



Compensated Neutron  
Gamma Ray  
Casing Collar Log

Company	Noble Energy Inc.			Location:	API # : 05-123-41725	Other Services MIT RCBL
Well	Wells Ranch AE32-635			SEC 32	TWP 6N	RGE 62W
Field	Wattenberg			Permanent Datum	Ground Level	Elevation 4722'
County	Weld			Log Measured From	Kelly Bushing	24 FT
State	Colorado			Drilling Measured From	Kelly Bushing	Elevation K.B. 4746' D.F. 4745' G.L. 4722'

Date	12-OCT-2015		
Run Number	One		
Depth Driller	15973 FT		
Depth Logger	6715 FT		
Bottom Logged Interval	6712 FT		
Top Log Interval	Surface		
Open Hole Size	8.750"		
Type Fluid	Water		
Density / Viscosity	8.34 lbm/gal		
Max. Recorded Temp.	224°F		
Estimated Cement Top	120 FT		
Time Well Ready	ROA		
Time Logger on Bottom	11:00		
Equipment Number	HD-0324		
Location	Fort Lupton, CO		
Recorded By	Chad Bryan		
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	619.0 FT		
Intermediate #1	7	26	P-110IC	24 FT	6841.7 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110IC	6724.2 FT	15958.0 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 Kelly Bushing of 24 FT  
Log ran from just above Liner Top to surface  
Recorded with 2500 PSI surface induced pressure  
Logging tools were coated with debris upon completion of operations  
  
Thank you for choosing FMC Technologies Completion Services, Inc.!!



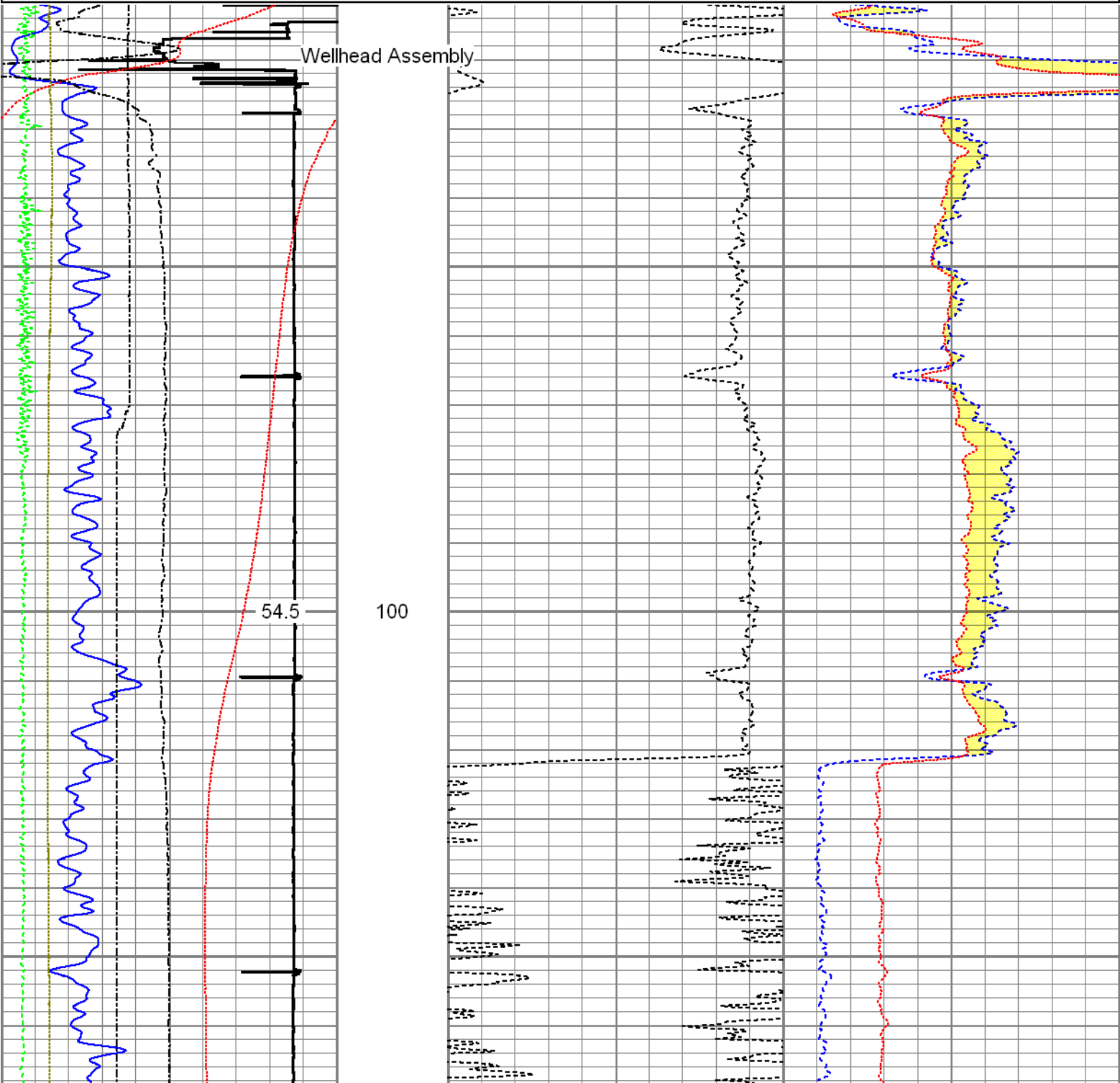
Main Pass

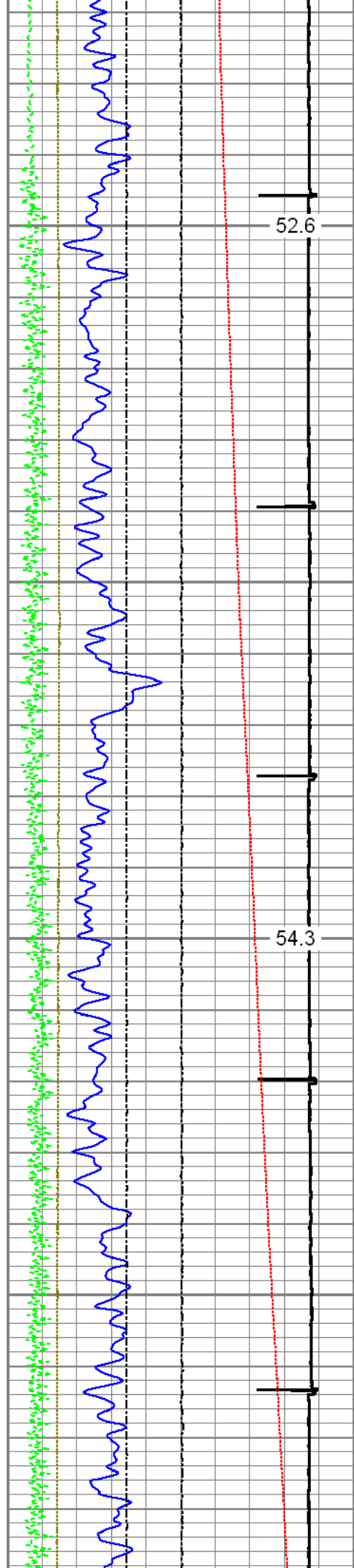
Recorded with 2500 PSI Surface Induced Pressure

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Dataset Pathname: main3.1  
Presentation Format: cnl\_4mit  
Dataset Creation: Mon Oct 12 17:12:57 2015 by Calc 7.0 B1  
Charted by: Depth in Feet scaled 1:240

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

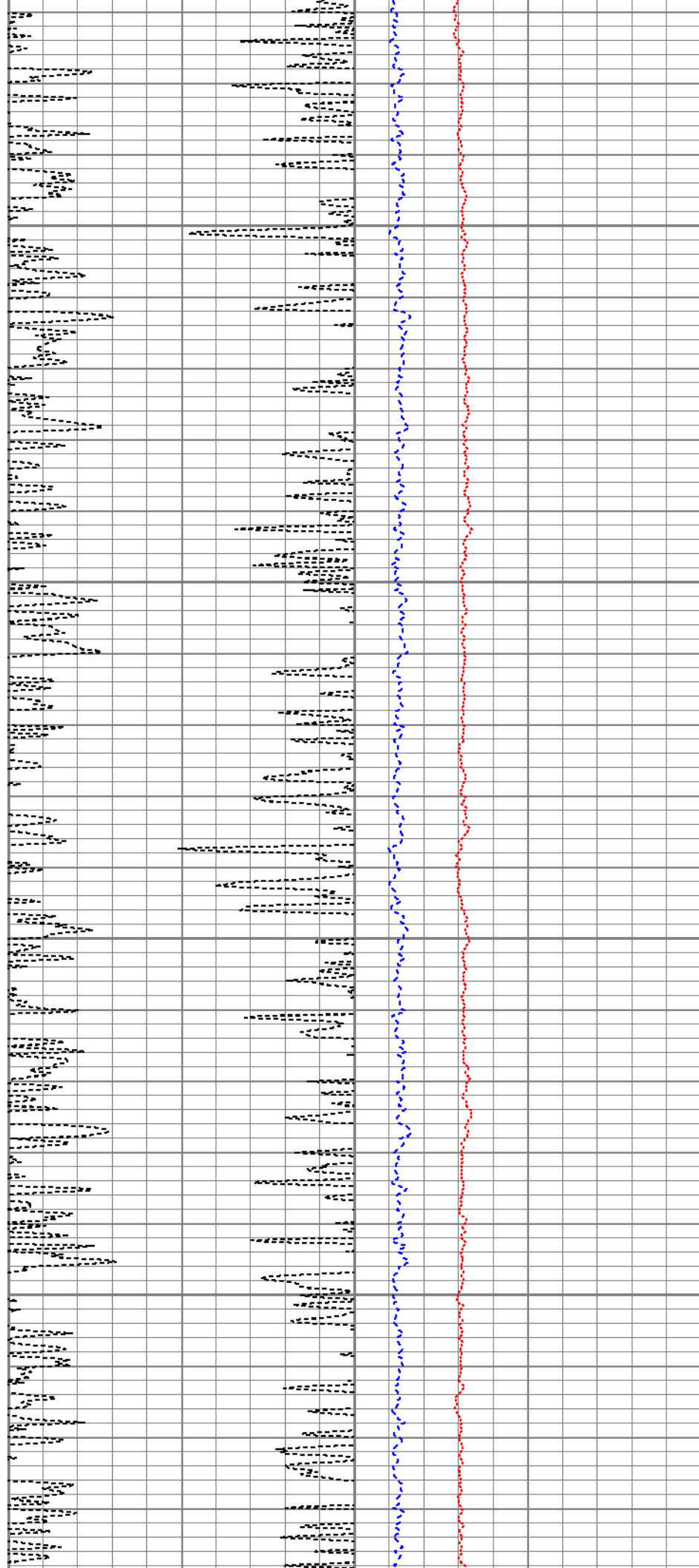
60	Neutron Porosity (pu)	0	0	Far Neutron (cps)	1000
0					Near Neutron (cps) 10000

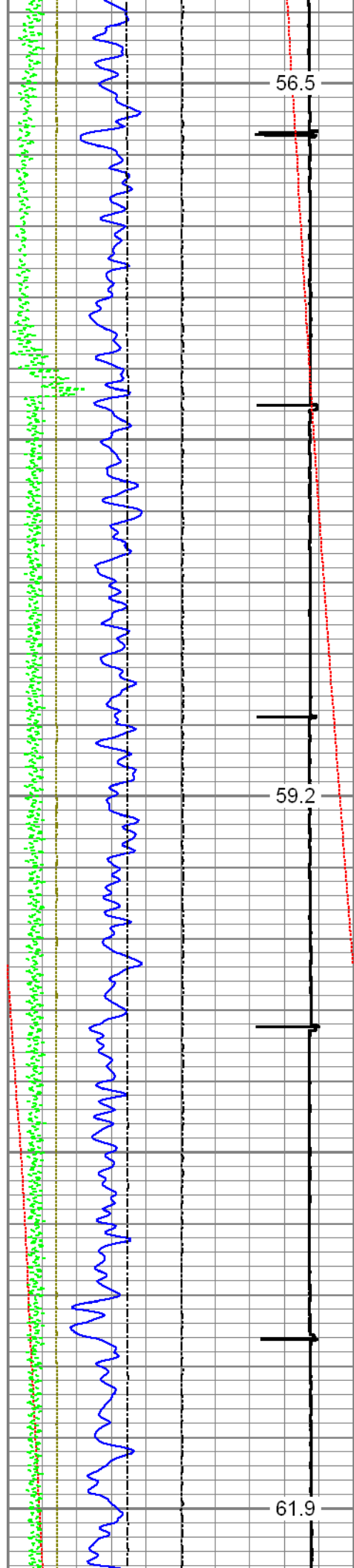




200

300

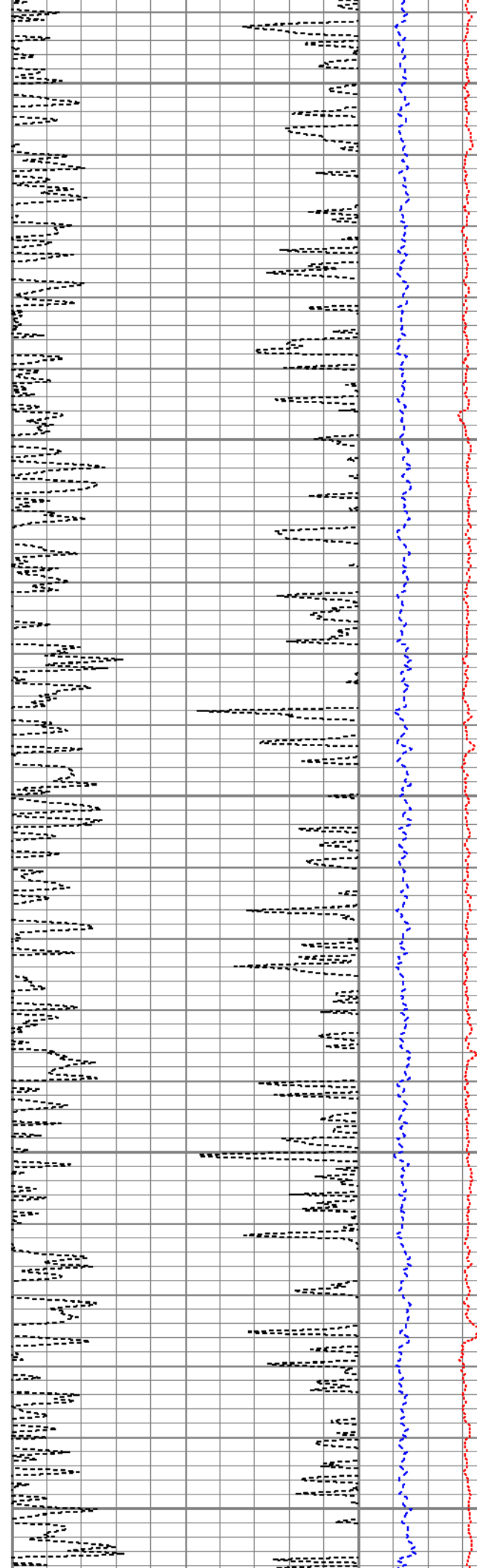


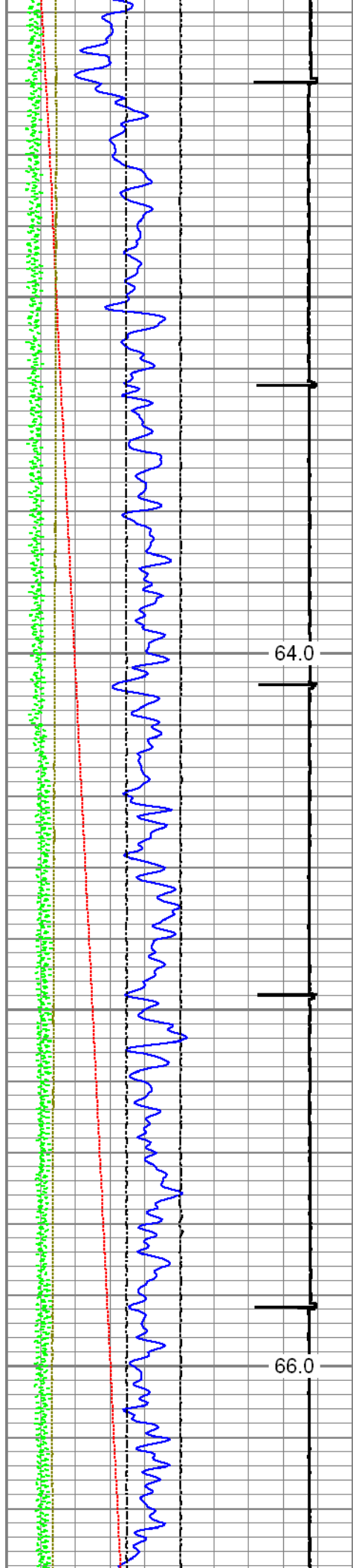


400

500

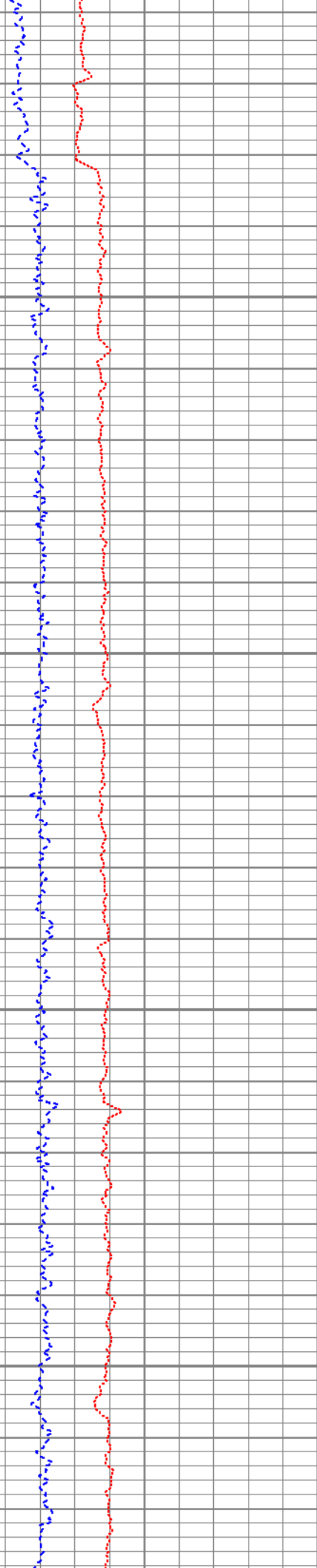
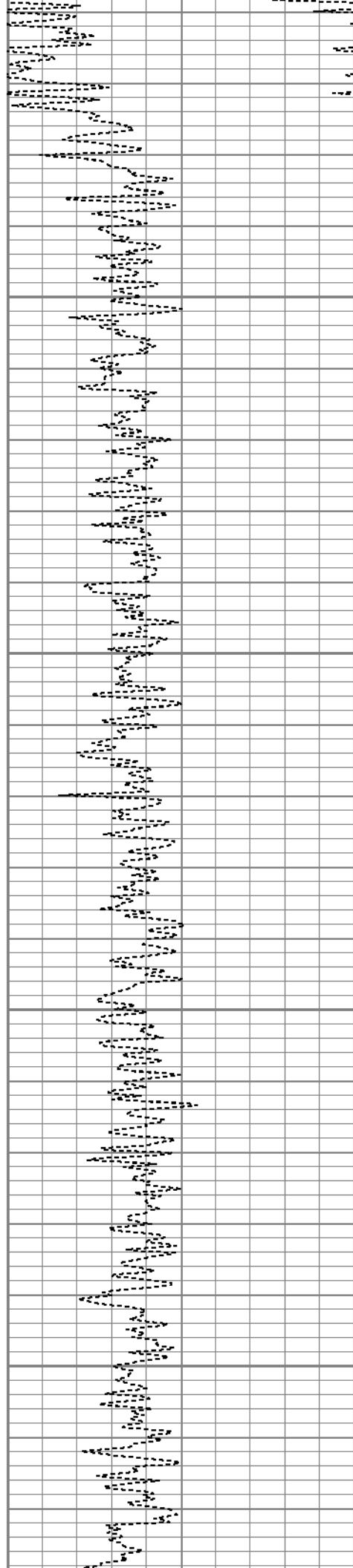
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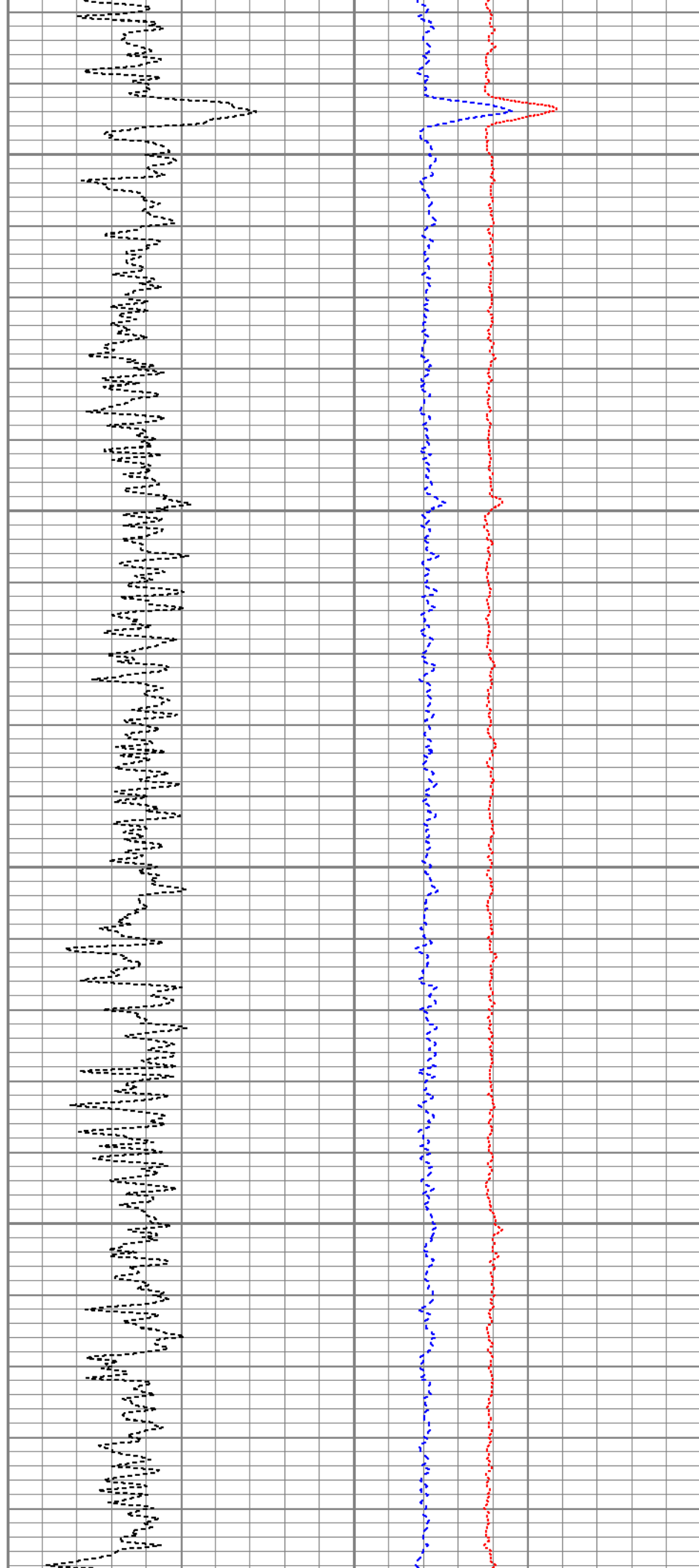
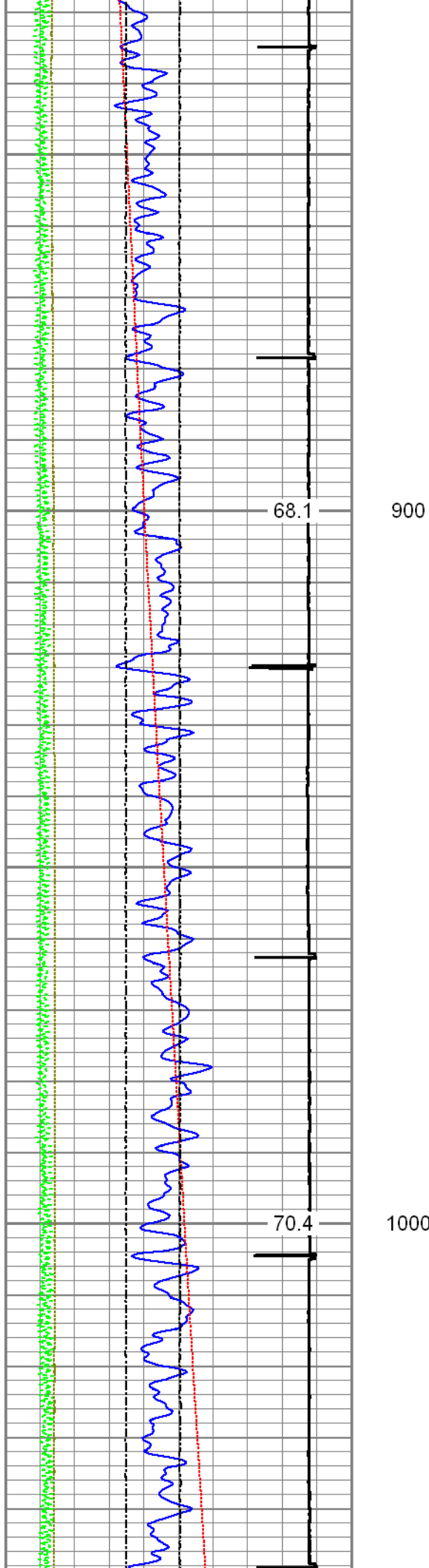


