

Company : NOBLE ENERGY INC
Well : WELLS RANCH AE 19-644
Field : WATTENBERG

Date : 17-Jan-2015
Time : 23:01



A Schlumberger Company

GAMMA-RAY

2" = 100'
FEET MD

COMPANY : NOBLE ENERGY INC
WELL : WELLS RANCH AE 19-644
FIELD : WATTENBERG
COUNTY : WELD
STATE : CO
COUNTRY : USA
API No. : 05-123-39639

COMPANY : NOBLE ENERGY INC
WELL : WELLS RANCH AE 19-644
FIELD : WATTENBERG
COUNTY : WELD
STATE : CO
COUNTRY : USA
API WELL No. : 05-123-39639

WELL LOCATION

LAT:40°28'10"N LON:104°21'21"
X:3,318,318 Y:1,415,961 NAD83
SEC:24 TWP:6N RANGE:63W

OTHER SERVICES

DIRECTIONAL
ROP

DEPTH REF. : ROTARY TABLE
ELEVATION : 30.00 ft (ROTARY TABLE - GROUND LEVEL)
ALTITUDE : 4786.00 ft (GROUND LEVEL - MEAN SEA LEVEL)

BOREHOLE RECORD

DEVIATION RECORD

| HOLE SIZE in | FROM ft | TO ft | INCLINATION deg | FROM ft | TO ft |
|--------------|---------|-------|-----------------|---------|-------|
| 8 3/4 | 719 | 7022 | 00-10 | 0 | 2319 |
| 6 1/8 | 7022 | 11985 | 10-00 | 2319 | 5722 |
| | | | 00-91 | 5722 | 7210 |
| | | | 90+/-3 | 7210 | 11985 |
| | | | | | |
| | | | | | |
| | | | | | |

CASING RECORD

| CASING SIZE in | FROM ft | TO ft |
|----------------|---------|-------|
| 9 5/8 | 0 | 709 |
| 7 | 0 | 7012 |
| | | |
| | | |
| | | |
| | | |

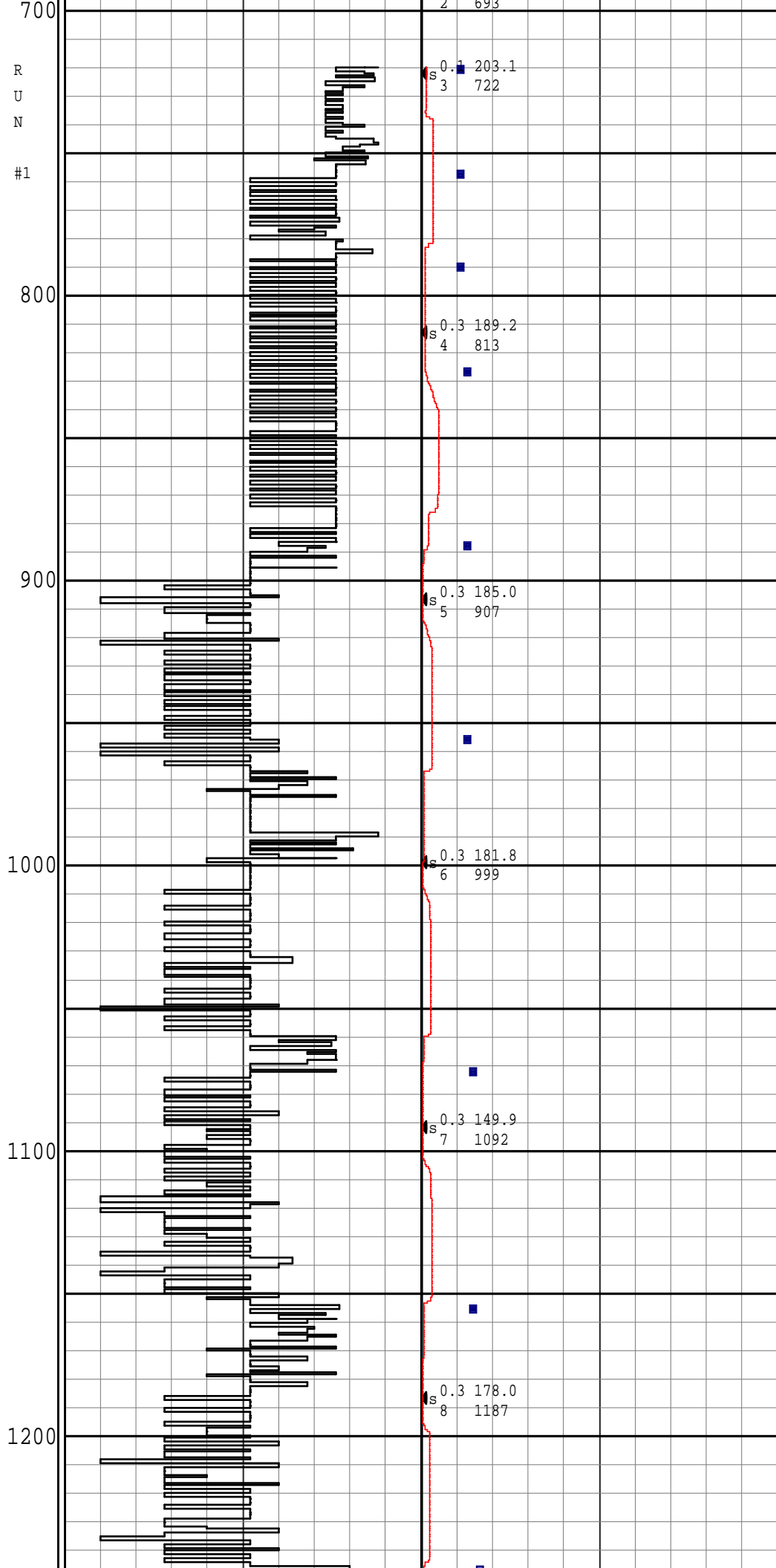
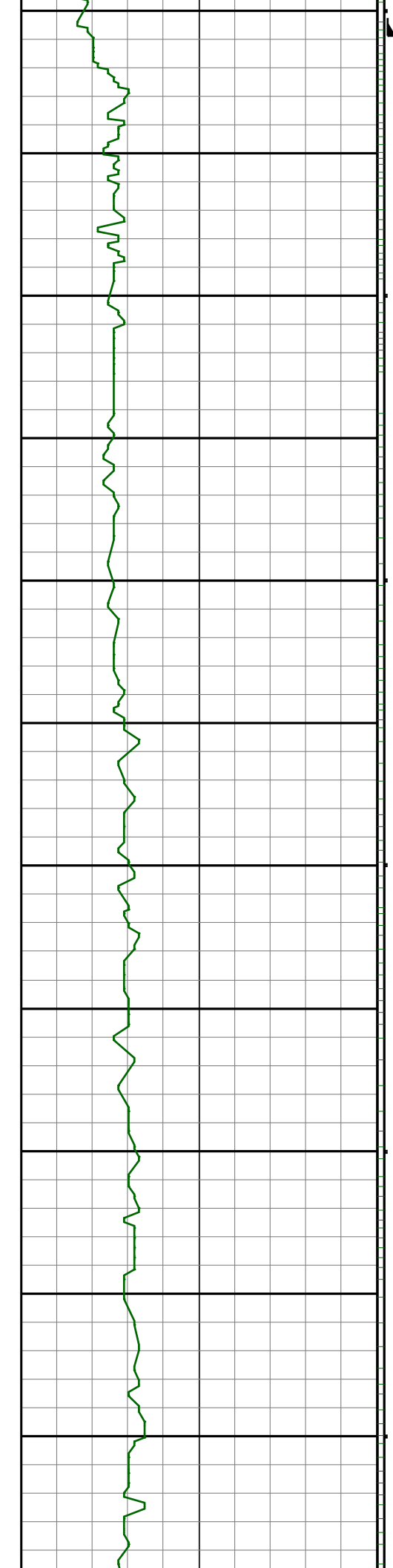
DRILLING Co.: HELMERICH & PAYNE, INC
RIG : 330
LMD UNIT No.: TRAILER DISTRICT : COMMERCE CTY
SPUD DATE : 8-JAN-15
LMD START DATE : 10-JAN-15 DEPTH : 719 ft
LMD END DATE : 16-JAN-15 DEPTH : 11985 ft
TOTAL DEPTH : 11985 ft

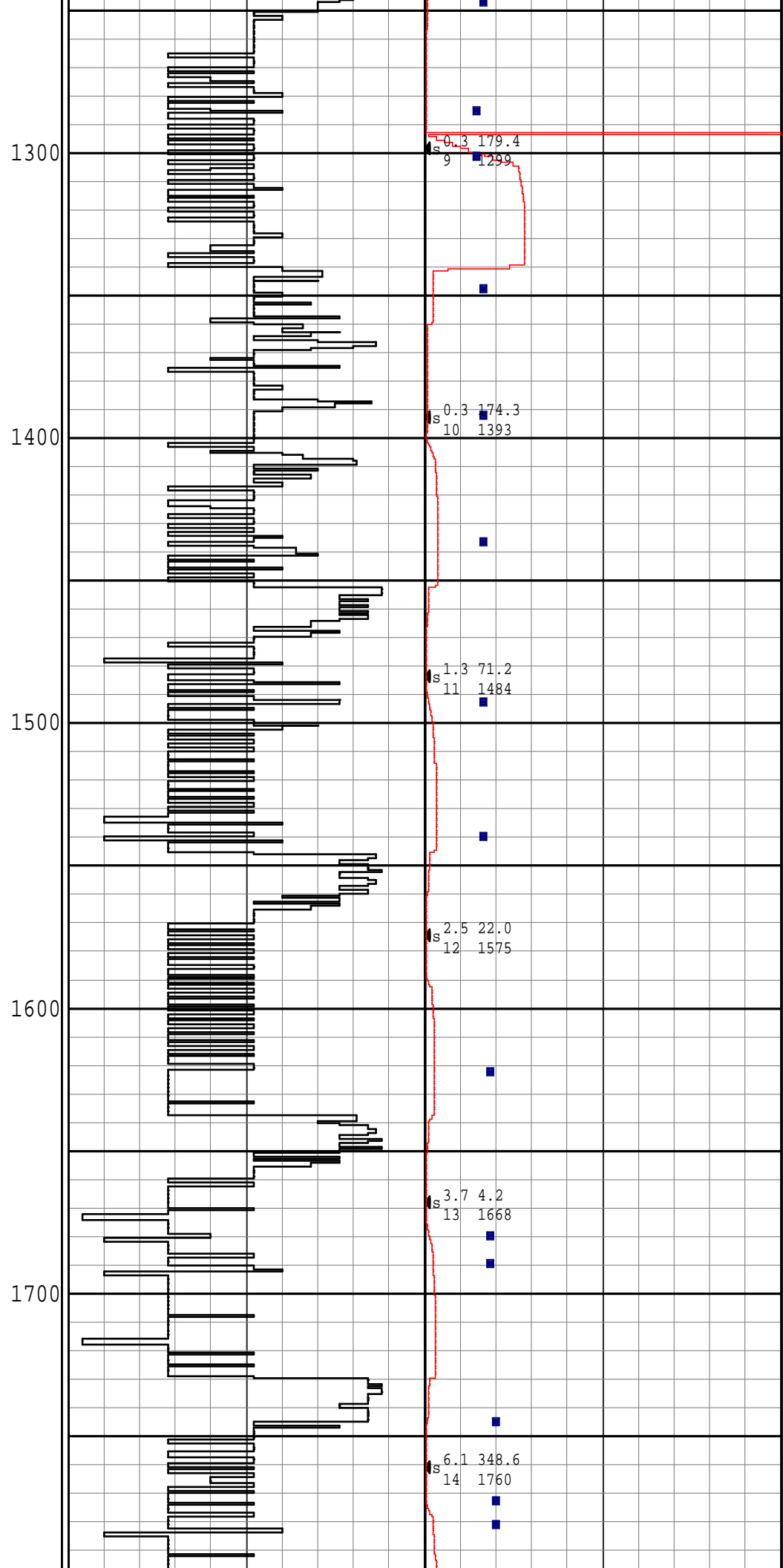
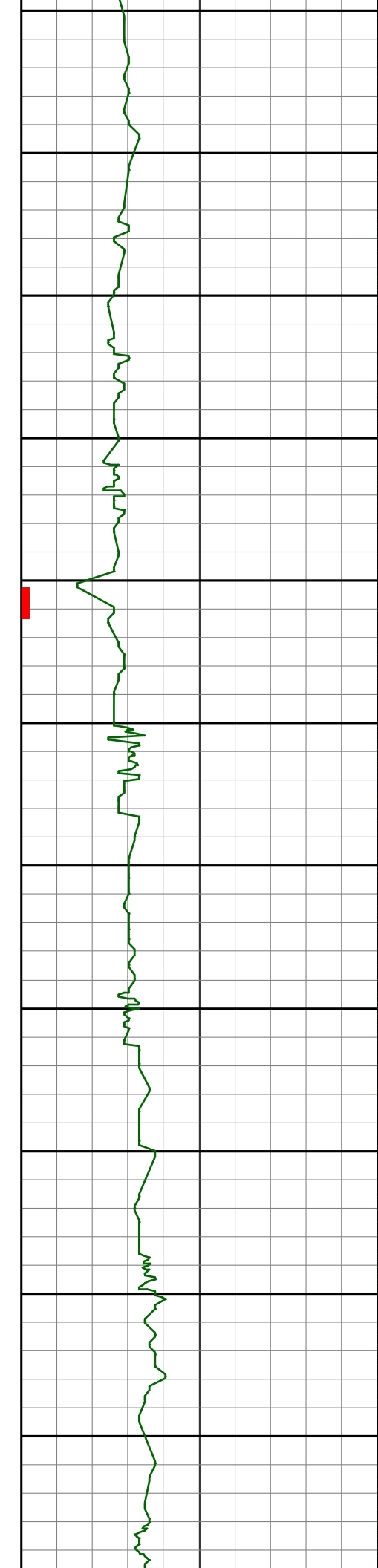
RUN DATA

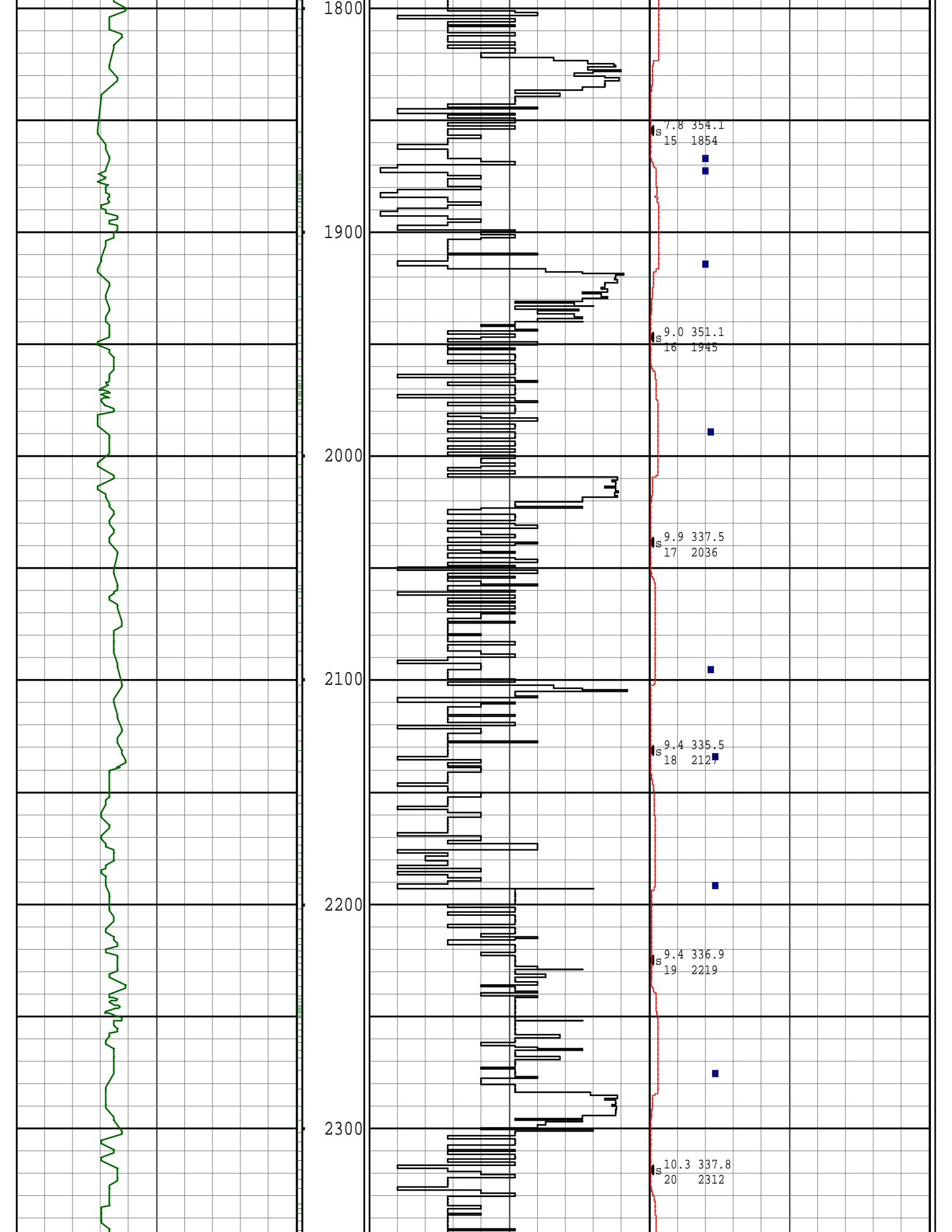
| | | | | | | |
|-------------------|-------------|-------------|-------------|--|--|--|
| RUN NUMBER | 1 | 2 | 3 | | | |
| START DATE | 10-JAN-15 | 12-JAN-15 | 13-JAN-15 | | | |
| START TIME | 05:00 | 01:45 | 23:45 | | | |
| END DATE | 12-JAN-15 | 13-JAN-15 | 16-JAN-15 | | | |
| END TIME | 00:00 | 00:50 | 06:00 | | | |
| DEPTH IN ft | 719 | 6331 | 7022 | | | |
| DEPTH OUT ft | 6331 | 7022 | 11985 | | | |
| LOG TOP ft | 709 | 6287 | 7012 | | | |
| LOG BOTTOM ft | 6287 | 6981 | 11944 | | | |
| HOLE SIZE in | 8 3/4 | 8 3/4 | 6 1/8 | | | |
| | | | | | | |
| MUD DATA @ ft | 5312 | 6761 | 9250 | | | |
| MUD TYPE | WATER BASED | WATER BASED | WATER BASED | | | |
| DENSITY lb/gal | 9.10 | 10.60 | 9.70 | | | |
| VISCOSITY s/qt | 44 | 45 | 36 | | | |
| pH | 8.5 | 8.8 | 9.0 | | | |
| FLUID LOSS cm3/30 | 0.0 | 0.0 | 0.0 | | | |
| SALINITY ppm | 2400 | 2000 | 1800 | | | |
| Rm ohmm @ deg F | @ | @ | @ | | | |
| Rmf ohmm @ deg F | @ | @ | @ | | | |

