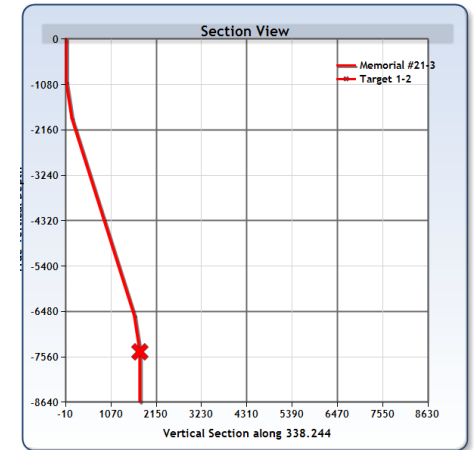
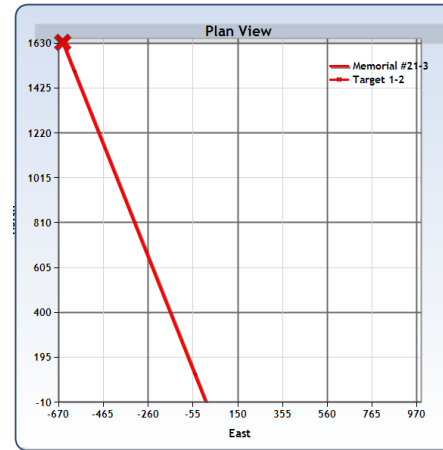


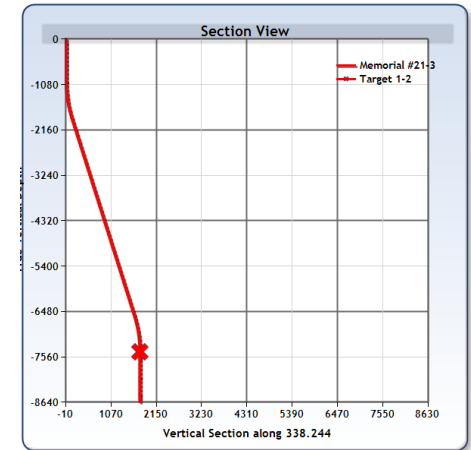
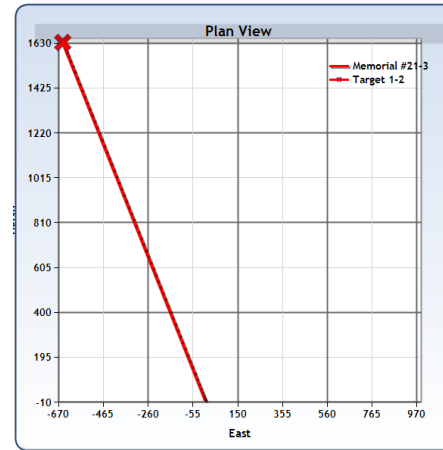
**Company:** Sovereign Operating Co., Inc.  
**Well Name:** Memorial #21-3  
**Location:** SENW Sec. 3 T1S R68W  
**Info:** North Reference is True North  
**Info:**  
**Vertical Section Calculated on an Azimuth of:** 338.2440  
**Survey Calculation method:** Minimum Curvature  
**File Name:** memorial #21-3 , directional proposal, 08-15-12.pl6



#	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	338.24	0.00	0.00	0.00	5210.00	0.00	0.00	0.00	0.00	
1	1011.00	0.00	338.24	1011.00	0.00	0.00	4199.00	0.00	0.00	0.00	0.00	
2	1891.00	17.60	338.24	1877.23	124.55	-49.70	3332.77	134.10	2.00	2.00	0.00	
3	6819.20	17.60	338.24	6574.74	1508.54	-602.03	-1364.74	1624.24	0.00	0.00	0.00	
4	7699.20	0.00	338.24	7440.97	1633.09	-651.74	-2230.97	1758.34	2.00	2.00	0.00	
5	8885.23	0.00	338.24	8627.00	1633.09	-651.74	-3417.00	1758.34	0.00	0.00	0.00	

