



Radial Cement Bond  
Gamma Ray  
Casing Collar Log

Company	Kerr-McGee Oil & Gas Onshore, L.P.			Location:	API # : 05-123-43024	Other Services JB/GR MIT
Well	Hopper State 24N-34SLHZ			SEC 15	TWP 2N	RGE 68W
Field	Wattenberg			Permanent Datum	Ground Level	Elevation
County	Weld			Log Measured From	Kelly Bushing	26 FT
State	Colorado			Drilling Measured From	Kelly Bushing	

Date	18-APR-2017		
Run Number	Two		
Depth Driller	21660 FT		
Depth Logger	7323 FT		
Bottom Logged Interval	7320 FT		
Top Log Interval	Surface		
Open Hole Size	7.875"		
Type Fluid	Water		
Density / Viscosity	8.34 lb/gal		
Max. Recorded Temp.	226°F		
Estimated Cement Top	Surface		
Time Well Ready	ROA		
Time Logger on Bottom	9:34 AM		
Equipment Number	HD-0325		
Location	Fort Lupton, CO		
Recorded By	G. Lueck		
Witnessed By	B. Jolly		

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	2366 FT		
Intermediate #1	5 1/2	20	HCP-110	Surface	21656 FT		
Intermediate #2							
Liner							

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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

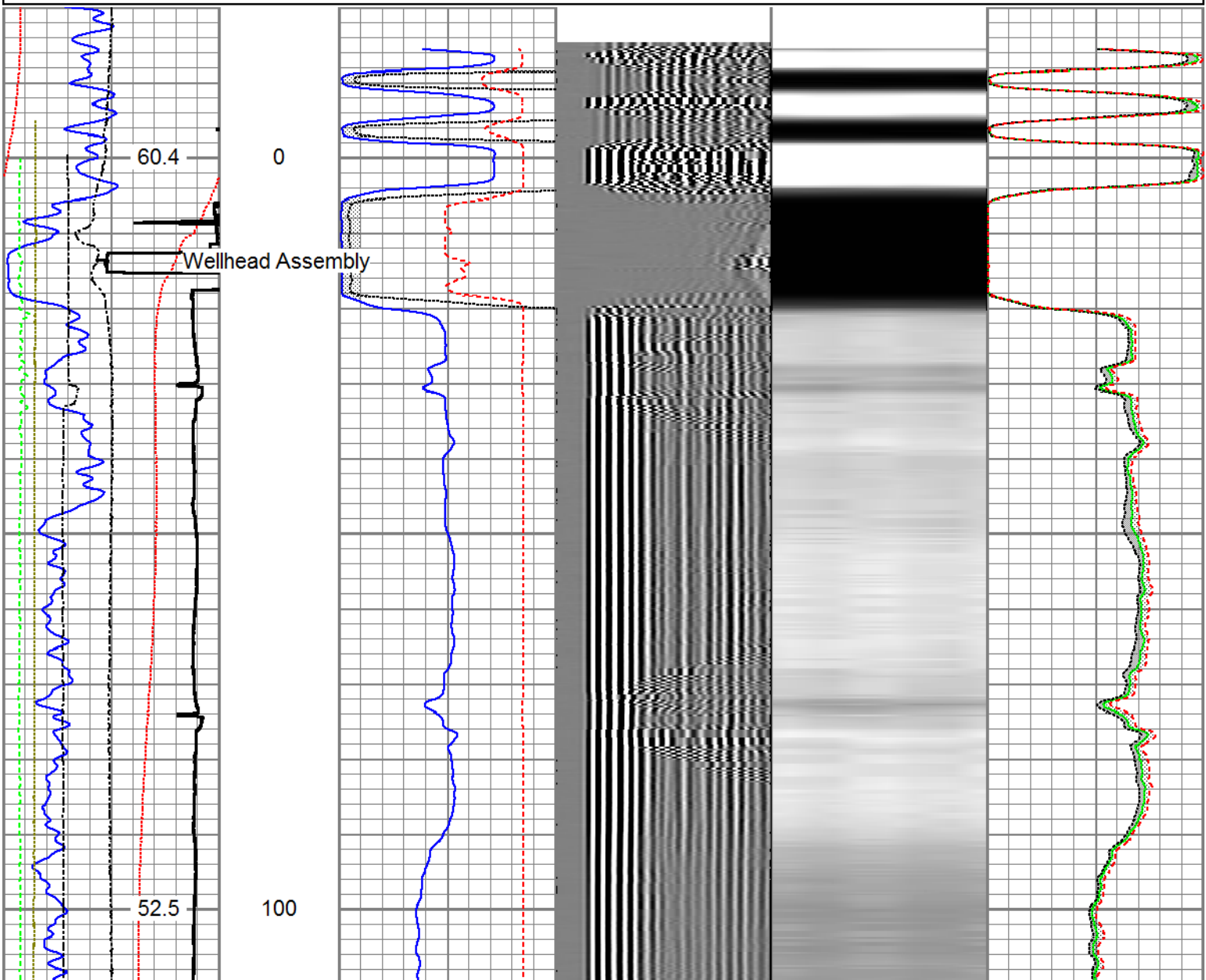
Log ran as per customer request  
Depth referenced to Casing Tally reported Marker Joint at 6568 FT  
Adjusted -5 FT to correlate with Marker Joint  
Gauge Ring/Junk Basket ran to 7506 FT with no debris  
Log ran from as deep as possible in heel to surface  
Log ran with 2800 PSI surface induced pressure  
Logging tools were clean and free of any debris upon completion of operations  
  
Thank you for choosing Reliance Oilfield Services, LLC!!

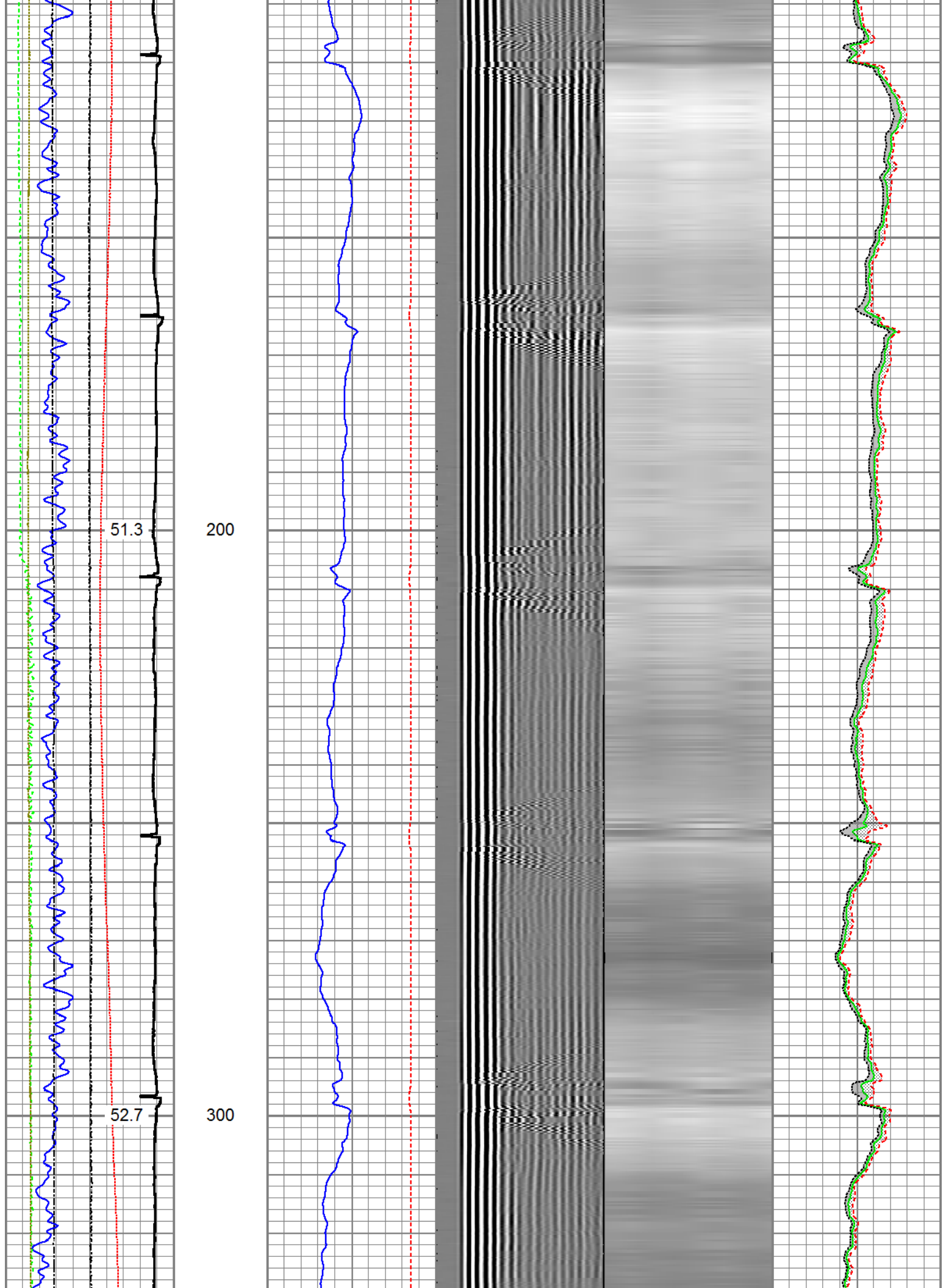


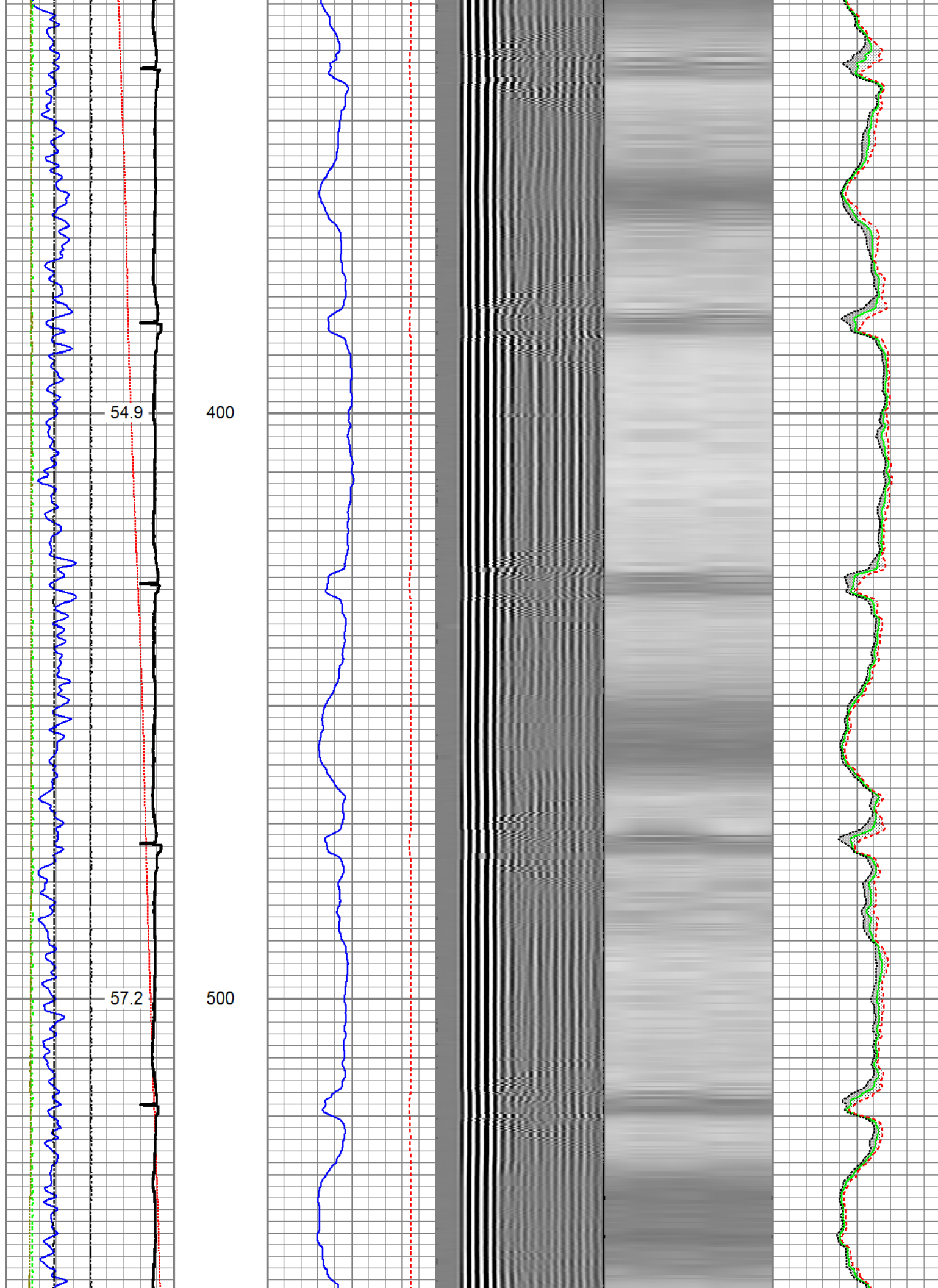
Main Pass

Recorded With 2800 PSI Surface Induced Pressure

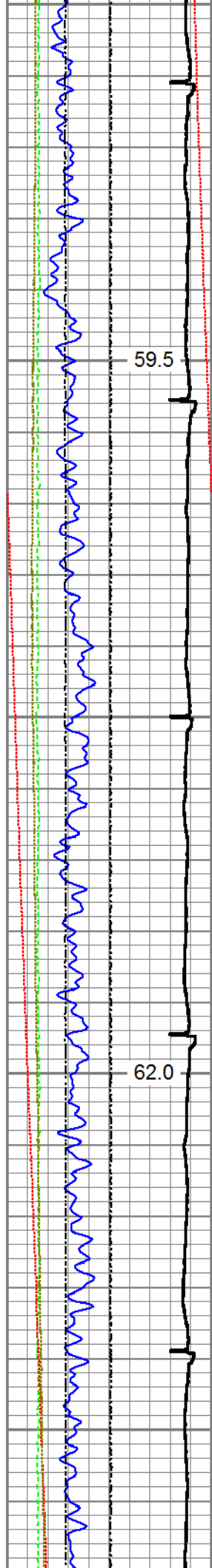
Gamma Ray (GAPI)	3' Amplitude (mV)	5' Variable Density Log	Sector Map	Average Amplitude
0 120	0 100	200 1200		0 100
Line Speed (ft/min)	3' Amplitude x 5 (mV)			Minimum Amplitude
-100 100	0 20			0 100
Line Tension (lb)	3' Travel Time (usec)			Maximum Amplitude
0 2000	650 150			0 100
Differential Temperature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





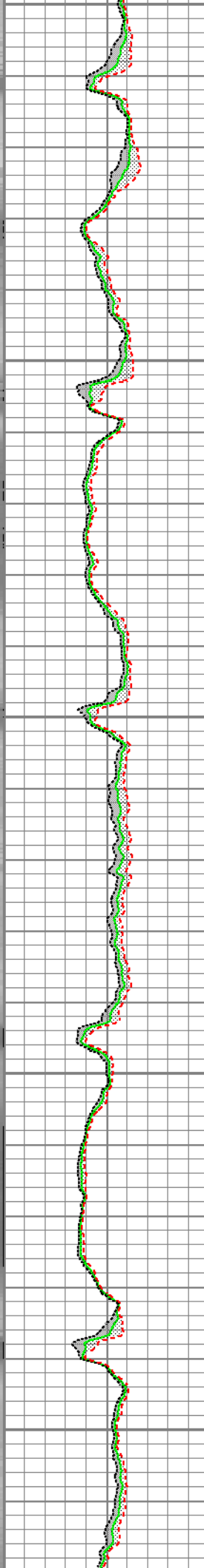
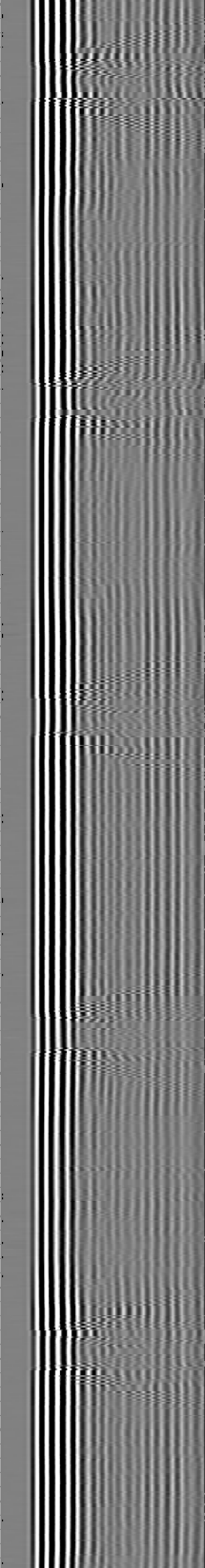
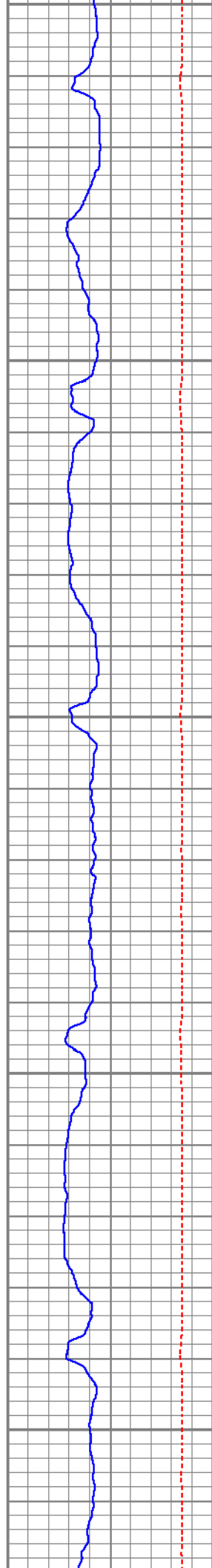