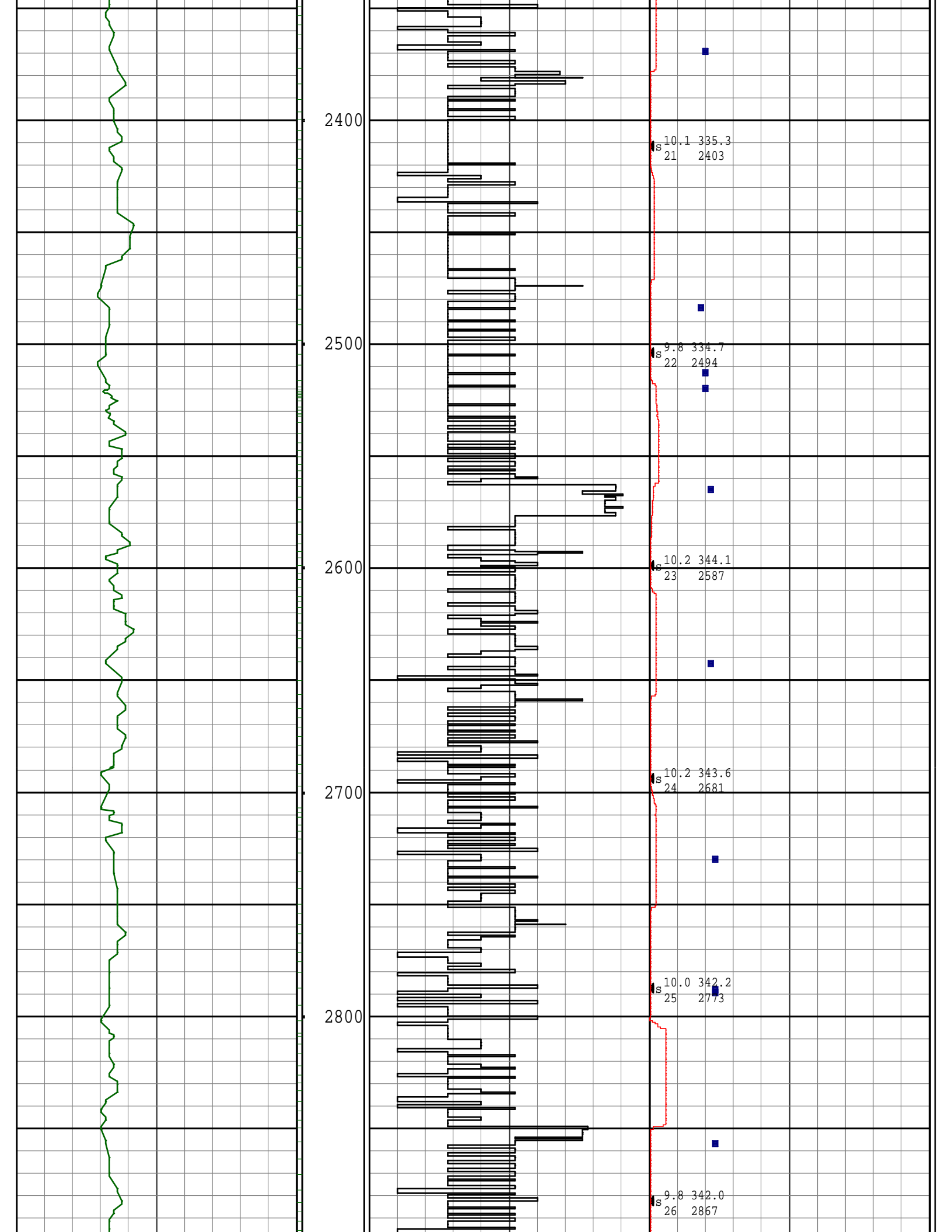
| |
|--|
| REMARKS |
| NOBLE ENERGY INC. AFE #:200462 |
| PATHFINDER JOB#: 15CC00124 |
| ALL LOGGING DATA IS TRANSMITTED ONLY UNLESS STATED OTHERWISE. |
| ALL REFERENCES TO LOG TOP, LOG BOTTOM, OR LOGGING TOOL DEPTH REFER TO THE GAMMA-RAY SENSOR UNLESS STATED OTHERWISE. |
| ALL ANNOTATIONS IN THE DEPTH TRACK ARE REFERENCED TO BIT DEPTH. |
| THIRD PARTY DEPTH TRACKING SERVICES PROVIDED BY PASON. |
| RUN #1: 6 3/4 HDS-1R/GAMMA LOGGING RUN. |
| RUN #2: 6 3/4 HDS-1R/GAMMA LOGGING RUN. |
| RUN #3: 4 3/4 HDS-1R/GAMMA LOGGING RUN. |
| SEE REMARK#1: GAMMA RAY LOGGED THROUGH CASING FROM 680'-709'MD (679'-708'TVD) |
| SEE REMARK #2:GAMMA RAY LOGGED THROUGH CASING FROM 6976'-7012'MD (6617'-6618'TVD). |
| NOTICE - All interpretations are opinions based on inferences from electrical or other measurements and we do not guarantee the accuracy or correctness of any interpretations. We shall not, except in the case of gross or willful negligence on our part, be liable or responsible for loss, costs, damages or expenses incurred or sustained by anyone as a result of any interpretations made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule. |
| PATHFINDER - A Schlumberger Company |
| Version No : RX5 V6.05B Release 20Jun2014 |
| Plot Time : 17-Jan-2015 23:01 |

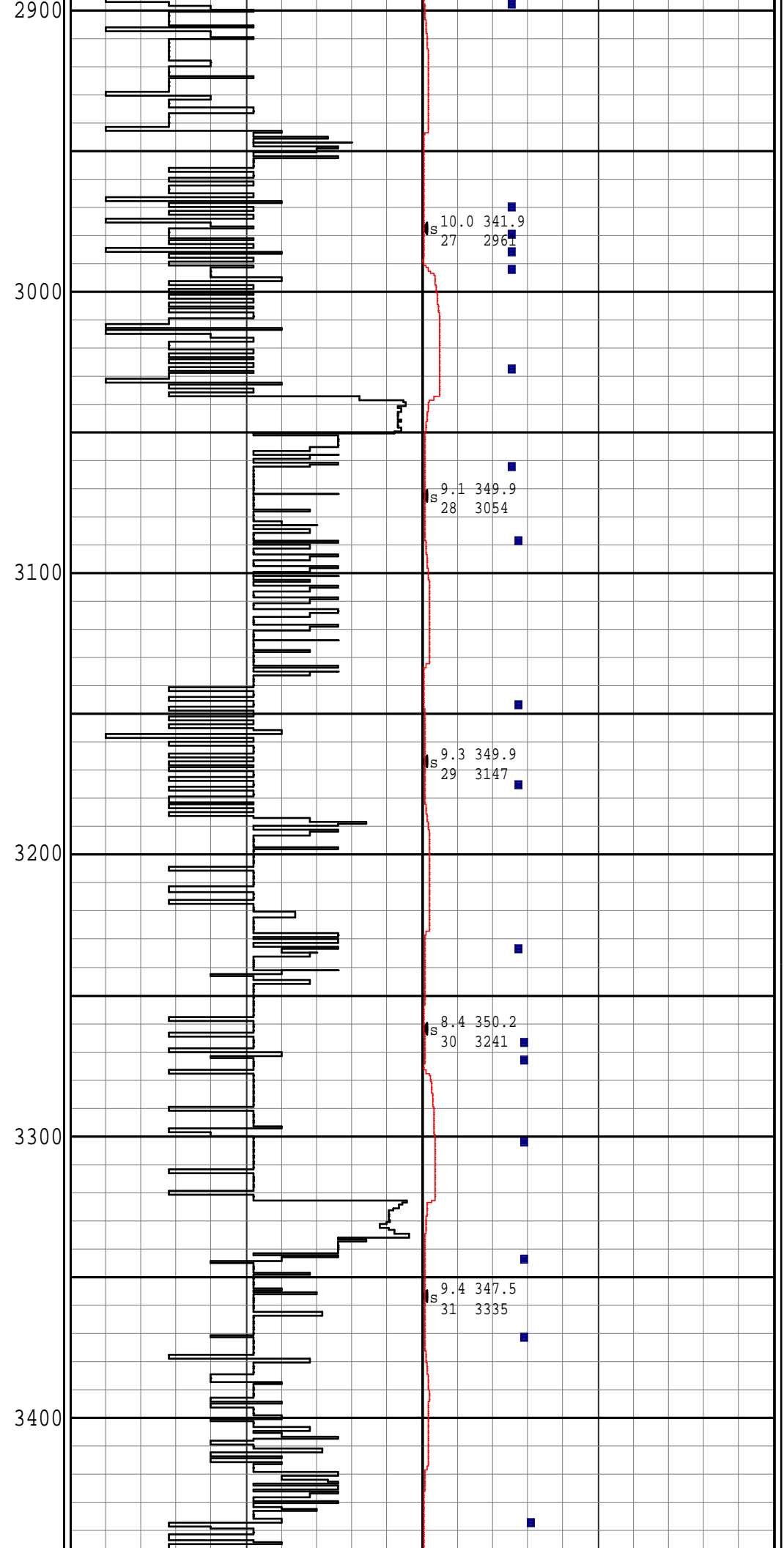
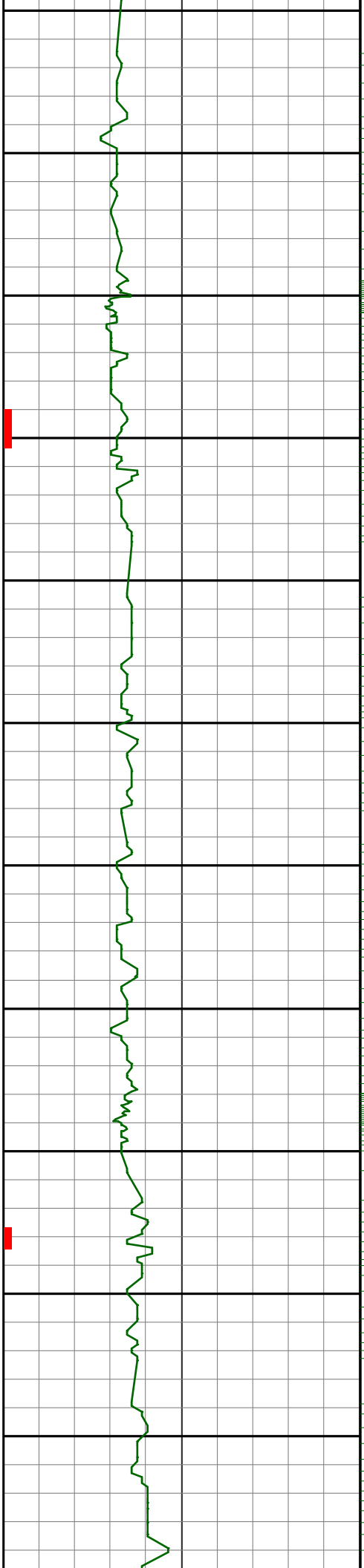
SEE REMARK #1

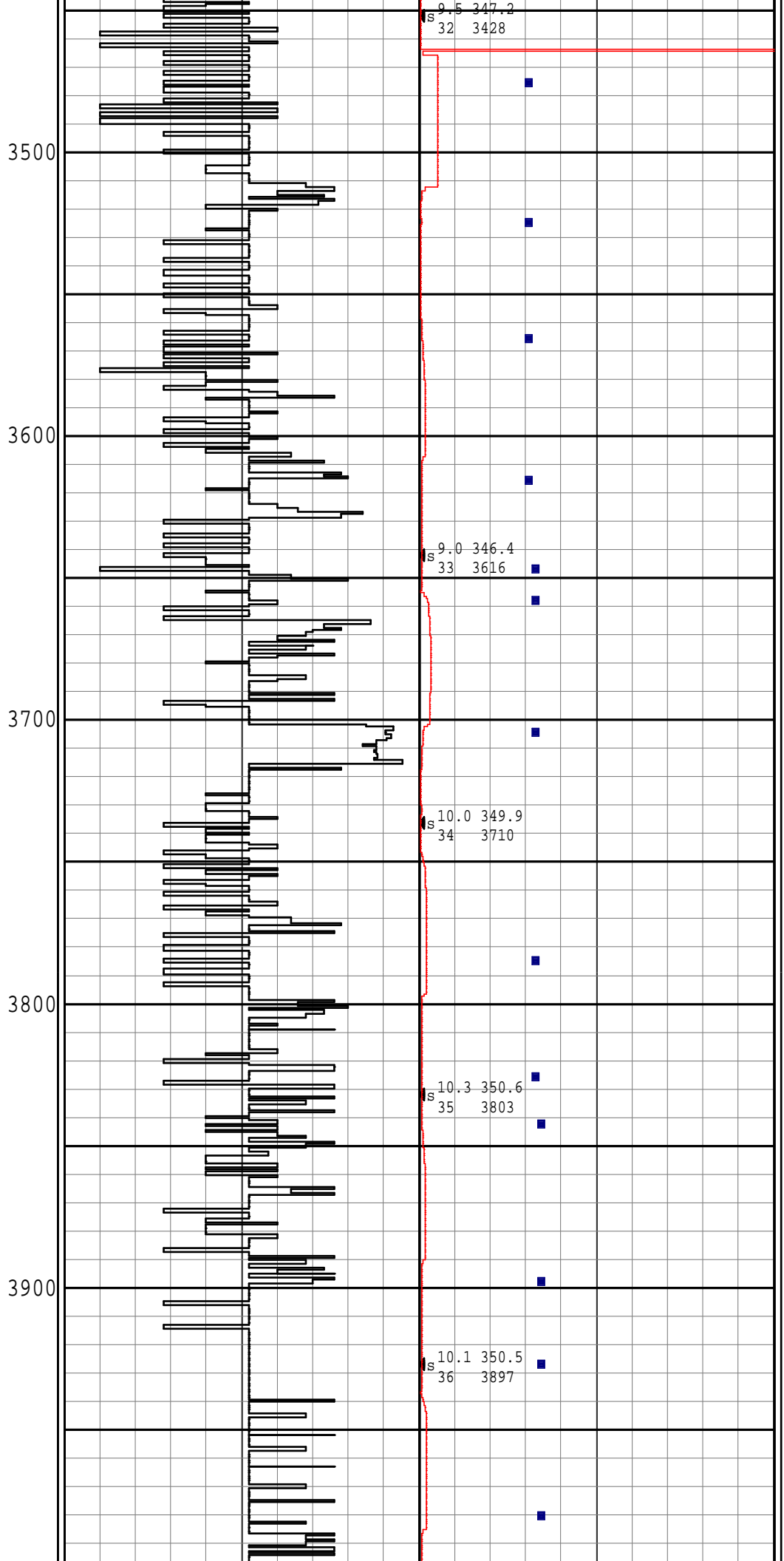
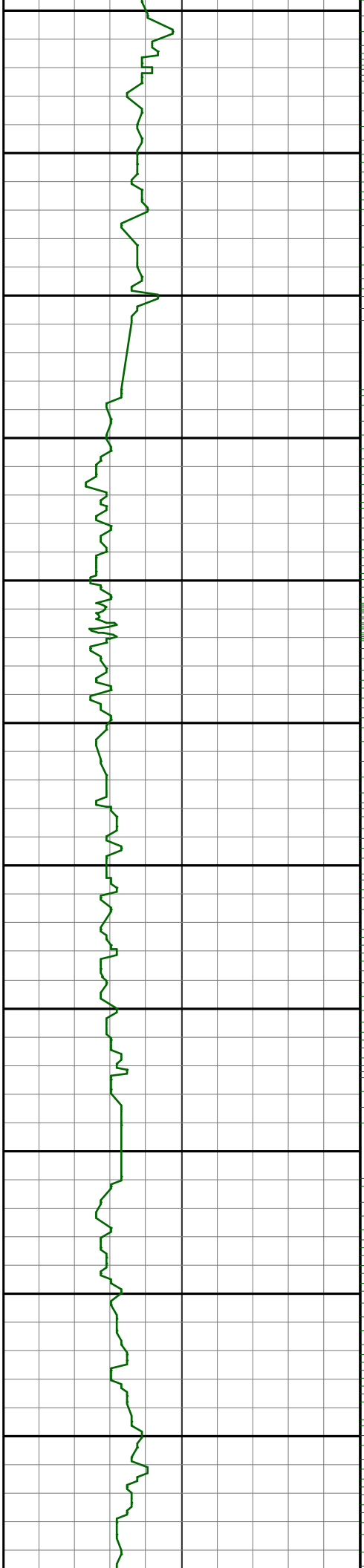


