



Compensated Neutron
Gamma Ray
Casing Collar Log

Company	Kerr-McGee Oil & Gas Onshore, L.P.				Location:	API # : 05-123-43809	Other Services JB/GR RBL
Well	Babcock 33C-33HZ				SEC 4	TWP 2N	RGE 67W
Field	Wattenberg				Permanent Datum	Ground Level	Elevation 4887'
County	Weld				Log Measured From	Kelly Bushing	21 FT
State	Colorado				Drilling Measured From	Kelly Bushing	Elevation 4887'
					Elevation K.B. 4908' D.F. 4907' G.L. 4887'		

Date	25-JULY-2017
Run Number	TWO
Depth Driller	12485 FT
Depth Logger	7590 FT
Bottom Logged Interval	7590 FT
Top Log Interval	Surface
Open Hole Size	7.875"
Type Fluid	Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	237°F
Estimated Cement Top	---
Time Well Ready	ROA
Time Logger on Bottom	08:43
Equipment Number	HD-340
Location	Fort Lupton, CO
Recorded By	Greg Lueck
Witnessed By	Chris Hayes

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	J-55	Surface	1841 FT		
Intermediate #1	5 1/2	17	P-110	Surface	12476 FT		
Intermediate #2							
Liner							

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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 6914 FT
Adjusted +9 FT to correlate with Marker Joint
Gauge Ring/Junk Basket ran to 7876 FT with no debris
Log ran from as deep as possible in heel to surface
Log ran with 2800 PSI surface induced pressure
Logging tools were clean and free of debris upon completion of operations

Thank you for choosing Reliance Oilfield Services, LLC!!

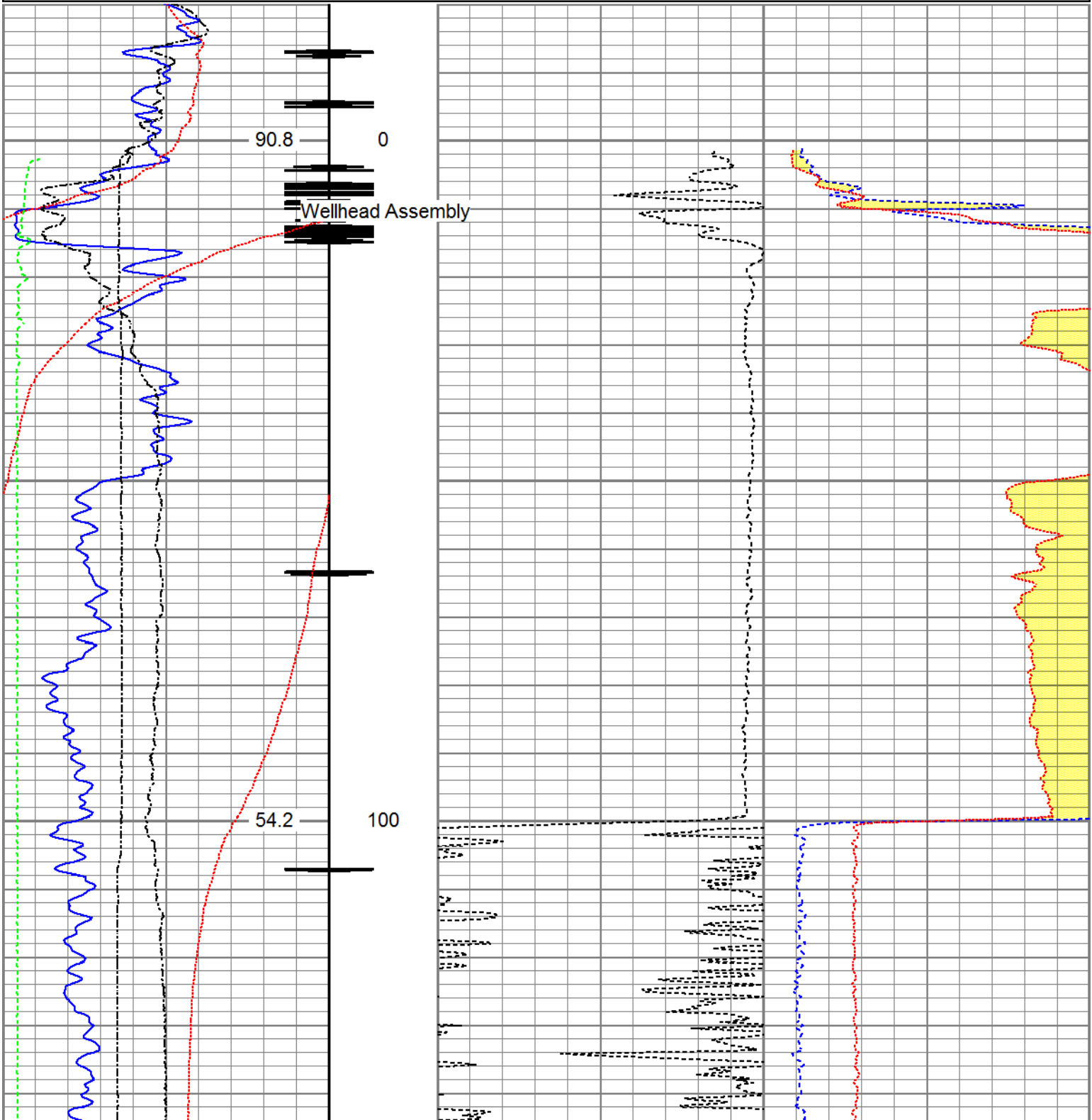


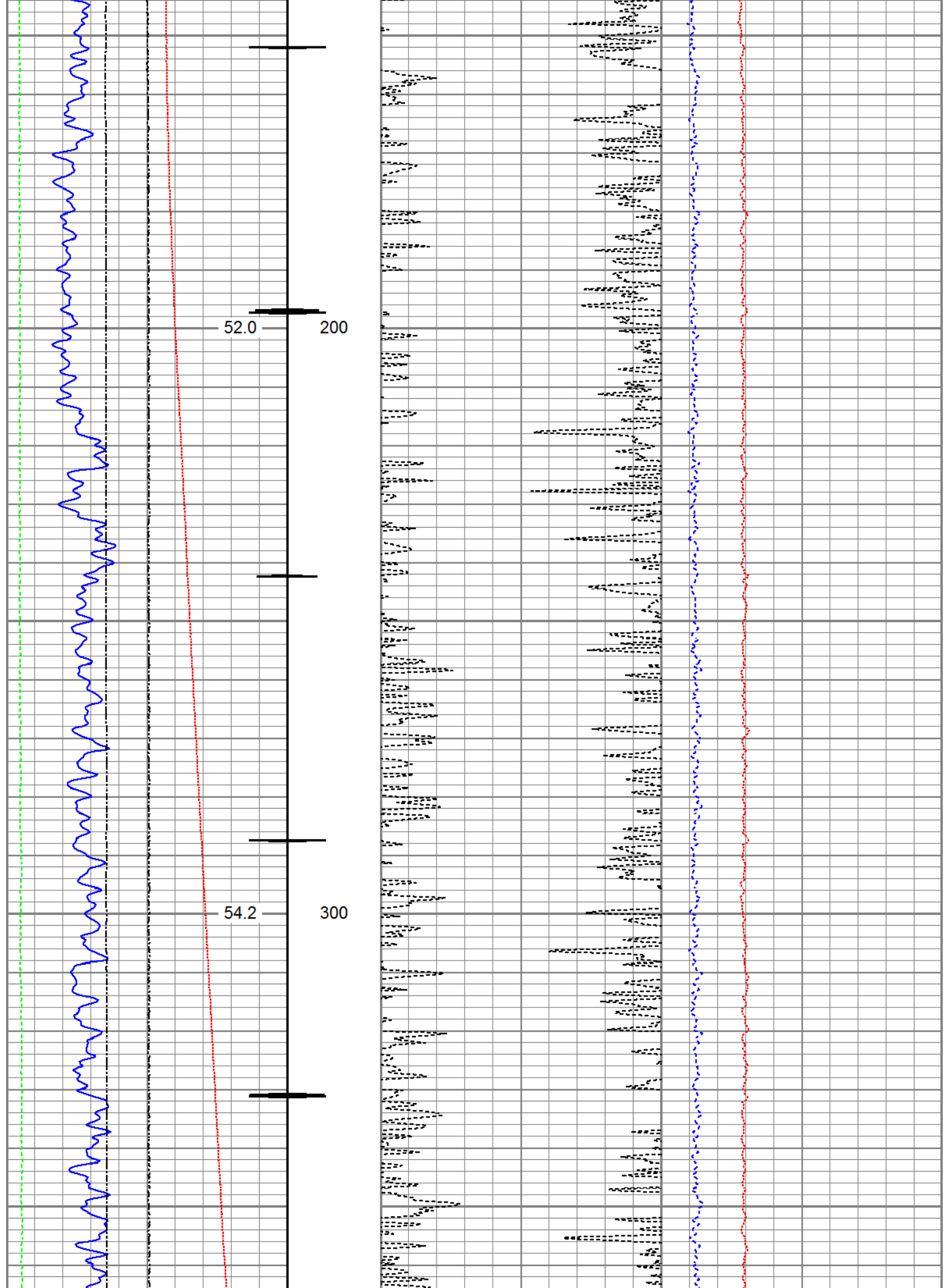
Main Pass

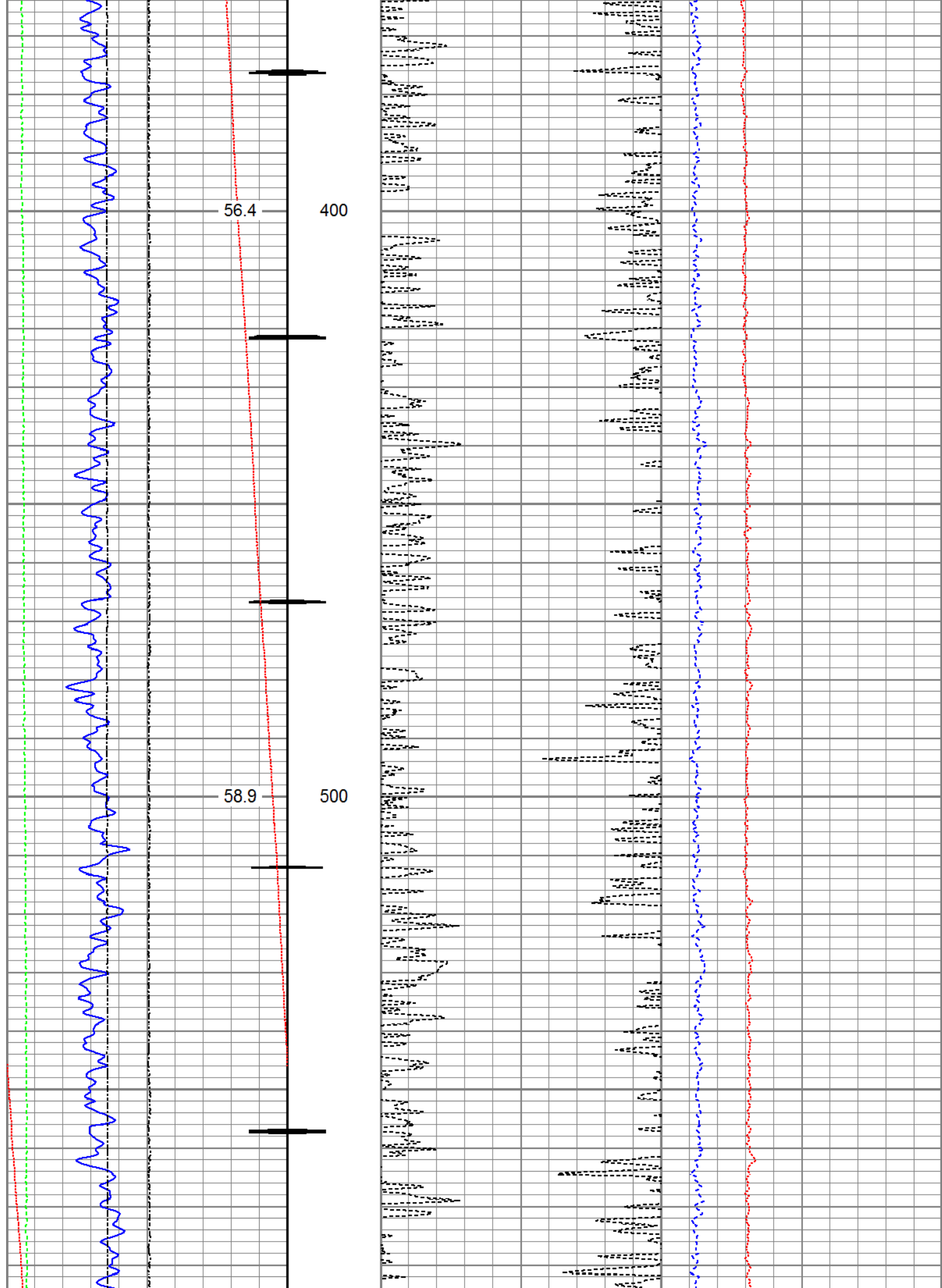
Recorded with 2800 PSI Surface Induced Pressure

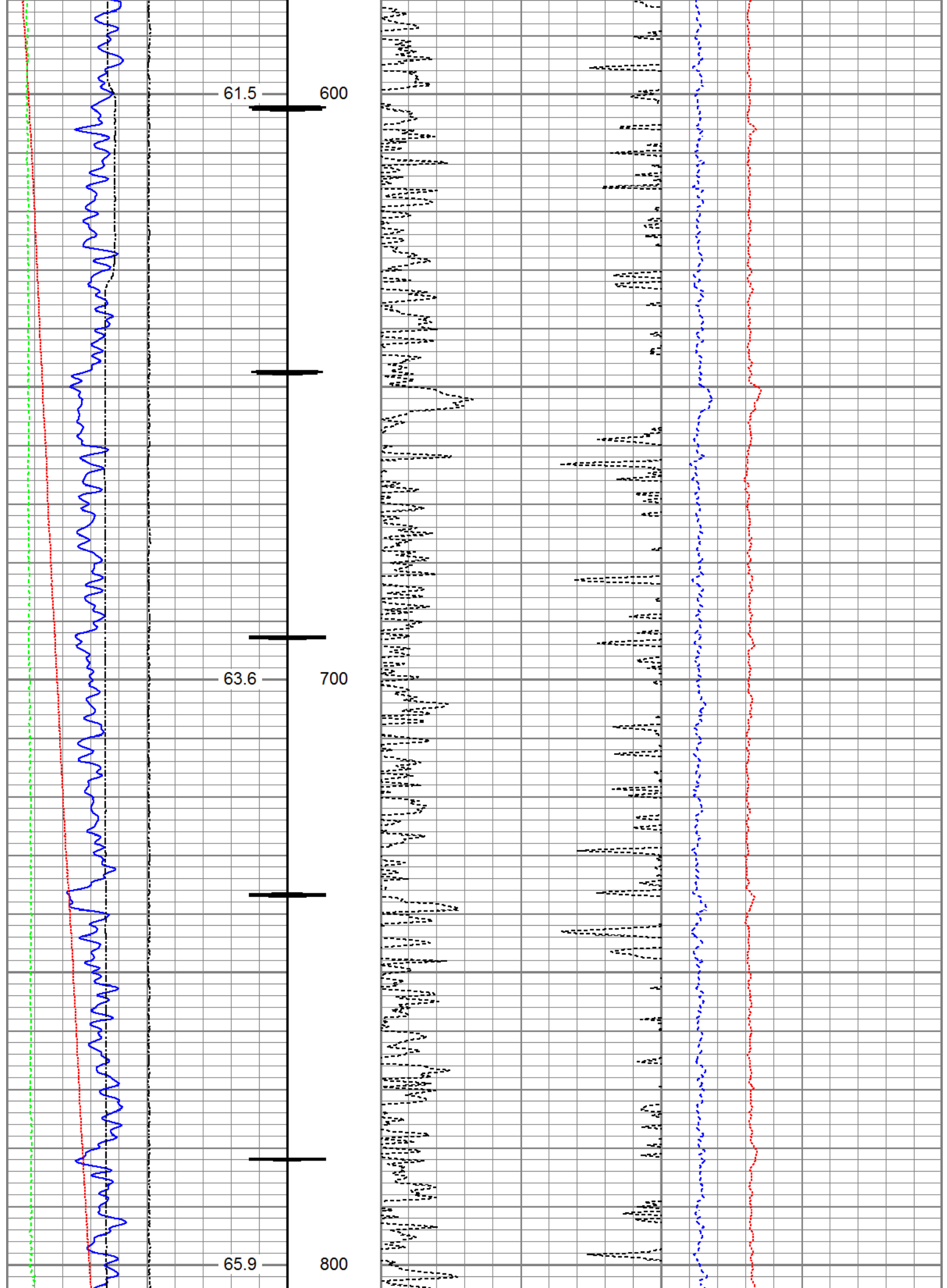
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Presentation Format	ros_cnl_sx
Dataset Creation	Tue Jul 25 08:59:00 2017
Charted by	Depth in Feet scaled 1:240

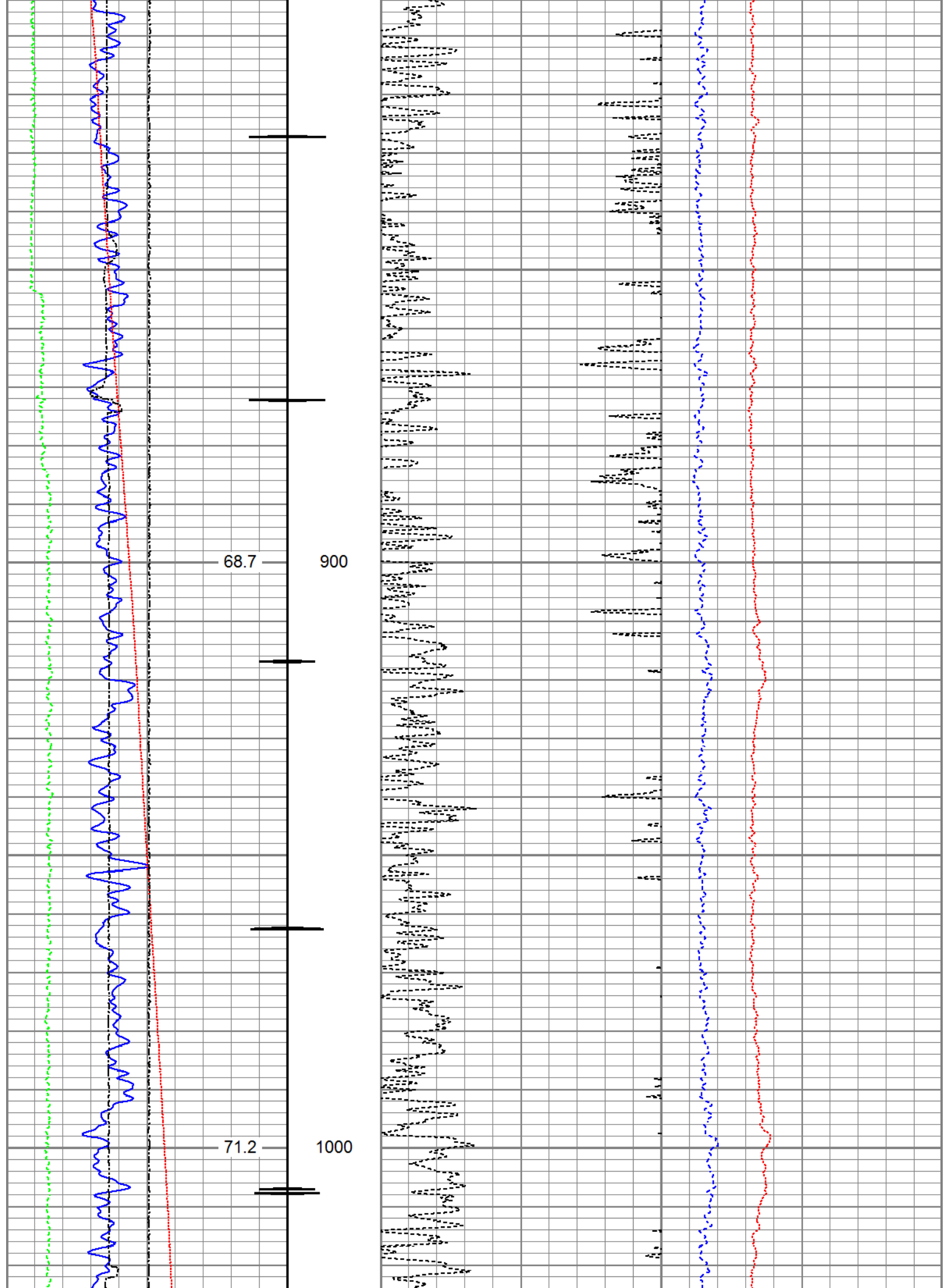
0	Gamma Ray (GAPI)	120	60	Neutron Porosity (pu)	0	0	Far Neutron (cps)	1000
Casing Collar Locator						0	Near Neutron (cps)	10000
0	Temperature (degF)	20						
-100	Line Speed (ft/min)	100						
0	Line Tension (lb)	2000						
Differential Temperature								
-2	(degF)	2						

