



Radial Cement Bond
Gamma Ray
Casing Collar Log

Company Noble Energy Inc.		Company Noble Energy Inc.					
Well Wells Ranch AE32-655		Well Wells Ranch AE32-655					
Field Wattenberg		Field Wattenberg					
County Weld		County Weld					
State Colorado		State Colorado					
Location:		API # : 05-123-41730					
SEC 32 TWP 6N RGE 62W		Other Services					
Permanent Datum		Ground Level					
Log Measured From Kelly Bushing		Elevation 4727'					
Drilling Measured From Kelly Bushing		Elevation K.B. 4757' D.F. 4756' G.L. 4727'					
Date 15-OCT-2015		MIT					
Run Number One							
Depth Driller 16000 FT							
Depth Logger 6715 FT							
Bottom Logged Interval 6710 FT							
Top Log Interval Surface							
Open Hole Size 8.750"							
Type Fluid Water							
Density / Viscosity 8.34 lbm/gal							
Max. Recorded Temp. 222°F							
Estimated Cement Top 180 FT							
Time Well Ready ROA							
Time Logger on Bottom 4:00 PM							
Equipment Number HD-0340							
Location Fort Lupton, CO							
Recorded By B. Kalkwarf							
Witnessed By Bill Mansfield							
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	30 FT	626.2 FT		
Intermediate #1	7	26	P-110	30 FT	6830.5 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110IC	6728 FT	15985 FT		

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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
Log ran from 6715 FT to Surface
Log was correlated to Casing Tally liner top of 6728 FT
Adjusted log -3 FT from KB to correlate with liner top
Recorded with 2500 PSI surface induced pressure
Logging tools were very dirty, caliper had metal shavings and debris all over fingers

Thank you for choosing FMC Technologies Completion Services, Inc.!!



Main Pass

Recorded with 2500 PSI Surface Induced Pressure

Database File: c:\warrior\data\10-15-15_noble energy_wells ranch ae32-655_mit_rbl\processed_10-15-15_noble ene

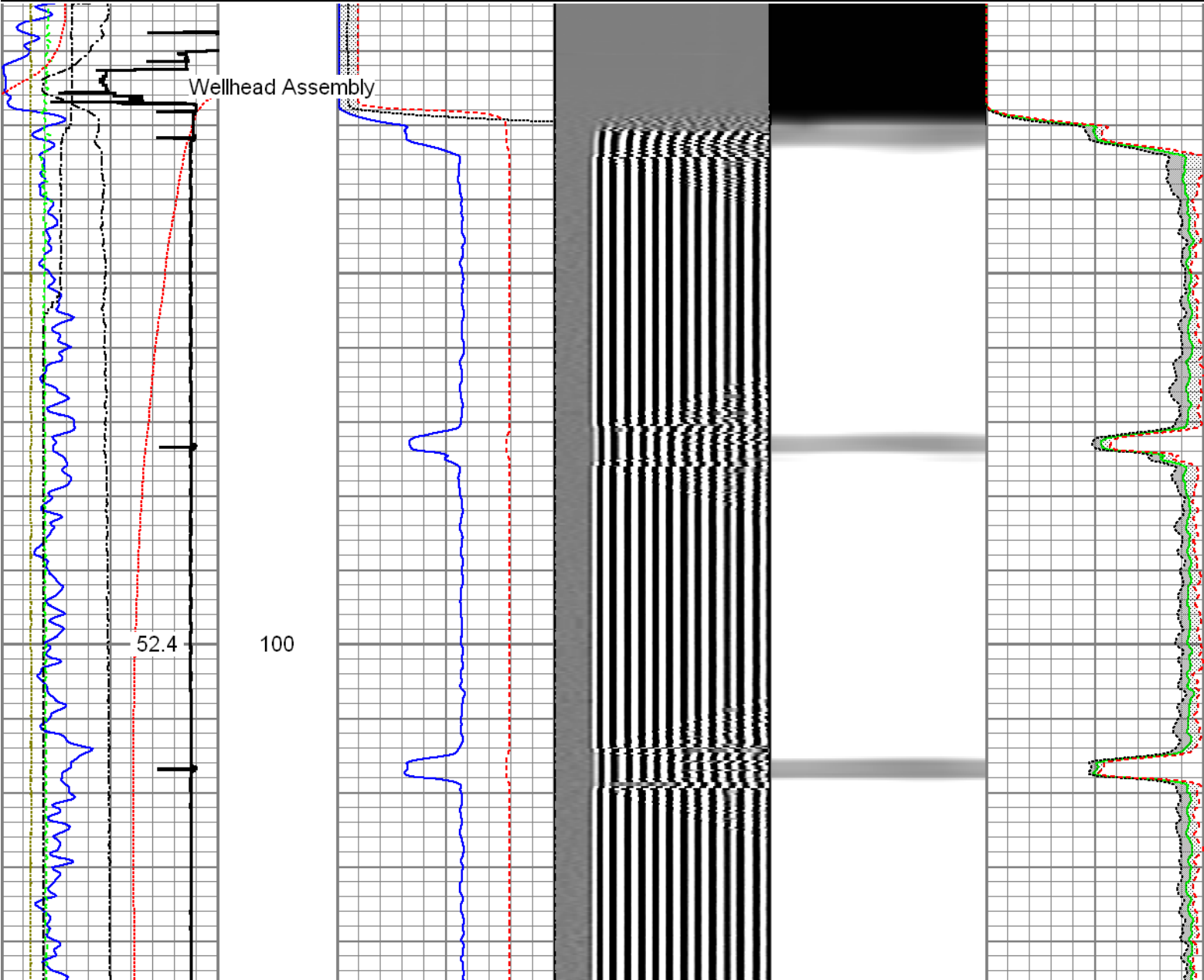
Dataset Pathname: pass7

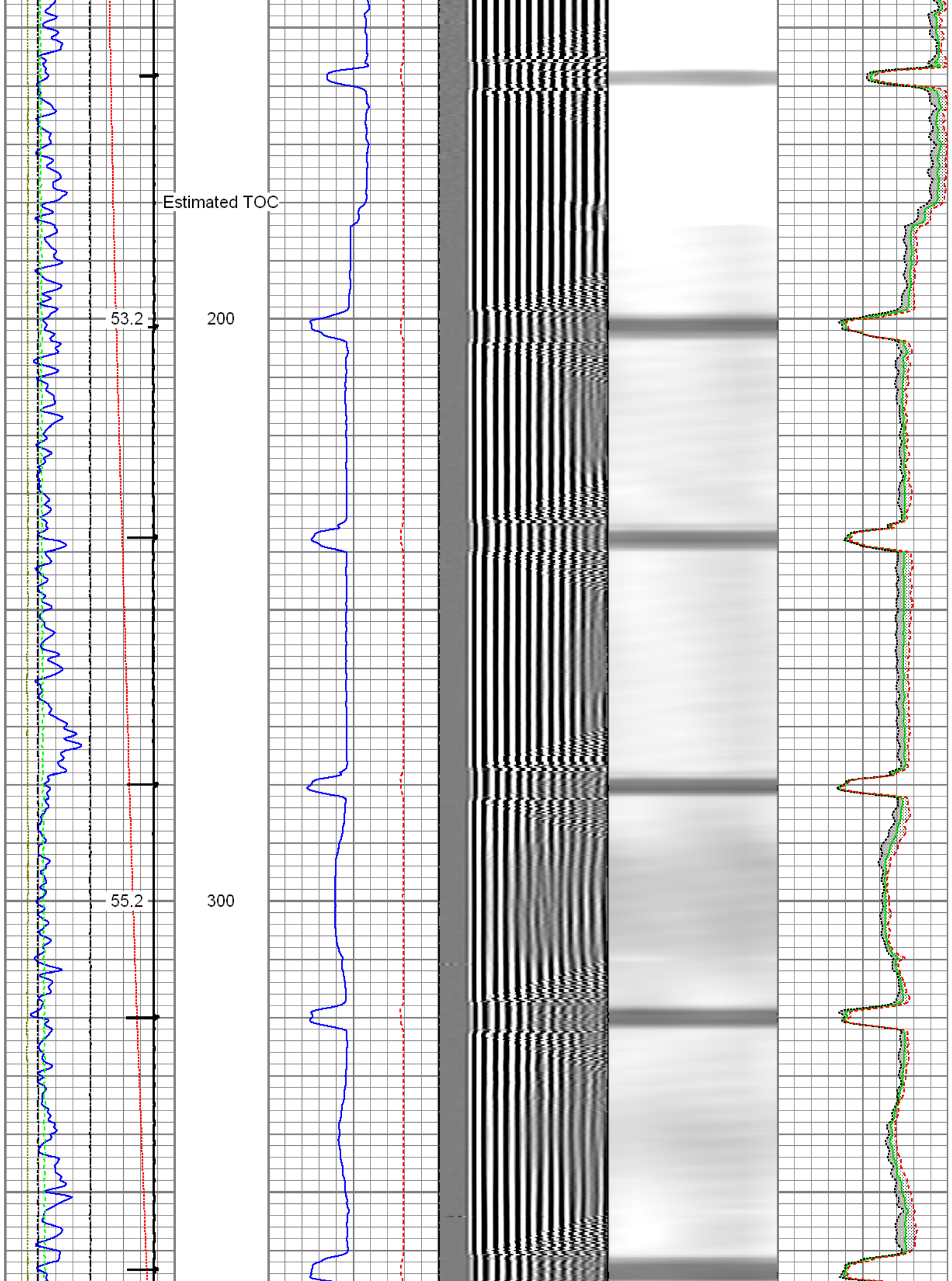
Presentation Format: rbt4_mit

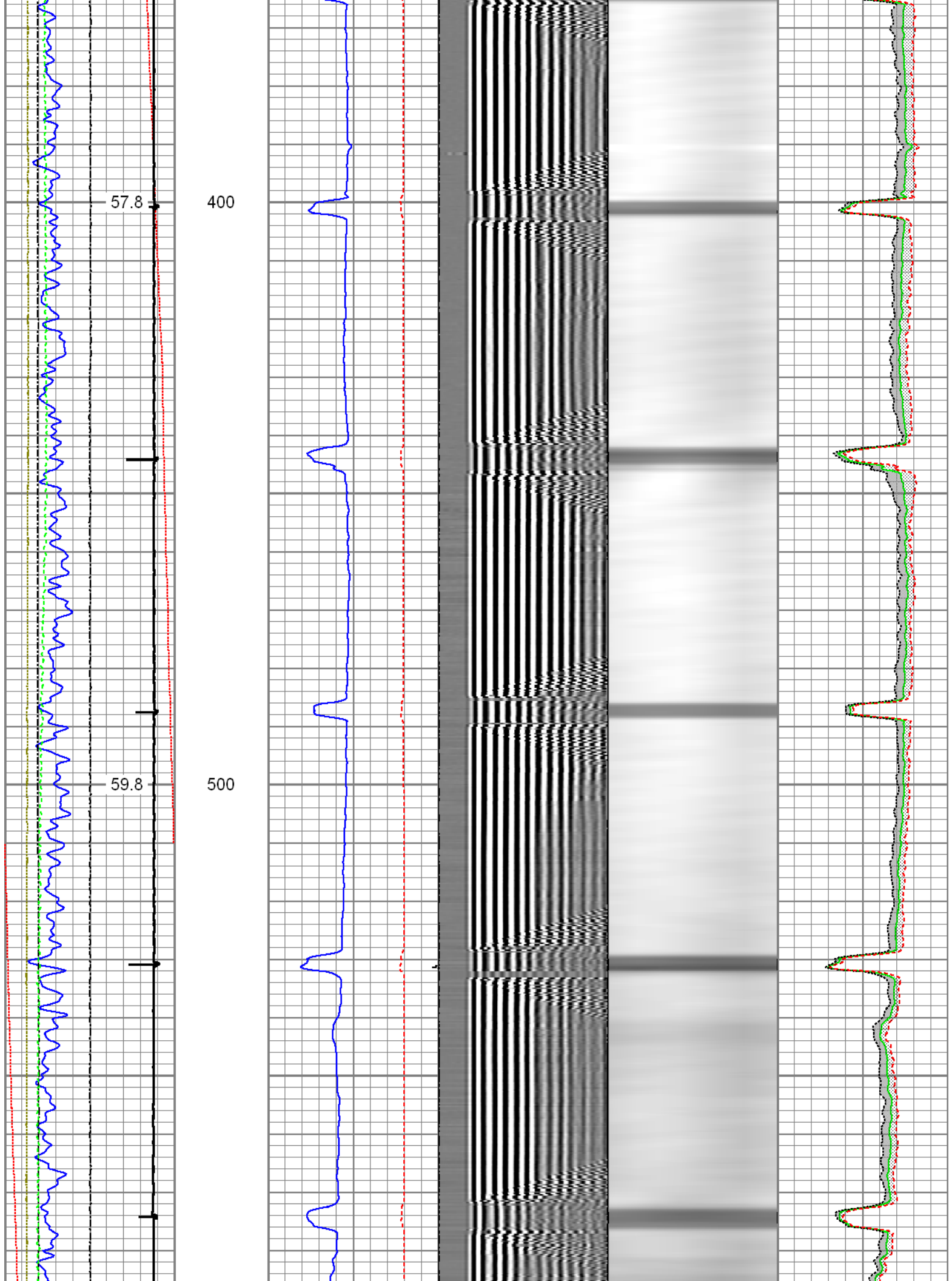
Dataset Creation: Thu Oct 15 16:09:04 2015 by Log 7.0 B1

