



Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	Noble Energy Inc.			Company	Noble Energy Inc.		
Well	Remora LC34-745			Well	Remora LC34-745		
Field	Wildcat			Field	Wildcat		
County	Weld			County	Weld		
State	Colorado			State	Colorado		
Location:				API # : 05-123-40599			
SEC 34 TWP 9N RGE 59W				Other Services			
				MIT			
Permanent Datum	Ground Level	Elevation	4816'	Elevation			
Log Measured From	Kelly Bushing	24 FT		K.B. 4840'			
Drilling Measured From	Kelly Bushing			D.F. 4839'			
				G.L. 4816'			

Date	19-Feb-2016									
Run Number	One									
Depth Driller	10355 FT									
Depth Logger	6299 FT									
Bottom Logged Interval	6294 FT									
Top Log Interval	Surface									
Open Hole Size	8.750"									
Type Fluid	Water									
Density / Viscosity	8.34 lbm/gal									
Max. Recorded Temp.	218 °F									
Estimated Cement Top	798 FT									
Time Well Ready	ROA									
Time Logger on Bottom	08:30									
Equipment Number	HD-0343									
Location	Fort Lupton, CO									
Recorded By	W.Wacker									
Witnessed By	Bill Mansfield									
Run Number	Borehole Record					Tubing Record				
	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	24 FT	611.2 FT					
Intermediate #1	7	26	P-110 IC	24 FT	6444.4 FT					
Intermediate #2										
Liner	4 1/2	11.6	P-110 IC	6309.1 FT	10345 FT					

<<< 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 Kelly Bushing at 24 FT
Log ran from 10 FT above Liner Top to surface
Recorded with 2500 PSI surface induced pressure
Logging tools were clean and free of any debris upon completion of operations

Thank you for choosing FMC Technologies Surface Integrated Services.

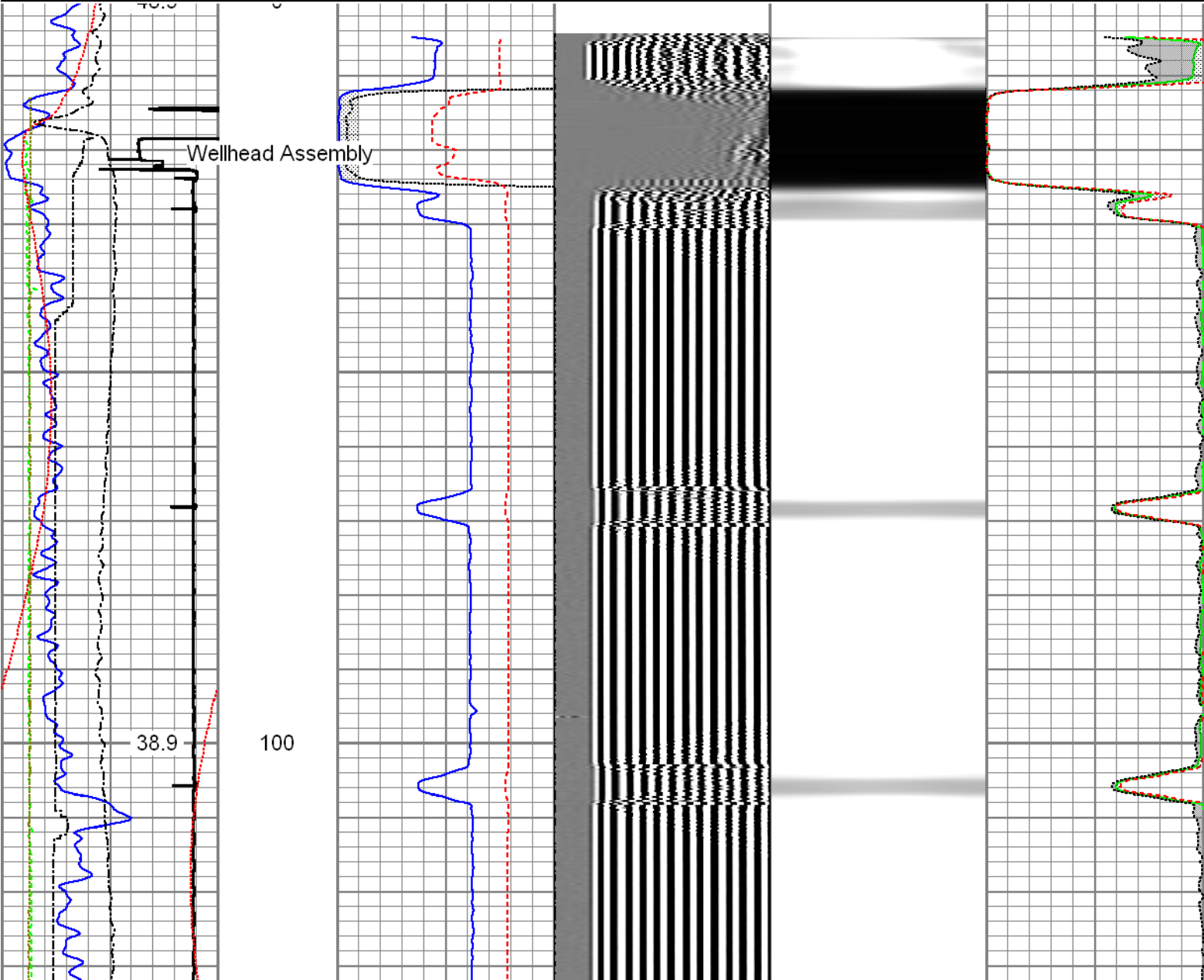


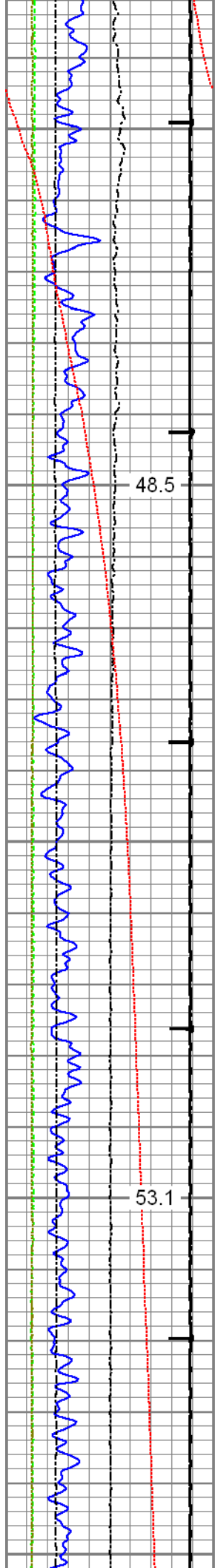
Main Pass

Recorded with 2500 PSI Surface Induced Pressure

Database File: 02-19-16_noble energy_remora lc34-745_mit_rbl.db
Dataset Pathname: main_a
Presentation Format: rbt4_mit
Dataset Creation: Fri Feb 19 08:29:40 2016 by Log 7.0 B1
Charted by: Depth in Feet scaled 1:240

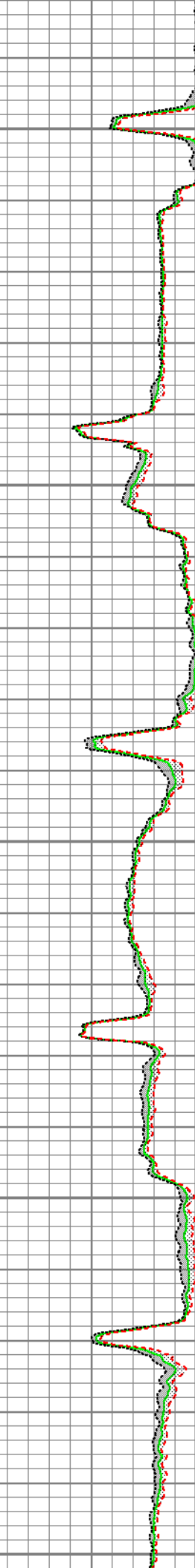
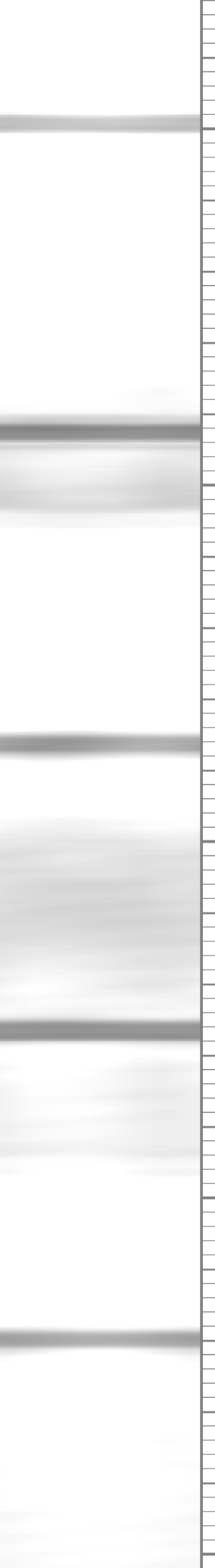
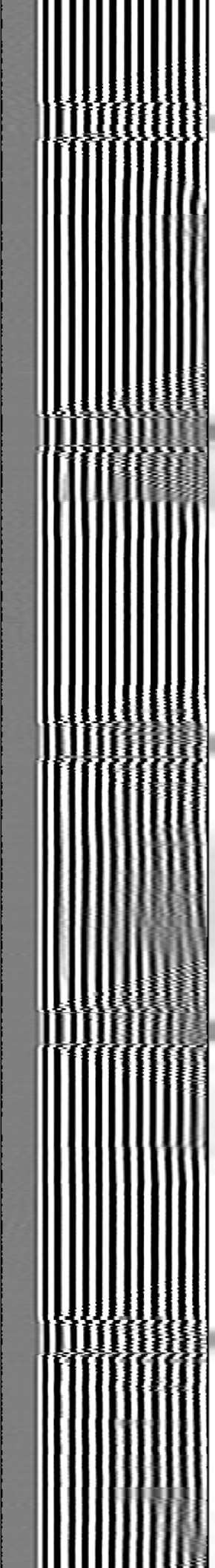
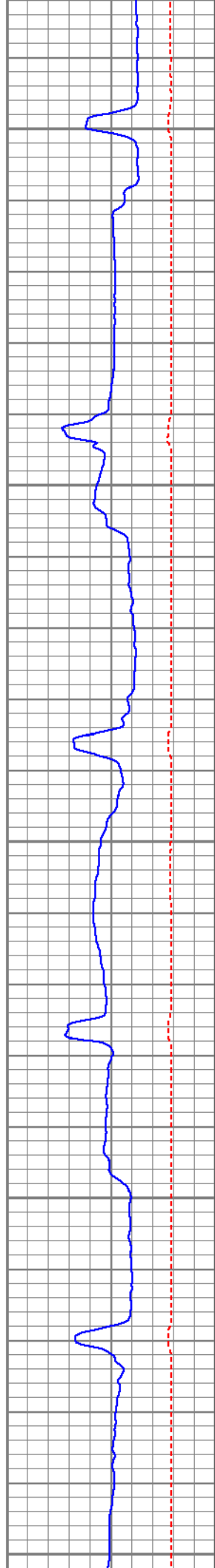
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000				
Differential Temperature				
-2 (degF) 2				
Temperature				
0 (degF) 20				
-10 Deviation (°) 90				

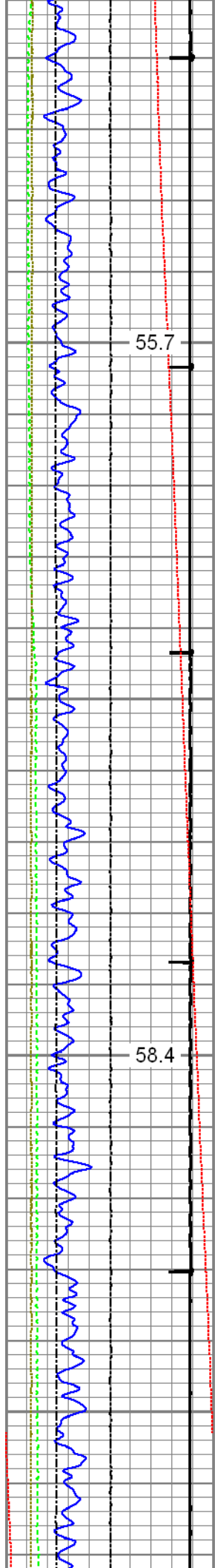




200

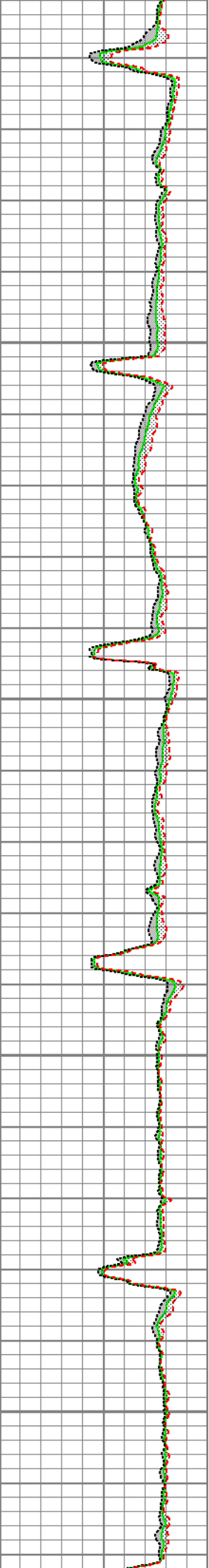
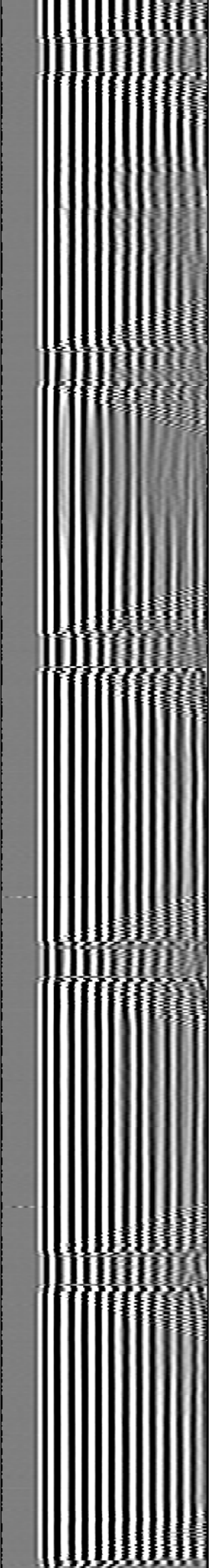
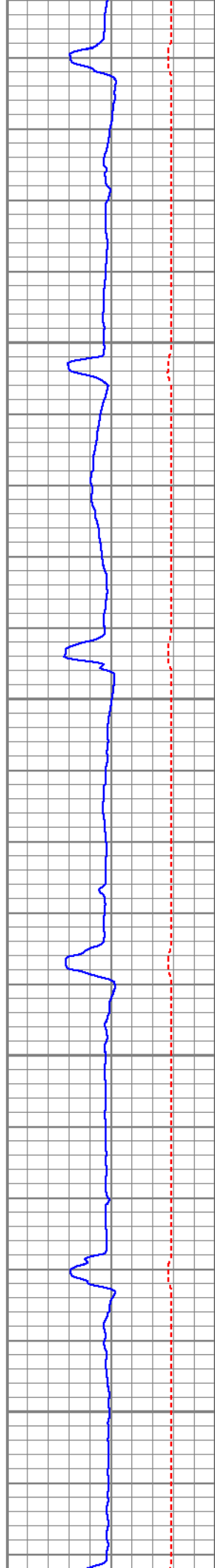
300

