

Radial Cement Bond Gamma Ray Casing Collar Log

Company	Noble Energy Inc.		
Well	Wells Ranch AA11-615		
Field	Wattenberg		
County	Weld		
State	Colorado		
Company	Noble Energy Inc.	Well	Wells Ranch AA11-615
Field	Wattenberg	County	Weld
State	Colorado	Location:	API #: 05-123-41249
Permanent Datum	SEC 11 TWP 6N RGE 63W	Ground Level	Elevation 4832'
Log Measured From	Kelly Bushing	Drilling Measured From	Kelly Bushing
Elevation	K.B. 4856'	D.F. 4855'	G.L. 4832'

Date	13-JUL-2015
Run Number	One
Depth Driller	13505 FT
Depth Logger	6635 FT
Bottom Logged Interval	6630 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	220°F
Estimated Cement Top	278 FT
Time Well Ready	ROA
Time Logger on Bottom	10:15
Equipment Number	HD-0340
Location	Fort Lupton, CO
Recorded By	Wayne Wacker
Witnessed By	Bill Mansfield

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	24 FT	589.2 FT		
Intermediate #1	7	26	P-110	24 FT	7023.3 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110 IC	6594.9 FT	13505 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 liner top at 6594.9 FT
 Adjusted -4 FT to correlate with liner top
 Log ran from just below 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:07-13-15_noble energy_wells ranch aa11-615_mit_rbl.db

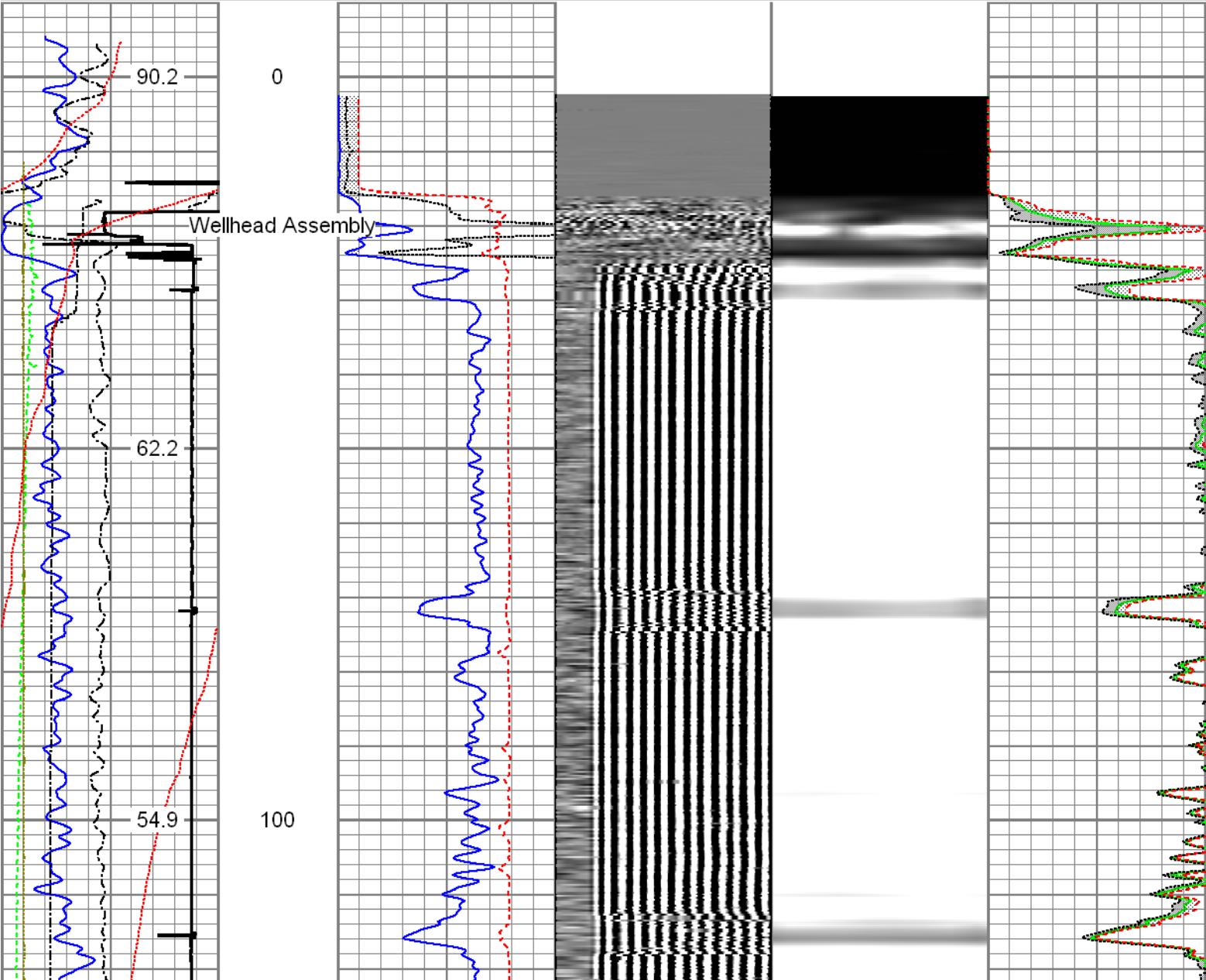
Dataset Pathname:main.1

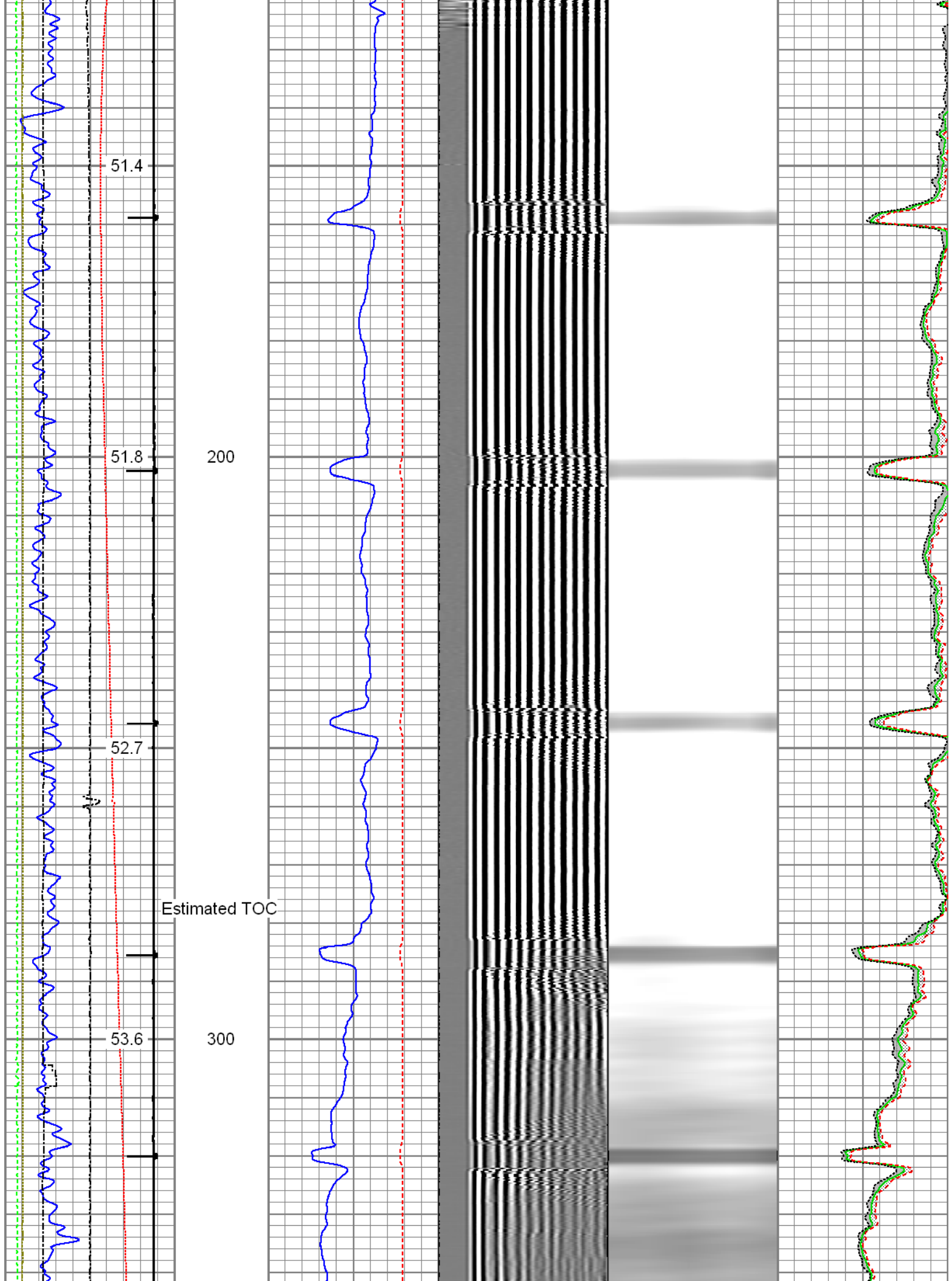
Presentation Format:rbt4_mit

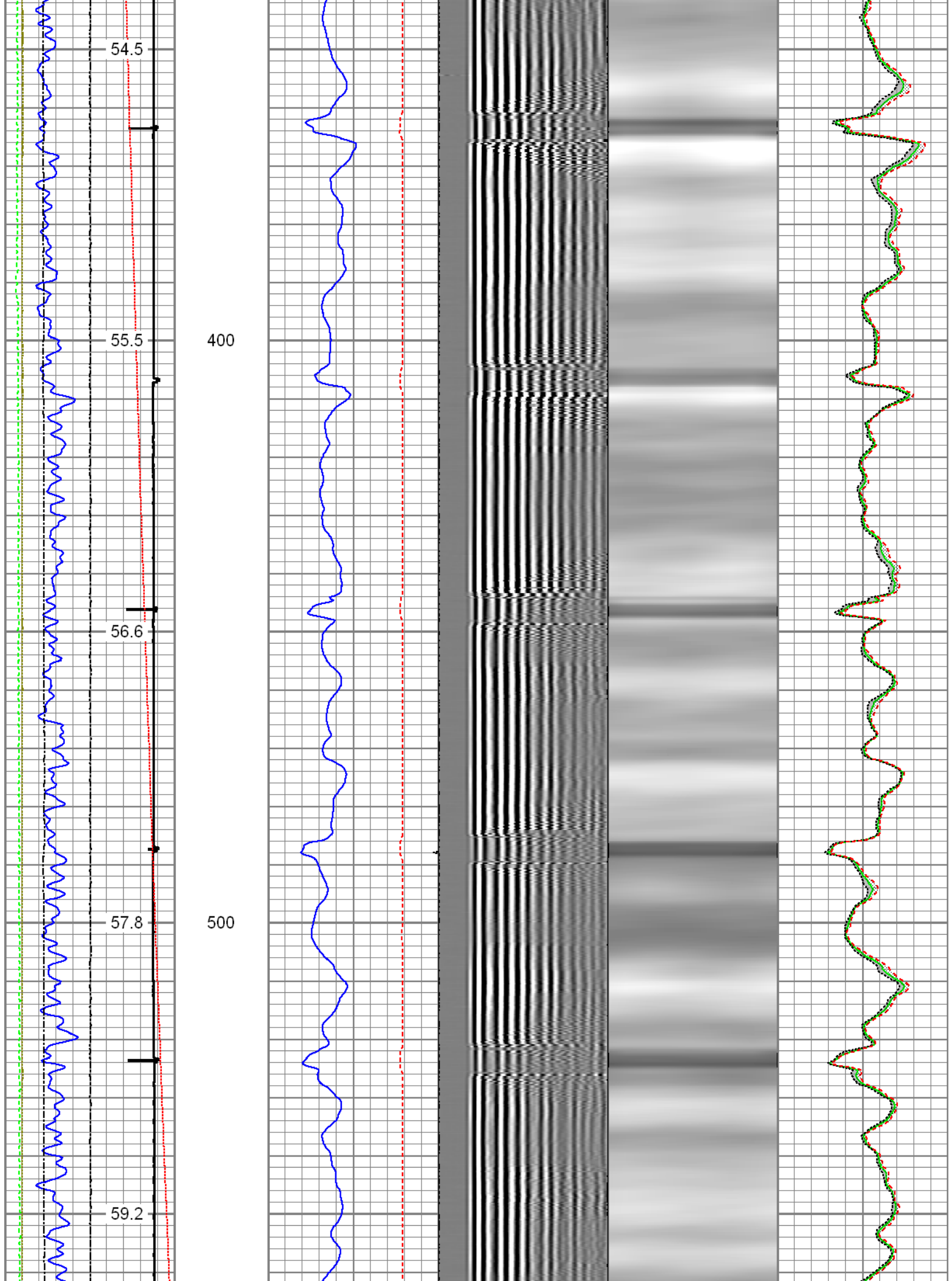
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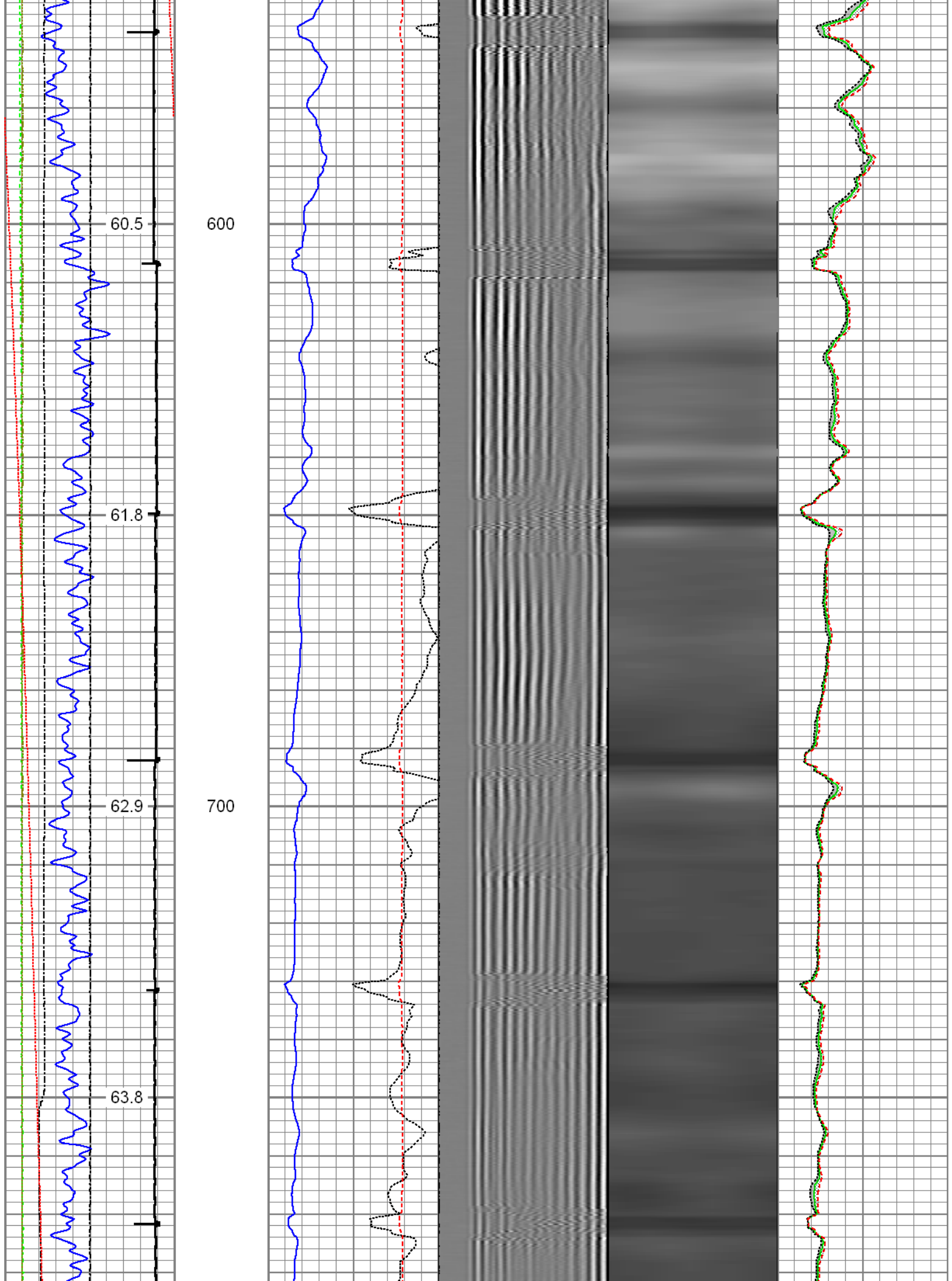
Charted by:Depth in Feet scaled 1:240

