



Company: NOBLE ENERGY INC.  
Field: WATTENBERG  
Cty/Blk/Par: Sec.33-T5N-R65W  
Well Name: SAUER F33-78-HC  
Rig: ENSIGN 121

Job Number: 121-171  
Magnetic Decl.:  
Grid Corr.: 8.04  
Total Survey Corr.: 8.04  
Target Info: EOB: N627.9 W581.1 TVD7047 EOL: N4530.1 W616.4 TVD7047

Calculation Method  
Proposed Azimuth 352.25  
Depth Reference RKB  
Tie Into SURFACE

Minimum Curvature

TARGET ANGLE=	90
TARGET TVD =	7067

No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates		DLS (°/100')	Bld Rate (°/100')	Wlk Rate (°/100')	Remarks	B/R NEEDED	PRJ TVD	Surveys				Planned					
								N/S (ft)	E/W (ft)							N/S	E/W	VS	TVD	VS	TVD	N/S	E/W		
0	Tie In	0	0.00	0.00	0	0.00	0.00	0.00	0	0.00				0.81	#DIV/0!	0	0	0.00	0.00	0	0	0	0		
1	MWD	300	0.20	234.54	300	300.00	-0.24	0.30	S	0.43	W	0.07	0.1	78.2	SURF SURVEYS	0.84	85949.98	-0.30	-0.43	-0.24	300.00	0	1500	0	0
2	MWD	606	0.20	328.04	306	606.00	0.00	0.16	S	1.14	W	0.10	0.0	30.6	GRID CORRECTED	0.88	#DIV/0!	-0.16	-1.14	0.00	606.00	-6.9	2110.5	-13.4	-47.2
3	MWD	739	1.10	261.90	133	738.99	0.20	0.14	S	2.53	W	0.78	0.7	-49.7	DIPA 67.1	0.89	9044.098	-0.14	-2.53	0.20	738.99	-77.2	5189.5	-149.6	-526.8
4	MWD	832	1.10	262.20	93	831.97	0.19	0.39	S	4.30	W	0.01	0.0	0.3		0.90	#DIV/0!	-0.39	-4.30	0.19	831.97	-84.1	5800	-163	-574
5	MWD	925	1.10	136.90	93	924.96	-0.54	1.16	S	4.57	W	2.10	0.0	-134.7		0.92	#DIV/0!	-1.16	-4.57	-0.54	924.96	-84.1	6324.3	-163	-574
6	MWD	1019	1.10	140.40	94	1018.95	-2.04	2.52	S	3.38	W	0.07	0.0	3.7		0.93	#DIV/0!	-2.52	-3.38	-2.04	1018.95	-84.12	6324.26	-163	-574
7	MWD	1117	1.10	144.80	98	1116.93	-3.67	4.01	S	2.24	W	0.09	0.0	4.5		0.94	#DIV/0!	-4.01	-2.24	-3.67	1116.93	-83.48	6354.64	-162.36	-574.01
8	MWD	1212	1.10	151.50	95	1211.91	-5.33	5.56	S	1.28	W	0.14	0.0	7.1		0.96	#DIV/0!	-5.56	-1.28	-5.33	1211.91	-80.69	6394.54	-159.54	-574.03
9	MWD	1306	1.30	57.60	94	1305.90	-5.73	5.78	S	0.05	E	1.87	0.2	-99.9		0.97	27625.9	-5.78	0.05	-5.73	1305.90	-75.7	6434.21	-154.51	-574.08
10	MWD	1401	1.40	55.20	95	1400.87	-4.76	4.54	S	1.91	E	0.12	0.1	-2.5		0.99	54505.91	-4.54	1.91	-4.76	1400.87	-68.52	6473.55	-147.27	-574.14
