

# Radial Cement Bond Gamma Ray Casing Collar Log

Company	Whiting Oil & Gas Corporation	Company	Whiting Oil & Gas Corporation
Well	Razor Fed 30K-1907	Well	Razor Fed 30K-1907
Field	Wildcat	Field	Wildcat
County	Weld	County	Weld
State	Colorado	State	Colorado
Location:	API #: 05-123-40209		
Permanent Datum	SEC 30 TWP 10N RGE 58W	Ground Level	Elevation 4828'
Log Measured From	Kelly Bushing	Drilling Measured From	Kelly Bushing
			Elevation 21 FT
			K.B. 4849'
			D.F. 4848'
			G.L. 4828'

Date	07-AUG-2015
Run Number	Three
Depth Driller	13788 FT
Depth Logger	5065 FT
Bottom Logged Interval	5060 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	190.9°F
Estimated Cement Top	871 FT
Time Well Ready	ROA
Time Logger on Bottom	11:36
Equipment Number	HD-0255
Location	Fort Lupton, CO
Recorded By	M. Steinman
Witnessed By	Casey Jackson

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	1603 FT		
Intermediate #1	7	29	HCP-110	Surface	6186 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110	5029 FT	13782 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.

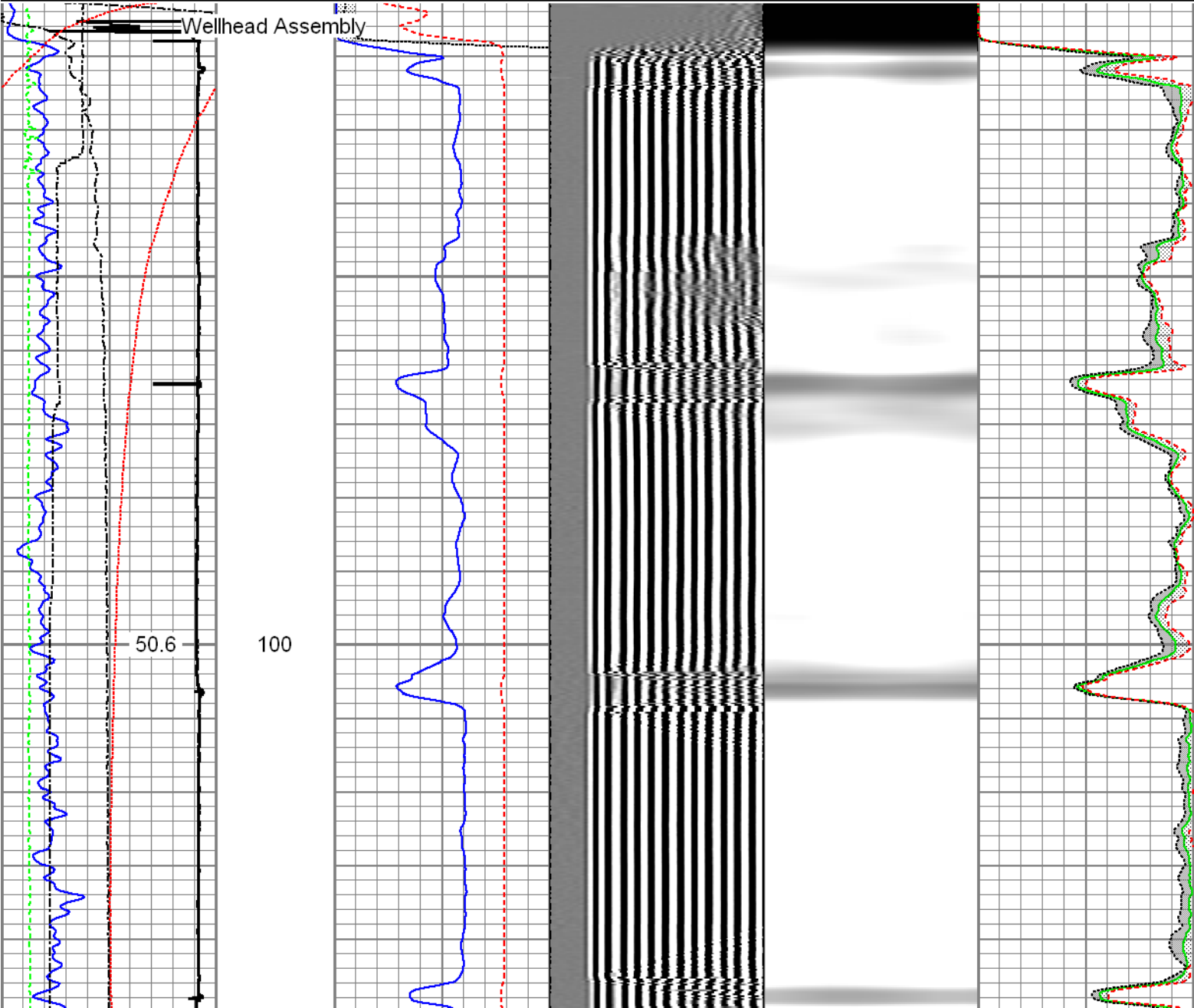
## Comments

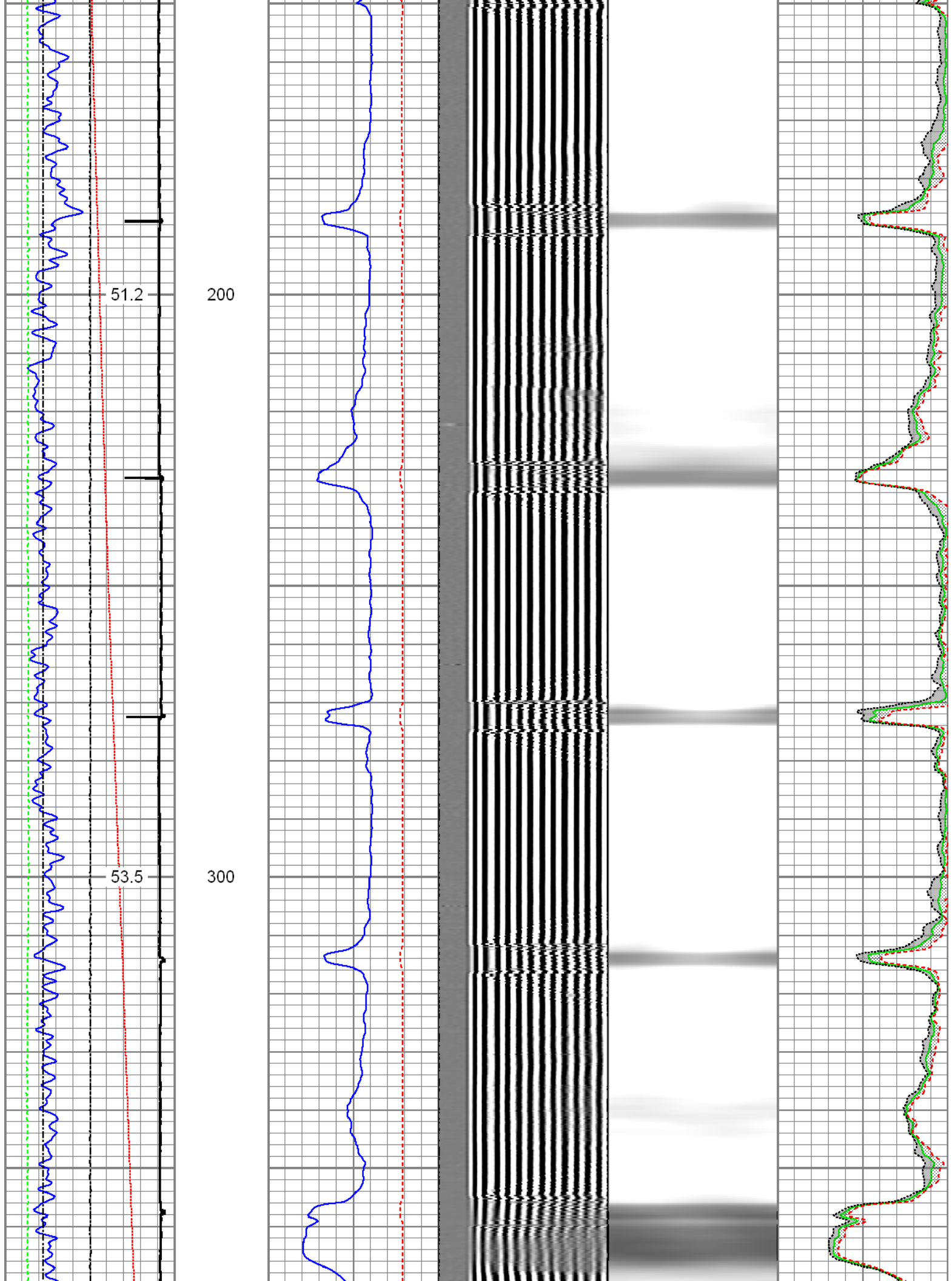
Log ran as per customer request  
 Depth referenced to casing tally reported liner top at 5029 FT  
 Adjusted log -7.5 FT to correlate with liner top  
 Gauge Ring/Junk Basket ran to 5172 FT with no debris found  
 Retrievable Bridge Plug set at 5110 FT  
 Log ran from just above RBP to surface  
 Log ran with 1500 PSI surface induced pressure  
 Logging tools were clean and free of any debris upon completion of operations

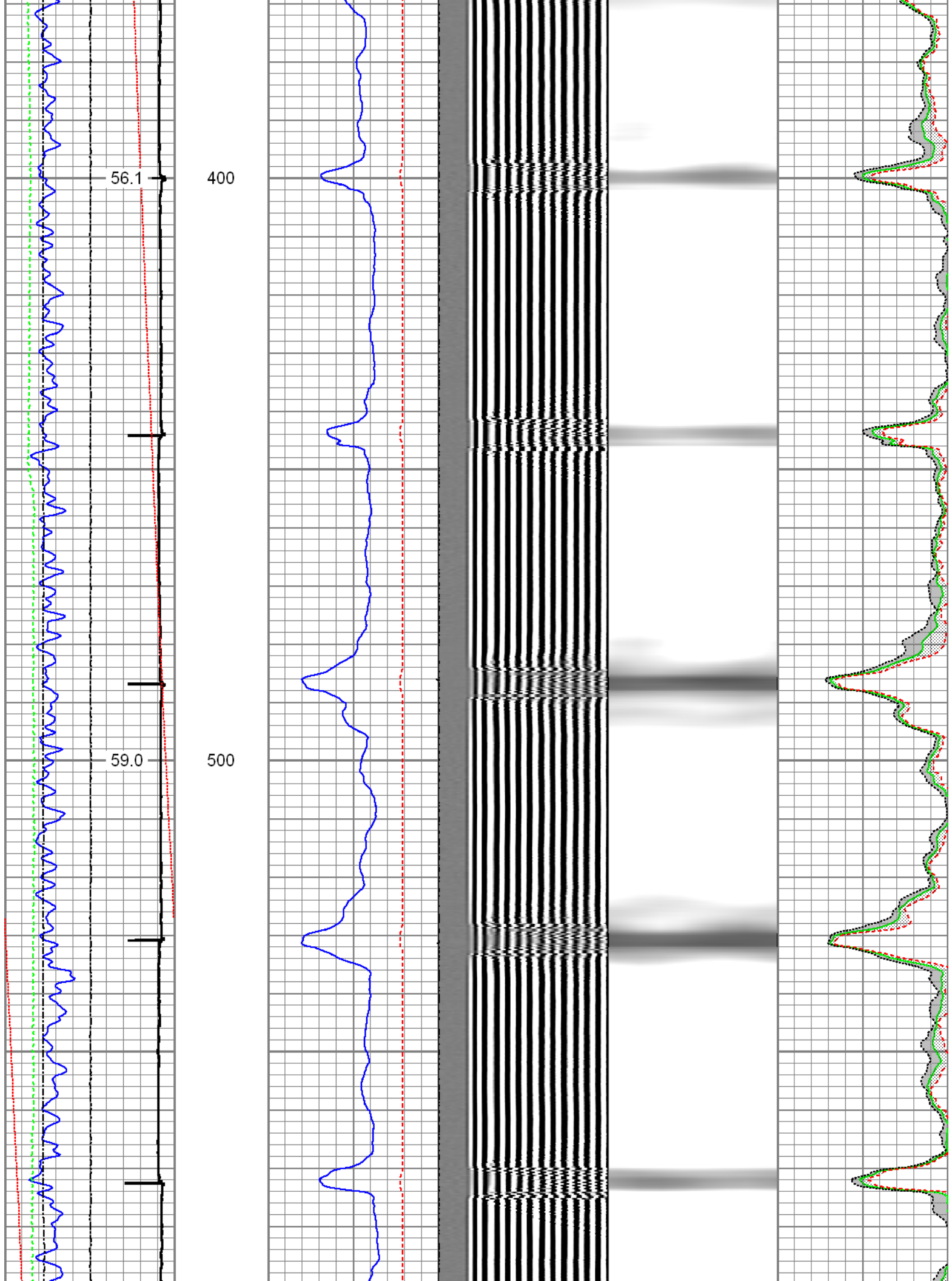
Thank you for choosing FMC Technologies Completion Services, Inc.!!

