

Radial Cement Bond Gamma Ray Casing Collar Log

Company	Whiting Oil and Gas Corporation	Company	Whiting Oil and Gas Corporation
Well	Razor 11G-0209A	Well	Razor 11G-0209A
Field	Wildcat	Field	Wildcat
County	Weld	County	Weld
State	Colorado	State	Colorado
Location:	API #: 05-123-38731		
Permanent Datum	SEC 11 TWP 10N RGE 58W	Ground Level	Elevation 4977'
Log Measured From	Kelly Bushing	Drilling Measured From	Kelly Bushing
		Other Services	MIT GR/JB RBP
		Elevation	K.B. 4994' D.F. --- G.L. 4977'

Date	26-MAR-2015
Run Number	Three
Depth Driller	13,538 FT
Depth Logger	5360 FT
Bottom Logged Interval	5359 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	191°F
Estimated Cement Top	Surface
Time Well Ready	ROA
Time Logger on Bottom	11:45 AM
Equipment Number	HD-0324
Location	Fort Lupton, CO
Recorded By	B. Kalkwarf
Witnessed By	Gary Chandler

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	1860 FT		
Intermediate #1	7	29	P-110	Surface	6337 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110	5300 FT	13,528 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.

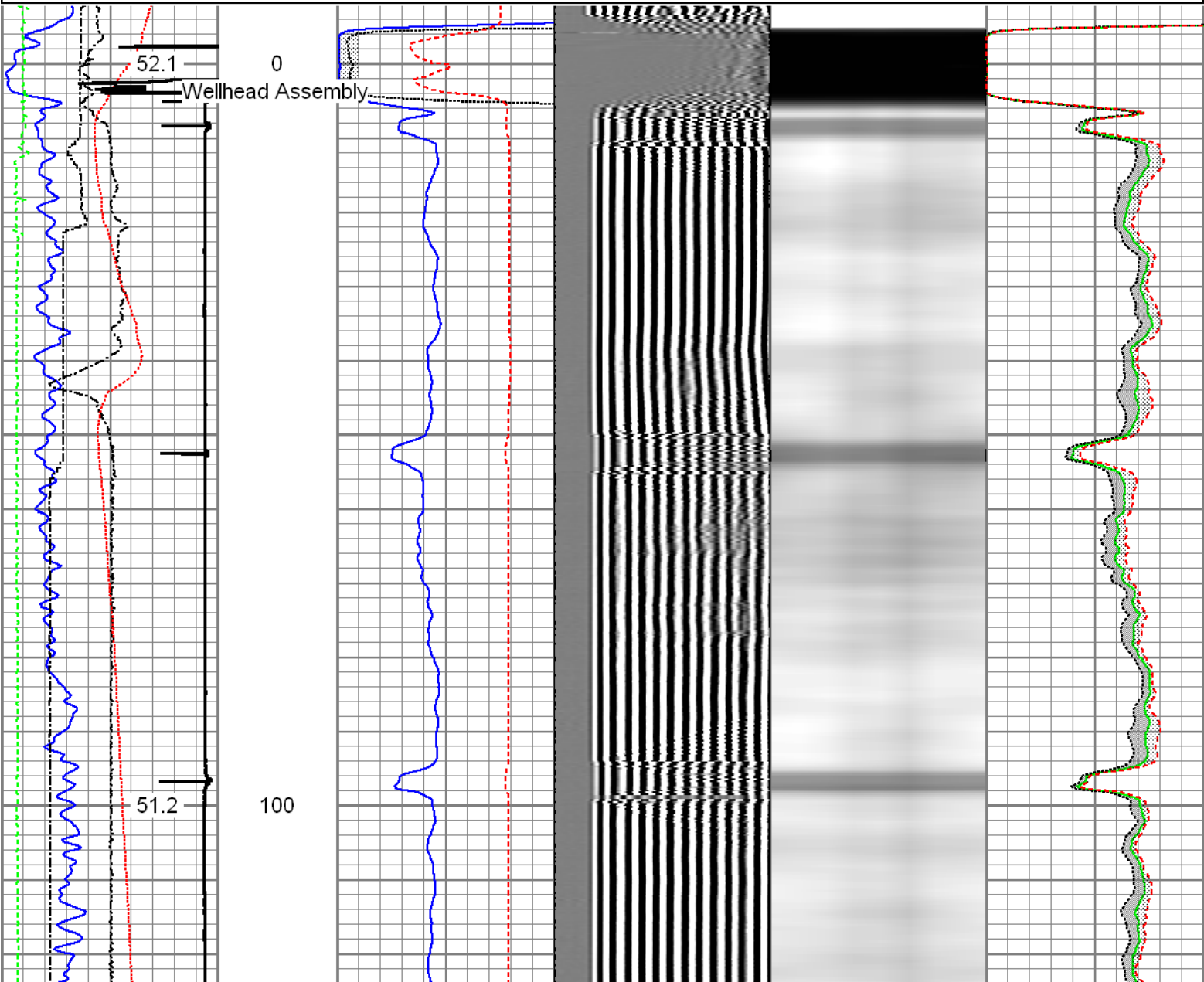
Comments

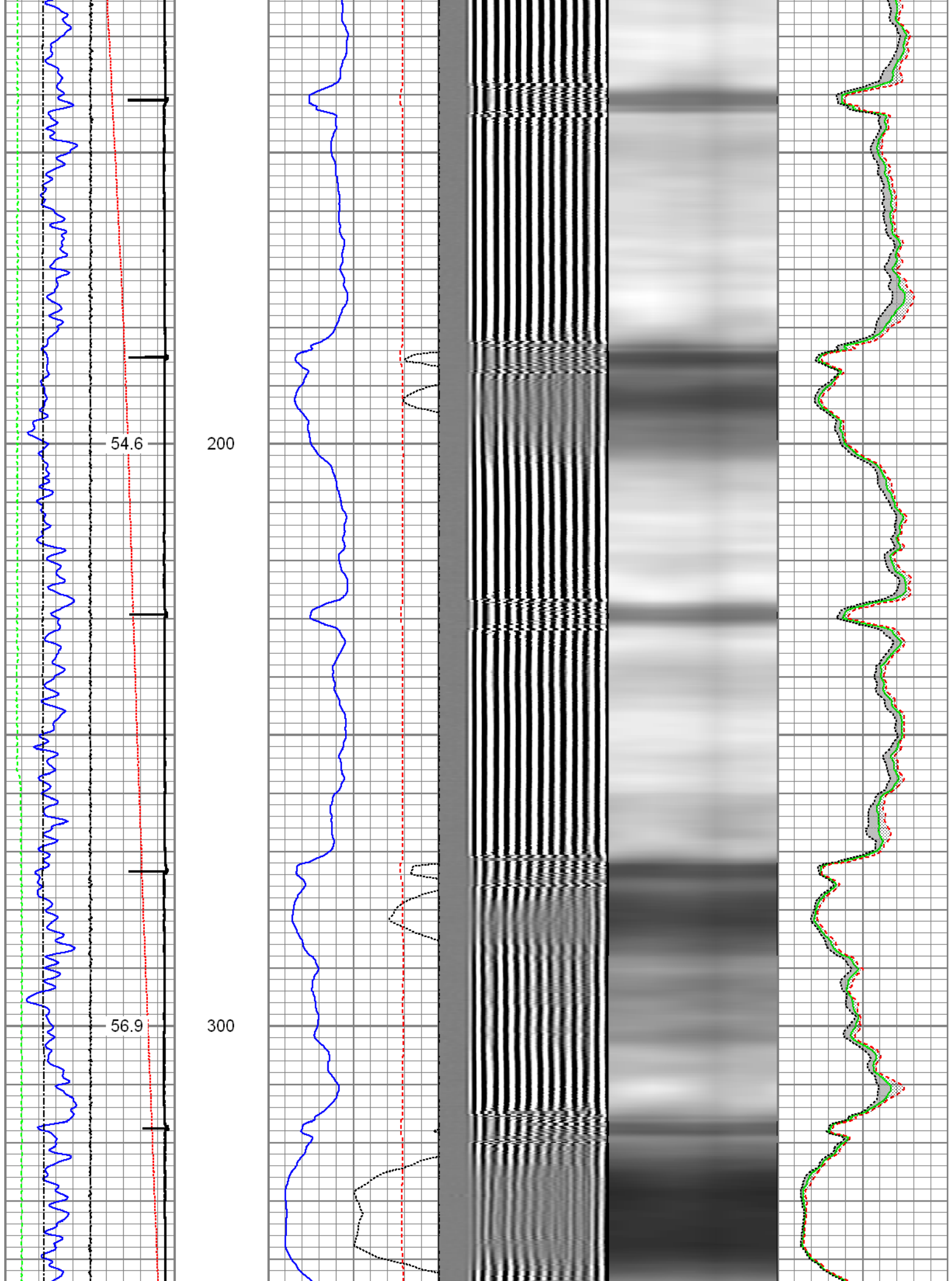
Log ran as per customer request.
All wireline depths measured from KB zero at 17 FT.
Depth reference to Casing Tally reported liner top at 5300 Ft.
Adjusted log -16.5 FT from KB zero to correlate with liner top.
Log ran from just below liner top to surface.
Log ran with 1800 PSI surface induced pressure.

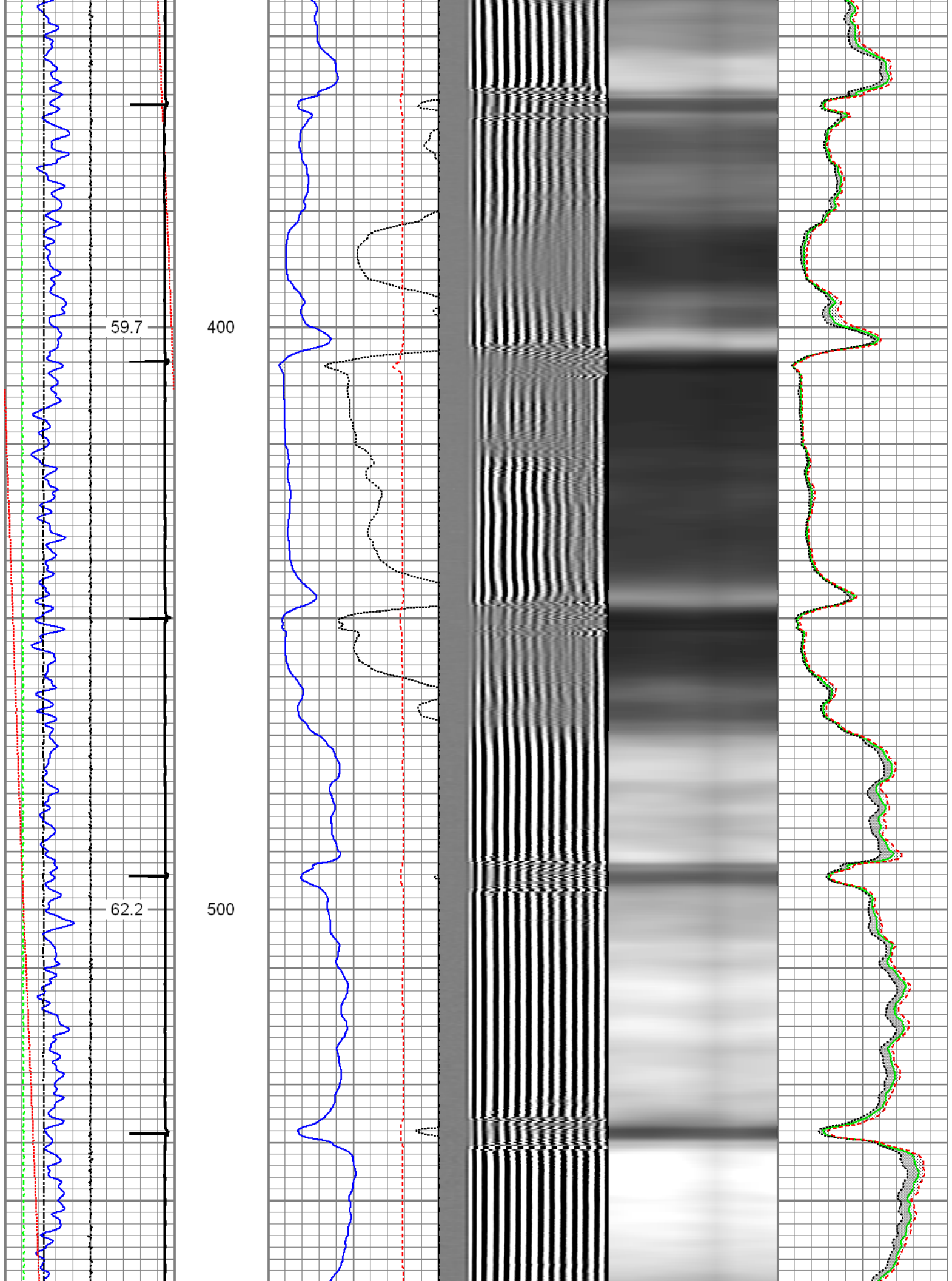
Thank you for choosing FMC Technologies Completion Services, Inc.!!

