



Company: Anadarko Petroleum
 Well: Nelson 9-31A
 API: 05-123-20670
 Rig Name: Production/ Warrior
 State/County: Colorado/Weld
 Latitude: 40.181, Longitude: -104.925
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB= Ground Level

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: h gyro-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 2/28/2014 / 09:57

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	0.592	151.021	99.998	-0.452	0.250	-0.452	0.516	151.021	0.592
200.000	0.256	109.446	199.996	-0.978	0.711	-0.978	1.209	143.986	0.435
300.000	0.233	103.629	299.995	-1.100	1.119	-1.100	1.569	134.514	0.034
400.000	0.095	140.398	399.994	-1.212	1.369	-1.212	1.829	131.509	0.167
500.000	0.159	216.275	499.994	-1.388	1.341	-1.388	1.930	135.987	0.164
600.000	0.255	232.399	599.993	-1.635	1.082	-1.635	1.961	146.501	0.112
700.000	0.373	246.567	699.992	-1.900	0.607	-1.900	1.995	162.278	0.140
800.000	0.494	259.440	799.989	-2.109	-0.115	-2.109	2.112	183.121	0.155
900.000	0.698	266.610	899.984	-2.224	-1.147	-2.224	2.502	207.286	0.217
1000.000	0.971	258.106	999.973	-2.435	-2.585	-2.435	3.551	226.712	0.299
1100.000	1.086	251.143	1099.957	-2.916	-4.311	-2.916	5.204	235.928	0.170
1200.000	1.217	260.333	1199.937	-3.400	-6.254	-3.400	7.119	241.469	0.226
1300.000	1.354	267.821	1299.912	-3.623	-8.482	-3.623	9.223	246.868	0.217
1400.000	1.439	260.952	1399.882	-3.866	-10.903	-3.866	11.568	250.477	0.188
1500.000	1.324	266.527	1499.853	-4.133	-13.296	-4.133	13.924	252.731	0.177
1600.000	1.153	263.939	1599.829	-4.309	-15.449	-4.309	16.039	254.414	0.180
1700.000	1.049	270.870	1699.811	-4.402	-17.365	-4.402	17.914	255.776	0.169
1800.000	0.710	252.467	1799.799	-4.574	-18.870	-4.574	19.417	256.374	0.437
1900.000	0.493	241.412	1899.794	-4.967	-19.838	-4.967	20.451	255.945	0.245
2000.000	0.715	219.264	1999.788	-5.655	-20.611	-5.655	21.372	254.656	0.318
2100.000	0.645	211.820	2099.781	-6.616	-21.302	-6.616	22.306	252.746	0.113
2200.000	0.747	219.764	2199.774	-7.595	-22.015	-7.595	23.289	250.966	0.140
2300.000	1.247	246.870	2299.759	-8.523	-23.433	-8.523	24.935	250.012	0.674
2400.000	1.448	255.853	2399.731	-9.260	-25.659	-9.260	27.279	250.157	0.291
2500.000	1.552	254.382	2499.697	-9.933	-28.189	-9.933	29.888	250.588	0.111
2600.000	1.102	264.301	2599.670	-10.393	-30.450	-10.393	32.175	251.154	0.504
2700.000	0.753	272.507	2699.657	-10.460	-32.064	-10.460	33.727	251.932	0.372
2800.000	0.728	277.247	2799.649	-10.351	-33.351	-10.351	34.920	252.757	0.066
2900.000	0.712	277.437	2899.641	-10.191	-34.598	-10.191	36.067	253.588	0.016
3000.000	0.758	270.326	2999.632	-10.106	-35.875	-10.106	37.272	254.267	0.102
3100.000	0.720	262.870	3099.624	-10.181	-37.160	-10.181	38.530	254.679	0.103
3200.000	0.678	262.095	3199.617	-10.340	-38.370	-10.340	39.739	254.918	0.043
3300.000	0.576	261.059	3299.611	-10.500	-39.453	-10.500	40.826	255.097	0.103
3400.000	0.508	249.122	3399.606	-10.736	-40.363	-10.736	41.767	255.106	0.131
3500.000	0.470	233.021	3499.603	-11.140	-41.105	-11.140	42.588	254.836	0.142

