

Radial Cement Bond Gamma Ray Casing Collar Log

Company Kerr-McGee Oil and Gas Onshore LP
Well Morning Fresh 36N-22HZR
Field Wattenberg
County Weld
State Colorado

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Location: API #: 05-123-39914
SHL: 581' FNL, 1974' FWL, NENW
Lat/Long: 40.126244/-104.765973
SEC 22 TWP 3N RGE 66W
Permanent Datum Ground Level Elevation 4886'
Log Measured From Kelly Bushing
Drilling Measured From Kelly Bushing
Other Services
Guage Ring
Set RBP
MIT
Elevation
K.B. 4899'
D.F. 4898'
G.L. 4886'

Date	21-August-2014
Run Number	Three
Depth Driller	12220 FT
Depth Logger	6810 FT
Bottom Logged Interval	6605 FT
Top Log Interval	Surface
Open Hole Size	8.625"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	217° F
Estimated Cement Top	21 FT
Time Well Ready	ROA
Time Logger on Bottom	8:45
Equipment Number	HD-0255
Location	Fort Lupton, Colorado
Recorded By	H. Raby
Witnessed By	Trevor Daniel

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	9-875	36	J-55	Surface	983 FT		
Intermediate #1	7	26	P-110	Surface	7743 FT		
Intermediate #2							
Liner	4.5	11.6	P-110	6782 FT	12210 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.

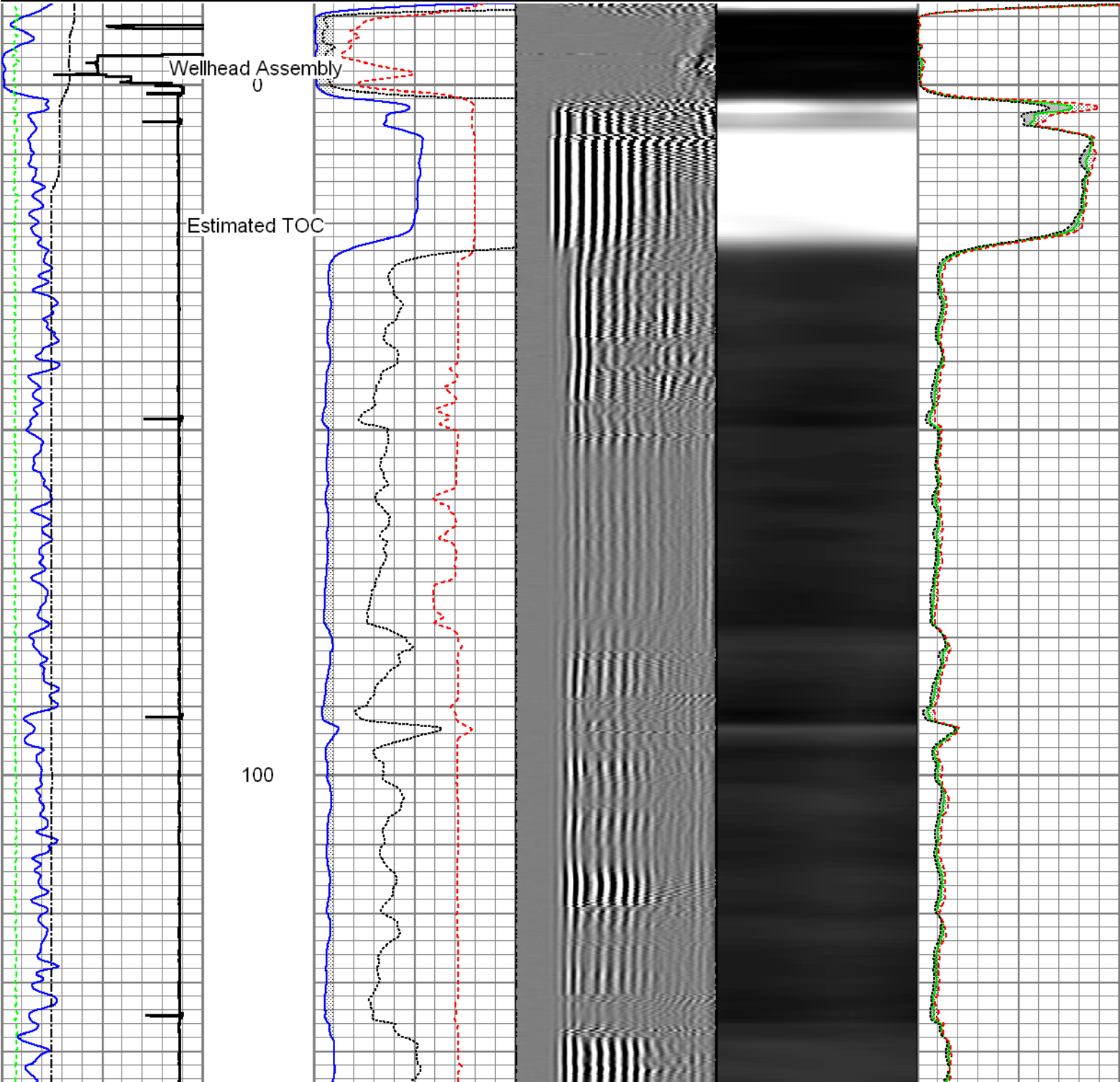
Comments

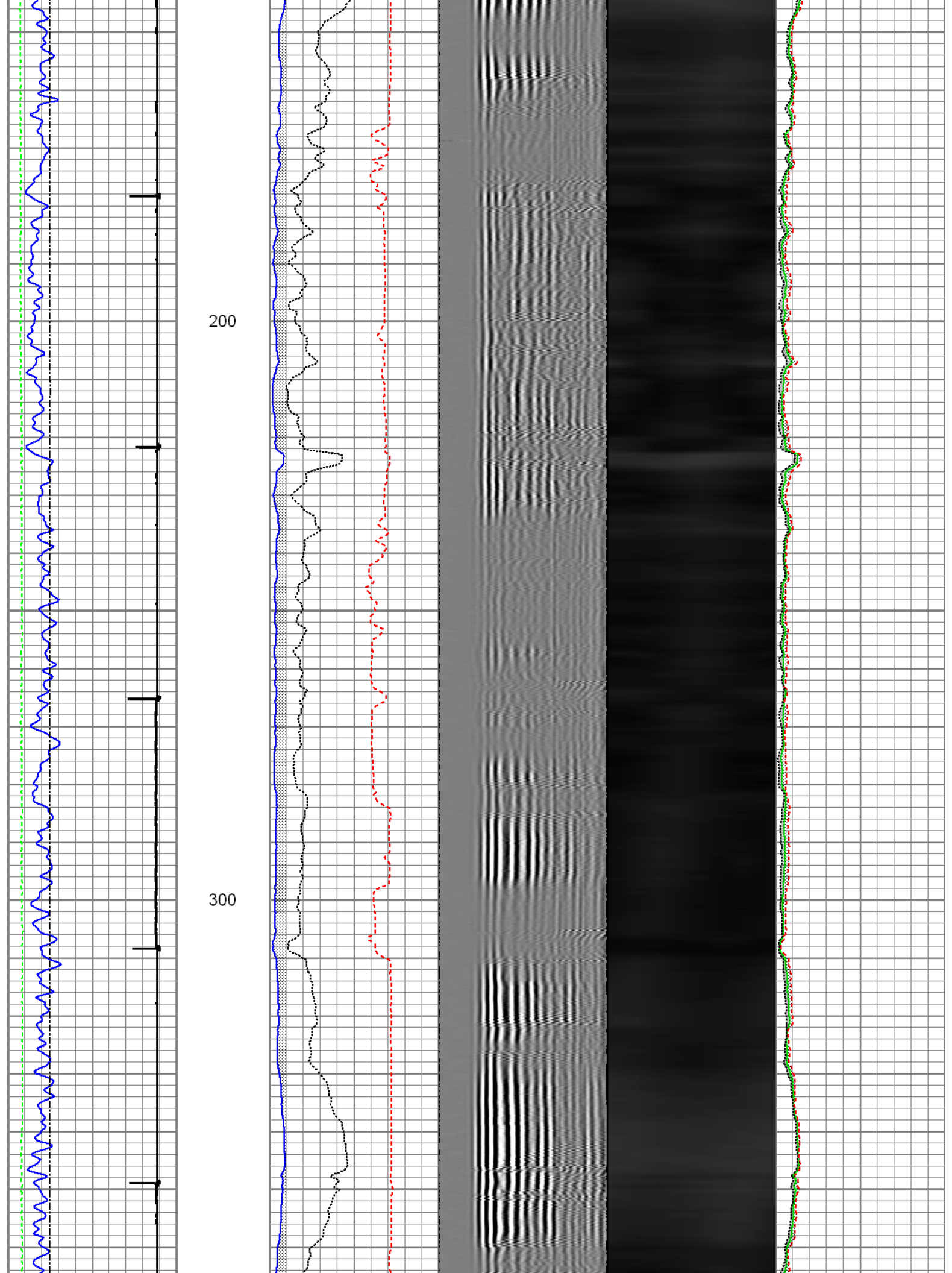
Log ran as per customer request.
Depth Reference to Casing Tally reported liner top at 6782 FT.
Adjusted log -14 FT to correlate with Liner Top.
Log ran from below the liner top to surface.
No debris found upon completion of logging.
Log ran with 2800 PSI surface induced pressure.

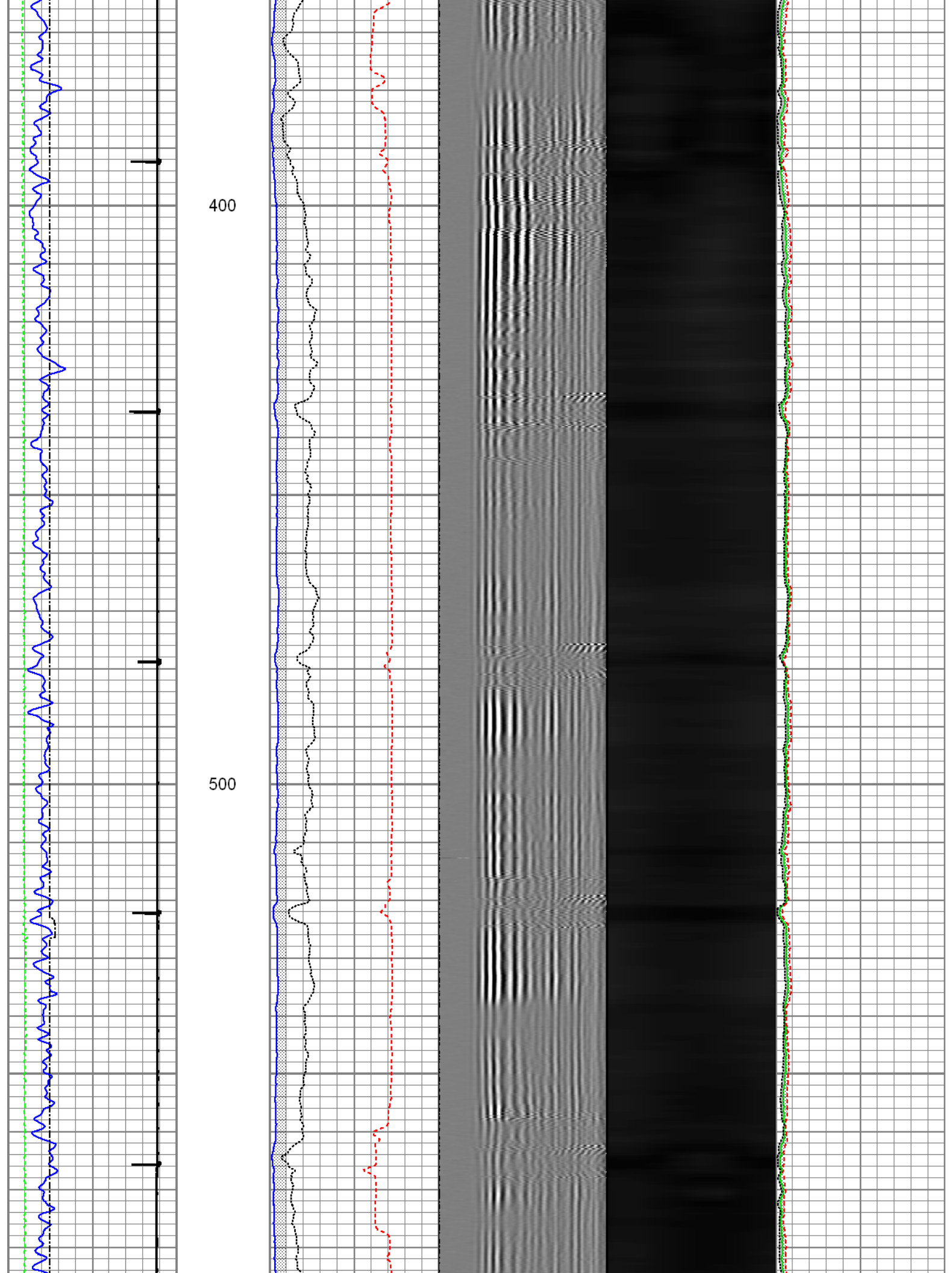
Thank you for choosing FMC Technologies Completion Services, Inc.!!

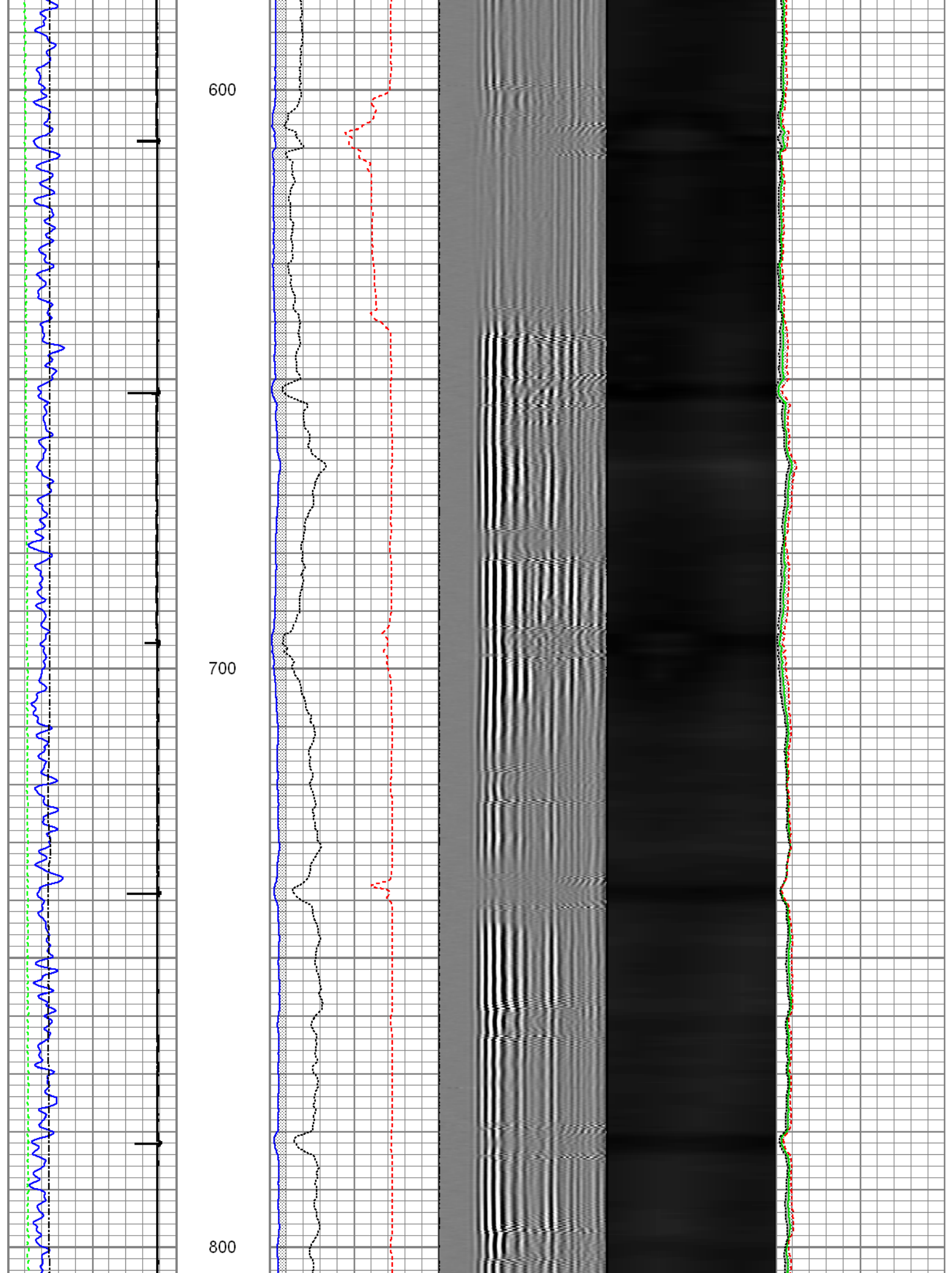
Database File: 0512339914_anadarko_morning fresh 36n-22hxr_08-21-14_mit_rbl.db
Dataset Pathname: pass4
Presentation Format: rbt4_mit
Dataset Creation: Thu Aug 21 08:52:11 2014 by Log SCH 111116
Charted by: Depth in Feet scaled 1:240

