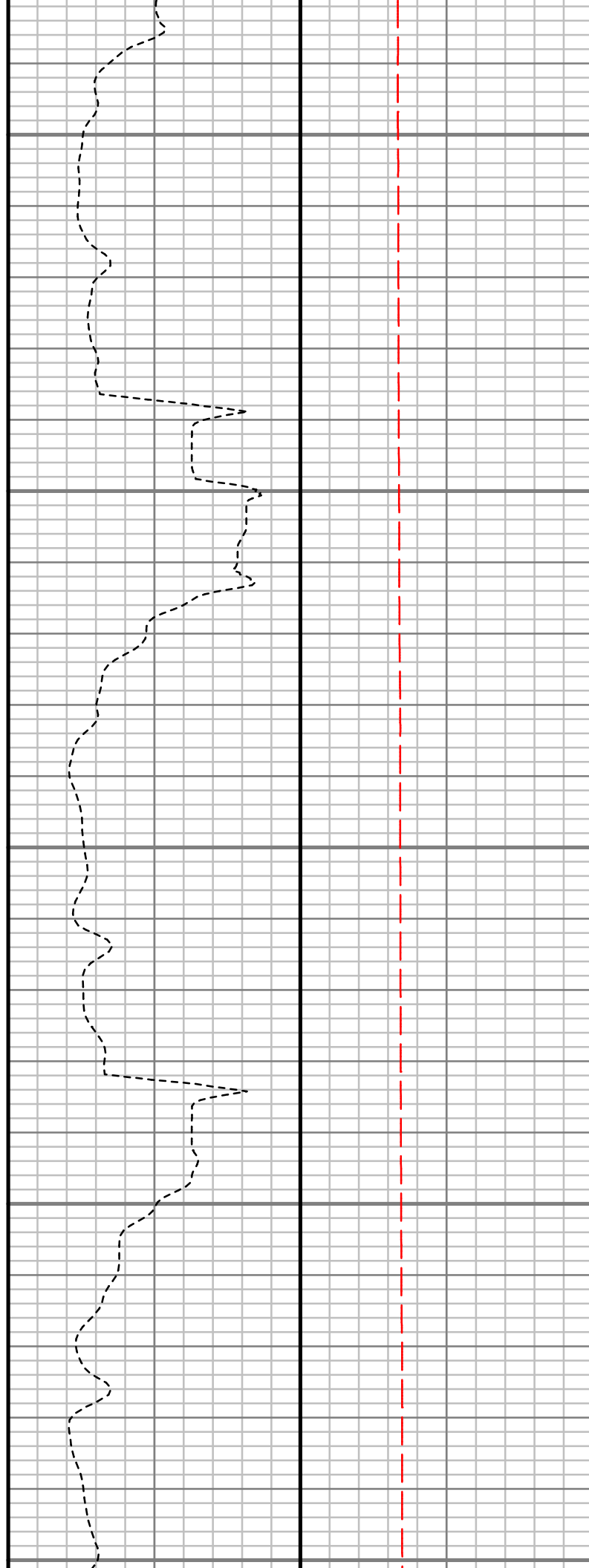
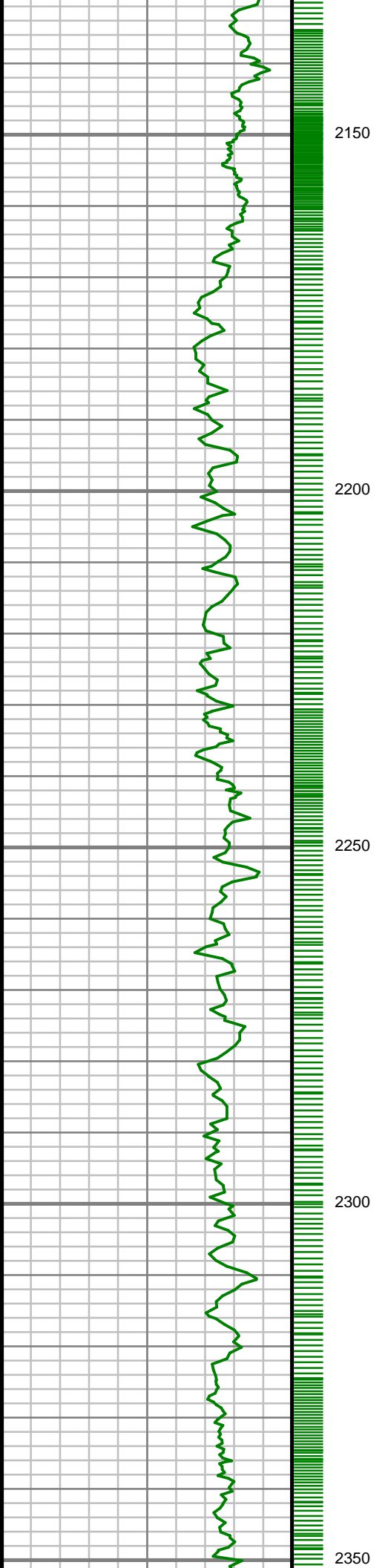


S: 20 MD: 1937.00 ft
Inc: 4.14 deg Az:
278.63 deg TVD:
1935.15 ft

S: 21 MD: 2031.00 ft
Inc: 3.96 deg Az:
282.44 deg TVD:
2028.92 ft

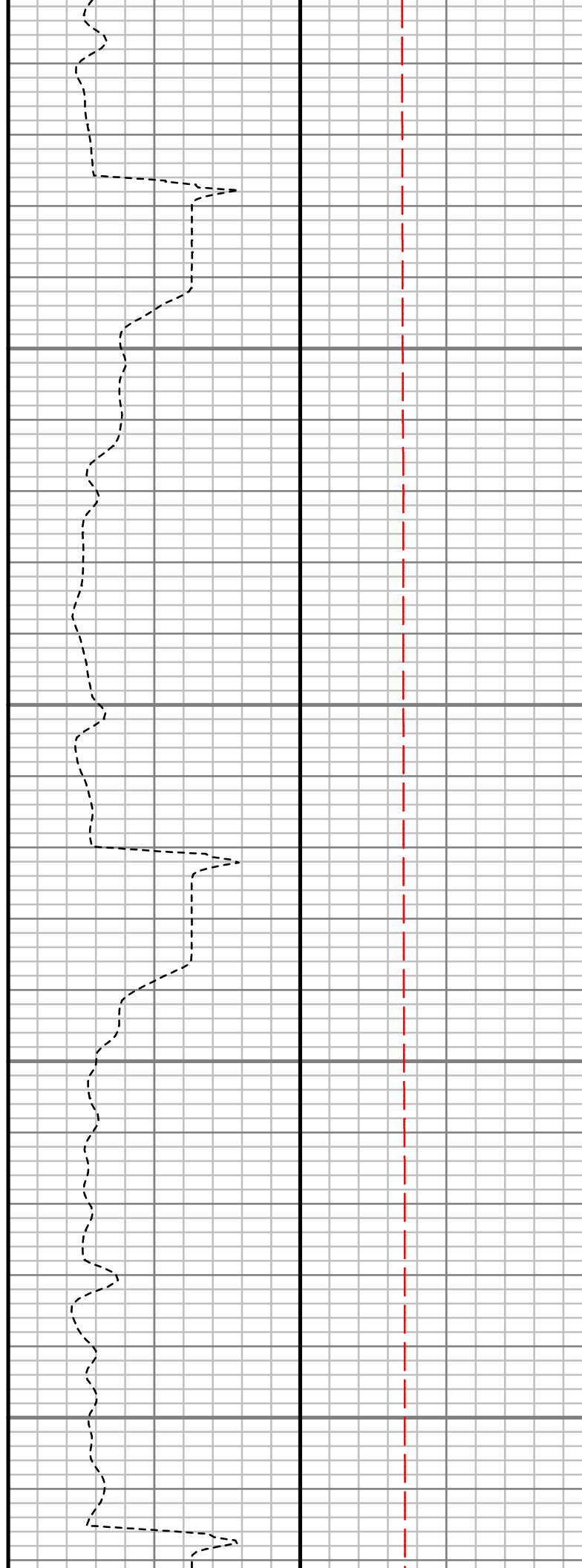
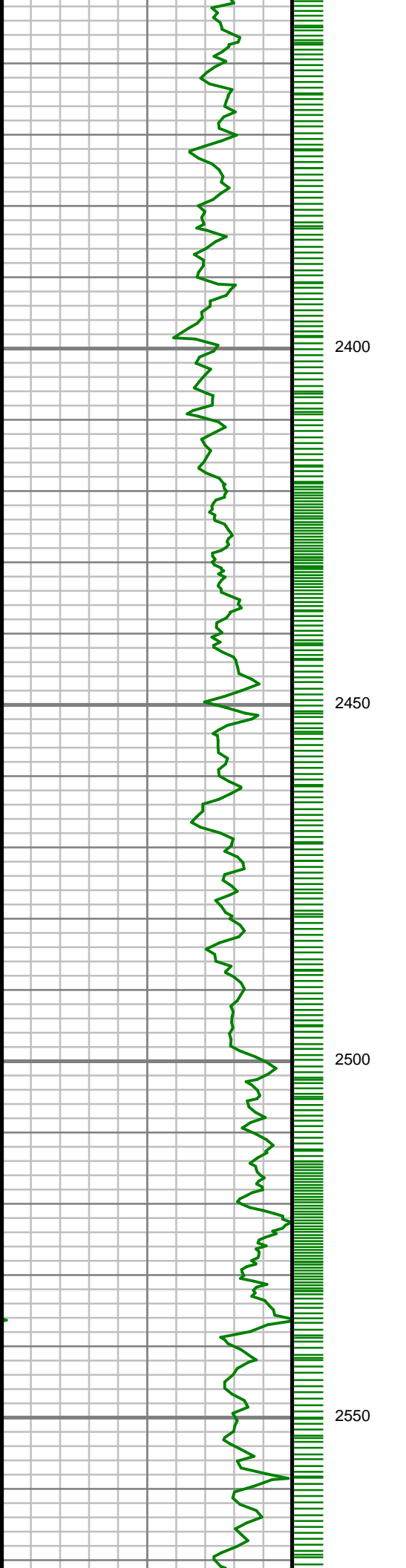
S: 22 MD: 2126.00 ft
Inc: 3.93 deg Az:



265.72 deg TVD:
2123.70 ft

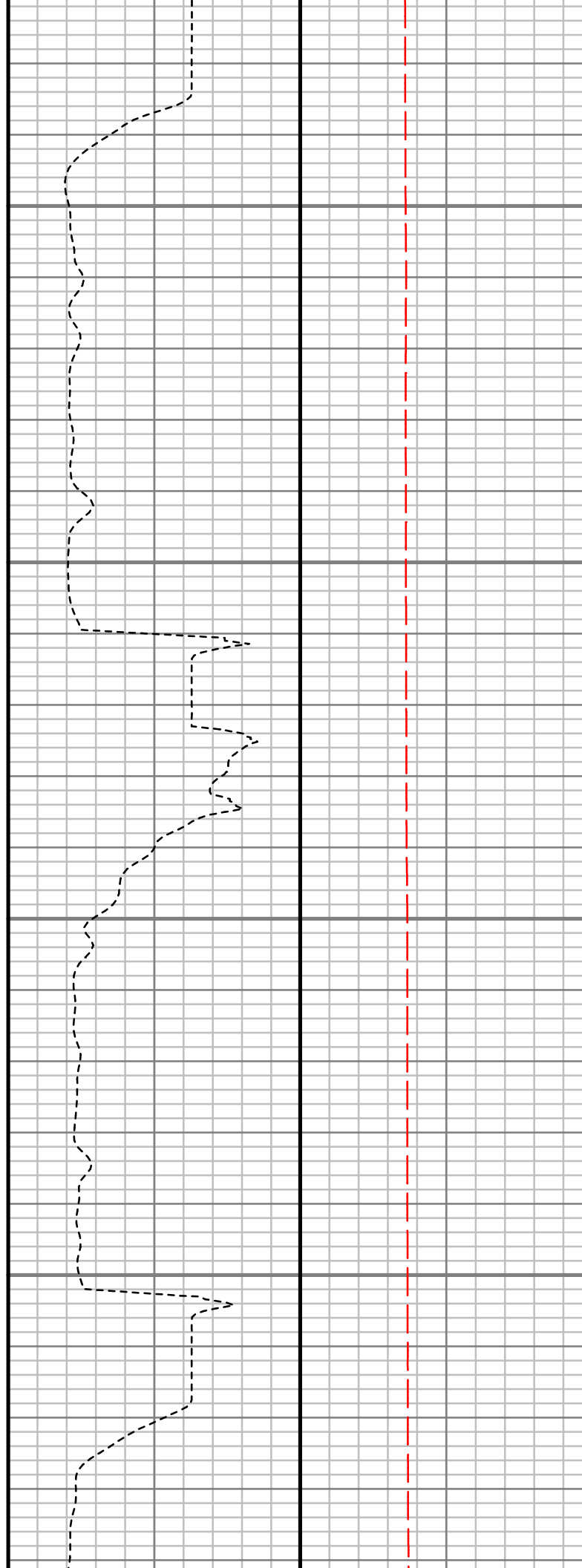
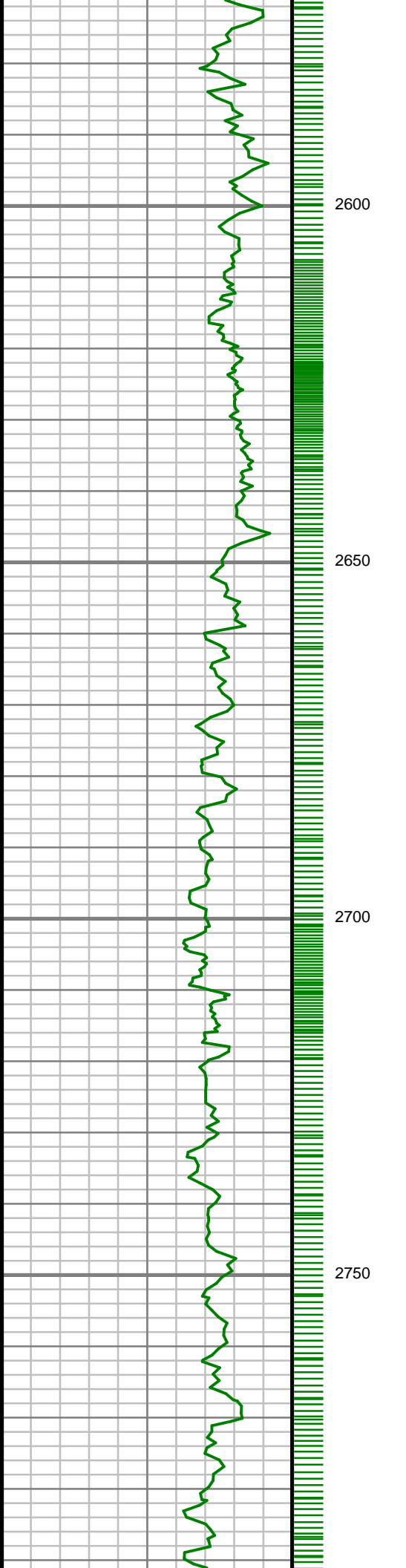
S: 23 MD: 2221.00 ft
Inc: 1.88 deg Az:
290.06 deg TVD:
2218.57 ft

S: 24 MD: 2314.00 ft
Inc: 1.94 deg Az:
300.40 deg TVD:
2311.52 ft



S: 25 MD: 2407.00 ft
Inc: 1.83 deg Az:
301.38 deg TVD:
2404.47 ft

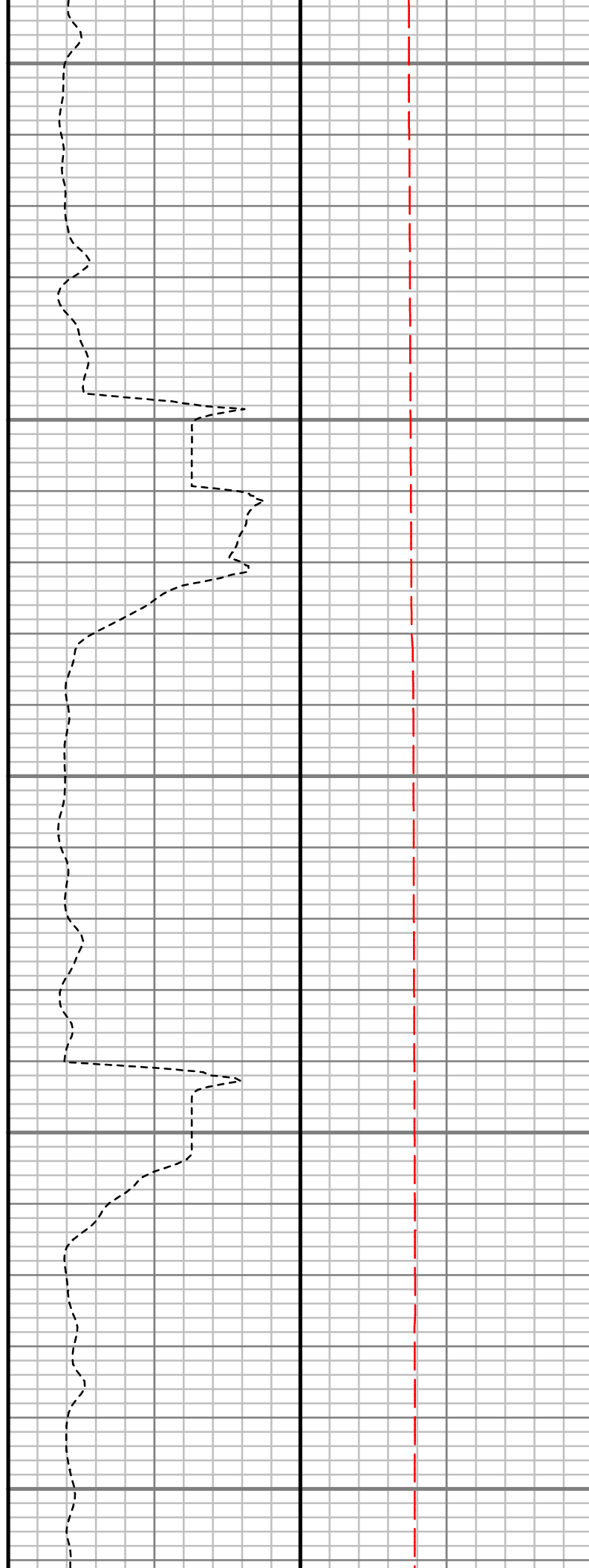
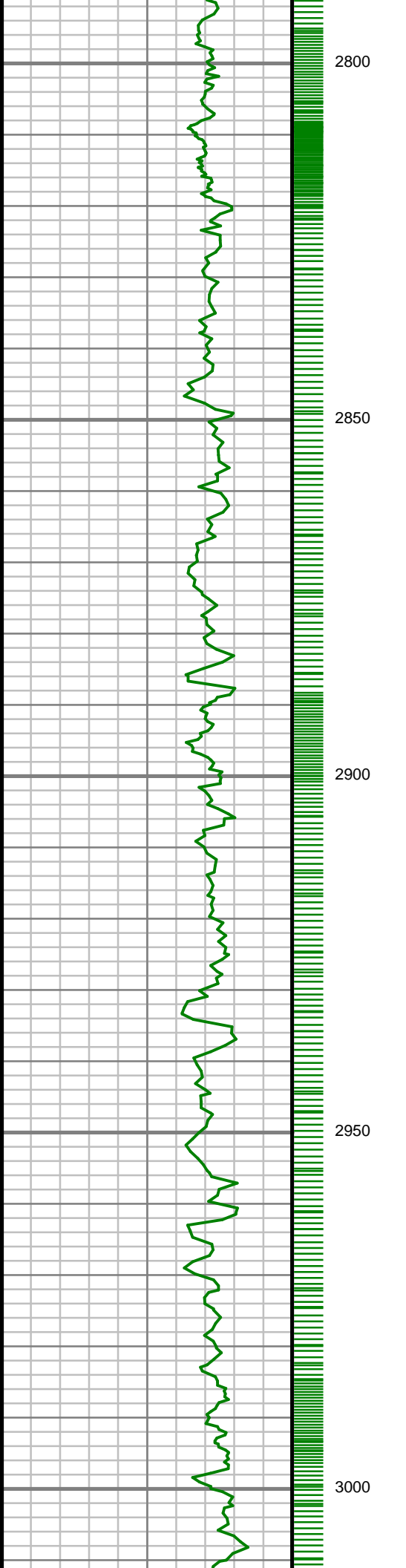
S: 26 MD: 2502.00 ft
Inc: 1.81 deg Az:
298.54 deg TVD:
2499.42 ft



S: 27 MD: 2596.00 ft
Inc: 1.92 deg Az:
292.60 deg TVD:
2593.37 ft

S: 28 MD: 2690.00 ft
Inc: 1.32 deg Az:
263.35 deg TVD:
2687.34 ft

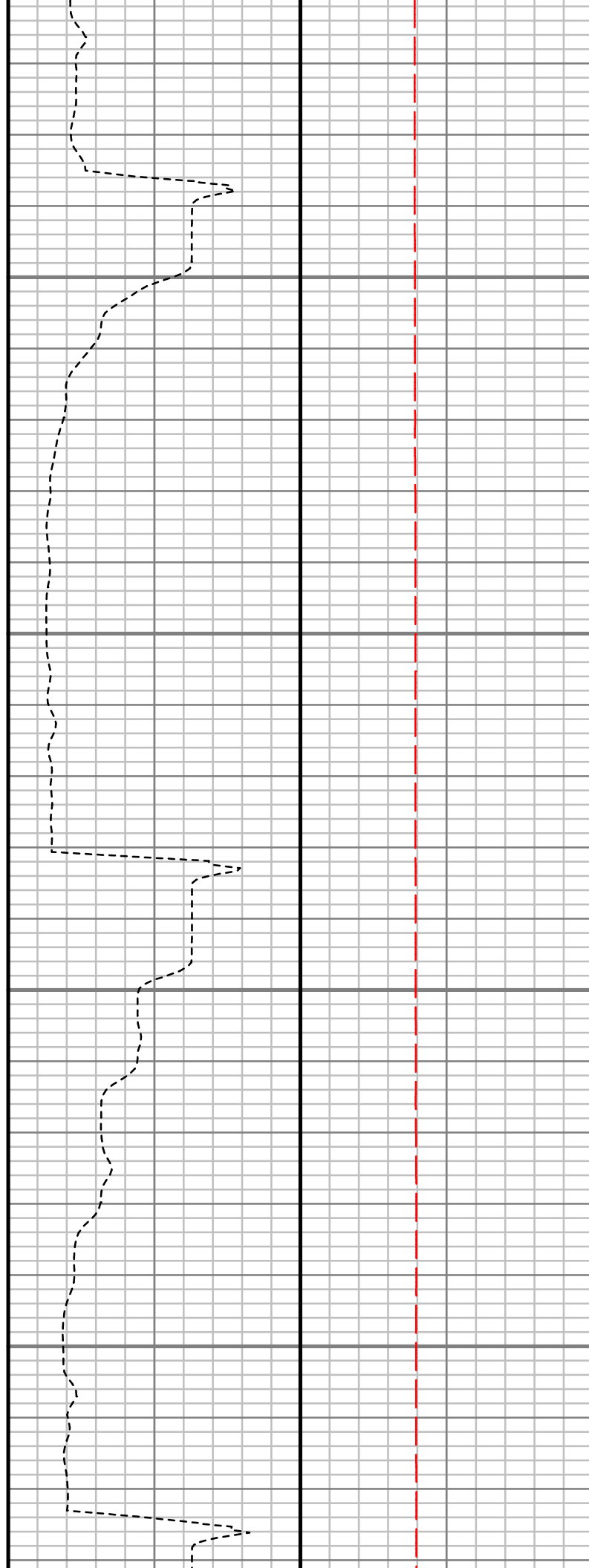
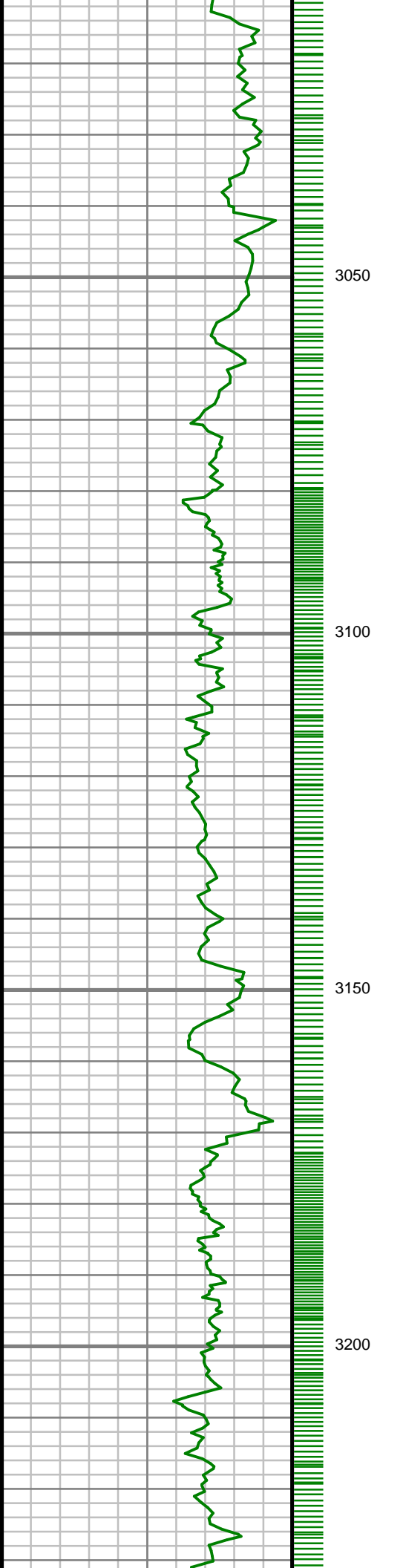
S: 29 MD: 2784.00 ft
Inc: 1.48 deg Az:
268.01 deg TVD:



2781.31 ft

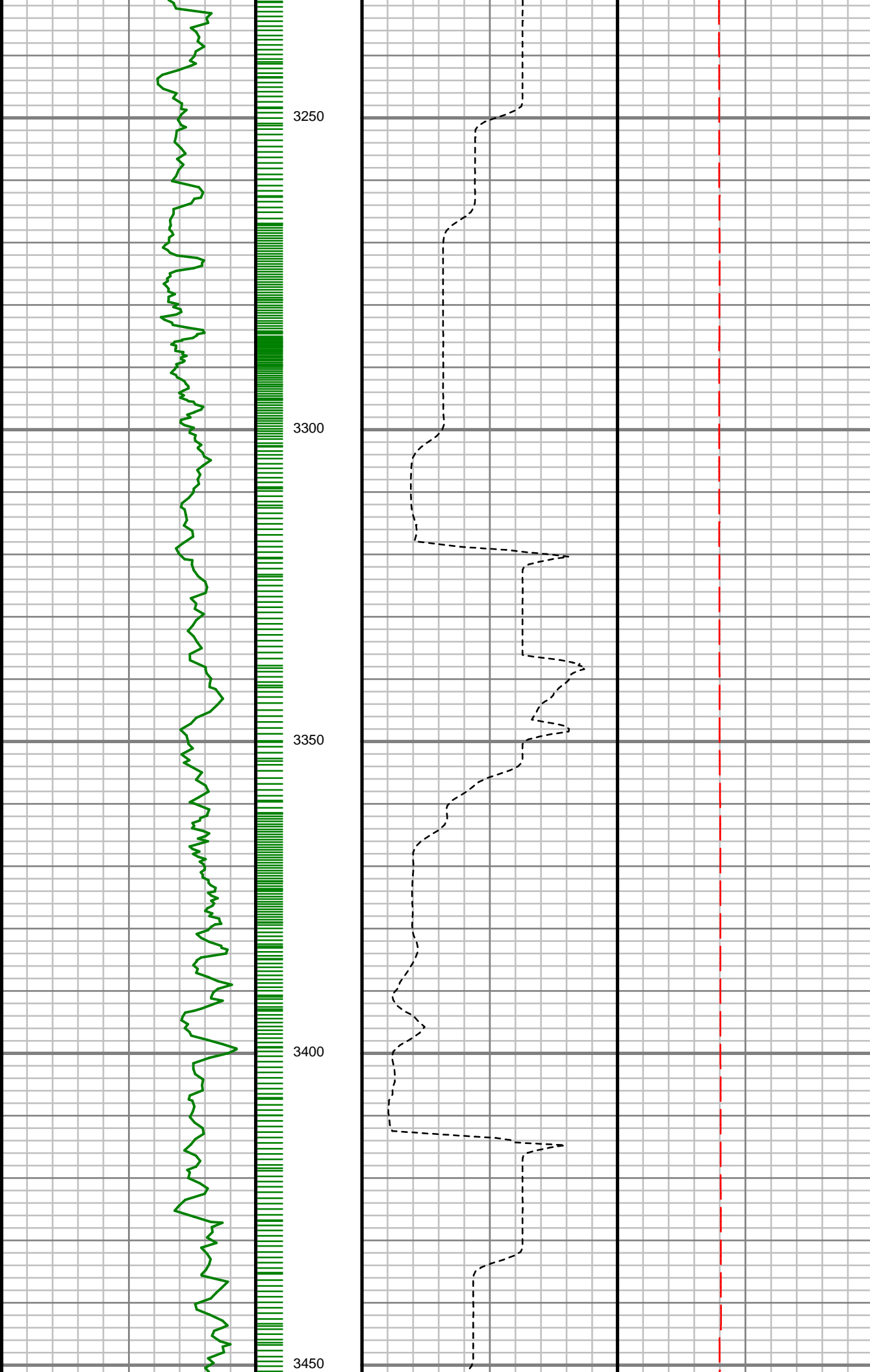
S: 30 MD: 2878.00 ft
Inc: 0.45 deg Az:
338.62 deg TVD:
2875.30 ft

S: 31 MD: 2972.00 ft
Inc: 0.24 deg Az:
344.36 deg TVD:
2969.30 ft



S: 32 MD: 3068.00 ft
Inc: 0.20 deg Az:
227.51 deg TVD:
3065.30 ft

S: 33 MD: 3160.00 ft
Inc: 0.39 deg Az:
240.94 deg TVD:
3157.29 ft



S: 34 MD: 3254.00 ft
Inc: 0.42 deg Az:
264.65 deg TVD:
3251.29 ft

S: 35 MD: 3348.00 ft
Inc: 0.77 deg Az:
126.90 deg TVD:
3345.29 ft

S: 36 MD: 3440.00 ft
Inc: 0.74 deg Az:
111.18 deg TVD: 3437.28 ft

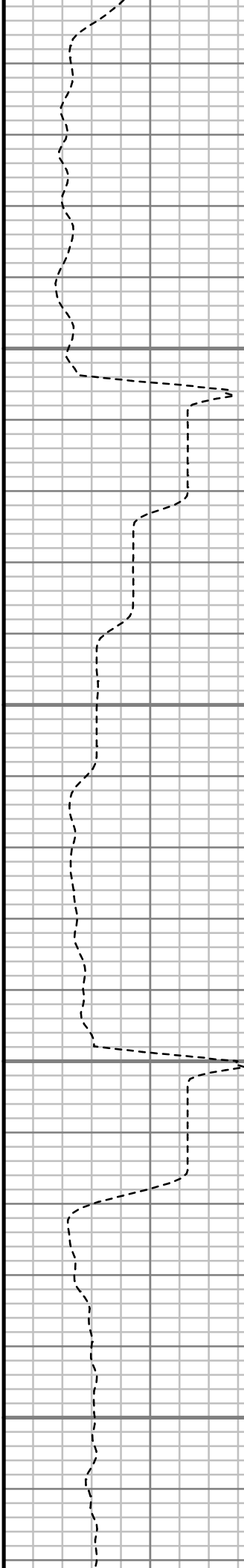


3500

3550

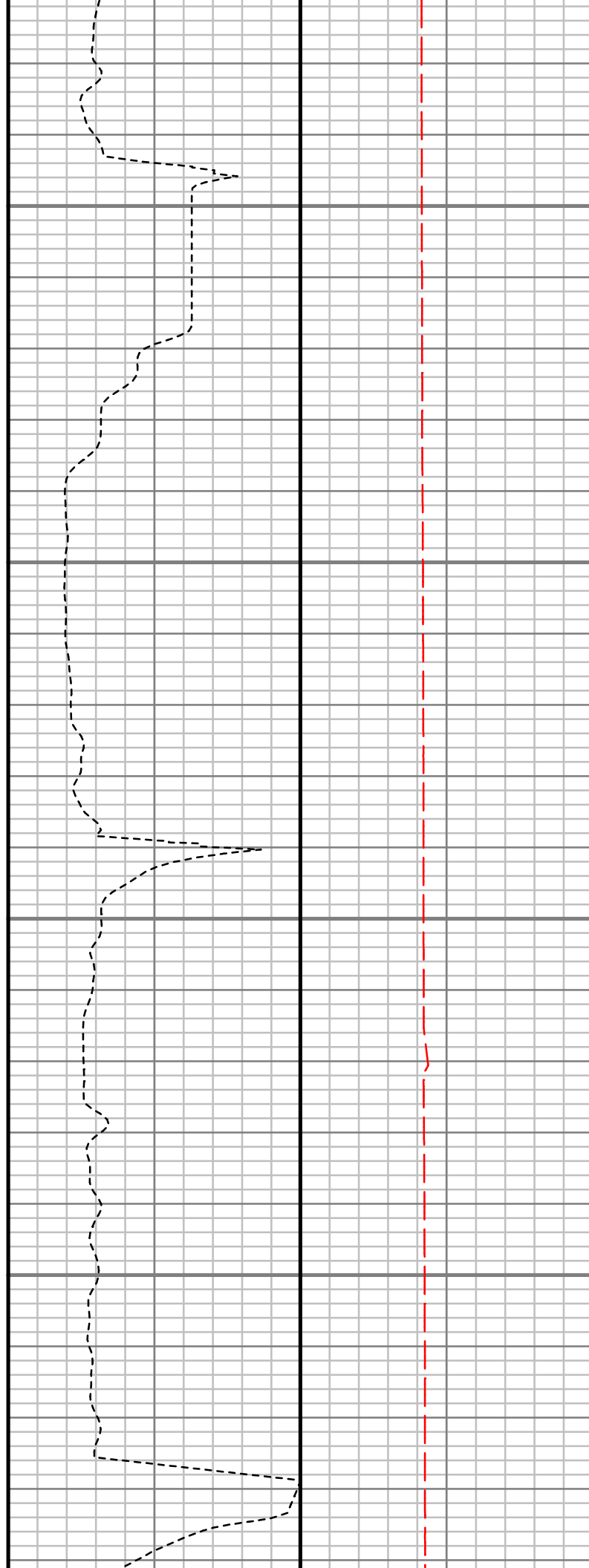
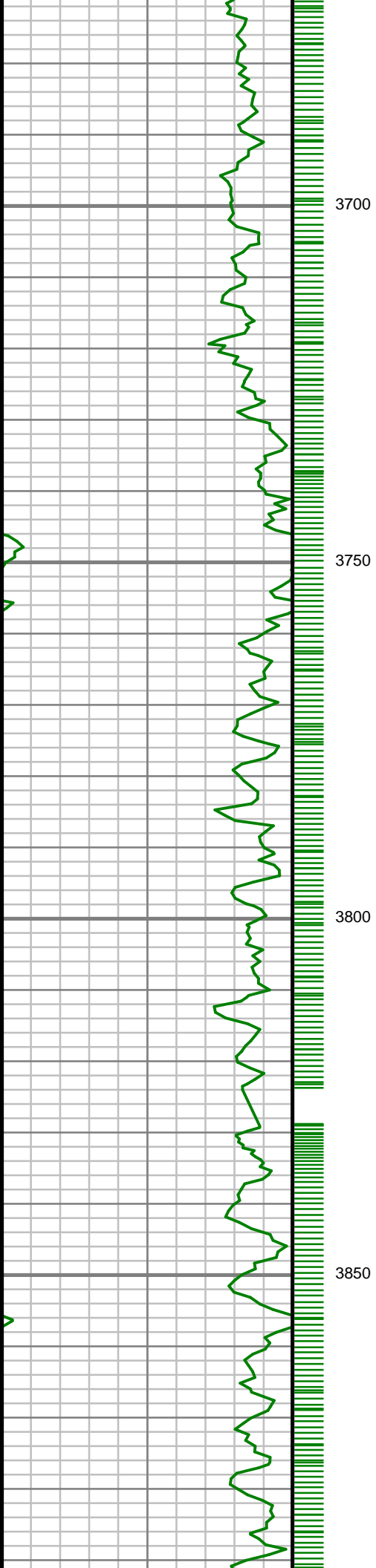
3600

