



MIDWEST WIRELINE

# DUAL INDUCTION LOG

Company Murfin Drilling Company, Inc.  
 Well Armbrister #1-36  
 Field Nicholson  
 County Trego  
 State Kansas

Company Murfin Drilling Company, Inc.  
 Well Armbrister #1-36  
 Field Nicholson  
 County Trego State Kansas

Location: API #: 15-195-23150-00-00  
 330 FNL & 1700 FWL  
 SEC 36 TWP 11S RGE 21W  
 Permanent Datum Ground Level Elevation 2296  
 Log Measured From Kelly Bushing  
 Drilling Measured From Kelly Bushing  
 Other Services  
 CNL/CDL  
 MEL/BHCS  
 Elevation  
 K.B. 2301  
 D.F.  
 G.L. 2296

Date	11/19/2022
Run Number	One
Depth Driller	4000
Depth Logger	3998
Bottom Logged Interval	3997
Top Log Interval	0
Casing Driller	8.625 @ 220
Casing Logger	2.19
Bit Size	7.875
Type Fluid in Hole	Chemical
Salinity, ppm CL	3500
Density / Viscosity	9.0 62
pH / Fluid Loss	10.0 5.8
Source of Sample	Flowline
Rm @ Meas. Temp	0.80 @ 50
Rmt @ Meas. Temp	0.60 @ 50
Rmc @ Meas. Temp	1.08 @ 50
Source of Rmf / Rmc	Charts
Rm @ BHT	0.34 @ 116
Operating Rig Time	5 Hours
Max Rec. Temp. F	116
Equipment Number	P-24
Location	Hays
Recorded By	D. Schmidt
Witnessed By	Rod Anderson

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and Midwest Wireline LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Midwest Wireline LLC will not 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.

### Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

Ellis,  
 North to Sleepy Hollow, 3 West,  
 South into

Log Measured From: Kelly Bushing      5 Ft. Above Permanent Datum

THANK YOU FOR USING MIDWEST WIRELINE LLC  
 785-625-3858

### Your Midwest Wireline Crew

Engineer: D. Schmidt  
 Operator:  
 Operator:  
 Operator:

### This Log Record Was Witnessed By

Primary Witness: Rod Anderson  
 Secondary Witness:  
 Secondary Witness:  
 Secondary Witness:

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.33		GR-M&W (106)	3.00	3.50	50.00
CNLSC CNSSC	37.23 36.48		CNT-M&W (207-MW)	5.00	3.50	100.00
LSD DCAL SSD	28.18 28.17 27.68		CDL-M&W (305-24)	8.50	4.00	250.00
MCAL MI MN	19.58 19.58 19.58		ML-PSIML (401)	7.58	4.00	65.00
RLL3F RLL3	15.50 15.50					
CILD	8.33		DIL-M&W (502 HT)	18.25	3.50	220.00
CILM	4.50					
SP	0.20					

Dataset: murfin\_arbrister 1-36.db: field/well/stkml/pass3.1  
 Total length: 42.33 ft  
 Total weight: 685.00 lb  
 O.D.: 4.00 in

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\murfin\_arbrister 1-36.db  
 Dataset field/well/stkml/pass3.1/\_vars\_

## Top - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	116	4.5	0	1	2	2.71
NPORSEL	PERFS	SNDERR mmho/m	SNDERRM mmho/m	SPSHIFT mV	SRFTEMP degF	SZCOR	TDEPTH ft
Limestone	0	0	0	33	40	Off	3998

## Variable Description

A : Cement Factor (a)  
 BOREID : Borehole I.D.  
 BOTTEMP : Bottom Hole Temperature  
 CASEOD : Casing O.D.  
 CASETHCK : Casing Thickness  
 FLUIDDEN : Fluid Density  
 M : Cement Exp (m)  
 MATRXDEN : Matrix Density

NPORSEL : Neutron Porosity Curve Select  
 PERFS : Perforation Flag  
 SNDERR : Deep Sonde Error Correction  
 SNDERRM : Medium Sonde Error Correction  
 SPSHIFT : S.P. Baseline Offset  
 SRFTEMP : Surface Temperature  
 SZCOR : CN Size Cor. ?  
 TDEPTH : Total Depth

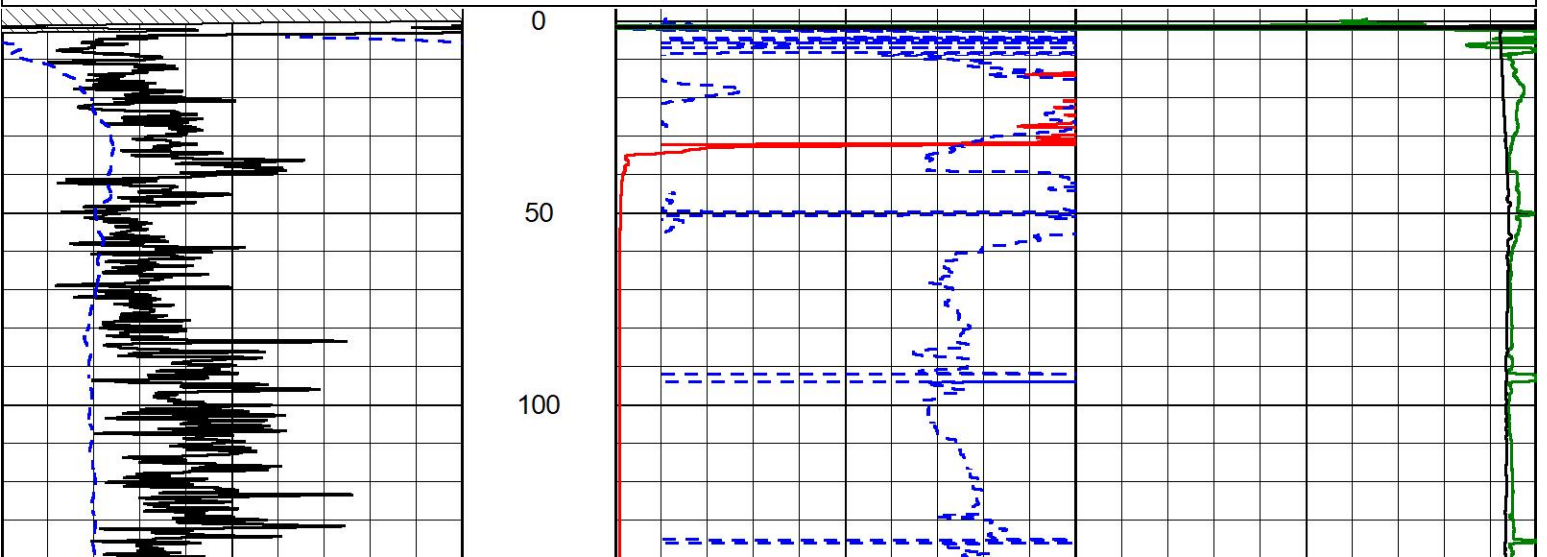


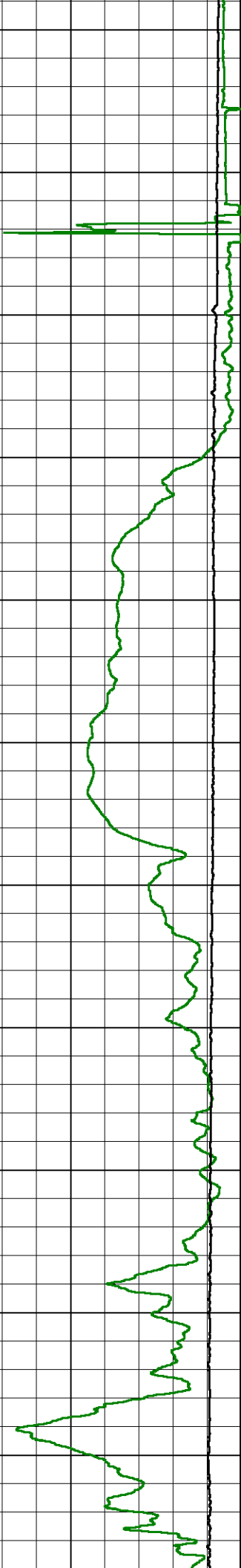
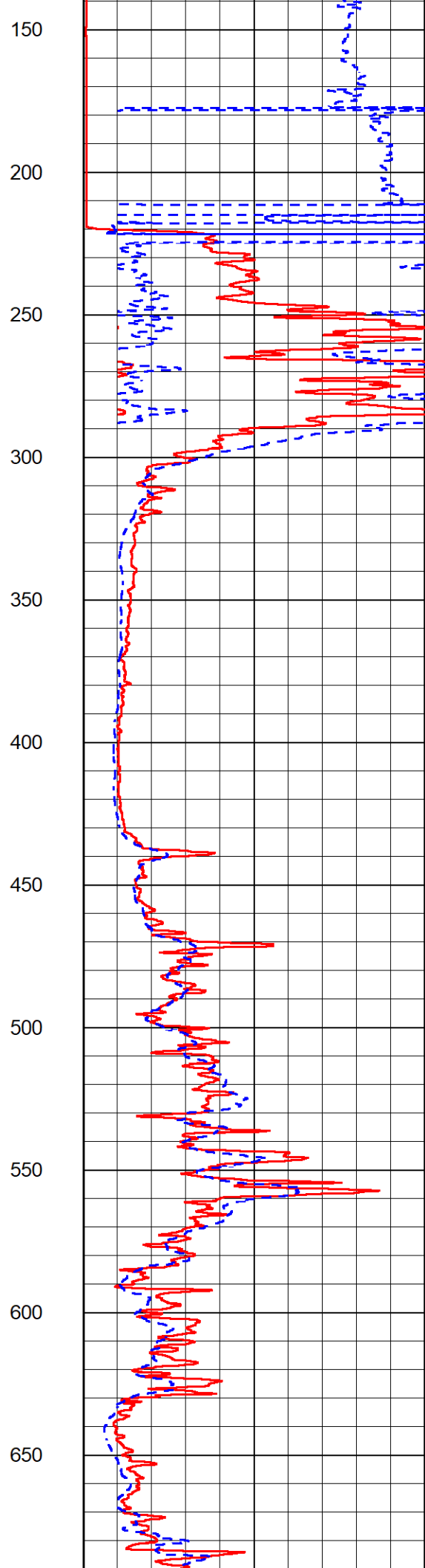
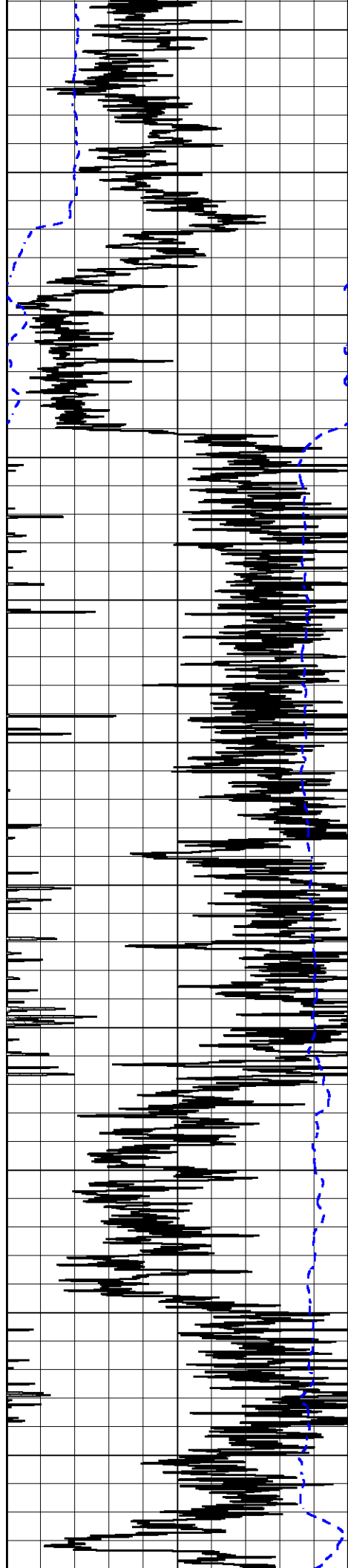
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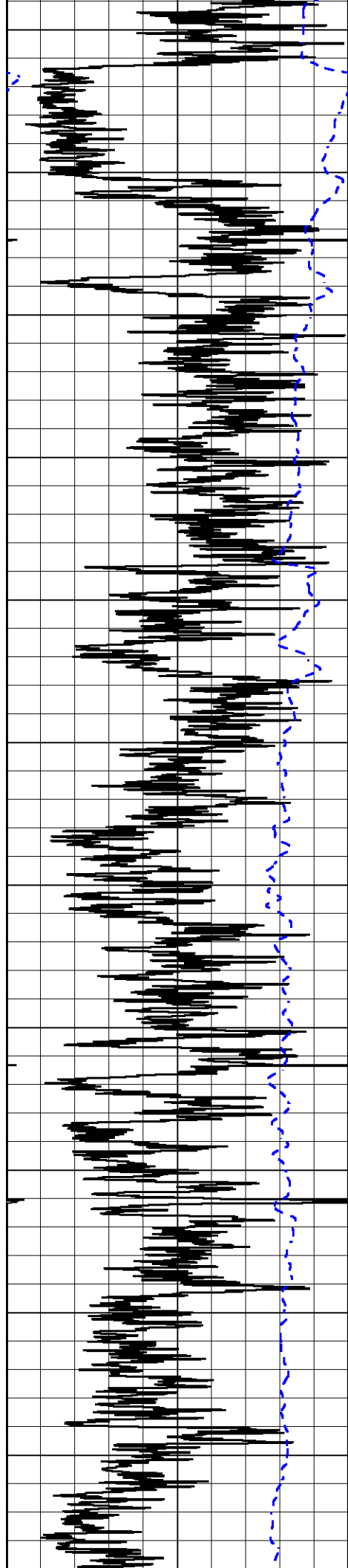
### MAIN PASS

Database File murfin\_arbrister 1-36.db  
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 Presentation Format \_dil2in  
 Dataset Creation Sat Nov 19 15:53:23 2022  
 Charted by Depth in Feet scaled 1:600

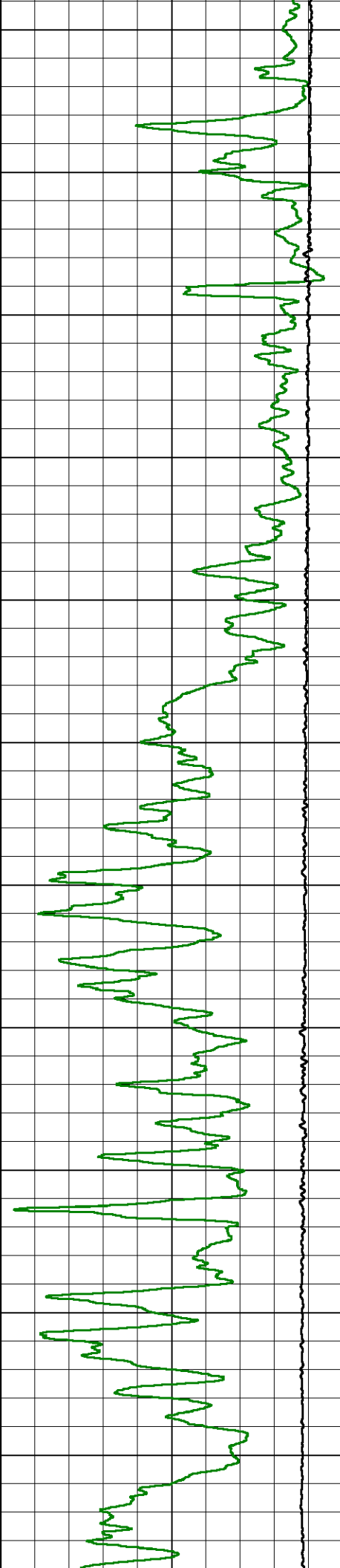
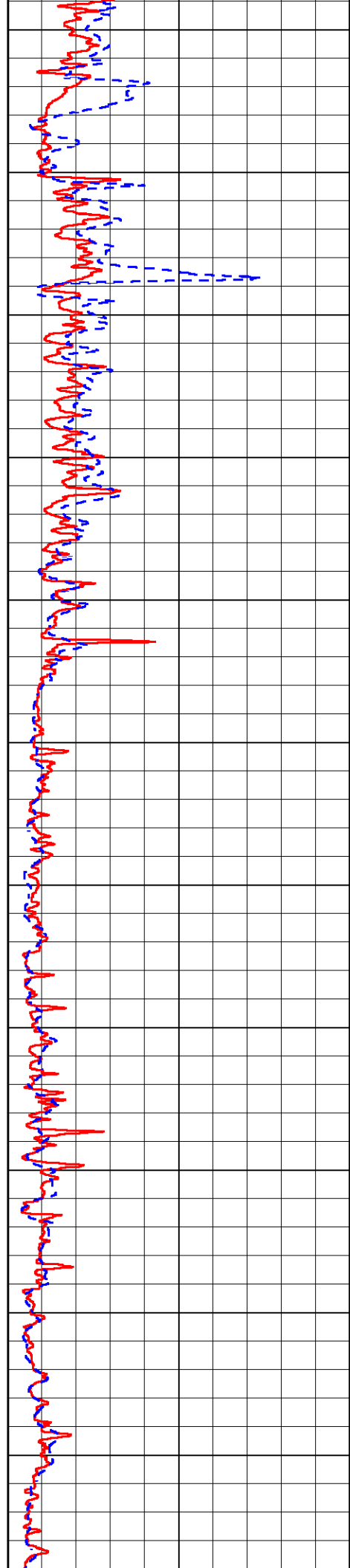
0	Gamma Ray (GAPI)	150	1000	Conductivity (mmho/m)	0
-200	SP (mV)	0	15000	Line Tension (lb)	0
			0	Shallow Resistivity (Ohm-m)	50
			0	Deep Resistivity (Ohm-m)	50
				Shallow Resistivity	
			50	(Ohm-m)	200
			50	Deep Resistivity (Ohm-m)	200

