



Radial Cement Bond  
Gamma Ray  
Casing Collar Log

Company	Kerr-McGee Oil & Gas Onshore, L.P.			Company	Kerr-McGee Oil & Gas Onshore, L.P.		
Well	Cream State 28C-21HZ			Well	Cream State 28C-21HZ		
Field	Wattenberg			Field	Wattenberg		
County	Weld			County	Weld		
State	Colorado			State	Colorado		
Location:				API # : 05-123-40949			
SEC 28 TWP 3N RGE 65W				Other Services Gauge Ring MIT			
Permanent Datum	Ground Level	Elevation		Elevation			
Log Measured From	Kelly Bushing	20 FT		K.B. 4848' D.F. 4847' G.L. 4828'			
Drilling Measured From	Kelly Bushing						

Date	22-JUL-2015						
Run Number	One						
Depth Driller	12654.03 FT						
Depth Logger	7100.8 FT						
Bottom Logged Interval	7095.8 FT						
Top Log Interval	Surface						
Open Hole Size	8.765"						
Type Fluid	Water						
Density / Viscosity	8.34 lbm/gal						
Max. Recorded Temp.	243.6 °F						
Estimated Cement Top	38 FT						
Time Well Ready	ROA						
Time Logger on Bottom	8:30 AM						
Equipment Number	HD-0324						
Location	Fort Lupton, CO						
Recorded By	R. Cameron			S. Hopper			
Witnessed By	Josh Gustafson						
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 LTC	Surface	1221.87 FT		
Intermediate #1	7	26	HCP-110 LTC	Surface	7501.27 FT		
Intermediate #2							
Liner	4 1/2	11.6	HCP-110 LTC	6596 FT	12654.03 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 6596 FT  
Adjusted log -6 FT from KB zero to correlate with liner top  
Log ran with 2800 PSI surface induced pressure

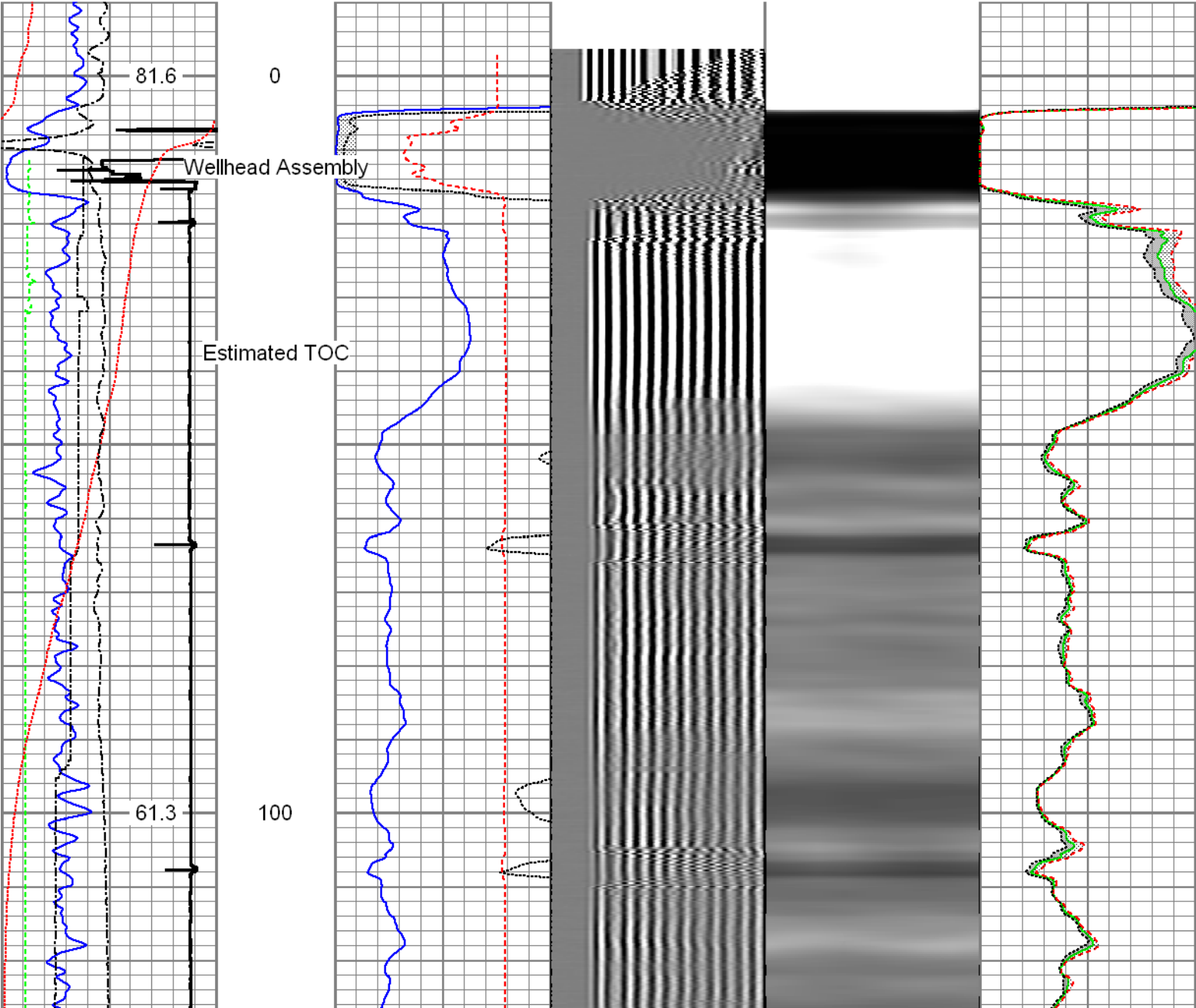
Thank you for choosing FMC Technologies Completion Services, Inc.!!

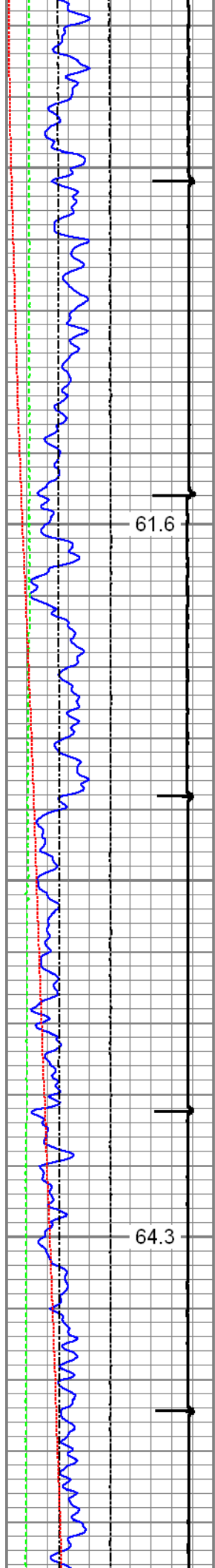


Main Pass

Recorded with 2800 PSI Surface Induced Pressure

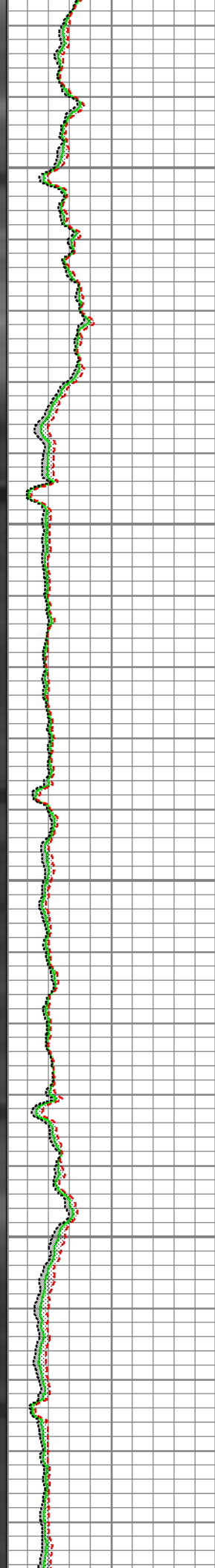
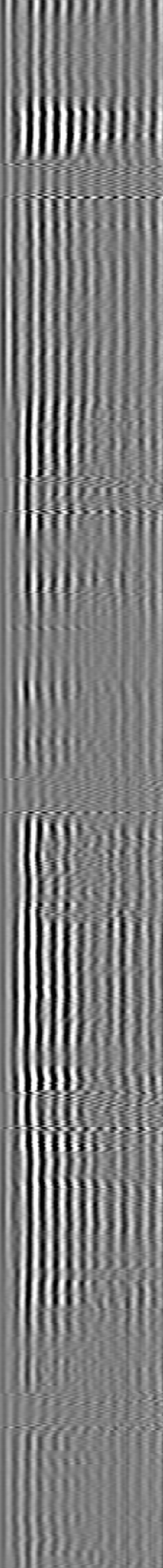
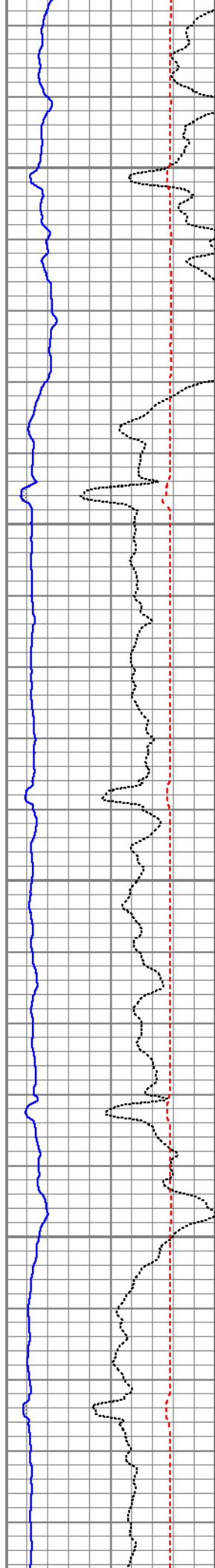
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

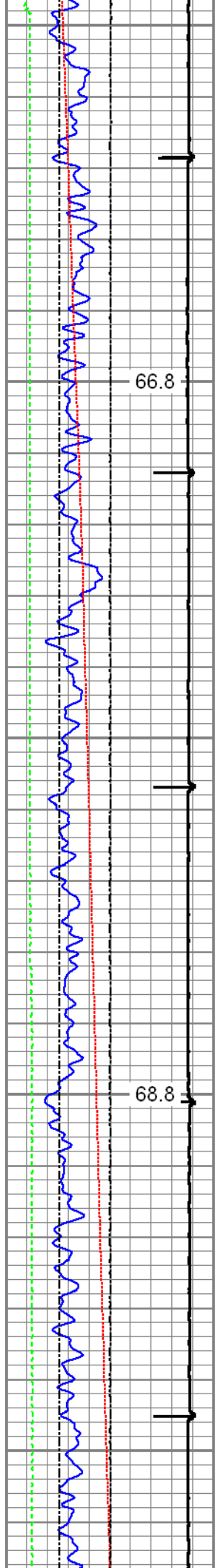




200

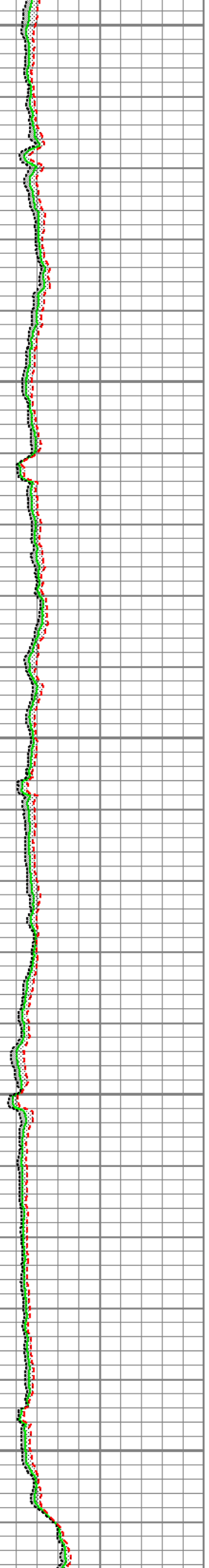
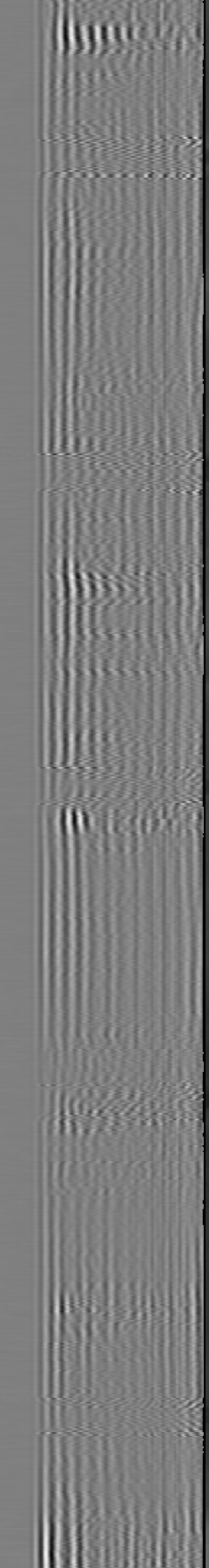
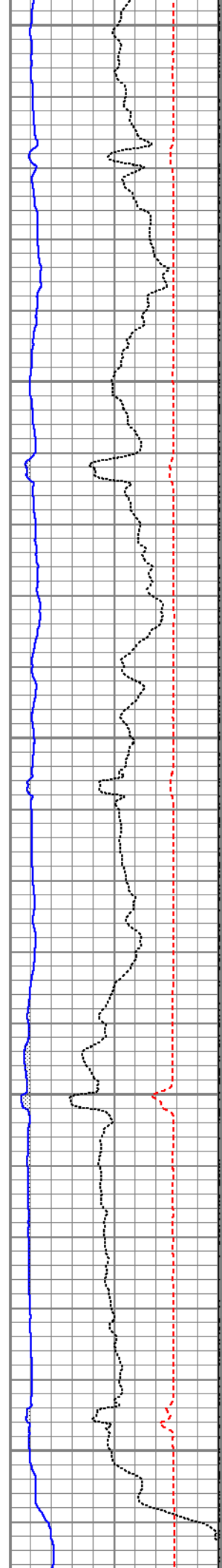
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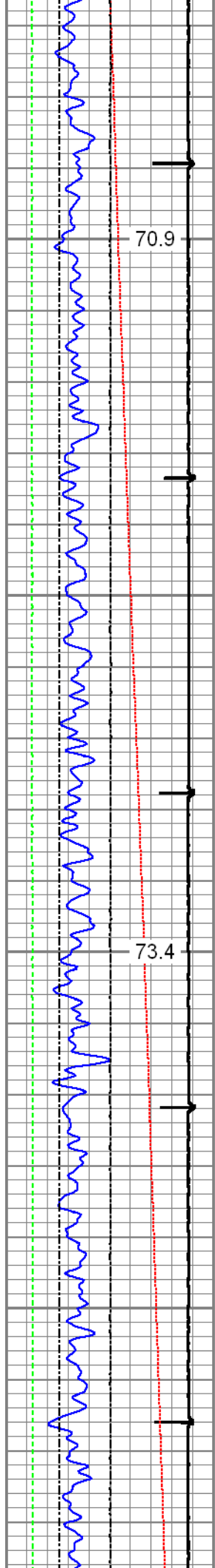




400

500



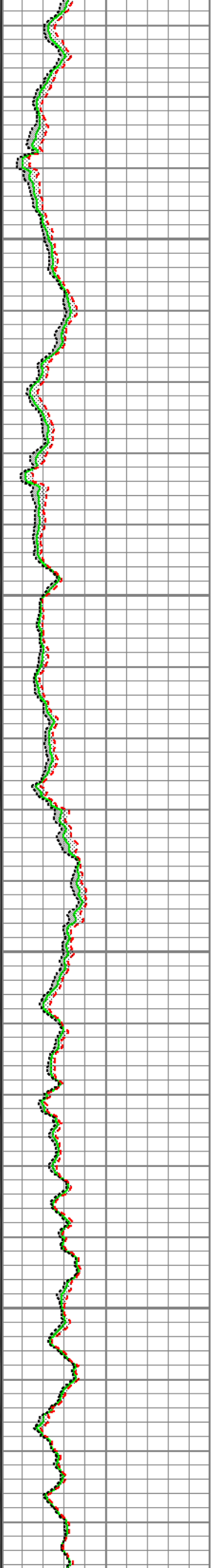
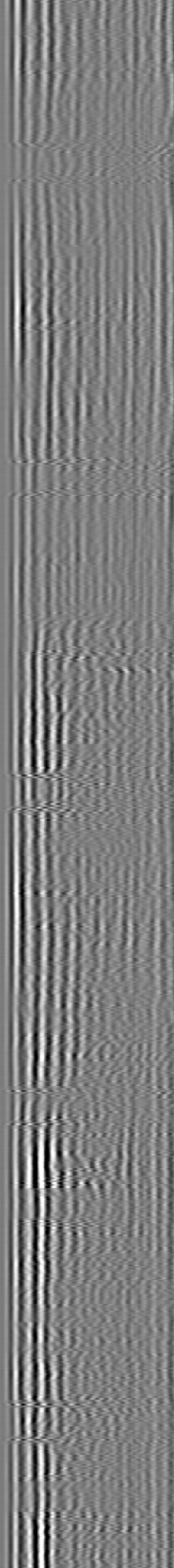
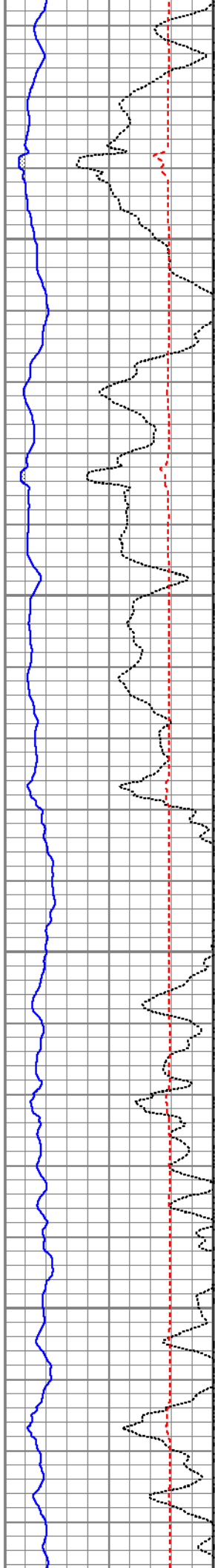