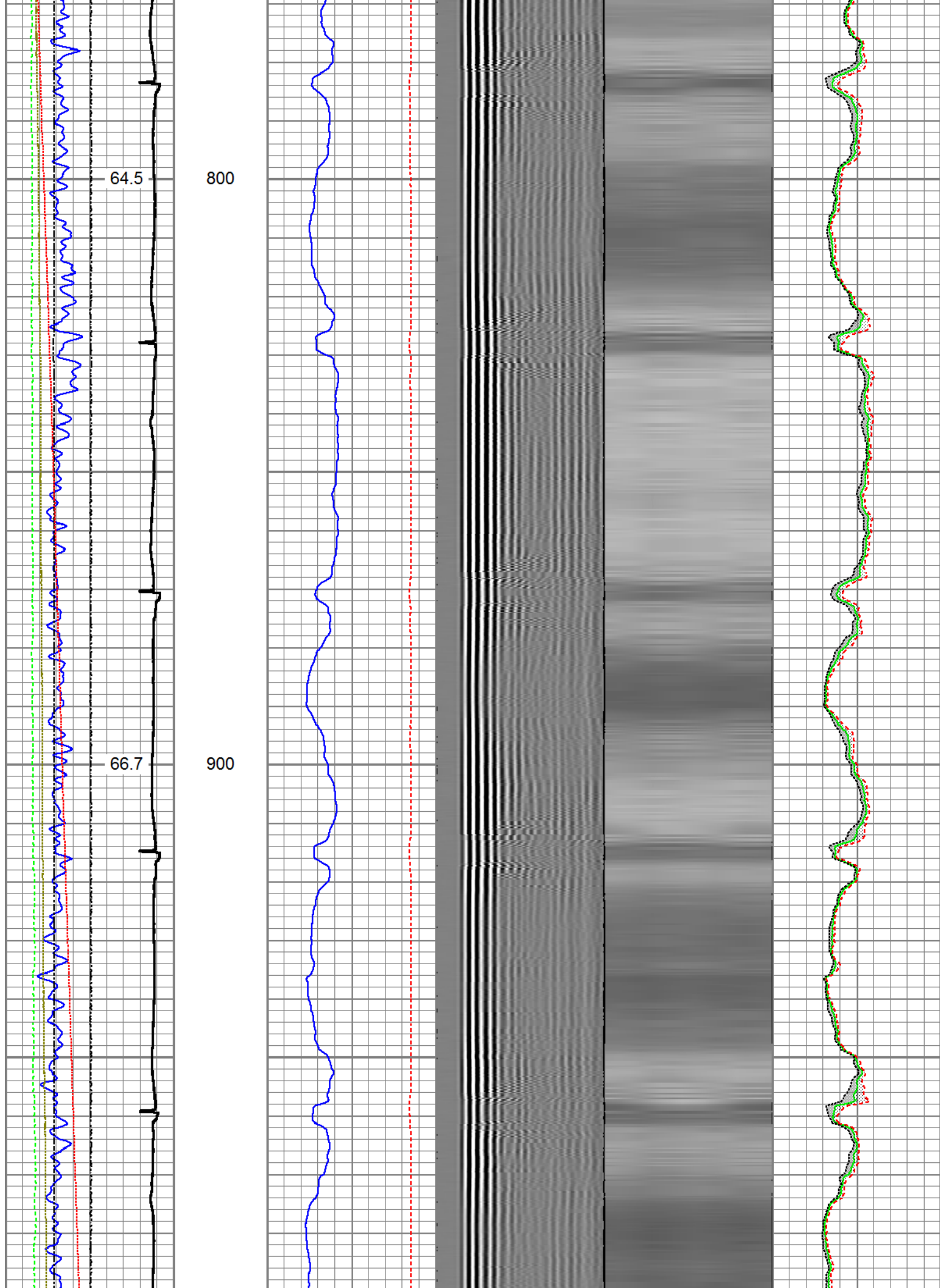


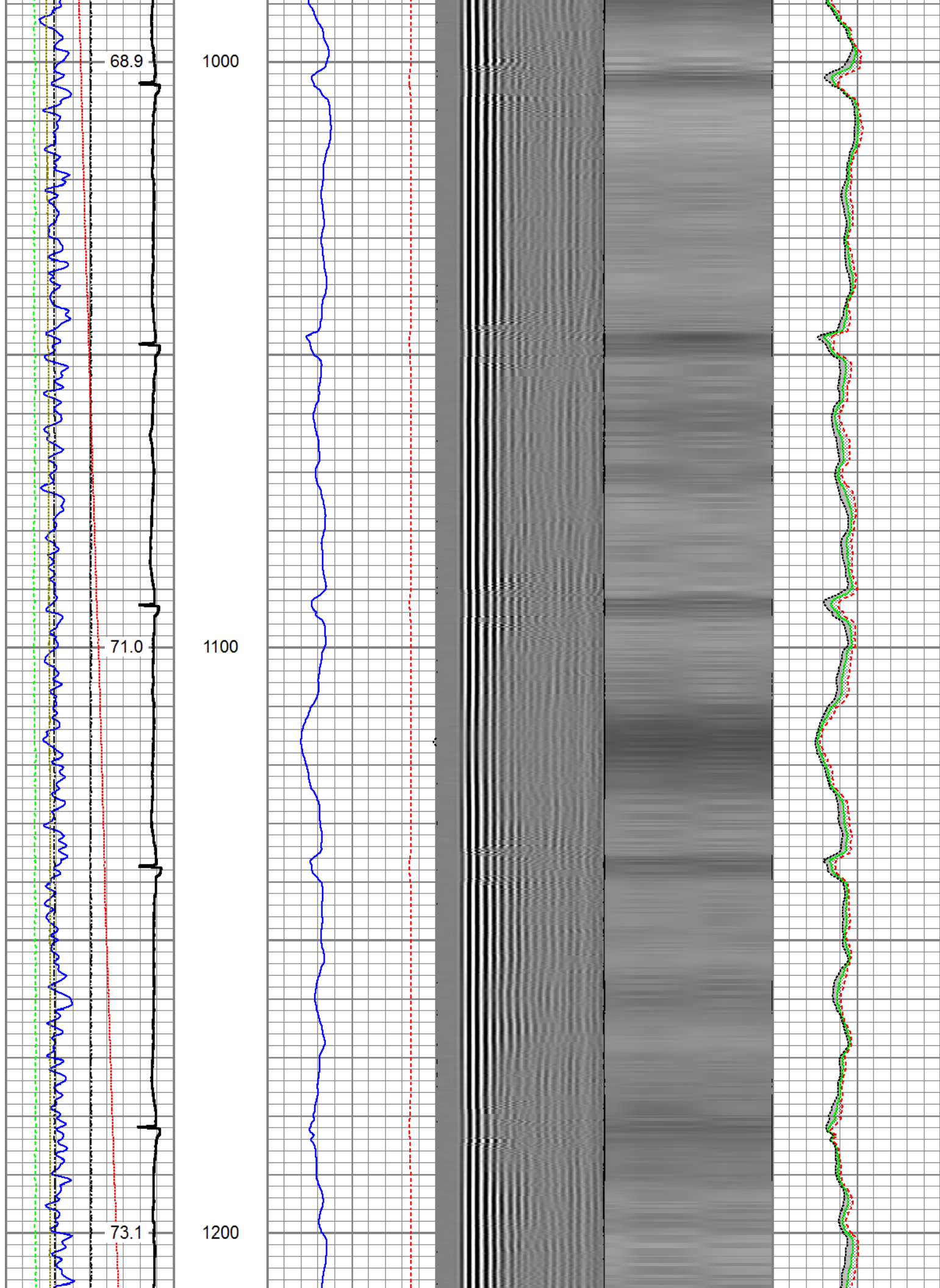


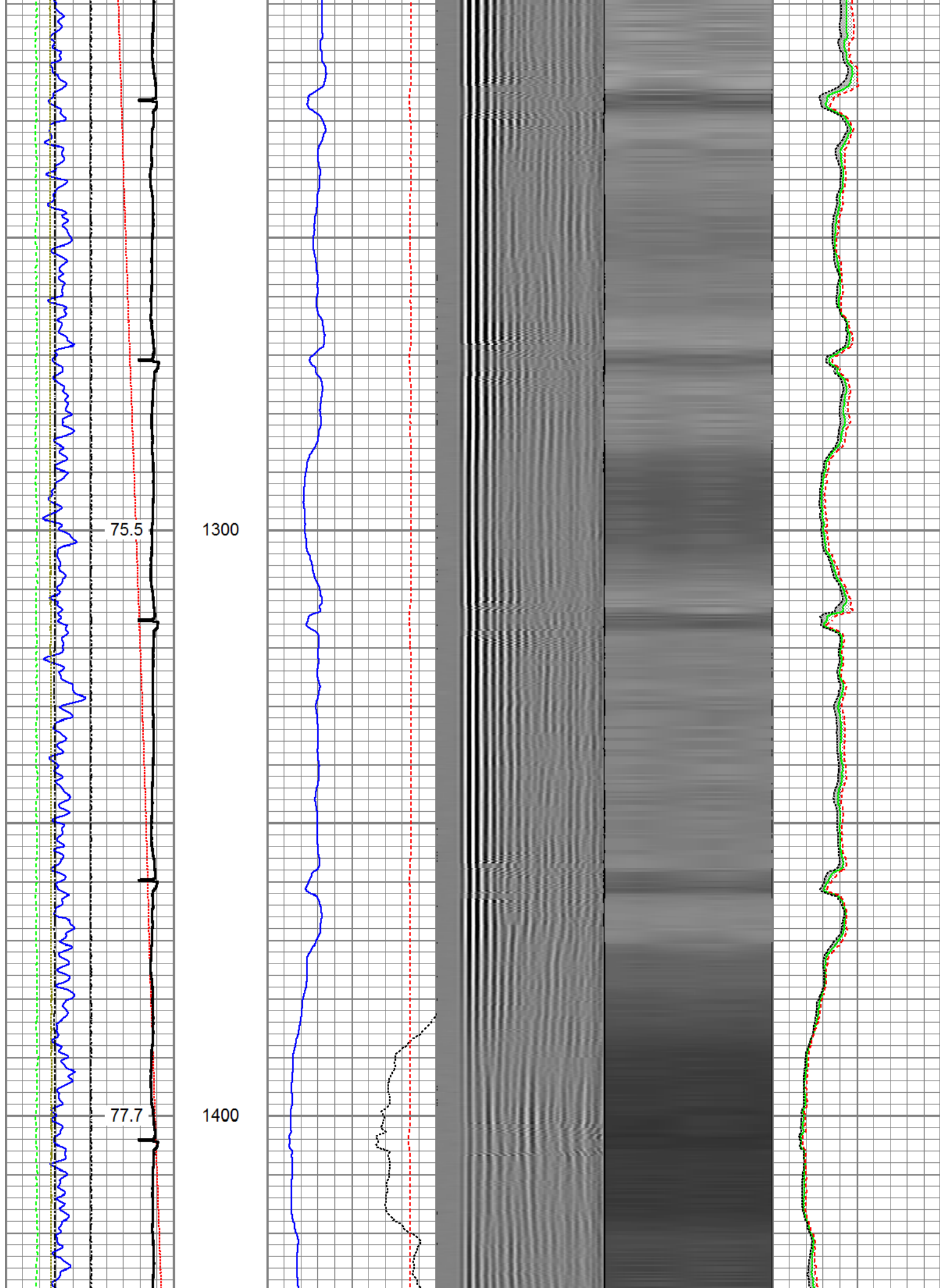
600

700

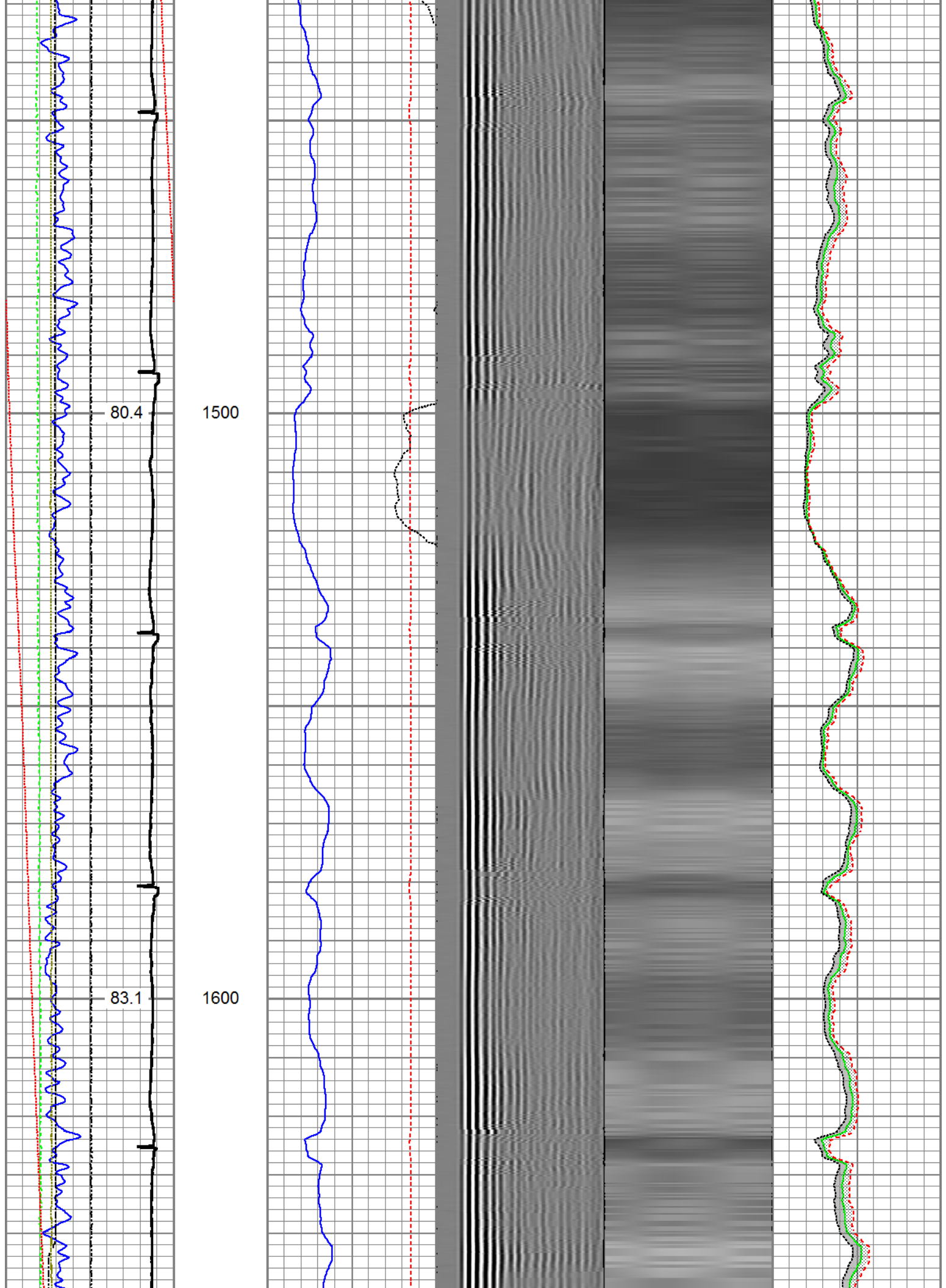


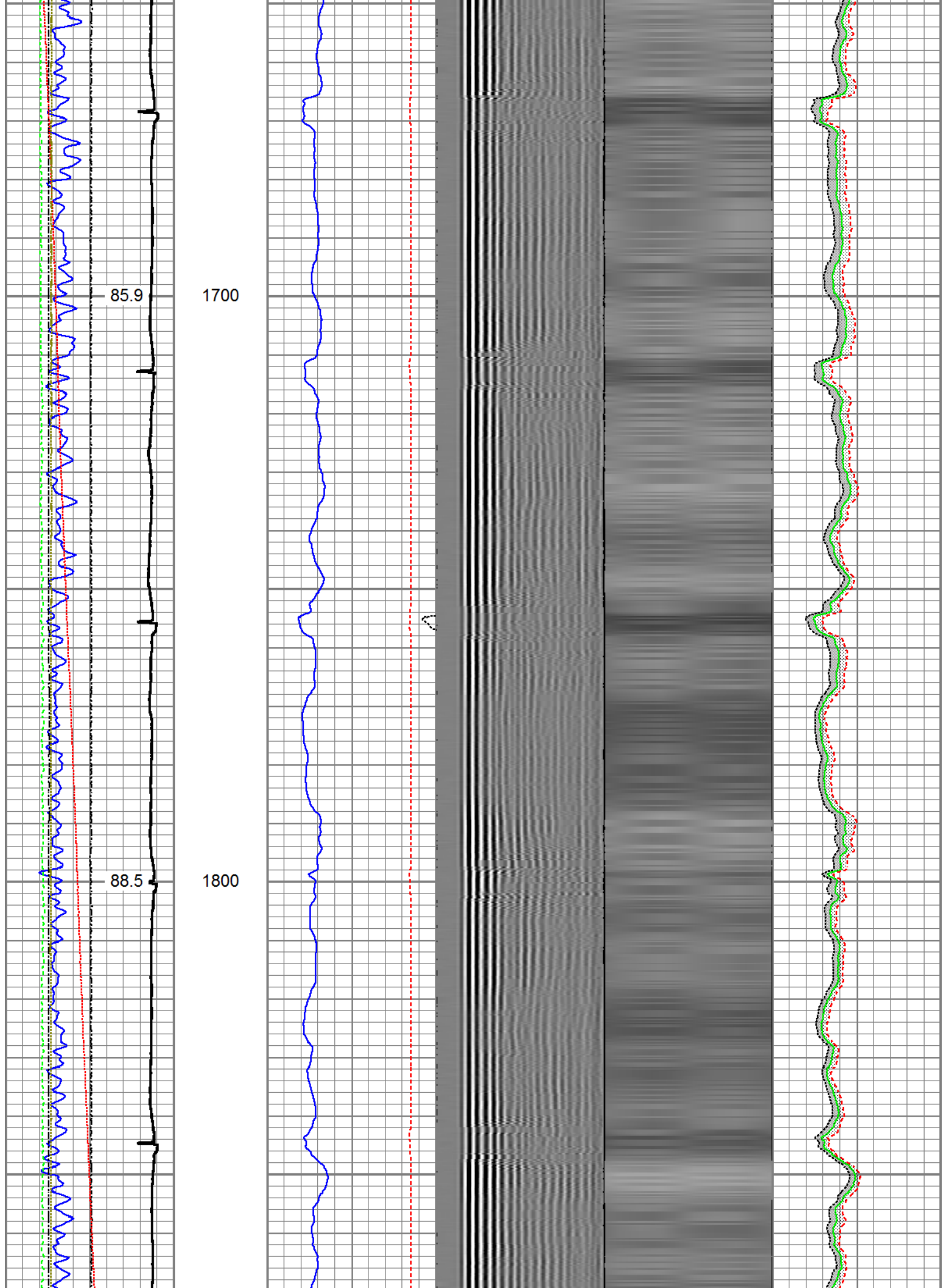


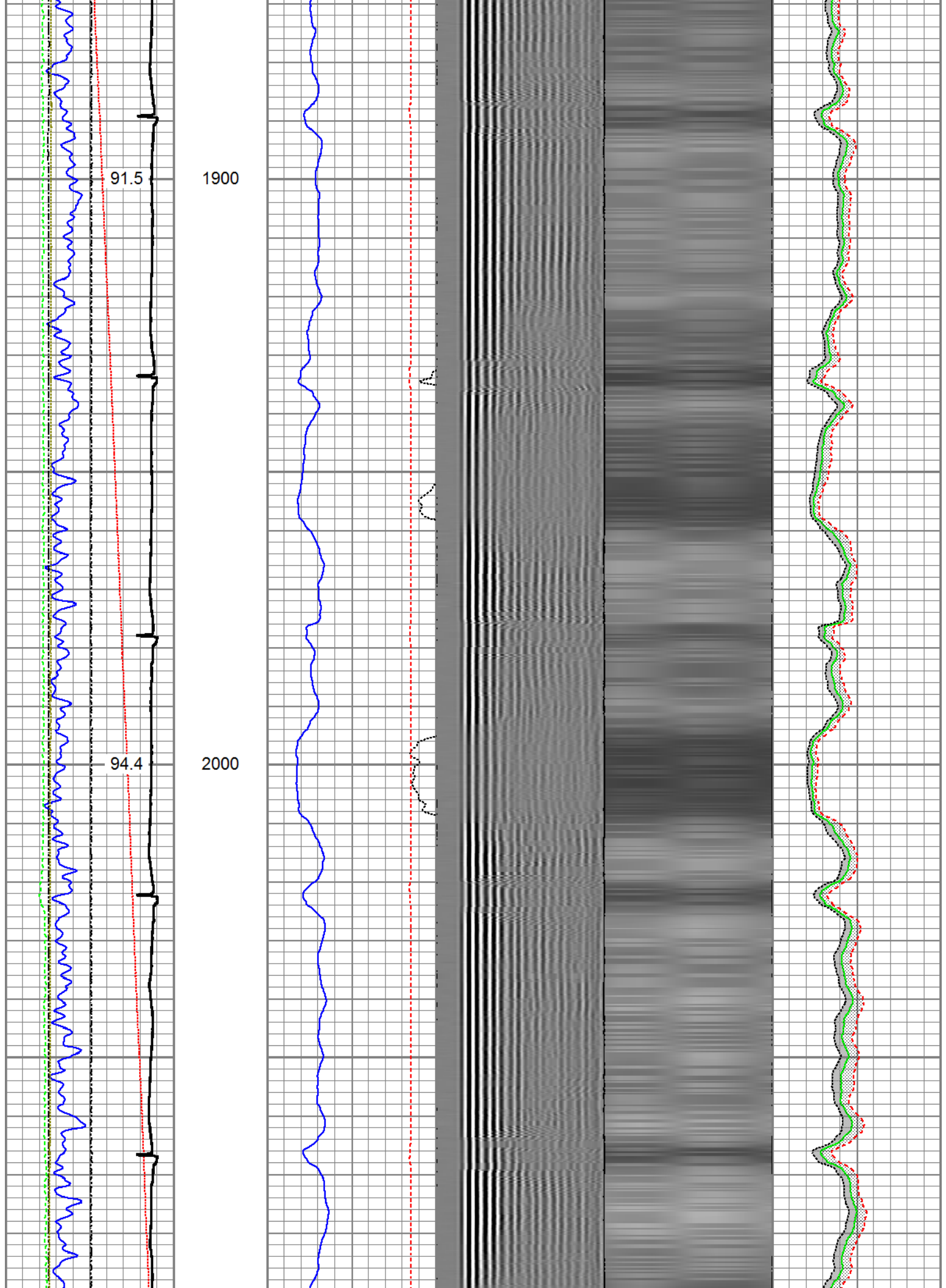


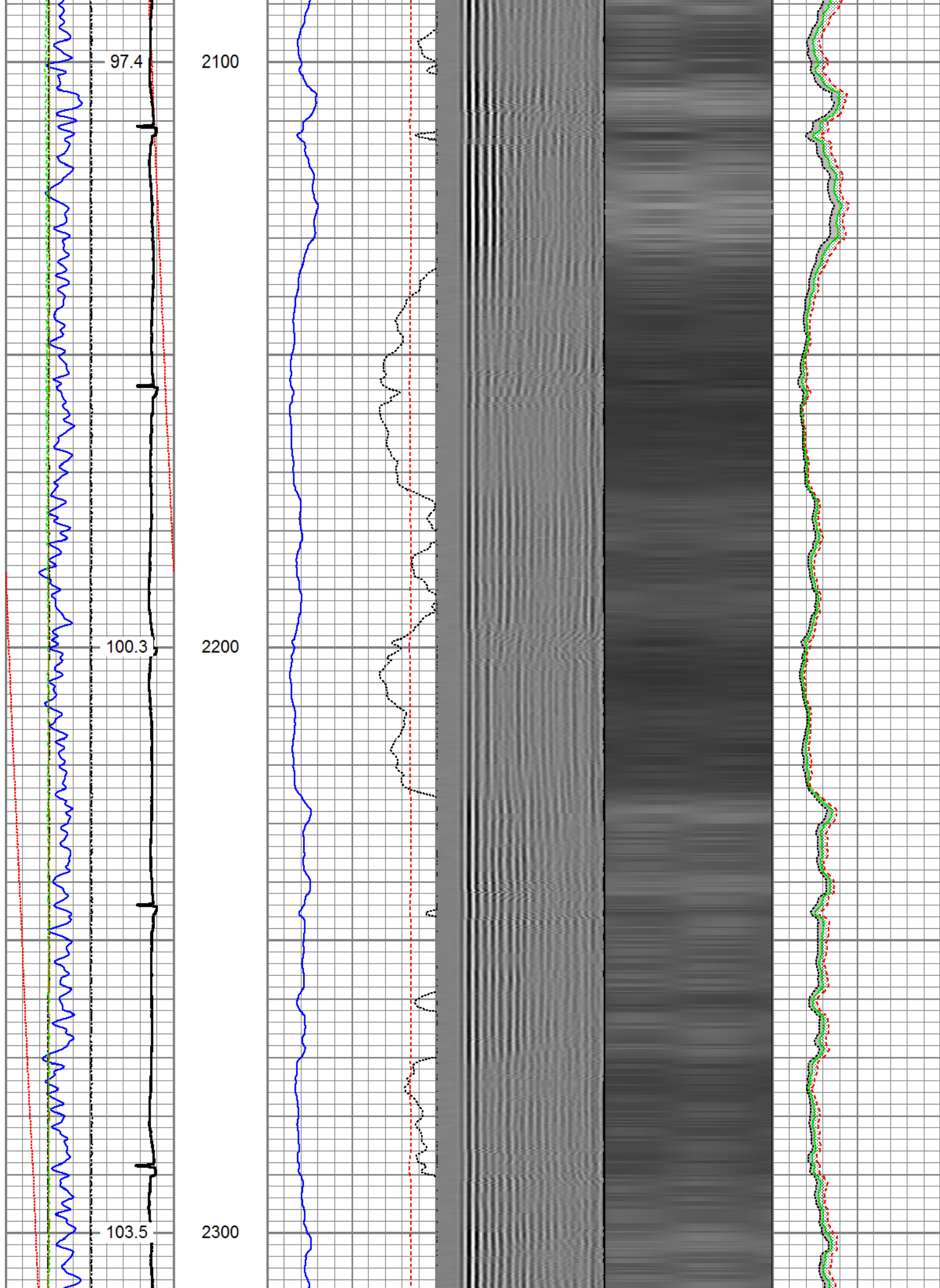