Closure is 1758.3370 feet on an Azimuth of 338.2440

**Company:** Sovereign Operating Co., Inc.  
**Well Name:** Memorial #21-3  
**Location:** SENW Sec. 3 T1S R68W  
**Info:** North Reference is True North  
**Info:**  
**Vertical Section Calculated on an Azimuth of:** 338.2440  
**Survey Calculation method:** Minimum Curvature  
**File Name:** Memorial #21-3 , Directional Surveys, 08-15-12.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	338.24	0.00	0.00	0.00	5210.00	0.00	0.00	0.00	0.00	
1	100.00	0.00	338.24	100.00	0.00	0.00	5110.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	338.24	200.00	0.00	0.00	5010.00	0.00	0.00	0.00	0.00	
3	300.00	0.00	338.24	300.00	0.00	0.00	4910.00	0.00	0.00	0.00	0.00	
4	400.00	0.00	338.24	400.00	0.00	0.00	4810.00	0.00	0.00	0.00	0.00	
5	500.00	0.00	338.24	500.00	0.00	0.00	4710.00	0.00	0.00	0.00	0.00	
6	600.00	0.00	338.24	600.00	0.00	0.00	4610.00	0.00	0.00	0.00	0.00	
7	700.00	0.00	338.24	700.00	0.00	0.00	4510.00	0.00	0.00	0.00	0.00	
8	800.00	0.00	338.24	800.00	0.00	0.00	4410.00	0.00	0.00	0.00	0.00	
9	900.00	0.00	338.24	900.00	0.00	0.00	4310.00	0.00	0.00	0.00	0.00	
10	1000.00	0.00	338.24	1000.00	0.00	0.00	4210.00	0.00	0.00	0.00	0.00	
KOP, B.G.=2°/100'												
11	1011.00	0.00	338.24	1011.00	0.00	0.00	4199.00	0.00	0.00	0.00	0.00	
12	1100.00	1.78	338.24	1099.99	1.28	-0.51	4110.01	1.38	2.00	2.00	0.00	
13	1200.00	3.78	338.24	1199.86	5.79	-2.31	4010.14	6.23	2.00	2.00	0.00	
14	1300.00	5.78	338.24	1299.51	13.53	-5.40	3910.49	14.56	2.00	2.00	0.00	
15	1400.00	7.78	338.24	1398.81	24.49	-9.77	3811.19	26.37	2.00	2.00	0.00	



#	Depth	Inc	Azimuth	TVD	North	East	SubSea	Section	Dogleg	BldRate	Trnrate	Comment
16	1500.00	9.78	338.24	1497.63	38.67	-15.43	3712.37	41.63	2.00	2.00	0.00	
17	1600.00	11.78	338.24	1595.86	56.04	-22.36	3614.14	60.34	2.00	2.00	0.00	
18	1700.00	13.78	338.24	1693.38	76.58	-30.56	3516.62	82.46	2.00	2.00	0.00	
19	1800.00	15.78	338.24	1790.06	100.28	-40.02	3419.94	107.97	2.00	2.00	0.00	
EOB, HOLD 17.6°												
20	1891.00	17.60	338.24	1877.23	124.55	-49.70	3332.77	134.10	2.00	2.00	0.00	
21	1900.00	17.60	338.24	1885.80	127.07	-50.71	3324.20	136.82	0.00	0.00	0.00	
22	2000.00	17.60	338.24	1981.12	155.16	-61.92	3228.88	167.06	0.00	0.00	0.00	
23	2100.00	17.60	338.24	2076.44	183.24	-73.13	3133.56	197.29	0.00	0.00	0.00	
24	2200.00	17.60	338.24	2171.76	211.32	-84.34	3038.24	227.53	0.00	0.00	0.00	
25	2300.00	17.60	338.24	2267.08	239.41	-95.54	2942.92	257.77	0.00	0.00	0.00	
26	2400.00	17.60	338.24	2362.40	267.49	-106.75	2847.60	288.01	0.00	0.00	0.00	
27	2500.00	17.60	338.24	2457.72	295.57	-117.96	2752.28	318.24	0.00	0.00	0.00	
28	2600.00	17.60	338.24	2553.04	323.66	-129.17	2656.96	348.48	0.00	0.00	0.00	
29	2700.00	17.60	338.24	2648.36	351.74	-140.37	2561.64	378.72	0.00	0.00	0.00	
30	2800.00	17.60	338.24	2743.68	379.82	-151.58	2466.32	408.95	0.00	0.00	0.00	
31	2900.00	17.60	338.24	2839.00	407.91	-162.79	2371.00	439.19	0.00	0.00	0.00	
32	3000.00	17.60	338.24	2934.31	435.99	-174.00	2275.69	469.43	0.00	0.00	0.00	
33	3100.00	17.60	338.24	3029.63	464.07	-185.20	2180.37	499.66	0.00	0.00	0.00	
34	3200.00	17.60	338.24	3124.95	492.16	-196.41	2085.05	529.90	0.00	0.00	0.00	
35	3300.00	17.60	338.24	3220.27	520.24	-207.62	1989.73	560.14	0.00	0.00	0.00	
36	3400.00	17.60	338.24	3315.59	548.32	-218.83	1894.41	590.38	0.00	0.00	0.00	
37	3500.00	17.60	338.24	3410.91	576.41	-230.03	1799.09	620.61	0.00	0.00	0.00	
38	3600.00	17.60	338.24	3506.23	604.49	-241.24	1703.77	650.85	0.00	0.00	0.00	
39	3700.00	17.60	338.24	3601.55	632.57	-252.45	1608.45	681.09	0.00	0.00	0.00	
40	3800.00	17.60	338.24	3696.87	660.66	-263.66	1513.13	711.32	0.00	0.00	0.00	
41	3900.00	17.60	338.24	3792.19	688.74	-274.86	1417.81	741.56	0.00	0.00	0.00	
42	4000.00	17.60	338.24	3887.51	716.82	-286.07	1322.49	771.80	0.00	0.00	0.00	
43	4100.00	17.60	338.24	3982.82	744.91	-297.28	1227.18	802.03	0.00	0.00	0.00	
44	4200.00	17.60	338.24	4078.14	772.99	-308.49	1131.86	832.27	0.00	0.00	0.00	
45	4300.00	17.60	338.24	4173.46	801.07	-319.69	1036.54	862.51	0.00	0.00	0.00	
46	4400.00	17.60	338.24	4268.78	829.16	-330.90	941.22	892.74	0.00	0.00	0.00	