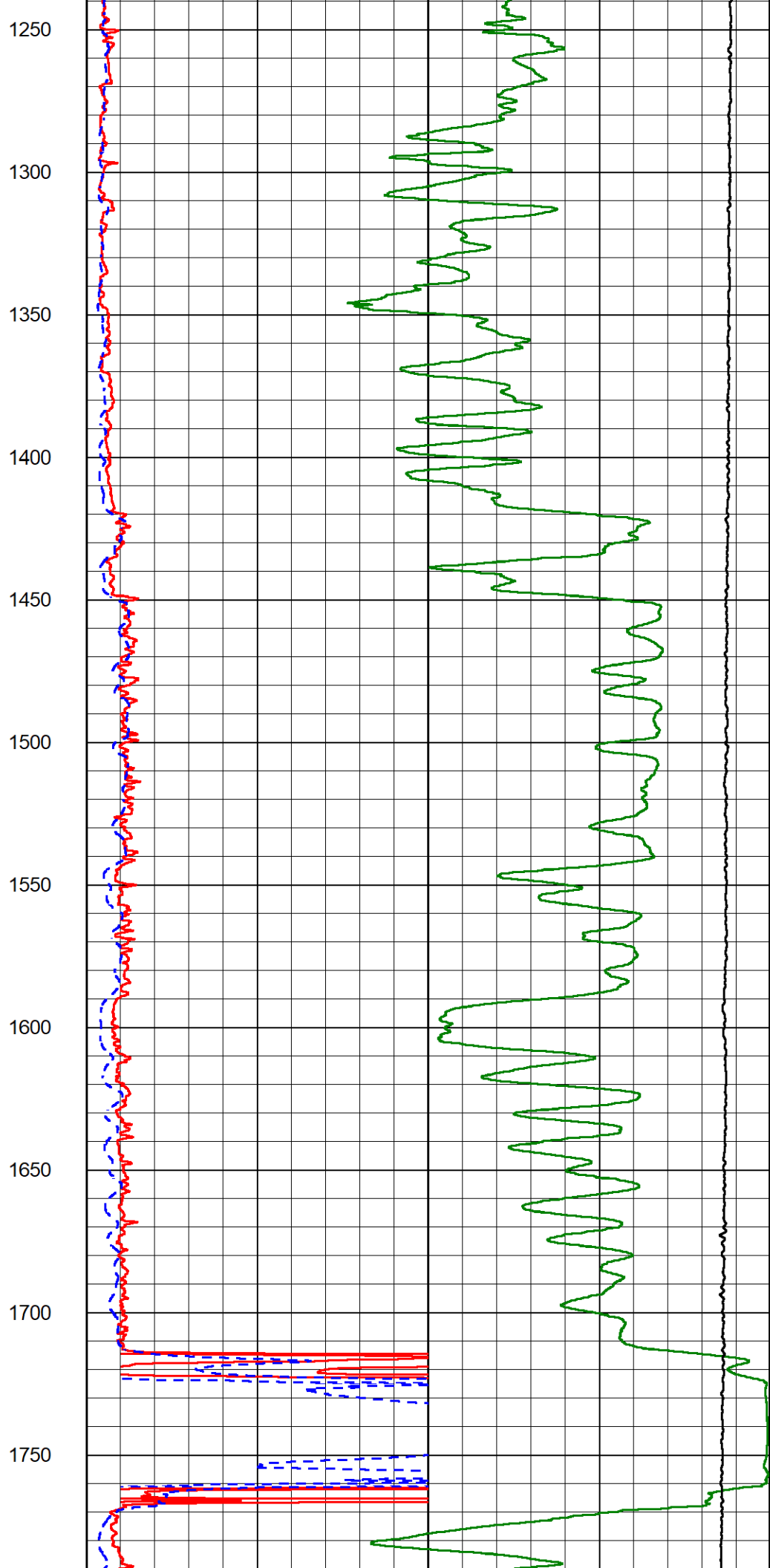
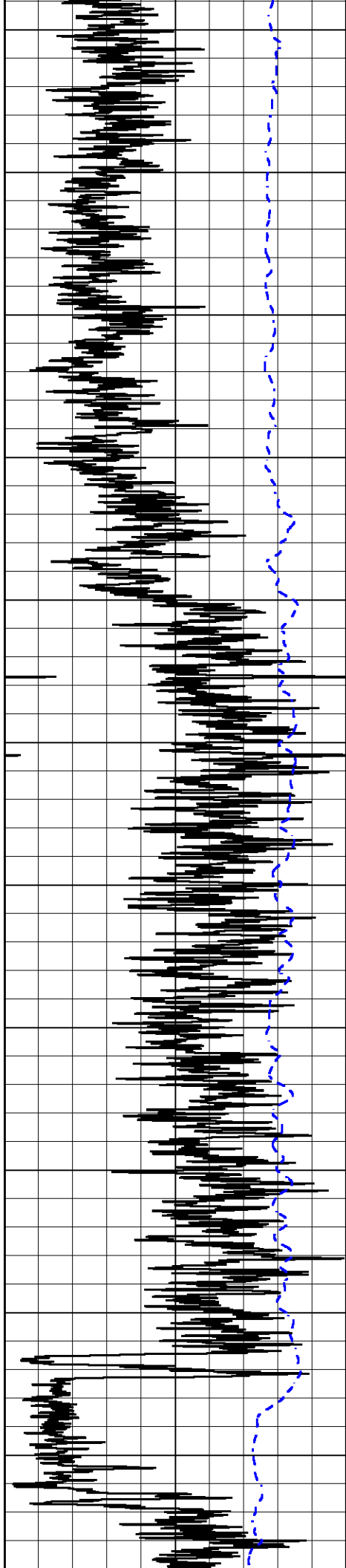


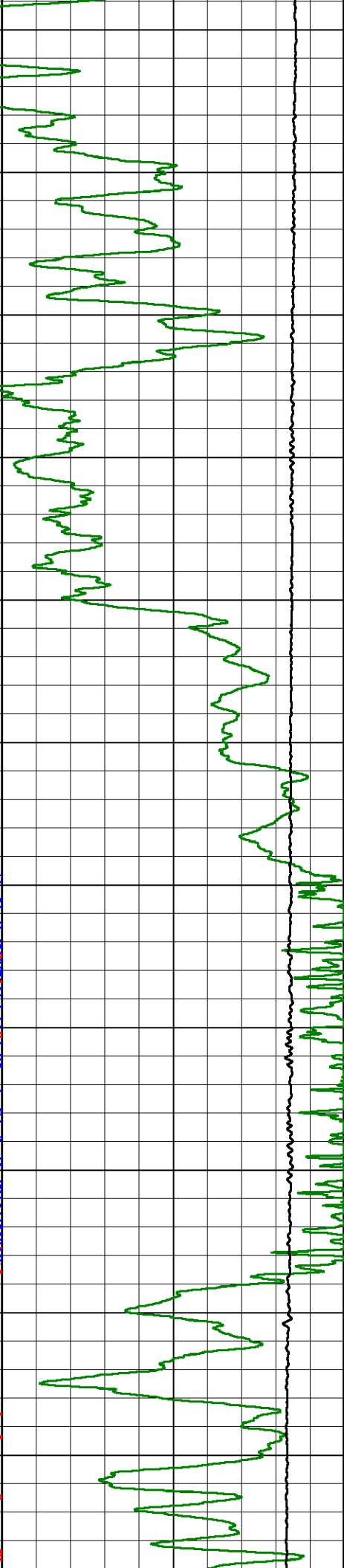
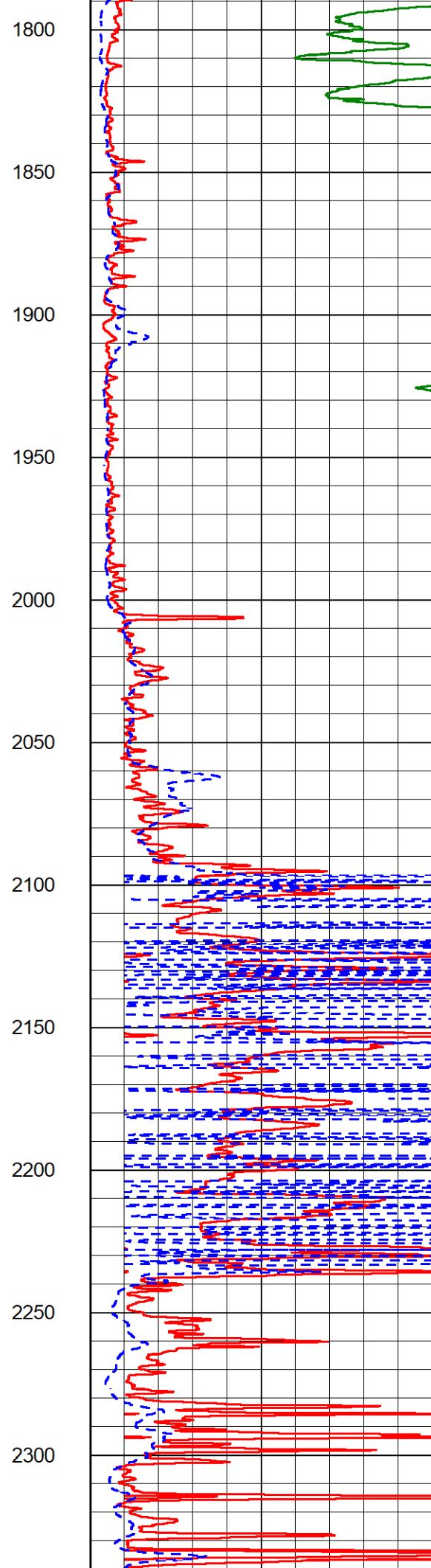
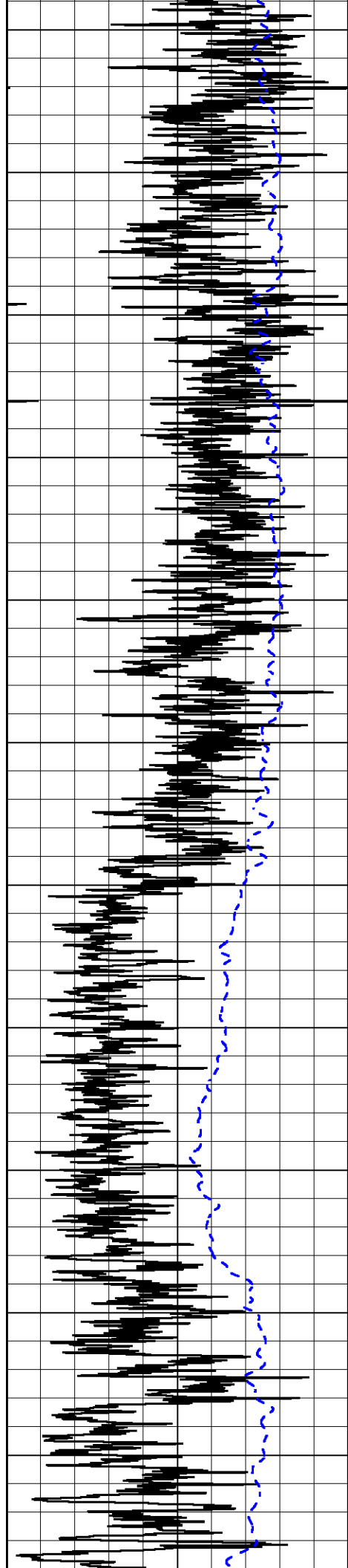


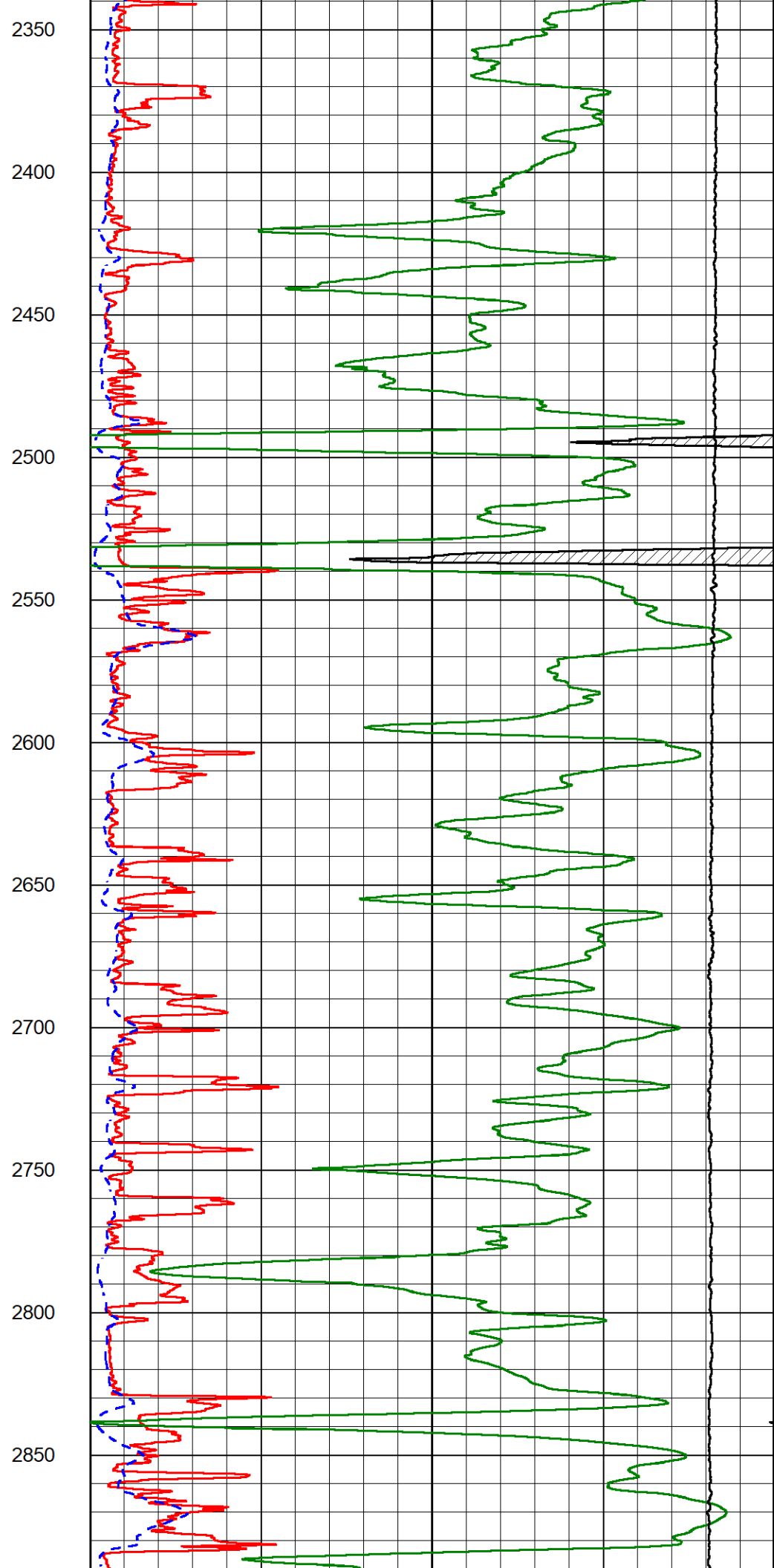
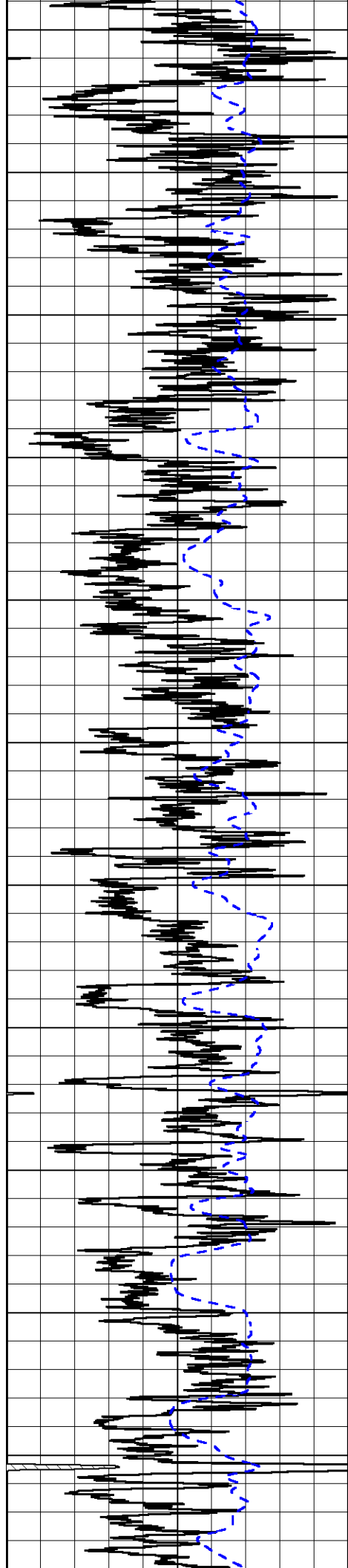


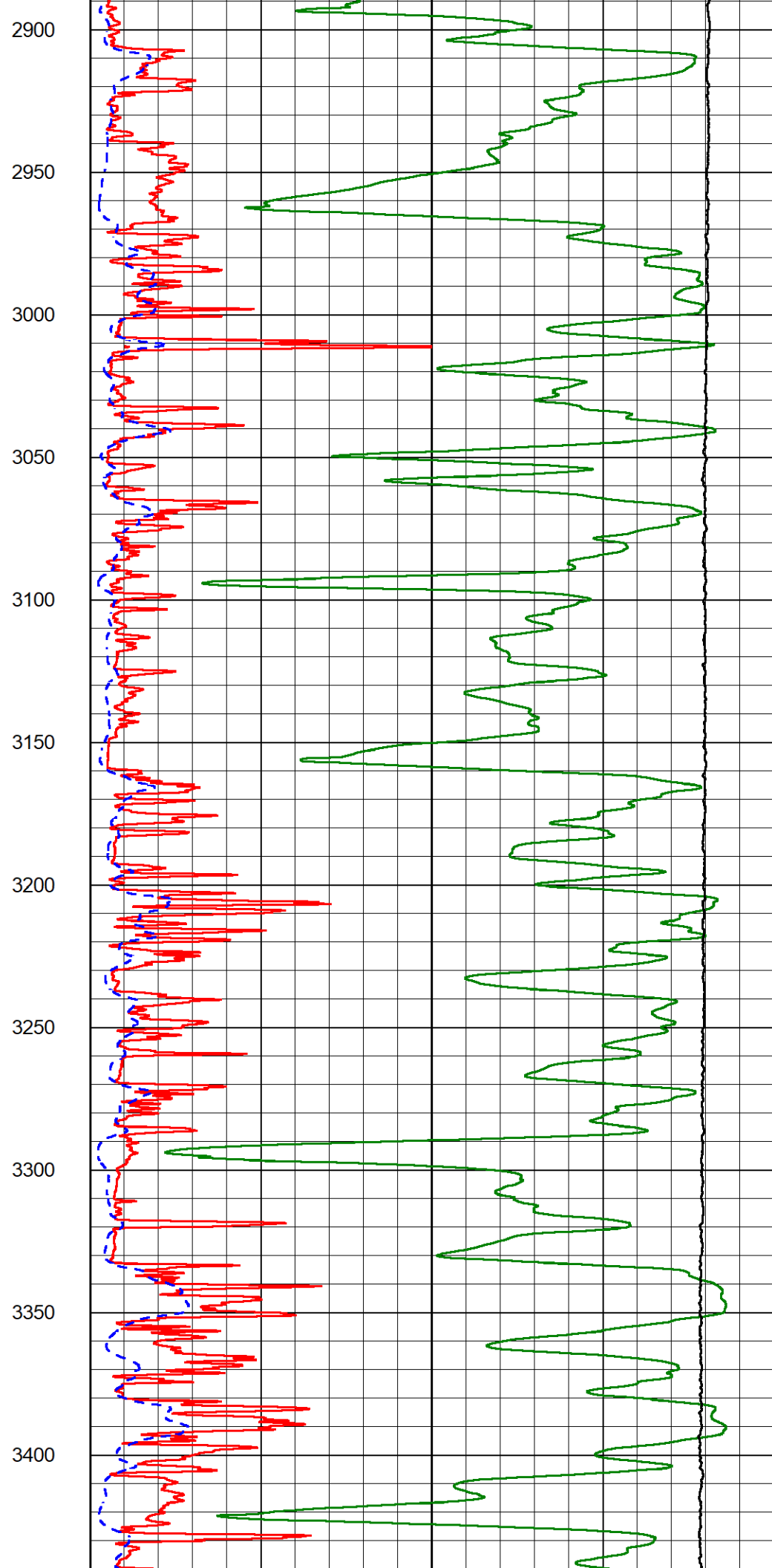
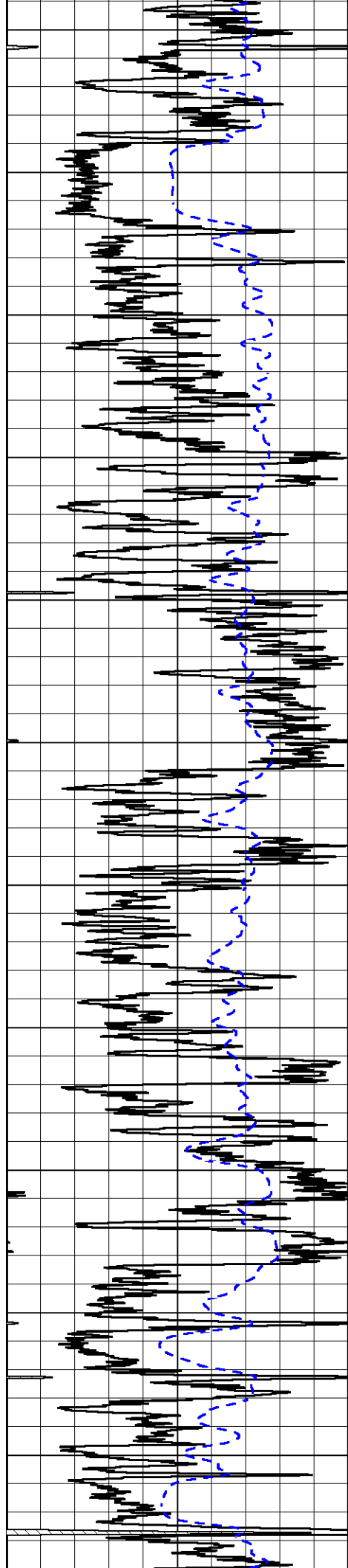
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800  
850  
900  
950  
1000  
1050  
1100  
1150  
1200

