



# HIGH RESOLUTION INDUCTION COMPENSATED DENISITY COMPENSATED NEUTRON

Pioneer Energy Services

Company Bonanza Creek Energy Oper. Co. LLC  
Well State Whitetail #O-K-36HNB  
Field Wattenberg  
County Colorado State USA

Location: API # : 05-123-38892

200' FSL & 2546' FEL SWSE

SEC 36 TWP 6N RGE 62W

Permanent Datum GL Elevation 4653  
Log Measured From KB  
Drilling Measured From KB

Other Services  
None

Elevation  
K.B. 4670  
D.F. 4669  
G.L. 4653

Date June 4, 2014

Run Number 1

Depth Driller 5673

Depth Logger 5459

Bottom Logged Interval 5459

Top Log Interval Casing

Casing Driller 468

Casing Logger 468

Bit Size 8-3/4"

Type Fluid in Hole Chem Gel

Density / Viscosity 8.8 / 36

pH / Fluid Loss 7.2 / n/a

Source of Sample Mudpit

Rm @ Meas. Temp 2.84 @ 70 F

Rmf @ Meas. Temp 2.27 @ 70 F

Rmc @ Meas. Temp 3.55 @ 70 F

Source of Rmf / Rmc Measure / Calc

Rm @ BHT 1.14 @ 174 F

Time Circulation Stopped 1000

Time Logger on Bottom 1315

Maximum Recorded Temperature 174 F

Equipment Number 48

Location Ft. Morgan

Recorded By Clint Christensen

Witnessed By Andy Gustafson

<<< Fold Here >>>

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

Annular Volumes for 7" casing

Cade Drilling Rig 21

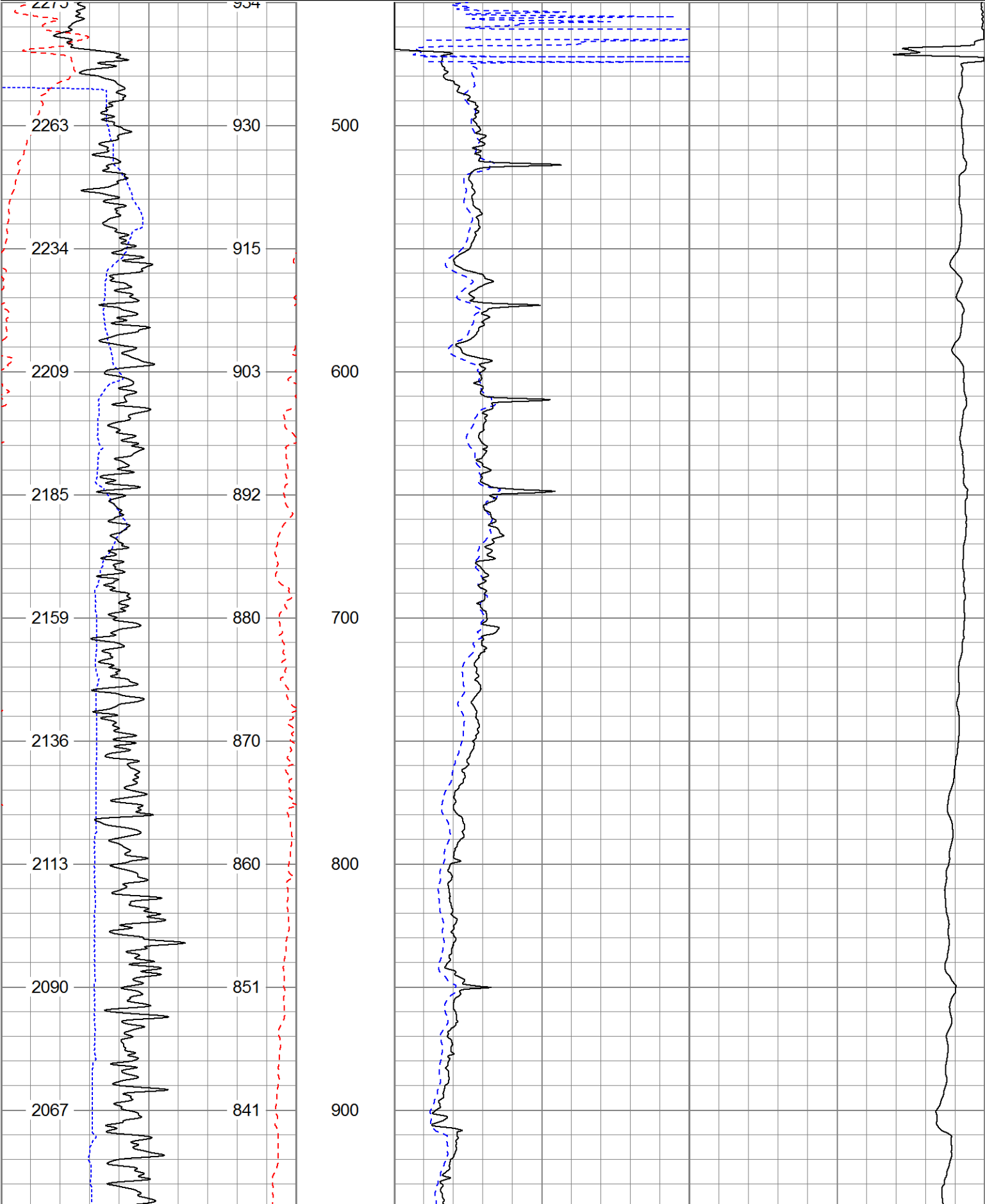
Thank You for using Pioneer Energy Services!