3650



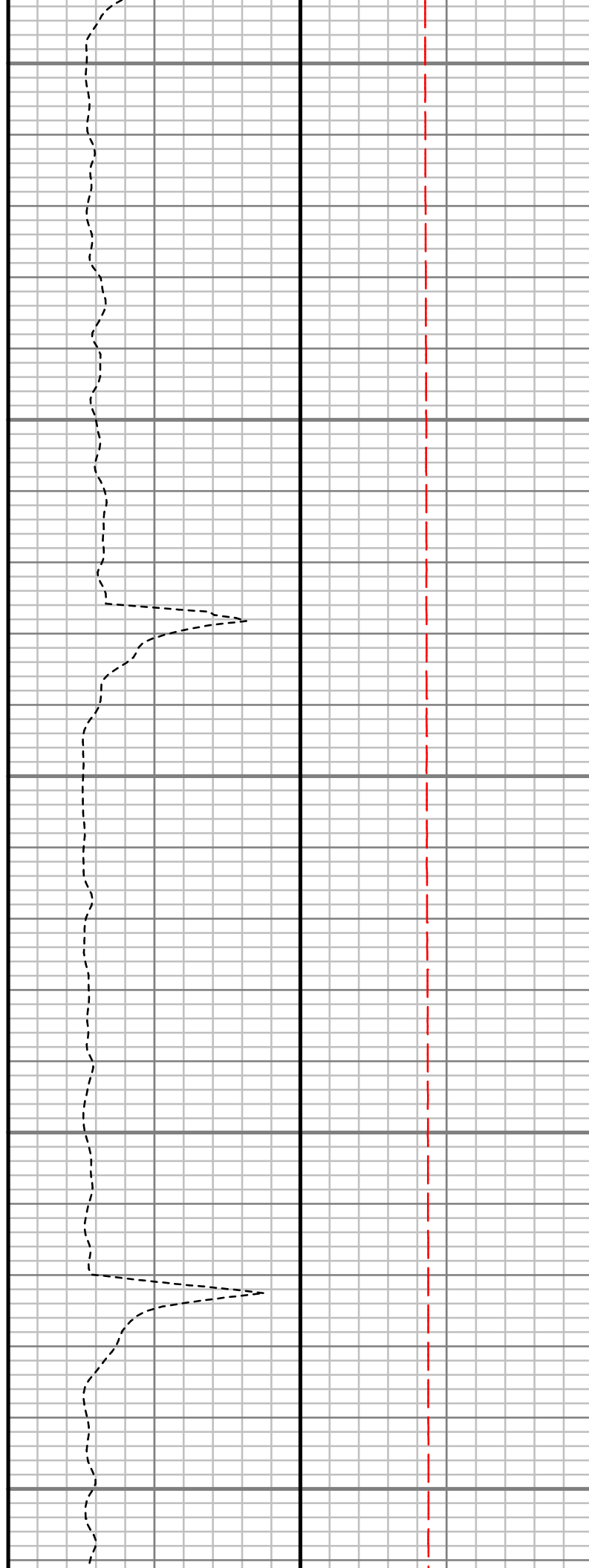
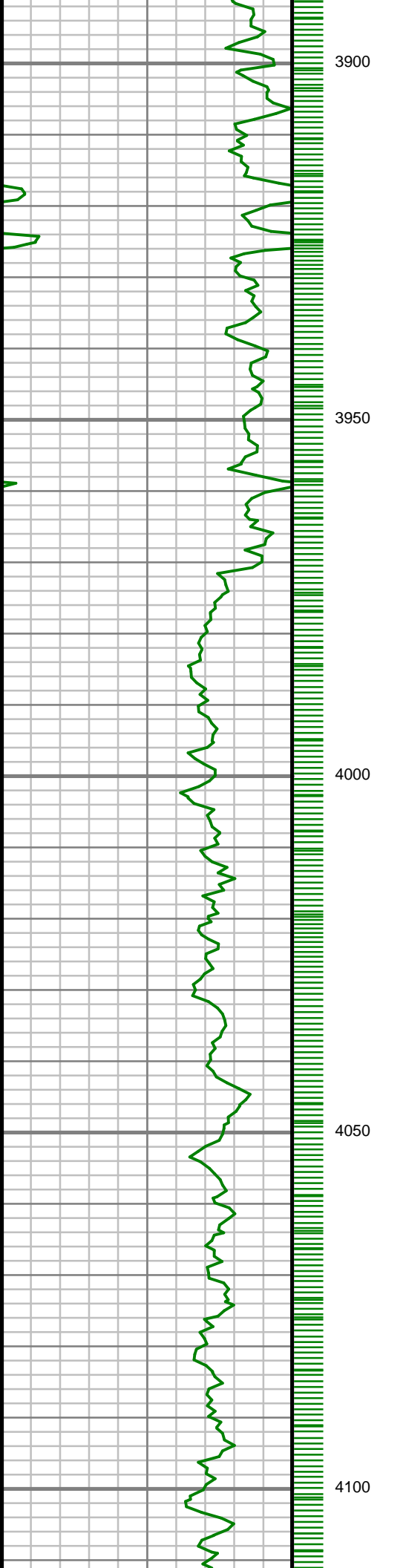
S: 37 MD: 3534.00 ft
Inc: 0.62 deg Az:
155.27 deg TVD:
3531.28 ft

S: 38 MD: 3628.00 ft
Inc: 0.84 deg Az:
167.11 deg TVD:
3625.27 ft



S: 39 MD: 3723.00 ft
Inc: 0.90 deg Az:
168.24 deg TVD:
3720.26 ft

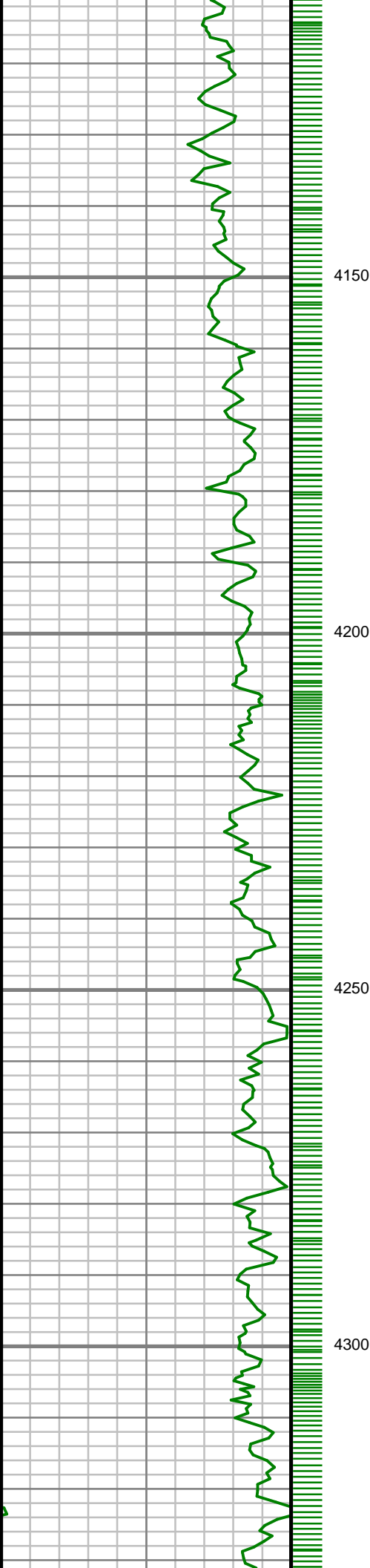
S: 40 MD: 3816.00 ft
Inc: 0.18 deg Az:
179.42 deg TVD:
3813.25 ft



S: 41 MD: 3909.00 ft
Inc: 0.26 deg Az:
344.04 deg TVD:
3906.25 ft

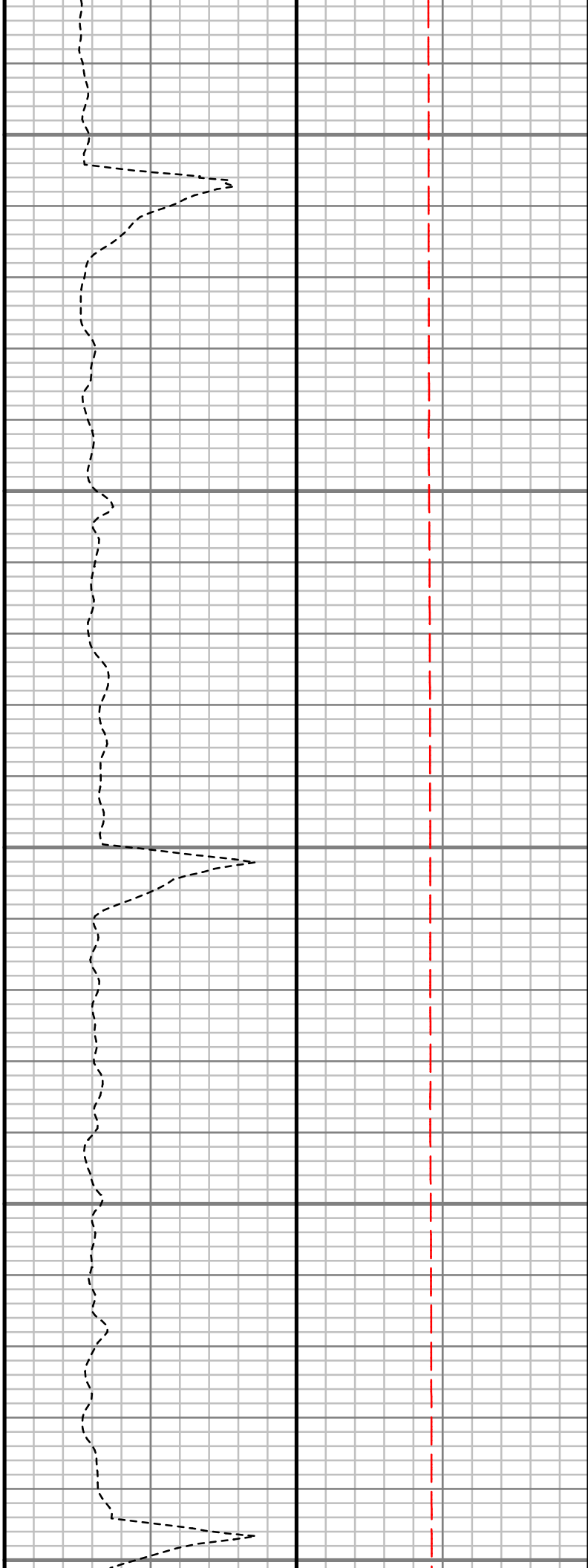
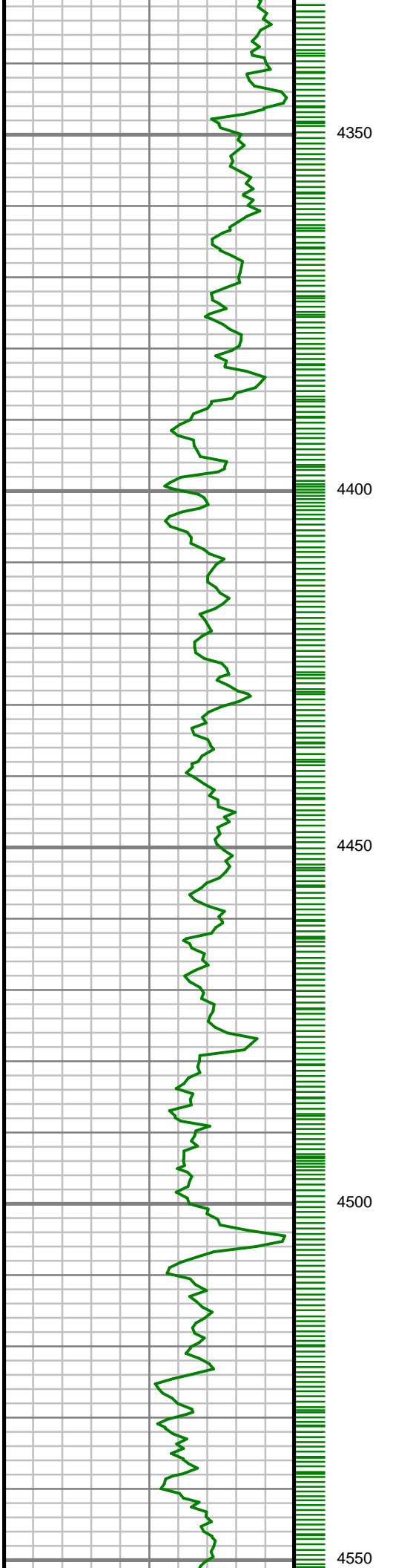
S: 42 MD: 4004.00 ft
Inc: 0.17 deg Az:
324.78 deg TVD:
4001.25 ft

S: 43 MD: 4099.00 ft
Inc: 0.50 deg Az: 97.23
deg TVD: 4096.25 ft



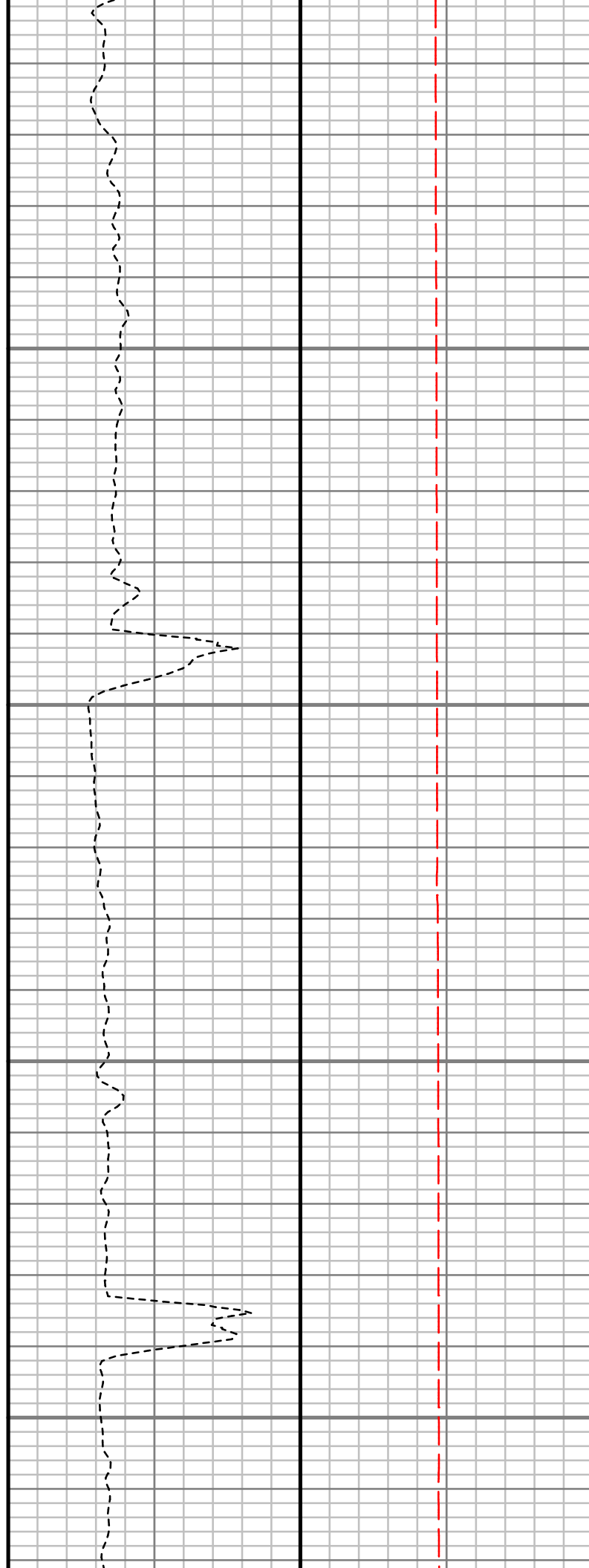
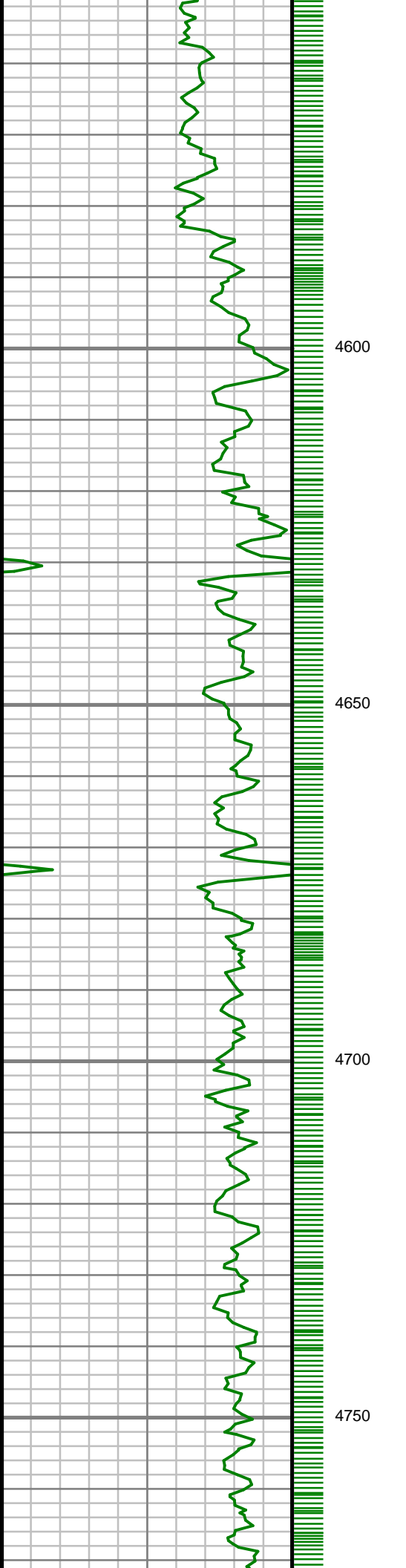
S: 44 MD: 4193.00 ft
Inc: 0.17 deg Az: 83.26
deg TVD: 4190.25 ft

S: 45 MD: 4287.00 ft
Inc: 0.26 deg Az:
239.00 deg TVD:
4284.25 ft



S: 46 MD: 4382.00 ft
Inc: 0.56 deg Az:
287.62 deg TVD:
4379.25 ft

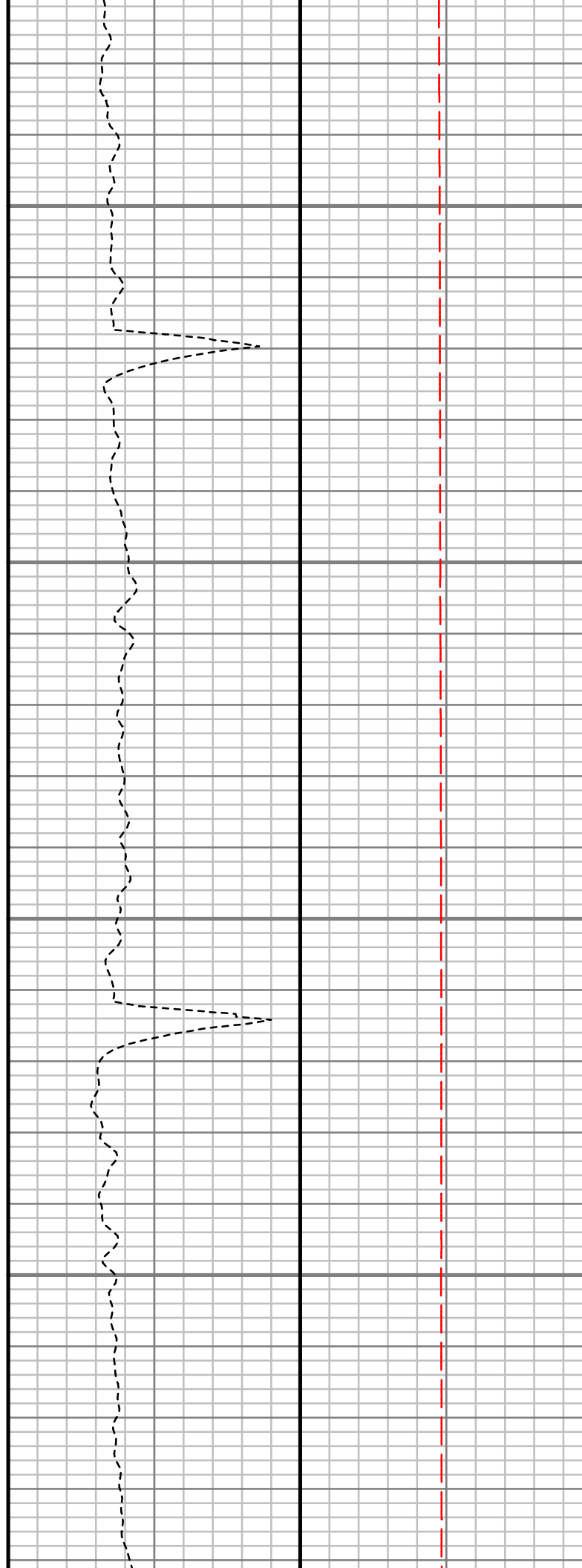
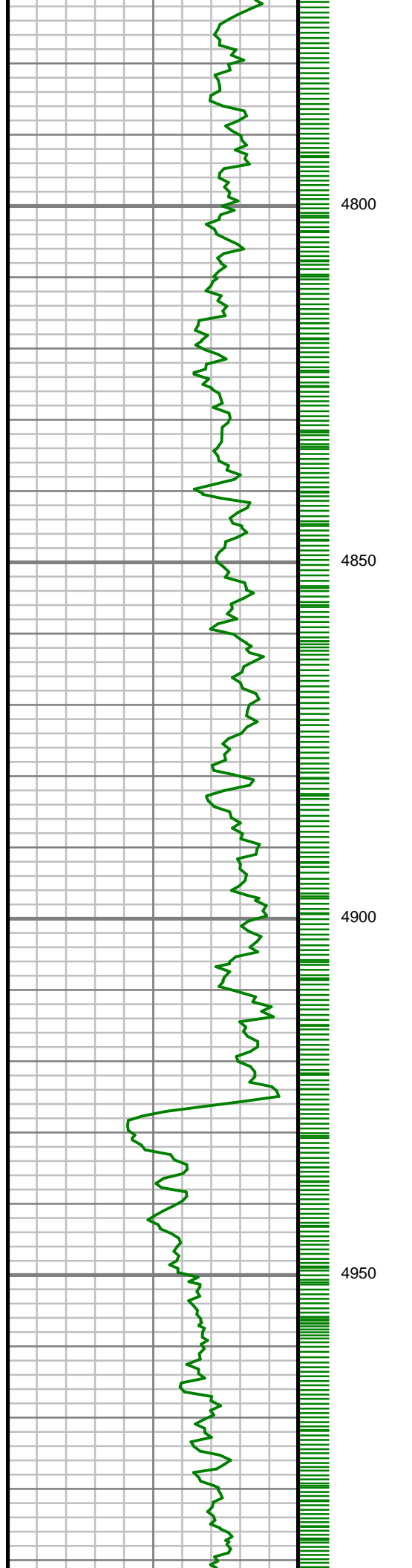
S: 47 MD: 4476.00 ft
Inc: 0.62 deg Az:
307.56 deg TVD:
4473.24 ft



S: 48 MD: 4571.00 ft
Inc: 0.93 deg Az:
311.65 deg TVD:
4568.23 ft

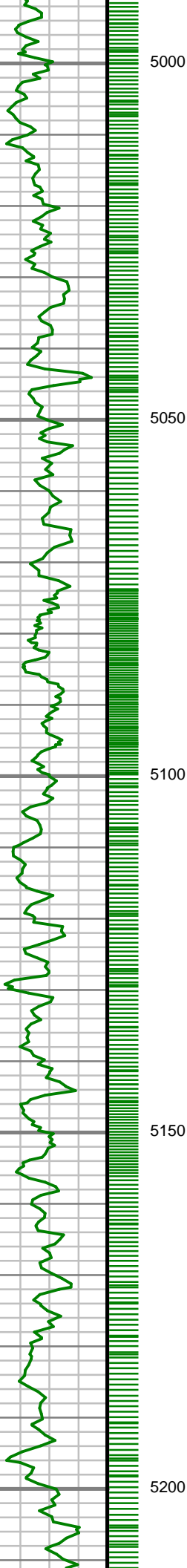
S: 49 MD: 4664.00 ft
Inc: 0.85 deg Az:
309.56 deg TVD:
4661.22 ft

S: 50 MD: 4758.00 ft
Inc: 0.75 deg Az:
322.41 deg TVD:
4755.21 ft



S: 51 MD: 4852.00 ft
Inc: 0.62 deg Az:
283.70 deg TVD:
4849.21 ft

S: 52 MD: 4947.00 ft
Inc: 0.49 deg Az:
300.89 deg TVD:
4944.20 ft



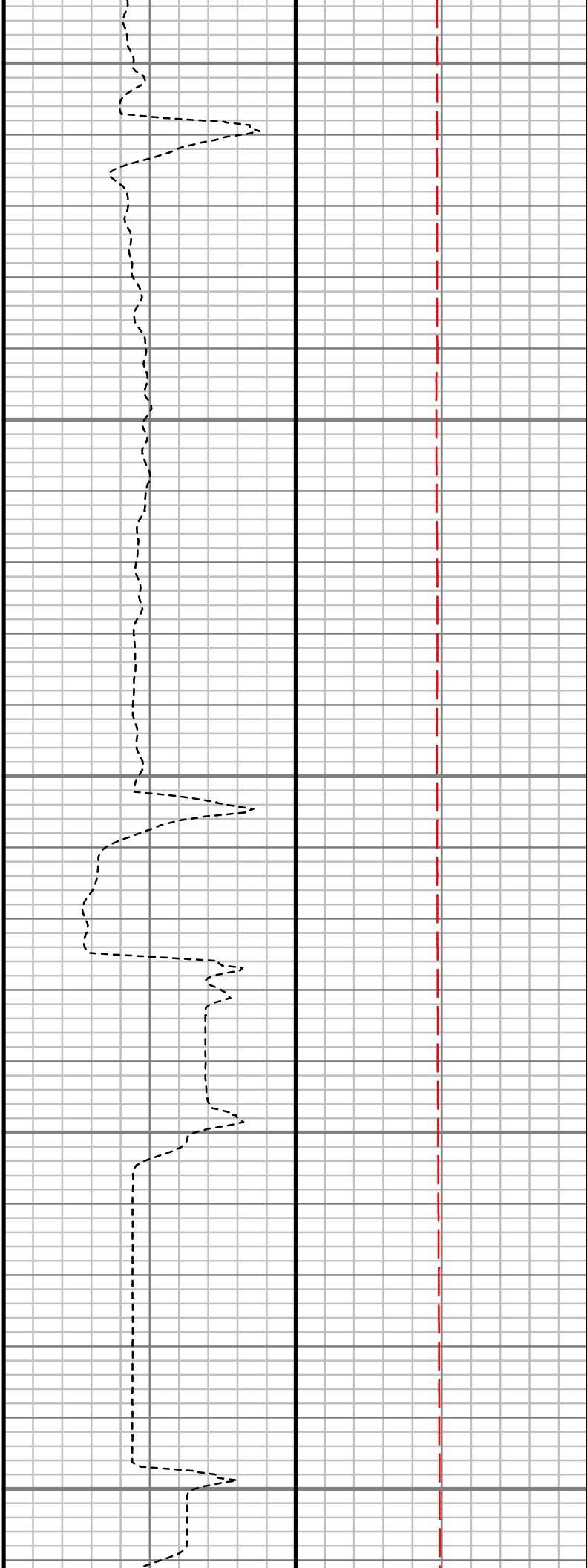
5000

5050

5100

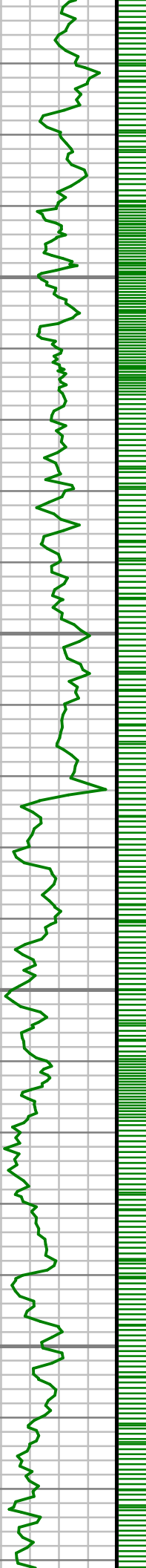
5150

5200



S: 53 MD: 5042.00 ft
Inc: 0.43 deg Az:
303.46 deg TVD:
5039.20 ft

S: 54 MD: 5135.00 ft
Inc: 0.33 deg Az:
151.65 deg TVD:
5132.20 ft

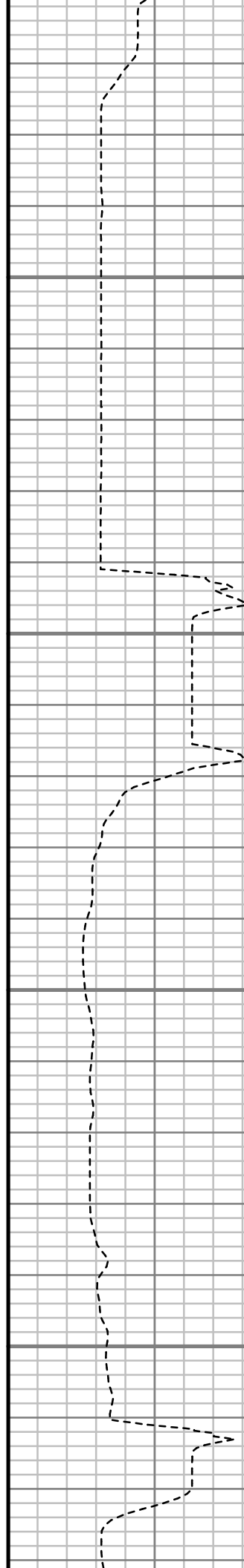


5250

5300

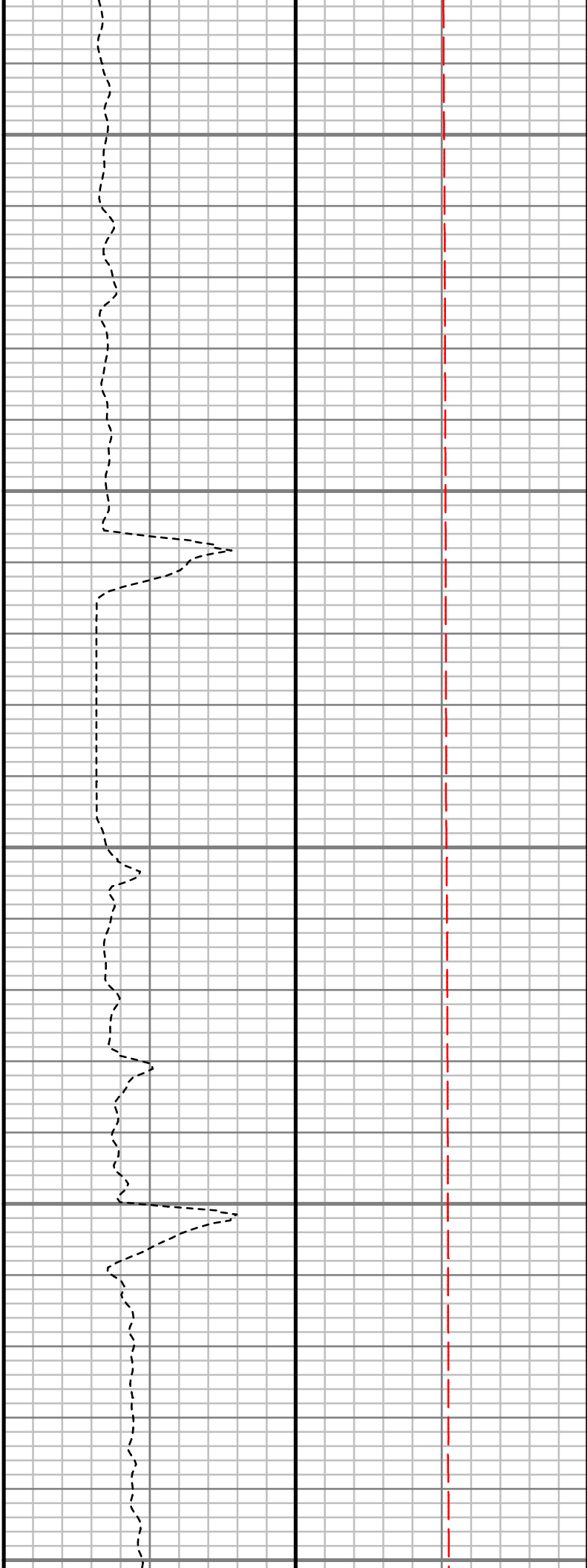
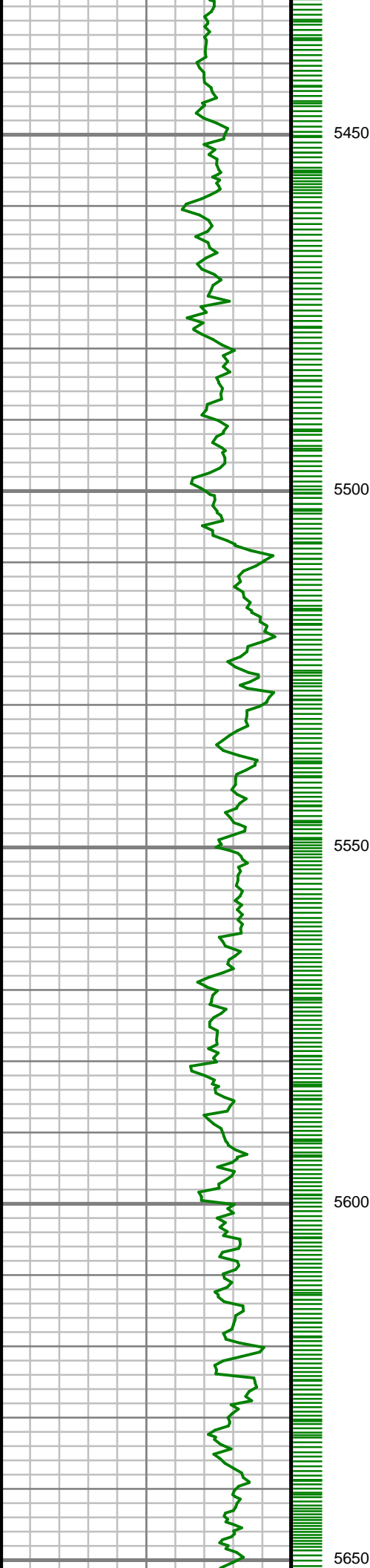
5350

5400



S: 55 MD: 5256.00 ft
Inc: 0.83 deg Az:
131.57 deg TVD:
5253.19 ft

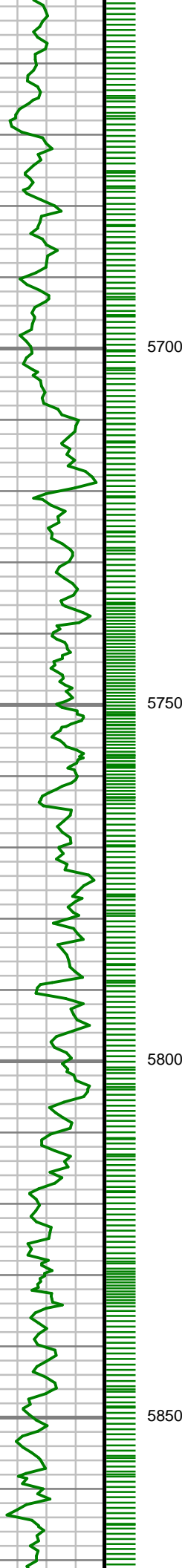
S: 56 MD: 5350.00 ft
Inc: 0.78 deg Az:
136.86 deg TVD:
5347.18 ft



