



# Compensated Neutron Gamma Ray Casing Collar Log

Company Whiting Oil & Gas Corporation						Company Whiting Oil & Gas Corporation	
Well Horsetail 8D-1704						Well Horsetail 8D-1704	
Field Wildcat						Field Wildcat	
County Weld						County Weld	
State Colorado						State Colorado	
Location:						API #: 05-123-41024	
						Graded Elevation 4983'KB 4962'GR	
SEC 8 TWP 10N RGE 57W							
Permanent Datum Ground Level Elevation 4958'						Other Services JBGR RBP RBL/MIT	
Log Measured From Kelly Bushing 21 FT						Elevation K.B. 4979' D.F. 4978' G.L. 4958'	
Drilling Measured From Kelly Bushing							
Date	Run Number		22-May-2015				
Depth Driller			Three				
Depth Logger			16110 FT				
Bottom Logged Interval			5200 FT				
Top Log Interval			5199 FT				
Open Hole Size			Surface				
Type Fluid			Water				
Density / Viscosity			8.34 lbm/gal				
Max. Recorded Temp.			196°F				
Estimated Cement Top			302FT				
Time Well Ready			ROA				
Time Logger on Bottom			1:15 pm				
Equipment Number			HD-0255				
Location			Fort Lupton, CO				
Recorded By			S. Hopper			B. Kalkwarf	
Witnessed By			Casey Jackson				
Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record	Size (in)	Wat (lbs/ft)	Grade	Top	Bottom		
Surface Casing	9.625"	36	J-55	Surface	1630 FT		
Intermediate #1	7	29	P-110	Surface	6178 FT		
Intermediate #2							
Liner	4.5"	11.6	---	5161 FT	16110 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.

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Comments

Log ran as per customer request.  
Depth referenced to Casing Tally reported Liner Top at 5161 FT.  
Adjusted log +12.5 FT to correlate with Liner Top.  
Gauge Ring/Junk Basket ran to 5362 FT with no debris found.  
Retrievable Bridge Plug set at 5250 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.!!



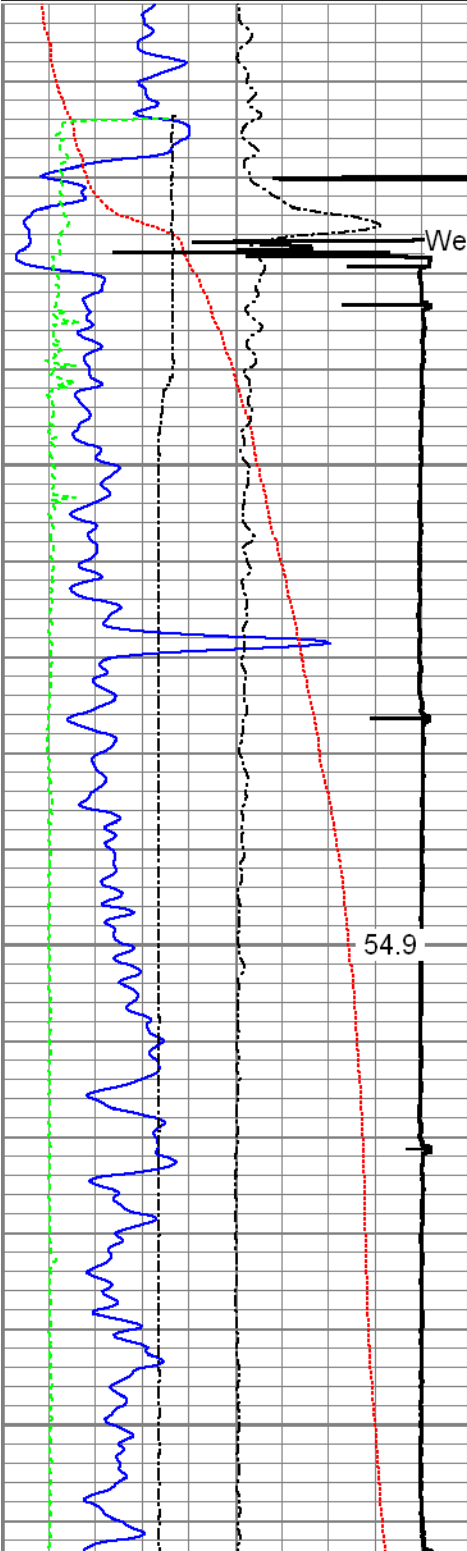
## Main Pass

Recorded with 1500 PSI surface induced pressure

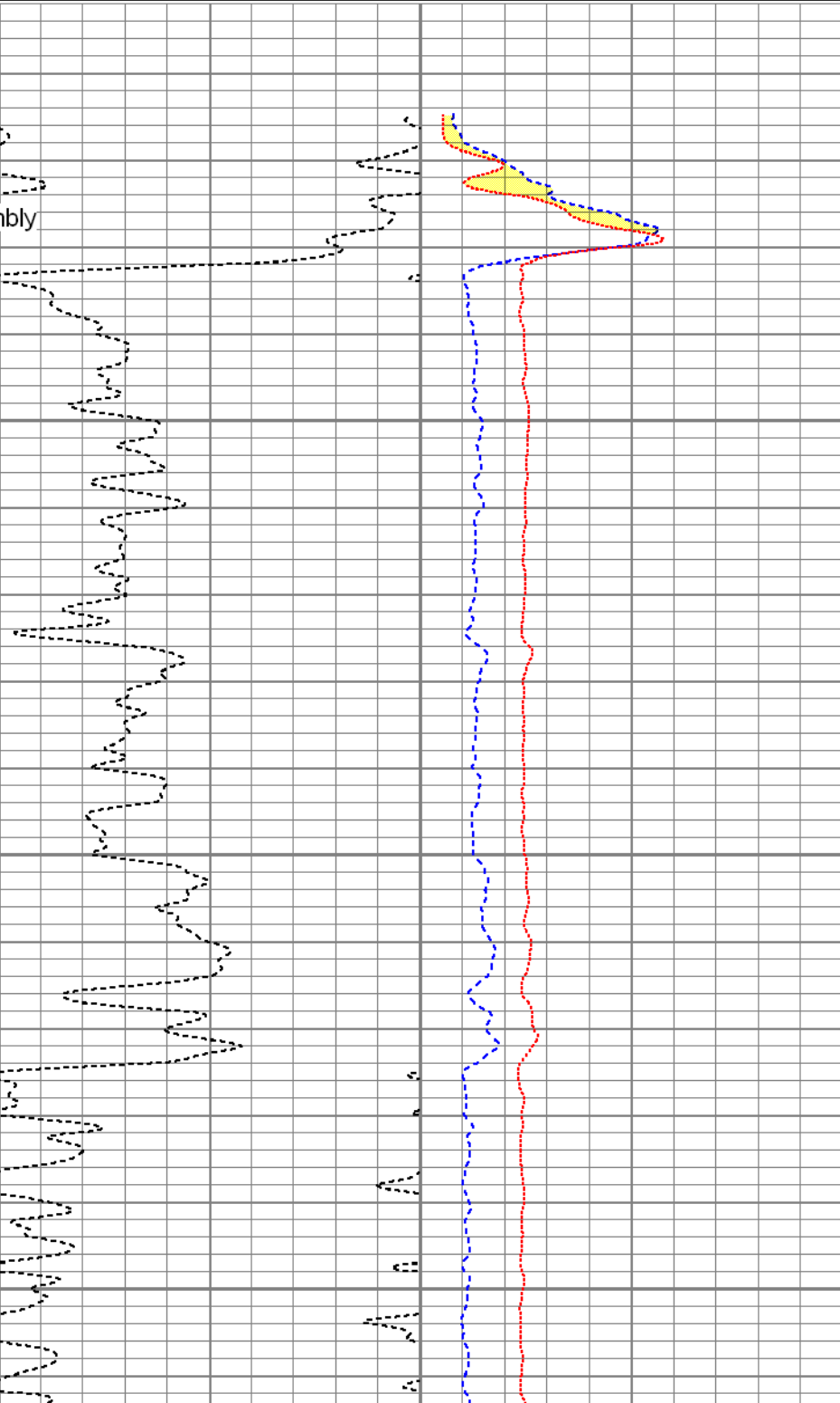
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Dataset Pathname: main  
Presentation Format: cnl  
Dataset Creation: Fri May 22 16:44:51 2015 by Calc 7.0 B1  
Charted by: Depth in Feet scaled 1:240

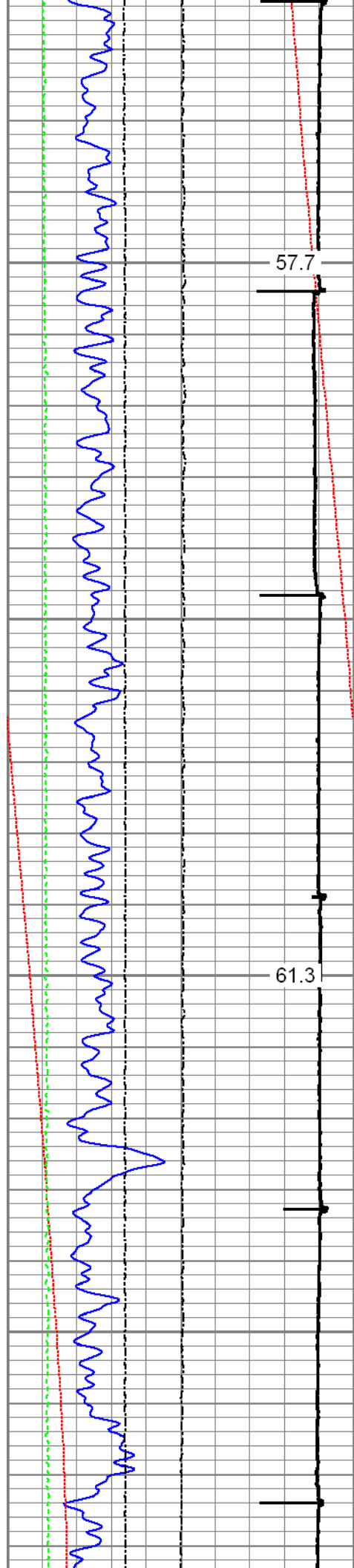
0	Gamma Ray (GAPI)	120
0	Temperature (degF)	20
-100	Line Speed (ft/min)	100
0	Line Tension (lb)	2000
-2	Differential Temperature (degF)	2
Casing Collar Locator		

60	Neutron Porosity (pu)	0	0	Far Neutron (cps)	1000
			0	Near Neutron (cps)	12000



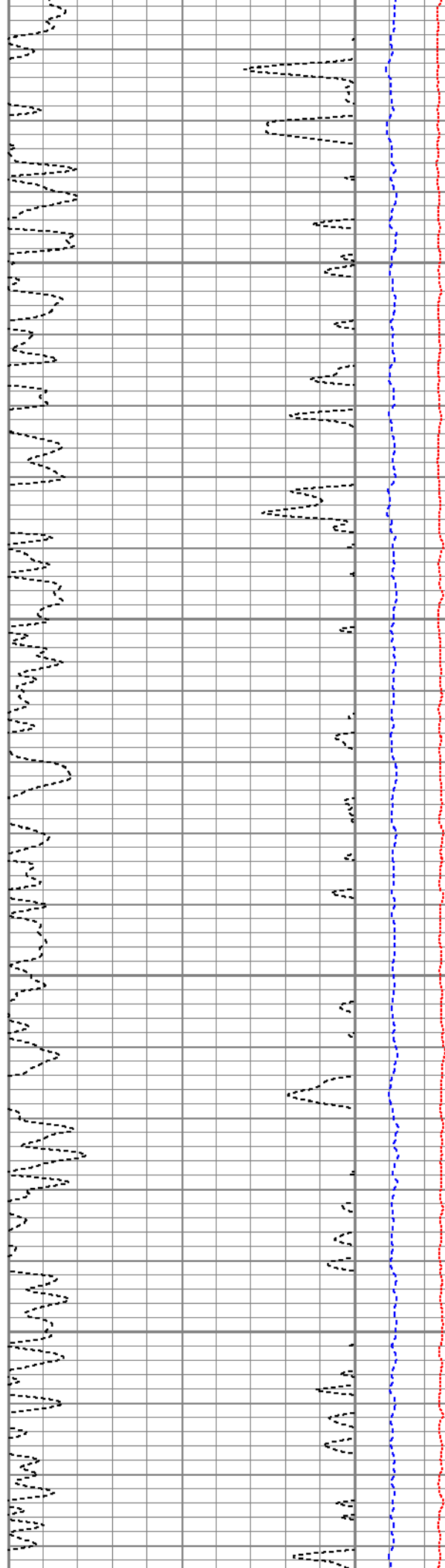
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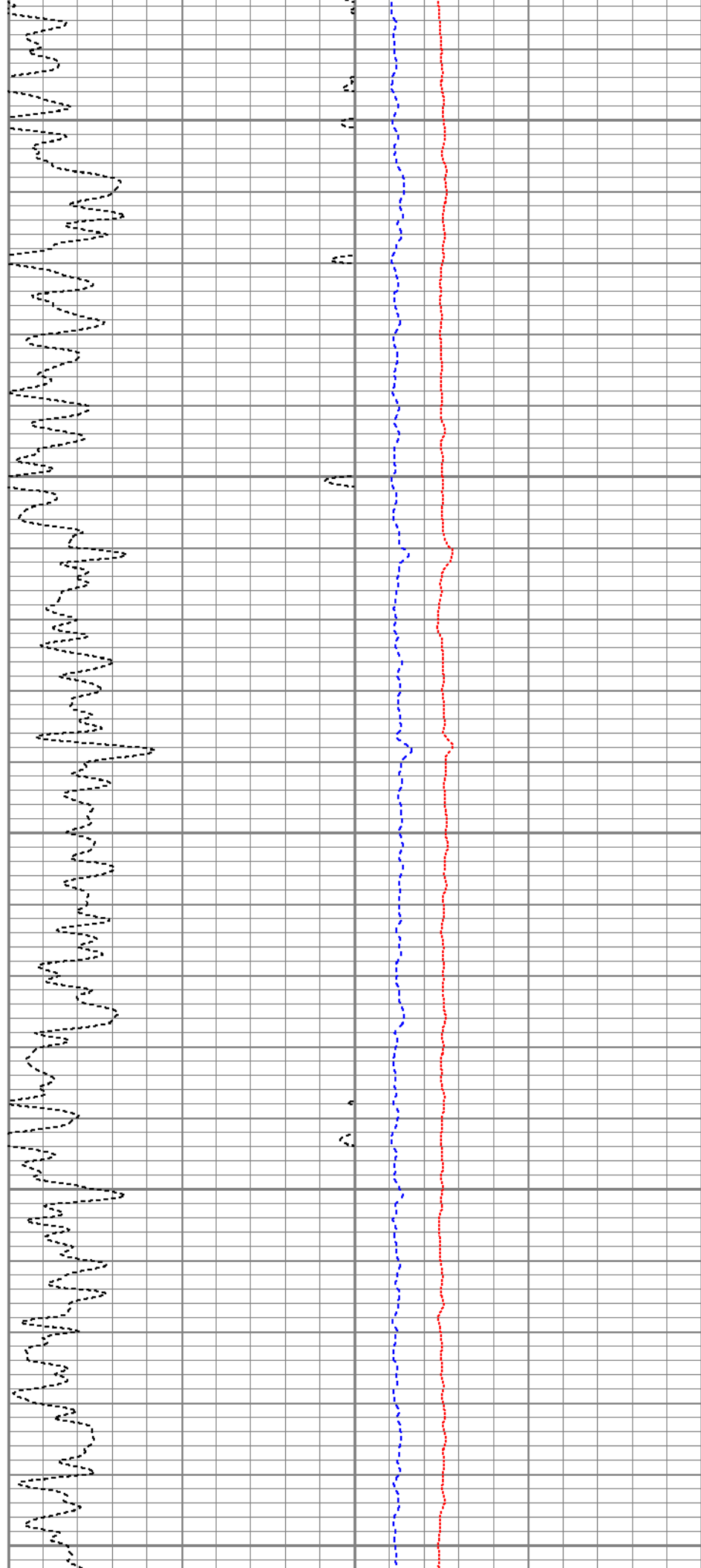
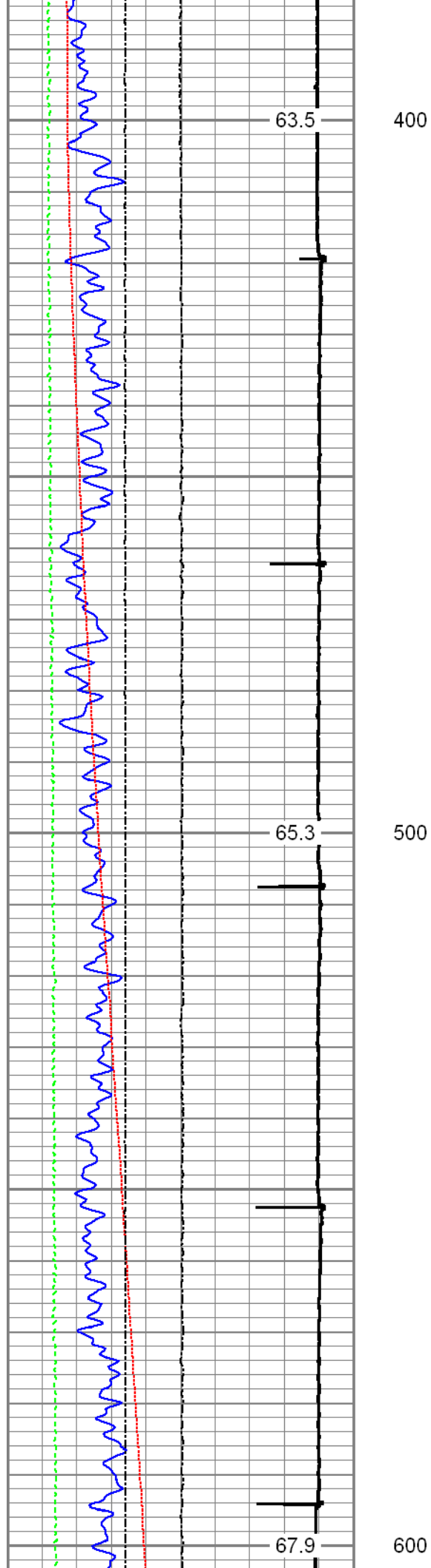