11	MWD	1496	1.20	222.30	95	1495.86	-4.87	4.61	S	2.20	E	2.72	-0.2	175.9		1.01	-25151.64	-4.61	2.20	-4.87	1495.86	-59.17	6512.42	-137.85	-574.23
12	MWD	1591	2.70	215.80	95	1590.80	-7.13	7.16	S	0.22	E	1.59	1.6	-6.8		1.00	5048.855	-7.16	0.22	-7.13	1590.80	-47.68	6550.7	-126.27	-574.33
13	MWD	1686	3.30	238.90	95	1685.68	-9.83	10.39	S	3.43	W	1.41	0.6	24.3		1.00	10235.93	-10.39	-3.43	-9.83	1685.68	-34.09	6588.27	-112.57	-574.46
14	MWD	1781	4.80	248.50	95	1780.44	-11.86	13.26	S	9.47	W	1.73	1.6	10.1		0.99	5105.772	-13.26	-9.47	-11.86	1780.44	-18.44	6625.02	-96.79	-574.6
15	MWD	1876	6.20	253.30	95	1875.00	-13.60	16.19	S	18.08	W	1.55	1.5	5.1		0.98	5343.289	-16.19	-18.08	-13.60	1875.00	-0.78	6660.84	-78.99	-574.76
16	MWD	1971	6.50	257.10	95	1969.42	-14.89	18.87	S	28.24	W	0.54	0.3	4.0		1.00	18060.34	-18.87	-28.24	-14.89	1969.42	18.84	6695.6	-59.22	-574.94
17	MWD	2066	7.60	262.80	95	2063.70	-15.31	20.85	S	39.71	W	1.37	1.2	6.0		0.99	6357.846	-20.85	-39.71	-15.31	2063.70	40.35	6729.21	-37.53	-575.13
18	MWD	2161	8.70	257.80	95	2157.74	-15.80	23.16	S	52.97	W	1.38	1.2	-5.3		0.99	6357.84	-23.16	-52.97	-15.80	2157.74	63.69	6761.55	-14.01	-575.35
19	MWD	2256	9.10	259.90	95	2251.59	-16.67	26.00	S	67.39	W	0.54	0.4	2.2		1.00	13708.01	-26.00	-67.39	-16.67	2251.59	88.78	6792.53	11.28	-575.57
20	MWD	2350	10.30	258.50	94	2344.25	-17.52	28.97	S	82.94	W	1.30	1.3	-1.5		1.00	6030.196	-28.97	-82.94	-17.52	2344.25	115.55	6822.05	38.27	-575.82
21	MWD	2445	9.80	255.70	95	2437.79	-19.00	32.66	S	99.10	W	0.74	-0.5	-2.9		1.03	-6596.137	-32.66	-99.10	-19.00	2437.79	143.91	6850.02	66.86	-576.08
22	MWD	2540	8.80	253.30	95	2531.54	-21.06	36.75	S	113.89	W	1.13	-1.1	-2.5		1.07	-2079.179	-36.75	-113.89	-21.06	2531.54	173.78	6876.35	96.96	-576.35
23	MWD	2635	9.70	254.10	95	2625.31	-23.32	41.03	S	128.55	W	0.96	0.9	0.8		1.07	7654.56	-41.03	-128.55	-23.32	2625.31	205.06	6900.96	128.49	-576.63
24	MWD	2729	9.70	254.70	94	2717.96	-25.48	45.29	S	143.81	W	0.11	0.0	0.6		1.10	#DIV/0!	-45.29	-143.81	-25.48	2717.96	237.65	6923.76	161.34	-576.93
25	MWD	2824	9.40	252.40	95	2811.65	-27.86	49.75	S	158.92	W	0.51	-0.3	-2.4		1.13	-12369.8	-49.75	-158.92	-27.86	2811.65	271.46	6944.7	195.42	-577.24
