

Compensated Neutron Gamma Ray Casing Collar Log

| | | | |
|------------------------|------------------------------------|--------------|----------------------|
| Company | Kerr-McGee Oil & Gas Onshore, L.P. | | |
| Well | Sunflower 7C-17HZ | | |
| Field | Wattenberg | | |
| County | Weld | | |
| State | Colorado | | |
| Company | Kerr-McGee Oil & Gas Onshore, L.P. | Well | Sunflower 7C-17HZ |
| Field | Wattenberg | County | Weld |
| State | Colorado | Location: | API # : 05-123-42071 |
| Permanent Datum | SEC 8 | TWP 2N | RGE 65W |
| Log Measured From | Ground Level | Ground Level | Elevation 4901' |
| Drilling Measured From | Kelly Bushing | 20 FT | Elevation 4901' |
| | Kelly Bushing | | Elevation 4901' |

| | |
|------------------------|-----------------|
| Date | 11-Jan-2016 |
| Run Number | One |
| Depth Driller | 12770 FT |
| Depth Logger | 7300 FT |
| Bottom Logged Interval | 7300 FT |
| Top Log Interval | Surface |
| Open Hole Size | 7.875" |
| Type Fluid | Water |
| Density / Viscosity | 8.34 lbm/gal |
| Max. Recorded Temp. | 249°F |
| Estimated Cement Top | Surface |
| Time Well Ready | ROA |
| Time Logger on Bottom | 11:14 A.M. |
| Equipment Number | HD-0325 |
| Location | Fort Lupton, CO |
| Recorded By | J. Morrison |
| Witnessed By | Mario Torres |

| Borehole Record | | | | Tubing Record | | | |
|-----------------|-----------|--------------|---------|---------------|----------|------|----|
| Run Number | Bit | From | To | Size | Weight | From | To |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Casing Record | Size (in) | Wgt (lbs/ft) | Grade | Top | Bottom | | |
| Surface Casing | 9 5/8 | 36 | J55 | Surface | 1854 FT | | |
| Intermediate #1 | | | | | | | |
| Intermediate #2 | | | | | | | |
| Liner | 5 1/2 | 17 | HCP-110 | Surface | 12770 FT | | |
| Marker Joint | | | | | | | |

<<< Fold Here >>>

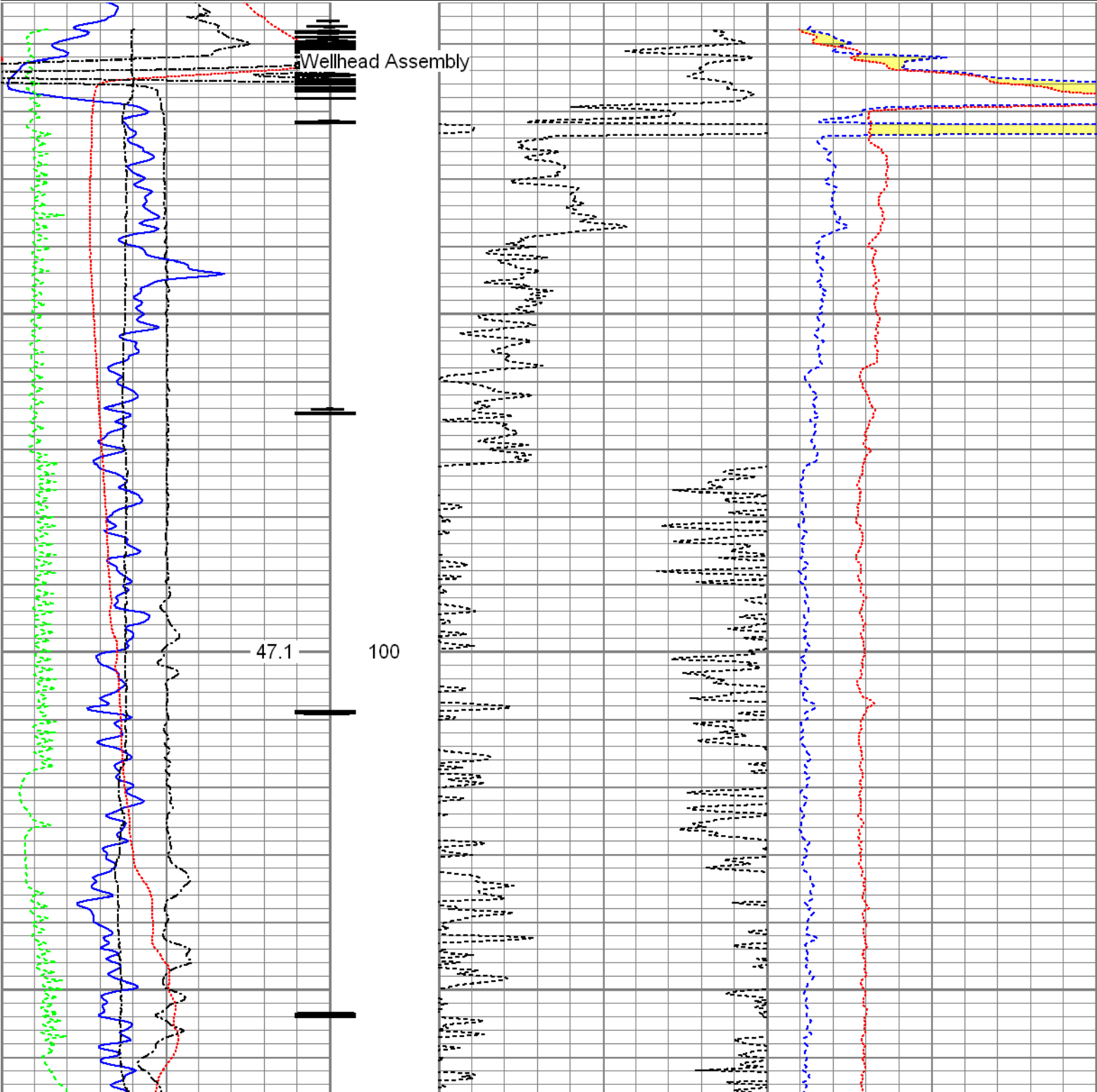
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

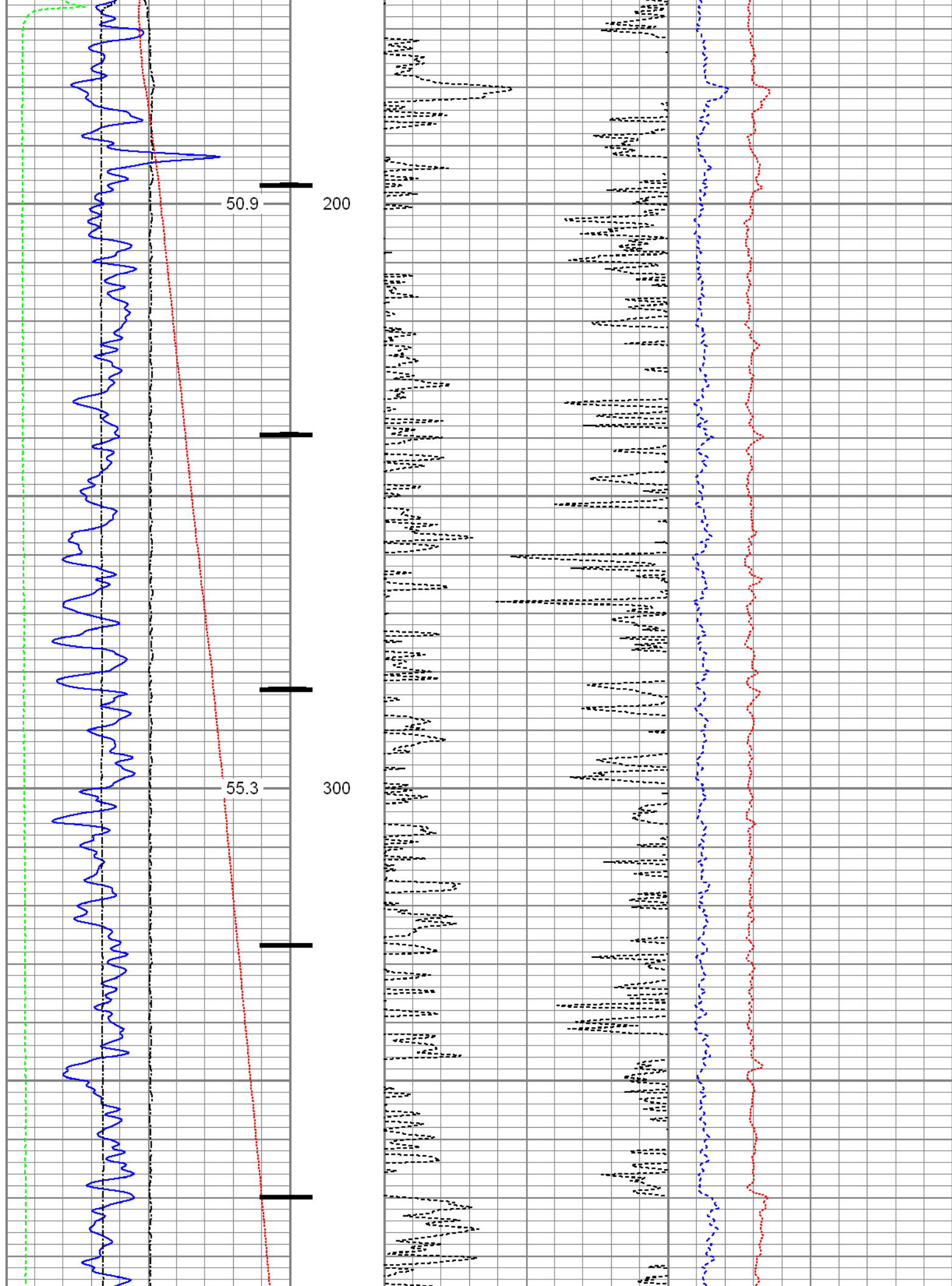
Comments

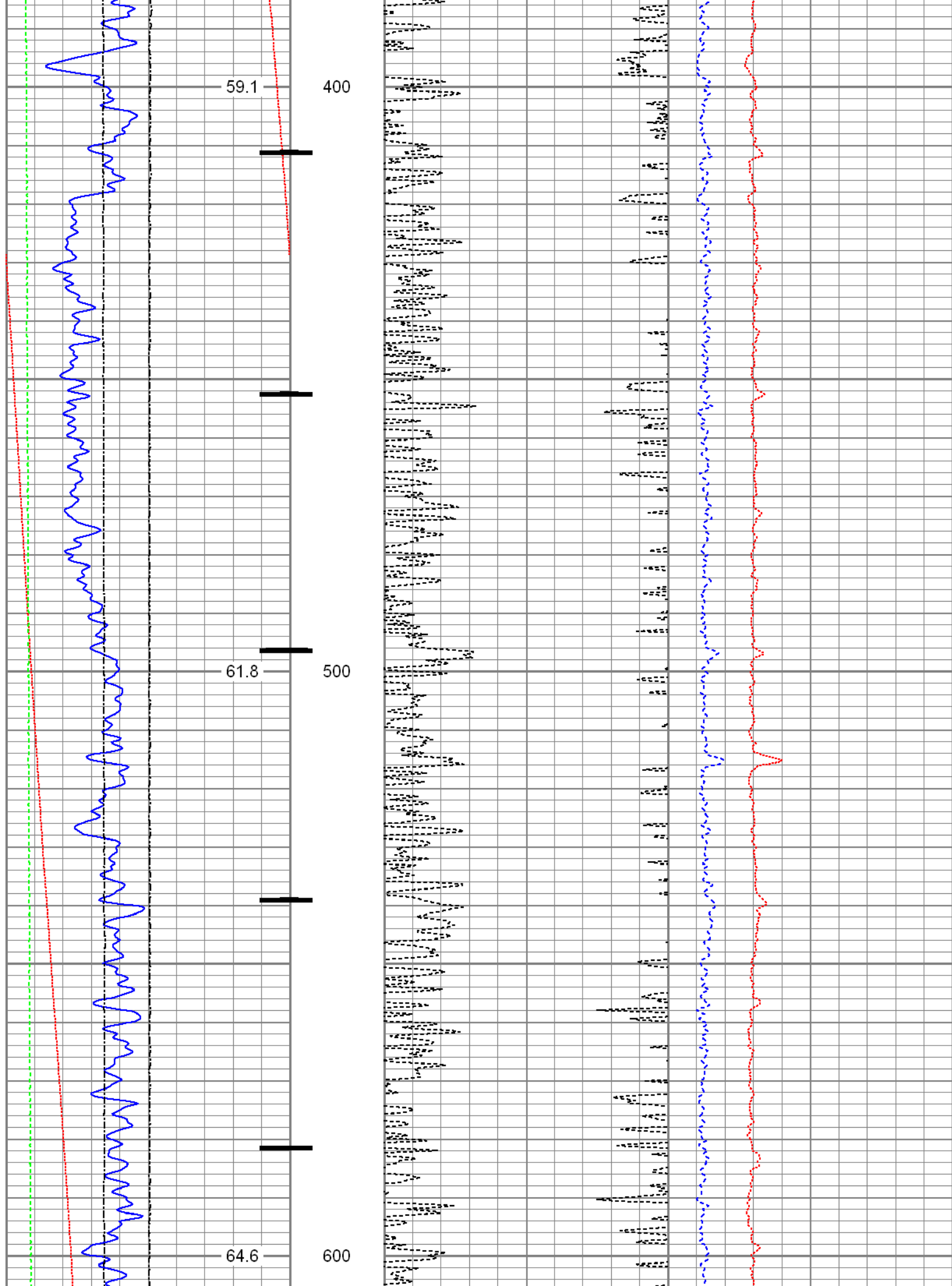
Log ran as per customer request
 Depth referenced to Casing Tally reported Marker Joint at 6612 FT
 Adjusted log 6 FT to correlate with Marker Joint
 Marker Joint at 6612 FT - 6634 FT
 Log ran from 7300 FT to surface
 Log ran with 2800 PSI surface induced pressure
 Logging tools were clean and free of any debris upon completions of operations
 Thank you for choosing FMC Technologies Surface Integrated Services.

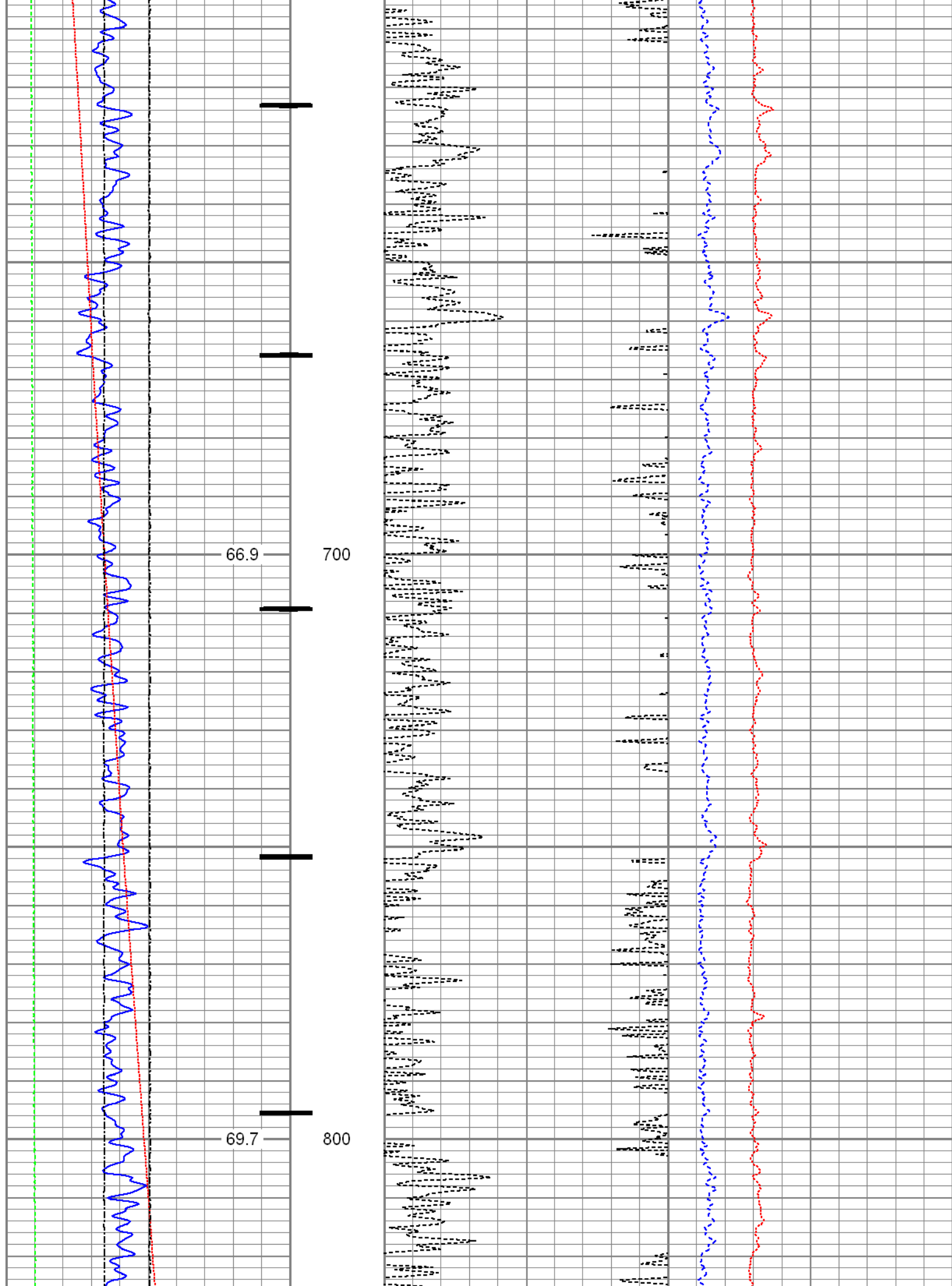
Database File: 0512342071_anadarko_sunflower 7c-17hz_01-11-16_rbl_cnl.db
Dataset Pathname: main
Presentation Format: cnl
Dataset Creation: Mon Jan 11 11:03:58 2016 by Log 7.0 B1
Charted by: Depth in Feet scaled 1:240

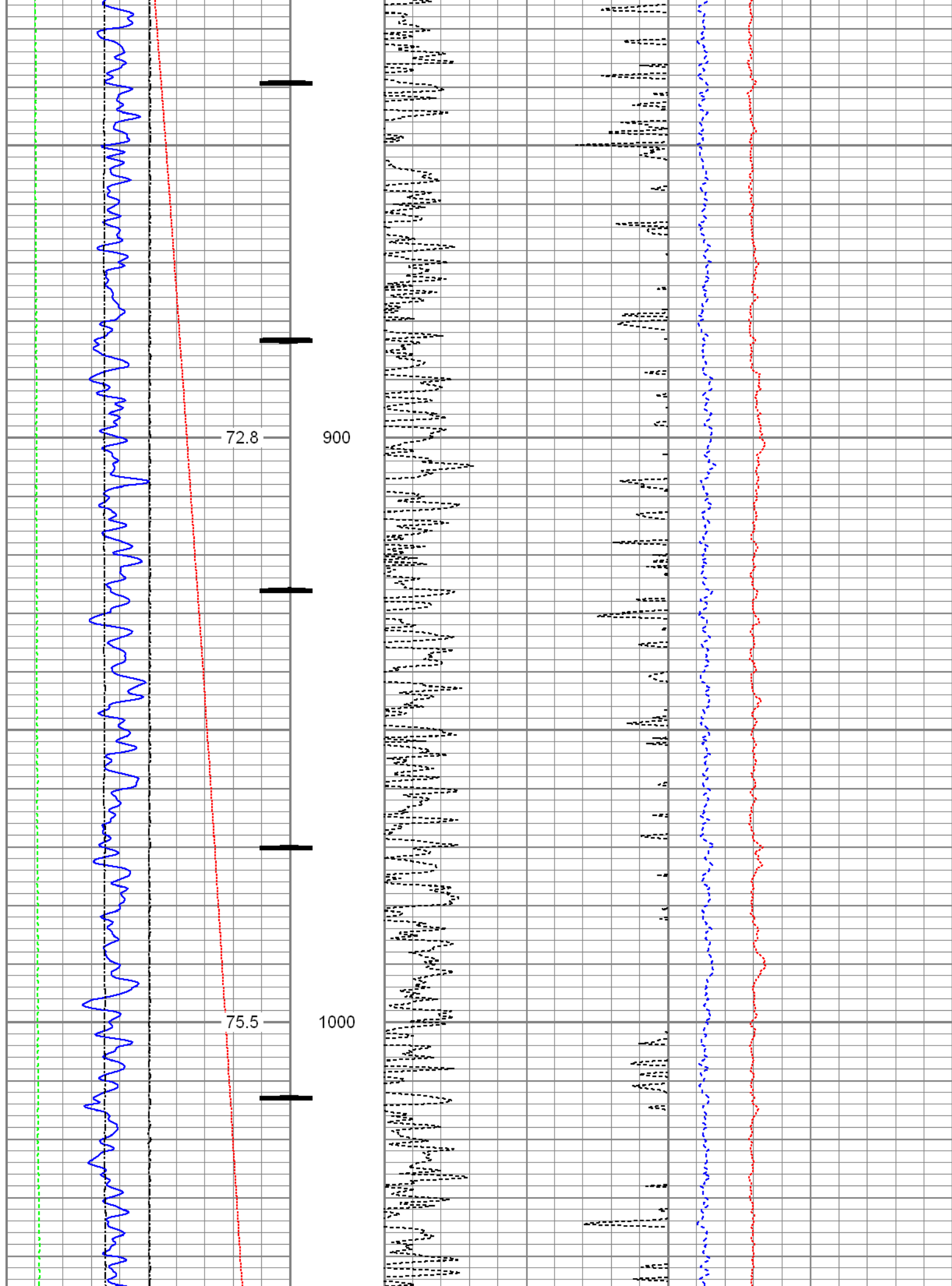
| | | | | | | | | |
|-----------------------|---------------------------------|------|----|-----------------------|---|---|--------------------|-------|
| 0 | Gamma Ray (GAPI) | 120 | 60 | Neutron Porosity (pu) | 0 | 0 | Far Neutron (cps) | 1000 |
| 0 | Temperature (degF) | 20 | | | | 0 | Near Neutron (cps) | 10000 |
| -100 | Line Speed (ft/min) | 100 | | | | | | |
| 0 | Line Tension (lb) | 2000 | | | | | | |
| -2 | Differential Temperature (degF) | 2 | | | | | | |
| Casing Collar Locator | | | | | | | | |