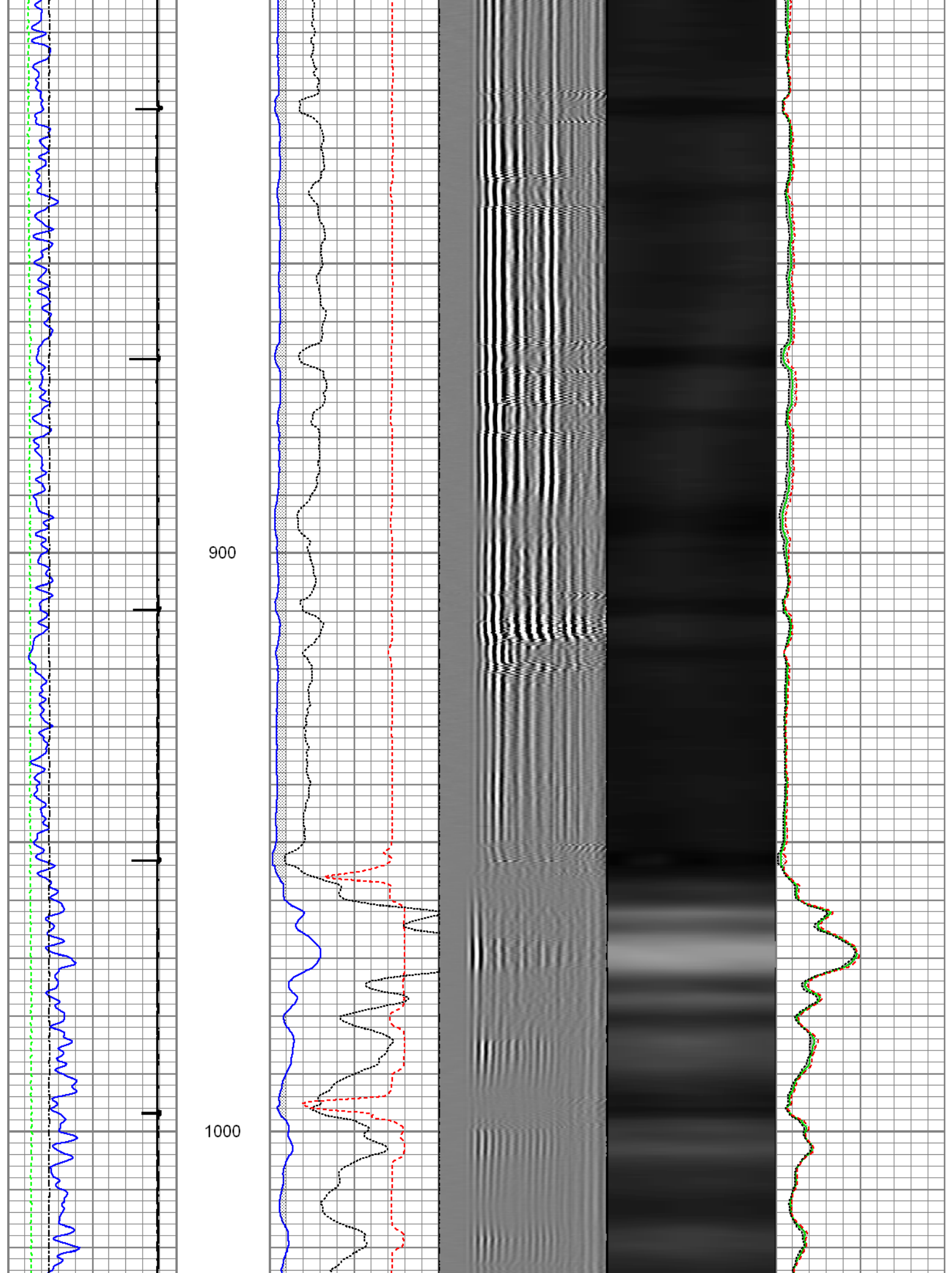
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Minimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000				