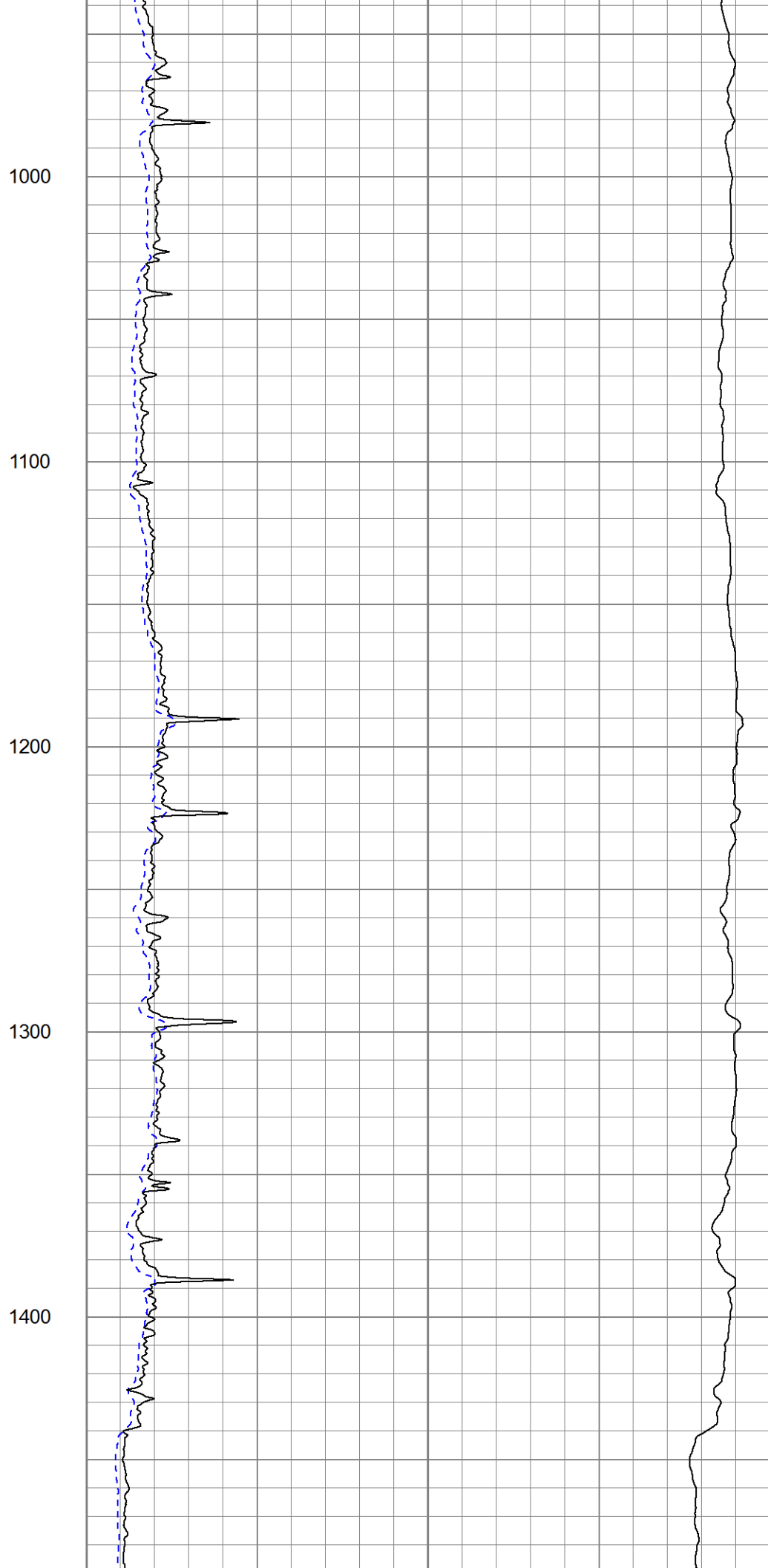
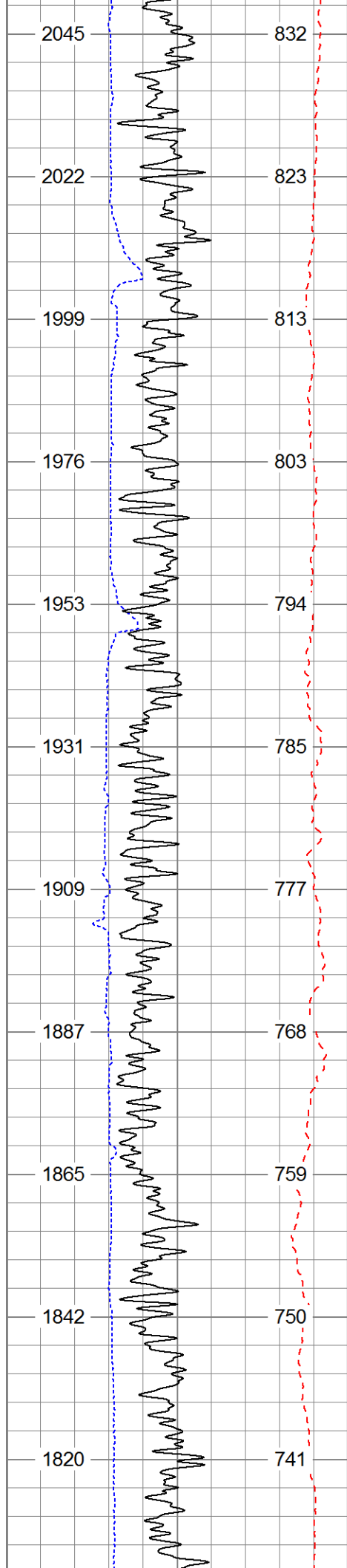
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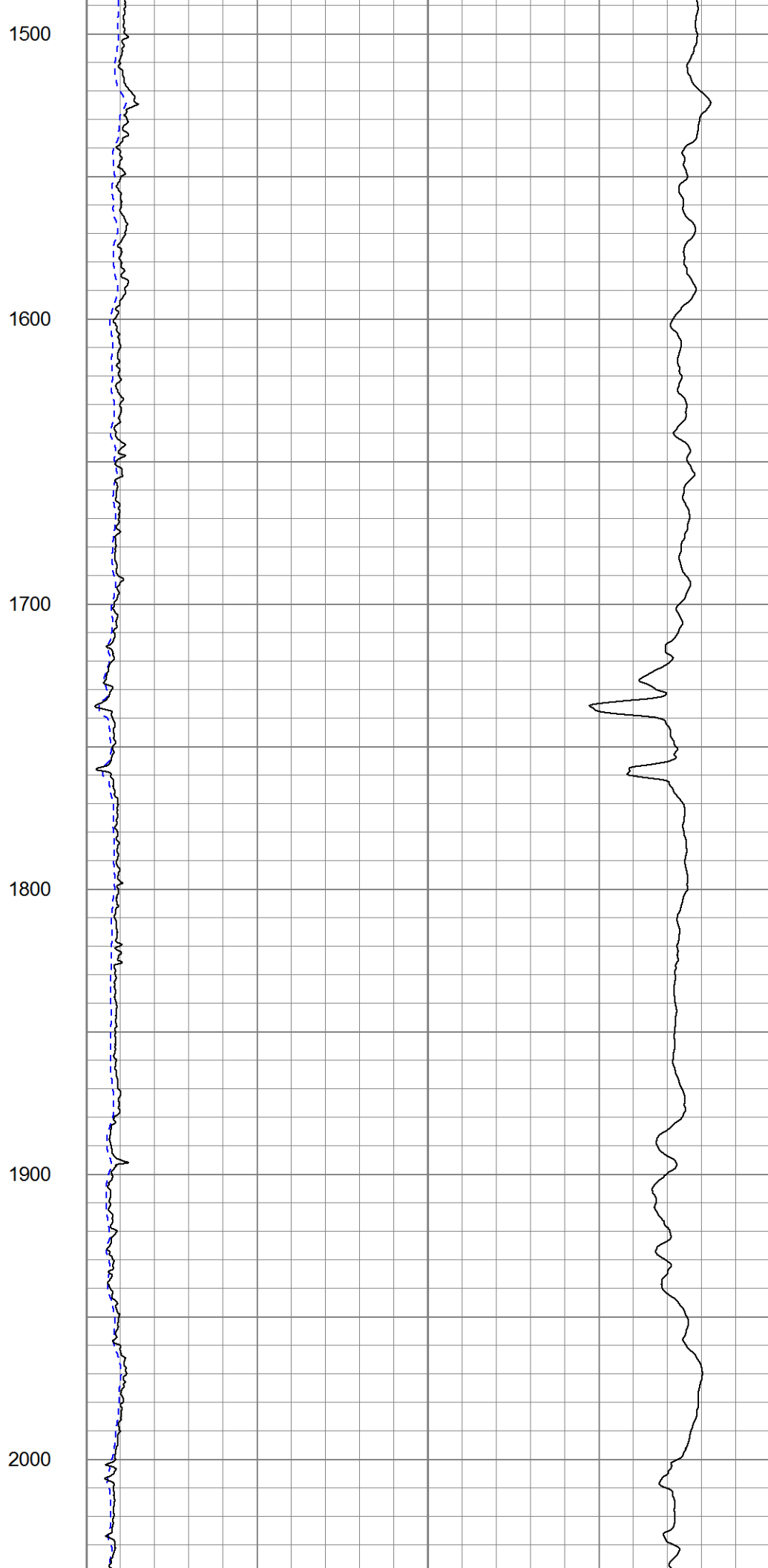
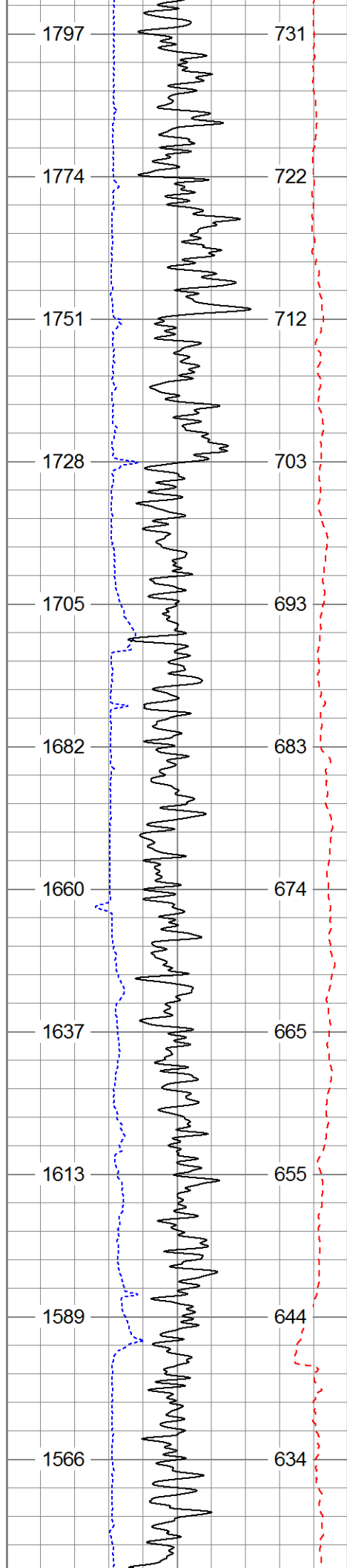
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Presentation Format: dilyn5  
Dataset Creation: Wed Jun 04 14:38:19 2014  