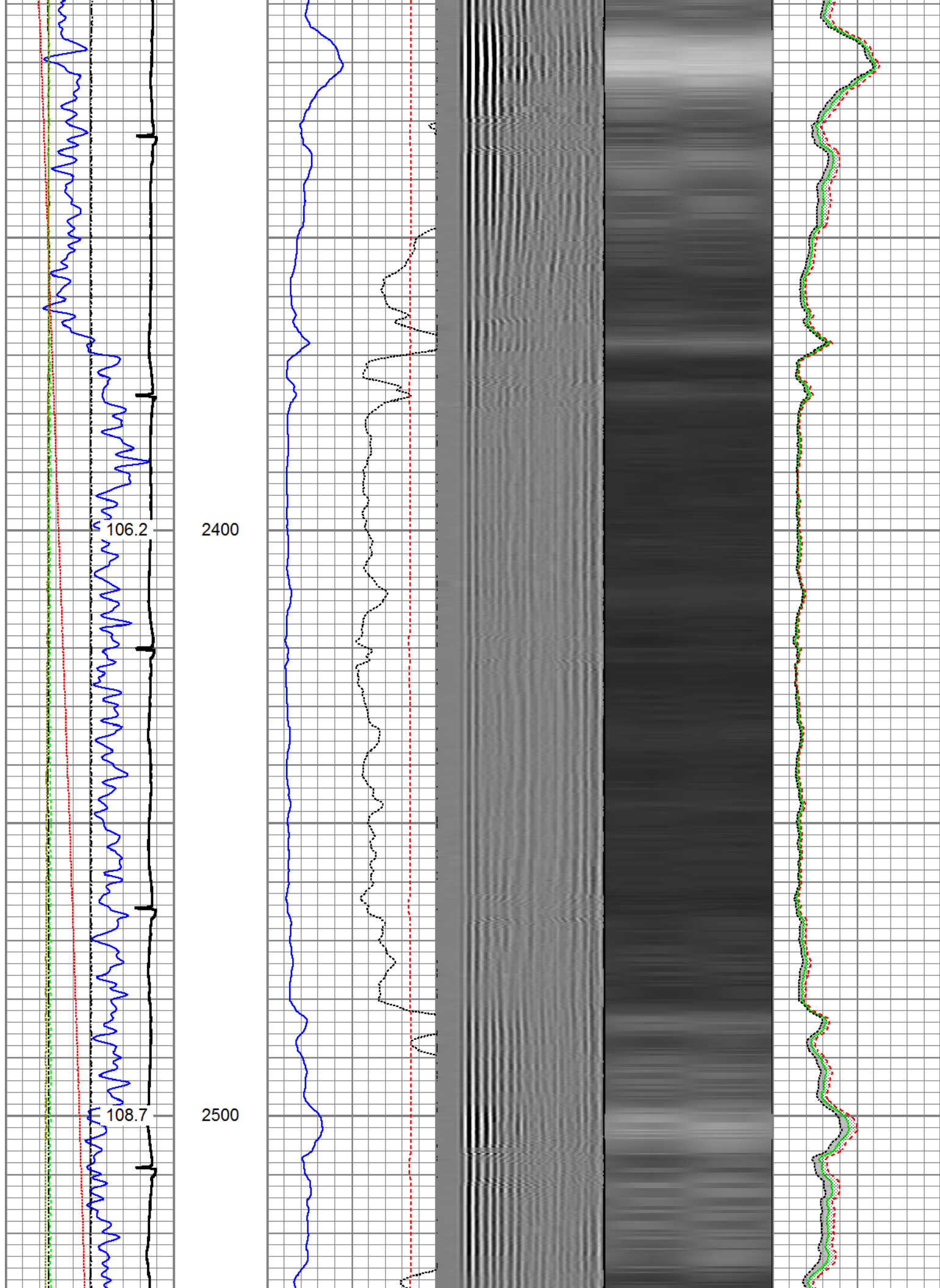


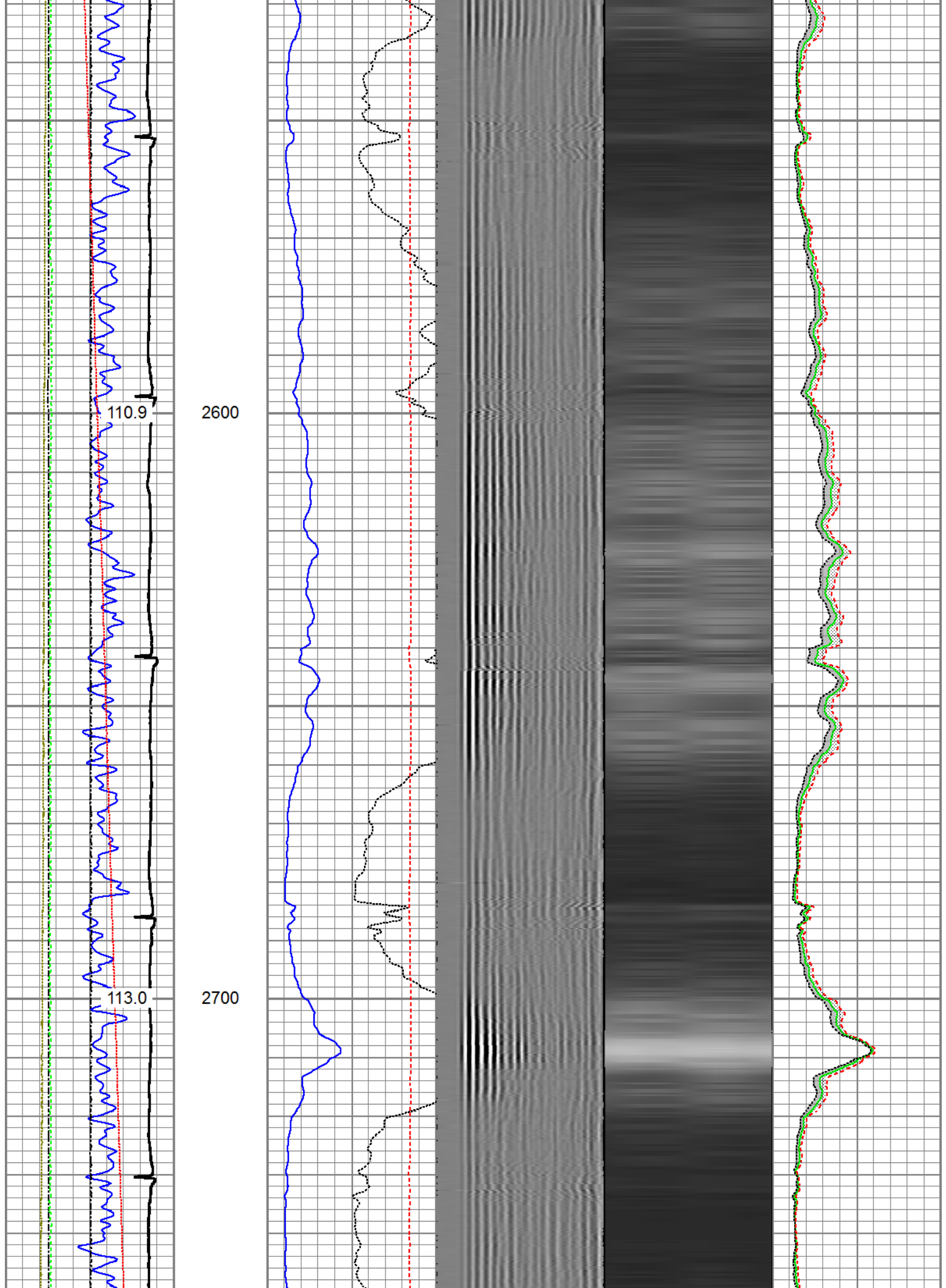


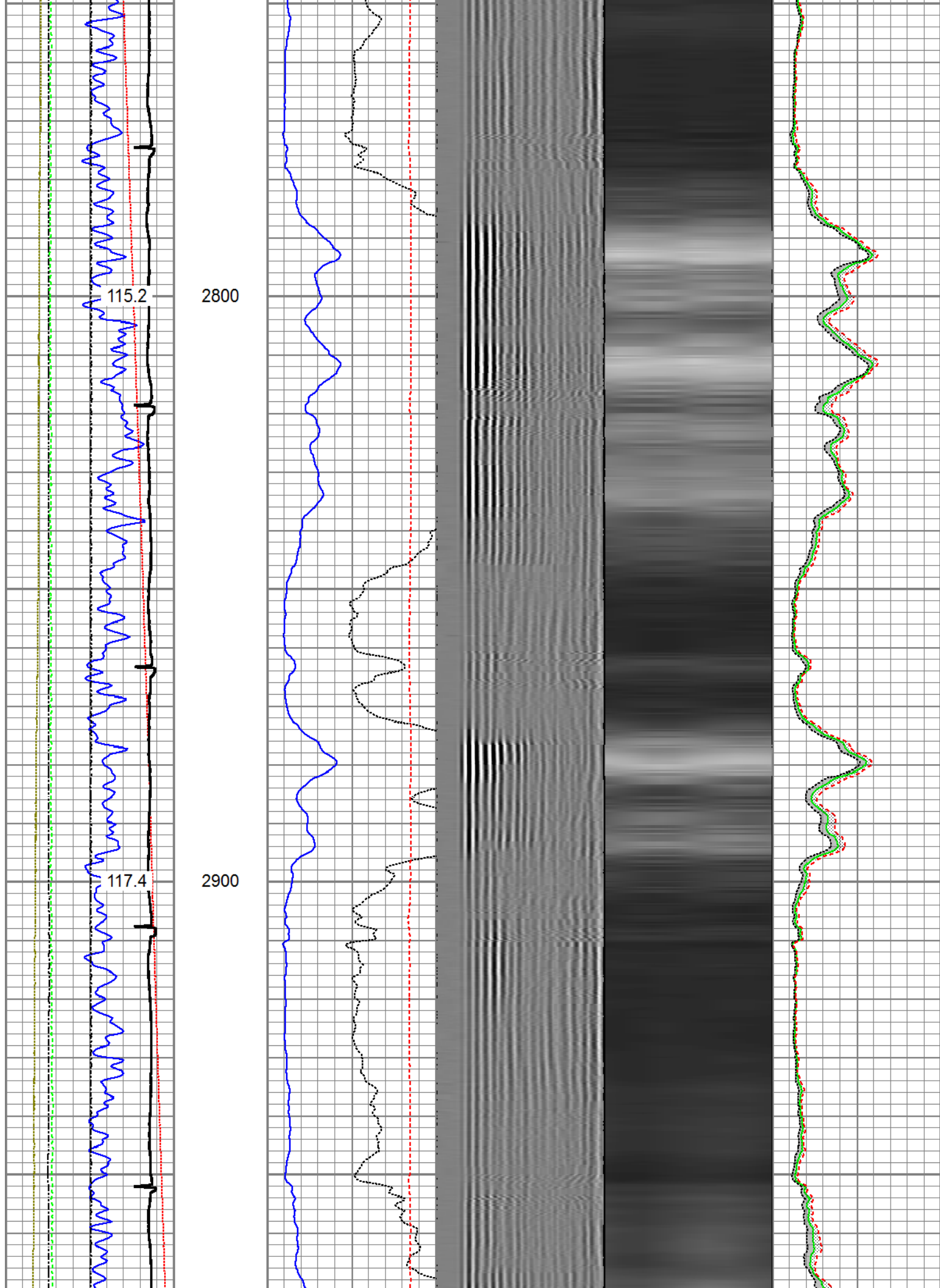


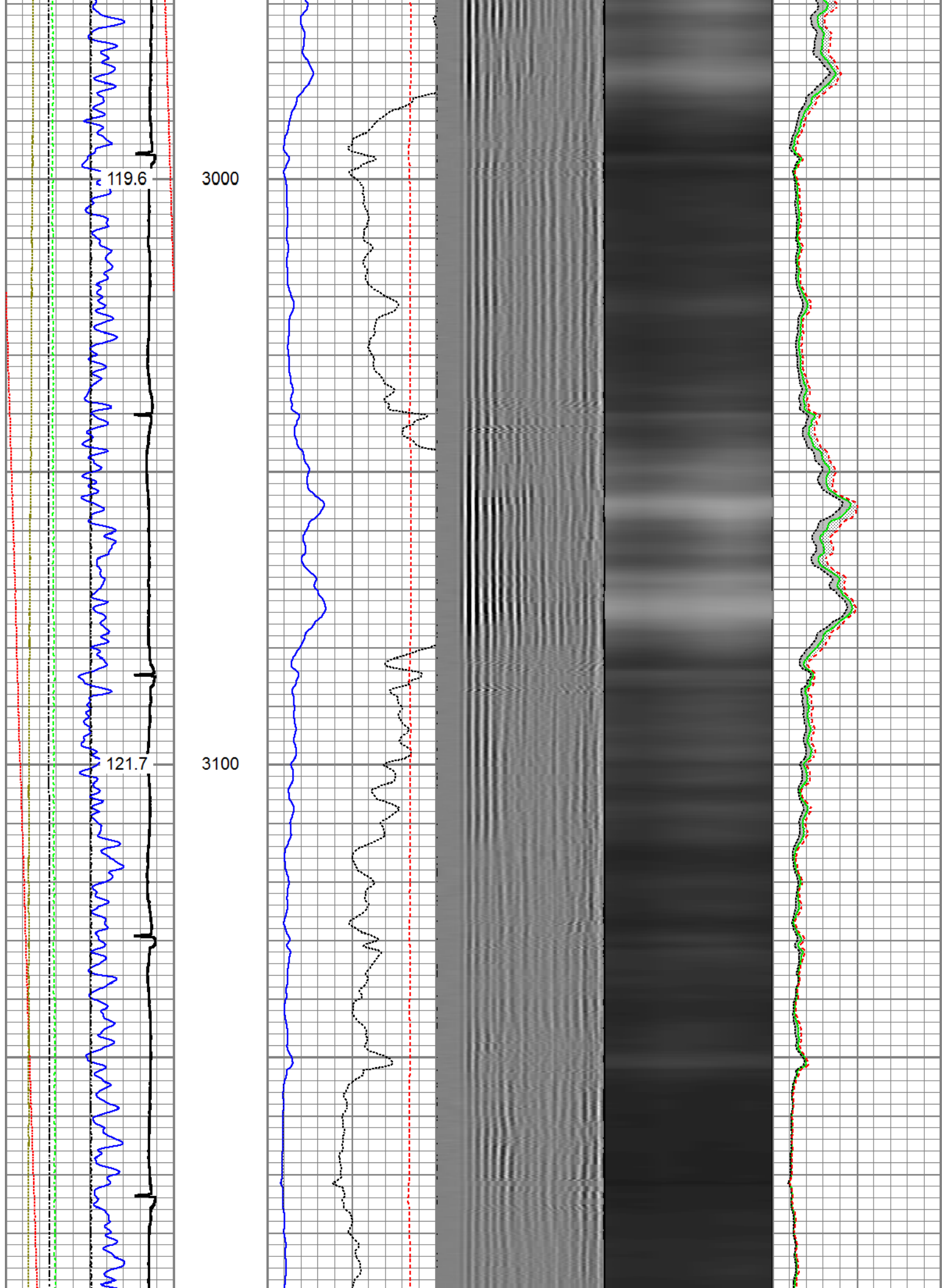




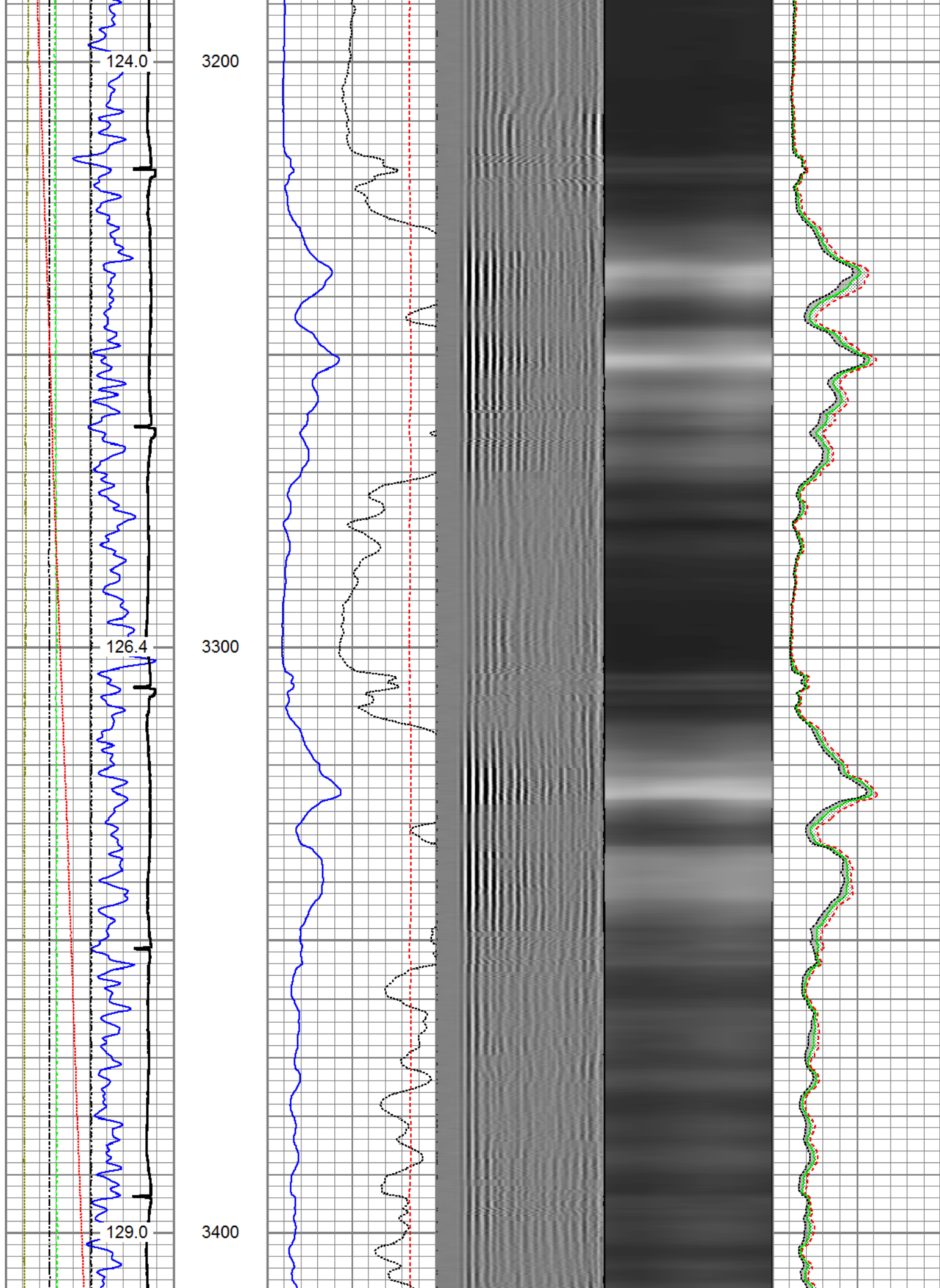


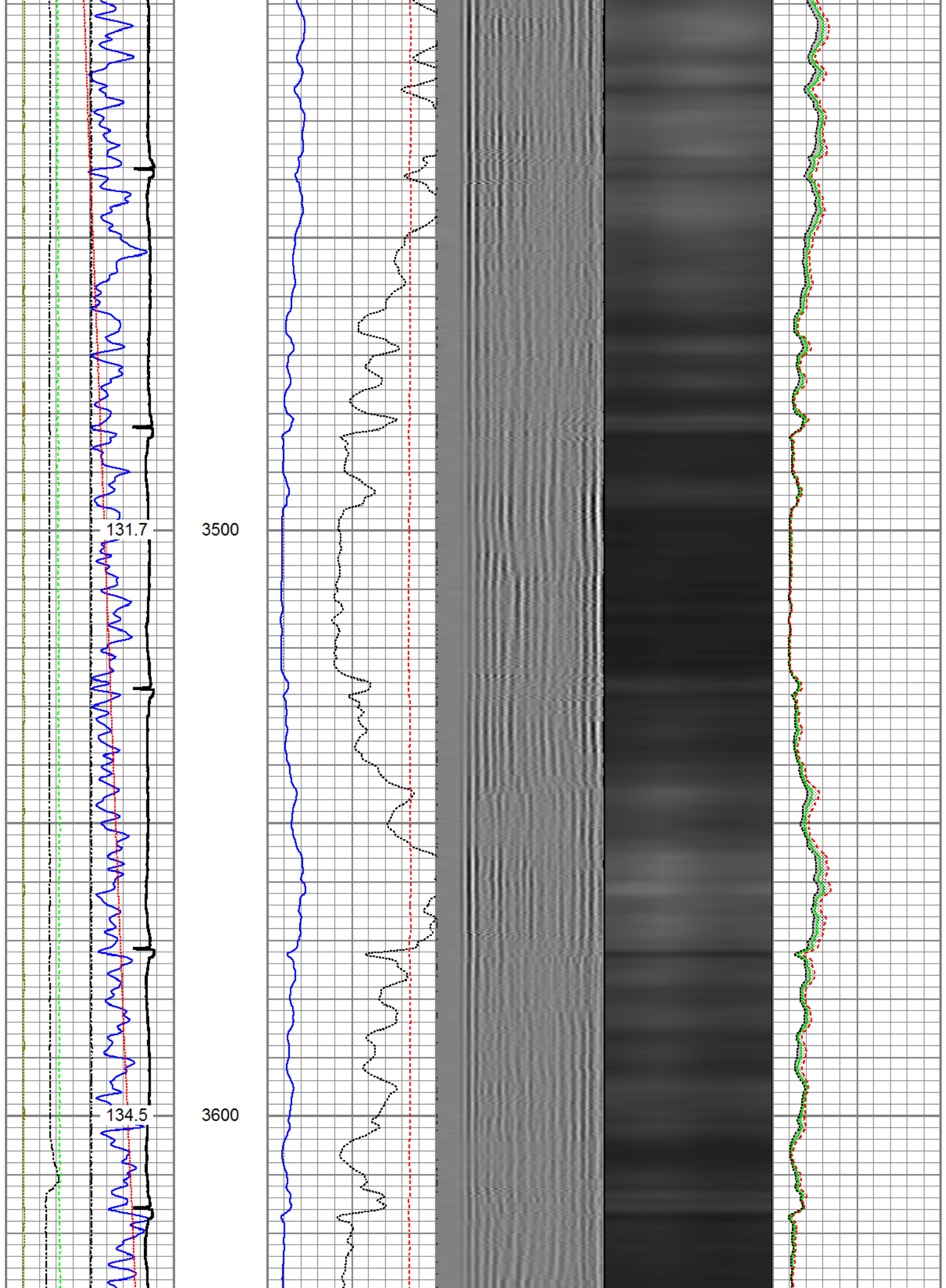


