FMC Technologies

Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	Whiting Oil & Gas Corporation
Well	Razor Fed 30K-3106
Field	Wildcat
County	Weld
State	Colorado

Company Whiting Oil & Gas Corporation

Well Razor Fed 30K-3106

Field Wildcat

County Weld State Colorado

Location: API # : 05-123-40213

SEC 30 TWP 10N RGE 58W

Permanent Datum	Ground Level	Elevation	4828'
Log Measured From	Kelly Bushing		21 FT
Drilling Measured From	Kelly Bushing		

Other Services: Gauge Ring, RBP, MIT

Elevation
K.B. 4849'
D.F. 4848'
G.L. 4828'

Date	07-AUG-2015
Run Number	Three
Depth Driller	13488 FT
Depth Logger	5372 FT
Bottom Logged Interval	5367 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	200°F
Estimated Cement Top	703 FT
Time Well Ready	ROA
Time Logger on Bottom	7:53
Equipment Number	HD-0255
Location	Fort Lupton, CO
Recorded By	M. Steinman
Witnessed By	Casey Jackson

Borehole Record

Run Number	Bit	From	To

Tubing Record

Size	Grade	Weight	From	To

Casing Record

	Size (in)	Wgt (lbs/Ft)	Grade	Top	Bottom
Surface Casing	9 5/8	36	J-55	Surface	1614 FT
Intermediate #1	7	29	L-80	Surface	6451 FT
Intermediate #2					
Liner	4 1/2	11.6	P-110	5351 FT	13480 FT

<<< Fold Here >>>

Comments

Log ran as per customer request
Depth referenced to casing tally reported liner top at 5351 FT
Adjusted log +17 FT to correlate with liner top
Gauge Ring/Junk Basket ran to 5500 FT with no debris found
Retrievable Bridge Plug set at 5430 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.!!

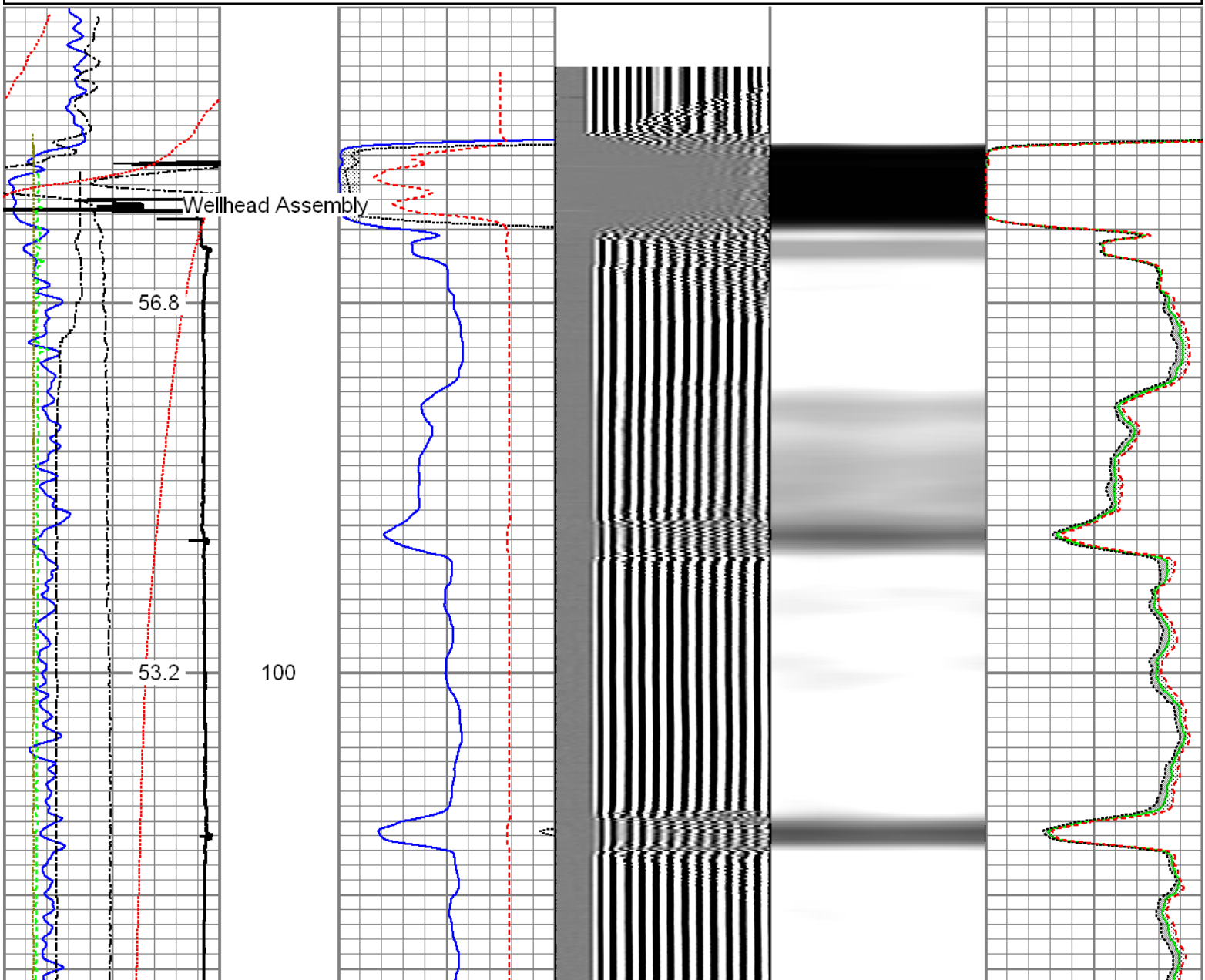
FMC Technologies

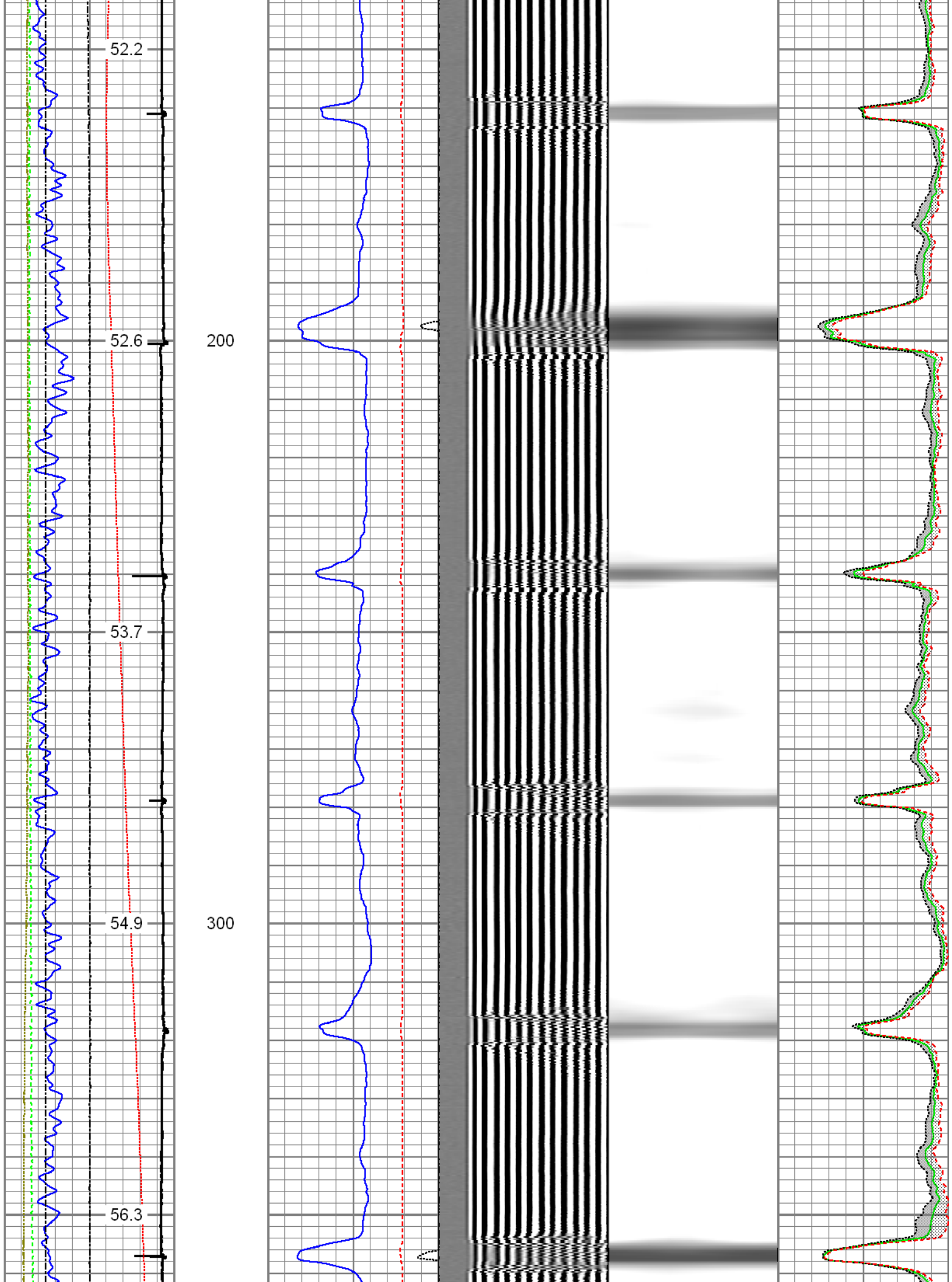
Main Pass

Recorded with 1500 PSI Surface Induced Pressure

Database File:	08-07-15_whiting_razor fed 30k-3106_mit_rbl.db
Dataset Pathname:	main2.1
Presentation Format:	rbt4_mit
Dataset Creation:	Fri Aug 07 12:39:07 2015 by Calc 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								