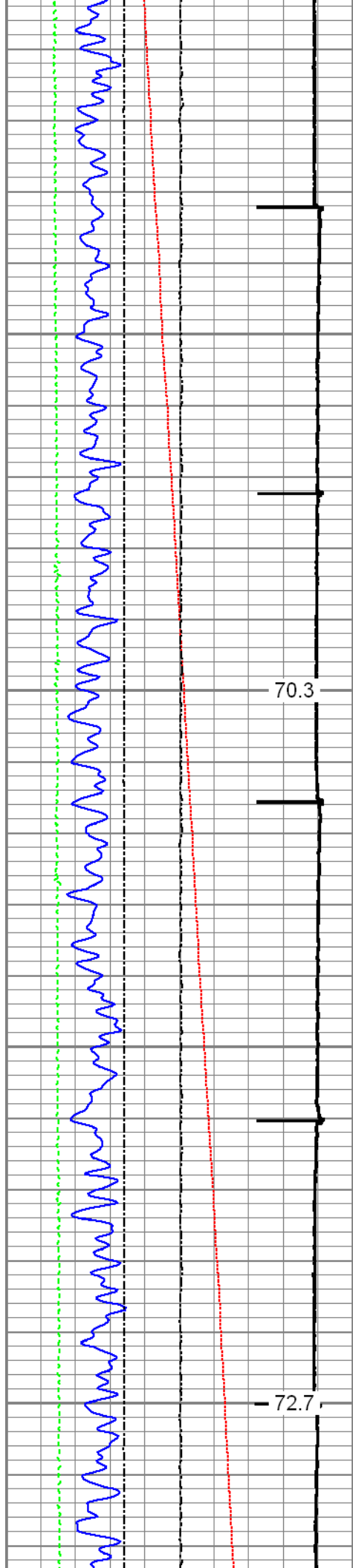


200

300

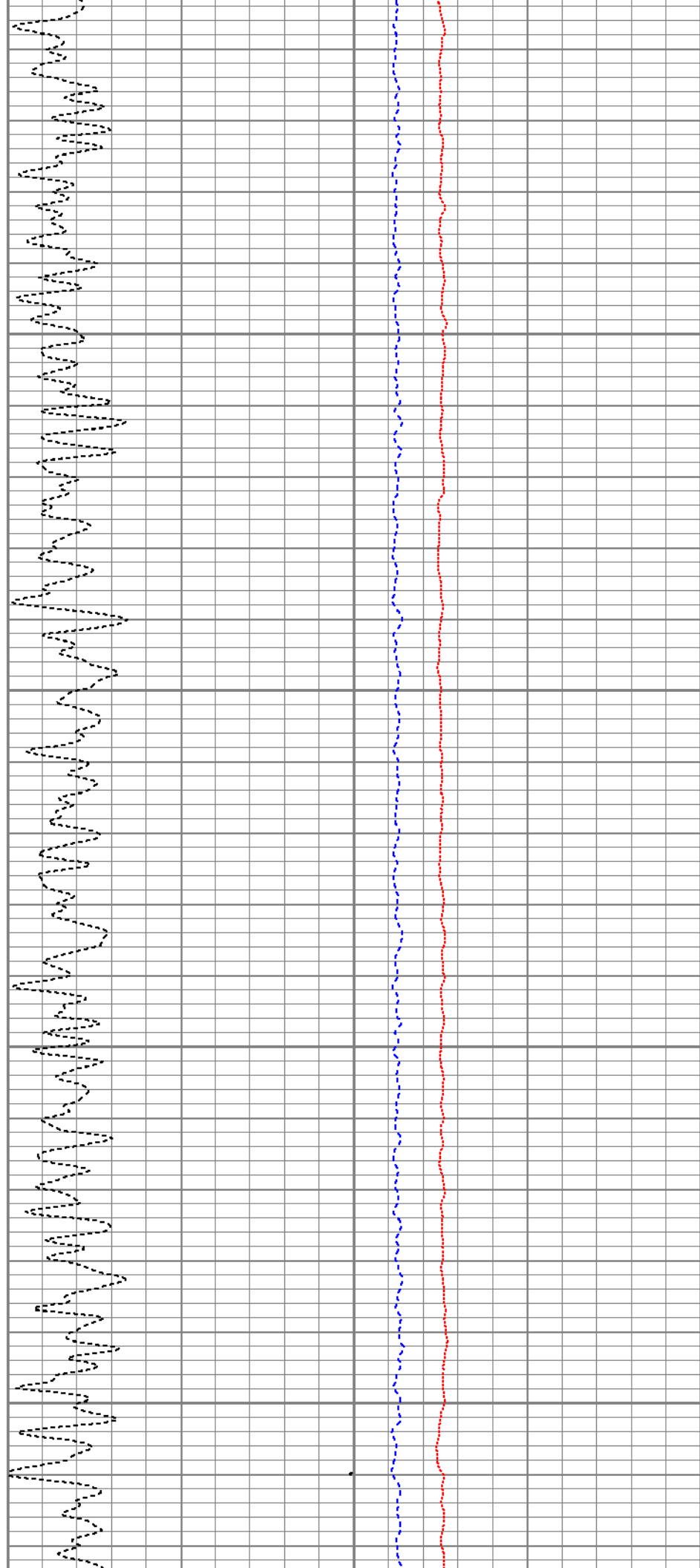


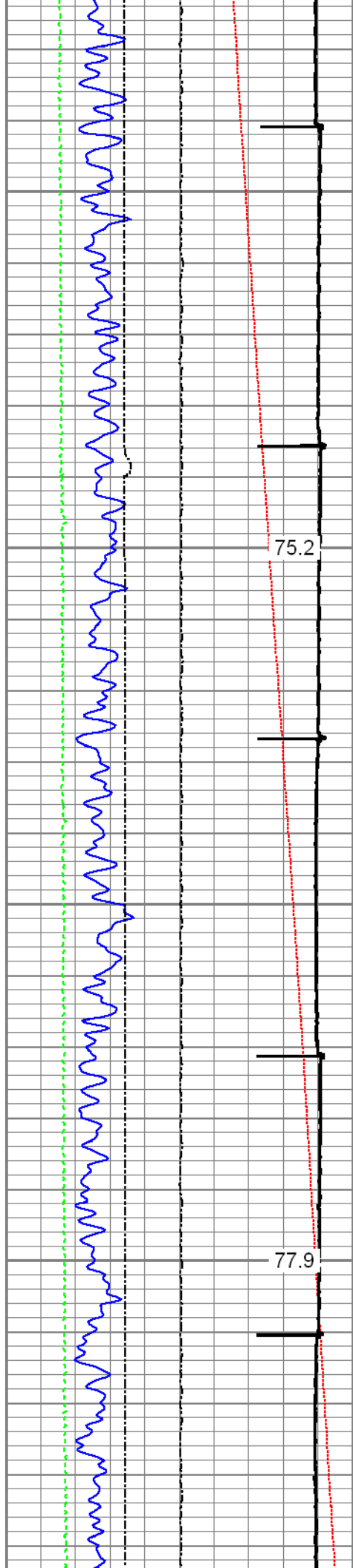




700

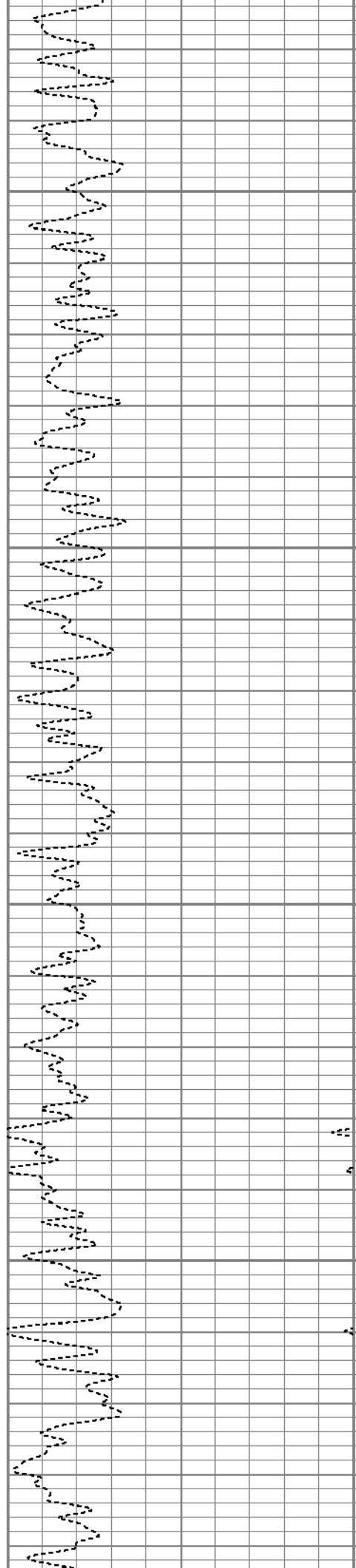
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900

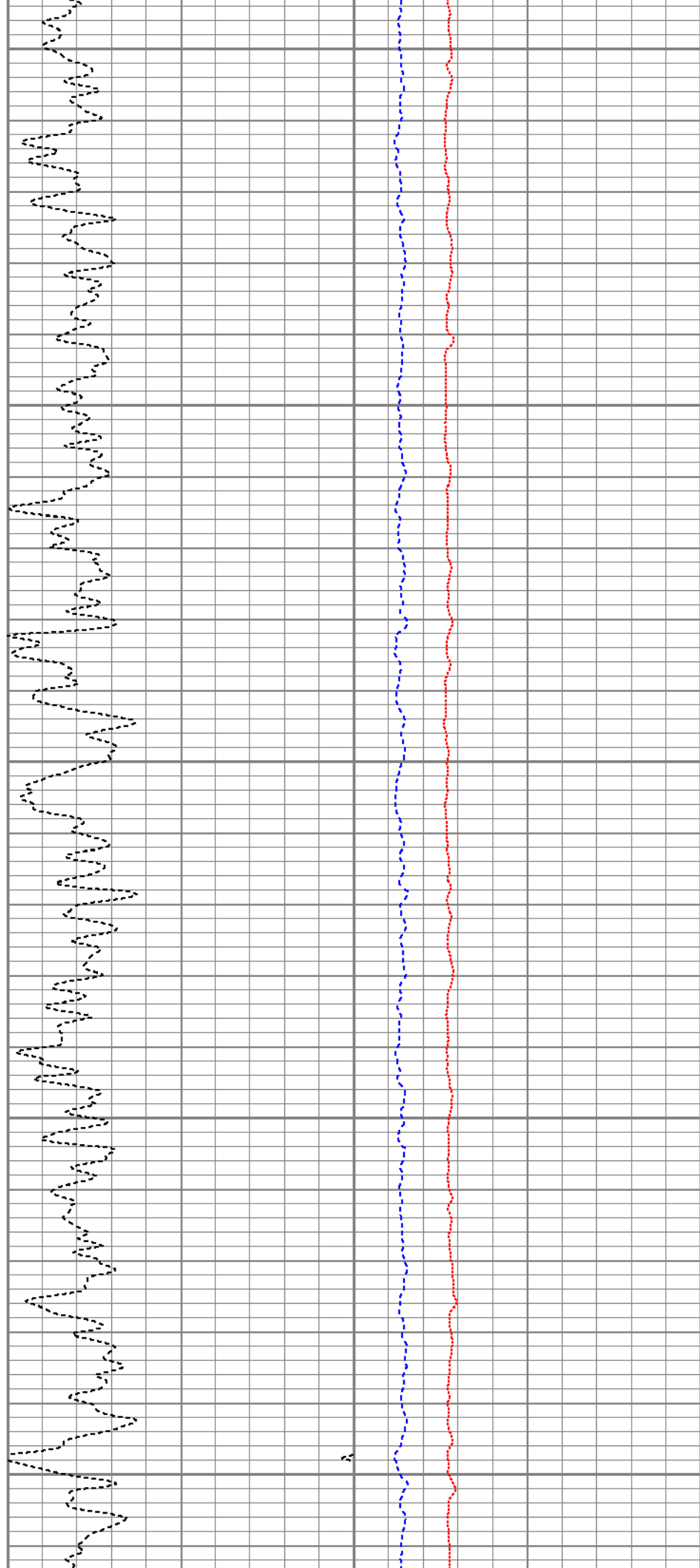
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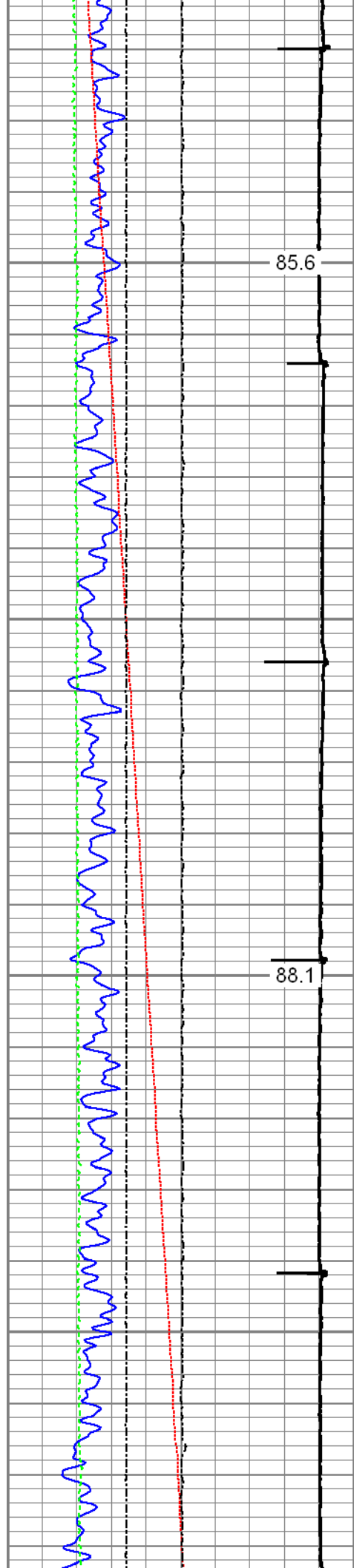




1100

1200



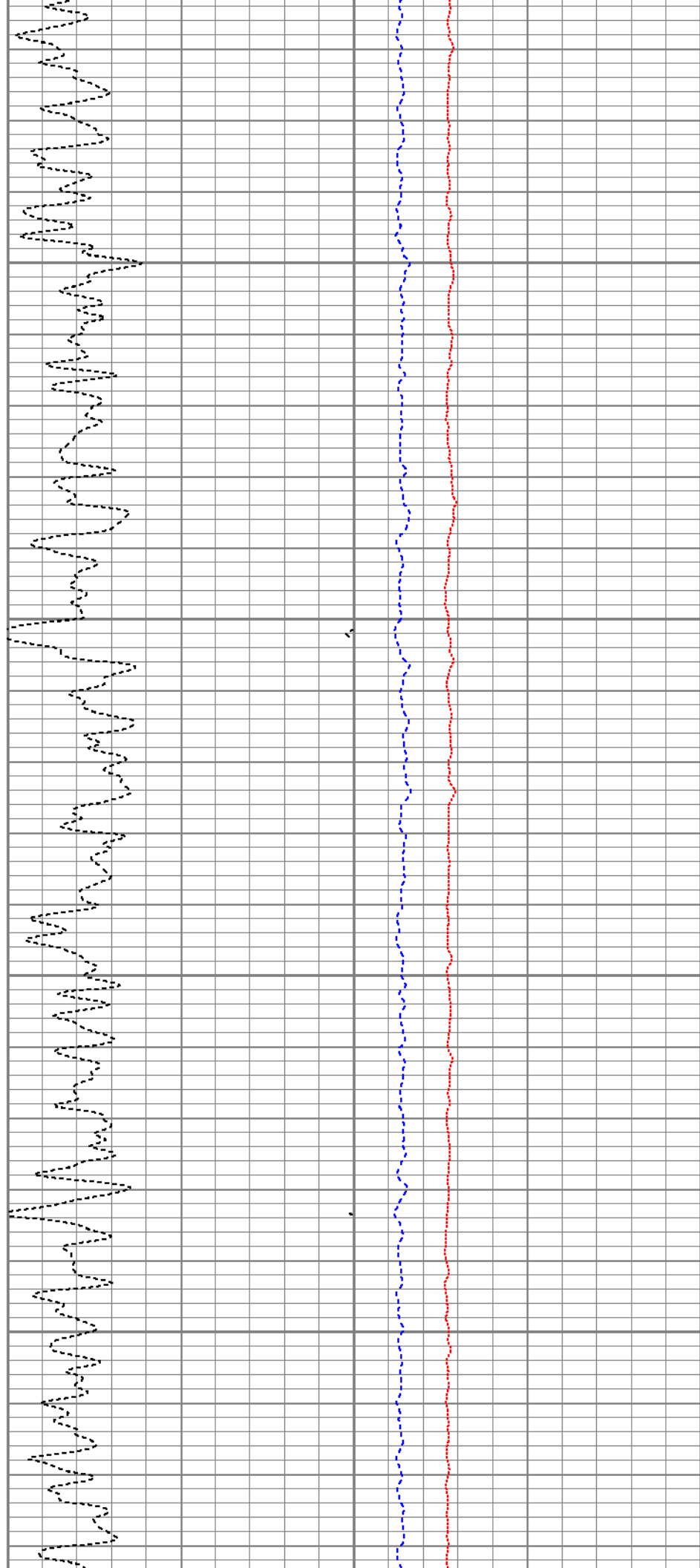


1300

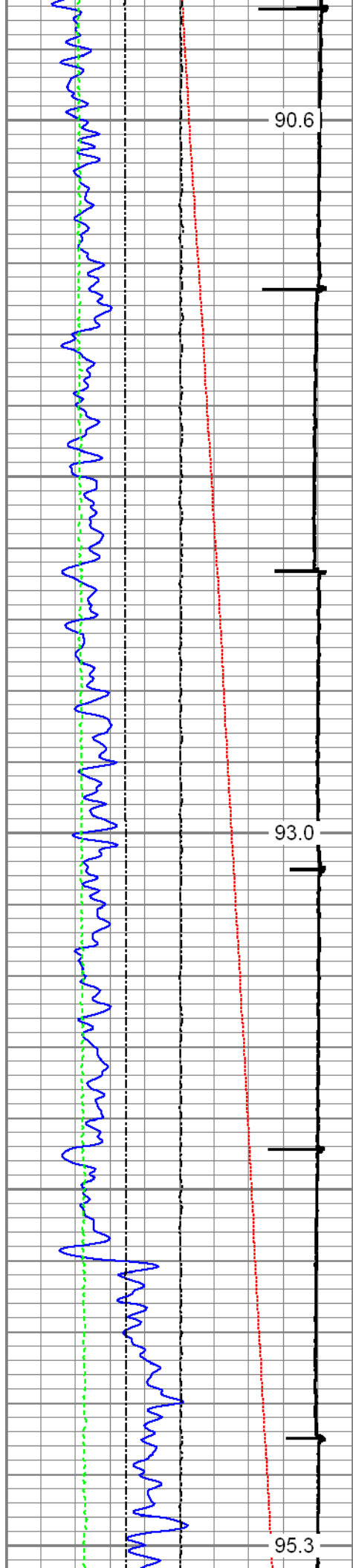
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1400