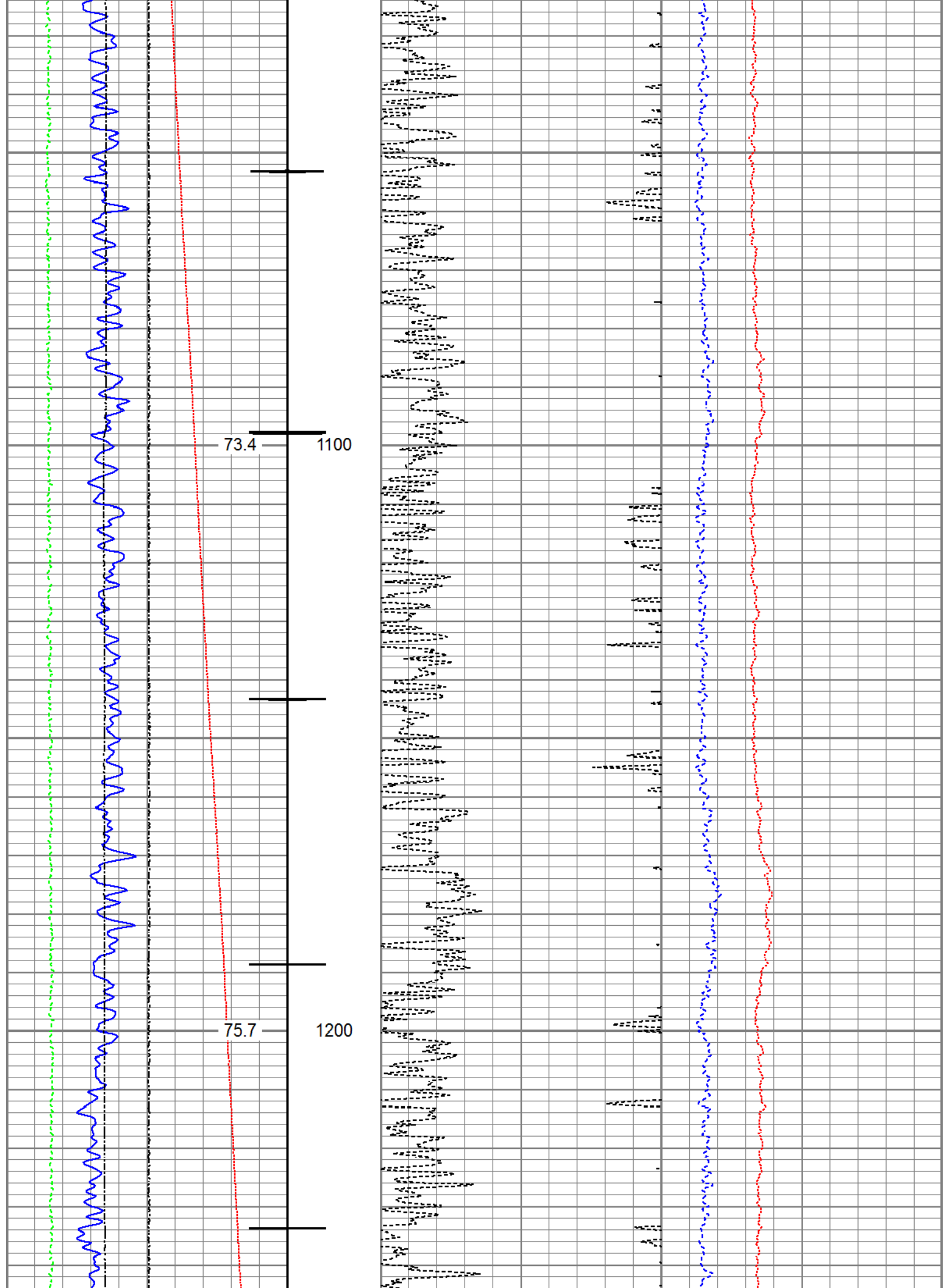


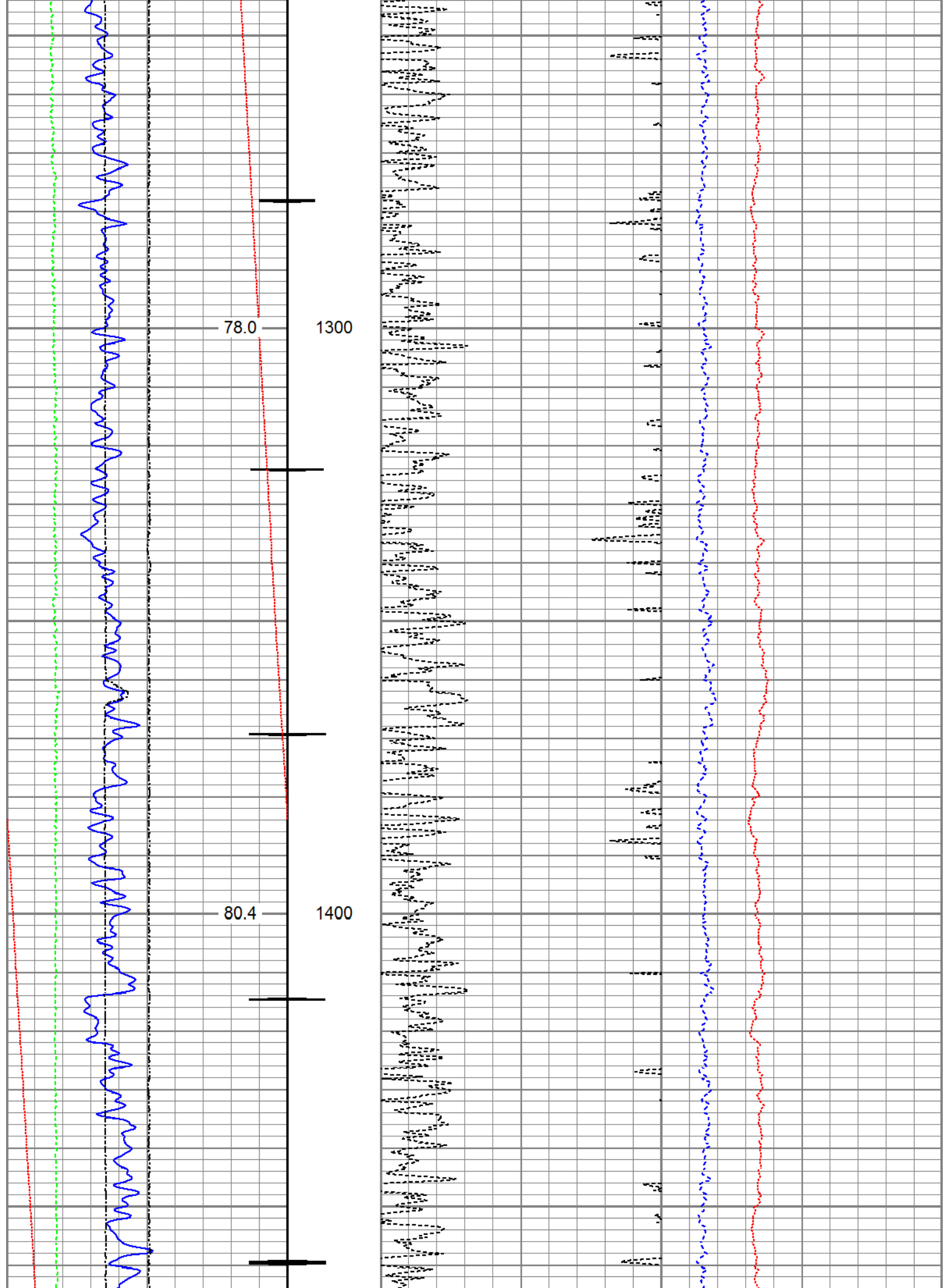


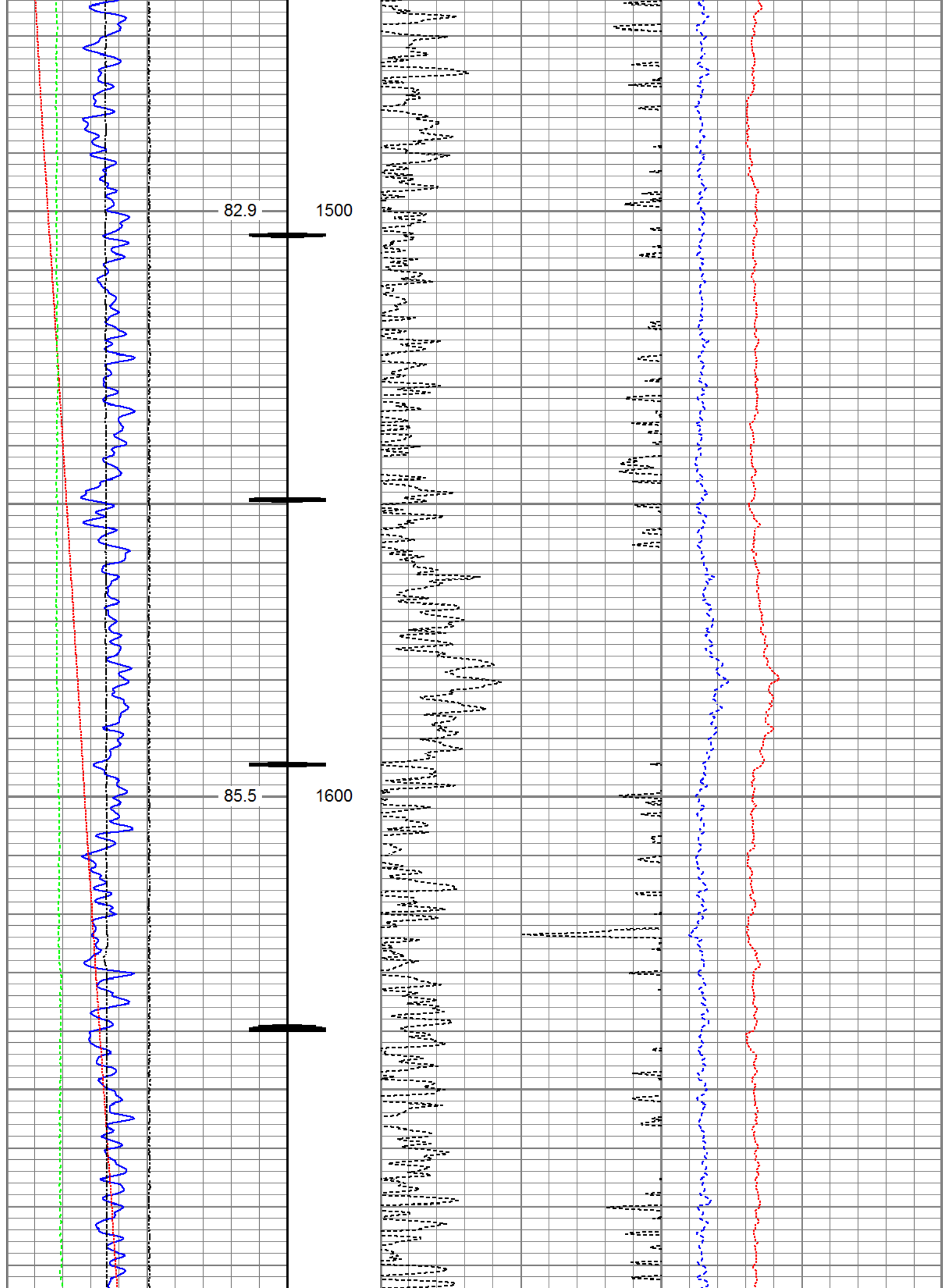


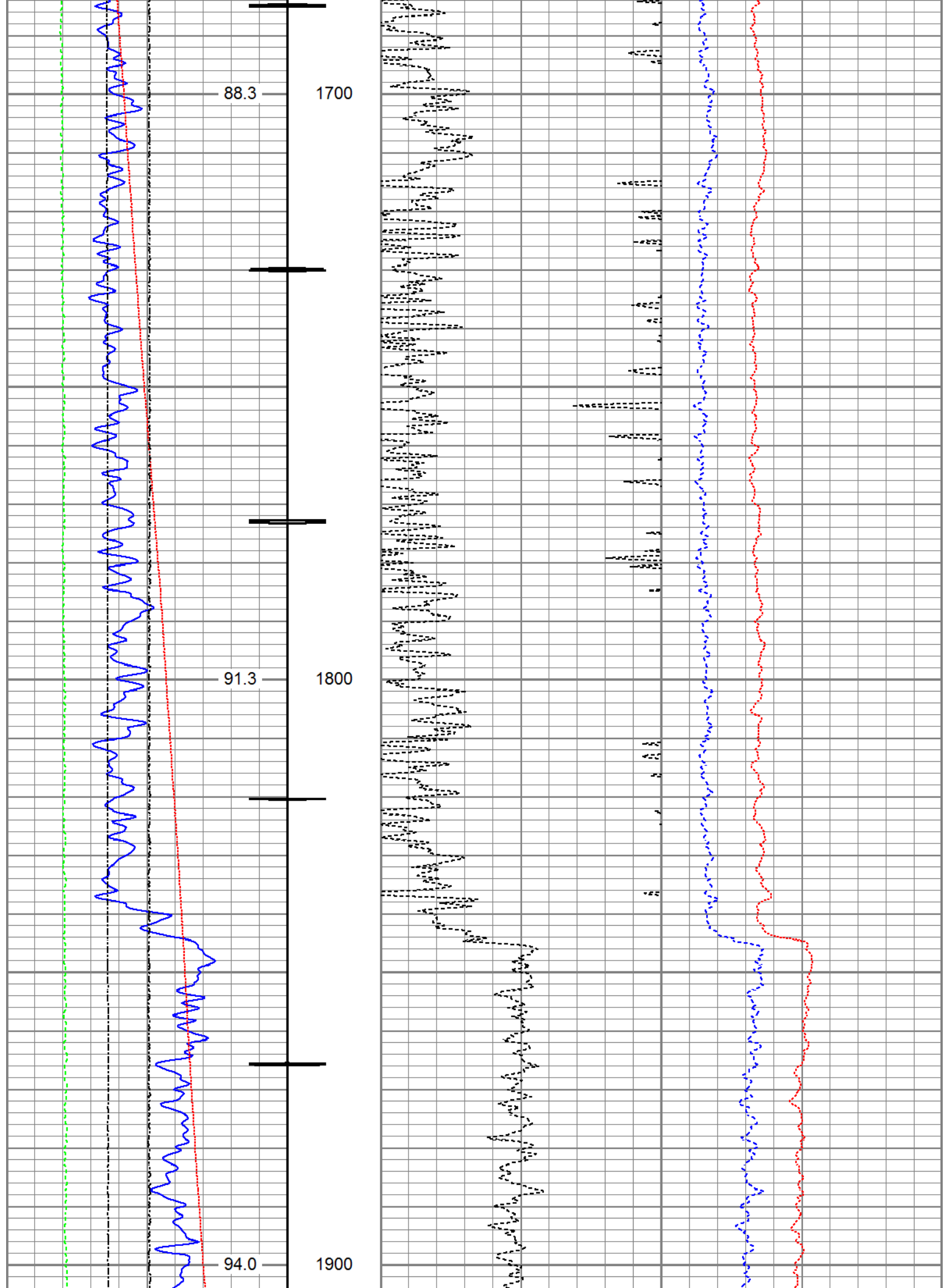


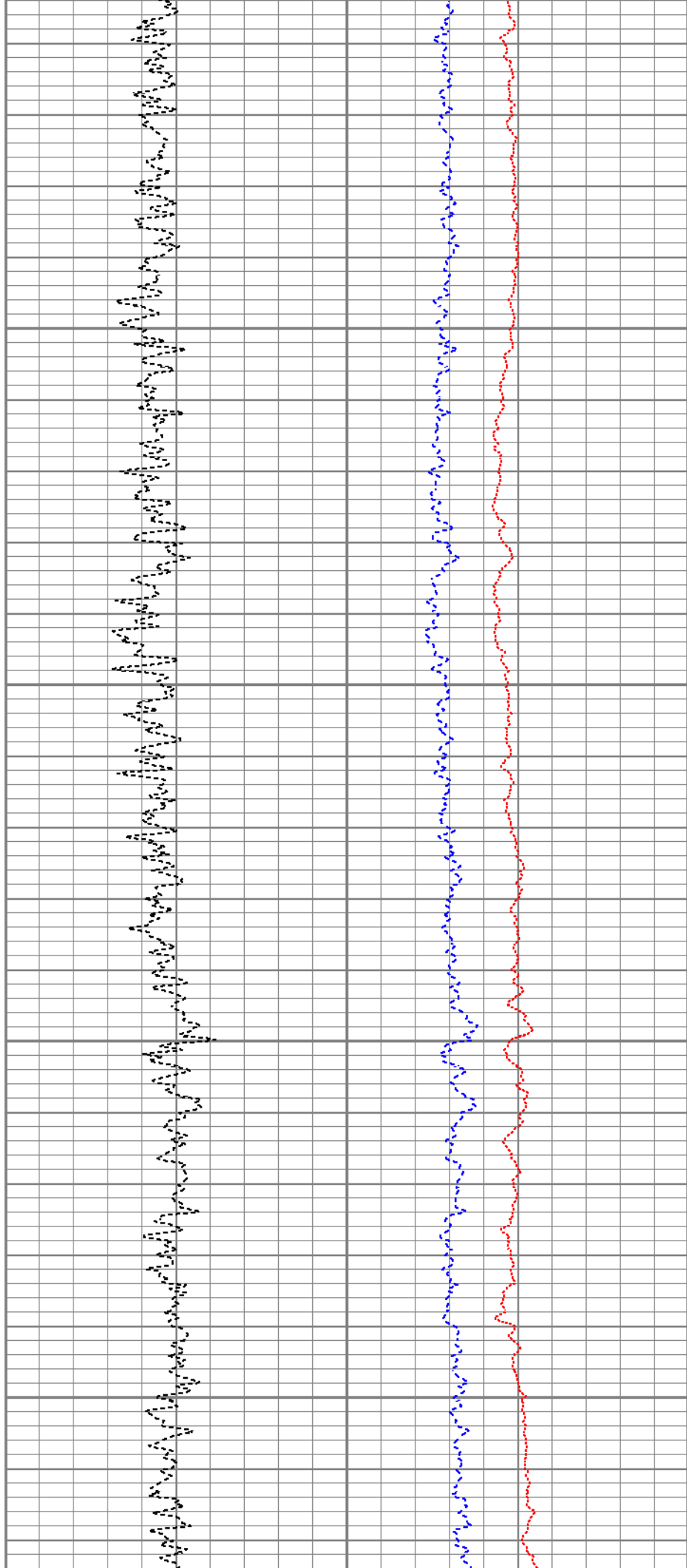
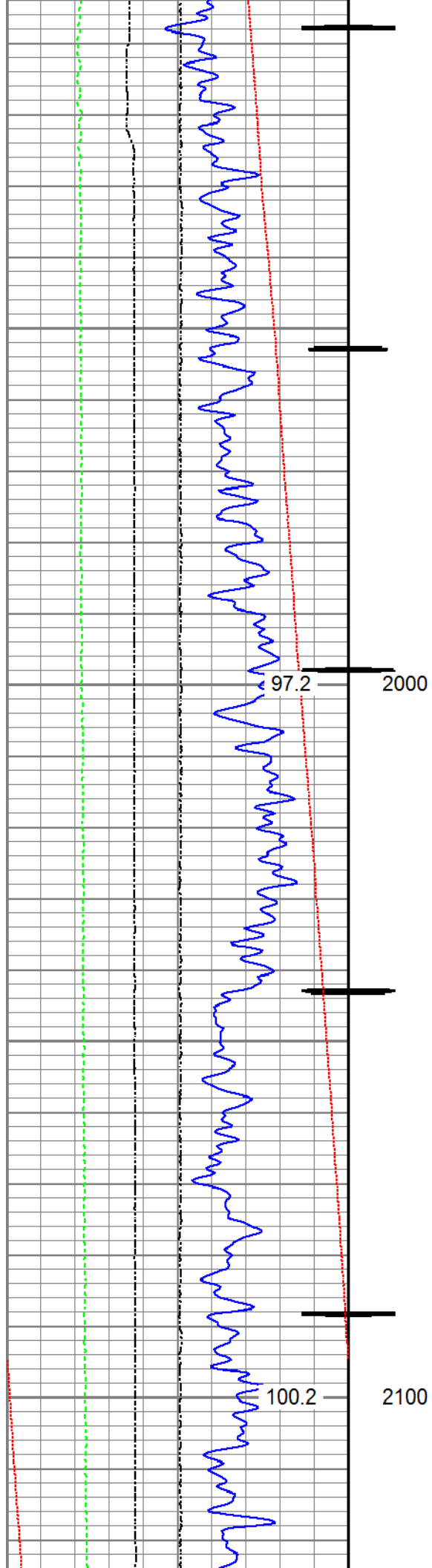


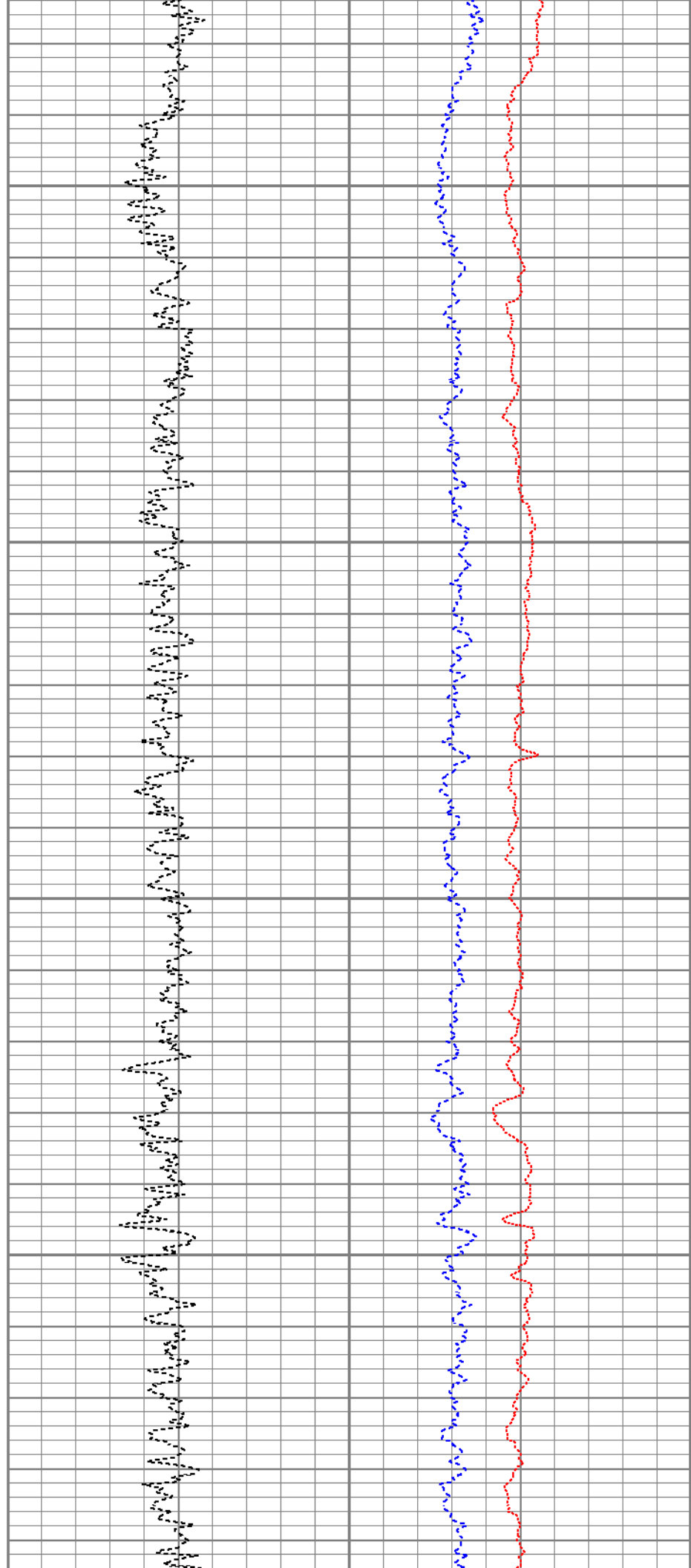
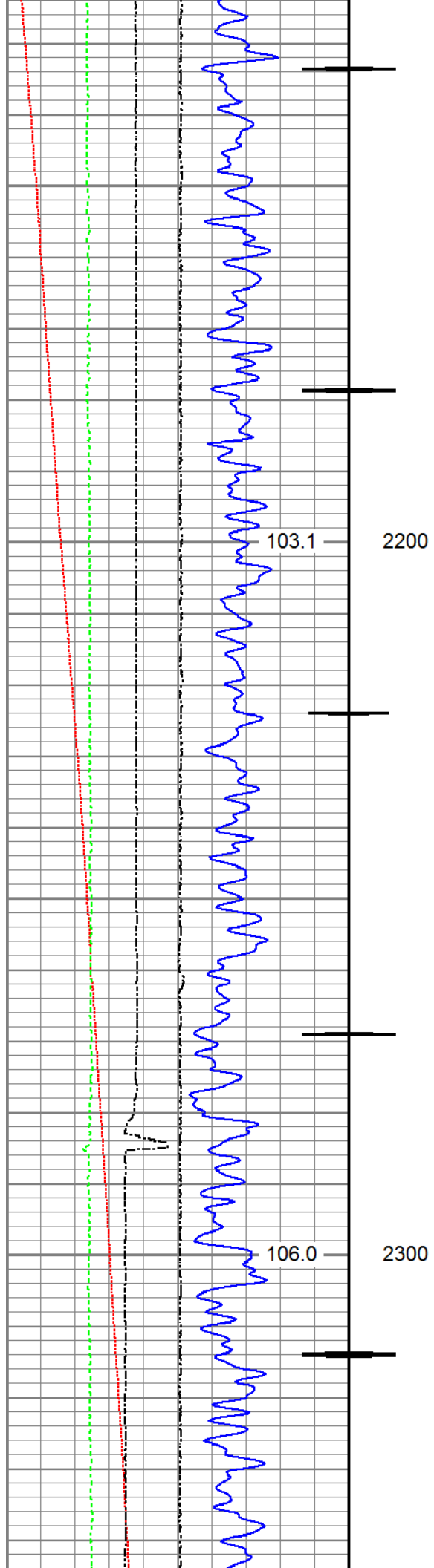