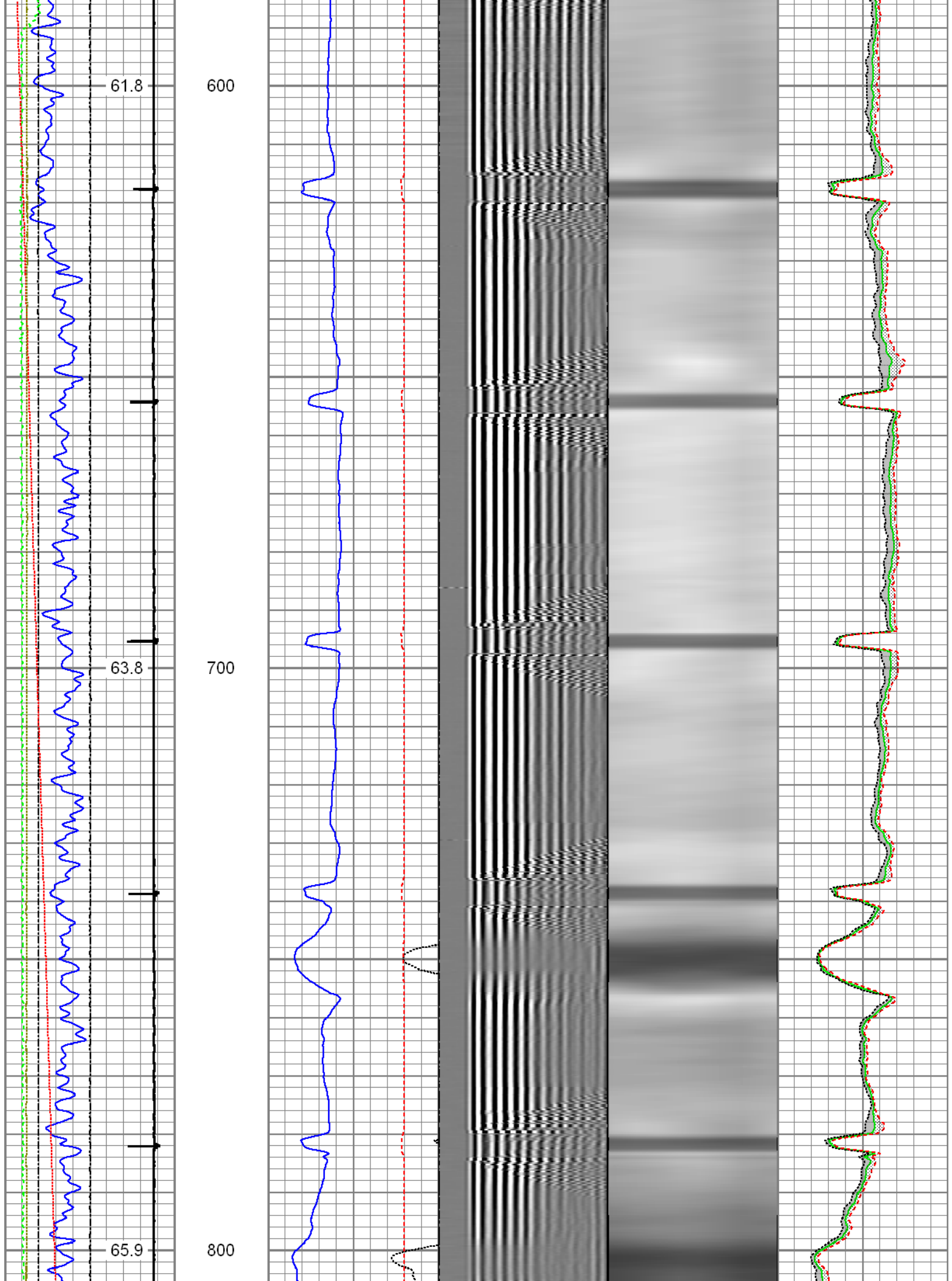
Charted by: Depth in Feet scaled 1:240

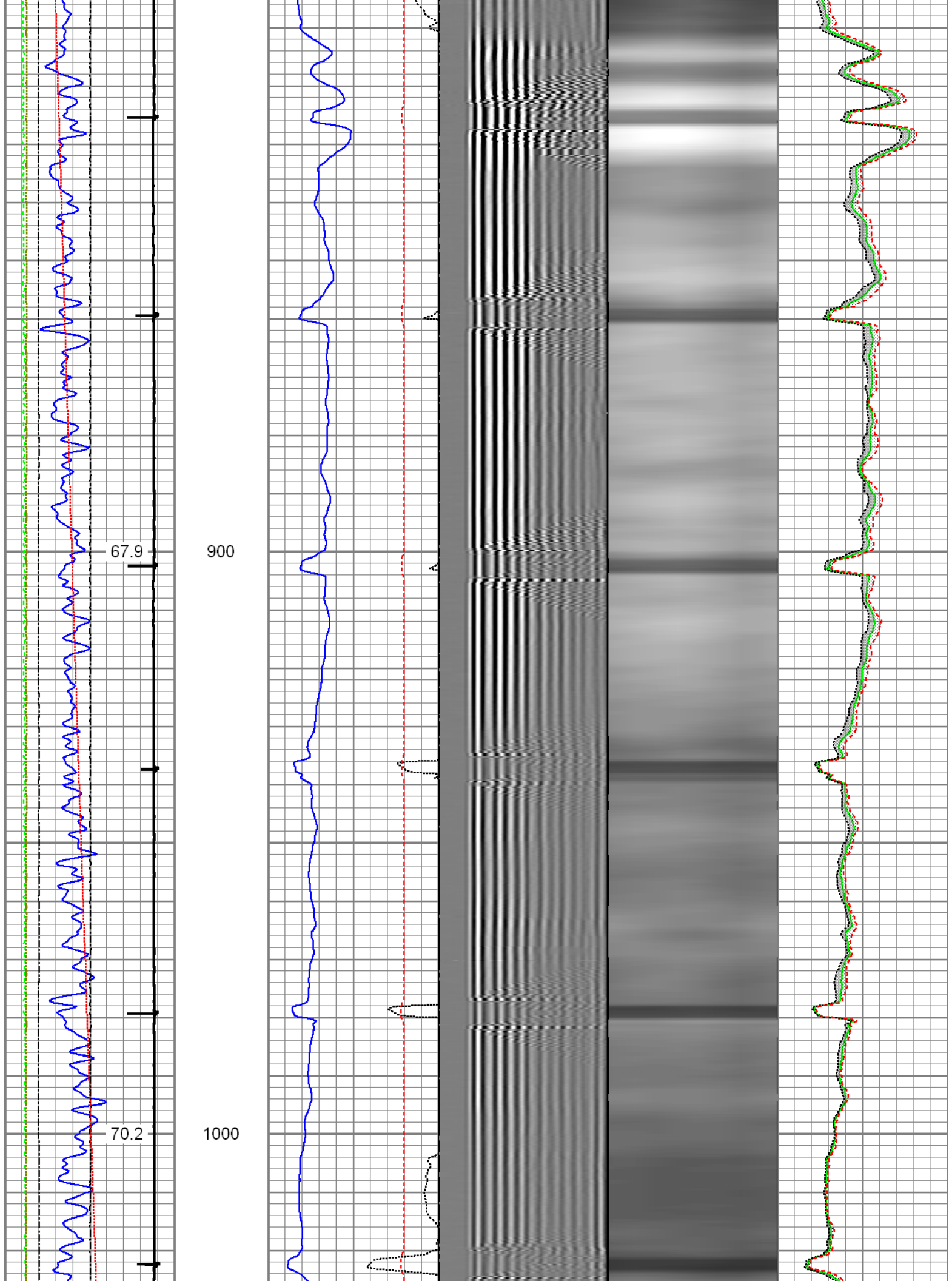
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-100 (ft/min) 100	0 (mV) 20			0 100
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	650 (usec) 150			0 100
Differential Temperature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

