



Radial Cement Bond
Gamma Ray
Casing Collar Log

Company Noble Energy Inc.		Company Noble Energy Inc.	
Well 70 Ranch State BB18-689		Well 70 Ranch State BB18-689	
Field Wattenberg		Field Wattenberg	
County Weld		County Weld	
State Colorado		State Colorado	
Location:		API #: 05-123-41530	
SEC 17 TWP 5N RGE 63W		Other Services	
Permanent Datum		Ground Level	
Log Measured From Kelly Bushing		Elevation 4697'	
Drilling Measured From Kelly Bushing		Elevation	
		K.B. 4721'	
		D.F. 4720'	
		G.L. 4697'	
Date		14-AUG-2015	
Run Number		Two	
Depth Driller		15845 FT	
Depth Logger		6839 FT	
Bottom Logged Interval		6834 FT	
Top Log Interval		Surface	
Open Hole Size		8.750"	
Type Fluid		Water	
Density / Viscosity		8.34 lbm/gal	
Max. Recorded Temp.		228°F	
Estimated Cement Top		95 FT	
Time Well Ready		ROA	
Time Logger on Bottom		14:15	
Equipment Number		HD-0343	
Location		Fort Lupton, CO	
Recorded By		Chad Bryan	
Witnessed By		---	
Borehole Record		Tubing Record	
Run Number		Bit	
From		To	
Size		Weight	
From		To	
Casing Record		Size (in)	
Surface Casing		9 5/8	
Intermediate #1		7	
Intermediate #2		4 1/2	
Liner		11.6	
		P-110 LT&C	
		6849 FT	
		15830 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 just above liner top to surface
