

Radial Cement Bond Gamma Ray Casing Collar Log

Company	Kerr-McGee Oil and Gas Onshore LP
Well	Como 34N-14HZ
Field	Wattenberg
County	Weld
State	Colorado
Company	Kerr-McGee Oil and Gas Onshore LP
Well	Como 34N-14HZ
Field	Wattenberg
County	Weld
State	Colorado
Location:	API # : 05-123-39945
Permanent Datum	SEC 11 TWP 11N RGE 68W
Log Measured From	Ground Level
Drilling Measured From	Kelly Bushing
	Elevation 5030'
	MIT
	Elevation
	K.B. 5055'
	D.F. 5054'
	G.L. 5030'

Date	29-Dec-2014
Run Number	Three
Depth Driller	16659 FT
Depth Logger	7200 FT
Bottom Logged Interval	6950 FT
Top Log Interval	Surface
Open Hole Size	---
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	212°F
Estimated Cement Top	Surface
Time Well Ready	ROA
Time Logger on Bottom	2:30 PM
Equipment Number	HD-0134
Location	Ft. Lupton, CO
Recorded By	R. Fogarty
Witnessed By	S. Segura

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	1137 FT		
Intermediate #1	7	26	P-110	Surface	8139 FT		
Intermediate #2							
Liner	4.5	11.6	P-110	6877 FT	16513 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 reference to Casing Tally reported Liner Top at 6877 FT.
Adjusted log +3.3 FT to correlate with Liner Top.
Log ran from below liner top to surface
Log ran with 2800 PSI surface induced pressure.
No debris found on logging tools after run.

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

Database File:0512339945_anadarko_como 34n-14hz_12-29-14_mit_rbl.db

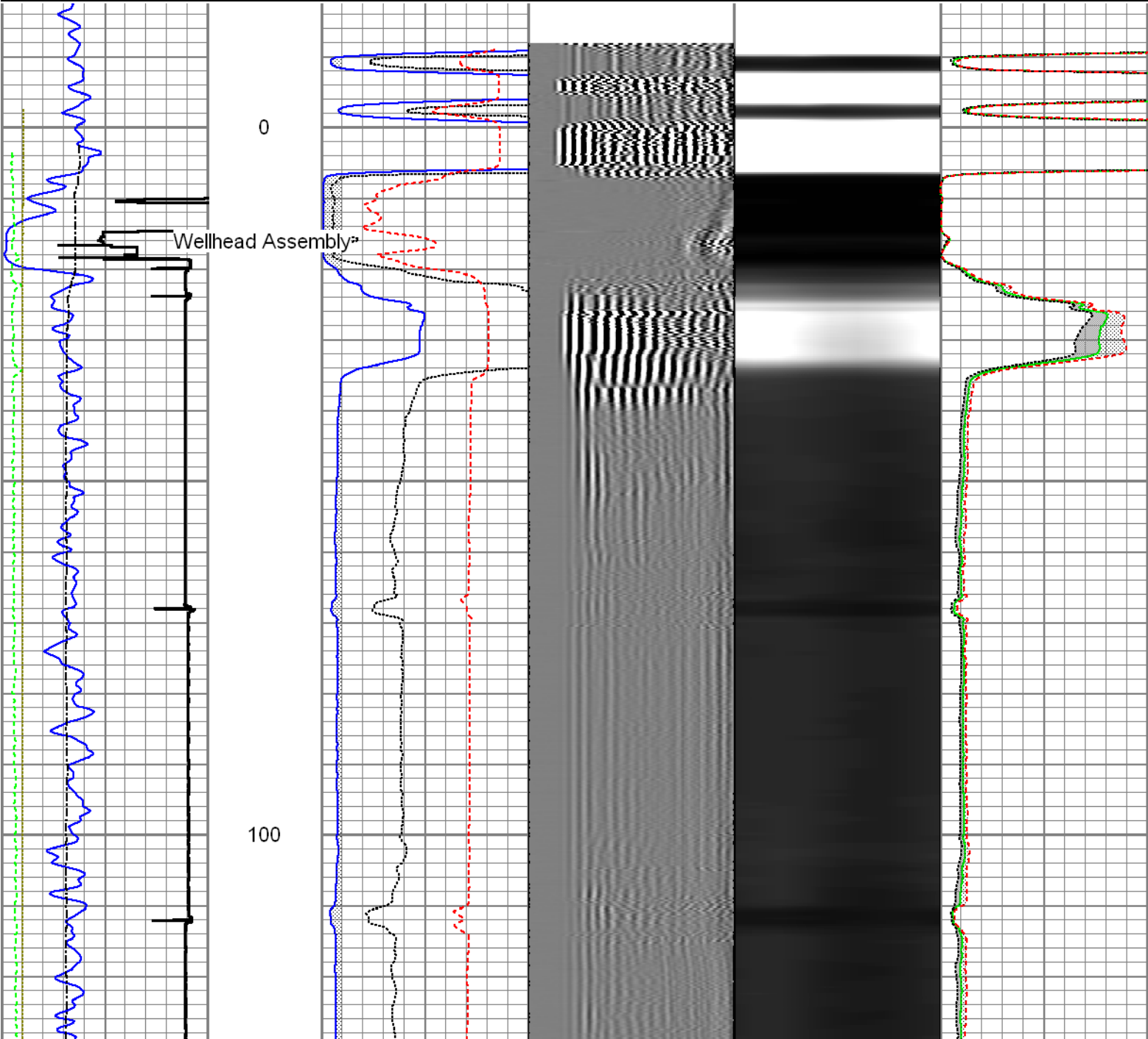
Dataset Pathname:merge1

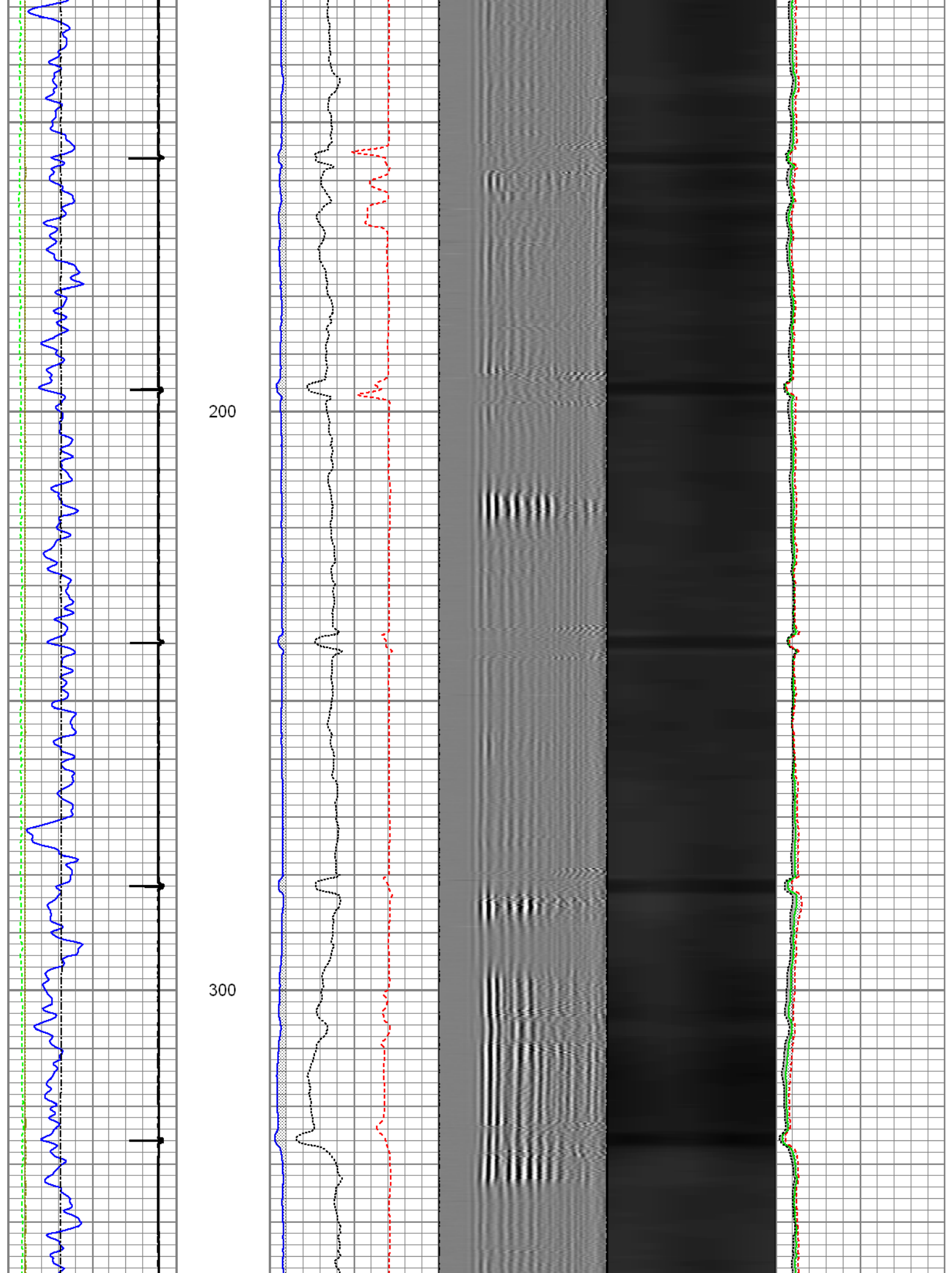
Presentation Format:rbt4_mit

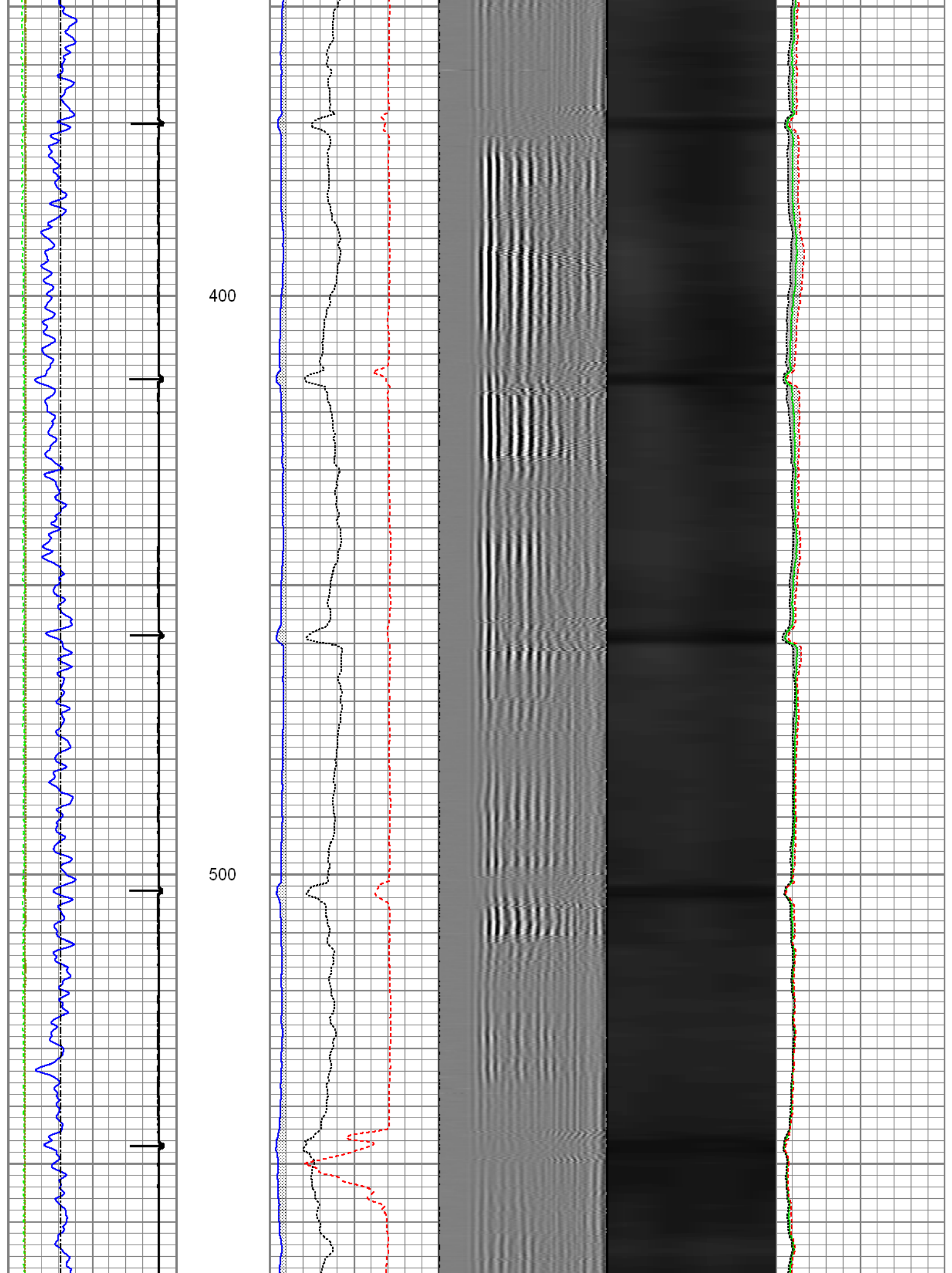
Dataset Creation:Thu Jan 01 08:12:57 2015