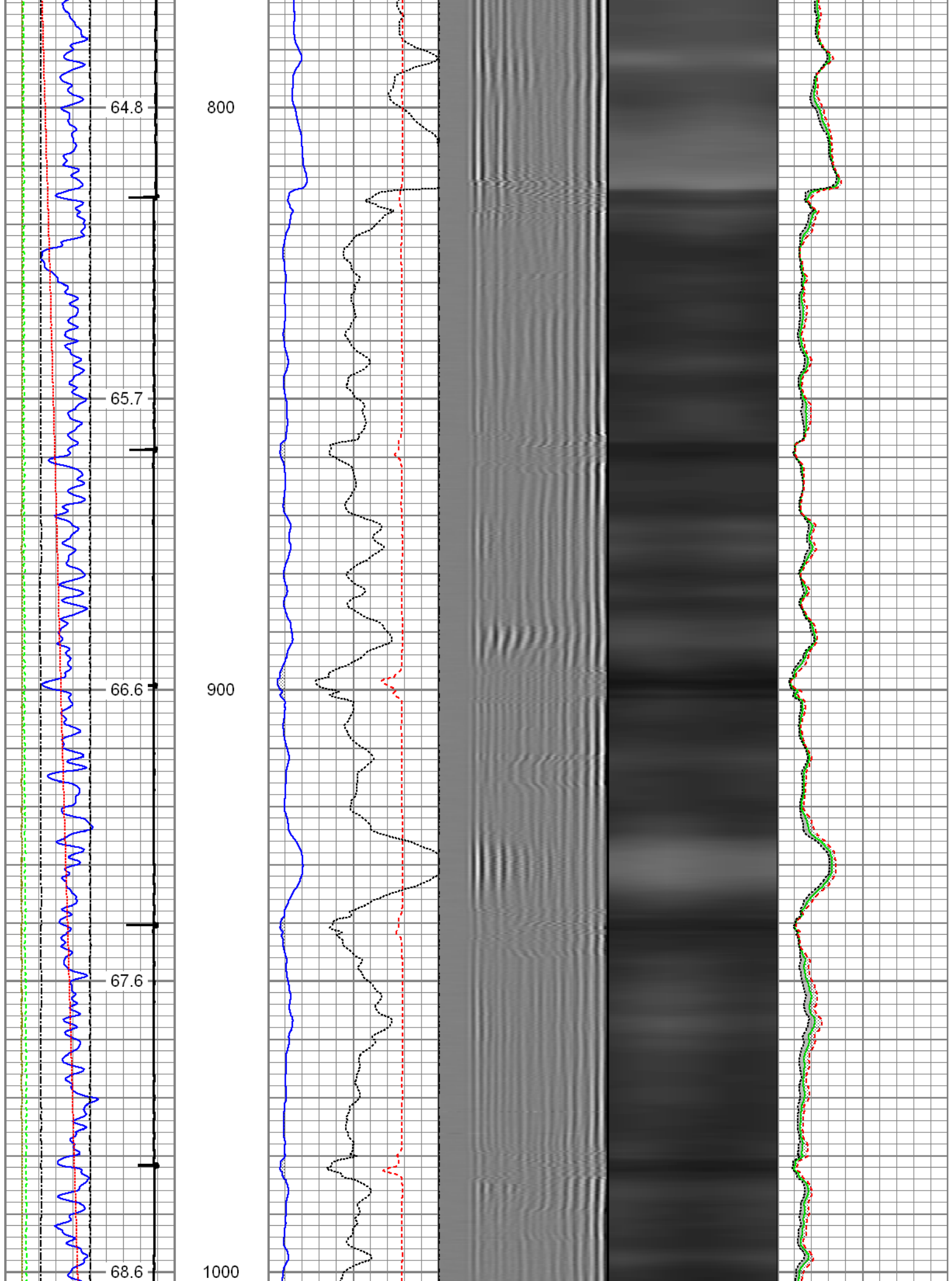
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