Log recorded with 2400 PSI surface induced pressure
No debris found on logging tools upon completion of run

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

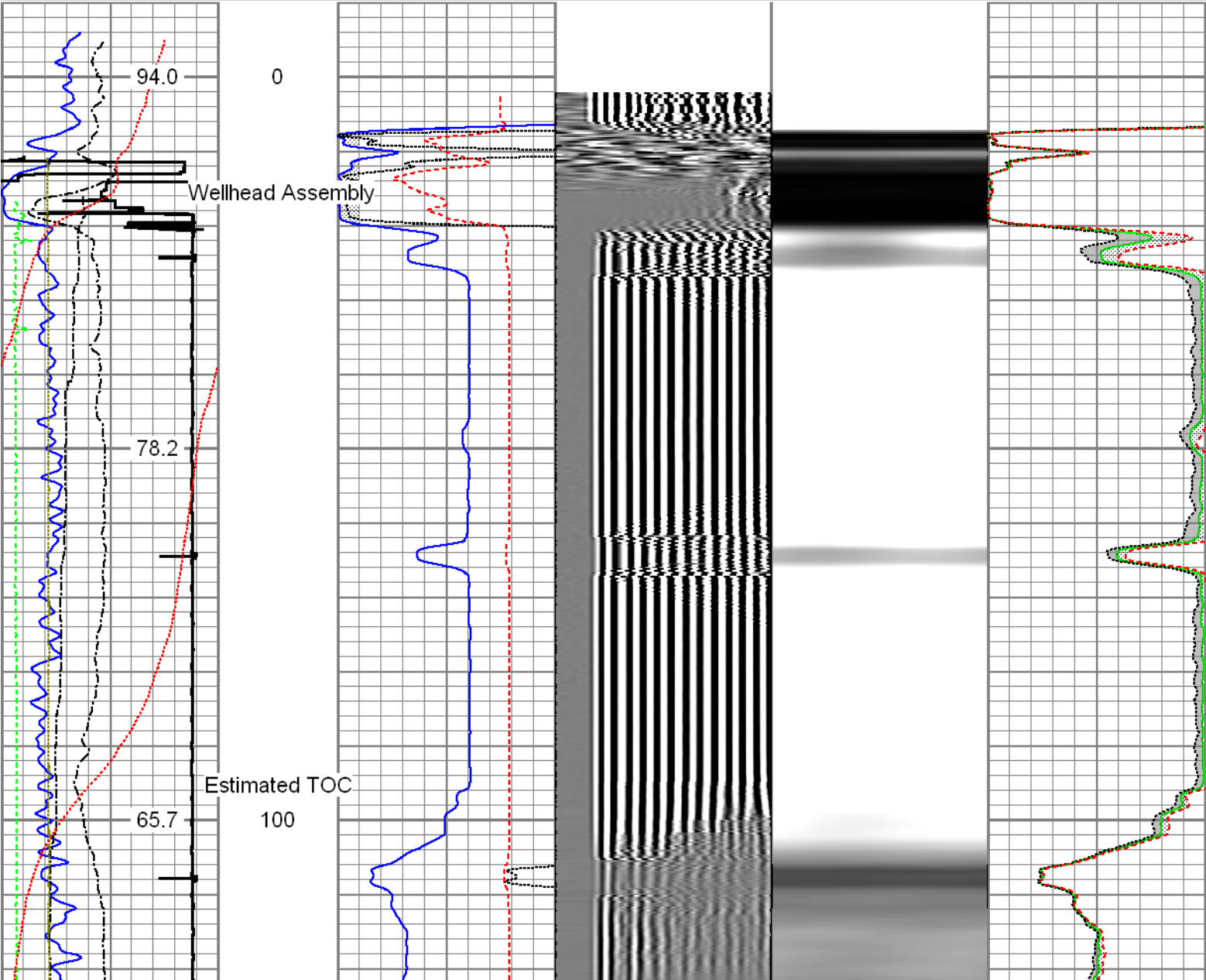


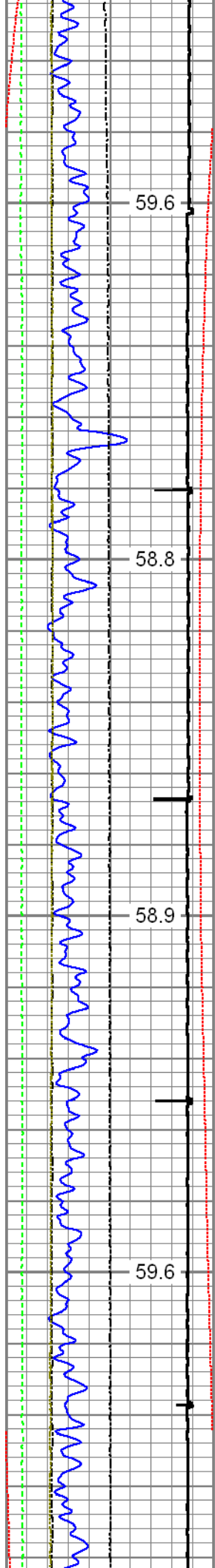
Main Pass

Recorded with 2400 PSI Surface Induced Pressure

Database File: 08-14-15_noble energy_70 ranch state bb18-689_mit_rbl.db
Dataset Pathname: main3
Presentation Format: rbt4_mit
Dataset Creation: Fri Aug 14 11:02:16 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
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				
-10 Deviation (°) 90				
Temperature				
0 (degF) 20				





59.6

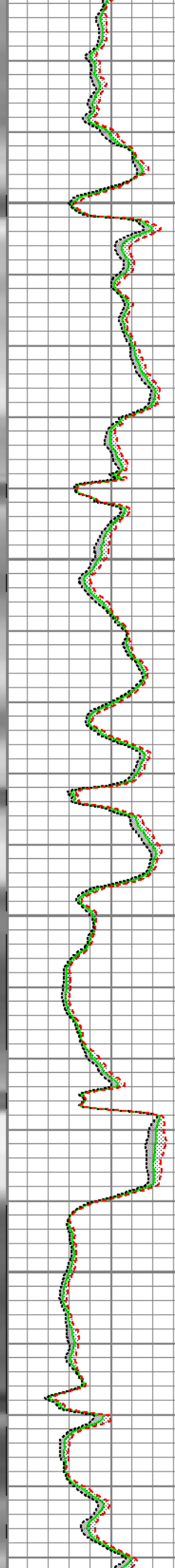
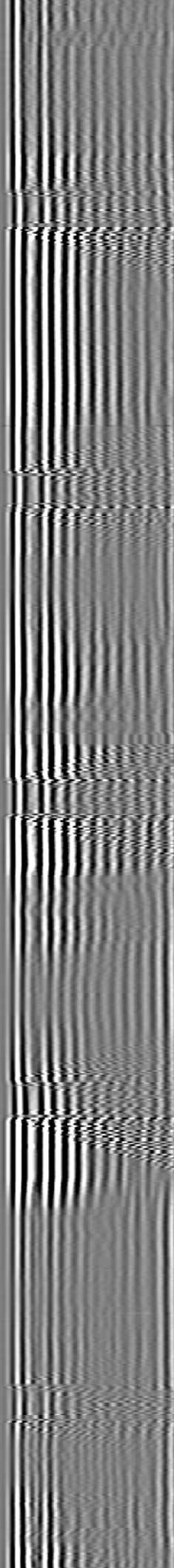
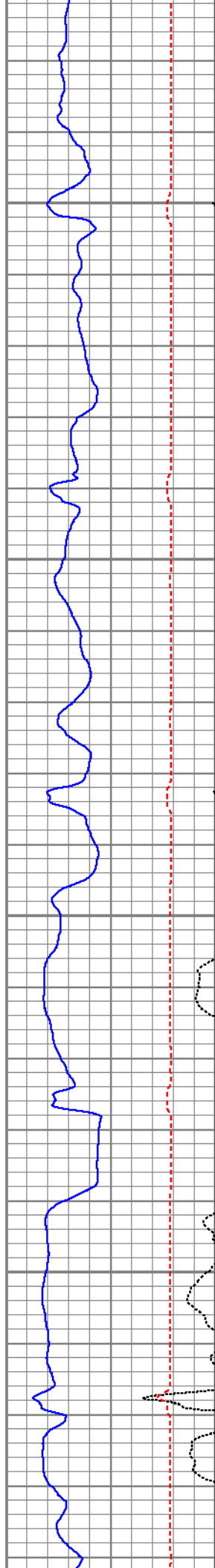
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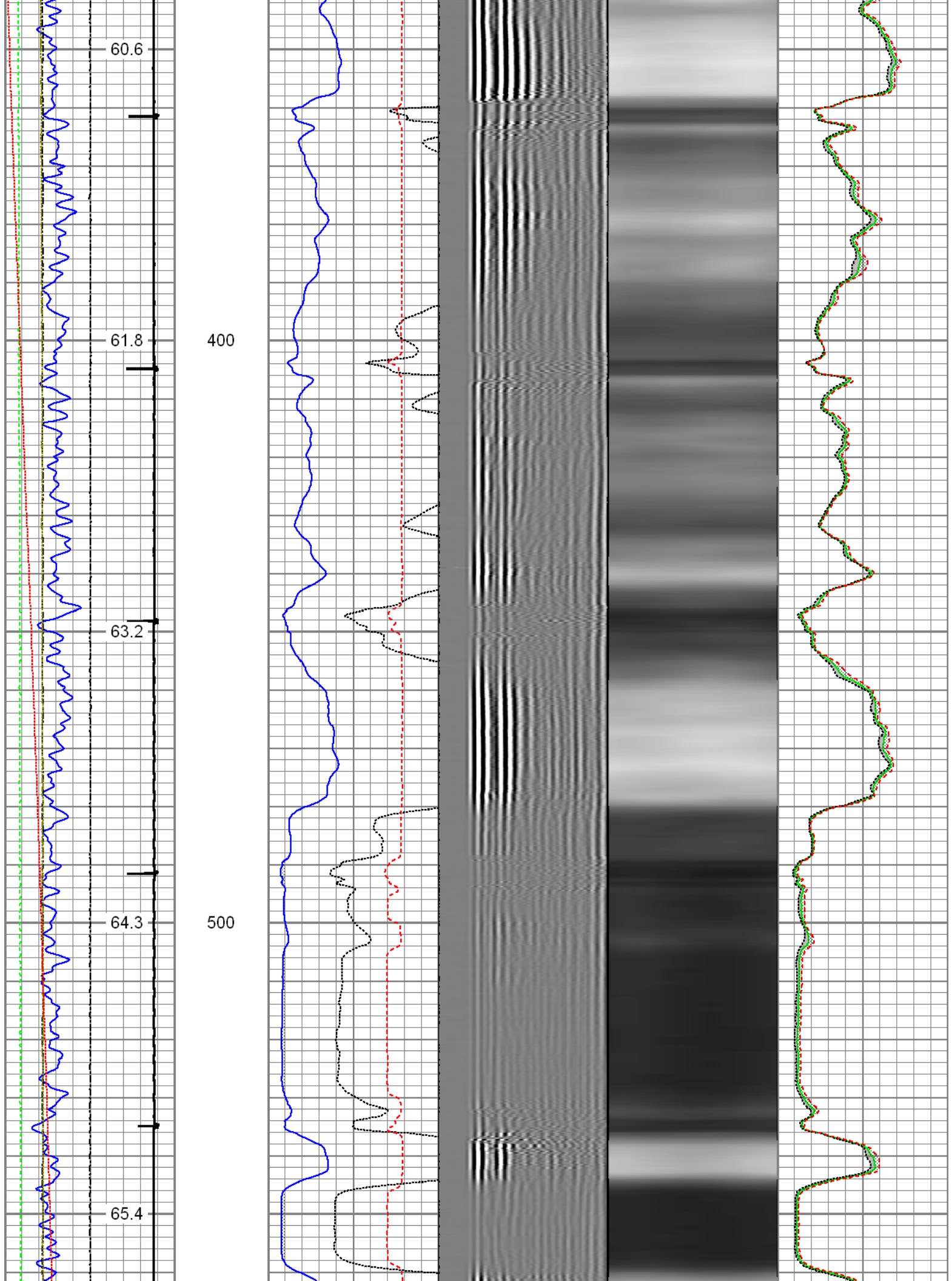
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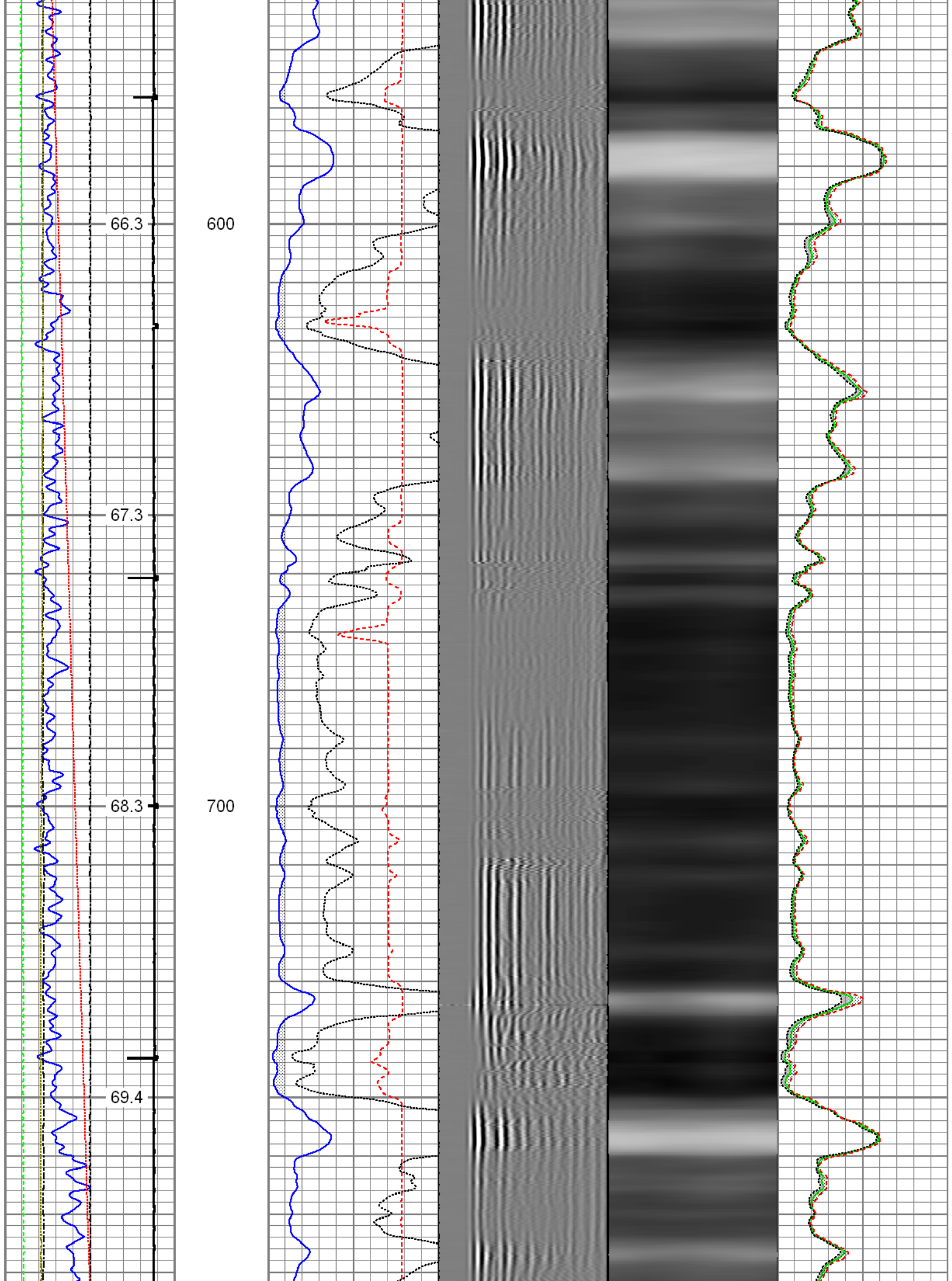
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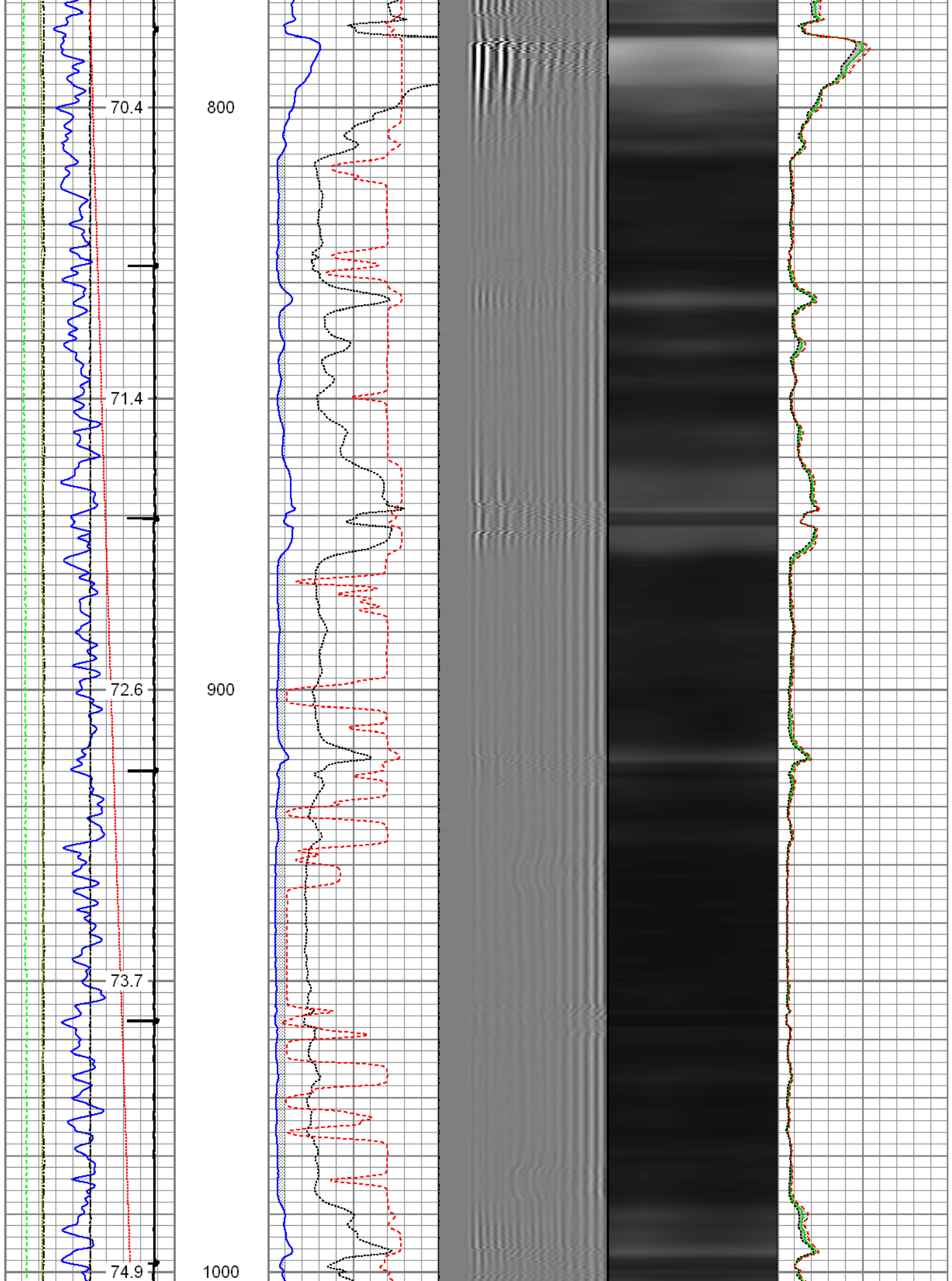
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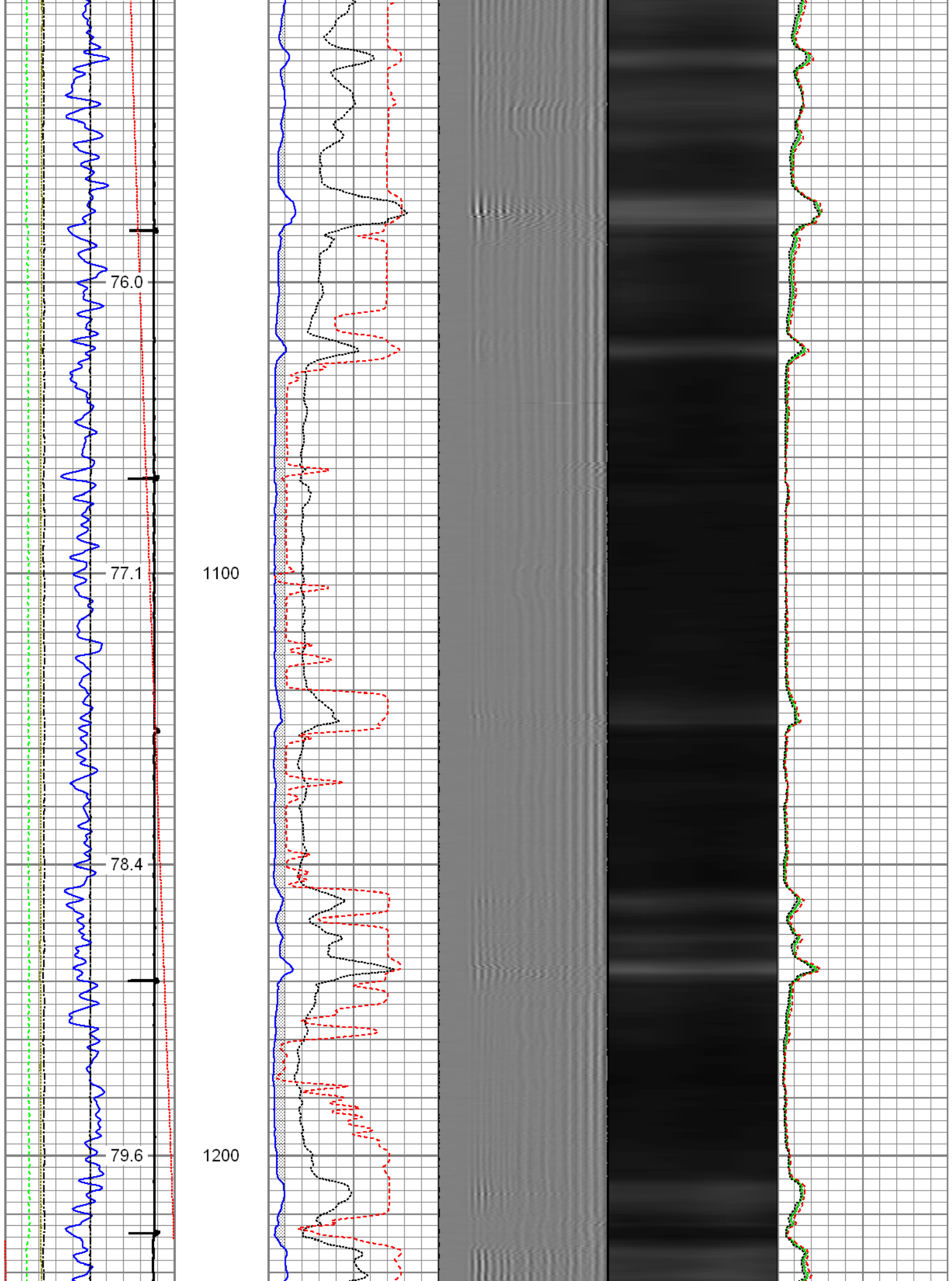
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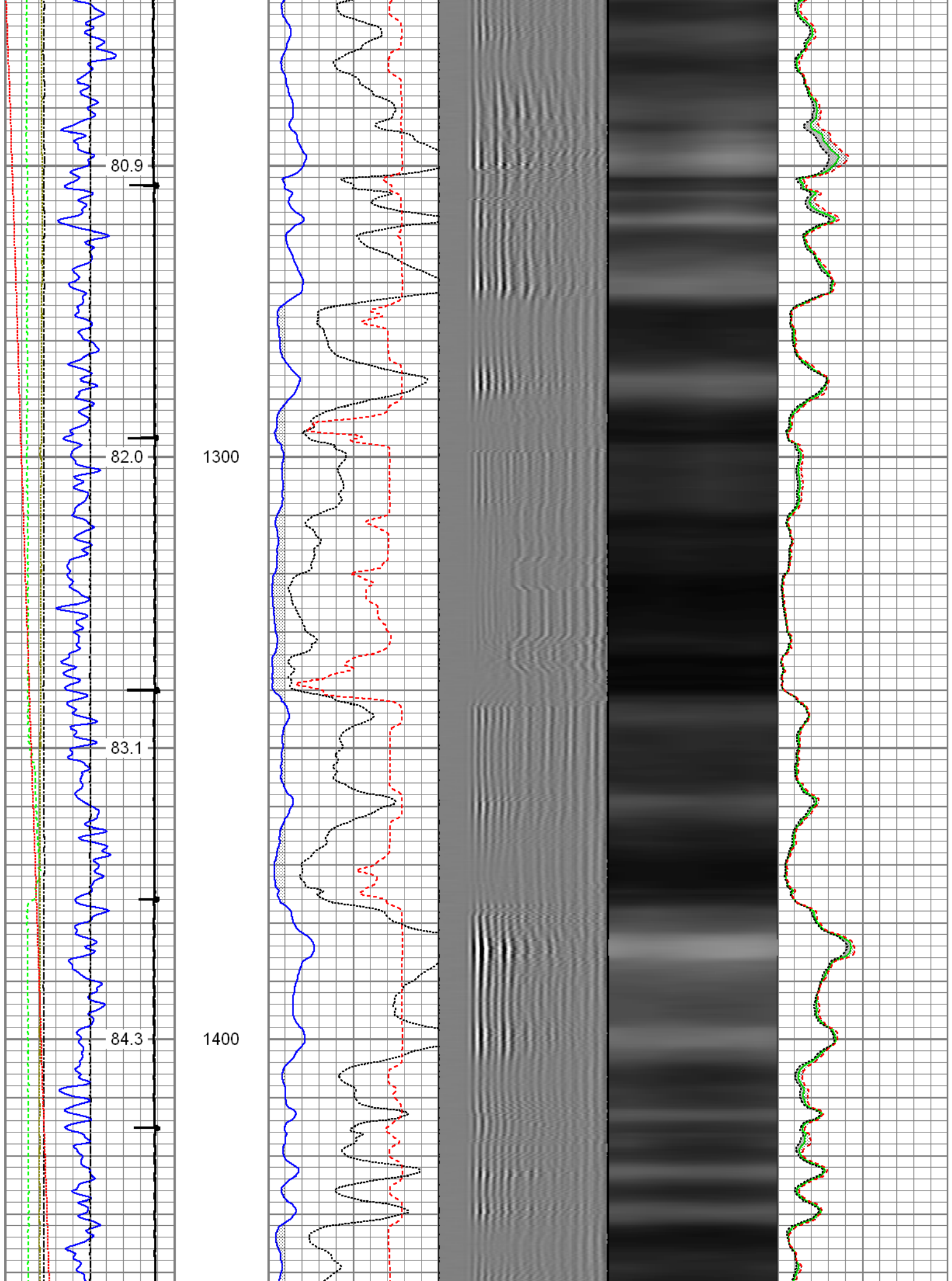