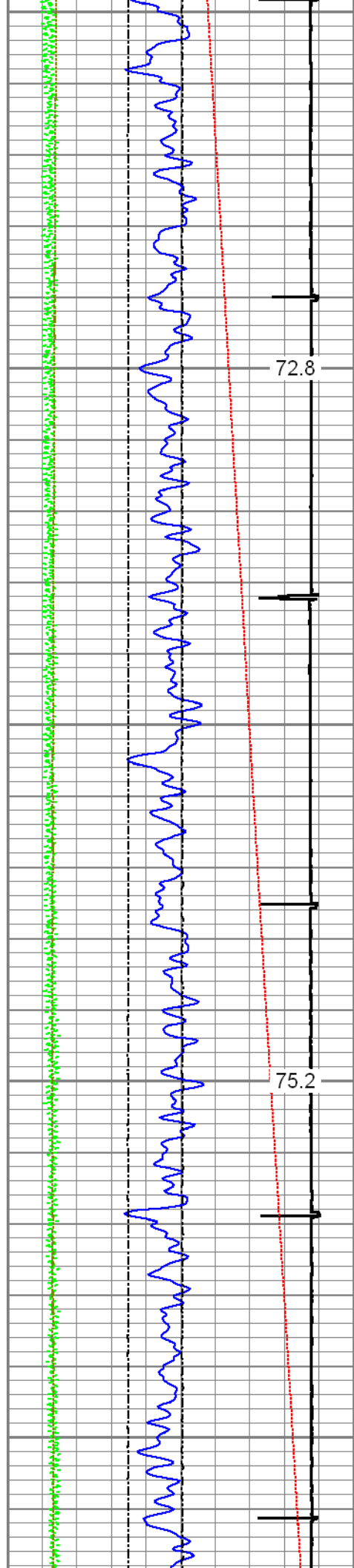


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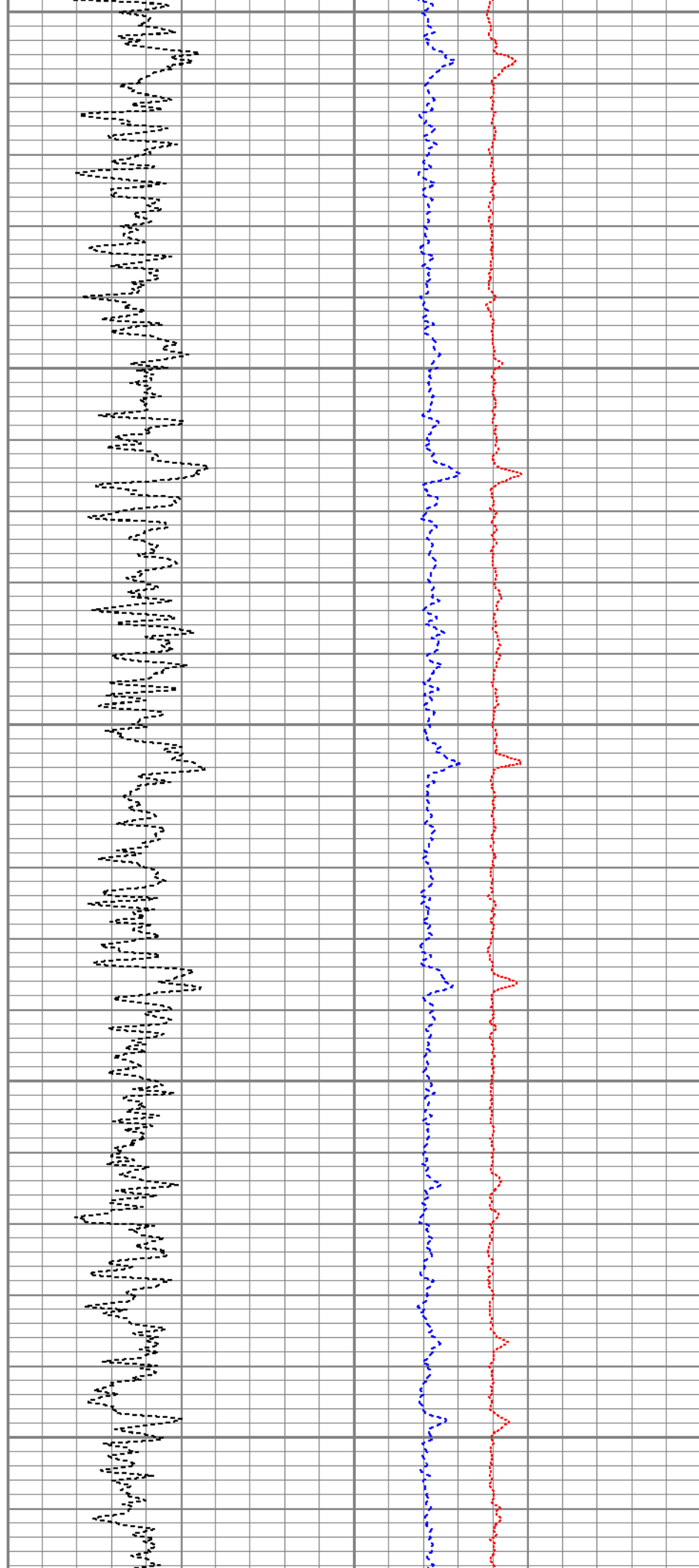




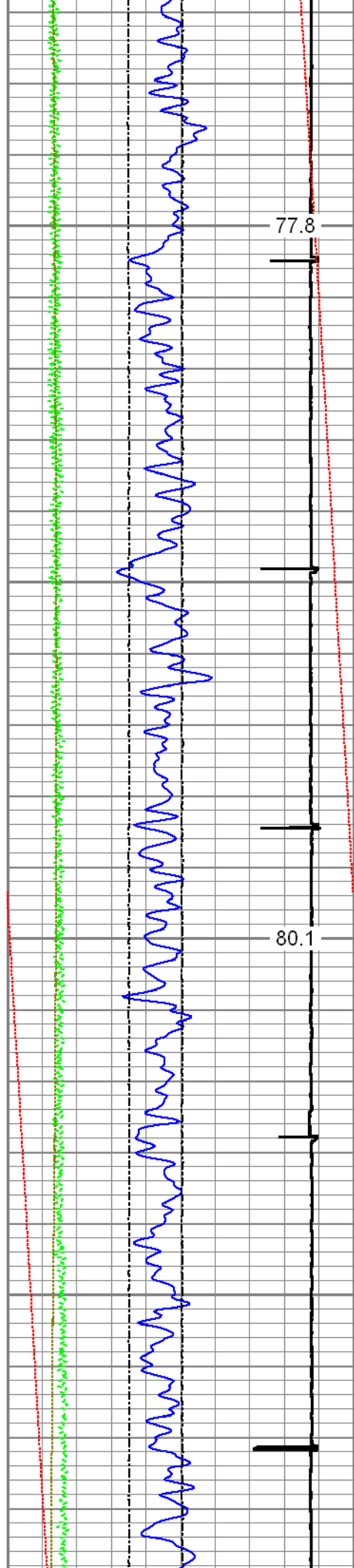


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1200





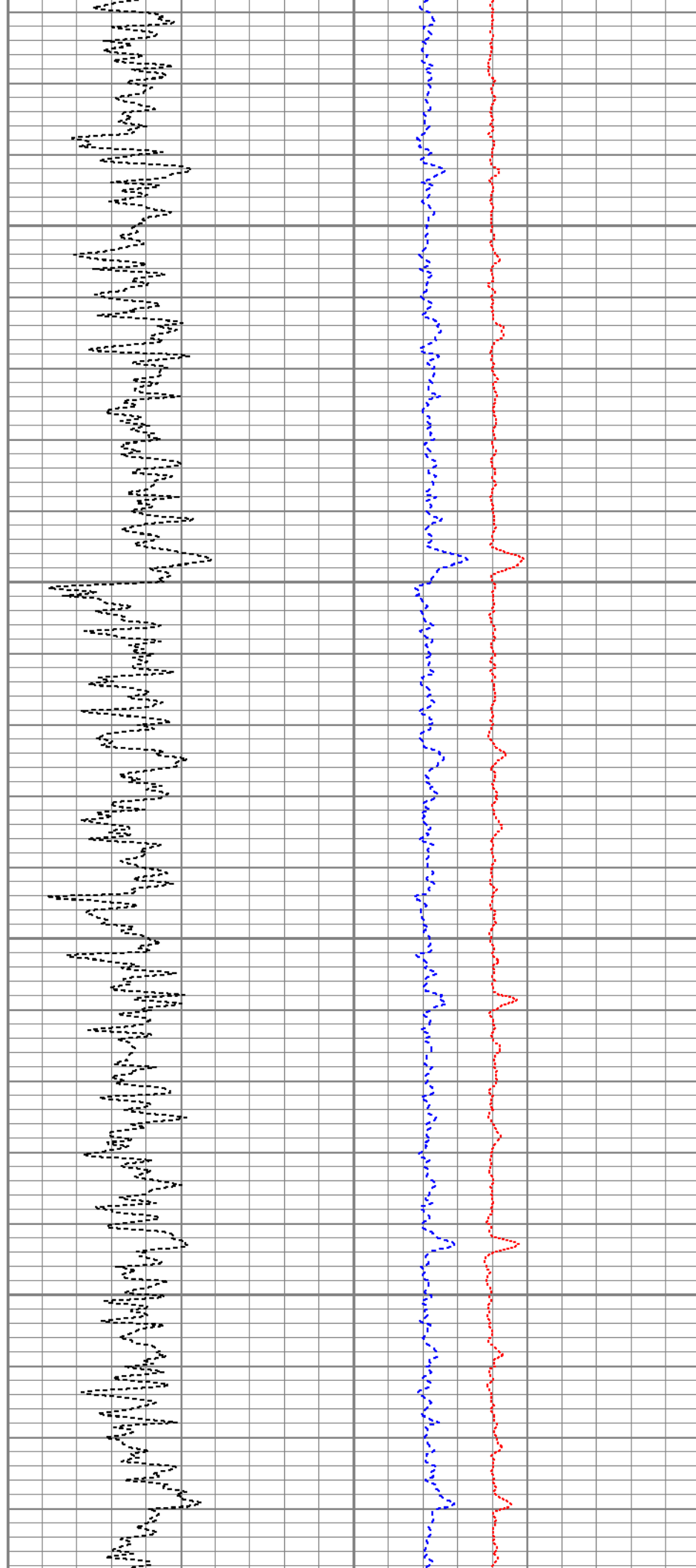


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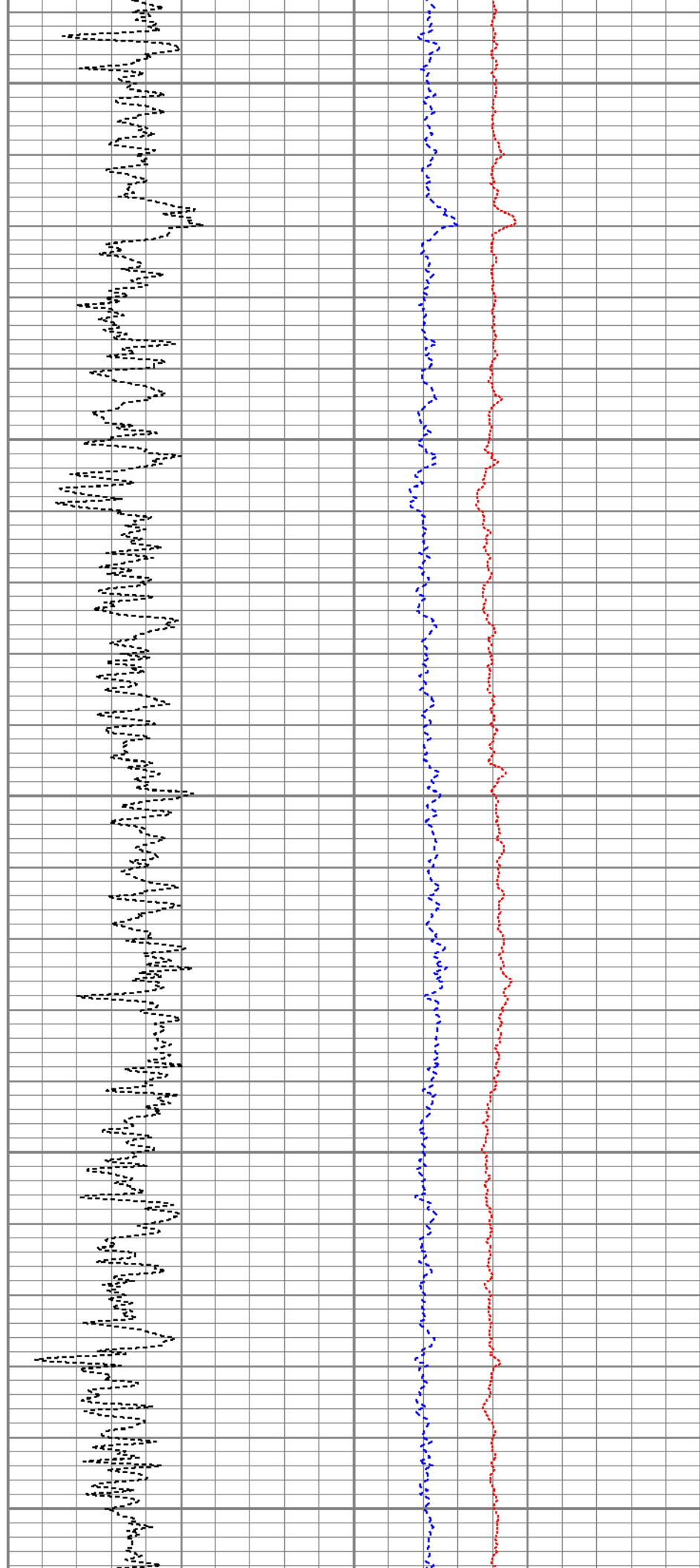
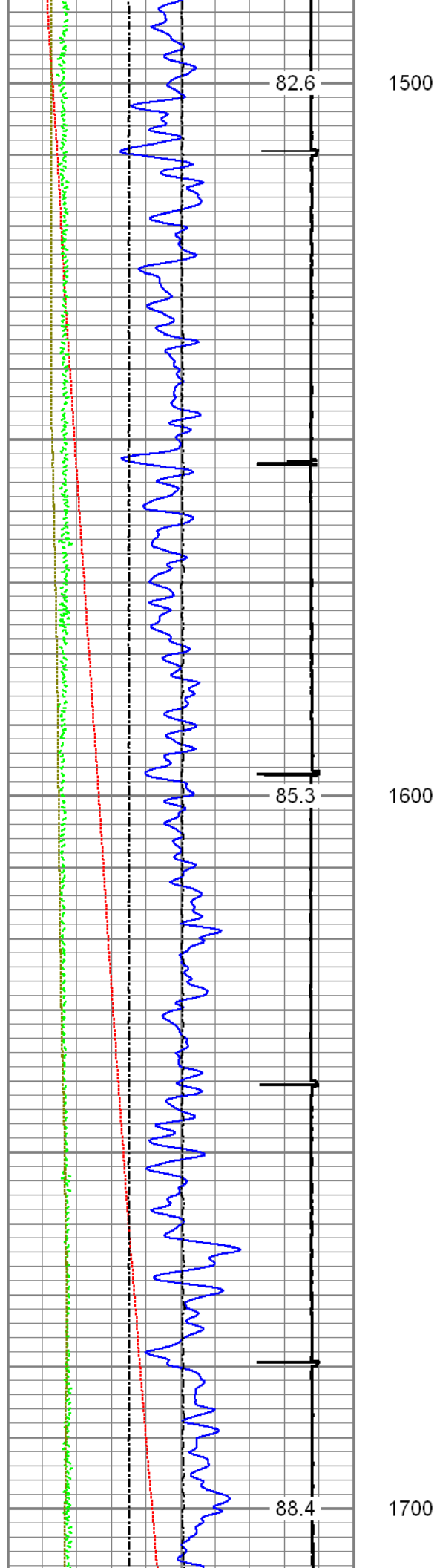
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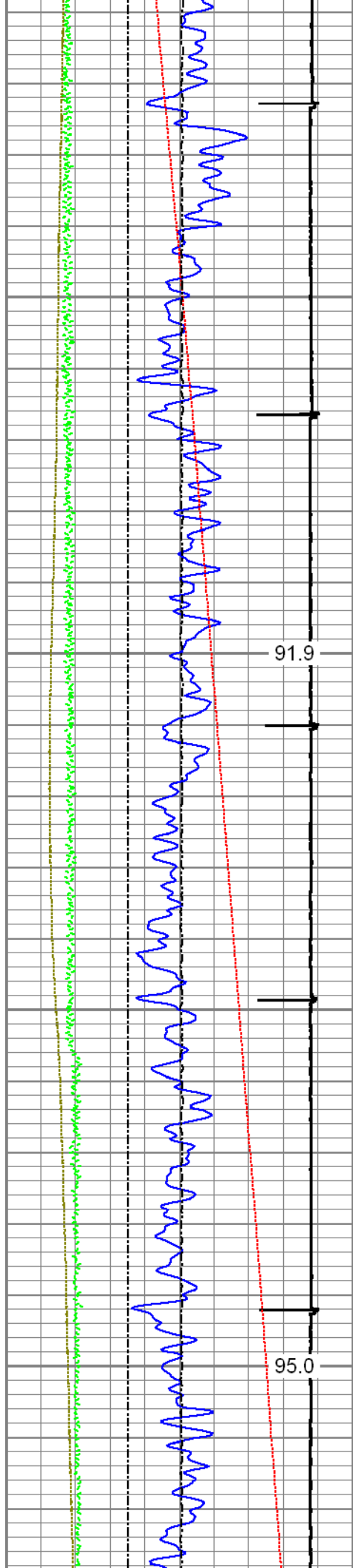
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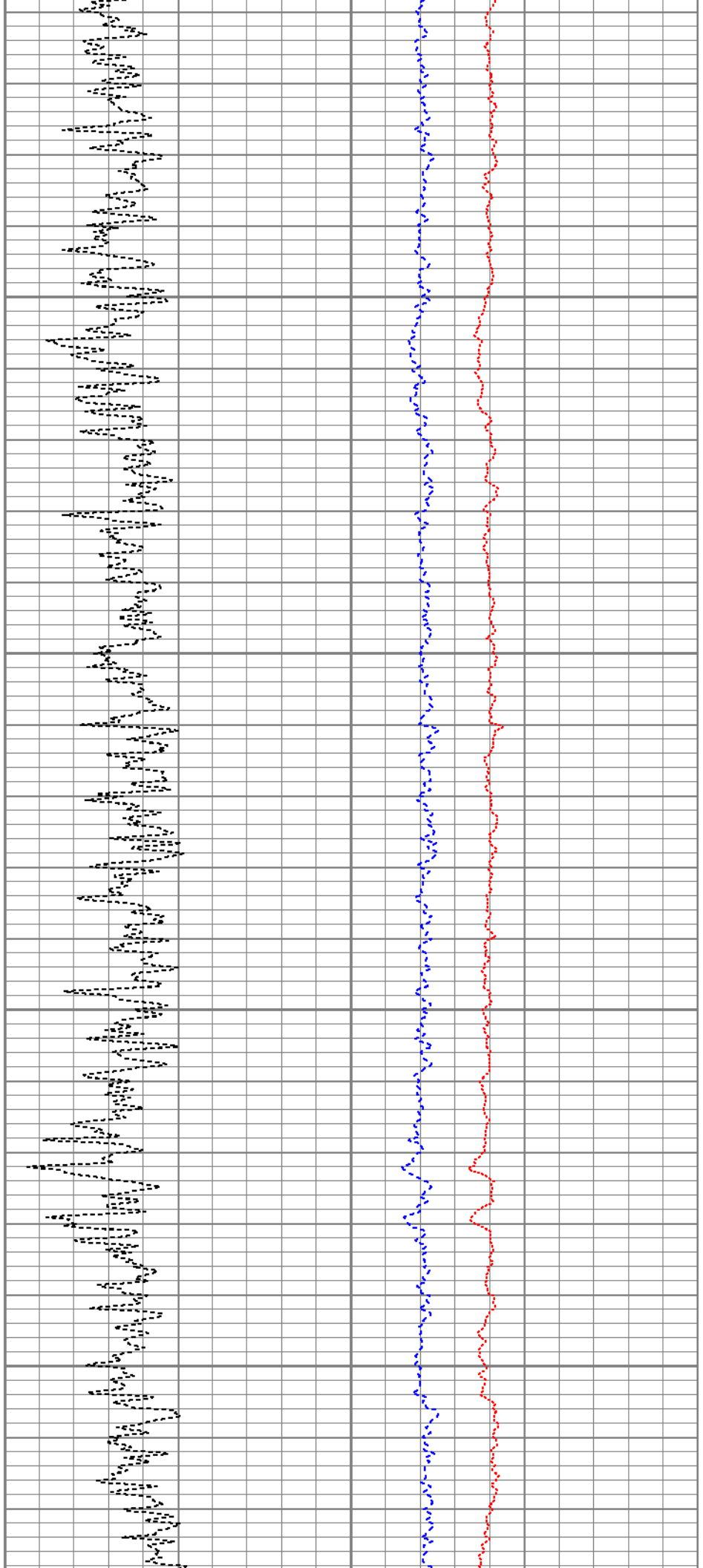


