



Company: Exxon
 Lease/Well: PCU/#197-34A7
 API#: 05-103-11538
 Rig Name: Production
 State/County: Colorado/Rio Blanco
 Latitude: 39.92
 GRID North is 1.79 Degrees West of True North
 VS-Azi: 0.00 Degrees



Depth Reference : GL

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: pcu 197-34a7.ut
 Minimum Curvature Method
 Report Date/Time: 12/3/2010 / 08:56

Vaughn Energy Services
 Rifle, Colorado 970-456-2071
 Surveyor: Garry Fowler
 North Seeking Rate Gyro
 PCU 197-34A7 / API# 05-103-11538

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
200.00	0.75	64.63	199.99	0.56	1.18	0.56	1.31	64.63	0.38
400.00	1.73	140.77	399.96	-1.22	4.27	-1.22	4.44	105.89	0.86
600.00	8.56	145.65	599.03	-15.86	14.60	-15.86	21.55	137.38	3.42
800.00	10.36	139.48	796.31	-41.82	34.68	-41.82	54.33	140.33	1.03
1000.00	16.84	138.04	990.60	-77.07	65.77	-77.07	101.32	139.53	3.24
1200.00	21.05	139.09	1179.72	-125.78	108.68	-125.78	166.23	139.17	2.11
1400.00	21.89	139.48	1365.84	-181.27	156.42	-181.27	239.43	139.21	0.43
1600.00	21.53	139.34	1551.66	-237.45	204.56	-237.45	313.41	139.26	0.18
1800.00	21.07	138.74	1737.99	-292.32	252.18	-292.32	386.06	139.22	0.25
2000.00	20.71	139.07	1924.85	-346.06	299.06	-346.06	457.38	139.17	0.19
2200.00	20.20	137.92	2112.24	-398.41	345.37	-398.41	527.26	139.08	0.32
2400.00	18.65	135.75	2300.85	-446.94	390.82	-446.94	593.72	138.83	0.85
2600.00	19.59	139.10	2489.82	-495.20	435.09	-495.20	659.19	138.70	0.72
2800.00	21.39	140.57	2677.16	-548.71	480.21	-548.71	729.17	138.81	0.94
3000.00	21.56	139.61	2863.28	-604.87	527.19	-604.87	802.37	138.93	0.20
3200.00	20.94	139.42	3049.68	-660.01	574.25	-660.01	874.86	138.97	0.31
3400.00	19.22	137.21	3237.51	-711.31	619.87	-711.31	943.51	138.93	0.94
3600.00	19.04	136.44	3426.47	-759.11	664.71	-759.11	1009.01	138.79	0.15
3800.00	18.70	135.88	3615.72	-805.77	709.51	-805.77	1073.62	138.63	0.19
4000.00	18.38	137.68	3805.34	-852.10	753.06	-852.10	1137.18	138.53	0.33

