



Company: Anadarko Petroleum Corp.
 Well/API: Marrs Red VV 22-2D/05-123-16636
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/CoreTech
 County/State: Weld/Colorado
 VS-Azi: 0.000 Degrees
 Latitude: 40.03962, Longitude: -104.88215
 All Azimuths referenced to True North
 No Grid Convergence Applied



Depth Reference : RKB= GL Elevation= 5013 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 2/13/2017 / 13:57

Lat/Long Obtained by Handheld GPS at Wellhead

Handheld GPS Reference: NAD83/ Device Error: ± 9 Feet

VES Survey International- Henderson Co

Surveyor: Geof Davis / Marrs Red VV 22-2D

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	0.868	312.112	99.996	0.508	-0.562	0.508	0.757	312.112	0.868
200.000	0.759	300.014	199.986	1.347	-1.697	1.347	2.166	308.438	0.203
300.000	0.915	287.646	299.976	1.920	-3.031	1.920	3.588	302.352	0.238
400.000	1.115	312.899	399.960	2.824	-4.504	2.824	5.317	302.088	0.485
500.000	1.315	342.015	499.939	4.578	-5.571	4.578	7.211	309.408	0.641
600.000	1.305	339.207	599.913	6.733	-6.330	6.733	9.241	316.770	0.065
700.000	1.417	340.005	699.884	8.960	-7.157	8.960	11.467	321.383	0.113
800.000	1.007	345.628	799.862	10.972	-7.797	10.972	13.461	324.600	0.427
900.000	0.798	332.732	899.849	12.442	-8.335	12.442	14.976	326.183	0.290
1000.000	0.829	317.426	999.840	13.594	-9.143	13.594	16.383	326.076	0.219
1100.000	0.904	332.233	1099.828	14.825	-10.000	14.825	17.882	325.999	0.235
1200.000	0.819	312.640	1199.817	16.007	-10.893	16.007	19.362	325.763	0.305
1300.000	0.703	317.233	1299.808	16.942	-11.836	16.942	20.667	325.061	0.131
1400.000	0.617	325.532	1399.802	17.837	-12.558	17.837	21.814	324.853	0.128
1500.000	0.770	323.555	1499.794	18.822	-13.262	18.822	23.025	324.831	0.155
1600.000	0.773	307.711	1599.785	19.775	-14.195	19.775	24.343	324.328	0.213

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
1700.000	0.865	307.725	1699.775	20.650	-15.326	20.650	25.716	323.418	0.092
1800.000	1.058	317.162	1799.761	21.789	-16.551	21.789	27.363	322.779	0.249
1900.000	1.610	320.234	1899.734	23.546	-18.078	23.546	29.686	322.484	0.556
2000.000	1.574	301.864	1999.696	25.351	-20.143	25.351	32.379	321.531	0.509
2100.000	1.653	309.158	2099.656	26.987	-22.428	26.987	35.090	320.272	0.220
2200.000	1.696	308.592	2199.613	28.821	-24.703	28.821	37.959	319.400	0.046
2300.000	1.489	304.144	2299.575	30.473	-26.935	30.473	40.671	318.527	0.241
2400.000	1.474	303.248	2399.541	31.908	-29.086	31.908	43.175	317.649	0.028
2500.000	1.568	306.013	2499.506	33.417	-31.268	33.417	45.764	316.903	0.119
2600.000	1.657	304.029	2599.466	35.031	-33.573	35.031	48.521	316.218	0.105
2700.000	1.287	308.663	2699.433	36.542	-35.648	36.542	51.050	315.709	0.388
2800.000	1.266	308.492	2799.408	37.931	-37.390	37.931	53.262	315.412	0.021
2900.000	1.363	315.107	2899.382	39.462	-39.095	39.462	55.548	315.268	0.180
3000.000	1.464	315.981	2999.352	41.223	-40.822	41.223	58.015	315.280	0.103
3100.000	1.562	307.927	3099.317	42.979	-42.784	42.979	60.644	315.130	0.234
3200.000	2.032	305.516	3199.268	44.847	-45.302	44.847	63.746	314.710	0.476
3300.000	2.510	293.065	3299.189	46.734	-48.760	46.734	67.540	313.785	0.684
3400.000	2.447	302.082	3399.096	48.726	-52.584	48.726	71.689	312.819	0.394
3500.000	3.055	298.908	3498.980	51.148	-56.726	51.148	76.380	312.040	0.627
3600.000	2.524	297.062	3598.862	53.439	-61.020	53.439	81.112	311.211	0.539
3700.000	1.955	301.156	3698.785	55.323	-64.440	55.323	84.931	310.647	0.591
3800.000	1.471	319.547	3798.741	57.182	-66.733	57.182	87.881	310.593	0.727
3900.000	1.220	319.857	3898.713	58.973	-68.252	58.973	90.200	310.828	0.252
3950.000	0.955	309.985	3948.704	59.647	-68.914	59.647	91.143	310.877	0.646