S: 57 MD: 5445.00 ft
Inc: 0.36 deg Az: 118.95 deg TVD: 5442.18 ft

S: 58 MD: 5540.00 ft
Inc: 0.35 deg Az: 93.27 deg TVD: 5537.17 ft

S: 59 MD: 5633.00 ft
Inc: 0.39 deg Az: 76.98 deg TVD: 5630.17 ft

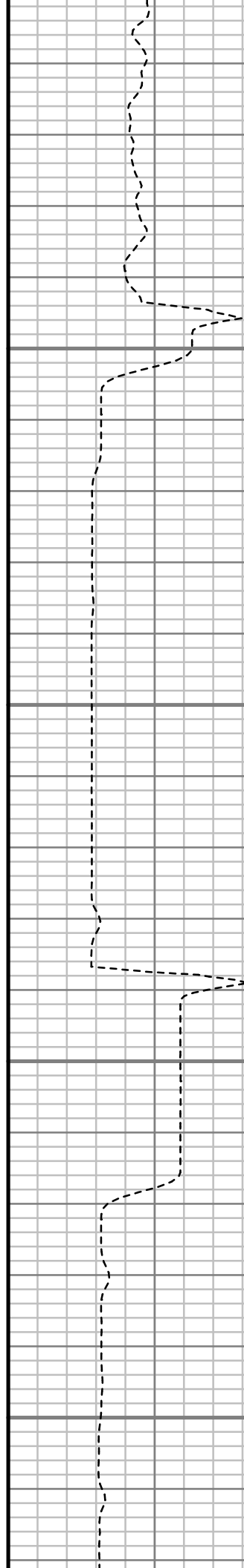


5700

5750

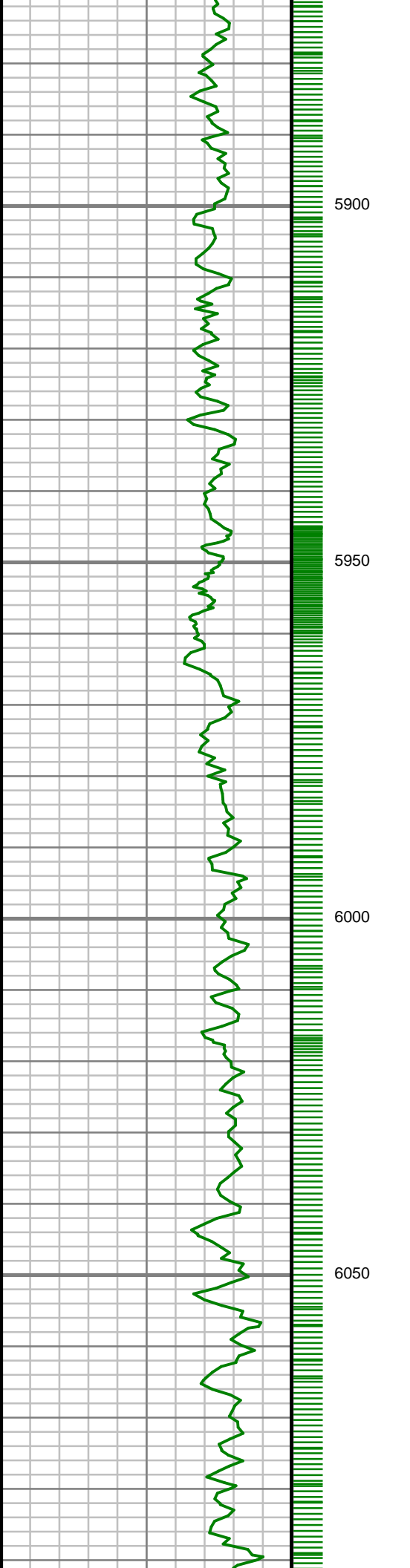
5800

5850



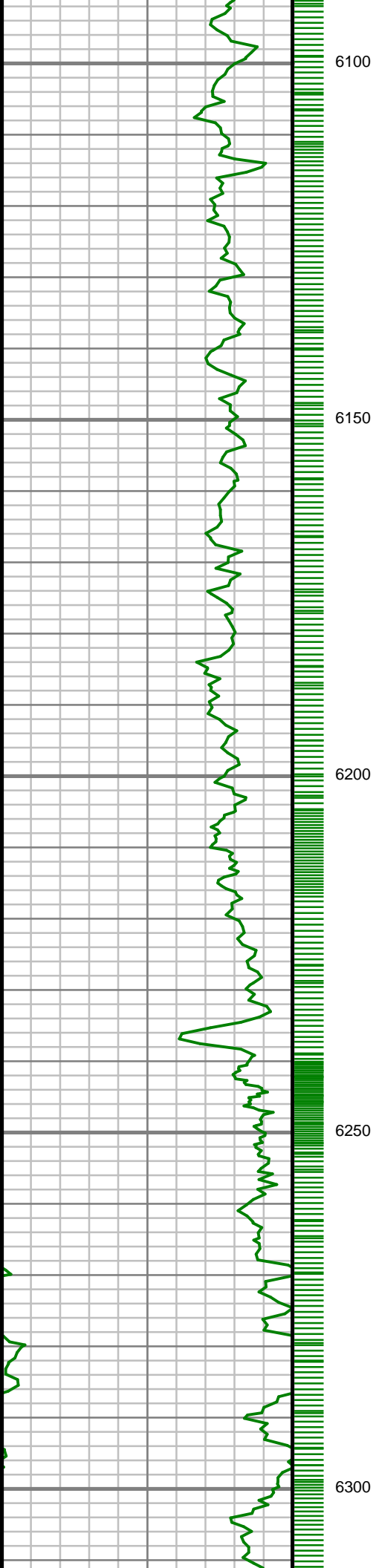
S: 60 MD: 5725.00 ft
Inc: 0.47 deg Az: 65.20
deg TVD: 5722.17 ft

S: 61 MD: 5818.00 ft
Inc: 0.83 deg Az: 59.44
deg TVD: 5815.16 ft



S: 62 MD: 5913.00 ft
Inc: 1.47 deg Az: 65.46
deg TVD: 5910.14 ft

S: 63 MD: 6005.00 ft
Inc: 1.93 deg Az: 103.69 deg
TVD: 6002.11 ft



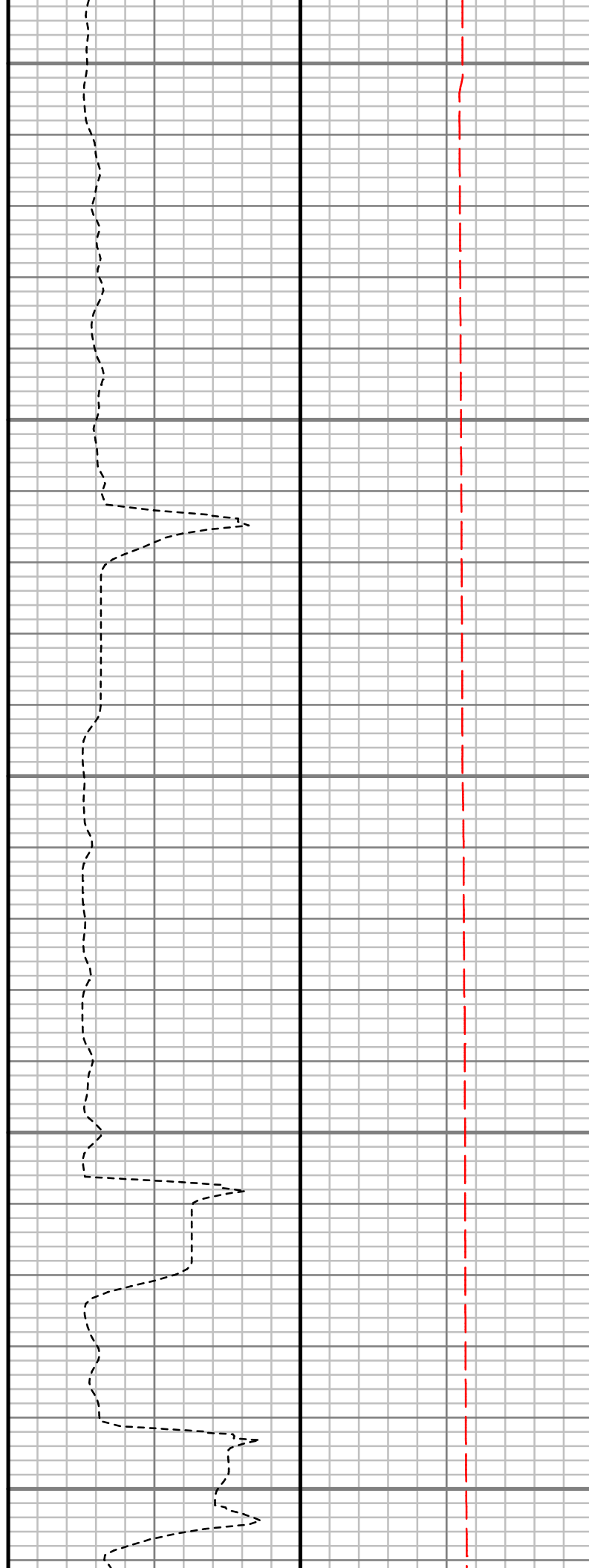
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6150

6200

6250

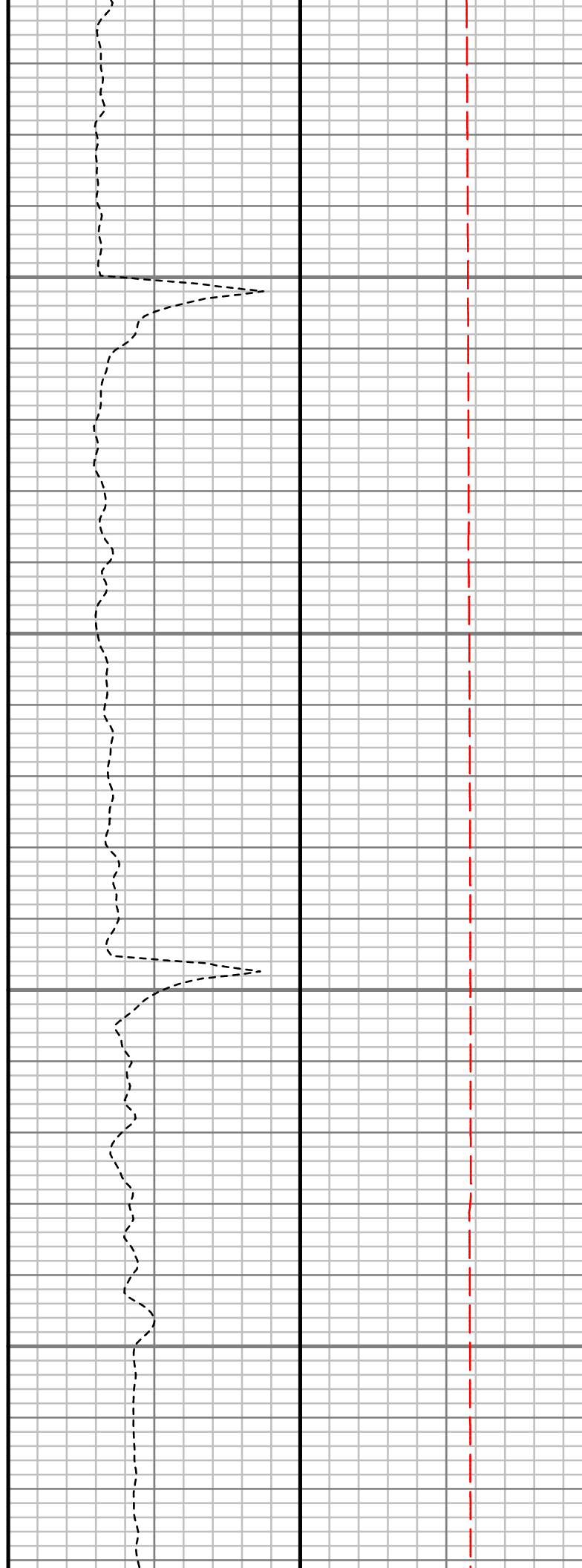
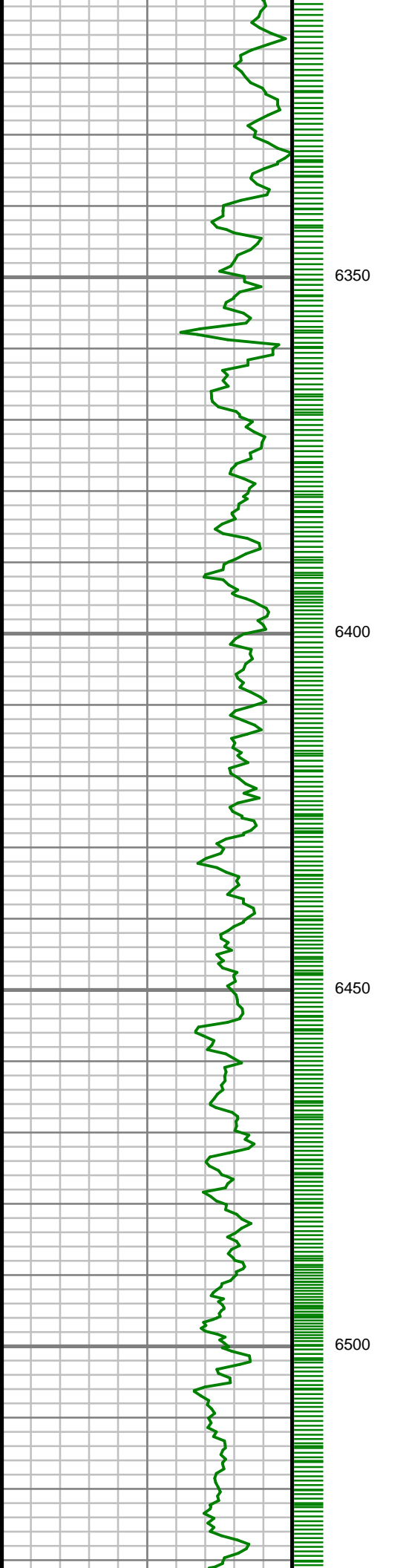
6300



S: 64 MD: 6099.00 ft
Inc: 1.41 deg Az:
112.23 deg TVD:
6096.07 ft

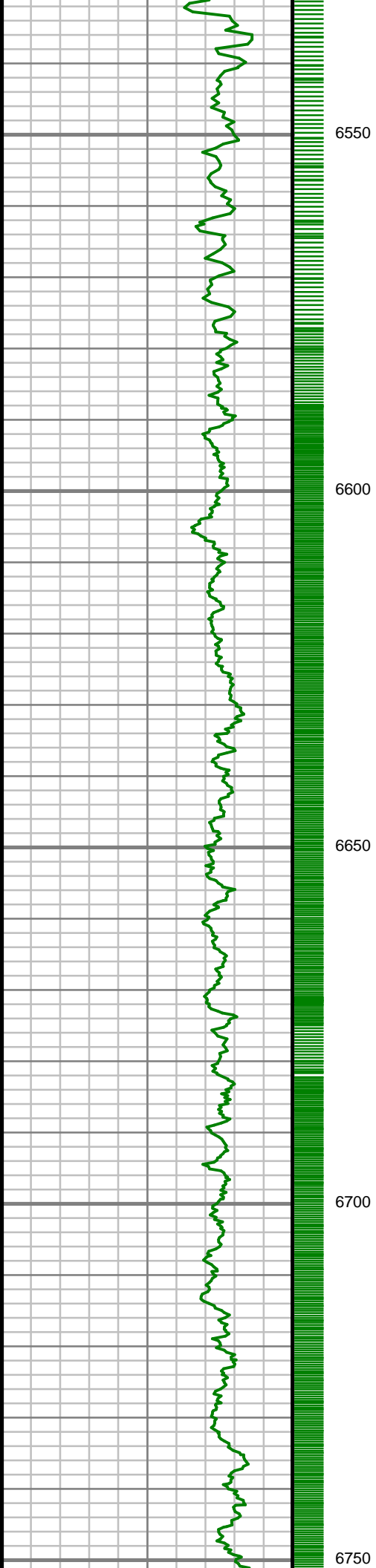
S: 65 MD: 6192.00 ft
Inc: 1.28 deg Az:
101.24 deg TVD:
6189.04 ft

S: 66 MD: 6286.00 ft
Inc: 0.50 deg Az: 98.29
deg TVD: 6283.03 ft



S: 67 MD: 6381.00 ft
Inc: 0.28 deg Az:
267.80 deg TVD:
6378.03 ft

S: 68 MD: 6475.00 ft
Inc: 0.44 deg Az:
350.05 deg TVD:
6472.03 ft



6550

6600

6650

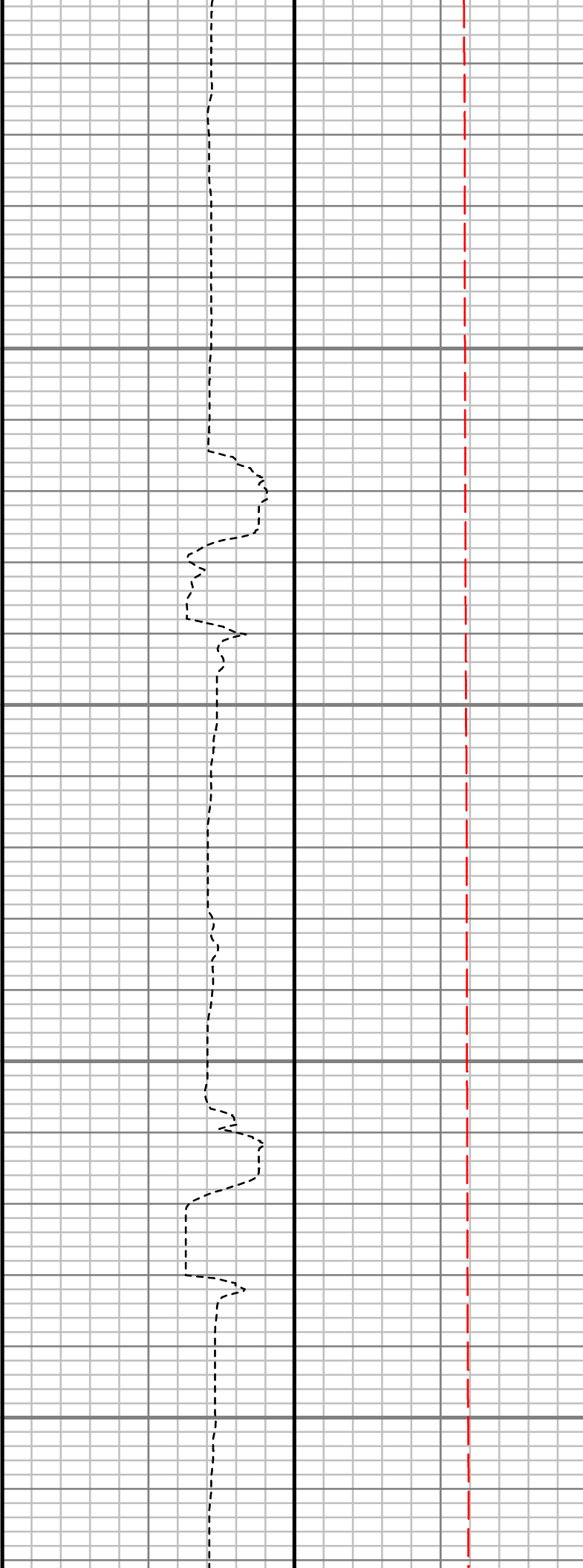
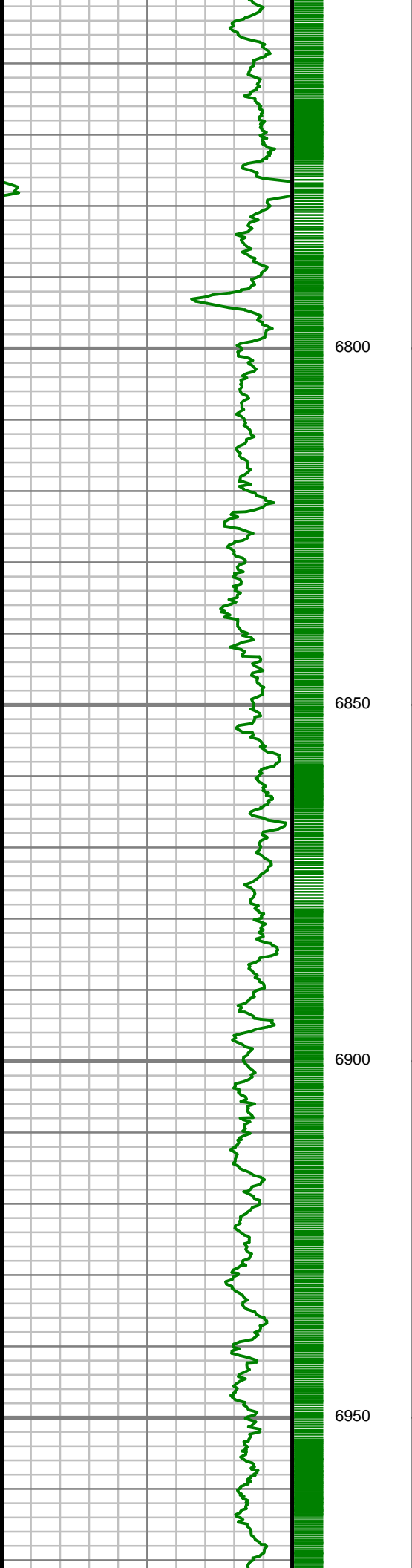
6700

6750



S: 69 MD: 6568.00 ft
Inc: 0.57 deg Az: 20.06
deg TVD: 6565.02 ft

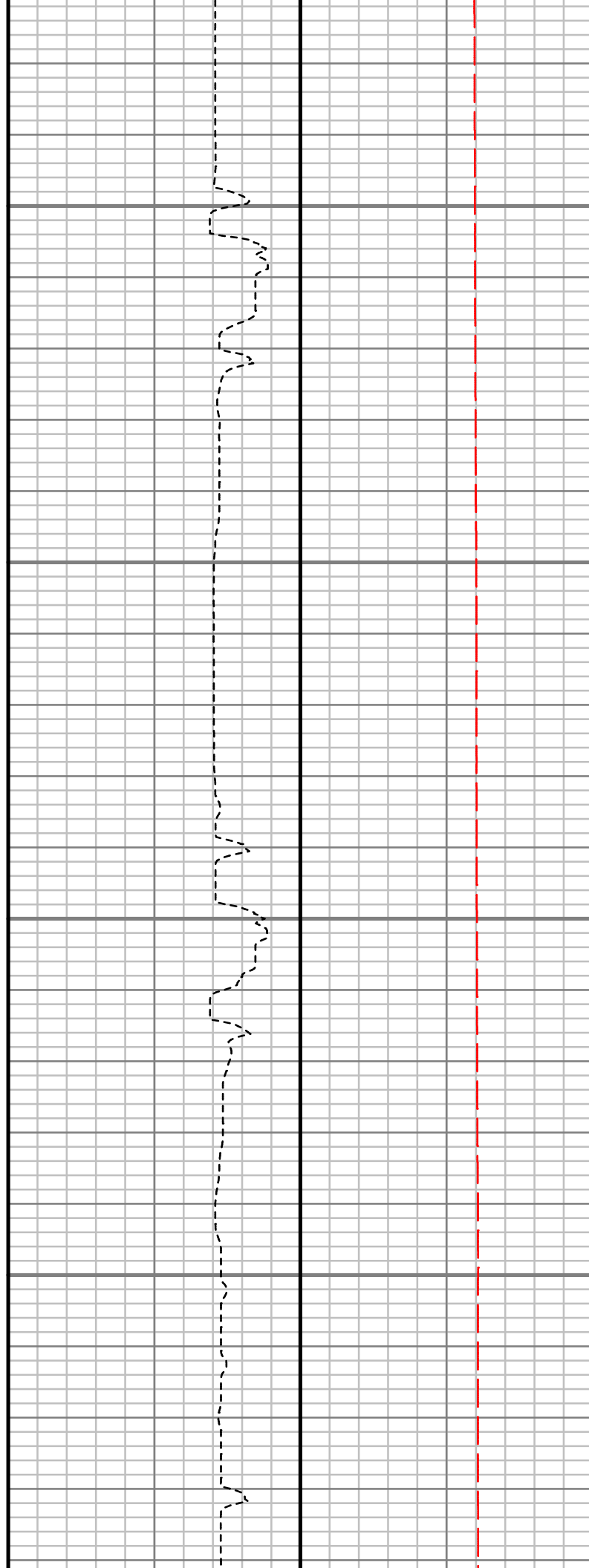
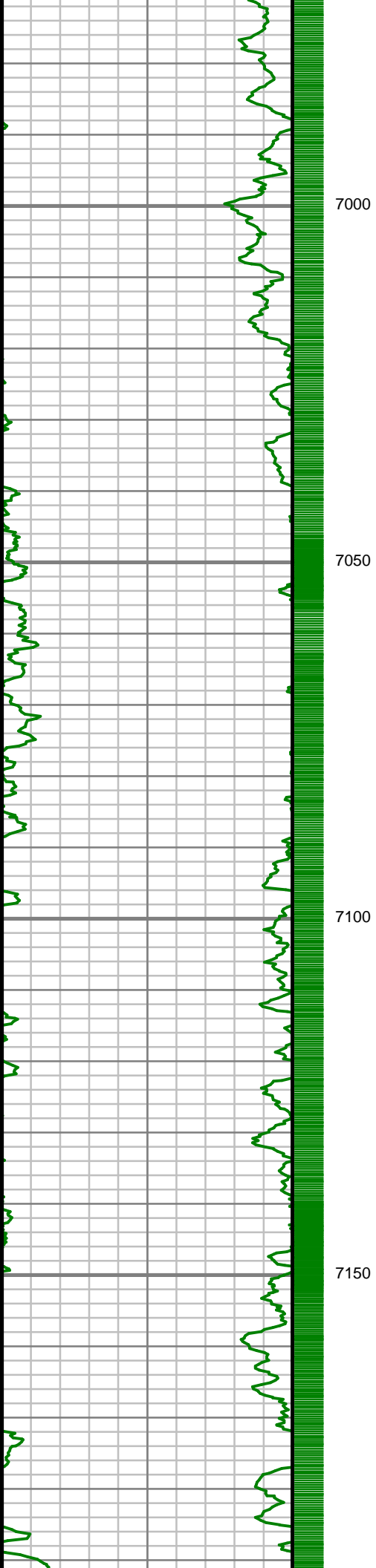
S: 70 MD: 6662.00 ft
Inc: 3.78 deg Az: 2.74
deg TVD: 6658.94 ft



S: 71 MD: 6756.00 ft
Inc: 14.32 deg Az: 5.79
deg TVD: 6751.64 ft

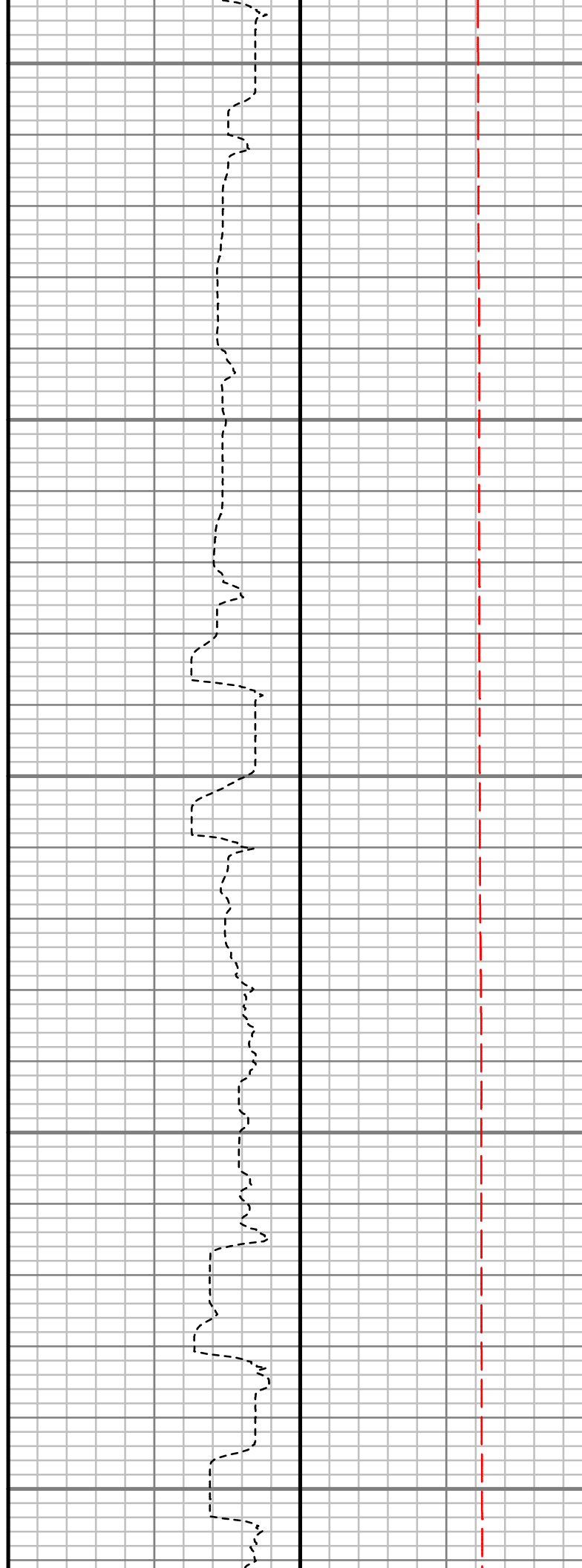
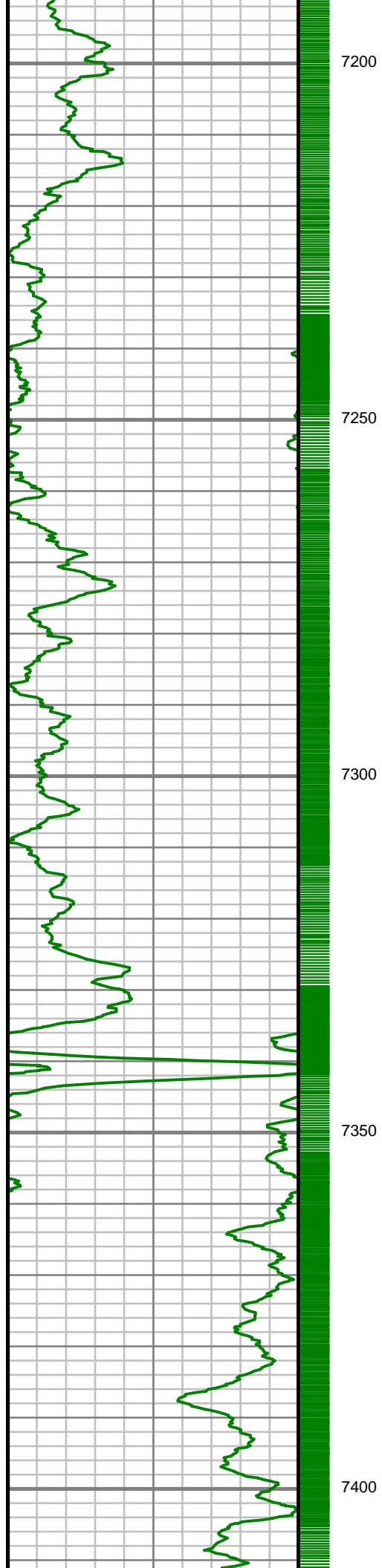
S: 72 MD: 6850.00 ft
Inc: 21.27 deg Az: 3.08
deg TVD: 6841.09 ft

S: 73 MD: 6944.00 ft
Inc: 28.13 deg Az: 1.51
deg TVD: 6926.44 ft



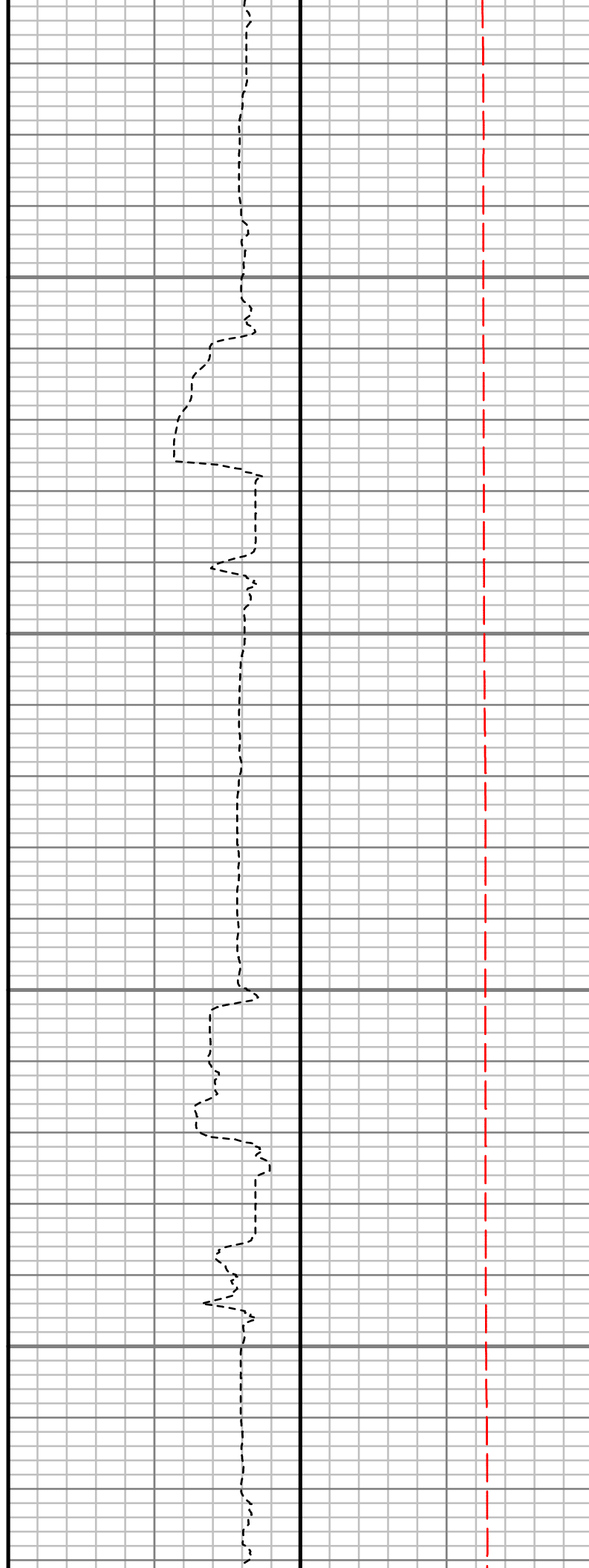
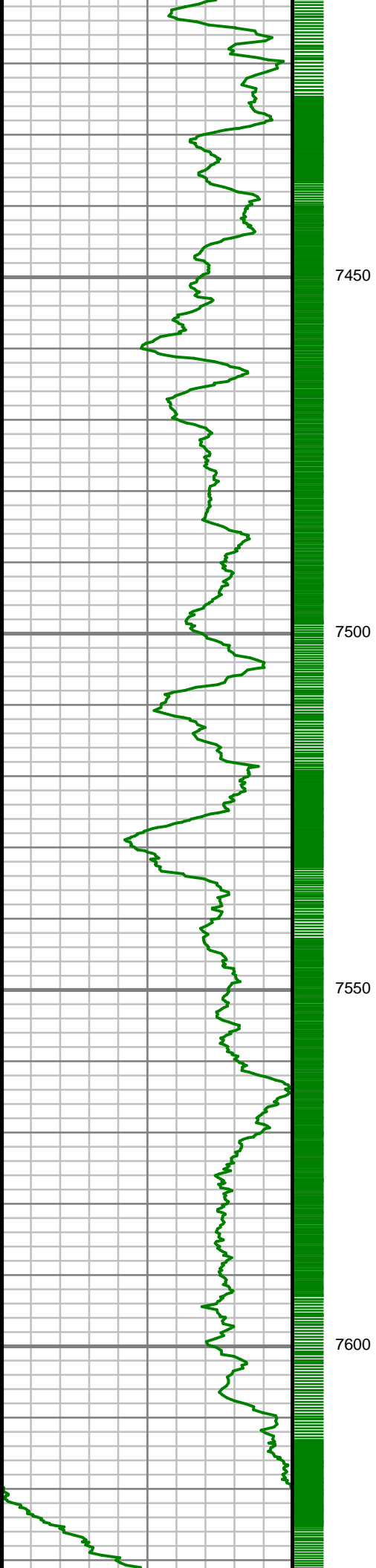
S: 74 MD: 7038.00 ft
Inc: 35.80 deg Az: 0.03
deg TVD: 7006.13 ft

S: 75 MD: 7132.00 ft
Inc: 43.35 deg Az:
357.03 deg TVD:
7078.54 ft



S: 76 MD: 7227.00 ft
Inc: 50.99 deg Az:
359.40 deg TVD:
7143.08 ft

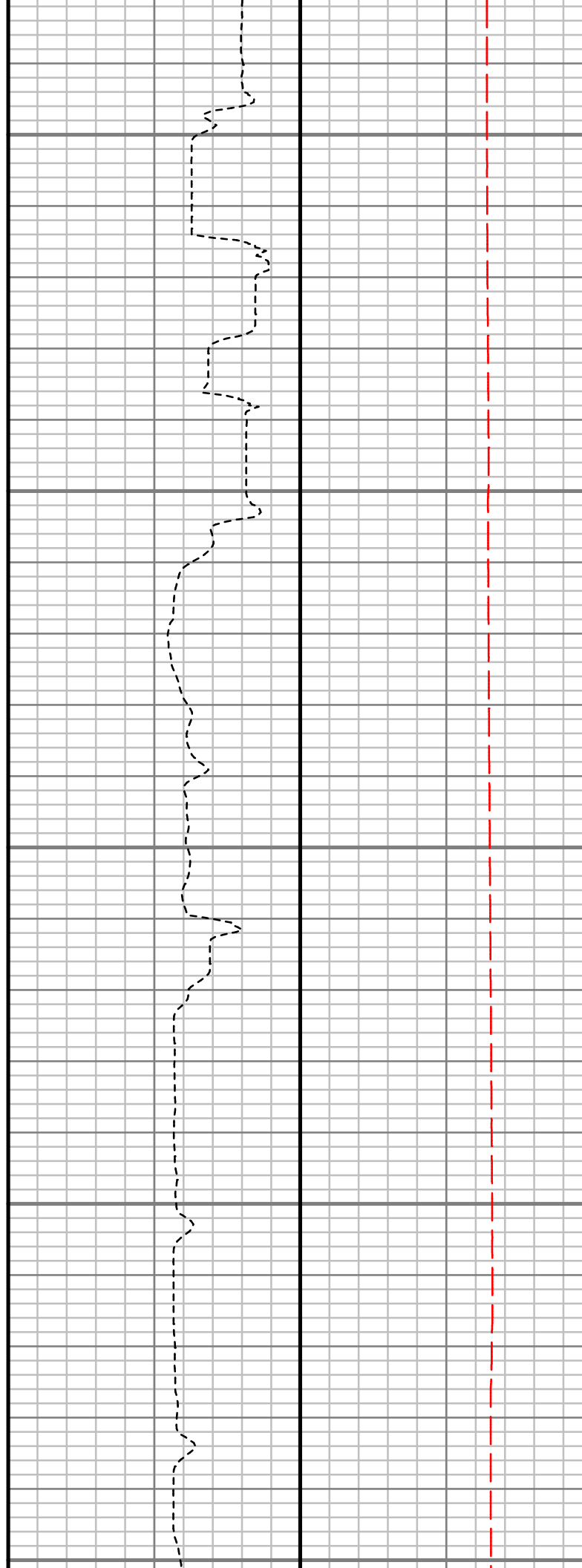
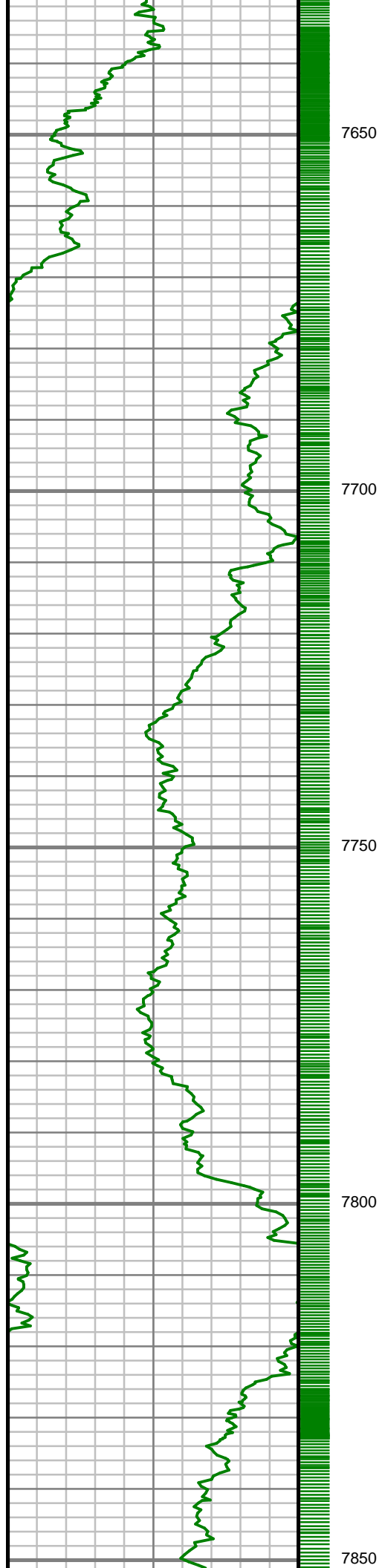
S: 77 MD: 7321.00 ft
Inc: 58.18 deg Az: 1.25
deg TVD: 7197.53 ft