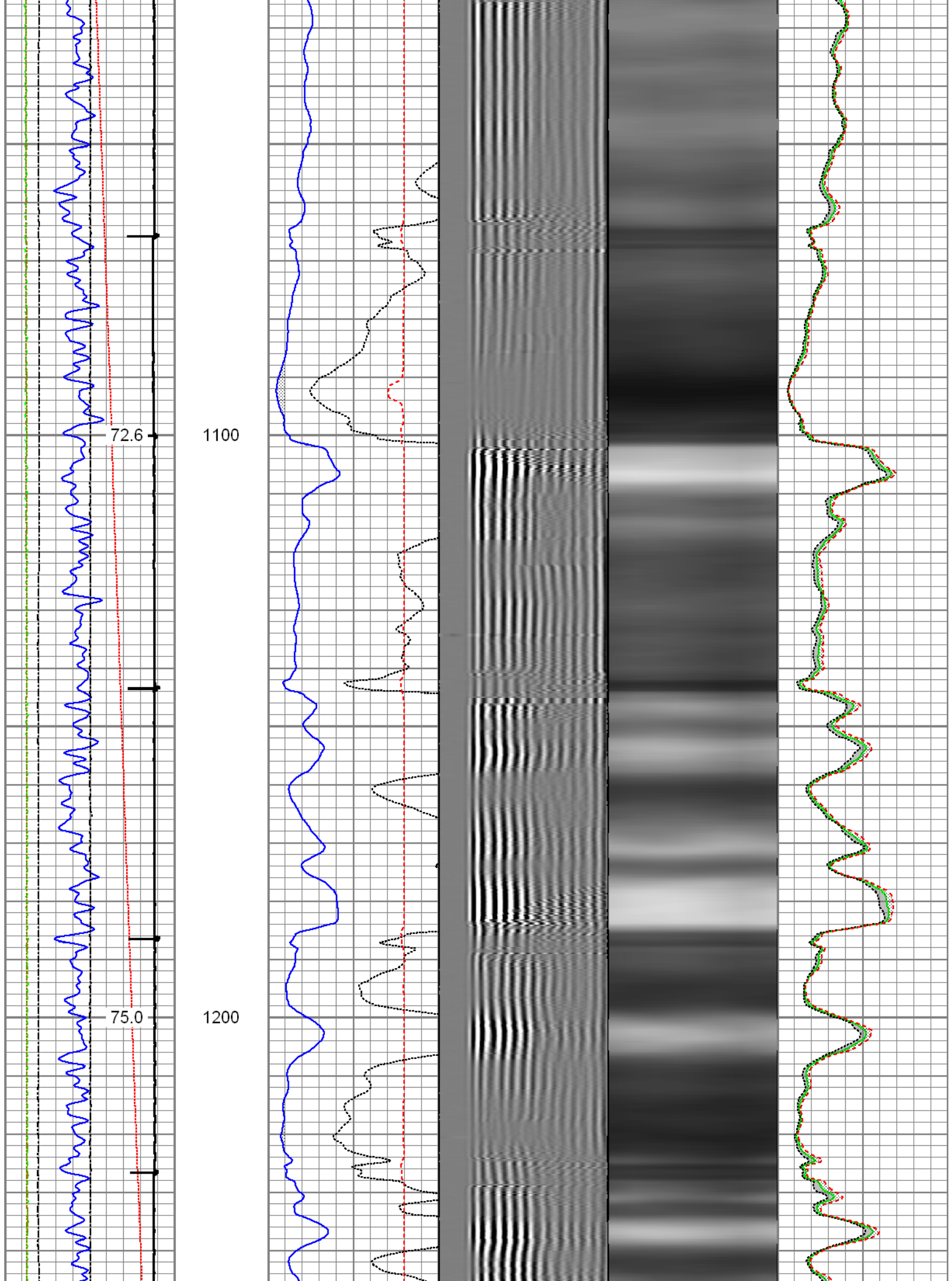


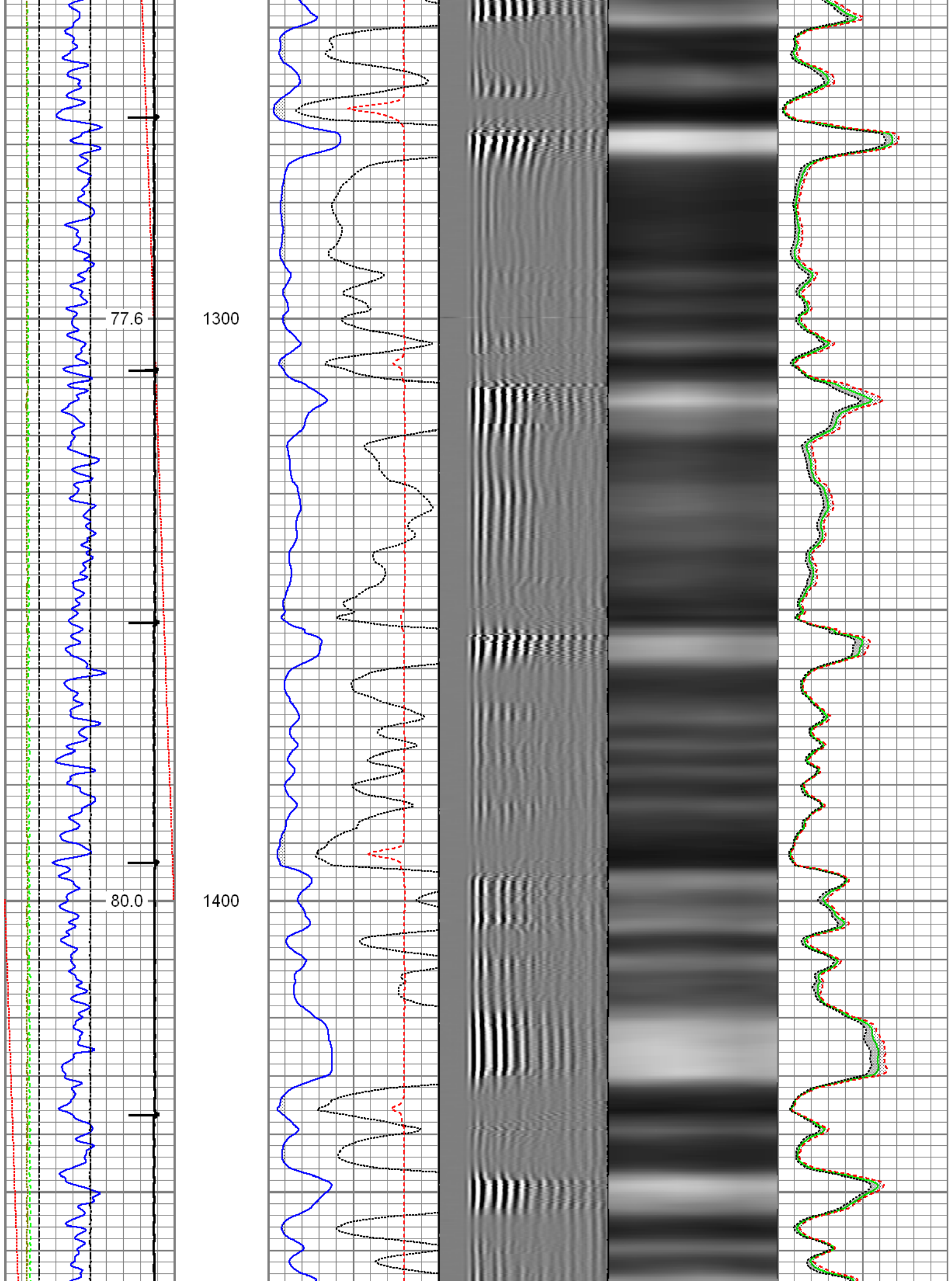


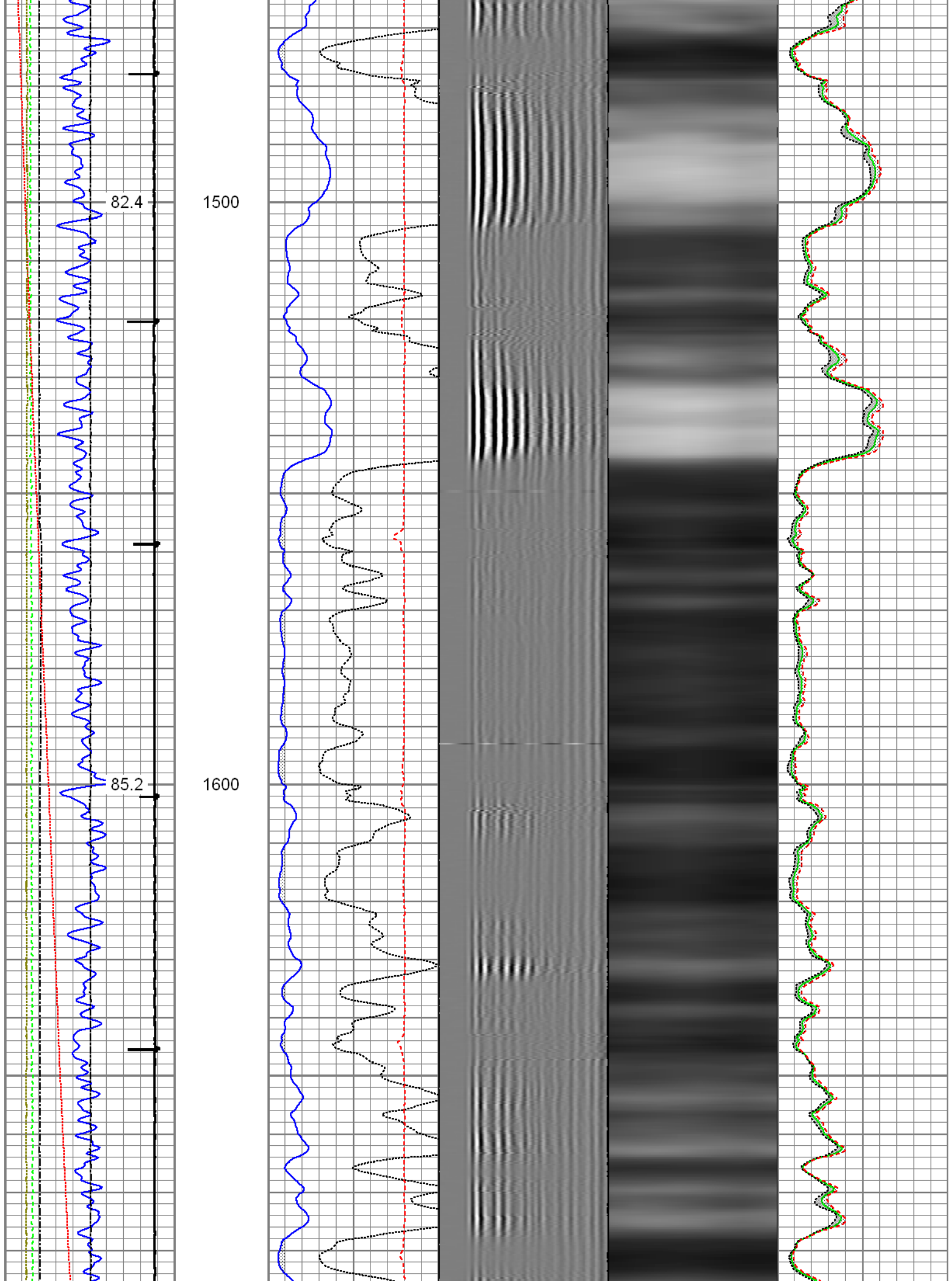


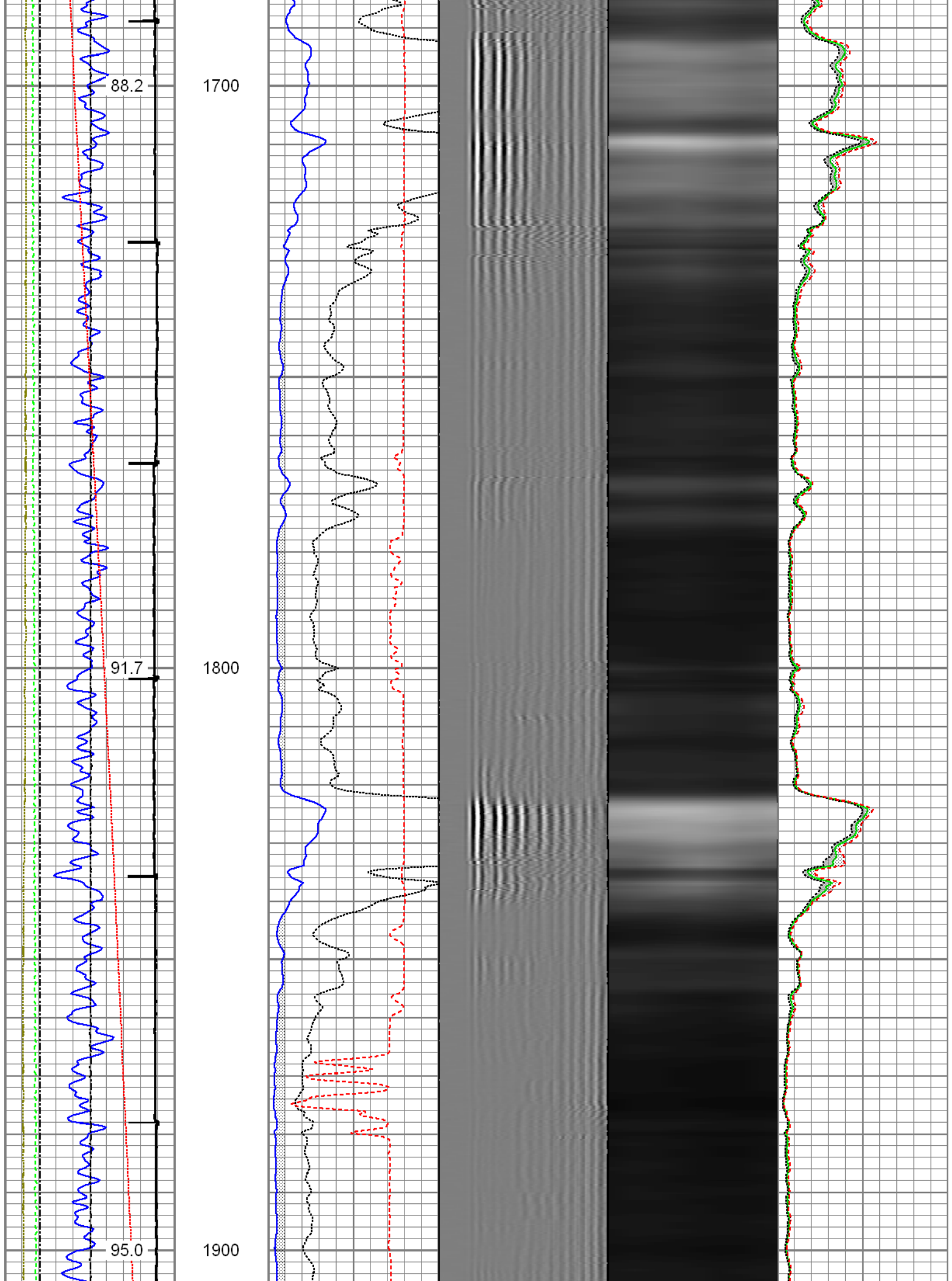


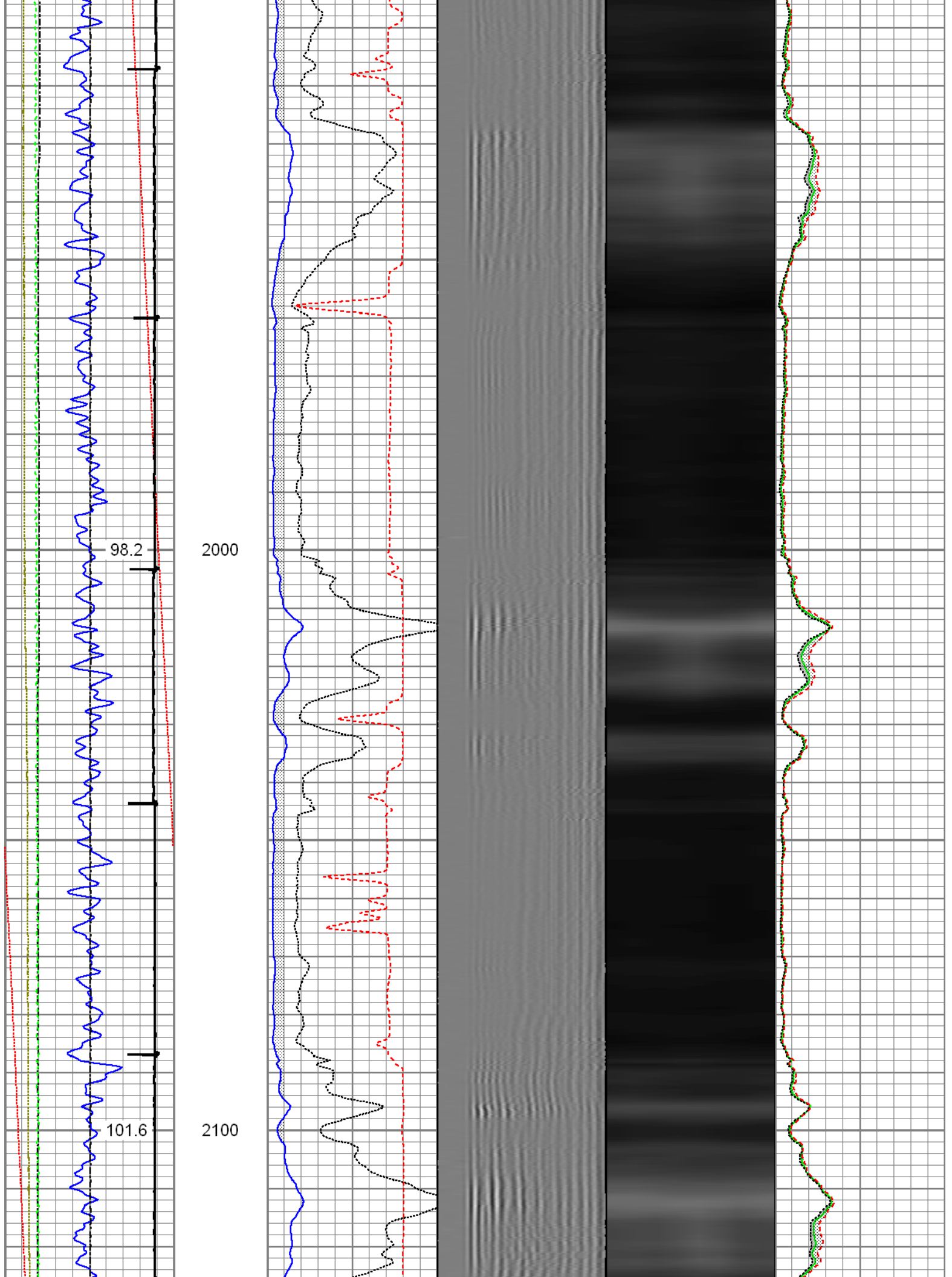


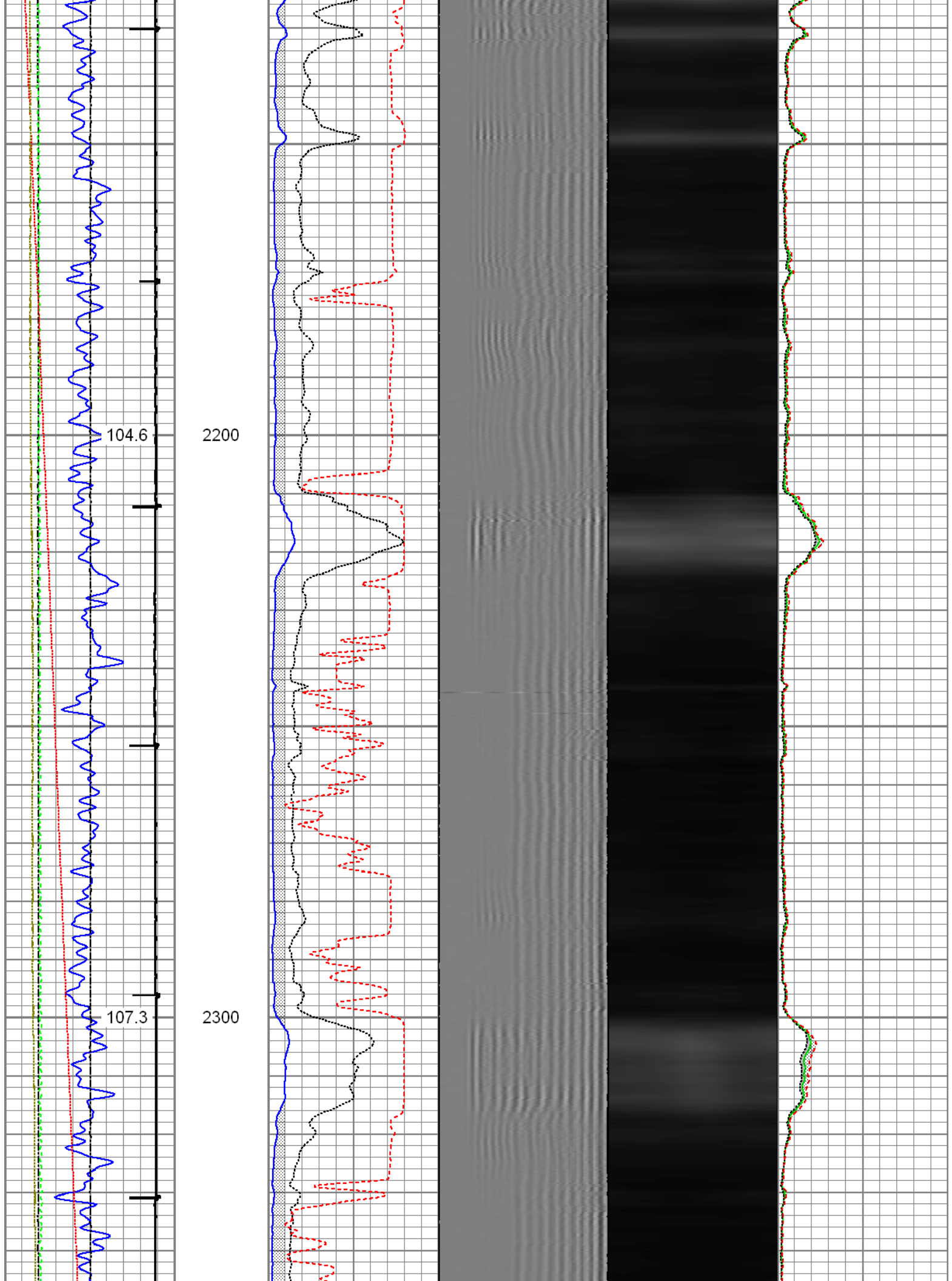


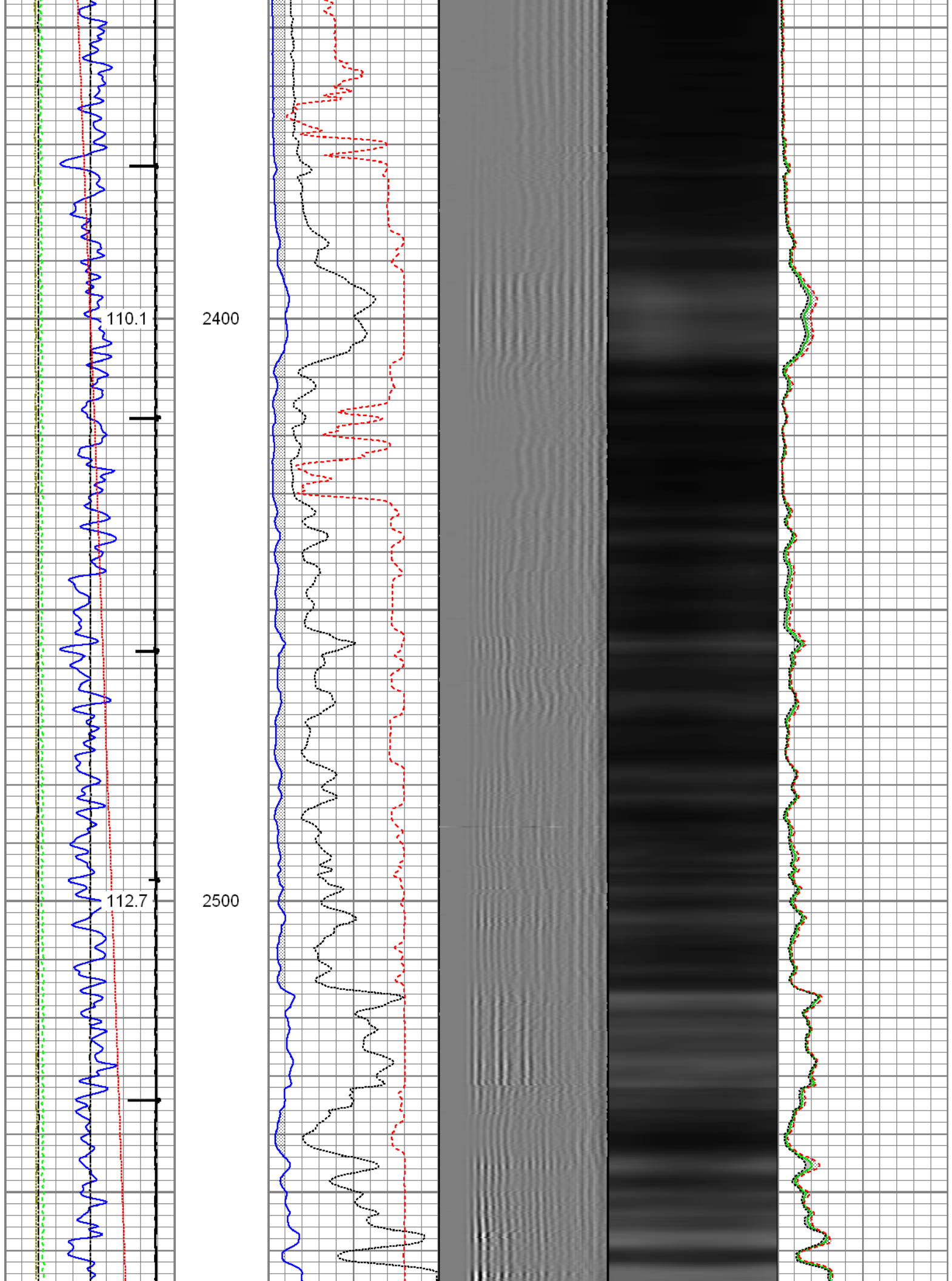


