

# Radial Cement Bond Gamma Ray Casing Collar Log

Company	Whiting Oil & Gas Corporation	Company	Whiting Oil & Gas Corporation
Well	Horsetail 30F-3106	Well	Horsetail 30F-3106
Field	Wildcat	Field	Wildcat
County	Weld	County	Weld
State	Colorado	State	Colorado
Location:	API #: 05-123-39200		
SEC 30	TWP 10N	RGE 57W	Other Services Gauge Ring Set Plug MIT
Permanent Datum	Ground Level	Elevation	4780'
Log Measured From	Kelly Bushing	17 FT	
Drilling Measured From	Kelly Bushing		K.B. 4797' D.F. 4796' G.L. 4780'

Date	21-Nov-2014
Run Number	Three
Depth Driller	13210 FT
Depth Logger	4940 FT
Bottom Logged Interval	4935 FT
Top Log Interval	Surface
Open Hole Size	9.625"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	192°F
Estimated Cement Top	Surface
Time Well Ready	ROA
Time Logger on Bottom	16:00
Equipment Number	HD-0134
Location	Fort Lupton, CO
Recorded By	Wayne Wacker
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	1581 FT		
Intermediate #1	7	29	L-80	Surface	5959 FT		
Intermediate #2							
Liner	4.5	11.6	L-80	4885 FT	13197 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.

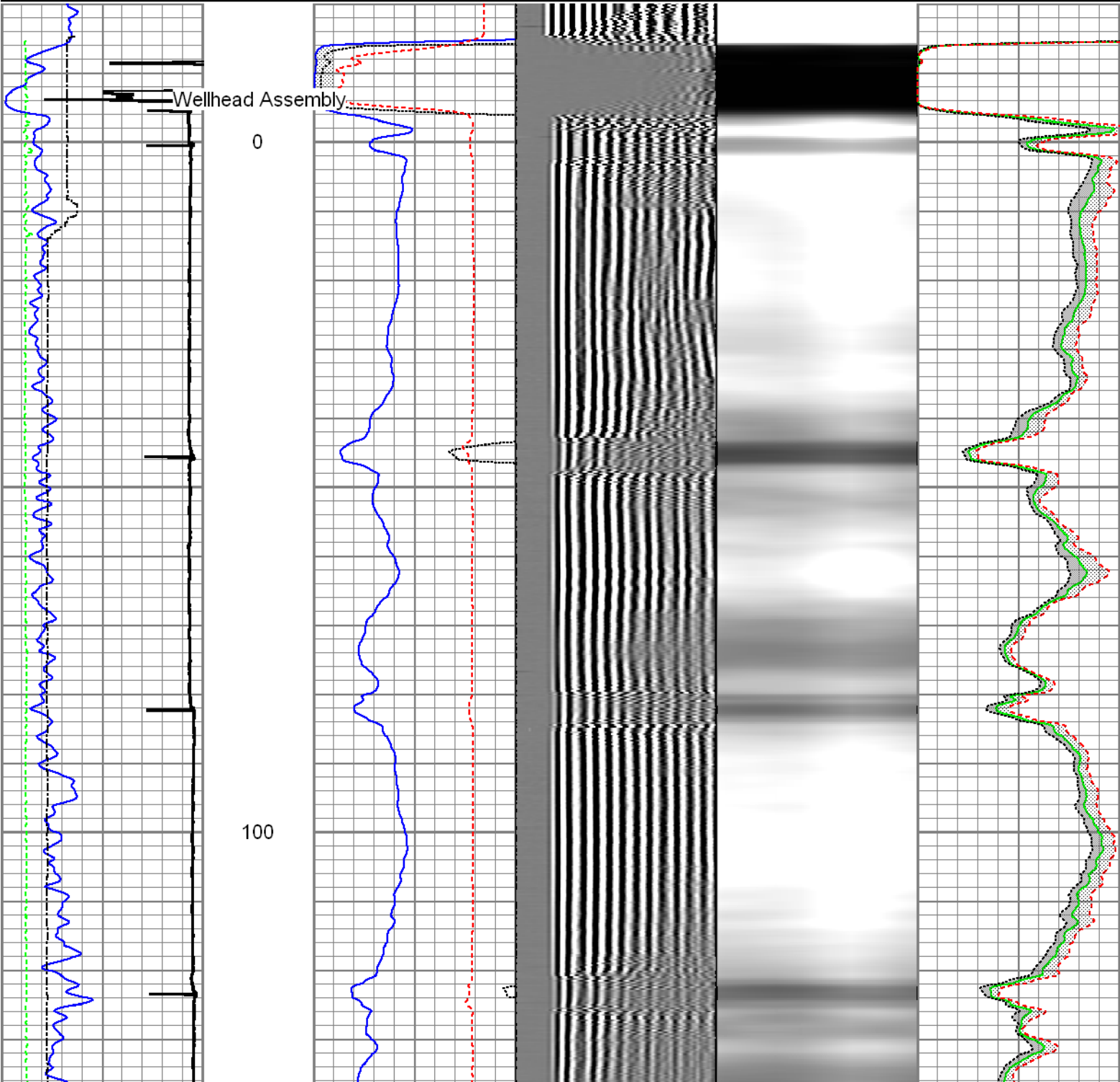
## Comments

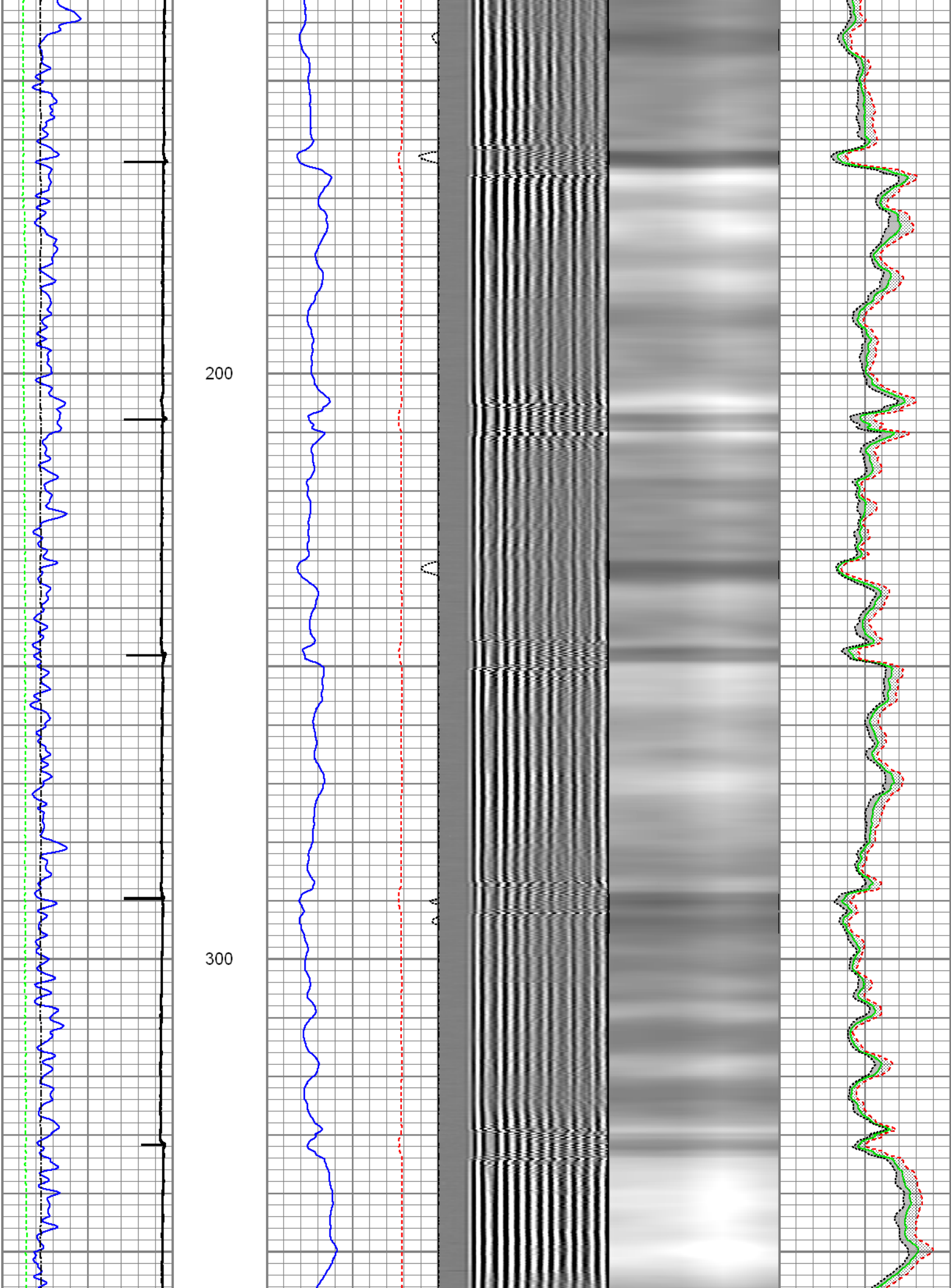
Log ran as per customer request.  
 Depth referenced to Casing Tally reported Liner Top at 4885 FT.  
 Adjusted -22 FT to correlate with Liner Top.  
 Gauge Ring/Junk Basket ran to 3 joints below liner top prior to logging.  
 Log ran from 4940 FT to surface.  
 Log ran with 1500 PSI surface induced pressure.

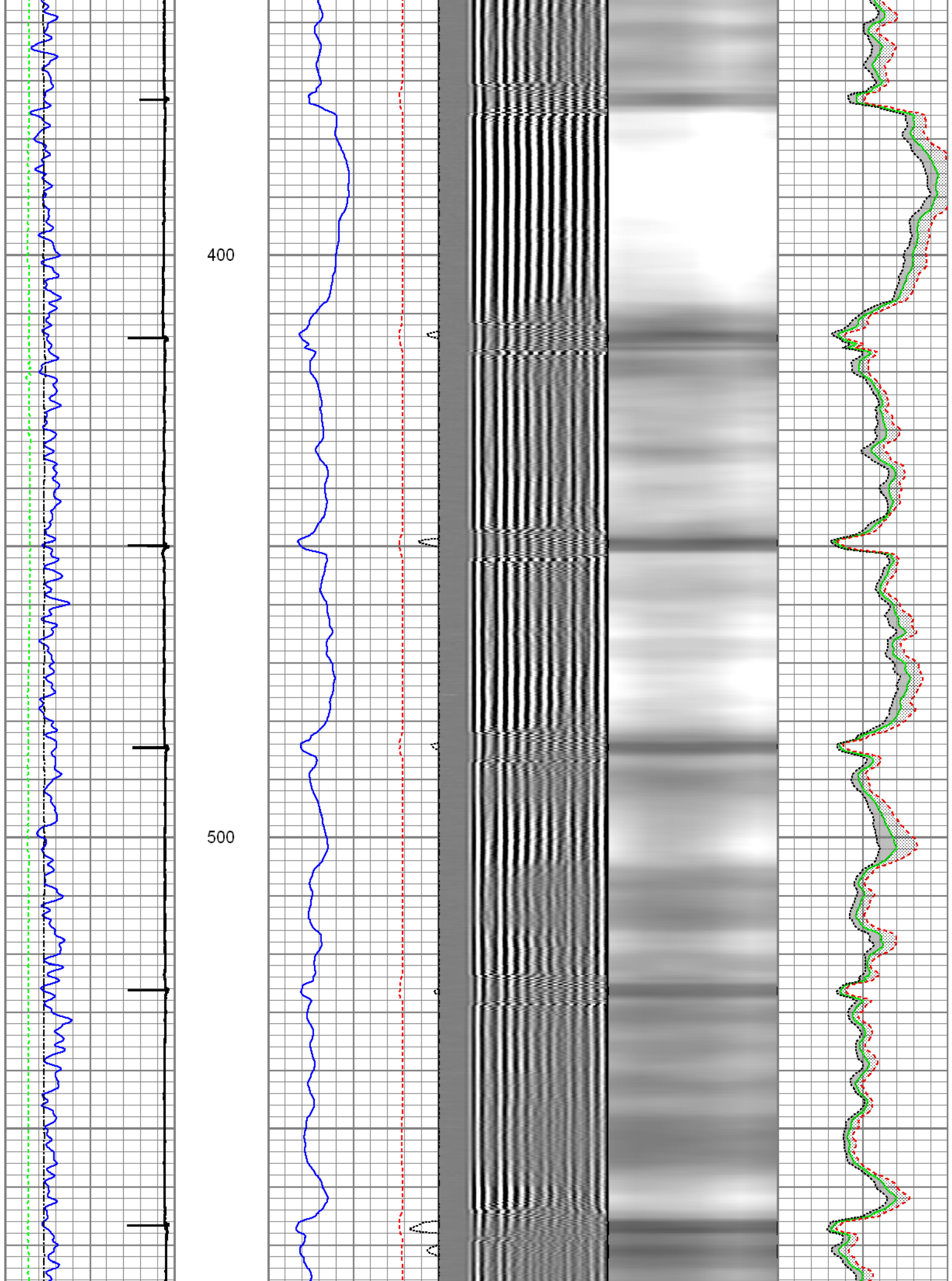
Thank you for choosing FMC Technologies Completion Services, Inc.!!