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
4200.00	18.46	140.15	3995.10	-899.72	794.58	-899.72	1200.36	138.55	0.39
4400.00	16.26	139.13	4185.98	-945.21	833.20	-945.21	1260.02	138.60	1.11
4600.00	12.74	137.23	4379.58	-982.59	866.50	-982.59	1310.08	138.59	1.78
4800.00	8.72	142.20	4576.04	-1010.77	890.78	-1010.77	1347.27	138.61	2.06
5000.00	4.83	142.12	4774.61	-1029.40	905.25	-1029.40	1370.82	138.67	1.95
5200.00	0.04	168.77	4974.37	-1036.12	910.44	-1036.12	1379.29	138.69	2.40
5400.00	0.23	88.89	5174.37	-1036.18	910.86	-1036.18	1379.61	138.68	0.12
5600.00	0.64	87.68	5374.36	-1036.12	912.39	-1036.12	1380.58	138.63	0.21
5800.00	0.65	88.74	5574.35	-1036.05	914.65	-1036.05	1382.02	138.56	0.01
6000.00	0.66	132.26	5774.34	-1036.81	916.64	-1036.81	1383.90	138.52	0.24
6200.00	0.85	130.54	5974.32	-1038.55	918.62	-1038.55	1386.53	138.51	0.10
6400.00	0.97	134.04	6174.30	-1040.69	920.97	-1040.69	1389.69	138.49	0.06
6600.00	1.02	135.00	6374.27	-1043.13	923.45	-1043.13	1393.16	138.48	0.03
6800.00	1.25	154.98	6574.23	-1046.37	925.63	-1046.37	1397.02	138.50	0.23
7000.00	0.93	158.44	6774.19	-1049.86	927.15	-1049.86	1400.65	138.55	0.16
7200.00	0.84	166.67	6974.17	-1052.79	928.09	-1052.79	1403.46	138.60	0.08
7400.00	0.74	178.91	7174.15	-1055.49	928.45	-1055.49	1405.73	138.66	0.10
7600.00	0.58	154.06	7374.14	-1057.69	928.92	-1057.69	1407.69	138.71	0.16
7800.00	0.78	159.96	7574.12	-1059.89	929.83	-1059.89	1409.94	138.74	0.10
8000.00	0.86	165.40	7774.10	-1062.61	930.67	-1062.61	1412.55	138.79	0.05
8200.00	1.22	179.86	7974.07	-1066.19	931.06	-1066.19	1415.49	138.87	0.22
8400.00	1.38	169.14	8174.02	-1070.69	931.52	-1070.69	1419.19	138.98	0.15
8600.00	1.51	167.42	8373.95	-1075.63	932.54	-1075.63	1423.59	139.08	0.07
8800.00	1.52	158.21	8573.88	-1080.66	934.10	-1080.66	1428.41	139.16	0.12
9000.00	1.65	157.33	8773.81	-1085.79	936.20	-1085.79	1433.67	139.23	0.07
9200.00	1.77	178.30	8973.72	-1091.54	937.40	-1091.54	1438.82	139.34	0.32
9400.00	2.02	187.88	9173.61	-1098.12	937.01	-1098.12	1443.56	139.53	0.20
9600.00	1.61	185.75	9373.51	-1104.41	936.25	-1104.41	1447.85	139.71	0.20
9800.00	1.41	174.25	9573.44	-1109.66	936.21	-1109.66	1451.84	139.85	0.18
10000.00	0.91	168.66	9773.40	-1113.66	936.77	-1113.66	1455.26	139.93	0.26
10200.00	0.70	163.02	9973.38	-1116.38	937.44	-1116.38	1457.77	139.98	0.11
10400.00	0.71	157.70	10173.36	-1118.69	938.26	-1118.69	1460.07	140.01	0.03
10600.00	0.72	219.21	10373.35	-1120.81	937.94	-1120.81	1461.49	140.08	0.37
10800.00	0.88	244.78	10573.33	-1122.44	935.76	-1122.44	1461.33	140.18	0.19
11000.00	0.93	259.16	10773.31	-1123.40	932.77	-1123.40	1460.16	140.30	0.12
11200.00	1.87	260.16	10973.25	-1124.26	927.96	-1124.26	1457.76	140.46	0.47
11400.00	1.87	246.42	11173.14	-1126.12	921.75	-1126.12	1455.26	140.70	0.22
11600.00	1.66	253.80	11373.05	-1128.23	915.98	-1128.23	1453.25	140.93	0.15
11800.00	1.00	245.29	11572.99	-1129.78	911.60	-1129.78	1451.69	141.10	0.34
12000.00	0.87	236.59	11772.96	-1131.35	908.73	-1131.35	1451.12	141.23	0.10
12200.00	0.86	235.71	11972.94	-1133.03	906.22	-1133.03	1450.86	141.35	0.01
12400.00	0.81	211.96	12172.92	-1135.08	904.23	-1135.08	1451.22	141.46	0.17

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
12488.00	0.77	207.78	12260.91	-1136.13	903.63	-1136.13	1451.67	141.50	0.08