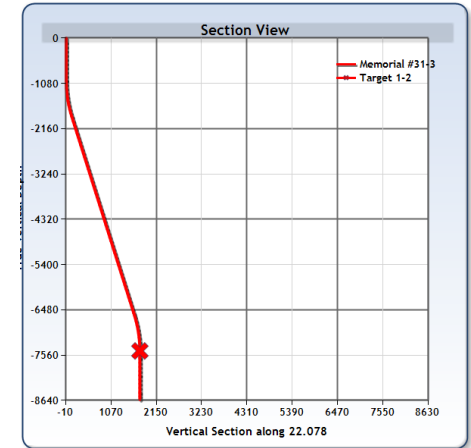
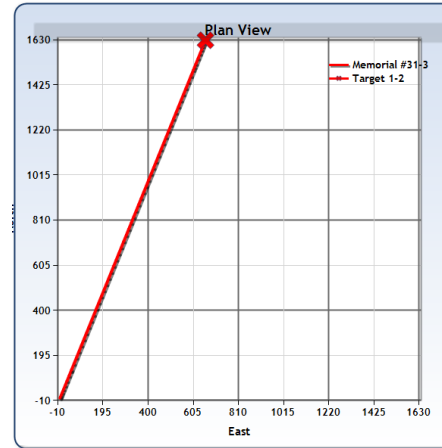


Company: Sovereign Operating Company, LLC
Well Name: Memorial #31-3
Location: SWNE Sec. 3 T1S R68W
Info: North Reference is True North
Info:
Vertical Section Calculated on an Azimuth of: 22.0780
Survey Calculation method: Minimum Curvature
File Name: Memorial #31-3 , Directional Surveys, 07-23-12.sr6



#	Depth Feet	Inc Degrees	Azimuth Degrees	TVD Feet	North Feet	East Feet	SubSea Feet	Section Feet	Dogleg /100 ft	BldRate /100 ft	Trnrate /100 ft	Comment
0	0.00	0.00	22.08	0.00	0.00	0.00	5209.00	0.00	0.00	0.00	0.00	
1	100.00	0.00	22.08	100.00	0.00	0.00	5109.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	22.08	200.00	0.00	0.00	5009.00	0.00	0.00	0.00	0.00	
3	300.00	0.00	22.08	300.00	0.00	0.00	4909.00	0.00	0.00	0.00	0.00	
4	400.00	0.00	22.08	400.00	0.00	0.00	4809.00	0.00	0.00	0.00	0.00	
5	500.00	0.00	22.08	500.00	0.00	0.00	4709.00	0.00	0.00	0.00	0.00	
6	600.00	0.00	22.08	600.00	0.00	0.00	4609.00	0.00	0.00	0.00	0.00	
7	700.00	0.00	22.08	700.00	0.00	0.00	4509.00	0.00	0.00	0.00	0.00	
8	800.00	0.00	22.08	800.00	0.00	0.00	4409.00	0.00	0.00	0.00	0.00	
9	900.00	0.00	22.08	900.00	0.00	0.00	4309.00	0.00	0.00	0.00	0.00	
10	1000.00	0.00	22.08	1000.00	0.00	0.00	4209.00	0.00	0.00	0.00	0.00	
KOP, B.G.=2°/100'												
11	1006.00	0.00	22.08	1006.00	0.00	0.00	4203.00	0.00	0.00	0.00	0.00	
12	1100.00	1.88	22.08	1099.98	1.43	0.58	4109.02	1.54	2.00	2.00	0.00	
13	1200.00	3.88	22.08	1199.85	6.08	2.47	4009.15	6.57	2.00	2.00	0.00	
14	1300.00	5.88	22.08	1299.48	13.97	5.67	3909.52	15.07	2.00	2.00	0.00	
15	1400.00	7.88	22.08	1398.76	25.07	10.17	3810.24	27.05	2.00	2.00	0.00	