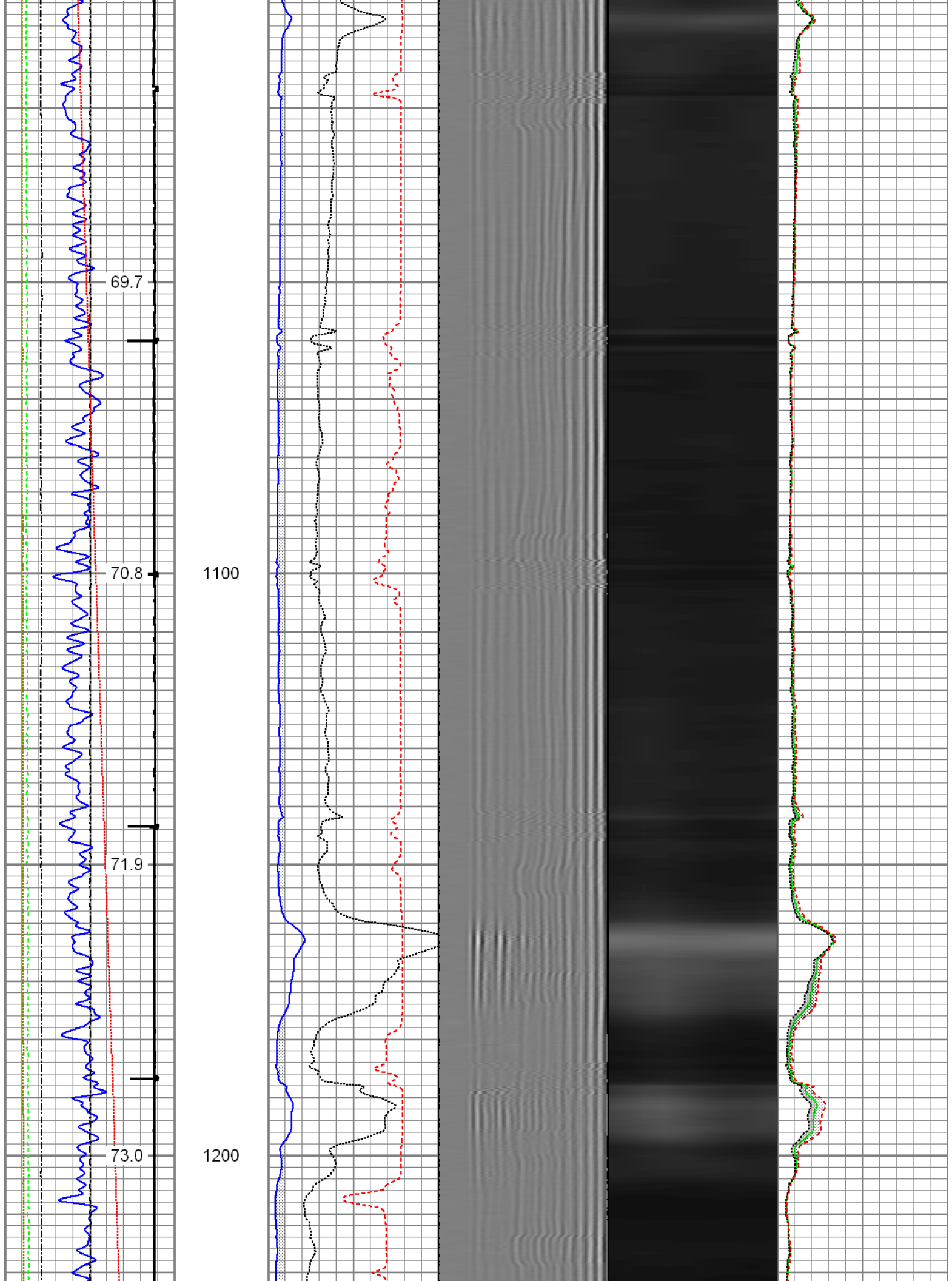


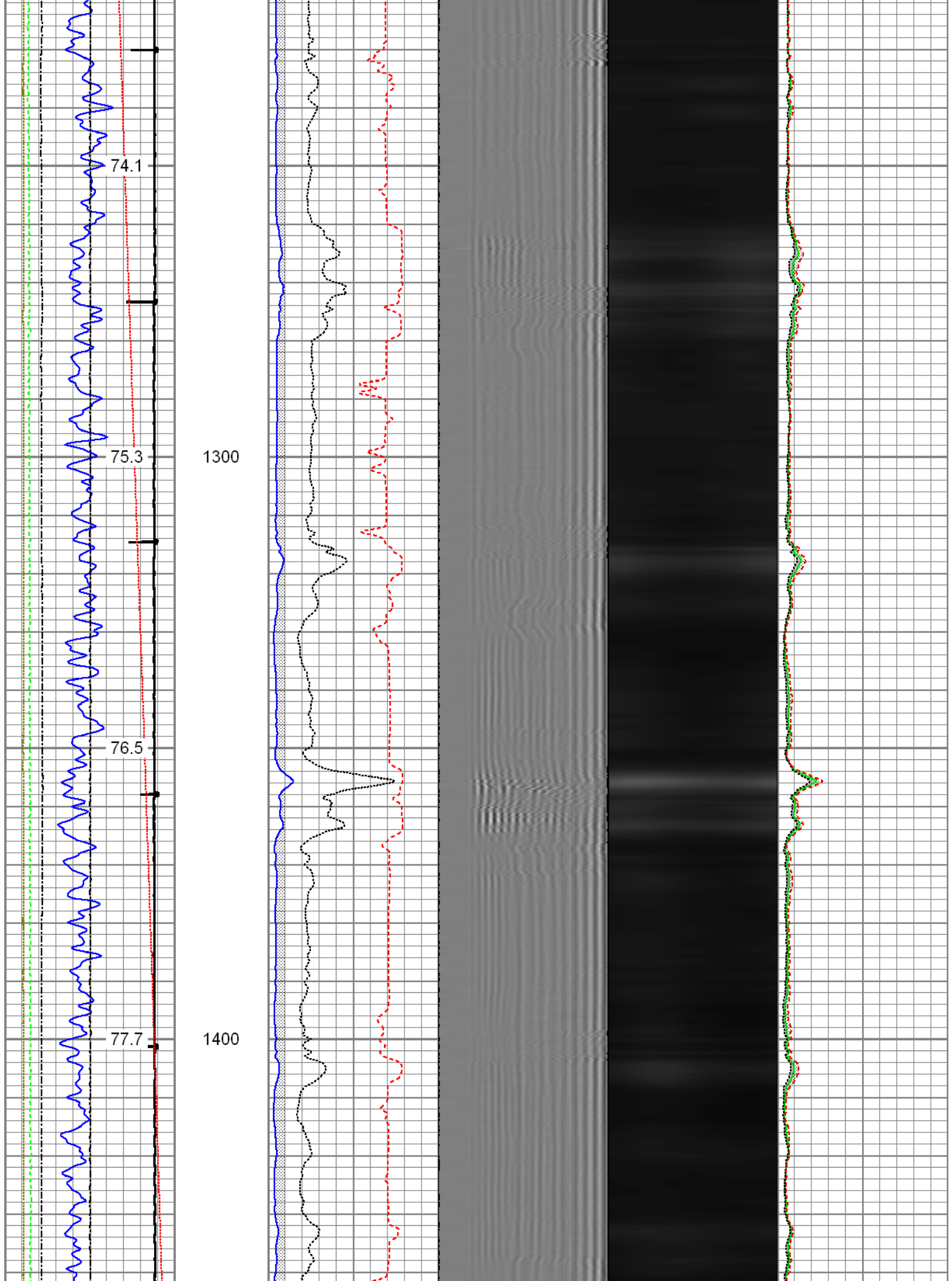


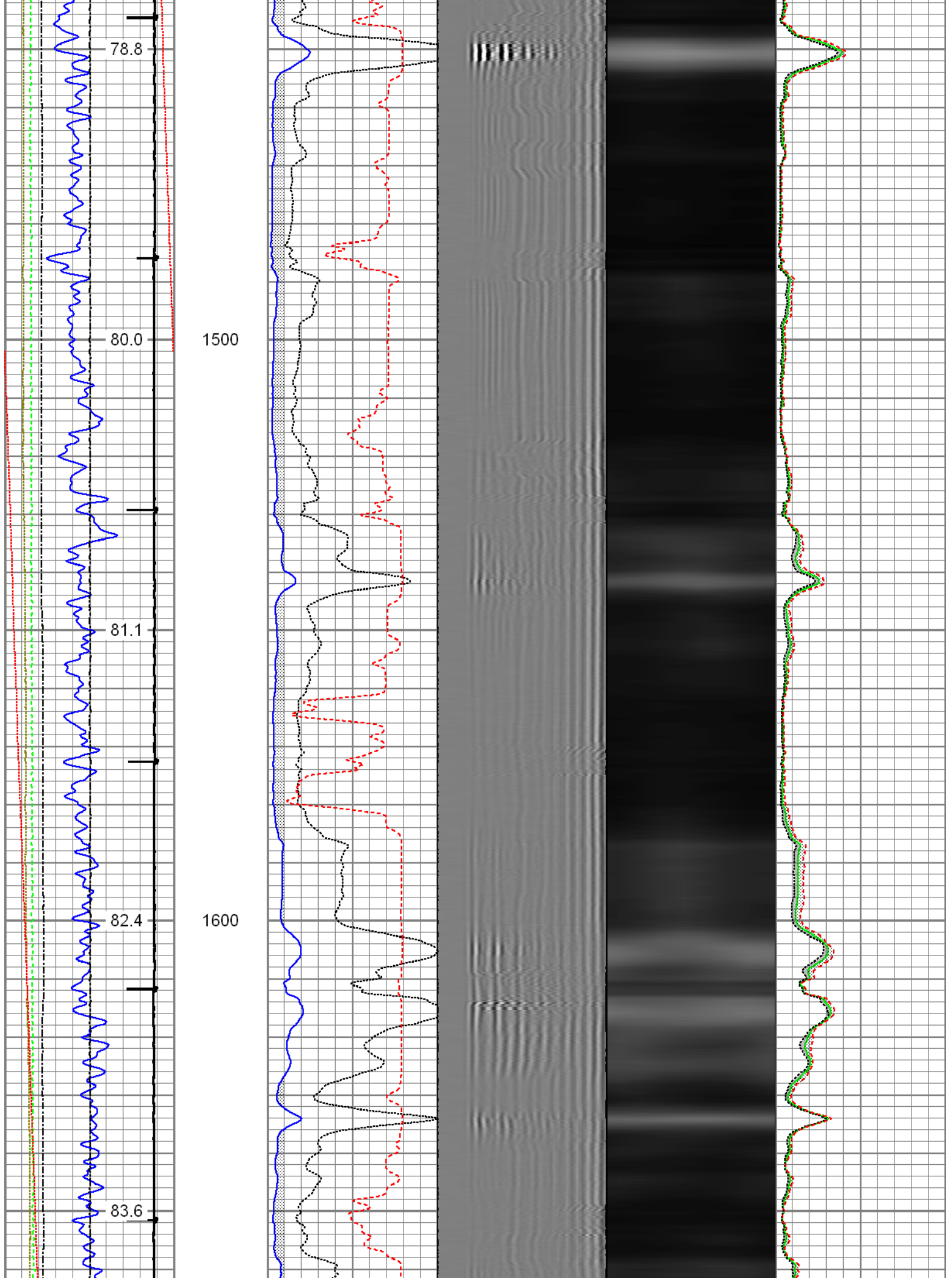


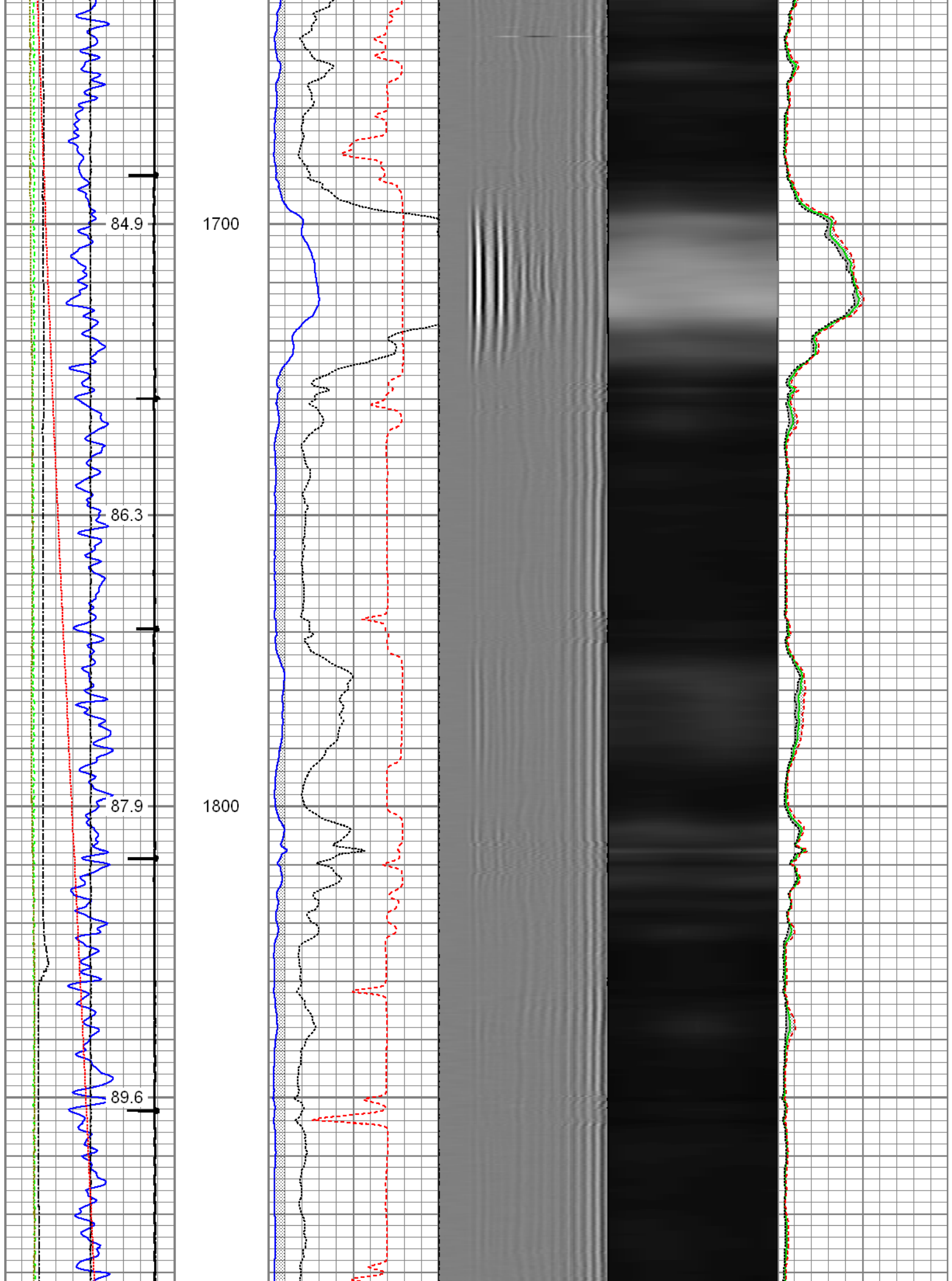


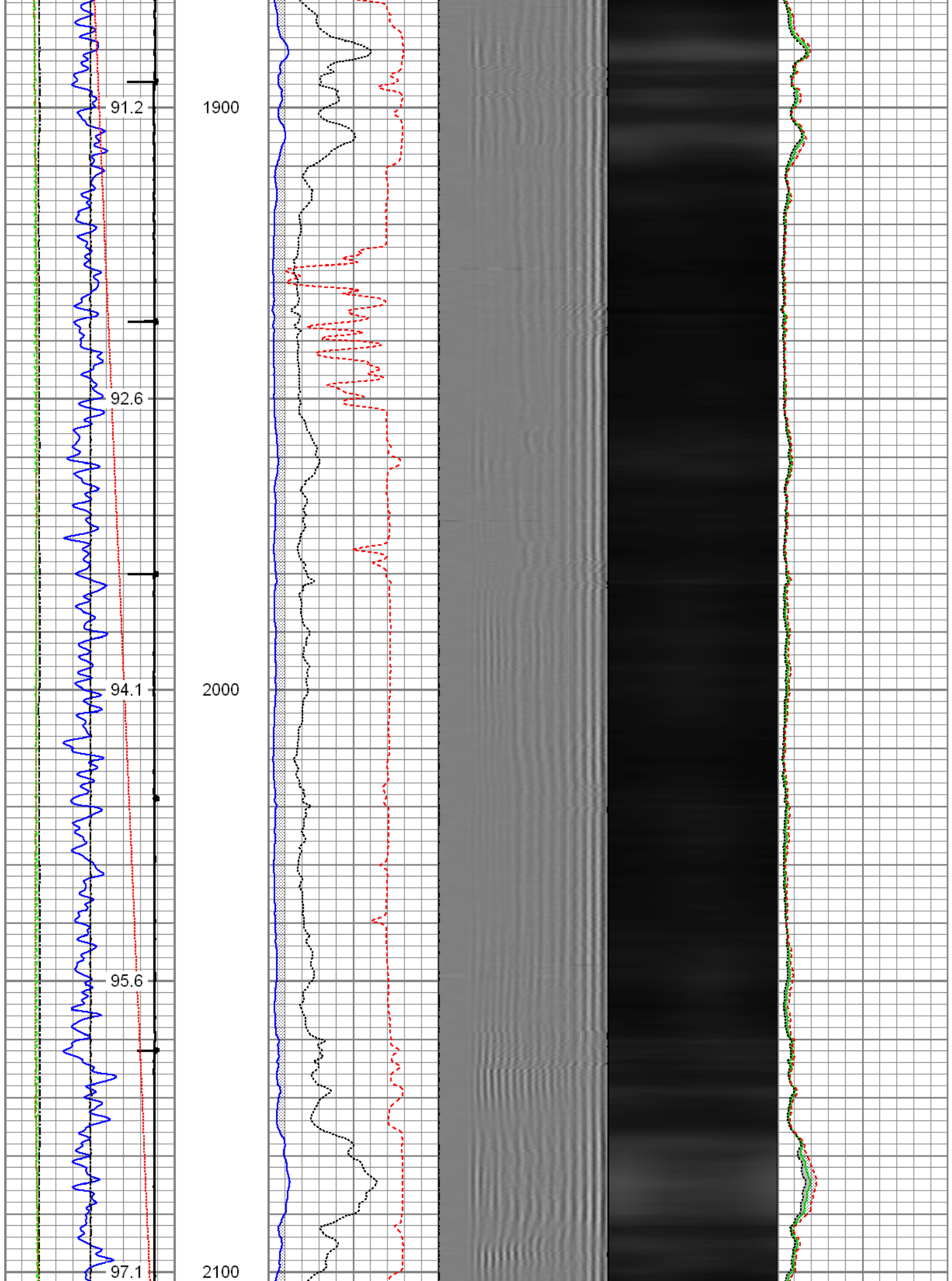


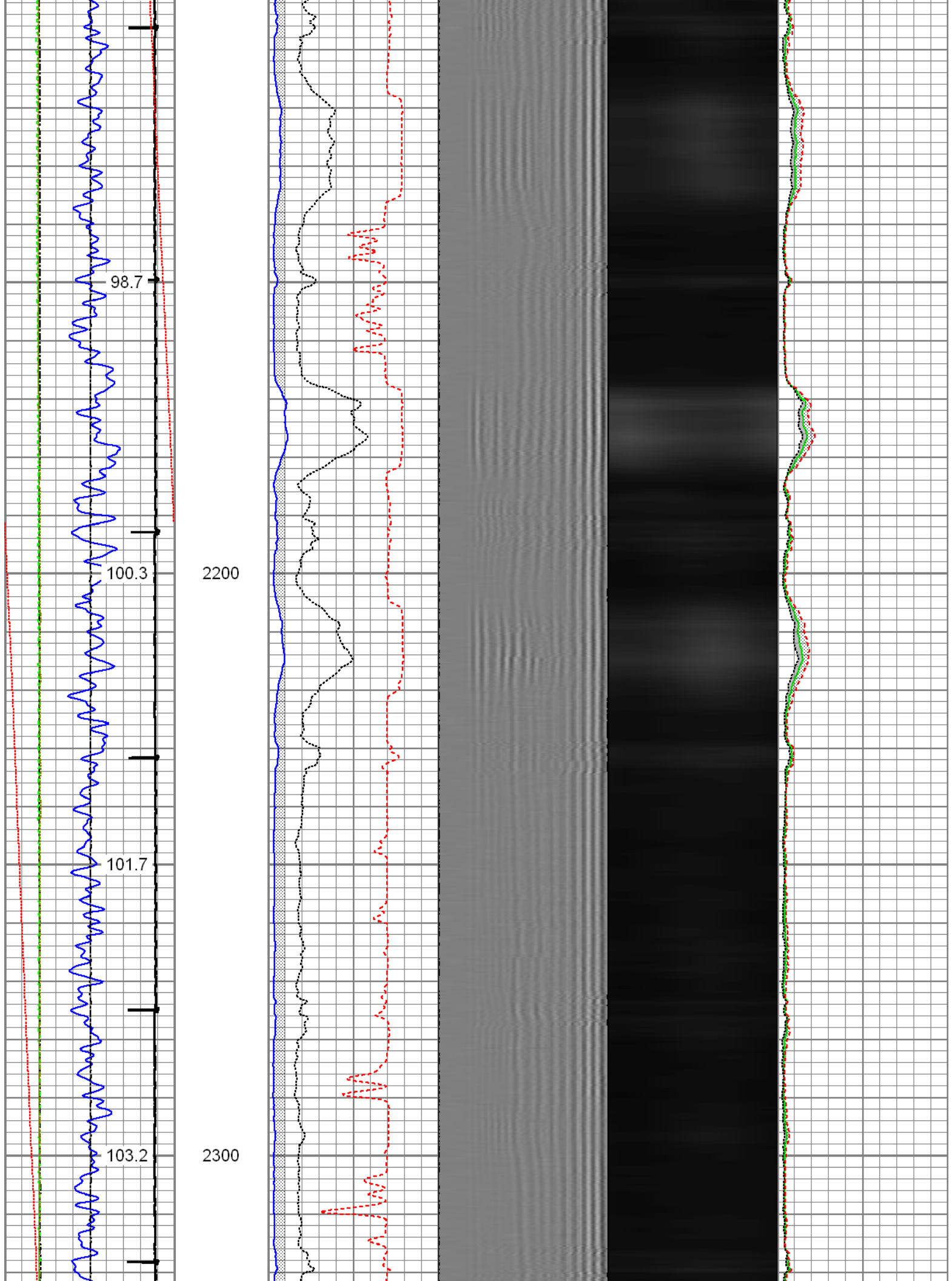


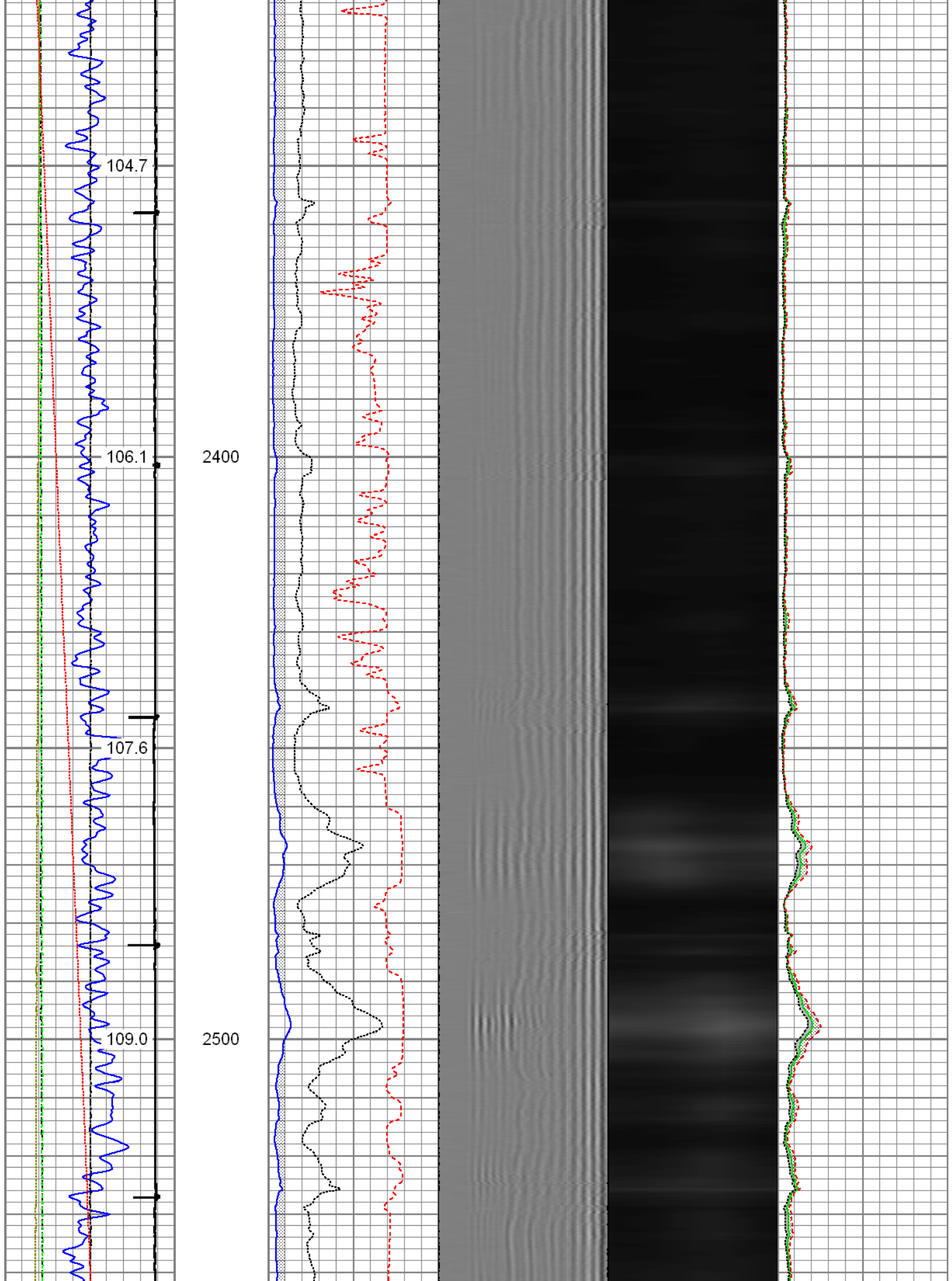


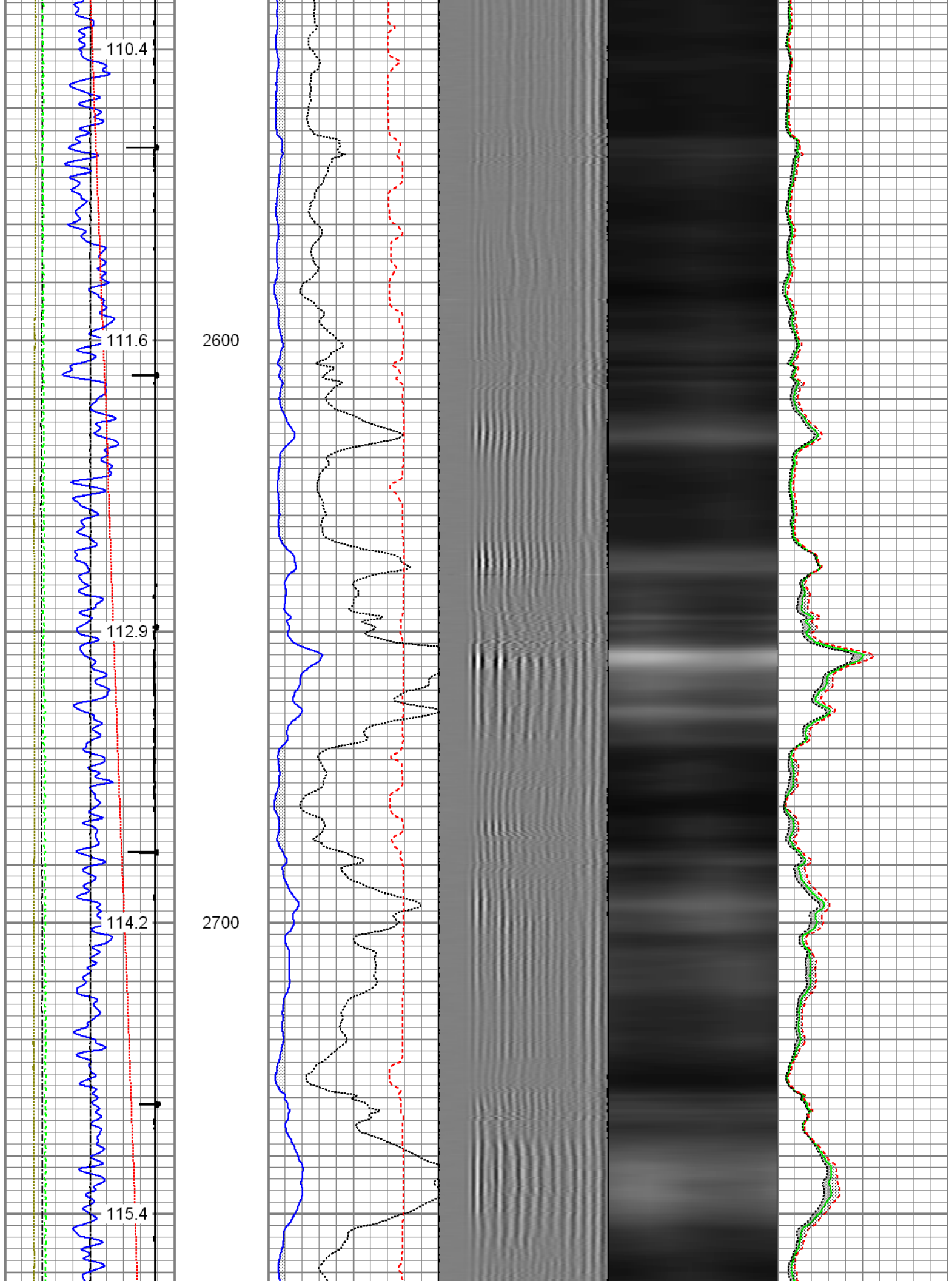


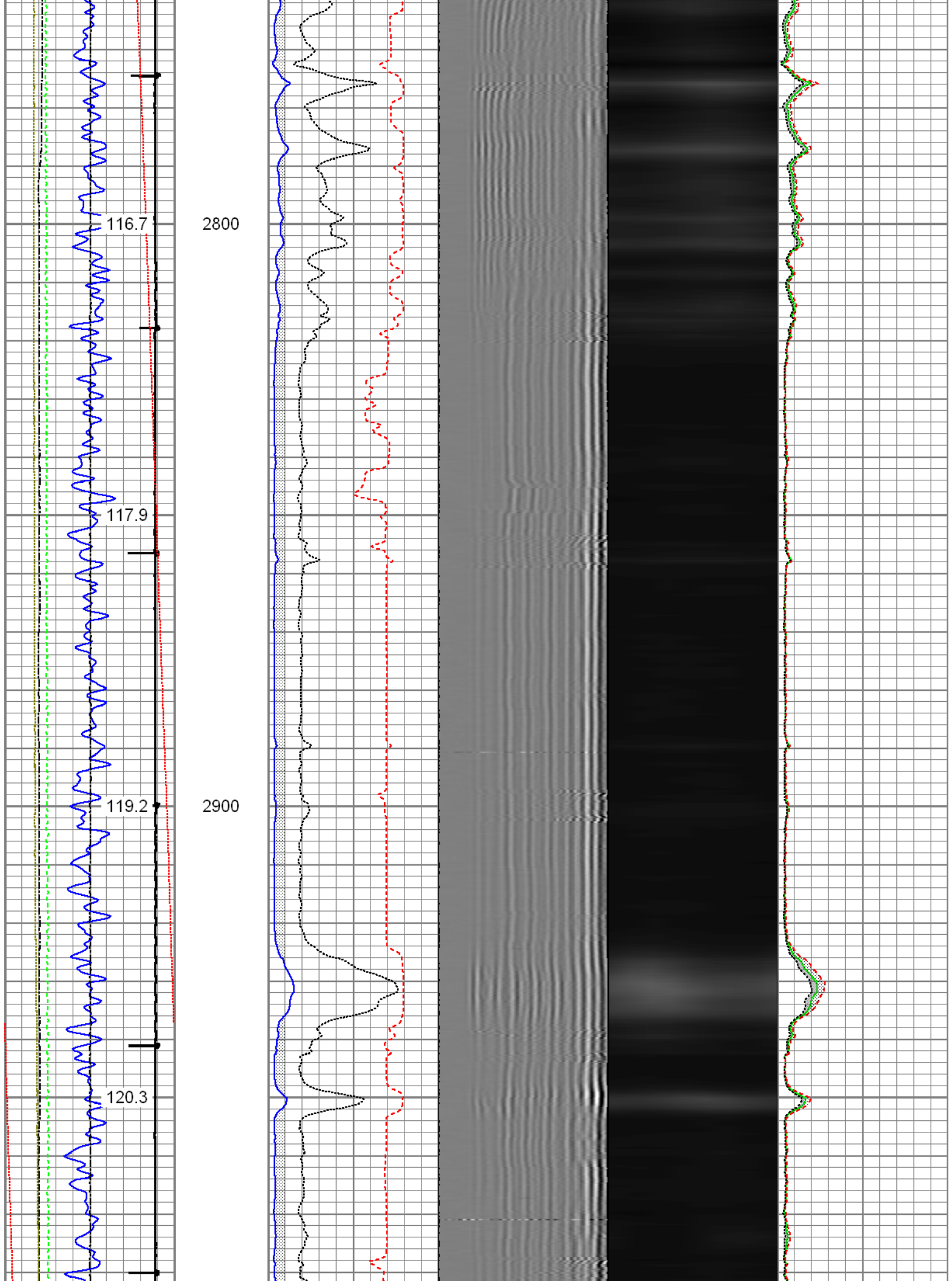


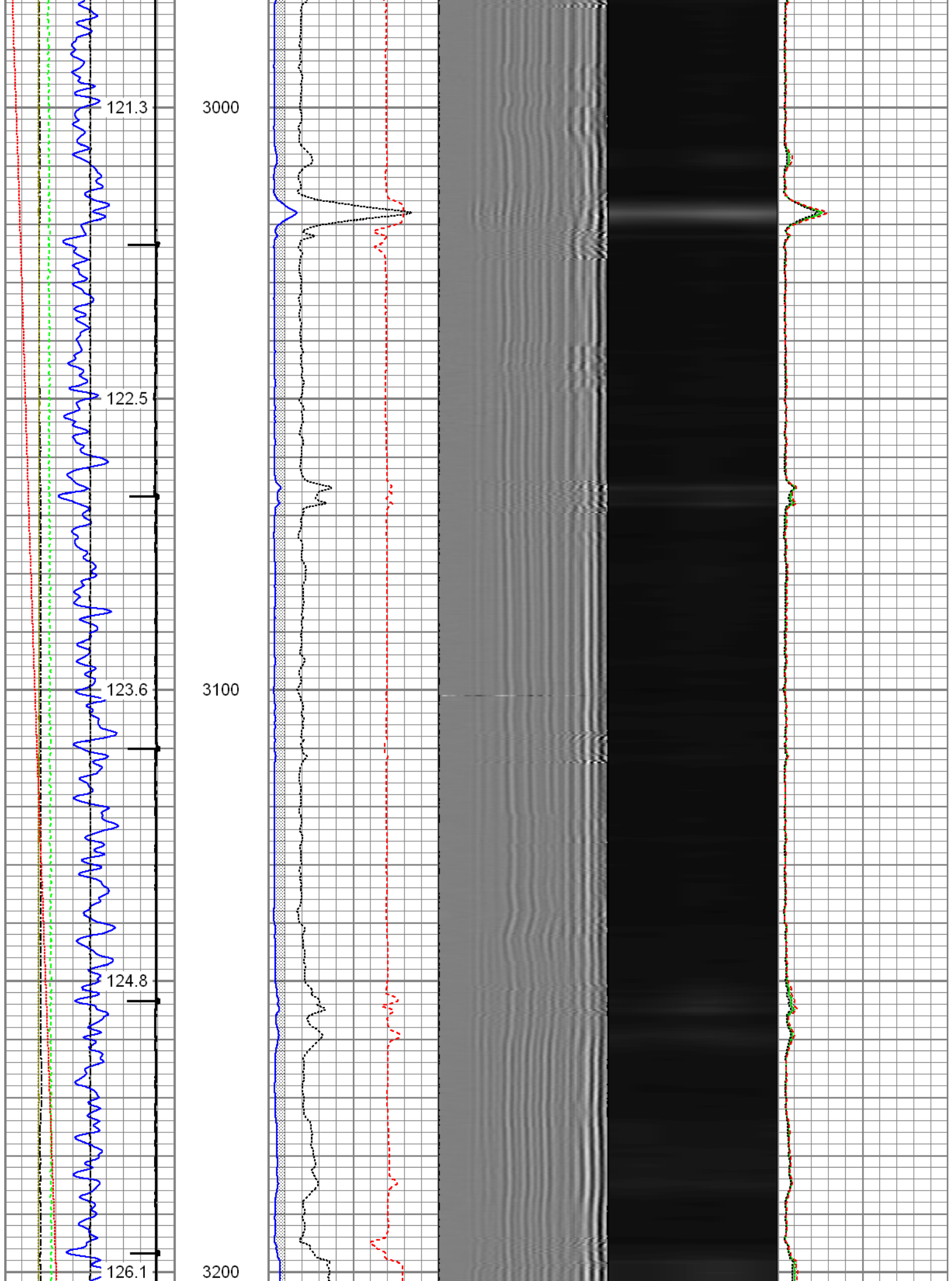


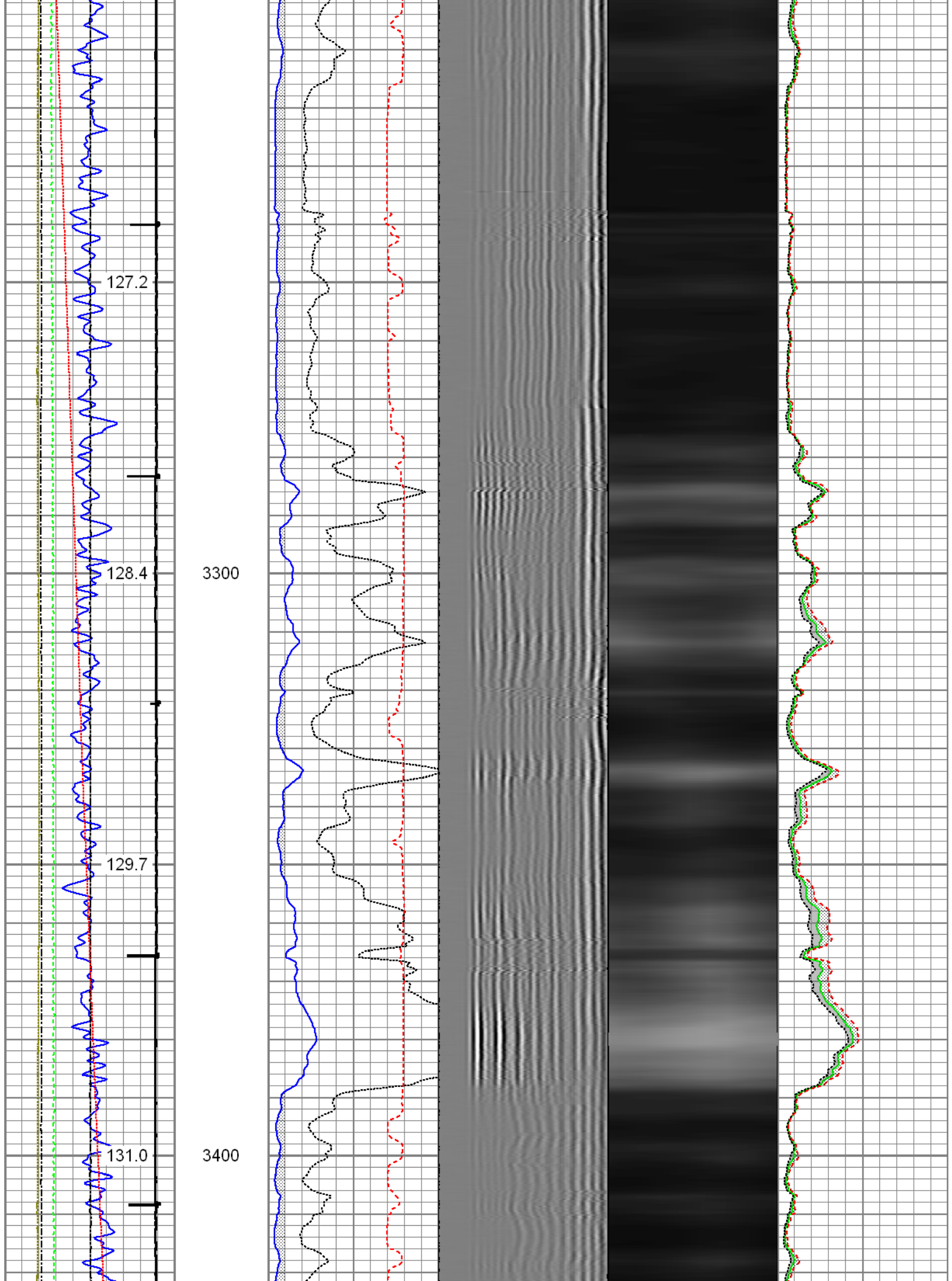


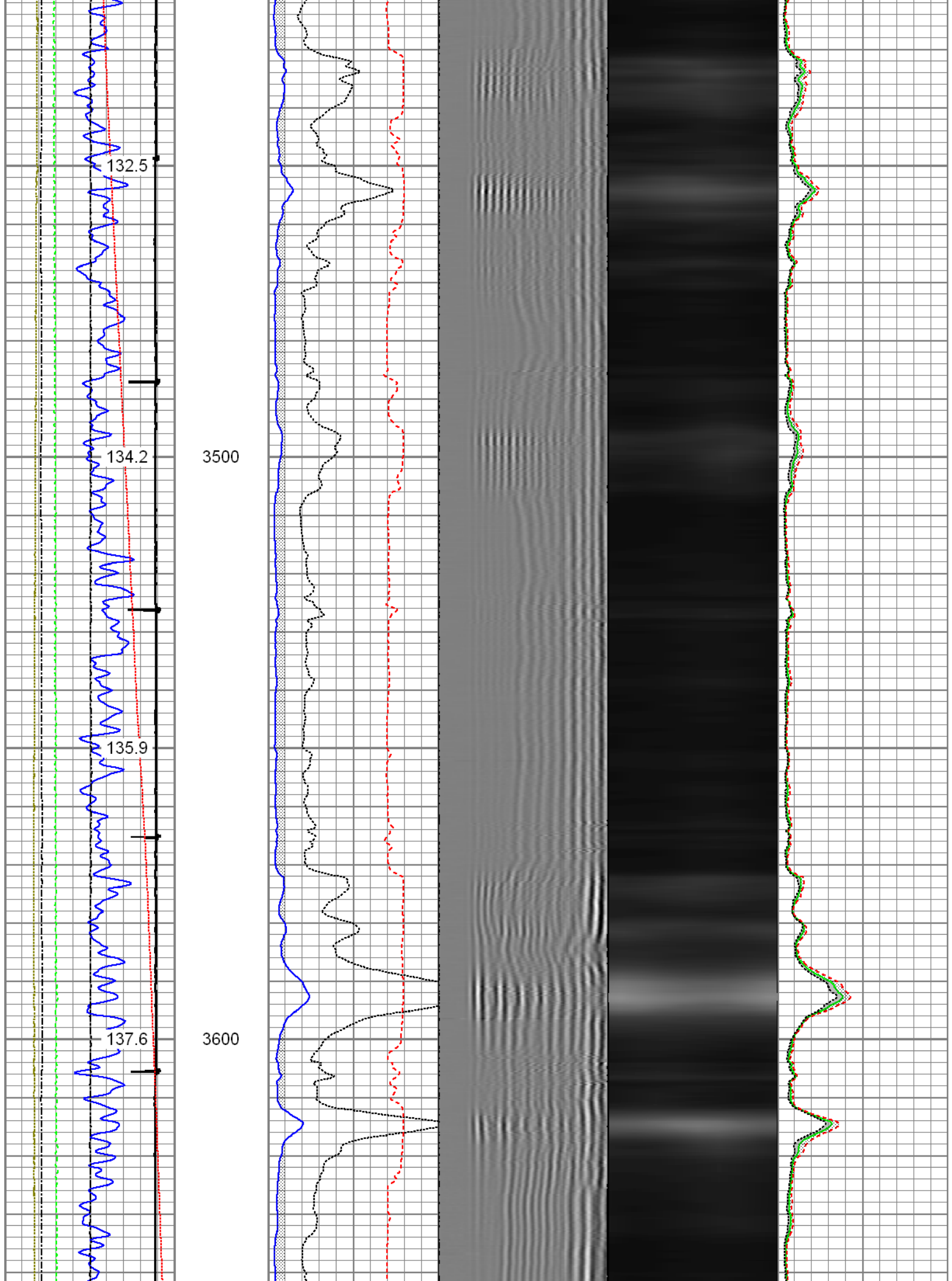


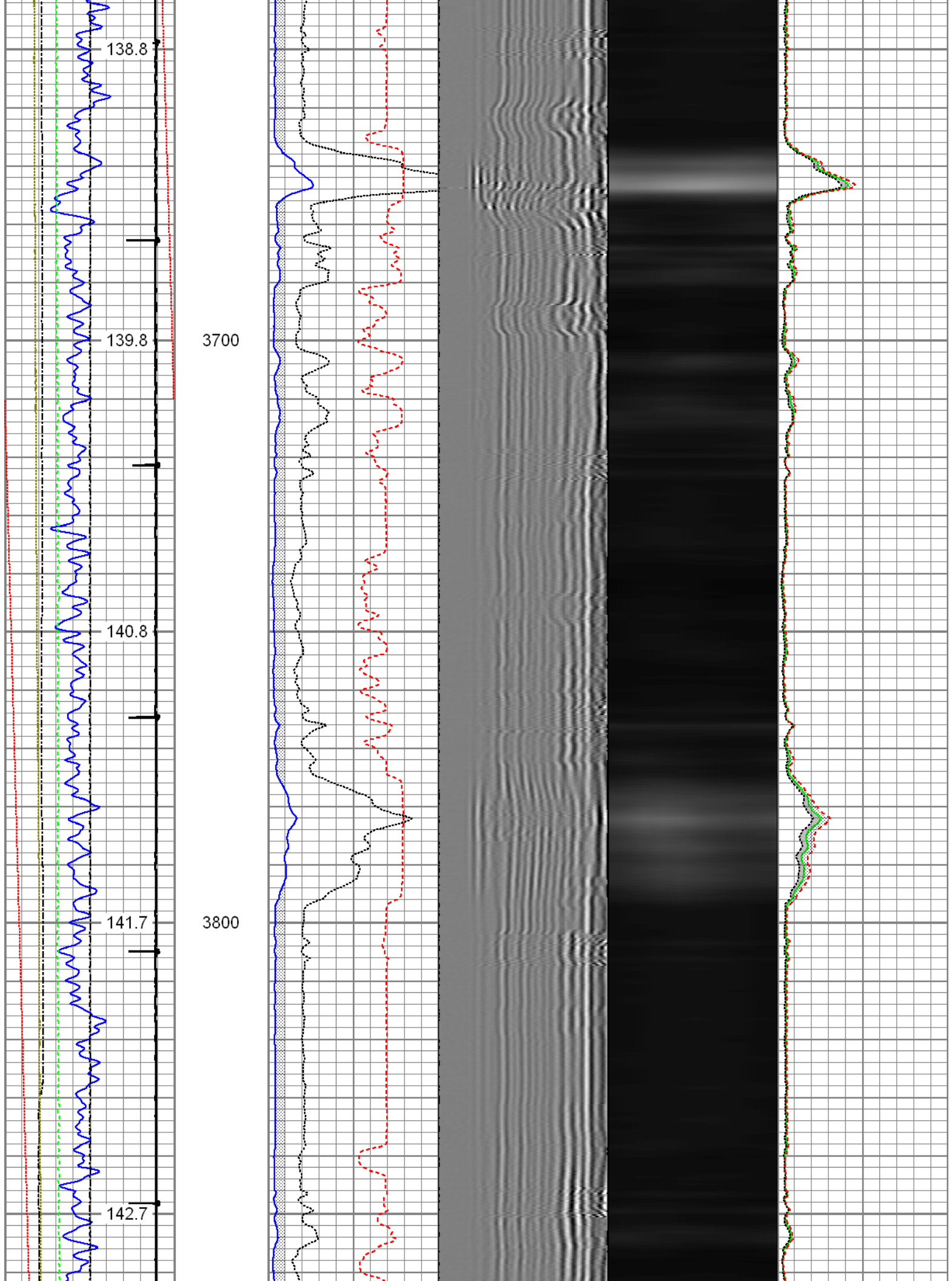


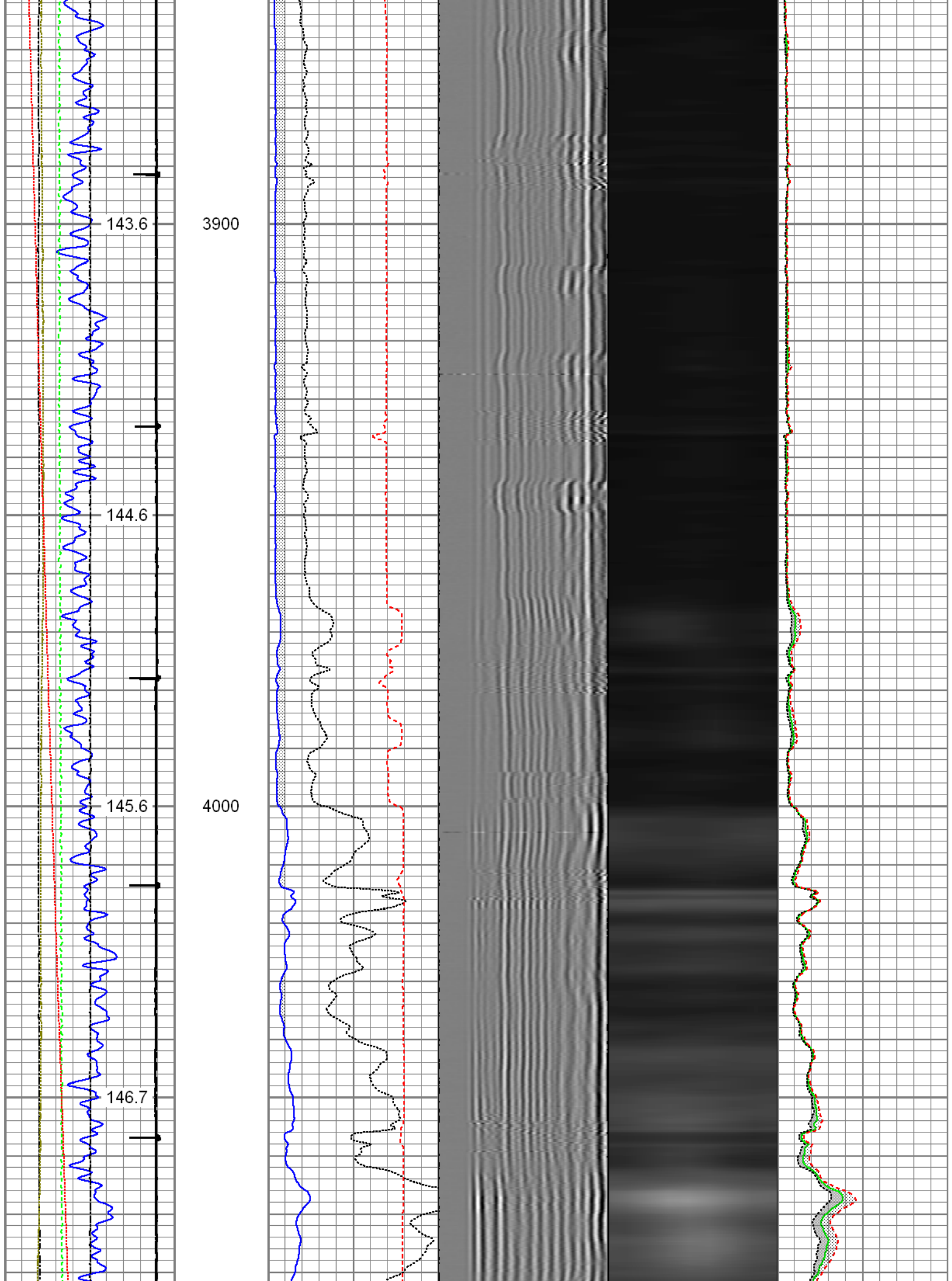


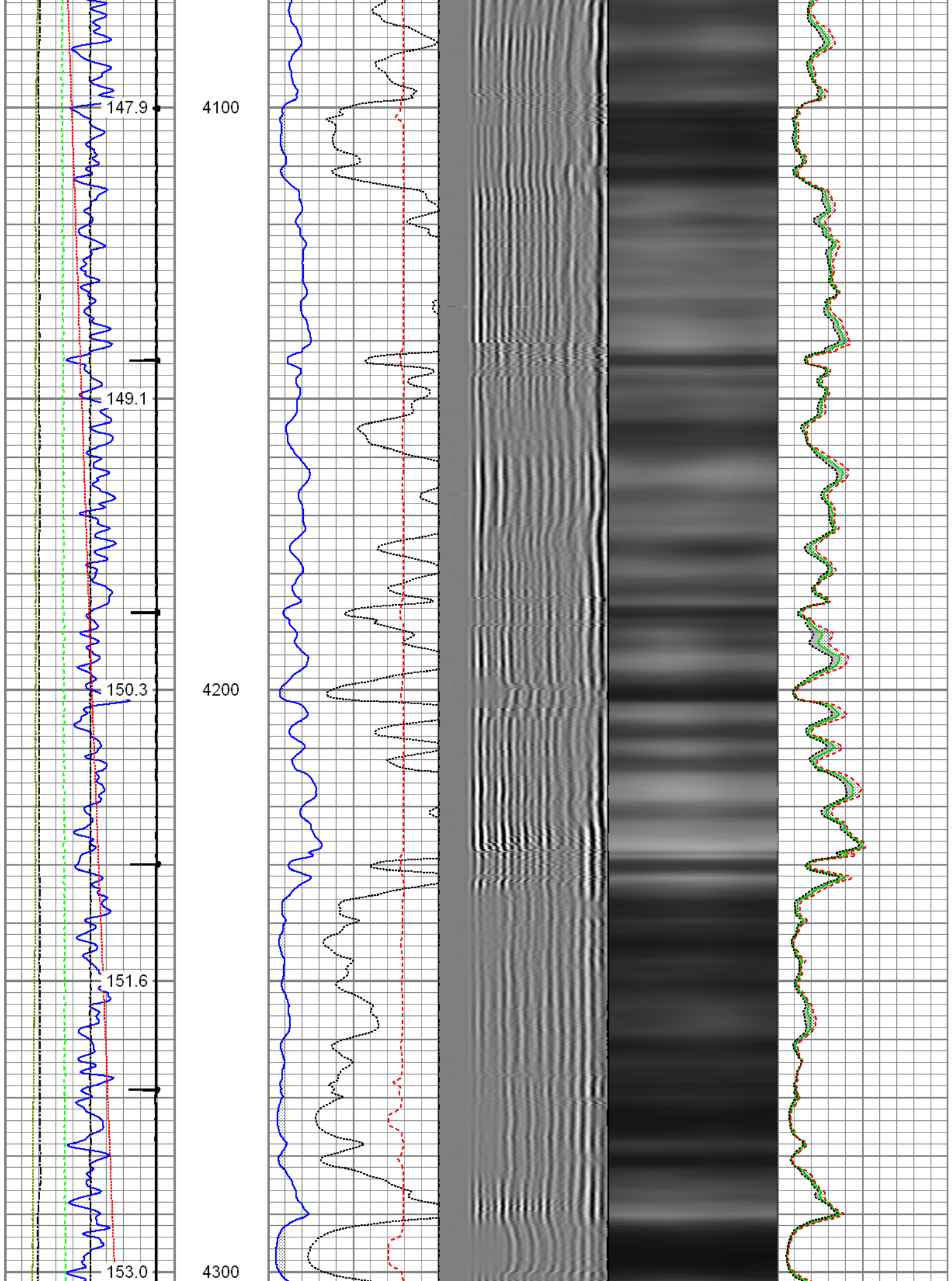


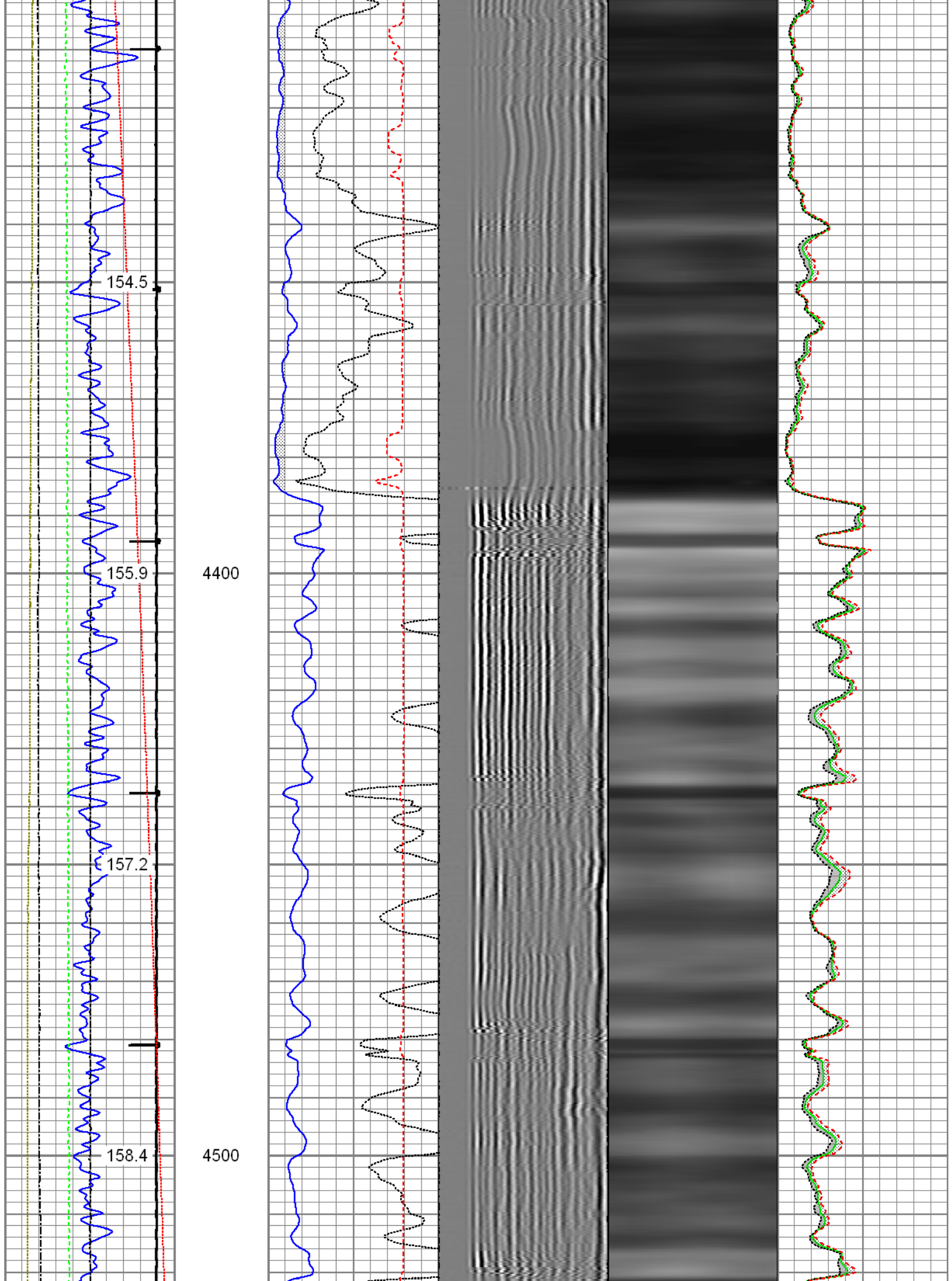


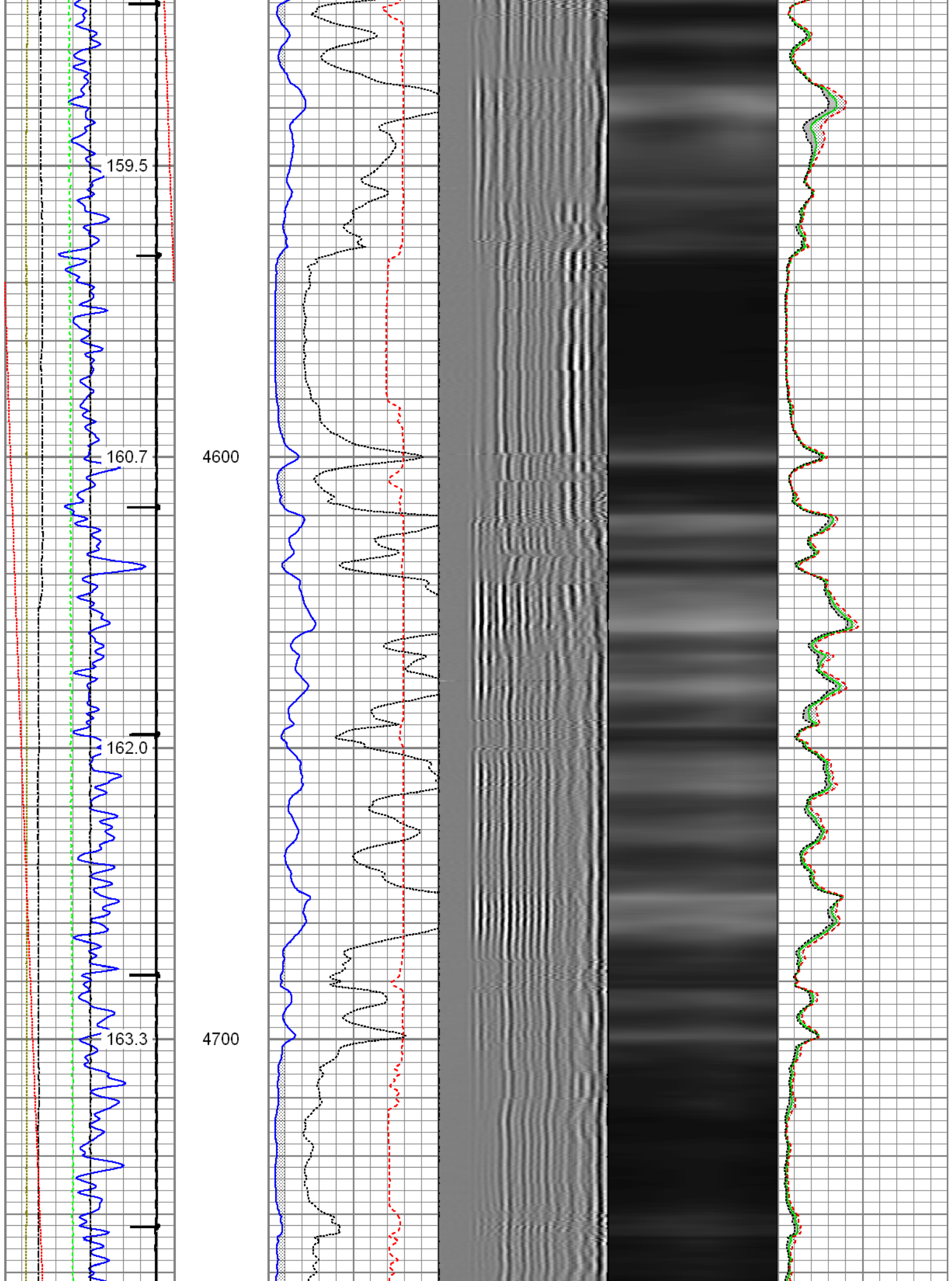


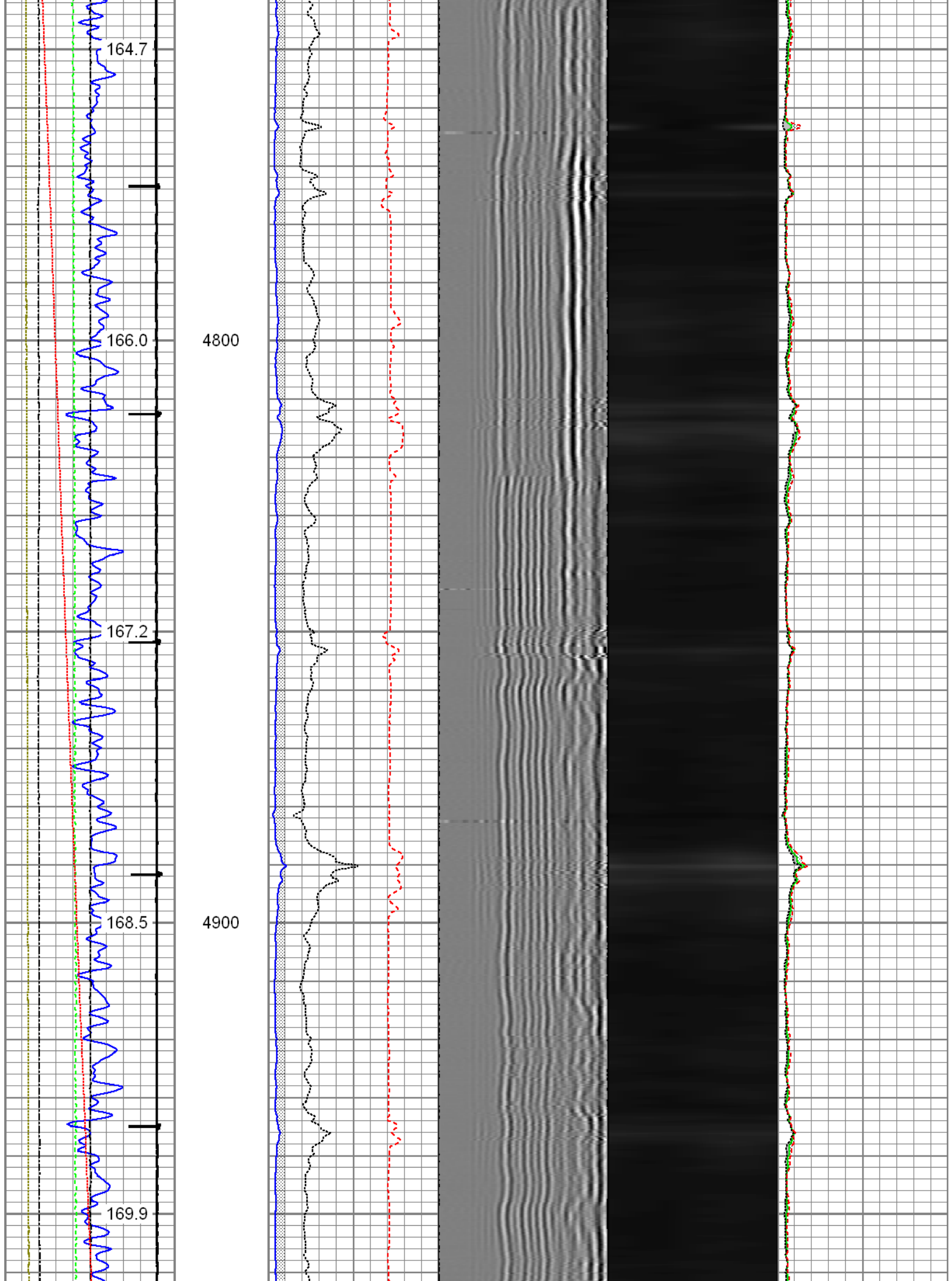


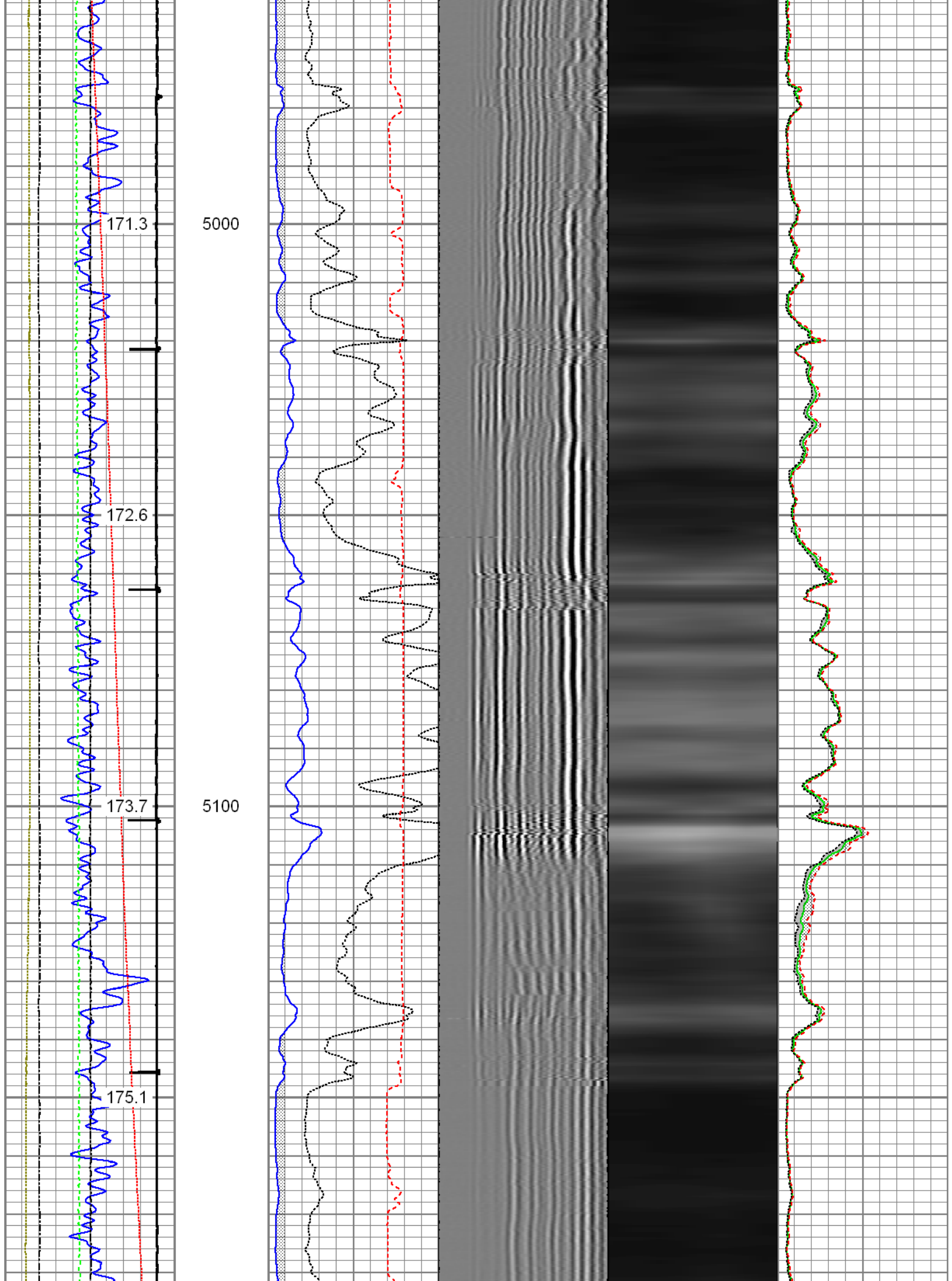


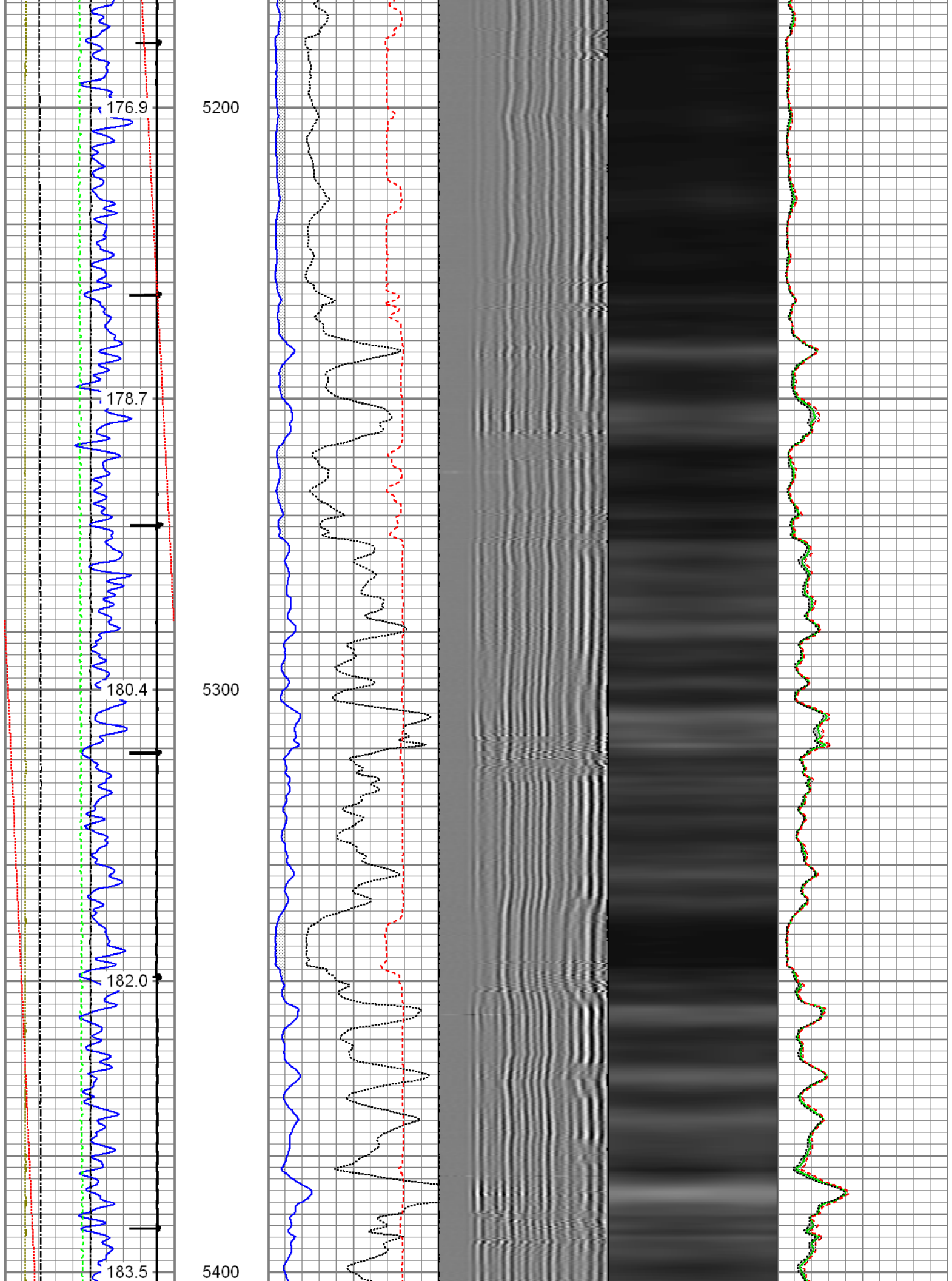


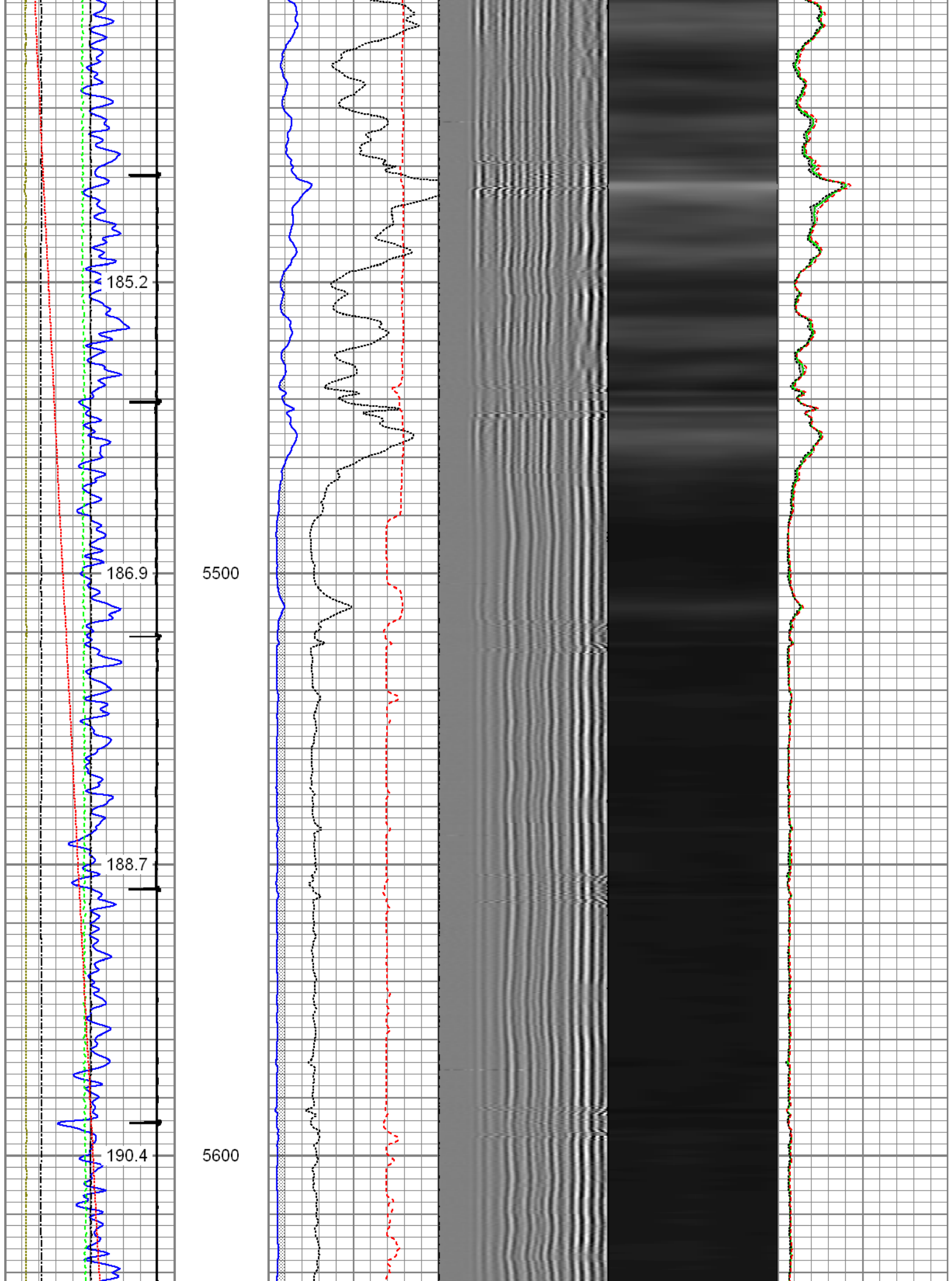


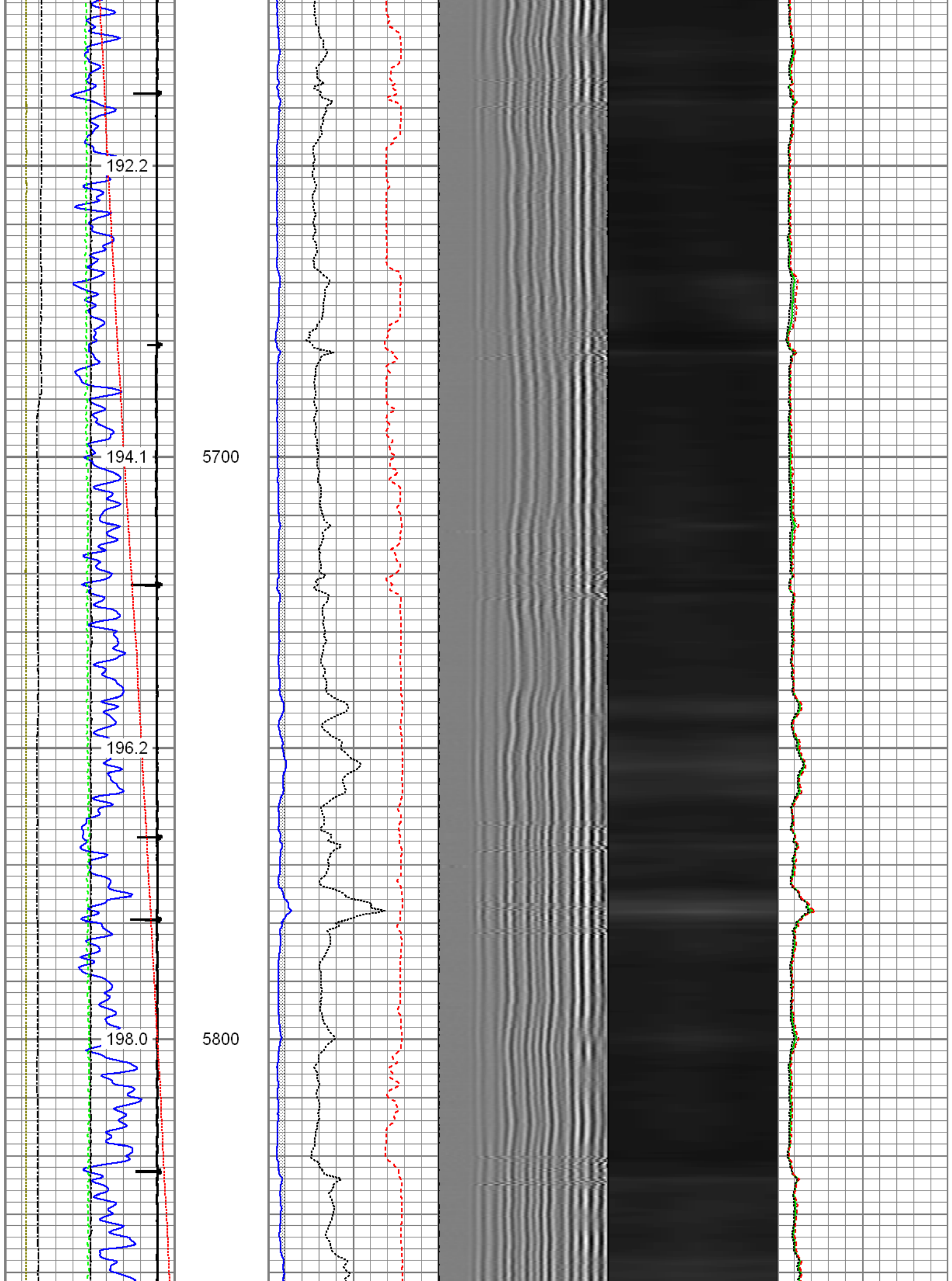


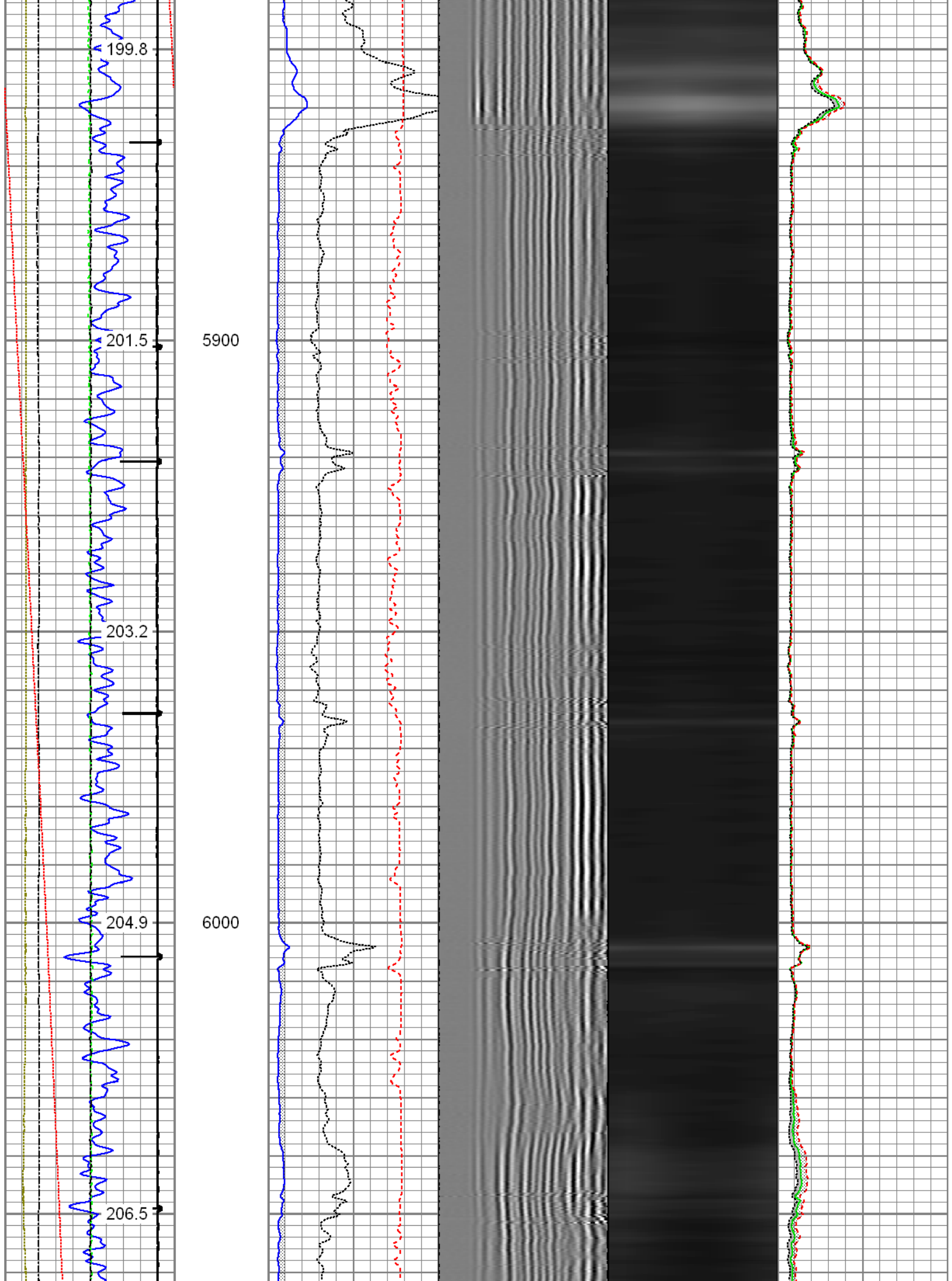