S: 78 MD: 7416.00 ft
Inc: 64.68 deg Az:
358.81 deg TVD:
7242.94 ft

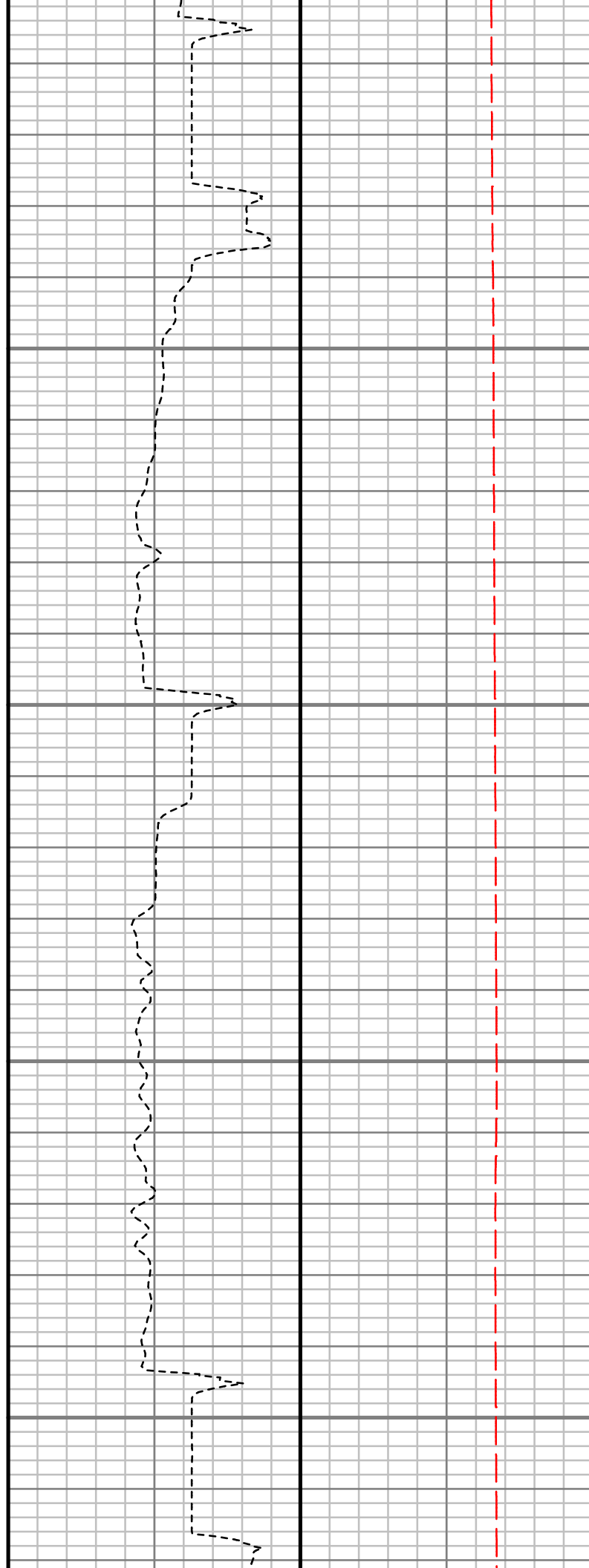
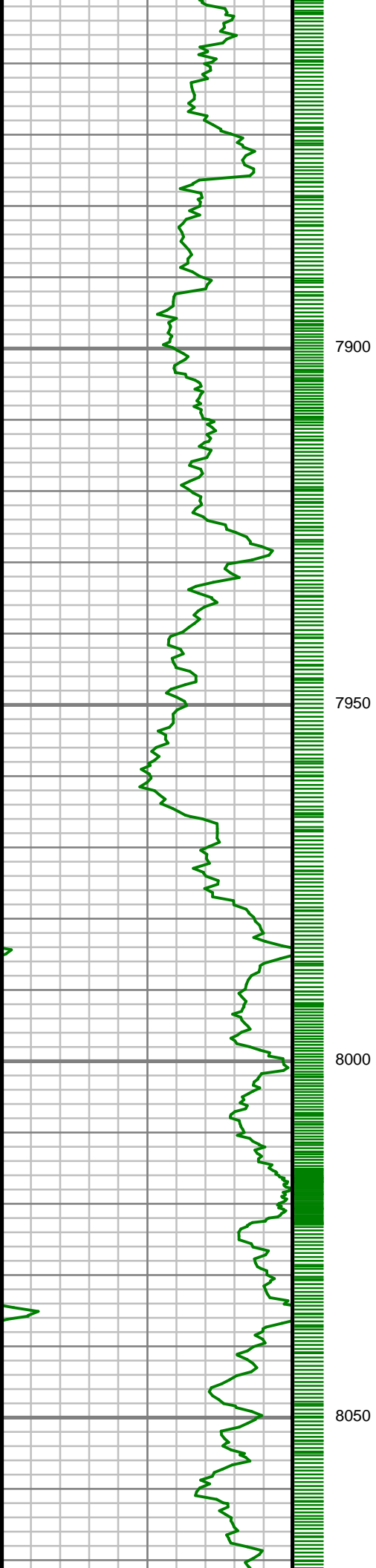
S: 79 MD: 7510.00 ft
Inc: 72.84 deg Az: 0.21
deg TVD: 7276.97 ft

S: 80 MD: 7604.00 ft
Inc: 80.05 deg Az: 0.55
deg TVD: 7298.99 ft



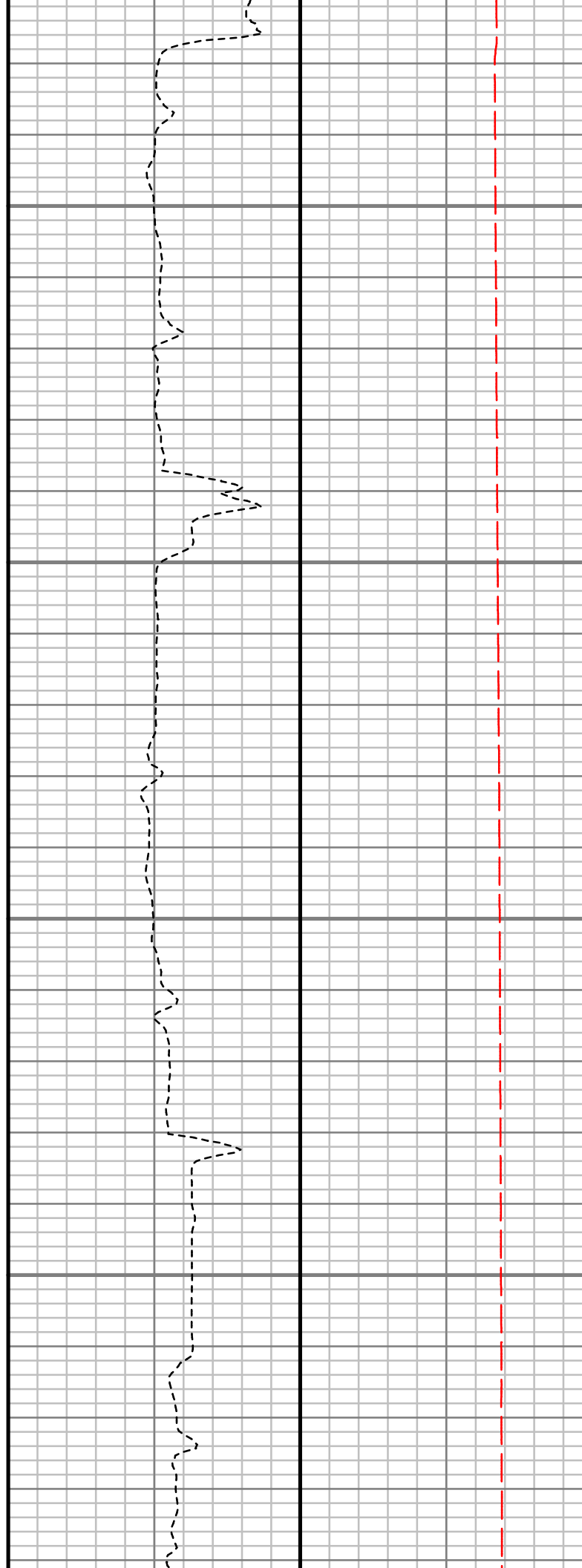
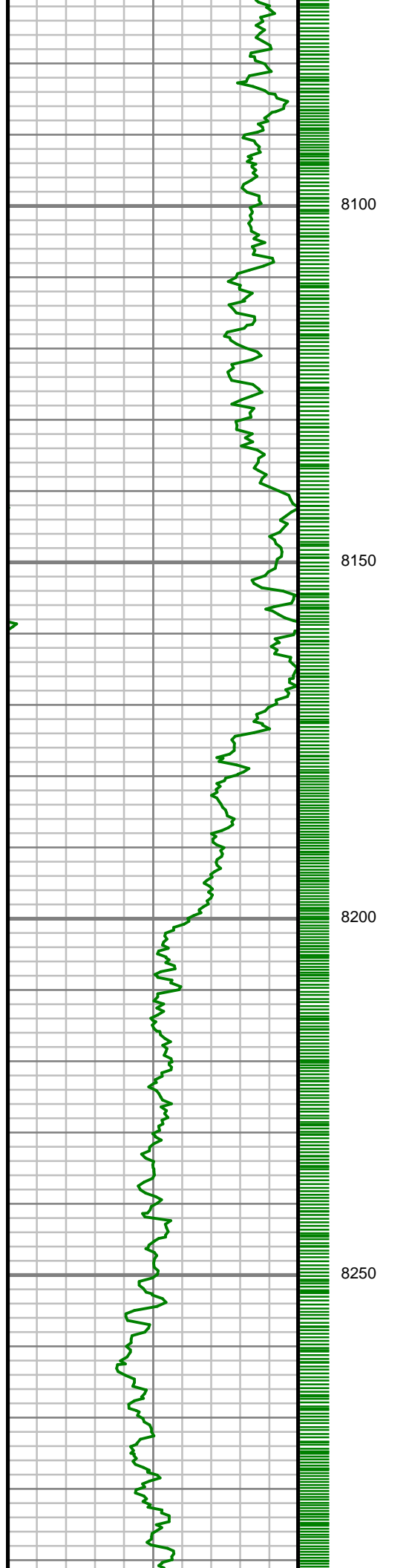
S: 81 MD: 7700.00 ft
Inc: 87.72 deg Az: 0.52
deg TVD: 7309.22 ft

S: 82 MD: 7793.00 ft
Inc: 87.88 deg Az:
359.98 deg TVD:
7312.79 ft



S: 83 MD: 7887.00 ft
Inc: 88.42 deg Az: 0.73
deg TVD: 7315.82 ft

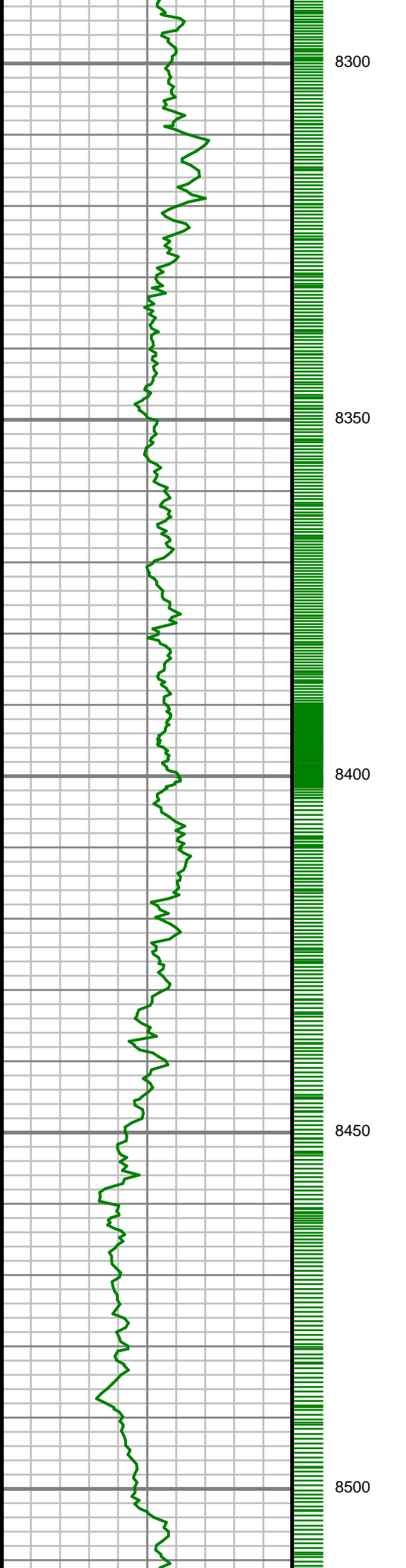
S: 84 MD: 7982.00 ft
Inc: 88.22 deg Az: 0.30
deg TVD: 7318.60 ft



S: 85 MD: 8076.00 ft
Inc: 89.06 deg Az: 0.46
deg TVD: 7320.83 ft

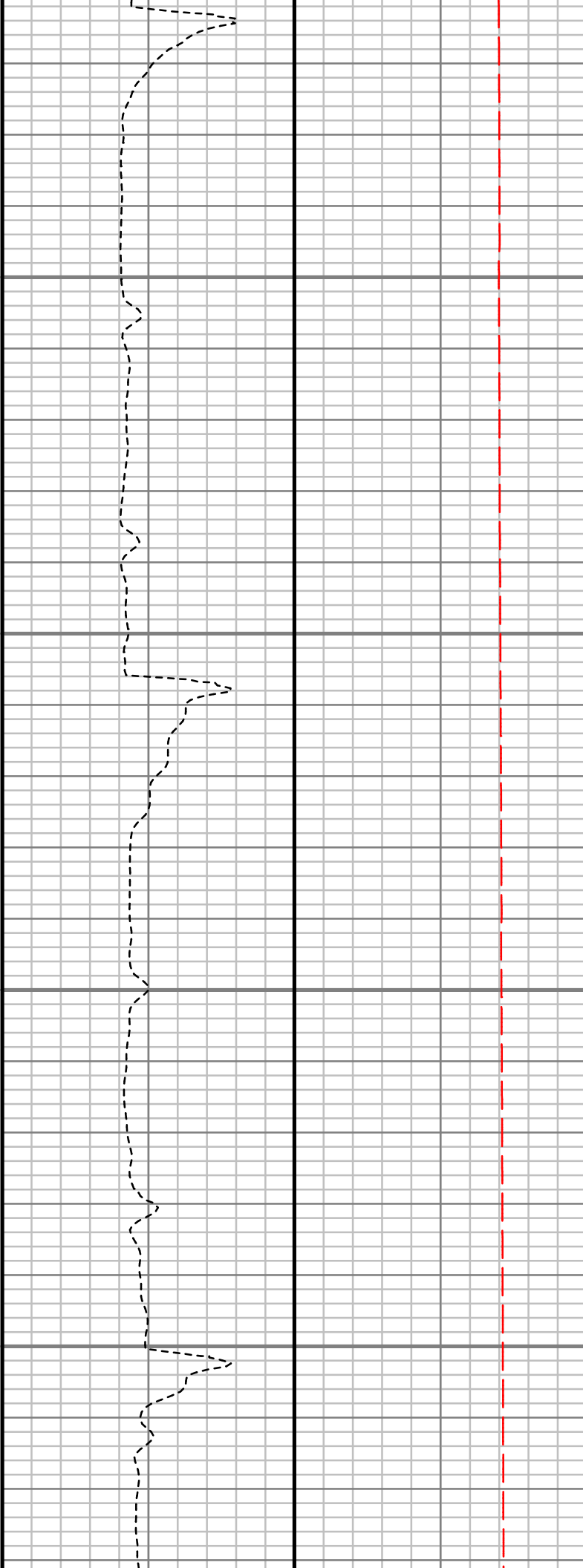
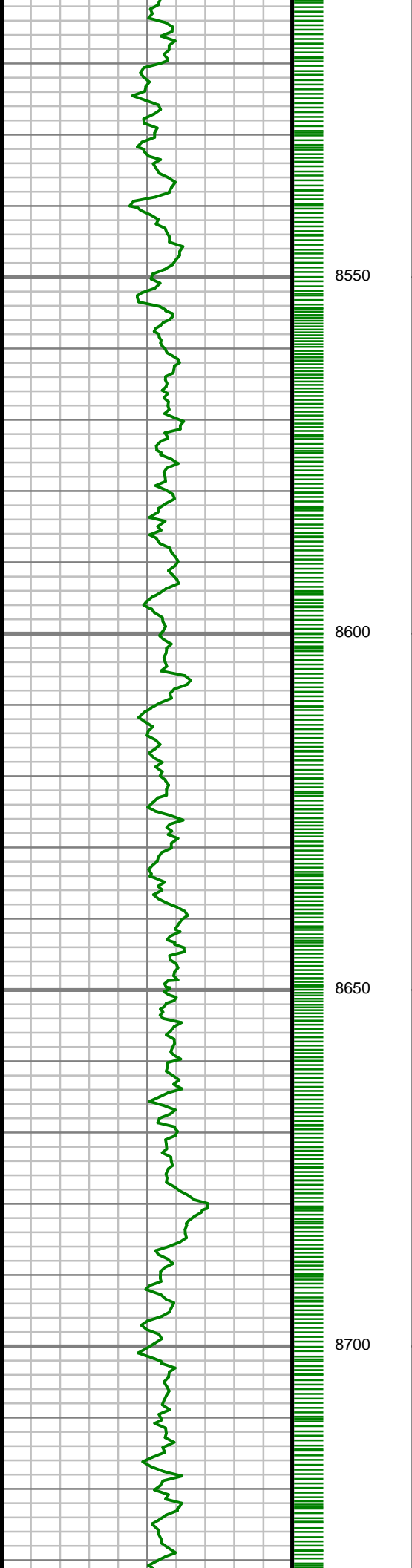
S: 86 MD: 8170.00 ft
Inc: 89.16 deg Az: 0.55
deg TVD: 7322.29 ft

S: 87 MD: 8264.00 ft
Inc: 89.56 deg Az:
359.84 deg TVD:
7323.33 ft



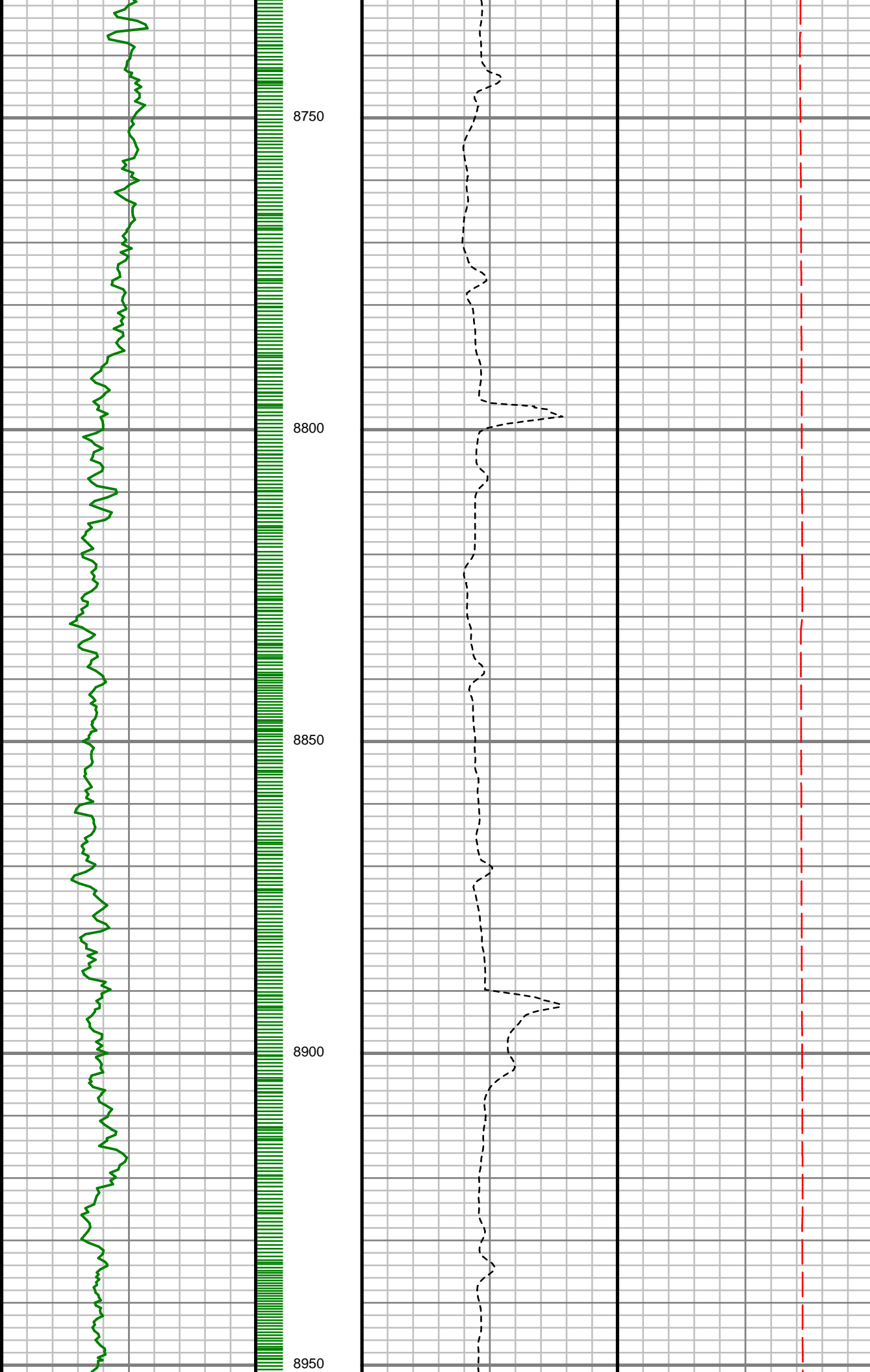
S: 88 MD: 8358.00 ft
Inc: 88.99 deg Az:
359.85 deg TVD:
7324.52 ft

S: 89 MD: 8452.00 ft
Inc: 89.09 deg Az: 0.90
deg TVD: 7326.09 ft



S: 90 MD: 8546.00 ft
Inc: 89.53 deg Az: 0.94
deg TVD: 7327.22 ft

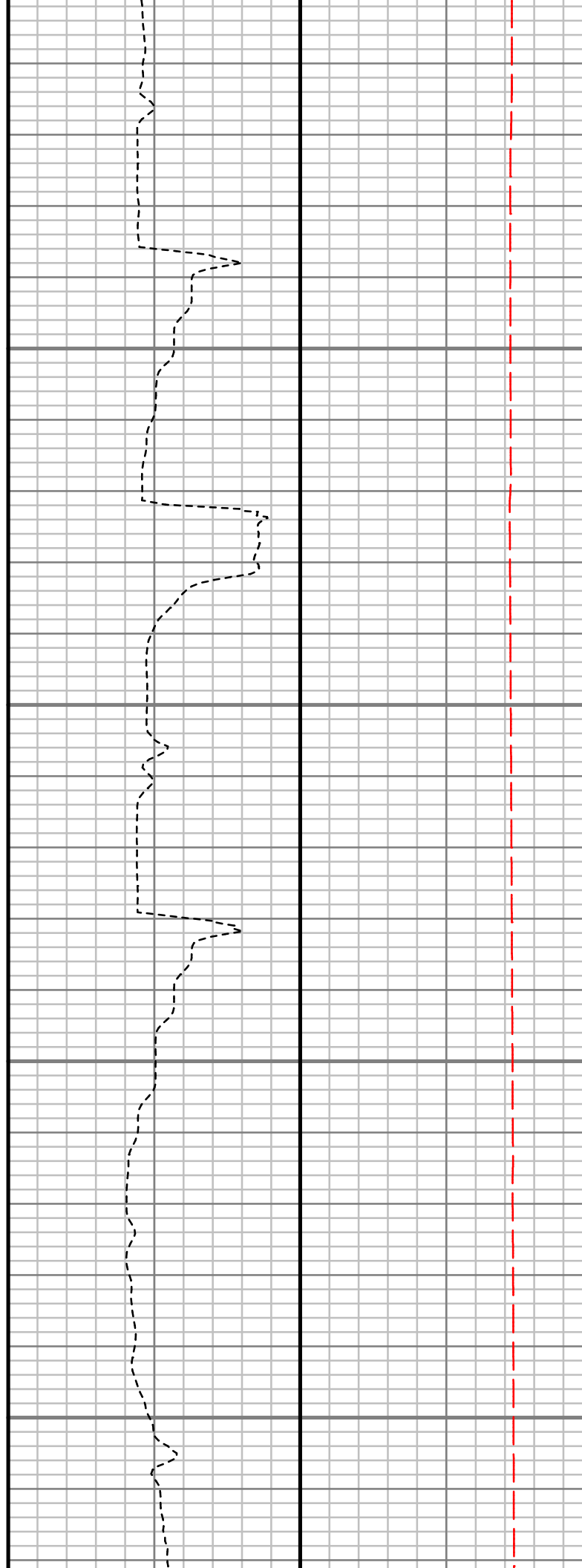
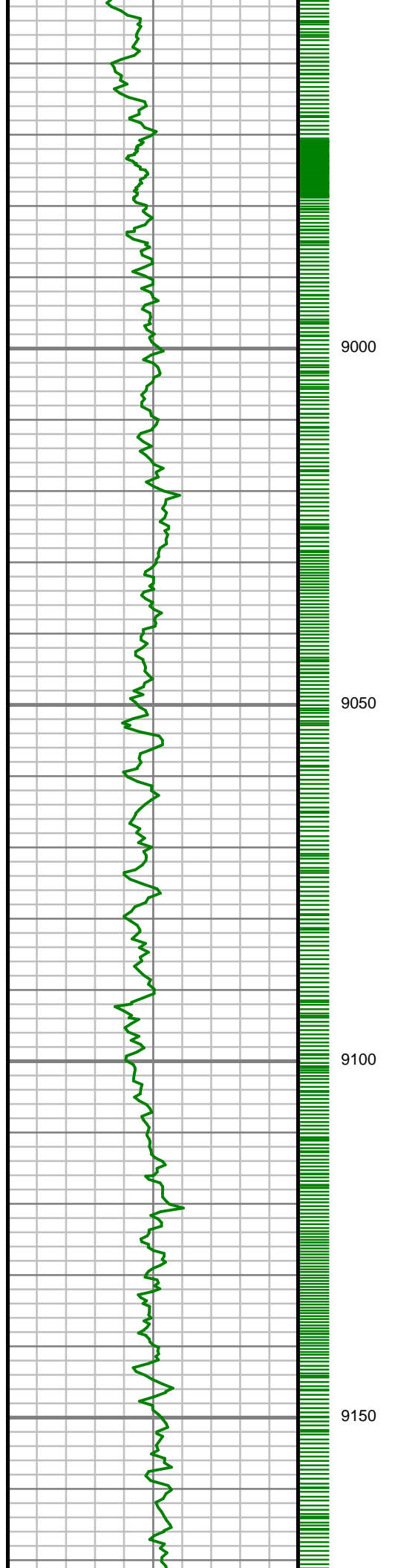
S: 91 MD: 8640.00 ft
Inc: 89.43 deg Az: 1.07
deg TVD: 7328.07 ft



S: 92 MD: 8735.00 ft
Inc: 90.23 deg Az: 1.44
deg TVD: 7328.35 ft

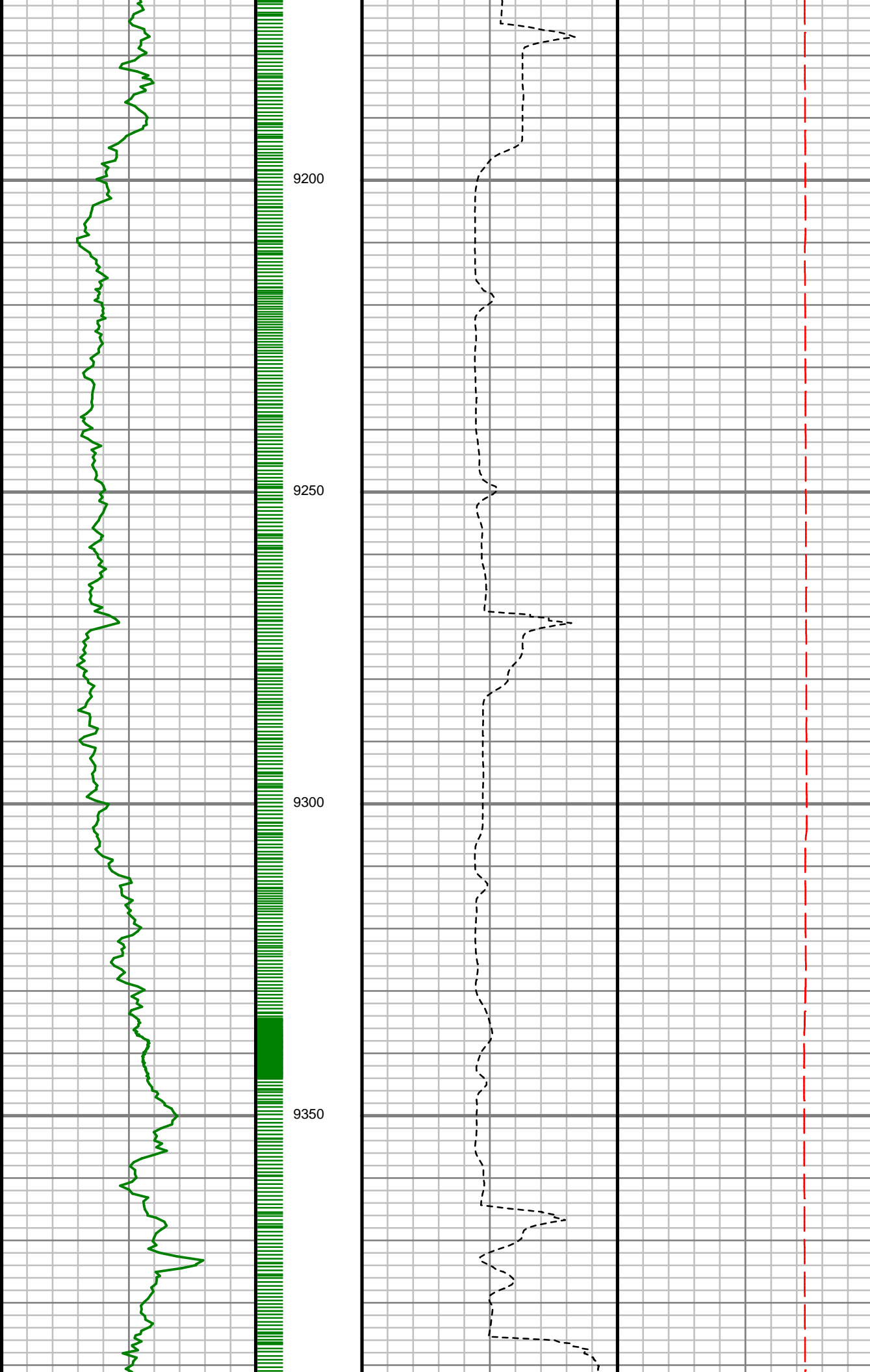
S: 93 MD: 8829.00 ft
Inc: 90.40 deg Az: 1.31
deg TVD: 7327.83 ft

S: 94 MD: 8924.00 ft
Inc: 91.18 deg Az: 1.59
deg TVD: 7326.52 ft



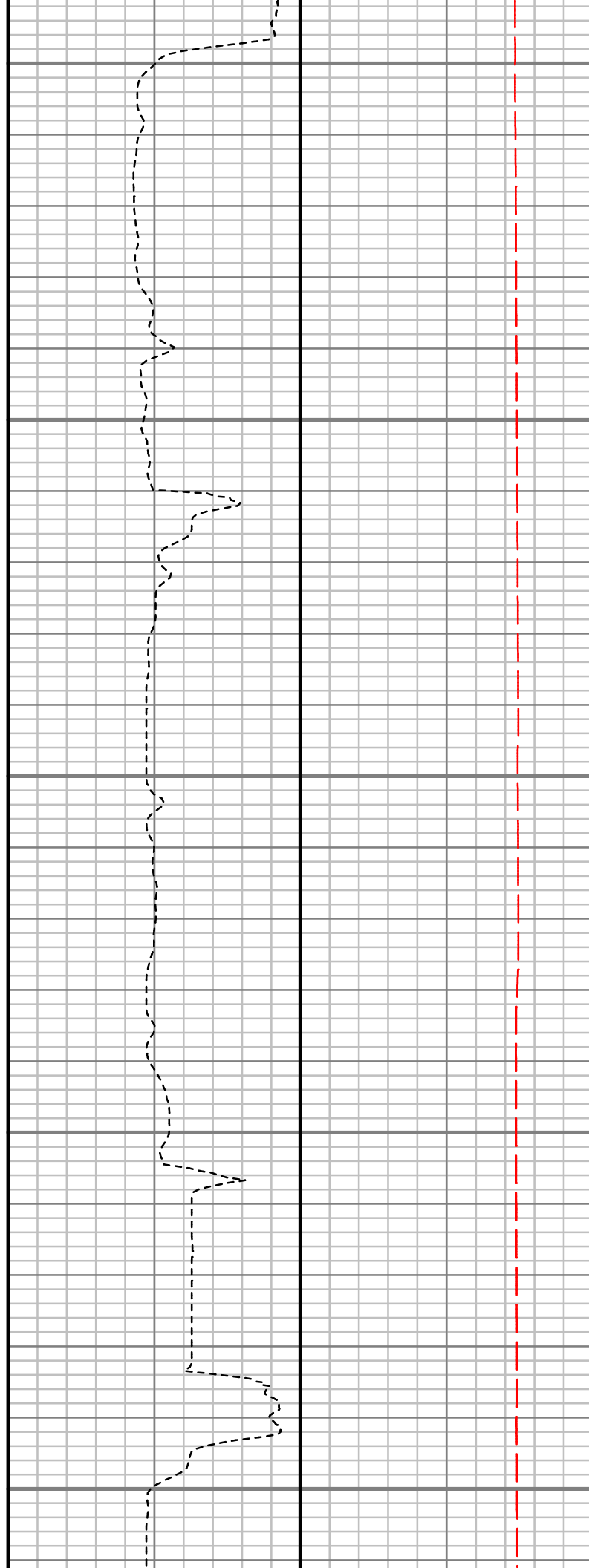
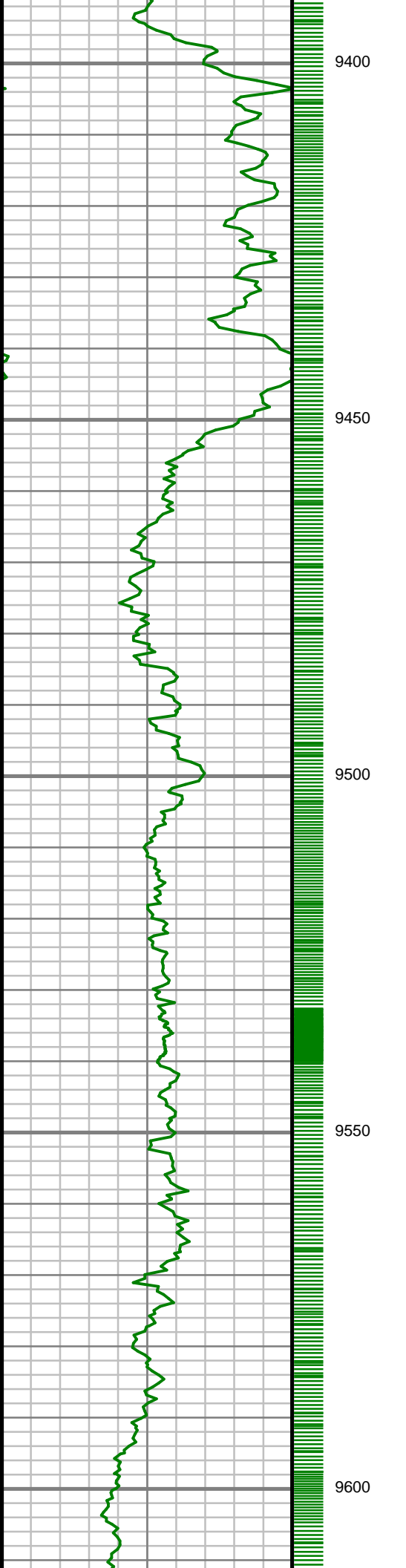
S: 95 MD: 9018.00 ft
Inc: 90.71 deg Az: 1.13
deg TVD: 7324.98 ft

