

Radial Cement Bond Gamma Ray Casing Collar Log

Company Noble Energy Inc.				Company Noble Energy Inc.			
Well Gracie LD22-730				Well Gracie LD22-730			
Field Wildcat				Field Wildcat			
County Weld				County Weld			
State Colorado				State Colorado			
Location:				API # : 05-123-41562			
SEC 22 TWP 9N RGE 58W				Other Services			
				MIT			
Permanent Datum				Ground Level			
Log Measured From				Kelly Bushing			
Drilling Measured From				Kelly Bushing			
				Elevation 4827'			
				Elevation			
				K.B. 4857'			
				D.F. 4856'			
				G.L. 4827'			
Date				04-SEP-2015			
Run Number				Two			
Depth Driller				10481 FT			
Depth Logger				6036 FT			
Bottom Logged Interval				6021 FT			
Top Log Interval				Surface			
Open Hole Size				8.75			
Type Fluid				Water			
Density / Viscosity				8.34 lbm/gal			
Max. Recorded Temp.				209.5°F			
Estimated Cement Top				210 FT			
Time Well Ready				ROA			
Time Logger on Bottom				8:00 AM			
Equipment Number				HD-0255			
Location				Ft. Lupton, CO			
Recorded By				R. Cameron			
Witnessed By				Bill Mansfield			
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			
				HCP-110			
				6046.5 FT			
				10461 FT			

<<< Fold Here >>>

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 Kelly Bushing at 30 FT
 Log ran from 10 FT above liner top to surface
 Recorded with 2500 PSI surface induced pressure
 Logging tools were clean and free of any debris upon completion of operations
 Thank you for choosing FMC Technologies Completion Services, Inc.!!

Database File:09-04-15_noble energy_gracie Id22-730_mit_rbl.db

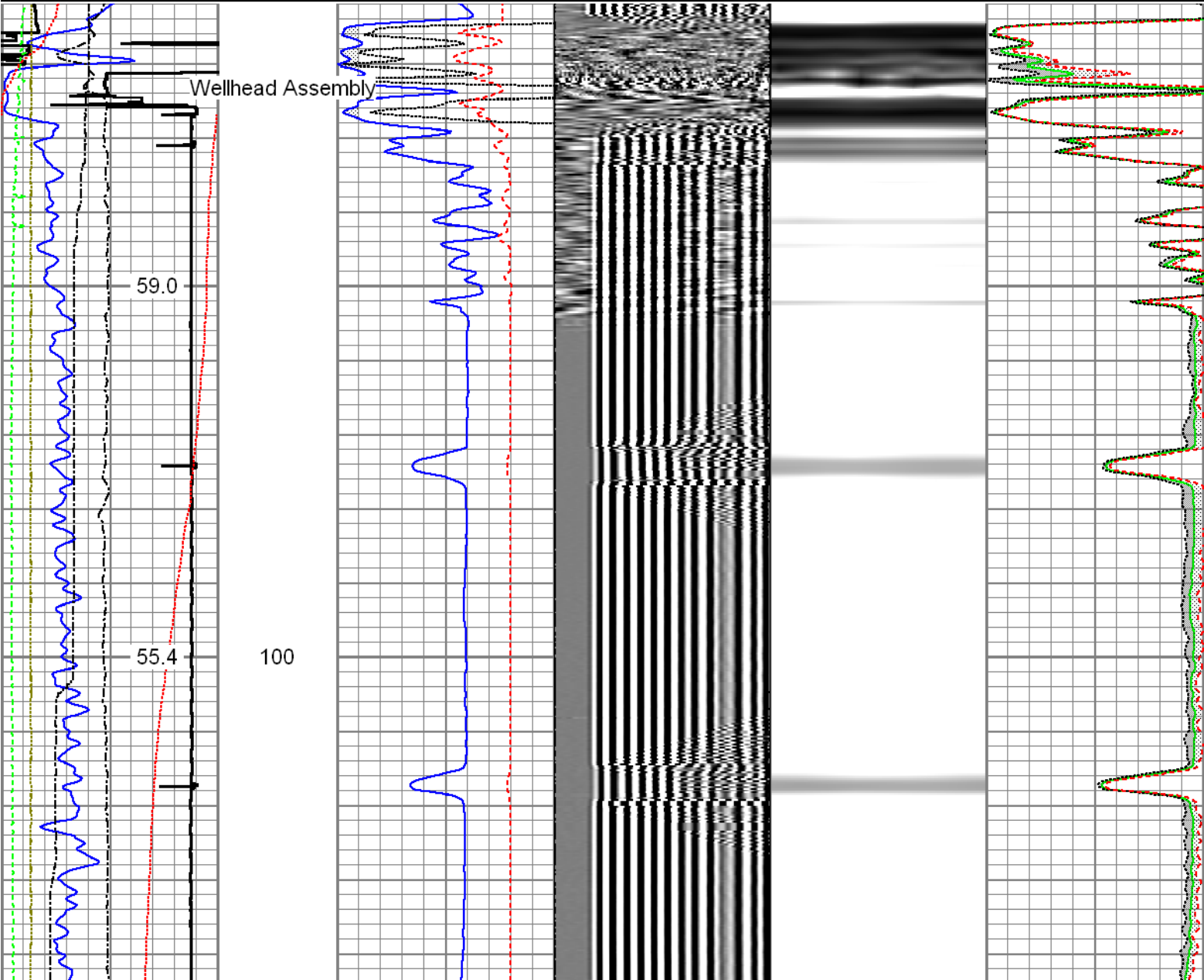
Dataset Pathname:pass8

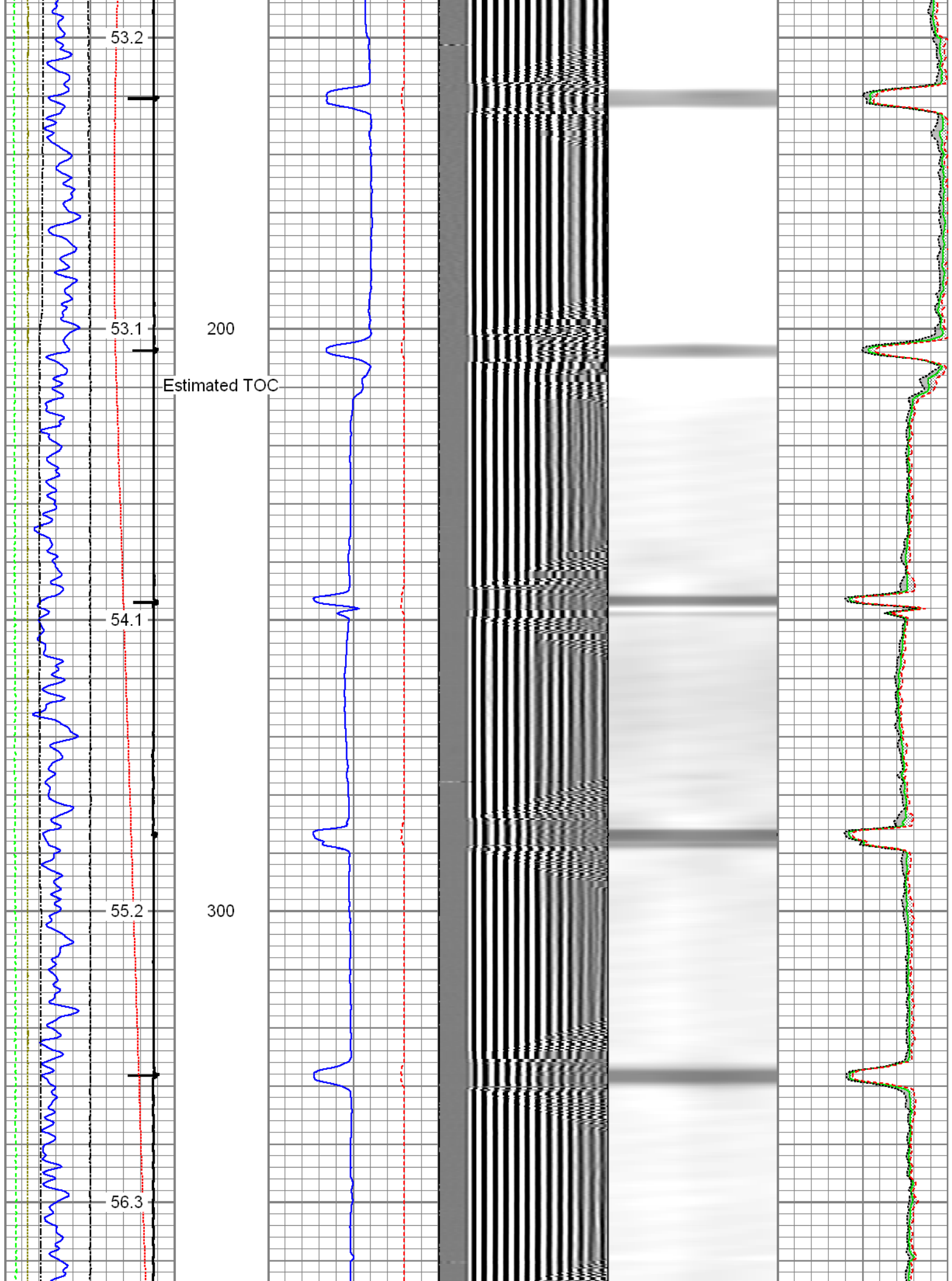
Presentation Format:rbt4_mit

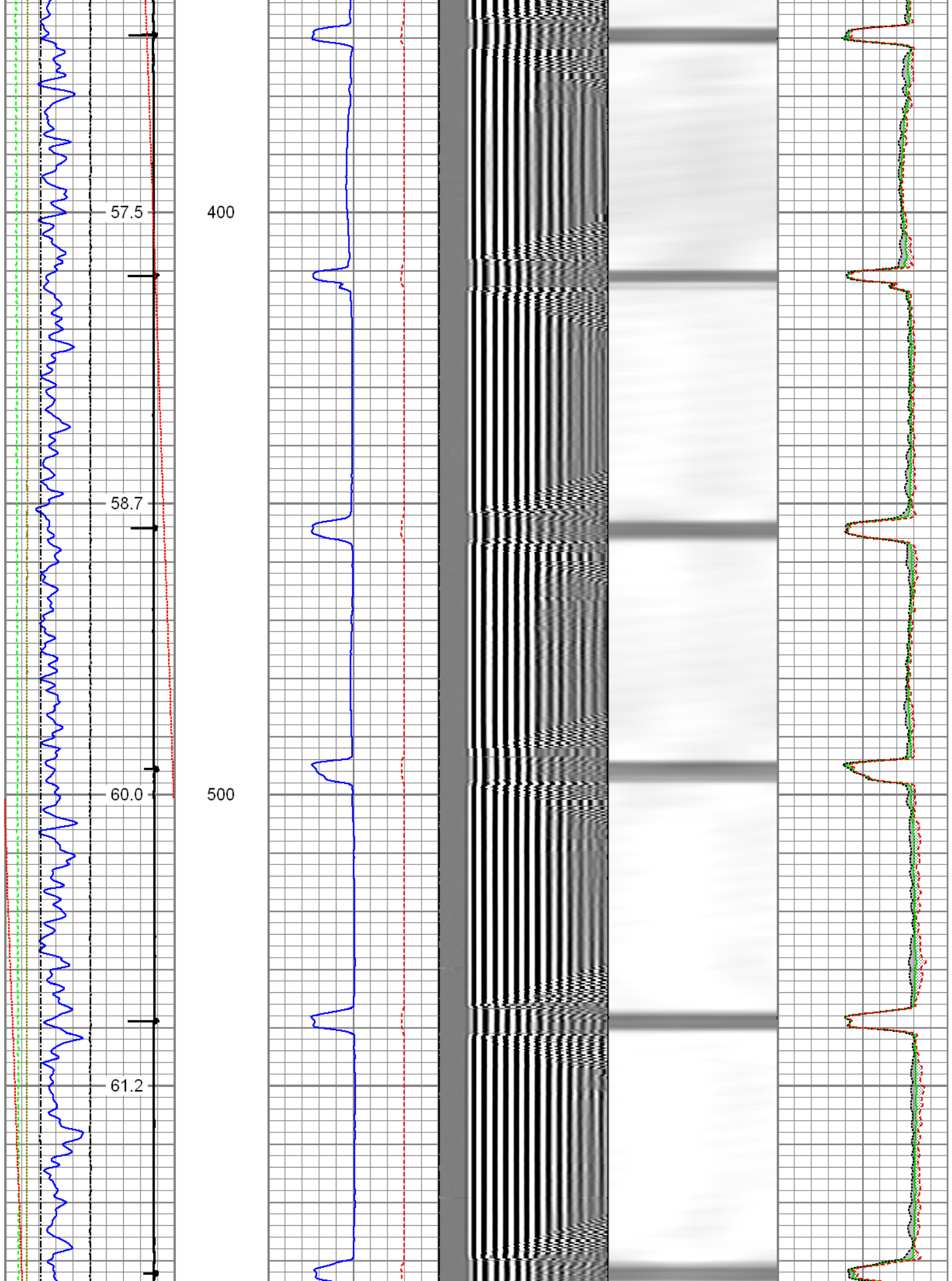
Dataset Creation:Fri Sep 04 07:59:08 2015 by Log 7.0 B1

