



Company: Anadarko Petroleum
 Well: McDonald 2-4A
 API: 05-123-21831
 Rig Name: Production/ CoreTech
 State/County: Colorado/Weld
 Latitude: 40.261, Longitude: -104.893
 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: 11/7/2013 / 17:41

VAUGHN ENERGY SERVICES

HENDERSON, COLORADO

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	0.691	171.319	99.998	-0.596	0.091	-0.596	0.603	171.319	0.691
200.000	0.887	181.368	199.988	-1.966	0.164	-1.966	1.973	175.245	0.239
300.000	1.061	205.721	299.974	-3.574	-0.257	-3.574	3.583	184.111	0.445
400.000	1.233	212.834	399.954	-5.312	-1.242	-5.312	5.456	193.161	0.223
500.000	1.304	211.062	499.929	-7.191	-2.413	-7.191	7.585	198.547	0.081
600.000	0.906	207.538	599.911	-8.867	-3.365	-8.867	9.484	200.783	0.403
700.000	0.740	197.989	699.900	-10.182	-3.930	-10.182	10.914	201.106	0.215
800.000	0.544	214.682	799.894	-11.187	-4.400	-11.187	12.021	201.469	0.269
900.000	0.727	205.978	899.888	-12.147	-4.948	-12.147	13.116	202.161	0.207
1000.000	0.824	191.262	999.879	-13.423	-5.366	-13.423	14.456	201.789	0.221
1100.000	0.897	206.798	1099.868	-14.827	-5.859	-14.827	15.943	201.563	0.244
1200.000	0.765	205.307	1199.857	-16.129	-6.497	-16.129	17.389	201.941	0.134
1300.000	0.943	220.129	1299.846	-17.362	-7.313	-17.362	18.839	202.842	0.282
1400.000	0.795	211.414	1399.835	-18.583	-8.205	-18.583	20.314	203.823	0.198
1500.000	0.835	215.269	1499.825	-19.770	-8.988	-19.770	21.717	204.447	0.068
1600.000	0.676	215.193	1599.816	-20.847	-9.748	-20.847	23.014	205.061	0.159
1700.000	0.388	188.475	1699.812	-21.665	-10.138	-21.665	23.920	205.078	0.372
1800.000	0.413	172.216	1799.809	-22.357	-10.139	-22.357	24.549	204.395	0.116
1900.000	0.636	157.647	1899.805	-23.228	-9.880	-23.228	25.241	203.042	0.258
2000.000	0.574	144.452	1999.799	-24.148	-9.377	-24.148	25.905	201.222	0.152
2100.000	0.551	142.187	2099.795	-24.936	-8.791	-24.936	26.440	199.421	0.032
2200.000	0.563	265.834	2199.792	-25.351	-8.987	-25.351	26.897	199.519	0.982
2300.000	0.937	279.141	2299.784	-25.257	-10.284	-25.257	27.270	202.154	0.410
2400.000	1.076	287.927	2399.768	-24.838	-11.984	-24.838	27.578	205.756	0.207
2500.000	1.285	299.504	2499.747	-23.997	-13.853	-23.997	27.708	209.996	0.316
2600.000	1.060	296.894	2599.726	-23.026	-15.654	-23.026	27.843	214.209	0.231
2700.000	0.938	290.108	2699.711	-22.326	-17.248	-22.326	28.213	217.687	0.170
2800.000	0.940	307.290	2799.698	-21.548	-18.669	-21.548	28.510	220.905	0.281
2900.000	0.748	299.965	2899.687	-20.725	-19.887	-20.725	28.723	223.818	0.220
3000.000	0.853	283.501	2999.677	-20.225	-21.177	-20.225	29.283	226.317	0.252
3100.000	0.746	264.206	3099.668	-20.117	-22.548	-20.117	30.218	228.262	0.288
3200.000	0.997	214.908	3199.657	-20.896	-23.694	-20.896	31.592	228.590	0.762
3300.000	1.238	214.650	3299.638	-22.499	-24.806	-22.499	33.489	227.792	0.241
3400.000	1.262	210.899	3399.614	-24.332	-25.985	-24.332	35.599	226.882	0.085
3500.000	0.803	163.994	3499.600	-25.951	-26.358	-25.951	36.989	225.446	0.923