S: 96 MD: 9113.00 ft
Inc: 90.91 deg Az: 0.71
deg TVD: 7323.64 ft



S: 97 MD: 9207.00 ft
Inc: 90.40 deg Az:
359.44 deg TVD:
7322.57 ft

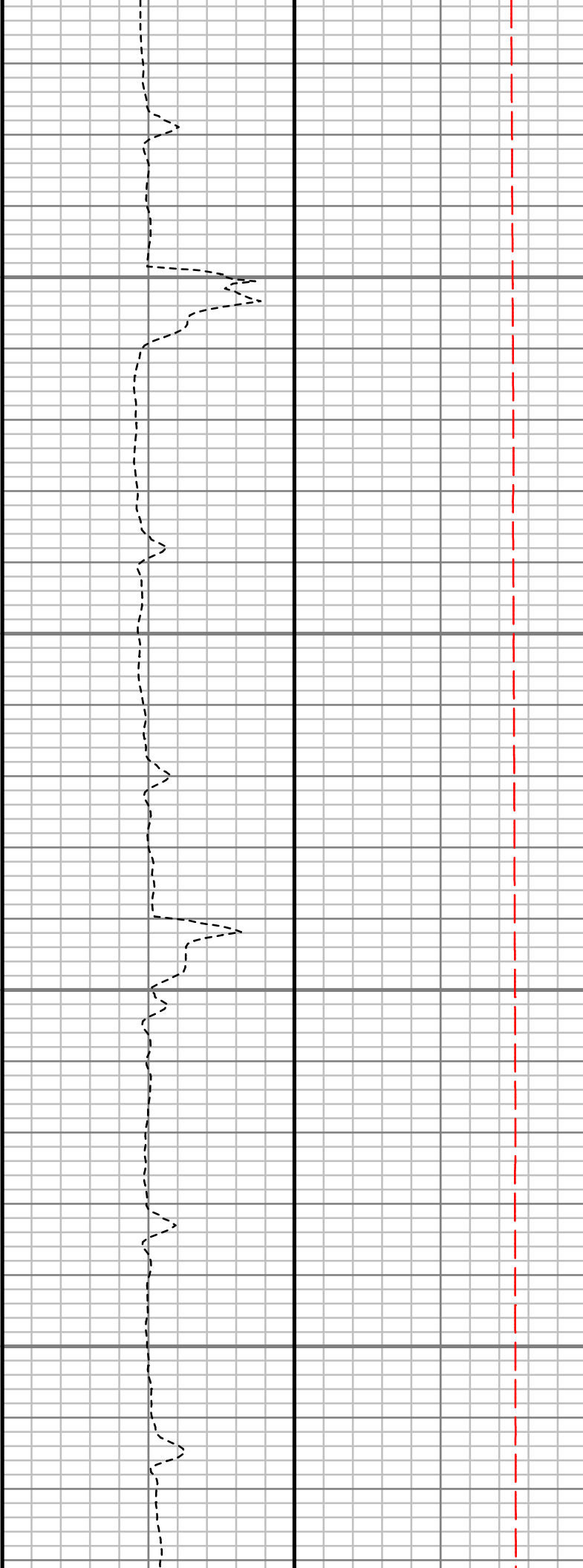
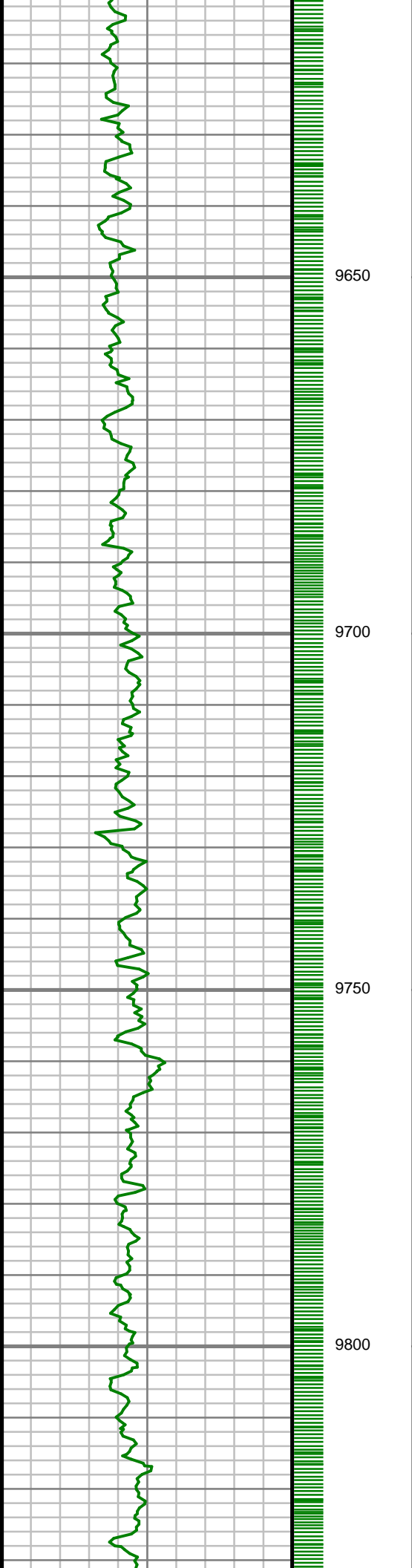
S: 98 MD: 9302.00 ft
Inc: 91.41 deg Az:
359.70 deg TVD:
7321.06 ft



S: 99 MD: 9396.00 ft
Inc: 89.66 deg Az: 0.53
deg TVD: 7320.18 ft

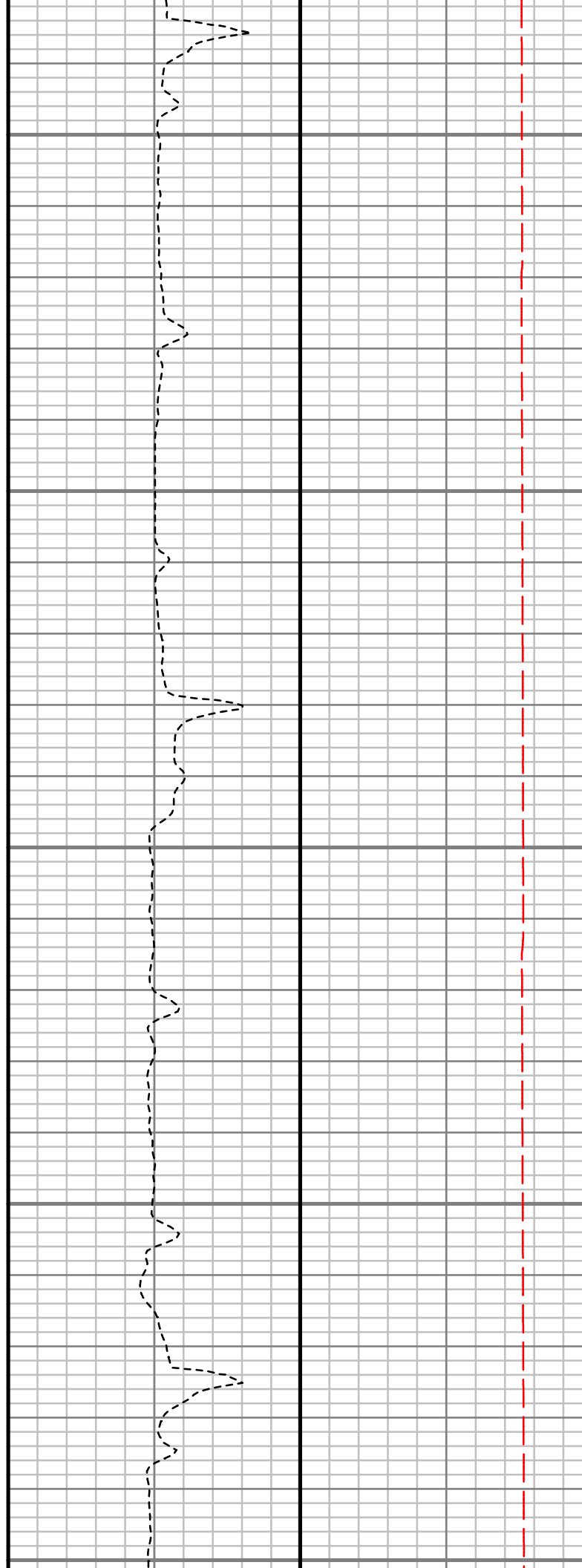
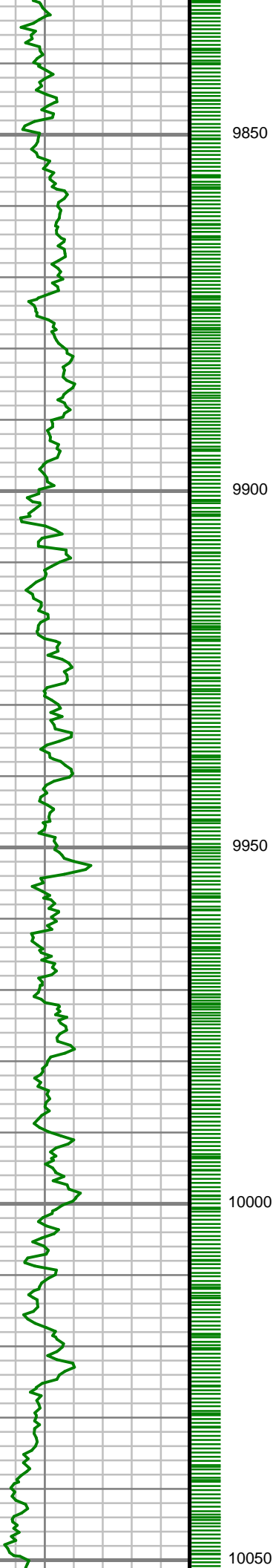
S: 100 MD: 9491.00 ft
Inc: 88.99 deg Az: 0.31
deg TVD: 7321.30 ft

S: 101 MD: 9585.00 ft
Inc: 89.46 deg Az: 0.98
deg TVD: 7322.56 ft



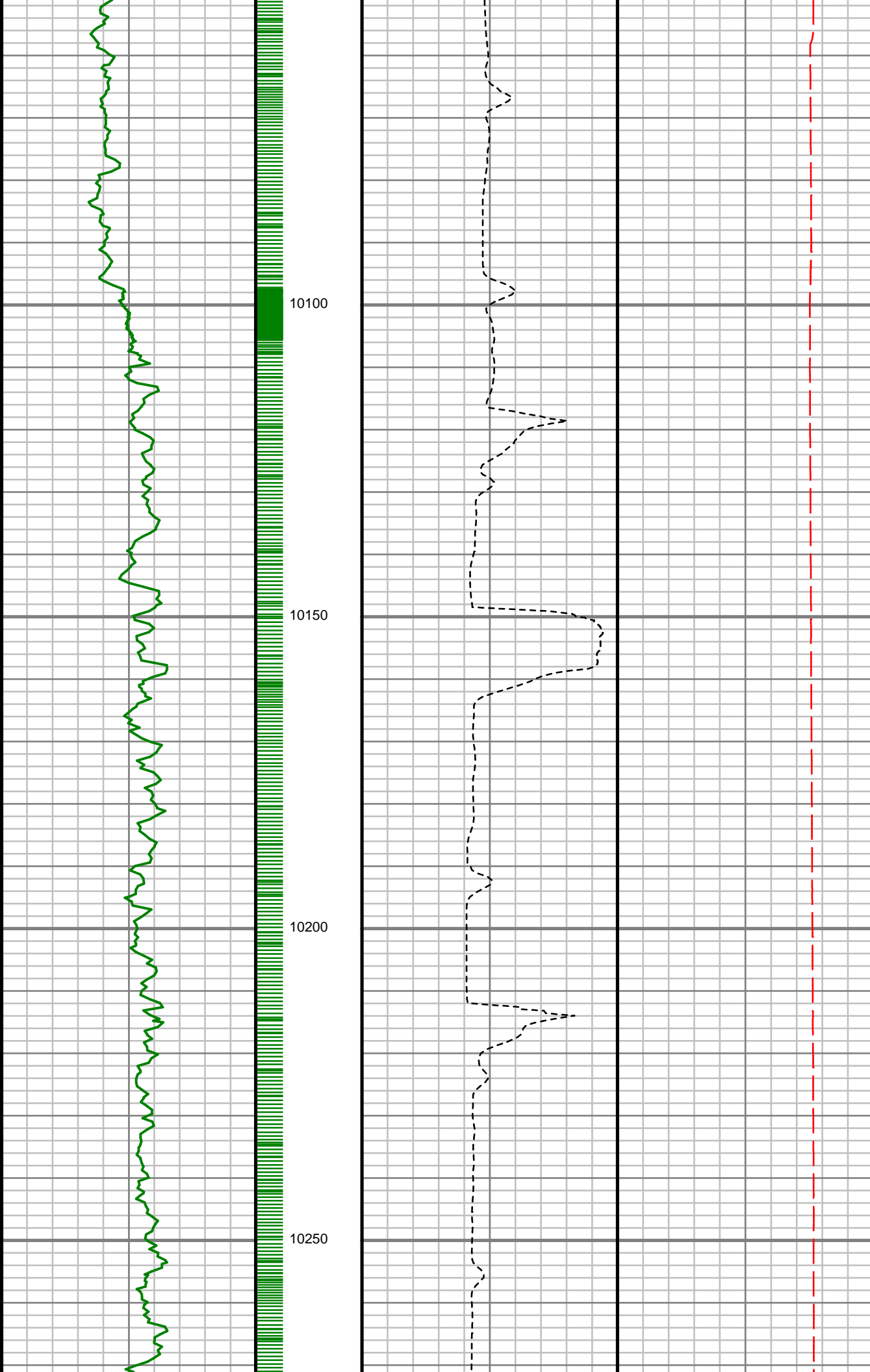
S: 102 MD: 9680.00 ft
Inc: 90.64 deg Az: 1.32
deg TVD: 7322.48 ft

S: 103 MD: 9773.00 ft
Inc: 90.67 deg Az: 0.99
deg TVD: 7321.42 ft



S: 104 MD: 9867.00 ft
Inc: 90.47 deg Az: 0.24
deg TVD: 7320.48 ft

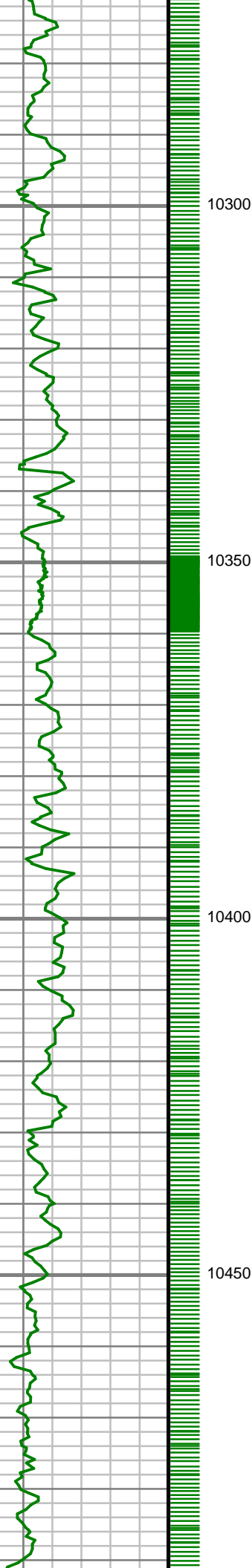
S: 105 MD: 9962.00 ft
Inc: 90.64 deg Az: 0.60
deg TVD: 7319.56 ft



S: 106 MD: 10055.00 ft
Inc: 91.41 deg Az: 0.31
deg TVD: 7317.90 ft

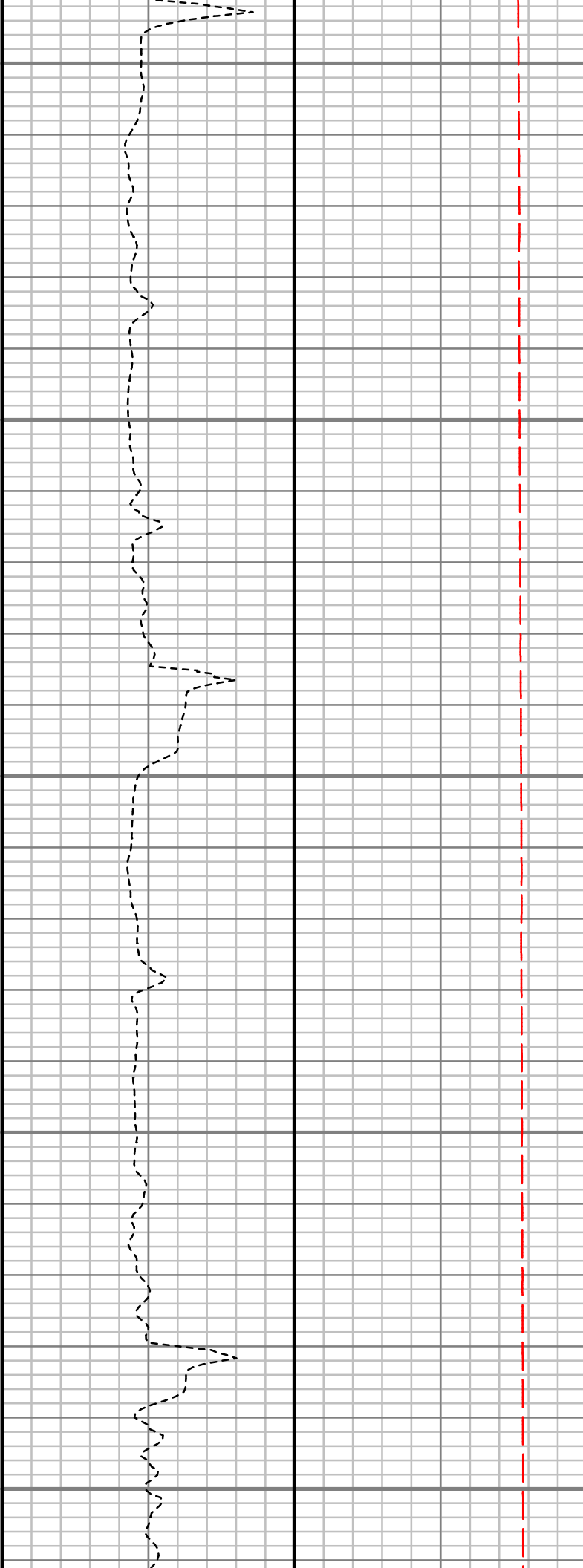
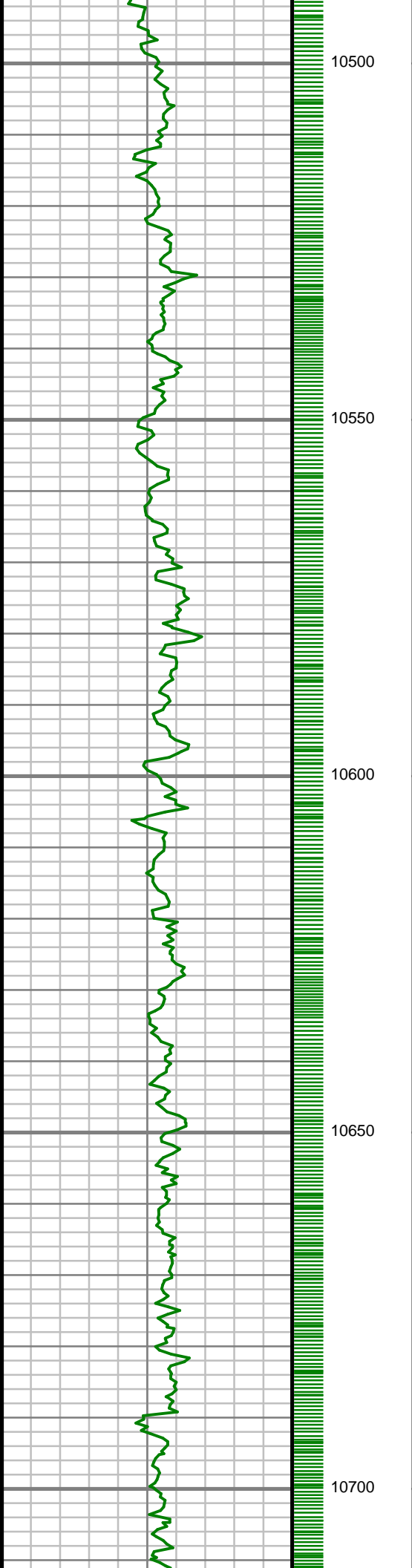
S: 107 MD: 10149.00 ft
Inc: 91.45 deg Az: 0.45
deg TVD: 7315.56 ft

S: 108 MD: 10244.00 ft
Inc: 90.03 deg Az:
359.10 deg TVD:
7314.34 ft



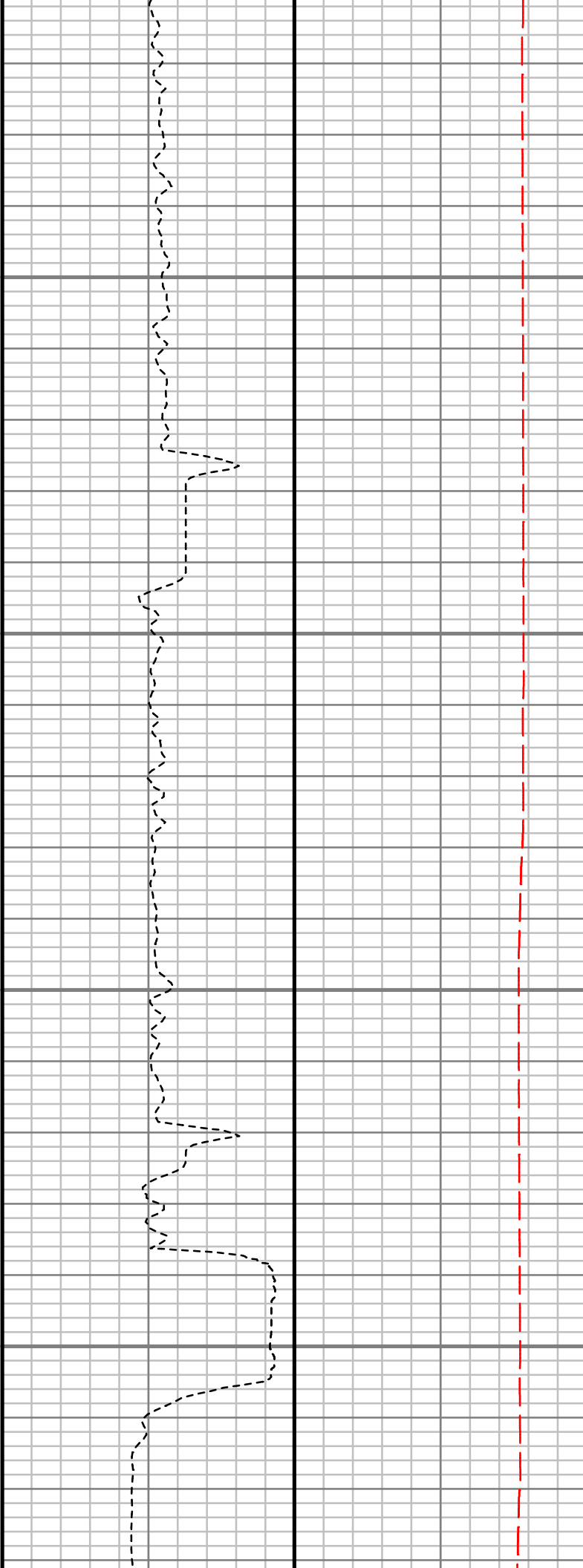
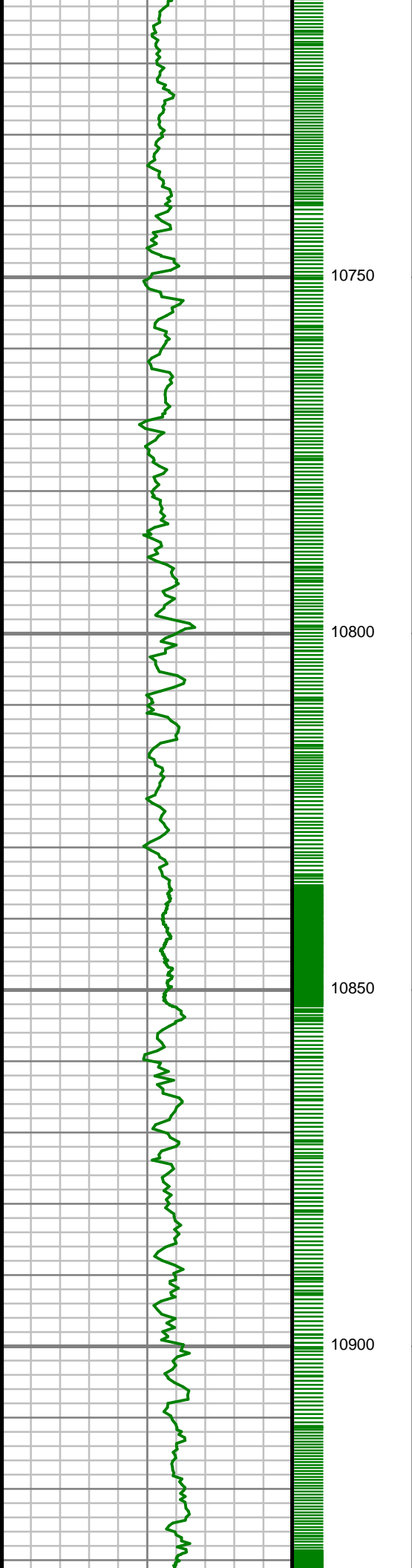
S: 109 MD: 10337.00 ft
Inc: 89.40 deg Az:
358.20 deg TVD:
7314.80 ft

S: 110 MD: 10431.00 ft
Inc: 89.50 deg Az:
359.18 deg TVD:
7315.71 ft



S: 111 MD: 10524.00 ft
Inc: 90.44 deg Az:
359.38 deg TVD:
7315.76 ft

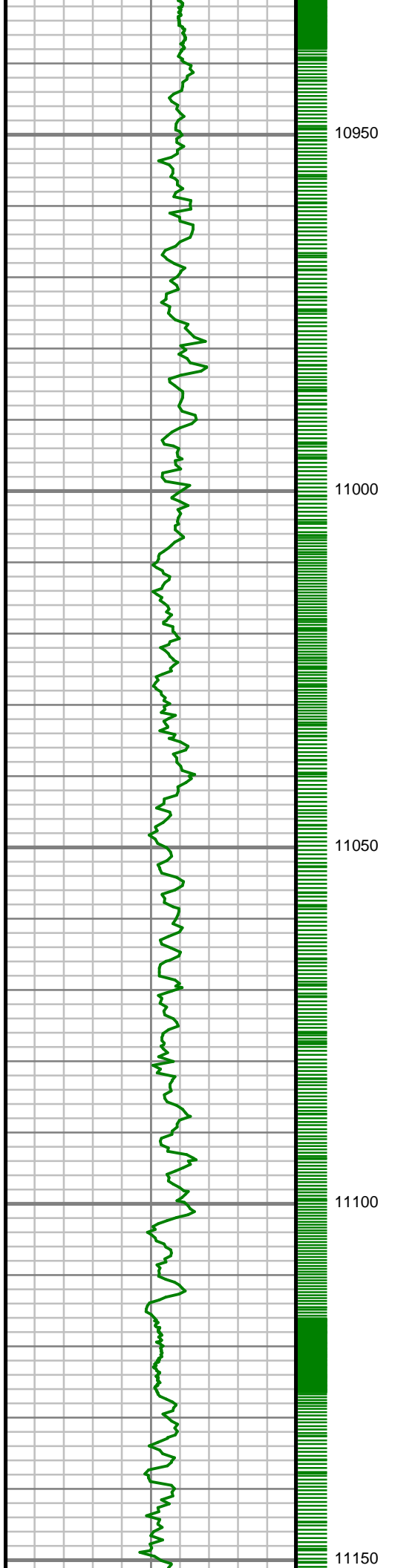
S: 112 MD: 10619.00 ft
Inc: 90.87 deg Az:
359.33 deg TVD:
7314.68 ft



S: 113 MD: 10714.00 ft
Inc: 90.34 deg Az:
358.23 deg TVD:
7313.68 ft

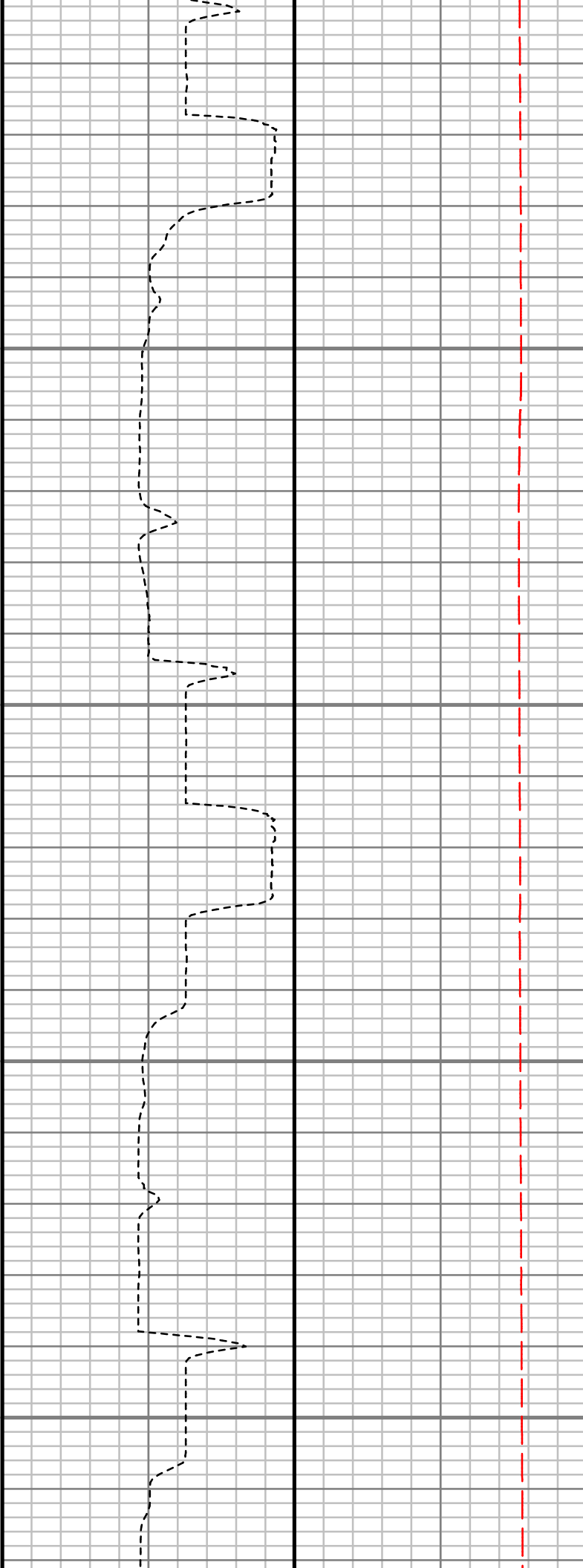
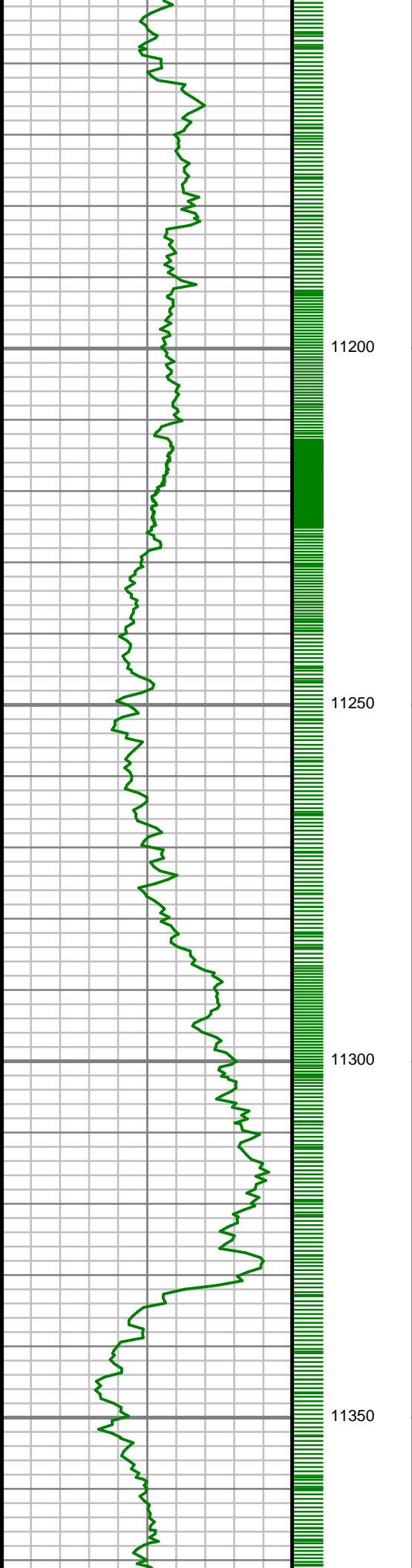
S: 114 MD: 10807.00 ft
Inc: 89.09 deg Az:
357.78 deg TVD:
7314.14 ft

S: 115 MD: 10901.00 ft
Inc: 89.66 deg Az:
359.21 deg TVD:
7315.16 ft



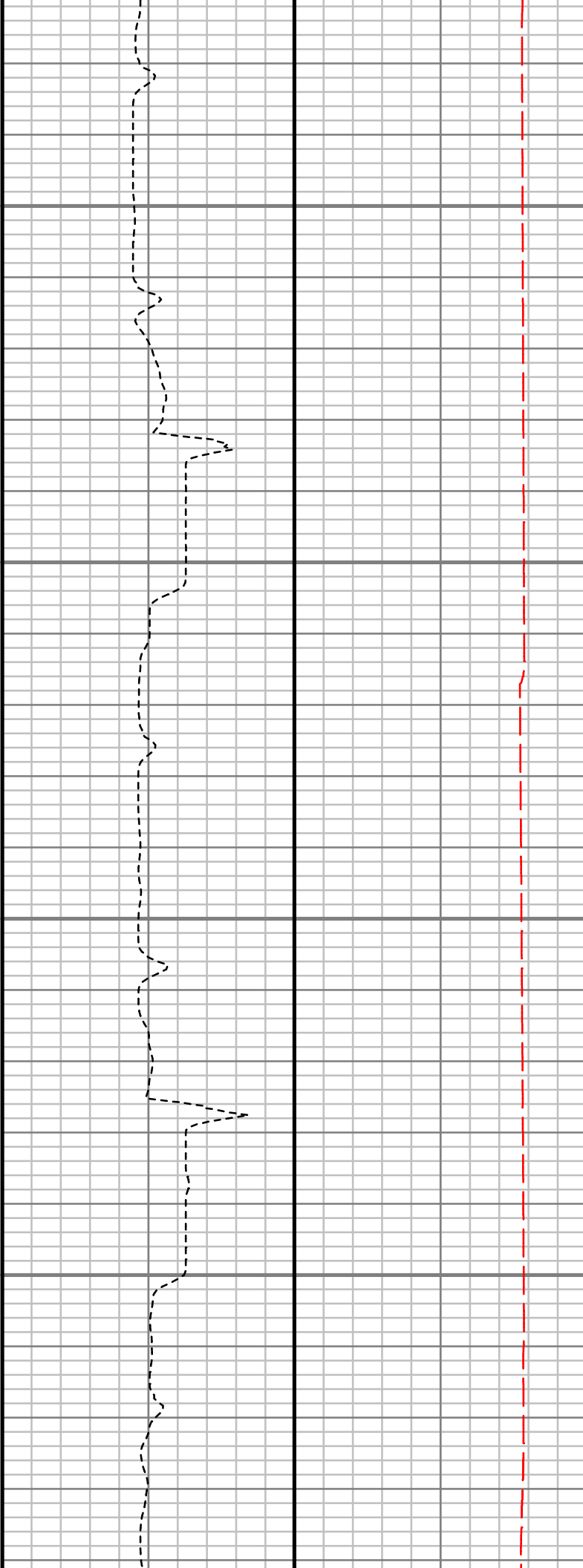
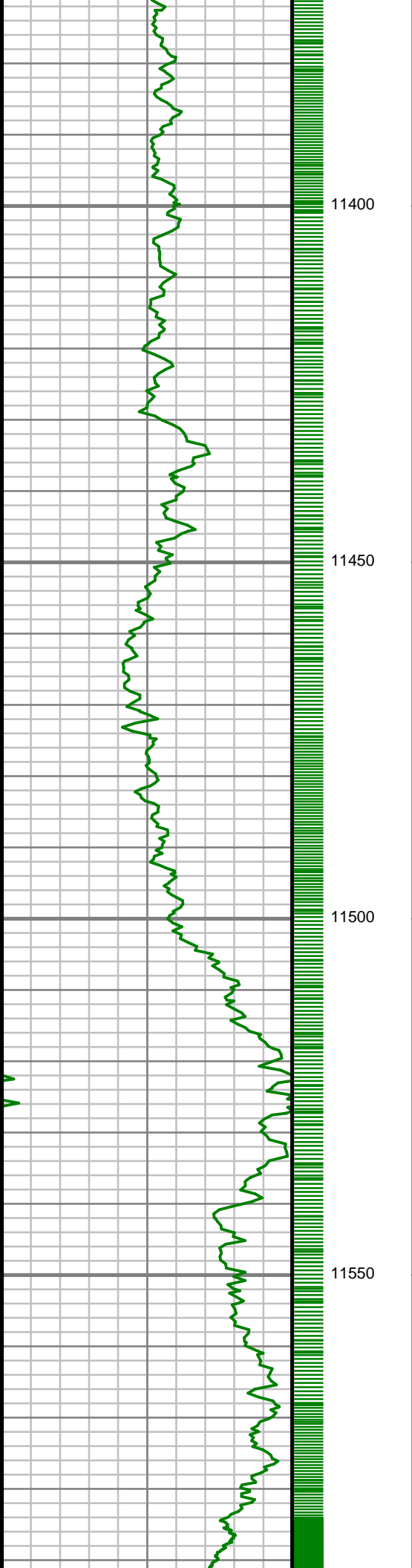
S: 116 MD: 10996.00 ft
Inc: 90.77 deg Az: 0.43
deg TVD: 7314.80 ft