26	MWD	2919	8.70	248.20	95	2905.46	-30.93	54.76	S	172.99	W	1.01	-0.7	-4.4		1.17	-3694.696	-54.76	-172.99	-30.93	2905.46	306.37	6963.71	230.61	-577.56
27	MWD	3014	10.20	250.60	95	2999.17	-34.38	60.22	S	187.59	W	1.63	1.6	2.5		1.16	5985.532	-60.22	-187.59	-34.38	2999.17	342.28	6980.72	266.8	-577.88
28	MWD	3109	9.40	247.50	95	3092.79	-38.05	65.99	S	202.69	W	1.01	-0.8	-3.3		1.21	-2600.258	-65.99	-202.69	-38.05	3092.79	379.07	6995.68	303.89	-578.22
29	MWD	3203	8.90	253.30	94	3185.59	-41.14	71.01	S	216.75	W	1.12	-0.5	6.2		1.25	-5920.206	-71.01	-216.75	-41.14	3185.59	416.64	7008.55	341.76	-578.56
30	MWD	3298	8.00	243.90	95	3279.56	-44.36	76.03	S	229.73	W	1.73	-0.9	-9.9		1.30	-1927.004	-76.03	-229.73	-44.36	3279.56	454.86	7019.28	380.28	-578.91
31	MWD	3393	8.30	246.20	95	3373.60	-48.34	81.71	S	241.94	W	0.47	0.3	2.4		1.33	18899.26	-81.71	-241.94	-48.34	3373.60	493.62	7027.85	419.35	-579.26
32	MWD	3488	7.00	256.10	95	3467.76	-50.85	85.87	S	253.83	W	1.94	-1.4	10.4		1.40	-209.2421	-85.87	-253.83	-50.85	3467.76	532.79	7034.22	458.83	-579.62
33	MWD	3583	8.20	258.00	95	3561.93	-51.98	88.67	S	266.08	W	1.29	1.3	2.0		1.40	7451.175	-88.67	-266.08	-51.98	3561.93	564.46	7037.74	490.75	-579.91
34	MWD	3677	8.10	262.10	94	3654.98	-52.49	90.97	S	279.20	W	0.63	-0.1	4.4		1.44	-42617.8	-90.97	-279.20	-52.49	3654.98	572.25	7038.42	498.6	-579.98
35	MWD	3772	8.40	262.60	95	3748.99	-52.47	92.79	S	292.71	W	0.32	0.3	0.5		1.47	19243.32	-92.79	-292.71	-52.47	3748.99	611.78	7041.91	538.45	-580.34
36	MWD	3867	9.80	265.90	95	3842.80	-51.91	94.26	S	307.65	W	1.57	1.5	3.5		1.47	7069.199	-94.26	-307.65	-51.91	3842.80	638.58	7044.27	565.46	-580.58
37	MWD	3962	9.60	264.70	95	3936.44	-51.06	95.57	S	323.60	W	0.30	-0.2	-1.3		1.53	-18742.03	-95.57	-323.60	-51.06	3936.44	651.32	7045.28	578.31	-580.7
38	MWD	4057	8.80	262.20	95	4030.22	-50.72	97.28	S	338.69	W	0.94	-0.8	-2.6		1.60	-1733.187	-97.28	-338.69	-50.72	4030.22	690.96	7046.94	618.26	-581.06
39	MWD	4152	9.10	264.00	95	4124.06	-50.50	99.06	S	353.36	W	0.43	0.3	1.9		1.64	19399.28	-99.06	-353.36	-50.50	4124.06	700.5	7047	627.88	-581.14



