



PIONEER
Pioneer Energy Services

**DUAL INDUCTION
LOG**

Company MURFIN DRILLING COMPANY, INC.
Well BURR #1-6
Field WILDCAT
County CHEYENNE
State KANSAS

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Well BURR #1-6
Field WILDCAT
County CHEYENNE State KANSAS

Location: API #: 15-023-21530-00-00
990' FSL & 330' FEL
SEC 6 TWP 3S RGE 37W
Permanent Datum GROUND LEVEL Elevation 3438'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING
Other Services
CNL/CDL
MEL/BHCS
Elevation
K.B. 3443'
D.F. N/A
G.L. 3438'

Date	1/16/2020
Run Number	ONE
Depth Driller	5100'
Depth Logger	5103'
Bottom Logged Interval	5102'
Top Log Interval	00
Casing Driller	8.625" @ 388'
Casing Logger	387'
Bit Size	7.875"
Type Fluid in Hole	CHEMICAL
Salinity, ppm CL	1300
Density / Viscosity	9.1 57
pH / Fluid Loss	11.0 6.0
Source of Sample	FLOWLINE
Rm @ Meas. Temp	1.10 @ 67
Rmt @ Meas. Temp	.83 @ 67
Rmc @ Meas. Temp	1.49 @ 67
Source of Rmf / Rmc	CHARTS
Rm @ BHT	.58 @ 12
Operating Rig Time	4 HOURS
Max Rec. Temp. F	127 DEGF
Equipment Number	P-108
Location	HAYS
Recorded By	J. HENRICKSON
Witnessed By	SAMAN SHARIFAIE

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

**BIRD CITY KANSAS
EAST TO 30 RD, 4 1/4 NORTH, WEST INTO**

Log Measured From: KELLY BUSHING 5 Ft. Above Permanent Datum

**THANK YOU FOR USING PIONEER ENERGY SERVICES
www.pioneerenergy.com 785-625-3858**

Your Pioneer Energy Services Crew	This Log Record Was Witnessed By
Engineer: J. HENRICKSON	Primary Witness: SAMAN SHARIFAIE
Operator:	Secondary Witness:
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Log Variables

DatabaseC:\ProgramData\Warrior\Data\murfir_burr_1_6.db
Dataset field/well/stackml/pass3.1/_vars_

Top - Bottom

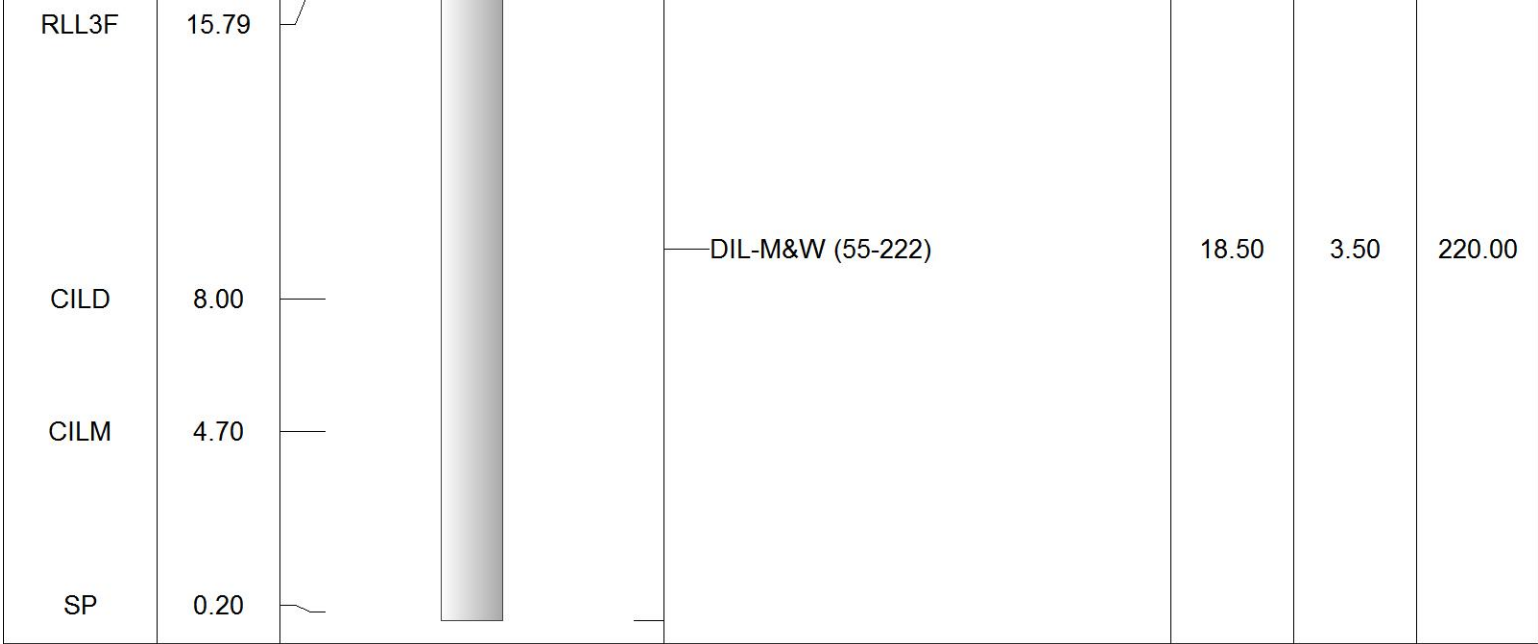
A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	127	5.5	0	1	2	2.71
NPORSEL	PERFS	SNDERR mmho/m	SNDERRM mmho/m	SPSHIFT mV	SRFTEMP degF	SZCOR	TDEPTH ft
Limestone	0	0	0	380	0	Off	5103

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

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)	
GR	44.50		GR-M&W (89-M&W)	3.00	3.50	50.00	
CNLSC	41.40		CNT-M&W (tk10-MW)	5.50	3.50	100.00	
CNSSC	40.65						
LSD	32.35		CDL-M&W (934-229)	8.50	4.00	250.00	
DCAL	32.33						
SSD	31.85						
			ML-PSI UDM ML (UDM-01) Stackable Microlog Tools	11.50	4.00	215.00	
MCAL	20.87						
MI	20.87						
MN	20.87						
RLL3	15.80						



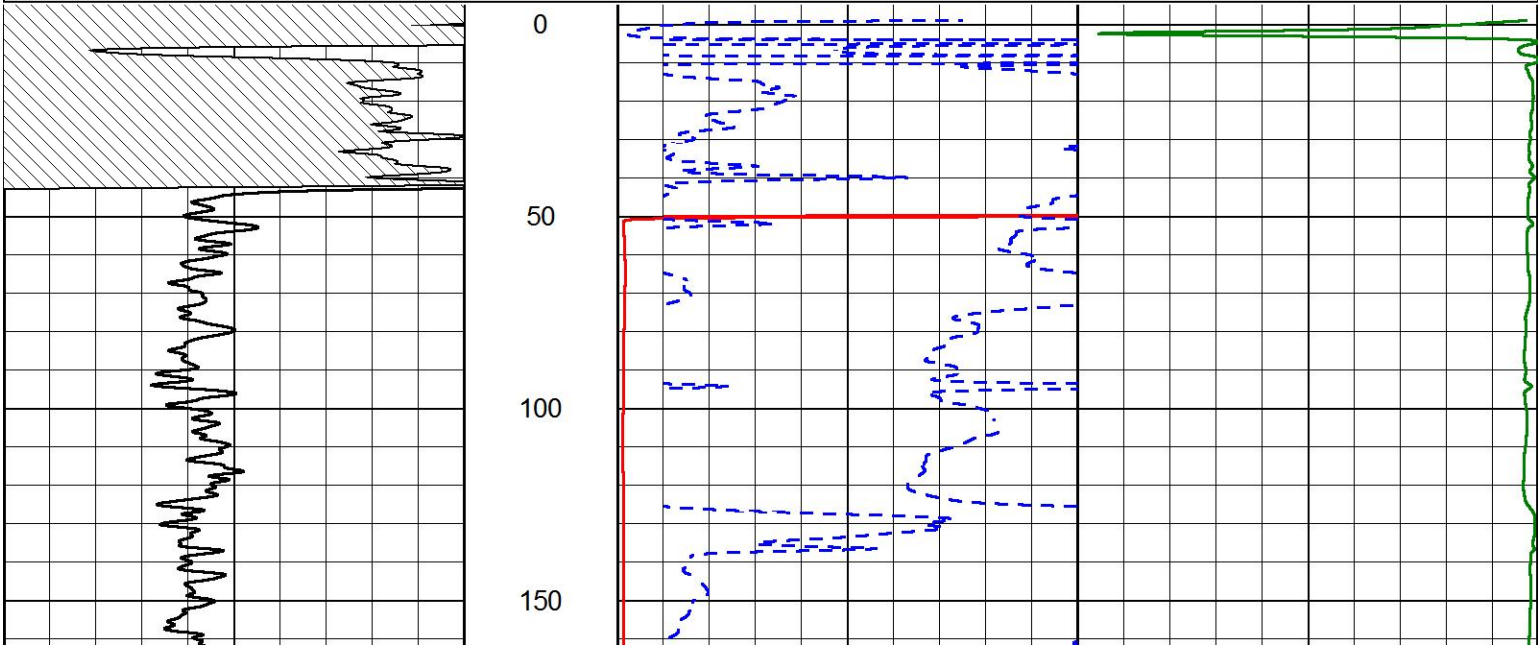
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 Total length: 47.00 ft
 Total weight: 835.00 lb
 O.D.: 4.00 in

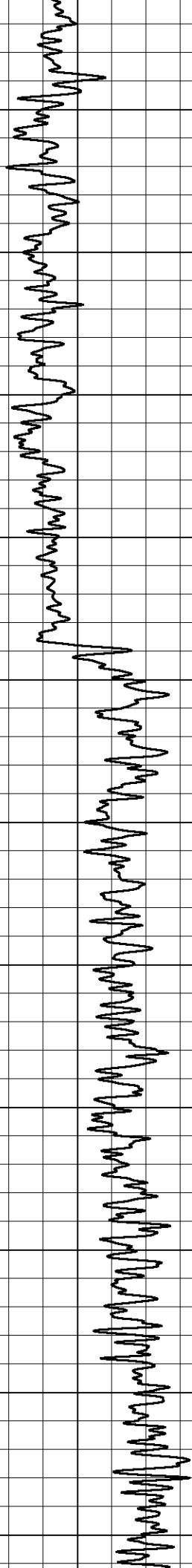


MAIN PASS

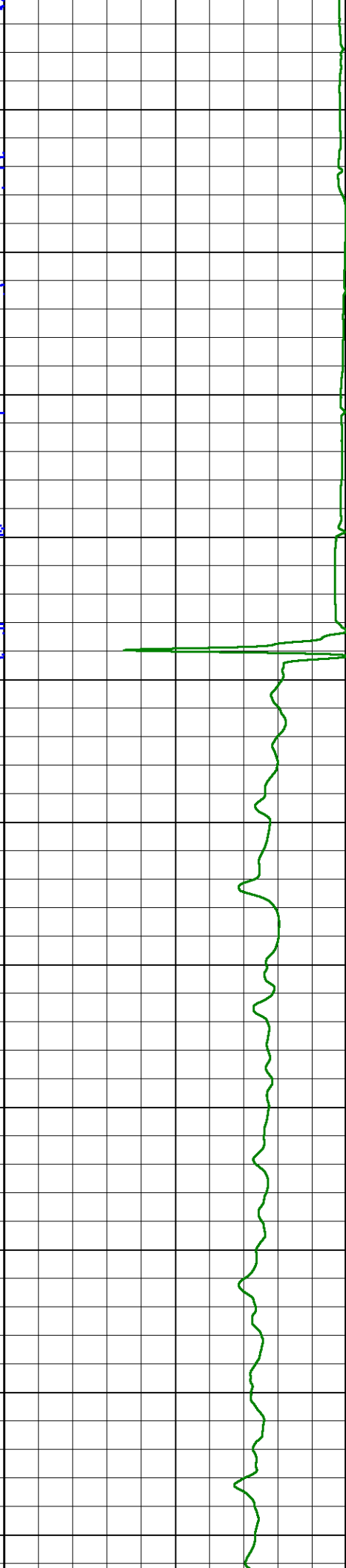
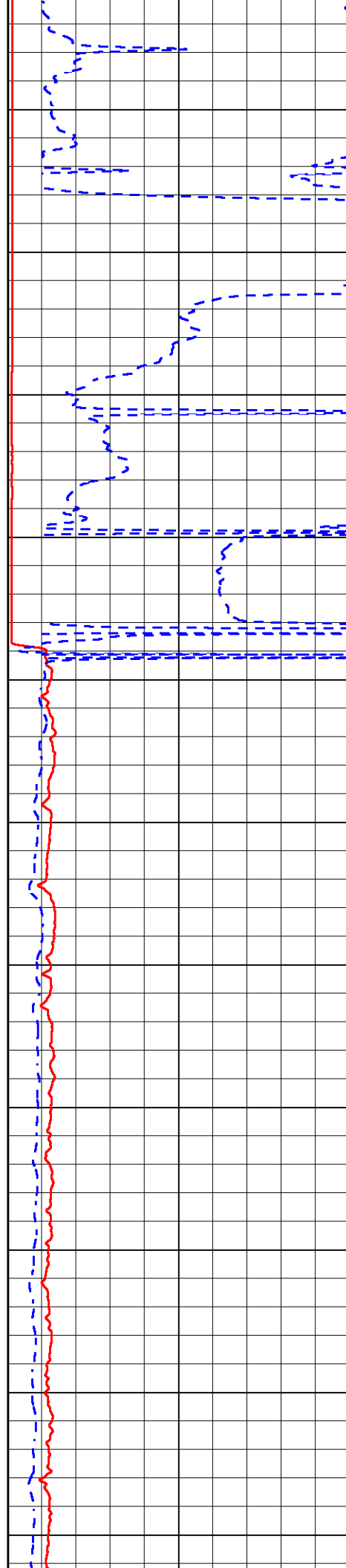
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 Dataset Creation: Fri Jan 17 00:32:42 2020
 Charted by: Depth in Feet scaled 1:600

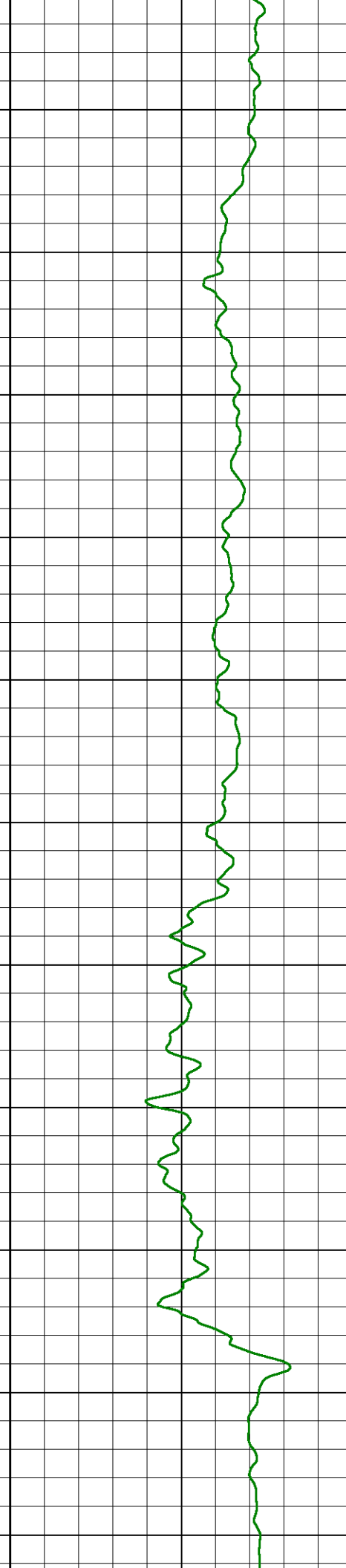
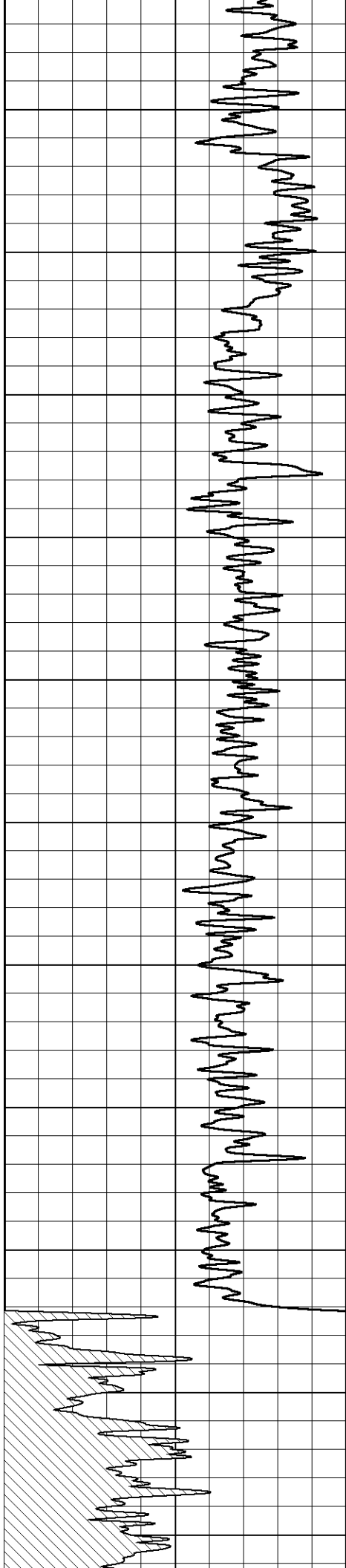
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0	RLL3 (Ohm-m)	50			
0	DEEP RESISTIVITY (Ohm-m)	50			
50	RLL3 (Ohm-m)	200			
50	RILD (Ohm-m)	200			

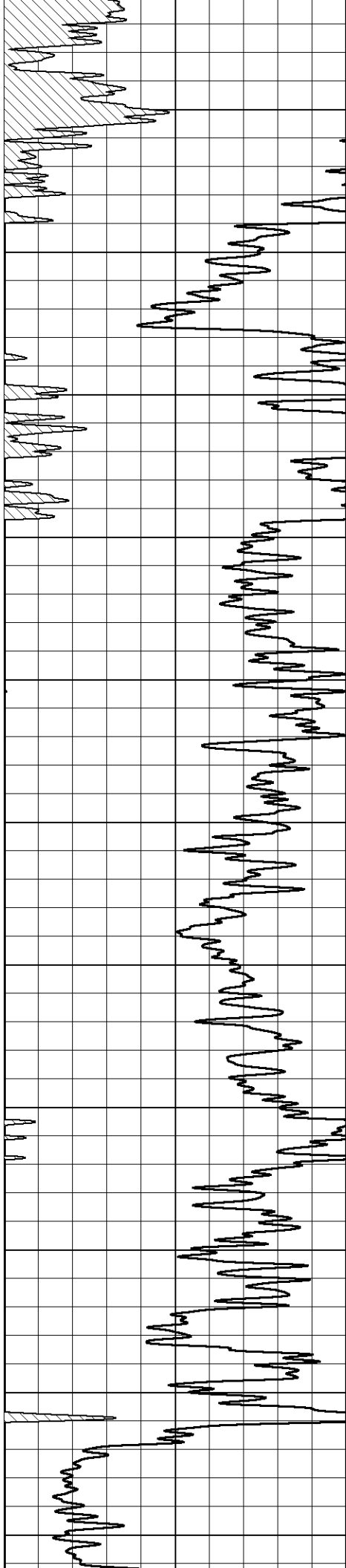




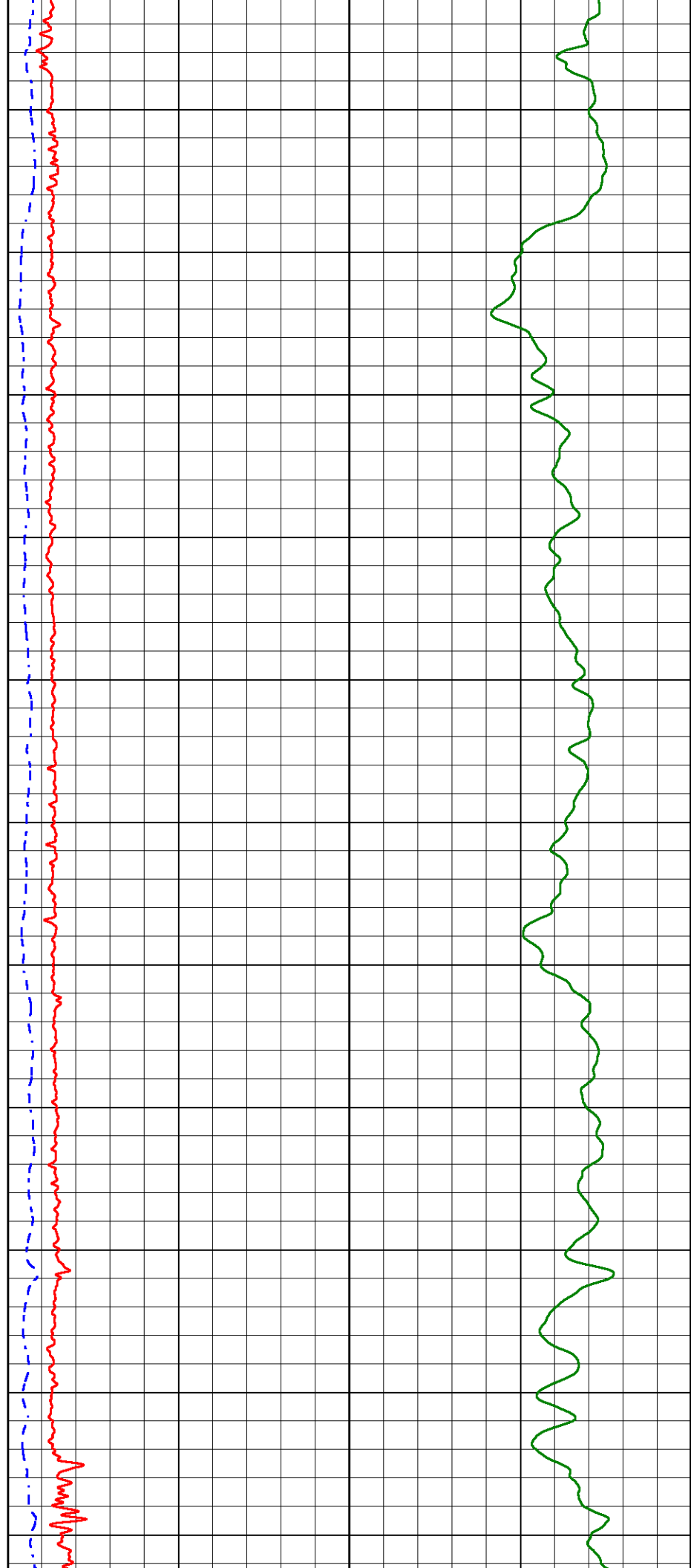
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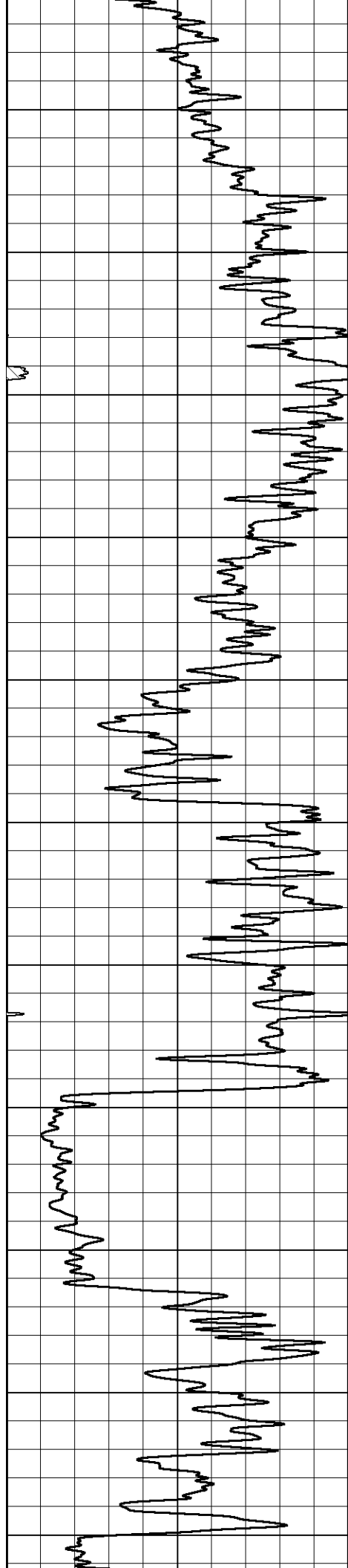