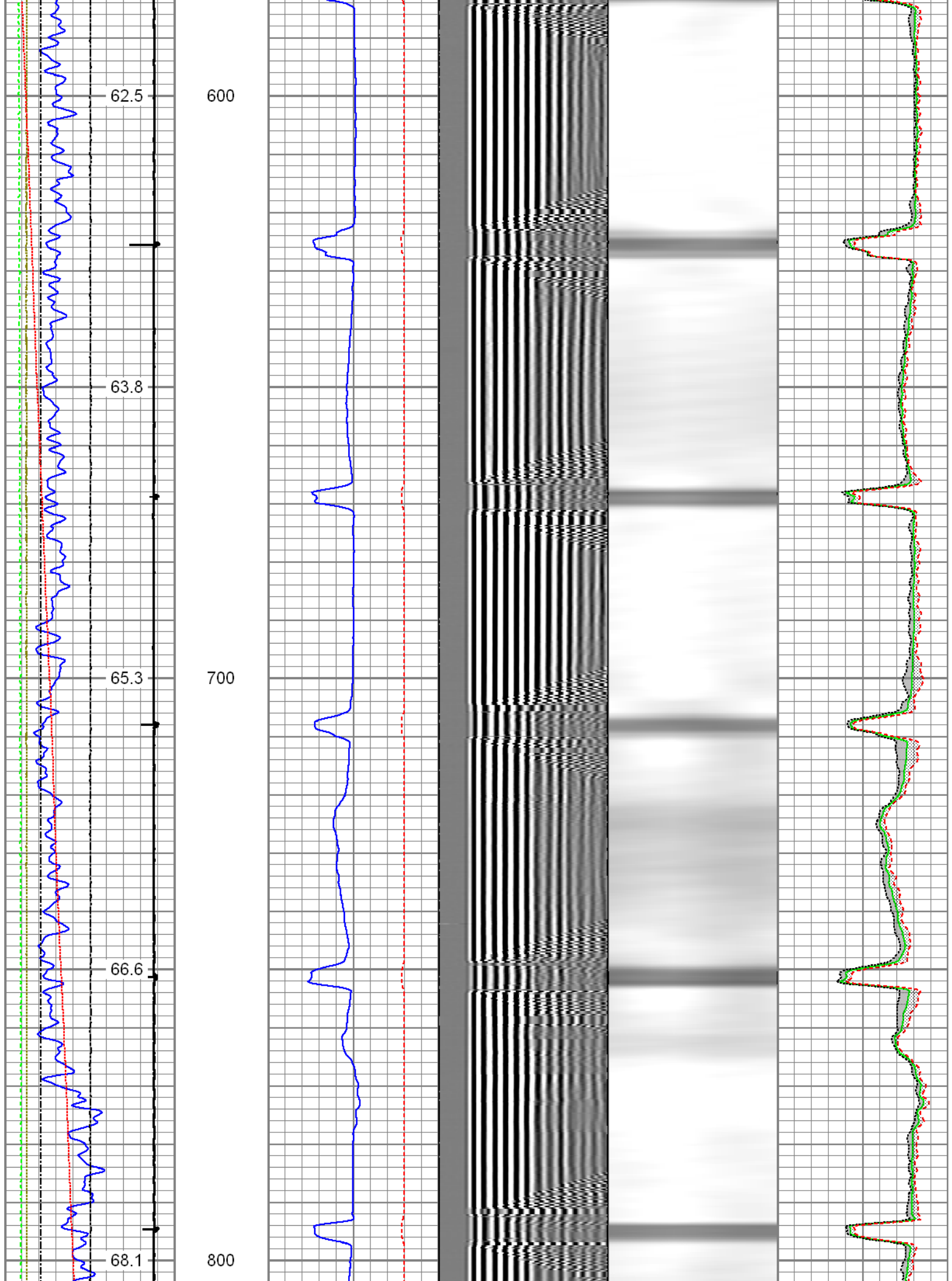
Charted by:Depth in Feet scaled 1:240

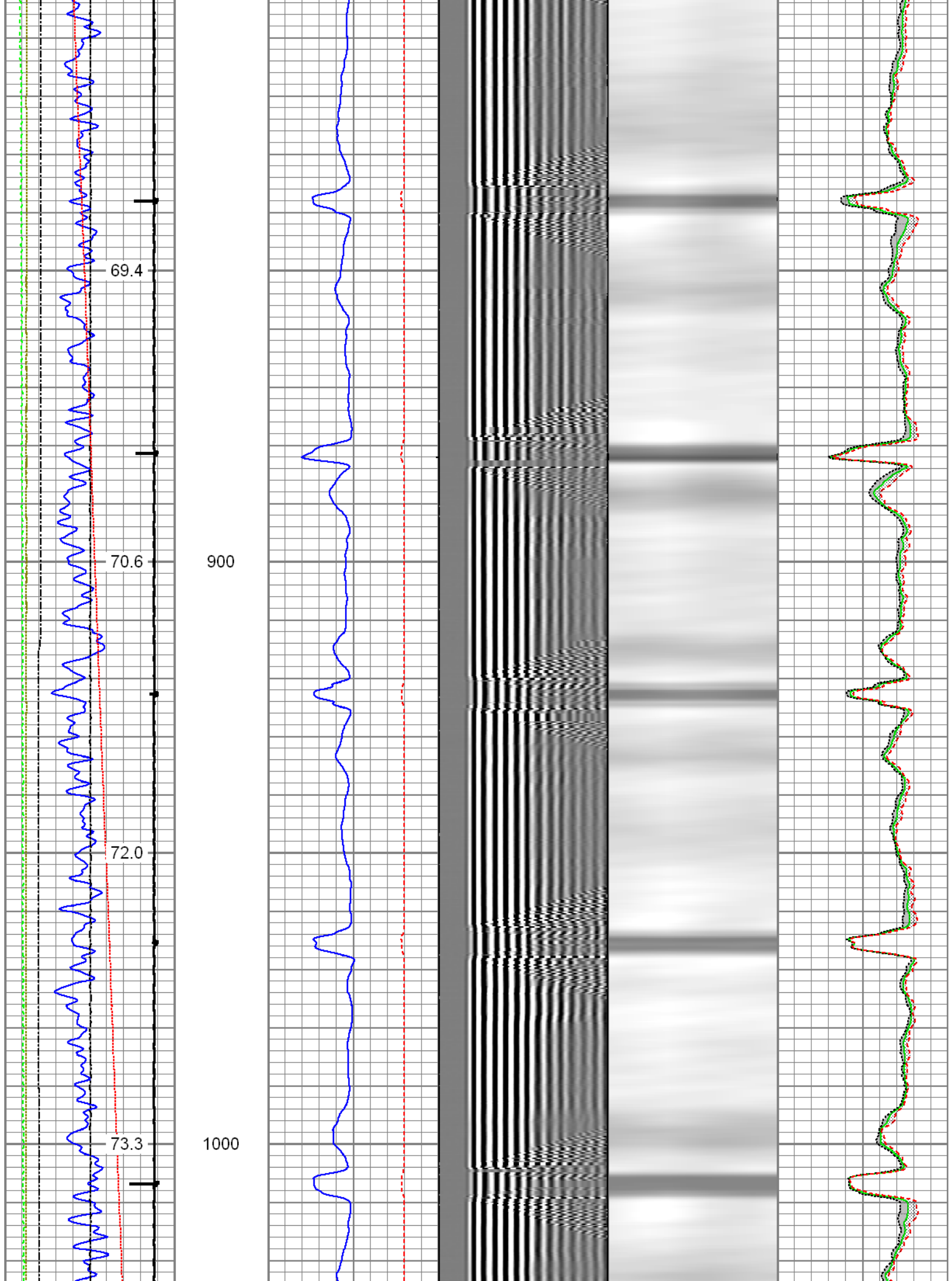
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000				
Differential Temperature				
-2 (degF) 2				
-10 Deviation (°) 90				
Temperature				
0 (degF) 20				