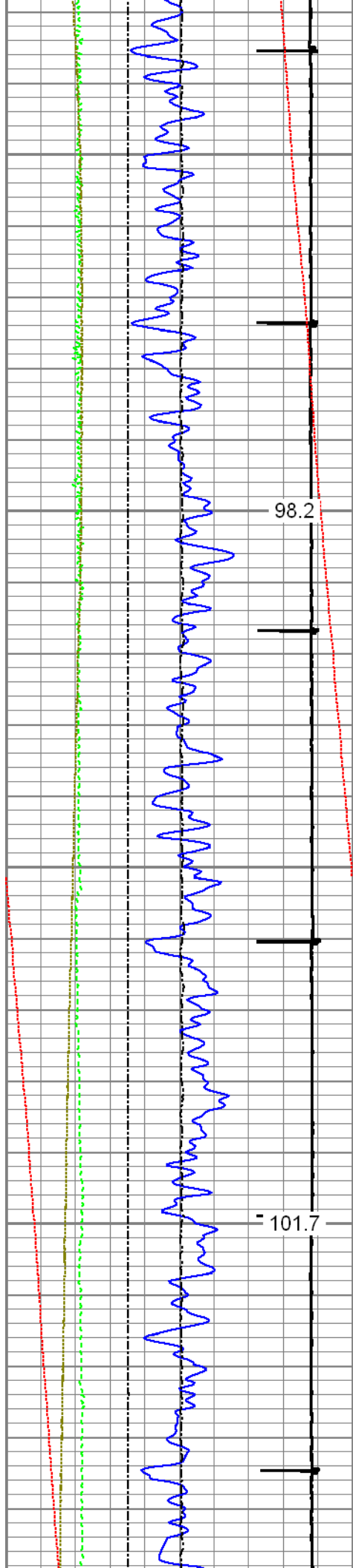




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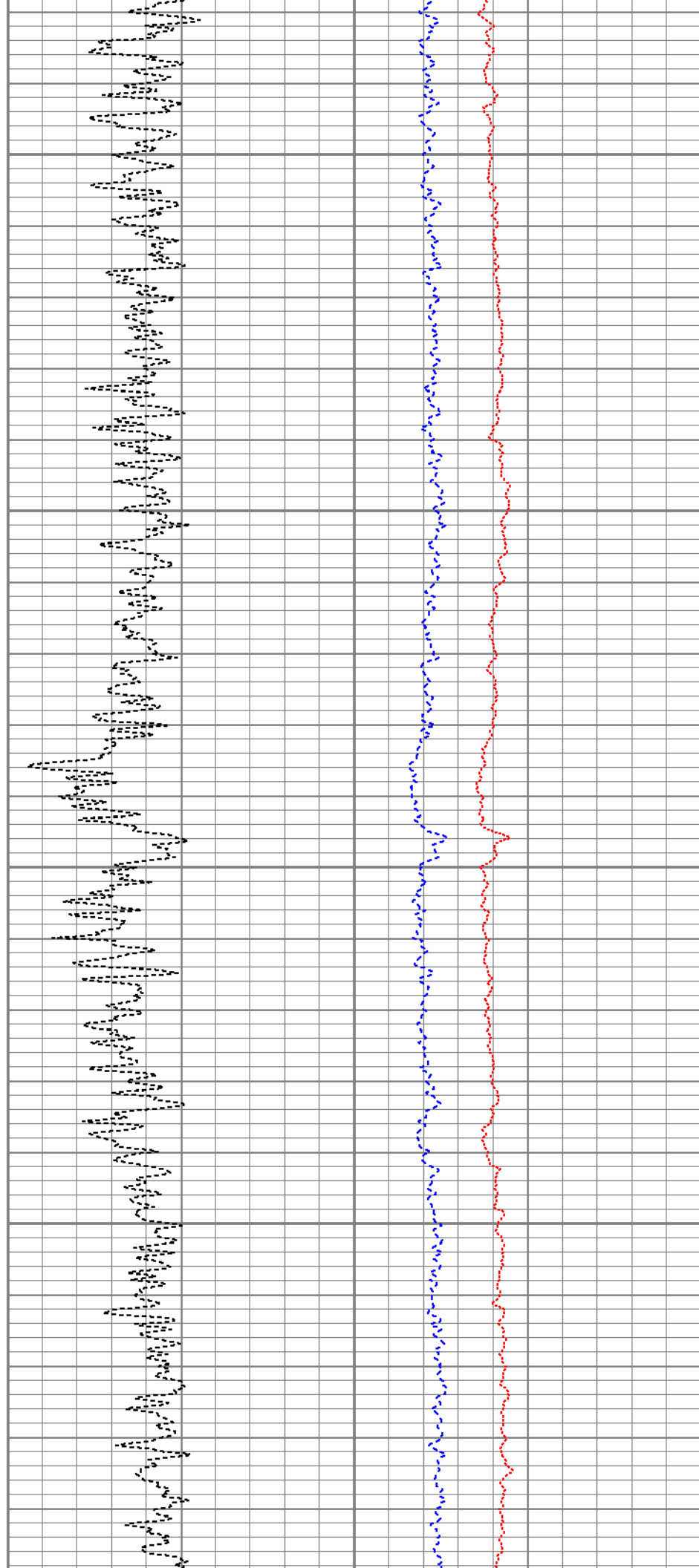
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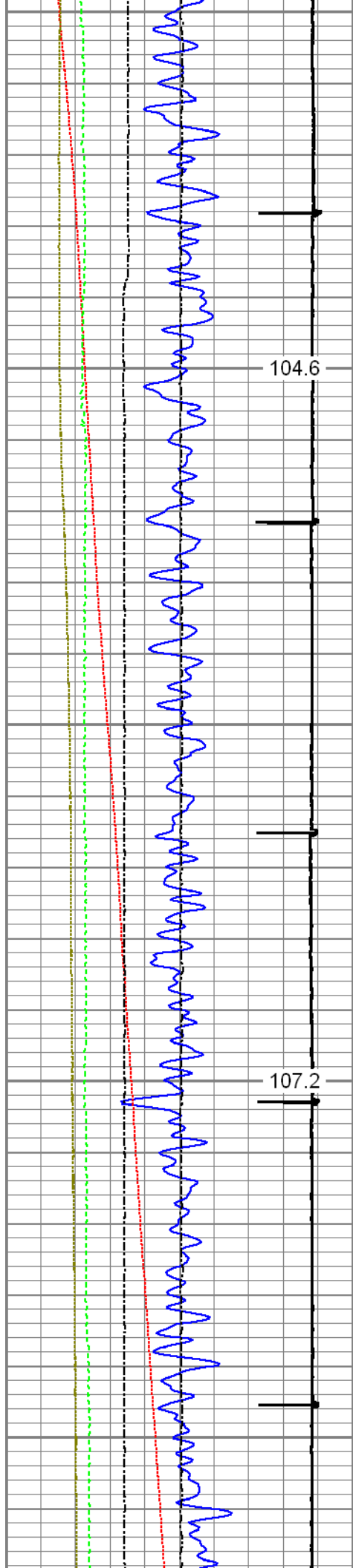




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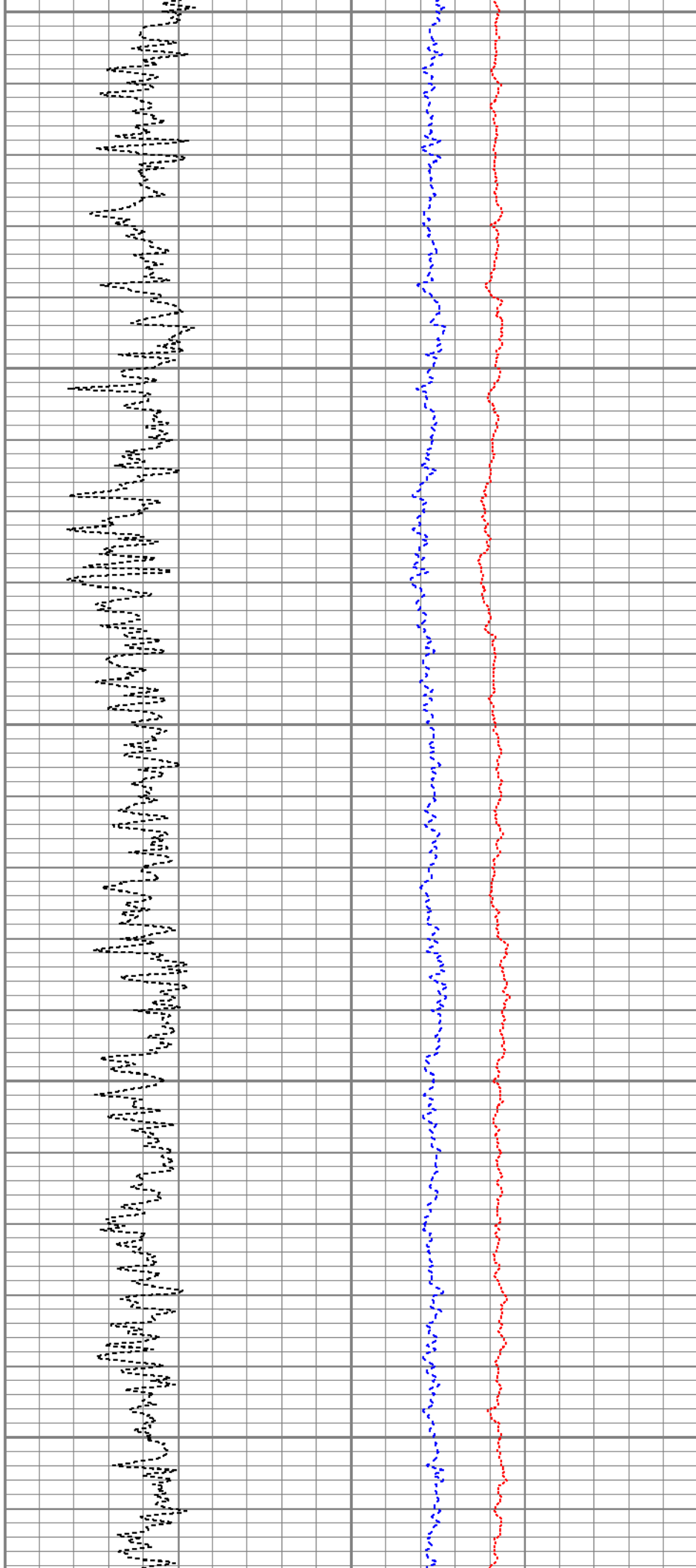


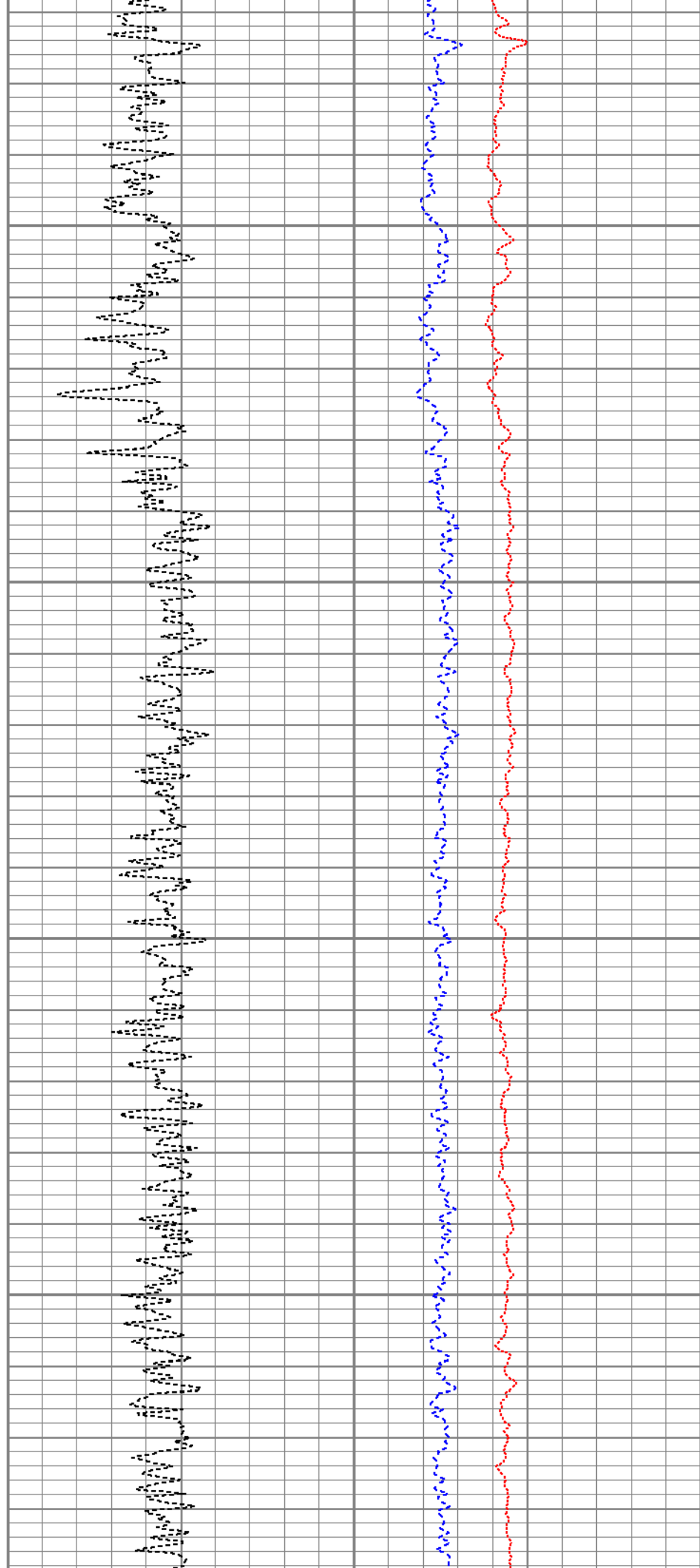
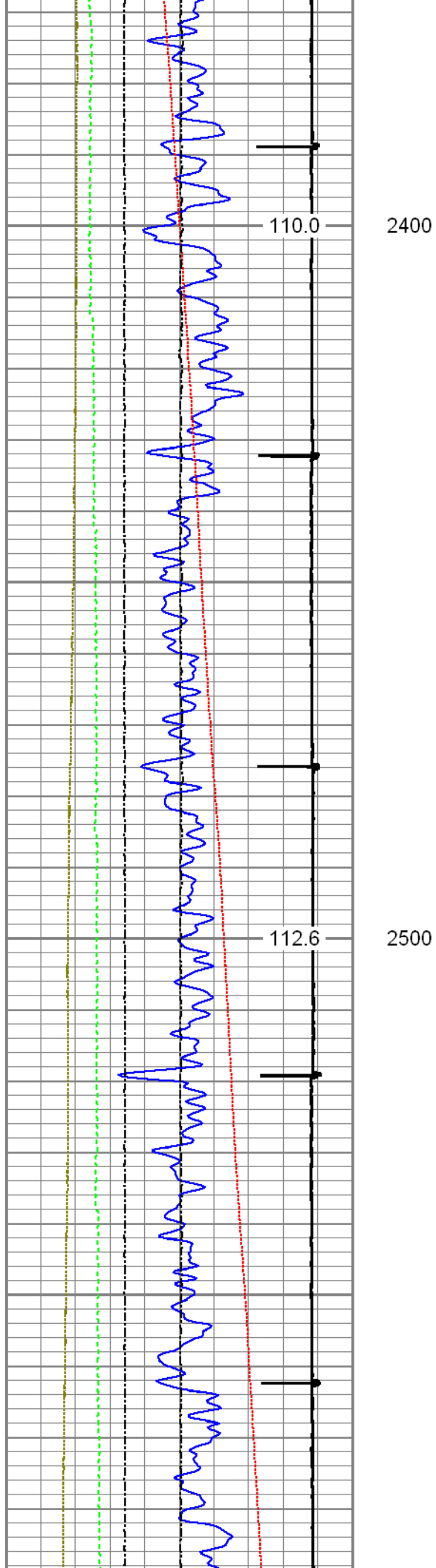
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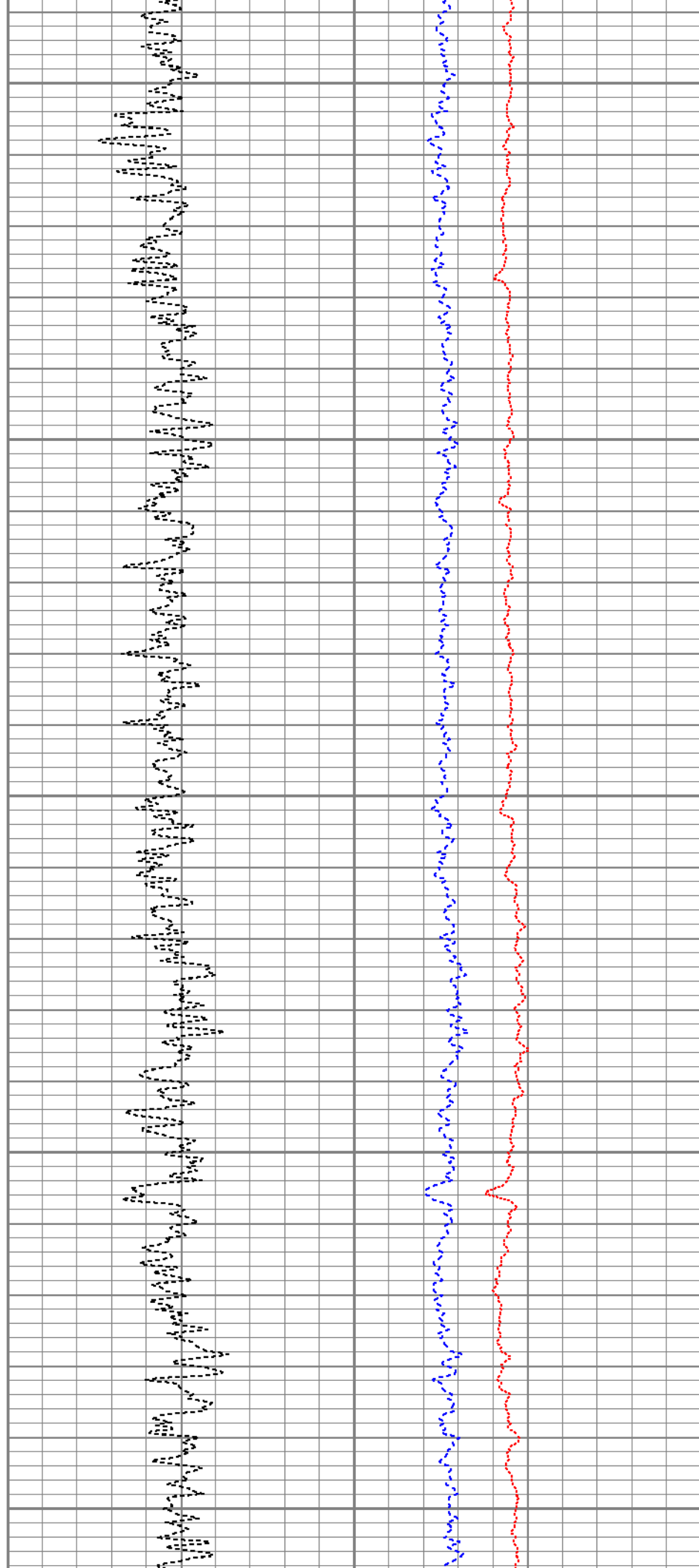
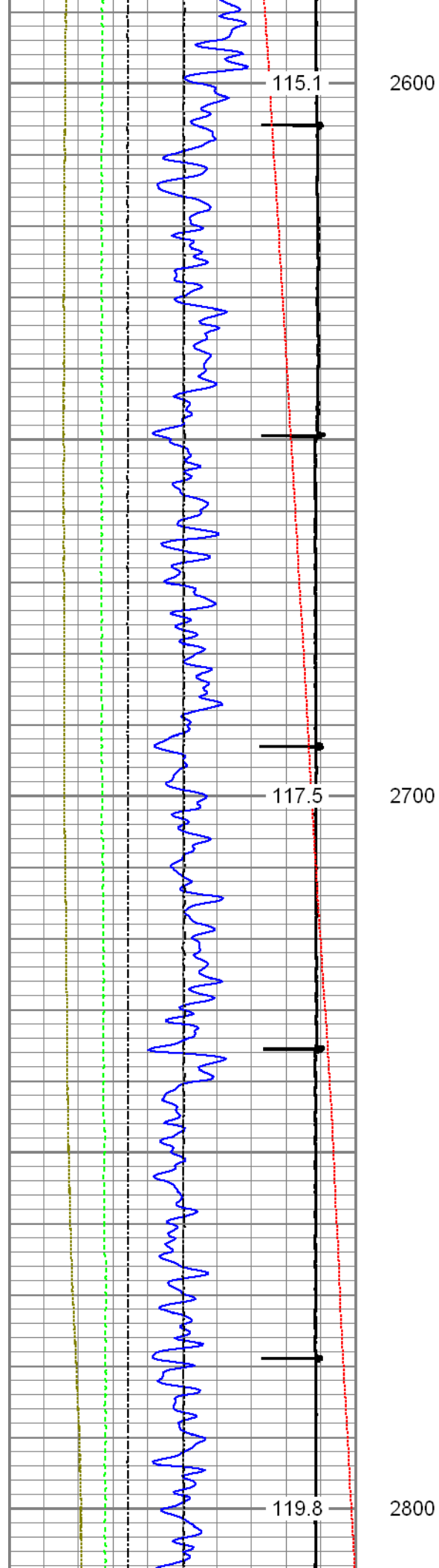
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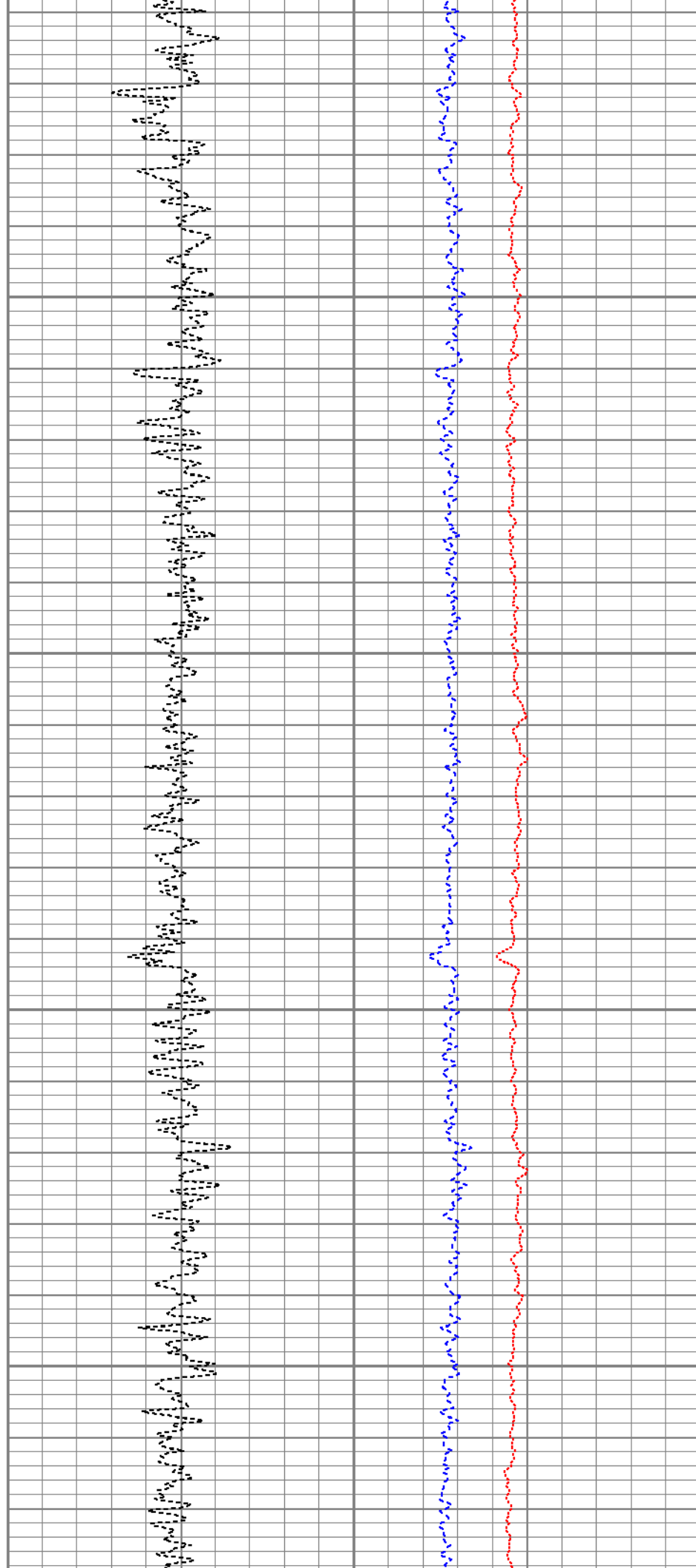
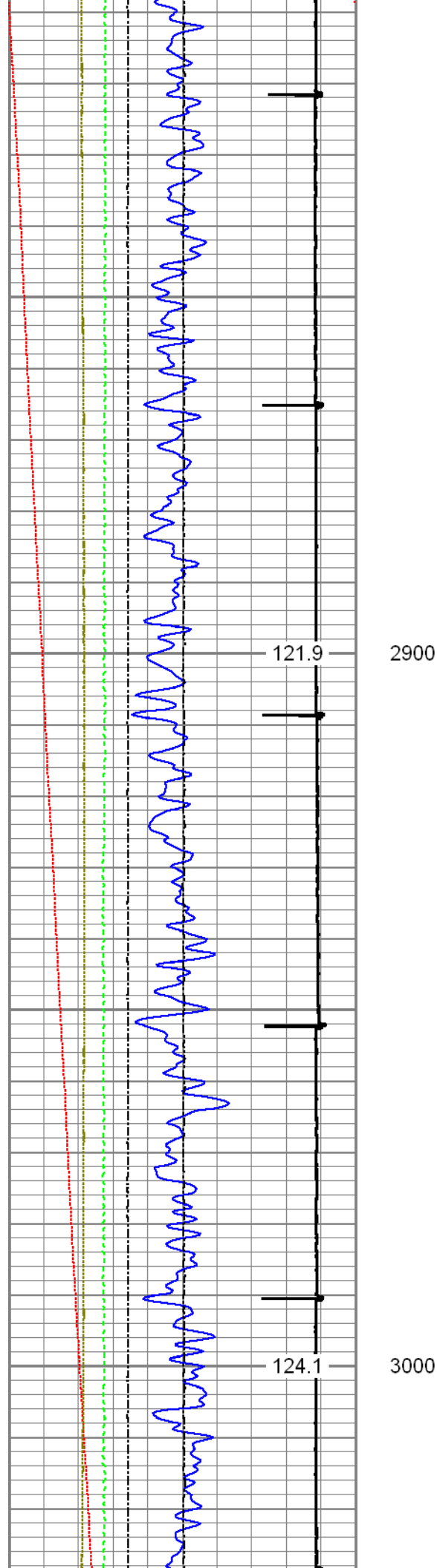
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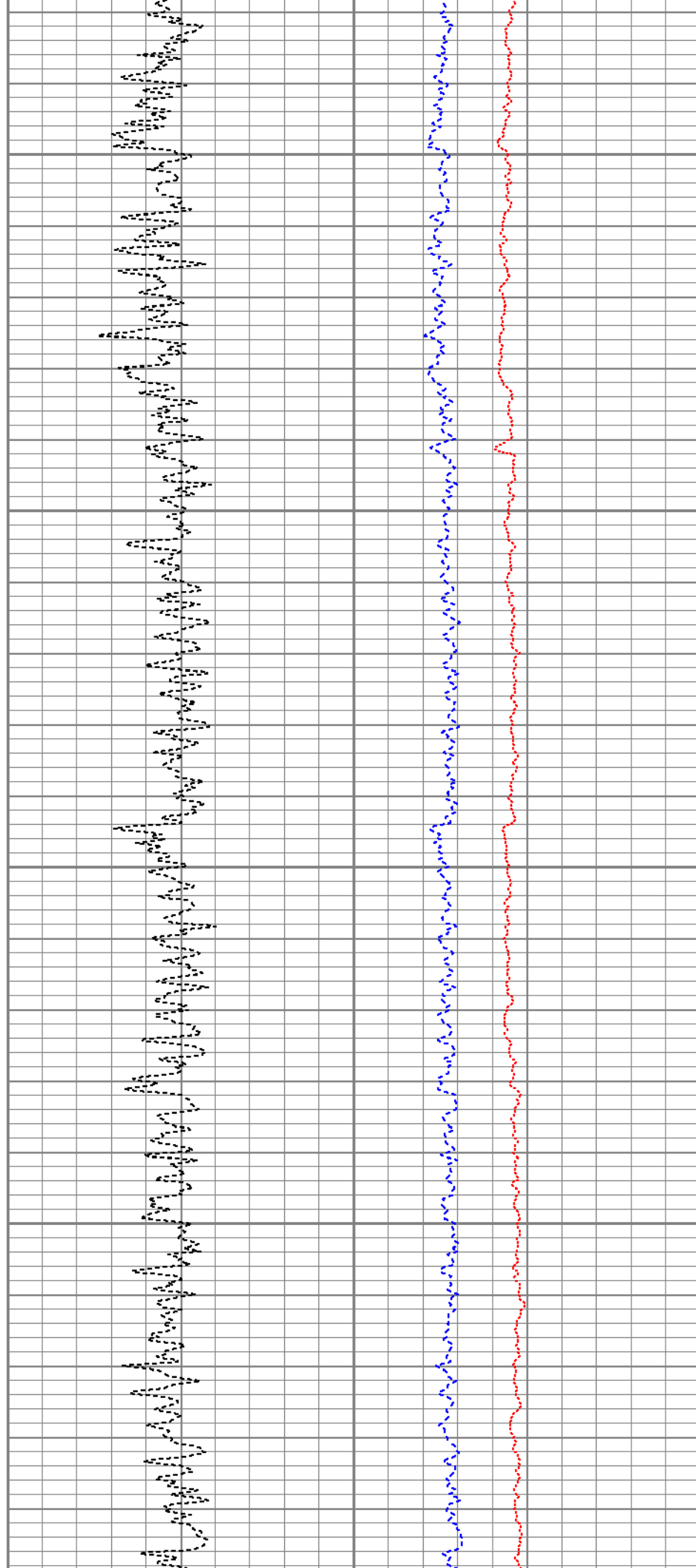
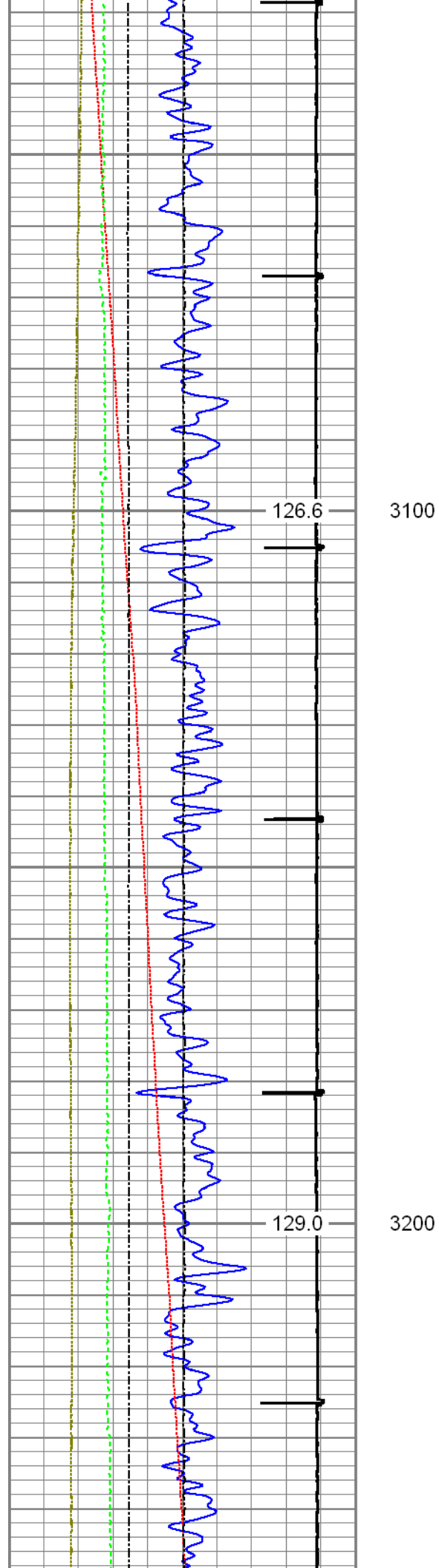