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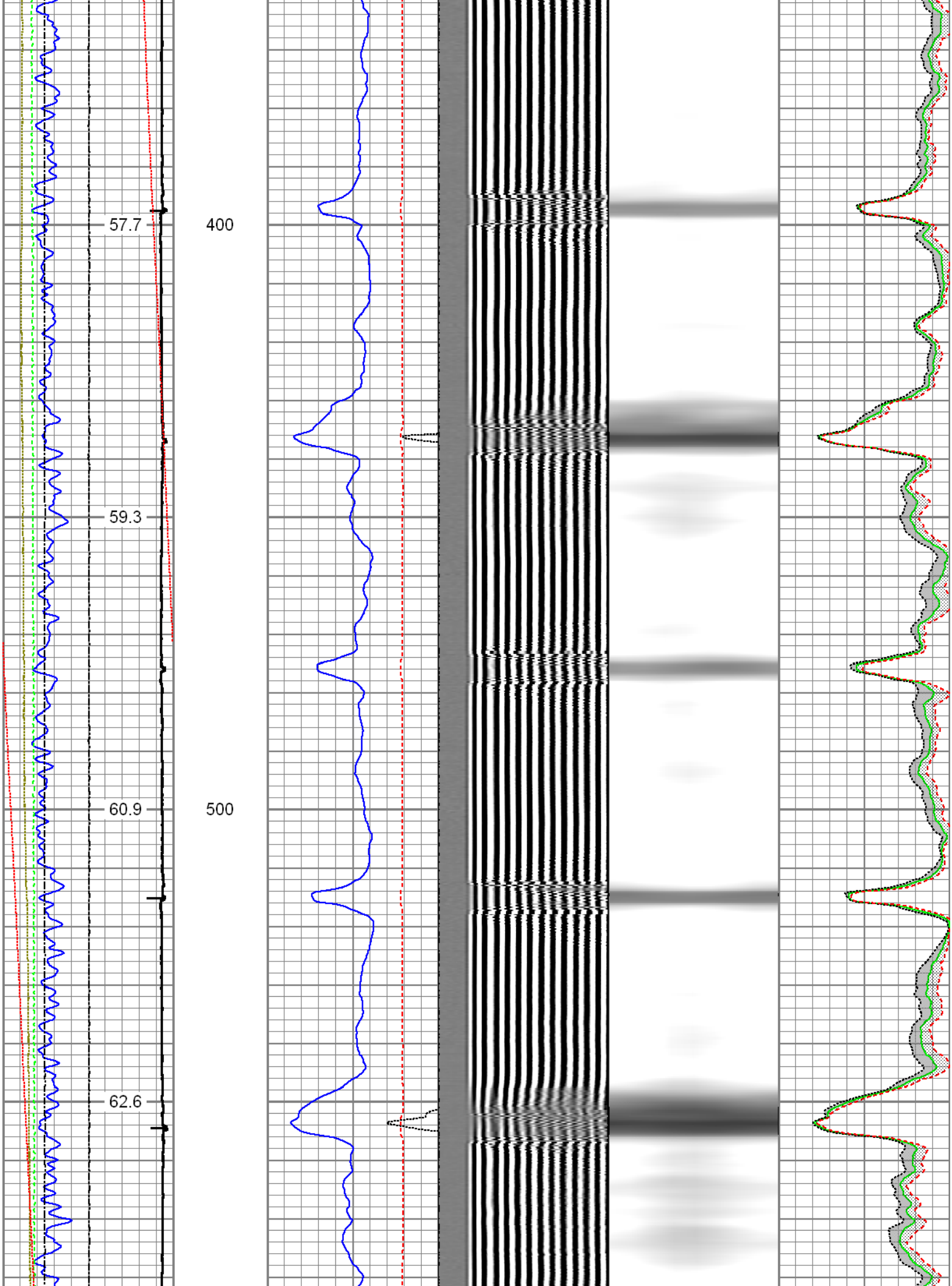
200
53.7
54.9
300
56.3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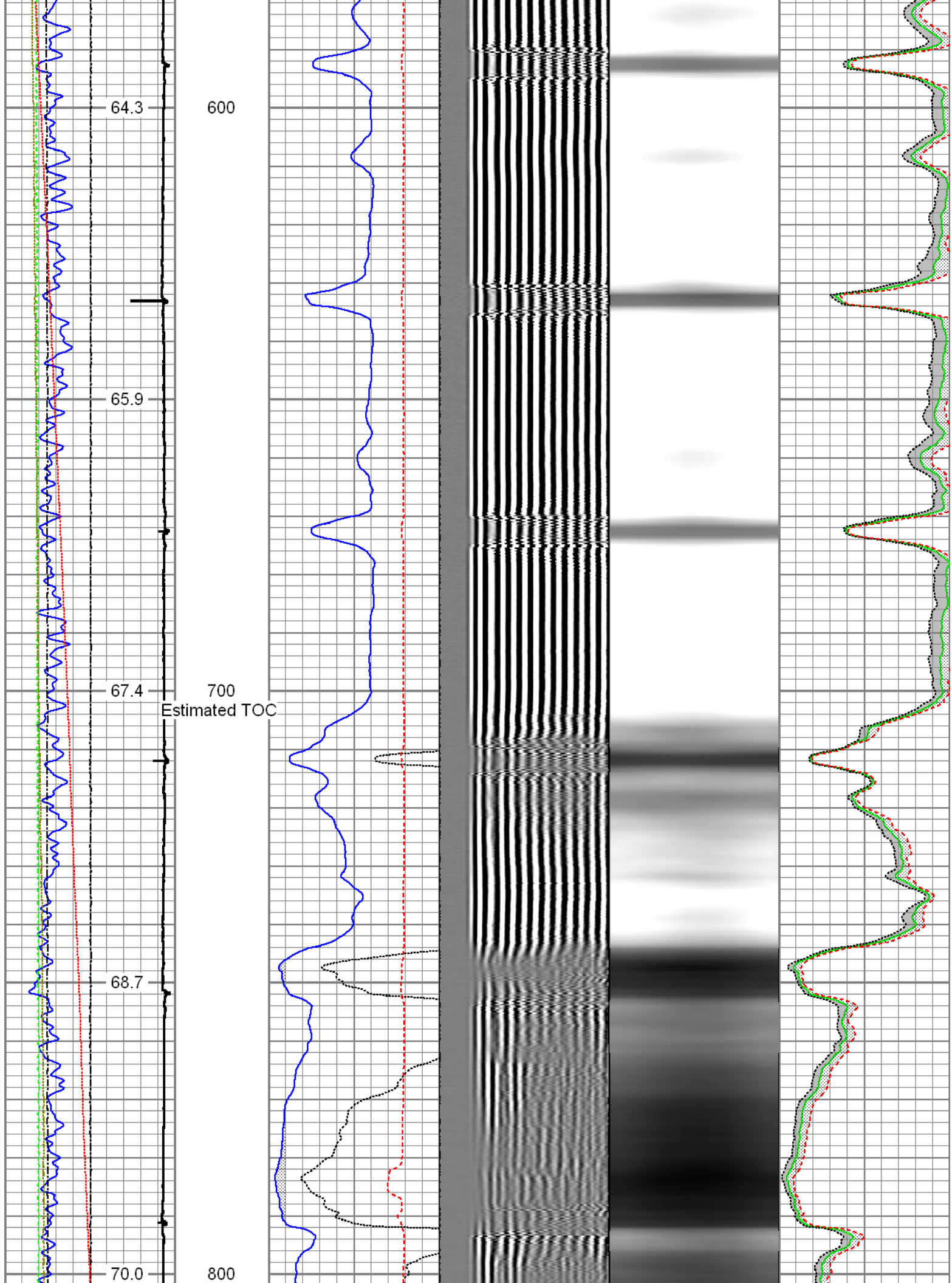
500
62.6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600
65.9
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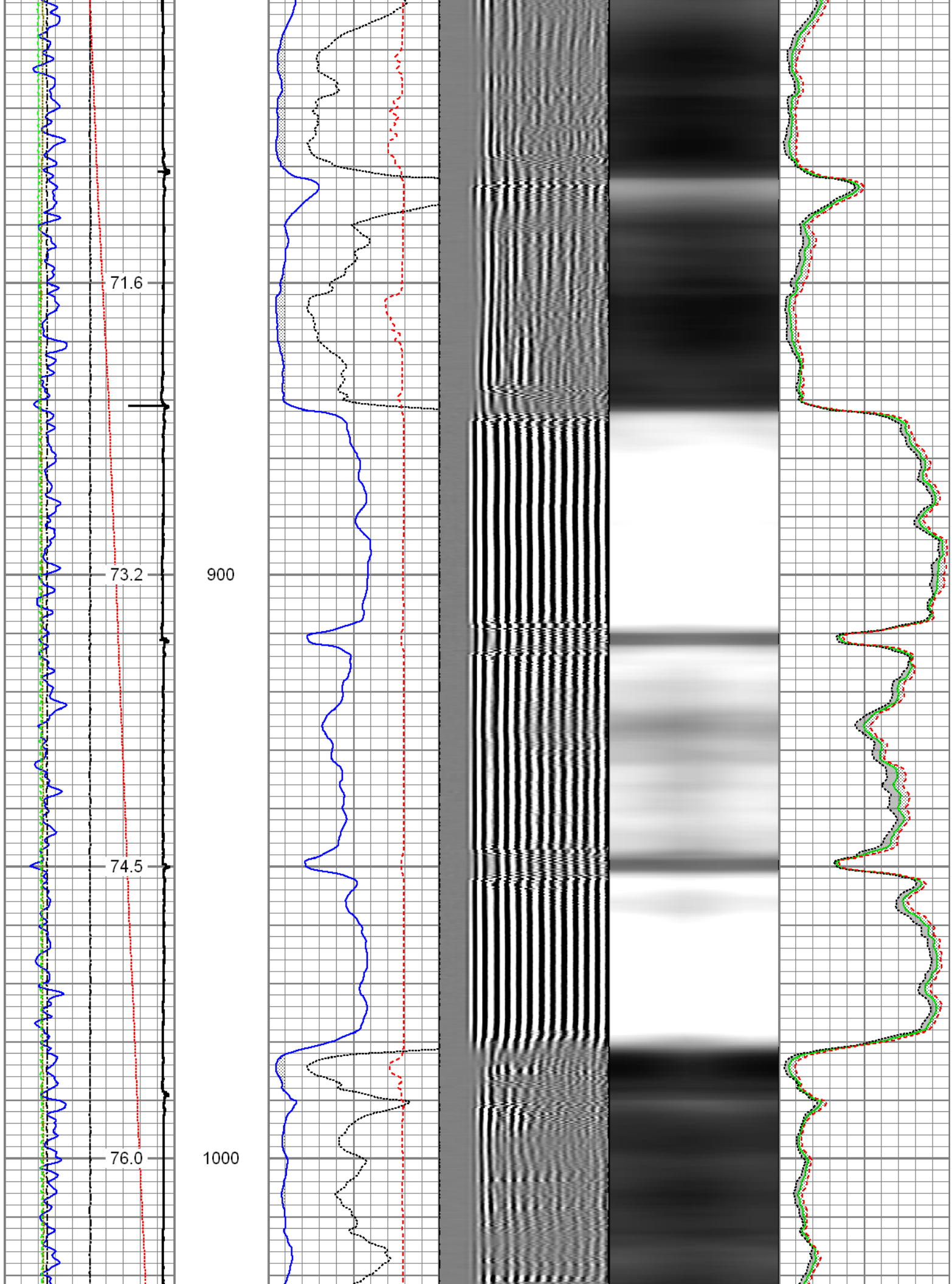
700
Estimated TOC
68.7
70.0
800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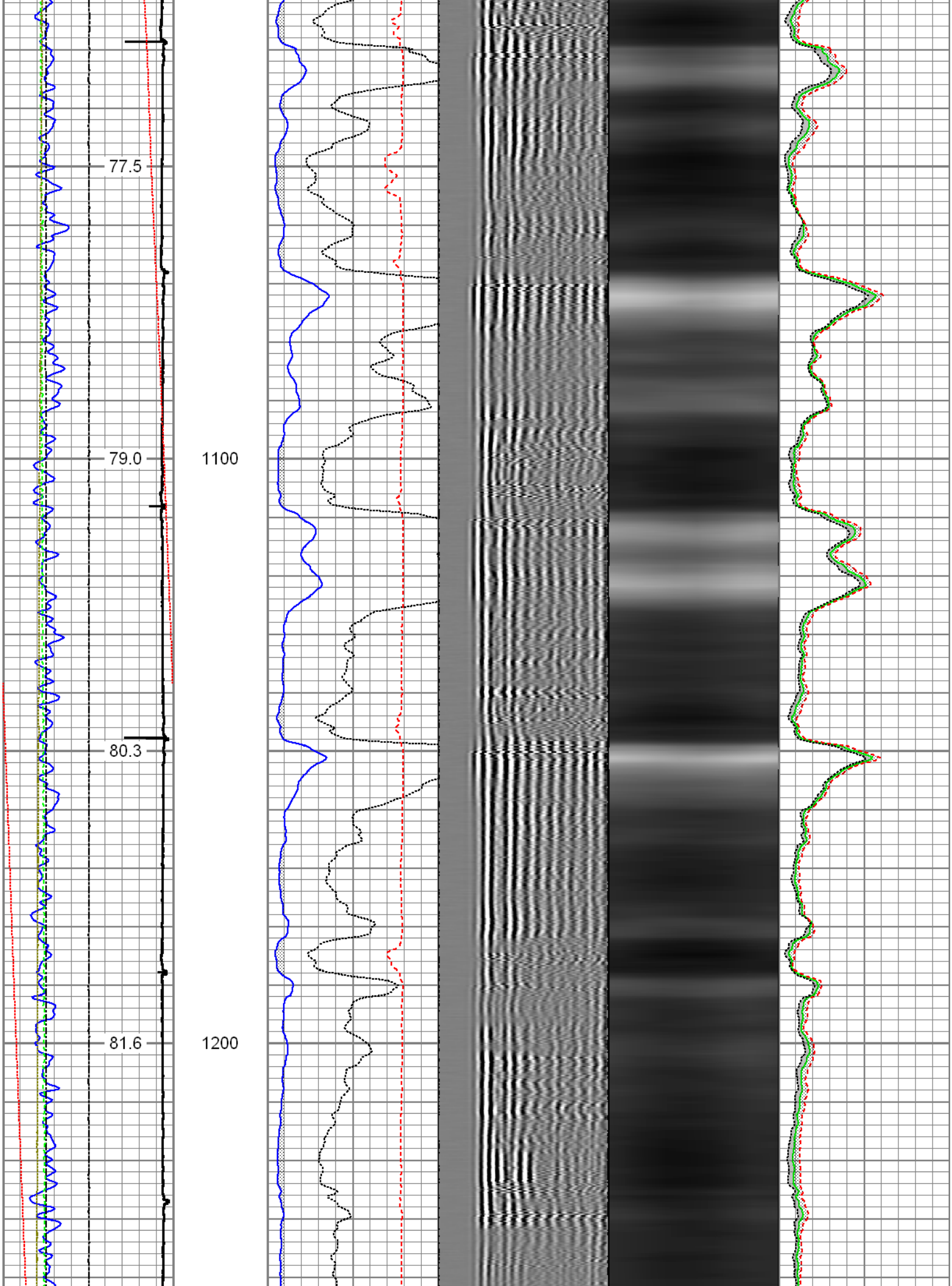
73.2
900
74.5
76.0
1000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80.3