88.1



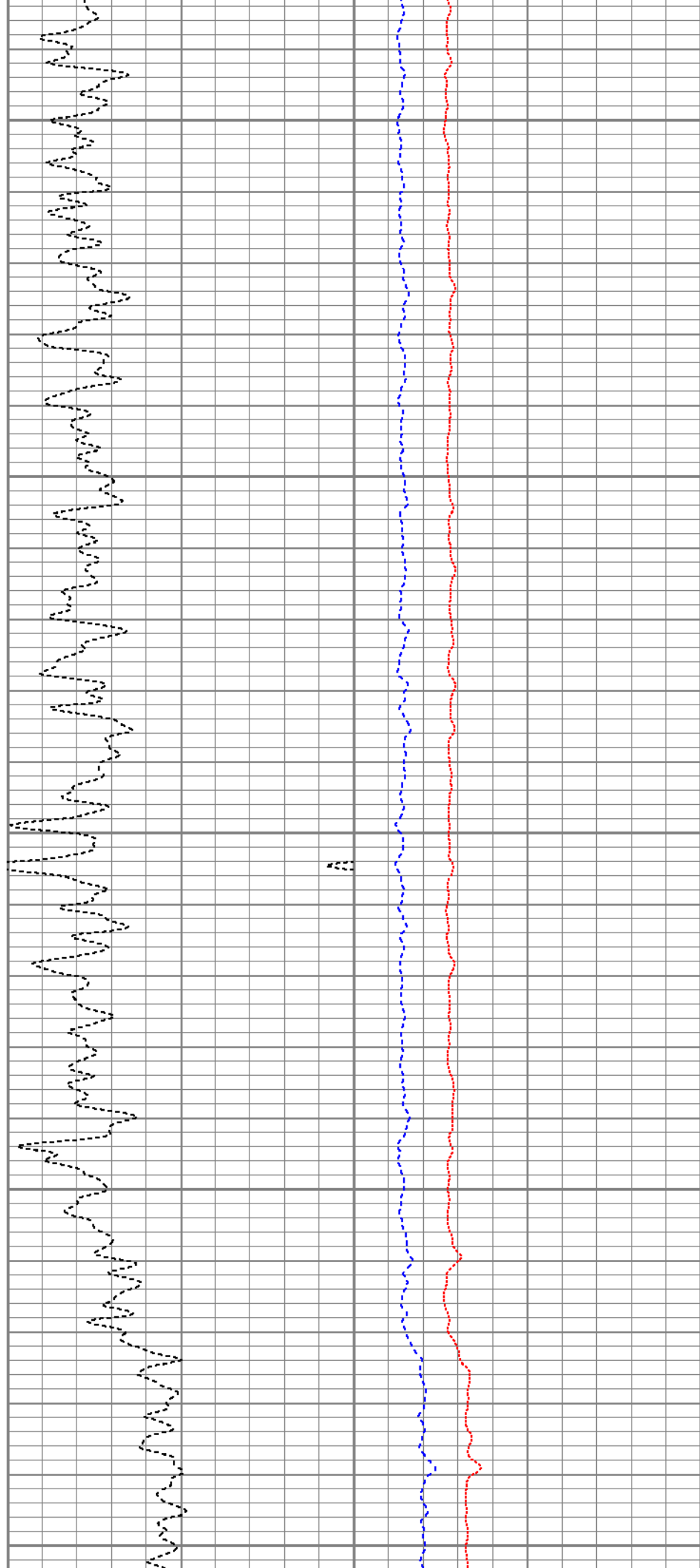


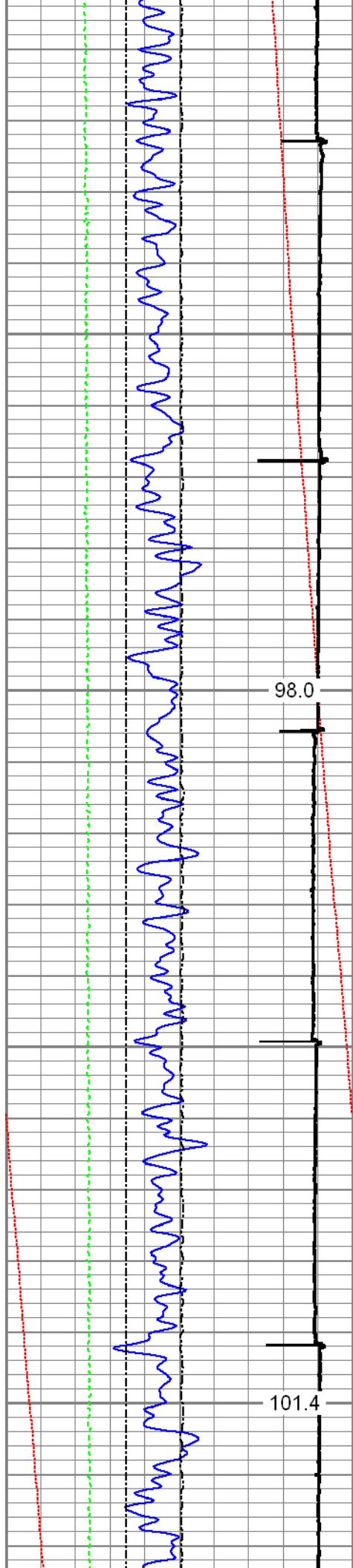


1500

1600

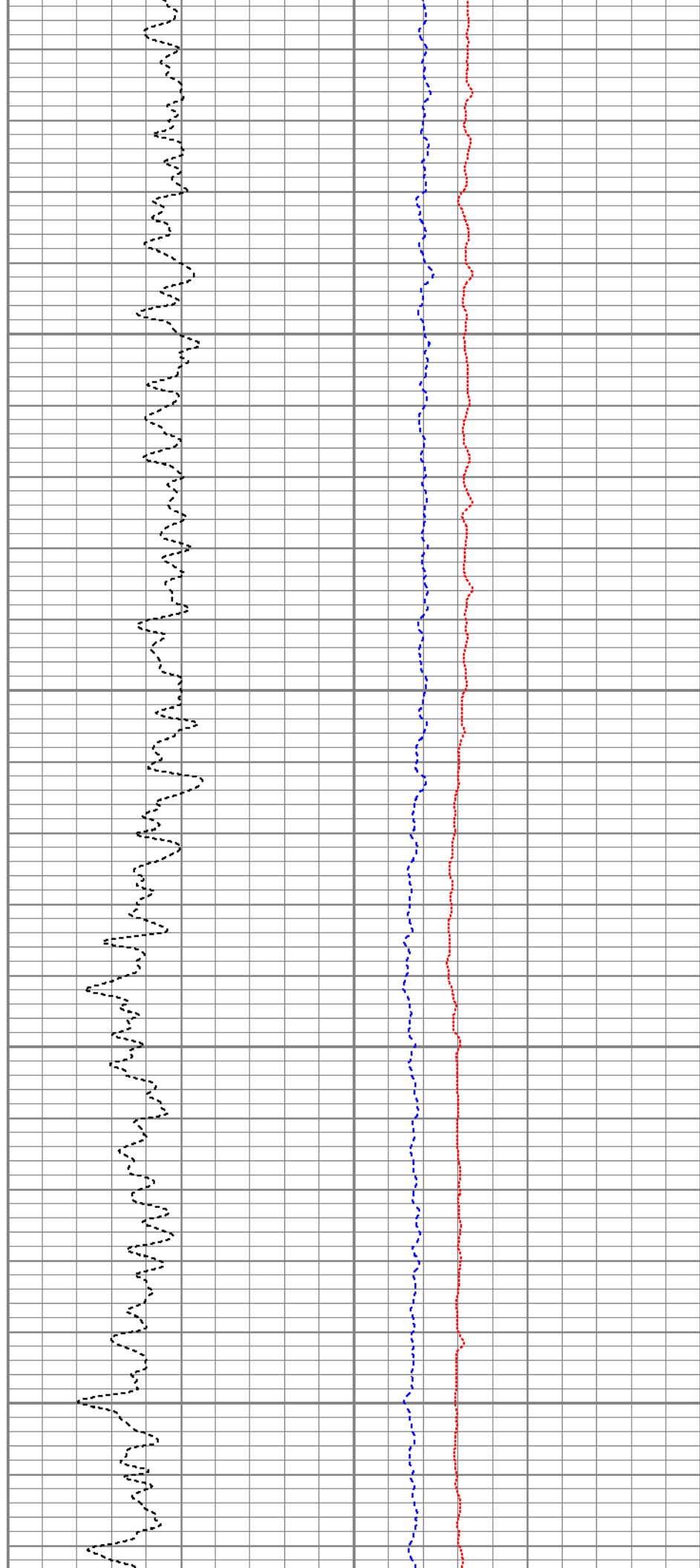
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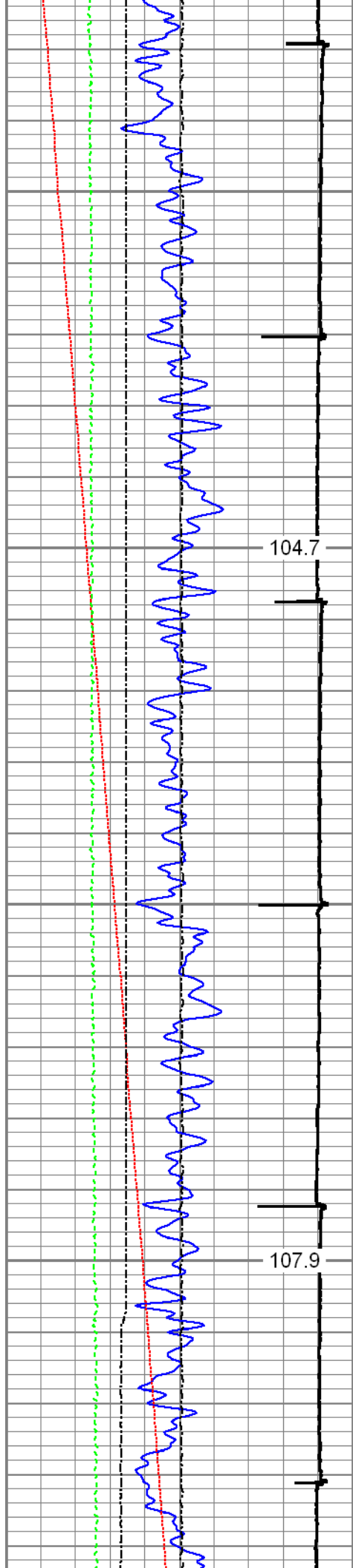




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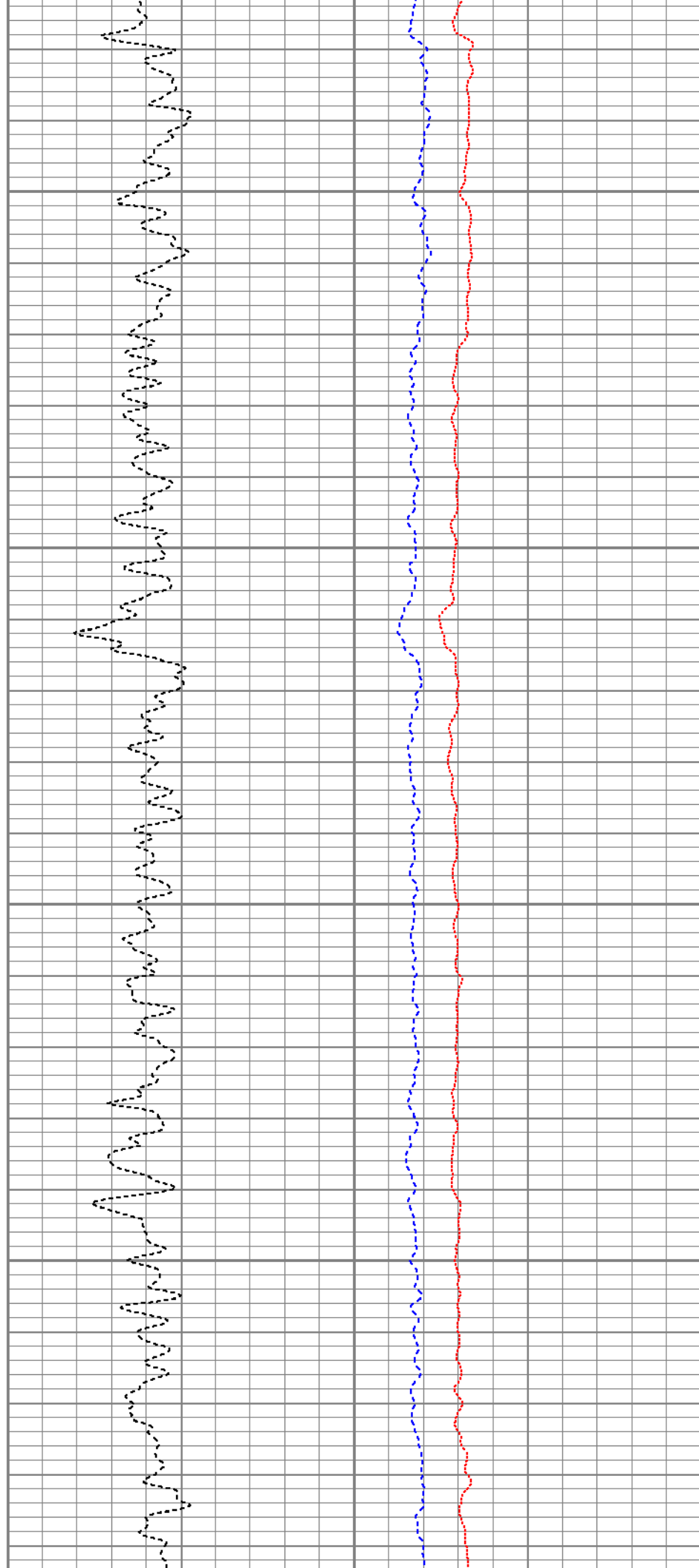
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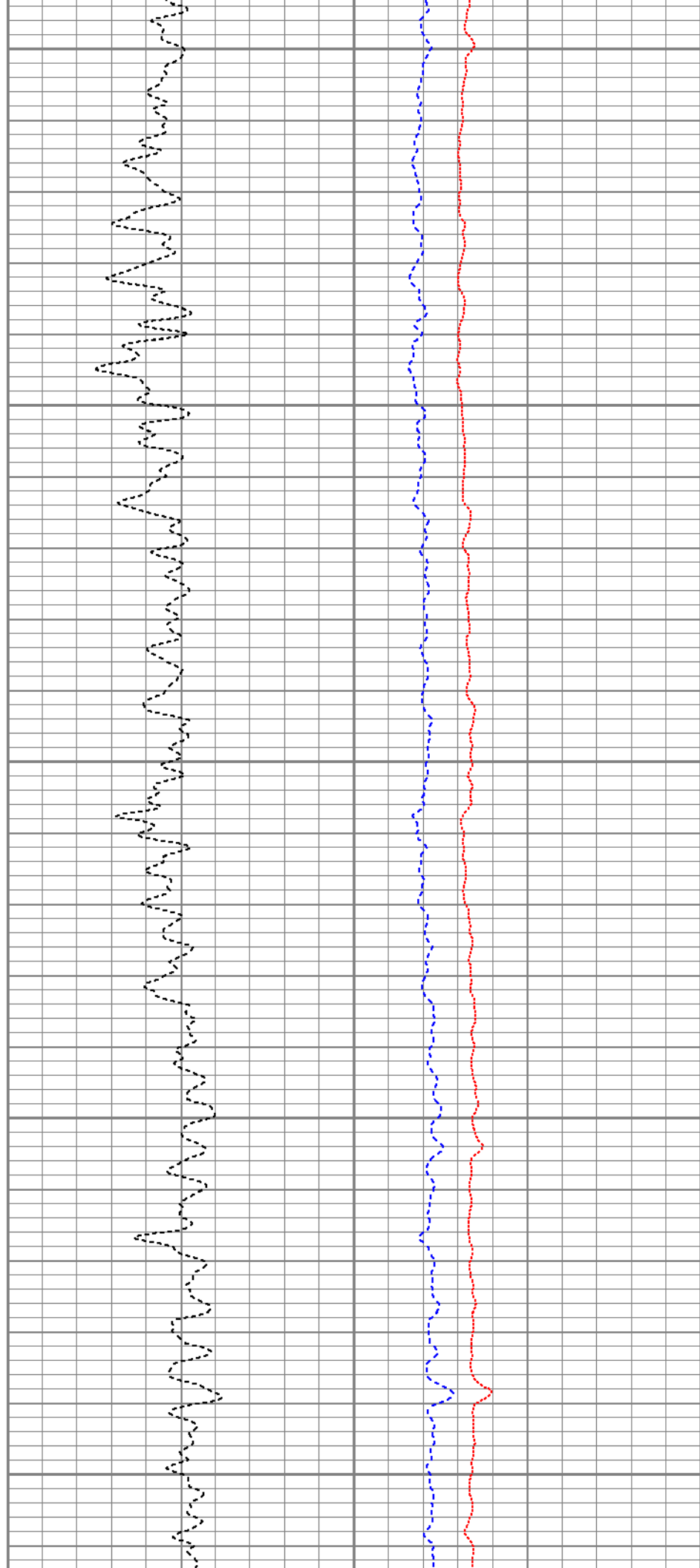
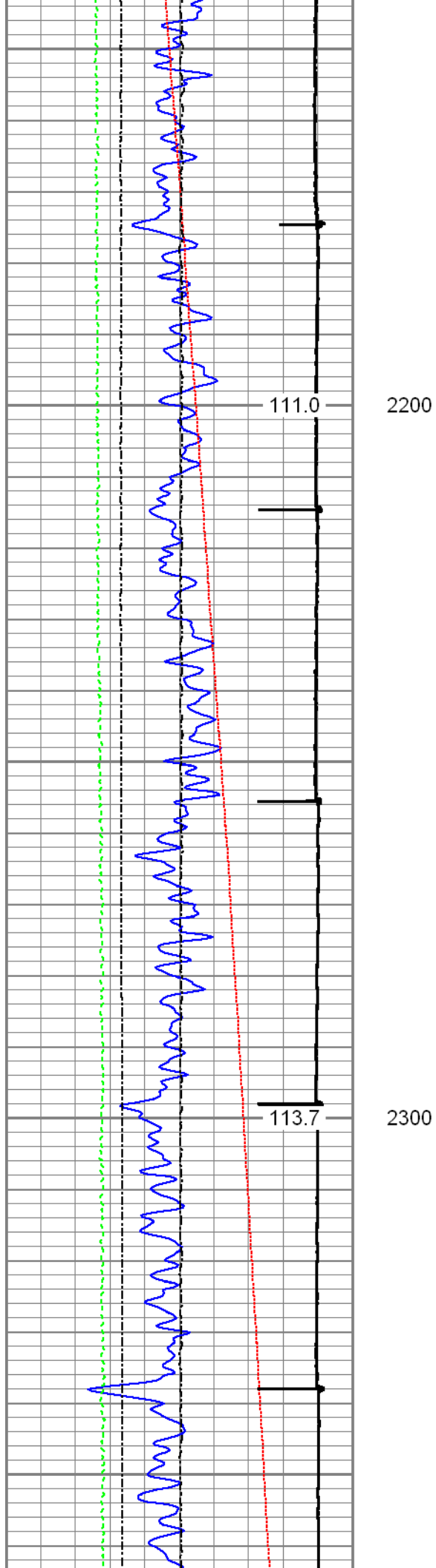


