



Company: Anadarko Petroleum Corp.  
 Well/API: HSR-Streed 10-13/05-123-19270  
 Tool Type: North Seeking Rate Gyro  
 Rig Name: Production/CoreTech  
 County/State: Weld/Colorado  
 VS-Azi: 0.000 Degrees  
 Latitude: 40.22313, Longitude: -104.83867  
 All Azimuths referenced to True North  
 No Grid Convergence Applied



Depth Reference : RKB = GL Elevation = 4784'

**DRILLOG MS GYRO SURVEY CALCULATIONS**

Filename: msgyro\_run02-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 10/27/2015 / 11:02

Lat/Long Obtained By Handheld GPS At Wellhead  
 Handheld GPS Reference: NAD83/Device Error: ±9 Feet  
 VES Survey International - Denver, Colorado  
 Surveyor: Jason Kinchelow / HSR-Streed 10-13  
 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	0.363	53.719	99.999	0.188	0.256	0.188	0.317	53.719	0.363
200.000	0.085	24.760	199.998	0.443	0.542	0.443	0.700	50.775	0.292
300.000	0.139	277.204	299.998	0.525	0.453	0.525	0.694	40.782	0.183
400.000	0.182	294.517	399.998	0.606	0.188	0.606	0.635	17.273	0.064
500.000	0.613	273.301	499.995	0.703	-0.490	0.703	0.857	325.103	0.449
600.000	0.577	268.105	599.990	0.717	-1.528	0.717	1.688	295.137	0.065
700.000	0.849	261.985	699.982	0.597	-2.765	0.597	2.829	282.182	0.282
800.000	0.757	266.818	799.972	0.457	-4.159	0.457	4.184	276.271	0.115
900.000	0.654	258.607	899.965	0.308	-5.377	0.308	5.386	273.274	0.144
1000.000	0.891	246.539	999.956	-0.115	-6.650	-0.115	6.651	269.012	0.287
1100.000	1.155	249.075	1099.940	-0.784	-8.305	-0.784	8.342	264.605	0.267
1200.000	1.193	252.555	1199.919	-1.456	-10.240	-1.456	10.343	261.905	0.081
1300.000	1.191	246.551	1299.897	-2.182	-12.186	-2.182	12.380	259.848	0.125
1400.000	1.060	255.039	1399.878	-2.835	-14.034	-2.835	14.317	258.581	0.212
1500.000	0.856	252.210	1499.864	-3.301	-15.638	-3.301	15.983	258.079	0.210
1600.000	0.737	249.221	1599.854	-3.758	-16.951	-3.758	17.362	257.500	0.126
1700.000	0.833	249.480	1699.845	-4.241	-18.233	-4.241	18.720	256.906	0.096
1800.000	0.732	253.828	1799.835	-4.674	-19.527	-4.674	20.079	256.540	0.117