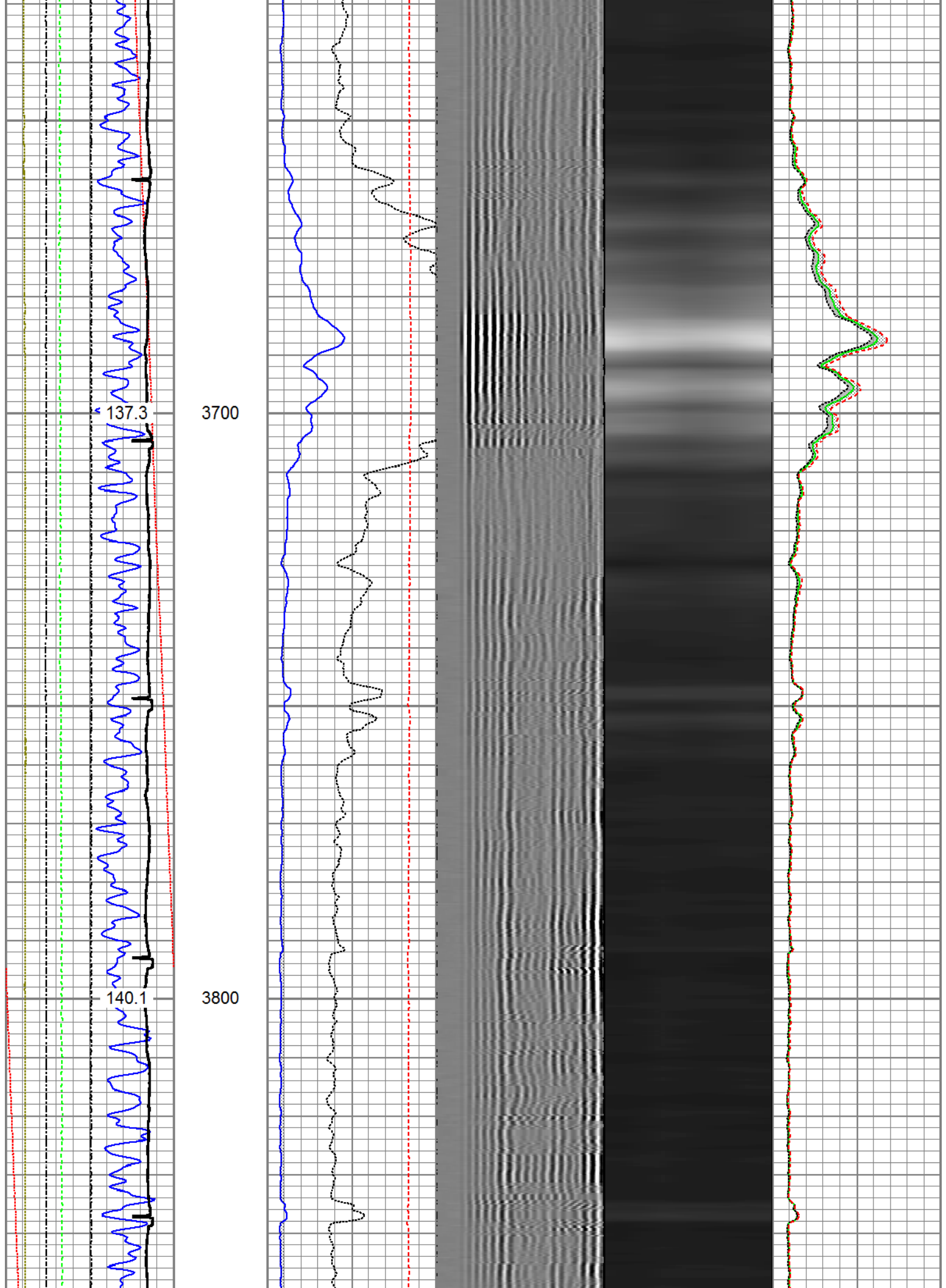


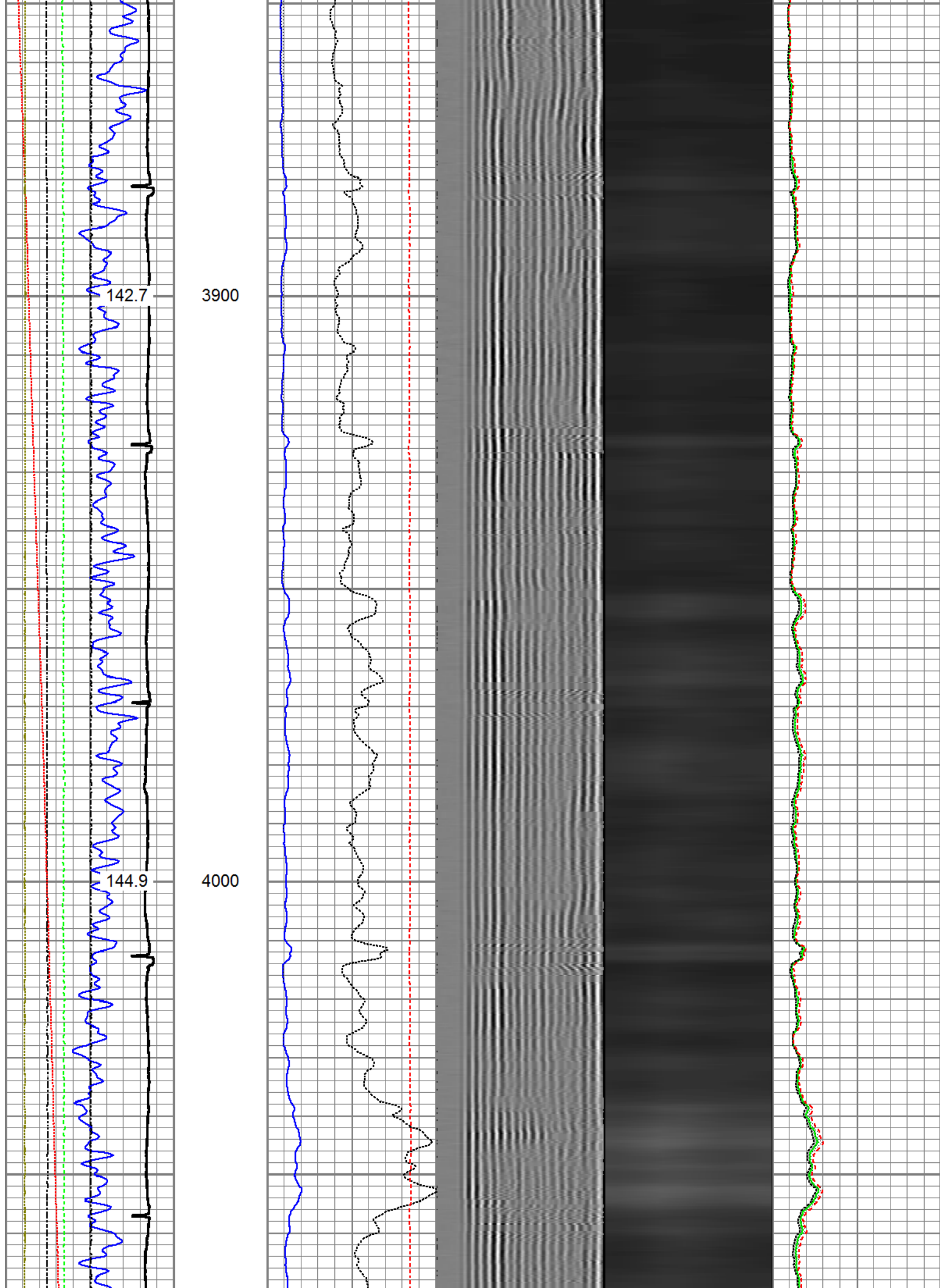




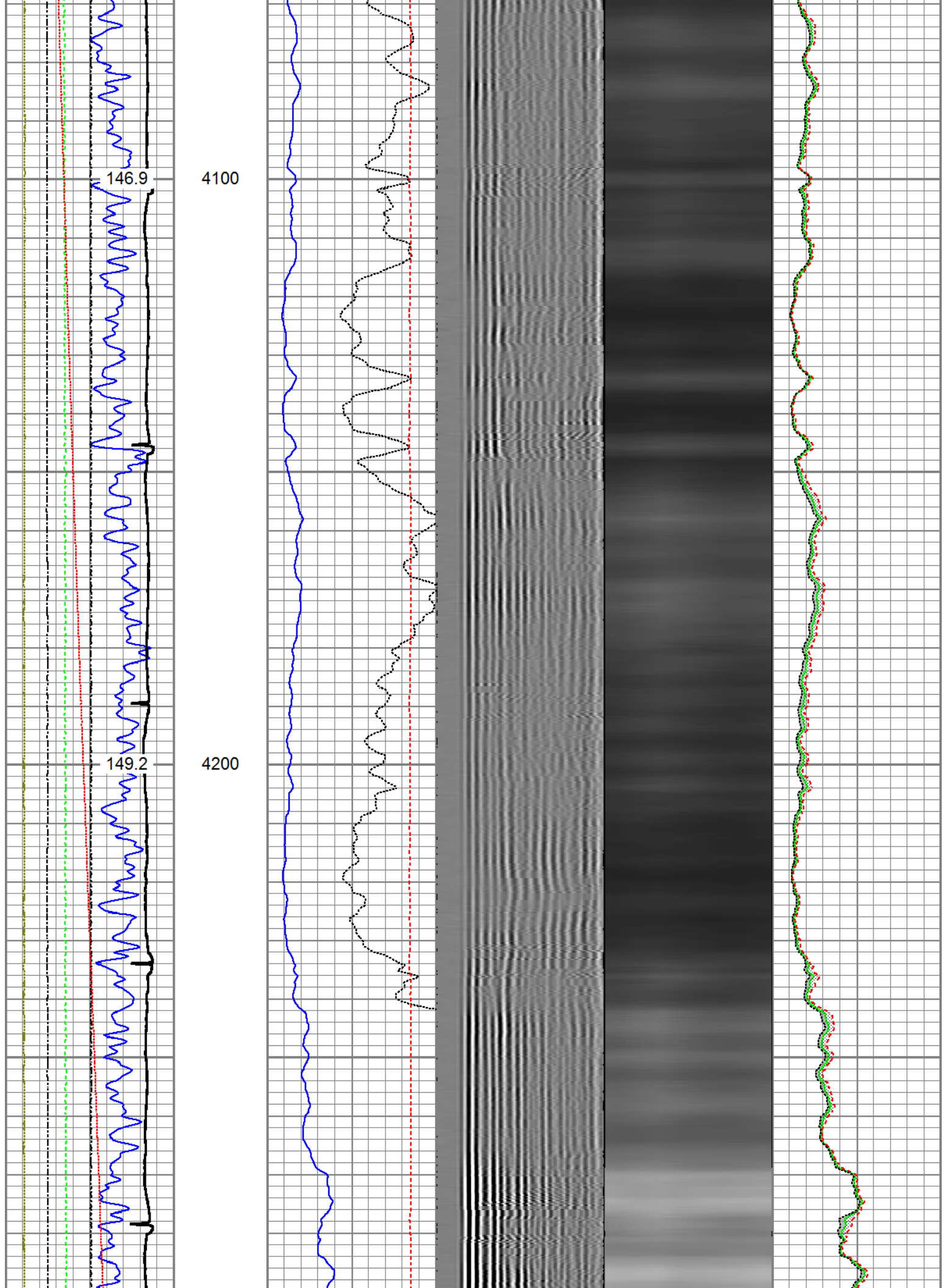


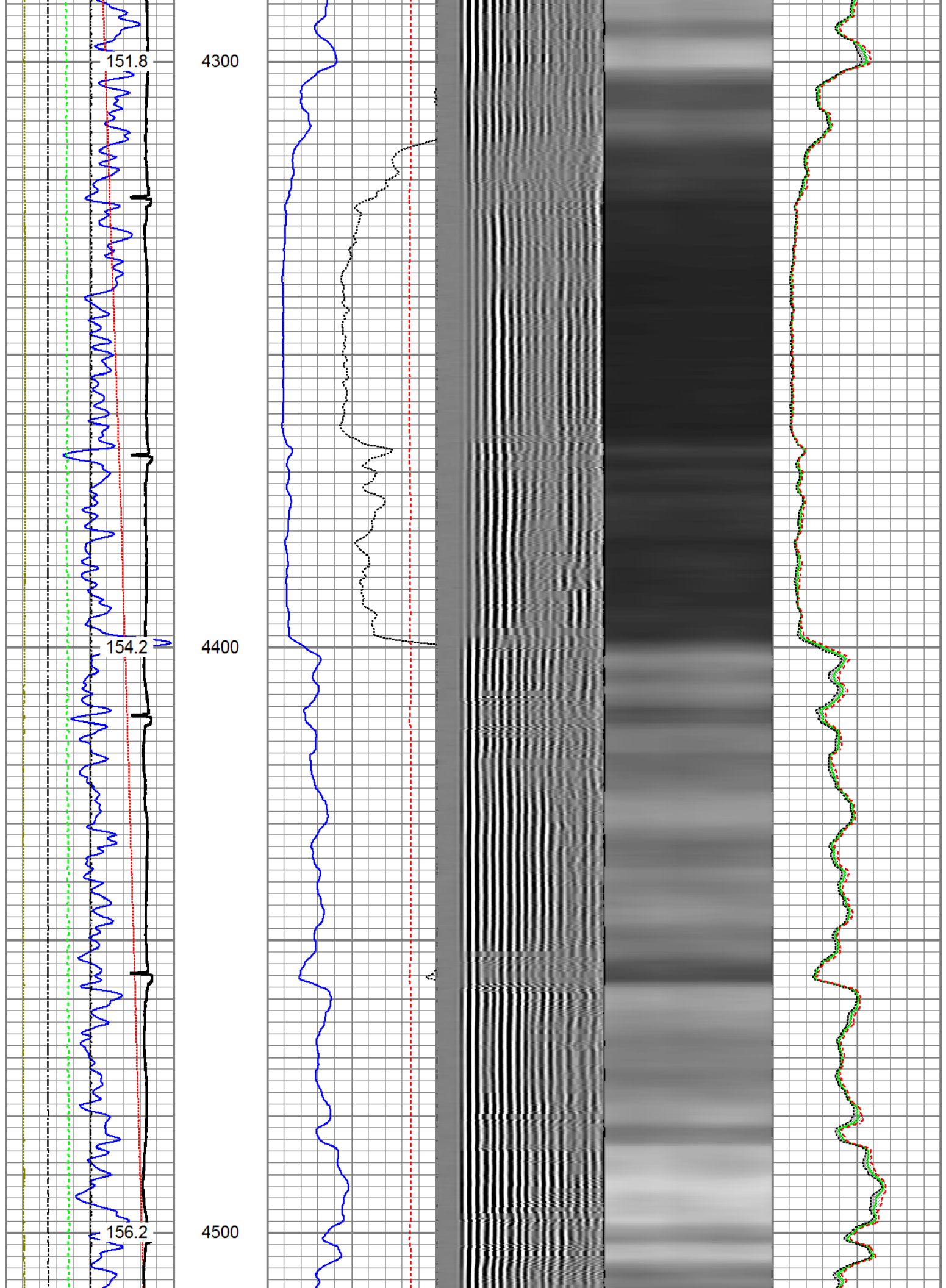


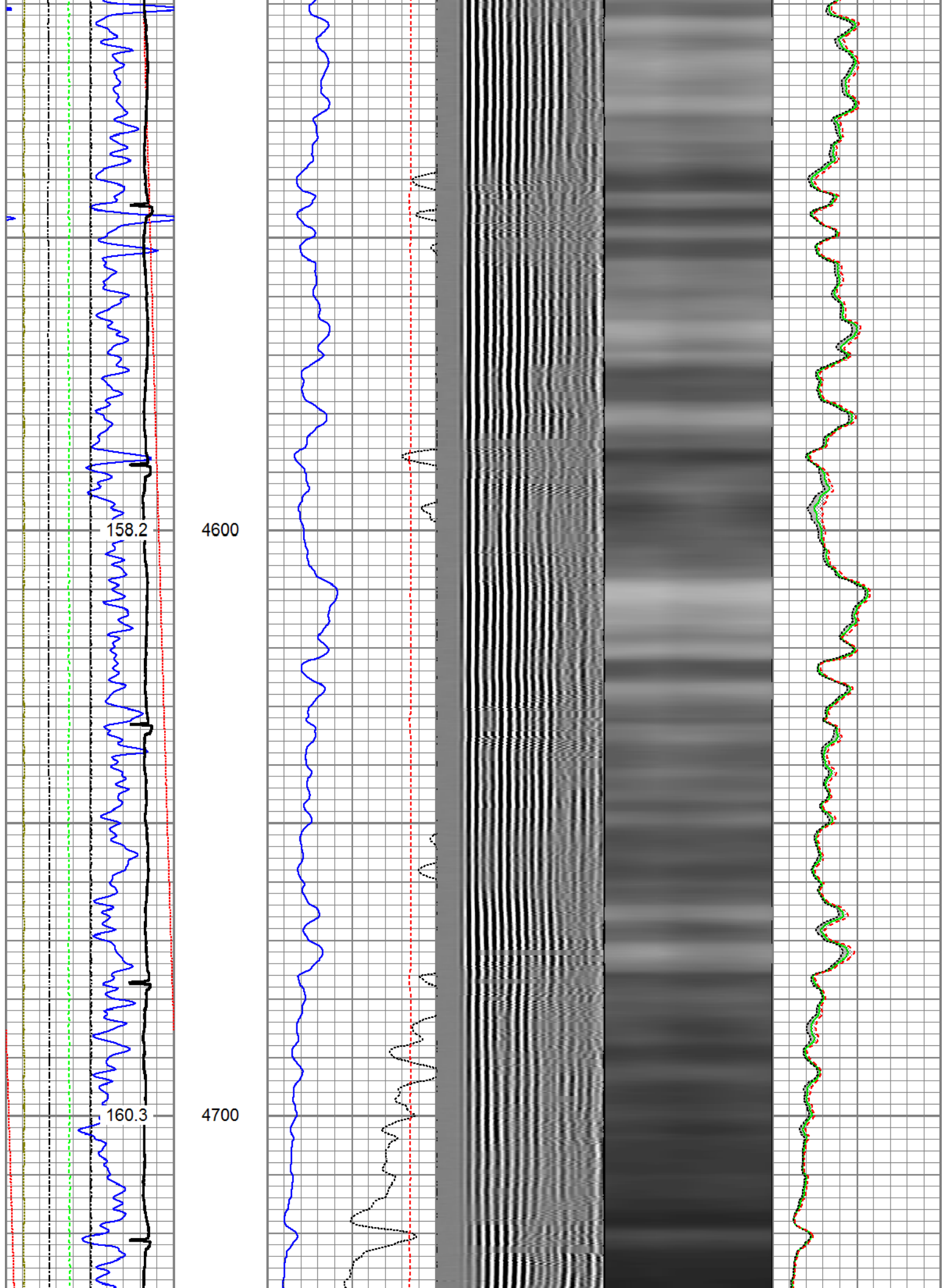


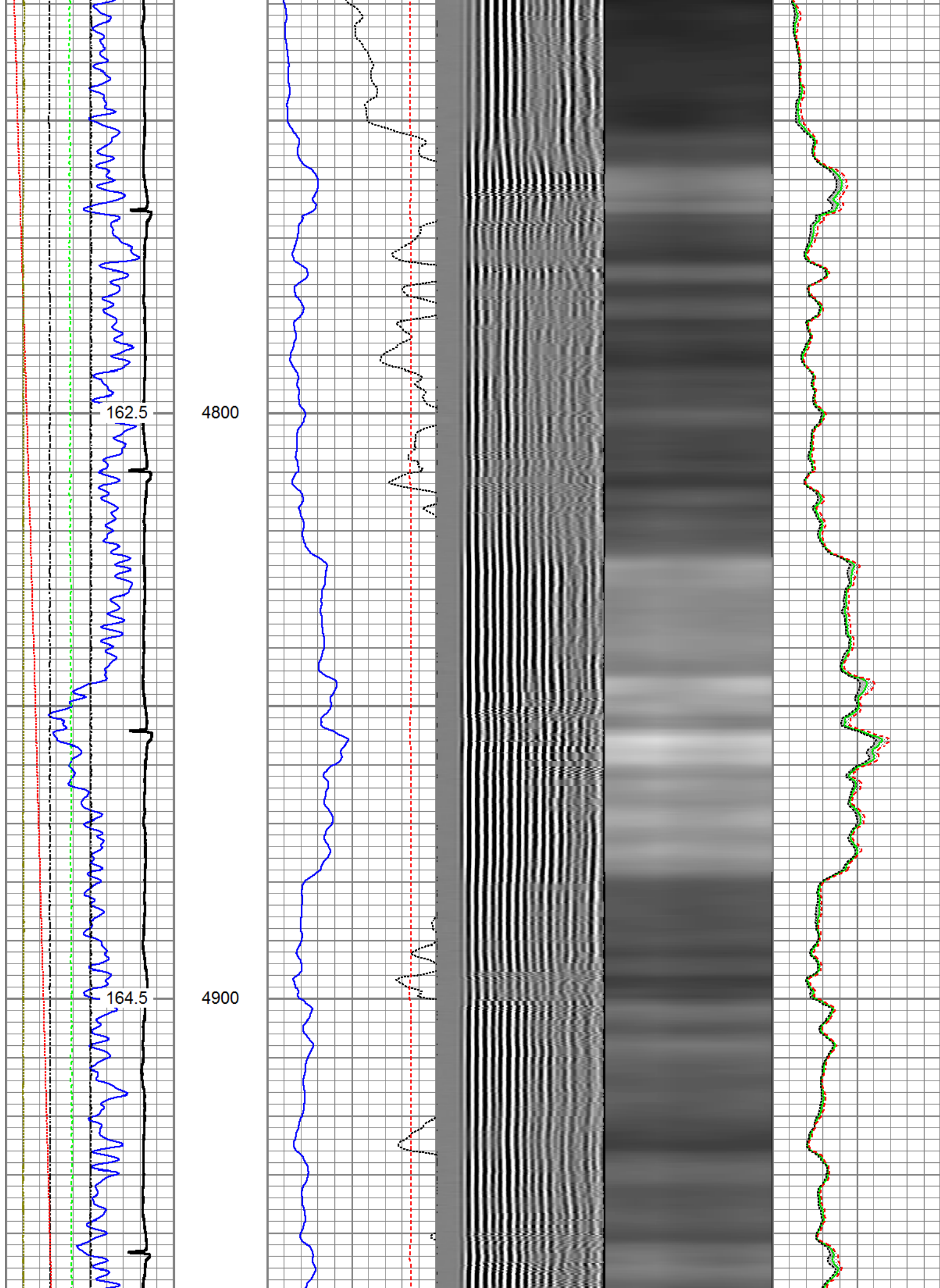




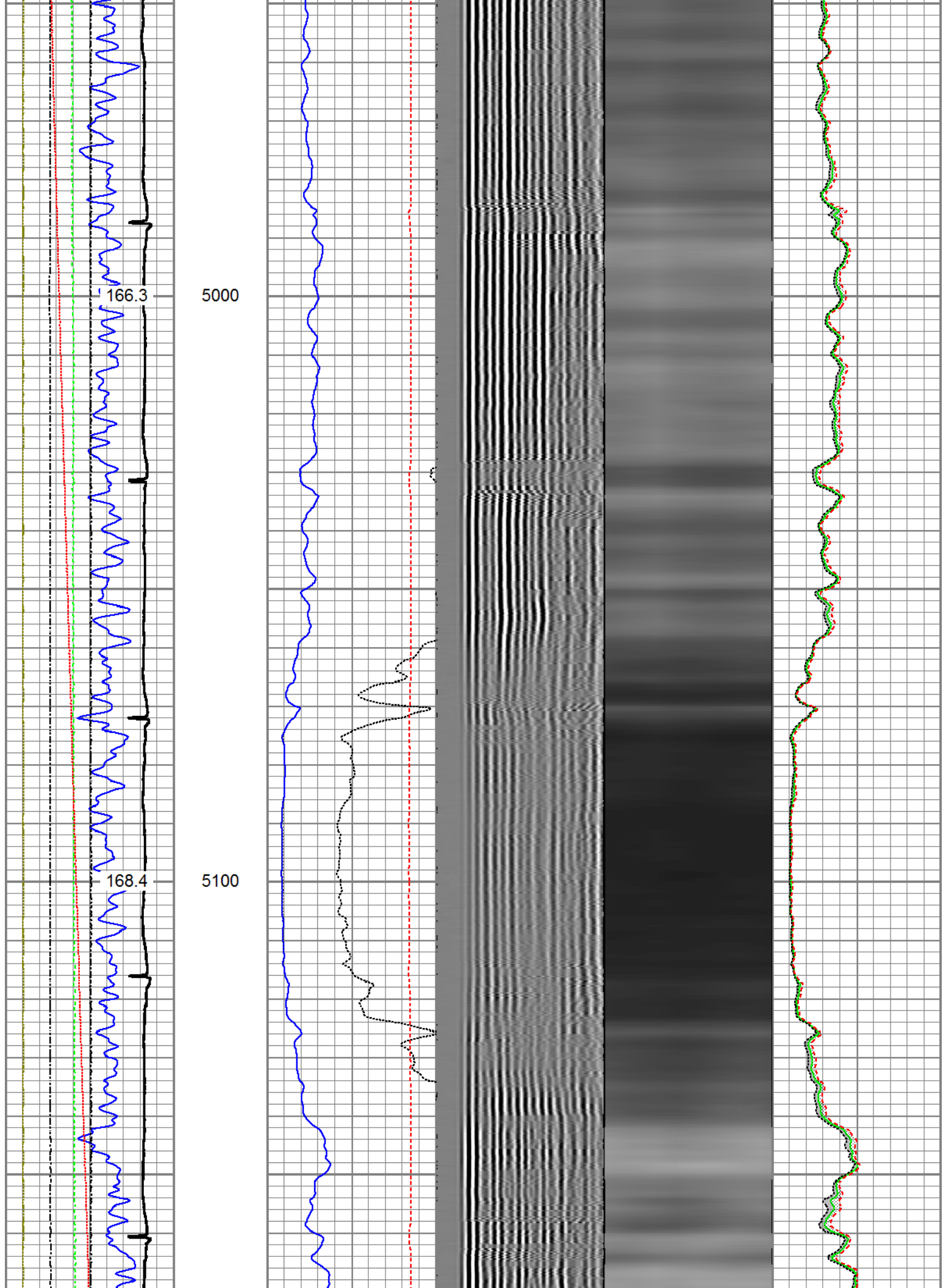