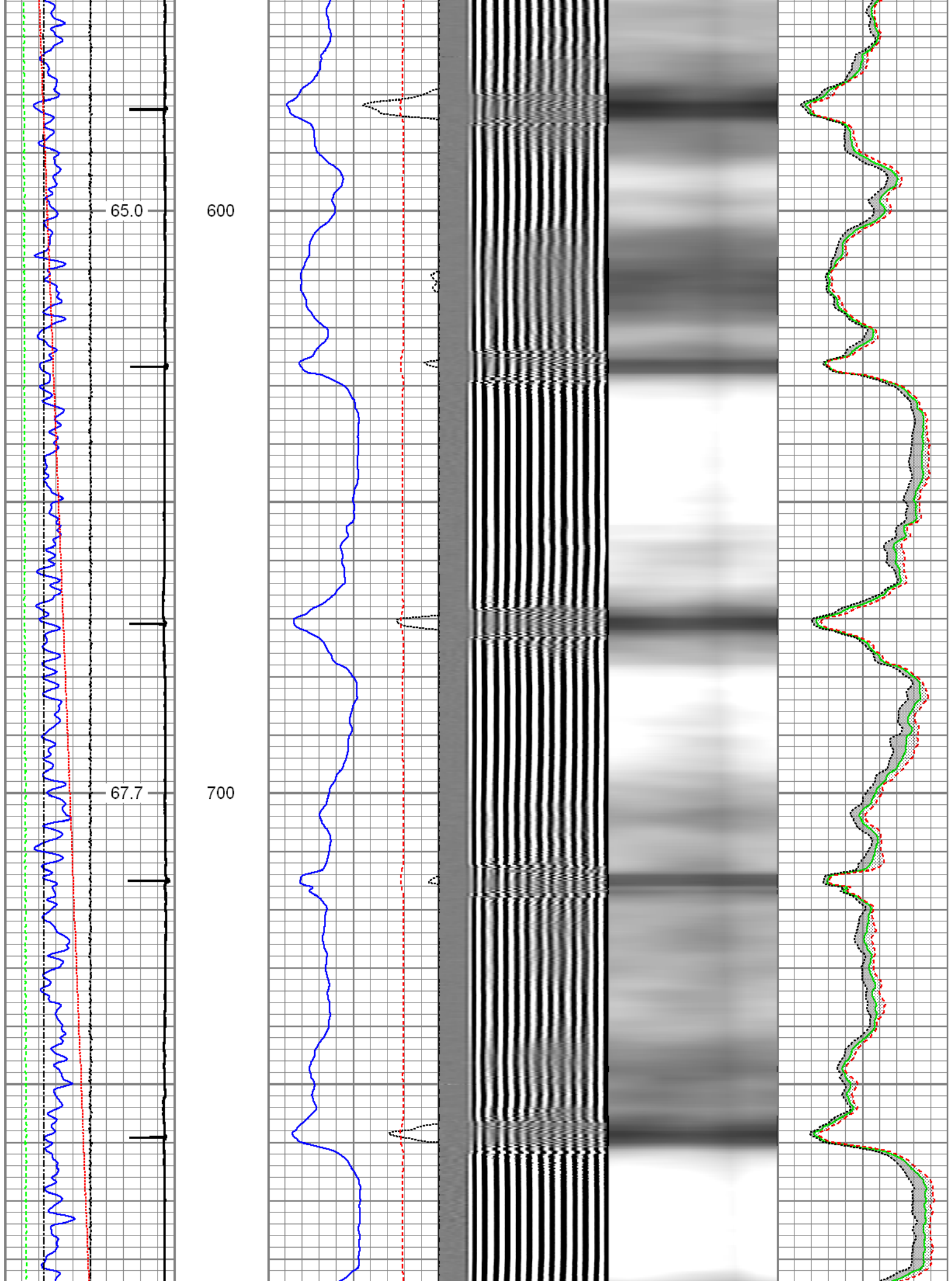
Database File: 03-26-15_whiting_razor 11g-0209a_mit_rbl.db
Dataset Pathname: pass4
Presentation Format: rbt4_mit
Dataset Creation: Thu Mar 26 10:56:09 2015 by Log 7.0 B1
Charted by: Depth in Feet scaled 1:240

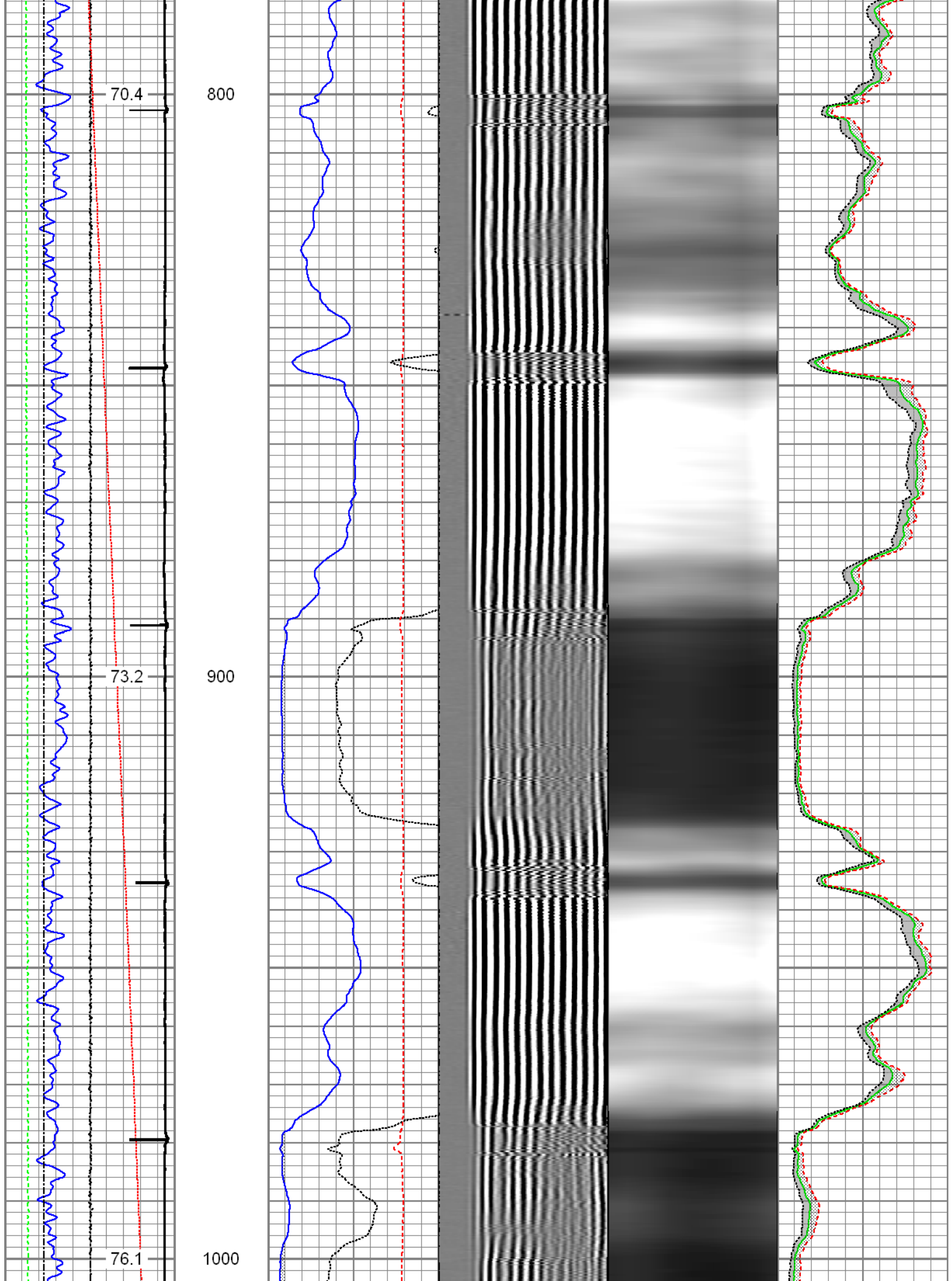
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-100 (ft/min) 100	0 (mV) 20			0 100
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	650 (usec) 150			0 100
Differential Temperature				
-2 (degF) 2				
Temperature				
0 (degF) 20				
Casing Collar Locator				
8 (in) 6.1				