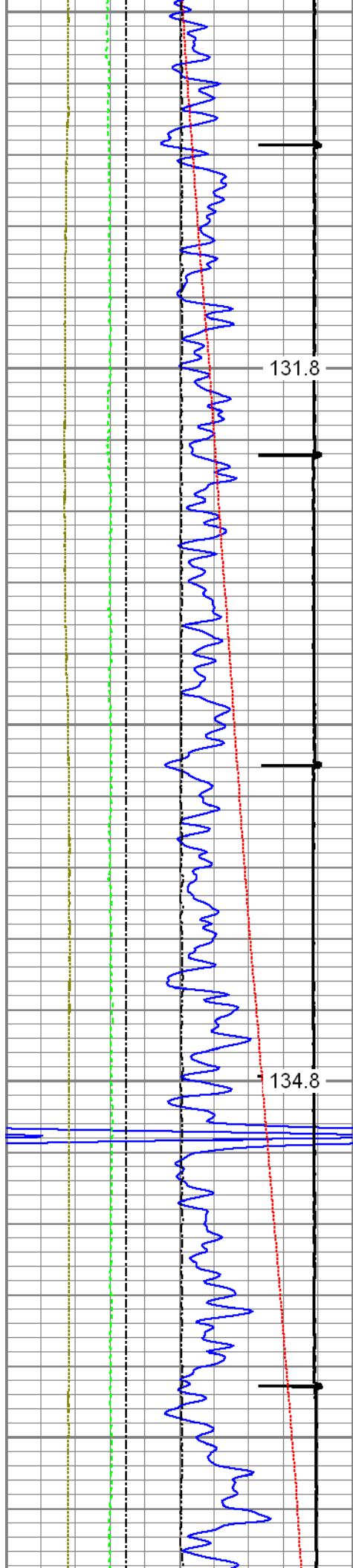






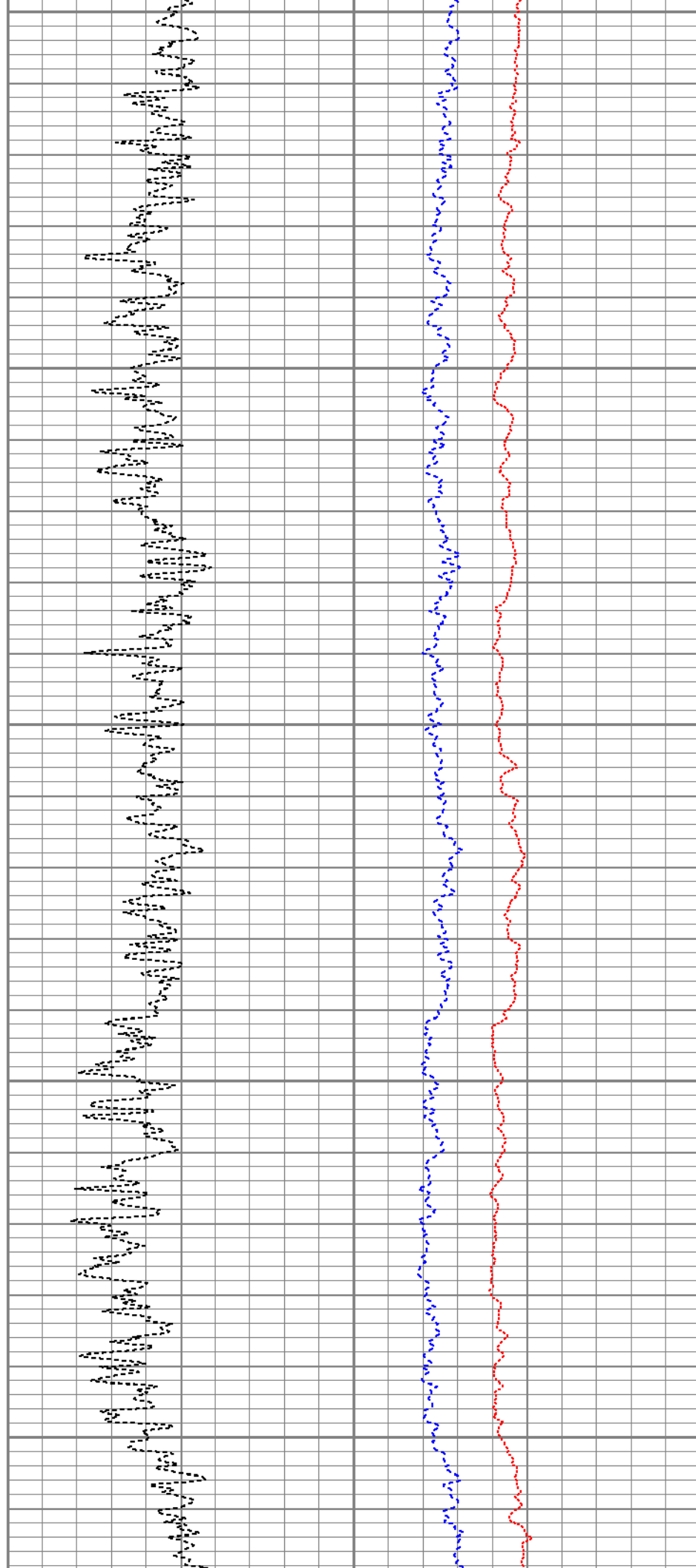


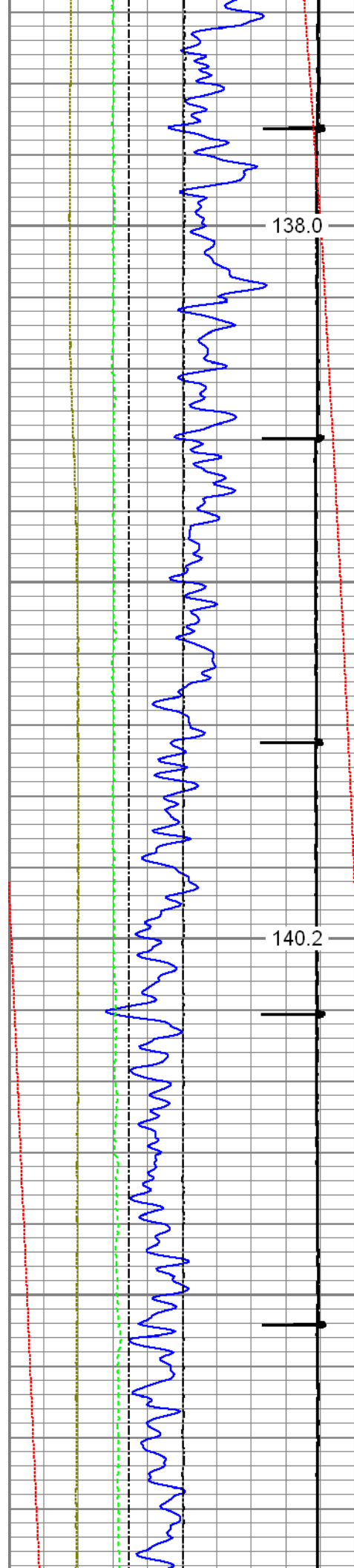




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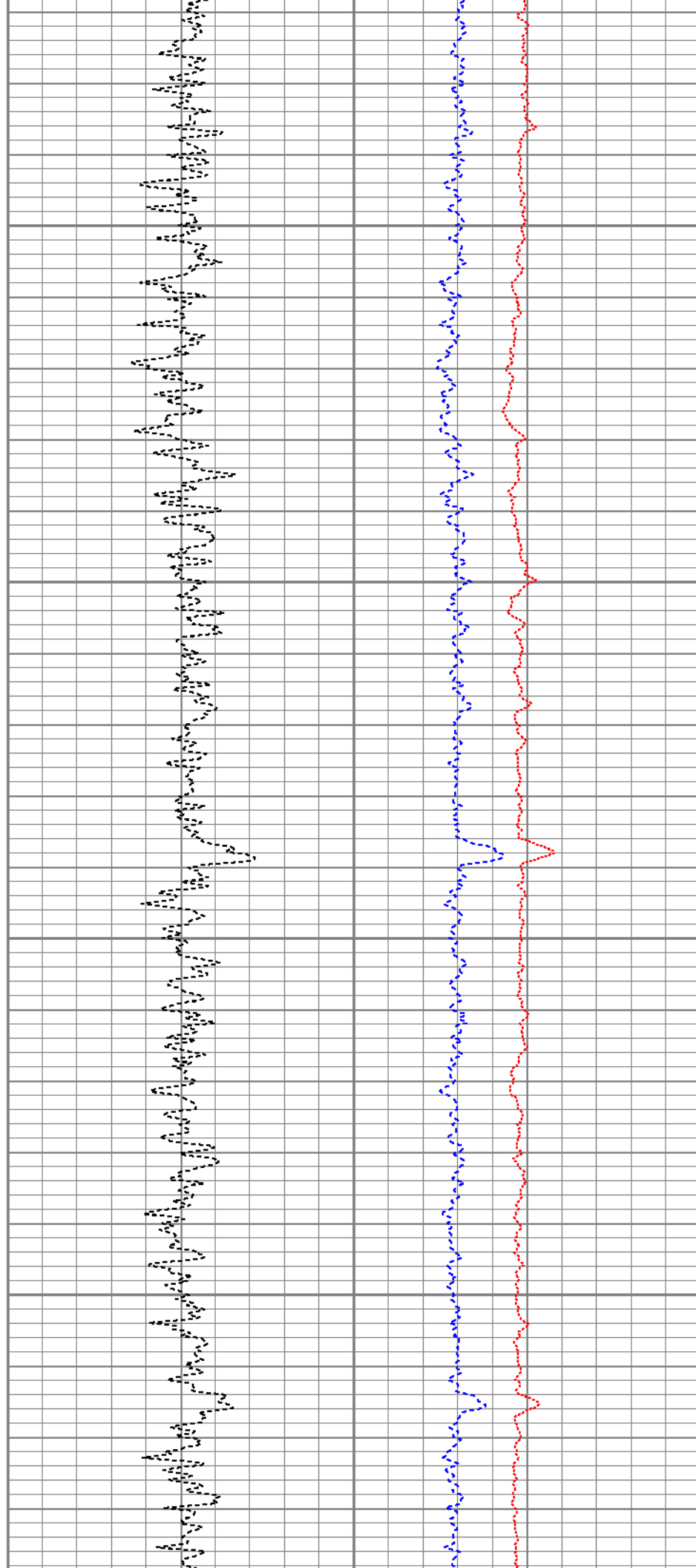
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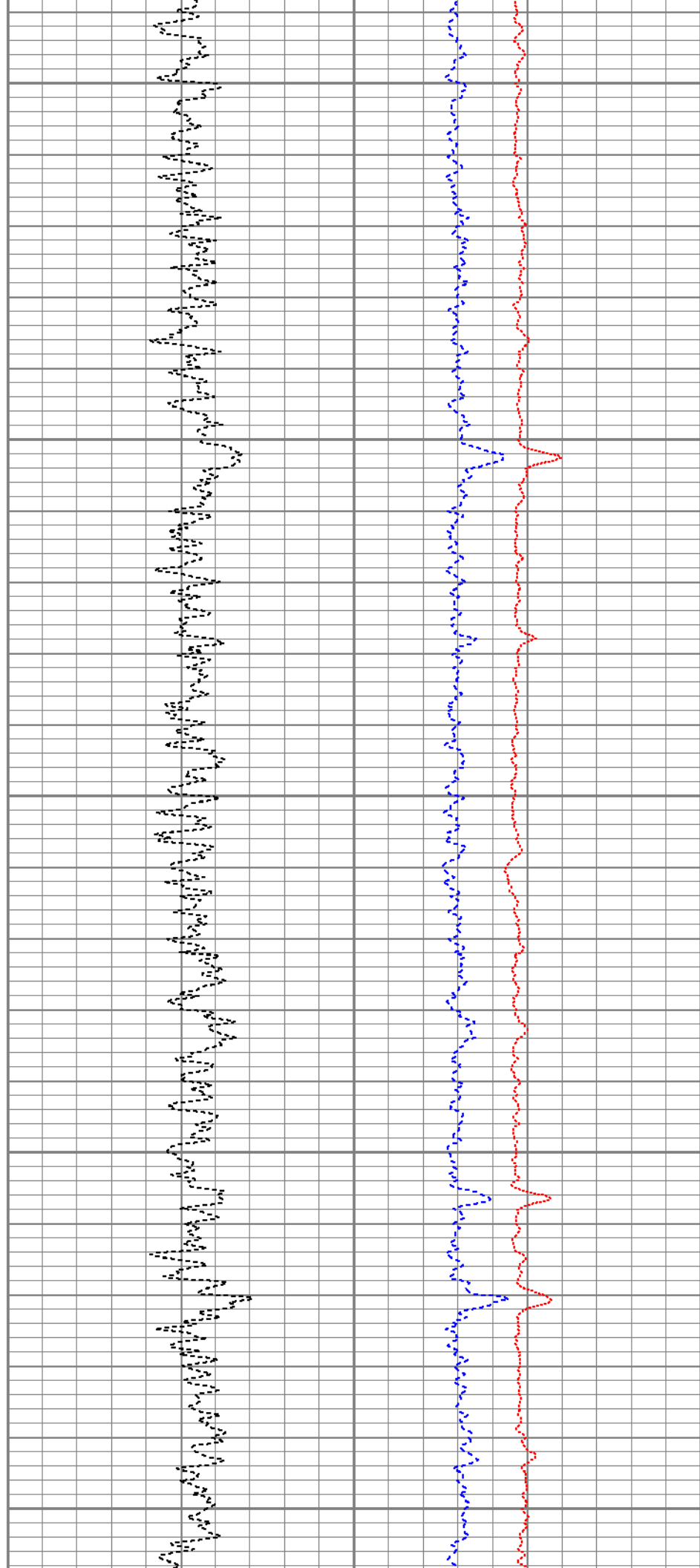
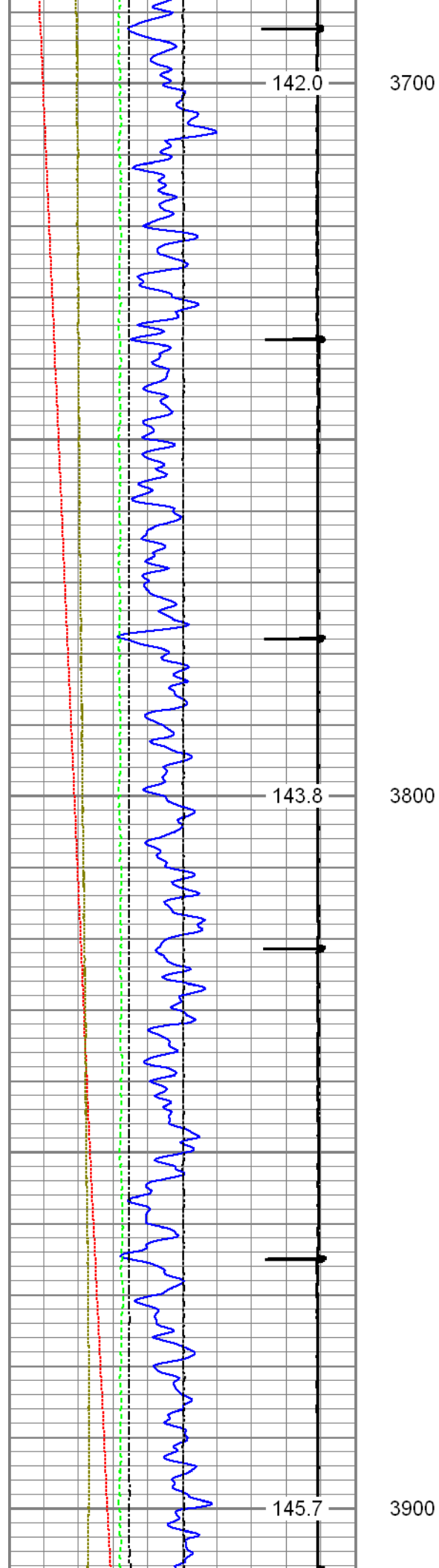