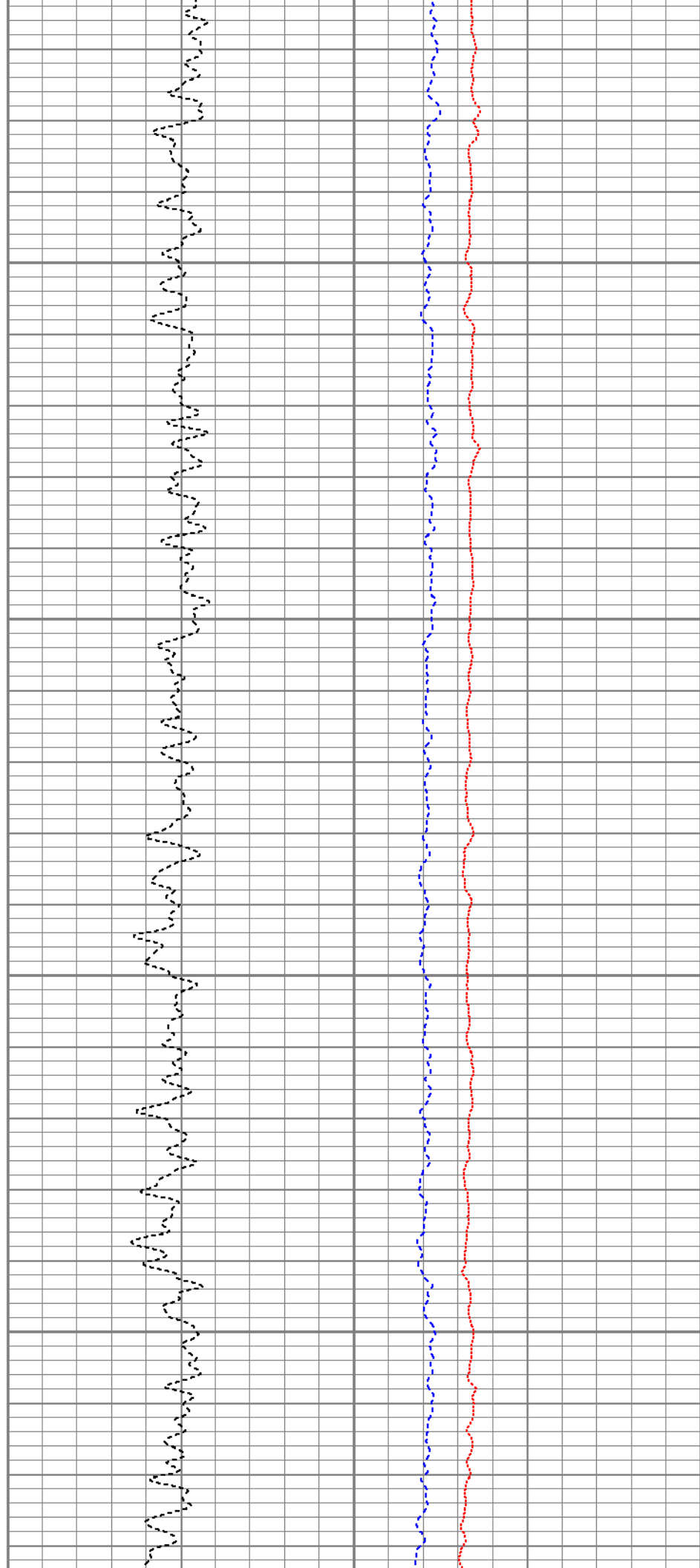
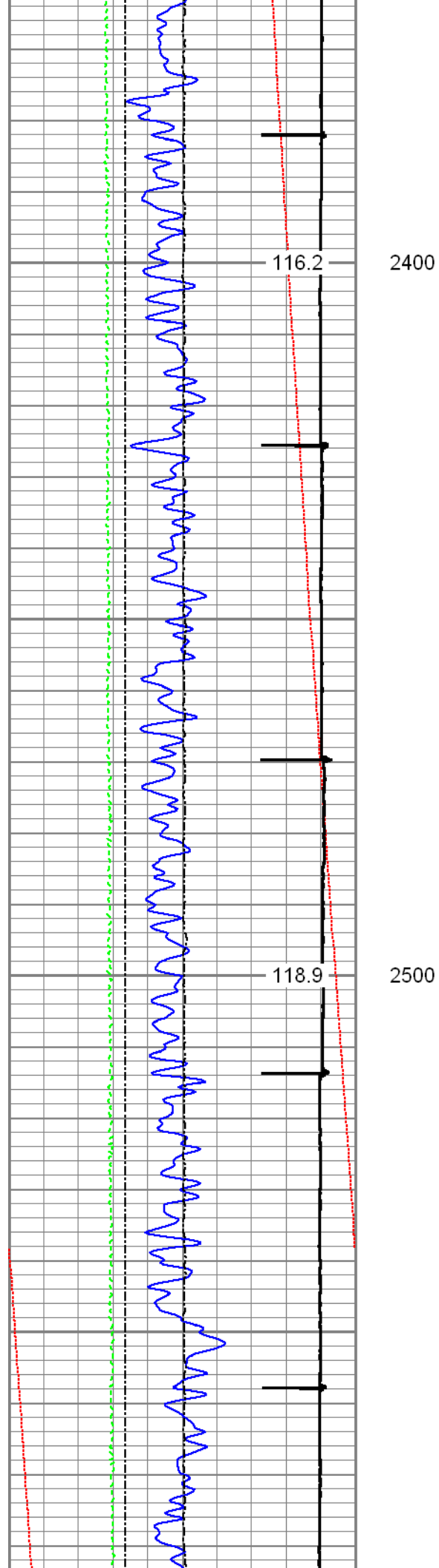


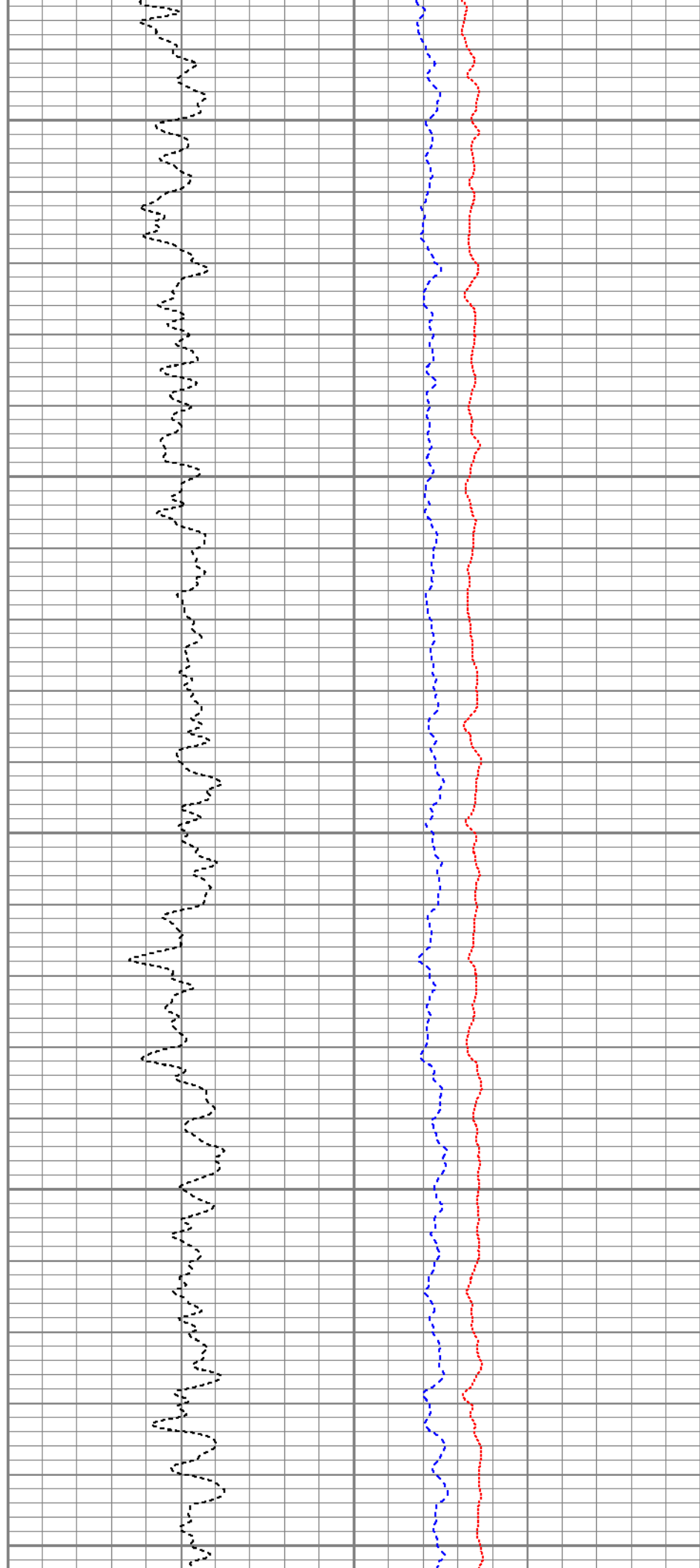
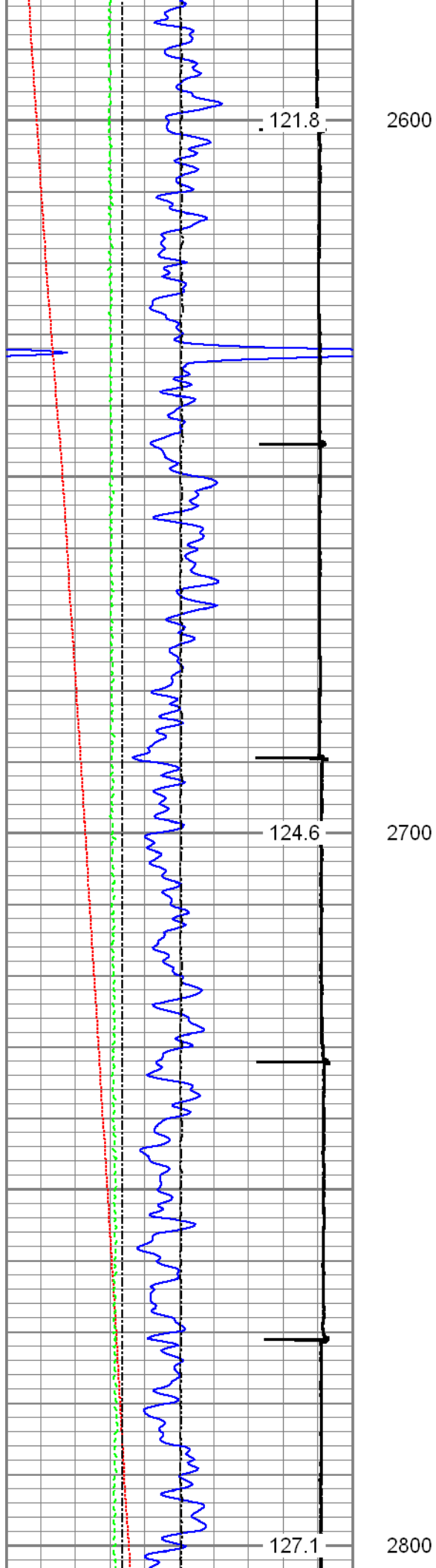
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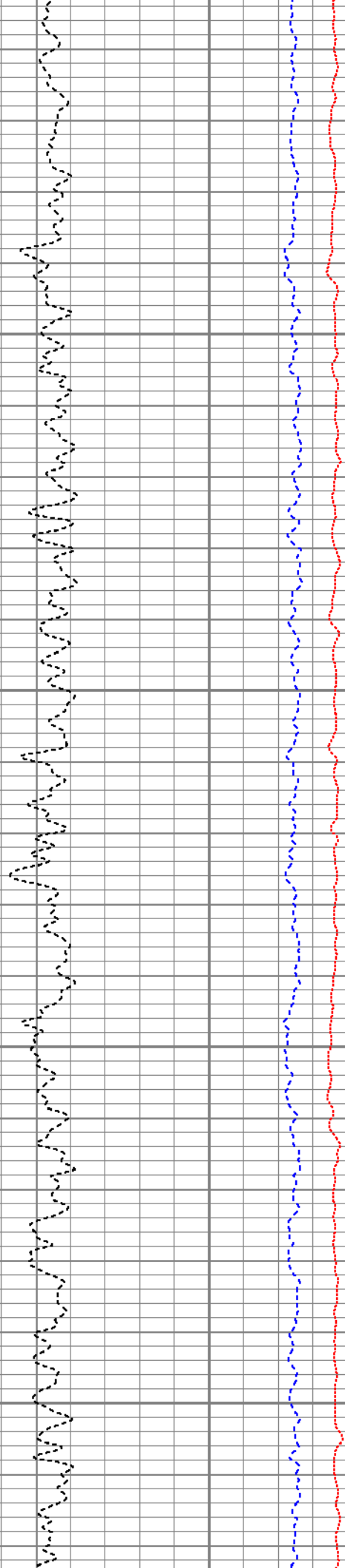
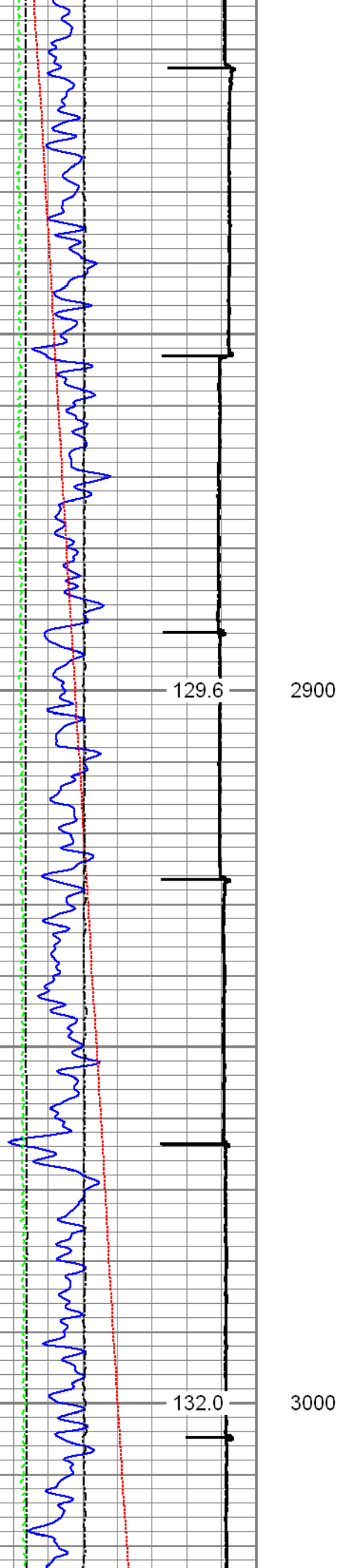
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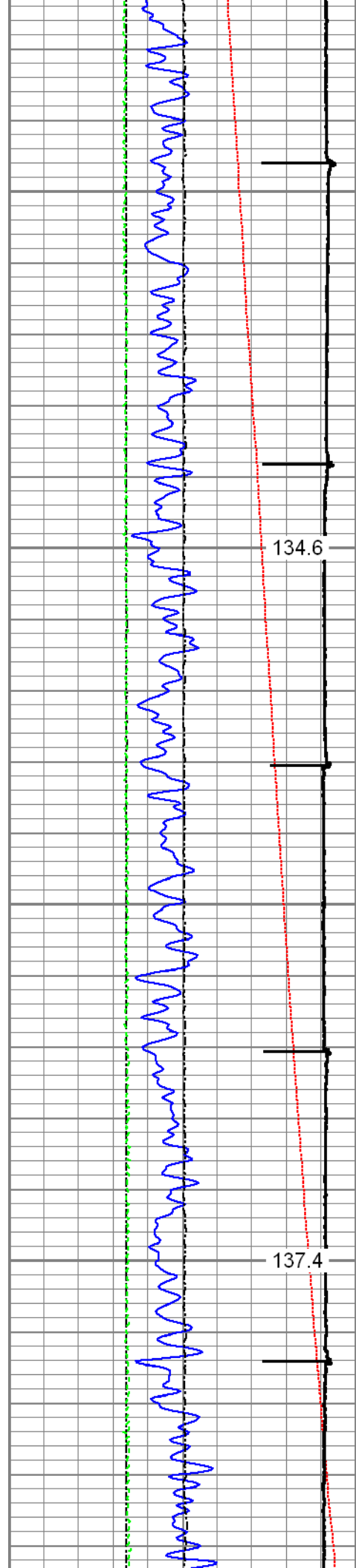






