



Company: PDC Energy
 Well: Walsh 23-24
 API: 05-123-20584
 Rig Name: Production/ VES
 State/County: Colorado/Weld
 Latitude: 40.122, Longitude: -104.953
 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: hagyar-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 10/25/2014 / 09:58

VES Survey International
 Henderson, CO 80640
 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	0.352	66.253	99.999	0.124	0.281	0.124	0.307	66.253	0.352
200.000	0.667	112.158	199.996	0.028	1.101	0.028	1.101	88.547	0.492
300.000	1.190	154.788	299.983	-1.131	2.082	-1.131	2.370	118.514	0.833
400.000	1.976	171.962	399.945	-3.778	2.766	-3.778	4.682	143.795	0.910
500.000	2.851	177.764	499.855	-7.971	3.104	-7.971	8.554	158.724	0.908
600.000	3.777	177.044	599.687	-13.745	3.371	-13.745	14.152	166.222	0.926
700.000	4.401	179.776	699.432	-20.871	3.555	-20.871	21.172	170.333	0.654
800.000	4.694	180.894	799.117	-28.799	3.507	-28.799	29.012	173.058	0.306
900.000	4.372	180.345	898.804	-36.701	3.420	-36.701	36.860	174.677	0.325
1000.000	4.016	182.681	998.536	-44.011	3.233	-44.011	44.130	175.799	0.394
1100.000	3.954	183.996	1098.295	-50.948	2.829	-50.948	51.027	176.822	0.111
1200.000	3.945	180.345	1198.057	-57.827	2.568	-57.827	57.884	177.457	0.252
1300.000	3.934	183.923	1297.821	-64.689	2.313	-64.689	64.730	177.953	0.246
1400.000	3.974	187.466	1397.583	-71.547	1.628	-71.547	71.566	178.697	0.248
1500.000	3.756	187.833	1497.356	-78.228	0.731	-78.228	78.231	179.465	0.220
1600.000	3.466	186.559	1597.157	-84.475	-0.061	-84.475	84.475	180.041	0.301
1700.000	2.813	199.023	1697.008	-89.798	-1.206	-89.798	89.806	180.769	0.941
1800.000	2.536	203.280	1796.899	-94.150	-2.880	-94.150	94.194	181.752	0.341
1900.000	2.277	216.110	1896.811	-97.788	-4.925	-97.788	97.912	182.883	0.596
2000.000	1.562	224.598	1996.755	-100.363	-7.053	-100.363	100.611	184.020	0.768
2100.000	1.032	251.766	2096.730	-101.616	-8.865	-101.616	102.002	184.986	0.798
2200.000	1.325	270.793	2196.709	-101.881	-10.877	-101.881	102.460	186.094	0.485
2300.000	1.221	285.678	2296.684	-101.577	-13.059	-101.577	102.413	187.326	0.345
2400.000	1.528	266.170	2396.656	-101.378	-15.416	-101.378	102.544	188.646	0.556
2500.000	1.614	271.769	2496.618	-101.424	-18.154	-101.424	103.036	190.148	0.176
2600.000	1.379	280.843	2596.584	-101.154	-20.744	-101.154	103.259	191.589	0.333
2700.000	1.315	261.449	2696.557	-101.099	-23.060	-101.099	103.695	192.849	0.458
2800.000	1.178	259.897	2796.534	-101.449	-25.206	-101.449	104.534	193.953	0.141
2900.000	1.342	249.087	2896.510	-102.048	-27.313	-102.048	105.640	194.984	0.288
3000.000	1.281	253.797	2996.483	-102.778	-29.480	-102.778	106.922	196.005	0.124
3100.000	1.238	250.615	3096.459	-103.448	-31.572	-103.448	108.159	196.972	0.082
3200.000	1.249	242.218	3196.436	-104.314	-33.554	-104.314	109.578	197.831	0.182
3300.000	0.962	271.955	3296.418	-104.794	-35.357	-104.794	110.598	198.644	0.631
3400.000	0.421	269.096	3396.410	-104.771	-36.563	-104.771	110.968	199.238	0.542
3500.000	0.791	251.817	3496.405	-104.992	-37.586	-104.992	111.517	199.697	0.409