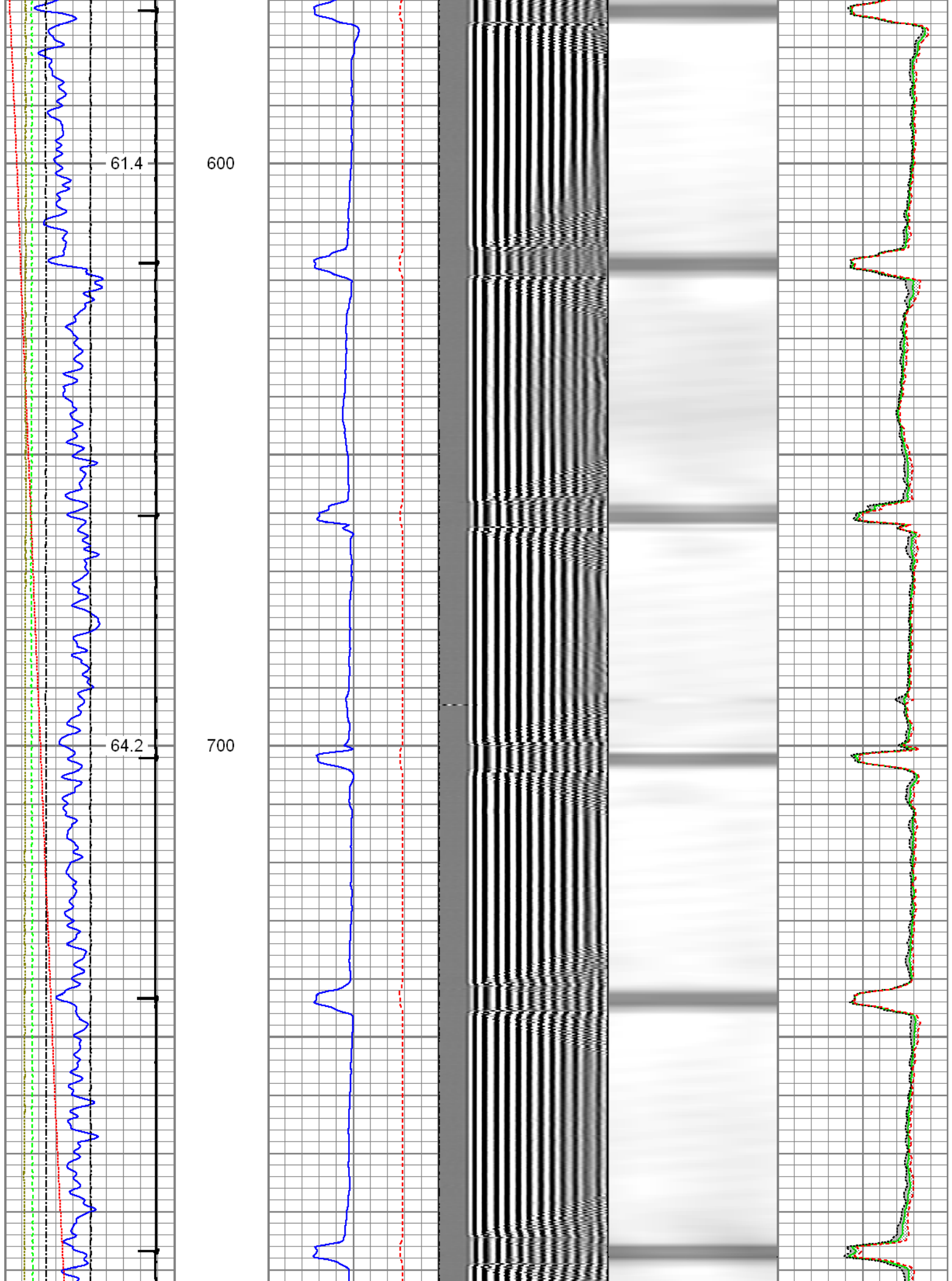


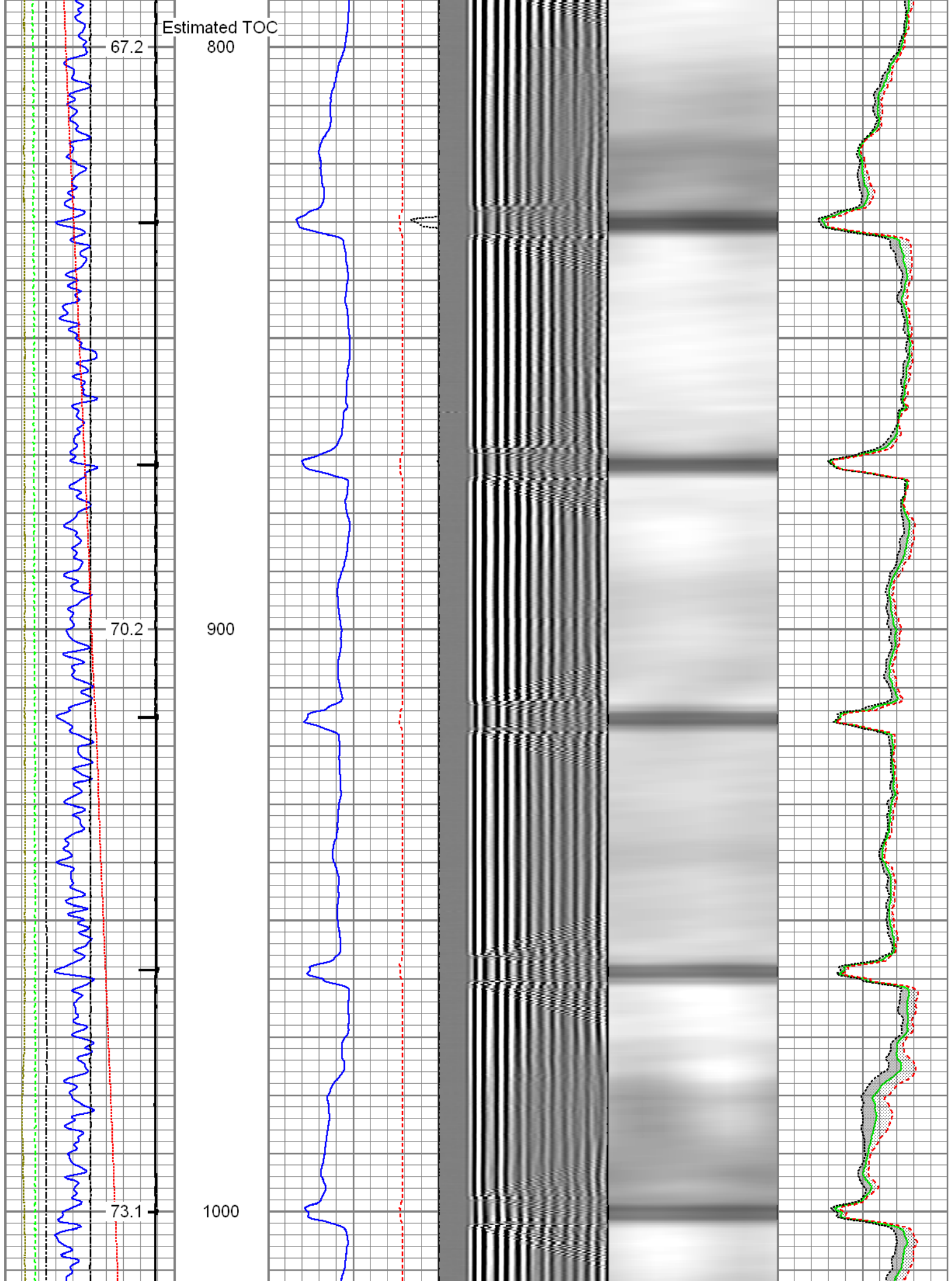


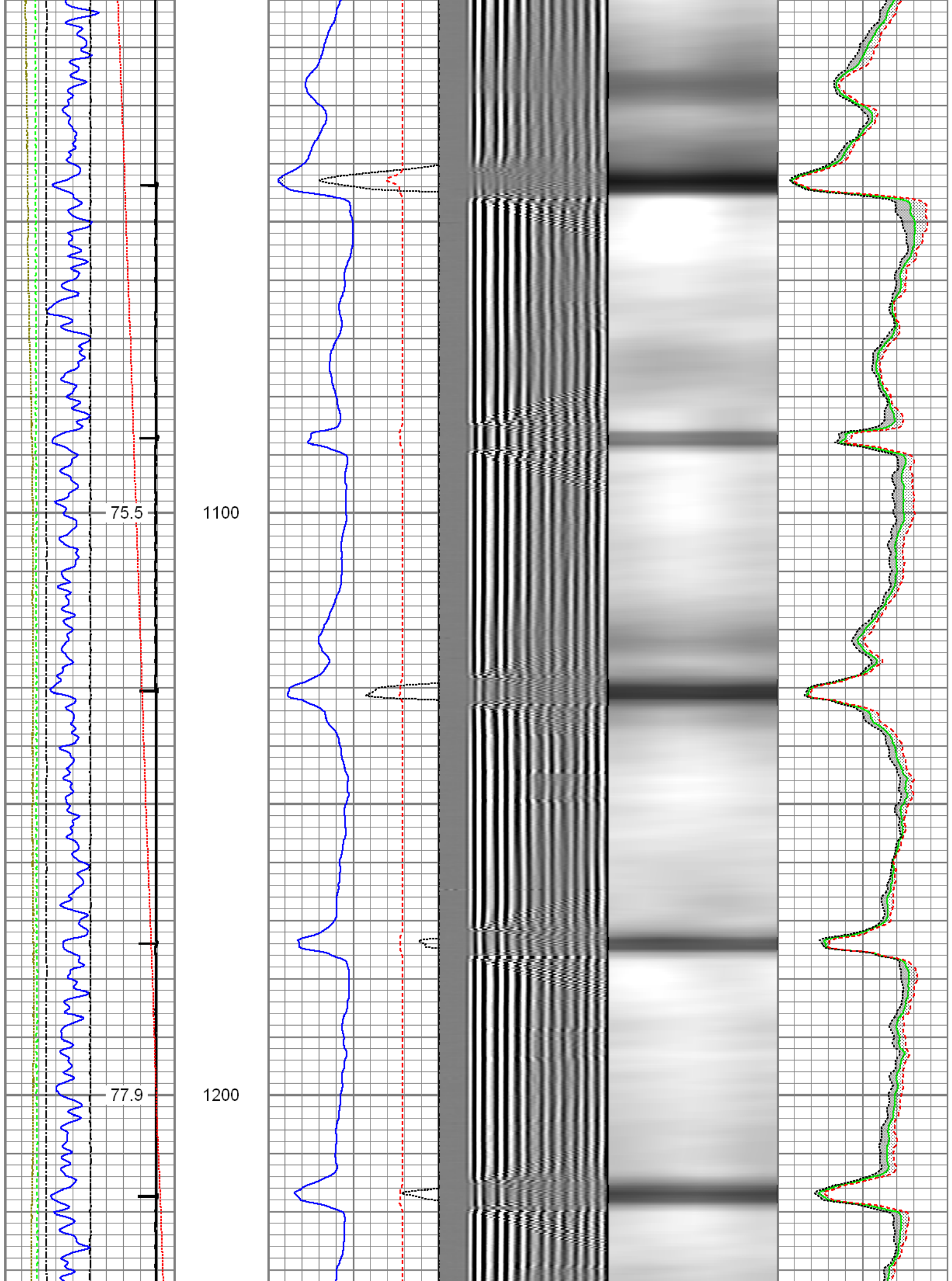
400

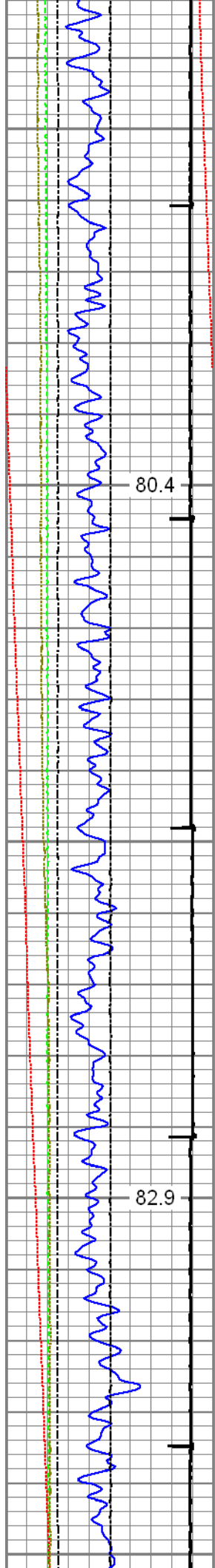
500









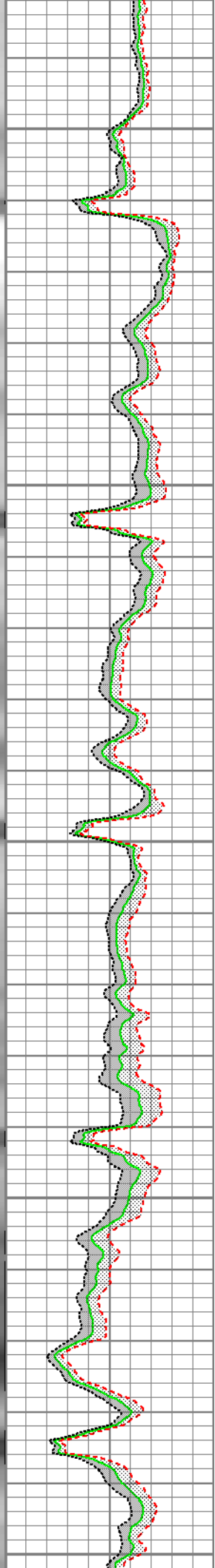
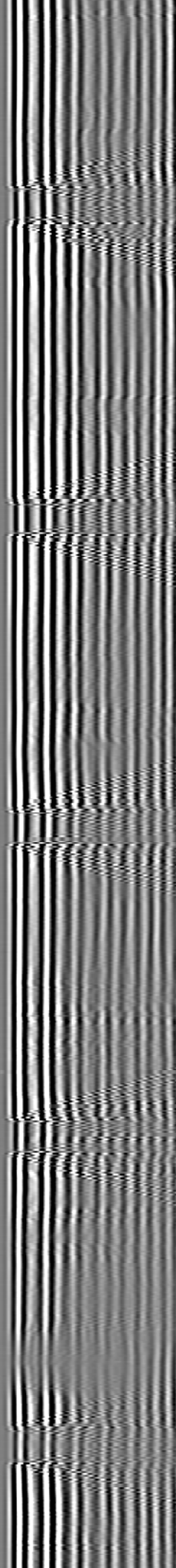
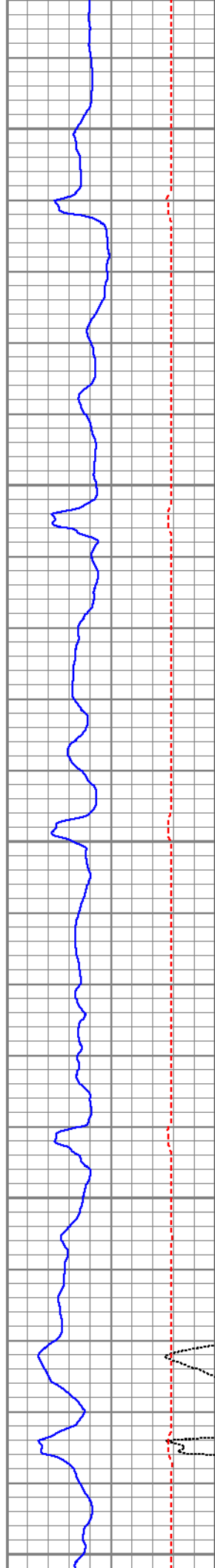