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	0.726	213.812	1899.828	-5.378	-20.493	-5.378	21.187	255.296	0.499
2000.000	0.839	234.210	1999.819	-6.332	-21.440	-6.332	22.355	253.545	0.298
2100.000	0.788	241.020	2099.809	-7.093	-22.634	-7.093	23.720	252.600	0.109
2200.000	0.903	220.081	2199.798	-8.029	-23.743	-8.029	25.064	251.316	0.327
2300.000	0.796	219.381	2299.787	-9.169	-24.691	-9.169	26.338	249.628	0.108
2400.000	0.596	240.963	2399.780	-9.958	-25.586	-9.958	27.456	248.734	0.326
2500.000	0.848	247.679	2499.772	-10.491	-26.725	-10.491	28.711	248.567	0.265
2600.000	1.119	257.030	2599.757	-10.991	-28.361	-10.991	30.416	248.816	0.314
2700.000	1.142	261.088	2699.738	-11.365	-30.296	-11.365	32.358	249.438	0.083
2800.000	1.278	267.038	2799.715	-11.577	-32.394	-11.577	34.401	250.334	0.185
2900.000	1.320	270.072	2899.690	-11.633	-34.659	-11.633	36.560	251.446	0.081
3000.000	1.319	268.682	2999.663	-11.658	-36.962	-11.658	38.757	252.494	0.032
3100.000	1.336	277.984	3099.636	-11.523	-39.267	-11.523	40.923	253.646	0.216
3200.000	1.228	283.874	3199.611	-11.104	-41.462	-11.104	42.923	255.008	0.170
3300.000	0.732	261.068	3299.597	-10.946	-43.133	-10.946	44.500	255.760	0.622
3400.000	0.482	346.176	3399.593	-10.637	-43.864	-10.637	45.135	256.369	0.841
3500.000	0.977	14.184	3499.585	-9.402	-43.755	-9.402	44.754	257.873	0.597
3600.000	1.098	7.154	3599.568	-7.624	-43.427	-7.624	44.091	260.043	0.175
3700.000	1.123	339.826	3699.550	-5.754	-43.646	-5.754	44.023	262.490	0.525
3800.000	0.916	341.392	3799.534	-4.076	-44.239	-4.076	44.426	264.736	0.208
3900.000	1.143	337.723	3899.518	-2.395	-44.872	-2.395	44.936	266.945	0.236
4000.000	1.070	325.833	3999.500	-0.699	-45.775	-0.699	45.780	269.125	0.240
4100.000	0.873	345.085	4099.485	0.810	-46.496	0.810	46.503	270.998	0.379
4200.000	0.690	8.335	4199.476	2.142	-46.604	2.142	46.654	272.631	0.363
4300.000	0.827	353.871	4299.468	3.454	-46.594	3.454	46.722	274.240	0.234
4400.000	1.132	307.589	4399.454	4.774	-47.454	4.774	47.693	275.745	0.819
4500.000	1.355	309.565	4499.431	6.129	-49.147	6.129	49.528	277.109	0.227
4600.000	1.747	325.304	4599.394	8.136	-50.926	8.136	51.572	279.077	0.576
4700.000	1.848	330.106	4699.345	10.787	-52.598	10.787	53.693	281.590	0.181
4800.000	2.097	338.797	4799.286	13.891	-54.063	13.891	55.819	284.410	0.389
4900.000	1.685	342.525	4899.231	17.000	-55.167	17.000	57.726	287.127	0.430
5000.000	1.769	337.218	4999.186	19.825	-56.206	19.825	59.600	289.429	0.181
5100.000	1.569	351.665	5099.144	22.603	-57.002	22.603	61.320	291.629	0.464
5200.000	3.938	40.001	5199.032	26.588	-54.993	26.588	61.083	295.803	3.123
5300.000	6.069	67.474	5298.659	31.244	-47.901	31.244	57.190	303.115	3.149
5400.000	8.925	90.836	5397.816	33.157	-35.257	33.157	48.399	313.242	4.122
5500.000	10.154	98.062	5496.435	31.808	-18.772	31.808	36.934	329.452	1.714
5600.000	10.861	106.280	5594.763	27.930	-1.000	27.930	27.948	357.949	1.655
5700.000	12.792	113.636	5692.641	20.850	18.188	20.850	27.668	41.099	2.446
5800.000	13.849	106.245	5789.957	13.062	39.823	13.062	41.910	71.840	2.002

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
5900.000	13.238	101.858	5887.178	7.361	62.520	7.361	62.952	83.285	1.195
6000.000	12.859	97.723	5984.598	3.513	84.754	3.513	84.826	87.627	1.007
6100.000	12.703	93.144	6082.122	1.415	106.760	1.415	106.769	89.241	1.025
6200.000	12.179	93.249	6179.774	0.214	128.270	0.214	128.270	89.905	0.524
6300.000	13.371	94.082	6277.297	-1.207	150.336	-1.207	150.341	90.460	1.205
6400.000	13.104	96.903	6374.641	-3.393	173.123	-3.393	173.156	91.123	0.699
6500.000	14.105	94.200	6471.835	-5.648	196.529	-5.648	196.610	91.646	1.186
6600.000	9.324	94.449	6569.724	-7.169	216.769	-7.169	216.888	91.894	4.782
6700.000	6.661	97.134	6668.744	-8.518	230.603	-8.518	230.760	92.116	2.688
6800.000	3.565	98.052	6768.334	-9.674	239.438	-9.674	239.634	92.314	3.096
6900.000	0.623	59.352	6868.258	-9.833	242.986	-9.833	243.185	92.317	3.103
7000.000	0.500	69.052	6968.254	-9.400	243.861	-9.400	244.042	92.207	0.156
7100.000	1.592	88.919	7068.236	-9.218	245.657	-9.218	245.830	92.149	1.135
7200.000	2.302	68.923	7168.178	-8.469	248.920	-8.469	249.064	91.949	0.972