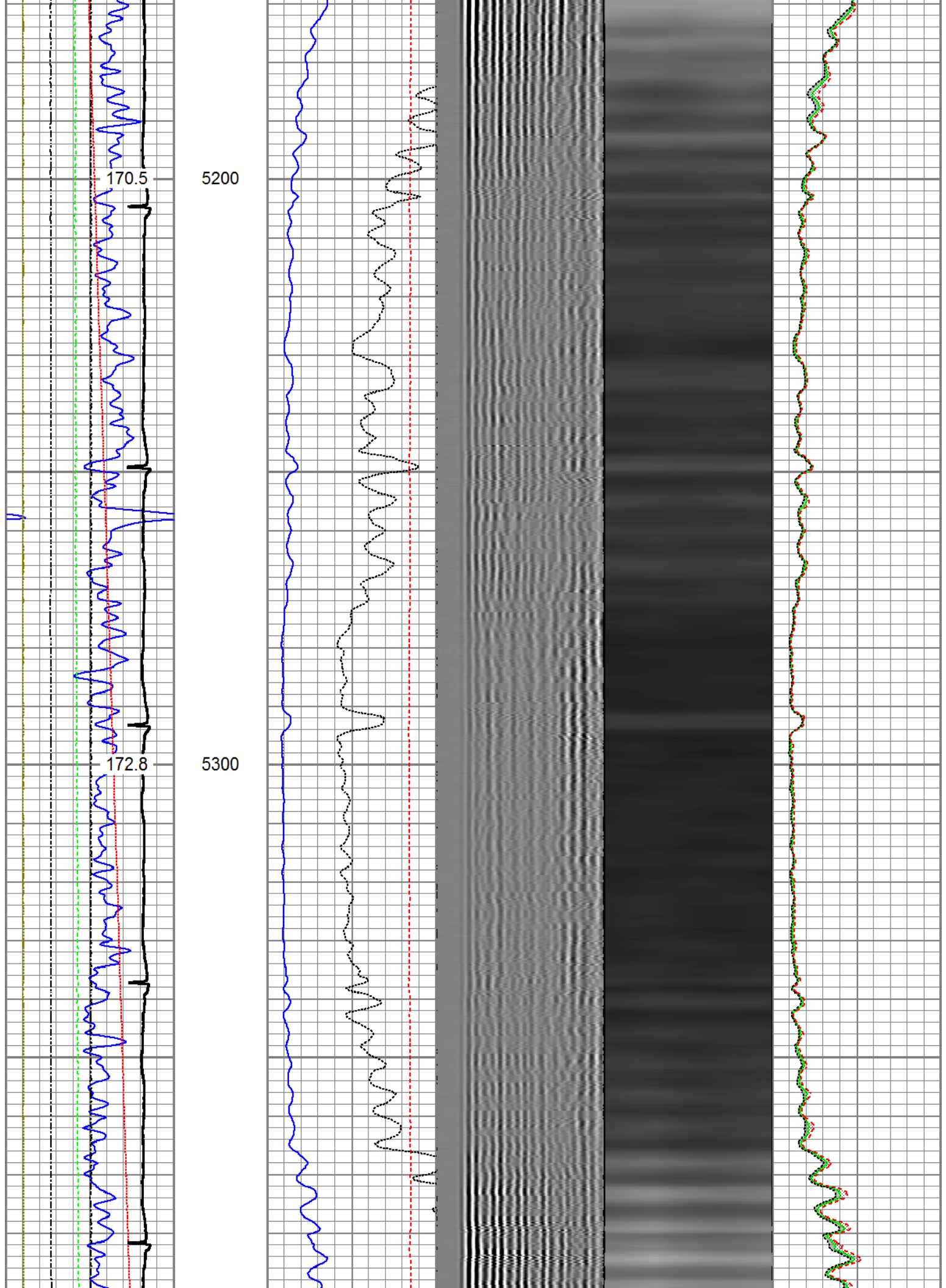


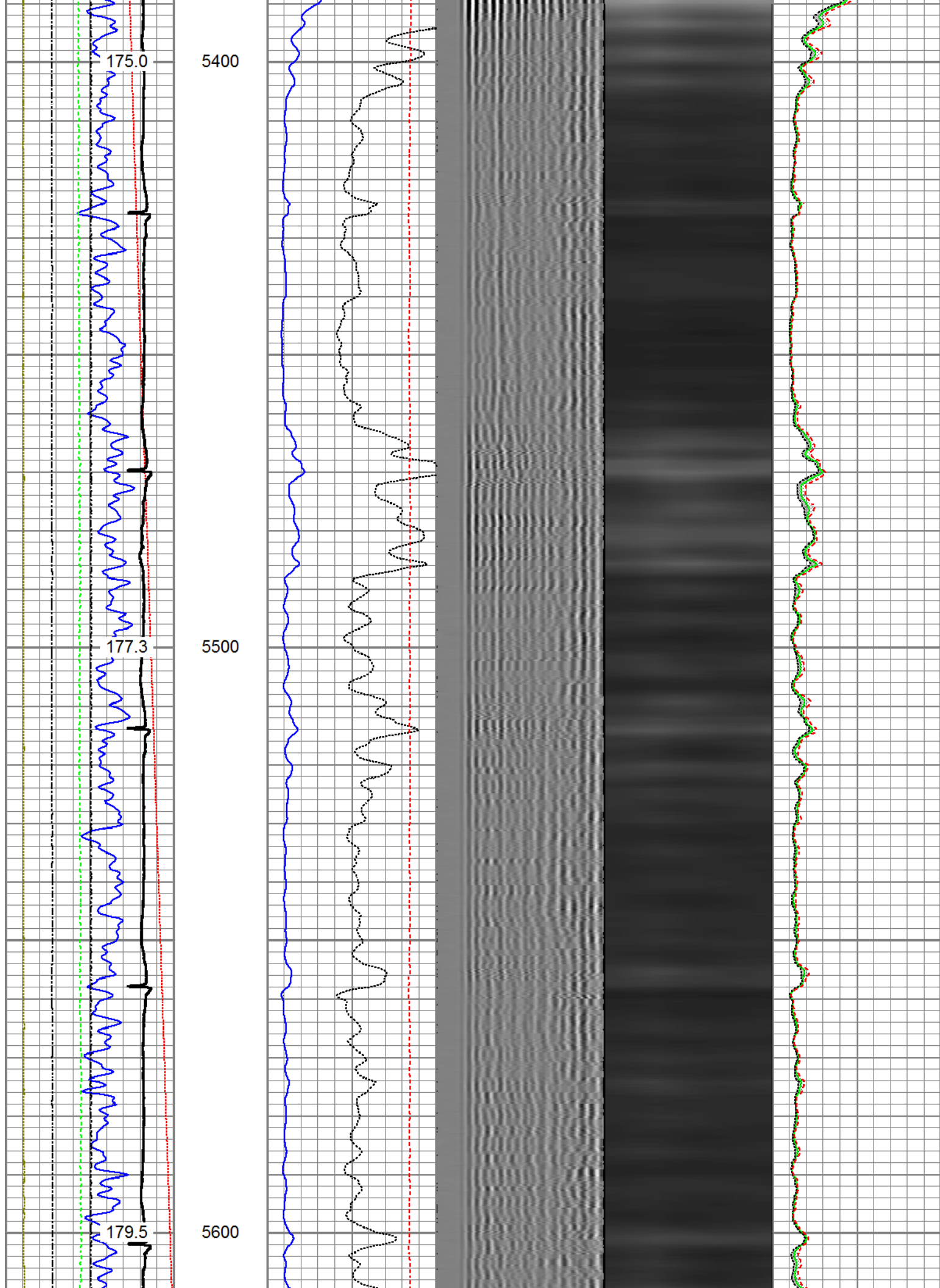


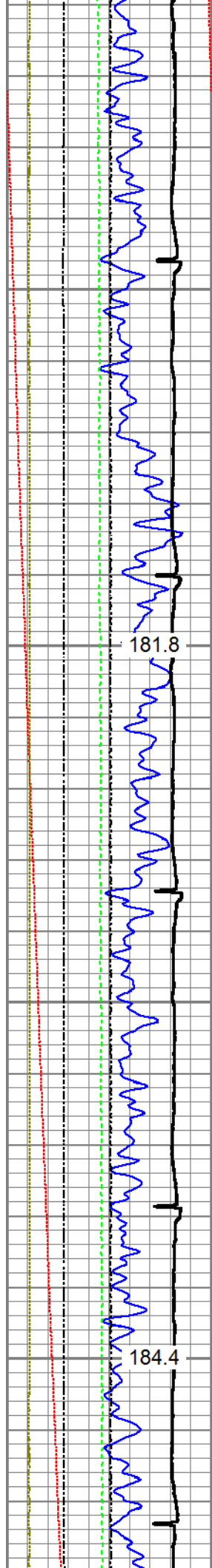




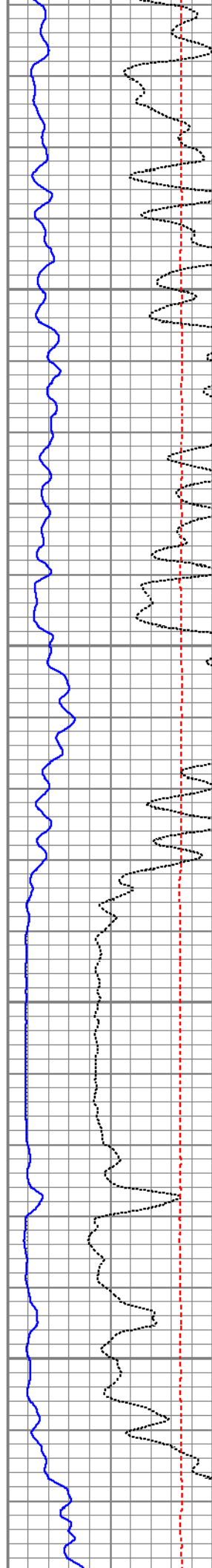




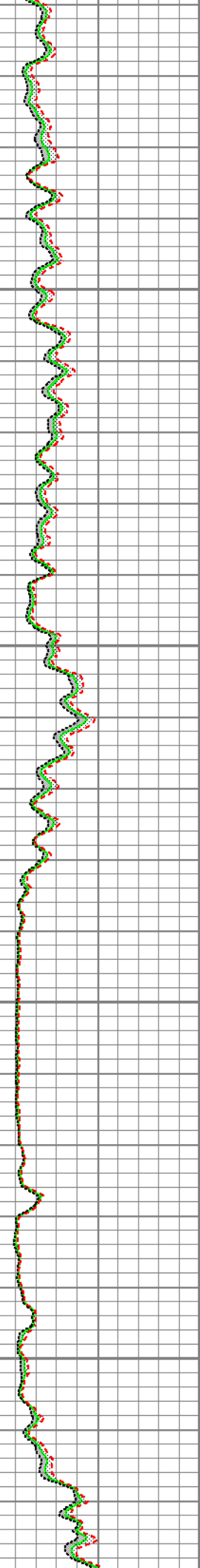
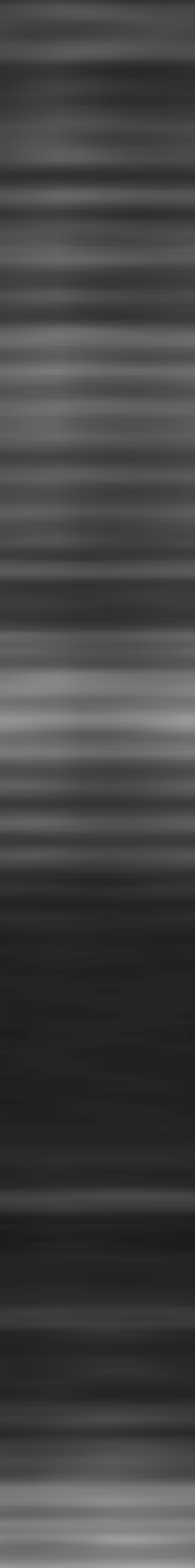
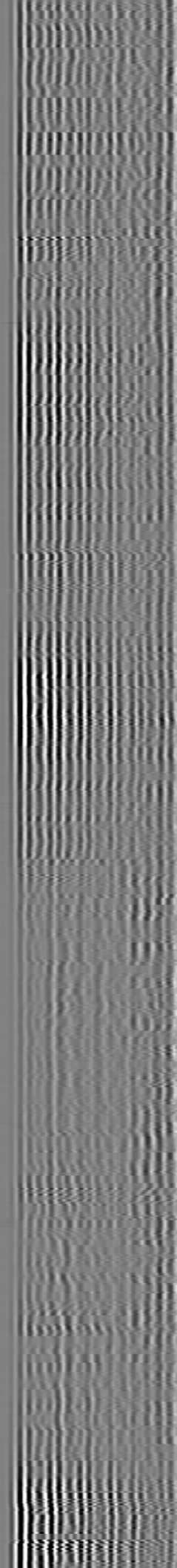