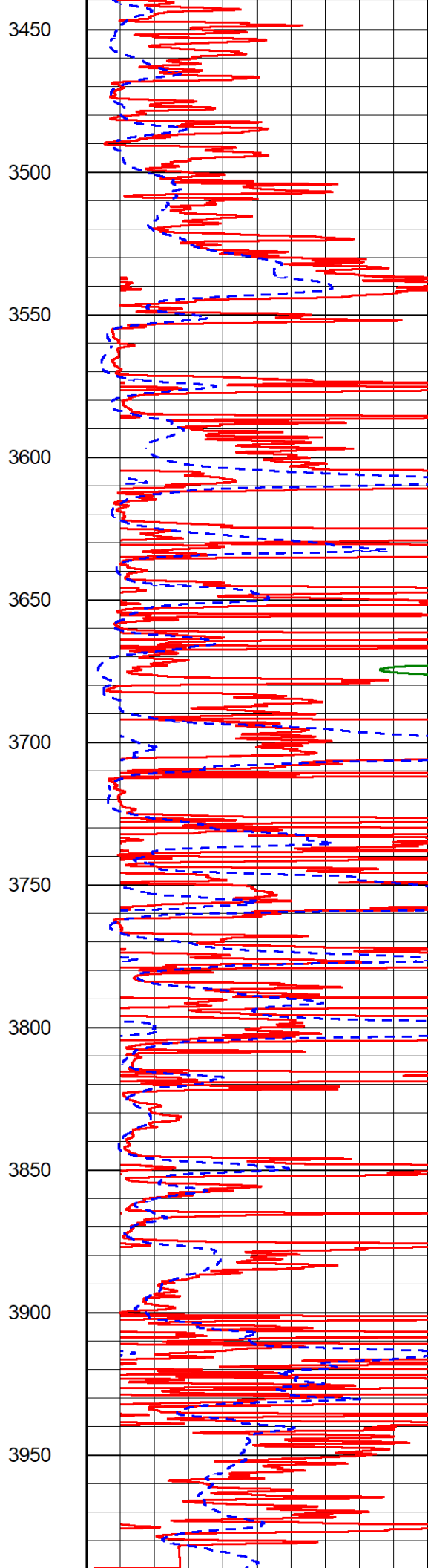
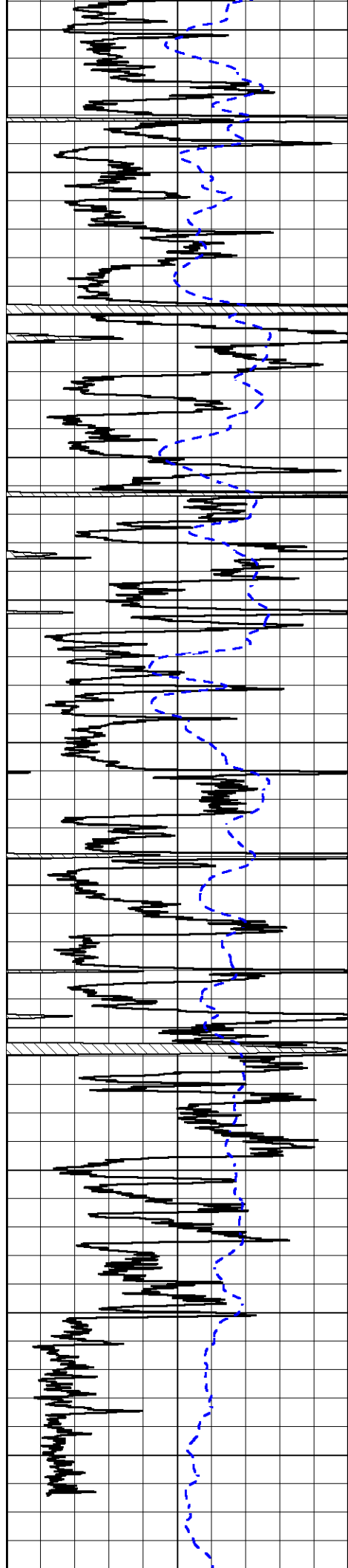


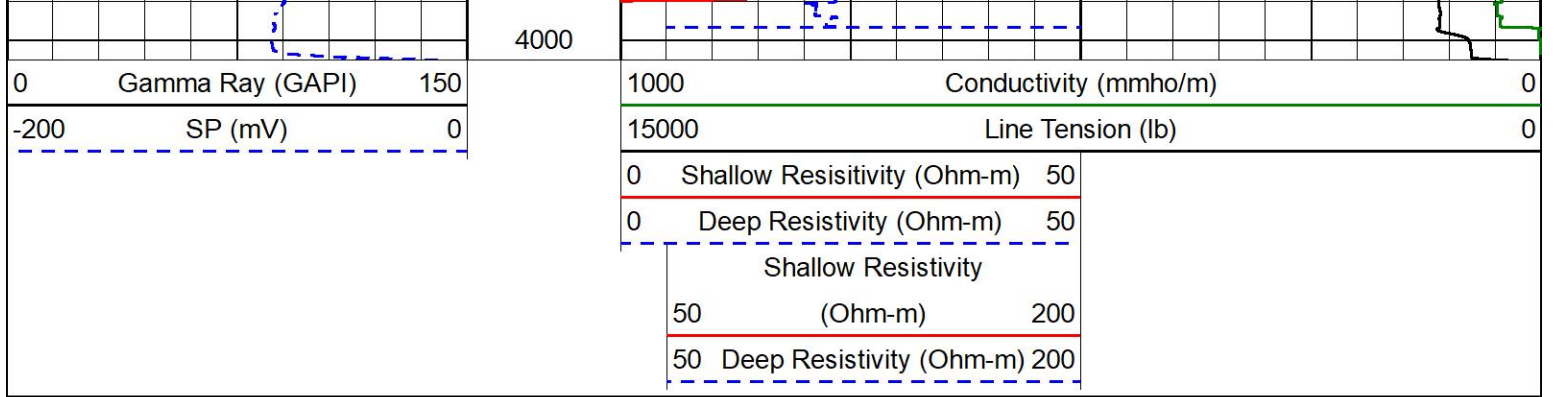










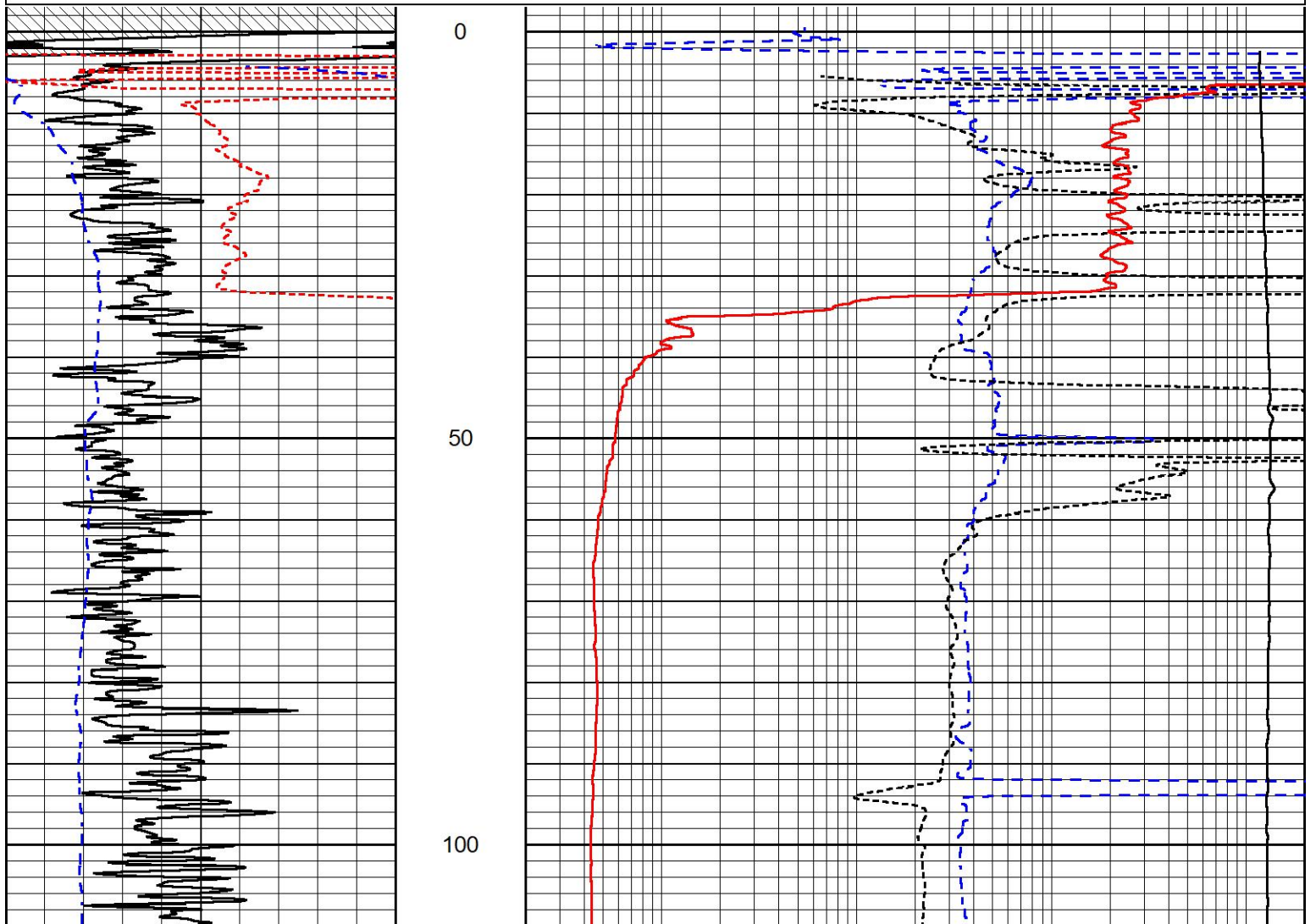
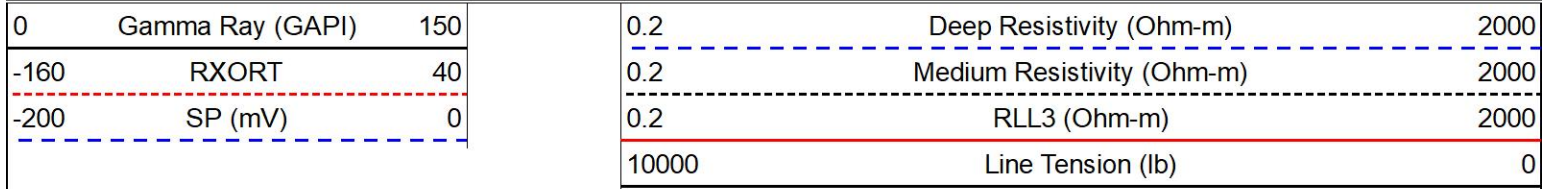


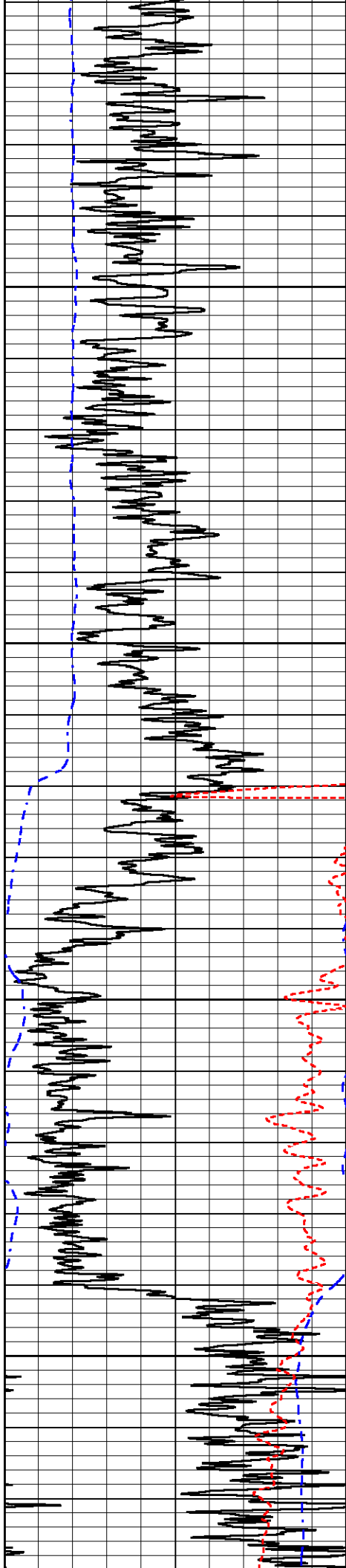
MIDWEST WIRELINE

# DETAIL SECTION

## MAIN PASS

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 Presentation Format \_dil  
 Dataset Creation Sat Nov 19 15:53:08 2022  
 Charted by Depth in Feet scaled 1:240



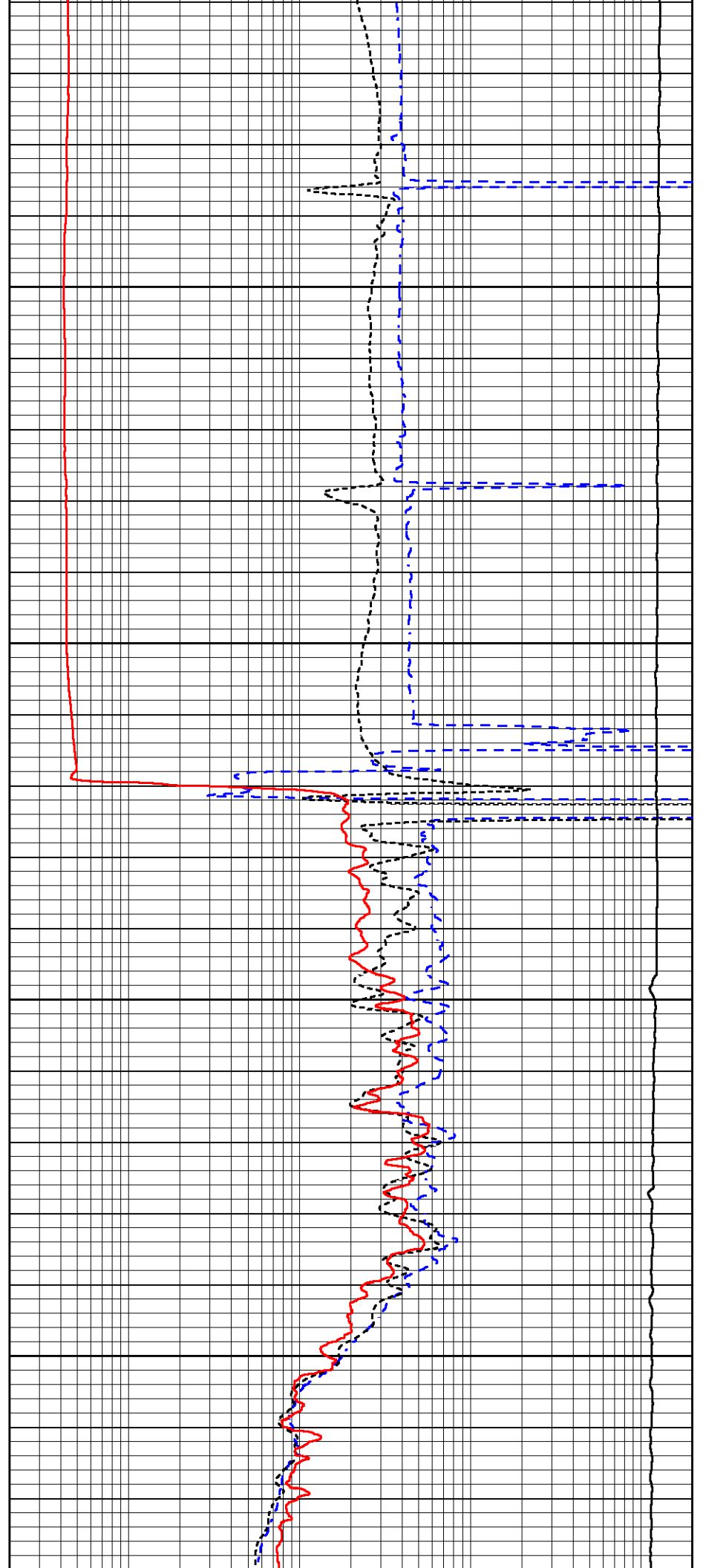


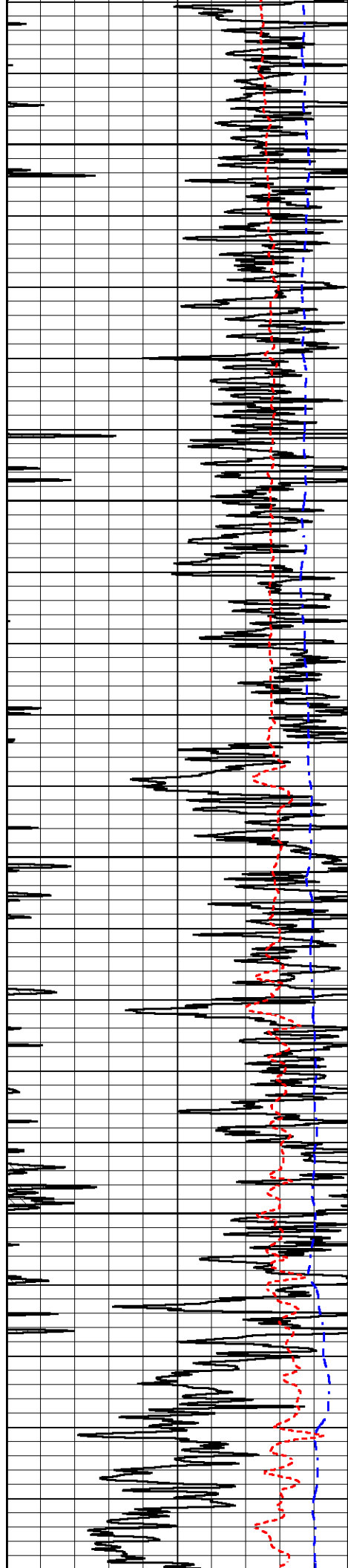
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200