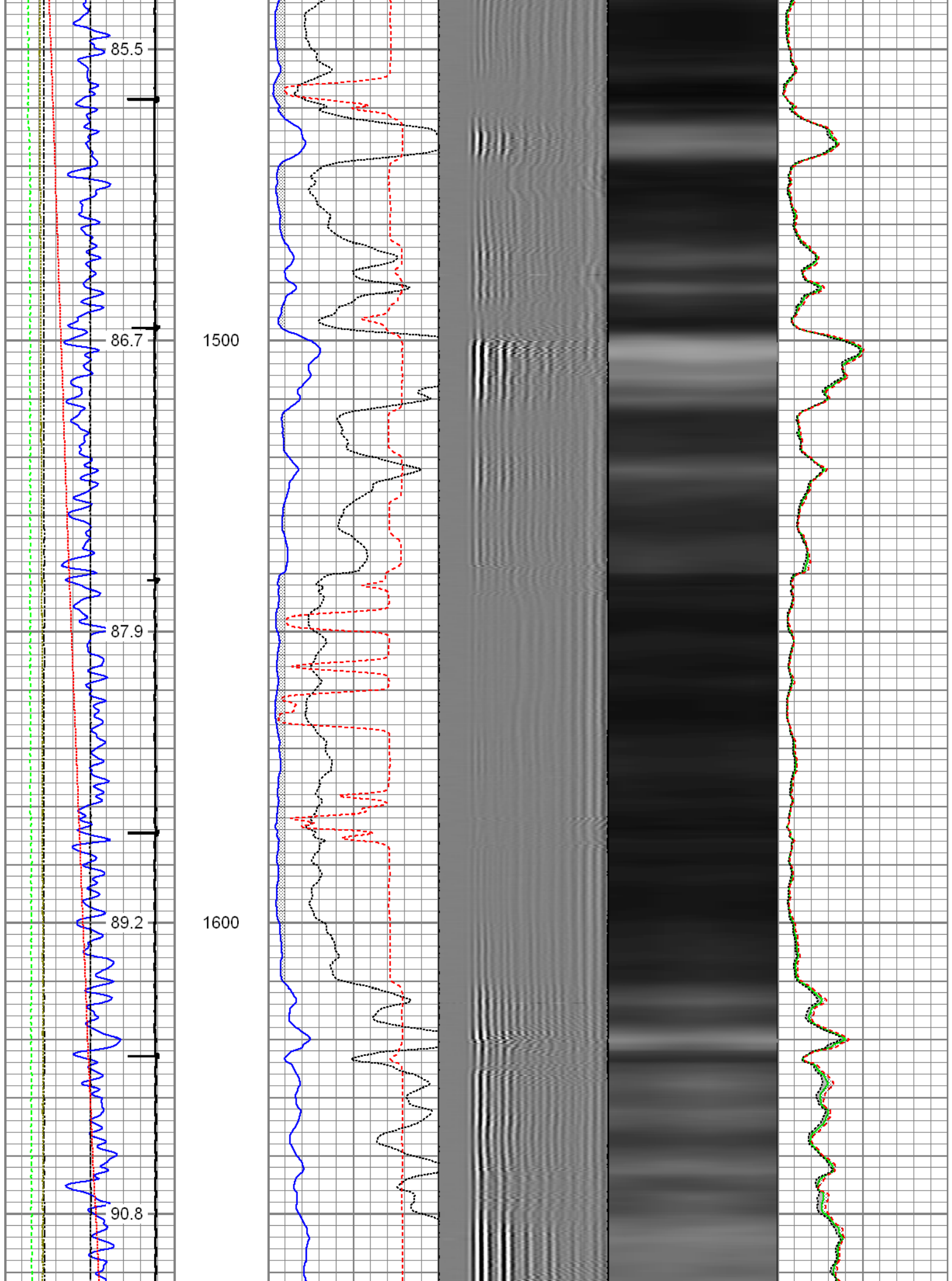


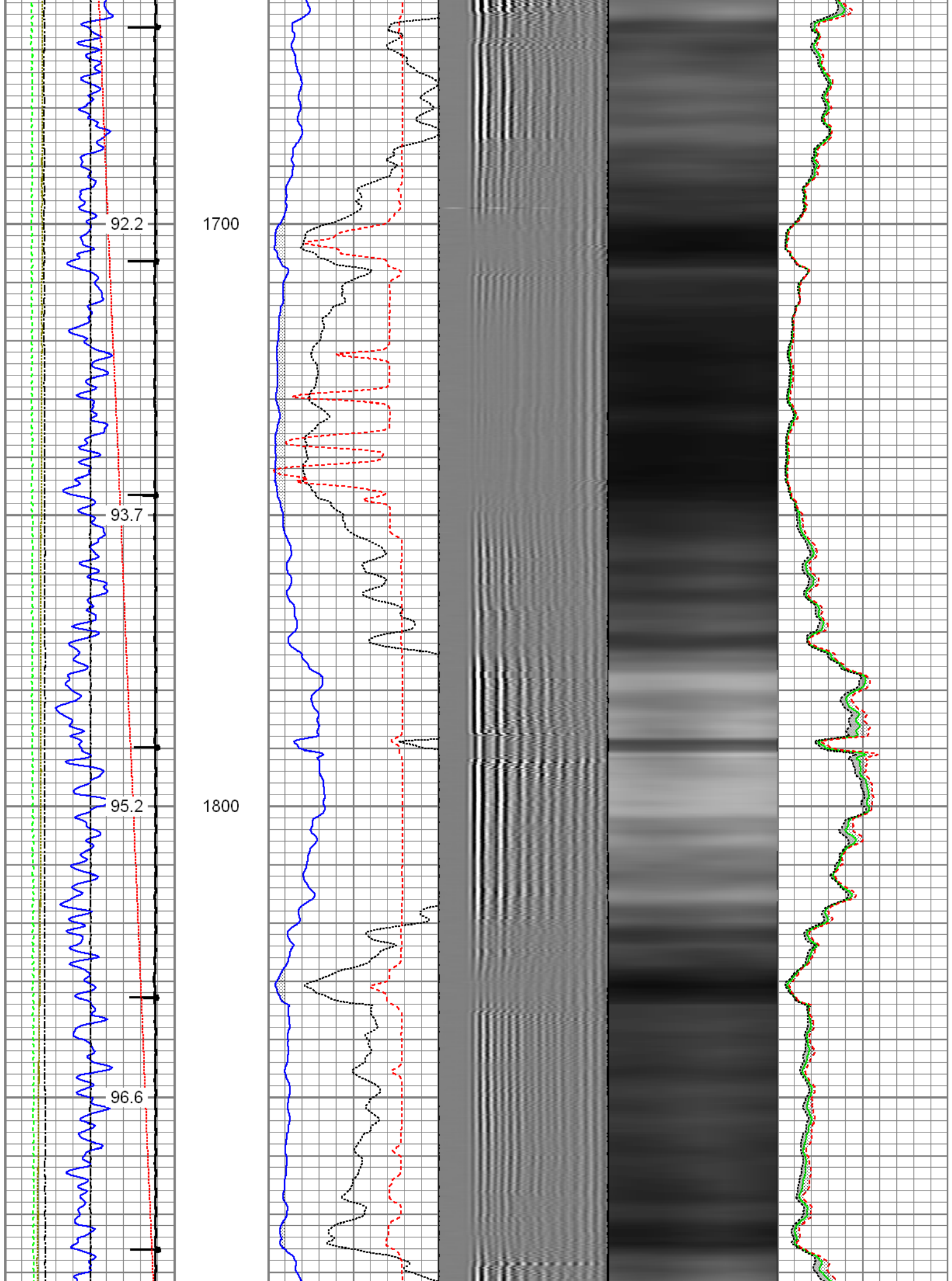


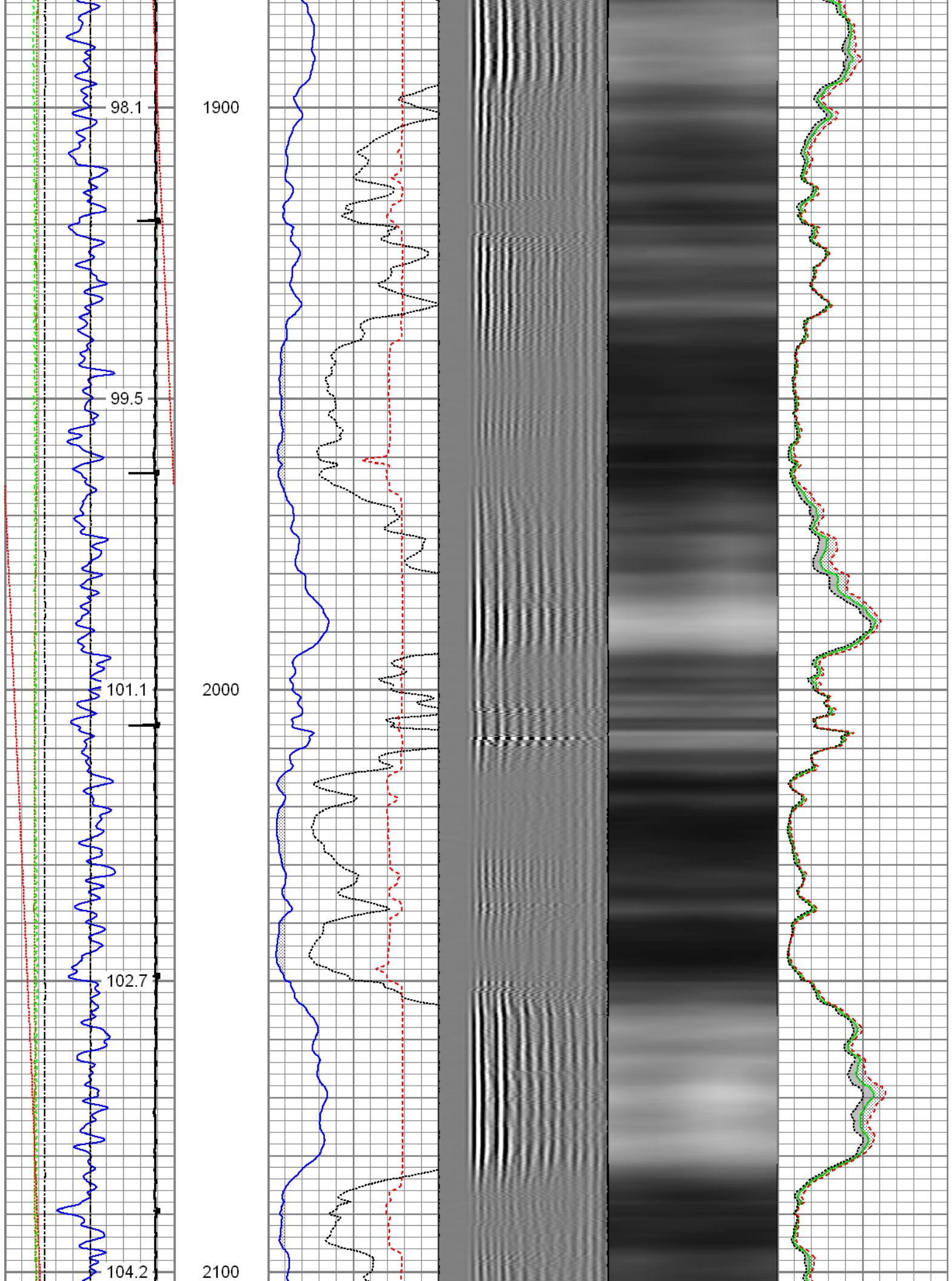


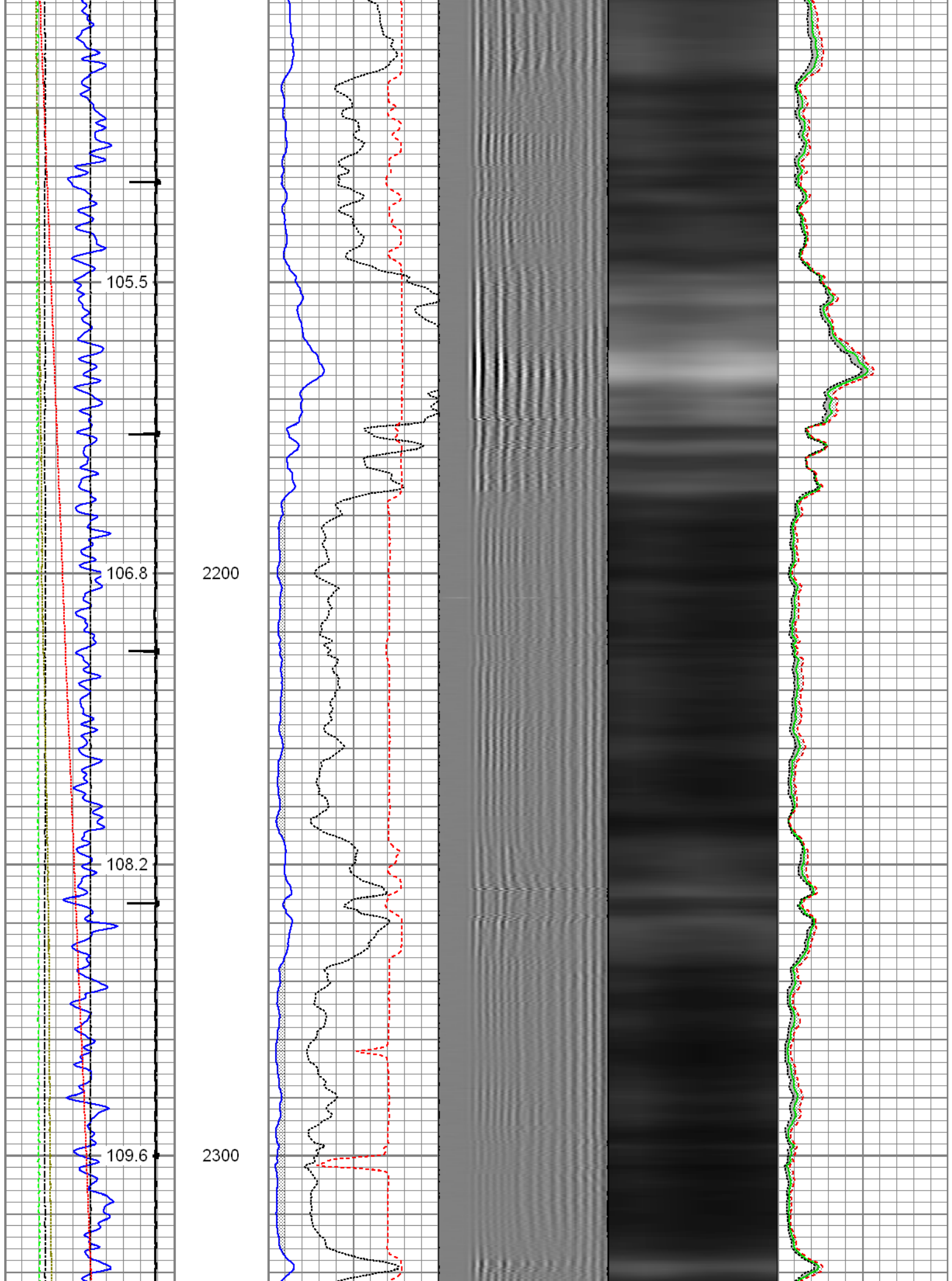


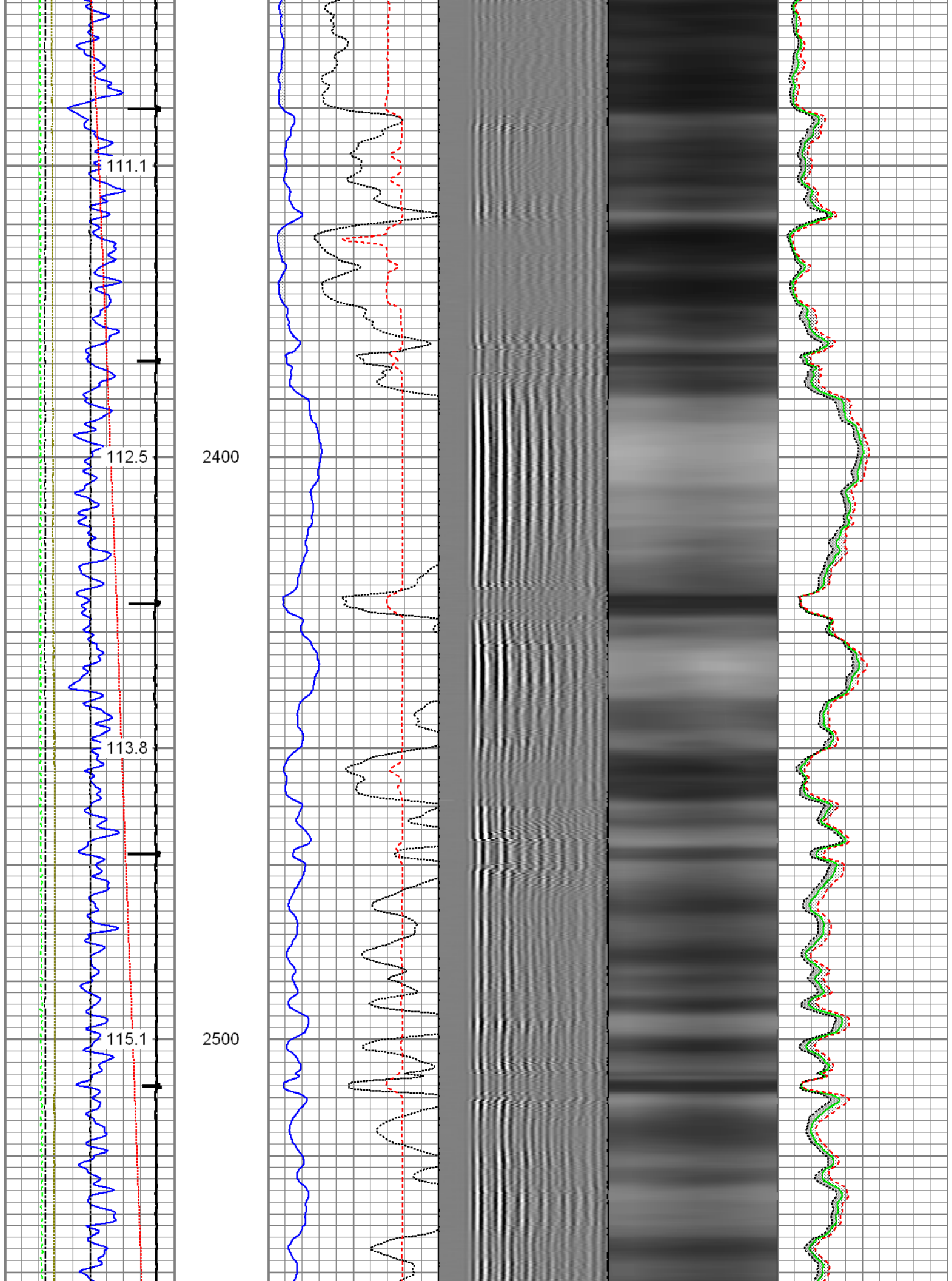


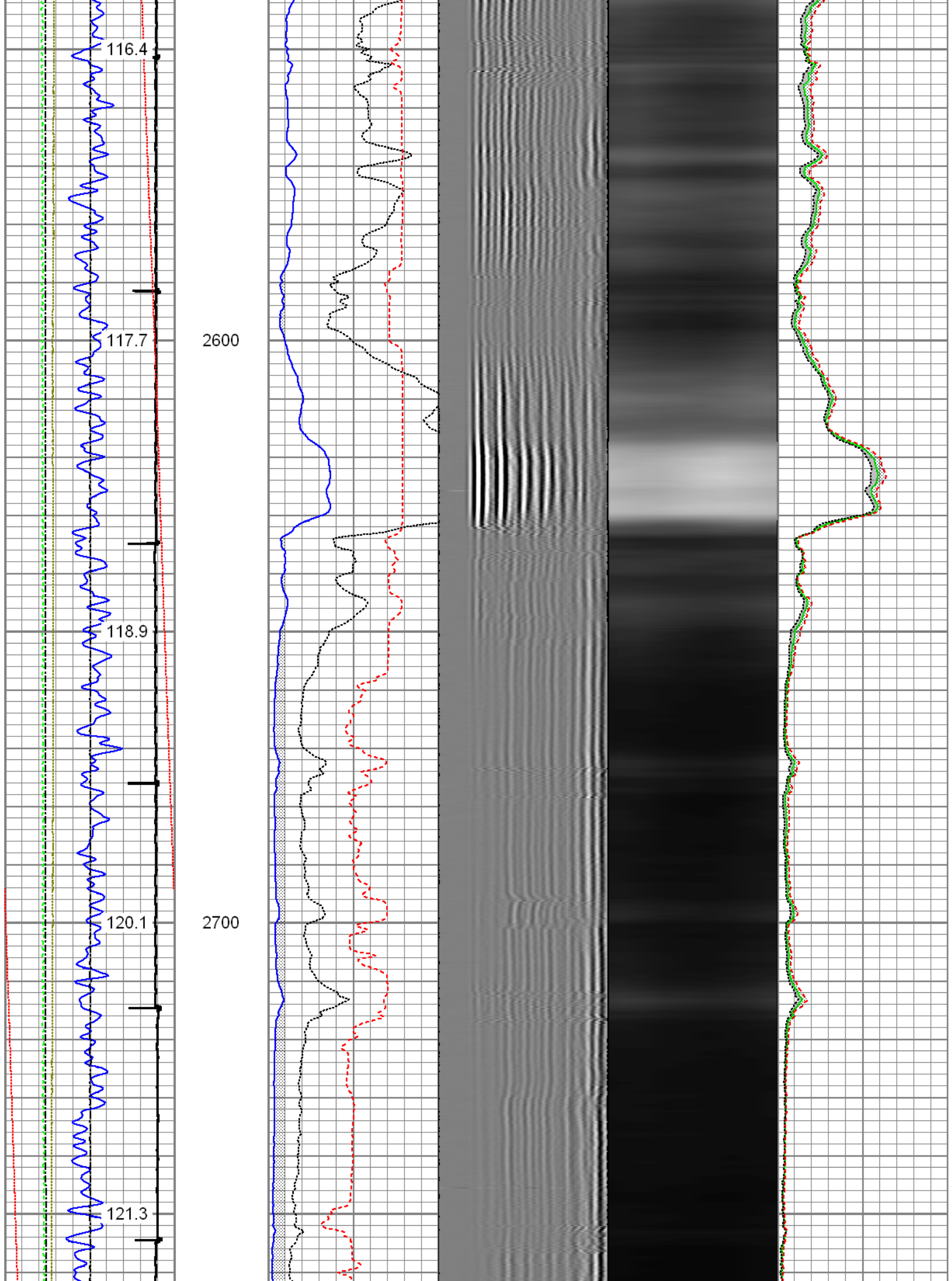