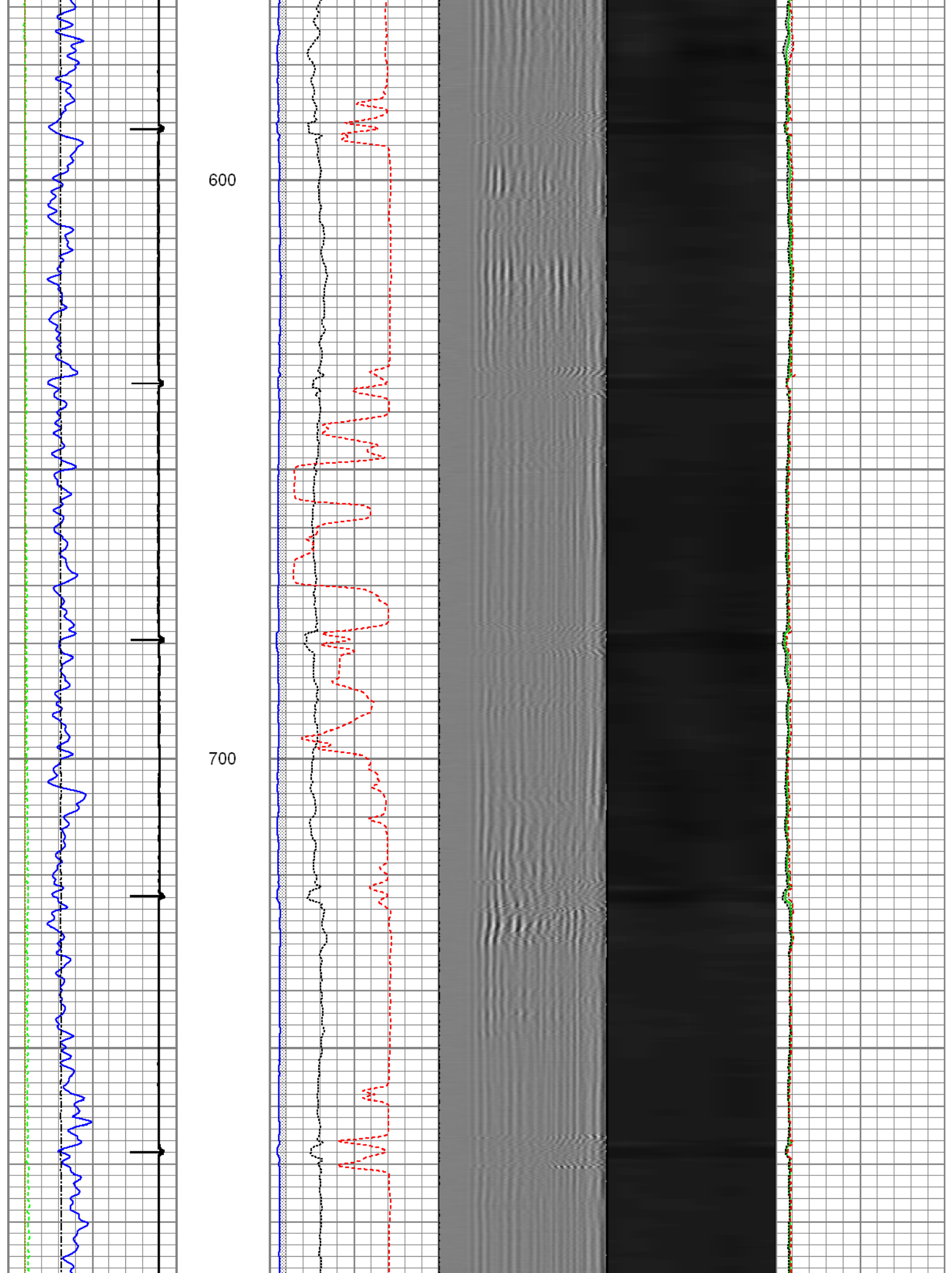
Charted by:Depth in Feet scaled 1:240

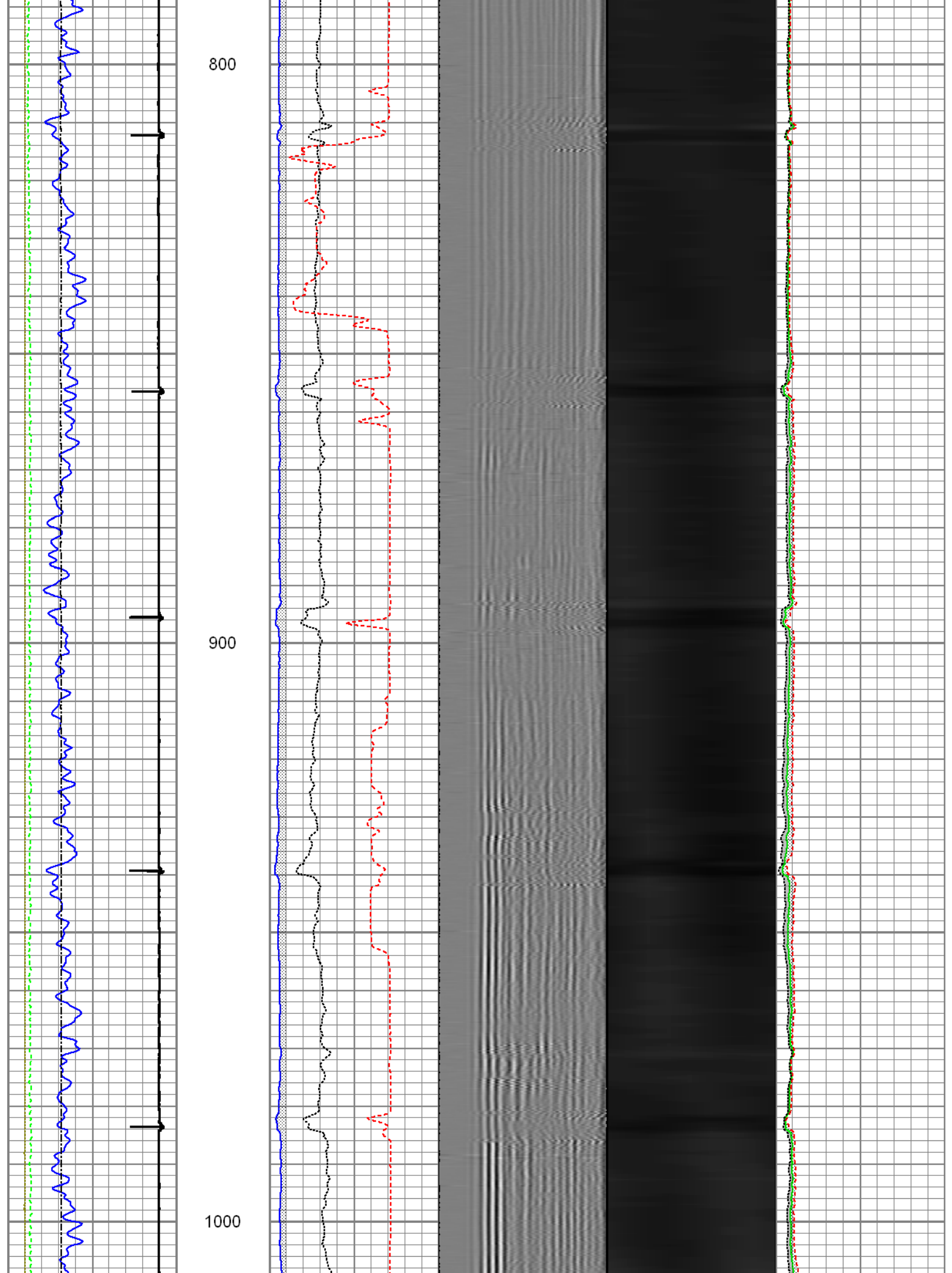
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