Database File: 11-21-14\_whiting\_horsetail\_30f-3106\_mit\_rbl.db  
Dataset Pathname: main  
Presentation Format: rbt4\_mit  
Dataset Creation: Fri Nov 21 16:08:02 2014 by Log 7.0 B1  
Charted by: Depth in Feet scaled 1:240

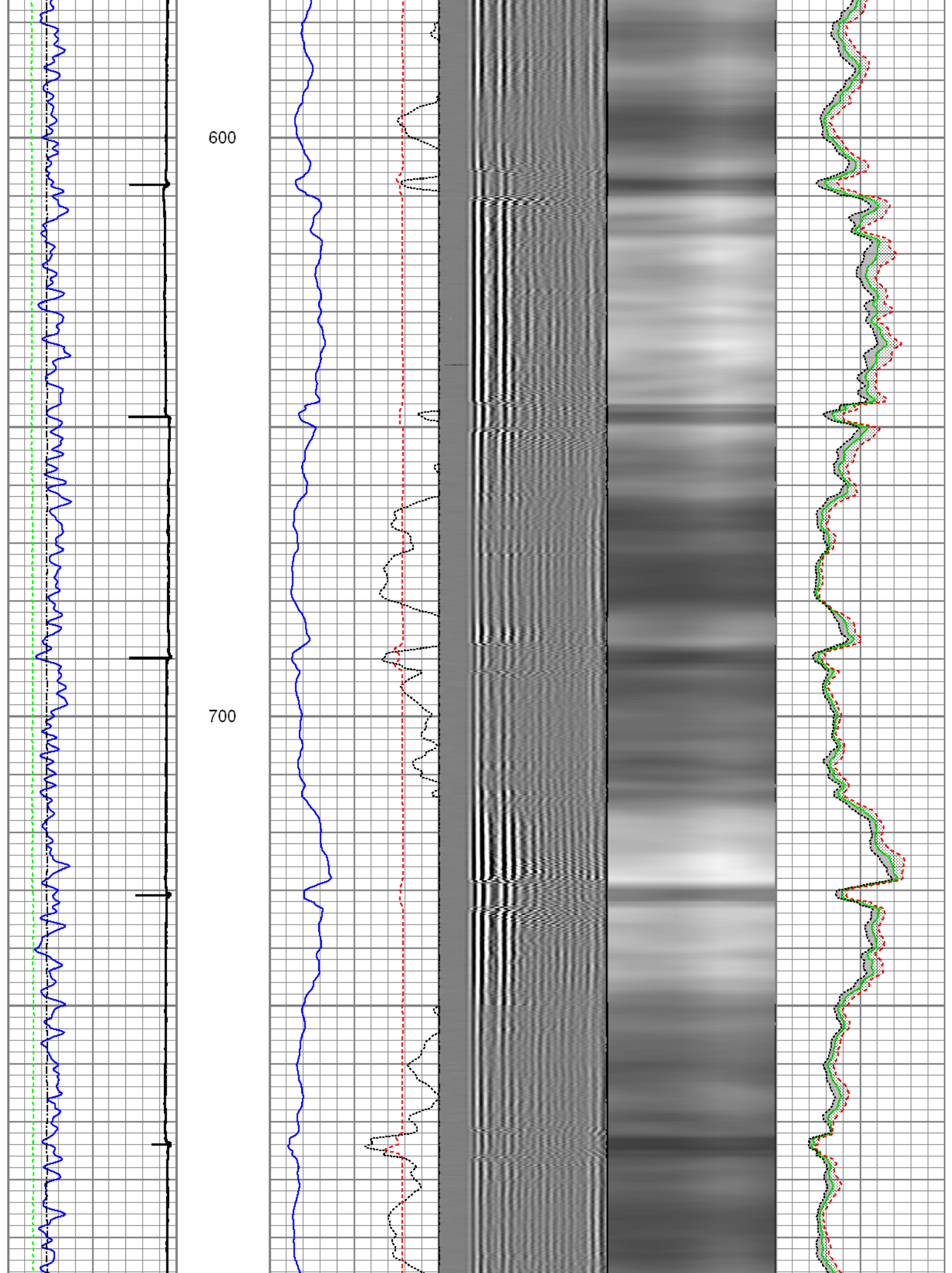
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000				