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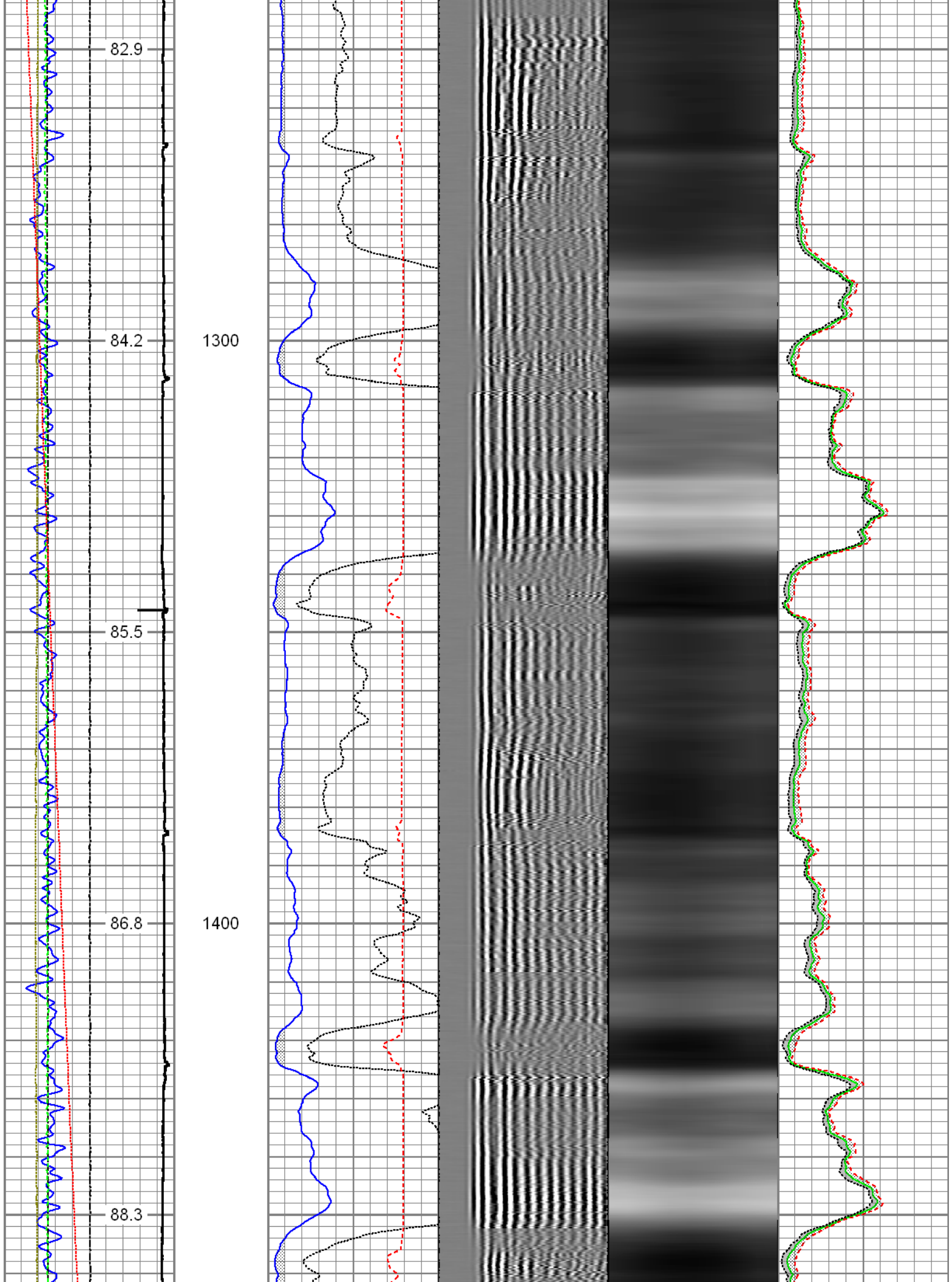
1200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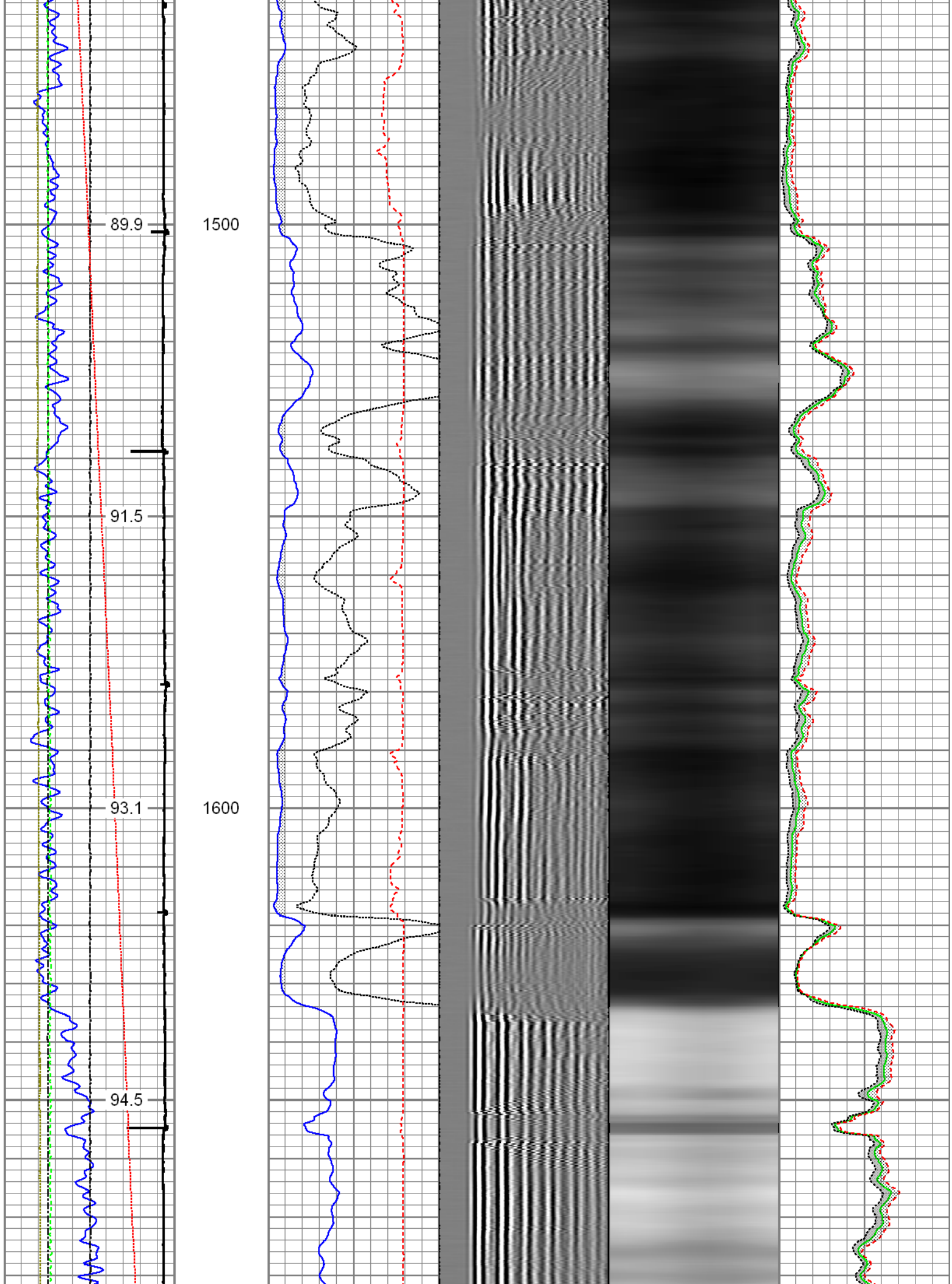
84.2
1300
85.5
86.8
1400
88.3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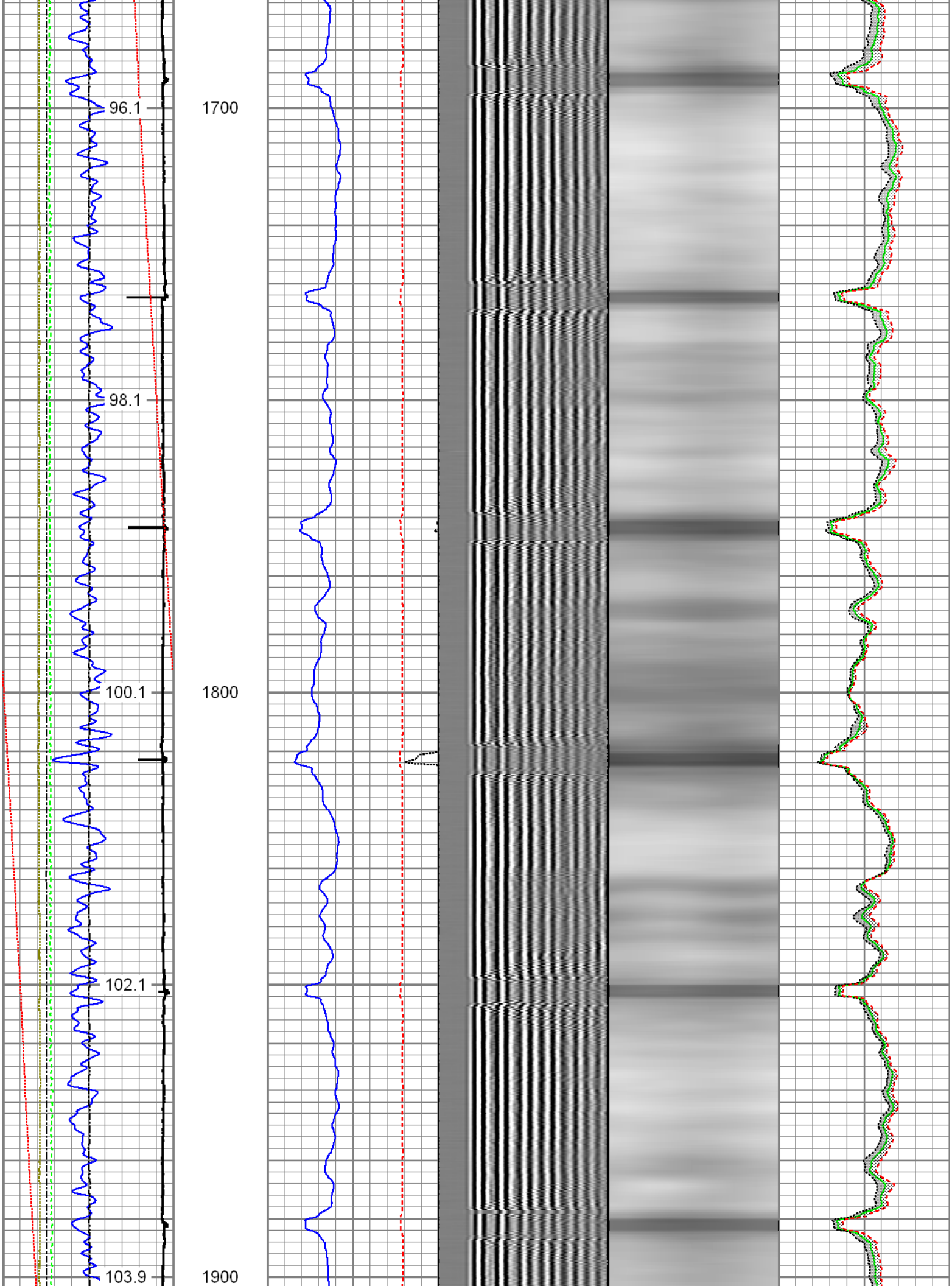
91.5
93.1
1600
94.5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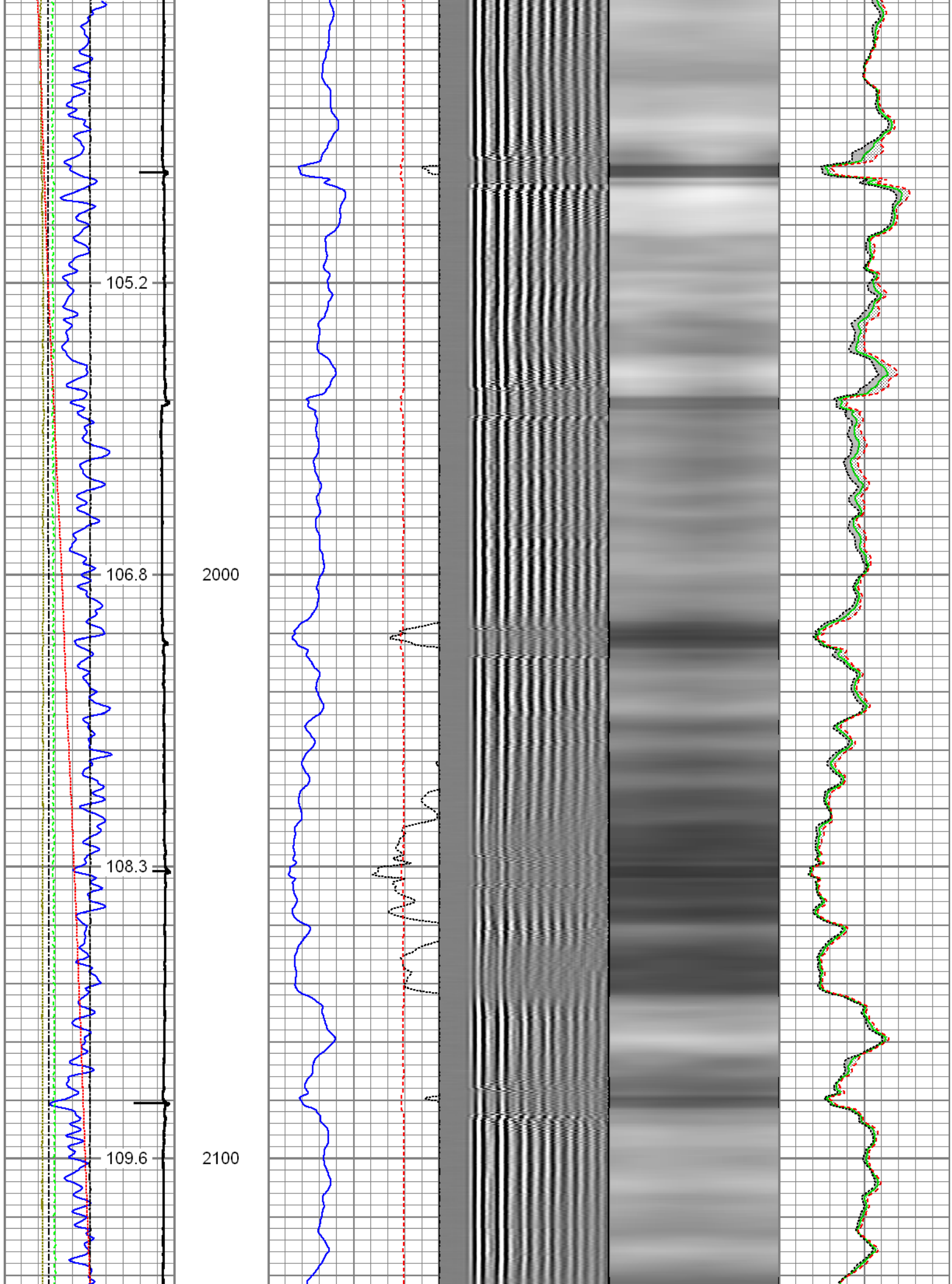
100.1
102.1
103.9
1700
1800
1900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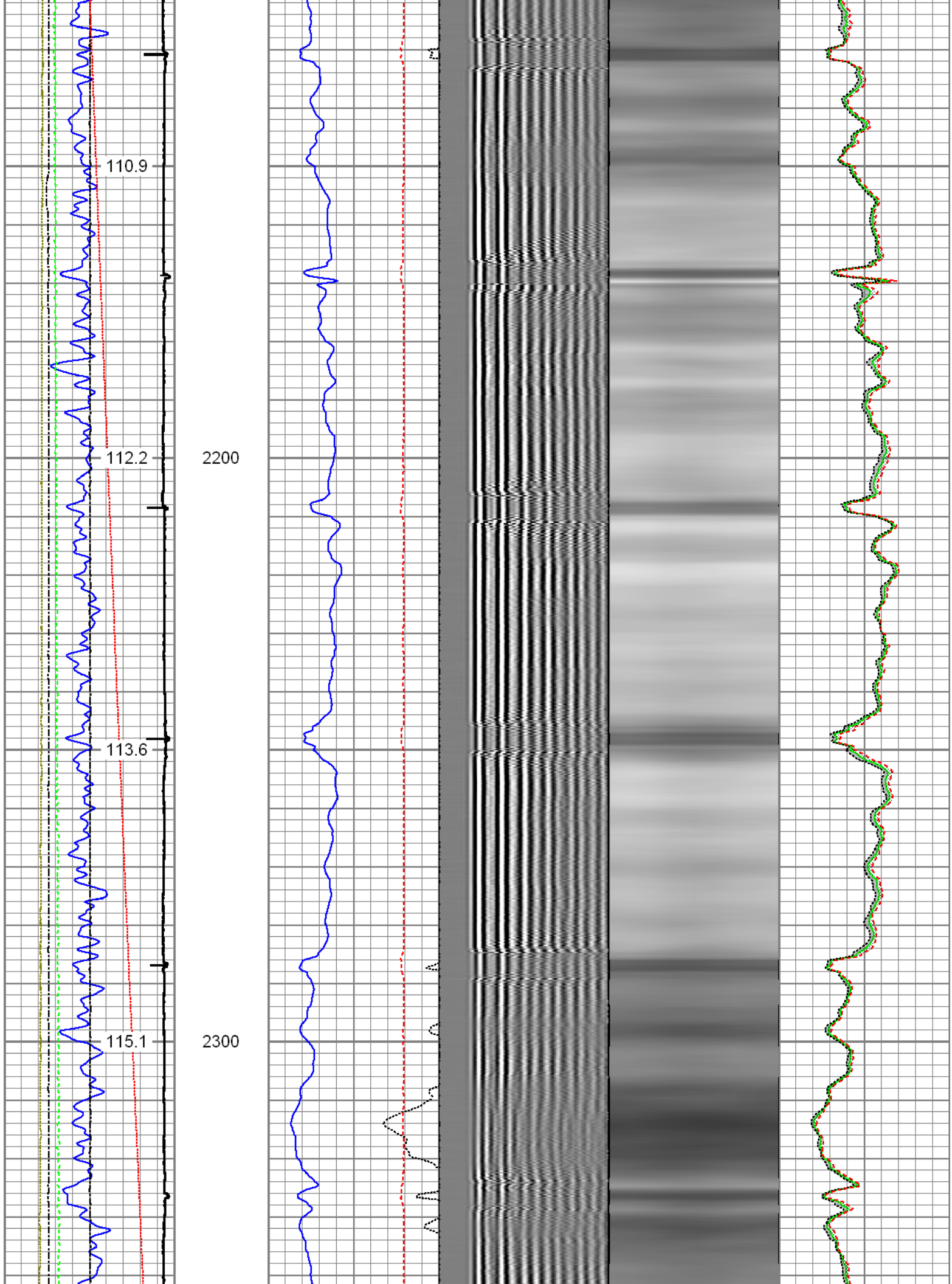
106.8
2000
108.3
109.6
2100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2200
113.6
