

**Cathedral Energy Services**

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405-261-6011 (Office)  
405-261-6188 (Fax)

**Sam 3M-25H-M166W****Scale 5":100' - MD****9/16/2018 8:12 AM****Oper. Company:** Crestone Peak Resources**Well:** Sam 3M-25H-M166W**Field:** DJ Basin**Rig:** Ensign 140**Well ID:** 05-123-46130-00**Job Number:** 185268

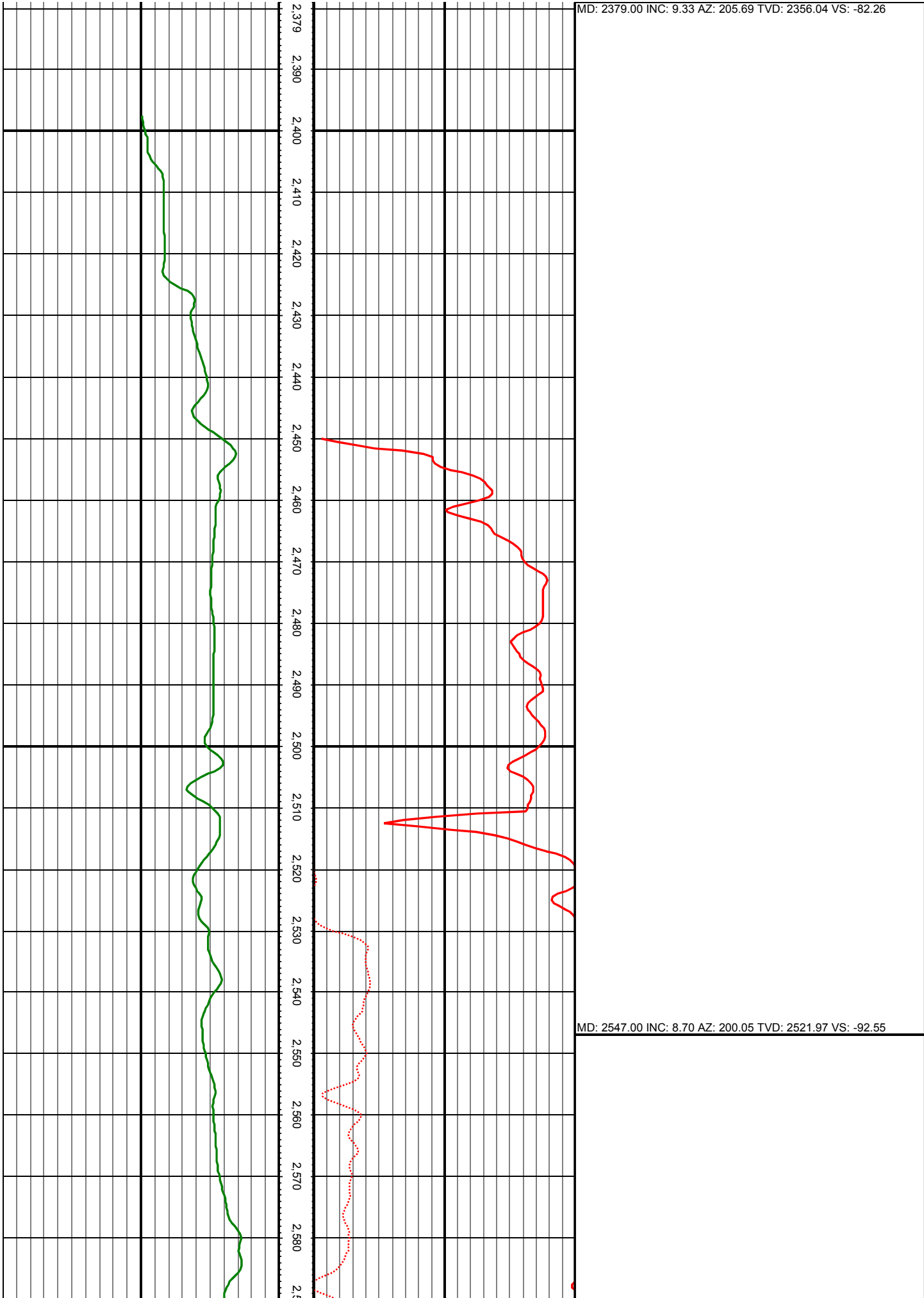
**Notes:** Gamma Ray Log  
Section Plan: 89.92°  
Datum: NAD1983 (NADCON CONUS)  
Magnetic North: 8.18°  
Grid Convergence: -.51°  
Gamma Averaging: 7% Smoothing

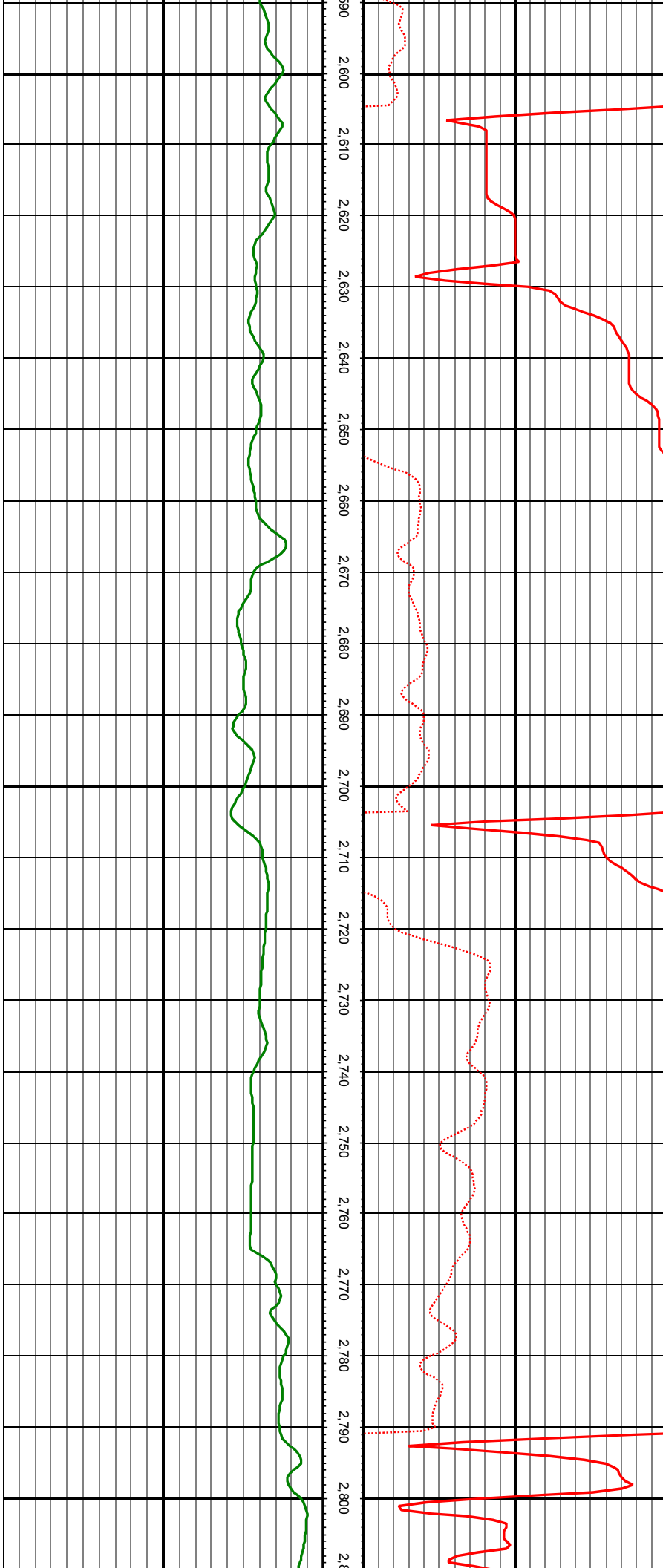
**State:** Colorado**County:** Weld**Country:** USA**Location:** S25-T1N-R66W**Start Date:** 09/13/2018 03:30:00**End Date:** 09/16/2018 02:00:00**Latitude:** 40.018565**Longitude:** -104.717756**Elev GL:** 5086.00**Elev DF:** 5109.00**Elev KB:** 5109.00**Notes:** Log & Survey Depths Relative to Kelly Bushing (KB) Depth**Operator 1:** Daniel Stevens**Operator 2:** Riley Rasmussen**Notes:** Maximun Temperature: 221.00 °f

| Tool Run Data       | Run #1                         | Run #2                        | Run #3 | Run #4 | Run #5 |
|---------------------|--------------------------------|-------------------------------|--------|--------|--------|
| Tool S/N            | DIA-06207                      | BTDM-1528                     |        |        |        |
| Bit Size            | 8.50                           | 8.50                          |        |        |        |
| Cal Factor          | 5.61                           | 5.64                          |        |        |        |
| Survey Offset       | 64.00                          | 60.00                         |        |        |        |
| Gamma Offset        | 58.84                          | 43.35                         |        |        |        |
| Resistivity Offset  | 0.00                           | 0.00                          |        |        |        |
| Start Depth         | 2440.00                        | 4407.00                       |        |        |        |
| StartDate           | 9/13/2018                      | 9/13/2018                     |        |        |        |
| StartTime           | 03:30                          | 21:00                         |        |        |        |
| EndDepth            | 4387.00                        | 11925.00                      |        |        |        |
| EndDate             | 9/13/2018                      | 9/16/2018                     |        |        |        |
| EndTime             | 19:30                          | 02:00                         |        |        |        |
| Mud Type            | INVERT                         | INVERT                        |        |        |        |
| Mud Weight          | 9.40 PPG                       | 9.40 PPG                      |        |        |        |
| Funnel Viscosity    | 52.00 SEC/QT                   | 46.00 SEC/QT                  |        |        |        |
| Plastic Viscosity   | 18.00 CP                       | 17.00 CP                      |        |        |        |
| Yield Point         | 12.00 LBS/100FT2               | 8.00 LBS/100FT2               |        |        |        |
| Gel Strength        | 9.00/12.00/13.00<br>LBS/100FT2 | 6.00/8.00/10.00<br>LBS/100FT2 |        |        |        |
| Solids Content      | 9.00 %                         | 7.90 %                        |        |        |        |
| Sand Content        | 0.01 %                         | 0.01 %                        |        |        |        |
| Mud Alkalinity      | 3.50 PPG                       | 3.50 PPG                      |        |        |        |
| Filtrate Alkalinity | 0.00 API                       | 0.00 API                      |        |        |        |
| Chlorides           | 31,000.00 MG/L                 | 33,000.00 MG/L                |        |        |        |
| Temperature         | 77.00° F                       | 212.00° F                     |        |        |        |

| Hole Data |         |          | Casing Data |      |         |
|-----------|---------|----------|-------------|------|---------|
| Size      | From    | To       | Size        | From | To      |
| 12.5      | 0.00    | 2424.00  | 9 5/8       | 0.00 | 2424.00 |
| 8.5       | 2424.00 | 11925.00 |             |      |         |

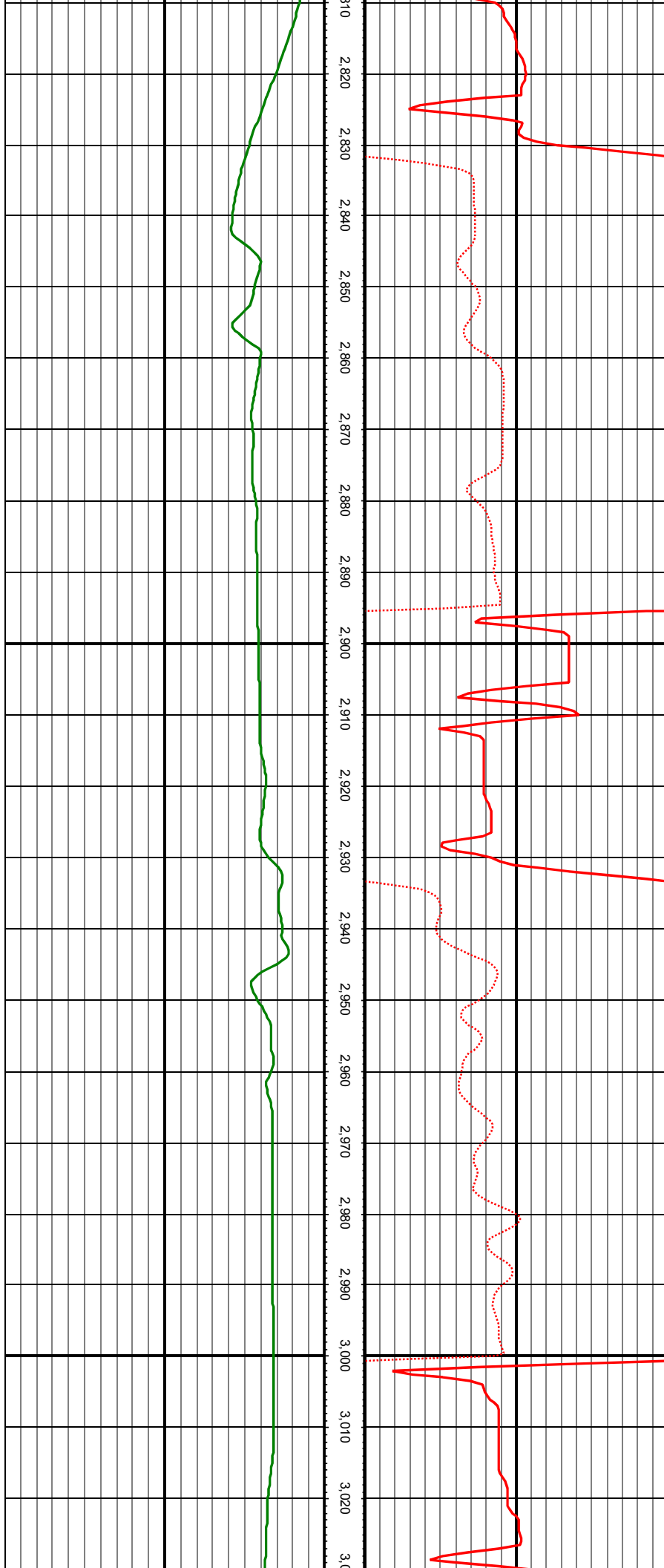
*All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not except in the case of gross or willful negligence on our part, be liable or responsible for any loss, cost damages or expenses incurred or sustained by anyone resulting from an interpretation made by any of our officers, agents, or employees.*





MD: 2642.00 INC: 9.71 AZ: 201.01 TVD: 2615.74 VS: -97.91

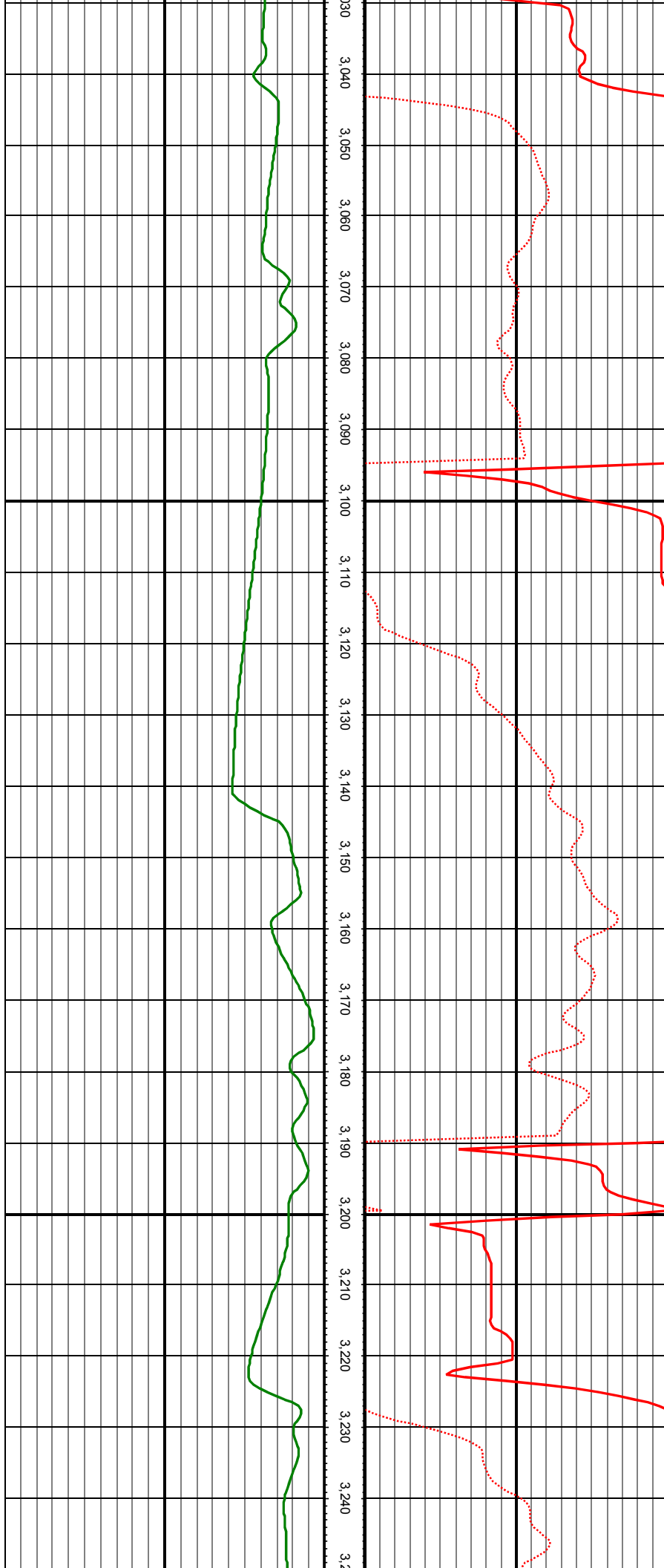
MD: 2736.00 INC: 9.14 AZ: 210.54 TVD: 2708.48 VS: -104.56