250

300





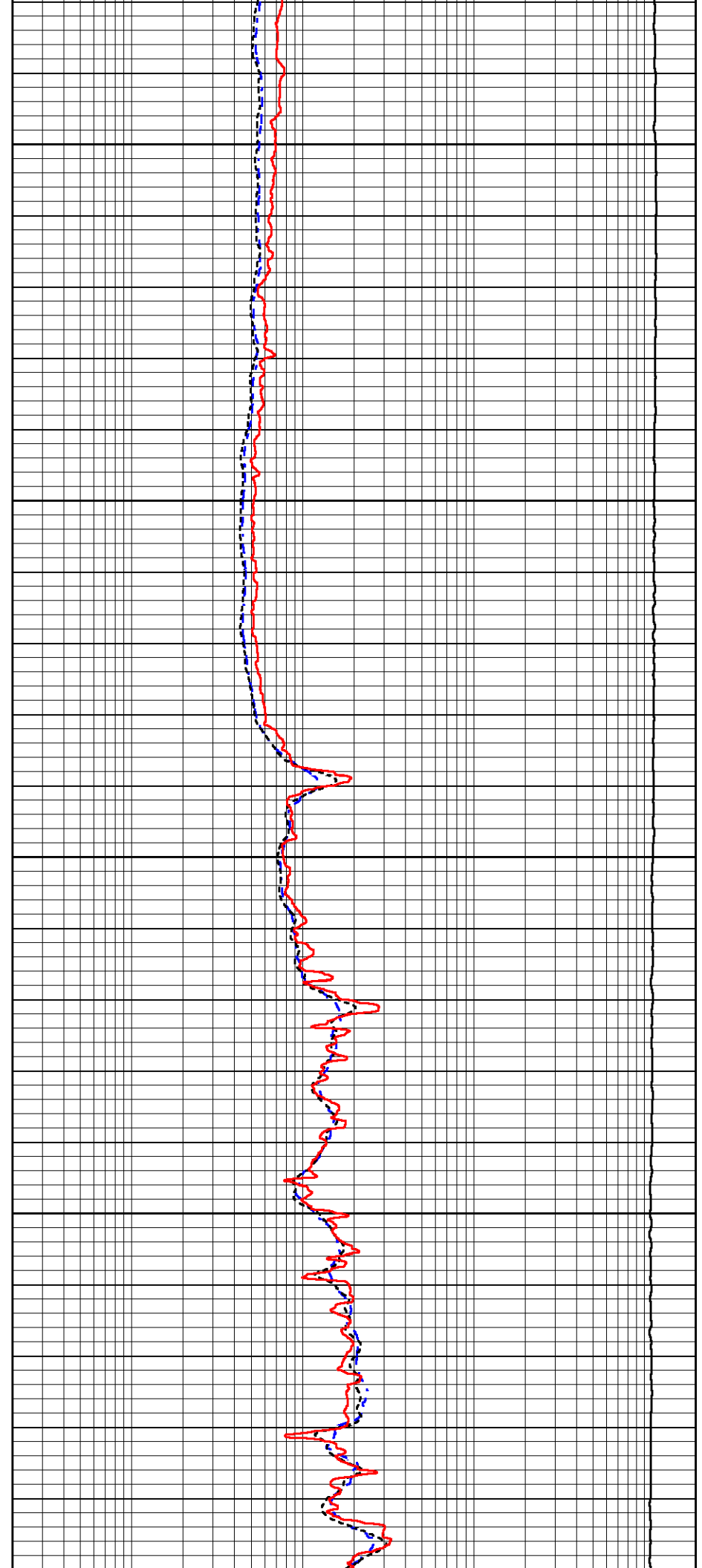
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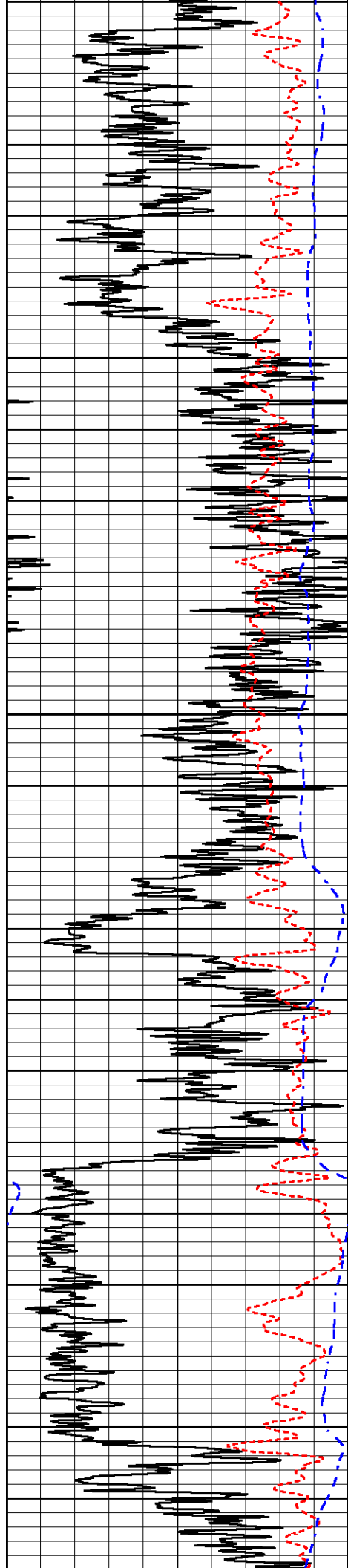
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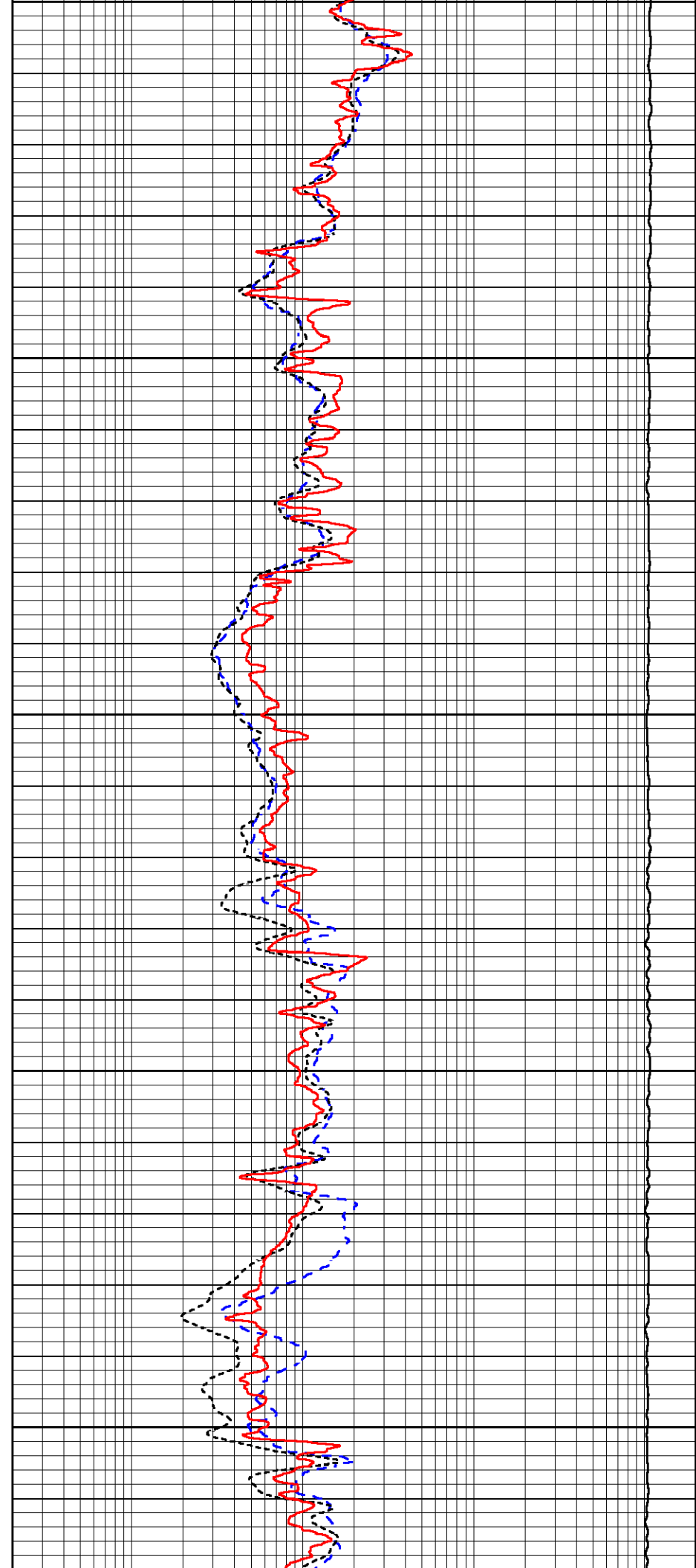
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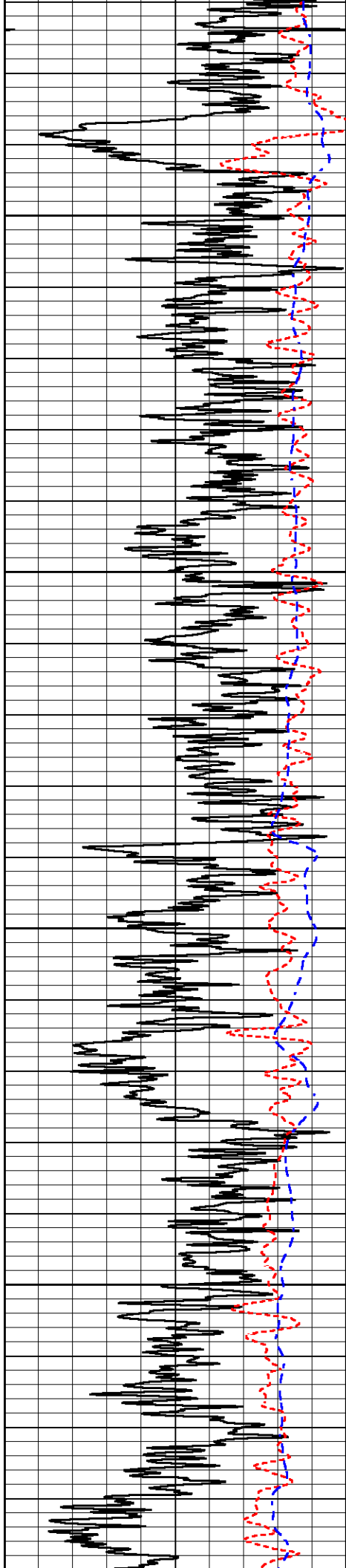
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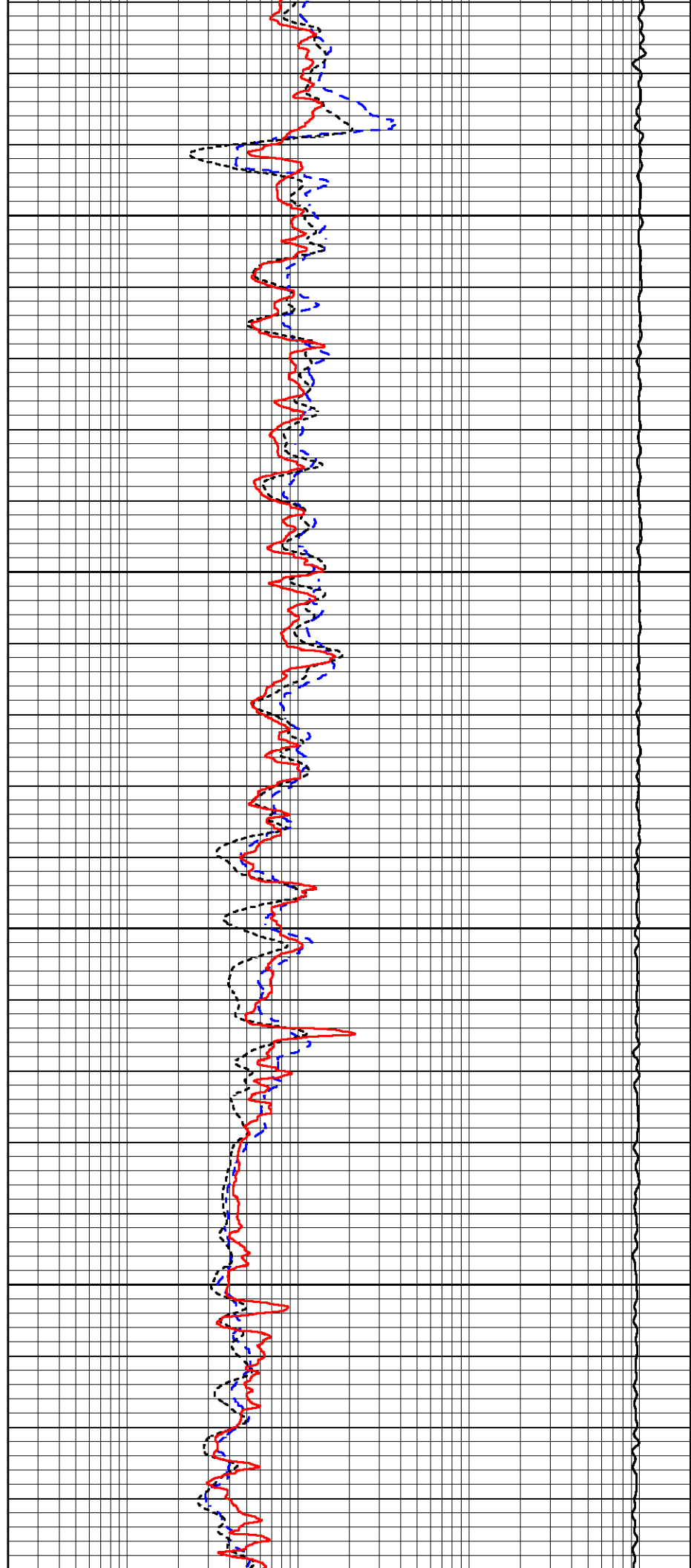


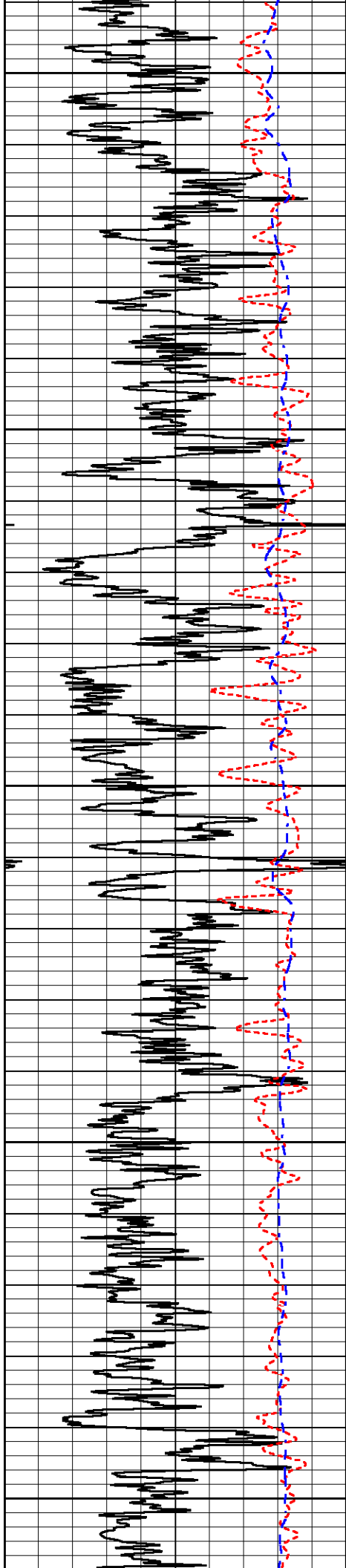
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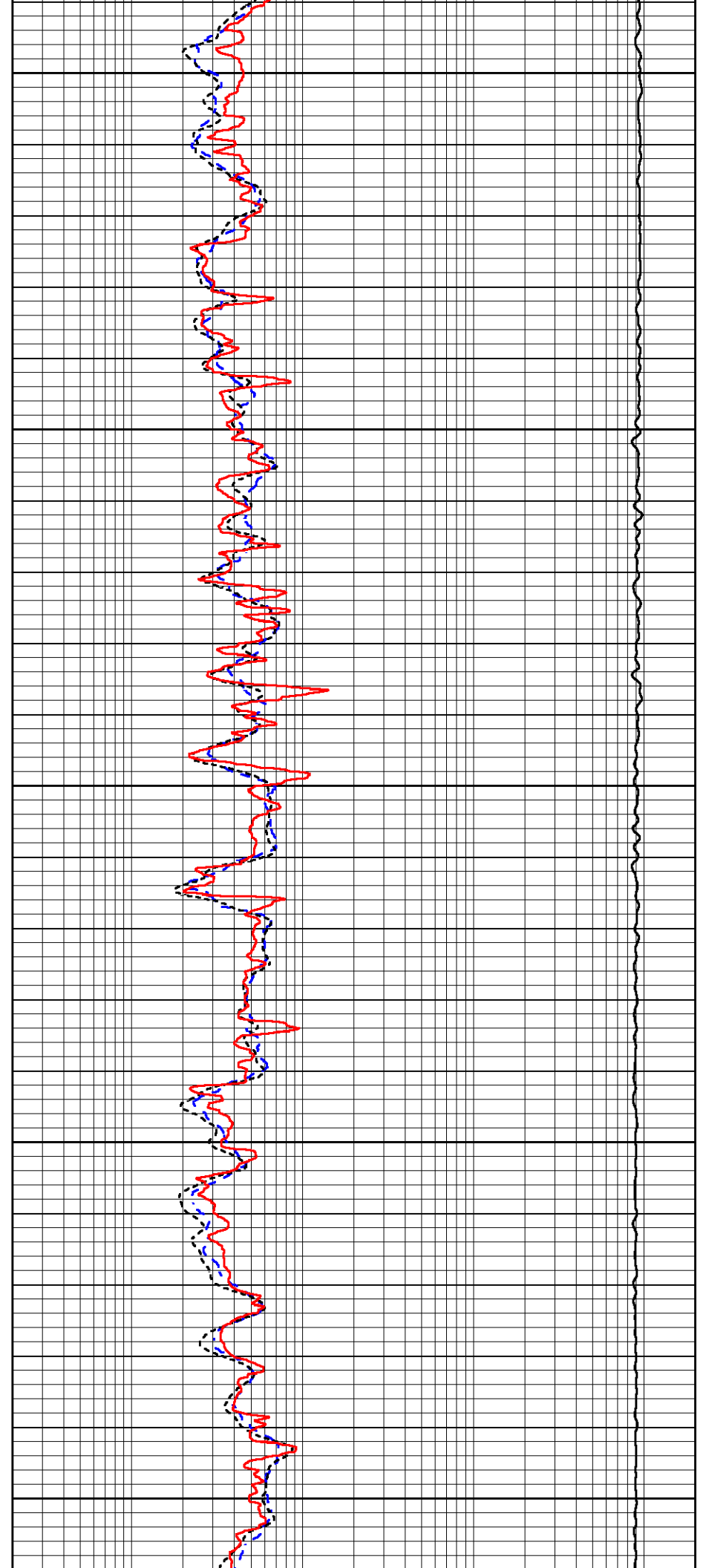
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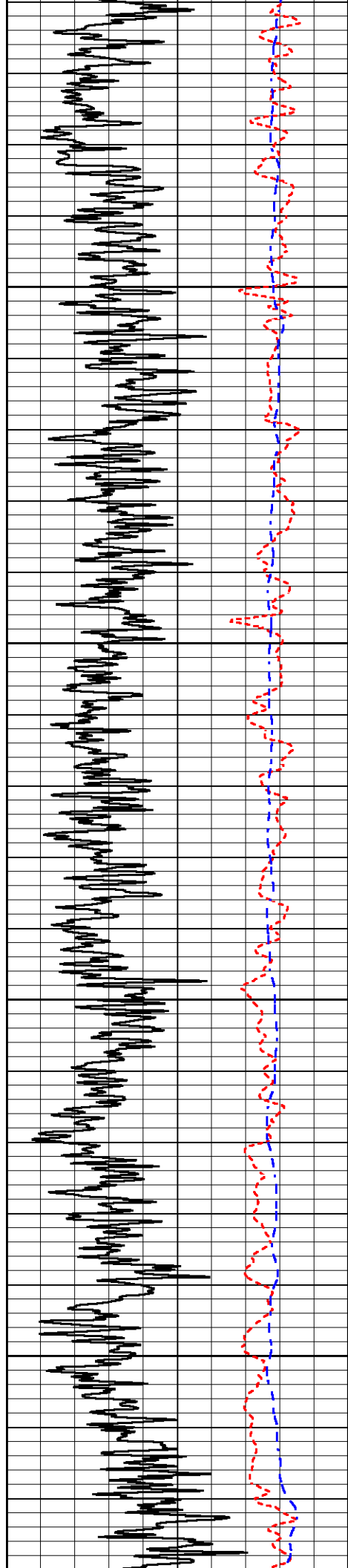
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1100