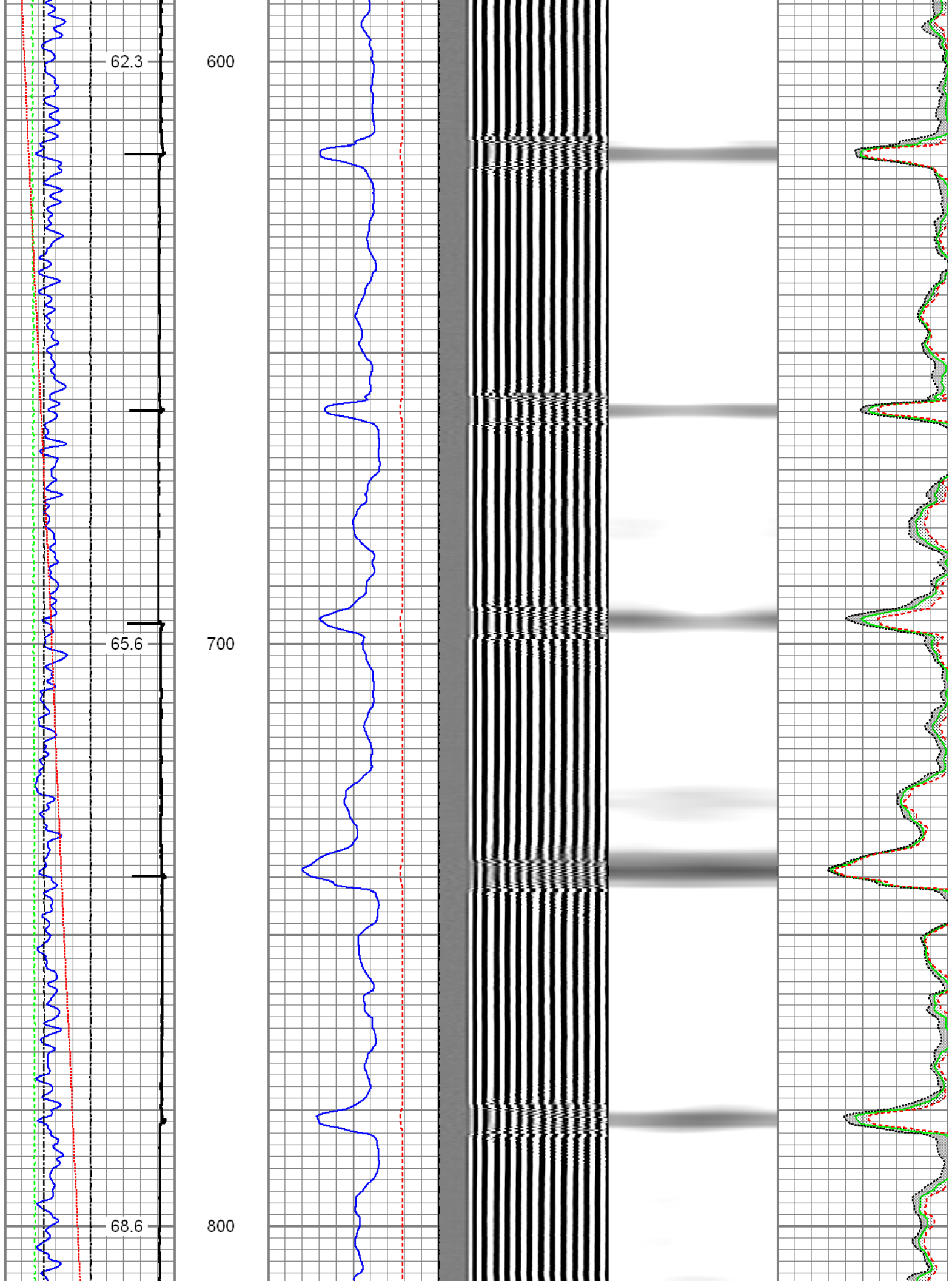
Database File: 08-07-15\_whiting\_razor fed 30k-1907\_mit\_rbl.db  
Dataset Pathname: main  
Presentation Format: rbt4\_mit  
Dataset Creation: Fri Aug 07 11:46:26 2015 by Log 7.0 B1  
Charted by: Depth in Feet scaled 1:240

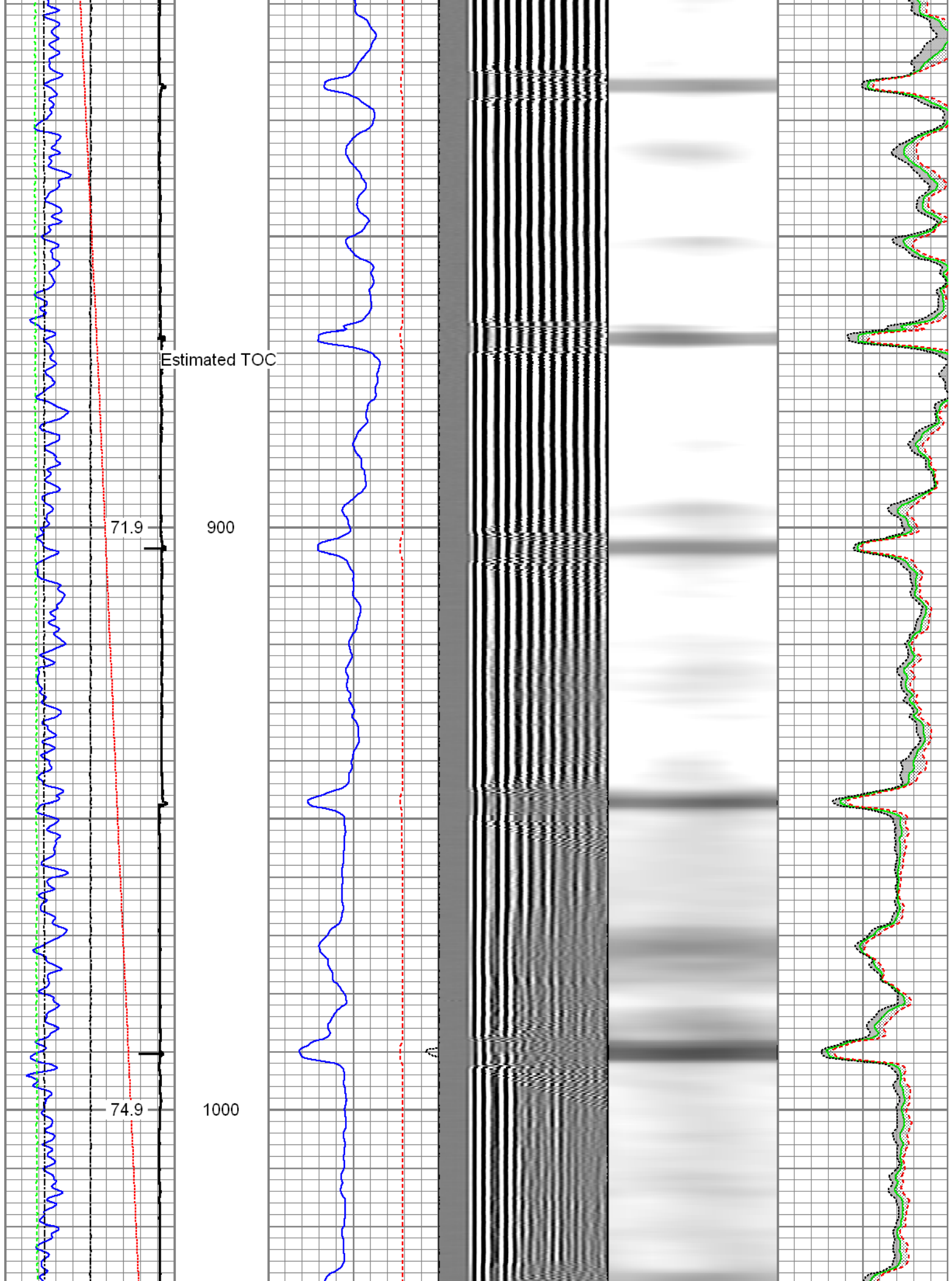
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