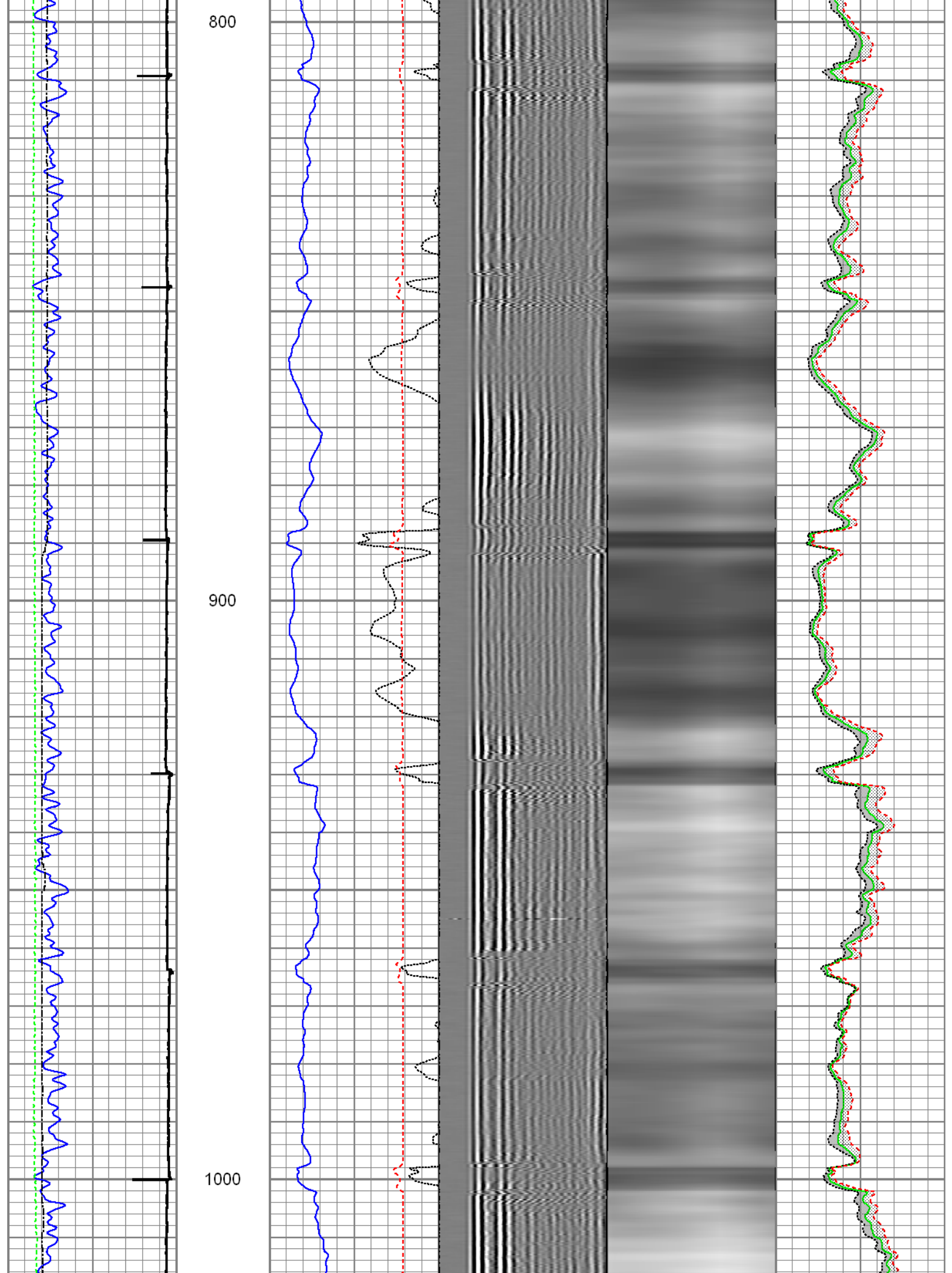


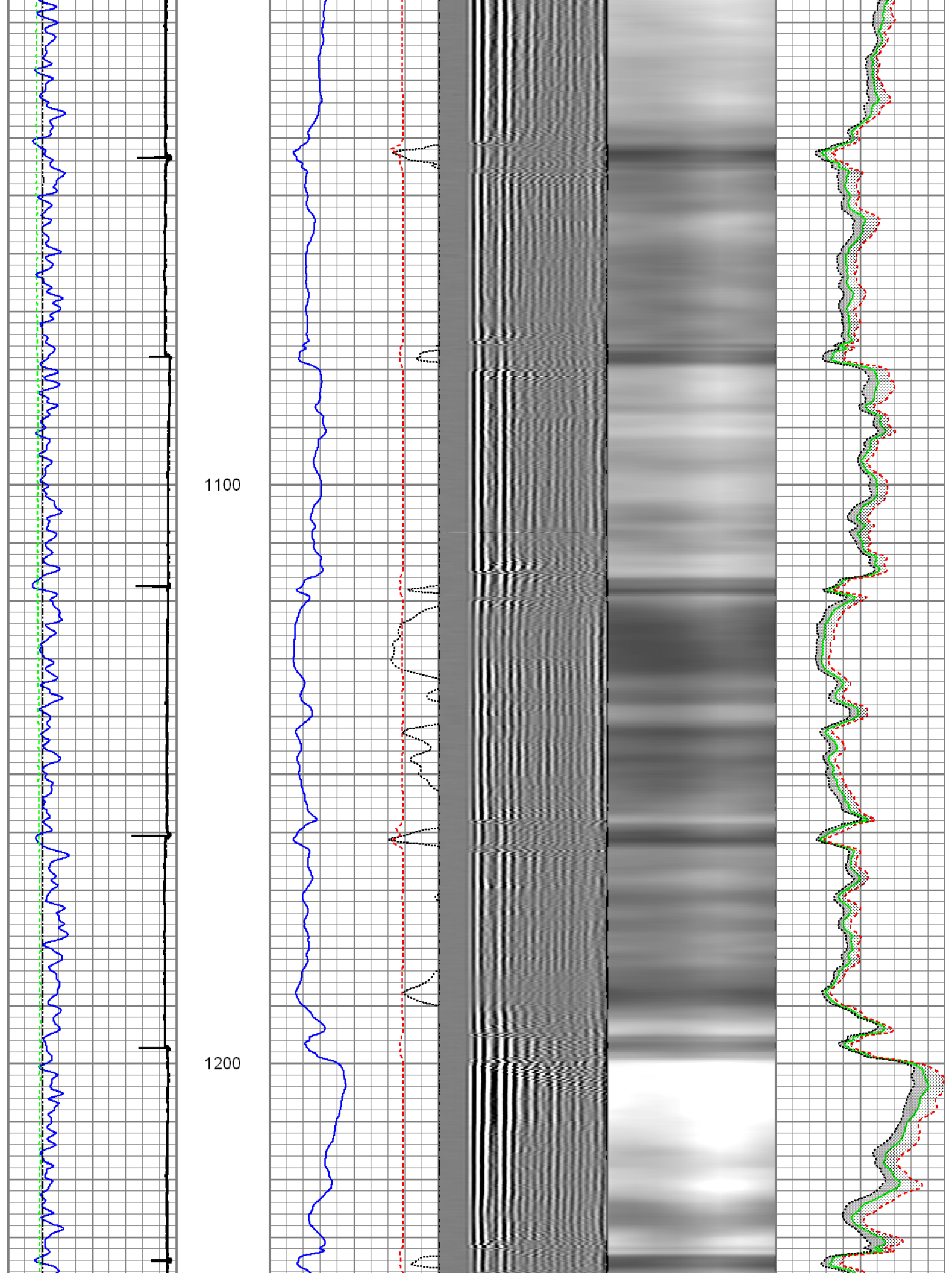


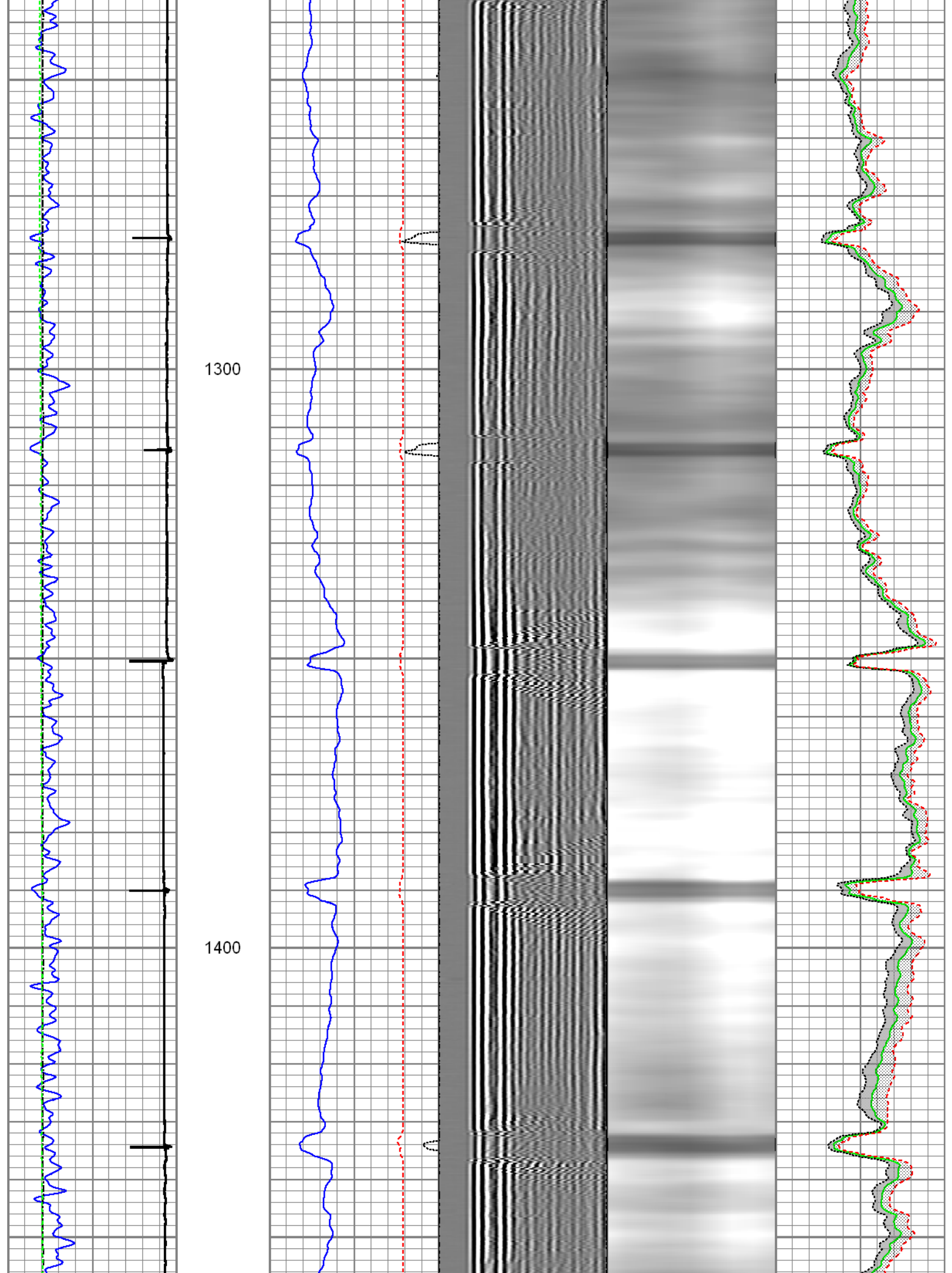




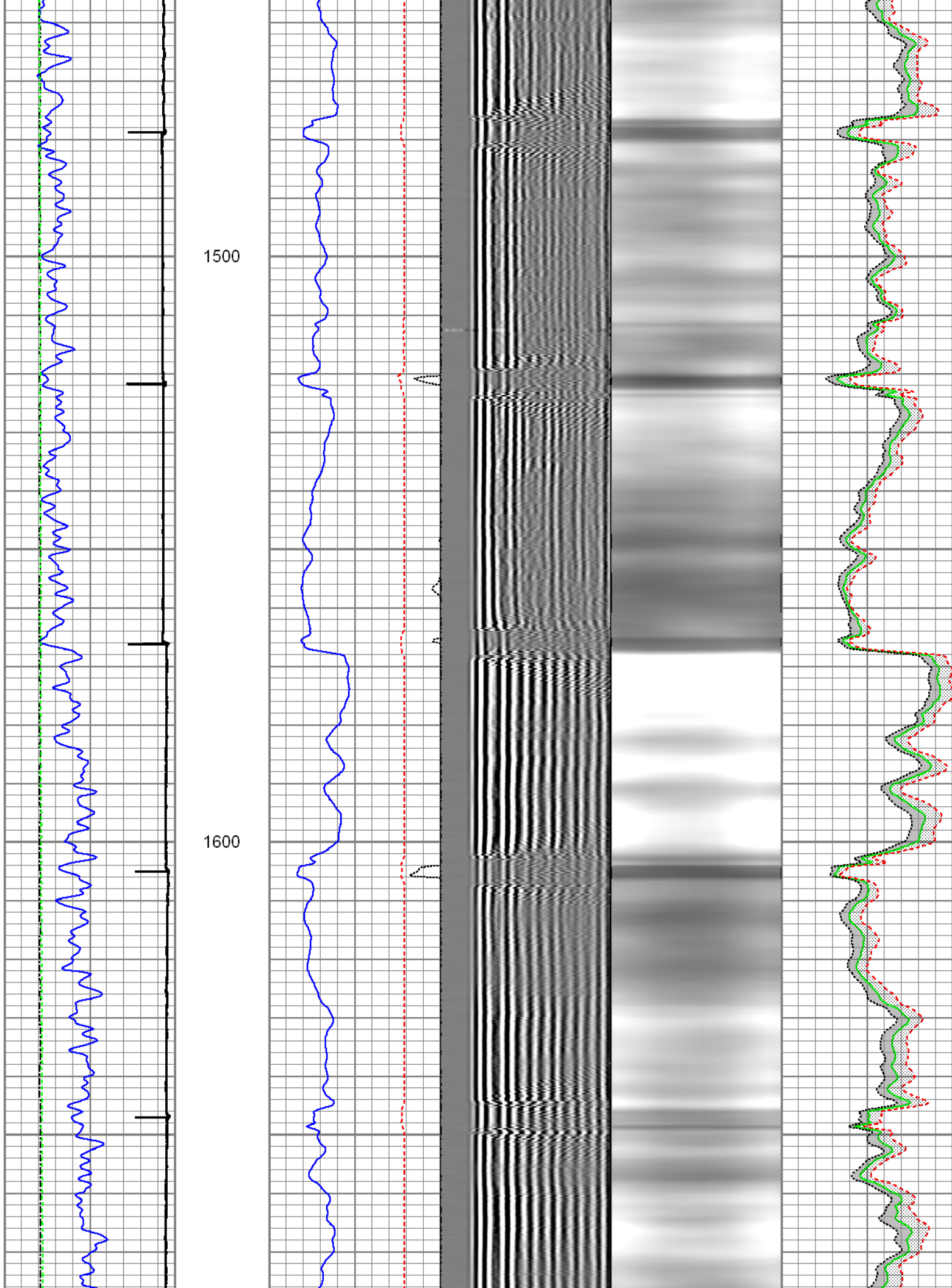