Charted by: Depth in Feet scaled 1:600

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6	Caliper (in)	16
0	Gamma Ray (GAPI)	200
TBHV (ft3)		ABHV (ft3)

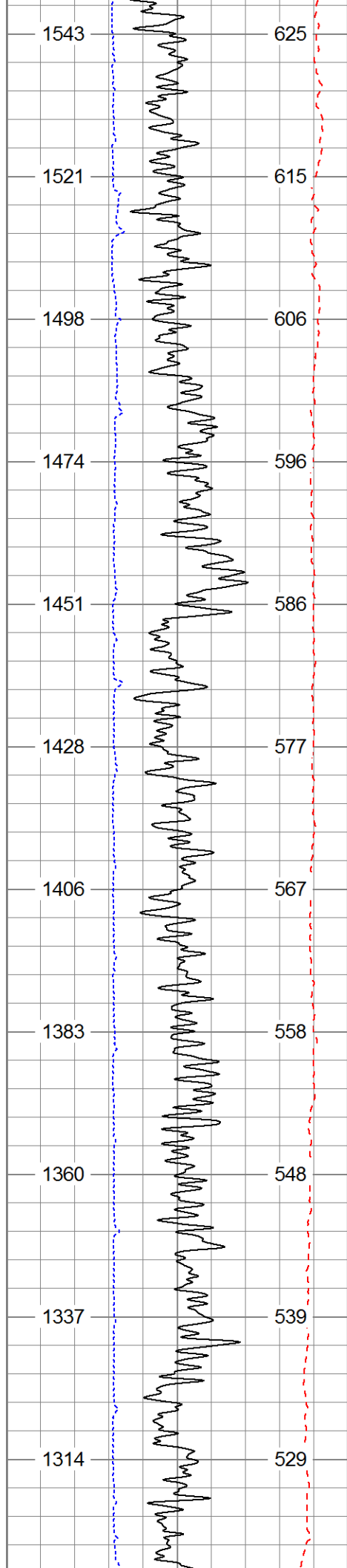
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0	Shallow Resistivity (Ohm-m)	50			
50	RILD (Ohm-m)	500			
50	RLL3 (Ohm-m)	500			