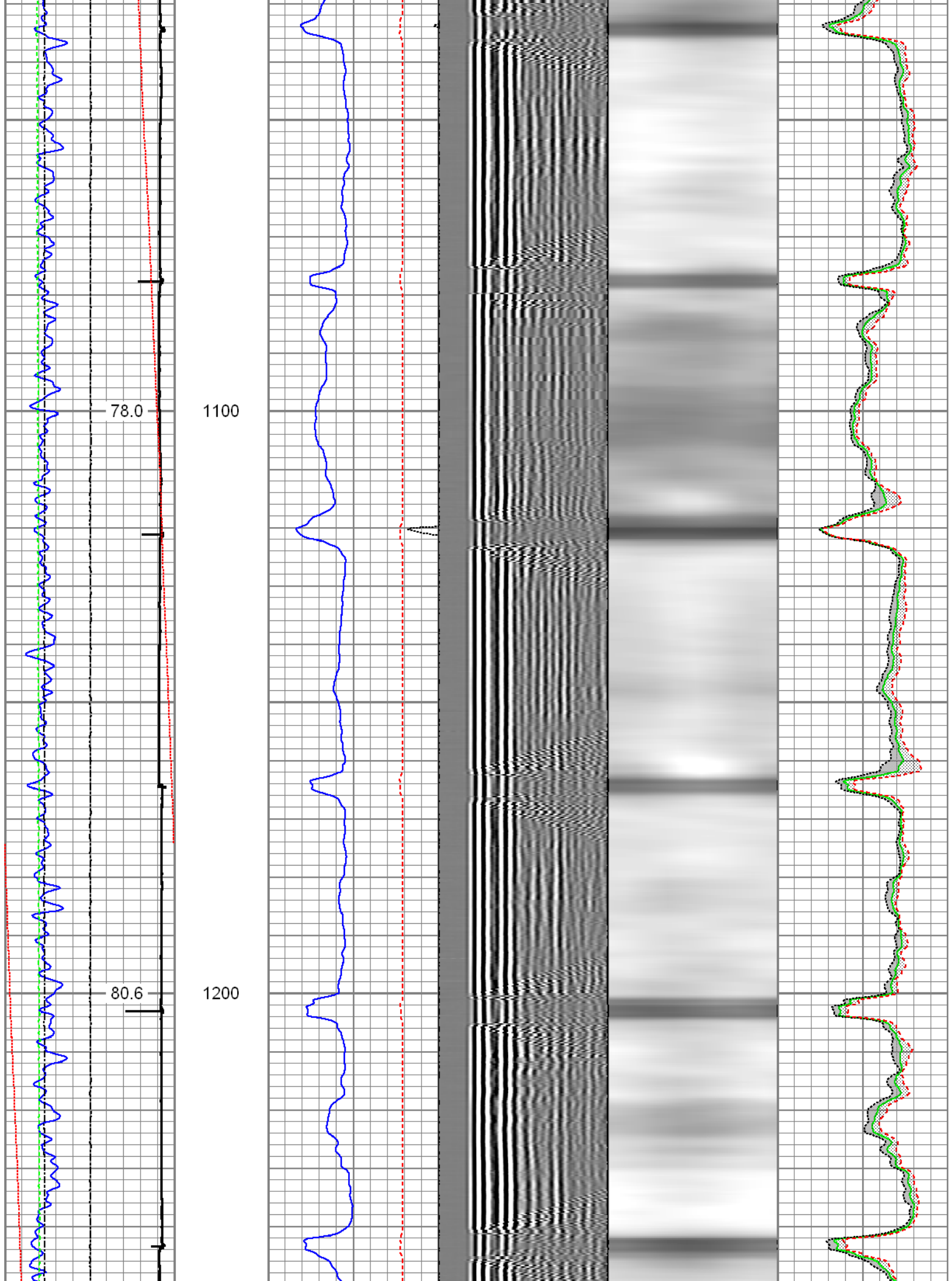


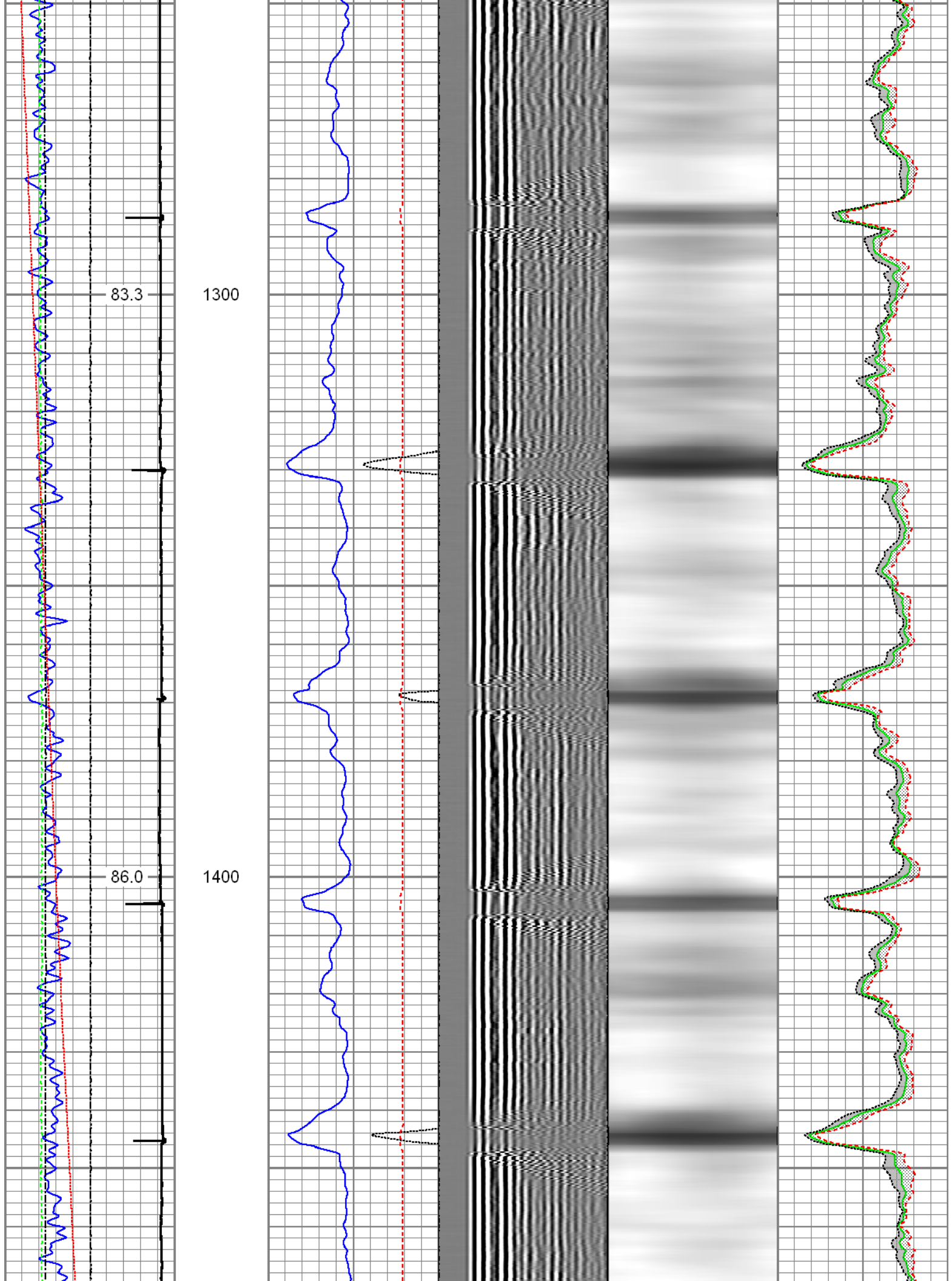


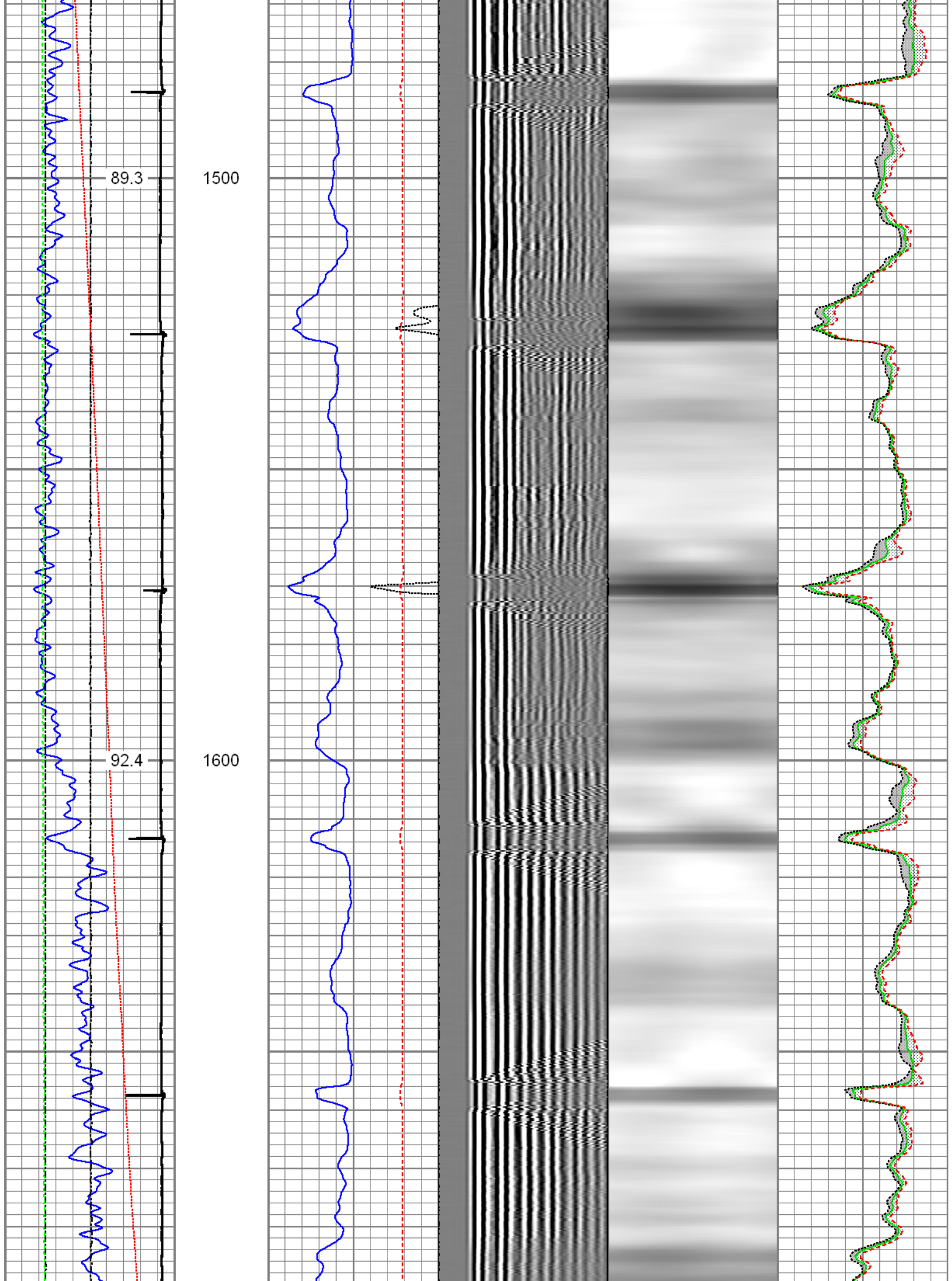


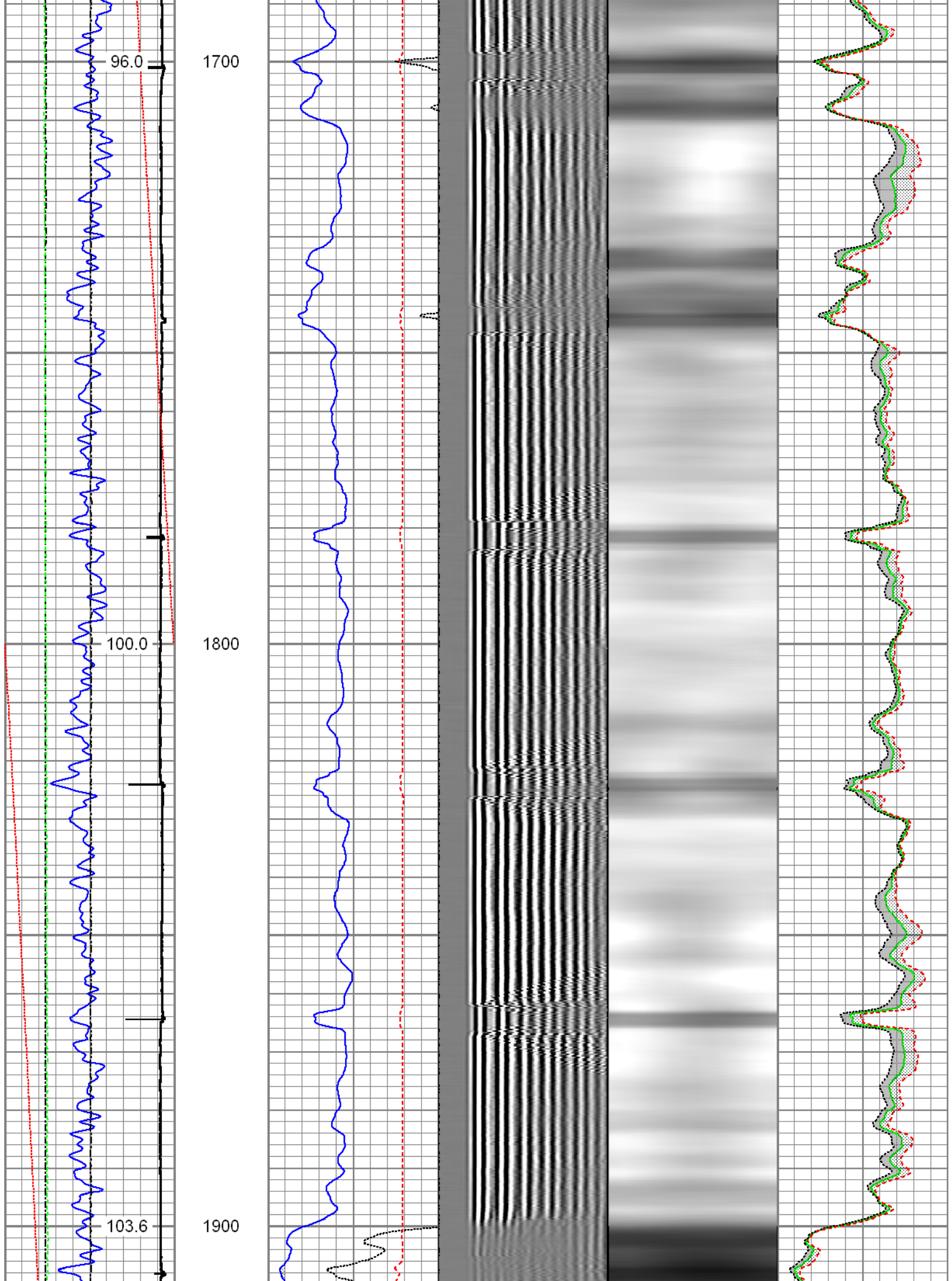