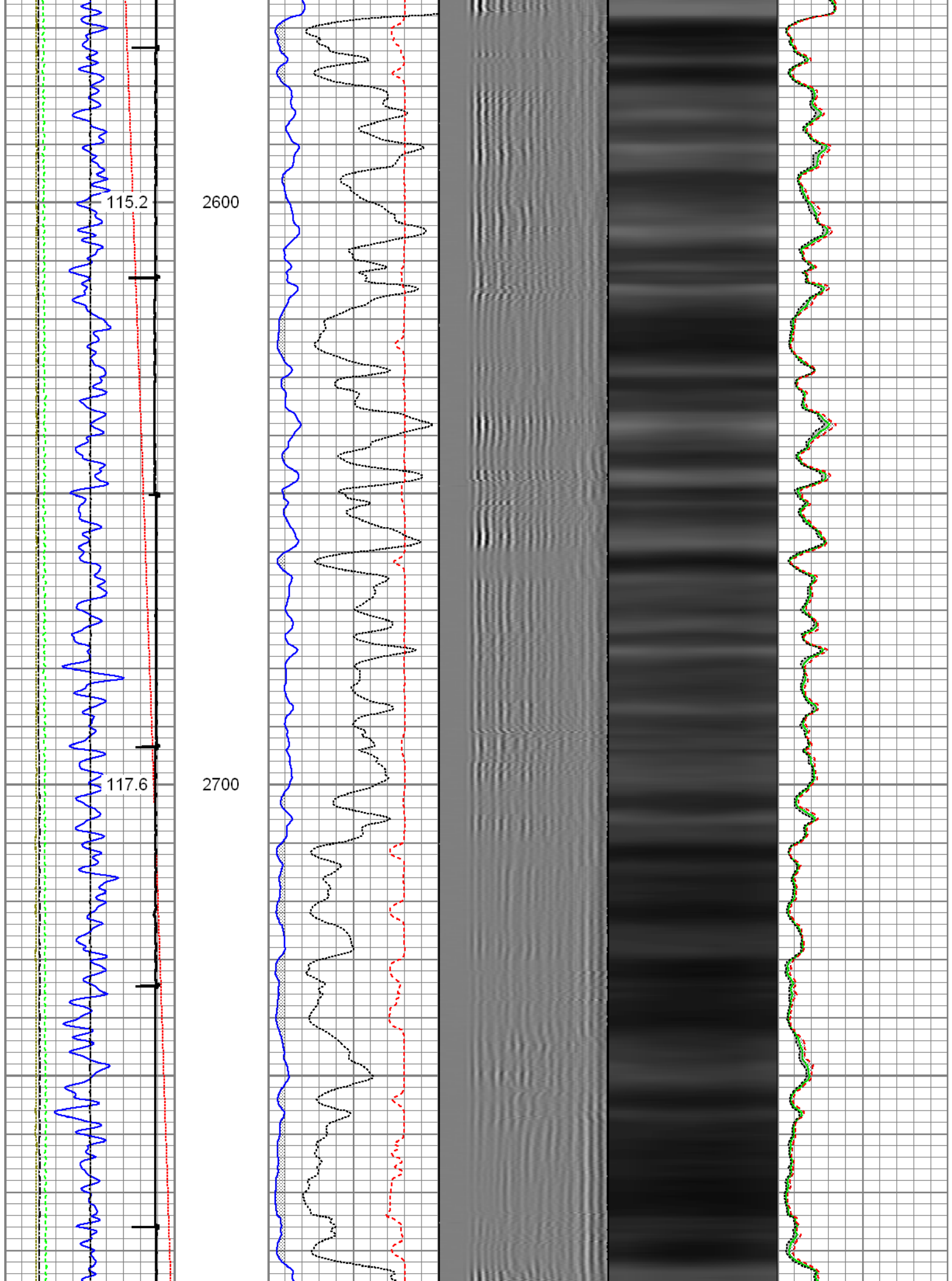


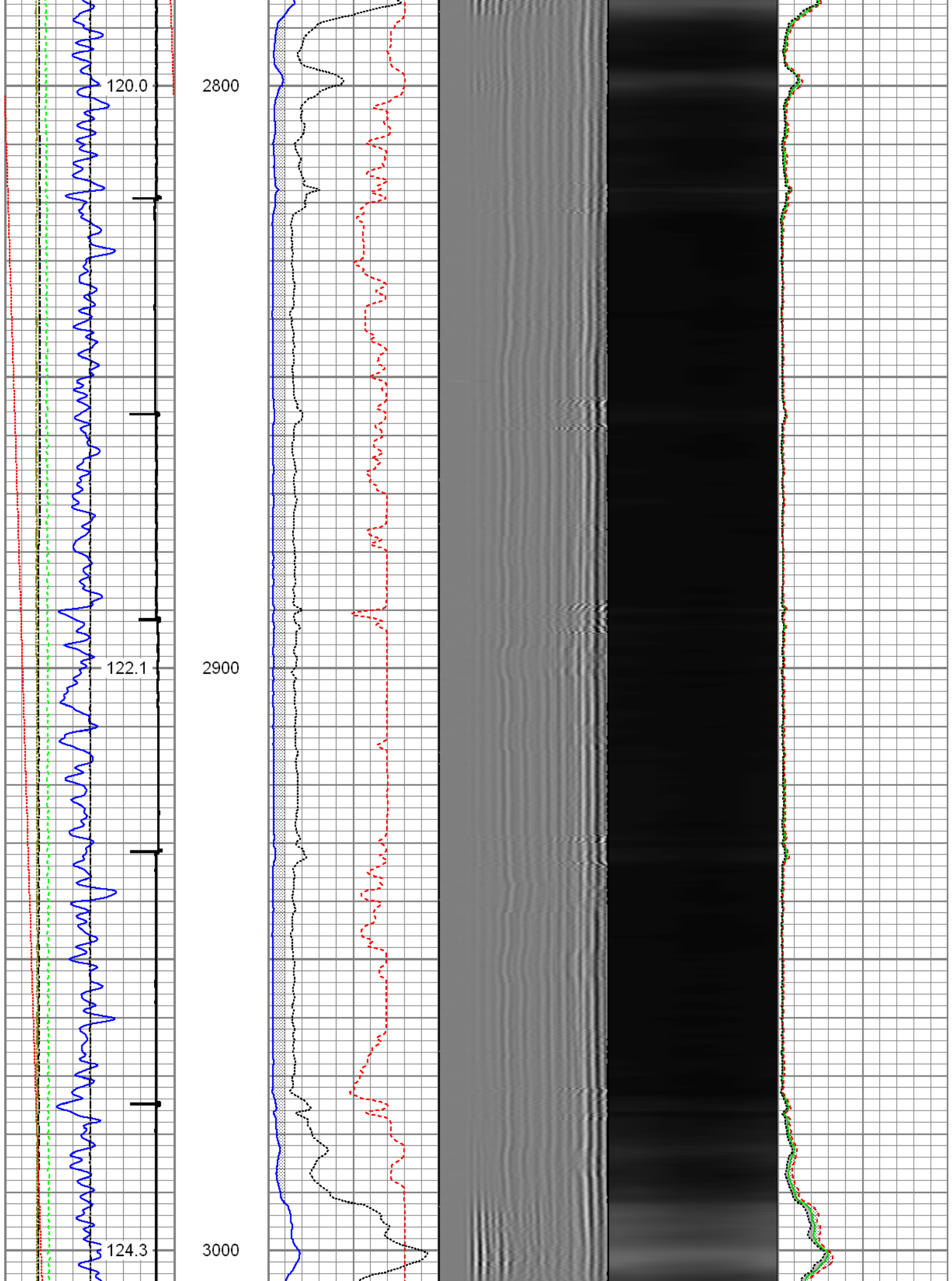


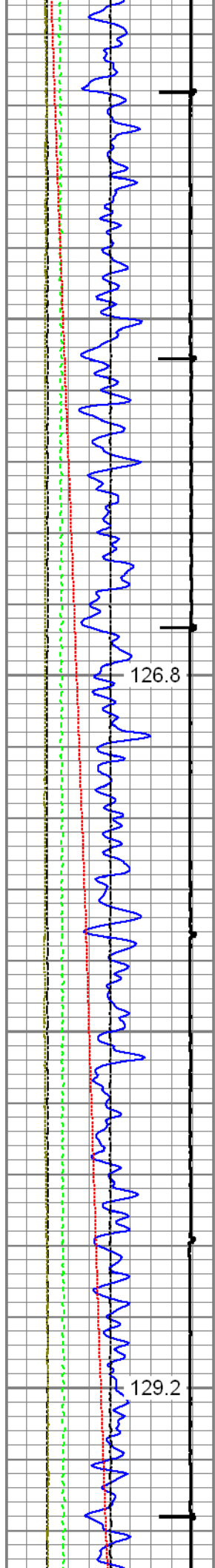










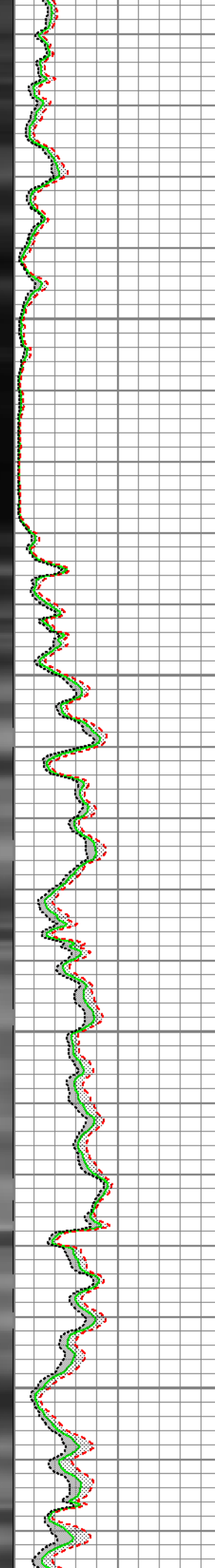
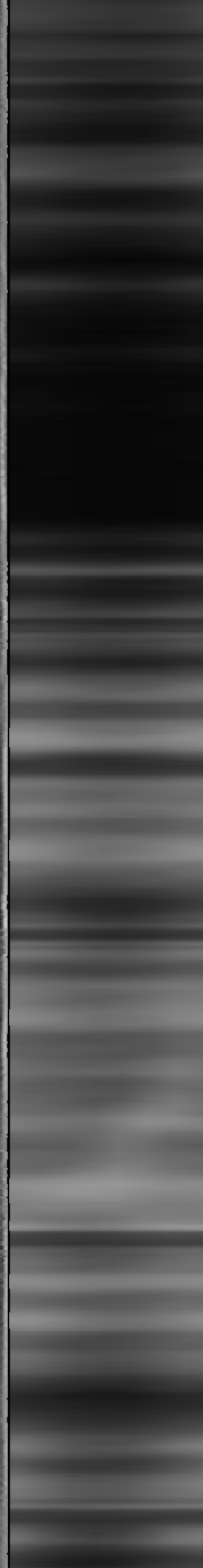
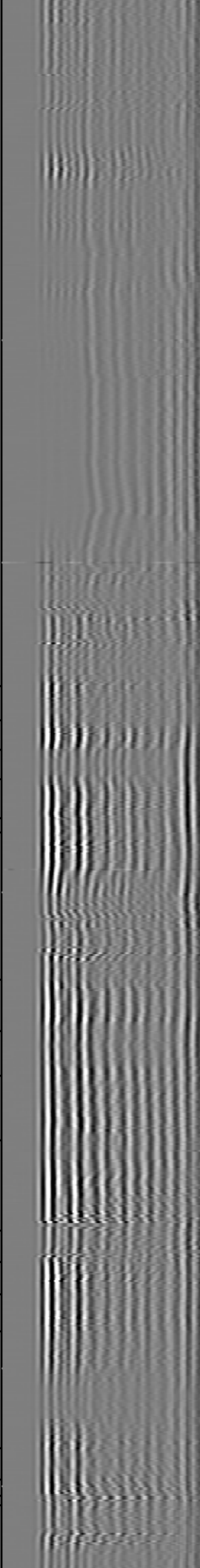
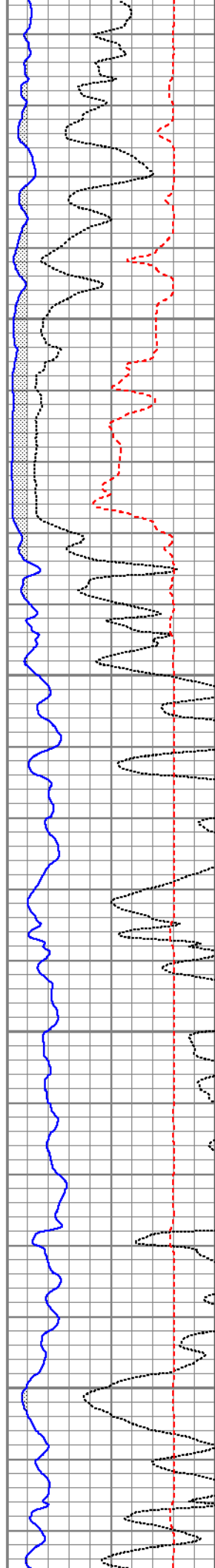