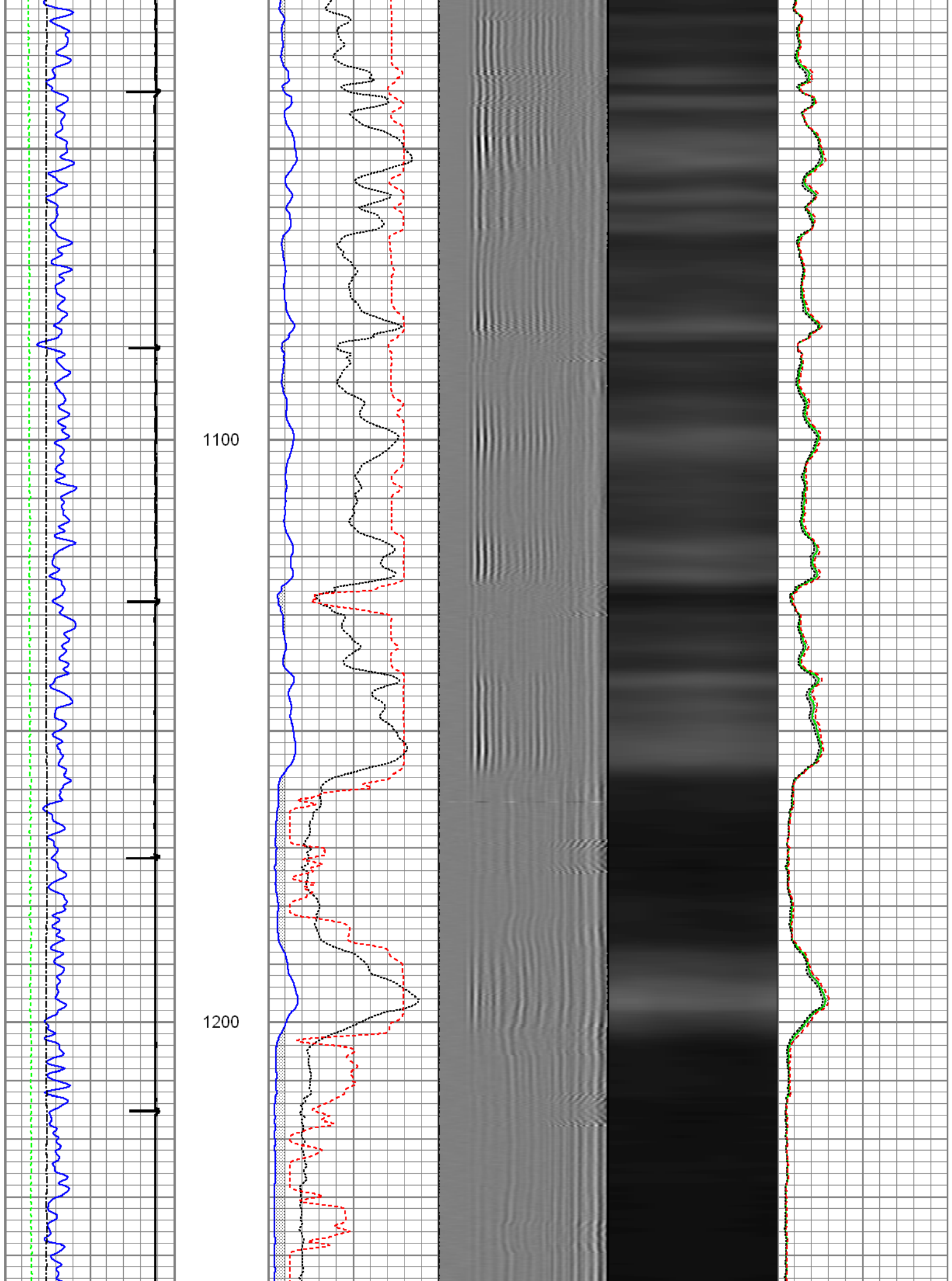


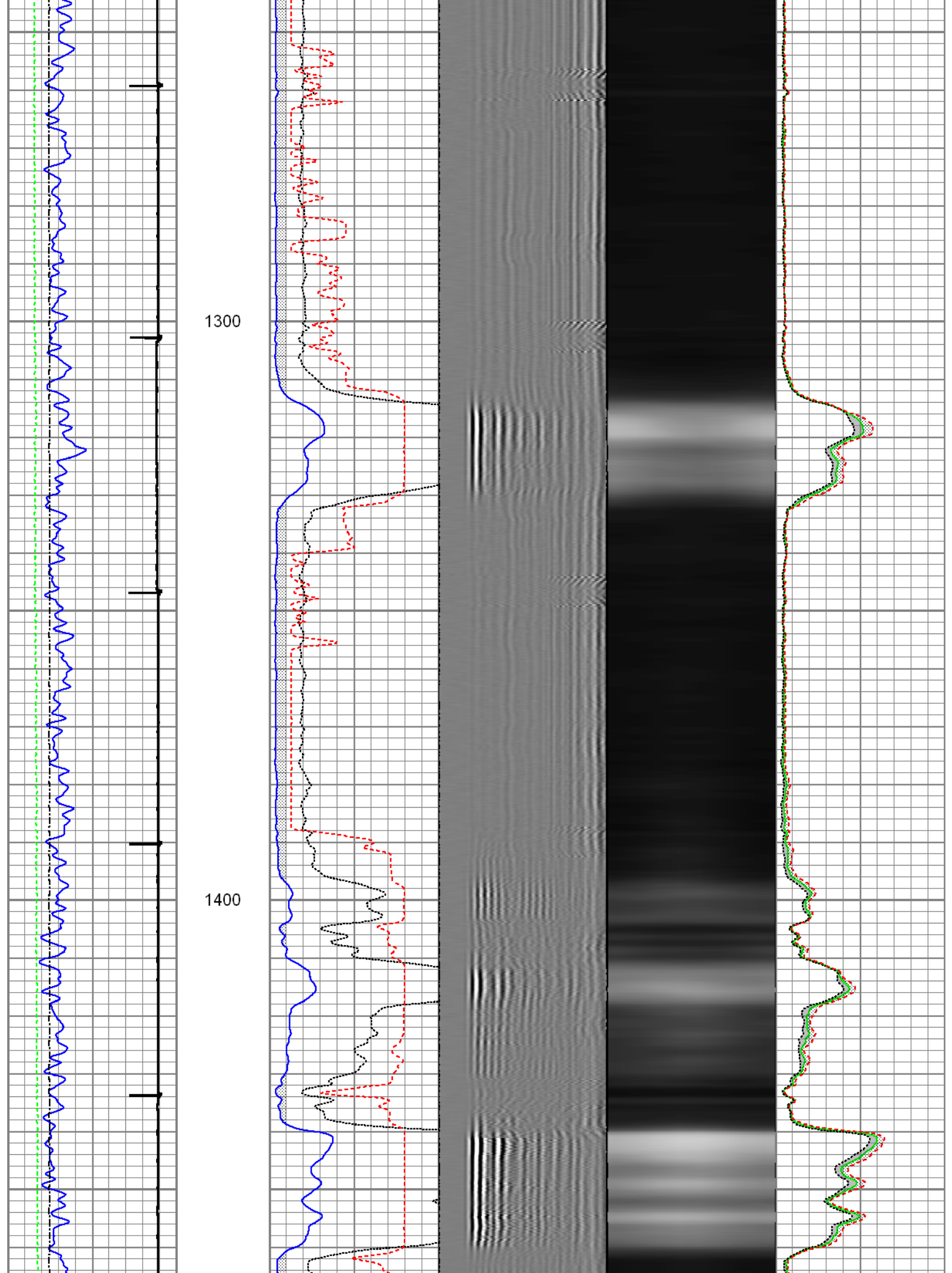


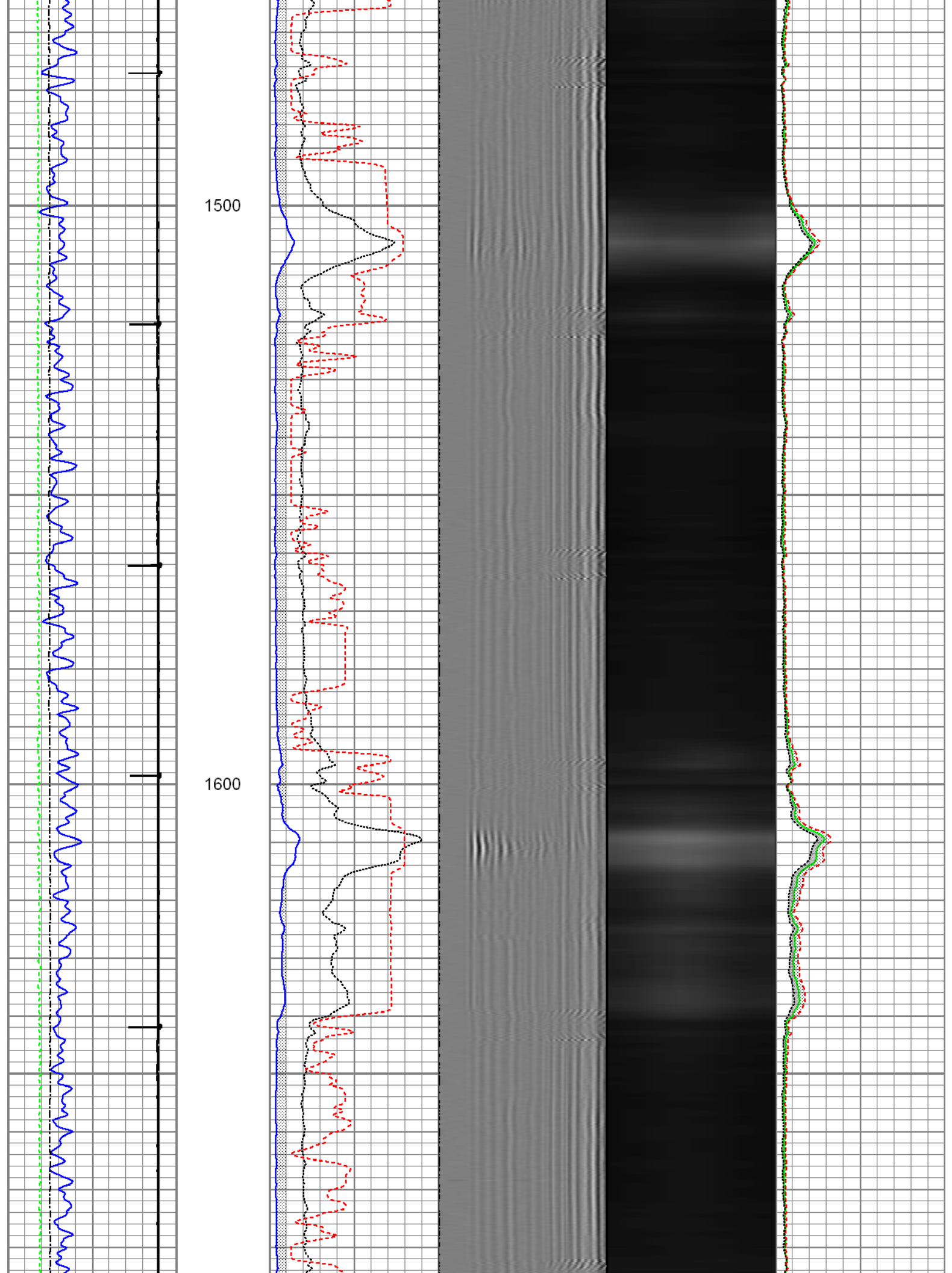








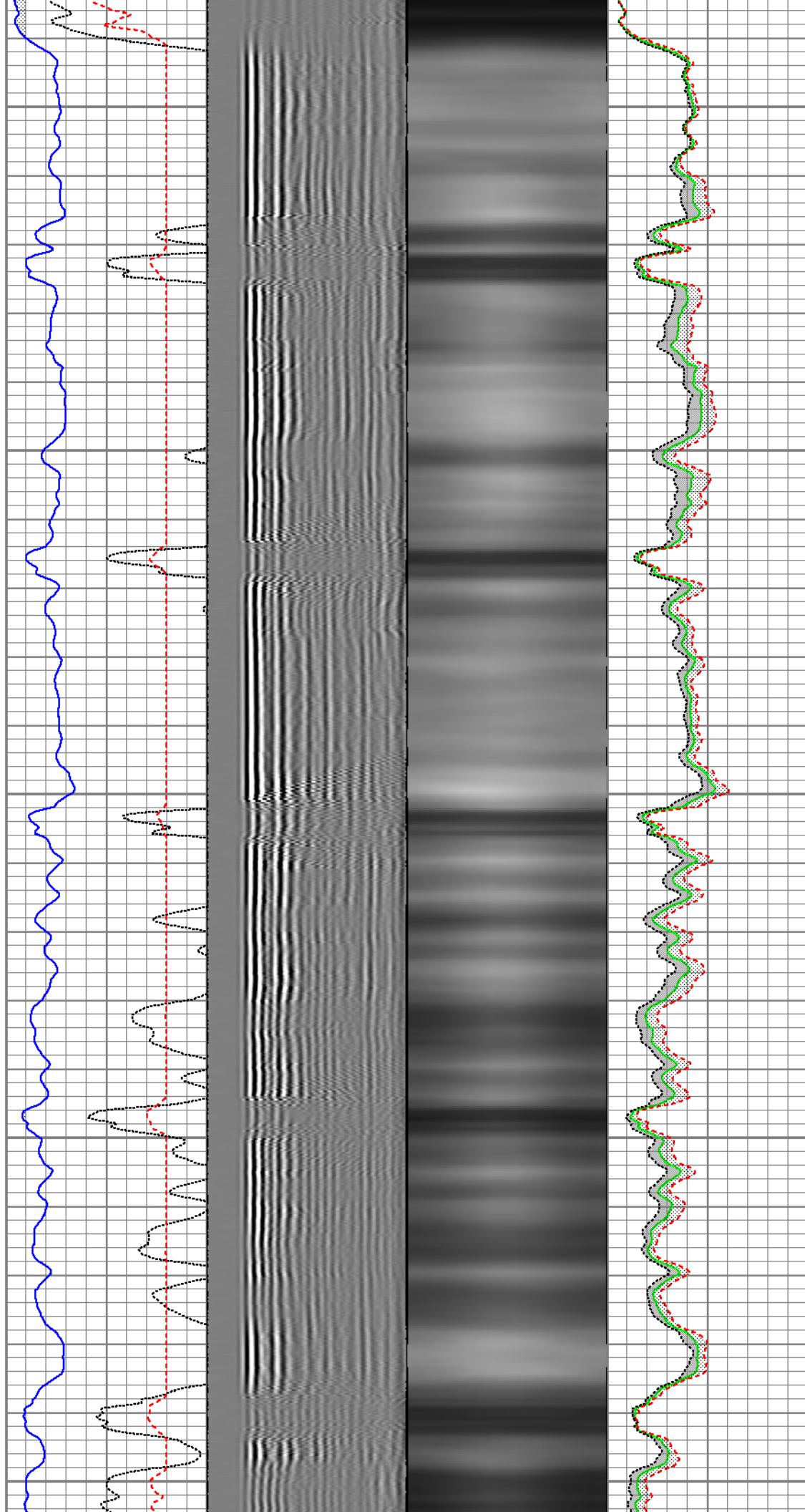


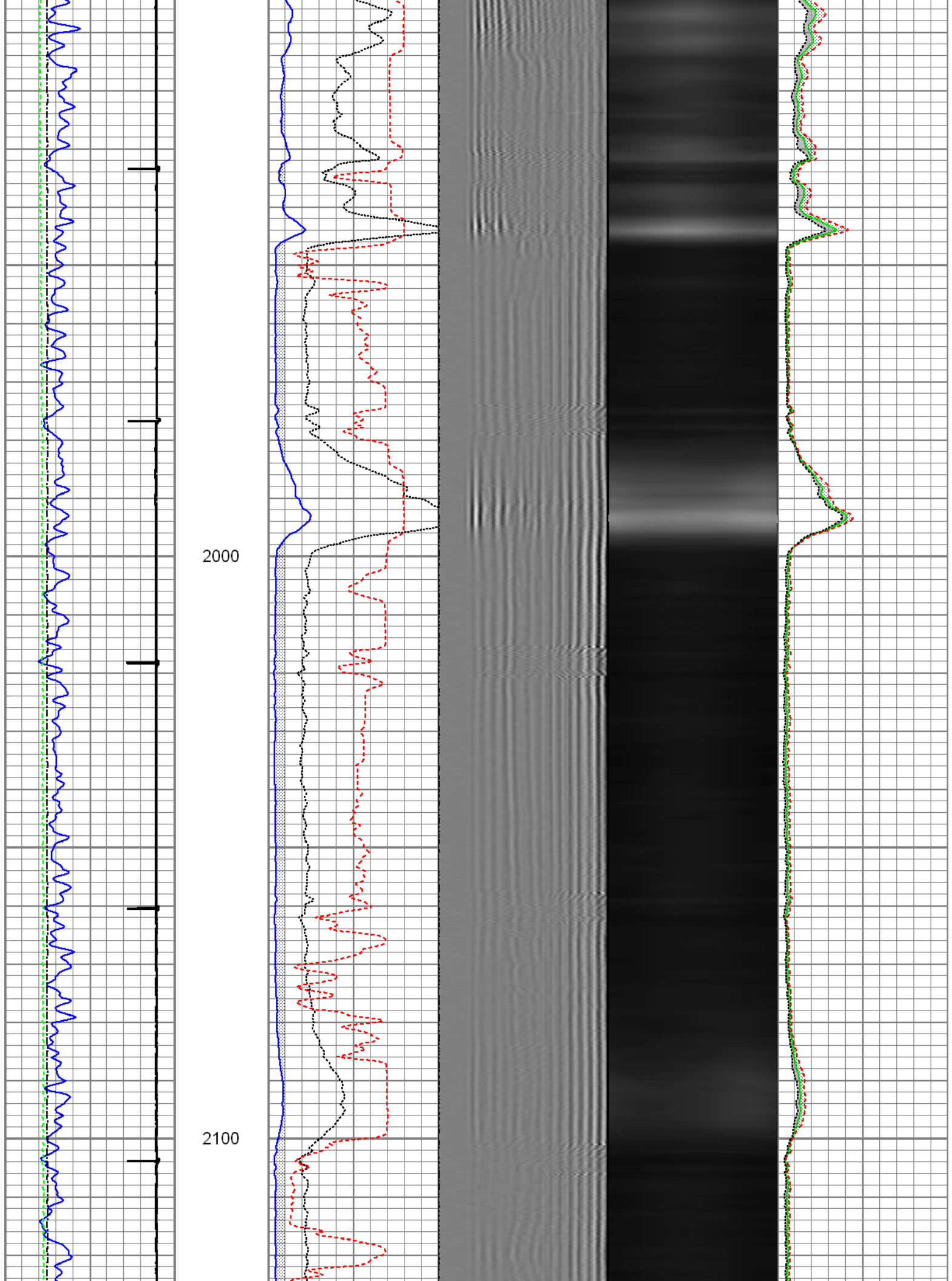


1700

1800

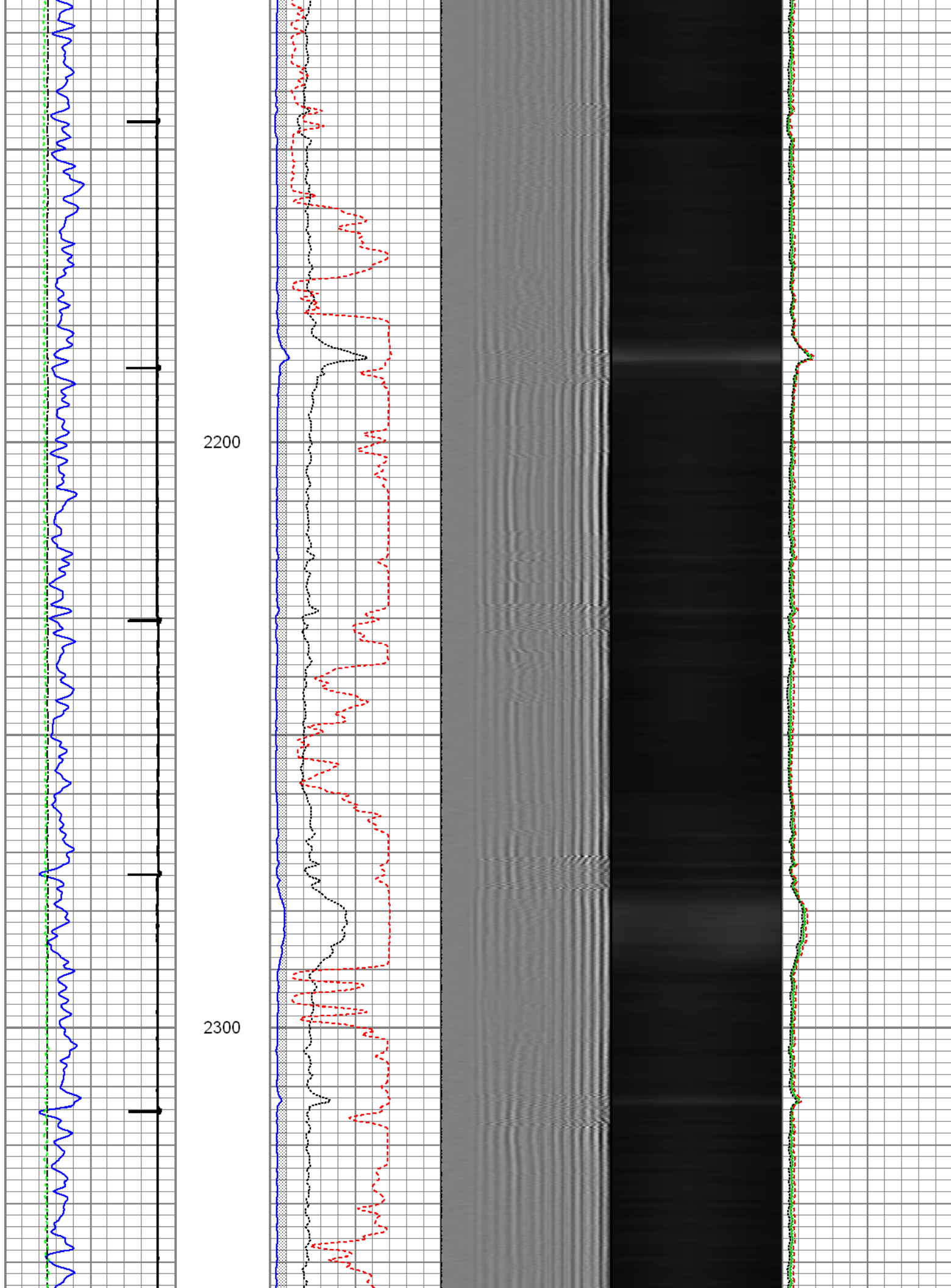
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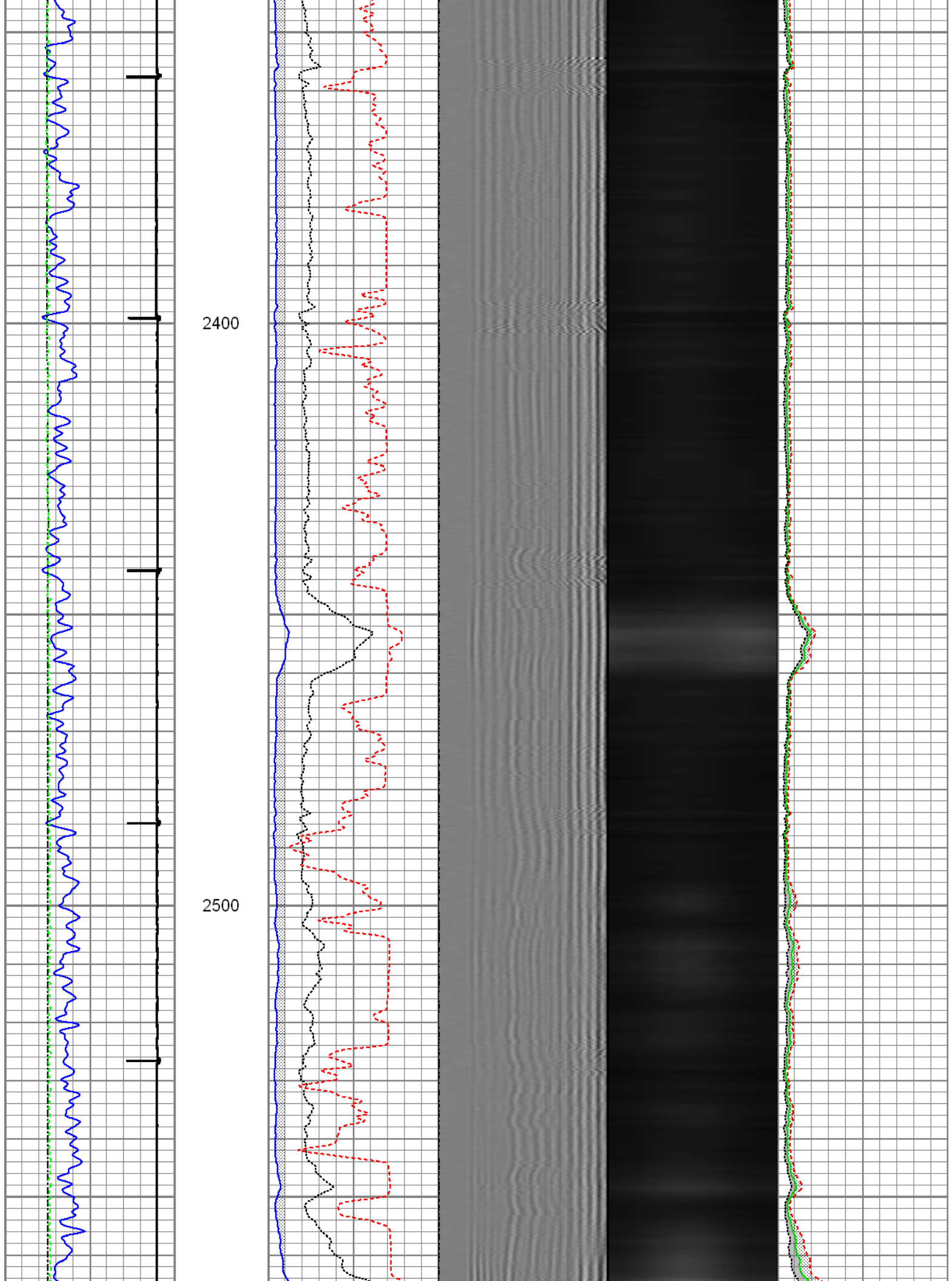