1150

1200



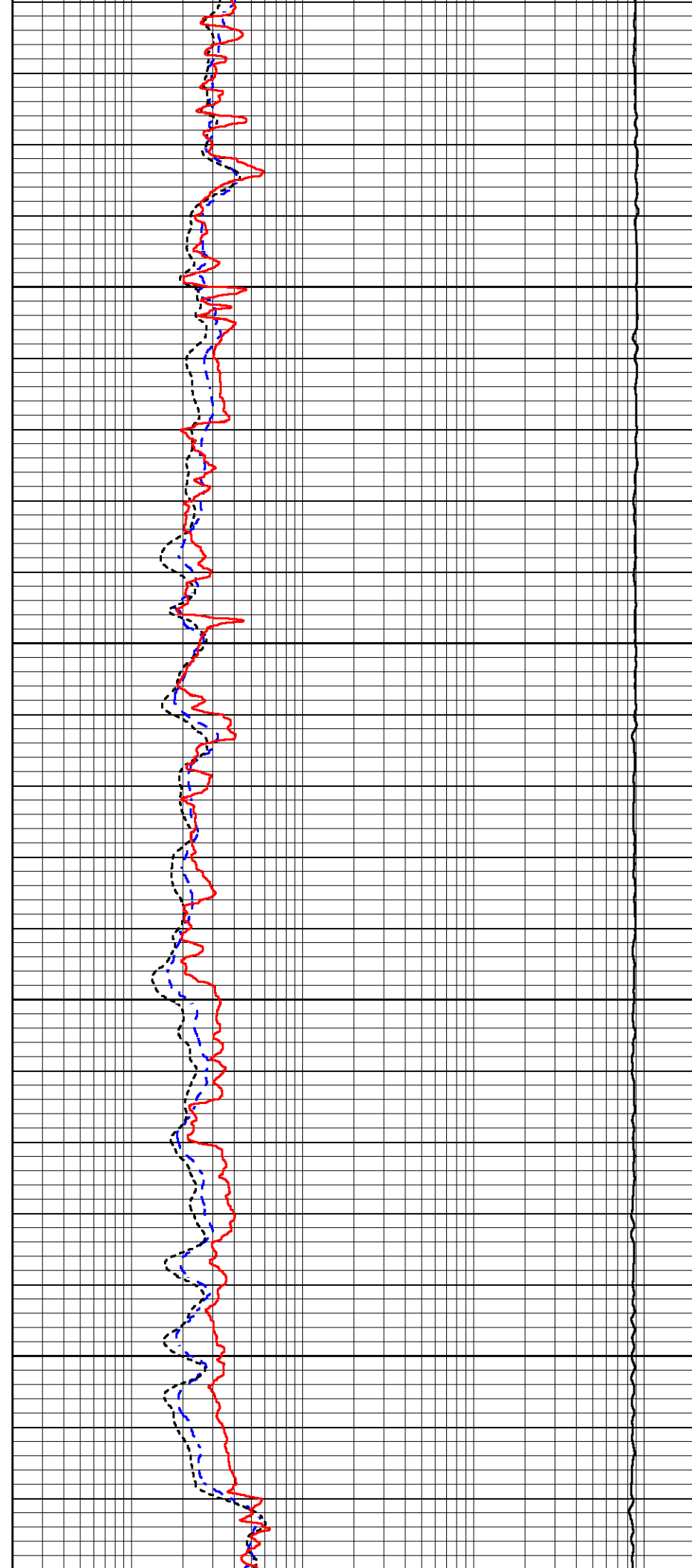


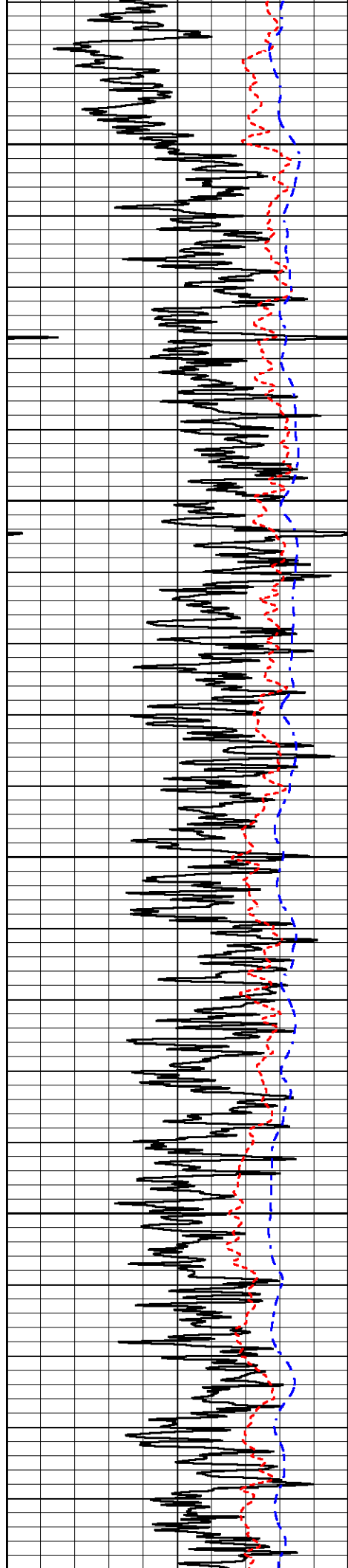
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1300

1350

1400





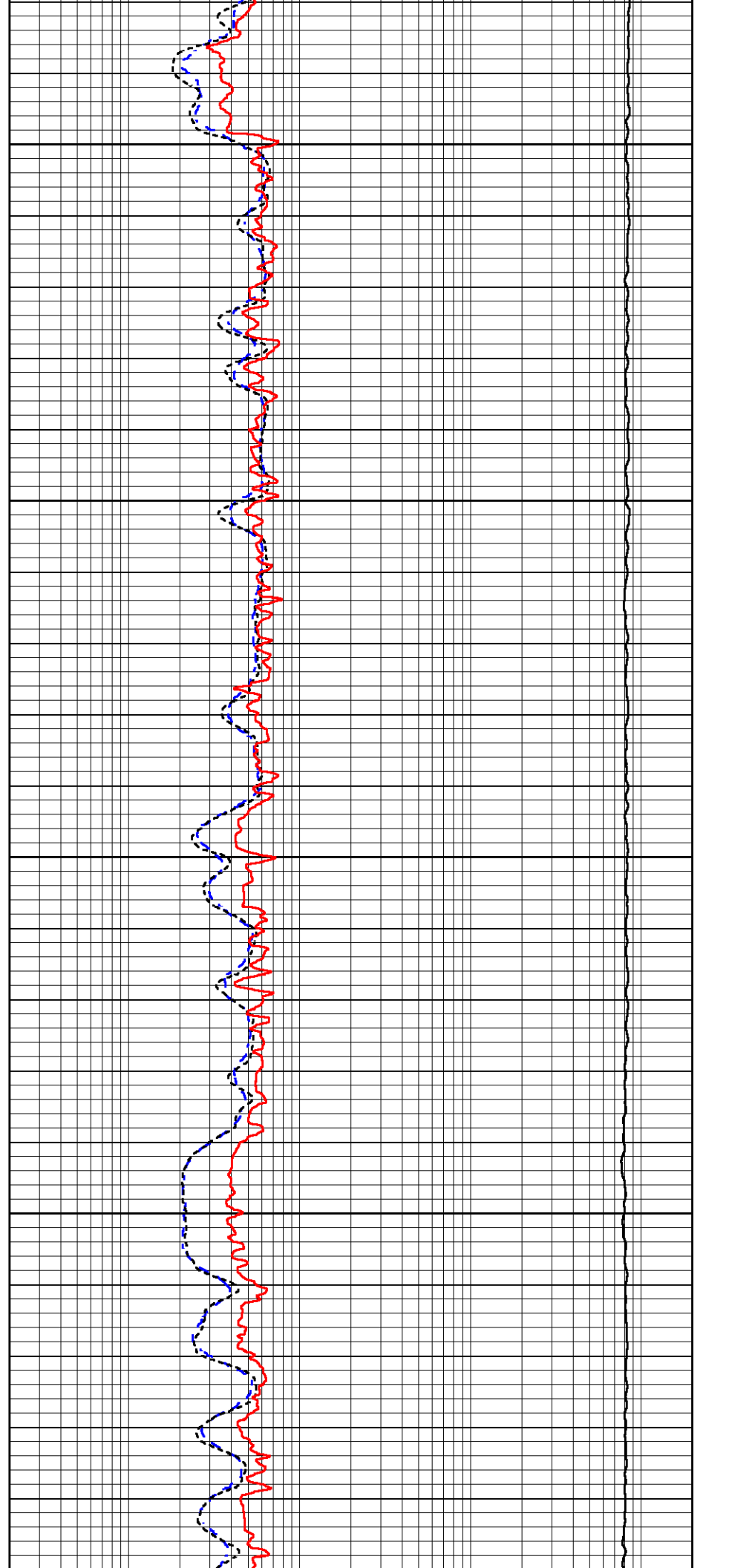
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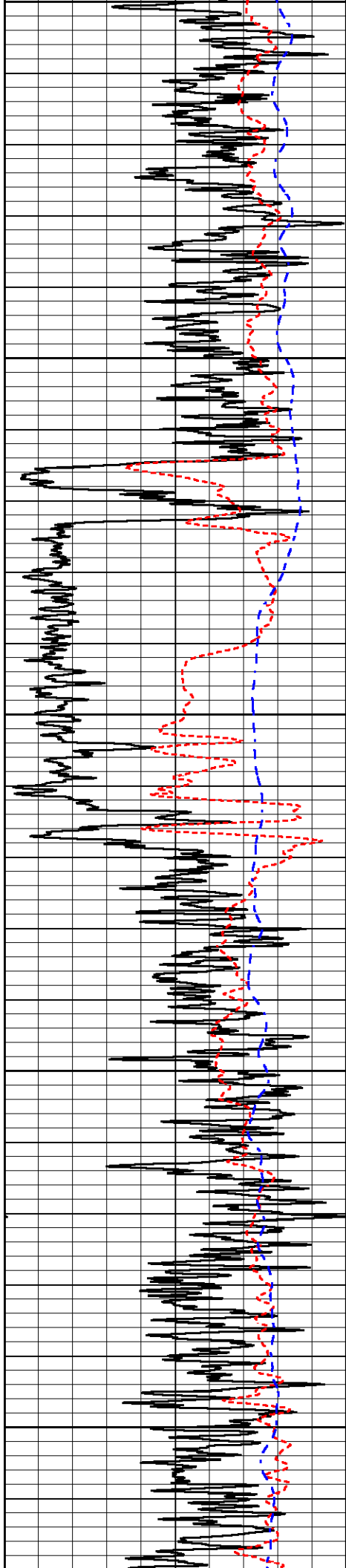
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1550

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1650





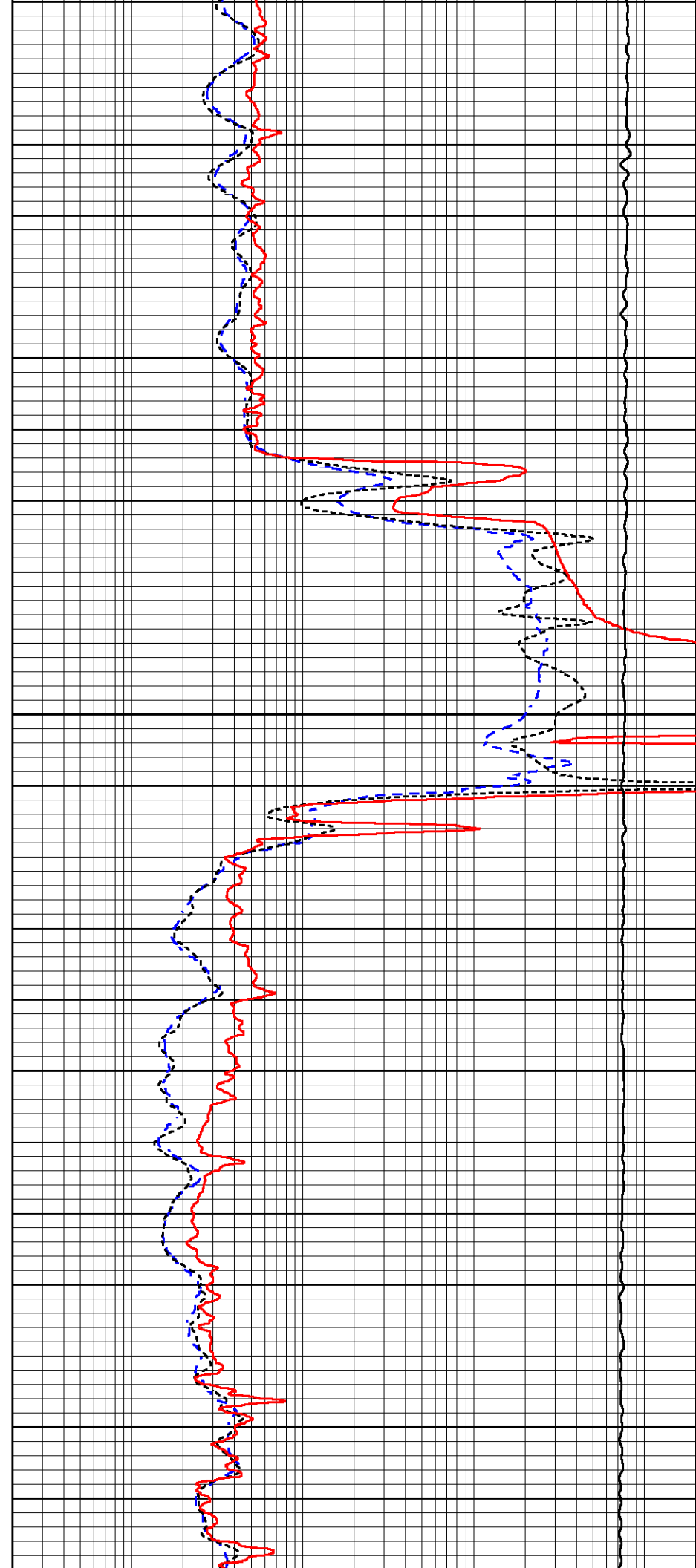
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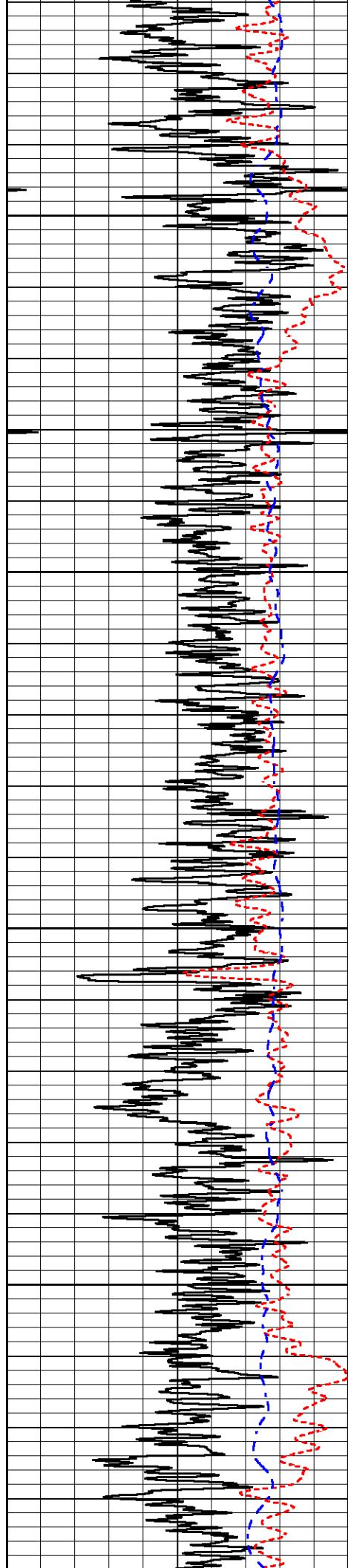
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1750

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1850



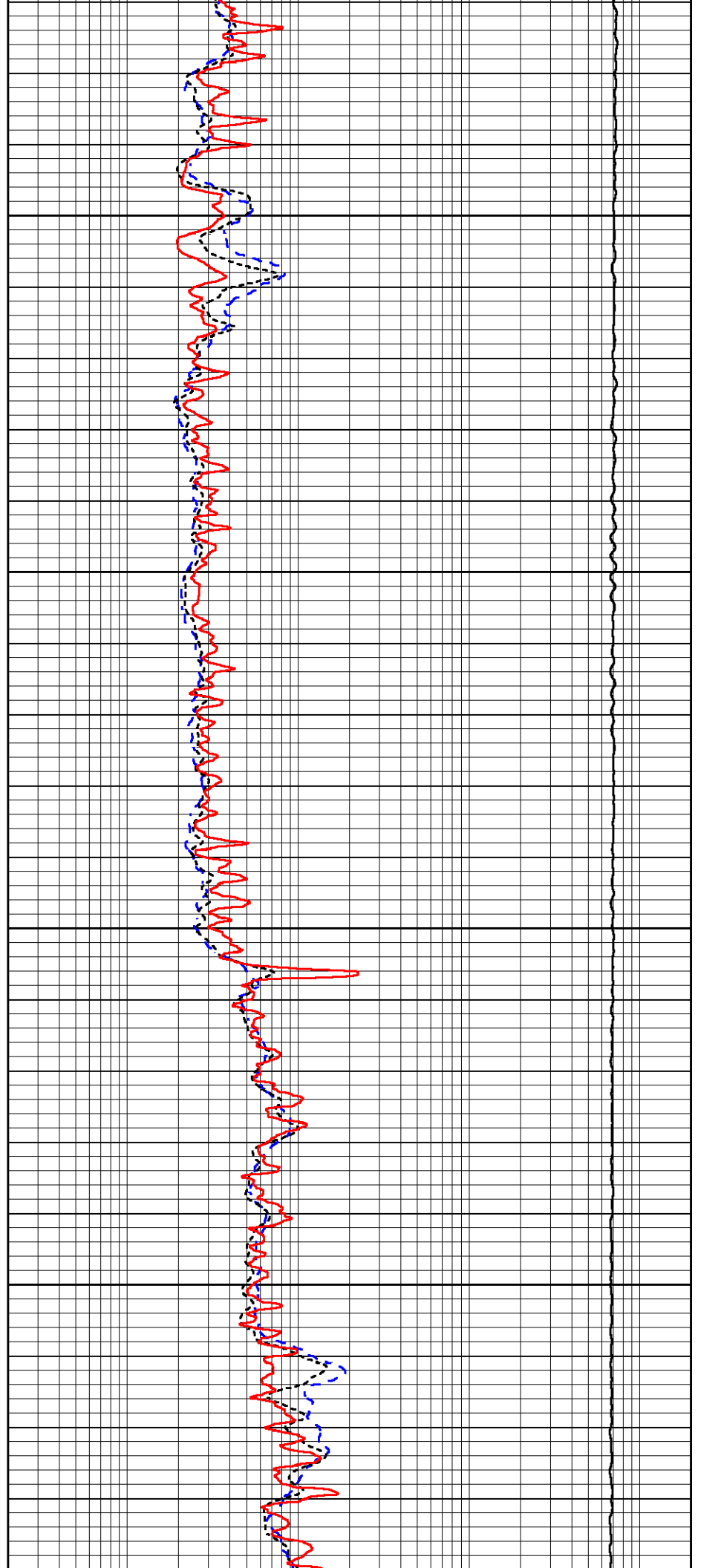


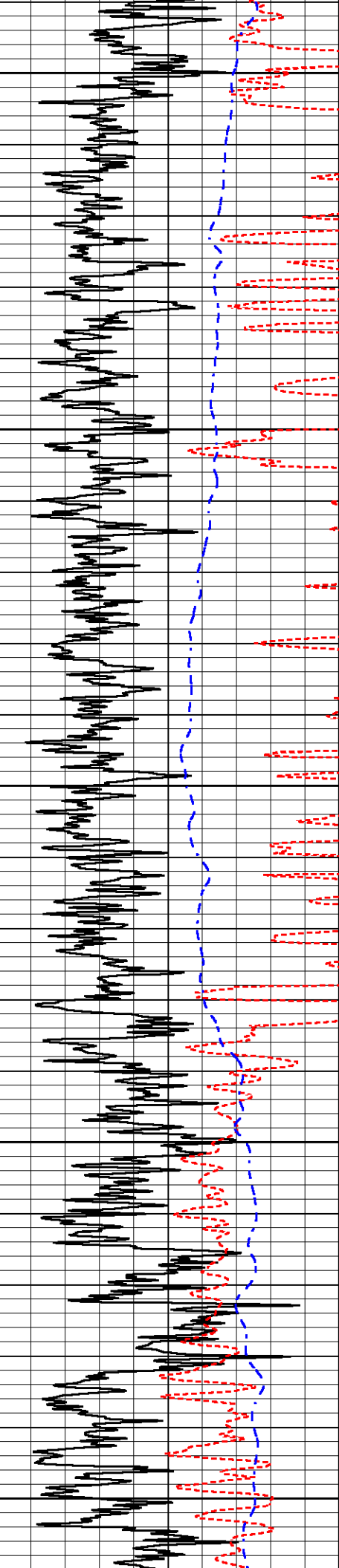
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2000