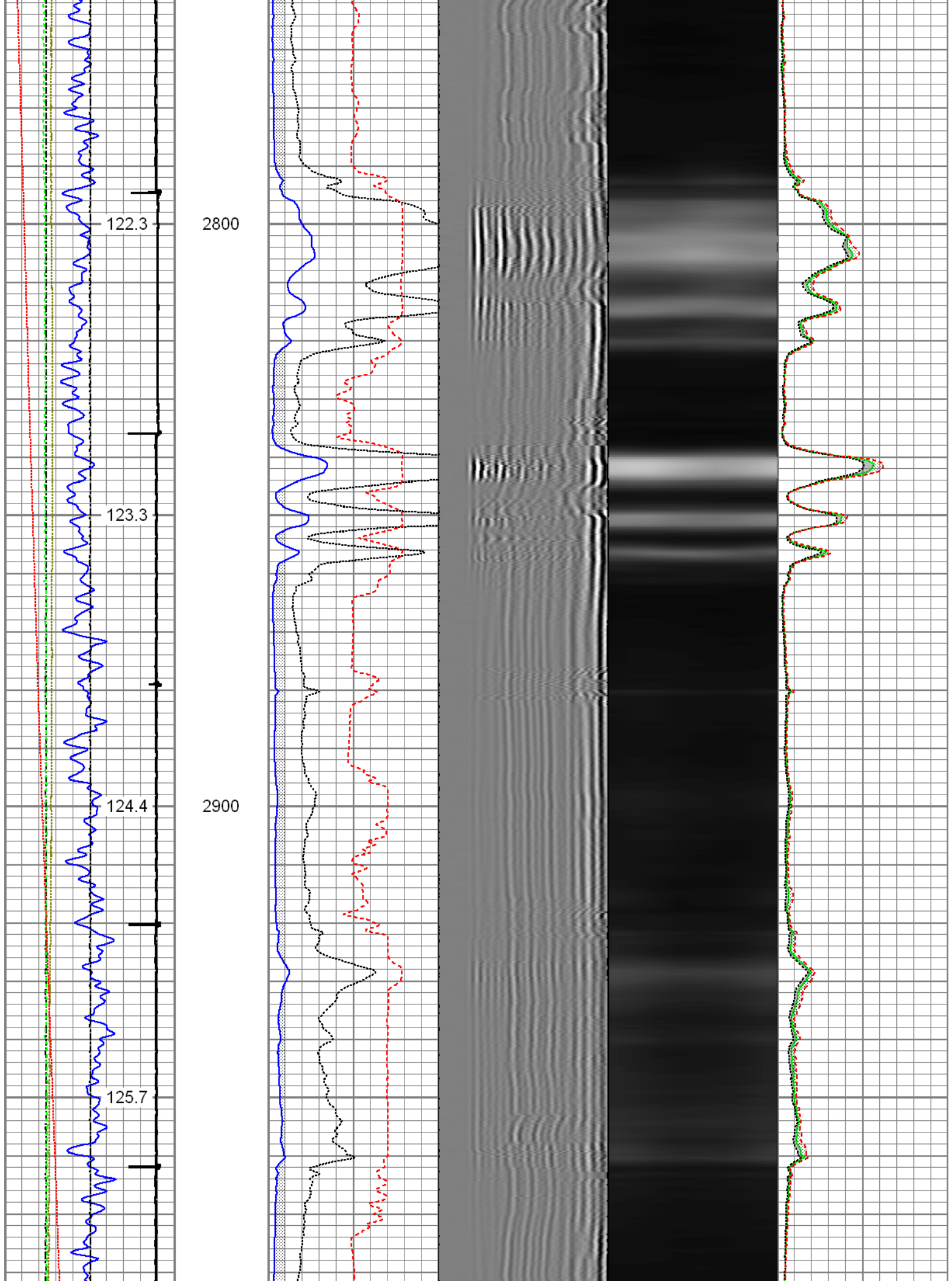


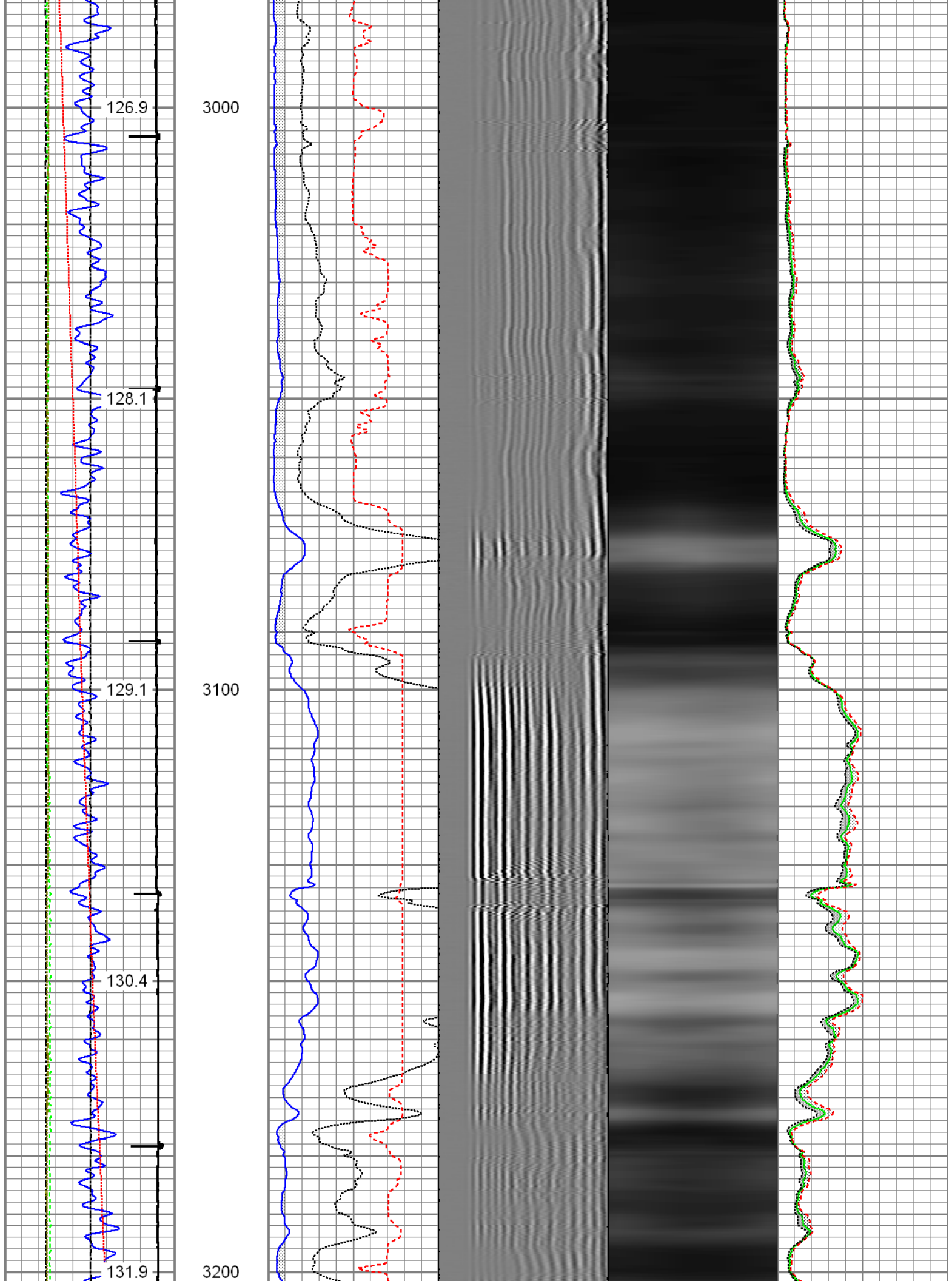


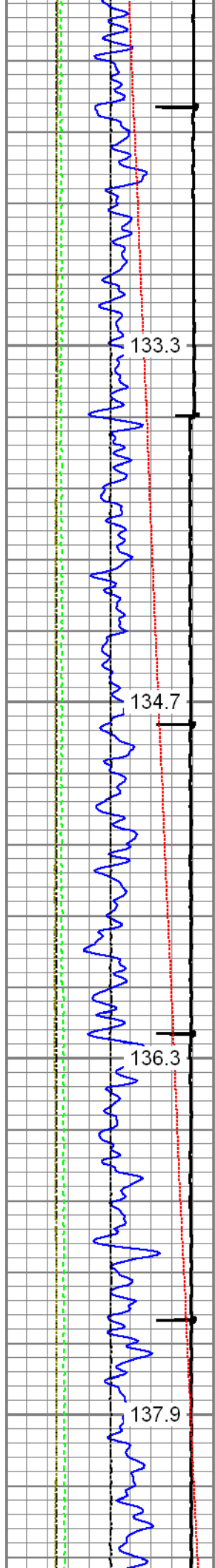






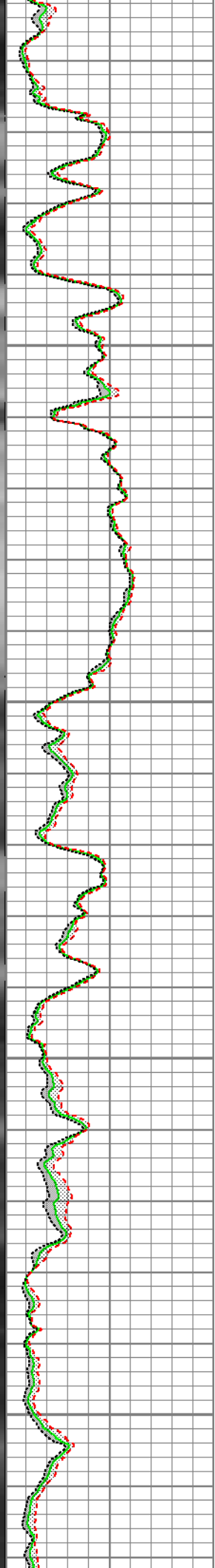
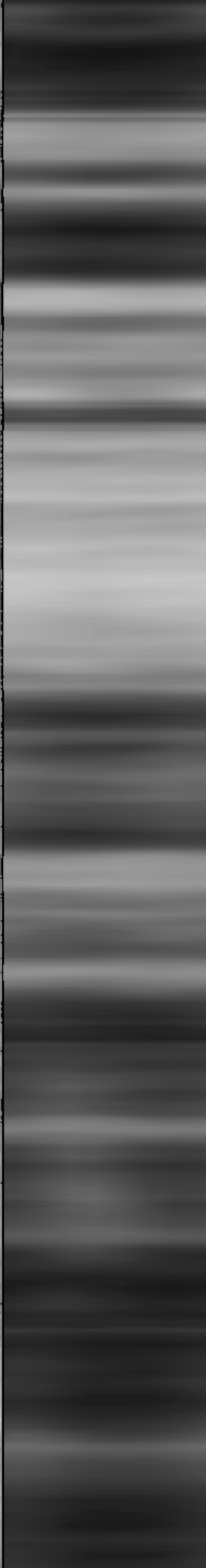
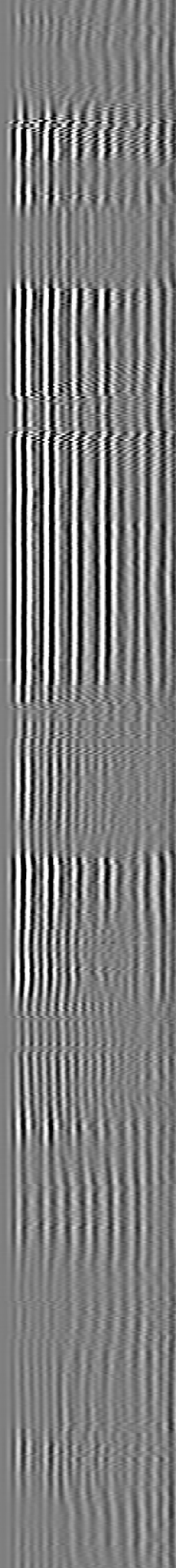
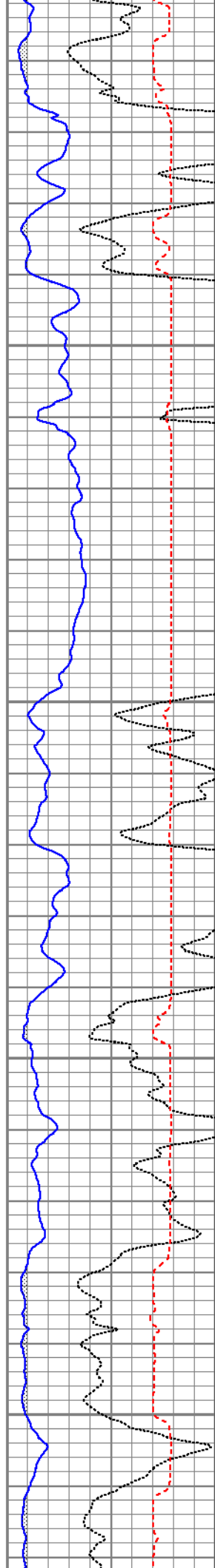