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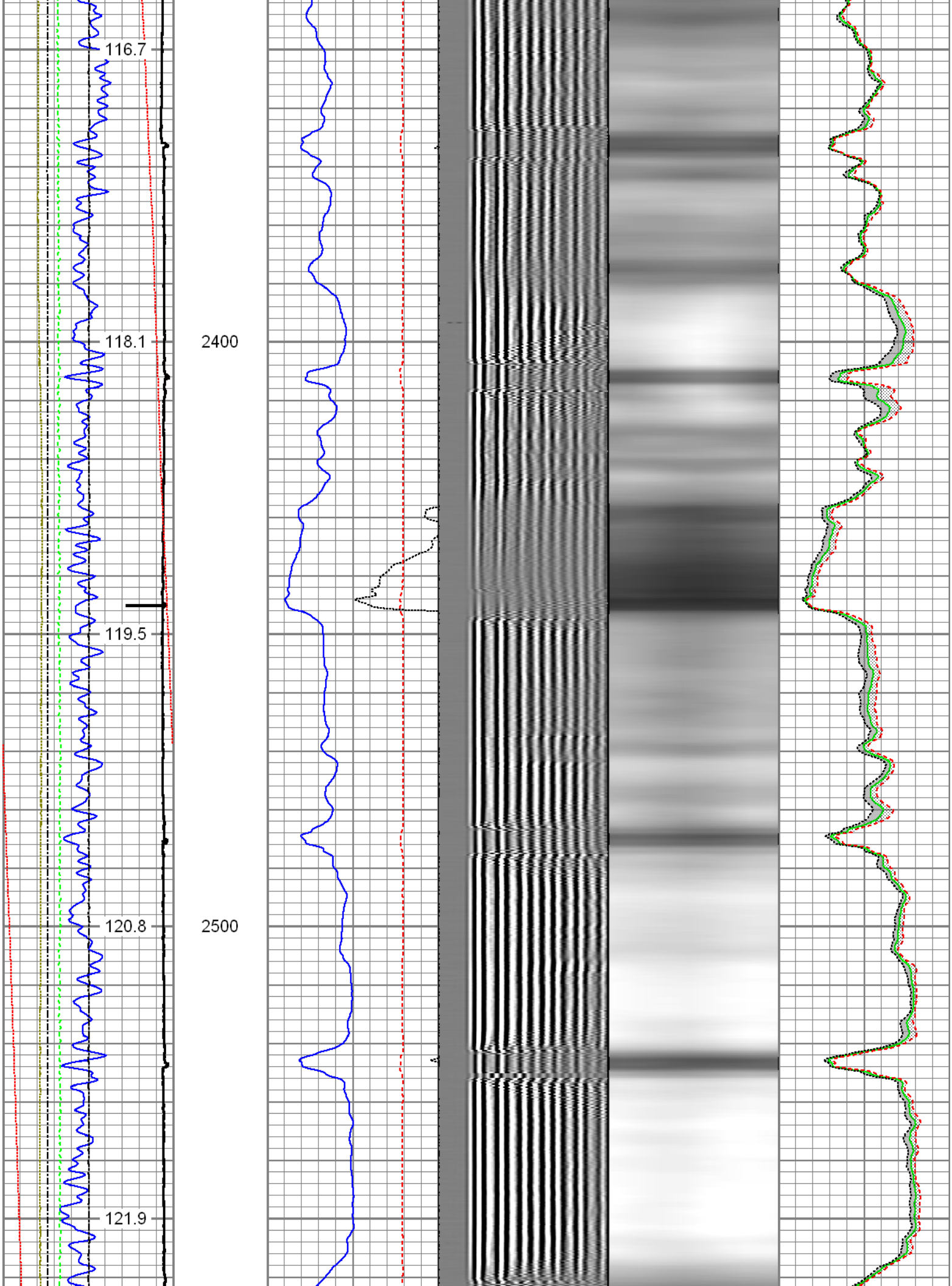
2300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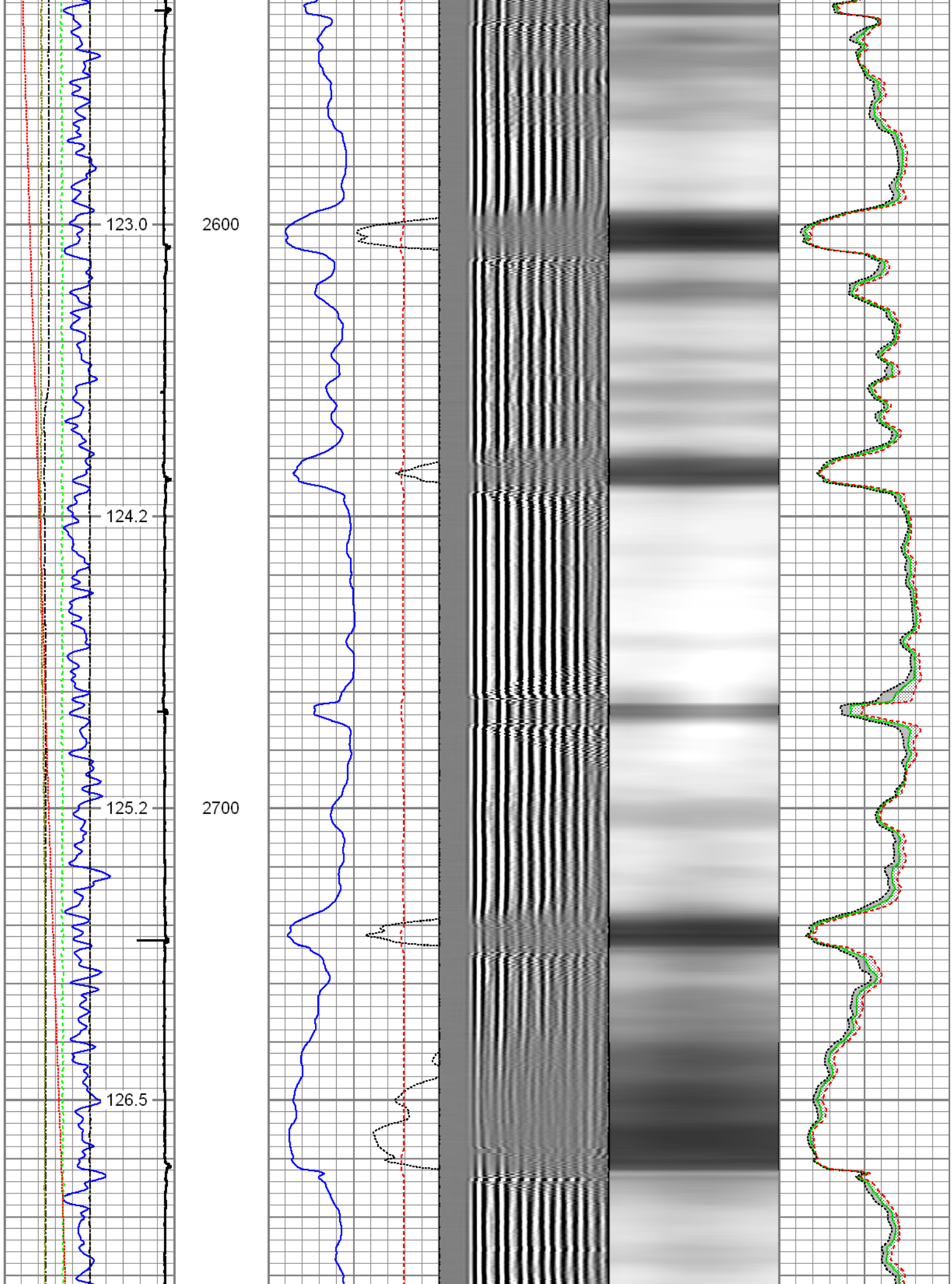
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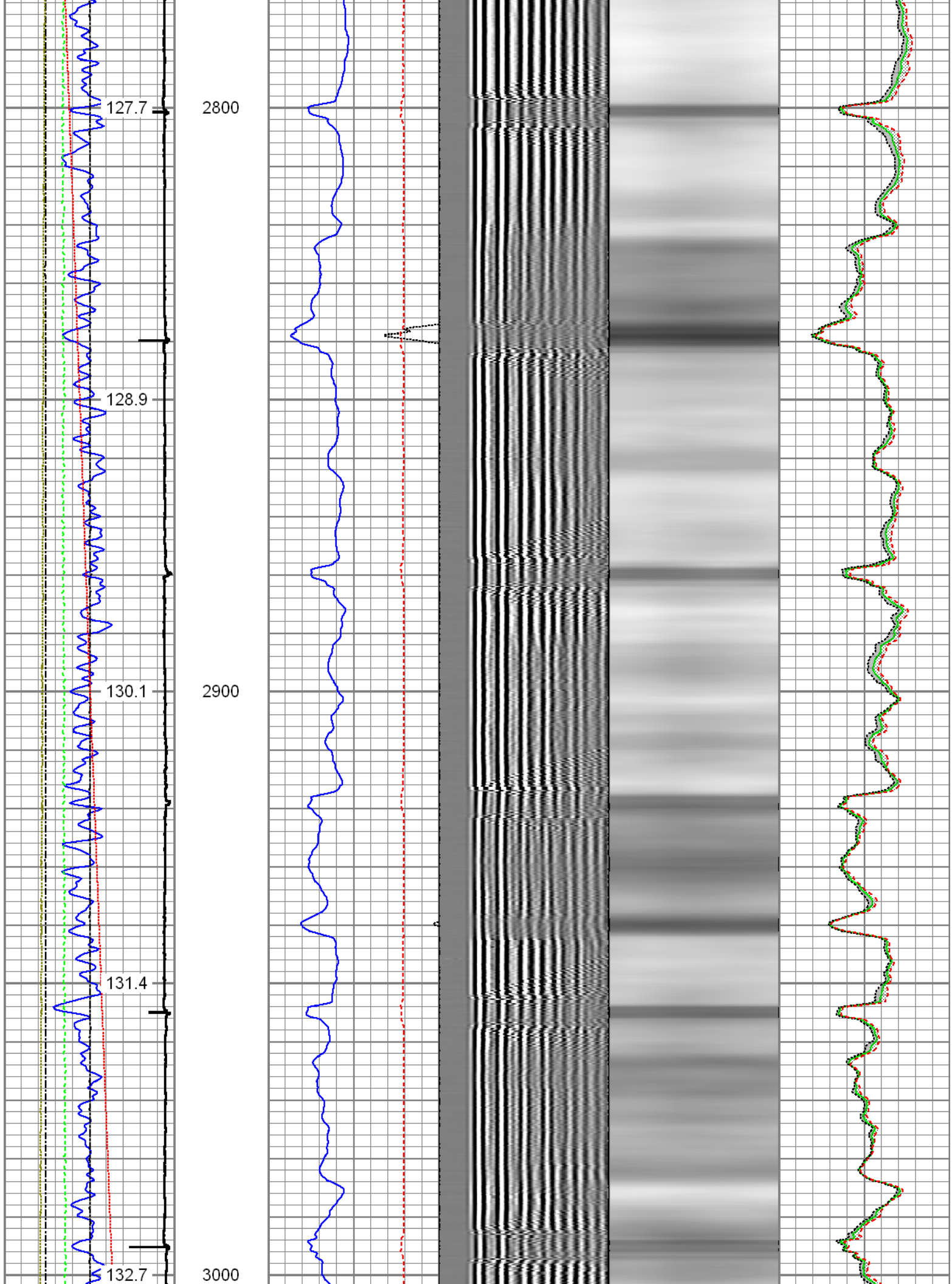
2600
124.2
125.2
2700
126.5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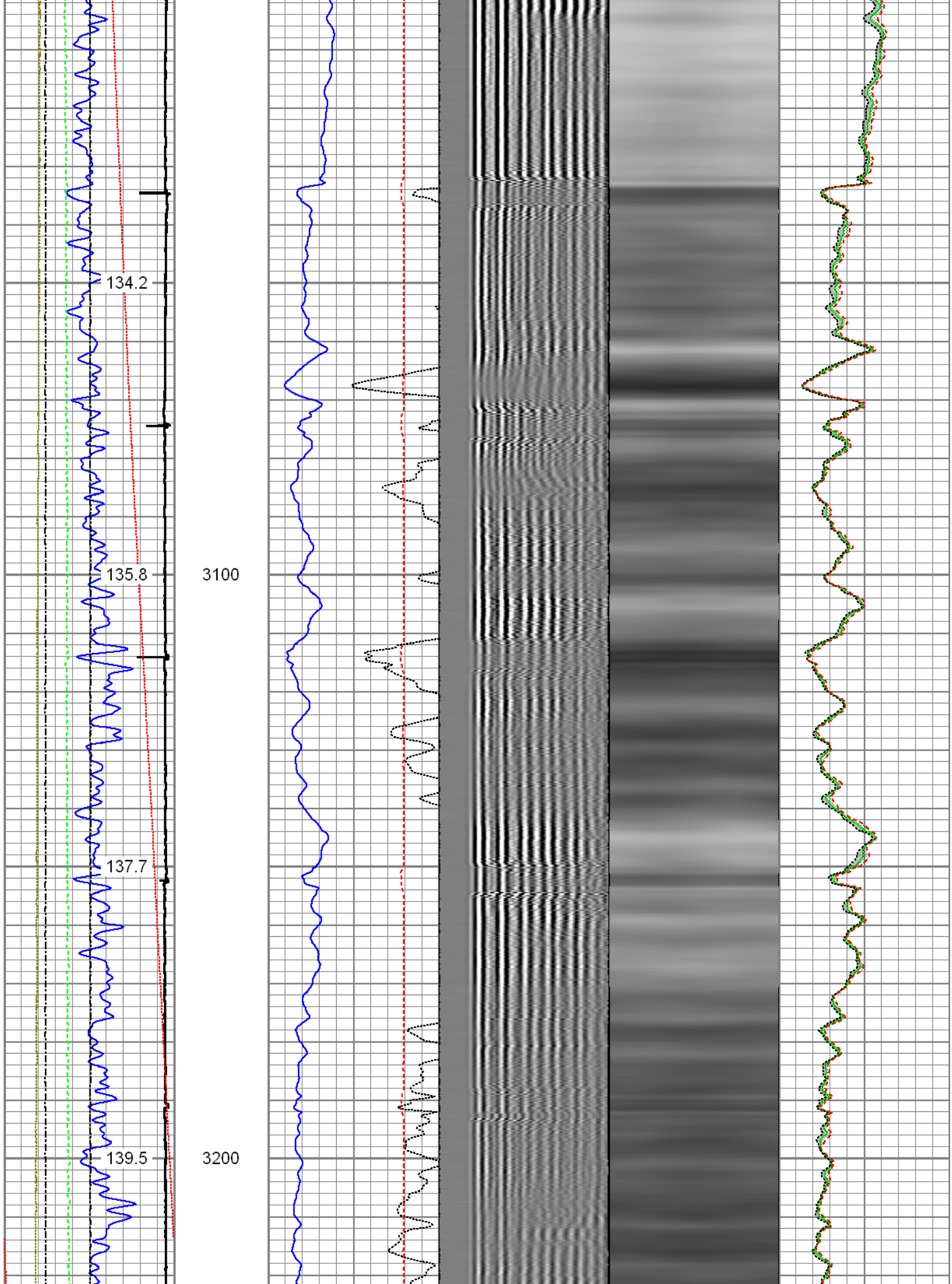
2800
128.9
130.1
2900
131.4
132.7
3000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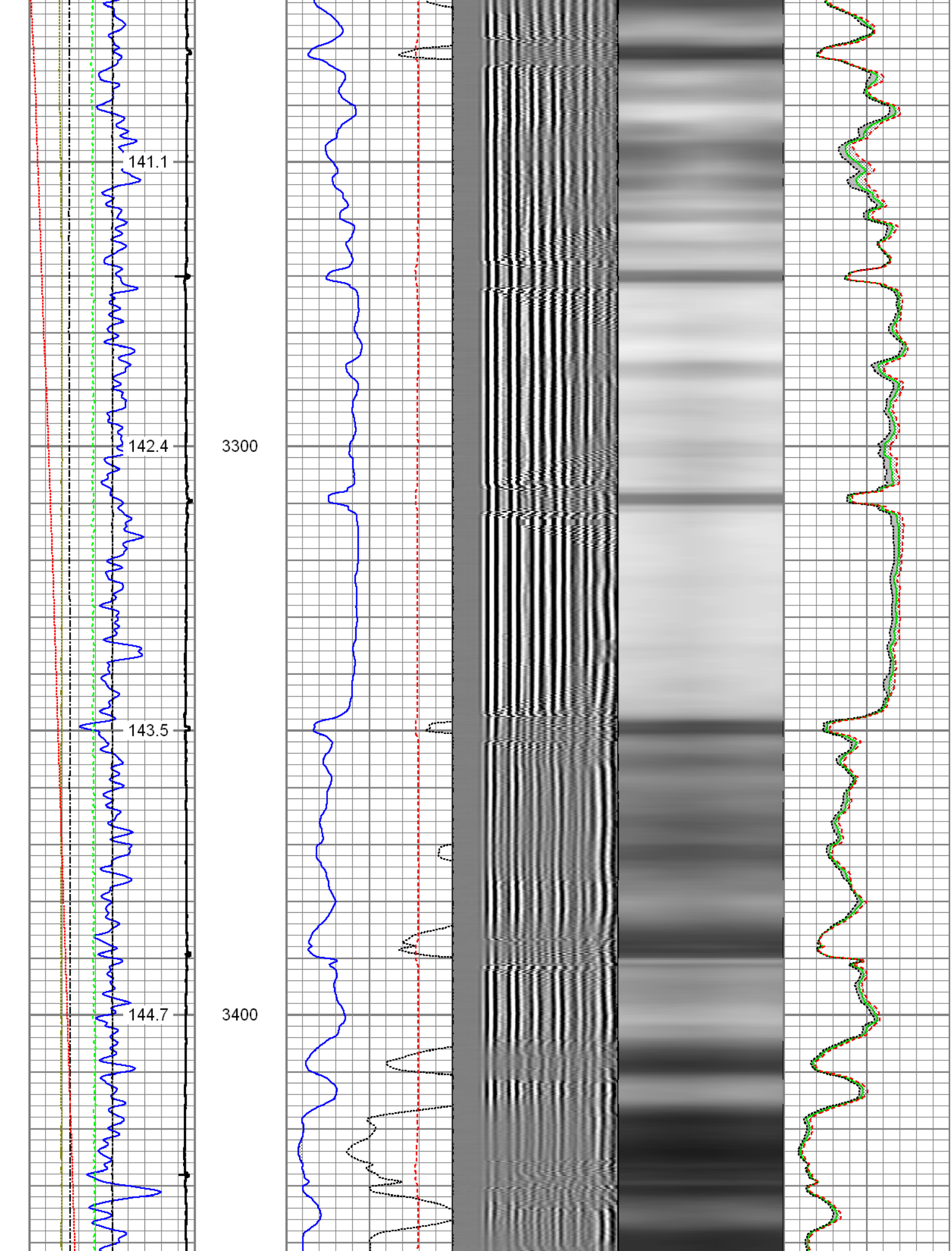
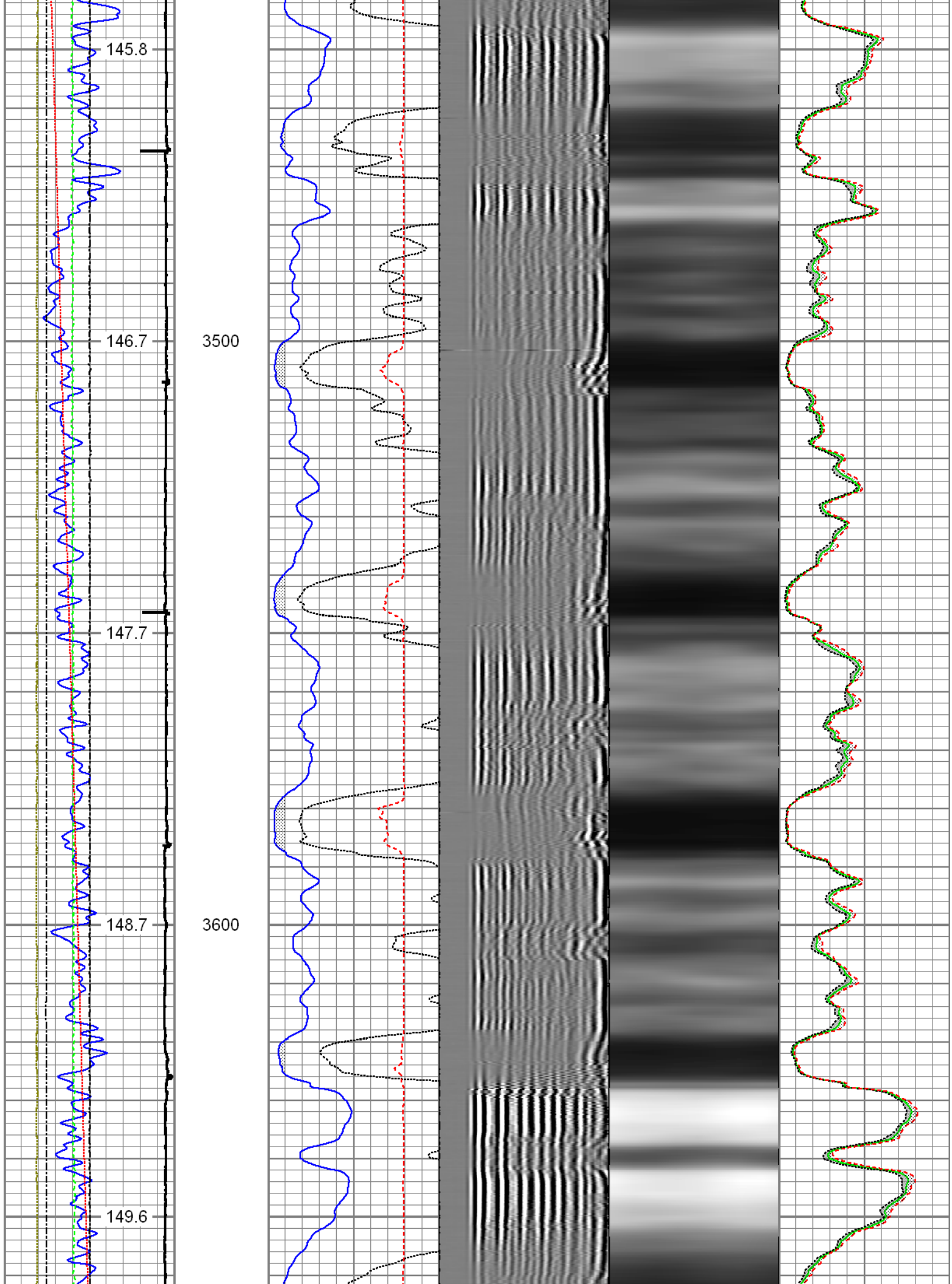
135.8
3100
137.7
139.5
3200