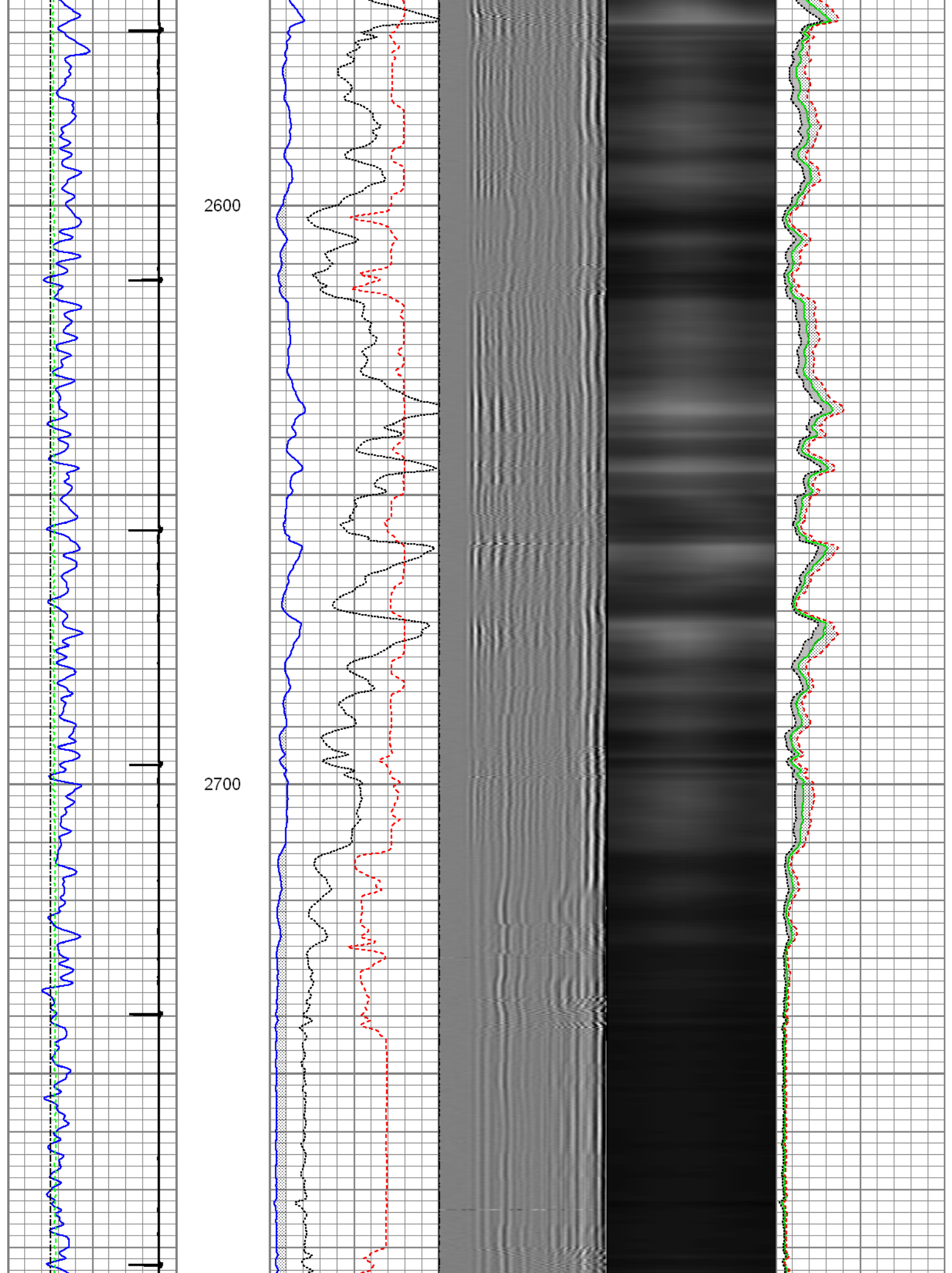


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2300



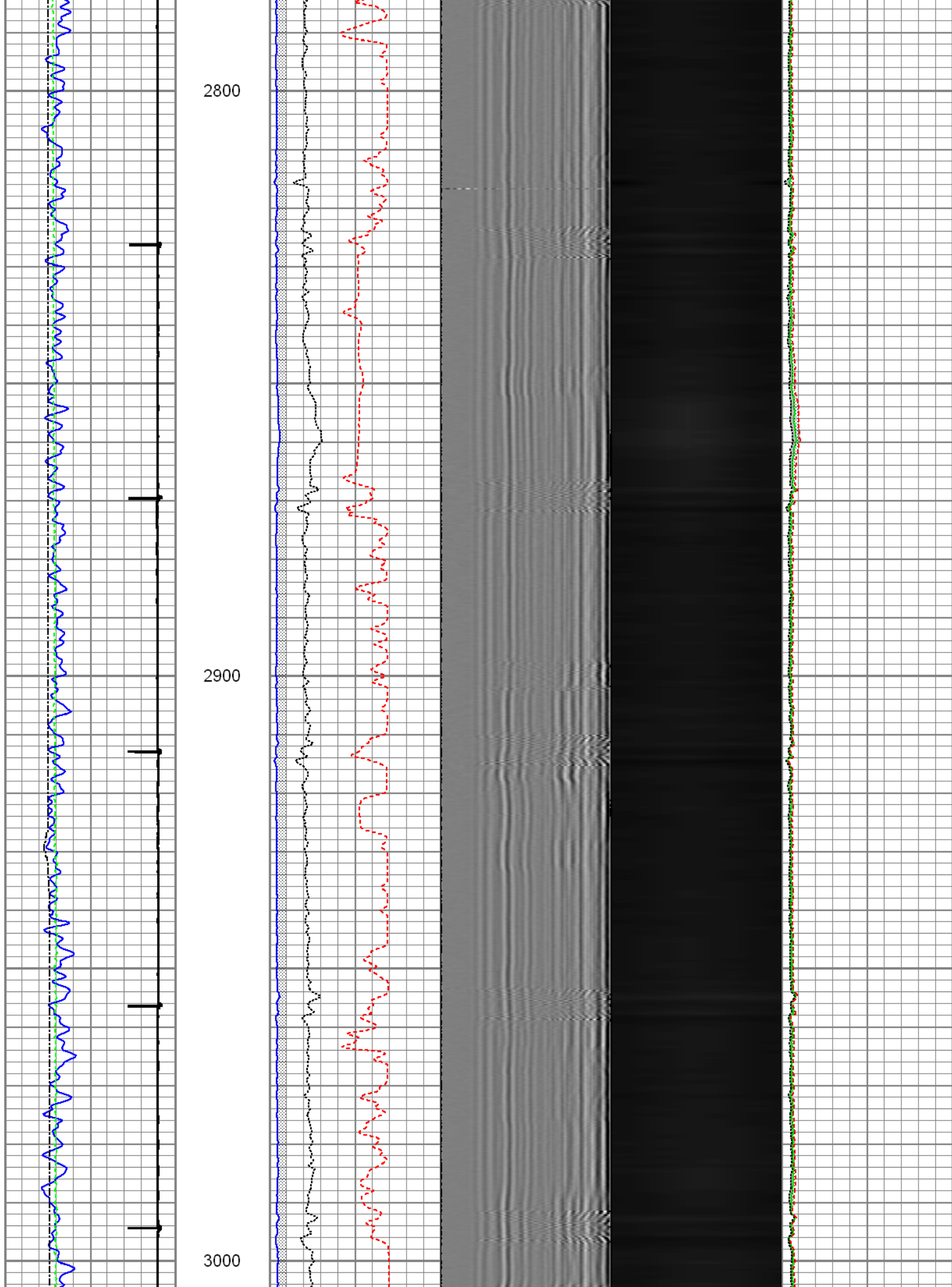




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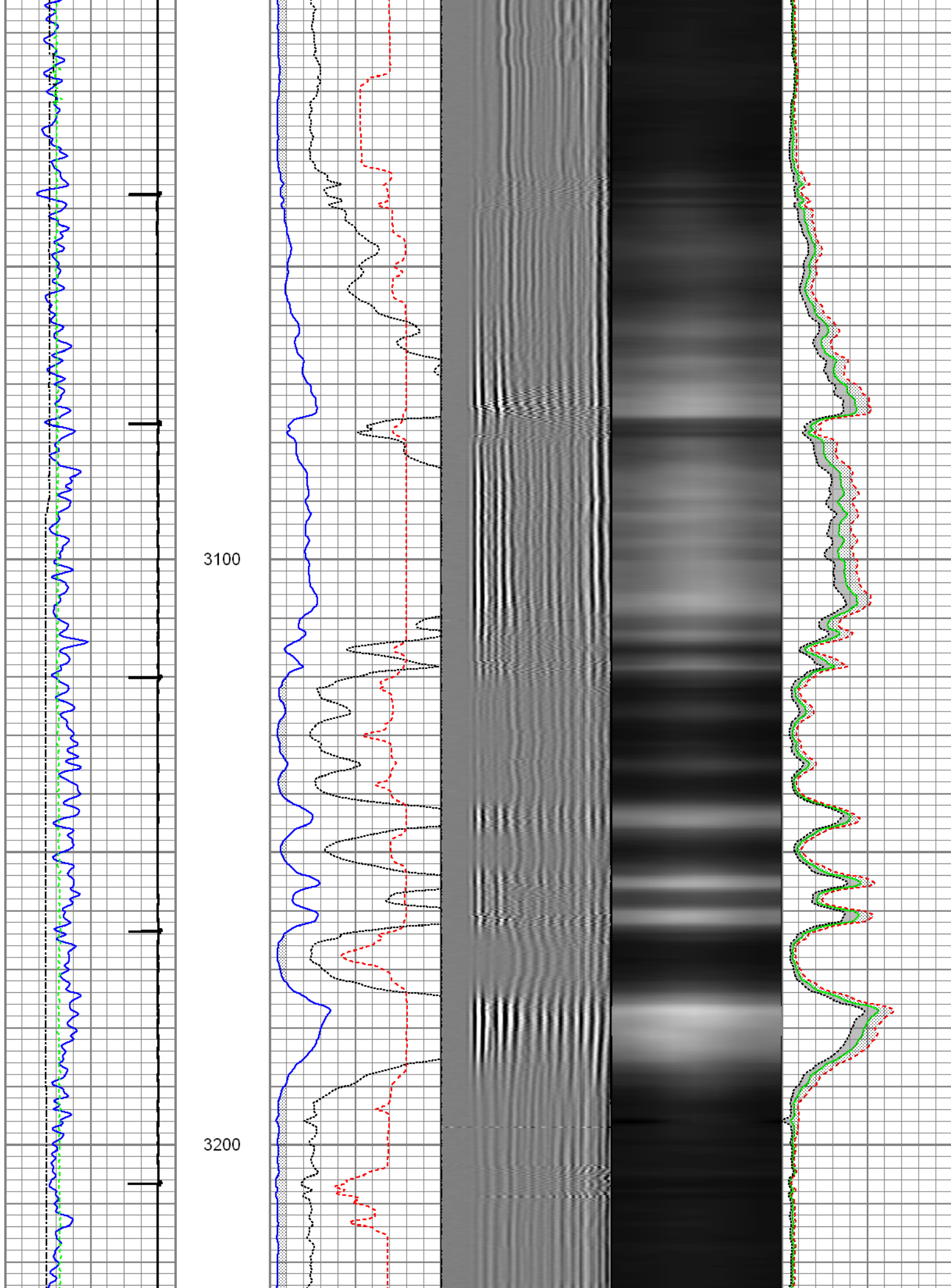
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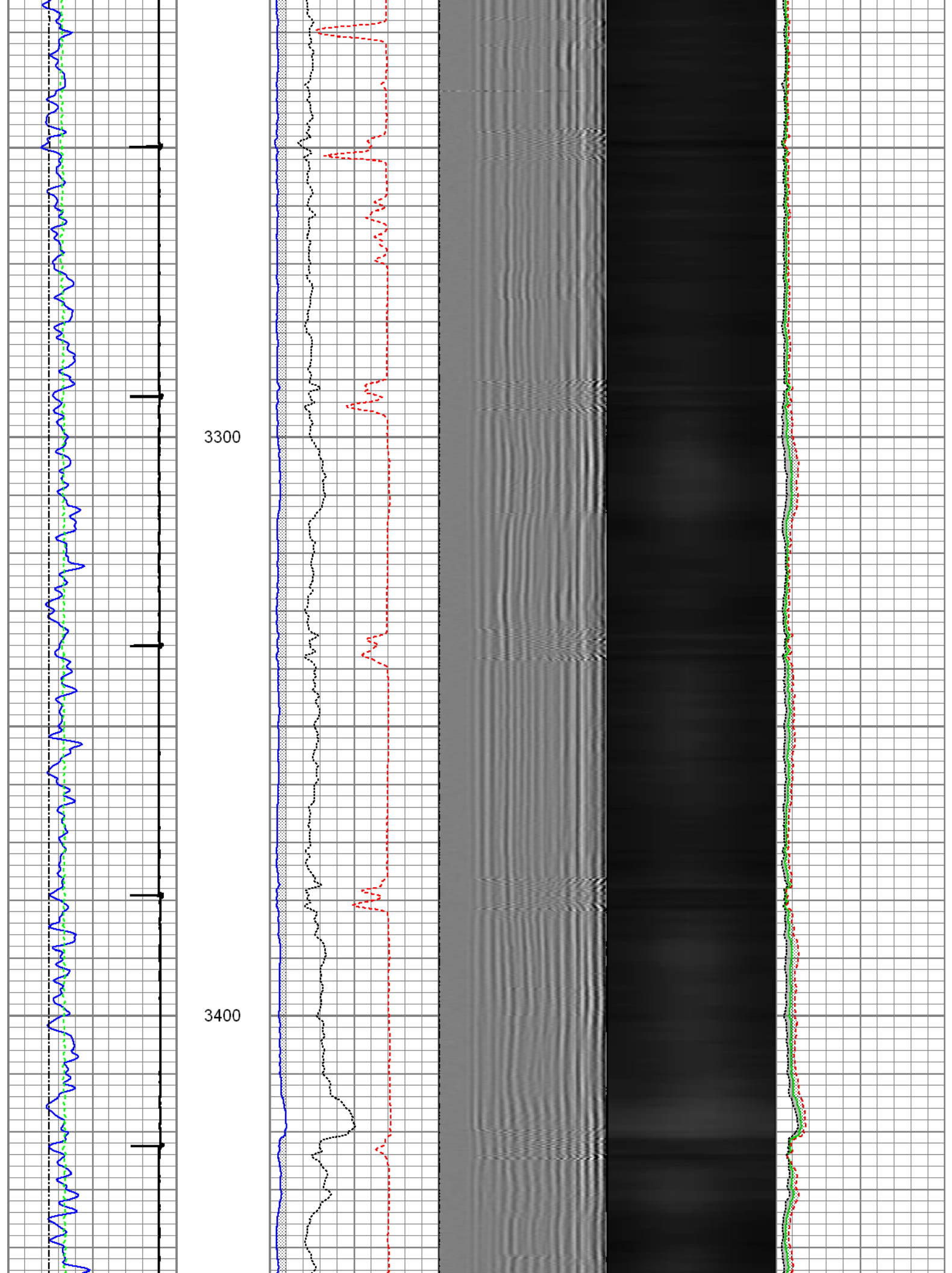
3000