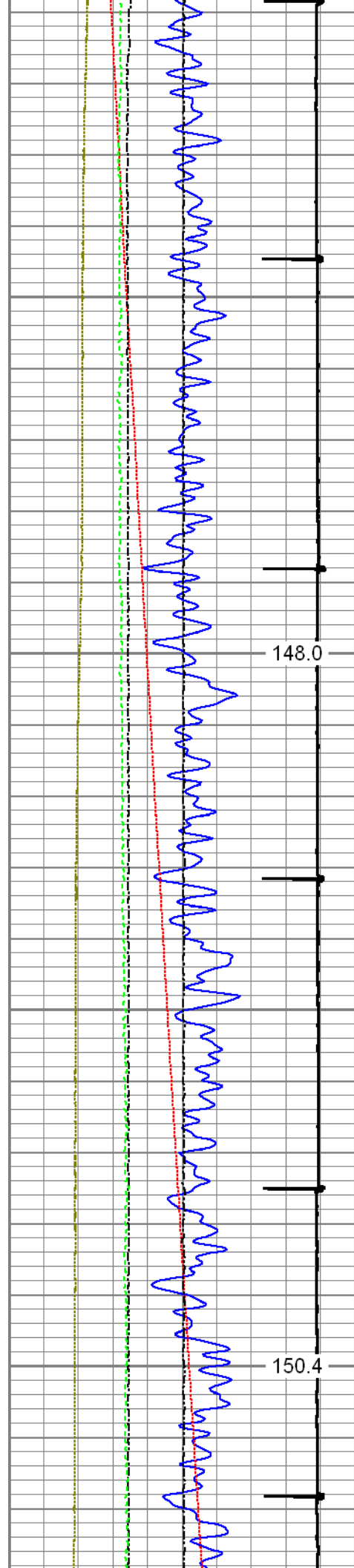


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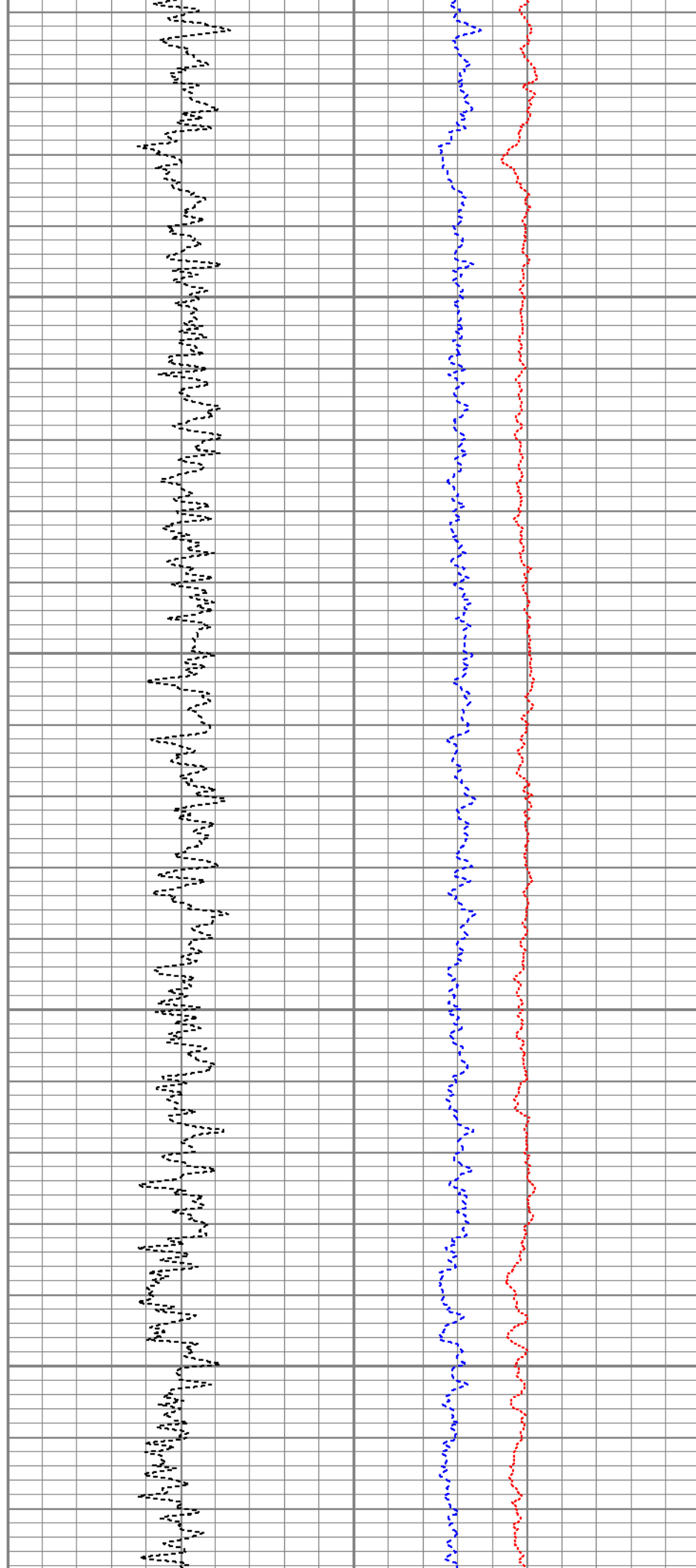


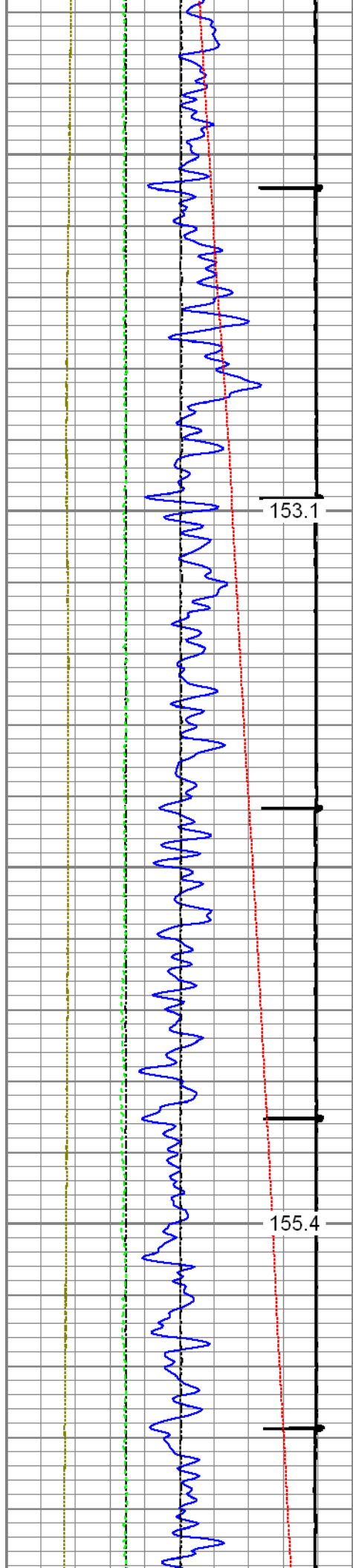




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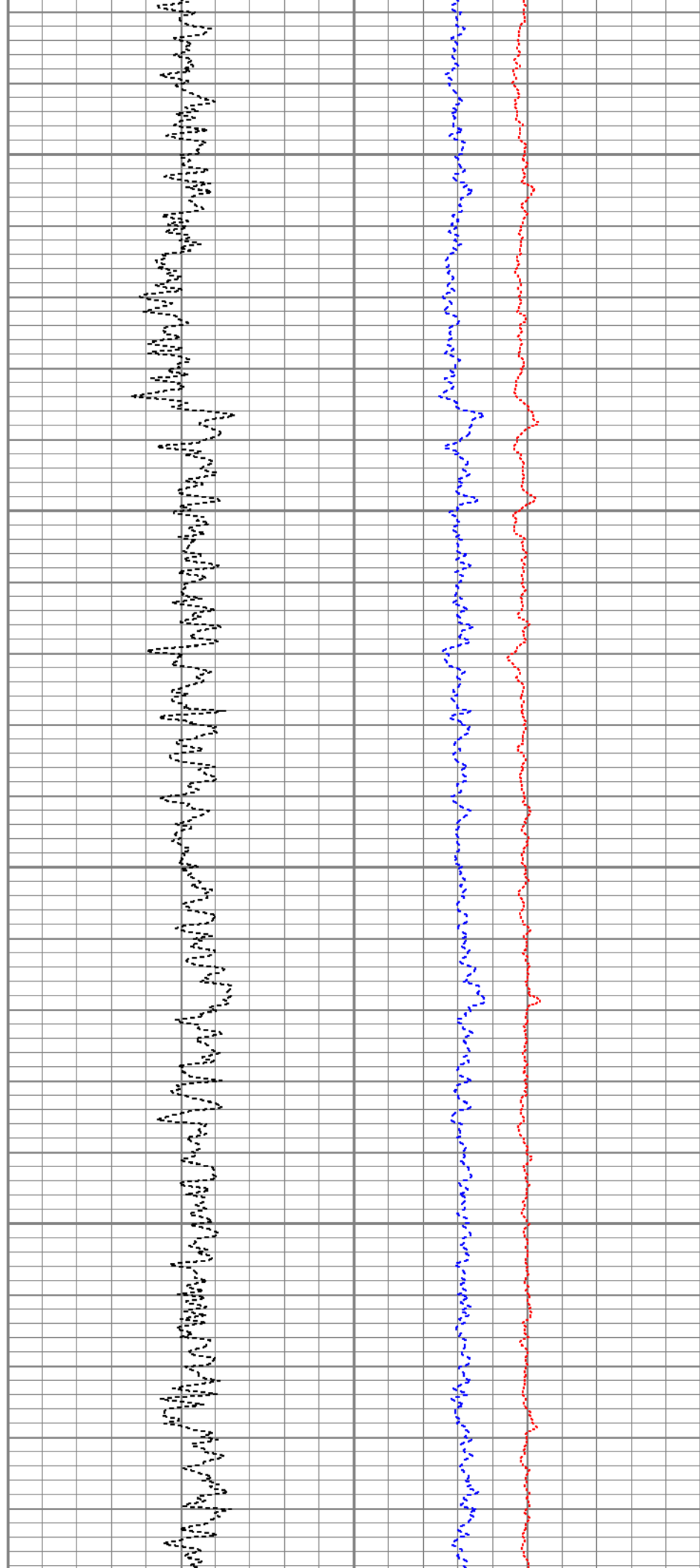


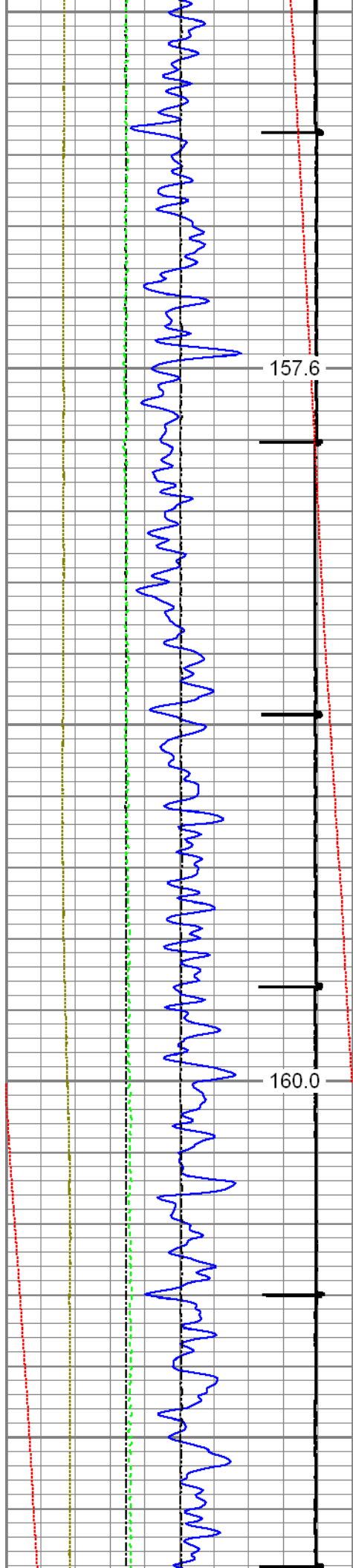
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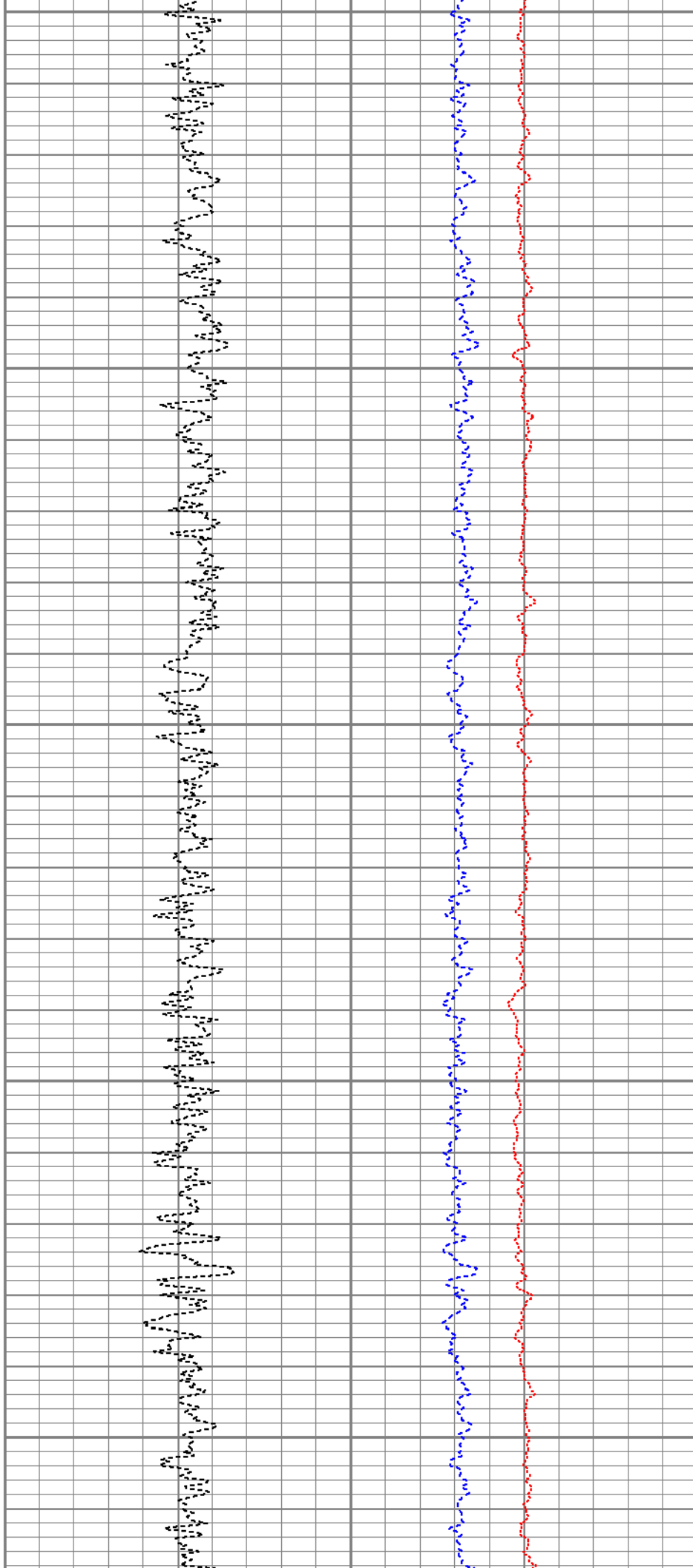
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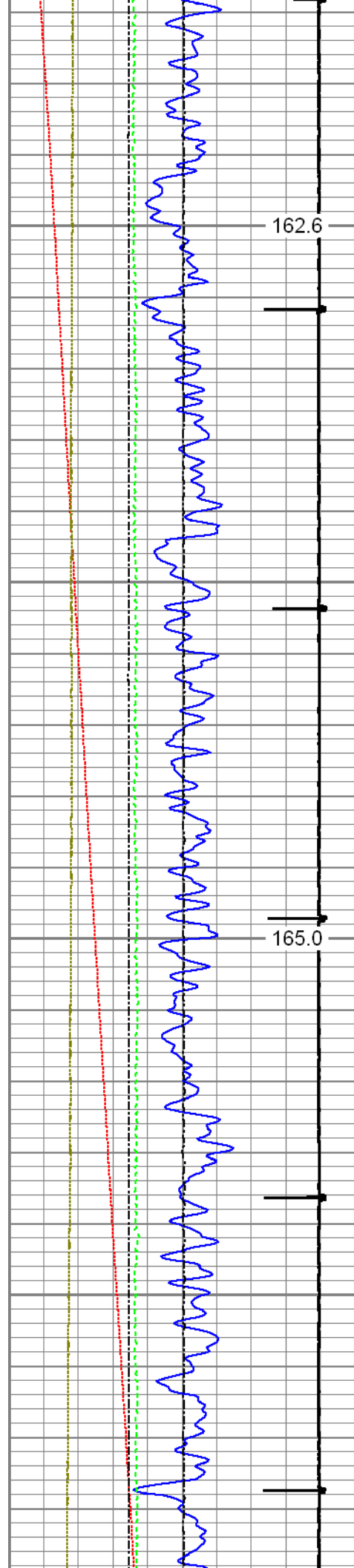