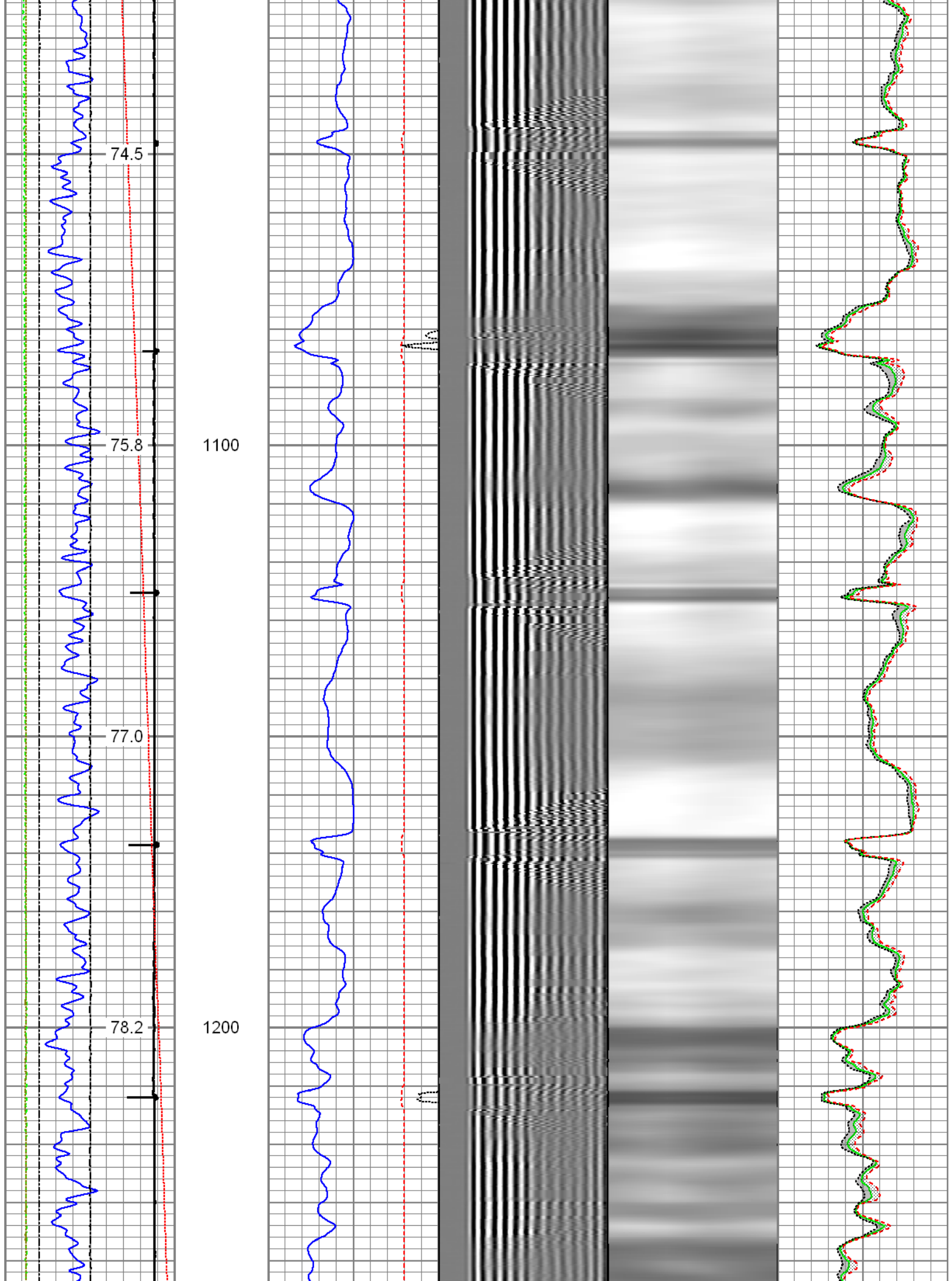


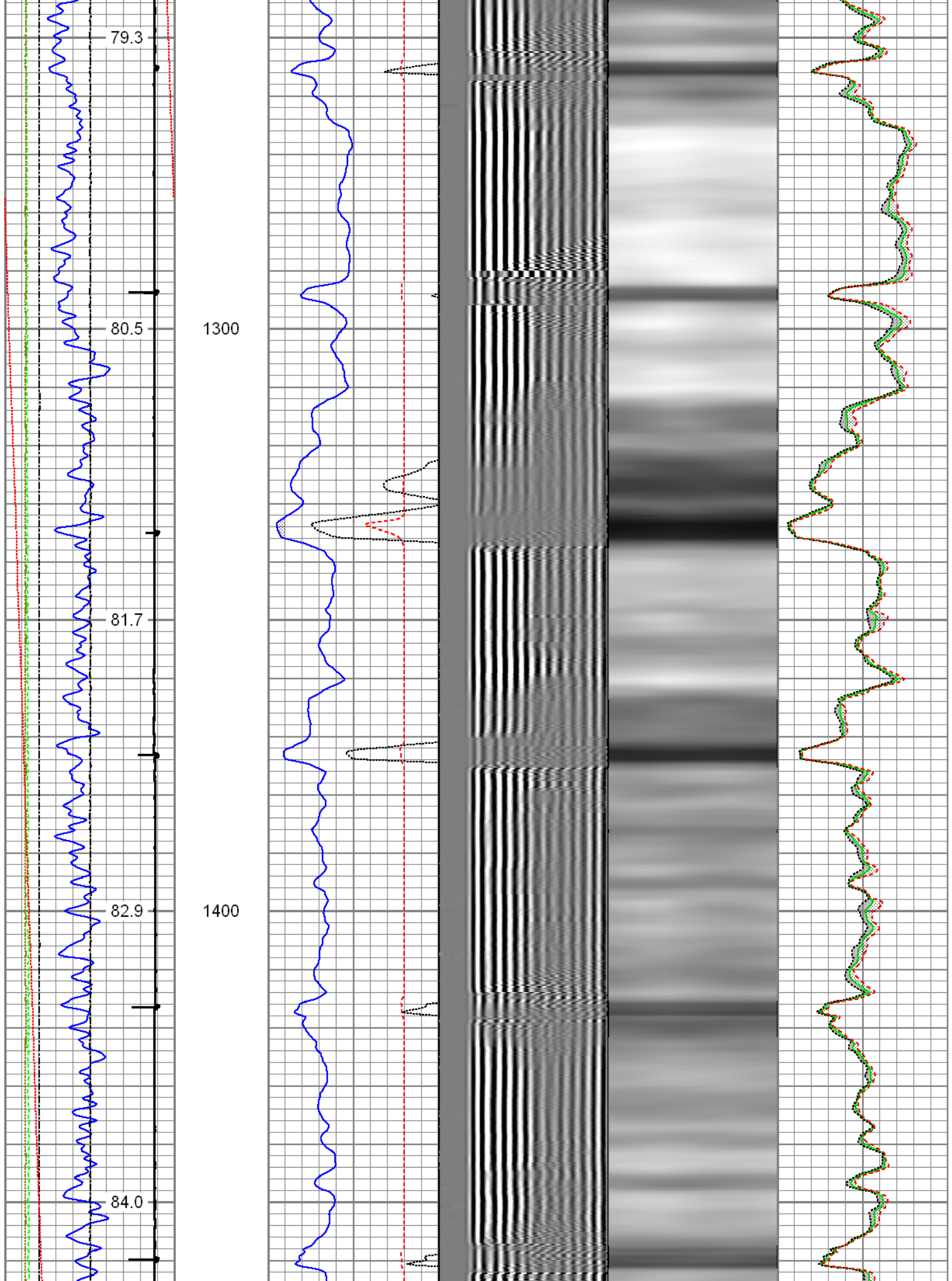


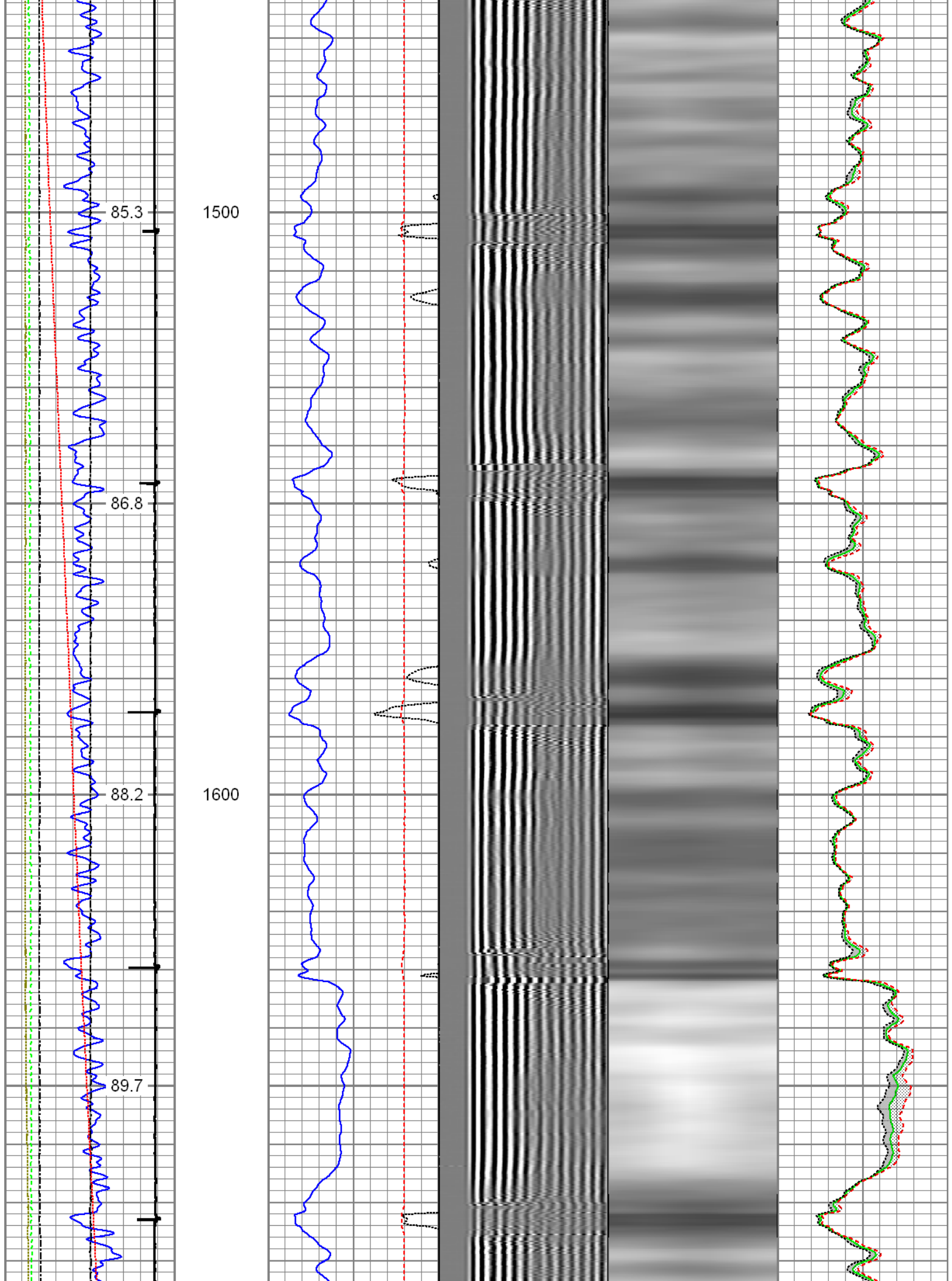


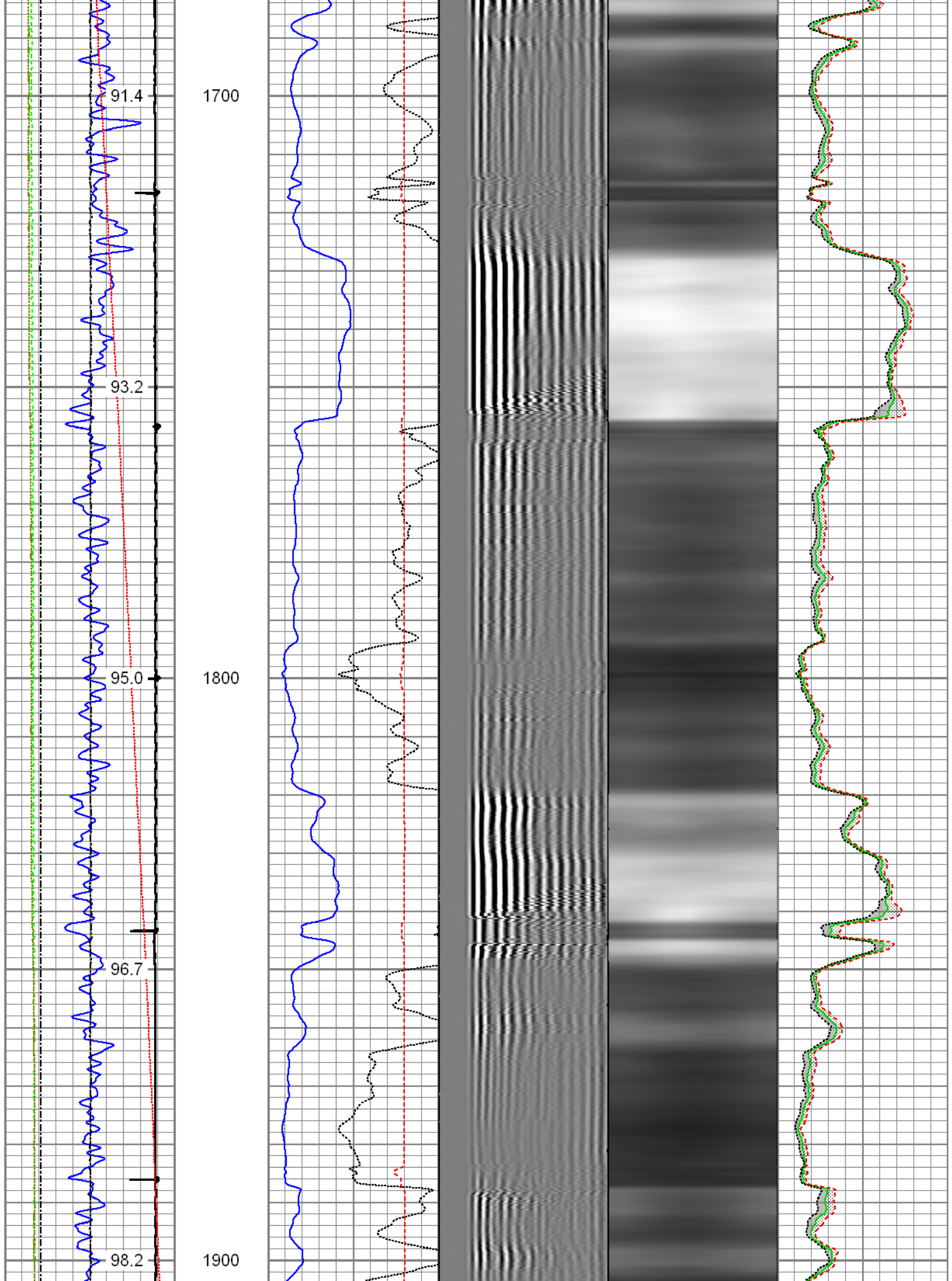


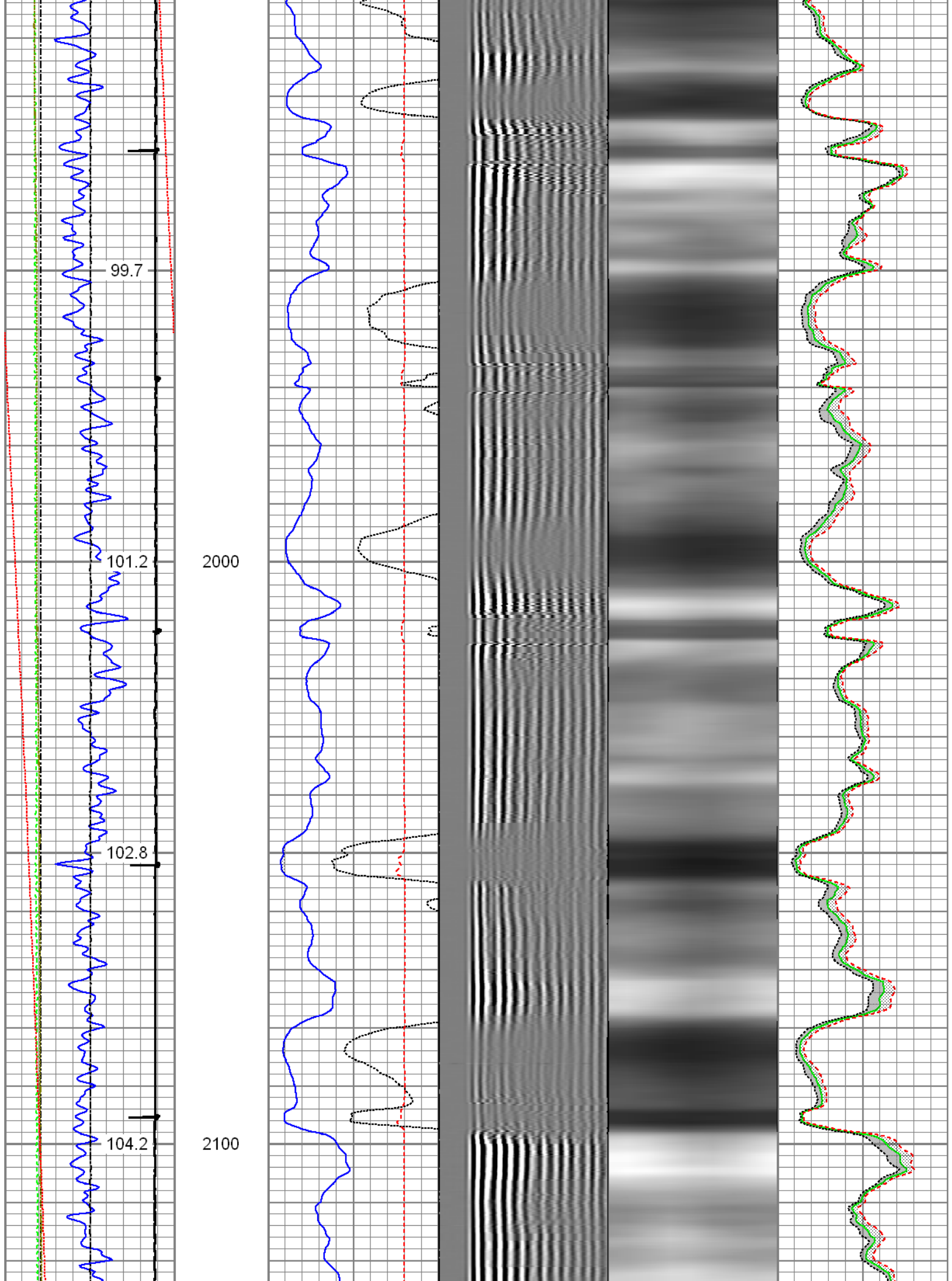


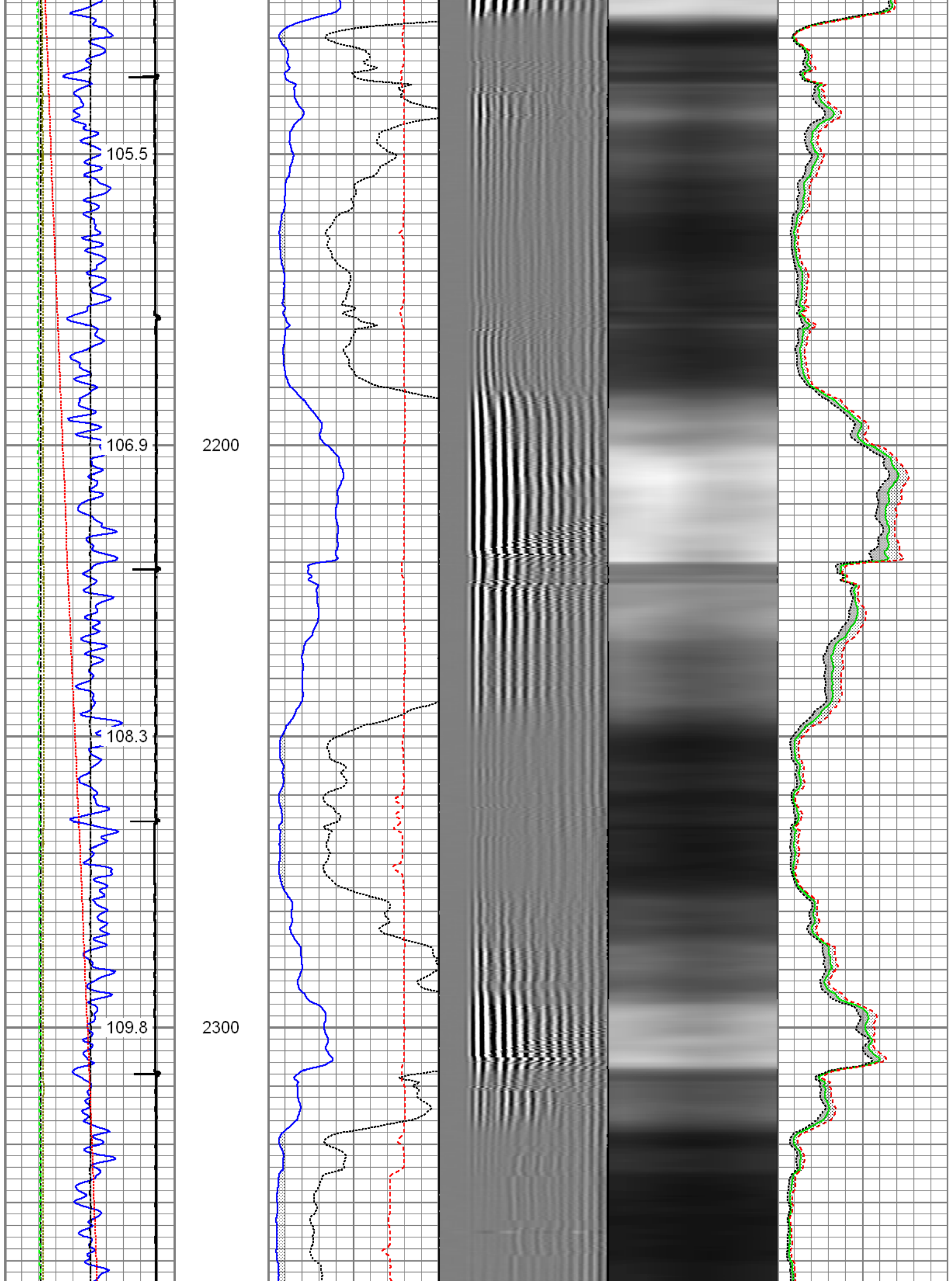