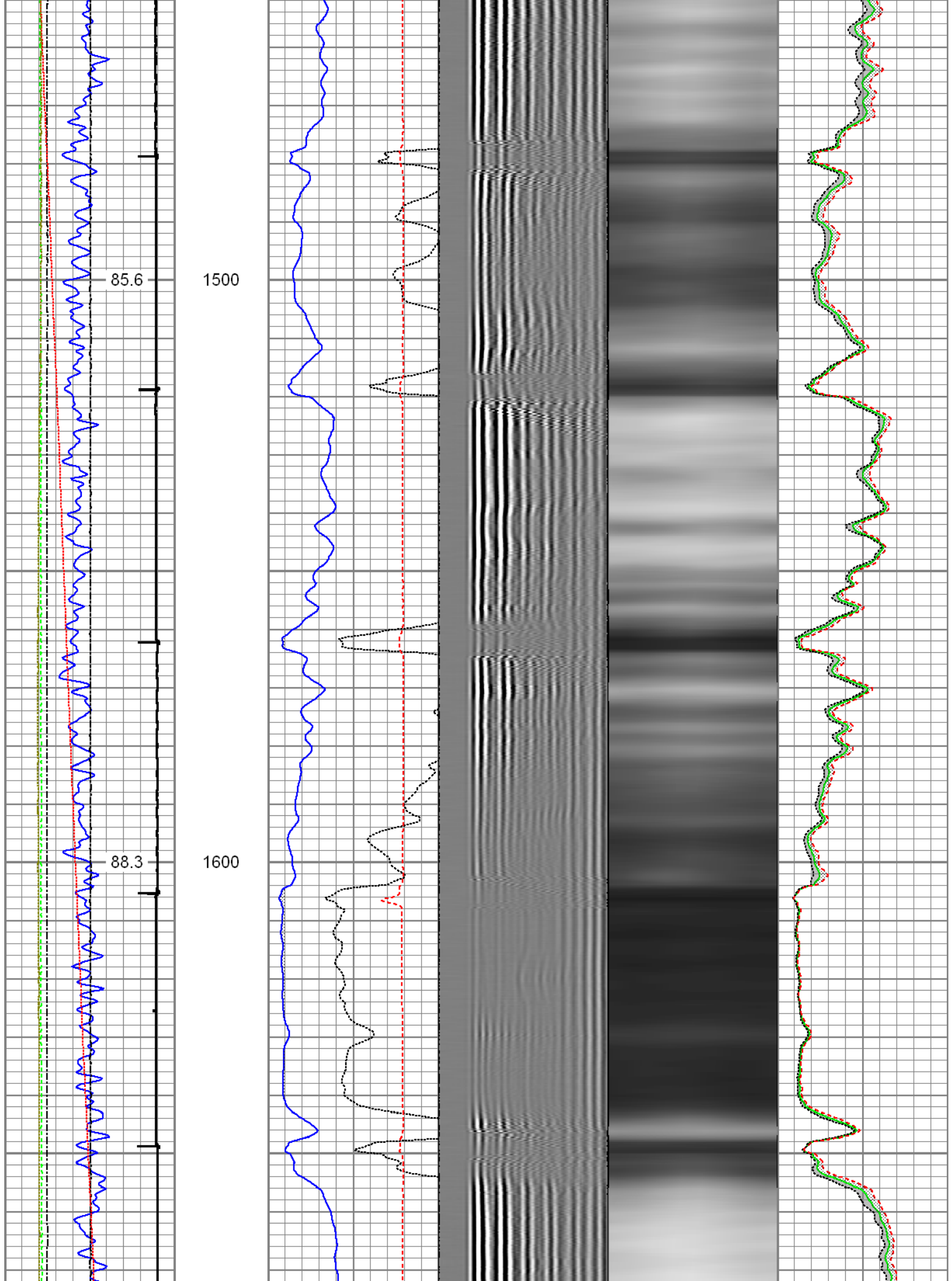
1300

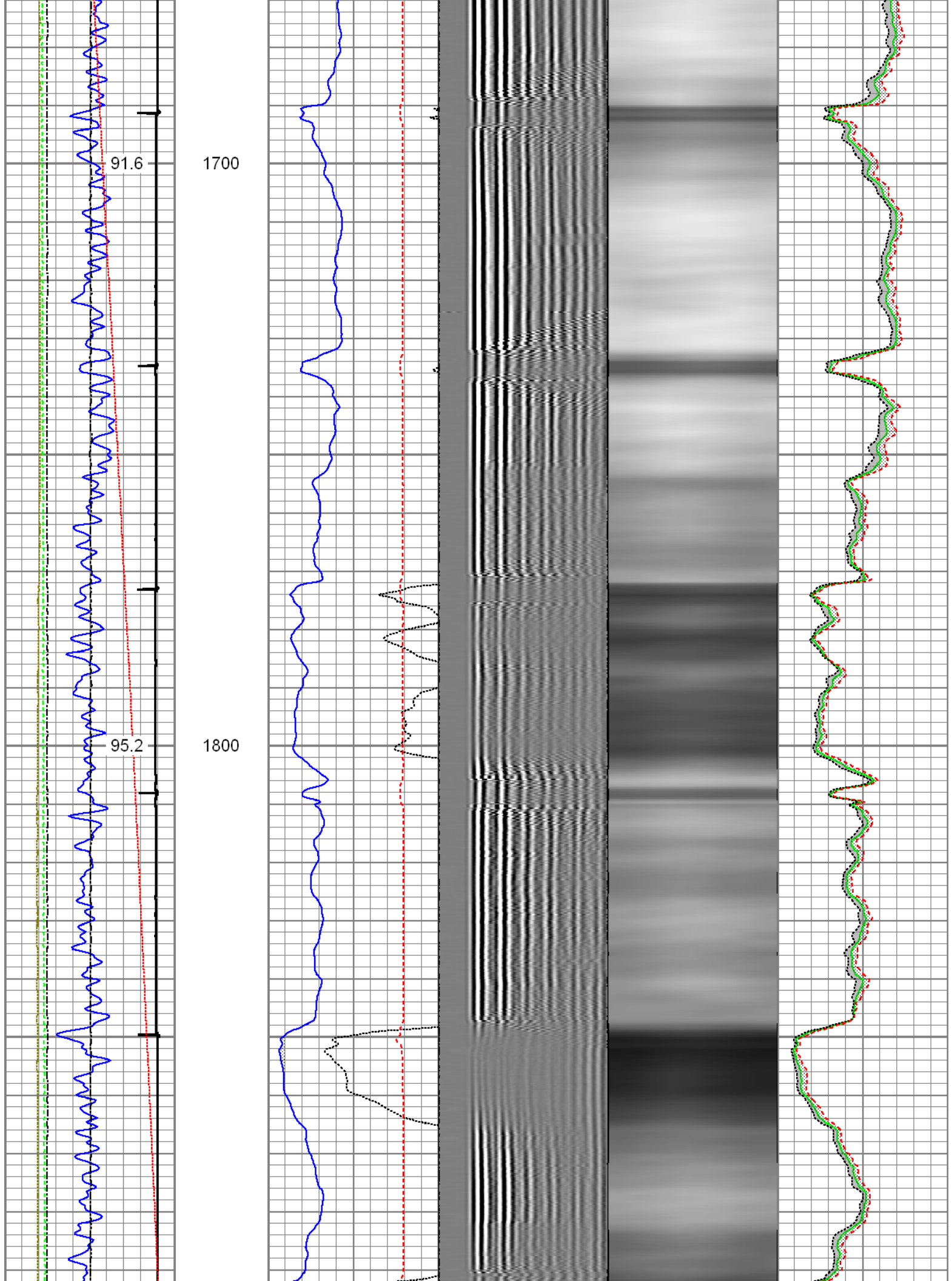
80.4

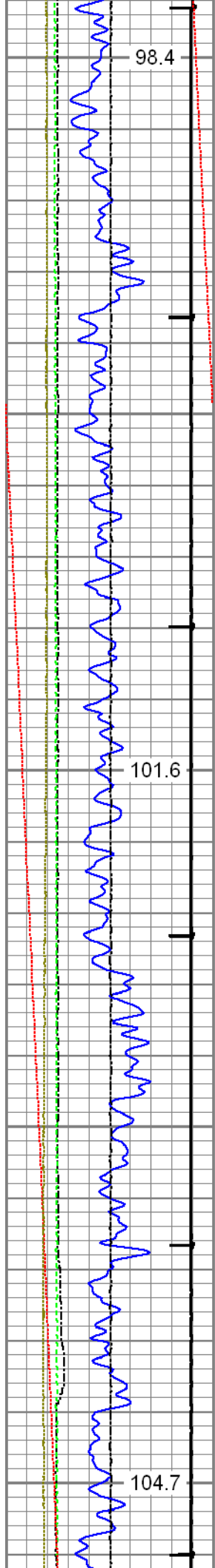
1400

82.9





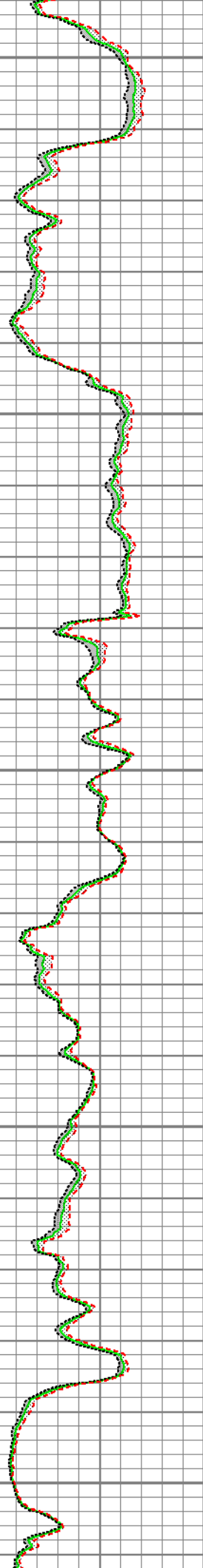
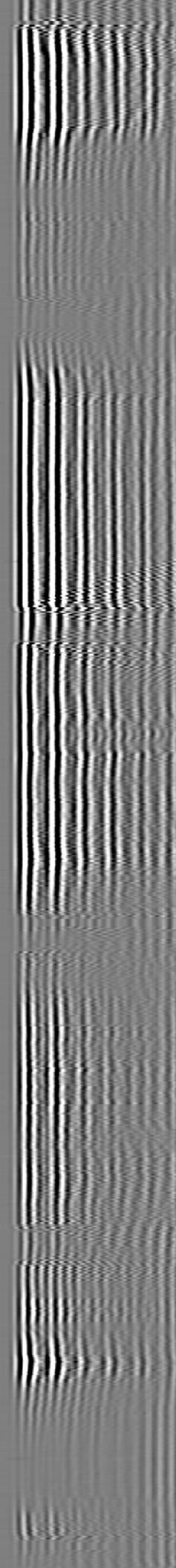
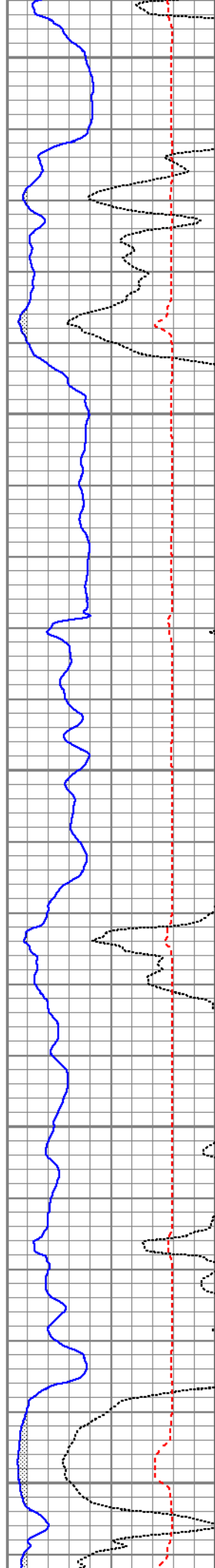


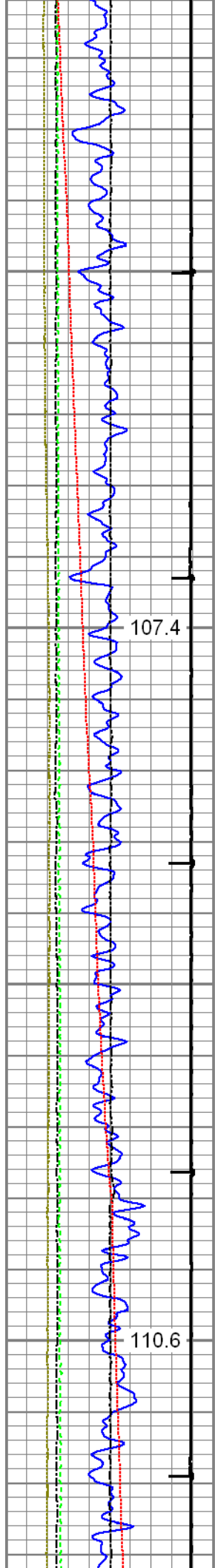


1900

2000

2100



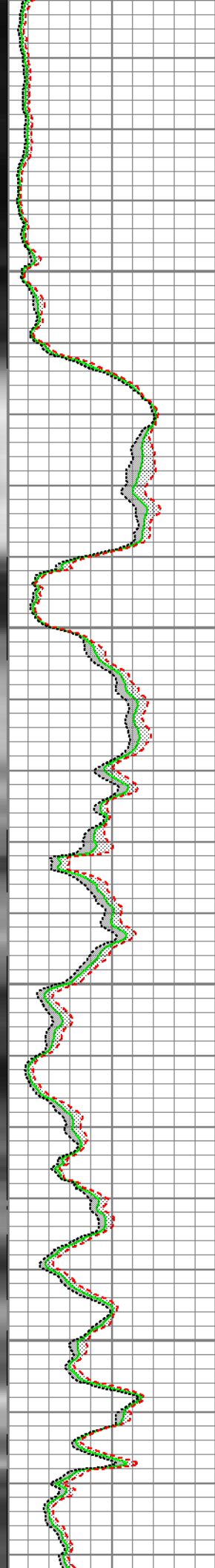
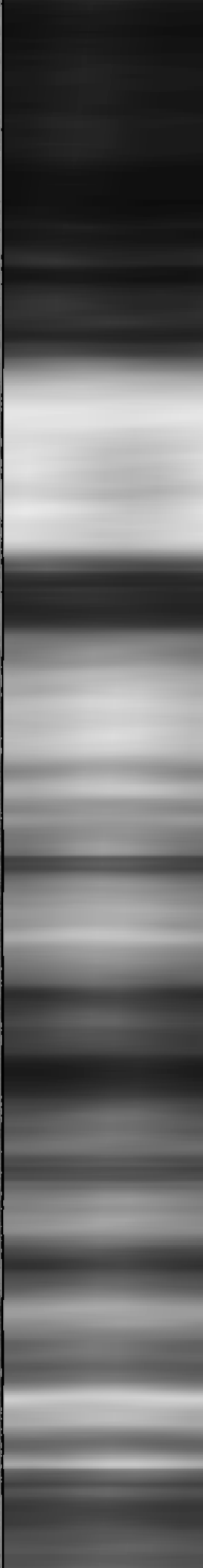
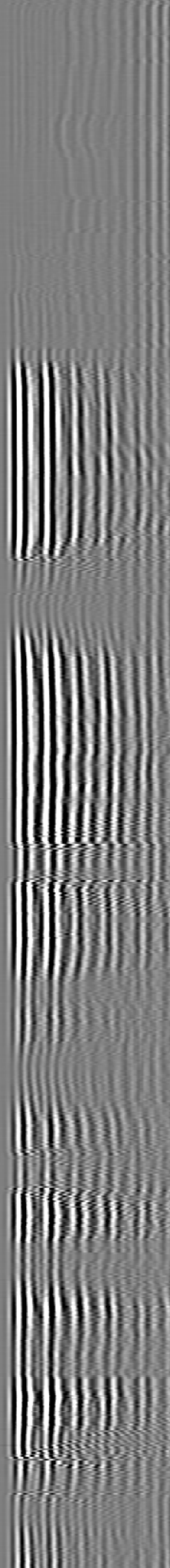
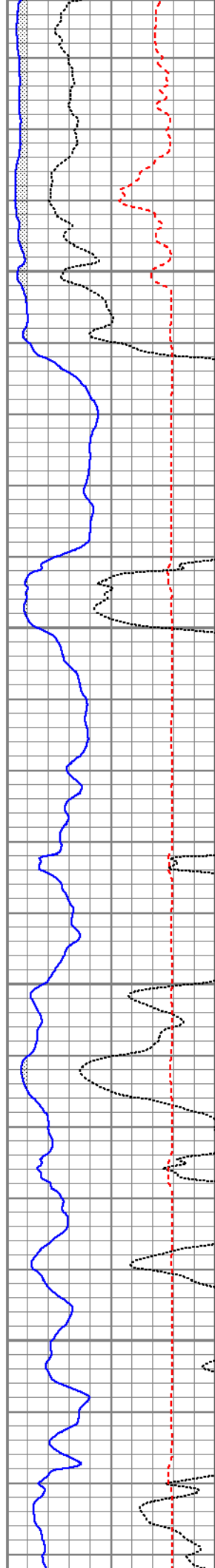