141.1
142.4
3300
143.5
144.7
3400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3500
147.7
148.7
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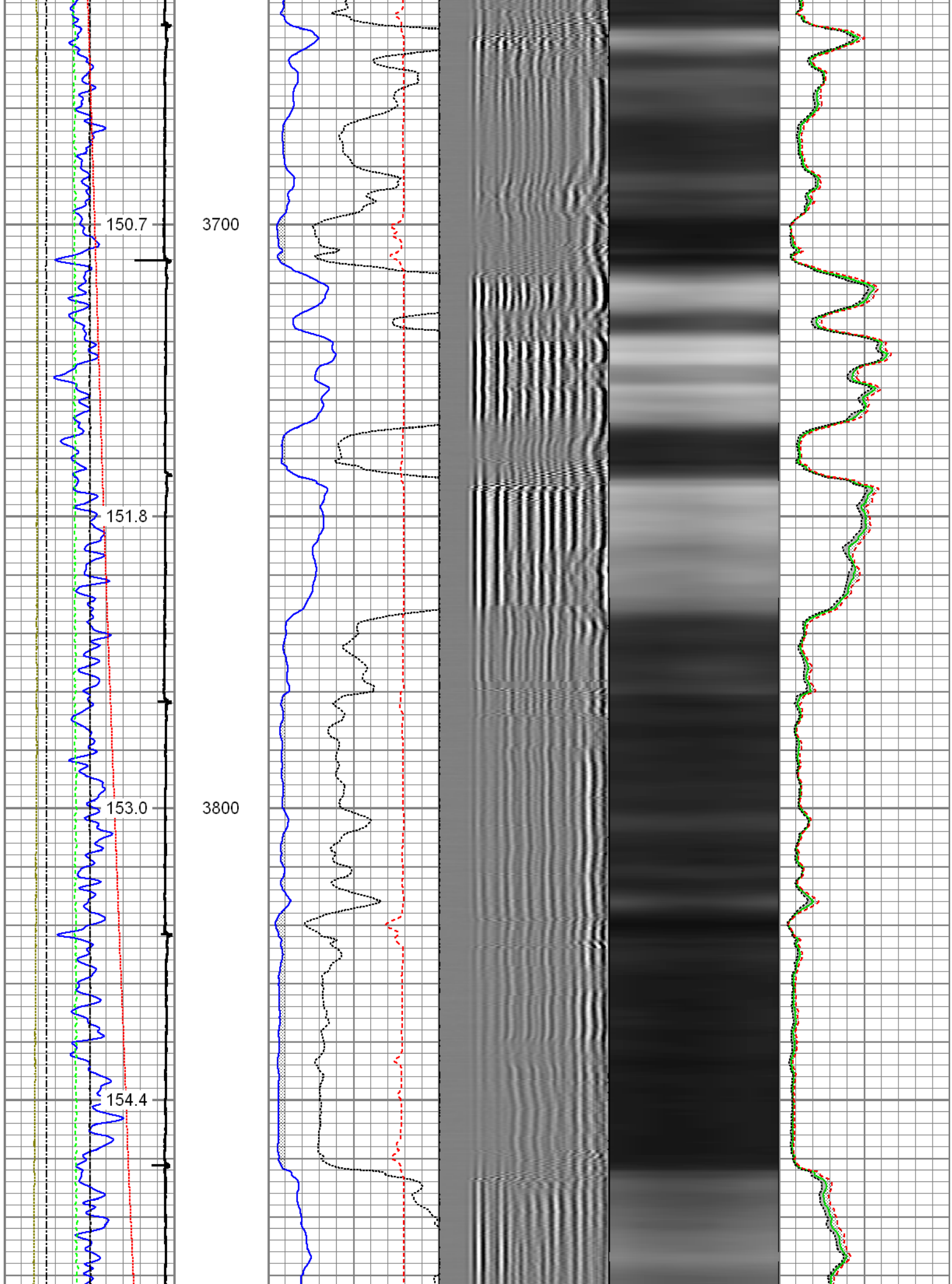
149.6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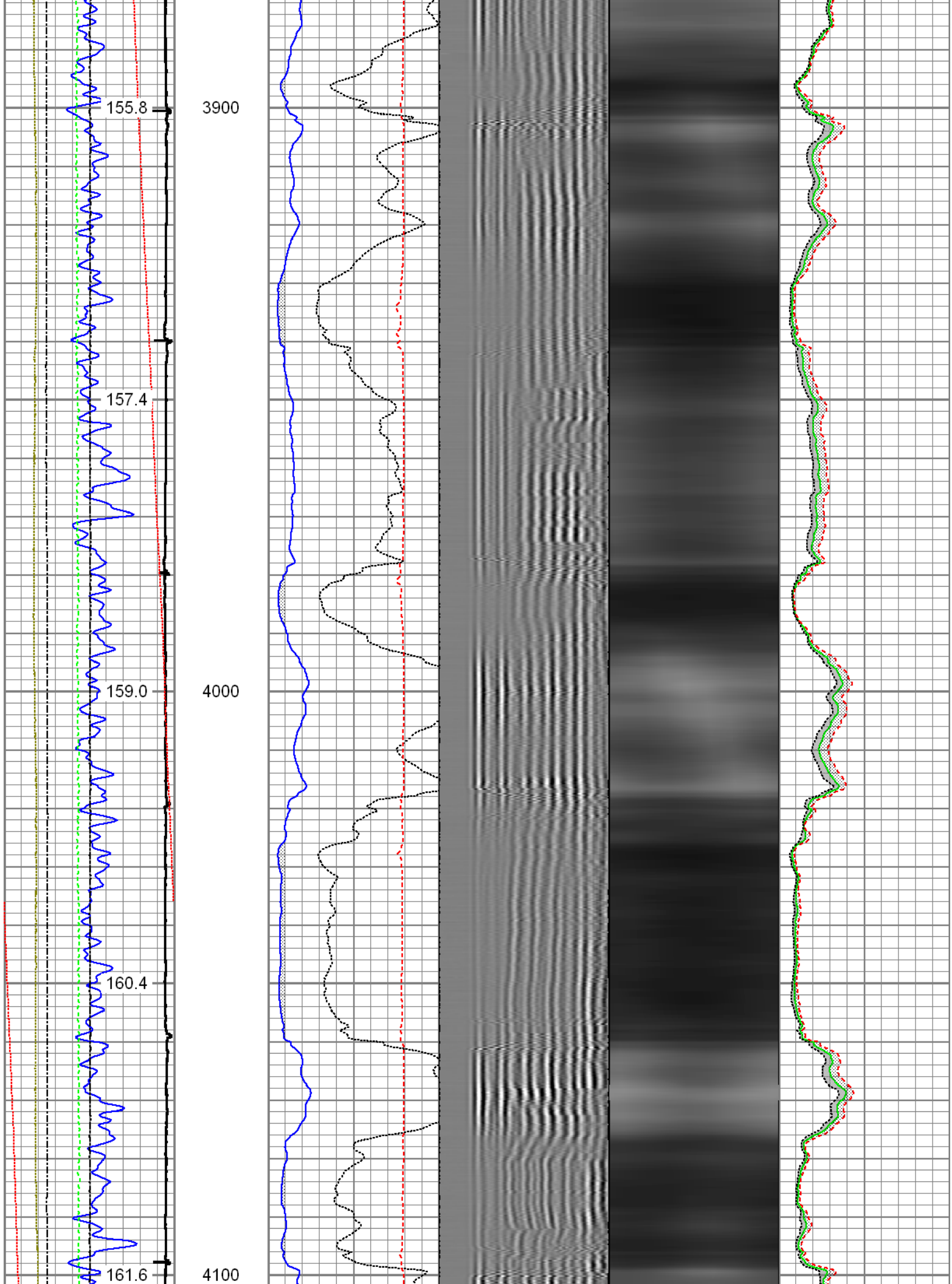
151.8
153.0
3800
154.4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157.4
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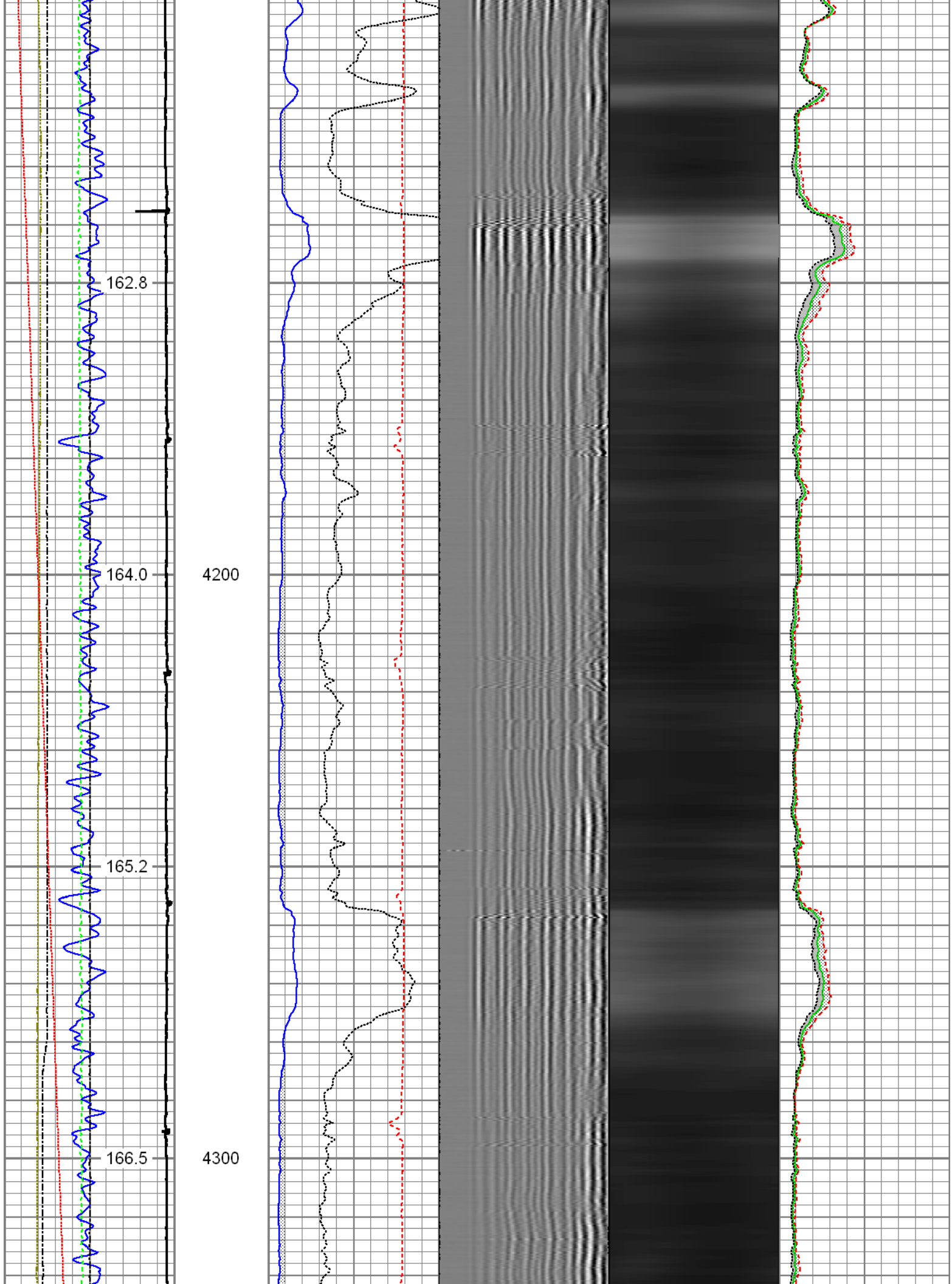
160.4
161.6