MD: 2841.00 INC: 8.83 AZ: 199.96 TVD: 2812.20 VS: -111.57

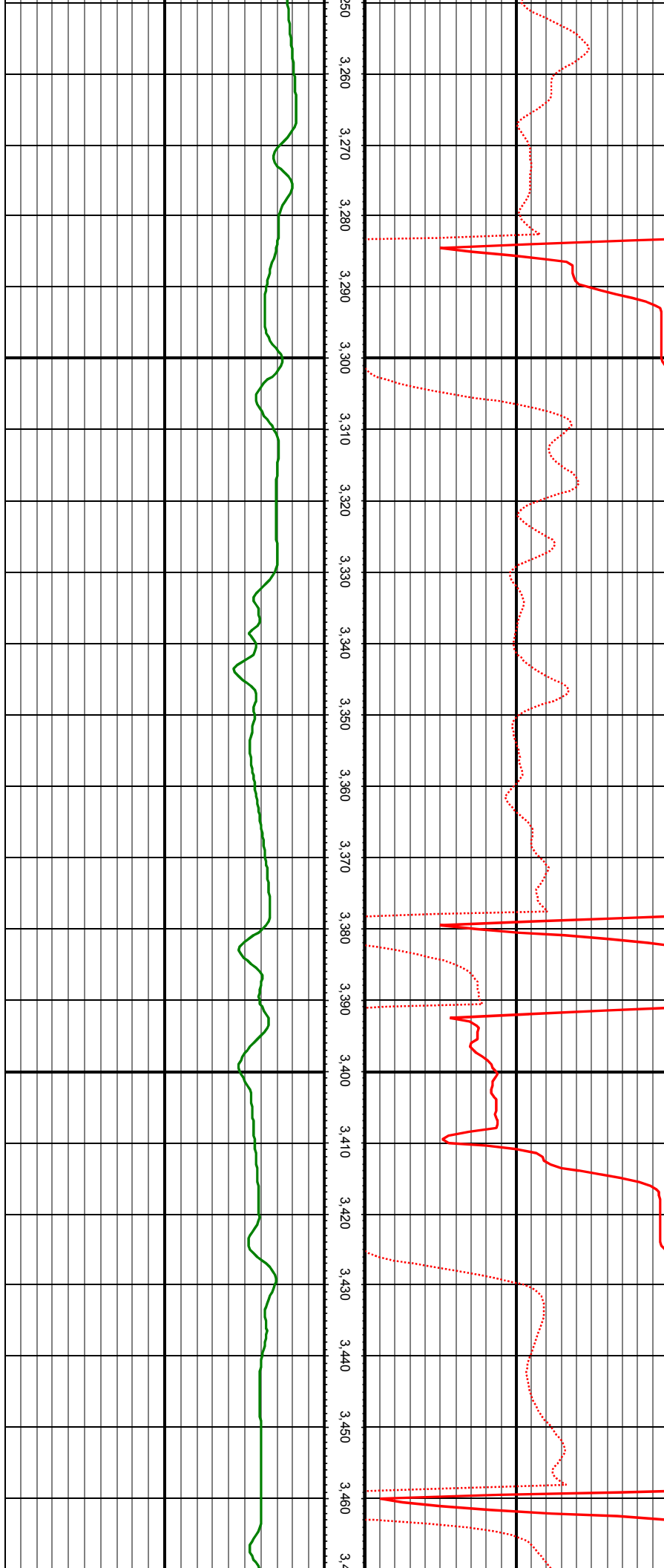
MD: 2936.00 INC: 8.57 AZ: 209.10 TVD: 2906.11 VS: -117.52

MD: 3030.00 INC: 9.76 AZ: 205.06 TVD: 2998.91 VS: -124.32



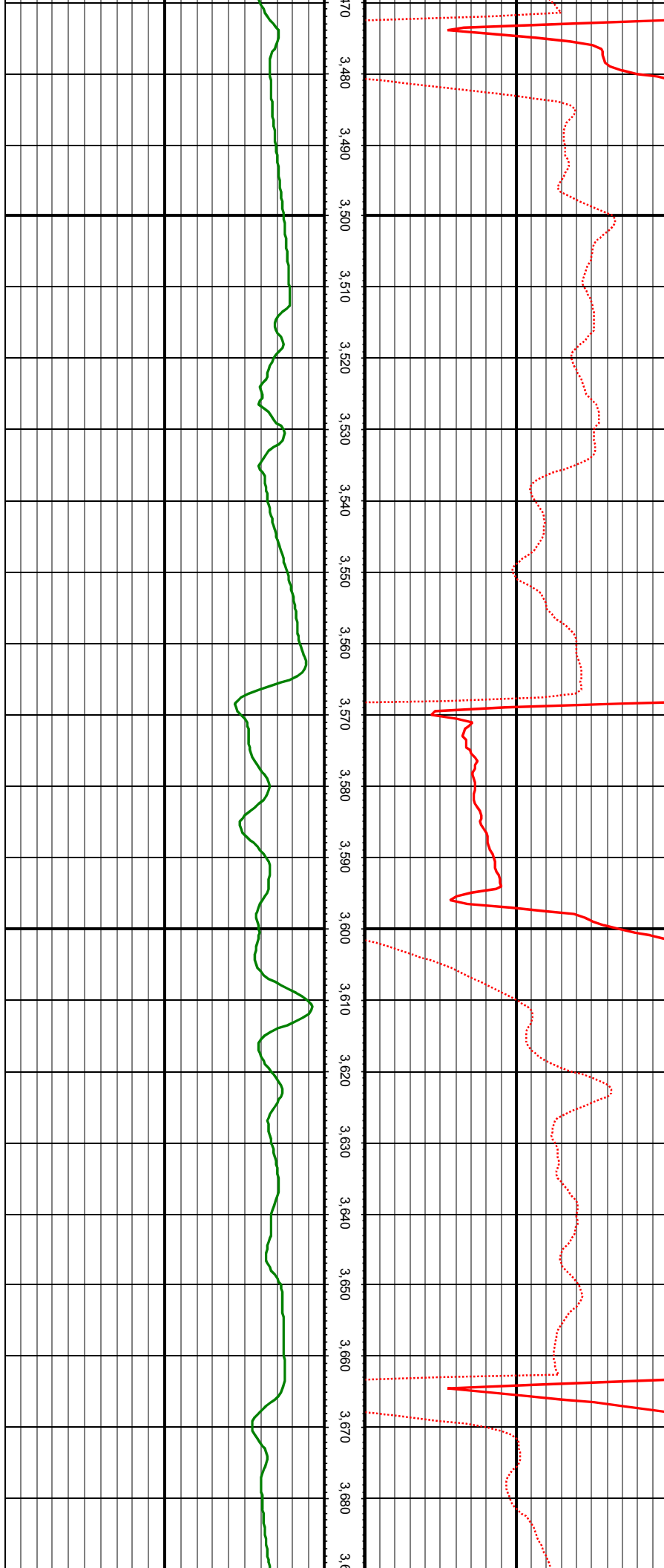
MD: 3125.00 INC: 9.32 AZ: 205.23 TVD: 3092.59 VS: -131.03

MD: 3219.00 INC: 9.05 AZ: 196.35 TVD: 3185.39 VS: -136.38



MD: 3314.00 INC: 8.61 AZ: 193.37 TVD: 3279.27 VS: -140.14

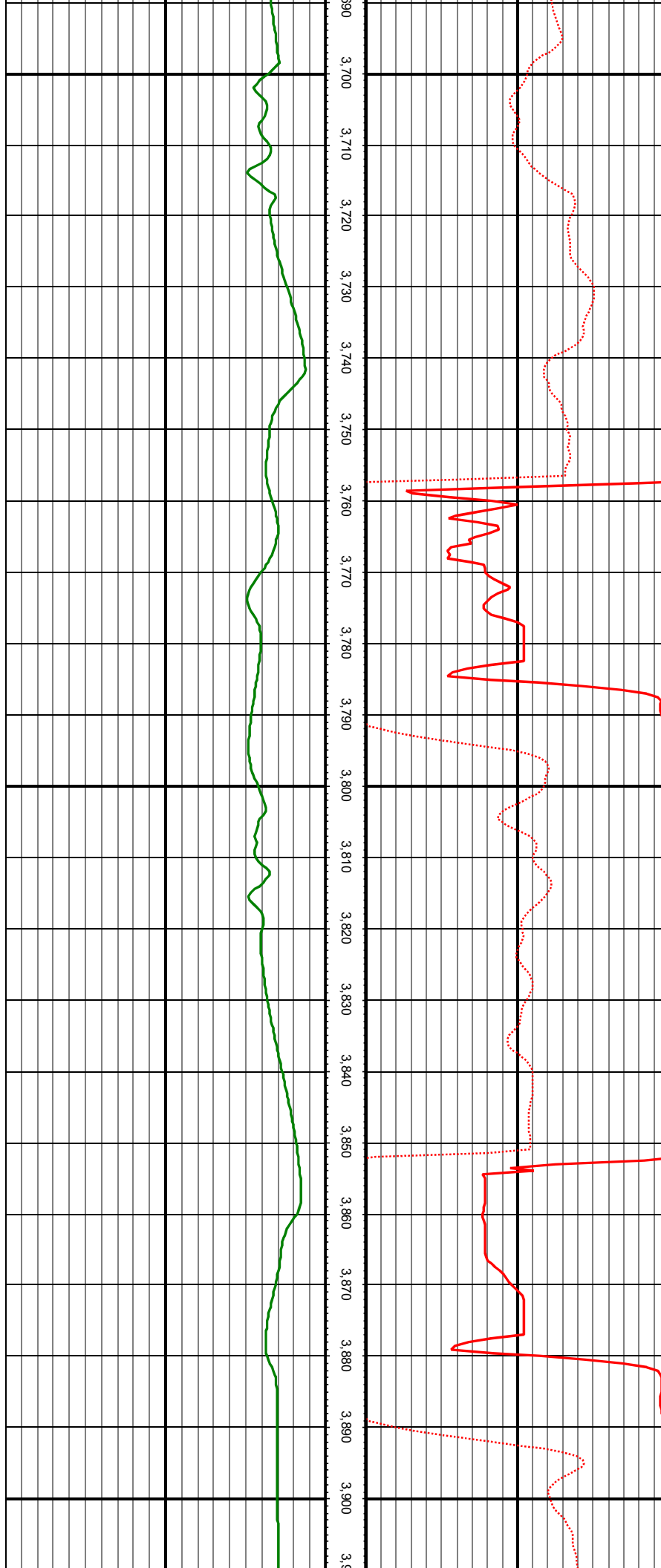
MD: 3409.00 INC: 9.14 AZ: 196.94 TVD: 3373.13 VS: -144.01



MD: 3504.00 INC: 8.53 AZ: 198.20 TVD: 3467.00 VS: -148.43

MD: 3599.00 INC: 10.02 AZ: 197.58 TVD: 3560.76 VS: -153.14

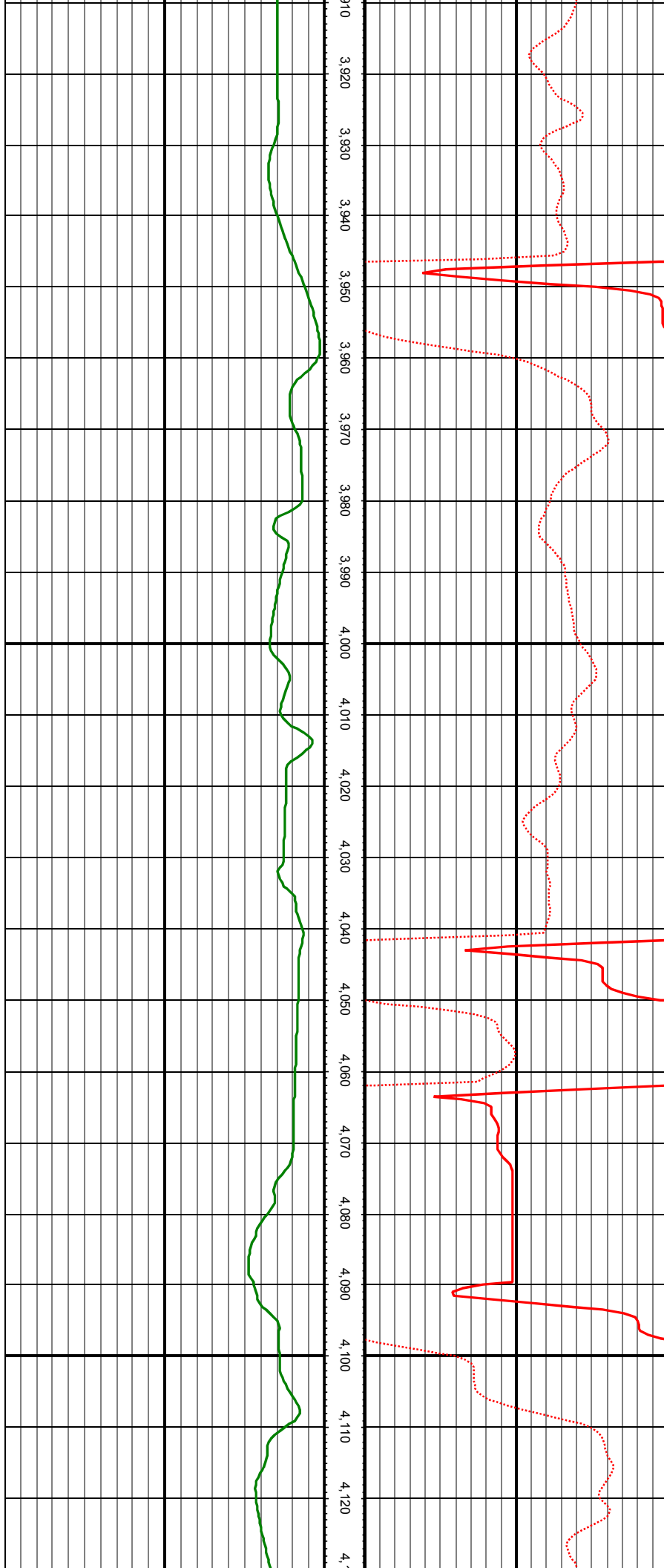
MD: 3693.00 INC: 9.27 AZ: 198.02 TVD: 3653.43 VS: -157.98



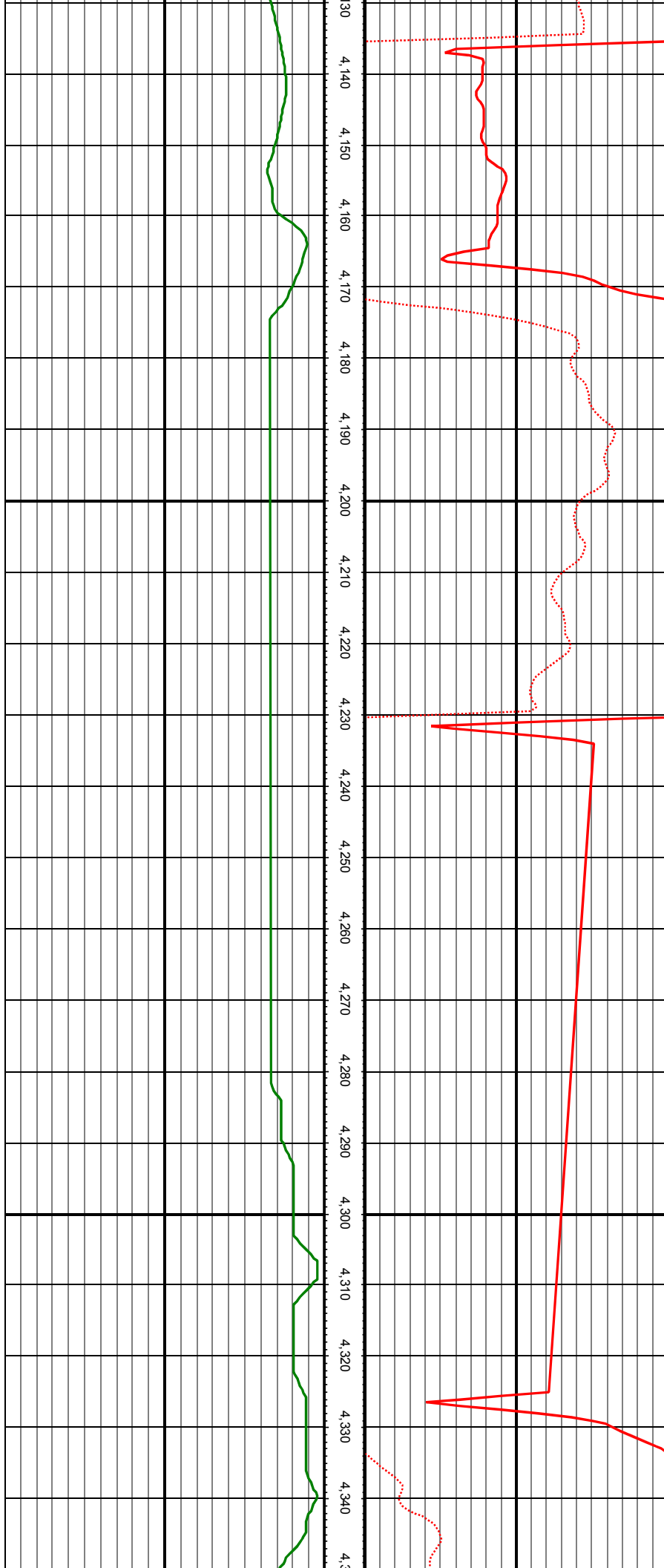
MD: 3787.00 INC: 7.38 AZ: 193.98 TVD: 3746.44 VS: -161.80

MD: 3882.00 INC: 9.01 AZ: 192.84 TVD: 3840.46 VS: -164.94





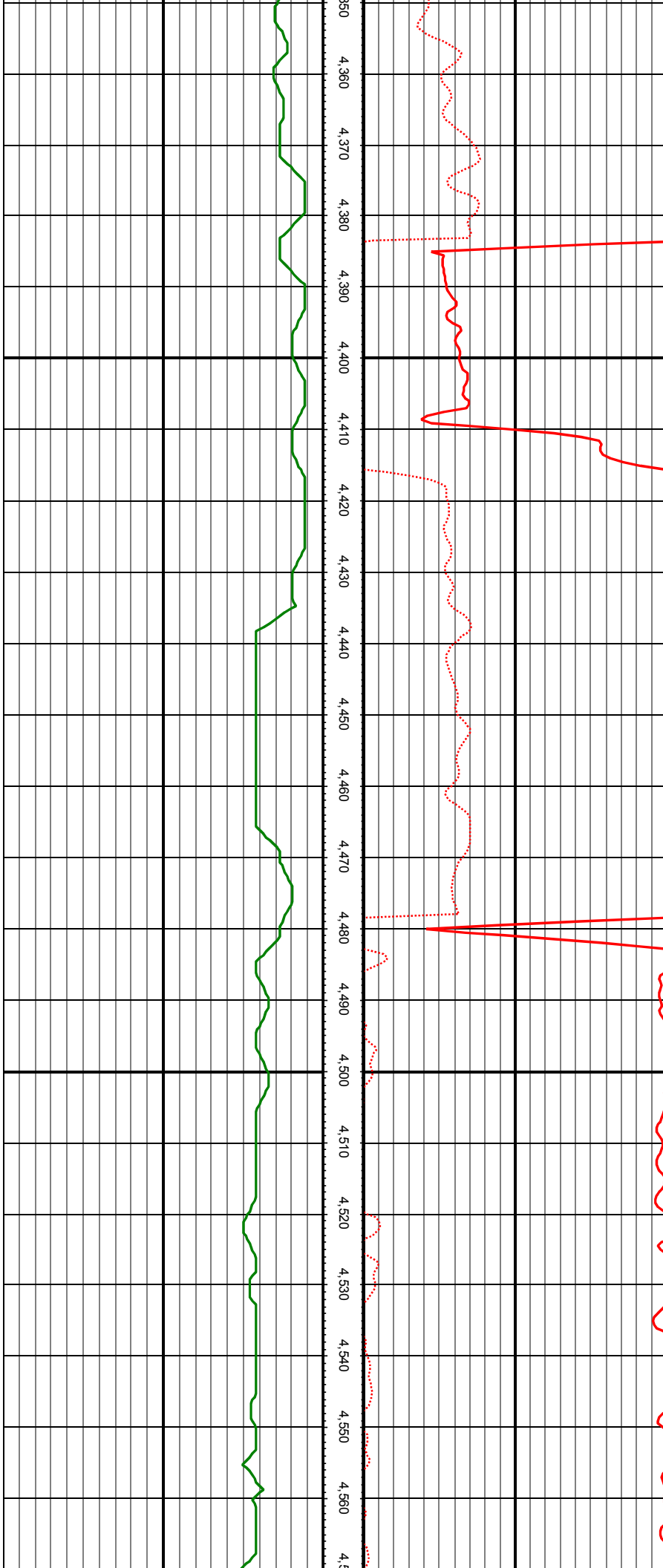
MD: 4071.00 INC: 7.87 AZ: 192.66 TVD: 4027.41 VS: -171.10