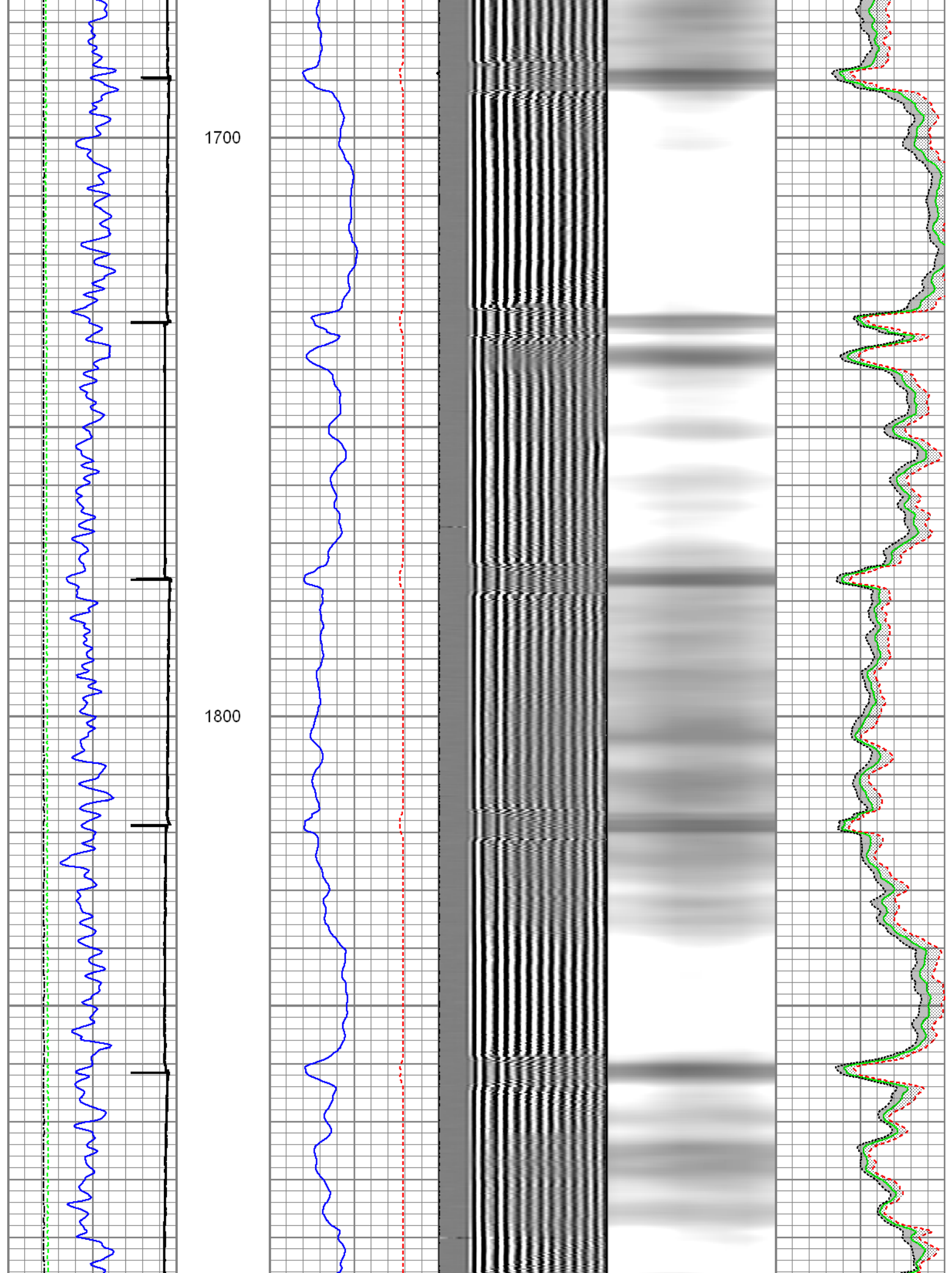


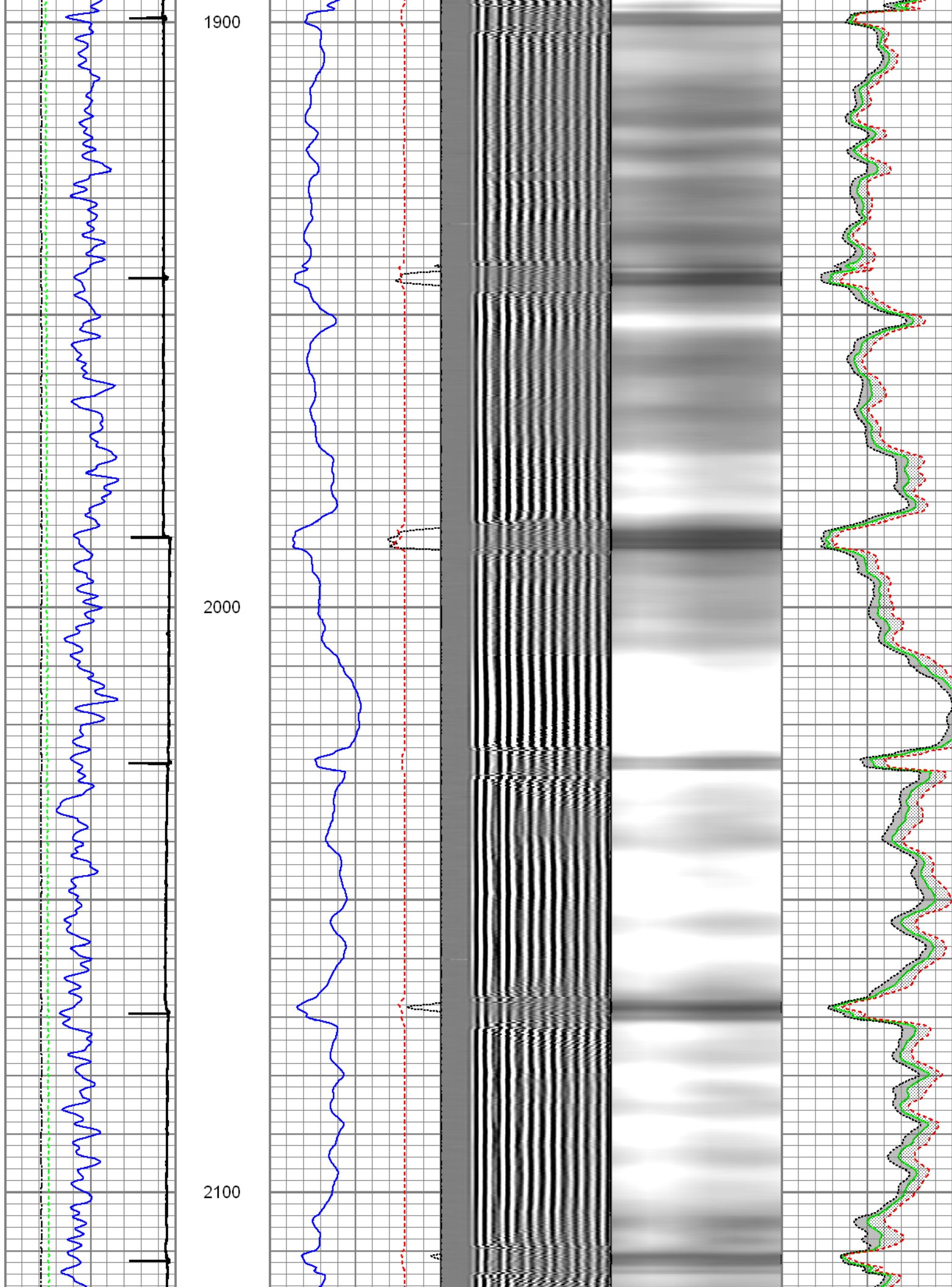








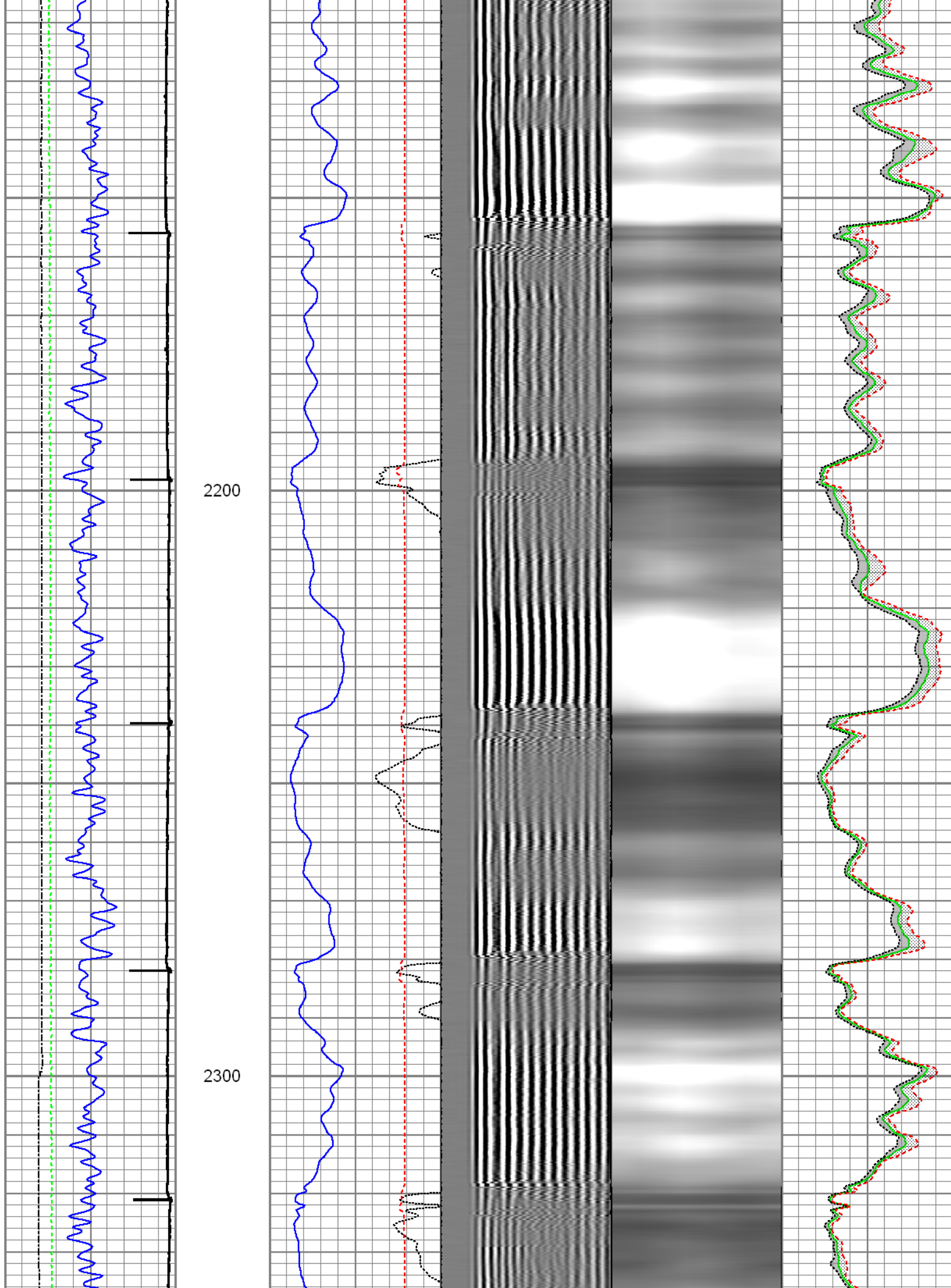




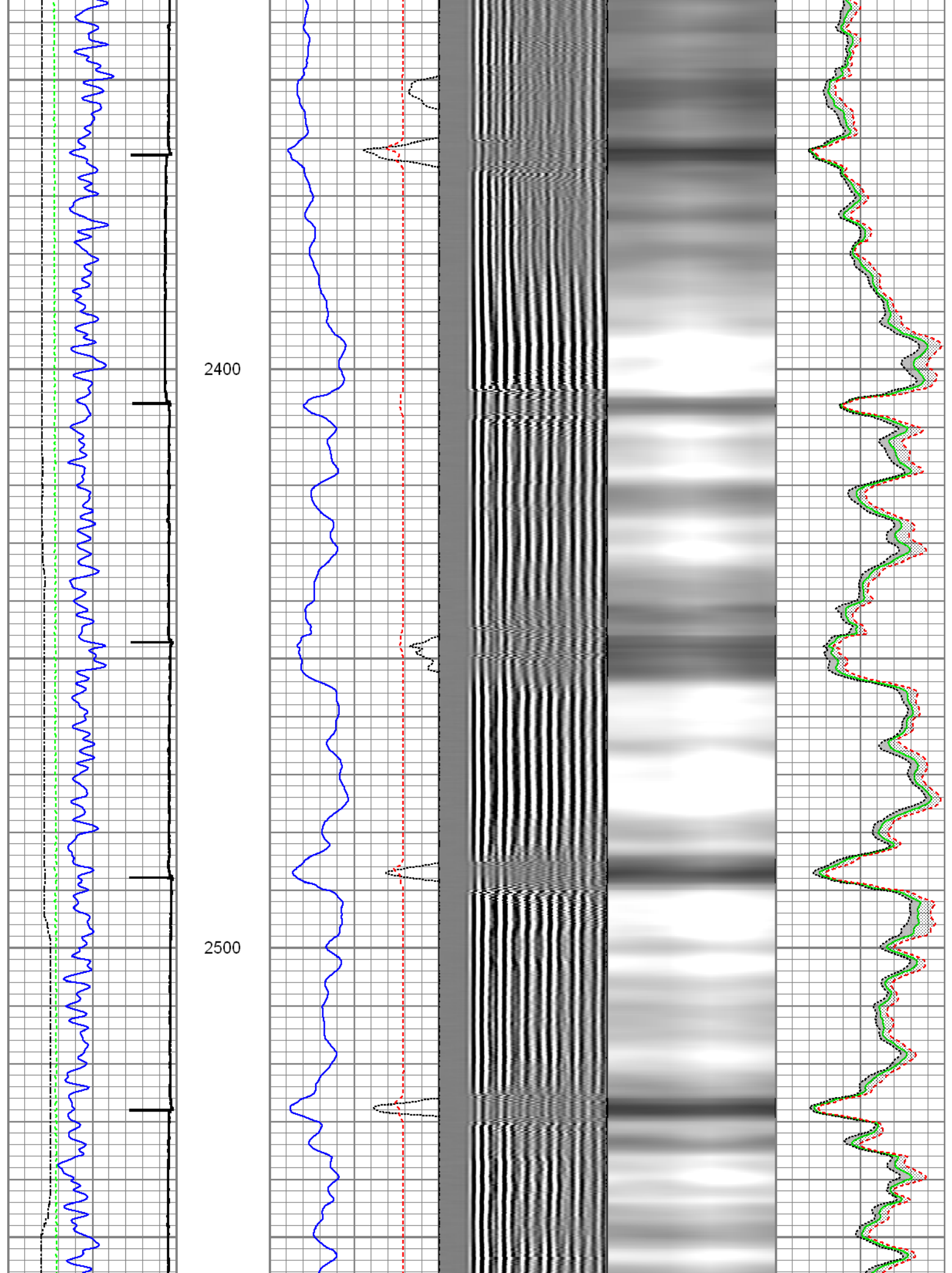