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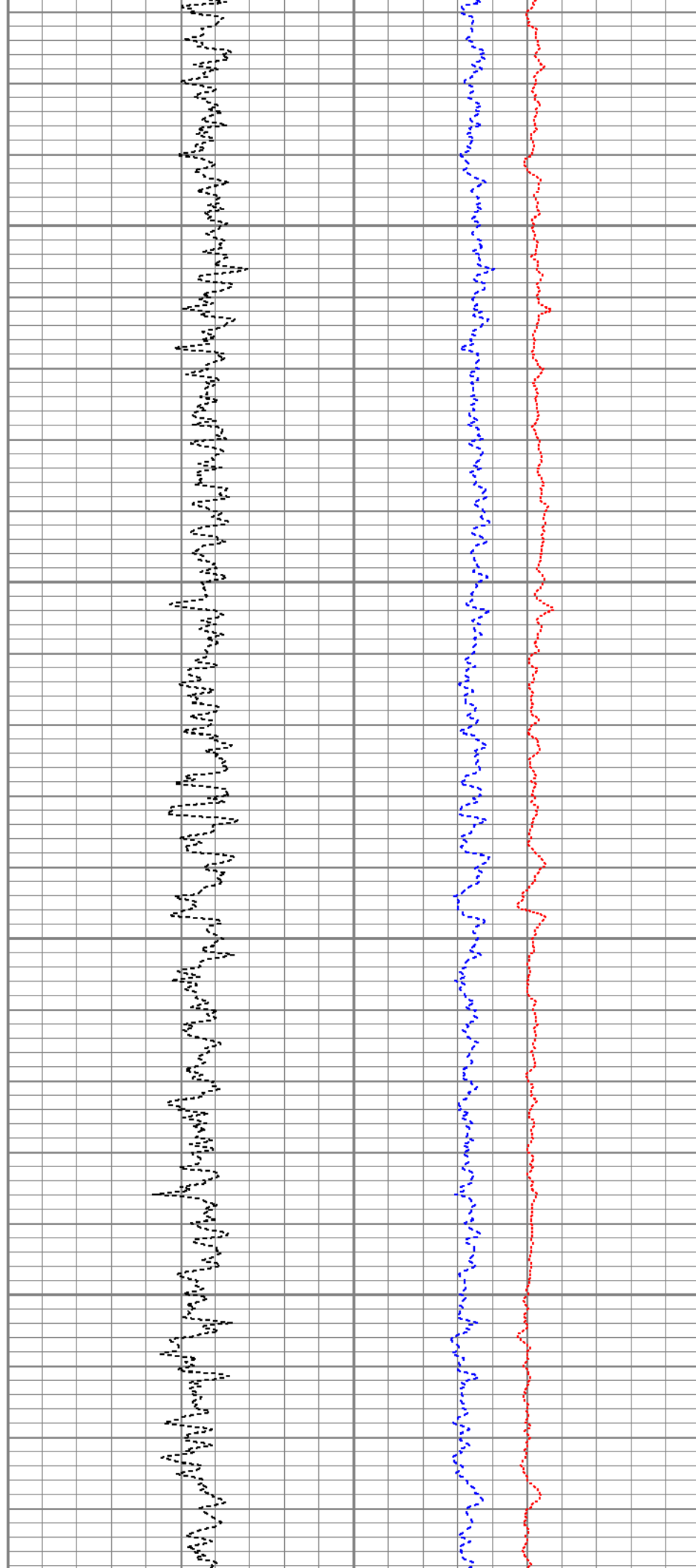


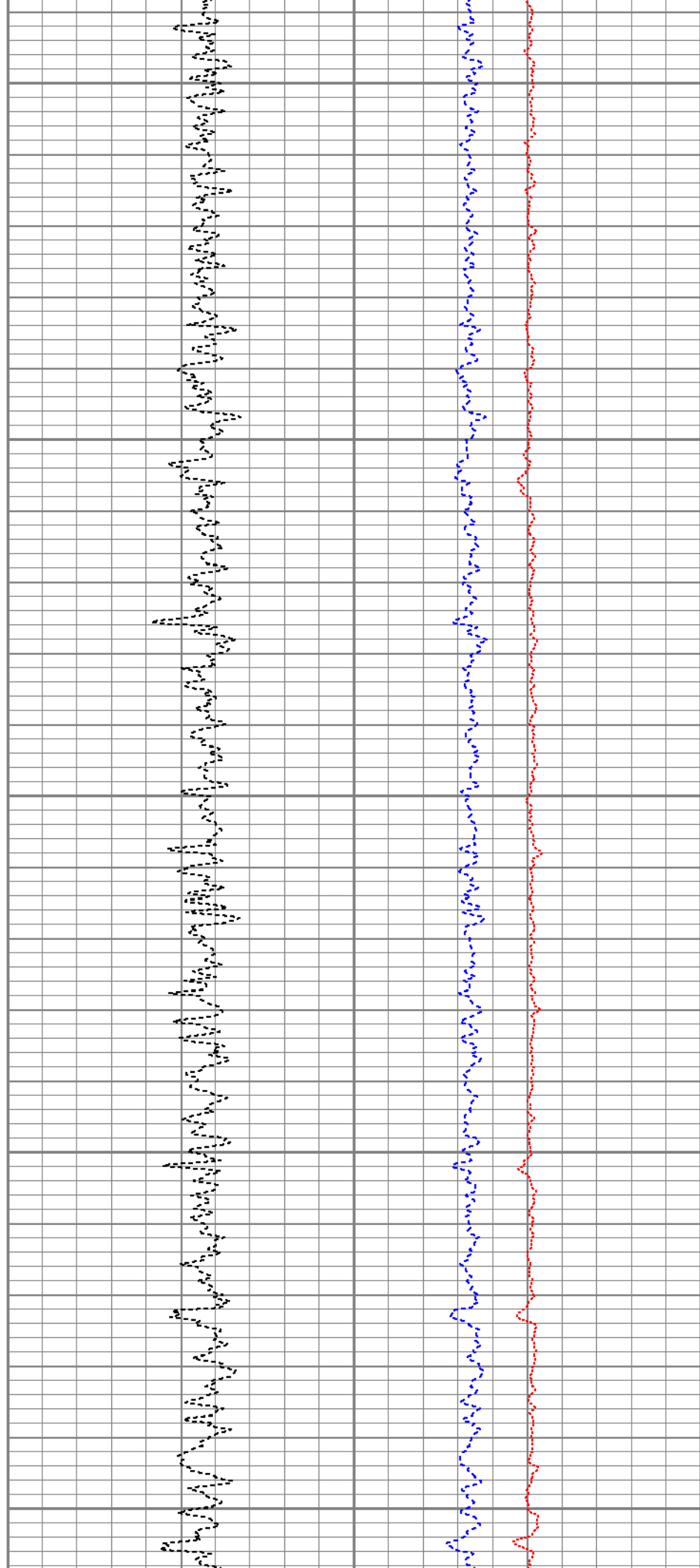
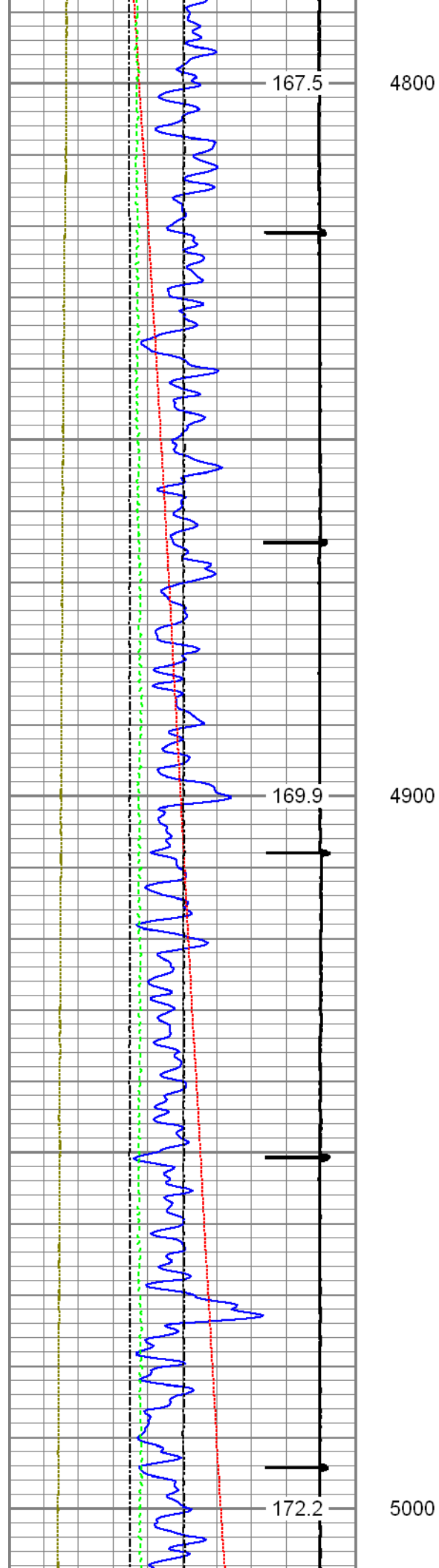


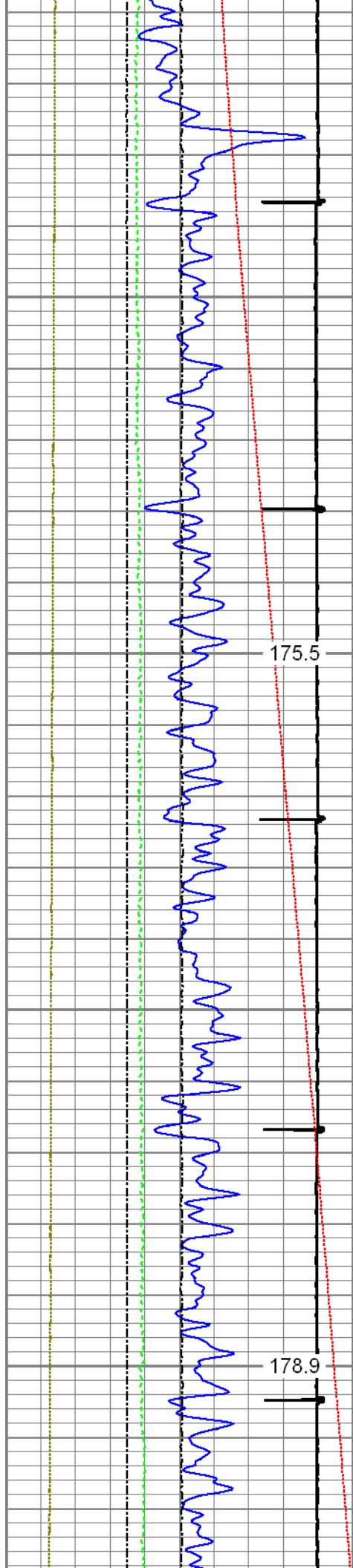


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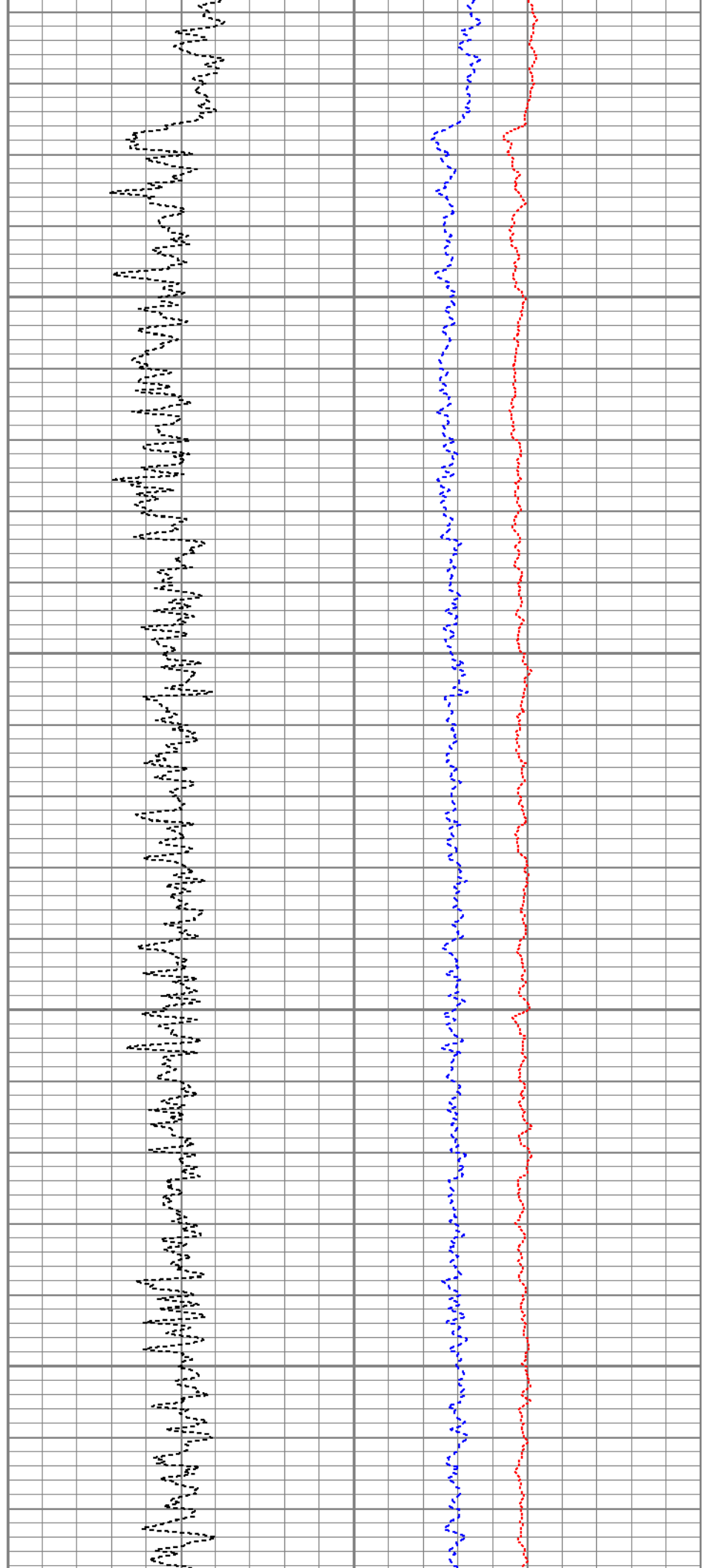


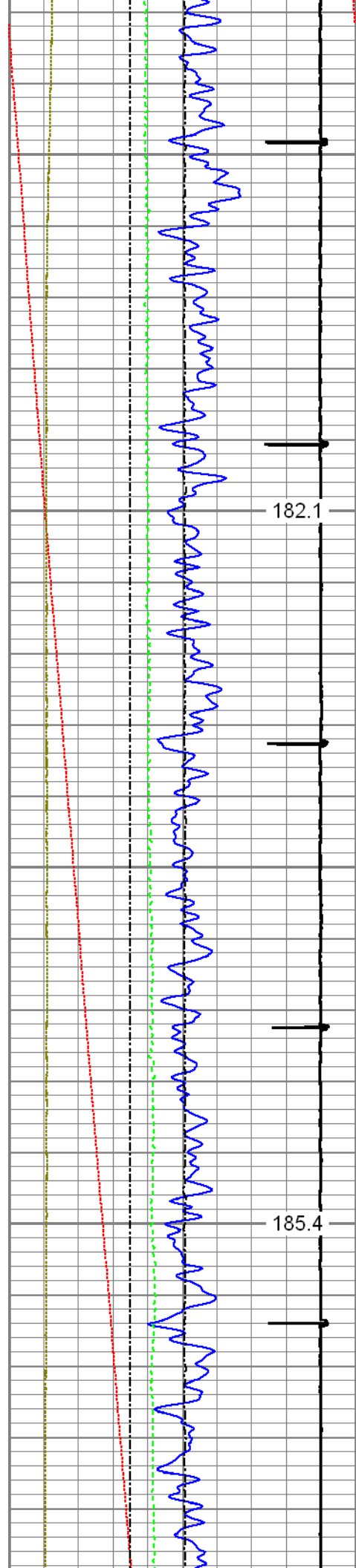




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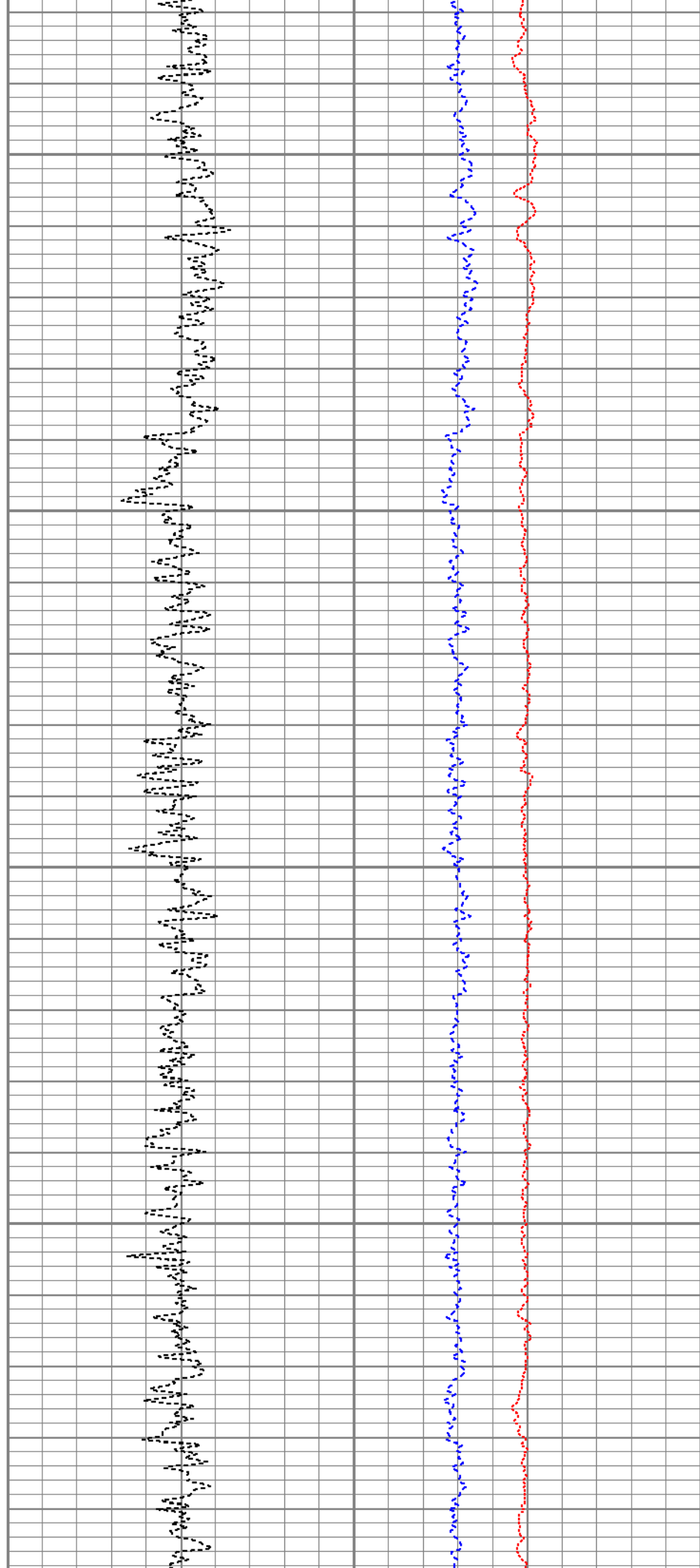


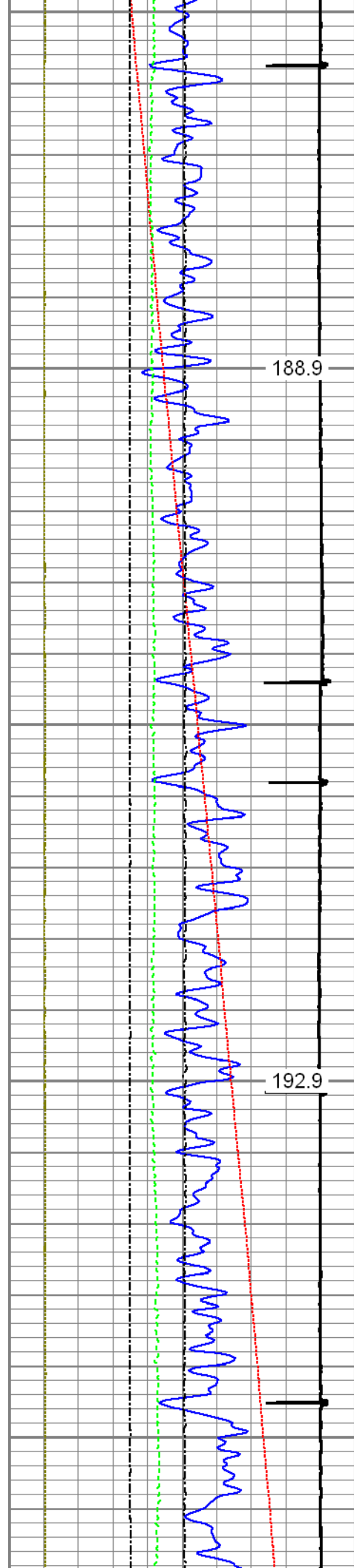
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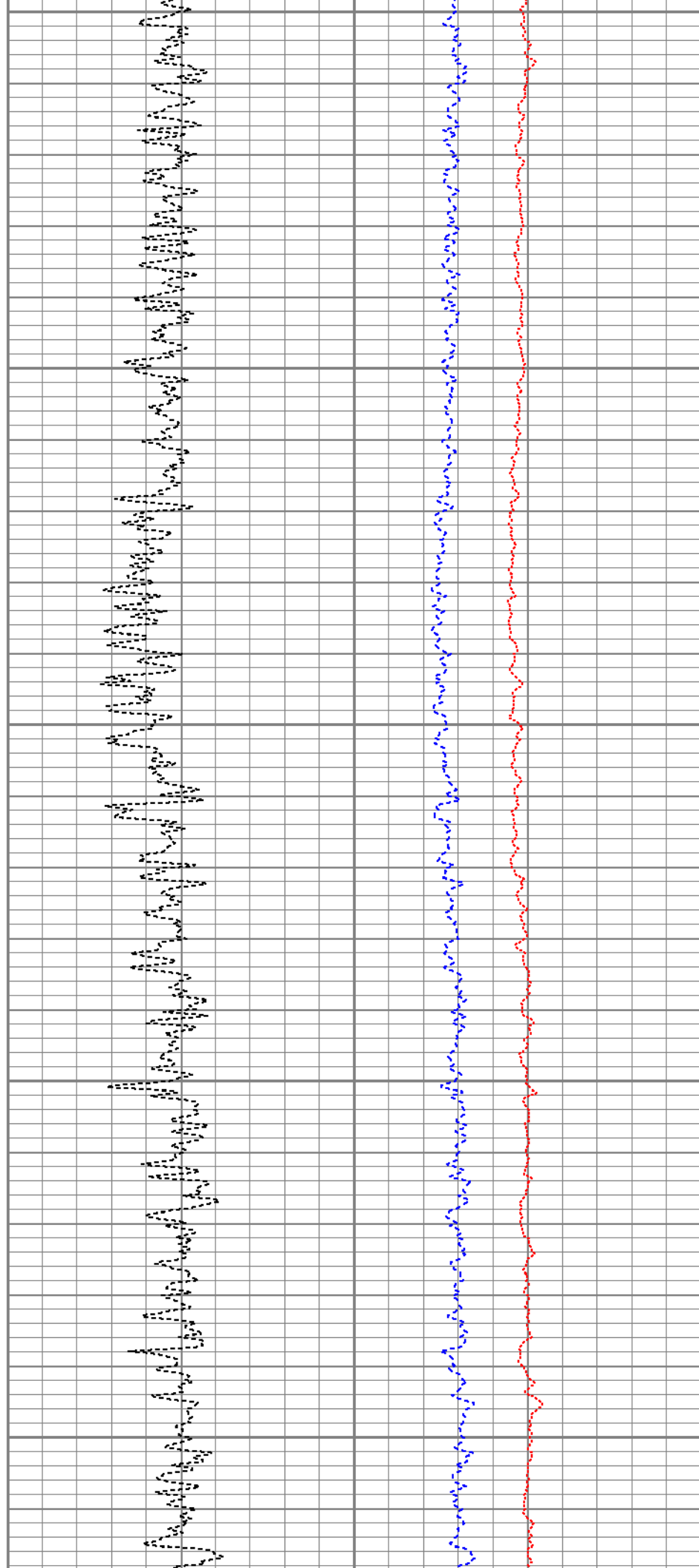
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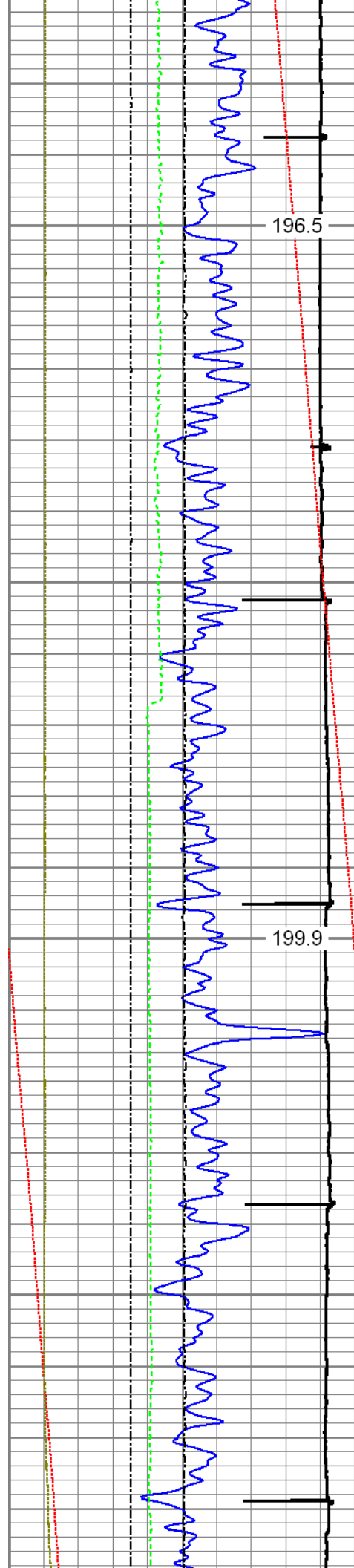