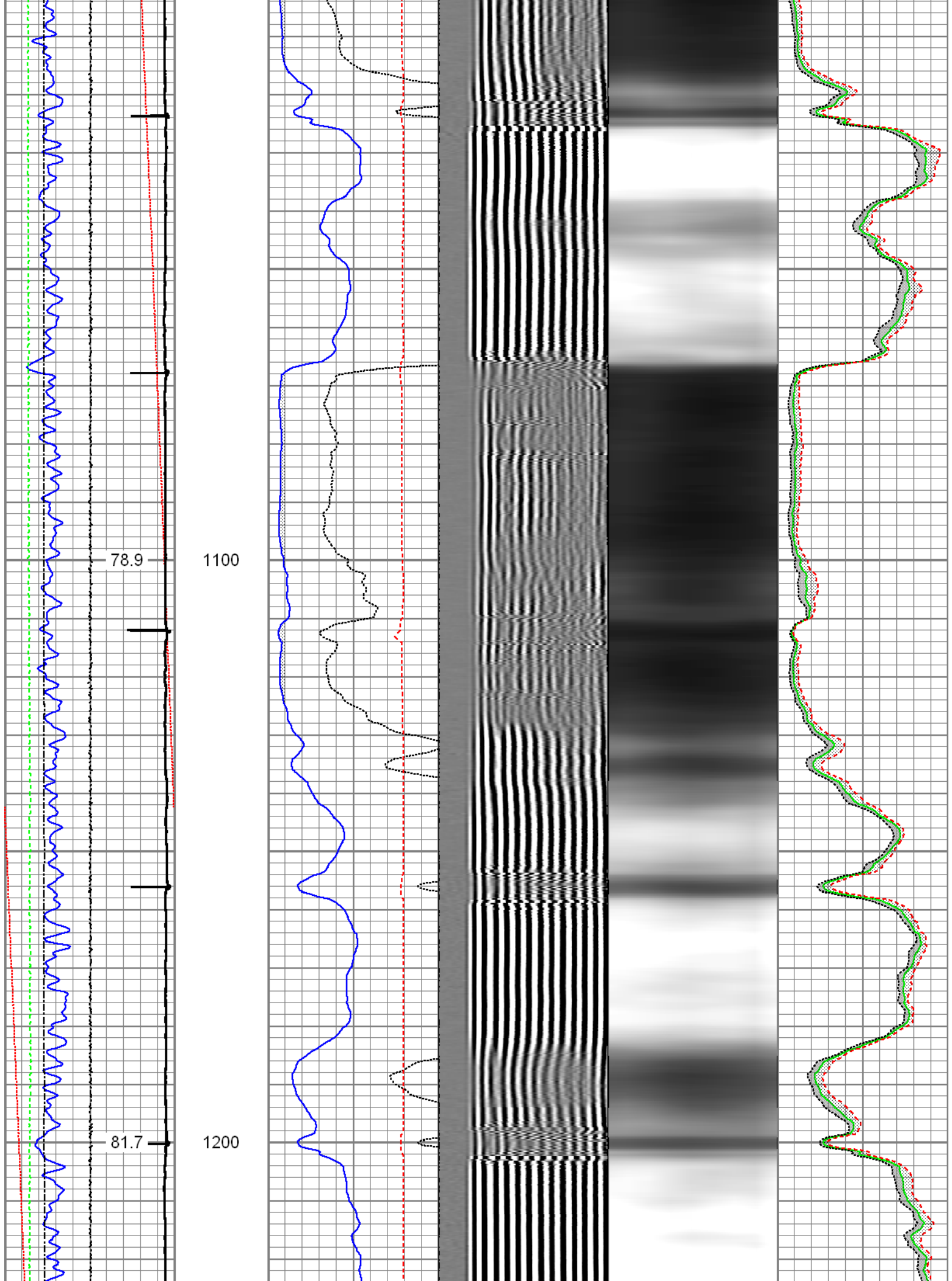


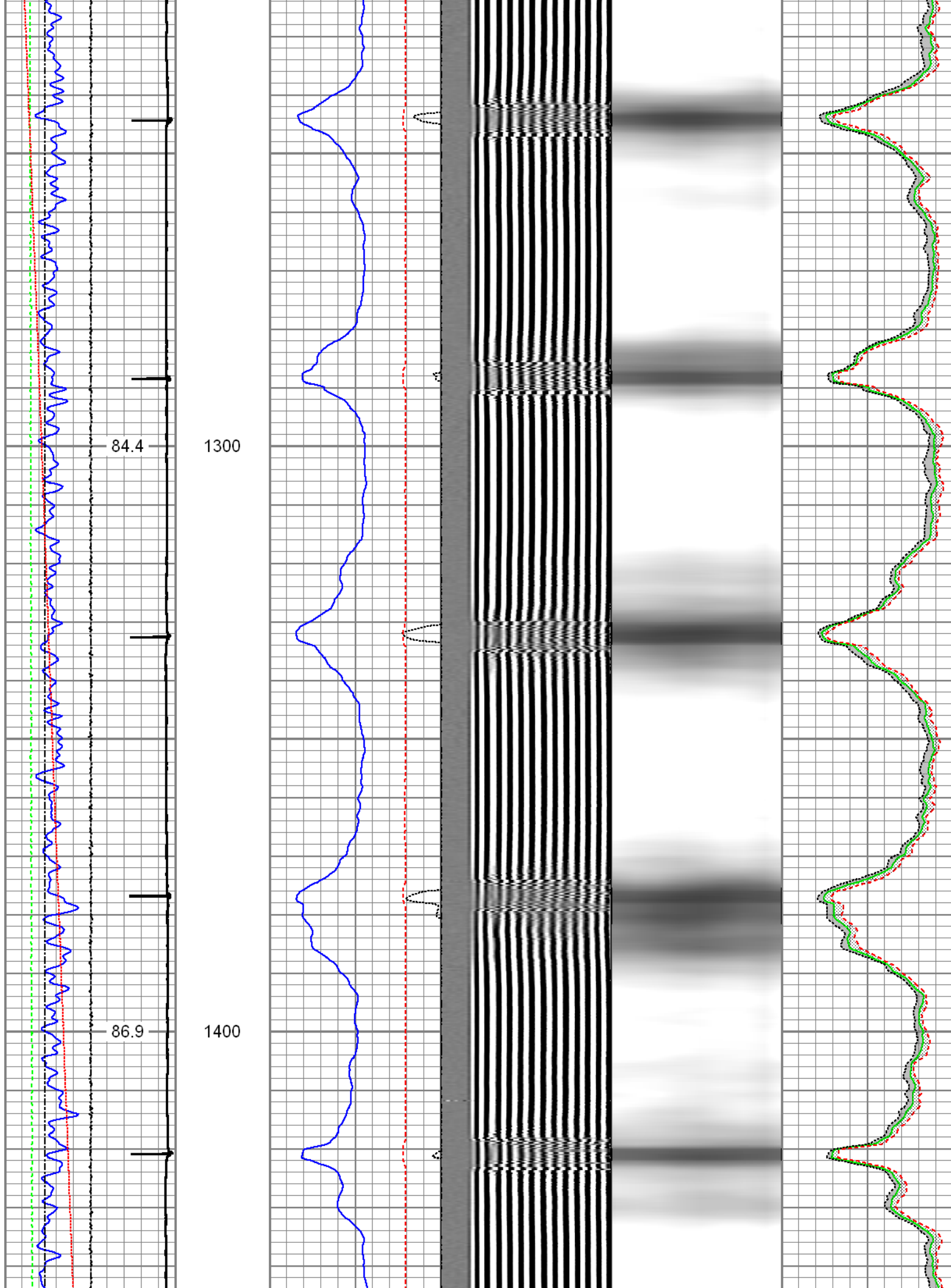


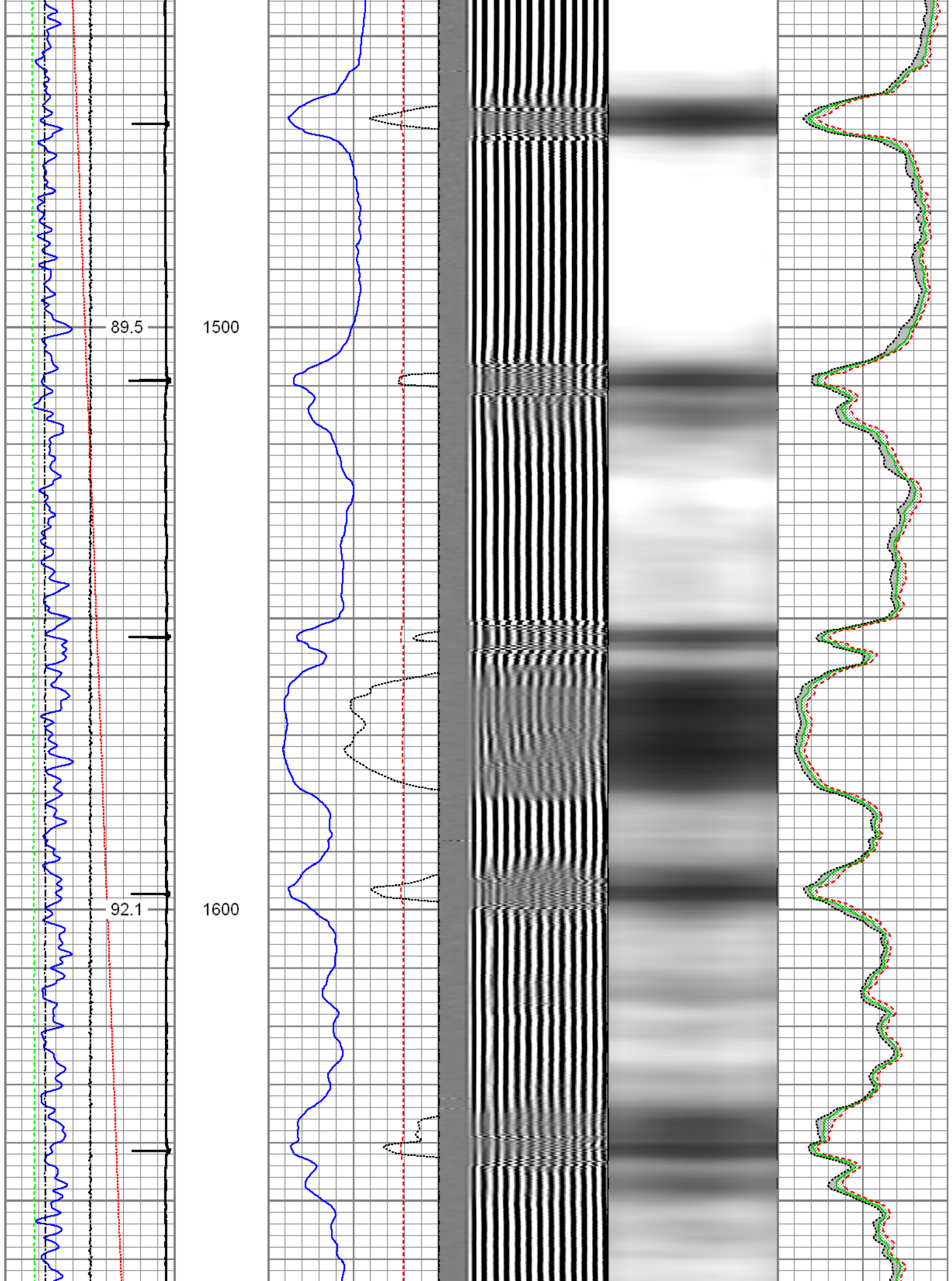


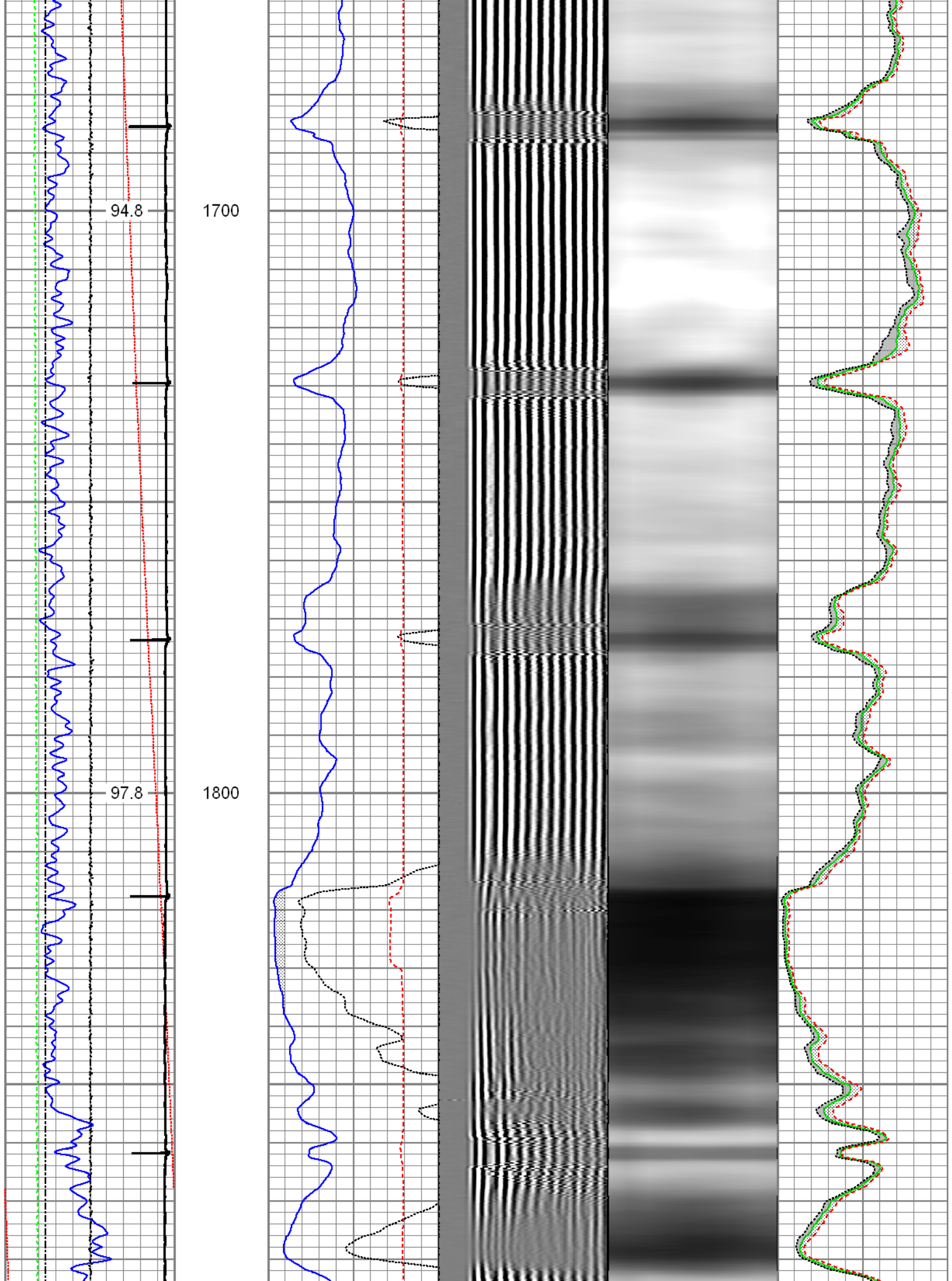


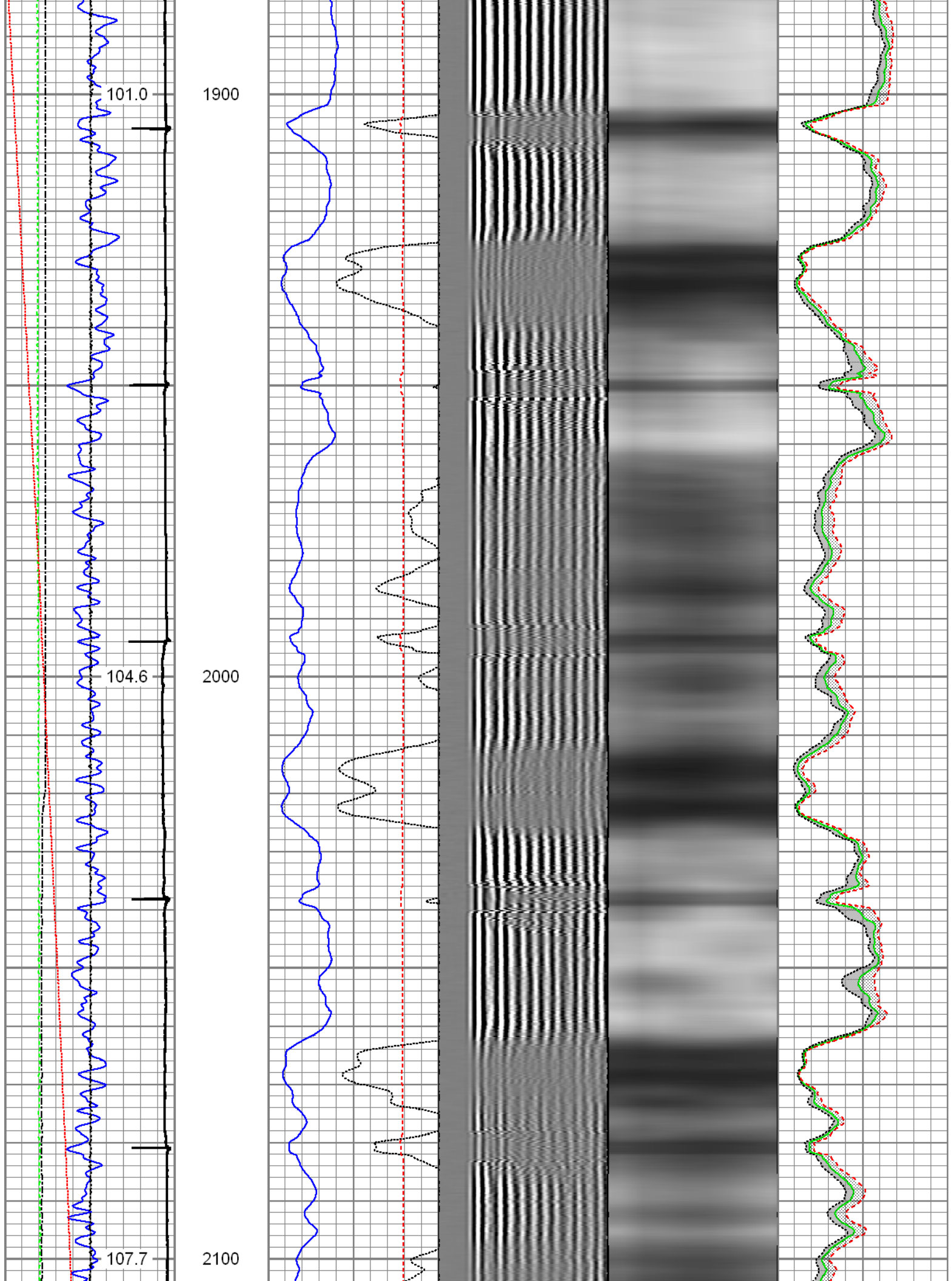


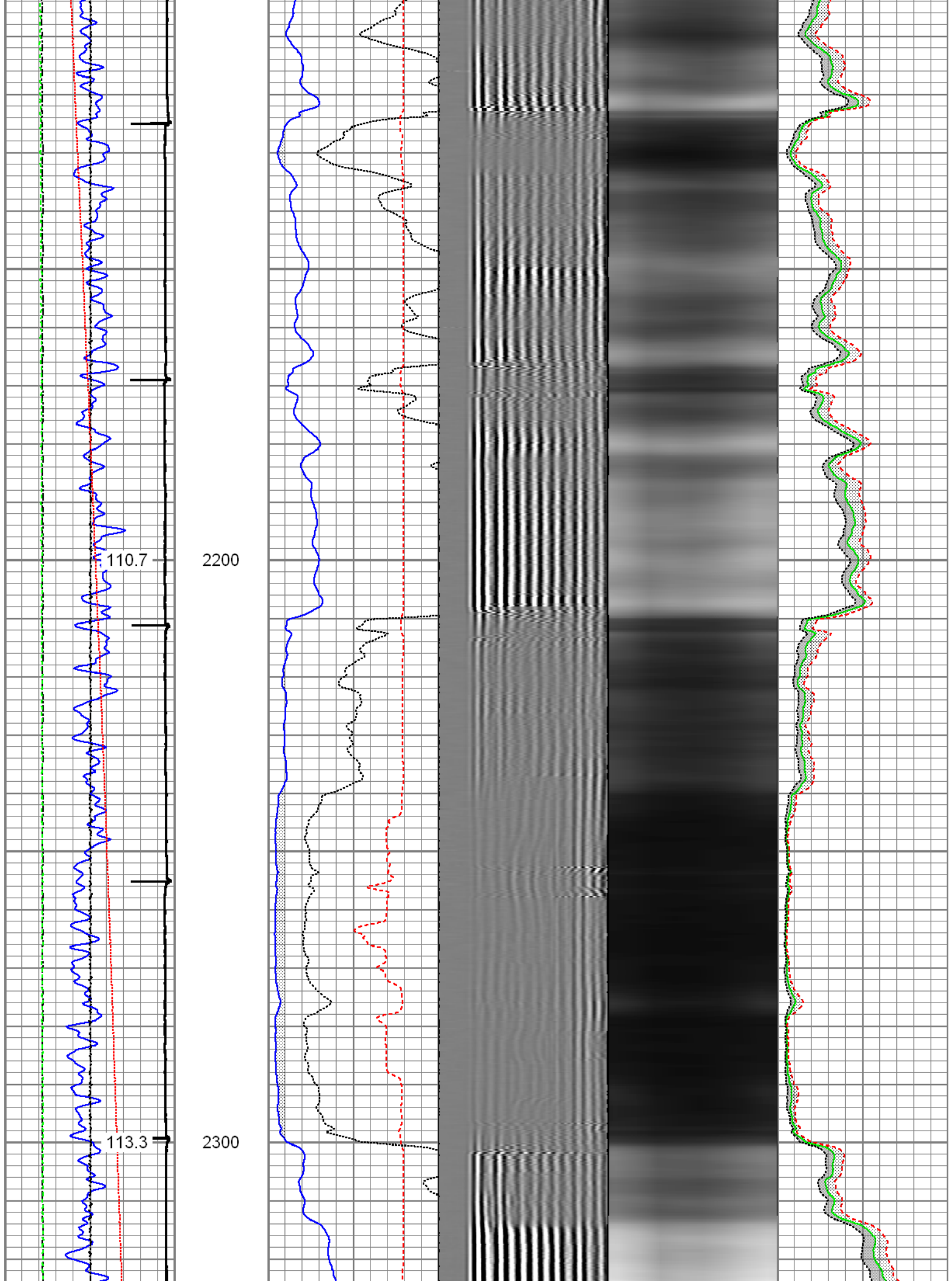


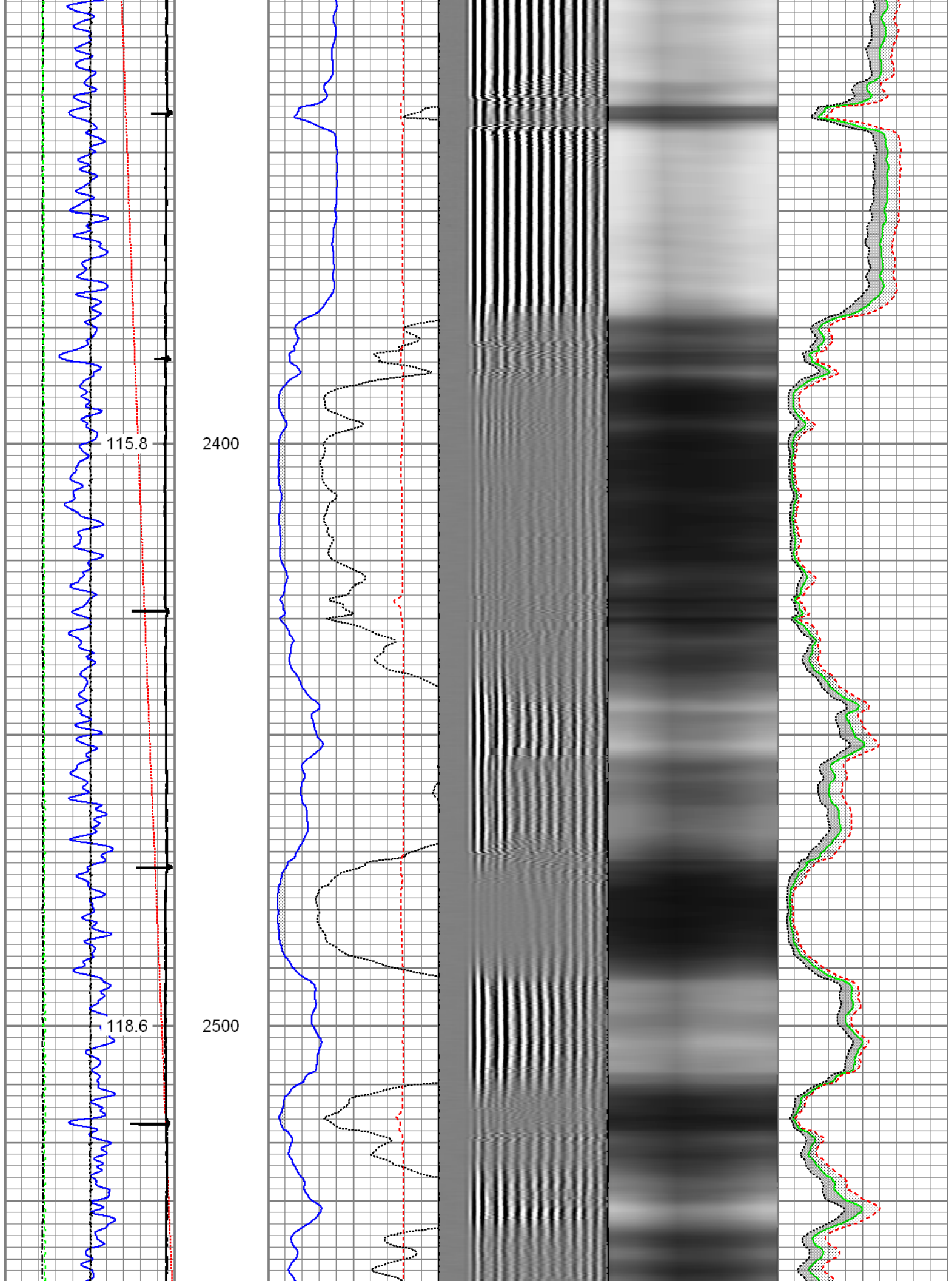


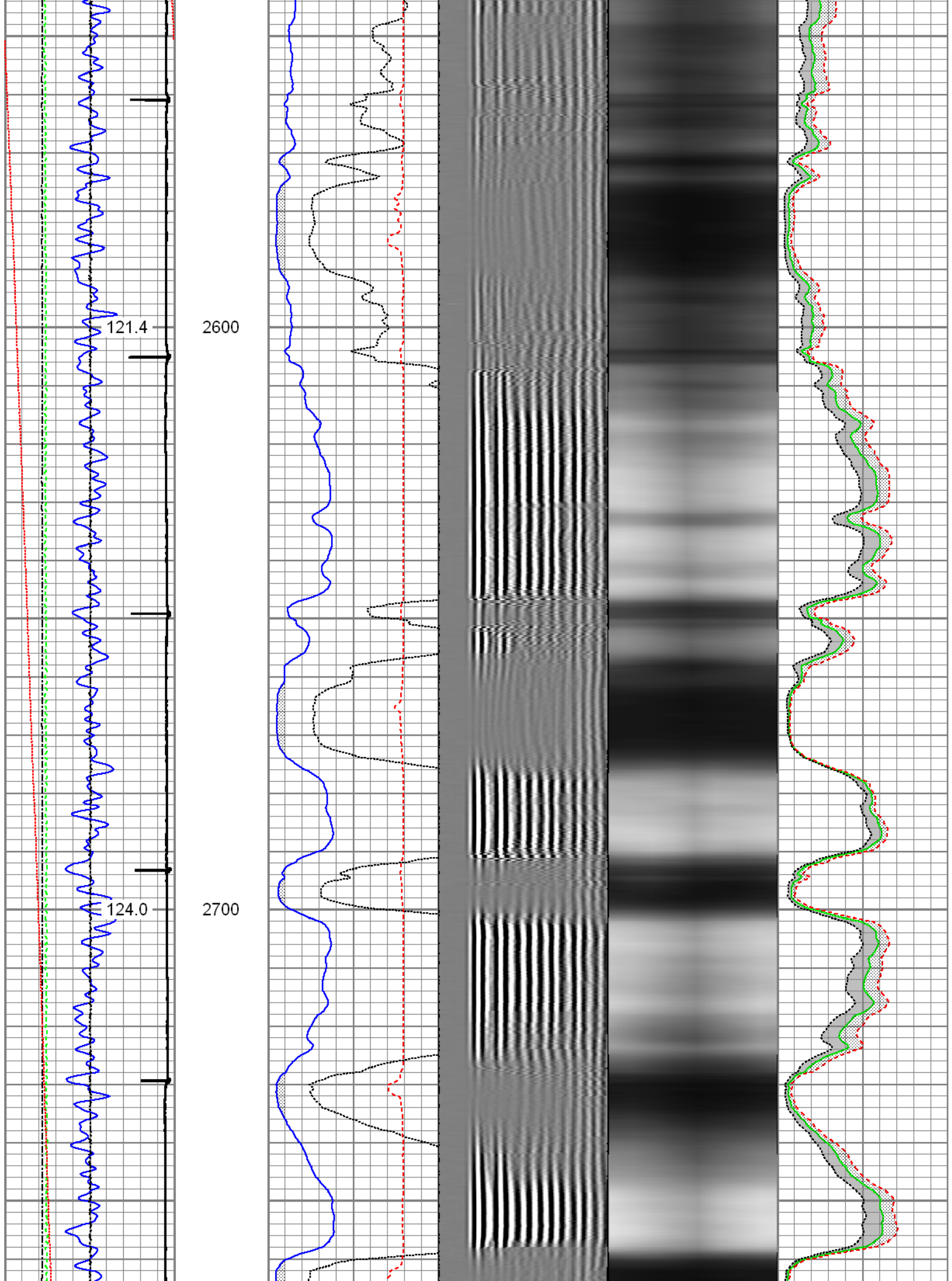


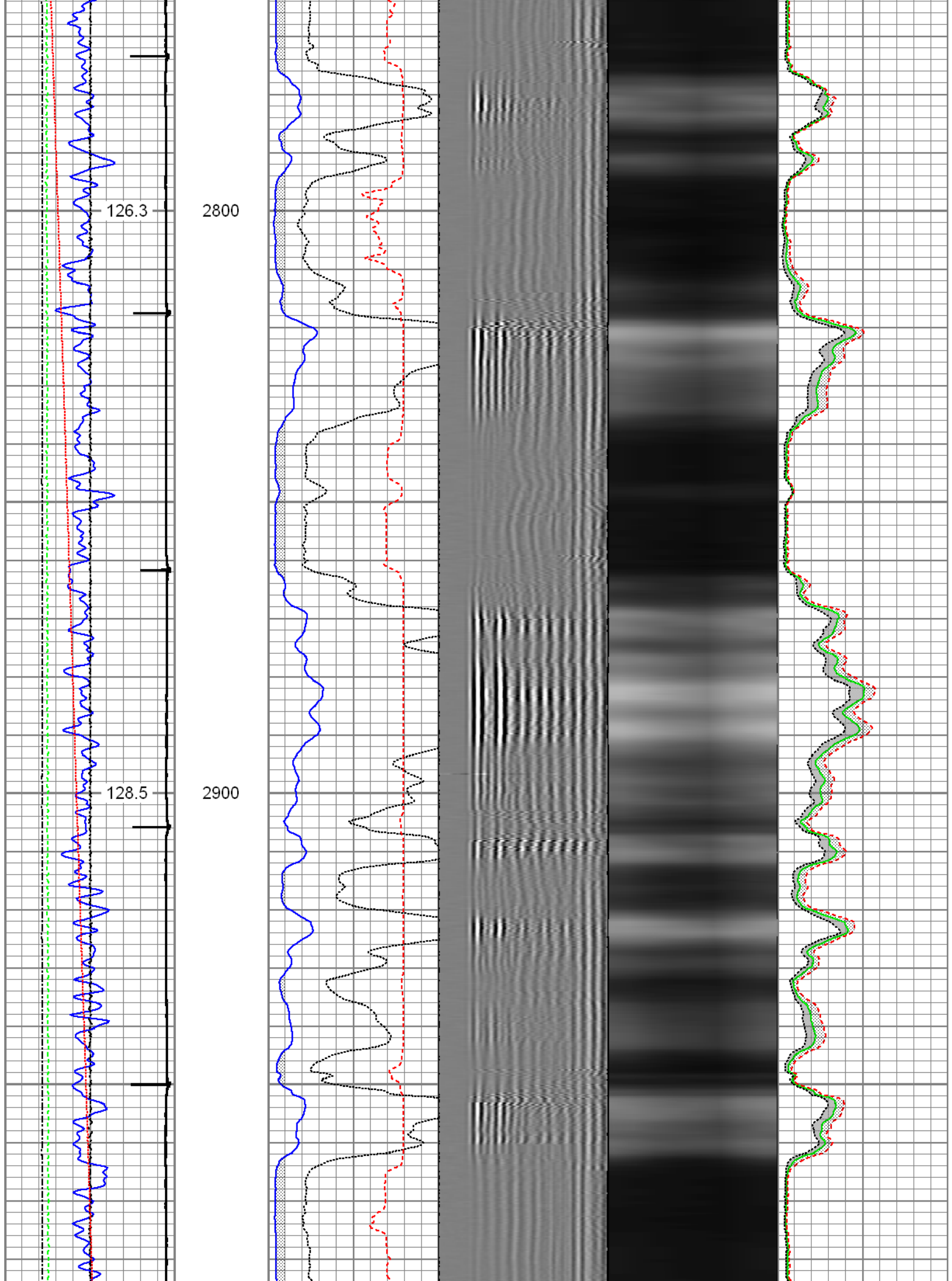


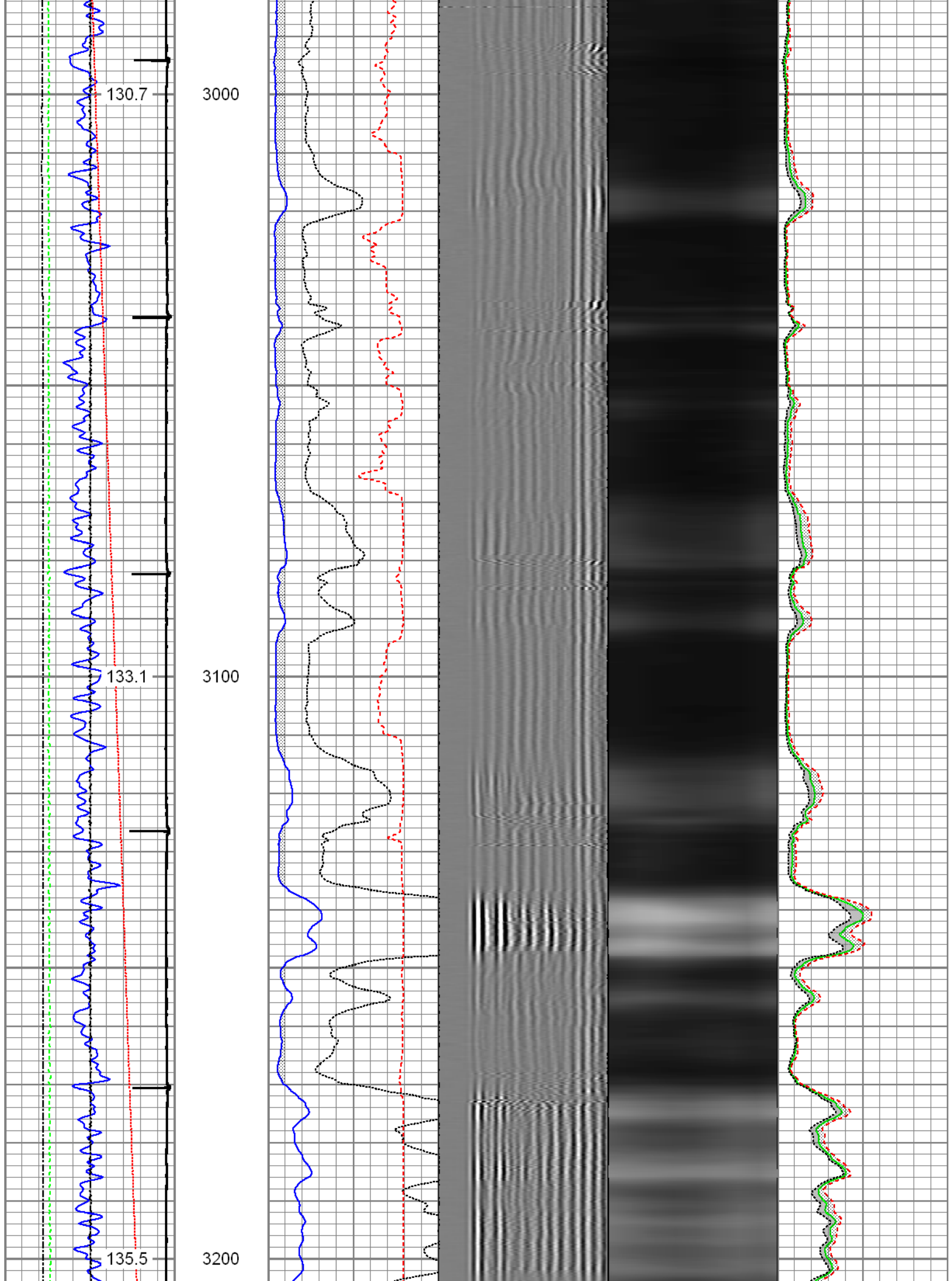


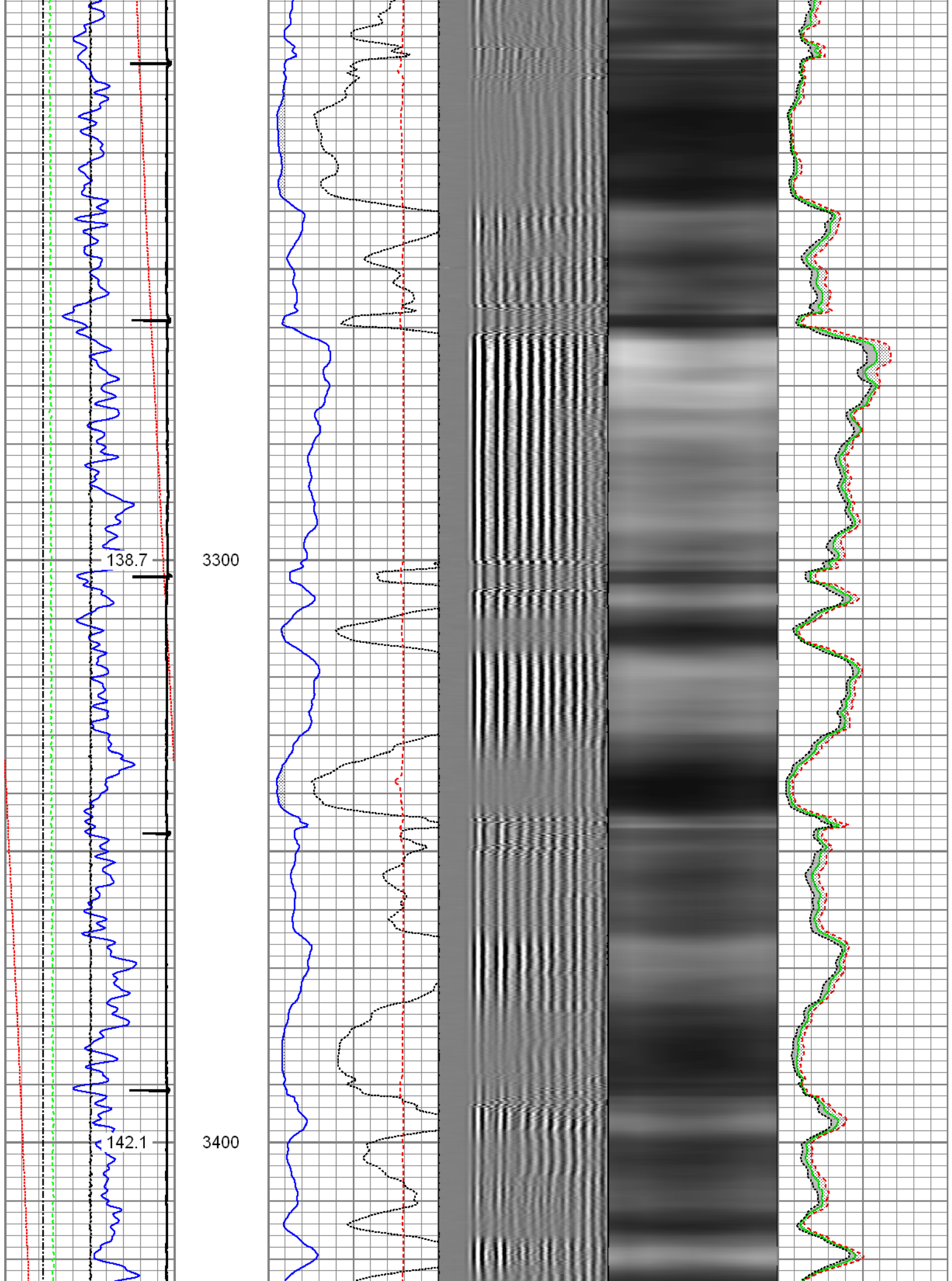


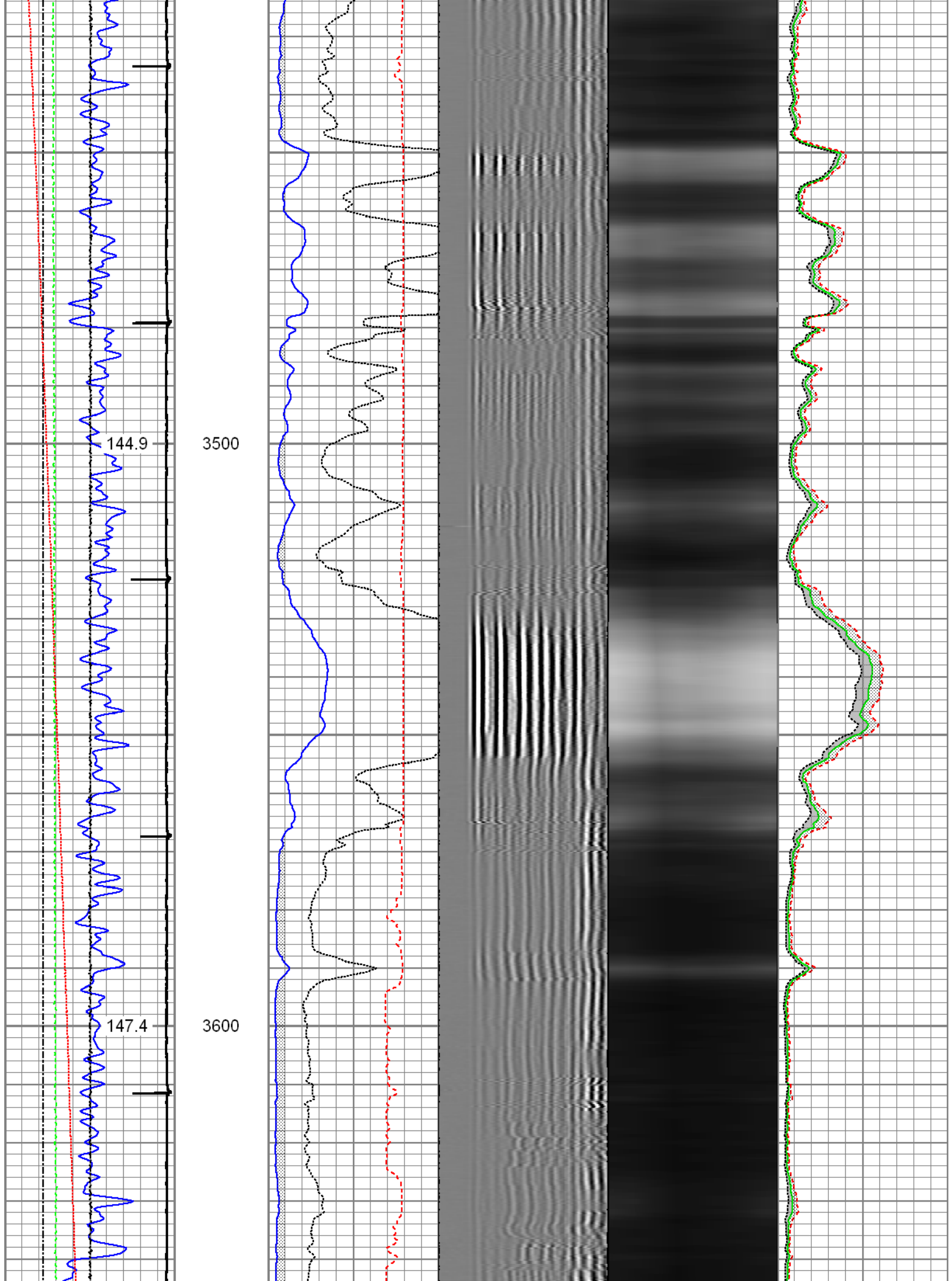


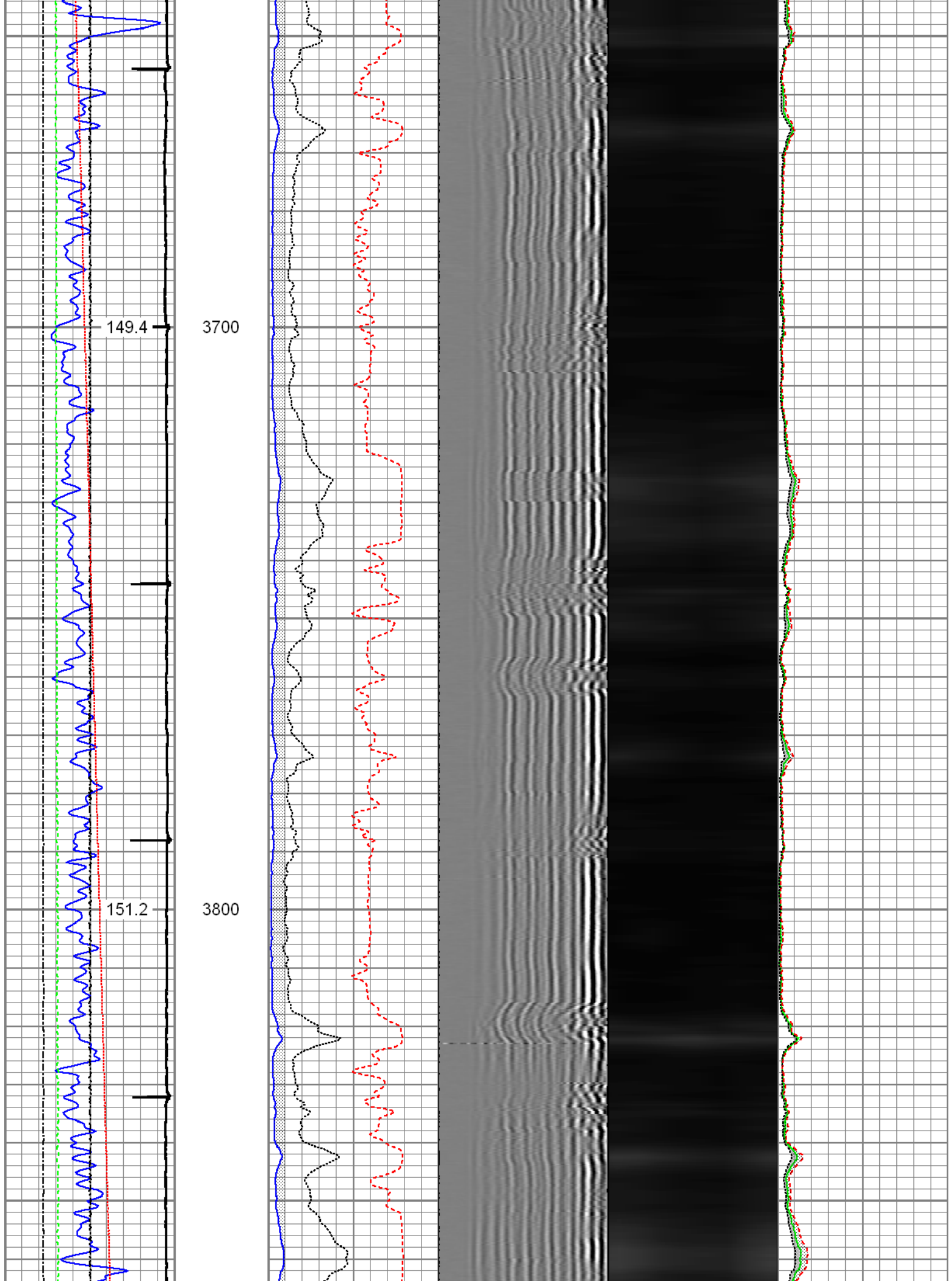


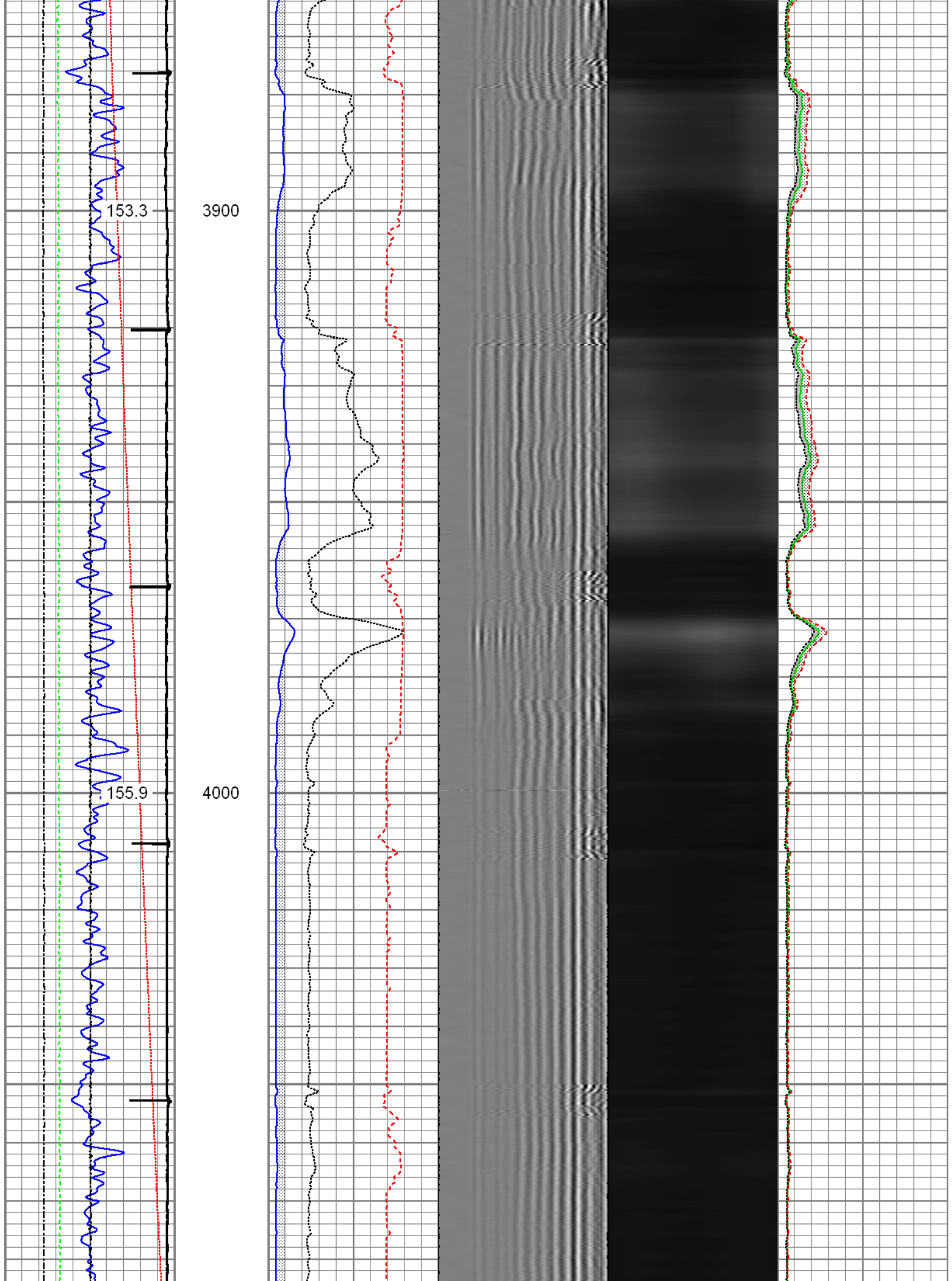


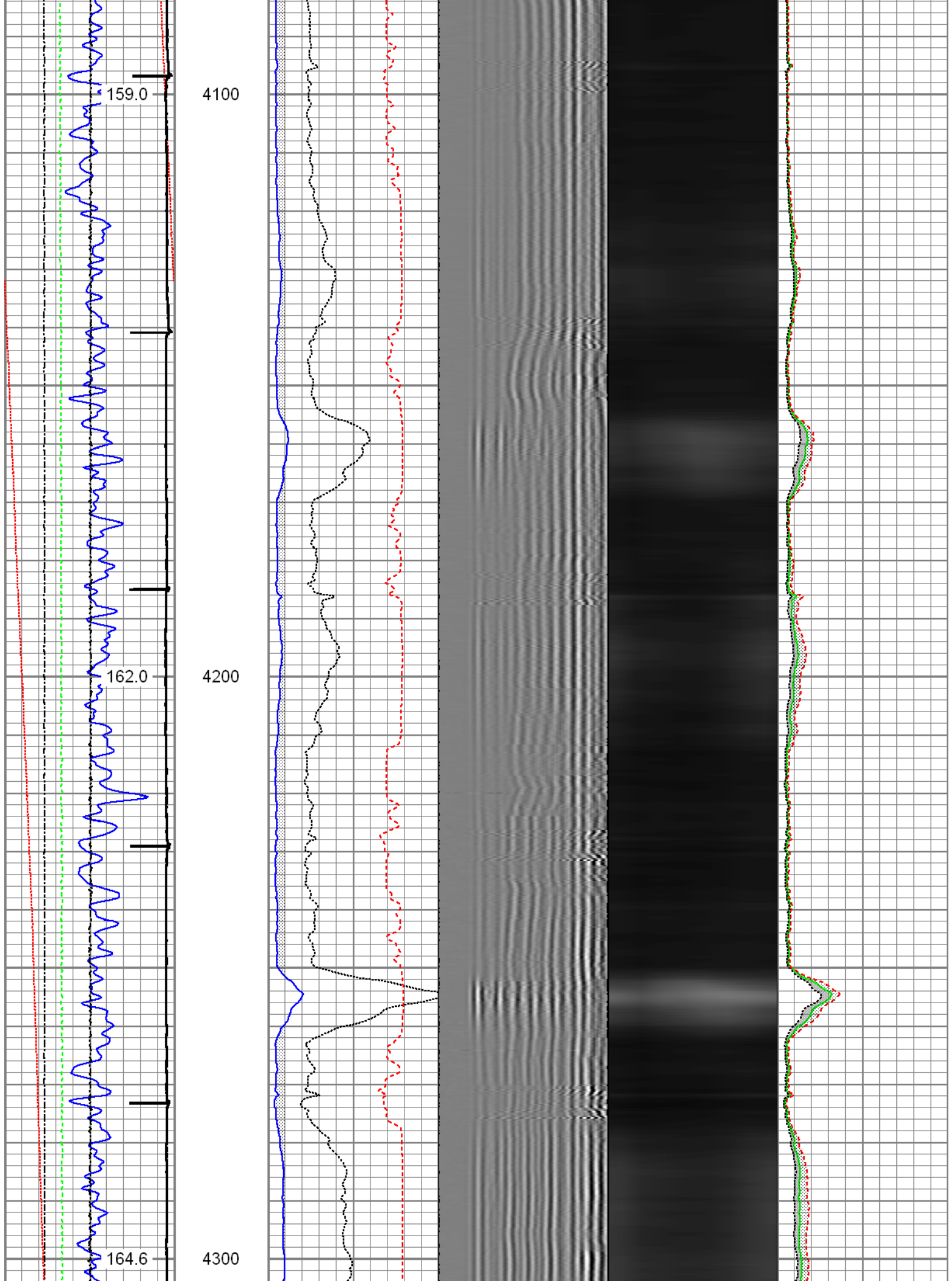


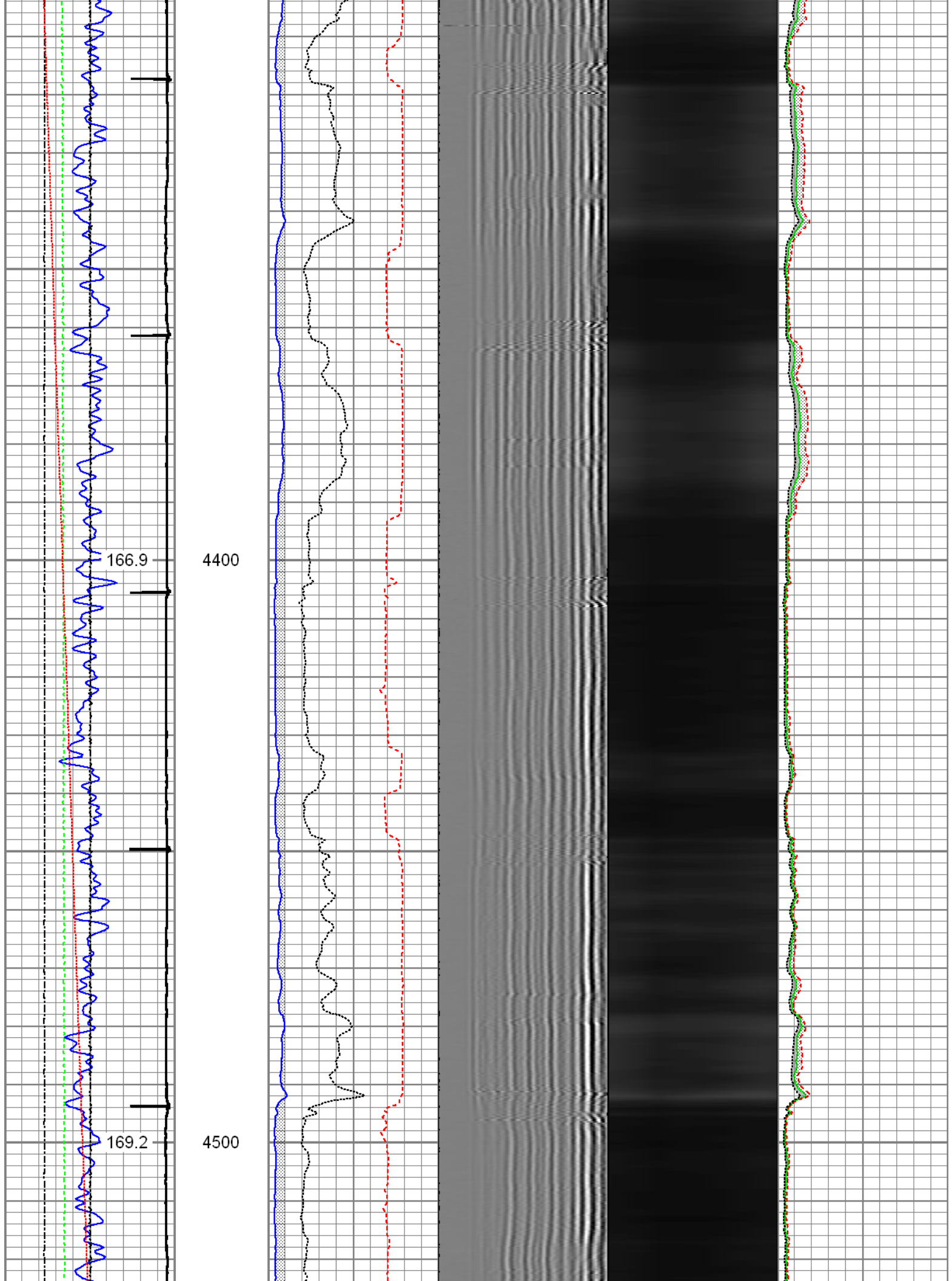


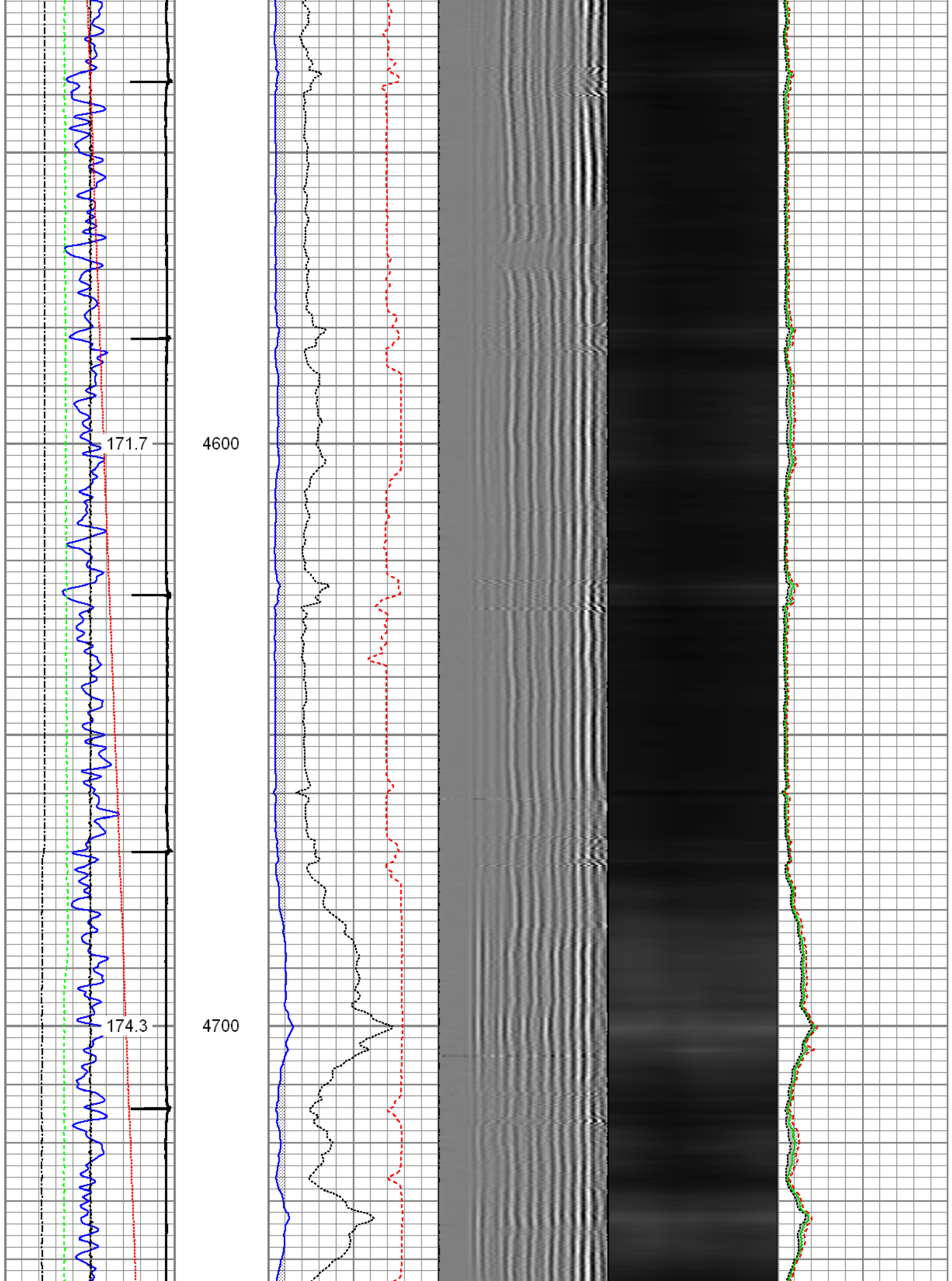


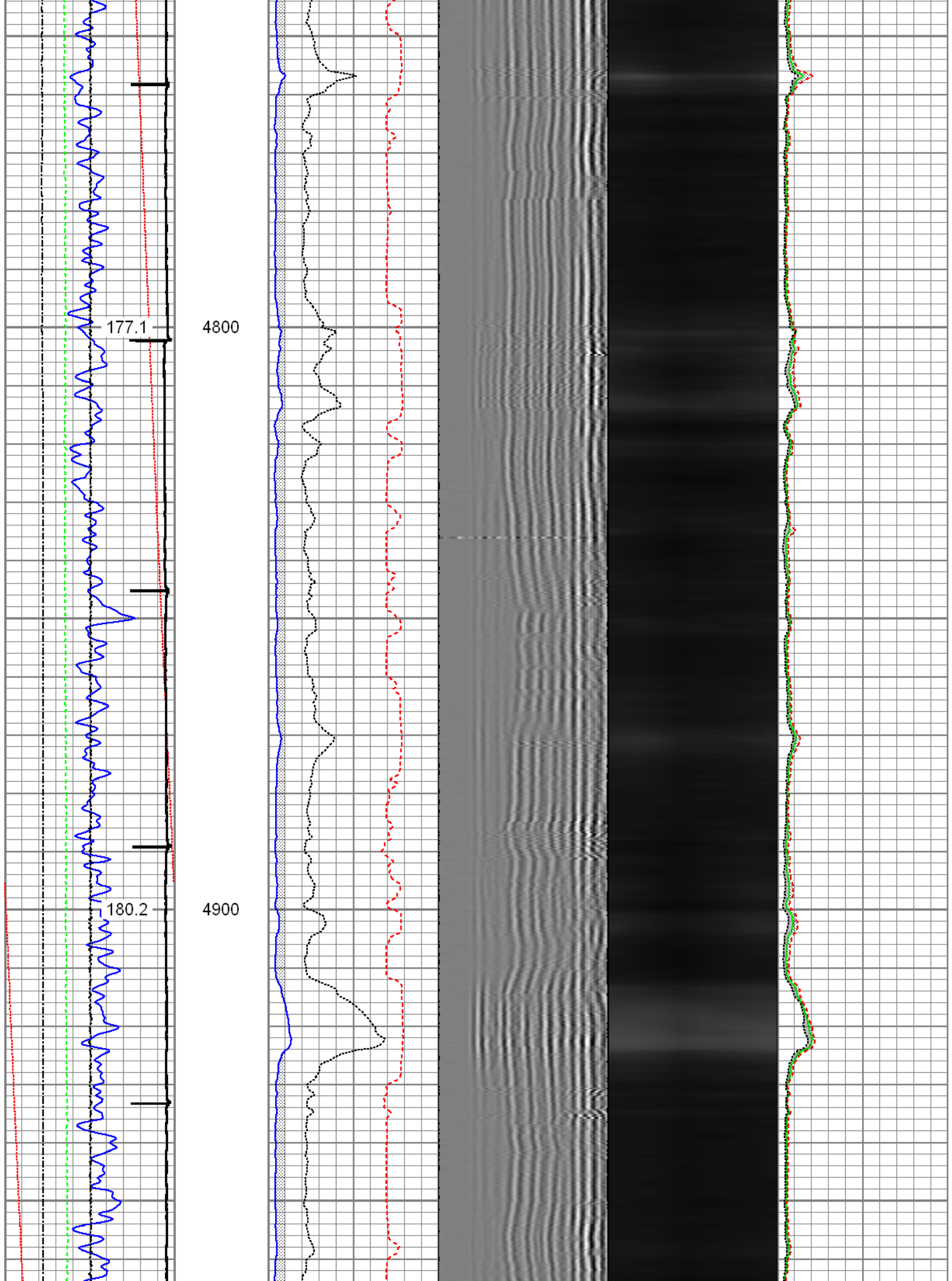


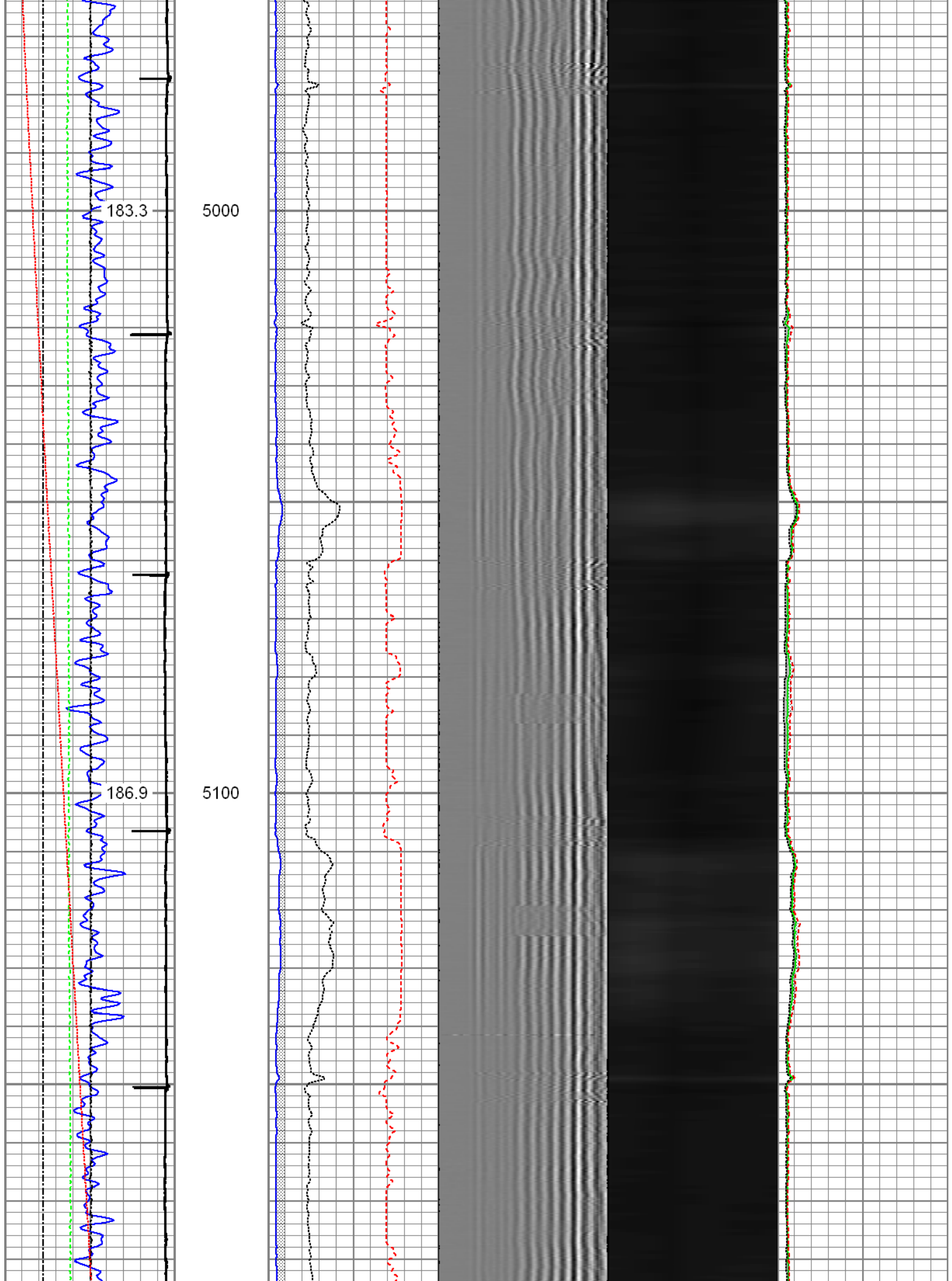


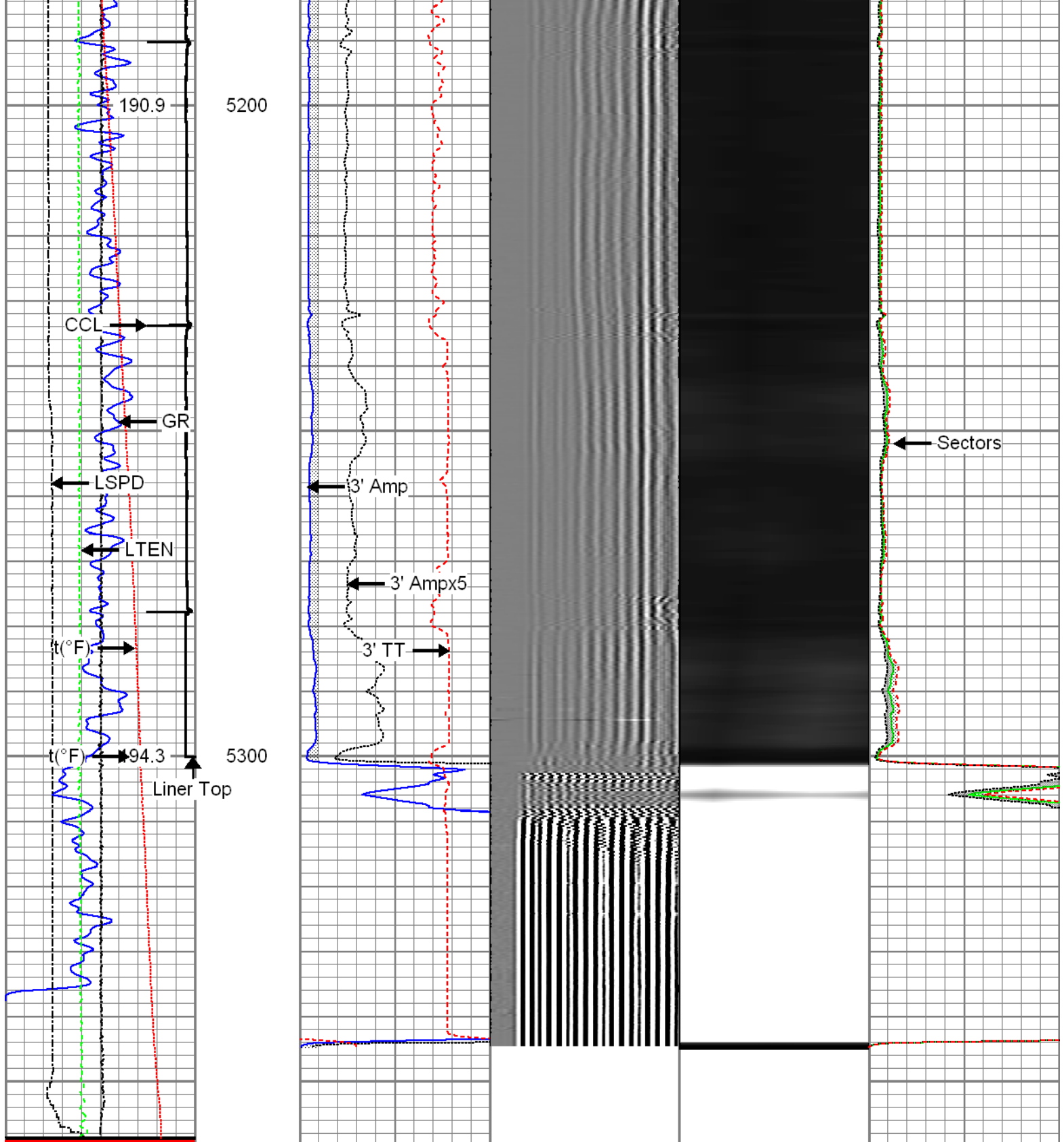









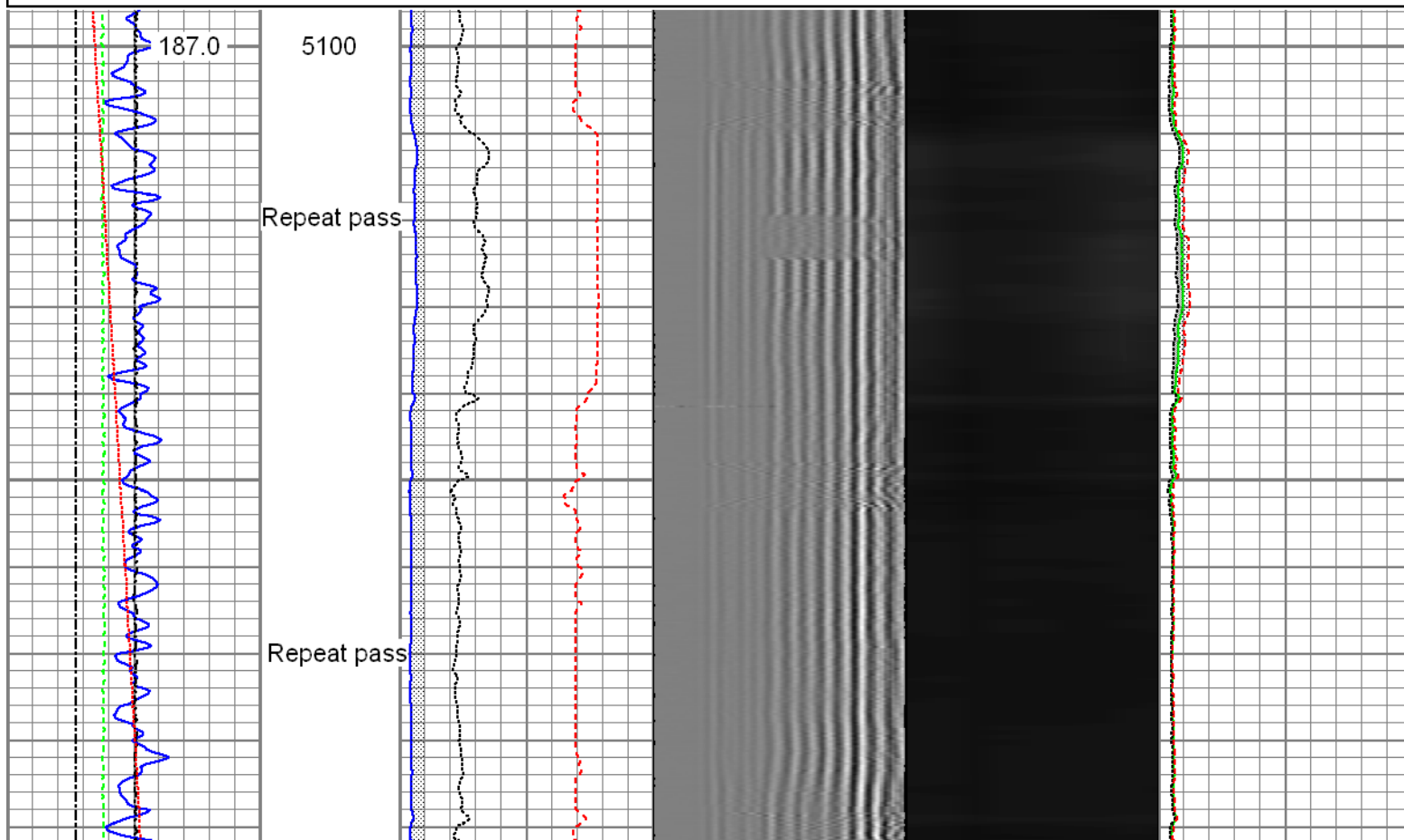


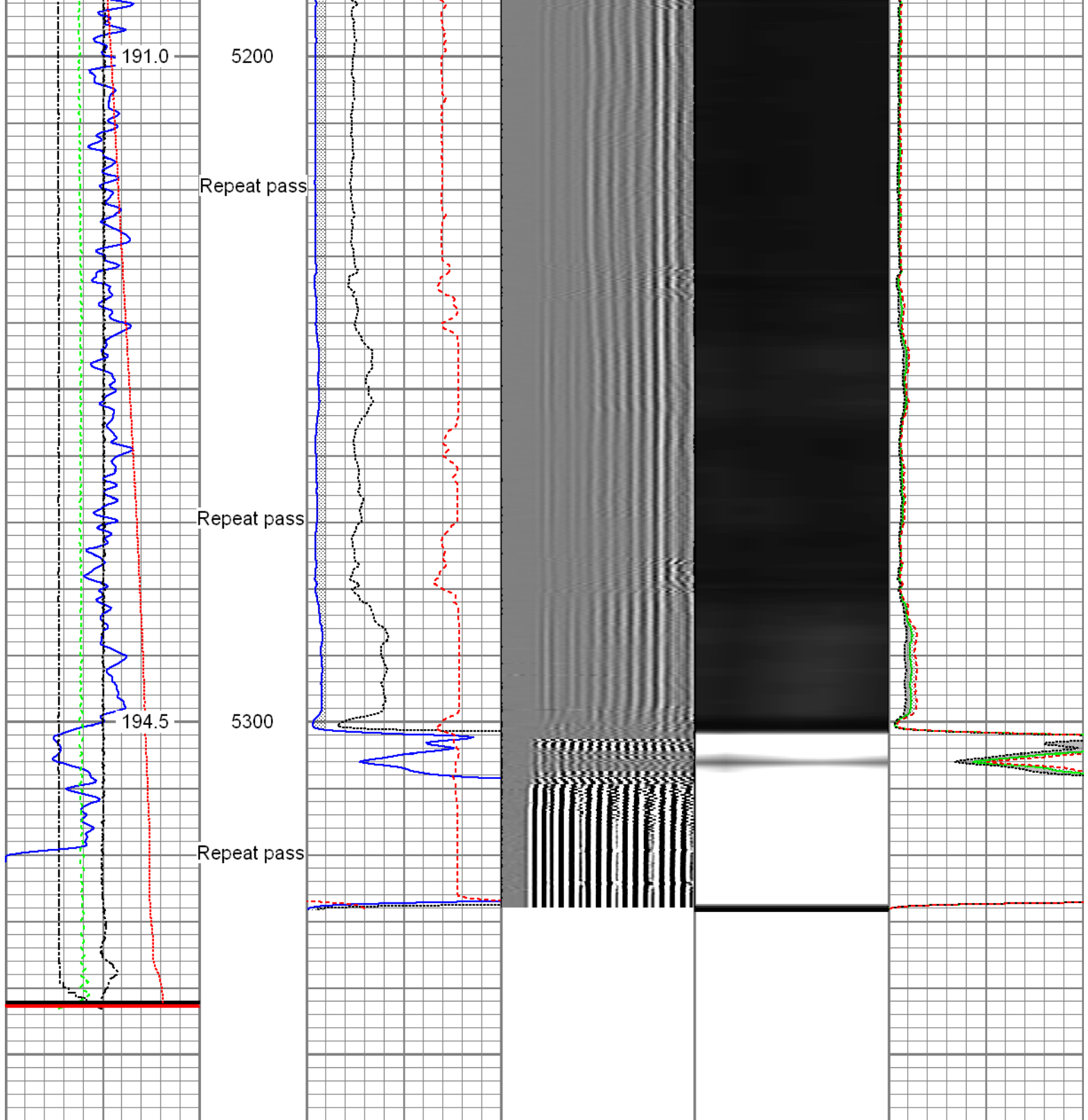


Gamma Ray (GAPI)	3' Amplitude (mV)	5' Variable Density Log	Sector Map	Average Amplitude
0120	0100	2001200		0100
Line Speed (ft/min)	3' Amplitude x 5 (mV)			Minimum Amplitude
-100100	020			0100