4100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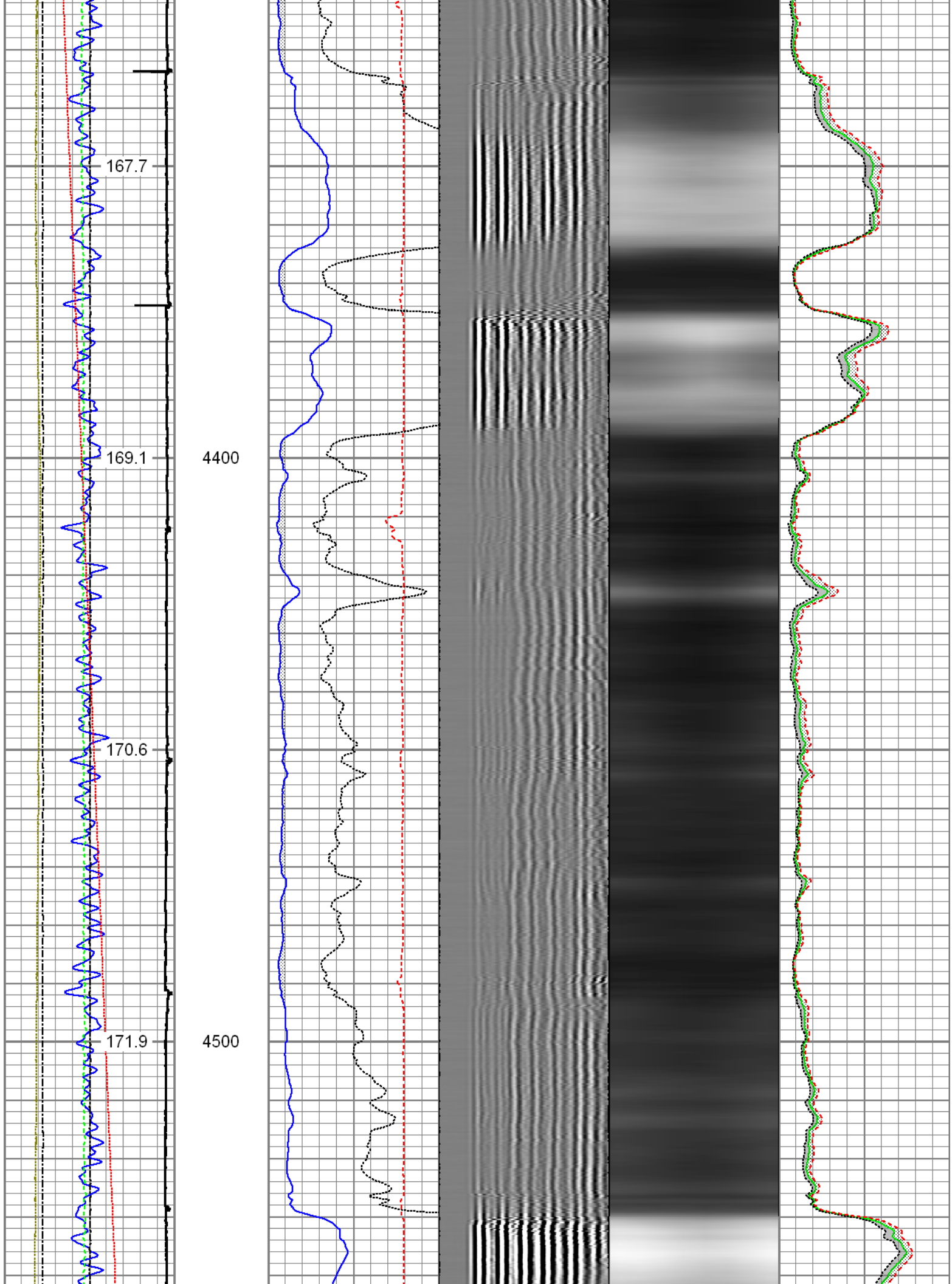
164.0
4200
165.2
166.5
4300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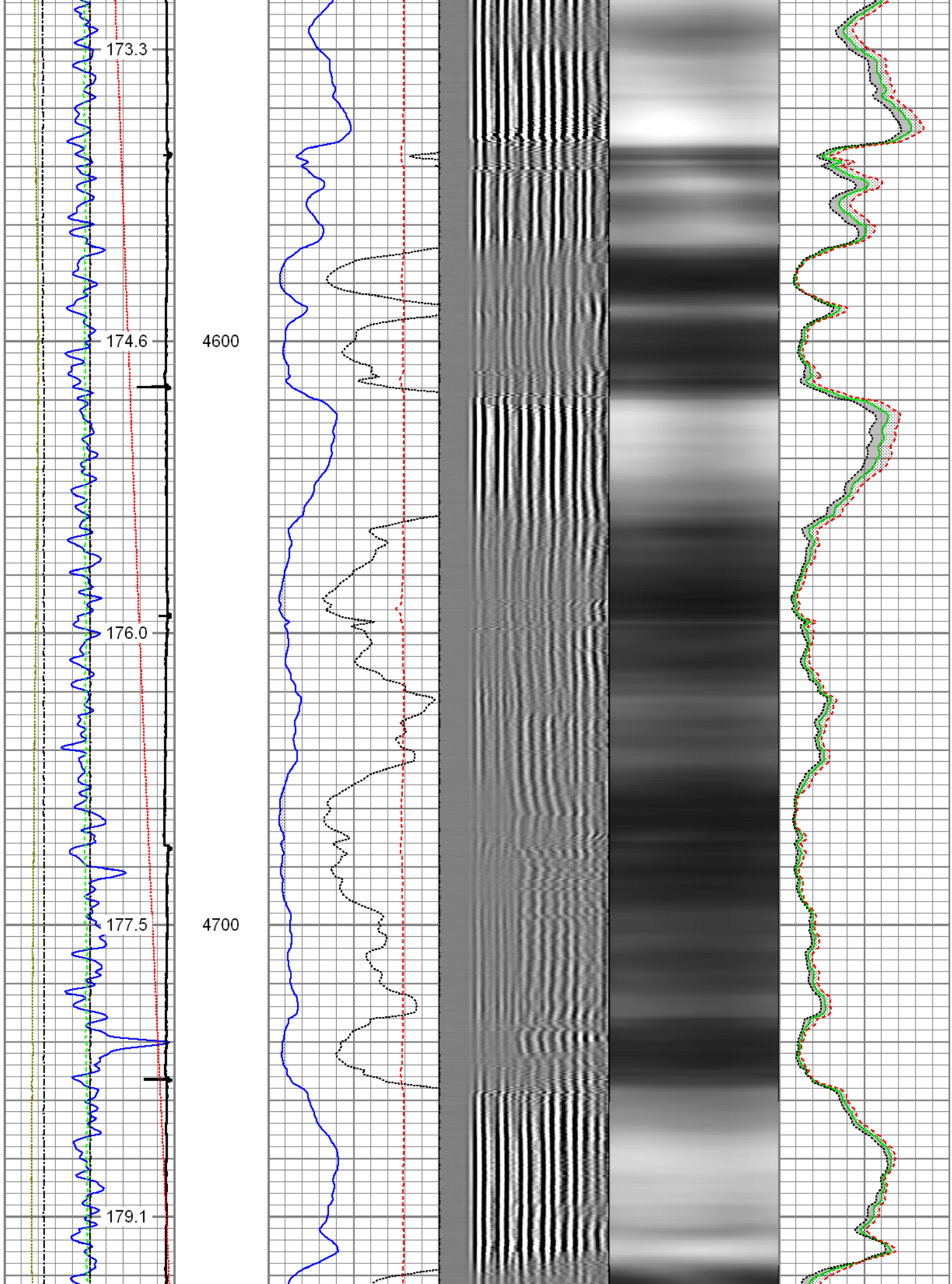
4400
170.6
171.9
4500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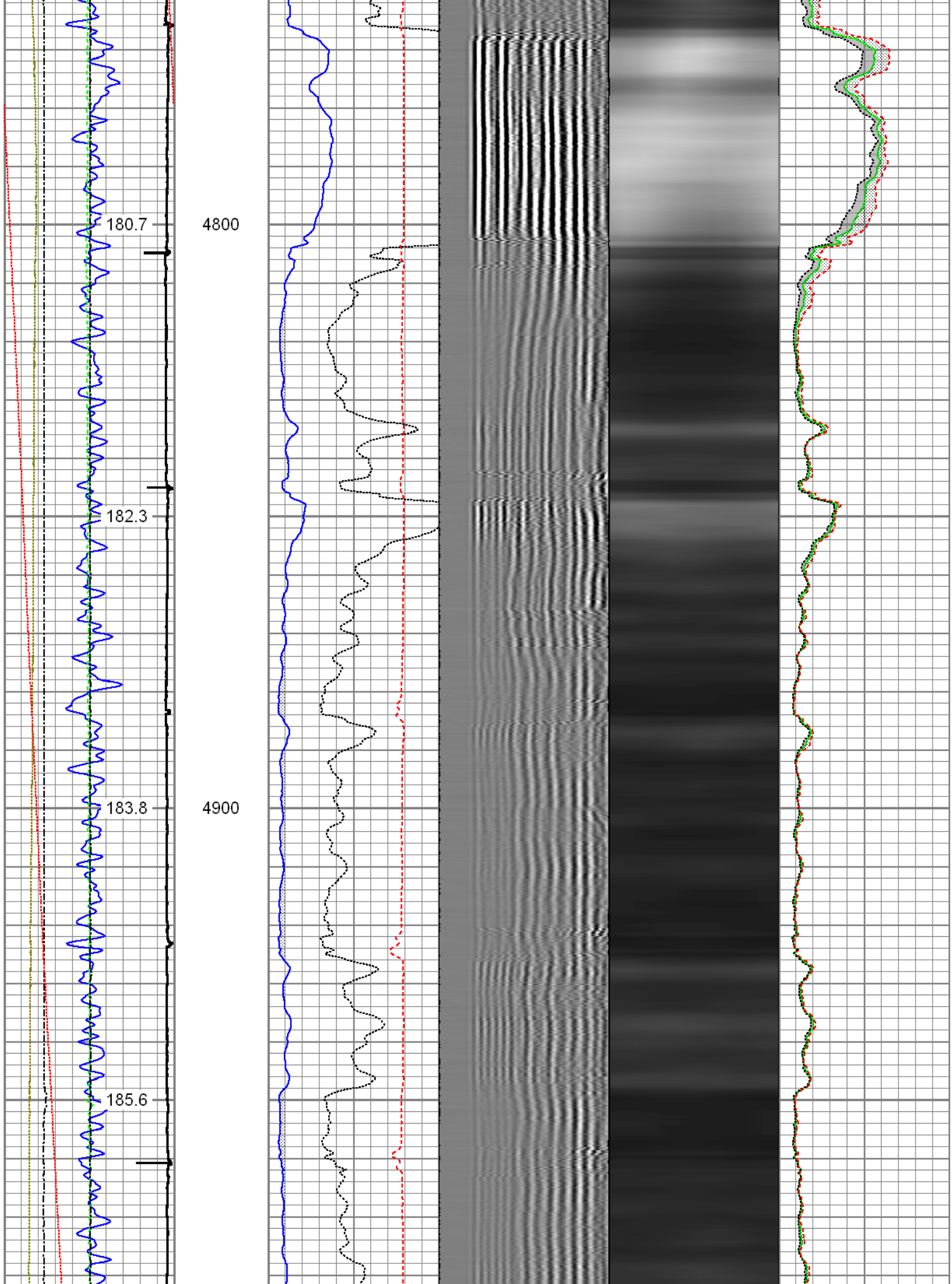
174.6
4600
176.0
177.5
4700
179.1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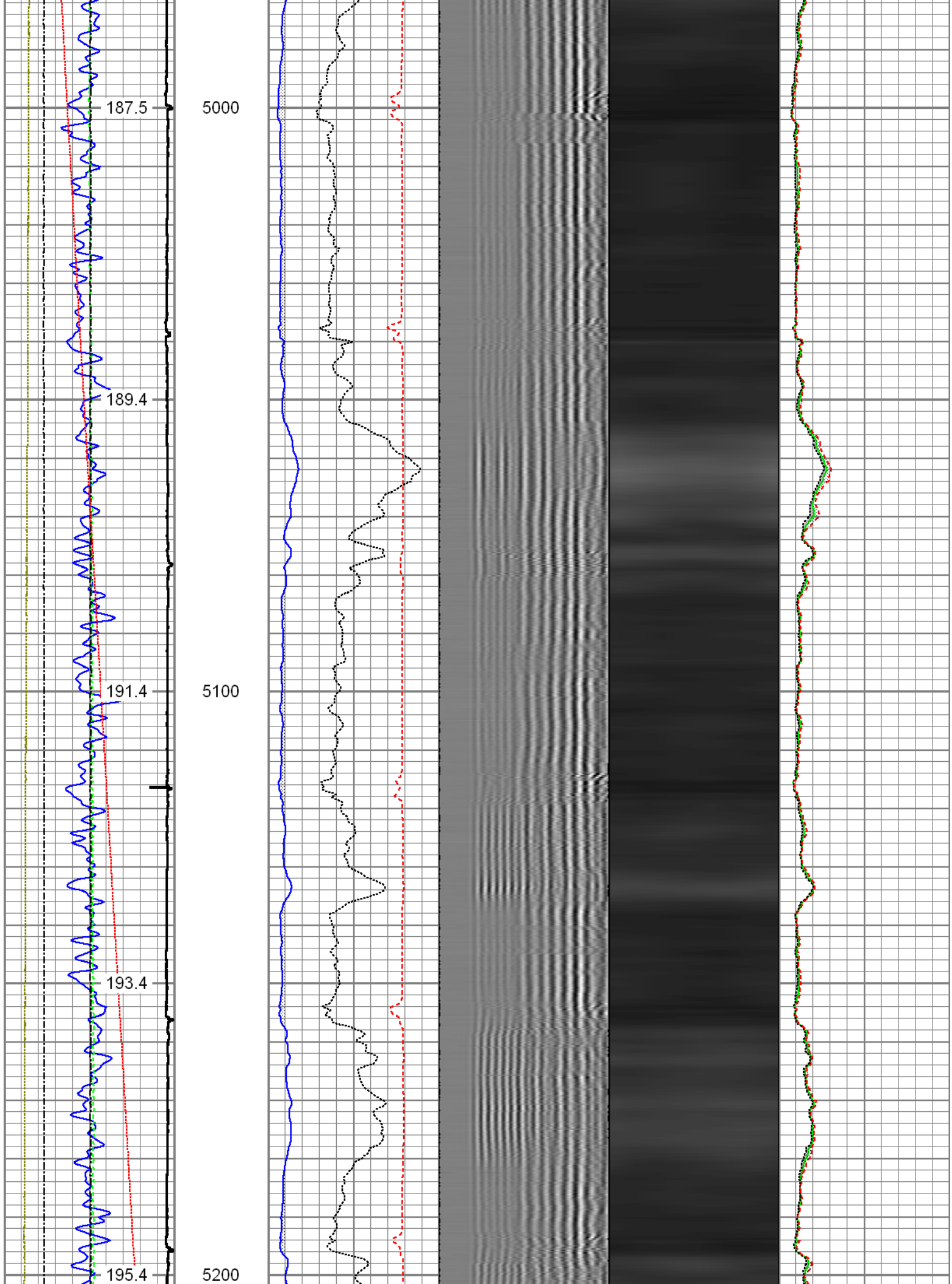
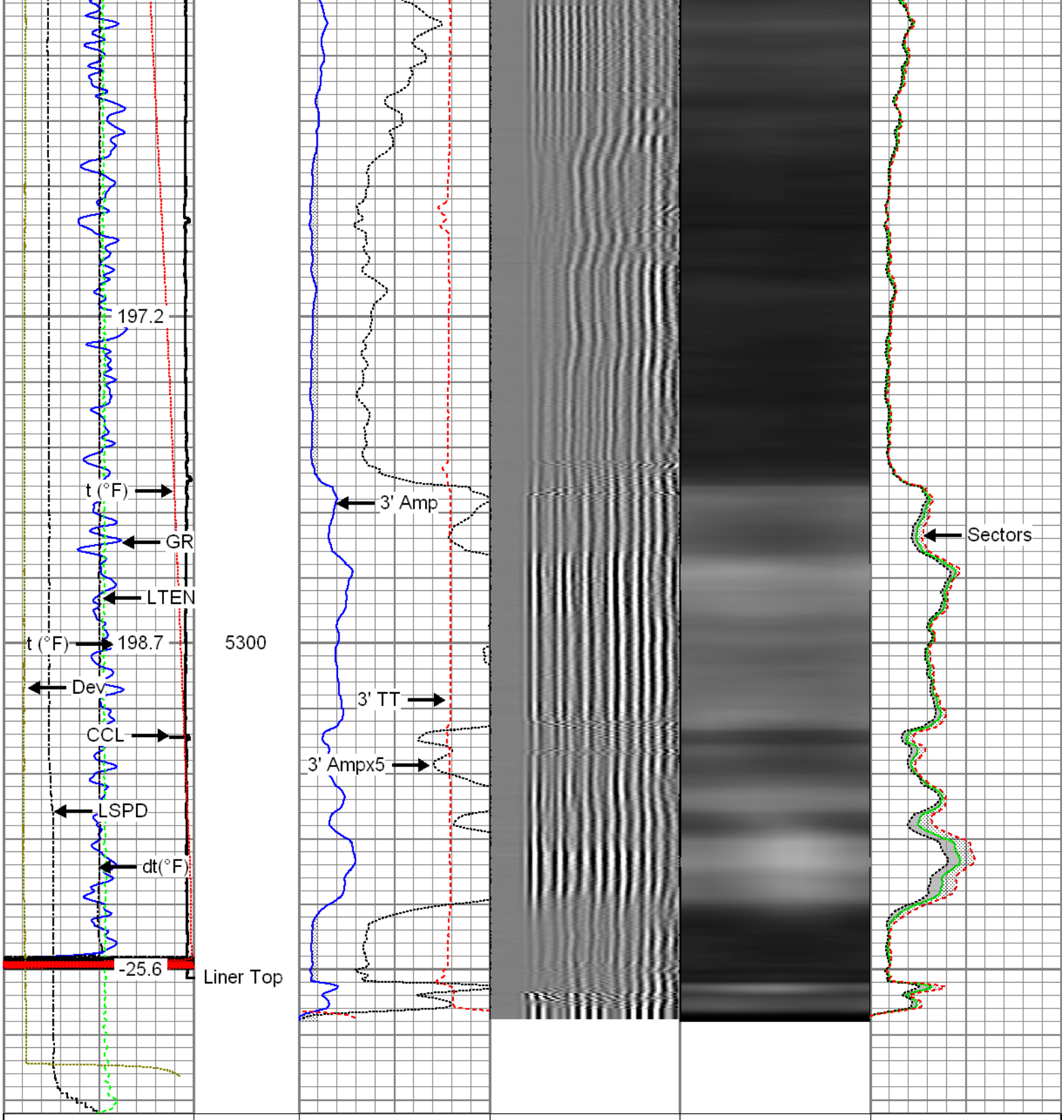
4800
182.3
183.8
4900
185.6