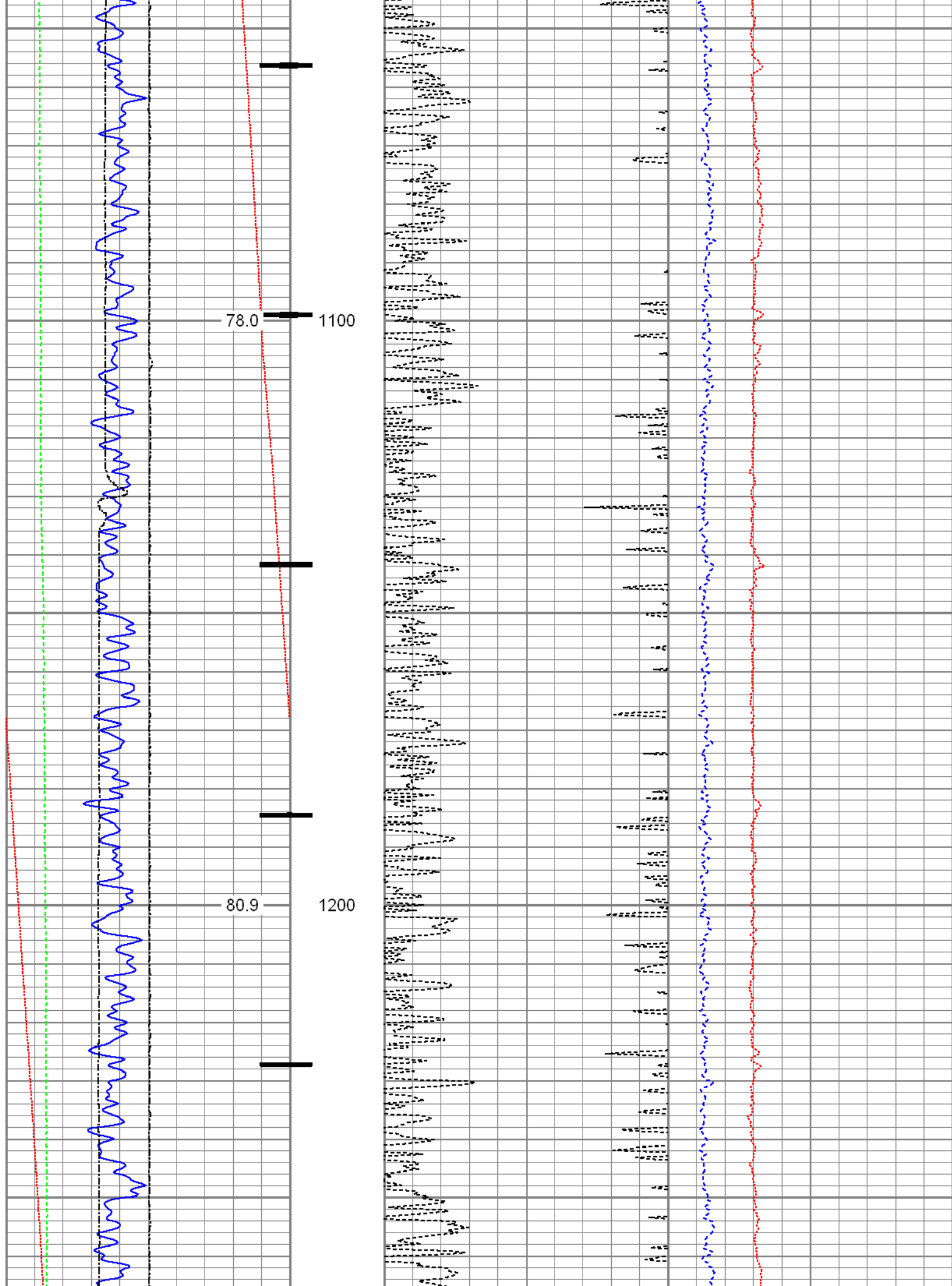


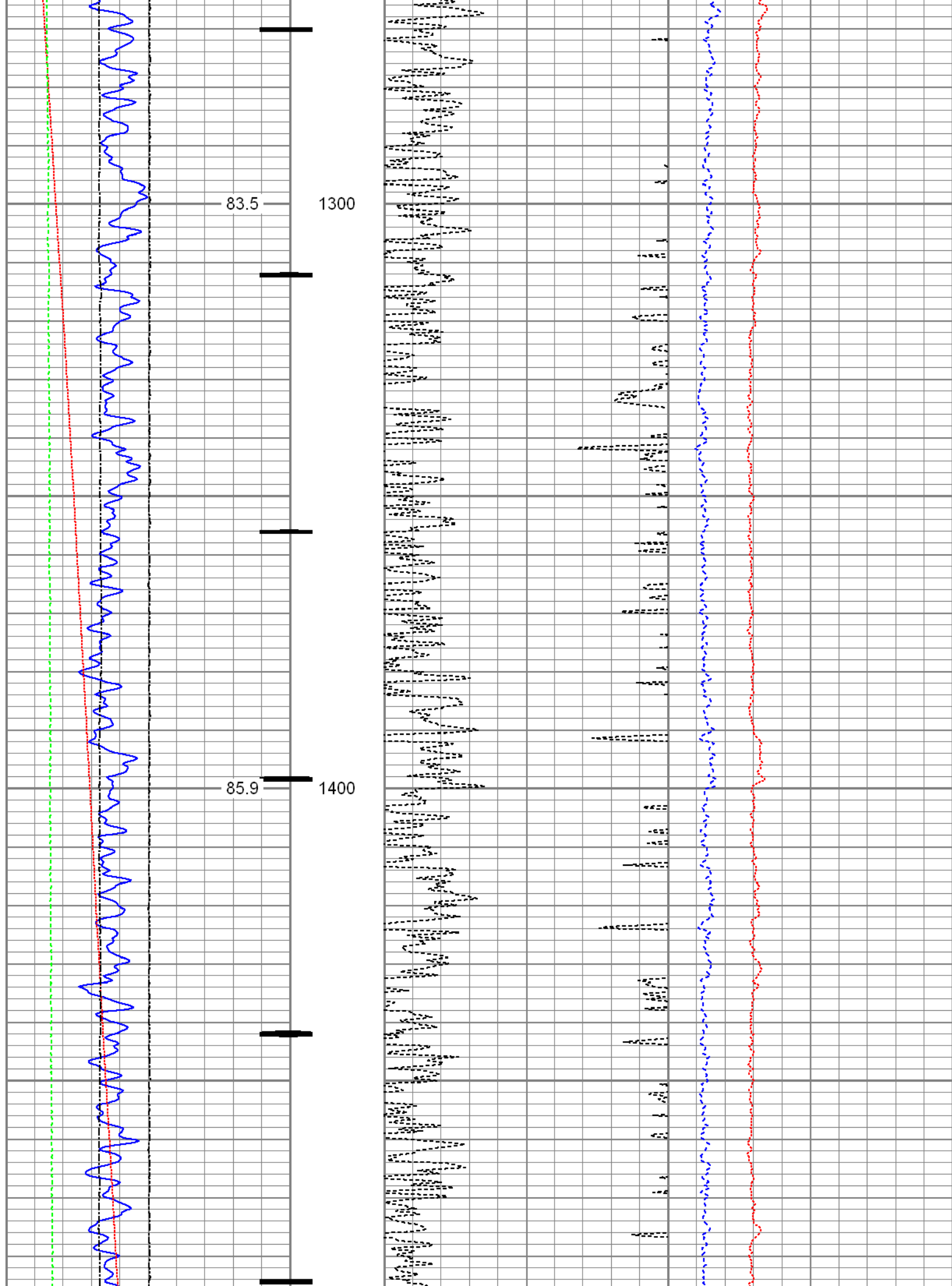


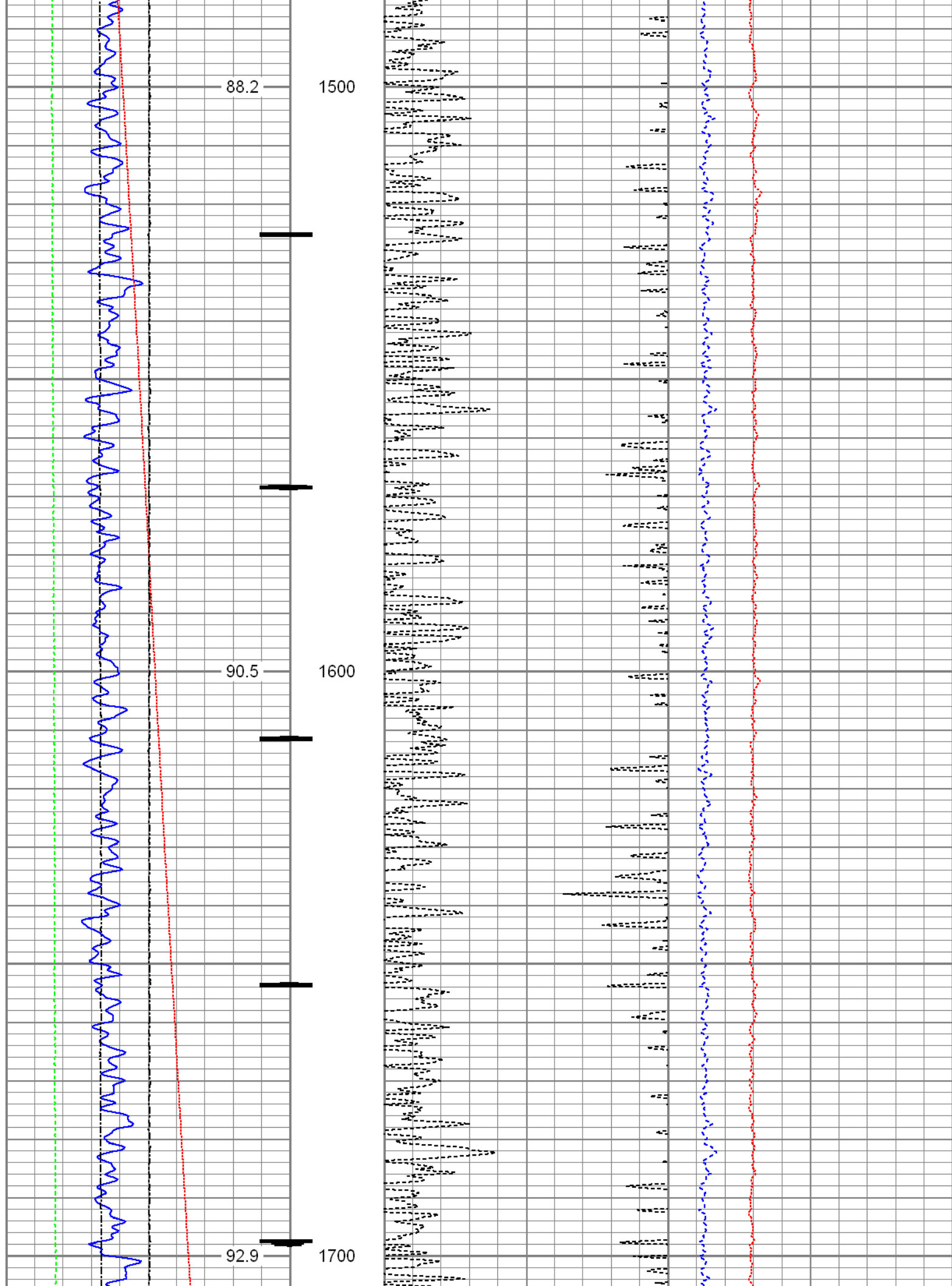


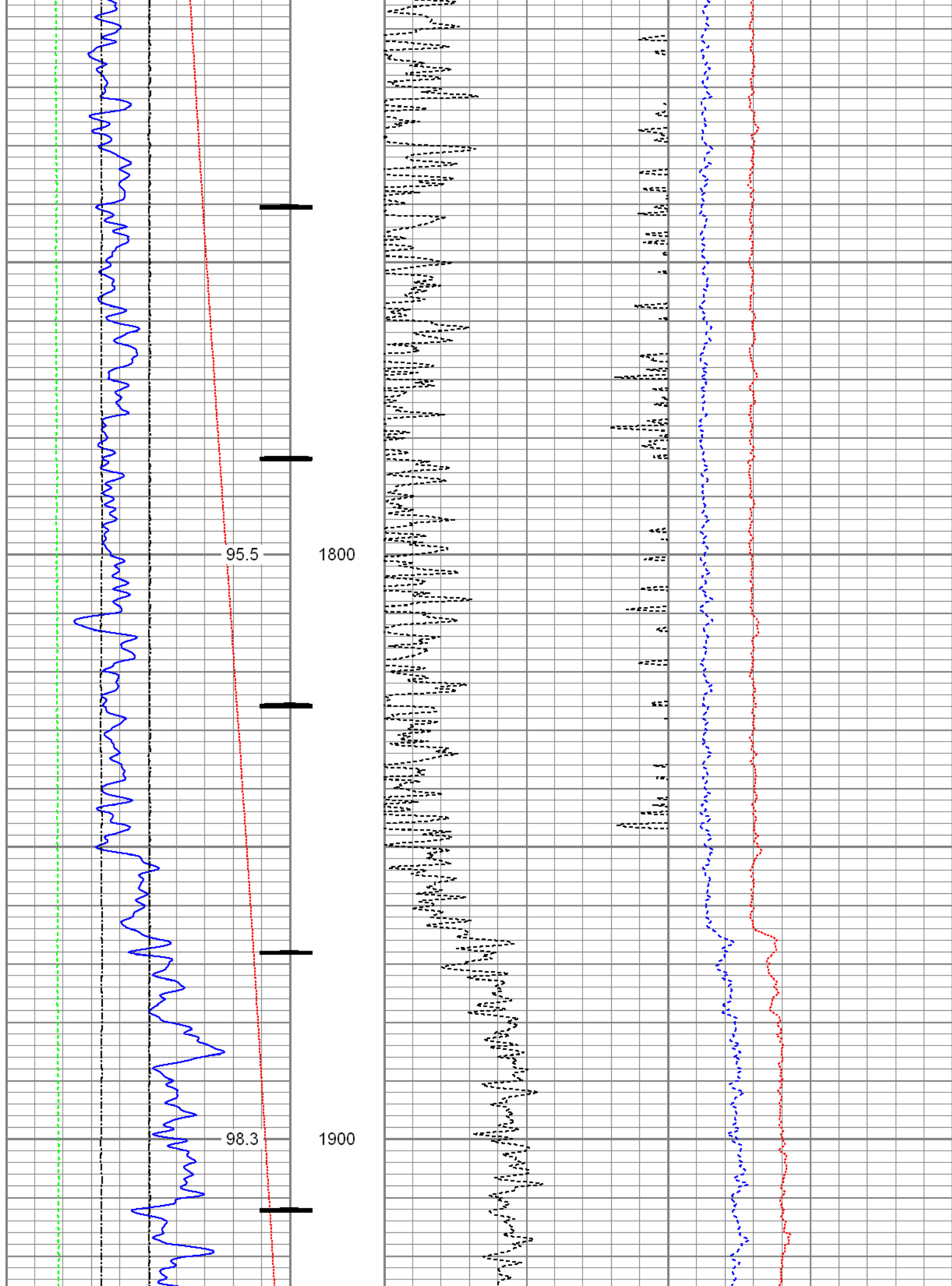


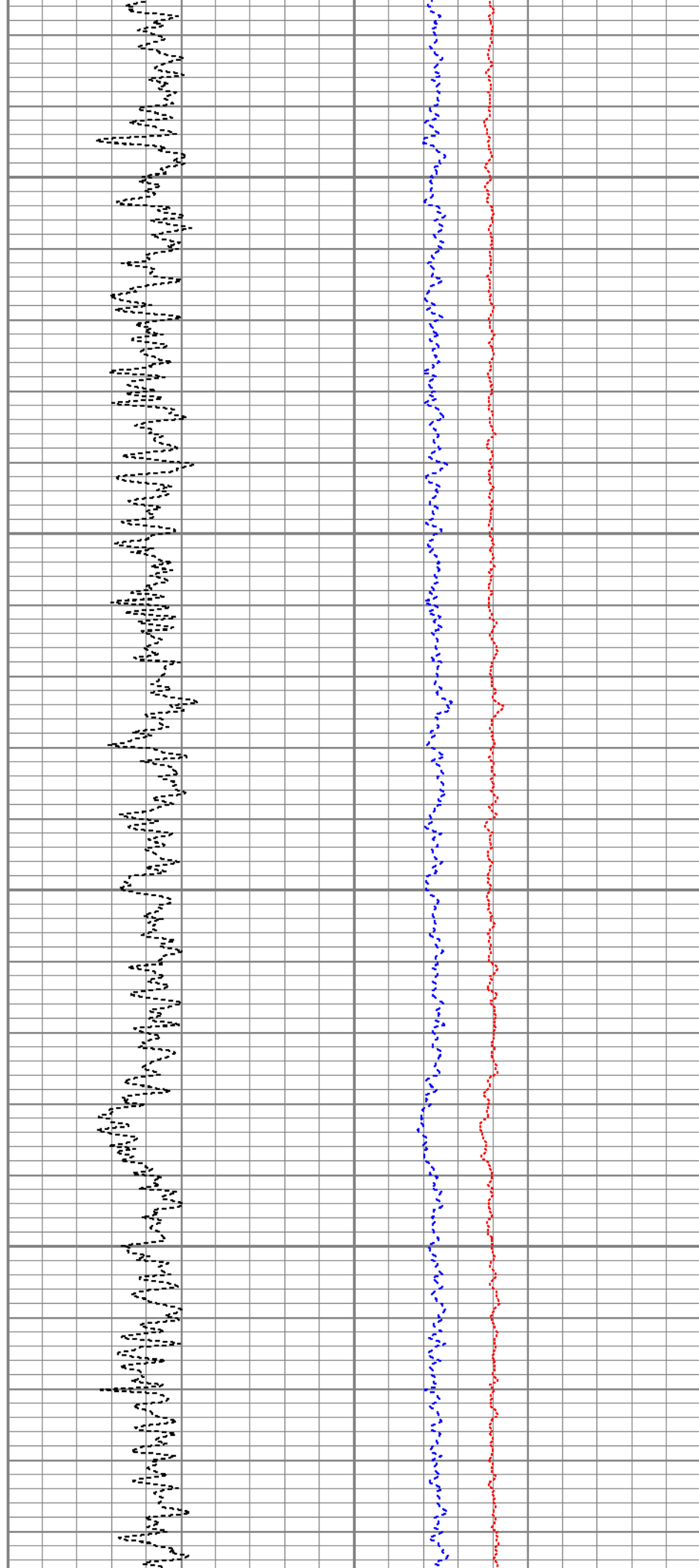
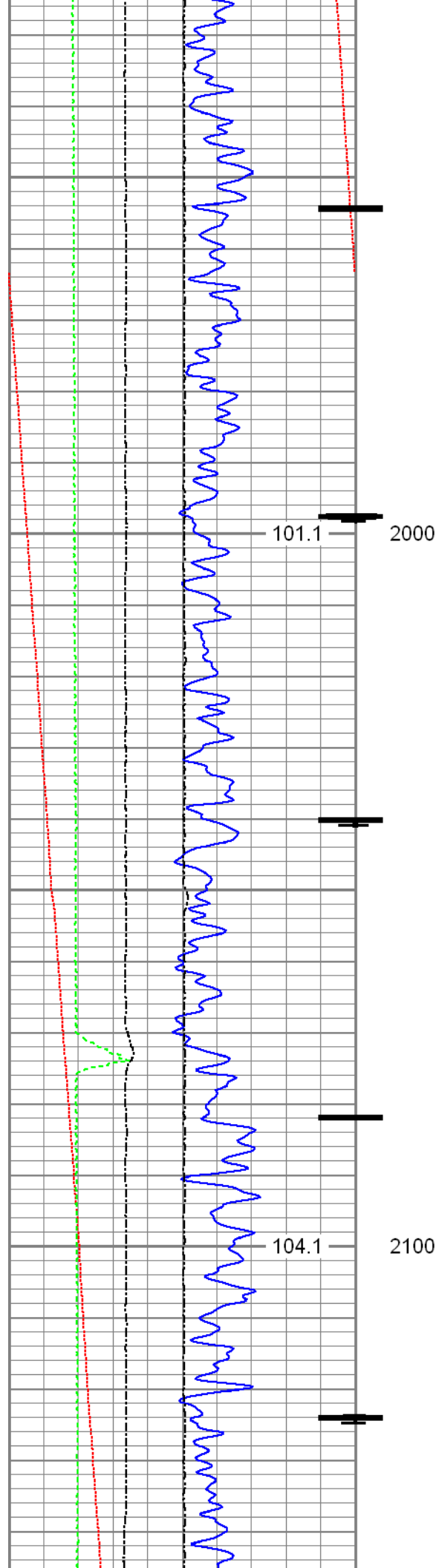


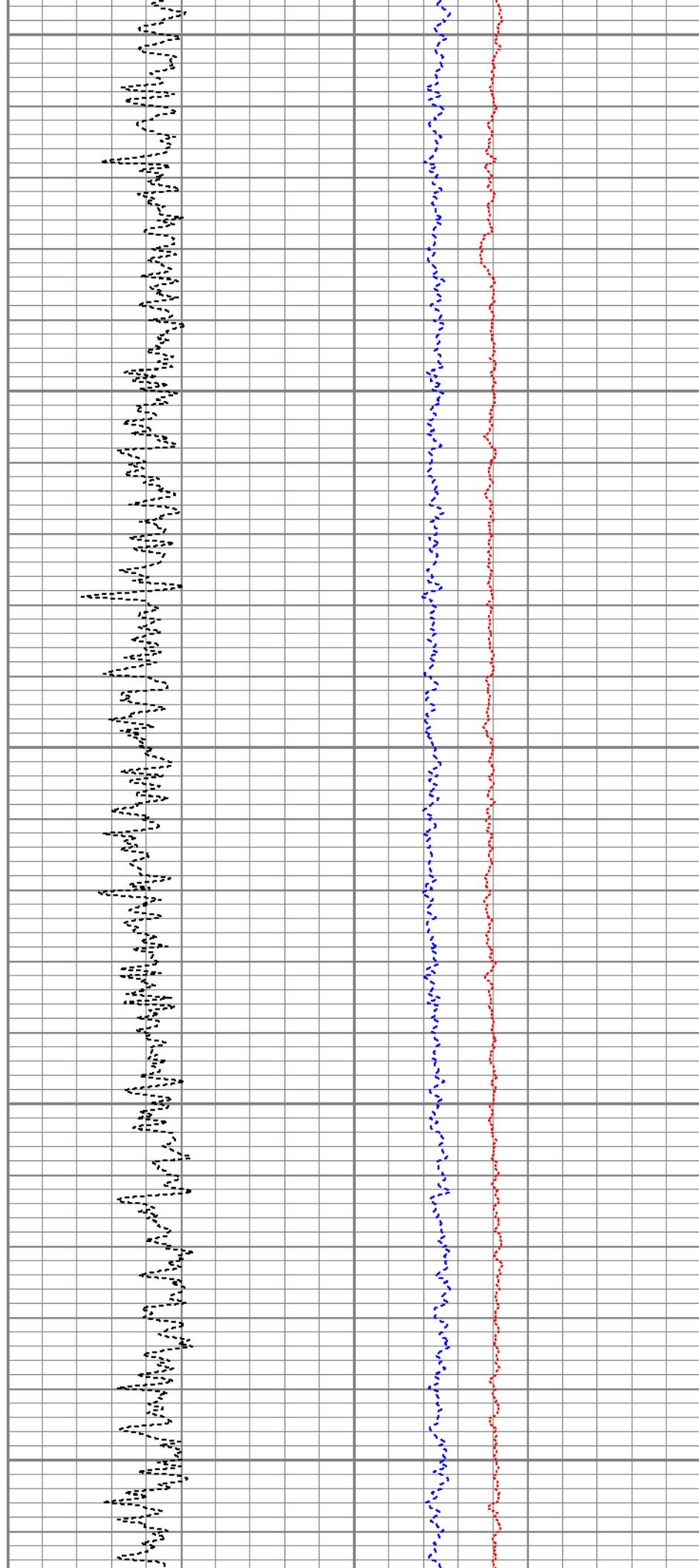
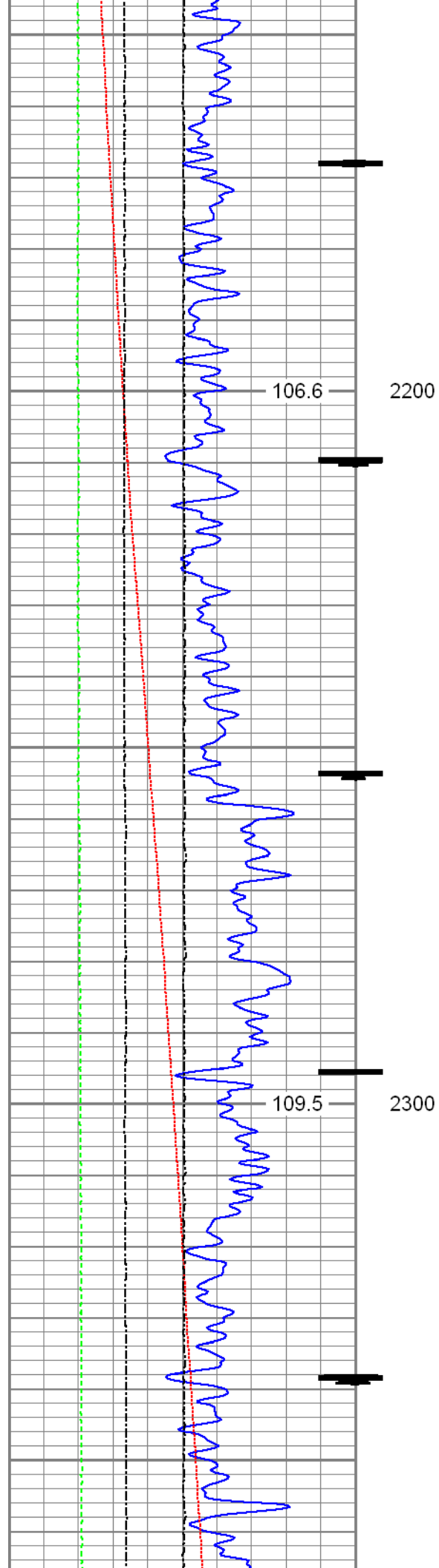