S: 117 MD: 11091.00 ft
Inc: 91.04 deg Az: 0.14
deg TVD: 7313.29 ft



S: 118 MD: 11183.00 ft
Inc: 90.44 deg Az: 0.14
deg TVD: 7312.11 ft

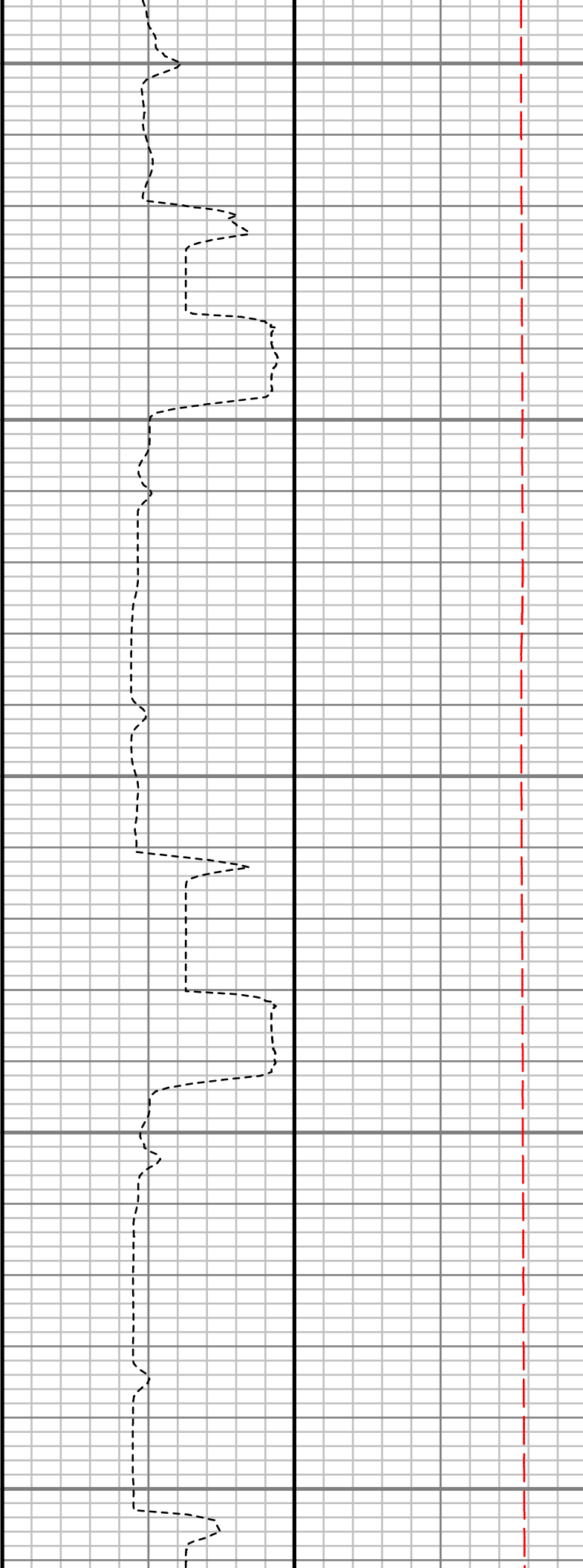
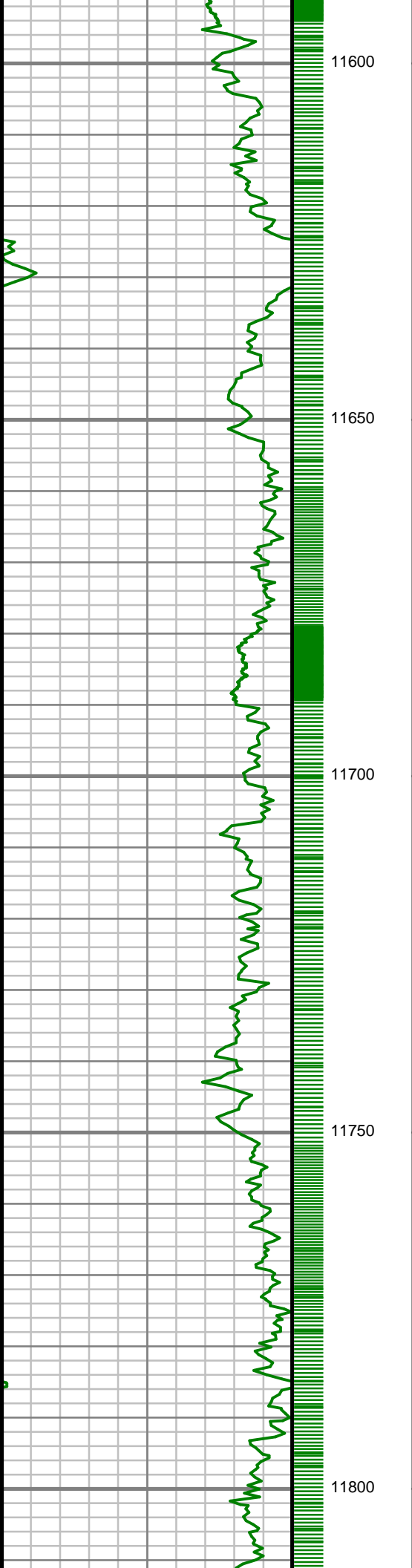
S: 119 MD: 11277.00 ft
Inc: 90.34 deg Az: 1.52
deg TVD: 7311.48 ft



S: 120 MD: 11371.00 ft
Inc: 90.37 deg Az: 1.58
deg TVD: 7310.90 ft

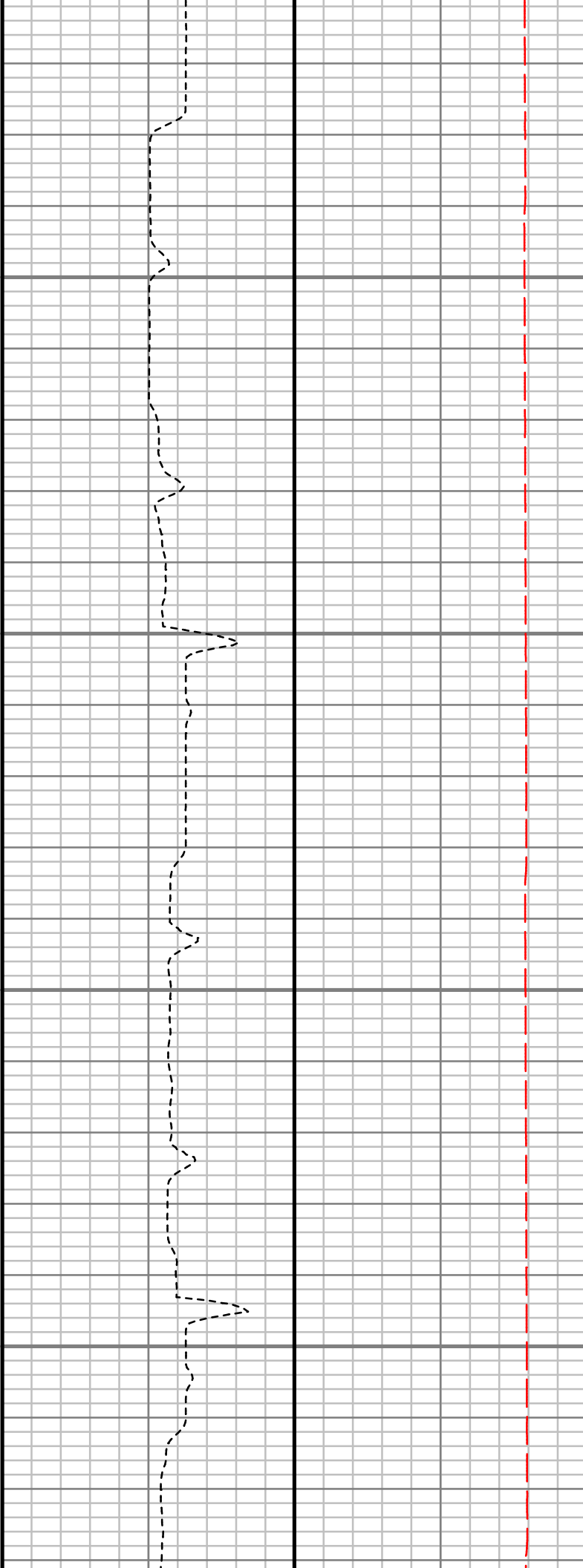
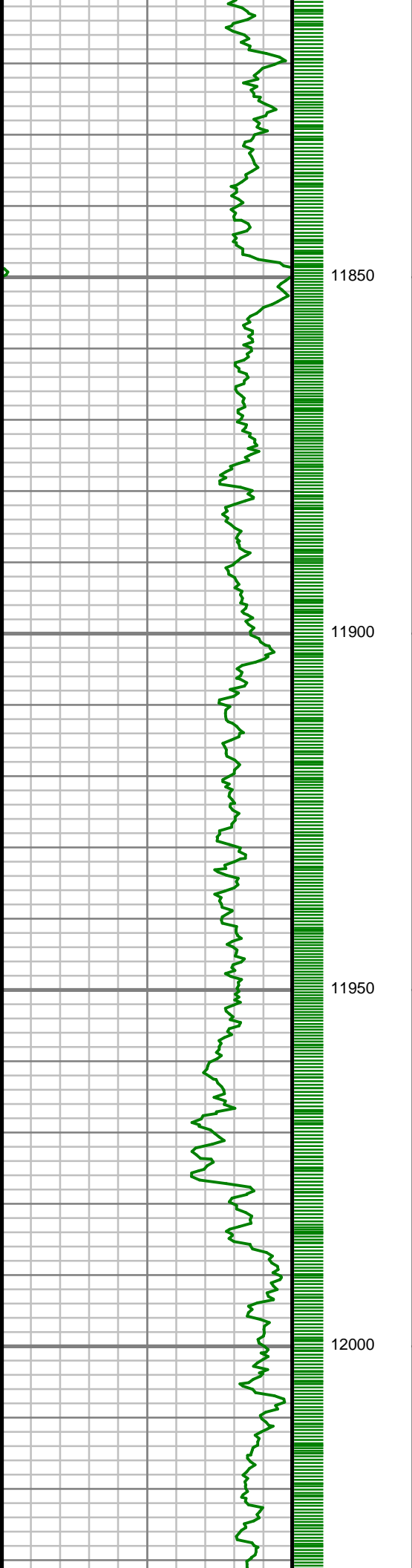
S: 121 MD: 11464.00 ft
Inc: 90.74 deg Az: 0.89
deg TVD: 7310.00 ft

S: 122 MD: 11558.00 ft
Inc: 91.14 deg Az: 1.00
deg TVD: 7308.46 ft



S: 123 MD: 11651.00 ft
Inc: 90.71 deg Az: 0.60
deg TVD: 7306.96 ft

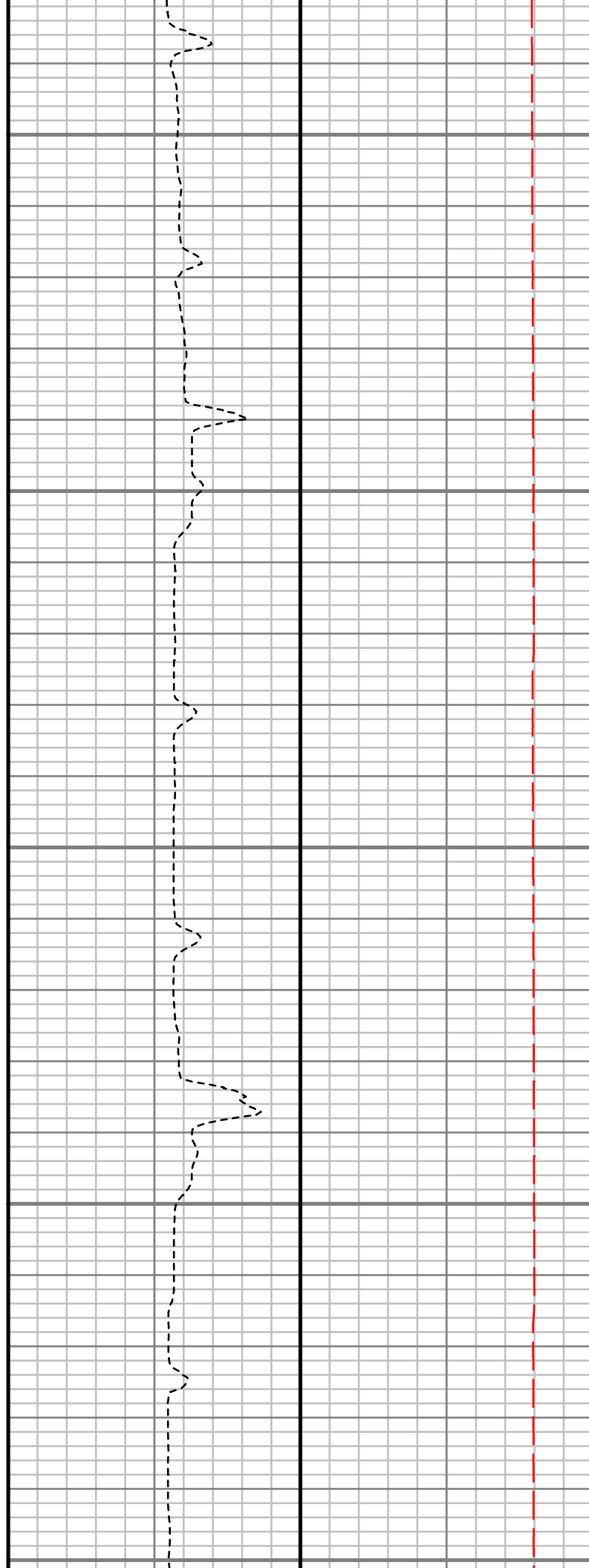
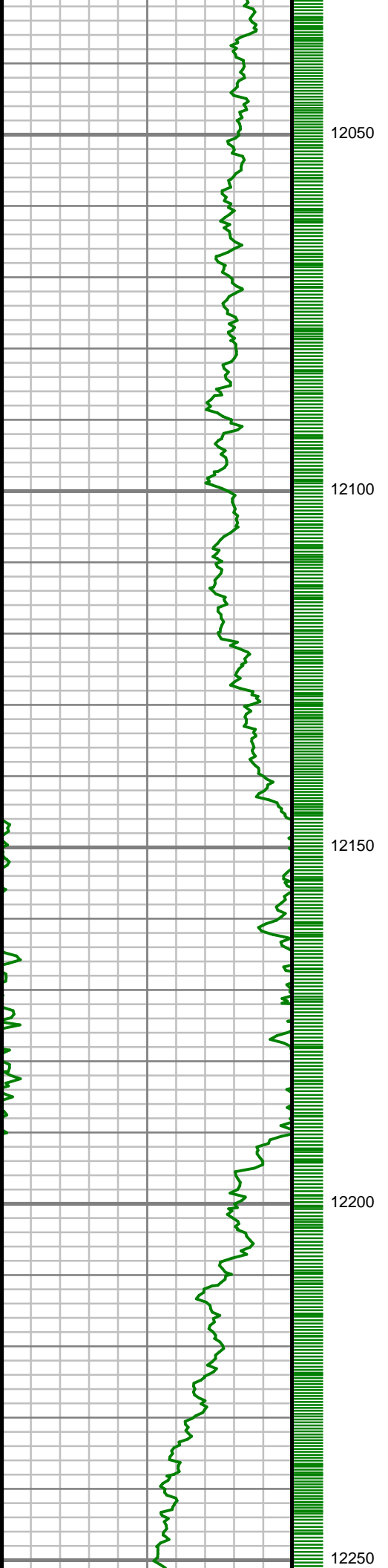
S: 124 MD: 11744.00 ft
Inc: 88.99 deg Az: 0.84
deg TVD: 7307.20 ft



S: 125 MD: 11839.00 ft
Inc: 89.46 deg Az: 1.38
deg TVD: 7308.48 ft

S: 126 MD: 11932.00 ft
Inc: 89.83 deg Az: 1.34
deg TVD: 7309.06 ft

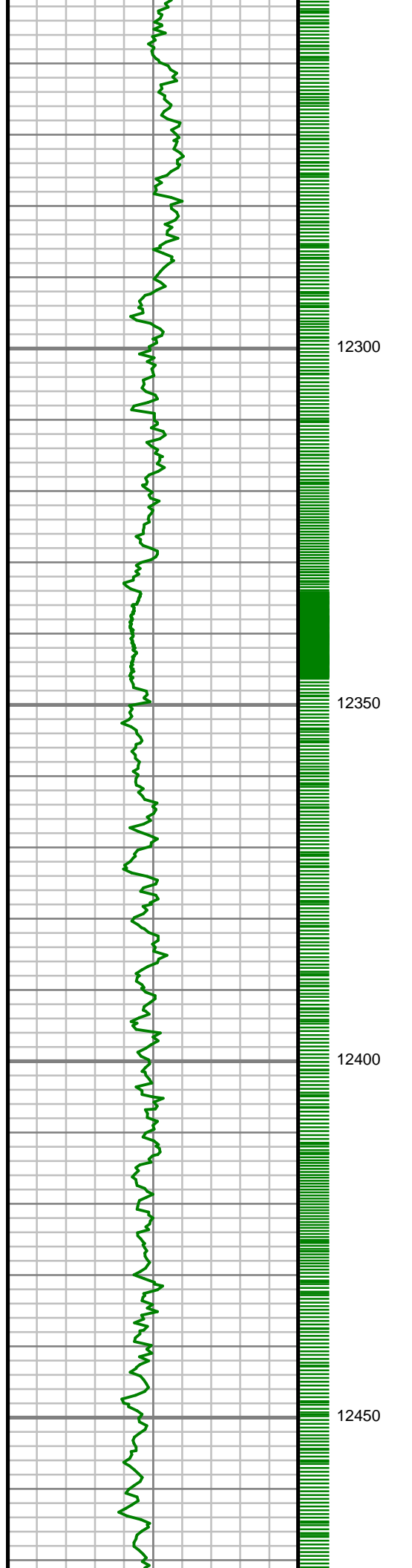
S: 127 MD: 12027.00 ft
Inc: 89.60 deg Az: 1.60
deg TVD: 7310.12 ft



Inc: 89.93 deg Az: 0.86
deg TVD: 7309.53 ft

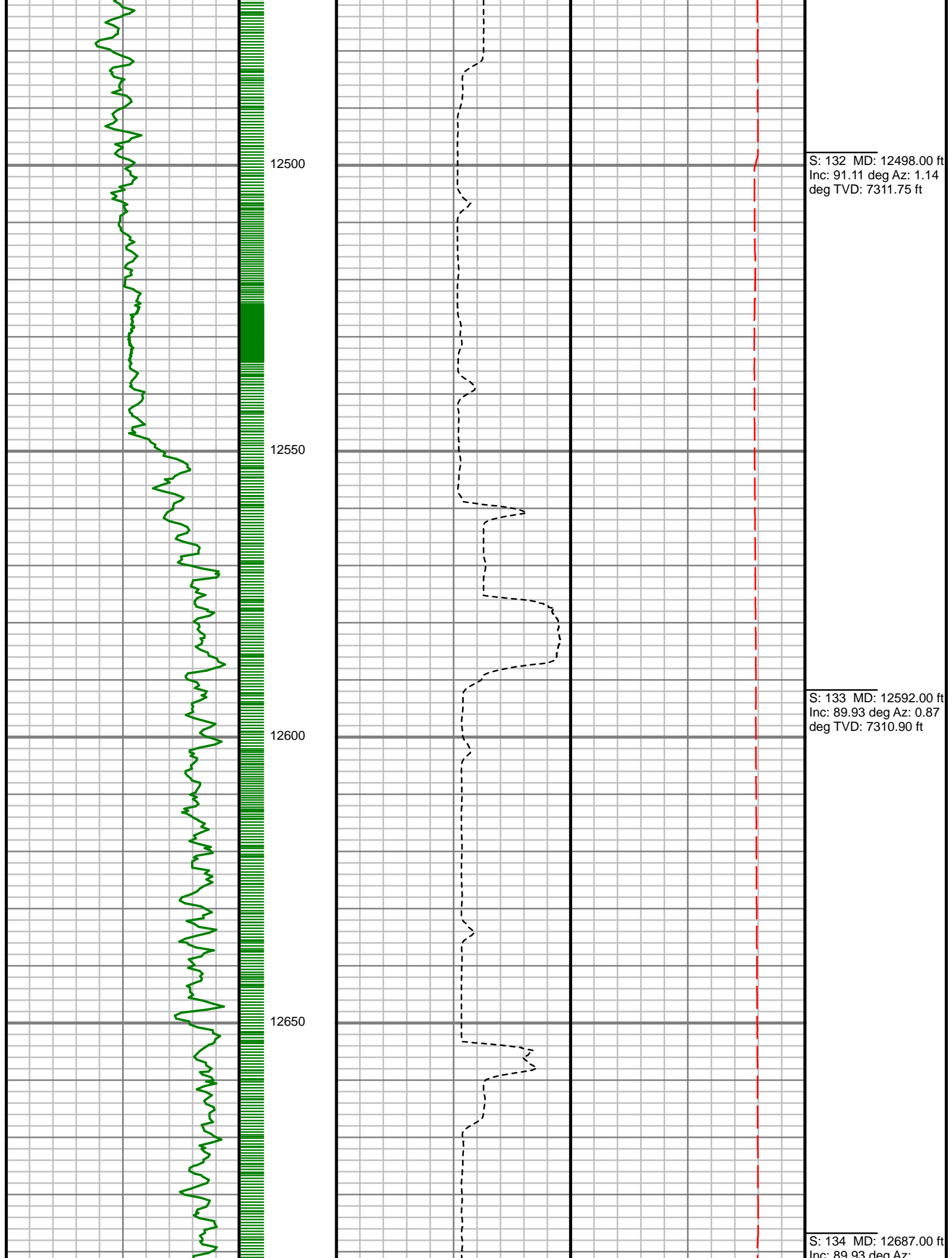
S: 128 MD: 12122.00 ft
Inc: 89.46 deg Az: 0.86
deg TVD: 7310.31 ft

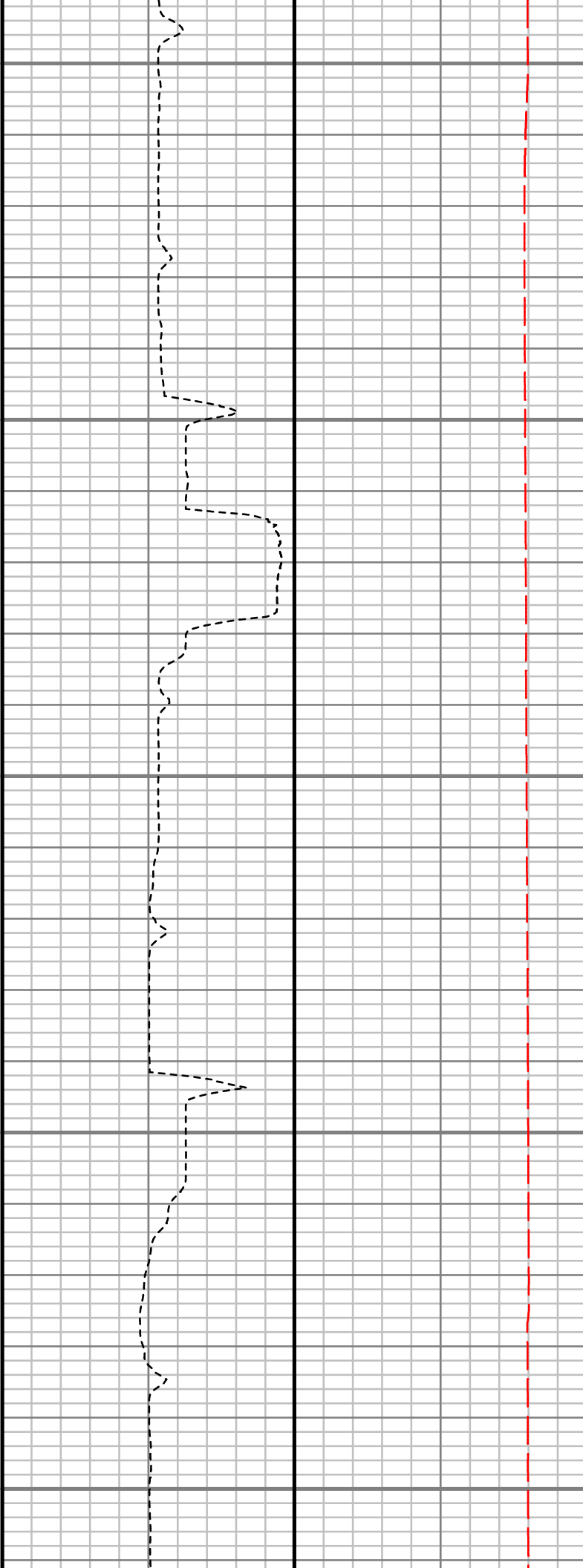
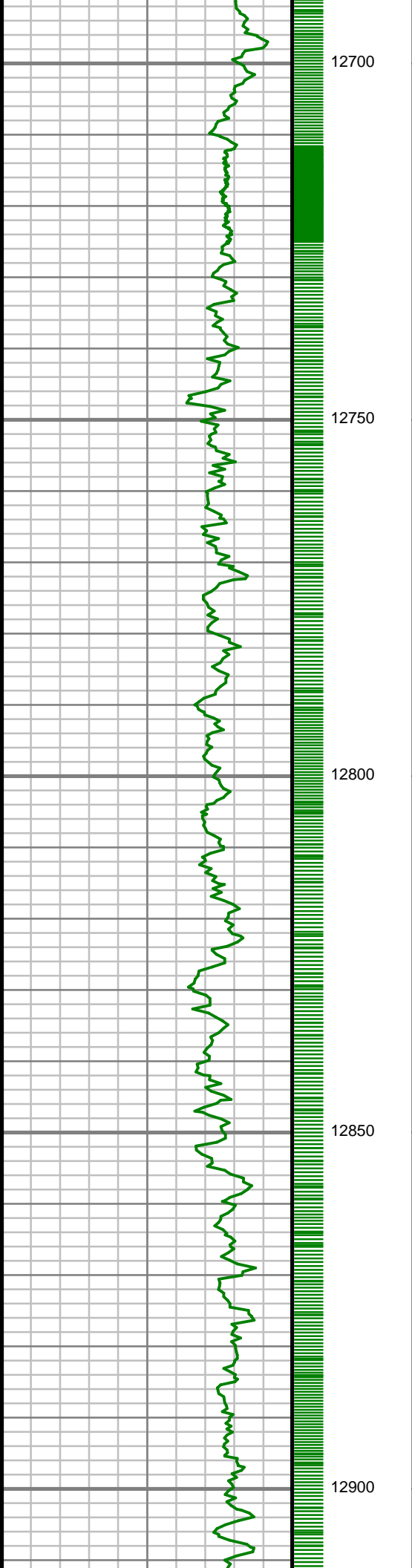
S: 129 MD: 12215.00 ft
Inc: 89.16 deg Az: 0.63
deg TVD: 7311.43 ft



S: 130 MD: 12310.00 ft
Inc: 89.36 deg Az:
359.93 deg TVD:
7312.65 ft

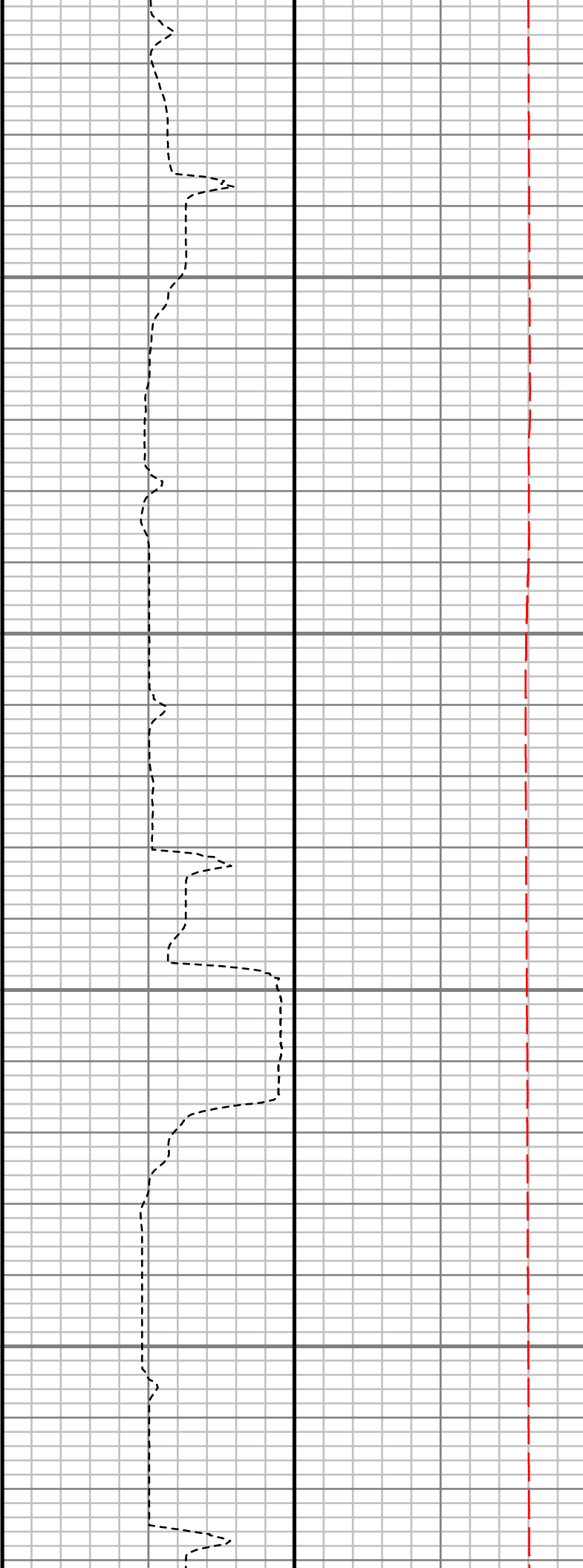
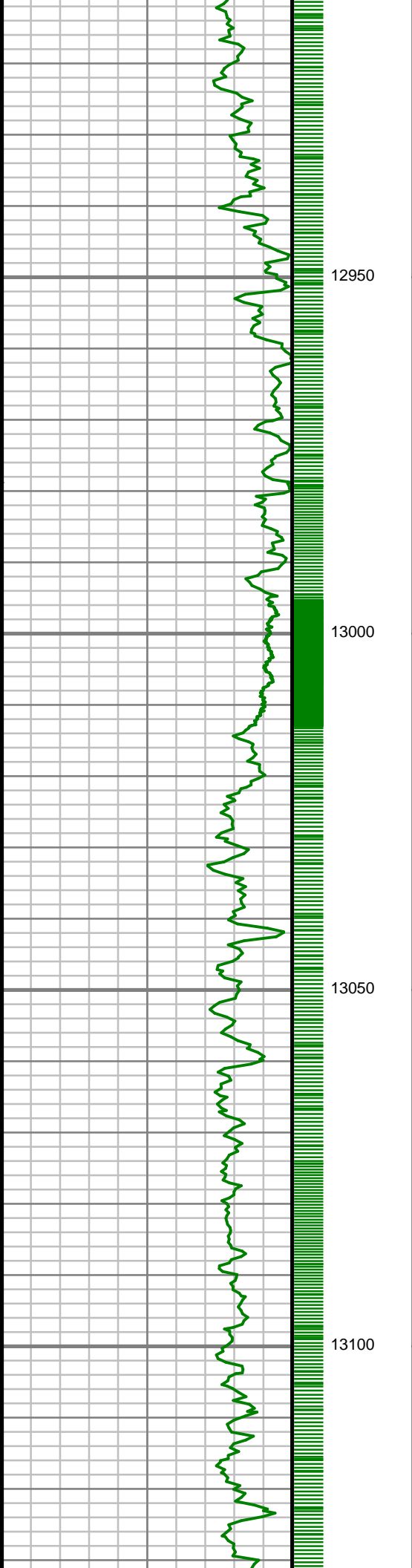
S: 131 MD: 12403.00 ft
Inc: 90.30 deg Az: 1.20
deg TVD: 7312.92 ft





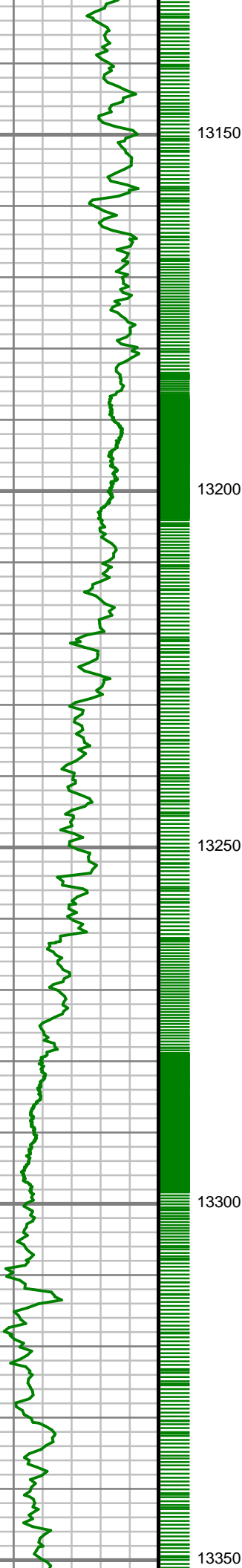
S: 135 MD: 12781.00 ft
Inc: 89.63 deg Az: 0.45
deg TVD: 7311.37 ft