#	Depth	Inc	Azimuth	TVD	North	East	SubSea	Section	Dogleg	BldRate	Trnrate	Comment
47	4500.00	17.60	338.24	4364.10	857.24	-342.11	845.90	922.98	0.00	0.00	0.00	
48	4600.00	17.60	338.24	4459.42	885.32	-353.32	750.58	953.22	0.00	0.00	0.00	
49	4700.00	17.60	338.24	4554.74	913.41	-364.52	655.26	983.46	0.00	0.00	0.00	
50	4800.00	17.60	338.24	4650.06	941.49	-375.73	559.94	1013.69	0.00	0.00	0.00	
51	4900.00	17.60	338.24	4745.38	969.57	-386.94	464.62	1043.93	0.00	0.00	0.00	
52	5000.00	17.60	338.24	4840.70	997.65	-398.14	369.30	1074.17	0.00	0.00	0.00	
53	5100.00	17.60	338.24	4936.01	1025.74	-409.35	273.99	1104.40	0.00	0.00	0.00	
54	5200.00	17.60	338.24	5031.33	1053.82	-420.56	178.67	1134.64	0.00	0.00	0.00	
55	5300.00	17.60	338.24	5126.65	1081.90	-431.77	83.35	1164.88	0.00	0.00	0.00	
56	5400.00	17.60	338.24	5221.97	1109.99	-442.97	-11.97	1195.11	0.00	0.00	0.00	
57	5500.00	17.60	338.24	5317.29	1138.07	-454.18	-107.29	1225.35	0.00	0.00	0.00	
58	5600.00	17.60	338.24	5412.61	1166.15	-465.39	-202.61	1255.59	0.00	0.00	0.00	
59	5700.00	17.60	338.24	5507.93	1194.24	-476.60	-297.93	1285.83	0.00	0.00	0.00	
60	5800.00	17.60	338.24	5603.25	1222.32	-487.80	-393.25	1316.06	0.00	0.00	0.00	
61	5900.00	17.60	338.24	5698.57	1250.40	-499.01	-488.57	1346.30	0.00	0.00	0.00	
62	6000.00	17.60	338.24	5793.89	1278.49	-510.22	-583.89	1376.54	0.00	0.00	0.00	
63	6100.00	17.60	338.24	5889.21	1306.57	-521.43	-679.21	1406.77	0.00	0.00	0.00	
64	6200.00	17.60	338.24	5984.52	1334.65	-532.63	-774.52	1437.01	0.00	0.00	0.00	
65	6300.00	17.60	338.24	6079.84	1362.74	-543.84	-869.84	1467.25	0.00	0.00	0.00	
66	6400.00	17.60	338.24	6175.16	1390.82	-555.05	-965.16	1497.48	0.00	0.00	0.00	
67	6500.00	17.60	338.24	6270.48	1418.90	-566.26	-1060.48	1527.72	0.00	0.00	0.00	
68	6600.00	17.60	338.24	6365.80	1446.99	-577.46	-1155.80	1557.96	0.00	0.00	0.00	
69	6700.00	17.60	338.24	6461.12	1475.07	-588.67	-1251.12	1588.20	0.00	0.00	0.00	
70	6800.00	17.60	338.24	6556.44	1503.15	-599.88	-1346.44	1618.43	0.00	0.00	0.00	
TOD, D.G.=2°/100'												
71	6819.20	17.60	338.24	6574.74	1508.54	-602.03	-1364.74	1624.24	0.00	0.00	0.00	
72	6900.00	15.98	338.24	6652.09	1530.22	-610.68	-1442.09	1647.58	2.00	2.00	0.00	
73	7000.00	13.98	338.24	6748.69	1554.24	-620.27	-1538.69	1673.43	2.00	2.00	0.00	
74	7100.00	11.98	338.24	6846.13	1575.10	-628.59	-1636.13	1695.90	2.00	2.00	0.00	
75	7200.00	9.98	338.24	6944.29	1592.80	-635.66	-1734.29	1714.95	2.00	2.00	0.00	
76	7300.00	7.98	338.24	7043.06	1607.30	-641.44	-1833.06	1730.57	2.00	2.00	0.00	
77	7400.00	5.98	338.24	7142.31	1618.59	-645.95	-1932.31	1742.73	2.00	2.00	0.00	