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Job Number: 121-171  
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Total Survey Corr.: 8.04  
Target Info: EOB: N627.9 W581.1 TVD7047 EOL: N4530.1 W616.4 TVD7047

Calculation Method  
Proposed Azimuth 352.25  
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Tie Into SURFACE

Minimum Curvature

TARGET ANGLE=	90
TARGET TVD =	7067

No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates		DLS (°/100')	Bld Rate (°/100')	Wlk Rate (°/100')	Remarks	B/R NEEDED	PRJ TVD	Surveys				Planned			
								N/S (ft)	E/W (ft)							N/S	E/W	VS	TVD	VS	TVD	N/S	E/W
40	MWD	4246	9.80	262.60	94	4216.78	-50.22	100.86	S 368.69	W 0.78	0.7	-1.5		1.67	10601.66	-100.86	-368.69	-50.22	4216.78	4571.9	7047	4530.1	-616.4
41	MWD	4341	9.10	258.40	95	4310.49	-50.68	103.42	S 384.07	W 1.03	-0.7	-4.4		1.75	-2236.03	-103.42	-384.07	-50.68	4310.49				
42	MWD	4436	8.40	259.10	95	4404.39	-51.57	106.24	S 398.24	W 0.75	-0.7	0.7		1.84	-2236.037	-106.24	-398.24	-51.57	4404.39				
43	MWD	4531	9.10	250.60	95	4498.29	-53.46	110.05	S 412.14	W 1.55	0.7	-8.9		1.88	11044.81	-110.05	-412.14	-53.46	4498.29				
44	MWD	4626	8.10	244.10	95	4592.22	-57.07	115.47	S 425.25	W 1.47	-1.1	-6.8		1.99	-84.28576	-115.47	-425.25	-57.07	4592.22				
45	MWD	4721	9.10	238.50	95	4686.15	-62.18	122.31	S 437.67	W 1.37	1.1	-5.9		2.03	9268.717	-122.31	-437.67	-62.18	4686.15				
46	MWD	4815	9.10	235.50	94	4778.97	-68.52	130.41	S 450.14	W 0.50	0.0	-3.2		2.11	#DIV/0!	-130.41	-450.14	-68.52	4778.97				
47	MWD	4910	9.50	236.70	95	4872.72	-75.28	138.97	S 462.88	W 0.47	0.4	1.3		2.18	16235.38	-138.97	-462.88	-75.28	4872.72				
48	MWD	5005	9.60	241.80	95	4966.40	-81.43	147.02	S 476.42	W 0.90	0.1	5.4		2.27	50323.35	-147.02	-476.42	-81.43	4966.40				
49	MWD	5100	9.70	243.40	95	5060.06	-86.78	154.34	S 490.55	W 0.30	0.1	1.7		2.37	50323.34	-154.34	-490.55	-86.78	5060.06				
50	MWD	5195	8.80	249.00	95	5153.83	-91.03	160.53	S 504.49	W 1.34	-0.9	5.9		2.54	30.80197	-160.53	-504.49	-91.03	5153.83				
51	MWD	5290	7.50	254.00	95	5247.87	-93.59	164.84	S 517.24	W 1.56	-1.4	5.3		2.74	1607.111	-164.84	-517.24	-93.59	5247.87				
52	MWD	5385	6.30	257.10	95	5342.18	-94.95	167.72	S 528.28	W 1.32	-1.3	3.3		2.96	1303.708	-167.72	-528.28	-94.95	5342.18				
53	MWD	5479	5.00	255.40	94	5435.72	-95.90	169.90	S 537.27	W 1.39	-1.4	-1.8		3.21	1653.593	-169.90	-537.27	-95.90	5435.72				
54	MWD	5574	4.00	258.70	95	5530.42	-96.60	171.59	S 544.53	W 1.09	-1.1	3.5		3.47	466.6431	-171.59	-544.53	-96.60	5530.42				
55	MWD	5669	3.20	261.00	95	5625.24	-96.86	172.66	S 550.39	W 0.86	-0.8	2.4		3.75	-799.309	-172.66	-550.39	-96.86	5625.24				