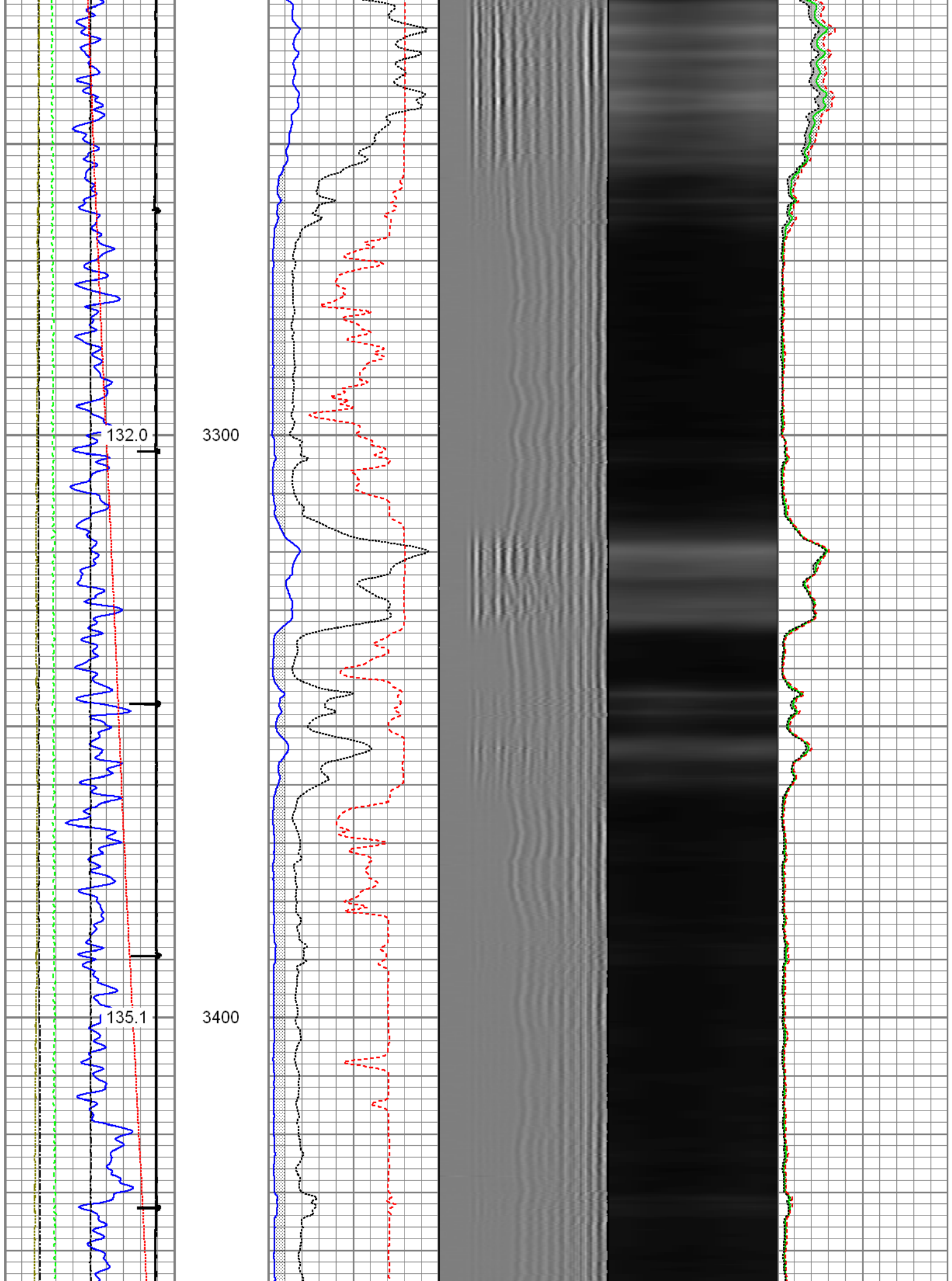
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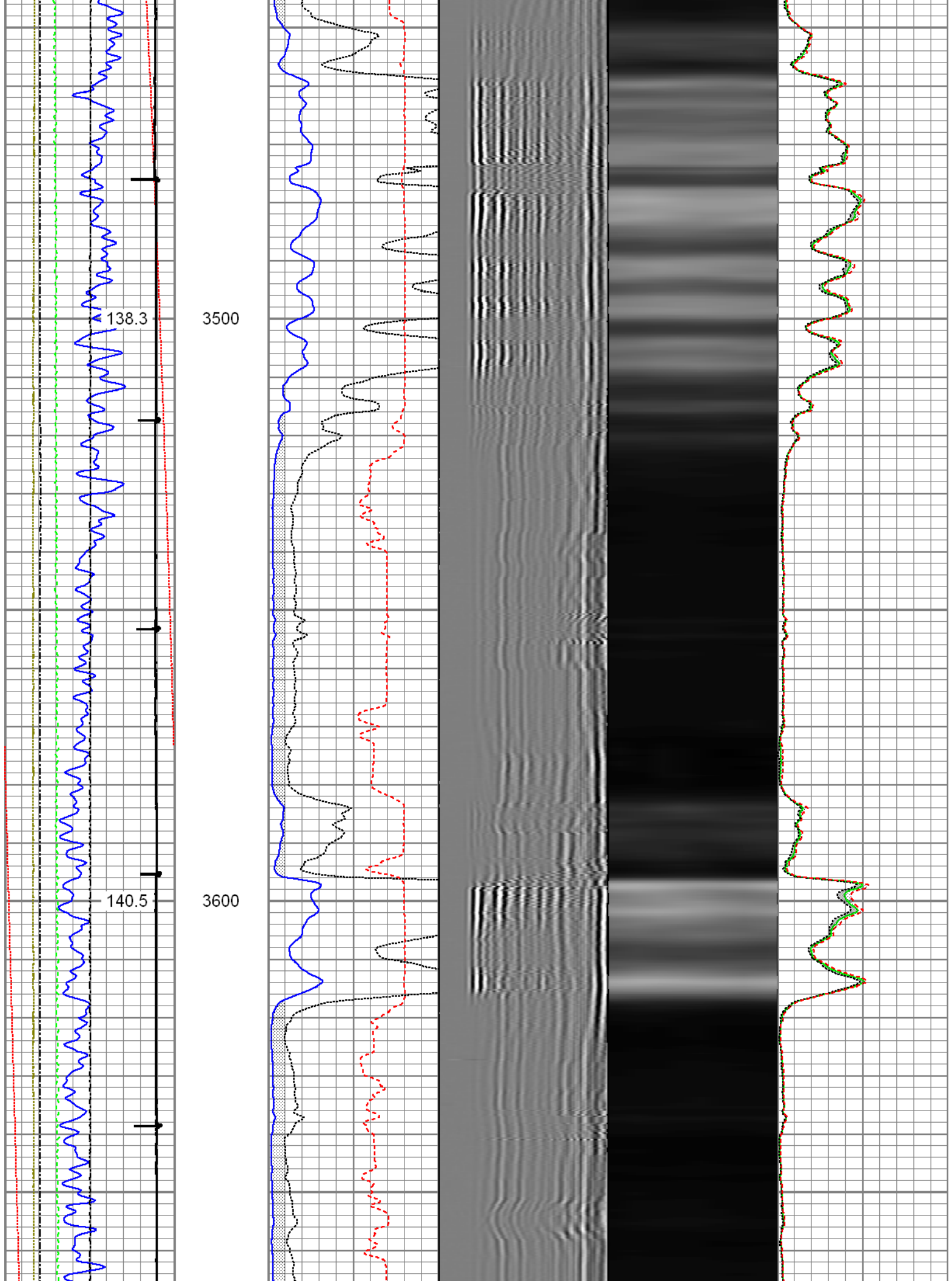
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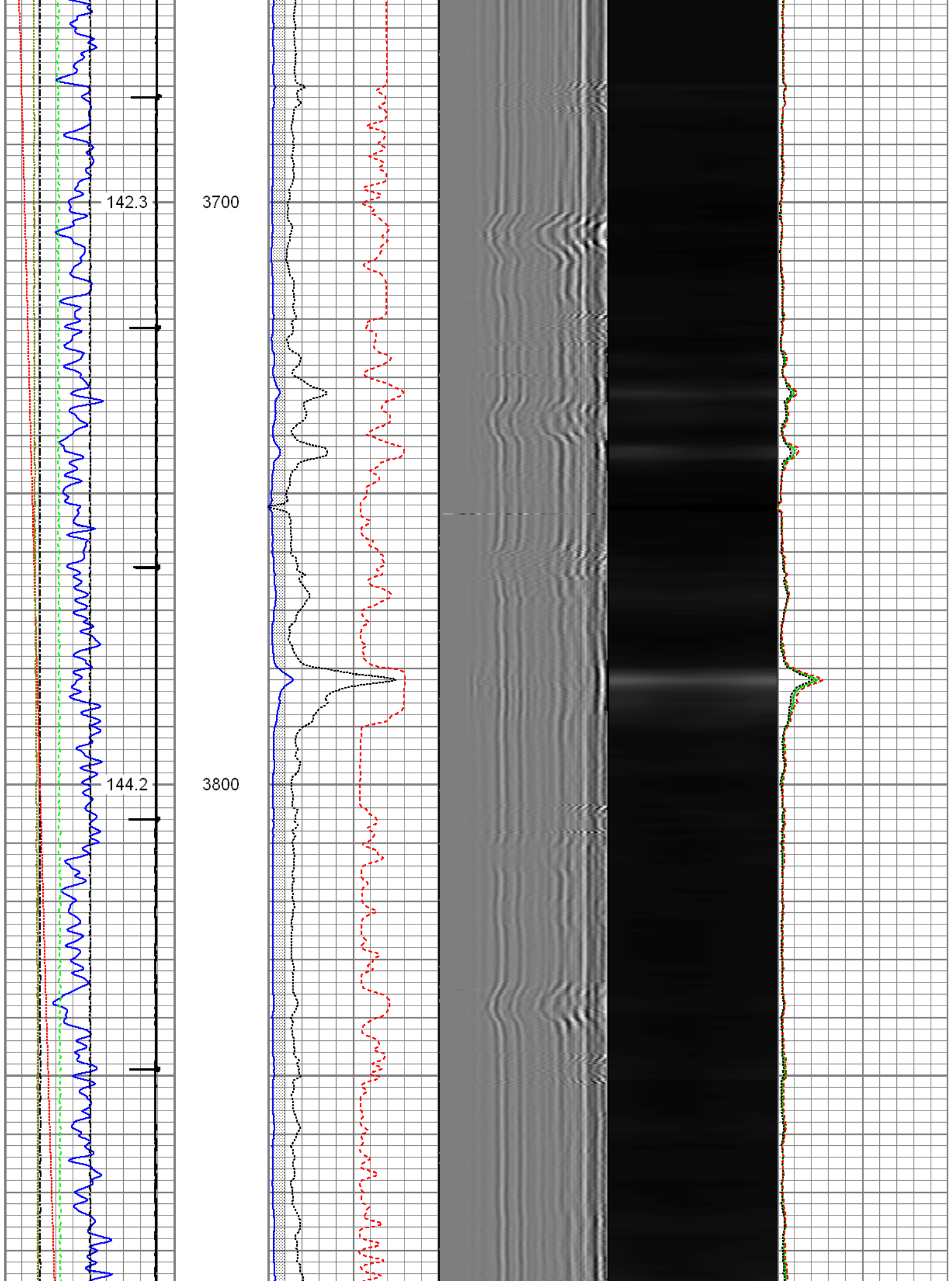
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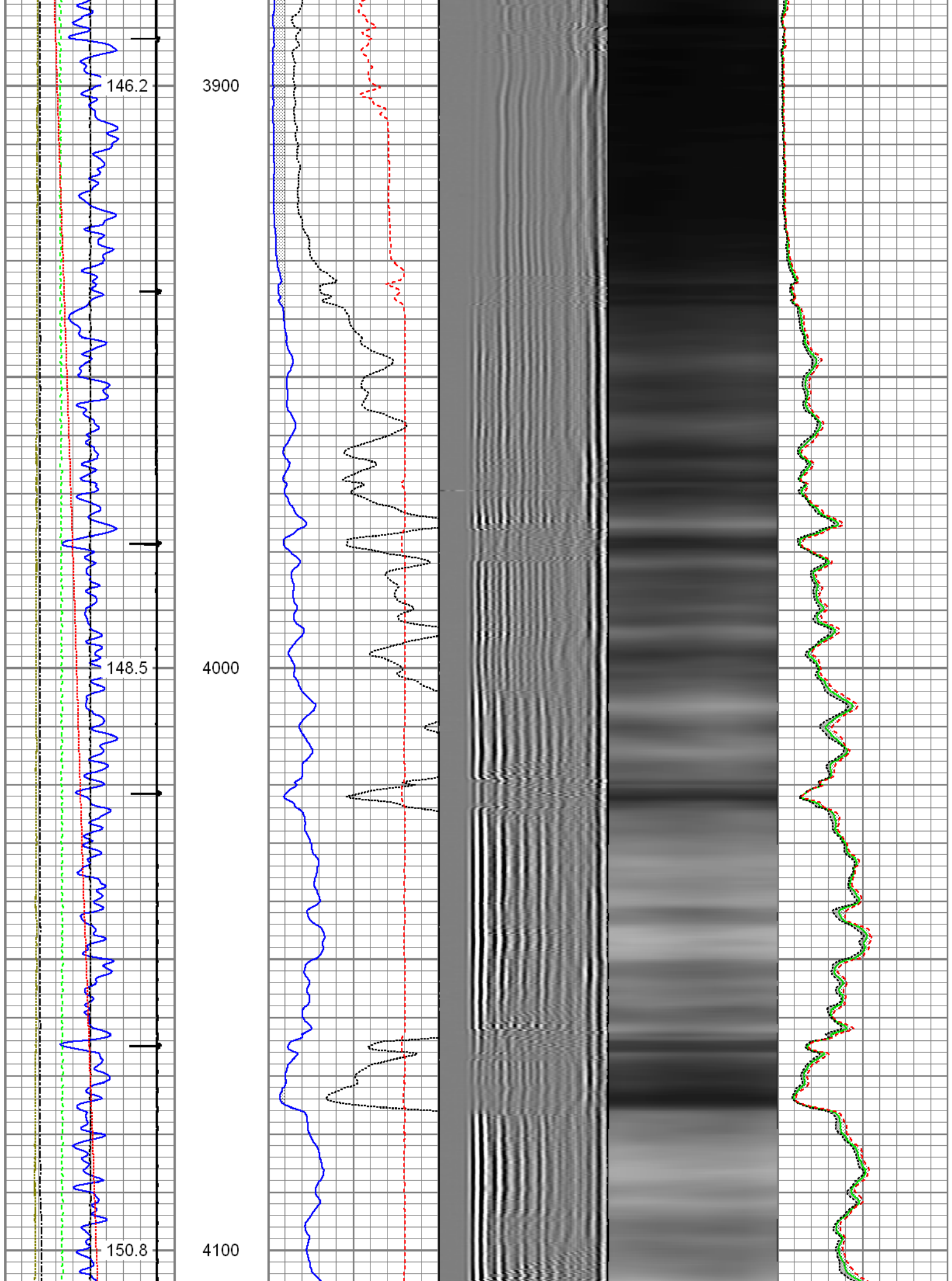
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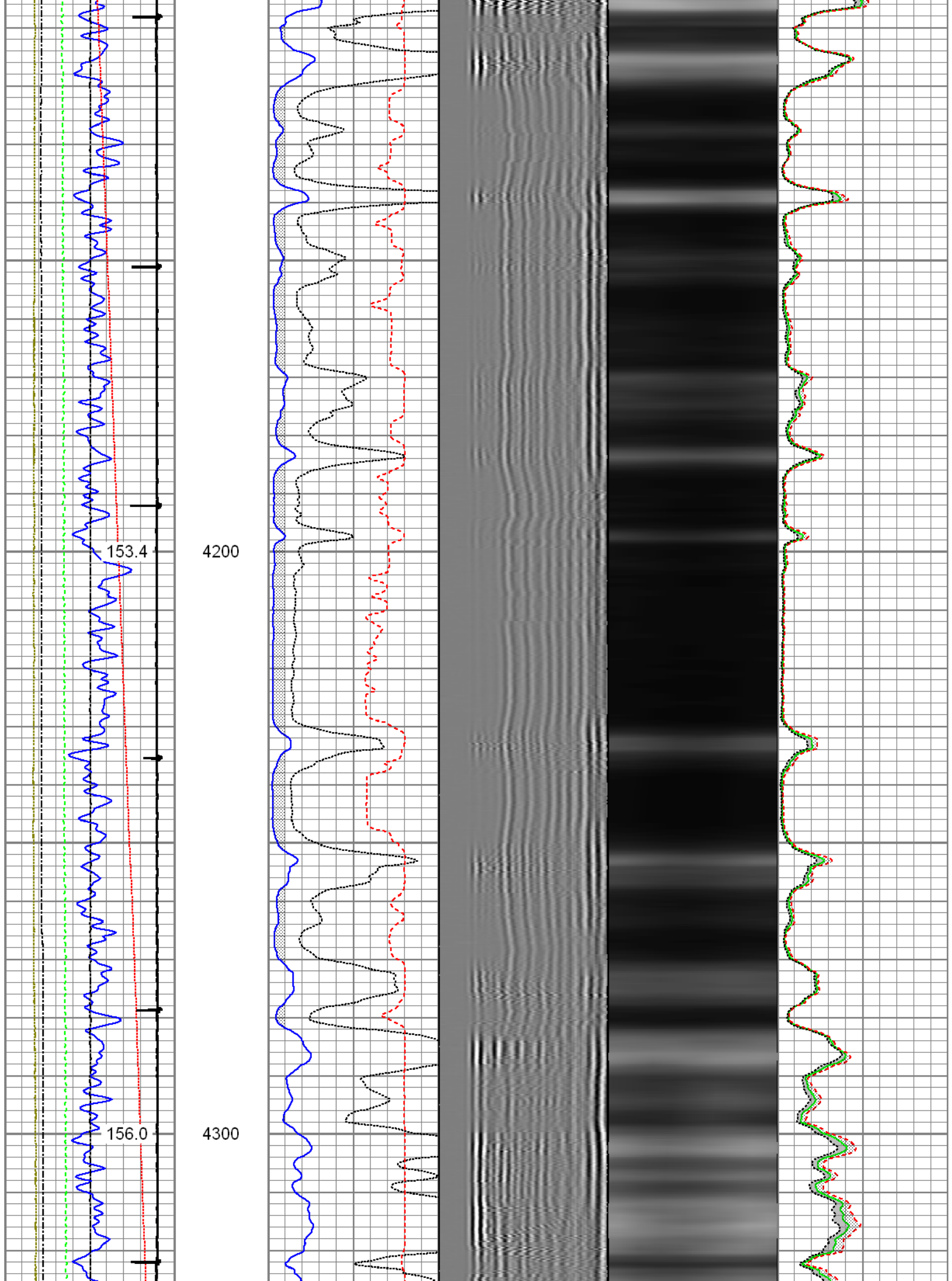