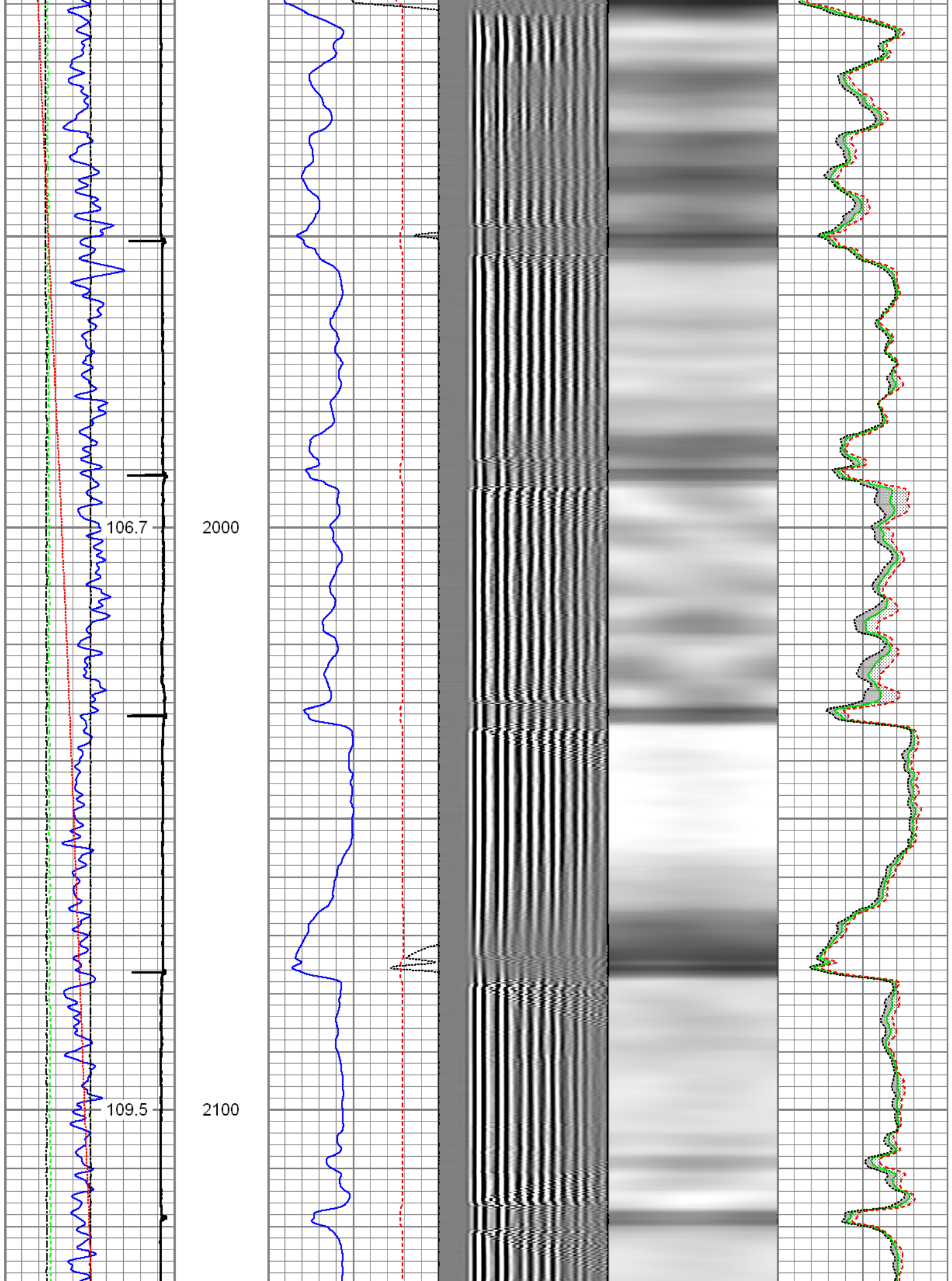


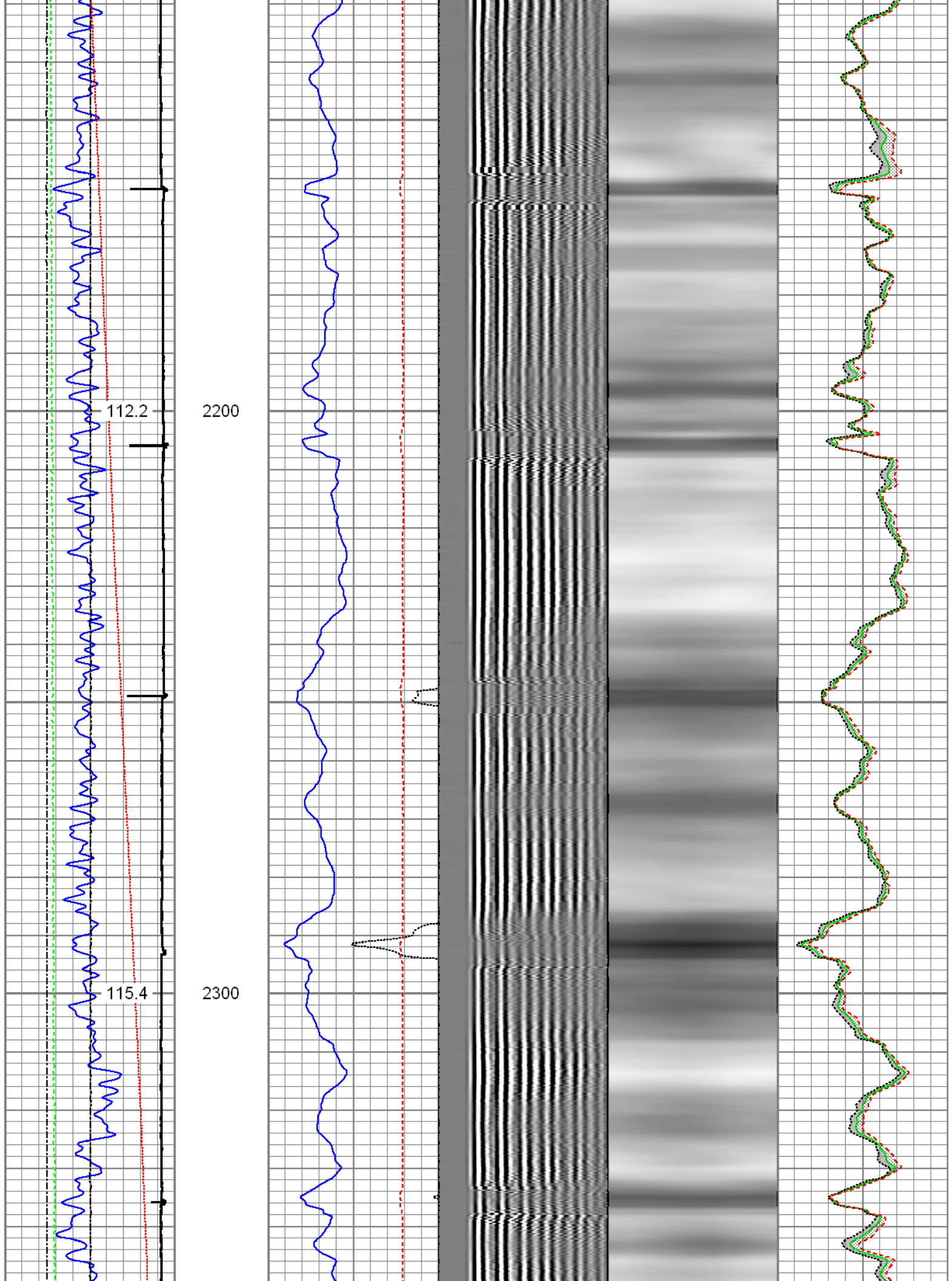


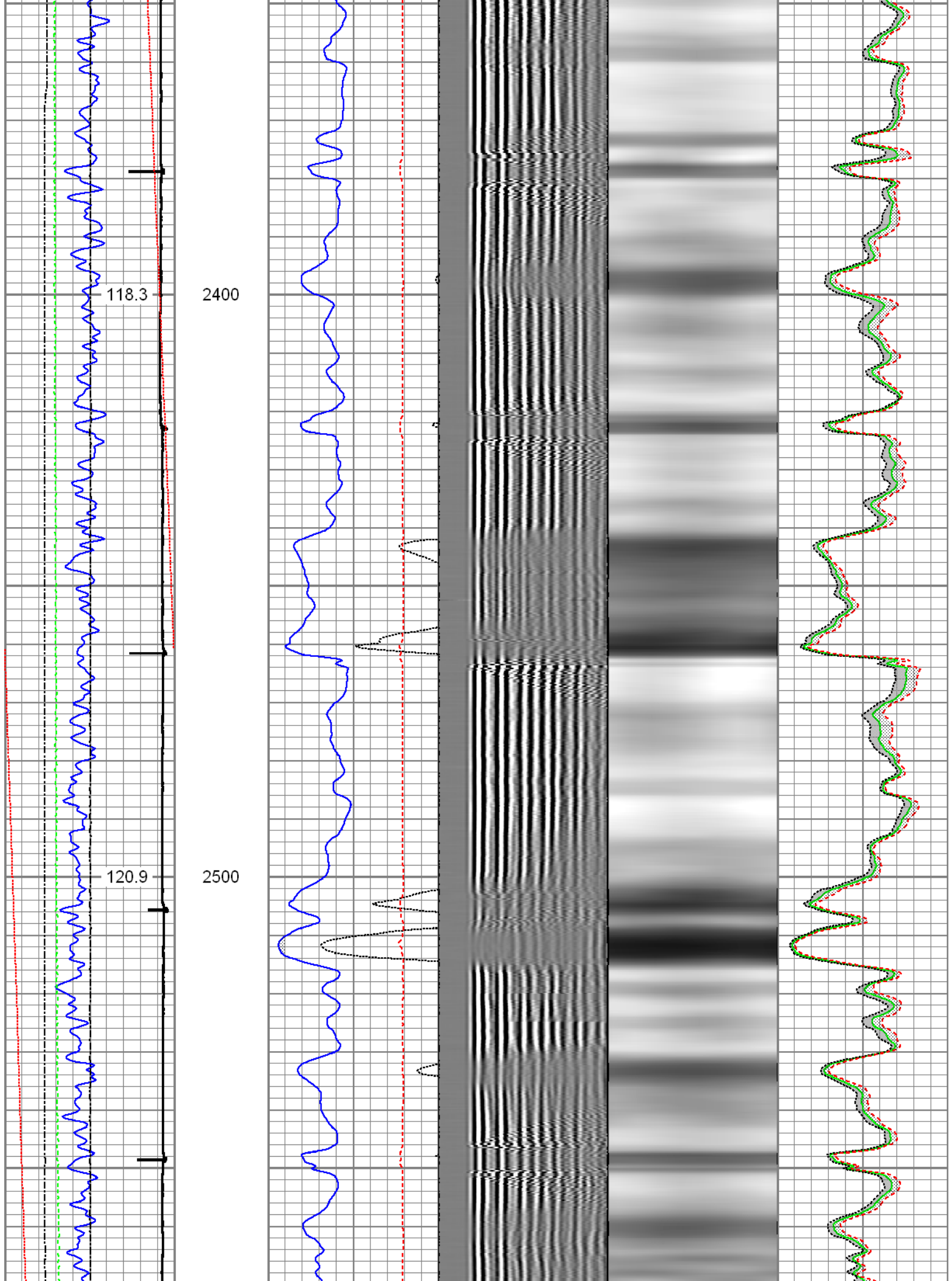


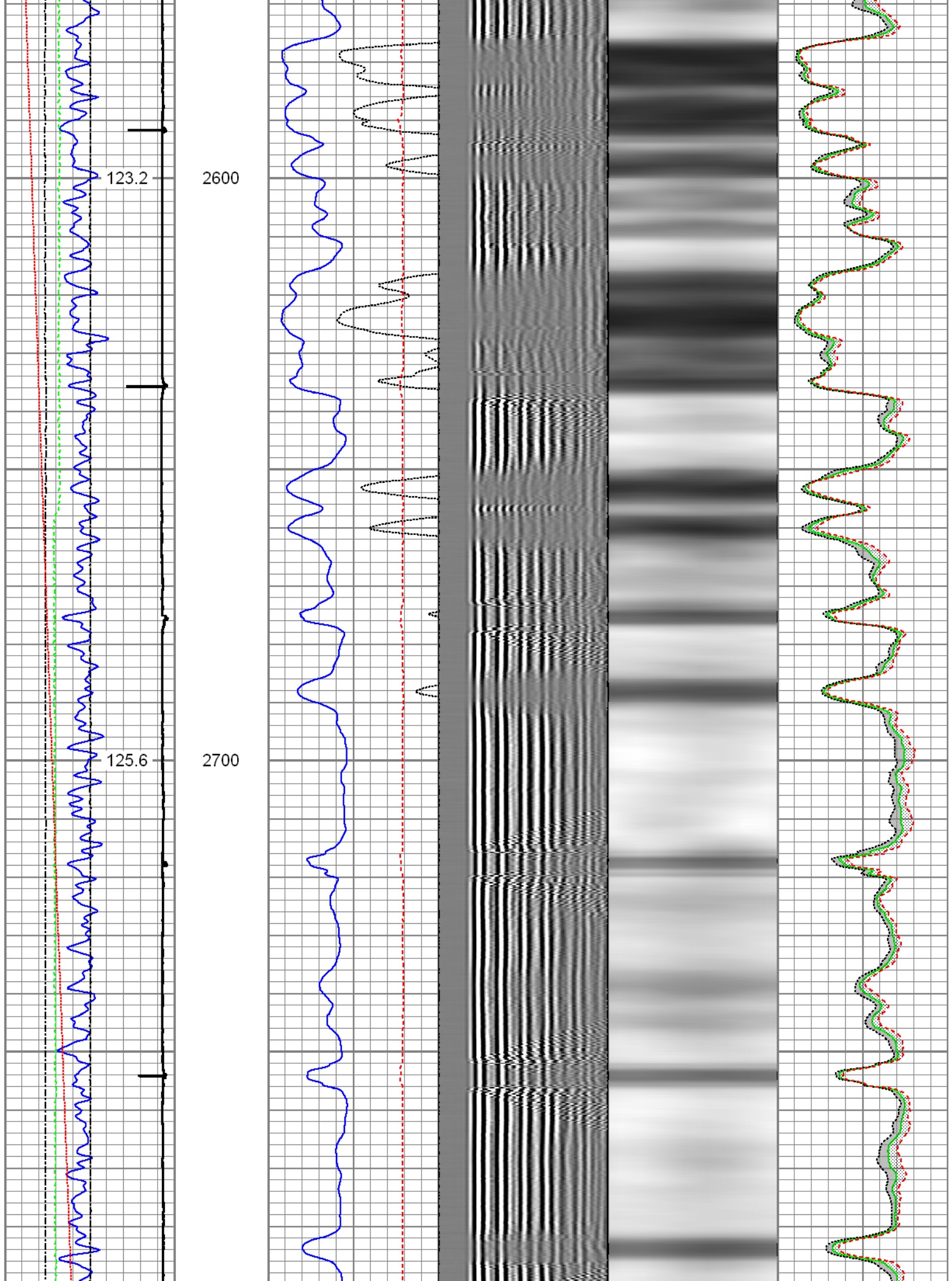


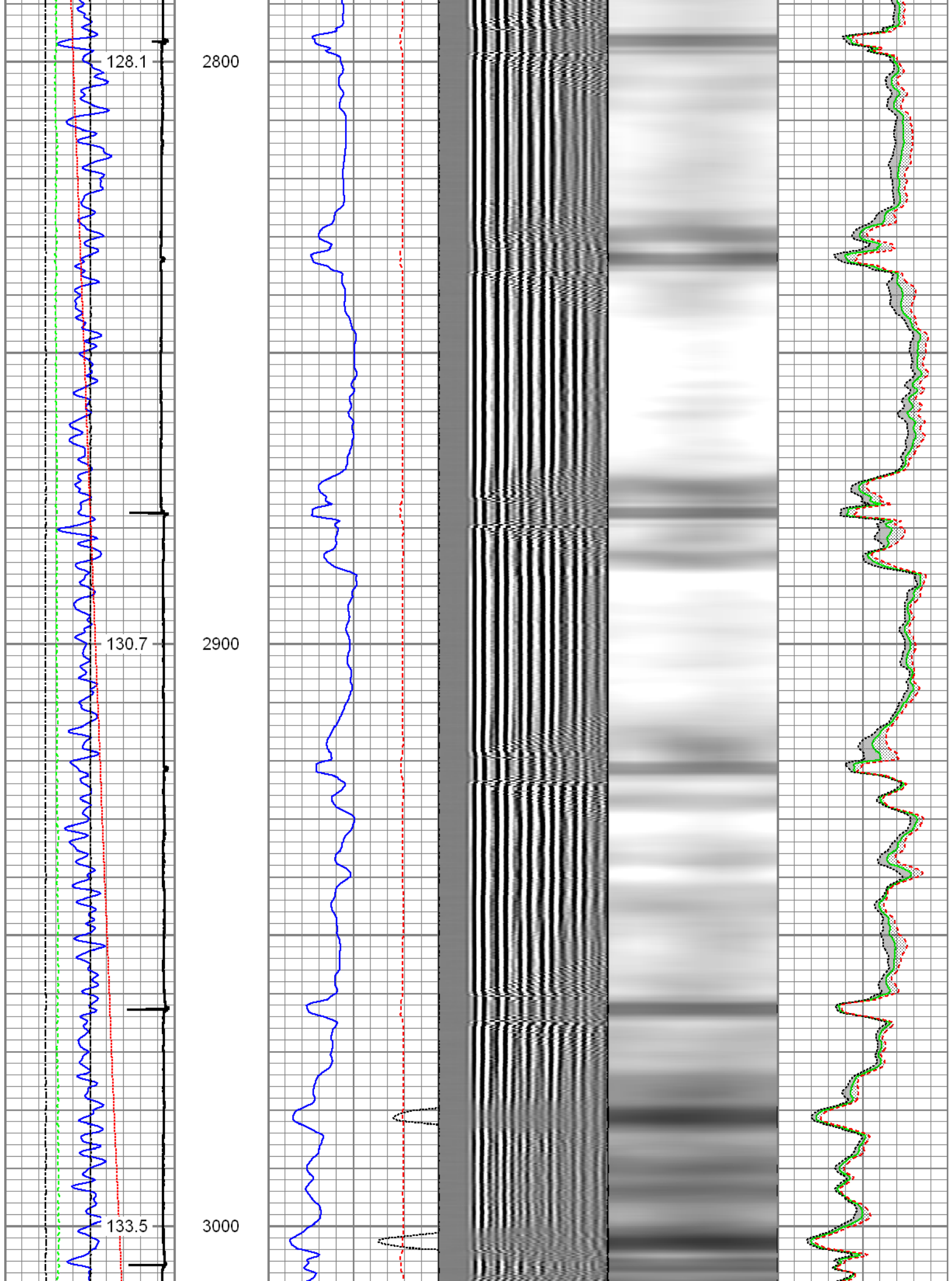


