



Scientific Drilling

Gyroscopic Survey Report
for
COG

30-015-29006

Well Location	EDDY COUNTY, NEW MEXICO
Well Name	WILLOW STATE #3
Rig Name	P/U
Survey Date	3/5/2011
Latitude	32.83 deg
North Reference	Grid North
Grid Correction	-0.25 deg
Depth Reference	RKB
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 0.00Azim (deg)
Definitive Survey	None
Operator	FRANK RENTERIA

Comments

14 FOOT KB





Survey Report

Well Name: WILLOW STATE #3

Survey: FINAL GYRO SURVEY

Survey Date: 3/5/2011

MD ft	Inc deg	Azim deg	TVD ft	VS ft	Northing ft	Easting ft	DLS deg/100ft	Closure Distance ft	Closure Angle deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
100.00	0.10	265.73	100.00	-0.01	-0.01	-0.09	0.10	0.09	265.73
200.00	0.10	154.59	200.00	-0.09	-0.09	-0.14	0.17	0.17	237.13
300.00	0.14	140.57	300.00	-0.27	-0.27	-0.03	0.05	0.27	186.57
400.00	0.12	27.54	400.00	-0.27	-0.27	0.09	0.21	0.28	160.64
500.00	0.31	348.97	500.00	0.09	0.09	0.09	0.23	0.13	45.35
600.00	0.71	24.18	599.99	0.92	0.92	0.29	0.49	0.96	17.68
700.00	0.84	15.88	699.99	2.18	2.18	0.75	0.17	2.31	18.84
800.00	1.15	16.15	799.97	3.85	3.85	1.23	0.31	4.04	17.64
900.00	1.13	16.69	899.95	5.76	5.76	1.79	0.03	6.03	17.24
1000.00	1.36	28.38	999.93	7.74	7.74	2.63	0.35	8.18	18.78
1100.00	2.05	40.37	1099.88	10.15	10.15	4.35	0.77	11.04	23.22
1200.00	3.03	42.96	1199.78	13.45	13.45	7.32	0.99	15.31	28.55
1300.00	3.61	43.76	1299.61	17.66	17.66	11.30	0.57	20.96	32.61
1400.00	3.81	46.92	1399.41	22.20	22.20	15.90	0.29	27.30	35.61
1500.00	3.87	48.04	1499.18	26.72	26.72	20.83	0.10	33.88	37.94
1600.00	3.64	50.50	1598.97	31.00	31.00	25.79	0.28	40.32	39.76
1700.00	3.12	52.48	1698.79	34.67	34.67	30.39	0.53	46.11	41.24
1800.00	2.57	53.05	1798.67	37.68	37.68	34.34	0.54	50.98	42.35
1900.00	1.52	50.13	1898.60	39.87	39.87	37.16	1.06	54.50	42.98
2000.00	0.83	54.35	1998.58	41.15	41.15	38.76	0.69	56.53	43.29
2100.00	0.28	193.91	2098.58	41.33	41.33	39.29	1.06	57.03	43.55
2200.00	0.82	215.18	2198.57	40.50	40.50	38.82	0.57	56.10	43.78
2300.00	1.40	229.98	2298.56	39.13	39.13	37.47	0.64	54.17	43.76
2400.00	1.49	233.21	2398.52	37.56	37.56	35.49	0.12	51.67	43.37
2500.00	1.53	237.28	2498.49	36.06	36.06	33.32	0.11	49.10	42.74
2600.00	1.58	236.26	2598.45	34.58	34.58	31.06	0.06	46.48	41.93
2700.00	1.67	237.20	2698.41	33.02	33.02	28.69	0.09	43.74	40.98
2800.00	1.68	235.50	2798.37	31.41	31.41	26.26	0.05	40.94	39.90
2900.00	1.69	238.44	2898.33	29.81	29.81	23.80	0.09	38.15	38.61
3000.00	1.82	238.33	2998.28	28.20	28.20	21.19	0.13	35.28	36.92
3100.00	1.95	238.41	3098.23	26.48	26.48	18.39	0.13	32.24	34.78
3200.00	1.98	239.41	3198.17	24.71	24.71	15.45	0.05	29.14	32.02
3300.00	2.07	239.66	3298.10	22.91	22.91	12.40	0.09	26.05	28.43
3400.00	2.17	239.94	3398.04	21.05	21.05	9.20	0.10	22.97	23.62
3500.00	2.33	237.43	3497.96	19.01	19.01	5.85	0.18	19.89	17.12
3600.00	2.32	234.38	3597.88	16.74	16.74	2.50	0.12	16.92	8.49
3700.00	2.53	231.17	3697.79	14.17	14.17	-0.87	0.25	14.20	356.49
3800.00	2.80	233.95	3797.68	11.35	11.35	-4.56	0.30	12.23	338.10