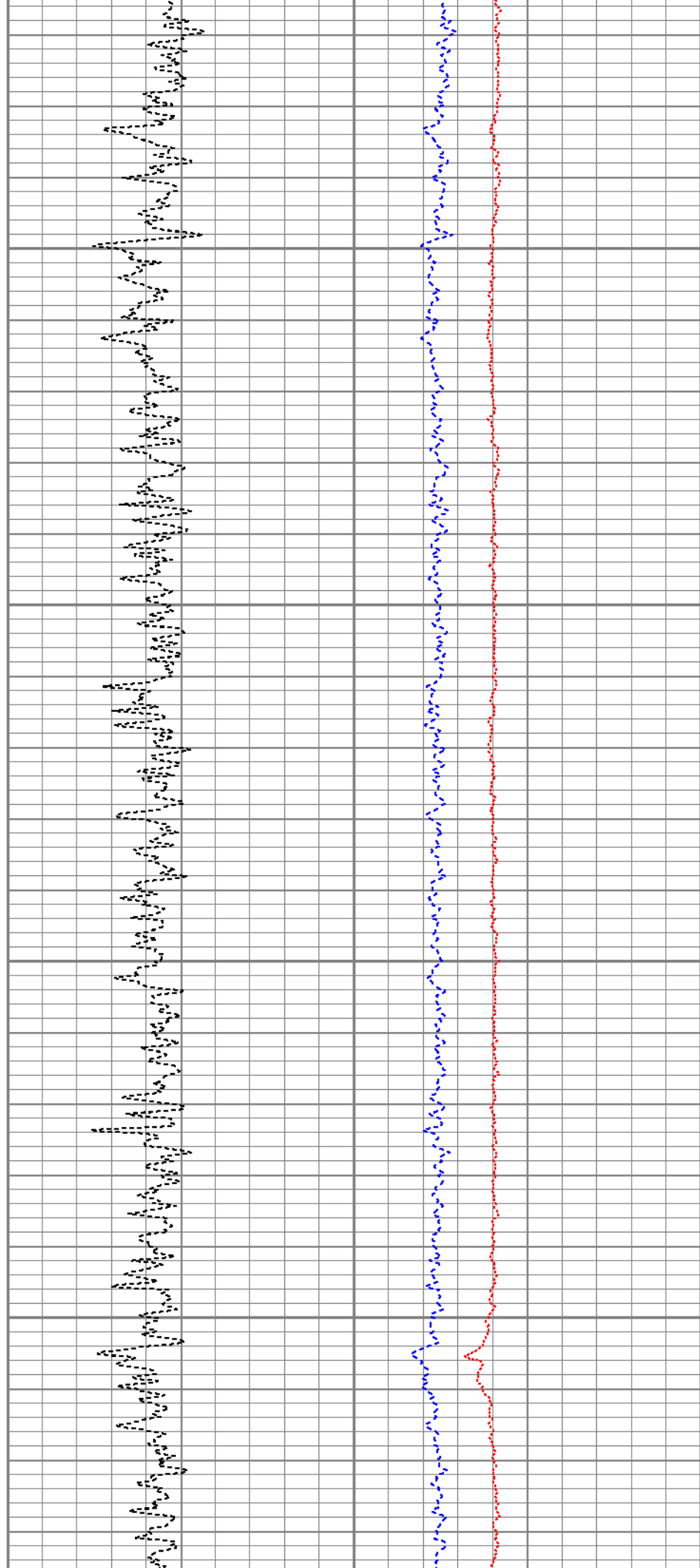
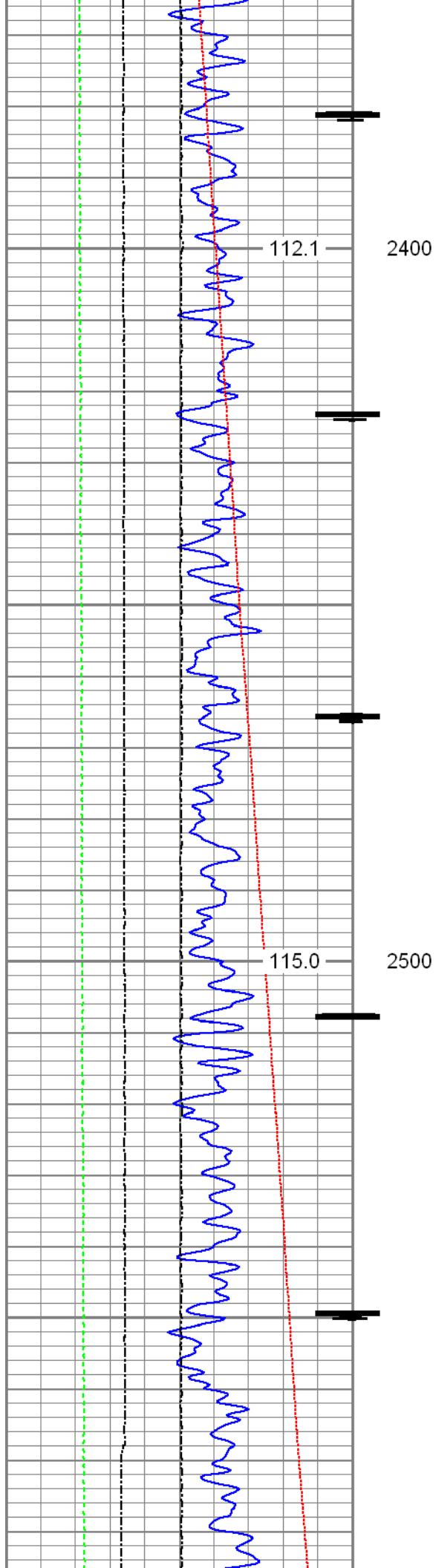


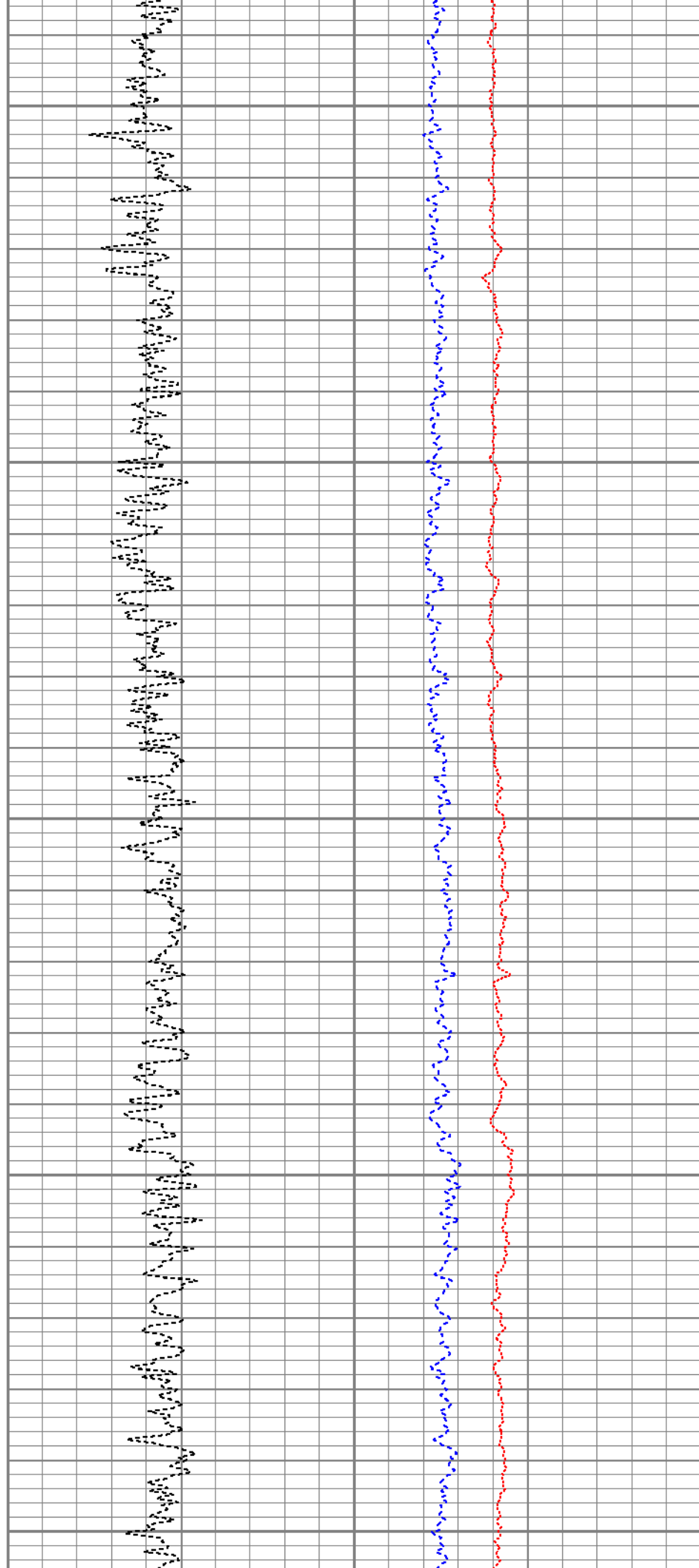
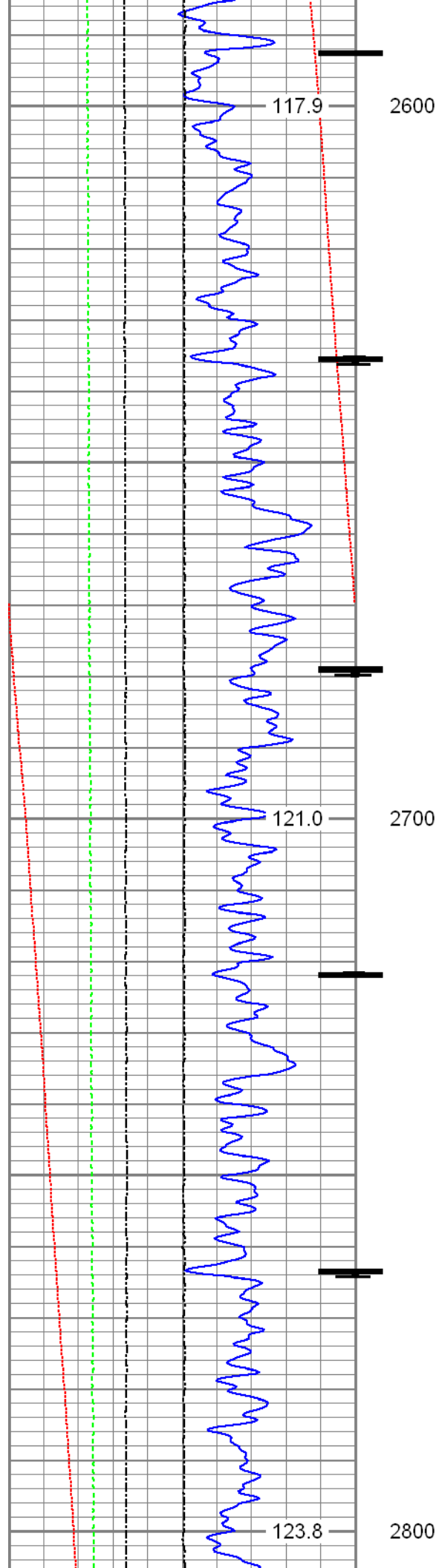


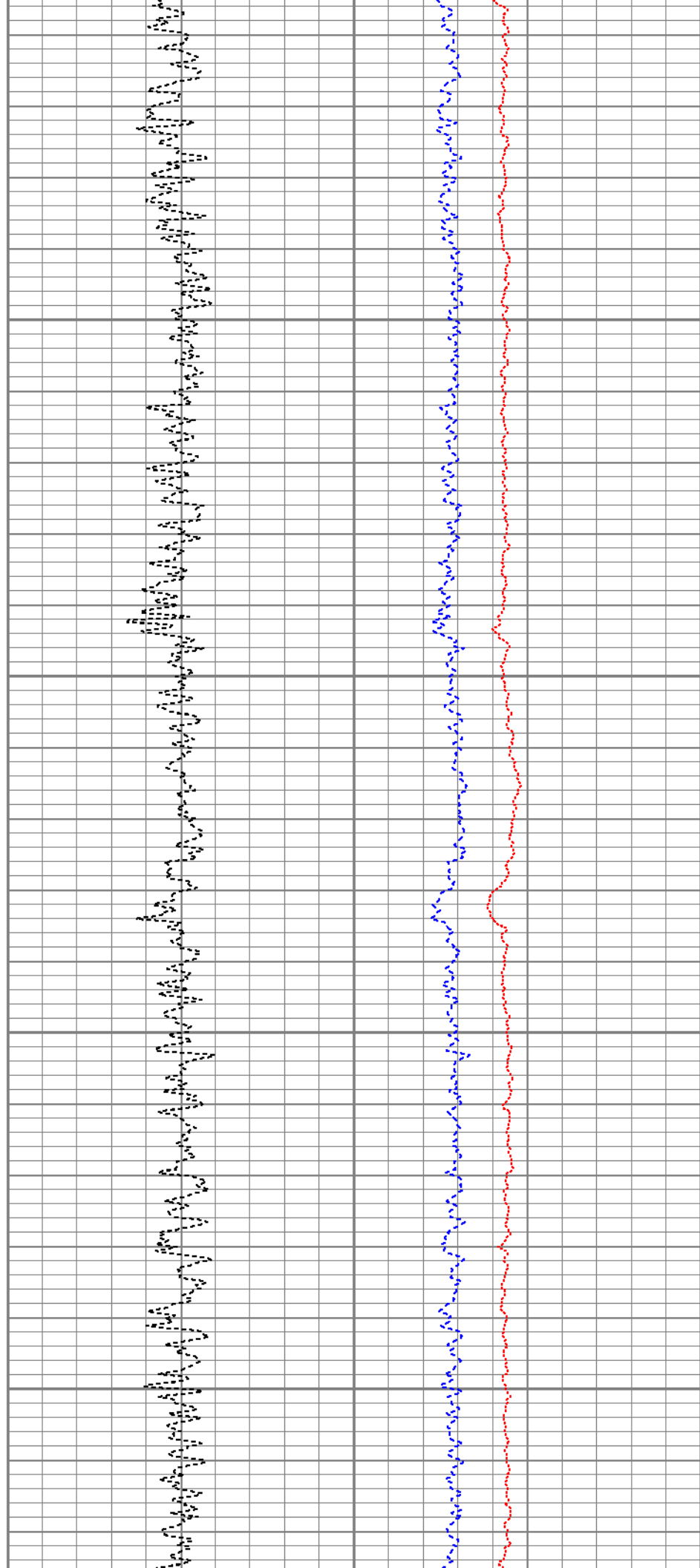
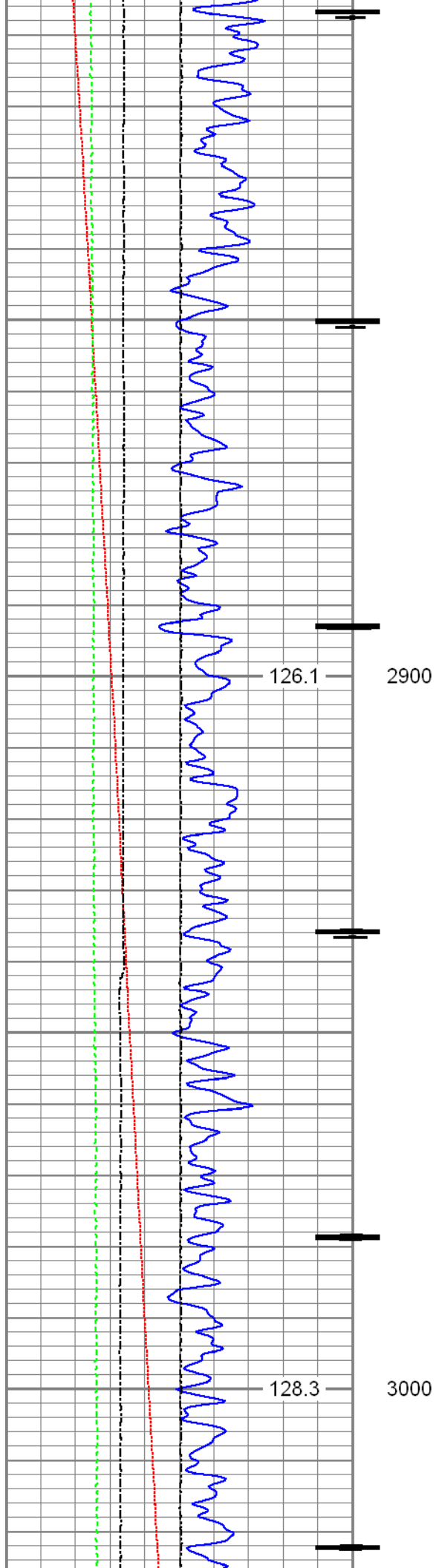


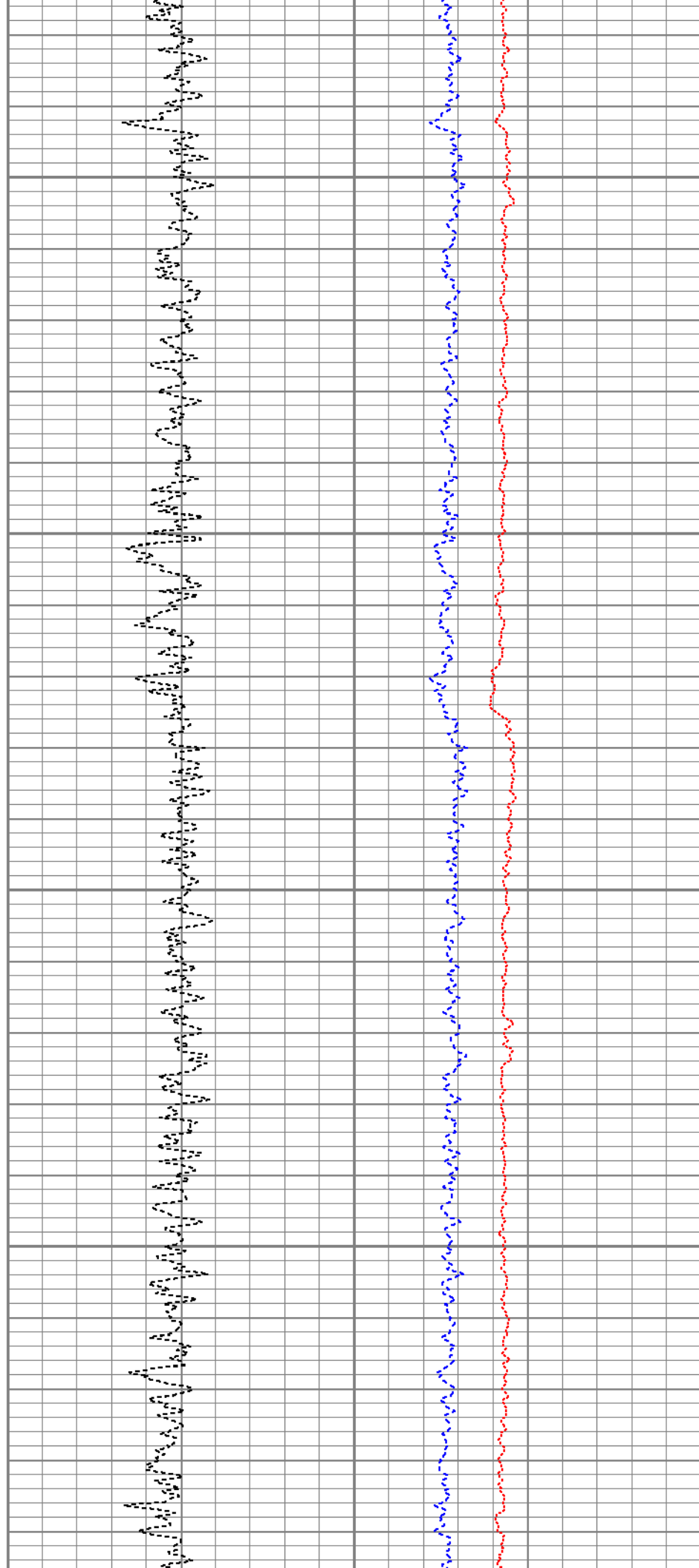
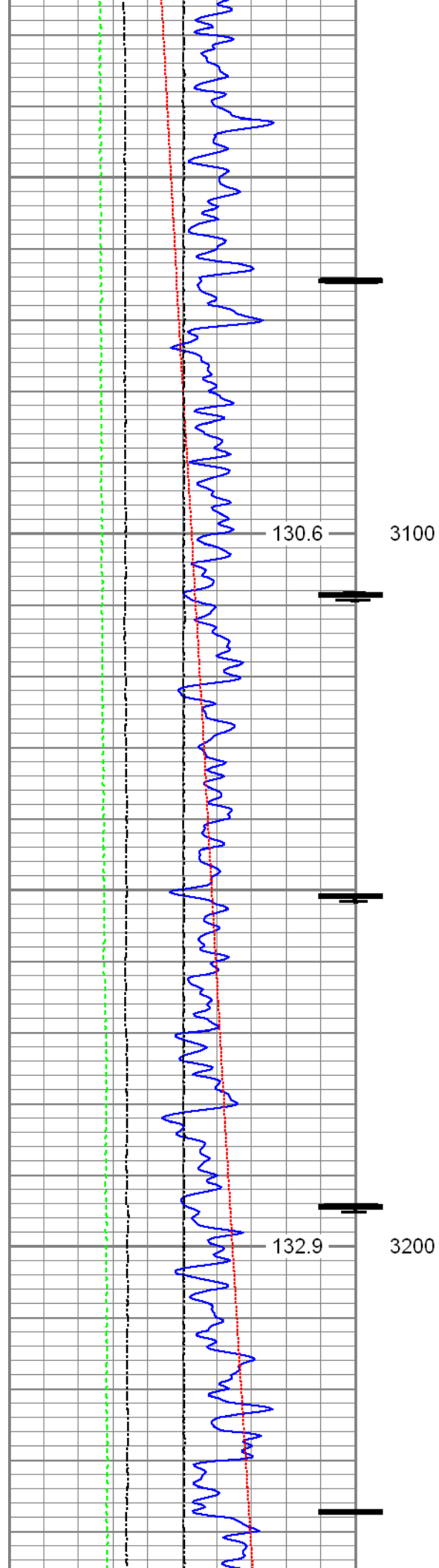