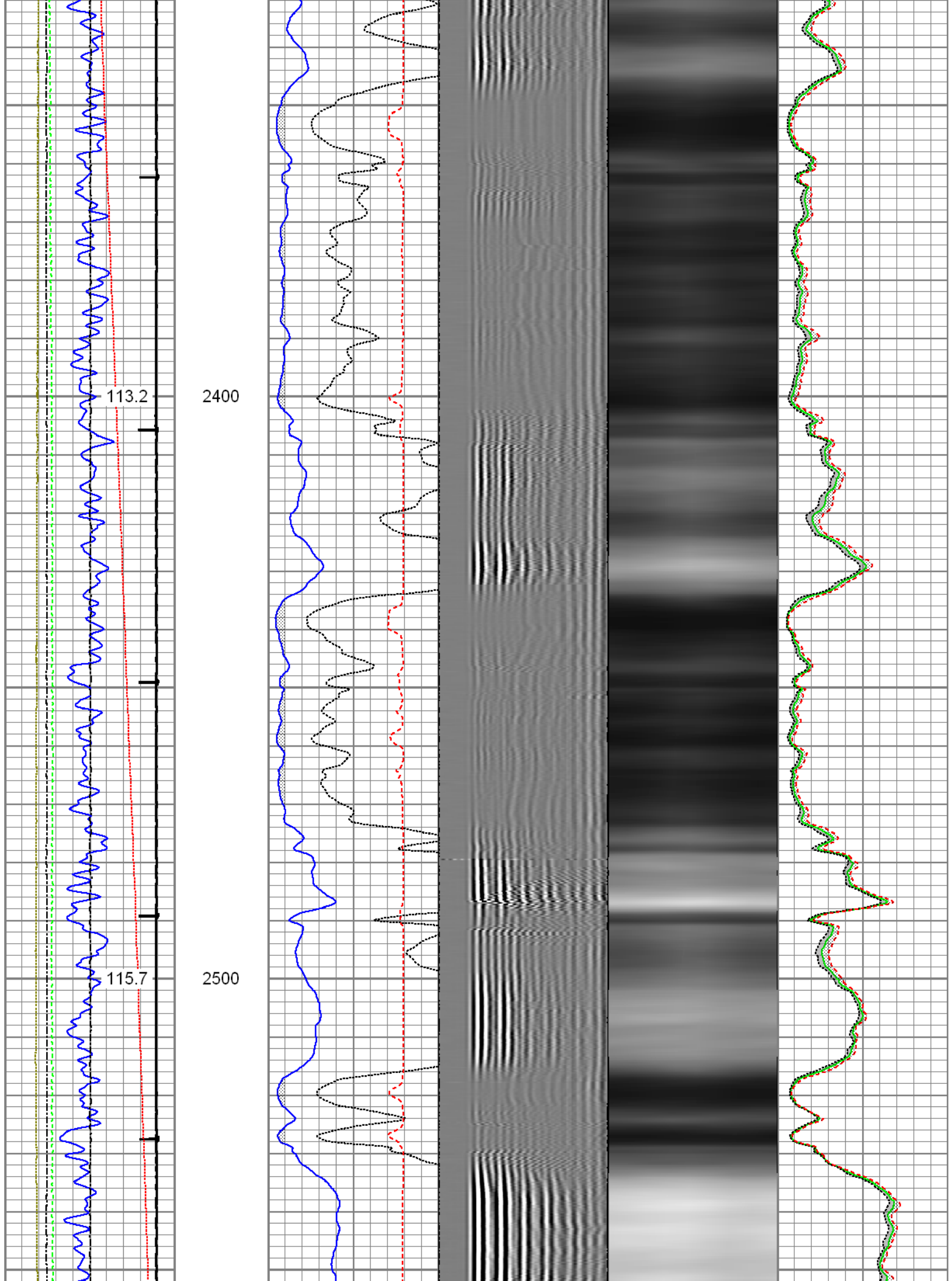
107.4

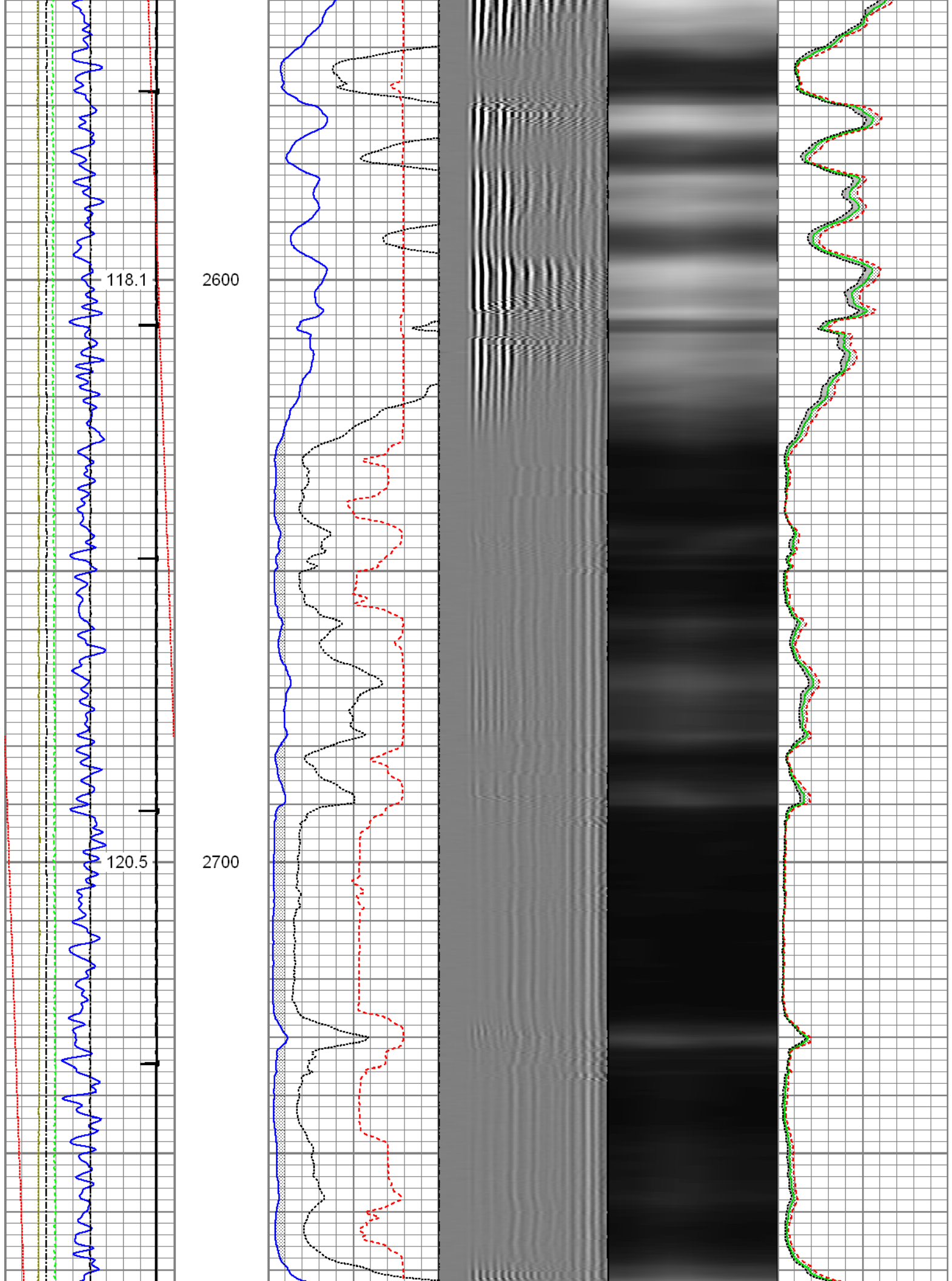
110.6

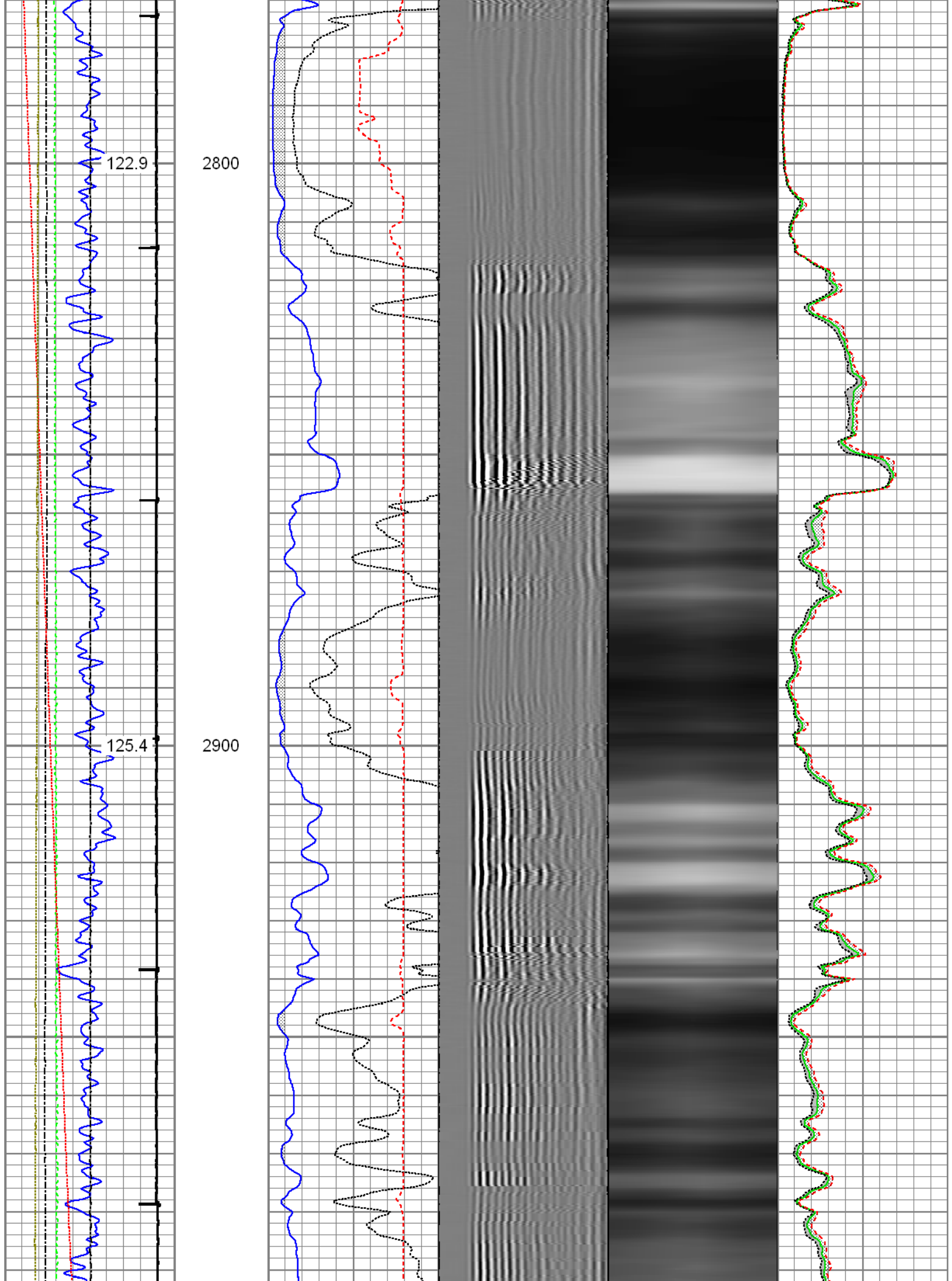
2200

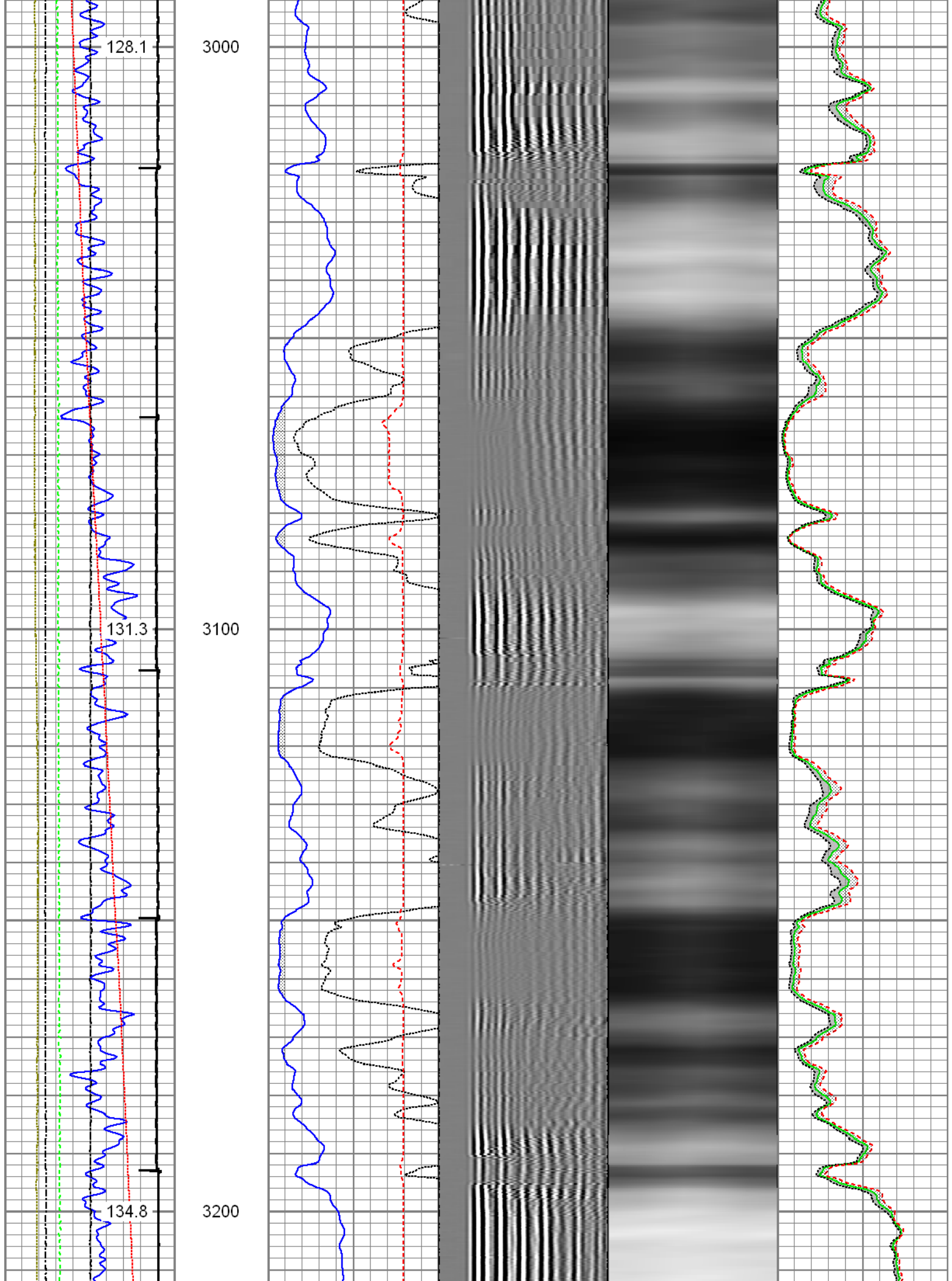
2300

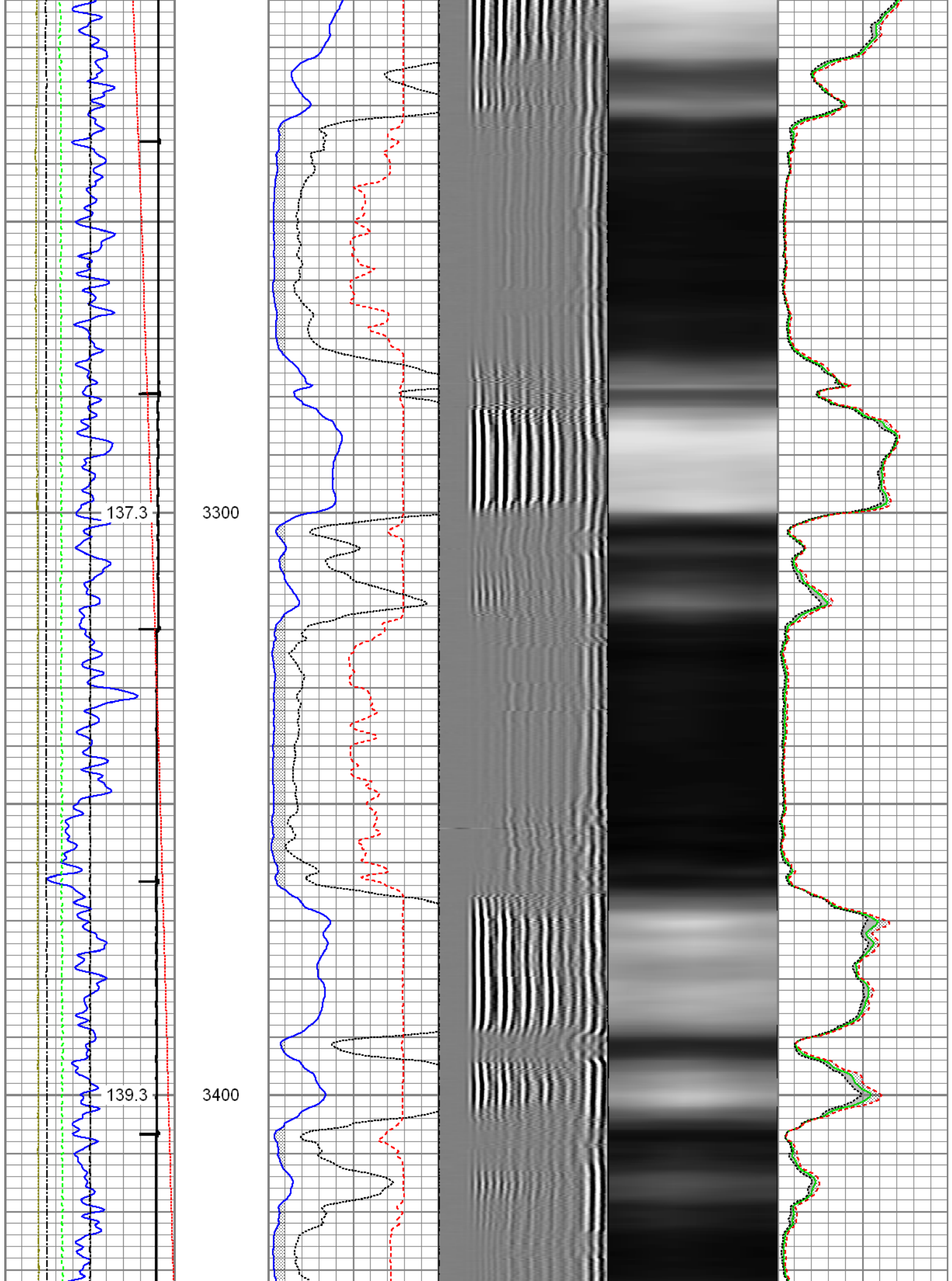


