

Company: Anadarko Petroleum Corp.
 Well/API: HSR-West Farm 13-14A/05-123-19742
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/CoreTech
 County/State: Weld/Colorado
 Latitude: 40.220, Longitude: -104.866
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Elevation = 4791

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro.ut

Minimum Curvature Method

Report Date/Time: 11/14/2014 / 10:43

Lat/Long Obtained By Handheld GPS At Wellhead

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

VES Survey International - Henderson CO

Justin Williams

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	0.485	202.847	99.999	-0.390	-0.164	-0.390	0.424	202.847	0.485
200.000	0.444	219.865	199.996	-1.078	-0.577	-1.078	1.222	208.166	0.143
300.000	0.649	222.477	299.991	-1.792	-1.208	-1.792	2.161	213.967	0.207
400.000	1.436	237.705	399.974	-2.879	-2.649	-2.879	3.912	222.612	0.827
500.000	2.006	242.682	499.928	-4.352	-5.263	-4.352	6.829	230.411	0.589
600.000	2.185	243.371	599.861	-6.009	-8.521	-6.009	10.427	234.808	0.181
700.000	2.227	240.747	699.787	-7.813	-11.921	-7.813	14.253	236.758	0.109
800.000	2.308	239.226	799.709	-9.793	-15.346	-9.793	18.205	237.456	0.100
900.000	2.334	240.336	899.627	-11.831	-18.845	-11.831	22.251	237.880	0.052
1000.000	2.423	239.638	999.541	-13.907	-22.438	-13.907	26.399	238.210	0.093
1100.000	2.392	240.417	1099.453	-16.006	-26.077	-16.006	30.597	238.459	0.045
1200.000	2.389	243.526	1199.366	-17.965	-29.757	-17.965	34.760	238.880	0.130
1300.000	2.373	248.107	1299.279	-19.666	-33.544	-19.666	38.884	239.618	0.191
1400.000	2.282	250.167	1399.197	-21.113	-37.338	-21.113	42.894	240.513	0.124
1500.000	2.186	255.198	1499.121	-22.276	-41.054	-22.276	46.708	241.516	0.218
1600.000	1.923	261.647	1599.057	-23.007	-44.558	-23.007	50.147	242.691	0.349
1700.000	1.792	266.501	1699.004	-23.346	-47.779	-23.346	53.178	243.959	0.205
1800.000	1.617	276.864	1798.960	-23.273	-50.740	-23.273	55.823	245.361	0.354
1900.000	1.546	276.450	1898.922	-22.953	-53.481	-22.953	58.199	246.772	0.072
2000.000	1.553	283.061	1998.886	-22.495	-56.142	-22.495	60.481	248.165	0.179
2100.000	1.985	296.519	2098.838	-21.415	-59.012	-21.415	62.777	250.054	0.597
2200.000	2.187	303.859	2198.772	-19.579	-62.147	-19.579	65.158	252.513	0.335
2300.000	2.280	305.372	2298.696	-17.364	-65.354	-17.364	67.621	255.121	0.110
2400.000	2.118	304.001	2398.622	-15.178	-68.508	-15.178	70.169	257.507	0.171
2500.000	2.140	305.544	2498.553	-13.060	-71.559	-13.060	72.741	259.657	0.061
2600.000	2.216	304.168	2598.481	-10.889	-74.677	-10.889	75.467	261.704	0.092
2700.000	2.182	298.012	2698.408	-8.909	-77.958	-8.909	78.465	263.480	0.238
2800.000	2.194	301.711	2798.335	-7.009	-81.267	-7.009	81.568	265.071	0.142
2900.000	2.278	294.246	2898.259	-5.187	-84.707	-5.187	84.865	266.496	0.303
3000.000	2.271	301.575	2998.180	-3.333	-88.207	-3.333	88.270	267.836	0.291
3100.000	2.256	298.357	3098.102	-1.361	-91.627	-1.361	91.637	269.149	0.128
3200.000	2.451	286.112	3198.018	0.168	-95.413	0.168	95.414	270.101	0.538
3300.000	2.850	280.278	3297.911	1.204	-99.914	1.204	99.921	270.691	0.481