S: 136 MD: 12874.00 ft
Inc: 90.27 deg Az: 0.66
deg TVD: 7311.45 ft



S: 137 MD: 12969.00 ft
Inc: 89.93 deg Az:
359.67 deg TVD:
7311.29 ft

S: 138 MD: 13064.00 ft
Inc: 89.87 deg Az: 0.11
deg TVD: 7311.45 ft



13150

13200

13250

13300

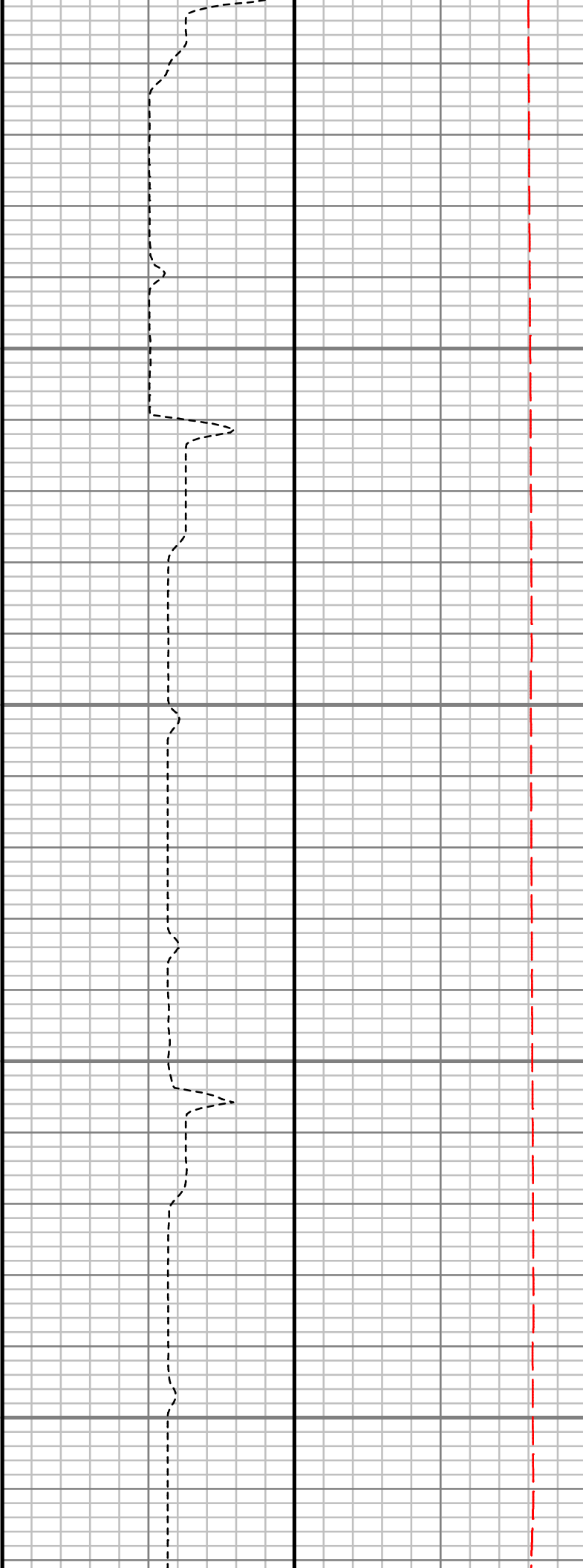
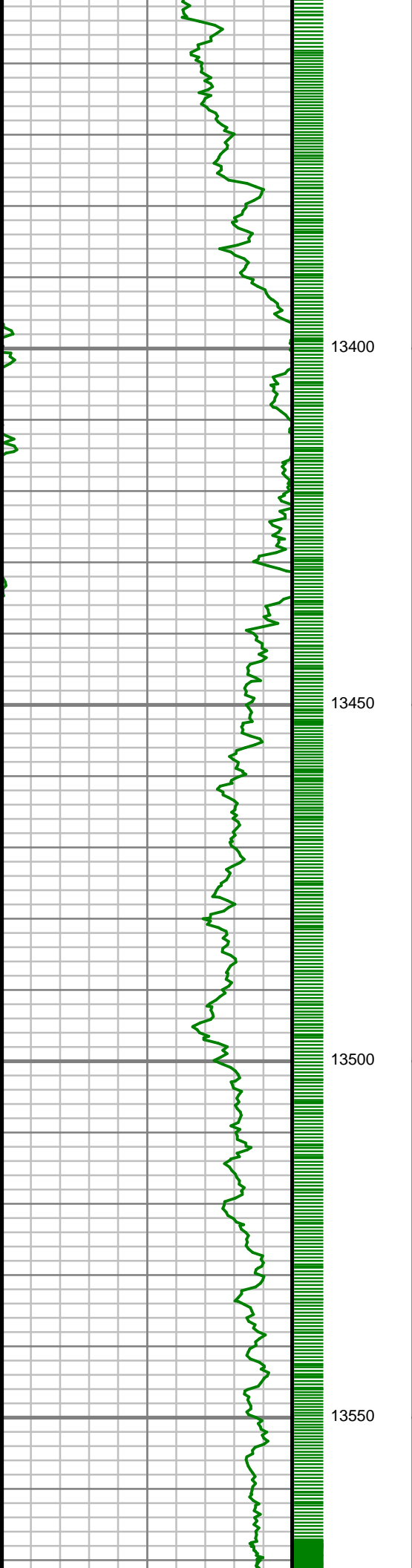
13350



S: 139 MD: 13157.00 ft
Inc: 90.13 deg Az:
359.00 deg TVD:
7311.45 ft

S: 140 MD: 13252.00 ft
Inc: 89.63 deg Az:
359.60 deg TVD:
7311.65 ft

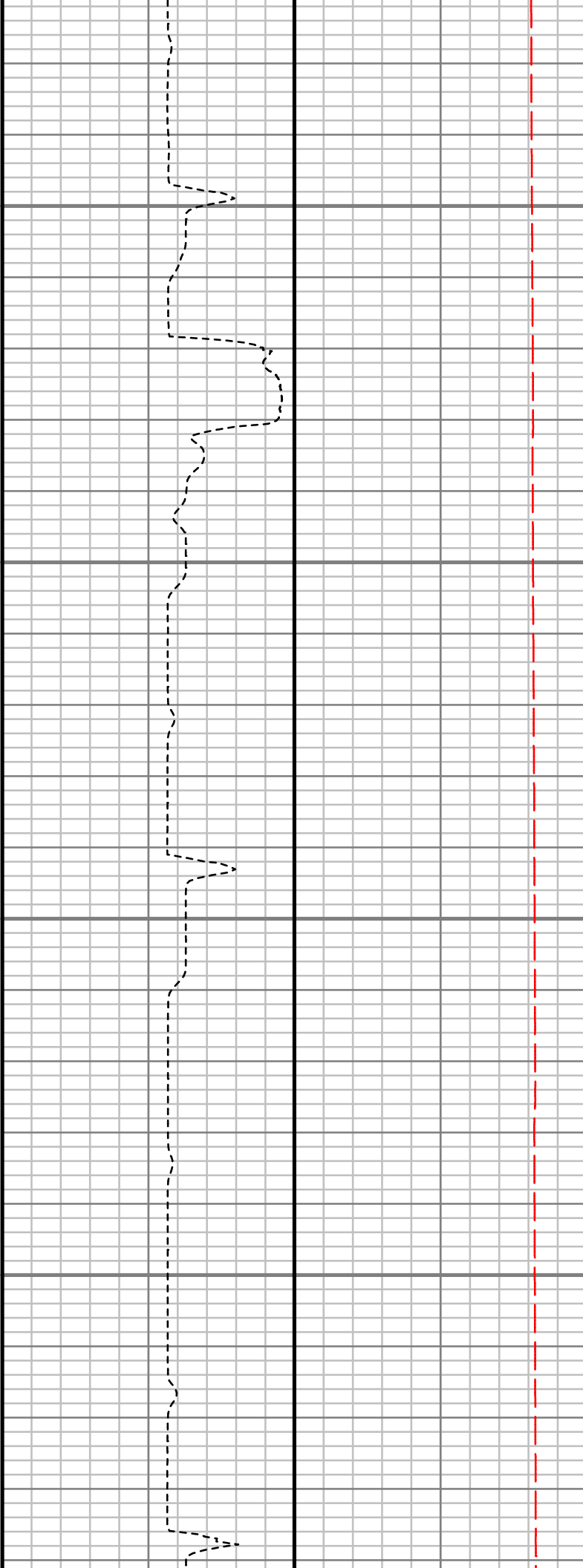
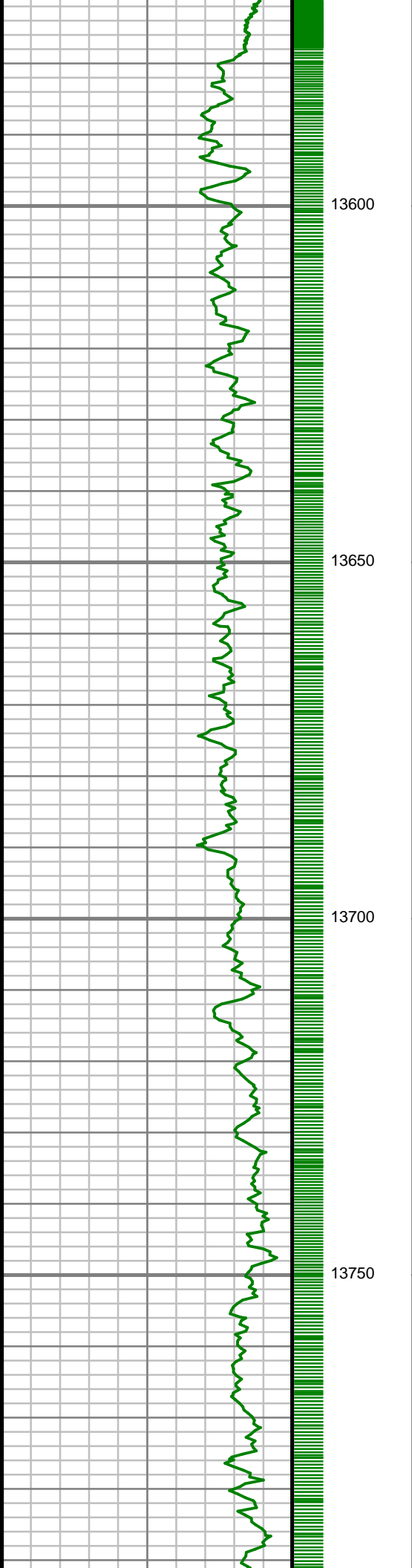
S: 141 MD: 13347.00 ft
Inc: 91.21 deg Az: 1.67



Inc: 91.12 deg Az: 1.93
deg TVD: 7310.95 ft

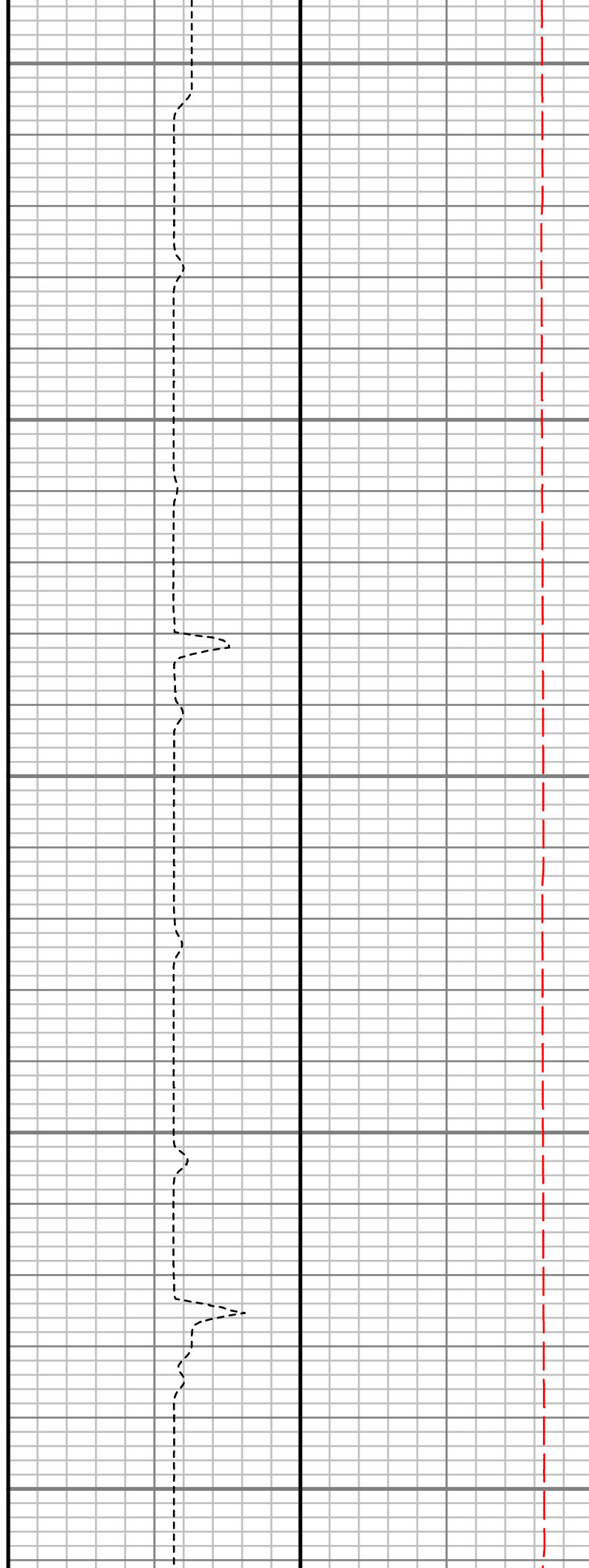
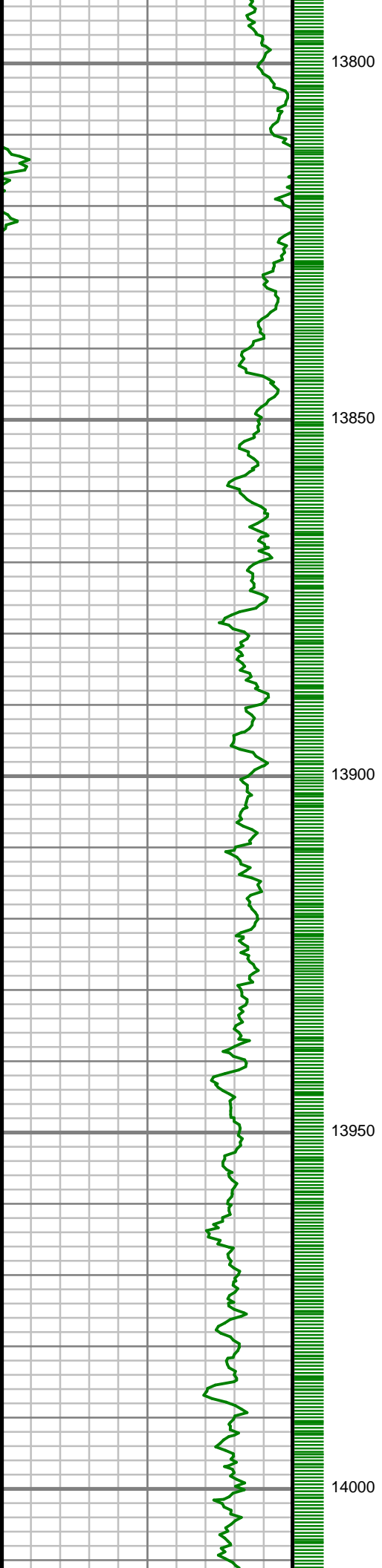
S: 142 MD: 13441.00 ft
Inc: 91.31 deg Az: 1.92
deg TVD: 7308.89 ft

S: 143 MD: 13534.00 ft
Inc: 91.51 deg Az: 1.20
deg TVD: 7306.60 ft



S: 144 MD: 13629.00 ft
Inc: 90.17 deg Az: 1.30
deg TVD: 7305.21 ft

S: 145 MD: 13723.00 ft
Inc: 90.54 deg Az: 0.95
deg TVD: 7304.64 ft

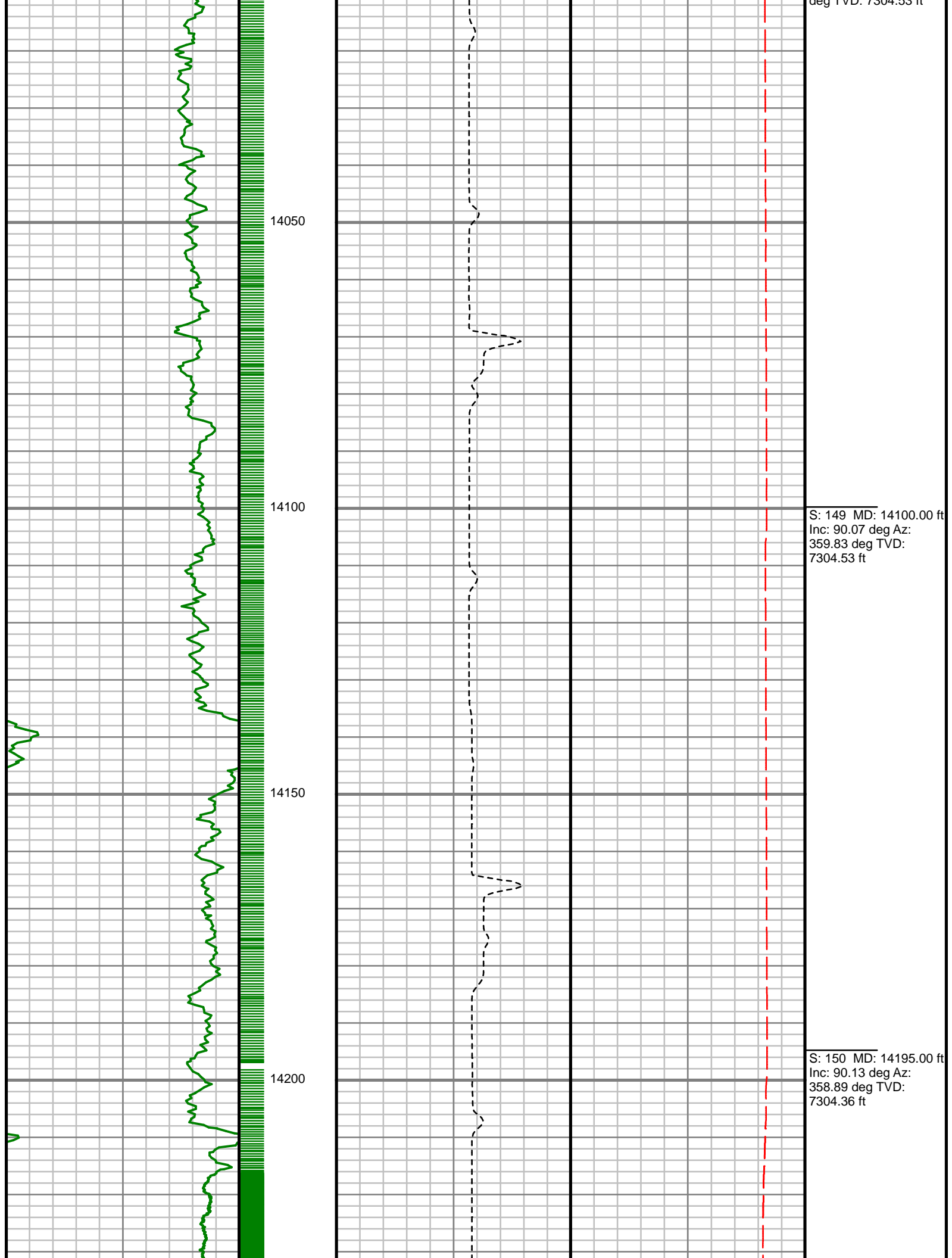


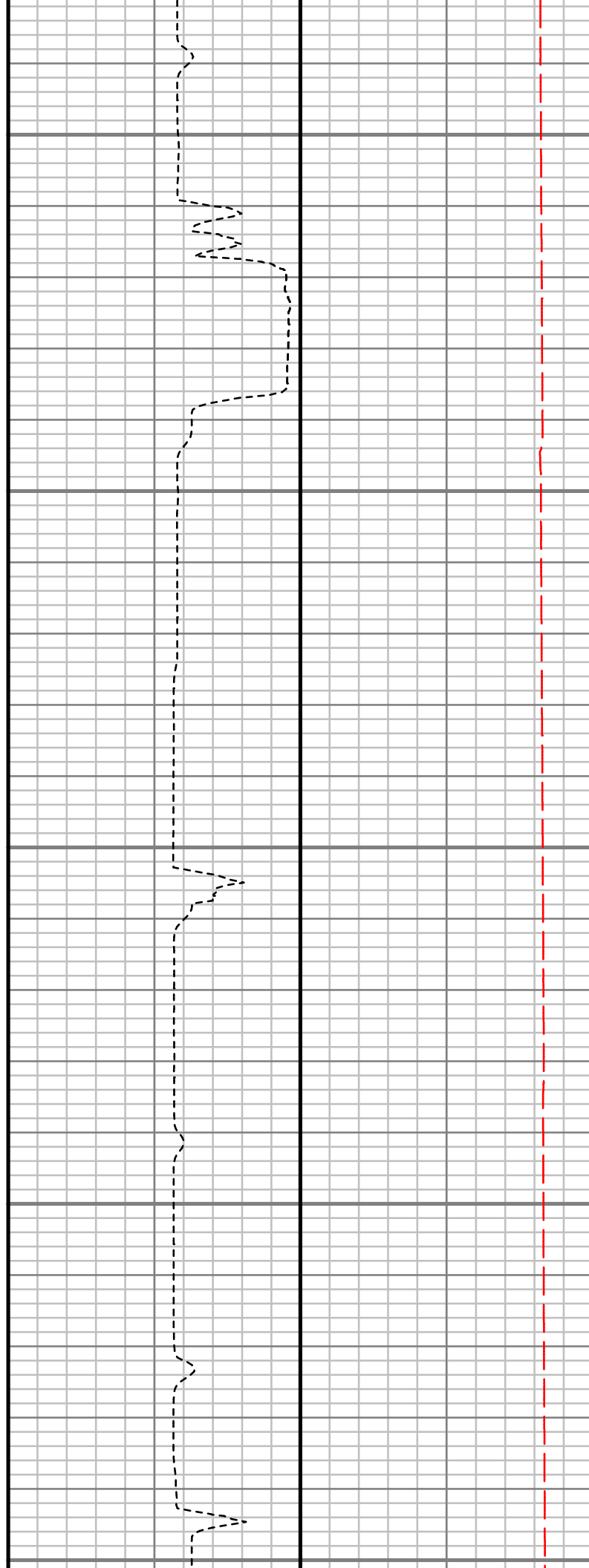
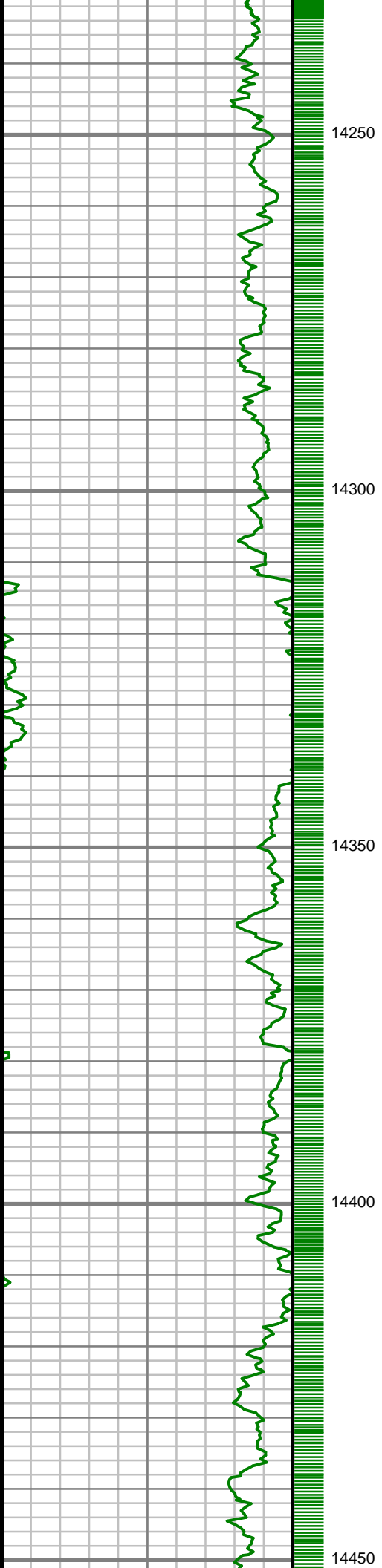
S: 146 MD: 13817.00 ft
Inc: 90.03 deg Az: 1.08
deg TVD: 7304.17 ft

S: 147 MD: 13910.00 ft
Inc: 89.80 deg Az: 0.72
deg TVD: 7304.30 ft

S: 148 MD: 14005.00 ft
Inc: 89.93 deg Az: 0.44
deg TVD: 7304.52 ft

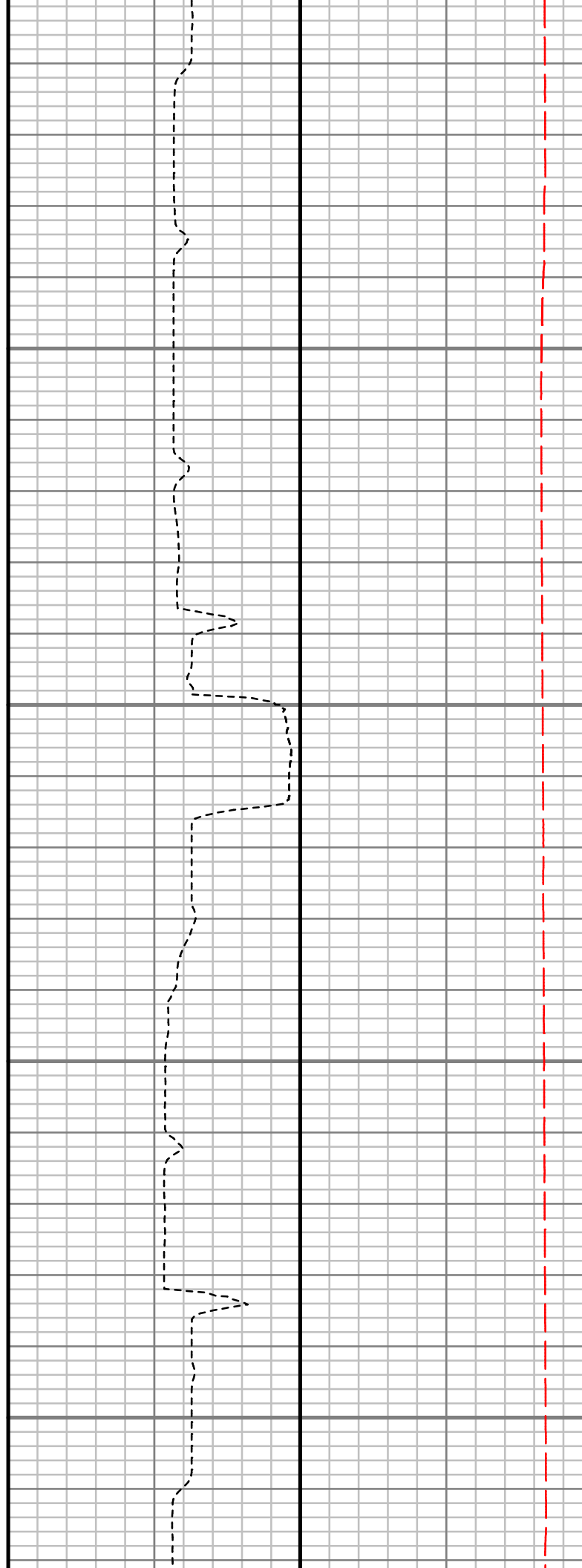
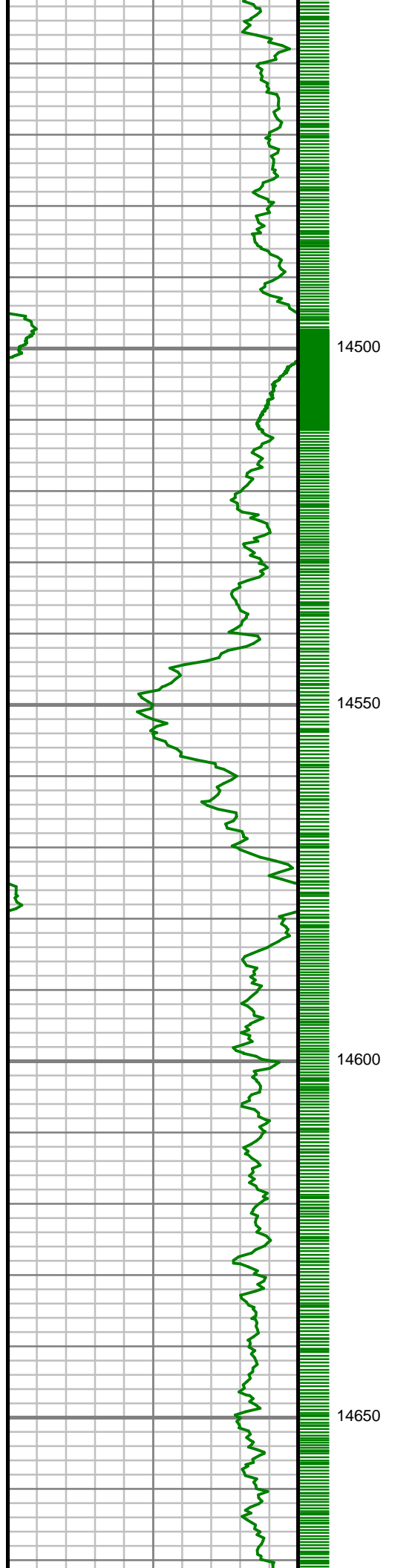
deg TVD: 7304.33 ft





S: 151 MD: 14288.00 ft
Inc: 90.40 deg Az: 1.84
deg TVD: 7303.92 ft

S: 152 MD: 14383.00 ft
Inc: 90.47 deg Az: 0.71
deg TVD: 7303.20 ft

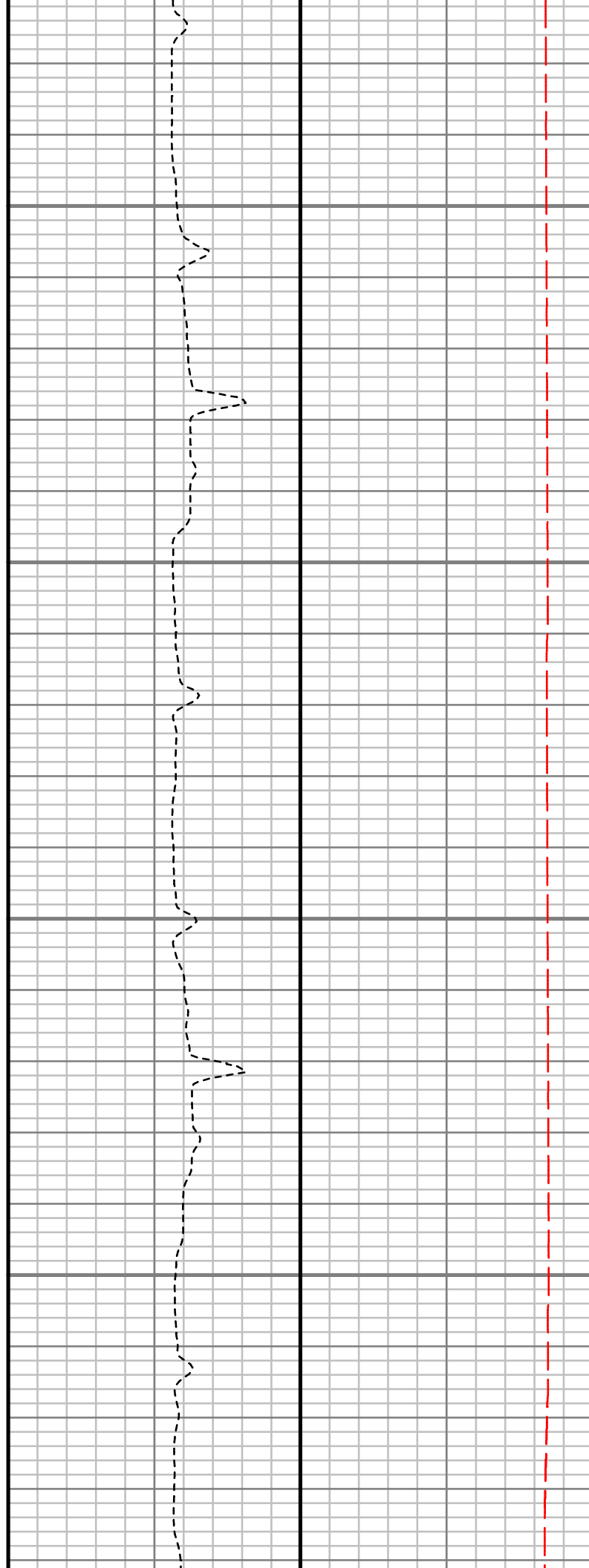
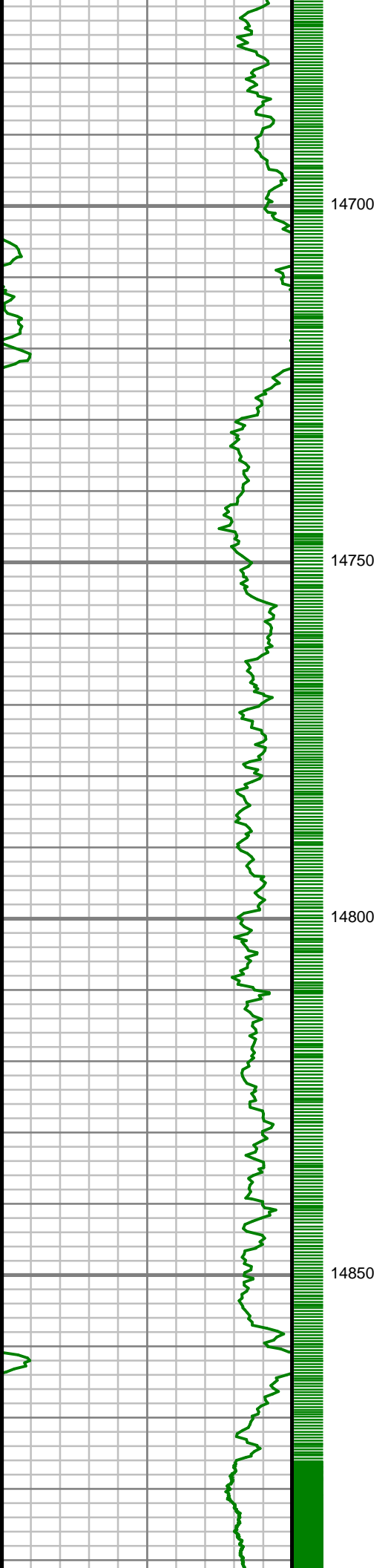