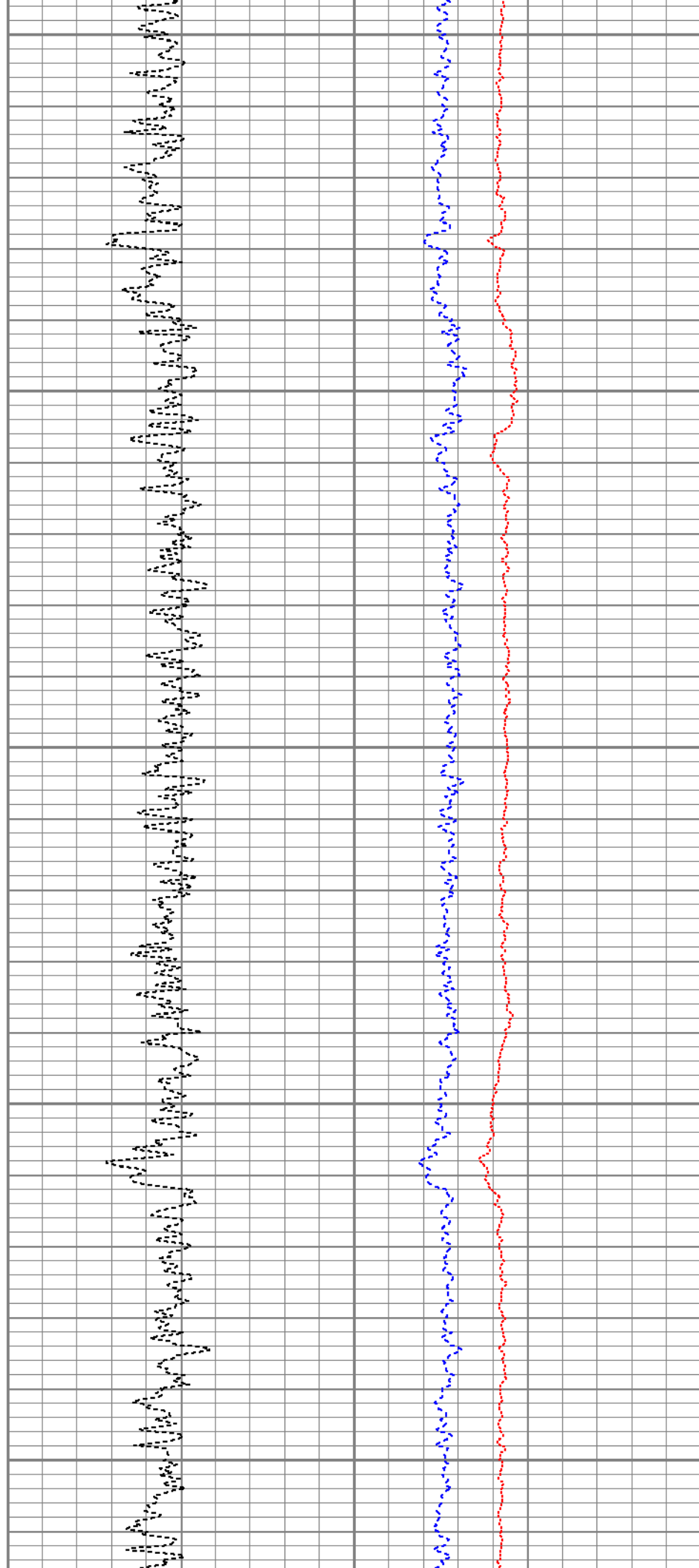
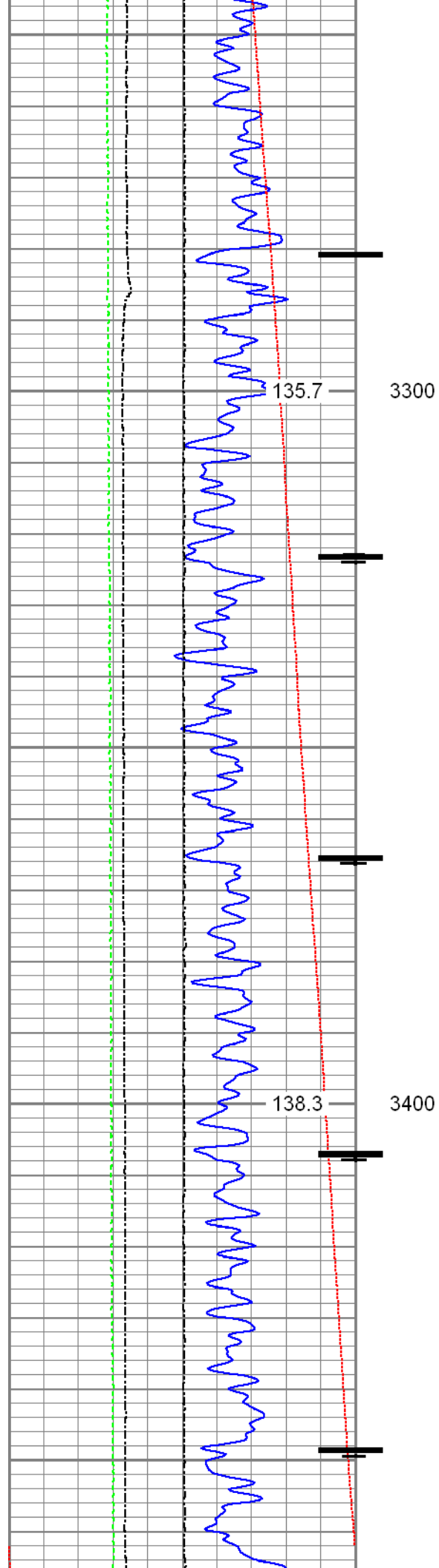


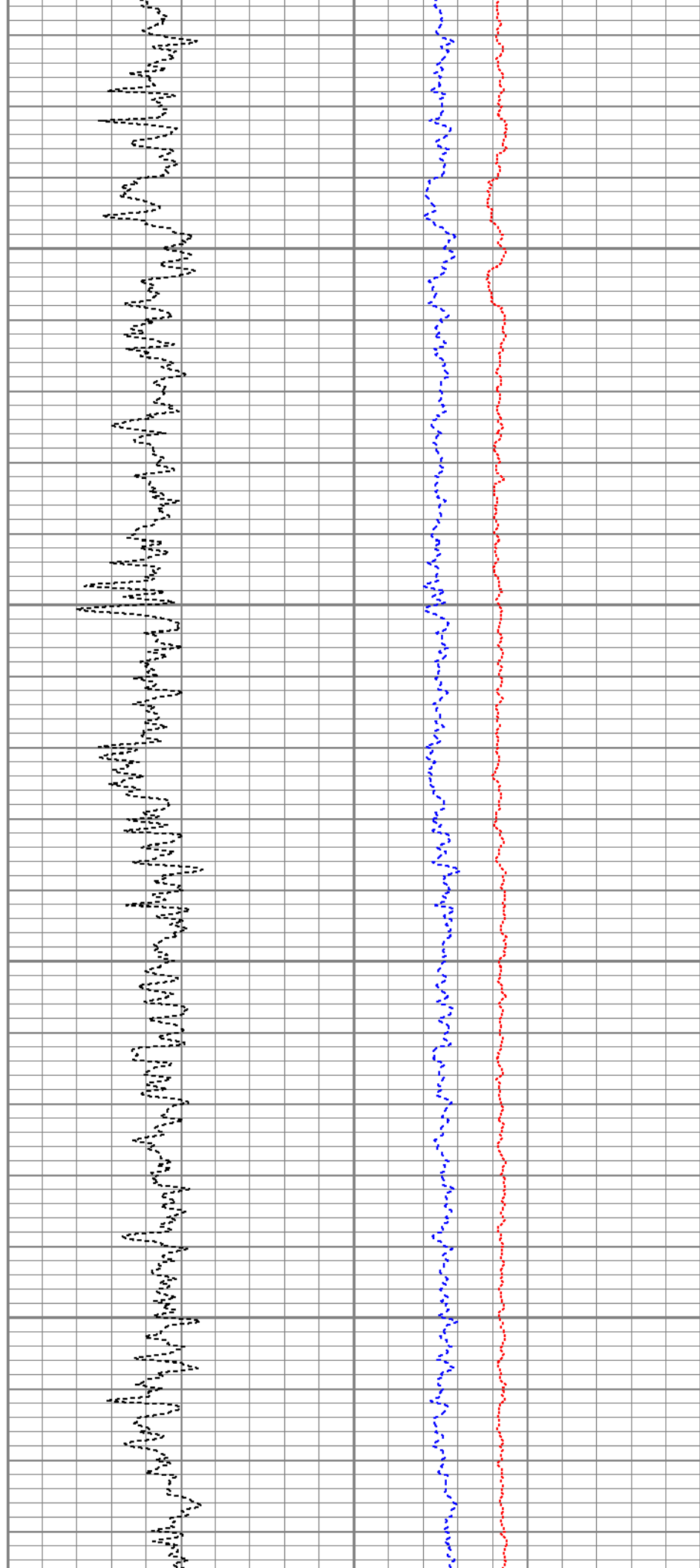
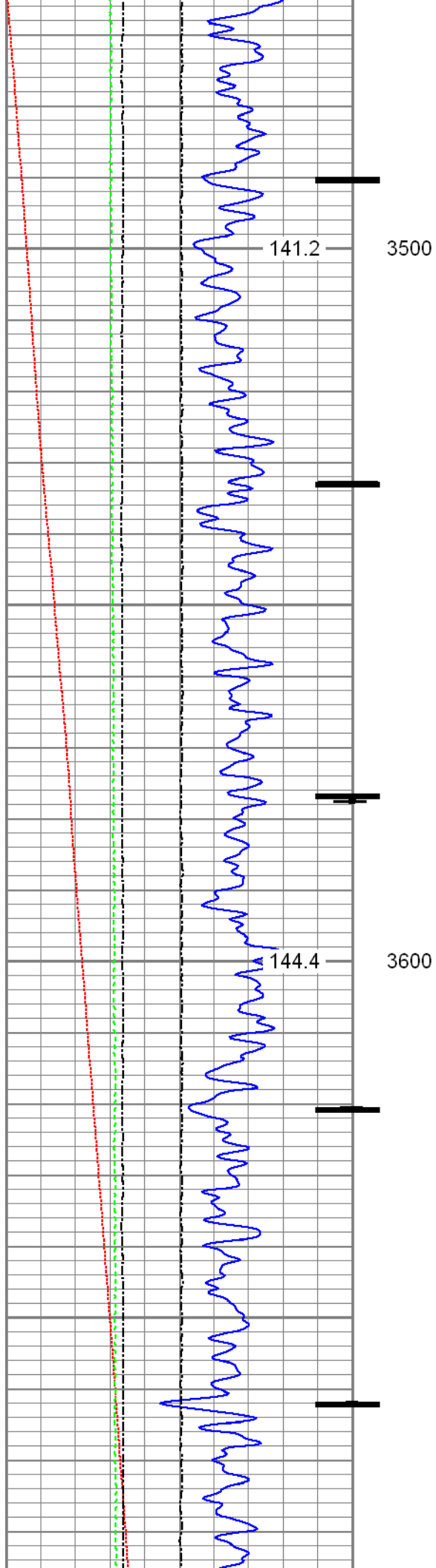


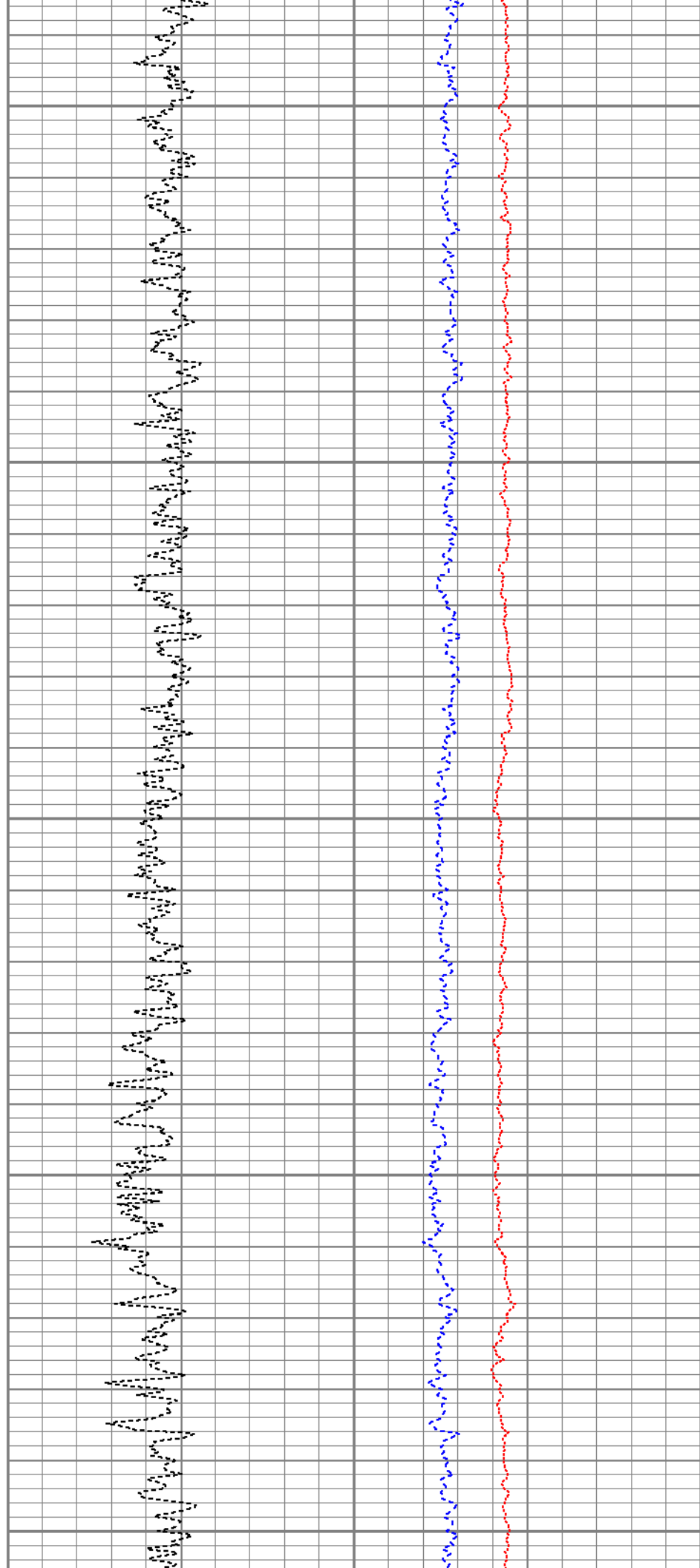
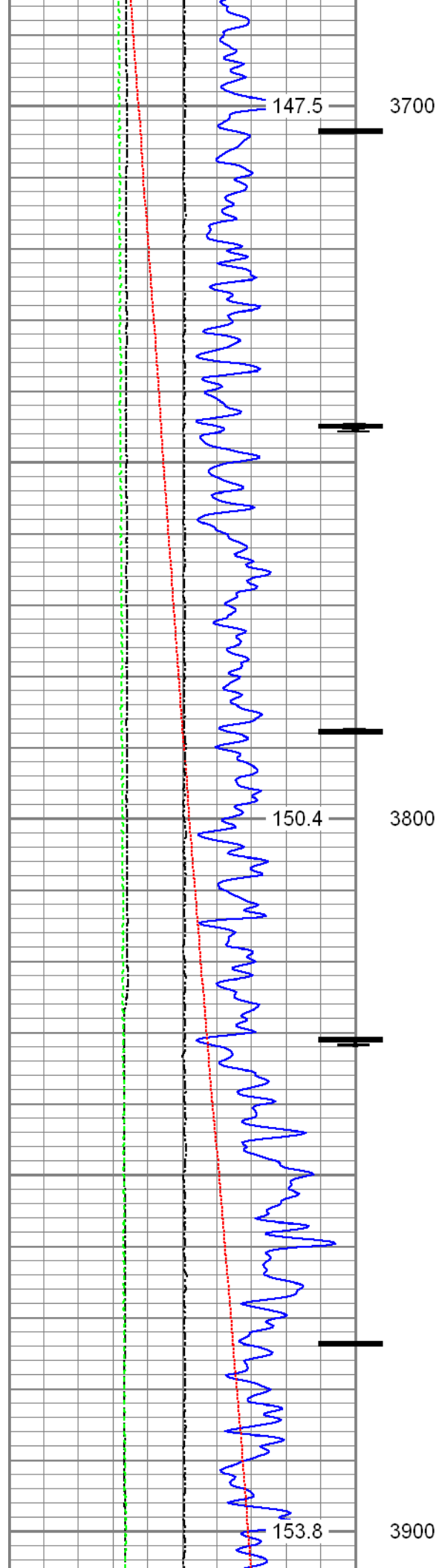


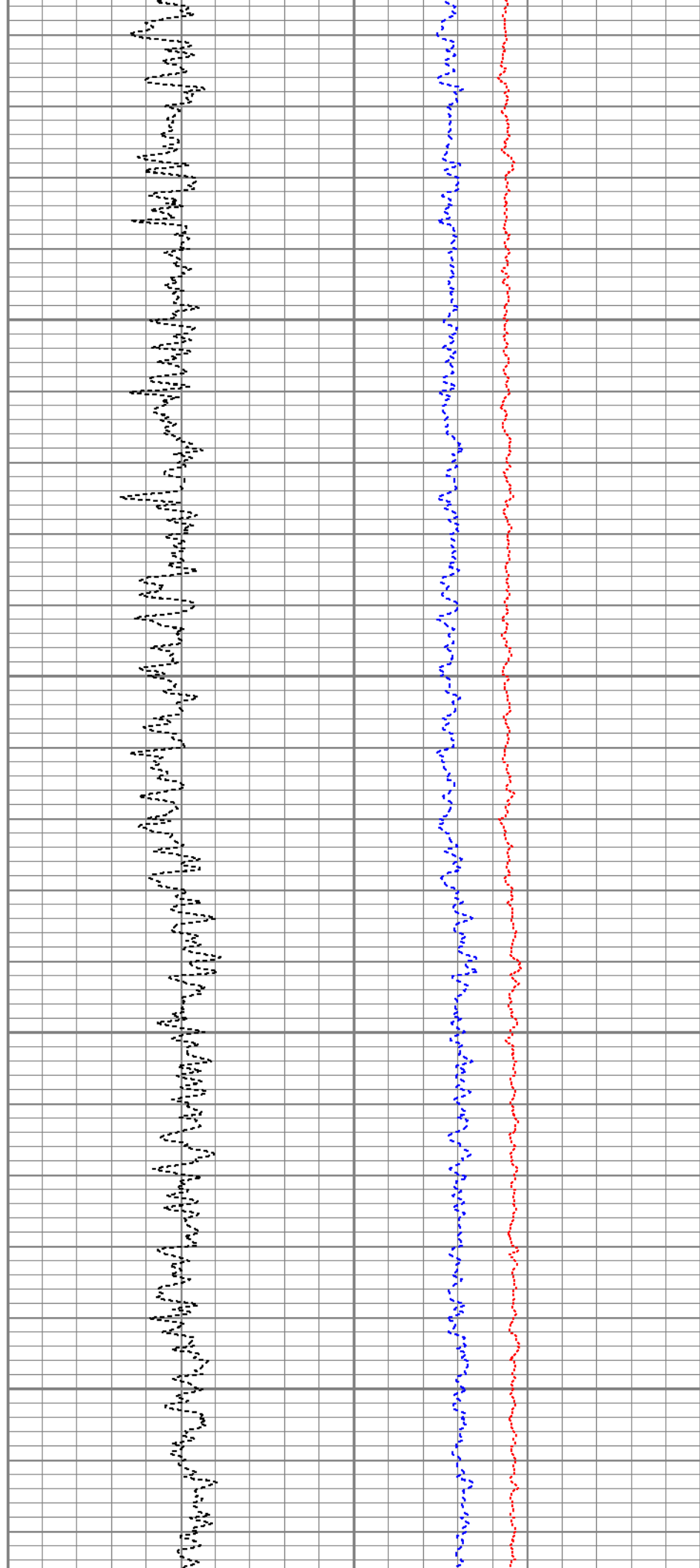
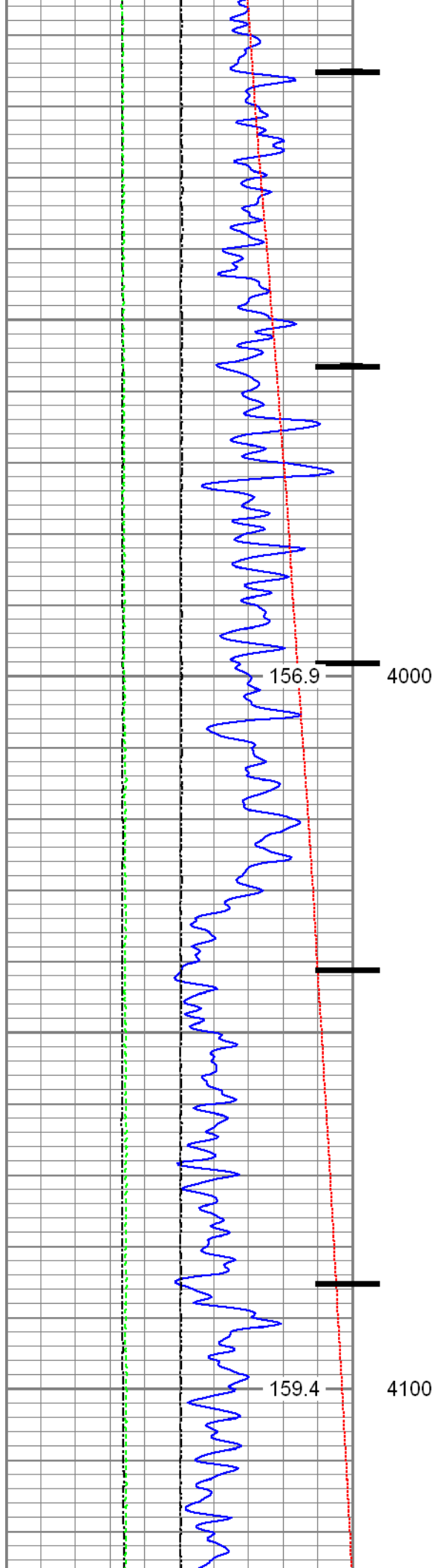