#	Depth	Inc	Azimuth	TVD	North	East	SubSea	Section	Dogleg	BldRate	Trnrate	Comment
78	7500.00	3.98	338.24	7241.93	1626.66	-649.17	-2031.93	1751.41	2.00	2.00	0.00	
79	7600.00	1.98	338.24	7341.79	1631.50	-651.10	-2131.79	1756.62	2.00	2.00	0.00	
<b>EOD, HOLD</b> 0°												
80	7699.20	0.00	338.24	7440.97	1633.09	-651.74	-2230.97	1758.34	2.00	2.00	0.00	
81	7700.00	0.00	338.24	7441.77	1633.09	-651.74	-2231.77	1758.34	0.00	0.00	0.00	
82	7800.00	0.00	338.24	7541.77	1633.09	-651.74	-2331.77	1758.34	0.00	0.00	0.00	
<b>NBRR</b>												
<b>Int</b>	7849.23	0.00	338.24	7591.00	1633.09	-651.74	-2381.00	1758.34	---	---	---	
84	7900.00	0.00	338.24	7641.77	1633.09	-651.74	-2431.77	1758.34	0.00	0.00	0.00	
85	8000.00	0.00	338.24	7741.77	1633.09	-651.74	-2531.77	1758.34	0.00	0.00	0.00	
86	8100.00	0.00	338.24	7841.77	1633.09	-651.74	-2631.77	1758.34	0.00	0.00	0.00	
87	8200.00	0.00	338.24	7941.77	1633.09	-651.74	-2731.77	1758.34	0.00	0.00	0.00	
88	8300.00	0.00	338.24	8041.77	1633.09	-651.74	-2831.77	1758.34	0.00	0.00	0.00	
<b>CODL</b>												
<b>Int</b>	8311.23	0.00	338.24	8053.00	1633.09	-651.74	-2843.00	1758.34	---	---	---	
90	8400.00	0.00	338.24	8141.77	1633.09	-651.74	-2931.77	1758.34	0.00	0.00	0.00	
91	8500.00	0.00	338.24	8241.77	1633.09	-651.74	-3031.77	1758.34	0.00	0.00	0.00	
92	8600.00	0.00	338.24	8341.77	1633.09	-651.74	-3131.77	1758.34	0.00	0.00	0.00	
93	8700.00	0.00	338.24	8441.77	1633.09	-651.74	-3231.77	1758.34	0.00	0.00	0.00	
<b>JSND</b>												
<b>Int</b>	8735.23	0.00	338.24	8477.00	1633.09	-651.74	-3267.00	1758.34	---	---	---	
95	8800.00	0.00	338.24	8541.77	1633.09	-651.74	-3331.77	1758.34	0.00	0.00	0.00	
96	8885.23	0.00	338.24	8627.00	1633.09	-651.74	-3417.00	1758.34	0.00	0.00	0.00	

Closure is 1758.3370 feet on an Azimuth of 338.2440