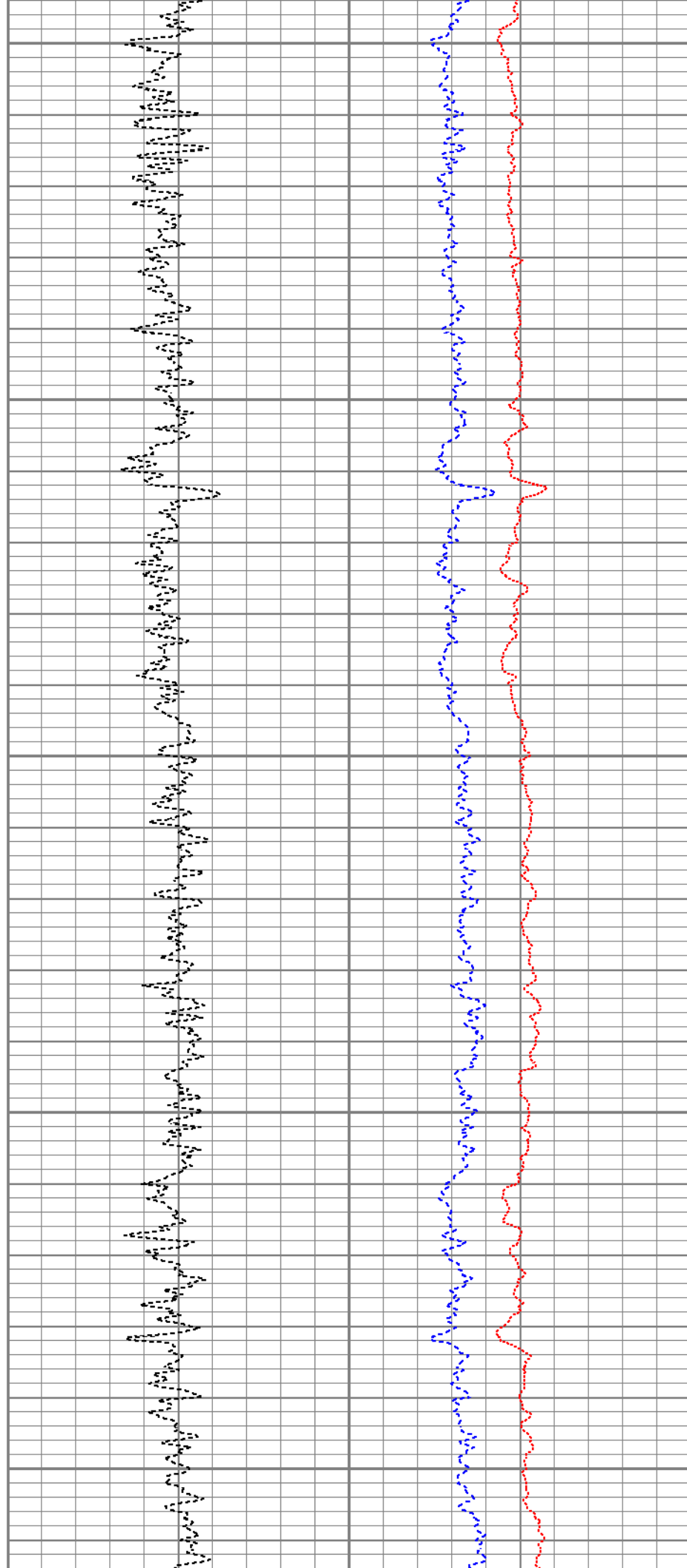
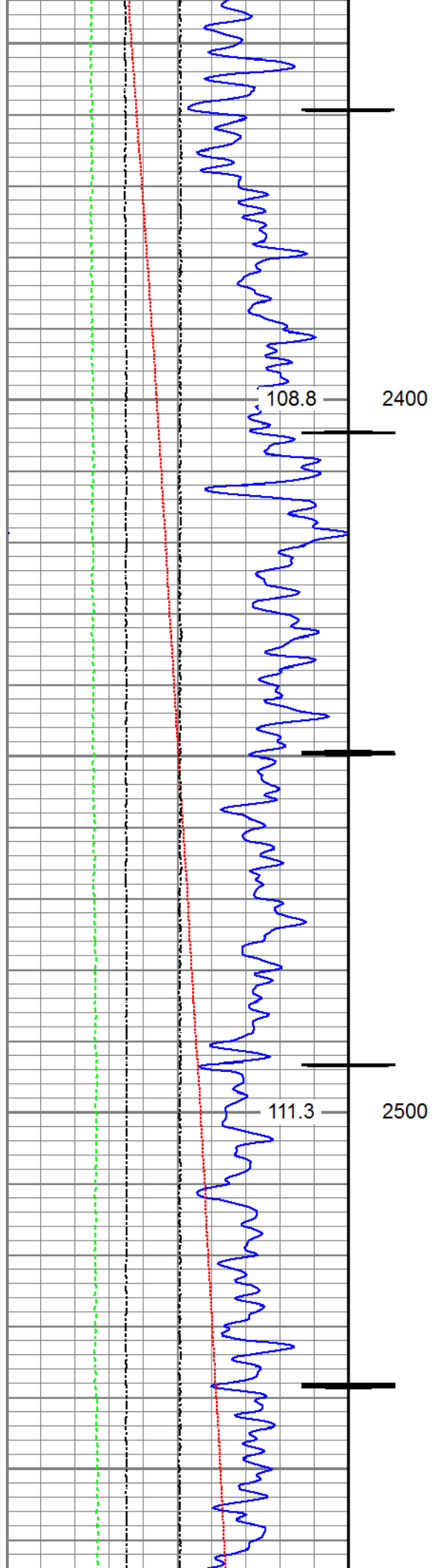


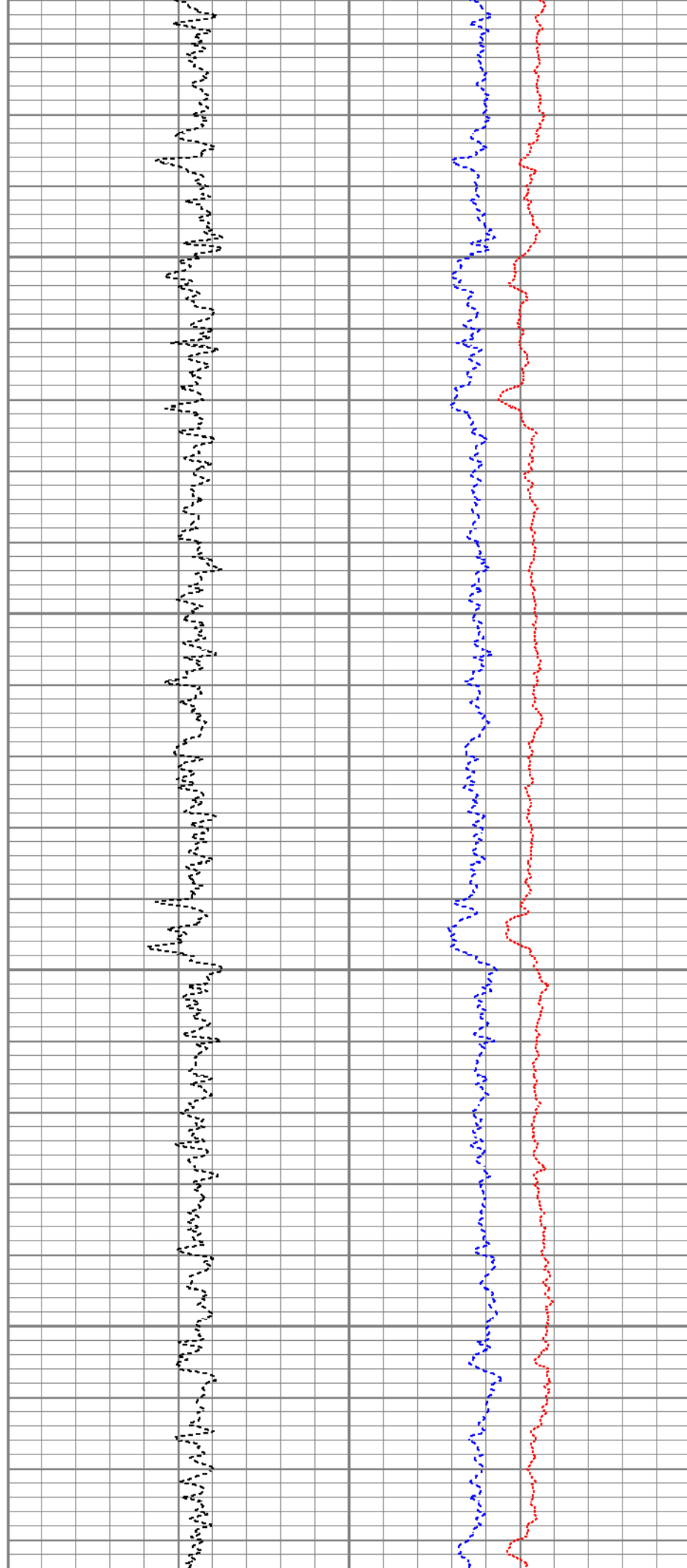
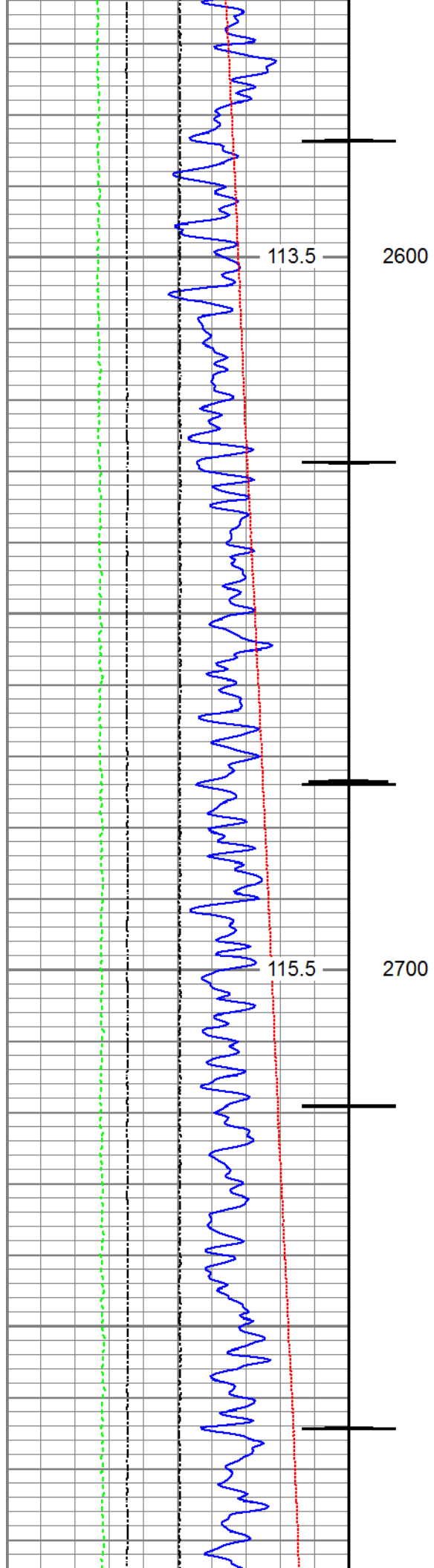


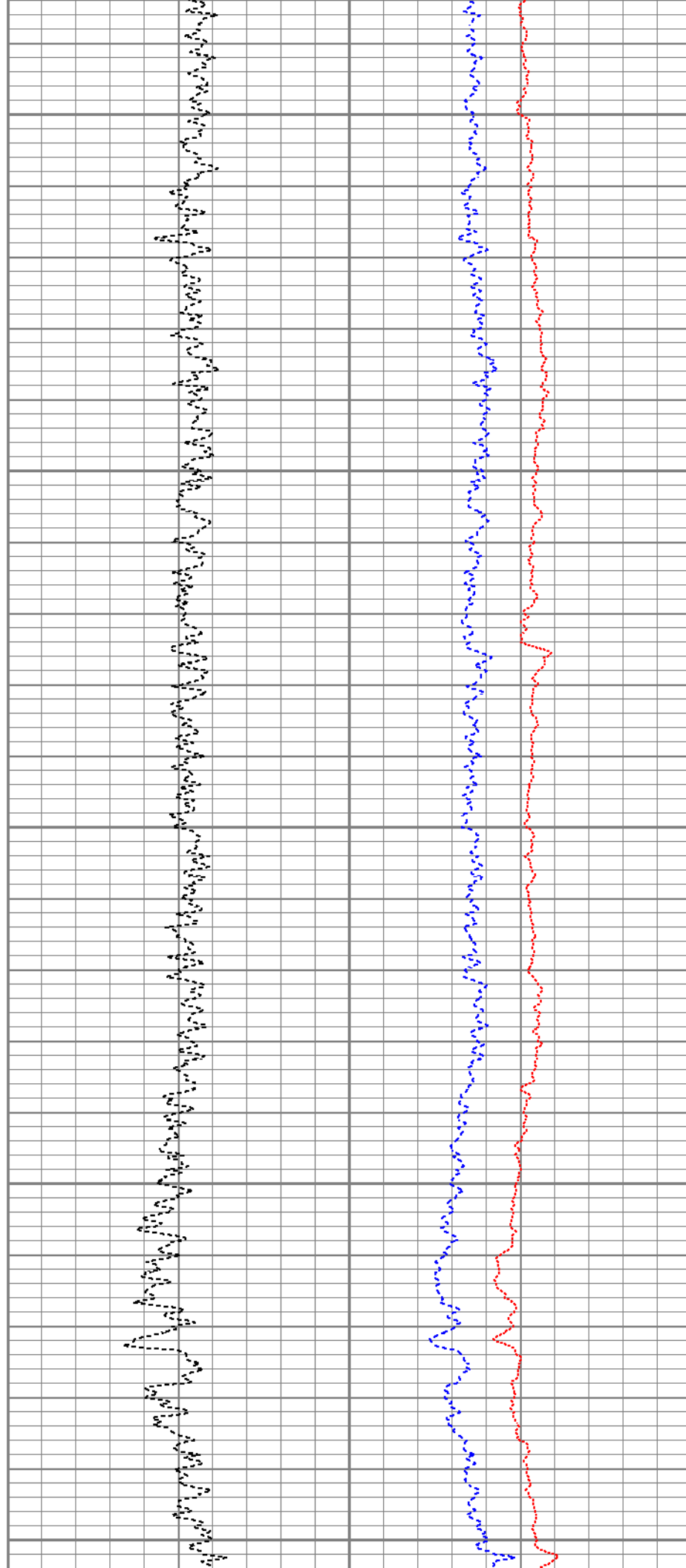
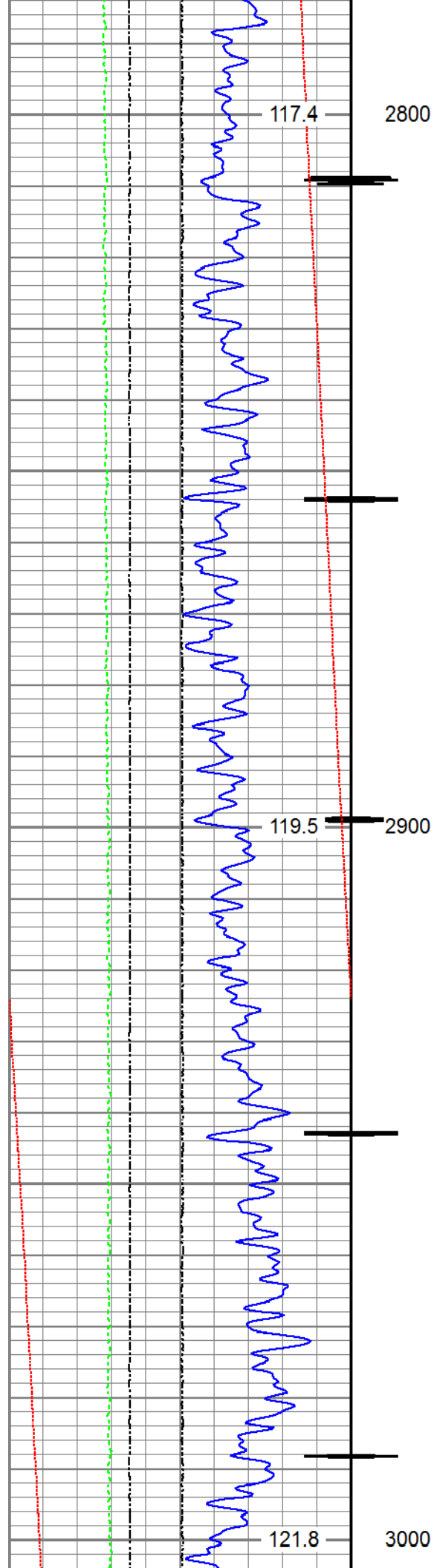


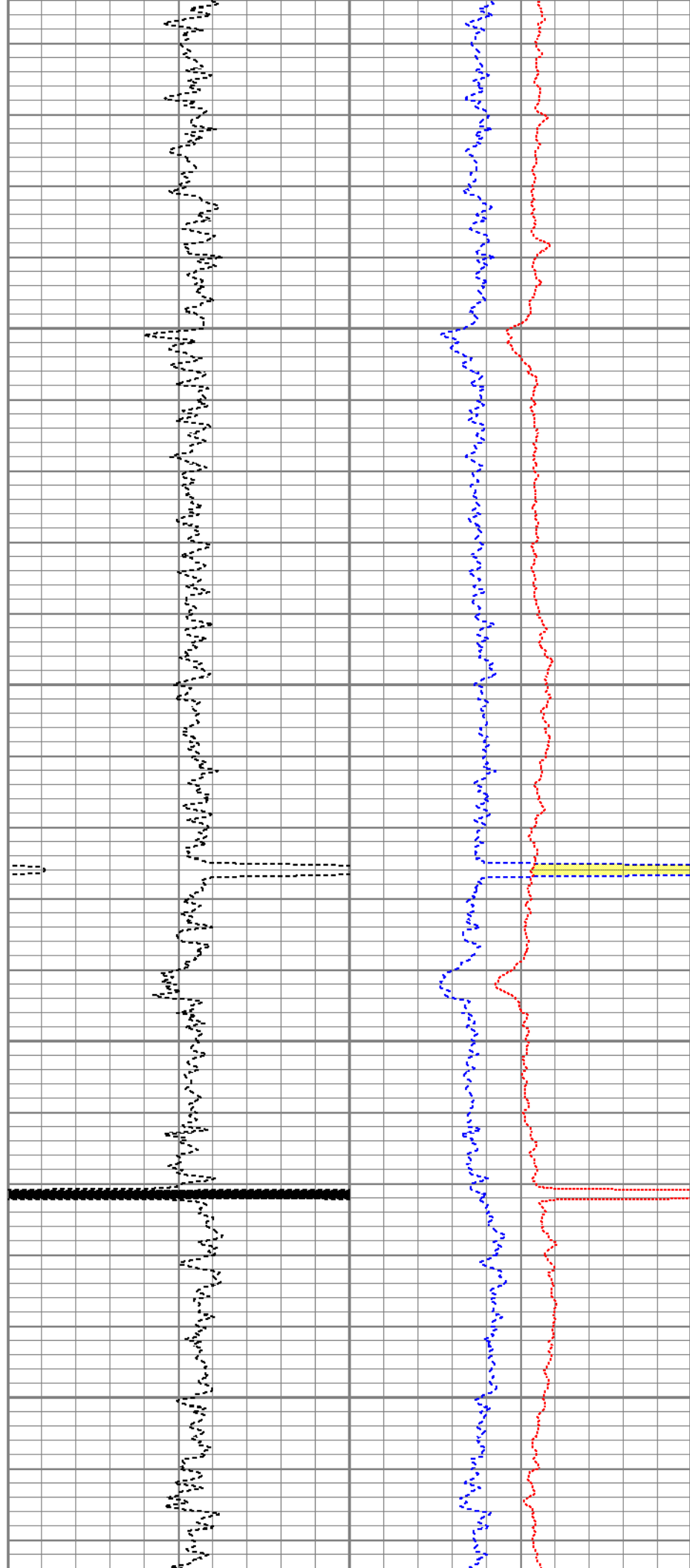
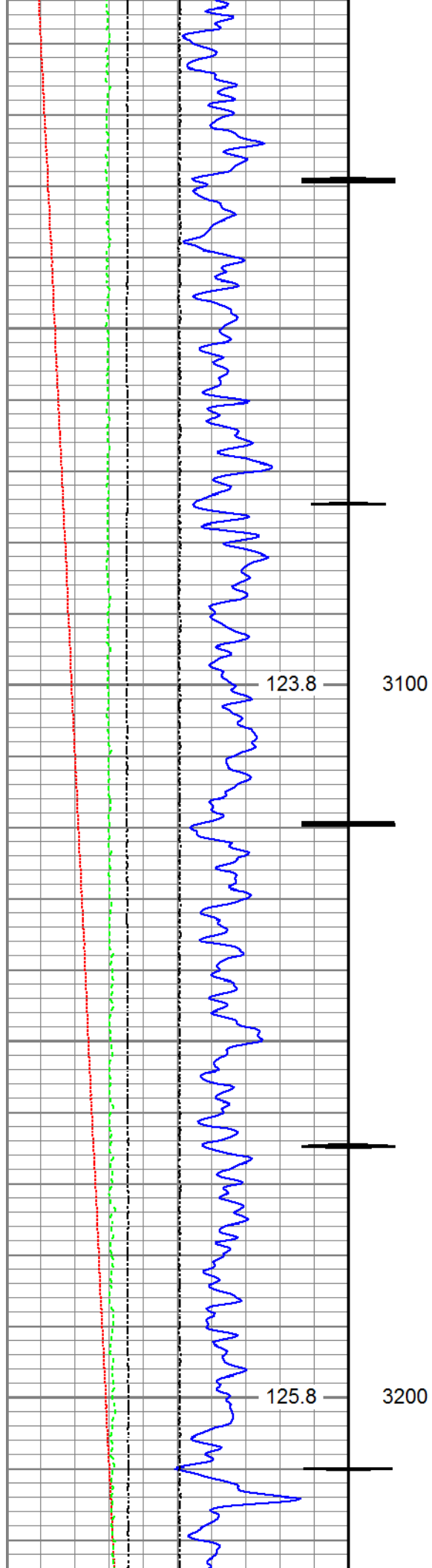