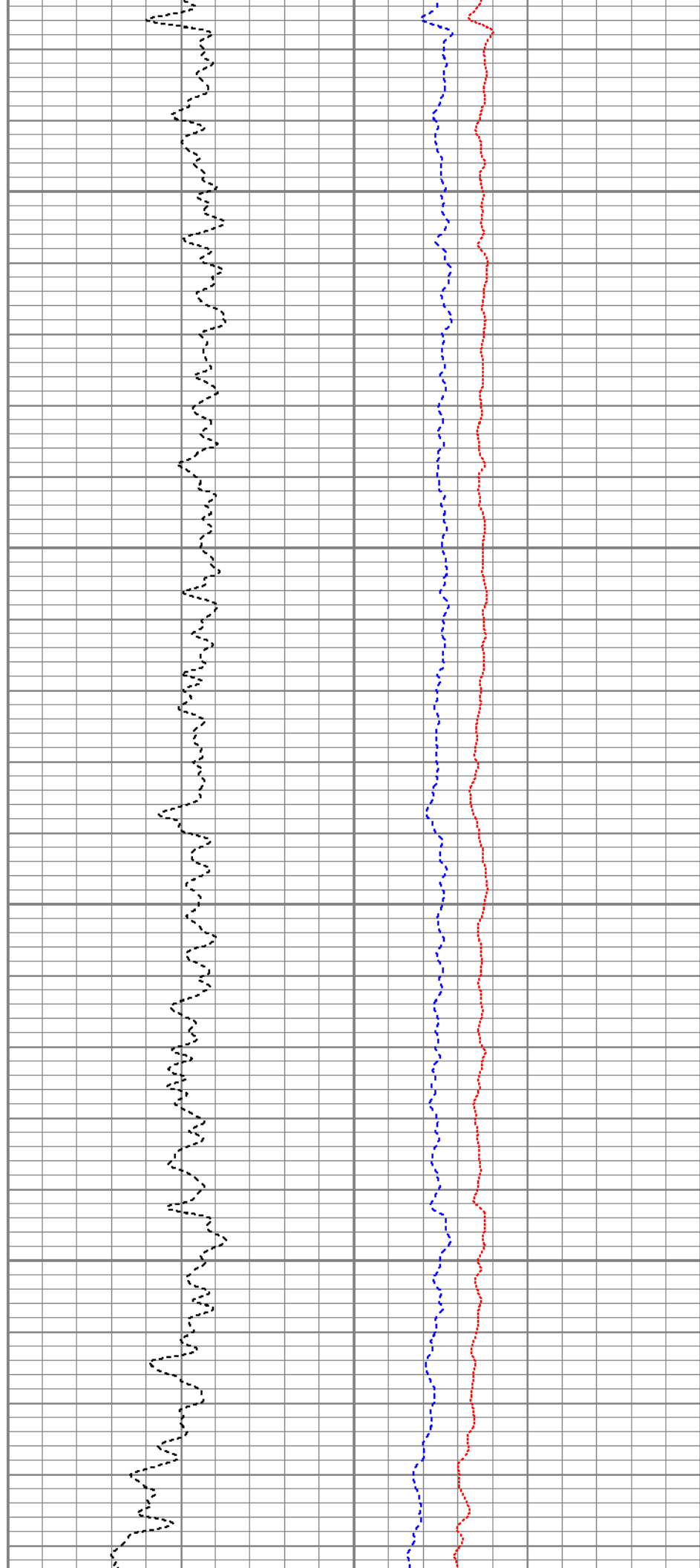




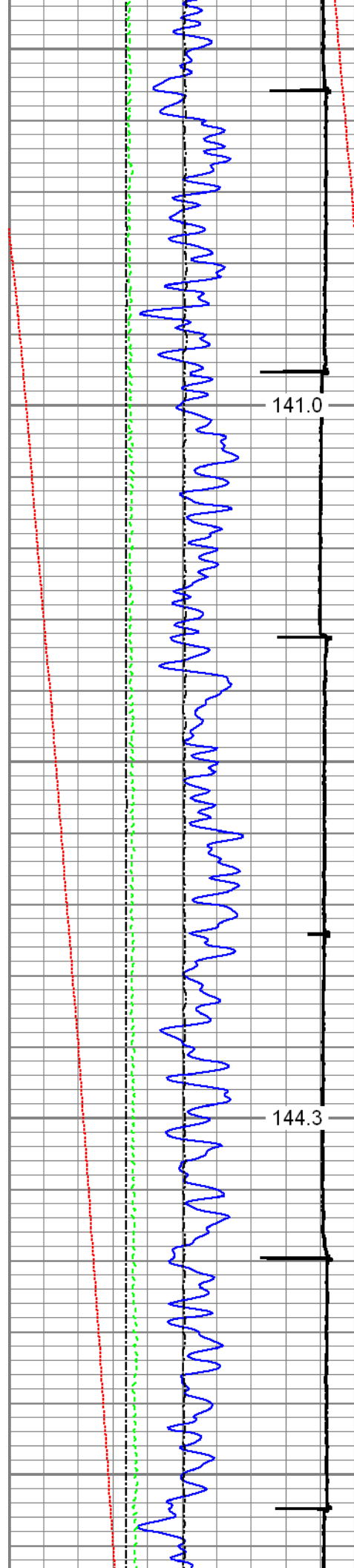


3100

3200





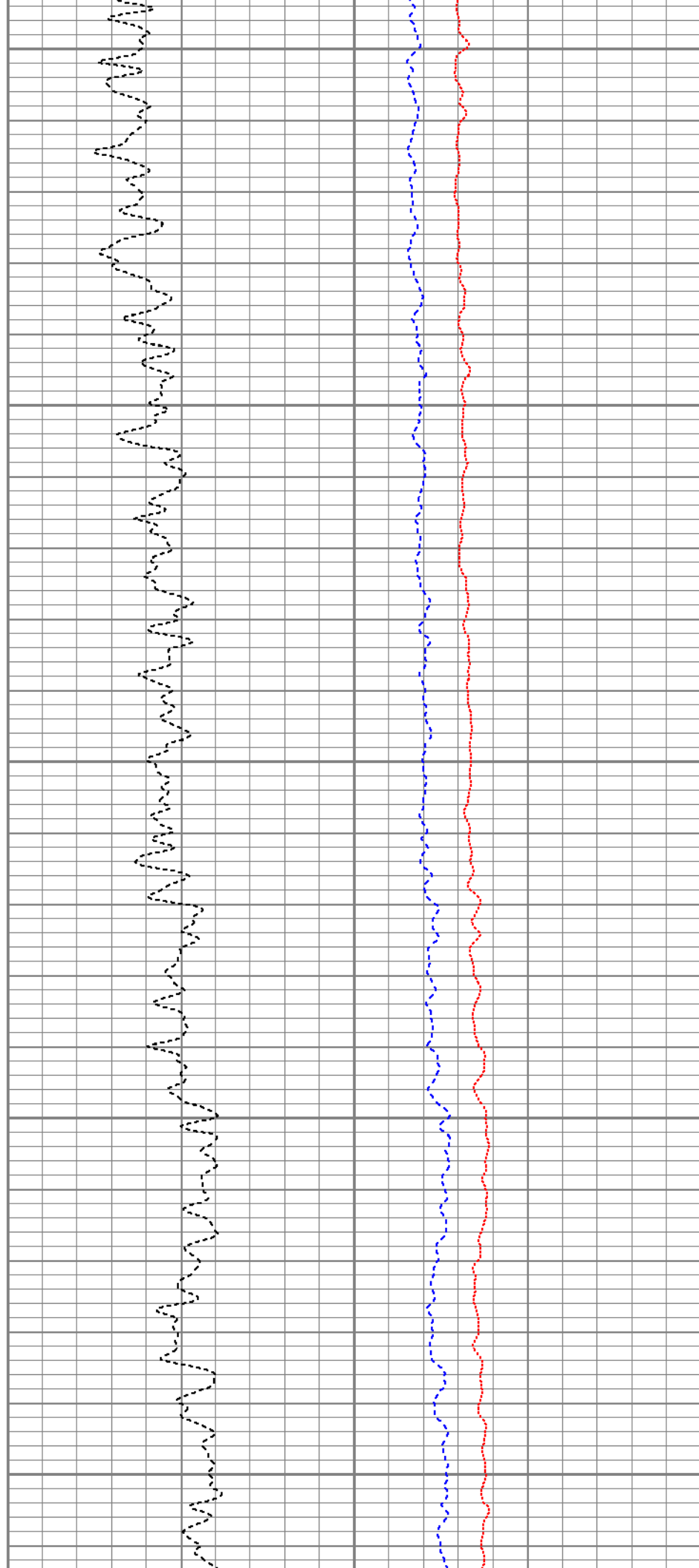


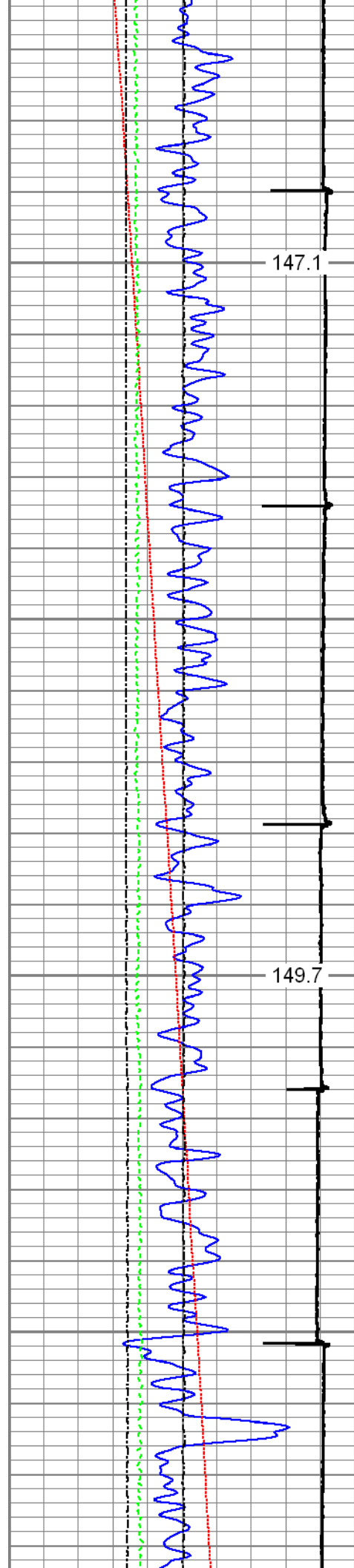
3300

141.0

3400

144.3



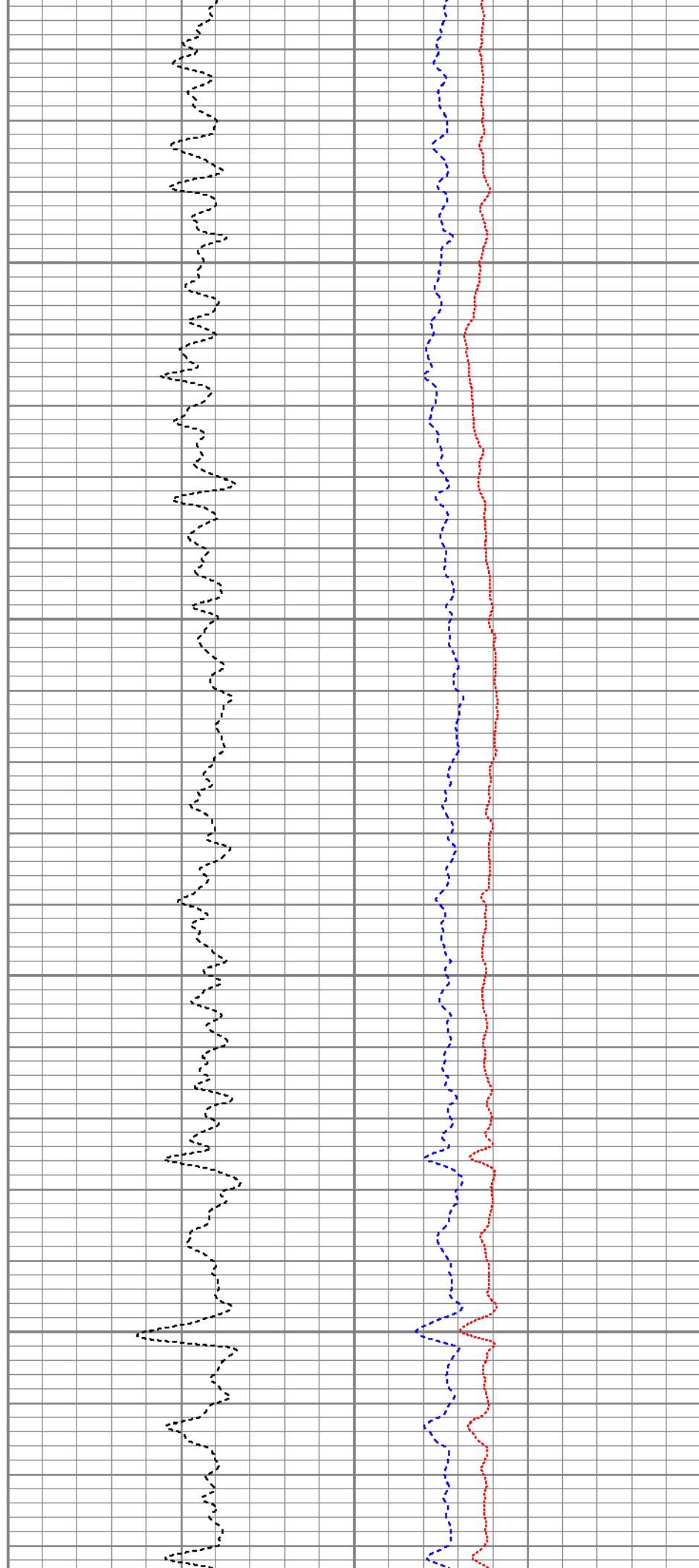


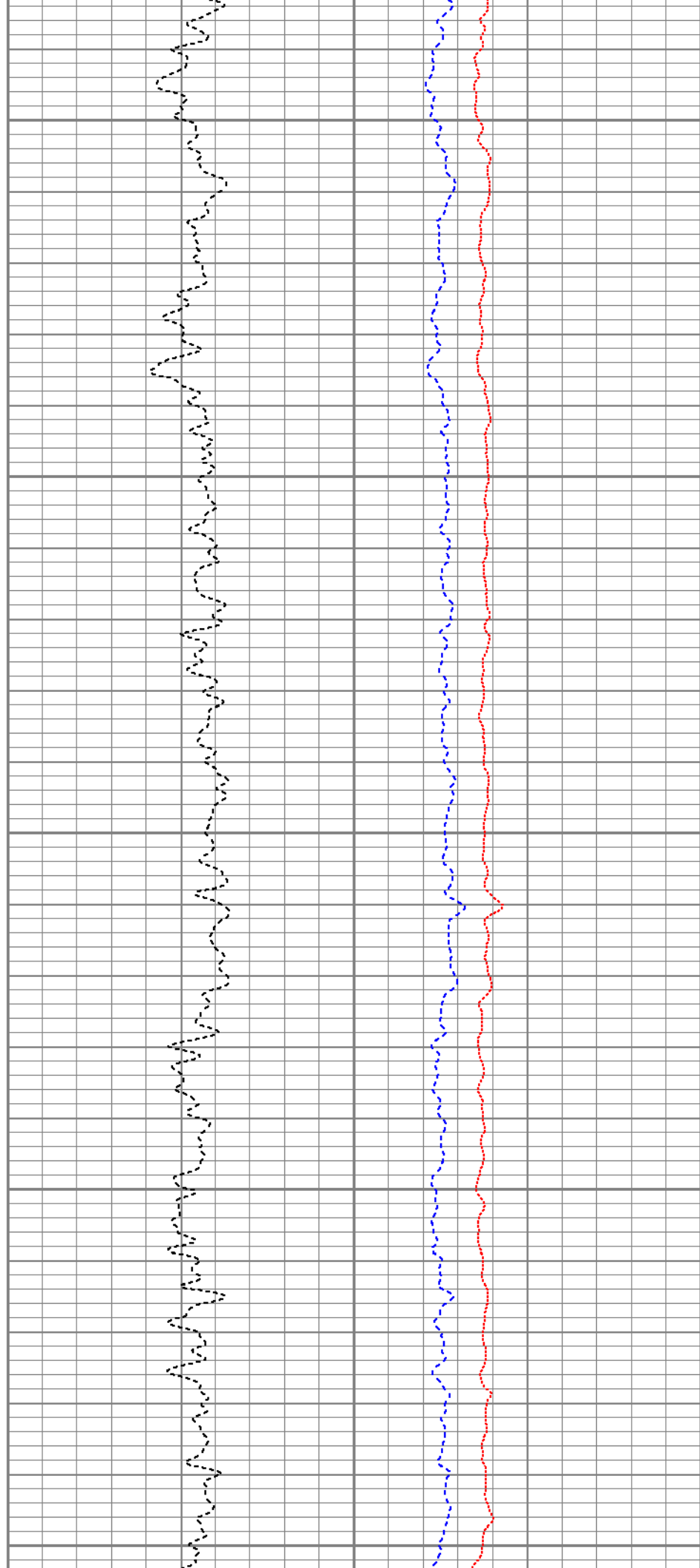
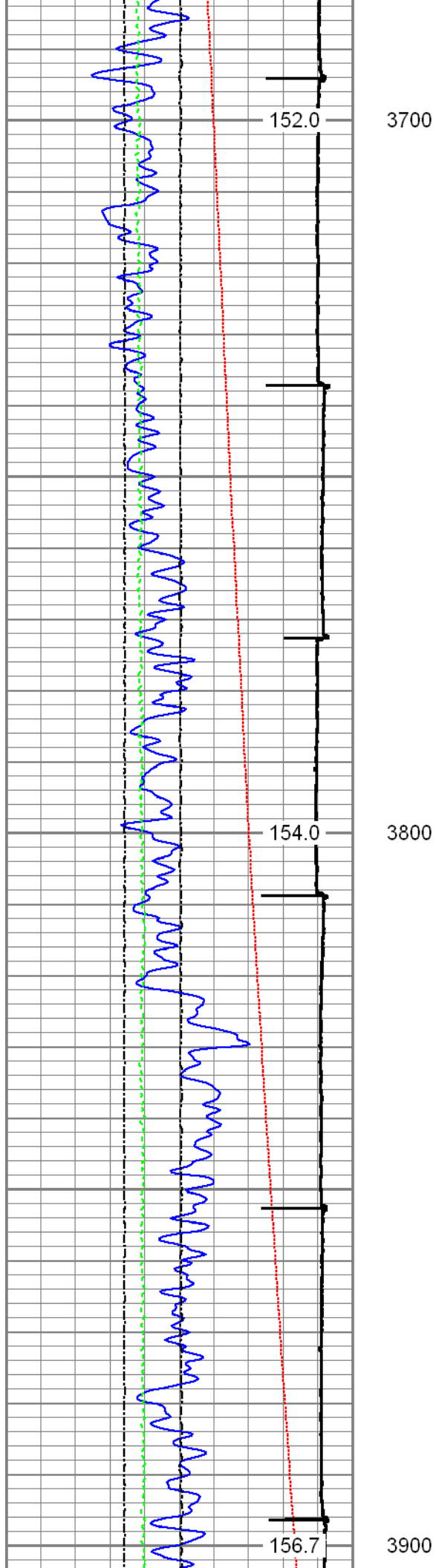
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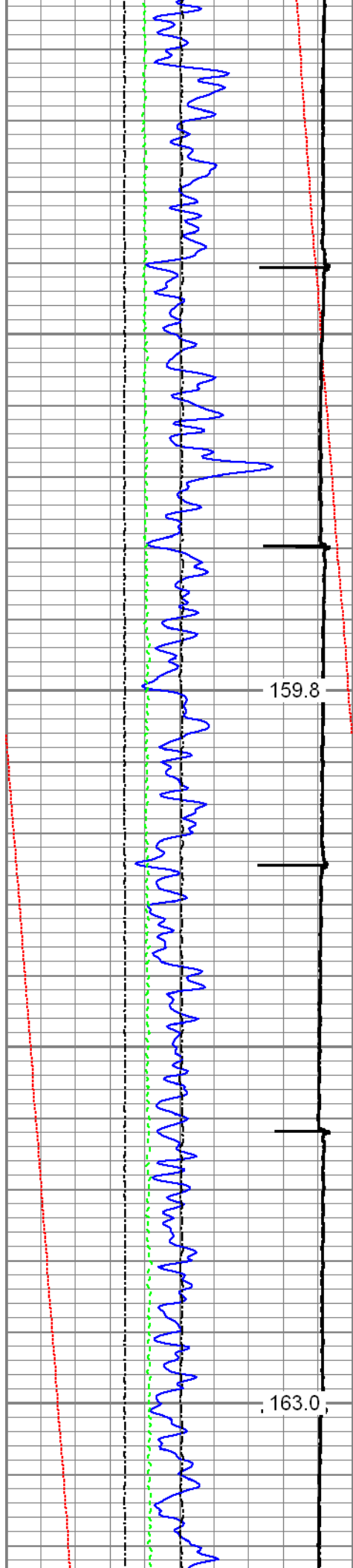
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149.7