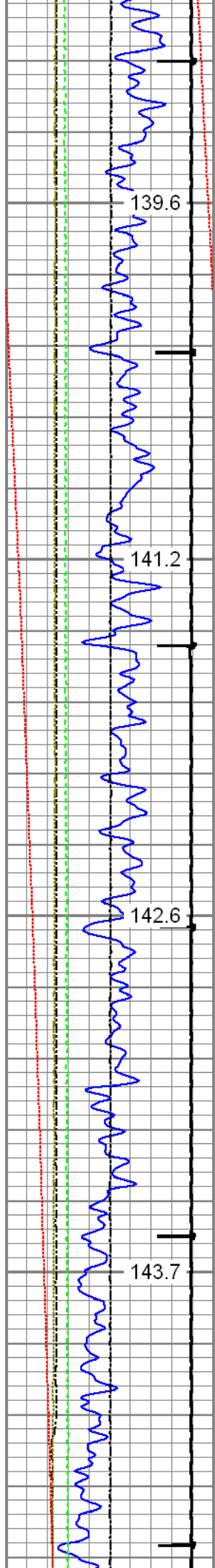




3300

3400





139.6

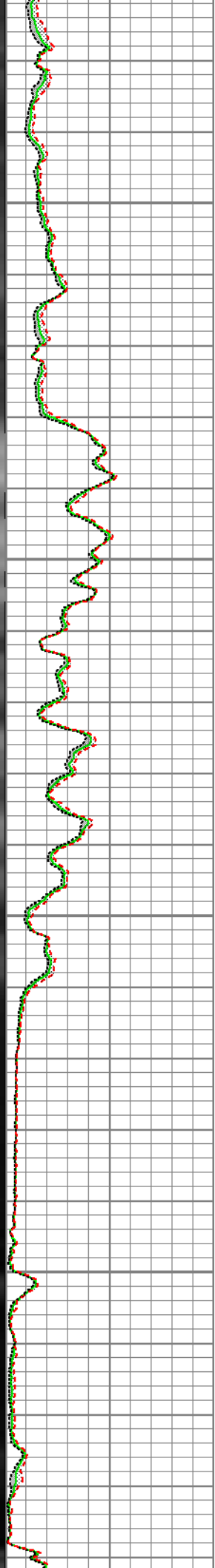
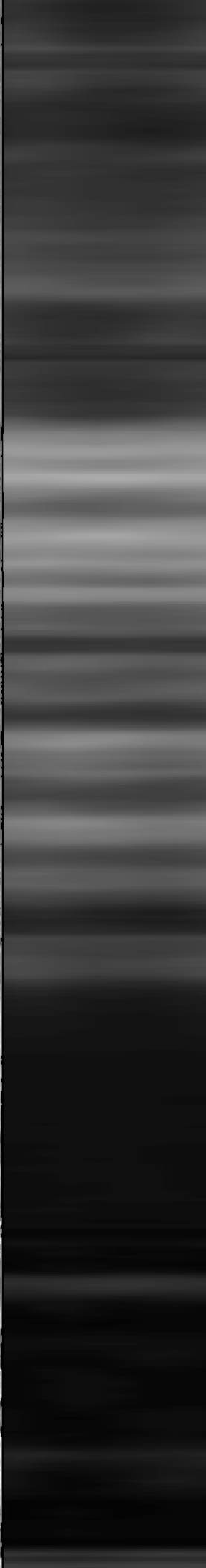
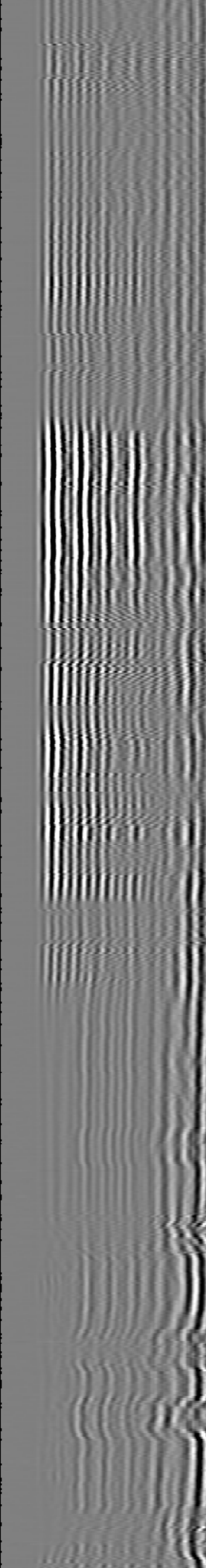
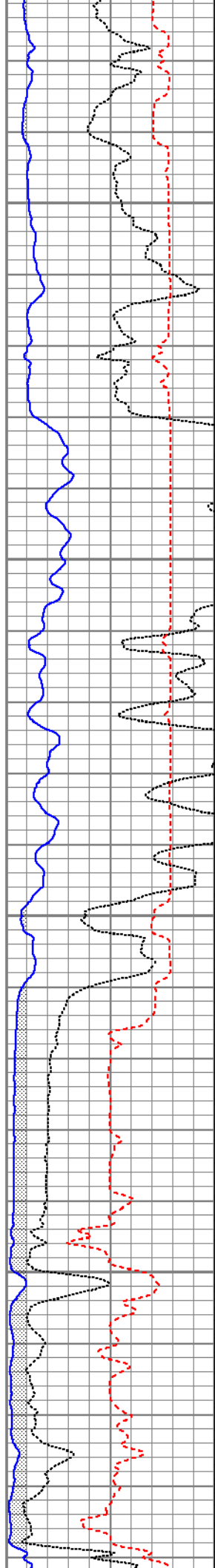
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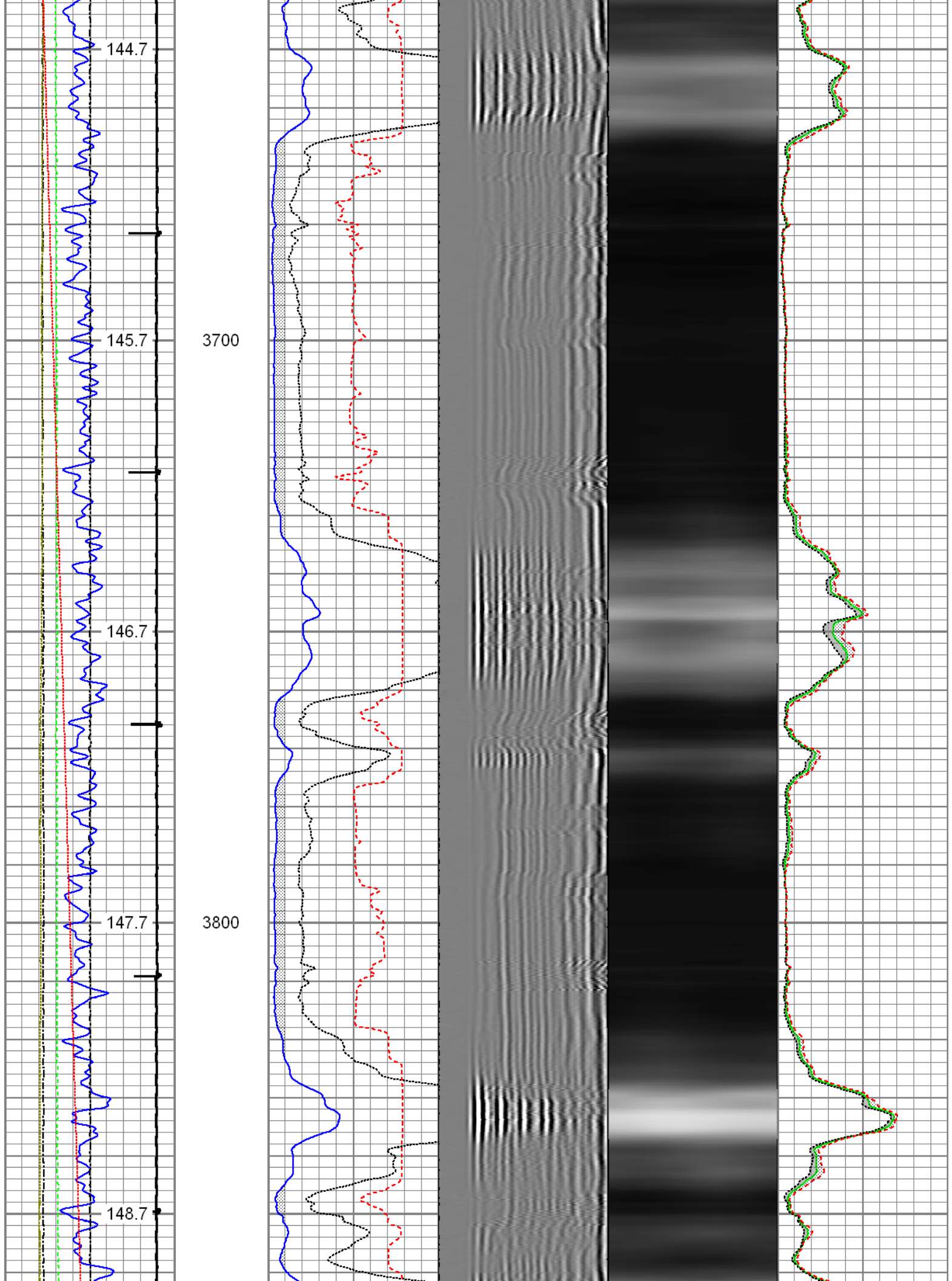
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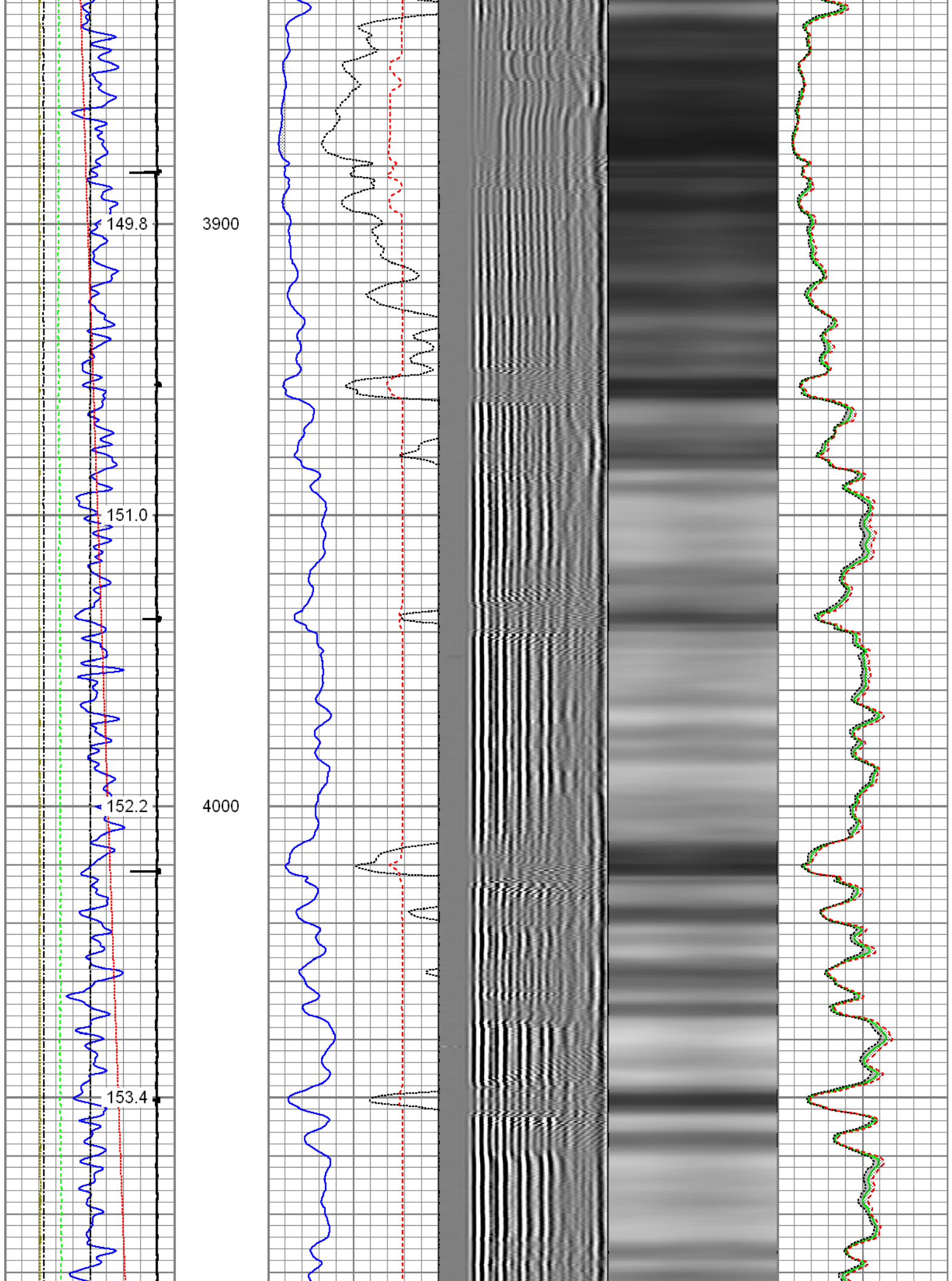
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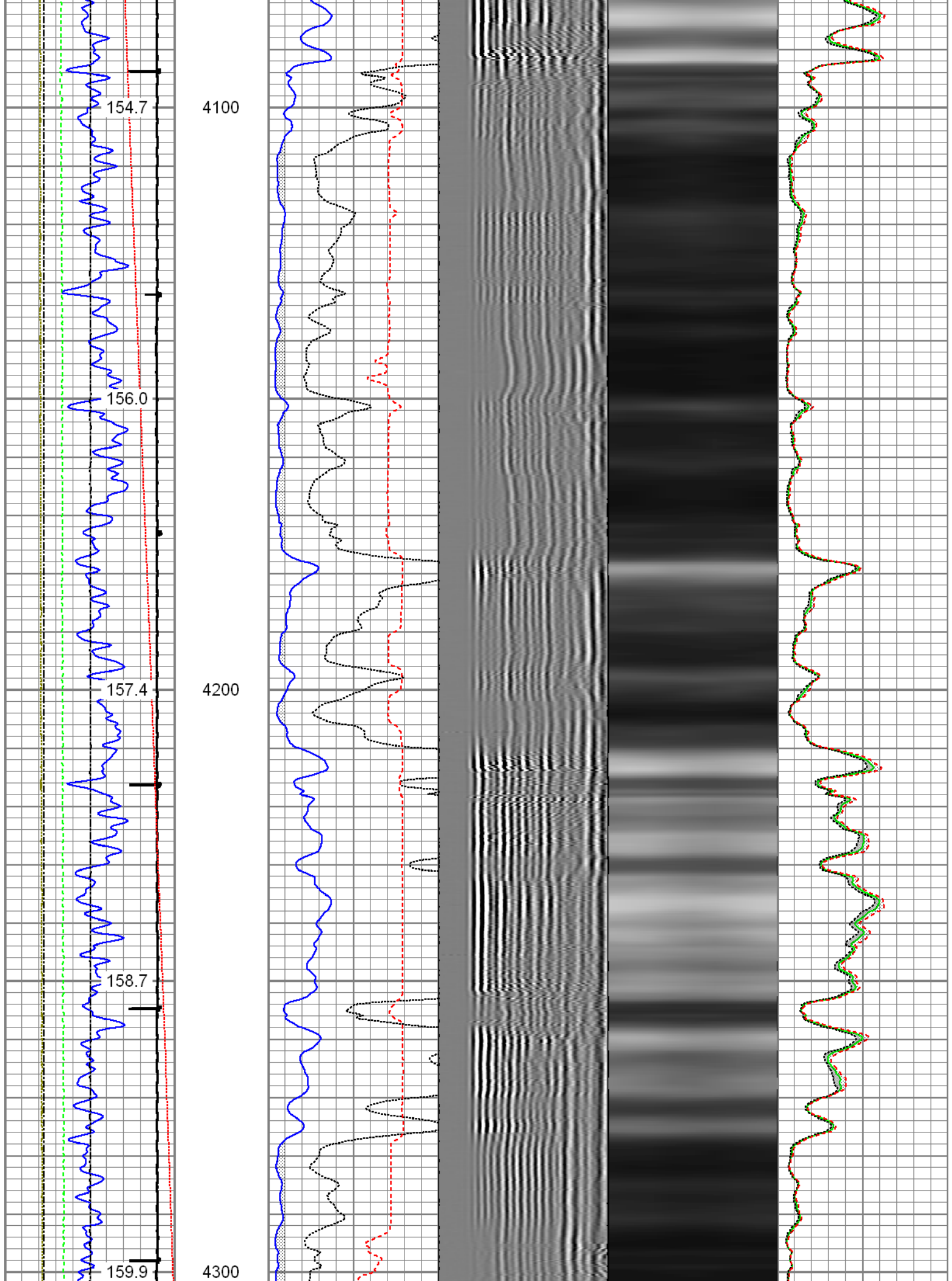
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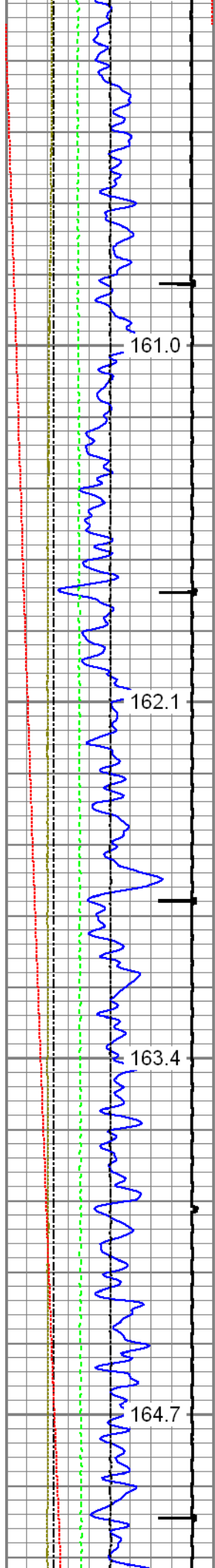
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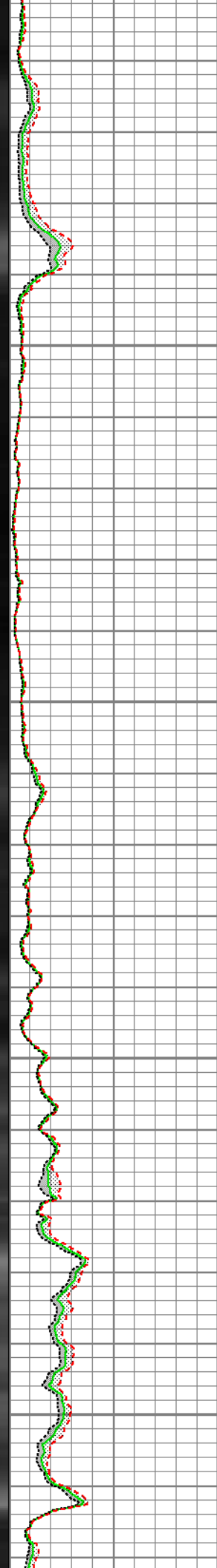
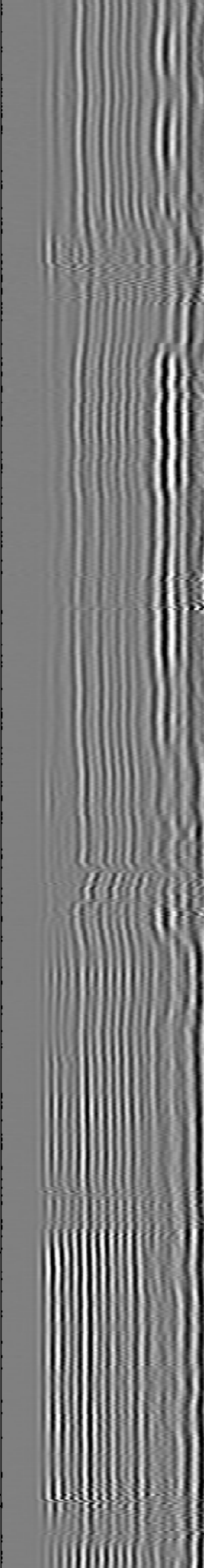
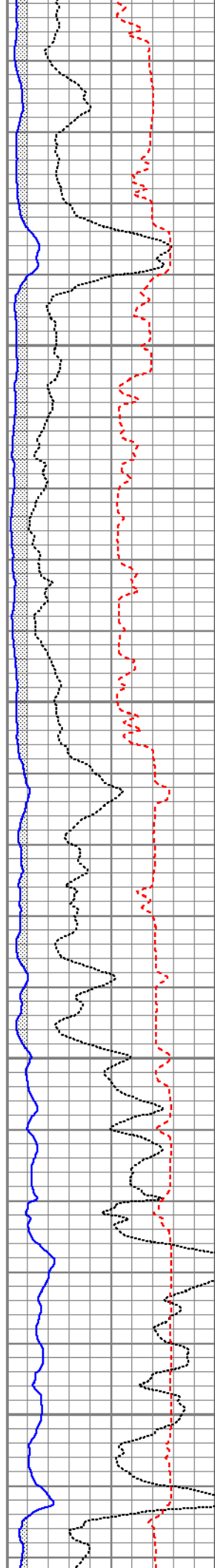