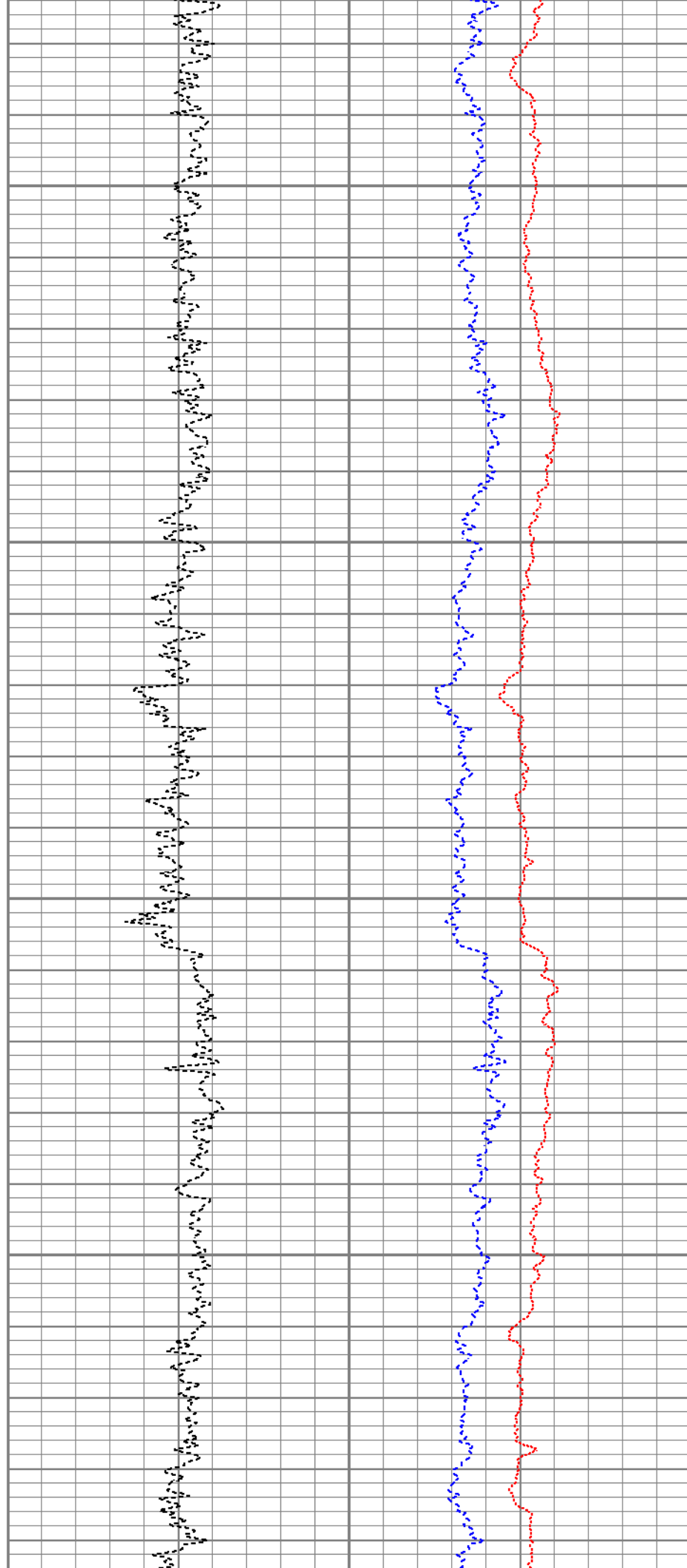
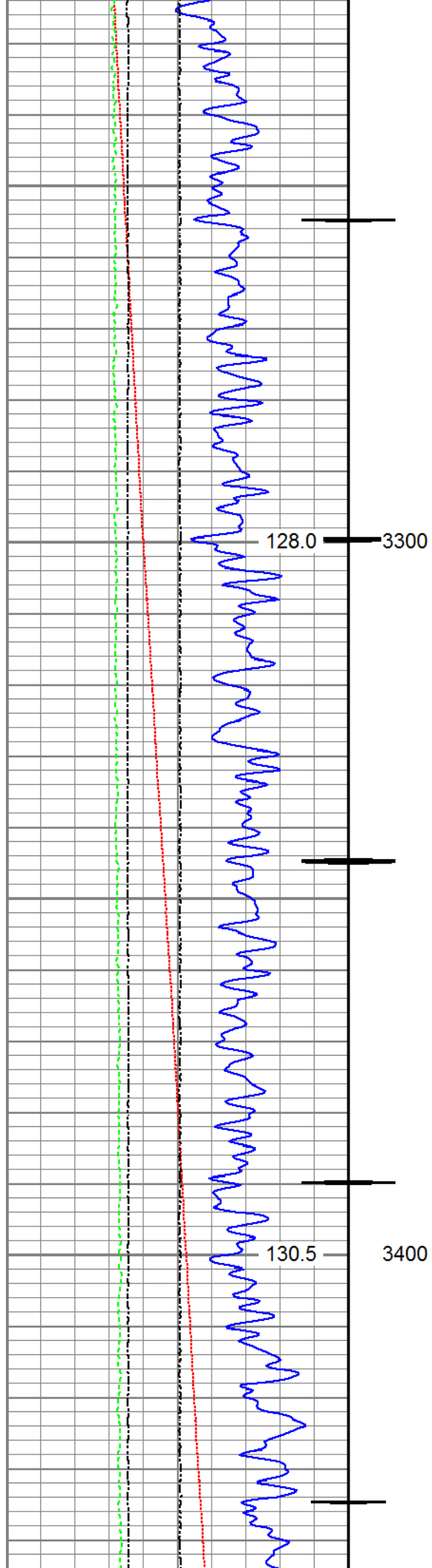


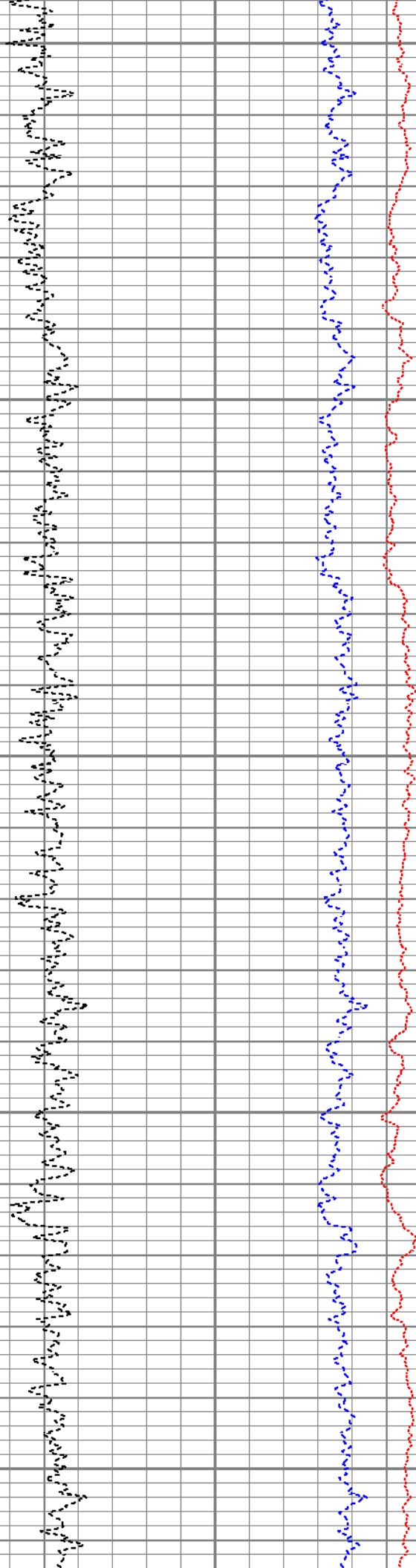
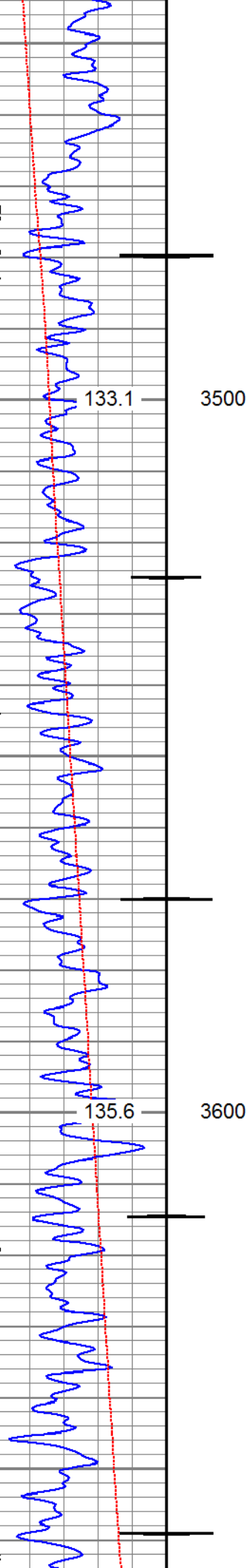


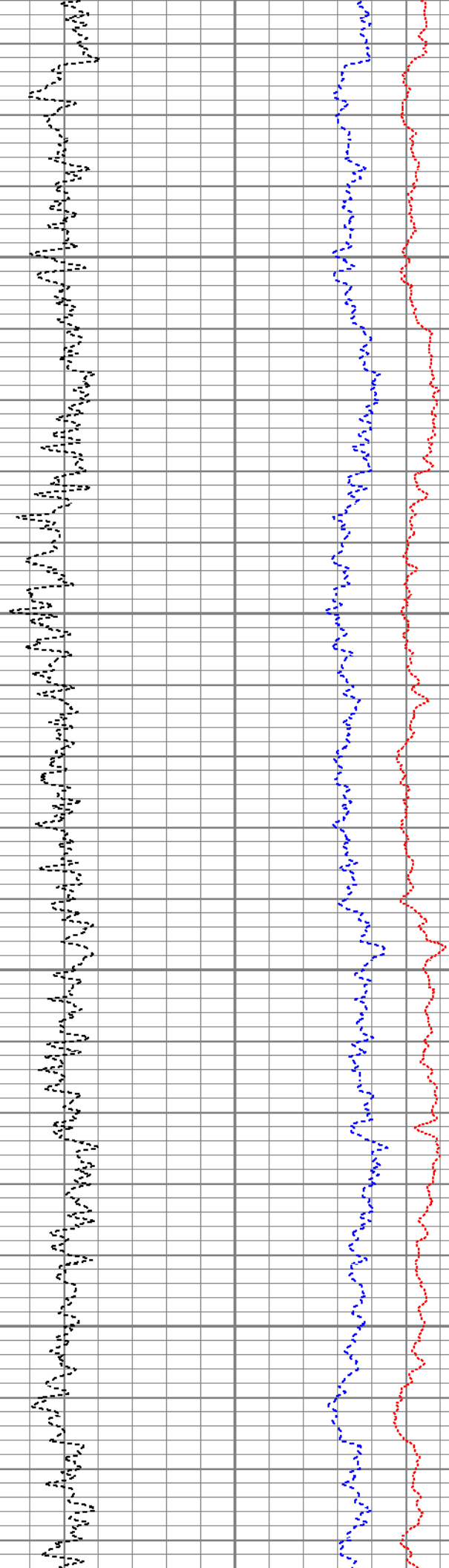
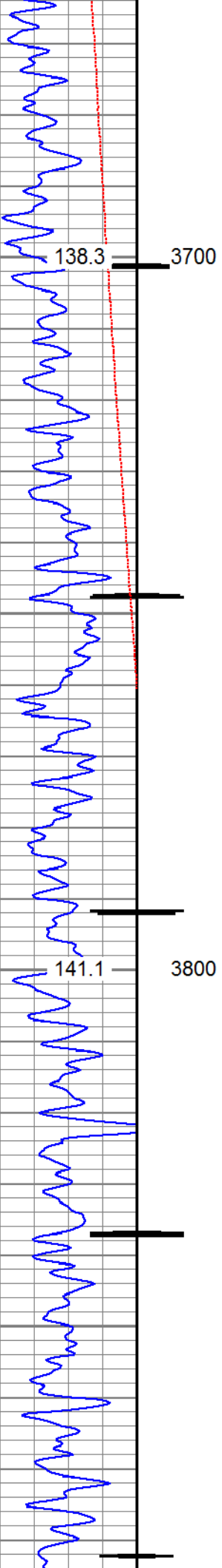


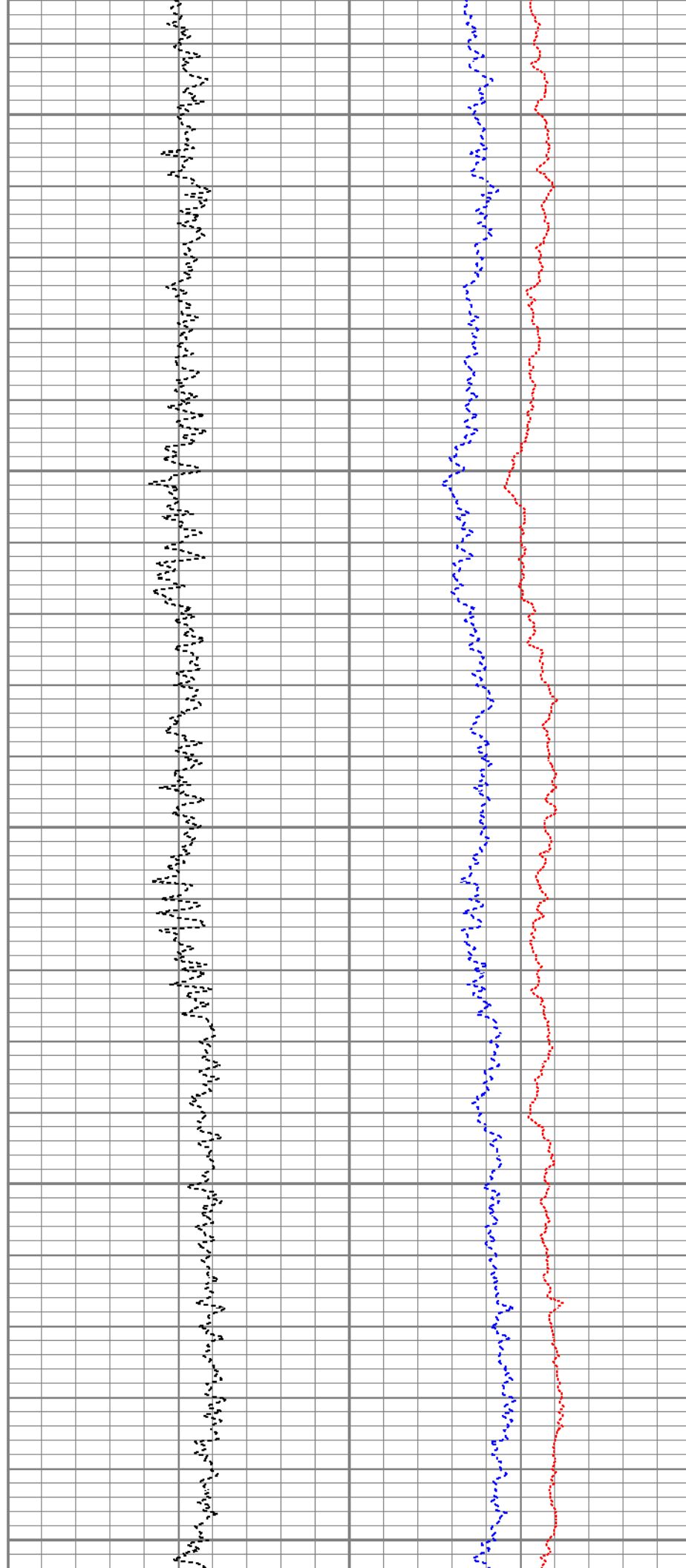
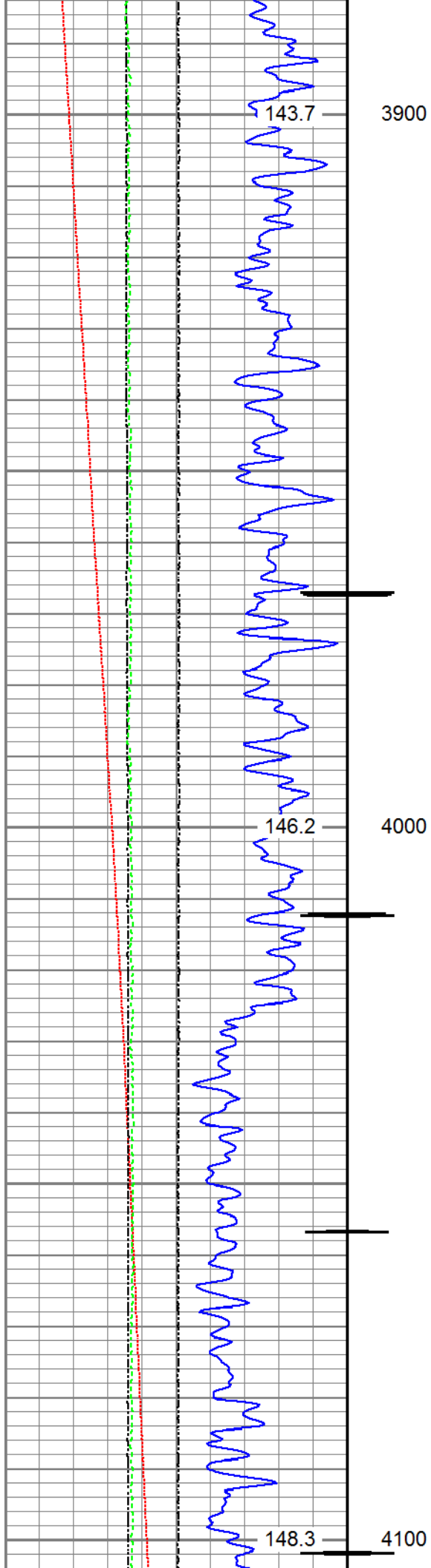


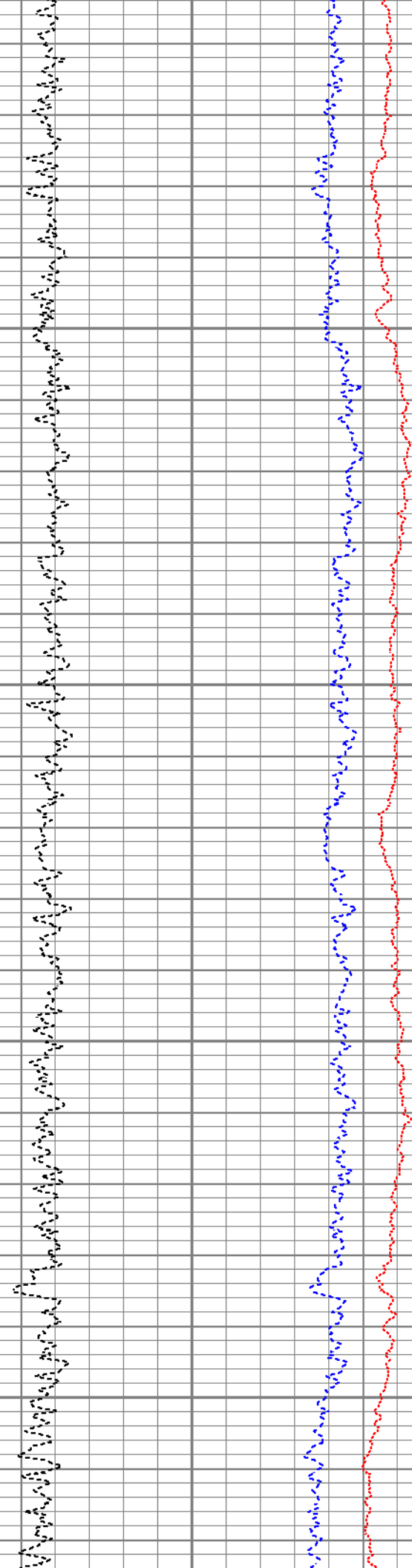
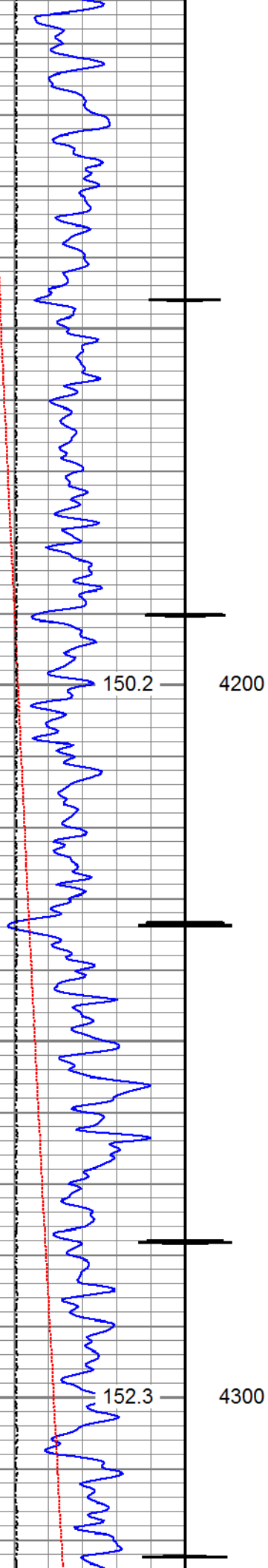