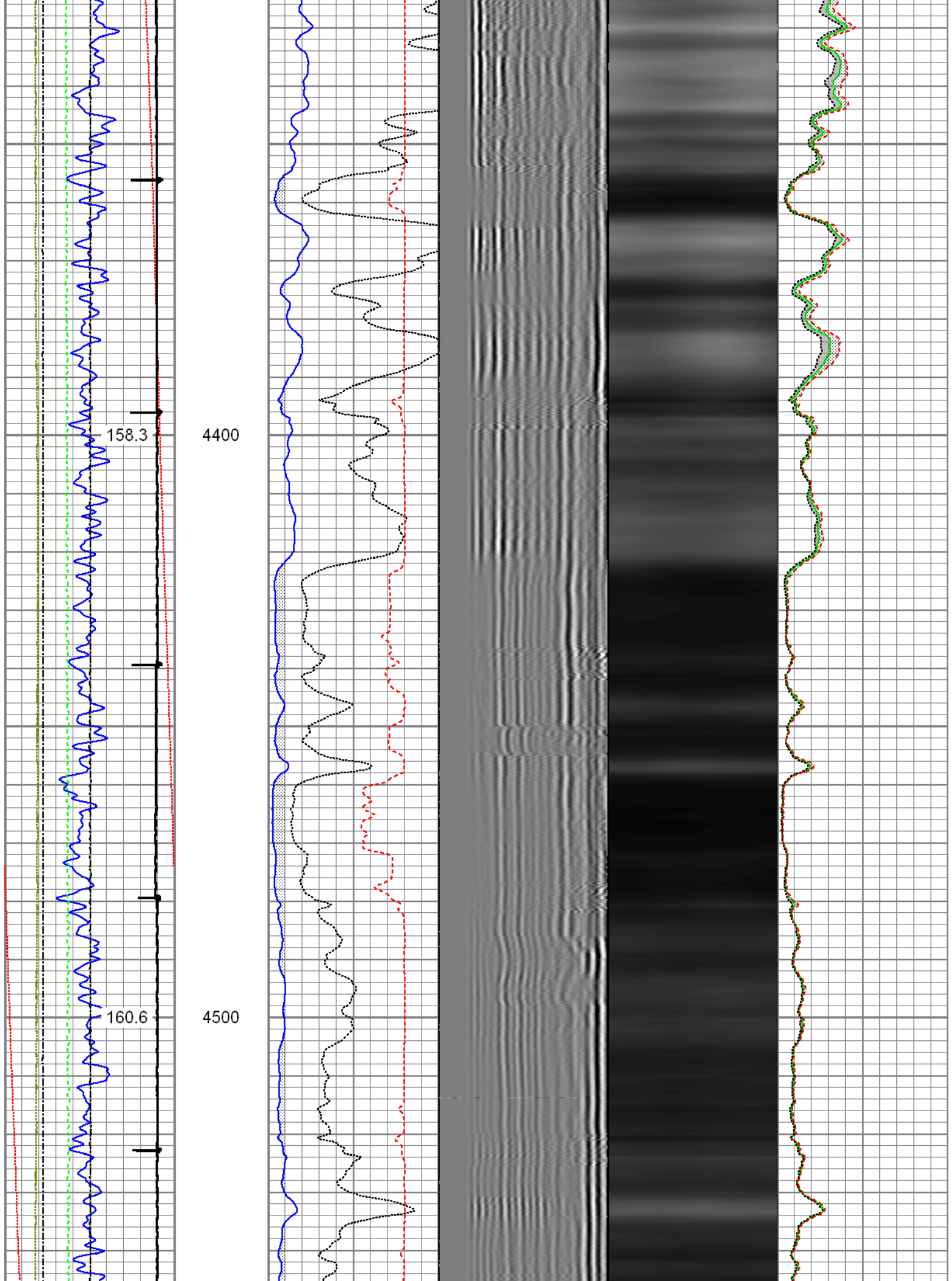


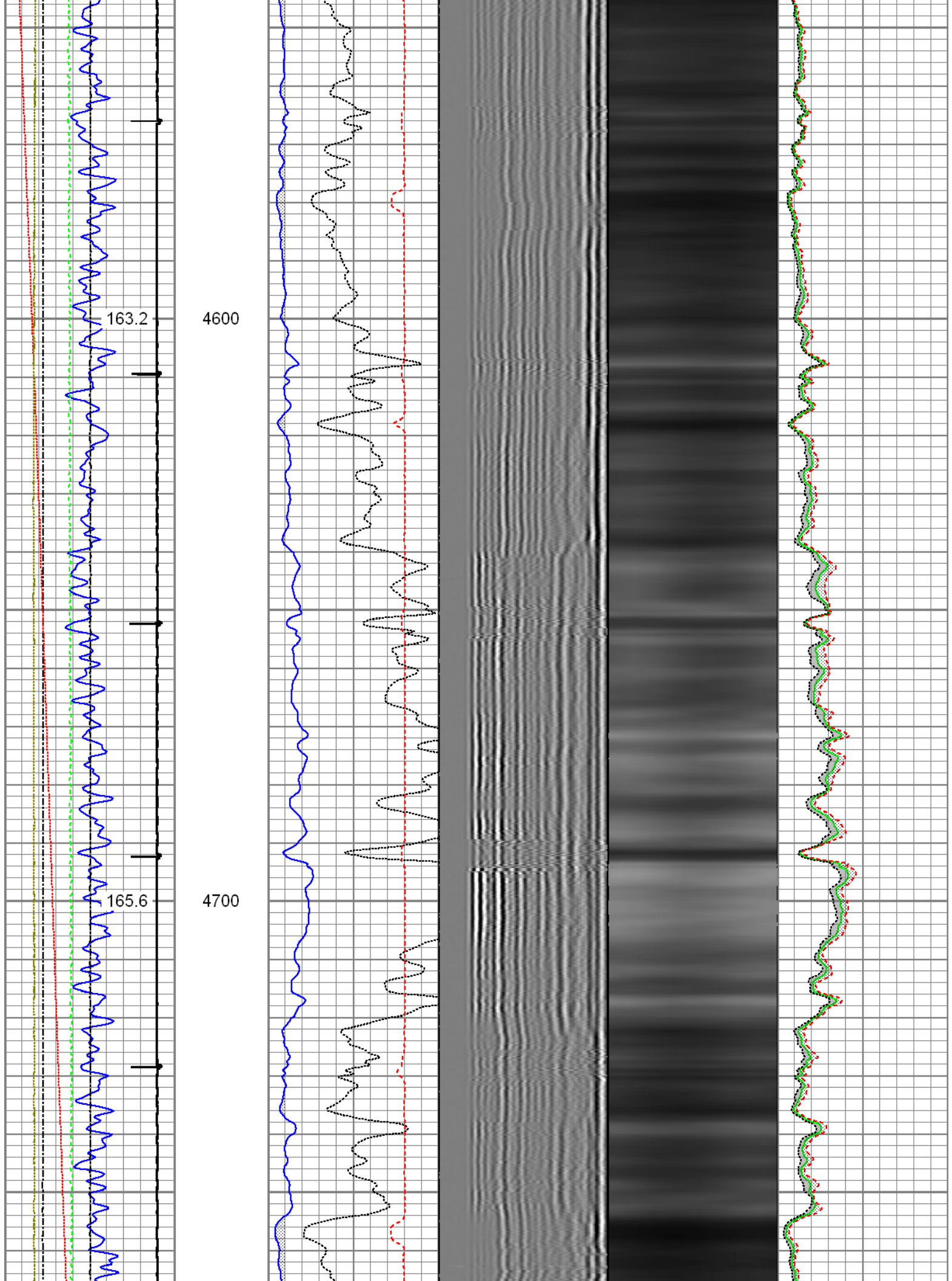


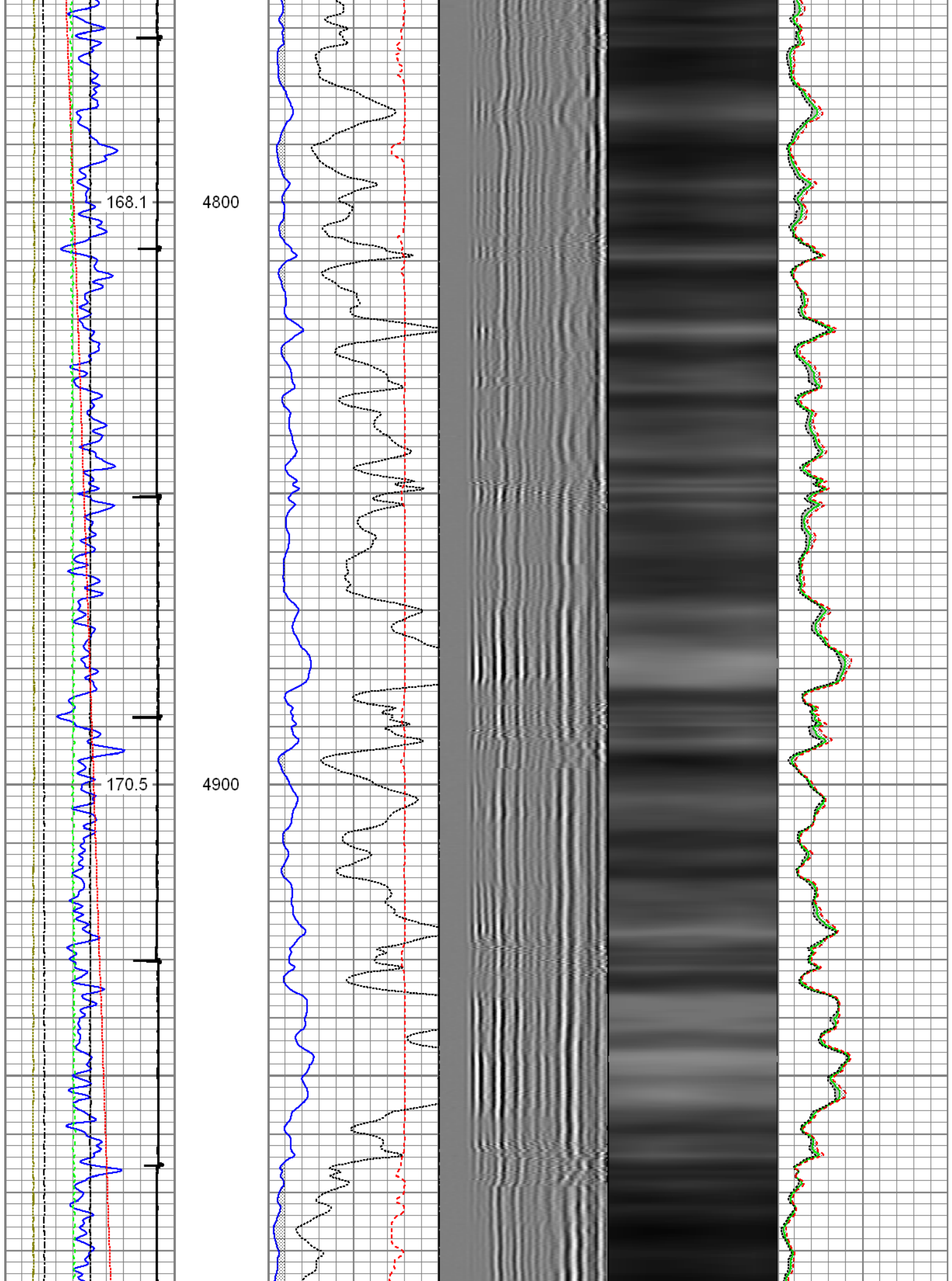


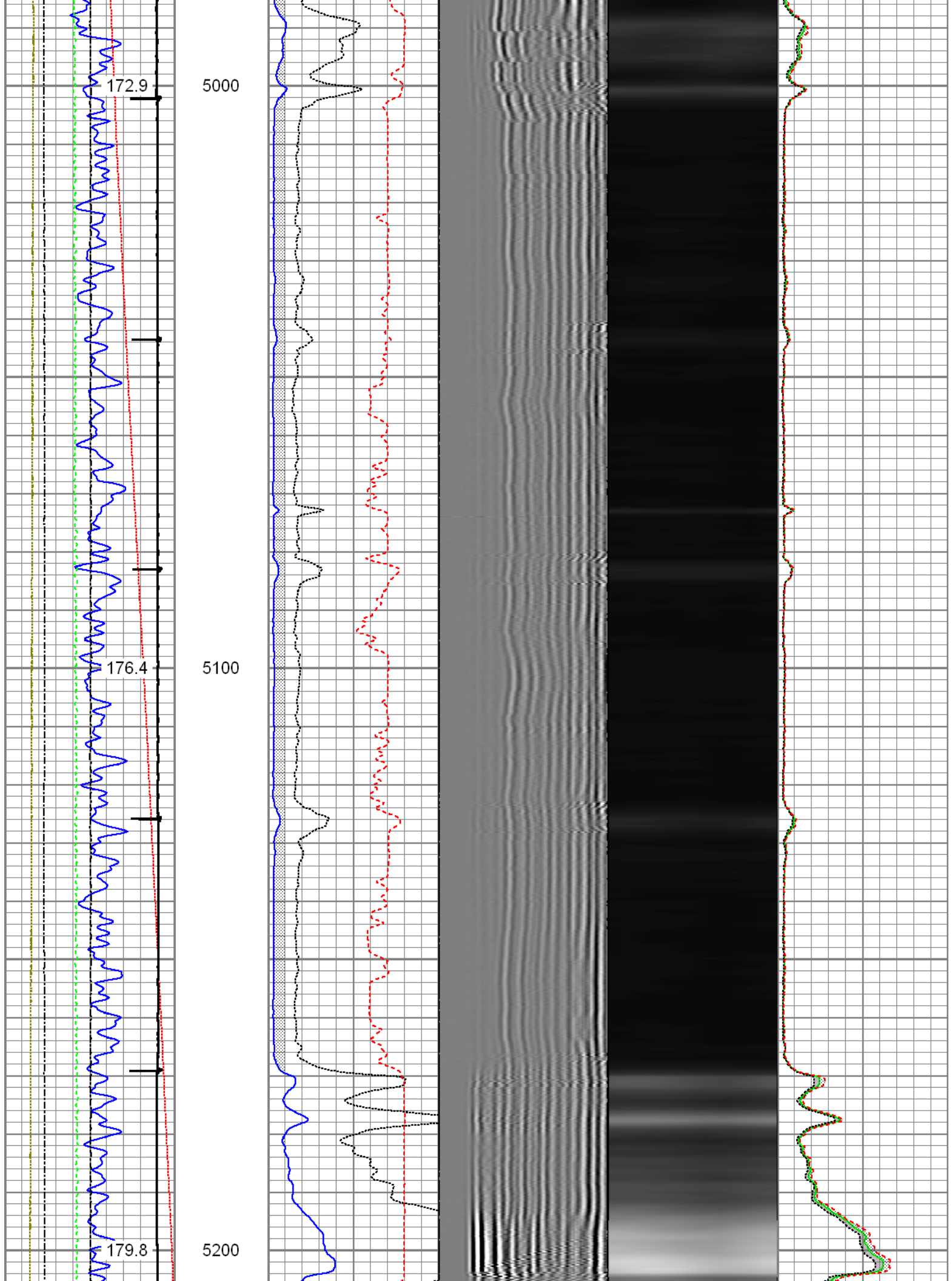


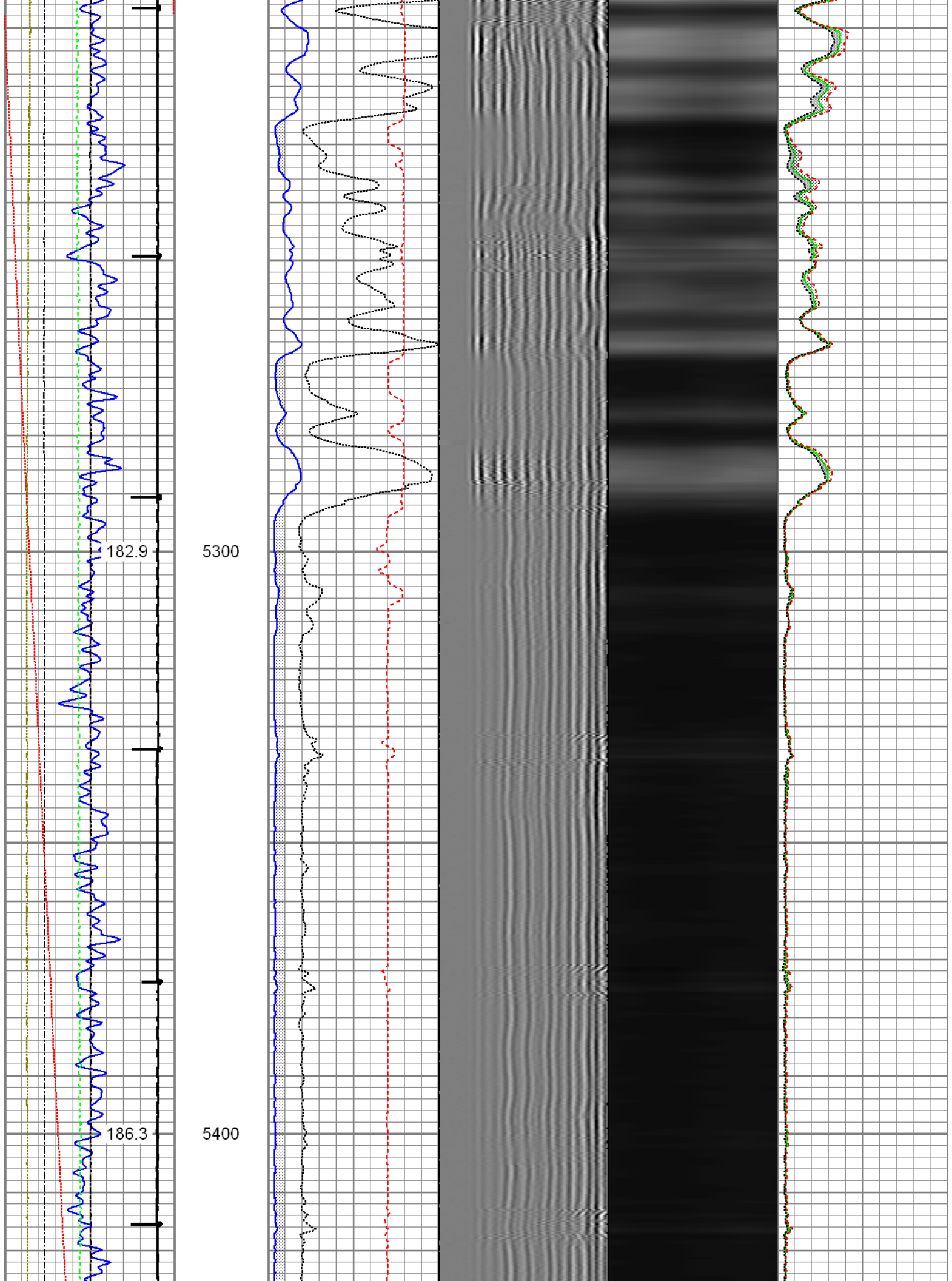


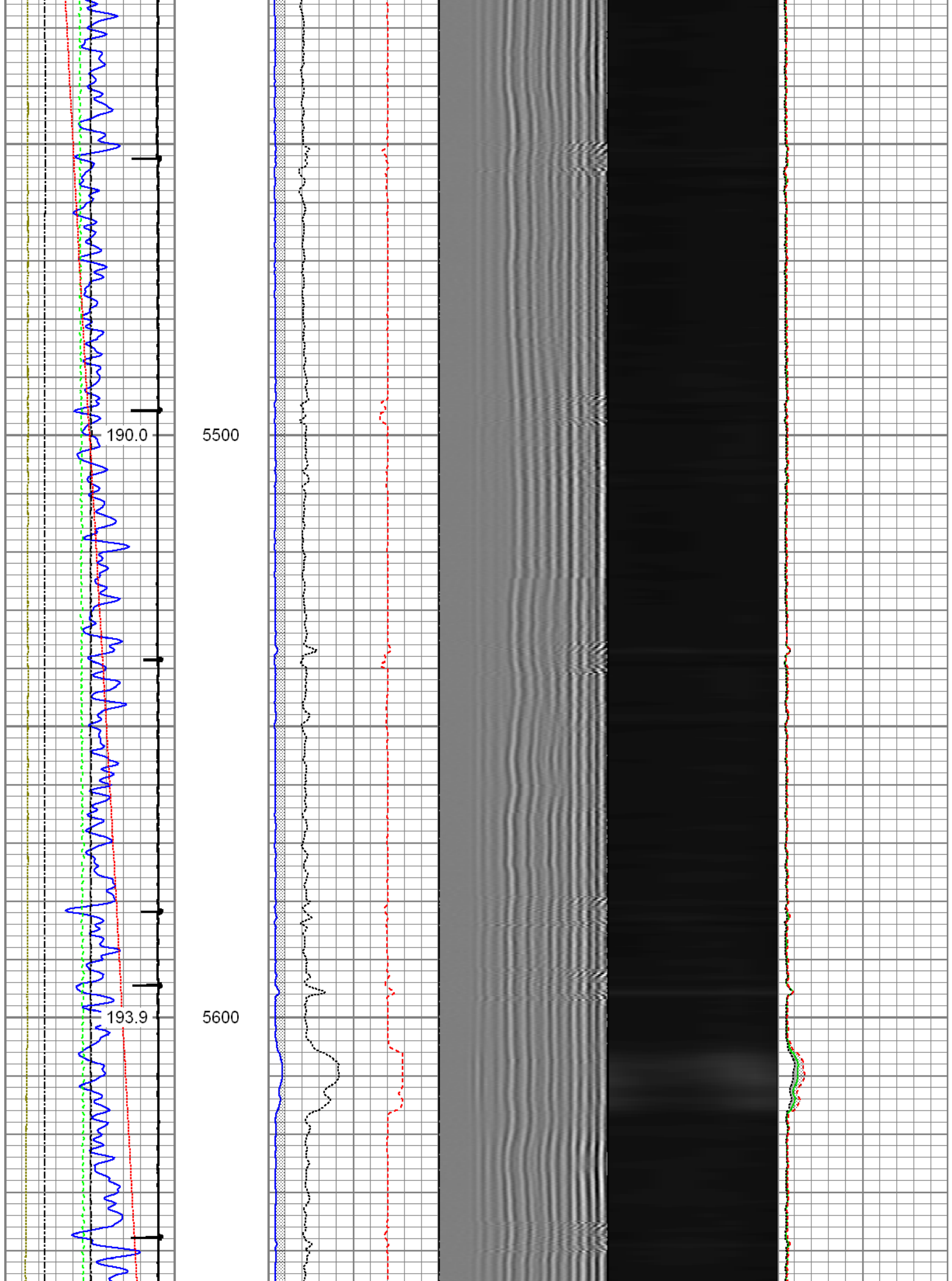


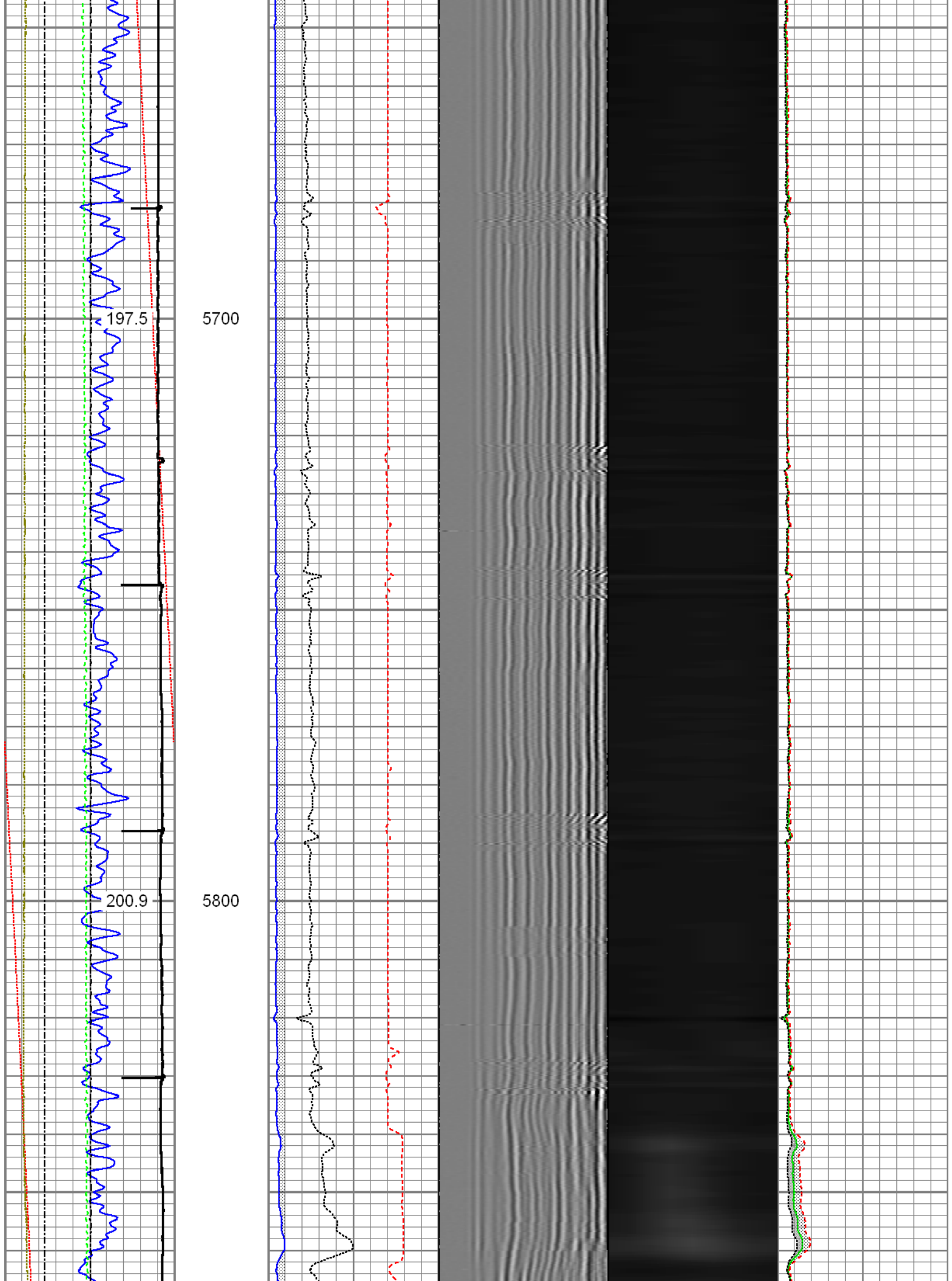


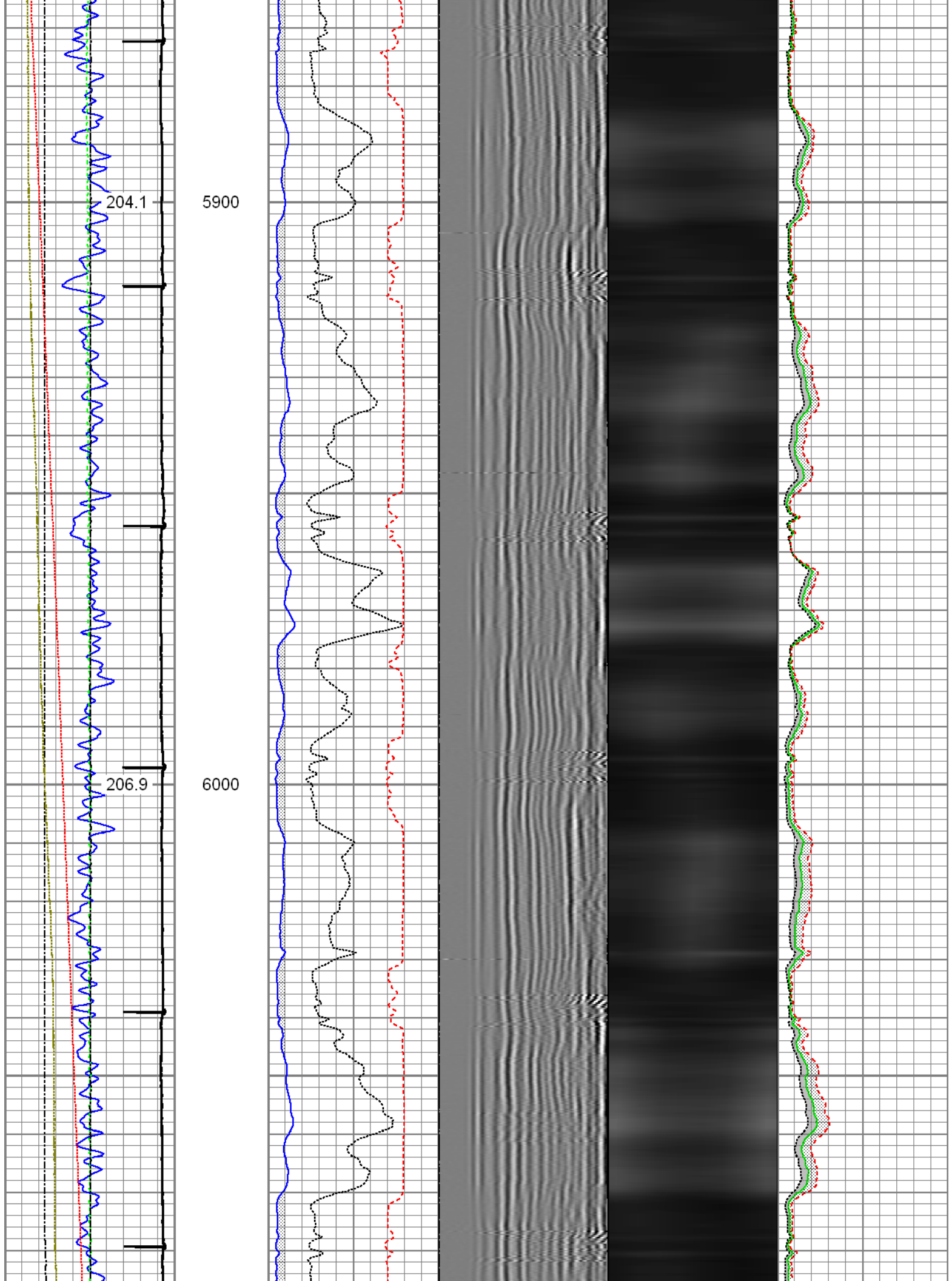


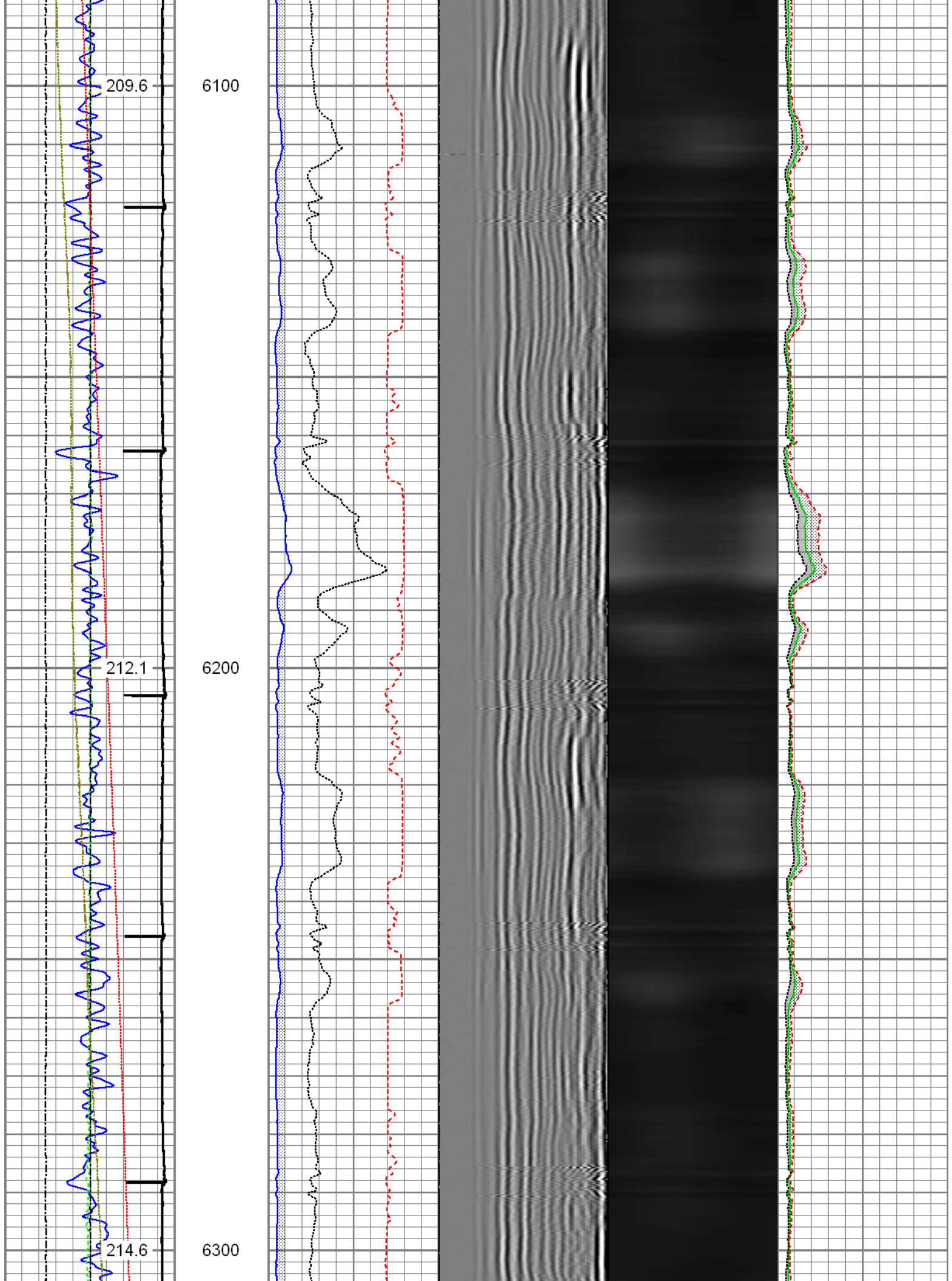