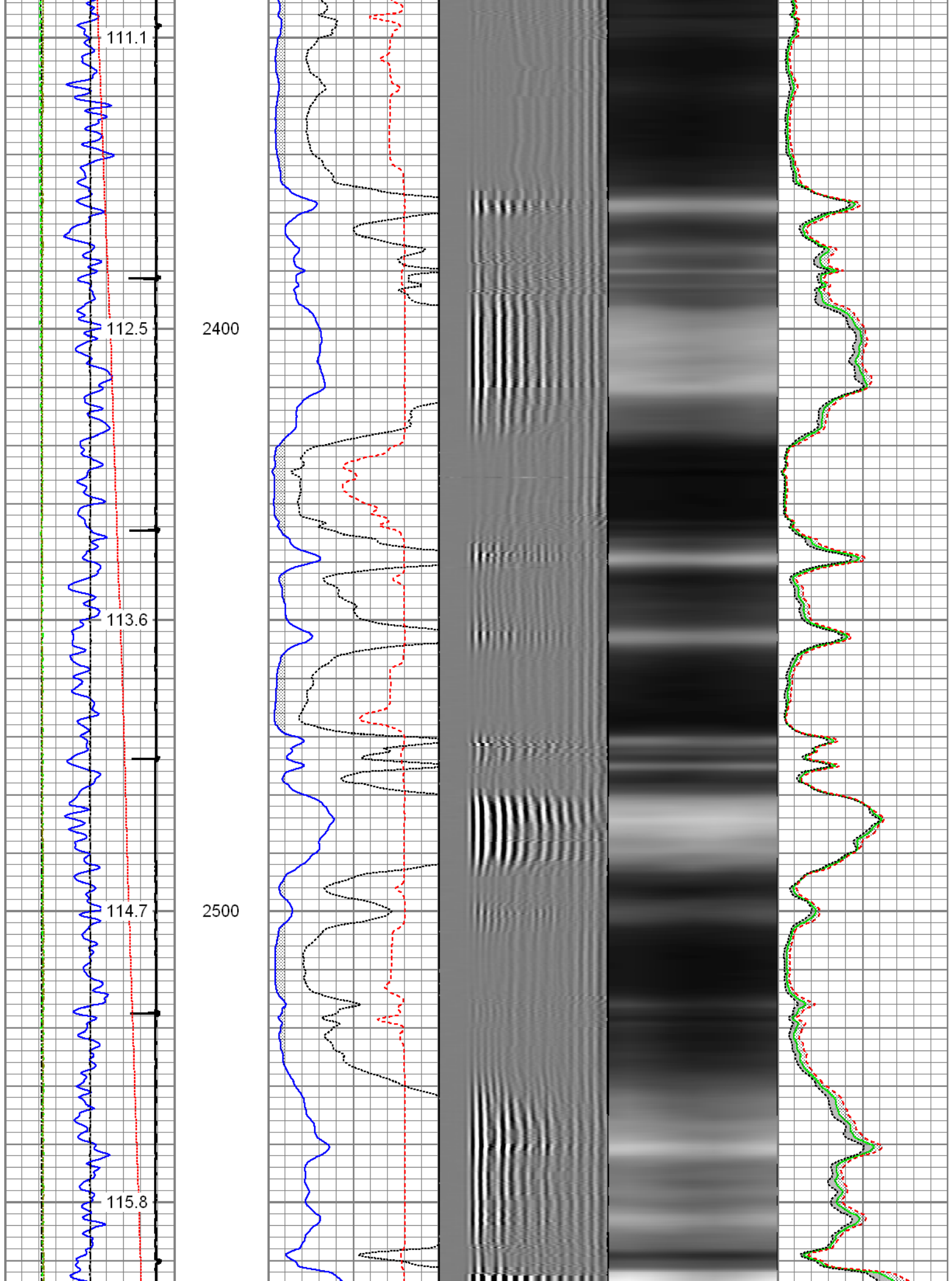


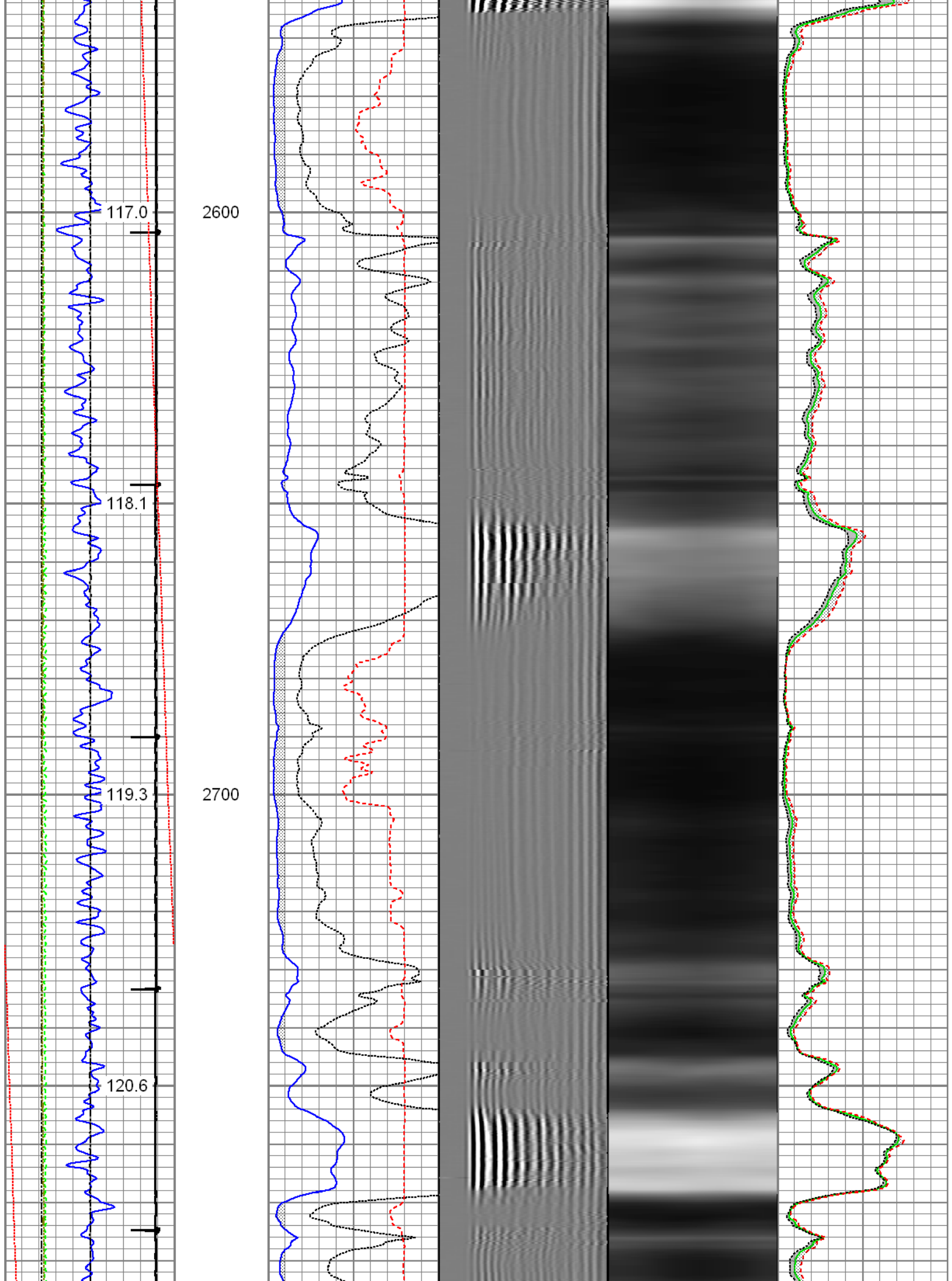


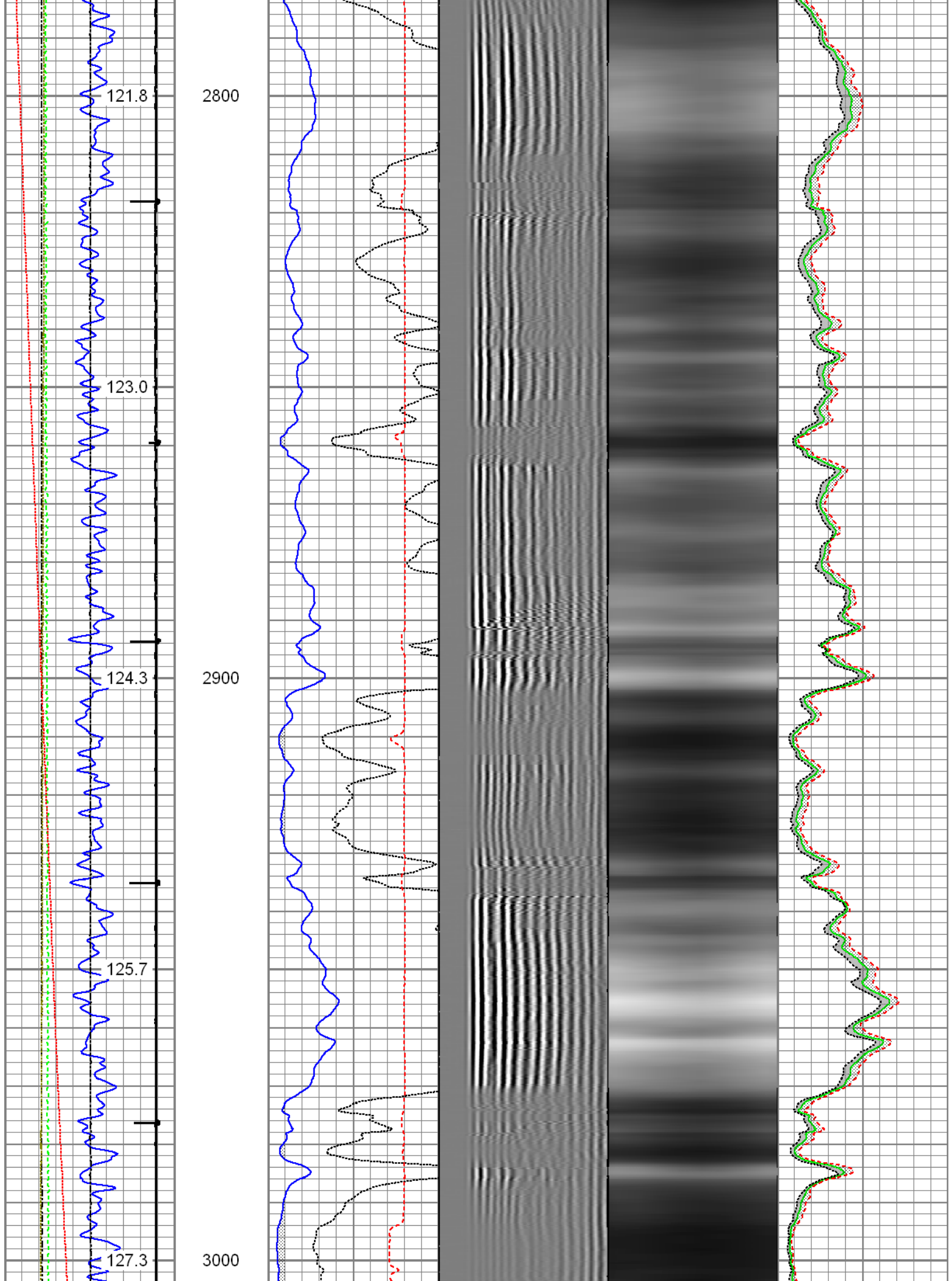


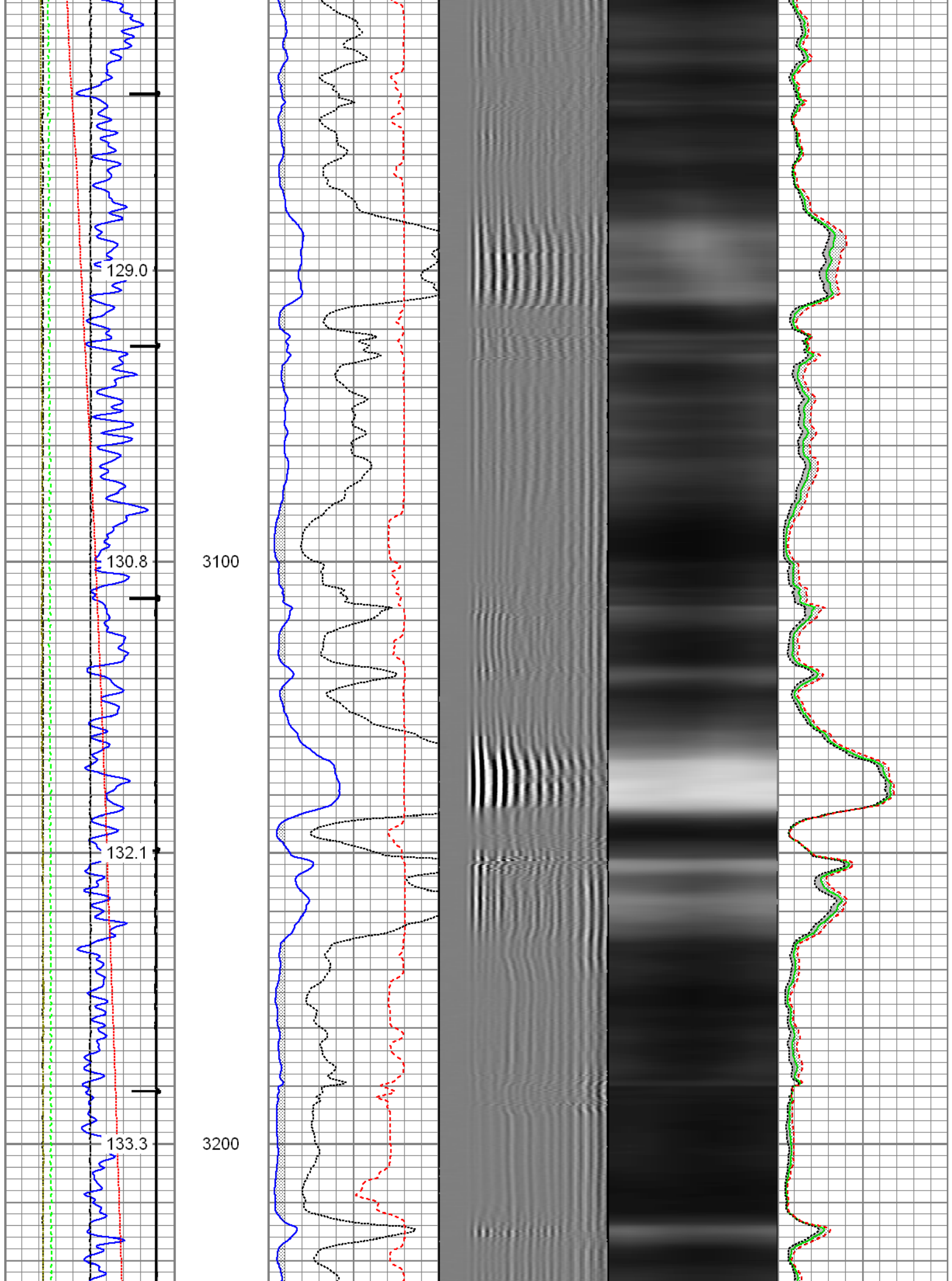


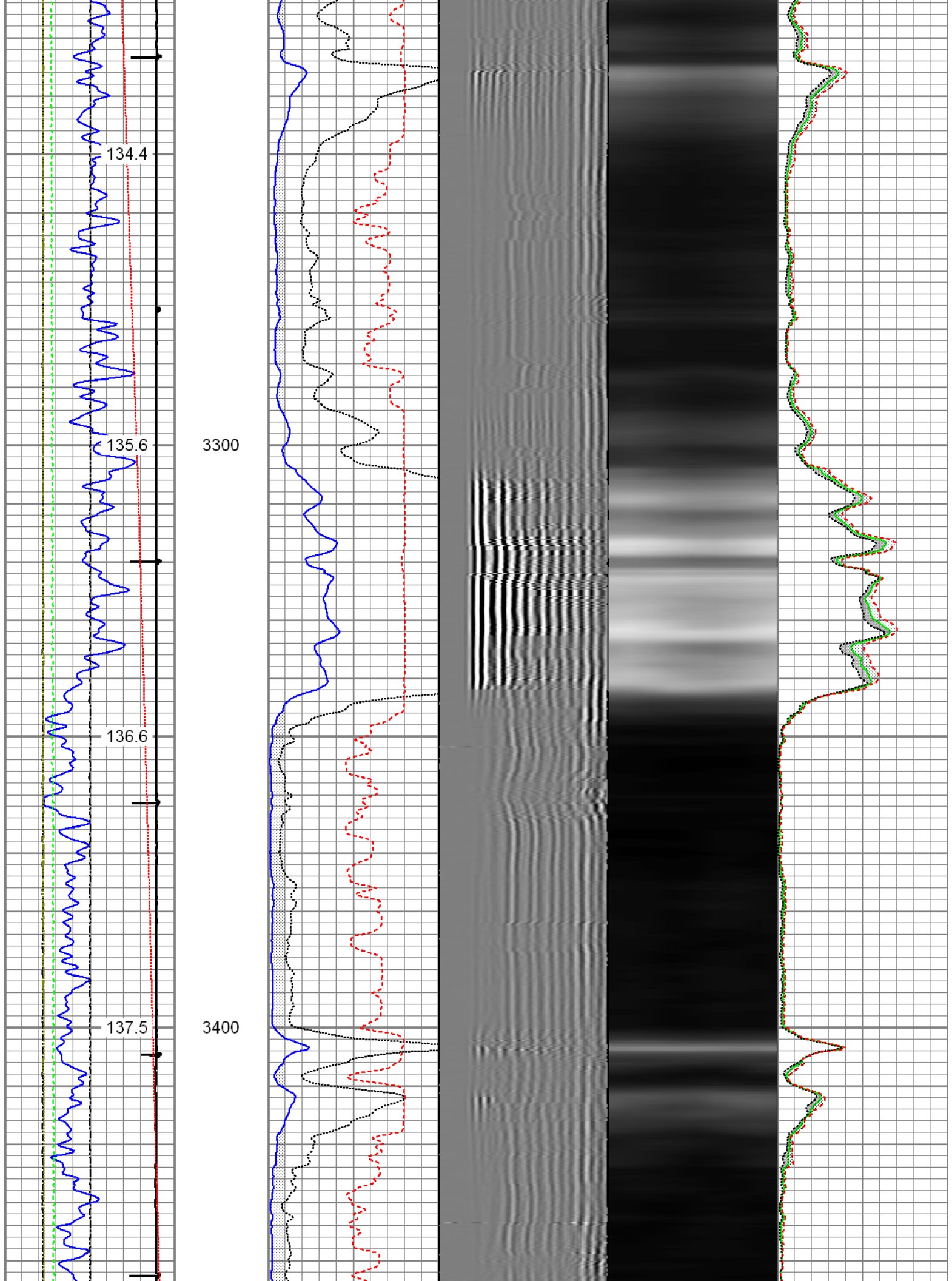


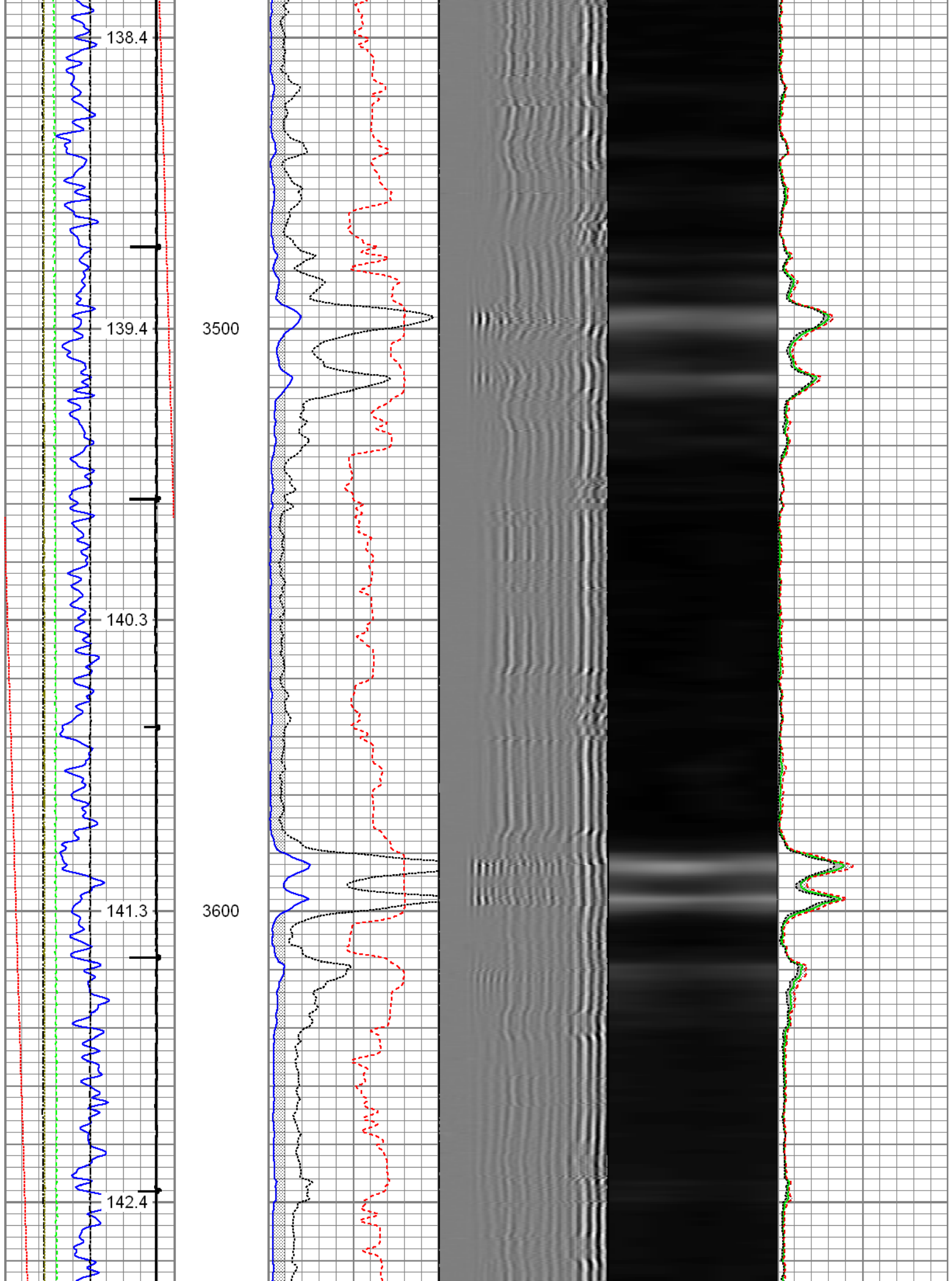


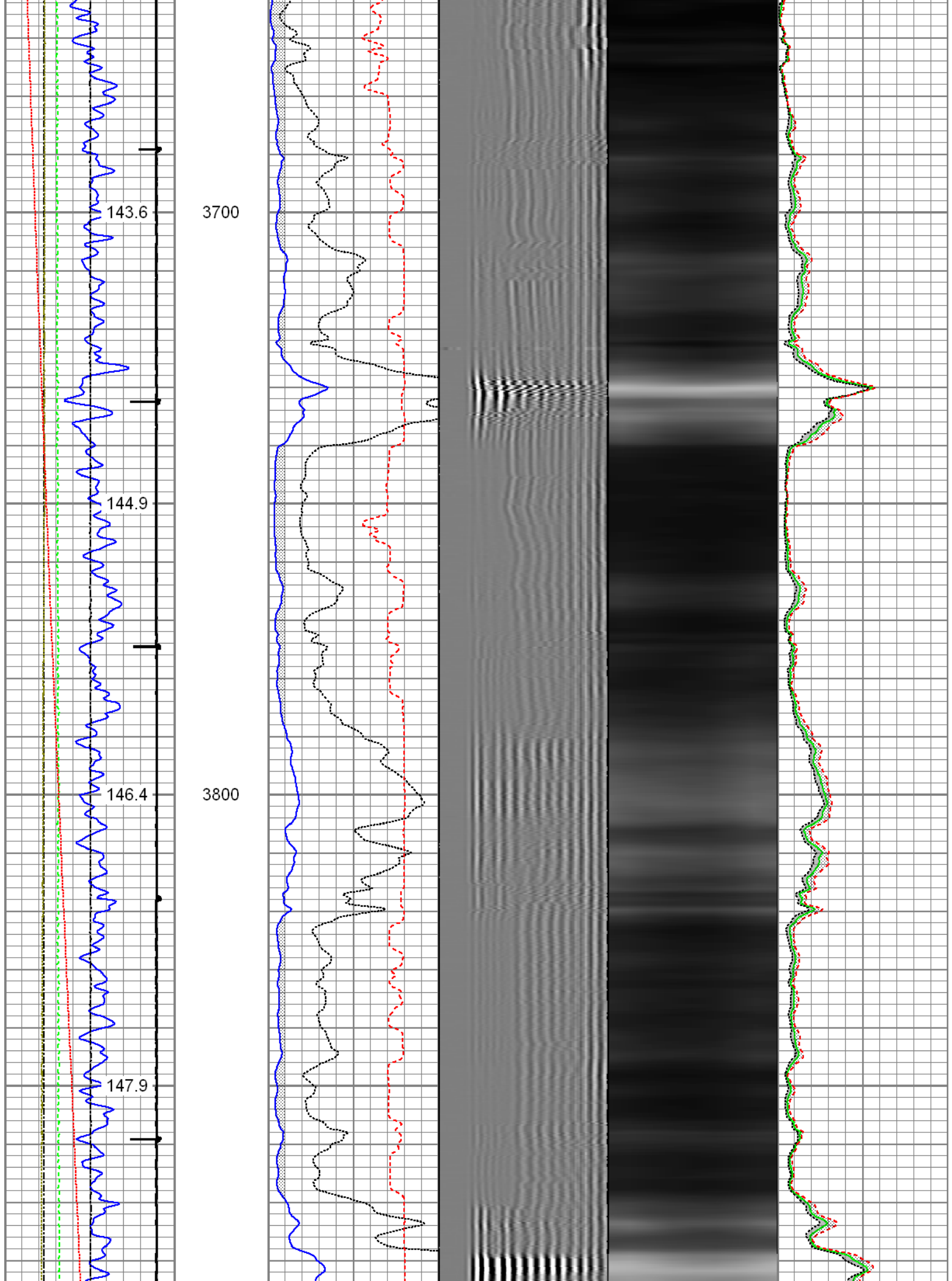


