.576	234.270	0.394
6100.000	0.984	71.073	6098.544	-41.633	-56.964	-41.633	70.556	233.838	0.435
6200.000	0.973	81.017	6198.530	-41.221	-55.313	-41.221	68.983	233.305	0.170
6300.000	0.752	97.323	6298.518	-41.172	-53.823	-41.172	67.765	232.585	0.329
6400.000	0.302	101.993	6398.514	-41.311	-52.915	-41.311	67.131	232.021	0.451
6500.000	0.180	193.944	6498.513	-41.518	-52.695	-41.518	67.085	231.766	0.357
6600.000	0.371	139.307	6598.512	-41.916	-52.521	-41.916	67.197	231.408	0.305
6700.000	0.416	126.452	6698.510	-42.377	-52.019	-42.377	67.095	230.832	0.099
6800.000	0.510	141.422	6798.507	-42.940	-51.449	-42.940	67.014	230.151	0.152
6900.000	0.473	121.130	6898.503	-43.501	-50.819	-43.501	66.894	229.436	0.177
7000.000	0.529	115.798	6998.499	-43.915	-50.050	-43.915	66.585	228.735	0.073
7100.000	0.651	111.436	7098.494	-44.324	-49.105	-44.324	66.151	227.930	0.131
HORIZONTAL DISPLACEMENT IS 66.151 FEET AT 227.930 DEGREES									