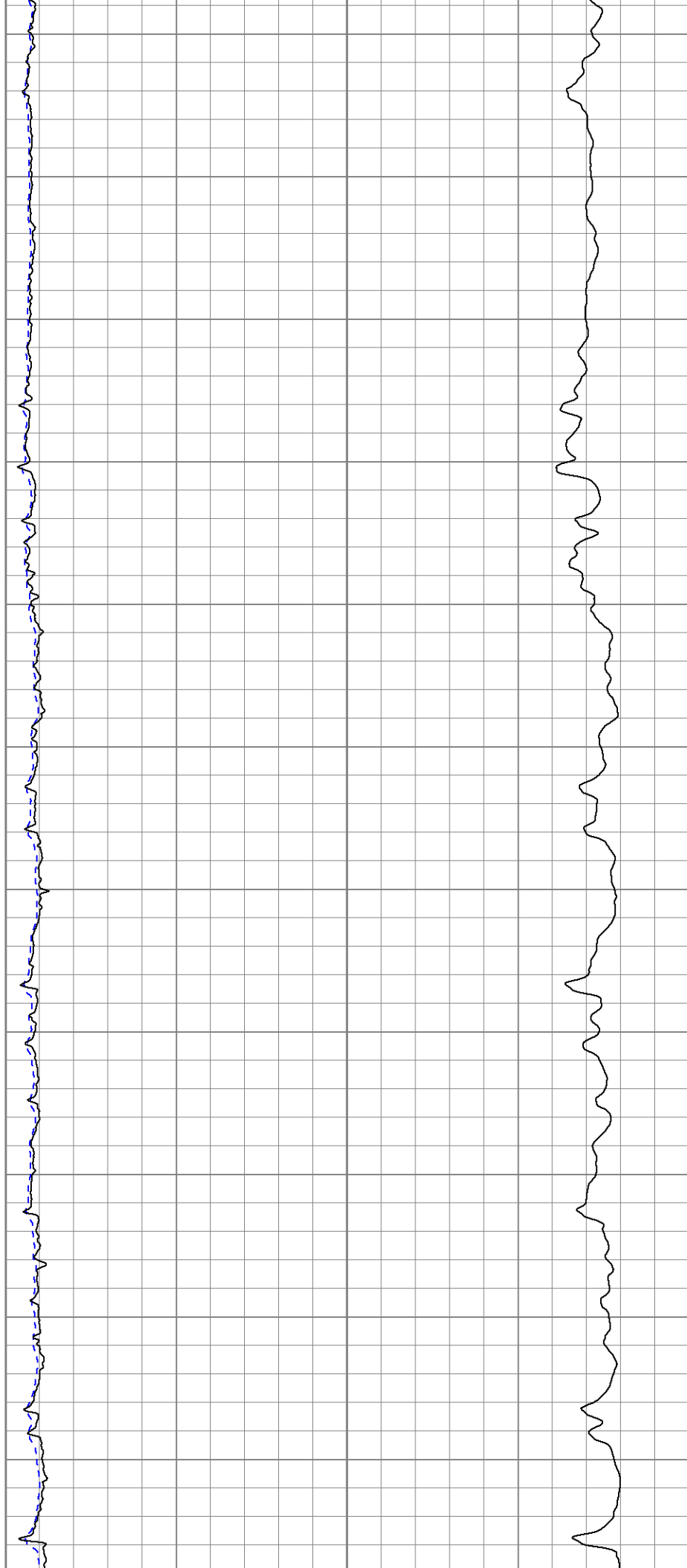
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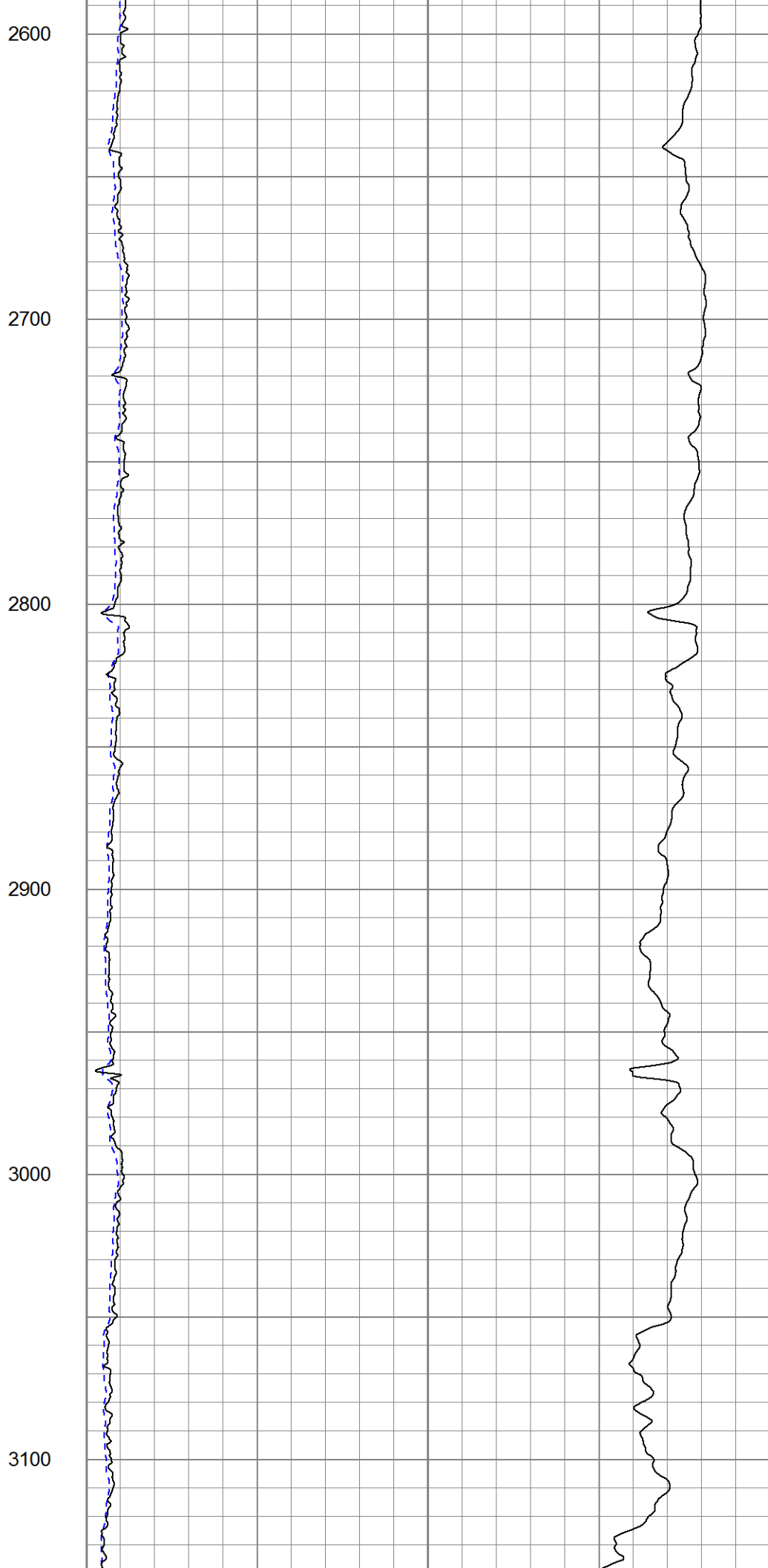
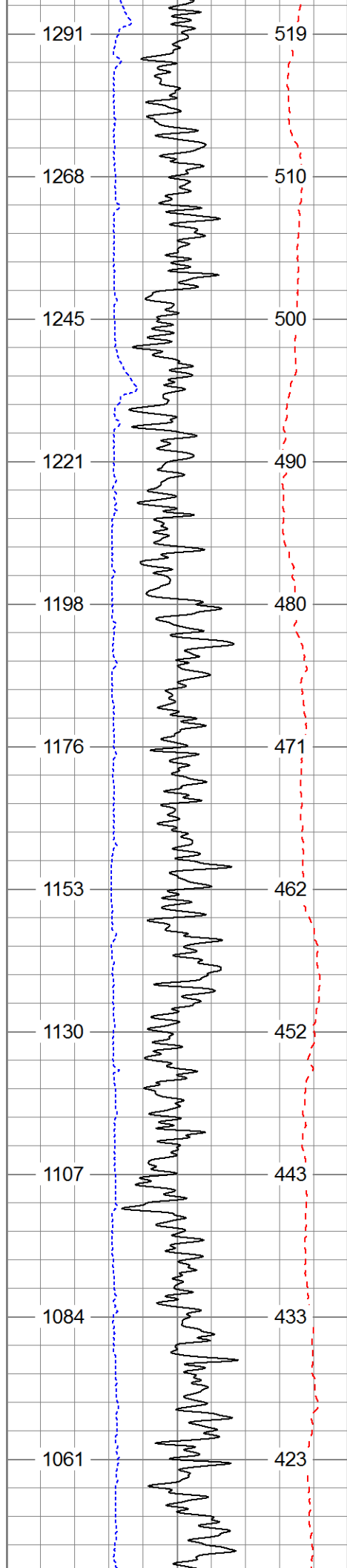
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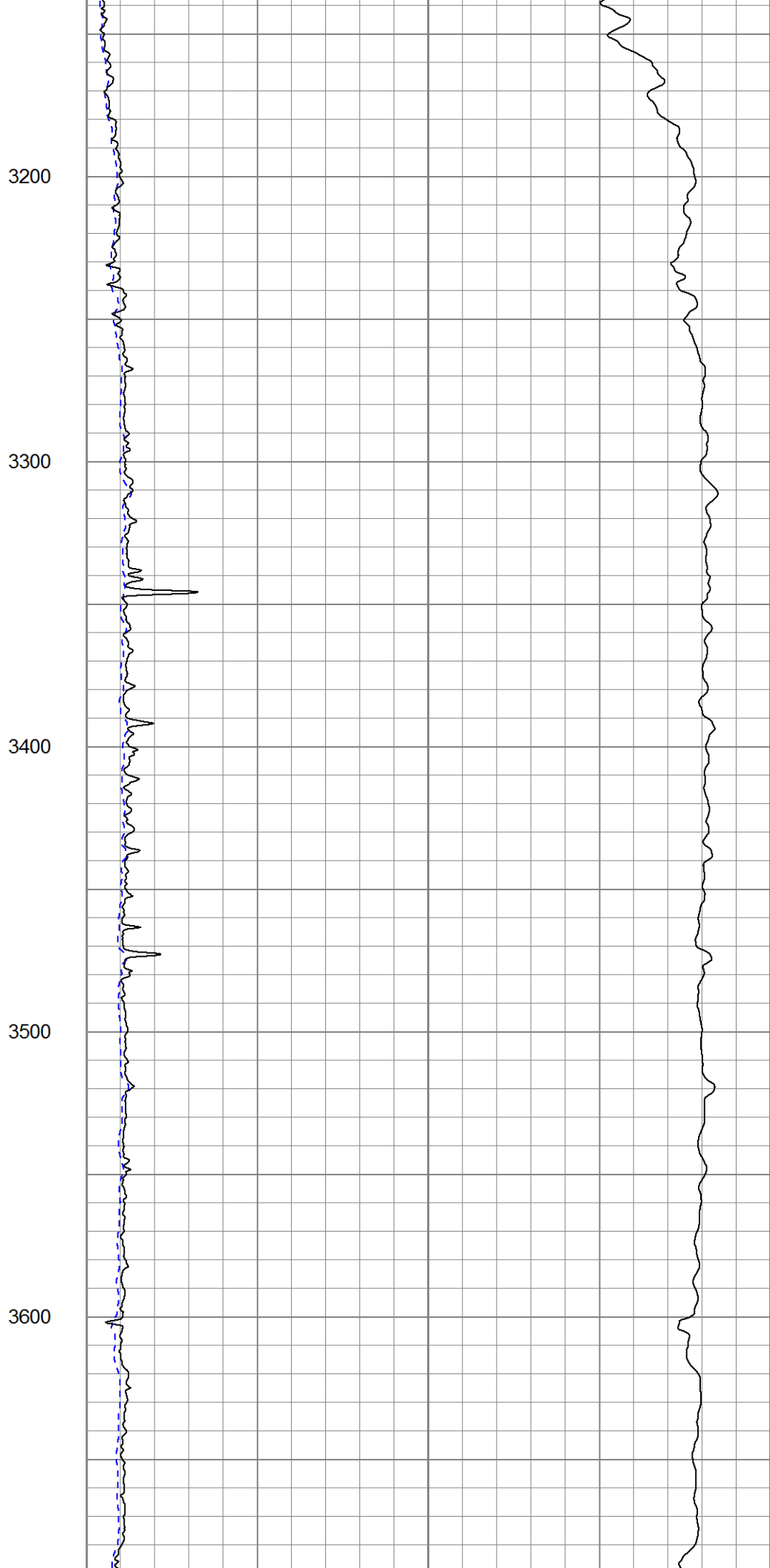