Line Tension (lb)	3' Travel Time (usec)			Maximum Amplitude
02000	650150			0100
Differential Temperature (degF)				
-22				
Temperature				

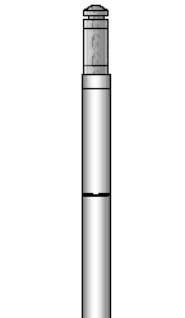

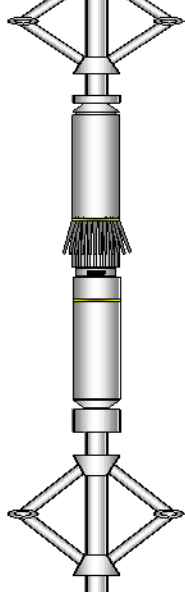

0	(degF)	20
Casing Collar Locator		
8	(in)	6.1

		<h2 style="text-align: center;">Repeat Pass</h2> <p style="text-align: center;">Recorded with 1800 PSI Surface Induced Pressure</p>			
Database File: 03-26-15_whiting_razor 11g-0209a_mit_rbl.db Dataset Pathname: pass2 Presentation Format: rbt4_mit Dataset Creation: Thu Mar 26 10:38:16 2015 by Log 7.0 B1 Charted by: Depth in Feet scaled 1:240					
Gamma Ray 0 (GAPI) 120 <hr/> Line Speed -100 (ft/min) 100 <hr/> Line Tension 0 (lb) 2000 <hr/> Differential Temperature -2 (degF) 2 <hr/> Temperature 0 (degF) 20 <hr/>		3' Amplitude 0 (mV) 100 <hr/> 3' Amplitude x 5 0 (mV) 20 <hr/> 3' Travel Time 650 (usec) 150 <hr/>	5' Variable Density Log 200 1200	Sector Map	Average Amplitude 0 100 <hr/> Mimimum Amplitude 0 100 <hr/> Maximum Amplitude 0 100 <hr/>





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								