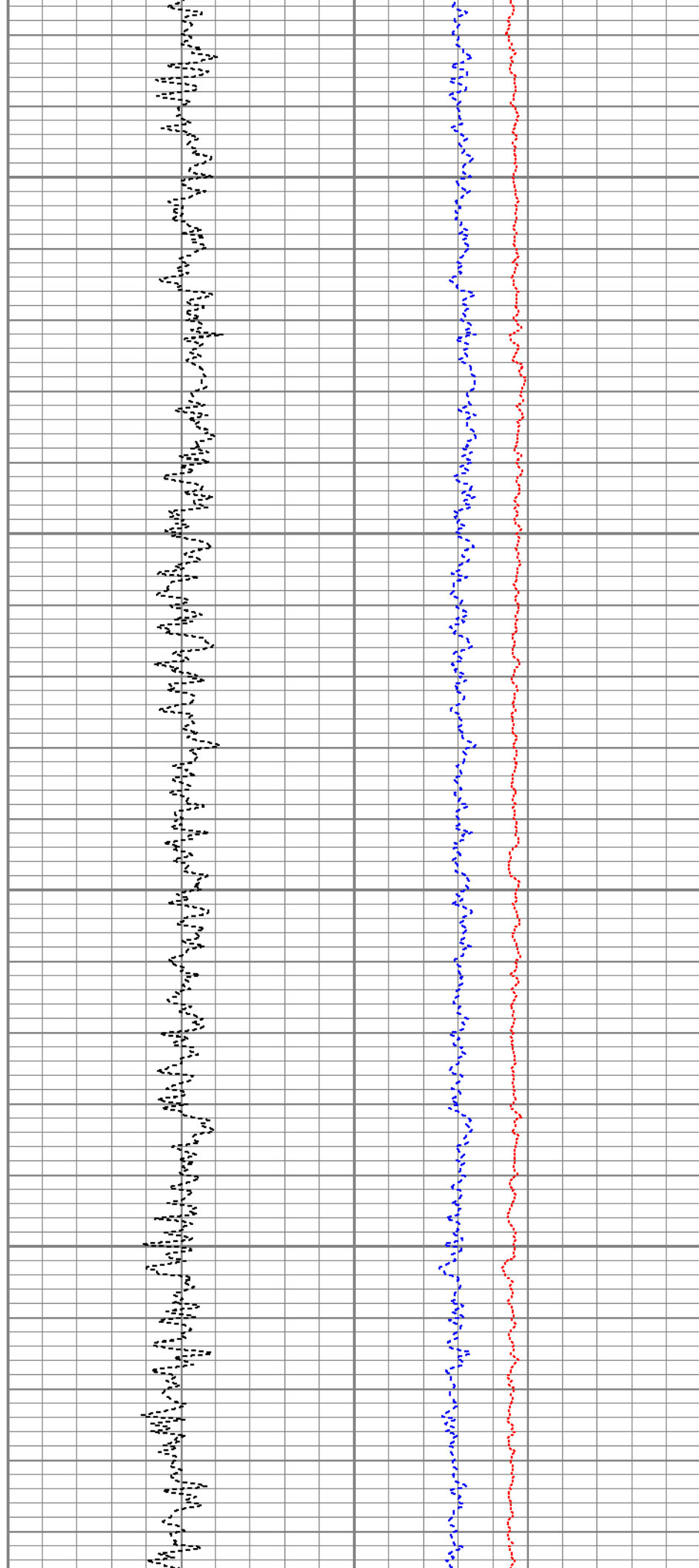
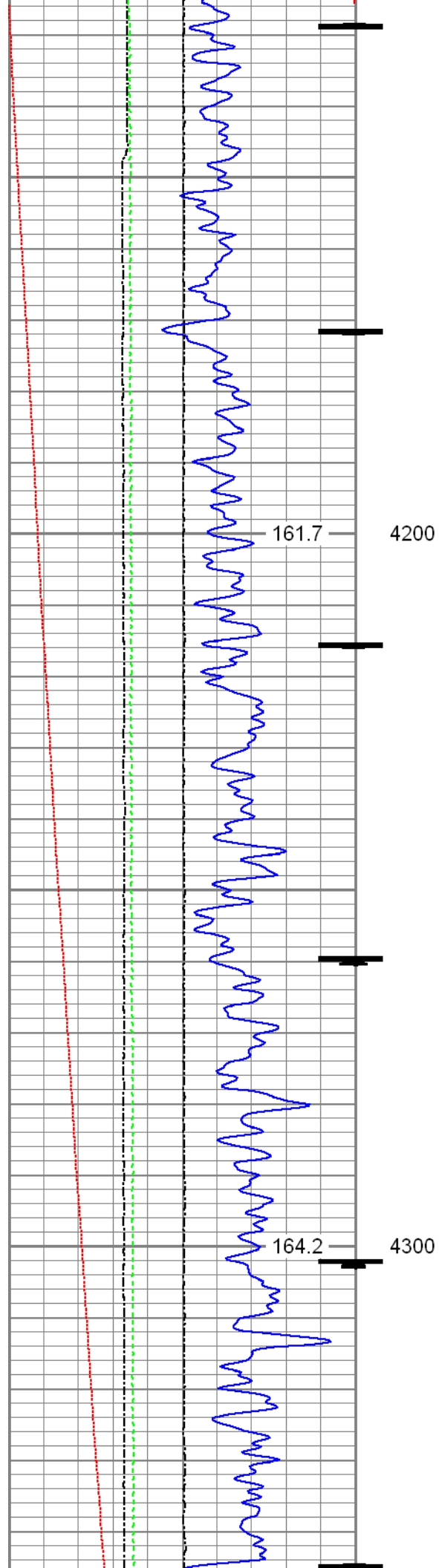


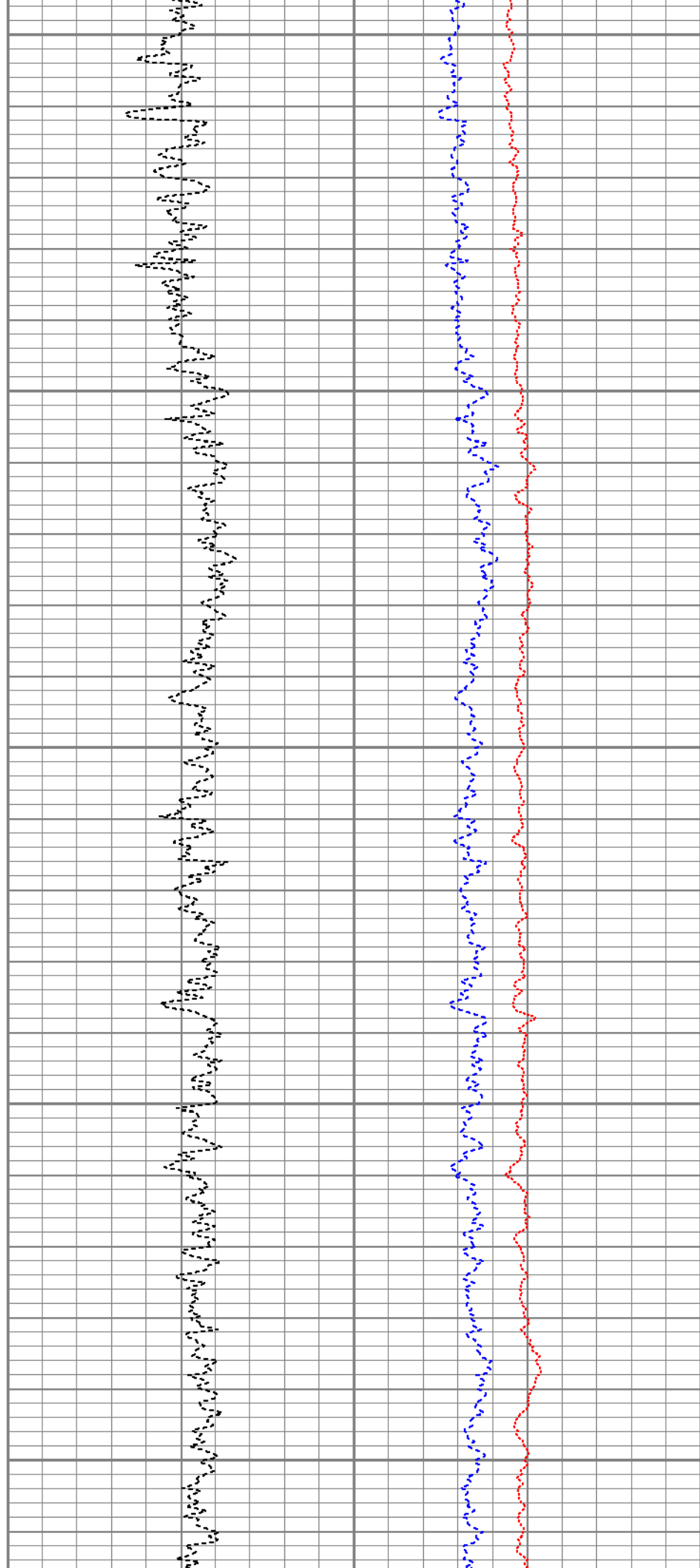
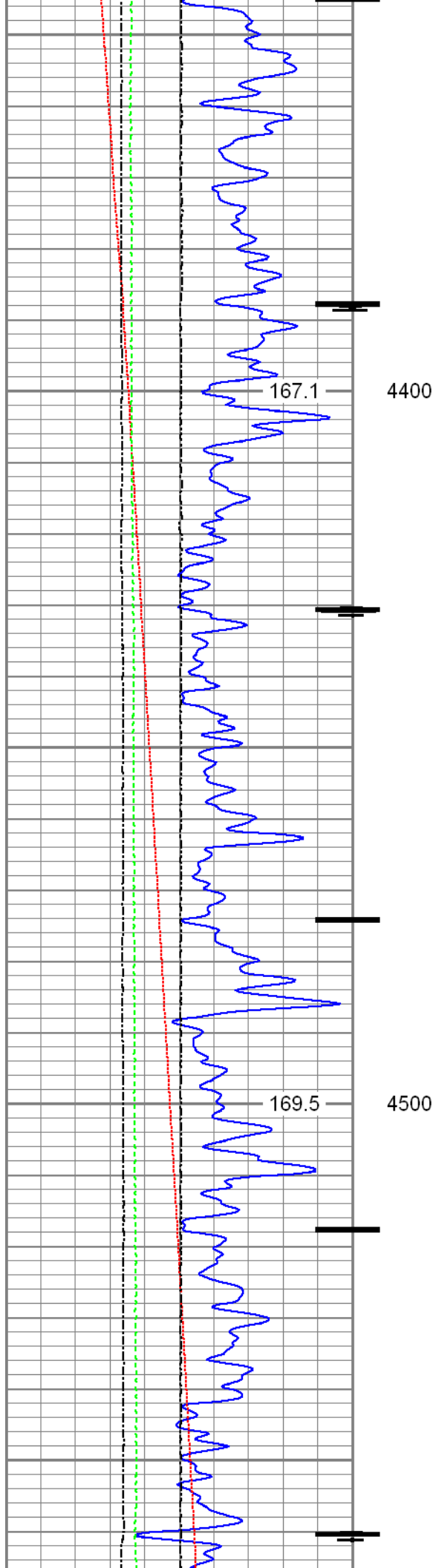


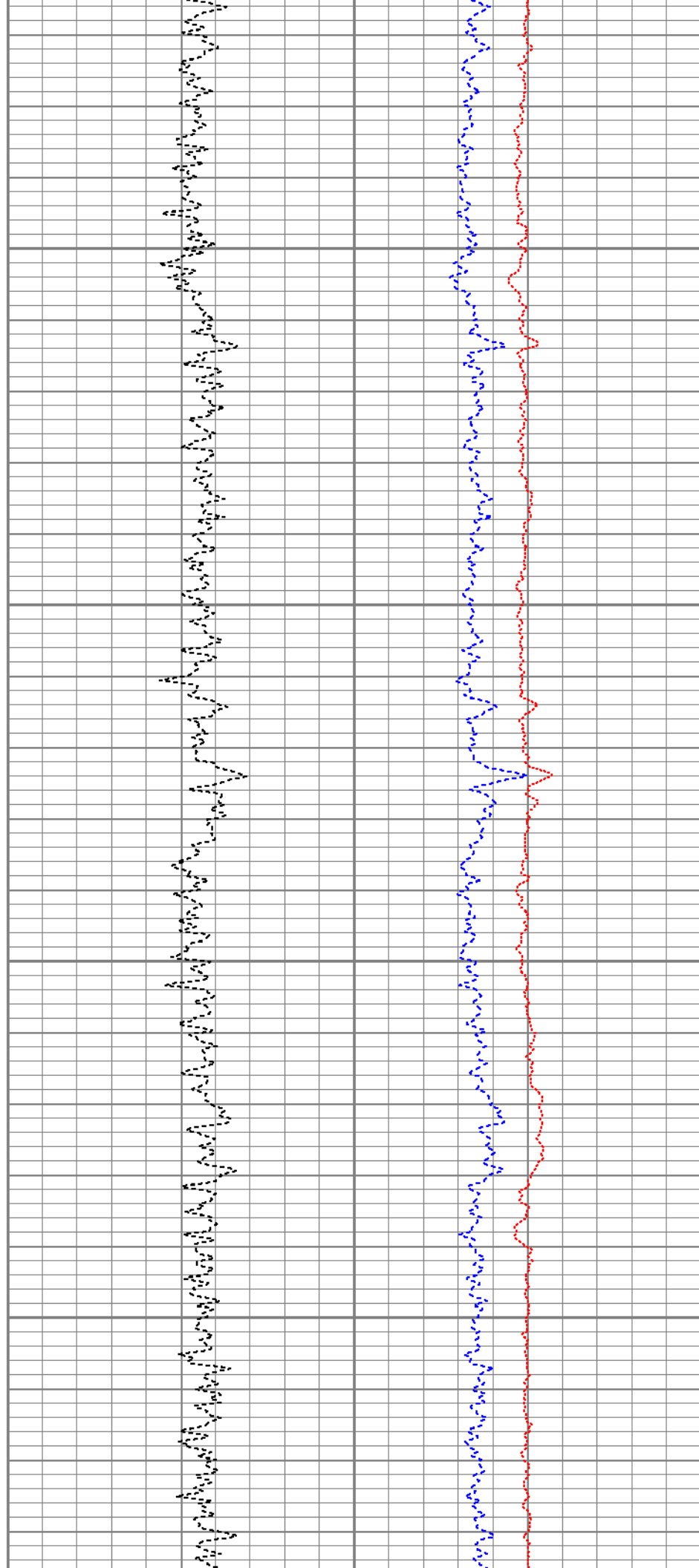
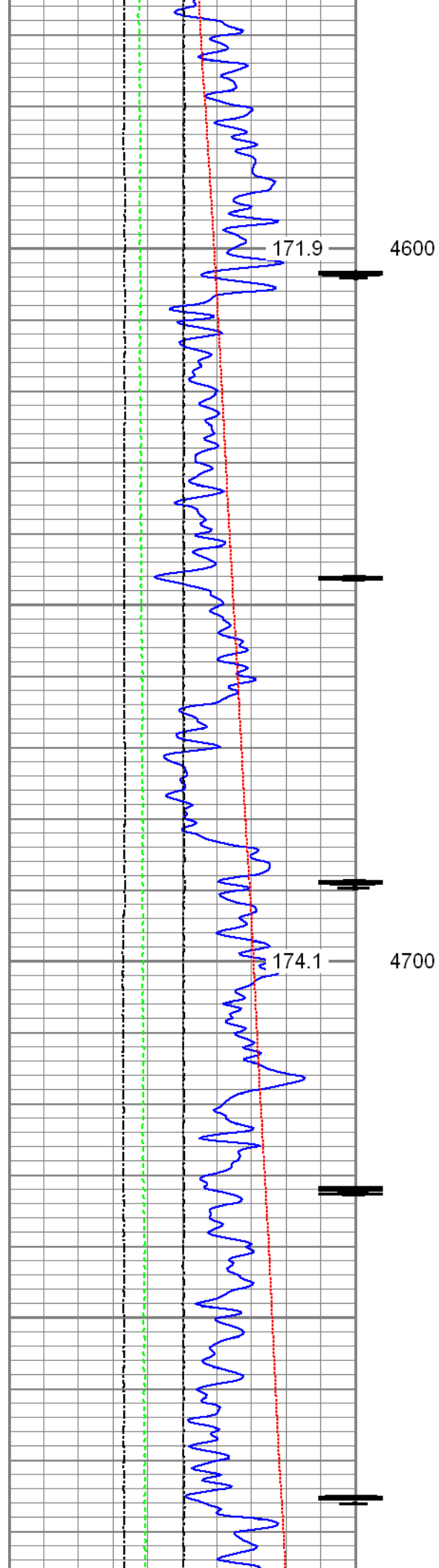


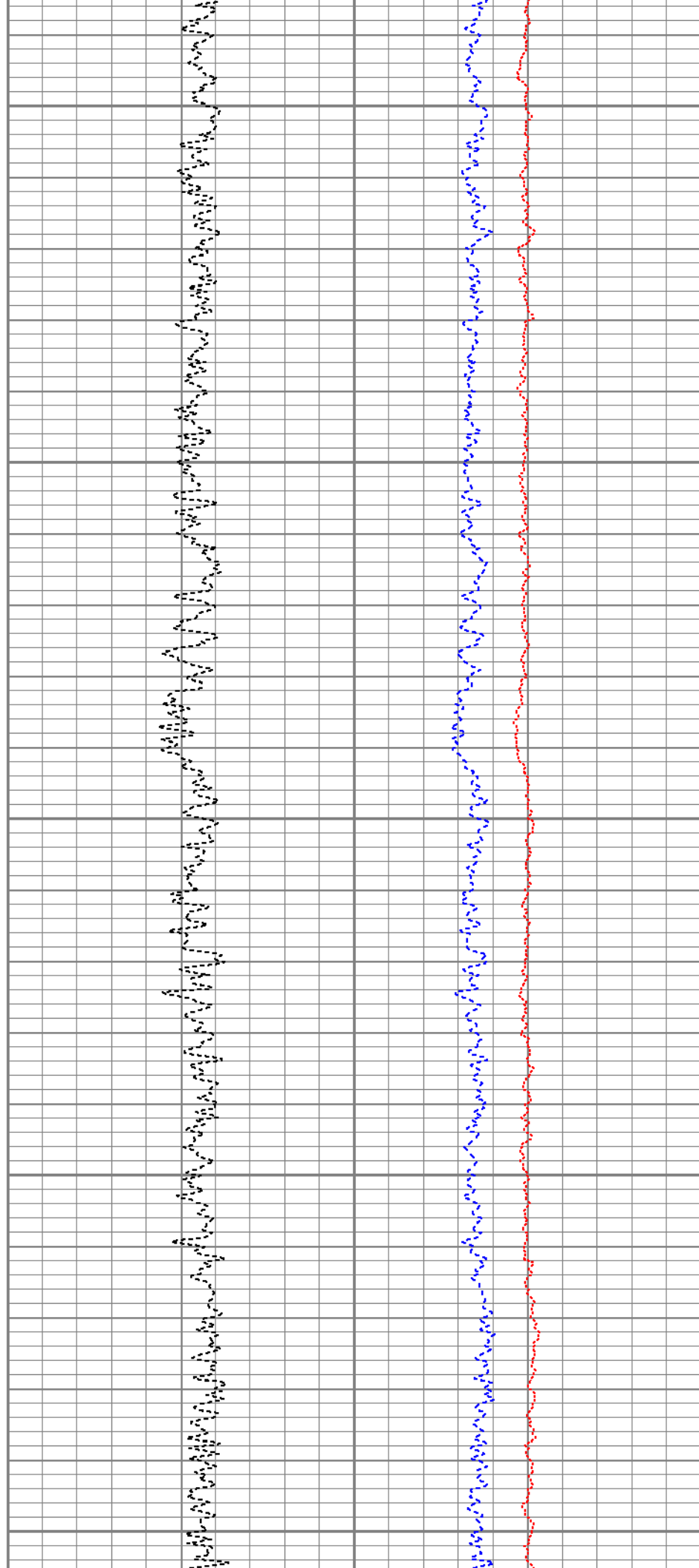
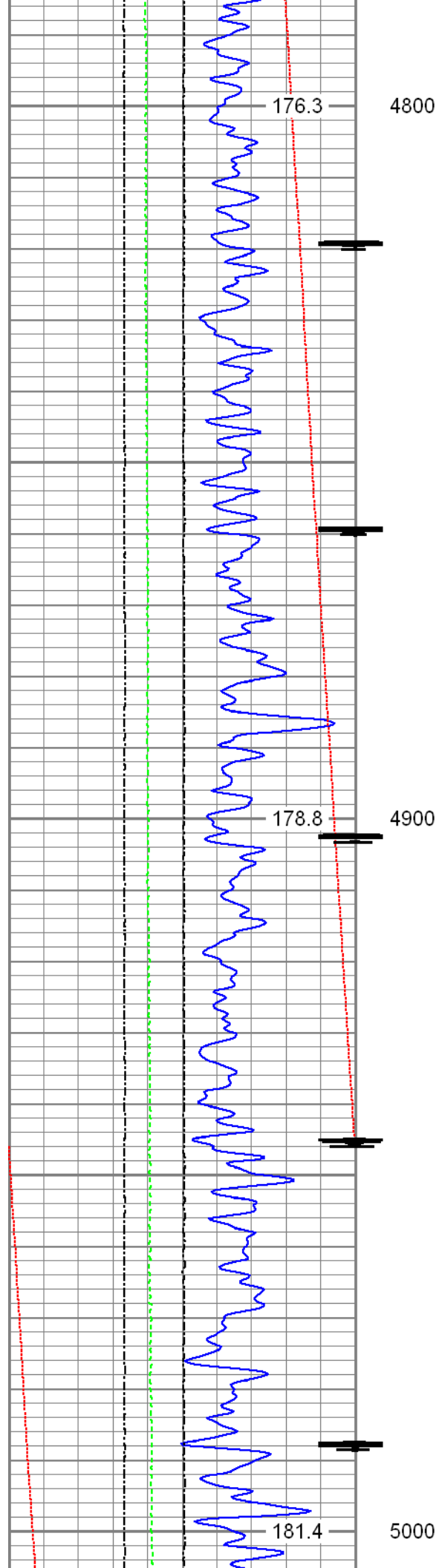


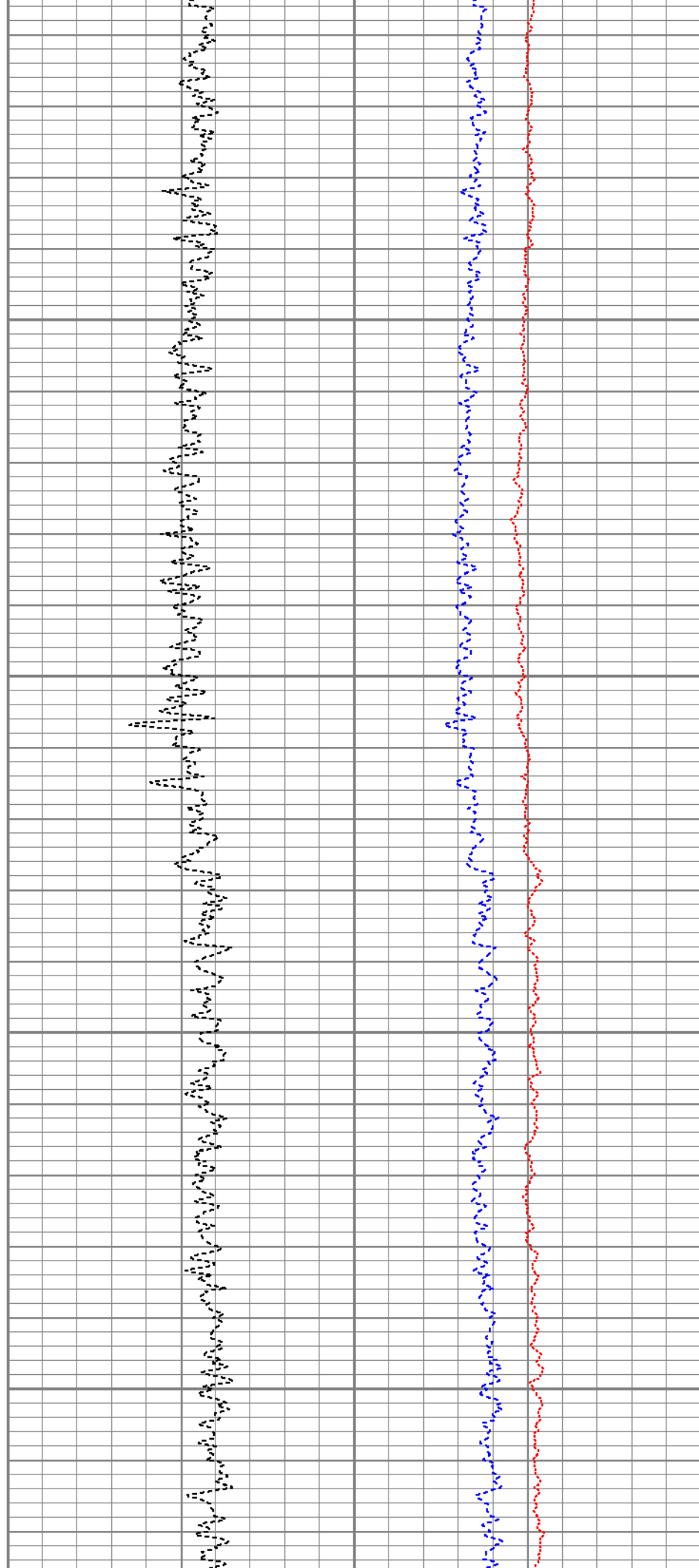
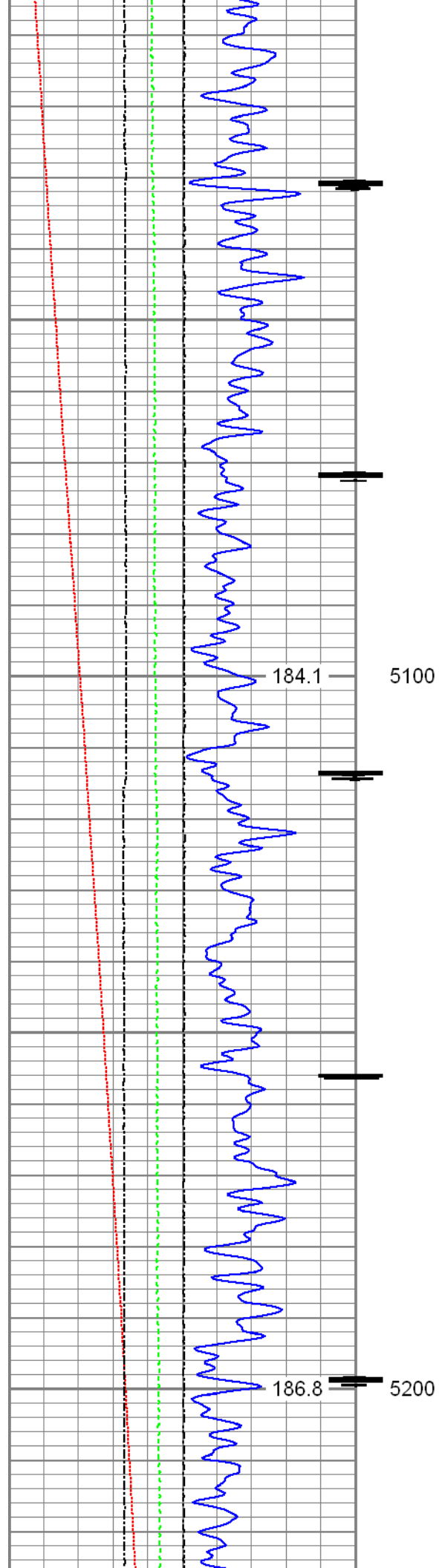