3600

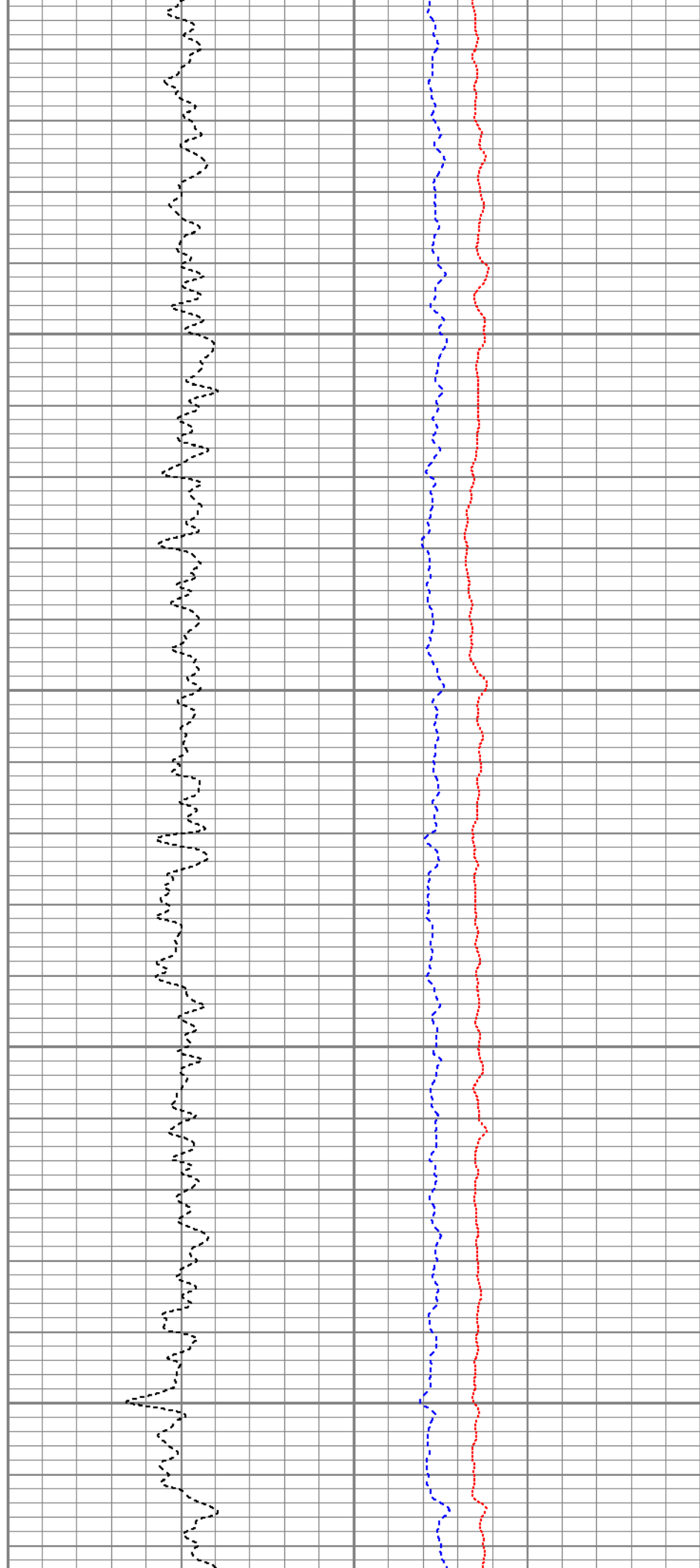


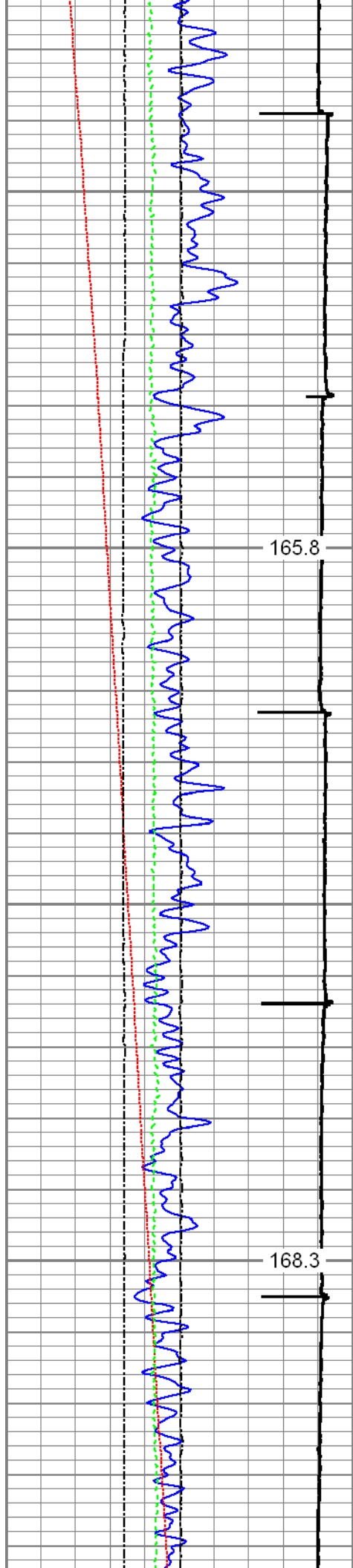




4000

4100



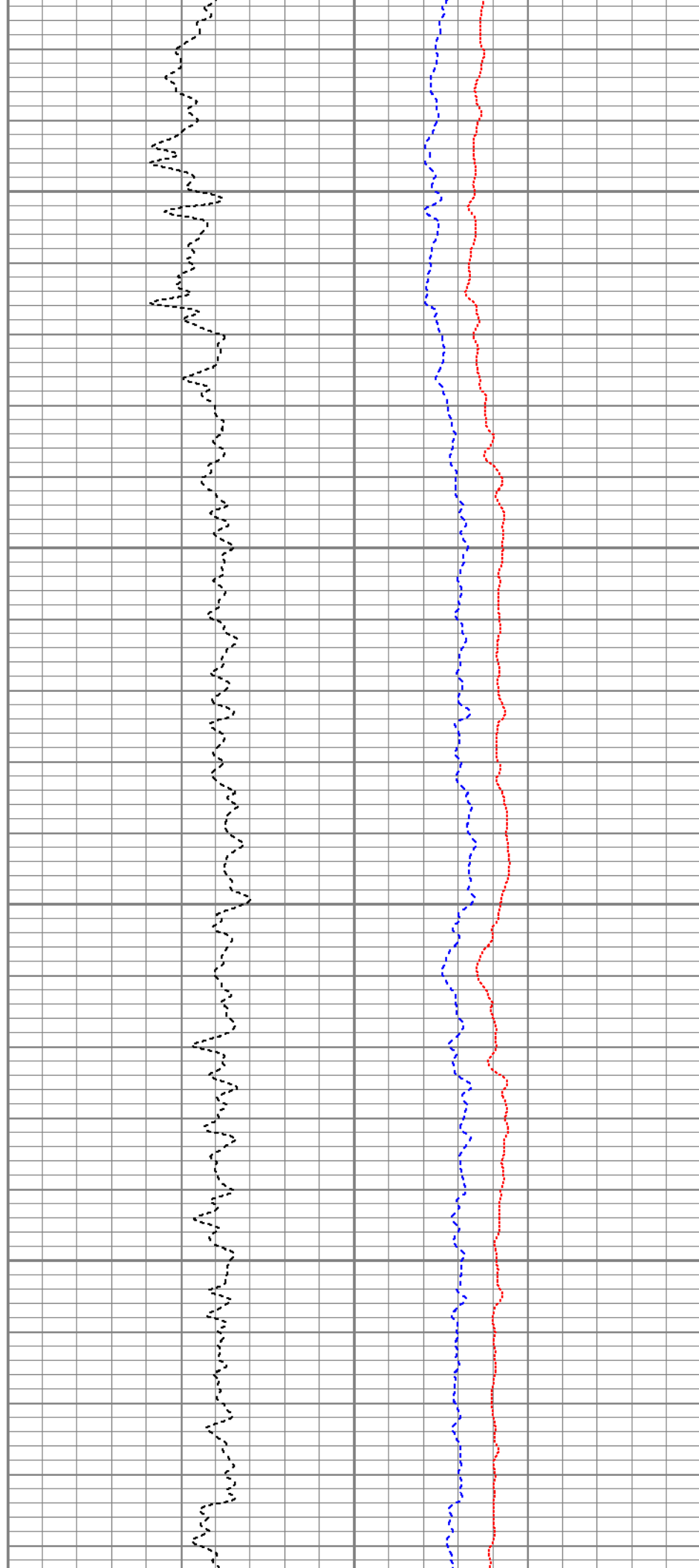


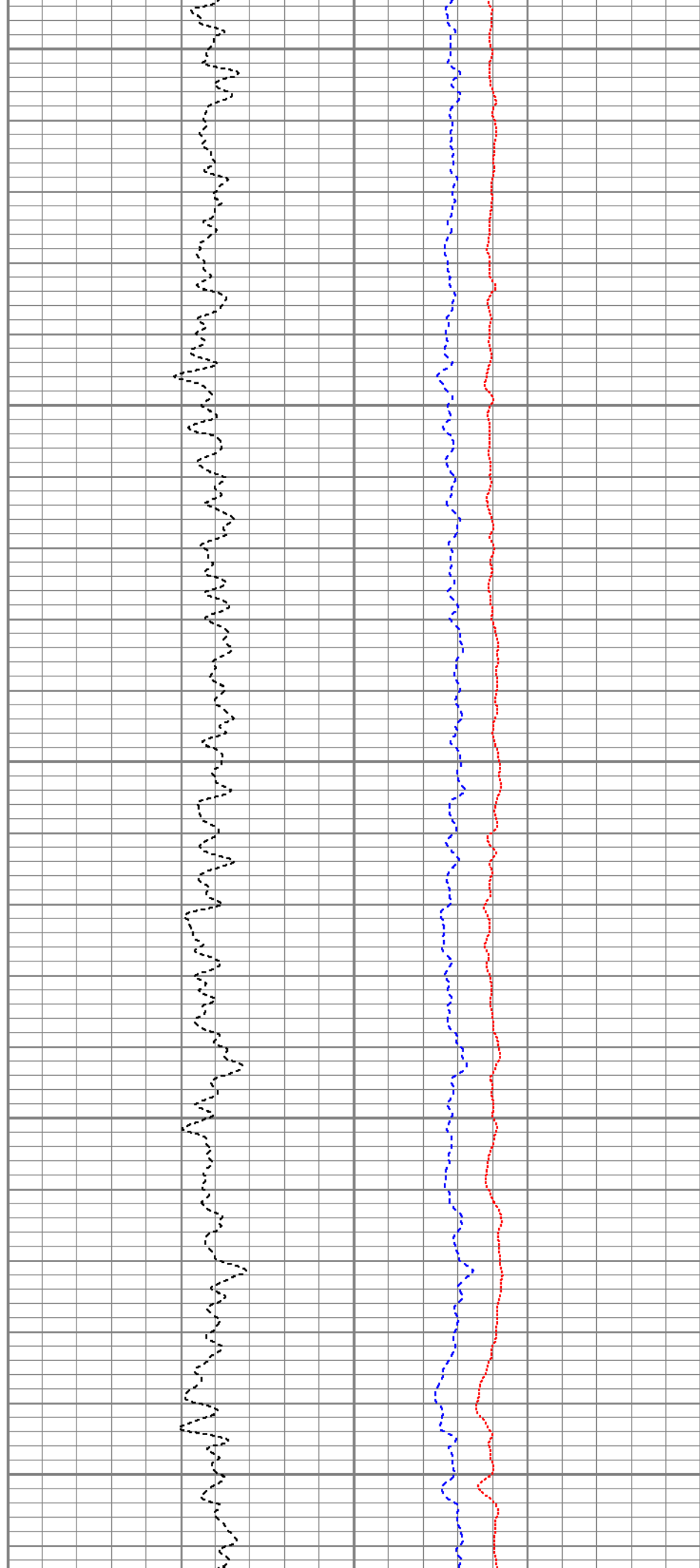
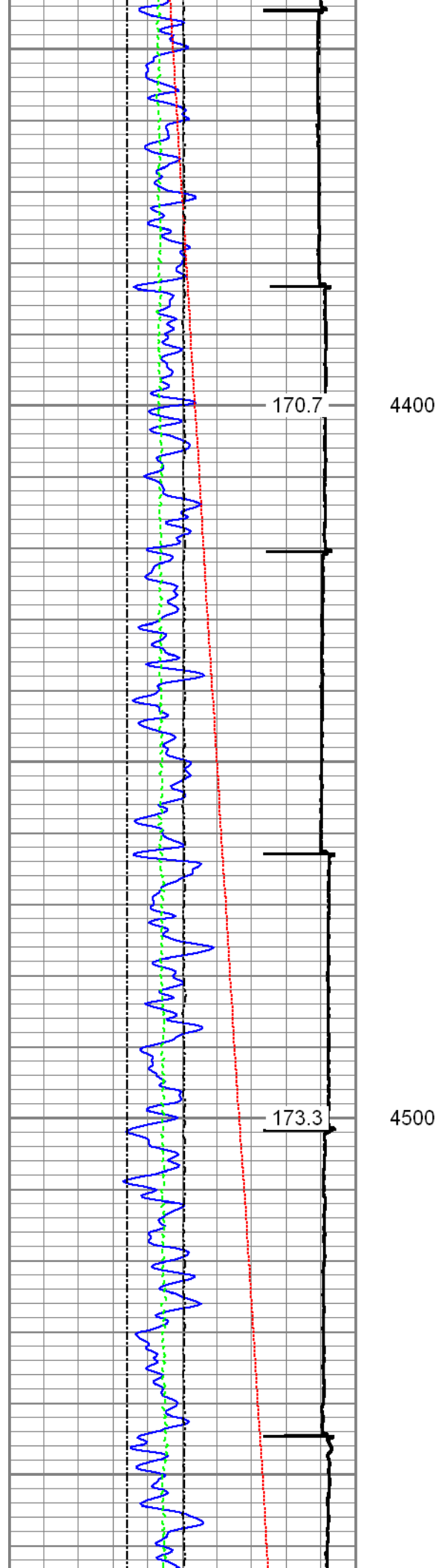
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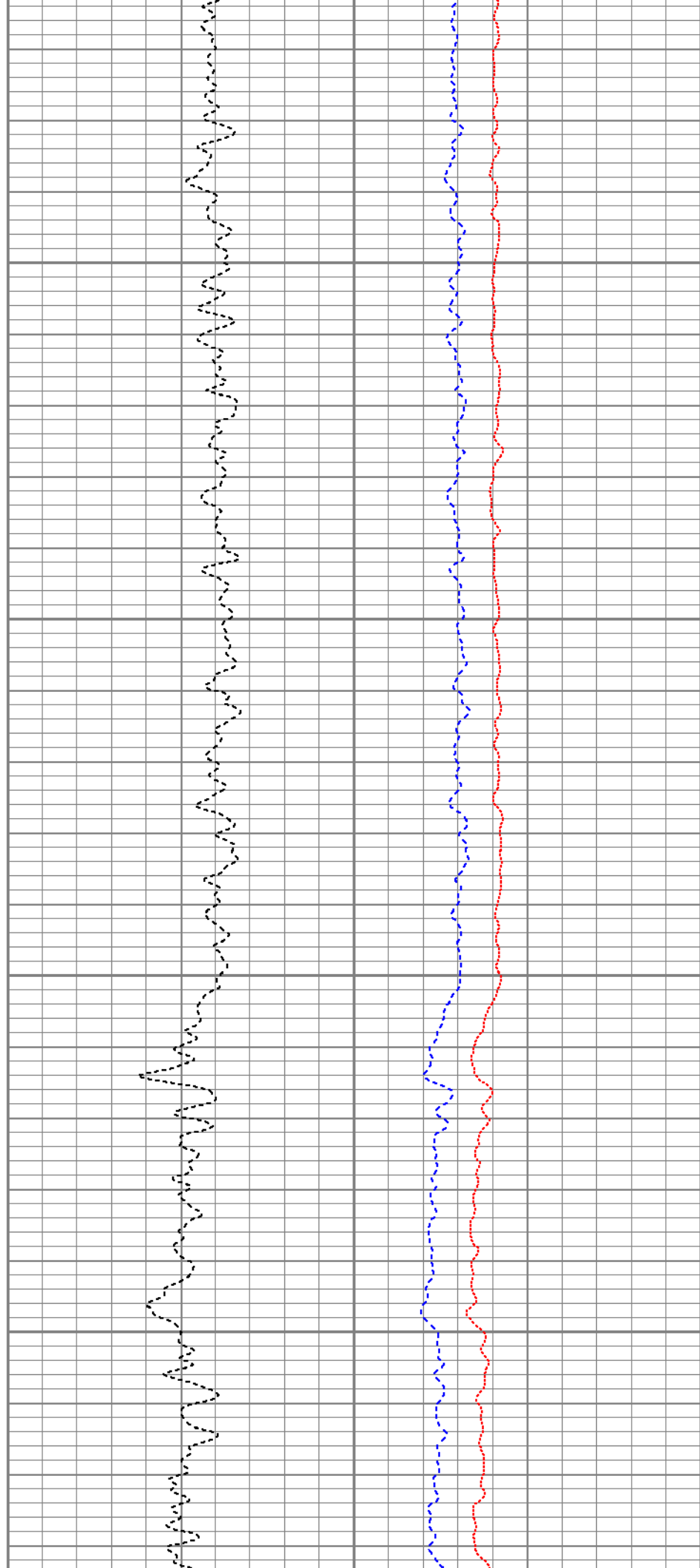