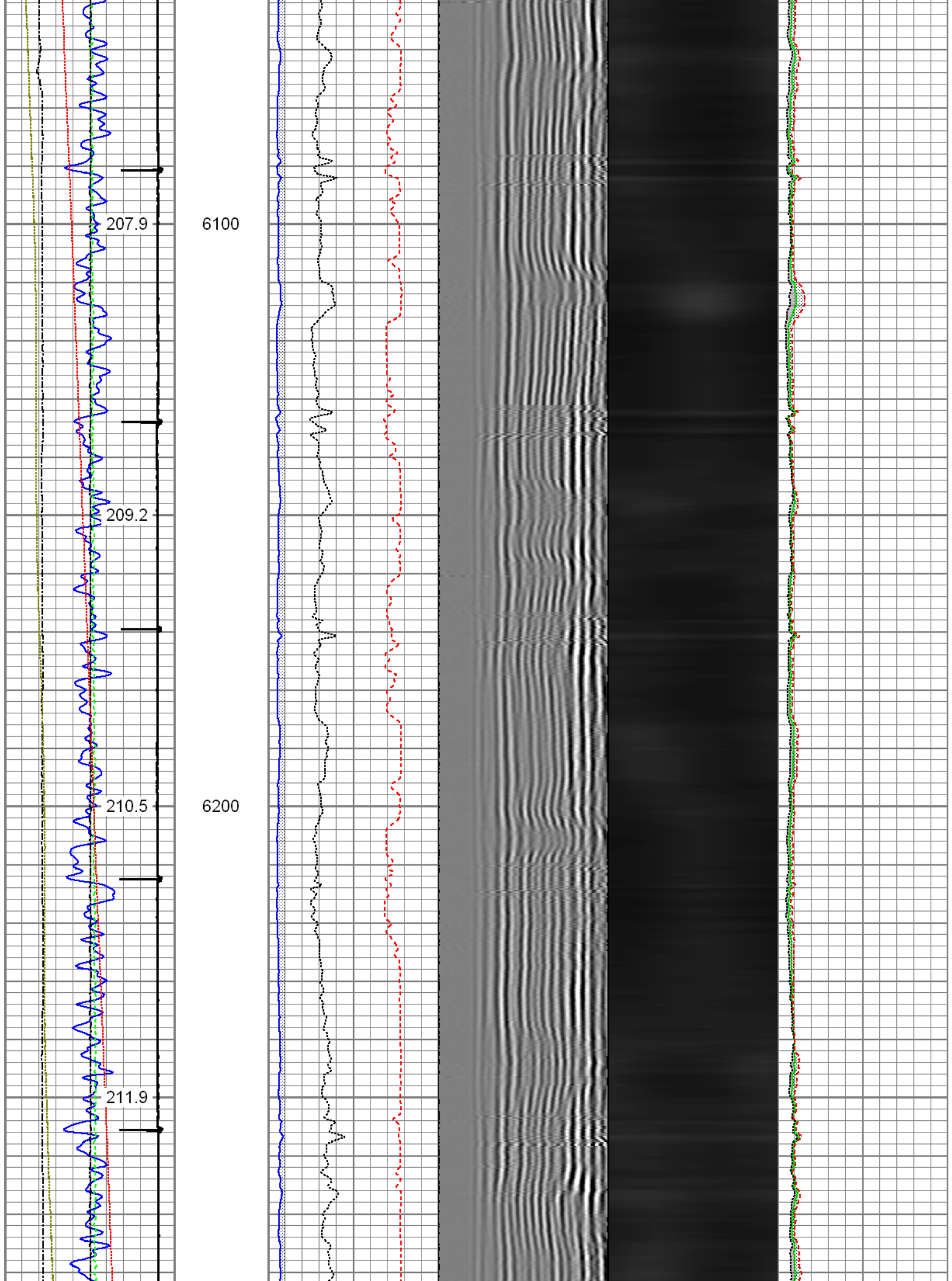


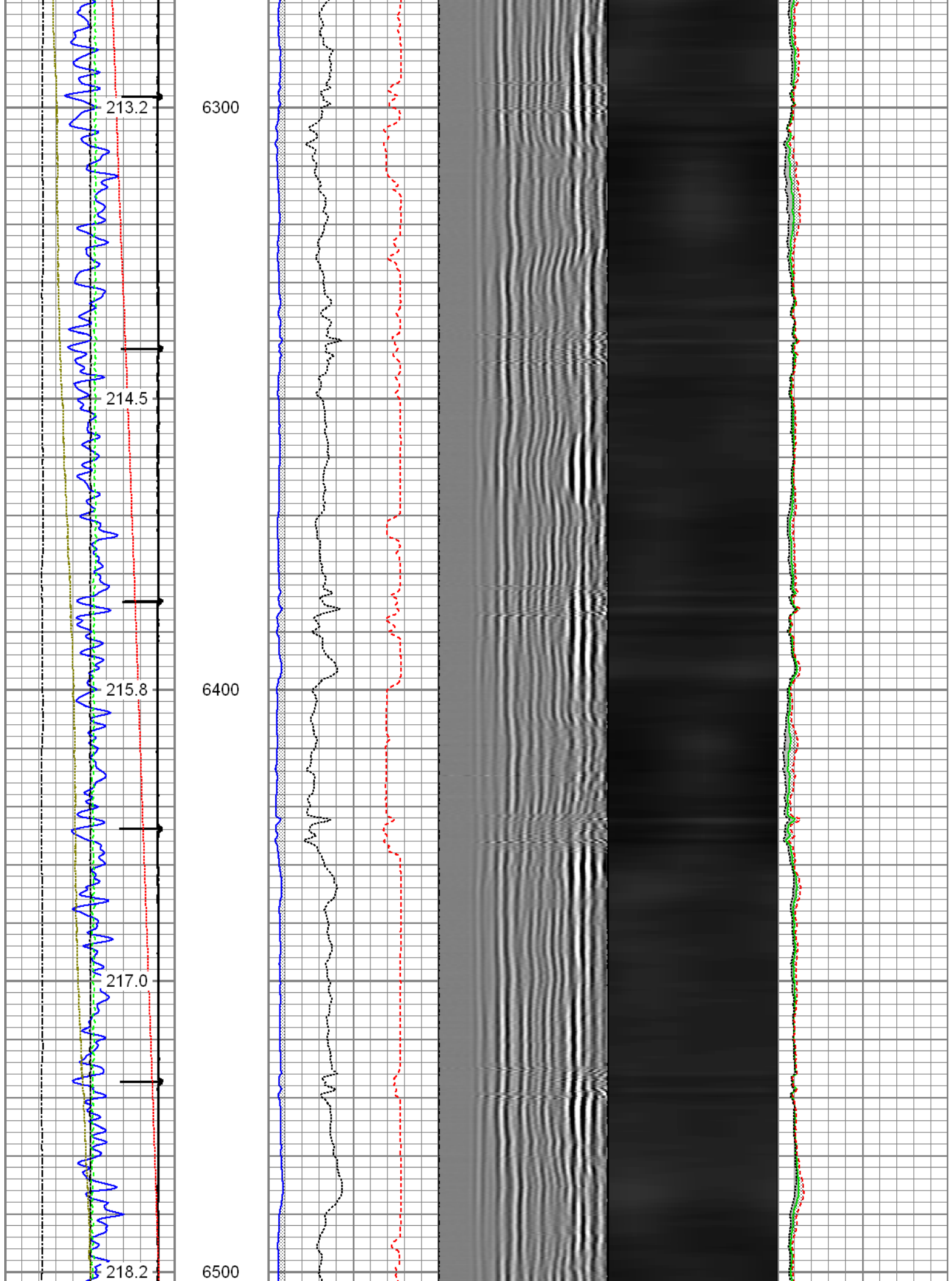


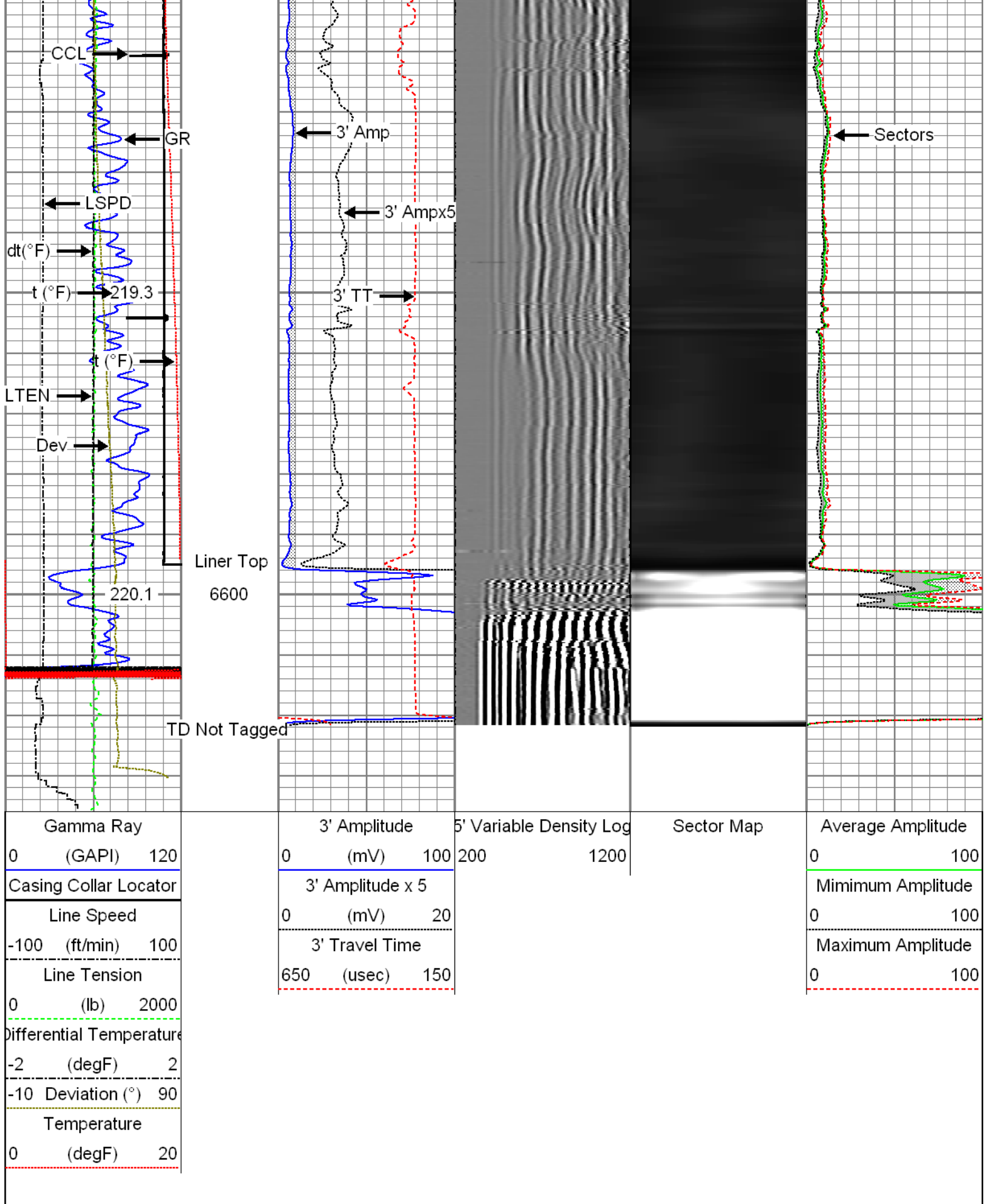






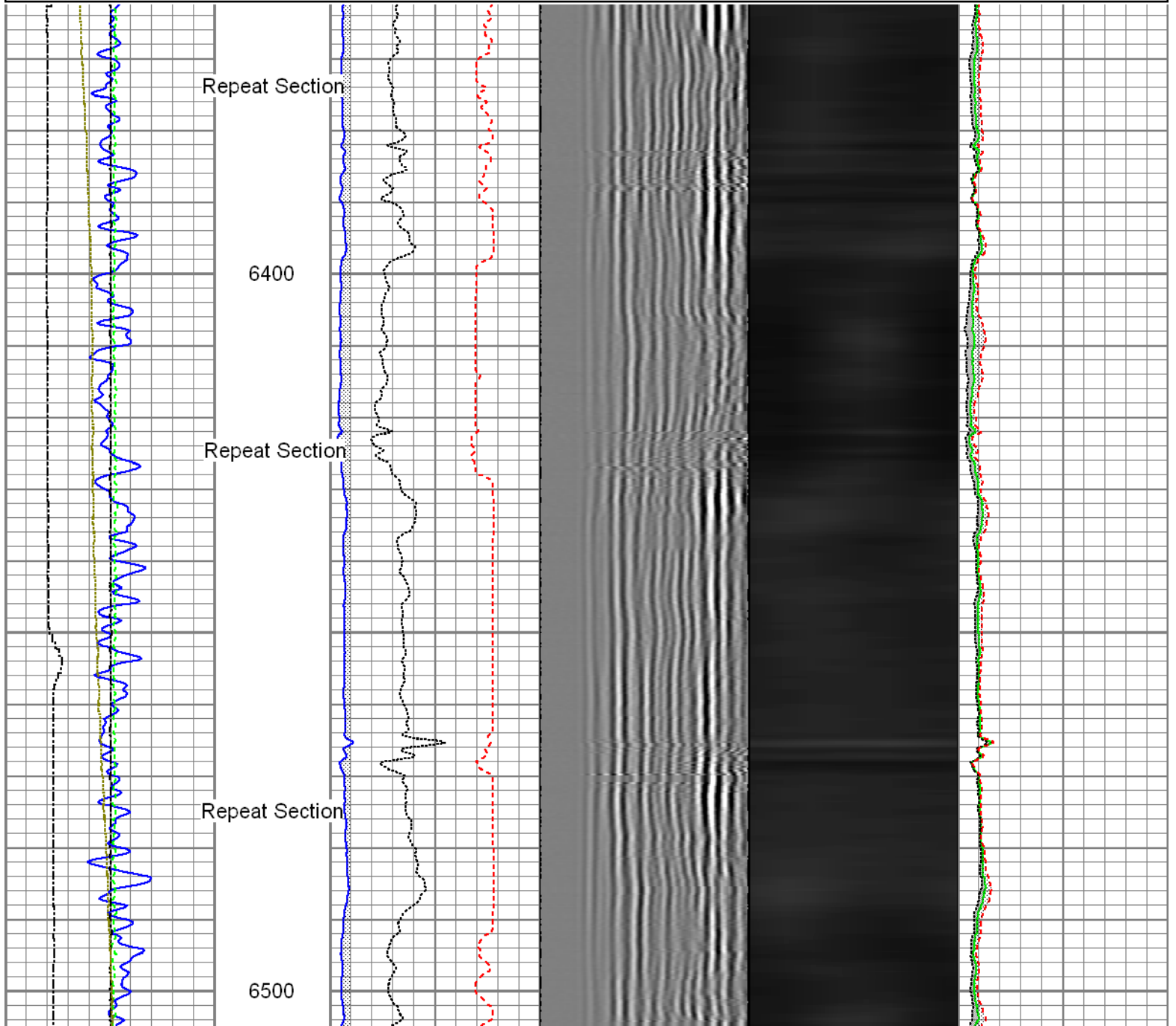


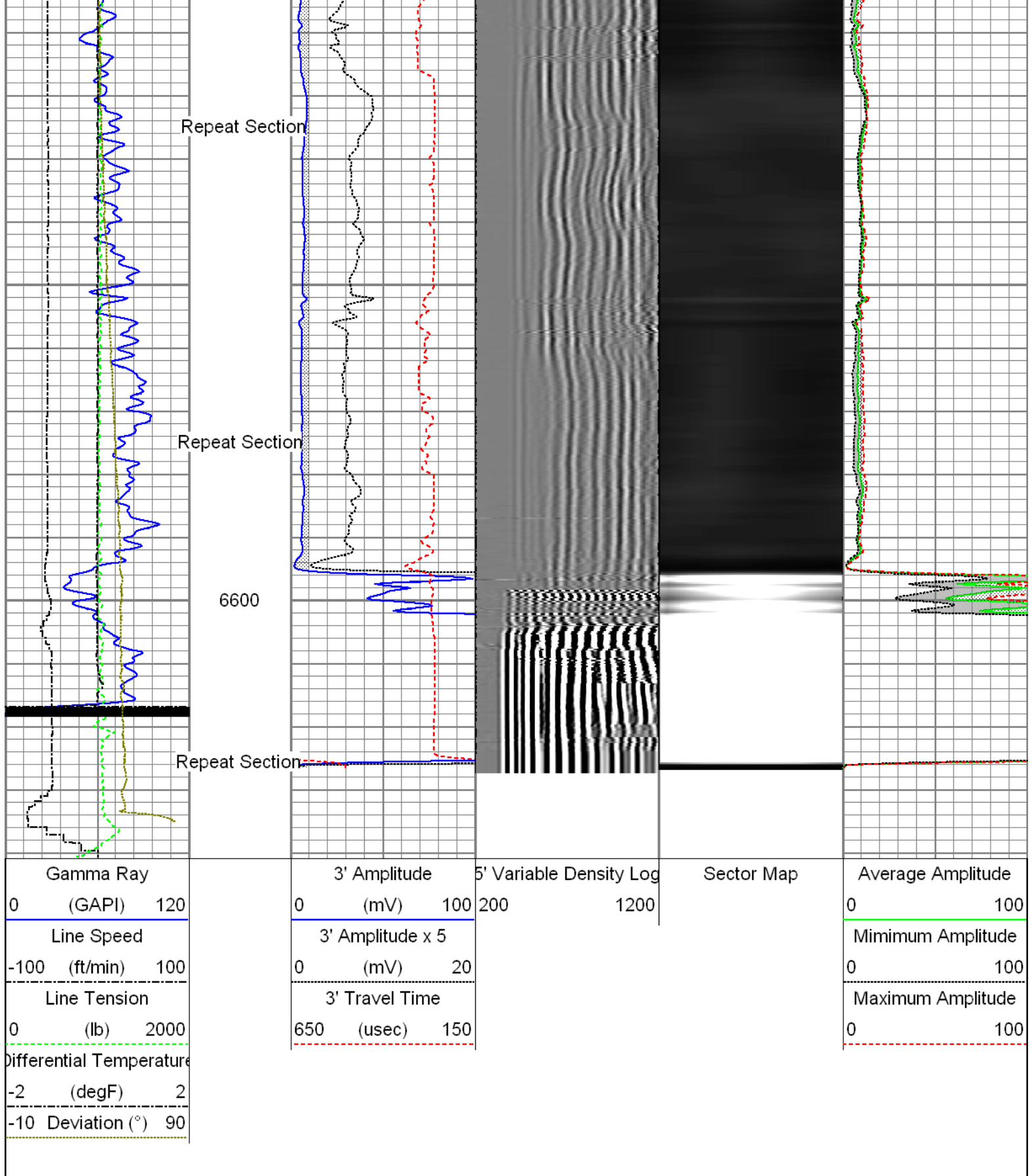




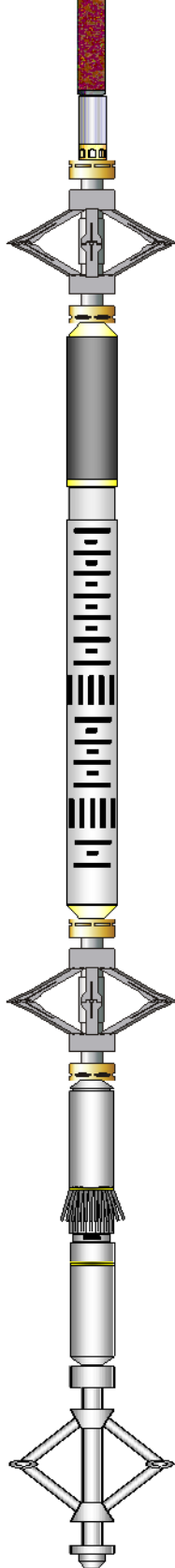
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 Dataset Pathname: repeat.1
 Presentation Format: rbt4_mit
 Dataset Creation: Mon Jul 13 16:26:56 2015 by Calc 7.0 B1
 Charted by: Depth in Feet scaled 1:240

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				
-10 Deviation (°)				
90				





Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
			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)	1.58	1.69	6.50

GR	23.85		UW_PGR-UW_PGR_020 (10013899) 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 (082) 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		UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
CBLROT	15.42					
WVF5FT	14.42					
MIT	5.41		UW_MIT-UW_MIT40_027 (218950) 40 Multifinger Imaging Tool	4.54	2.75	61.10