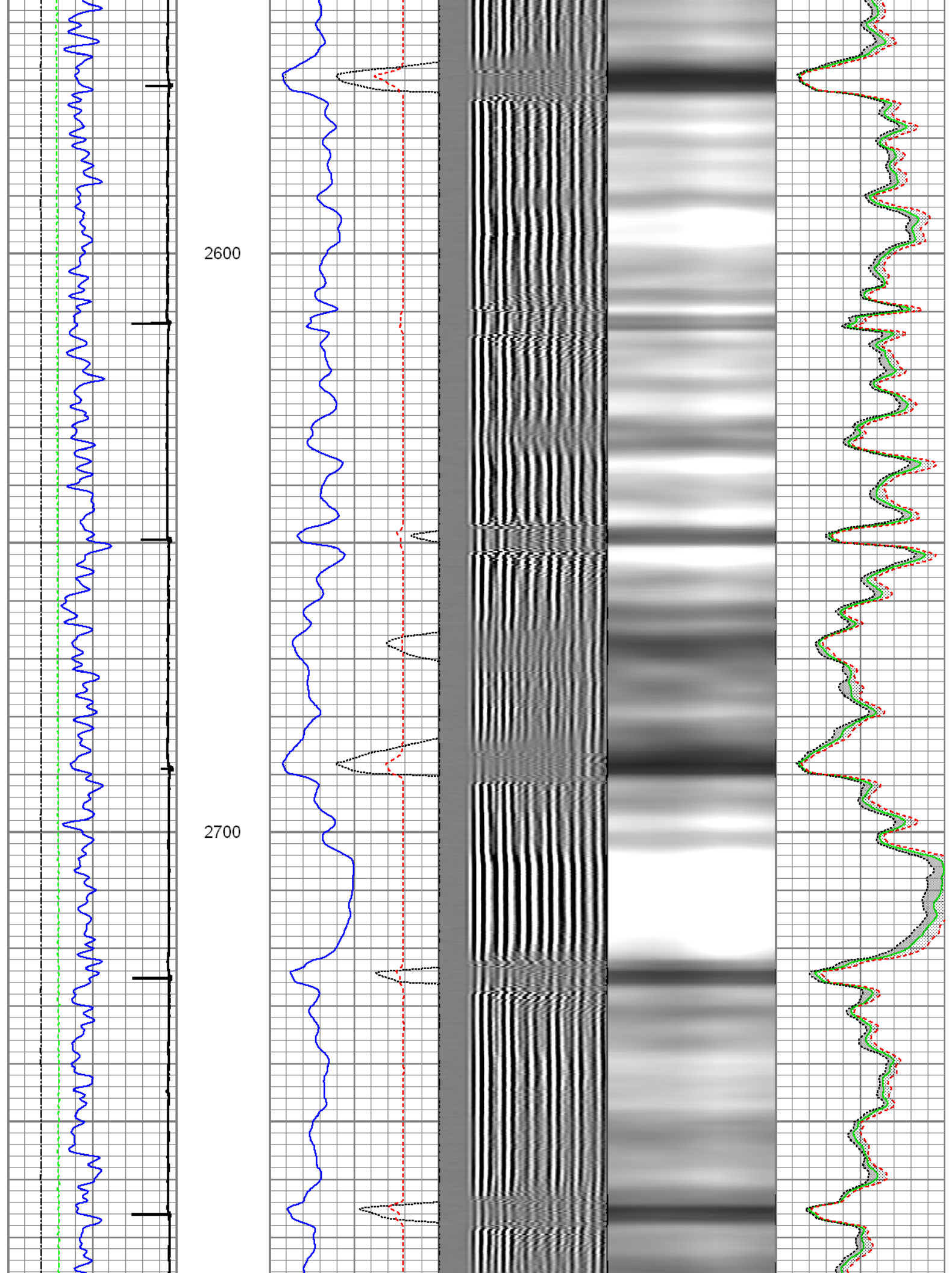
2200

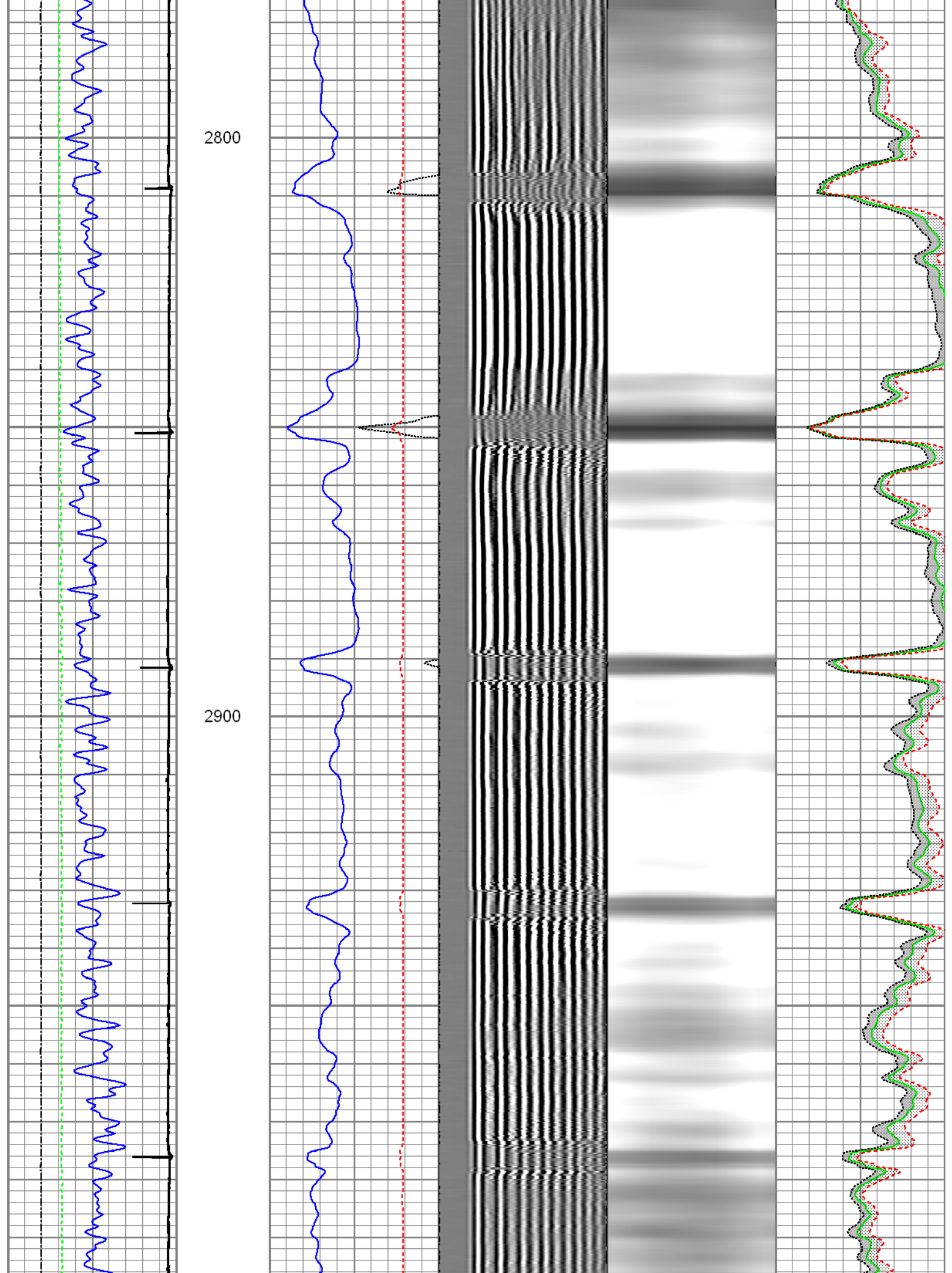
2300









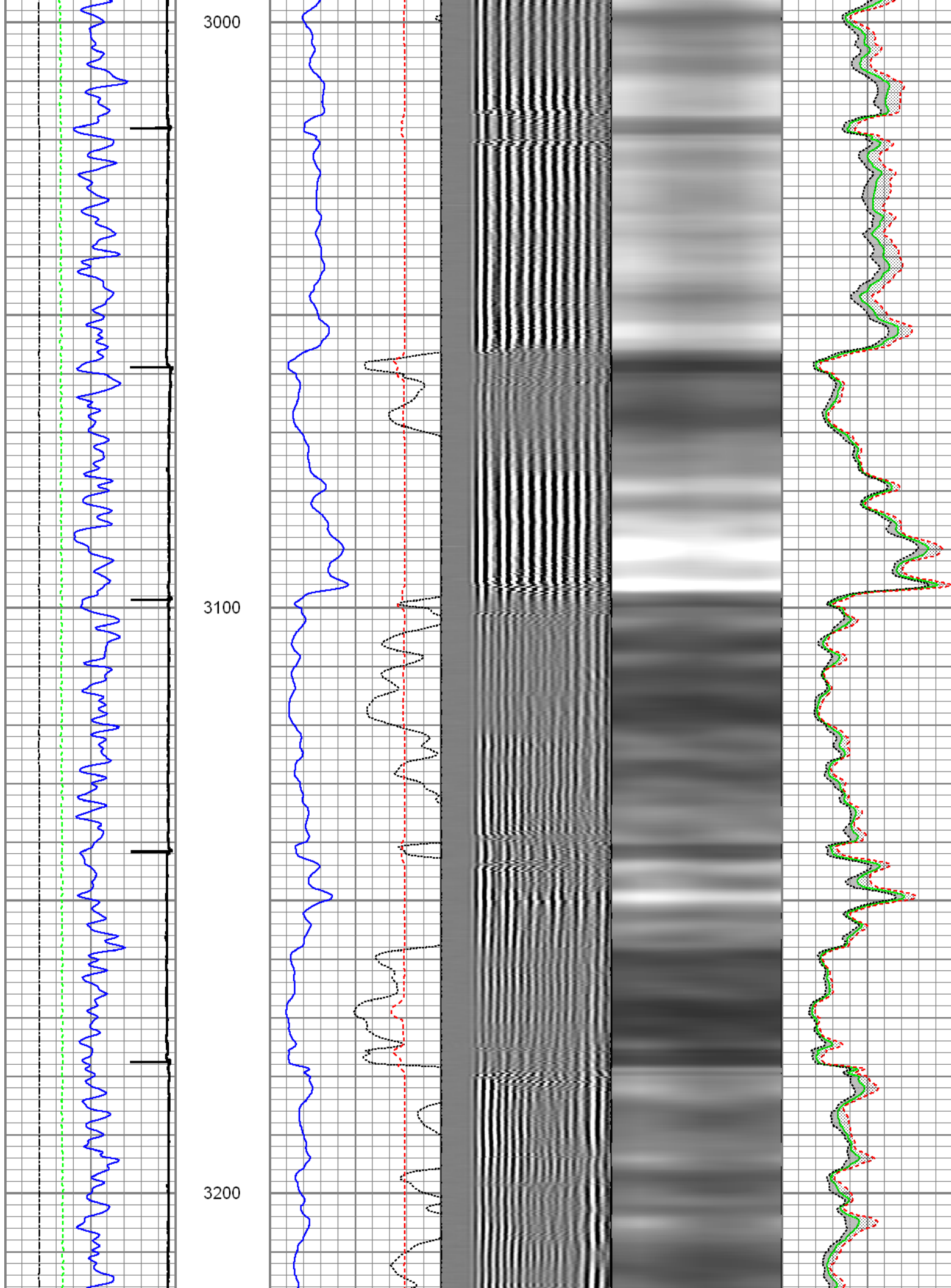




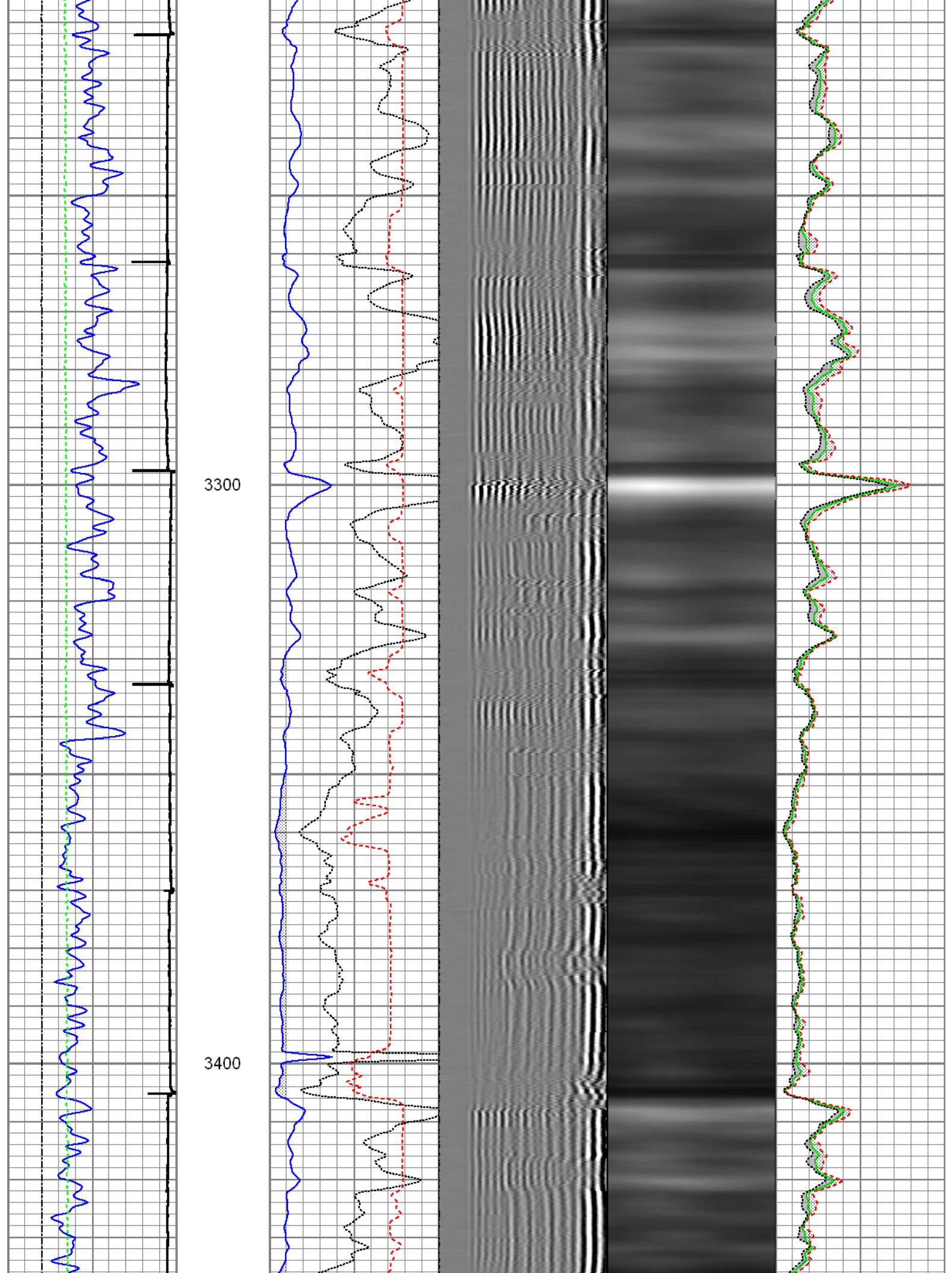
3000