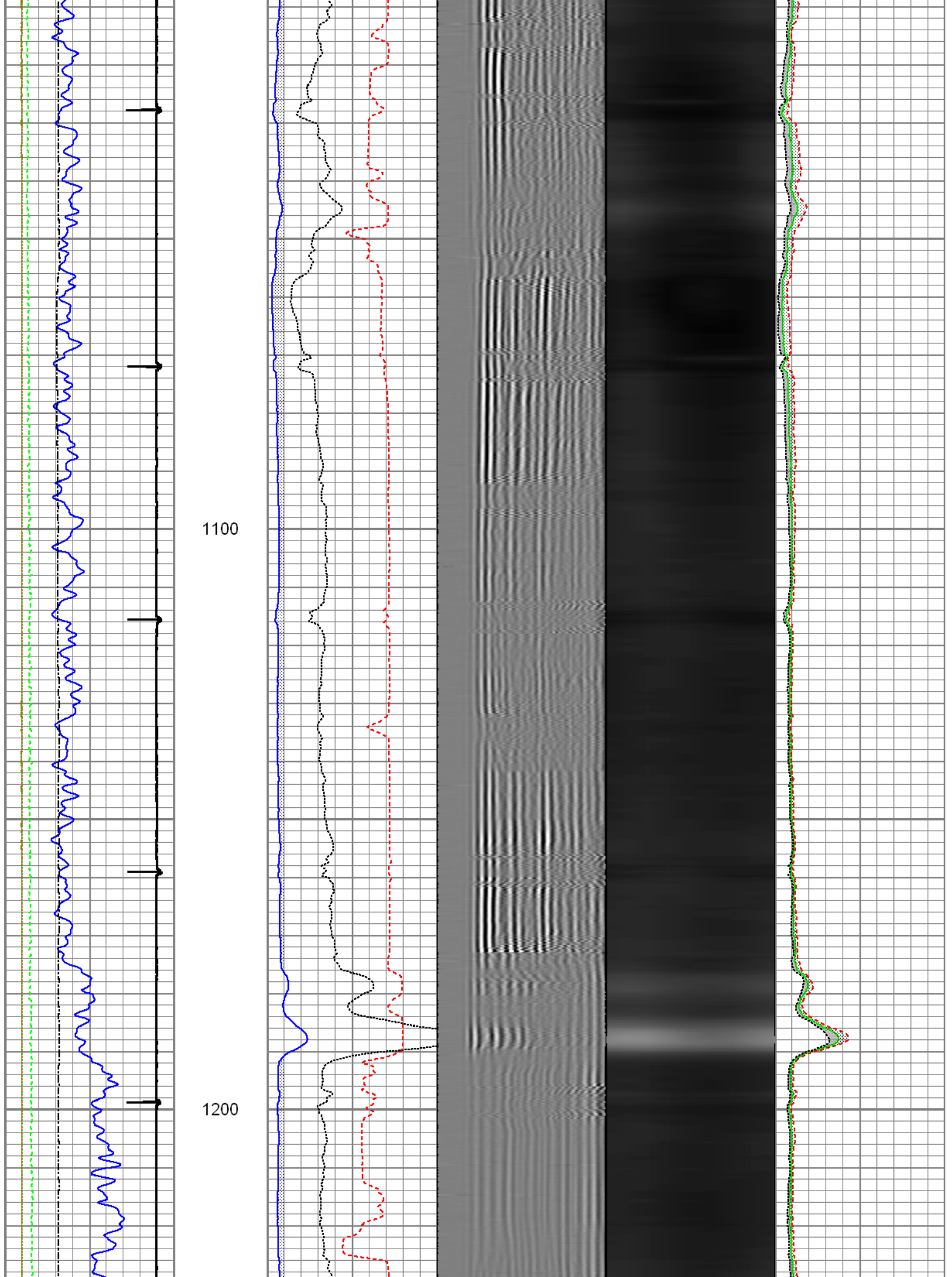


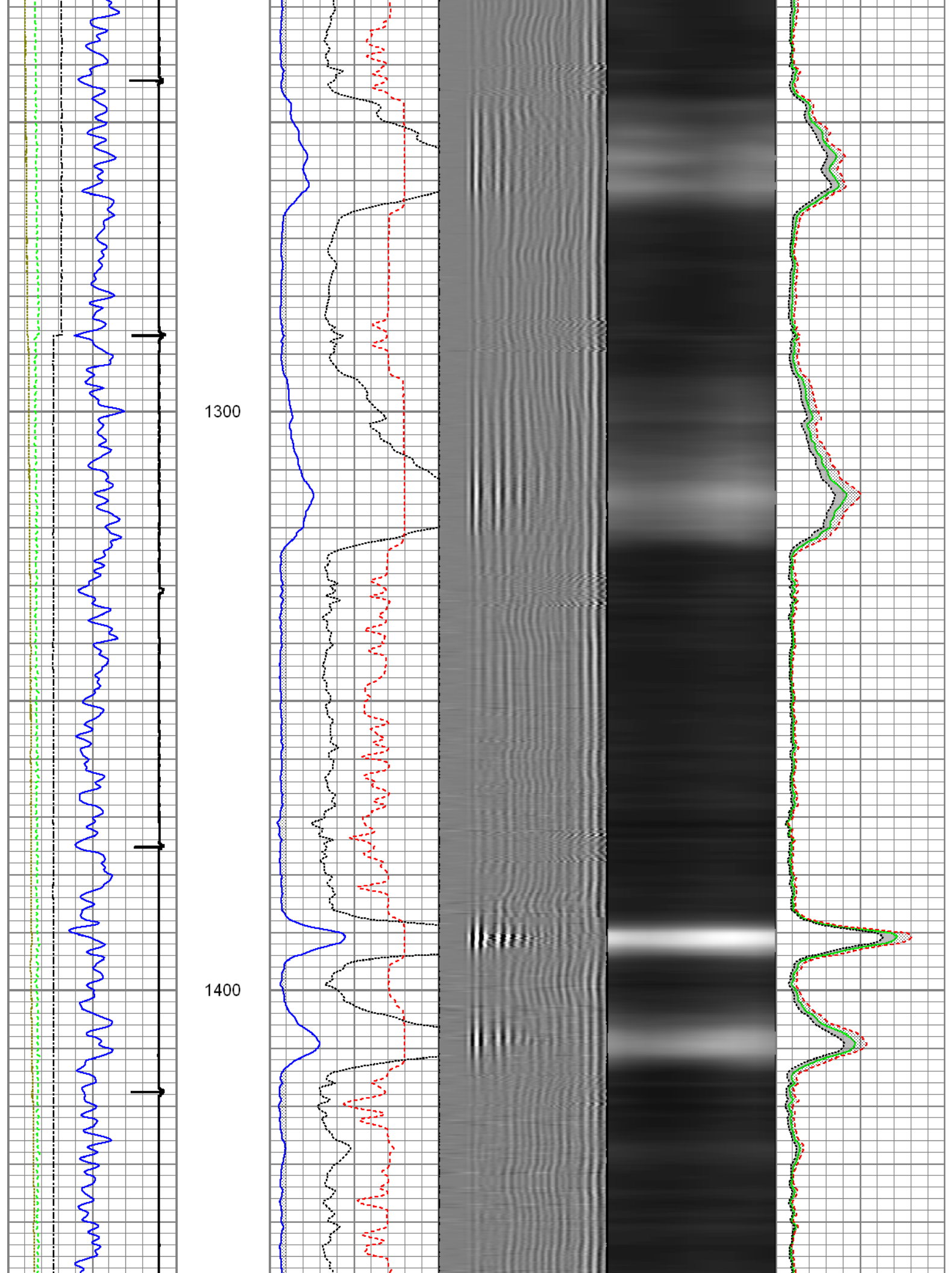


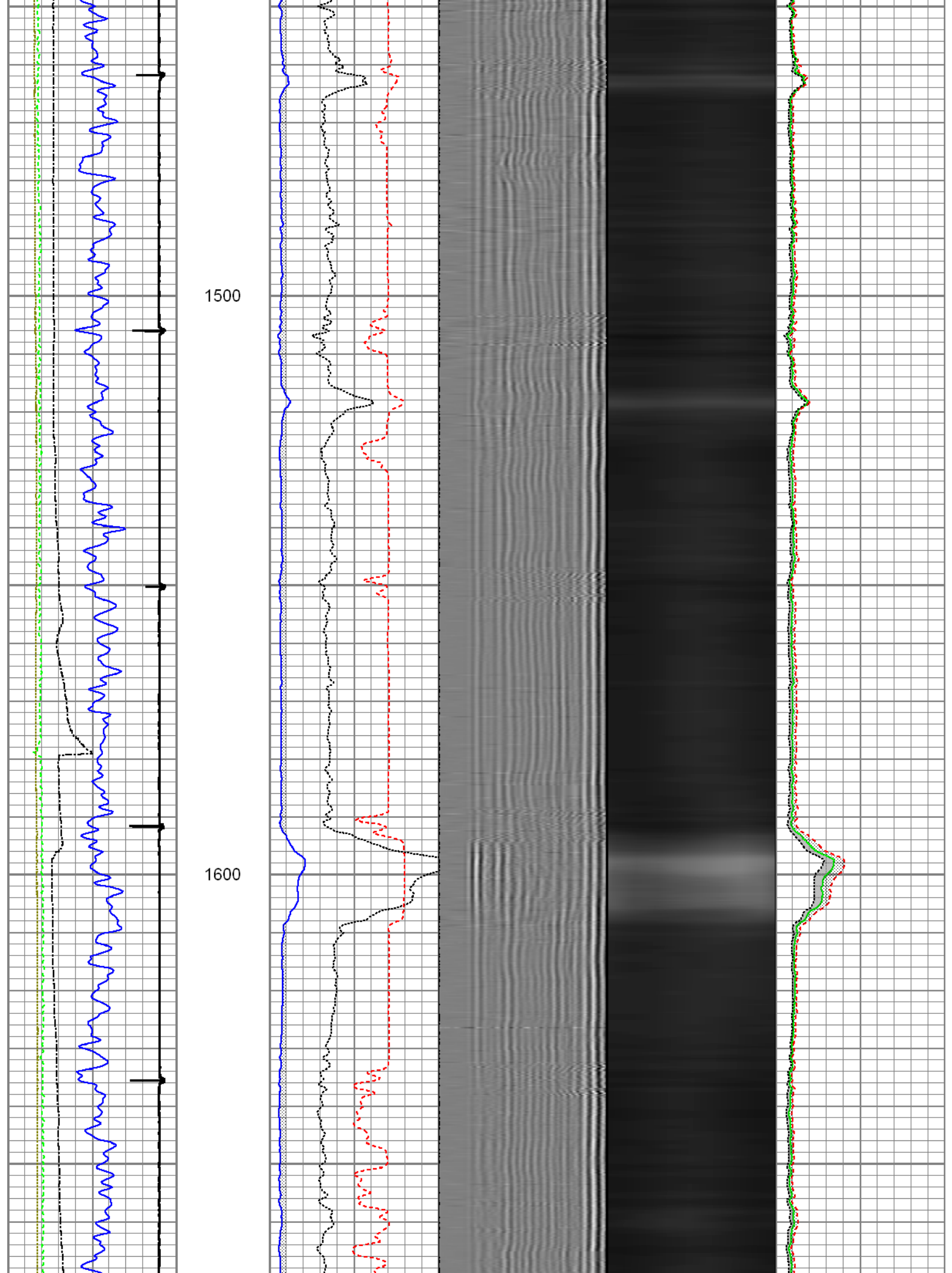


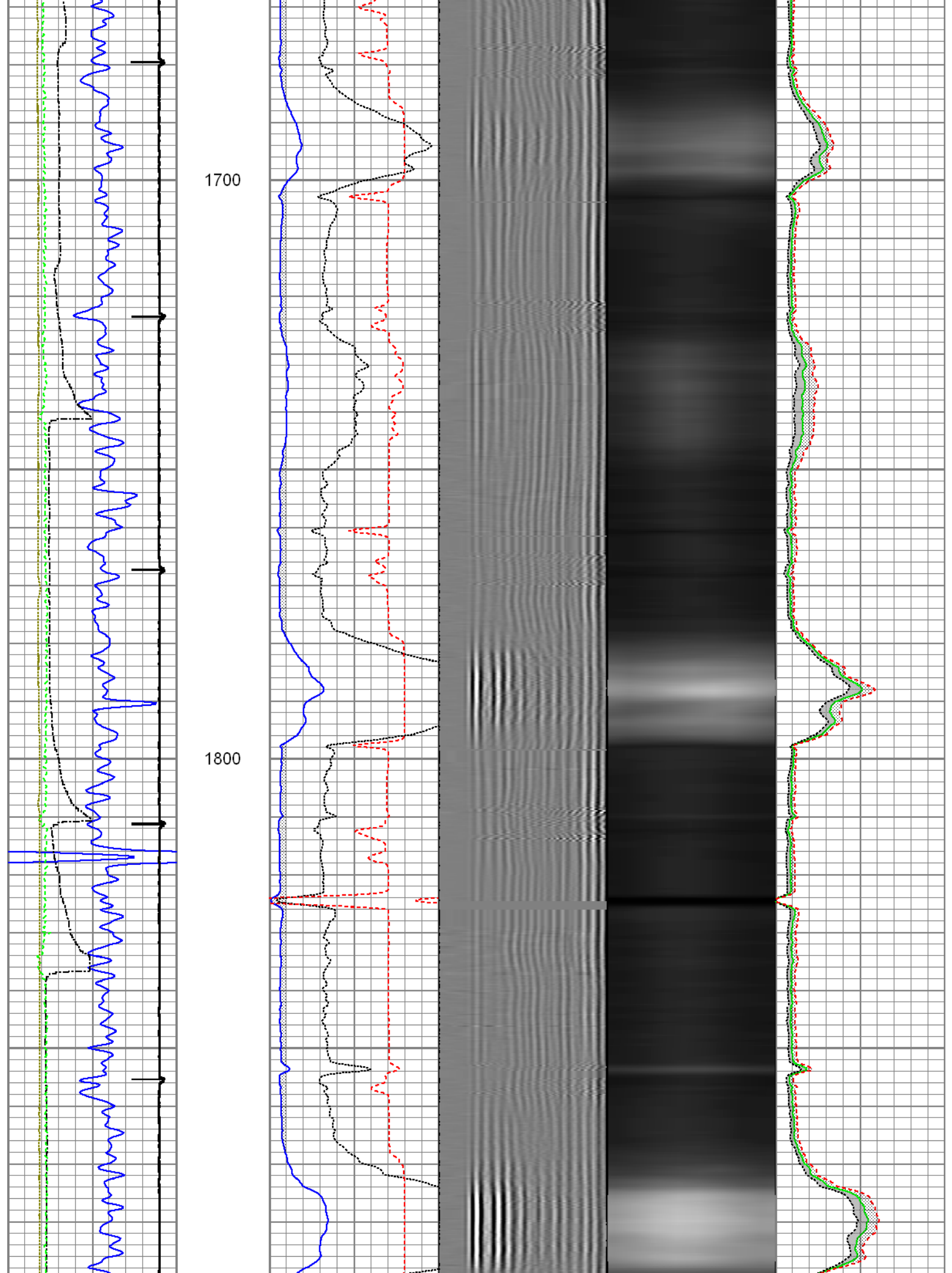


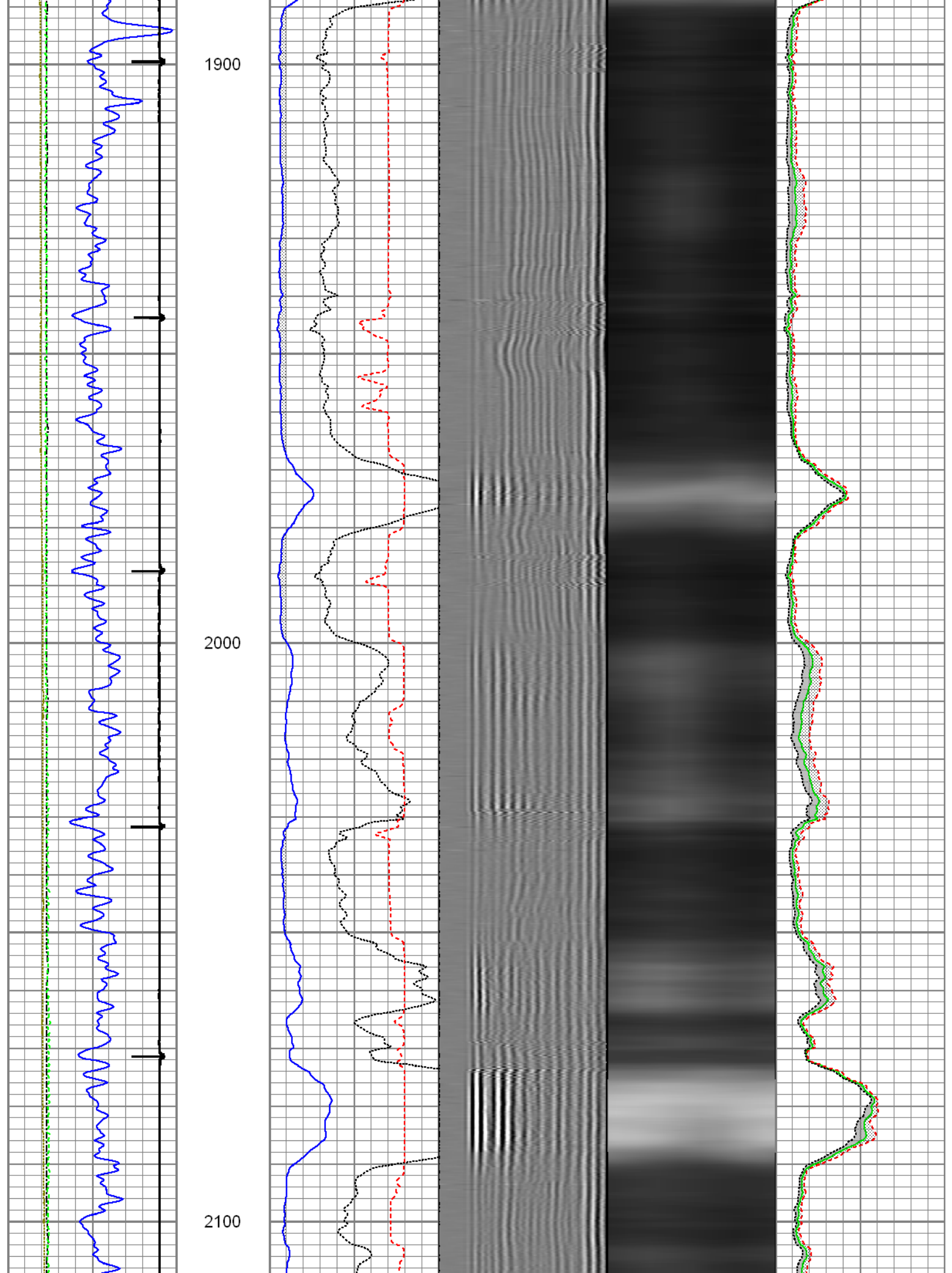






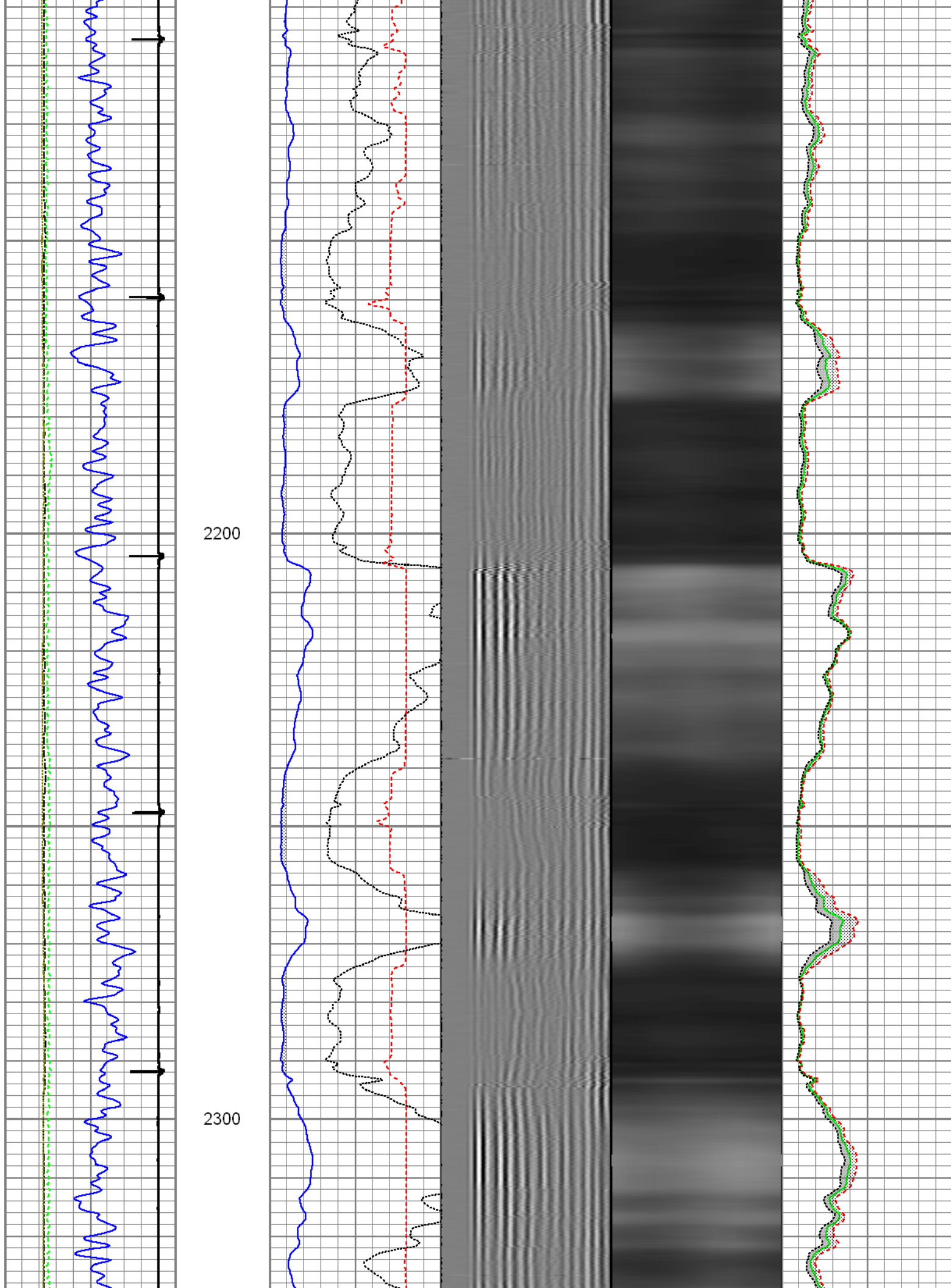






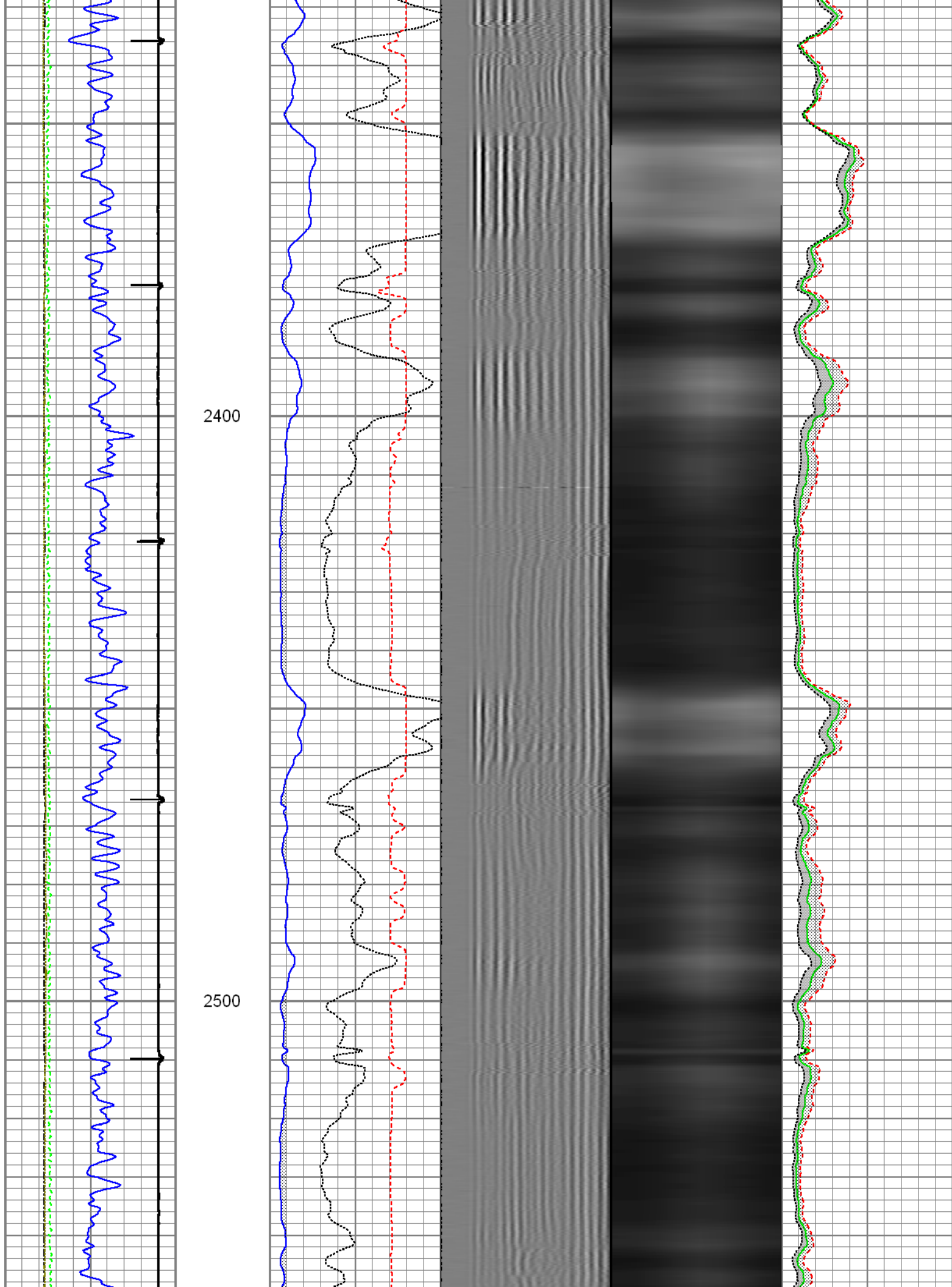
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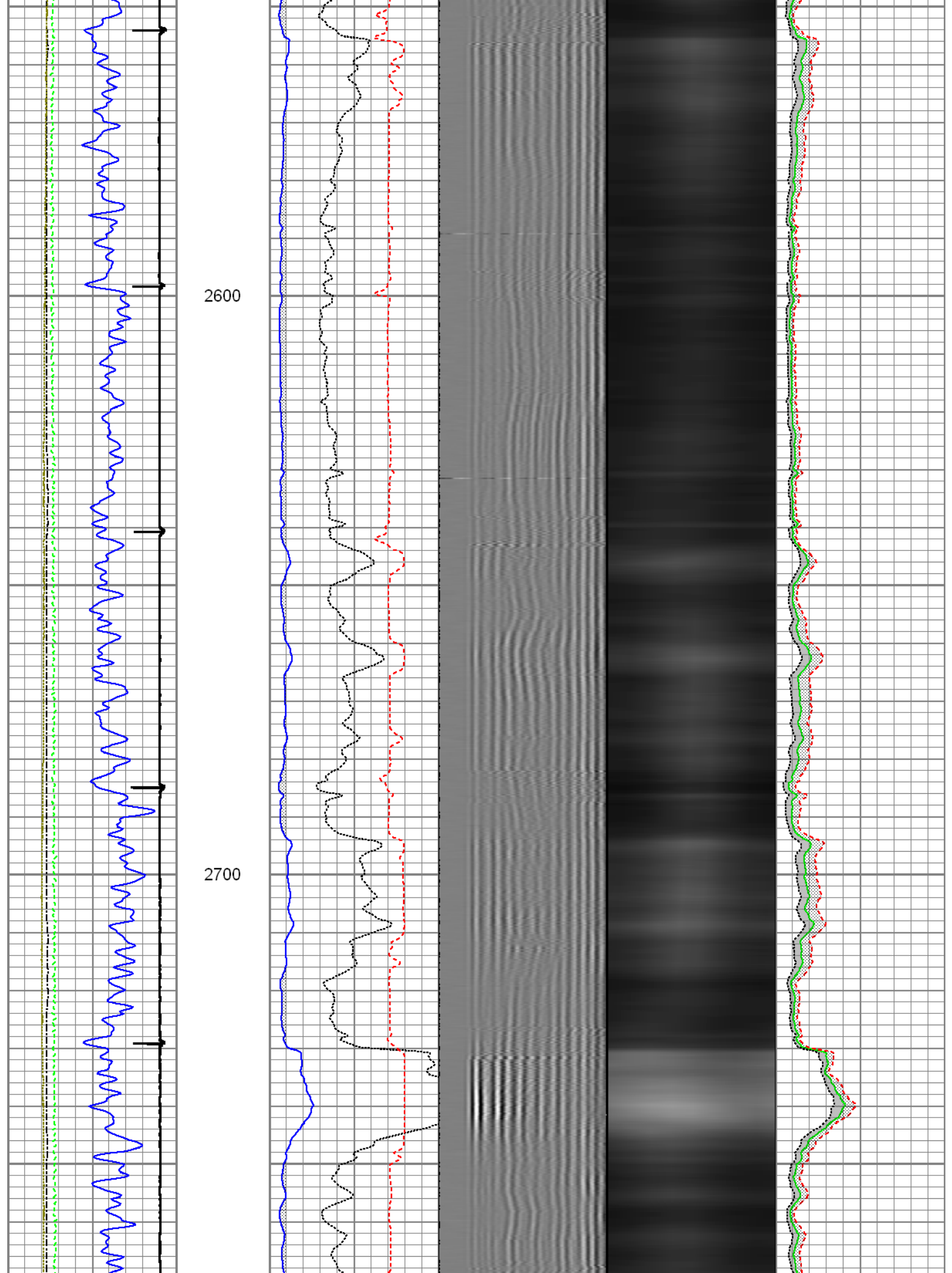
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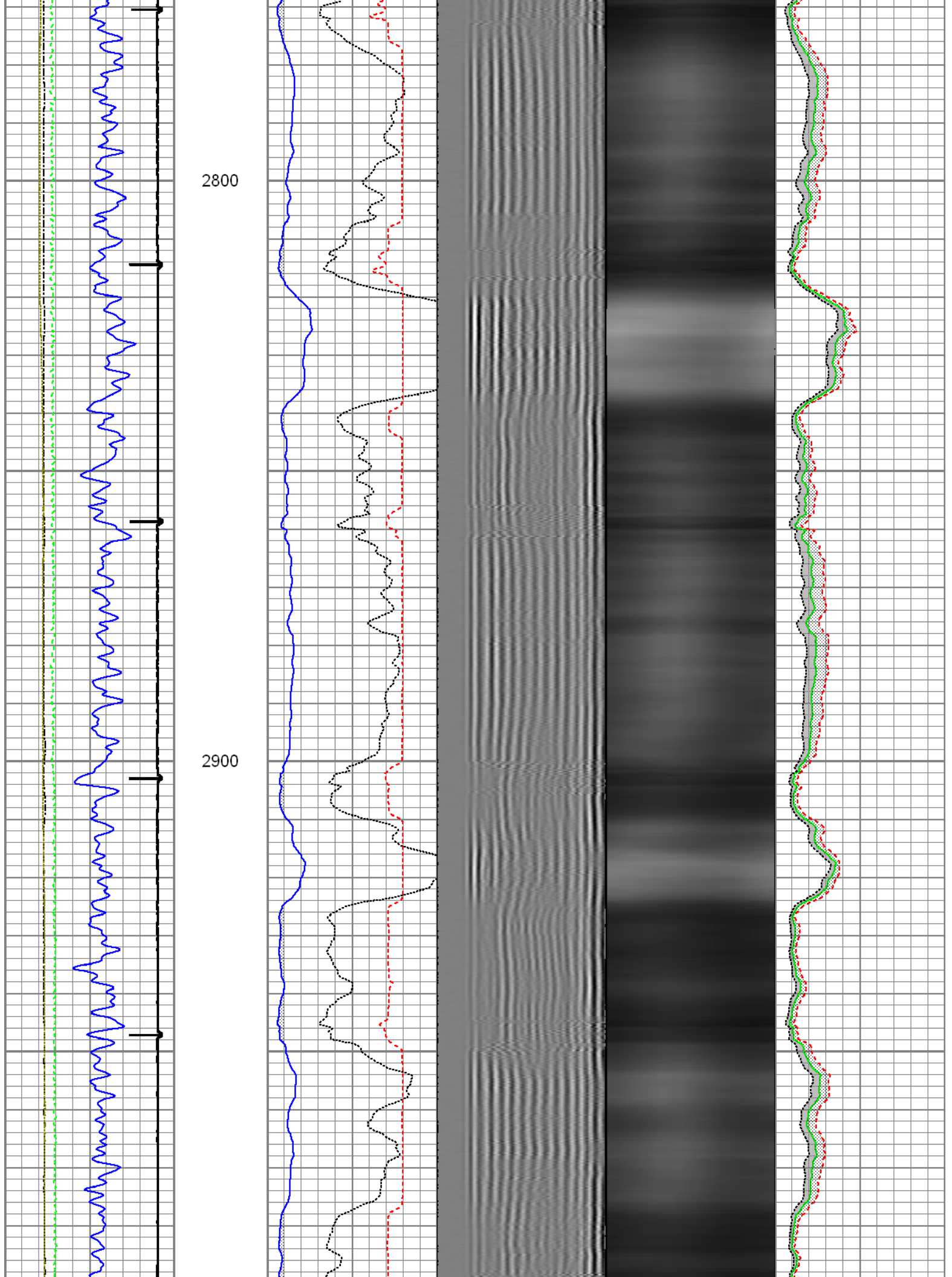