187.5
5000
189.4
191.4
5100
193.4
195.4
5200



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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Repeat Pass

Recorded with 1500 PSI Surface Induced Pressure

Database File:	08-07-15_whiting_razor fed 30k-3106_mit_rbl.db
Dataset Pathname:	repeat
Presentation Format:	rbt4_mit
Dataset Creation:	Fri Aug 07 07:51:00 2015 by Log 7.0 B1
Charted by:	Depth in Feet scaled 1:240

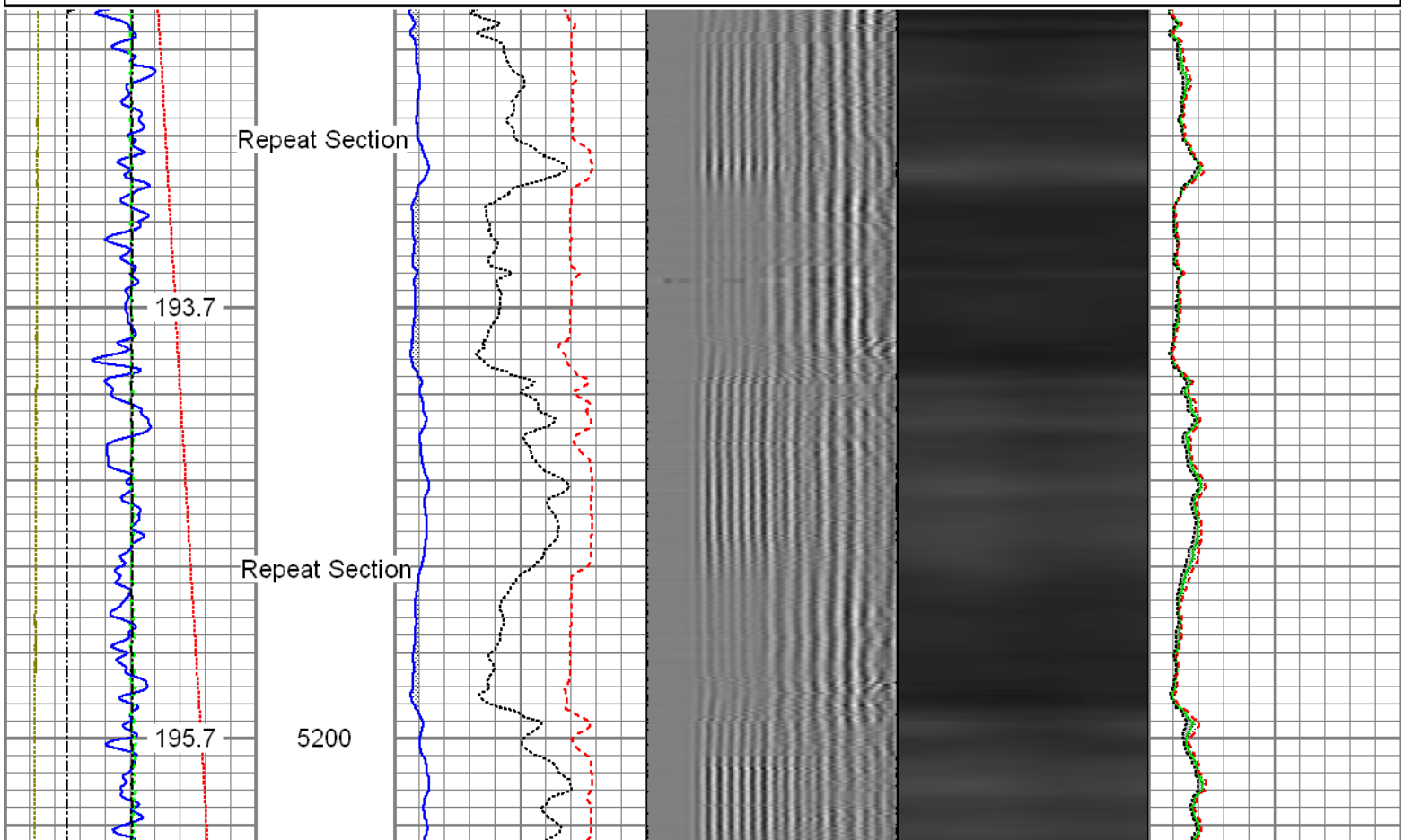
Gamma Ray
0 (GAPI) 120
Line Speed
-100 (ft/min) 100
Line Tension
0 (lb) 2000
Differential Temperature
-2 (degF) 2
-10 Deviation (°) 90
Temperature
0 (degF) 20