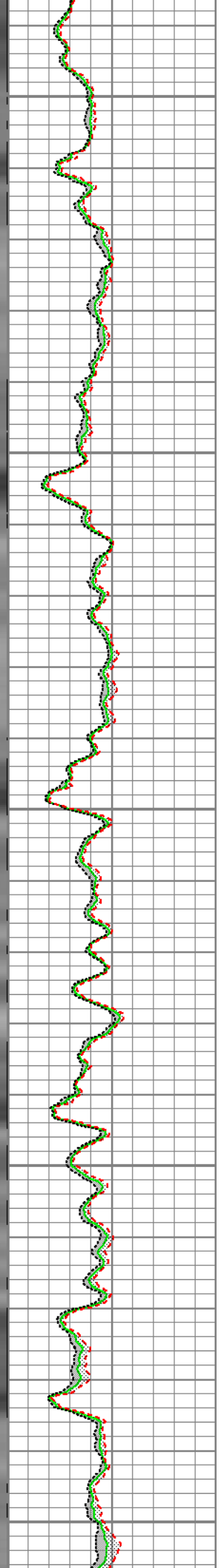
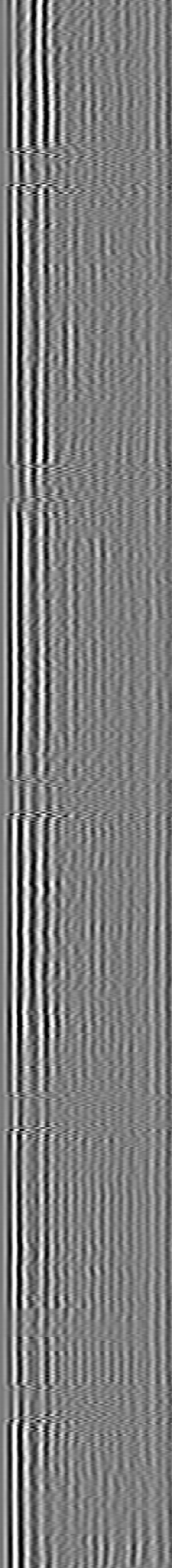
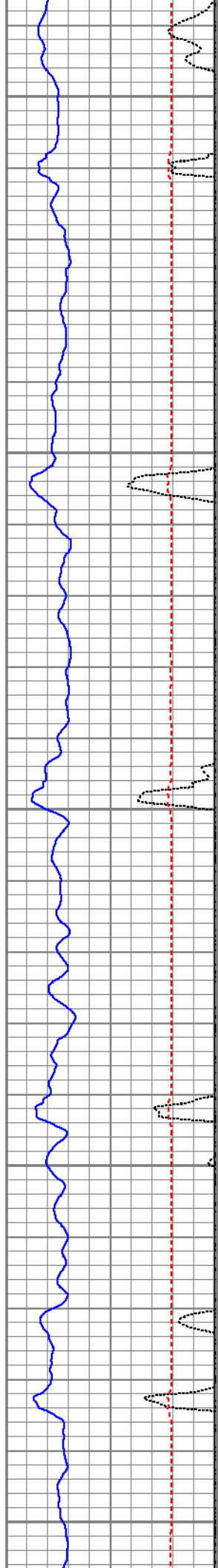
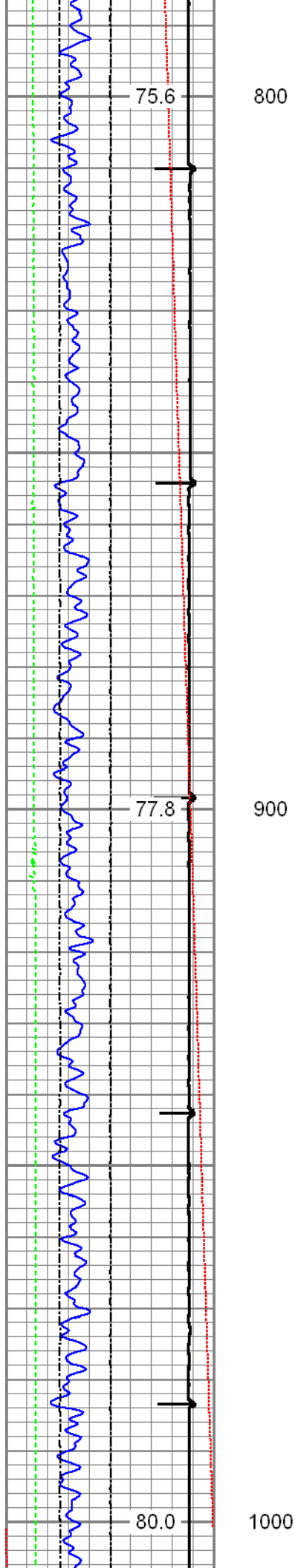
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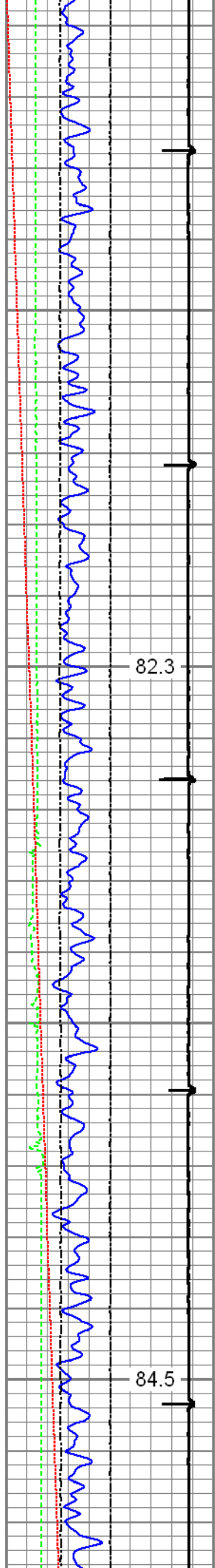
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73.4

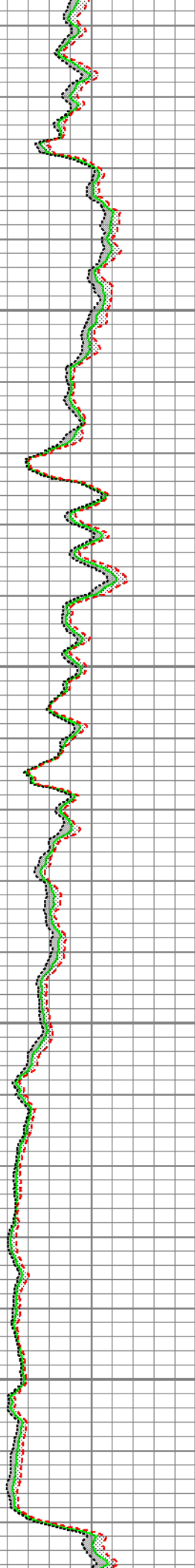
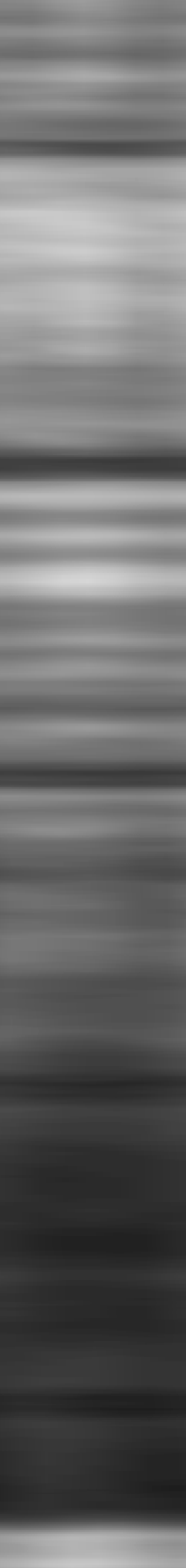
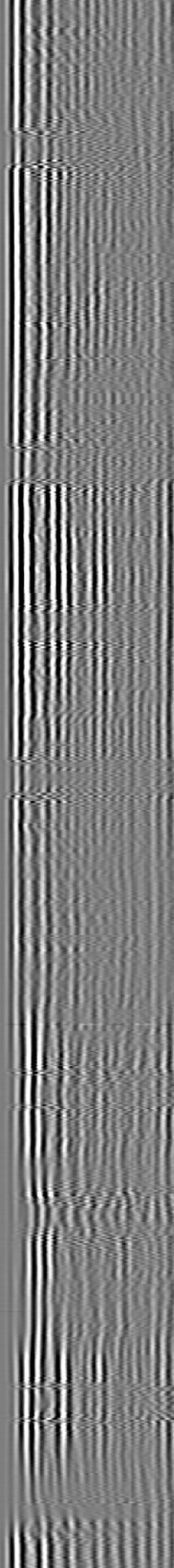
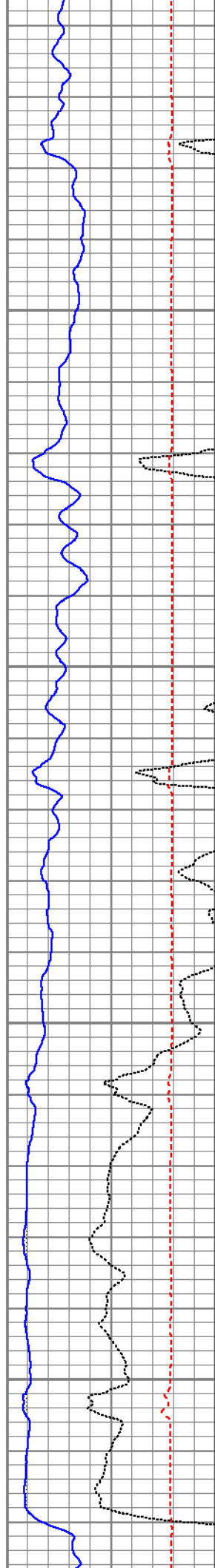
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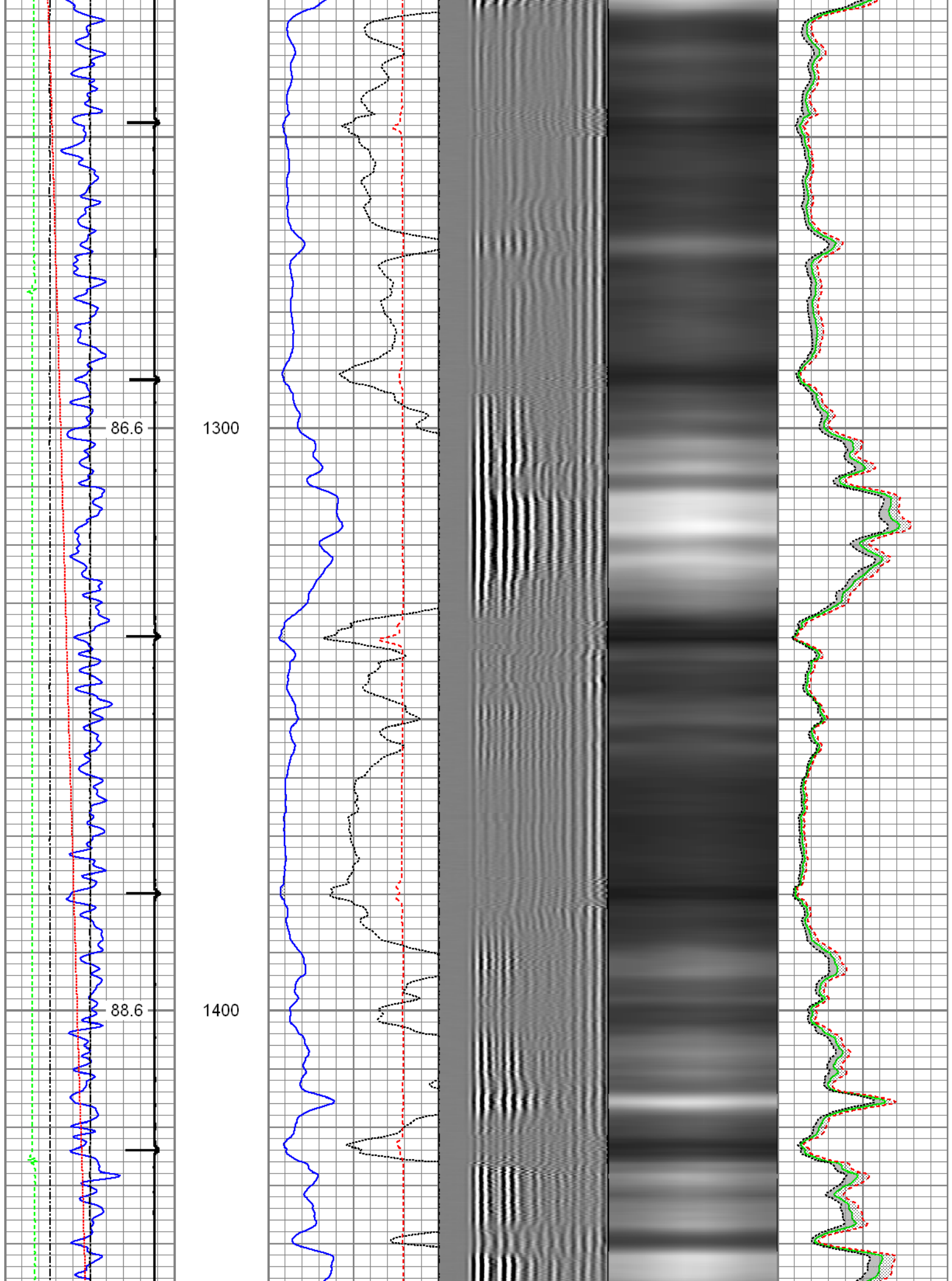