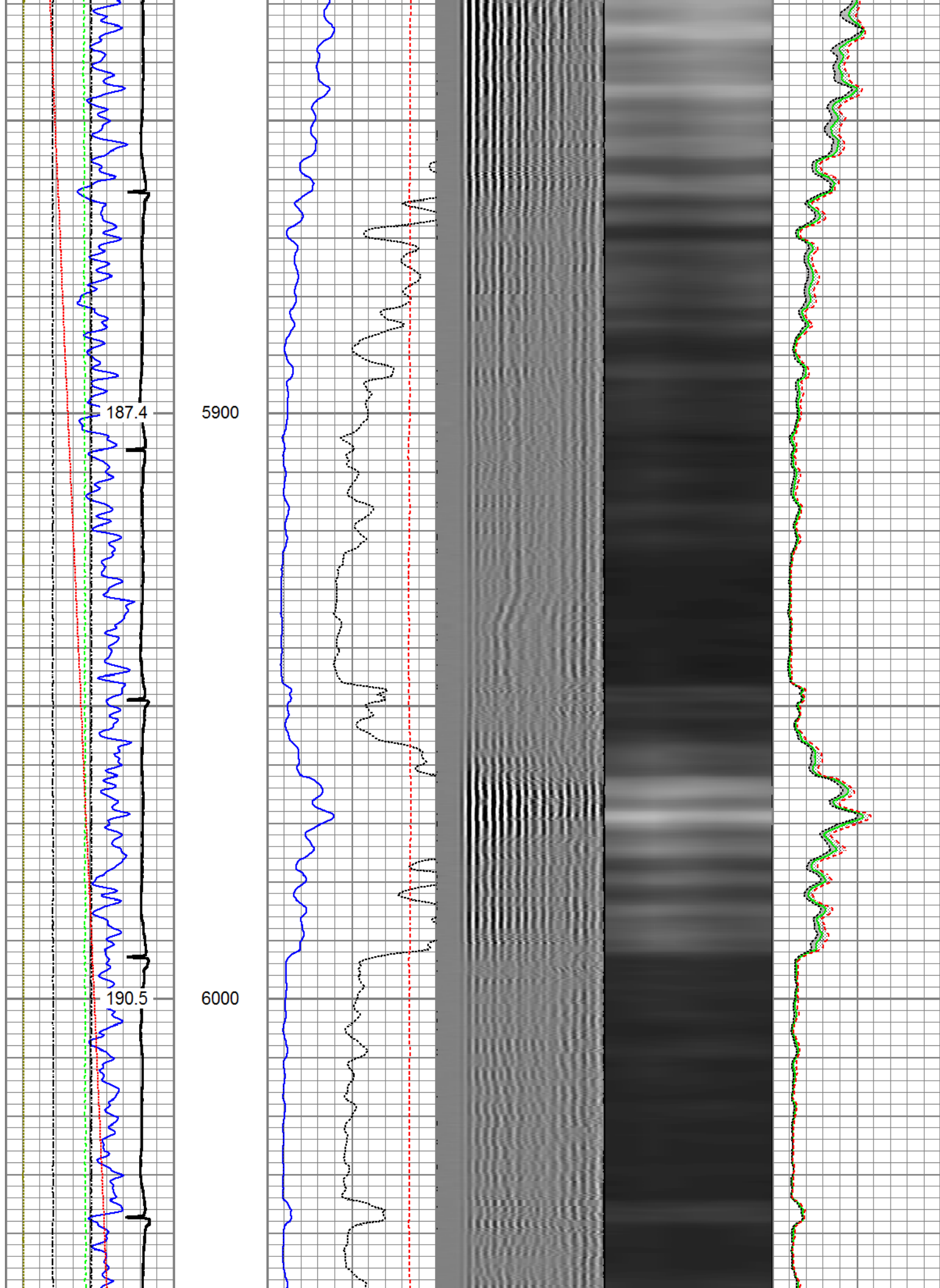
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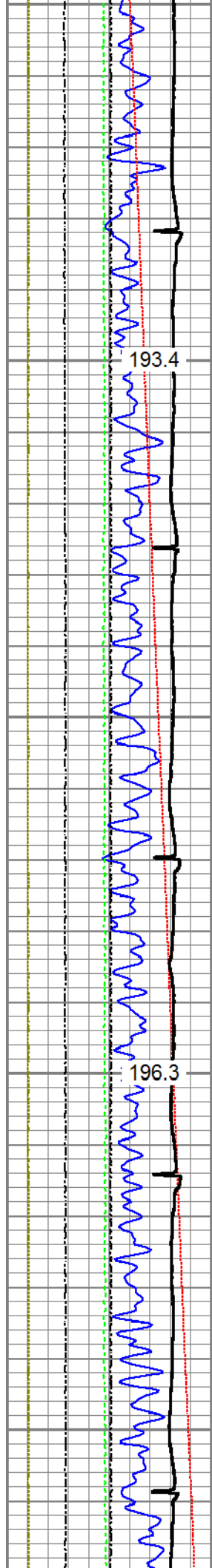


5800







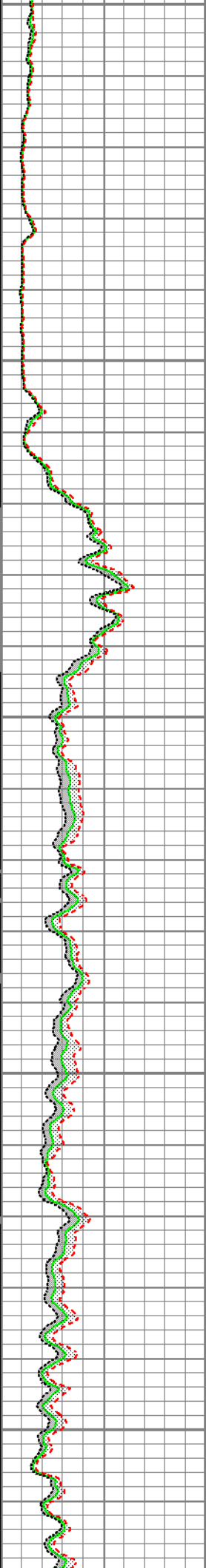
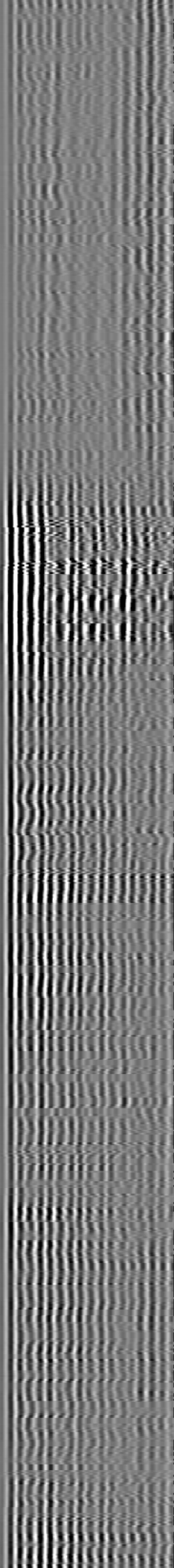
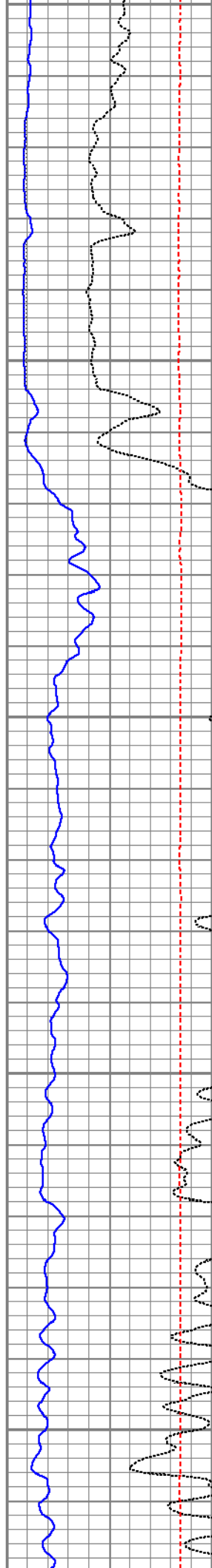