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	0.436	243.370	3599.600	-11.558	-41.773	-11.558	43.343	254.535	0.088
3700.000	0.459	247.456	3699.597	-11.882	-42.484	-11.882	44.114	254.375	0.039
3800.000	0.824	290.392	3799.591	-11.785	-43.528	-11.785	45.095	254.850	0.579
3900.000	1.257	300.548	3899.574	-10.977	-45.146	-10.977	46.461	256.334	0.469
4000.000	1.865	314.299	3999.537	-9.284	-47.255	-9.284	48.158	258.885	0.710
4100.000	2.149	322.154	4099.475	-6.666	-49.570	-6.666	50.016	262.340	0.395
4200.000	2.234	321.641	4199.402	-3.657	-51.930	-3.657	52.059	265.972	0.087
4300.000	2.052	328.026	4299.332	-0.610	-54.088	-0.610	54.091	269.354	0.300
4400.000	1.629	333.622	4399.281	2.182	-55.667	2.182	55.710	272.245	0.459
4500.000	1.569	329.181	4499.242	4.631	-57.000	4.631	57.188	274.645	0.138
4600.000	1.314	319.793	4599.210	6.683	-58.442	6.683	58.823	276.524	0.347
4700.000	1.193	315.758	4699.186	8.305	-59.909	8.305	60.482	277.892	0.150
4800.000	1.132	307.030	4799.166	9.645	-61.423	9.645	62.176	278.924	0.187
4900.000	1.115	289.344	4899.147	10.562	-63.130	10.562	64.008	279.498	0.346
5000.000	0.914	282.390	4999.131	11.056	-64.828	11.056	65.764	279.678	0.236
5100.000	0.843	287.177	5099.119	11.444	-66.310	11.444	67.290	279.792	0.102
5200.000	0.863	285.282	5199.108	11.860	-67.740	11.860	68.770	279.931	0.035
5300.000	0.849	277.602	5299.097	12.157	-69.201	12.157	70.260	279.964	0.116
5400.000	0.689	275.840	5399.088	12.316	-70.533	12.316	71.600	279.905	0.162
5500.000	0.388	266.006	5499.084	12.354	-71.469	12.354	72.529	279.807	0.314
5600.000	0.225	243.772	5599.082	12.243	-71.983	12.243	73.017	279.653	0.199
5700.000	0.301	254.811	5699.081	12.088	-72.413	12.088	73.415	279.477	0.091
5800.000	0.263	295.012	5799.080	12.116	-72.874	12.116	73.874	279.439	0.197
5900.000	0.178	287.739	5899.079	12.260	-73.230	12.260	74.249	279.504	0.089
6000.000	0.144	282.235	5999.079	12.334	-73.500	12.334	74.528	279.526	0.037
6100.000	0.064	314.244	6099.079	12.399	-73.663	12.399	74.699	279.555	0.096
6200.000	0.203	146.031	6199.079	12.291	-73.603	12.291	74.623	279.480	0.266
6300.000	0.343	79.679	6299.078	12.197	-73.210	12.197	74.219	279.459	0.321
6400.000	0.280	237.675	6399.077	12.120	-73.123	12.120	74.120	279.411	0.611
6500.000	0.017	140.115	6499.077	11.978	-73.320	11.978	74.292	279.279	0.283
6600.000	0.154	235.864	6599.077	11.892	-73.421	11.892	74.378	279.200	0.156
6700.000	0.282	151.441	6699.076	11.601	-73.415	11.601	74.326	278.979	0.307
6800.000	0.478	160.408	6799.074	10.991	-73.157	10.991	73.978	278.544	0.205
6900.000	0.487	179.451	6899.070	10.173	-73.013	10.173	73.719	277.932	0.160
7000.000	0.410	211.090	6999.067	9.441	-73.194	9.441	73.800	277.350	0.256
7100.000	0.497	224.773	7099.064	8.827	-73.684	8.827	74.211	276.831	0.138
7200.000	0.186	216.915	7199.062	8.389	-74.087	8.389	74.561	276.460	0.313
7300.000	0.116	347.830	7299.062	8.358	-74.206	8.358	74.675	276.426	0.277
7400.000	0.222	156.549	7399.062	8.279	-74.150	8.279	74.611	276.371	0.337
7500.000	0.117	18.529	7499.062	8.198	-74.041	8.198	74.493	276.318	0.319
7600.000	0.266	71.359	7599.061	8.369	-73.789	8.369	74.262	276.471	0.216
HORIZONTAL DISPLACEMENT IS 74.262 FEET AT 276.471 DEGREES									