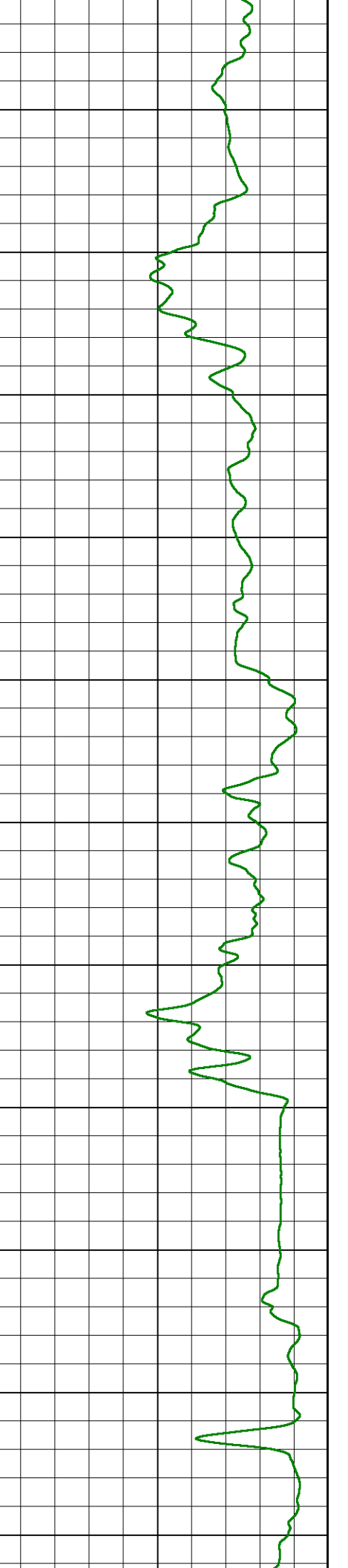
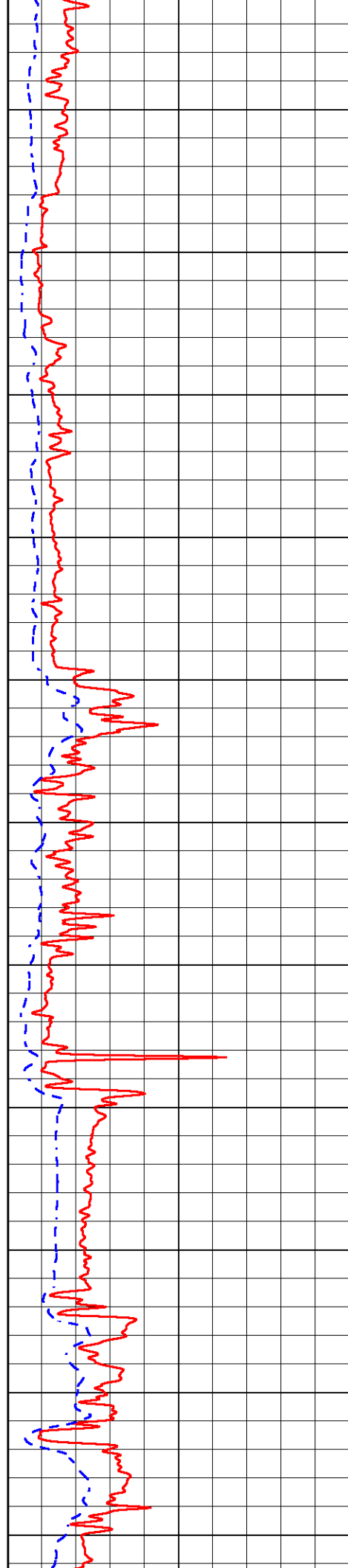


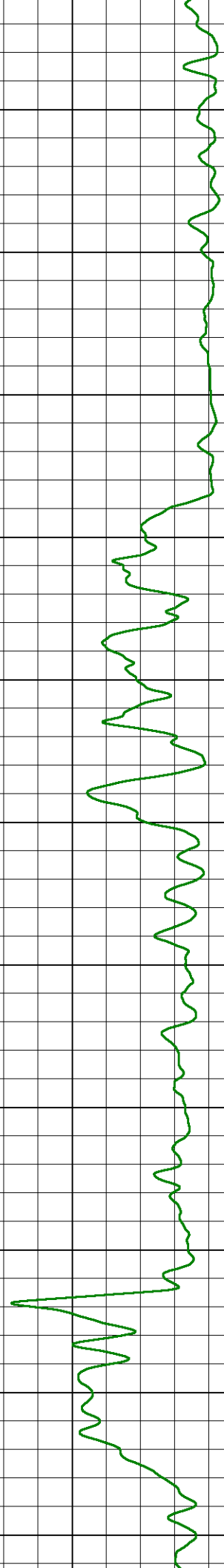
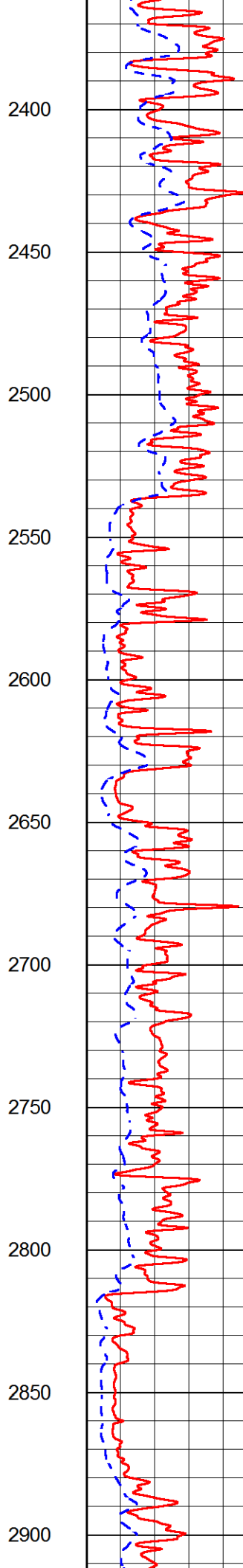
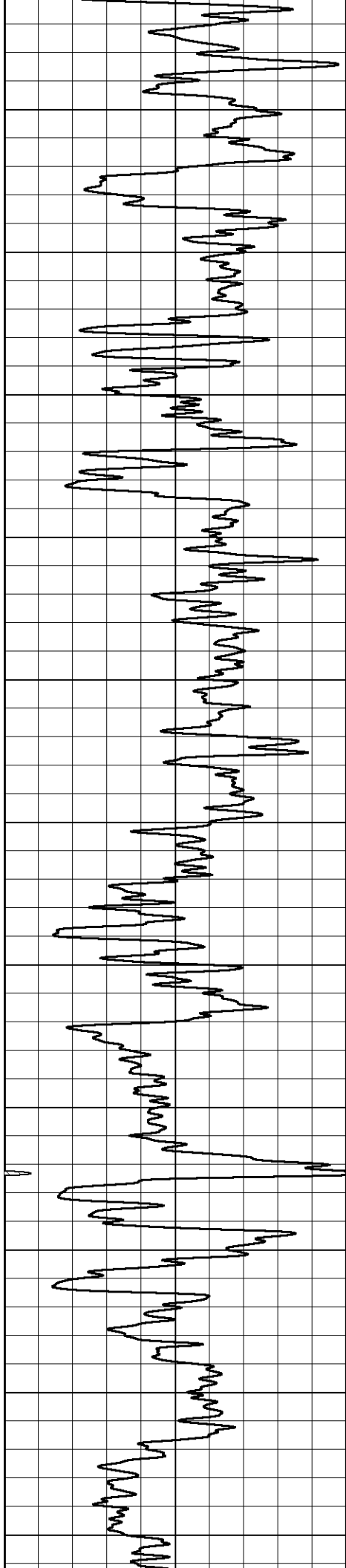
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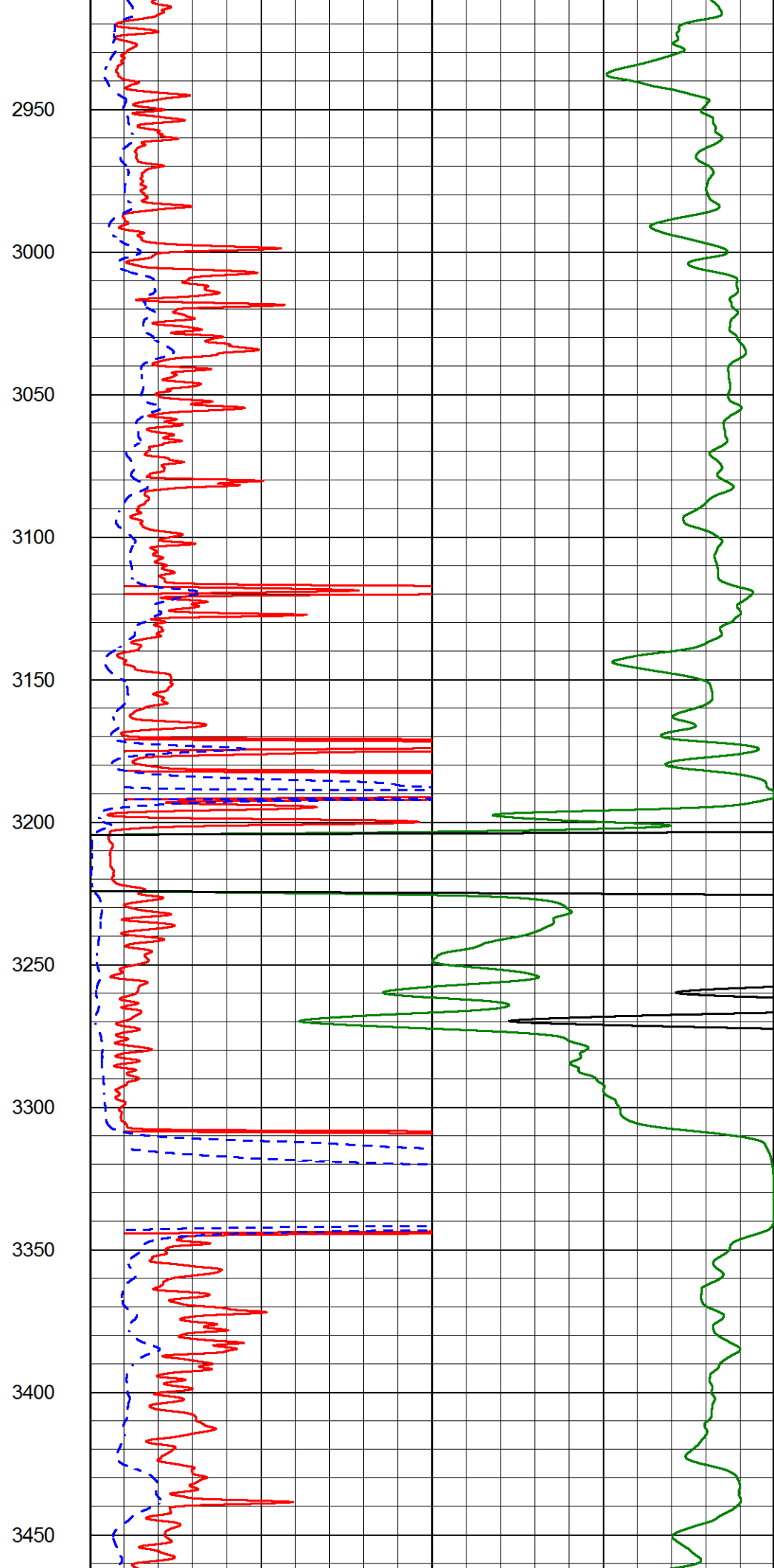
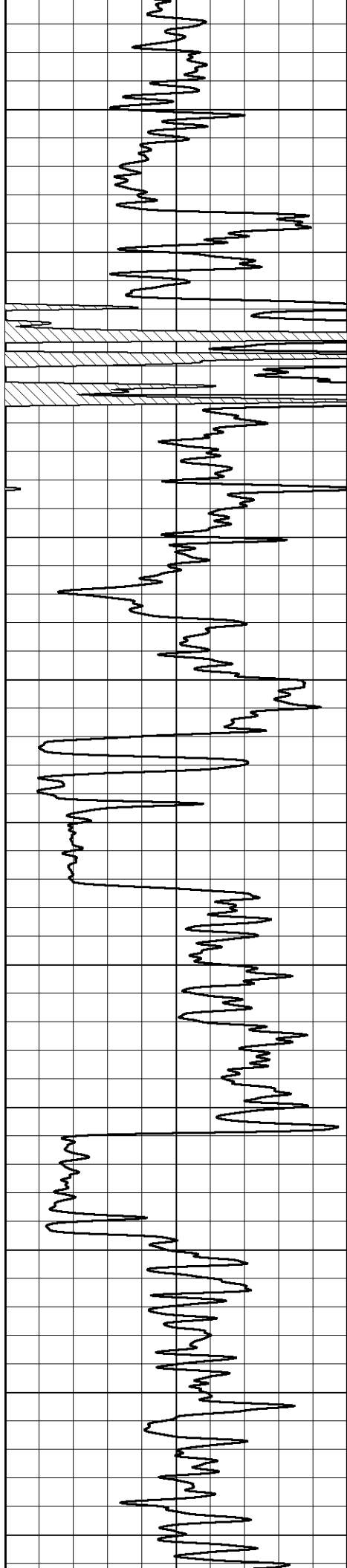


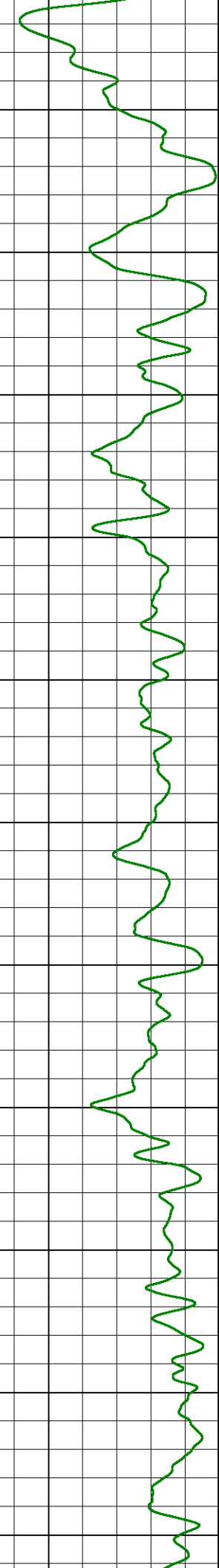
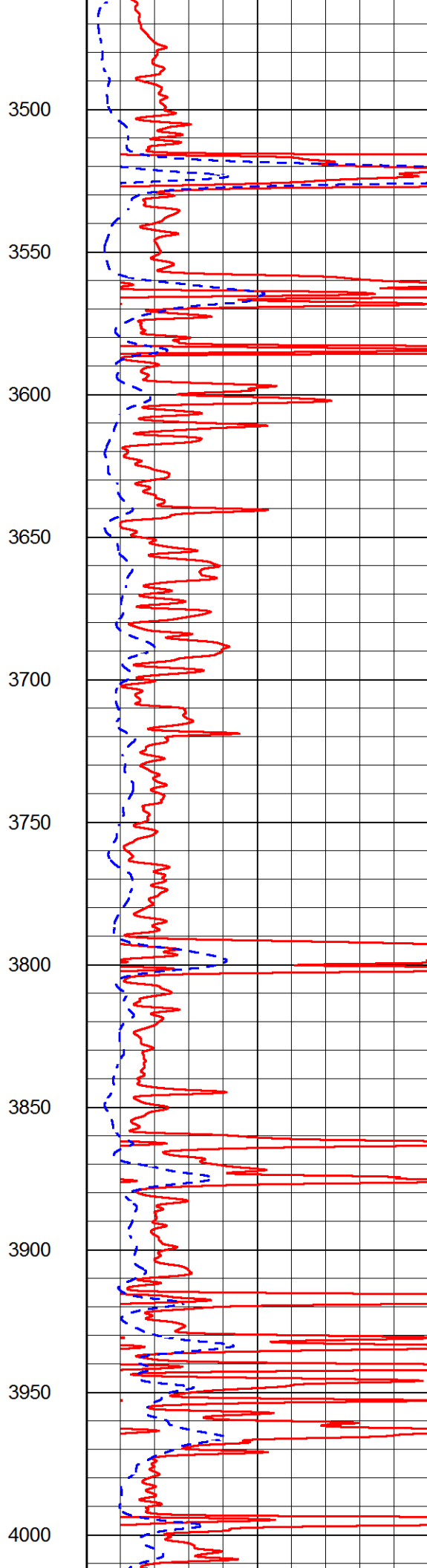
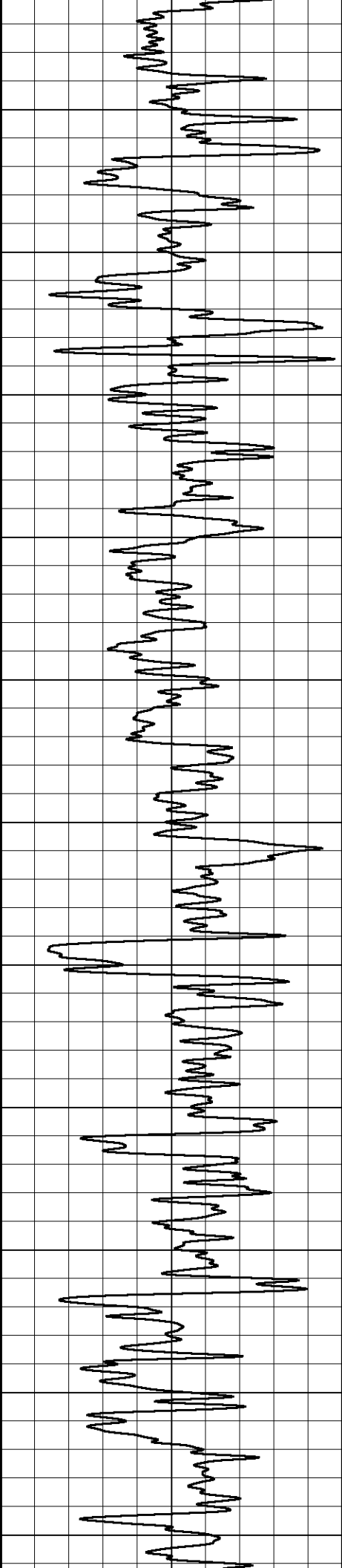