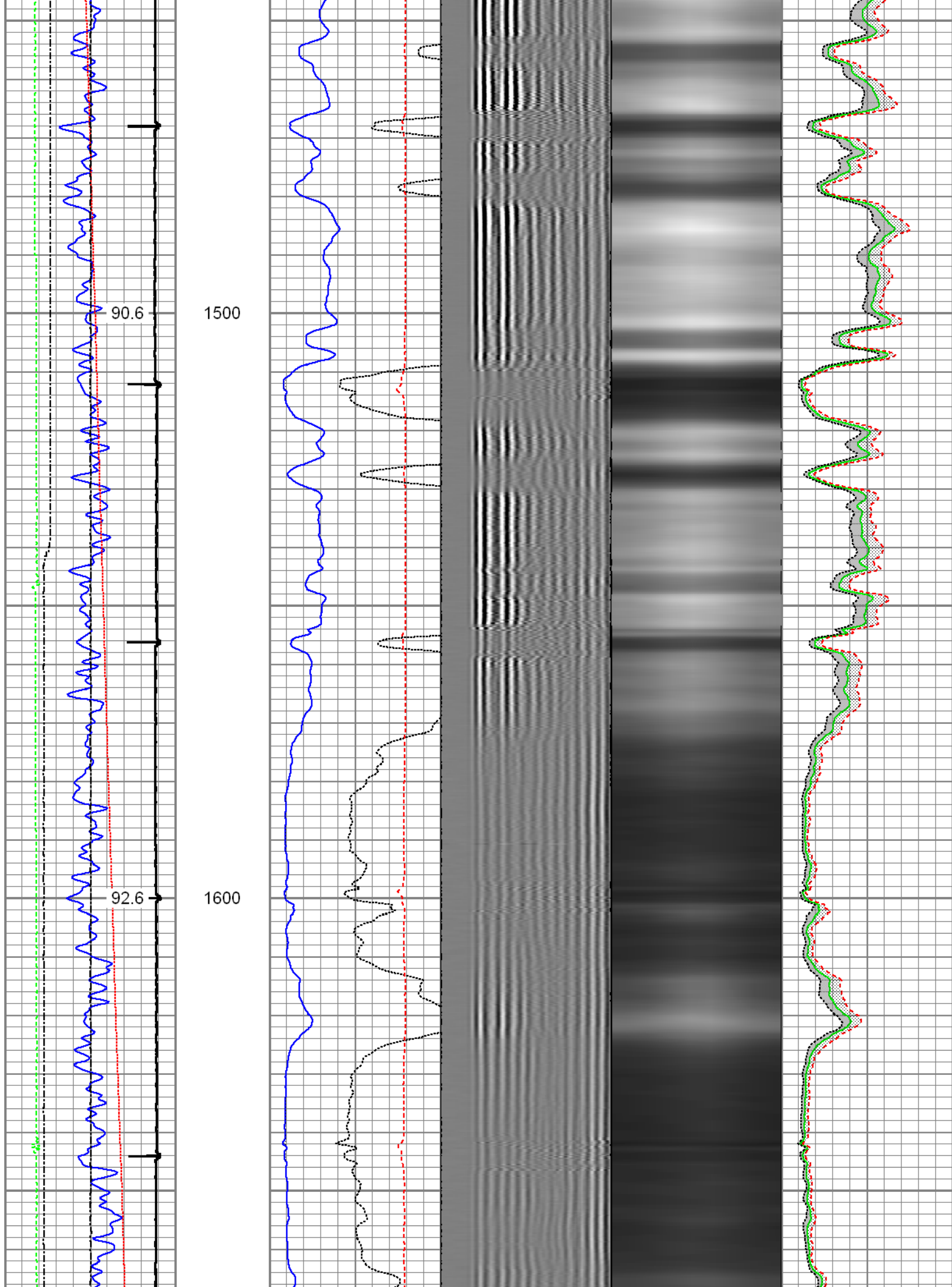


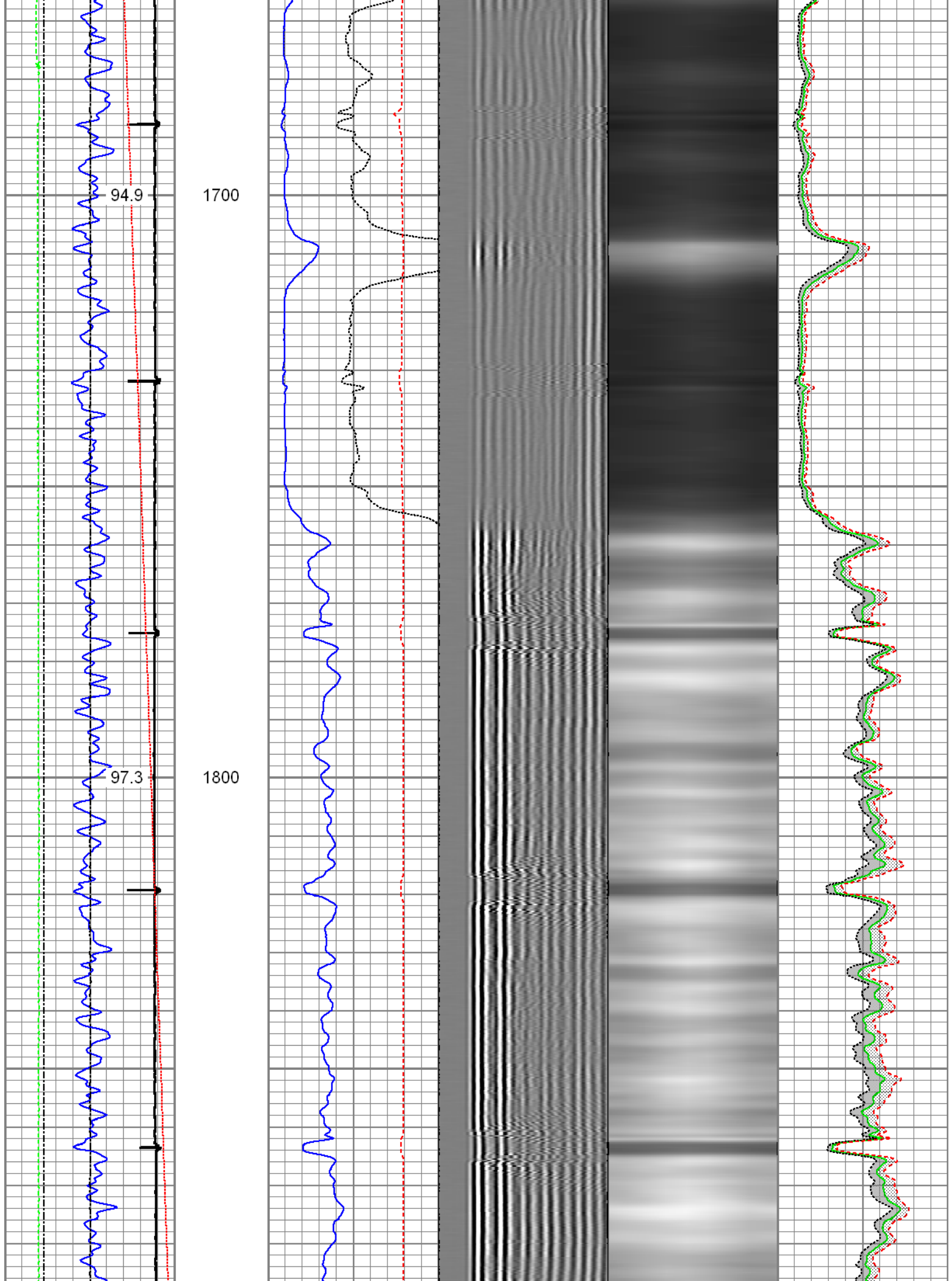
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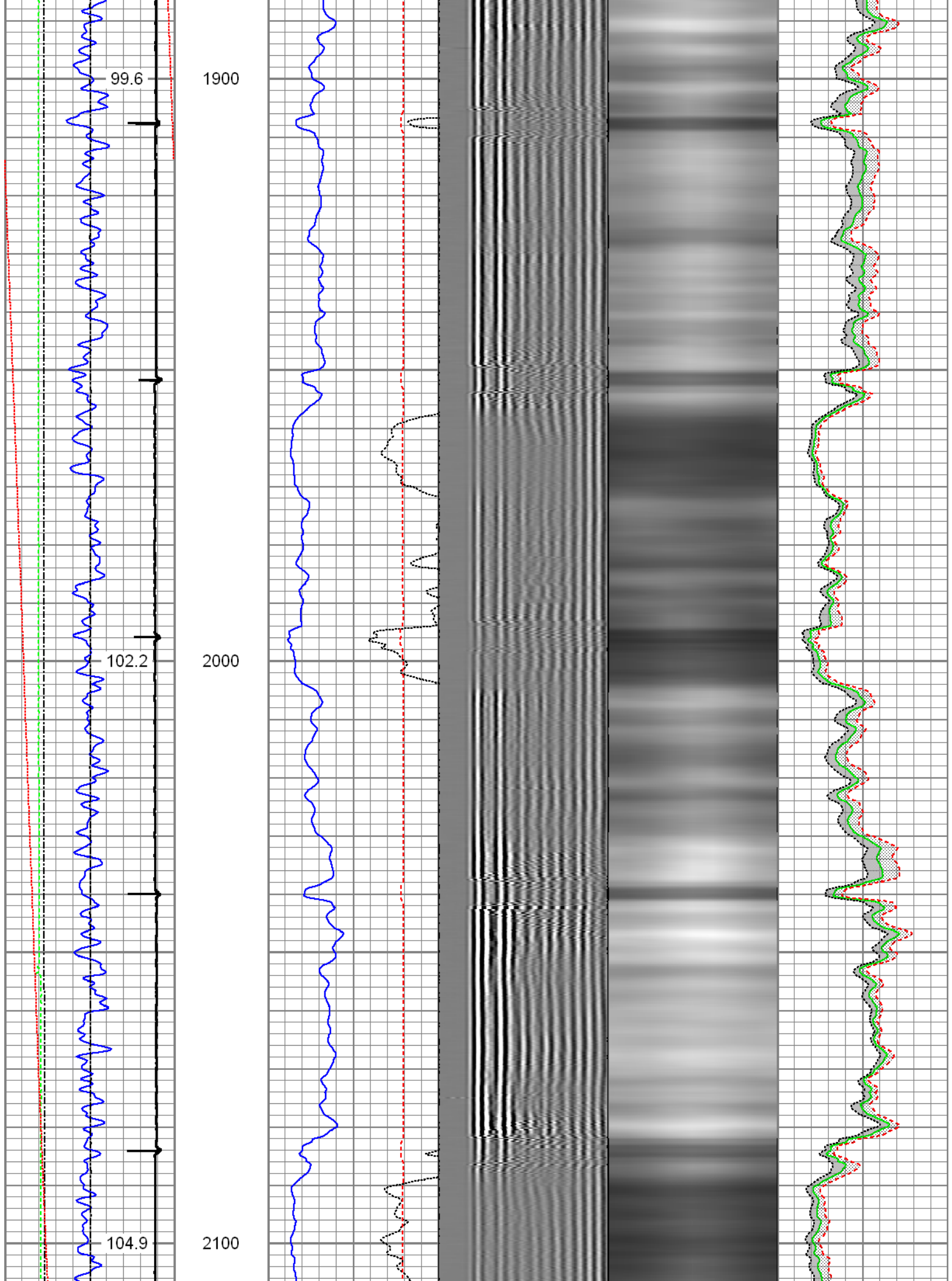


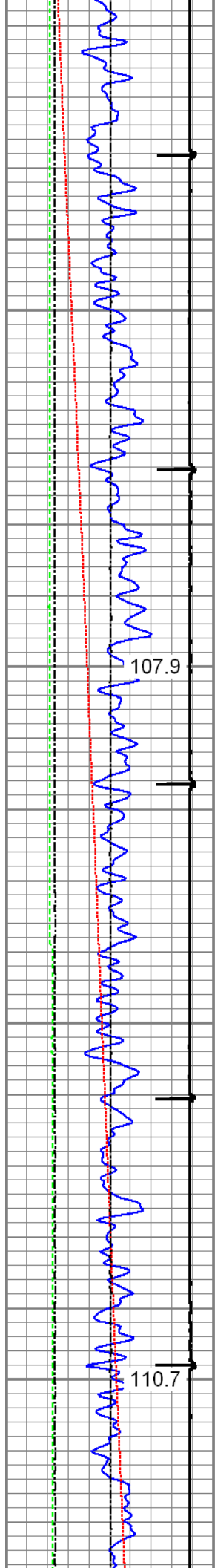
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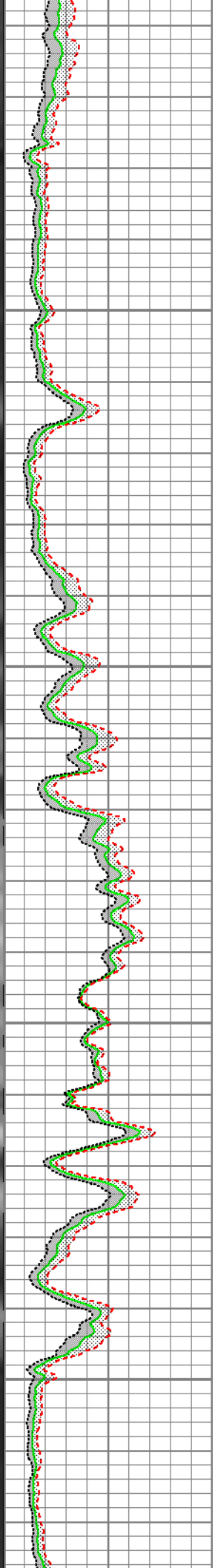
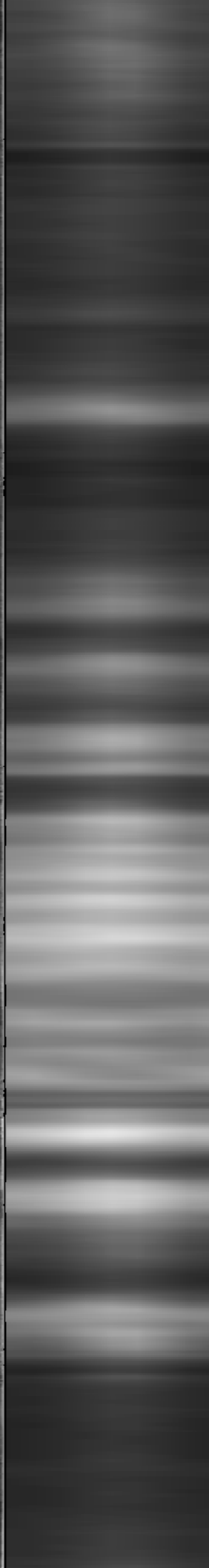
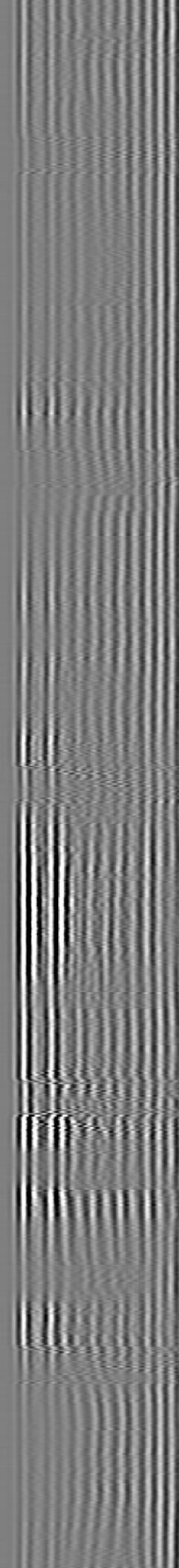
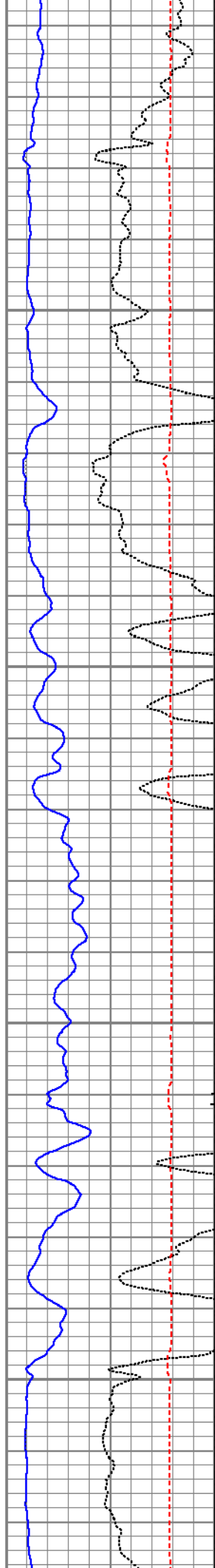