2050





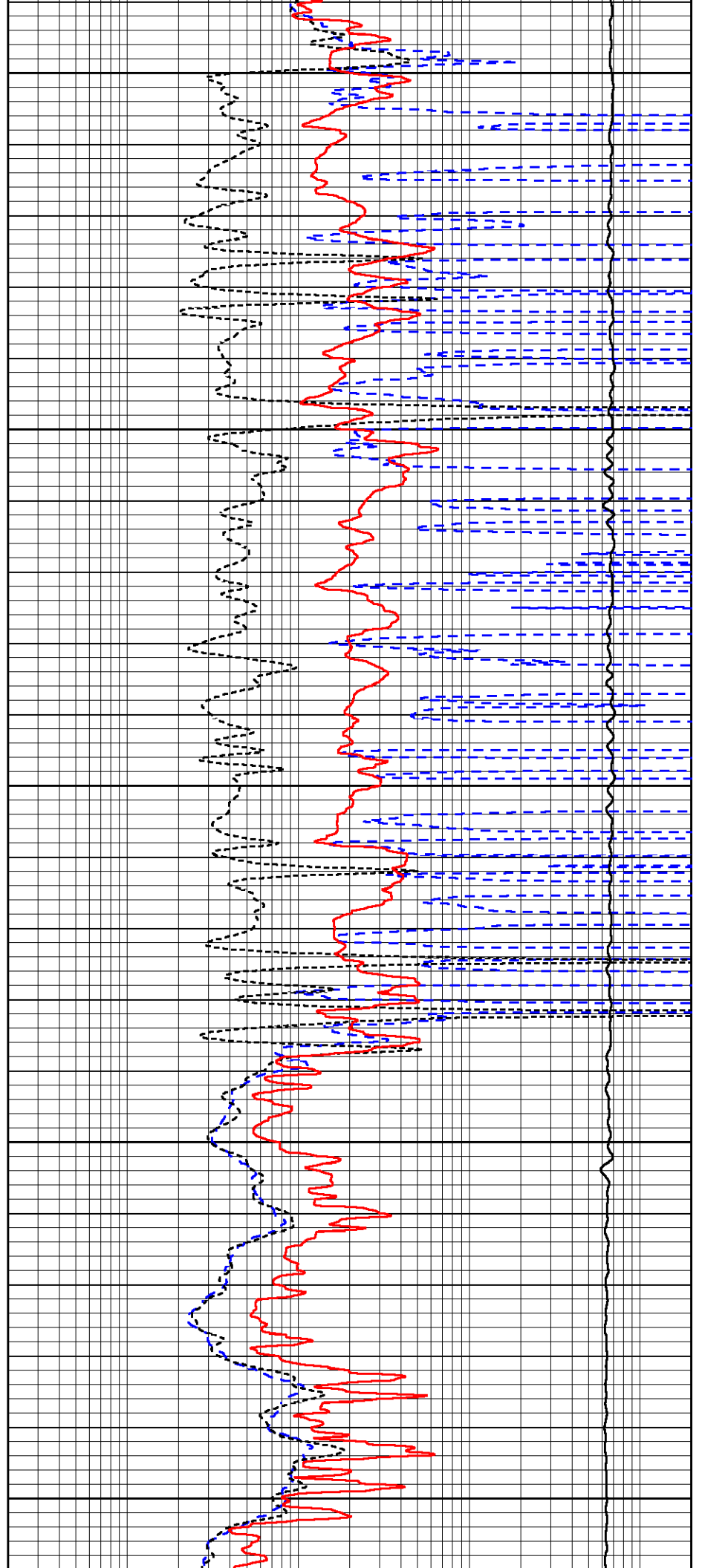
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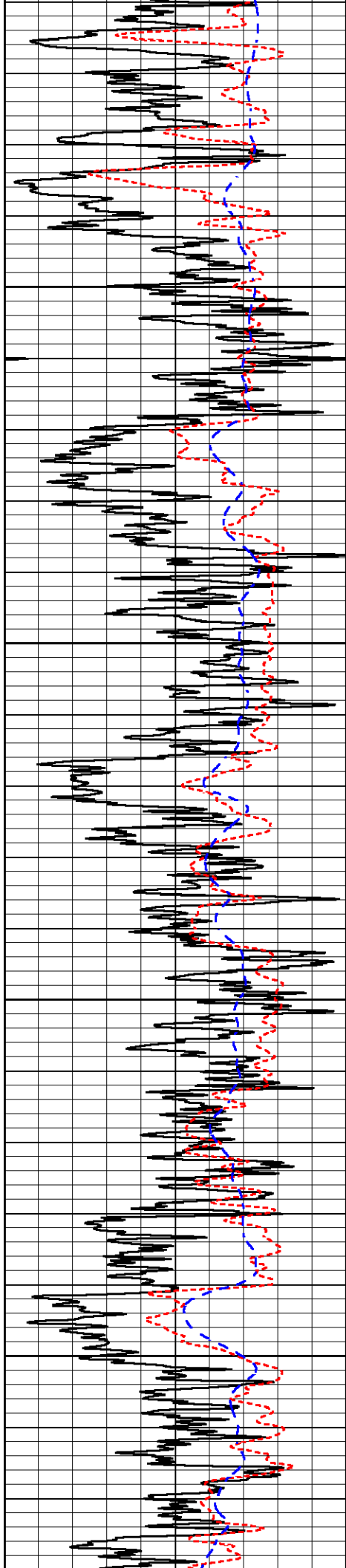
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2200

2250

2300



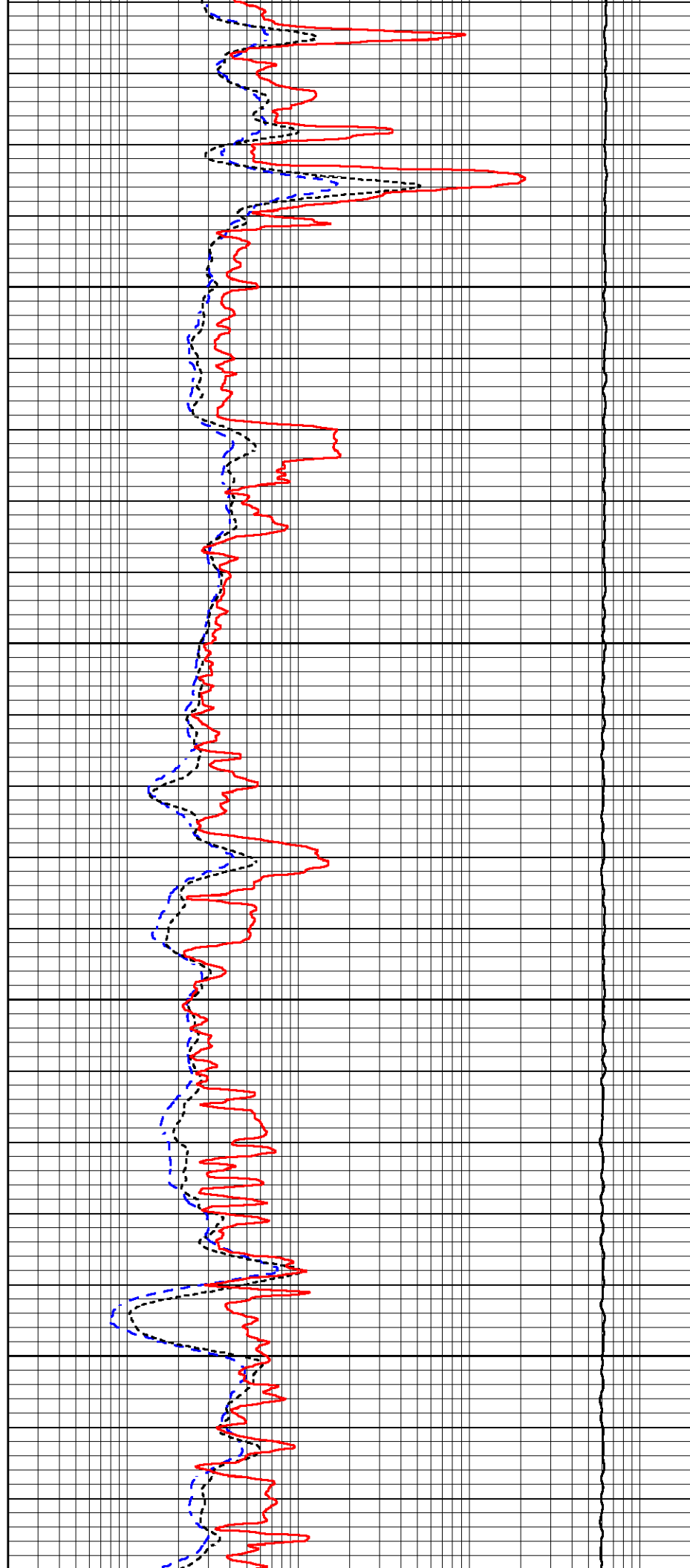


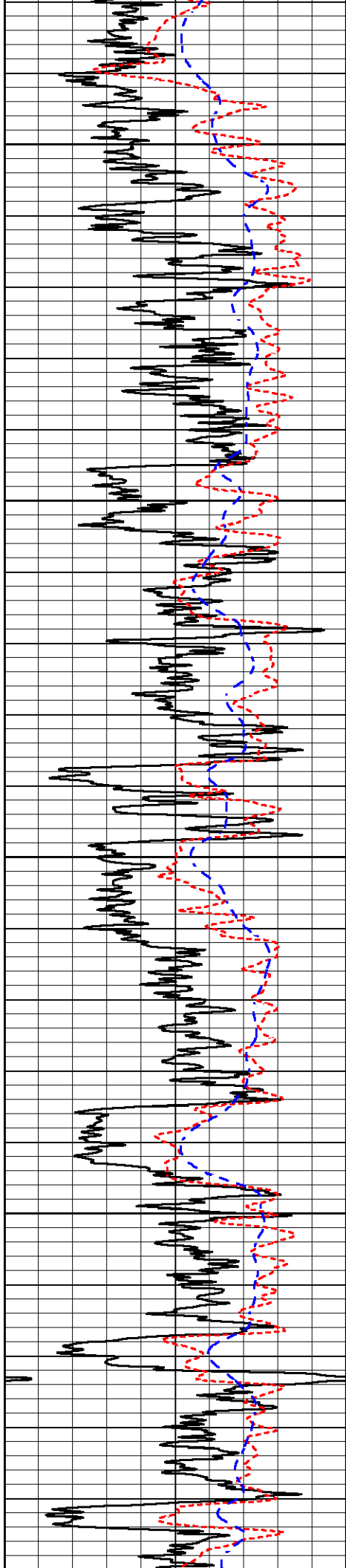
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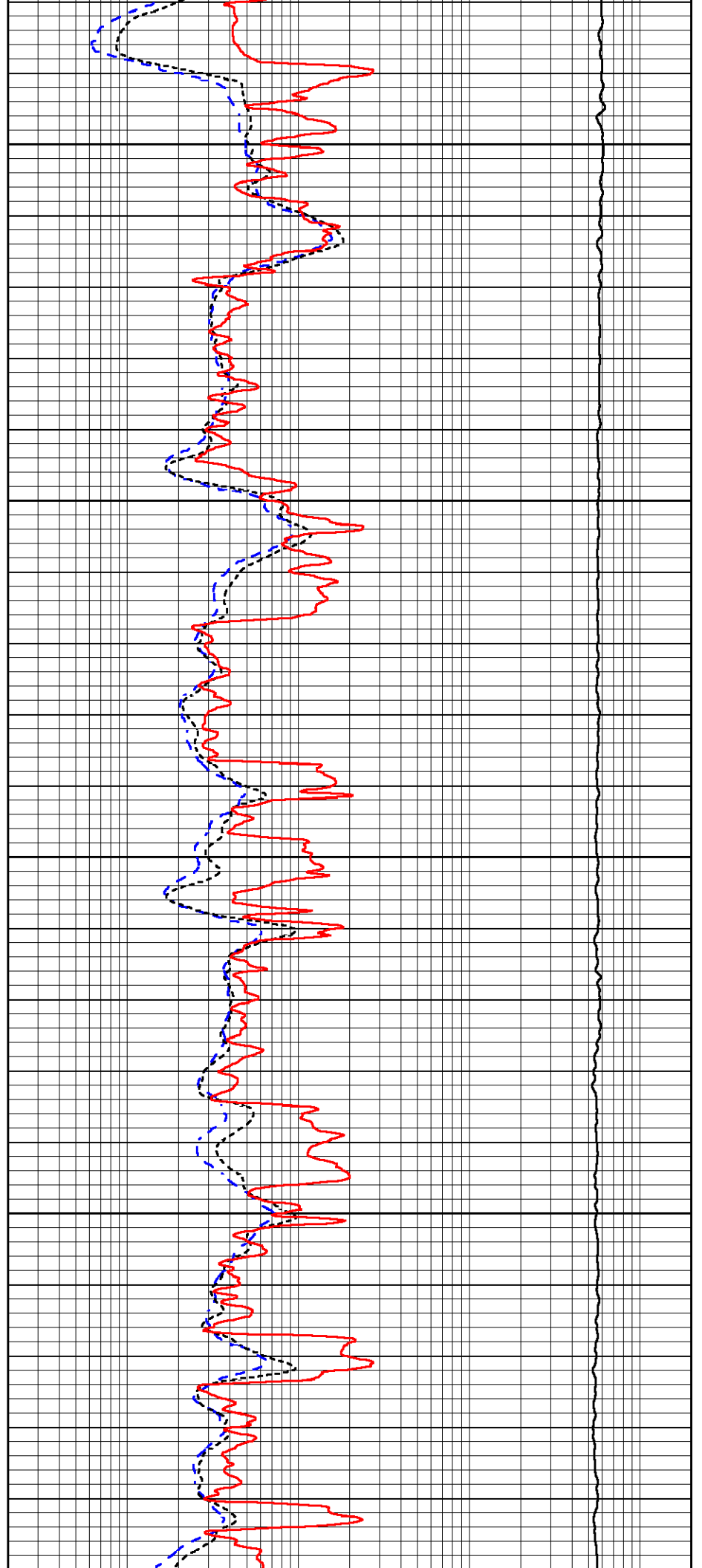
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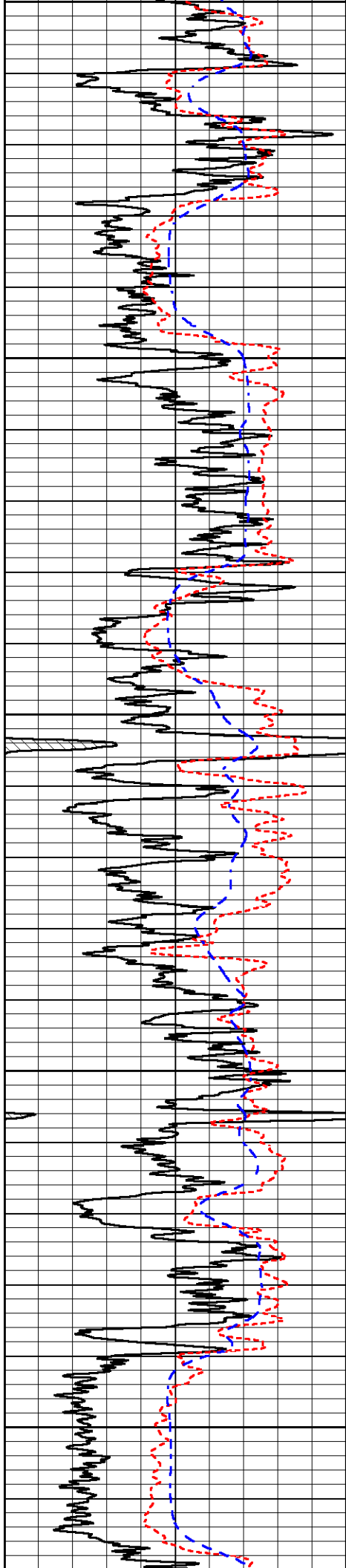
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2750





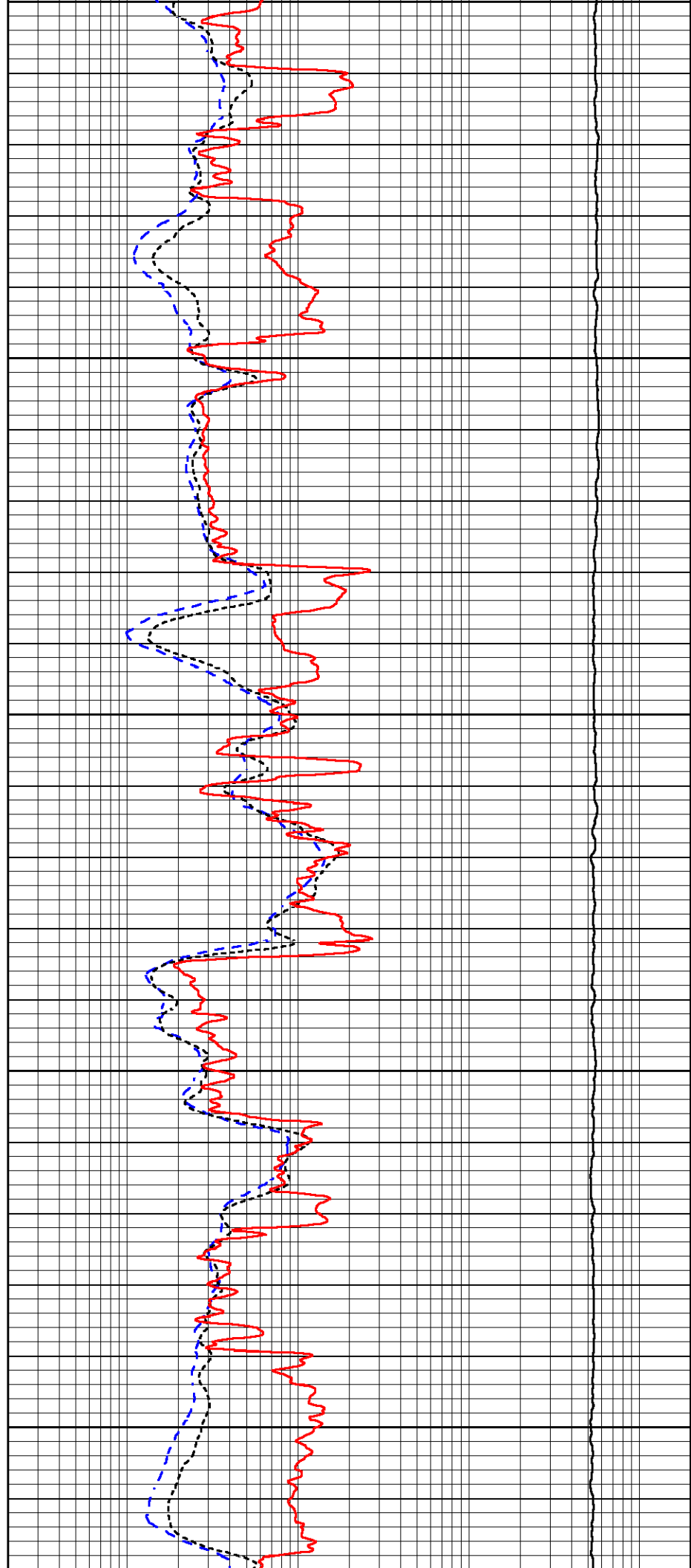
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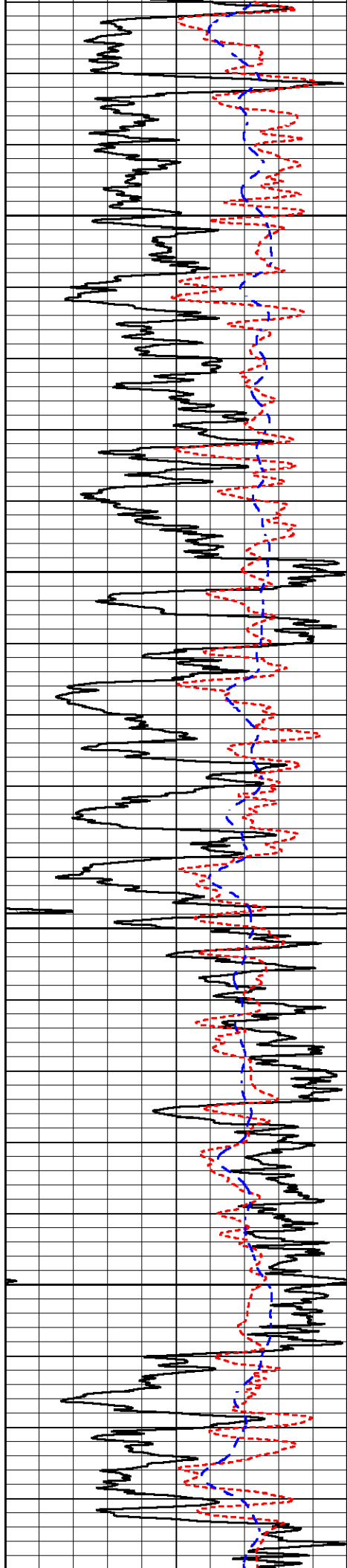
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2850