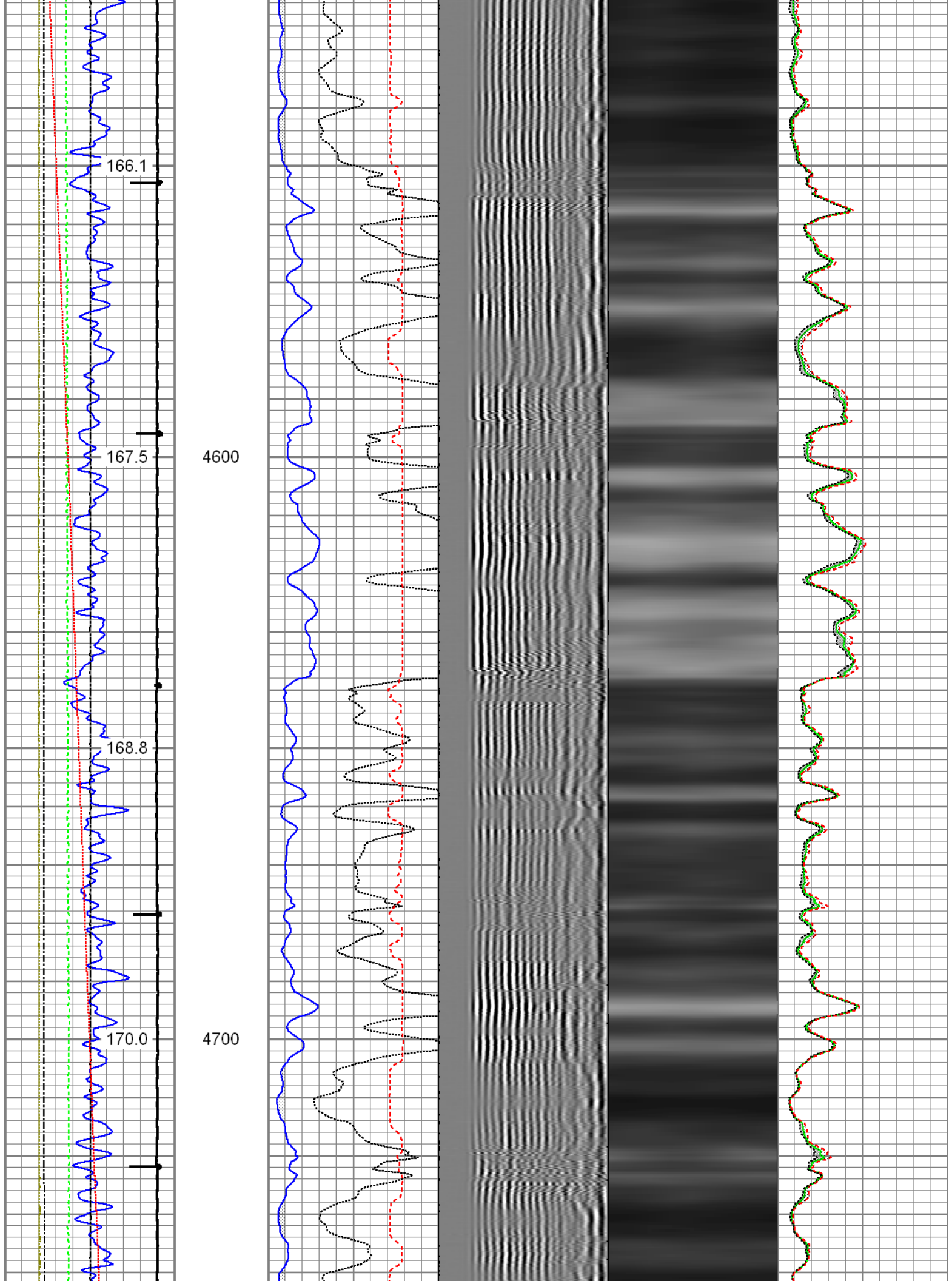


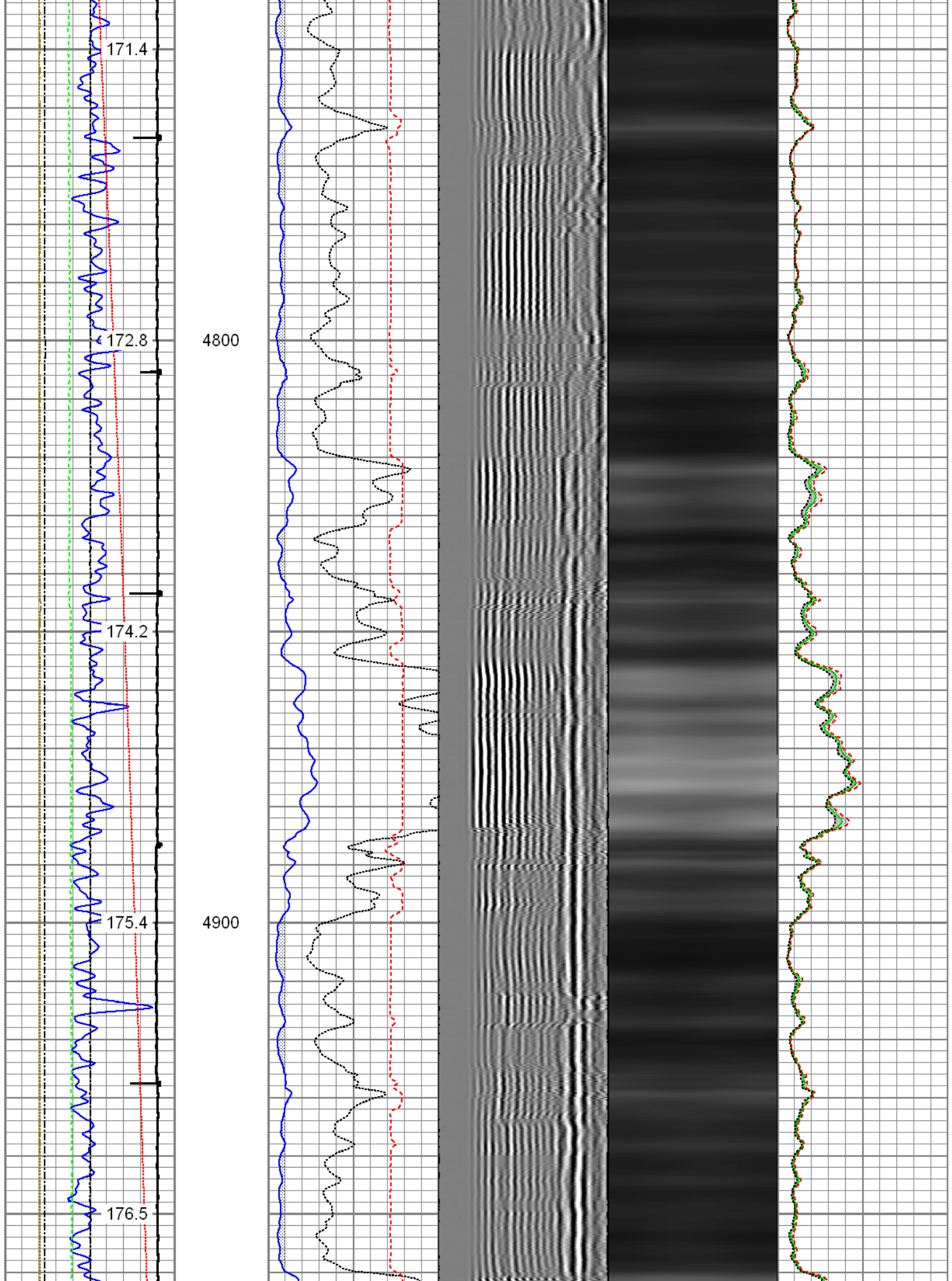


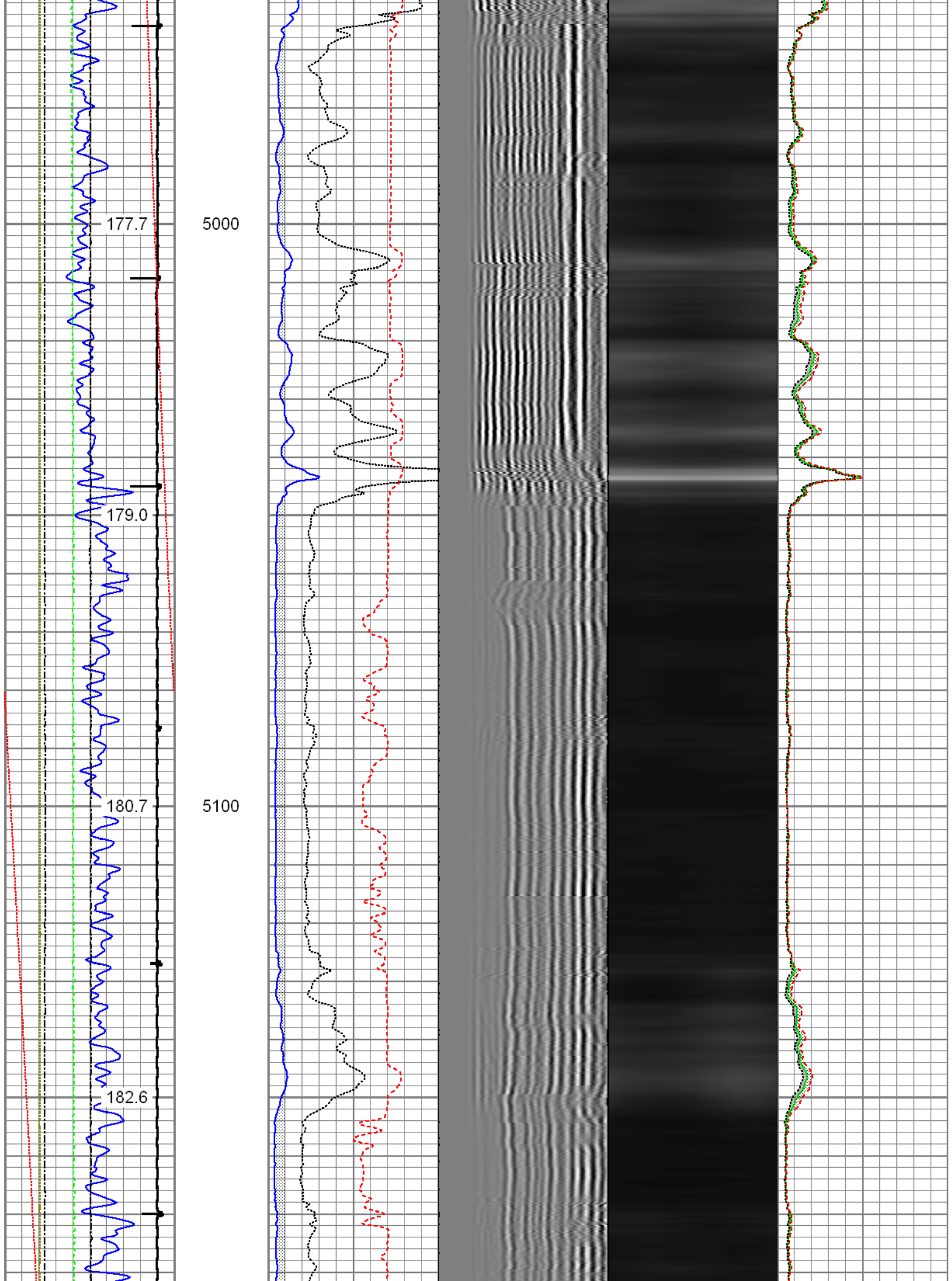
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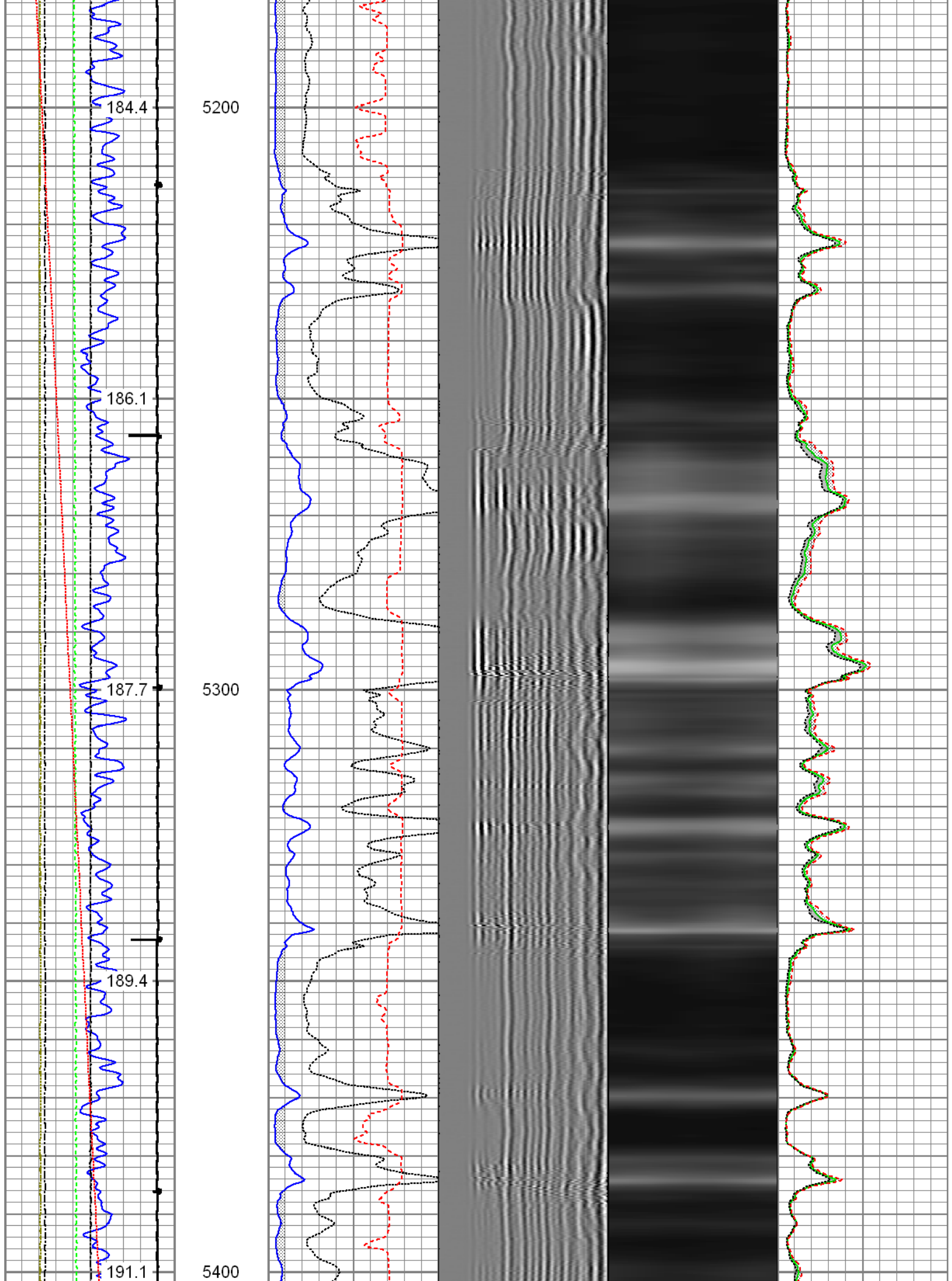
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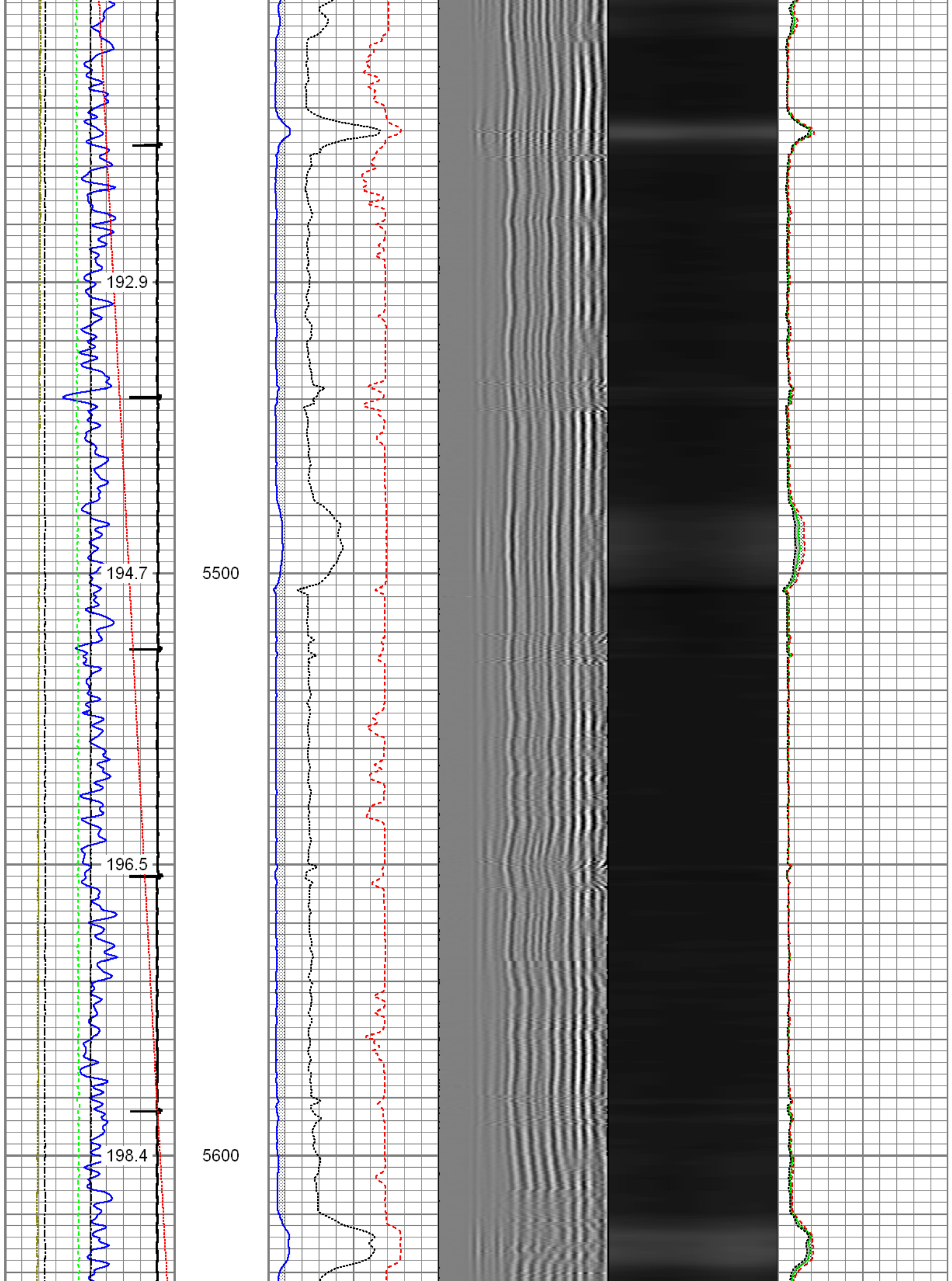


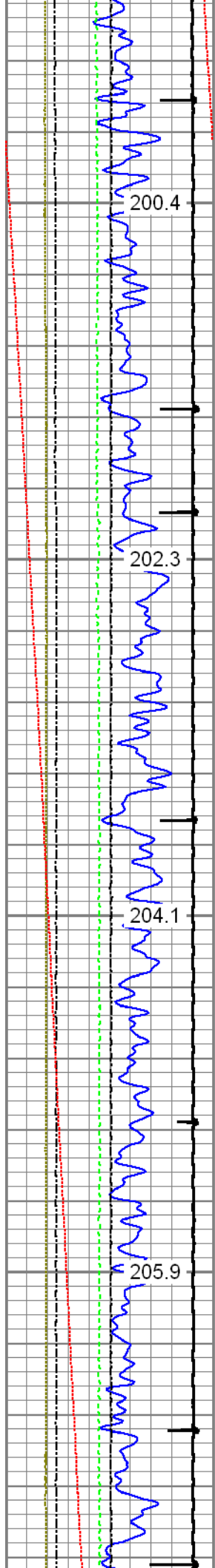






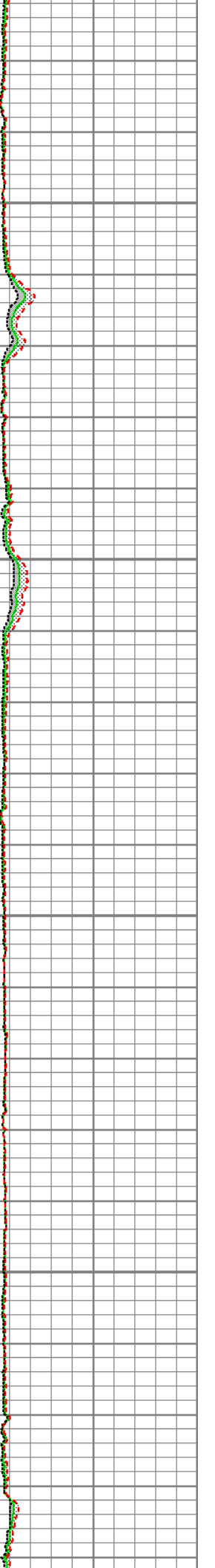
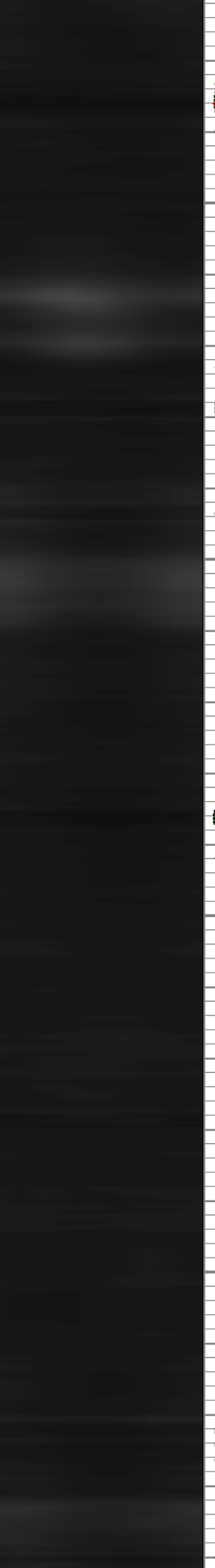
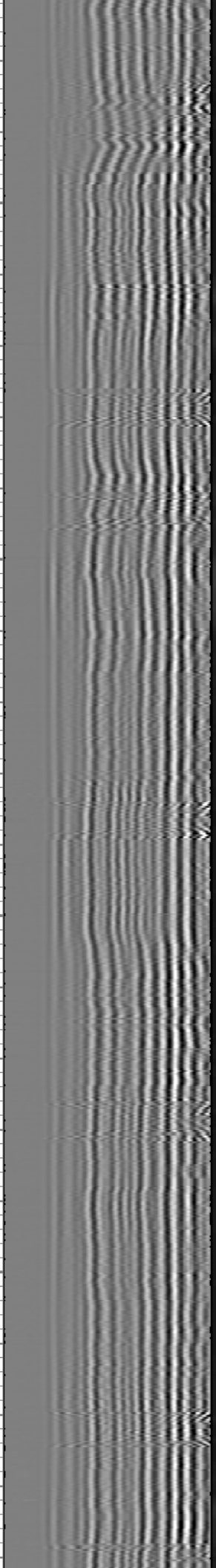
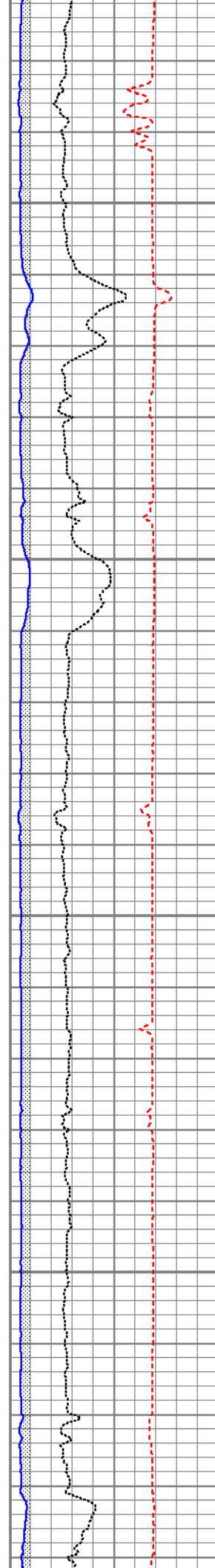