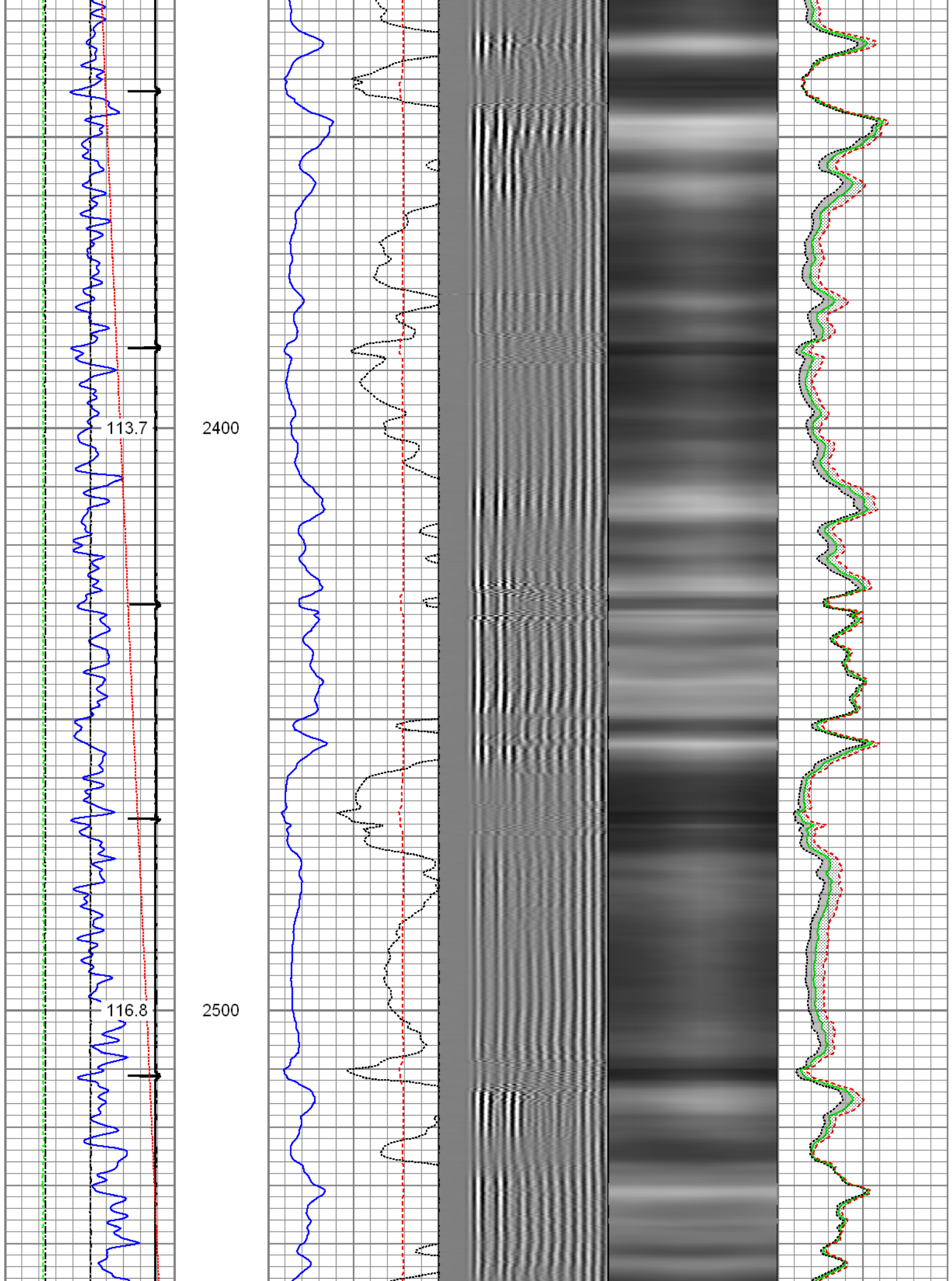


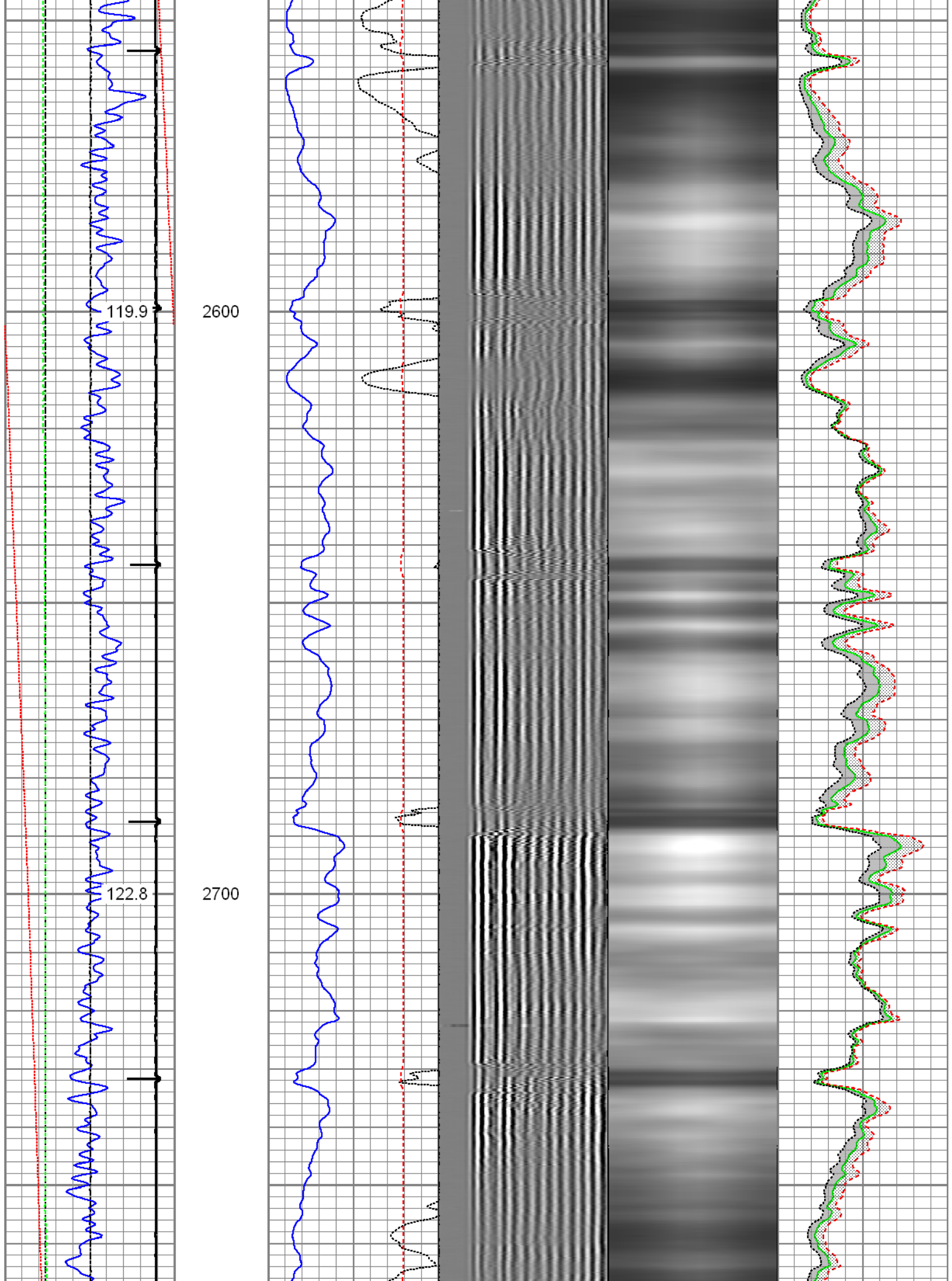


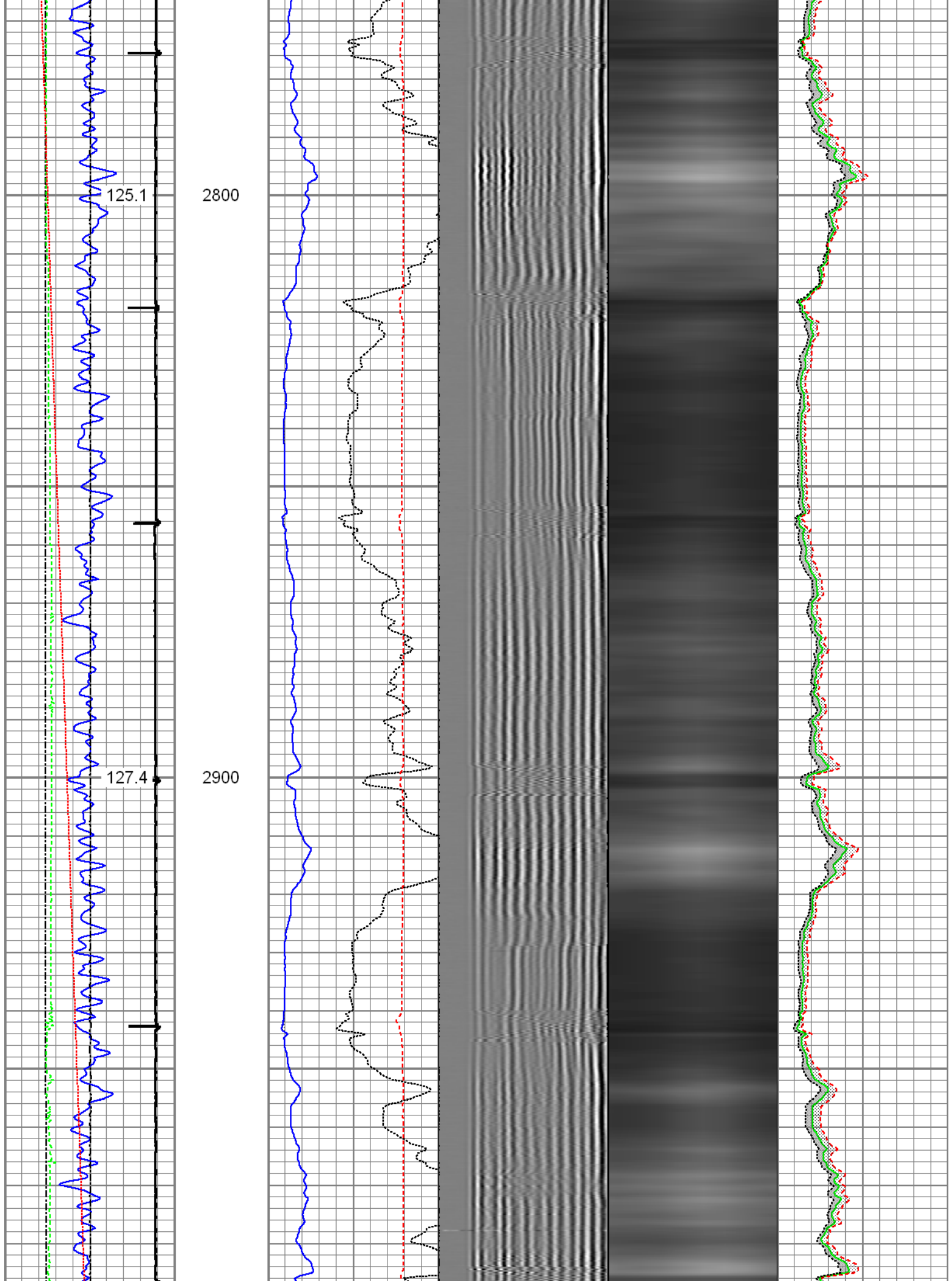
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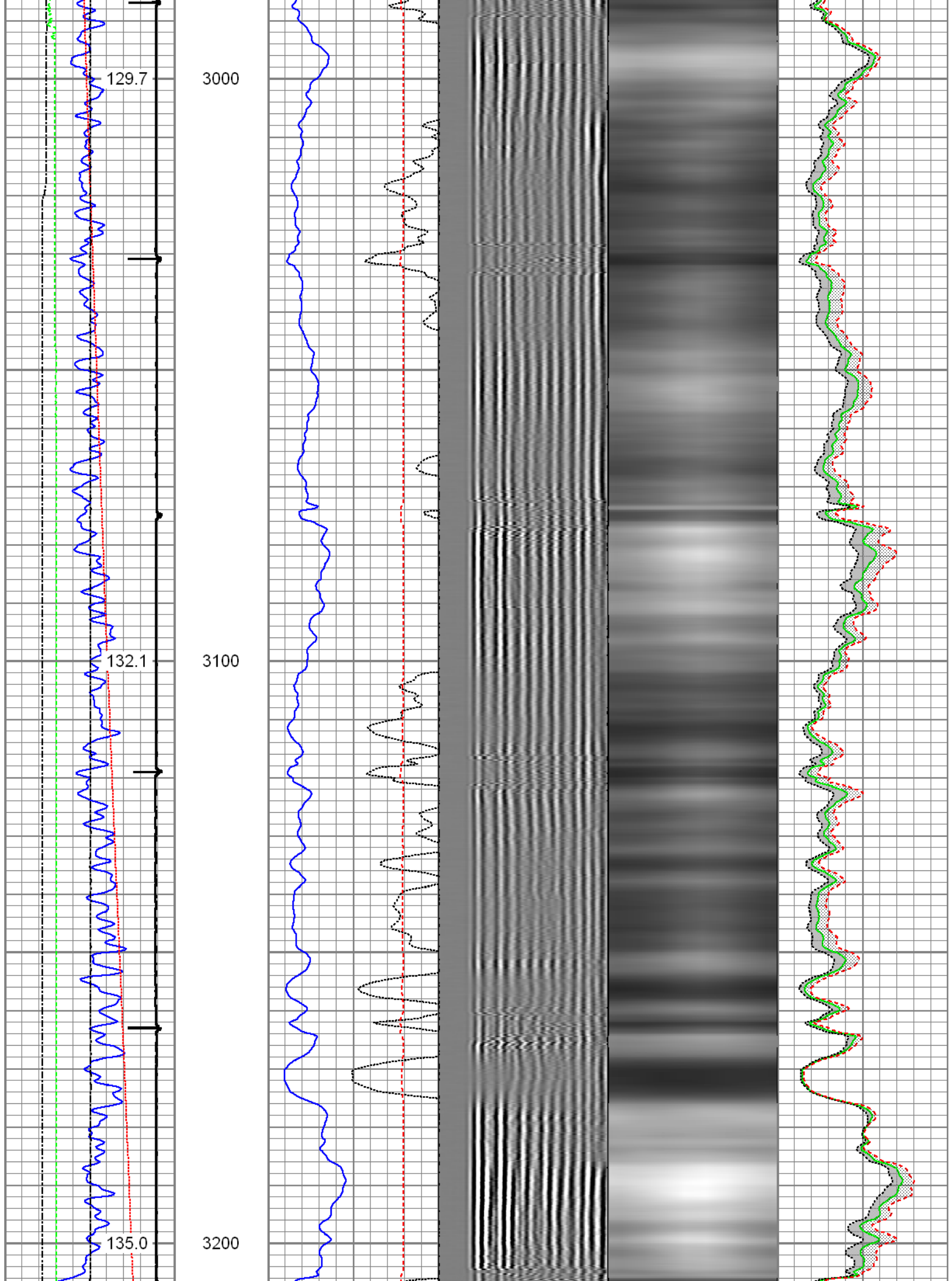
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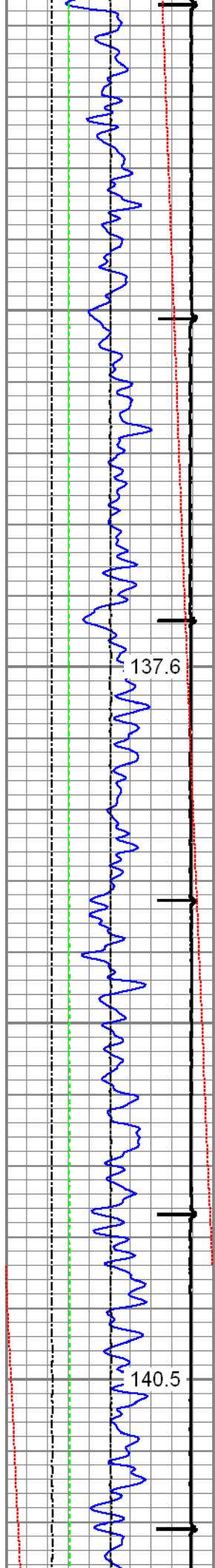






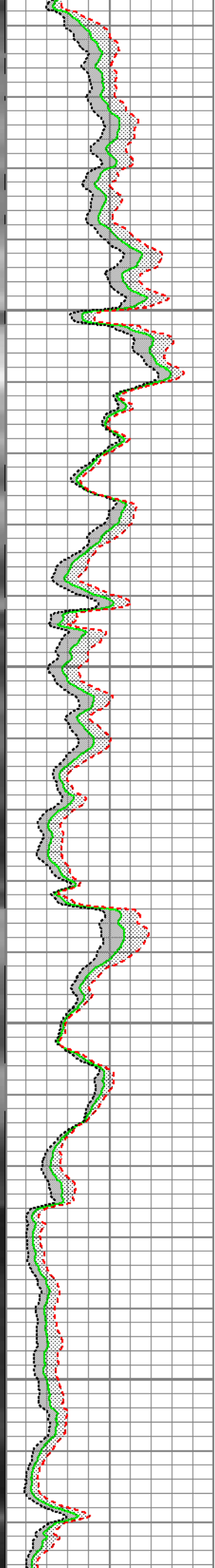
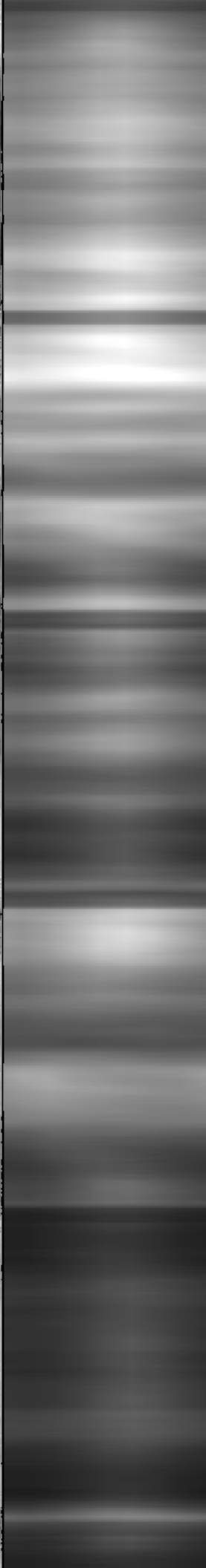
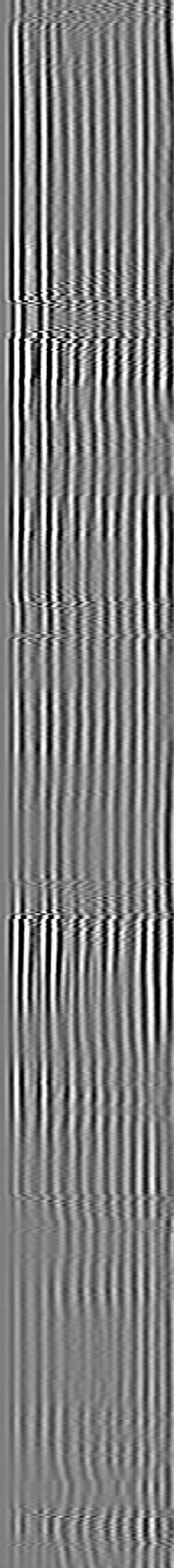
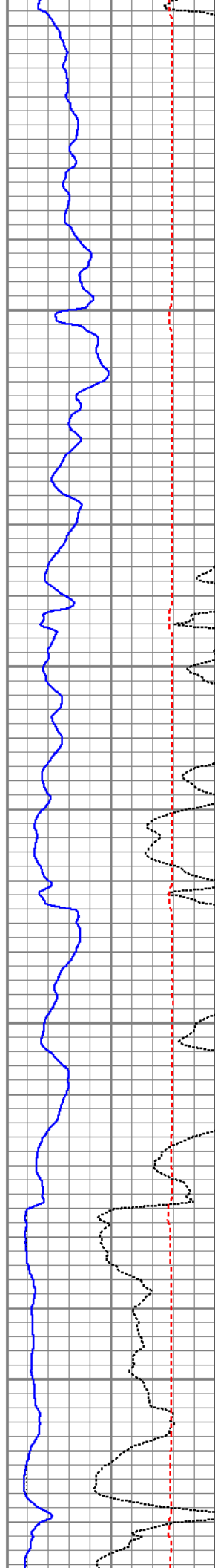


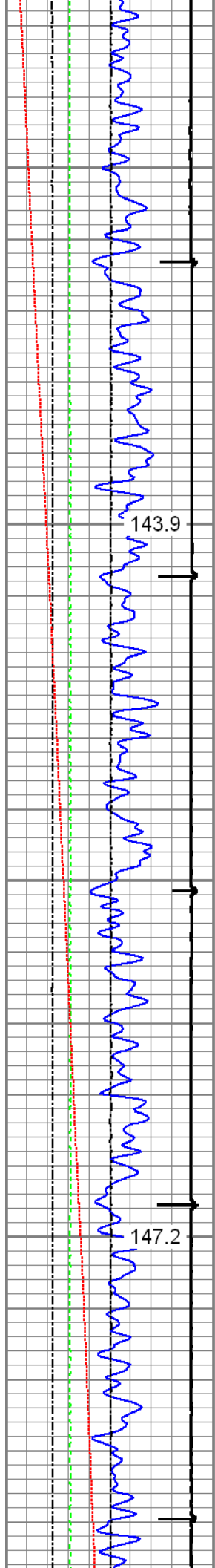




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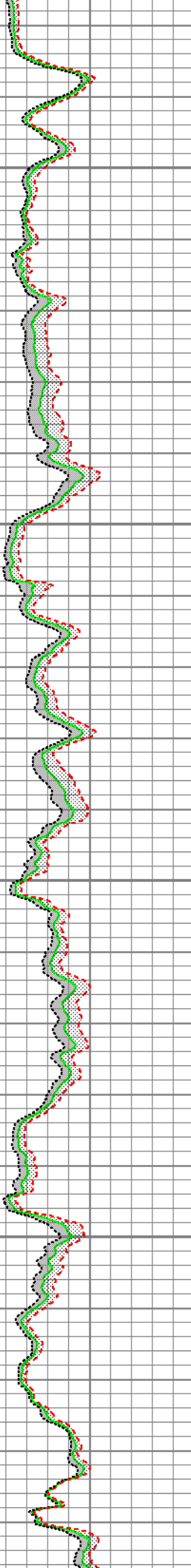
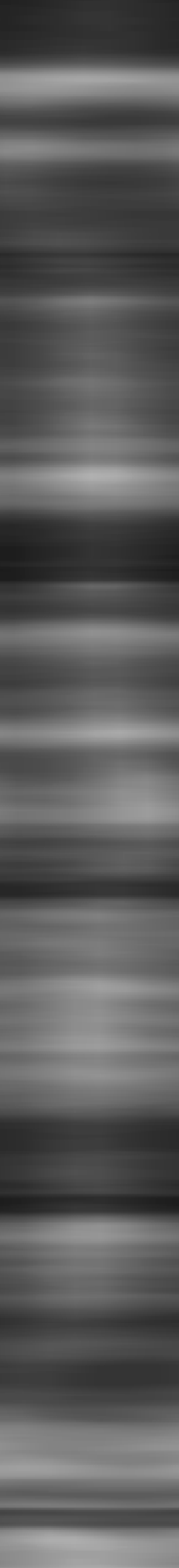
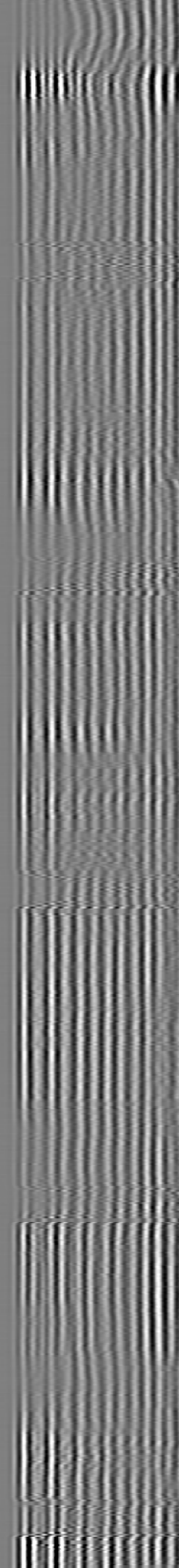
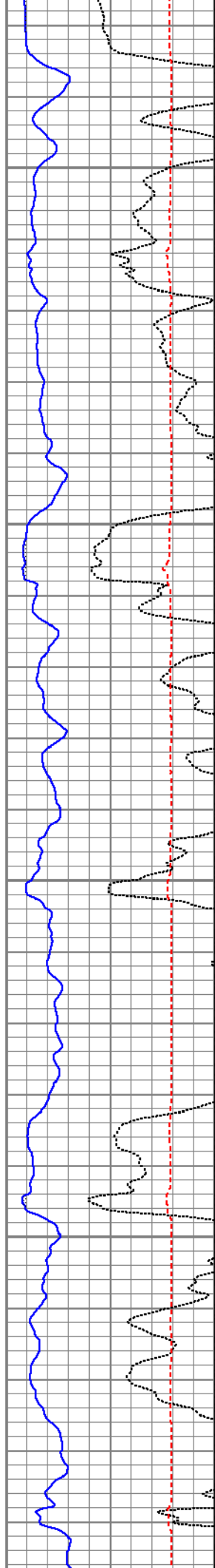
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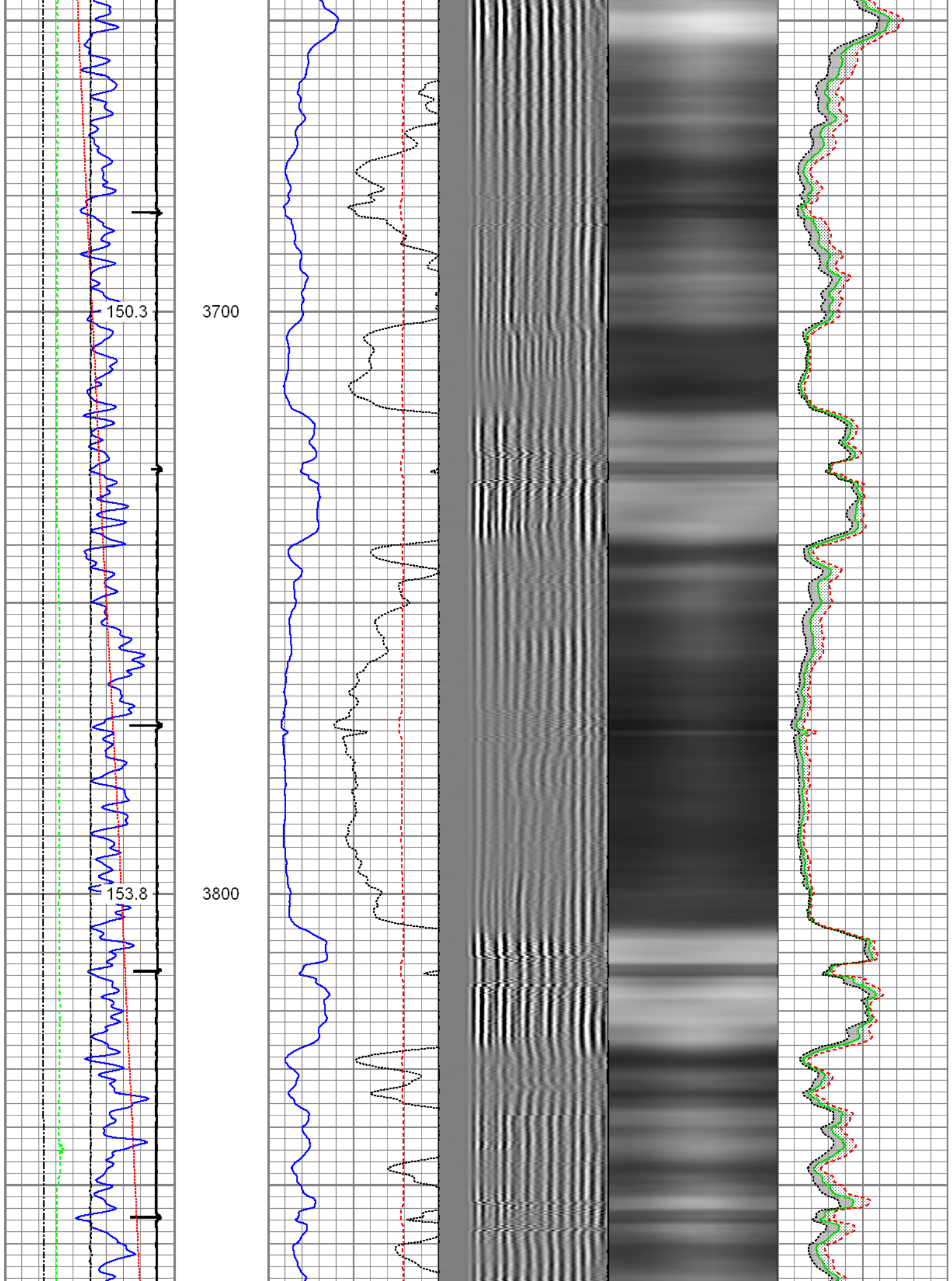