MD: 4166.00 INC: 11.12 AZ: 194.33 TVD: 4121.10 VS: -174.82

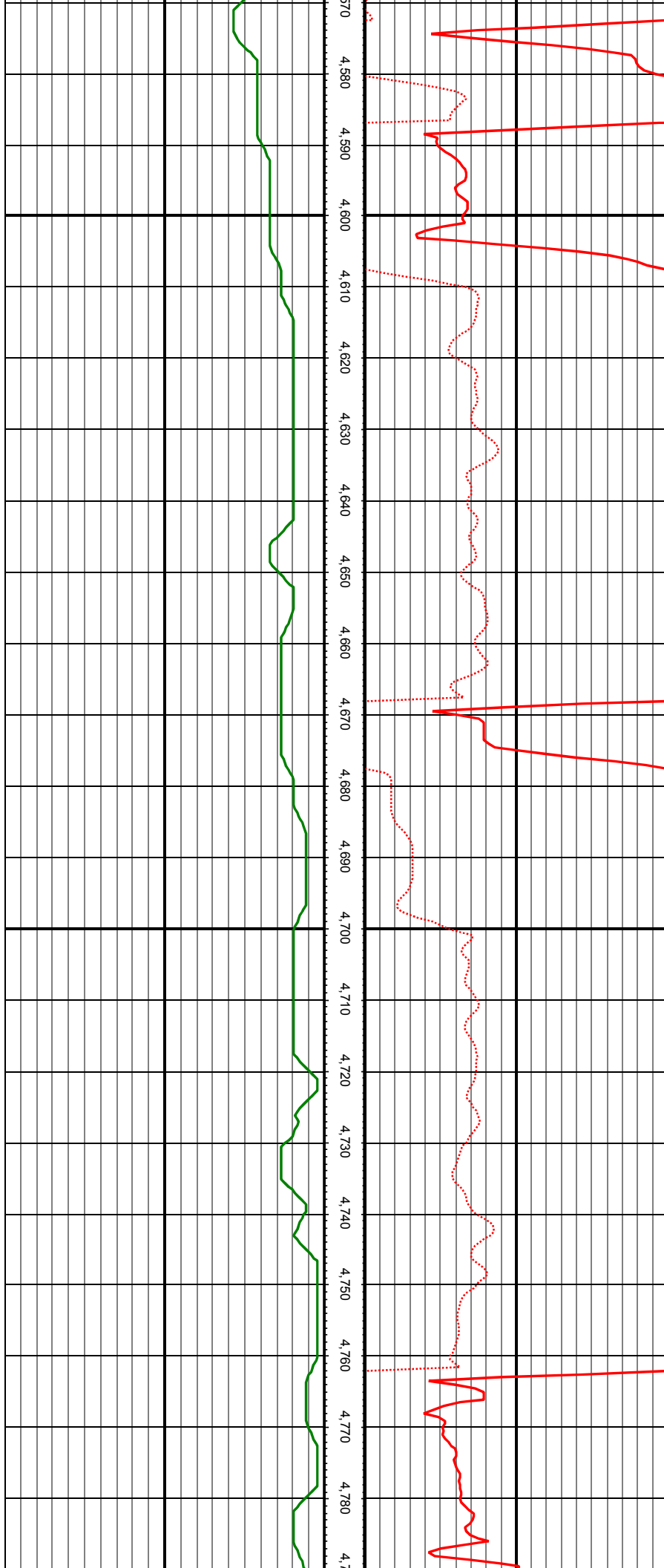
MD: 4233.00 INC: 10.46 AZ: 193.01 TVD: 4186.91 VS: -177.80

MD: 4327.00 INC: 8.30 AZ: 191.60 TVD: 4279.65 VS: -181.11



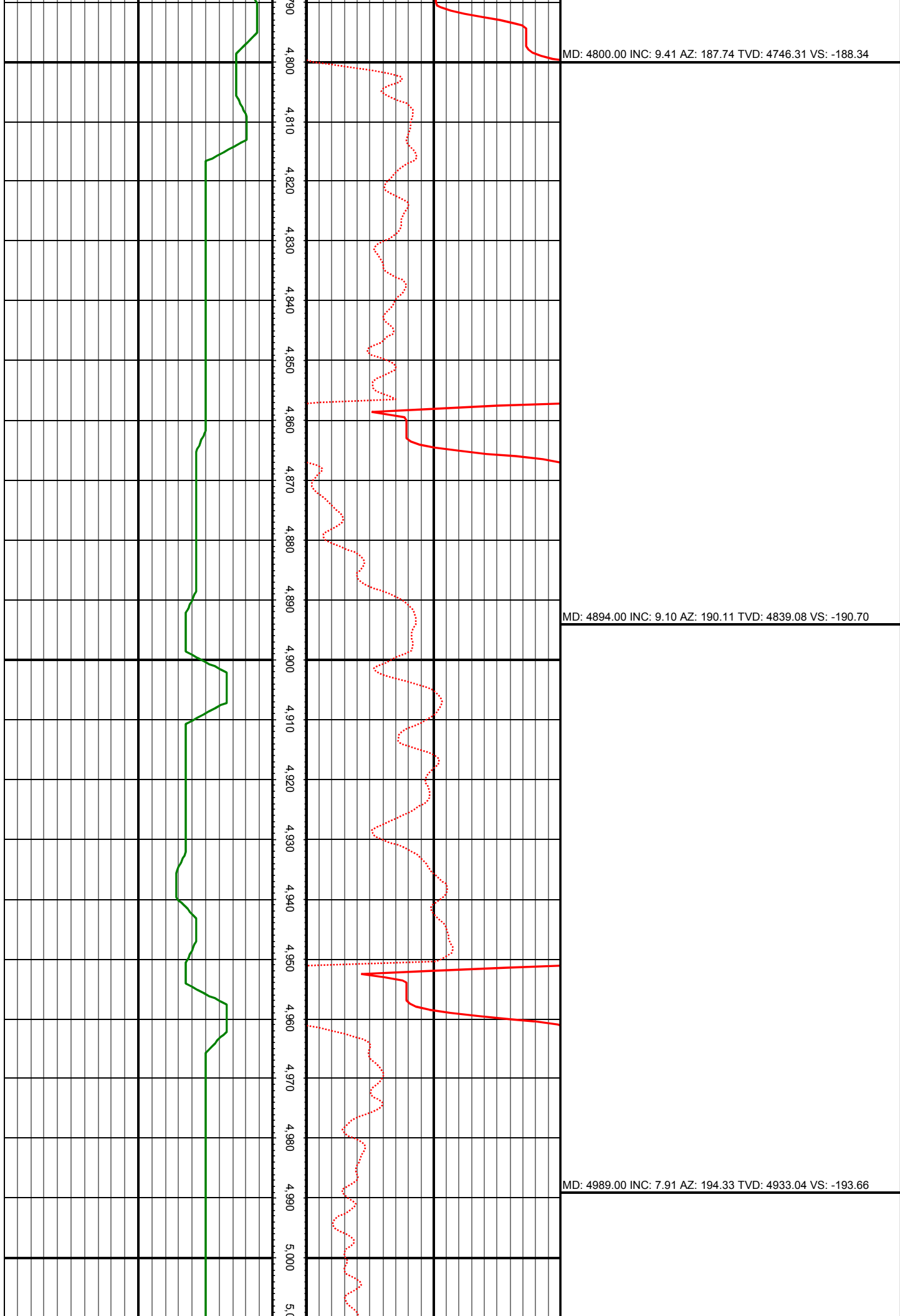
MD: 4422.00 INC: 9.89 AZ: 180.18 TVD: 4373.46 VS: -182.54

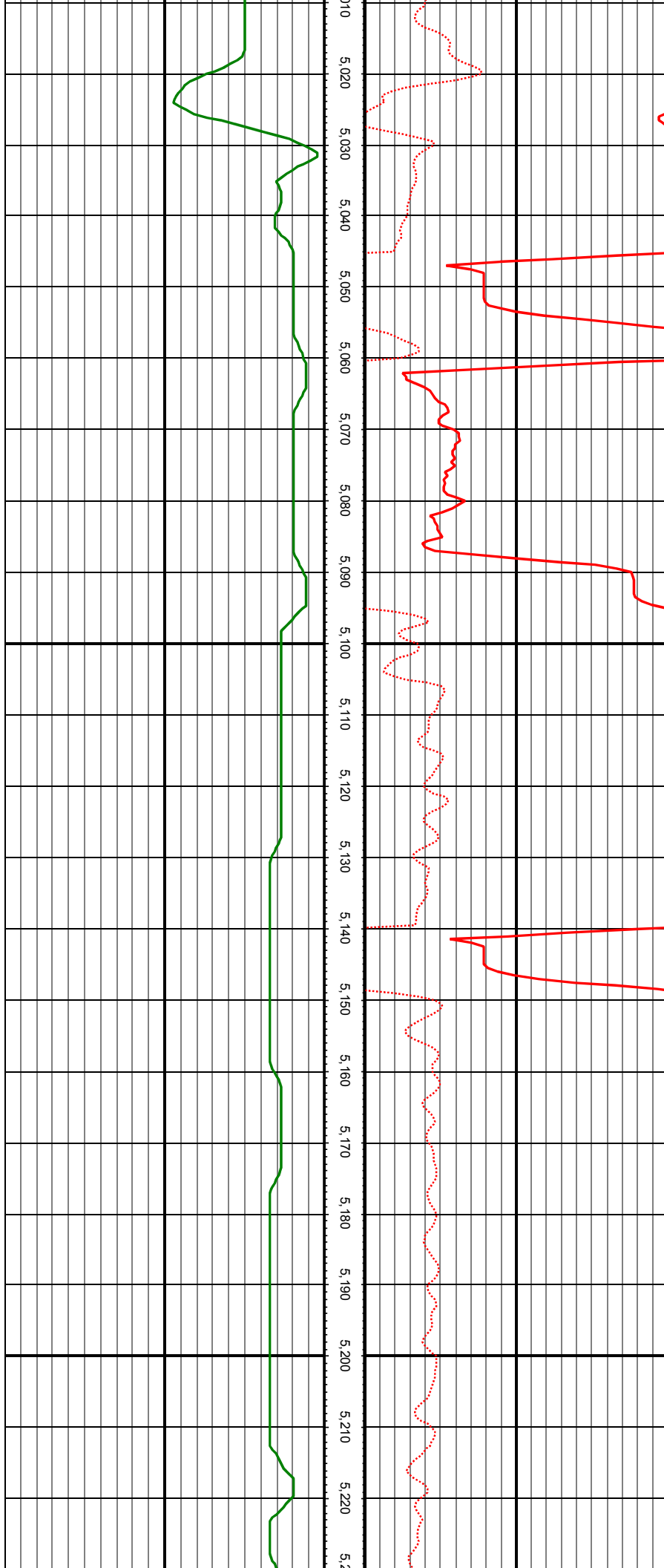
MD: 4516.00 INC: 9.49 AZ: 178.95 TVD: 4466.12 VS: -182.44



MD: 4611.00 INC: 9.80 AZ: 188.71 TVD: 4559.78 VS: -183.54

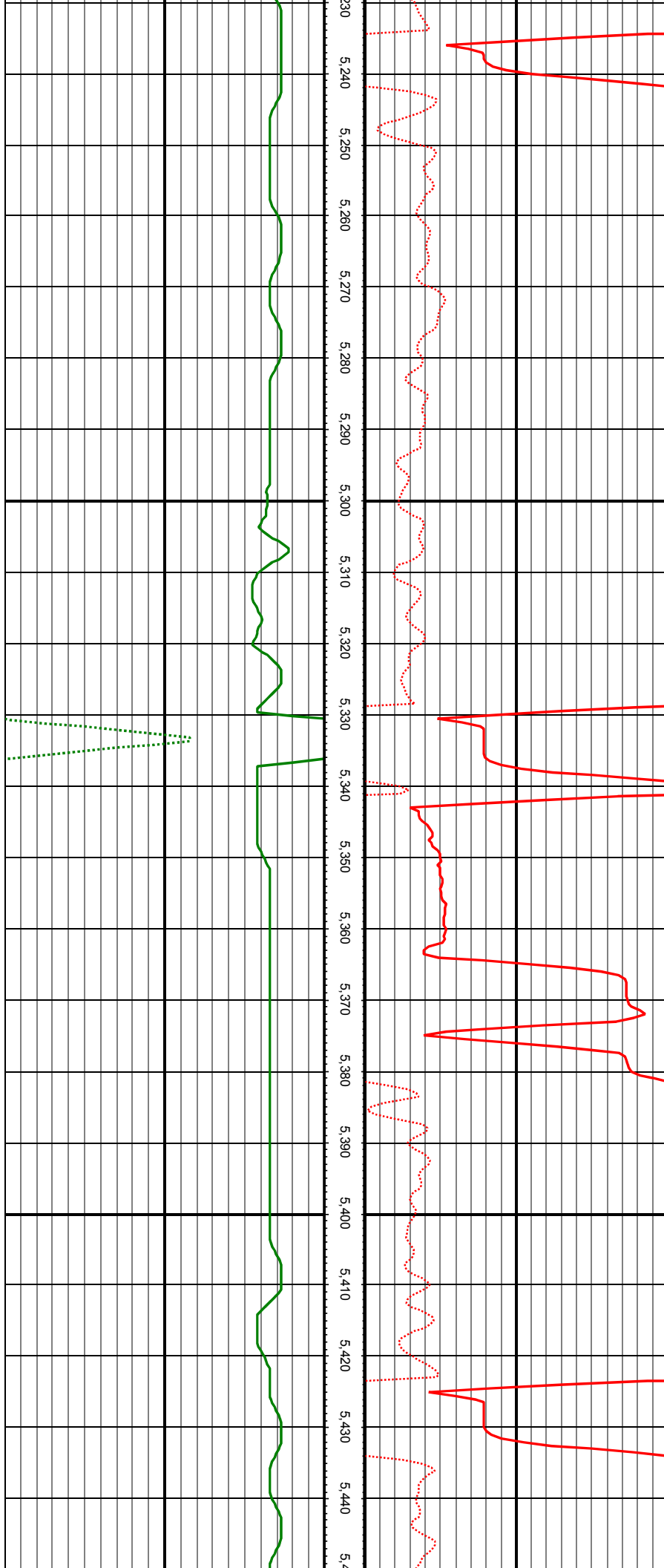
MD: 4705.00 INC: 8.97 AZ: 189.76 TVD: 4652.53 VS: -186.02





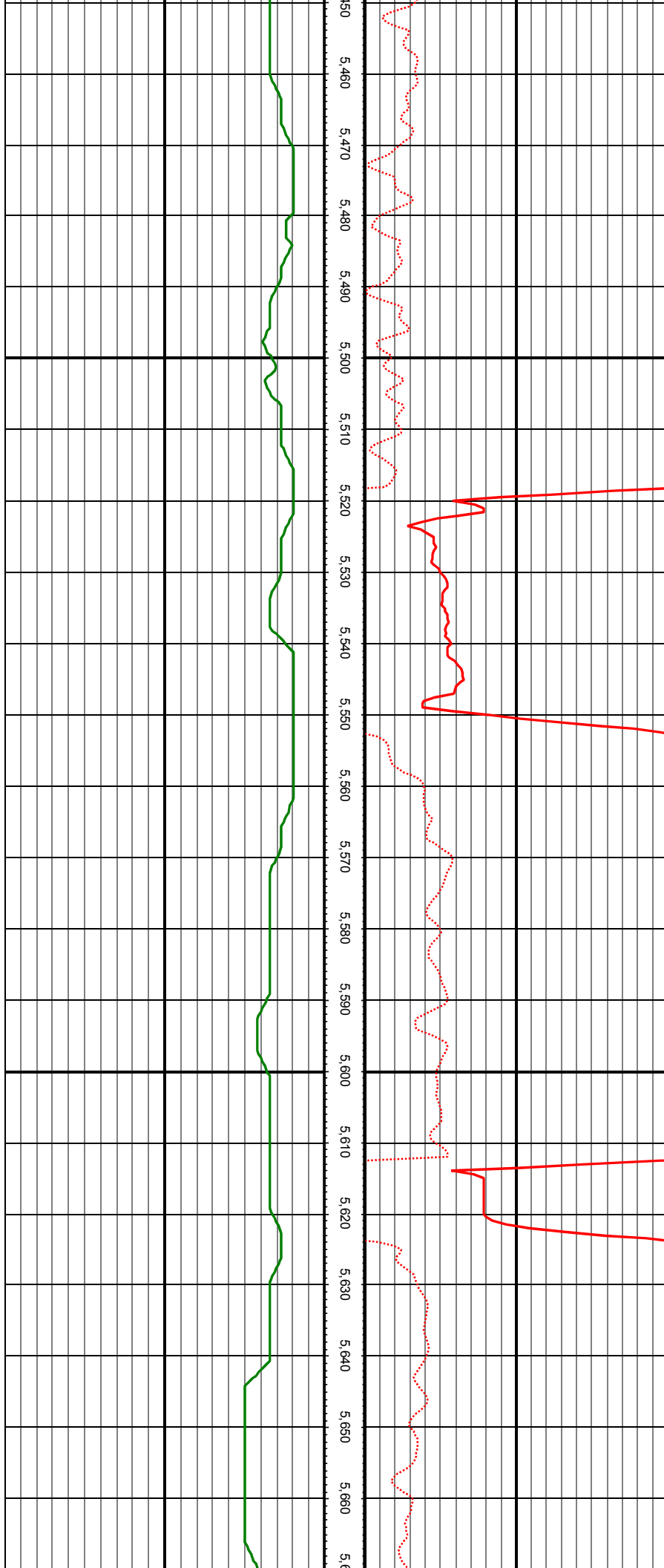
MD: 5084.00 INC: 9.67 AZ: 194.16 TVD: 5026.92 VS: -197.25