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	0.786	247.850	3596.395	-105.466	-38.877	-105.466	112.404	200.235	0.055
3700.000	0.956	223.183	3696.384	-106.333	-40.083	-106.333	113.637	200.655	0.407
3800.000	0.990	186.392	3796.370	-107.799	-40.750	-107.799	115.245	200.708	0.615
3900.000	1.261	192.210	3896.351	-109.734	-41.079	-109.734	117.171	200.524	0.294
4000.000	1.102	174.290	3996.330	-111.766	-41.216	-111.766	119.124	200.243	0.400
4100.000	0.897	190.865	4096.315	-113.492	-41.268	-113.492	120.762	199.982	0.352
4200.000	0.900	158.804	4196.303	-114.992	-41.132	-114.992	122.127	199.682	0.496
4300.000	0.633	148.223	4296.294	-116.194	-40.557	-116.194	123.069	199.242	0.301
4400.000	1.044	135.695	4396.283	-117.315	-39.630	-117.315	123.828	198.666	0.448
4500.000	0.576	134.413	4496.273	-118.319	-38.635	-118.319	124.467	198.083	0.468
4600.000	0.177	161.857	4596.271	-118.818	-38.227	-118.818	124.816	197.835	0.427
4700.000	0.235	158.686	4696.270	-119.156	-38.105	-119.156	125.101	197.734	0.059
4800.000	0.868	102.946	4796.266	-119.517	-37.292	-119.517	125.200	197.329	0.761
4900.000	1.718	99.847	4896.239	-119.943	-35.076	-119.943	124.967	196.301	0.852
5000.000	1.436	86.797	4996.202	-120.130	-32.348	-120.130	124.409	195.071	0.455
5100.000	0.803	106.036	5096.182	-120.253	-30.424	-120.253	124.042	194.198	0.728
5200.000	0.428	67.011	5196.177	-120.301	-29.406	-120.301	123.843	193.736	0.542
5300.000	0.326	298.368	5296.176	-120.020	-29.312	-120.020	123.547	193.725	0.681
5400.000	0.156	6.601	5396.175	-119.749	-29.547	-119.749	123.341	193.860	0.305
5500.000	0.385	332.005	5496.174	-119.318	-29.689	-119.318	122.956	193.973	0.272
5600.000	0.404	262.638	5596.172	-119.066	-30.196	-119.066	122.835	194.231	0.449
5700.000	0.184	345.667	5696.171	-118.956	-30.585	-118.956	122.825	194.419	0.423
5800.000	0.507	314.581	5796.169	-118.490	-30.940	-118.490	122.463	194.634	0.363
5900.000	0.526	347.148	5896.165	-117.732	-31.358	-117.732	121.837	194.914	0.290
6000.000	1.113	346.196	5996.155	-116.342	-31.691	-116.342	120.581	195.238	0.588
6100.000	1.185	7.780	6096.135	-114.374	-31.783	-114.374	118.708	195.530	0.436
6200.000	0.982	10.382	6196.117	-112.506	-31.489	-112.506	116.830	195.636	0.209
6300.000	0.742	341.711	6296.106	-111.049	-31.538	-111.049	115.440	195.854	0.486
6400.000	0.774	9.453	6396.098	-109.768	-31.630	-109.768	114.235	196.074	0.365
6500.000	0.708	354.602	6496.089	-108.487	-31.577	-108.487	112.989	196.228	0.202
6600.000	0.686	2.113	6596.082	-107.274	-31.613	-107.274	111.835	196.420	0.094
6700.000	0.241	328.059	6696.079	-106.497	-31.702	-106.497	111.116	196.577	0.505
6800.000	0.313	347.223	6796.077	-106.053	-31.873	-106.053	110.739	196.728	0.117
6900.000	0.236	323.873	6896.076	-105.620	-32.055	-105.620	110.377	196.883	0.135
7000.000	0.054	297.830	6996.076	-105.432	-32.218	-105.432	110.245	196.992	0.188
7100.000	0.290	220.465	7096.075	-105.602	-32.424	-105.602	110.468	197.069	0.283
7200.000	0.169	159.091	7196.075	-105.932	-32.535	-105.932	110.816	197.073	0.256
7300.000	0.094	357.593	7296.075	-105.988	-32.486	-105.988	110.855	197.041	0.260
7400.000	0.312	275.062	7396.074	-105.882	-32.761	-105.882	110.835	197.192	0.314
7500.000	0.511	59.165	7496.073	-105.629	-32.649	-105.629	110.560	197.176	0.786
7600.000	0.342	9.625	7596.070	-105.107	-32.216	-105.107	109.933	197.041	0.389
7700.000	0.449	85.471	7696.069	-104.782	-31.776	-104.782	109.494	196.870	0.493
7800.000	0.278	9.896	7796.067	-104.512	-31.344	-104.512	109.111	196.694	0.465
7900.000	0.219	110.901	7896.066	-104.341	-31.124	-104.341	108.884	196.609	0.385

HORIZONTAL DISPLACEMENT IS
108.884 FEET AT 196.609 DEGREES