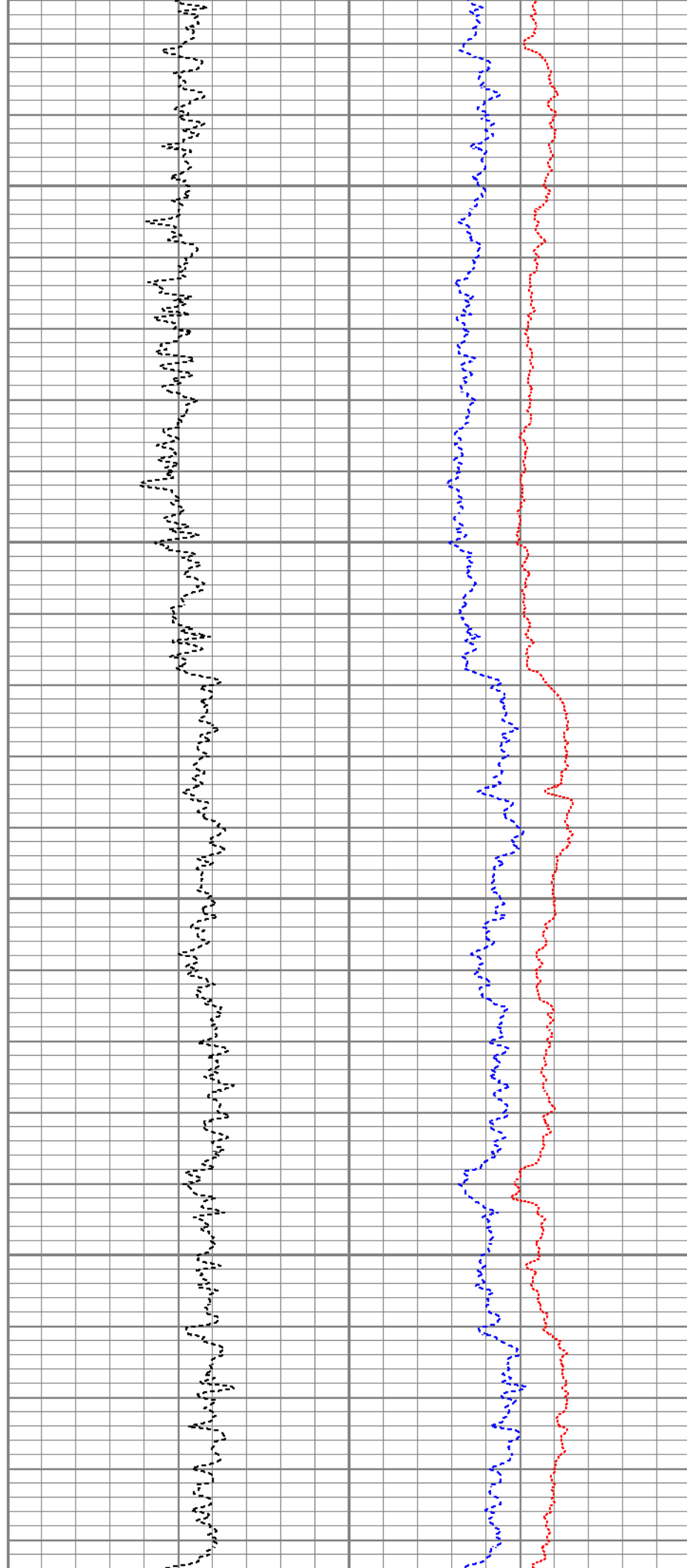
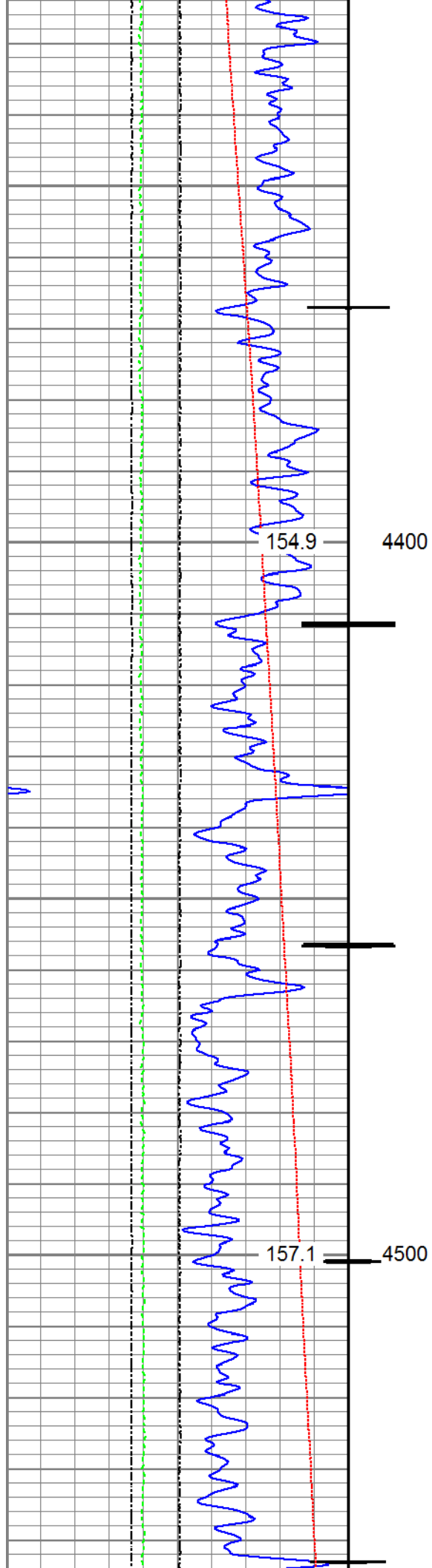


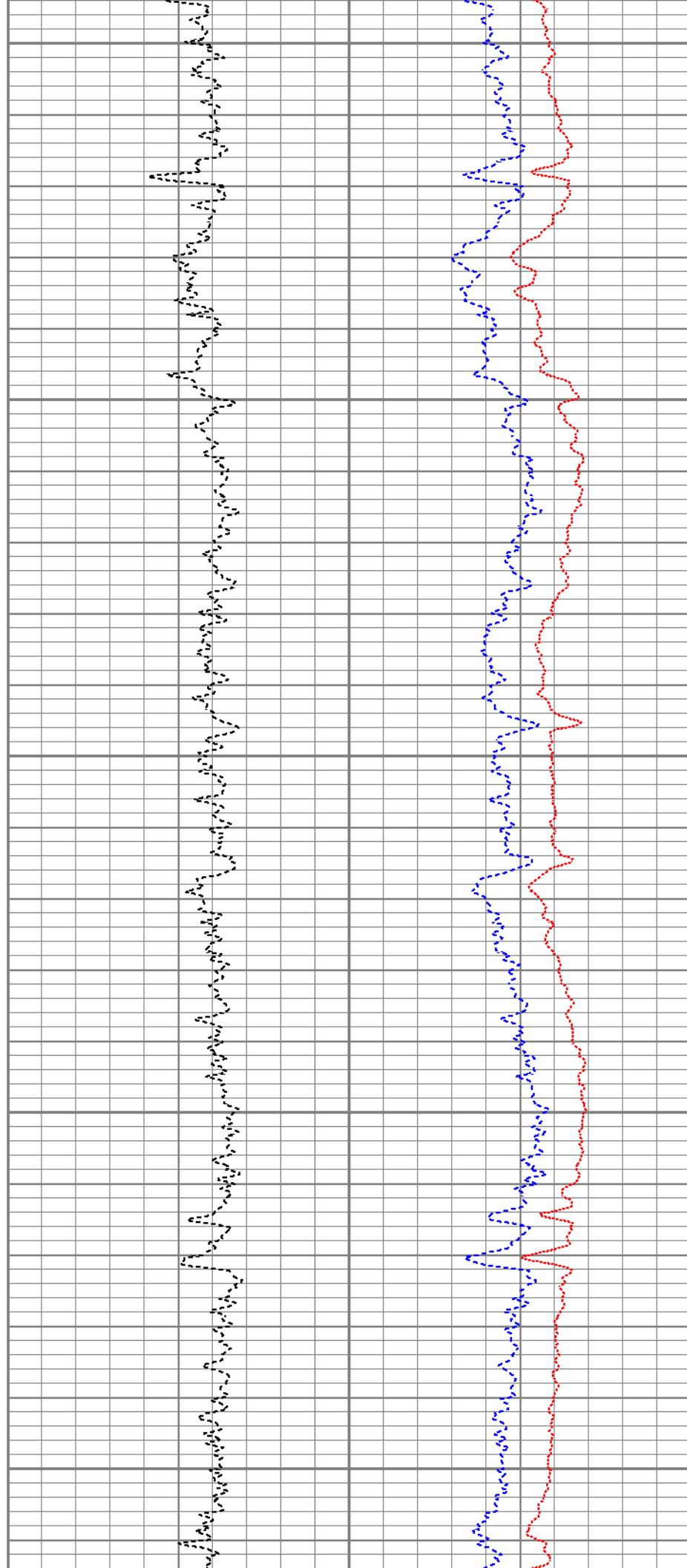
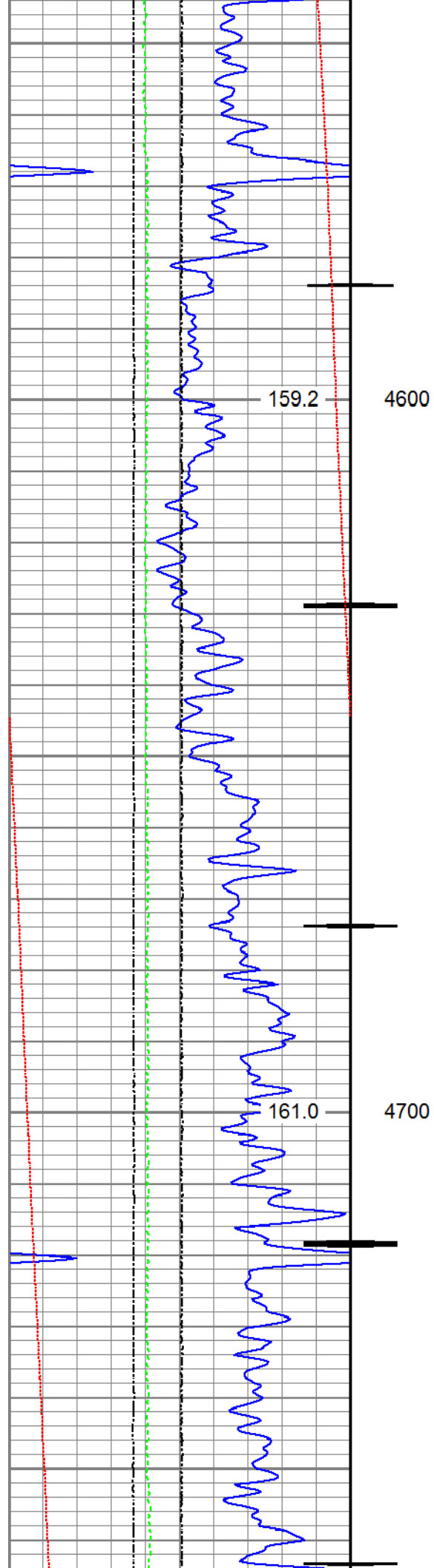


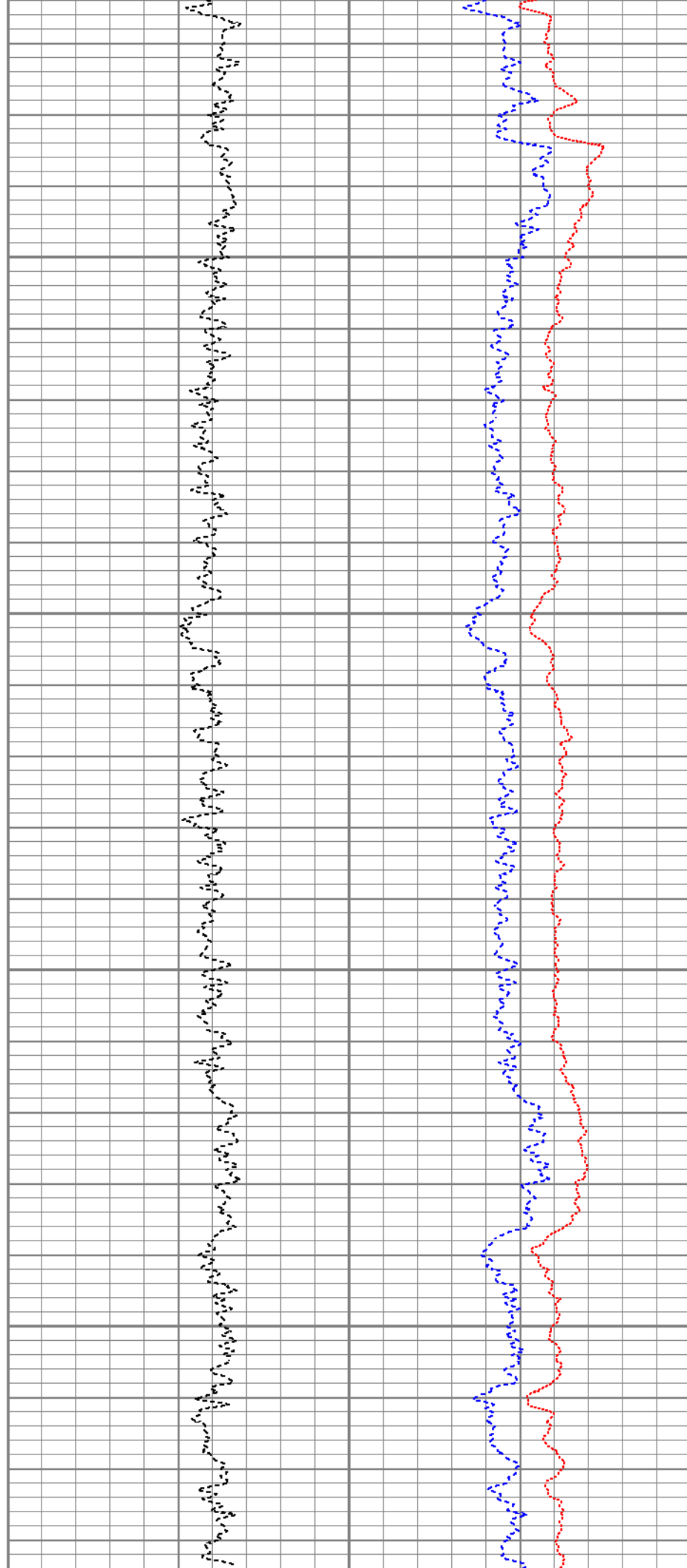
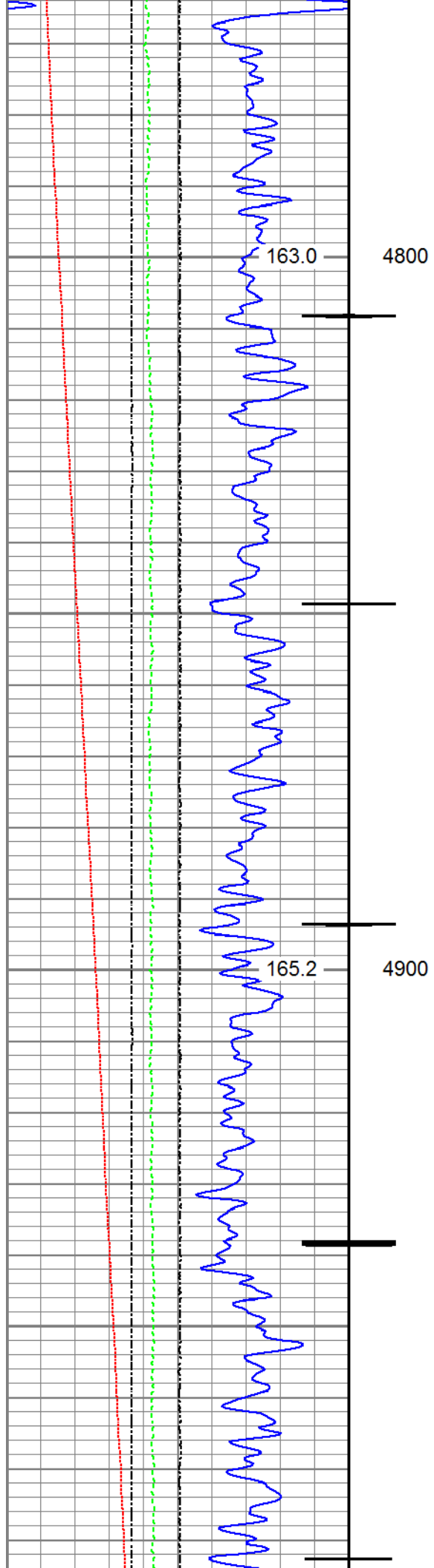


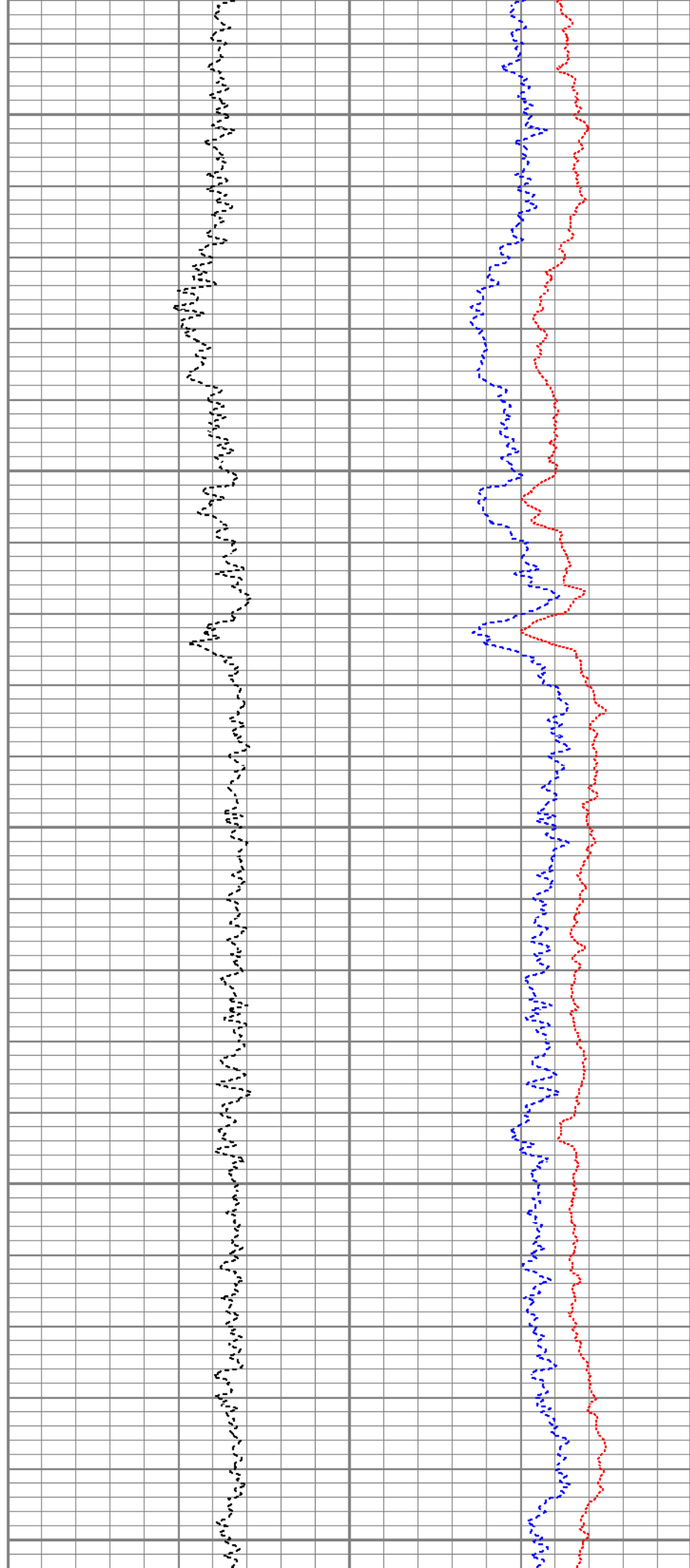
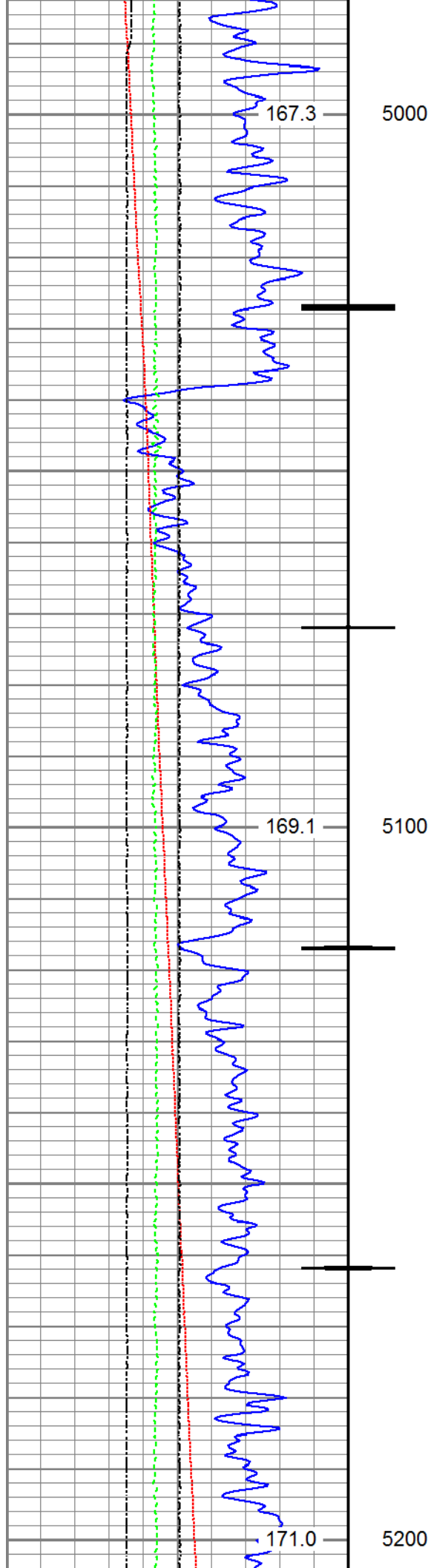


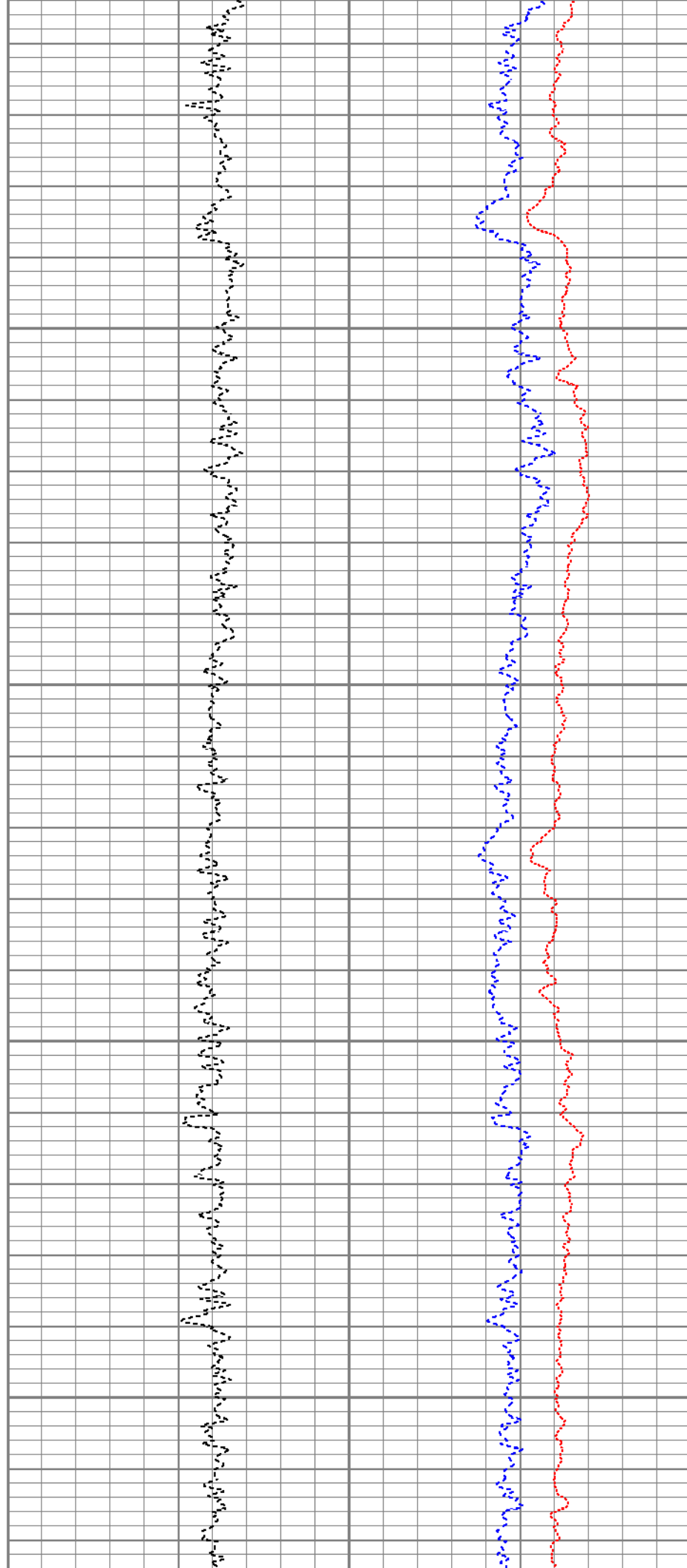
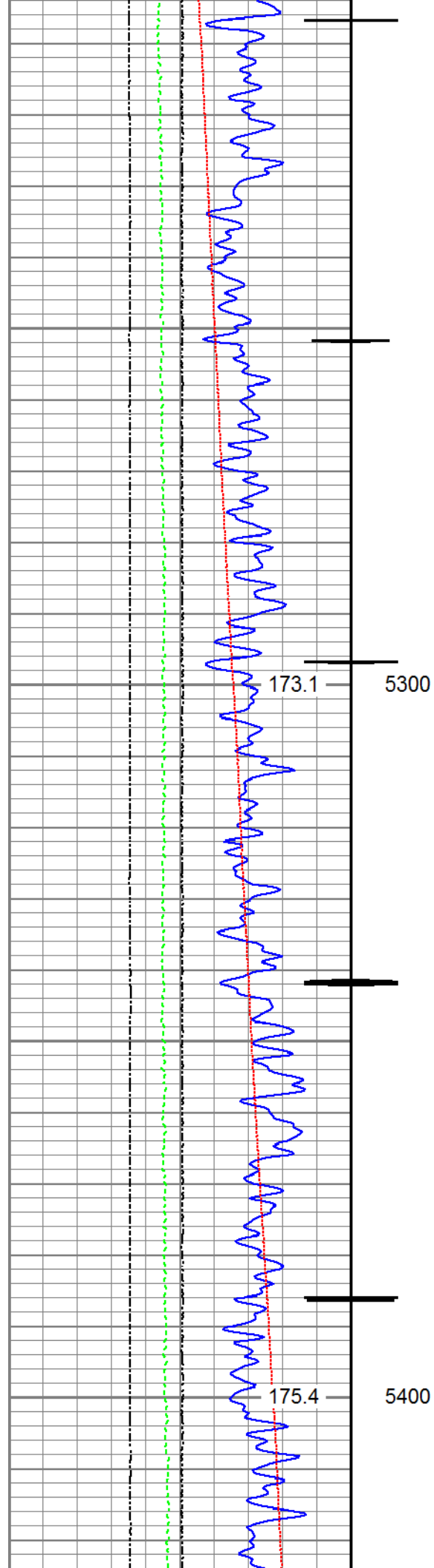