3100

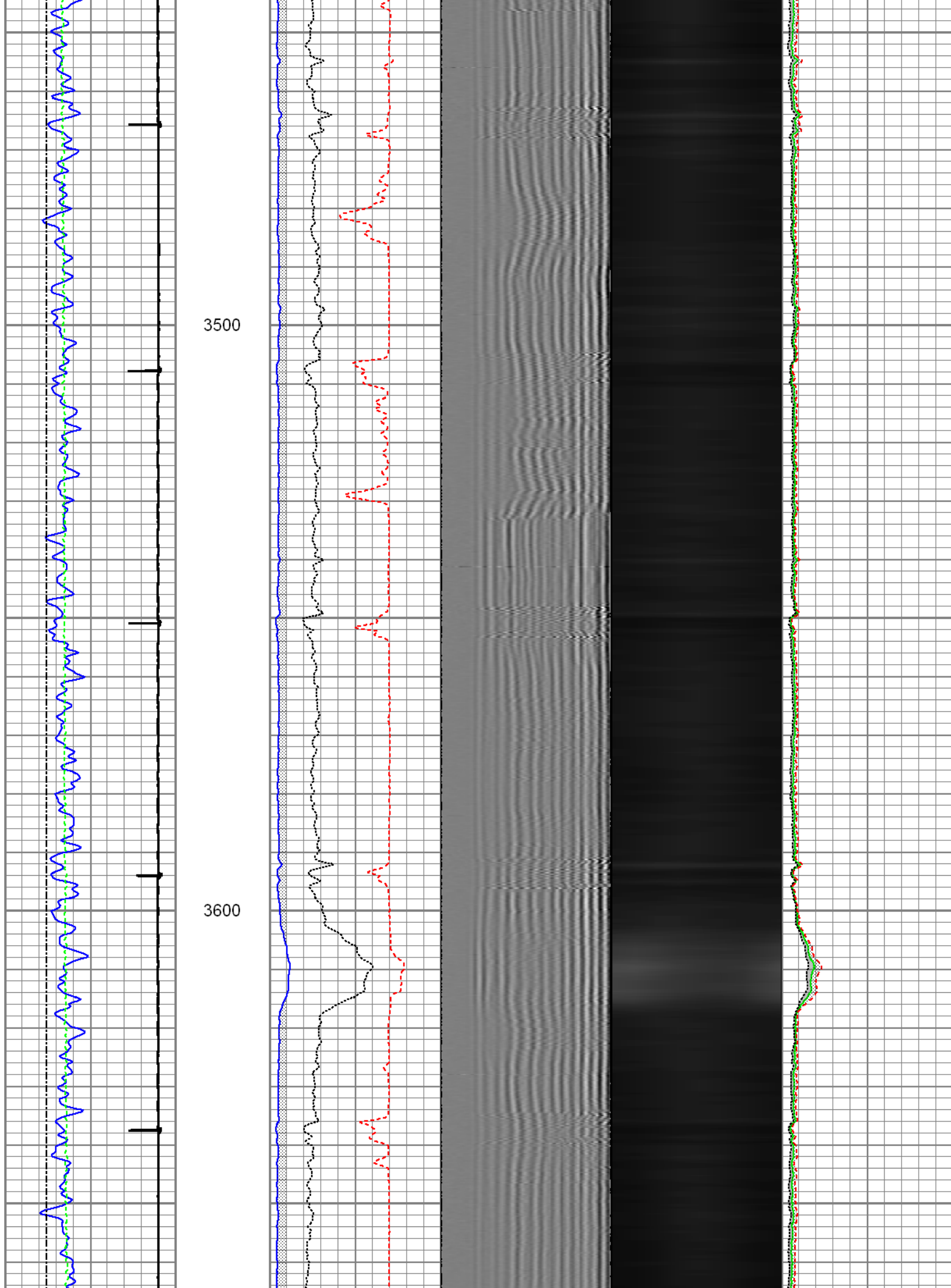
3200





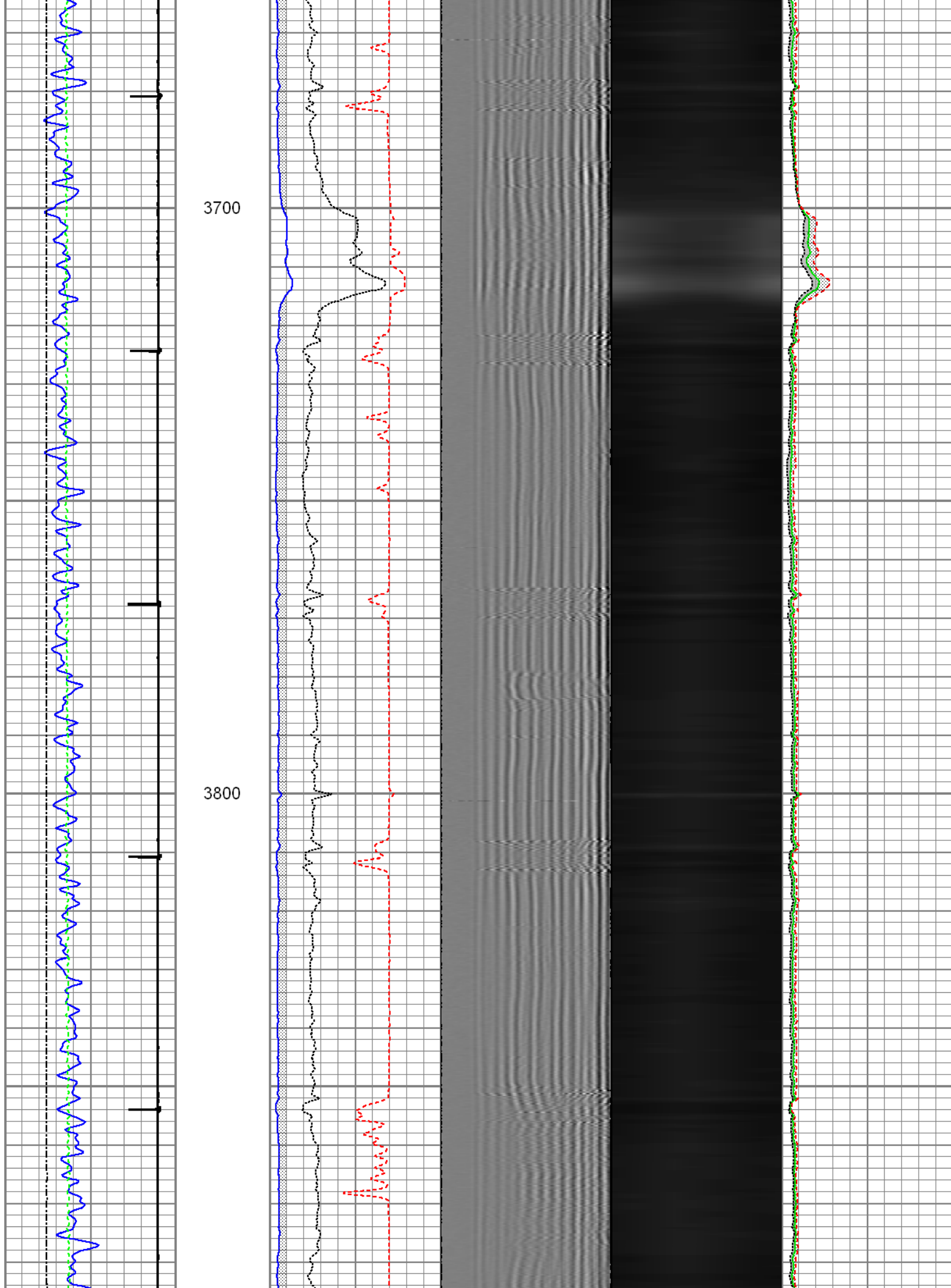
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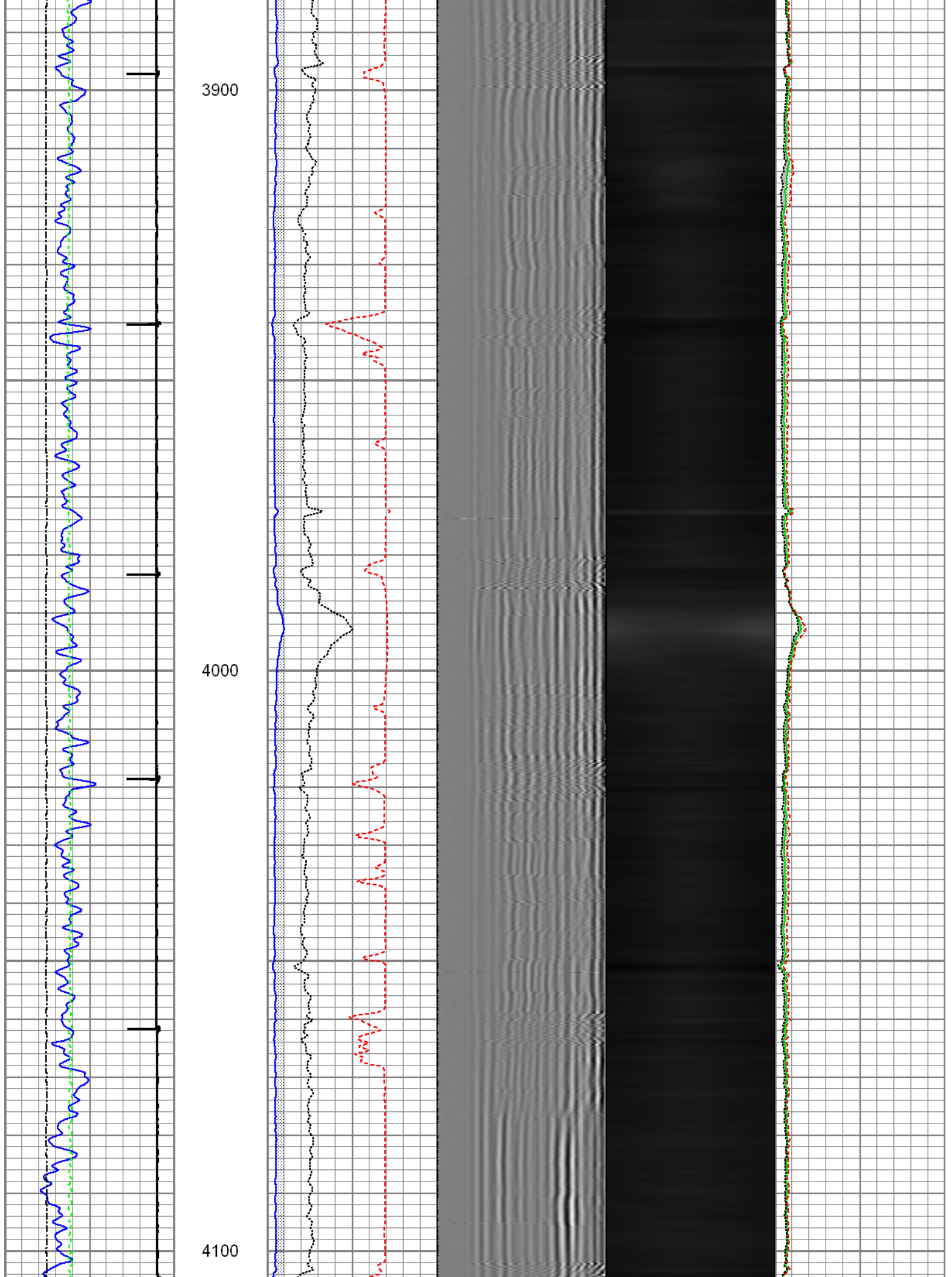
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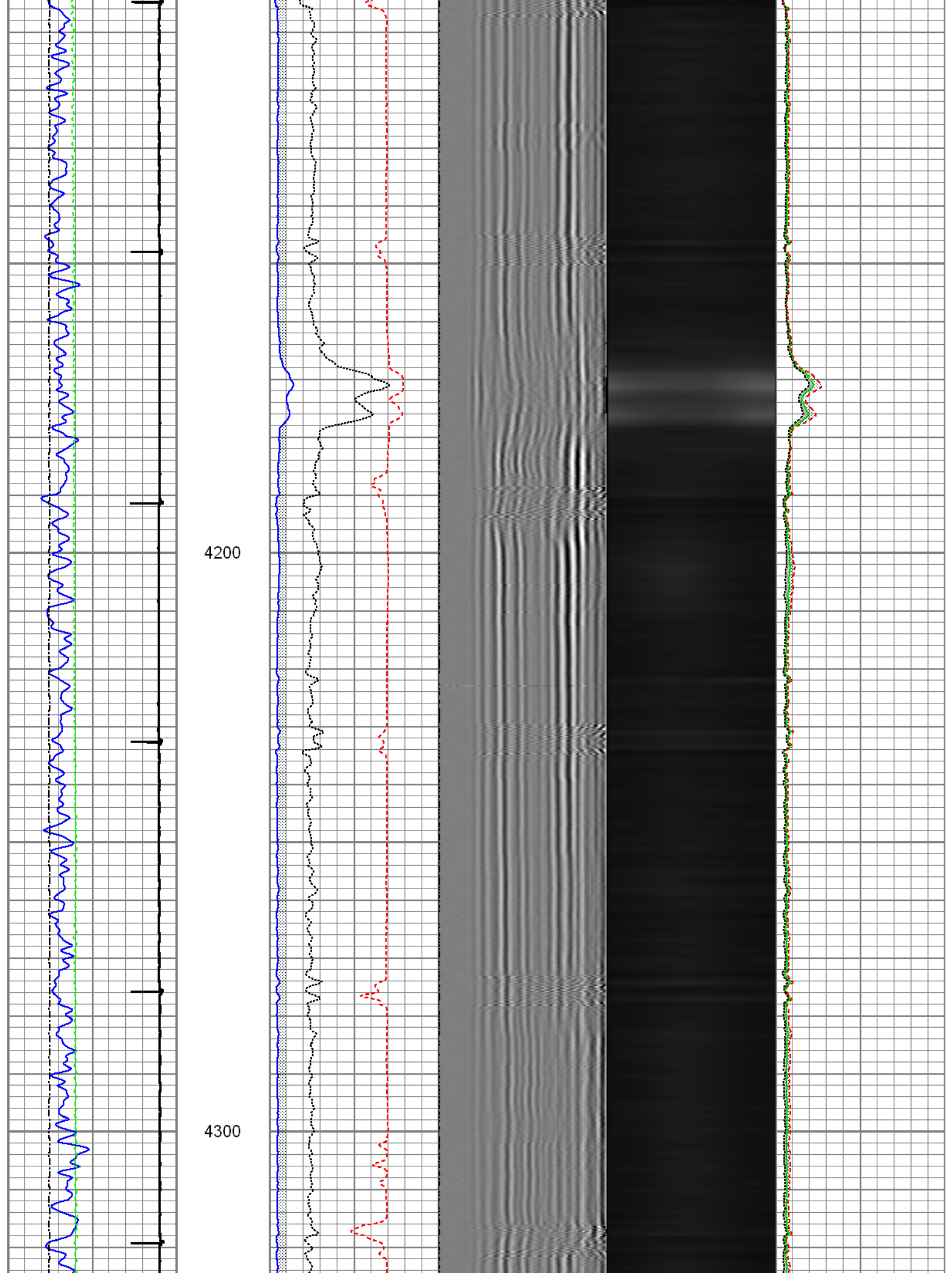


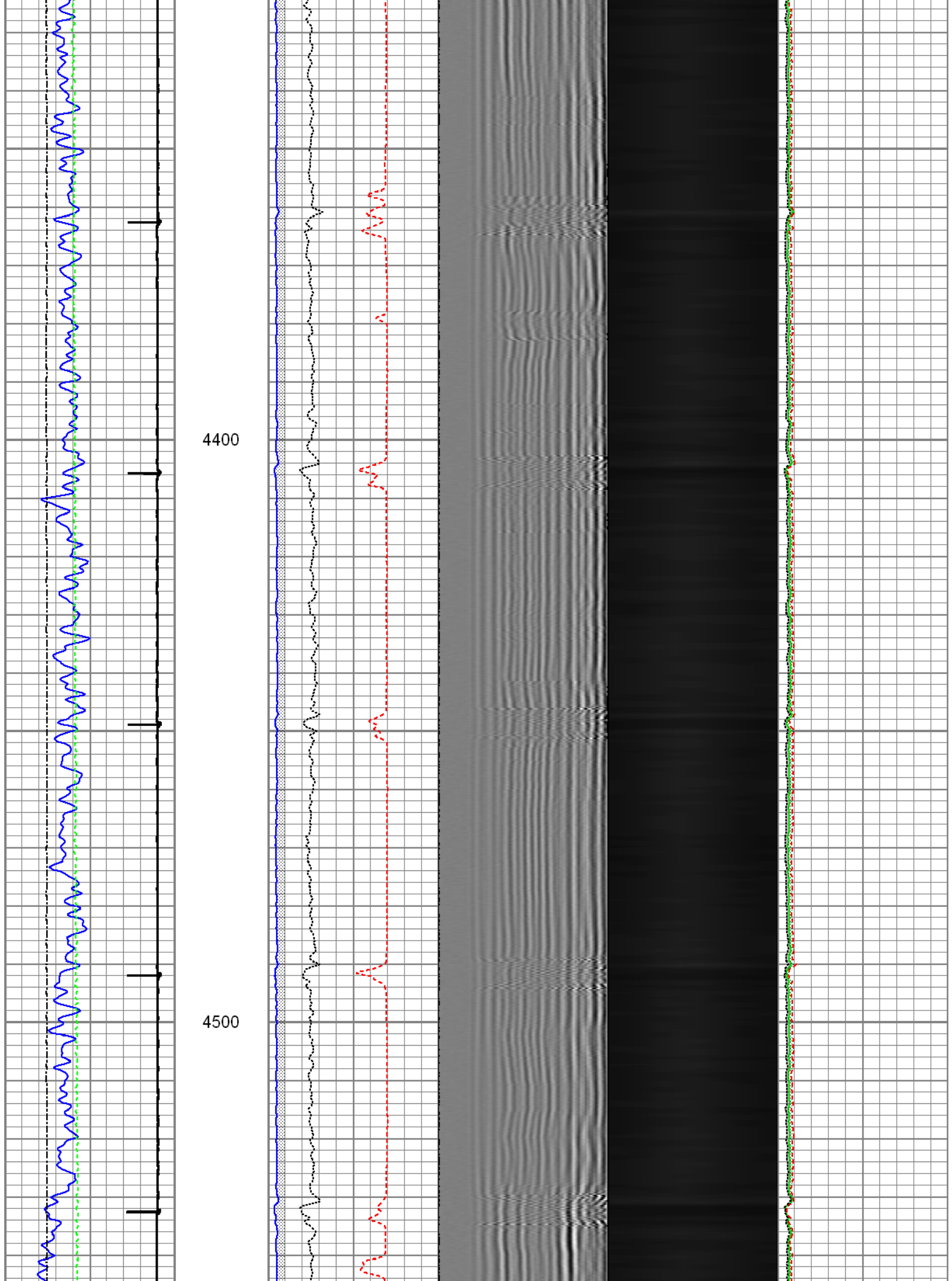
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3800



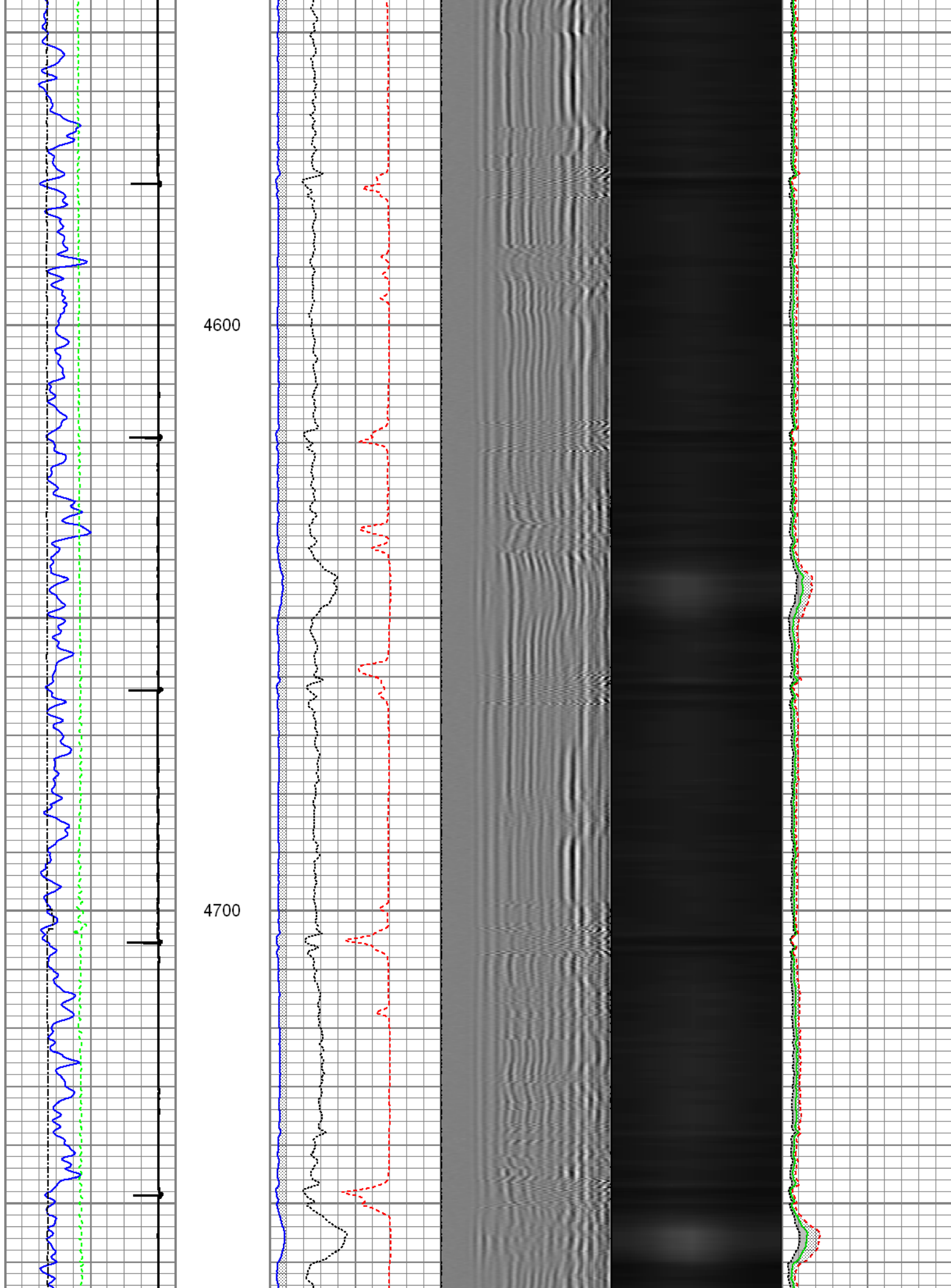






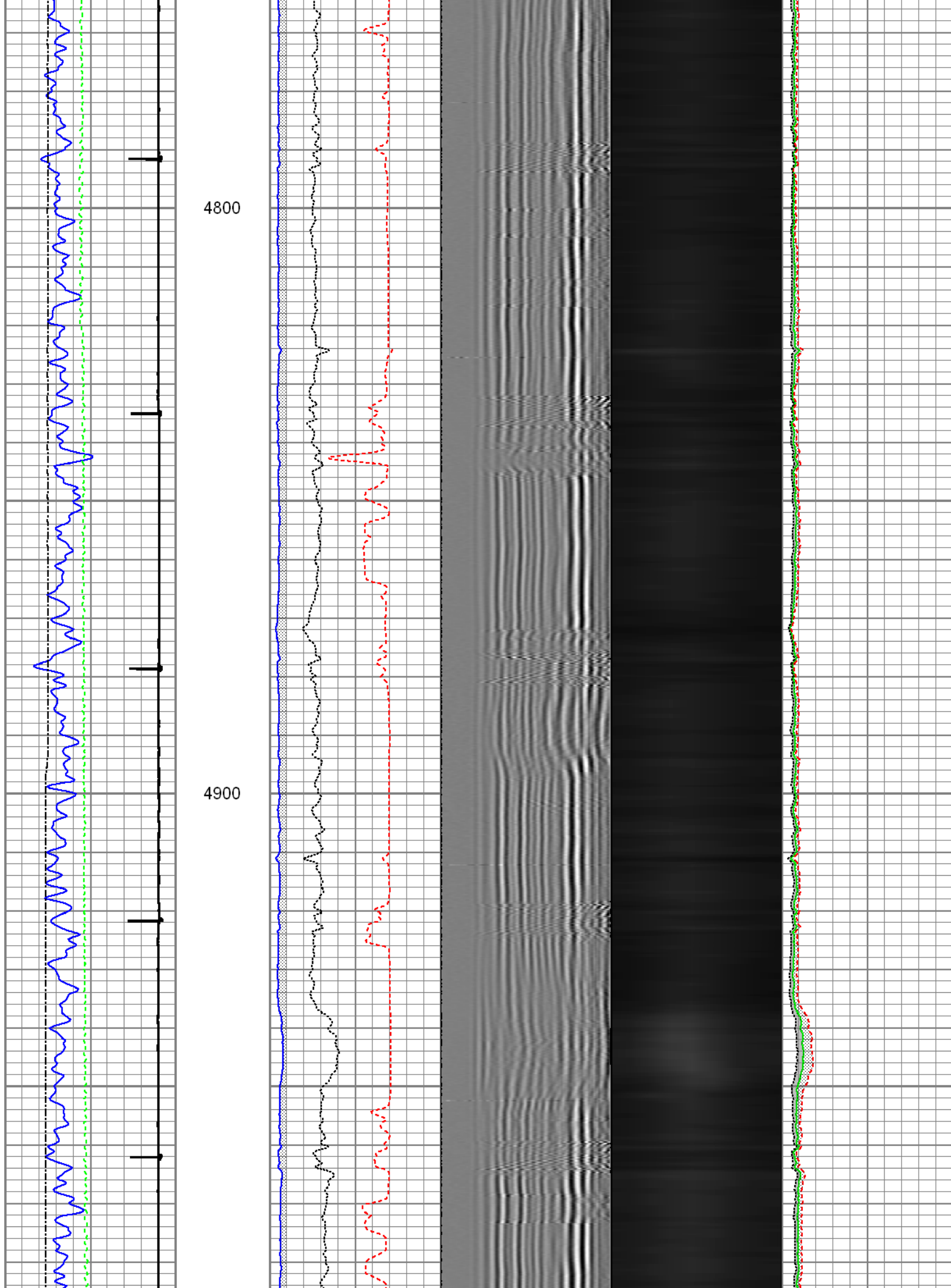
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4700