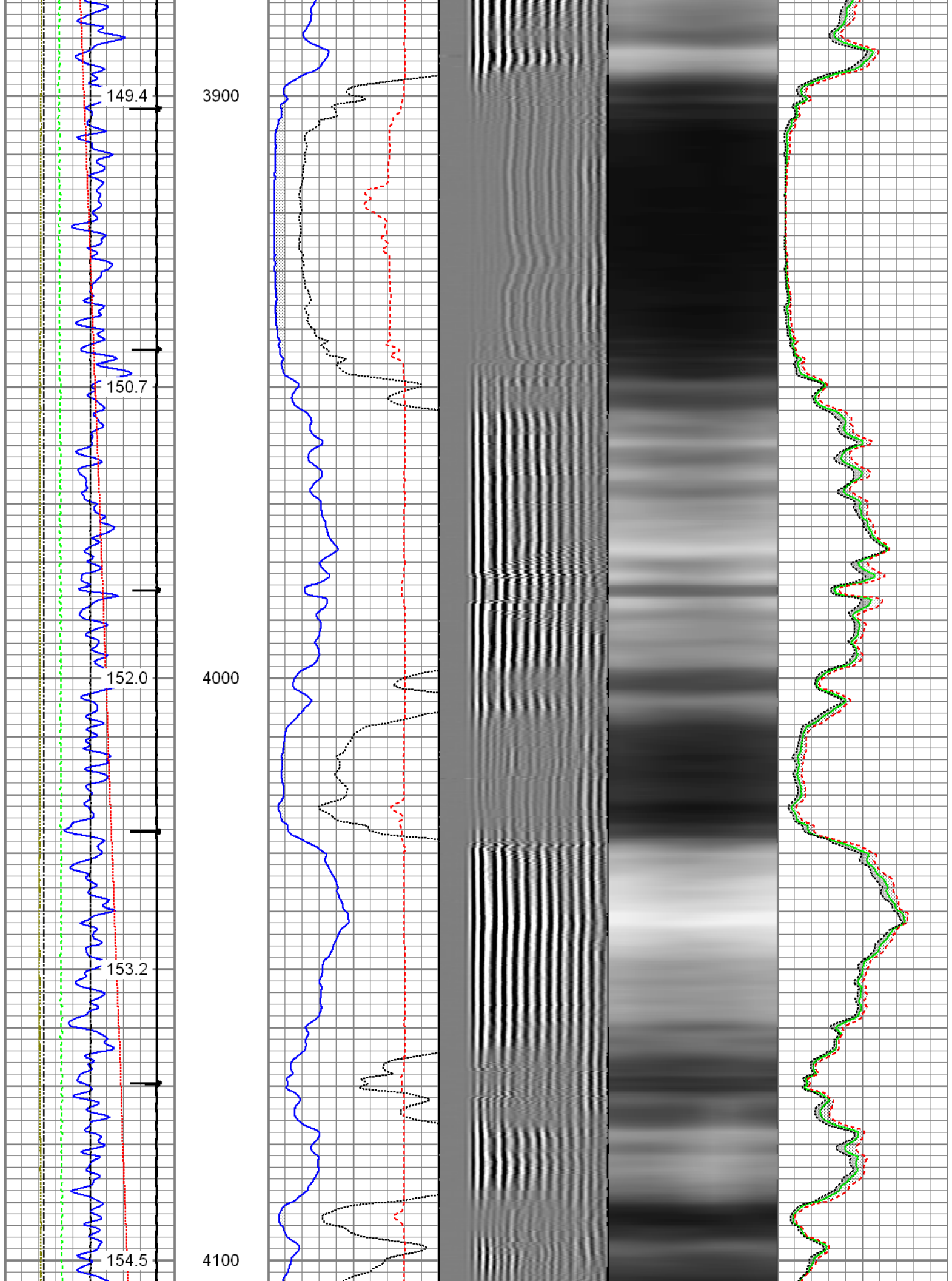


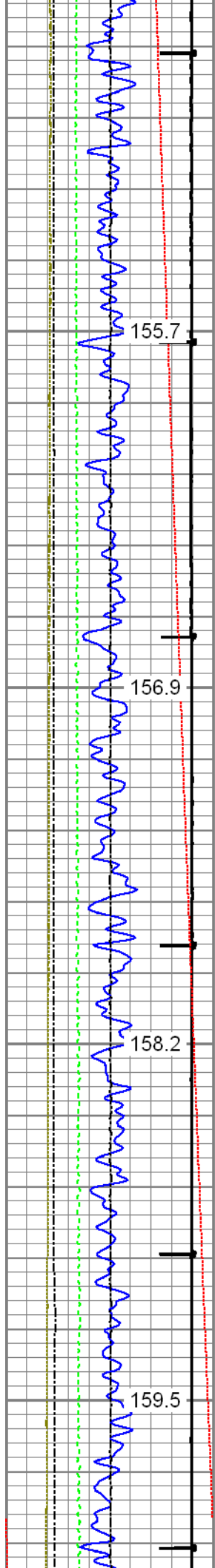






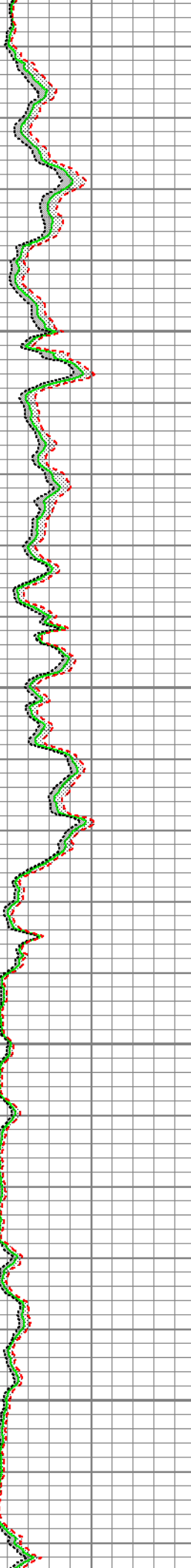
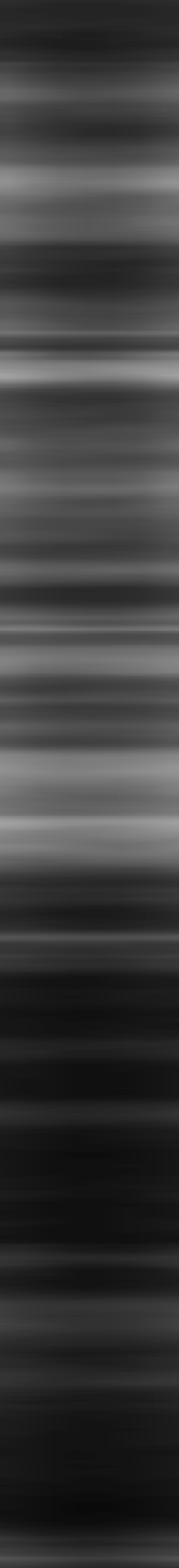
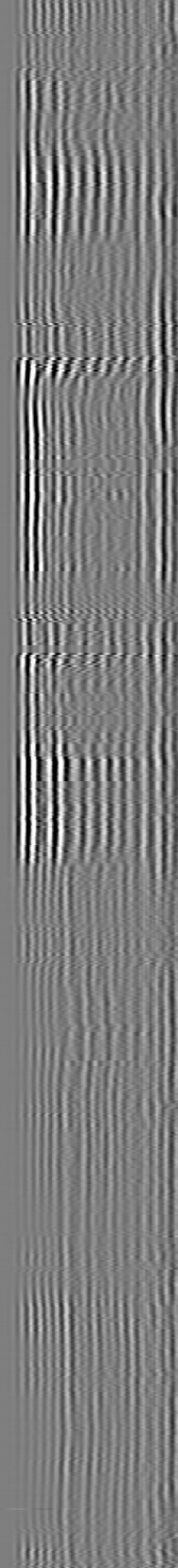
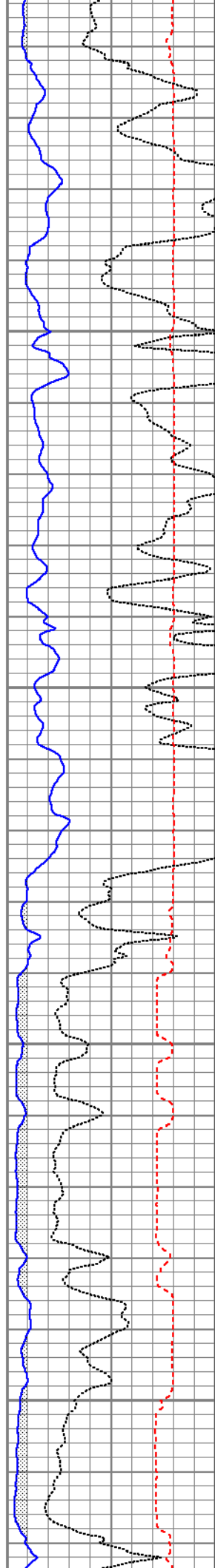