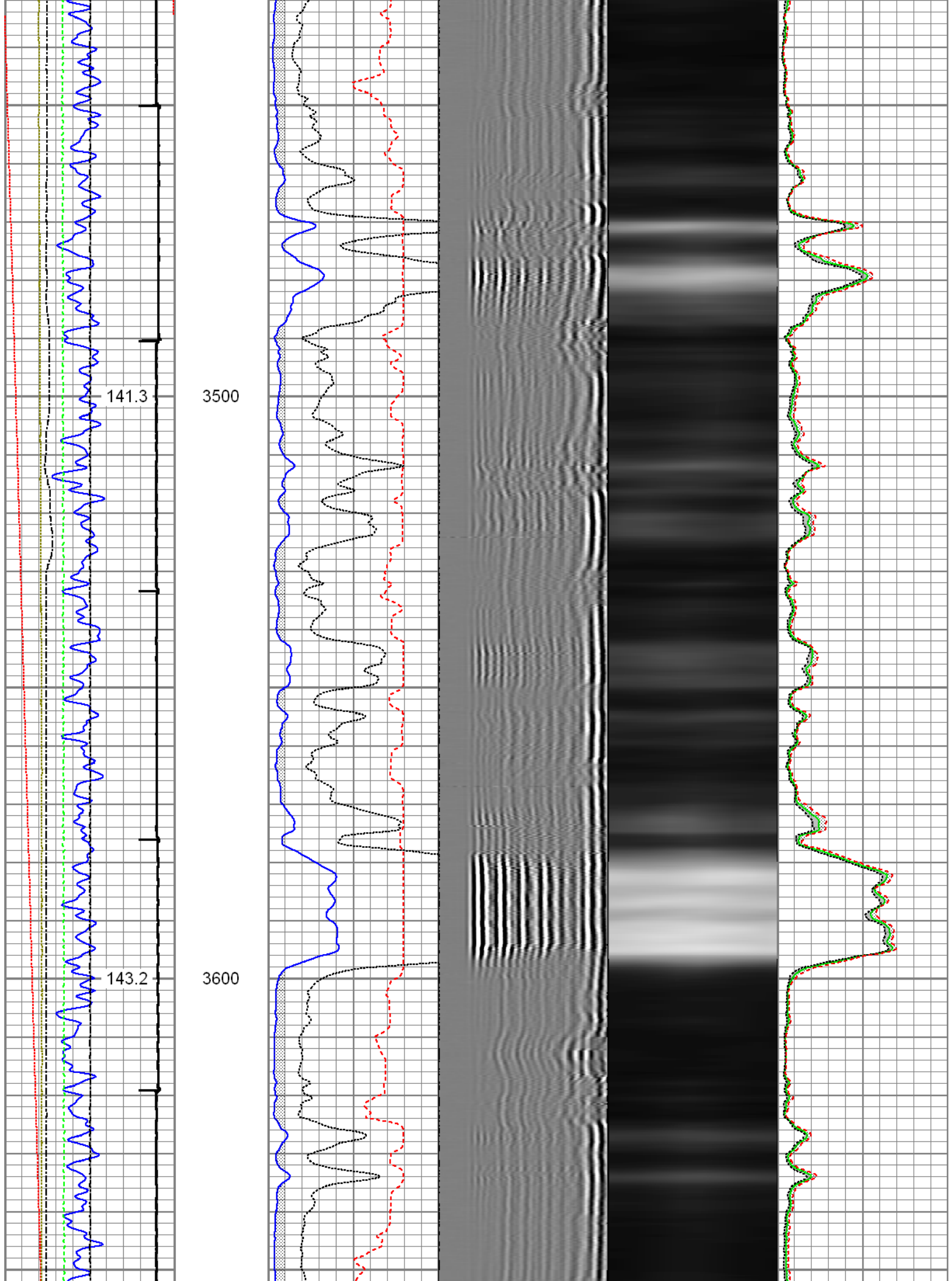


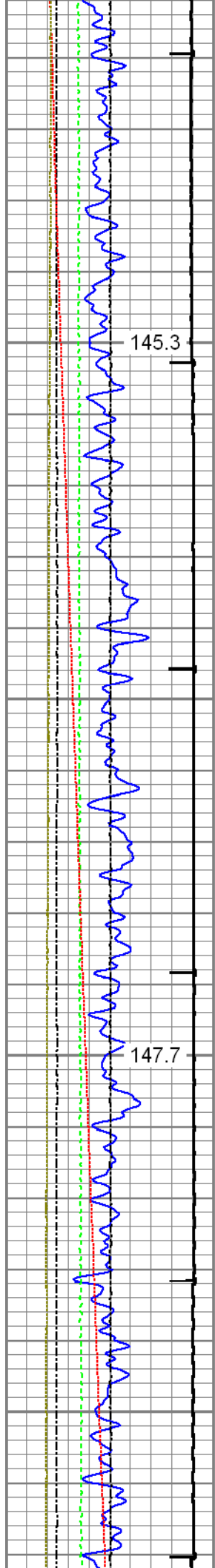






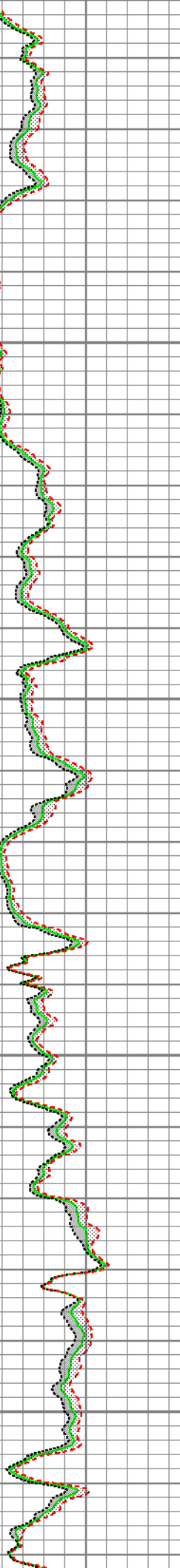
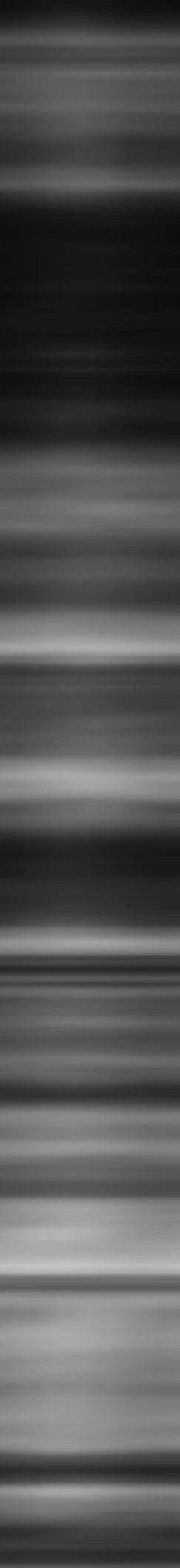
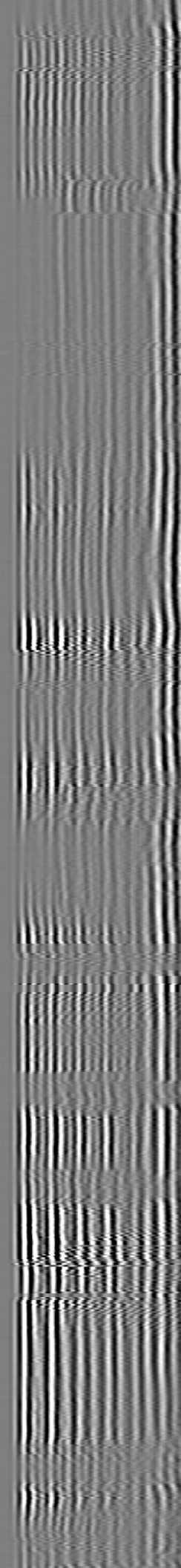
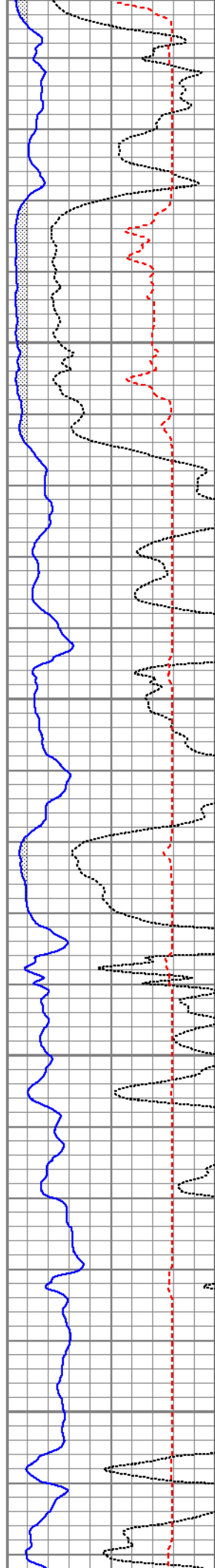