MD: 5179.00 INC: 9.76 AZ: 194.33 TVD: 5120.55 VS: -201.21



MD: 5274.00 INC: 8.22 AZ: 195.12 TVD: 5214.39 VS: -205.00

MD: 5368.00 INC: 9.32 AZ: 193.89 TVD: 5307.28 VS: -208.60

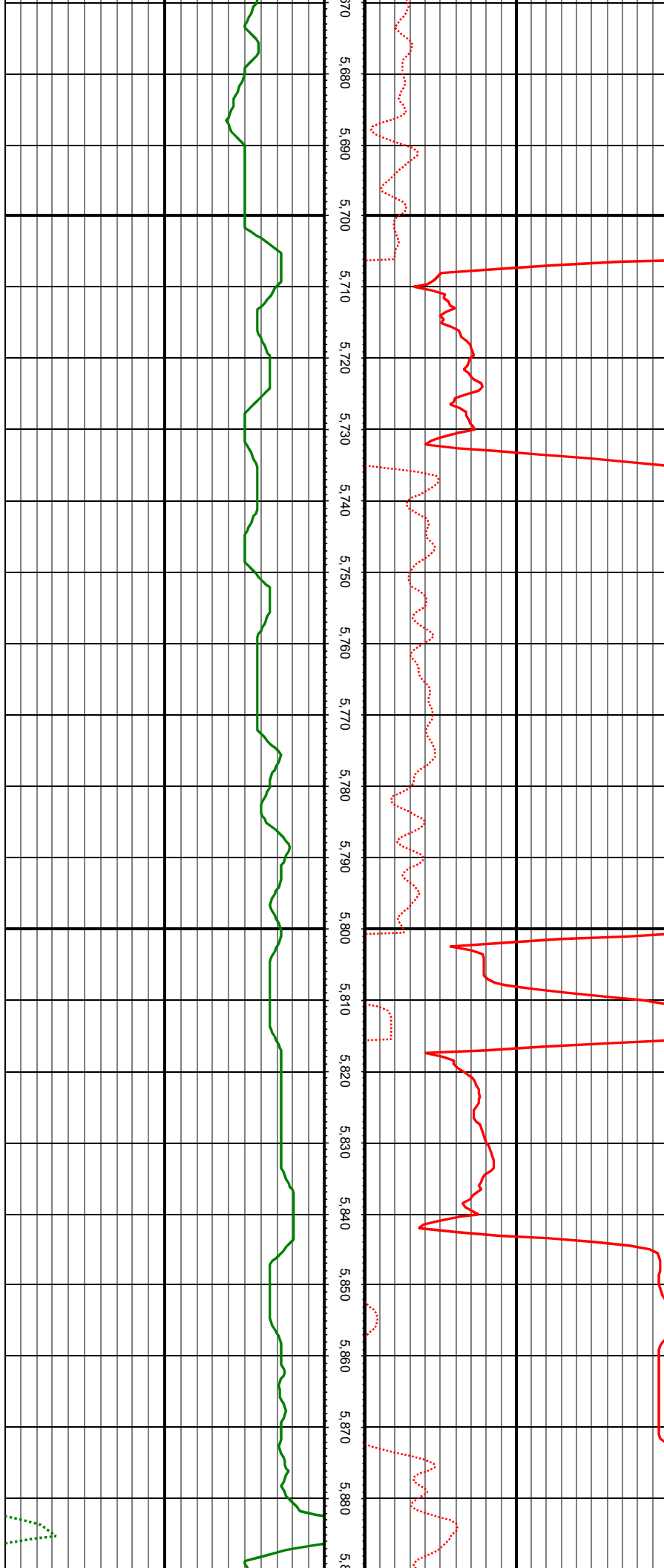


MD: 5462.00 INC: 8.26 AZ: 193.80 TVD: 5400.18 VS: -212.06

MD: 5557.00 INC: 9.32 AZ: 200.48 TVD: 5494.06 VS: -216.39

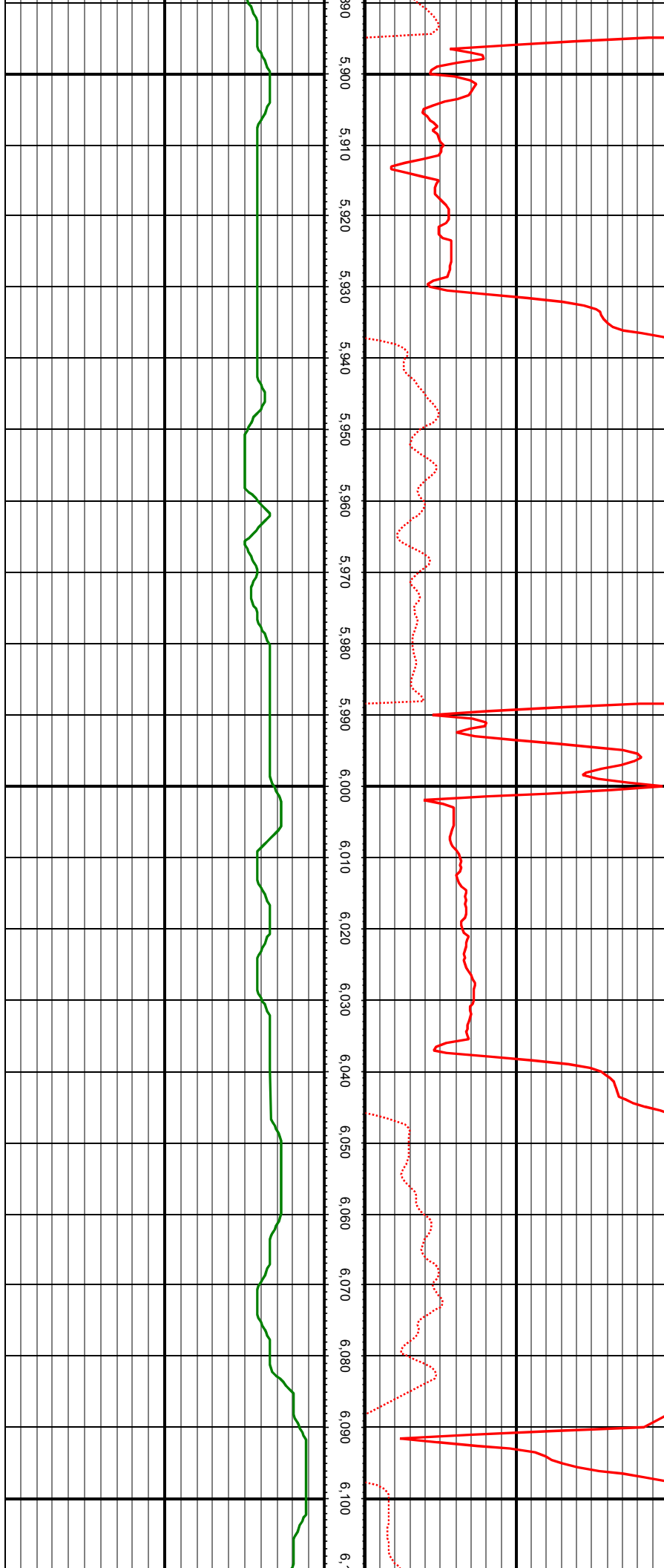
MD: 5651.00 INC: 8.13 AZ: 200.40 TVD: 5586.98 VS: -221.39





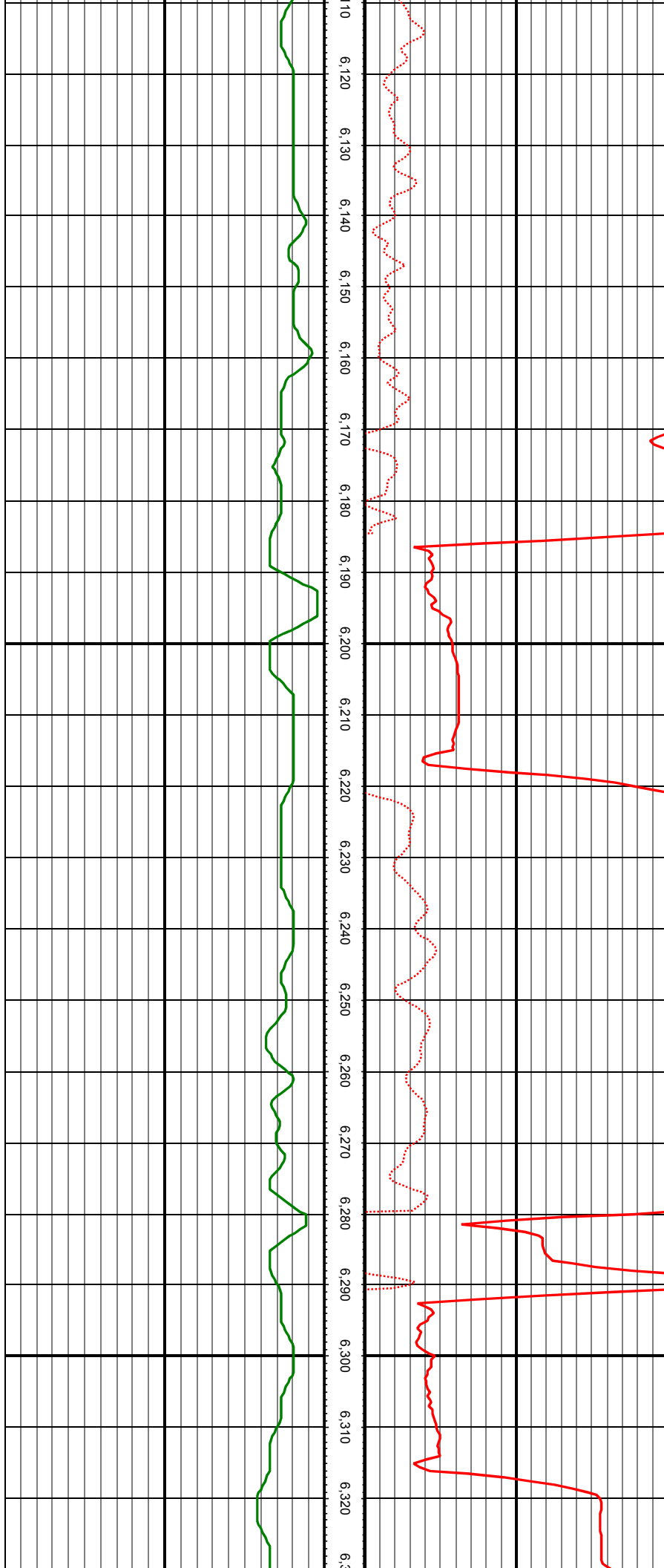
MD: 5745.00 INC: 8.48 AZ: 204.79 TVD: 5679.99 VS: -226.63

MD: 5840.00 INC: 8.62 AZ: 204.00 TVD: 5773.93 VS: -232.48



MD: 5935.00 INC: 8.79 AZ: 201.89 TVD: 5867.84 VS: -238.11

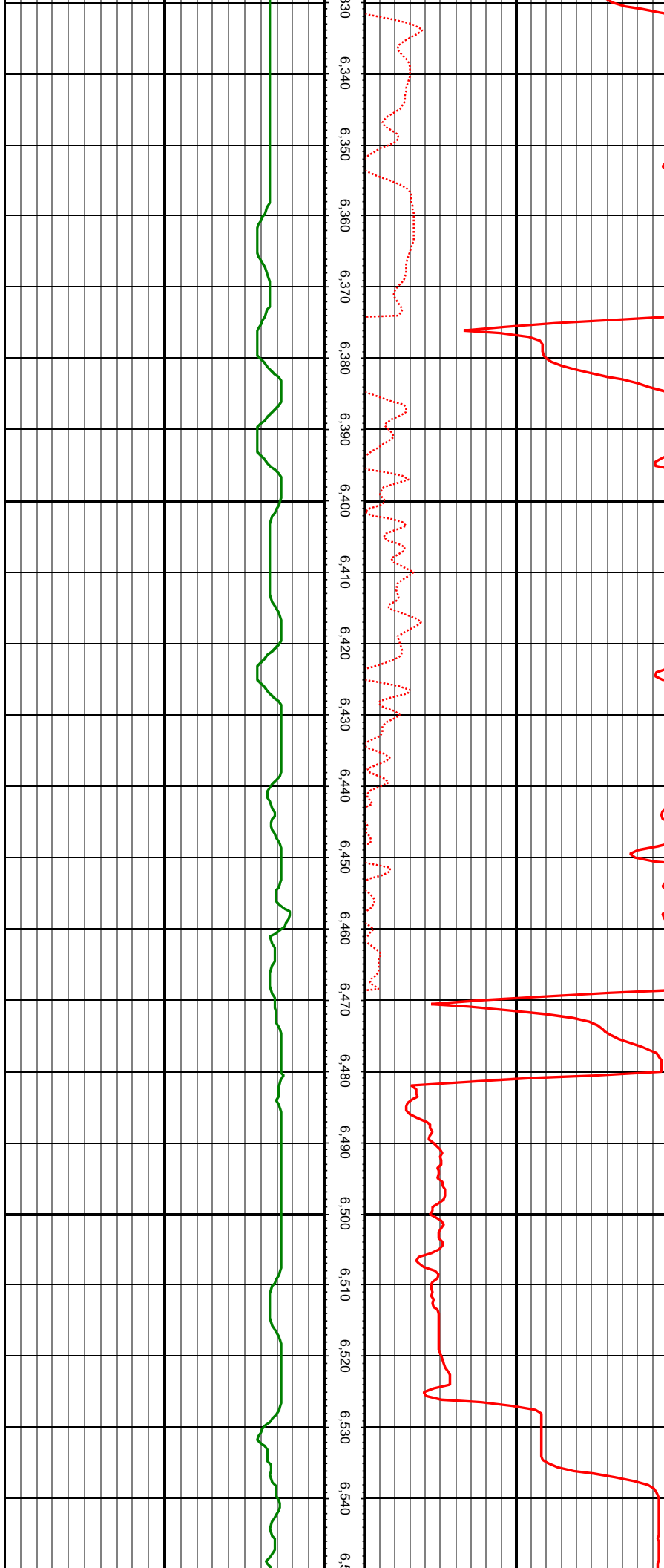
MD: 6030.00 INC: 10.33 AZ: 200.84 TVD: 5961.52 VS: -243.86



MD: 6124.00 INC: 9.14 AZ: 200.84 TVD: 6054.16 VS: -249.54

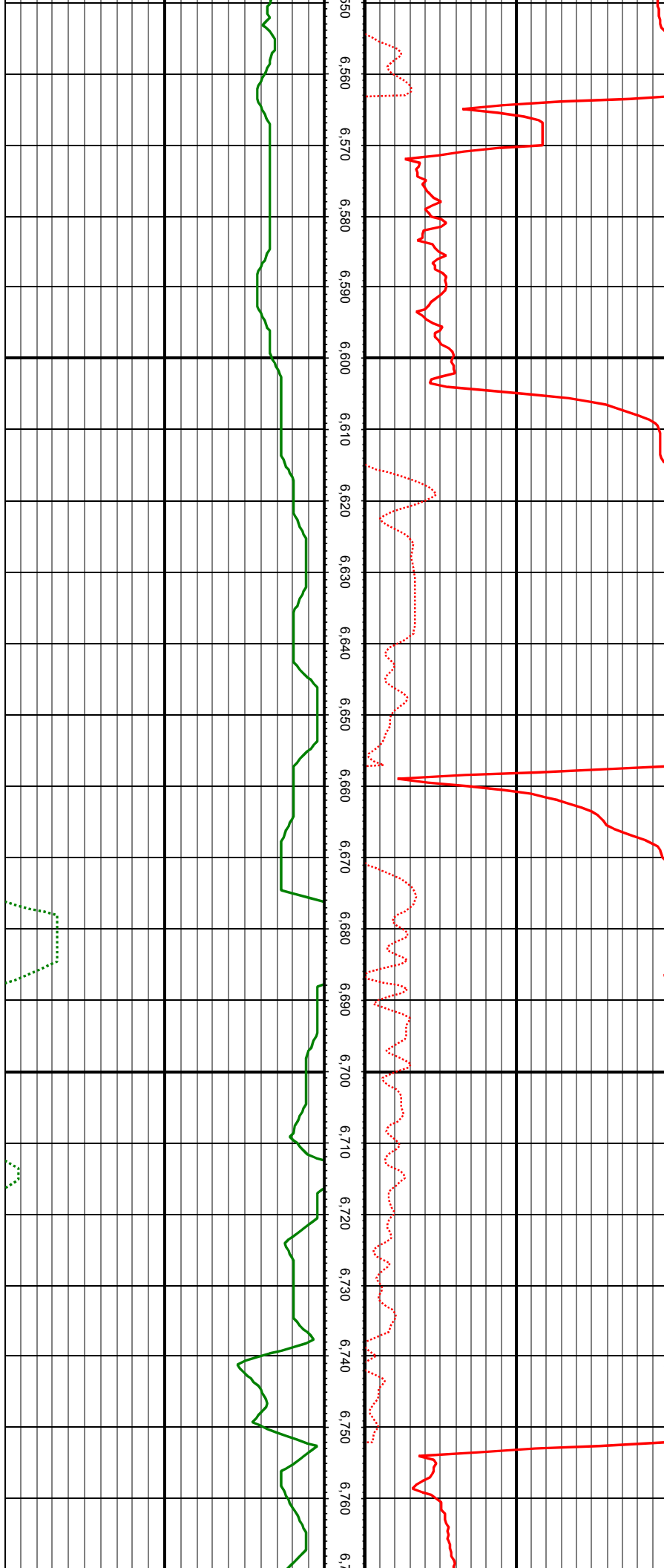
MD: 6219.00 INC: 9.76 AZ: 194.77 TVD: 6147.88 VS: -254.30