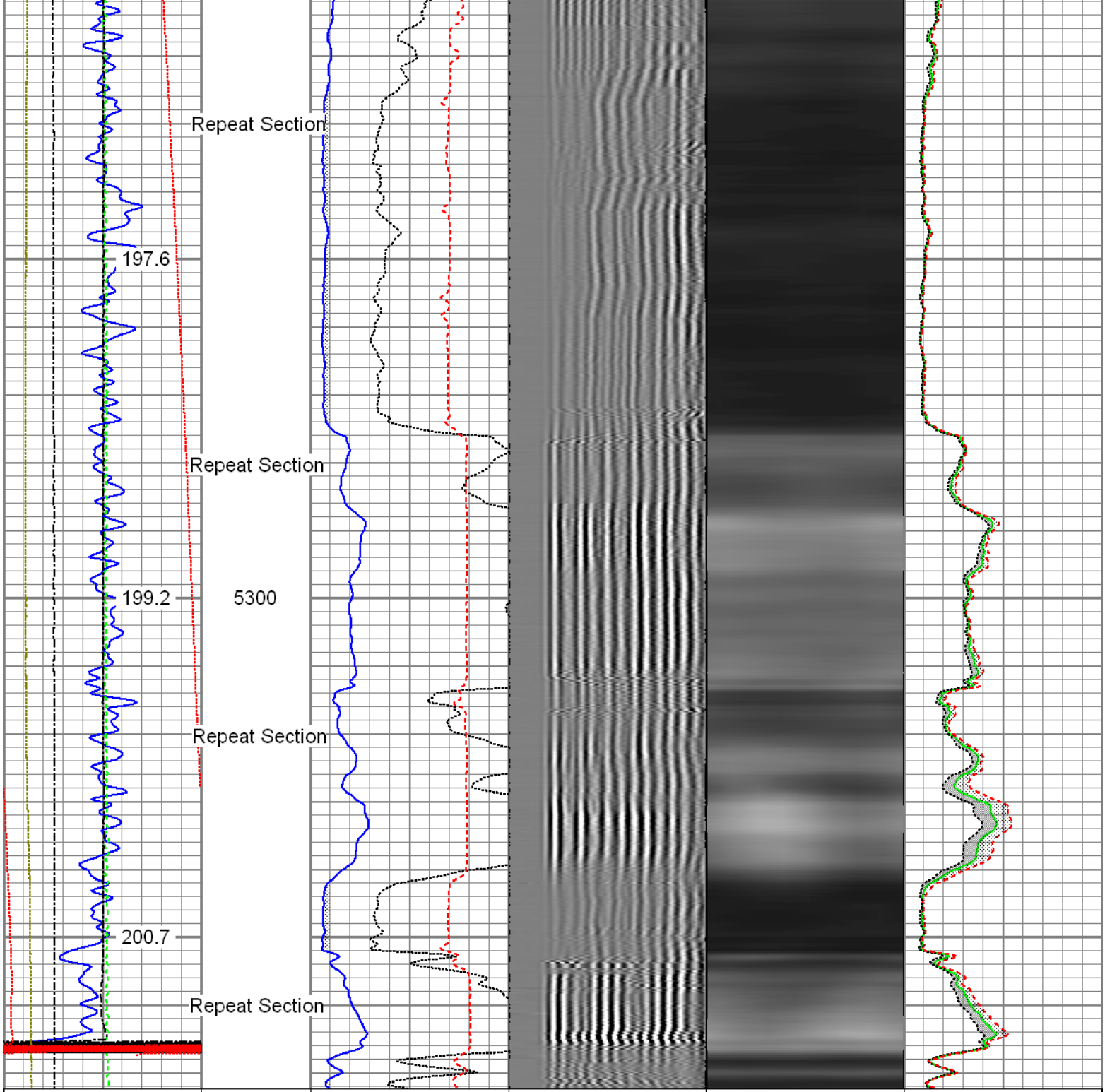
3' Amplitude
0 (mV) 100
3' Amplitude x 5
0 (mV) 20
3' Travel Time
650 (usec) 150

5' Variable Density Log
200 1200

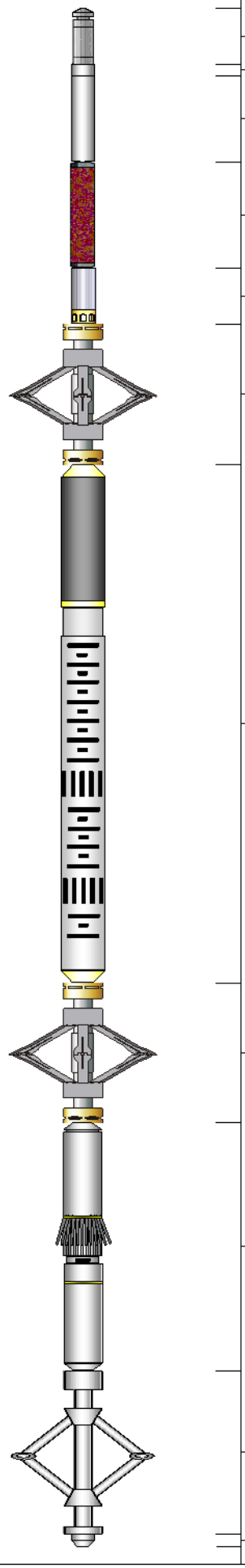
Sector Map

Average Amplitude
0 100
Mimimum Amplitude
0 100
Maximum Amplitude
0 100





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			Mimimum 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)
			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
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 (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					
WVF5FT	14.42					
			UW_PRC-DSSRAC (080) 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: 08-07-15_Whiting_Razor Fed 30K-3106_MIT_RBL.db: field/well/run1/main2
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-3106_MIT_RBL.db
Dataset Pathname: calreport
Dataset Creation: Fri Aug 07 11:00:15 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.:	335.589

Finger Calibration Report

Performed: Fri Aug 07 07:20:12 2015

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1009	365.0	1374	392.0	1766	427.0	2193
Finger 02:	1148	380.0	1528	392.0	1920	420.0	2340
Finger 03:	1058	391.0	1449	408.0	1857	446.0	2303
Finger 04:	1055	375.0	1430	395.0	1825	437.0	2262
Finger 05:	1053	383.0	1436	400.0	1836	431.0	2267
Finger 06:	1061	386.0	1447	399.0	1846	426.0	2272
Finger 07:	1045	389.0	1434	401.0	1835	425.0	2260
Finger 08:	1076	383.0	1459	392.0	1851	421.0	2272
Finger 09:	1064	388.0	1452	391.0	1843	415.0	2258
Finger 10:	1074	387.0	1461	391.0	1852	410.0	2262
Finger 11:	1072	393.0	1465	388.0	1853	401.0	2254
Finger 12:	1080	392.0	1472	388.0	1860	406.0	2266
Finger 13:	1087	389.0	1476	380.0	1856	392.0	2248
Finger 14:	1080	395.0	1475	390.0	1865	402.0	2267
Finger 15:	1028	401.0	1429	400.0	1829	409.0	2238
Finger 16:	1044	401.0	1445	401.0	1846	407.0	2253
Finger 17:	958	381.0	1339	386.0	1725	402.0	2127
Finger 18:	1107	389.0	1496	383.0	1879	387.0	2266
Finger 19:	1063	391.0	1454	389.0	1843	393.0	2236
Finger 20:	1056	394.0	1450	403.0	1853	405.0	2258
Finger 21:	1068	402.0	1470	400.0	1870	390.0	2260
Finger 22:	1034	396.0	1430	403.0	1833	407.0	2240
Finger 23:	994	396.0	1390	411.0	1801	421.0	2222
Finger 24:	1062	391.0	1453	391.0	1844	386.0	2230
Finger 25:	1002	390.0	1392	413.0	1805	417.0	2222
Finger 26:	1137	380.0	1517	383.0	1900	387.0	2287
Finger 27:	1069	388.0	1457	404.0	1861	407.0	2268
Finger 28:	1080	377.0	1457	390.0	1847	398.0	2245
Finger 29:	1014	382.0	1396	410.0	1806	424.0	2230
Finger 30:	1068	381.0	1449	402.0	1851	423.0	2274
Finger 31:	1072	374.0	1446	396.0	1842	417.0	2259
Finger 32:	1040	381.0	1421	412.0	1833	433.0	2266

Finger 33:	1127	374.0	1501	386.0	1887	400.0	2287
Finger 34:	1086	368.0	1454	397.0	1851	423.0	2274
Finger 35:	1017	382.0	1399	423.0	1822	454.0	2276
Finger 36:	1032	374.0	1406	408.0	1814	442.0	2256
Finger 37:	1085	376.0	1461	400.0	1861	429.0	2290
Finger 38:	1108	371.0	1479	397.0	1876	416.0	2292
Finger 39:	1104	367.0	1471	389.0	1860	421.0	2281
Finger 40:	1048	376.0	1424	404.0	1828	436.0	2264

Post Survey Calibration Check

Performed: Fri Aug 07 10:58:47 2015

Ring size: (in)	4	Nom. wear	5	Nom. wear	6	Nom. wear	7	Nom. wear
Finger 01:	4.011	0.005	5.008	0.004	6.009	0.005	7.017	0.009
Finger 02:	4.007	0.003	5.002	0.001	6.011	0.005	7.015	0.008
Finger 03:	4.012	0.006	5.007	0.003	6.011	0.005	7.014	0.007
Finger 04:	4.012	0.006	5.005	0.003	6.008	0.004	7.003	0.002
Finger 05:	4.012	0.006	5.007	0.004	6.008	0.004	7.015	0.008
Finger 06:	4.014	0.007	5.011	0.006	6.013	0.006	7.016	0.008
Finger 07:	4.014	0.007	5.010	0.005	6.013	0.007	7.016	0.008
Finger 08:	4.008	0.004	5.008	0.004	6.012	0.006	7.015	0.007
Finger 09:	4.012	0.006	5.008	0.004	6.012	0.006	7.013	0.007
Finger 10:	4.008	0.004	5.013	0.006	6.012	0.006	7.013	0.006
Finger 11:	4.022	0.011	5.012	0.006	6.009	0.004	7.016	0.008
Finger 12:	4.016	0.008	5.009	0.004	6.017	0.008	7.014	0.007
Finger 13:	4.014	0.007	5.007	0.004	6.015	0.007	7.013	0.007
Finger 14:	4.003	0.002	5.006	0.003	6.018	0.009	7.015	0.007
Finger 15:	4.011	0.006	5.004	0.002	6.013	0.006	7.018	0.009
Finger 16:	4.006	0.003	5.001	0.001	6.009	0.004	7.016	0.008
Finger 17:	4.019	0.009	5.000	0.000	6.005	0.002	7.019	0.010
Finger 18:	4.008	0.004	5.005	0.002	6.017	0.008	7.016	0.008
Finger 19:	4.013	0.006	5.004	0.002	6.012	0.006	7.015	0.007
Finger 20:	4.008	0.004	5.008	0.004	6.013	0.007	7.022	0.011
Finger 21:	4.017	0.009	5.006	0.003	6.010	0.005	7.017	0.008
Finger 22:	4.016	0.008	5.011	0.006	6.018	0.009	7.020	0.010
Finger 23:	4.016	0.008	5.009	0.004	6.012	0.006	7.014	0.007
Finger 24:	4.013	0.007	5.005	0.003	6.012	0.006	7.013	0.006
Finger 25:	4.007	0.003	5.009	0.004	6.003	0.002	7.011	0.006
Finger 26:	4.012	0.006	5.006	0.003	6.012	0.006	7.017	0.009
Finger 27:	4.012	0.006	5.005	0.003	6.010	0.005	7.013	0.006
Finger 28:	4.013	0.006	5.010	0.005	6.008	0.004	7.012	0.006
Finger 29:	4.009	0.005	5.008	0.004	6.010	0.005	7.014	0.007
Finger 30:	4.008	0.004	5.008	0.004	6.017	0.009	7.012	0.006
Finger 31:	4.014	0.007	5.008	0.004	6.014	0.007	7.012	0.006
Finger 32:	4.011	0.005	5.008	0.004	6.011	0.006	7.013	0.006
Finger 33:	4.017	0.009	5.011	0.005	6.014	0.007	7.013	0.007
Finger 34:	4.012	0.006	5.009	0.004	6.012	0.006	7.017	0.009
Finger 35:	4.012	0.006	5.006	0.003	6.016	0.008	7.016	0.008
Finger 36:	4.009	0.005	5.006	0.003	6.011	0.006	7.019	0.009
Finger 37:	4.014	0.007	5.006	0.003	6.013	0.006	7.018	0.009
Finger 38:	4.016	0.008	5.004	0.002	6.021	0.011	7.025	0.013
Finger 39:	4.012	0.006	5.004	0.002	6.012	0.006	7.021	0.010
Finger 40:	4.010	0.005	5.002	0.001	6.008	0.004	7.013	0.007
Average:	4.012	0.006	5.007	0.003	6.012	0.006	7.015	0.008

Segmented Cement Bond Log Calibration Report

Serial Number: 10022773
Tool Model: UW_RBT_004

Calibration Casing Diameter: 7.000 in
Calibration Depth: 4550.032 ft

Master Calibration, performed Fri Aug 07 08:53:00 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	0.002	0.522	0.800	62.200	118.076	0.512
5FT	-0.001	0.455	0.800	62.200	134.558	0.964
S1	0.002	0.483	0.000	100.000	207.999	-0.515
S2	0.001	0.485	0.000	100.000	206.760	-0.252
S3	0.002	0.490	0.000	100.000	205.206	-0.501
S4	0.002	0.506	0.000	100.000	198.253	-0.341
S5	0.002	0.541	0.000	100.000	185.634	-0.453
S6	0.002	0.549	0.000	100.000	182.894	-0.355
S7	0.003	0.532	0.000	100.000	188.691	-0.474
S8	0.002	0.508	0.000	100.000	197.942	-0.476

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

FMC Technologies

Company Whiting Oil & Gas Corporation
Well Razor Fed 30K-3106
Field Wildcat
County Weld
State Colorado