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MD ft	Inc deg	Azim deg	TVD ft	VS ft	Northing ft	Easting ft	DLS deg/100ft	Closure Distance ft	Closure Angle deg
3900.00	3.06	229.27	3897.55	8.17	8.17	-8.56	0.35	11.84	313.67
4000.00	3.08	226.00	3997.40	4.56	4.56	-12.52	0.18	13.32	290.03
4100.00	2.90	225.94	4097.27	0.94	0.94	-16.27	0.18	16.29	273.31
4200.00	2.76	224.25	4197.15	-2.54	-2.54	-19.76	0.16	19.93	262.67
4300.00	2.78	223.12	4297.03	-6.04	-6.04	-23.10	0.06	23.88	255.35
4400.00	2.53	222.62	4396.92	-9.44	-9.44	-26.26	0.25	27.90	250.23
4500.00	2.46	218.10	4496.83	-12.75	-12.75	-29.08	0.21	31.75	246.32
4600.00	2.55	219.63	4596.73	-16.16	-16.16	-31.82	0.11	35.69	243.08
4700.00	2.44	217.73	4696.64	-19.55	-19.55	-34.54	0.14	39.69	240.49
4800.00	2.41	215.39	4796.55	-22.95	-22.95	-37.06	0.10	43.59	238.23
4900.00	2.18	223.37	4896.47	-26.04	-26.04	-39.58	0.40	47.38	236.66
5000.00	2.05	211.02	4996.40	-28.95	-28.95	-41.81	0.47	50.86	235.30
5100.00	2.67	206.92	5096.31	-32.56	-32.56	-43.78	0.65	54.57	233.36
5200.00	2.98	198.52	5196.19	-37.11	-37.11	-45.67	0.51	58.84	230.90
5300.00	3.18	194.98	5296.05	-42.25	-42.25	-47.21	0.27	63.35	228.17
5400.00	2.86	201.37	5395.91	-47.25	-47.25	-48.83	0.46	67.95	225.94
5500.00	2.58	203.63	5495.80	-51.64	-51.64	-50.65	0.30	72.33	224.44
5600.00	2.22	203.44	5595.71	-55.48	-55.48	-52.32	0.37	76.26	223.32
5700.00	1.97	206.19	5695.64	-58.80	-58.80	-53.85	0.26	79.73	222.48
5800.00	2.00	206.27	5795.58	-61.91	-61.91	-55.38	0.02	83.06	221.81
5900.00	1.82	212.53	5895.53	-64.81	-64.81	-57.01	0.27	86.31	221.33
6000.00	1.96	207.20	5995.47	-67.67	-67.67	-58.64	0.22	89.54	220.91
6100.00	1.74	203.13	6095.42	-70.59	-70.59	-60.02	0.26	92.66	220.37
6200.00	1.72	202.96	6195.37	-73.37	-73.37	-61.20	0.02	95.55	219.83
6300.00	1.68	203.82	6295.33	-76.10	-76.10	-62.38	0.05	98.40	219.34
6400.00	1.65	207.20	6395.29	-78.72	-78.72	-63.63	0.10	101.22	218.95
6500.00	1.87	202.78	6495.24	-81.50	-81.50	-64.92	0.26	104.20	218.54
6504.00	1.88	202.88	6499.24	-81.62	-81.62	-64.97	0.31	104.33	218.52