MD: 6314.00 INC: 10.46 AZ: 197.76 TVD: 6241.40 VS: -259.00



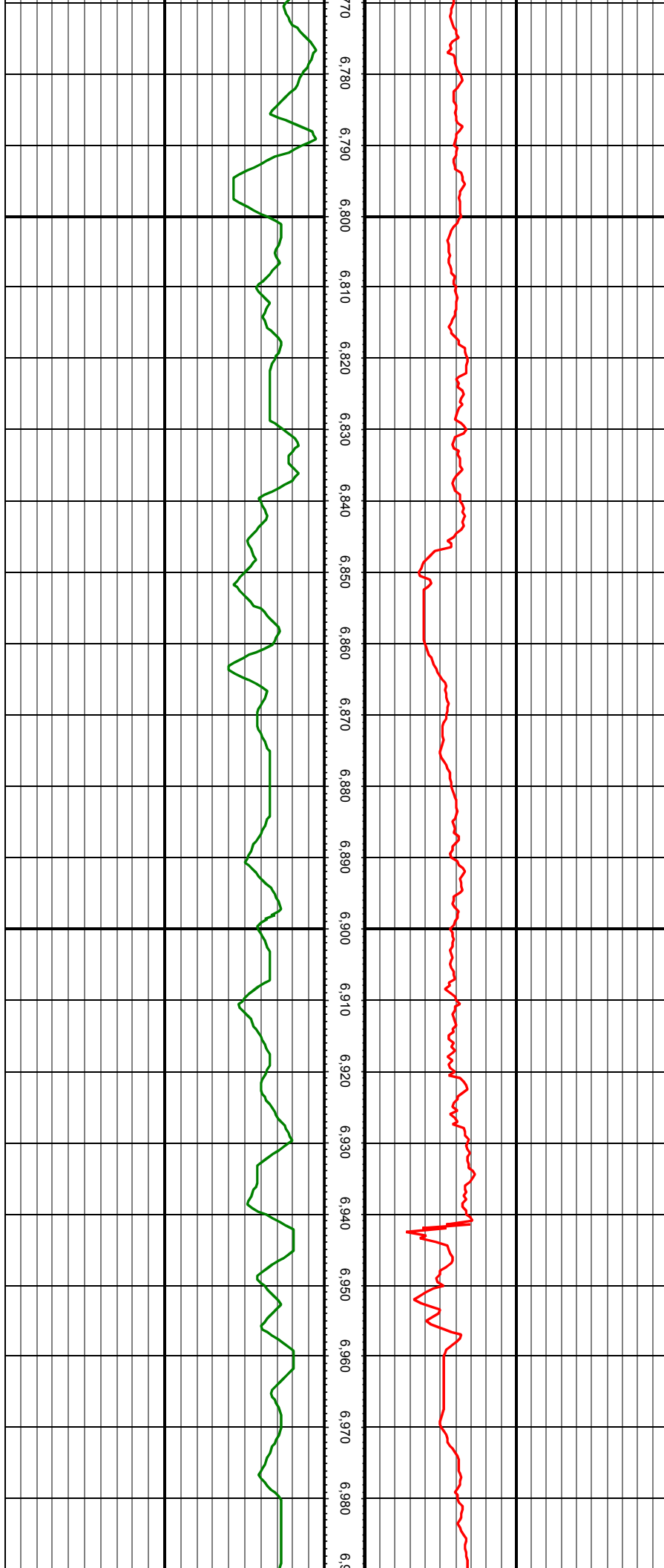
MD: 6408.00 INC: 8.44 AZ: 196.09 TVD: 6334.12 VS: -263.54

MD: 6502.00 INC: 9.80 AZ: 195.74 TVD: 6426.93 VS: -267.64



MD: 6597.00 INC: 11.91 AZ: 200.57 TVD: 6520.23 VS: -273.30

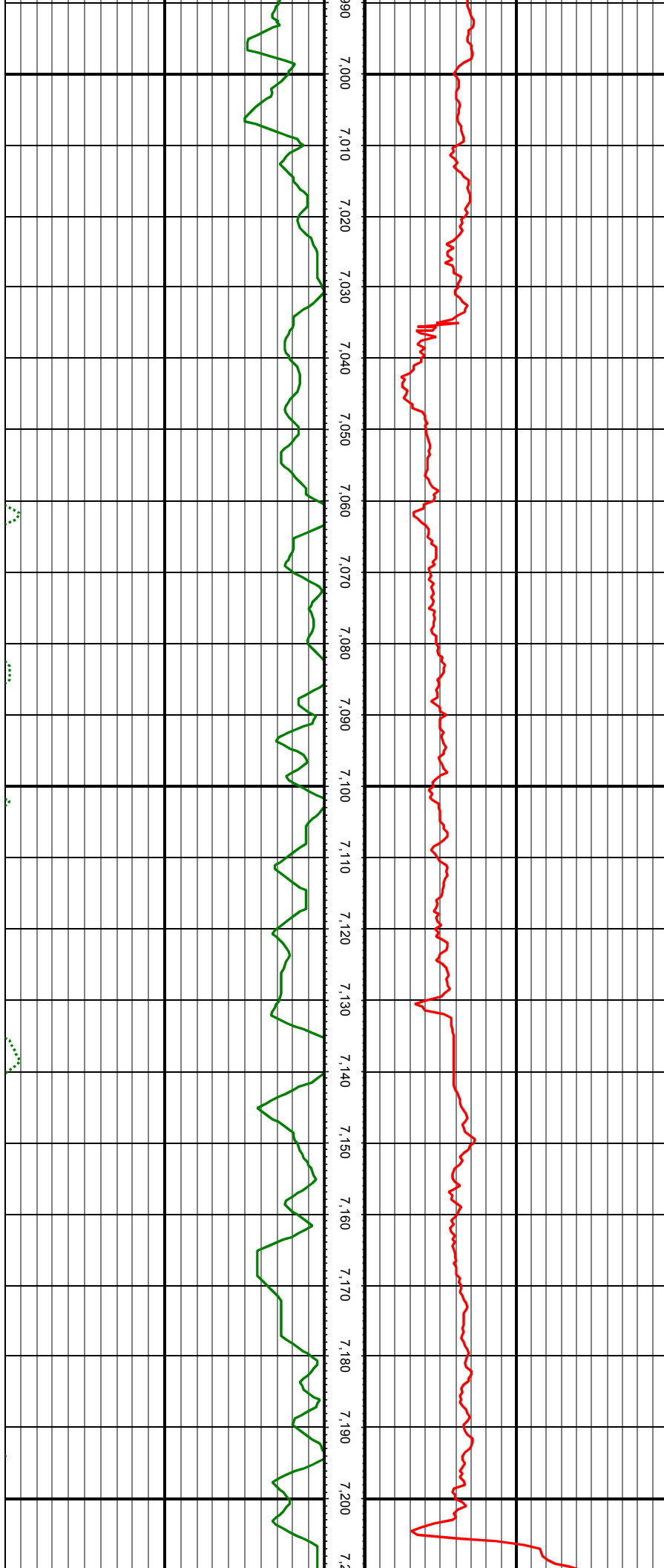
MD: 6691.00 INC: 9.63 AZ: 200.13 TVD: 6612.56 VS: -279.44



MD: 6786.00 INC: 9.27 AZ: 168.58 TVD: 6706.34 VS: -280.68

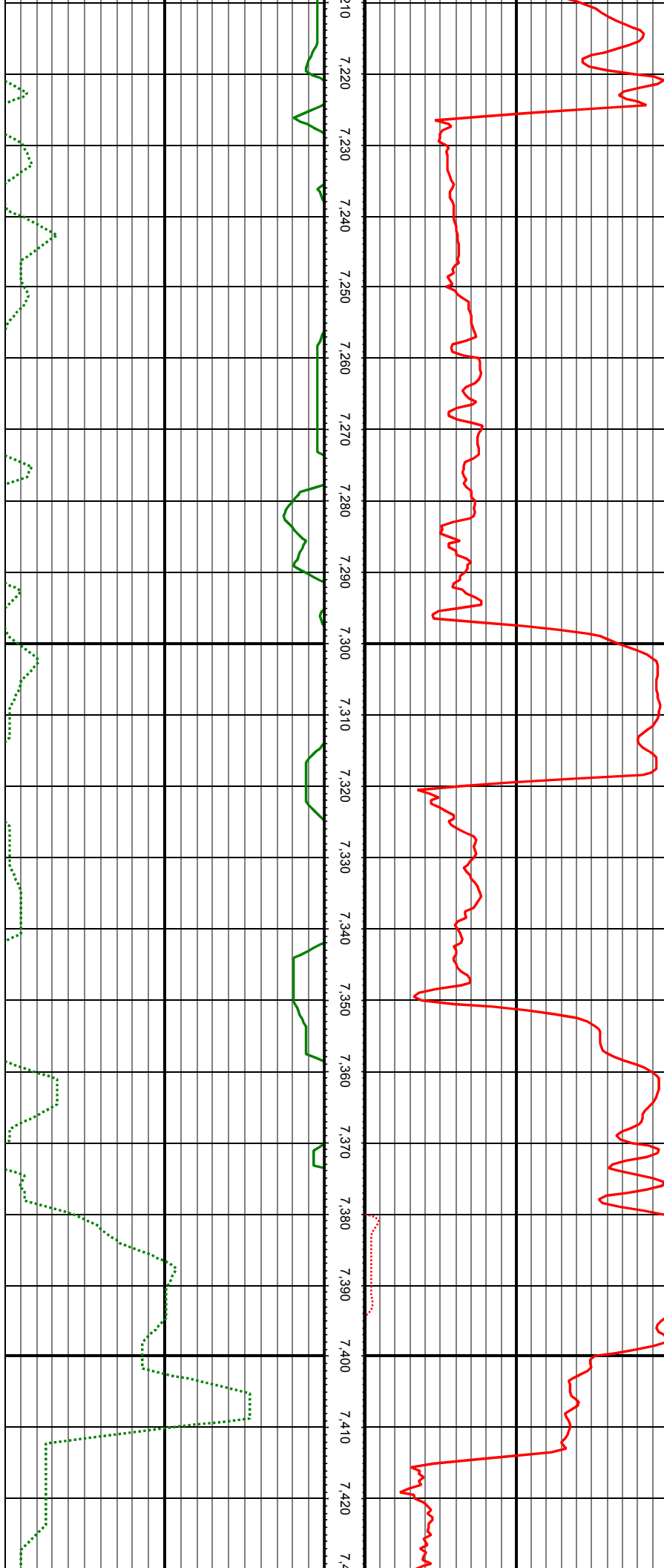
MD: 6880.00 INC: 19.30 AZ: 140.46 TVD: 6797.41 VS: -269.28

MD: 6975.00 INC: 25.76 AZ: 133.60 TVD: 6885.13 VS: -244.34



MD: 7069.00 INC: 32.97 AZ: 114.62 TVD: 6967.17 VS: -206.20

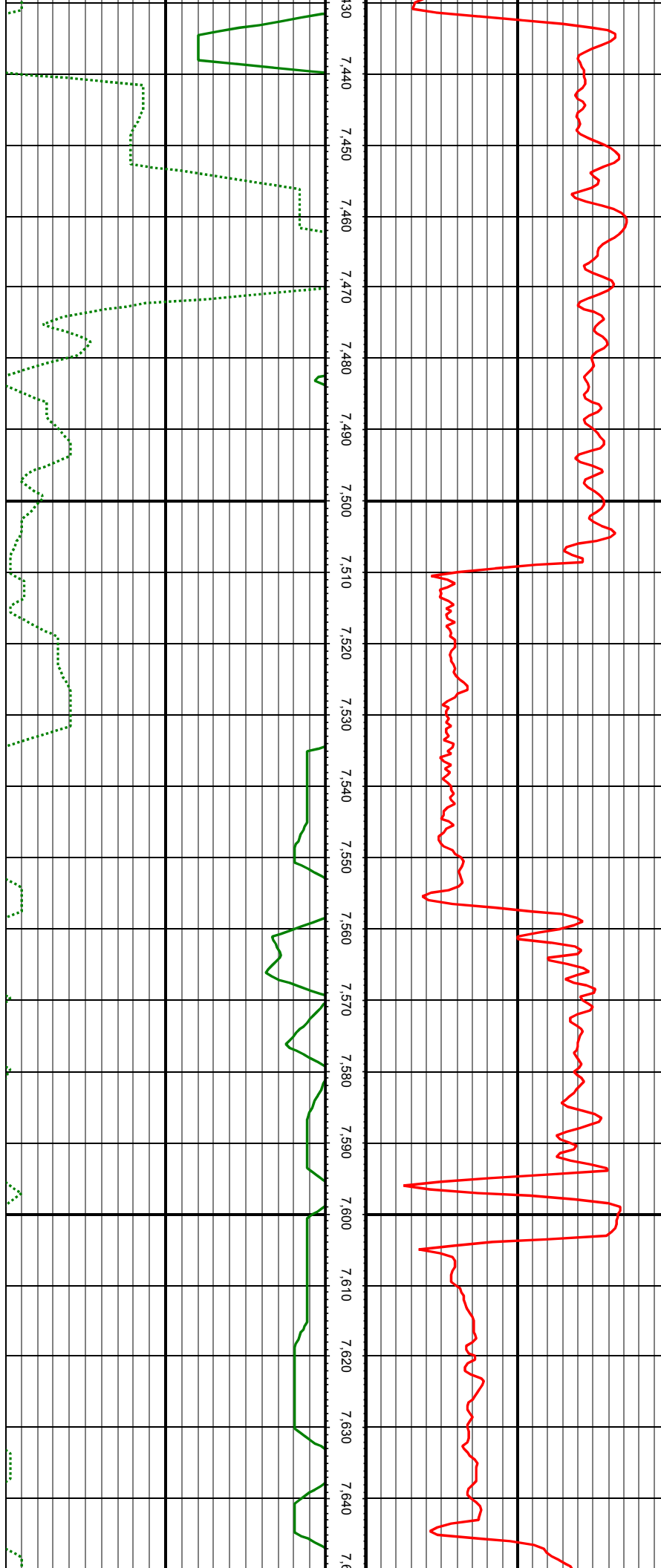
MD: 7164.00 INC: 42.20 AZ: 98.88 TVD: 7042.55 VS: -150.95



MD: 7259.00 INC: 49.54 AZ: 92.82 TVD: 7108.68 VS: -83.21

MD: 7353.00 INC: 55.21 AZ: 94.58 TVD: 7166.05 VS: -8.96

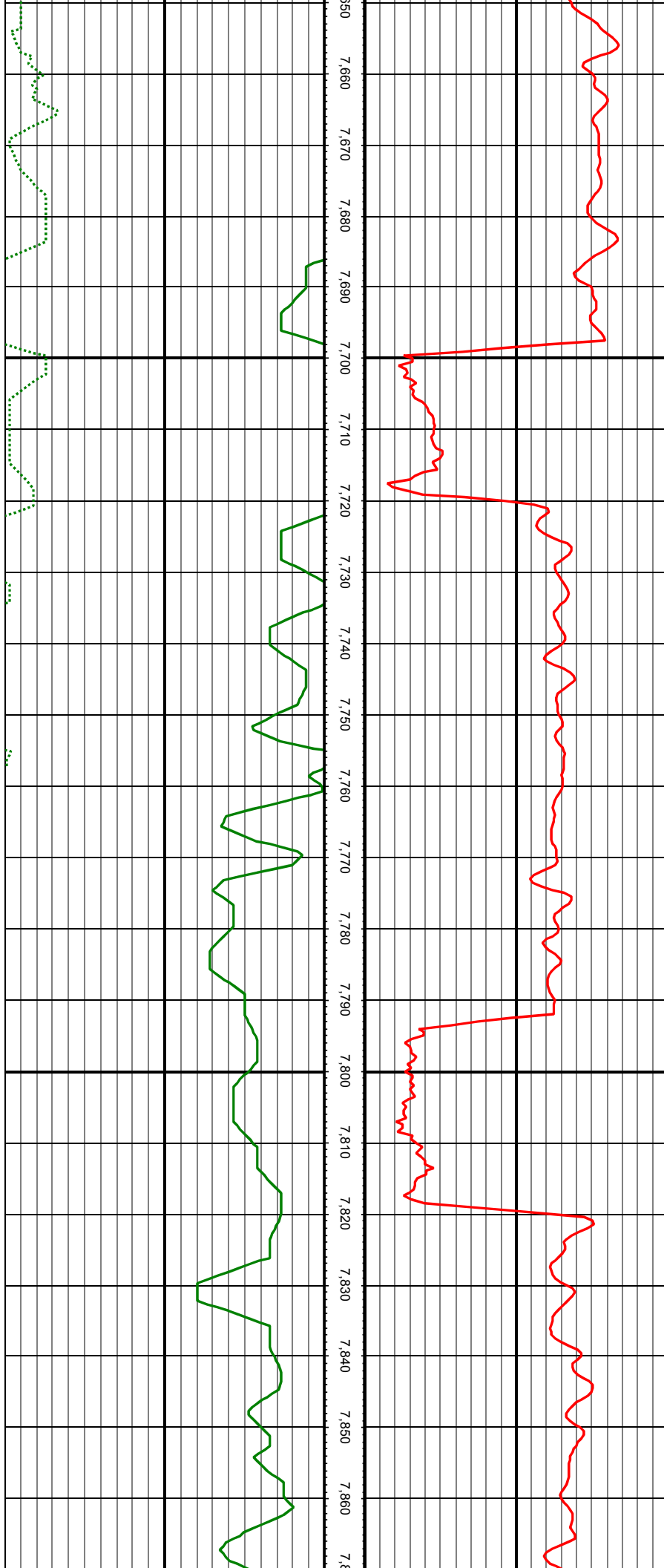




MD: 7448.00 INC: 55.82 AZ: 94.22 TVD: 7219.84 VS: 69.10

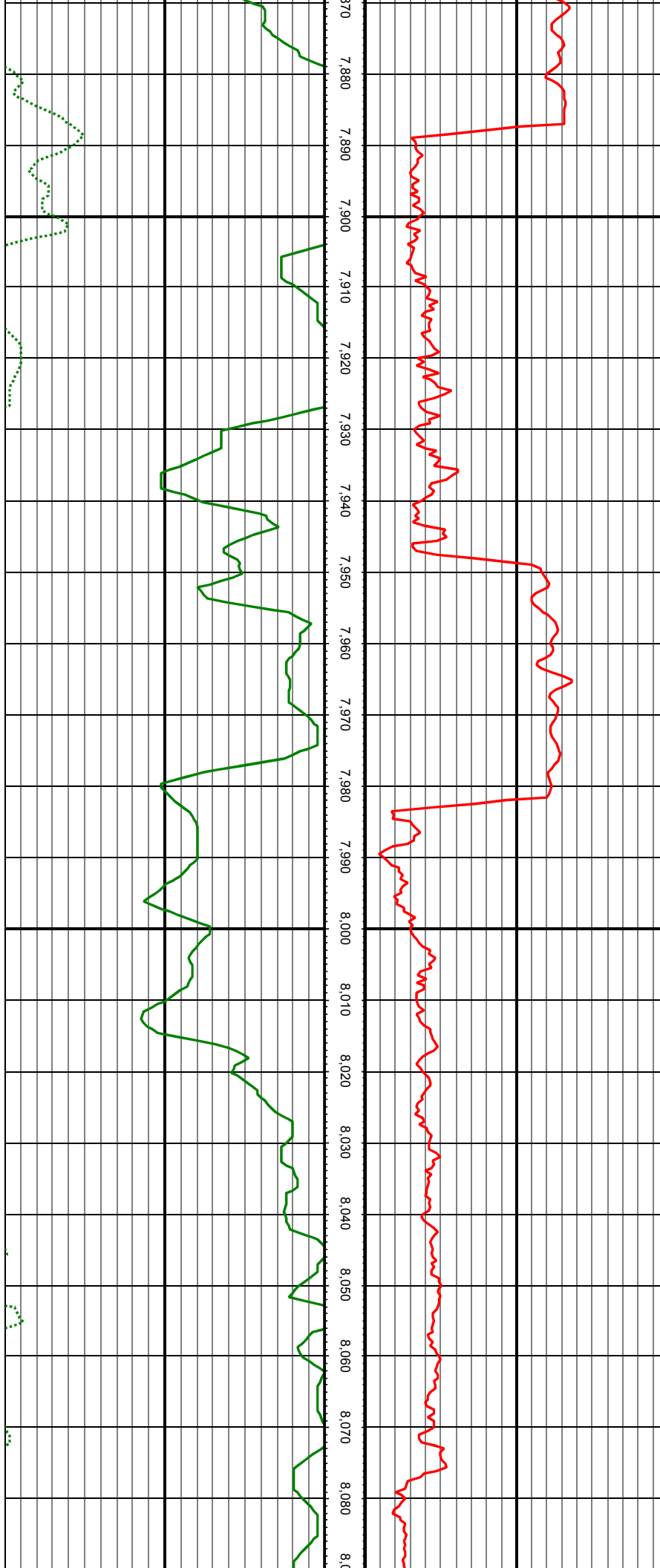
MD: 7543.00 INC: 58.20 AZ: 92.73 TVD: 7271.56 VS: 148.63