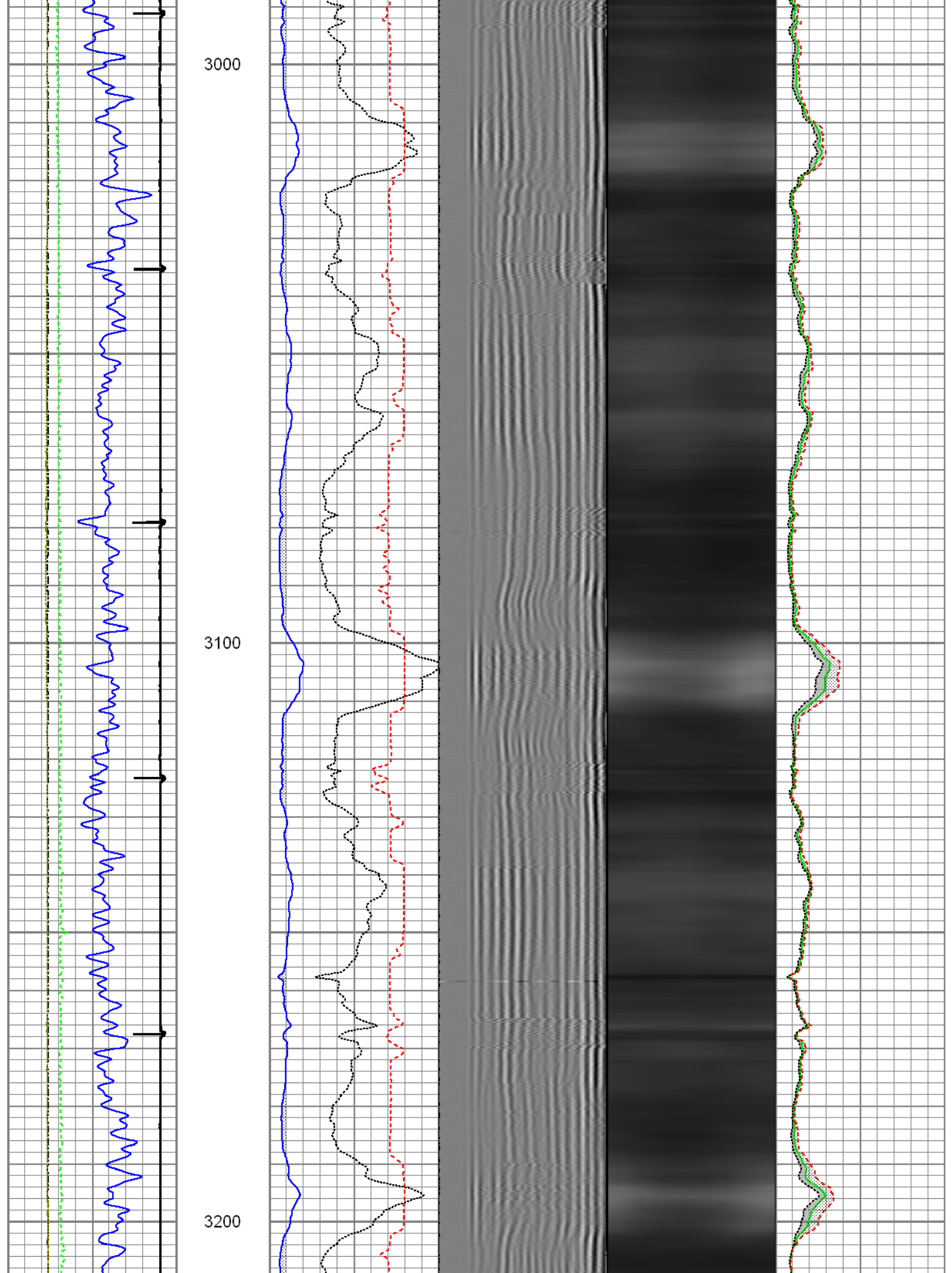
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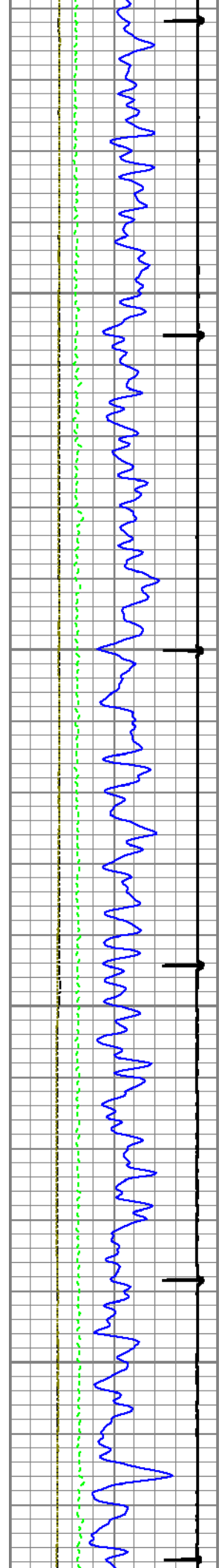
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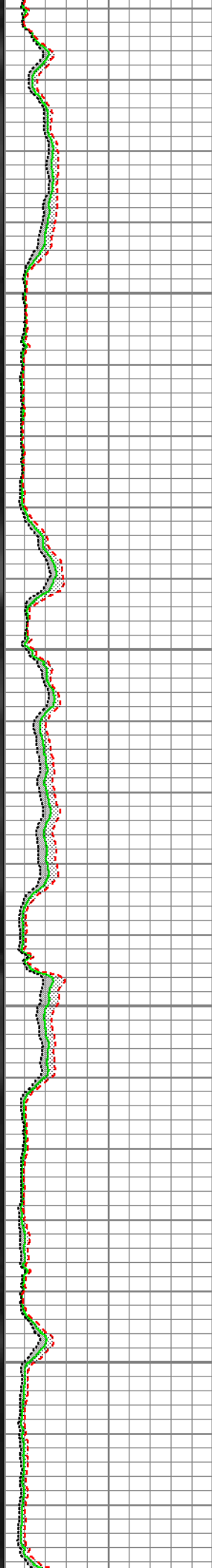
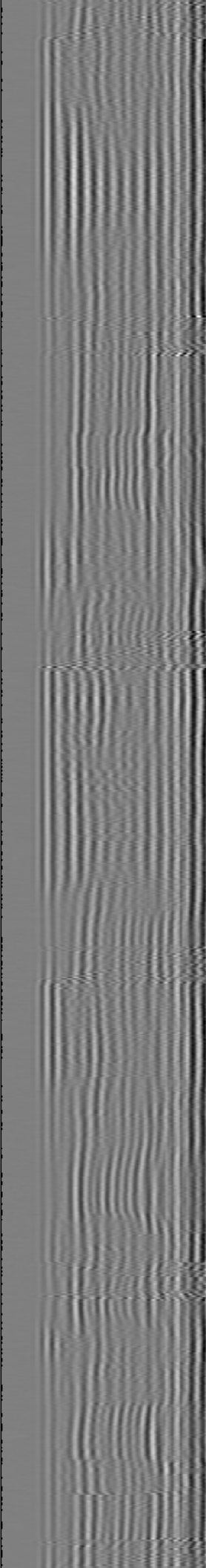
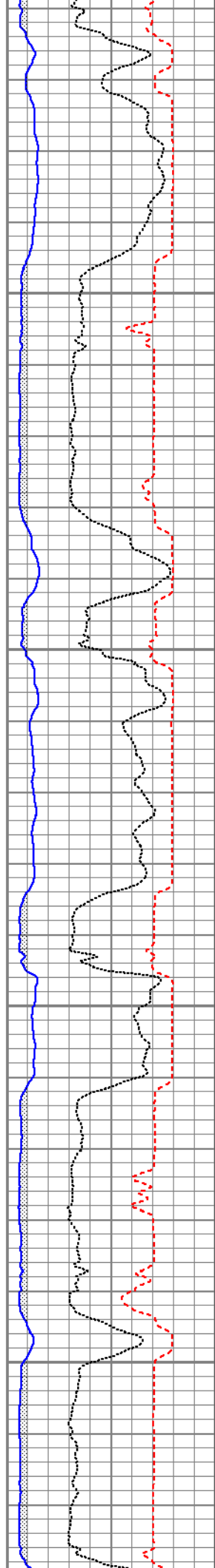