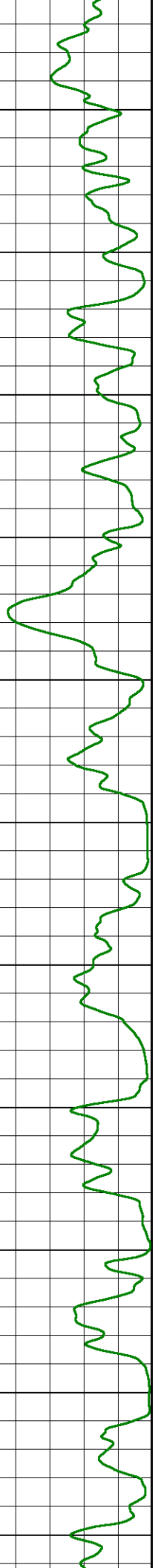
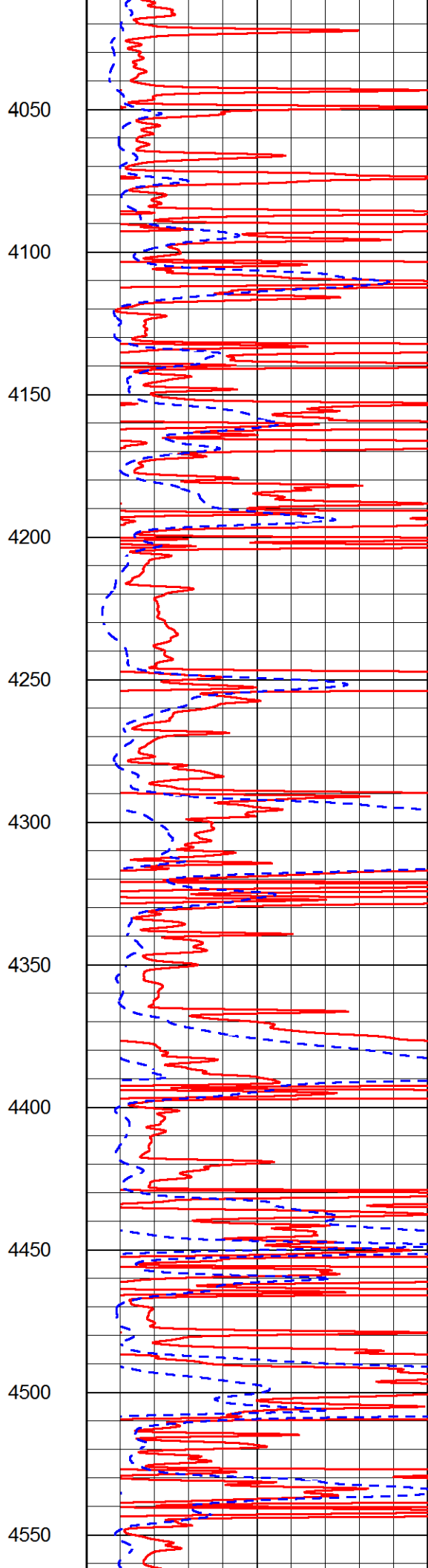
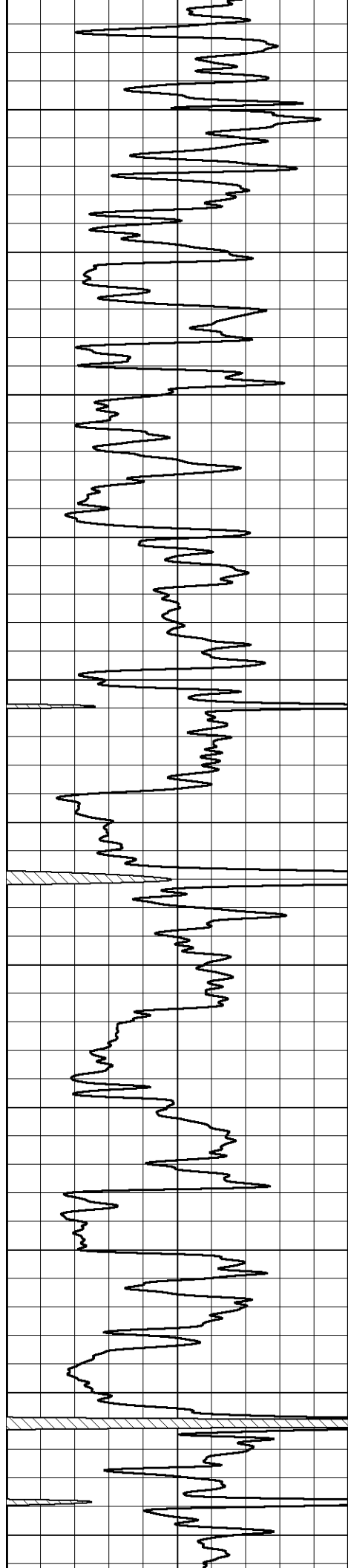
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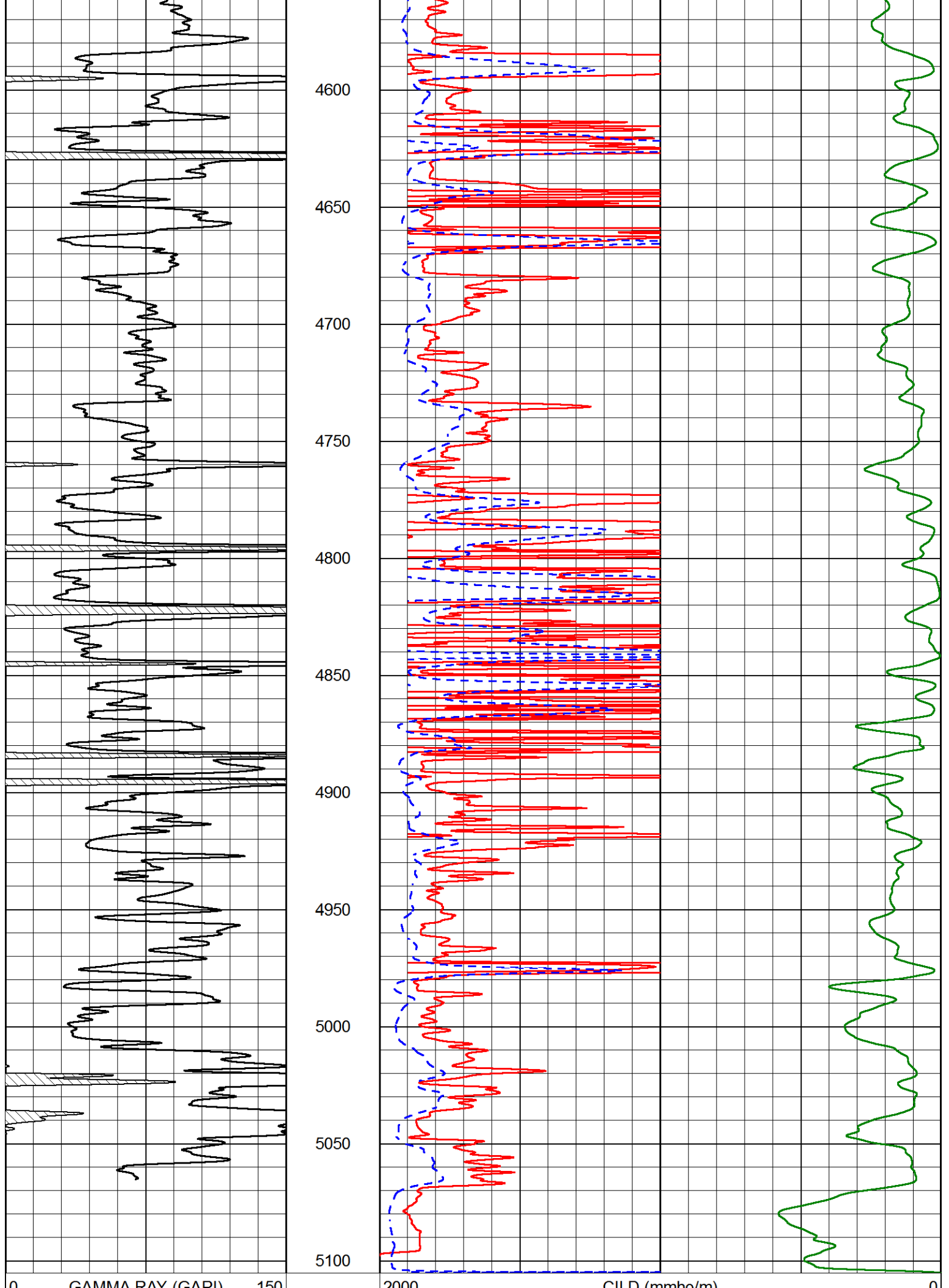












GAMMA RAY (GAPI) 150

2000 RLL3 (Ohm-m) 50

0 DEEP RESISTIVITY (Ohm-m) 50

50 RLL3 (Ohm-m) 200

50 RILD (Ohm-m) 200

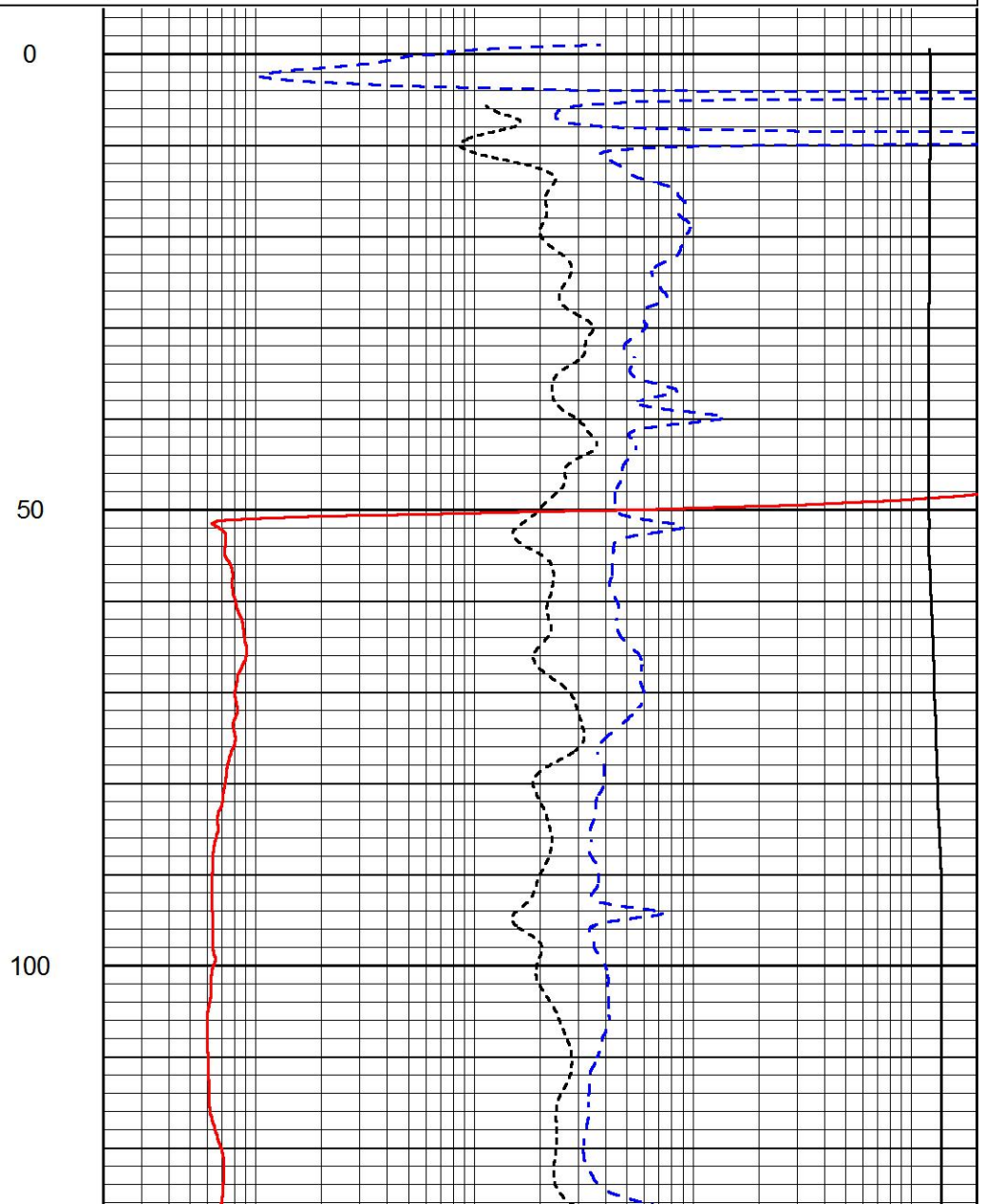
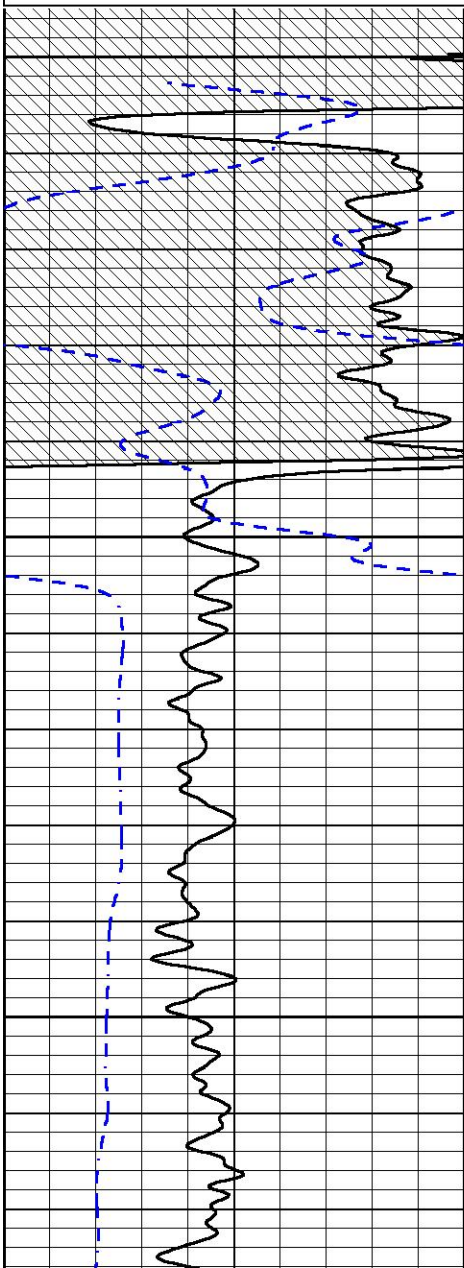


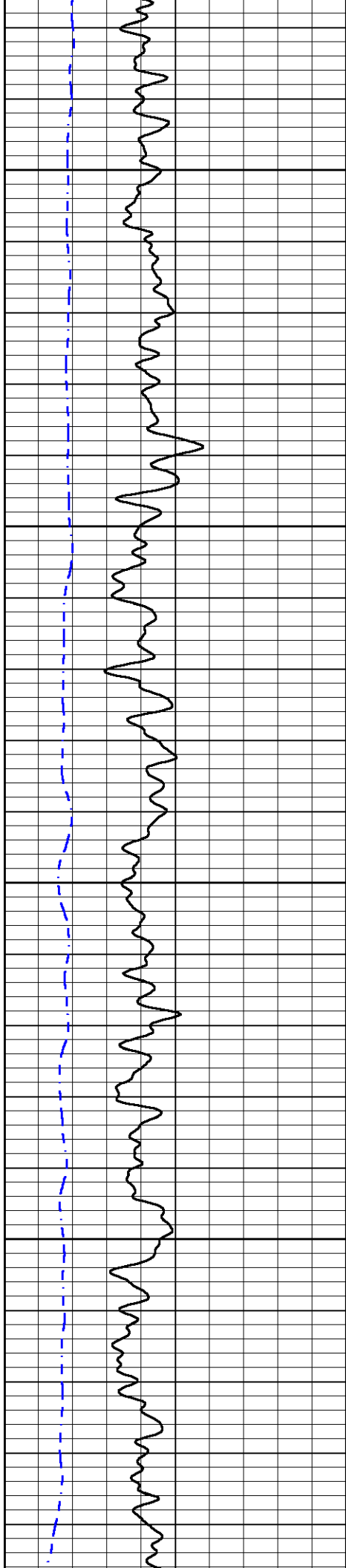
MAIN PASS

Database File murfin_burr_1_6.db
 Dataset Pathname stackml/pass3.1
 Presentation Format dil
 Dataset Creation Fri Jan 17 00:32:42 2020
 Charted by Depth in Feet scaled 1:240

0 GAMMA RAY (GAPI) 150
 -200 SP (mV) 0

0.2 DEEP RESISTIVITY (Ohm-m) 2000
 0.2 MEDIUM RESISTIVITY (Ohm-m) 2000
 0.2 RLL3 (Ohm-m) 2000
 15000 LINE TENSION (lb) 0



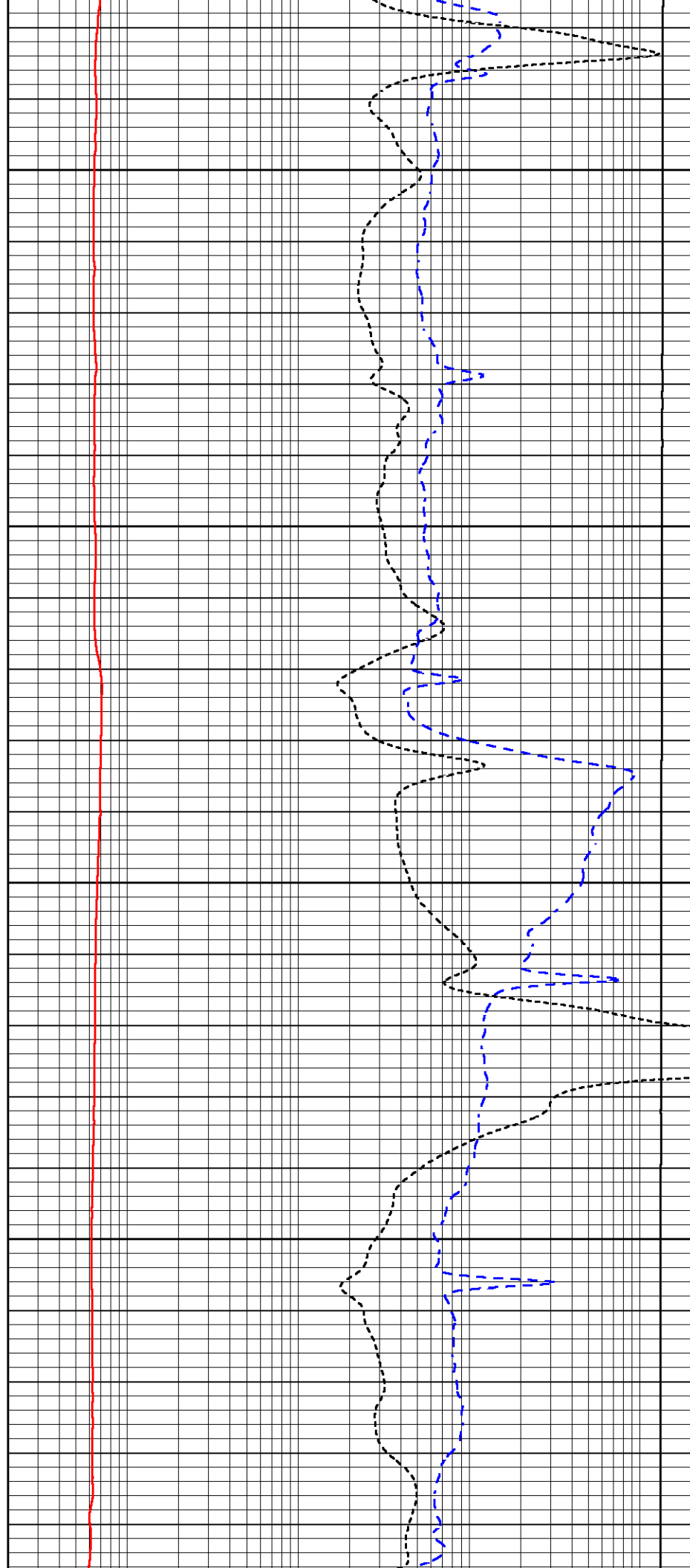


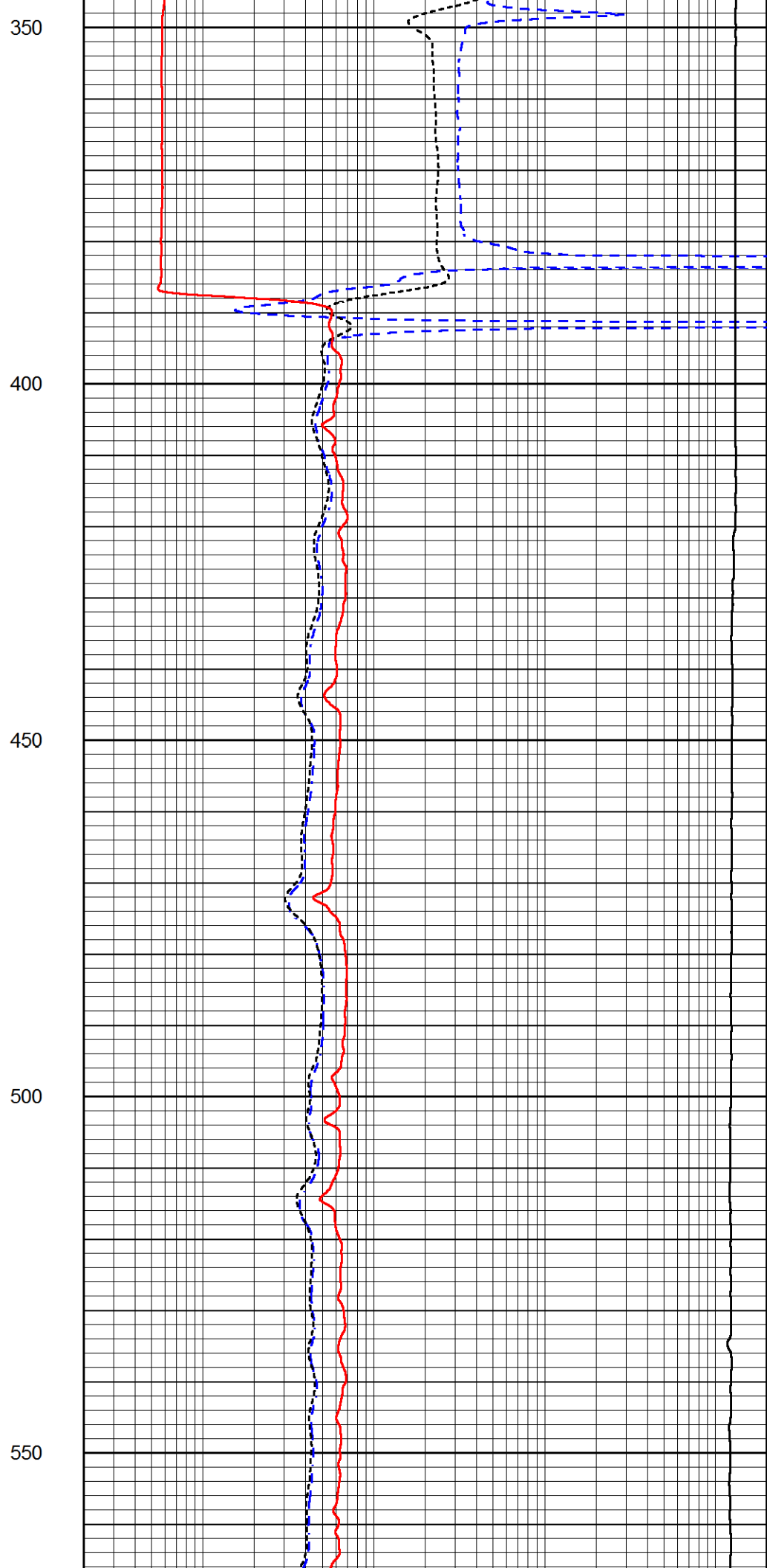
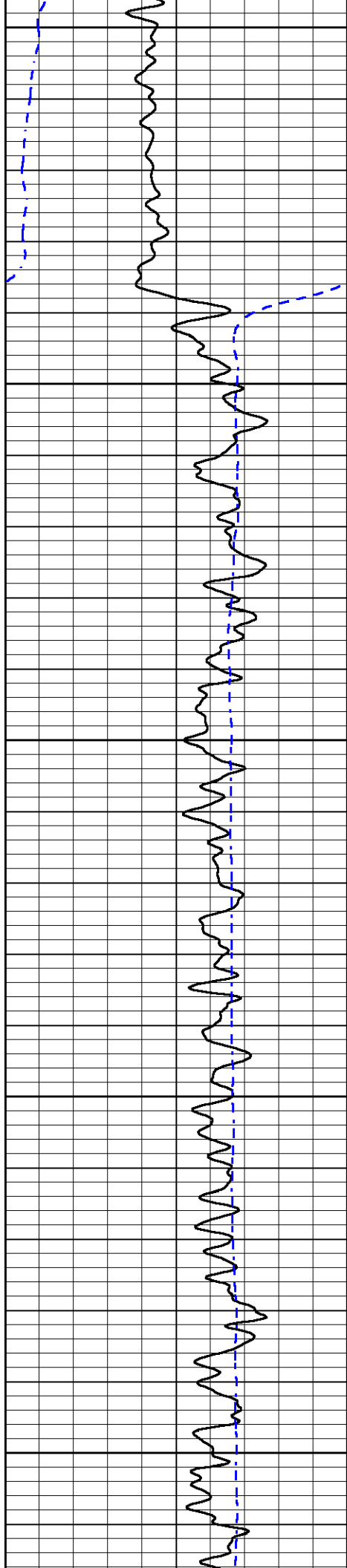
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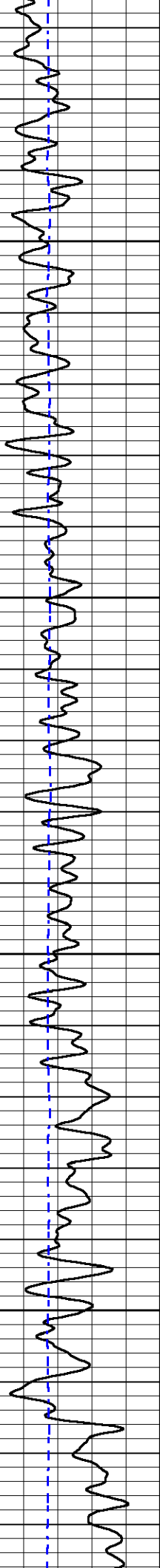
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250