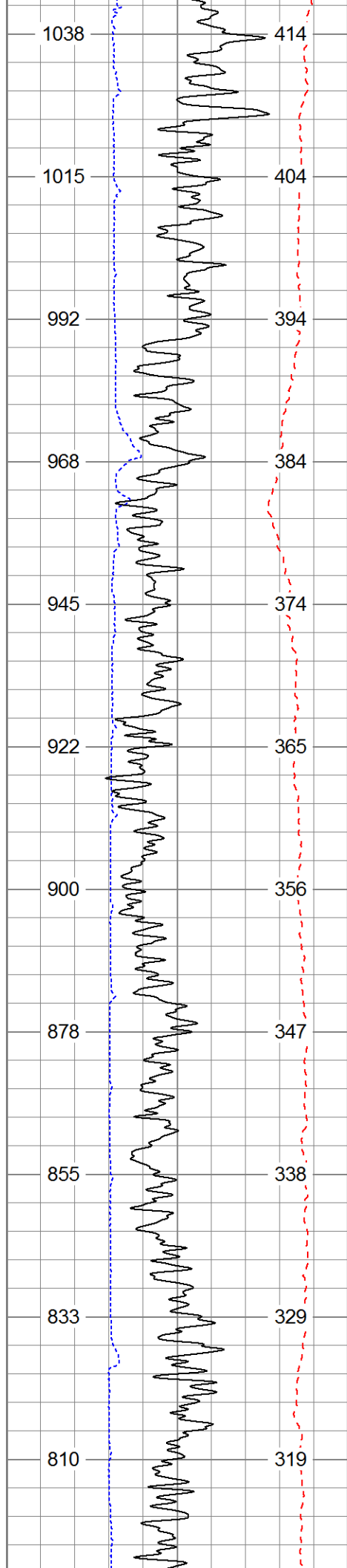
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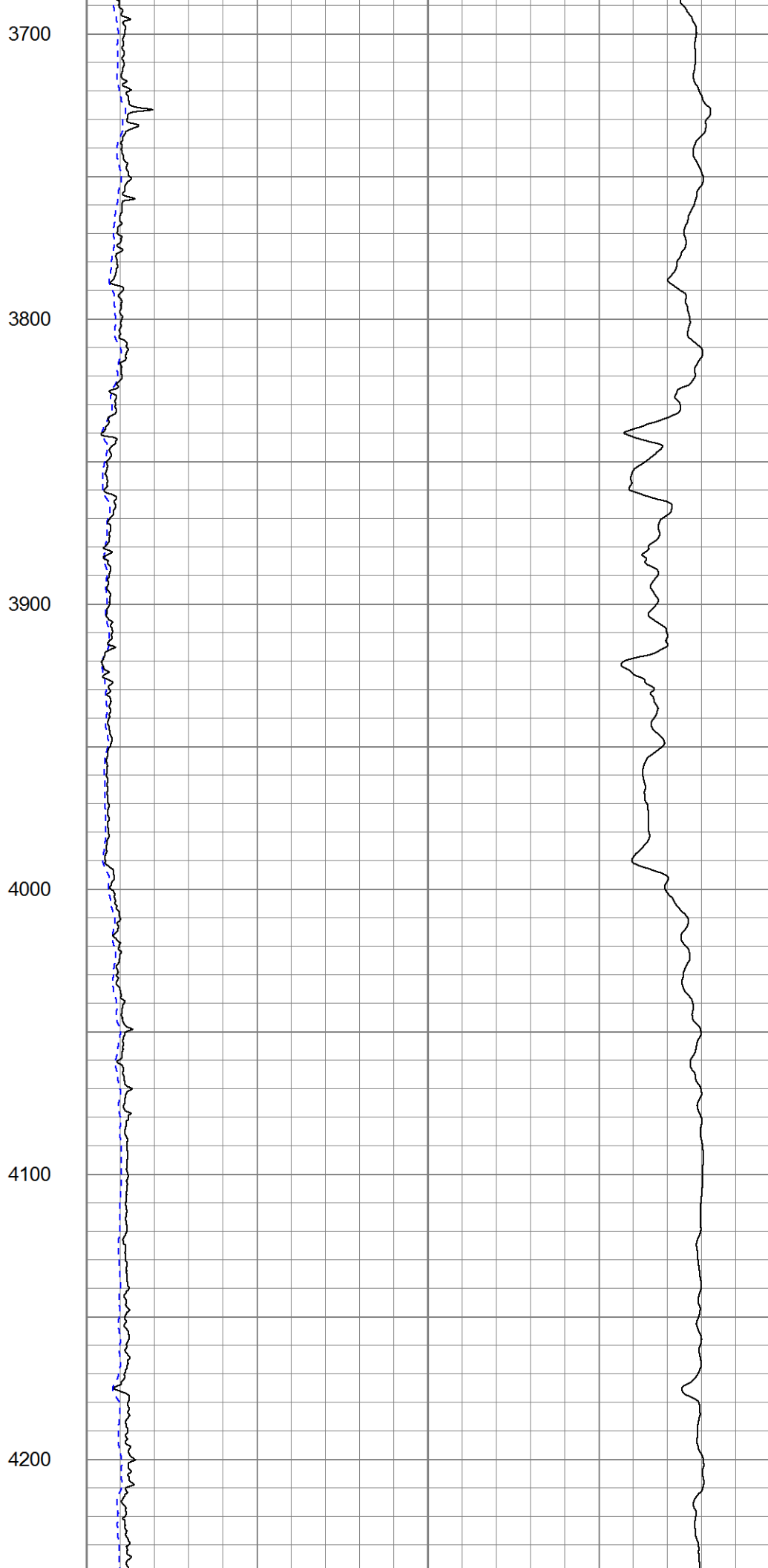
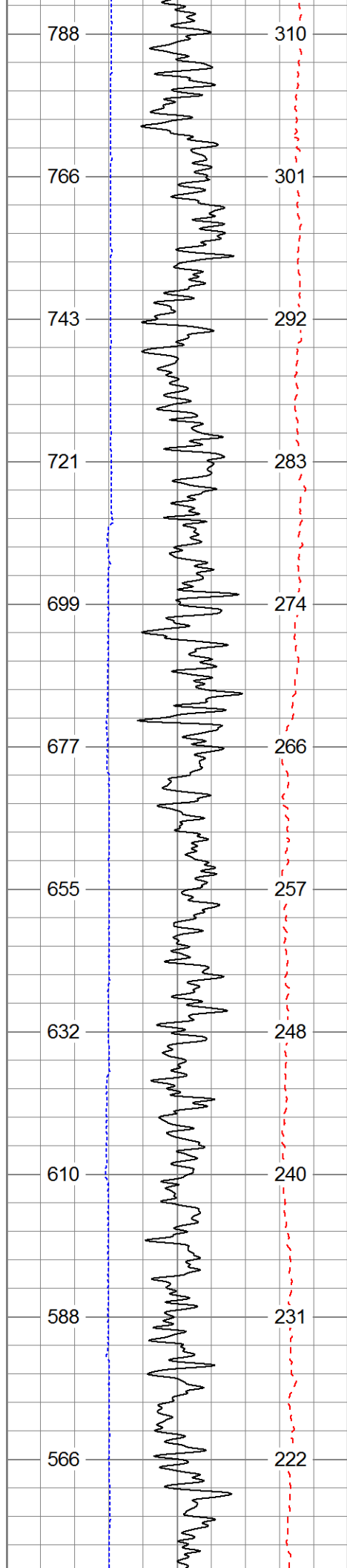