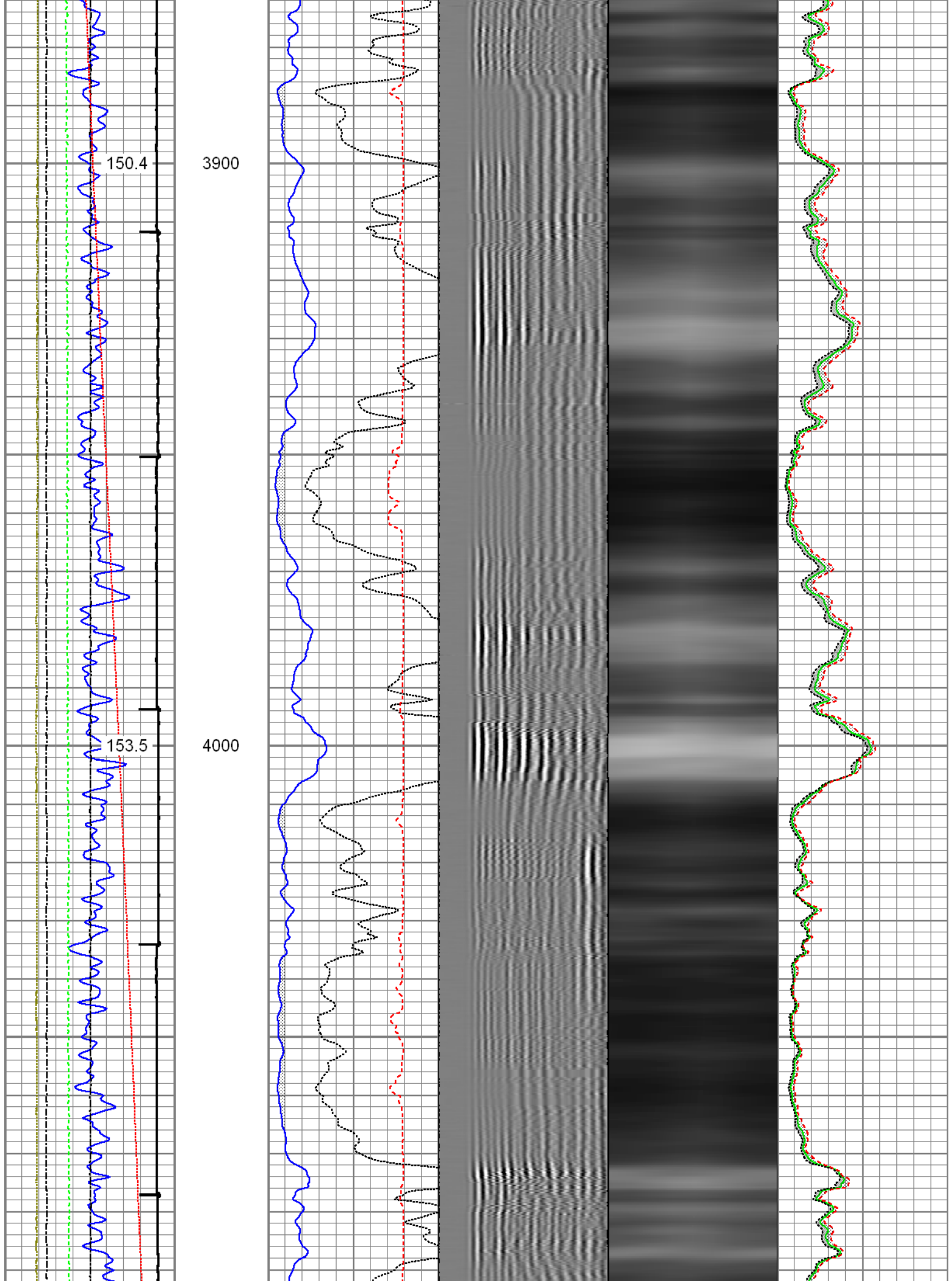


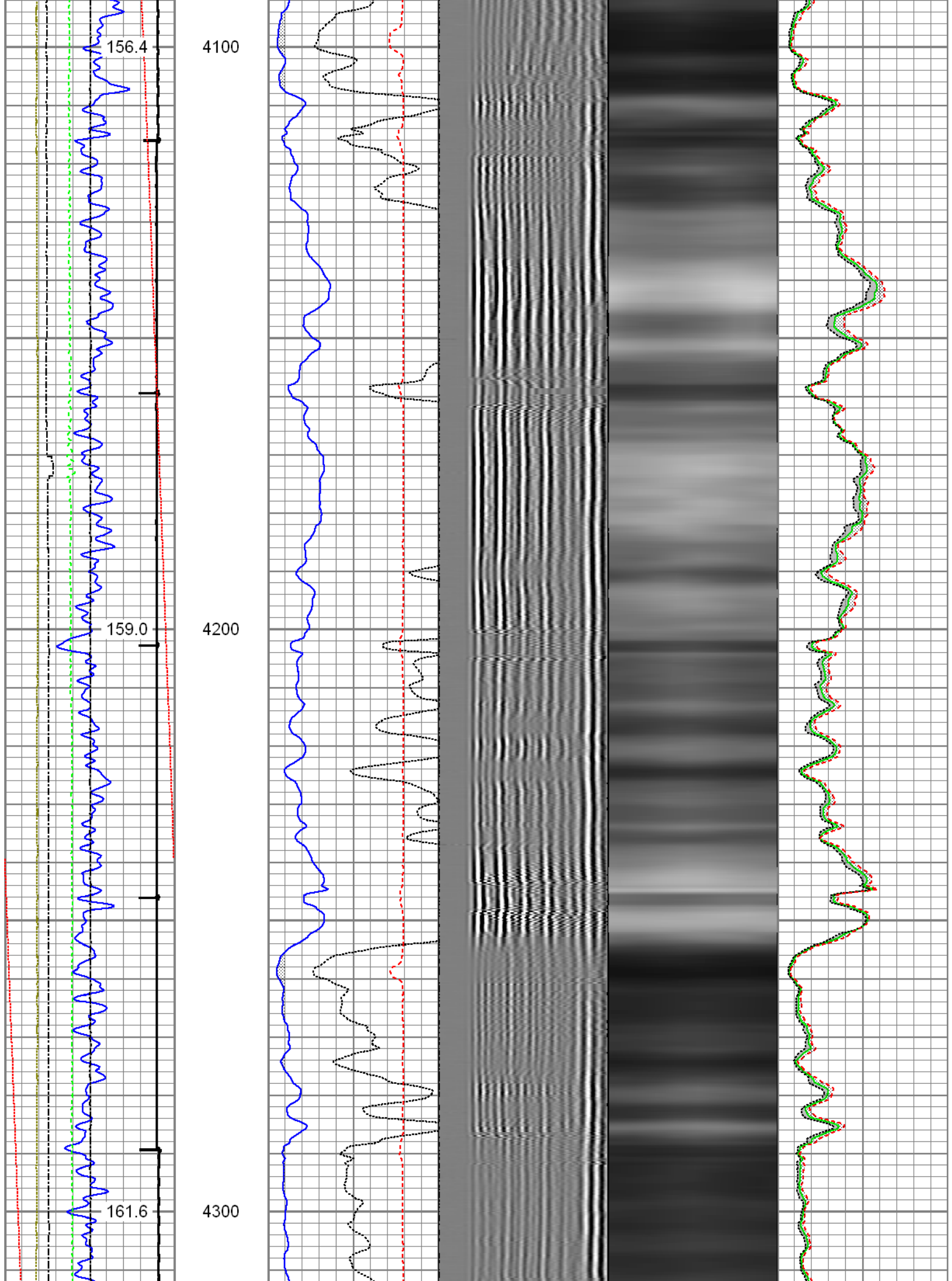


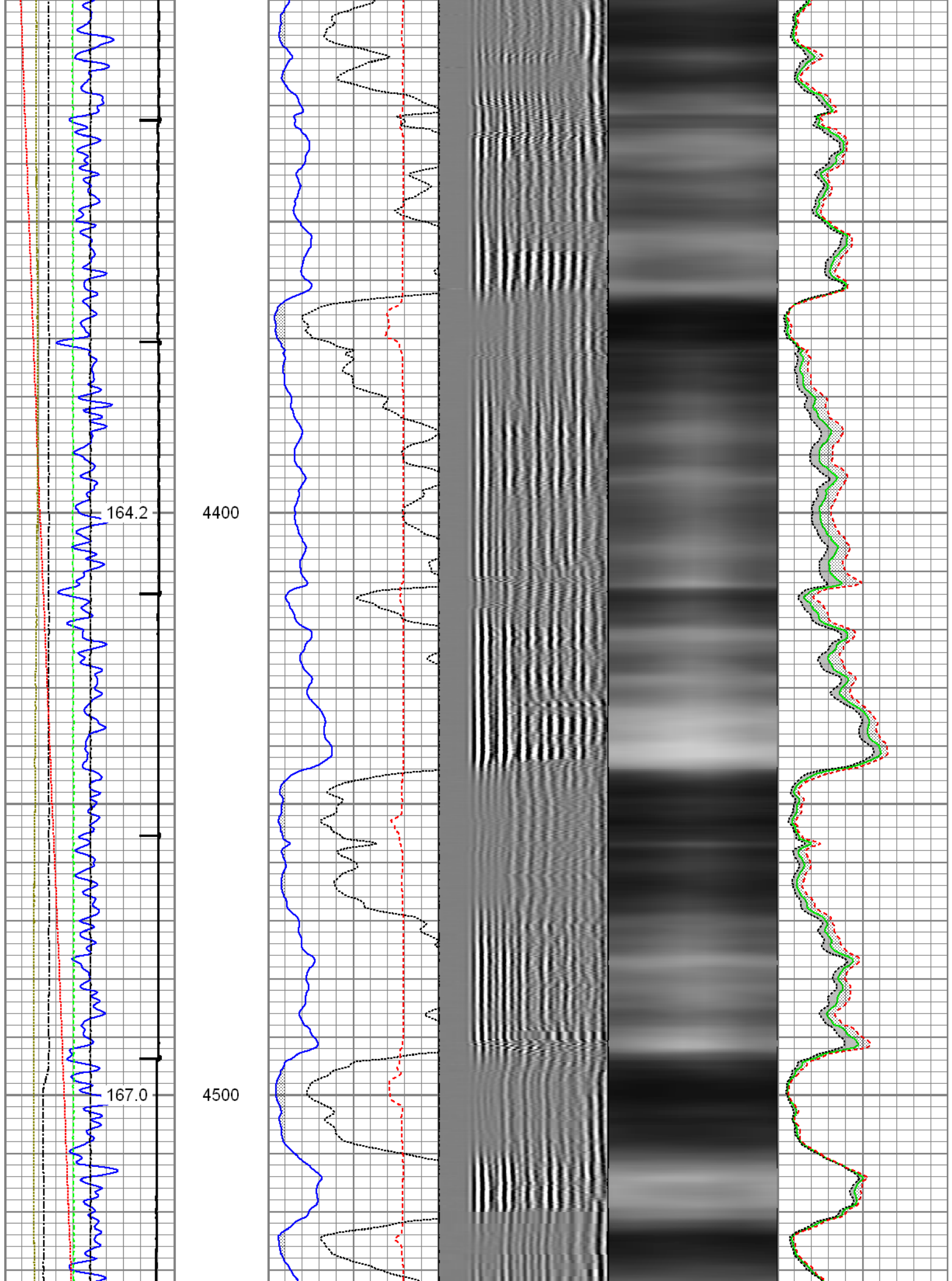
3700

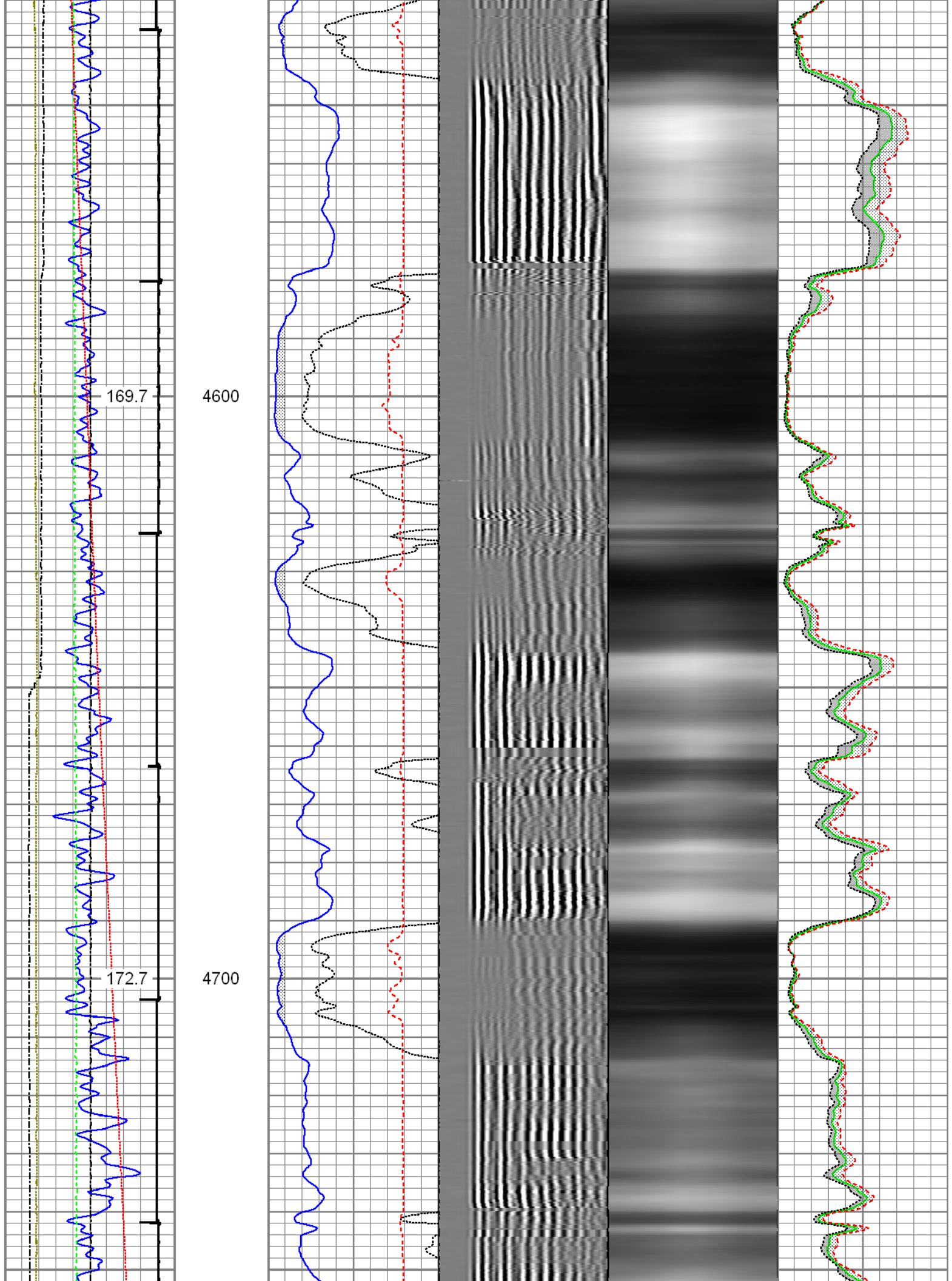
3800

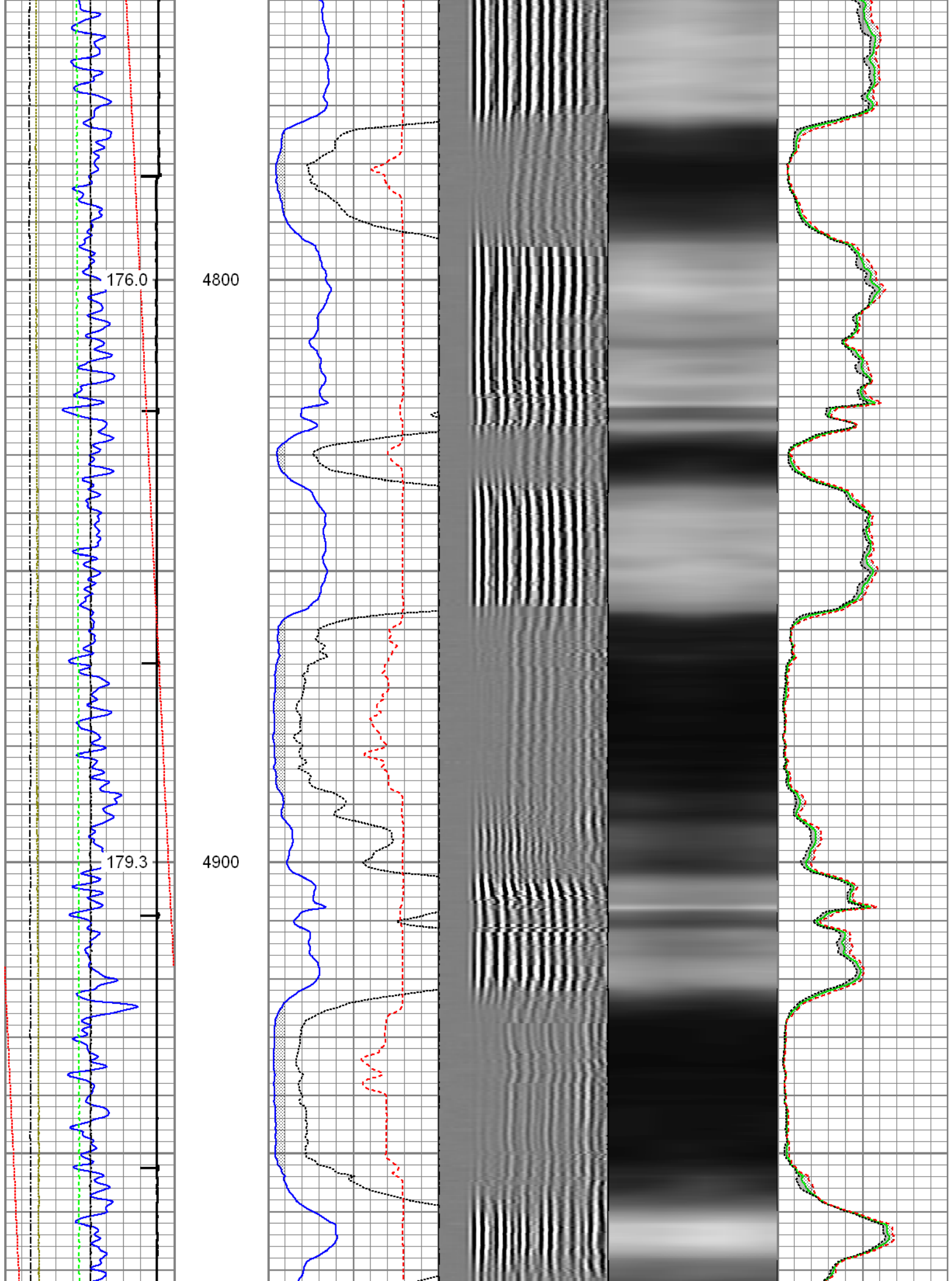


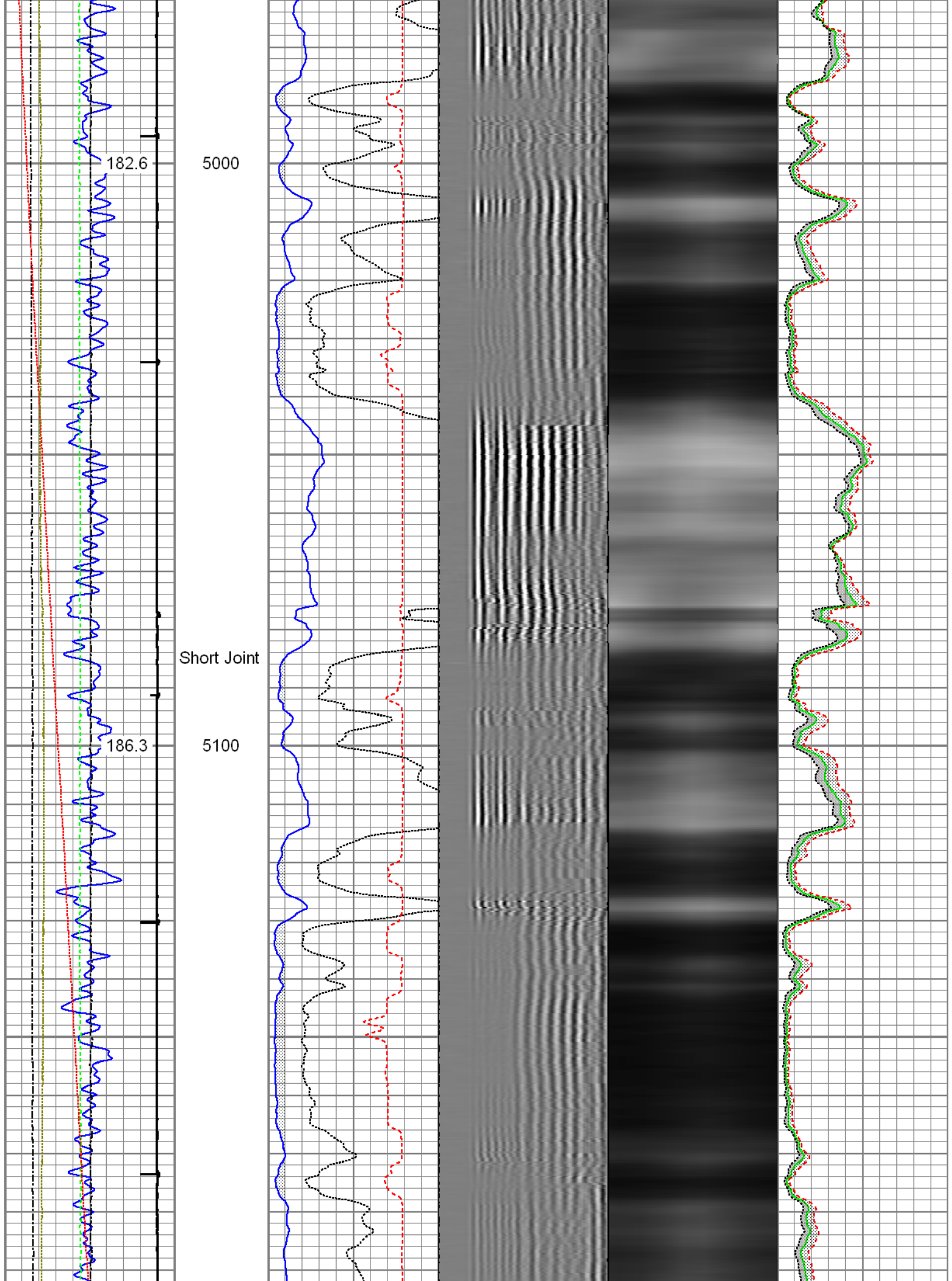


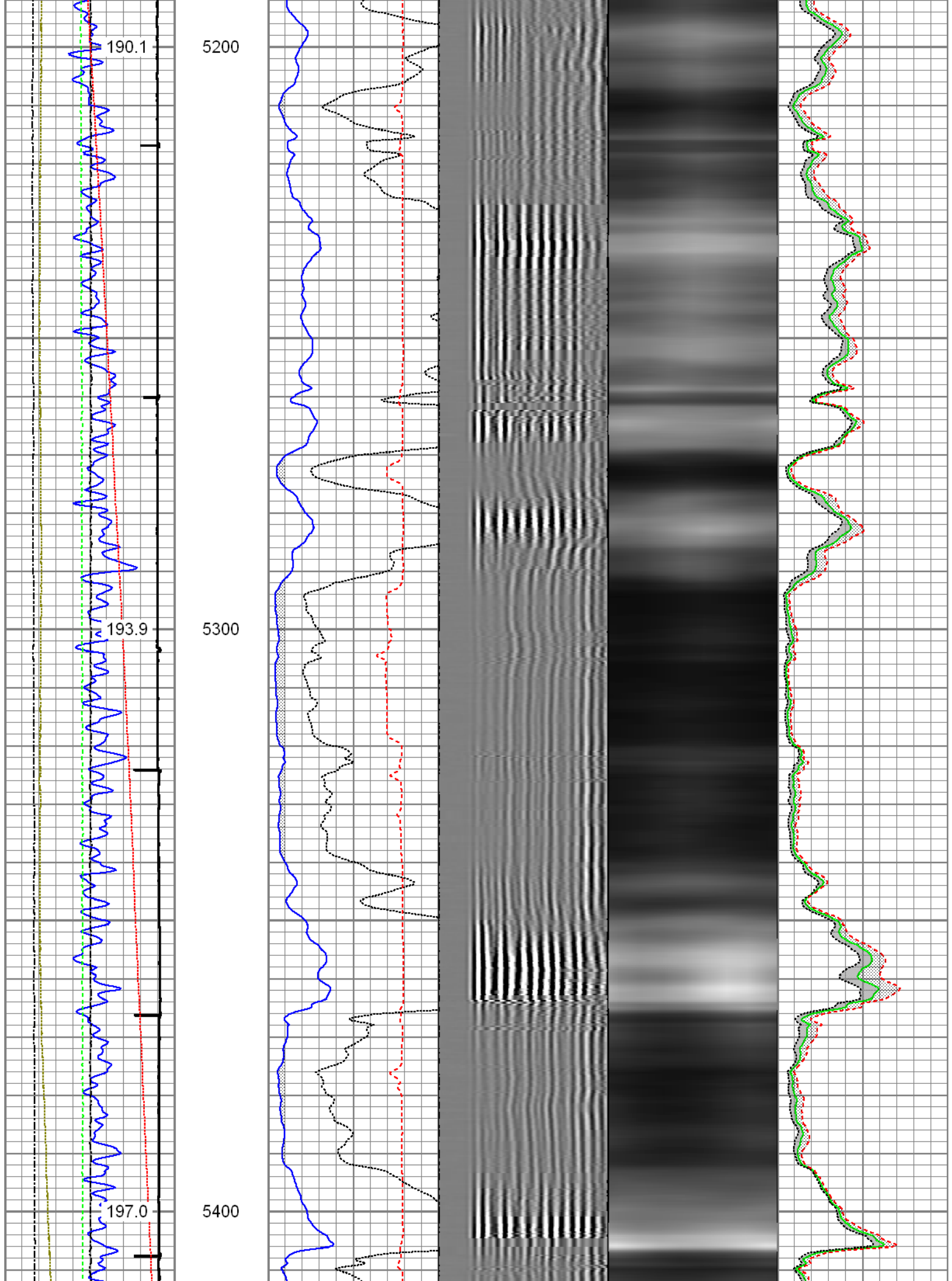


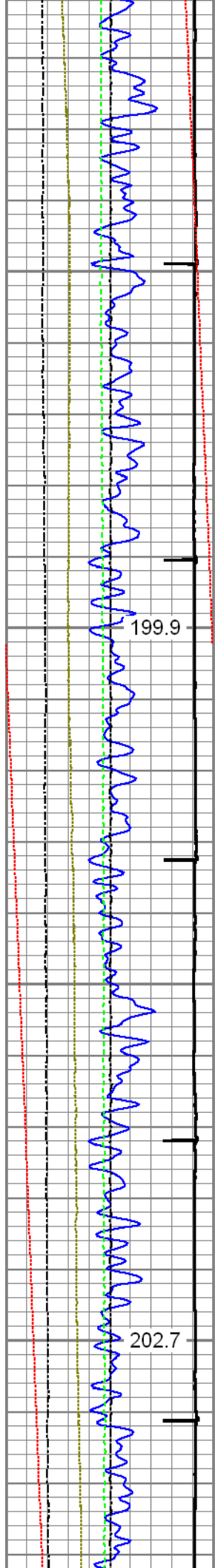