MD: 7637.00 INC: 64.09 AZ: 92.64 TVD: 7316.91 VS: 230.82



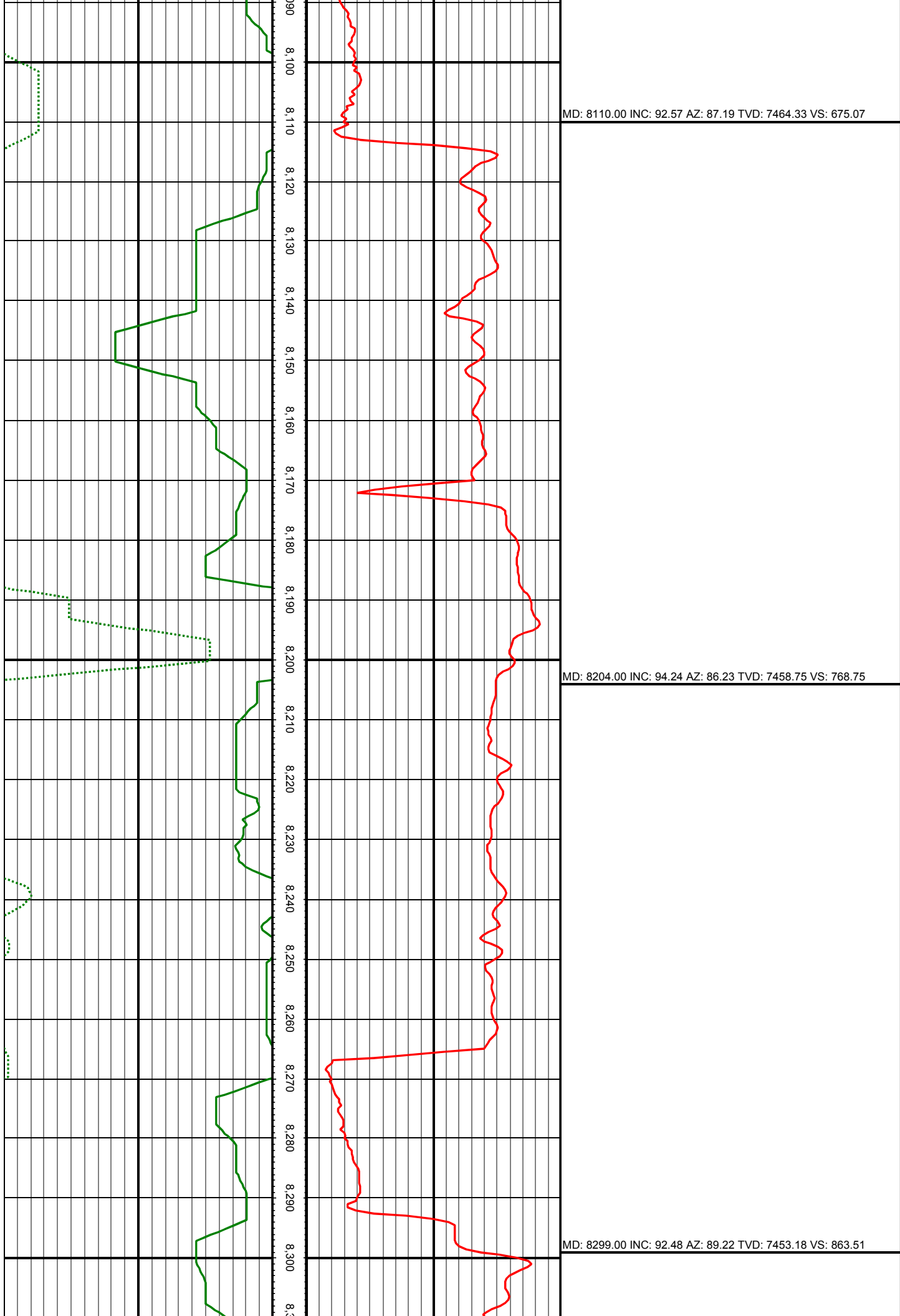
MD: 7732.00 INC: 65.19 AZ: 93.52 TVD: 7357.60 VS: 316.53

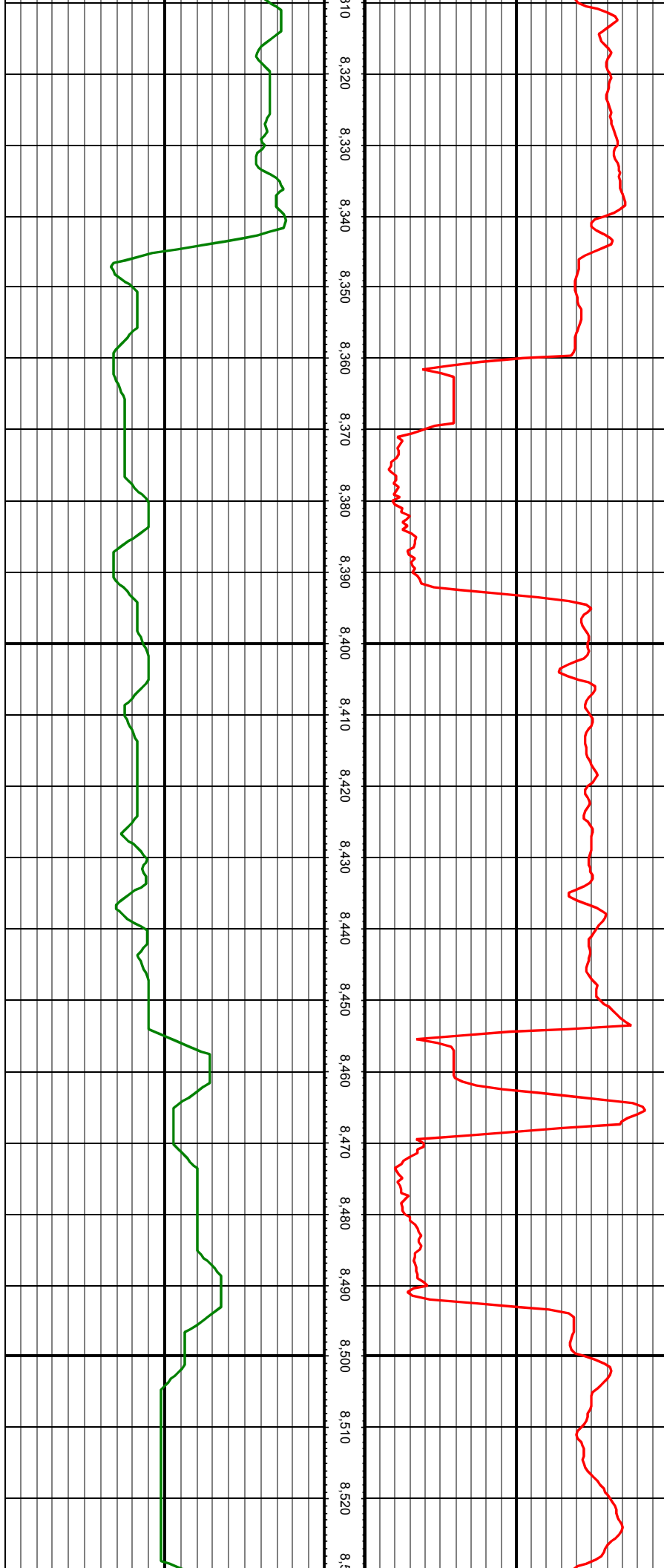
MD: 7826.00 INC: 66.95 AZ: 92.91 TVD: 7395.72 VS: 402.31



MD: 7921.00 INC: 70.11 AZ: 93.96 TVD: 7430.49 VS: 490.54

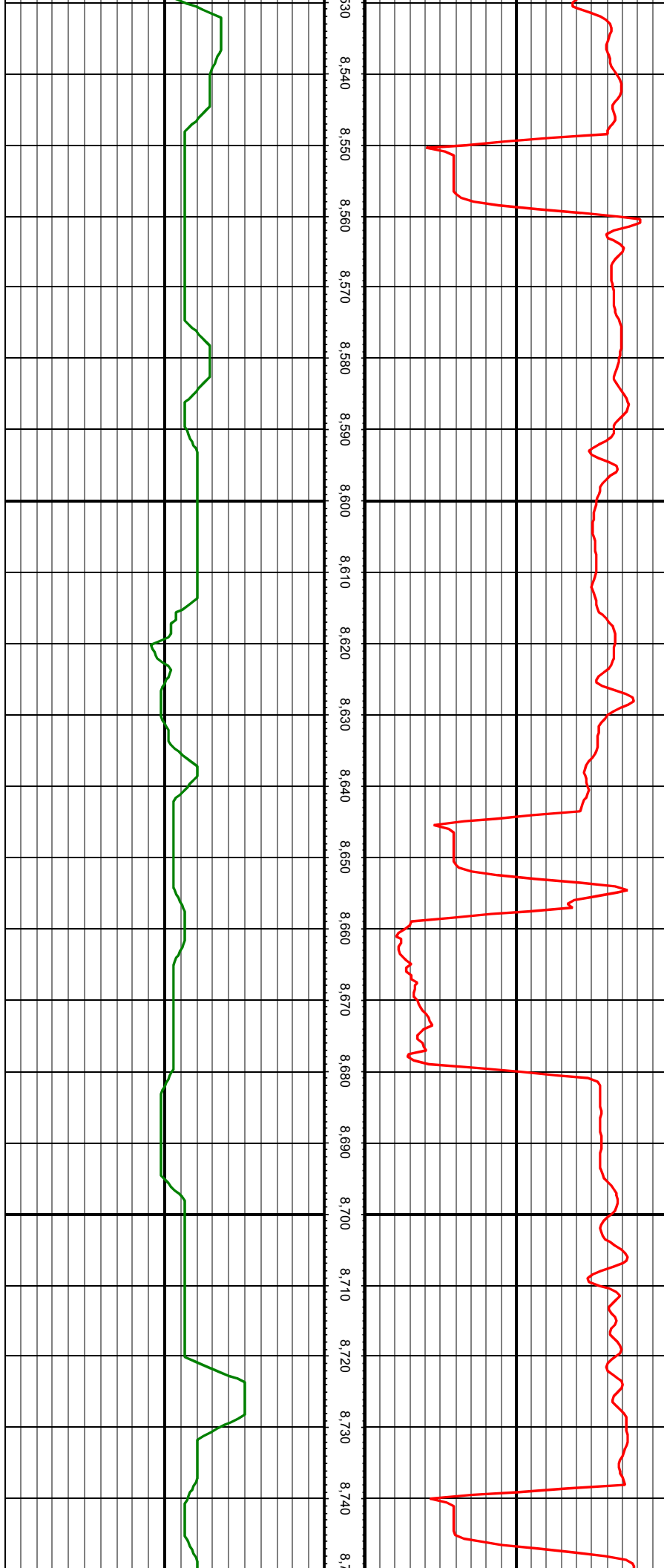
MD: 8015.00 INC: 77.85 AZ: 91.85 TVD: 7456.41 VS: 580.69





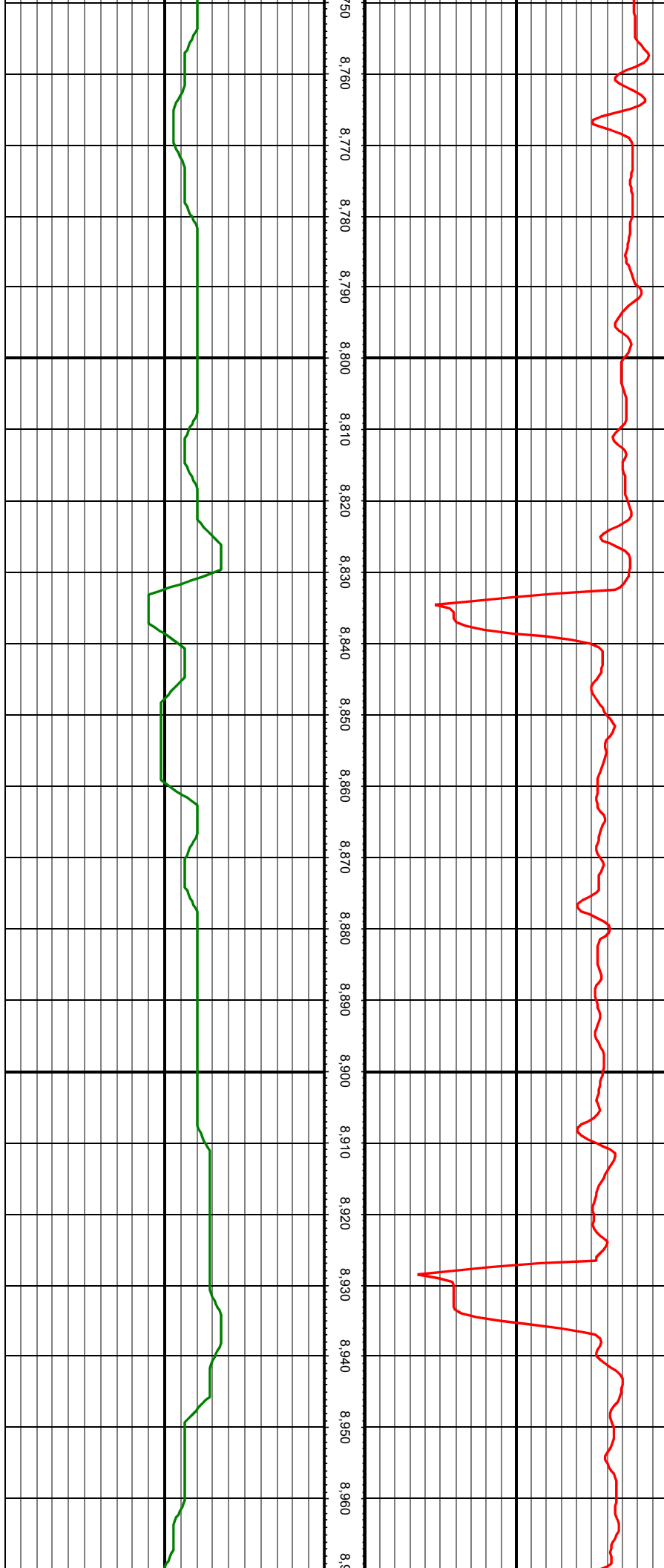
MD: 8393.00 INC: 92.09 AZ: 91.76 TVD: 7449.43 VS: 957.42

MD: 8488.00 INC: 90.46 AZ: 92.38 TVD: 7447.32 VS: 1052.32



MD: 8582.00 INC: 90.99 AZ: 92.82 TVD: 7446.13 VS: 1146.21

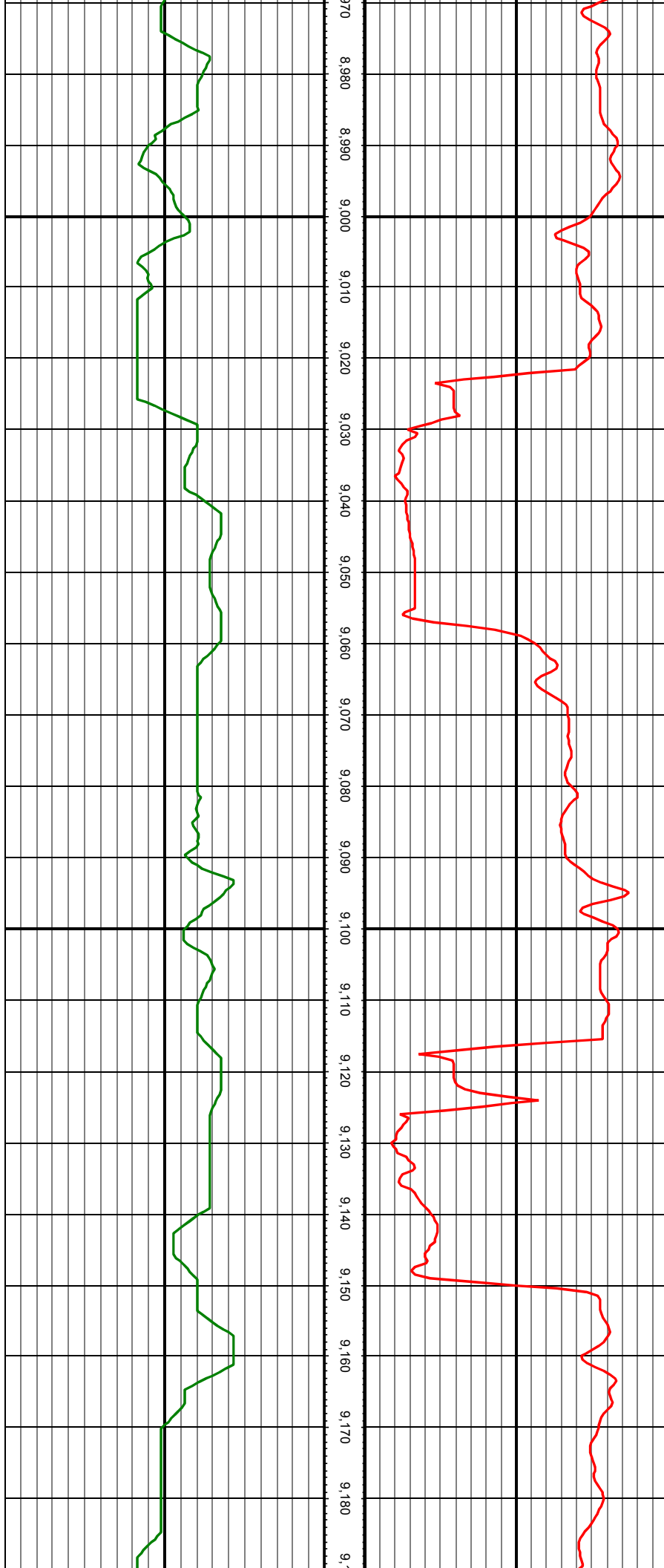
MD: 8676.00 INC: 90.15 AZ: 89.65 TVD: 7445.19 VS: 1240.17