4800

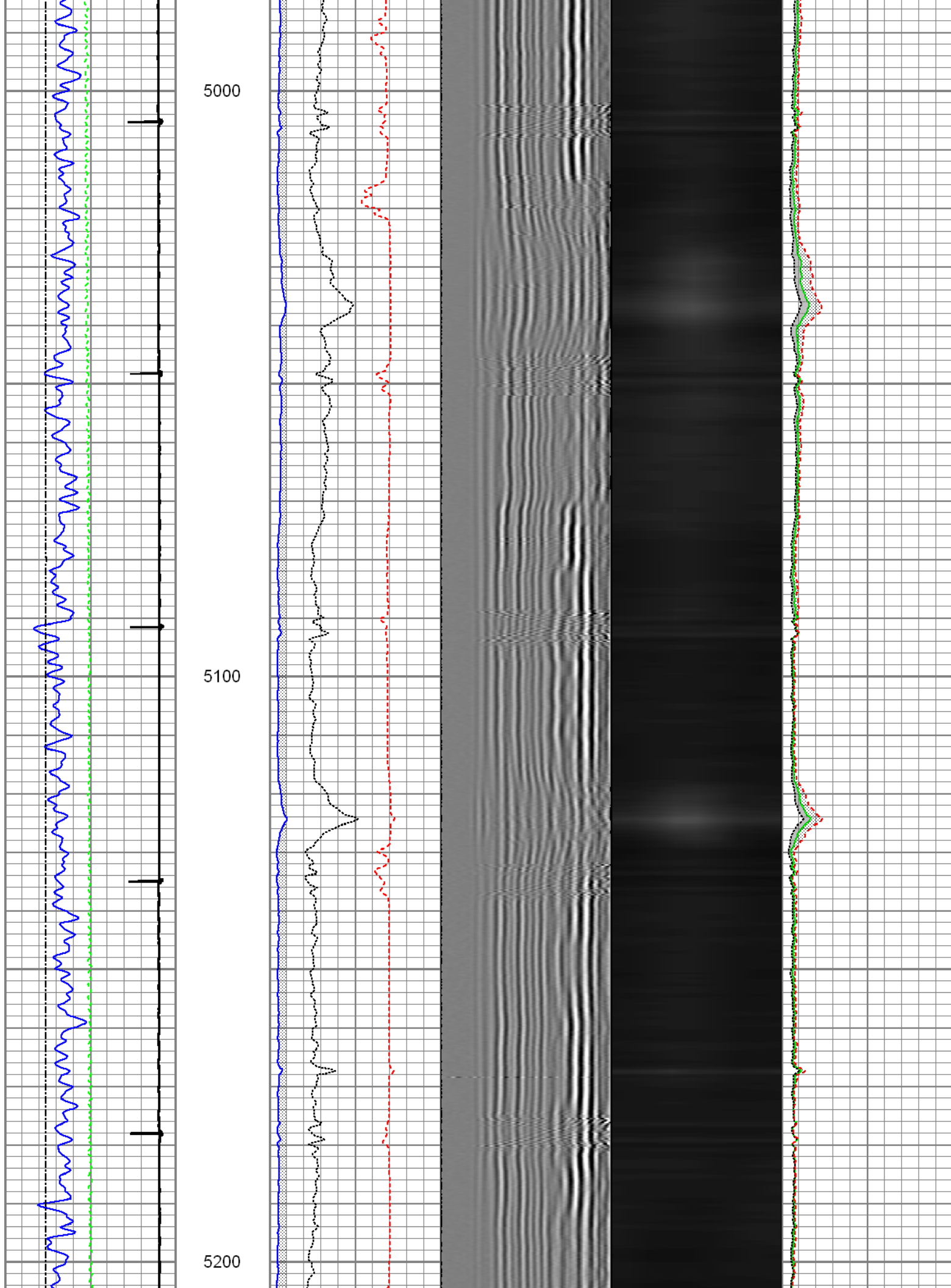
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5000

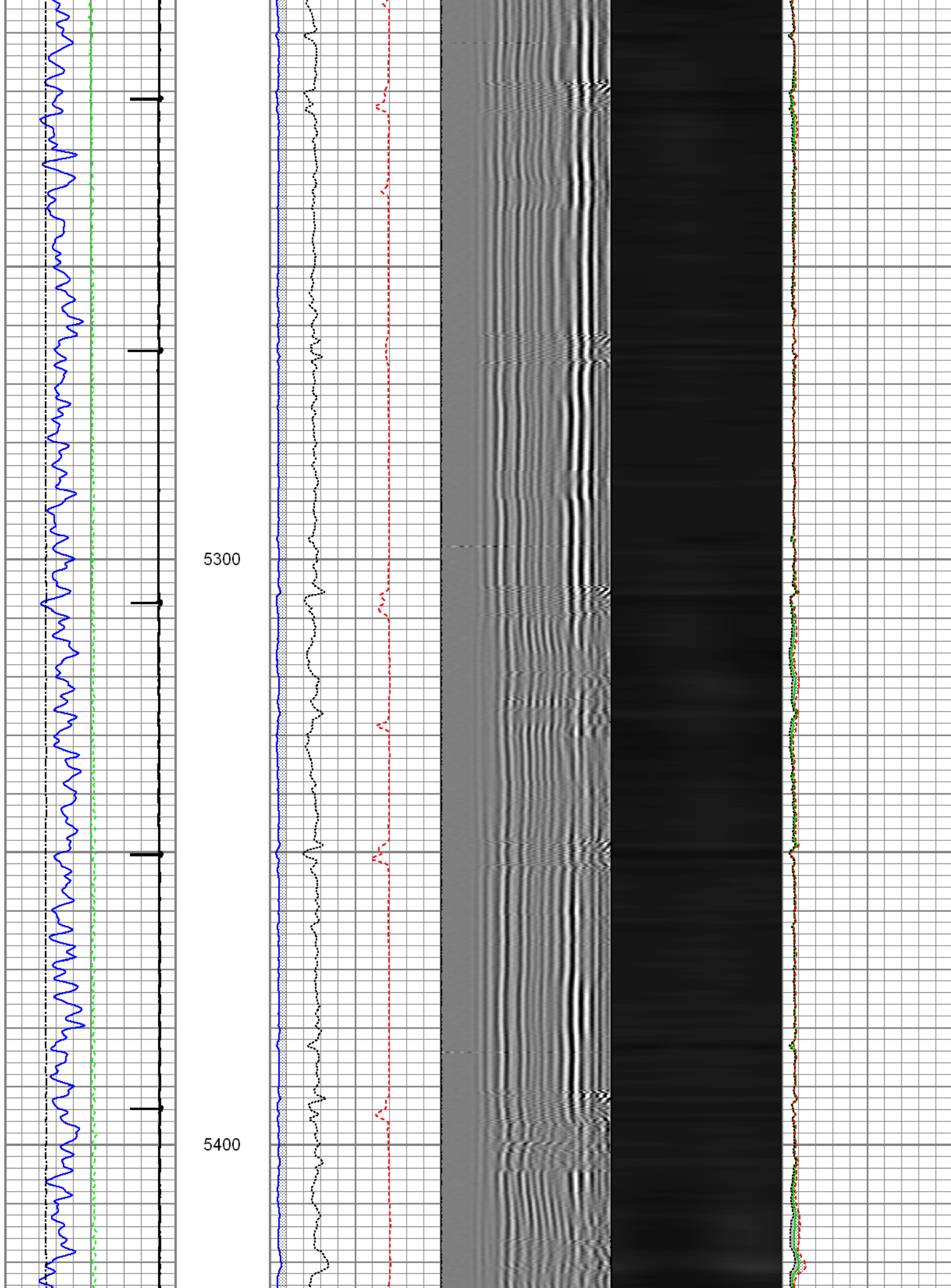
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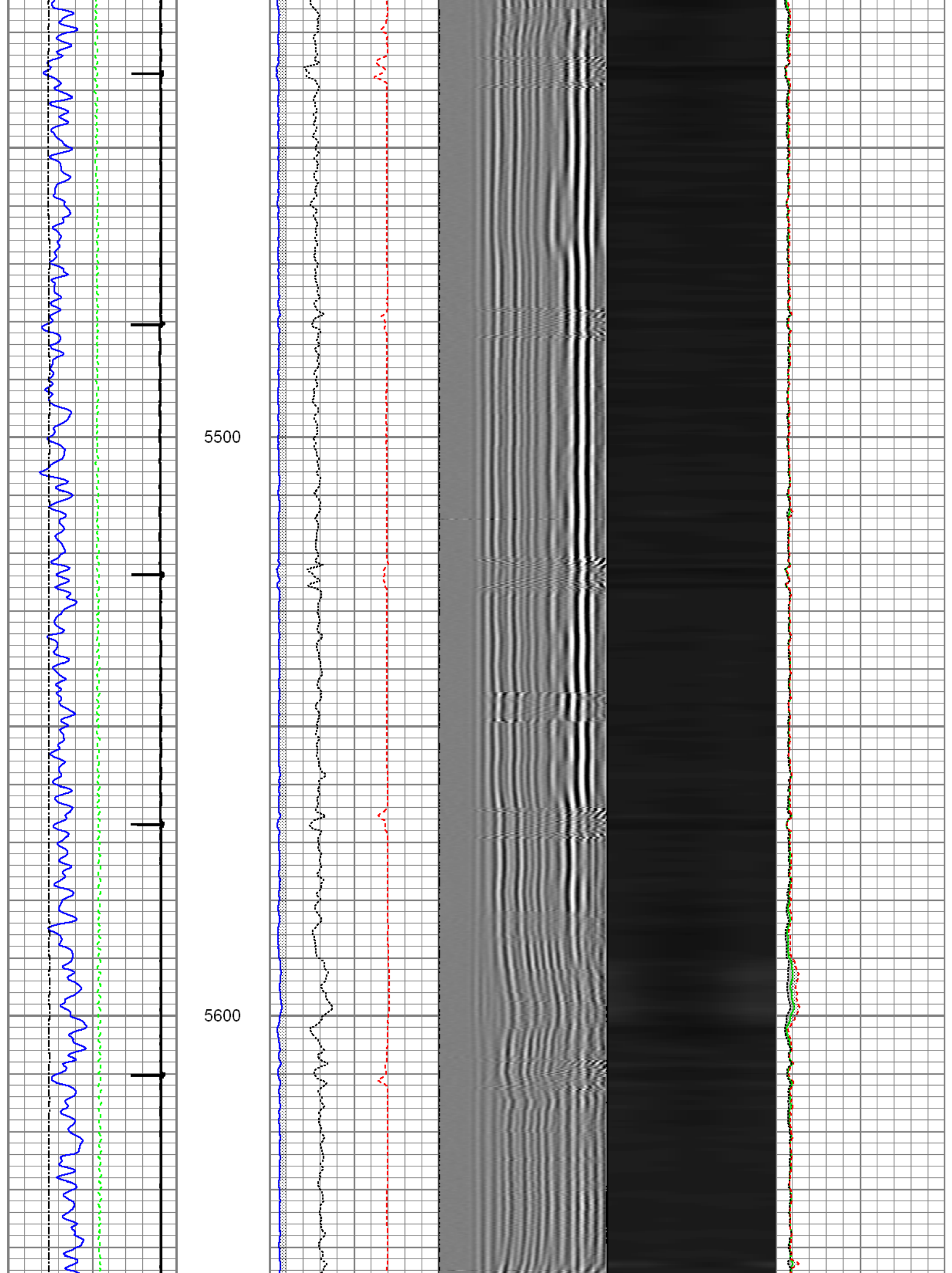
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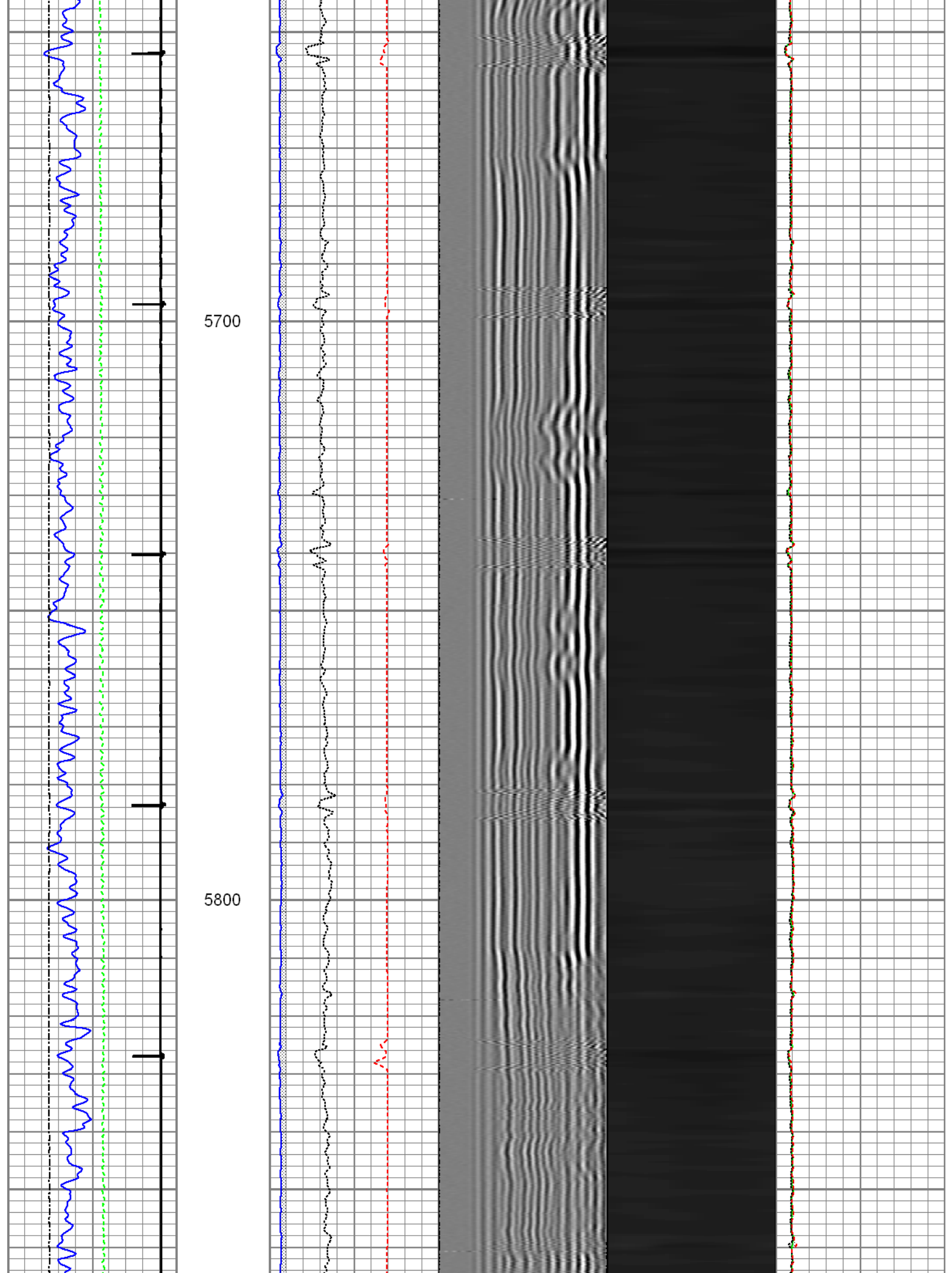