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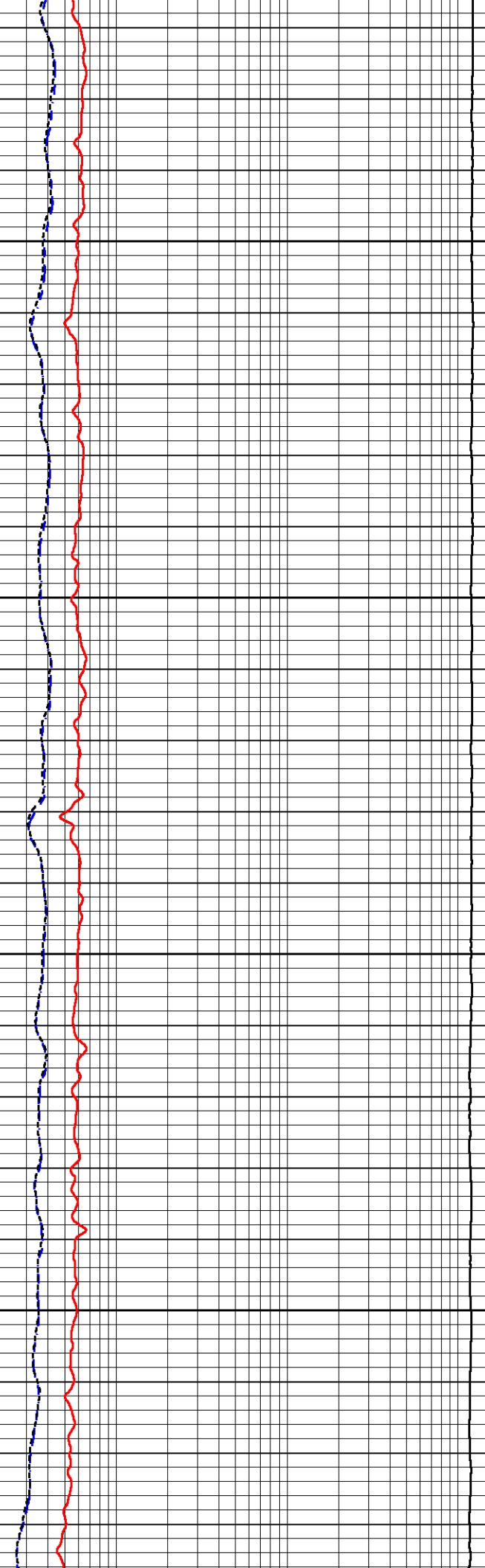


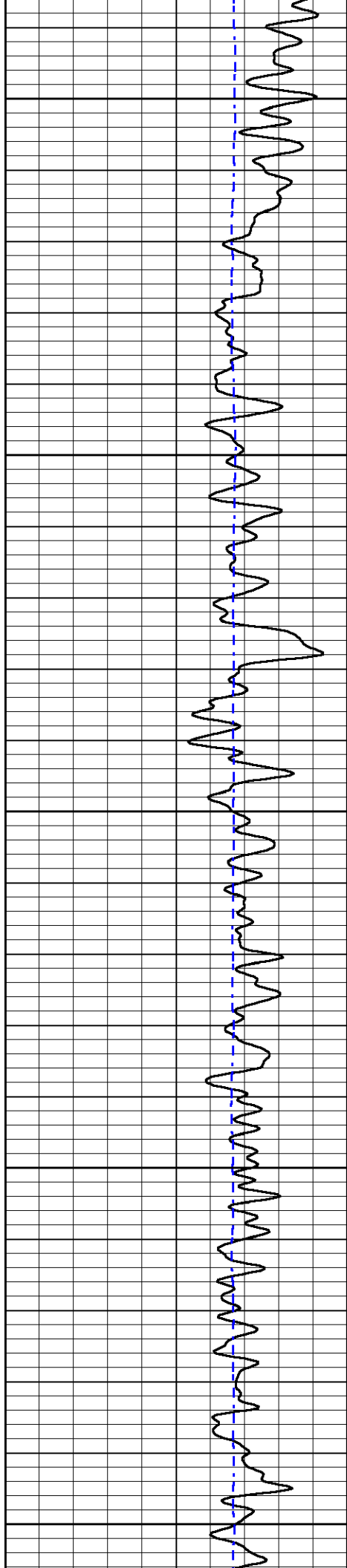
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700

750





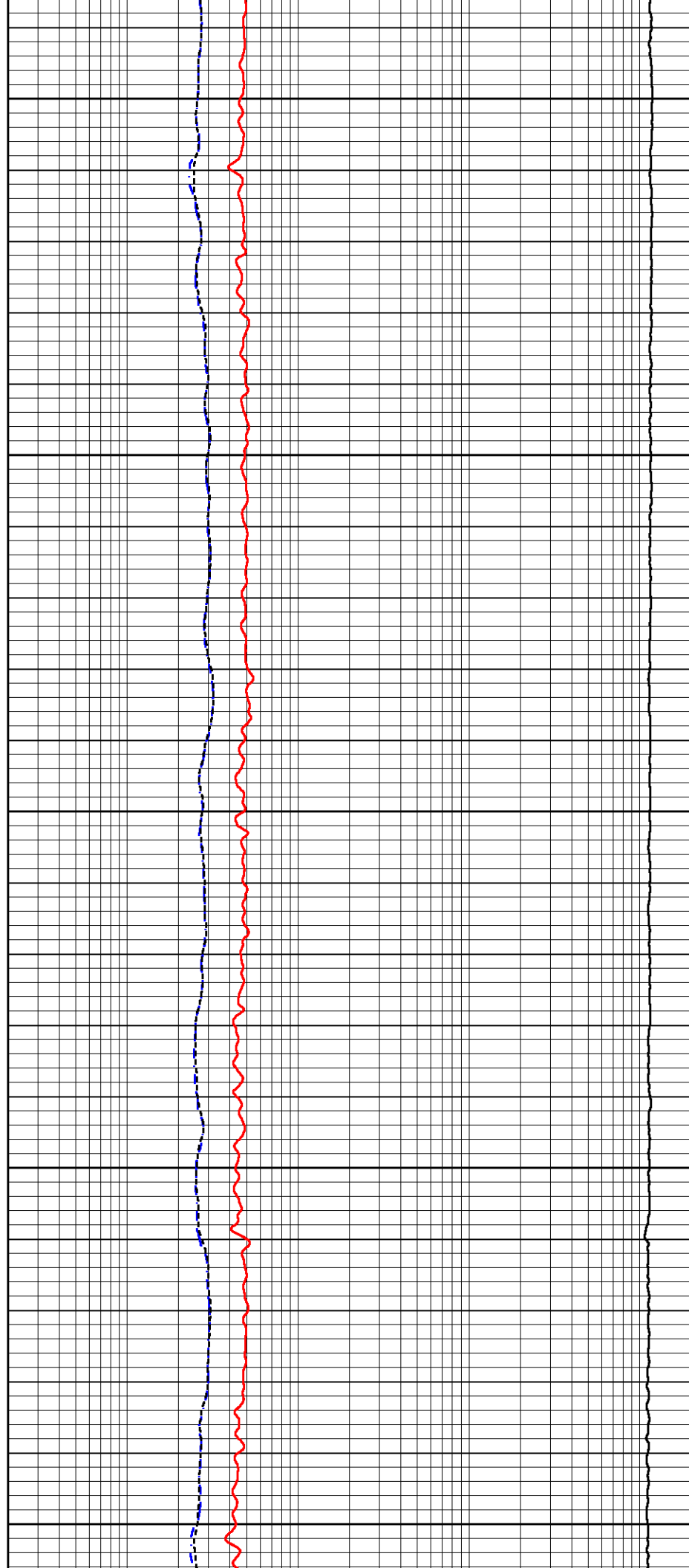
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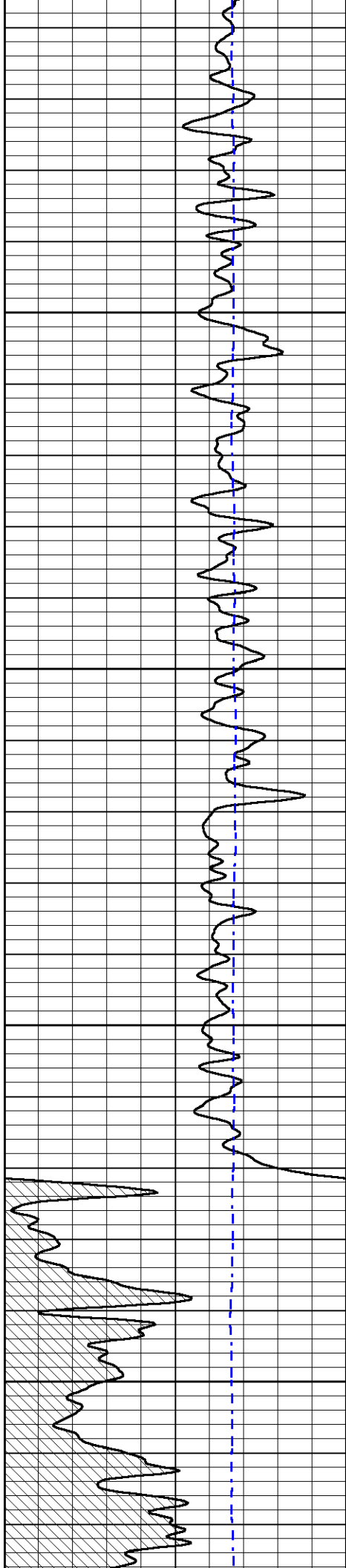
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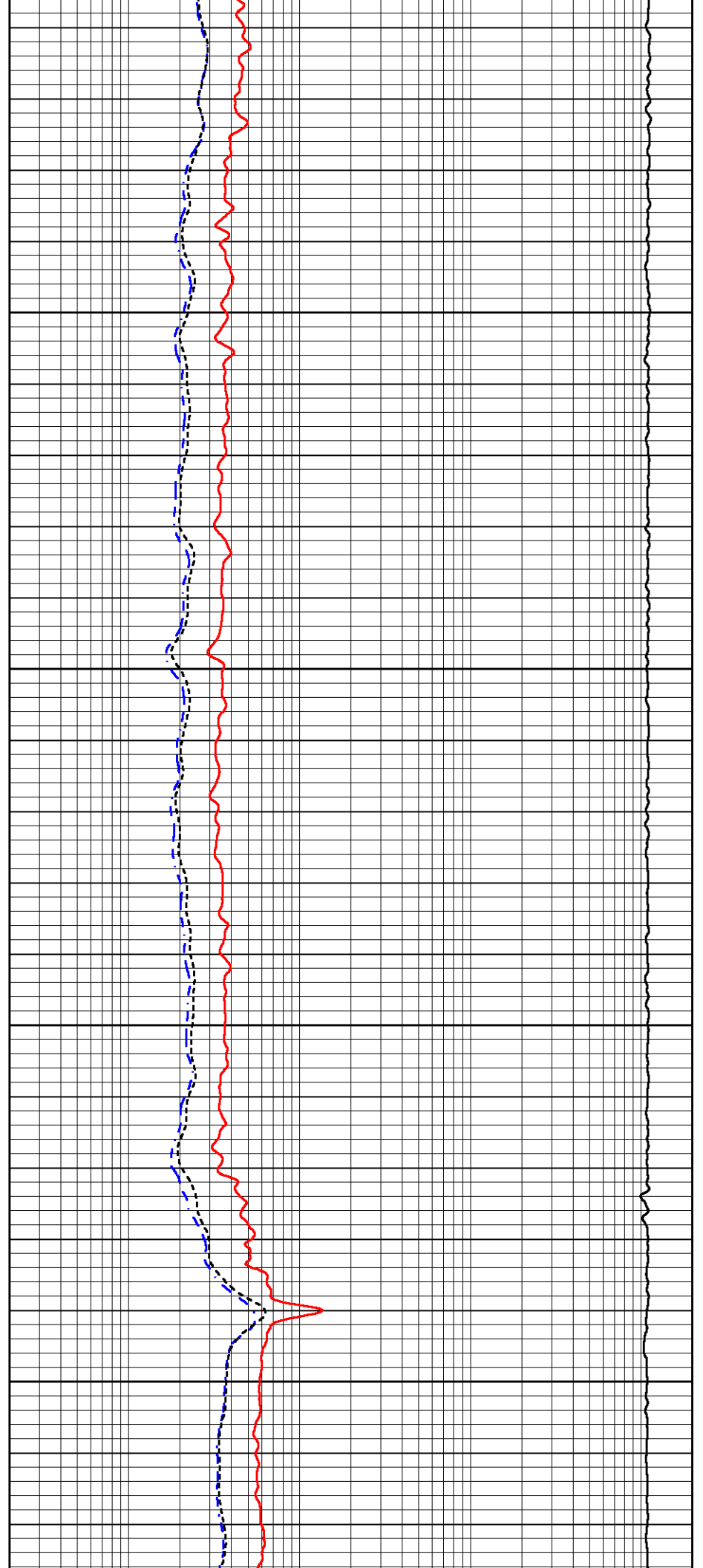


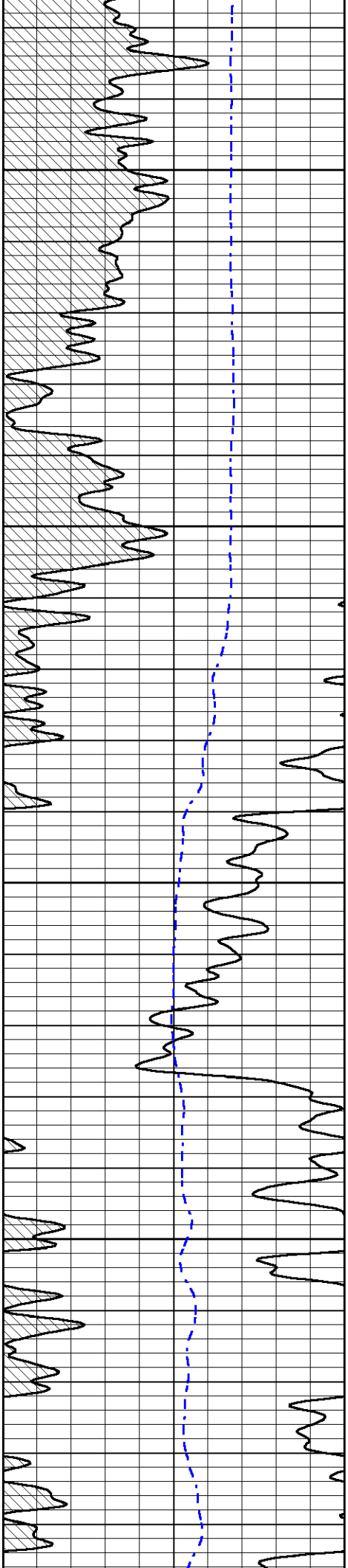
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1150

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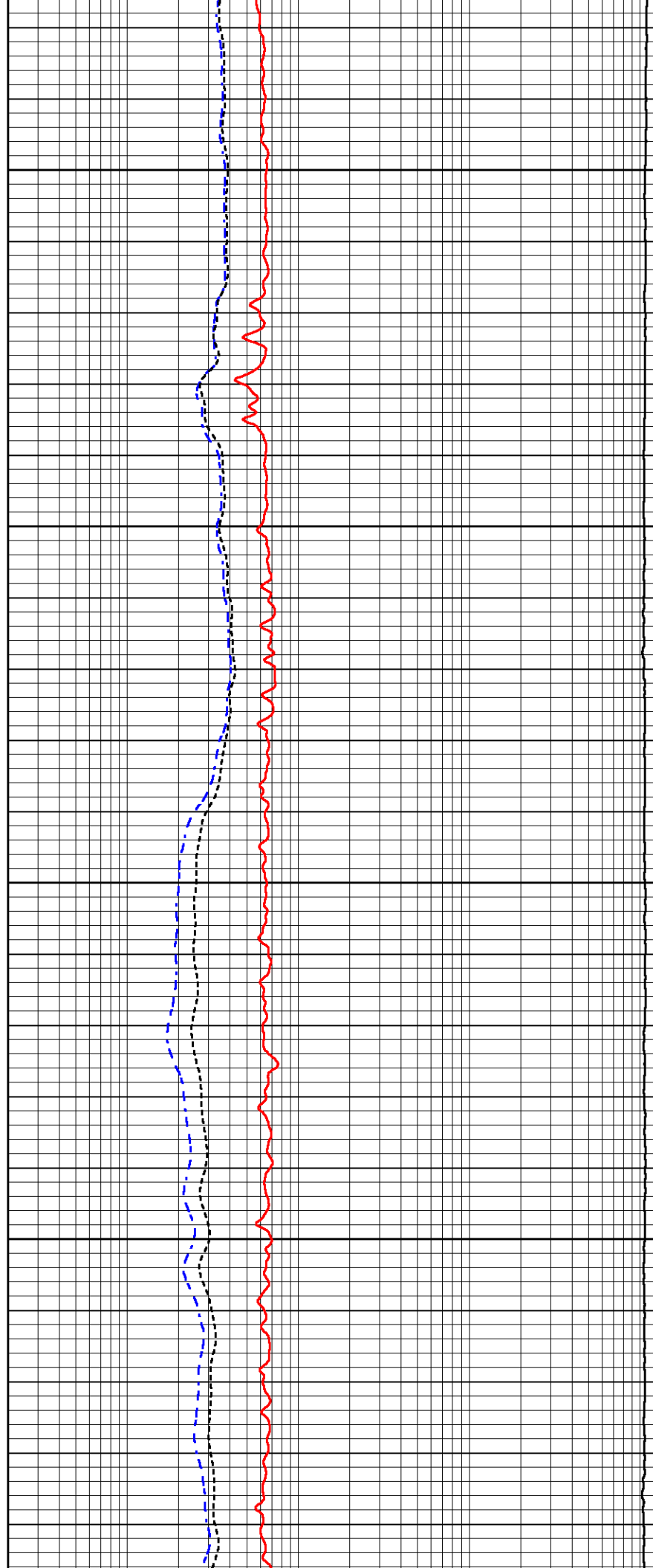