S: 153 MD: 14477.00 ft
Inc: 90.34 deg Az: 359.26 deg TVD: 7302.54 ft

S: 154 MD: 14572.00 ft
Inc: 89.93 deg Az: 1.14 deg TVD: 7302.31 ft

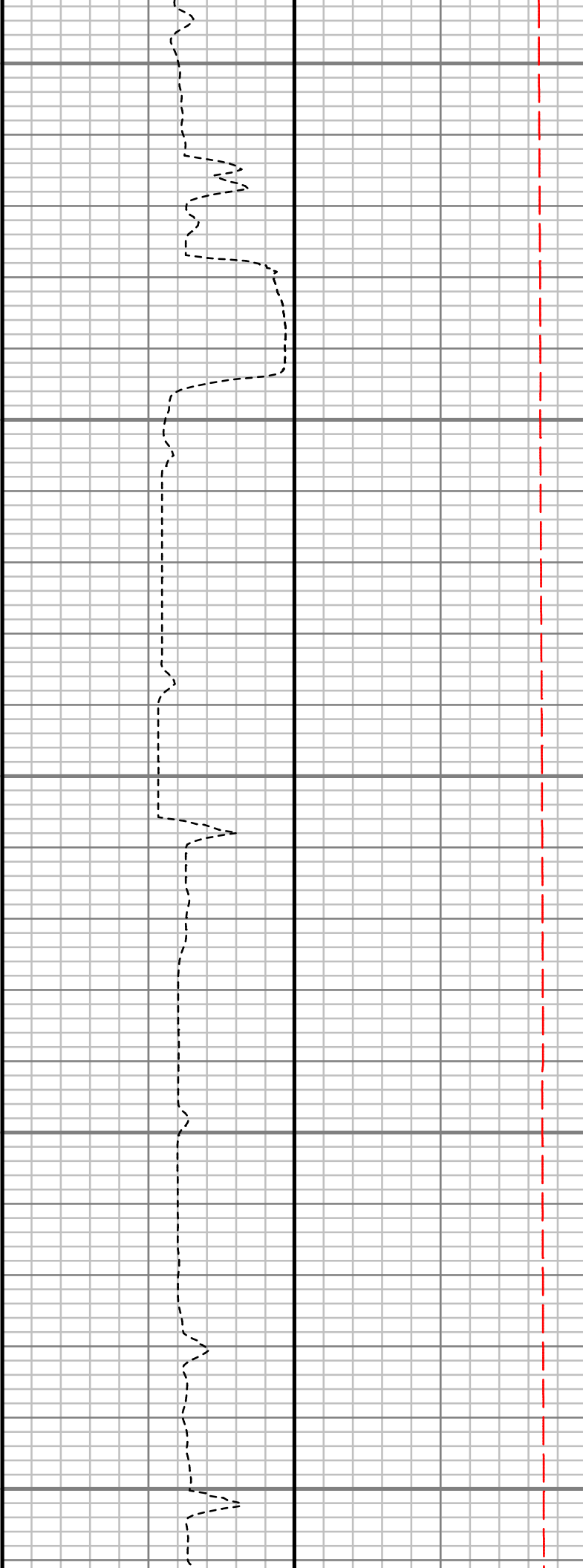
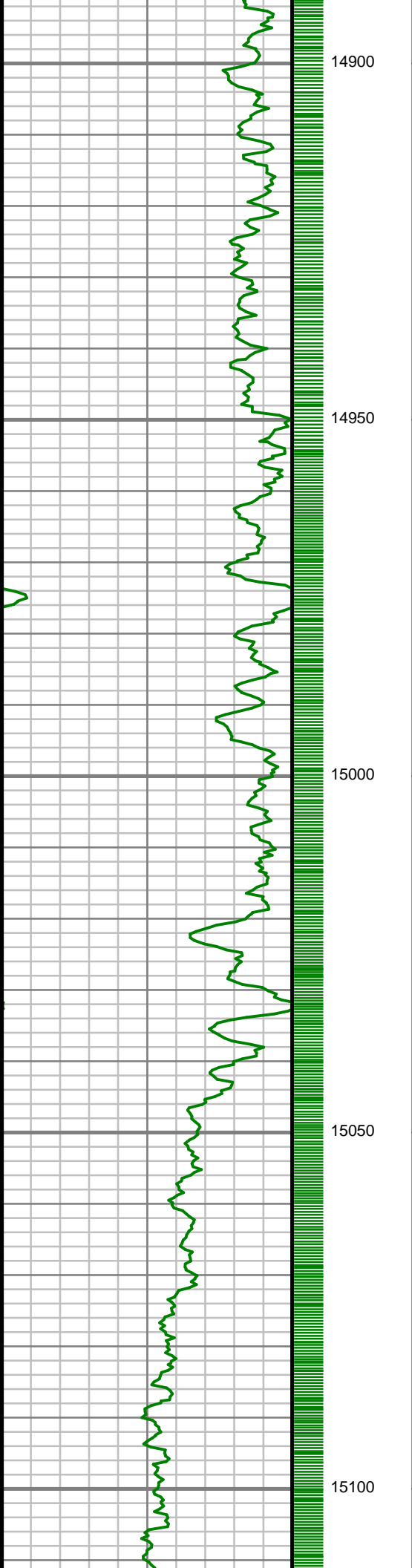
S: 155 MD: 14666.00 ft
Inc: 90.81 deg Az: 1.07

deg TVD: 7301.71 ft



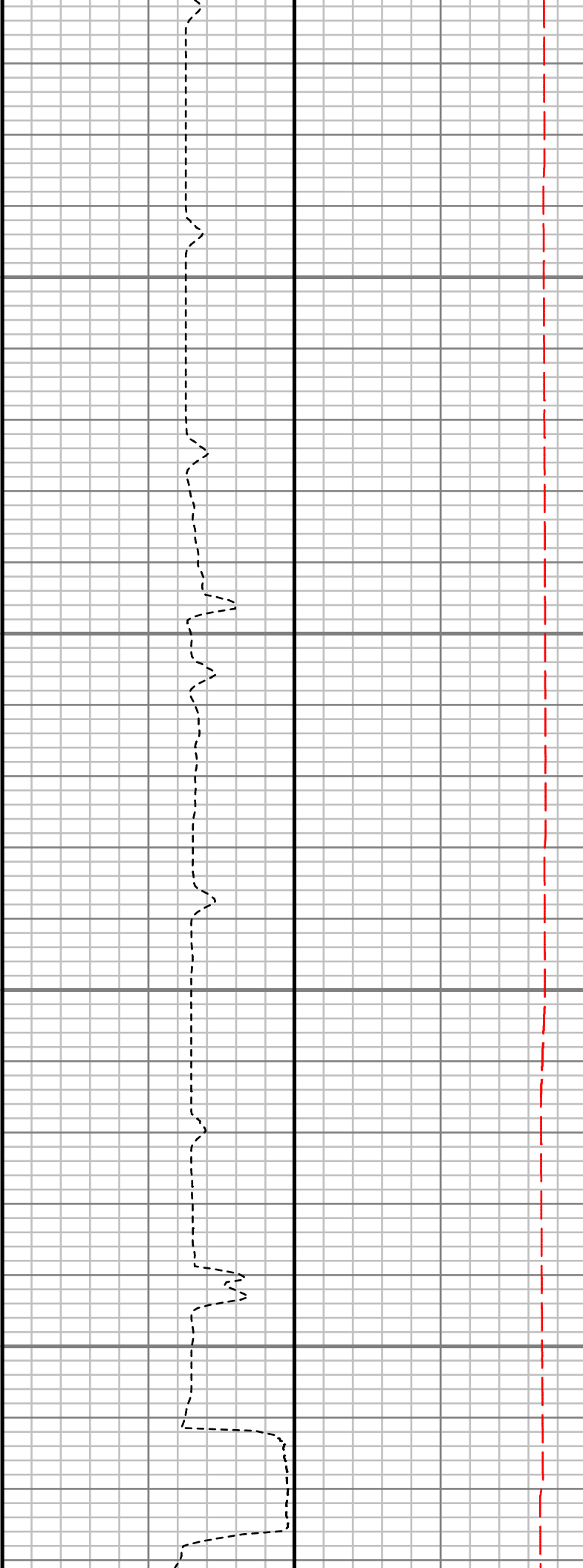
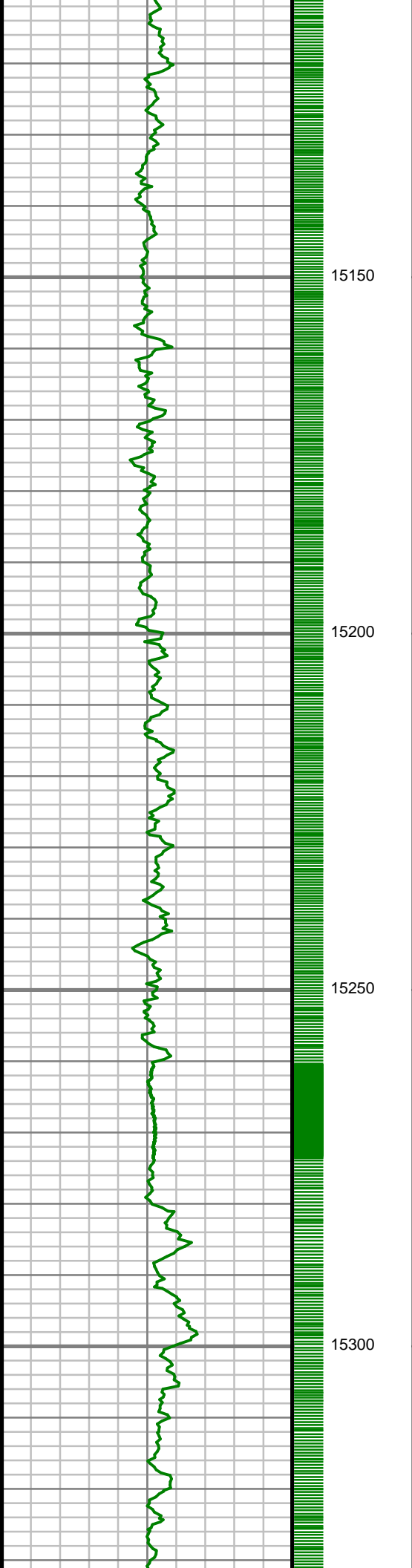
S: 156 MD: 14759.00 ft
Inc: 90.64 deg Az: 1.35
deg TVD: 7300.54 ft

S: 157 MD: 14851.00 ft
Inc: 90.81 deg Az: 3.49
deg TVD: 7299.38 ft



S: 158 MD: 14946.00 ft
Inc: 90.40 deg Az: 1.82
deg TVD: 7298.38 ft

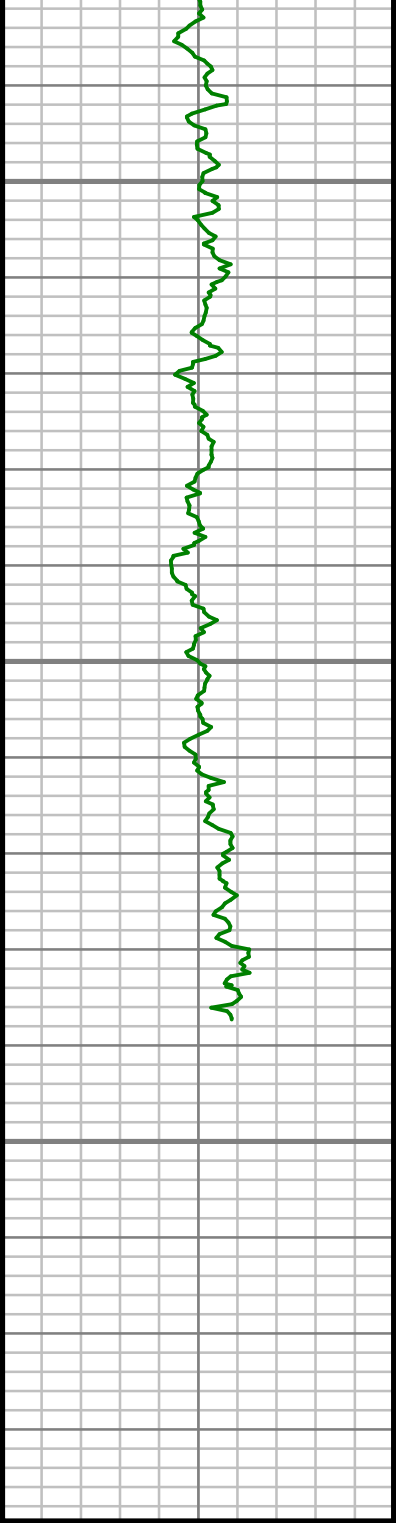
S: 159 MD: 15039.00 ft
Inc: 90.13 deg Az: 1.41
deg TVD: 7297.94 ft



S: 160 MD: 15133.00 ft
Inc: 90.64 deg Az: 1.30
deg TVD: 7297.31 ft

S: 161 MD: 15227.00 ft
Inc: 89.87 deg Az:
359.67 deg TVD:
7296.89 ft

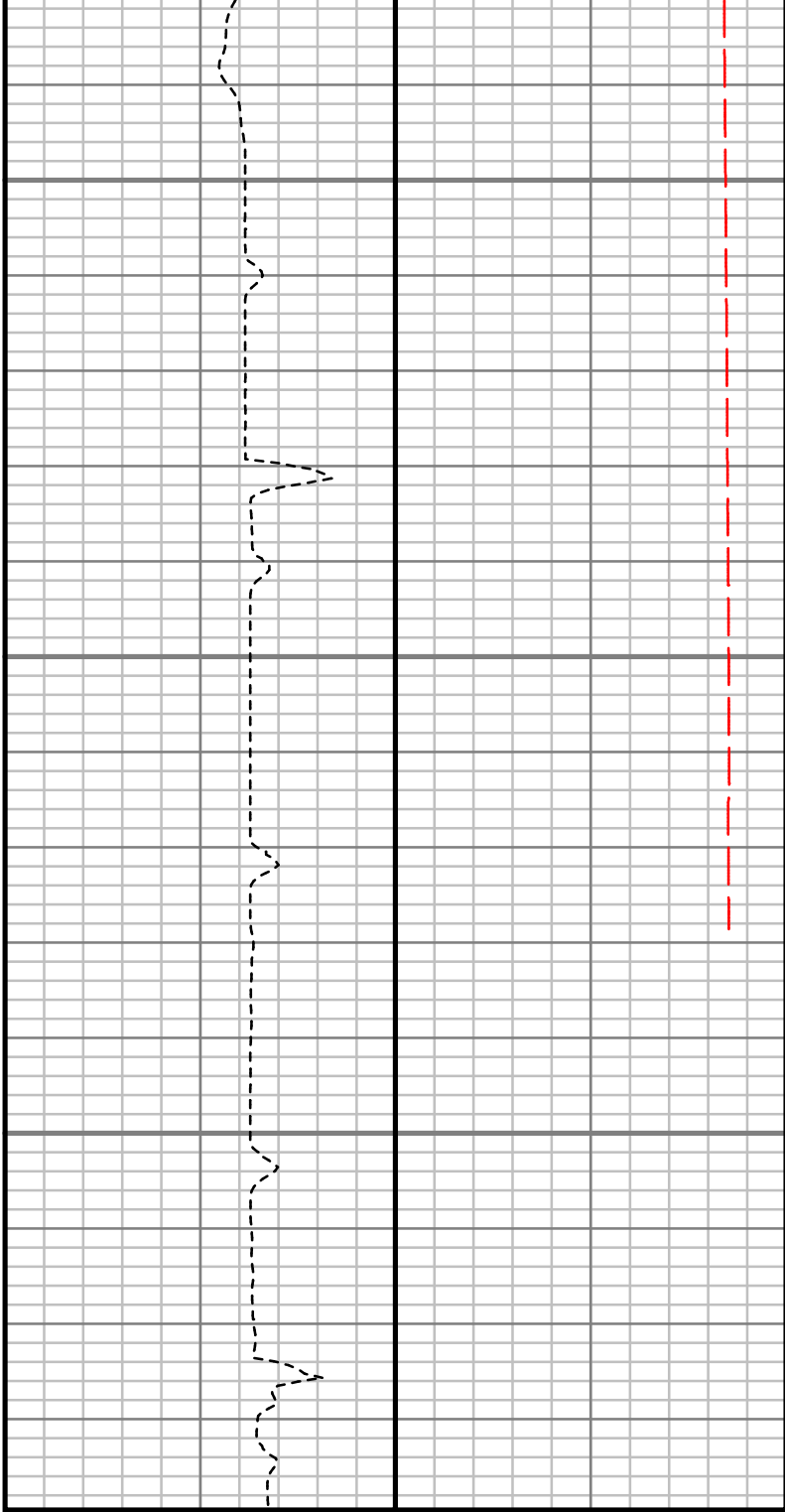
S: 162 MD: 15319.00 ft
Inc: 90.00 deg Az: 0.62
deg TVD: 7297.00 ft



| Gamma Ray (GR) | | |
|----------------|-------------|-----|
| 0 | Unit = aapi | 150 |



MEASURED DEPTH
1:240 (ft)



| Rate of Penetration (ROP) | | |
|---------------------------|--------------|---|
| 800 | Unit = ft/hr | 0 |

| Tool Temperature (TEMP) | | |
|-------------------------|-----------|-----|
| 0 | Unit = °F | 300 |

S: 163 MD: 15413.00 ft
Inc: 89.06 deg Az:
359.64 deg TVD:
7297.77 ft

| Comments |
|----------|
|----------|

SURVEY REPORT

BUTTERBALL 9N-34HZ BUTTERBALL 9N-34HZ

CUSTOMER ANADARKO PETROLEUM CORPORATION
PROJECT BUTTERBALL
FIELD WATTENBERG

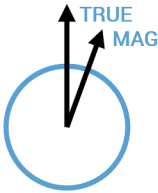
WELL INFORMATION
Lat/Long 40.158269° N, 104.869651° W
Northing 14,584,393.12 ft
Easting 1,676,836.61 ft
UWI 05123443180000

MAP INFORMATION

North Reference True North
Grid Correction
System Universal Transverse Mercator (US Survey Feet)
Datum North American Datum 1983 (GRS 1980)
Map Zone Zone 13N (108 W to 102 W)

VERTICAL SECTION REFERENCE

+N/-S 0 ft
+E/-W 0 ft
Proposal Direction 0.61°
Calculation Method Minimum Curvature



GEOMAGNETIC REFERENCE INFORMATION

Local Gravity: 999.050 mG [computed]

| MD | MODEL | DATE | DECLINATION | MAG TO TRUE |
|----------------|--------------------|-------------|-------------|-------------|
| 0-3816 ft | ANADARKO MAGVAR | 18 May 2017 | 8.36° | add 8.36° |
| 3816-11744 ft | ANADARKO MAGVAR | 18 May 2017 | 8.37° | add 8.37° |
| 11744-15413 ft | ANADARKO MAGVAR | 18 May 2017 | 8.34° | add 8.34° |

| MD | Inc | Azim | TVD | VS | +N/-S | +E/-W | DLS |
|---------|------|--------|---------|-------|-------|--------|---------|
| ft | deg | deg | ft | ft | ft | ft | °/100ft |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Invalid |
| 153.00 | 0.26 | 100.08 | 153.00 | -0.06 | -0.06 | 0.34 | 0.17 |
| 239.00 | 0.17 | 346.91 | 239.00 | 0.03 | 0.03 | 0.51 | 0.42 |
| 328.00 | 0.24 | 58.76 | 328.00 | 0.26 | 0.25 | 0.63 | 0.28 |
| 415.00 | 0.37 | 4.09 | 415.00 | 0.64 | 0.63 | 0.81 | 0.35 |
| 503.00 | 0.21 | 38.83 | 503.00 | 1.05 | 1.04 | 0.93 | 0.26 |
| 637.00 | 0.74 | 238.61 | 636.99 | 0.78 | 0.78 | 0.35 | 0.70 |
| 723.00 | 0.77 | 238.41 | 722.99 | 0.18 | 0.19 | -0.62 | 0.04 |
| 810.00 | 0.44 | 231.79 | 809.98 | -0.34 | -0.33 | -1.38 | 0.39 |
| 899.00 | 0.62 | 251.98 | 898.98 | -0.71 | -0.69 | -2.11 | 0.29 |
| 987.00 | 1.38 | 282.90 | 986.96 | -0.64 | -0.60 | -3.59 | 1.03 |
| 1076.00 | 2.06 | 294.57 | 1075.92 | 0.24 | 0.31 | -6.09 | 0.86 |
| 1165.00 | 2.92 | 298.31 | 1164.84 | 1.95 | 2.05 | -9.54 | 0.98 |
| 1253.00 | 2.79 | 310.29 | 1252.73 | 4.36 | 4.50 | -13.15 | 0.69 |
| 1340.00 | 3.11 | 292.46 | 1339.62 | 6.59 | 6.77 | -16.95 | 1.11 |
| 1425.00 | 3.60 | 292.95 | 1424.47 | 8.46 | 8.69 | -21.53 | 0.58 |
| 1511.00 | 3.99 | 290.05 | 1510.28 | 10.48 | 10.77 | -26.83 | 0.51 |
| 1598.00 | 4.08 | 294.84 | 1597.07 | 12.76 | 13.10 | -32.48 | 0.40 |
| 1685.00 | 4.57 | 299.50 | 1683.82 | 15.70 | 16.11 | -38.31 | 0.69 |
| 1775.00 | 4.05 | 286.58 | 1773.57 | 18.31 | 18.78 | -44.47 | 1.22 |

| MD ft | Inc deg | Azim deg | TVD ft | VS ft | +N/-S ft | +E/-W ft | DLS °/100ft |
|----------|------------|-------------|-----------|----------|-------------|-------------|----------------|
| 1937.00 | 4.14 | 278.63 | 1935.15 | 20.70 | 21.29 | -55.74 | 0.35 |
| 2031.00 | 3.96 | 282.44 | 2028.92 | 21.84 | 22.50 | -62.26 | 0.35 |
| 2126.00 | 3.93 | 265.72 | 2123.70 | 22.23 | 22.97 | -68.70 | 1.21 |
| 2221.00 | 1.88 | 290.06 | 2218.57 | 22.47 | 23.26 | -73.41 | 2.47 |
| 2314.00 | 1.94 | 300.40 | 2311.52 | 23.76 | 24.57 | -76.20 | 0.37 |
| 2407.00 | 1.83 | 301.38 | 2404.47 | 25.30 | 26.14 | -78.82 | 0.12 |
| 2502.00 | 1.81 | 298.54 | 2499.42 | 26.79 | 27.65 | -81.44 | 0.10 |
| 2596.00 | 1.92 | 292.60 | 2593.37 | 28.07 | 28.97 | -84.21 | 0.24 |
| 2690.00 | 1.32 | 263.35 | 2687.34 | 28.53 | 29.45 | -86.74 | 1.07 |
| 2784.00 | 1.48 | 268.01 | 2781.31 | 28.34 | 29.29 | -89.02 | 0.21 |
| 2878.00 | 0.45 | 338.62 | 2875.30 | 28.62 | 29.58 | -90.36 | 1.48 |
| 2972.00 | 0.24 | 344.36 | 2969.30 | 29.15 | 30.12 | -90.55 | 0.22 |
| 3068.00 | 0.20 | 227.51 | 3065.30 | 29.23 | 30.20 | -90.73 | 0.40 |
| 3160.00 | 0.39 | 240.94 | 3157.29 | 28.97 | 29.94 | -91.13 | 0.22 |
| 3254.00 | 0.42 | 264.65 | 3251.29 | 28.77 | 29.75 | -91.75 | 0.18 |
| 3348.00 | 0.77 | 126.90 | 3345.29 | 28.36 | 29.34 | -91.58 | 1.19 |
| 3440.00 | 0.74 | 111.18 | 3437.28 | 27.78 | 28.75 | -90.53 | 0.23 |
| 3534.00 | 0.62 | 155.27 | 3531.28 | 27.11 | 28.06 | -89.75 | 0.56 |
| 3628.00 | 0.84 | 167.11 | 3625.27 | 25.97 | 26.93 | -89.38 | 0.28 |
| 3723.00 | 0.90 | 168.24 | 3720.26 | 24.57 | 25.52 | -89.07 | 0.07 |

| MD ft | Inc deg | Azim deg | TVD ft | VS ft | +N/-S ft | +E/-W ft | DLS °/100ft |
|----------|------------|-------------|-----------|----------|-------------|-------------|----------------|
| 3816.00 | 0.18 | 179.42 | 3813.25 | 23.71 | 24.66 | -88.92 | 0.78 |
| 3909.00 | 0.26 | 344.04 | 3906.25 | 23.76 | 24.71 | -88.98 | 0.47 |
| 4004.00 | 0.17 | 324.78 | 4001.25 | 24.08 | 25.03 | -89.12 | 0.12 |
| 4099.00 | 0.50 | 97.23 | 4096.25 | 24.14 | 25.09 | -88.79 | 0.66 |
| 4193.00 | 0.17 | 83.26 | 4190.25 | 24.11 | 25.05 | -88.24 | 0.36 |
| 4287.00 | 0.26 | 239.00 | 4284.25 | 24.02 | 24.96 | -88.29 | 0.45 |
| 4382.00 | 0.56 | 287.62 | 4379.25 | 24.04 | 24.99 | -88.91 | 0.46 |
| 4476.00 | 0.62 | 307.56 | 4473.24 | 24.48 | 25.43 | -89.75 | 0.23 |
| 4571.00 | 0.93 | 311.65 | 4568.23 | 25.29 | 26.26 | -90.73 | 0.33 |
| 4664.00 | 0.85 | 309.56 | 4661.22 | 26.22 | 27.20 | -91.83 | 0.09 |
| 4758.00 | 0.75 | 322.41 | 4755.21 | 27.14 | 28.13 | -92.74 | 0.22 |
| 4852.00 | 0.62 | 283.70 | 4849.21 | 27.74 | 28.73 | -93.61 | 0.50 |
| 4947.00 | 0.49 | 300.89 | 4944.20 | 28.06 | 29.06 | -94.45 | 0.22 |
| 5042.00 | 0.43 | 303.46 | 5039.20 | 28.45 | 29.47 | -95.09 | 0.07 |
| 5135.00 | 0.33 | 151.65 | 5132.20 | 28.40 | 29.42 | -95.25 | 0.79 |
| 5256.00 | 0.83 | 131.57 | 5253.19 | 27.52 | 28.53 | -94.43 | 0.44 |
| 5350.00 | 0.78 | 136.86 | 5347.18 | 26.61 | 27.61 | -93.48 | 0.09 |
| 5445.00 | 0.36 | 118.95 | 5442.18 | 26.00 | 26.99 | -92.78 | 0.48 |
| 5540.00 | 0.35 | 93.27 | 5537.17 | 25.84 | 26.83 | -92.23 | 0.17 |
| 5633.00 | 0.39 | 76.98 | 5630.17 | 25.90 | 26.88 | -91.64 | 0.12 |

| MD ft | Inc deg | Azim deg | TVD ft | VS ft | +N/-S ft | +E/-W ft | DLS °/100ft |
|----------|------------|-------------|-----------|----------|-------------|-------------|----------------|
| 5725.00 | 0.47 | 65.20 | 5722.17 | 26.14 | 27.11 | -90.99 | 0.13 |
| 5818.00 | 0.83 | 59.44 | 5815.16 | 26.65 | 27.61 | -90.07 | 0.39 |
| 5913.00 | 1.47 | 65.46 | 5910.14 | 27.52 | 28.46 | -88.37 | 0.69 |
| 6005.00 | 1.93 | 103.69 | 6002.11 | 27.67 | 28.59 | -85.79 | 1.30 |
| 6099.00 | 1.41 | 112.23 | 6096.07 | 26.89 | 27.78 | -83.18 | 0.61 |
| 6192.00 | 1.28 | 101.24 | 6189.04 | 26.28 | 27.14 | -81.10 | 0.31 |
| 6286.00 | 0.50 | 98.29 | 6283.03 | 26.03 | 26.88 | -79.66 | 0.83 |
| 6381.00 | 0.28 | 267.80 | 6378.03 | 25.96 | 26.81 | -79.49 | 0.83 |
| 6475.00 | 0.44 | 350.05 | 6472.03 | 26.30 | 27.15 | -79.78 | 0.52 |
| 6568.00 | 0.57 | 20.06 | 6565.02 | 27.09 | 27.94 | -79.68 | 0.31 |
| 6662.00 | 3.78 | 2.74 | 6658.94 | 30.63 | 31.47 | -79.38 | 3.44 |
| 6756.00 | 14.32 | 5.79 | 6751.64 | 45.34 | 46.17 | -78.05 | 11.22 |
| 6850.00 | 21.27 | 3.08 | 6841.09 | 73.98 | 74.79 | -75.96 | 7.44 |
| 6944.00 | 28.13 | 1.51 | 6926.44 | 113.22 | 114.02 | -74.46 | 7.34 |
| 7038.00 | 35.80 | 0.03 | 7006.13 | 162.95 | 163.74 | -73.86 | 8.20 |
| 7132.00 | 43.35 | 357.03 | 7078.54 | 222.73 | 223.55 | -75.52 | 8.28 |
| 7227.00 | 50.99 | 359.40 | 7143.08 | 292.28 | 293.12 | -77.60 | 8.25 |
| 7321.00 | 58.18 | 1.25 | 7197.53 | 368.83 | 369.67 | -77.11 | 7.82 |
| 7416.00 | 64.68 | 358.81 | 7242.94 | 452.20 | 453.05 | -77.13 | 7.20 |
| 7510.00 | 72.84 | 0.21 | 7276.97 | 539.72 | 540.58 | -77.85 | 8.79 |

| MD ft | Inc deg | Azim deg | TVD ft | VS ft | +N/-S ft | +E/-W ft | DLS °/100ft |
|----------|------------|-------------|-----------|----------|-------------|-------------|----------------|
| 7604.00 | 80.05 | 0.55 | 7298.99 | 631.04 | 631.90 | -77.24 | 7.68 |
| 7700.00 | 87.72 | 0.52 | 7309.22 | 726.42 | 727.28 | -76.35 | 7.99 |
| 7793.00 | 87.88 | 359.98 | 7312.79 | 819.35 | 820.21 | -75.94 | 0.61 |
| 7887.00 | 88.42 | 0.73 | 7315.82 | 913.30 | 914.16 | -75.37 | 0.98 |
| 7982.00 | 88.22 | 0.30 | 7318.60 | 1008.26 | 1009.11 | -74.52 | 0.50 |
| 8076.00 | 89.06 | 0.46 | 7320.83 | 1102.23 | 1103.08 | -73.90 | 0.91 |
| 8170.00 | 89.16 | 0.55 | 7322.29 | 1196.22 | 1197.07 | -73.07 | 0.14 |
| 8264.00 | 89.56 | 359.84 | 7323.33 | 1290.21 | 1291.06 | -72.76 | 0.87 |
| 8358.00 | 88.99 | 359.85 | 7324.52 | 1384.20 | 1385.05 | -73.01 | 0.61 |
| 8452.00 | 89.09 | 0.90 | 7326.09 | 1478.18 | 1479.04 | -72.40 | 1.11 |
| 8546.00 | 89.53 | 0.94 | 7327.22 | 1572.17 | 1573.02 | -70.89 | 0.47 |
| 8640.00 | 89.43 | 1.07 | 7328.07 | 1666.17 | 1667.00 | -69.24 | 0.17 |
| 8735.00 | 90.23 | 1.44 | 7328.35 | 1761.16 | 1761.97 | -67.16 | 0.93 |
| 8829.00 | 90.40 | 1.31 | 7327.83 | 1855.15 | 1855.94 | -64.90 | 0.23 |
| 8924.00 | 91.18 | 1.59 | 7326.52 | 1950.13 | 1950.90 | -62.50 | 0.86 |
| 9018.00 | 90.71 | 1.13 | 7324.98 | 2044.11 | 2044.87 | -60.28 | 0.70 |
| 9113.00 | 90.91 | 0.71 | 7323.64 | 2139.10 | 2139.84 | -58.75 | 0.49 |
| 9207.00 | 90.40 | 359.44 | 7322.57 | 2233.08 | 2233.83 | -58.62 | 1.46 |
| 9302.00 | 91.41 | 359.70 | 7321.06 | 2328.06 | 2328.82 | -59.34 | 1.09 |
| 9396.00 | 89.66 | 0.53 | 7320.18 | 2422.04 | 2422.81 | -59.15 | 2.06 |

| MD ft | Inc deg | Azim deg | TVD ft | VS ft | +N/-S ft | +E/-W ft | DLS °/100ft |
|----------|------------|-------------|-----------|----------|-------------|-------------|----------------|
| 9491.00 | 88.99 | 0.31 | 7321.30 | 2517.04 | 2517.80 | -58.45 | 0.74 |
| 9585.00 | 89.46 | 0.98 | 7322.56 | 2611.03 | 2611.79 | -57.39 | 0.87 |
| 9680.00 | 90.64 | 1.32 | 7322.48 | 2706.02 | 2706.76 | -55.49 | 1.28 |
| 9773.00 | 90.67 | 0.99 | 7321.42 | 2799.01 | 2799.74 | -53.62 | 0.35 |
| 9867.00 | 90.47 | 0.24 | 7320.48 | 2893.00 | 2893.73 | -52.61 | 0.82 |
| 9962.00 | 90.64 | 0.60 | 7319.56 | 2988.00 | 2988.72 | -51.90 | 0.42 |
| 10055.00 | 91.41 | 0.31 | 7317.90 | 3080.98 | 3081.70 | -51.16 | 0.89 |
| 10149.00 | 91.45 | 0.45 | 7315.56 | 3174.95 | 3175.67 | -50.54 | 0.15 |
| 10244.00 | 90.03 | 359.10 | 7314.34 | 3269.93 | 3270.66 | -50.91 | 2.06 |
| 10337.00 | 89.40 | 358.20 | 7314.80 | 3362.87 | 3363.63 | -53.10 | 1.19 |
| 10431.00 | 89.50 | 359.18 | 7315.71 | 3456.82 | 3457.60 | -55.25 | 1.06 |
| 10524.00 | 90.44 | 359.38 | 7315.76 | 3549.79 | 3550.59 | -56.42 | 1.03 |
| 10619.00 | 90.87 | 359.33 | 7314.68 | 3644.76 | 3645.58 | -57.49 | 0.46 |
| 10714.00 | 90.34 | 358.23 | 7313.68 | 3739.70 | 3740.55 | -59.51 | 1.30 |
| 10807.00 | 89.09 | 357.78 | 7314.14 | 3832.60 | 3833.49 | -62.76 | 1.42 |
| 10901.00 | 89.66 | 359.21 | 7315.16 | 3926.53 | 3927.45 | -65.23 | 1.64 |
| 10996.00 | 90.77 | 0.43 | 7314.80 | 4021.52 | 4022.44 | -65.52 | 1.74 |
| 11091.00 | 91.04 | 0.14 | 7313.29 | 4116.51 | 4117.43 | -65.06 | 0.42 |
| 11183.00 | 90.44 | 0.14 | 7312.11 | 4208.49 | 4209.42 | -64.83 | 0.66 |
| 11277.00 | 90.34 | 1.52 | 7311.48 | 4302.49 | 4303.41 | -63.47 | 1.46 |

| MD ft | Inc deg | Azim deg | TVD ft | VS ft | +N/-S ft | +E/-W ft | DLS °/100ft |
|----------|------------|-------------|-----------|----------|-------------|-------------|----------------|
| 11371.00 | 90.37 | 1.58 | 7310.90 | 4396.48 | 4397.37 | -60.93 | 0.07 |
| 11464.00 | 90.74 | 0.89 | 7310.00 | 4489.46 | 4490.35 | -58.92 | 0.84 |
| 11558.00 | 91.14 | 1.00 | 7308.46 | 4583.45 | 4584.32 | -57.37 | 0.44 |
| 11651.00 | 90.71 | 0.60 | 7306.96 | 4676.44 | 4677.30 | -56.07 | 0.63 |
| 11744.00 | 88.99 | 0.84 | 7307.20 | 4769.43 | 4770.29 | -54.90 | 1.86 |
| 11839.00 | 89.46 | 1.38 | 7308.48 | 4864.42 | 4865.26 | -53.06 | 0.76 |
| 11932.00 | 89.83 | 1.34 | 7309.06 | 4957.41 | 4958.23 | -50.86 | 0.40 |
| 12027.00 | 89.60 | 1.60 | 7309.53 | 5052.40 | 5053.20 | -48.42 | 0.37 |
| 12122.00 | 89.46 | 0.86 | 7310.31 | 5147.39 | 5148.17 | -46.38 | 0.79 |
| 12215.00 | 89.16 | 0.63 | 7311.43 | 5240.38 | 5241.16 | -45.17 | 0.41 |
| 12310.00 | 89.36 | 359.93 | 7312.65 | 5335.37 | 5336.15 | -44.71 | 0.77 |
| 12403.00 | 90.30 | 1.20 | 7312.92 | 5428.37 | 5429.14 | -43.79 | 1.70 |
| 12498.00 | 91.11 | 1.14 | 7311.75 | 5523.36 | 5524.11 | -41.86 | 0.85 |
| 12592.00 | 89.93 | 0.87 | 7310.90 | 5617.35 | 5618.09 | -40.21 | 1.28 |
| 12687.00 | 89.93 | 359.23 | 7311.01 | 5712.34 | 5713.09 | -40.12 | 1.72 |
| 12781.00 | 89.63 | 0.45 | 7311.37 | 5806.33 | 5807.09 | -40.39 | 1.33 |
| 12874.00 | 90.27 | 0.66 | 7311.45 | 5899.33 | 5900.08 | -39.49 | 0.72 |
| 12969.00 | 89.93 | 359.67 | 7311.29 | 5994.32 | 5995.08 | -39.21 | 1.10 |
| 13064.00 | 89.87 | 0.11 | 7311.45 | 6089.32 | 6090.08 | -39.40 | 0.46 |
| 13157.00 | 90.13 | 359.00 | 7311.45 | 6182.30 | 6183.08 | -40.12 | 1.23 |

| MD ft | Inc deg | Azim deg | TVD ft | VS ft | +N/-S ft | +E/-W ft | DLS °/100ft |
|----------|------------|-------------|-----------|----------|-------------|-------------|----------------|
| 13252.00 | 89.63 | 359.60 | 7311.65 | 6277.27 | 6278.07 | -41.29 | 0.83 |
| 13347.00 | 91.21 | 1.67 | 7310.95 | 6372.26 | 6373.05 | -40.23 | 2.74 |
| 13441.00 | 91.31 | 1.92 | 7308.89 | 6466.22 | 6466.98 | -37.29 | 0.28 |
| 13534.00 | 91.51 | 1.20 | 7306.60 | 6559.18 | 6559.92 | -34.76 | 0.80 |
| 13629.00 | 90.17 | 1.30 | 7305.21 | 6654.16 | 6654.89 | -32.69 | 1.42 |
| 13723.00 | 90.54 | 0.95 | 7304.64 | 6748.15 | 6748.86 | -30.85 | 0.54 |
| 13817.00 | 90.03 | 1.08 | 7304.17 | 6842.15 | 6842.85 | -29.20 | 0.55 |
| 13910.00 | 89.80 | 0.72 | 7304.30 | 6935.15 | 6935.84 | -27.74 | 0.46 |
| 14005.00 | 89.93 | 0.44 | 7304.53 | 7030.15 | 7030.83 | -26.78 | 0.32 |
| 14100.00 | 90.07 | 359.83 | 7304.53 | 7125.14 | 7125.83 | -26.56 | 0.65 |
| 14195.00 | 90.13 | 358.89 | 7304.36 | 7220.12 | 7220.82 | -27.62 | 1.00 |
| 14288.00 | 90.40 | 1.84 | 7303.92 | 7313.11 | 7313.81 | -27.02 | 3.19 |
| 14383.00 | 90.47 | 0.71 | 7303.20 | 7408.10 | 7408.78 | -24.91 | 1.19 |
| 14477.00 | 90.34 | 359.26 | 7302.54 | 7502.09 | 7502.78 | -24.93 | 1.55 |
| 14572.00 | 89.93 | 1.14 | 7302.31 | 7597.08 | 7597.77 | -24.60 | 2.03 |
| 14666.00 | 90.81 | 1.07 | 7301.71 | 7691.07 | 7691.75 | -22.78 | 0.93 |
| 14759.00 | 90.64 | 1.35 | 7300.54 | 7784.06 | 7784.72 | -20.81 | 0.34 |
| 14851.00 | 90.81 | 3.49 | 7299.38 | 7876.00 | 7876.63 | -16.93 | 2.34 |
| 14946.00 | 90.40 | 1.82 | 7298.38 | 7970.93 | 7971.52 | -12.53 | 1.81 |
| 15039.00 | 90.13 | 1.41 | 7297.94 | 8063.92 | 8064.48 | -9.92 | 0.53 |

| MD ft | Inc deg | Azim deg | TVD ft | VS ft | +N/-S ft | +E/-W ft | DLS °/100ft |
|----------|------------|-------------|-----------|----------|-------------|-------------|----------------|
| 15133.00 | 90.64 | 1.30 | 7297.31 | 8157.91 | 8158.45 | -7.69 | 0.55 |
| 15227.00 | 89.87 | 359.67 | 7296.89 | 8251.90 | 8252.44 | -6.89 | 1.92 |
| 15319.00 | 90.00 | 0.62 | 7297.00 | 8343.90 | 8344.44 | -6.66 | 1.04 |
| 15413.00 | 89.06 | 359.64 | 7297.77 | 8437.89 | 8438.44 | -6.45 | 1.44 |

5" = 100' MD