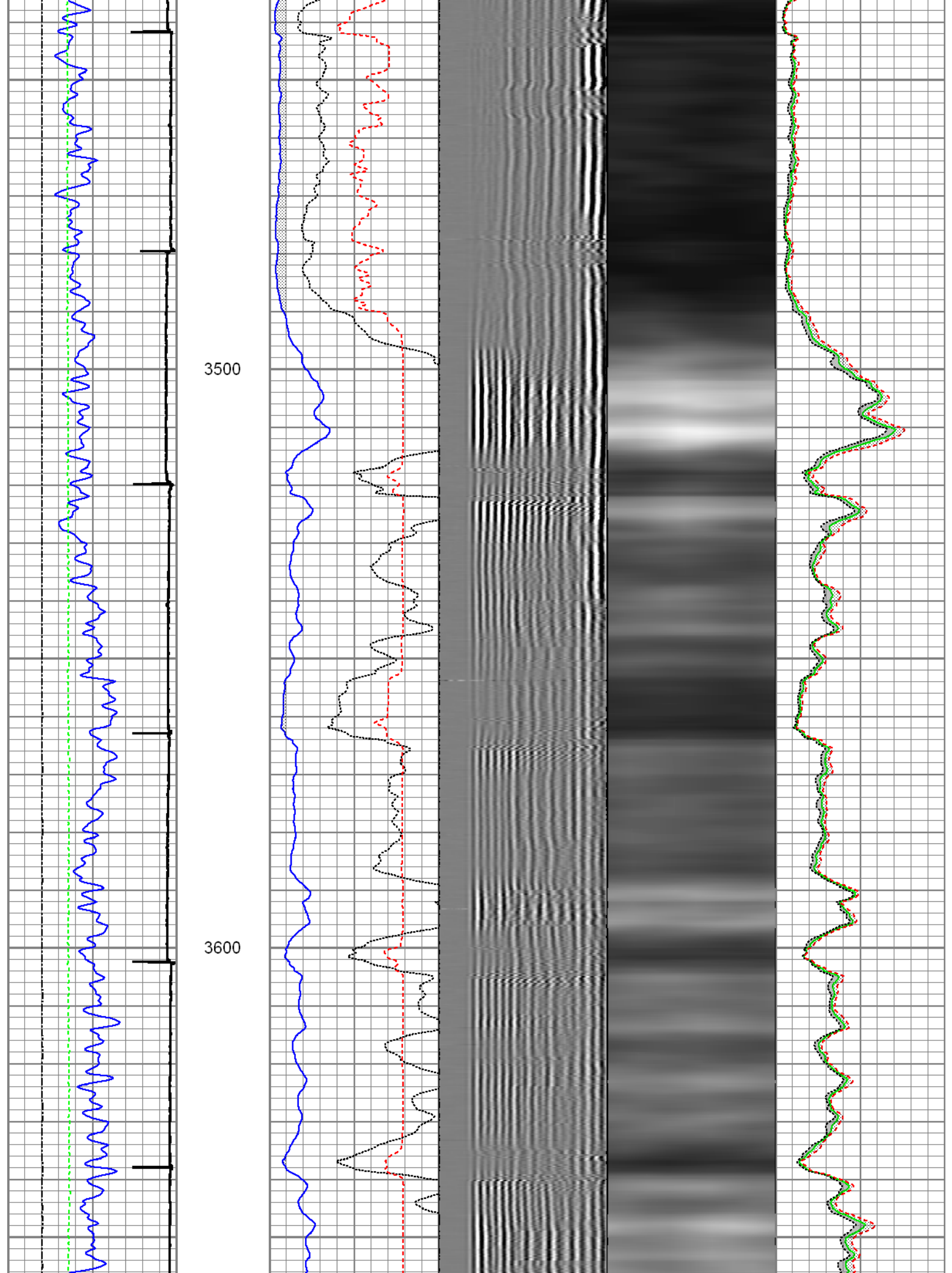
3100

3200



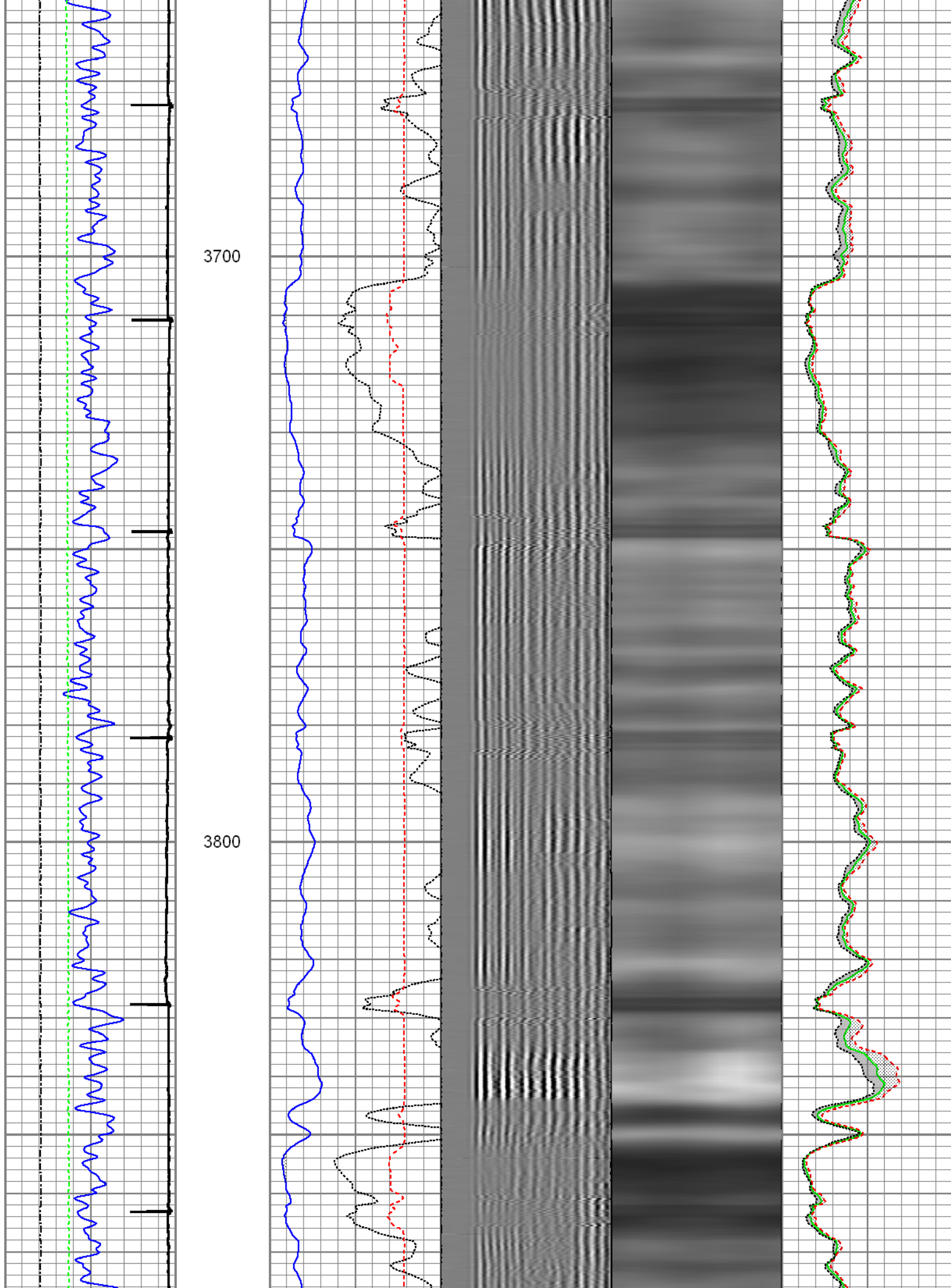


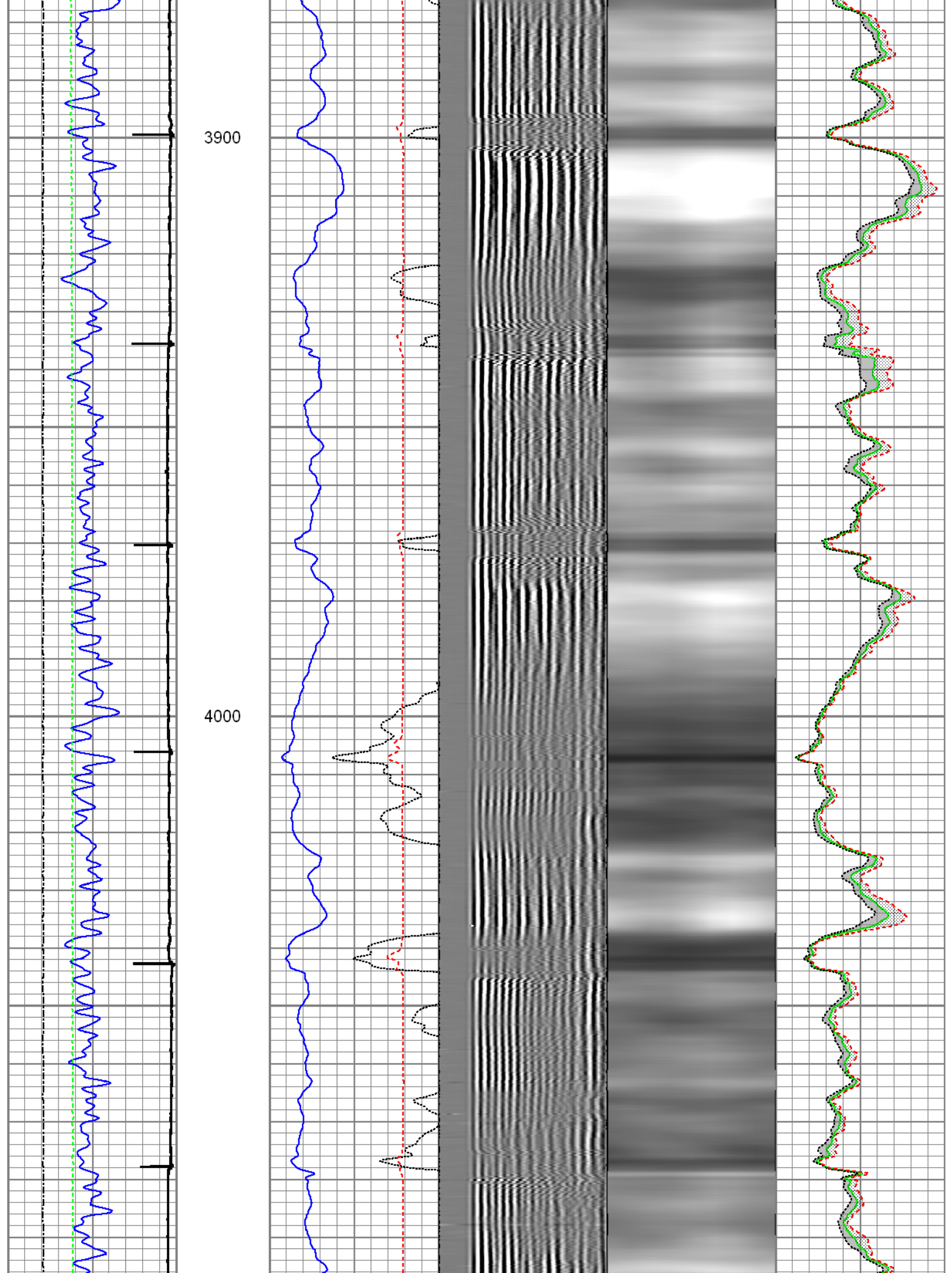




3700

3800



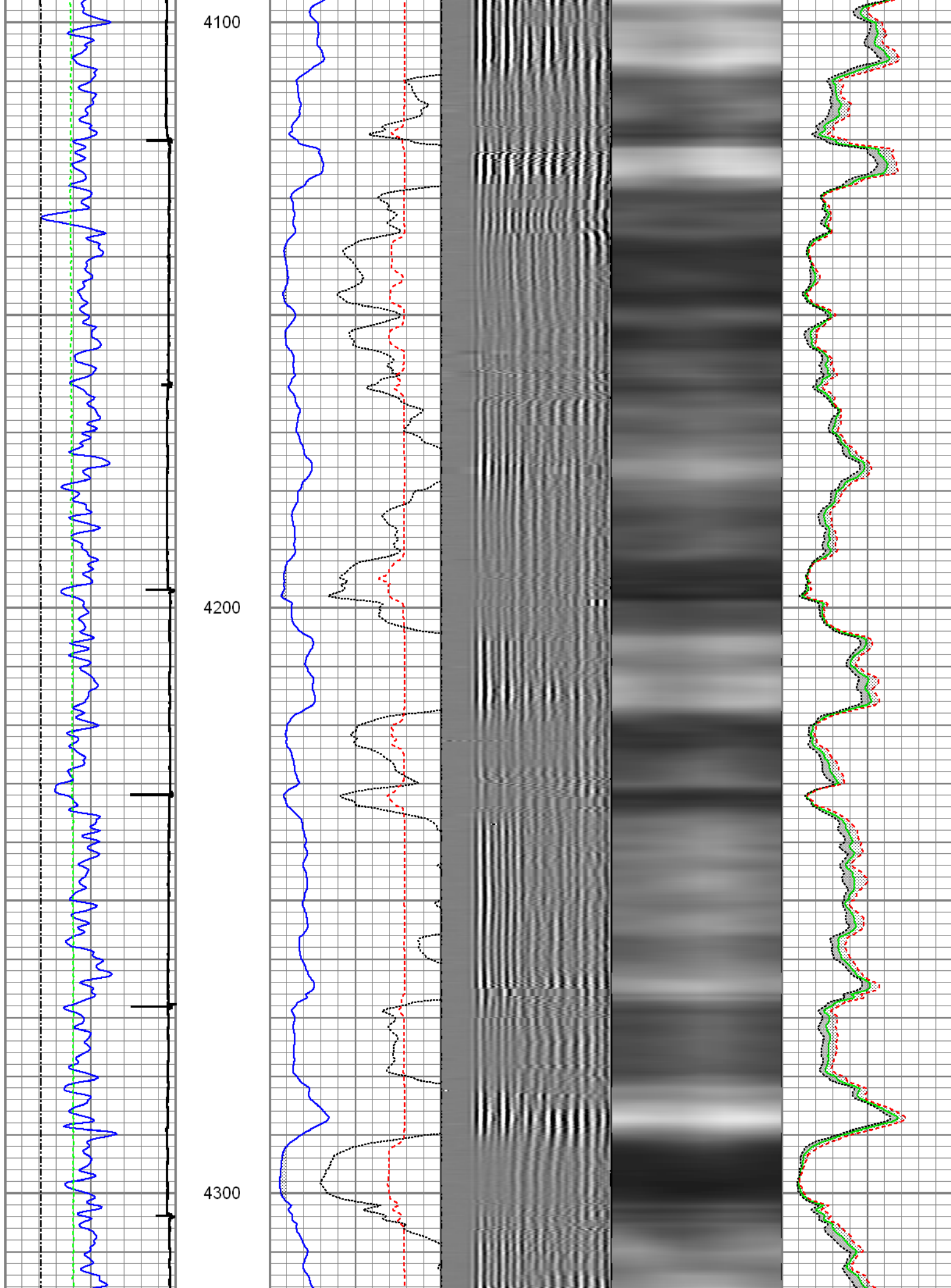