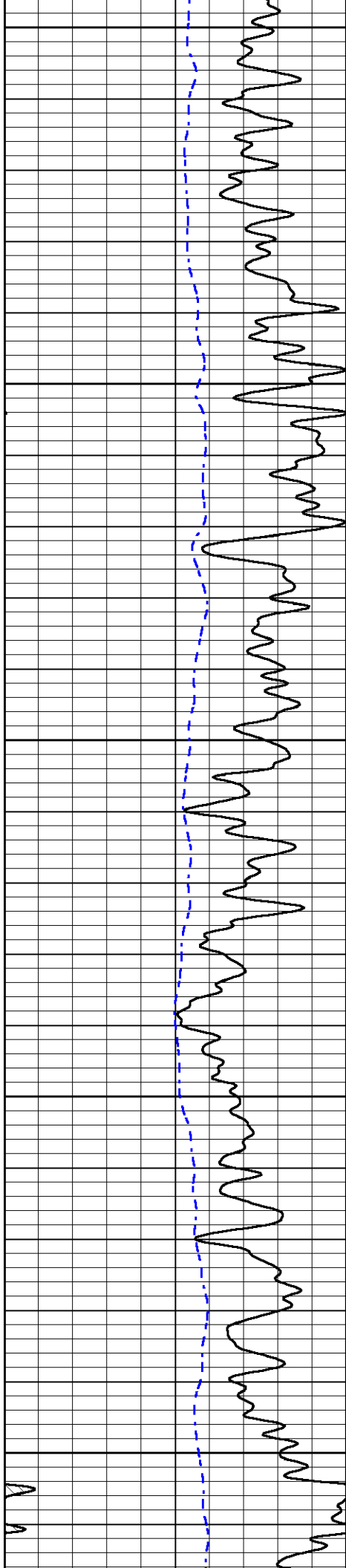
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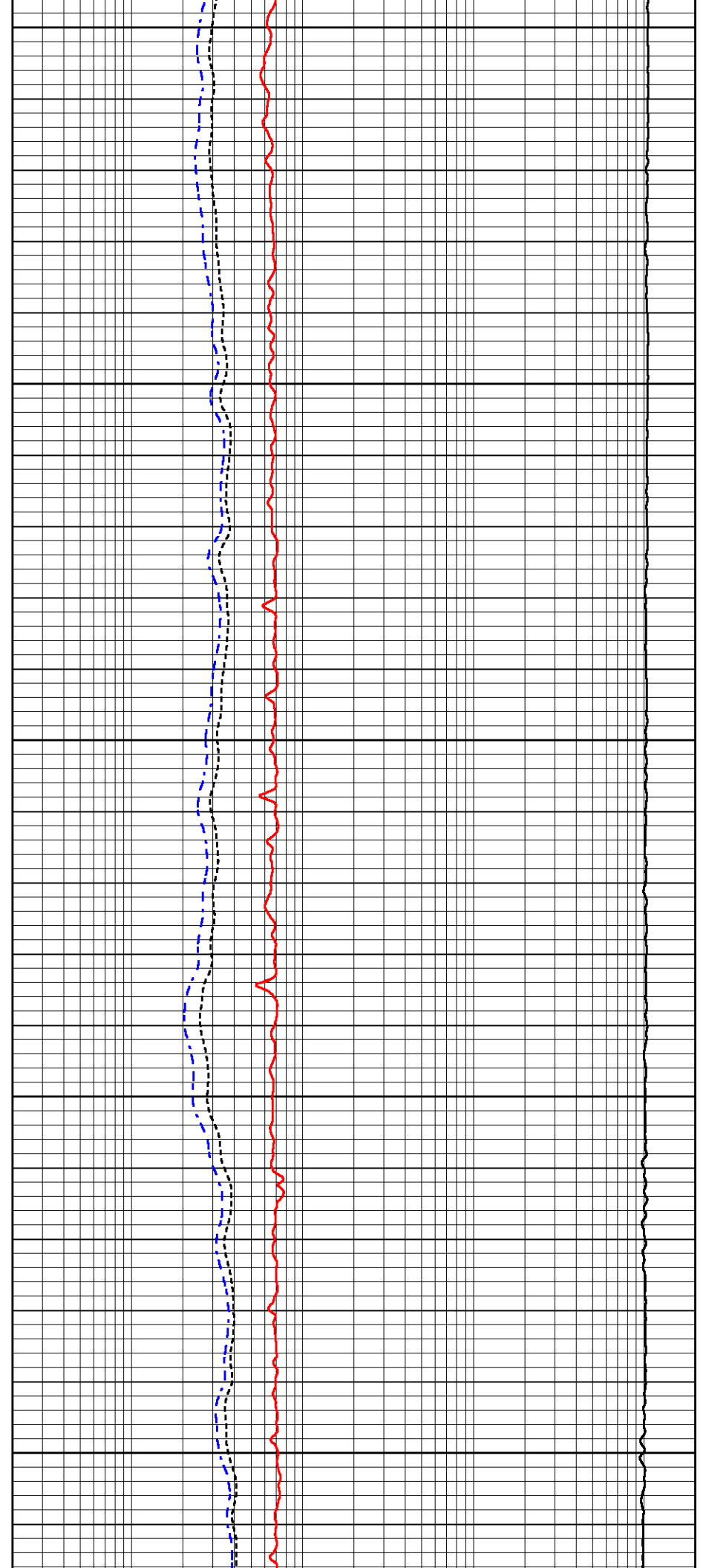
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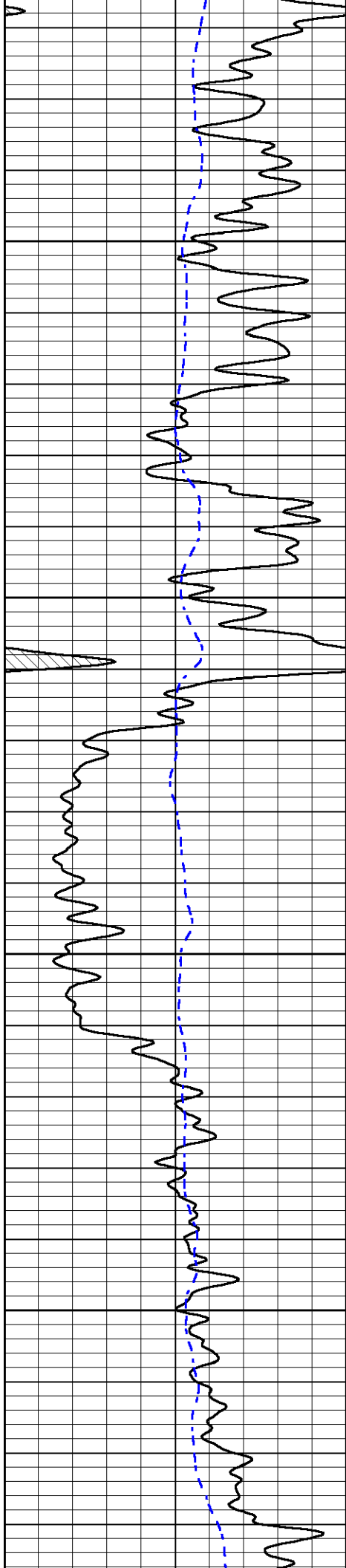
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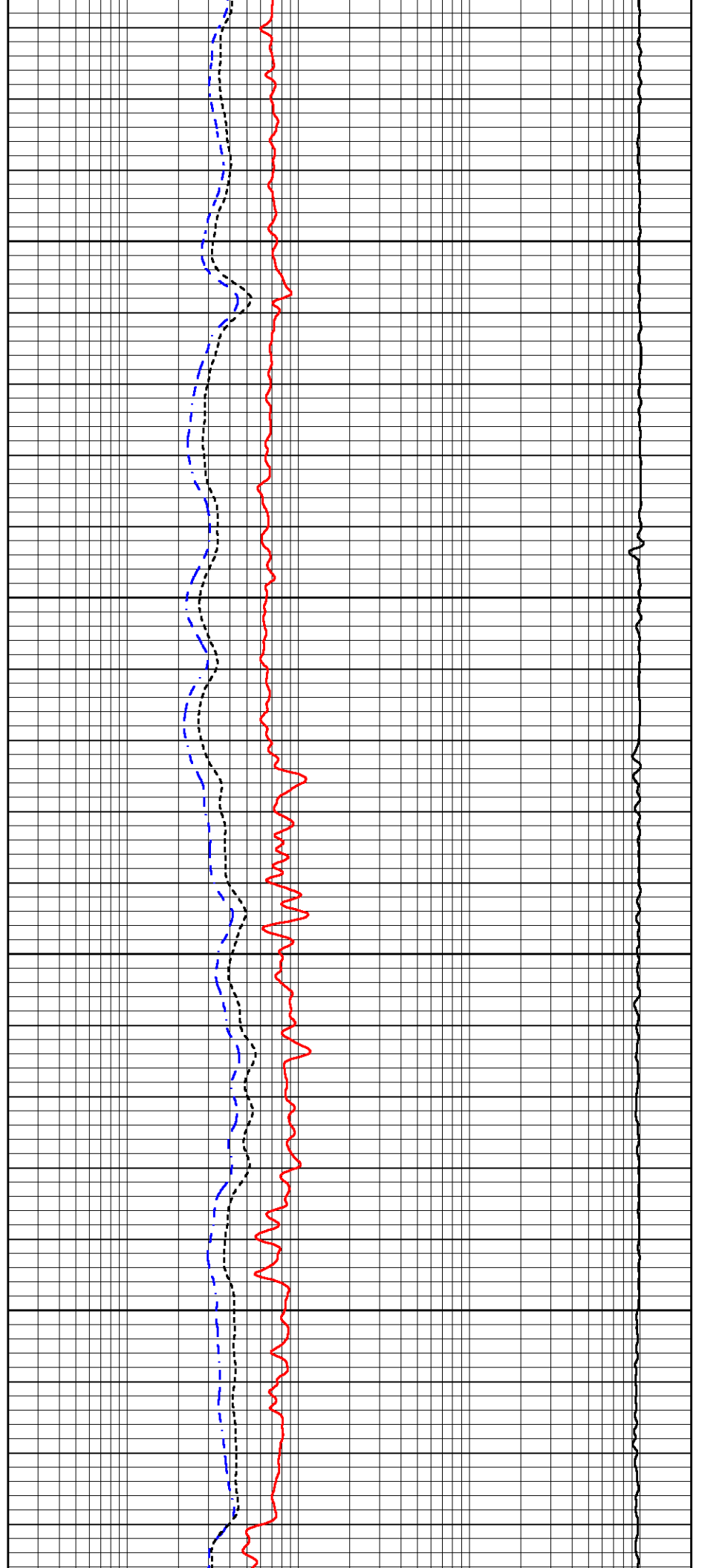


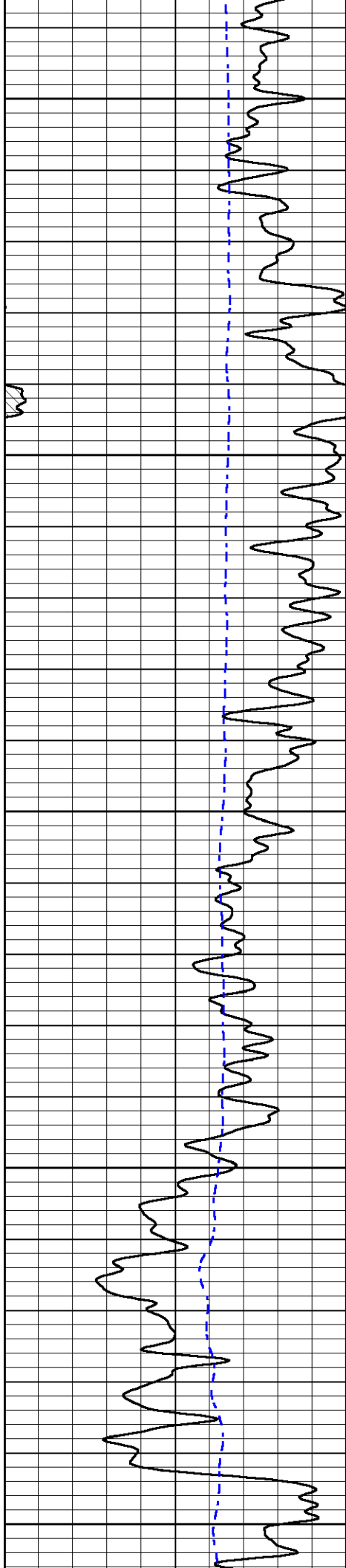
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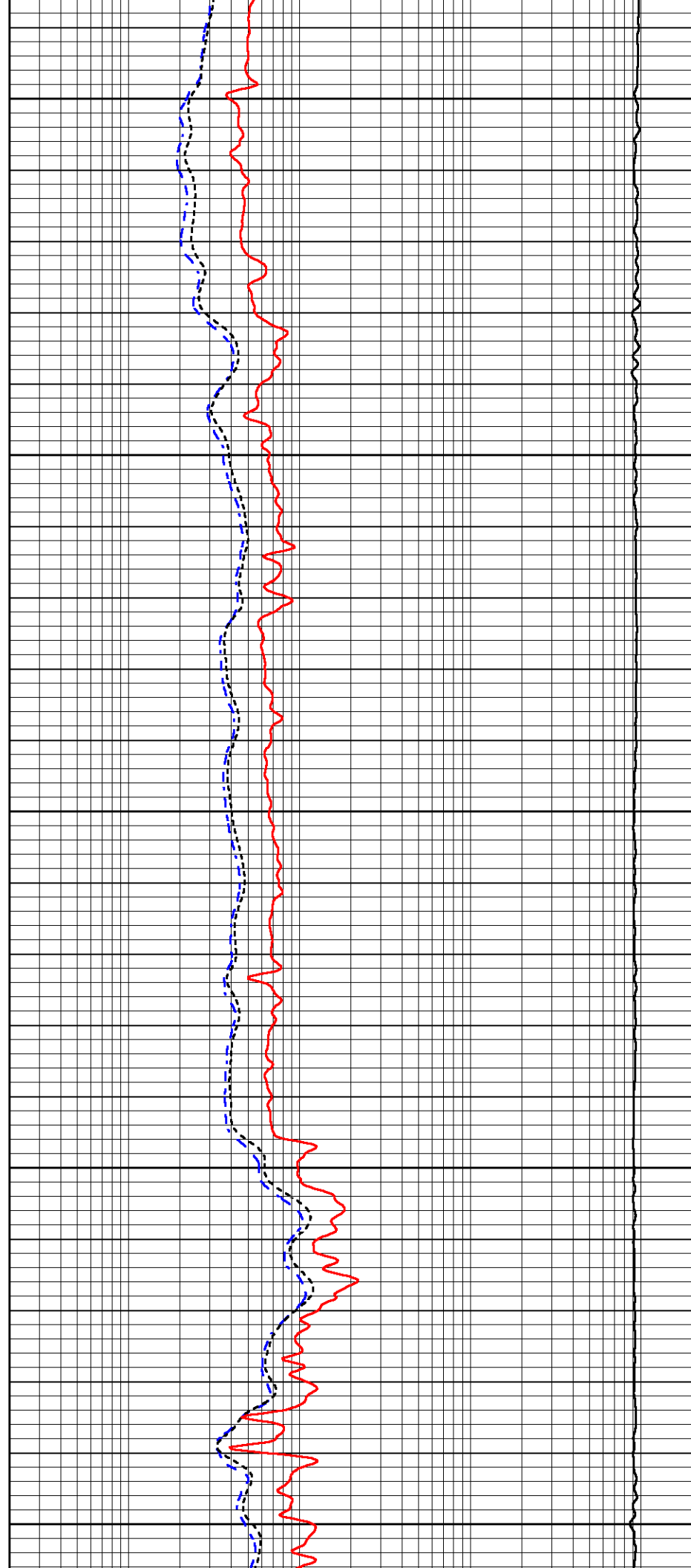
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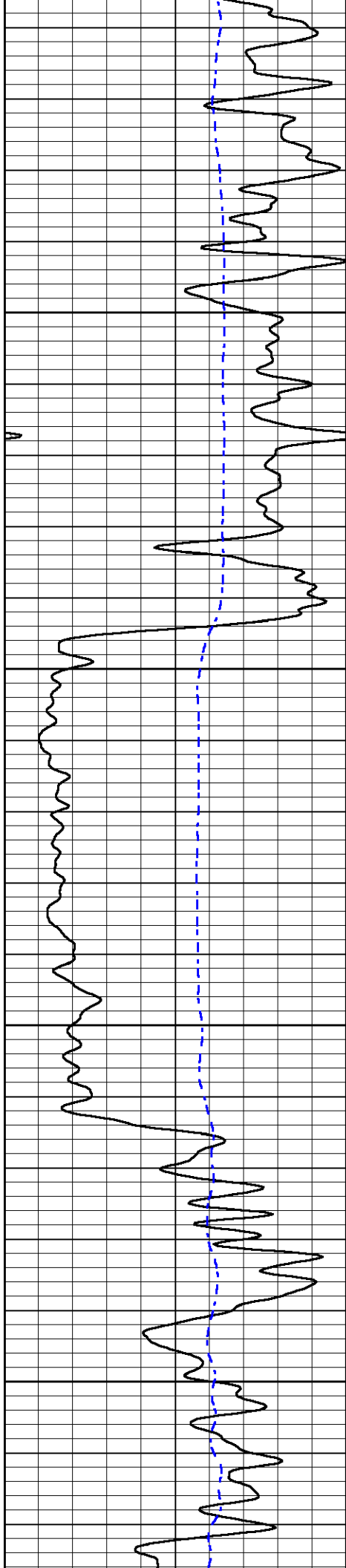
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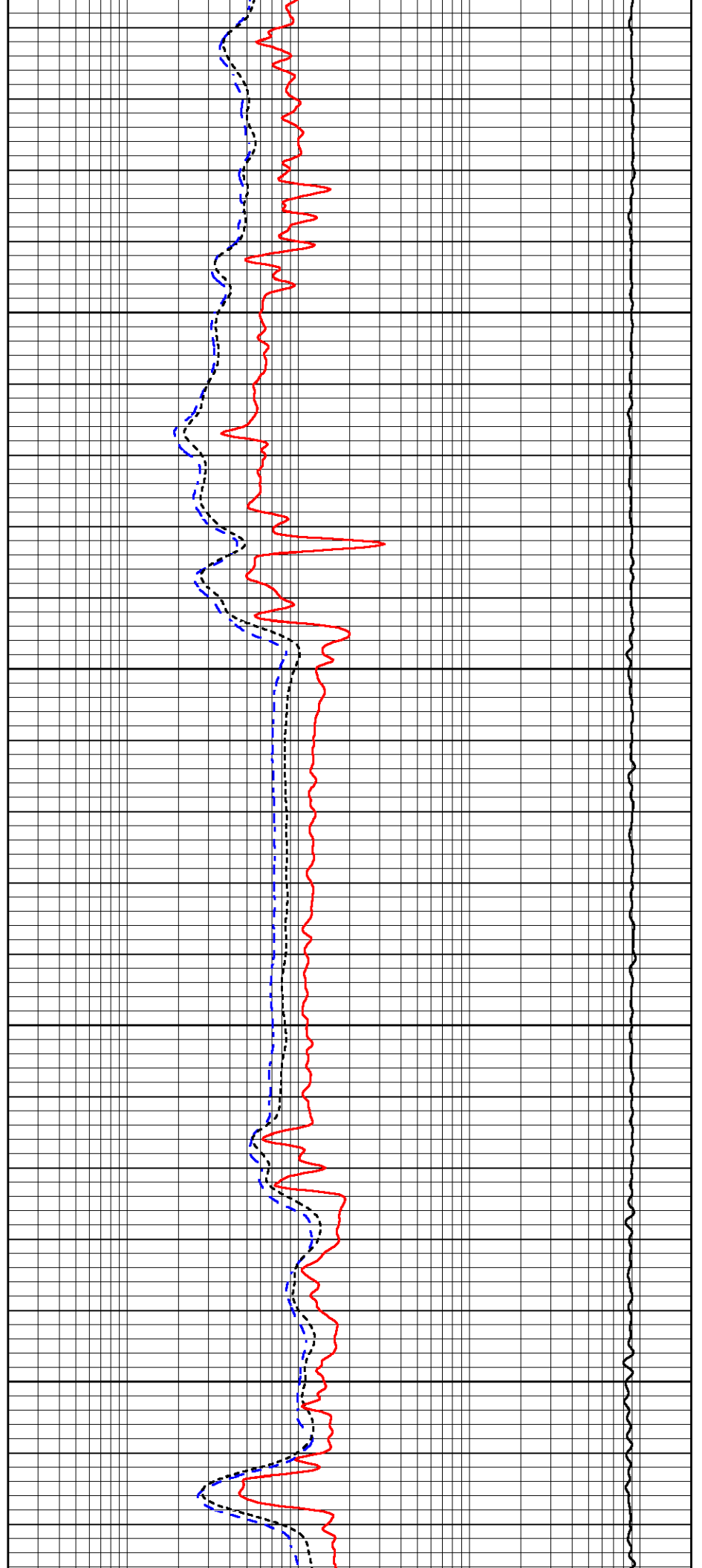


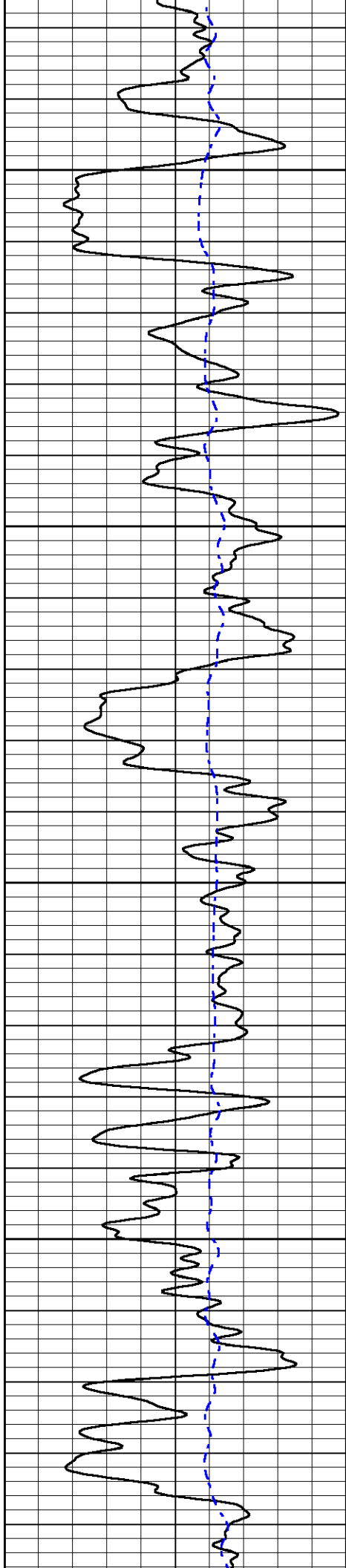
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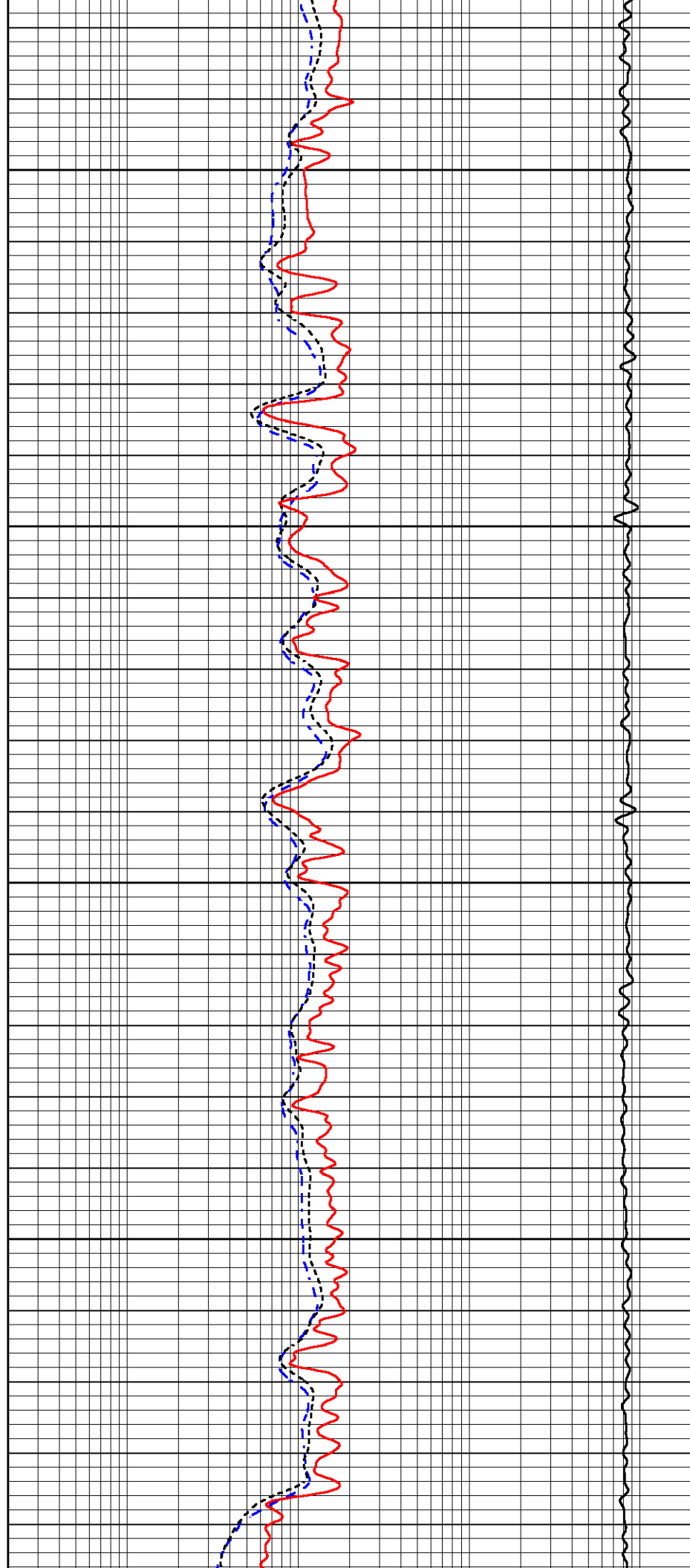