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 (211461) Crossover Ultrawire Toolbus to Ultralink	1.58	1.69	6.50
			UW_PGR-UW_PGR_020 (10024770) Production Gamma Ray	1.93	1.69	9.50
			UW_PRC #4 -DSSRAC (081) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
WVFS3FT	16.46		UW_RBT-UW_RBT_004 (10013454) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00
WVFS1	16.46					
WVFS2	16.46					
WVFS3	16.46					
WVFS4	16.46					
WVFS5	16.46					
WVFS6	16.46					
WVFS7	16.46					
WVFS8	16.46					
CBLTEMP	16.46					
CBLROT	16.46					
WVFS5FT	15.46					
MIT	6.45		UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
			UW_MIT-UW_MIT40_027 (218949) 40 Multifinger Imaging Tool	4.54	2.75	61.10
			UW_PRC #3 -UW_PRC_057 (1038) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
TEMP	0.37		UW_PRT-UW_PRT_016 (10025097) Platinum Resistance Thermometer	1.04	1.69	5.20
TSTAMP	0.00		UW_BUL-UW_BUL_006 (218707) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20

Total Length: 28.09 ft
Total Weight: 324.50 lb
O.D. 3.13 in

Calibration Report

Database File: 03-26-15_whiting_razor 11g-0209a_mit_rbl.db
Dataset Pathname: pass4
Dataset Creation: Thu Mar 26 10:56:09 2015 by Log 7.0 B1