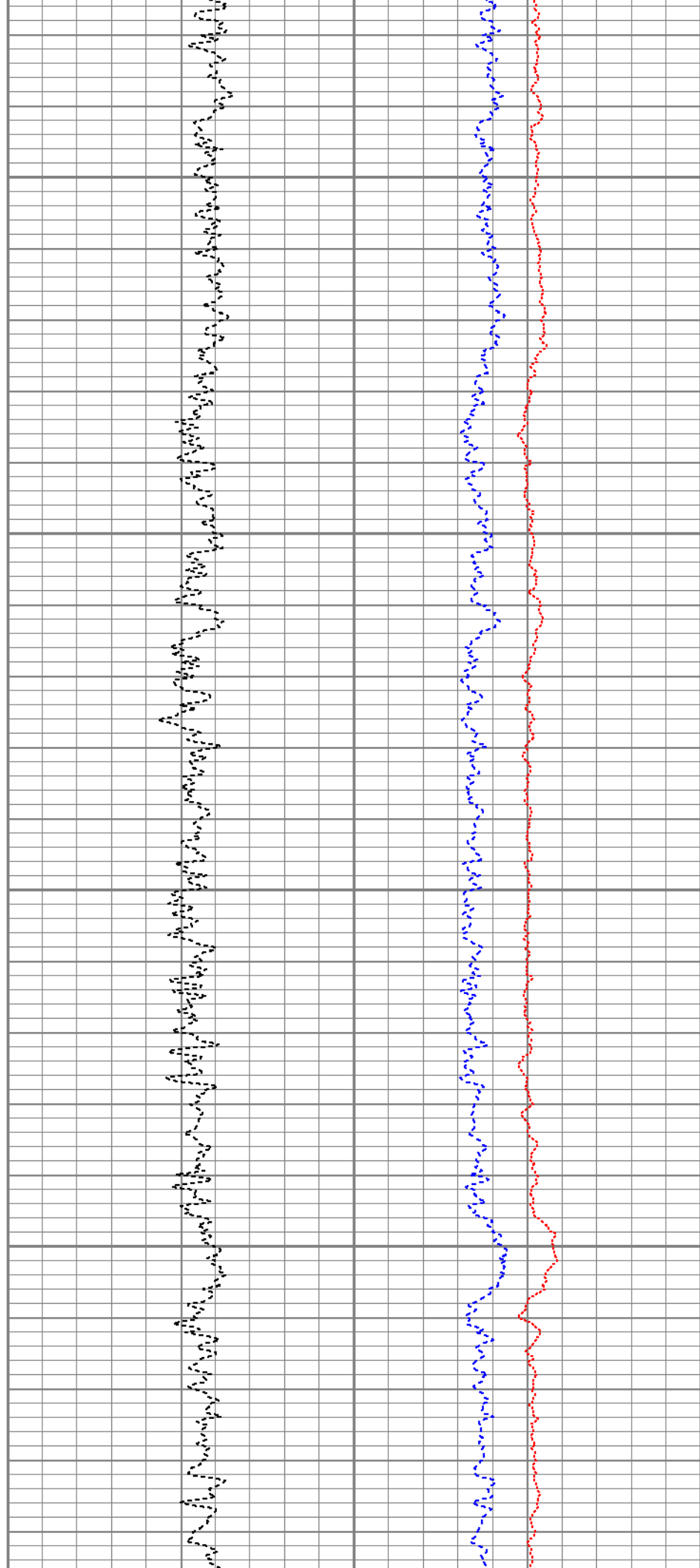
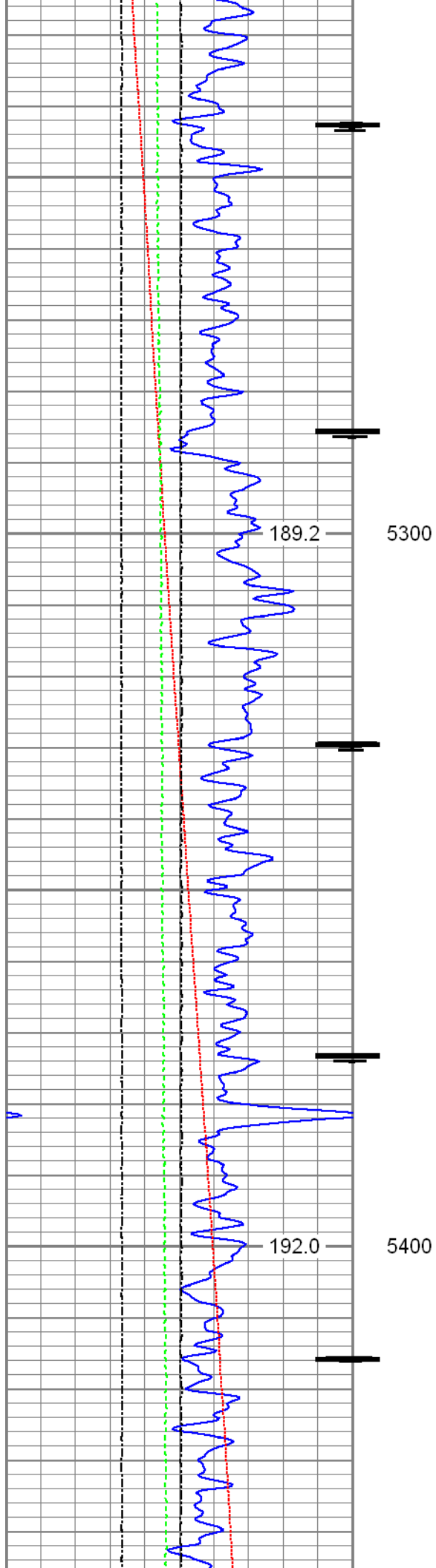


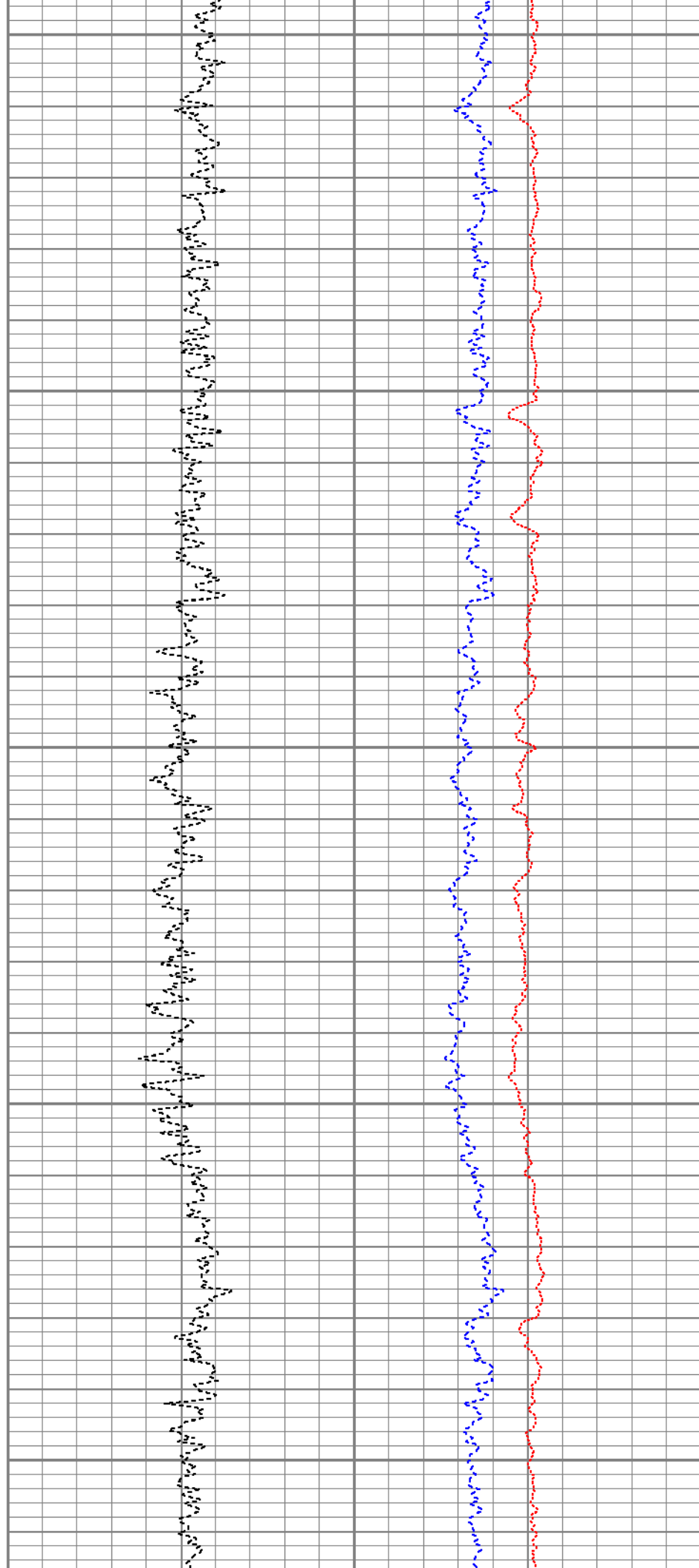
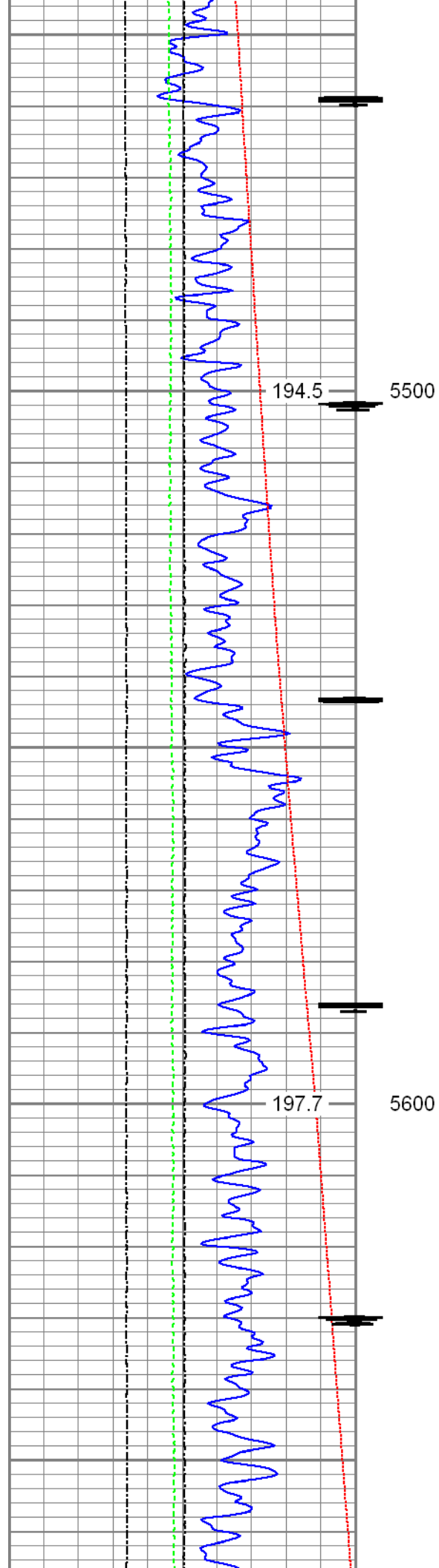


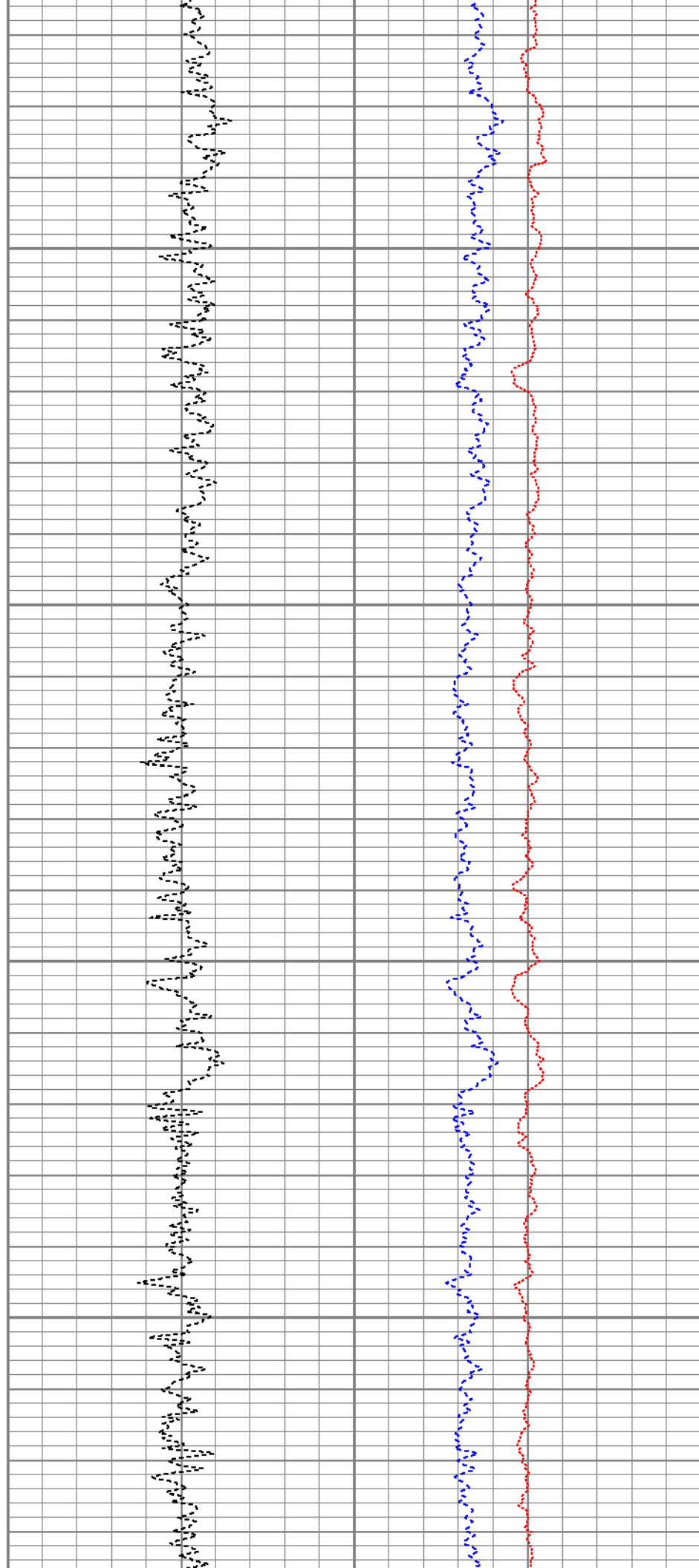
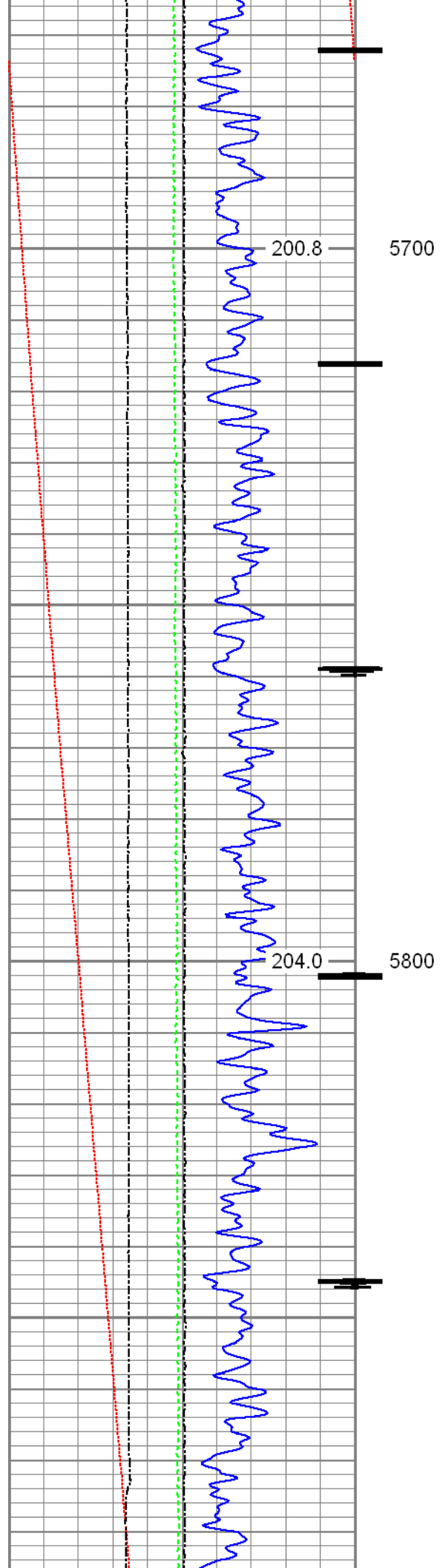


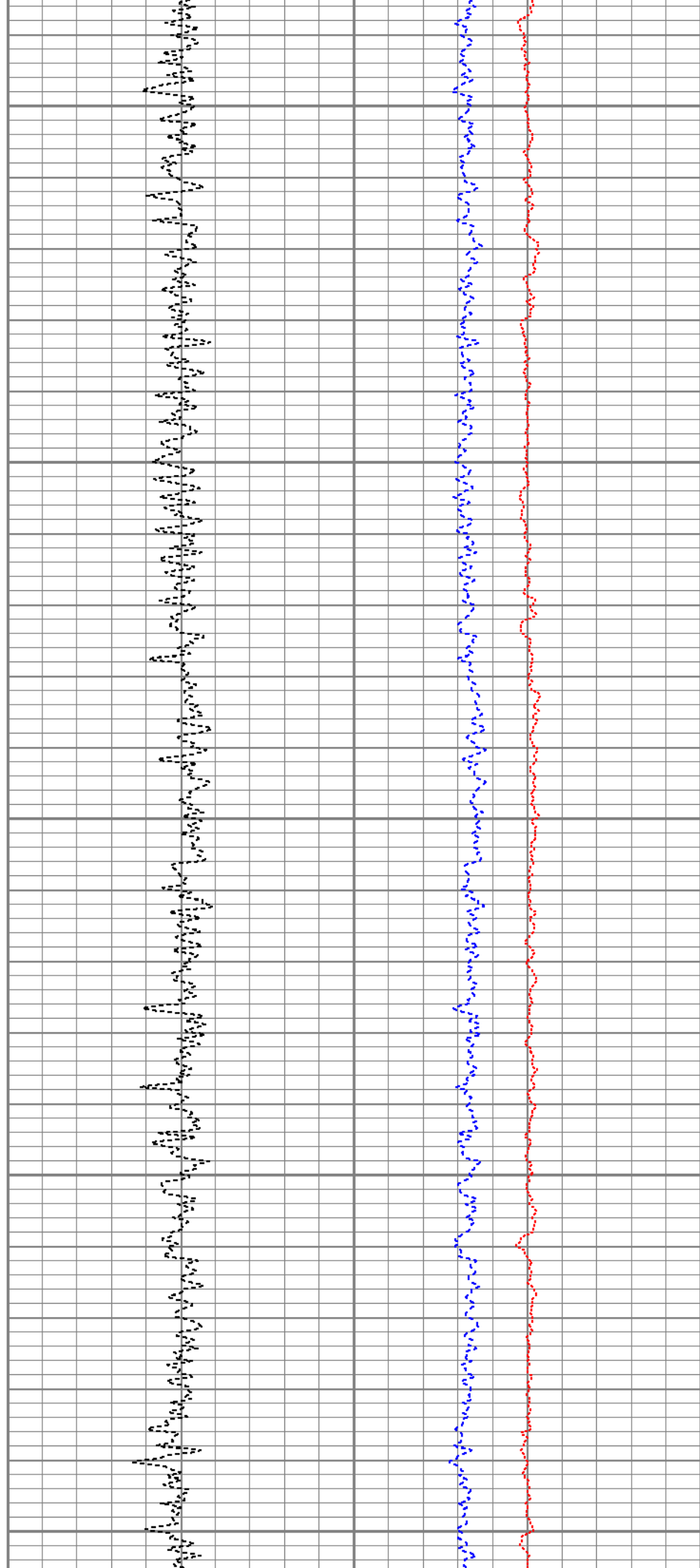
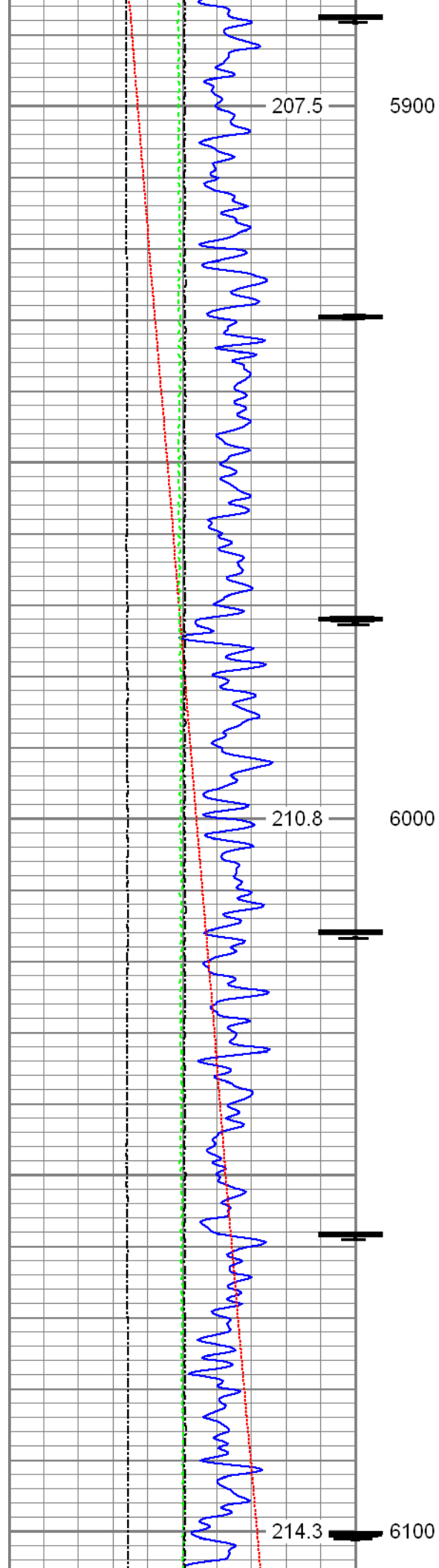