#	Depth	Inc	Azimuth	TVD	North	East	SubSea	Section	Dogleg	BldRate	Trnrate	Comment
16	1500.00	9.88	22.08	1497.56	39.37	15.97	3711.44	42.49	2.00	2.00	0.00	
17	1600.00	11.88	22.08	1595.75	56.86	23.06	3613.25	61.36	2.00	2.00	0.00	
18	1700.00	13.88	22.08	1693.23	77.52	31.44	3515.77	83.65	2.00	2.00	0.00	
19	1800.00	15.88	22.08	1789.87	101.31	41.09	3419.13	109.33	2.00	2.00	0.00	
1881, Hold 17.50°												
20	1881.00	17.50	22.08	1867.46	122.87	49.84	3341.54	132.59	2.00	2.00	0.00	
21	1900.00	17.50	22.08	1885.58	128.16	51.98	3323.42	138.30	0.00	0.00	0.00	
22	2000.00	17.50	22.08	1980.95	156.03	63.29	3228.05	168.38	0.00	0.00	0.00	
23	2100.00	17.50	22.08	2076.32	183.89	74.59	3132.68	198.45	0.00	0.00	0.00	
24	2200.00	17.50	22.08	2171.69	211.76	85.89	3037.31	228.52	0.00	0.00	0.00	
25	2300.00	17.50	22.08	2267.07	239.63	97.19	2941.93	258.59	0.00	0.00	0.00	
26	2400.00	17.50	22.08	2362.44	267.49	108.50	2846.56	288.66	0.00	0.00	0.00	
27	2500.00	17.50	22.08	2457.81	295.36	119.80	2751.19	318.73	0.00	0.00	0.00	
28	2600.00	17.50	22.08	2553.18	323.22	131.10	2655.82	348.80	0.00	0.00	0.00	
29	2700.00	17.50	22.08	2648.55	351.09	142.40	2560.45	378.87	0.00	0.00	0.00	
30	2800.00	17.50	22.08	2743.92	378.95	153.71	2465.08	408.94	0.00	0.00	0.00	
31	2900.00	17.50	22.08	2839.30	406.82	165.01	2369.70	439.01	0.00	0.00	0.00	
32	3000.00	17.50	22.08	2934.67	434.68	176.31	2274.33	469.08	0.00	0.00	0.00	
33	3100.00	17.50	22.08	3030.04	462.55	187.62	2178.96	499.15	0.00	0.00	0.00	
34	3200.00	17.50	22.08	3125.41	490.42	198.92	2083.59	529.22	0.00	0.00	0.00	
35	3300.00	17.50	22.08	3220.78	518.28	210.22	1988.22	559.29	0.00	0.00	0.00	
36	3400.00	17.50	22.08	3316.15	546.15	221.52	1892.85	589.36	0.00	0.00	0.00	
37	3500.00	17.50	22.08	3411.53	574.01	232.83	1797.47	619.43	0.00	0.00	0.00	
38	3600.00	17.50	22.08	3506.90	601.88	244.13	1702.10	649.50	0.00	0.00	0.00	
39	3700.00	17.50	22.08	3602.27	629.74	255.43	1606.73	679.58	0.00	0.00	0.00	
40	3800.00	17.50	22.08	3697.64	657.61	266.73	1511.36	709.65	0.00	0.00	0.00	
41	3900.00	17.50	22.08	3793.01	685.48	278.04	1415.99	739.72	0.00	0.00	0.00	
42	4000.00	17.50	22.08	3888.38	713.34	289.34	1320.62	769.79	0.00	0.00	0.00	
43	4100.00	17.50	22.08	3983.76	741.21	300.64	1225.24	799.86	0.00	0.00	0.00	
44	4200.00	17.50	22.08	4079.13	769.07	311.94	1129.87	829.93	0.00	0.00	0.00	
45	4300.00	17.50	22.08	4174.50	796.94	323.25	1034.50	860.00	0.00	0.00	0.00	
46	4400.00	17.50	22.08	4269.87	824.80	334.55	939.13	890.07	0.00	0.00	0.00	