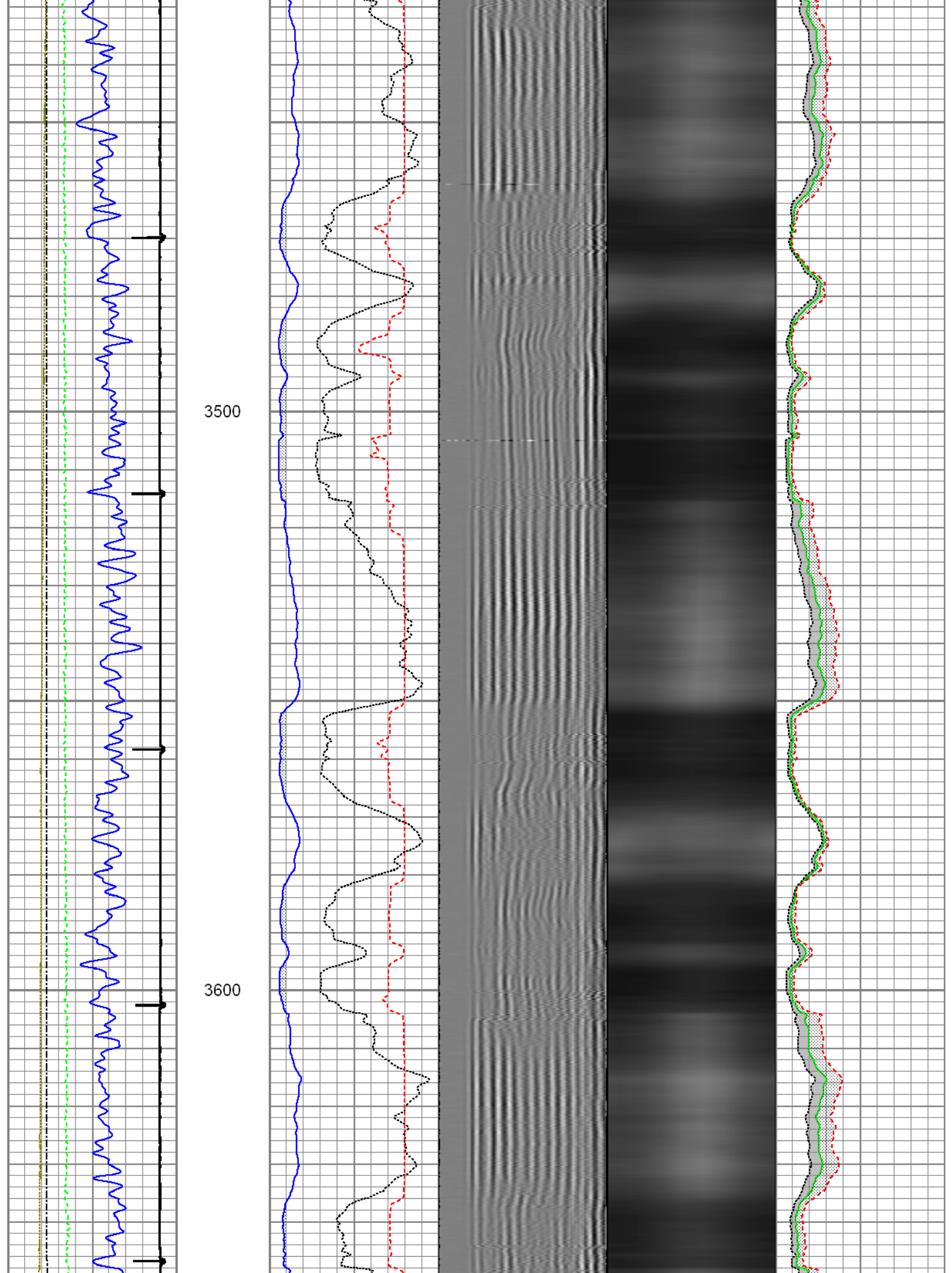




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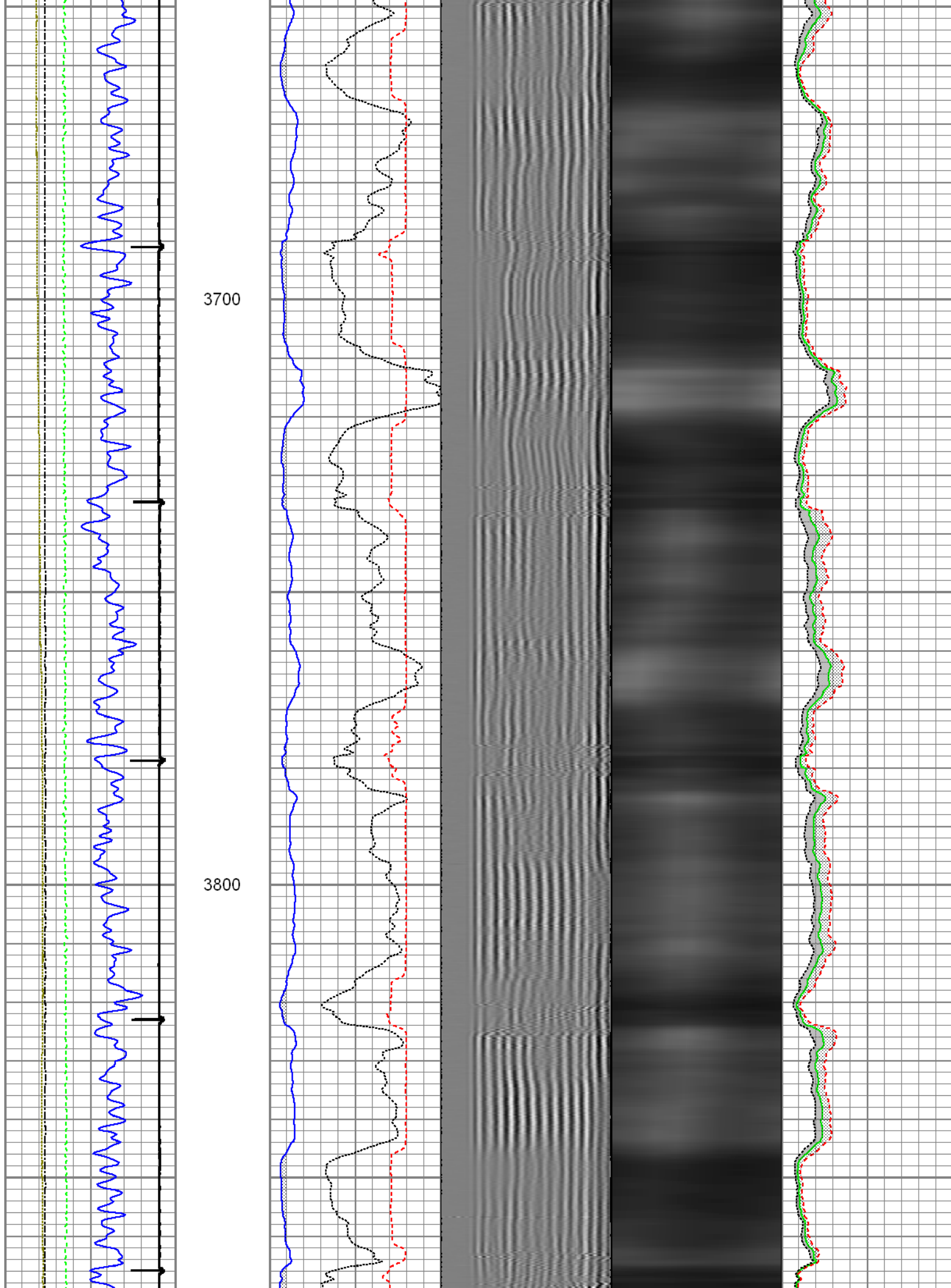
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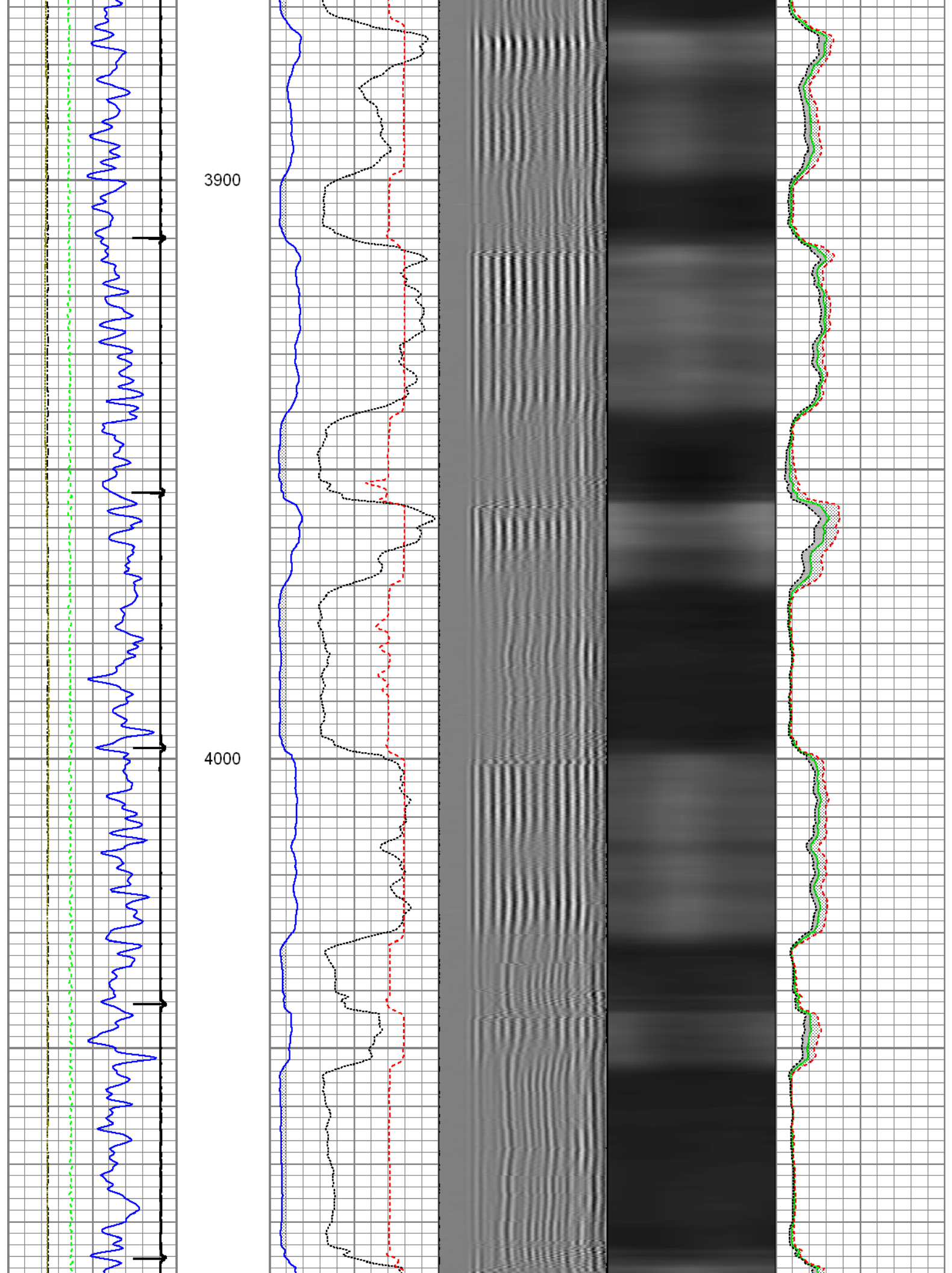