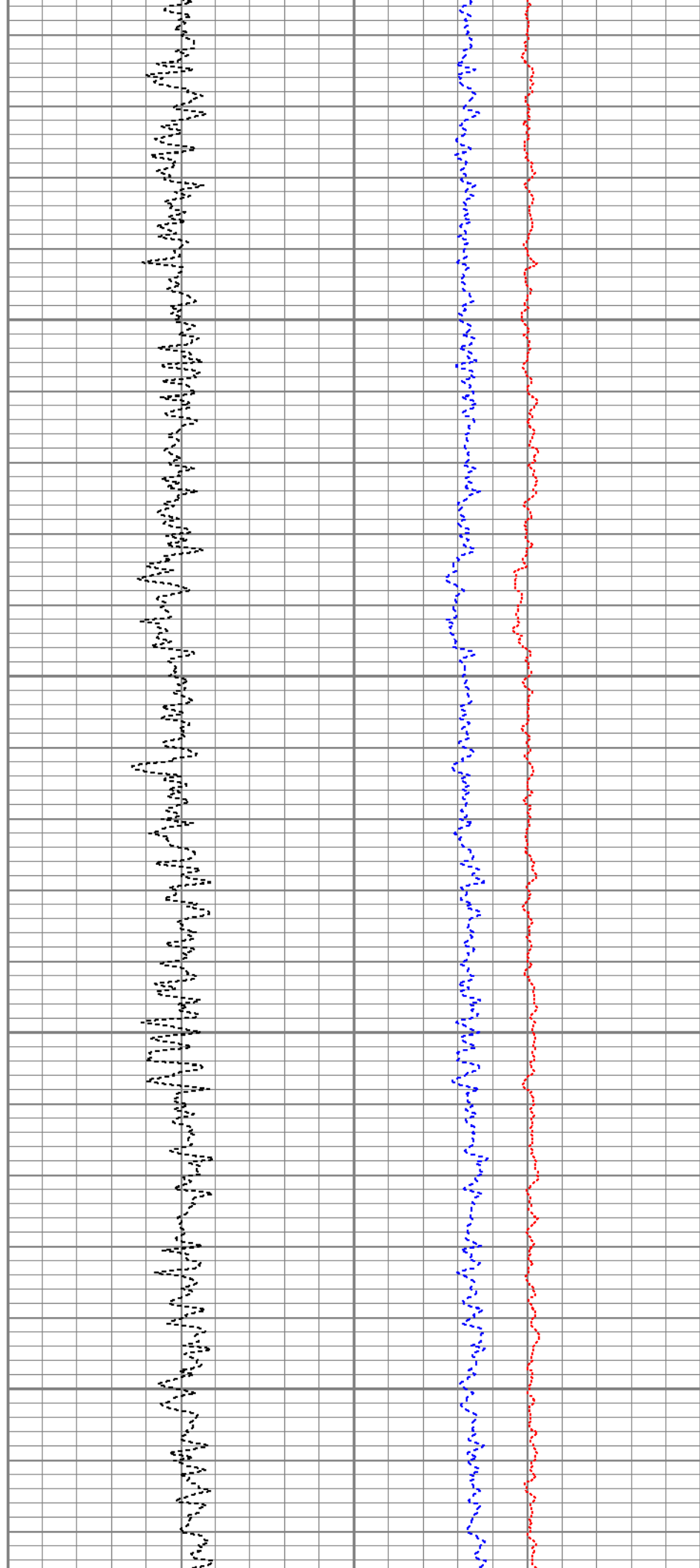
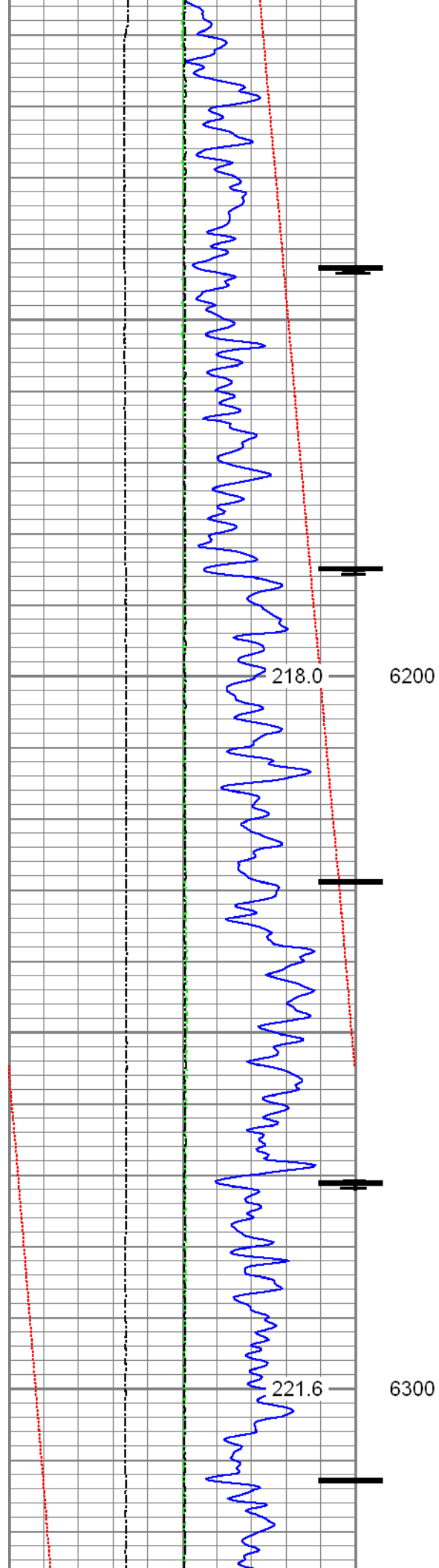


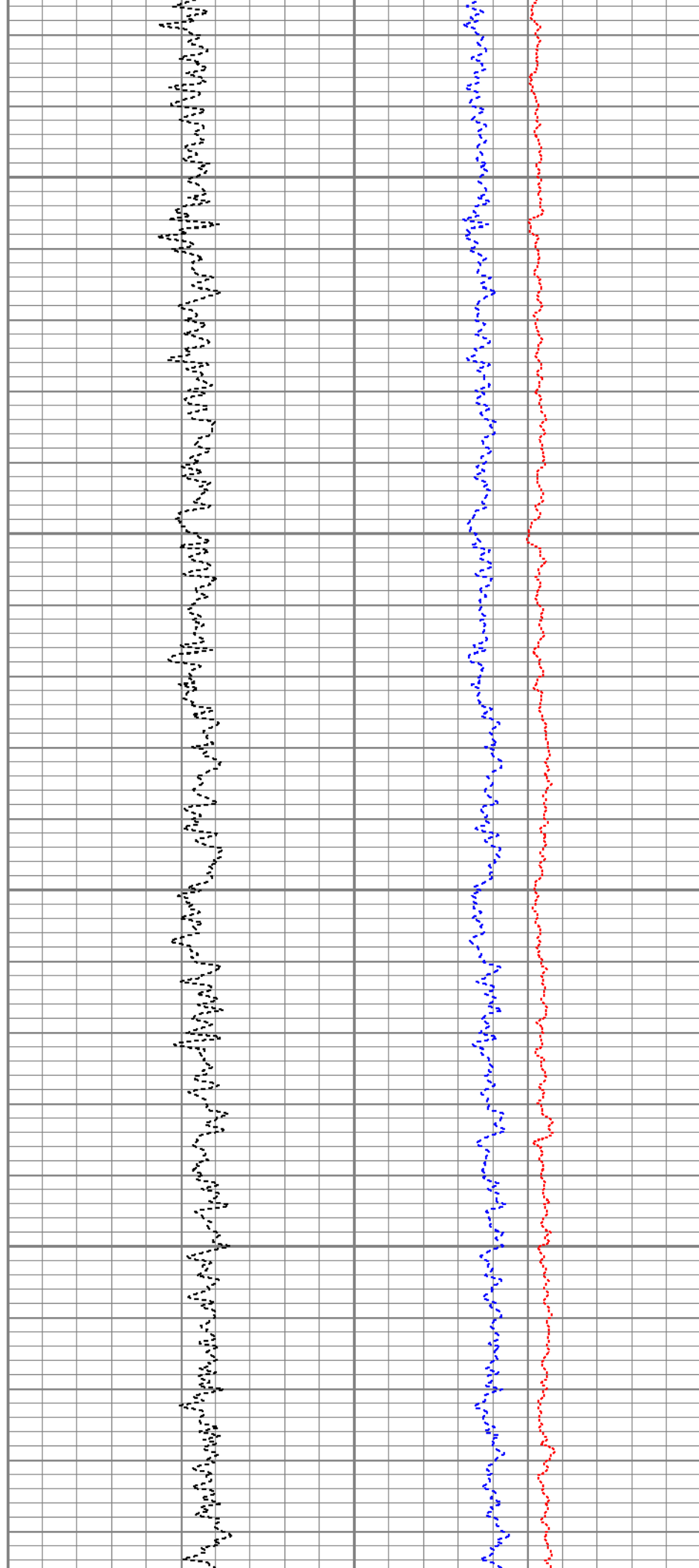
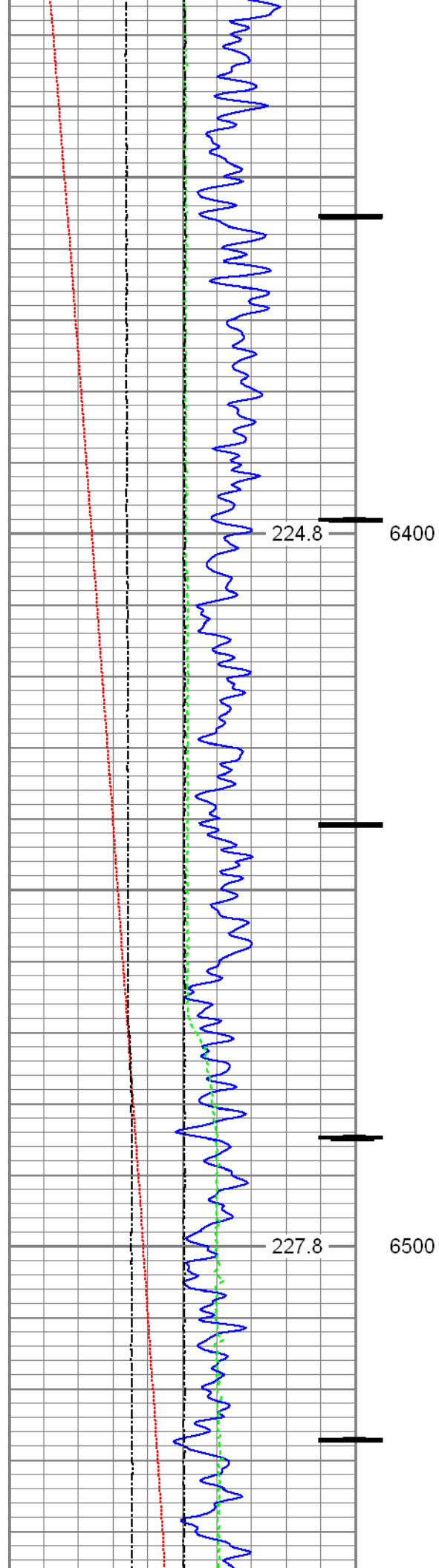


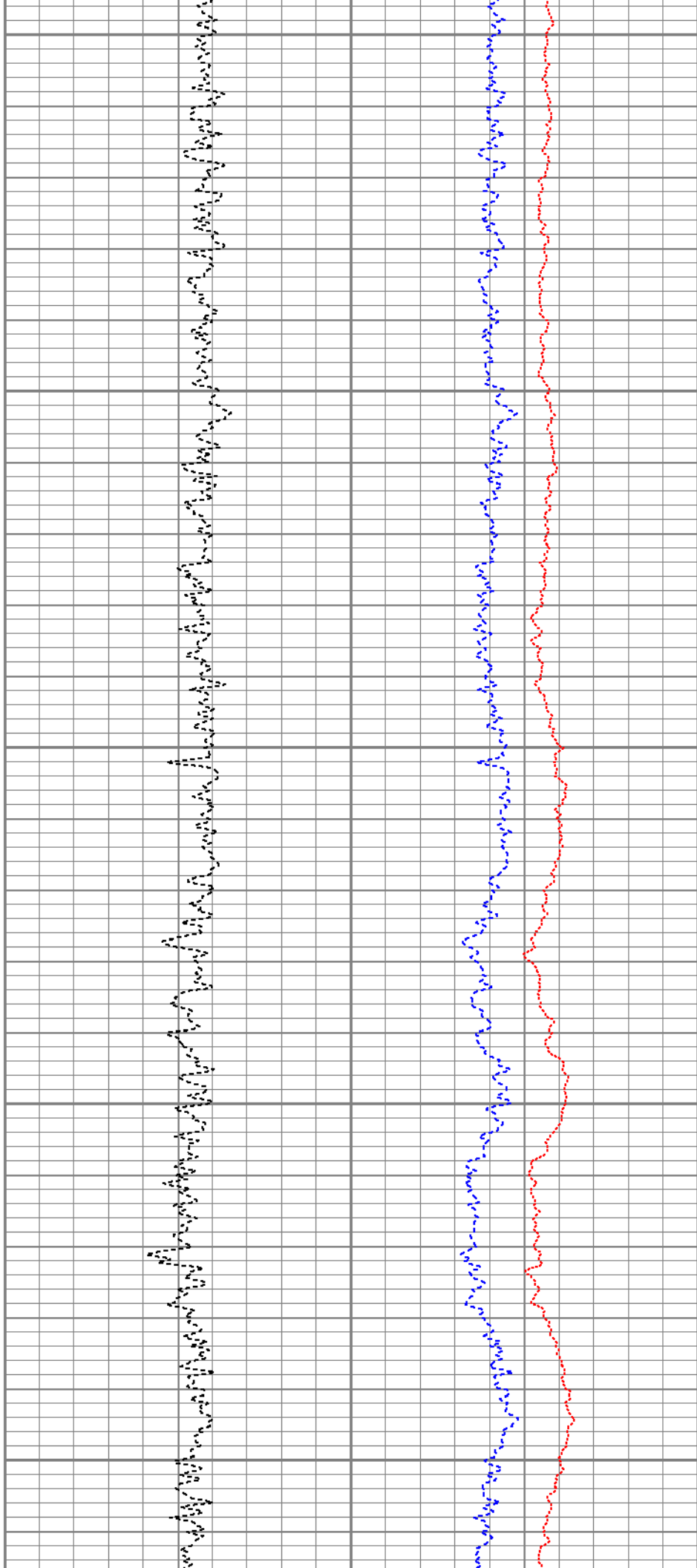
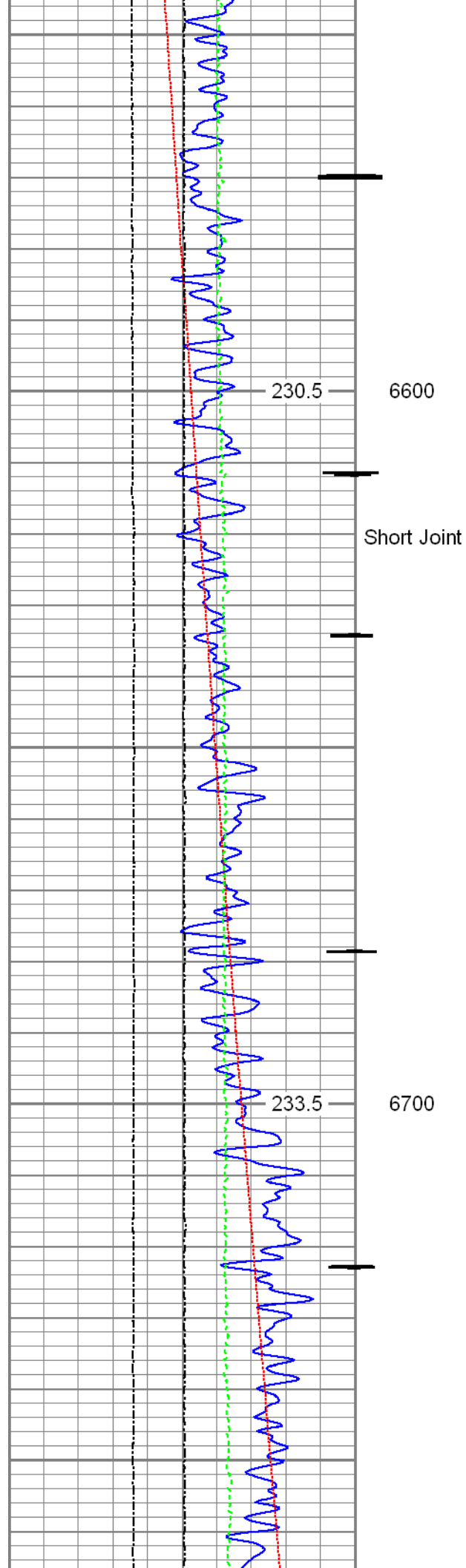


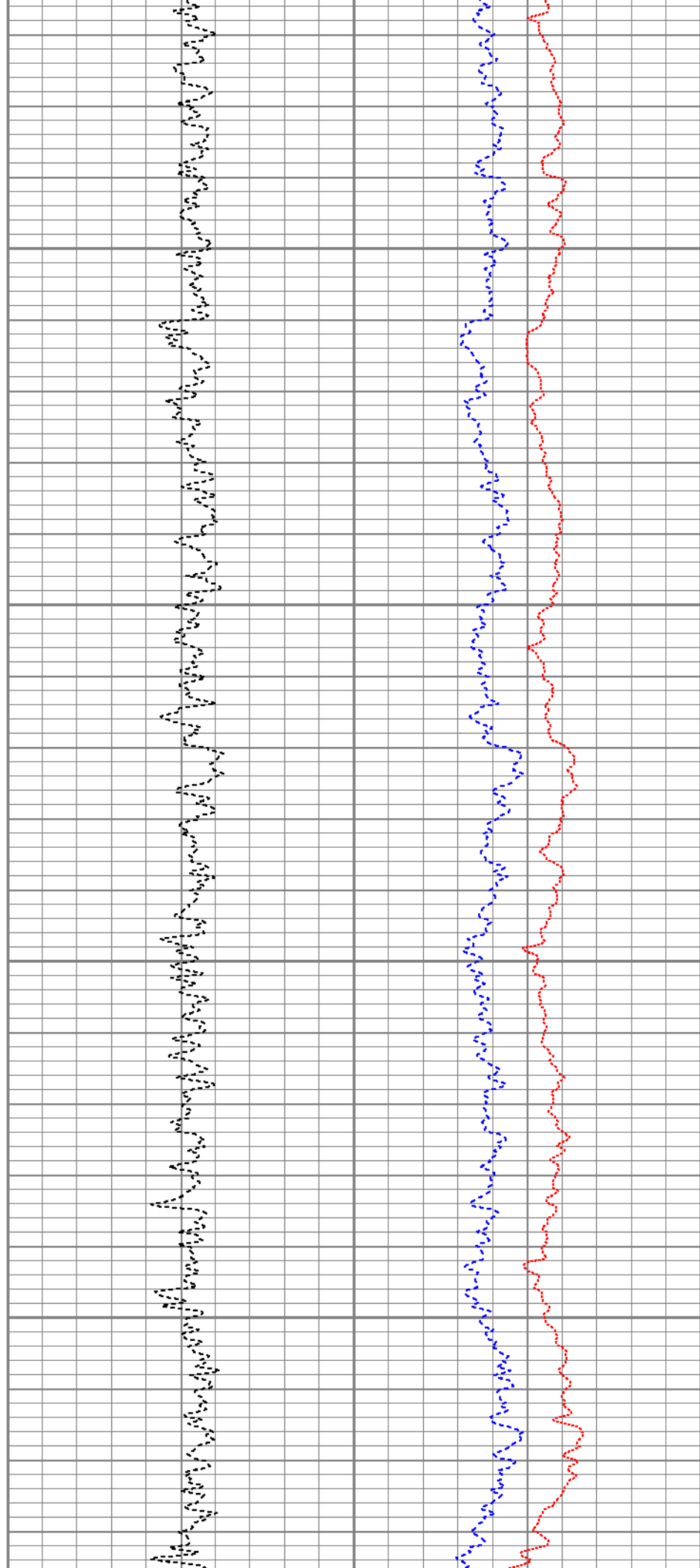
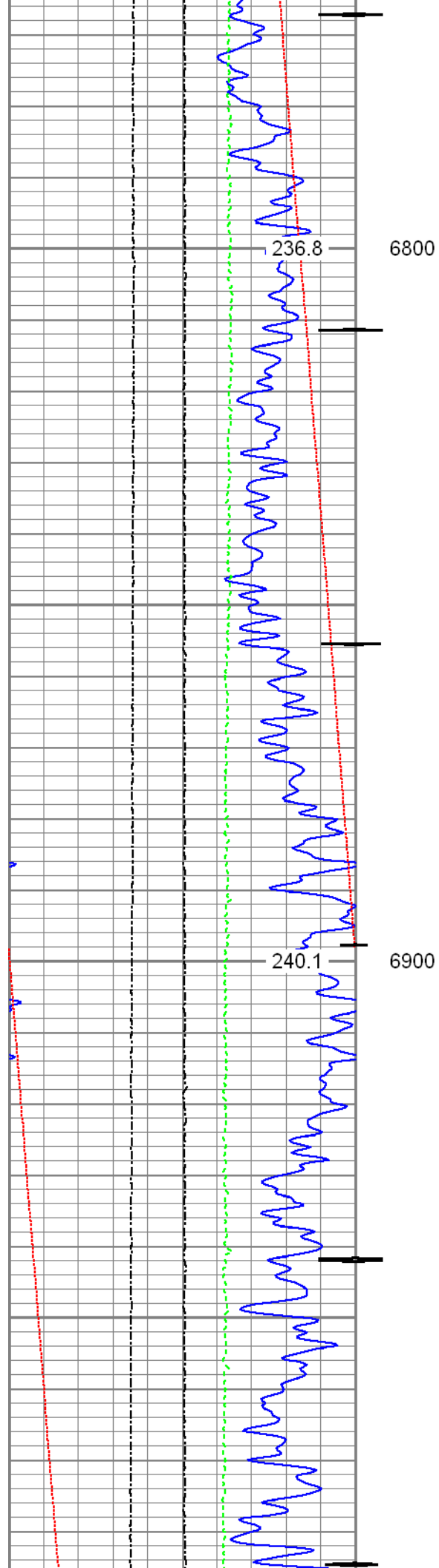