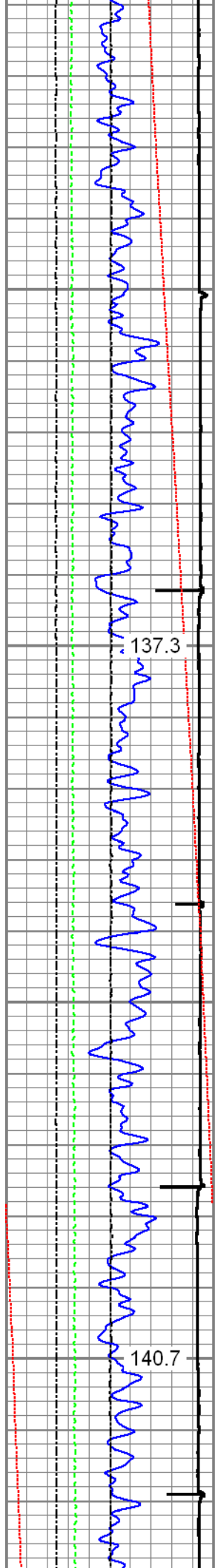






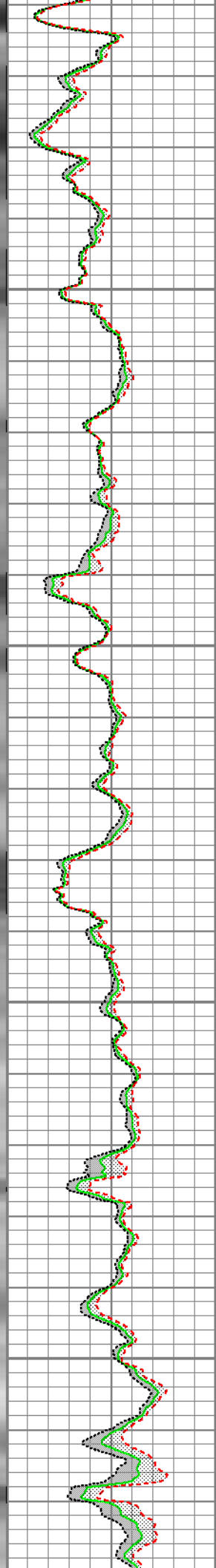
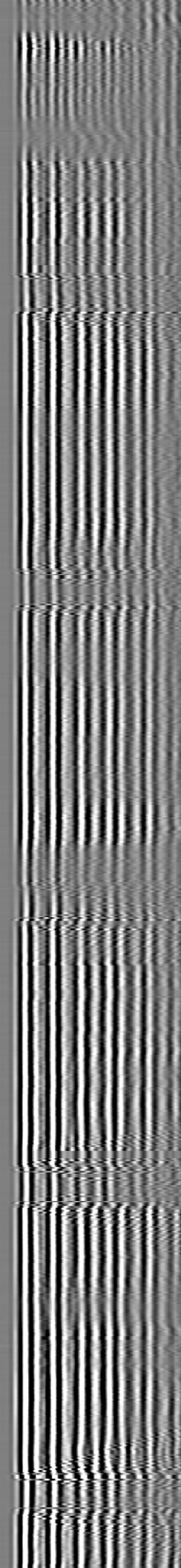
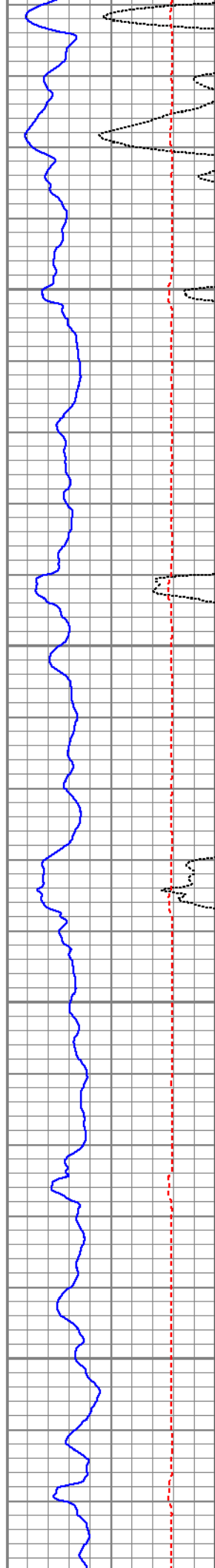