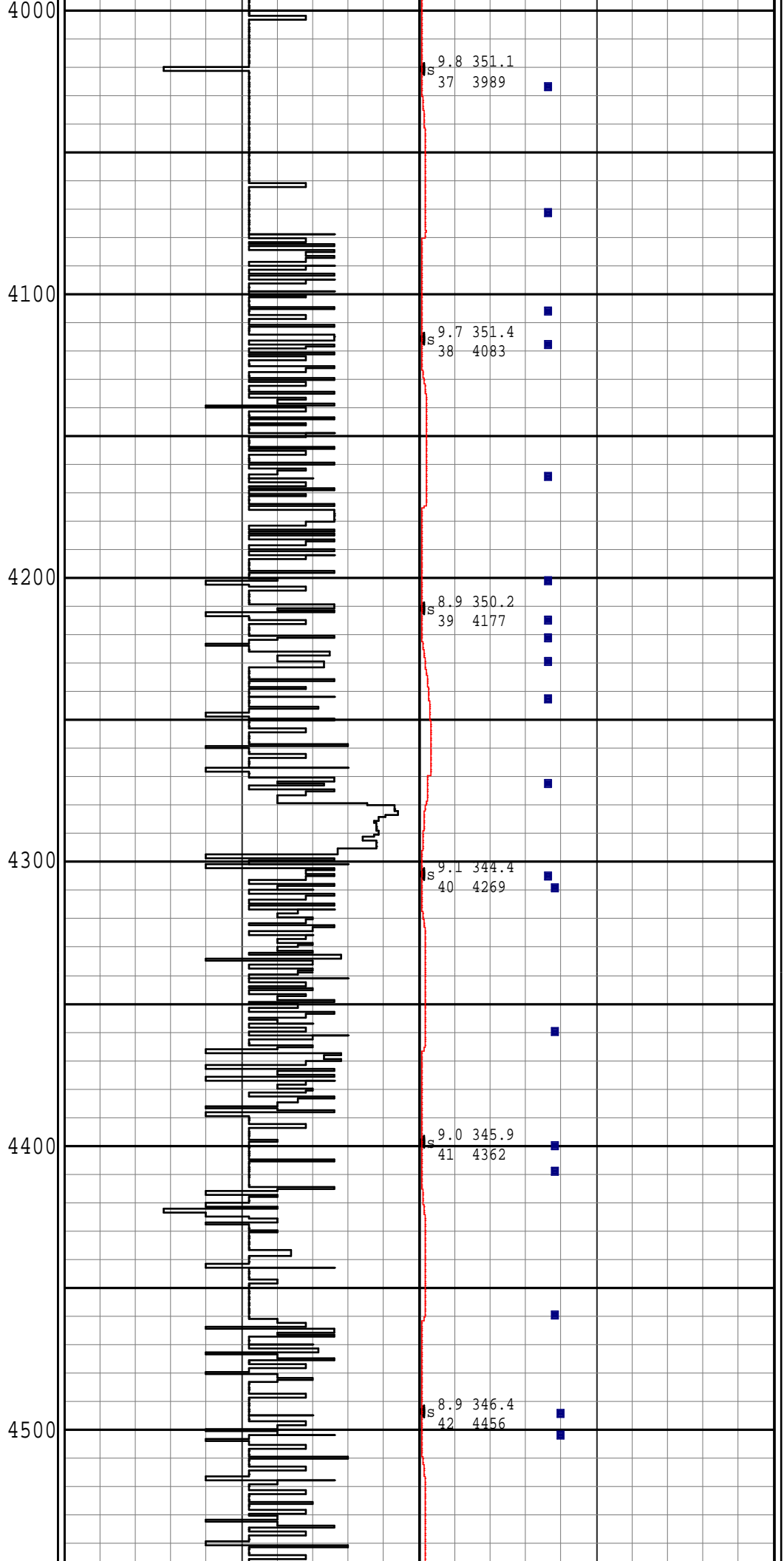
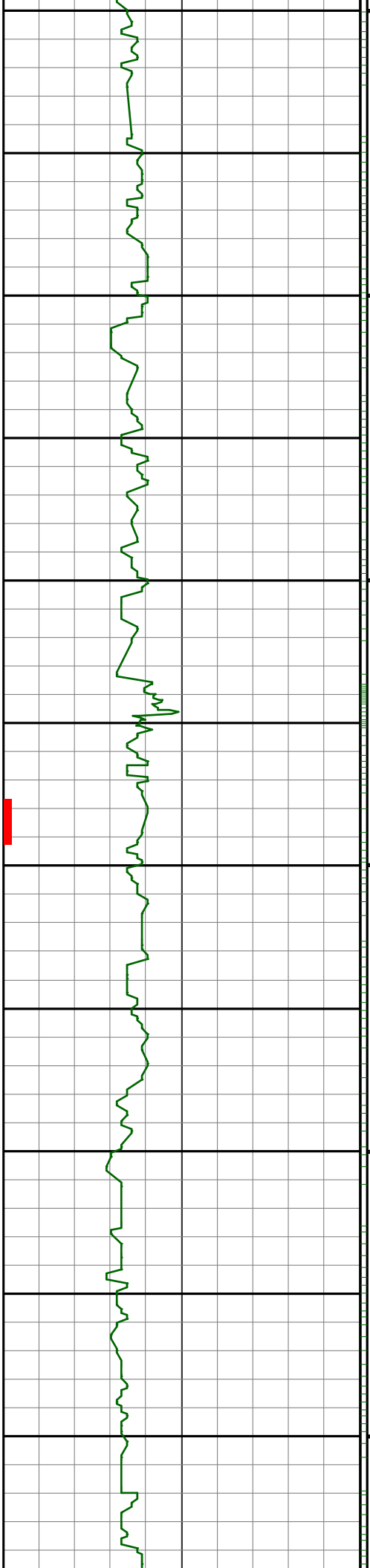


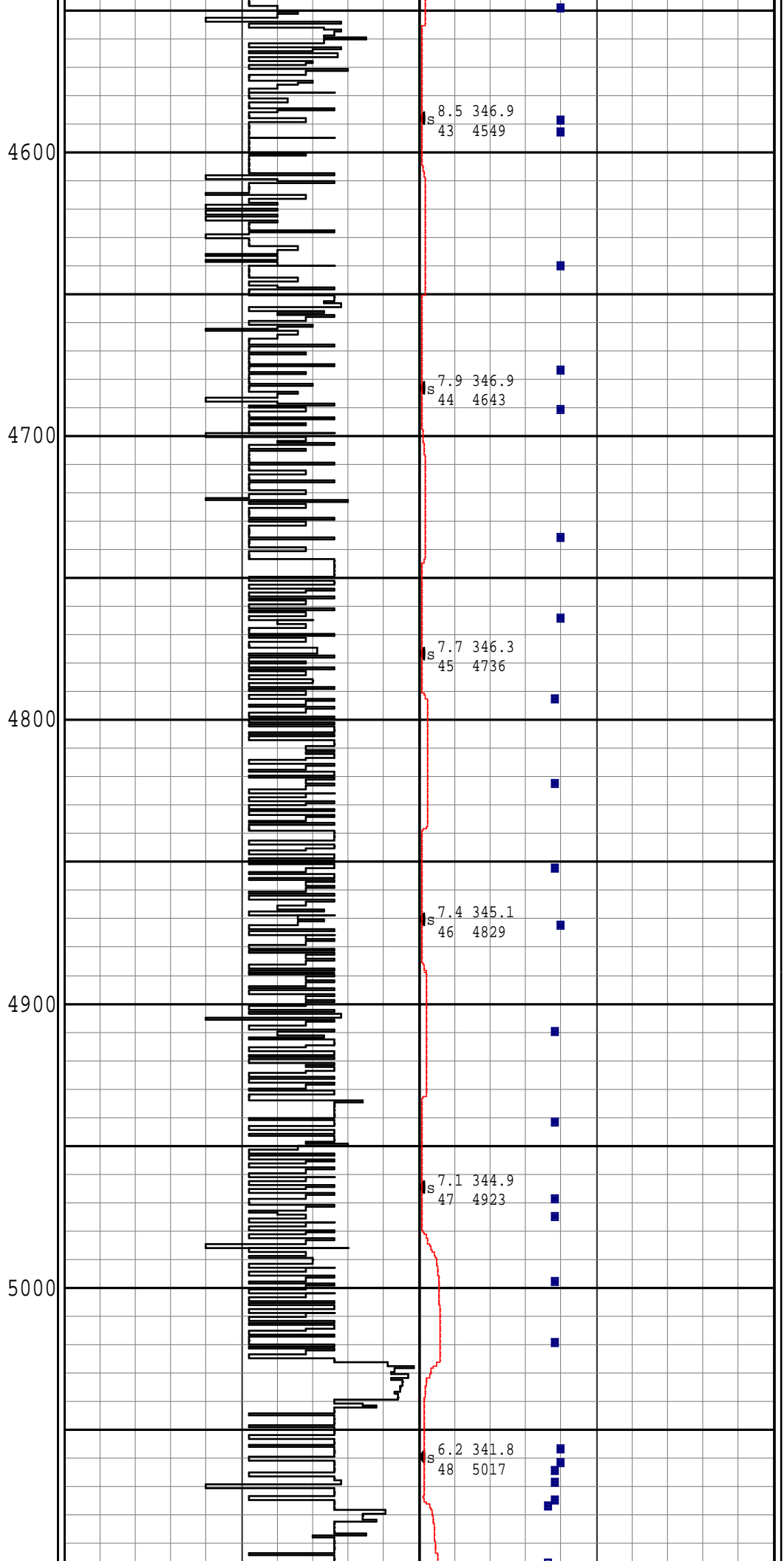
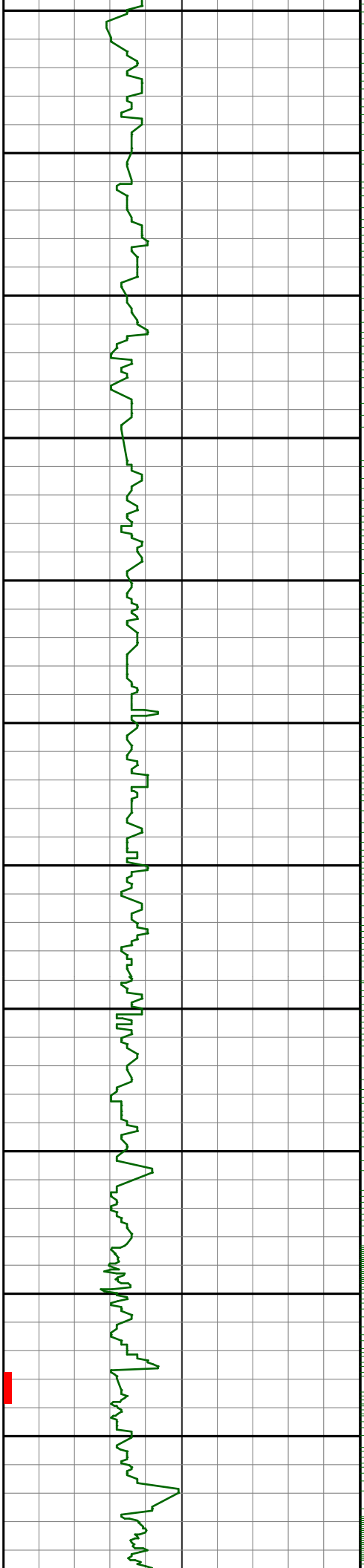