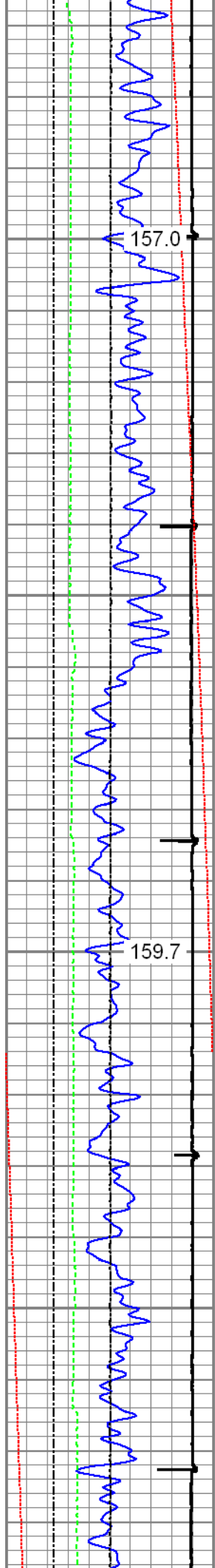


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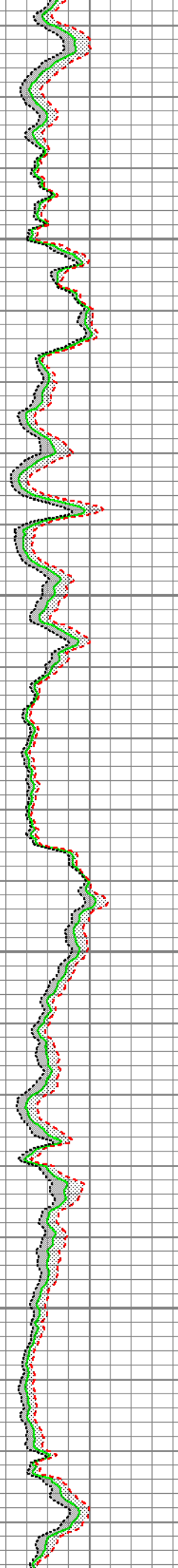
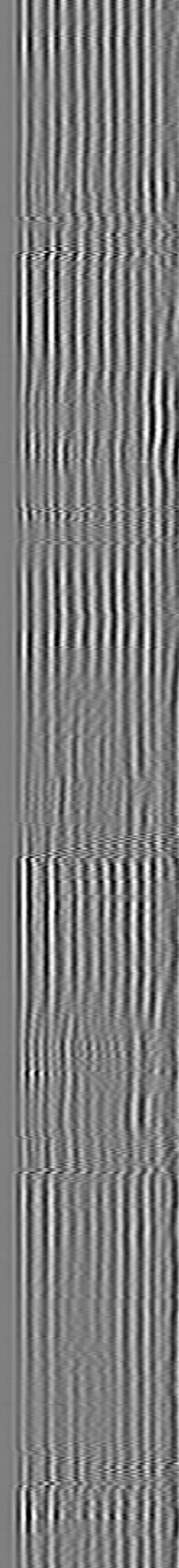
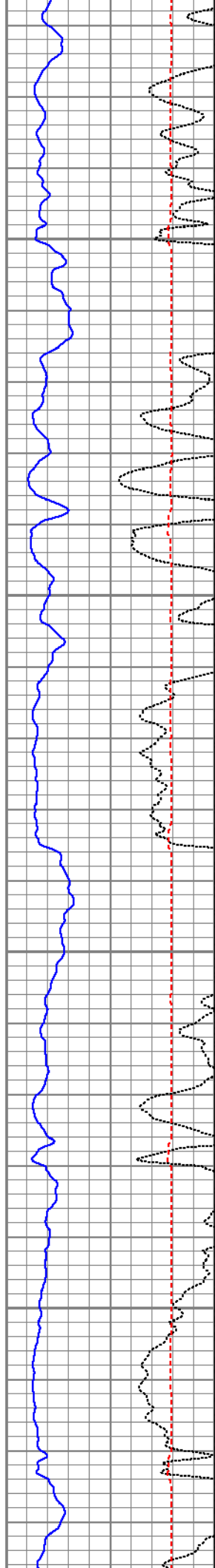


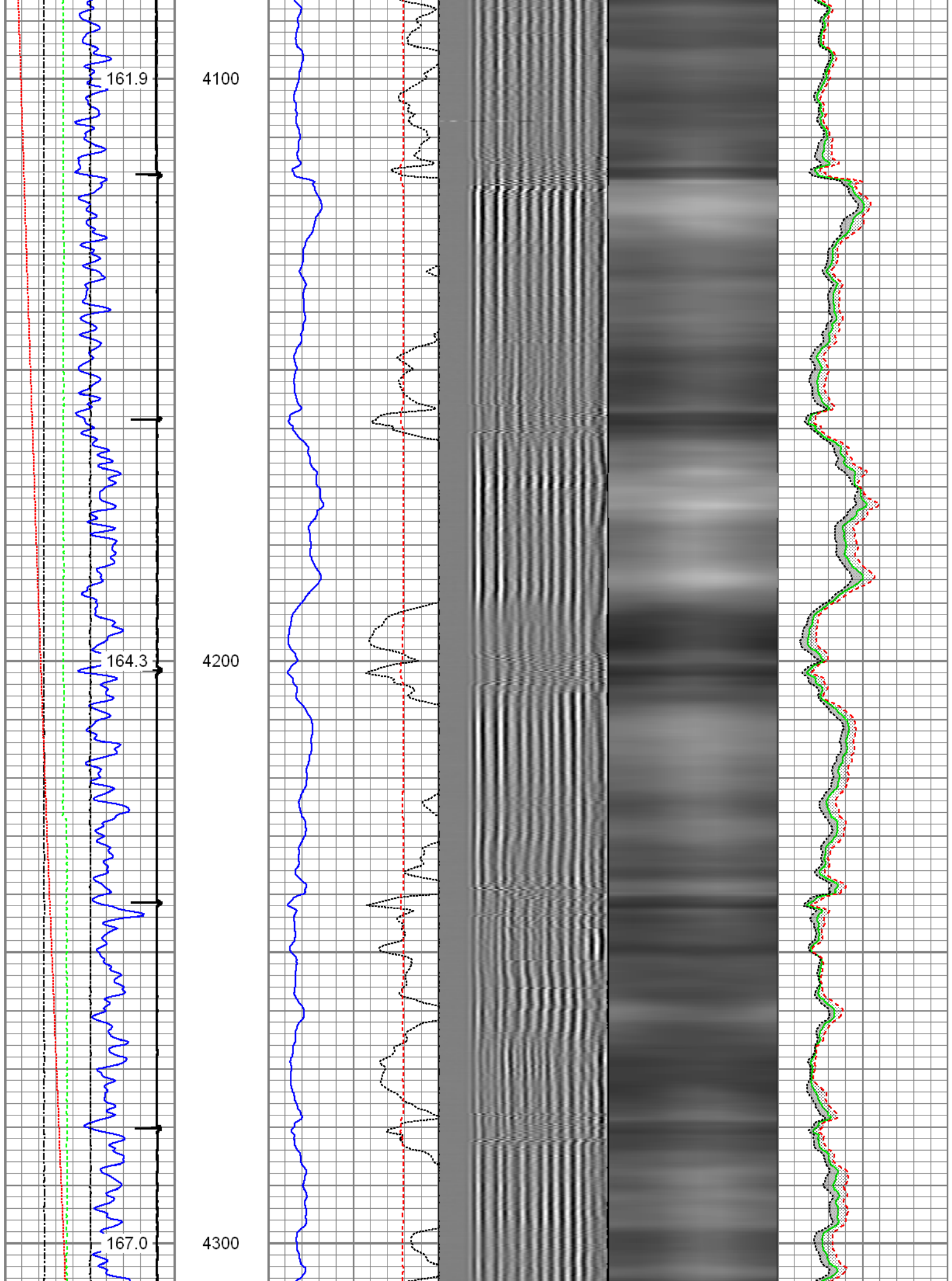


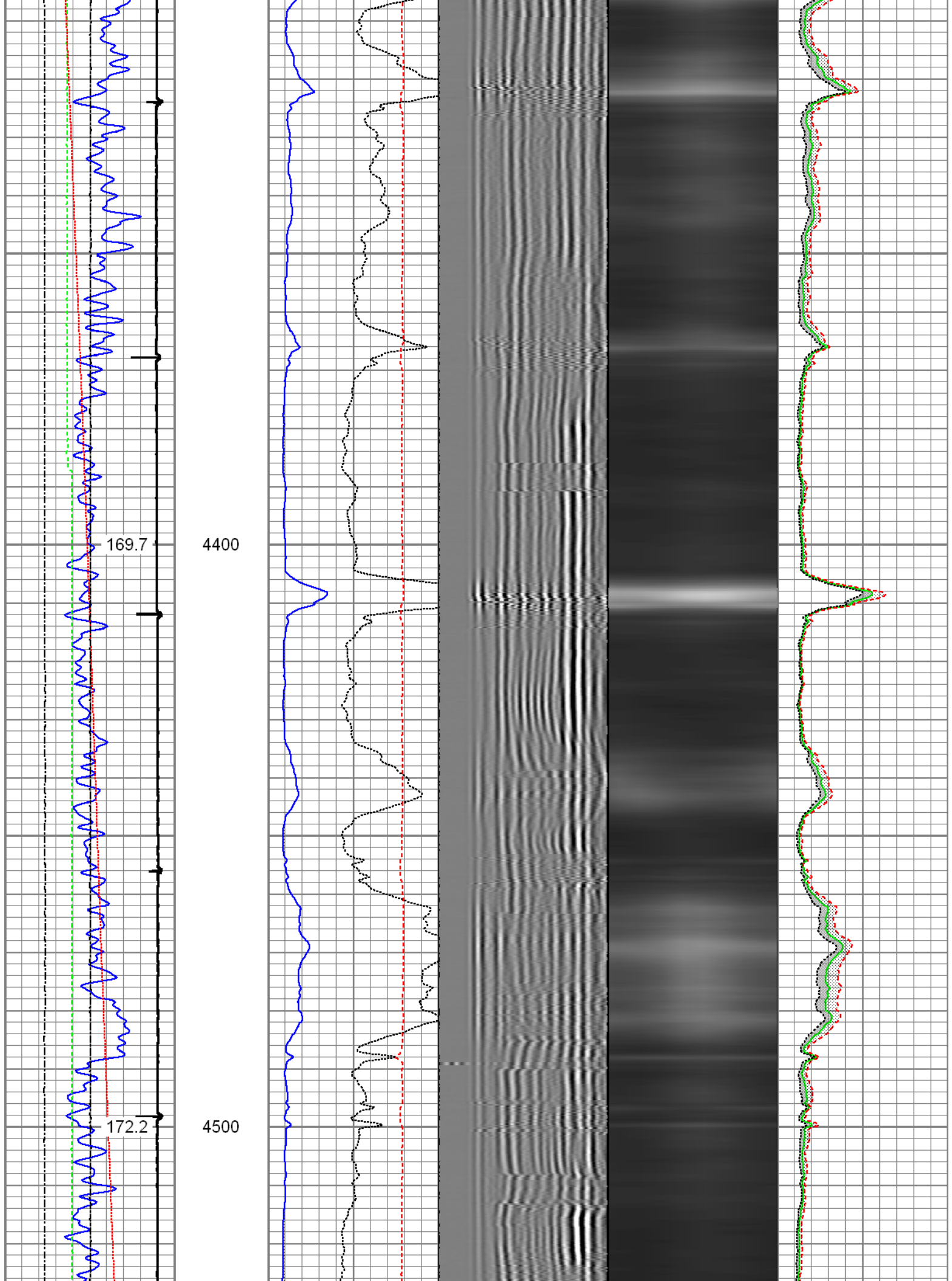


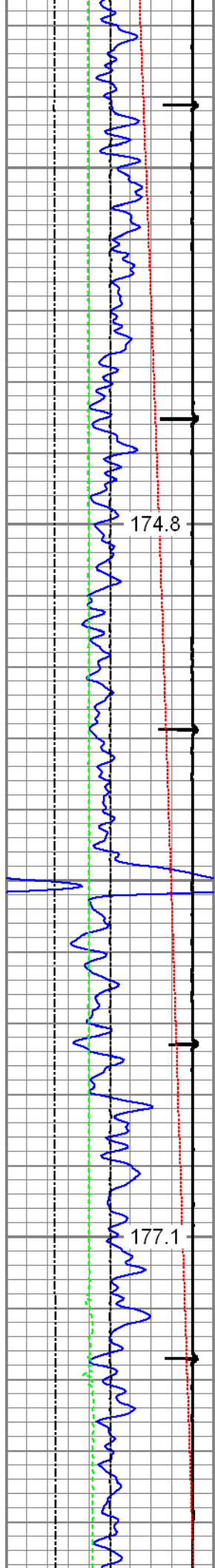
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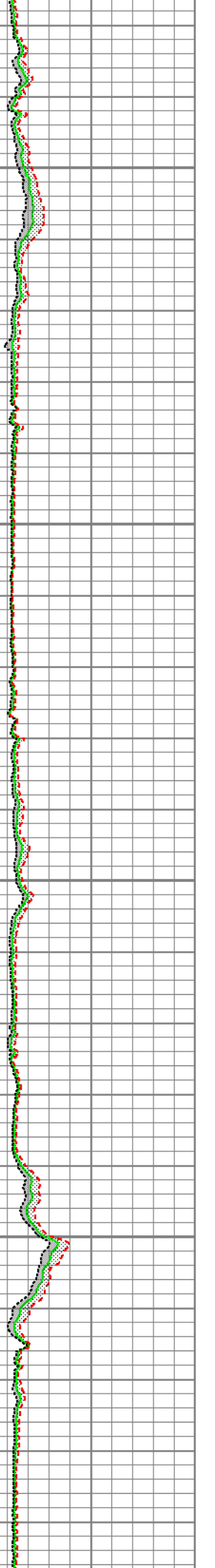
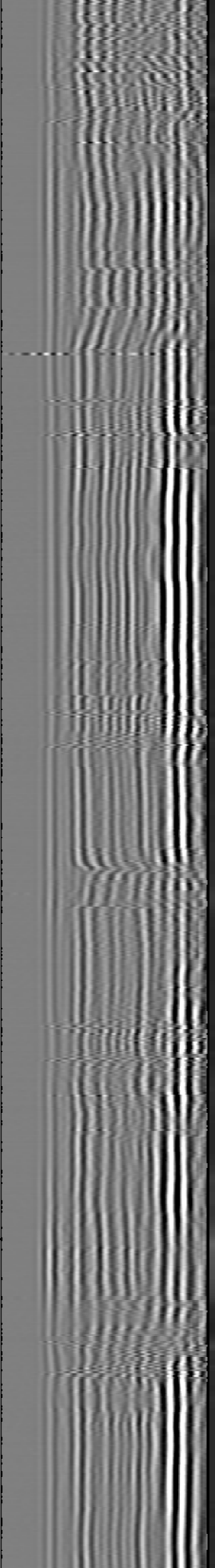
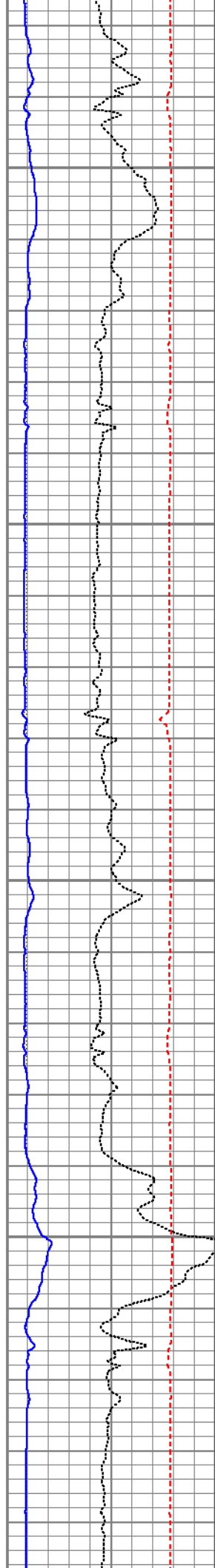


