



Company: PDC Energy  
 Well: Alvin State #1  
 API: 05-123-10602  
 Rig Name: Production / VESSI  
 State/County: Colorado/Weld  
 Latitude: 40.133, Longitude: -104.902  
 Directions are relative to True North  
 VS-Azi: 0.000 Degrees



**FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : Gournrd Level

**DRILLOG HA GYRO SURVEY CALCULATIONS**

Filename: hagyar-de\_01.ut  
 Minimum Curvature Method  
 Report Date/Time: 10/27/2014 / 09:56

VES Survey International  
 Henderson, Colorado  
 303-853-4976  
 Kevin McDowell

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	0.297	298.381	100.000	0.123	-0.228	0.123	0.259	298.381	0.297
200.000	0.311	280.127	199.998	0.294	-0.722	0.294	0.780	292.128	0.097
300.000	0.283	294.434	299.997	0.444	-1.214	0.444	1.293	290.068	0.079
400.000	0.189	287.604	399.996	0.595	-1.596	0.595	1.703	290.462	0.098
500.000	0.301	212.502	499.995	0.424	-1.894	0.424	1.941	282.620	0.311
600.000	0.475	138.731	599.993	-0.109	-1.762	-0.109	1.765	266.467	0.486
700.000	0.343	152.585	699.991	-0.686	-1.350	-0.686	1.515	243.081	0.164
800.000	0.503	170.471	799.988	-1.384	-1.140	-1.384	1.793	219.484	0.206
900.000	0.488	168.318	899.984	-2.234	-0.981	-2.234	2.440	203.717	0.024
1000.000	0.376	208.316	999.982	-2.940	-1.051	-2.940	3.122	199.670	0.314
1100.000	0.406	241.162	1099.980	-3.399	-1.517	-3.399	3.723	204.049	0.223
1200.000	0.635	221.642	1199.976	-3.984	-2.196	-3.984	4.549	208.857	0.286
1300.000	0.583	216.420	1299.970	-4.808	-2.866	-4.808	5.597	210.798	0.076
1400.000	0.643	221.987	1399.964	-5.634	-3.543	-5.634	6.655	212.164	0.084
1500.000	0.642	233.304	1499.958	-6.385	-4.367	-6.385	7.736	214.369	0.127
1600.000	0.646	238.241	1599.952	-7.017	-5.295	-7.017	8.791	217.041	0.056
1700.000	0.608	242.185	1699.946	-7.561	-6.244	-7.561	9.806	219.551	0.058
1800.000	0.439	232.059	1799.941	-8.044	-7.016	-8.044	10.674	221.092	0.192
1900.000	0.701	235.819	1899.936	-8.623	-7.823	-8.623	11.643	222.216	0.264
2000.000	0.655	244.359	1999.929	-9.214	-8.845	-9.214	12.772	223.828	0.111
2100.000	0.513	245.242	2099.924	-9.649	-9.767	-9.649	13.730	225.348	0.142
2200.000	0.661	259.973	2199.919	-9.937	-10.742	-9.937	14.633	227.228	0.210
2300.000	0.363	250.017	2299.915	-10.146	-11.607	-10.146	15.417	228.844	0.310
2400.000	0.562	272.631	2399.912	-10.232	-12.394	-10.232	16.072	230.461	0.266
2500.000	0.596	248.328	2499.907	-10.401	-13.367	-10.401	16.937	232.113	0.246
2600.000	0.598	276.218	2599.901	-10.536	-14.369	-10.536	17.818	233.749	0.288
2700.000	0.522	247.777	2699.897	-10.652	-15.310	-10.652	18.651	235.171	0.285
2800.000	0.671	254.337	2799.891	-10.983	-16.296	-10.983	19.651	236.021	0.164
2900.000	0.692	263.552	2899.884	-11.209	-17.460	-11.209	20.748	237.301	0.111
3000.000	0.543	270.057	2999.879	-11.276	-18.534	-11.276	21.695	238.684	0.165
3100.000	0.750	252.405	3099.872	-11.473	-19.632	-11.473	22.738	239.696	0.285
3200.000	0.836	265.743	3199.863	-11.725	-20.983	-11.725	24.037	240.803	0.203
3300.000	0.907	265.933	3299.851	-11.836	-22.500	-11.836	25.423	242.254	0.072
3400.000	0.623	276.923	3399.842	-11.826	-23.829	-11.826	26.602	243.605	0.319
3500.000	0.648	274.594	3499.836	-11.716	-24.932	-11.716	27.547	244.831	0.036