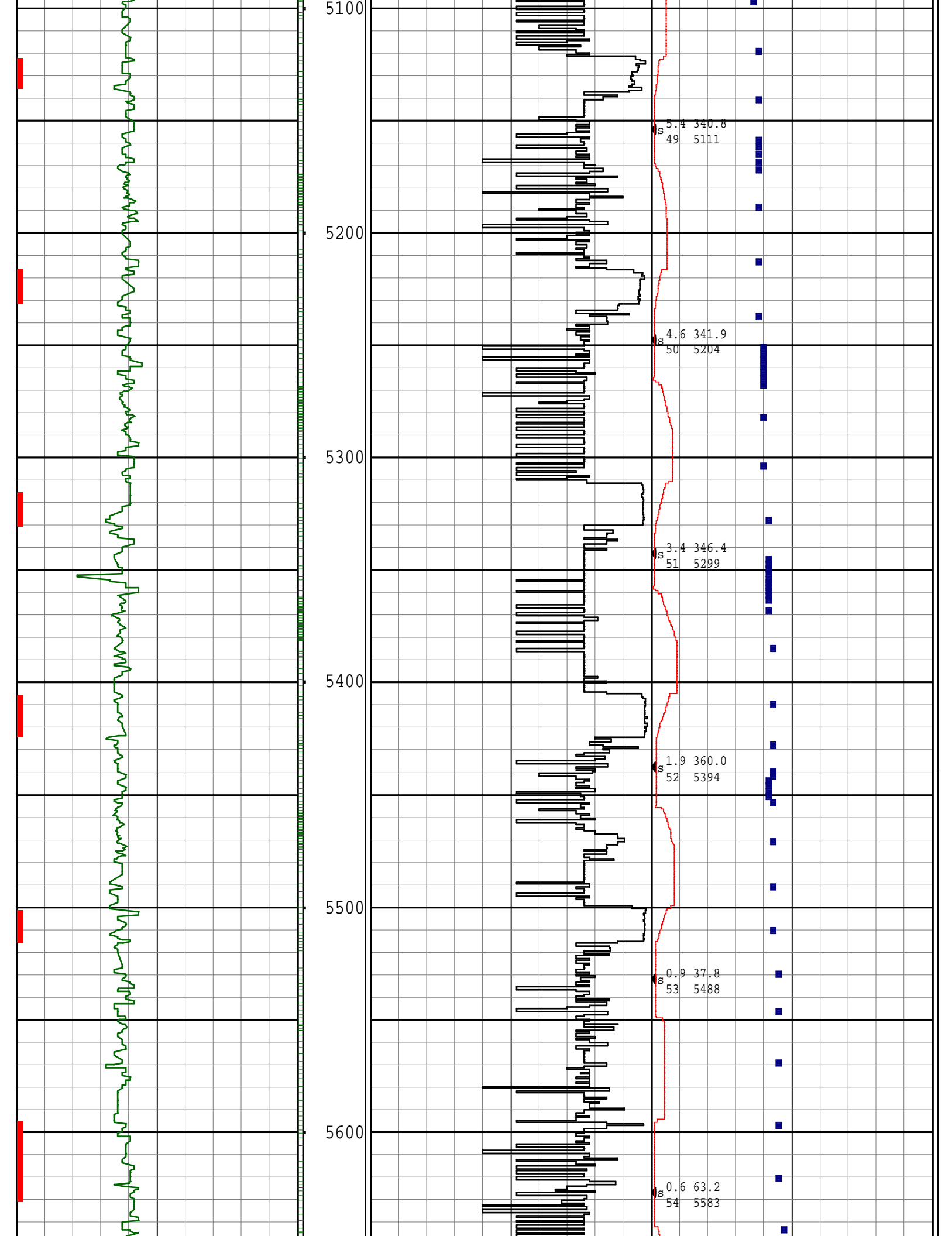


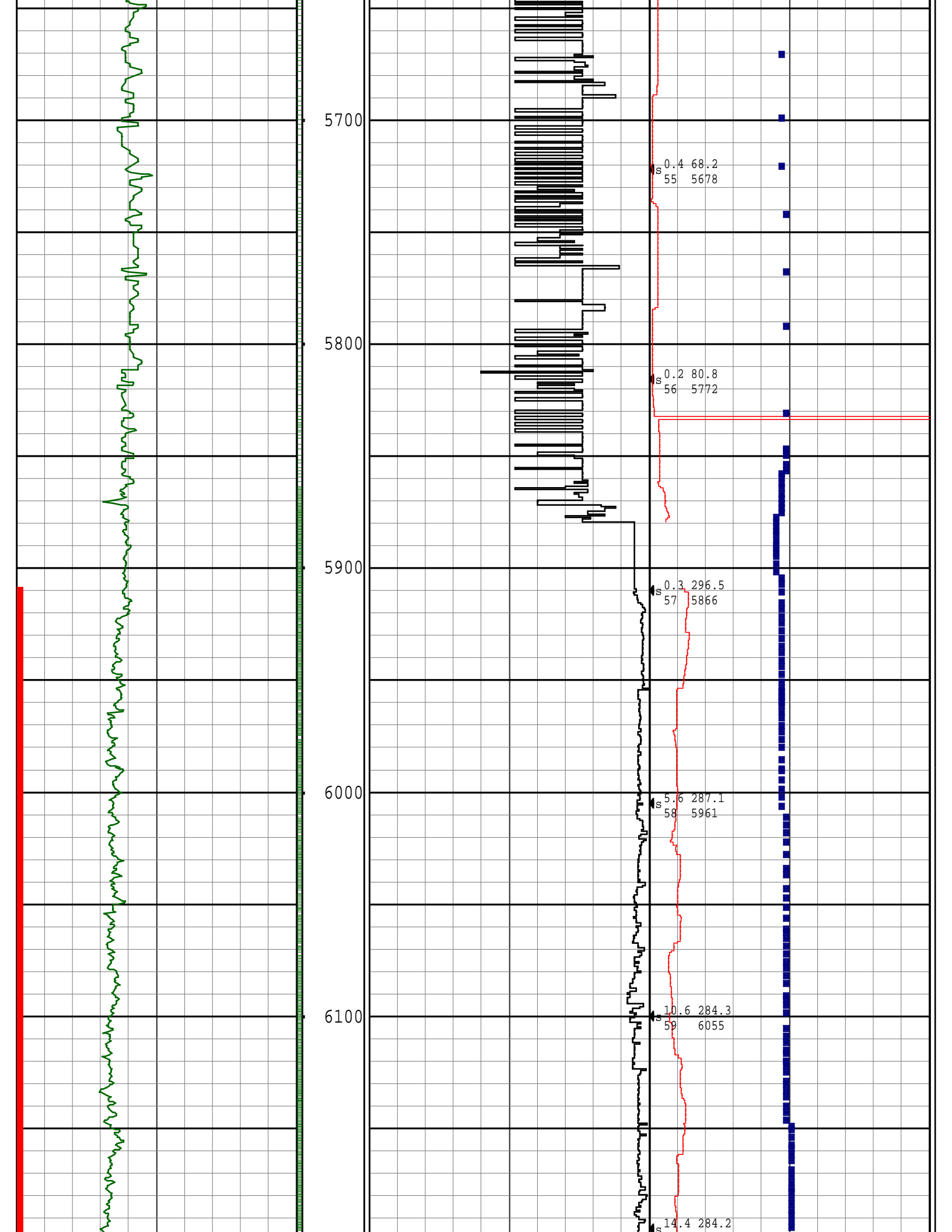


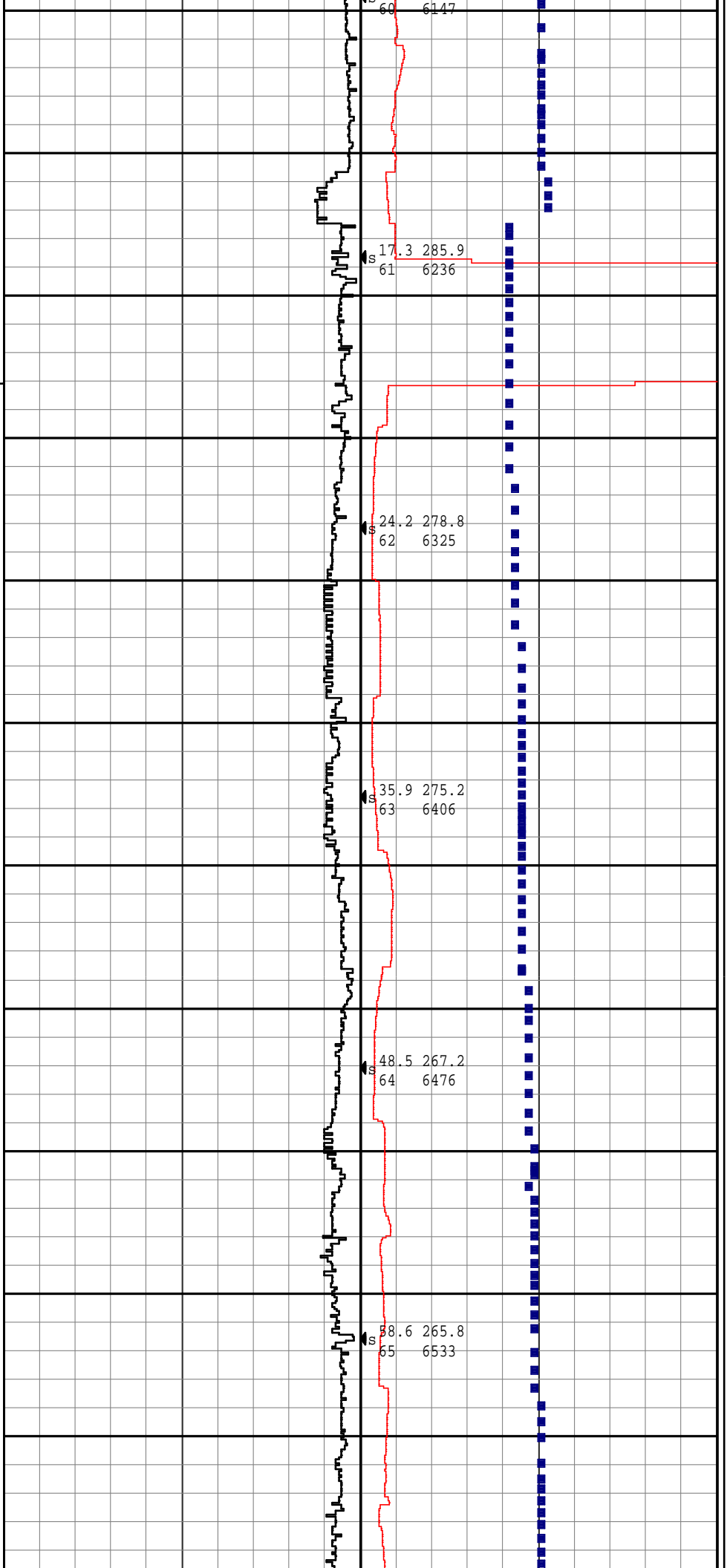
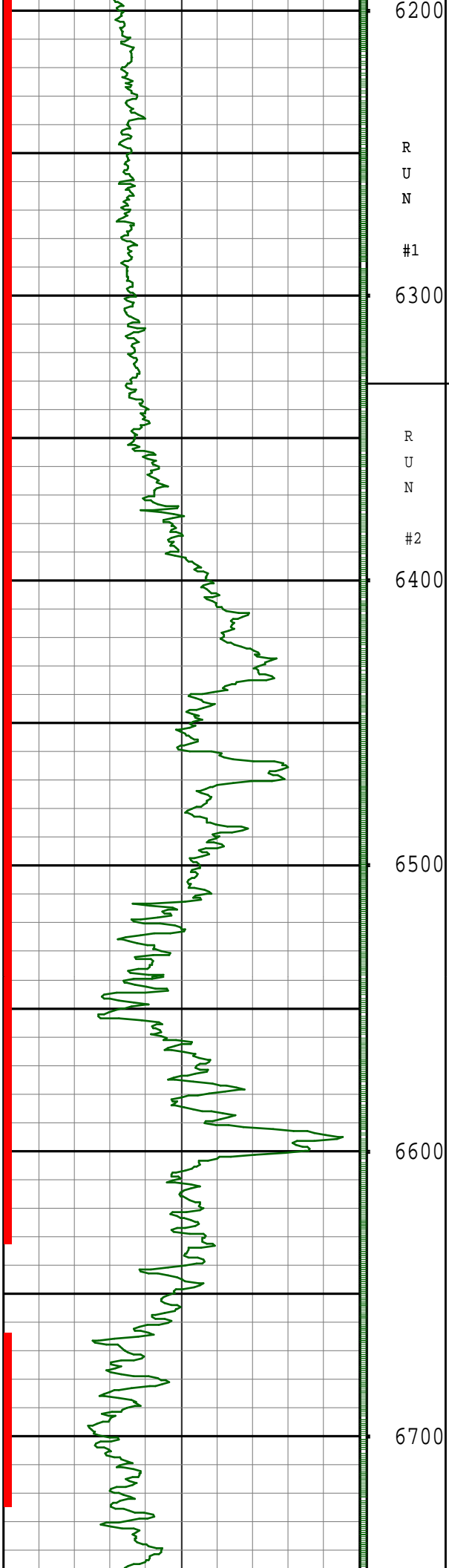


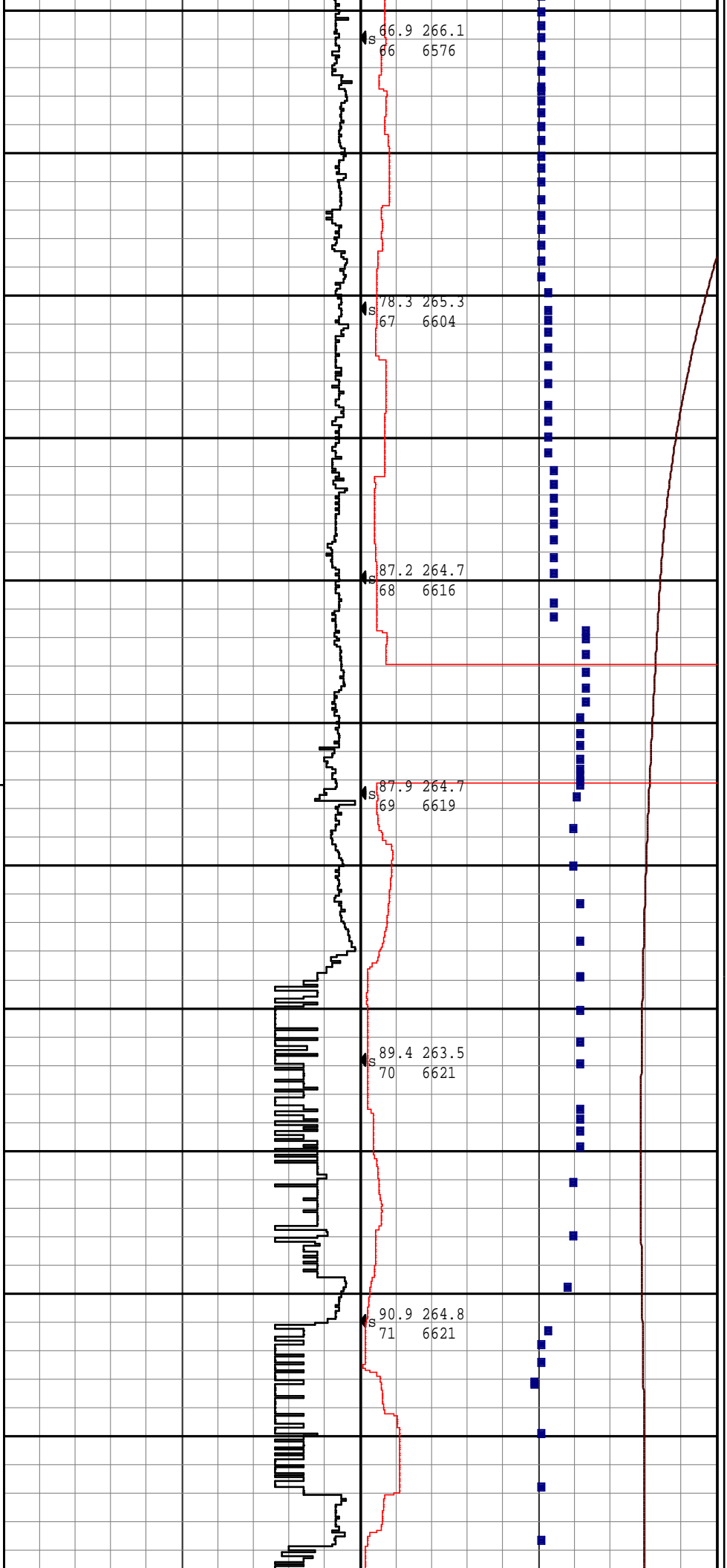
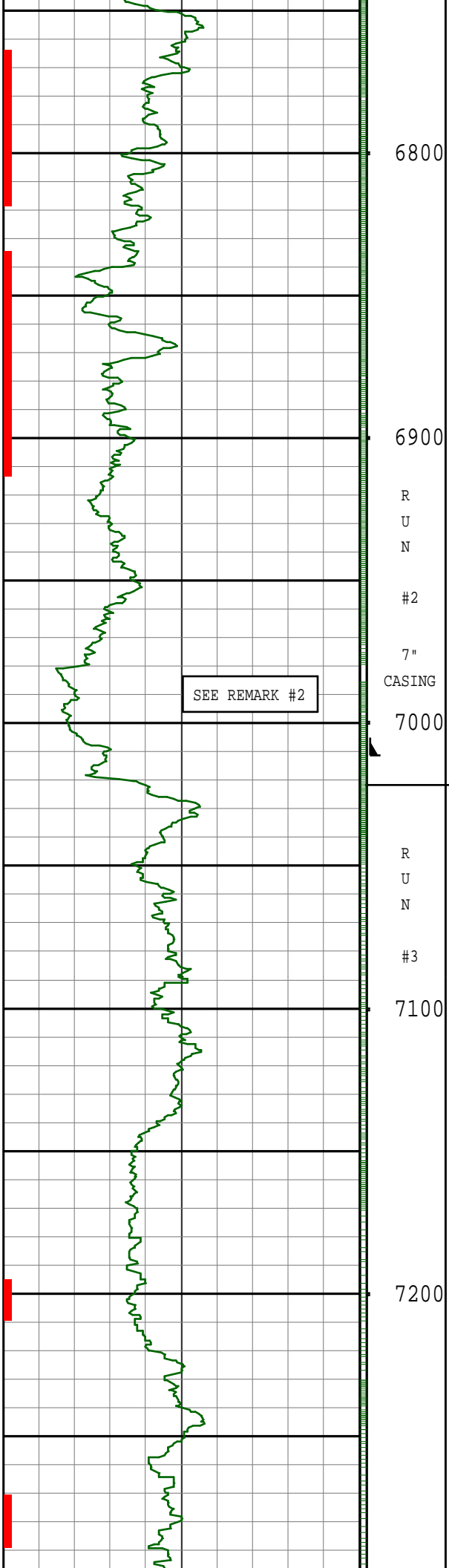