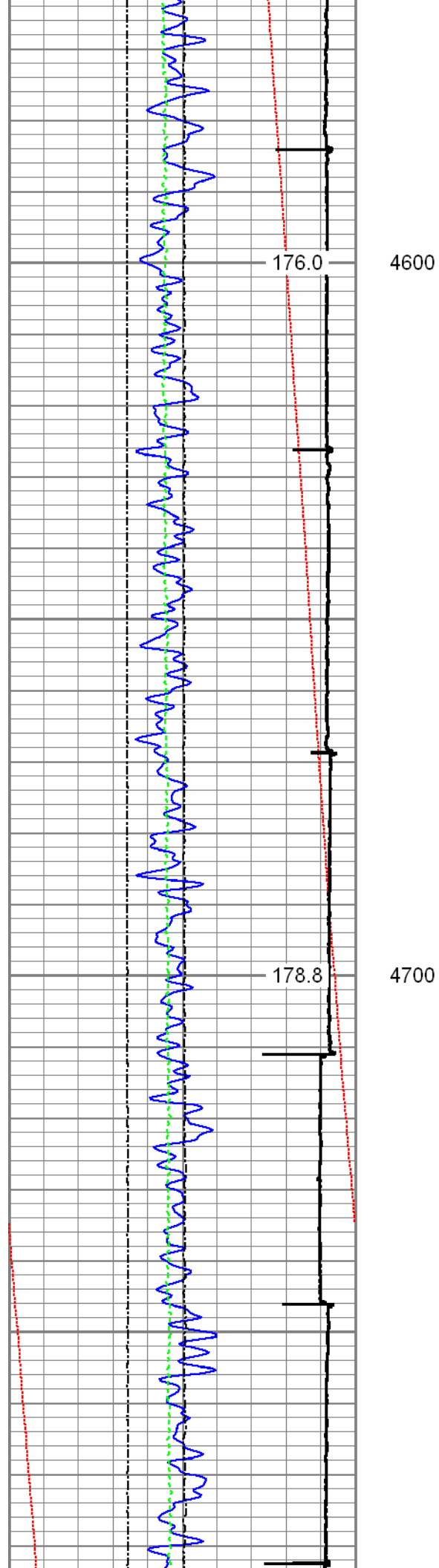
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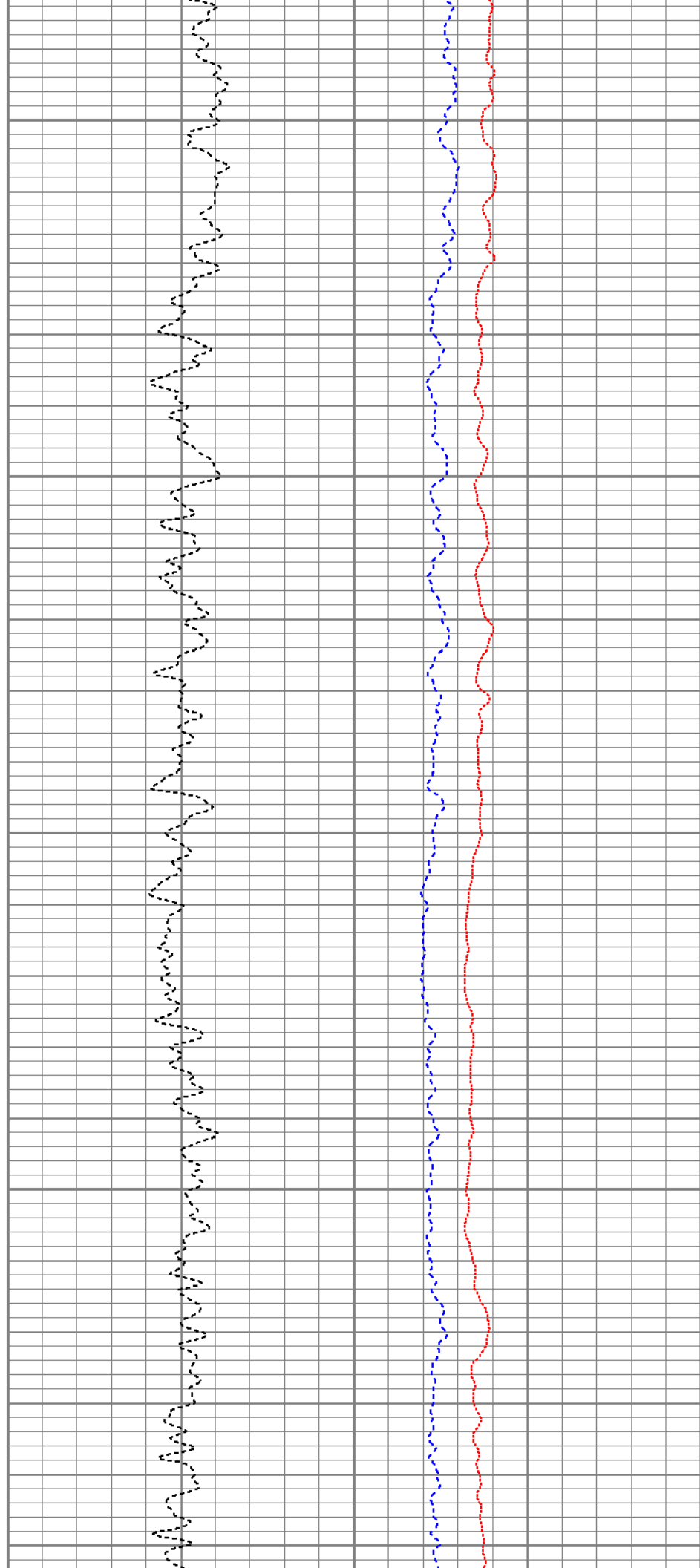
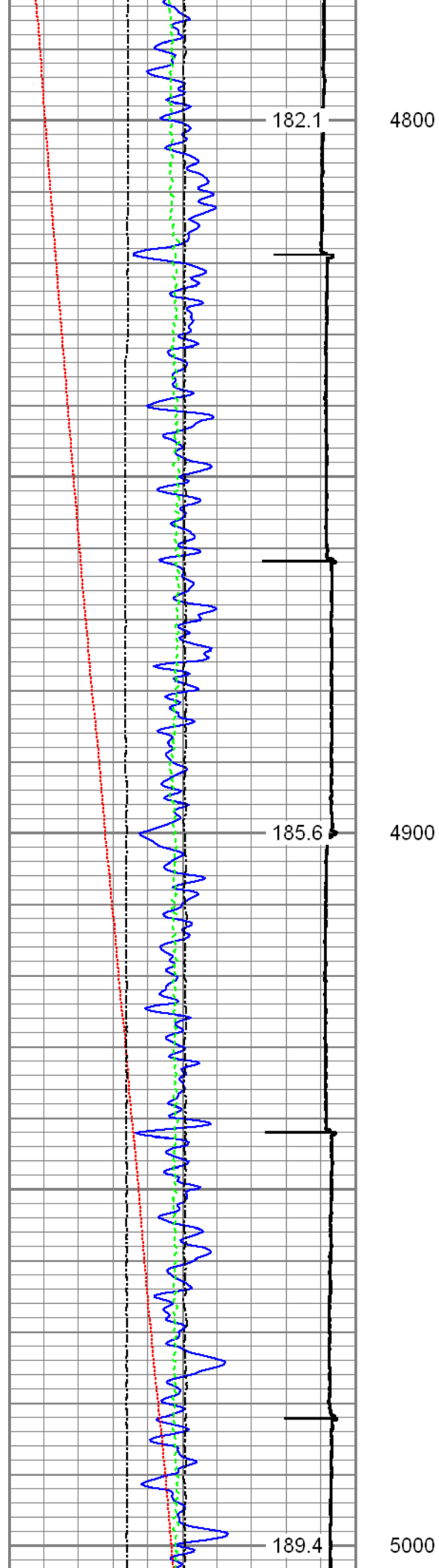
168.3

4300

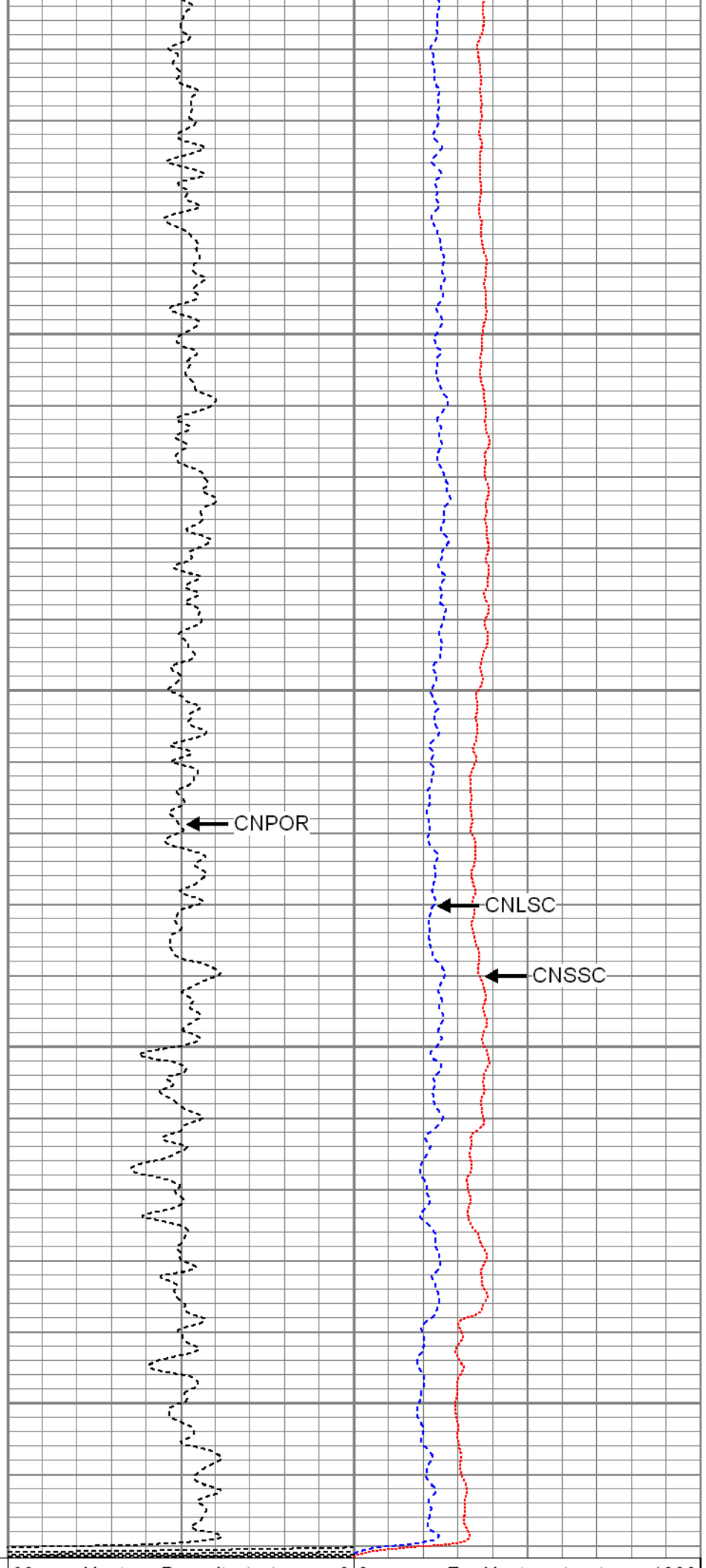
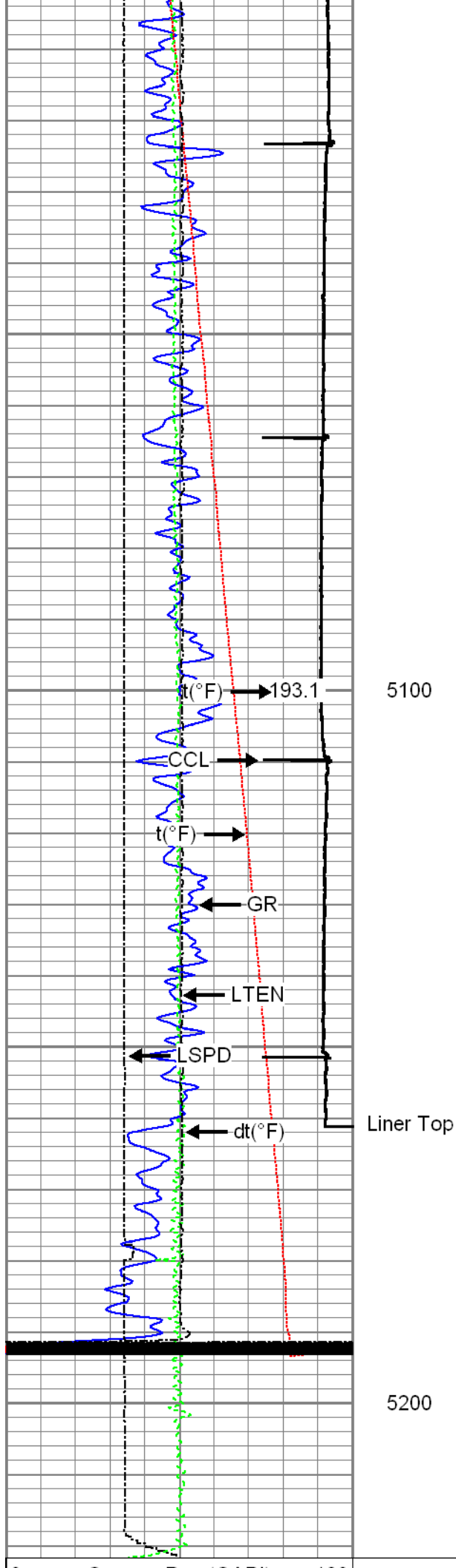












