

Minimum Curvature Directional Program Sauer 15-31

NE/SE Sec 31, T5N, R67W

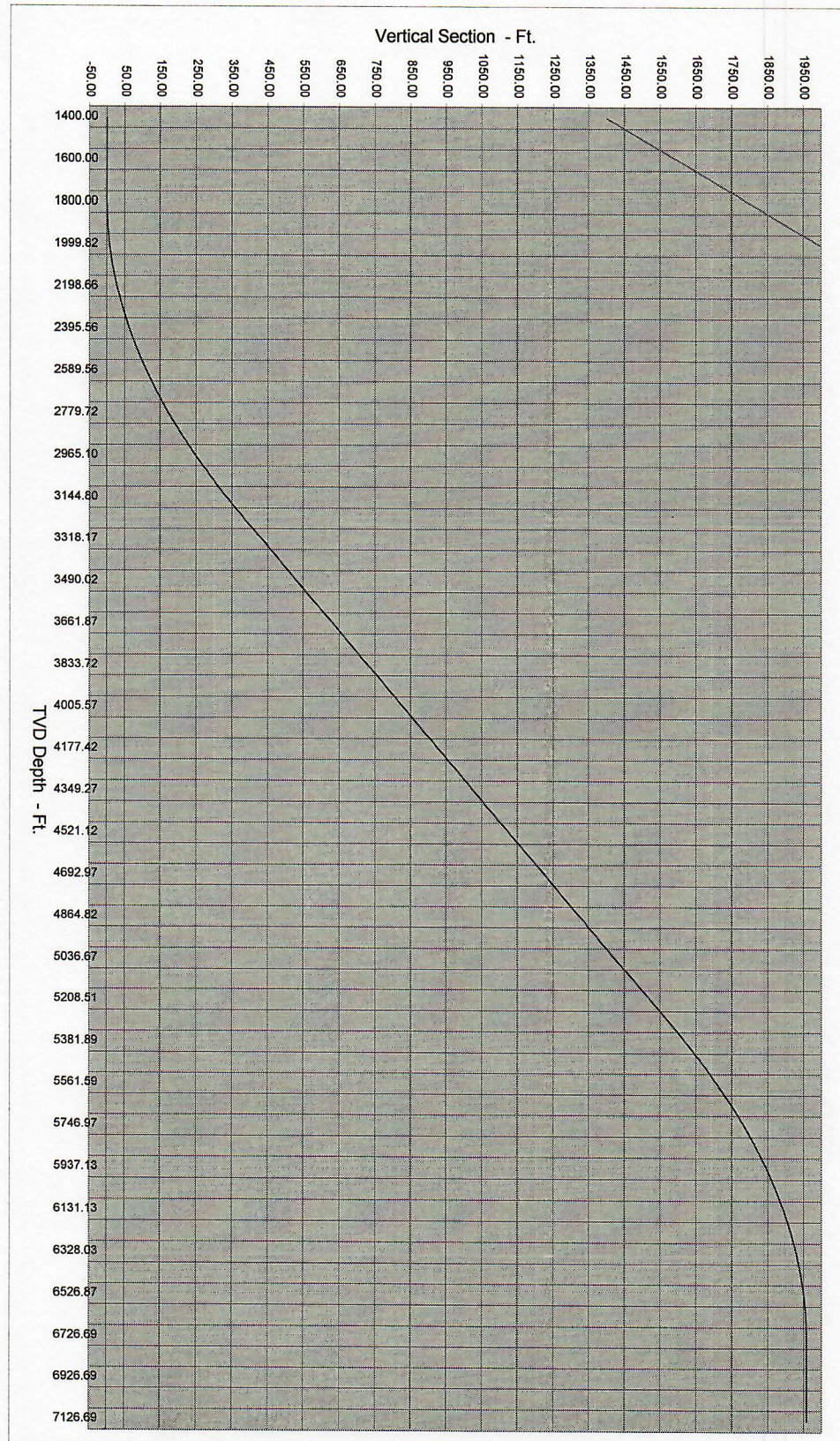
Surface Location: 512' FEL & 1956' FSL

Bottomhole Location: 1980' FEL & 660' FSL

Target Azimuth 228.56 degrees

| Measured Depth | Inclination Degrees | Azimuth Degrees | TVD Feet | d North | North Feet | d East | East Feet | DOGLEG Severity | Vertical Section |
|-------------------|------------------------|--------------------|-------------|---------|---------------|--------|--------------|--------------------|---------------------|
| 0 | 0.00 | 228.56 | | | | | | | |
| 500 | 0.00 | 228.56 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,400 | 0.00 | 228.56 | 1400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,500 | 0.00 | 228.56 | 1500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,600 | 0.00 | 228.56 | 1600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,700 | 0.00 | 228.56 | 1700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,800 | 0.00 | 228.56 | 1800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,900 | 2.00 | 228.56 | 1899.97 | -1.15 | -1.16 | -1.31 | -1.31 | 2.00 | 1.75 |
| 2,000 | 4.00 | 228.56 | 1999.82 | -3.46 | -4.62 | -3.92 | -5.23 | 2.00 | 6.98 |
| 2,100 | 6.00 | 228.56 | 2099.42 | -5.77 | -10.39 | -6.53 | -11.76 | 2.00 | 15.69 |
| 2,200 | 8.00 | 228.56 | 2198.66 | -8.06 | -18.45 | -9.13 | -20.90 | 2.00 | 27.88 |
| 2,300 | 10.00 | 228.56 | 2297.41 | -10.35 | -28.80 | -11.73 | -32.62 | 2.00 | 43.52 |
| 2,400 | 12.00 | 228.56 | 2395.56 | -12.63 | -41.43 | -14.30 | -46.93 | 2.00 | 62.60 |
| 2,500 | 14.00 | 228.56 | 2492.98 | -14.89 | -56.31 | -16.86 | -63.79 | 2.00 | 85.09 |
| 2,600 | 16.00 | 228.56 | 2589.56 | -17.13 | -73.44 | -19.40 | -83.19 | 2.00 | 110.97 |
| 2,700 | 18.00 | 228.56 | 2685.18 | -19.35 | -92.79 | -21.91 | -105.10 | 2.00 | 140.20 |
| 2,800 | 20.00 | 228.56 | 2779.72 | -21.54 | -114.33 | -24.40 | -129.50 | 2.00 | 172.75 |
| 2,900 | 22.00 | 228.56 | 2873.06 | -23.71 | -138.04 | -26.86 | -156.37 | 2.00 | 208.58 |
| 3,000 | 24.00 | 228.56 | 2965.10 | -25.86 | -163.90 | -29.29 | -185.65 | 2.00 | 247.65 |
| 3,100 | 26.00 | 228.56 | 3055.71 | -27.97 | -191.87 | -31.68 | -217.33 | 2.00 | 289.90 |
| 3,200 | 28.00 | 228.56 | 3144.80 | -30.04 | -221.91 | -34.03 | -251.36 | 2.00 | 335.30 |