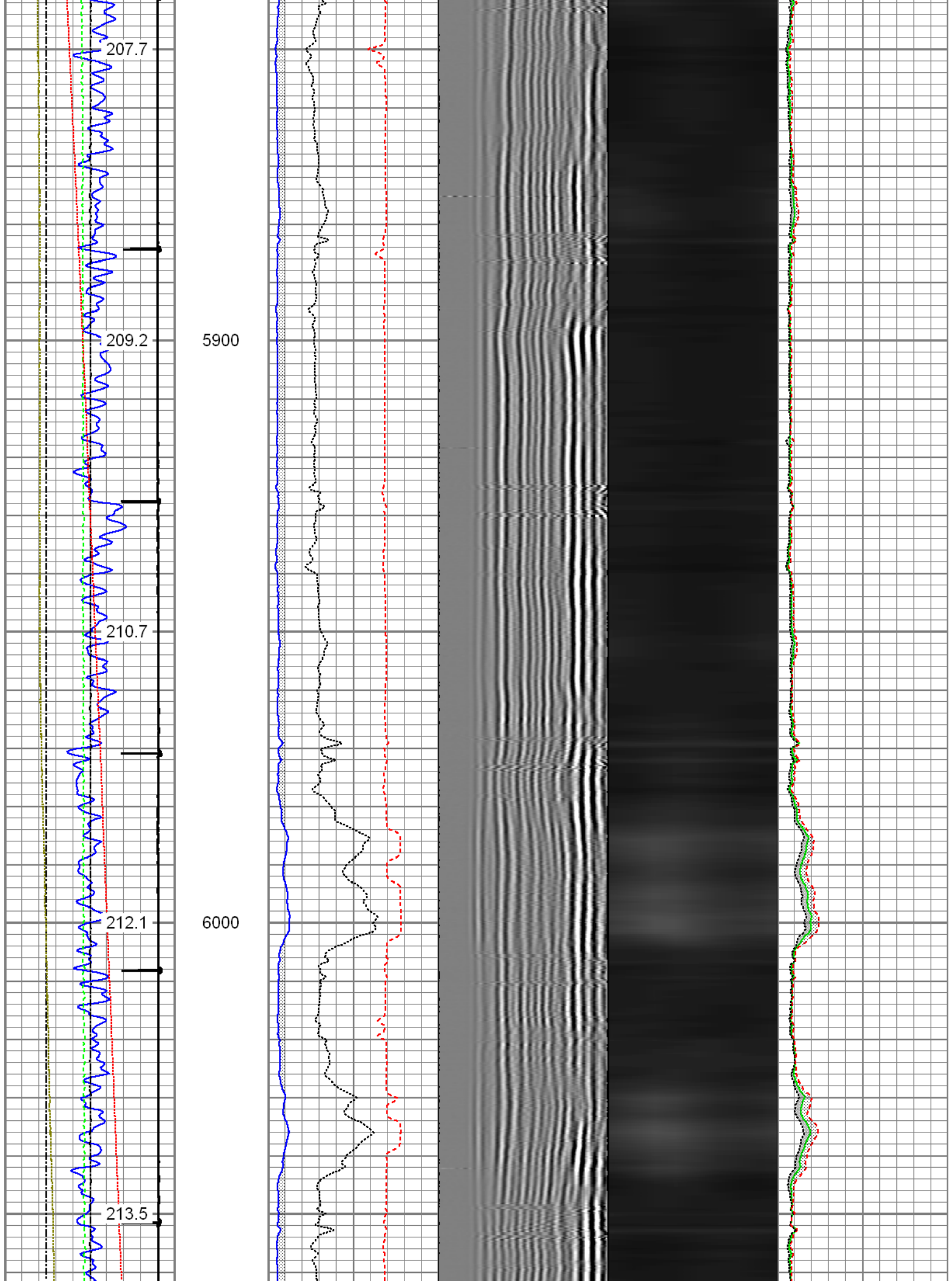


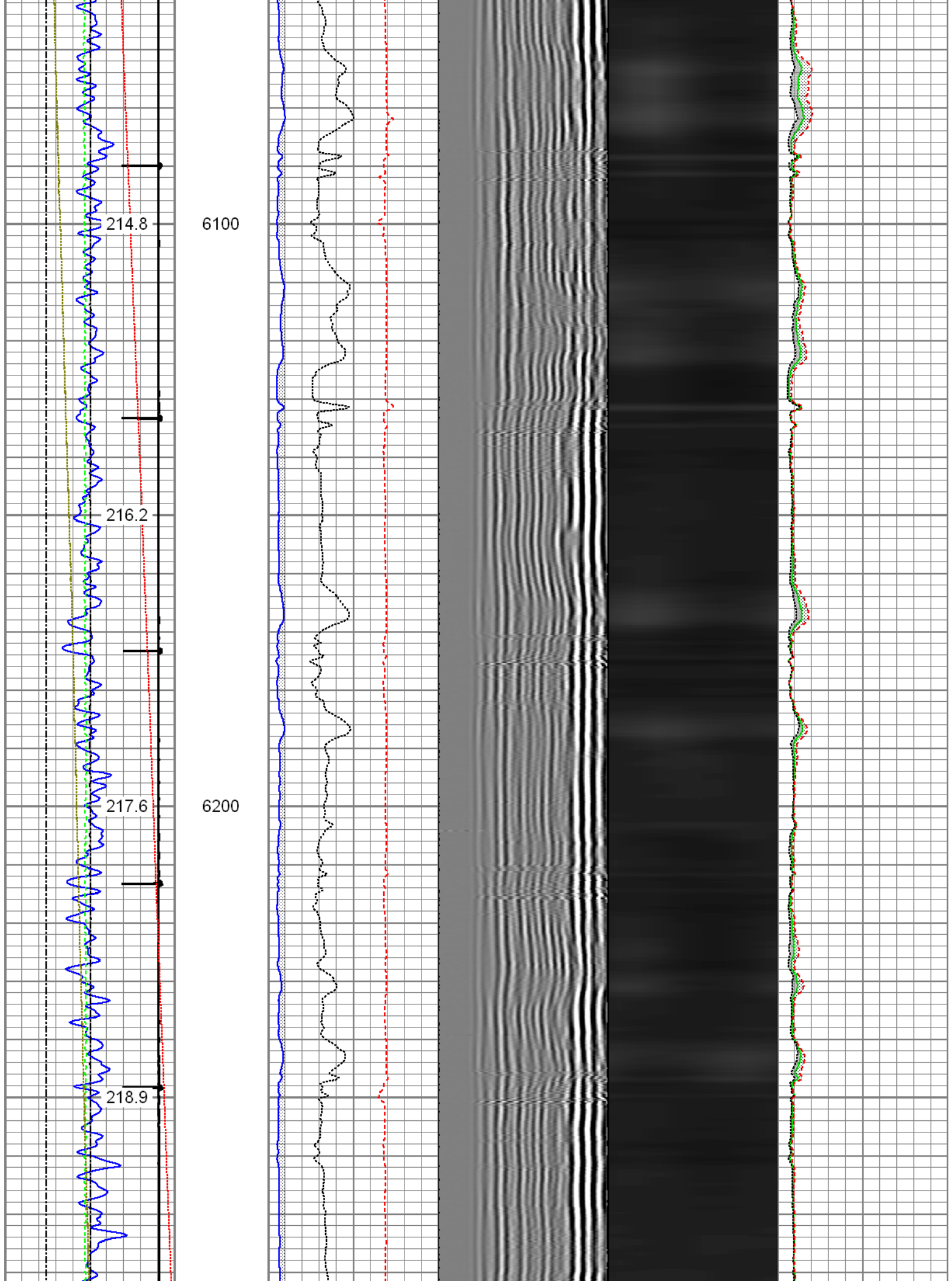


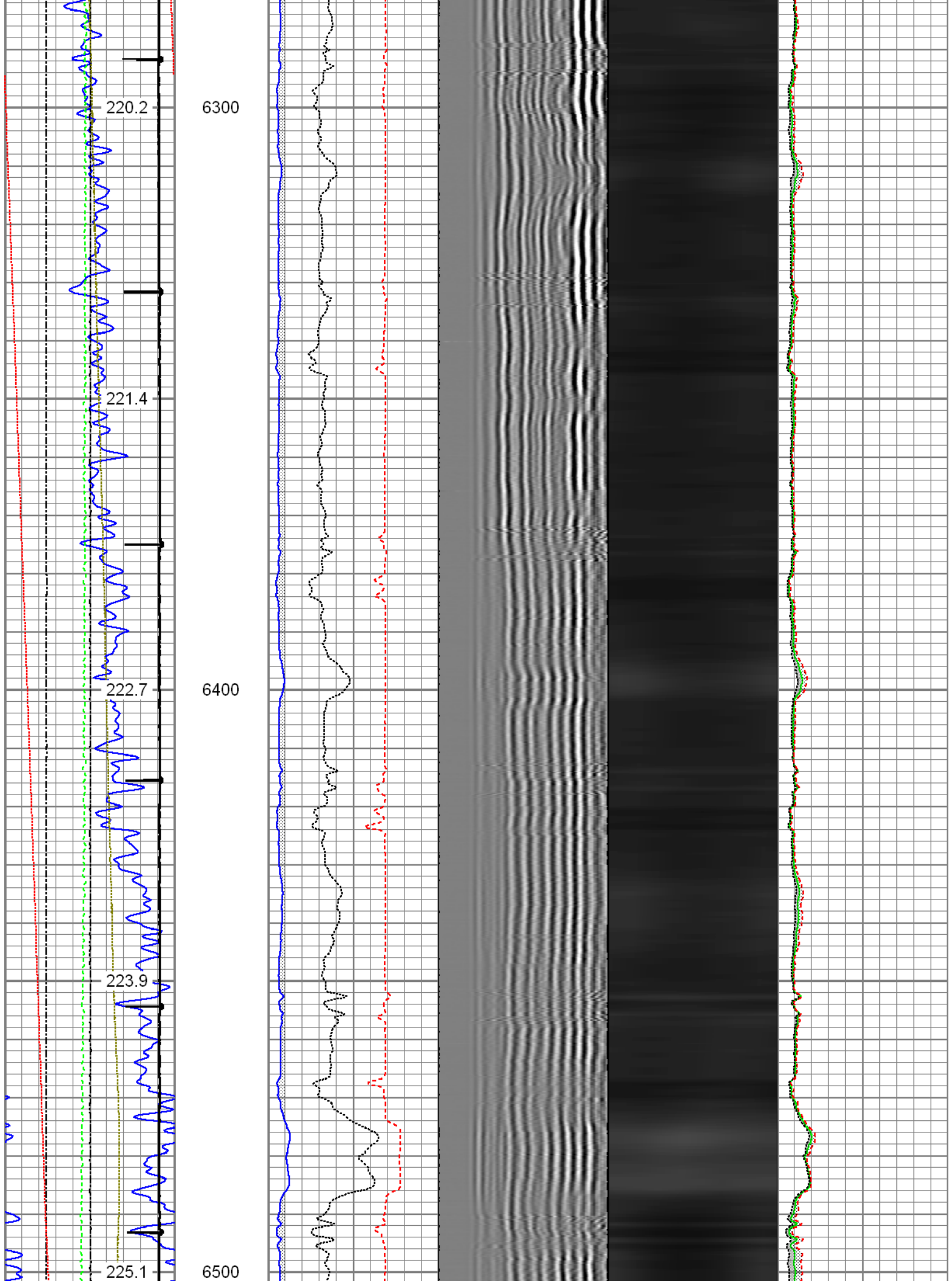
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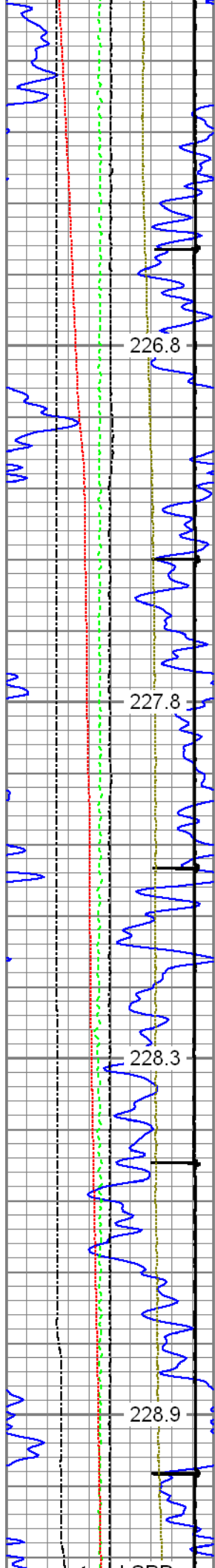
5800











226.8

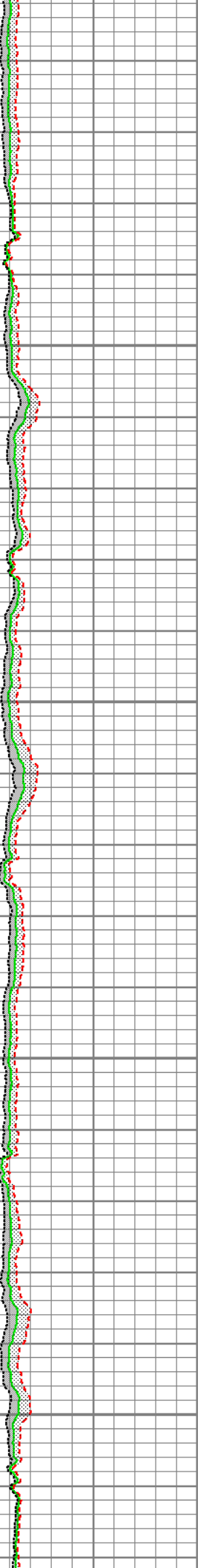
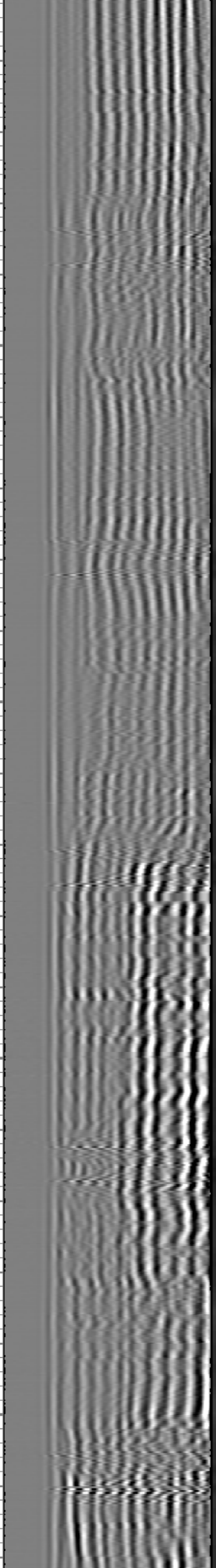
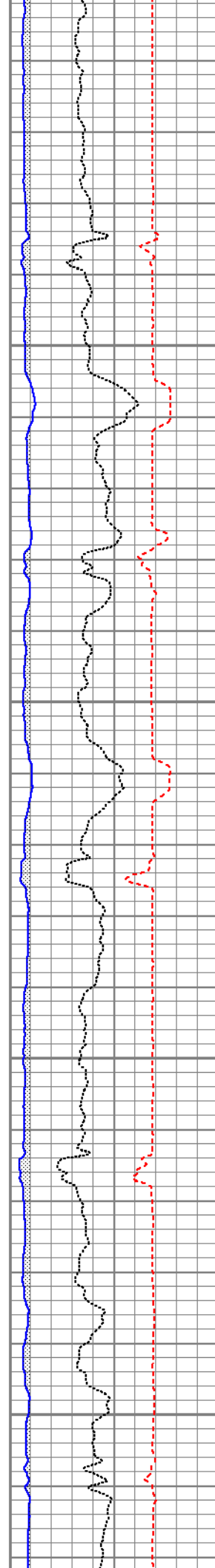
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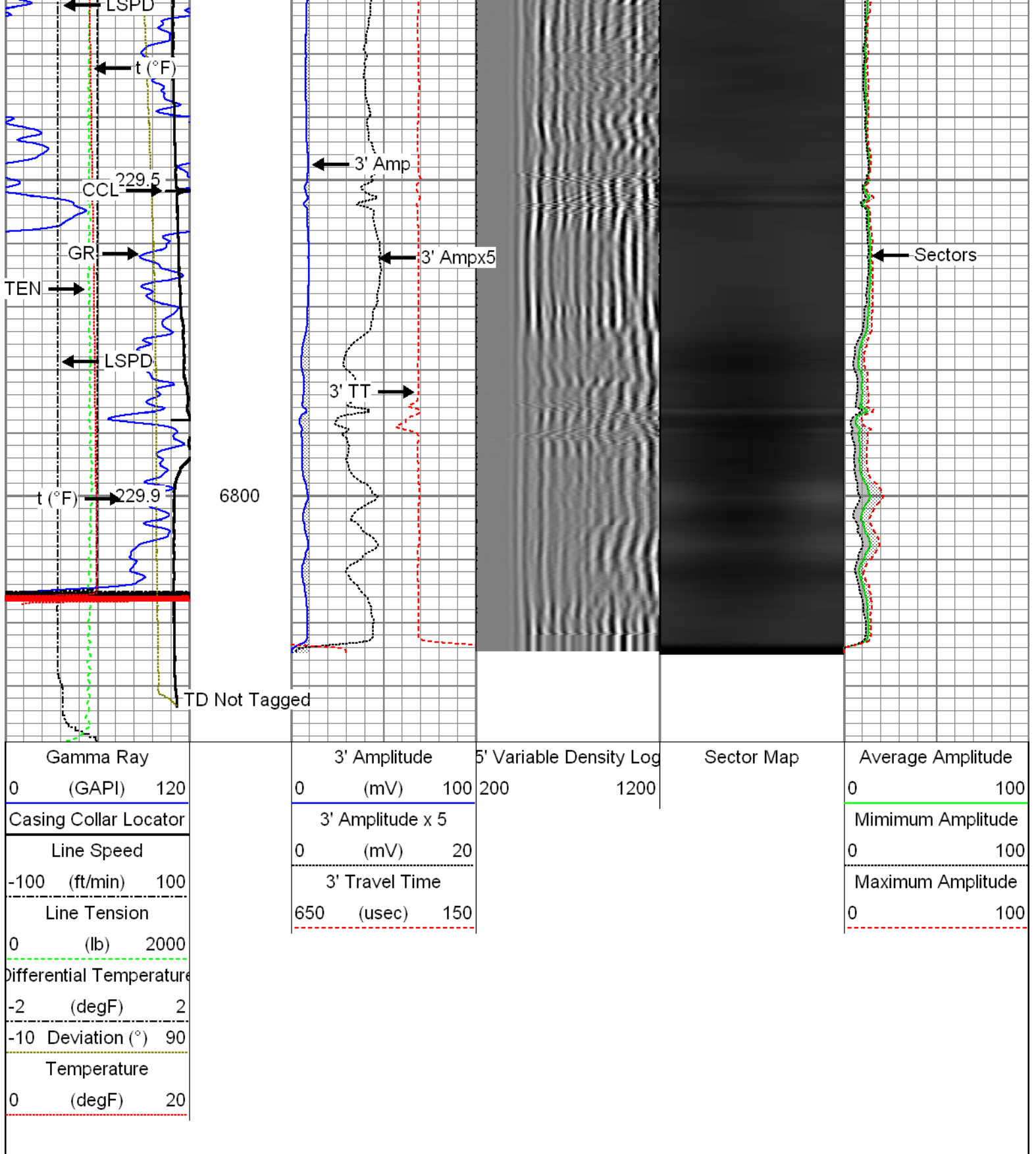
228.3