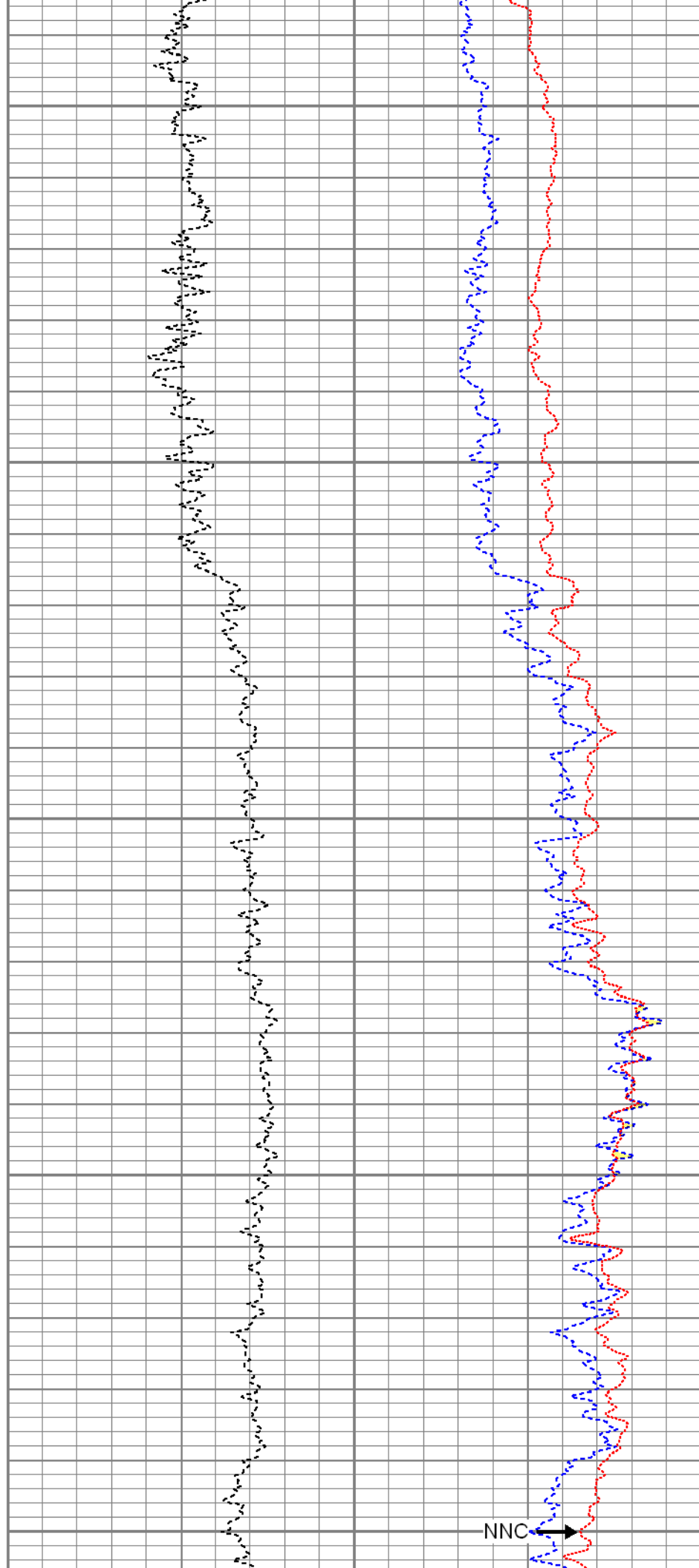
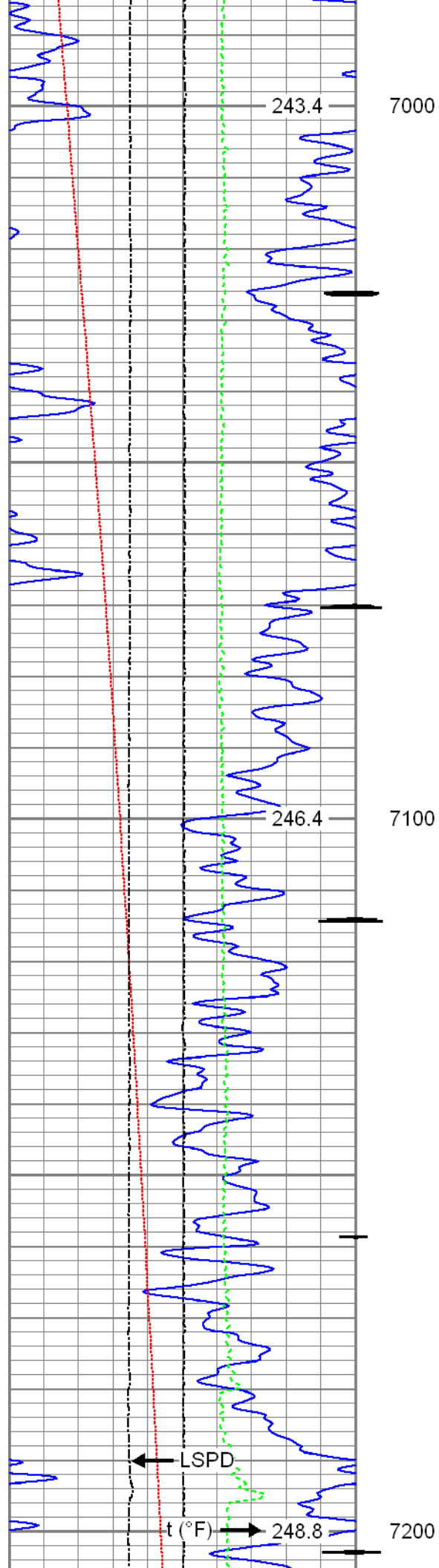


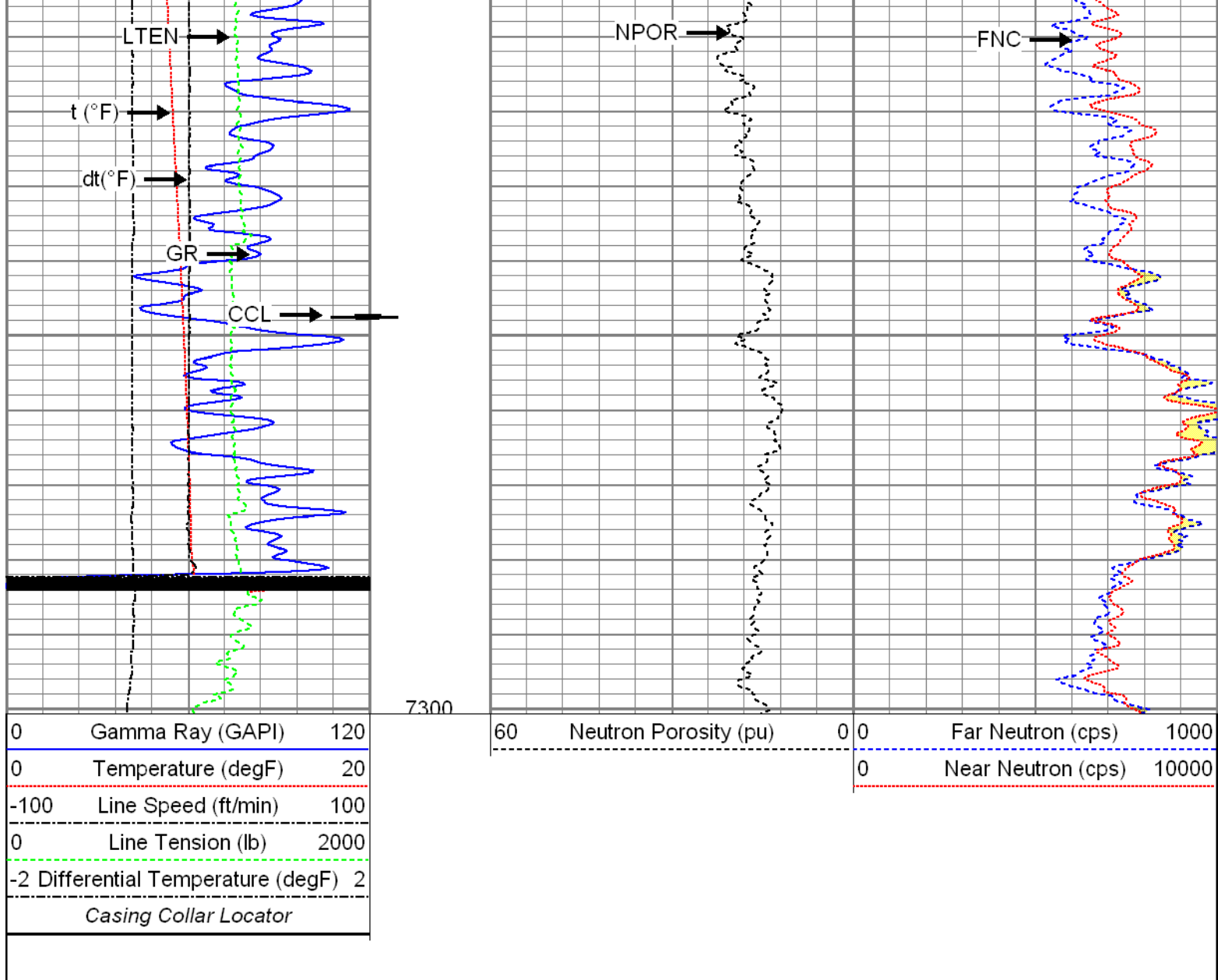












Repeat Pass

Recorded with 2800 PSI Surface Induced Pressure

Database File: 0512342071_anadarko_sunflower 7c-17hz_01-11-16_rbl_cnl.db

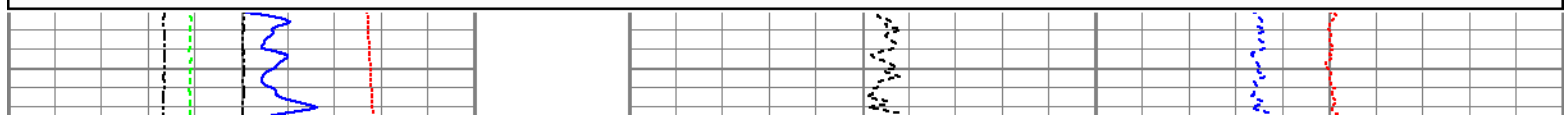
Dataset Pathname: repeat

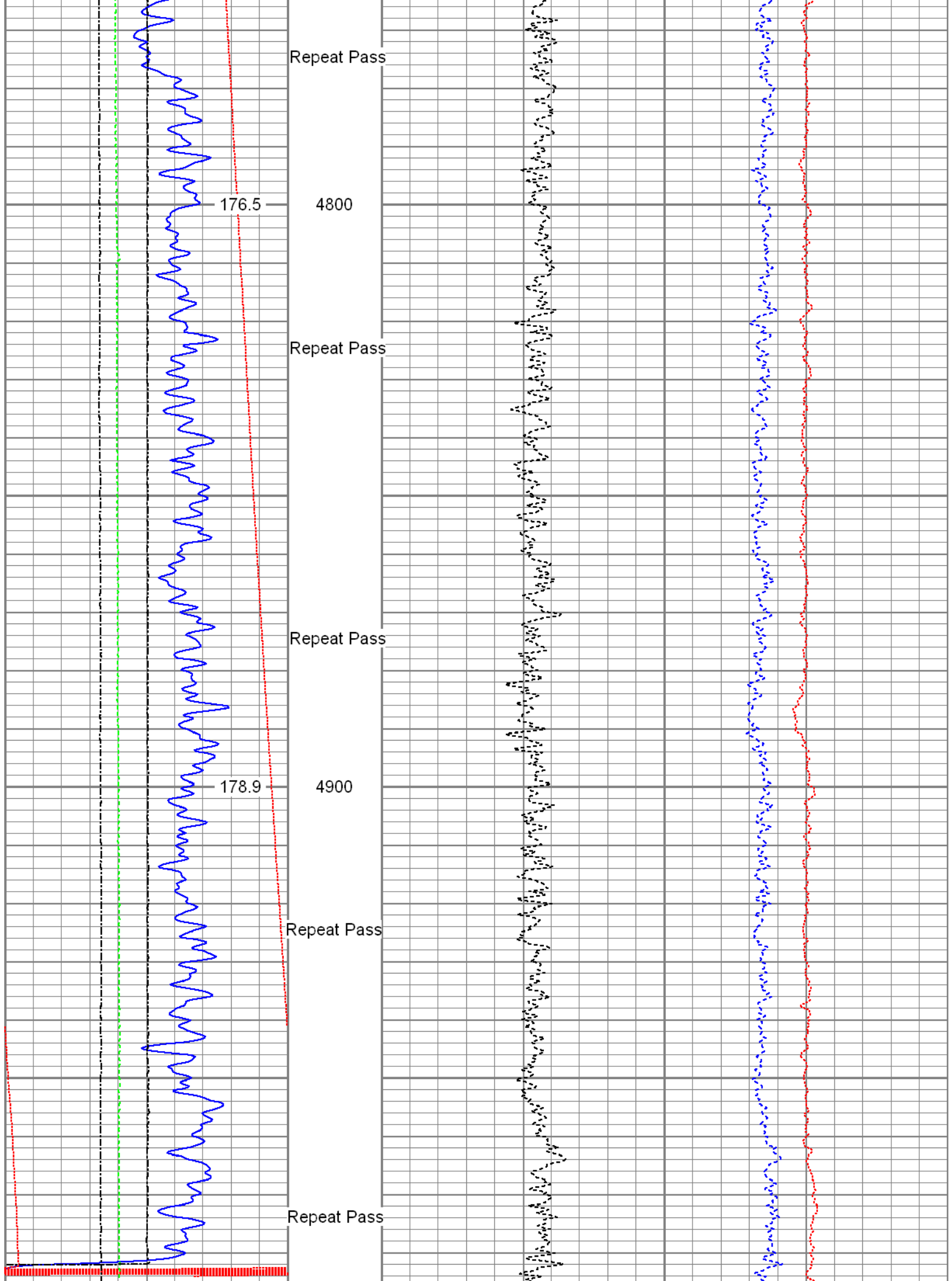
Presentation Format: cnl

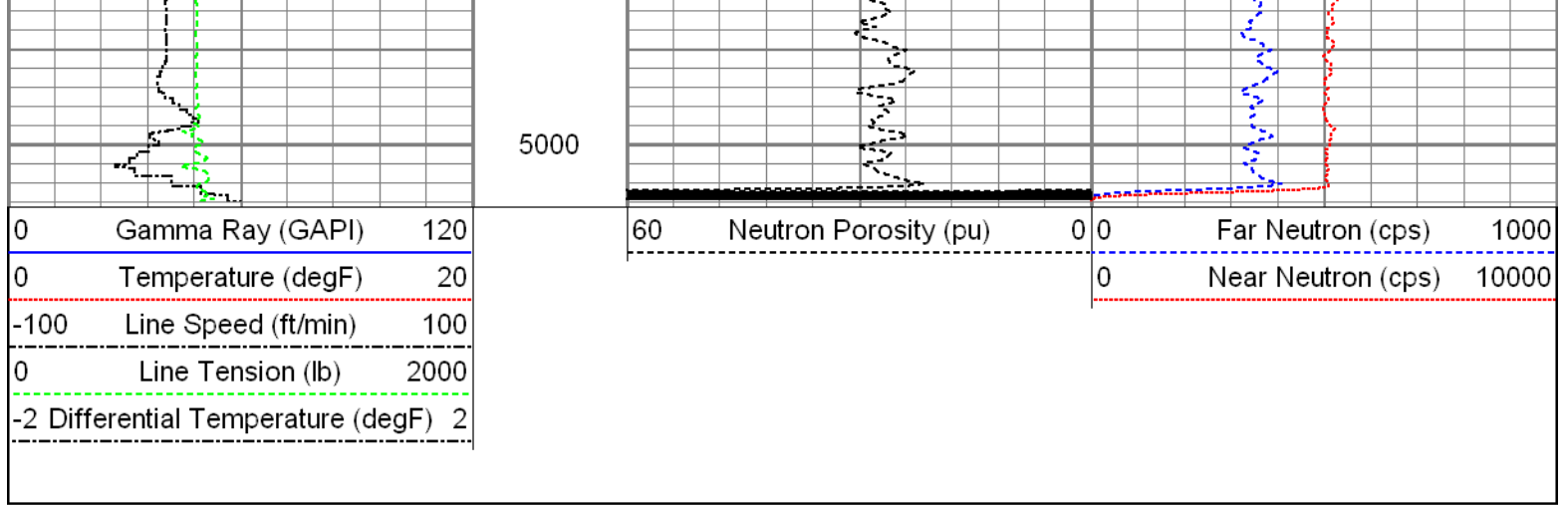
Dataset Creation: Mon Jan 11 10:41:48 2016 by Log 7.0 B1

Charted by: Depth in Feet scaled 1:240

| 0 | Gamma Ray (GAPI) | 120 | 60 | Neutron Porosity (pu) | 0 | 0 | Far Neutron (cps) | 1000 |
|------|---------------------------------|------|----|-----------------------|---|---|--------------------|-------|
| 0 | Temperature (degF) | 20 | 0 | Near Neutron (cps) | 0 | 0 | Near Neutron (cps) | 10000 |
| -100 | Line Speed (ft/min) | 100 | | | | | | |
| 0 | Line Tension (lb) | 2000 | | | | | | |
| -2 | Differential Temperature (degF) | 2 | | | | | | |







| Sensor | Offset (ft) | Schematic | Description | Len (ft) | OD (in) | Wt (lb) | |
|---|-------------|-----------|--|--|---------|---------|--------|
| GR | 24.33 | | T_CH14375_1_GO Titan 1-7/16" Assembled Electric Cable Head with 1" Fishing Neck | 1.03 | 1.44 | 4.00 | |
| | | | UW_AGS-UW_AGS_001 (215017) Sondex Adapter - GO Box to Sondex Pin | 0.21 | 1.69 | 1.00 | |
| | | | UW_XTU-UW_XTU_002 (10024655) Crossover Ultrawire Toolbus to Ultralink | 1.58 | 1.69 | 6.50 | |
| | | | UW_PGR-UW_PGR_020 (10013899) Production Gamma Ray | 1.93 | 1.69 | 9.50 | |
| TEMP | 22.94 | | UW_PRT-UW_PRT_016 (10025097) Platinum Resistance Thermometer | 1.04 | 1.69 | 5.20 | |
| CCL | 21.69 | | UW_CCL-UW_CCL_028 (10009470) Ultrawire 3-1/8" CCL | 1.61 | 3.13 | 36.00 | |
| WVFS3FT WVFS1 WVFS2 WVFS3 WVFS4 WVFS5 WVFS6 WVFS7 WVFS8 | 14.29 | | UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer | 2.55 | 2.75 | 32.00 | |
| | 14.29 | | | | | | |
| | 14.29 | | | | | | |
| | 14.29 | | | | | | |
| | 14.29 | | | | | | |
| | 14.29 | | | | | | |
| | 14.29 | | | | | | |
| | 14.29 | | | | | | |
| | CBLTEMP | | 14.29 | UW_RBT-UW_RBT_004 (10013454) Sondex Ultrawire 3-1/8" Radial Bond Tool | 9.47 | 3.13 | 140.00 |
| | CBLROT | | 14.29 | | | | |
| WVFS5FT | 13.29 | | | | | | |
| | | | UW_PRC-DSSRAC (081) 2-3/4" DSS 5 Arm Roller Centralizer | 2.55 | 2.75 | 32.00 | |

| | | | | | | |
|---|------|--|--|--|------|-------|
| | | | | | | |
| | | | | CNL-007 (1005) Compensated Neutron Logging Tool | 6.61 | 1.69 |
| CNLSC | 1.53 | | | | | 30.00 |
| CNSSC | 1.12 | | | | | |
| TSTAMP | 0.00 | | | | | |
| Dataset: 0512342071_Anadarko_Sunflower 7C-17HZ_01-11-16_RBL_CNL.db: field/well/run1/main Total Length: 28.58 ft Total Weight: 296.20 lb O.D. 3.13 in | | | | | | |

| | | | |
|--|---|----------------|--|
| Calibration Report | | | |
| Database File: | 0512342071_Anadarko_Sunflower 7C-17HZ_01-11-16_RBL_CNL.db | | |
| Dataset Pathname: | main | | |
| Dataset Creation: | Mon Jan 11 11:03:58 2016 by Log 7.0 B1 | | |
| Compensated Neutron Calibration Report | | | |
| Serial Number: | 1005 | | |
| Tool Model: | 007 | | |
| Master Calibration | Tue Jun 03 09:29:29 2014 | | |
| Detector | Readings | | |
| Short Space | 240.87 | cps | |
| Long Space | 303.55 | cps | |
| Ratio | Measured | Reference | |
| CNRAT Gain K | 0.8150 | Sleeve: 1.0000 | |
| | 1.0271 | | |
| Before Survey | | | |
| Detector | Readings | | |
| Short Space | | cps | |
| Long Space | | cps | |
| Ratio | Measured | Reference | |
| After Survey | | | |
| Detector | Readings | | |
| Short Space | | cps | |
| Long Space | | cps | |
| Ratio | Measured | Reference | |

| | | | |
|--|------------|--|--|
| Segmented Cement Bond Log Calibration Report | | | |
| Serial Number: | 10013454 | | |
| Tool Model: | UW_RBT_004 | | |
| Calibration Casing Diameter: | 5.500 in | | |

Calibration Casing Diameter: 5.500 in
Calibration Depth: 313.767 ft

Master Calibration, performed Mon Jan 11 10:11:43 2016:

| | Raw (v) | | Calibrated (mv) | | Results | |
|-----|---------|-------|-----------------|---------|---------|--------|
| | Zero | Cal | Zero | Cal | Gain | Offset |
| 3FT | 0.000 | 0.779 | 0.800 | 71.921 | 91.293 | 0.798 |
| 5FT | -0.001 | 0.765 | 0.800 | 71.921 | 92.807 | 0.920 |
| S1 | -0.001 | 0.768 | 0.000 | 100.000 | 130.197 | 0.073 |
| S2 | -0.002 | 0.790 | 0.000 | 100.000 | 126.266 | 0.310 |
| S3 | -0.002 | 0.795 | 0.000 | 100.000 | 125.516 | 0.215 |
| S4 | -0.002 | 0.800 | 0.000 | 100.000 | 124.652 | 0.292 |
| S5 | -0.001 | 0.788 | 0.000 | 100.000 | 126.633 | 0.151 |
| S6 | -0.002 | 0.775 | 0.000 | 100.000 | 128.656 | 0.308 |
| S7 | 0.004 | 0.754 | 0.000 | 100.000 | 133.379 | -0.521 |
| S8 | -0.001 | 0.754 | 0.000 | 100.000 | 132.514 | 0.146 |

Temperature Calibration Report

Serial Number: 10025097
Tool Model: UW_PRT_016
Performed: Wed Feb 11 13:44:44 2015

| Point # | Reading | Reference |
|---------|--------------|-------------|
| 1 | 13053.00 cps | 68.00 degF |
| 2 | 18014.00 cps | 104.00 degF |
| 3 | 29668.00 cps | 176.00 degF |
| 4 | 41181.00 cps | 248.00 degF |
| 5 | 52983.00 cps | 320.00 degF |
| 6 | 58931.00 cps | 356.00 degF |
| 7 | cps | degF |
| 8 | cps | degF |
| 9 | cps | degF |
| 10 | cps | degF |

Gamma Ray Calibration Report

Serial Number: 10013899
Tool Model: UW_PGR_020
Performed: Sun Jun 13 13:33:21 1993

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
Calibrator Reading: 1.0 cps

Sensitivity: 1.0000 GAPI/cps



Company Kerr-McGee Oil & Gas Onshore, L.P.
Well Sunflower 7C-17HZ
Field Wattenberg
County Weld
State Colorado