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
3600.000	0.634	158.579	3599.592	-27.140	-25.962	-27.140	37.558	223.730	0.182
3700.000	0.584	151.108	3699.586	-28.101	-25.514	-28.101	37.955	222.237	0.094
3800.000	0.702	164.401	3799.580	-29.137	-25.103	-29.137	38.459	220.746	0.190
3900.000	0.685	160.665	3899.572	-30.291	-24.740	-30.291	39.111	219.240	0.048
4000.000	1.340	134.899	3999.557	-31.680	-23.714	-31.680	39.573	216.817	0.782
4100.000	1.745	116.202	4099.521	-33.178	-21.520	-33.178	39.546	212.969	0.641
4200.000	1.205	111.616	4199.488	-34.237	-19.177	-34.237	39.242	209.254	0.553
4300.000	0.998	101.497	4299.469	-34.798	-17.346	-34.798	38.882	206.495	0.283
4400.000	0.782	93.159	4399.457	-35.009	-15.810	-35.009	38.414	204.304	0.251
4500.000	0.767	64.620	4499.448	-34.760	-14.524	-34.760	37.672	202.677	0.382
4600.000	1.113	39.418	4599.435	-33.723	-13.302	-33.723	36.251	201.527	0.531
4700.000	0.987	19.303	4699.419	-32.159	-12.401	-32.159	34.467	201.087	0.387
4800.000	0.764	12.289	4799.407	-30.695	-11.974	-30.695	32.948	201.311	0.246
4900.000	0.537	20.786	4899.400	-29.605	-11.666	-29.605	31.820	201.507	0.246
5000.000	0.459	342.882	4999.397	-28.784	-11.617	-28.784	31.040	201.979	0.332
5100.000	0.243	334.810	5099.395	-28.210	-11.825	-28.210	30.588	202.743	0.222
5200.000	0.394	322.236	5199.393	-27.746	-12.126	-27.746	30.280	203.607	0.166
5300.000	0.425	323.314	5299.391	-27.176	-12.559	-27.176	29.938	204.802	0.032
5400.000	0.525	337.404	5399.387	-26.456	-12.956	-26.456	29.458	206.092	0.153
5500.000	0.288	315.143	5499.385	-25.855	-13.309	-25.855	29.080	207.237	0.280
5600.000	0.798	194.332	5599.382	-26.352	-13.659	-26.352	29.682	207.398	0.977
5700.000	0.981	200.696	5699.370	-27.828	-14.133	-27.828	31.211	206.926	0.207
5800.000	0.913	195.486	5799.356	-29.396	-14.649	-29.396	32.844	206.488	0.109
5900.000	0.964	201.353	5899.343	-30.948	-15.168	-30.948	34.465	206.110	0.109
6000.000	0.846	192.289	5999.330	-32.452	-15.631	-32.452	36.020	205.719	0.185
6100.000	0.867	193.006	6099.319	-33.910	-15.959	-33.910	37.478	205.202	0.024
6200.000	0.793	181.132	6199.309	-35.340	-16.142	-35.340	38.852	204.550	0.187
6300.000	0.847	204.114	6299.299	-36.706	-16.458	-36.706	40.227	204.150	0.331
6400.000	0.799	213.700	6399.288	-37.961	-17.147	-37.961	41.654	204.308	0.146
6500.000	0.760	224.892	6499.279	-39.011	-18.002	-39.011	42.964	204.771	0.157
6600.000	0.896	247.831	6599.269	-39.776	-19.194	-39.776	44.165	205.760	0.355
6700.000	1.759	267.937	6699.242	-40.126	-21.452	-40.126	45.500	208.130	0.968
6800.000	1.685	241.739	6799.198	-40.877	-24.281	-40.877	47.545	210.710	0.784
6900.000	1.664	219.779	6899.156	-42.689	-26.505	-42.689	50.248	211.836	0.638
7000.000	1.569	207.294	6999.117	-45.022	-28.062	-45.022	53.051	211.935	0.364
7100.000	1.327	195.783	7099.085	-47.353	-29.005	-47.353	55.530	211.488	0.377
7200.000	1.052	194.754	7199.063	-49.355	-29.553	-49.355	57.527	210.913	0.276
7300.000	0.913	192.834	7299.049	-51.020	-29.964	-51.020	59.168	210.426	0.142
7400.000	0.512	173.540	7399.041	-52.241	-30.091	-52.241	60.287	209.942	0.462
7500.000	0.906	191.067	7499.033	-53.461	-30.193	-53.461	61.397	209.456	0.445
HORIZONTAL DISPLACEMENT IS 61.397 FEET AT 209.456 DEGREES									