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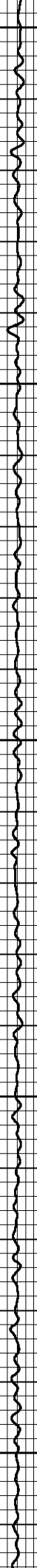
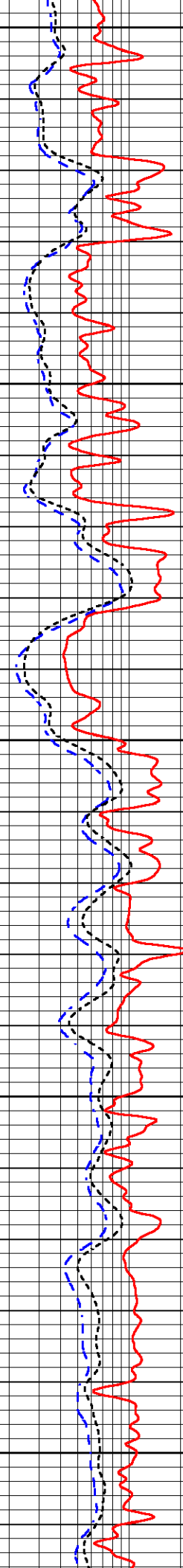
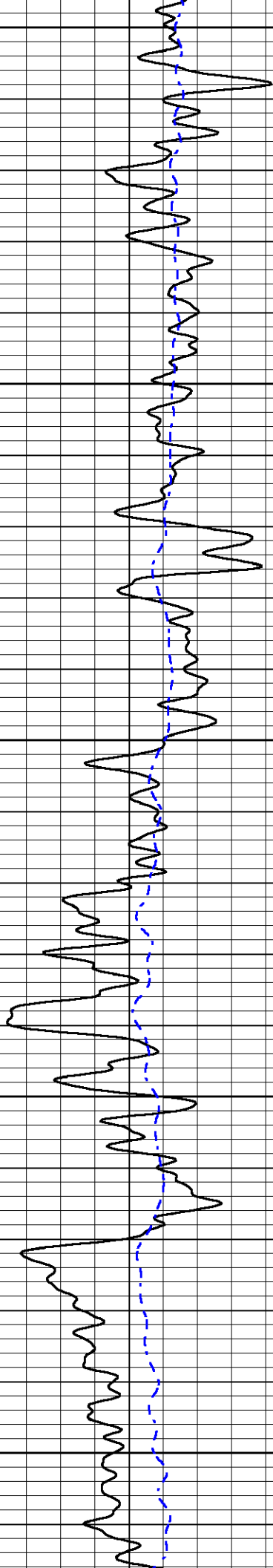
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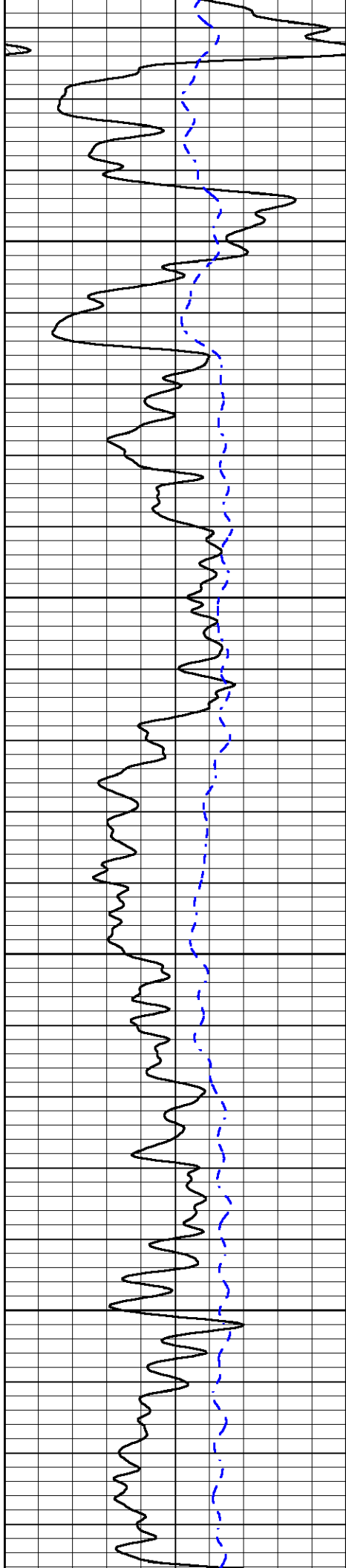
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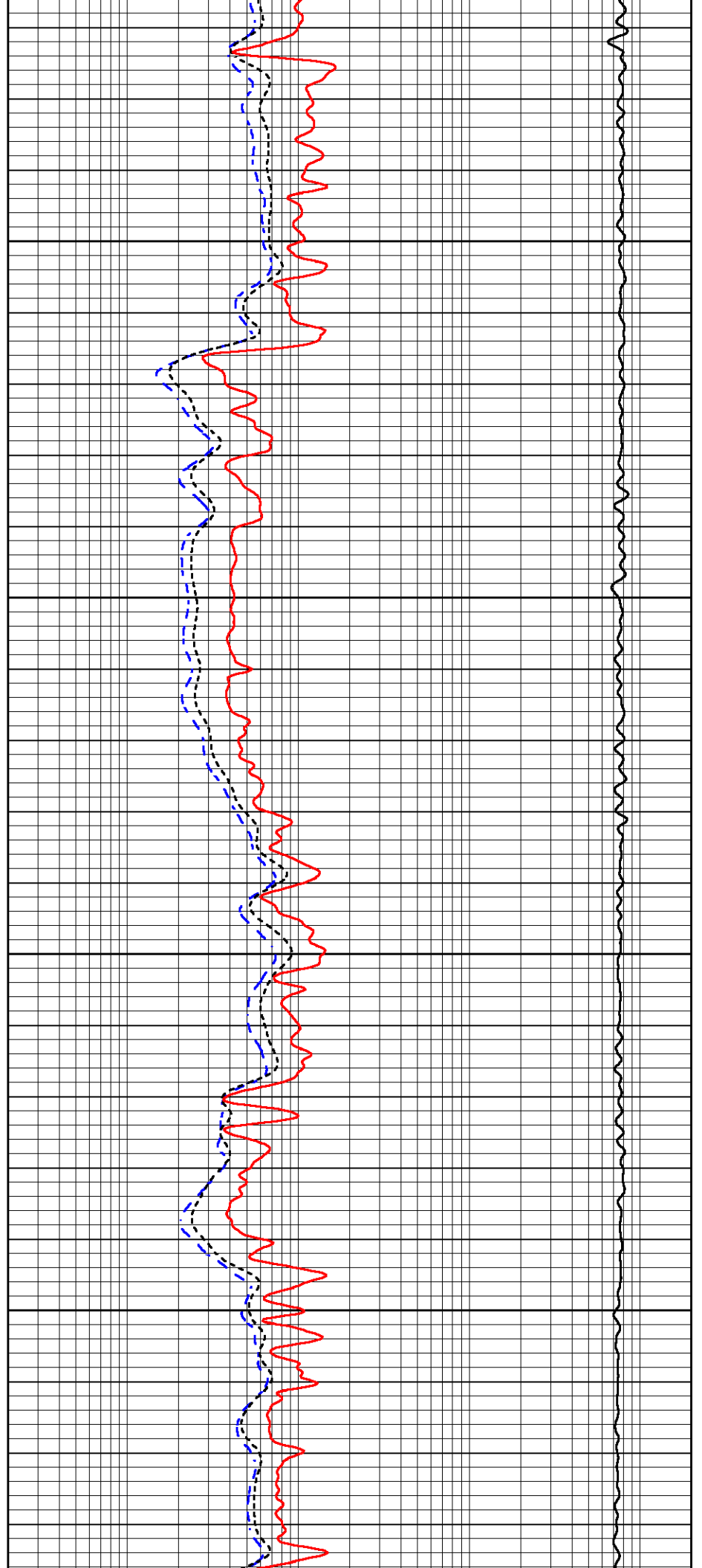


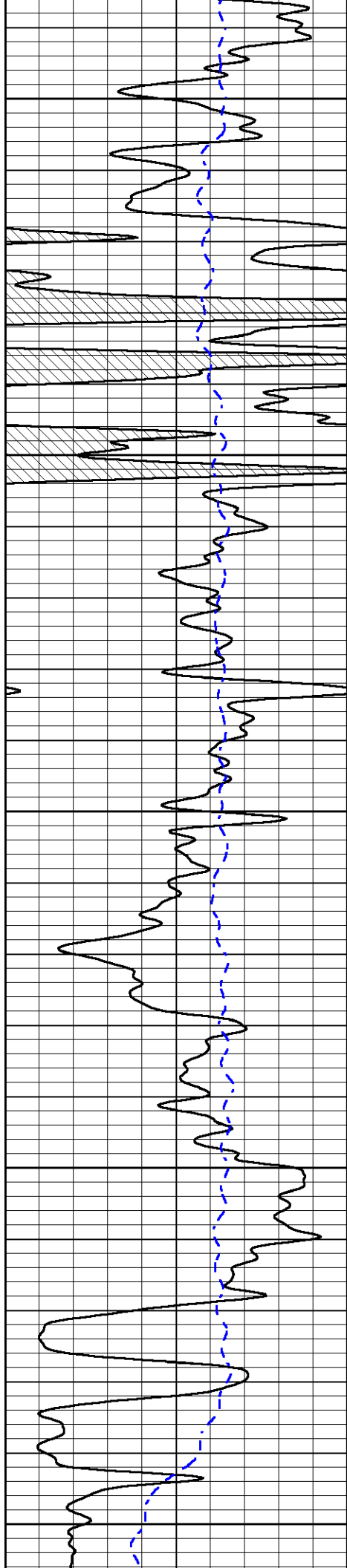
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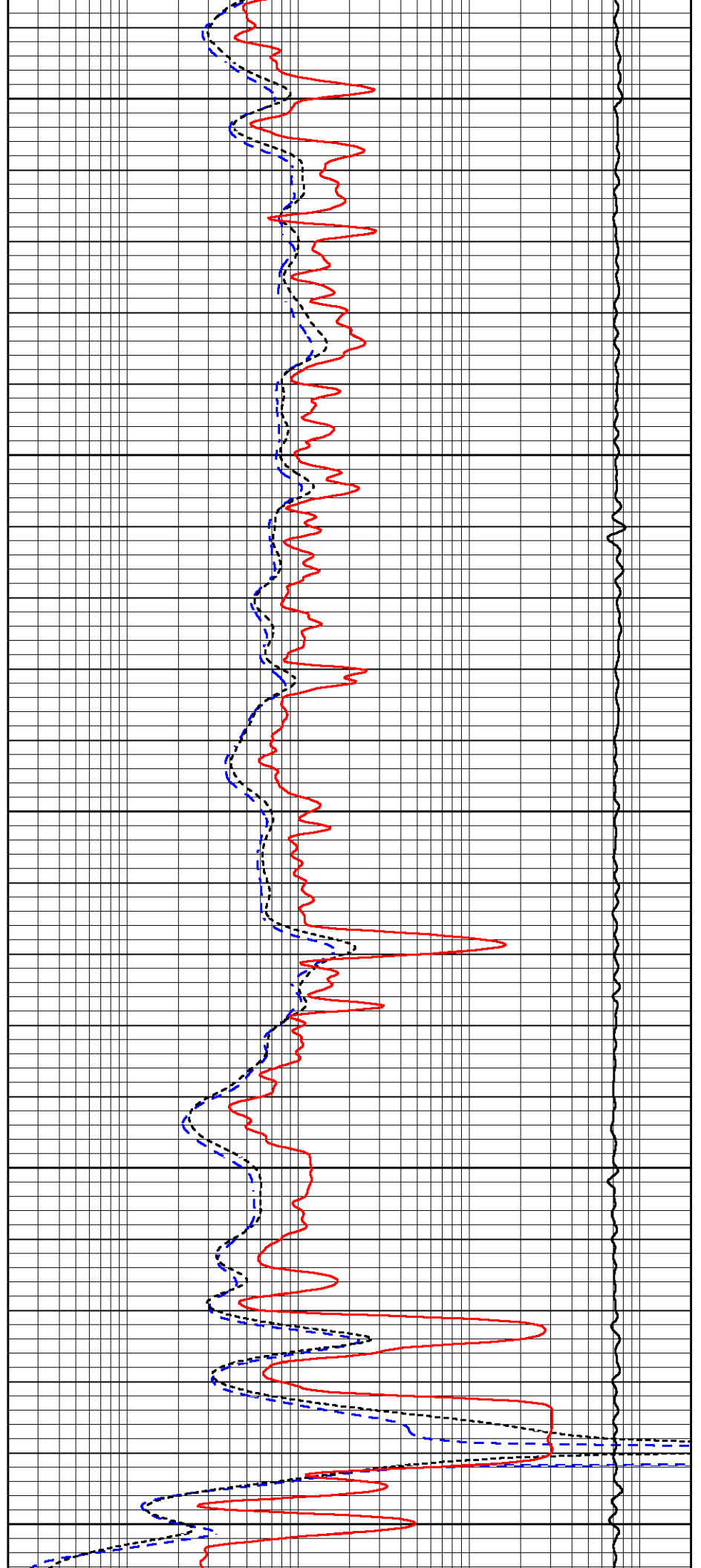
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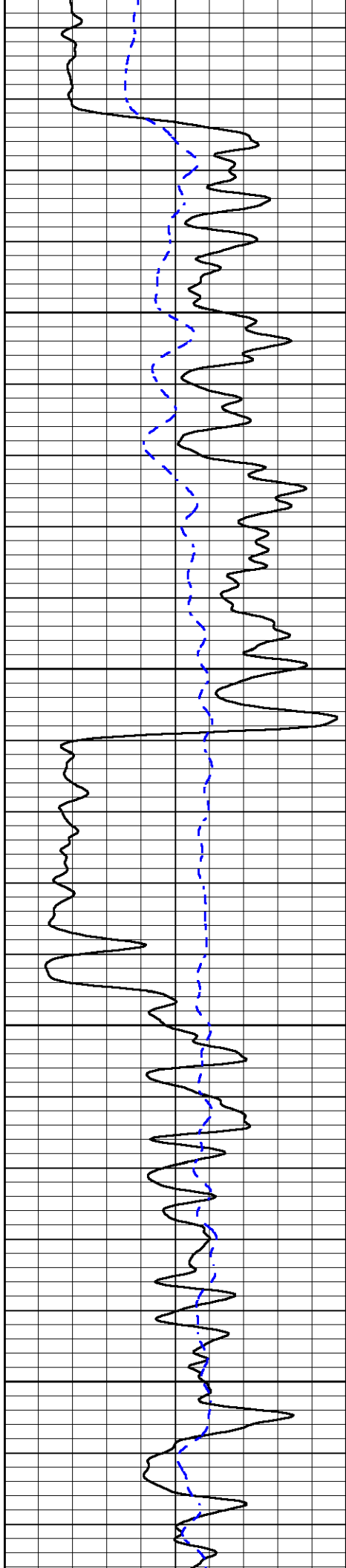
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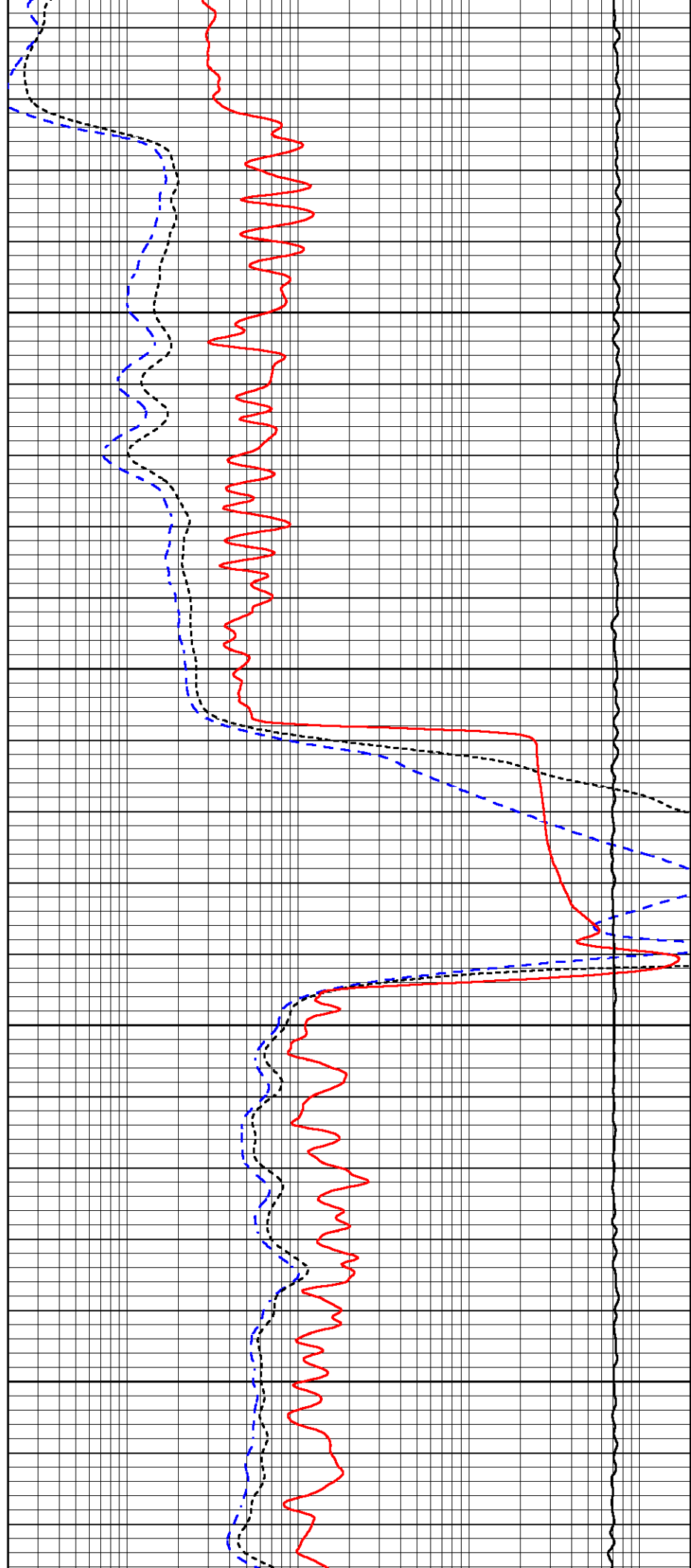


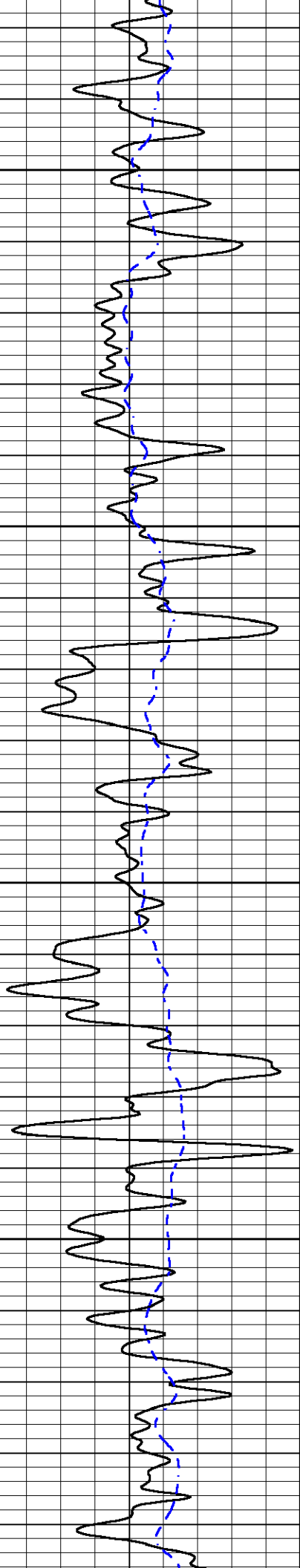
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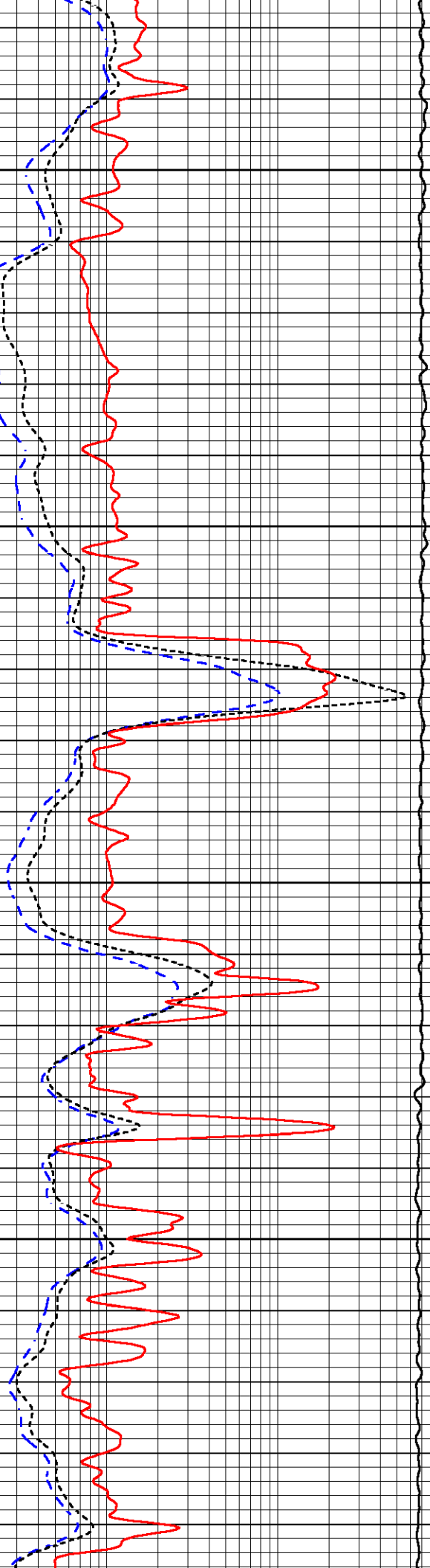