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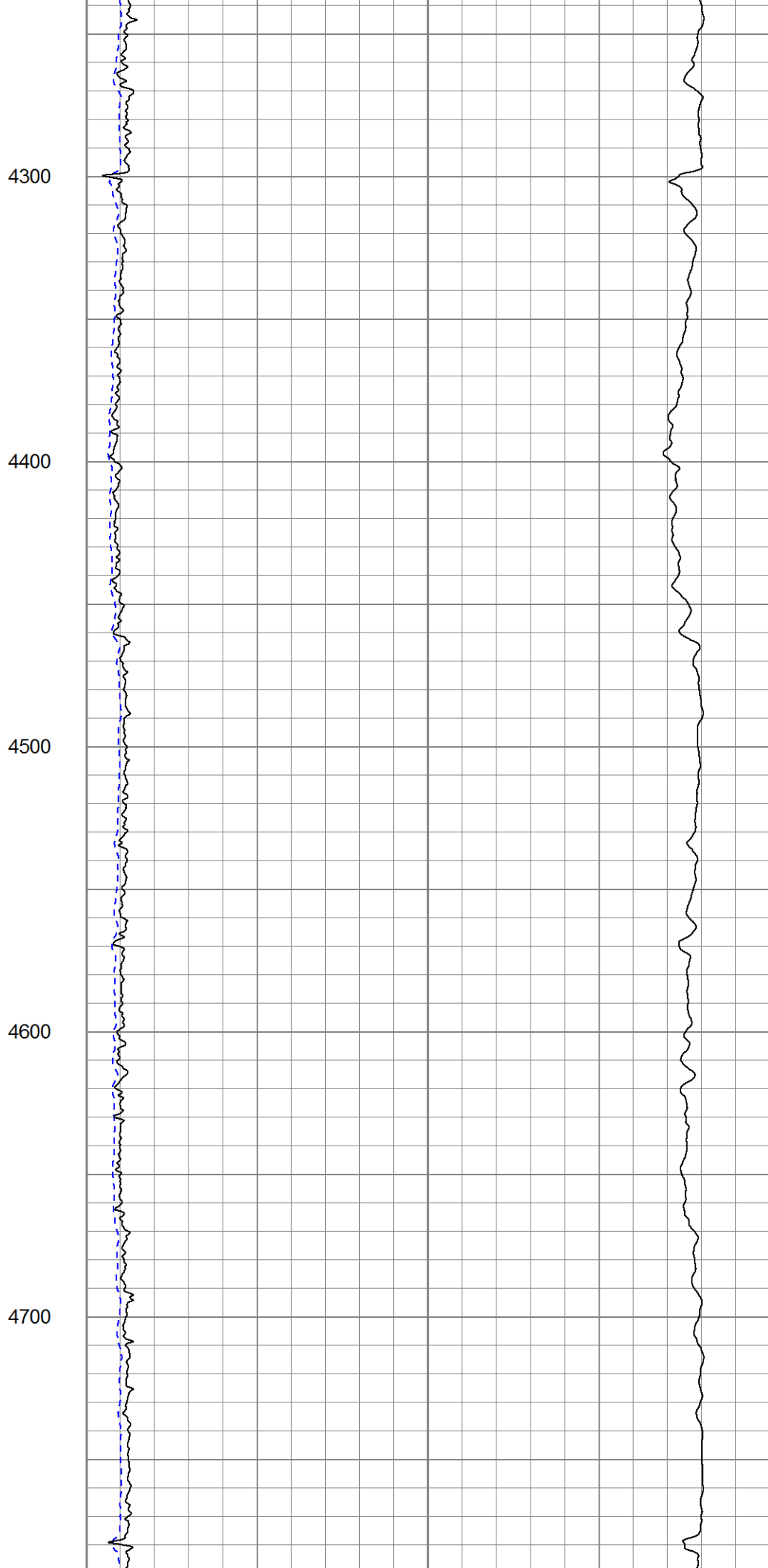
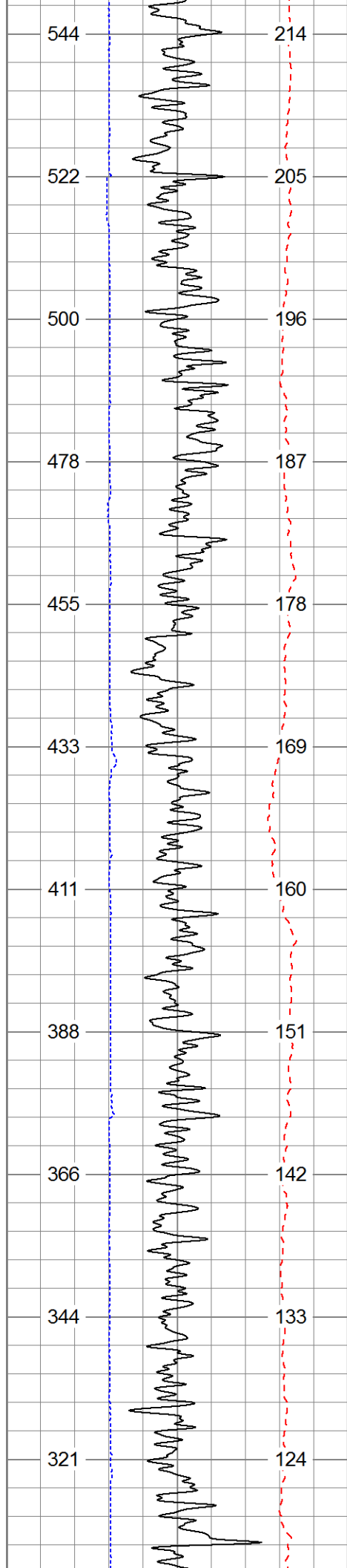
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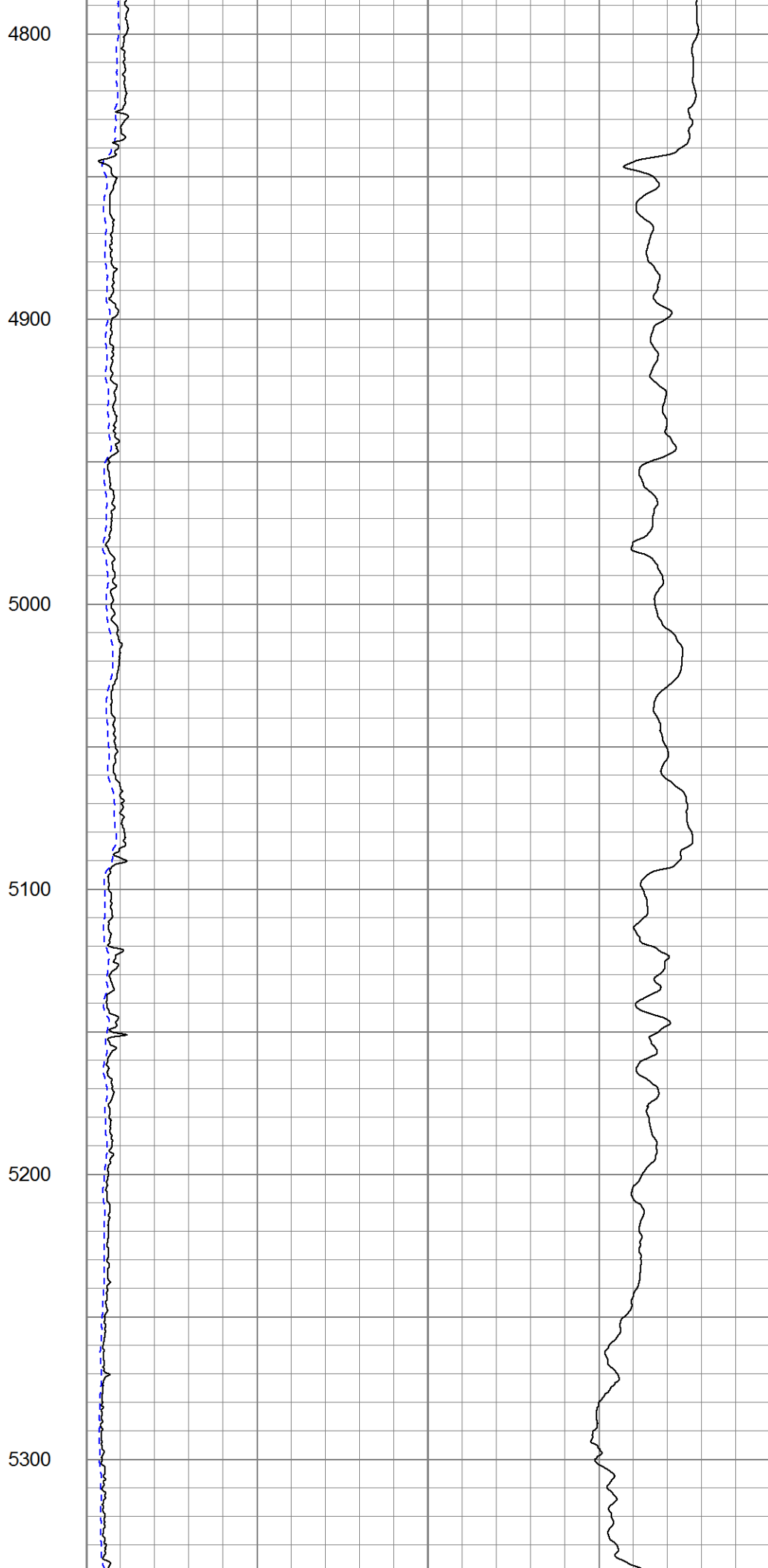
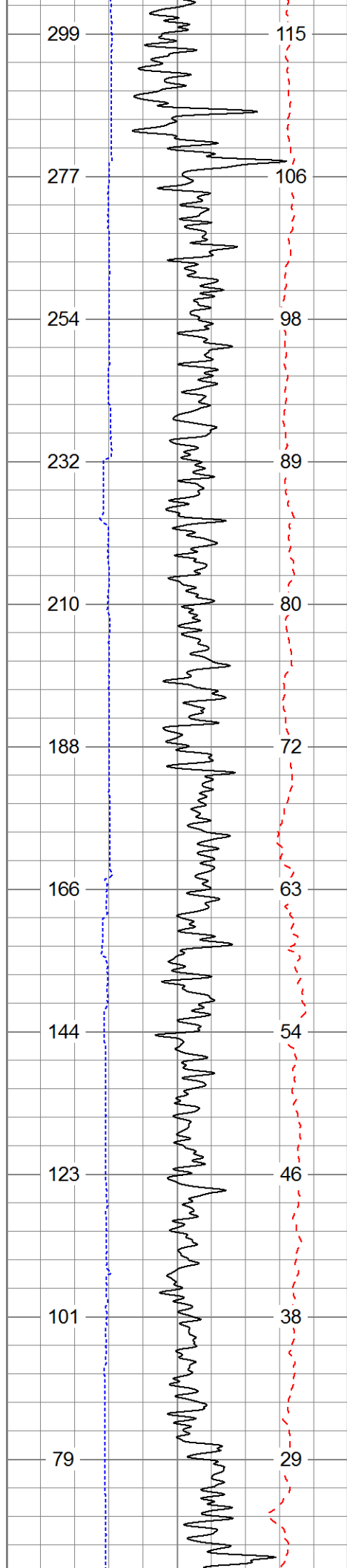