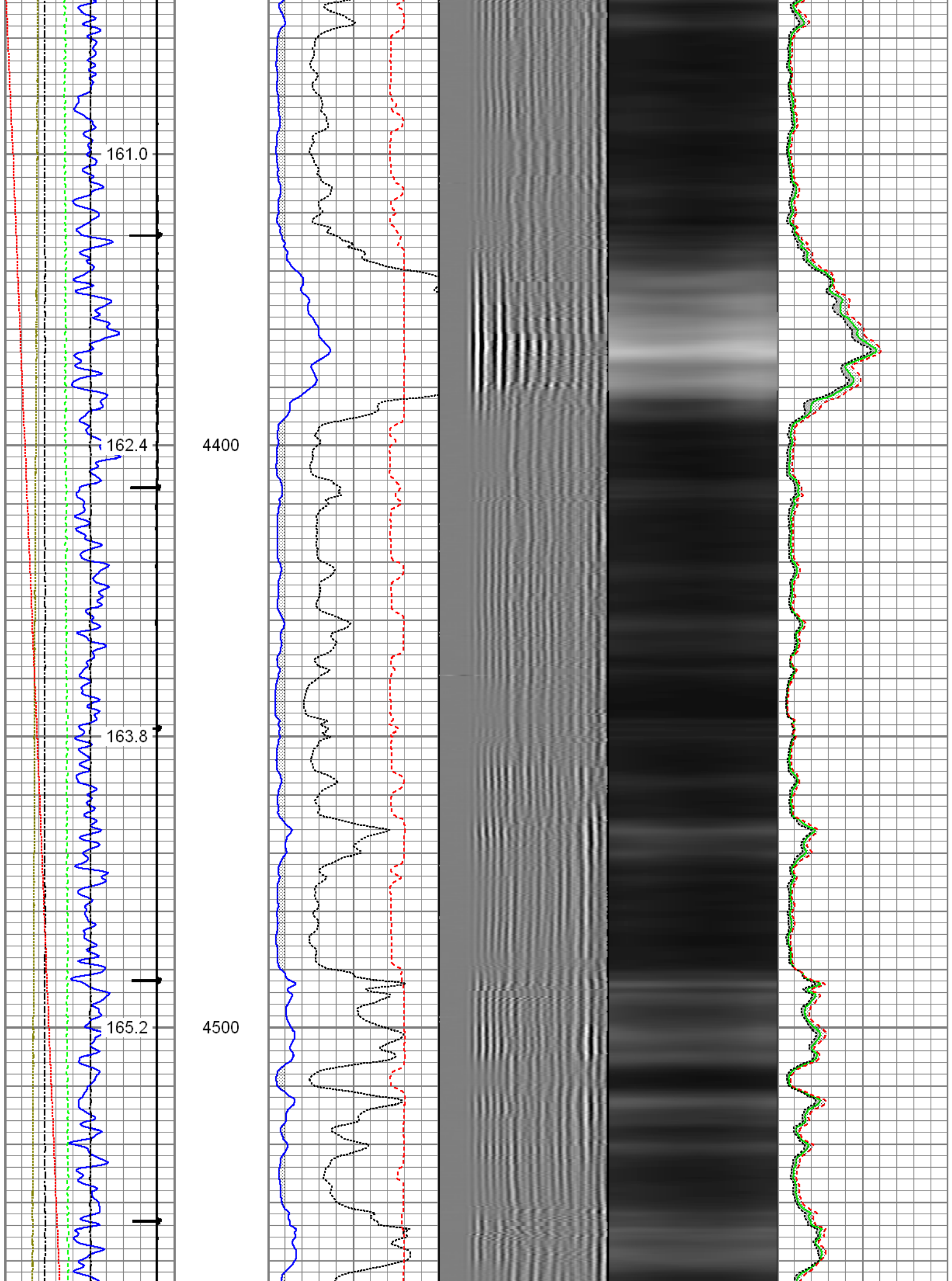


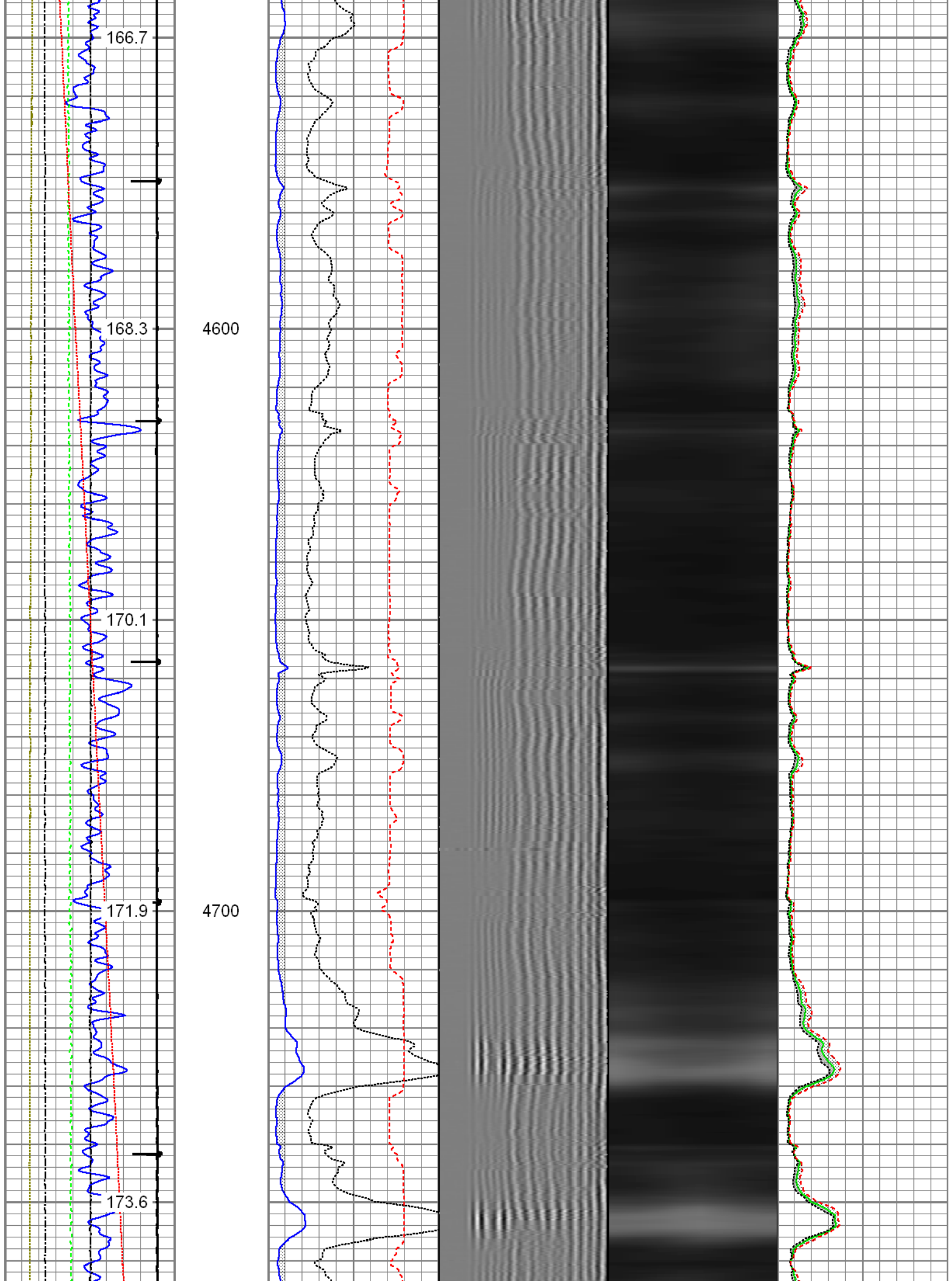


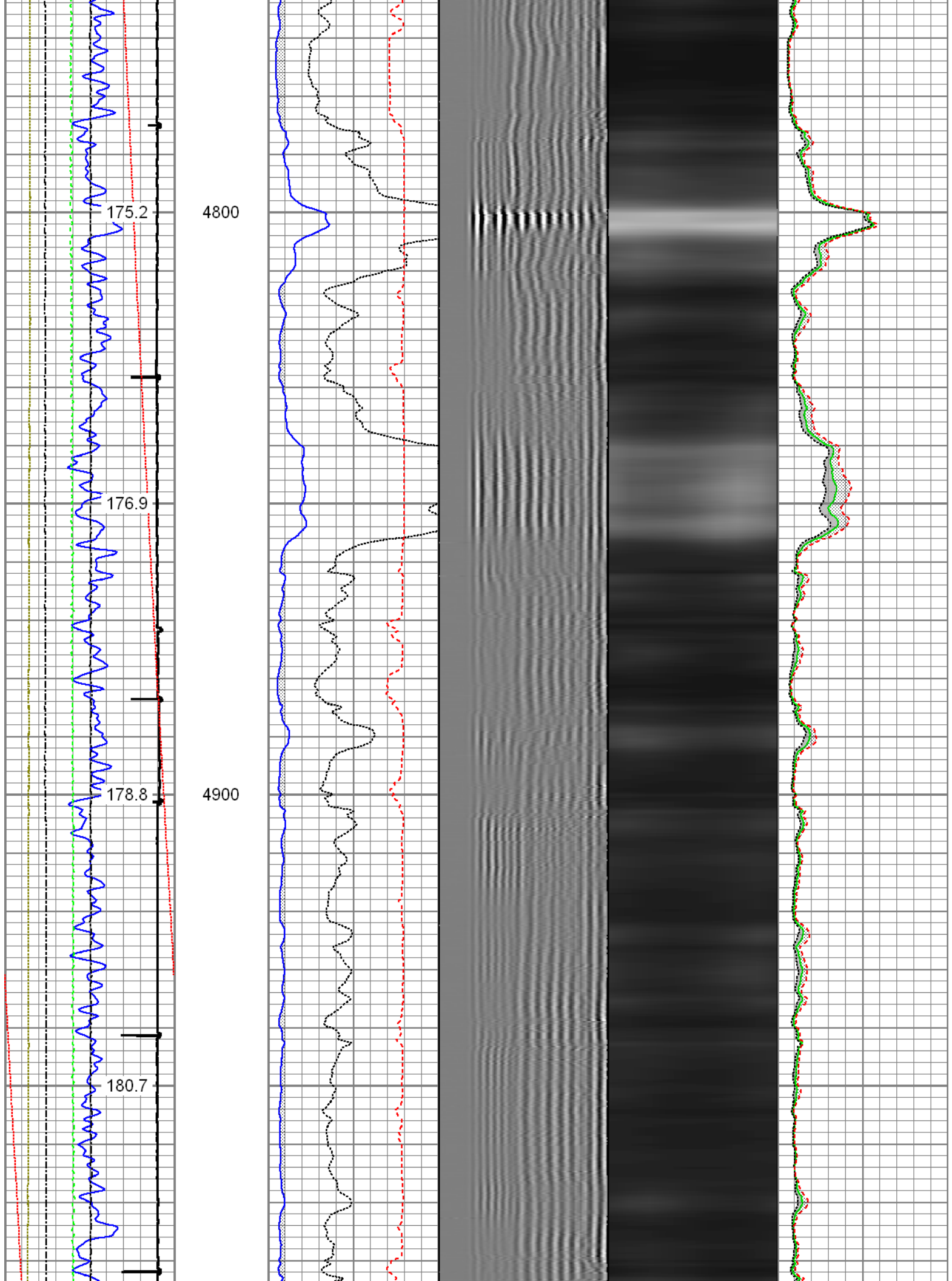
4200

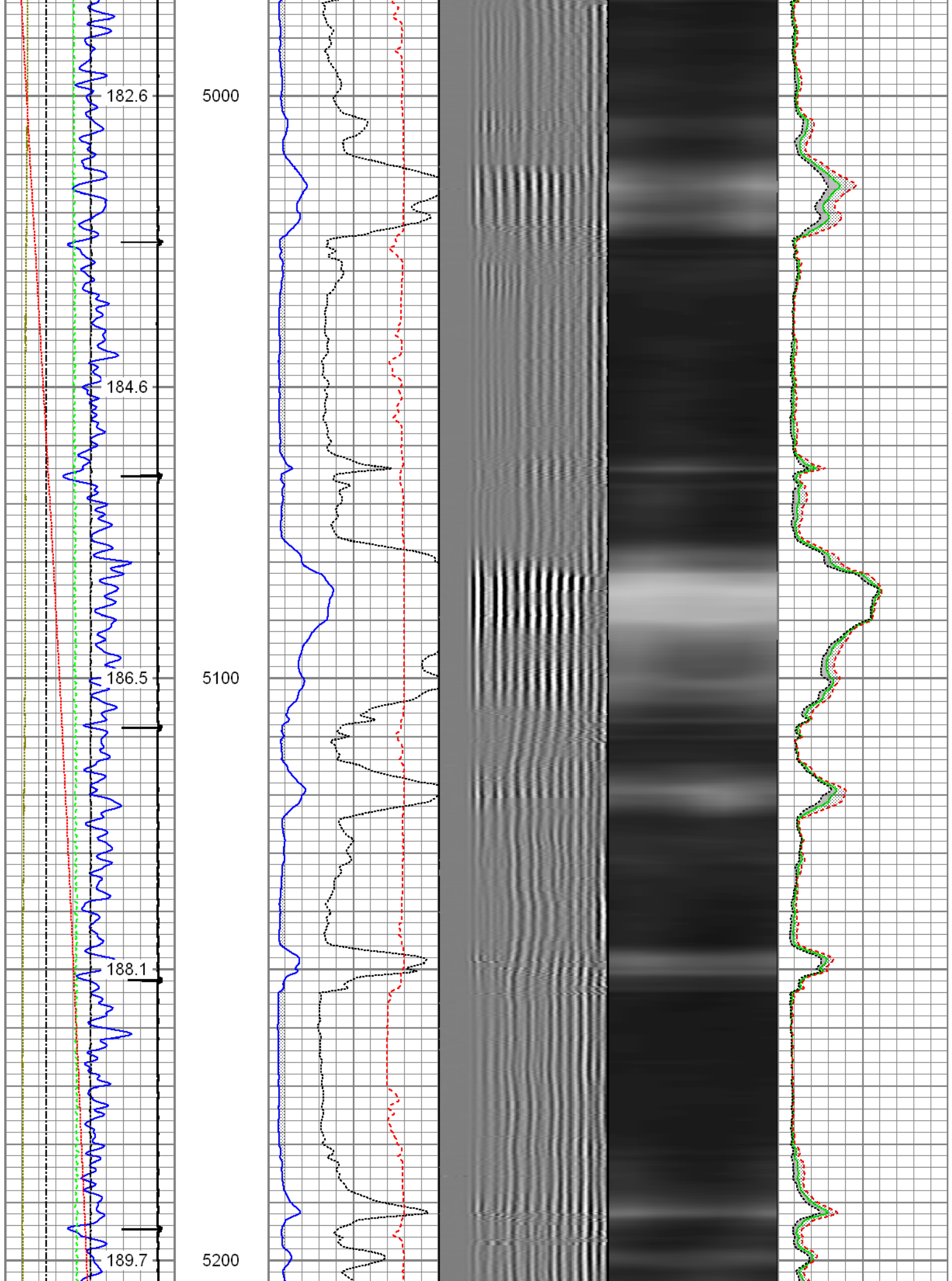
4300

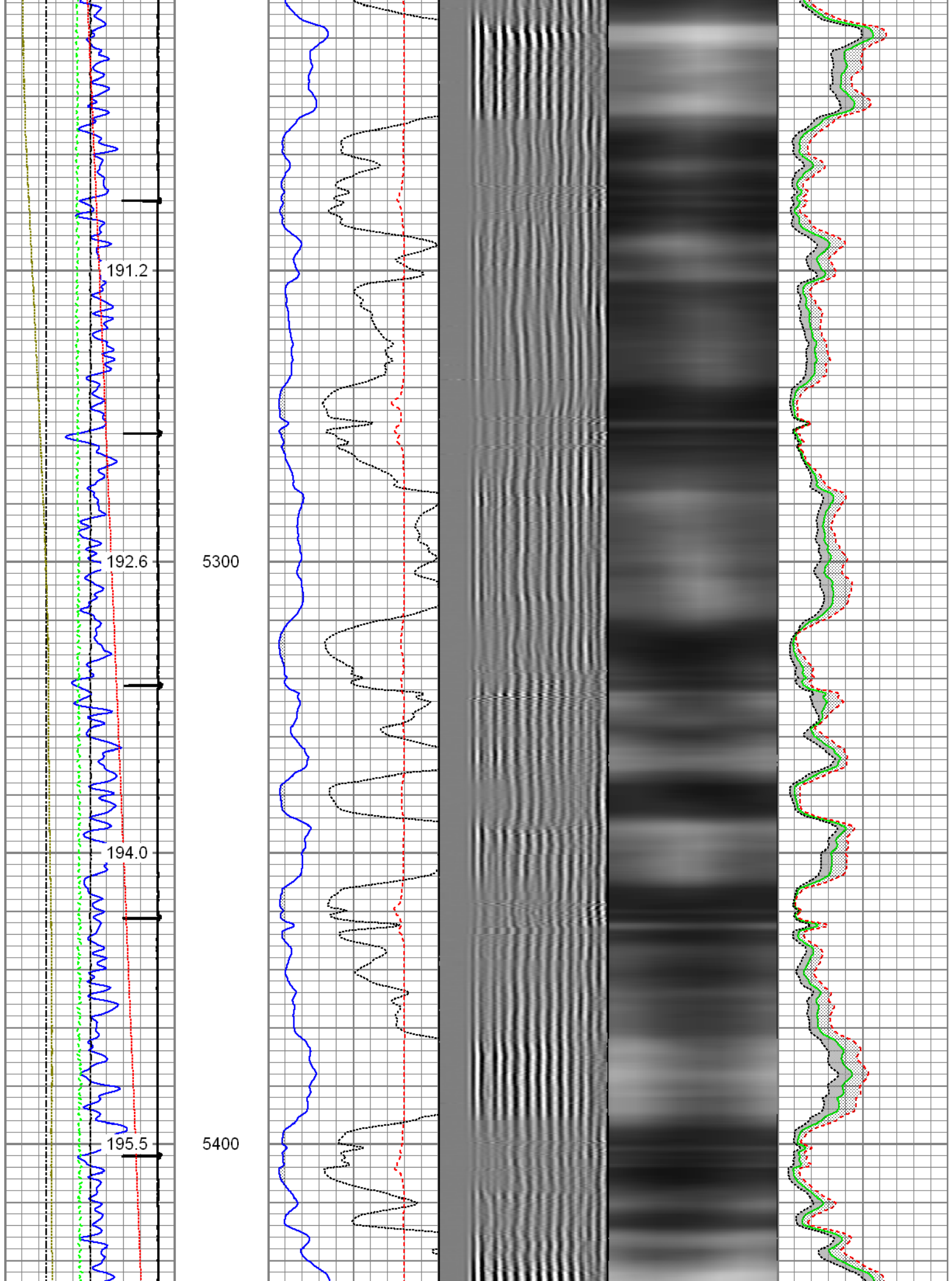


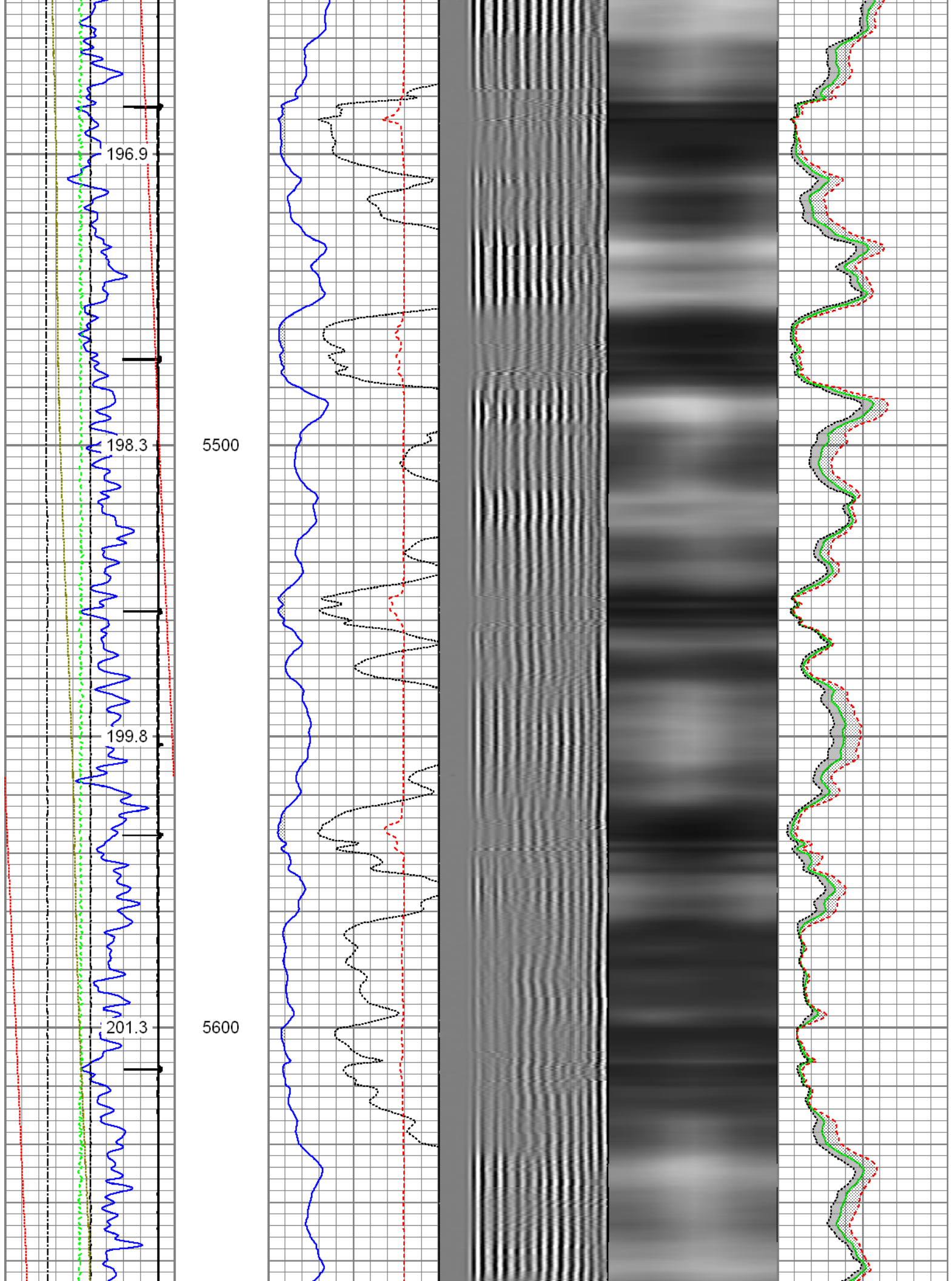


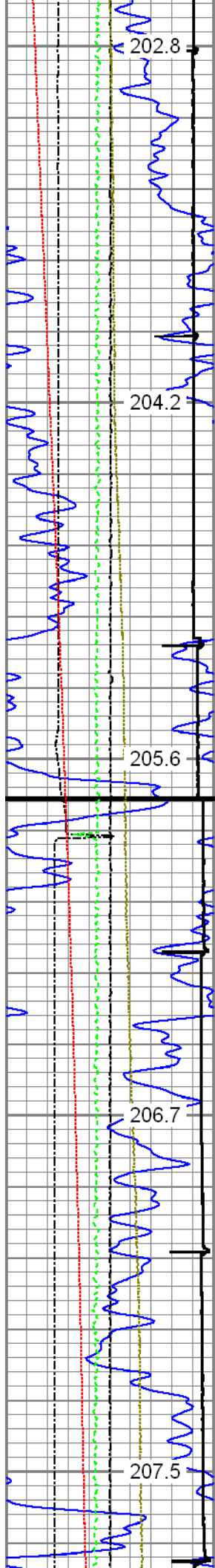






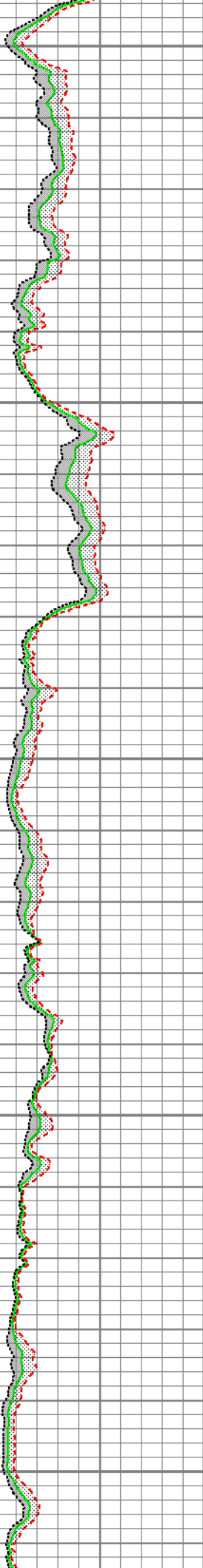
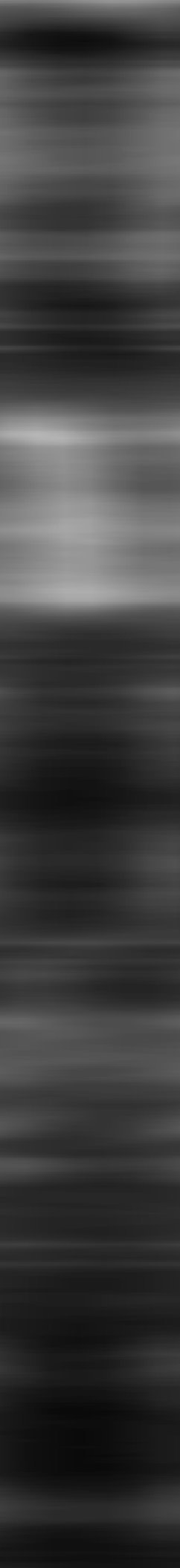