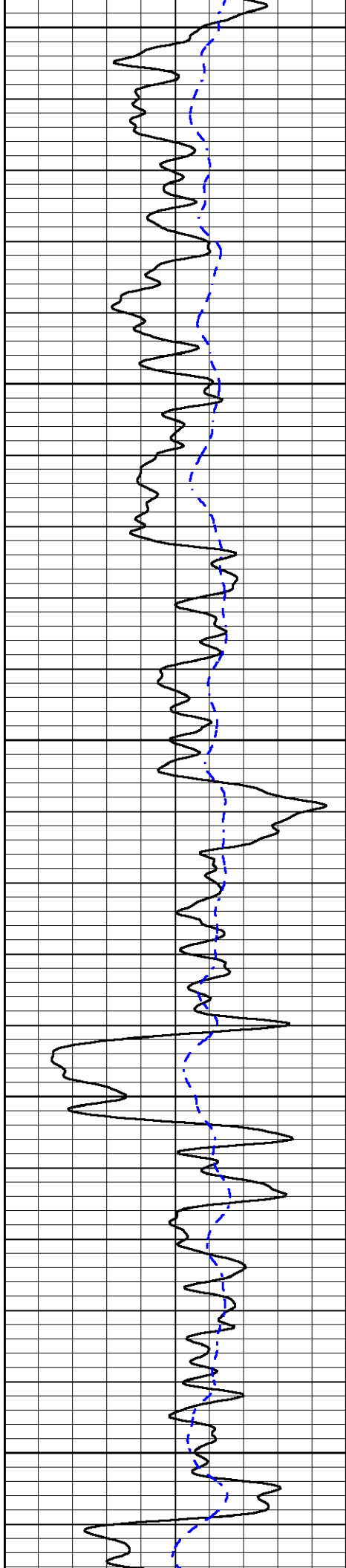
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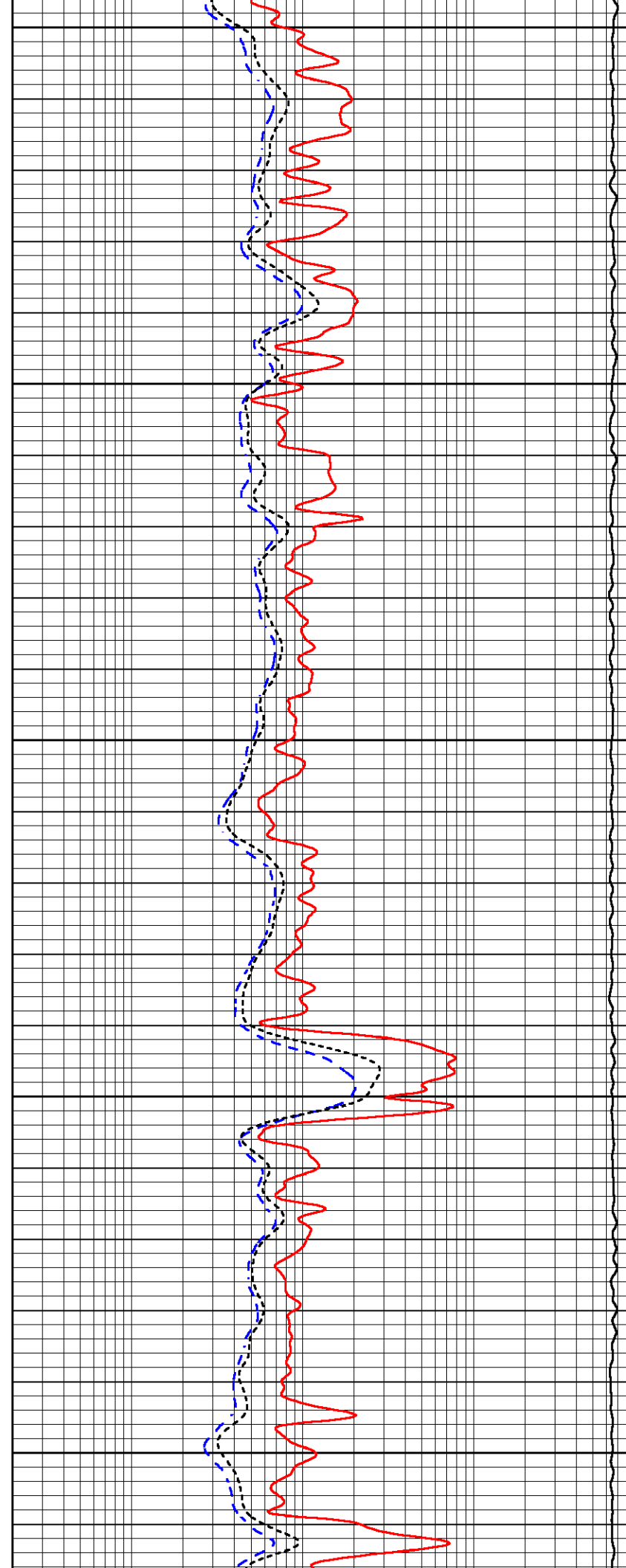
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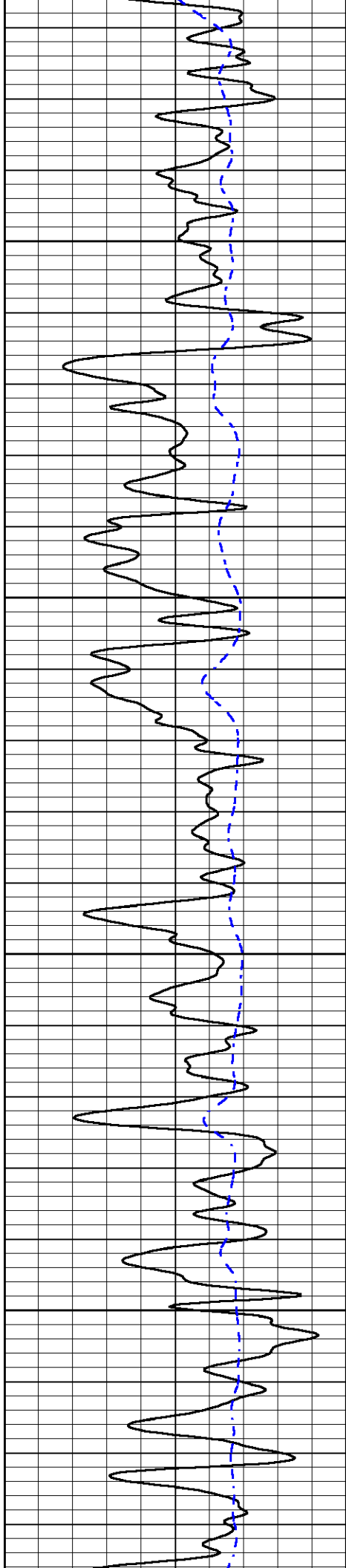
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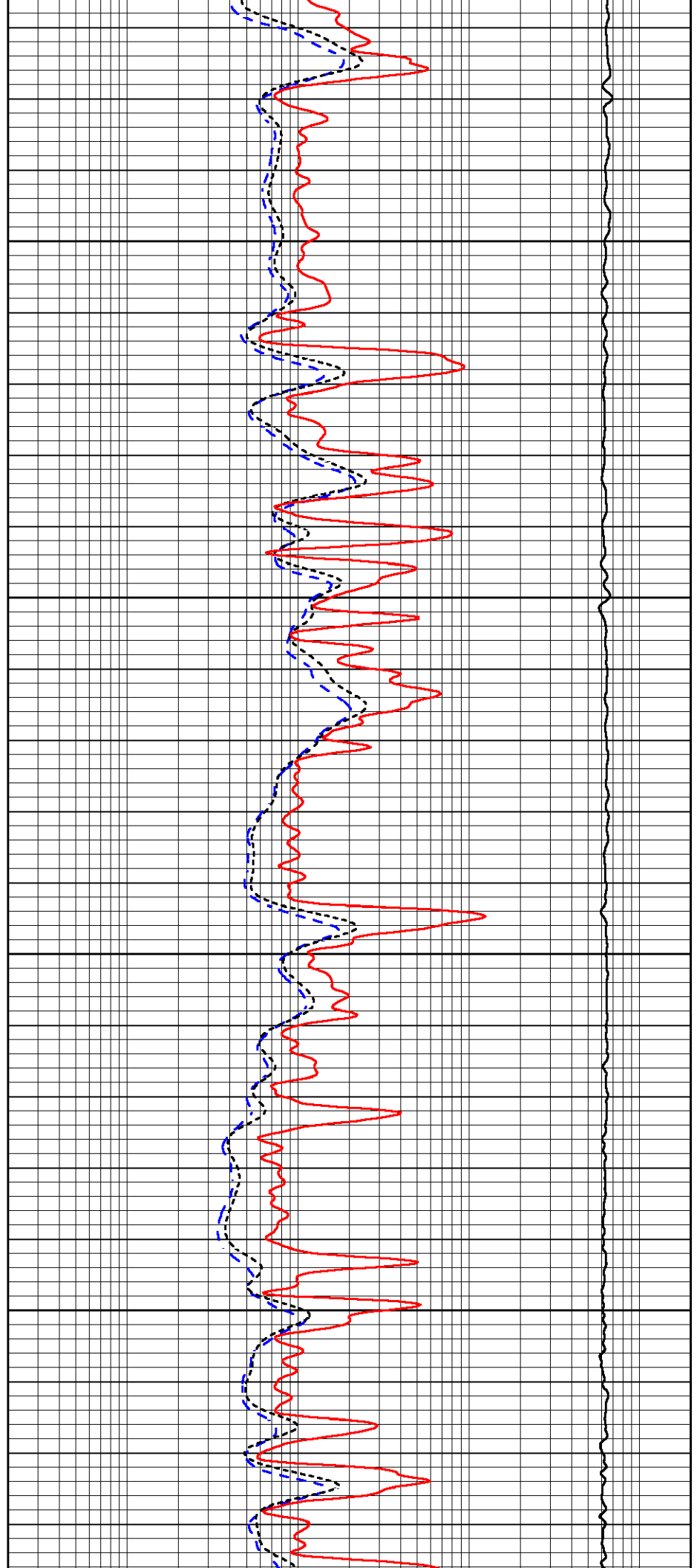


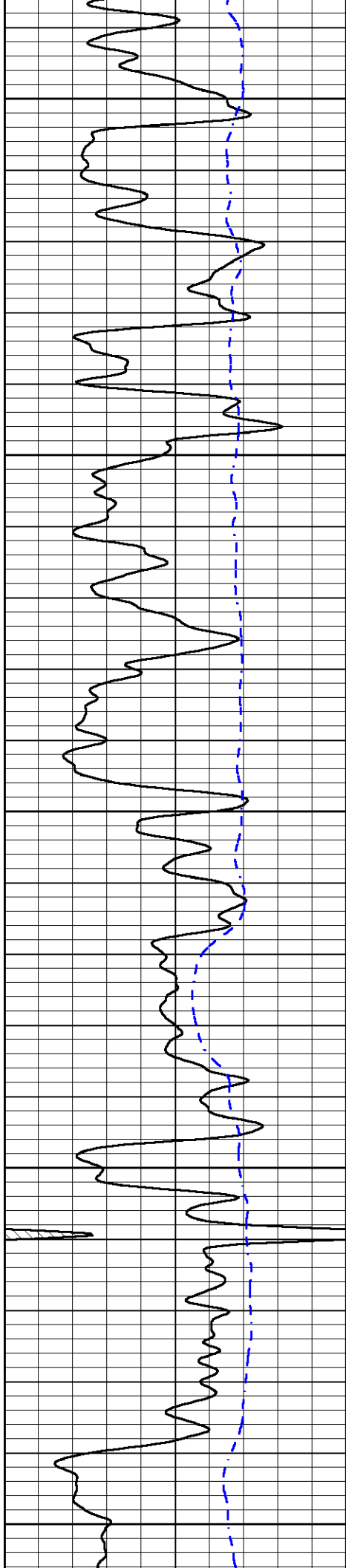
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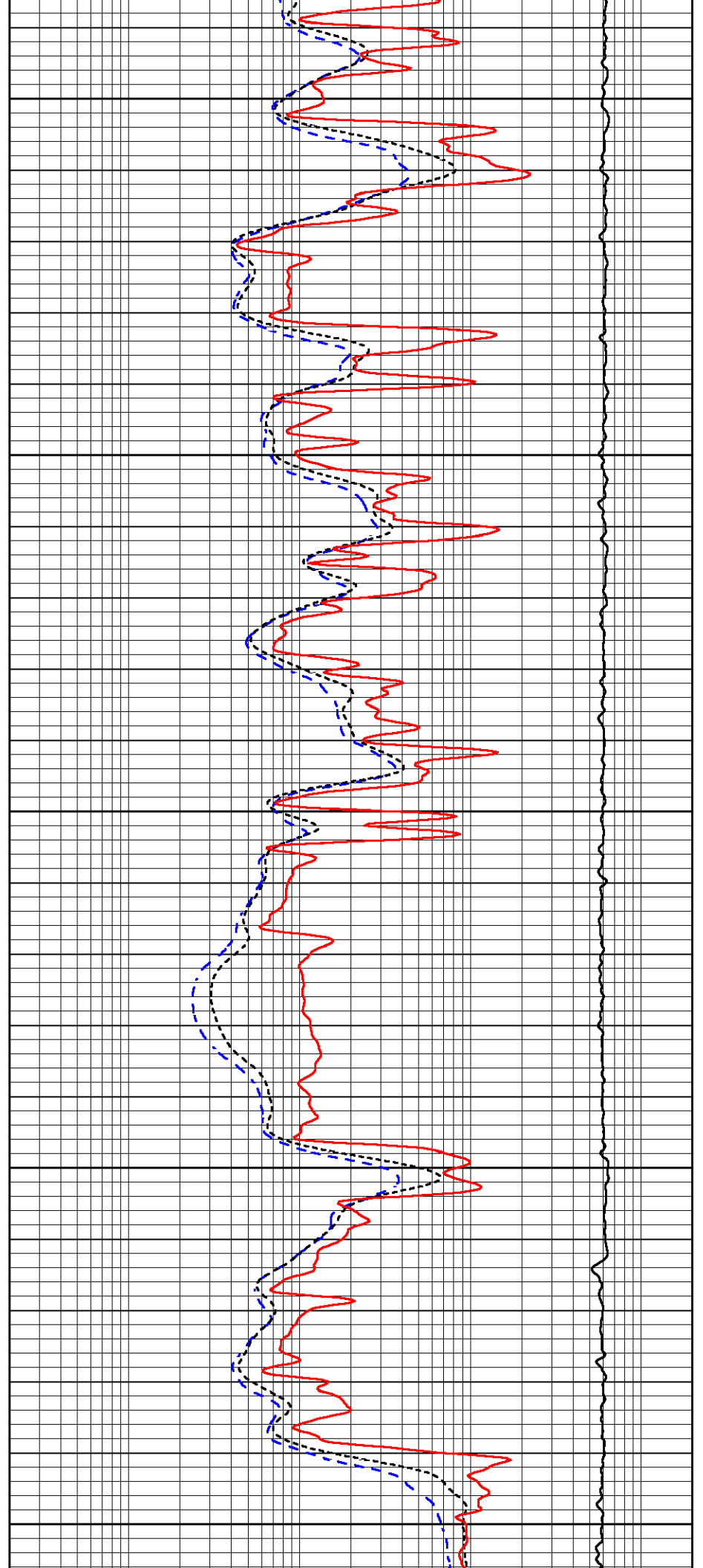
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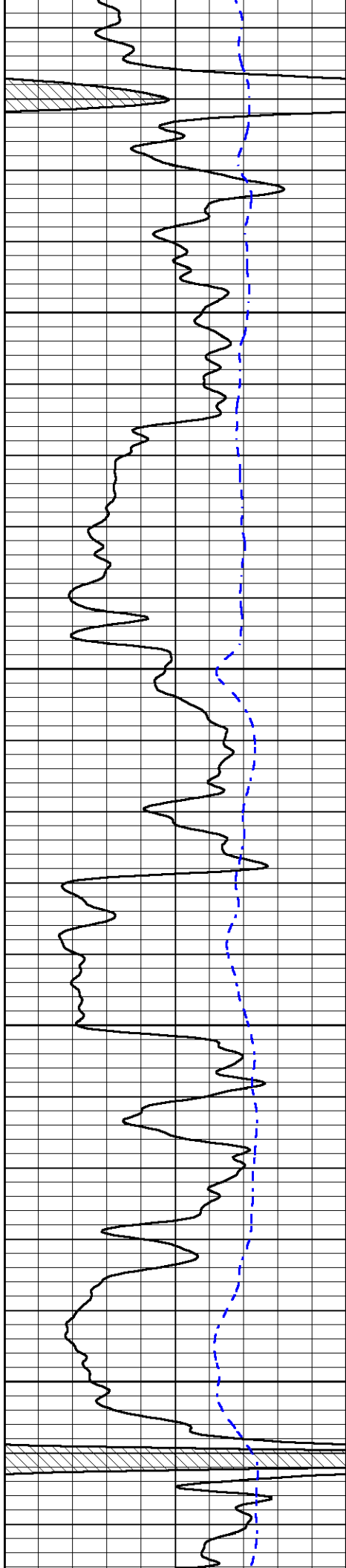
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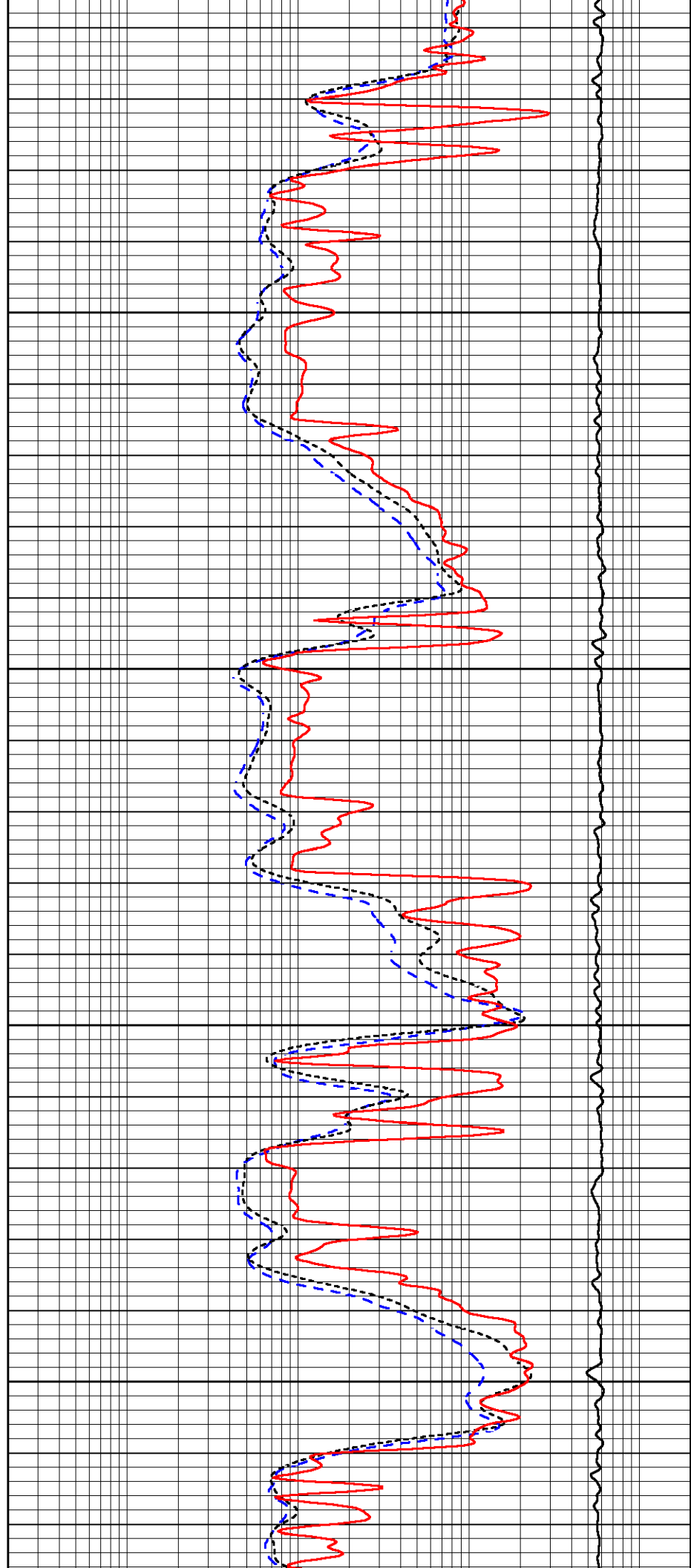


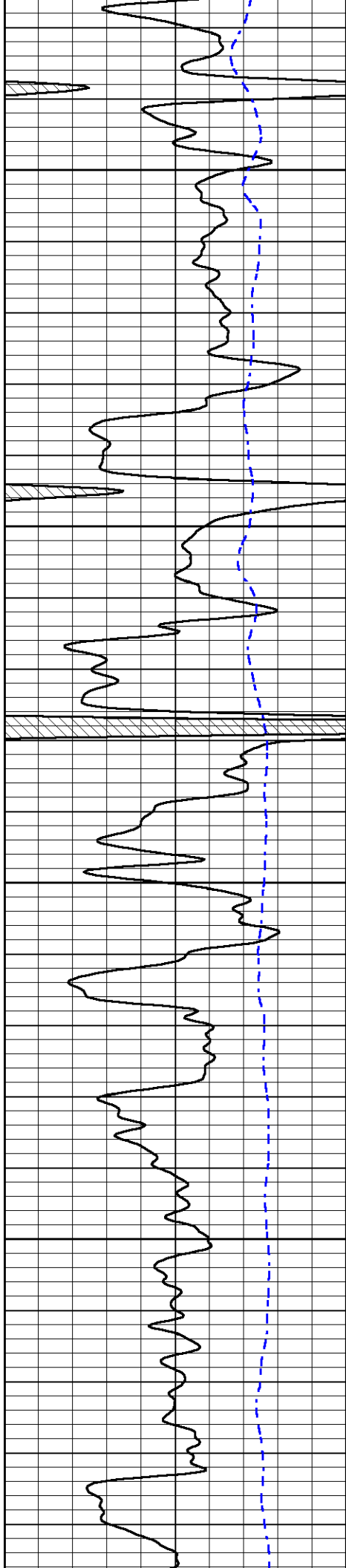
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4500