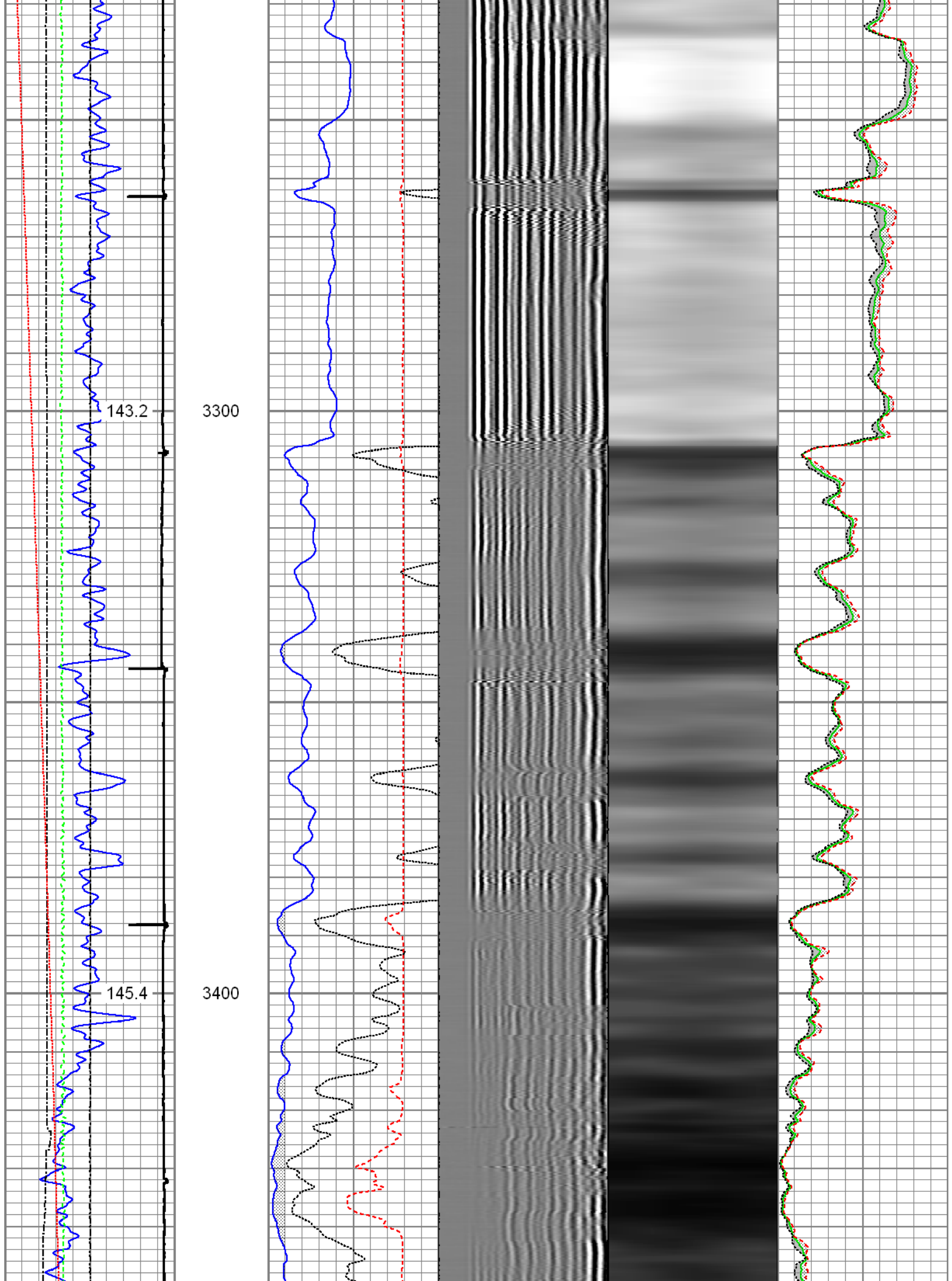


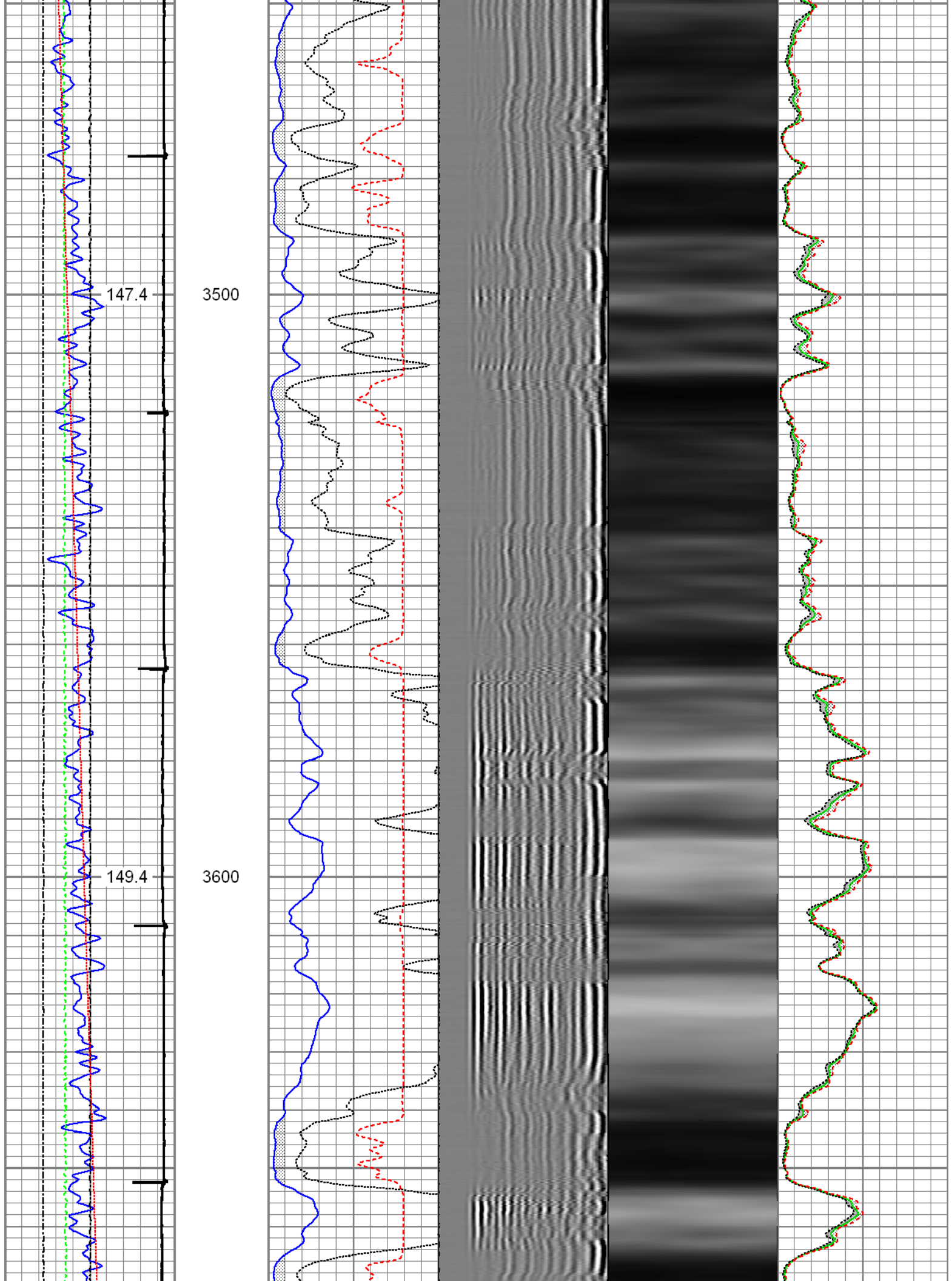


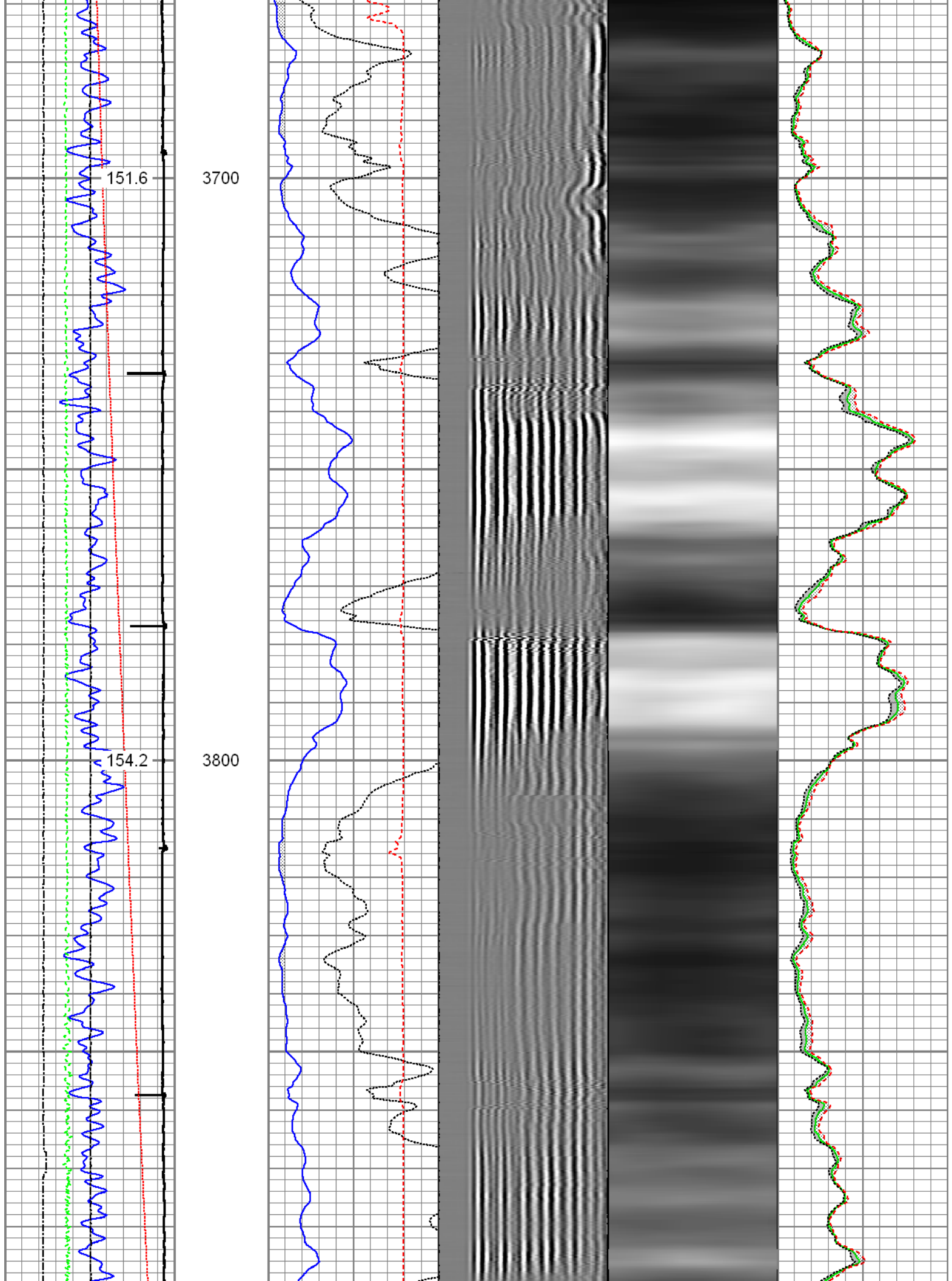
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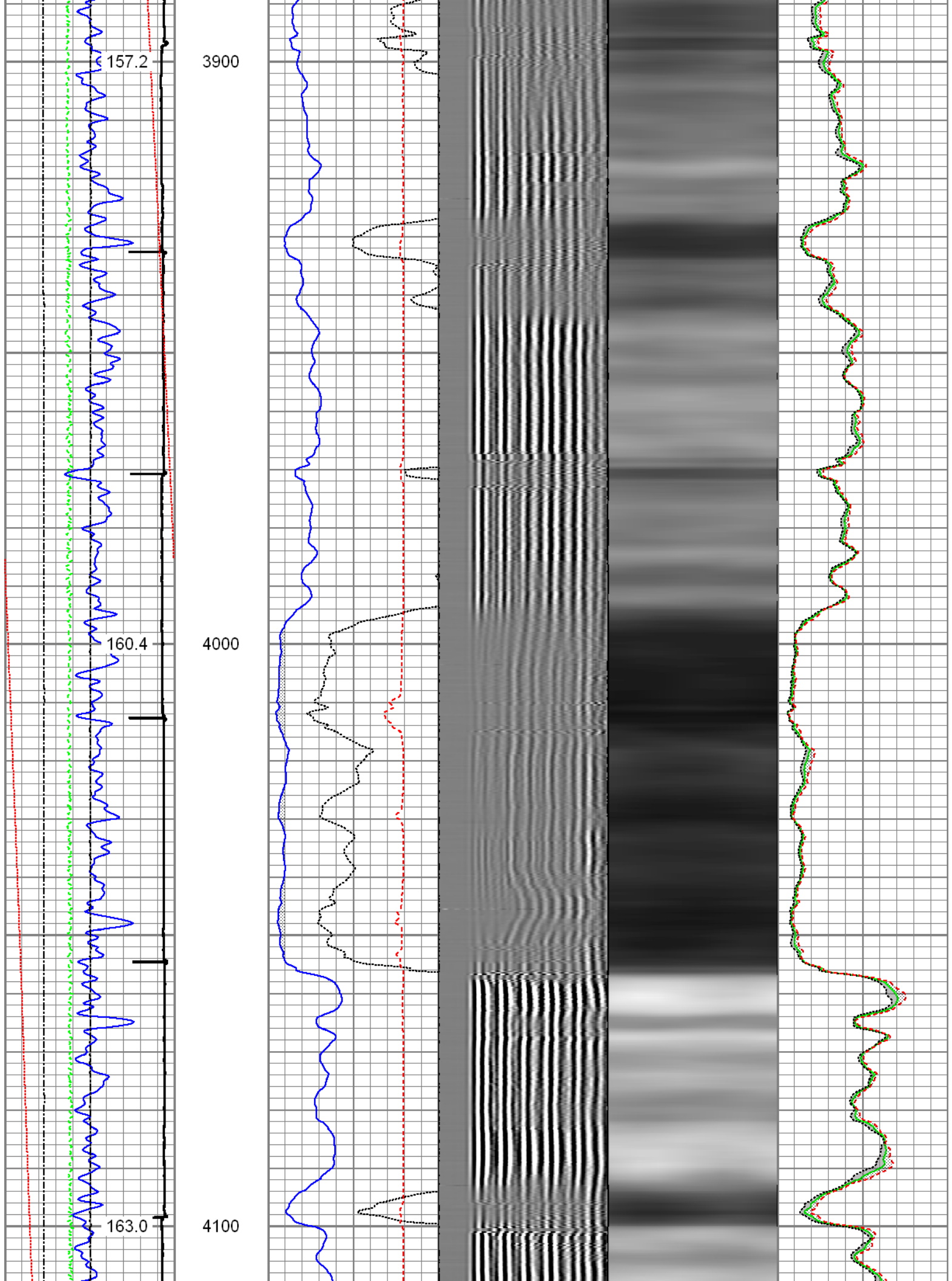
3200