3700

3800

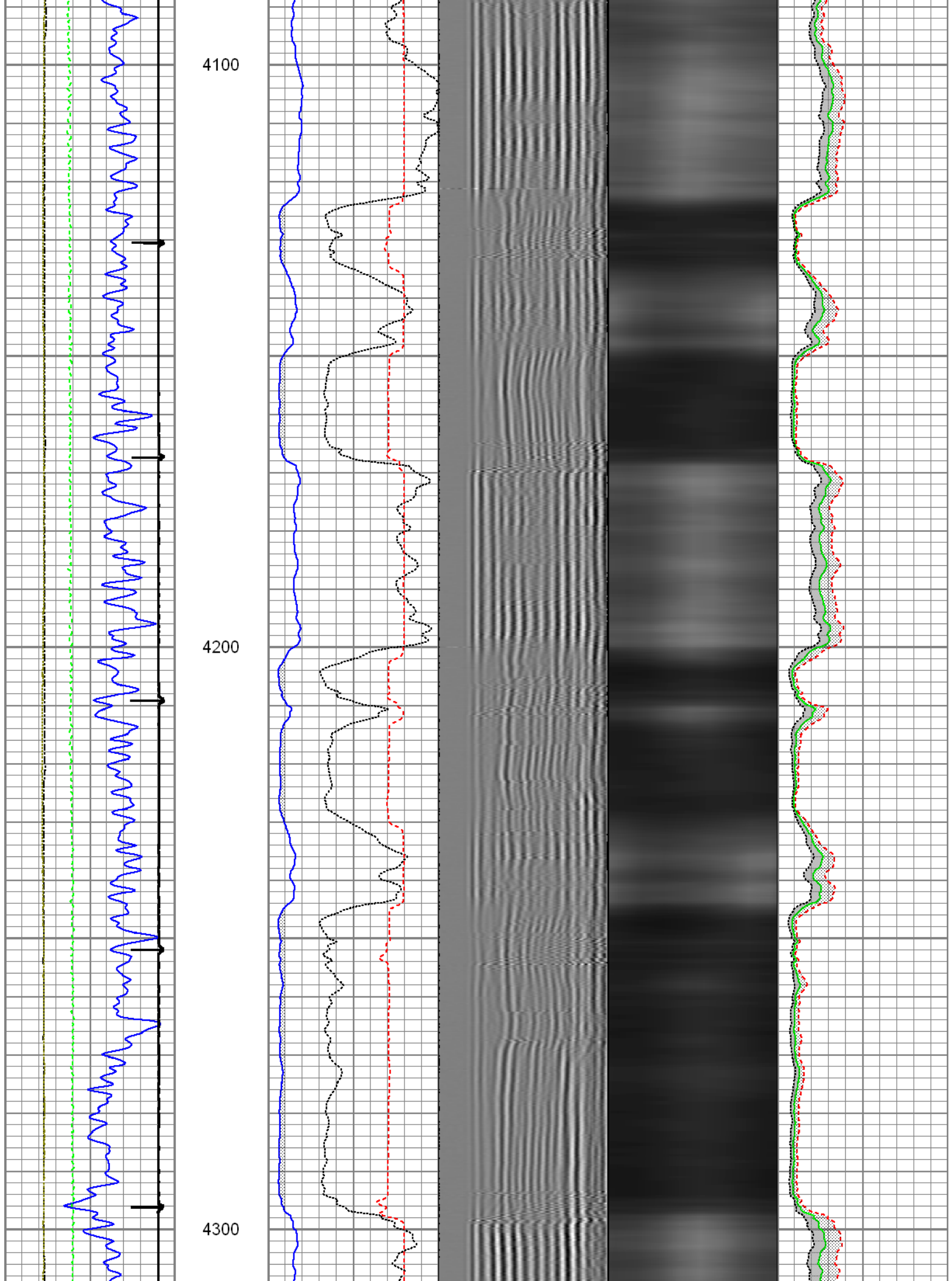


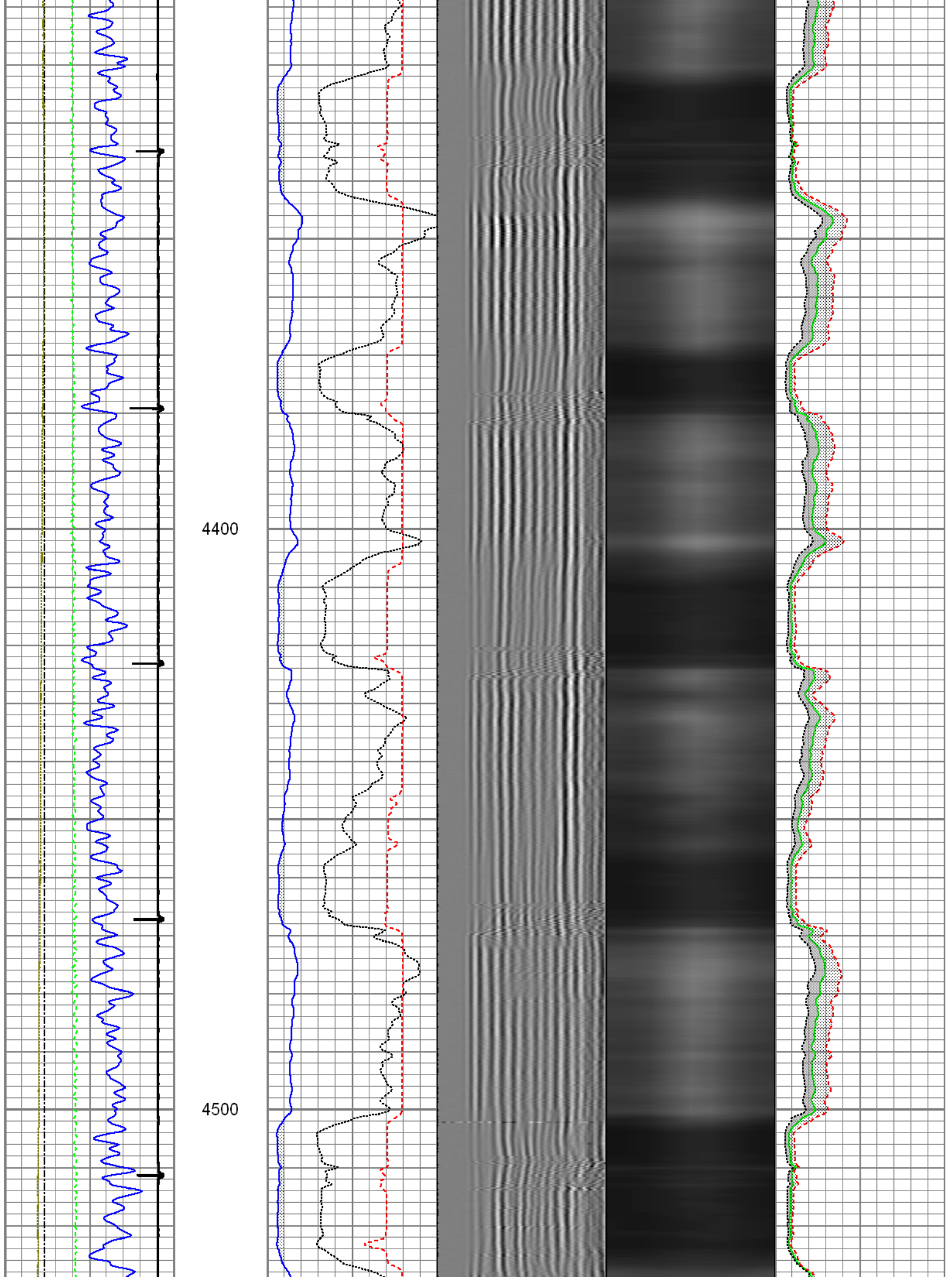


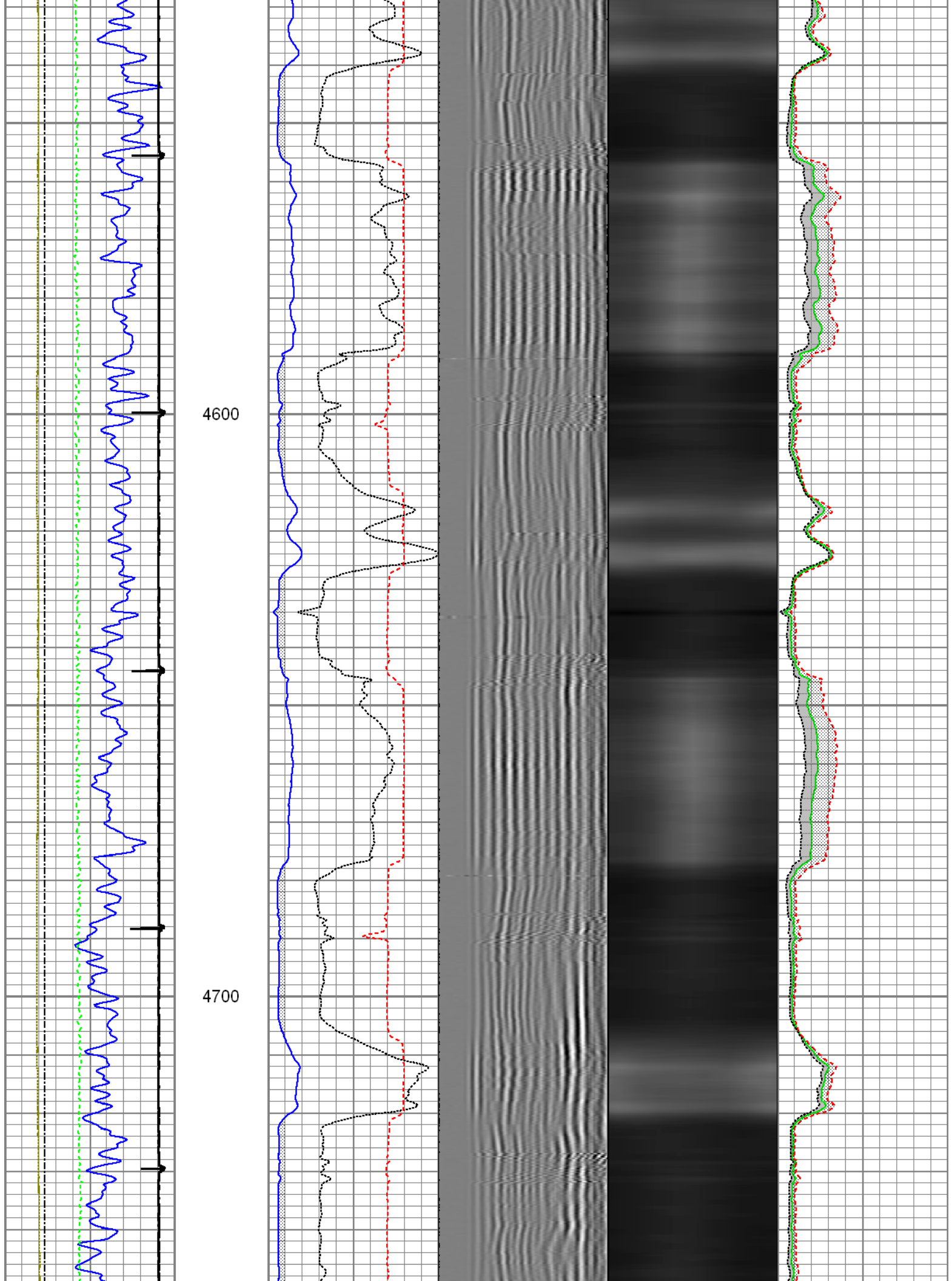
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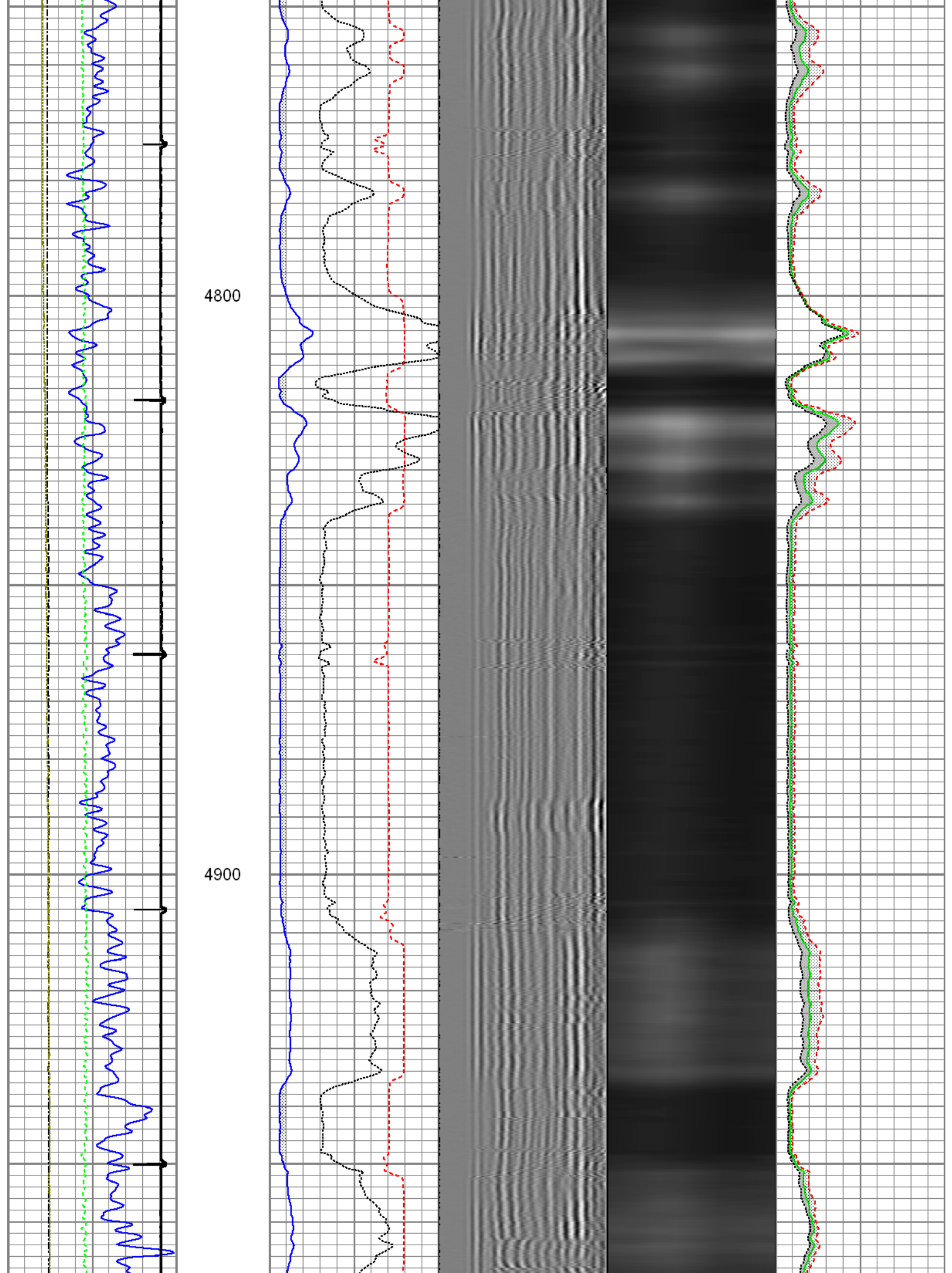
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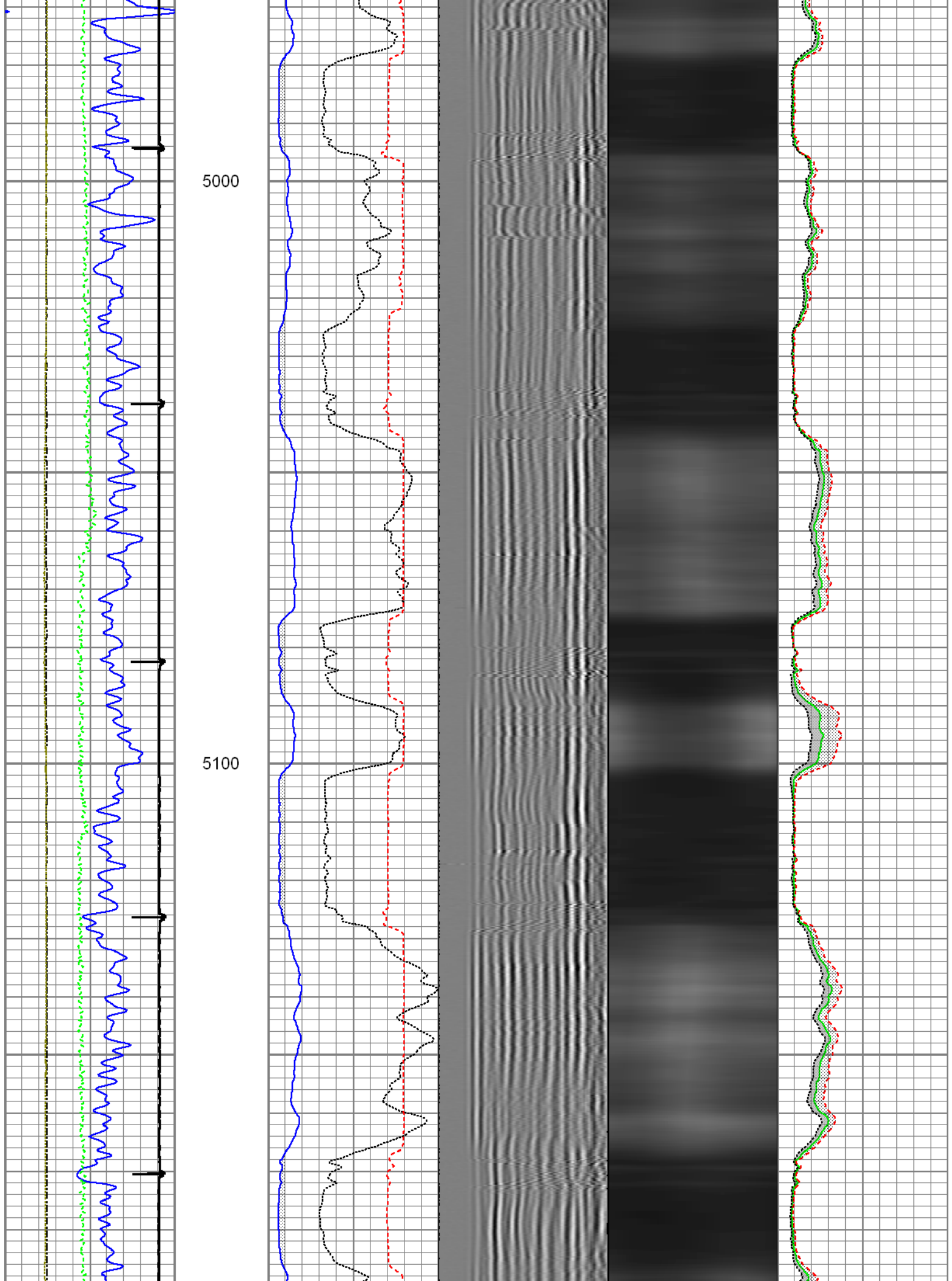
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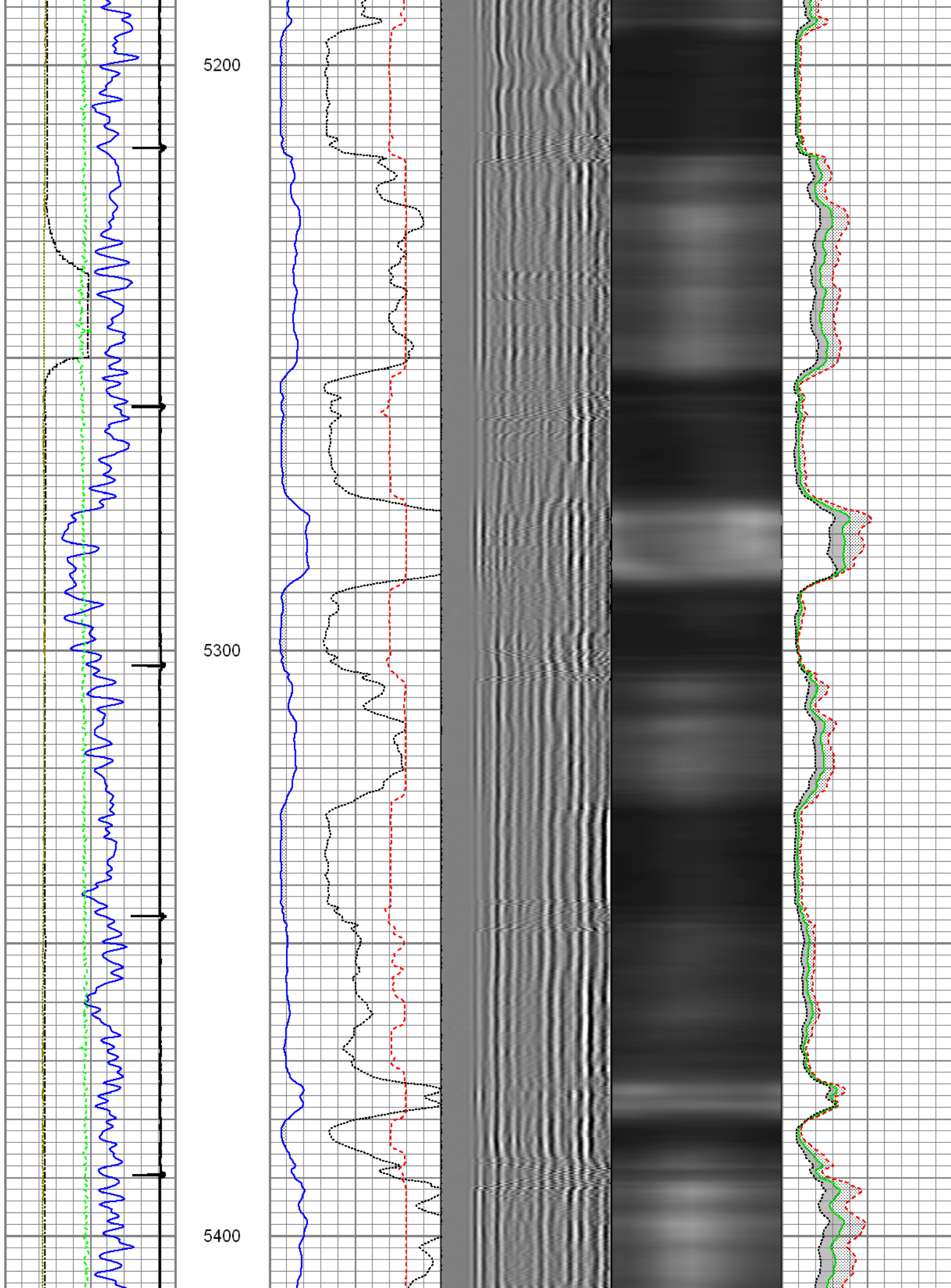