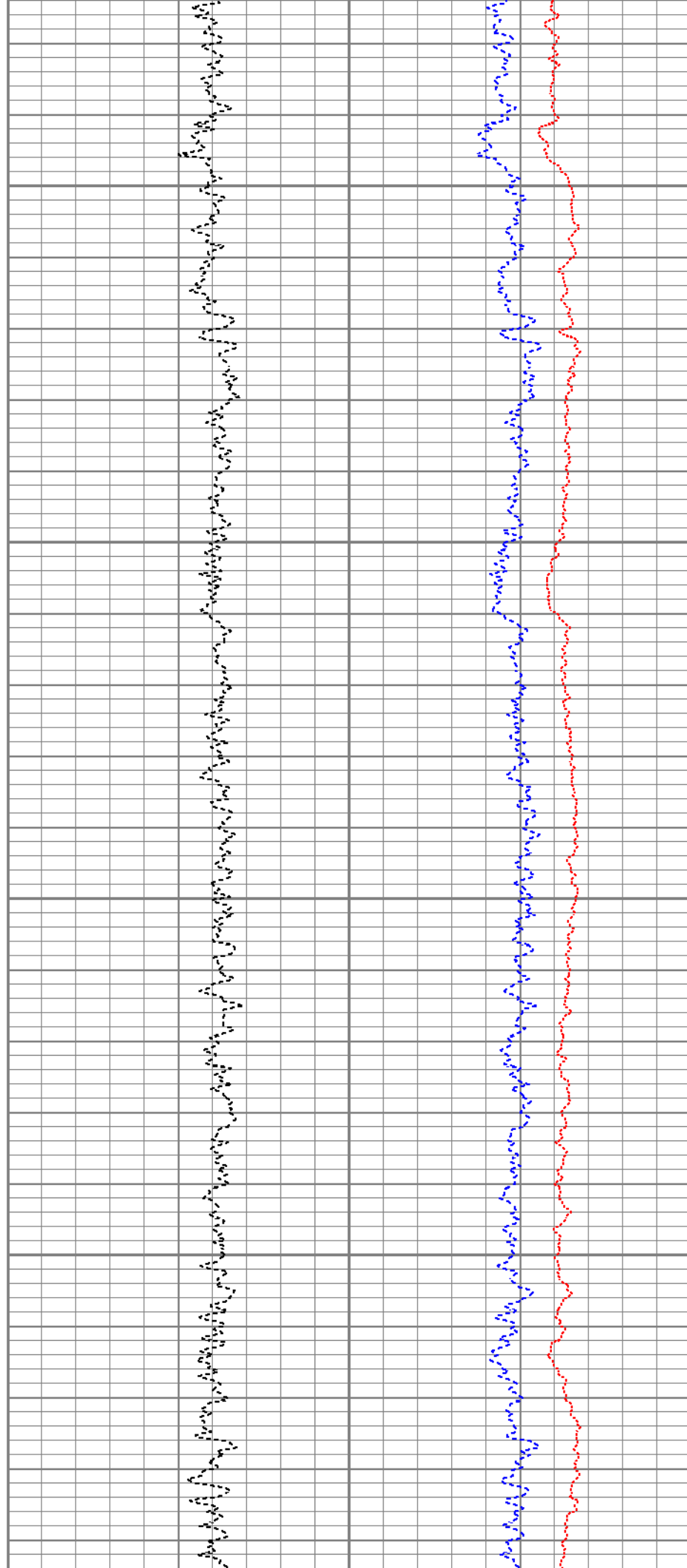
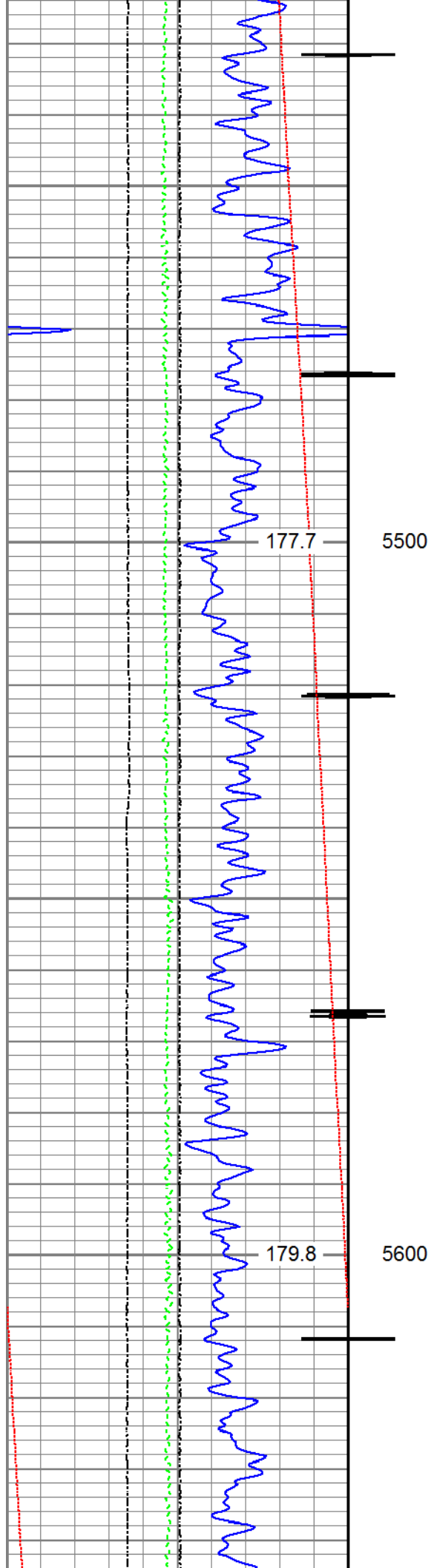


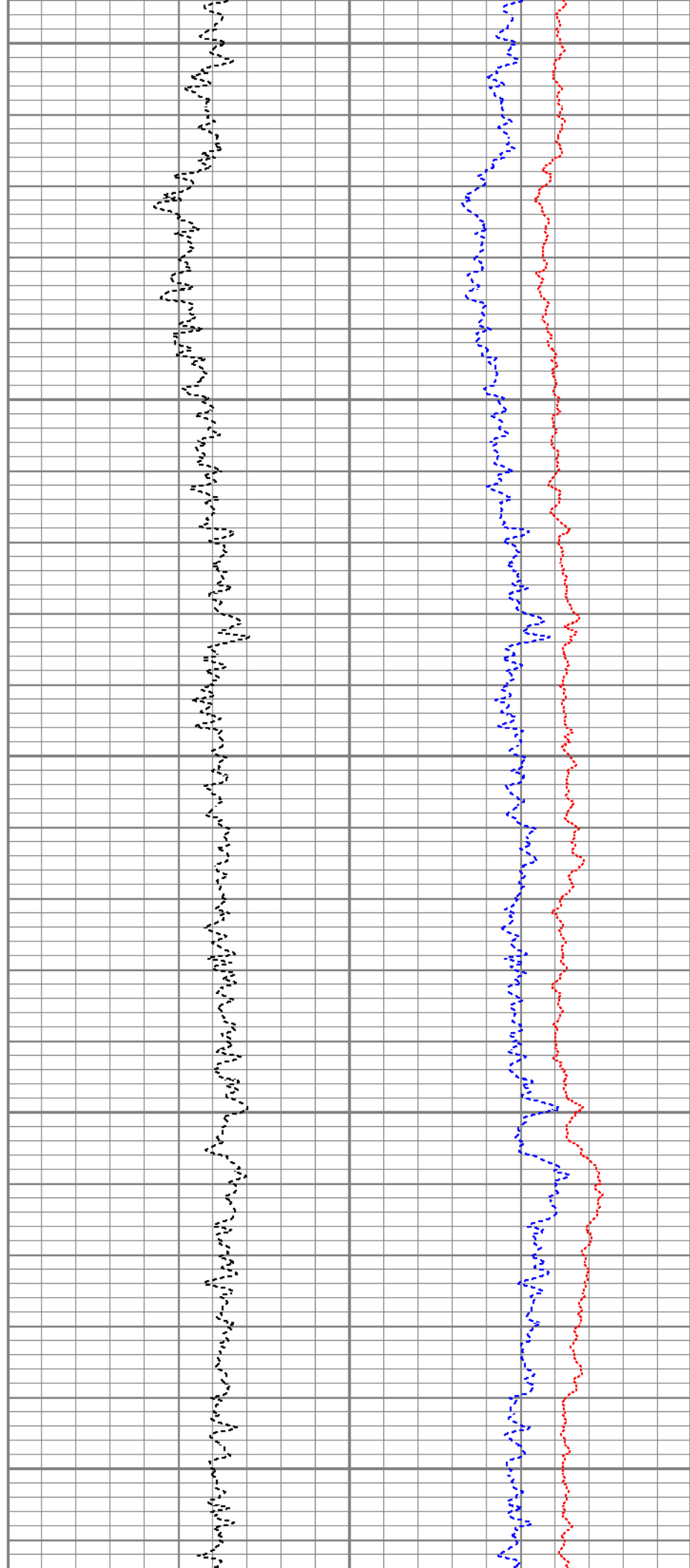
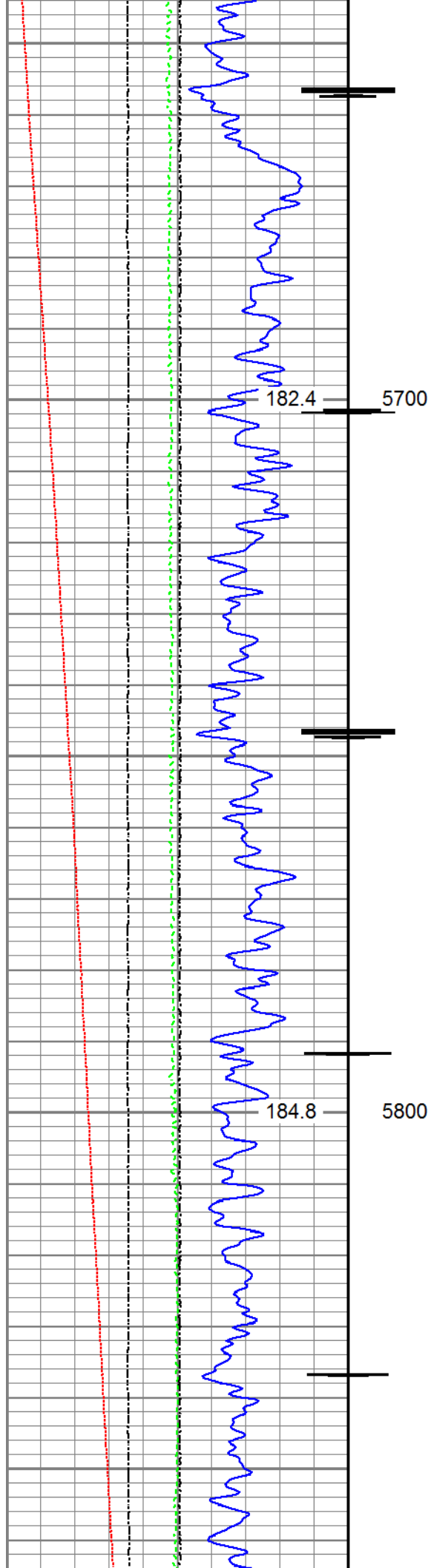


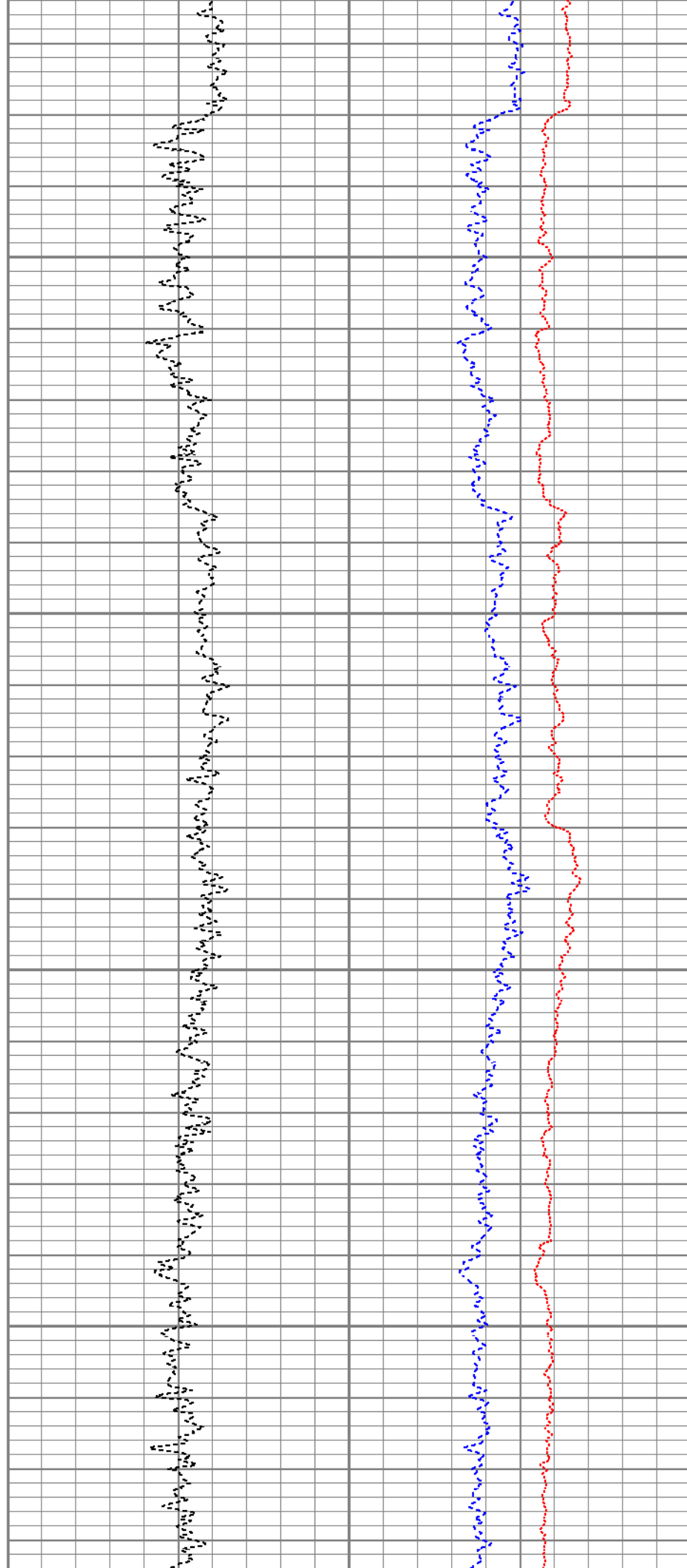
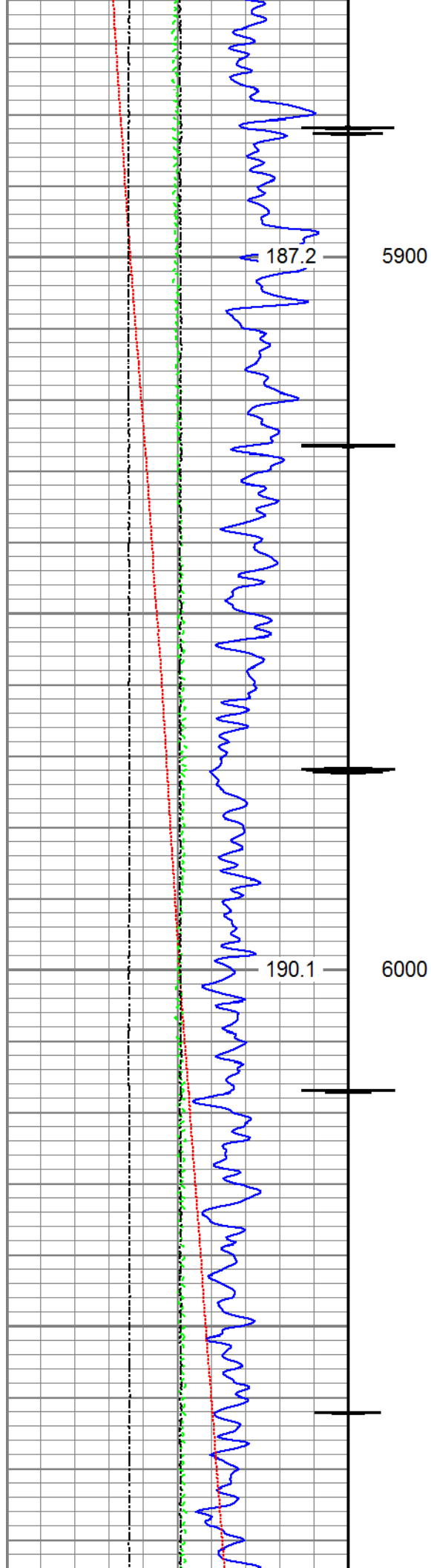


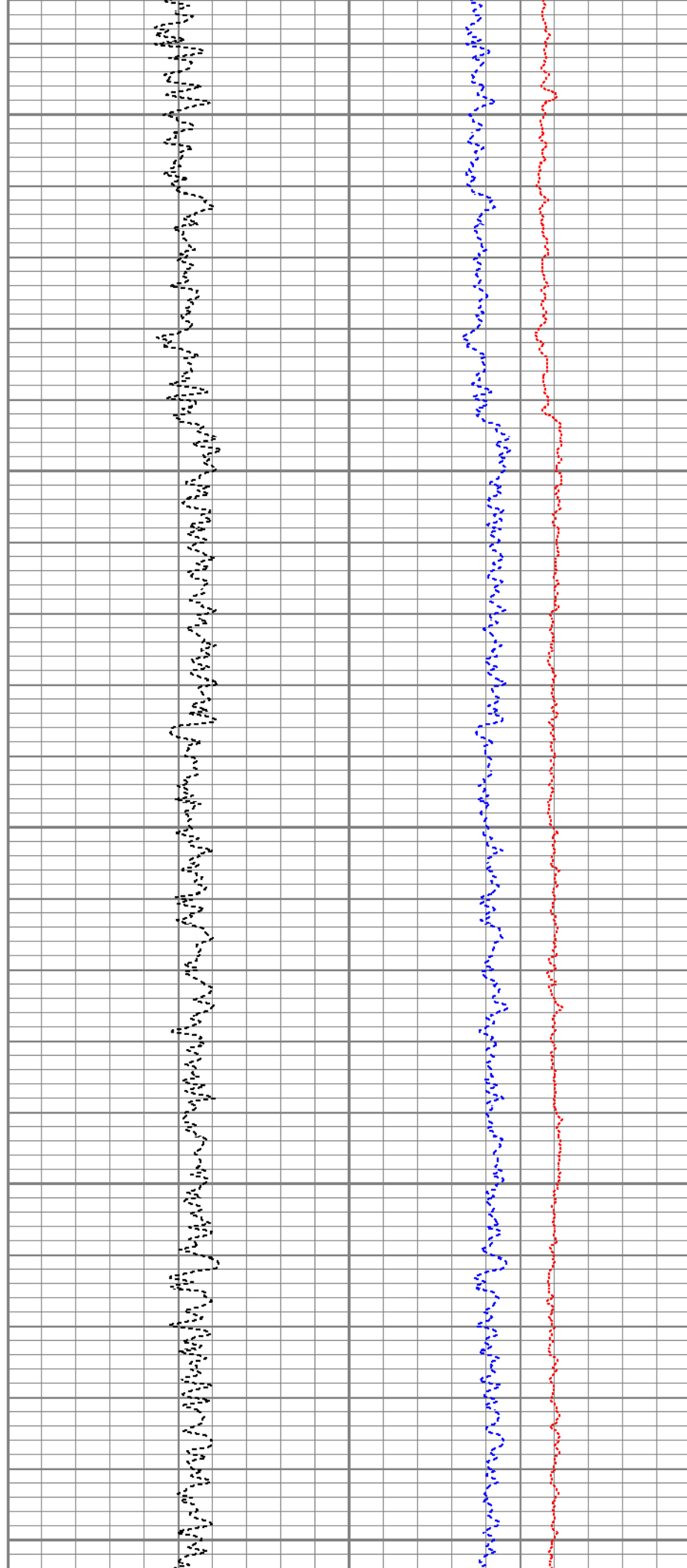
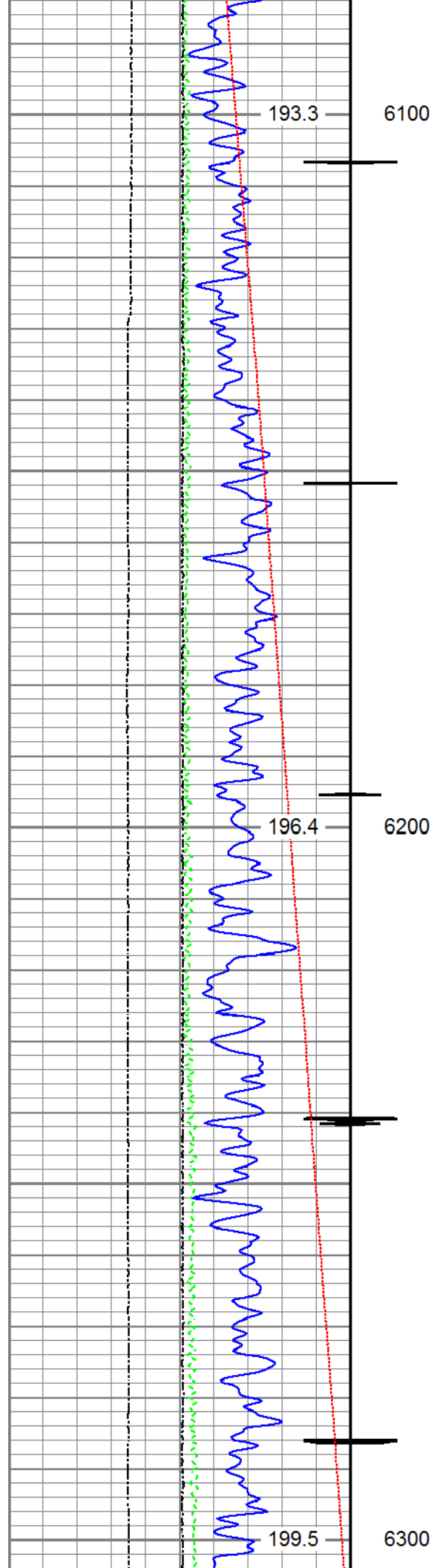