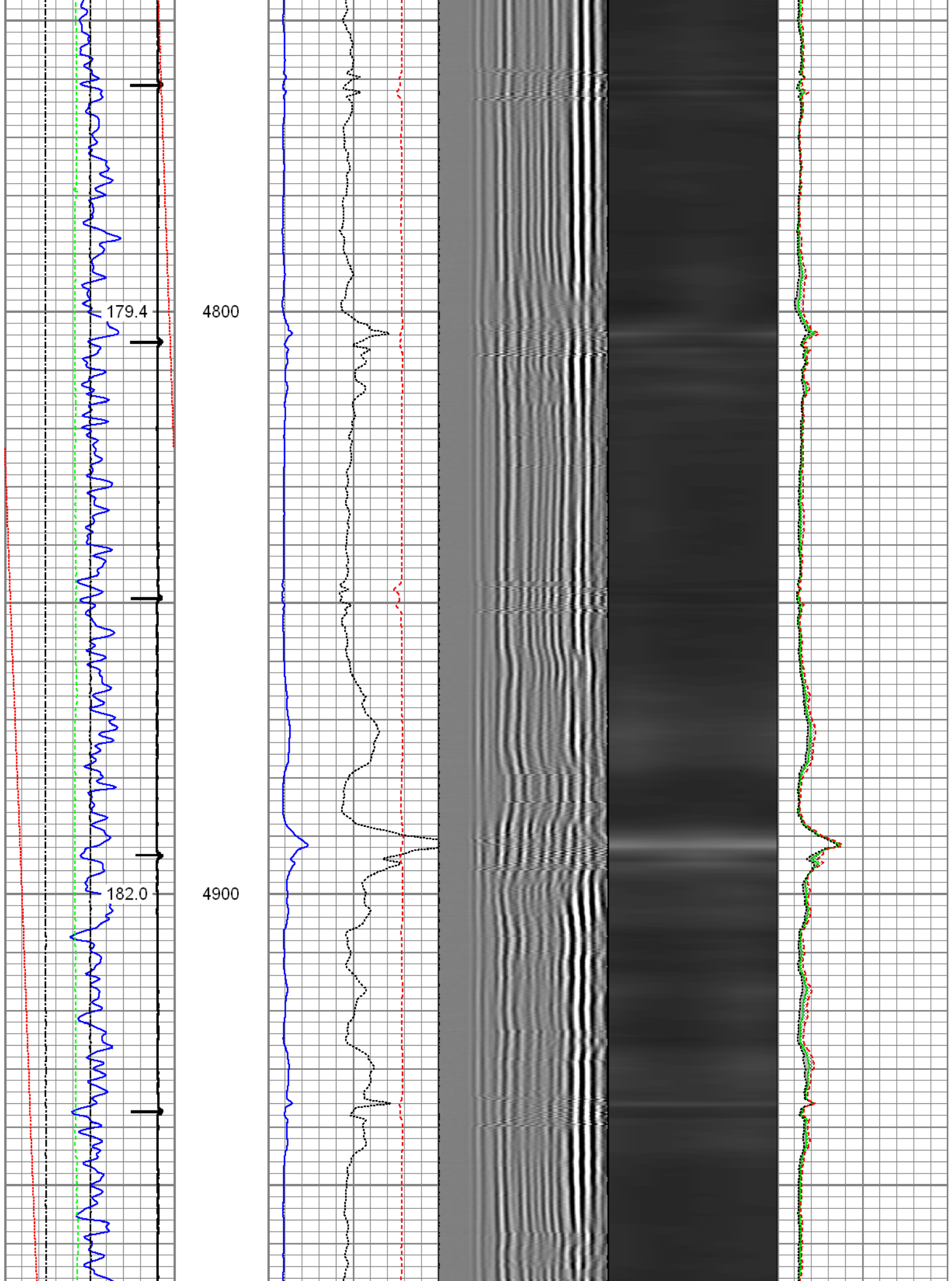


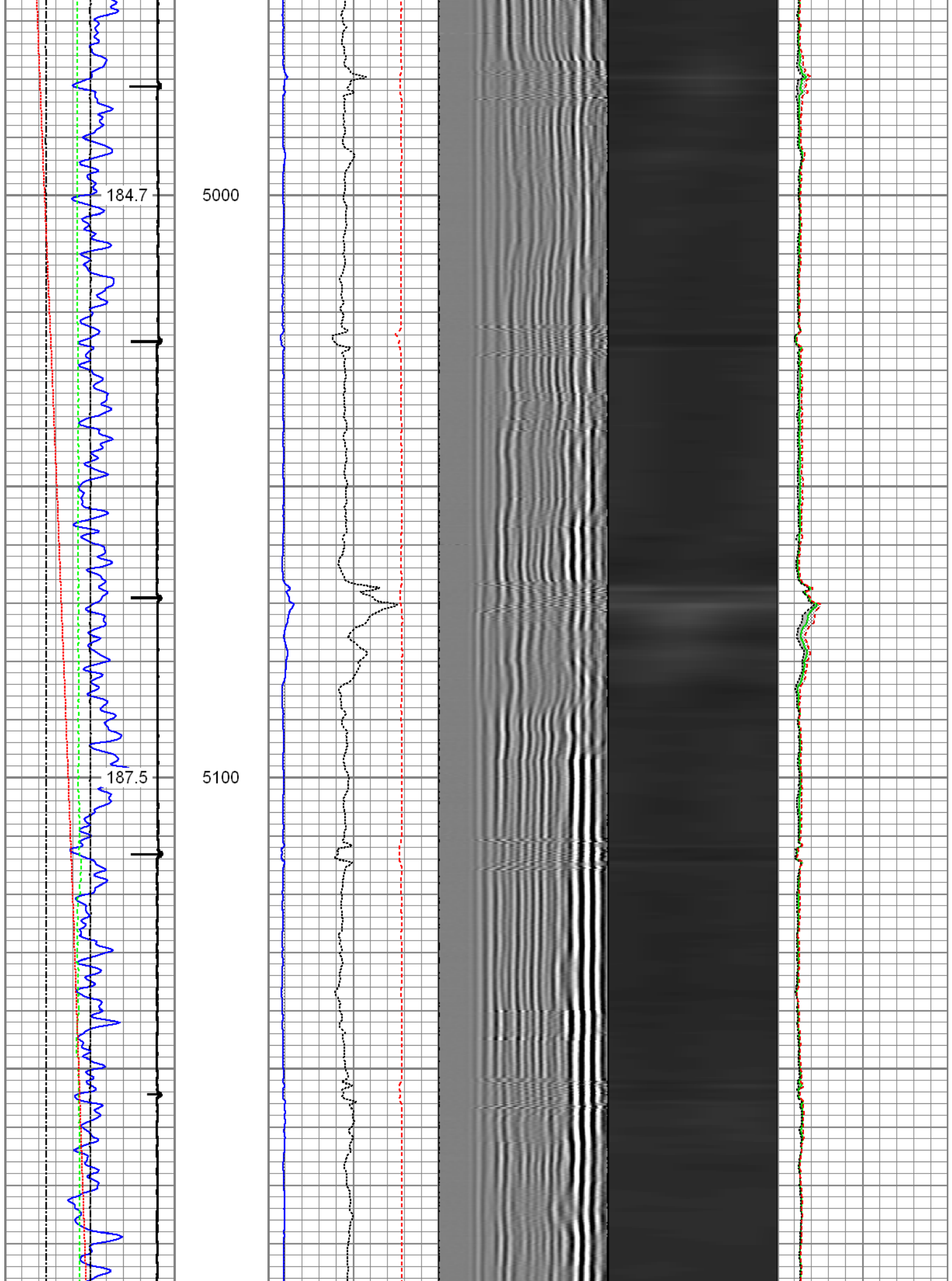


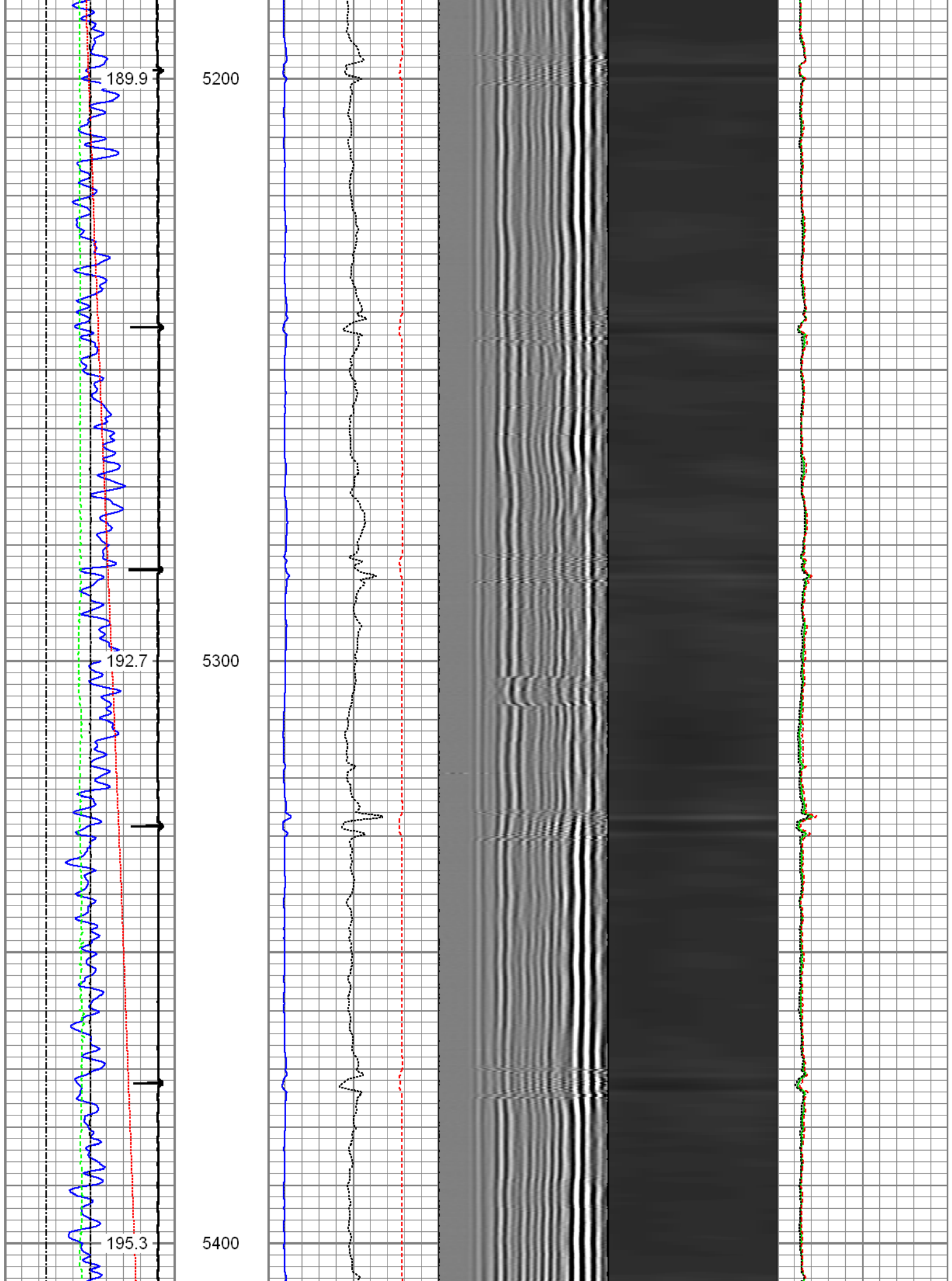
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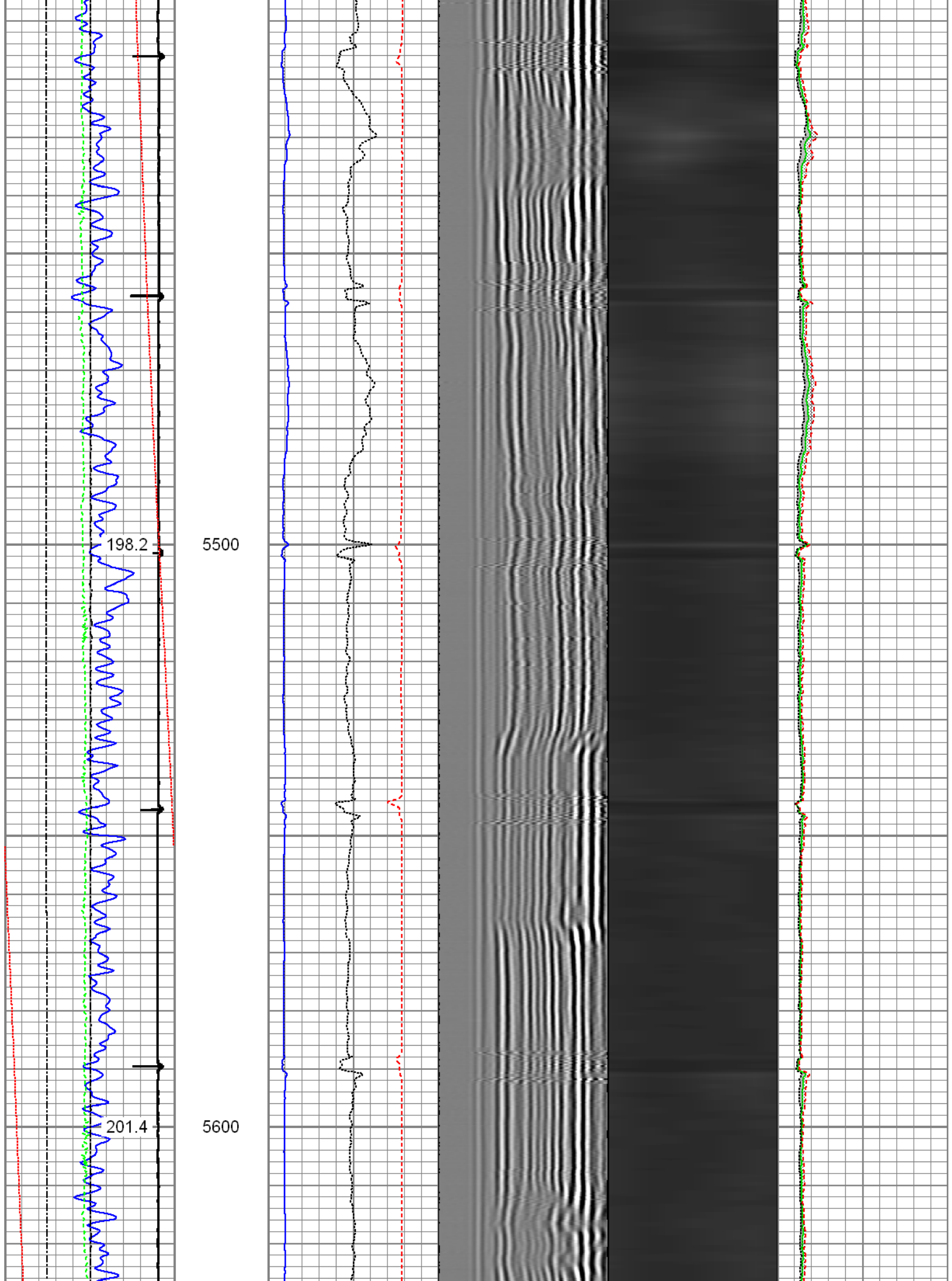
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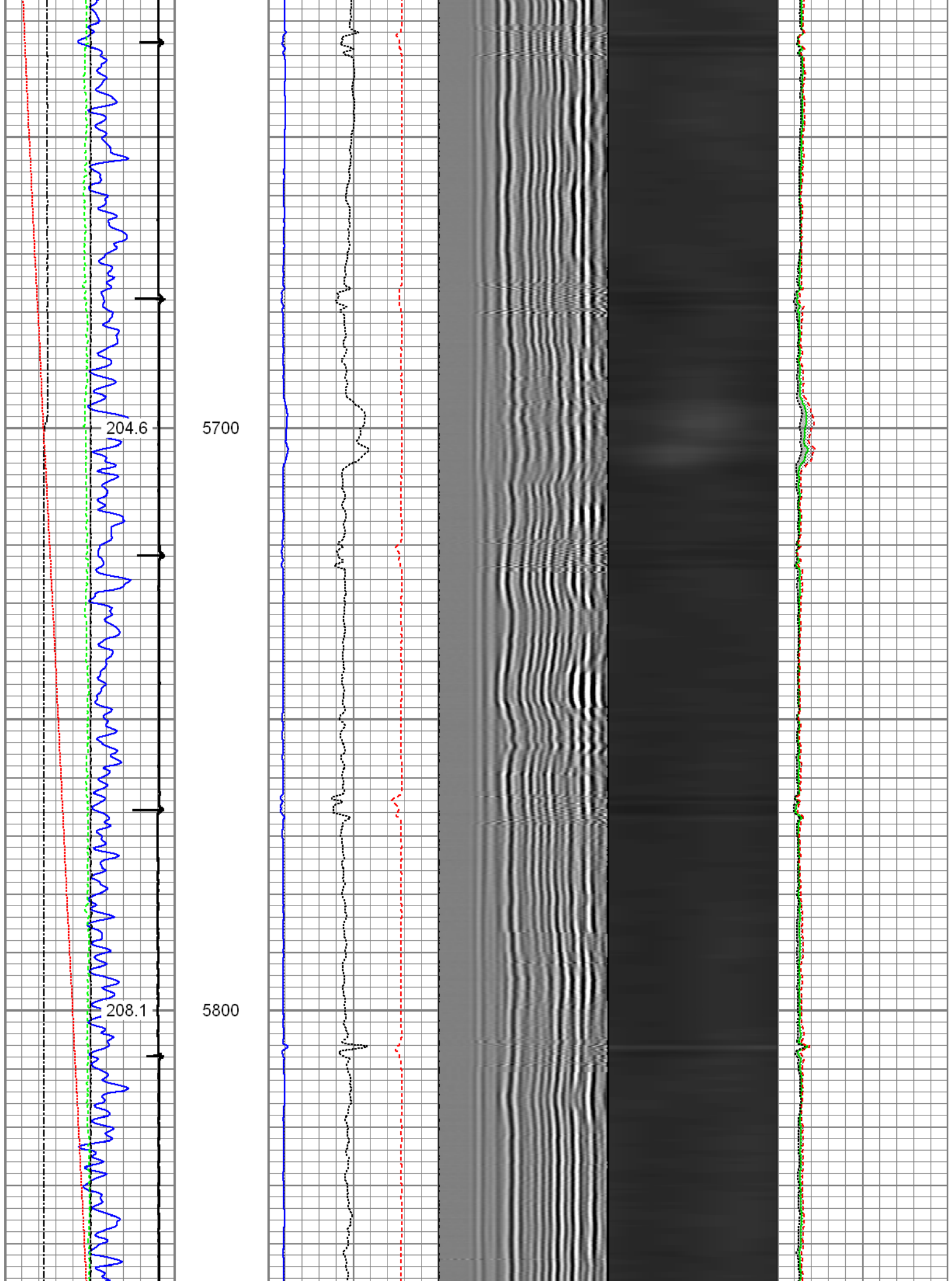