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5400

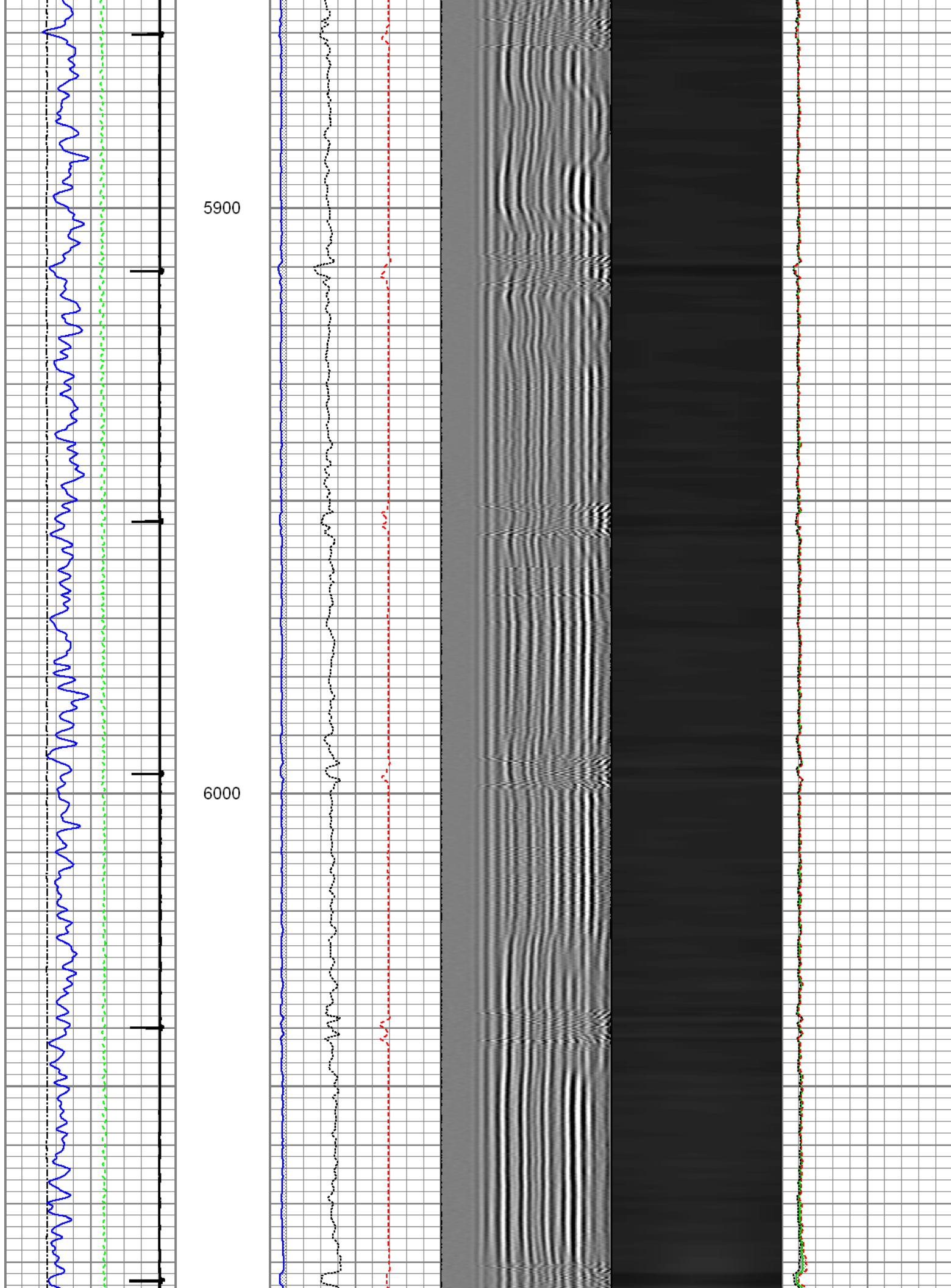






5900

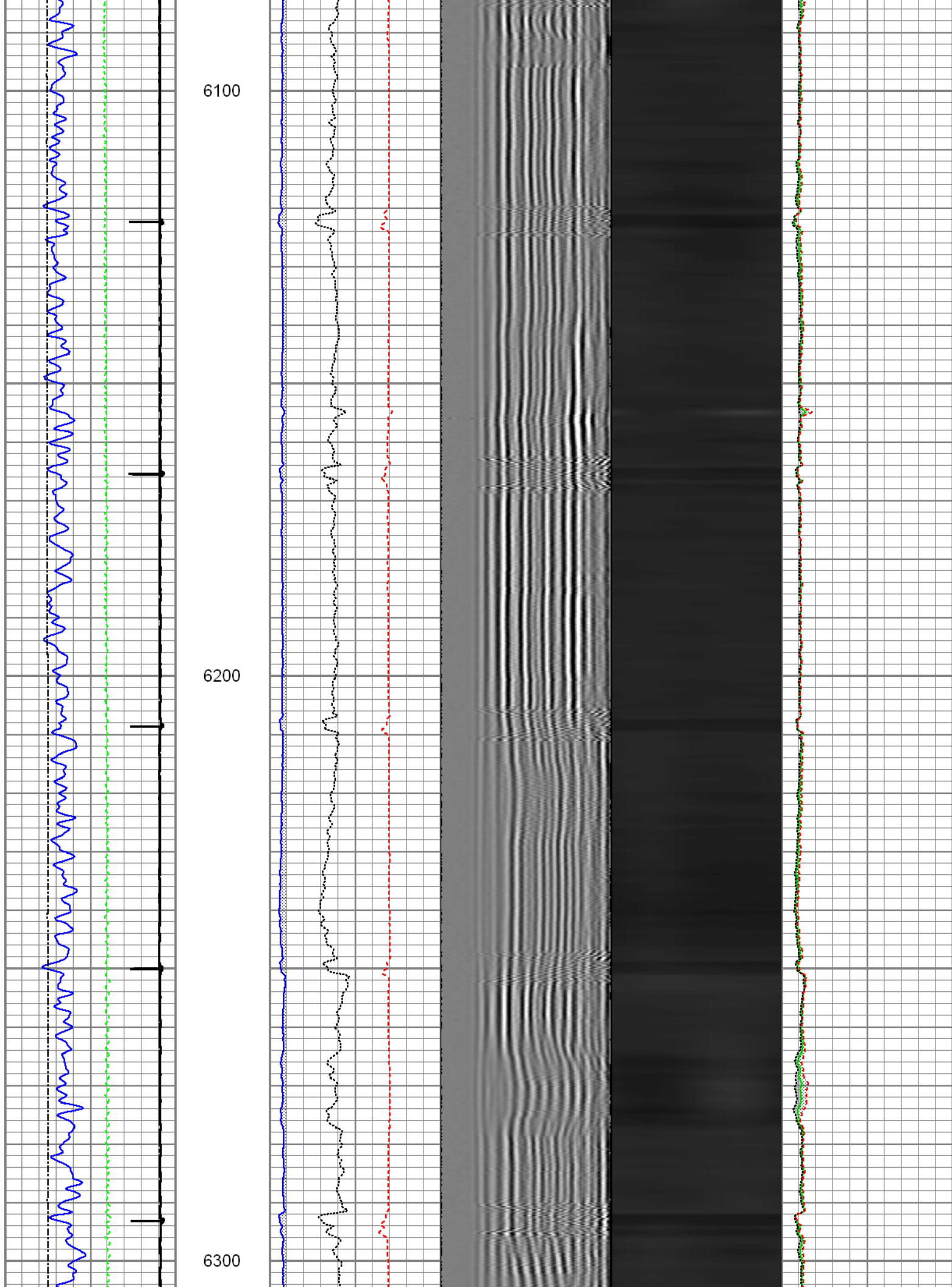
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6100

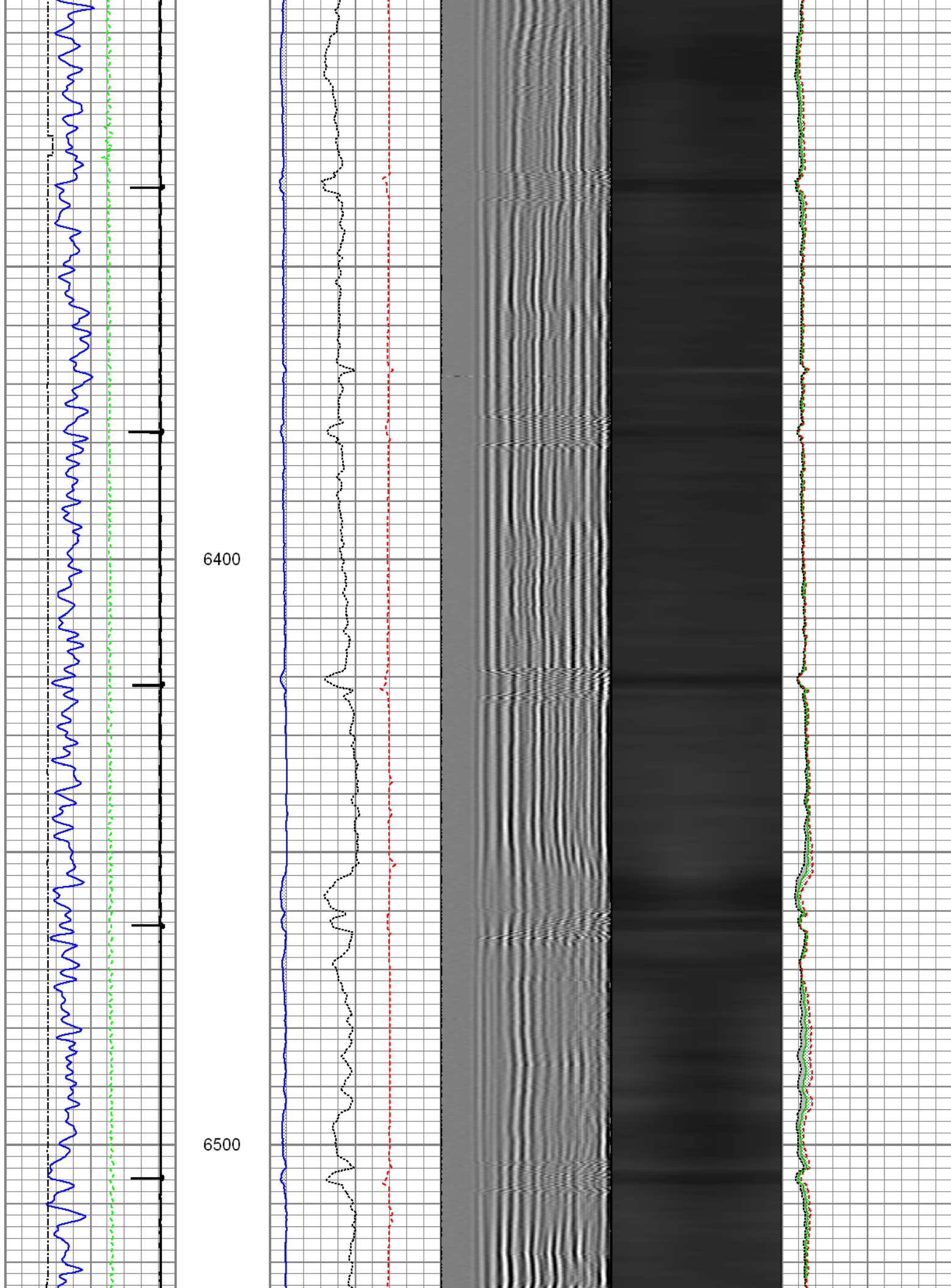
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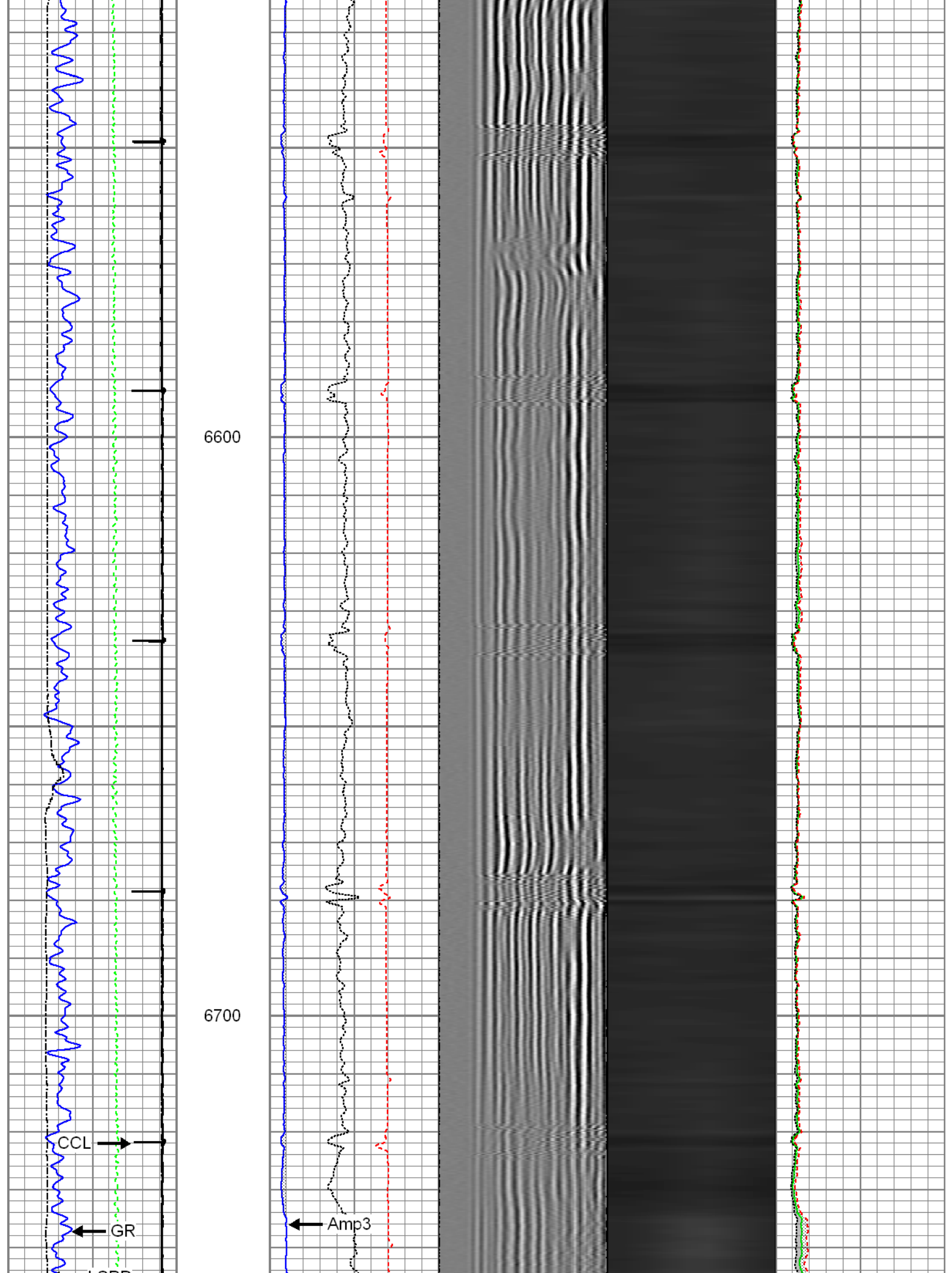
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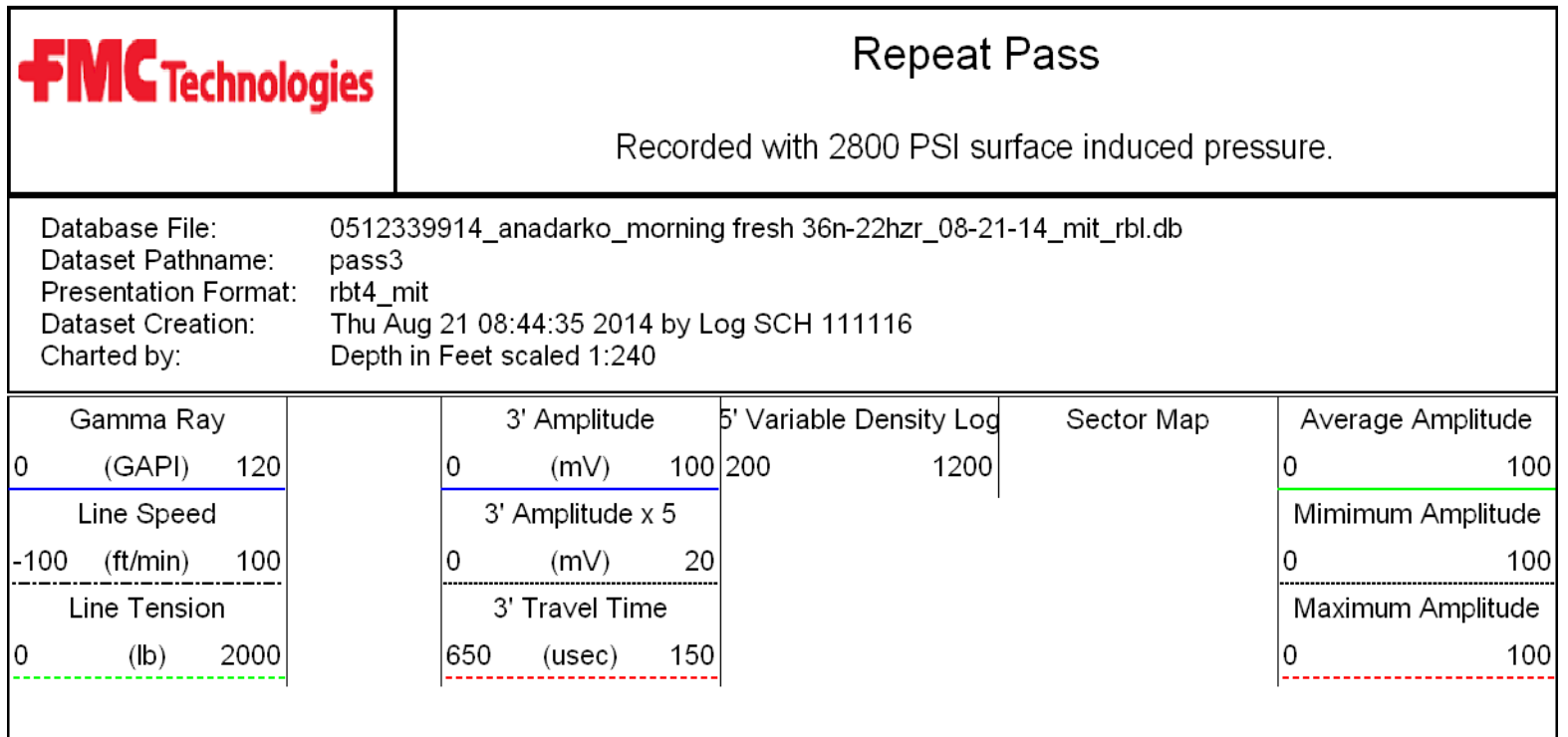
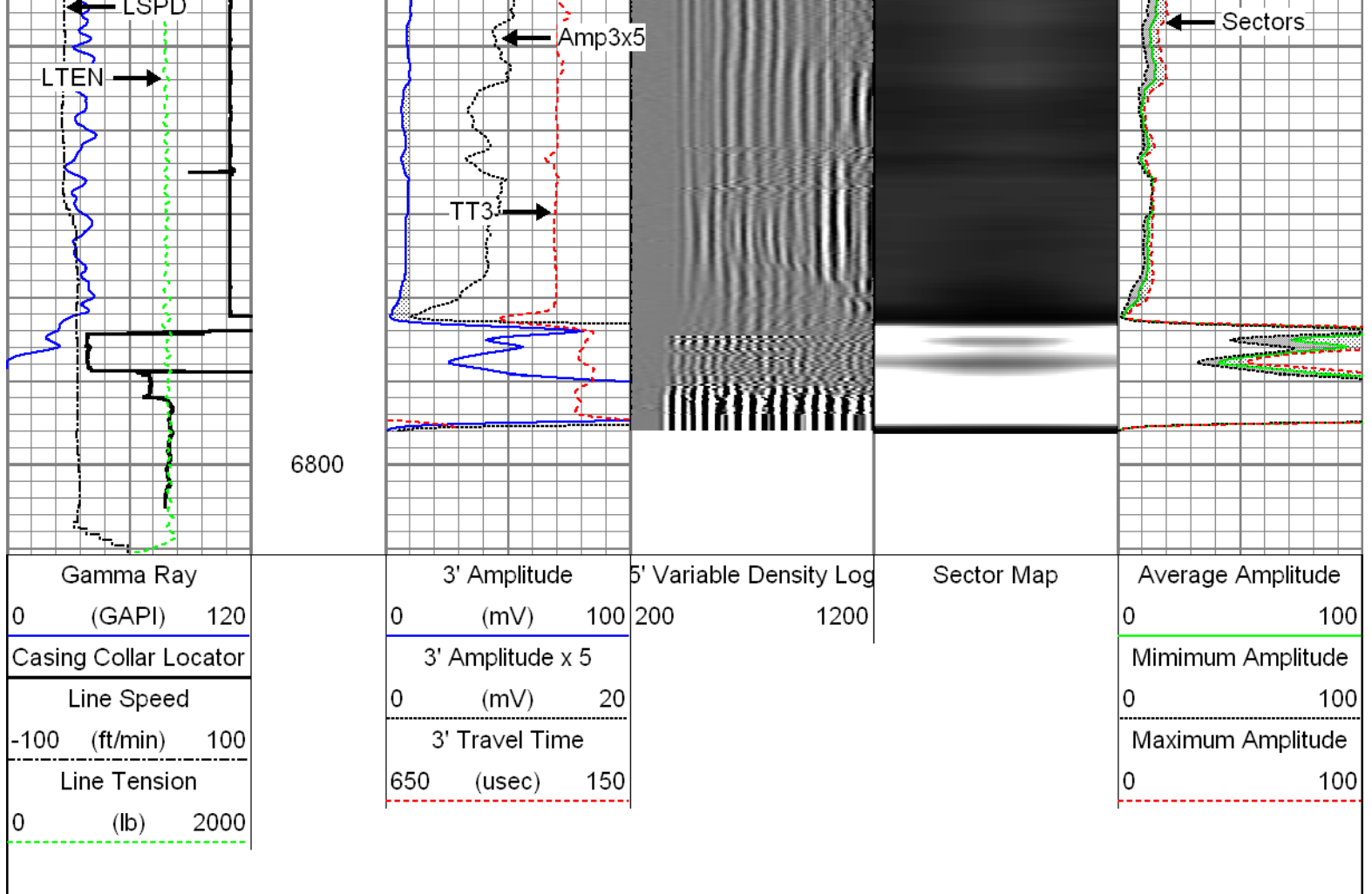