| 3,300 | 30.00 | 228.56 | 3232.25 | -32.08 | -253.99 | -36.34 | -287.70 | 2.00 | 383.77 |
| 3,399 | 30.00 | 228.56 | 3318.17 | -32.83 | -286.82 | -37.19 | -324.89 | 0.00 | 433.38 |
| 3,498 | 30.00 | 228.56 | 3404.10 | -32.83 | -319.65 | -37.19 | -362.08 | 0.00 | 482.99 |
| 3,598 | 30.00 | 228.56 | 3490.02 | -32.83 | -352.48 | -37.19 | -399.27 | 0.00 | 532.60 |
| 3,697 | 30.00 | 228.56 | 3575.95 | -32.83 | -385.32 | -37.19 | -436.45 | 0.00 | 582.20 |
| 3,796 | 30.00 | 228.56 | 3661.87 | -32.83 | -418.15 | -37.19 | -473.64 | 0.00 | 631.81 |
| 3,895 | 30.00 | 228.56 | 3747.80 | -32.83 | -450.98 | -37.19 | -510.83 | 0.00 | 681.42 |
| 3,995 | 30.00 | 228.56 | 3833.72 | -32.83 | -483.81 | -37.19 | -548.02 | 0.00 | 731.03 |
| 4,094 | 30.00 | 228.56 | 3919.65 | -32.83 | -516.65 | -37.19 | -585.21 | 0.00 | 780.64 |
| 4,193 | 30.00 | 228.56 | 4005.57 | -32.83 | -549.48 | -37.19 | -622.40 | 0.00 | 830.25 |
| 4,292 | 30.00 | 228.56 | 4091.49 | -32.83 | -582.31 | -37.19 | -659.59 | 0.00 | 879.86 |
| 4,391 | 30.00 | 228.56 | 4177.42 | -32.83 | -615.14 | -37.19 | -696.78 | 0.00 | 929.46 |
| 4,491 | 30.00 | 228.56 | 4263.34 | -32.83 | -647.97 | -37.19 | -733.97 | 0.00 | 979.07 |
| 4,590 | 30.00 | 228.56 | 4349.27 | -32.83 | -680.81 | -37.19 | -771.16 | 0.00 | 1028.68 |
| 4,689 | 30.00 | 228.56 | 4435.19 | -32.83 | -713.64 | -37.19 | -808.35 | 0.00 | 1078.29 |
| 4,788 | 30.00 | 228.56 | 4521.12 | -32.83 | -746.47 | -37.19 | -845.54 | 0.00 | 1127.90 |
| 4,887 | 30.00 | 228.56 | 4607.04 | -32.83 | -779.30 | -37.19 | -882.73 | 0.00 | 1177.51 |
| 4,987 | 30.00 | 228.56 | 4692.97 | -32.83 | -812.14 | -37.19 | -919.92 | 0.00 | 1227.12 |
| 5,086 | 30.00 | 228.56 | 4778.89 | -32.83 | -844.97 | -37.19 | -957.11 | 0.00 | 1276.72 |
| 5,185 | 30.00 | 228.56 | 4864.82 | -32.83 | -877.80 | -37.19 | -994.30 | 0.00 | 1326.33 |
| 5,284 | 30.00 | 228.56 | 4950.74 | -32.83 | -910.63 | -37.19 | -1031.49 | 0.00 | 1375.94 |
| 5,384 | 30.00 | 228.56 | 5036.67 | -32.83 | -943.46 | -37.19 | -1068.68 | 0.00 | 1425.55 |
| 5,483 | 30.00 | 228.56 | 5122.59 | -32.83 | -976.30 | -37.19 | -1105.87 | 0.00 | 1475.16 |
| 5,582 | 30.00 | 228.56 | 5208.51 | -32.83 | -1009.13 | -37.19 | -1143.06 | 0.00 | 1524.77 |
| 5,681 | 30.00 | 228.56 | 5294.44 | -32.83 | -1041.96 | -37.19 | -1180.25 | 0.00 | 1574.38 |