2900

2950



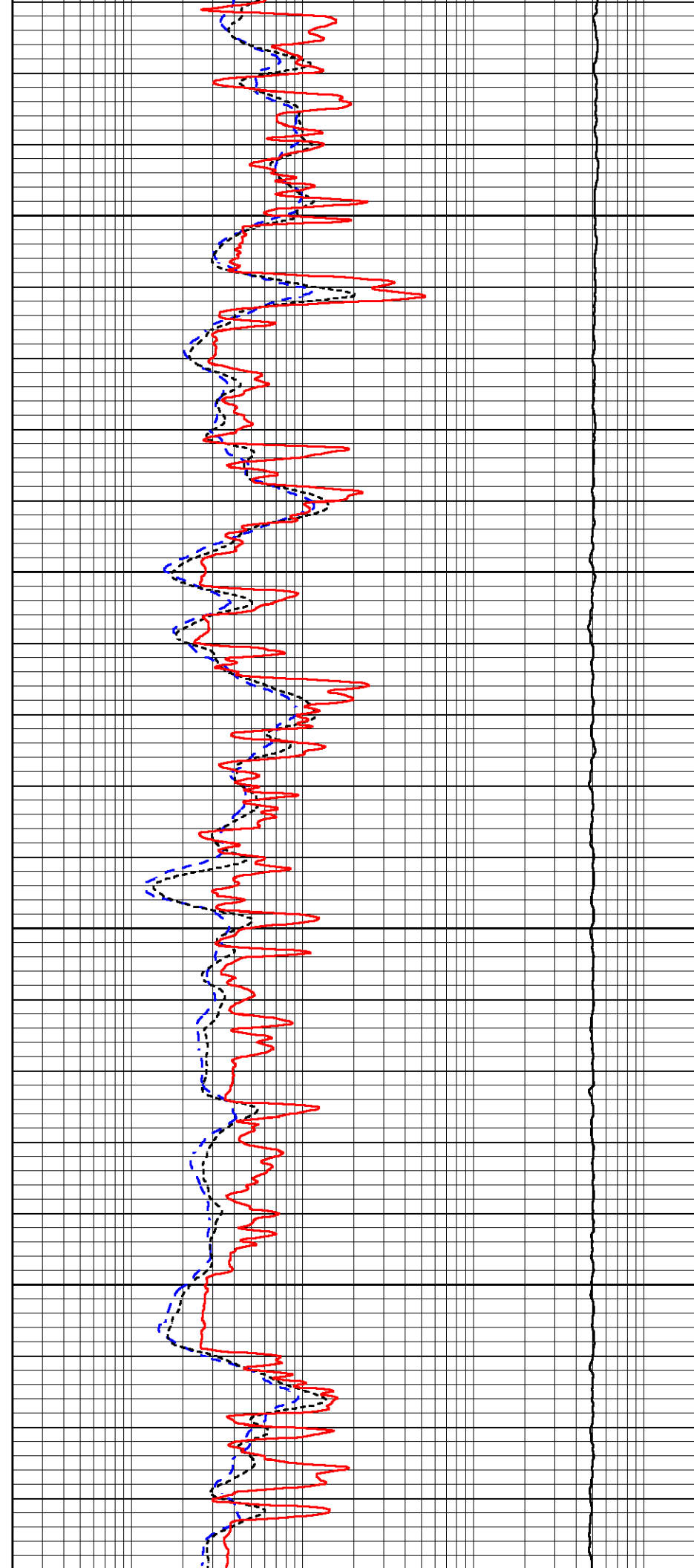


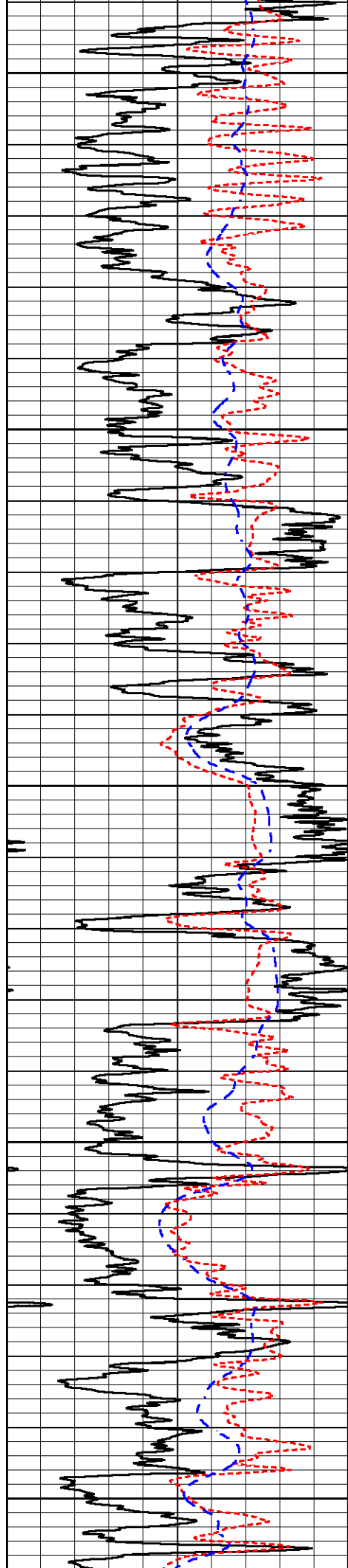
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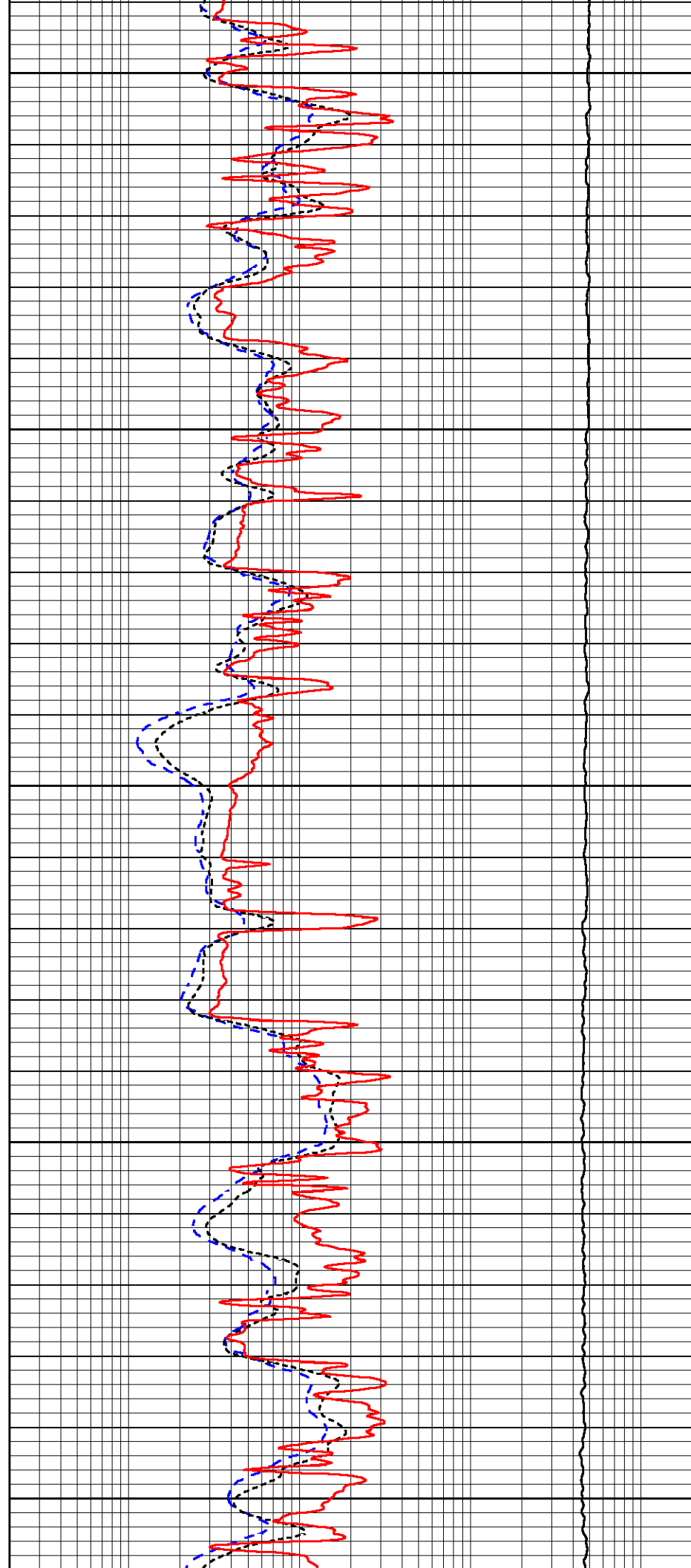
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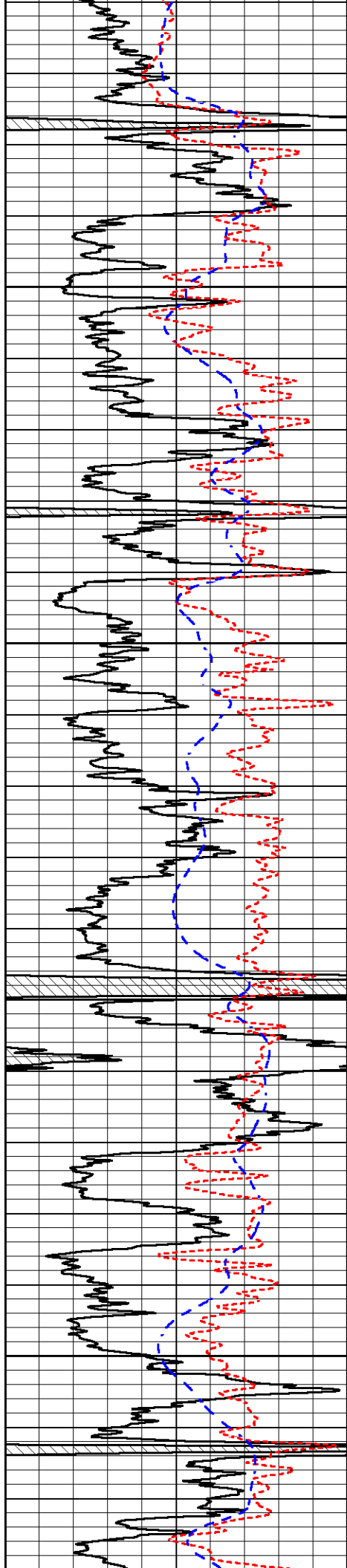
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3350

3400



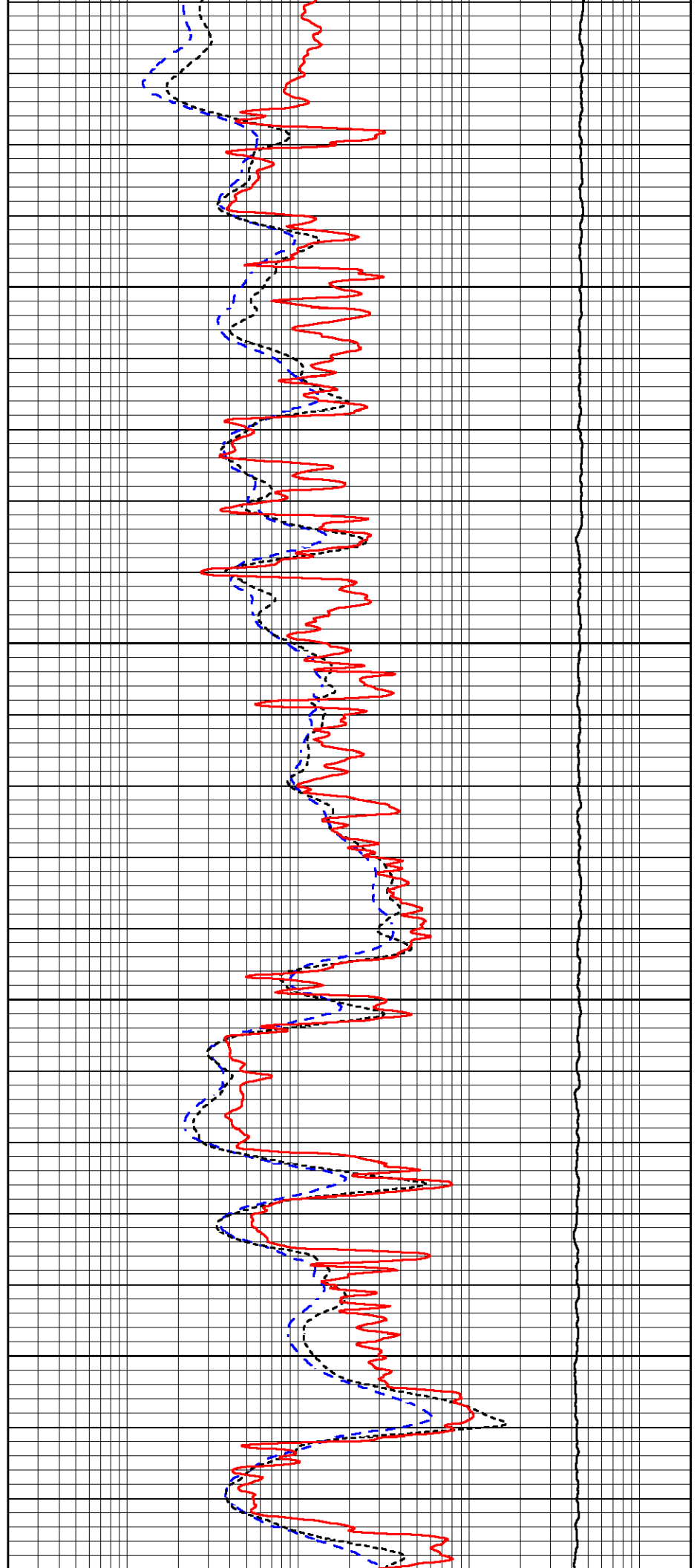


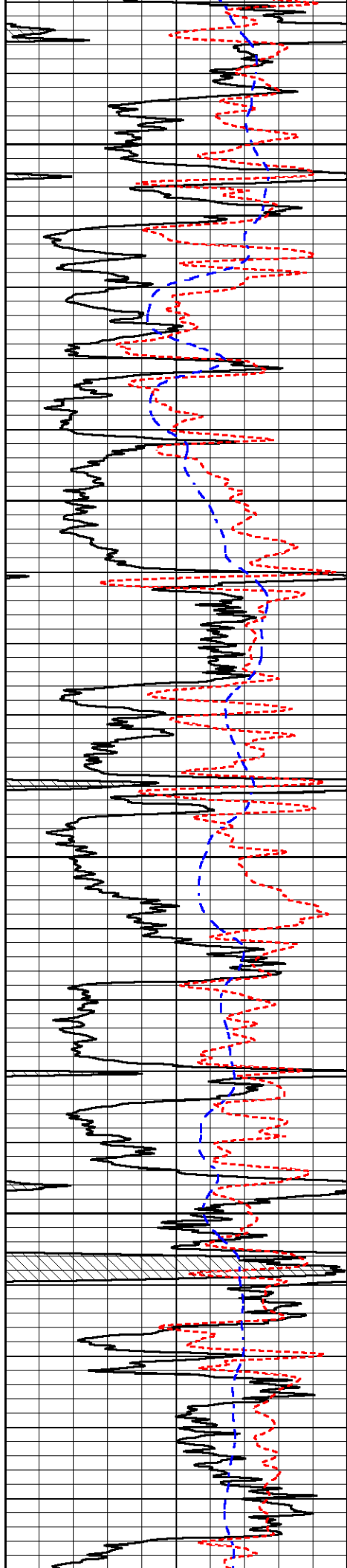
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3600





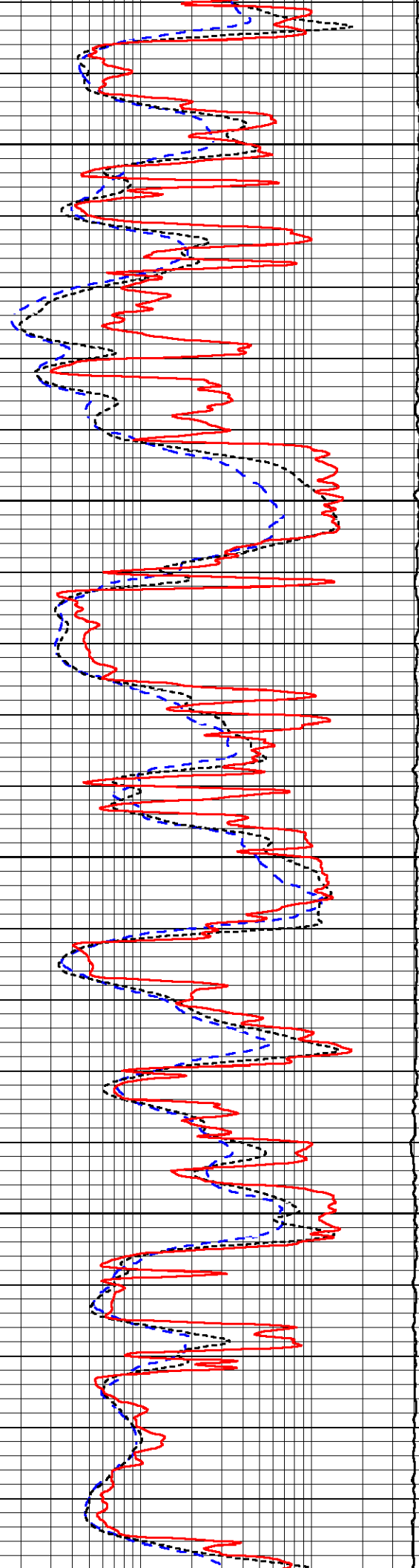
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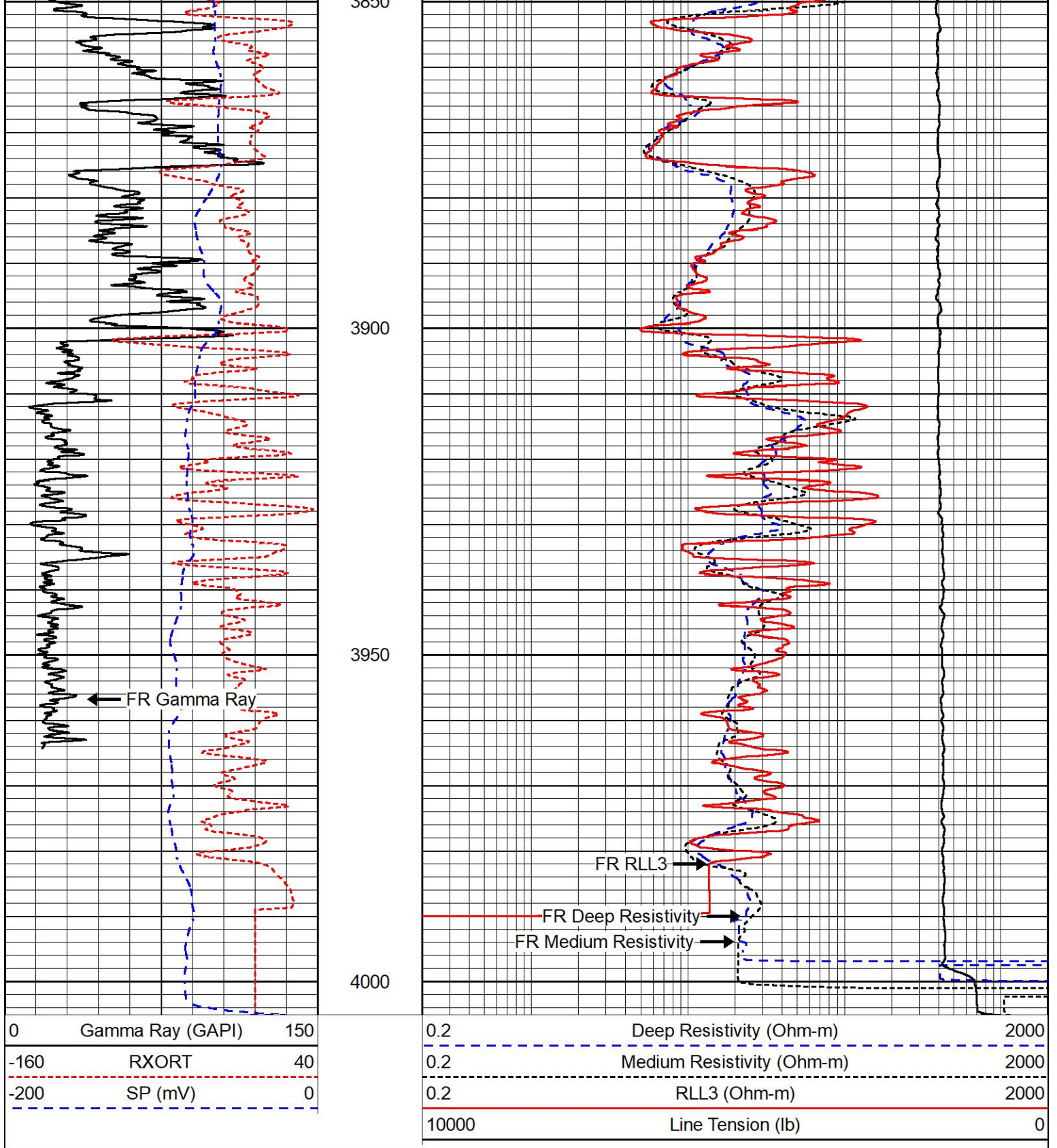
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3750