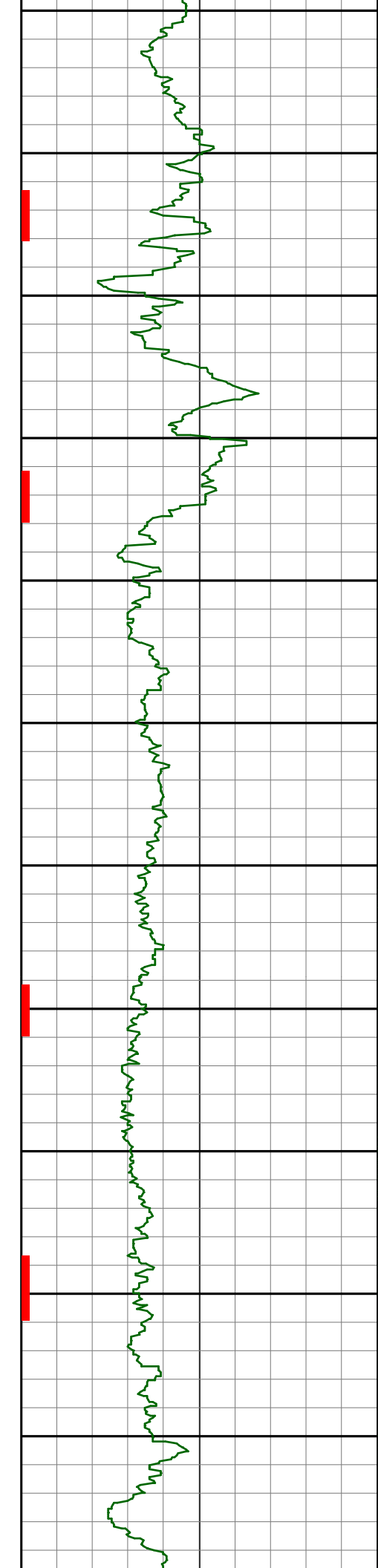




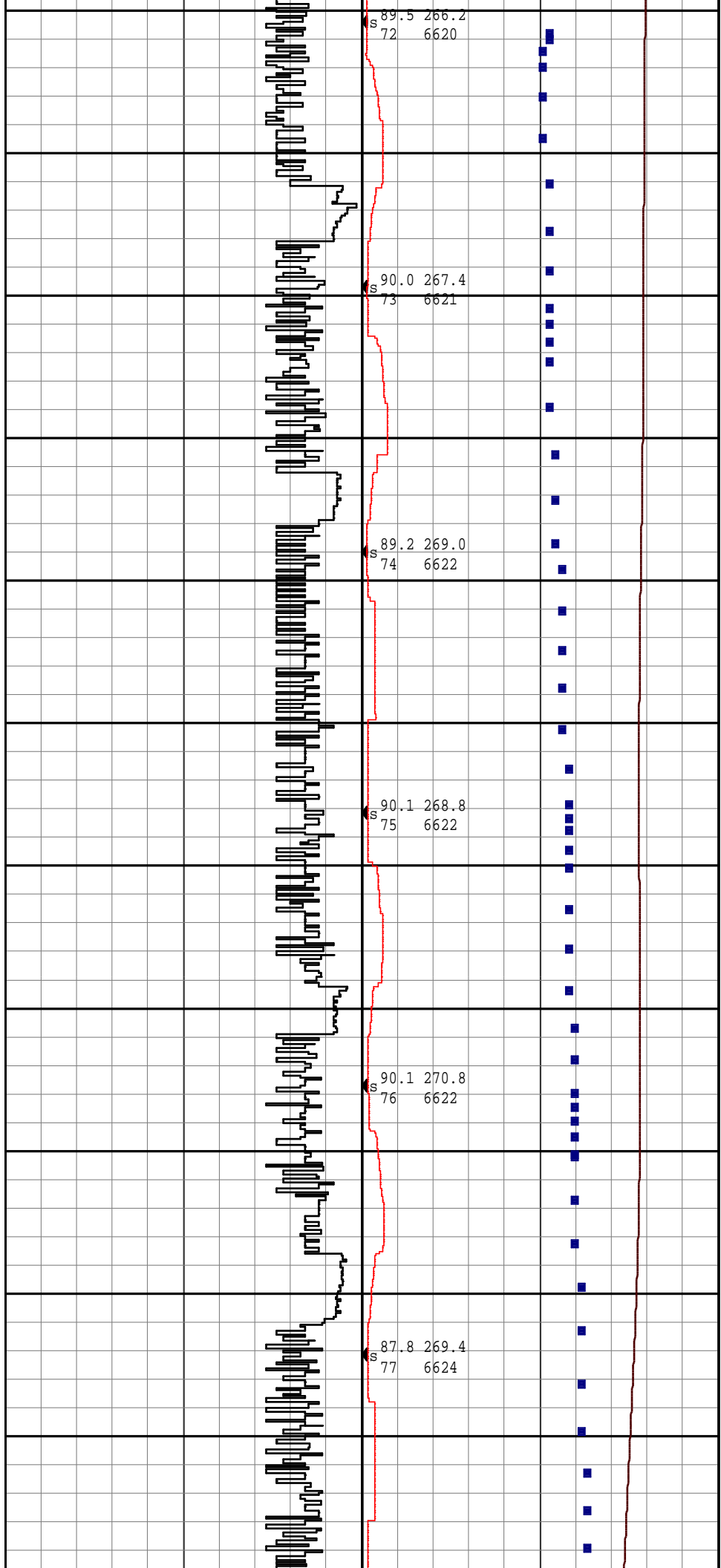


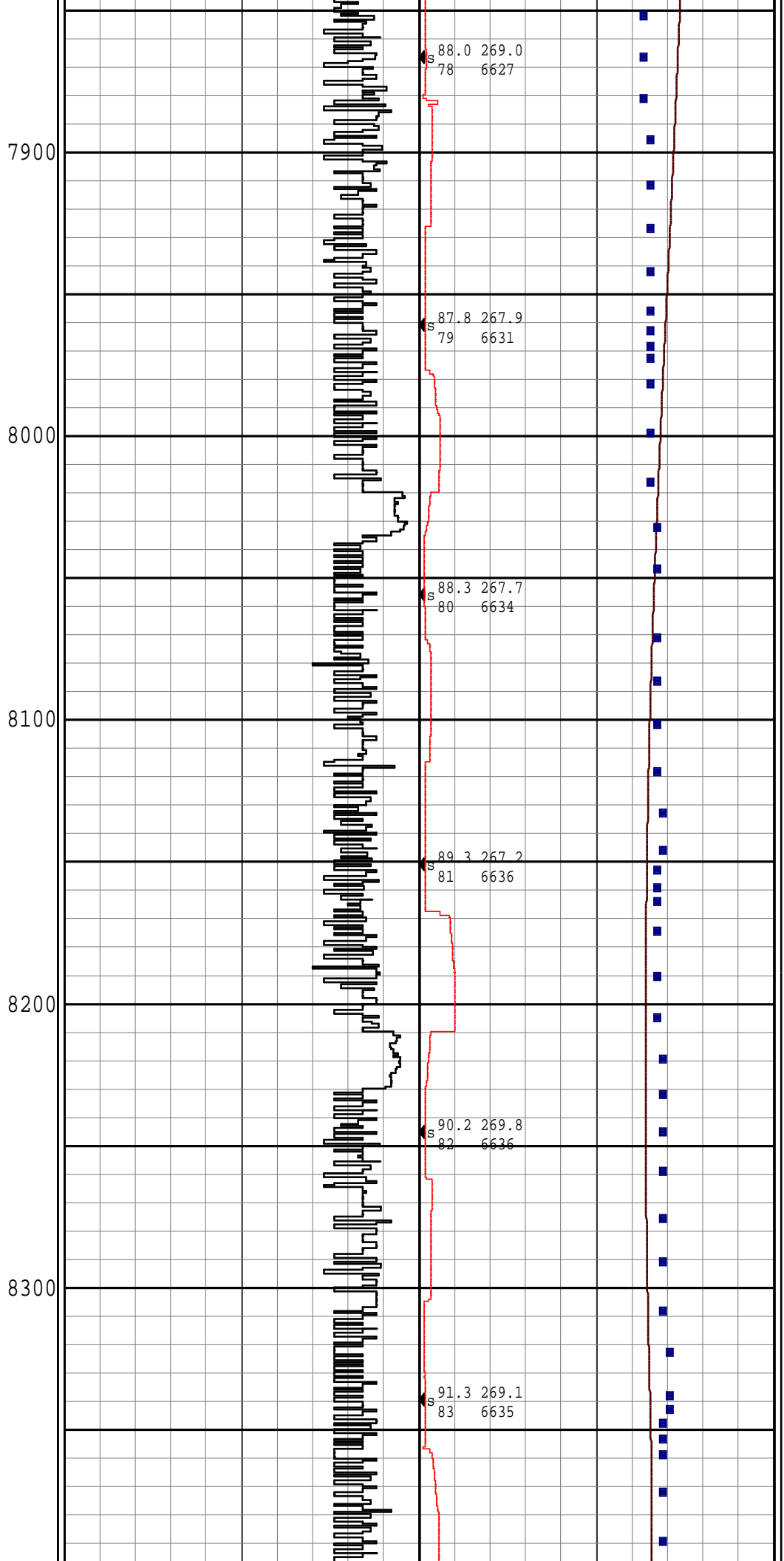
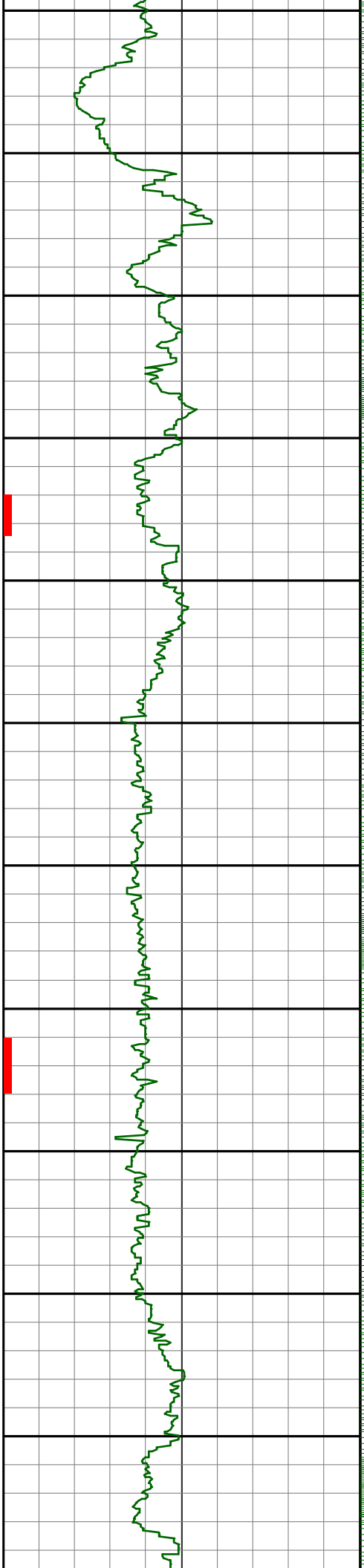


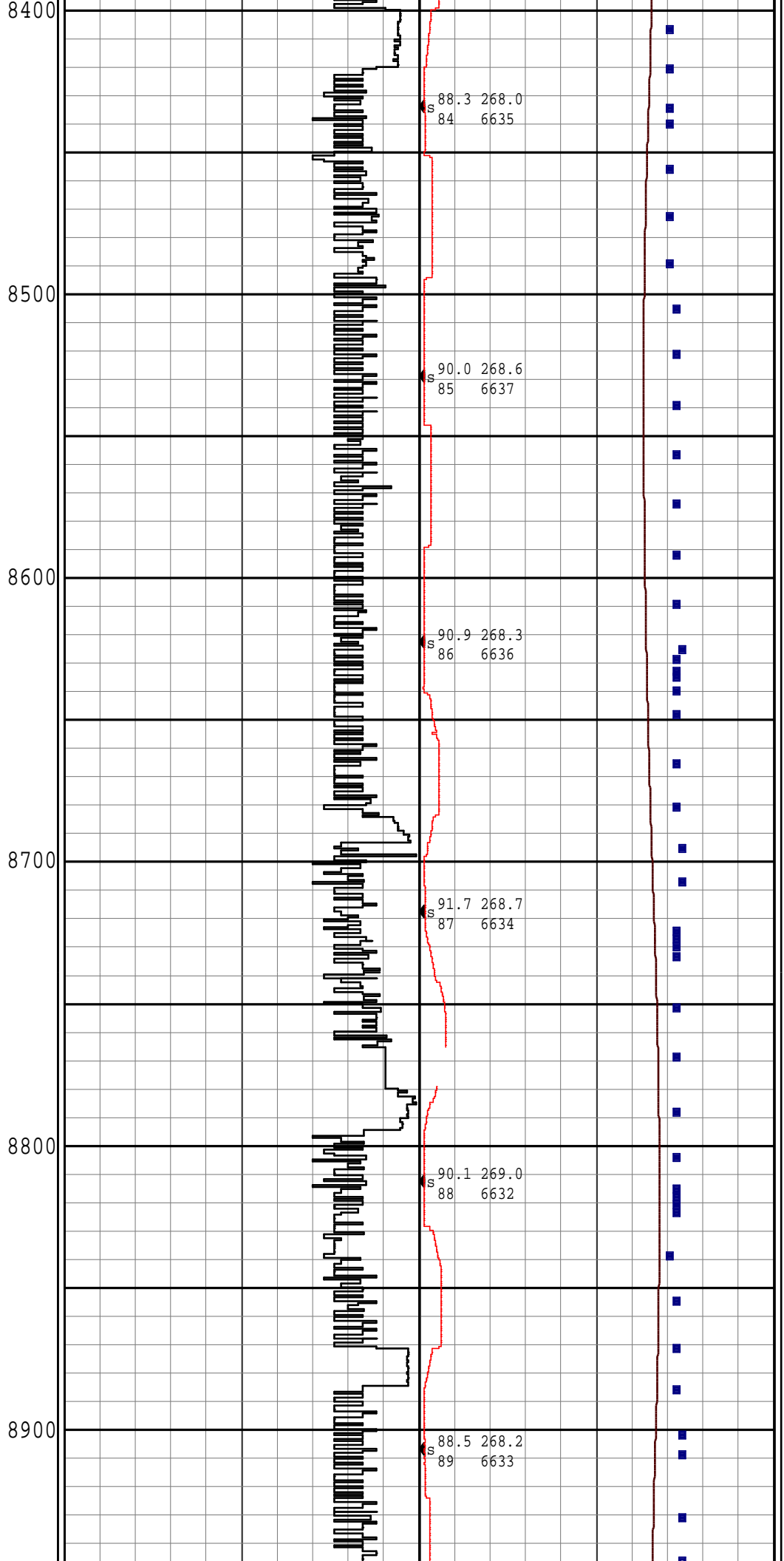
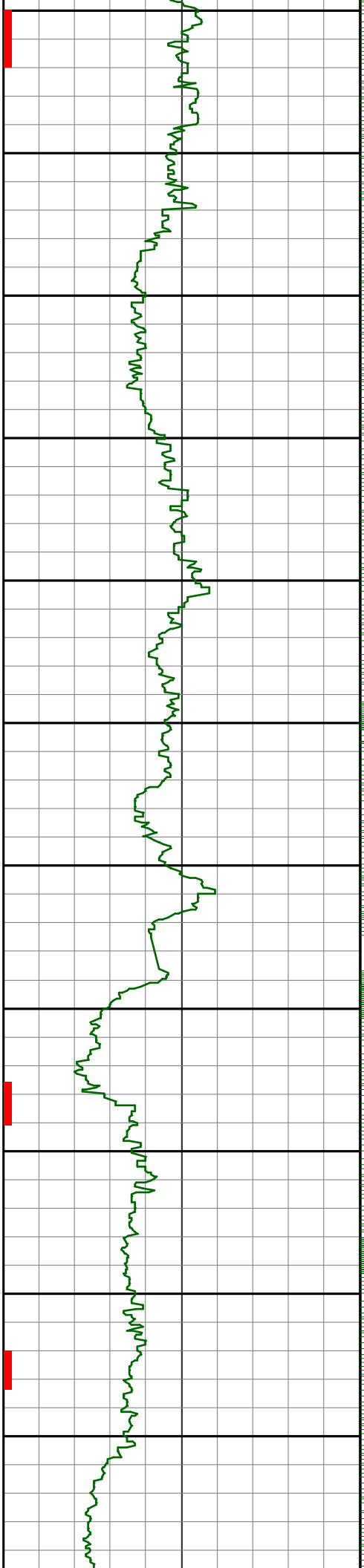