0	Gamma Ray (GAPI)	120
0	Temperature (degF)	20
-100	Line Speed (ft/min)	100
0	Line Tension (lb)	2000
-2	Differential Temperature (degF)	2
Casing Collar Locator		

60 Neutron Porosity (pu) 0 0

0 Far Neutron (cps) 1000

0 Near Neutron (cps) 12000



## Repeat Section

Recorded with 1500 PSI surface induced pressure

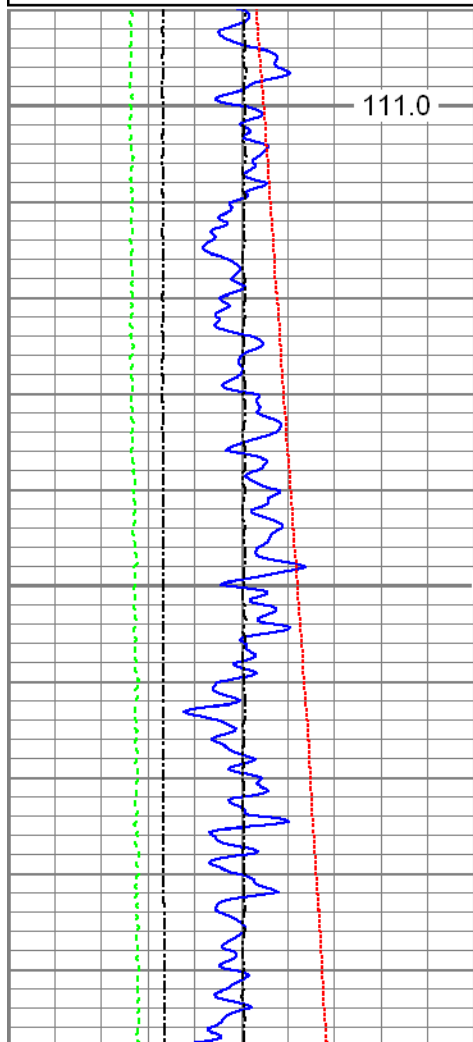
Database File: whiting\_horsetail08d\_1704\_rbt\_mit\_cnl.db  
Dataset Pathname: repeat1  
Presentation Format: cnl  
Dataset Creation: Fri May 22 16:56:30 2015 by Calc 7.0 B1  
Charted by: Depth in Feet scaled 1:240

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

60 Neutron Porosity (pu) 0 0

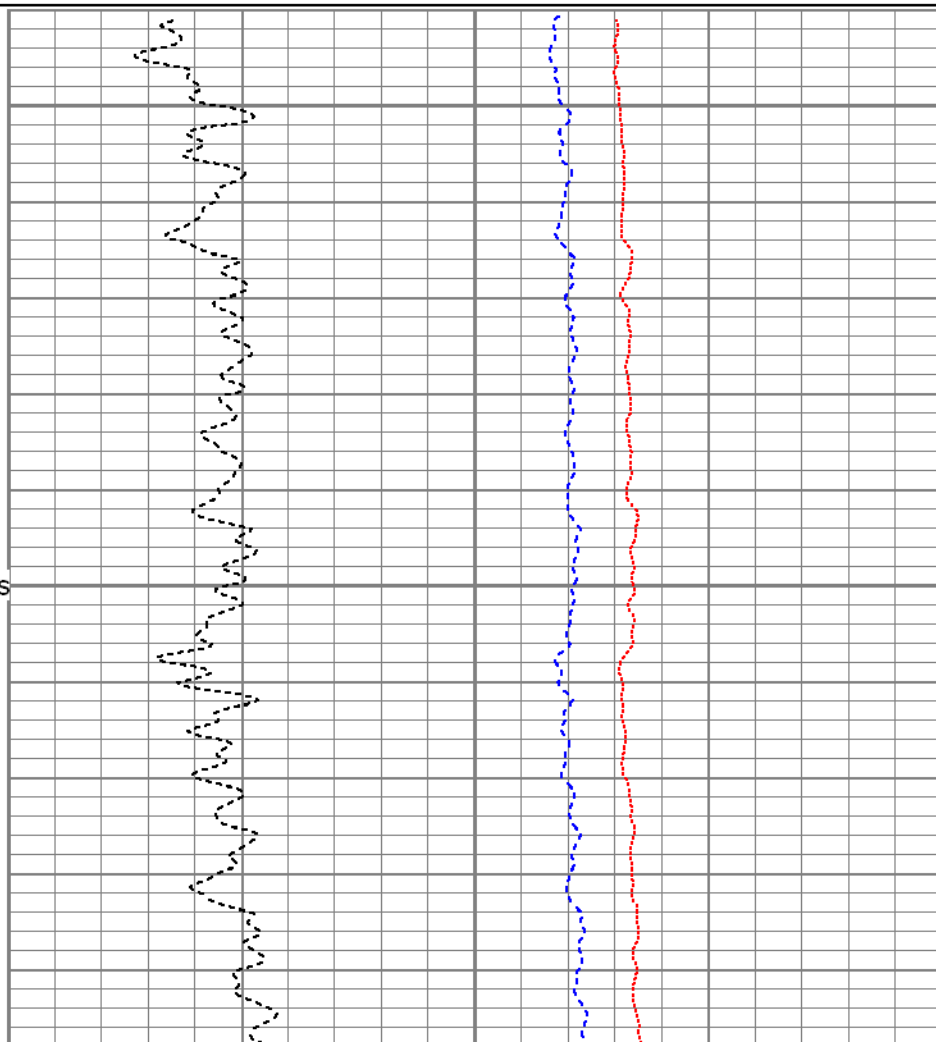
0 Far Neutron (cps) 1000

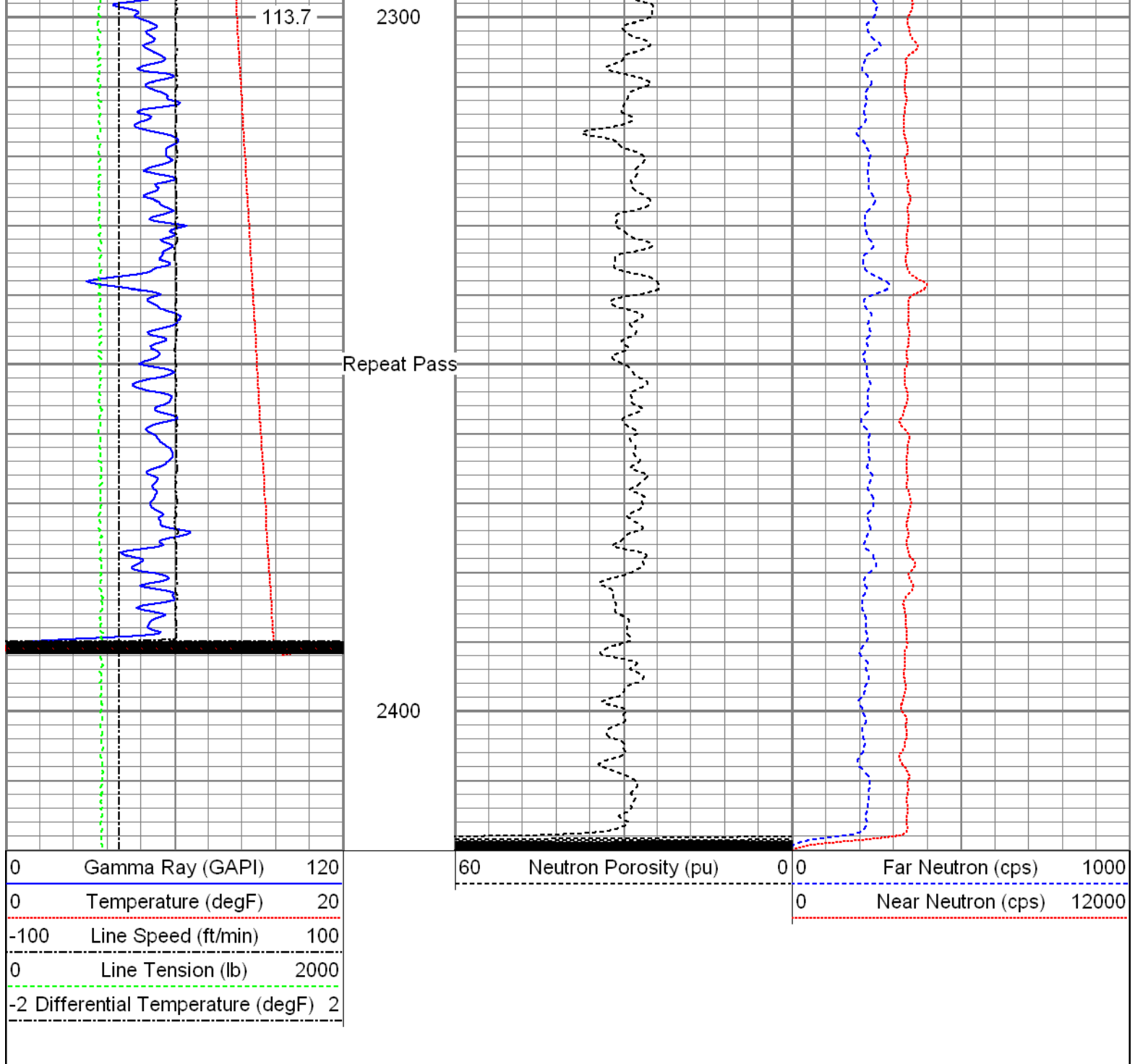
0 Near Neutron (cps) 12000

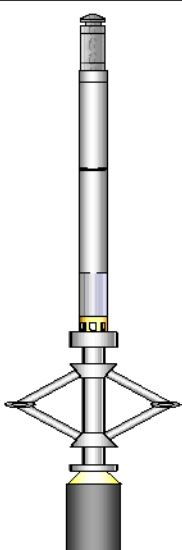


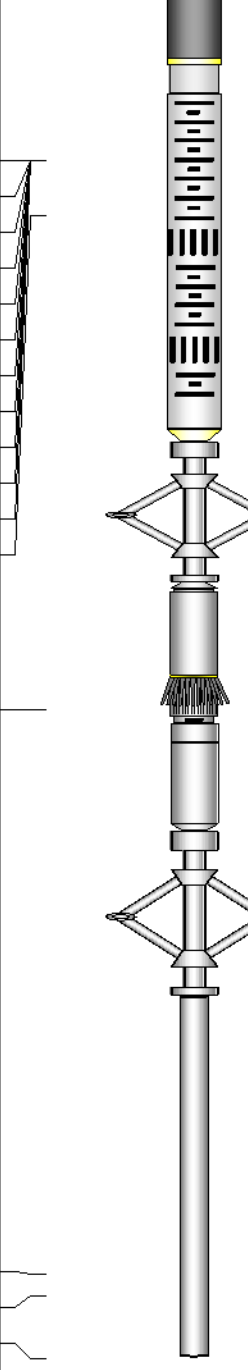
111.0 2200

Repeat Pass





Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
GR TEMP	30.23 28.83		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 (10024770) Production Gamma Ray	1.93	1.69	9.50
			UW_PRT-UW_PRT_016 (10025100) Platinum Resistance Thermometer	1.04	1.69	5.20
			UW_PRC #4 -DSSRAC (081) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00

WVF3FT	21.80		UW_RBT-UW_RBT_004 (10022773) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00
WVFS1	21.80					
WVFS2	21.80					
WVFS3	21.80					
WVFS4	21.80					
WVFS5	21.80					
WVFS6	21.80					
WVFS7	21.80					
WVFS8	21.80					
CBLTEMP	21.80					
CBLROT	21.80					
WVF5FT	20.80					
			UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
			UW_MIT-UW_MIT40_042 (10014703) 40 Multifinger Imaging Tool	4.54	2.75	61.10
			UW_PRC #3 -UW_PRC_057 (1038) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
			CNL-007 (1004) Compensated Neutron Logging Tool	6.60	1.69	30.00
CNLSC	1.53					
CNSSC	1.12					
TSTAMP	0.00					
Dataset: whiting_horsetail08d_1704_rbt_mit_cnl.db: field/well/run1/main Total Length: 34.47 ft Total Weight: 353.30 lb O.D. 3.13 in						

Calibration Report			
Database File:	whiting_horsetail08d_1704_rbt_mit_cnl.db		
Dataset Pathname:	main		
Dataset Creation:	Fri May 22 16:44:51 2015 by Calc 7.0 B1		
Compensated Neutron Calibration Report			
Serial Number:	1004		
Tool Model:	007		
Master Calibration	Wed Dec 17 13:14:29 2008		
Detector	Readings		
Short Space	1848.96	cps	
Long Space	2132.78	cps	

	Ratio	Measured	Reference
	CNRAT Gain K	1.0000	Sleeve: 1.0000
		1.0000	
Before Survey			
	Detector	Readings	
	Short Space		cps
	Long Space		cps
		Measured	Reference
	Ratio		
After Survey			
	Detector	Readings	
	Short Space		cps
	Long Space		cps
		Measured	Reference
	Ratio		

Multi-finger Imaging Tool Calibration Report			
Serial Number:		10014703	
Number of Fingers:		40	
Tool Model:		UW_MIT40_042	
Inclinometer Calibration Report			
Performed:		Fri Sep 20 11:47:48 2013	
Calibration Angle:		45	
		Inc X	Inc Y
Vertical:		1963	1960
Finger 1 up:		1748	1727
Finger 31 up:		2195	1742
Finger 21 up:		2178	2188
Finger 11 up:		1727	2173
Sensitivity ratio:		1.00706	
X-axis angle:		132.825	
Deviation const.:		317.775	

Finger Calibration Report							
	Performed: Fri May 22 12:09:57 2015						
Ring size:	4	5	6	7			
(in)							
	Sens	Sens	Sens				
Finger 01:	1107	394.0	1501	392.0	1893	396.0	2289
Finger 02:	1044	394.0	1438	405.0	1843	419.0	2262
Finger 03:	1128	388.0	1516	390.0	1906	400.0	2306
Finger 04:	1006	393.0	1399	411.0	1810	431.0	2241
Finger 05:	1057	381.0	1438	384.0	1822	396.0	2218
Finger 06:	997	380.0	1377	395.0	1772	416.0	2188
Finger 07:	1028	386.0	1414	395.0	1809	410.0	2219
Finger 08:	1009	387.0	1396	406.0	1802	428.0	2230
Finger 09:	1068	393.0	1461	396.0	1857	399.0	2256
Finger 10:	1072	395.0	1467	403.0	1870	414.0	2284
Finger 11:	1010	385.0	1395	401.0	1796	423.0	2219
Finger 12:	1111	386.0	1497	381.0	1878	379.0	2257
Finger 13:	1027	375.0	1402	398.0	1800	413.0	2213
Finger 14:	1005	391.0	1396	412.0	1808	430.0	2238
Finger 15:	996	395.0	1391	419.0	1810	436.0	2246
Finger 16:	984	377.0	1361	404.0	1765	422.0	2187

Finger 17:	1071	380.0	1451	391.0	1842	405.0	2247
Finger 18:	1078	379.0	1457	389.0	1846	402.0	2248
Finger 19:	1037	383.0	1420	401.0	1821	416.0	2237
Finger 20:	992	390.0	1382	417.0	1799	431.0	2230
Finger 21:	1058	379.0	1437	396.0	1833	415.0	2248
Finger 22:	1013	377.0	1390	402.0	1792	425.0	2217
Finger 23:	1083	386.0	1469	403.0	1872	416.0	2288
Finger 24:	1072	355.0	1427	372.0	1799	387.0	2186
Finger 25:	1065	390.0	1455	405.0	1860	417.0	2277
Finger 26:	1097	381.0	1478	397.0	1875	414.0	2289
Finger 27:	1190	399.0	1589	403.0	1992	409.0	2401
Finger 28:	1076	373.0	1449	390.0	1839	409.0	2248
Finger 29:	1044	386.0	1430	403.0	1833	419.0	2252
Finger 30:	999	378.0	1377	404.0	1781	424.0	2205
Finger 31:	1212	409.0	1621	411.0	2032	420.0	2452
Finger 32:	984	373.0	1357	387.0	1744	403.0	2147
Finger 33:	1081	400.0	1481	412.0	1893	431.0	2324
Finger 34:	981	376.0	1357	393.0	1750	413.0	2163
Finger 35:	1131	406.0	1537	412.0	1949	422.0	2371
Finger 36:	1041	368.0	1409	377.0	1786	391.0	2177
Finger 37:	1130	406.0	1536	409.0	1945	419.0	2364
Finger 38:	1073	379.0	1452	383.0	1835	398.0	2233
Finger 39:	1041	365.0	1406	373.0	1779	386.0	2165
Finger 40:	947	383.0	1330	409.0	1739	433.0	2172

Segmented Cement Bond Log Calibration Report							
Serial Number:				10022773			
Tool Model:				UW_RBT_004			
Calibration Casing Diameter:				7.000	in		
Calibration Depth:				1948.941	ft		

Master Calibration, performed Fri May 22 16:44:33 2015:							
		Raw (v)		Calibrated (mv)		Results	
		Zero	Cal	Zero	Cal	Gain	Offset
3FT		-0.021	0.658	1.000	62.165	90.128	2.894
5FT		0.036	0.591	1.000	62.165	110.314	-3.024
S1		-0.023	0.636	0.000	100.000	151.698	3.540
S2		-0.030	0.671	0.000	100.000	142.823	4.221
S3		-0.028	0.666	0.000	100.000	144.057	4.077
S4		-0.029	0.650	0.000	100.000	147.144	4.288
S5		-0.029	0.649	0.000	100.000	147.470	4.227
S6		-0.028	0.632	0.000	100.000	151.417	4.254
S7		-0.028	0.624	0.000	100.000	153.494	4.268
S8		-0.028	0.627	0.000	100.000	152.819	4.237

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  
9  
10

cps  
cps  
cps

degF  
degF  
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	Whiting Oil & Gas Corporation
Well	Horsetail 8D-1704
Field	Wildcat
County	Weld
State	Colorado