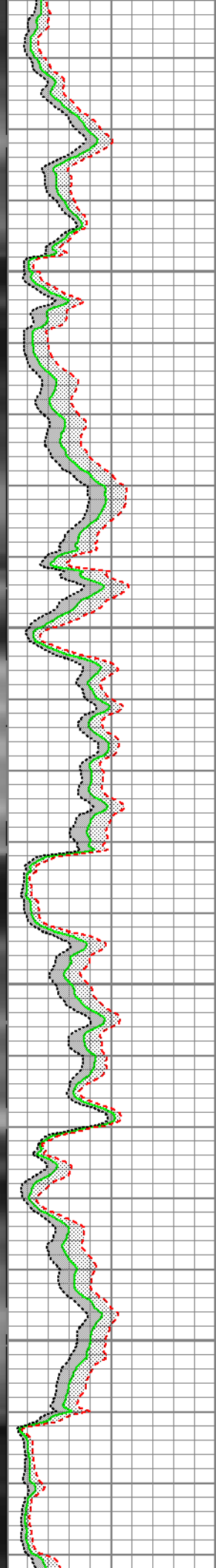
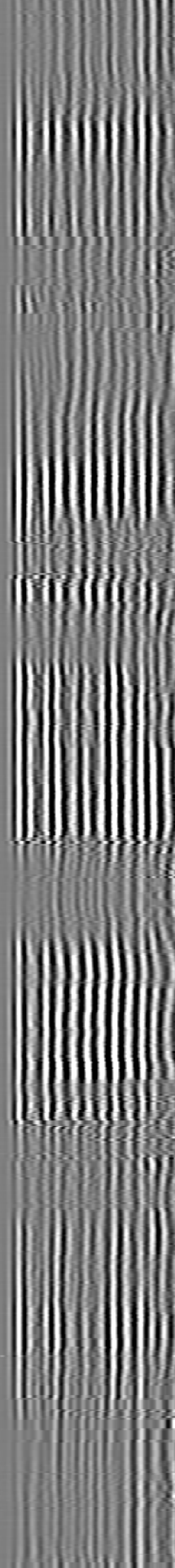
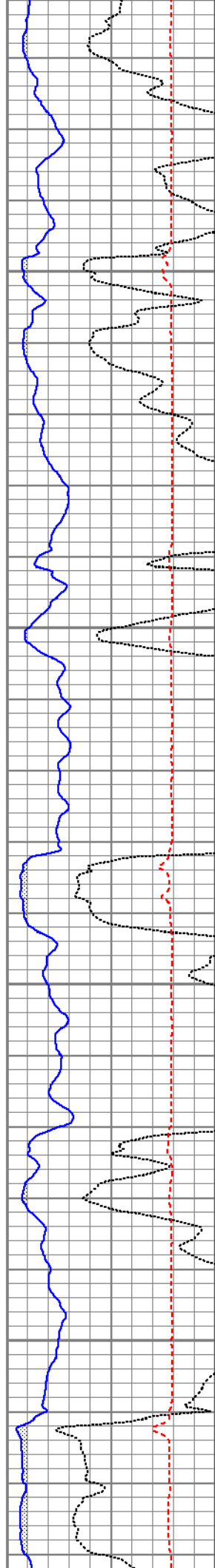


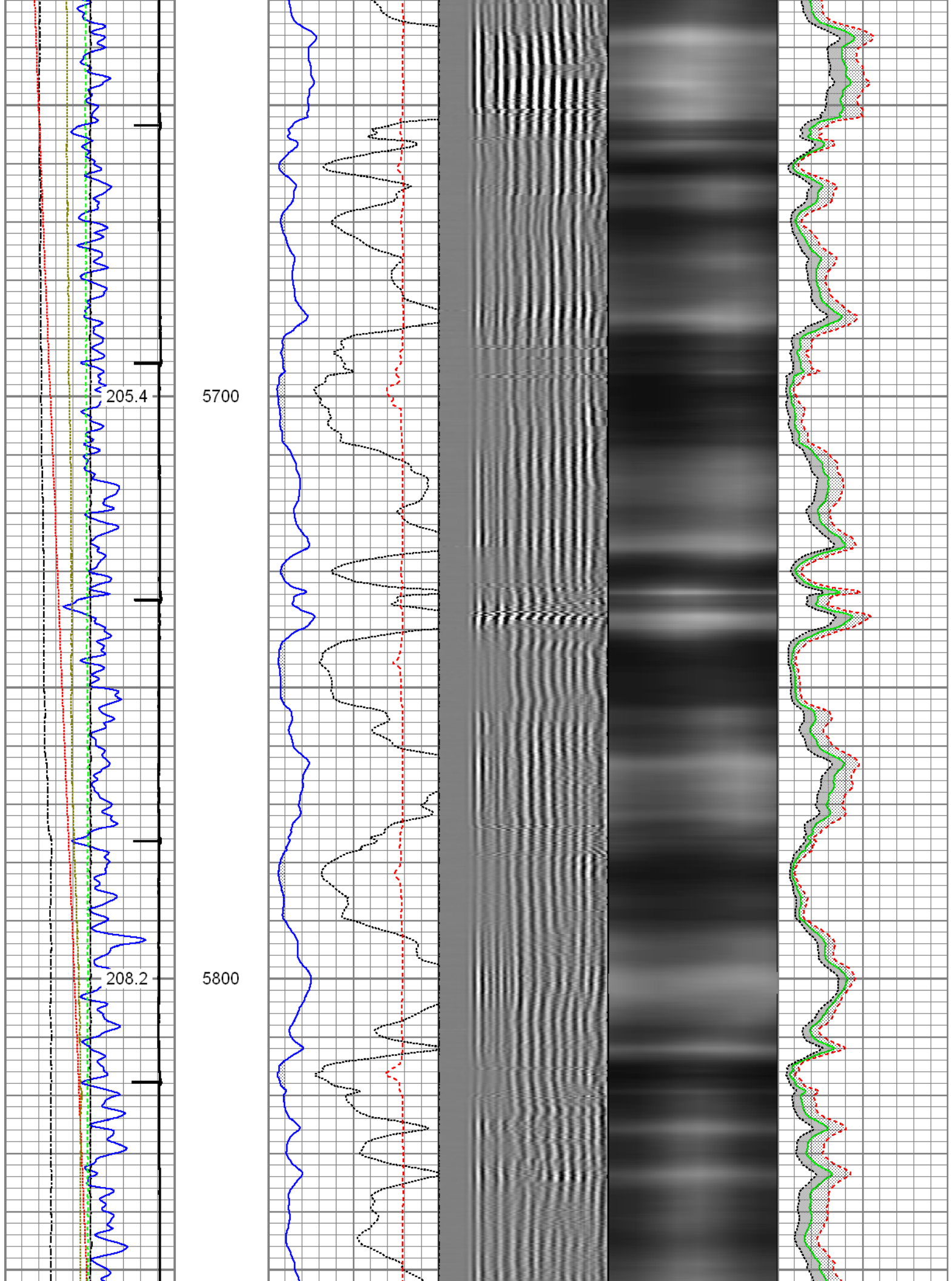
199.9

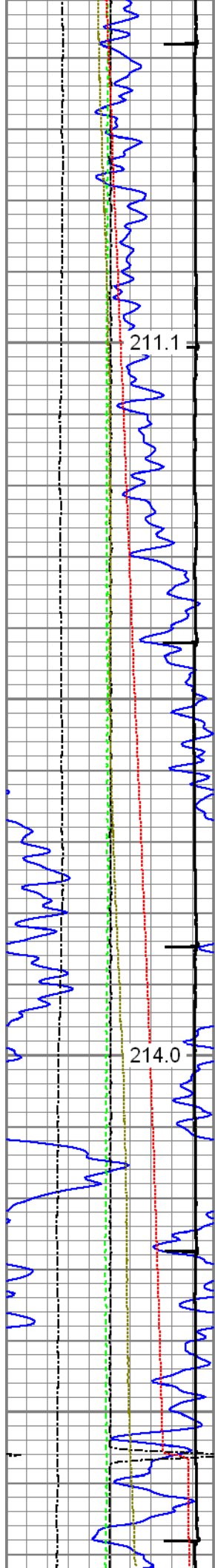
202.7

5500

5600

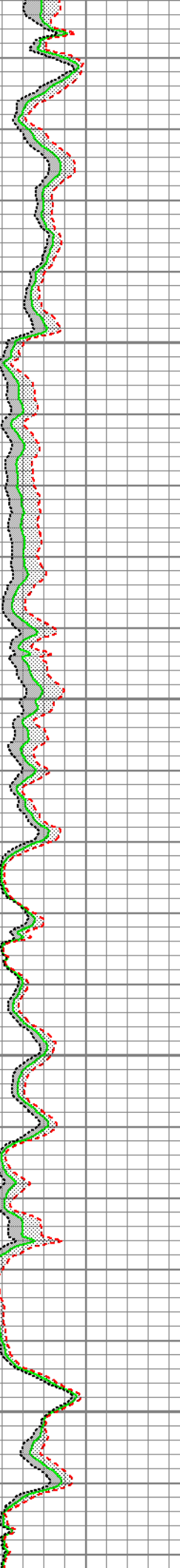
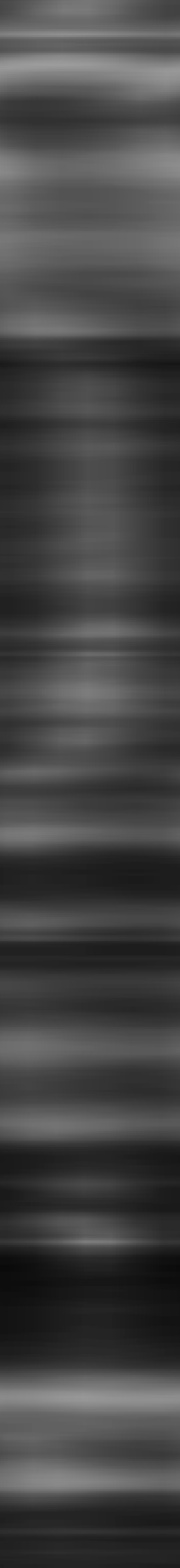
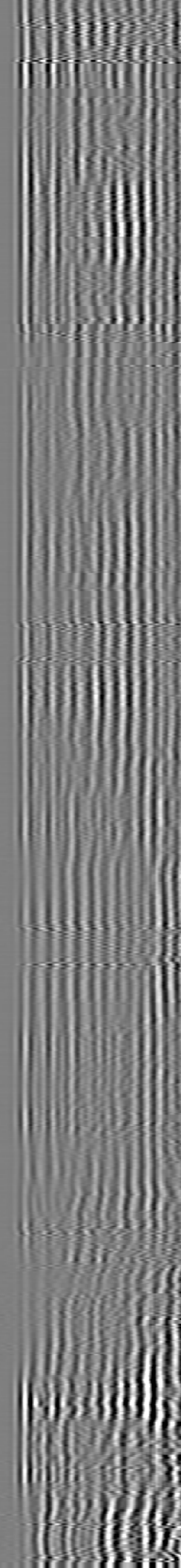
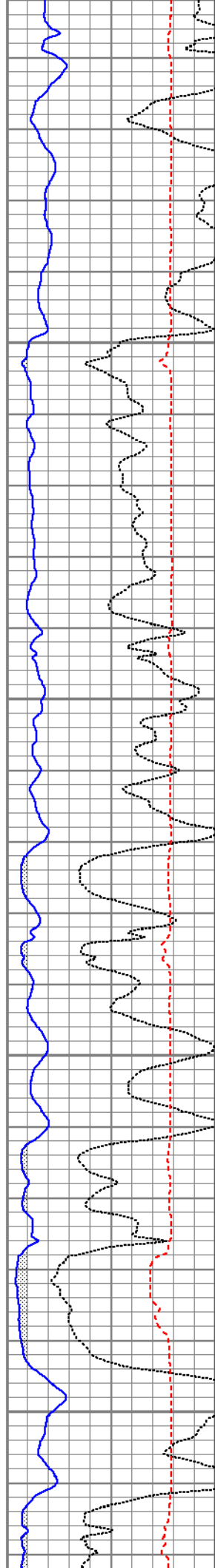