56	MWD	5764	2.30	262.10	95	5720.13	-96.92	173.33	S 554.90	W 0.95	-0.9	1.2		4.08	-85.4777	-173.33	-554.90	-96.92	5720.13				
57	MWD	5858	1.70	265.70	94	5814.07	-96.84	173.70	S 558.16	W 0.65	-0.6	3.8		4.44	-2896.619	-173.70	-558.16	-96.84	5814.07				
58	MWD	5953	1.30	265.70	95	5909.03	-96.69	173.88	S 560.64	W 0.42	-0.4	0.0		4.84	-7390.969	-173.88	-560.64	-96.69	5909.03				
59	MWD	6048	0.90	263.80	95	6004.02	-96.61	174.05	S 562.46	W 0.42	-0.4	-2.0		5.31	-7390.976	-174.05	-562.46	-96.61	6004.02				
60	MWD	6143	0.50	268.70	95	6099.01	-96.54	174.14	S 563.61	W 0.43	-0.4	5.2		5.87	-7390.983	-174.14	-563.61	-96.54	6099.01				
61	MWD	6238	0.30	272.40	95	6194.01	-96.45	174.13	S 564.28	W 0.21	-0.2	3.9		6.53	-20880.98	-174.13	-564.28	-96.45	6194.01				
62	MWD	6332	0.20	249.20	94	6288.01	-96.44	174.18	S 564.67	W 0.15	-0.1	-24.7		7.33	-47385.98	-174.18	-564.67	-96.44	6288.01				
63	MWD	6427	4.90	345.00	95	6382.89	-92.45	170.32	S 565.88	W 5.18	4.9	100.8		7.66	7442.153	-170.32	-565.88	-92.45	6382.89				
64	MWD	6522	9.90	349.80	95	6477.07	-80.26	158.36	S 568.38	W 5.30	5.3	5.1		8.04	7378.591	-158.36	-568.38	-80.26	6477.07				
65	MWD	6617	13.50	352.20	95	6570.08	-61.01	139.33	S 571.33	W 3.82	3.8	2.5		8.84	7729.177	-139.33	-571.33	-61.01	6570.08				
66	MWD	6712	16.50	357.20	95	6661.84	-36.47	114.86	S 573.50	W 3.44	3.2	5.3		10.13	7960.993	-114.86	-573.50	-36.47	6661.84				
67	MWD	6807	21.90	0.70	95	6751.52	-5.48	83.64	S 573.94	W 5.81	5.7	-375.3		11.39	7383.587	-83.64	-573.94	-5.48	6751.52				
68	MWD	6854	25.10	359.30	47	6794.62	13.08	64.91	S 573.95	W 6.91	6.8	763.0		12.11	7279.211	-64.91	-573.95	13.08	6794.62				
69	MWD	6902	29.30	354.70	48	6837.31	34.93	43.02	S 575.16	W 9.78	8.8	-9.6		12.74	7171.689	-43.02	-575.16	34.93	6837.31				
70	MWD	6949	34.50	354.30	47	6877.20	59.74	18.31	S 577.55	W 11.07	11.1	-0.9		13.09	7101.756	-18.31	-577.55	59.74	6877.20				
71	MWD	6996	40.20	356.10	47	6914.54	88.20	10.10	N 579.90	W 12.35	12.1	3.8		13.33	7082.056	10.10	-579.90	88.20	6914.54				
72	MWD	7043	45.80	357.70	47	6948.90	120.14	42.09	N 581.61	W 12.14	11.9	3.4		13.74	7085.045	42.09	-581.61	120.14	6948.90				
73	MWD	7091	51.50	359.10	48	6980.60	155.94	78.09	N 582.60	W 12.07	11.9	2.9		14.42	7085.501	78.09	-582.60	155.94	6980.60				
74	MWD	7138	57.20	358.60	47	7007.99	193.87	116.26	N 583.37	W 12.16	12.1	-1.1		15.48	7083.314	116.26	-583.37	193.87	7007.99				
75	PRJ	7188	63.20	358.60	50	7032.82	236.97	159.62	N 584.43	W 12.00	12.0	0.0	PROJ @ BIT	18.01	7084.114	159.62	-584.43	236.97	7032.82				
76	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
77	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
78	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				