			UW_PRC #4 -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
<div>Dataset: 07-13-15_Noble Energy_Wells Ranch AA11-615_MIT_RBL.db: field/well/run1/main.1</div> <div>Total Length: 28.09 ft</div> <div>Total Weight: 324.50 lb</div> <div>O.D. 3.13 in</div>						

Calibration Report	
Database File:	07-13-15_noble energy_wells ranch aa11-615_mit_rbl.db
Dataset Pathname:	main.1
Dataset Creation:	Mon Jul 13 16:12:14 2015 by Calc 7.0 B1
Multi-finger Imaging Tool Calibration Report	

Serial Number: 218950
Number of Fingers: 40
Tool Model: UW_MIT40_027

Inclinometer Calibration Report
Performed: Fri, Oct, 10 10:41:51 2008
Calibration Angle: 45

		Inc X	Inc Y
Vertical:		1996	1975
Finger 1 up:		2238	2226
Finger 31 up:		1760	2216
Finger 21 up:		1769	1745
Finger 11 up:		2250	1738
Sensitivity ratio:	1.00023		
X-axis angle:	314.283		
Deviation const.:	339.139		

Finger Calibration Report
Performed: Mon Jul 13 10:43:57 2015

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1430	270.0	1700	294.0	1994	296.0	2290
Finger 02:	1500	246.0	1746	264.0	2010	259.0	2269
Finger 03:	1416	270.0	1686	297.0	1983	289.0	2272
Finger 04:	1432	273.0	1705	295.0	2000	284.0	2284
Finger 05:	1472	263.0	1735	283.0	2018	273.0	2291
Finger 06:	1404	270.0	1674	301.0	1975	292.0	2267
Finger 07:	1422	266.0	1688	298.0	1986	289.0	2275
Finger 08:	1424	263.0	1687	294.0	1981	281.0	2262
Finger 09:	1419	265.0	1684	299.0	1983	289.0	2272
Finger 10:	1434	257.0	1691	290.0	1981	281.0	2262
Finger 11:	1424	265.0	1689	297.0	1986	290.0	2276
Finger 12:	1380	266.0	1646	301.0	1947	297.0	2244
Finger 13:	1479	251.0	1730	276.0	2006	273.0	2279
Finger 14:	1420	253.0	1673	287.0	1960	290.0	2250
Finger 15:	1421	266.0	1687	294.0	1981	300.0	2281
Finger 16:	1422	262.0	1684	292.0	1976	297.0	2273
Finger 17:	1438	271.0	1709	298.0	2007	307.0	2314
Finger 18:	1386	259.0	1645	284.0	1929	292.0	2221
Finger 19:	1440	265.0	1705	289.0	1994	299.0	2293
Finger 20:	1450	268.0	1718	289.0	2007	307.0	2314