3800

3850





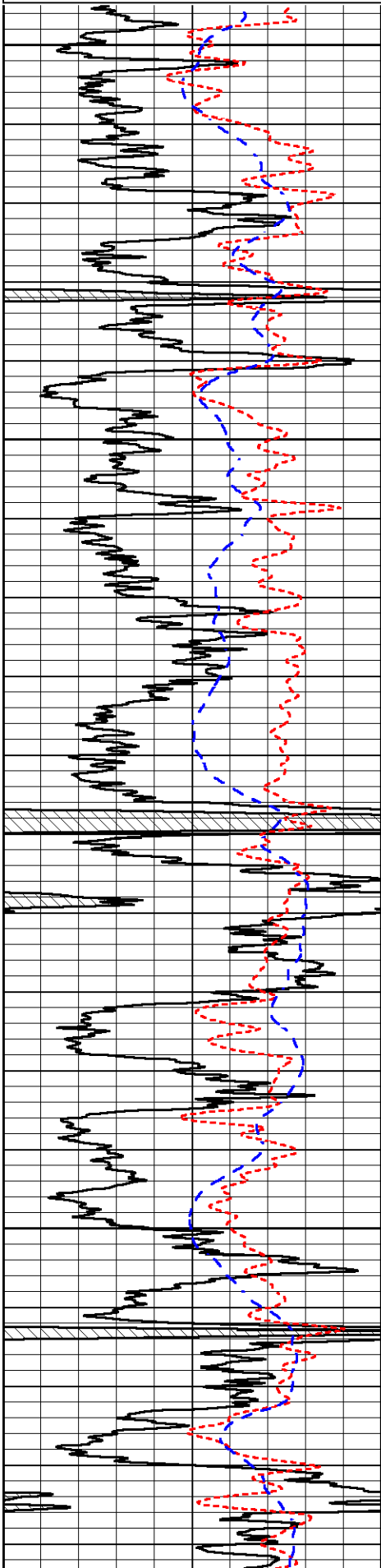
## REPEAT SECTION

REPEAT PASS

Database File murfin\_arbrister 1-36.db  
 Dataset Pathname stkml/pass2.16  
 Presentation Format \_dil  
 Dataset Creation Sat Nov 19 15:44:43 2022  
 Charted by Depth in Feet scaled 1:240

0	Gamma Ray (GAPI)	150
-160	RXORT	40
-200	SP (mV)	0

0.2	Deep Resistivity (Ohm-m)	2000
0.2	Medium Resistivity (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
10000	Line Tension (lb)	0

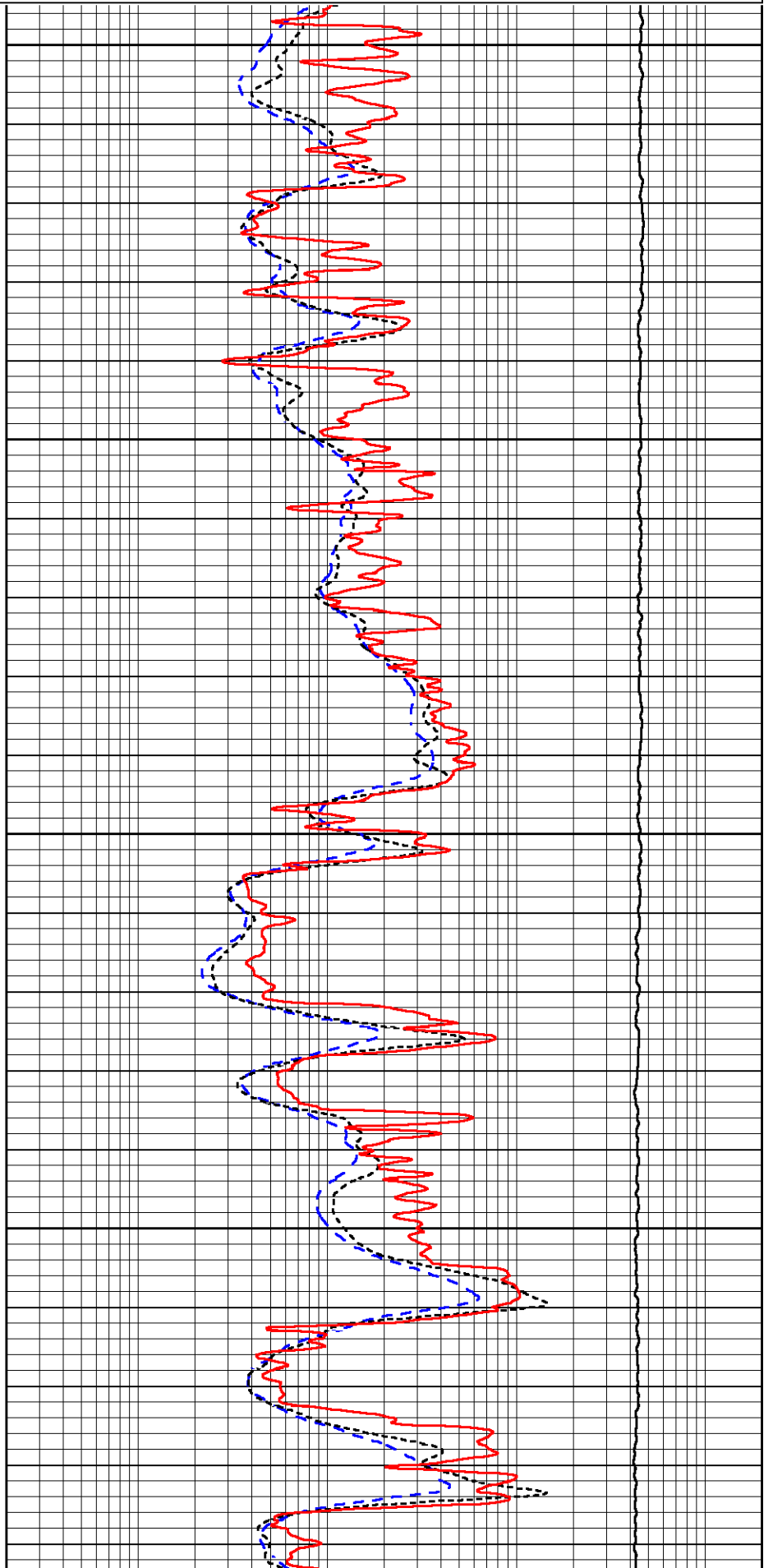


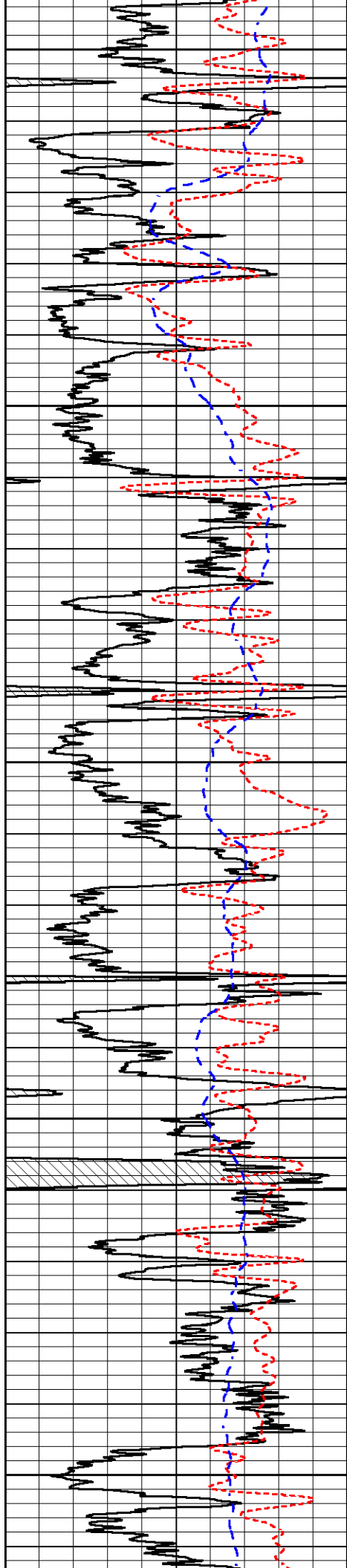
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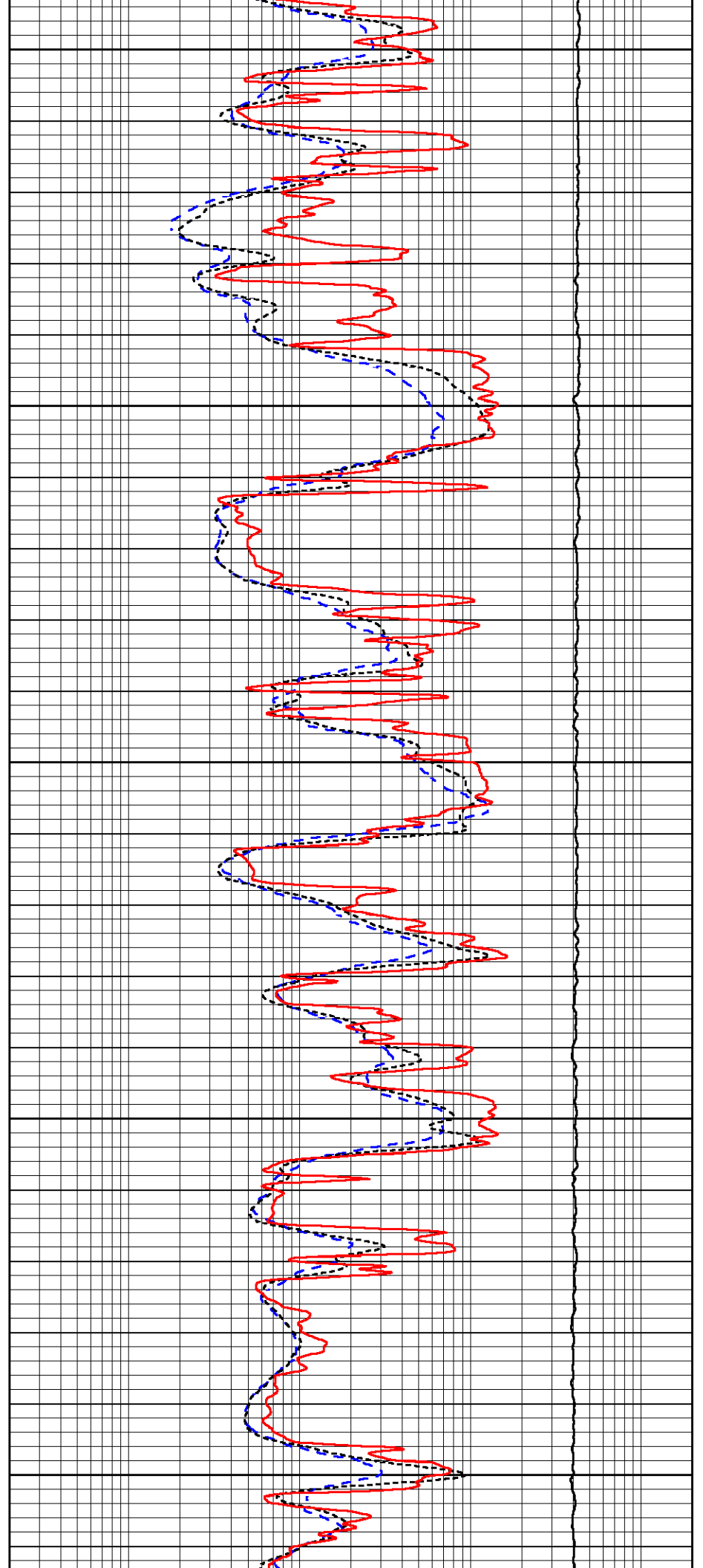
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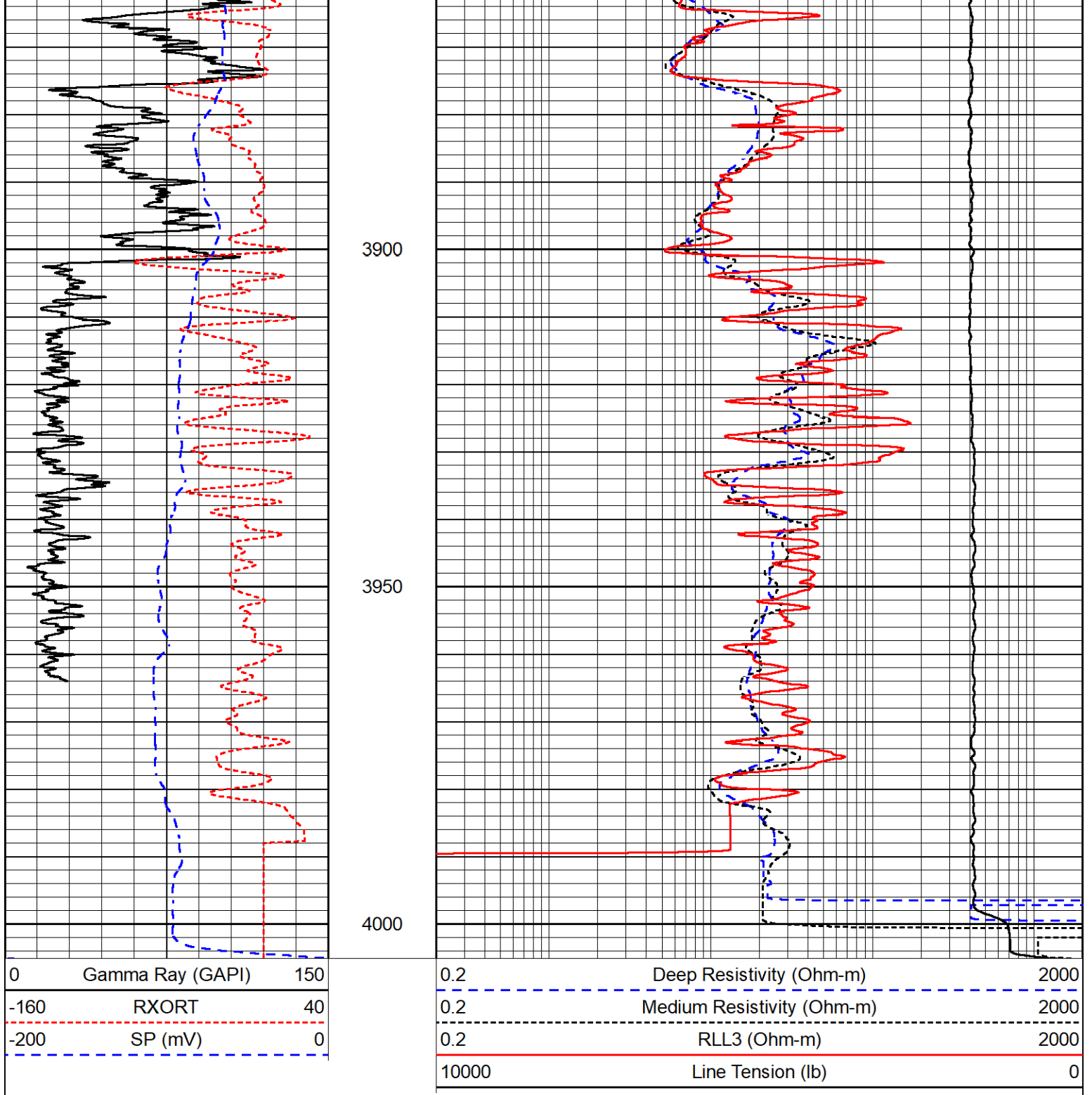
3700

3750

3800

3850





### Calibration Report

Database File      murfin\_arbrister 1-36.db  
 Dataset Pathname    stkml/pass3.1  
 Dataset Creation    Sat Nov 19 15:53:08 2022

### Dual Induction Calibration Report

Serial-Model:                      502 HT-M&W  
 Surface Cal Performed:            Mon Nov 7 15:53:48 2022

Loop:	Readings		References		Results	
	Air	Loop	Air	Loop	m	b
Deep	83.639	487.104	0.000	255.800	mmho/m	0.454    -31.000

Deep	00.000	407.104	0.000	255.800	mmho/m	0.404	01.000
Medium	113.335	1585.690	0.000	255.800	mmho/m	0.350	-11.000

Microlog Calibration Report

Serial-Model: 401-PSIML  
 Performed: Mon Nov 7 15:53:59 2022

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	9000.0000	-0.6500
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	8000.0000	0.0000
Caliper	1.0052	1.0858	5.0000	16.5000	in	98.0000	-93.2500

Compensated Density Calibration Report

Serial-Model: 305-24-M&W  
 Source #: 20762B  
 Master Calibration Performed: Mon Jun 20 16:54:11 2022

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4771.35	5494.27	cps
Aluminum	2.650	g/cc	908.54	3539.54	cps
Spine Angle = 75.15			Density/Spine Ratio = 0.522		
	Size		Reading		
Small Ring	4.00	in	1.74		
Large Ring	14.00	in	1.38		

Compensated Neutron Calibration Report

Serial Number: 207-MW  
 Tool Model: M&W

CALIBRATION

Detector	Readings	Target	Normalization
Short Space	6240.00 cps	1000.00 cps	1.6025
Long Space	460.00 cps	1000.00 cps	1.9500

PRE-SURVEY VERIFICATION

	Detector	Readings	Measured	Target
1)	Short Space	cps	pu	pu
	Long Space	cps		
2)	Short Space	cps	pu	
	Long Space	cps		
3)	Short Space	cps	pu	
	Long Space	cps		

POST-SURVEY VERIFICATION

Detector	Readings	Measured	Target
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1)	Short Space Long Space	cps cps	pu	pu
2)	Short Space Long Space	cps cps	pu	pu
3)	Short Space Long Space	cps cps	pu	pu

Gamma Ray Calibration Report

Serial Number:	106	
Tool Model:	M&W	
Performed:	Fri Dec 3 15:10:46 2021	
Calibrator Value:	500.0	GAPI
Background Reading:	24.0	cps
Calibrator Reading:	637.0	cps
Sensitivity:	0.5500	GAPI/cps

 <b>MIDWEST WIRELINE</b>	<b>Company</b>	Murfin Drilling Company, Inc.
	<b>Well</b>	Armbrister #1-36
	<b>Field</b>	Nicholson
	<b>County</b>	Trego
	<b>State</b>	Kansas