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TARGET ANGLE=	90
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No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates		DLS (°/100')	Bld Rate (°/100')	Wlk Rate (°/100')	Remarks	B/R NEEDED	PRJ TVD	Surveys				Planned			
								N/S (ft)	E/W (ft)							N/S	E/W	VS	TVD	VS	TVD	N/S	E/W
79	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
80	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
81	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
82	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
83	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
84	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
85	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
86	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
87	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
88	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
89	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
90	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
91	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
92	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
93	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
94	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
95	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
96	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
97	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
98	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
99	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
100	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
101	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
102	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
103	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
104	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
105	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
106	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
107	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
108	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
109	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
110	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
111	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
112	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
113	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
114	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
115	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
116	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
117	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				



Company: NOBLE ENERGY INC.  
Field: WATTENBERG  
Cty/Blk/Par: Sec.33-T5N-R65W  
Well Name: SAUER F33-78-HC  
Rig: ENSIGN 121

Job Number: 121-171  
Magnetic Decl.:  
Grid Corr.: 8.04  
Total Survey Corr.: 8.04  
Target Info: EOB: N627.9 W581.1 TVD7047 EOL: N4530.1 W616.4 TVD7047

Calculation Method  
Proposed Azimuth 352.25  
Depth Reference RKB  
Tie Into SURFACE

Minimum Curvature

TARGET ANGLE=	90
TARGET TVD =	7067

No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates		DLS (°/100')	Bld Rate (°/100')	Wlk Rate (°/100')	Remarks	B/R NEEDED	PRJ TVD	Surveys				Planned			
								N/S (ft)	E/W (ft)							N/S	E/W	VS	TVD	VS	TVD	N/S	E/W
118	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
119	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
120	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
121	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
122	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
123	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
124	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
125	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
126	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
127	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
128	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
129	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
130	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
131	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
132	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
133	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
134	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
135	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
136	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
137	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
138	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
139	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
140	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
141	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
142	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
143	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
144	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
145	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
146	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
147	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
148	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
149	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
150	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
151	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
152	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
153	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
154	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
155	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
156	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				



Company: NOBLE ENERGY INC.  
Field: WATTENBERG  
Cty/Blk/Par: Sec.33-T5N-R65W  
Well Name: SAUER F33-78-HC  
Rig: ENSIGN 121

Job Number: 121-171  
Magnetic Decl.:  
Grid Corr.: 8.04  
Total Survey Corr.: 8.04  
Target Info: EOB: N627.9 W581.1 TVD7047 EOL: N4530.1 W616.4 TVD7047

Calculation Method  
Proposed Azimuth 352.25  
Depth Reference RKB  
Tie Into SURFACE

Minimum Curvature

TARGET ANGLE=	90
TARGET TVD =	7067

No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates		DLS (°/100')	Bld Rate (°/100')	Wlk Rate (°/100')	Remarks	B/R NEEDED	PRJ TVD	Surveys				Planned			
								N/S (ft)	E/W (ft)							N/S	E/W	VS	TVD	VS	TVD	N/S	E/W
157	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
158	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
159	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
160	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
161	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
162	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
163	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
164	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
165	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
166	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
167	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
168	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
169	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
170	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
171	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
172	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
173	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
174	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
175	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
176	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
177	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
178	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
179	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
180	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
181	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
182	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
183	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
184	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
185	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
186	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
187	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
188	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
189	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
190	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
191	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
192	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
193	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
194	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
195	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				





Company: NOBLE ENERGY INC.  
Field: WATTENBERG  
Cty/Blk/Par: Sec.33-T5N-R65W  
Well Name: SAUER F33-78-HC  
Rig: ENSIGN 121

Job Number: 121-171  
Magnetic Decl.:  
Grid Corr.: 8.04  
Total Survey Corr.: 8.04  
Target Info: EOB: N627.9 W581.1 TVD7047 EOL: N4530.1 W616.4 TVD7047

Calculation Method  
Proposed Azimuth 352.25  
Depth Reference RKB  
Tie Into SURFACE