228.9

6600

6700



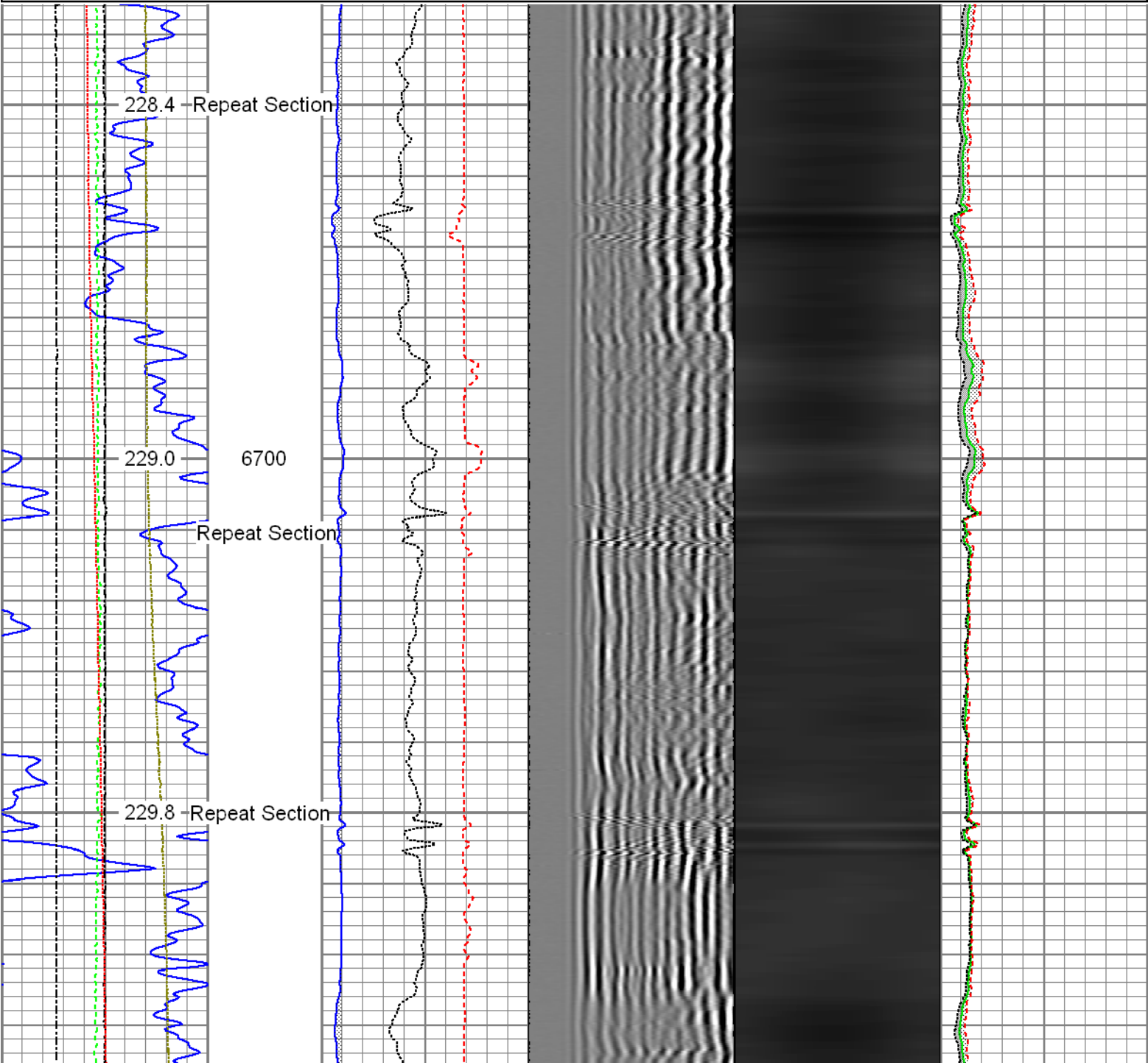


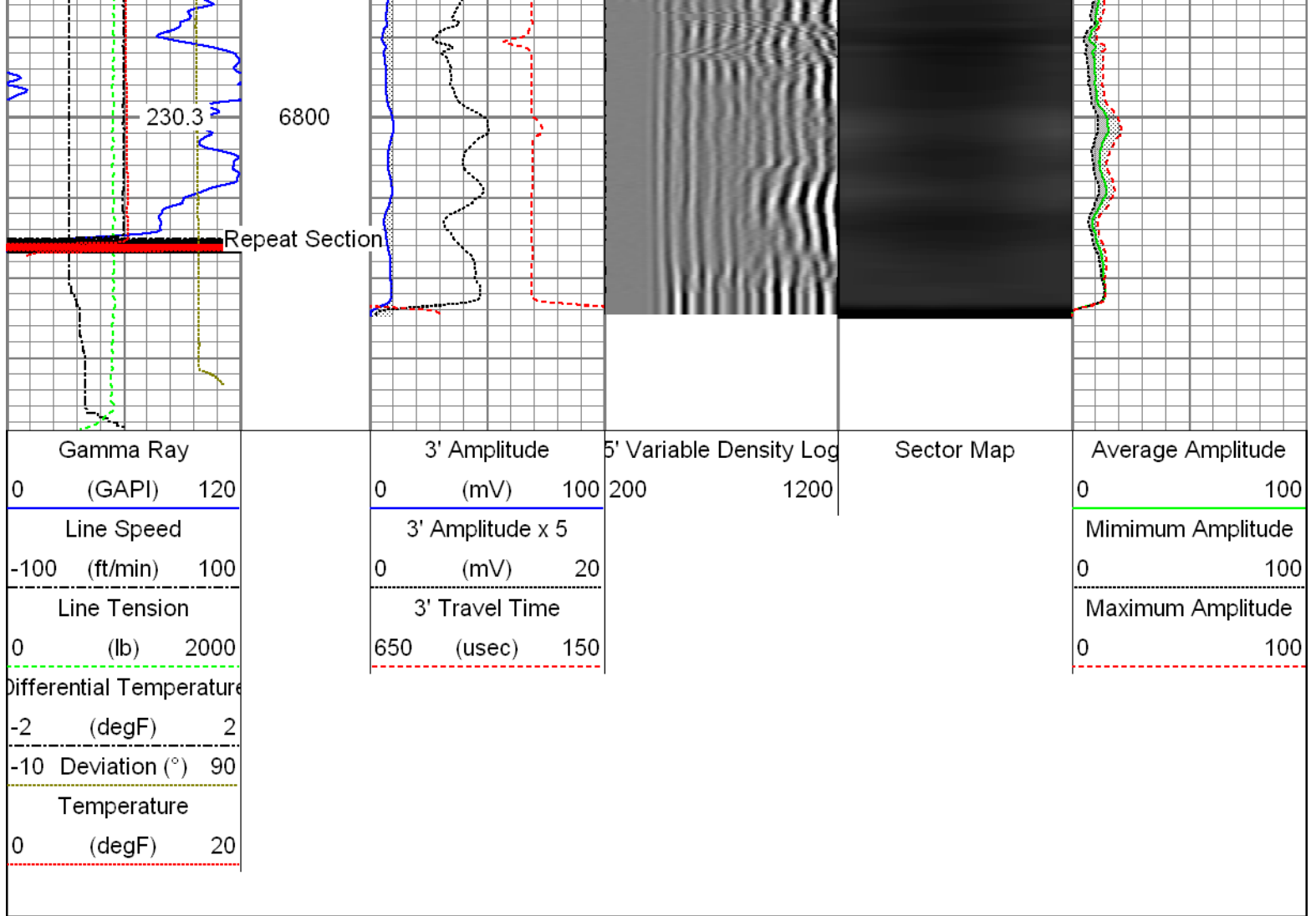
Repeat Pass

Recorded with 2400 PSI Surface Induced Pressure

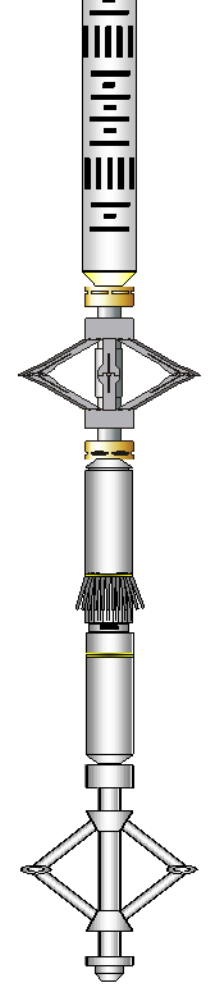
Database File: 08-14-15_noble energy_70 ranch state bb18-689_mit_rbl.db
 Dataset Pathname: repeat
 Presentation Format: rbt4_mit

Dataset Creation:		Fri Aug 14 09:18:40 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
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						
-10 Deviation (°) 90							
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 (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
			UW_PRT-UW_PRT_016 (10025095) Platinum Resistance Thermometer	1.04	1.69	5.20
TEMP	22.45		UW_PRC #4 -DSSRAC (081) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
WV3FT WVFS1	15.42 15.42		UW_RBT-UW_RBT_004 (10022773) 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								
WVF5FT	14.42								
				UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00		
MIT	5.41			UW_MIT-UW_MIT40_027 (211111) 40 Multifinger Imaging Tool	4.54	2.75	61.10		
				UW_PRC-UW_PRC_057 (1102) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00		
TSTAMP	0.00			UW_BUL-UW_BUL_006 (031422) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20		
Dataset: 08-14-15_Noble Energy_70 Ranch State BB18-689_MIT_RBL.db: field/well/run1/main3 Total Length: 28.09 ft Total Weight: 324.50 lb O.D. 3.13 in									

Calibration Report			
Database File:	08-14-15_noble energy_70 ranch state bb18-689_mit_rbl.db		
Dataset Pathname:	main3		
Dataset Creation:	Fri Aug 14 11:02:16 2015 by Log 7.0 B1		
Multi-finger Imaging Tool Calibration Report			
Serial Number:	211111		
Number of Fingers:	40		
Tool Model:	UW_MIT40_027		
Inclinometer Calibration Report			
Performed:	Mon Nov 18 15:31:59 2013		
Calibration Angle:	46		
	Inc X	Inc Y	
Vertical:	1931	1952	
Finger 1 up:	1959	2266	
Finger 31 up:	1608	1962	
Finger 21 up:	1927	1623	
Finger 11 up:	2253	1930	
Sensitivity ratio:	1.0031		
X-axis angle:	272.845		
Deviation const.:	311.818		
Finger Calibration Report			
Performed:	Fri Aug 14 10:33:13 2015		

Ring size: (in)	4	Sens	5	Sens	6	Sens	7
Finger 01:	1443	273.0	1716	294.0	2010	303.0	2313
Finger 02:	1510	253.0	1763	260.0	2023	266.0	2289
Finger 03:	1430	279.0	1709	289.0	1998	301.0	2299
Finger 04:	1450	279.0	1729	289.0	2018	294.0	2312
Finger 05:	1488	272.0	1760	278.0	2038	282.0	2320
Finger 06:	1419	282.0	1701	292.0	1993	304.0	2297
Finger 07:	1439	282.0	1721	289.0	2010	301.0	2311
Finger 08:	1437	274.0	1711	287.0	1998	294.0	2292
Finger 09:	1428	278.0	1706	292.0	1998	302.0	2300
Finger 10:	1441	269.0	1710	284.0	1994	292.0	2286
Finger 11:	1426	281.0	1707	289.0	1996	301.0	2297
Finger 12:	1376	283.0	1659	294.0	1953	307.0	2260
Finger 13:	1475	264.0	1739	271.0	2010	279.0	2289
Finger 14:	1413	267.0	1680	282.0	1962	296.0	2258
Finger 15:	1405	281.0	1686	292.0	1978	305.0	2283
Finger 16:	1407	275.0	1682	289.0	1971	300.0	2271
Finger 17:	1413	287.0	1700	295.0	1995	308.0	2303
Finger 18:	1360	271.0	1631	283.0	1914	296.0	2210
Finger 19:	1409	280.0	1689	288.0	1977	297.0	2274
Finger 20:	1410	283.0	1693	288.0	1981	300.0	2281
Finger 21:	1365	295.0	1660	302.0	1962	315.0	2277
Finger 22:	1387	276.0	1663	284.0	1947	292.0	2239
Finger 23:	1389	284.0	1673	288.0	1961	298.0	2259
Finger 24:	1417	285.0	1702	286.0	1988	292.0	2280
Finger 25:	1346	281.0	1627	281.0	1908	294.0	2202
Finger 26:	1331	286.0	1617	290.0	1907	301.0	2208
Finger 27:	1422	282.0	1704	286.0	1990	293.0	2283
Finger 28:	1411	290.0	1701	293.0	1994	301.0	2295
Finger 29:	1465	273.0	1738	276.0	2014	284.0	2298
Finger 30:	1376	288.0	1664	294.0	1958	305.0	2263
Finger 31:	1407	292.0	1699	299.0	1998	306.0	2304
Finger 32:	1470	275.0	1745	279.0	2024	284.0	2308
Finger 33:	1424	290.0	1714	302.0	2016	310.0	2326
Finger 34:	1429	286.0	1715	293.0	2008	306.0	2314
Finger 35:	1487	260.0	1747	271.0	2018	274.0	2292
Finger 36:	1471	270.0	1741	283.0	2024	293.0	2317
Finger 37:	1387	274.0	1661	278.0	1939	294.0	2233
Finger 38:	1518	255.0	1773	260.0	2033	271.0	2304
Finger 39:	1447	274.0	1721	284.0	2005	290.0	2295
Finger 40:	1413	288.0	1701	298.0	1999	310.0	2309

Segmented Cement Bond Log Calibration Report							
Serial Number:				10022773			
Tool Model:				UW_RBT_004			
Calibration Casing Diameter:				7.000	in		
Calibration Depth:				96.804	ft		

Master Calibration, performed Fri Aug 14 08:41:21 2015:							
	Raw (v)		Calibrated (mv)		Results		
	Zero	Cal	Zero	Cal	Gain	Offset	
3FT	0.002	0.790	0.800	62.165	77.912	0.610	
5FT	-0.001	0.786	0.800	62.165	77.923	0.895	
S1	0.003	0.750	0.000	100.000	133.892	-0.363	
S2	0.001	0.783	0.000	100.000	127.835	-0.156	
S3	0.002	0.779	0.000	100.000	128.696	-0.314	
S4	0.002	0.768	0.000	100.000	130.519	-0.213	
S5	0.002	0.774	0.000	100.000	129.532	-0.316	
S6	0.002	0.759	0.000	100.000	132.029	-0.256	

S7	0.002	0.750	0.000	100.000	133.798	-0.327
S8	0.002	0.751	0.000	100.000	133.582	-0.324

Temperature Calibration Report

Serial Number:	10025095
Tool Model:	UW_PRT_016
Performed:	Wed Feb 11 13:43:20 2015

Point #	Reading		Reference	
1	12798.00	cps	68.00	degF
2	18136.00	cps	104.00	degF
3	29513.00	cps	176.00	degF
4	40905.00	cps	248.00	degF
5	52487.00	cps	320.00	degF
6	58362.00	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	70 Ranch State BB18-689
Field	Wattenberg
County	Weld
State	Colorado