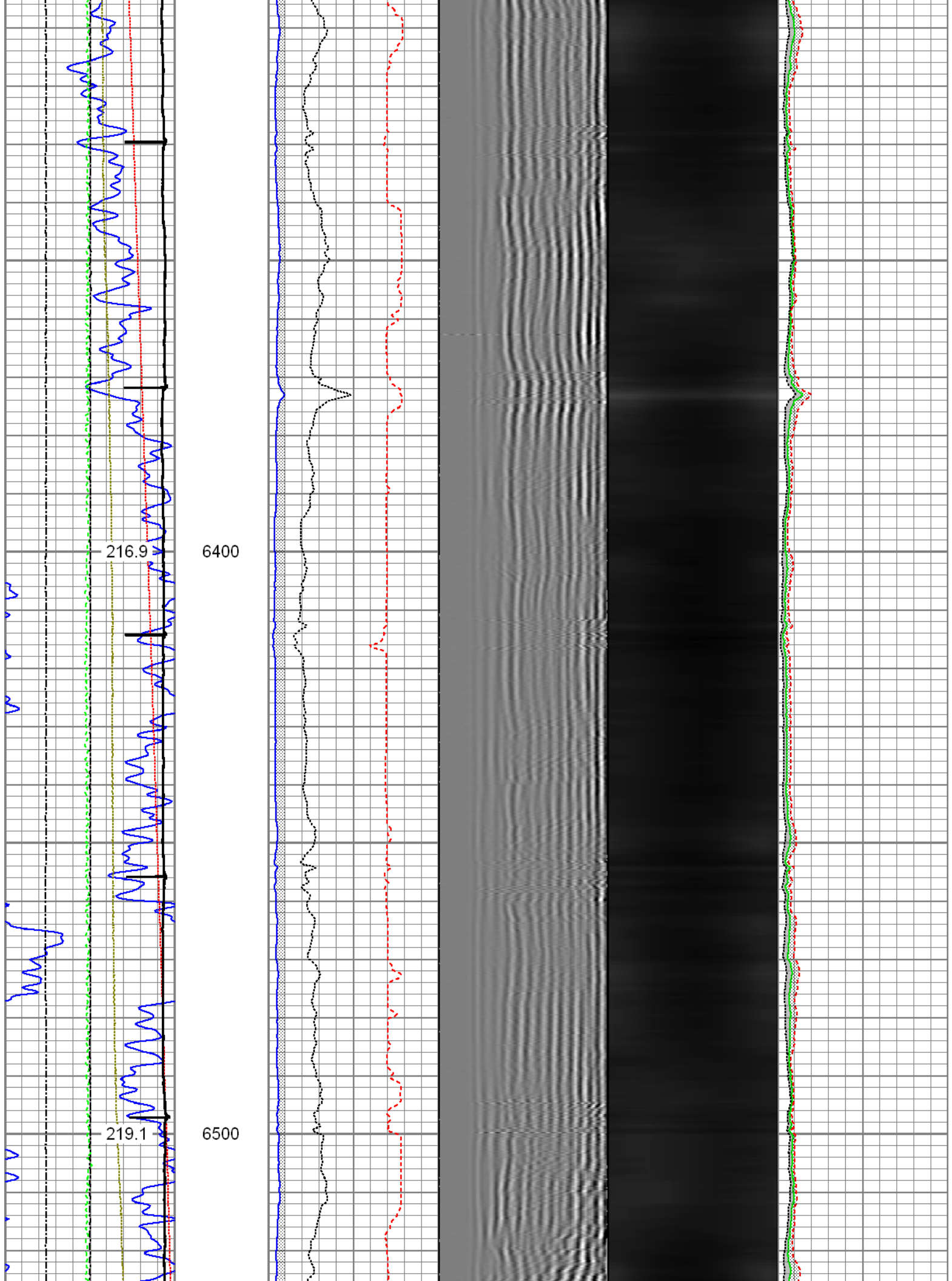


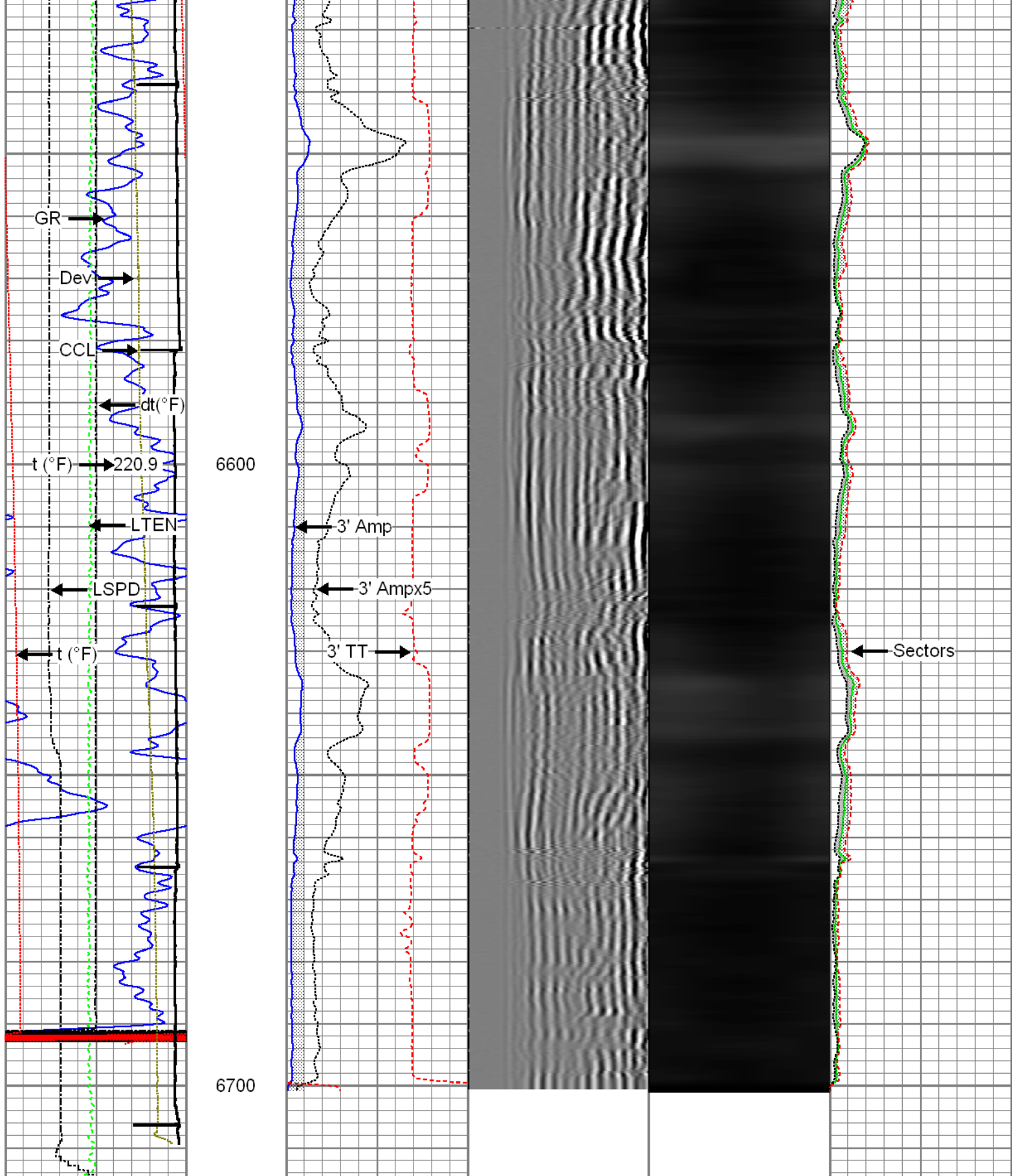













Gamma Ray (GAPI)		3' Amplitude (mV)		5' Variable Density Log	Sector Map	Average Amplitude	
0	120	0	100			0	100
Line Speed (ft/min)		3' Amplitude x 5 (mV)				Minimum Amplitude	
-100	100	0	20			0	100
Line Tension (lb)		3' Travel Time (usec)				Maximum Amplitude	
0	2000	650	150			0	100