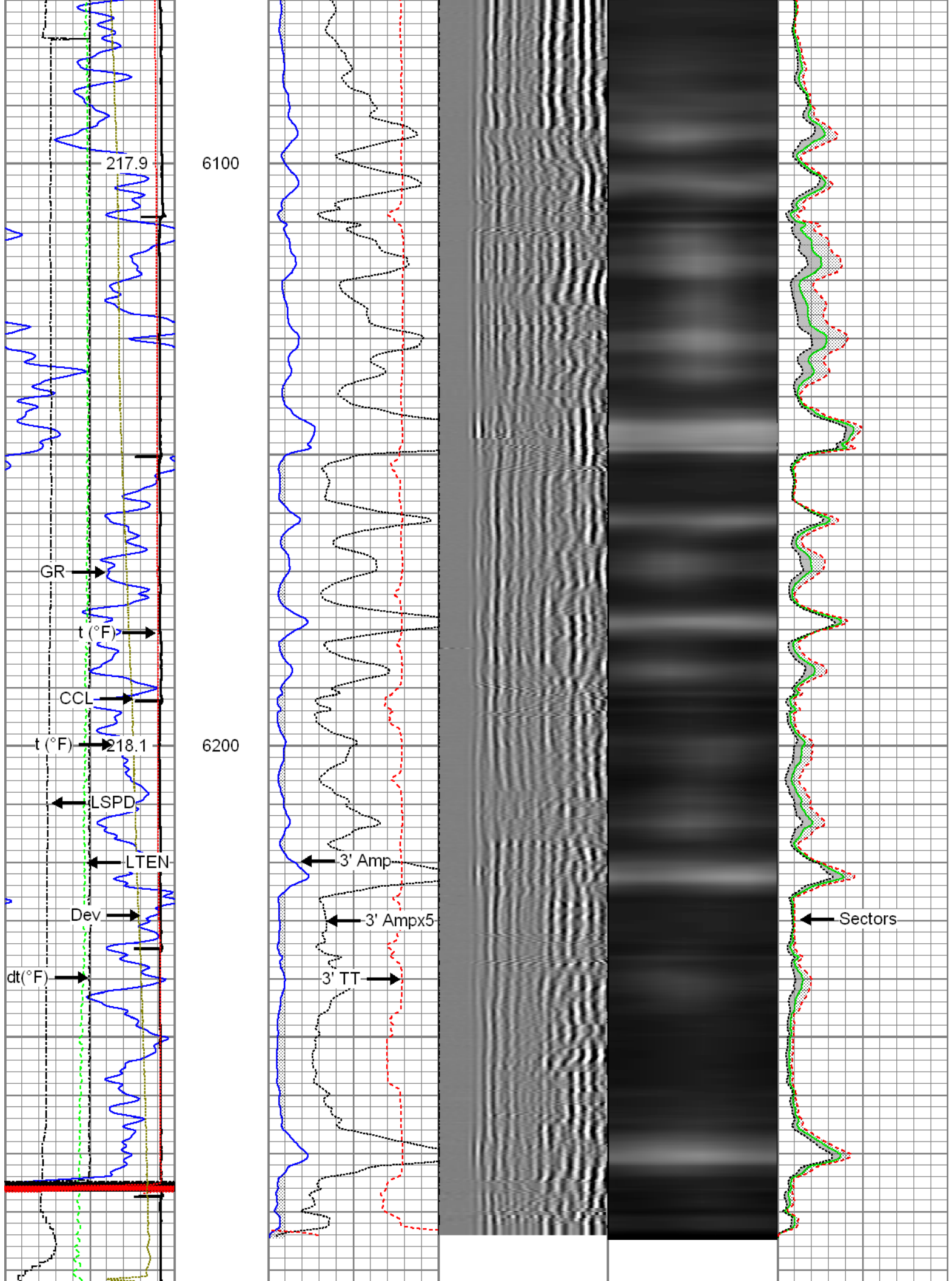





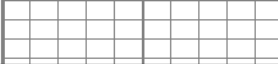



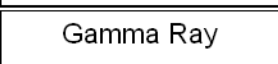



5900

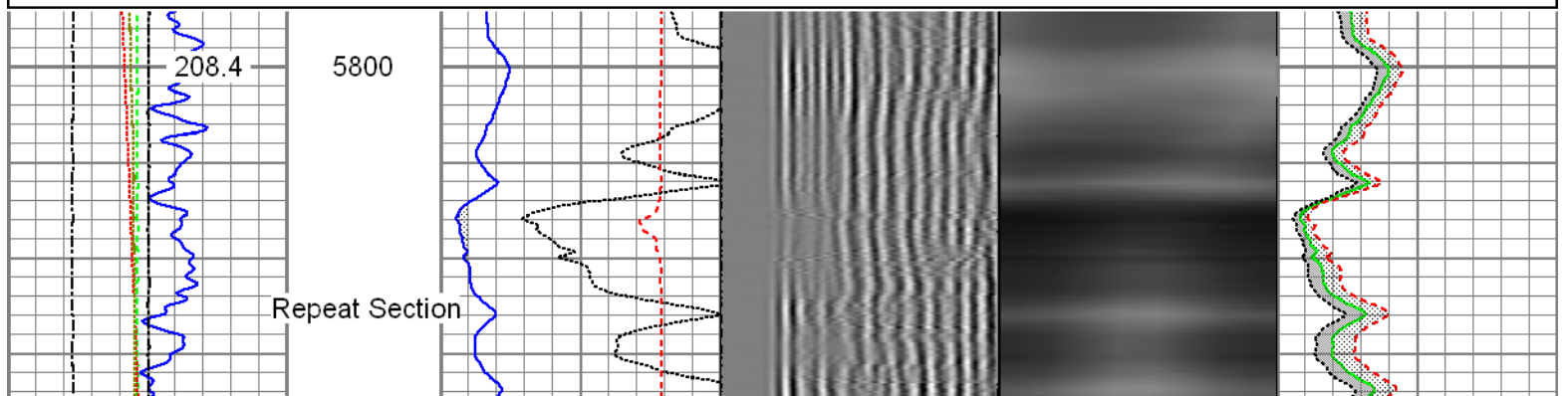
6000

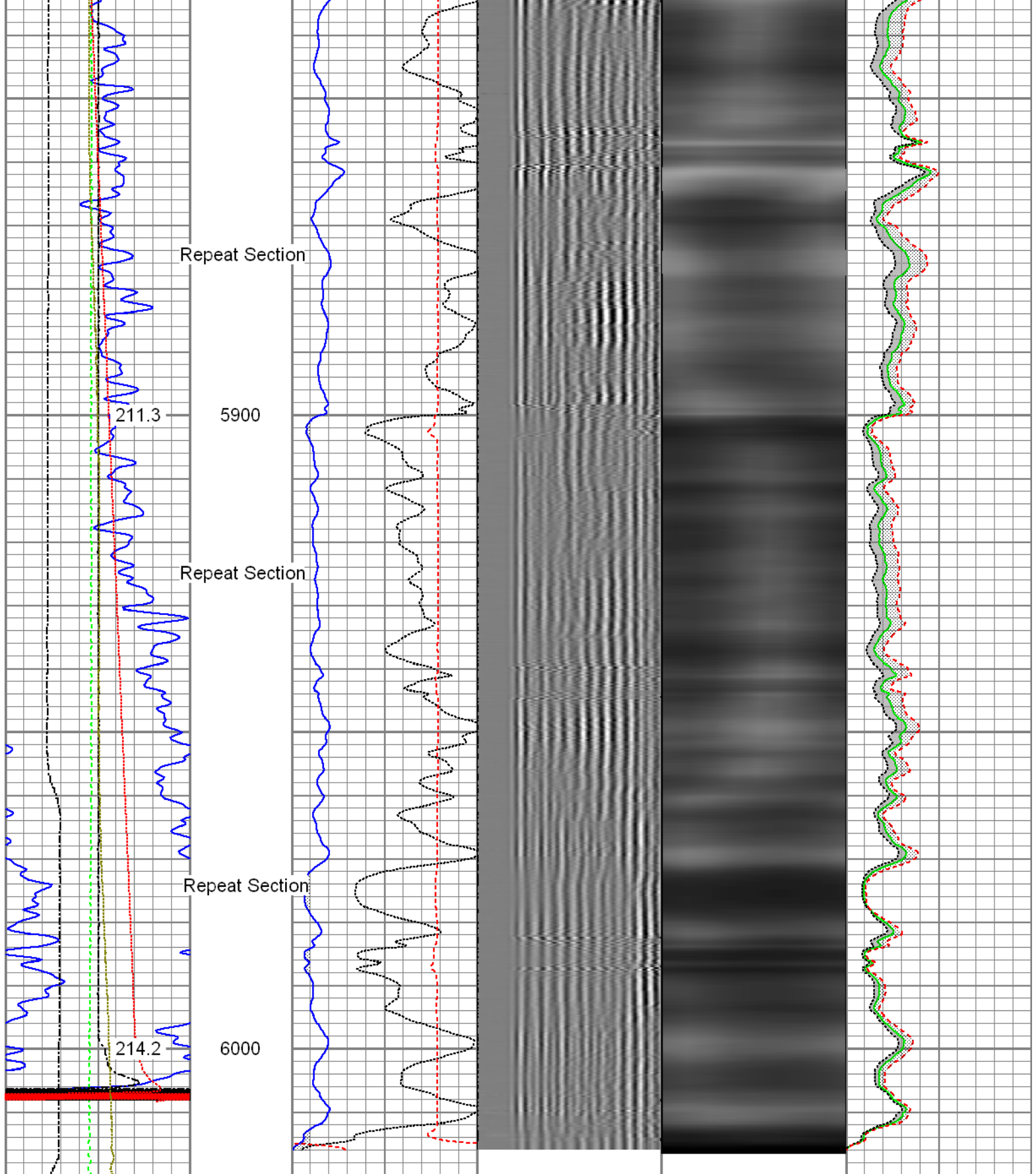




					
Gamma Ray		3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120		0 (mV) 100	200 1200		0 100
Casing Collar Locator		3' Amplitude x 5			Minimum Amplitude
Line Speed		0 (mV) 20			0 100
-100 (ft/min) 100		3' Travel Time			Maximum Amplitude
Line Tension		650 (usec) 150			0 100
0 (lb) 2000					
Differential Temperature					
-2 (degF) 2					
Temperature					
0 (degF) 20					
-10 Deviation (°) 90					

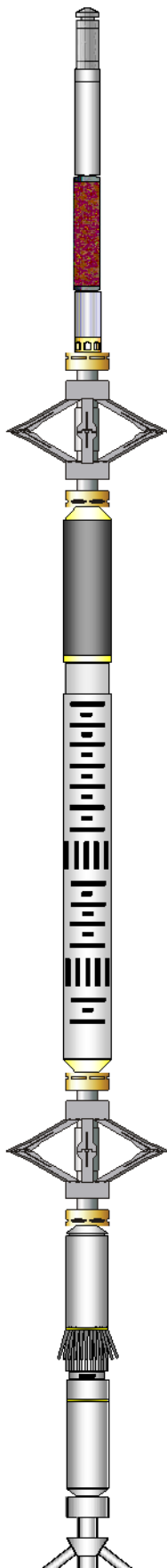
		Repeat Section			
		Recorded with 2500 PSI Surface Induced Pressure			
Database File:		02-19-16_noble energy_remora lc34-745_mit_rbl.db			
Dataset Pathname:		repeat_b			
Presentation Format:		rbt4_mit			
Dataset Creation:		Fri Feb 19 08:08:13 2016 by Log 7.0 B1			
Charted by:		Depth in Feet scaled 1:240			
					
Gamma Ray		3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120		0 (mV) 100	200 1200		0 100
Line Speed		3' Amplitude x 5			Minimum Amplitude
-100 (ft/min) 100		0 (mV) 20			0 100
Line Tension		3' Travel Time			Maximum Amplitude
0 (lb) 2000		650 (usec) 150			0 100
Differential Temperature					
-2 (degF) 2					
Temperature					
0 (degF) 20					
-10 Deviation (°) 90					

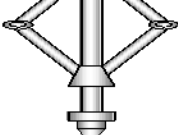




Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Line Speed	3' Amplitude x 5			Minimum Amplitude
-100 (ft/min) 100	0 (mV) 20			0 100
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	650 (usec) 150			0 100
Differential Temperature				

-2	(degF)	2
Temperature		
0	(degF)	20
-10	Deviation (°)	90

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)	
GR	23.85		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 (219135) 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	22.45		UW_PRT-UW_PRT_016 (10025100) Platinum Resistance Thermometer	1.04	1.69	5.20	
			UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00	
WV3FT	15.42		UW_RBT-UW_RBT_004 (10013454) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00	
WVFS1	15.42						
WVFS2	15.42						
WVFS3	15.42						
WVFS4	15.42						
WVFS5	15.42						
WVFS6	15.42						
WVFS7	15.42						
WVFS8	15.42						
CBLTEMP	15.42		UW_PRC #3 -DSSRAC (083) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00	
CBLROT	15.42						
WV5FT	14.42		UW_MIT-UW_MIT40_042 (10014703) 40 Multifinger Imaging Tool	4.54	2.75	61.10	
MIT	5.41						

TSTAMP	0.00		UW_PRC #4 -UW_PRC_057 (1038) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
			UW_BUL-UW_BUL_006 (10019616) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
Dataset: 02-19-16_Noble Energy_Remora LC34-745_MIT_RBL.db: field/well/run1/main_a Total Length: 28.09 ft Total Weight: 324.50 lb O.D. 3.13 in						

Calibration Report			
Database File:	02-19-16_noble energy_remora lc34-745_mit_rbl.db		
Dataset Pathname:	main_a		
Dataset Creation:	Fri Feb 19 08:29:40 2016 by Log 7.0 B1		
Multi-finger Imaging Tool Calibration Report			
Serial Number:	10014703		
Number of Fingers:	40		
Tool Model:	UW_MIT40_042		
Inclinometer Calibration Report			
Performed:	Fri Sep 20 11:47:48 2013		
Calibration Angle:	45		
	Inc X	Inc Y	
Vertical:	1963	1960	
Finger 1 up:	1748	1727	
Finger 31 up:	2195	1742	
Finger 21 up:	2178	2188	
Finger 11 up:	1727	2173	
Sensitivity ratio:	1.00706		
X-axis angle:	132.825		
Deviation const.:	317.775		

Finger Calibration Report						
Performed:		Fri Feb 19 07:21:36 2016				
Ring size:	4	5	6	7		
(in)						
	Sens	Sens	Sens	Sens		
Finger 01:	1103 398.0	1501 371.0	1872 385.0	2257		
Finger 02:	1062 400.0	1462 389.0	1851 408.0	2259		
Finger 03:	1051 384.0	1435 374.0	1809 400.0	2209		
Finger 04:	1021 396.0	1417 400.0	1817 427.0	2244		
Finger 05:	1037 373.0	1410 371.0	1781 398.0	2179		
Finger 06:	1045 382.0	1427 391.0	1818 415.0	2233		
Finger 07:	1050 374.0	1424 382.0	1806 410.0	2216		
Finger 08:	1023 374.0	1397 401.0	1798 426.0	2224		
Finger 09:	1086 374.0	1460 389.0	1849 403.0	2252		
Finger 10:	1055 366.0	1421 393.0	1814 413.0	2227		
Finger 11:	1023 359.0	1382 396.0	1778 425.0	2203		
Finger 12:	1118 354.0	1472 377.0	1849 390.0	2239		
Finger 13:	1048 349.0	1397 392.0	1789 425.0	2214		
Finger 14:	1030 359.0	1389 416.0	1805 441.0	2246		
Finger 15:	989 355.0	1344 414.0	1758 447.0	2205		
Finger 16:	1042 351.0	1393 405.0	1798 433.0	2231		
Finger 17:	1068 345.0	1413 391.0	1804 414.0	2218		
Finger 18:	1102 346.0	1448 394.0	1842 417.0	2259		
Finger 19:	1052 353.0	1405 400.0	1805 428.0	2233		
Finger 20:	971 349.0	1320 412.0	1732 443.0	2175		
Finger 21:	1047 346.0	1393 396.0	1789 424.0	2213		
Finger 22:	1045 356.0	1401 400.0	1801 428.0	2229		
Finger 23:	1064 359.0	1423 399.0	1822 426.0	2248		
Finger 24:	1051 334.0	1385 370.0	1755 393.0	2148		
Finger 25:	1059 373.0	1424 402.0	1822 422.0	2256		

Finger 25:	1058	373.0	1431	402.0	1833	423.0	2256
Finger 26:	1006	359.0	1365	388.0	1753	417.0	2170
Finger 27:	1172	389.0	1561	395.0	1956	407.0	2363
Finger 28:	1036	358.0	1394	374.0	1768	403.0	2171
Finger 29:	1008	376.0	1384	390.0	1774	416.0	2190
Finger 30:	991	377.0	1368	392.0	1760	420.0	2180
Finger 31:	1217	415.0	1632	401.0	2033	412.0	2445
Finger 32:	983	383.0	1366	373.0	1739	391.0	2130
Finger 33:	1080	412.0	1492	398.0	1890	420.0	2310
Finger 34:	965	383.0	1348	379.0	1727	400.0	2127
Finger 35:	1120	427.0	1547	394.0	1941	408.0	2349
Finger 36:	1045	382.0	1427	362.0	1789	377.0	2166
Finger 37:	1130	419.0	1549	396.0	1945	403.0	2348
Finger 38:	1094	393.0	1487	374.0	1861	379.0	2240
Finger 39:	1089	383.0	1472	357.0	1829	375.0	2204
Finger 40:	993	409.0	1402	402.0	1804	422.0	2226

Segmented Cement Bond Log Calibration Report

Serial Number: 10013454
Tool Model: UW_RBT_004

Calibration Casing Diameter: 7.000 in
Calibration Depth: 24.002 ft

Master Calibration, performed Fri Feb 19 07:20:09 2016:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.002	0.727	0.800	62.165	84.078	1.005
5FT	-0.004	0.799	0.800	62.165	76.456	1.083
S1	-0.003	0.726	0.000	100.000	137.158	0.457
S2	-0.004	0.740	0.000	100.000	134.534	0.504
S3	-0.004	0.737	0.000	100.000	134.966	0.499
S4	-0.004	0.737	0.000	100.000	134.948	0.601
S5	-0.003	0.725	0.000	100.000	137.266	0.478
S6	-0.004	0.715	0.000	100.000	139.221	0.520
S7	-0.003	0.705	0.000	100.000	141.188	0.457
S8	-0.003	0.714	0.000	100.000	139.465	0.455

Temperature Calibration Report

Serial Number: 10025100
Tool Model: UW_PRT_016
Performed: Wed Feb 11 13:47:59 2015

Point #	Reading		Reference	
1	13249.00	cps	68.00	degF
2	18454.00	cps	104.00	degF
3	29735.00	cps	176.00	degF
4	41457.00	cps	248.00	degF
5	52851.00	cps	320.00	degF
6	59128.00	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	Noble Energy Inc.
Well	Remora LC34-745
Field	Wildcat
County	Weld
State	Colorado