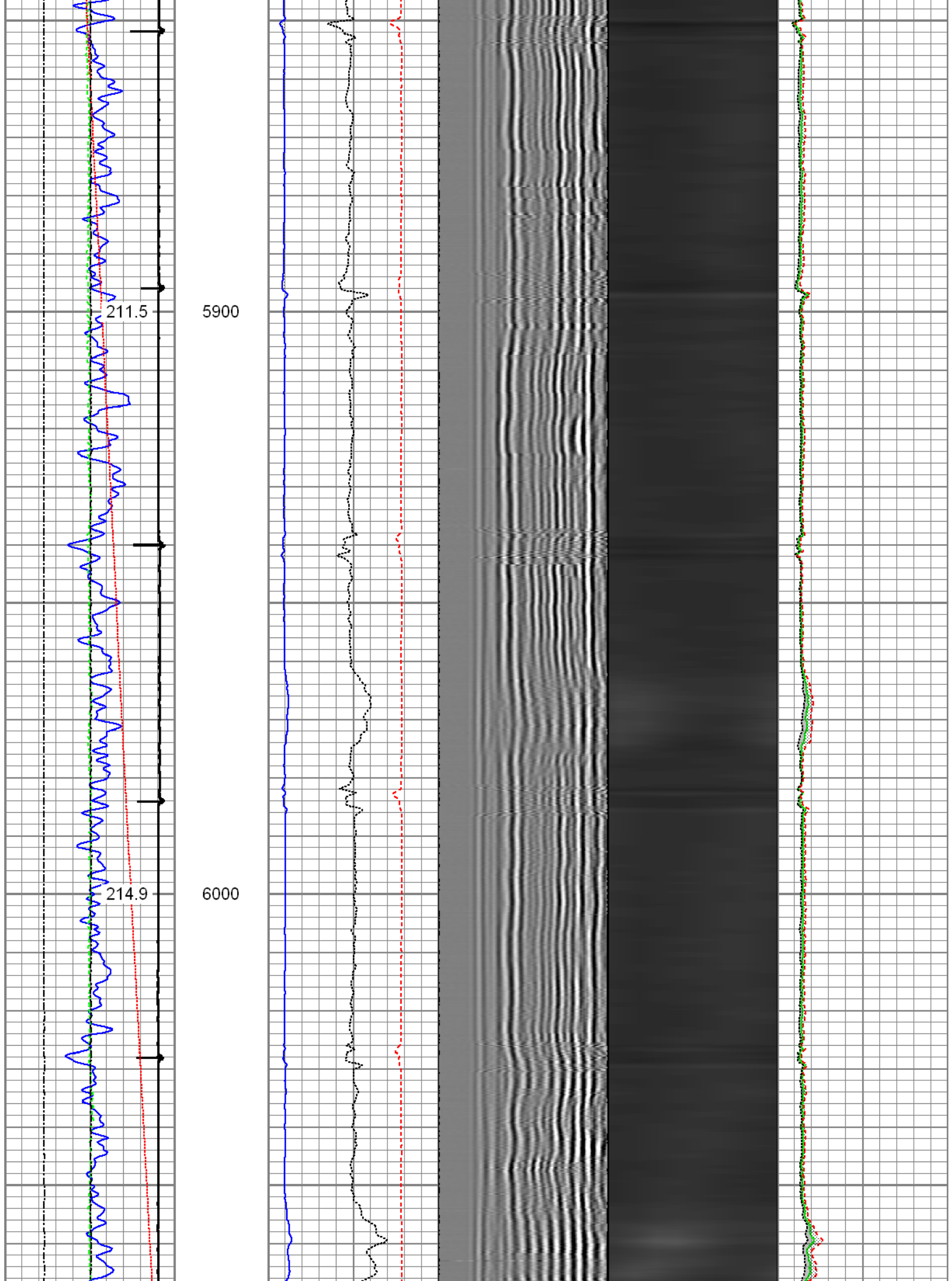


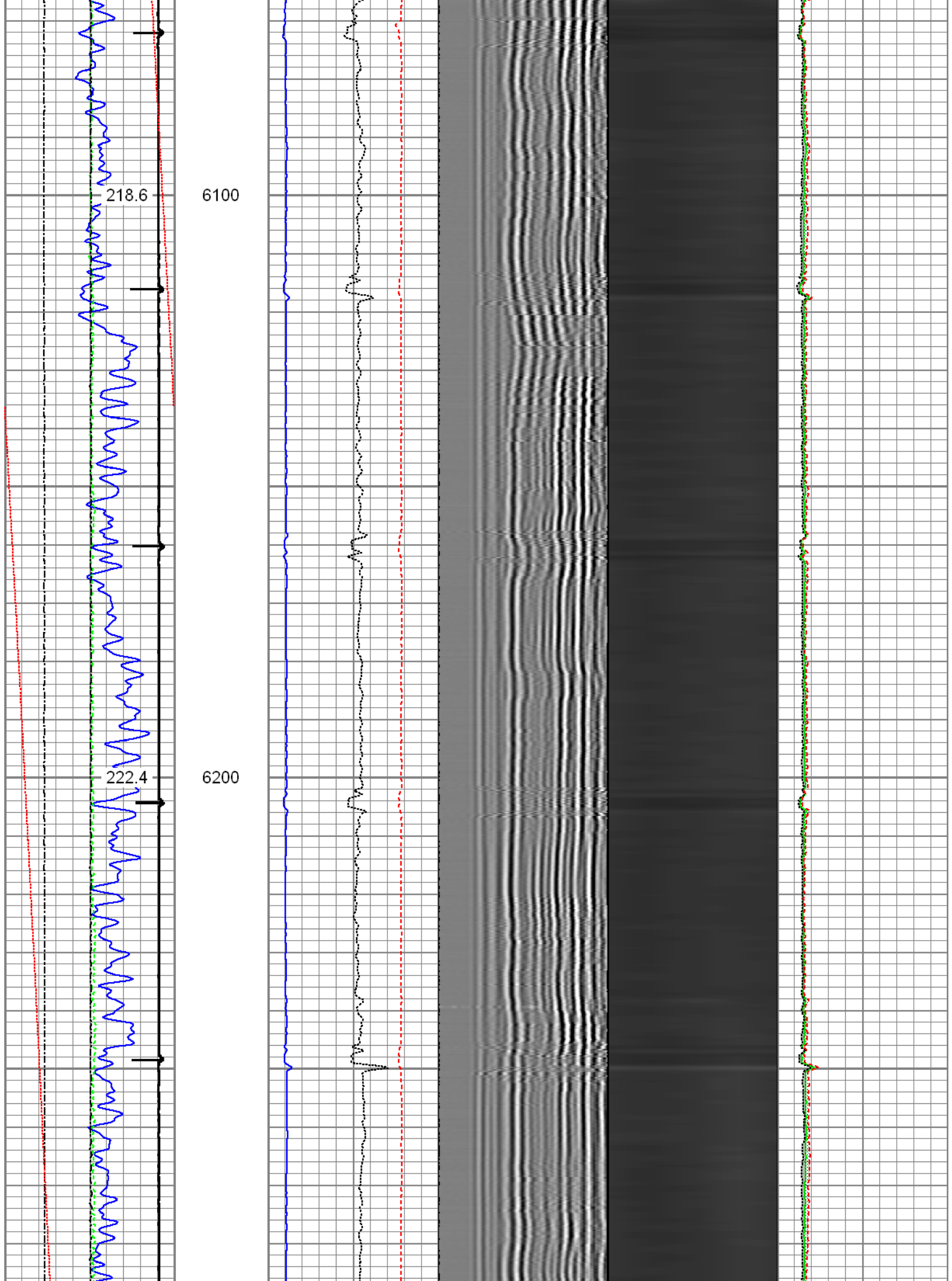


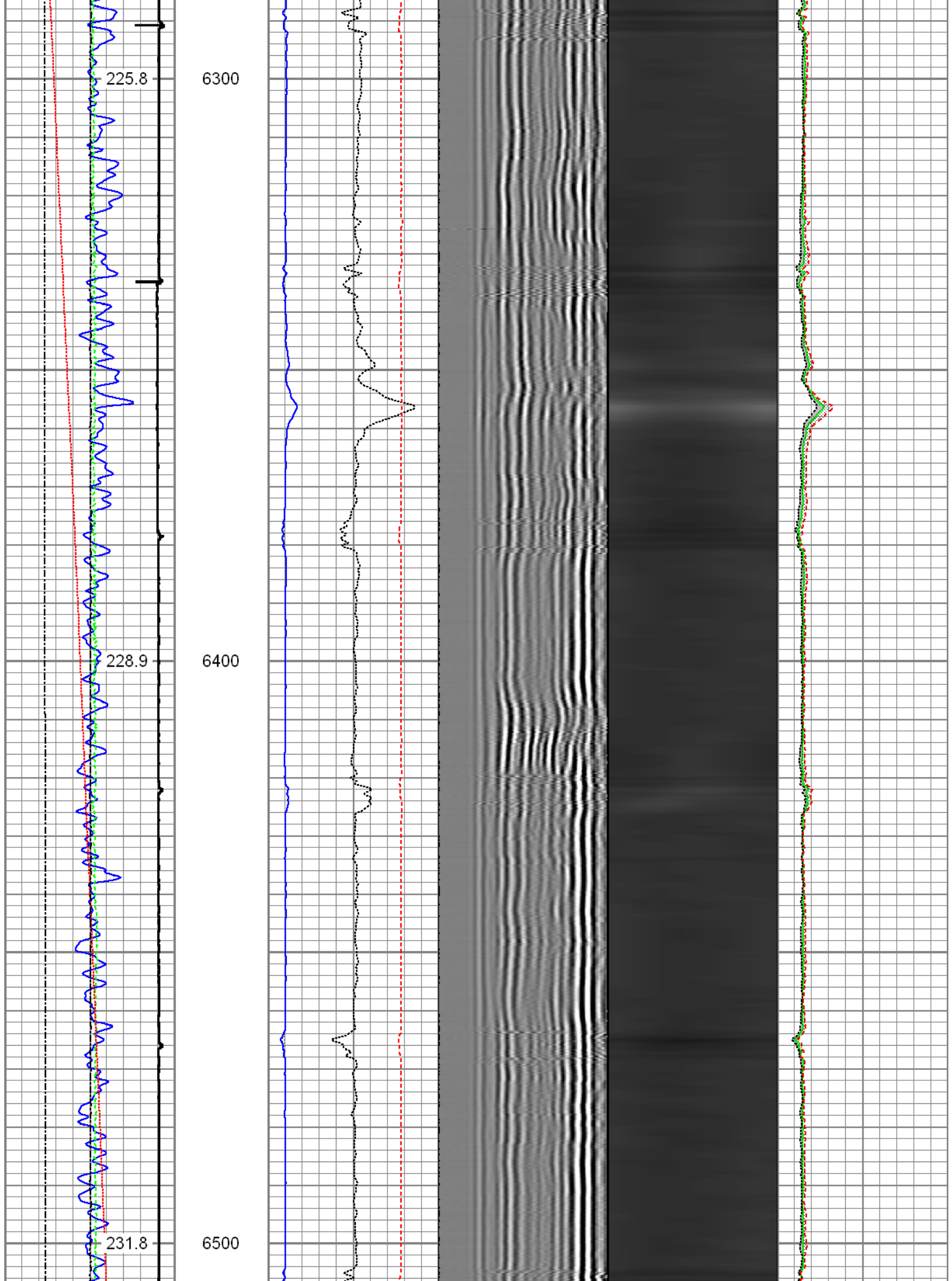


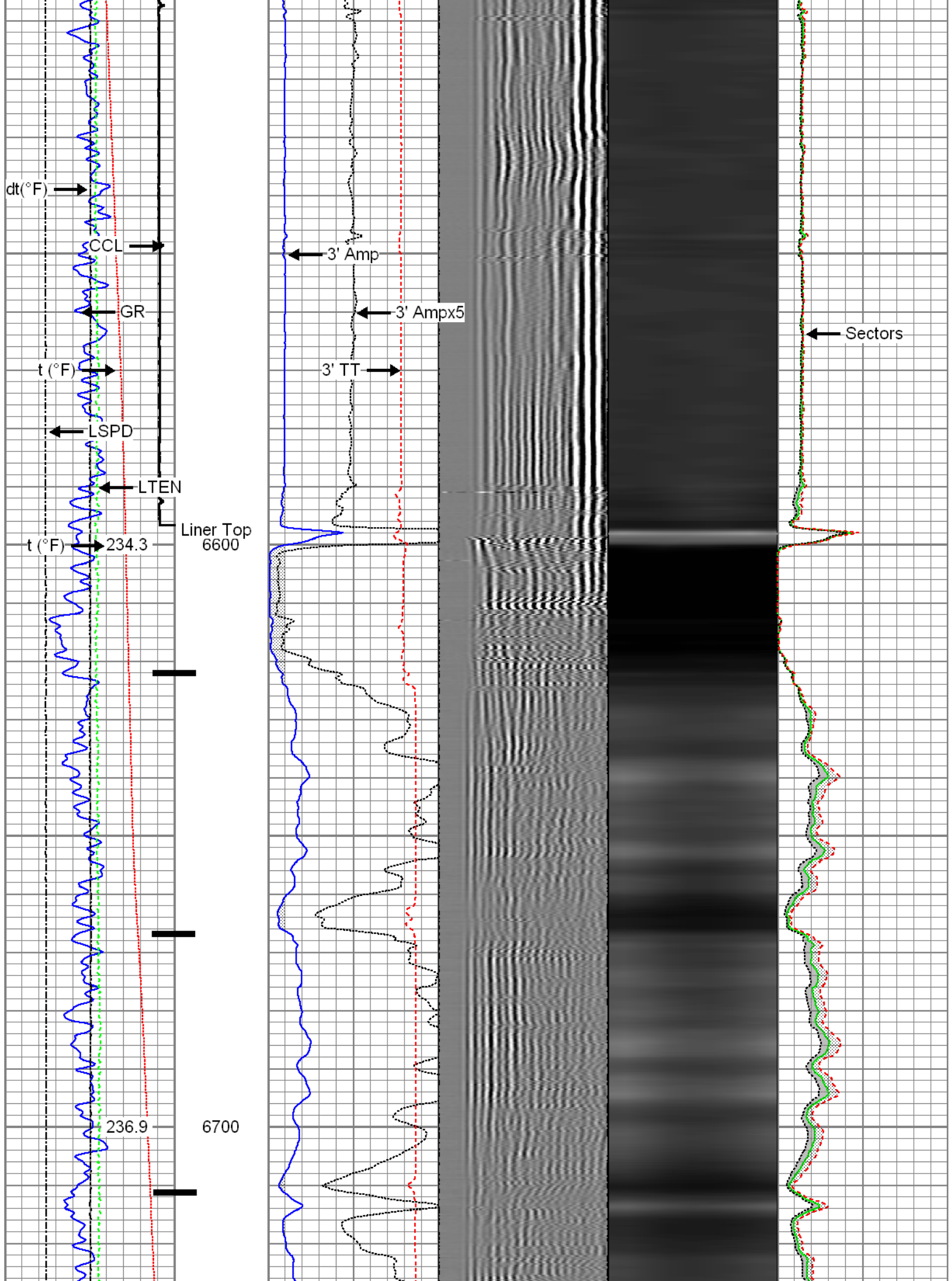


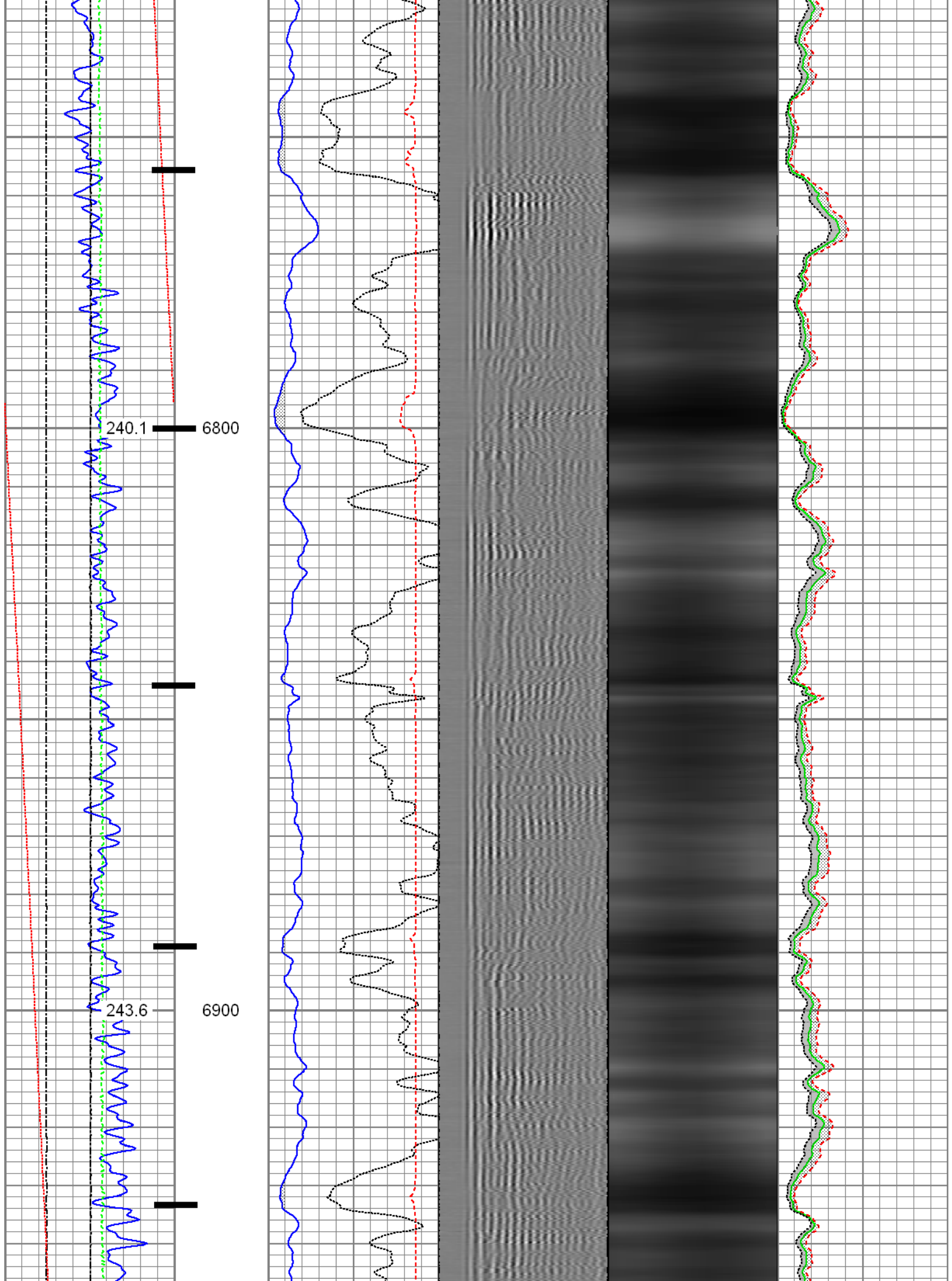


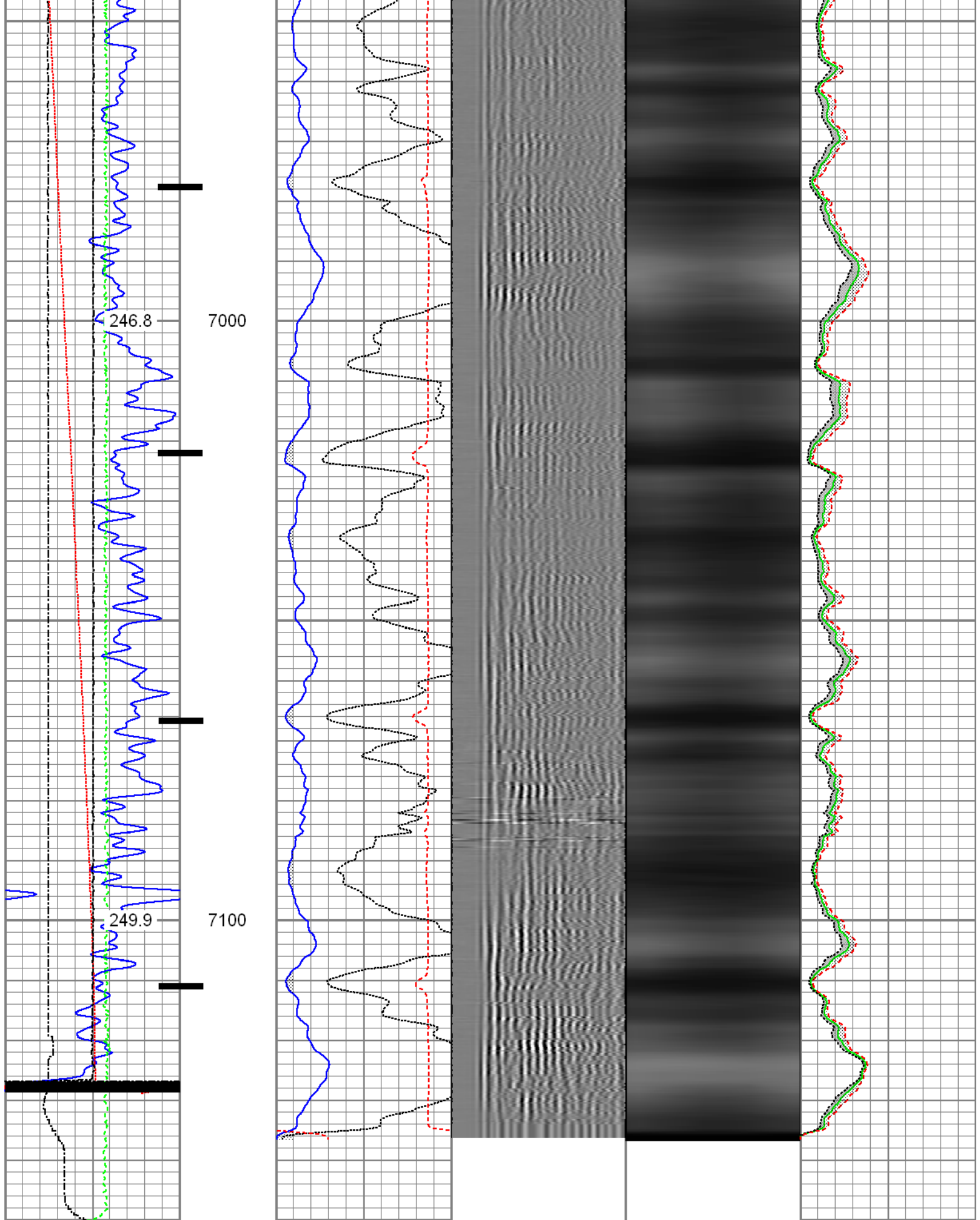













Gamma Ray (GAPI)	3' Amplitude (mV)	5' Variable Density Log	Sector Map	Average Amplitude
0 120	0 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Minimum Amplitude

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		
Temperature		
0 (degF) 20		
Differential Temperature		
-2 (degF) 2		

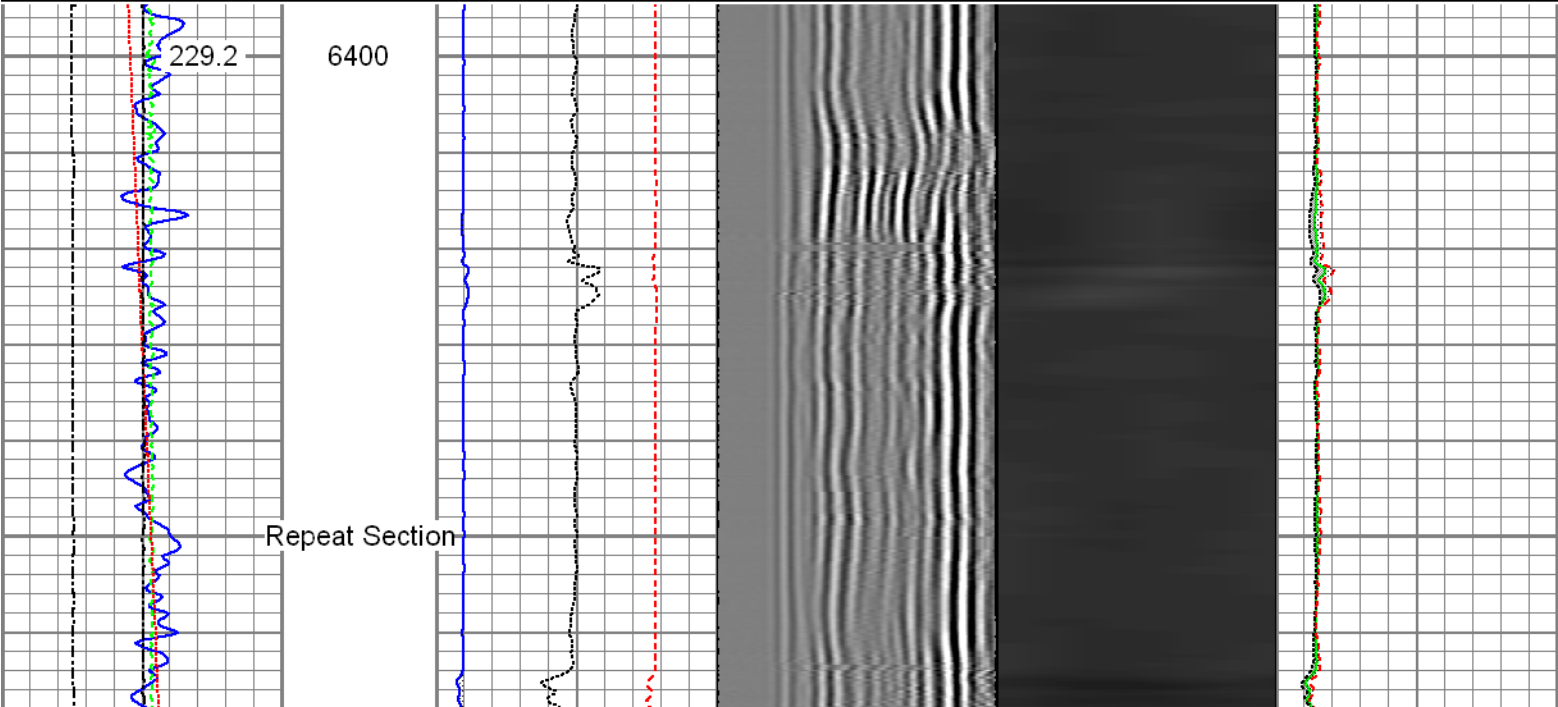


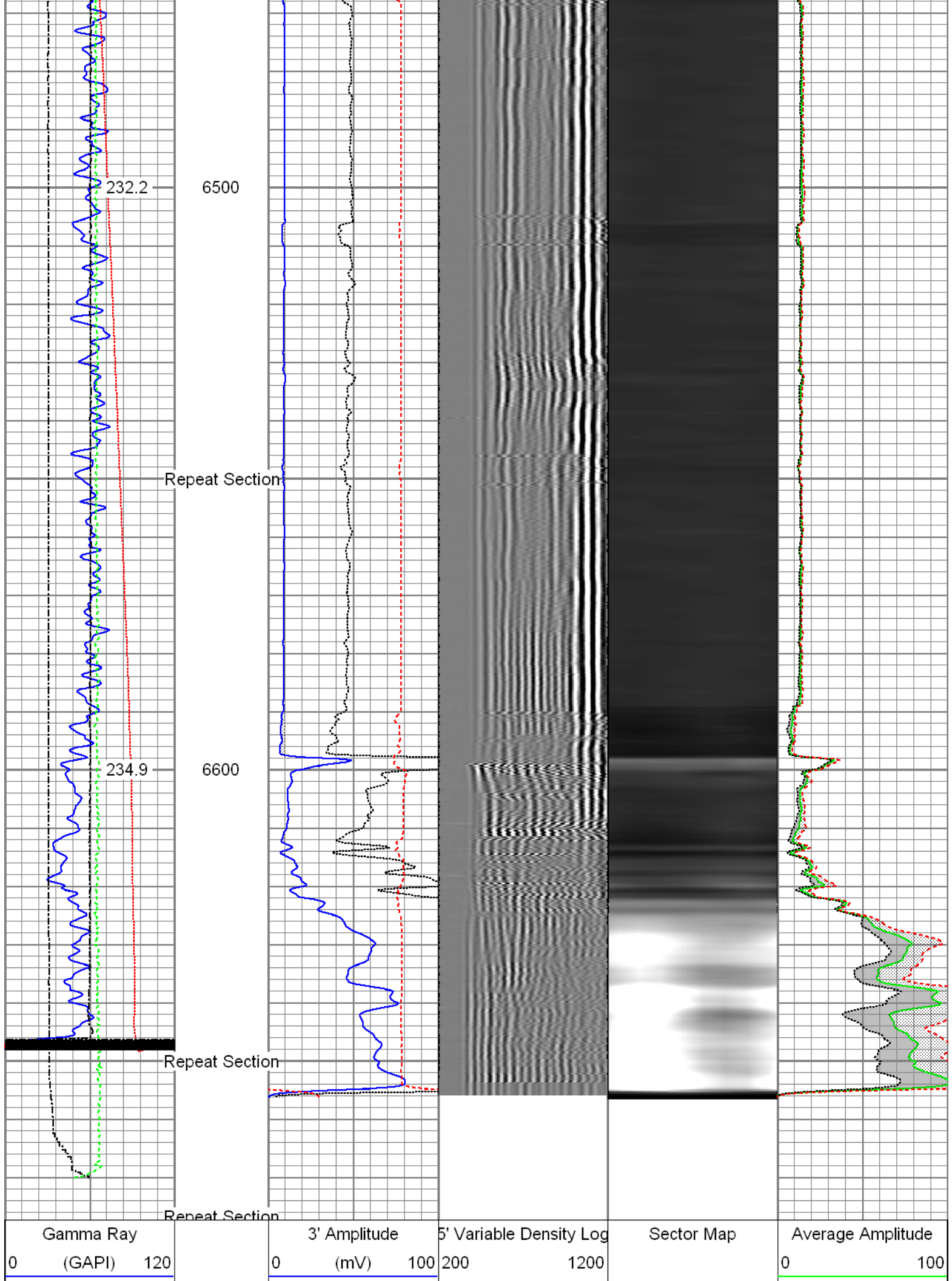
# Repeat Pass

Recorded with 2800 PSI Surface Induced Pressure

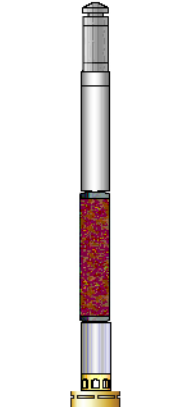
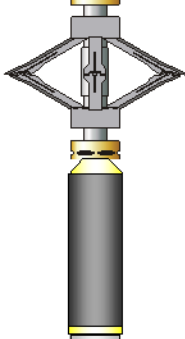
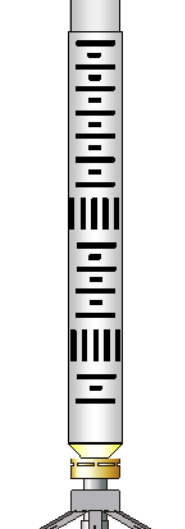
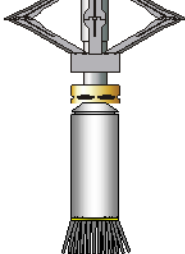

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Dataset Pathname: pass4  
Presentation Format: rbt4\_mit  
Dataset Creation: Wed Jul 22 08:09:25 2015 by Log 7.0 B1  
Charted by: Depth in Feet scaled 1:240

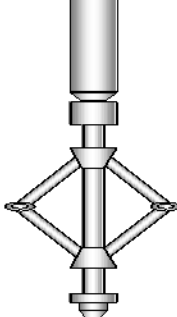
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Line Speed	3' Amplitude x 5			Minimum Amplitude
-100 (ft/min) 100	0 (mV) 20			0 100
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	650 (usec) 150			0 100
Temperature				
0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





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
Temperature		
0 (degF) 20		
Differential Temperature		
-2 (degF) 2		

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 (10024052) Platinum Resistance Thermometer	1.04	1.69	5.20
			UW_PRC #3 -DSSRAC (081) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
WVF3FT	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					
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_042 (10012912) 40 Multifinger Imaging Tool	4.54	2.75	61.10

TSTAMP	0.00		UW_PRC #4 -UW_PRC_057 (1101) 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: 0512340949_anadarko_cream state 28c-21hz_07-22-15_mit_rbl.db: field/well/run1/pass6 Total Length: 28.09 ft Total Weight: 324.50 lb O.D. 3.13 in						

Calibration Report			
Database File:	c:\warrior\data\anadarko_cream state 28c-21hz\0512340949_anadarko_cream state 28c-21hz_07-22-15		
Dataset Pathname:	pass6		
Dataset Creation:	Wed Jul 22 08:24:52 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:				Wed Jul 22 07:17:00 2015			
Ring size:	4	5	6	7			
(in)							
		Sens	Sens	Sens			
Finger 01:	1049	355.0	1404	378.0	1782	410.0	2192
Finger 02:	1189	370.0	1559	378.0	1937	403.0	2340
Finger 03:	1095	386.0	1481	398.0	1879	429.0	2308
Finger 04:	1094	365.0	1459	387.0	1846	418.0	2264
Finger 05:	1090	373.0	1463	393.0	1856	419.0	2275
Finger 06:	1098	378.0	1476	392.0	1868	415.0	2283
Finger 07:	1082	378.0	1460	395.0	1855	417.0	2272