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	1.046	259.761	3599.825	-11.833	-26.394	-11.833	28.925	245.853	0.451
3700.000	1.533	271.694	3699.800	-11.955	-28.629	-11.955	31.025	247.335	0.553
3800.000	1.421	279.418	3799.766	-11.713	-31.189	-11.713	33.316	249.417	0.228
3900.000	1.845	282.593	3899.726	-11.159	-33.983	-11.159	35.768	251.821	0.433
4000.000	1.585	280.641	3999.681	-10.553	-36.913	-10.553	38.392	254.046	0.266
4100.000	1.153	270.501	4099.652	-10.289	-39.279	-10.289	40.604	255.322	0.494
4200.000	0.741	232.441	4199.639	-10.674	-40.797	-10.674	42.171	255.338	0.730
4300.000	1.128	197.564	4299.626	-12.007	-41.607	-12.007	43.305	253.903	0.671
4400.000	1.386	205.303	4399.602	-14.039	-42.421	-14.039	44.684	251.689	0.309
4500.000	1.548	228.111	4499.570	-16.035	-43.944	-16.035	46.778	249.954	0.601
4600.000	1.258	224.804	4599.540	-17.715	-45.723	-17.715	49.035	248.821	0.301
4700.000	1.352	221.592	4699.514	-19.376	-47.279	-19.376	51.096	247.715	0.119
4800.000	1.553	246.243	4799.483	-20.804	-49.303	-20.804	53.513	247.122	0.651
4900.000	1.450	247.476	4899.449	-21.835	-51.712	-21.835	56.133	247.108	0.108
5000.000	1.510	274.608	4999.417	-22.214	-54.194	-22.214	58.570	247.712	0.697
5100.000	1.416	257.431	5099.385	-22.377	-56.713	-22.377	60.968	248.468	0.447
5200.000	1.703	271.119	5199.348	-22.617	-59.405	-22.617	63.564	249.157	0.469
5300.000	1.315	259.053	5299.313	-22.806	-62.017	-22.806	66.078	249.810	0.500
5400.000	1.399	281.134	5399.286	-22.788	-64.342	-22.788	68.258	250.498	0.526
5500.000	0.862	258.818	5499.266	-22.698	-66.278	-22.698	70.057	251.096	0.685
5600.000	1.097	262.340	5599.252	-22.971	-67.965	-22.971	71.742	251.325	0.242
5700.000	1.165	251.272	5699.232	-23.425	-69.875	-23.425	73.697	251.467	0.228
5800.000	1.377	263.181	5799.208	-23.894	-72.031	-23.894	75.891	251.648	0.338
5900.000	0.958	286.144	5899.187	-23.804	-74.028	-23.804	77.761	252.174	0.620
6000.000	0.913	287.837	5999.174	-23.328	-75.589	-23.328	79.107	252.849	0.053
6100.000	0.783	301.056	6099.163	-22.731	-76.933	-22.731	80.221	253.539	0.234
6200.000	1.152	278.794	6199.149	-22.225	-78.511	-22.225	81.597	254.194	0.521
6300.000	0.964	286.982	6299.132	-21.826	-80.309	-21.826	83.222	254.796	0.241
6400.000	0.949	291.027	6399.118	-21.283	-81.887	-21.283	84.607	255.431	0.069
6500.000	1.324	295.096	6499.098	-20.496	-83.706	-20.496	86.179	256.241	0.383
6600.000	1.284	263.685	6599.074	-20.129	-85.865	-20.129	88.193	256.806	0.707
6700.000	1.361	277.411	6699.047	-20.099	-88.156	-20.099	90.419	257.156	0.325
6800.000	0.747	280.346	6799.030	-19.829	-89.976	-19.829	92.135	257.572	0.616
6900.000	0.848	303.467	6899.021	-19.304	-91.234	-19.304	93.254	258.053	0.335
7000.000	1.259	289.324	6999.004	-18.532	-92.889	-18.532	94.719	258.717	0.483
7100.000	1.227	271.784	7098.980	-18.135	-94.995	-18.135	96.711	259.192	0.380
7200.000	0.806	240.861	7198.965	-18.444	-96.679	-18.444	98.423	259.199	0.677
7300.000	0.915	251.475	7298.954	-19.040	-98.050	-19.040	99.882	259.010	0.193
7400.000	1.288	267.856	7398.936	-19.336	-99.931	-19.336	101.784	259.049	0.484

HORIZONTAL DISPLACEMENT IS  
101.784 FEET AT 259.049 DEGREES