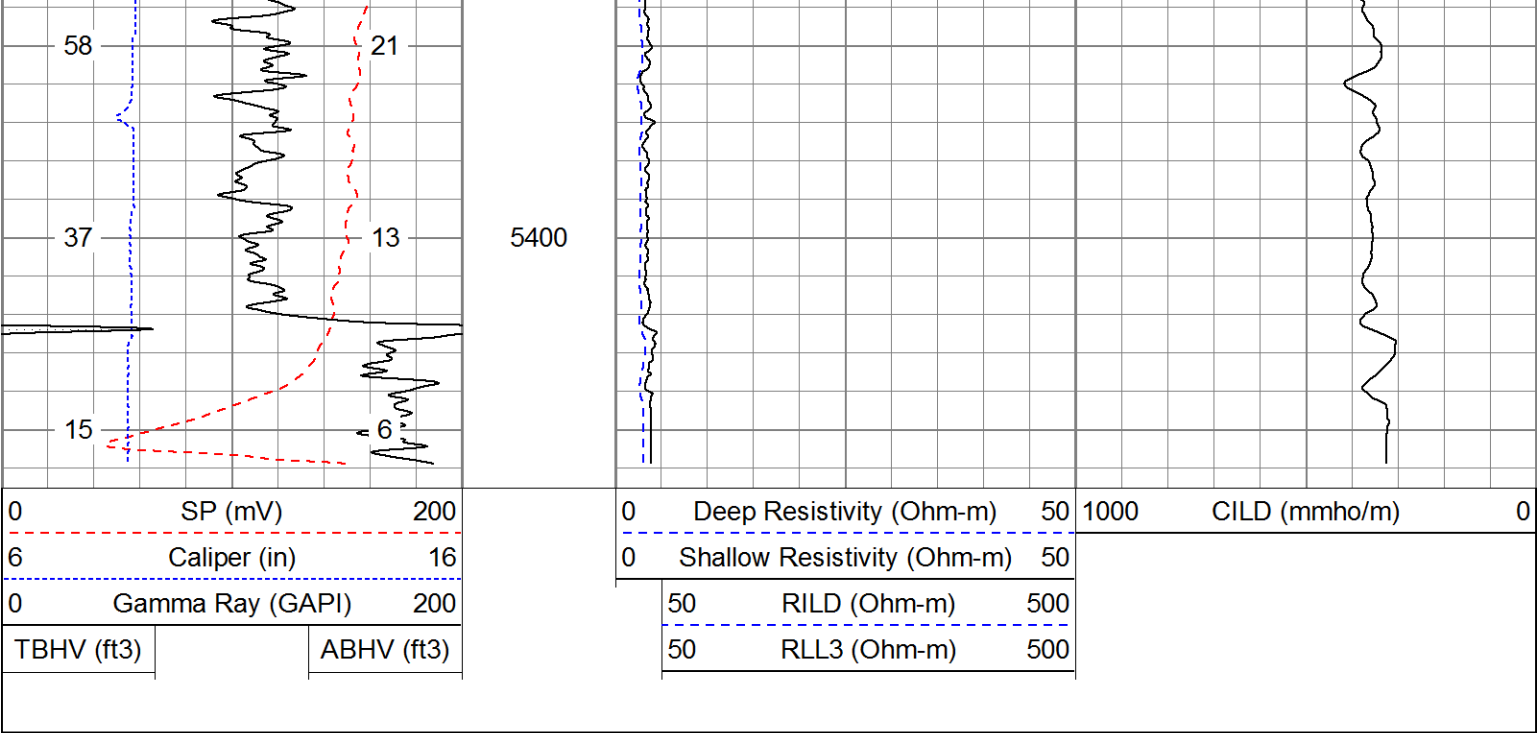










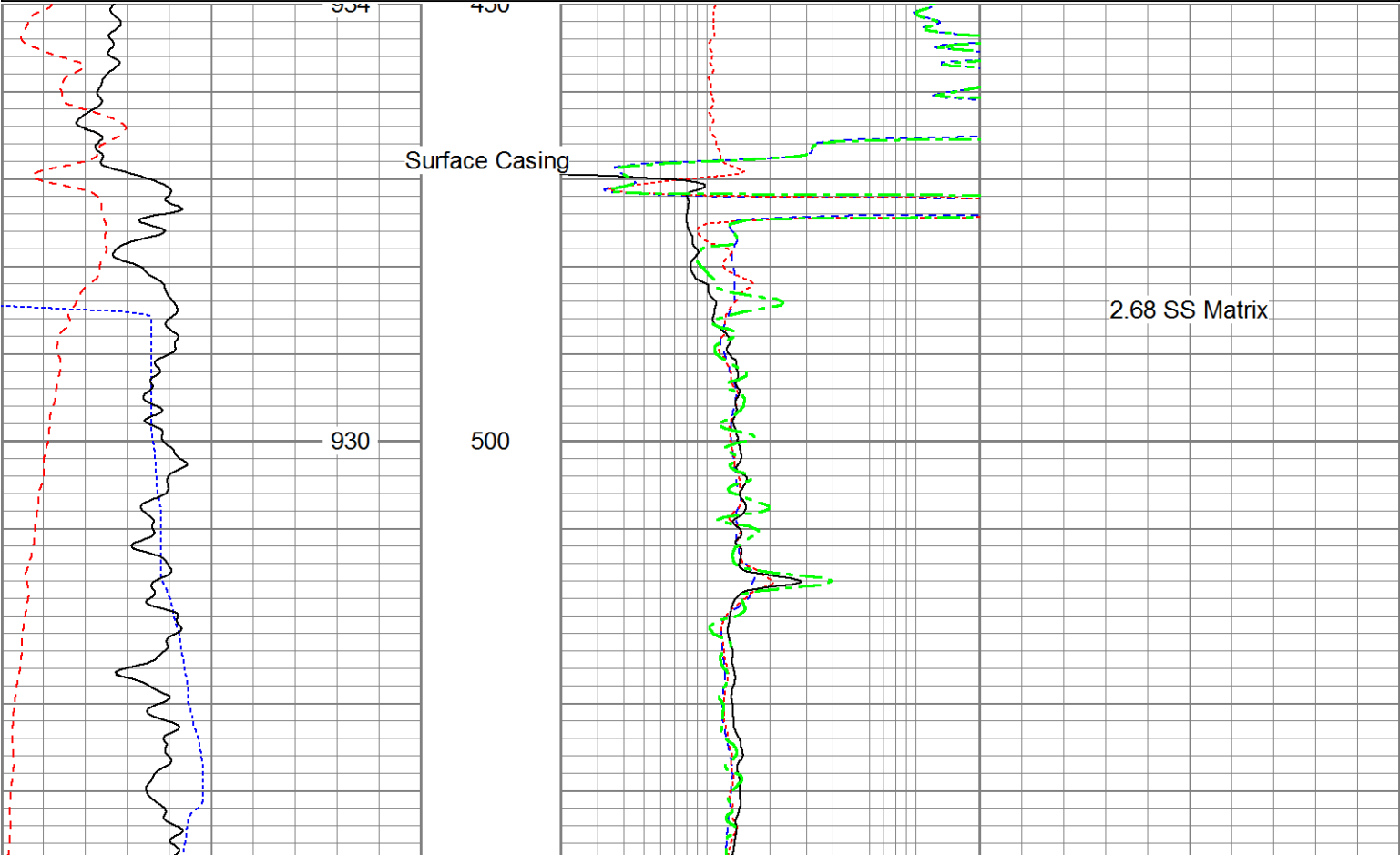


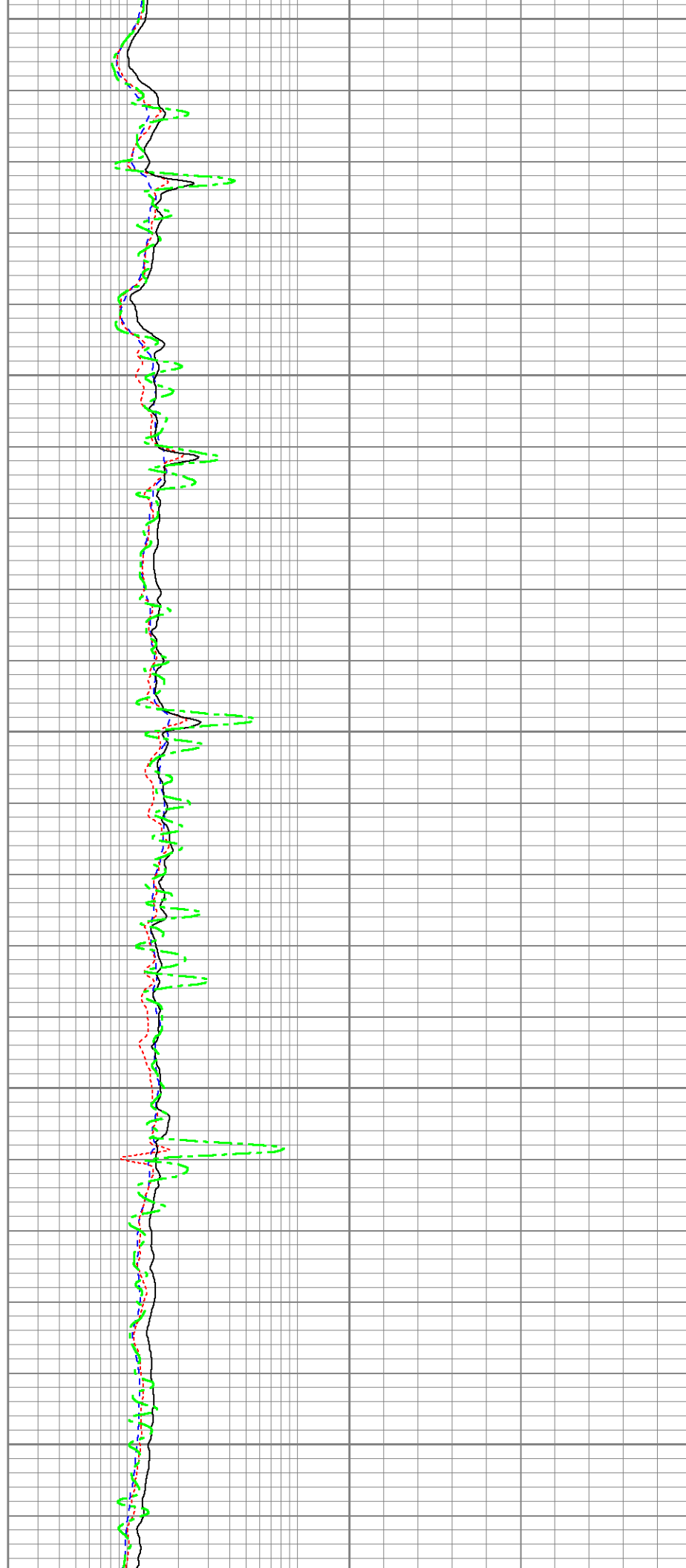
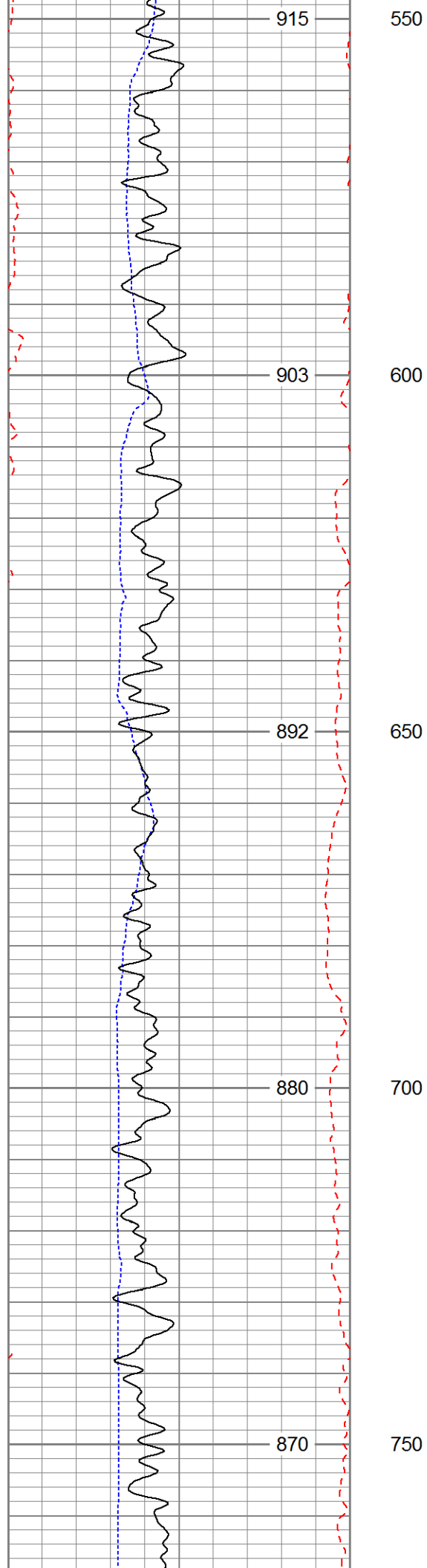
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Presentation Format: pdc			
Dataset Creation: Wed Jun 04 14:38:19 2014			
Charted by: Depth in Feet scaled 1:240			