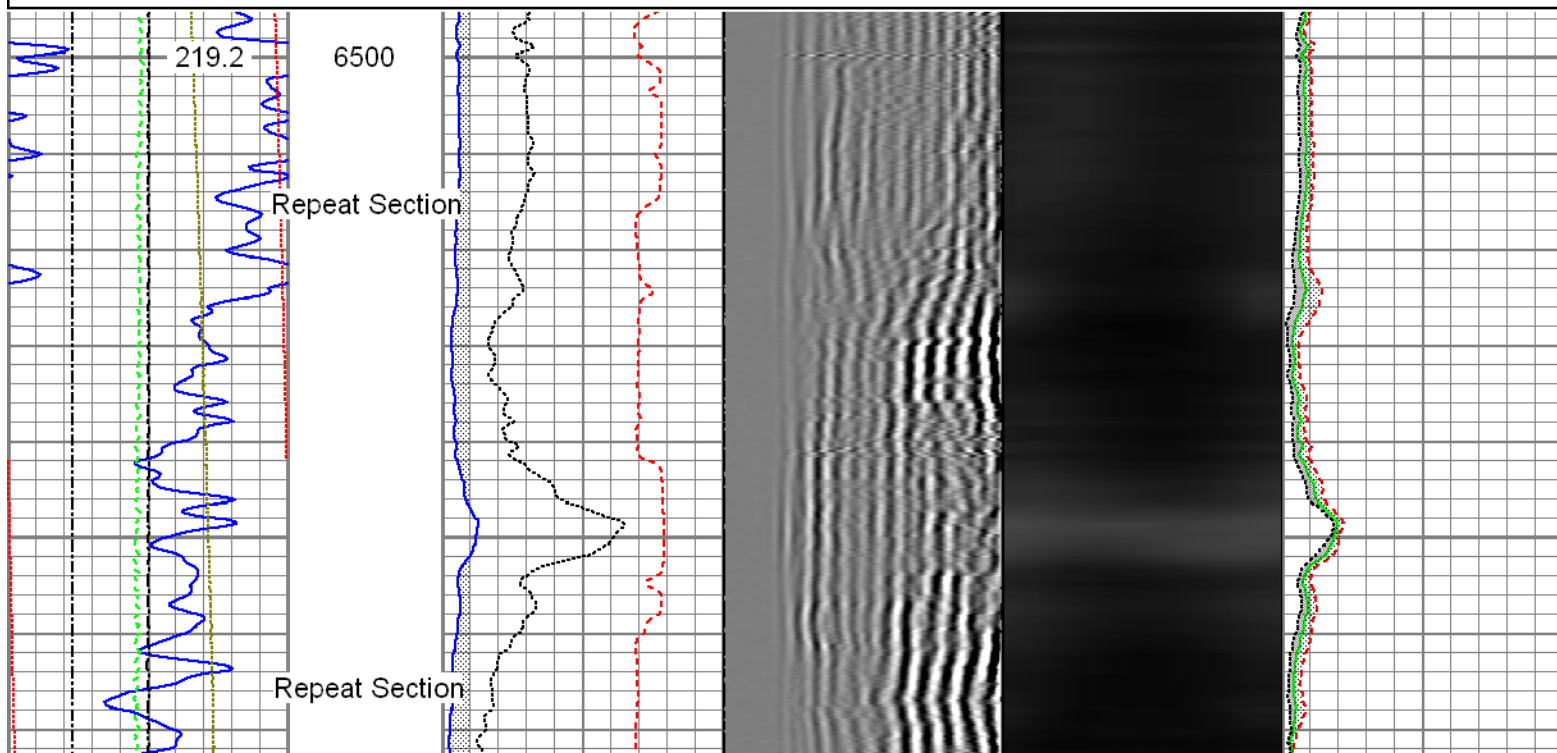
Differential Temperature		
-2	(degF)	2
Temperature		
0	(degF)	20
-10	Deviation (°)	90
Casing Collar Locator		

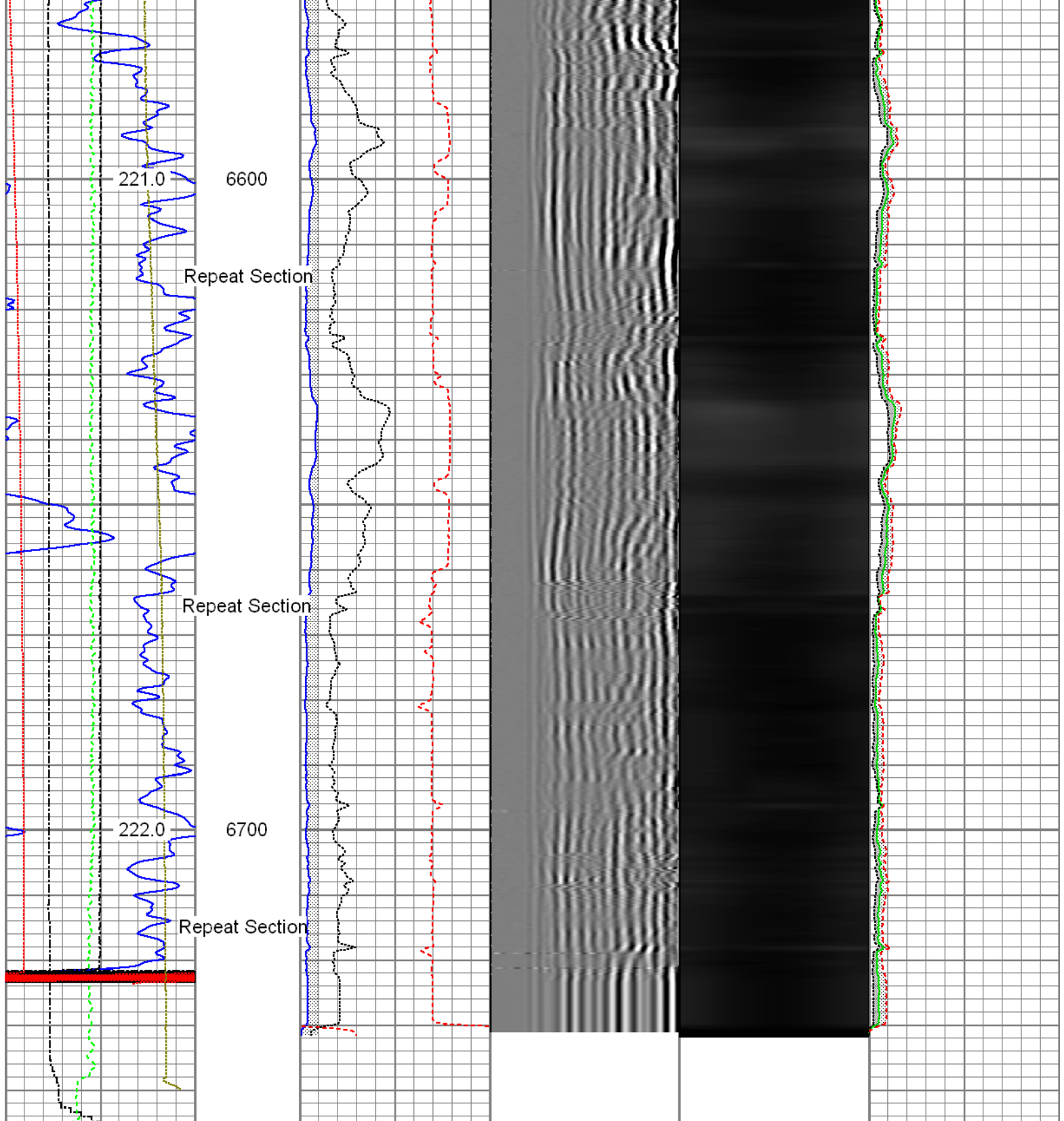
	Repeat Pass
	Recorded with 2500 PSI Surface Induced Pressure

Database File: c:\warrior\data\10-15-15_noble energy_wells ranch ae32-655_mit_rbl\processed_10-15-15_noble ene
 Dataset Pathname: pass5
 Presentation Format: rbt4_mit
 Dataset Creation: Thu Oct 15 15:28:41 2015 by Log 7.0 B1
 Charted by: Depth in Feet scaled 1:240


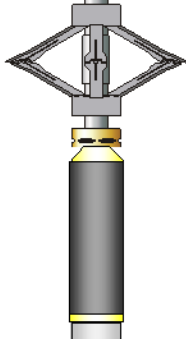
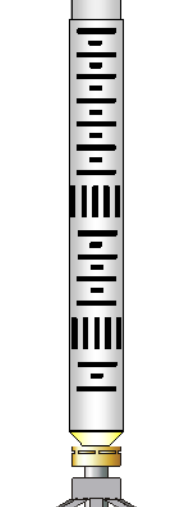
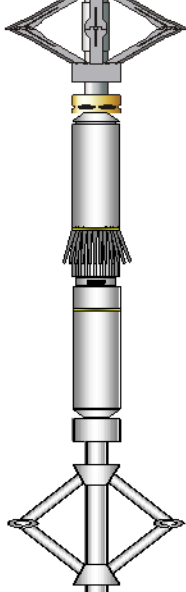
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Line Speed	3' Amplitude x 5			Minimum Amplitude
-100 (ft/min) 100	0 (mV) 20			0 100
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	650 (usec) 150			0 100

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





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

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 (218874) 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 (10025097) 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
WVF3FT	15.42		UW_RBT-UW_RBT_004 (1063) 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					
CBLROT	15.42					
WVF5FT	14.42					
MIT	5.41		UW_PRC-DSSRAC (081) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
			UW_MIT-UW_MIT40_042 (10012912) 40 Multifinger Imaging Tool	4.54	2.75	61.10
			UW_PRC #3 -UW_PRC_057 (1037) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
TSTAMP	0.00		UW_BUL-UW_BUL_006 (10019616) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20

Dataset:	PROCESSED_10-15-15_Noble Energy_Wells Ranch AE32-655_MIT_RBL.db: field/well/run1/pass7
Total Length:	28.09 ft
Total Weight:	324.50 lb
O.D.	3.13 in

Calibration Report

Database File:	C:\Warrior\Data\10-15-15_Noble Energy_Wells Ranch AE32-655_MIT_RBL\PROCESSED_10-15-15_
Dataset Pathname:	pass7
Dataset Creation:	Thu Oct 15 16:09:04 2015 by Log 7.0 B1

Multi-finger Imaging Tool Calibration Report

Serial Number:	10012912
Number of Fingers:	40
Tool Model:	UW_MIT40_042

Inclinometer Calibration Report

Performed:	Mon Jul 15 09:39:36 2013
Calibration Angle:	45

		Inc X	Inc Y
Vertical:		1968	1974
Finger 1 up:		1740	1744
Finger 31 up:		2215	1741
Finger 21 up:		2205	2224
Finger 11 up:		1731	2217
Sensitivity ratio:	0.992868		
X-axis angle:	134.307		
Deviation const.:	335.589		

Finger Calibration Report

Performed:	Thu Oct 15 14:38:28 2015
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Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1073	366.0	1439	389.0	1828	411.0	2239
Finger 02:	1202	372.0	1574	389.0	1963	402.0	2365
Finger 03:	1081	380.0	1461	410.0	1871	432.0	2303
Finger 04:	1124	367.0	1491	399.0	1890	422.0	2312
Finger 05:	1137	381.0	1518	404.0	1922	421.0	2343
Finger 06:	1137	377.0	1514	404.0	1918	421.0	2339
Finger 07:	1070	379.0	1449	404.0	1853	426.0	2279
Finger 08:	1149	374.0	1523	405.0	1928	420.0	2348
Finger 09:	1110	370.0	1480	403.0	1883	416.0	2299
Finger 10:	1098	366.0	1464	400.0	1864	414.0	2278
Finger 11:	1189	381.0	1570	409.0	1979	410.0	2389
Finger 12:	1077	368.0	1445	399.0	1844	413.0	2257
Finger 13:	1109	365.0	1474	396.0	1870	401.0	2271
Finger 14:	1088	374.0	1462	404.0	1866	413.0	2279
Finger 15:	1041	378.0	1419	417.0	1836	425.0	2261
Finger 16:	1071	380.0	1451	418.0	1869	428.0	2297
Finger 17:	965	354.0	1319	399.0	1718	422.0	2140
Finger 18:	1094	363.0	1457	395.0	1852	401.0	2253
Finger 19:	1079	372.0	1451	407.0	1858	410.0	2268
Finger 20:	1038	370.0	1408	412.0	1820	422.0	2242
Finger 21:	1042	377.0	1419	410.0	1829	408.0	2237
Finger 22:	1017	378.0	1395	412.0	1807	424.0	2231
Finger 23:	1015	385.0	1400	421.0	1821	433.0	2254
Finger 24:	1066	376.0	1442	400.0	1842	400.0	2242
Finger 25:	993	378.0	1371	415.0	1786	431.0	2217
Finger 26:	1116	376.0	1492	386.0	1878	396.0	2274
Finger 27:	1045	379.0	1424	403.0	1827	415.0	2242
Finger 28:	1080	368.0	1448	387.0	1835	404.0	2239
Finger 29:	1212	377.0	1425	422.0	1821	422.0	2232

Finger 29:	1018	377.0	1395	406.0	1801	428.0	2229
Finger 30:	1058	382.0	1440	397.0	1837	418.0	2255
Finger 31:	1119	373.0	1492	391.0	1883	411.0	2294
Finger 32:	1053	382.0	1435	406.0	1841	429.0	2270
Finger 33:	1198	376.0	1574	377.0	1951	387.0	2338
Finger 34:	1080	362.0	1442	388.0	1830	413.0	2243
Finger 35:	1058	396.0	1454	423.0	1877	439.0	2316
Finger 36:	1066	375.0	1441	400.0	1841	429.0	2270
Finger 37:	1149	385.0	1534	391.0	1925	411.0	2336
Finger 38:	1183	371.0	1554	385.0	1939	397.0	2336
Finger 39:	1201	365.0	1566	384.0	1950	398.0	2348
Finger 40:	1106	376.0	1482	399.0	1881	420.0	2301

Segmented Cement Bond Log Calibration Report

Serial Number:	1063
Tool Model:	UW_RBT_004

Calibration Casing Diameter:	7.000	in
Calibration Depth:	-79.986	ft

Master Calibration, performed Thu Oct 15 11:35:21 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.003	0.740	1.000	62.165	82.361	1.211
5FT	-0.006	0.828	1.000	62.165	73.361	1.448
S1	-0.004	0.716	0.000	100.000	138.876	0.509
S2	-0.003	0.743	0.000	100.000	134.016	0.429
S3	-0.004	0.749	0.000	100.000	132.802	0.486
S4	-0.004	0.768	0.000	100.000	129.598	0.475
S5	-0.002	0.759	0.000	100.000	131.413	0.310
S6	-0.003	0.743	0.000	100.000	134.109	0.347
S7	-0.002	0.721	0.000	100.000	138.176	0.337
S8	-0.002	0.702	0.000	100.000	141.868	0.352

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
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Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	1.0000	GAPI/cps

	Company	Noble Energy Inc.
	Well	Wells Ranch AE32-655
	Field	Wattenberg
	County	Weld
	State	Colorado