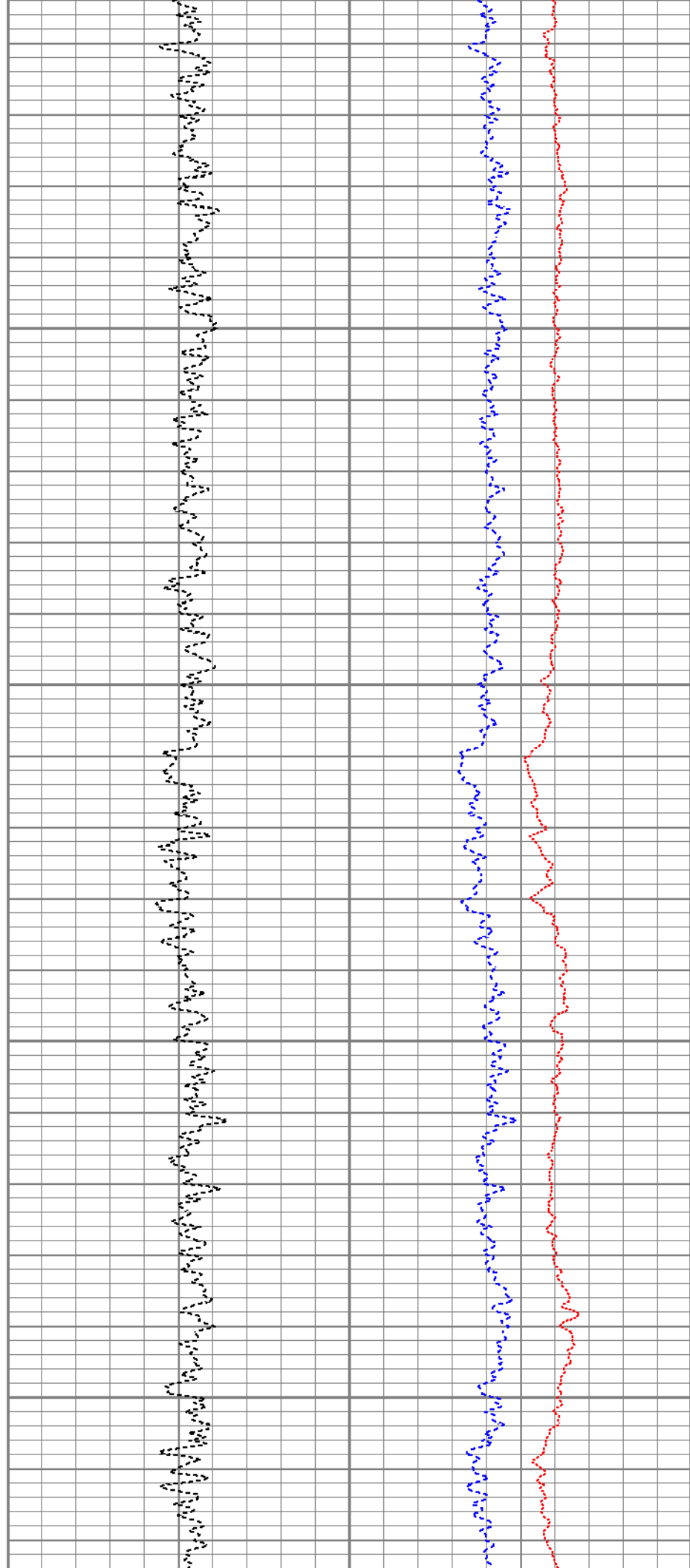
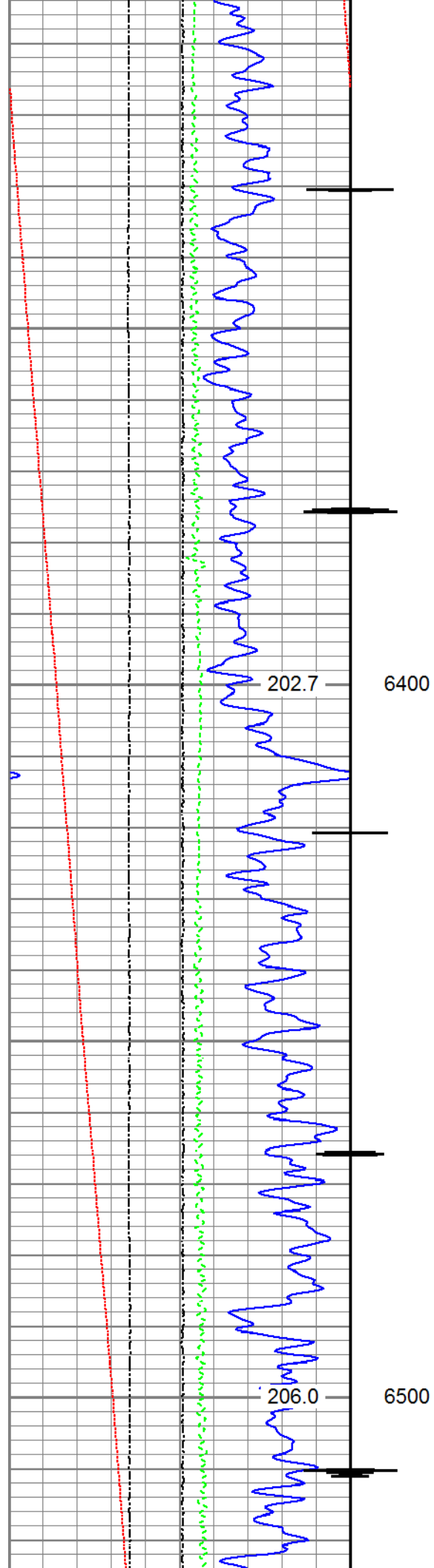


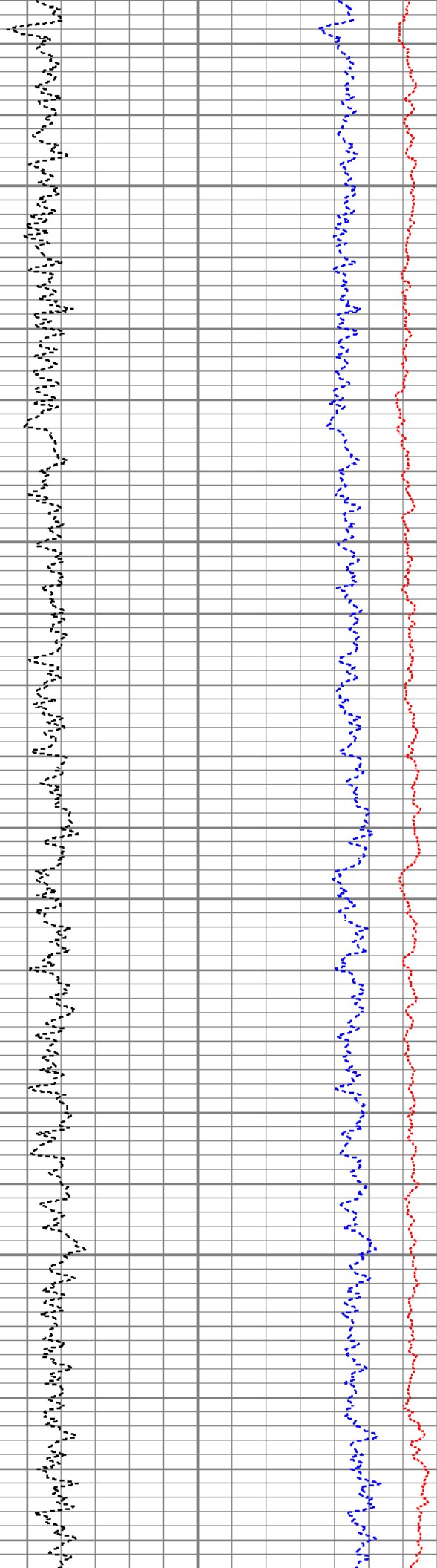
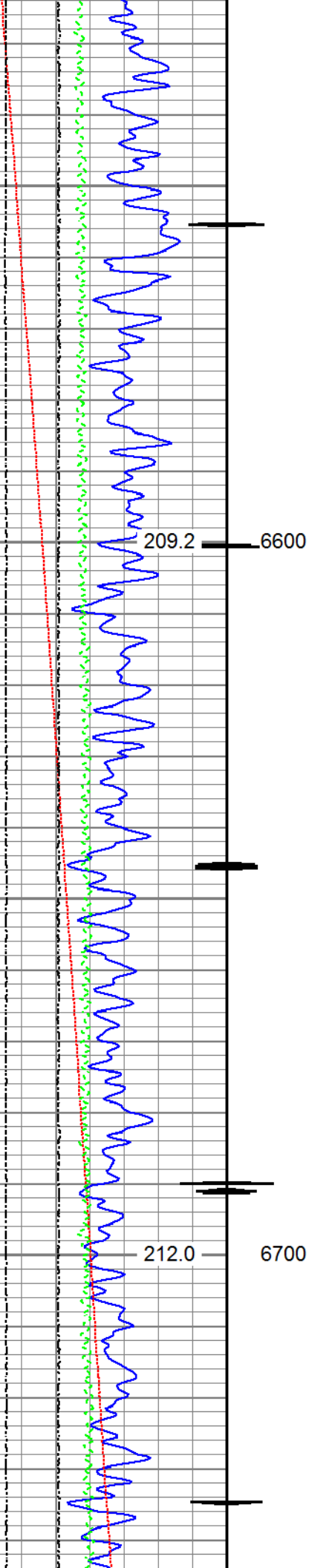


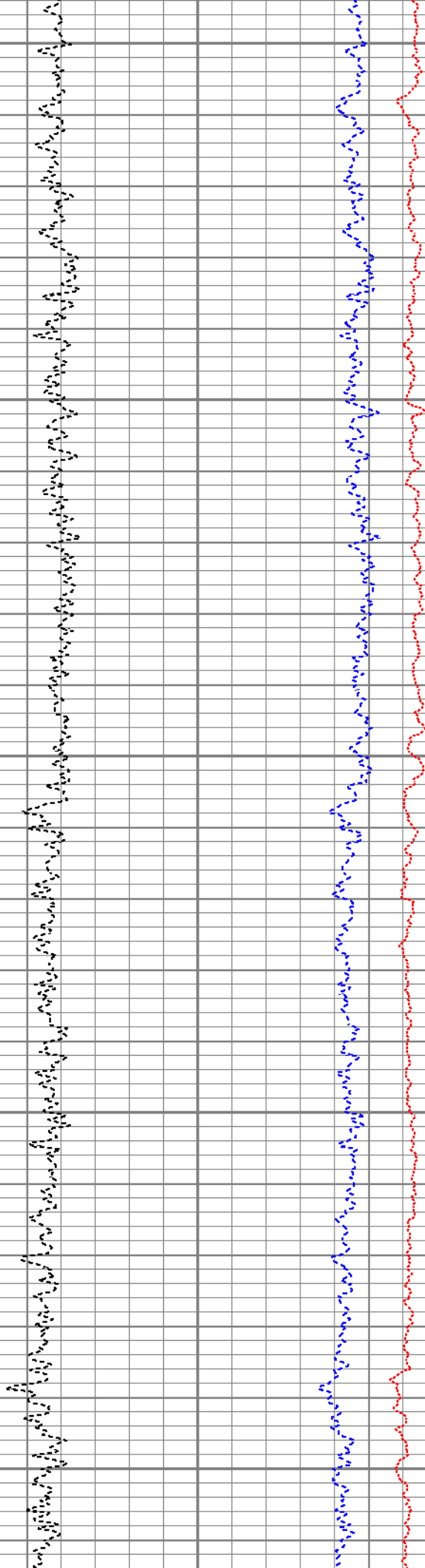
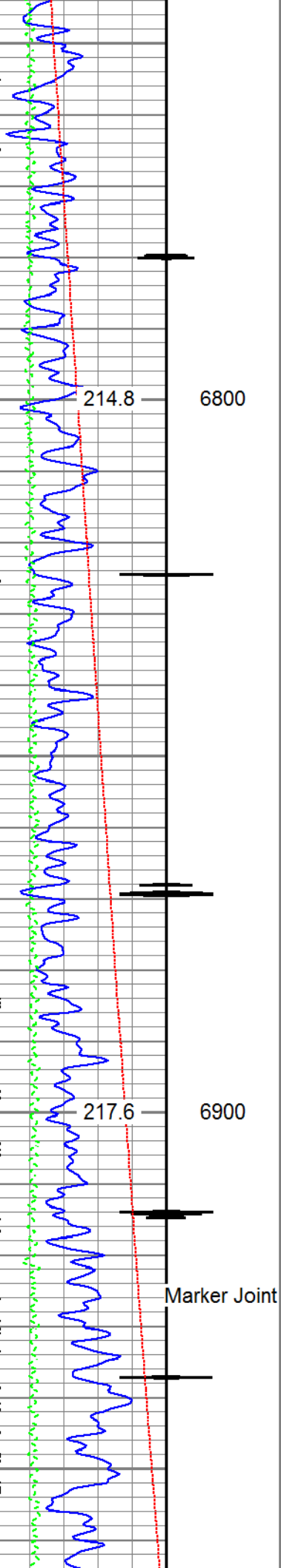


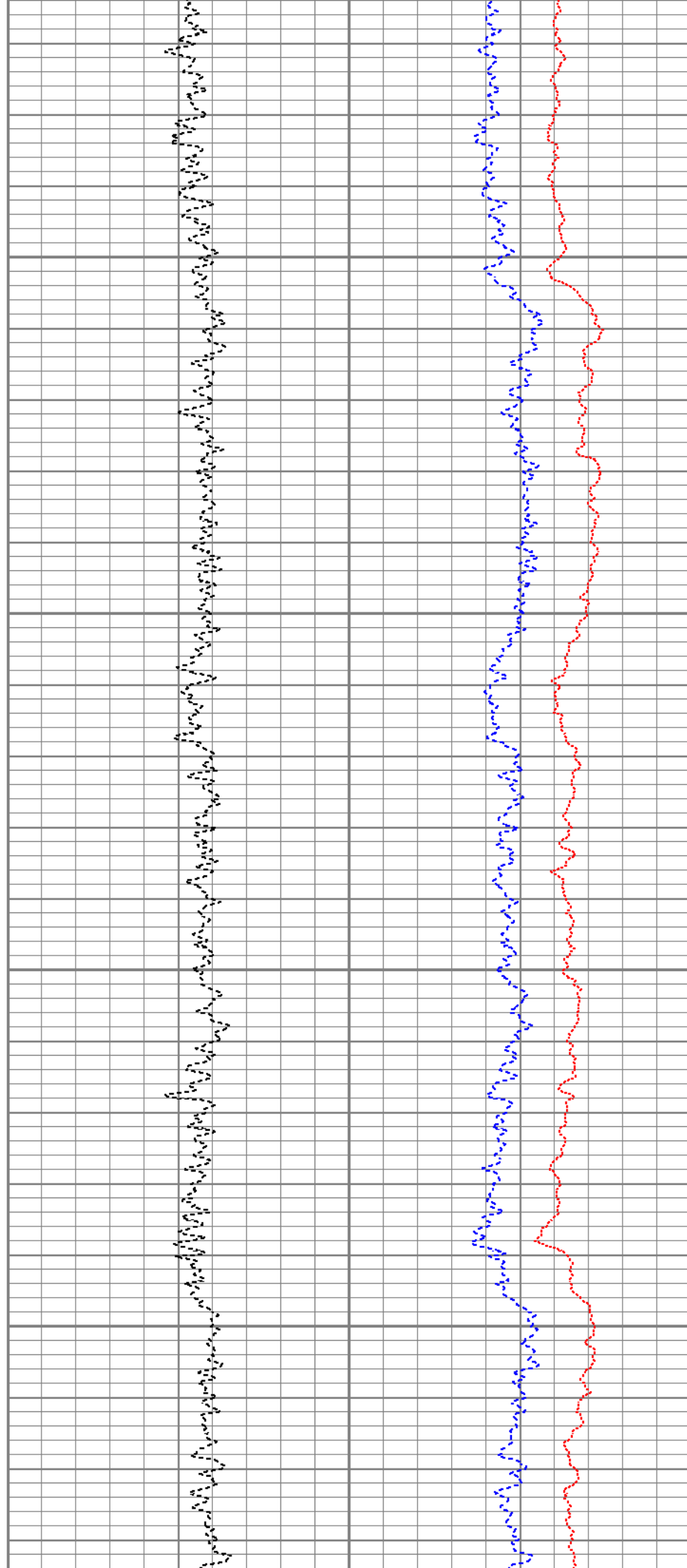
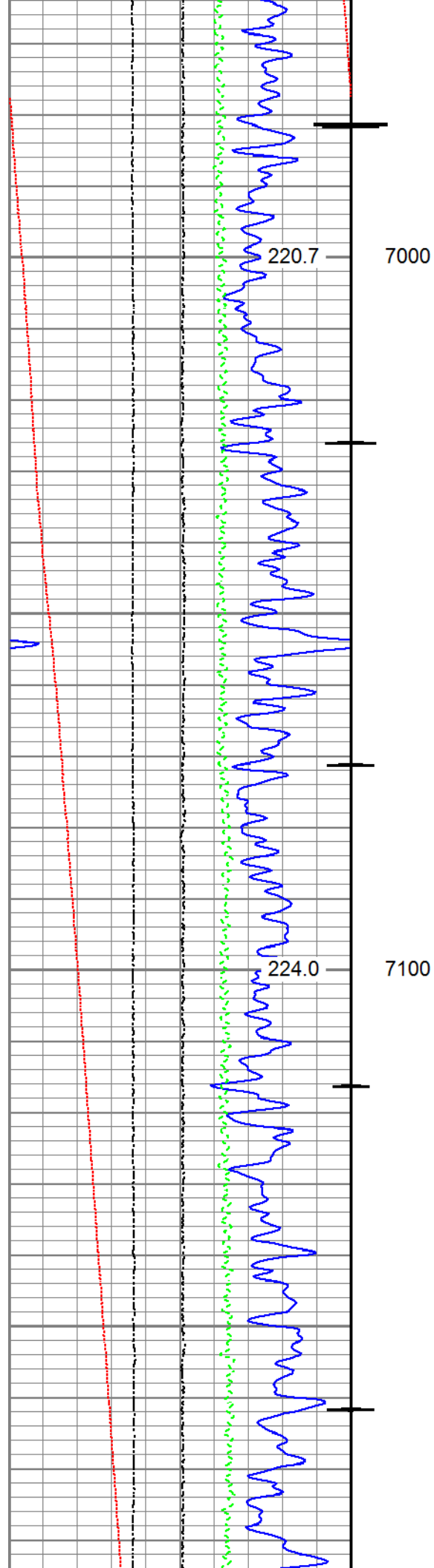


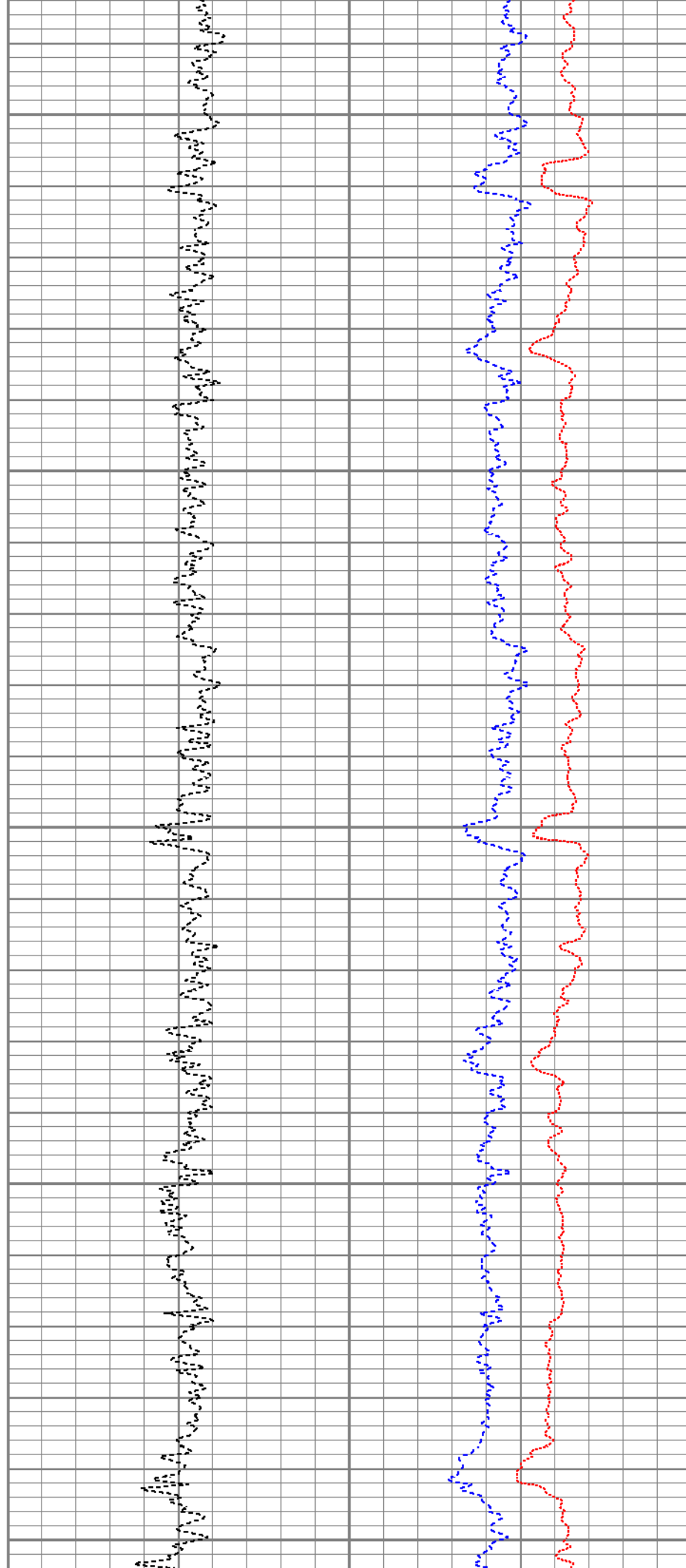
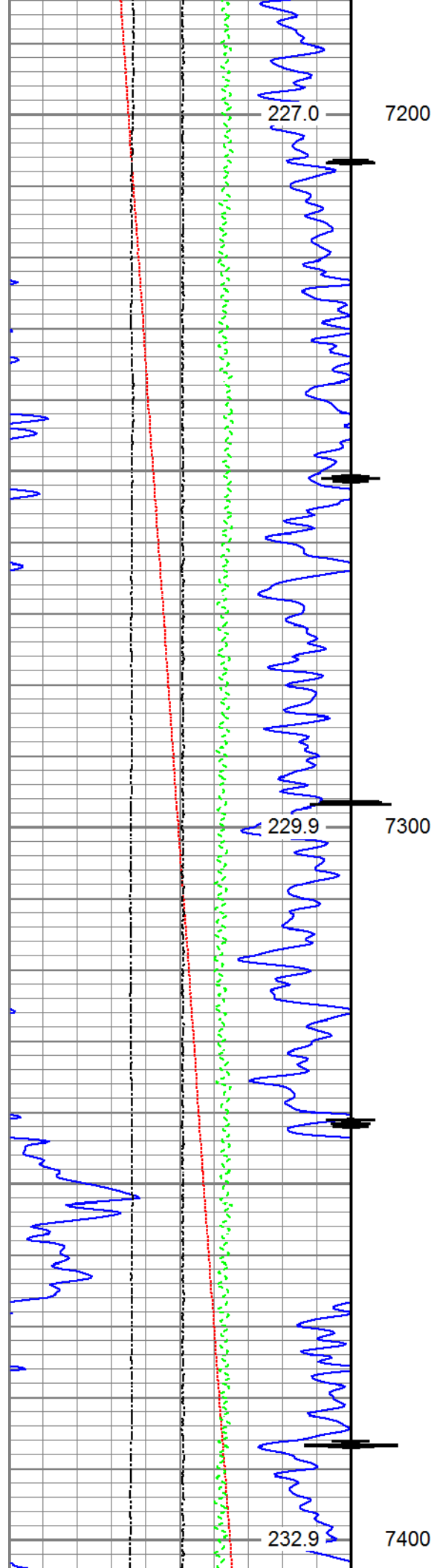