Minimum Curvature

TARGET ANGLE=	90
TARGET TVD =	7067

No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates		DLS (°/100')	Bld Rate (°/100')	Wlk Rate (°/100')	Remarks	B/R NEEDED	PRJ TVD	Surveys				Planned			
								N/S (ft)	E/W (ft)							N/S	E/W	VS	TVD	VS	TVD	N/S	E/W
196	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
197	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
198	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
199	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
200	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
201	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
202	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
203	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
204	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
205	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
206	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
207	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
208	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
209	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
210	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
211	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
212	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
213	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
214	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
215	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
216	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
217	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
218	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
219	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
220	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
221	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
222	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
223	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
224	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
225	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
226	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
227	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
228	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
229	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
230	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
231	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
232	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
233	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
234	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
235	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
236	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
237	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
238	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
239	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				



Company: NOBLE ENERGY INC.  
Field: WATTENBERG  
Cty/Blk/Par: Sec.33-T5N-R65W  
Well Name: SAUER F33-78-HC  
Rig: ENSIGN 121

Job Number: 121-171  
Magnetic Decl.:  
Grid Corr.: 8.04  
Total Survey Corr.: 8.04  
Target Info: EOB: N627.9 W581.1 TVD7047 EOL: N4530.1 W616.4 TVD7047

Calculation Method  
Proposed Azimuth 352.25  
Depth Reference RKB  
Tie Into SURFACE

Minimum Curvature

TARGET ANGLE=	90
TARGET TVD =	7067

No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates		DLS (°/100')	Bld Rate (°/100')	Wlk Rate (°/100')	Remarks	B/R NEEDED	PRJ TVD	Surveys				Planned			
								N/S (ft)	E/W (ft)							N/S	E/W	VS	TVD	VS	TVD	N/S	E/W
240	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
241	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
242	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
243	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
244	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
245	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
246	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
247	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
248	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
249	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
250	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
251	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
252	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
253	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
254	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
255	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
256	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
257	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
258	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
259	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
260	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
261	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
262	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
263	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
264	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
265	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
266	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
267	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
268	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
269	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
270	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
271	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
272	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
273	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
274	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
275	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
276	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
277	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
278	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
279	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
280	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
281	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
282	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
283	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				



Company: NOBLE ENERGY INC.  
Field: WATTENBERG  
Cty/Blk/Par: Sec.33-T5N-R65W  
Well Name: SAUER F33-78-HC  
Rig: ENSIGN 121

Job Number: 121-171  
Magnetic Decl.:  
Grid Corr.: 8.04  
Total Survey Corr.: 8.04  
Target Info: EOB: N627.9 W581.1 TVD7047 EOL: N4530.1 W616.4 TVD7047

Calculation Method  
Proposed Azimuth 352.25  
Depth Reference RKB  
Tie Into SURFACE

Minimum Curvature

TARGET ANGLE=	90
TARGET TVD =	7067

No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates		DLS (°/100')	Bld Rate (°/100')	Wlk Rate (°/100')	Remarks	B/R NEEDED	PRJ TVD	Surveys				Planned			
								N/S (ft)	E/W (ft)							N/S	E/W	VS	TVD	VS	TVD	N/S	E/W
284	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
285	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
286	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
287	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
288	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
289	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
290	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
291	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
292	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
293	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
294	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
295	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
296	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
297	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
298	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
299	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
300	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
301	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
302	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
303	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
304	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
305	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
306	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
307	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
308	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
309	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
310	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
311	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
312	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
313	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
314	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
315	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
316	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
317	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
318	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
319	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
320	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
321	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
322	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
323	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
324	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
325	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
326	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
327	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				





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Calculation Method  
Proposed Azimuth 352.25  
Depth Reference RKB  
Tie Into SURFACE

Minimum Curvature

TARGET ANGLE=	90
TARGET TVD =	7067

No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates		DLS (°/100')	Bld Rate (°/100')	Wlk Rate (°/100')	Remarks	B/R NEEDED	PRJ TVD	Surveys				Planned			
								N/S (ft)	E/W (ft)							N/S	E/W	VS	TVD	VS	TVD	N/S	E/W
328	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
329	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
330	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
331	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
332	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
333	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
334	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
335	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
336	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
337	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
338	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
339	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
340	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
341	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
342	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
343	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
344	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
345	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
346	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
347	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
348	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
349	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				
350	MWD													#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!				