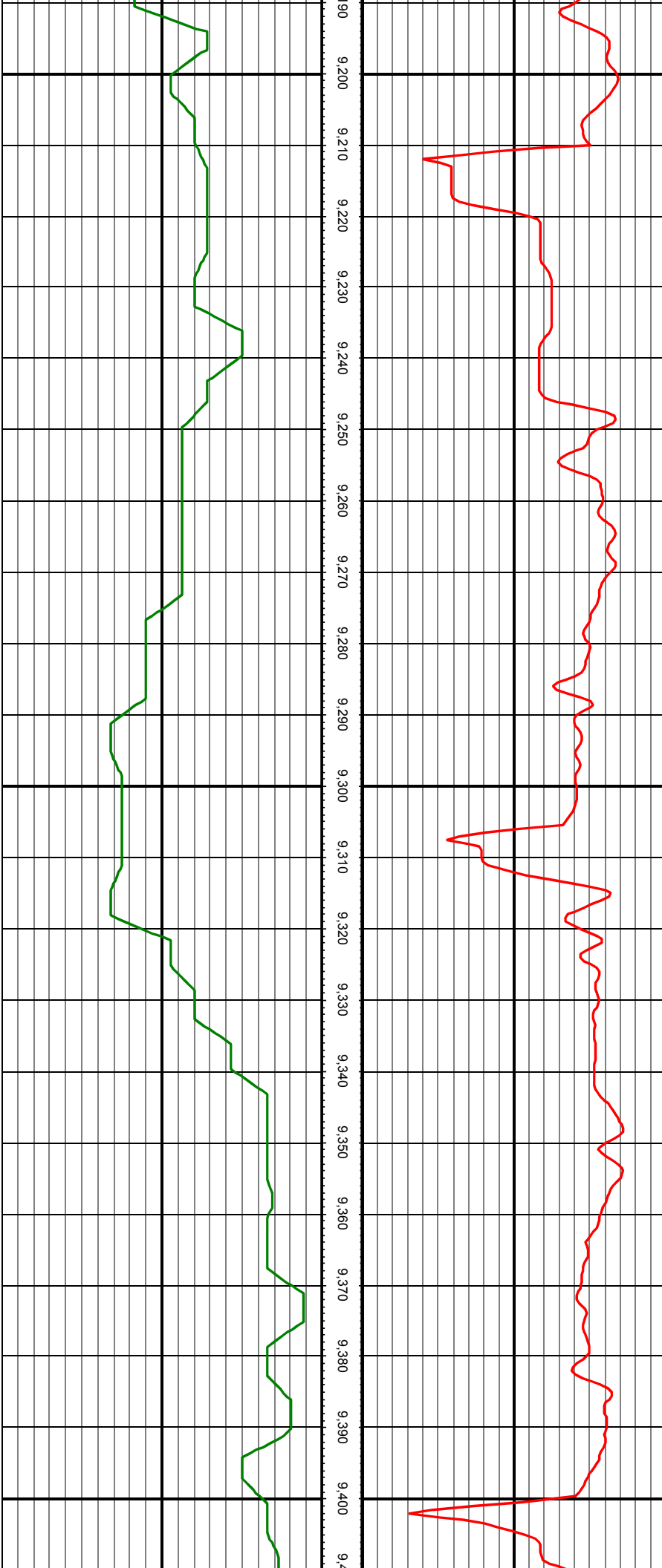
MD: 8771.00 INC: 90.68 AZ: 87.98 TVD: 7444.50 VS: 1335.15

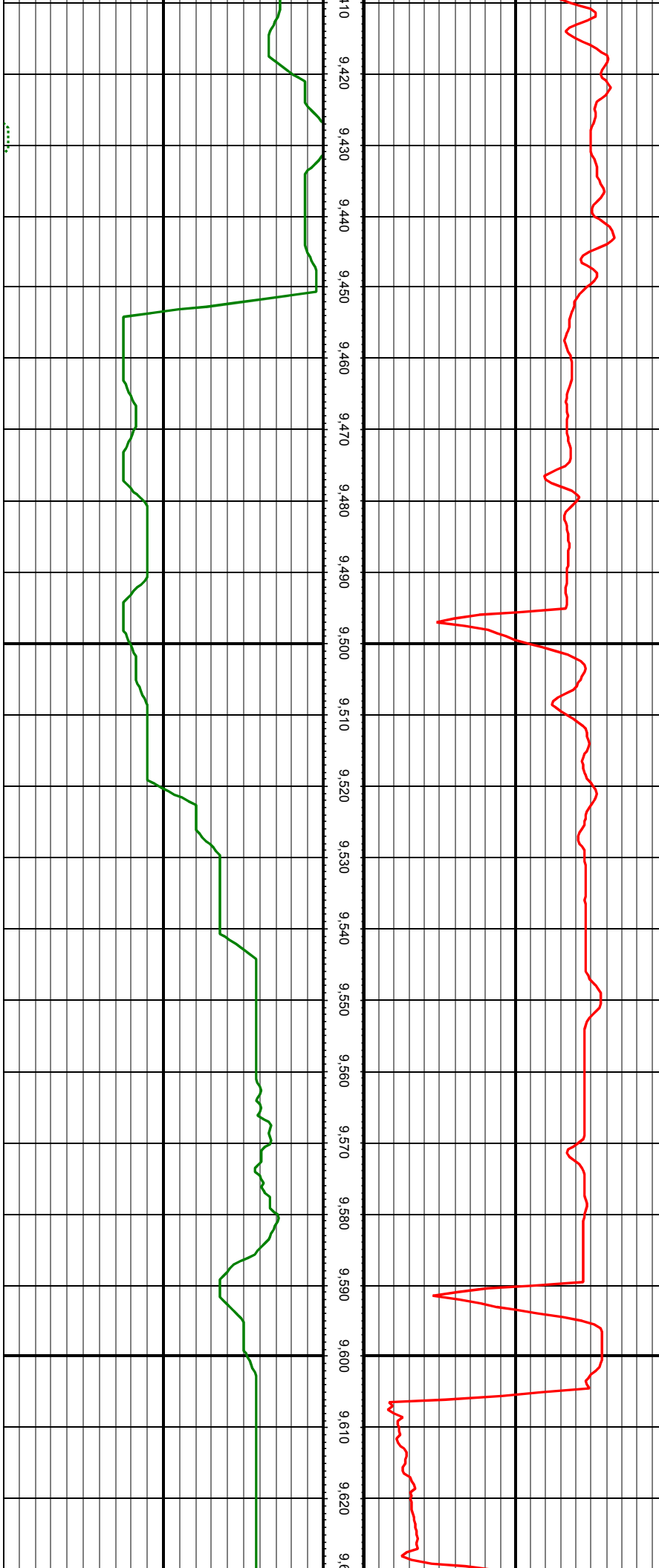
MD: 8866.00 INC: 91.38 AZ: 87.02 TVD: 7442.80 VS: 1430.05

MD: 8960.00 INC: 93.10 AZ: 89.13 TVD: 7439.12 VS: 1523.92





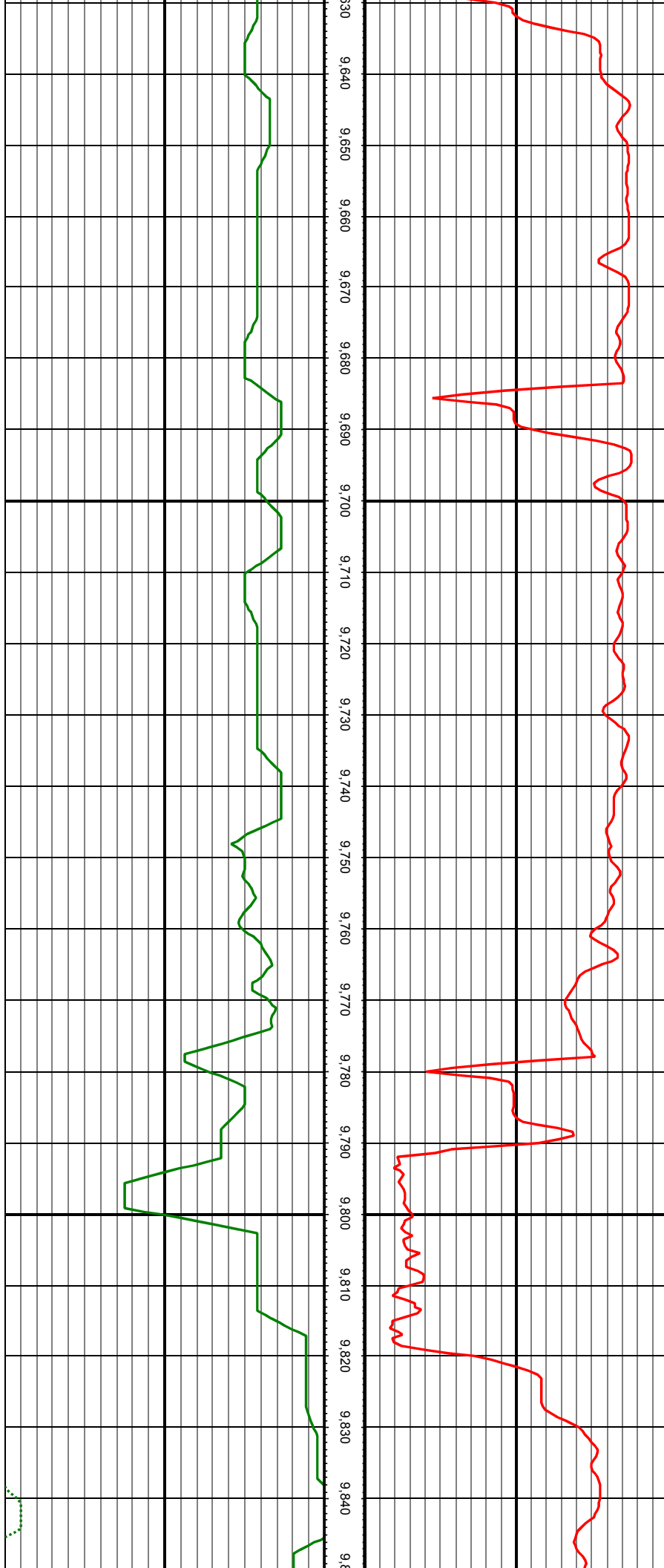




MD: 9435.00 INC: 89.98 AZ: 87.72 TVD: 7441.90 VS: 1998.27

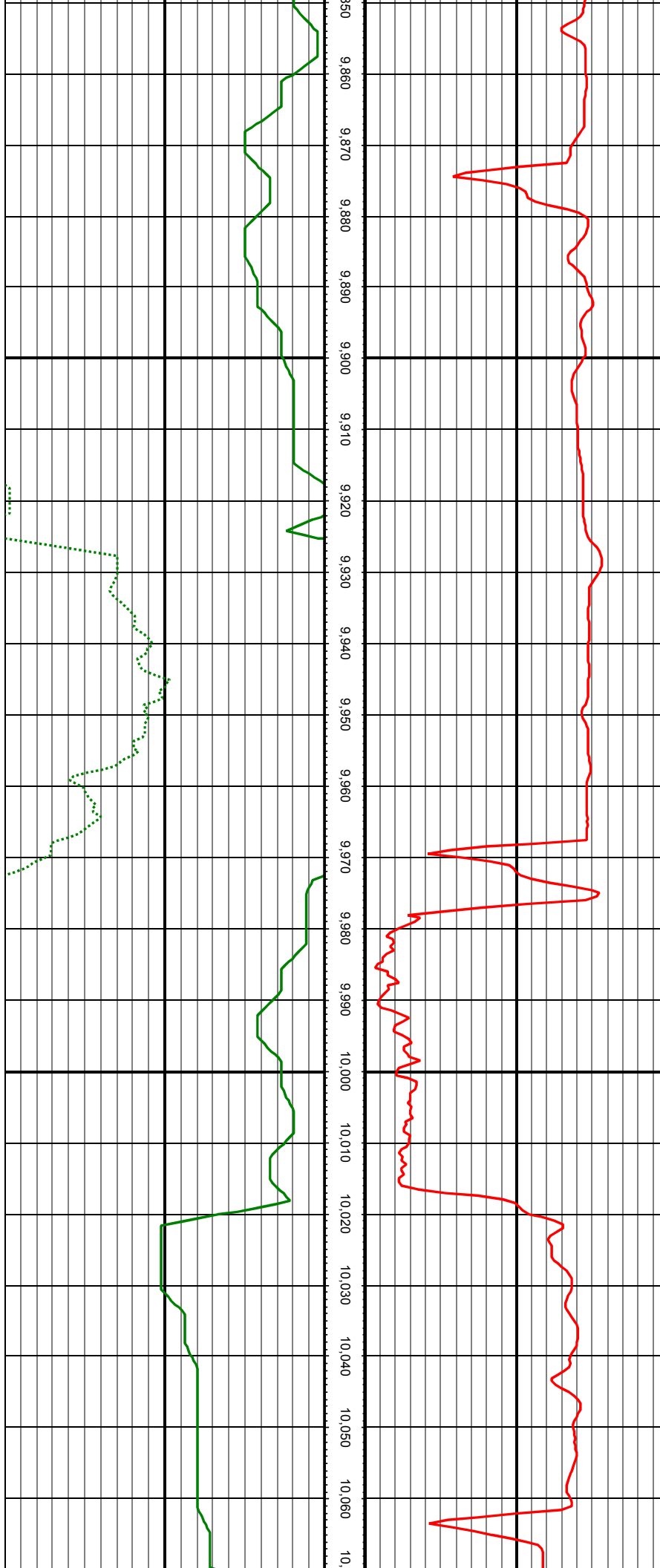
MD: 9529.00 INC: 90.51 AZ: 88.07 TVD: 7441.49 VS: 2092.21