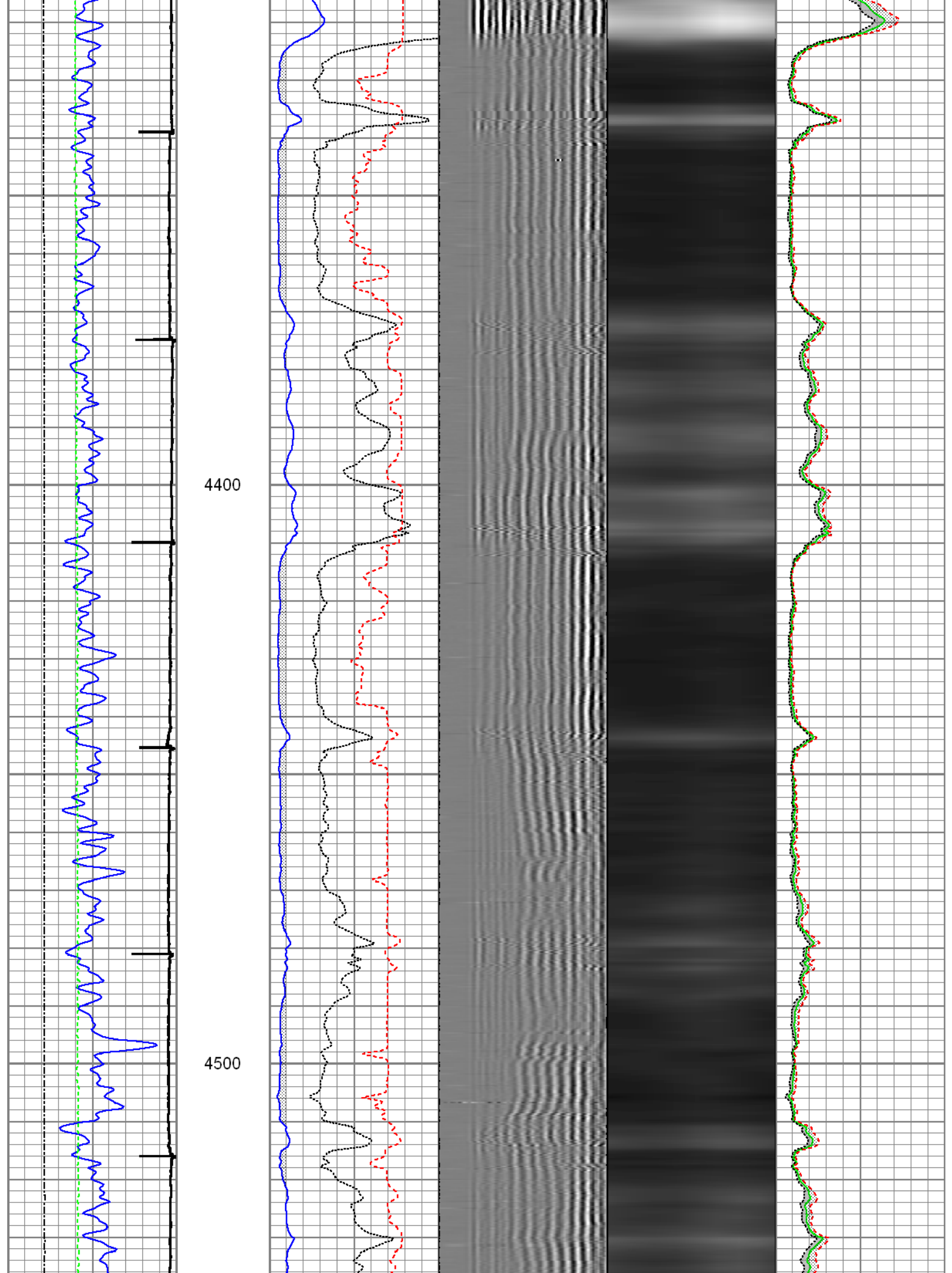


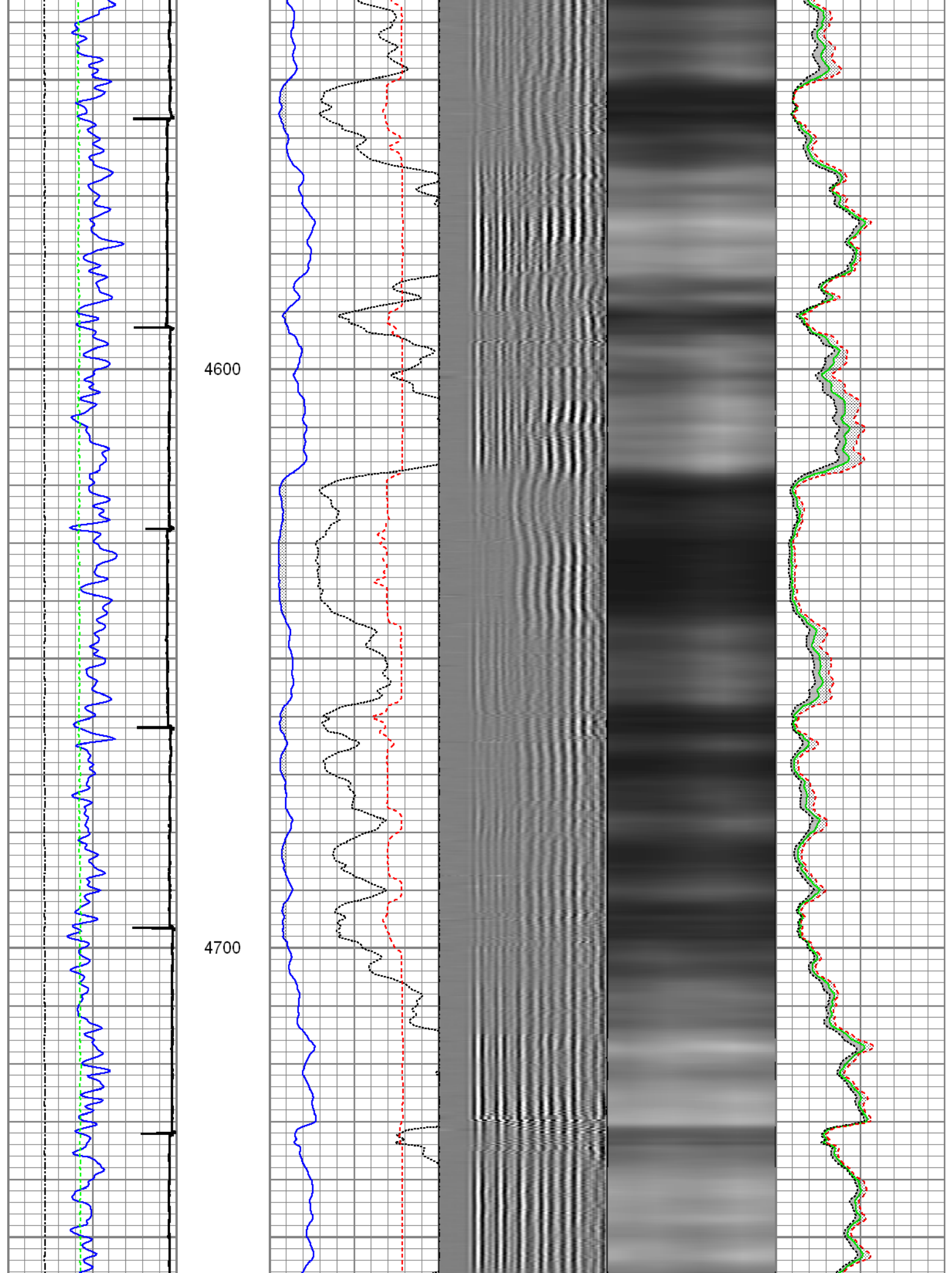
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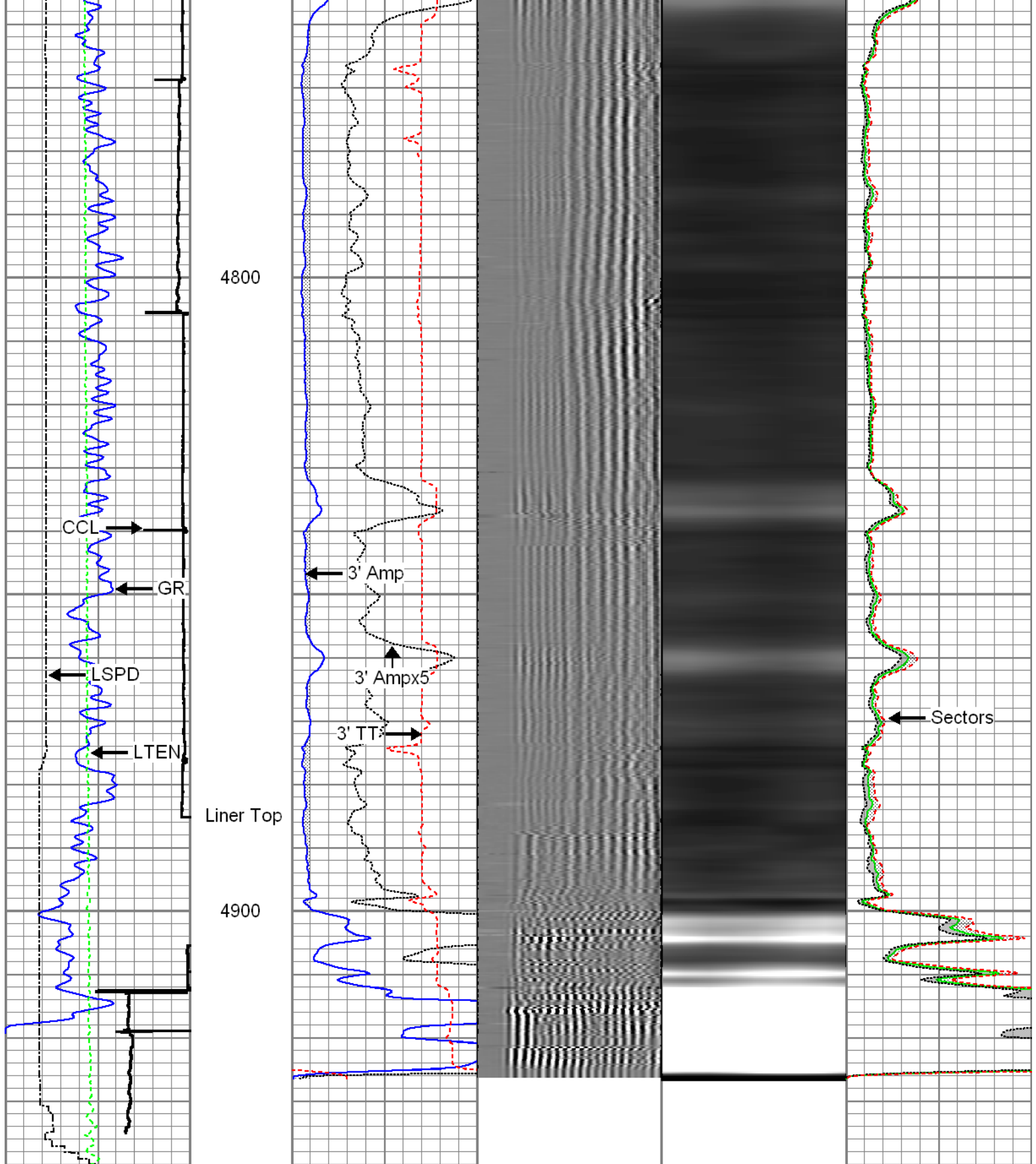
4200