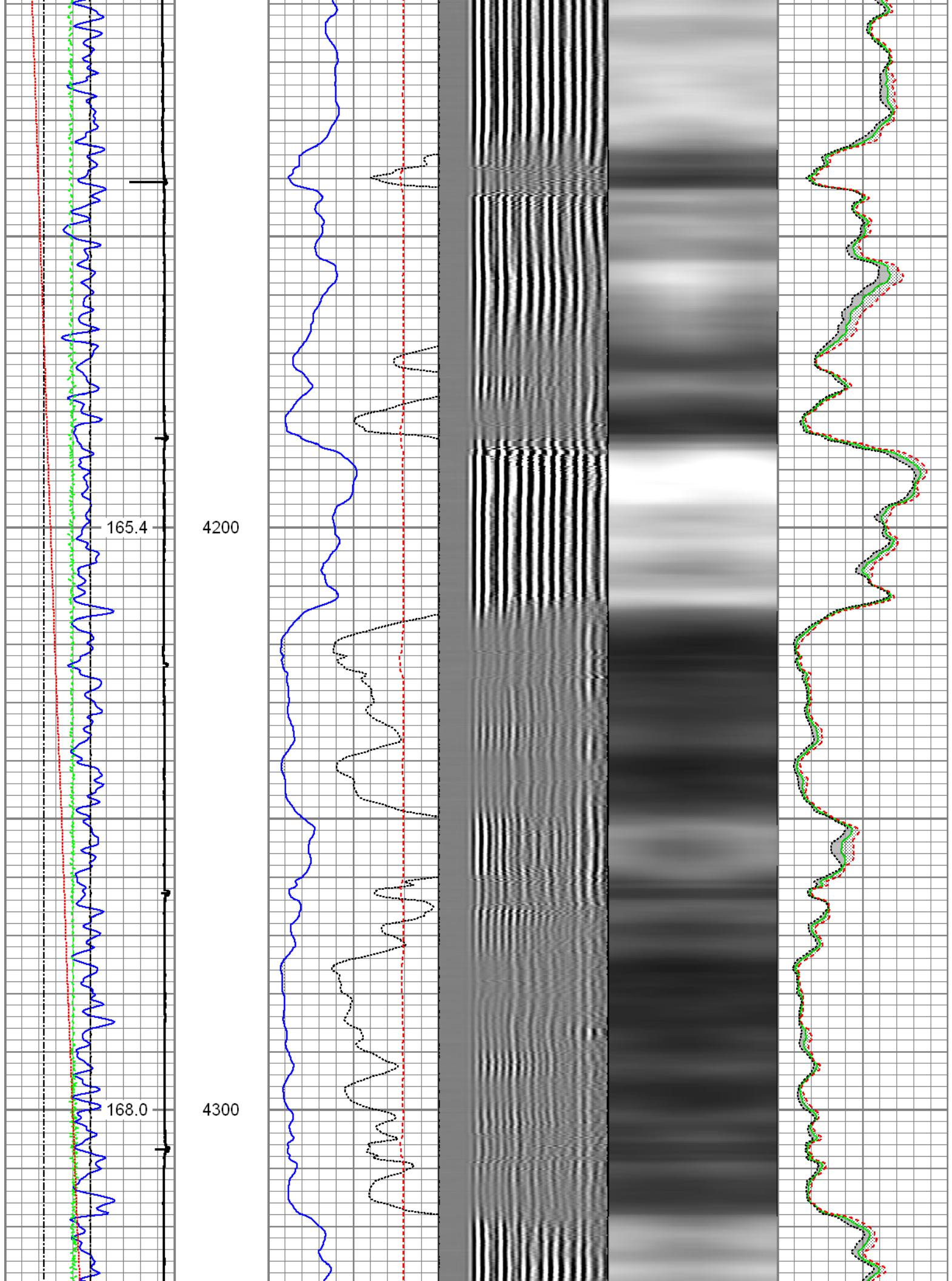


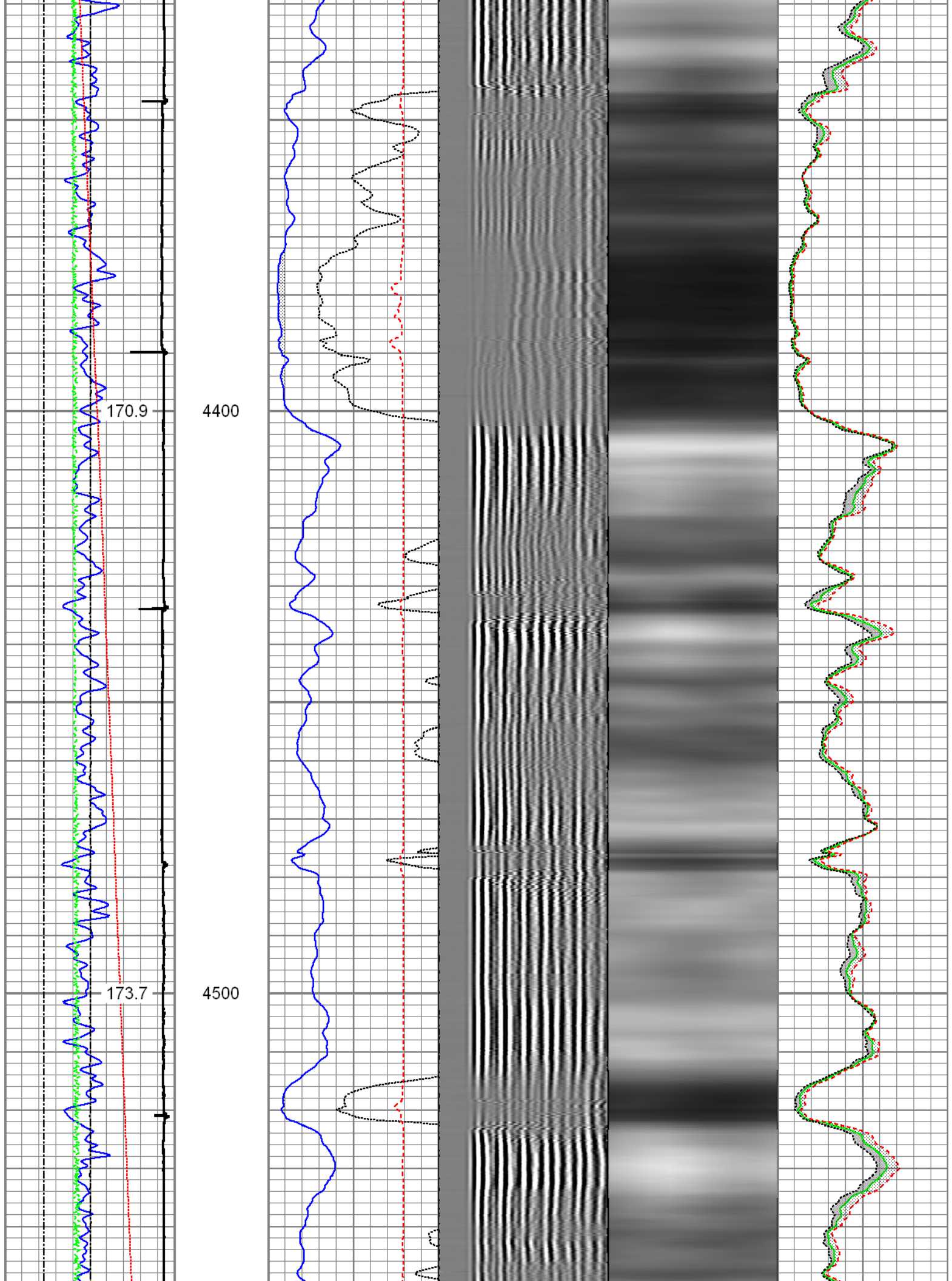


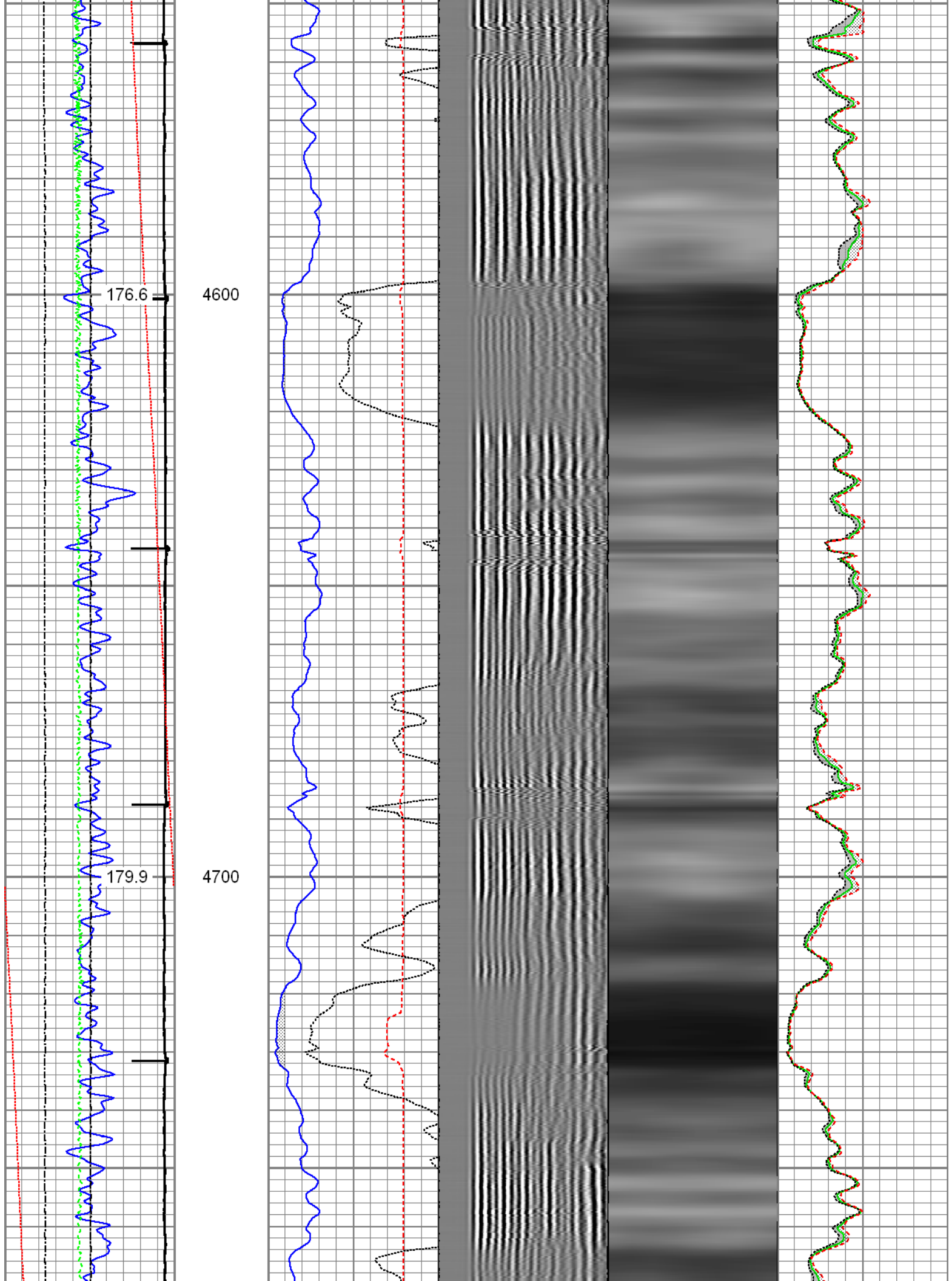


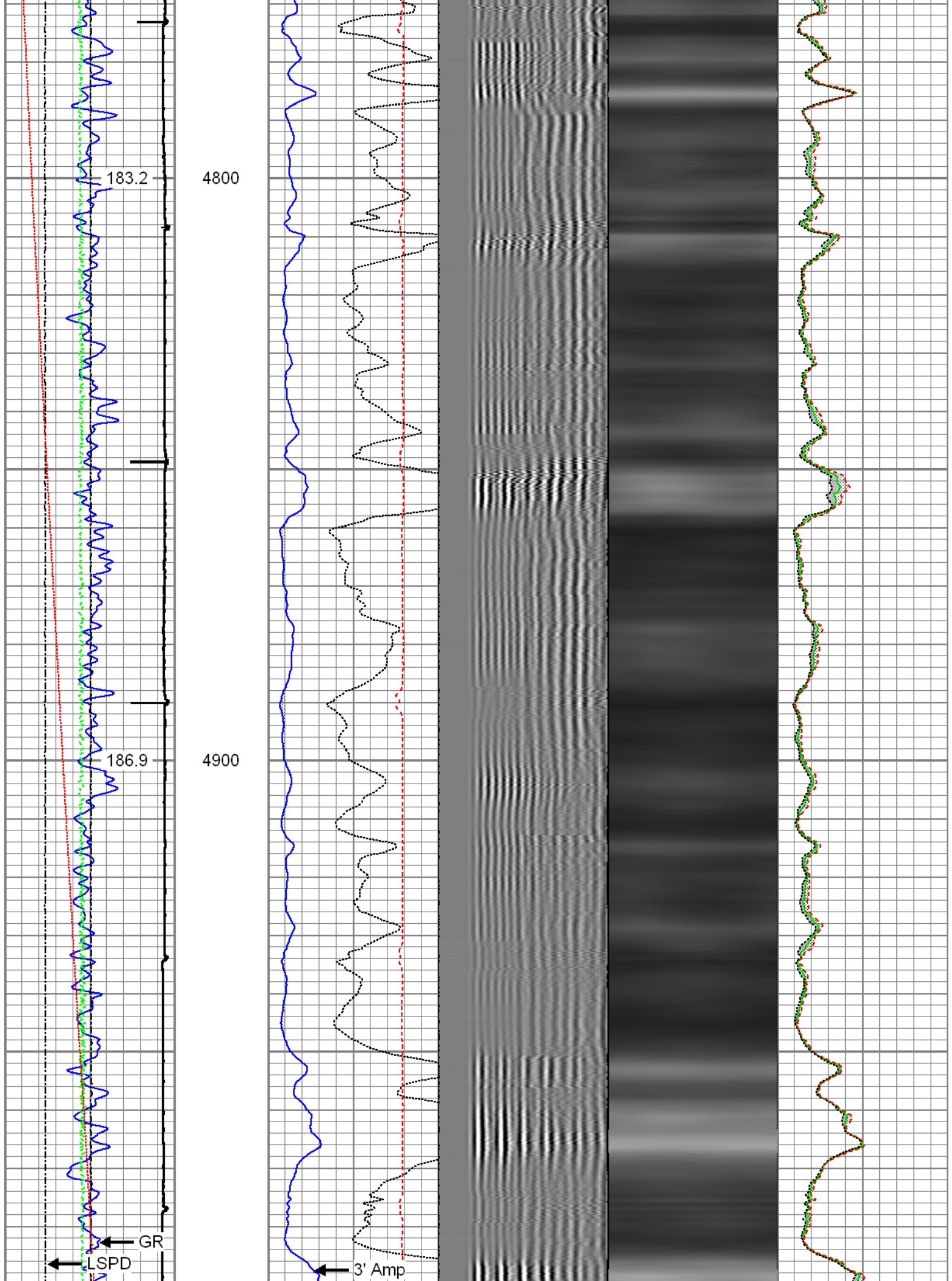


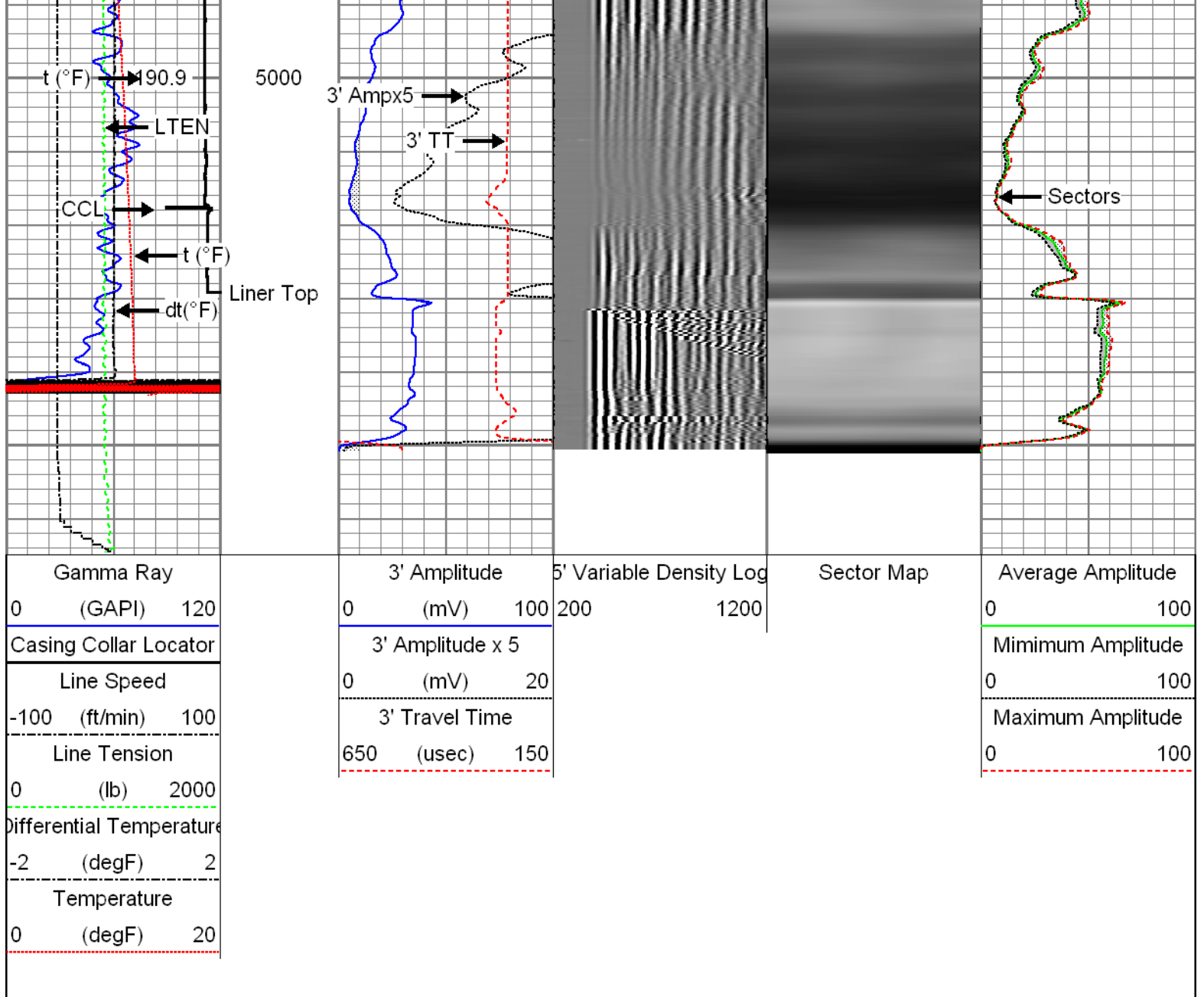








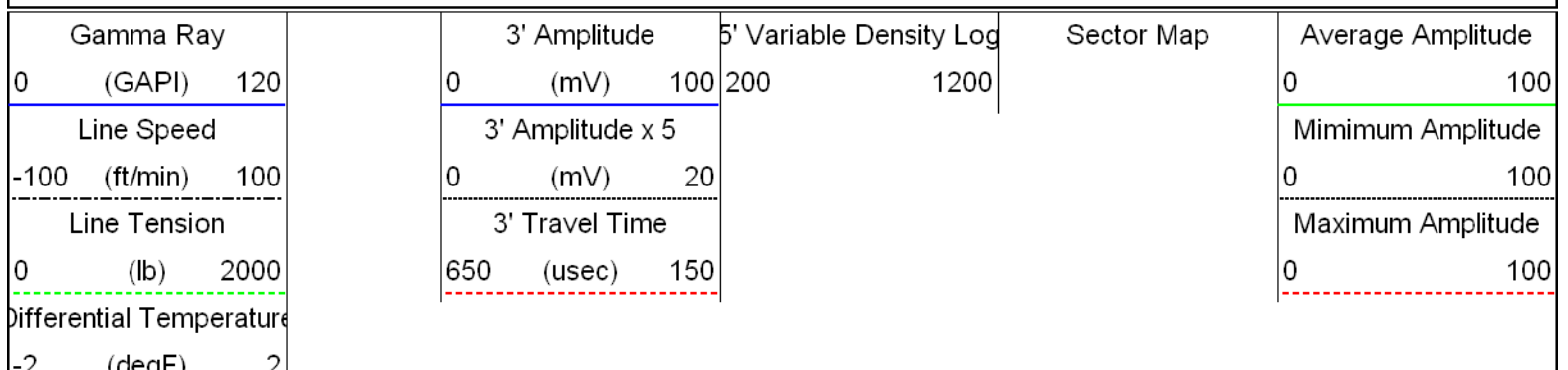




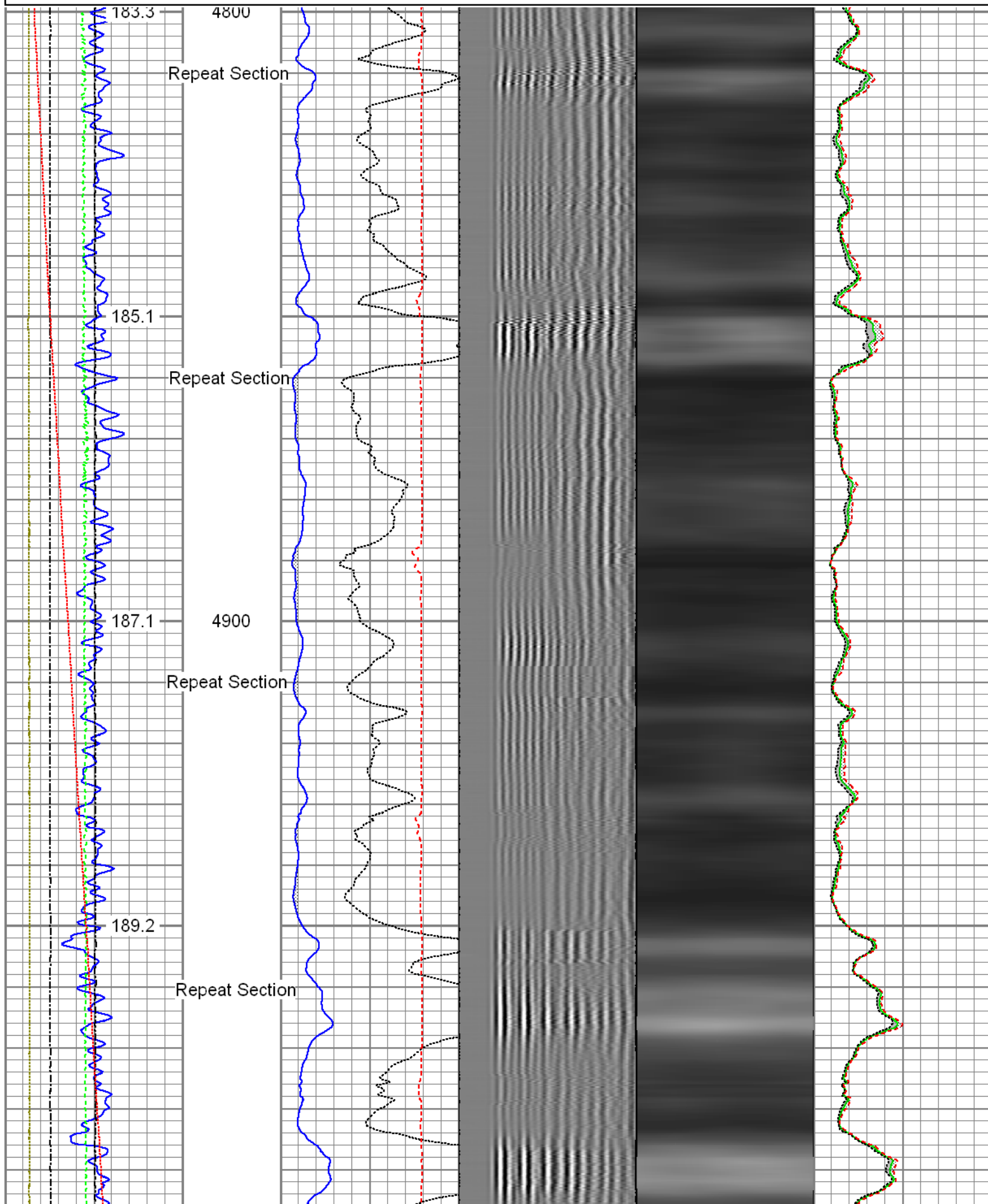
## Repeat Section

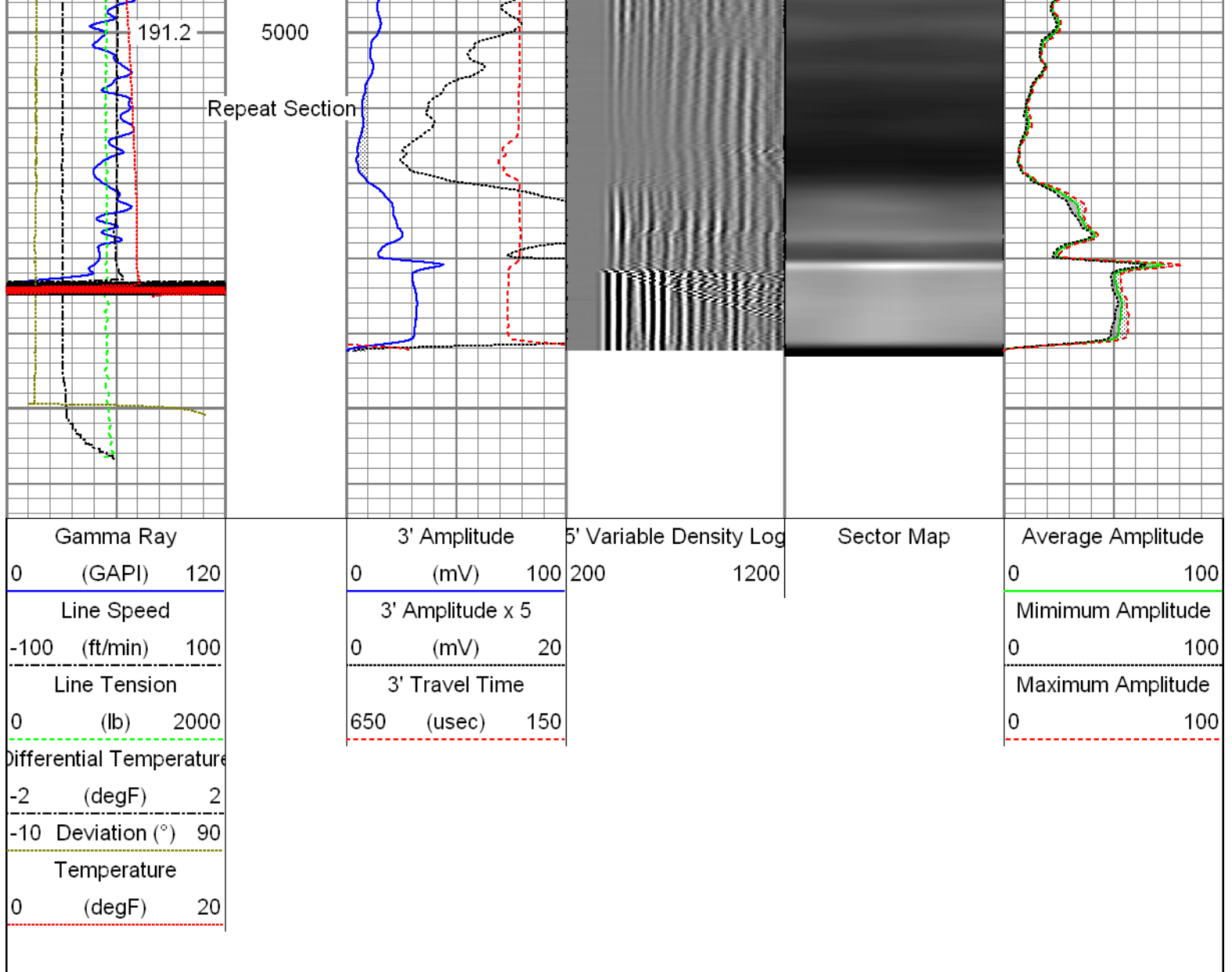
Recorded with 1500 PSI Surface Induced Pressure

Database File: 08-07-15\_whiting\_razor fed 30k-1907\_mit\_rbl.db  
 Dataset Pathname: repeat  
 Presentation Format: rbt4\_mit  
 Dataset Creation: Fri Aug 07 11:36:09 2015 by Log 7.0 B1  
 Charted by: Depth in Feet scaled 1:240

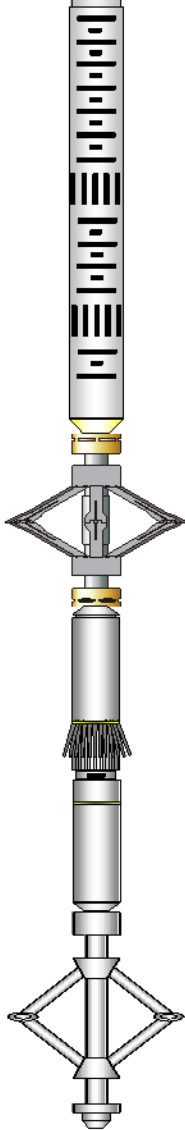


2	(degF)	2
-10	Deviation (°)	90
Temperature		
0	(degF)	20





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
TEMP	22.45		UW_PRT-UW_PRT_016 (10025097) Platinum Resistance Thermometer	1.04	1.69	5.20
			UW_PRC #3 -DSSRAC (082) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00

WVF3FT	15.42		UW_RBT-UW_RBT_004 (10022773) 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		UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
WVF5FT	14.42					
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: 08-07-15_Whiting_Razor Fed 30K-1907_MIT_RBL.db: field/well/run1/main Total Length: 28.09 ft Total Weight: 324.50 lb O.D. 3.13 in						

Calibration Report			
Database File:	08-07-15_whiting_razor fed 30k-1907_mit_rbl.db		
Dataset Pathname:	main		
Dataset Creation:	Fri Aug 07 11:46:26 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 :	335.580		

## Finger Calibration Report

Performed:

Fri Aug 07 11:04:05 2015

Ring size: (in)	4	Sens	5	Sens	6	Sens	7
Finger 01:	1019	390.0	1409	393.0	1802	396.0	2198
Finger 02:	1155	407.0	1562	392.0	1954	393.0	2347
Finger 03:	1057	422.0	1479	413.0	1892	418.0	2310
Finger 04:	1051	405.0	1456	400.0	1856	409.0	2265
Finger 05:	1044	414.0	1458	406.0	1864	410.0	2274
Finger 06:	1046	418.0	1464	409.0	1873	407.0	2280
Finger 07:	1024	419.0	1443	413.0	1856	410.0	2266
Finger 08:	1047	413.0	1460	408.0	1868	410.0	2278
Finger 09:	1030	414.0	1444	411.0	1855	409.0	2264
Finger 10:	1033	413.0	1446	412.0	1858	411.0	2269
Finger 11:	1032	409.0	1441	412.0	1853	408.0	2261
Finger 12:	1033	406.0	1439	419.0	1858	414.0	2272
Finger 13:	1034	400.0	1434	414.0	1848	406.0	2254
Finger 14:	1020	403.0	1423	430.0	1853	419.0	2272
Finger 15:	971	399.0	1370	441.0	1811	433.0	2244