6400

6500



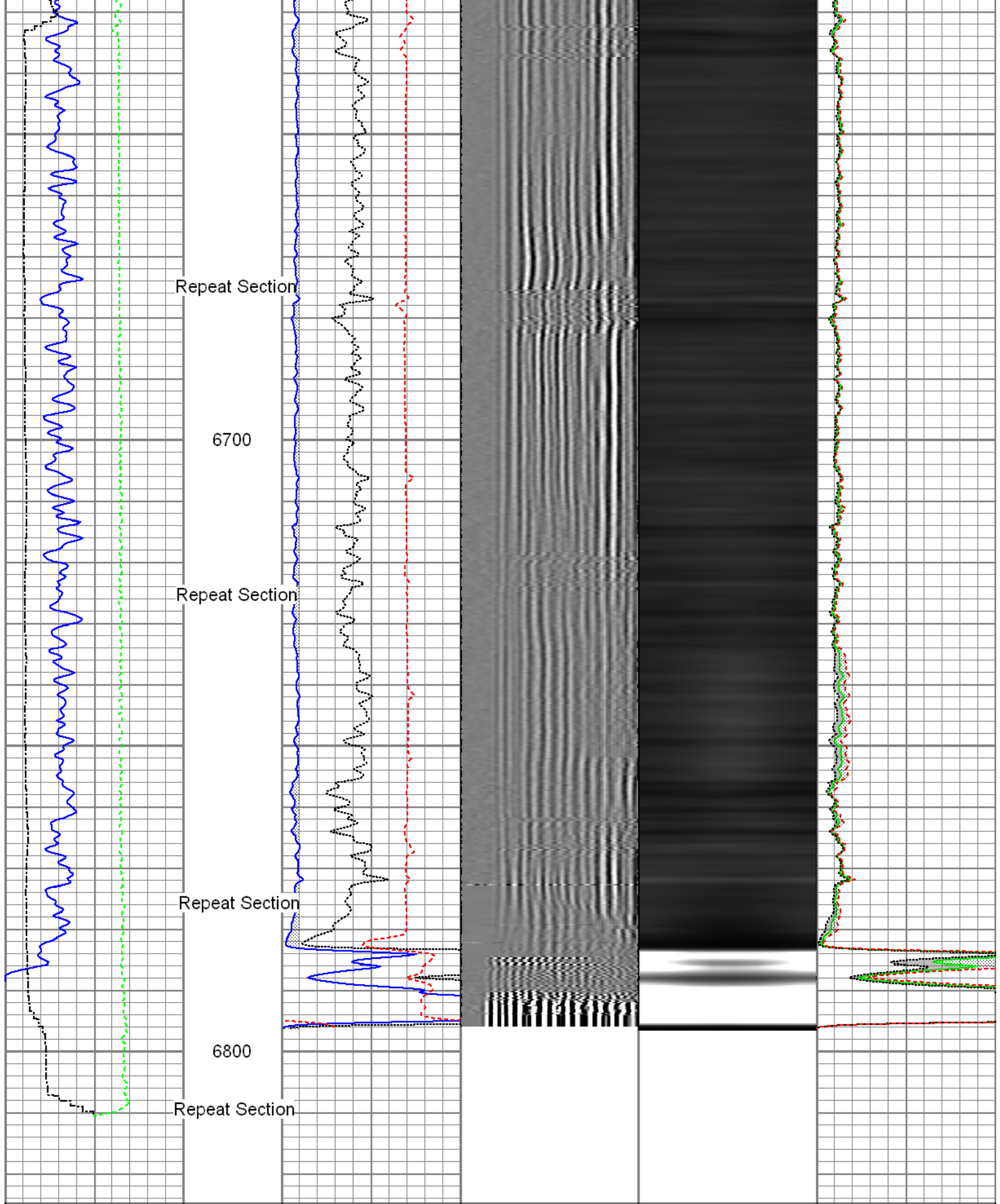




Repeat Pass

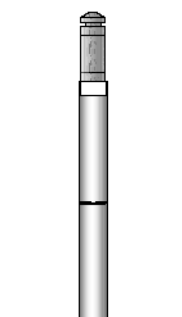
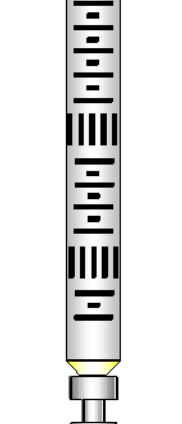
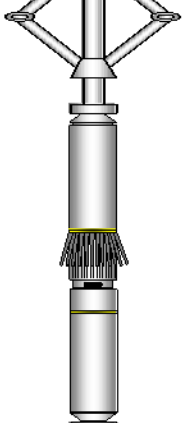
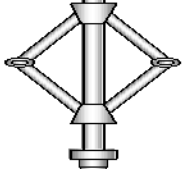
Recorded with 2800 PSI surface induced pressure.

Database File: 0512339914_anadarko_morning fresh 36n-22hxr_08-21-14_mit_rbl.db
 Dataset Pathname: pass3
 Presentation Format: rbt4_mit
 Dataset Creation: Thu Aug 21 08:44:35 2014 by Log SCH 111116
 Charted by: Depth in Feet scaled 1:240



Gamma Ray (GAPI)	3' Amplitude (mV)	5' Variable Density Log 200 1200	Sector Map	Average Amplitude 0 100
Line Speed (ft/min)	3' Amplitude x 5 (mV)			Minimum Amplitude 0 100
Line Tension	3' Travel Time			Maximum Amplitude

0	(lb)	2000	650	(usec)	150	0	100
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Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
GR	23.67		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 (211461) Crossover Ultrawire Toolbus to Ultralink	1.58	1.69	6.50
			UW_PGR-UW_PGR_020 (050836) Production Gamma Ray	1.93	1.69	9.50
			UW_PRC-UW_PRC_057 (1037) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
WVFS3FT	15.85		UW_RBT-UW_RBT_004 (1066) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00
WVFS1	15.85					
WVFS2	15.85					
WVFS3	15.85					
WVFS4	15.85					
WVFS5	15.85					
WVFS6	15.85					
WVFS7	15.85					
WVFS8	15.85					
CBLTEMP	15.85					
CBLROT	15.85					
WVFS5FT	14.85					
MIT	5.41		UW_PRC-UW_PRC_057 (1038) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
			UW_MIT-UW_MIT40_027 (218950) 40 Multifinger Imaging Tool	4.54	2.75	61.10
			UW_PRC #3 -UW_PRC_057 (1101) 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:	0512339914_Anadarko_Morning Fresh 36n-22hxr_08-21-14_MIT_RBL.db: field/well/run1/pass4
Total Length:	27.92 ft
Total Weight:	319.30 lb
O.D.	3.13 in

Calibration Report

Database File: 0512339914_Anadarko_Morning Fresh 36n-22hxr_08-21-14_MIT_RBL.db
Dataset Pathname: pass5
Dataset Creation: Thu Aug 21 11:37:43 2014 by Log SCH 111116

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: Thu Aug 21 08:14:50 2014

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1446	271.0	1717	287.0	2004	294.0	2298
Finger 02:	1501	251.0	1752	257.0	2009	261.0	2270
Finger 03:	1411	273.0	1684	286.0	1970	295.0	2265
Finger 04:	1440	274.0	1714	286.0	2000	287.0	2287
Finger 05:	1477	265.0	1742	274.0	2016	276.0	2292
Finger 06:	1405	275.0	1680	290.0	1970	295.0	2265
Finger 07:	1405	271.0	1676	288.0	1964	294.0	2258
Finger 08:	1407	267.0	1674	282.0	1956	288.0	2244
Finger 09:	1421	274.0	1695	290.0	1985	296.0	2281
Finger 10:	1419	266.0	1685	282.0	1967	288.0	2255
Finger 11:	1412	270.0	1682	289.0	1971	295.0	2266
Finger 12:	1369	275.0	1644	294.0	1938	304.0	2242
Finger 13:	1467	254.0	1721	270.0	1991	275.0	2266
Finger 14:	1413	262.0	1675	284.0	1959	293.0	2252
Finger 15:	1414	273.0	1687	292.0	1979	303.0	2282
Finger 16:	1414	264.0	1678	289.0	1967	302.0	2269
Finger 17:	1420	276.0	1696	293.0	1989	307.0	2296
Finger 18:	1414	264.0	1678	284.0	1962	296.0	2258
Finger 19:	1461	268.0	1729	286.0	2015	297.0	2312
Finger 20:	1448	268.0	1716	287.0	2003	303.0	2306
Finger 21:	1382	279.0	1661	303.0	1964	325.0	2289
Finger 22:	1433	264.0	1697	281.0	1978	297.0	2275
Finger 23:	1442	270.0	1712	286.0	1998	300.0	2298
Finger 24:	1470	274.0	1744	286.0	2030	296.0	2326
Finger 25:	1454	275.0	1729	288.0	2017	303.0	2320
Finger 26:	1420	276.0	1696	292.0	1988	308.0	2296
Finger 27:	1474	269.0	1743	282.0	2025	295.0	2320
Finger 28:	1438	276.0	1714	288.0	2002	308.0	2310
Finger 29:	1522	263.0	1785	273.0	2058	286.0	2344

Finger 29:	1322	263.0	1783	273.0	2038	286.0	2344
Finger 30:	1393	275.0	1668	287.0	1955	311.0	2266
Finger 31:	1456	279.0	1735	295.0	2030	308.0	2338
Finger 32:	1514	264.0	1778	275.0	2053	285.0	2338
Finger 33:	1433	280.0	1713	296.0	2009	311.0	2320
Finger 34:	1459	277.0	1736	292.0	2028	307.0	2335
Finger 35:	1485	259.0	1744	264.0	2008	276.0	2284
Finger 36:	1486	265.0	1751	278.0	2029	291.0	2320
Finger 37:	1463	278.0	1741	290.0	2031	300.0	2331
Finger 38:	1506	249.0	1755	257.0	2012	270.0	2282
Finger 39:	1446	269.0	1715	279.0	1994	285.0	2279
Finger 40:	1408	280.0	1688	294.0	1982	302.0	2284

Post Survey Calibration Check								
Performed: Thu Aug 21 11:37:36 2014								
Ring size: (in)	4	Nom. wear	5	Nom. wear	6	Nom. wear	7	Nom. wear
Finger 01:	3.984	-0.008	4.988	-0.006	5.983	-0.008	6.995	-0.003
Finger 02:	3.983	-0.009	4.981	-0.009	5.988	-0.006	6.994	-0.003
Finger 03:	3.983	-0.008	4.985	-0.008	5.991	-0.005	6.994	-0.003
Finger 04:	3.985	-0.008	4.987	-0.007	5.989	-0.005	6.993	-0.003
Finger 05:	3.990	-0.005	4.984	-0.008	5.990	-0.005	6.993	-0.003
Finger 06:	3.987	-0.006	4.991	-0.005	5.987	-0.007	6.992	-0.004
Finger 07:	3.972	-0.014	4.989	-0.006	5.988	-0.006	6.992	-0.004
Finger 08:	3.969	-0.015	4.983	-0.008	5.988	-0.006	6.994	-0.003
Finger 09:	3.980	-0.010	4.982	-0.009	5.987	-0.007	6.995	-0.003
Finger 10:	3.985	-0.008	4.986	-0.007	5.992	-0.004	7.000	0.000
Finger 11:	3.981	-0.010	4.991	-0.005	5.985	-0.007	6.995	-0.002
Finger 12:	3.993	-0.003	4.992	-0.004	5.992	-0.004	6.998	-0.001
Finger 13:	3.985	-0.007	4.990	-0.005	5.995	-0.002	6.998	-0.001
Finger 14:	3.990	-0.005	4.988	-0.006	5.984	-0.008	7.001	0.000
Finger 15:	3.978	-0.011	4.985	-0.007	5.988	-0.006	6.990	-0.005
Finger 16:	3.998	-0.001	5.008	0.004	6.003	0.001	6.990	-0.005
Finger 17:	3.984	-0.008	4.980	-0.010	5.991	-0.005	6.987	-0.006
Finger 18:	3.985	-0.007	4.989	-0.006	5.993	-0.004	6.993	-0.003
Finger 19:	3.987	-0.007	4.984	-0.008	5.989	-0.005	6.993	-0.003
Finger 20:	3.989	-0.006	4.990	-0.005	5.995	-0.002	7.000	-0.000
Finger 21:	3.987	-0.007	4.985	-0.007	5.989	-0.006	6.975	-0.012
Finger 22:	3.984	-0.008	4.982	-0.009	5.988	-0.006	6.994	-0.003
Finger 23:	3.981	-0.010	4.987	-0.006	5.983	-0.009	6.996	-0.002
Finger 24:	3.986	-0.007	4.989	-0.006	5.984	-0.008	7.004	0.002
Finger 25:	3.982	-0.009	4.987	-0.007	5.988	-0.006	6.995	-0.003
Finger 26:	3.980	-0.010	4.985	-0.007	5.983	-0.008	6.995	-0.002
Finger 27:	3.977	-0.012	4.987	-0.007	5.992	-0.004	7.001	0.000
Finger 28:	3.981	-0.010	4.985	-0.007	5.996	-0.002	6.991	-0.004
Finger 29:	3.985	-0.007	4.991	-0.005	5.987	-0.007	6.998	-0.001
Finger 30:	3.987	-0.006	4.986	-0.007	5.992	-0.004	6.991	-0.004
Finger 31:	3.982	-0.009	4.992	-0.004	5.990	-0.005	6.992	-0.004
Finger 32:	3.979	-0.011	4.988	-0.006	5.987	-0.007	6.991	-0.004
Finger 33:	3.982	-0.009	4.984	-0.008	5.990	-0.005	7.000	-0.000
Finger 34:	3.984	-0.008	4.991	-0.005	5.991	-0.005	6.993	-0.003
Finger 35:	3.994	-0.003	4.988	-0.006	5.995	-0.003	6.992	-0.004
Finger 36:	3.985	-0.008	4.992	-0.004	5.992	-0.004	6.993	-0.004
Finger 37:	3.995	-0.003	4.992	-0.004	5.990	-0.005	6.993	-0.003
Finger 38:	3.988	-0.006	4.990	-0.005	5.996	-0.002	6.993	-0.003
Finger 39:	3.985	-0.008	4.988	-0.006	5.991	-0.004	6.997	-0.001
Finger 40:	3.988	-0.006	4.990	-0.005	5.988	-0.006	6.990	-0.005
Average:	3.984	-0.008	4.988	-0.006	5.990	-0.005	6.994	-0.003

Segmented Cement Bond Log Calibration Report
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Serial Number:	1066
Tool Model:	UW_RBT_004
Calibration Date:	5/26/2014

Calibration Casing Diameter: 5.500 in
Calibration Depth: 375.084 ft

Master Calibration, performed Thu Aug 21 08:26:54 2014:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.001	0.771	0.800	62.200	79.515	0.897
5FT	-0.007	0.647	0.800	62.200	93.971	1.418
S1	-0.001	0.707	0.000	100.000	141.273	0.157
S2	-0.003	0.730	0.000	100.000	136.363	0.424
S3	-0.003	0.768	0.000	100.000	129.779	0.369
S4	-0.003	0.806	0.000	100.000	123.497	0.418
S5	-0.002	0.816	0.000	100.000	122.220	0.209
S6	-0.003	0.805	0.000	100.000	123.728	0.400
S7	-0.002	0.778	0.000	100.000	128.223	0.288
S8	-0.002	0.731	0.000	100.000	136.347	0.336

Gamma Ray Calibration Report

Serial Number: 050836
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 and Gas Onshore LP
Well Morning Fresh 36N-22HZR
Field Wattenberg
County Weld
State Colorado