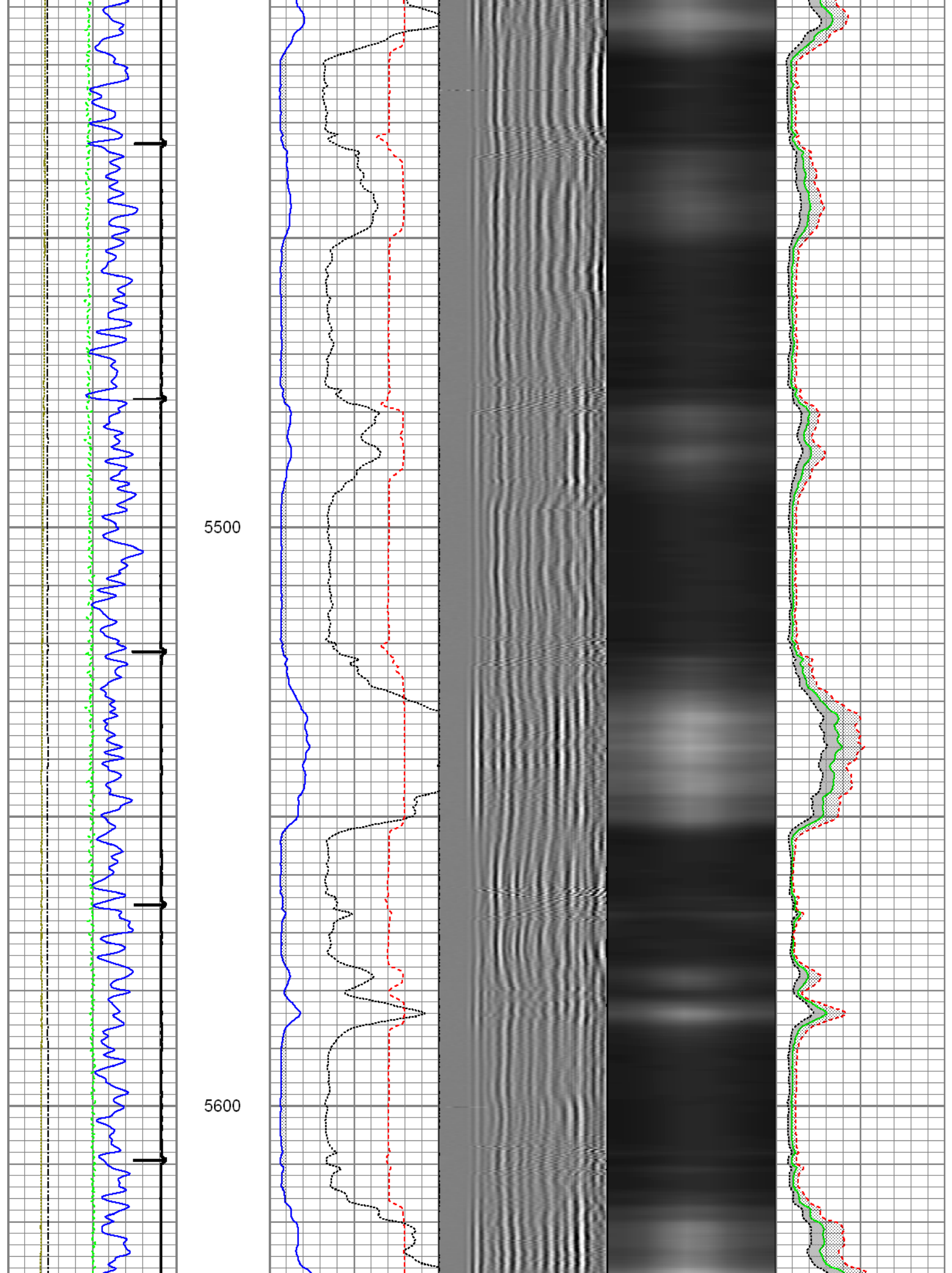


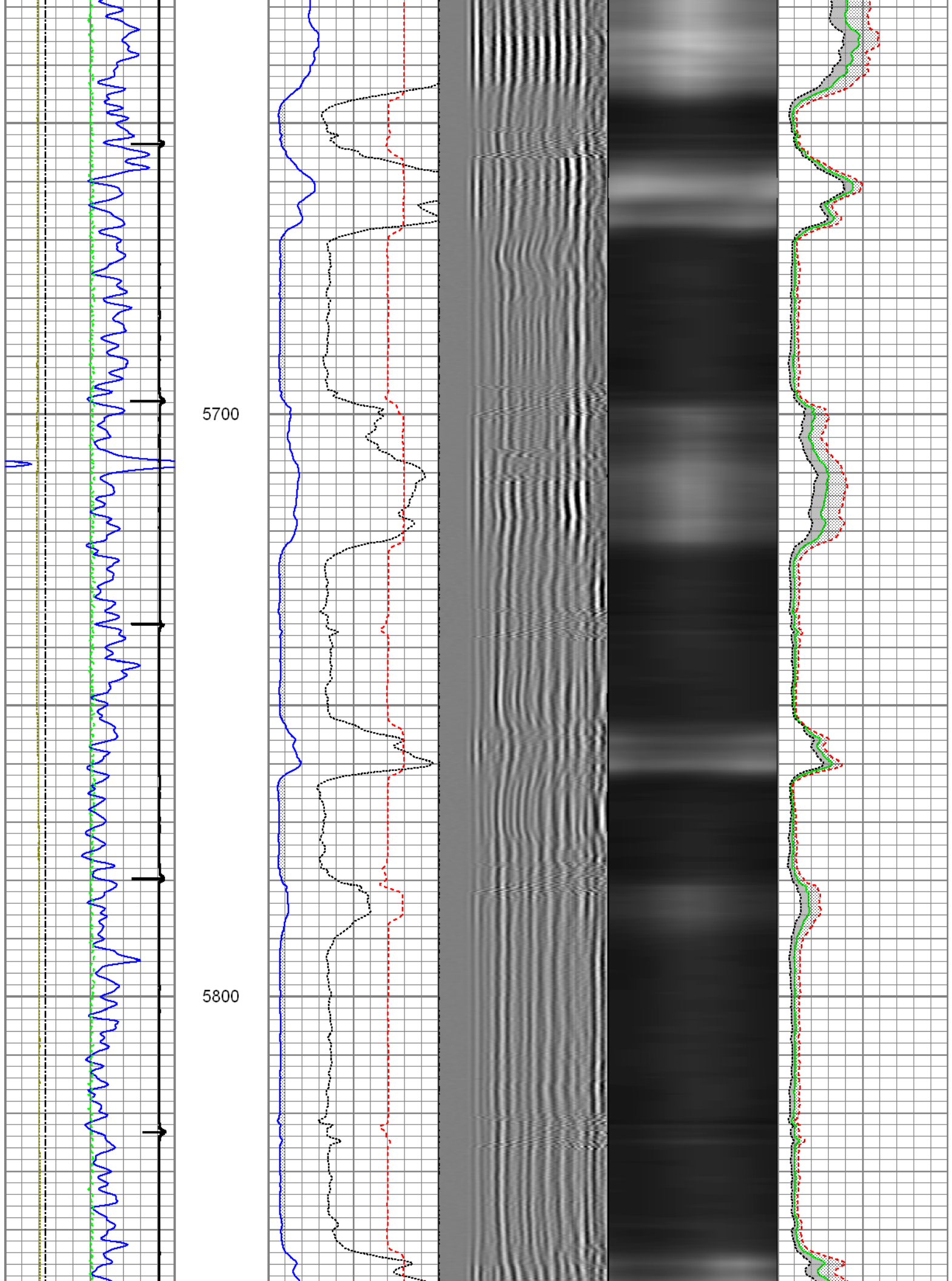
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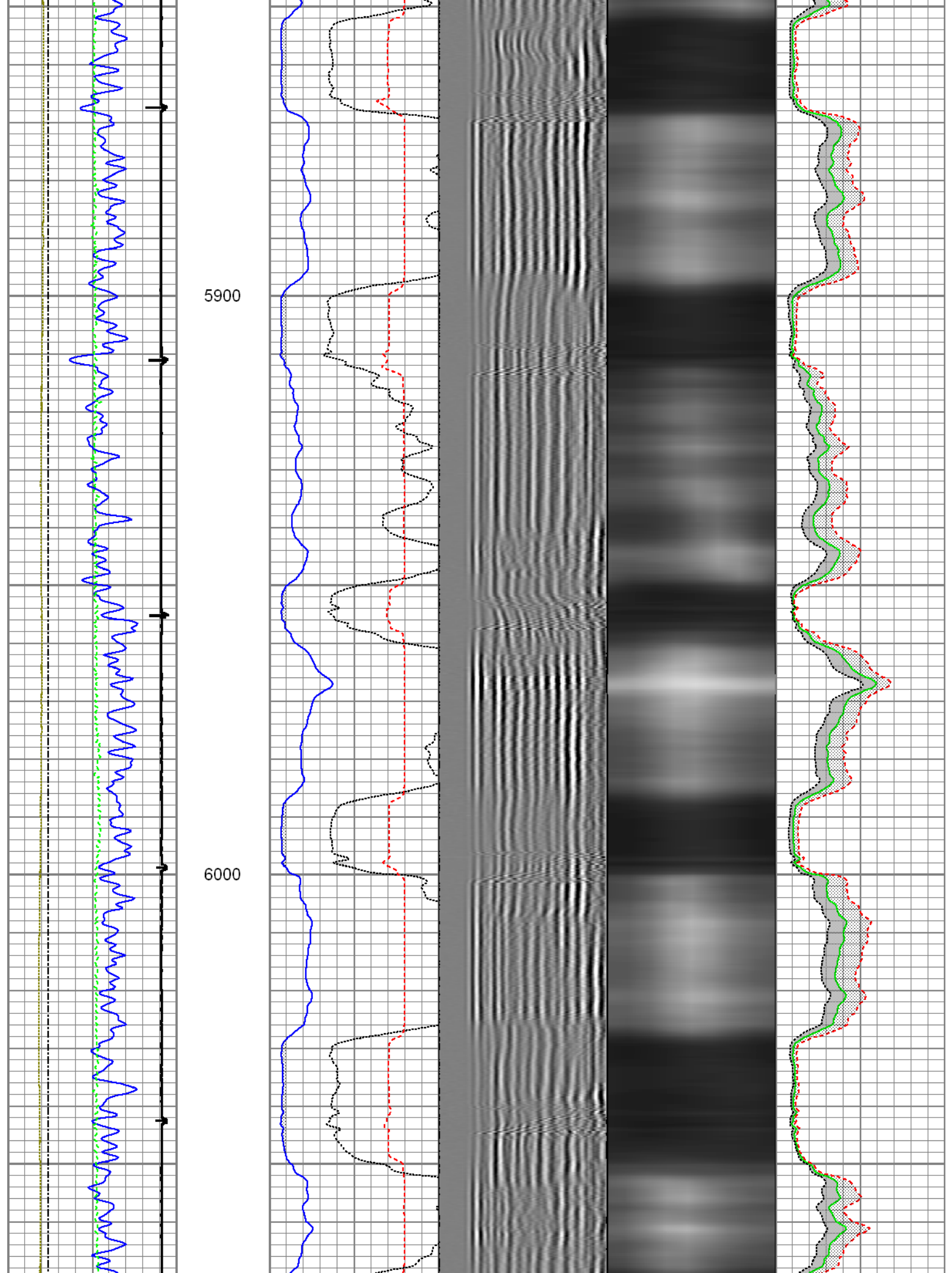
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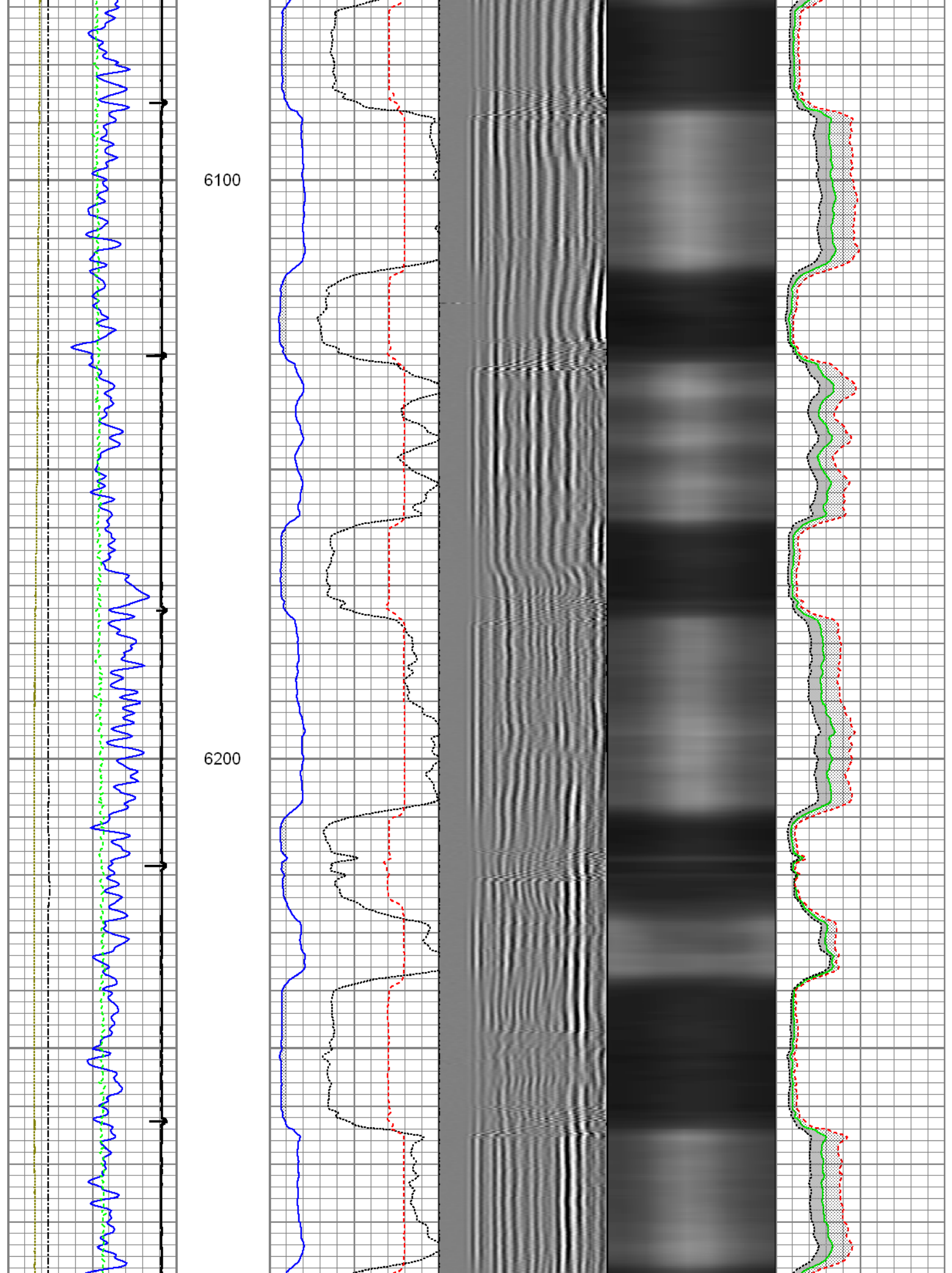
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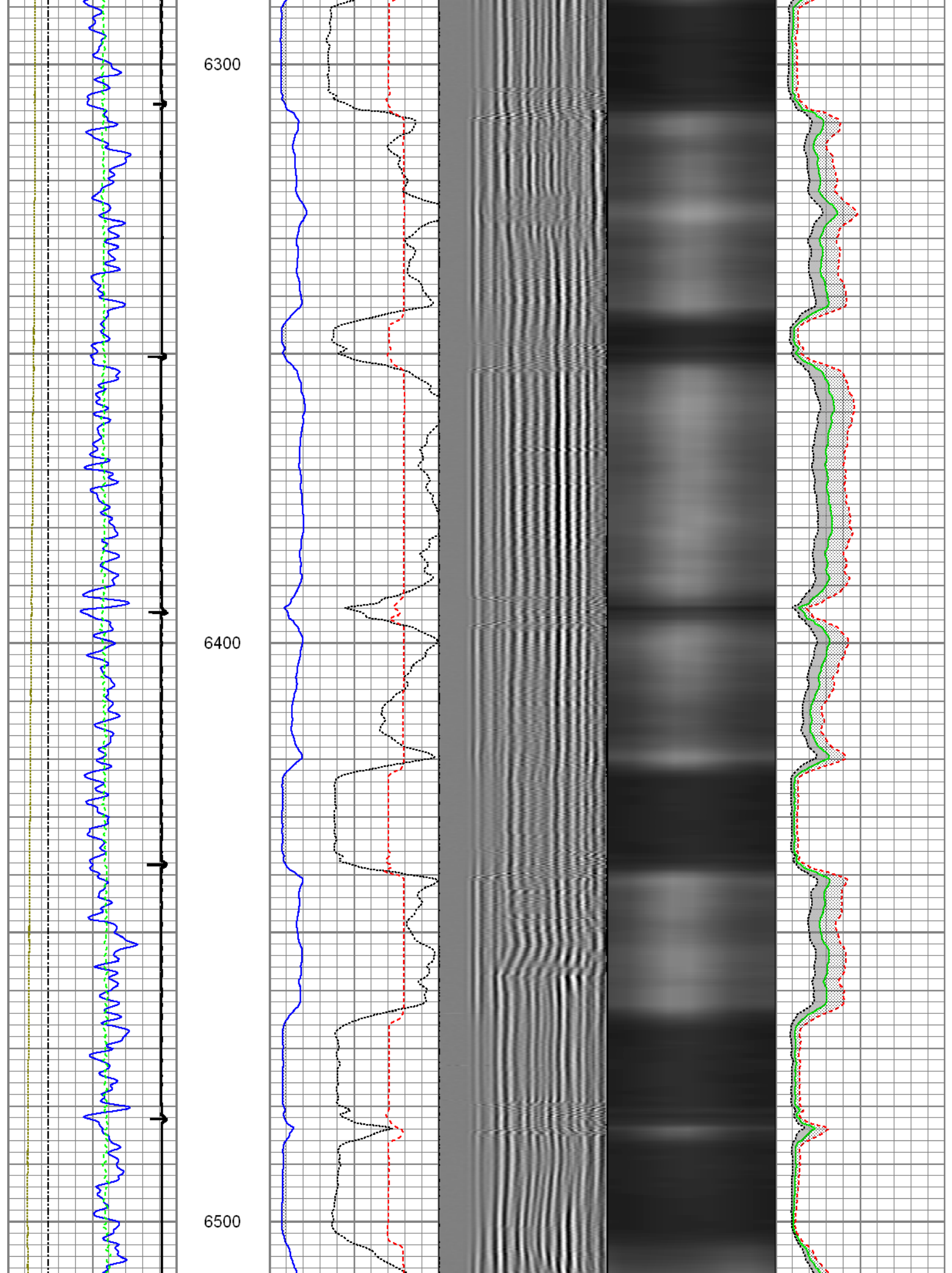