| 5,781 | 28.00 | 228.56 | 5381.89 | -32.08 | -1074.04 | -36.34 | -1216.58 | 2.00 | 1622.85 |
| 5,881 | 26.00 | 228.56 | 5470.97 | -30.04 | -1104.08 | -34.03 | -1250.61 | 2.00 | 1668.24 |
| 5,981 | 24.00 | 228.56 | 5561.59 | -27.97 | -1132.05 | -31.68 | -1282.29 | 2.00 | 1710.50 |
| 6,081 | 22.00 | 228.56 | 5653.63 | -25.86 | -1157.90 | -29.29 | -1311.58 | 2.00 | 1749.56 |
| 6,181 | 20.00 | 228.56 | 5746.97 | -23.71 | -1181.62 | -26.86 | -1338.44 | 2.00 | 1785.40 |
| 6,281 | 18.00 | 228.56 | 5841.51 | -21.54 | -1203.16 | -24.40 | -1362.84 | 2.00 | 1817.95 |
| 6,381 | 16.00 | 228.56 | 5937.13 | -19.35 | -1222.51 | -21.91 | -1384.76 | 2.00 | 1847.18 |
| 6,481 | 14.00 | 228.56 | 6033.70 | -17.13 | -1239.64 | -19.40 | -1404.16 | 2.00 | 1873.06 |
| 6,581 | 12.00 | 228.56 | 6131.13 | -14.89 | -1254.52 | -16.86 | -1421.02 | 2.00 | 1895.55 |
| 6,681 | 10.00 | 228.56 | 6229.27 | -12.63 | -1267.15 | -14.30 | -1435.32 | 2.00 | 1914.63 |
| 6,781 | 8.00 | 228.56 | 6328.03 | -10.35 | -1277.50 | -11.73 | -1447.04 | 2.00 | 1930.27 |
| 6,881 | 6.00 | 228.56 | 6427.27 | -8.06 | -1285.56 | -9.13 | -1456.18 | 2.00 | 1942.45 |
| 6,981 | 4.00 | 228.56 | 6526.87 | -5.77 | -1291.33 | -6.53 | -1462.71 | 2.00 | 1951.17 |
| 7,081 | 2.00 | 228.56 | 6626.72 | -3.46 | -1294.79 | -3.92 | -1466.63 | 2.00 | 1956.40 |
| 7,181 | 0.00 | 228.56 | 6726.69 | -1.15 | -1295.95 | -1.31 | -1467.94 | 2.00 | 1958.15 |
| 7,281 | 0.00 | 228.56 | 6826.69 | 0.00 | -1295.95 | 0.00 | -1467.94 | 0.00 | 1958.15 |
| 7,381 | 0.00 | 228.56 | 6926.69 | 0.00 | -1295.95 | 0.00 | -1467.94 | 0.00 | 1958.15 |
| 7,481 | 0.00 | 228.56 | 7026.69 | 0.00 | -1295.95 | 0.00 | -1467.94 | 0.00 | 1958.15 |
| 7,581 | 1.00 | 228.56 | 7126.68 | -0.58 | -1296.53 | -0.65 | -1468.60 | 1.00 | 1959.02 |
| 7,681 | 2.00 | 228.56 | 7226.64 | -1.73 | -1298.26 | -1.96 | -1470.56 | 1.00 | 1961.64 |

Sauer 15-31



Plan View

Sauer 15-31

NE/SE Sec 31, T5N, R67W

Surface Location: 512' FEL & 1956' FSL

Bottomhole Location: 1980' FEL & 660' FSL

Target Azimuth 228.56 degrees

Vertical Section 1958.224 ft.

| | East | North | |
|--------|---------|---------|-----|
| | 0.0 | 0.0 | 0.0 |
| 391.6 | -293.6 | -259.2 | |
| 783.3 | -587.2 | -518.4 | |
| 1174.9 | -880.8 | -777.6 | |
| 1566.6 | -1174.4 | -1036.8 | |
| 1958.2 | -1468.0 | -1296.0 | |