4300









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



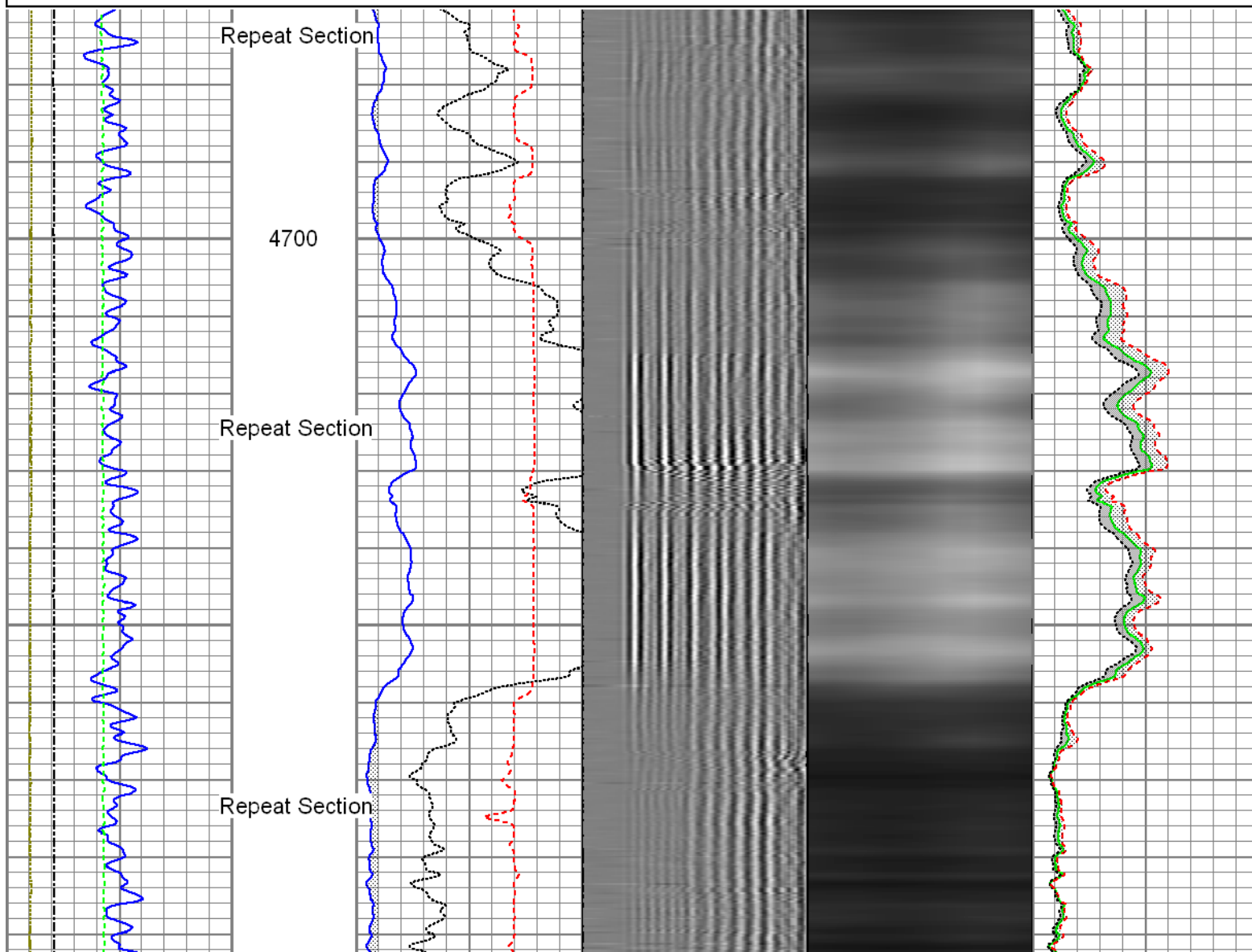


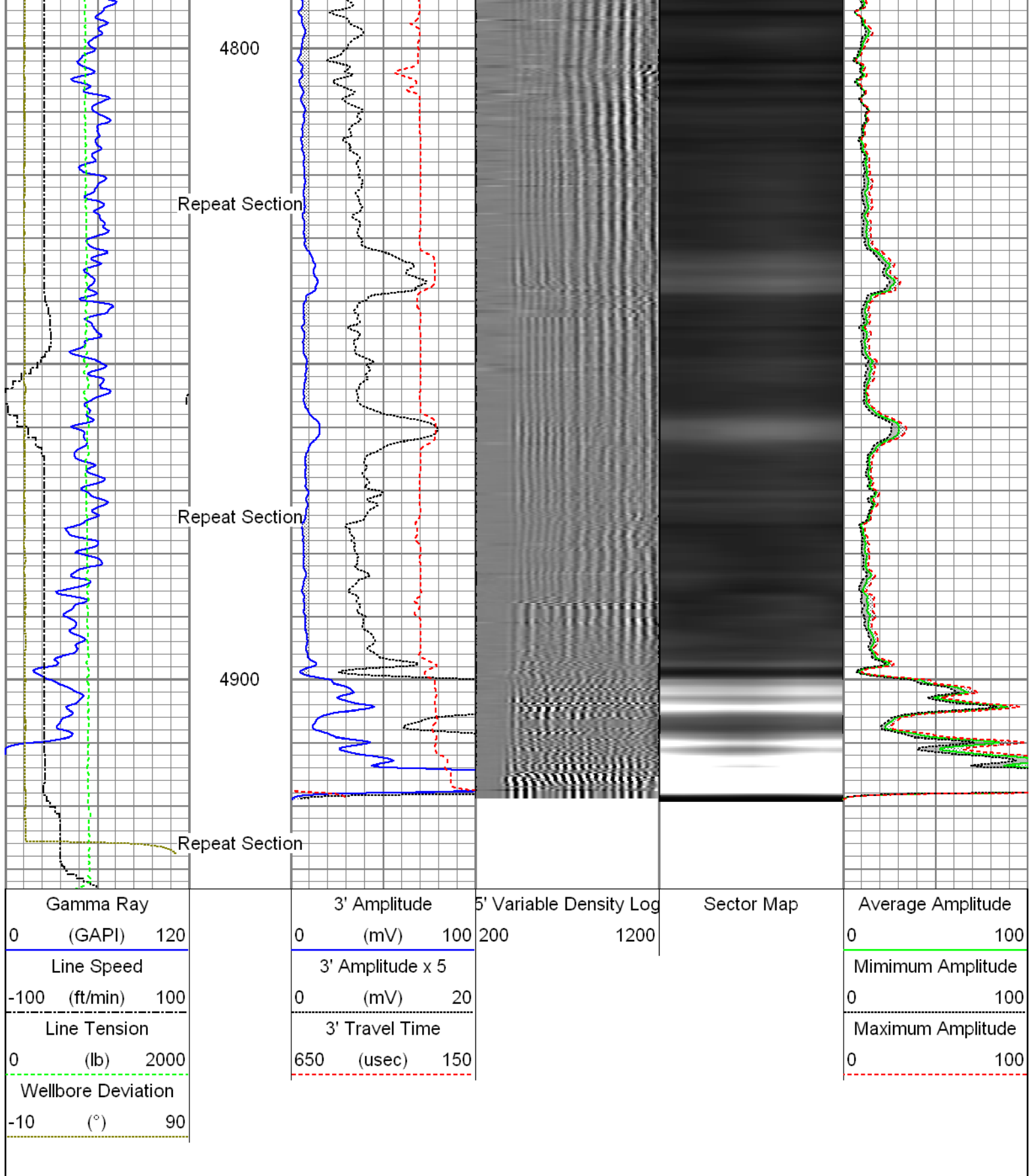
## Repeat Section

Recorded with 1500 PSI Surface Induced Pressure

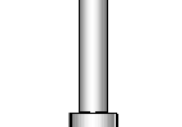

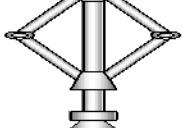
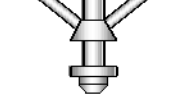
Database File: 11-21-14\_whiting\_horsetail\_30f-3106\_mit\_rbl.db  
Dataset Pathname: repeat1  
Presentation Format: rbt4\_mit  
Dataset Creation: Fri Nov 21 15:58:36 2014 by Log 7.0 B1  
Charted by: Depth in Feet scaled 1:240

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





Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
			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) Sondex Adapter - GO Box to Sondex Pin	1.58	1.69	6.50

GR	22.81		UW_PGR-UW_PGR_020 (10013899) 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
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					
CBLROT	15.42					
WV5FT	14.42					
MIT	5.41		UW_PRC-DSSRAC (082) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
			UW_MIT-UW_MIT40_027 (218950) 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
TSTAMP	0.00		UW_BUL-UW_BUL_006 (218707) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
Dataset: 11-21-14_Whiting_Horsetail_30F-3106_MIT_RBL.db: field/well/run1/main Total Length: 27.05 ft Total Weight: 319.30 lb O.D. 3.13 in						

Calibration Report	
Database File:	11-21-14_whiting_horsetail_30f-3106_mit_rbl.db
Dataset Pathname:	main
Dataset Creation:	Fri Nov 21 16:08:02 2014 by Log 7.0 B1

### Multi-finger Imaging Tool Calibration Report

Serial Number: 218950  
Number of Fingers: 40  
Tool Model: UW\_MIT40\_027

Inclinometer Calibration Report

Performed: Fri, Oct, 10 10:41:51 2008  
Calibration Angle: 45

Vertical:	Inc X	Inc Y
	1996	1975
Finger 1 up:	2238	2226
Finger 31 up:	1760	2216
Finger 21 up:	1769	1745
Finger 11 up:	2250	1738
Sensitivity ratio:	1.00023	
X-axis angle:	314.283	
Deviation const.:	339.139	

Finger Calibration Report

Performed: Fri Nov 21 15:26:01 2014

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1462	273.0	1735	288.0	2023	295.0	2318
Finger 02:	1511	250.0	1761	256.0	2017	265.0	2282
Finger 03:	1419	274.0	1693	289.0	1982	300.0	2282
Finger 04:	1451	274.0	1725	288.0	2013	291.0	2304
Finger 05:	1488	262.0	1750	275.0	2025	281.0	2306
Finger 06:	1407	275.0	1682	293.0	1975	302.0	2277
Finger 07:	1404	272.0	1676	289.0	1965	300.0	2265
Finger 08:	1408	266.0	1674	285.0	1959	294.0	2253
Finger 09:	1422	271.0	1693	293.0	1986	301.0	2287
Finger 10:	1443	262.0	1705	283.0	1988	291.0	2279
Finger 11:	1409	267.0	1676	293.0	1969	300.0	2269
Finger 12:	1366	268.0	1634	302.0	1936	309.0	2245
Finger 13:	1463	253.0	1716	274.0	1990	276.0	2266
Finger 14:	1412	259.0	1671	287.0	1958	295.0	2253
Finger 15:	1407	275.0	1682	296.0	1978	303.0	2281
Finger 16:	1416	269.0	1685	290.0	1975	299.0	2274
Finger 17:	1413	273.0	1686	300.0	1986	311.0	2297
Finger 18:	1408	261.0	1669	292.0	1961	298.0	2259
Finger 19:	1453	267.0	1720	293.0	2013	299.0	2312
Finger 20:	1444	266.0	1710	294.0	2004	308.0	2312
Finger 21:	1376	284.0	1660	304.0	1964	322.0	2286
Finger 22:	1429	262.0	1691	289.0	1980	294.0	2274
Finger 23:	1437	270.0	1707	294.0	2001	301.0	2302
Finger 24:	1470	274.0	1744	292.0	2036	294.0	2330
Finger 25:	1451	278.0	1729	296.0	2025	302.0	2327
Finger 26:	1417	280.0	1697	301.0	1998	309.0	2307
Finger 27:	1478	274.0	1752	286.0	2038	292.0	2330
Finger 28:	1440	280.0	1720	296.0	2016	305.0	2321
Finger 29:	1526	267.0	1793	279.0	2072	284.0	2356
Finger 30:	1398	283.0	1681	296.0	1977	306.0	2283
Finger 31:	1457	292.0	1749	298.0	2047	305.0	2352
Finger 32:	1520	274.0	1794	280.0	2074	280.0	2354
Finger 33:	1437	291.0	1728	301.0	2029	306.0	2335
Finger 34:	1468	284.0	1752	296.0	2048	305.0	2353
Finger 35:	1494	263.0	1757	270.0	2027	274.0	2301
Finger 36:	1497	270.0	1767	284.0	2051	288.0	2339
Finger 37:	1476	283.0	1759	294.0	2053	298.0	2351
Finger 38:	1517	253.0	1770	261.0	2031	270.0	2301
Finger 39:	1460	272.0	1732	283.0	2015	285.0	2300
Finger 40:	1418	285.0	1703	298.0	2001	305.0	2306



Serial Number: 10013454  
Tool Model: UW\_RBT\_004

Calibration Casing Diameter: 5.500 in  
Calibration Depth: 15.746 ft

Master Calibration, performed Fri Nov 21 15:28:28 2014:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.002	0.850	0.800	71.921	83.478	0.947
5FT	-0.003	0.303	0.800	71.921	232.372	1.455
S1	-0.001	0.630	0.000	100.000	158.435	0.193
S2	-0.004	0.673	0.000	100.000	147.897	0.534
S3	-0.002	0.724	0.000	100.000	137.716	0.336
S4	-0.004	0.744	0.000	100.000	133.809	0.485
S5	-0.001	0.750	0.000	100.000	133.154	0.167
S6	-0.003	0.734	0.000	100.000	135.661	0.462
S7	-0.002	0.667	0.000	100.000	149.299	0.364
S8	-0.003	0.622	0.000	100.000	160.248	0.403

#### 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 Whiting Oil & Gas Corporation  
Well Horsetail 30F-3106  
Field Wildcat  
County Weld  
State Colorado