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

Multi-finger Imaging Tool Calibration Report

Serial Number: 218949
Number of Fingers: 40
Tool Model: UW_MIT40_027

Inclinometer Calibration Report

Performed: Mon, Oct, 06 14:03:04 2008
Calibration Angle: 45

	Inc X	Inc Y
Vertical:	1996	1984
Finger 1 up:	1780	1738
Finger 31 up:	2235	1756
Finger 21 up:	2216	2228
Finger 11 up:	1736	2196
Sensitivity ratio:	1.0062	
X-axis angle:	131.534	
Deviation const.:	331.322	

Finger Calibration Report

Performed: Thu Mar 26 10:53:03 2015

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1375	284.0	1659	290.0	1949	306.0	2255
Finger 02:	1450	273.0	1723	286.0	2009	302.0	2311
Finger 03:	1661	278.0	1939	278.0	2217	288.0	2505
Finger 04:	1673	278.0	1951	275.0	2226	281.0	2507
Finger 05:	1542	261.0	1803	269.0	2072	278.0	2350
Finger 06:	1536	257.0	1793	262.0	2055	271.0	2326
Finger 07:	1354	273.0	1627	285.0	1912	299.0	2211
Finger 08:	1547	260.0	1807	260.0	2067	271.0	2338
Finger 09:	1425	271.0	1696	280.0	1976	292.0	2268
Finger 10:	1491	267.0	1758	277.0	2035	278.0	2313
Finger 11:	1482	264.0	1746	267.0	2013	275.0	2288
Finger 12:	1323	280.0	1603	295.0	1898	304.0	2202