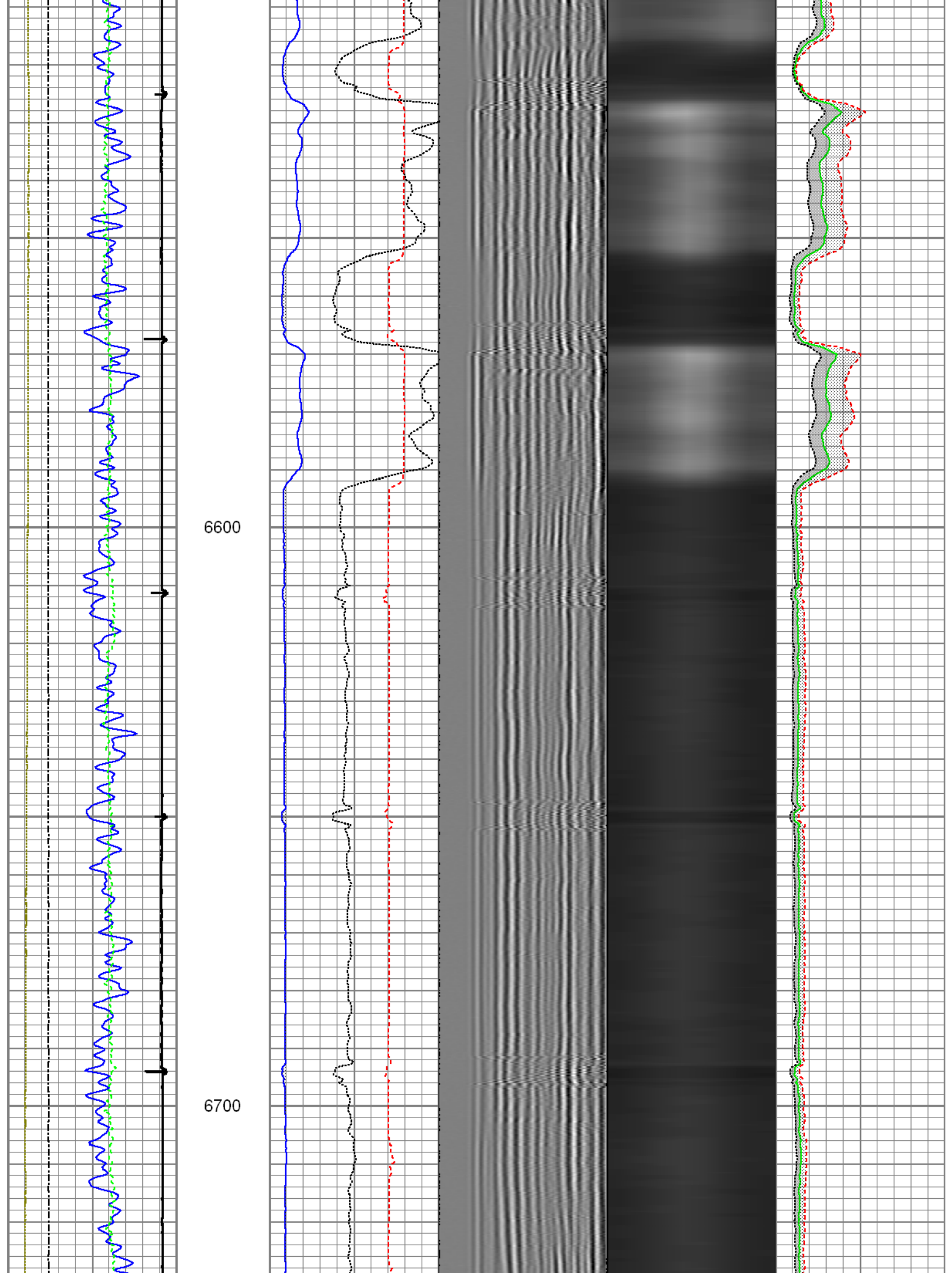


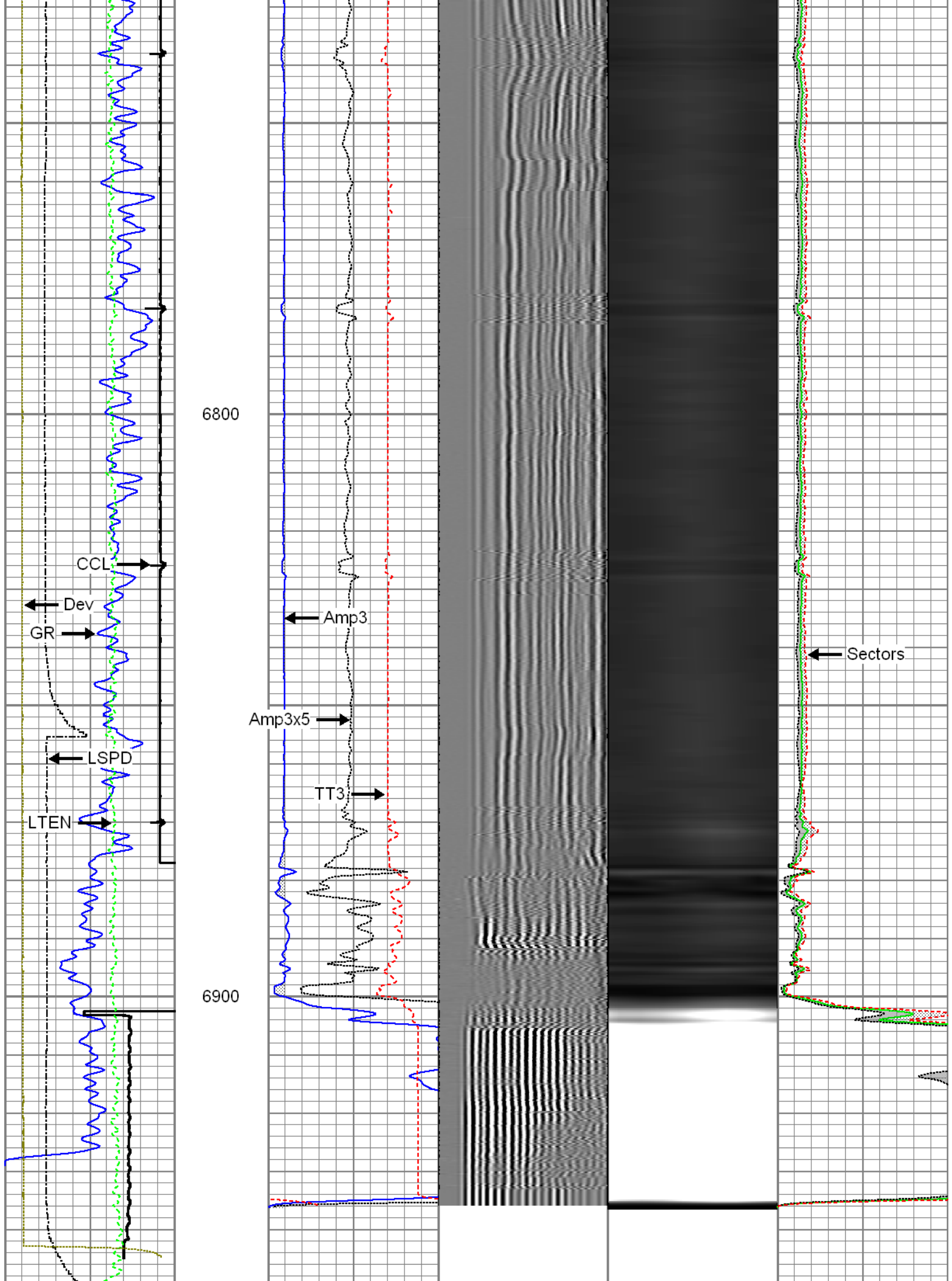










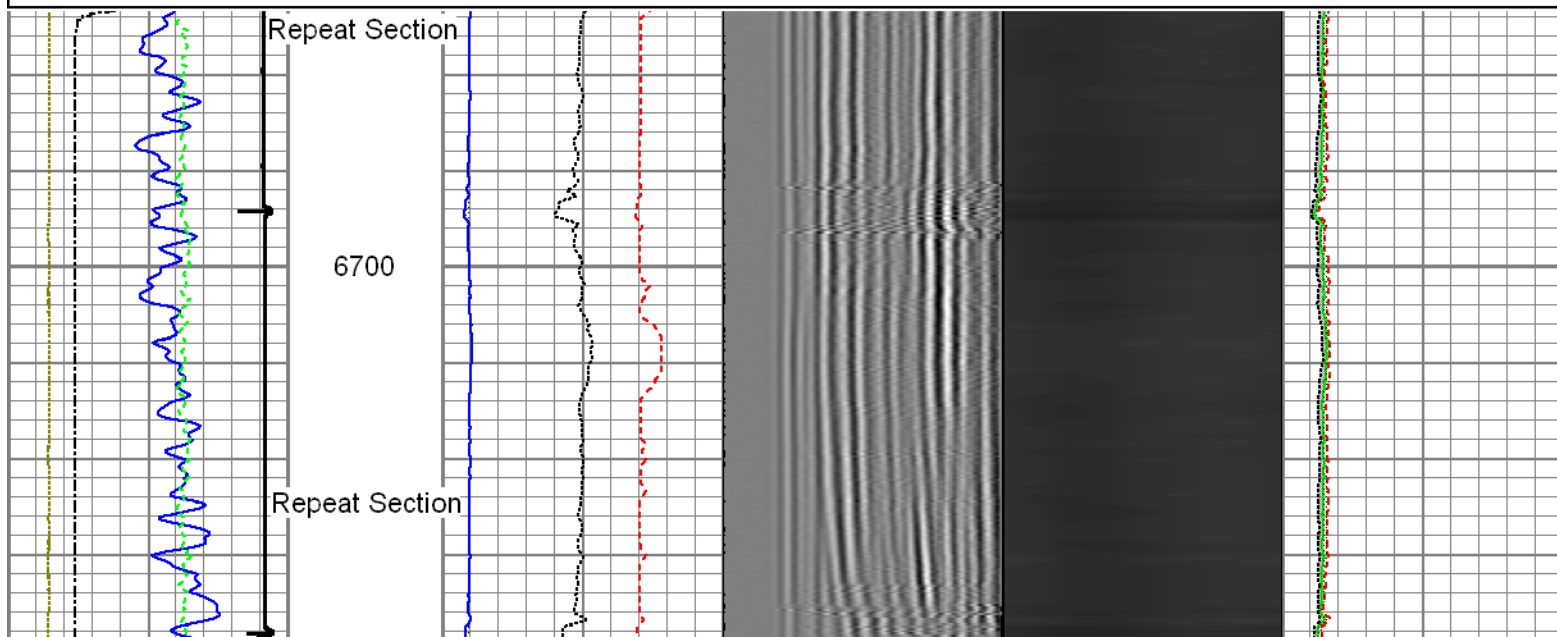


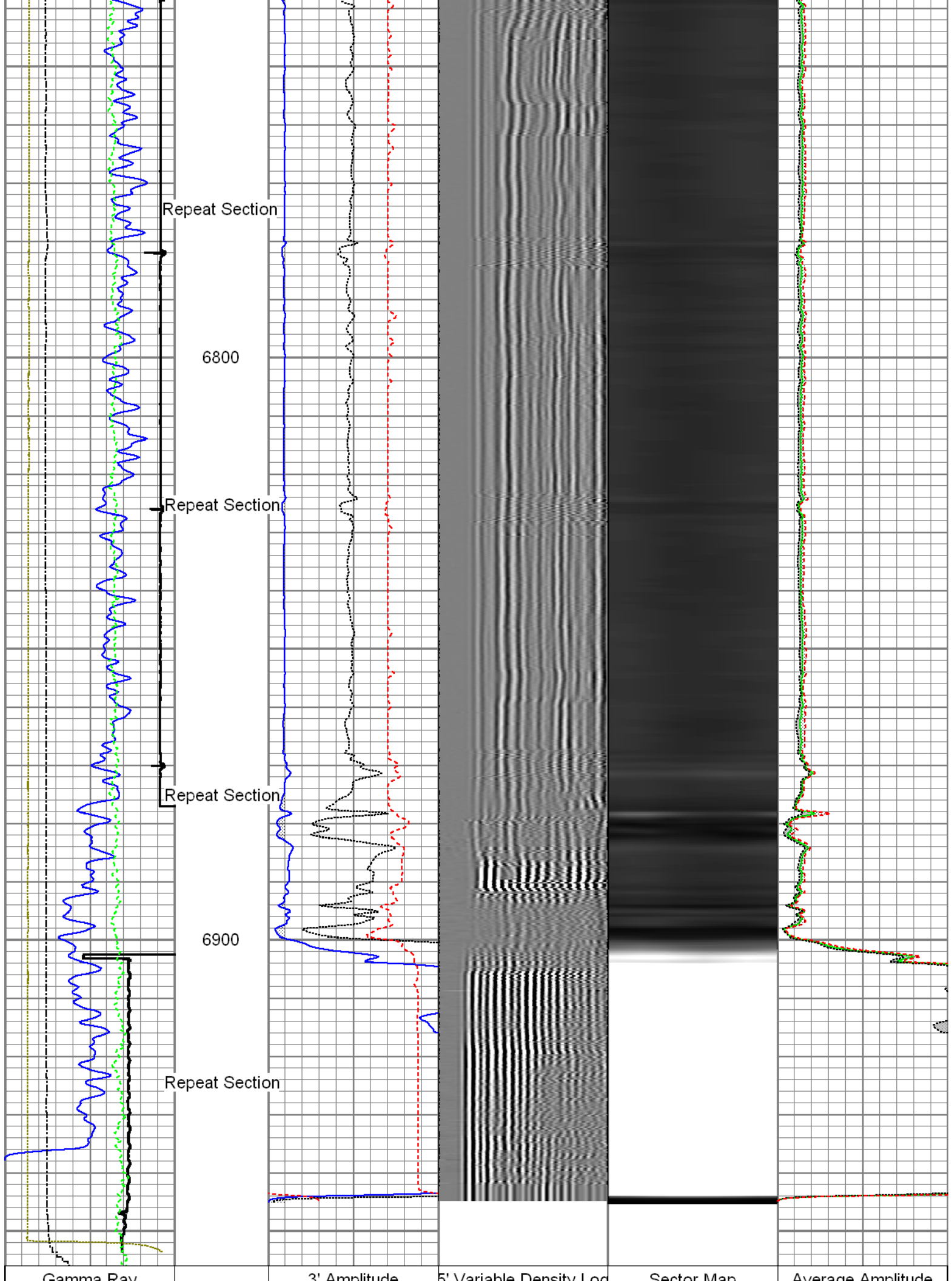
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Minimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

FMC Technologies	Repeat Pass
	Recorded with 2800 PSI Surface Induced Pressure

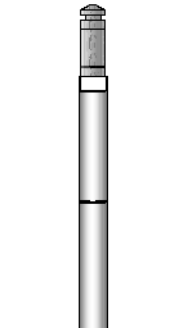
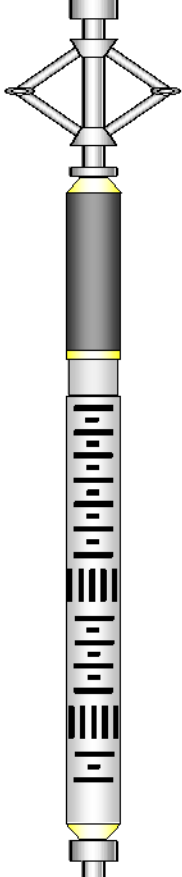
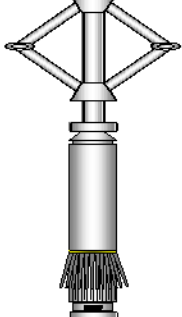
Database File: 0512339945_anadarko_como 34n-14hz_12-29-14_mit_rbl.db
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 Presentation Format: rbt4_mit
 Dataset Creation: Mon Dec 29 14:19:12 2014 by Log 7.0 B1
 Charted by: Depth in Feet scaled 1:240

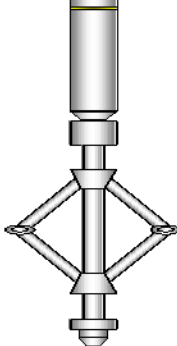
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Minimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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





Gamma Ray	0 (GAPI) 120	3' Amplitude	0 (mV) 100	Variable Density Log	0 100	Average Amplitude	0 100
Casing Collar Locator		3' Amplitude x 5					
Line Speed	0 (ft/min) 100	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)
GR	22.81		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 (10024281) Crossover Ultrawire Toolbus to Ultralink	1.58	1.69	6.50
			UW_PGR-UW_PGR_020 (10024555) 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					
WVFS1	15.42		UW_RBT-UW_RBT_004 (1066) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00
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

TSTAMP	0.00		UW_PRC #3 -UW_PRC_057 (1038) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
			UW_BUL-UW_BUL_006 (218707) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
Dataset: 0512339945_Anadarko_Como 34N-14hz_12-29-14_MIT_RBL.db: field/well/run1/pass6 Total Length: 27.05 ft Total Weight: 319.30 lb O.D. 3.13 in						

Calibration Report			
Database File:	0512339945_anadarko_como 34n-14hz_12-29-14_mit_rbl.db		
Dataset Pathname:	merge1		
Dataset Creation:	Thu Jan 01 08:12:57 2015		
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		
		Inc X	Inc Y
Vertical:		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: Mon Dec 29 12:48:34 2014							
Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1461	277.0	1738	295.0	2033	292.0	2325
Finger 02:	1518	256.0	1774	263.0	2037	262.0	2299
Finger 03:	1419	281.0	1700	300.0	2000	299.0	2299
Finger 04:	1453	284.0	1737	295.0	2032	286.0	2318
Finger 05:	1494	278.0	1772	285.0	2057	275.0	2332
Finger 06:	1399	297.0	1696	300.0	1996	302.0	2298
Finger 07:	1427	280.0	1707	298.0	2005	300.0	2305
Finger 08:	1445	281.0	1726	291.0	2017	290.0	2307
Finger 09:	1435	286.0	1721	299.0	2020	300.0	2320
Finger 10:	1455	274.0	1729	282.0	2011	288.0	2299
Finger 11:	1444	277.0	1721	291.0	2012	301.0	2313
Finger 12:	1416	289.0	1705	297.0	2002	308.0	2310
Finger 13:	1502	261.0	1763	267.0	2030	274.0	2304
Finger 14:	1469	268.0	1737	278.0	2015	291.0	2306
Finger 15:	1502	279.0	1781	285.0	2066	298.0	2364
Finger 16:	1481	275.0	1756	280.0	2036	297.0	2333
Finger 17:	1525	281.0	1806	284.0	2090	302.0	2392
Finger 18:	1447	282.0	1729	280.0	2009	301.0	2310

Finger 19:	1499	288.0	1787	281.0	2068	309.0	2377
Finger 20:	1485	286.0	1771	281.0	2052	308.0	2360
Finger 21:	1421	301.0	1722	296.0	2018	322.0	2340
Finger 22:	1482	281.0	1763	271.0	2034	295.0	2329
Finger 23:	1477	286.0	1763	279.0	2042	305.0	2347
Finger 24:	1513	280.0	1793	272.0	2065	291.0	2356
Finger 25:	1508	284.0	1792	280.0	2072	302.0	2374
Finger 26:	1460	287.0	1747	288.0	2035	310.0	2345
Finger 27:	1522	276.0	1798	273.0	2071	289.0	2360
Finger 28:	1502	290.0	1792	286.0	2078	306.0	2384
Finger 29:	1554	263.0	1817	266.0	2083	280.0	2363
Finger 30:	1461	282.0	1743	291.0	2034	308.0	2342
Finger 31:	1488	288.0	1776	295.0	2071	303.0	2374
Finger 32:	1520	267.0	1787	279.0	2066	278.0	2344
Finger 33:	1492	289.0	1781	298.0	2079	300.0	2379
Finger 34:	1493	283.0	1776	295.0	2071	297.0	2368
Finger 35:	1544	262.0	1806	269.0	2075	268.0	2343
Finger 36:	1514	272.0	1786	280.0	2066	286.0	2352
Finger 37:	1484	287.0	1771	293.0	2064	291.0	2355
Finger 38:	1568	260.0	1828	257.0	2085	264.0	2349
Finger 39:	1483	278.0	1761	283.0	2044	276.0	2320
Finger 40:	1415	298.0	1713	304.0	2017	303.0	2320

Segmented Cement Bond Log Calibration Report

Serial Number:	1066
Tool Model:	UW_RBT_004
Calibration Casing Diameter:	7.000 in
Calibration Depth:	25.023 ft

Master Calibration, performed Mon Dec 29 12:50:48 2014:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	0.002	0.740	0.800	62.165	83.218	0.597
5FT	-0.003	0.712	0.800	62.165	85.846	1.031
S1	0.002	0.785	0.000	100.000	127.783	-0.317
S2	0.001	0.795	0.000	100.000	125.921	-0.163
S3	0.002	0.757	0.000	100.000	132.433	-0.267
S4	0.002	0.714	0.000	100.000	140.291	-0.224
S5	0.002	0.682	0.000	100.000	147.180	-0.354
S6	0.002	0.688	0.000	100.000	145.701	-0.281
S7	0.002	0.729	0.000	100.000	137.625	-0.326
S8	0.003	0.762	0.000	100.000	131.594	-0.339

Gamma Ray Calibration Report

Serial Number:	10024555
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



Well	Como 34N-14HZ
Field	Wattenberg
County	Weld
State	Colorado