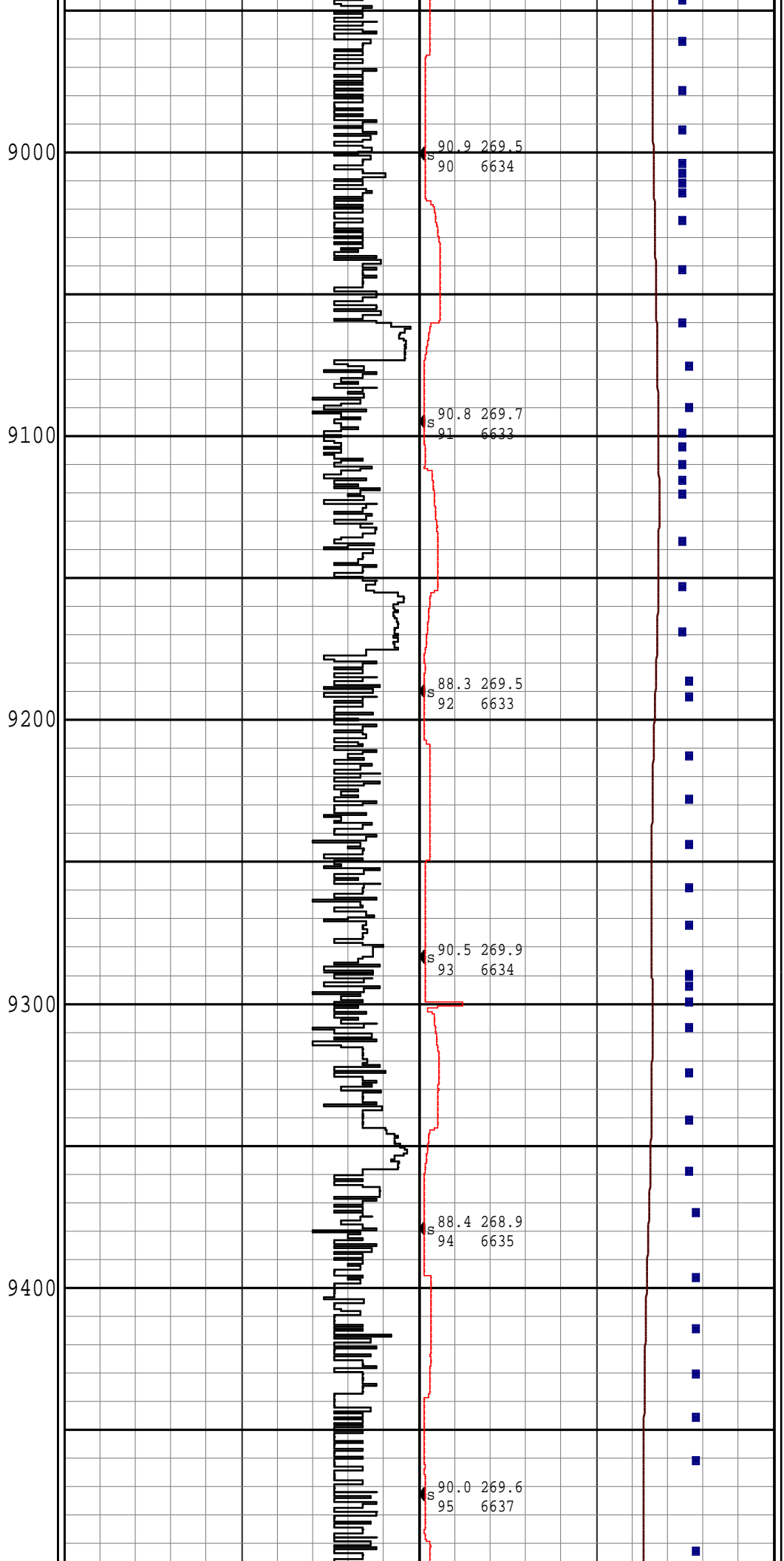
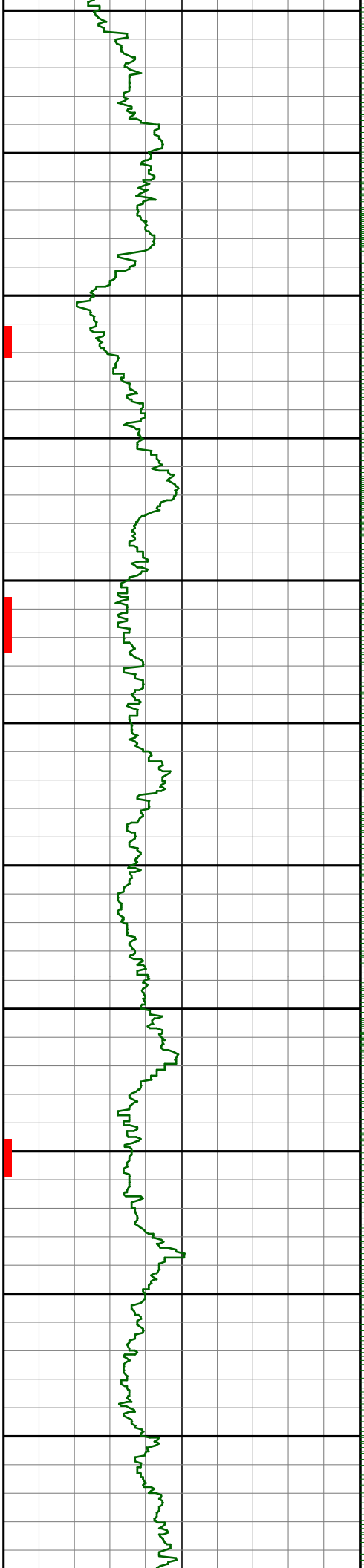


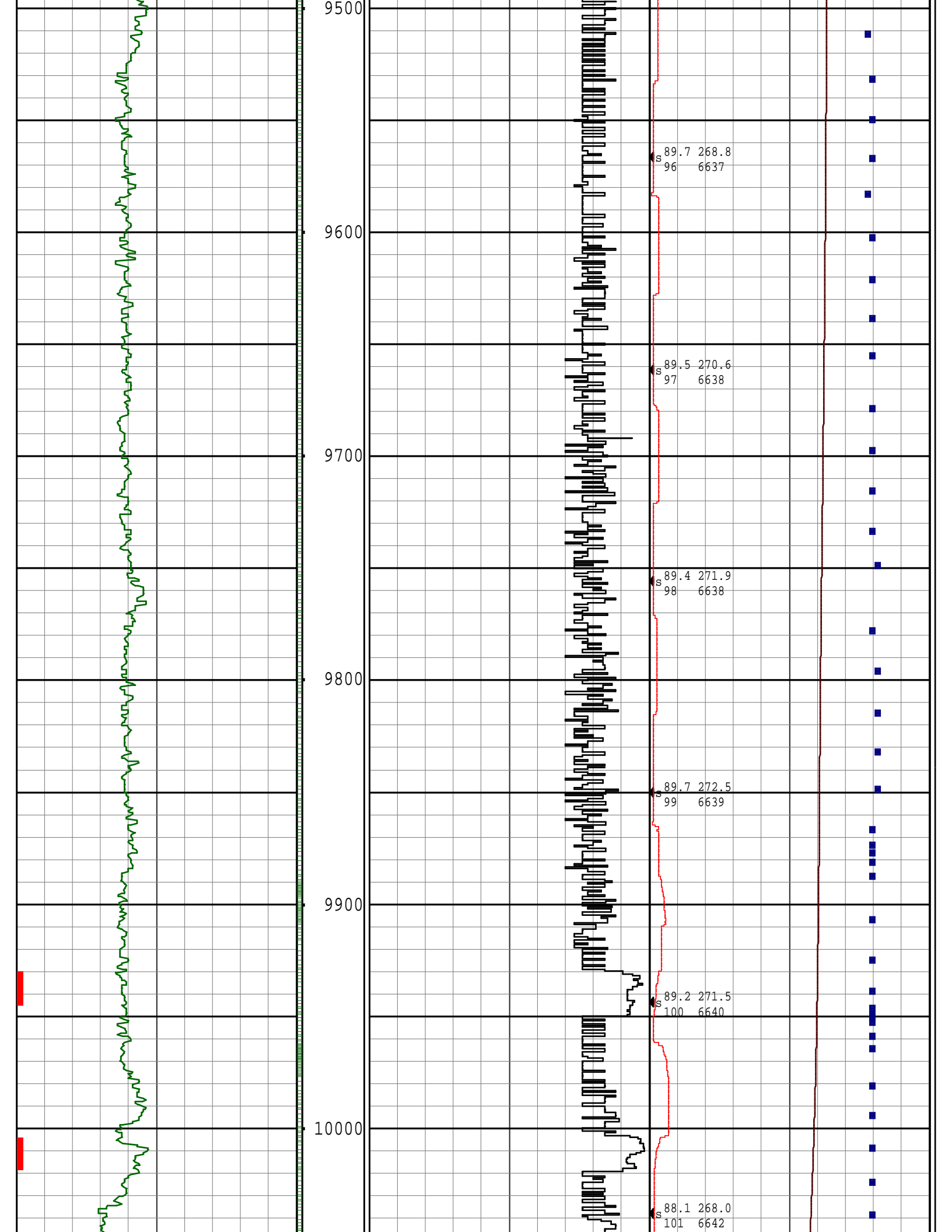
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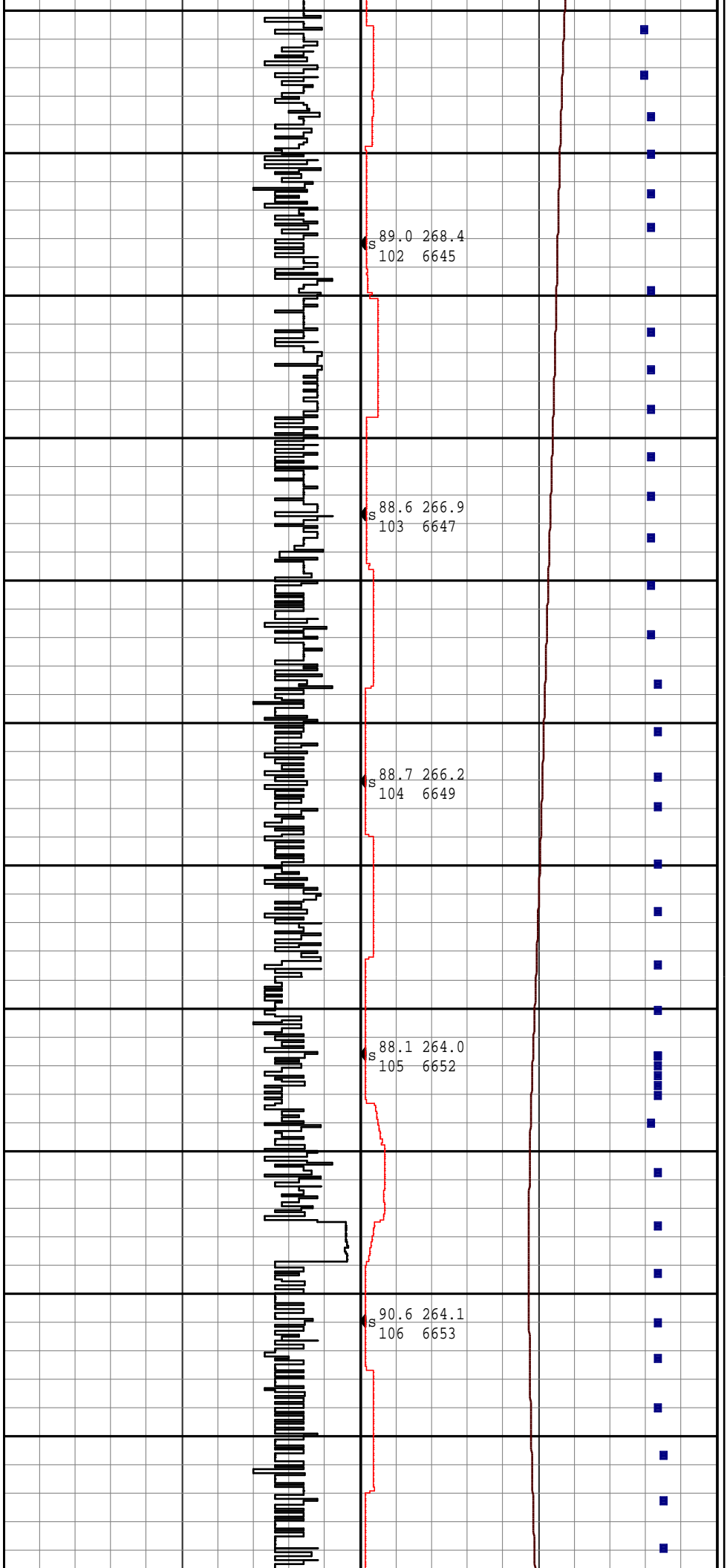
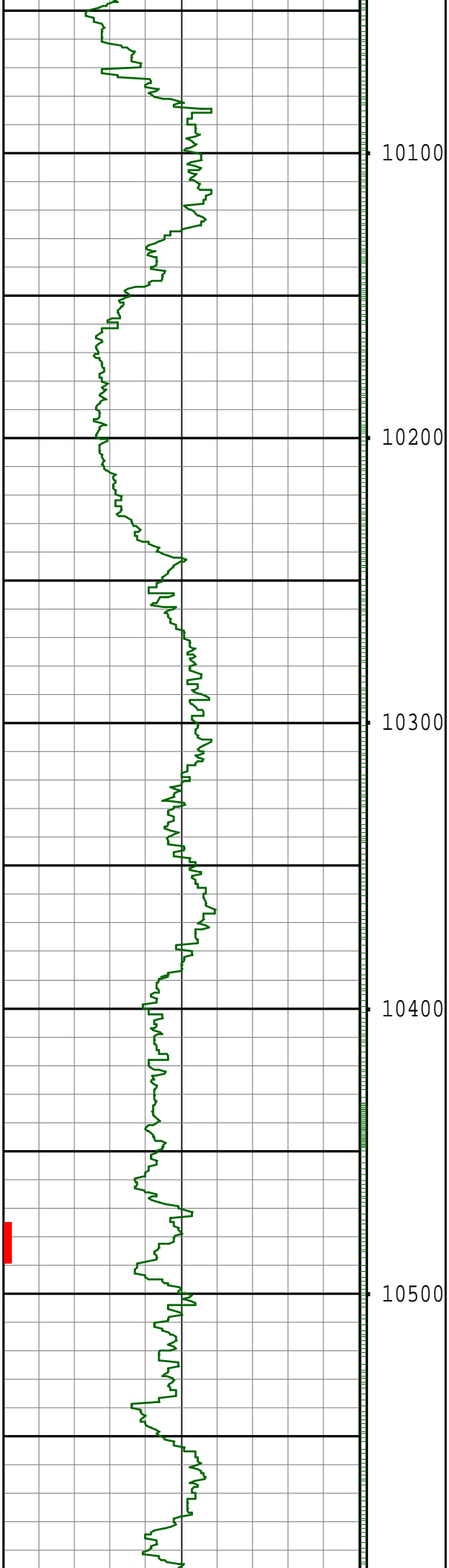


