



Company: Exxon  
Lease/Well: FRU/197-33B3

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 : KB = 0 FEET

**DRILLOG MS GYRO SURVEY CALCULATIONS**

Filename: fru 197-33b3.ut

Minimum Curvature Method

Report Date/Time: 10/15/2010 / 13:53

Vaughn Energy Services

Rifle, Colorado

970-456-2071

Surveyor: Garry Fowler

FRU 197-33B3

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	1.01	40.76	199.99	1.33	1.15	1.33	1.76	40.76	0.50
400.00	4.19	45.04	399.76	7.82	7.46	7.82	10.80	43.65	1.59
600.00	5.24	87.41	599.14	13.39	21.76	13.39	25.55	58.39	1.77
800.00	9.28	93.13	797.50	12.92	46.99	12.92	48.74	74.62	2.05
1000.00	9.76	100.04	994.75	9.09	79.78	9.09	80.30	83.50	0.62
1200.00	10.29	103.37	1191.69	2.00	113.86	2.00	113.88	88.99	0.39
1400.00	13.69	101.84	1387.30	-6.99	154.43	-6.99	154.58	92.59	1.71
1600.00	17.51	98.61	1579.90	-16.35	207.36	-16.35	208.00	94.51	1.96
1800.00	19.62	94.69	1769.49	-23.60	270.59	-23.60	271.61	94.98	1.23
2000.00	20.16	91.23	1957.56	-27.08	338.52	-27.08	339.60	94.57	0.65
2200.00	20.31	87.04	2145.22	-26.03	407.66	-26.03	408.49	93.65	0.73
2400.00	20.87	84.20	2332.45	-20.64	477.76	-20.64	478.21	92.47	0.57
2600.00	20.98	82.65	2519.26	-12.46	548.71	-12.46	548.85	91.30	0.28
2800.00	23.08	78.75	2704.66	-0.23	622.69	-0.23	622.69	90.02	1.28
3000.00	22.54	78.05	2889.02	15.36	698.65	15.36	698.82	88.74	0.31
3200.00	21.43	78.16	3074.47	30.79	771.91	30.79	772.52	87.72	0.55
3400.00	17.66	75.77	3262.92	45.75	837.09	45.75	838.34	86.87	1.93
3600.00	15.49	74.09	3454.60	60.53	892.18	60.53	894.23	86.12	1.11
3800.00	12.26	73.95	3648.74	73.72	938.28	73.72	941.18	85.51	1.62
4000.00	9.34	71.59	3845.17	84.72	974.10	84.72	977.78	85.03	1.47

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	5.58	65.50	4043.45	93.89	998.37	93.89	1002.77	84.63	1.92
4400.00	2.50	53.92	4242.93	100.49	1010.75	100.49	1015.73	84.32	1.58
4600.00	2.37	58.75	4442.75	105.21	1017.81	105.21	1023.24	84.10	0.12
4800.00	2.13	64.75	4642.59	108.94	1024.71	108.94	1030.49	83.93	0.17
5000.00	2.14	76.87	4842.46	111.37	1031.70	111.37	1037.70	83.84	0.23
5200.00	2.24	89.32	5042.31	112.27	1039.25	112.27	1045.30	83.83	0.24
5400.00	2.36	98.35	5242.15	111.72	1047.24	111.72	1053.18	83.91	0.19
5600.00	2.53	109.02	5441.97	109.68	1055.50	109.68	1061.18	84.07	0.24
5800.00	2.98	122.54	5641.74	105.44	1064.06	105.44	1069.27	84.34	0.39
6000.00	3.42	133.06	5841.43	98.57	1072.80	98.57	1077.32	84.75	0.37
6200.00	2.39	144.78	6041.17	91.07	1079.58	91.07	1083.41	85.18	0.59
6400.00	2.18	183.65	6241.02	83.86	1081.75	83.86	1084.99	85.57	0.77
6600.00	2.15	168.76	6440.88	76.39	1082.24	76.39	1084.93	85.96	0.28
6800.00	2.27	153.49	6640.73	69.17	1084.73	69.17	1086.94	86.35	0.30
7000.00	2.73	143.55	6840.54	61.80	1089.33	61.80	1091.08	86.75	0.32
7200.00	2.87	140.17	7040.30	54.12	1095.37	54.12	1096.71	87.17	0.11
7400.00	2.82	136.11	7240.06	46.72	1101.99	46.72	1102.98	87.57	0.10
7600.00	2.55	137.44	7439.84	39.90	1108.42	39.90	1109.13	87.94	0.14
7800.00	2.36	156.68	7639.66	32.83	1113.06	32.83	1113.54	88.31	0.42
8000.00	2.35	171.45	7839.49	24.99	1115.30	24.99	1115.58	88.72	0.30
8200.00	2.27	172.27	8039.33	17.02	1116.44	17.02	1116.57	89.13	0.04
8400.00	2.14	173.14	8239.18	9.39	1117.42	9.39	1117.46	89.52	0.07
8600.00	1.39	179.02	8439.08	3.27	1117.90	3.27	1117.91	89.83	0.39
8800.00	1.27	180.93	8639.03	-1.36	1117.91	-1.36	1117.91	90.07	0.06
9000.00	0.99	208.37	8838.99	-5.09	1117.05	-5.09	1117.07	90.26	0.30
9200.00	0.96	211.38	9038.96	-8.03	1115.36	-8.03	1115.39	90.41	0.03
9400.00	0.93	213.78	9238.94	-10.82	1113.59	-10.82	1113.64	90.56	0.02
9600.00	1.21	216.12	9438.90	-13.87	1111.44	-13.87	1111.53	90.71	0.14
9800.00	1.24	219.42	9638.86	-17.24	1108.83	-17.24	1108.96	90.89	0.04
10000.00	1.26	212.27	9838.81	-20.77	1106.28	-20.77	1106.47	91.08	0.08
10200.00	1.16	202.48	10038.76	-24.49	1104.33	-24.49	1104.61	91.27	0.12
10400.00	1.15	186.89	10238.72	-28.35	1103.32	-28.35	1103.69	91.47	0.16
10600.00	1.14	187.69	10438.68	-32.31	1102.82	-32.31	1103.29	91.68	0.01
10800.00	1.16	189.02	10638.64	-36.28	1102.23	-36.28	1102.83	91.89	0.02
11000.00	1.18	199.96	10838.60	-40.22	1101.21	-40.22	1101.94	92.09	0.11
11200.00	1.17	211.11	11038.56	-43.91	1099.45	-43.91	1100.33	92.29	0.11
11400.00	1.15	205.22	11238.52	-47.48	1097.54	-47.48	1098.56	92.48	0.06
11600.00	1.18	187.73	11438.48	-51.33	1096.41	-51.33	1097.61	92.68	0.18
11800.00	1.24	182.93	11638.43	-55.53	1096.02	-55.53	1097.42	92.90	0.06
12000.00	1.23	171.72	11838.39	-59.82	1096.22	-59.82	1097.85	93.12	0.12
12200.00	1.20	170.41	12038.34	-64.00	1096.87	-64.00	1098.74	93.34	0.02
12400.00	1.31	173.13	12238.30	-68.34	1097.50	-68.34	1099.62	93.56	0.06

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
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12534.00	1.41	175.68	12372.26	-71.51	1097.81	-71.51	1100.13	93.73	0.09
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