Finger 13:	1582	283.0	1865	288.0	2153	284.0	2437
Finger 14:	1423	280.0	1703	295.0	1998	301.0	2299
Finger 15:	1541	263.0	1804	275.0	2079	276.0	2355
Finger 16:	1404	279.0	1683	299.0	1982	302.0	2284
Finger 17:	1637	269.0	1906	280.0	2186	283.0	2469
Finger 18:	1377	288.0	1665	312.0	1977	316.0	2293
Finger 19:	1634	258.0	1892	265.0	2157	259.0	2416
Finger 20:	1501	267.0	1768	279.0	2047	286.0	2333
Finger 21:	1586	251.0	1837	262.0	2099	262.0	2361
Finger 22:	1520	278.0	1798	287.0	2085	295.0	2380
Finger 23:	1333	280.0	1613	294.0	1907	301.0	2208
Finger 24:	1662	270.0	1932	275.0	2207	282.0	2489
Finger 25:	1349	288.0	1637	312.0	1949	326.0	2275
Finger 26:	1519	288.0	1807	302.0	2109	313.0	2422
Finger 27:	1452	265.0	1717	276.0	1993	281.0	2274
Finger 28:	1630	274.0	1904	288.0	2192	298.0	2490
Finger 29:	1452	271.0	1723	289.0	2012	300.0	2312
Finger 30:	1411	270.0	1681	296.0	1977	308.0	2285
Finger 31:	1515	261.0	1776	283.0	2059	296.0	2355
Finger 32:	1327	268.0	1595	284.0	1879	302.0	2181
Finger 33:	1596	296.0	1892	314.0	2206	324.0	2530
Finger 34:	1532	266.0	1798	278.0	2076	290.0	2366
Finger 35:	1427	266.0	1693	284.0	1977	300.0	2277
Finger 36:	1581	282.0	1863	288.0	2151	299.0	2450