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	2.881	283.145	3397.787	2.220	-104.806	2.220	104.830	271.213	0.147
3500.000	2.955	284.543	3497.657	3.438	-109.748	3.438	109.802	271.794	0.103
3600.000	3.000	285.607	3597.522	4.789	-114.763	4.789	114.863	272.390	0.071
3700.000	3.228	287.372	3697.374	6.334	-119.970	6.334	120.137	273.022	0.247
3800.000	3.247	285.499	3797.215	7.931	-125.385	7.931	125.636	273.619	0.107
3900.000	3.286	286.683	3897.052	9.510	-130.859	9.510	131.204	274.157	0.078
4000.000	3.533	294.878	3996.876	11.629	-136.400	11.629	136.895	274.873	0.546
4100.000	3.641	308.304	4096.682	14.894	-141.687	14.894	142.467	276.001	0.845
4200.000	3.380	314.799	4196.494	18.939	-146.270	18.939	147.491	277.378	0.475
4300.000	2.987	311.072	4296.340	22.728	-150.326	22.728	152.034	278.597	0.444
4400.000	2.671	305.781	4396.218	25.802	-154.180	25.802	156.325	279.500	0.409
4500.000	1.979	313.341	4496.135	28.349	-157.327	28.349	159.860	280.215	0.755
4600.000	1.462	330.259	4596.091	30.642	-159.215	30.642	162.137	280.894	0.719
4700.000	1.579	327.086	4696.055	32.907	-160.597	32.907	163.934	281.580	0.144
4800.000	1.475	318.533	4796.020	35.028	-162.198	35.028	165.937	282.186	0.250
4900.000	1.525	309.710	4895.986	36.842	-164.074	36.842	168.159	282.656	0.236
5000.000	1.811	301.538	4995.944	38.519	-166.444	38.519	170.843	283.030	0.372
5100.000	2.081	298.090	5095.886	40.201	-169.393	40.201	174.098	283.351	0.294
5200.000	2.164	288.853	5195.817	41.666	-172.782	41.666	177.735	283.558	0.352
5300.000	2.373	299.916	5295.740	43.309	-176.364	43.309	181.603	283.797	0.484
5400.000	2.314	284.751	5395.657	44.855	-180.110	44.855	185.611	283.985	0.621
5500.000	2.414	273.259	5495.572	45.489	-184.164	45.489	189.699	283.874	0.483
5600.000	3.264	275.722	5595.449	45.892	-189.099	45.892	194.588	283.641	0.858
5700.000	4.206	280.204	5695.236	46.826	-195.540	46.826	201.069	283.467	0.986
5800.000	4.057	291.591	5794.977	48.777	-202.439	48.777	208.232	283.547	0.832
5900.000	3.892	296.461	5894.737	51.591	-208.767	51.591	215.047	283.881	0.376
6000.000	3.823	299.818	5994.511	54.761	-214.697	54.761	221.571	284.309	0.236
6100.000	3.503	303.236	6094.306	58.093	-220.144	58.093	227.681	284.783	0.387
6200.000	3.247	298.831	6194.133	61.133	-225.180	61.133	233.331	285.189	0.364
6300.000	2.491	291.802	6294.007	63.306	-229.679	63.306	238.244	285.410	0.832
6400.000	2.760	308.320	6393.904	65.606	-233.586	65.606	242.624	285.688	0.799
6500.000	3.639	314.922	6493.747	69.340	-237.722	69.340	247.628	286.261	0.952
6600.000	4.232	322.260	6593.511	74.499	-242.228	74.499	253.425	287.096	0.777
6700.000	4.867	325.212	6693.196	80.901	-246.907	80.901	259.823	288.142	0.677
6800.000	5.552	328.532	6792.783	88.511	-251.853	88.511	266.953	289.364	0.748
6900.000	4.921	321.932	6892.366	96.015	-257.023	96.015	274.371	290.484	0.872
7000.000	4.170	314.863	6992.051	101.956	-262.245	101.956	281.367	291.245	0.935
7100.000	3.627	305.586	7091.820	106.362	-267.395	106.362	287.772	291.691	0.831
7200.000	3.685	310.652	7191.617	110.296	-272.405	110.296	293.887	292.043	0.328
7300.000	3.504	312.625	7291.420	114.459	-277.092	114.459	299.801	292.444	0.219
7400.000	3.609	305.515	7391.228	118.357	-281.902	118.357	305.740	292.775	0.453
7500.000	4.428	302.486	7490.982	122.259	-287.720	122.259	312.618	293.022	0.846
7600.000	5.038	297.920	7590.641	126.388	-294.856	126.388	320.802	293.202	0.717
HORIZONTAL DISPLACEMENT IS 320.802 FEET AT 293.202 DEGREES									