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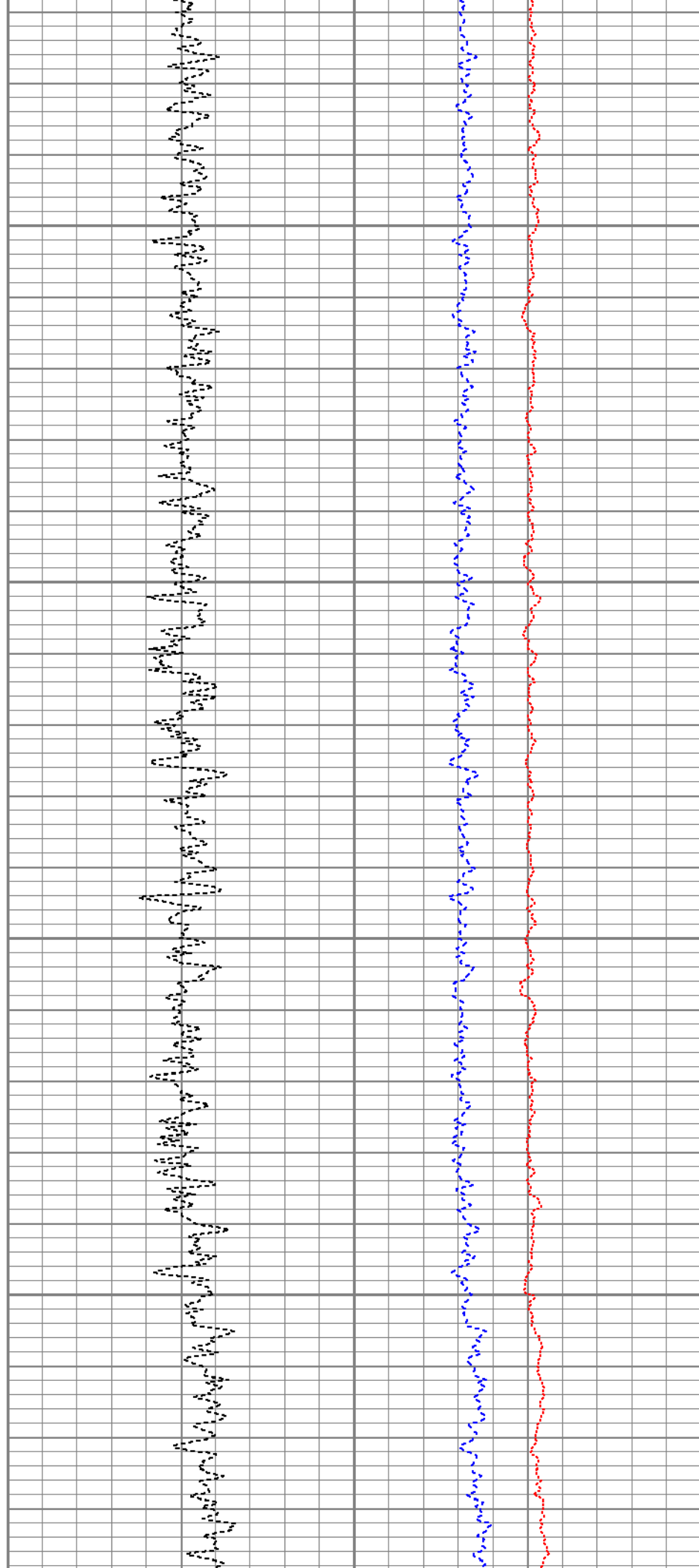
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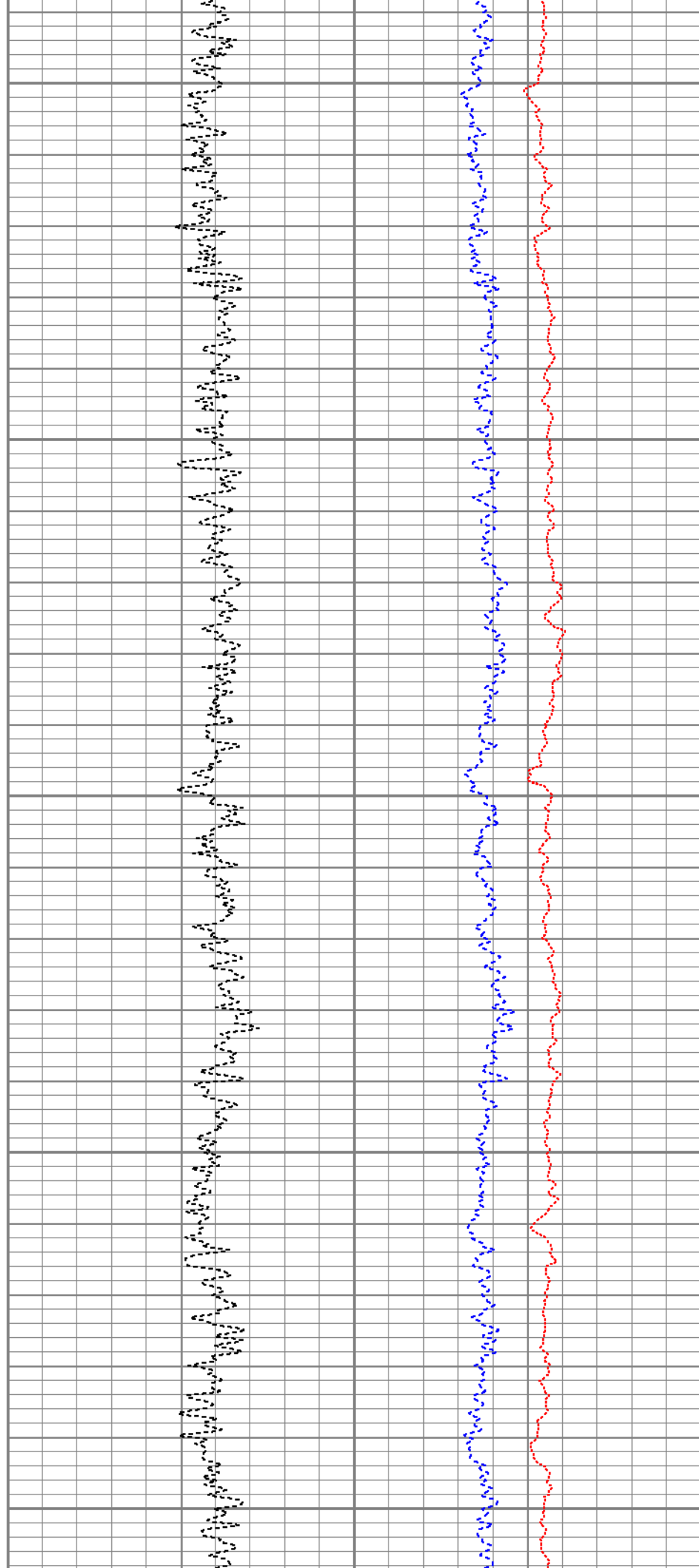
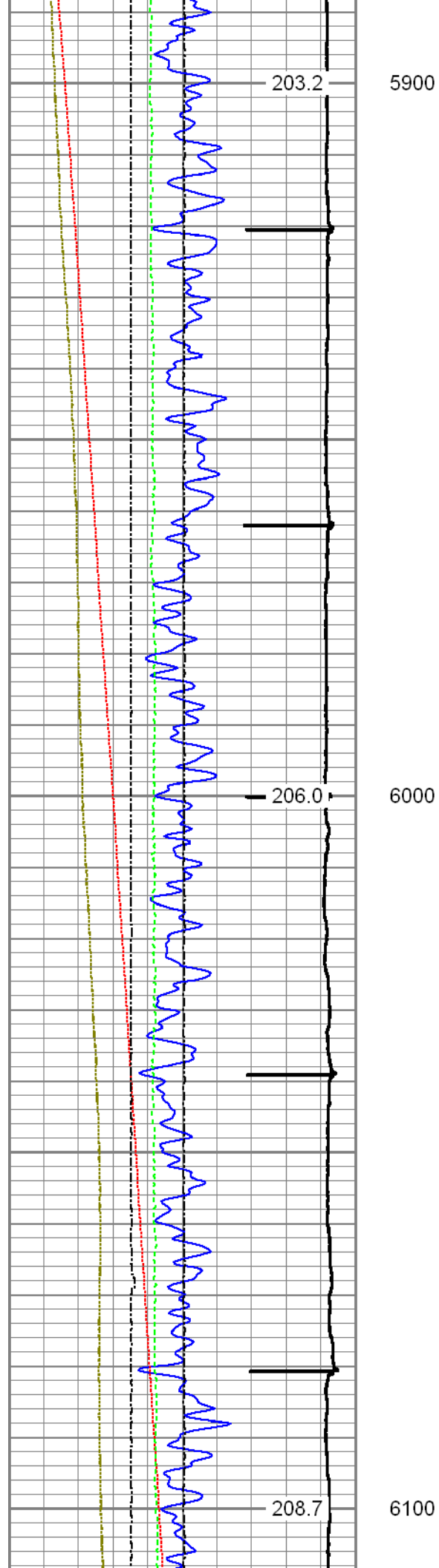




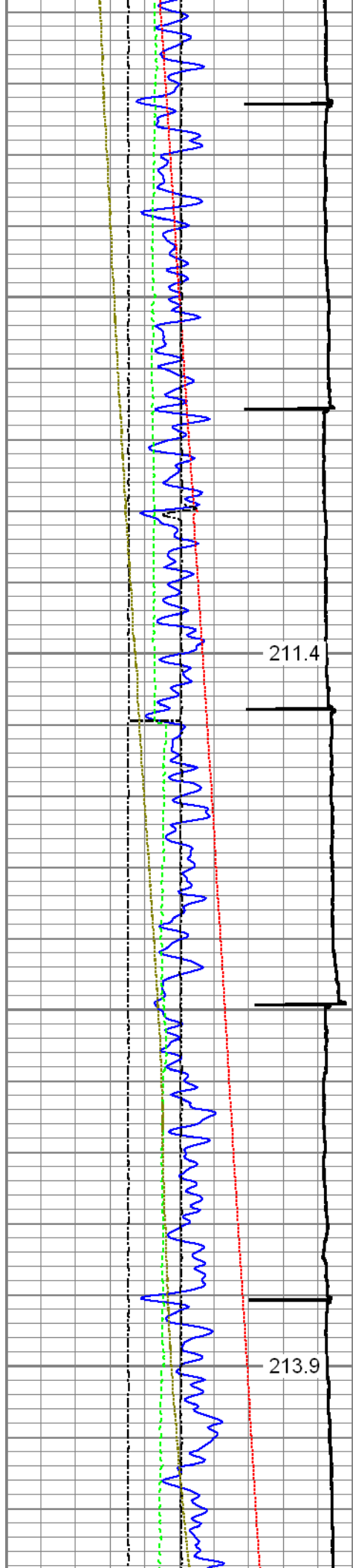
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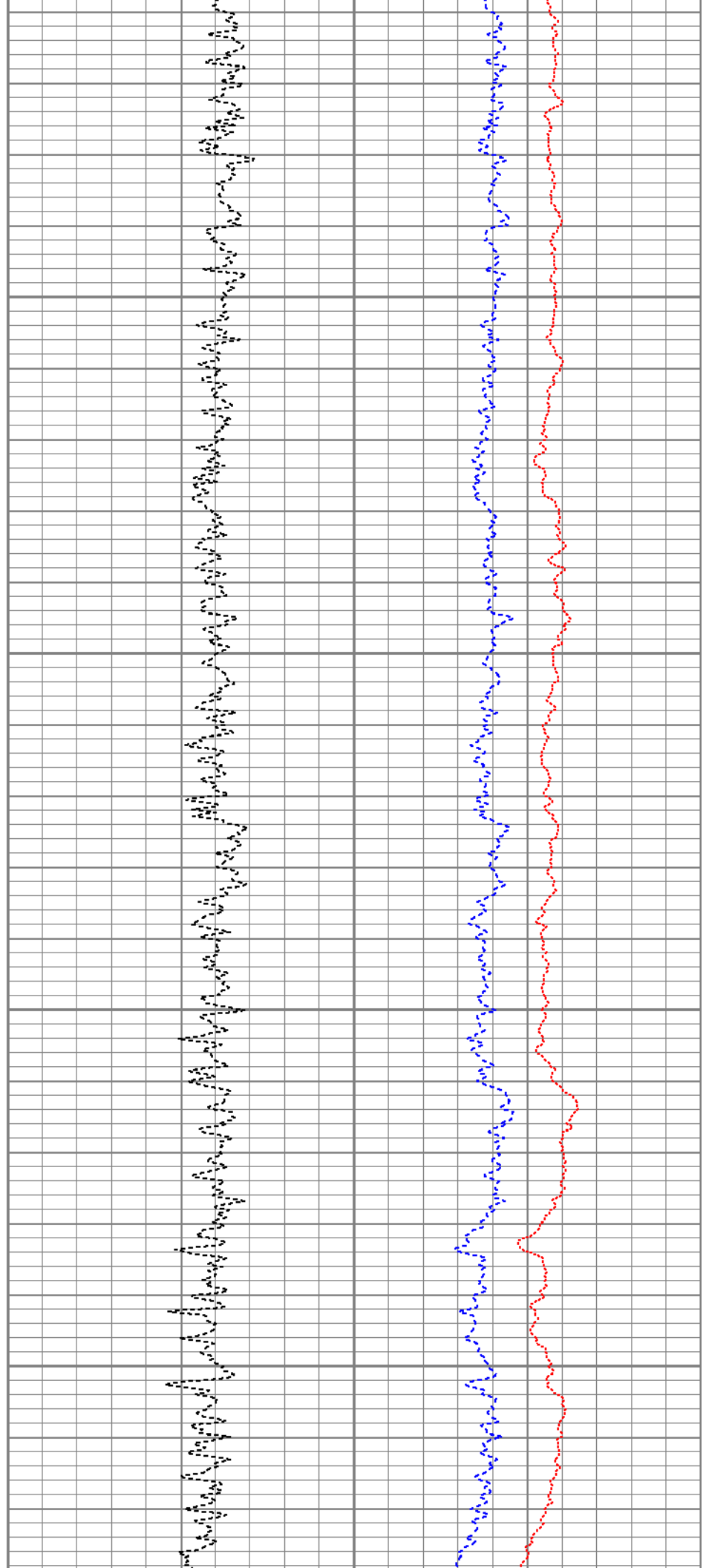


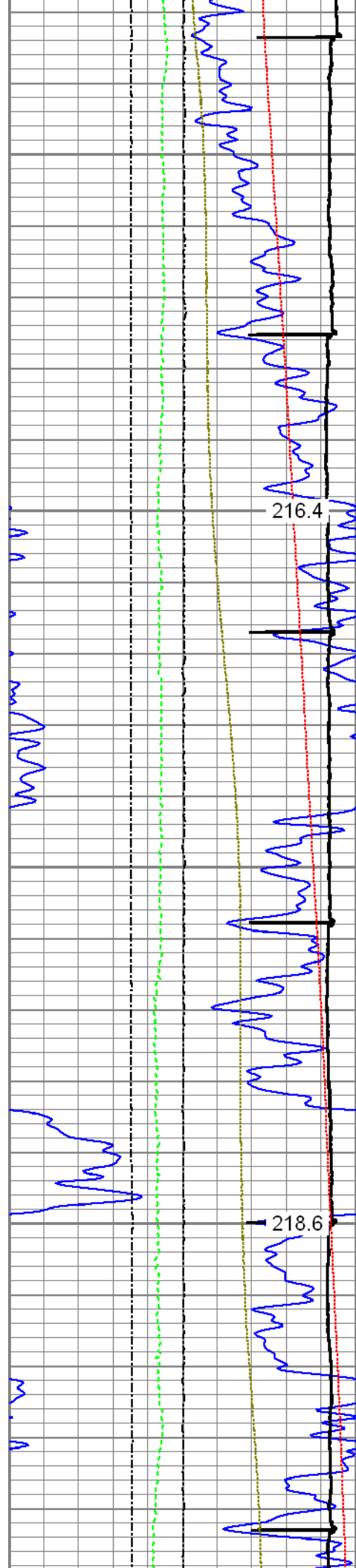




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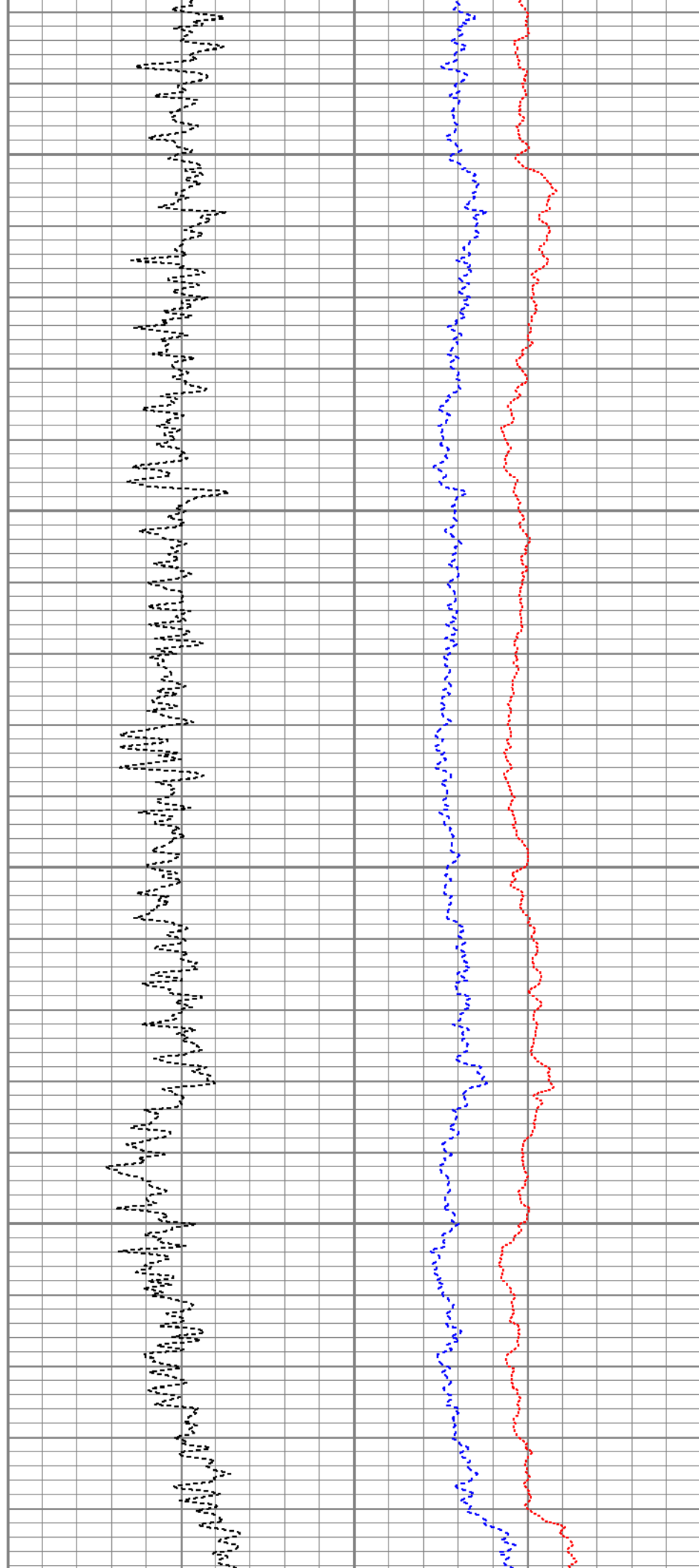
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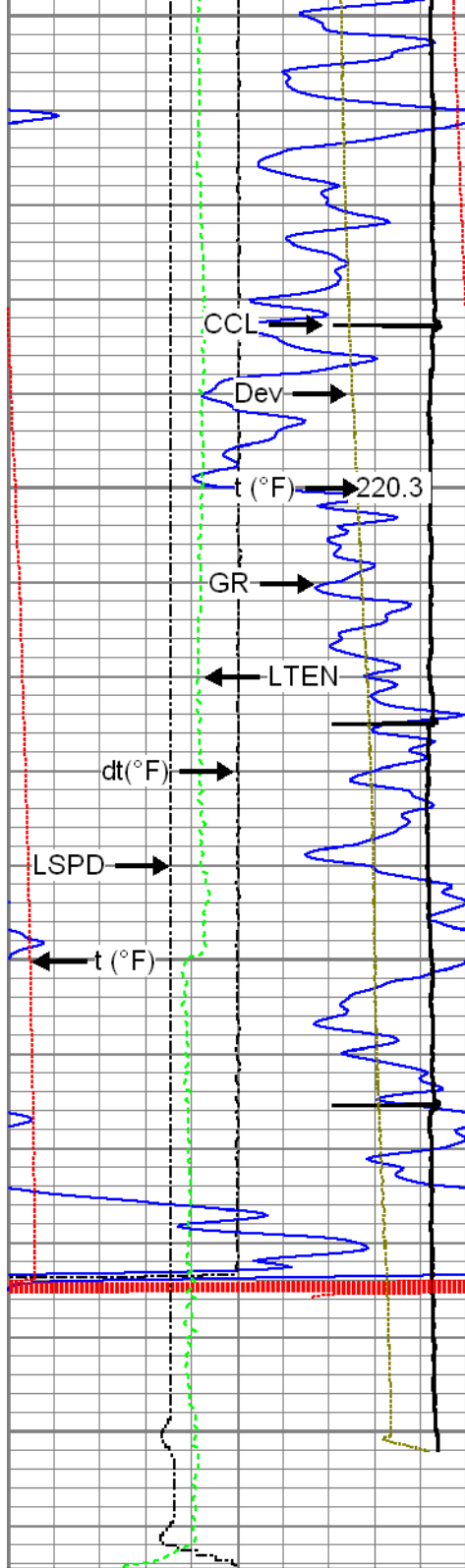