Finger 37:	1595	272.0	1867	282.0	2149	296.0	2445
Finger 38:	1488	274.0	1762	288.0	2050	299.0	2349
Finger 39:	1463	277.0	1740	293.0	2033	307.0	2340
Finger 40:	1577	290.0	1867	293.0	2160	306.0	2466

Segmented Cement Bond Log Calibration Report						
Serial Number:		10013454				
Tool Model:		UW_RBT_004				
Calibration Casing Diameter:		5.500	in			
Calibration Depth:		-25.786	ft			
Master Calibration, performed Thu Mar 26 10:49:33 2015:						
	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.001	1.002	1.000	71.921	70.672	1.097
5FT	-0.003	0.990	1.000	71.921	71.412	1.227
S1	-0.001	1.002	0.000	100.000	99.680	0.130
S2	-0.004	1.002	0.000	100.000	99.420	0.364
S3	-0.003	1.007	0.000	100.000	99.070	0.265
S4	-0.004	1.007	0.000	100.000	98.935	0.359
S5	-0.001	1.009	0.000	100.000	98.927	0.136
S6	-0.004	1.009	0.000	100.000	98.735	0.351
S7	-0.002	0.998	0.000	100.000	99.976	0.244
S8	-0.002	1.000	0.000	100.000	99.796	0.229

Gamma Ray Calibration Report			
Serial Number:		10024770	
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	Whiting Oil and Gas Corporation
Well	Razor 11G-0209A
Field	Wildcat
County	Weld
State	Colorado