#	Depth	Inc	Azimuth	TVD	North	East	SubSea	Section	Dogleg	BldRate	Trnrate	Comment
47	4500.00	17.50	22.08	4365.24	852.67	345.85	843.76	920.14	0.00	0.00	0.00	
48	4600.00	17.50	22.08	4460.62	880.53	357.15	748.38	950.21	0.00	0.00	0.00	
49	4700.00	17.50	22.08	4555.99	908.40	368.46	653.01	980.28	0.00	0.00	0.00	
50	4800.00	17.50	22.08	4651.36	936.27	379.76	557.64	1010.35	0.00	0.00	0.00	
51	4900.00	17.50	22.08	4746.73	964.13	391.06	462.27	1040.42	0.00	0.00	0.00	
52	5000.00	17.50	22.08	4842.10	992.00	402.36	366.90	1070.49	0.00	0.00	0.00	
53	5100.00	17.50	22.08	4937.47	1019.86	413.67	271.53	1100.56	0.00	0.00	0.00	
54	5200.00	17.50	22.08	5032.85	1047.73	424.97	176.15	1130.63	0.00	0.00	0.00	
55	5300.00	17.50	22.08	5128.22	1075.59	436.27	80.78	1160.70	0.00	0.00	0.00	
56	5400.00	17.50	22.08	5223.59	1103.46	447.57	-14.59	1190.77	0.00	0.00	0.00	
57	5500.00	17.50	22.08	5318.96	1131.32	458.88	-109.96	1220.85	0.00	0.00	0.00	
58	5600.00	17.50	22.08	5414.33	1159.19	470.18	-205.33	1250.92	0.00	0.00	0.00	
59	5700.00	17.50	22.08	5509.70	1187.06	481.48	-300.70	1280.99	0.00	0.00	0.00	
60	5800.00	17.50	22.08	5605.08	1214.92	492.79	-396.08	1311.06	0.00	0.00	0.00	
61	5900.00	17.50	22.08	5700.45	1242.79	504.09	-491.45	1341.13	0.00	0.00	0.00	
62	6000.00	17.50	22.08	5795.82	1270.65	515.39	-586.82	1371.20	0.00	0.00	0.00	
63	6100.00	17.50	22.08	5891.19	1298.52	526.69	-682.19	1401.27	0.00	0.00	0.00	
64	6200.00	17.50	22.08	5986.56	1326.38	538.00	-777.56	1431.34	0.00	0.00	0.00	
65	6300.00	17.50	22.08	6081.93	1354.25	549.30	-872.93	1461.41	0.00	0.00	0.00	
66	6400.00	17.50	22.08	6177.31	1382.11	560.60	-968.31	1491.48	0.00	0.00	0.00	
67	6500.00	17.50	22.08	6272.68	1409.98	571.90	-1063.68	1521.55	0.00	0.00	0.00	
68	6600.00	17.50	22.08	6368.05	1437.85	583.21	-1159.05	1551.62	0.00	0.00	0.00	
69	6700.00	17.50	22.08	6463.42	1465.71	594.51	-1254.42	1581.69	0.00	0.00	0.00	
70	6800.00	17.50	22.08	6558.79	1493.58	605.81	-1349.79	1611.76	0.00	0.00	0.00	
71	6843.80	17.50	22.08	6600.57	1505.78	610.76	-1391.57	1624.93	0.00	0.00	0.00	
TOD, D.G.=2°/100'												
72	6900.00	16.38	22.08	6654.33	1520.95	616.92	-1445.33	1641.31	2.00	2.00	0.00	
73	7000.00	14.38	22.08	6750.74	1545.52	626.88	-1541.74	1667.82	2.00	2.00	0.00	
74	7100.00	12.38	22.08	6848.02	1566.96	635.58	-1639.02	1690.95	2.00	2.00	0.00	
75	7200.00	10.38	22.08	6946.05	1585.24	642.99	-1737.05	1710.68	2.00	2.00	0.00	
76	7300.00	8.38	22.08	7044.71	1600.33	649.11	-1835.71	1726.97	2.00	2.00	0.00	
77	7400.00	6.38	22.08	7143.88	1612.23	653.94	-1934.88	1739.80	2.00	2.00	0.00	



#	Depth	Inc	Azimuth	TVD	North	East	SubSea	Section	Dogleg	BldRate	Trnrate	Comment
78	7500.00	4.38	22.08	7243.44	1620.91	657.46	-2034.44	1749.17	2.00	2.00	0.00	
79	7600.00	2.38	22.08	7343.26	1626.37	659.67	-2134.26	1755.06	2.00	2.00	0.00	
80	7700.00	0.38	22.08	7443.22	1628.59	660.58	-2234.22	1757.46	2.00	2.00	0.00	
81	7718.80	0.00	22.08	7462.02	1628.65	660.60	-2253.02	1757.53	2.00	2.00	0.00	
EOD, Hold 0°												
82	7800.00	0.00	22.08	7543.22	1628.65	660.60	-2334.22	1757.53	0.00	0.00	0.00	
Int	7875.78	0.00	22.08	7619.00	1628.65	660.60	-2410.00	1757.53	---	---	---	
NBRR												
84	7900.00	0.00	22.08	7643.22	1628.65	660.60	-2434.22	1757.53	0.00	0.00	0.00	
85	8000.00	0.00	22.08	7743.22	1628.65	660.60	-2534.22	1757.53	0.00	0.00	0.00	
86	8100.00	0.00	22.08	7843.22	1628.65	660.60	-2634.22	1757.53	0.00	0.00	0.00	
87	8200.00	0.00	22.08	7943.22	1628.65	660.60	-2734.22	1757.53	0.00	0.00	0.00	
88	8300.00	0.00	22.08	8043.22	1628.65	660.60	-2834.22	1757.53	0.00	0.00	0.00	
Int	8301.78	0.00	22.08	8045.00	1628.65	660.60	-2836.00	1757.53	---	---	---	
CODL												
90	8400.00	0.00	22.08	8143.22	1628.65	660.60	-2934.22	1757.53	0.00	0.00	0.00	
91	8500.00	0.00	22.08	8243.22	1628.65	660.60	-3034.22	1757.53	0.00	0.00	0.00	
92	8600.00	0.00	22.08	8343.22	1628.65	660.60	-3134.22	1757.53	0.00	0.00	0.00	
93	8700.00	0.00	22.08	8443.22	1628.65	660.60	-3234.22	1757.53	0.00	0.00	0.00	
Int	8729.78	0.00	22.08	8473.00	1628.65	660.60	-3264.00	1757.53	---	---	---	
JSND												
95	8800.00	0.00	22.08	8543.22	1628.65	660.60	-3334.22	1757.53	0.00	0.00	0.00	
96	8879.78	0.00	22.08	8623.00	1628.65	660.60	-3414.00	1757.53	0.00	0.00	0.00	

Closure is 1757.5251 feet on an Azimuth of 22.0780