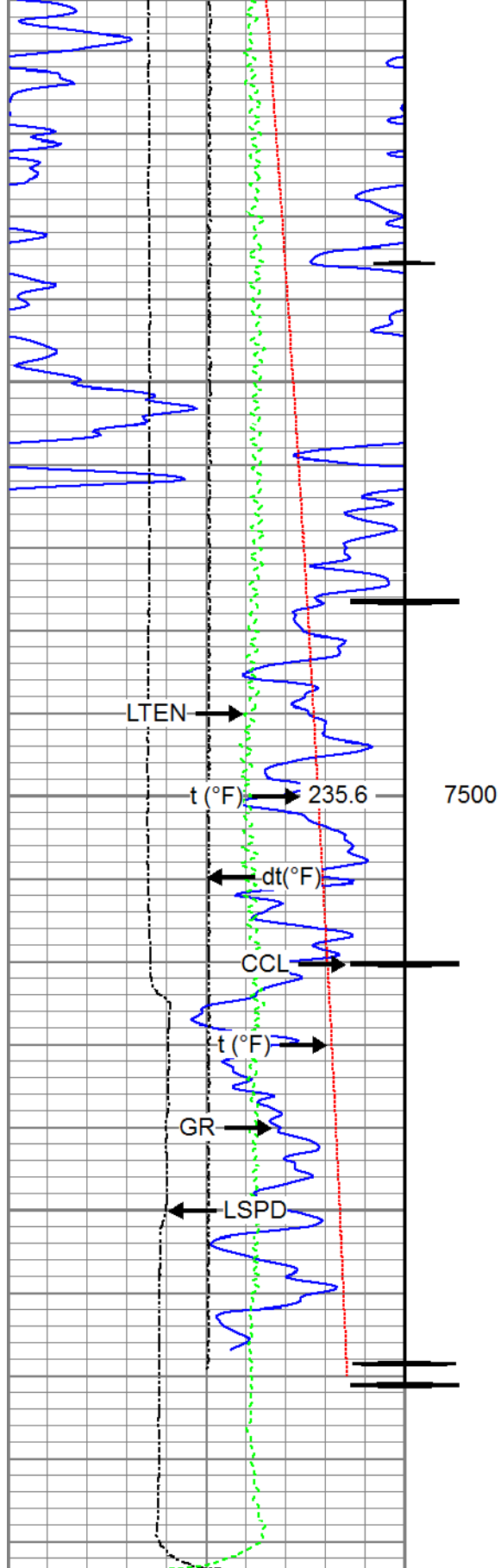




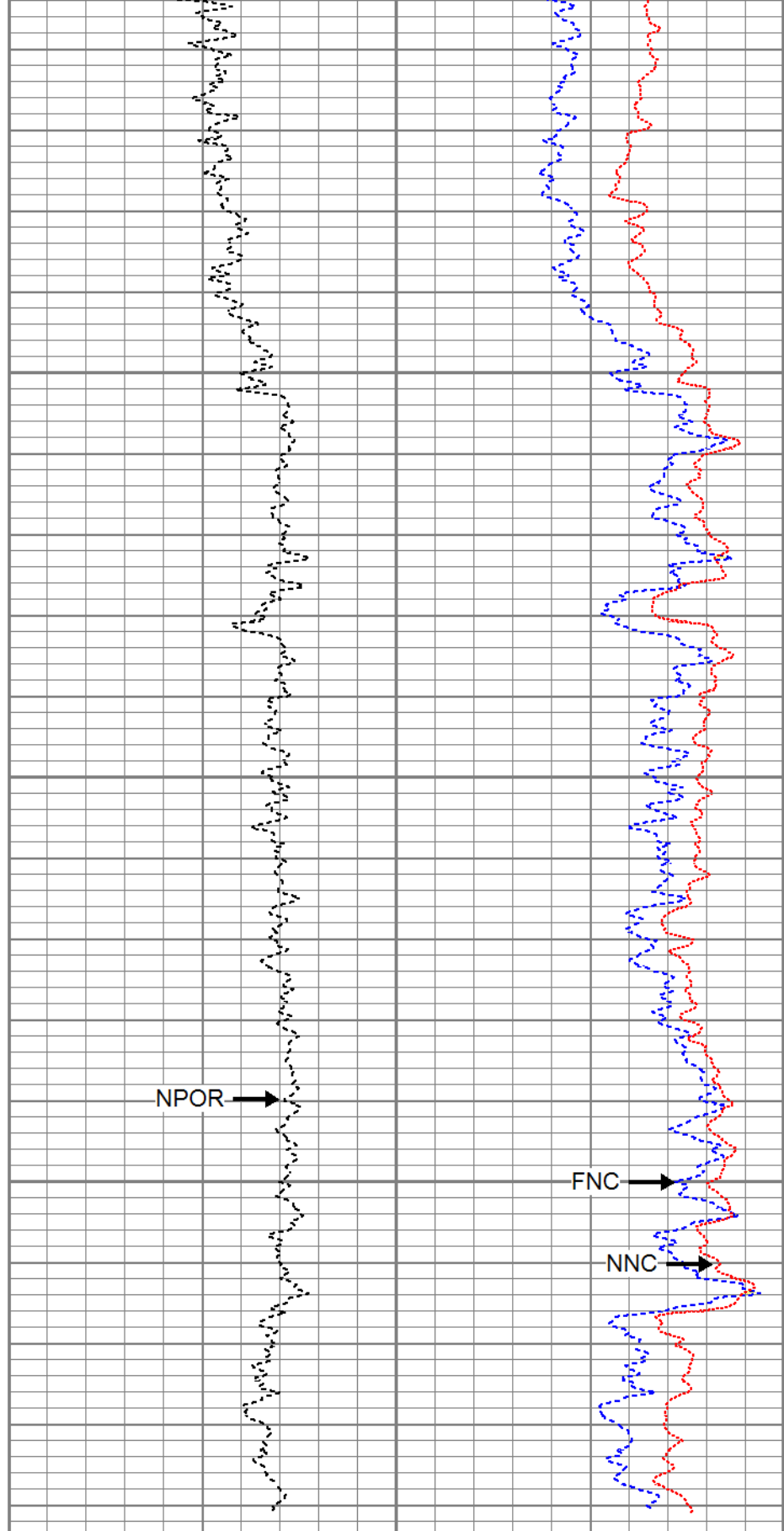








0	Gamma Ray (GAPI)	120
Casing Collar Locator		
0	Temperature (degF)	20
-100	Line Speed (ft/min)	100
0	Line Tension (lb)	2000
Differential Temperature		



60	Neutron Porosity (pu)	0	0	Far Neutron (cps)	1000
Near Neutron (cps)					
0					10000

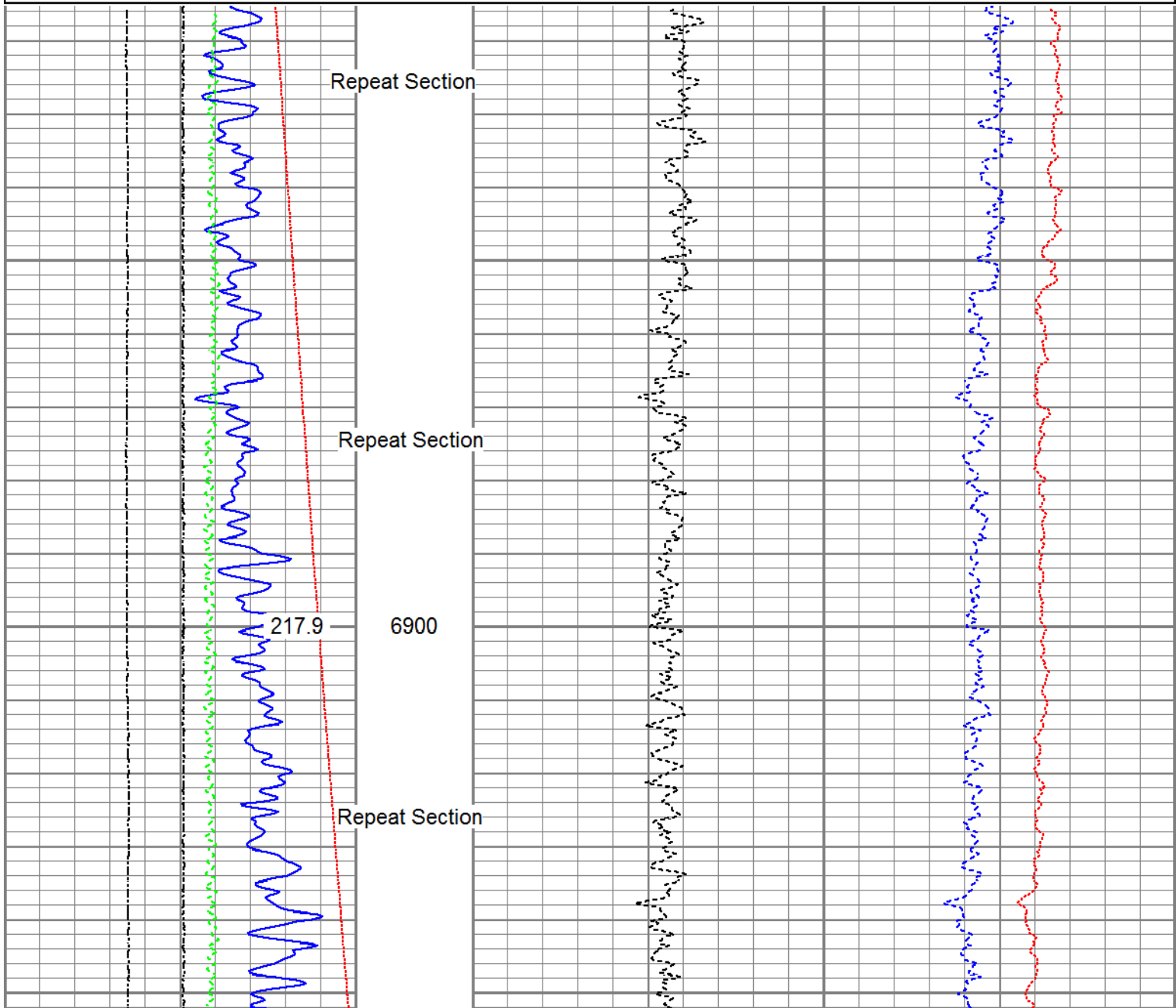


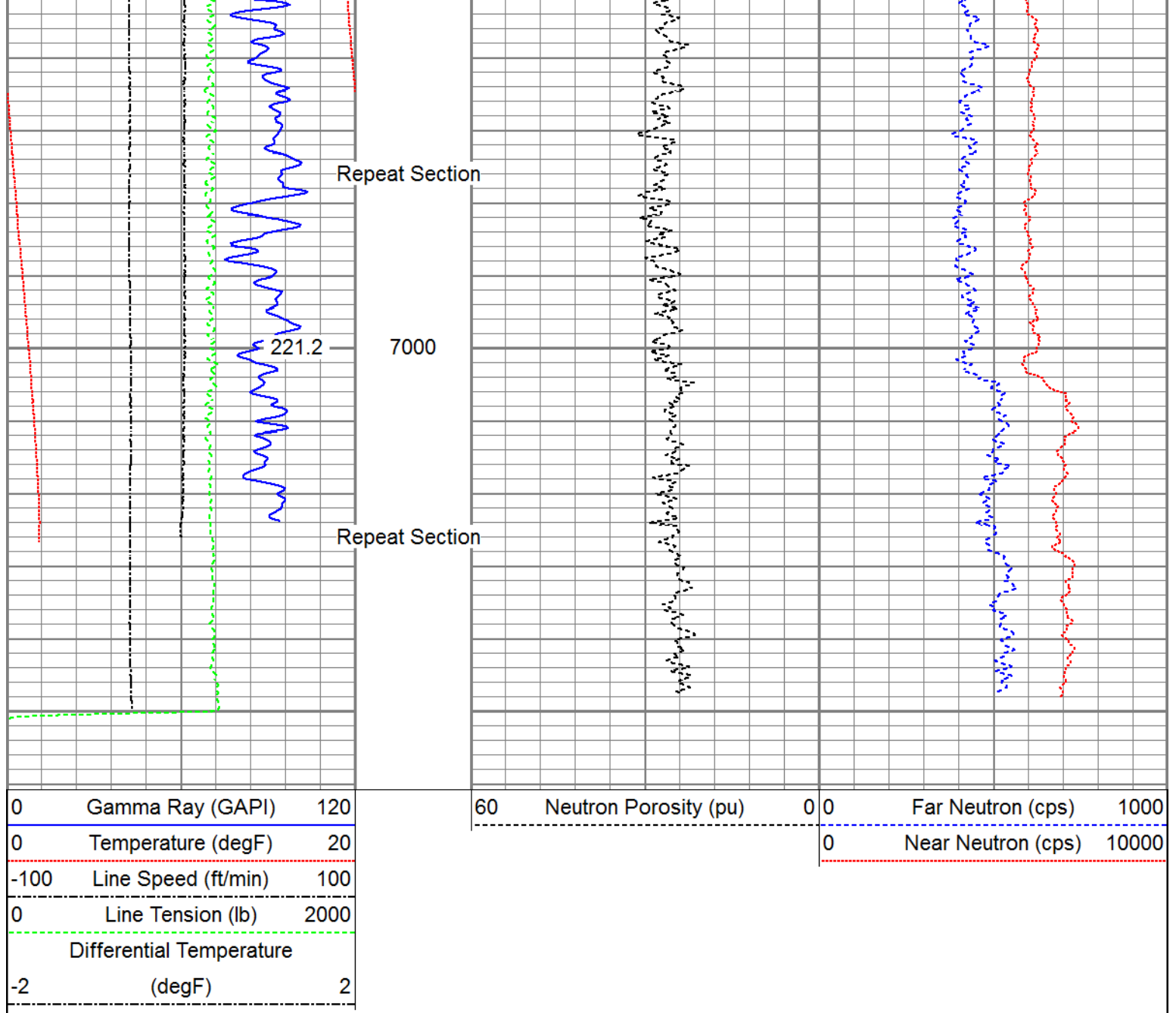
Repeat Pass

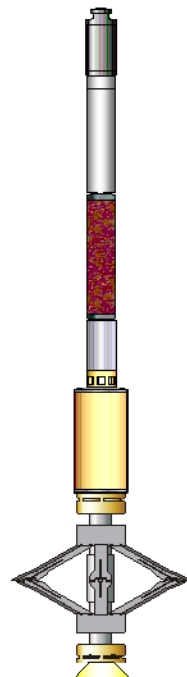
Recorded with 2800 PSI Surface Induced Pressure

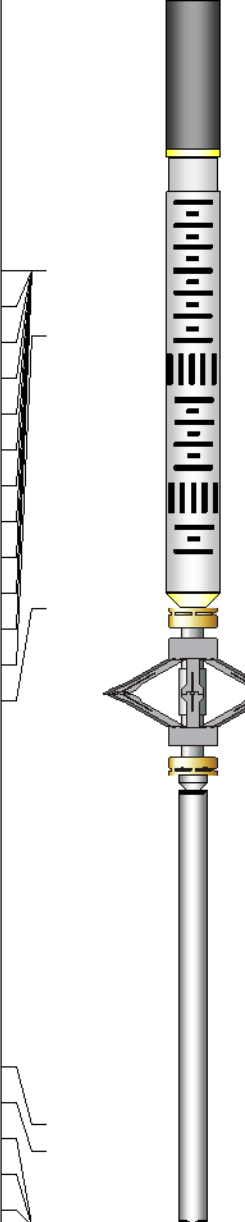
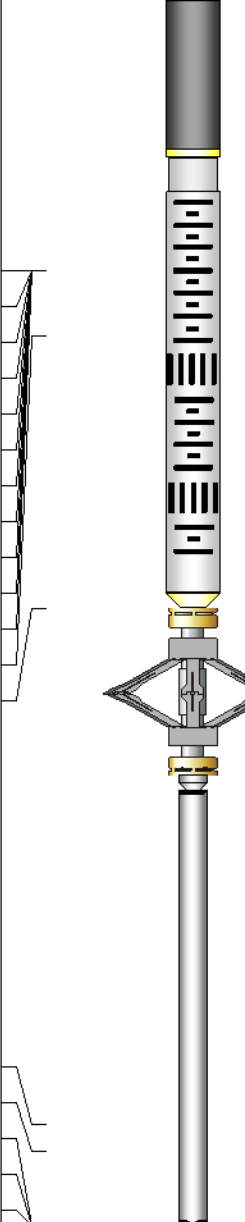
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 Dataset Pathname pass7
 Presentation Format ros_cnl_sx
 Dataset Creation Tue Jul 25 08:47:31 2017
 Charted by Depth in Feet scaled 1:240

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						
	Differential Temperature							
-2	(degF)	2						





Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	24.55		Titan_Electric_Cable_Heads-Titan_1-11/16" Electric Cable Head with 1" Fishing Neck	1.03	1.69	5.40
			UW_AGS-UW_AGS_001 (219135) Sondex Adapter - GO Box to Sondex Pin	0.21	1.69	1.00
			UW_XTU-UW_XTU_002 (10024085) Crossover Ultrawire Toolbus to Ultralink	1.58	1.69	6.50
			UW_PGR-UW_PGR_020 (10024770) Production Gamma Ray	1.92	1.69	9.50
TEMP	23.15		UW_PRT-PRT_016 (10025097) Platinum Resistance Thermometer	1.04	1.69	5.20
CCL	21.91		UW_CCL-UW_CCL_028 (10018437) 3-1/8" Ultrawire Casing Collar Locator	1.61	3.13	36.00
			UW_PRC-DSS_RAC 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00

CBLROT	14.51		UW_RBT-UW_RBT_004 (1063) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.48	3.13	140.00
CBLTEMP	14.51					
WVFS8	14.51					
WVFS7	14.51					
WVFS6	14.51					
WVFS5	14.51					
WVFS4	14.51					
WVFS3	14.51					
WVFS2	14.51					
WVFS1	14.51					
WVF3FT	14.51					
WVF5FT	13.51					
CBLTEMP	9.38					
			UW_PRC-DSS_RAC 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00
			UW_BUL-UW_BUL_006 (031422) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
			UW_CNL-UW_CNL_007 (1005) Sondex Compensated Neutron Logging Tool	6.61	1.69	30.00
CNLSC	1.53					
CNSSC	1.12					
HVOLTX	0.00					
ITEMPX	0.00					
TSTAMP	0.00					
Dataset: PROCESSED_0512343809_Anadarko_Babcock 33C-33HZ_RBL_CNL_07-25-17.db: field/well/run1/pass9						
Total length: 28.80 ft						
Total weight: 298.80 lb						
O.D.: 3.13 in						

Calibration Report			
Database File	C:\ProgramData\Warrior\Data\Anadarko_Babcock 33C-33HZ_RBL_CNL_07-25-17\PROCESSED_0512343809_Anadarko_Babcock 33C-33HZ_RBL_CNL_07-25-17		
Dataset Pathname	pass9		
Dataset Creation	Tue Jul 25 08:59:00 2017		
Compensated Neutron Calibration Report			
Serial Number:	1005		
Tool Model:	UW_CNL_007		
Master Calibration	Sun Feb 07 11:39:11 2016		
Detector	Readings		
Short Space	240.87	cps	
Long Space	303.55	cps	
	Measured	Reference	
Ratio	0.8150	Sleeve: 1.0000	
CNRAT Gain K	1.0271		

Before Survey			
Detector		Readings	
Short Space		cps	
Long Space		cps	
		Measured	Reference
Ratio			

After Survey			
Detector		Readings	
Short Space		cps	
Long Space		cps	
		Measured	Reference
Ratio			

Segmented Cement Bond Log Calibration Report			
Serial Number:		1063	
Tool Model:		UW_RBT_004	
Calibration Casing Diameter:		7.000	in
Calibration Depth:		305.118	ft

Master Calibration, performed (Derived):						
	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.083	1.093	0.800	71.921	60.452	5.830
5FT	-0.010	1.081	0.800	71.921	65.173	1.473
S1	-0.064	0.979	0.000	100.000	95.881	6.173
S2	-0.062	0.985	0.000	100.000	95.551	5.901
S3	-0.061	0.965	0.000	100.000	97.476	5.954
S4	-0.068	0.954	0.000	100.000	97.841	6.690
S5	-0.073	0.921	0.000	100.000	100.643	7.348
S6	-0.082	0.938	0.000	100.000	98.034	8.002
S7	-0.069	0.963	0.000	100.000	96.856	6.713
S8	-0.074	0.967	0.000	100.000	96.122	7.093

Temperature Calibration Report					
Serial Number:		10025097			
Tool Model:		PRT_016			
Performed:		Sun Oct 11 12:34:58 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:	10024770	
Tool Model:	UW_PGR_020	
Performed:	Mon Oct 12 16:33:44 2015	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	1.0000	GAPI/cps



RELIANCE
DILLFIELD SERVICES

Company	Kerr-McGee Oil & Gas Onshore, L.P.
Well	Babcock 33C-33HZ
Field	Wattenberg
County	Weld
State	Colorado