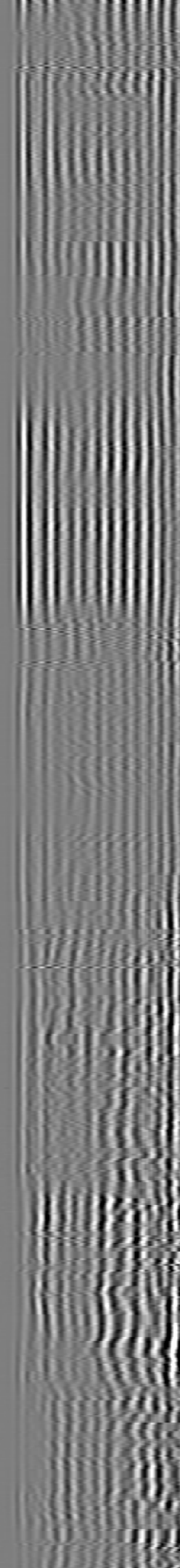
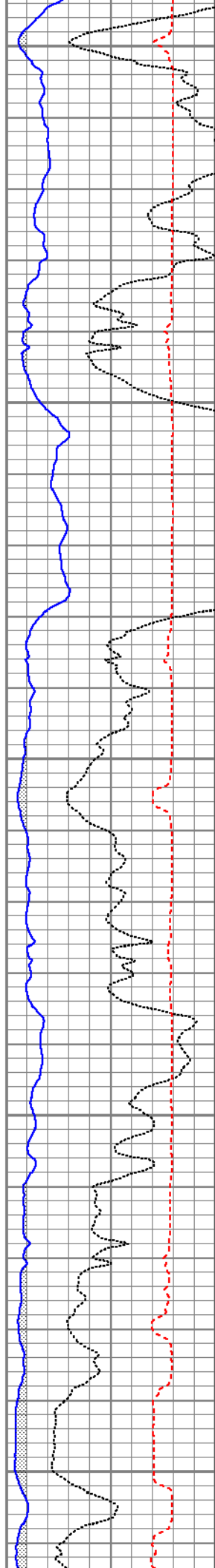


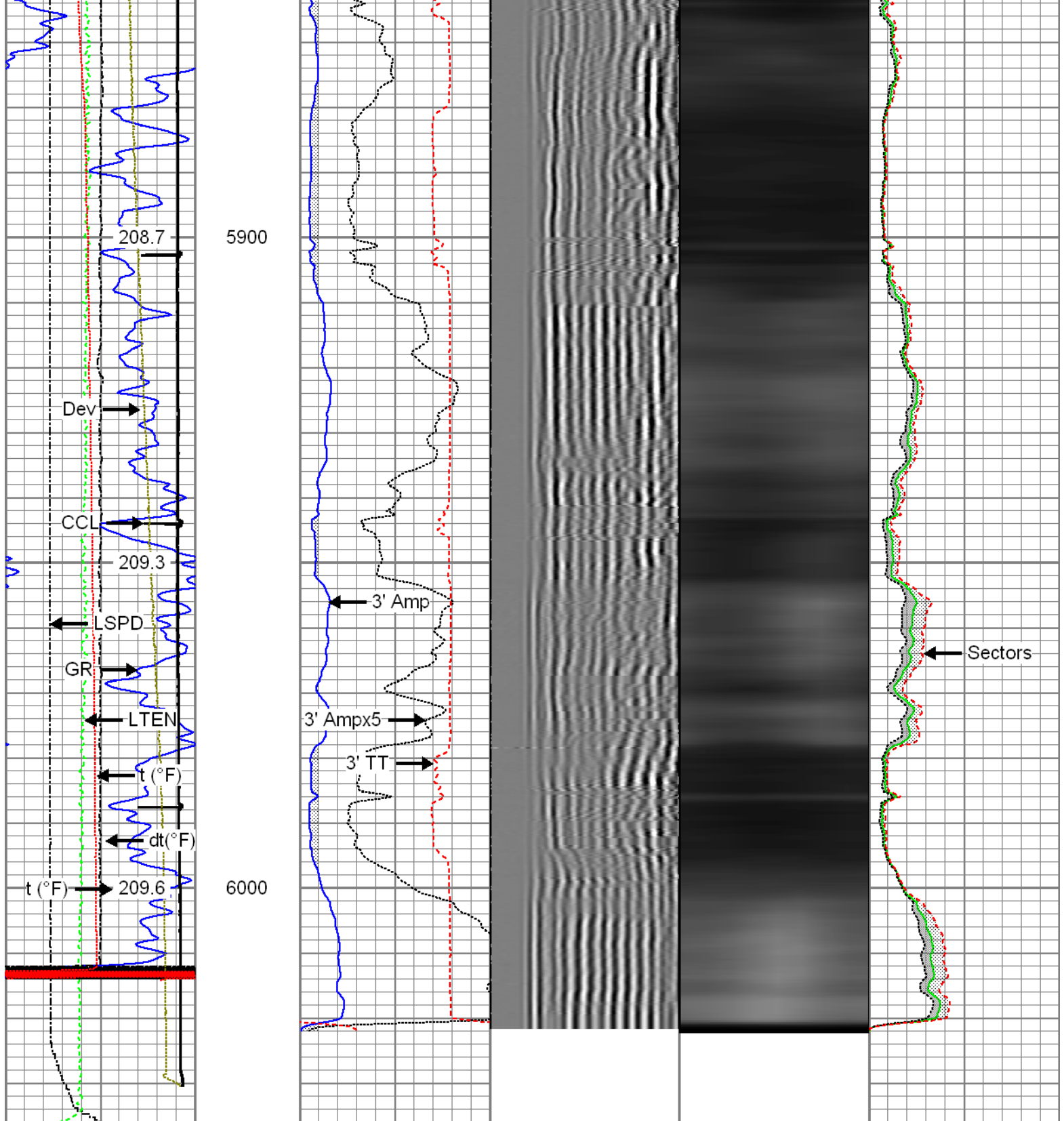




5700

5800





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 (mV)			Minimum Amplitude
Line Speed (ft/min)	0 20			0 100
-100 100	3' Travel Time (usec)			Maximum Amplitude
Line Tension (lb)	650 150			0 100
0 2000				
Differential Temperature (degF)				
-2 2				
-10 Deviation (°)				
90				