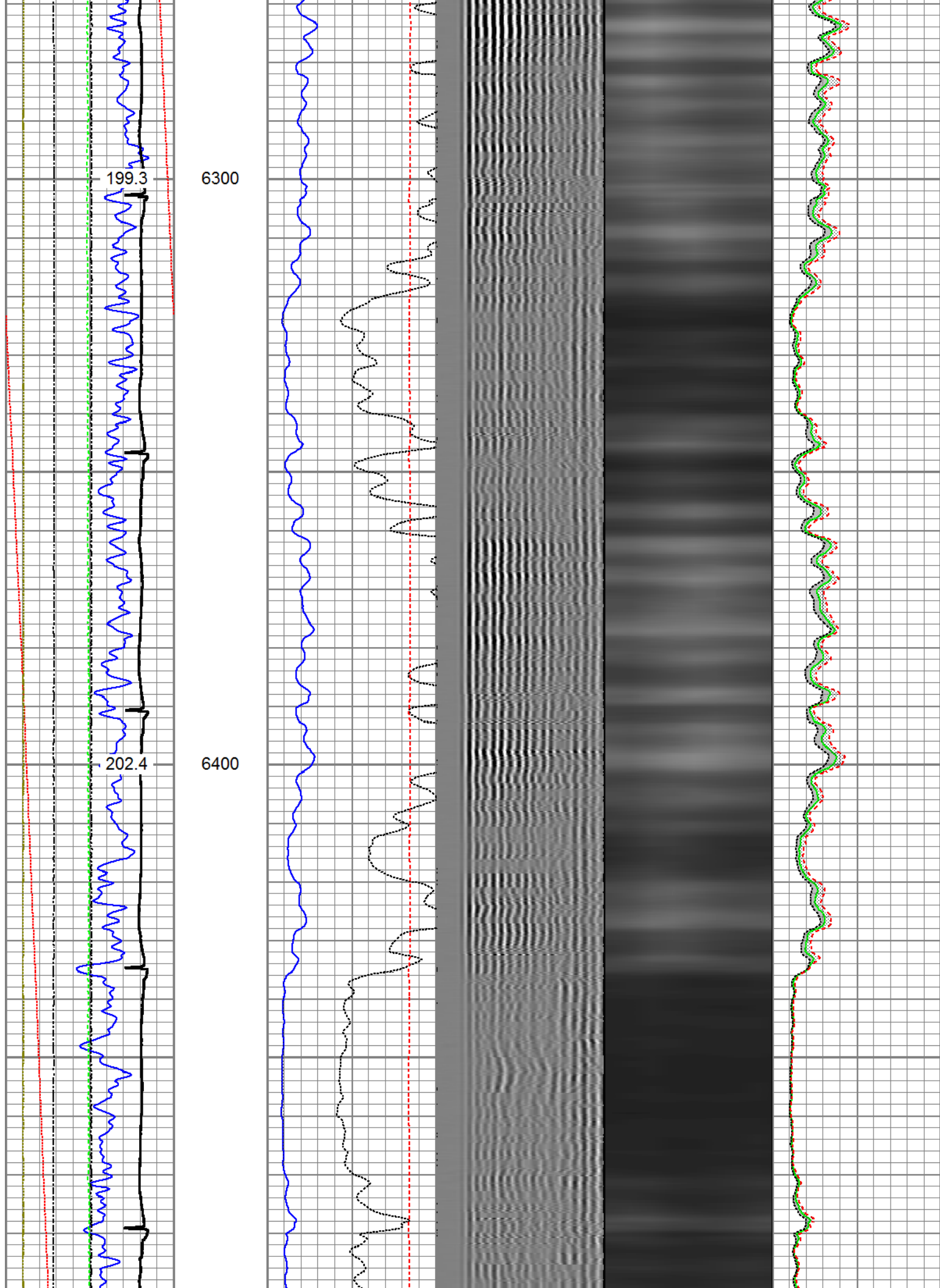
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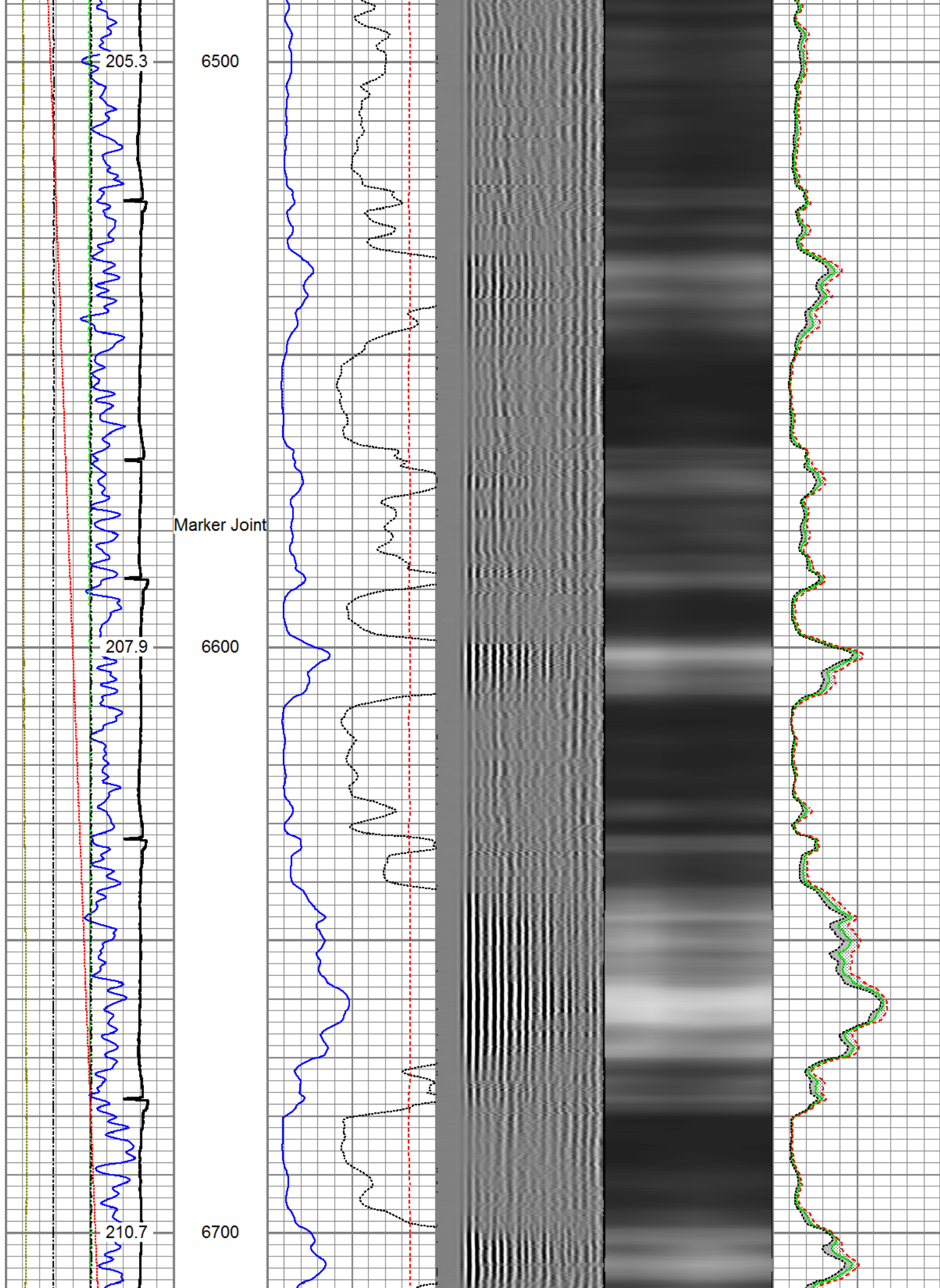
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196.3

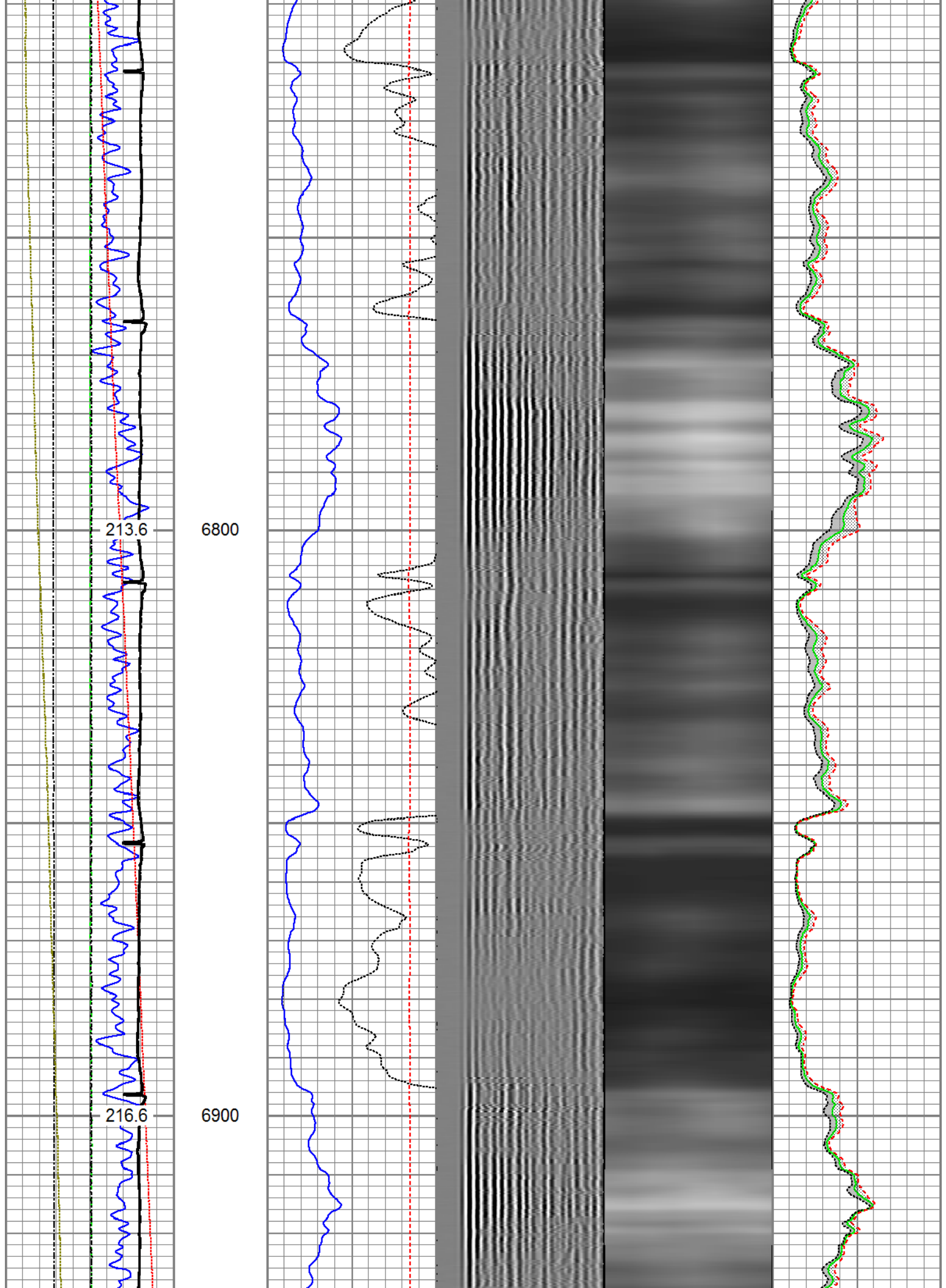
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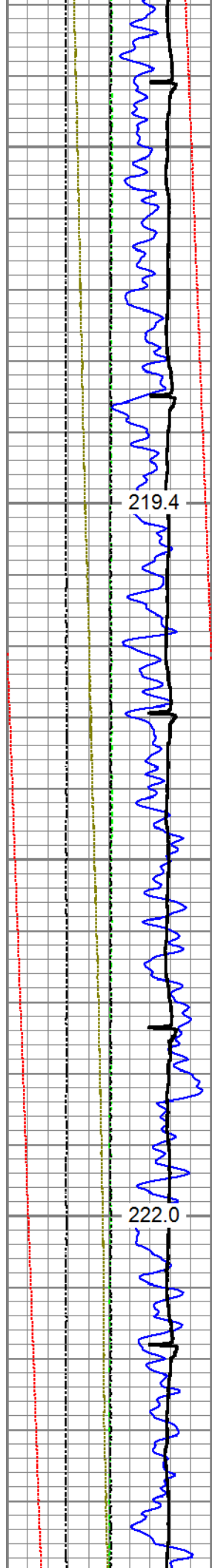










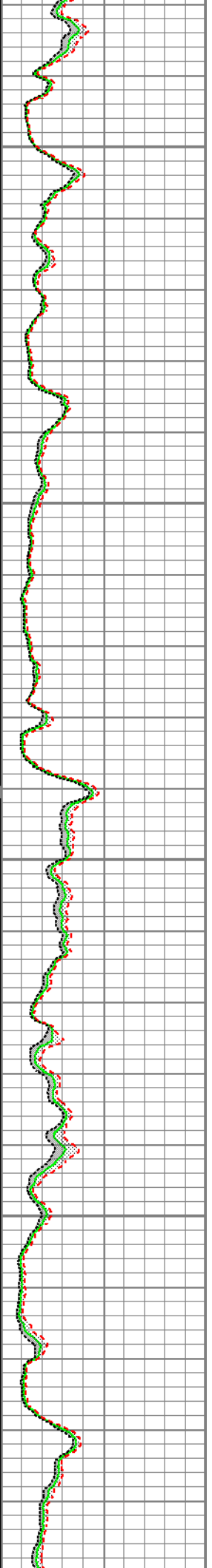
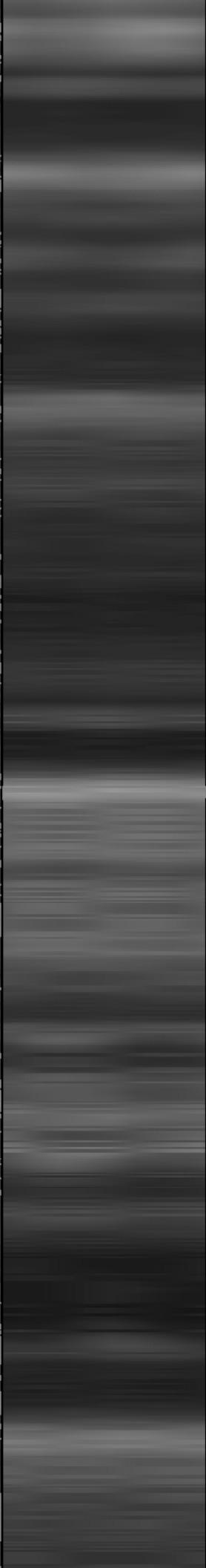
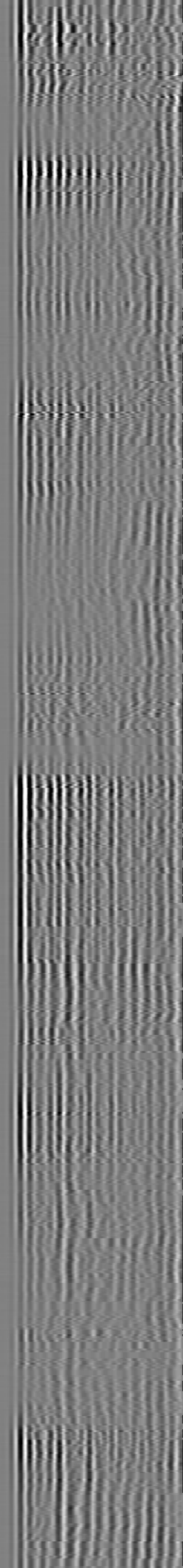
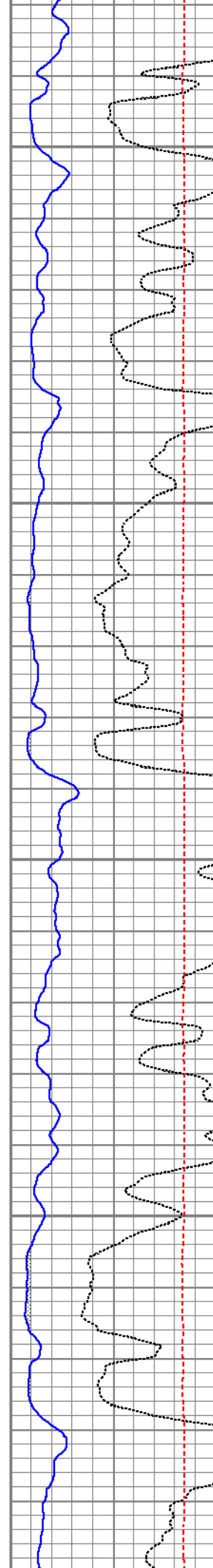