Finger 08:	1106	374.0	1480	390.0	1870	414.0	2284
Finger 09:	1096	377.0	1473	390.0	1863	412.0	2275
Finger 10:	1099	376.0	1475	391.0	1866	411.0	2277
Finger 11:	1099	375.0	1474	391.0	1865	405.0	2270
Finger 12:	1100	376.0	1476	394.0	1870	408.0	2278
Finger 13:	1102	373.0	1475	387.0	1862	398.0	2260
Finger 14:	1090	381.0	1471	399.0	1870	409.0	2279
Finger 15:	1037	382.0	1419	411.0	1830	421.0	2251
Finger 16:	1051	382.0	1433	410.0	1843	420.0	2263
Finger 17:	960	364.0	1324	396.0	1720	420.0	2140
Finger 18:	1101	373.0	1474	393.0	1867	402.0	2269
Finger 19:	1061	371.0	1432	399.0	1831	410.0	2241

Finger 19:	1001	377.0	1422	414.0	1836	421.0	2257
Finger 20:	1045	377.0	1422	414.0	1836	421.0	2257
Finger 21:	1063	385.0	1448	411.0	1859	408.0	2267
Finger 22:	1028	375.0	1403	412.0	1815	422.0	2237
Finger 23:	990	374.0	1364	419.0	1783	434.0	2217
Finger 24:	1057	369.0	1426	399.0	1825	397.0	2222
Finger 25:	999	371.0	1370	413.0	1783	429.0	2212
Finger 26:	1136	365.0	1501	384.0	1885	394.0	2279
Finger 27:	1070	367.0	1437	402.0	1839	414.0	2253
Finger 28:	1090	358.0	1448	391.0	1839	404.0	2243
Finger 29:	1026	362.0	1388	408.0	1796	426.0	2222
Finger 30:	1080	366.0	1446	397.0	1843	418.0	2261
Finger 31:	1085	356.0	1441	391.0	1832	412.0	2244
Finger 32:	1057	365.0	1422	406.0	1828	425.0	2253
Finger 33:	1149	356.0	1505	375.0	1880	393.0	2273
Finger 34:	1101	351.0	1452	382.0	1834	411.0	2245
Finger 35:	1046	368.0	1414	407.0	1821	440.0	2261
Finger 36:	1063	359.0	1422	393.0	1815	430.0	2245
Finger 37:	1120	362.0	1482	383.0	1865	411.0	2276
Finger 38:	1146	361.0	1507	380.0	1887	399.0	2286
Finger 39:	1144	353.0	1497	376.0	1873	403.0	2276
Finger 40:	1089	365.0	1454	390.0	1844	418.0	2262

Segmented Cement Bond Log Calibration Report						
Serial Number:		10013454				
Tool Model:		UW_RBT_004				
Calibration Casing Diameter:		7.000	in			
Calibration Depth:		359.176	ft			
Master Calibration, performed Wed Jul 22 07:36:18 2015:						
	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	0.000	0.637	0.800	62.165	96.401	0.800
5FT	-0.002	0.599	0.800	62.165	101.956	1.049
S1	0.001	0.617	0.000	100.000	162.431	-0.198
S2	-0.001	0.648	0.000	100.000	153.927	0.188
S3	0.000	0.668	0.000	100.000	149.672	0.000
S4	-0.001	0.671	0.000	100.000	148.873	0.153
S5	0.000	0.644	0.000	100.000	155.323	-0.013
S6	-0.001	0.621	0.000	100.000	160.754	0.196
S7	-0.000	0.595	0.000	100.000	167.973	0.016
S8	-0.000	0.595	0.000	100.000	167.959	0.006

Temperature Calibration Report					
Serial Number:			10024052		
Tool Model:			UW_PRT_016		
Performed:			Wed Feb 11 16:41:28 2015		
Point #	Reading		Reference		
1	12242.00	cps	68.00	degF	
2	18329.00	cps	104.00	degF	
3	29563.00	cps	176.00	degF	
4	41222.00	cps	248.00	degF	
5	52988.00	cps	320.00	degF	
6	58824.00	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	Kerr-McGee Oil & Gas Onshore, L.P.
	Well	Cream State 28C-21HZ
	Field	Wattenberg
	County	Weld
	State	Colorado