10 Deviation (°)	00
Temperature	
0 (degF)	20

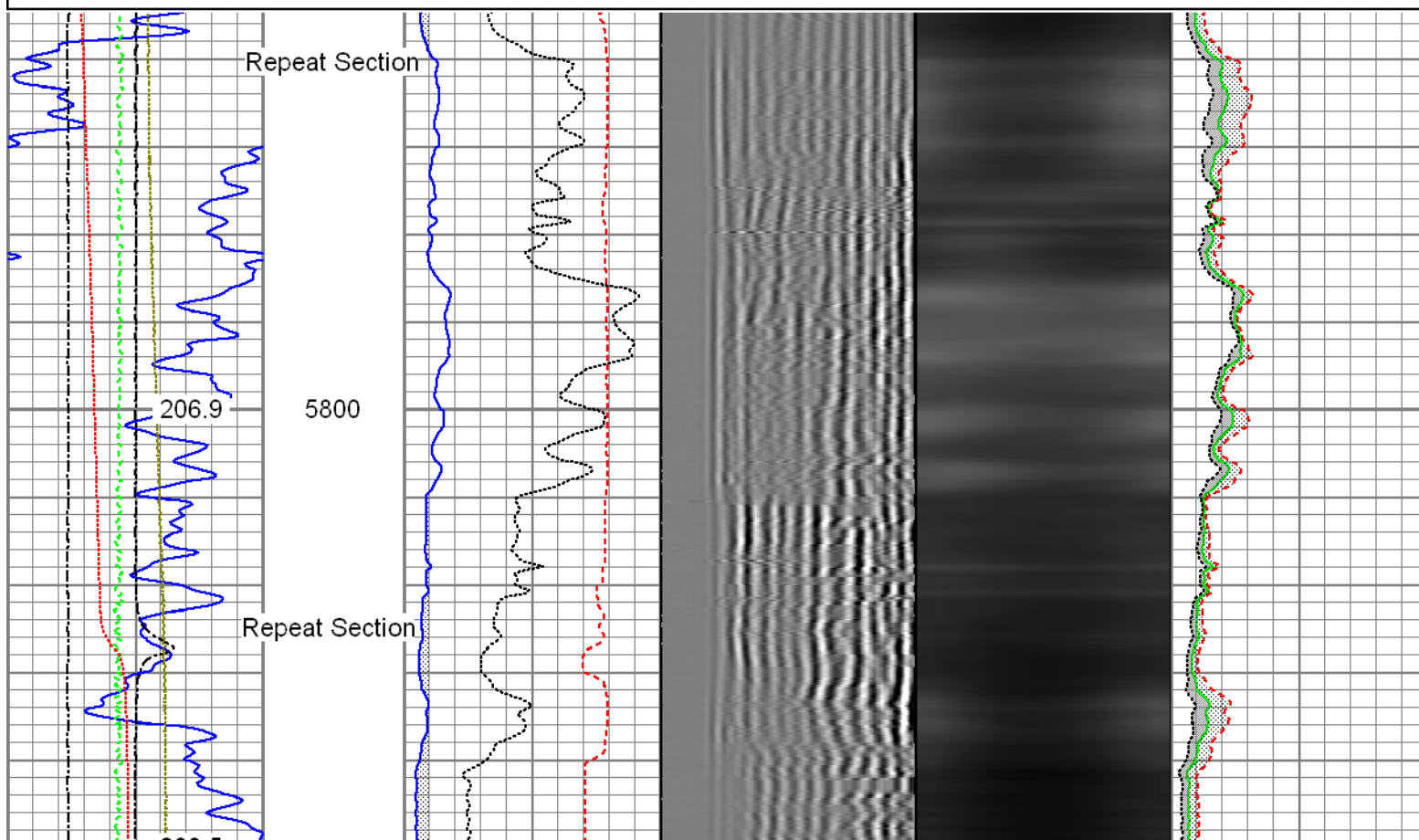


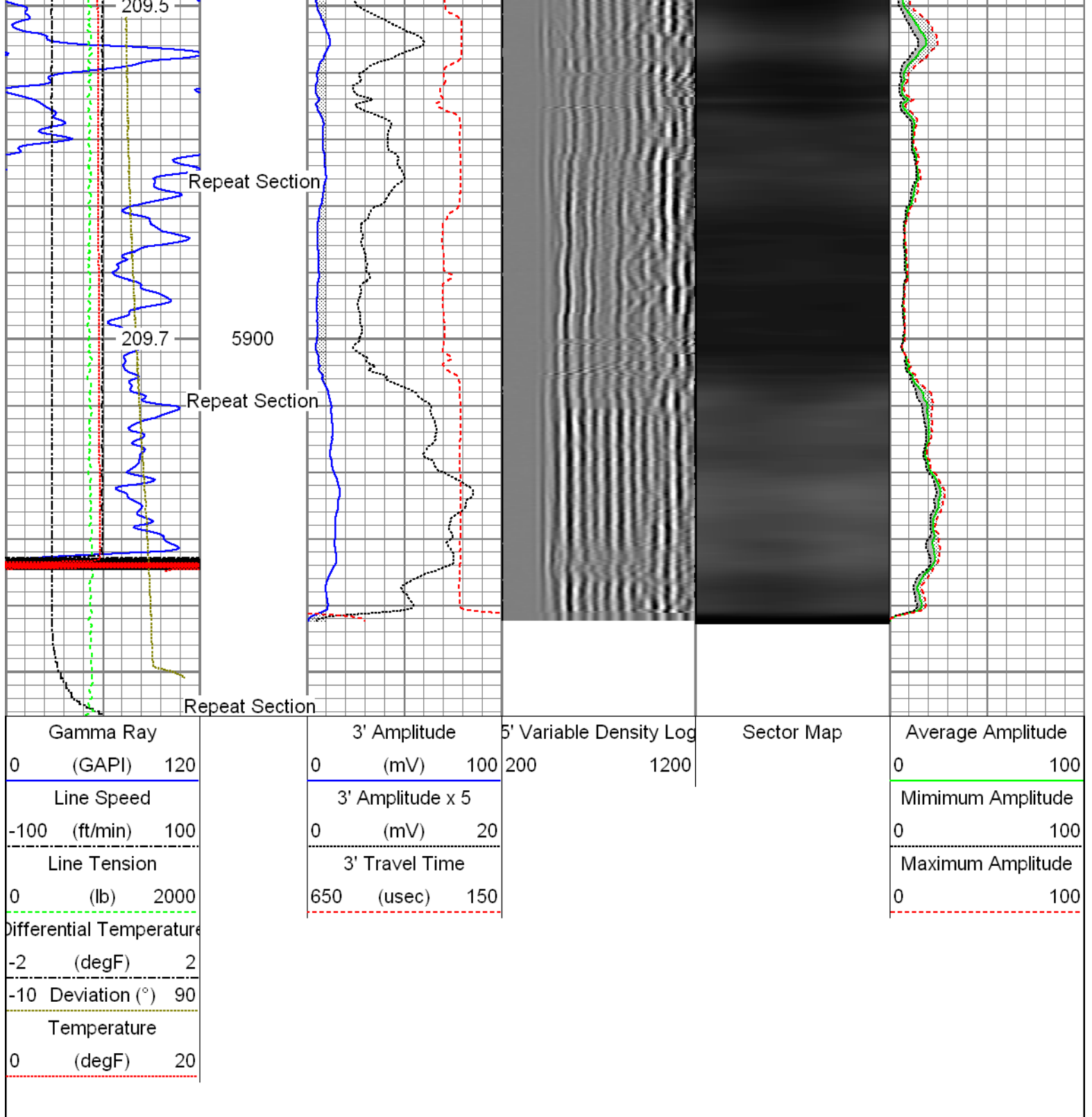
Repeat Section


Recorded with 2500 PSI Surface Induced Pressure


Database File: 09-04-15_noble energy_gracie Id22-730_mit_rbl.db
 Dataset Pathname: pass6
 Presentation Format: rbt4_mit
 Dataset Creation: Fri Sep 04 07:49:14 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
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_XTU-UW_XTU_002 (219135) Crossover Ultrawire Toolbus to Ultralink	1.58	1.69	6.50
			UW_AGS-UW_AGS_001 (215017) Sondex Adapter - GO Box to Sondex Pin	0.21	1.69	1.00
			UW_PGR-UW_PGR_020 (10013902) Production Gamma Ray	1.93	1.69	9.50
TEMP	22.45		UW_PRT-UW_PRT_016 (10025100) Platinum Resistance Thermometer	1.04	1.69	5.20

			UW_PRC #3 -DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
WVF3FT	15.42		UW_RBT-UW_RBT_004 (1063) 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 #4 -DSSRAC (081) 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
			UW_PRC-UW_PRC_057 (1037) 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: 09-04-15_Noble Energy_Gracie LD22-730_MIT_RBL.db: field/well/run1/pass9 Total Length: 28.09 ft Total Weight: 324.50 lb O.D. 3.13 in						

Calibration Report	
Database File:	09-04-15_noble energy_gracie ld22-730_mit_rbl.db
Dataset Pathname:	pass8
Dataset Creation:	Fri Sep 04 07:59:08 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

Vertical:		Inc X	Inc Y
		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: Fri Sep 04 07:11:12 2015

Ring size: (in)	4	Sens	5	Sens	6	Sens	7
Finger 01:	1052	387.0	1439	388.0	1827	412.0	2239
Finger 02:	1187	387.0	1574	388.0	1962	402.0	2364
Finger 03:	1064	394.0	1458	410.0	1868	431.0	2299
Finger 04:	1112	384.0	1496	397.0	1893	420.0	2313
Finger 05:	1124	392.0	1516	402.0	1918	420.0	2338
Finger 06:	1120	392.0	1512	403.0	1915	418.0	2333
Finger 07:	1052	388.0	1440	403.0	1843	423.0	2266
Finger 08:	1128	388.0	1516	402.0	1918	420.0	2338
Finger 09:	1080	393.0	1473	404.0	1877	411.0	2288
Finger 10:	1075	380.0	1455	399.0	1854	412.0	2266
Finger 11:	1166	395.0	1561	405.0	1966	411.0	2377
Finger 12:	1058	377.0	1435	396.0	1831	410.0	2241
Finger 13:	1086	379.0	1465	392.0	1857	399.0	2256
Finger 14:	1063	385.0	1448	403.0	1851	412.0	2263
Finger 15:	1020	387.0	1407	415.0	1822	425.0	2247
Finger 16:	1047	388.0	1435	418.0	1853	428.0	2281
Finger 17:	947	361.0	1308	395.0	1703	424.0	2127
Finger 18:	1072	370.0	1442	394.0	1836	401.0	2237
Finger 19:	1062	376.0	1438	403.0	1841	412.0	2253
Finger 20:	1019	377.0	1396	408.0	1804	424.0	2228
Finger 21:	1019	386.0	1405	410.0	1815	410.0	2225
Finger 22:	1003	379.0	1382	412.0	1794	426.0	2220
Finger 23:	1003	384.0	1387	421.0	1808	435.0	2243
Finger 24:	1053	380.0	1433	401.0	1834	402.0	2236
Finger 25:	984	381.0	1365	416.0	1781	434.0	2215
Finger 26:	1112	372.0	1484	388.0	1872	398.0	2270
Finger 27:	1049	382.0	1431	404.0	1835	422.0	2257
Finger 28:	1072	378.0	1450	392.0	1842	410.0	2252
Finger 29:	1014	383.0	1397	409.0	1806	430.0	2236
Finger 30:	1049	382.0	1431	402.0	1833	423.0	2256
Finger 31:	1110	380.0	1490	394.0	1884	411.0	2295
Finger 32:	1046	390.0	1436	408.0	1844	430.0	2274
Finger 33:	1191	385.0	1576	378.0	1954	388.0	2342
Finger 34:	1072	371.0	1443	388.0	1831	420.0	2251
Finger 35:	1047	415.0	1462	408.0	1870	474.0	2344
Finger 36:	1056	387.0	1443	402.0	1845	431.0	2276
Finger 37:	1147	387.0	1534	393.0	1927	414.0	2341
Finger 38:	1175	382.0	1557	385.0	1942	397.0	2339
Finger 39:	1189	381.0	1570	385.0	1955	398.0	2353
Finger 40:	1087	392.0	1479	401.0	1880	422.0	2302

Segmented Cement Bond Log Calibration Report

Serial Number: 1063
Tool Model: UW_RBT_004

Calibration Casing Diameter: 7.000 in
Calibration Depth: 147.897 ft

Master Calibration, performed Fri Sep 04 07:20:25 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.003	0.682	0.800	62.165	89.658	1.025
5FT	-0.006	0.781	0.800	62.165	77.931	1.276
S1	-0.004	0.701	0.000	100.000	141.915	0.520
S2	-0.004	0.722	0.000	100.000	137.880	0.495
S3	-0.004	0.715	0.000	100.000	139.055	0.509
S4	-0.004	0.711	0.000	100.000	139.908	0.512
S5	-0.002	0.680	0.000	100.000	146.451	0.352
S6	-0.003	0.648	0.000	100.000	153.633	0.413
S7	-0.002	0.647	0.000	100.000	153.991	0.378
S8	-0.003	0.666	0.000	100.000	149.511	0.396

Temperature Calibration Report

Serial Number: 10025100
Tool Model: UW_PRT_016
Performed: Wed Feb 11 13:47:59 2015

Point #	Reading	Reference
1	13249.00 cps	68.00 degF
2	18454.00 cps	104.00 degF
3	29735.00 cps	176.00 degF
4	41457.00 cps	248.00 degF
5	52851.00 cps	320.00 degF
6	59128.00 cps	356.00 degF
7	cps	degF
8	cps	degF
9	cps	degF
10	cps	degF

Gamma Ray Calibration Report

Serial Number: 10013902
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: Gracie LD22-730
Field: Wildcat
County: Weld
State: Colorado