Finger 21:	1400	279.0	1679	301.0	1980	321.0	2301
Finger 22:	1419	264.0	1683	280.0	1963	299.0	2262
Finger 23:	1425	270.0	1695	284.0	1979	307.0	2286
Finger 24:	1461	274.0	1735	284.0	2019	304.0	2323
Finger 25:	1438	275.0	1713	285.0	1998	309.0	2307
Finger 26:	1406	280.0	1686	289.0	1975	314.0	2289
Finger 27:	1458	271.0	1729	281.0	2010	304.0	2314
Finger 28:	1446	281.0	1727	286.0	2013	312.0	2325
Finger 29:	1497	263.0	1760	270.0	2030	293.0	2323
Finger 30:	1404	281.0	1685	288.0	1973	315.0	2288
Finger 31:	1432	286.0	1718	294.0	2012	314.0	2326
Finger 32:	1485	272.0	1757	275.0	2032	291.0	2323
Finger 33:	1437	288.0	1725	298.0	2023	315.0	2338
Finger 34:	1444	280.0	1724	291.0	2015	310.0	2325
Finger 35:	1491	260.0	1751	267.0	2018	279.0	2297
Finger 36:	1473	268.0	1741	283.0	2024	293.0	2317
Finger 37:	1447	278.0	1725	293.0	2018	302.0	2320
Finger 38:	1517	248.0	1765	261.0	2026	267.0	2293
Finger 39:	1440	270.0	1710	287.0	1997	286.0	2283
Finger 40:	1405	282.0	1687	301.0	1988	302.0	2290

Serial Number: 10013454
Tool Model: UW_RBT_004

Calibration Casing Diameter: 7.000 in
Calibration Depth: 147.000 ft

Master Calibration, performed Mon Jul 13 15:12:08 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.002	0.693	0.800	62.165	88.285	1.018
5FT	-0.003	0.759	0.800	62.165	80.466	1.054
S1	-0.002	0.682	0.000	100.000	146.266	0.295
S2	-0.005	0.703	0.000	100.000	141.179	0.742
S3	-0.004	0.718	0.000	100.000	138.505	0.572
S4	-0.004	0.726	0.000	100.000	137.065	0.493
S5	-0.001	0.719	0.000	100.000	138.839	0.177
S6	-0.003	0.701	0.000	100.000	142.034	0.392
S7	-0.002	0.674	0.000	100.000	147.847	0.363
S8	-0.003	0.669	0.000	100.000	148.992	0.382

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: 10013899
Tool Model: UW_PGR_020
Performed: Sun Jun 13 12:33:21 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: Wells Ranch AA11-615
Field: Wattenberg
County: Weld
State: Colorado

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525
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