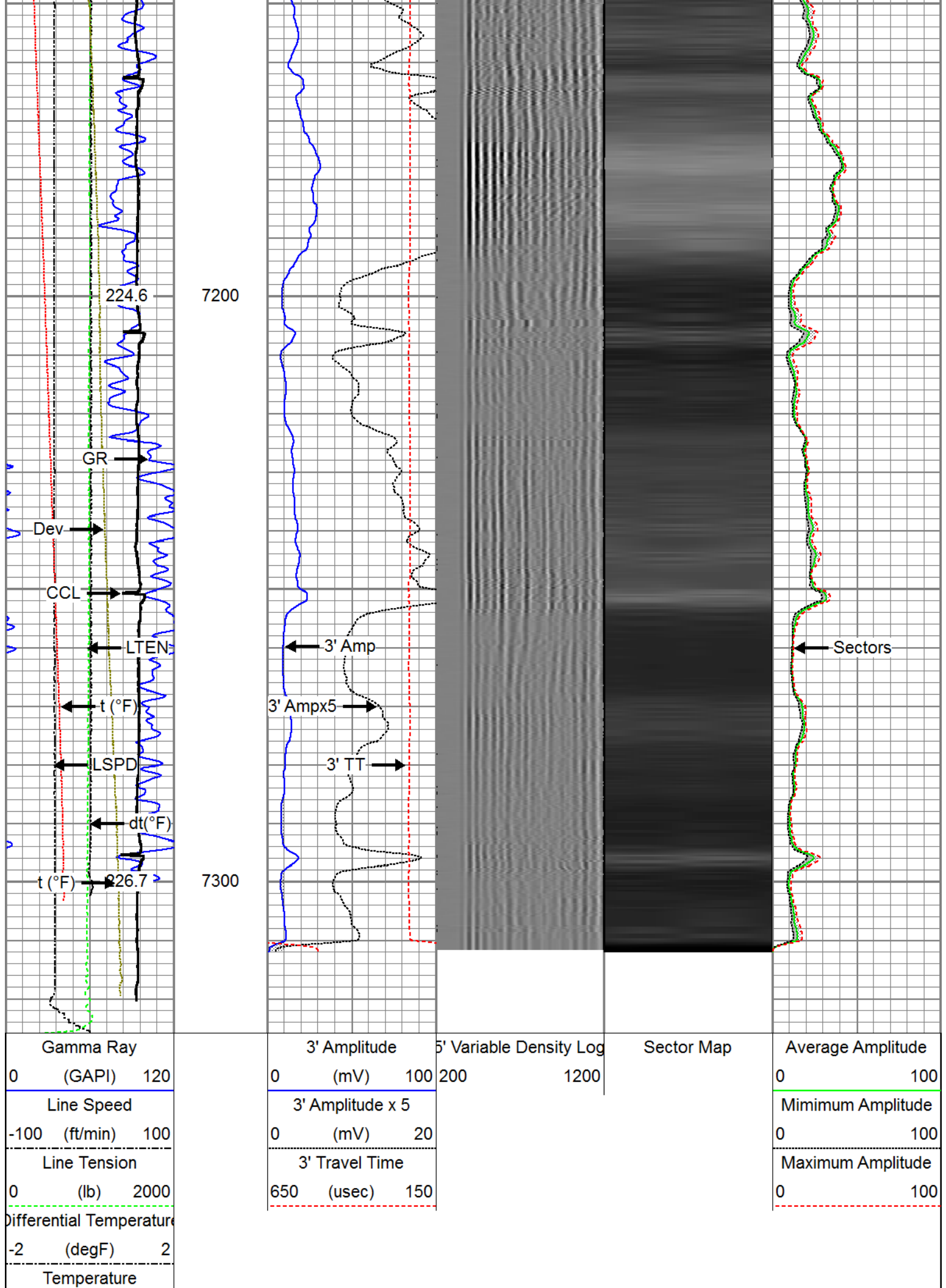
219.4

222.0

7000

7100





0	(degF)	20
Casing Collar Locator		
Deviation		
-10	(deg)	90

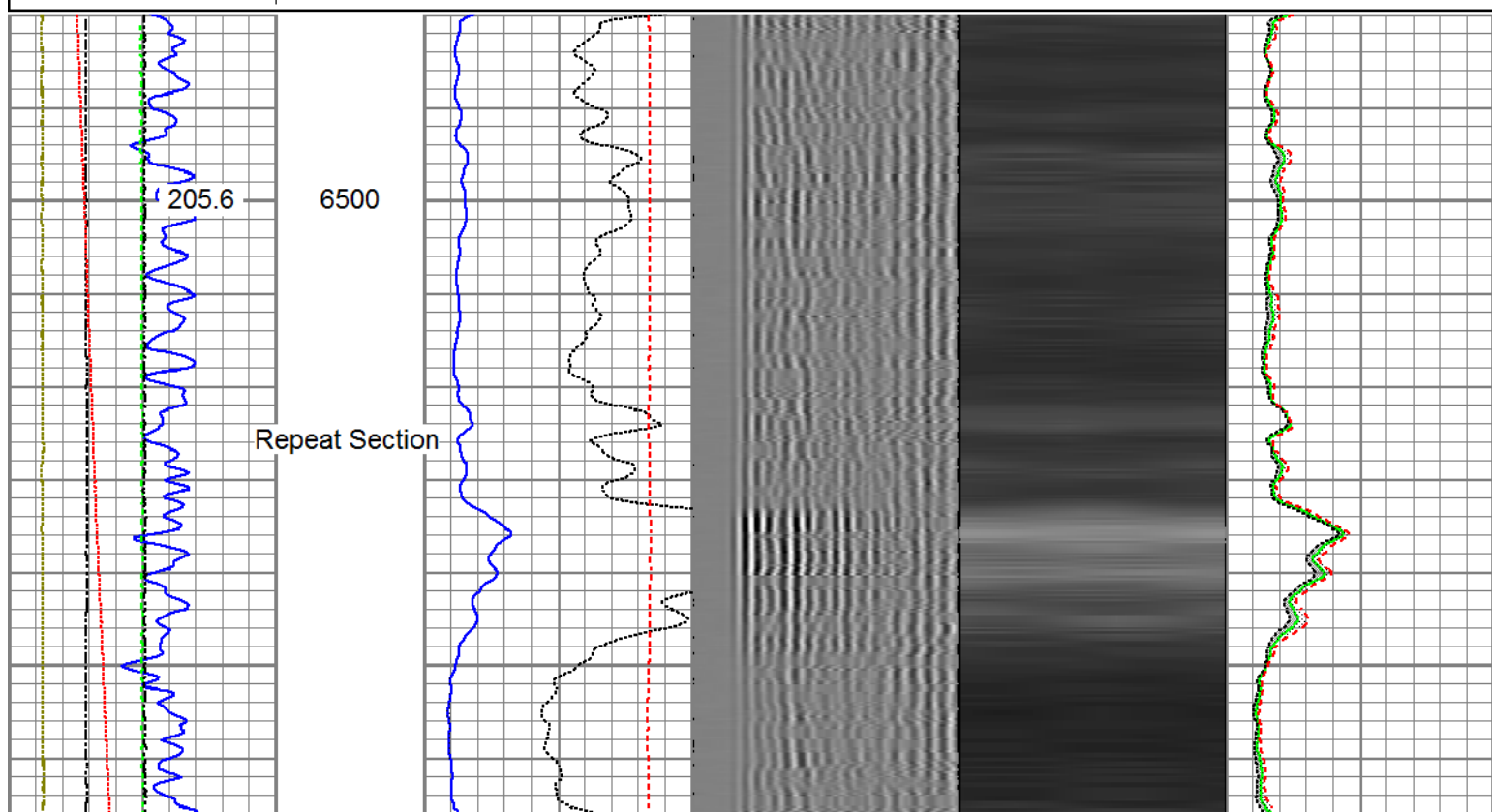


## Repeat Pass

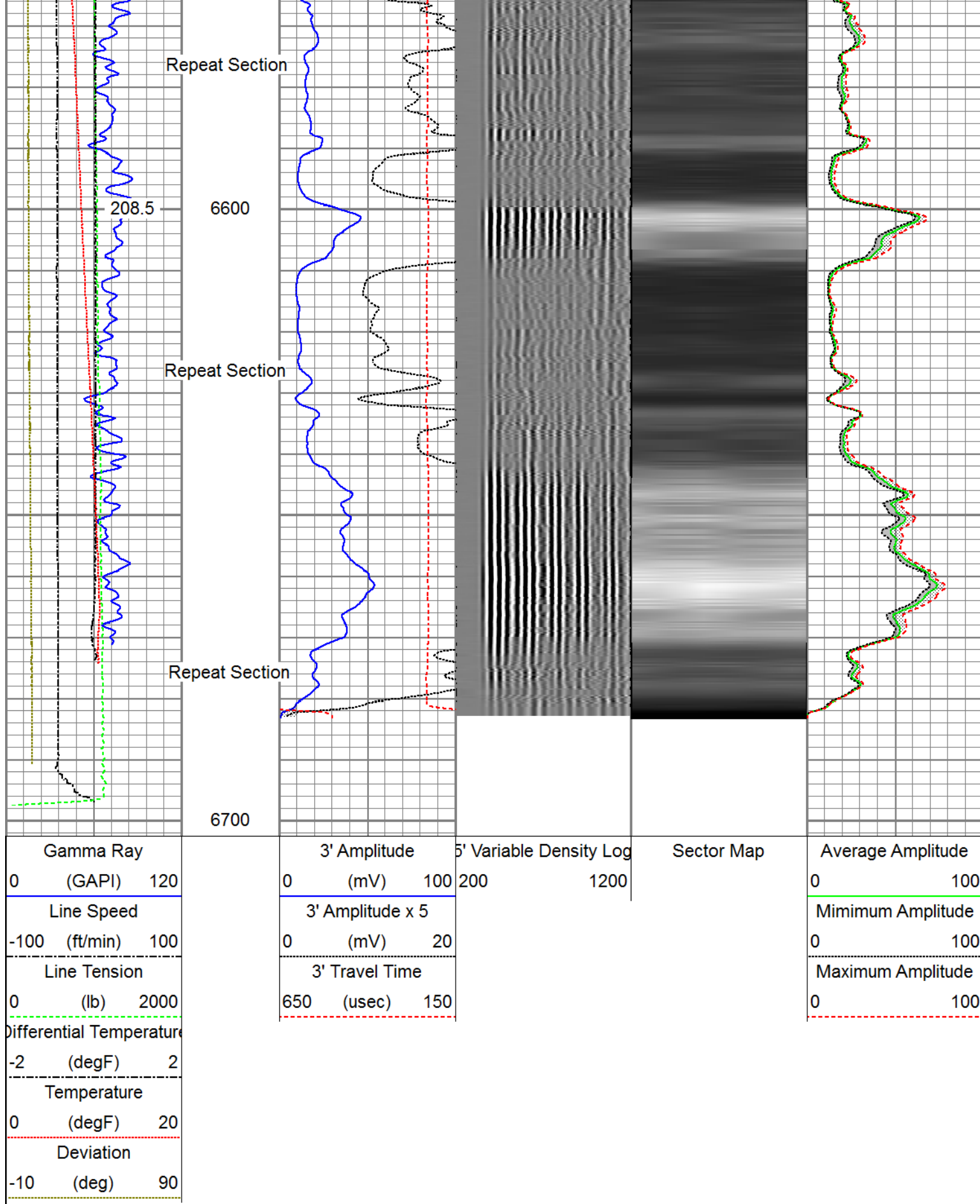
Recorded With 2800 PSI Surface Induced Pressure


Database File anadarko\_hopper state 24n-34slhz\_18-apr-17\_rbl\_mit\0512343024\_anadarko\_hopper state 24n-34s  
Dataset Pathname pass1.4  
Presentation Format ros\_rbt\_mit\_sx  
Dataset Creation Tue Apr 18 09:07:19 2017  
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				
Temperature				
0 (degF) 20				
Deviation				
-10 (deg) 90				







Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			Titan_Electric_Cable_Heads-Titan_1-11/16" Electric Cable Head with 1" Fishing Neck	16" 1.03	1.69	5.40
			UW_AGS-UW_AGS_001 (219135)	0.21	1.69	1.00

				Sondex Adapter - GO Box to Sondex Pin			
				UW_XTU-UW_XTU_002 (219135) Crossover Ultrawire Toolbus to Ultralink	1.58	1.69	6.50
GR	23.58			UW_PGR-UW_PGR_020 (10013899) Production Gamma Ray	1.92	1.69	9.50
TEMP	22.18			UW_PRT-PRT_016 (10025097) Platinum Resistance Thermometer	1.04	1.69	5.20
				UW_PRC-DSS_RAC 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00
CBLROT	15.15			UW_RBT-UW_RBT_004 (1066) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.48	3.13	140.00
WVFS8	15.15						
WVFS7	15.15						
WVFS6	15.15						
WVFS5	15.15						
WVFS4	15.15						
WVFS3	15.15						
WVFS2	15.15						
WVFS1	15.15						
WVF3FT	15.15						
WVF5FT	14.15						
CBLTEMP	10.02			UW_PRC-DSS_RAC 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00
MIT	5.27			UW_MIT-UW_MIT40_042 (10012912) 40 Multifinger Imaging Tool Ext.	4.54	2.75	65.00
HVOLTX	0.00			UW_PRC-PRC_057 4 Arm 2-3/4" Production Roller Centralizer	2.71	2.75	32.00
ITEMPX	0.00						
TSTAMP	0.00			UW_BUL-UW_BUL_006 (031422) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
Dataset: 0512343024_Anadarko_Hopper State 24N-34SLHZ_18-APR-17_RBL_MIT.db: field/well/run1/pass1.8							
Total length: 27.83 ft							
Total weight: 329.80 lb							
O.D.: 3.13 in							

## Multifinger 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: Tue Apr 18 08:19:34 2017

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1059	347.0	1406	389.0	1795	403.0	2198
Finger 02:	1198	357.0	1555	387.0	1942	399.0	2341
Finger 03:	1076	361.0	1437	404.0	1841	428.0	2269
Finger 04:	1110	354.0	1464	391.0	1855	423.0	2278
Finger 05:	1117	357.0	1474	402.0	1876	415.0	2291
Finger 06:	1112	361.0	1473	394.0	1867	429.0	2296
Finger 07:	1105	362.0	1467	394.0	1861	432.0	2293
Finger 08:	1137	356.0	1493	386.0	1879	433.0	2312
Finger 09:	1119	363.0	1482	382.0	1864	429.0	2293
Finger 10:	1130	359.0	1489	386.0	1875	433.0	2308
Finger 11:	1132	358.0	1490	382.0	1872	427.0	2299
Finger 12:	1133	354.0	1487	383.0	1870	432.0	2302
Finger 13:	1146	357.0	1503	378.0	1881	421.0	2302
Finger 14:	1130	368.0	1498	389.0	1887	436.0	2323
Finger 15:	1085	366.0	1451	400.0	1851	447.0	2298
Finger 16:	1090	367.0	1457	399.0	1856	446.0	2302
Finger 17:	1006	345.0	1351	386.0	1737	444.0	2181
Finger 18:	1137	359.0	1496	384.0	1880	422.0	2302
Finger 19:	1101	363.0	1464	390.0	1854	427.0	2281
Finger 20:	1090	365.0	1455	401.0	1856	435.0	2291
Finger 21:	1091	369.0	1460	398.0	1858	415.0	2273
Finger 22:	1066	367.0	1433	405.0	1838	429.0	2267
Finger 23:	1015	366.0	1381	413.0	1794	437.0	2231
Finger 24:	1101	362.0	1463	393.0	1856	393.0	2249
Finger 25:	1036	364.0	1400	412.0	1812	425.0	2237
Finger 26:	1158	350.0	1508	383.0	1891	382.0	2273
Finger 27:	1086	362.0	1448	404.0	1852	403.0	2255
Finger 28:	1120	353.0	1473	392.0	1865	389.0	2254
Finger 29:	1052	359.0	1411	410.0	1821	408.0	2229
Finger 30:	1077	360.0	1437	403.0	1840	399.0	2239
Finger 31:	1113	358.0	1471	393.0	1864	392.0	2256
Finger 32:	1167	384.0	1551	429.0	1980	416.0	2396
Finger 33:	1163	369.0	1532	380.0	1912	363.0	2275
Finger 34:	1102	361.0	1463	408.0	1871	400.0	2271
Finger 35:	978	329.0	1307	385.0	1692	393.0	2085
Finger 36:	1074	357.0	1431	406.0	1837	405.0	2242
Finger 37:	1118	357.0	1475	398.0	1873	397.0	2270
Finger 38:	1140	353.0	1493	386.0	1879	387.0	2266
Finger 39:	1152	349.0	1501	386.0	1887	390.0	2277

Finger 40:	1105	358.0	1463	400.0	1863	409.0	2272	
<div>Post Survey Calibration Check</div> <div>Performed: Tue Apr 18 12:16:08 2017</div>								
Ring size: (in)	4	Nom. wear	5	Nom. wear	6	Nom. wear	7	Nom. wear
Finger 01:	4.011	0.005	5.005	0.003	6.005	0.002	6.889	-0.056
Finger 02:	3.997	-0.002	4.997	-0.002	5.998	-0.001	6.889	-0.056
Finger 03:	4.003	0.002	4.998	-0.001	5.999	-0.001	6.882	-0.059
Finger 04:	4.001	0.001	5.003	0.001	6.001	0.000	6.892	-0.054
Finger 05:	4.002	0.001	5.027	0.013	5.978	-0.011	6.905	-0.047
Finger 06:	4.008	0.004	5.004	0.002	5.999	-0.000	6.885	-0.057
Finger 07:	3.995	-0.003	4.996	-0.002	6.001	0.000	6.884	-0.058
Finger 08:	4.000	0.000	4.997	-0.001	6.000	0.000	6.885	-0.057
Finger 09:	4.000	0.000	4.988	-0.006	5.998	-0.001	6.889	-0.056
Finger 10:	3.993	-0.003	4.997	-0.002	6.001	0.000	6.885	-0.058
Finger 11:	3.997	-0.001	4.995	-0.003	5.999	-0.000	6.891	-0.055
Finger 12:	3.998	-0.001	5.000	-0.000	6.000	0.000	6.890	-0.055
Finger 13:	4.001	0.001	4.991	-0.005	6.049	0.024	6.886	-0.057
Finger 14:	4.007	0.003	5.001	0.000	5.998	-0.001	6.887	-0.056
Finger 15:	4.000	0.000	4.997	-0.002	5.997	-0.001	6.891	-0.055
Finger 16:	4.013	0.006	5.024	0.012	5.996	-0.002	6.902	-0.049
Finger 17:	3.996	-0.002	4.992	-0.004	6.006	0.003	6.883	-0.058
Finger 18:	4.005	0.003	5.021	0.011	6.002	0.001	6.899	-0.050
Finger 19:	4.011	0.005	4.998	-0.001	5.993	-0.004	6.882	-0.059
Finger 20:	4.007	0.004	4.999	-0.001	5.998	-0.001	6.885	-0.057
Finger 21:	4.007	0.003	4.995	-0.002	5.999	-0.001	6.885	-0.057
Finger 22:	4.000	0.000	4.999	-0.000	5.996	-0.002	6.884	-0.058
Finger 23:	4.005	0.002	5.002	0.001	6.000	-0.000	6.890	-0.055
Finger 24:	3.999	-0.001	4.995	-0.002	5.990	-0.005	6.883	-0.058
Finger 25:	3.995	-0.002	4.996	-0.002	5.997	-0.002	6.884	-0.058
Finger 26:	3.992	-0.004	5.001	0.001	5.998	-0.001	6.891	-0.055
Finger 27:	4.005	0.003	5.004	0.002	6.003	0.001	6.889	-0.055
Finger 28:	3.992	-0.004	5.000	0.000	5.995	-0.002	6.891	-0.055
Finger 29:	4.000	0.000	5.003	0.001	6.006	0.003	6.893	-0.053
Finger 30:	4.001	0.001	4.997	-0.001	5.996	-0.002	6.882	-0.059
Finger 31:	4.005	0.003	5.015	0.007	6.033	0.017	6.903	-0.049
Finger 32:	4.003	0.001	5.002	0.001	6.000	-0.000	6.887	-0.057
Finger 33:	4.012	0.006	4.980	-0.010	5.992	-0.004	6.889	-0.056
Finger 34:	4.002	0.001	5.001	0.000	6.000	-0.000	6.887	-0.057
Finger 35:	3.999	-0.000	5.004	0.002	6.007	0.003	6.889	-0.056
Finger 36:	4.002	0.001	5.003	0.001	6.005	0.003	6.895	-0.052
Finger 37:	4.004	0.002	5.005	0.002	6.002	0.001	6.889	-0.055
Finger 38:	3.995	-0.002	4.989	-0.005	5.999	-0.000	6.882	-0.059
Finger 39:	4.004	0.002	4.999	-0.000	5.997	-0.002	6.882	-0.059
Finger 40:	4.007	0.003	5.004	0.002	6.001	0.001	6.887	-0.056
Average:	4.002	0.001	5.001	0.000	6.001	0.000	6.889	-0.056

Segmented Cement Bond Log Calibration Report								
			Serial Number:		1066			
			Tool Model:		UW_RBT_004			
			Calibration Casing Diameter:		5.500	in		
			Calibration Depth:		0.000	ft		

Master Calibration, performed (Derived):							
		Raw (v)		Calibrated (mv)		Results	
		Zero	Cal	Zero	Cal	Gain	Offset
3FT		-0.002	0.911	0.800	71.921	77.935	0.918



5FT	-0.008	0.933	0.800	71.921	75.591	1.413
S1	-0.001	0.924	0.000	100.000	108.058	0.152
S2	-0.003	0.945	0.000	100.000	105.529	0.281
S3	-0.002	0.928	0.000	100.000	107.521	0.227
S4	-0.003	0.913	0.000	100.000	109.197	0.343
S5	-0.001	0.890	0.000	100.000	112.140	0.159
S6	-0.002	0.930	0.000	100.000	107.337	0.220
S7	-0.002	0.953	0.000	100.000	104.767	0.181
S8	-0.002	0.913	0.000	100.000	109.288	0.167

#### Temperature Calibration Report

Serial Number: 10025097  
 Tool Model: PRT\_016  
 Performed: Sun Oct 11 12:34:58 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: (Not Performed)

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: Hopper State 24N-34SLHZ  
 Field: Wattenberg  
 County: Weld  
 State: Colorado