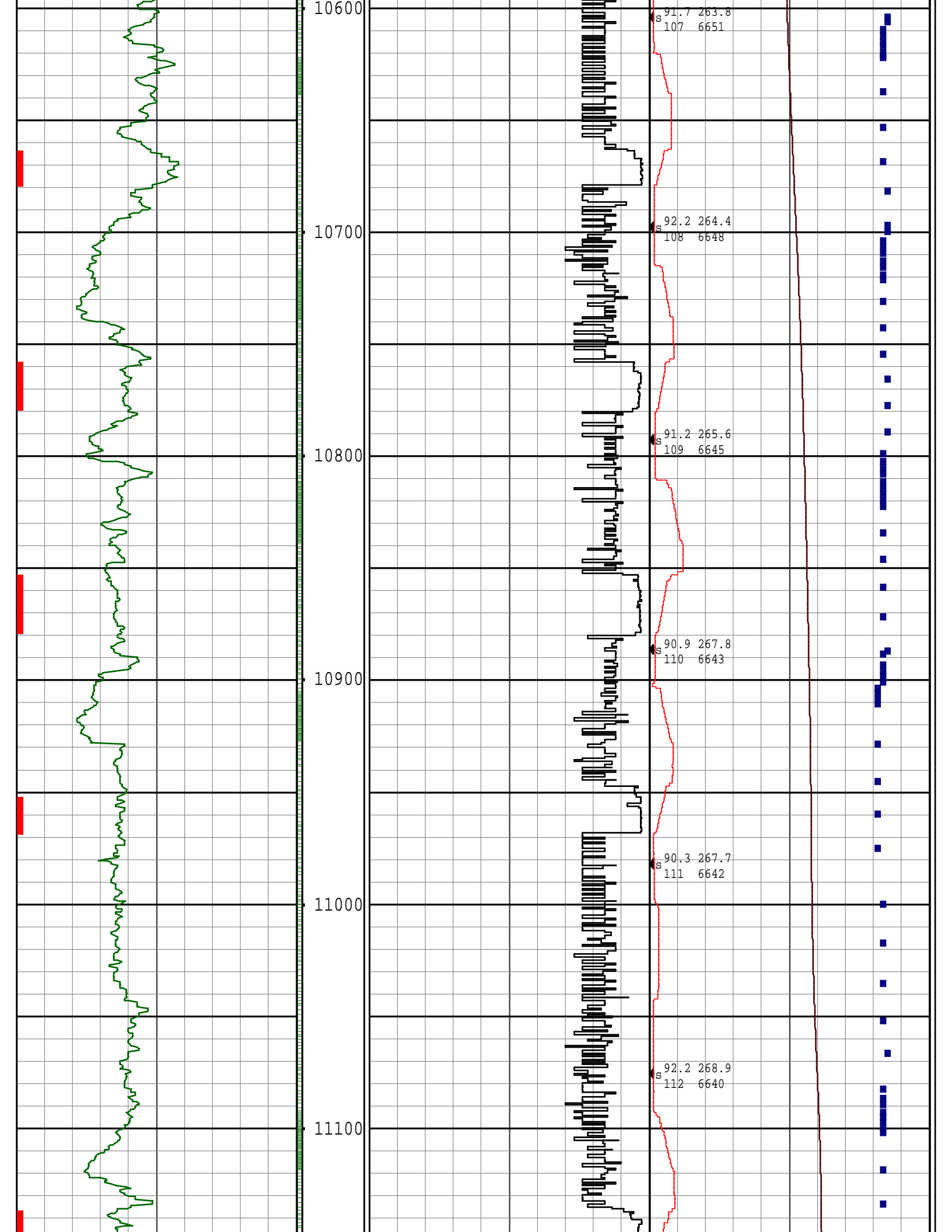


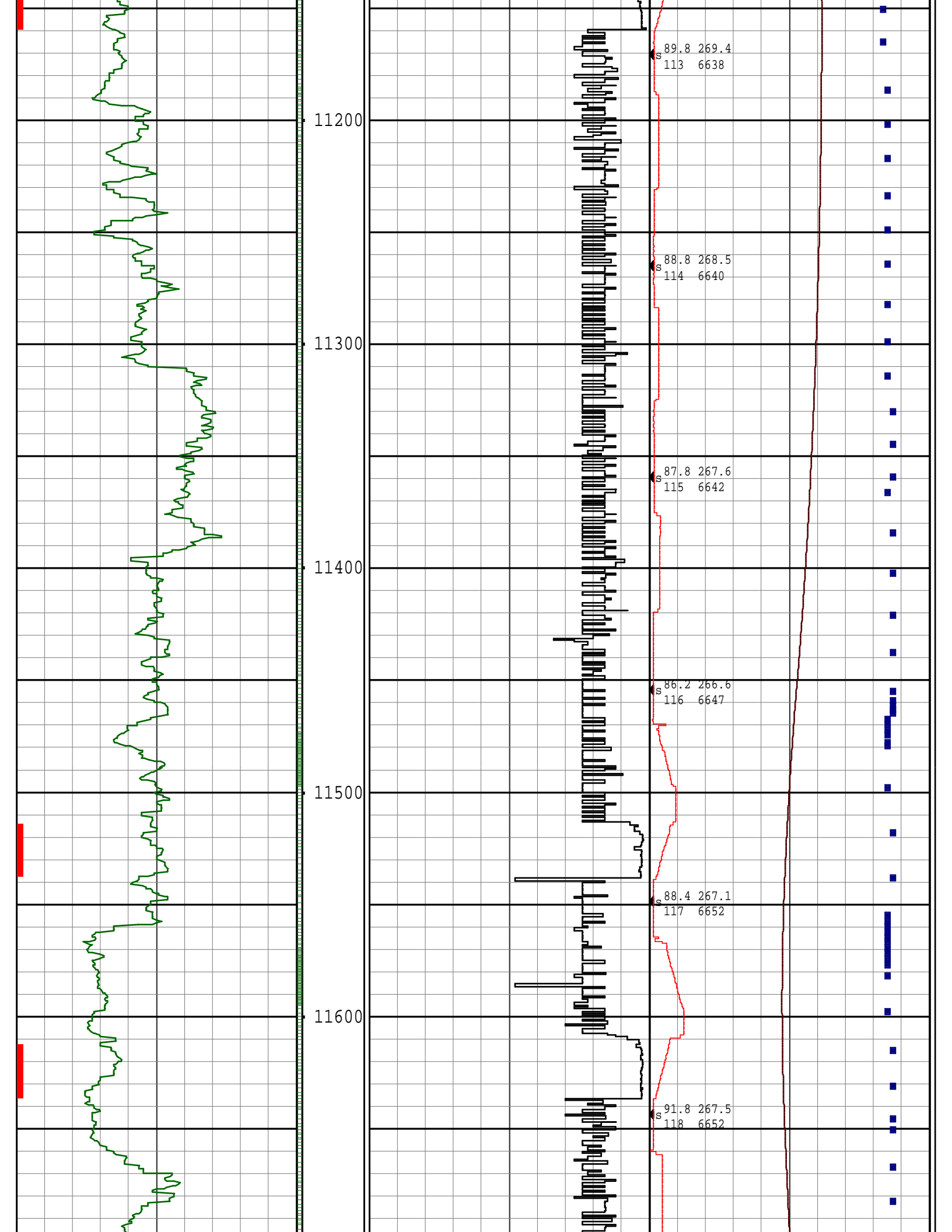


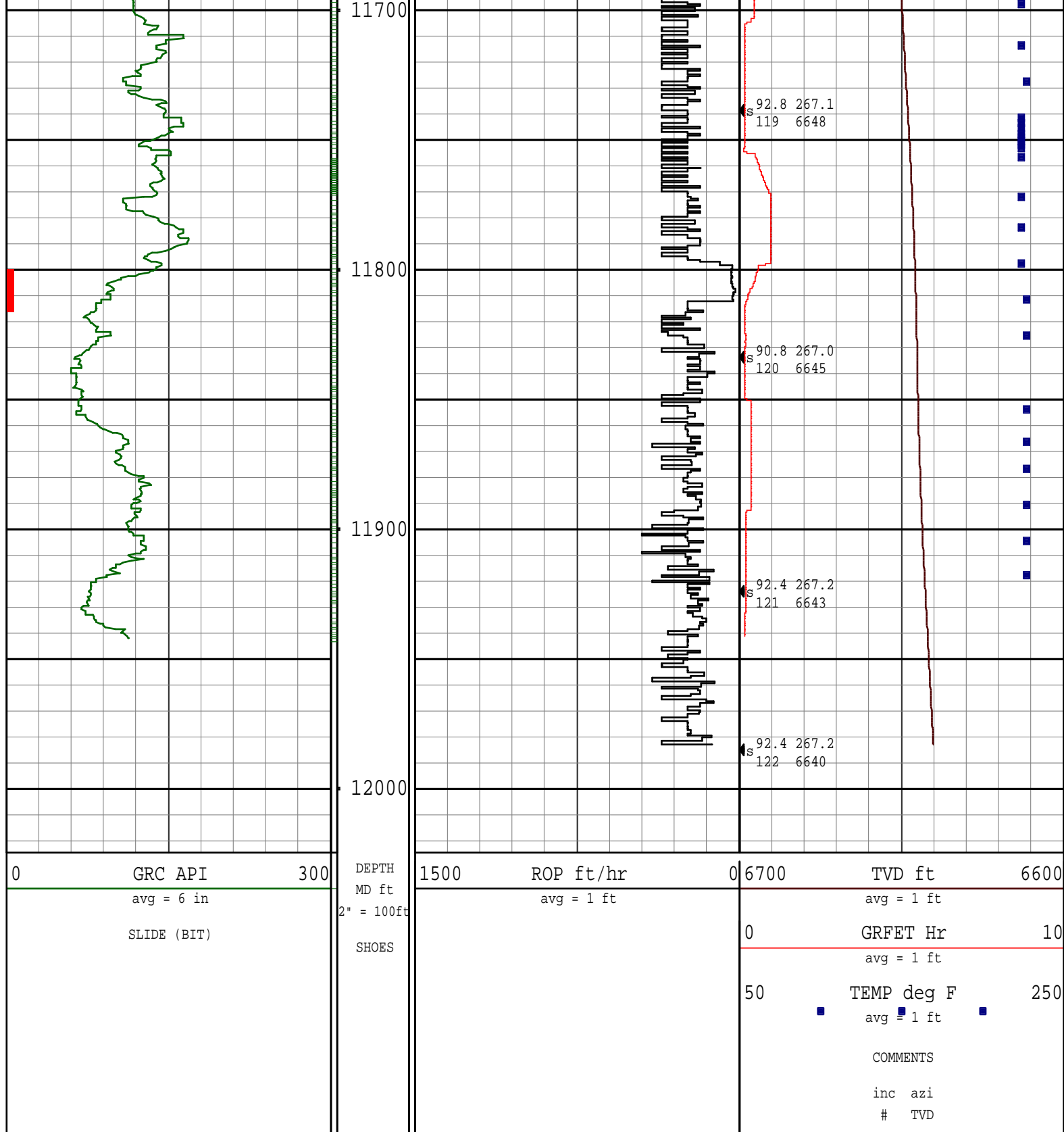













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|--|-------|--------|---------|--------|--------|----------|----------|--------|--------|-------|--------|
| 693.00 | 0.00 | 285.4 | 692.99 | 307.00 | 1.59 | 1.71 S | 1.71 W | 2.42 | 225.00 | 0.13 | |
| THE FOLLOWING ARE PATHFINDER MWD SURVEYS | | | | | | | | | | | |
| 722.00 | 0.09 | 203.05 | 721.99 | 29.00 | 1.60 | 1.73 S | 1.72 W | 2.44 | 224.80 | 0.31 | 72.11 |
| 813.00 | 0.35 | 189.20 | 812.99 | 91.00 | 1.65 | 2.07 S | 1.79 W | 2.74 | 220.86 | 0.29 | 75.72 |
| 907.00 | 0.35 | 184.98 | 906.99 | 94.00 | 1.68 | 2.64 S | 1.86 W | 3.23 | 215.19 | 0.03 | 75.72 |
| 999.00 | 0.26 | 181.75 | 998.99 | 92.00 | 1.67 | 3.13 S | 1.89 W | 3.66 | 211.17 | 0.10 | 75.72 |
| 1092.00 | 0.35 | 149.91 | 1091.99 | 93.00 | 1.51 | 3.59 S | 1.76 W | 3.99 | 206.11 | 0.20 | 79.34 |
| 1187.00 | 0.35 | 177.97 | 1186.99 | 95.00 | 1.31 | 4.13 S | 1.60 W | 4.43 | 201.21 | 0.18 | 79.34 |
| 1299.00 | 0.26 | 179.39 | 1298.99 | 112.00 | 1.26 | 4.72 S | 1.59 W | 4.98 | 198.57 | 0.08 | 79.34 |
| 1393.00 | 0.35 | 174.31 | 1392.98 | 94.00 | 1.19 | 5.22 S | 1.56 W | 5.45 | 196.59 | 0.10 | 82.95 |
| 1484.00 | 1.32 | 71.16 | 1483.98 | 91.00 | 0.18 | 5.16 S | 0.54 W | 5.19 | 185.94 | 1.58 | 82.95 |
| 1575.00 | 2.55 | 22.01 | 1574.93 | 91.00 | -1.41 | 2.94 S | 1.21 E | 3.19 | 157.59 | 2.15 | 86.57 |
| 1668.00 | 3.69 | 4.23 | 1667.79 | 93.00 | -2.07 | 1.96 N | 2.21 E | 2.95 | 48.47 | 1.59 | 86.57 |
| 1761.00 | 6.07 | 348.65 | 1760.45 | 93.00 | -0.79 | 9.76 N | 1.46 E | 9.87 | 8.52 | 2.91 | 90.18 |
| 1855.00 | 7.83 | 354.12 | 1853.76 | 94.00 | 1.61 | 21.01 N | 0.17 W | 21.01 | 359.53 | 2.00 | 90.18 |
| 1947.00 | 8.97 | 351.10 | 1944.77 | 92.00 | 4.28 | 34.33 N | 1.92 W | 34.38 | 356.79 | 1.33 | 93.80 |
| 2039.00 | 9.94 | 337.52 | 2035.53 | 92.00 | 9.40 | 48.75 N | 6.07 W | 49.13 | 352.90 | 2.64 | 93.80 |
| 2132.00 | 9.41 | 335.54 | 2127.21 | 93.00 | 16.59 | 63.09 N | 12.29 W | 64.28 | 348.98 | 0.67 | 93.80 |
| 2225.00 | 9.41 | 336.85 | 2218.96 | 93.00 | 23.67 | 77.00 N | 18.42 W | 79.17 | 346.54 | 0.23 | 97.41 |
| 2319.00 | 10.29 | 337.82 | 2311.57 | 94.00 | 30.87 | 91.84 N | 24.61 W | 95.08 | 345.00 | 0.95 | 97.41 |
| 2412.00 | 10.11 | 335.33 | 2403.10 | 93.00 | 38.43 | 106.95 N | 31.16 W | 111.40 | 343.76 | 0.51 | 86.57 |
| 2504.00 | 9.76 | 334.74 | 2493.72 | 92.00 | 46.10 | 121.34 N | 37.85 W | 127.11 | 342.67 | 0.40 | 86.57 |
| 2599.00 | 10.20 | 344.12 | 2587.29 | 95.00 | 52.88 | 136.71 N | 43.59 W | 143.50 | 342.31 | 1.77 | 93.80 |
| 2694.00 | 10.20 | 343.65 | 2680.79 | 95.00 | 58.65 | 152.88 N | 48.26 W | 160.31 | 342.48 | 0.09 | 97.41 |
| 2788.00 | 10.02 | 342.19 | 2773.33 | 94.00 | 64.57 | 168.65 N | 53.11 W | 176.81 | 342.52 | 0.33 | 97.41 |
| 2883.00 | 9.76 | 342.02 | 2866.92 | 95.00 | 70.64 | 184.18 N | 58.12 W | 193.13 | 342.49 | 0.28 | 97.41 |
| 2978.00 | 10.02 | 341.90 | 2960.50 | 95.00 | 76.74 | 199.69 N | 63.17 W | 209.45 | 342.45 | 0.27 | 101.02 |
| 3073.00 | 9.06 | 349.94 | 3054.19 | 95.00 | 81.66 | 214.91 N | 67.05 W | 225.13 | 342.67 | 1.73 | 104.64 |
| 3167.00 | 9.32 | 349.85 | 3146.99 | 94.00 | 85.30 | 229.69 N | 69.68 W | 240.03 | 343.12 | 0.28 | 104.64 |
| 3262.00 | 8.44 | 350.22 | 3240.85 | 95.00 | 88.83 | 244.14 N | 72.22 W | 254.59 | 343.52 | 0.93 | 108.25 |
| 3357.00 | 9.41 | 347.46 | 3334.70 | 95.00 | 92.68 | 258.59 N | 75.09 W | 269.27 | 343.81 | 1.12 | 108.25 |
| 3452.00 | 9.50 | 347.22 | 3428.41 | 95.00 | 97.14 | 273.81 N | 78.51 W | 284.85 | 344.00 | 0.10 | 111.87 |
| 3642.00 | 8.97 | 346.36 | 3615.94 | 190.00 | 106.13 | 303.50 N | 85.47 W | 315.31 | 344.27 | 0.29 | 115.48 |
| 3737.00 | 10.02 | 349.89 | 3709.64 | 95.00 | 110.37 | 318.83 N | 88.67 W | 330.93 | 344.46 | 1.26 | 115.48 |
| 3832.00 | 10.29 | 350.60 | 3803.15 | 95.00 | 114.33 | 335.34 N | 91.51 W | 347.60 | 344.74 | 0.31 | 119.09 |
| 3927.00 | 10.11 | 350.52 | 3896.65 | 95.00 | 118.23 | 351.94 N | 94.27 W | 364.34 | 345.01 | 0.19 | 119.09 |
| 4021.00 | 9.76 | 351.09 | 3989.24 | 94.00 | 121.91 | 367.94 N | 96.86 W | 380.48 | 345.25 | 0.39 | 119.09 |
| 4116.00 | 9.67 | 351.41 | 4082.88 | 95.00 | 125.43 | 383.79 N | 99.30 W | 396.43 | 345.49 | 0.11 | 122.71 |
| 4211.00 | 8.88 | 350.23 | 4176.64 | 95.00 | 128.90 | 398.90 N | 101.73 W | 411.67 | 345.69 | 0.86 | 122.71 |
| 4305.00 | 9.15 | 344.38 | 4269.48 | 94.00 | 133.13 | 413.25 N | 104.98 W | 426.38 | 345.75 | 1.02 | 126.32 |
| 4399.00 | 8.97 | 345.94 | 4362.30 | 94.00 | 137.89 | 427.56 N | 108.77 W | 441.18 | 345.73 | 0.32 | 126.32 |
| 4494.00 | 8.88 | 346.41 | 4456.15 | 95.00 | 142.39 | 441.87 N | 112.29 W | 455.92 | 345.74 | 0.12 | 129.94 |
| 4588.00 | 8.53 | 346.89 | 4549.07 | 94.00 | 146.62 | 455.71 N | 115.58 W | 470.14 | 345.77 | 0.38 | 129.94 |
| 4683.00 | 7.91 | 346.86 | 4643.09 | 95.00 | 150.60 | 468.94 N | 118.66 W | 483.72 | 345.80 | 0.65 | 129.94 |
| 4777.00 | 7.74 | 346.31 | 4736.22 | 94.00 | 154.42 | 481.39 N | 121.63 W | 496.52 | 345.82 | 0.20 | 129.94 |
| 4871.00 | 7.39 | 345.15 | 4829.40 | 94.00 | 158.29 | 493.38 N | 124.68 W | 508.89 | 345.82 | 0.41 | 129.94 |
| 4965.00 | 7.12 | 344.89 | 4922.65 | 94.00 | 162.13 | 504.85 N | 127.75 W | 520.76 | 345.80 | 0.29 | 129.94 |
| 5060.00 | 6.16 | 341.76 | 5017.01 | 95.00 | 165.98 | 515.37 N | 130.88 W | 531.73 | 345.75 | 1.08 | 129.94 |
| 5154.00 | 5.45 | 340.84 | 5110.53 | 94.00 | 169.64 | 524.38 N | 133.92 W | 541.21 | 345.67 | 0.76 | 126.32 |
| 5248.00 | 4.57 | 341.89 | 5204.17 | 94.00 | 172.79 | 532.16 N | 136.55 W | 549.40 | 345.61 | 0.94 | 129.94 |
| 5343.00 | 3.43 | 346.42 | 5298.94 | 95.00 | 175.07 | 538.52 N | 138.39 W | 556.02 | 345.59 | 1.25 | 133.55 |
| 5438.00 | 1.93 | 359.98 | 5393.83 | 95.00 | 176.04 | 542.88 N | 139.06 W | 560.41 | 345.63 | 1.70 | 137.17 |
| 5532.00 | 0.88 | 37.85 | 5487.80 | 94.00 | 175.74 | 545.03 N | 138.62 W | 562.38 | 345.73 | 1.43 | 140.78 |
| 5627.00 | 0.62 | 63.23 | 5582.79 | 95.00 | 174.89 | 545.84 N | 137.71 W | 562.94 | 345.84 | 0.44 | 144.39 |
| 5722.00 | 0.44 | 68.16 | 5677.79 | 95.00 | 174.12 | 546.21 N | 136.92 W | 563.11 | 345.93 | 0.20 | 148.01 |
| 5816.00 | 0.18 | 80.75 | 5771.79 | 94.00 | 173.65 | 546.37 N | 136.43 W | 563.14 | 345.98 | 0.28 | 148.01 |
| 5910.00 | 0.35 | 296.47 | 5865.79 | 94.00 | 173.78 | 546.52 N | 136.55 W | 563.32 | 345.97 | 0.54 | 144.39 |
| 6005.00 | 5.63 | 287.08 | 5960.62 | 95.00 | 178.58 | 548.02 N | 141.26 W | 565.93 | 345.55 | 5.56 | 148.01 |
| 6100.00 | 10.64 | 284.27 | 6054.64 | 95.00 | 191.76 | 551.55 N | 154.23 W | 572.71 | 344.38 | 5.29 | 148.01 |
| 6195.00 | 14.42 | 284.20 | 6147.36 | 95.00 | 212.03 | 556.61 N | 174.20 W | 583.24 | 342.62 | 3.98 | 151.62 |
| 6287.00 | 17.32 | 285.91 | 6235.84 | 92.00 | 236.71 | 563.18 N | 198.48 W | 597.13 | 340.59 | 3.19 | 133.55 |
| 6382.00 | 24.18 | 278.83 | 6324.64 | 95.00 | 269.97 | 570.05 N | 231.35 W | 615.21 | 337.91 | 7.68 | 137.17 |
| 6476.00 | 35.88 | 275.21 | 6405.89 | 94.00 | 316.86 | 575.53 N | 277.97 W | 639.14 | 334.22 | 12.59 | 140.78 |
| 6571.00 | 48.45 | 267.16 | 6476.22 | 95.00 | 380.29 | 576.30 N | 341.50 W | 669.88 | 329.35 | 14.38 | 144.39 |
| 6666.00 | 58.56 | 265.81 | 6532.65 | 95.00 | 455.91 | 571.56 N | 417.62 W | 707.88 | 323.85 | 10.70 | 148.01 |
| 6760.00 | 66.92 | 266.10 | 6575.66 | 94.00 | 538.59 | 565.68 N | 500.90 W | 755.58 | 318.48 | 8.90 | 151.62 |
| 6855.00 | 78.35 | 265.33 | 6603.97 | 95.00 | 628.17 | 558.90 N | 591.17 W | 813.54 | 313.39 | 12.06 | 155.24 |
| 6949.00 | 87.23 | 264.68 | 6615.75 | 94.00 | 720.20 | 550.78 N | 683.98 W | 878.17 | 308.84 | 9.47 | 158.85 |