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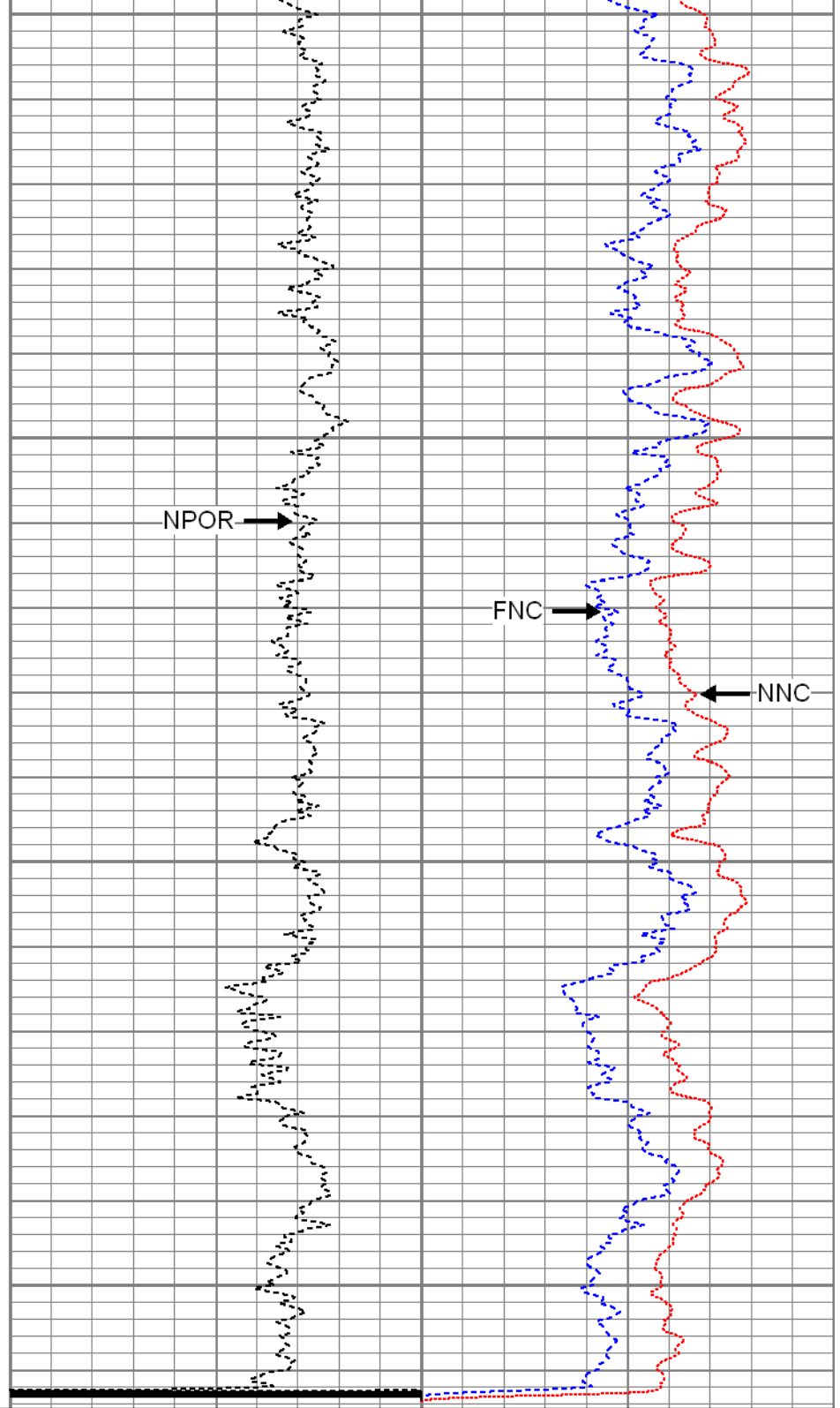




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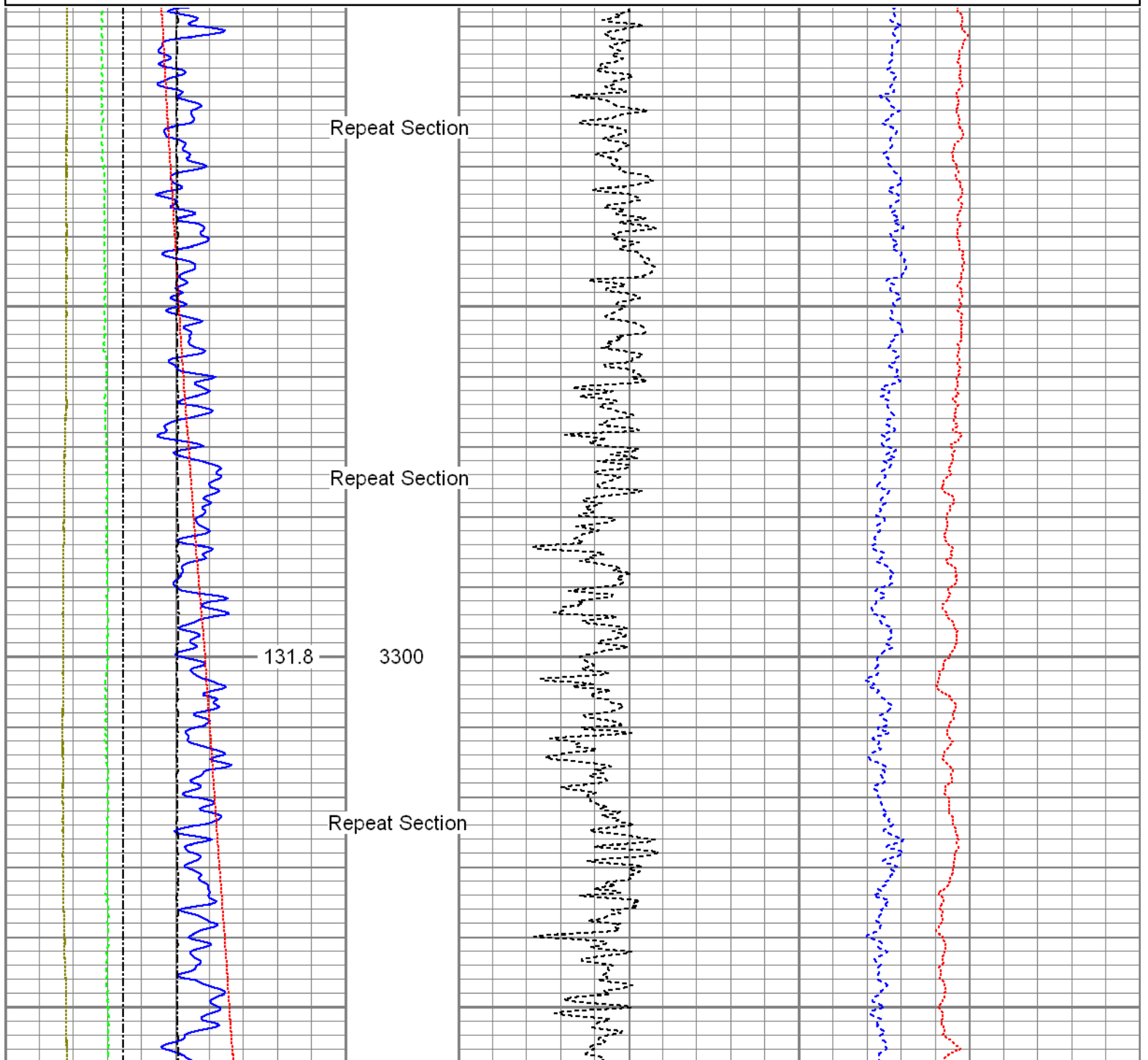
0	Gamma Ray (GAPI)	120
Casing Collar Locator		
0	Temperature (degF)	20
-100	Line Speed (ft/min)	100
0	Line Tension (lb)	2000
-2	Differential Temperature (degF)	2
-10	Deviation (°)	90

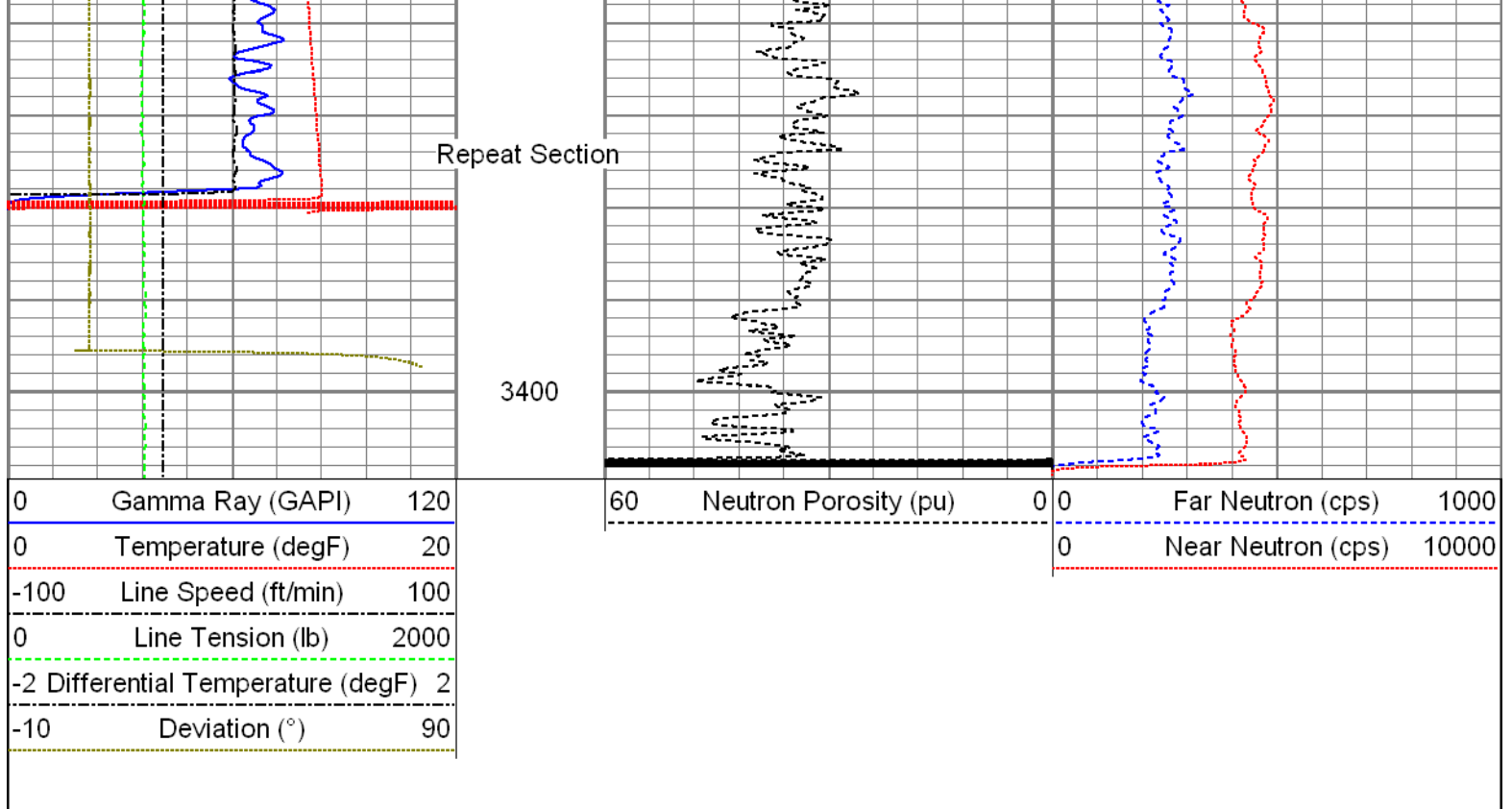


60	Neutron Porosity (pu)	0	0	Far Neutron (cps)	1000
			0	Near Neutron (cps)	10000

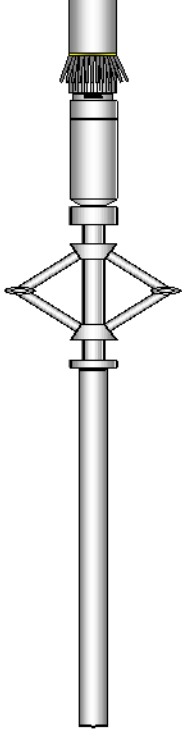
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 Dataset Pathname: repeat.1  
 Presentation Format: cnl\_4mit  
 Dataset Creation: Mon Oct 12 17:18:15 2015 by Calc 7.0 B1  
 Charted by: Depth in Feet scaled 1:240

0	Gamma Ray (GAPI)	120	60	Neutron Porosity (pu)	0	0	Far Neutron (cps)	1000
0	Temperature (degF)	20				0	Near Neutron (cps)	10000
-100	Line Speed (ft/min)	100						
0	Line Tension (lb)	2000						
-2	Differential Temperature (degF)	2						
-10	Deviation (°)	90						





Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
GR	30.67		T_CH14375_1_GO Titan 1-7/16" Assembled Electric Cable Head with 1" Fishing Neck	1.03	1.44	4.00
TEMP	29.27		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 (10024770) Production Gamma Ray	1.93	1.69	9.50
			UW_PRT-UW_PRT_016 (10025097) Platinum Resistance Thermometer	1.04	1.69	5.20
			UW_PRC #3 -UW_PRC_057 (1038) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
WVF3FT	21.81		UW_RBT-UW_RBT_004 (10013454) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00
WVFS1	21.81					
WVFS2	21.81					
WVFS3	21.81					
WVFS4	21.81					
WVFS5	21.81					
WVFS6	21.81					
WVFS7	21.81					
WVFS8	21.81					
CBLTEMP	21.81					
CBLROT	21.81		UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
WVF5FT	20.81					

MIT	11.80		UW_MIT-UW_MIT40_042 (10012912) 40 Multifinger Imaging Tool	4.54	2.75	61.10
			UW_PRC #4 -UW_PRC_057 (1101) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
			CNL-007 (1004) Compensated Neutron Logging Tool	6.61	1.69	30.00
CNLSC	1.53					
CNSSC	1.12					
TSTAMP	0.00					
Dataset: 10-12-15_Noble Energy_Wells Ranch AE32-635_MIT_RBL_CNL.db: field/well/run1/main3.1 Total Length: 34.92 ft Total Weight: 353.30 lb O.D. 3.13 in						

Calibration Report			
Database File:	C:\Warrior\Data\10-12-15_Noble Energy_Wells Ranch AE32-635_MIT_RBL_CNL\10-12-15_Noble Energy_Wells Ranch AE32-635_MIT_RBL_CNL		
Dataset Pathname:	calreport		
Dataset Creation:	Mon Oct 12 17:52:22 2015 by Log 7.0 B1		
Compensated Neutron Calibration Report			
Serial Number:	1004		
Tool Model:	007		
Master Calibration	Tue Jun 03 14:35:57 2014		
Detector	Readings		
Short Space	241.46	cps	
Long Space	300.95	cps	
Ratio	Measured	Reference	
CNRAT Gain K	0.8150	Sleeve: 1.0000	
	1.0158		
Before Survey			
Detector	Readings		
Short Space		cps	
Long Space		cps	
	Measured	Reference	
Ratio			
After Survey			
Detector	Readings		
Short Space		cps	

Long Space		cps	
Ratio		Measured	Reference
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:	Mon Oct 12 08:57:58 2015
Ring size:	4	5	6
(in)	Sens	Sens	Sens
Finger 01:	1027	394.0	1421
Finger 02:	1156	397.0	1553
Finger 03:	1035	404.0	1439
Finger 04:	1076	400.0	1476
Finger 05:	1086	413.0	1499
Finger 06:	1092	401.0	1493
Finger 07:	1032	390.0	1422
Finger 08:	1107	395.0	1502
Finger 09:	1069	390.0	1459
Finger 10:	1058	387.0	1445
Finger 11:	1152	401.0	1553
Finger 12:	1052	375.0	1427
Finger 13:	1083	380.0	1463
Finger 14:	1060	389.0	1449
Finger 15:	1019	393.0	1412
Finger 16:	1051	391.0	1442
Finger 17:	948	365.0	1313
Finger 18:	1077	372.0	1449
Finger 19:	1069	378.0	1447
Finger 20:	1027	380.0	1407
Finger 21:	1032	384.0	1416
Finger 22:	1009	388.0	1397
Finger 23:	1010	393.0	1403
Finger 24:	1050	396.0	1446
Finger 25:	990	387.0	1377
Finger 26:	1114	382.0	1496
Finger 27:	1055	387.0	1442
Finger 28:	1074	384.0	1458
Finger 29:	1013	396.0	1409
Finger 30:	1042	392.0	1434
Finger 31:	1098	391.0	1489
Finger 32:	1037	398.0	1435
Finger 33:	1176	395.0	1571
Finger 34:	1056	382.0	1438
Finger 35:	1032	408.0	1440
Finger 36:	1034	399.0	1433



Finger 37:	1120	401.0	1521	391.0	1912	408.0	2320
Finger 38:	1146	396.0	1542	385.0	1927	393.0	2320
Finger 39:	1157	395.0	1552	383.0	1935	396.0	2331
Finger 40:	1063	401.0	1464	400.0	1864	415.0	2279

Post Survey Calibration Check								
Performed: Mon Oct 12 17:52:11 2015								
Ring size: (in)	4	Nom. wear	5	Nom. wear	6	Nom. wear	7	Nom. wear
Finger 01:	4.078	0.039	5.020	0.010	6.016	0.008	7.012	0.006
Finger 02:	4.070	0.035	5.020	0.010	6.019	0.010	7.019	0.009
Finger 03:	4.065	0.032	5.016	0.008	6.019	0.009	7.015	0.008
Finger 04:	4.090	0.045	5.033	0.017	6.030	0.015	7.024	0.012
Finger 05:	4.089	0.045	5.010	0.005	6.012	0.006	7.016	0.008
Finger 06:	4.066	0.033	5.017	0.009	6.016	0.008	7.019	0.009
Finger 07:	4.064	0.032	5.039	0.019	6.057	0.029	7.046	0.023
Finger 08:	4.065	0.032	5.017	0.008	6.014	0.007	7.010	0.005
Finger 09:	4.078	0.039	5.019	0.010	6.017	0.009	7.020	0.010
Finger 10:	4.075	0.038	5.024	0.012	6.017	0.009	7.018	0.009
Finger 11:	4.069	0.035	5.017	0.008	6.017	0.009	7.011	0.006
Finger 12:	4.060	0.030	5.025	0.012	6.017	0.009	7.028	0.014
Finger 13:	4.053	0.026	5.015	0.008	6.017	0.009	7.022	0.011
Finger 14:	4.076	0.038	5.015	0.007	6.024	0.012	7.014	0.007
Finger 15:	4.074	0.037	5.017	0.009	6.019	0.009	7.022	0.011
Finger 16:	4.073	0.036	5.023	0.011	6.018	0.009	7.017	0.009
Finger 17:	4.079	0.040	5.022	0.011	6.019	0.010	7.031	0.015
Finger 18:	4.077	0.039	5.046	0.023	6.029	0.014	7.034	0.017
Finger 19:	4.073	0.036	5.027	0.014	6.017	0.008	7.018	0.009
Finger 20:	4.081	0.041	5.023	0.011	6.024	0.012	7.014	0.007
Finger 21:	4.070	0.035	5.023	0.012	6.037	0.019	7.032	0.016
Finger 22:	4.067	0.033	5.019	0.009	6.021	0.011	7.026	0.013
Finger 23:	4.072	0.036	5.016	0.008	6.016	0.008	7.026	0.013
Finger 24:	4.098	0.049	5.031	0.015	6.022	0.011	7.028	0.014
Finger 25:	4.056	0.028	5.022	0.011	6.018	0.009	7.019	0.010
Finger 26:	4.079	0.040	5.024	0.012	6.037	0.019	7.024	0.012
Finger 27:	4.062	0.031	4.993	-0.003	6.007	0.004	6.993	-0.004
Finger 28:	4.063	0.032	5.009	0.004	6.005	0.003	7.005	0.002
Finger 29:	4.055	0.028	4.996	-0.002	6.004	0.002	7.006	0.003
Finger 30:	4.084	0.042	5.037	0.018	6.035	0.018	7.030	0.015
Finger 31:	4.080	0.040	5.032	0.016	6.029	0.015	7.031	0.015
Finger 32:	4.064	0.032	5.028	0.014	6.038	0.019	7.032	0.016
Finger 33:	4.073	0.036	5.033	0.016	6.021	0.010	7.024	0.012
Finger 34:	4.074	0.037	5.021	0.011	6.022	0.011	7.017	0.009
Finger 35:	4.075	0.037	5.044	0.022	6.012	0.006	7.037	0.018
Finger 36:	4.069	0.034	5.022	0.011	6.021	0.011	7.025	0.012
Finger 37:	4.073	0.037	5.020	0.010	6.021	0.011	7.024	0.012
Finger 38:	4.070	0.035	5.017	0.008	6.018	0.009	7.023	0.012
Finger 39:	4.073	0.037	5.016	0.008	6.017	0.009	7.019	0.009
Finger 40:	4.066	0.033	5.018	0.009	6.028	0.014	7.024	0.012
Average:	4.072	0.036	5.022	0.011	6.021	0.011	7.021	0.011

Segmented Cement Bond Log Calibration Report		
Serial Number:	10013454	
Tool Model:	UW_RBT_004	
Calibration Casing Diameter:	5.500	in
Calibration Depth:	-103.369	ft

Master Calibration, performed Mon Oct 12 17:12:49 2015:		
Raw (v)	Calibrated (mv)	Results

	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.001	1.002	0.800	71.921	70.889	0.880
5FT	-0.004	0.990	0.800	71.921	71.585	1.055
S1	-0.002	1.002	0.000	100.000	99.573	0.238
S2	-0.004	1.002	0.000	100.000	99.420	0.364
S3	-0.004	1.007	0.000	100.000	98.973	0.362
S4	-0.004	1.007	0.000	100.000	98.927	0.367
S5	-0.002	1.009	0.000	100.000	98.823	0.241
S6	-0.004	1.009	0.000	100.000	98.724	0.362
S7	-0.004	0.998	0.000	100.000	99.869	0.351
S8	-0.003	1.000	0.000	100.000	99.746	0.279

#### 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: 10024770  
 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: Noble Energy Inc.  
 Well: Wells Ranch AE32-635  
 Field: Wattenberg  
 County: Weld  
 State: Colorado