MD: 9623.00 INC: 89.85 AZ: 90.53 TVD: 7441.20 VS: 2186.19



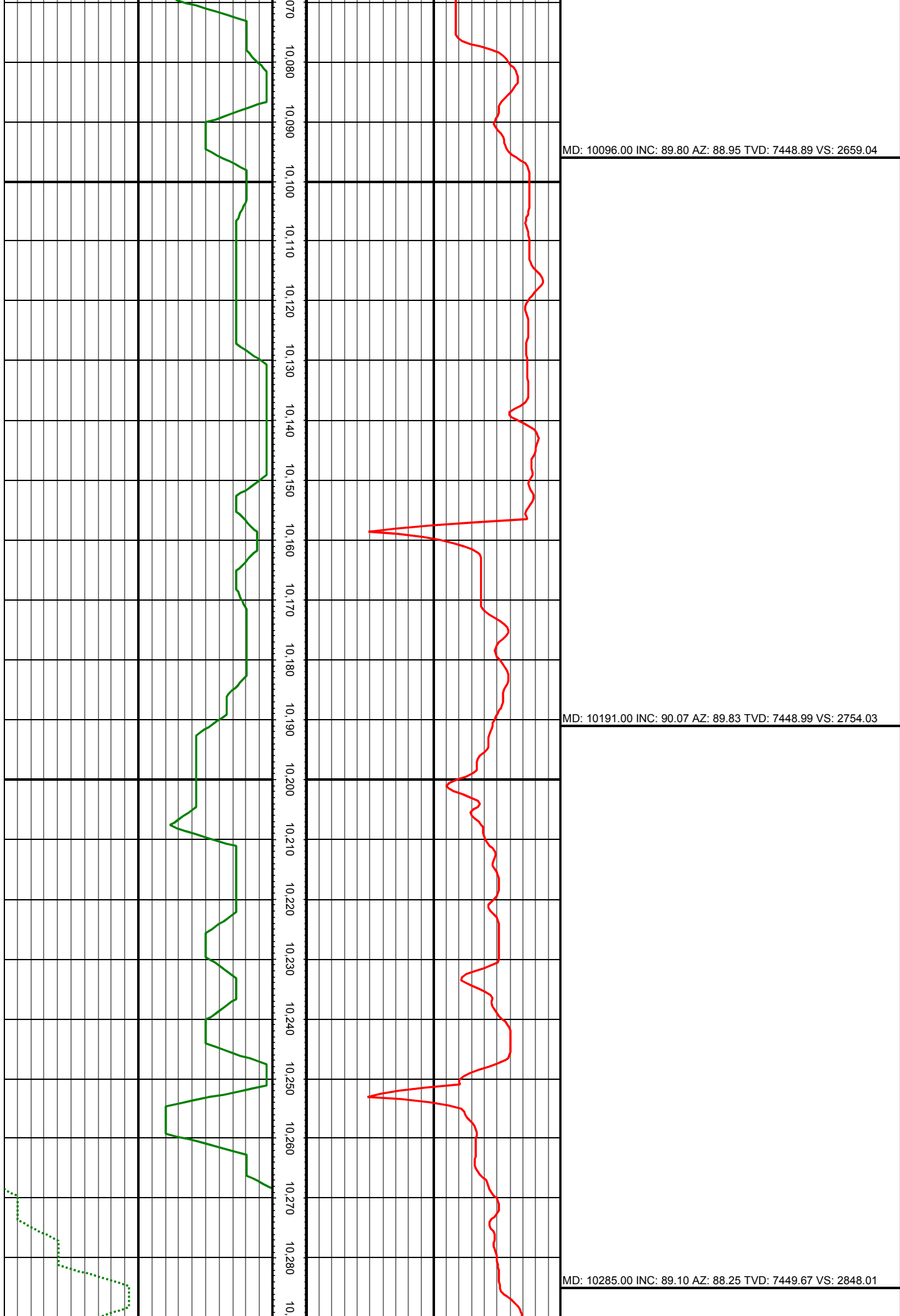
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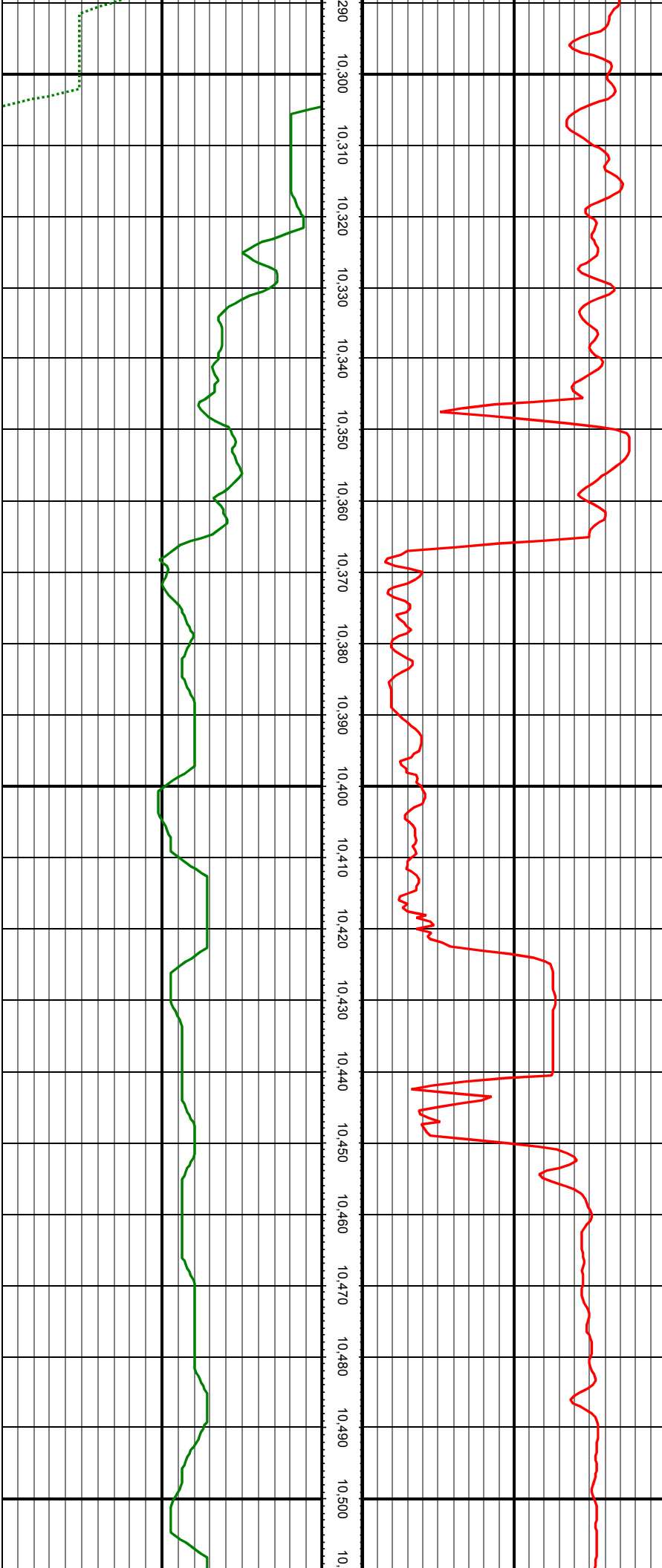
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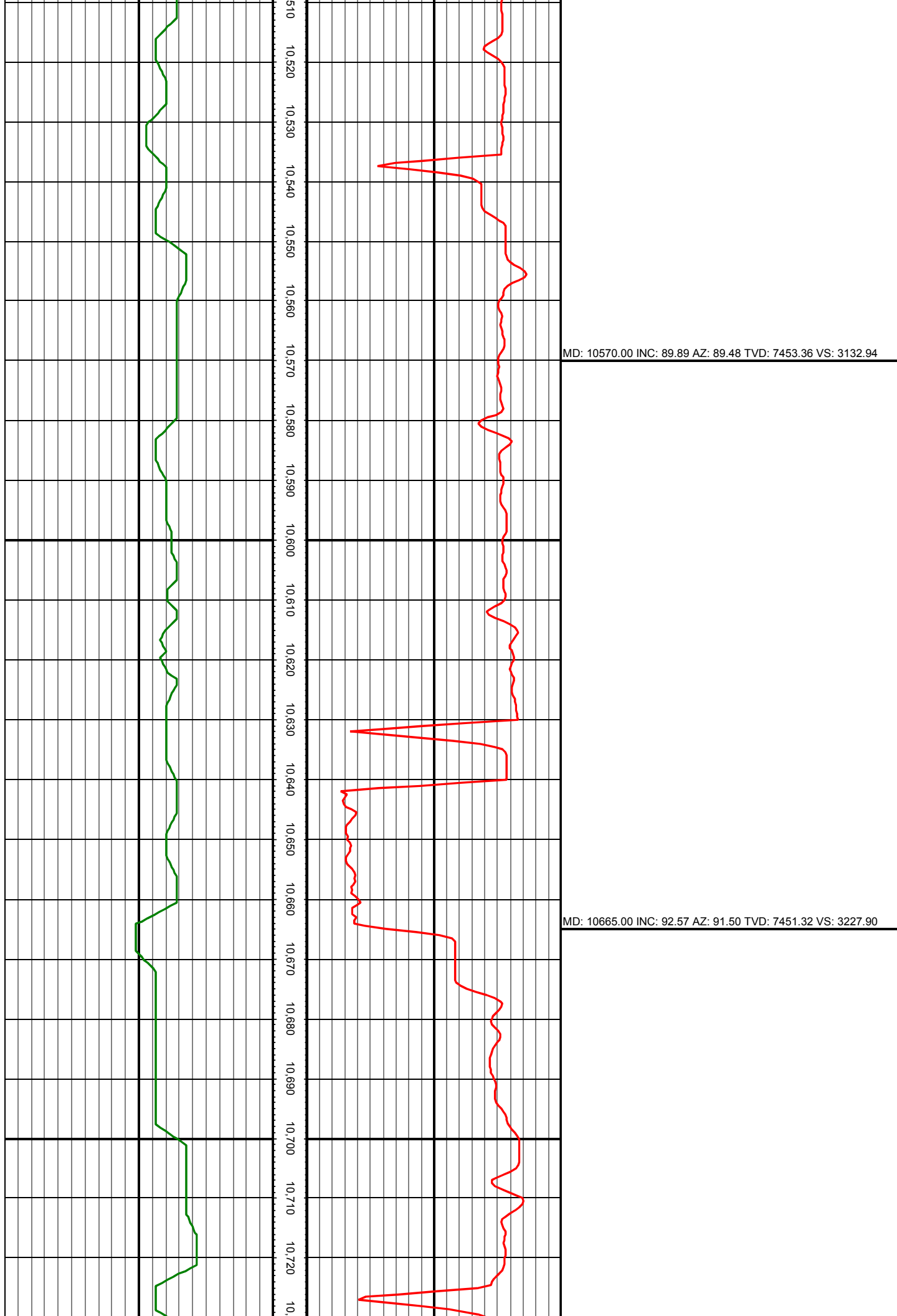
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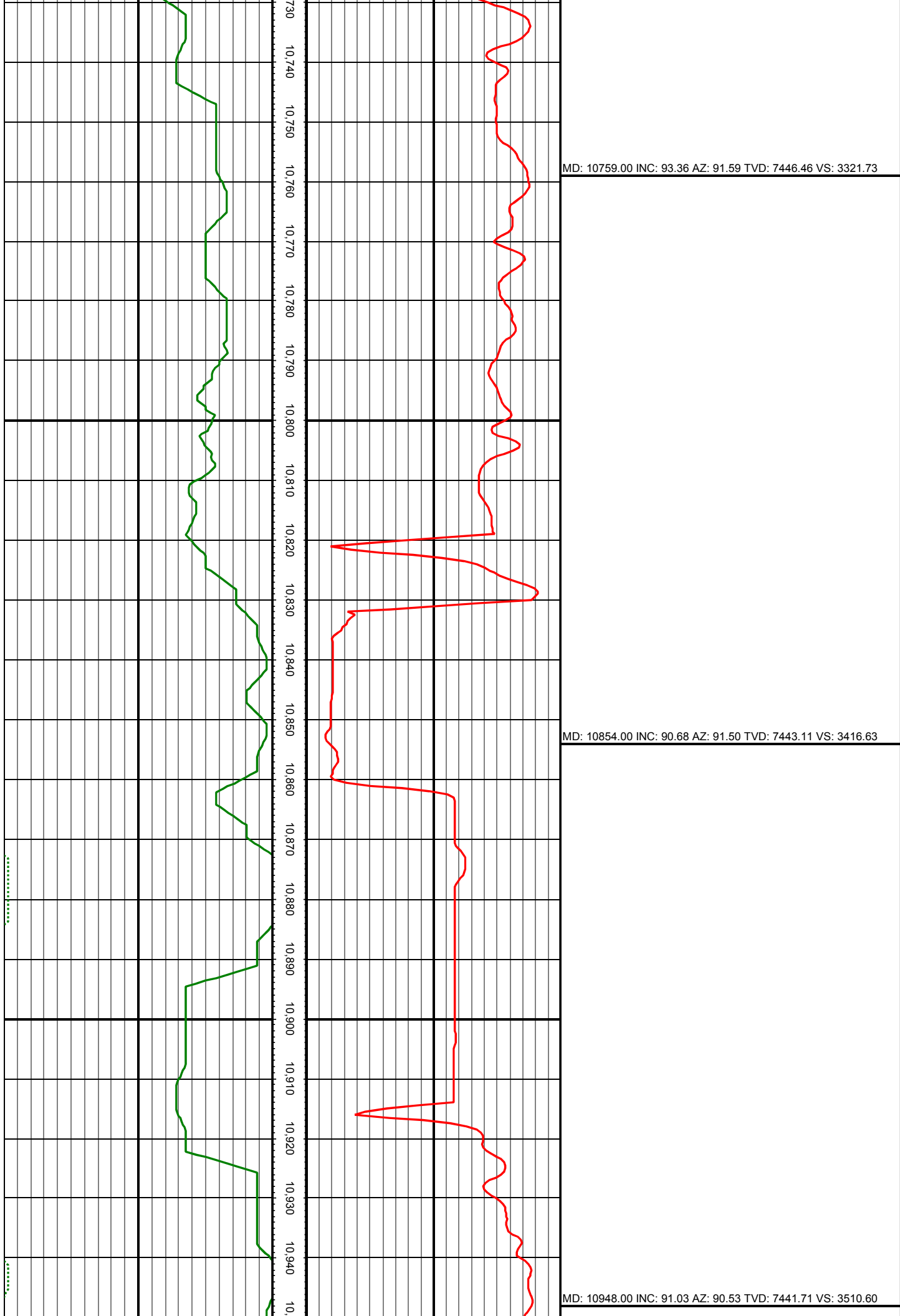




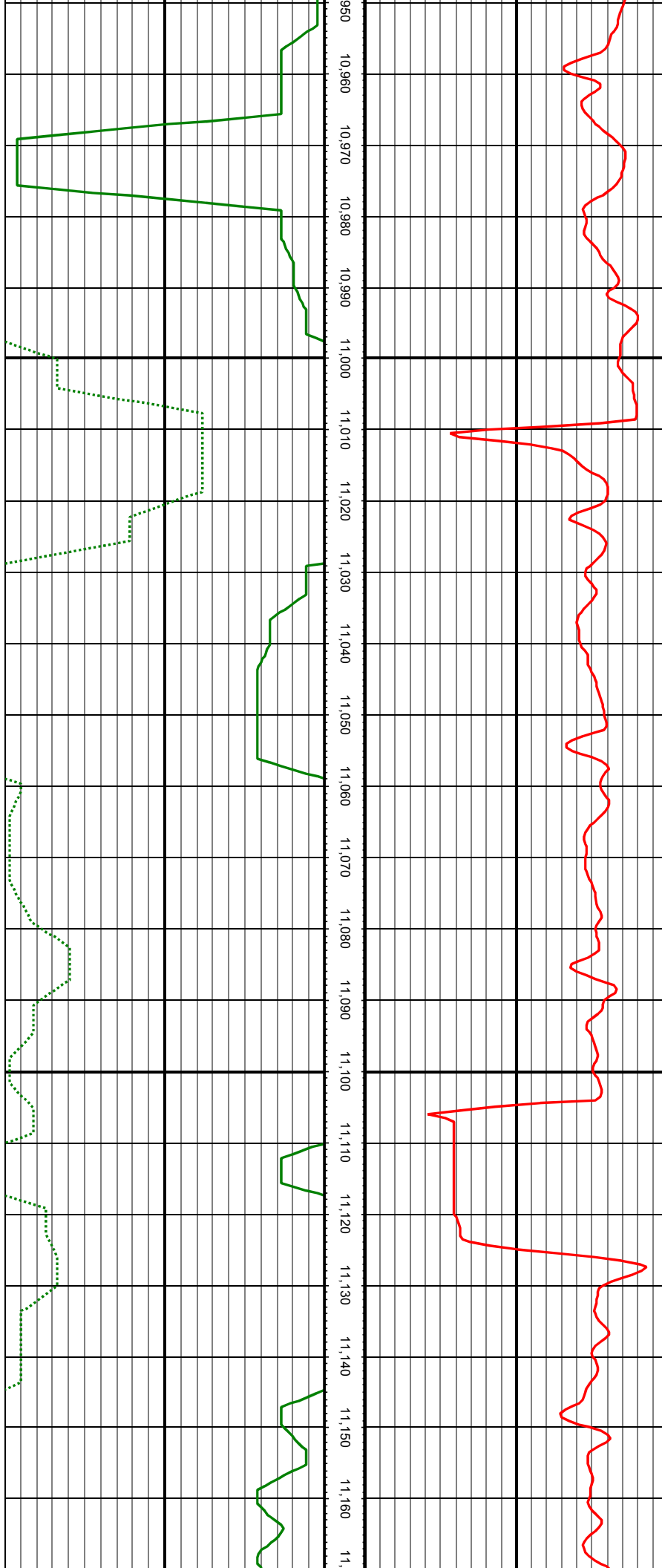
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MD: 10475.00 INC: 90.37 AZ: 90.27 TVD: 7453.58 VS: 3037.94









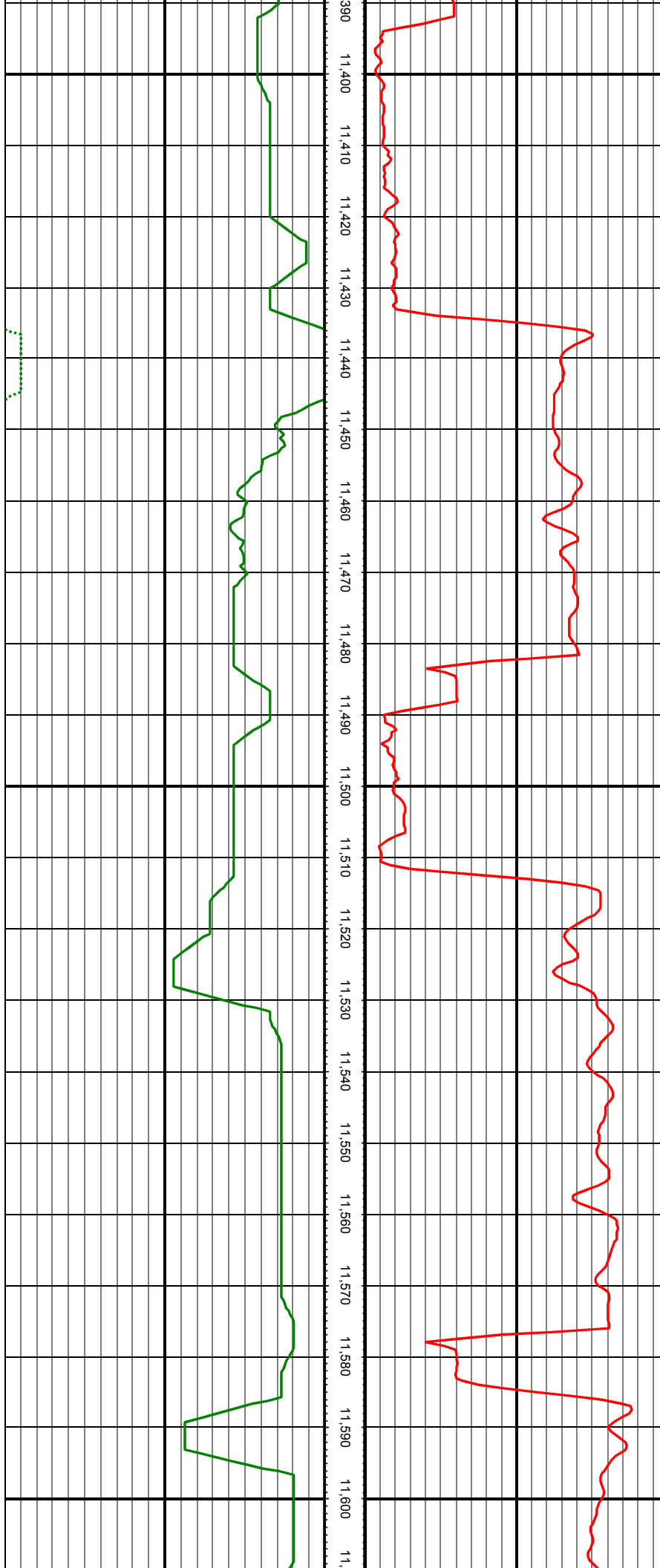
MD: 11043.00 INC: 91.91 AZ: 90.27 TVD: 7439.27 VS: 3605.56

MD: 11137.00 INC: 93.23 AZ: 89.74 TVD: 7435.06 VS: 3699.47



MD: 11232.00 INC: 94.24 AZ: 89.57 TVD: 7428.87 VS: 3794.26

MD: 11327.00 INC: 92.57 AZ: 90.18 TVD: 7423.23 VS: 3889.09



MD: 11421.00 INC: 90.07 AZ: 91.68 TVD: 7421.06 VS: 3983.04

MD: 11516.00 INC: 87.25 AZ: 93.43 TVD: 7423.28 VS: 4077.90

MD: 11611.00 INC: 87.82 AZ: 93.61 TVD: 7427.27 VS: 4172.62