| | | | | | | | | | | | |
|---------------------------------------|-------------------|---------------|----------|--------------------|-----------------------|--------------------------------------|-----------------------|-----------------------|-------------------------|---------------------------|--------------|
| Survey Report | | | | | | | | | | | |
| Vertical Section Plane: 273.94° | | | | | | Total Correction: 7.38° East to Grid | | | | | |
| Calculation Method: Minimum Curvature | | | | | | Survey Reference: Wellhead | | | | | |
| North Aligned to: Grid North | | | | | | Well: WELLS RANCH AE 19-644 | | | | | |
| RT: 30' ROTARY TABLE TO GROUND LEVEL | | | | | | FIELD: WATTENBERG | | | | | |
| Measured Depth (ft) | Inclination (deg) | Azimuth (deg) | TVD (ft) | Course Length (ft) | Vertical Section (ft) | Rect Co-ord North (ft) | Rect Co-ord East (ft) | Closure Distance (ft) | Closure Direction (deg) | Dog-leg Severity (dg/hft) | Temp (deg F) |
| 7025.00 | 87.93 | 264.68 | 6618.96 | 76.00 | 795.15 | 543.74 N | 759.58 W | 934.14 | 305.60 | 0.92 | 173.31 |
| 7118.00 | 89.43 | 263.55 | 6621.11 | 93.00 | 886.75 | 534.21 N | 852.06 W | 1005.68 | 302.09 | 2.02 | 173.31 |
| 7210.00 | 90.92 | 264.78 | 6620.83 | 92.00 | 977.41 | 524.86 N | 943.58 W | 1079.73 | 299.08 | 2.10 | 158.85 |
| 7304.00 | 89.52 | 266.25 | 6620.46 | 94.00 | 1070.39 | 517.51 N | 1037.29 W | 1159.21 | 296.51 | 2.16 | 155.24 |
| 7397.00 | 89.96 | 267.41 | 6620.89 | 93.00 | 1162.68 | 512.37 N | 1130.14 W | 1240.86 | 294.39 | 1.33 | |
| 7490.00 | 89.16 | 269.01 | 6621.60 | 93.00 | 1255.20 | 509.46 N | 1223.09 W | 1324.95 | 292.61 | 1.92 | 158.85 |

| | | | | | | | | | | | |
|---|-------|--------|---------|-------|---------|----------|-----------|---------|--------|------|--------|
| 7582.00 | 90.13 | 268.77 | 6622.17 | 92.00 | 1346.84 | 507.68 N | 1315.07 W | 1409.66 | 291.11 | 1.09 | 166.08 |
| 7677.00 | 90.13 | 270.77 | 6621.96 | 95.00 | 1441.59 | 507.30 N | 1410.06 W | 1498.54 | 289.79 | 2.11 | 169.69 |
| 7772.00 | 87.85 | 269.44 | 6623.63 | 95.00 | 1536.35 | 507.47 N | 1505.04 W | 1588.29 | 288.63 | 2.78 | 173.31 |
| 7867.00 | 88.02 | 268.97 | 6627.05 | 95.00 | 1630.97 | 506.15 N | 1599.97 W | 1678.12 | 287.55 | 0.53 | 176.92 |
| 7961.00 | 87.76 | 267.88 | 6630.51 | 94.00 | 1724.47 | 503.57 N | 1693.87 W | 1767.14 | 286.56 | 1.19 | 180.54 |
| 8056.00 | 88.29 | 267.73 | 6633.79 | 95.00 | 1818.87 | 499.94 N | 1788.74 W | 1857.29 | 285.62 | 0.58 | 184.15 |
| 8151.00 | 89.34 | 267.24 | 6635.75 | 95.00 | 1913.24 | 495.77 N | 1883.63 W | 1947.78 | 284.75 | 1.22 | 184.15 |
| 8245.00 | 90.22 | 269.79 | 6636.11 | 94.00 | 2006.81 | 493.33 N | 1977.59 W | 2038.19 | 284.01 | 2.87 | 187.76 |
| 8340.00 | 91.28 | 269.12 | 6634.87 | 95.00 | 2101.51 | 492.43 N | 2072.57 W | 2130.27 | 283.37 | 1.32 | 191.38 |
| 8434.00 | 88.29 | 267.97 | 6635.22 | 94.00 | 2195.08 | 490.04 N | 2166.53 W | 2221.26 | 282.75 | 3.41 | 191.38 |
| 8529.00 | 89.96 | 268.56 | 6636.67 | 95.00 | 2289.60 | 487.17 N | 2261.47 W | 2313.35 | 282.16 | 1.87 | 194.99 |
| 8623.00 | 90.92 | 268.31 | 6635.95 | 94.00 | 2383.16 | 484.60 N | 2355.43 W | 2404.77 | 281.63 | 1.05 | 198.61 |
| 8718.00 | 91.71 | 268.67 | 6633.77 | 95.00 | 2477.71 | 482.10 N | 2450.37 W | 2497.35 | 281.13 | 0.91 | 198.61 |
| 8813.00 | 90.13 | 268.96 | 6632.25 | 95.00 | 2572.31 | 480.13 N | 2545.34 W | 2590.23 | 280.68 | 1.69 | 194.99 |
| 8907.00 | 88.46 | 268.19 | 6633.40 | 94.00 | 2665.89 | 477.80 N | 2639.30 W | 2682.20 | 280.26 | 1.96 | 198.61 |
| 9001.00 | 90.92 | 269.53 | 6633.91 | 94.00 | 2759.51 | 475.93 N | 2733.27 W | 2774.39 | 279.88 | 2.98 | 198.61 |
| 9095.00 | 90.75 | 269.71 | 6632.54 | 94.00 | 2853.23 | 475.30 N | 2827.26 W | 2866.93 | 279.54 | 0.26 | 202.22 |
| 9190.00 | 88.29 | 269.51 | 6633.34 | 95.00 | 2947.95 | 474.66 N | 2922.24 W | 2960.54 | 279.23 | 2.60 | 202.22 |
| 9284.00 | 90.48 | 269.90 | 6634.35 | 94.00 | 3041.68 | 474.17 N | 3016.23 W | 3053.27 | 278.93 | 2.37 | 202.22 |
| 9379.00 | 88.37 | 268.93 | 6635.30 | 95.00 | 3136.38 | 473.20 N | 3111.21 W | 3146.99 | 278.65 | 2.44 | 205.83 |
| 9473.00 | 89.96 | 269.65 | 6636.67 | 94.00 | 3230.05 | 472.04 N | 3205.19 W | 3239.77 | 278.38 | 1.86 | 205.83 |
| 9567.00 | 89.69 | 268.83 | 6636.96 | 94.00 | 3323.73 | 470.79 N | 3299.18 W | 3332.61 | 278.12 | 0.92 | 209.45 |
| 9662.00 | 89.52 | 270.61 | 6637.61 | 95.00 | 3418.47 | 470.33 N | 3394.18 W | 3426.61 | 277.89 | 1.88 | 209.45 |
| 9756.00 | 89.43 | 271.90 | 6638.47 | 94.00 | 3512.36 | 472.39 N | 3488.15 W | 3519.99 | 277.71 | 1.38 | 213.06 |
| 9850.00 | 89.69 | 272.55 | 6639.19 | 94.00 | 3606.32 | 476.03 N | 3582.07 W | 3613.57 | 277.57 | 0.74 | 213.06 |
| 9944.00 | 89.25 | 271.52 | 6640.06 | 94.00 | 3700.26 | 479.37 N | 3676.01 W | 3707.13 | 277.43 | 1.19 | 209.45 |
| 10038.00 | 88.11 | 267.99 | 6642.23 | 94.00 | 3793.97 | 478.97 N | 3769.97 W | 3800.27 | 277.24 | 3.95 | 209.45 |
| 10132.00 | 88.99 | 268.35 | 6644.61 | 94.00 | 3887.46 | 475.97 N | 3863.89 W | 3893.09 | 277.02 | 1.01 | 213.06 |
| 10227.00 | 88.55 | 266.85 | 6646.65 | 95.00 | 3981.86 | 471.99 N | 3958.78 W | 3986.82 | 276.80 | 1.65 | 213.06 |
| 10321.00 | 88.72 | 266.16 | 6648.89 | 94.00 | 4075.04 | 466.26 N | 4052.58 W | 4079.31 | 276.56 | 0.76 | 216.68 |
| 10416.00 | 88.11 | 264.03 | 6651.52 | 95.00 | 4168.87 | 458.15 N | 4147.19 W | 4172.42 | 276.30 | 2.33 | 216.68 |
| 10510.00 | 90.57 | 264.13 | 6652.60 | 94.00 | 4261.46 | 448.45 N | 4240.67 W | 4264.32 | 276.04 | 2.62 | 216.68 |
| 10604.00 | 91.71 | 263.79 | 6650.73 | 94.00 | 4354.02 | 438.56 N | 4334.13 W | 4356.26 | 275.78 | 1.27 | 220.29 |
| 10698.00 | 92.15 | 264.41 | 6647.56 | 94.00 | 4446.59 | 428.91 N | 4427.58 W | 4448.31 | 275.53 | 0.81 | 220.29 |
| 10793.00 | 91.19 | 265.62 | 6644.79 | 95.00 | 4540.39 | 420.65 N | 4522.18 W | 4541.70 | 275.31 | 1.63 | 220.29 |
| 10887.00 | 90.92 | 267.75 | 6643.06 | 94.00 | 4633.62 | 415.22 N | 4616.00 W | 4634.64 | 275.14 | 2.28 | 220.29 |
| 10982.00 | 90.31 | 267.69 | 6642.04 | 95.00 | 4728.05 | 411.44 N | 4710.92 W | 4728.85 | 274.99 | 0.64 | 216.68 |
| 11076.00 | 92.15 | 268.91 | 6640.02 | 94.00 | 4821.57 | 408.65 N | 4804.85 W | 4822.20 | 274.86 | 2.35 | 220.29 |
| 11171.00 | 89.78 | 269.40 | 6638.43 | 95.00 | 4916.22 | 407.25 N | 4899.82 W | 4916.71 | 274.75 | 2.55 | 220.29 |
| 11265.00 | 88.81 | 268.54 | 6639.58 | 94.00 | 5009.86 | 405.56 N | 4993.79 W | 5010.23 | 274.64 | 1.38 | 220.29 |
| 11360.00 | 87.76 | 267.59 | 6642.42 | 95.00 | 5104.31 | 402.36 N | 5088.69 W | 5104.58 | 274.52 | 1.49 | 223.91 |
| 11455.00 | 86.17 | 266.63 | 6647.45 | 95.00 | 5198.50 | 397.58 N | 5183.44 W | 5198.66 | 274.39 | 1.95 | 223.91 |
| 11549.00 | 88.37 | 267.14 | 6651.93 | 94.00 | 5291.68 | 392.47 N | 5277.18 W | 5291.76 | 274.25 | 2.40 | 220.29 |
| 11644.00 | 91.80 | 267.50 | 6651.79 | 95.00 | 5386.03 | 388.03 N | 5372.07 W | 5386.06 | 274.13 | 3.63 | 223.91 |
| 11739.00 | 92.77 | 267.15 | 6648.00 | 95.00 | 5480.32 | 383.60 N | 5466.89 W | 5480.33 | 274.01 | 1.09 | 227.52 |
| 11834.00 | 90.75 | 266.95 | 6645.09 | 95.00 | 5574.59 | 378.72 N | 5561.71 W | 5574.59 | 273.90 | 2.14 | 227.52 |
| 11924.00 | 92.42 | 267.20 | 6642.60 | 90.00 | 5663.90 | 374.12 N | 5651.55 W | 5663.92 | 273.79 | 1.88 | 227.52 |
| STRAIGHT LINE PROJECTION TO BIT DEPTH AT 11985'MD | | | | | | | | | | | |
| 11985.00 | 92.42 | 267.20 | 6640.02 | 61.00 | 5724.43 | 371.15 N | 5712.43 W | 5724.47 | 273.72 | 0.00 | |

| BOTTOM HOLE ASSEMBLY RECORD | | | | | | | | | | | |
|-----------------------------|--|---------|------------------|--|---------|------------------|--|---------|--|--|--|
| RUN #1 | | ft | RUN #2 | | ft | RUN #3 | | ft | | | |
| 8 3/4" PDC BIT | | 0.69 | 8 3/4" PDC BIT | | 0.65 | 6 1/8" PDC BIT | | 0.56 | | | |
| 1.75° FX MOTOR | | 26.28 | 2.25 R675 MOTOR | | 24.56 | 1.5° G2 MOTOR | | 26.80 | | | |
| NM STABILIZER | | 5.53 | NM FLOAT SUB | | 2.93 | SUB MULESHOE | | 3.05 | | | |
| SUB MULESHOE | | 2.66 | SUB MULESHOE | | 2.66 | HDS-1R (DIR/GR) | | 30.03 | | | |
| HDS-1R (DIR/GR) | | 30.62 | HDS-1R (DIR/GR) | | 30.62 | NM DC | | 30.73 | | | |
| NM FLEX DC | | 31.05 | NM FLEX DC | | 31.05 | NM FLOAT SUB | | 1.78 | | | |
| NM FLEX DC | | 31.07 | NM FLEX DC | | 31.07 | NM DC | | 30.85 | | | |
| FILTER SUB | | 3.23 | FILTER SUB | | 3.23 | FILTER SUB | | 3.10 | | | |
| DRILL PIPE | | 1040.06 | XOVER SUB | | 3.20 | XOVER SUB | | 3.78 | | | |
| XOVER SUB | | 3.20 | DRILL PIPE | | 1040.06 | HWDP | | 31.55 | | | |
| HWDP | | 1392.51 | | | | REAMER | | 8.52 | | | |
| | | | | | | DRILL PIPE | | 2179.05 | | | |
| | | | | | | AGITATOR | | 11.55 | | | |
| | | | | | | SHOCK SUB | | 11.14 | | | |
| | | | | | | DRILL PIPE | | 3875.91 | | | |
| | | | | | | HWDP | | 1392.91 | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| ===== | | | ===== | | | ===== | | | | | |
| TOTAL BHA LENGTH | | 2566.90 | TOTAL BHA LENGTH | | 1170.03 | TOTAL BHA LENGTH | | 7643.97 | | | |

| | | | | | | | |
|-----------------|-------|-----------------|-------|-----------------|-------|--|--|
| | | | | | | | |
| SENSOR OFFSETS: | | SENSOR OFFSETS: | | SENSOR OFFSETS: | | | |
| ===== | | ===== | | ===== | | | |
| DIRECTIONAL | 60.84 | DIRECTIONAL | 58.08 | DIRECTIONAL | 58.69 | | |
| GAMMA-RAY | 43.44 | GAMMA-RAY | 40.68 | GAMMA RAY | 41.29 | | |



A Schlumberger Company

GAMMA-RAY

2" = 100'

FEET MD