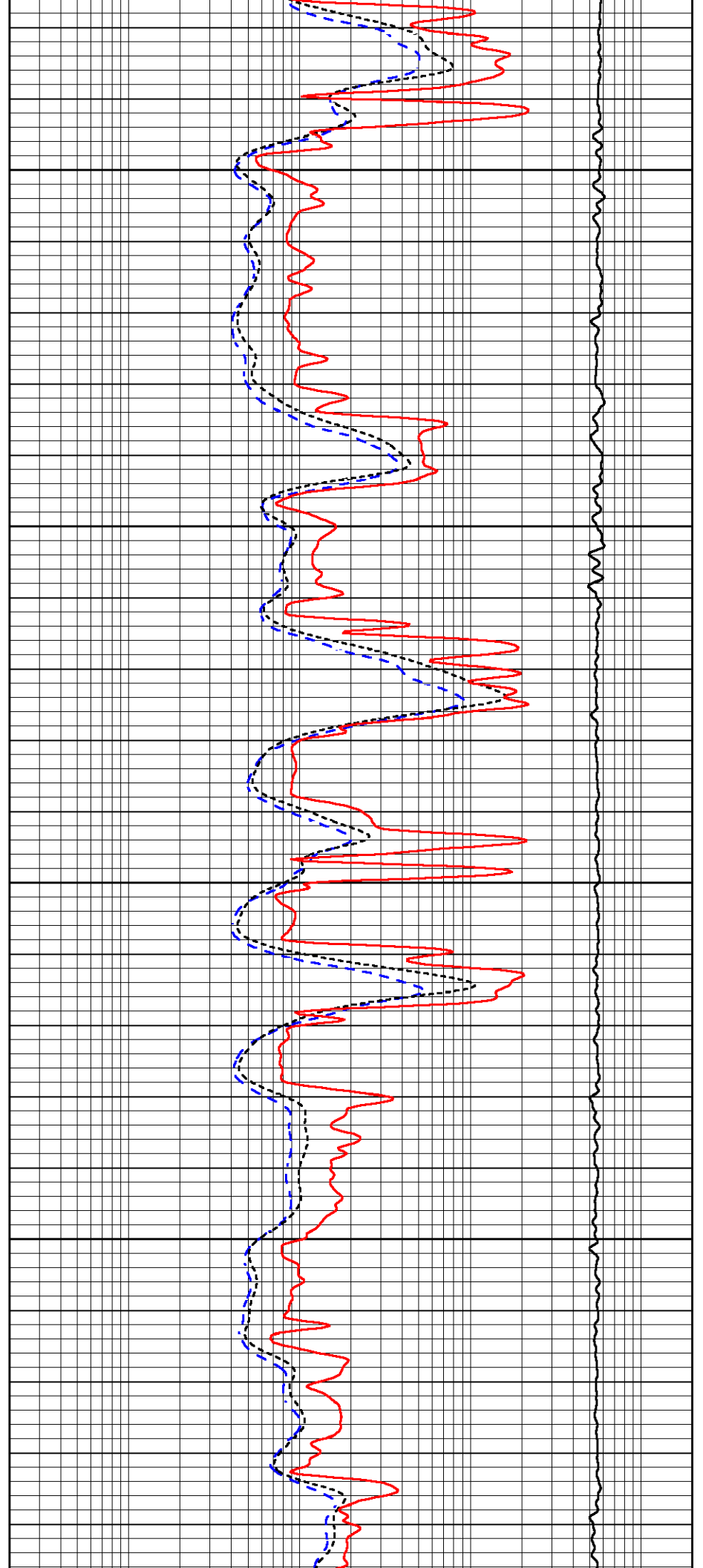


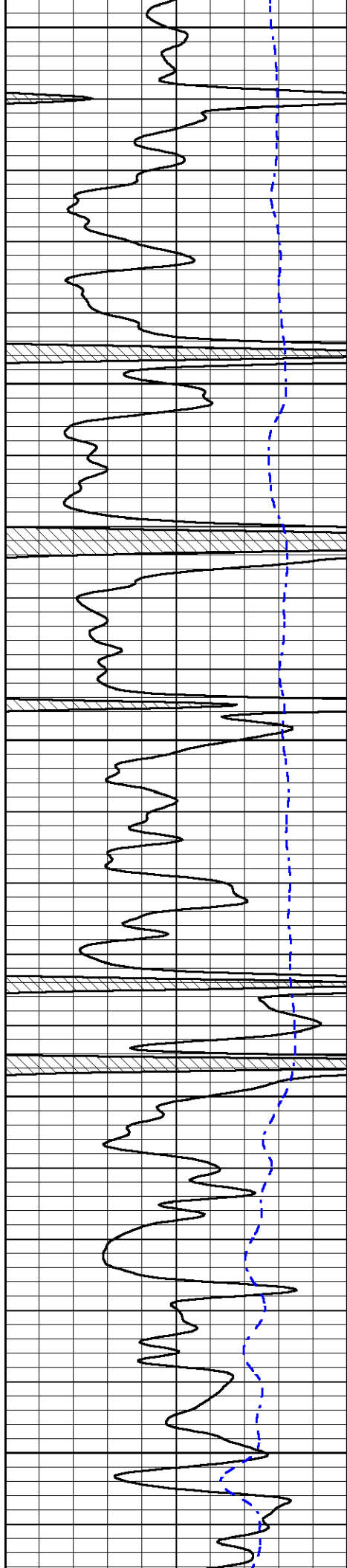
4550

4600

4650

4700





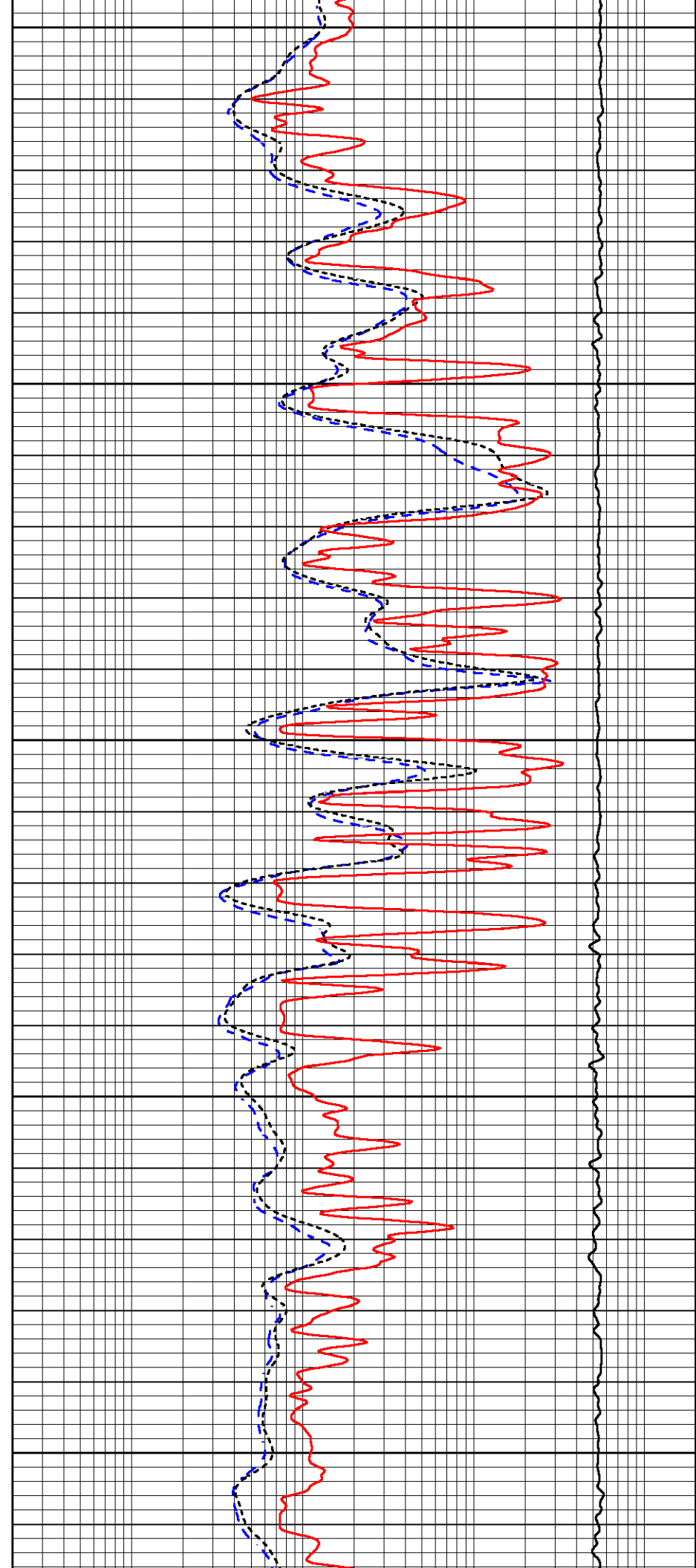
4750

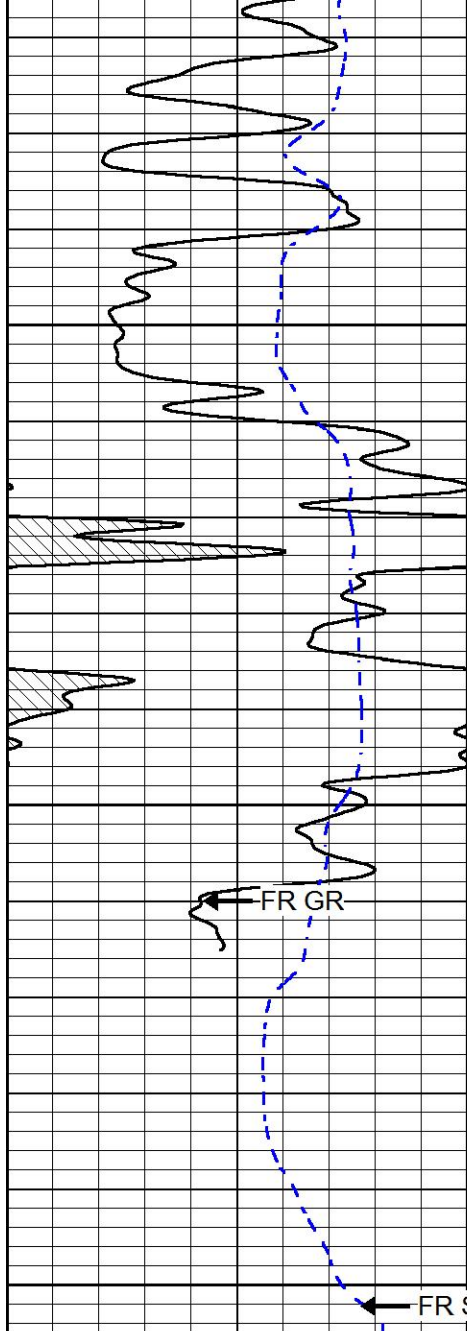
4800

4850

4900

4950





5000

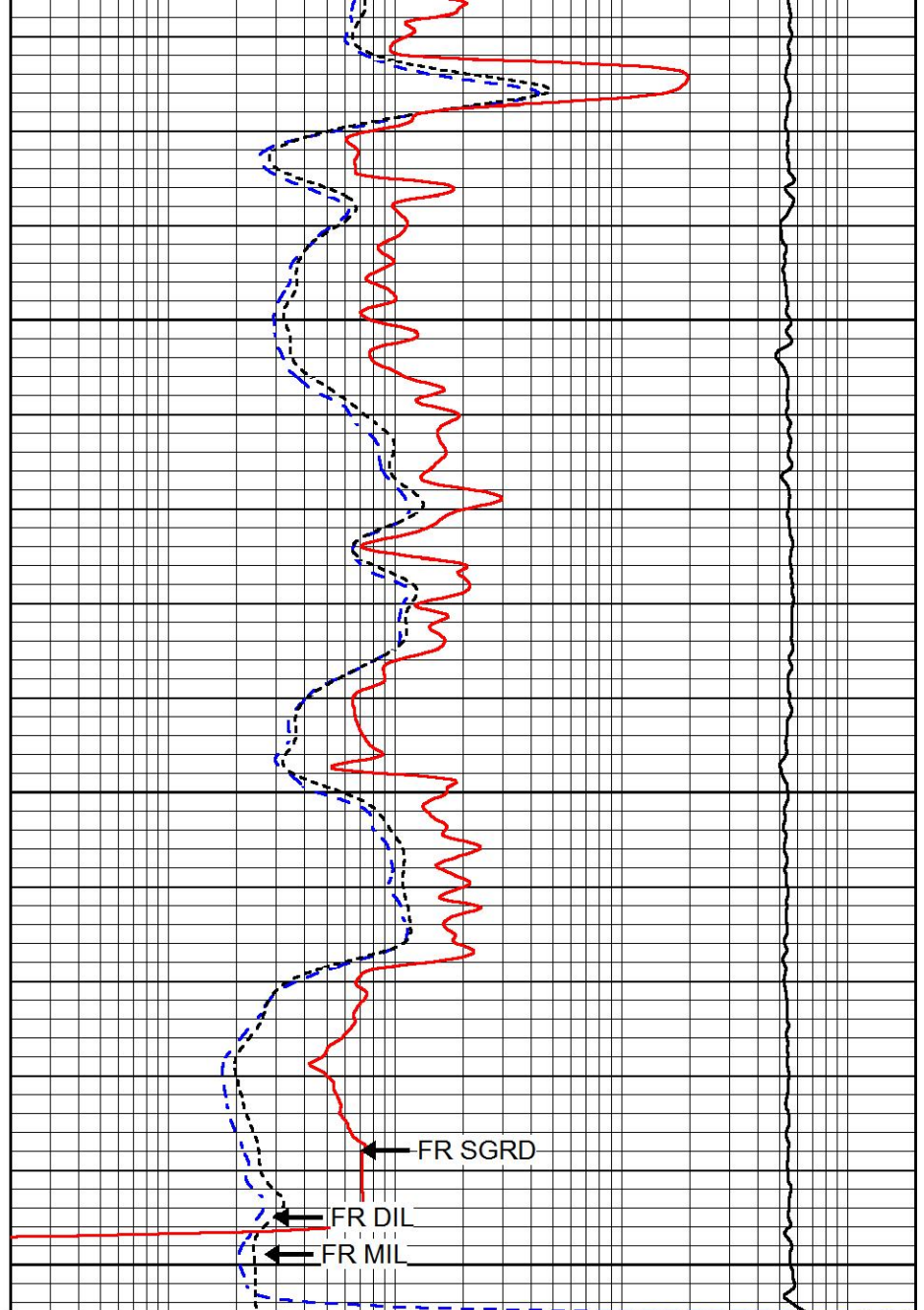
5050

5100

FR GR

FR SP

0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0



FR SGRD

FR DIL

FR MIL

0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
15000	LINE TENSION (lb)	0

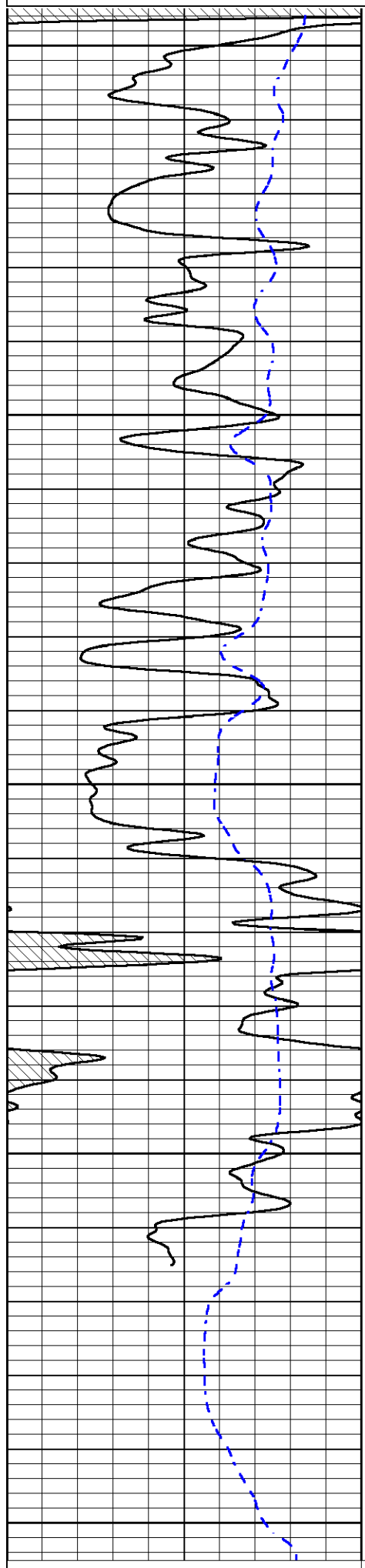


REPEAT SECTION

Database File murfin_burr_1_6.db
 Dataset Pathname stackml/pass2.1
 Presentation Format dil
 Dataset Creation Thu Jan 16 23:42:43 2020
 Charted by Depth in Feet scaled 1:240

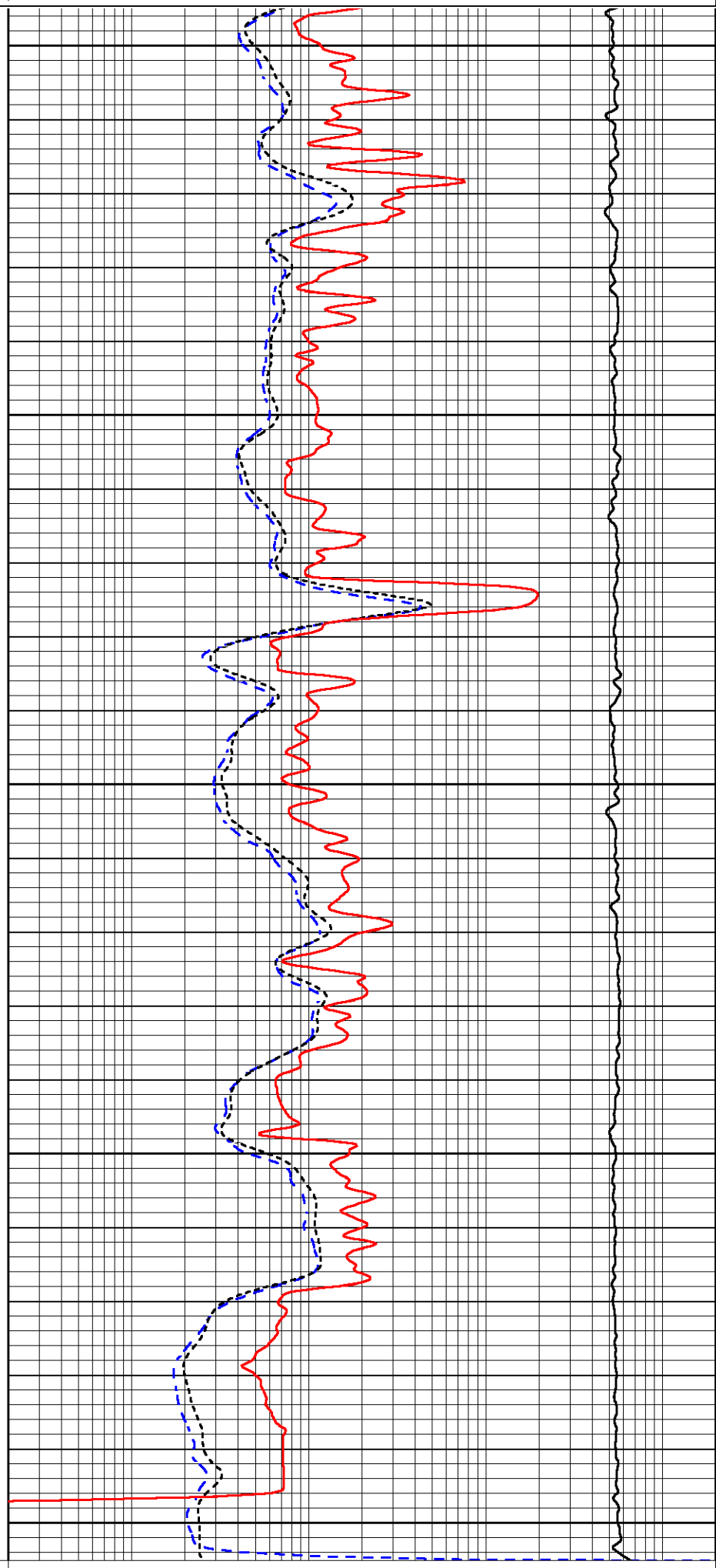
0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000



4900
4950
5000
5050
5100

0 GAMMA RAY (GAPI) 150



0.2 DEEP RESISTIVITY (Ohm-m) 2000

-200	SP (mV)	0
------	---------	---

0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
15000	LINE TENSION (lb)	0

Calibration Report	
Database File	murfin_burr_1_6.db
Dataset Pathname	stackml/pass3.1
Dataset Creation	Fri Jan 17 00:32:42 2020

Dual Induction Calibration Report

Serial-Model:	55-222-M&W
Calibration Performed:	Tue Dec 10 05:11:10 2019

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		Gain	Offset
Deep	167.000	835.000	0.000	255.800	mmho/m	0.500	-41.000
Medium	0.000	1348.000	142.000	255.800	mmho/m	0.370	-15.000

Microlog Calibration Report

Serial-Model:	UDM-01-PSI UDM ML
Performed:	Fri May 31 06:10:42 2019

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	25000.0000	-1.0000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	25000.0000	-0.4000
Caliper	1.0019	1.2642	8.0000	22.0000	in	53.3774	-47.4000

Compensated Density Calibration Report

Serial-Model:	934-229-M&W
Source / Verifier:	21170B /
Master Calibration Performed:	Thu Dec 19 15:46:53 2019

Master Calibration						
	Density			Far Detector	Near Detector	
Magnesium	1.755	g/cc		3391.68	2392.26	cps
Aluminum	2.670	g/cc		645.86	1568.99	cps
	Spine Angle = 75.73			Density/Spine Ratio = 0.535		
	Size			Reading		
Small Ring	4.00	in		1.39		
Large Ring	14.00	in		1.04		


Compensated Neutron Calibration Report

Serial Number:	tk10-MW
Tool Model:	M&W
Calibration Performed:	Wed Nov 16 11:21:36 2016

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

Gamma Ray Calibration Report

Serial Number:	89-M&W		
Tool Model:	M&W		
Calibration Performed:	Tue Dec 10 05:11:34 2019		
Calibrator Value:	1000.0	GAPI	
Background Reading:	0.0	cps	
Calibrator Reading:	6.2	cps	
Sensitivity:	0.5200	GAPI/cps	

 <p>PIONEER Pioneer Energy Services</p>	Company	MURFIN DRILLING COMPANY, INC.
	Well	BURR #1-6
	Field	WILDCAT
	County	CHEYENNE
	State	KANSAS