Finger 16:	985	396.0	1381	442.0	1823	434.0	2257
Finger 17:	903	366.0	1269	427.0	1696	434.0	2130
Finger 18:	1048	378.0	1426	429.0	1855	414.0	2269
Finger 19:	1008	372.0	1380	433.0	1813	425.0	2238
Finger 20:	1002	373.0	1375	448.0	1823	439.0	2262
Finger 21:	1016	378.0	1394	444.0	1838	424.0	2262
Finger 22:	991	366.0	1357	447.0	1804	438.0	2242
Finger 23:	957	362.0	1319	452.0	1771	450.0	2221
Finger 24:	1029	358.0	1387	431.0	1818	410.0	2228
Finger 25:	974	357.0	1331	445.0	1776	444.0	2220
Finger 26:	1115	350.0	1465	415.0	1880	407.0	2287
Finger 27:	1054	357.0	1411	431.0	1842	424.0	2266
Finger 28:	1073	348.0	1421	414.0	1835	408.0	2243
Finger 29:	1011	355.0	1366	432.0	1798	431.0	2229
Finger 30:	1068	358.0	1426	423.0	1849	425.0	2274
Finger 31:	1079	356.0	1435	411.0	1846	413.0	2259
Finger 32:	1050	368.0	1418	423.0	1841	426.0	2267
Finger 33:	1141	364.0	1505	394.0	1899	389.0	2288
Finger 34:	1101	363.0	1464	403.0	1867	407.0	2274
Finger 35:	1036	383.0	1419	426.0	1845	432.0	2277
Finger 36:	1052	379.0	1431	410.0	1841	418.0	2259
Finger 37:	1105	385.0	1490	399.0	1889	404.0	2293
Finger 38:	1125	385.0	1510	393.0	1903	393.0	2296
Finger 39:	1121	383.0	1504	387.0	1891	393.0	2284
Finger 40:	1063	396.0	1459	402.0	1861	408.0	2269

## Segmented Cement Bond Log Calibration Report

Serial Number: 10022773  
Tool Model: UW\_RBT\_004

Calibration Casing Diameter: 7.000 in  
Calibration Depth: 437.817 ft

Master Calibration, performed Fri Aug 07 11:16:48 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	0.002	0.756	0.800	62.200	81.506	0.601
5FT	-0.001	0.739	0.800	62.200	82.915	0.901
S1	0.002	0.703	0.000	100.000	142.718	-0.354
S2	0.001	0.721	0.000	100.000	142.718	-0.122

S2	0.001	0.724	0.000	100.000	138.313	-0.169
S3	0.002	0.725	0.000	100.000	138.309	-0.338
S4	0.002	0.730	0.000	100.000	137.240	-0.236
S5	0.002	0.756	0.000	100.000	132.658	-0.324
S6	0.002	0.749	0.000	100.000	133.782	-0.260
S7	0.003	0.737	0.000	100.000	136.107	-0.342
S8	0.002	0.720	0.000	100.000	139.280	-0.335

#### Temperature Calibration Report

Serial Number: 10025097  
 Tool Model: UW\_PRT\_016  
 Performed: Wed Feb 11 13:44:44 2015

Point #	Reading	Reference
1	13053.00 cps	68.00 degF
2	18014.00 cps	104.00 degF
3	29668.00 cps	176.00 degF
4	41181.00 cps	248.00 degF
5	52983.00 cps	320.00 degF
6	58931.00 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 Whiting Oil & Gas Corporation  
 Well Razor Fed 30K-1907  
 Field Wildcat  
 County Weld  
 State Colorado