6	Caliper (in)	16
0	Gamma Ray (GAPI)	200
0	SP (mV)	200

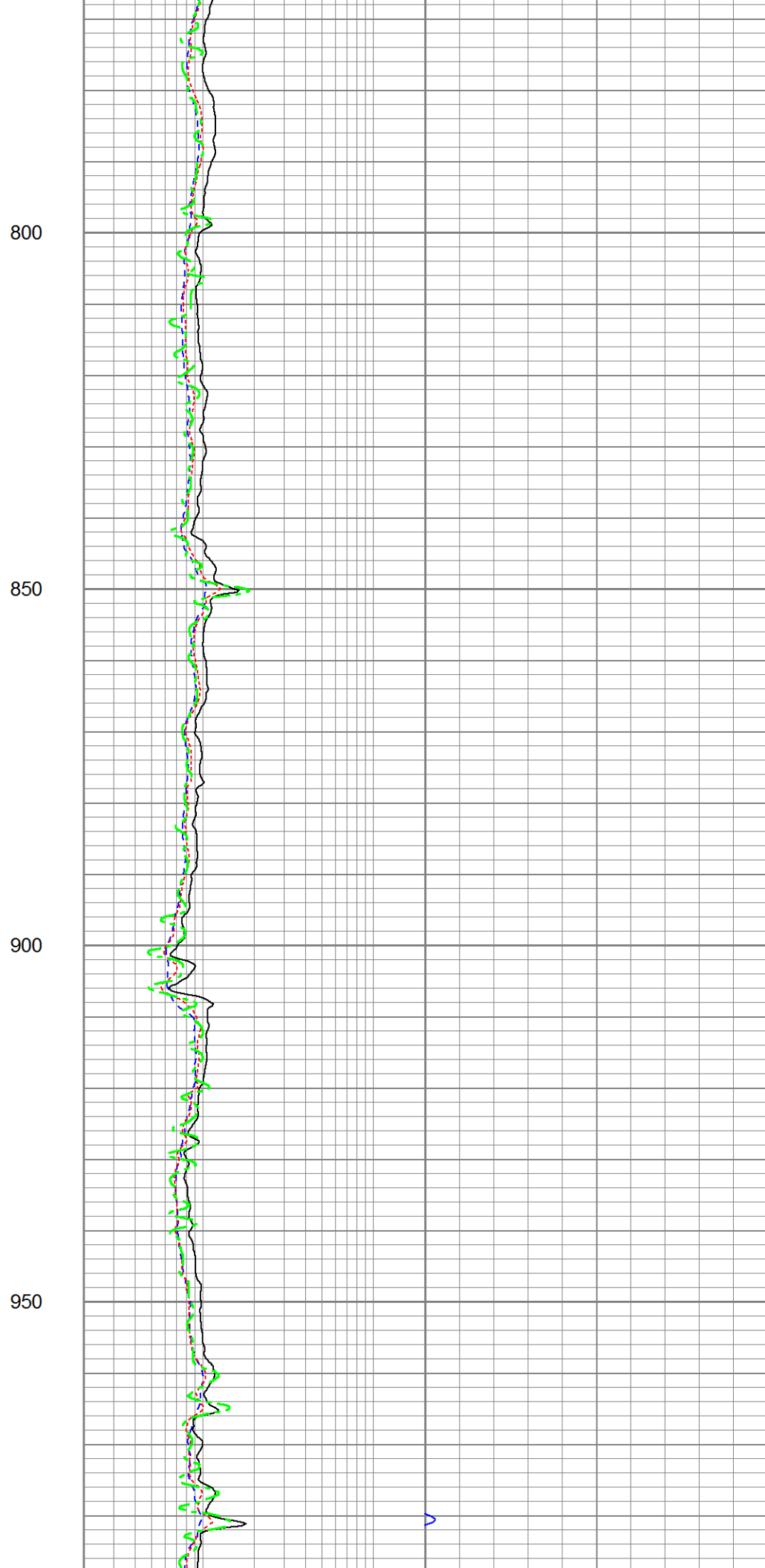
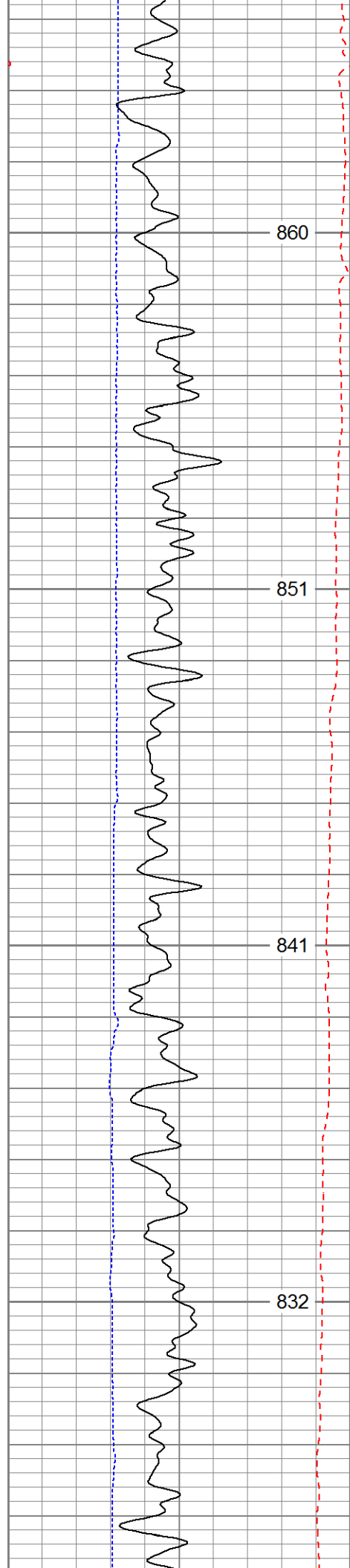
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2	Medium Resistivity (Ohm-m)	200
2	Shallow Resistivity (Ohm-m)	200
2	Rt (Ohm-m)	200

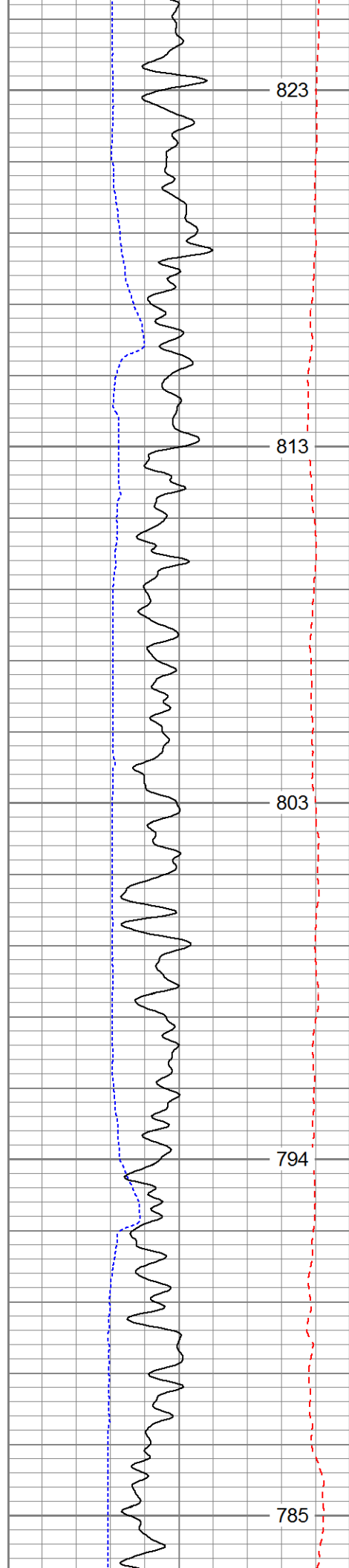
20	Density Porosity (pu)	0
20	Neutron Porosity (pu)	0











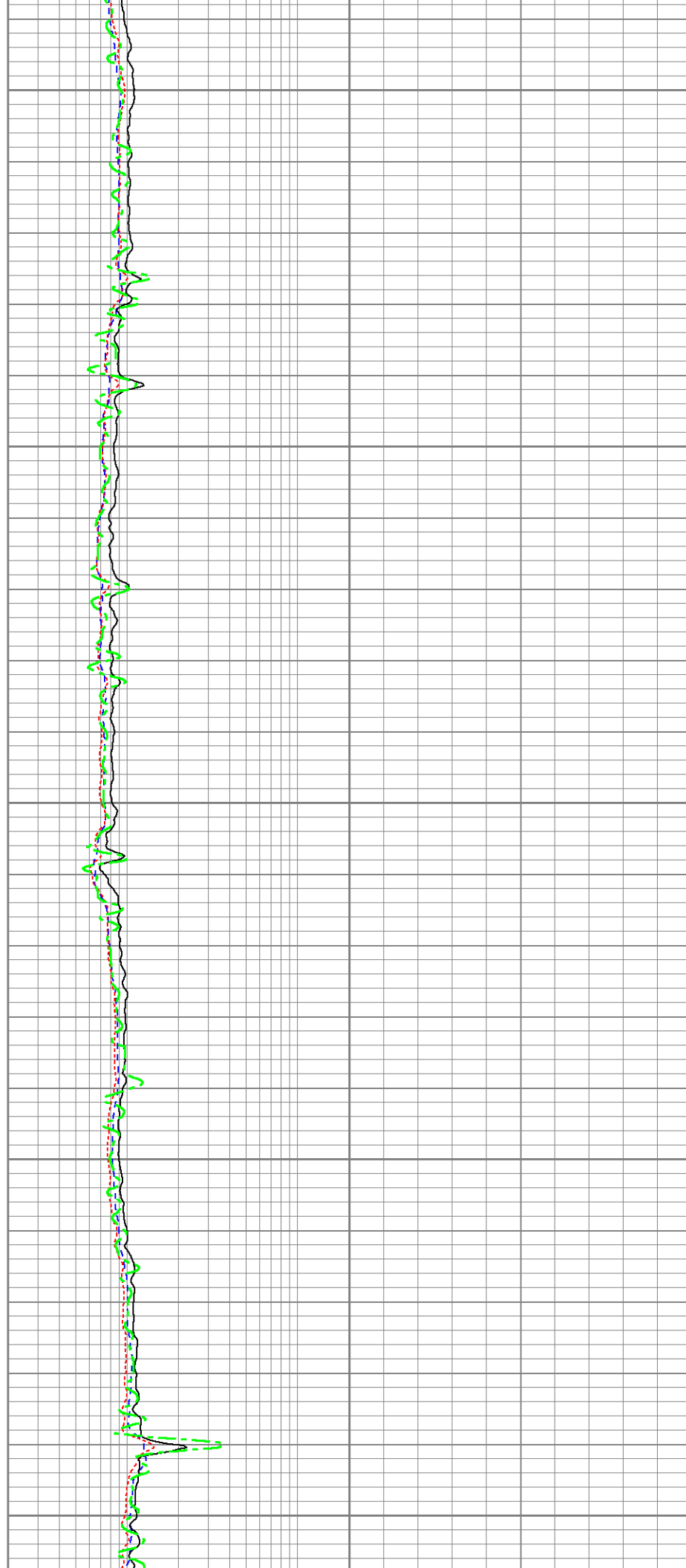
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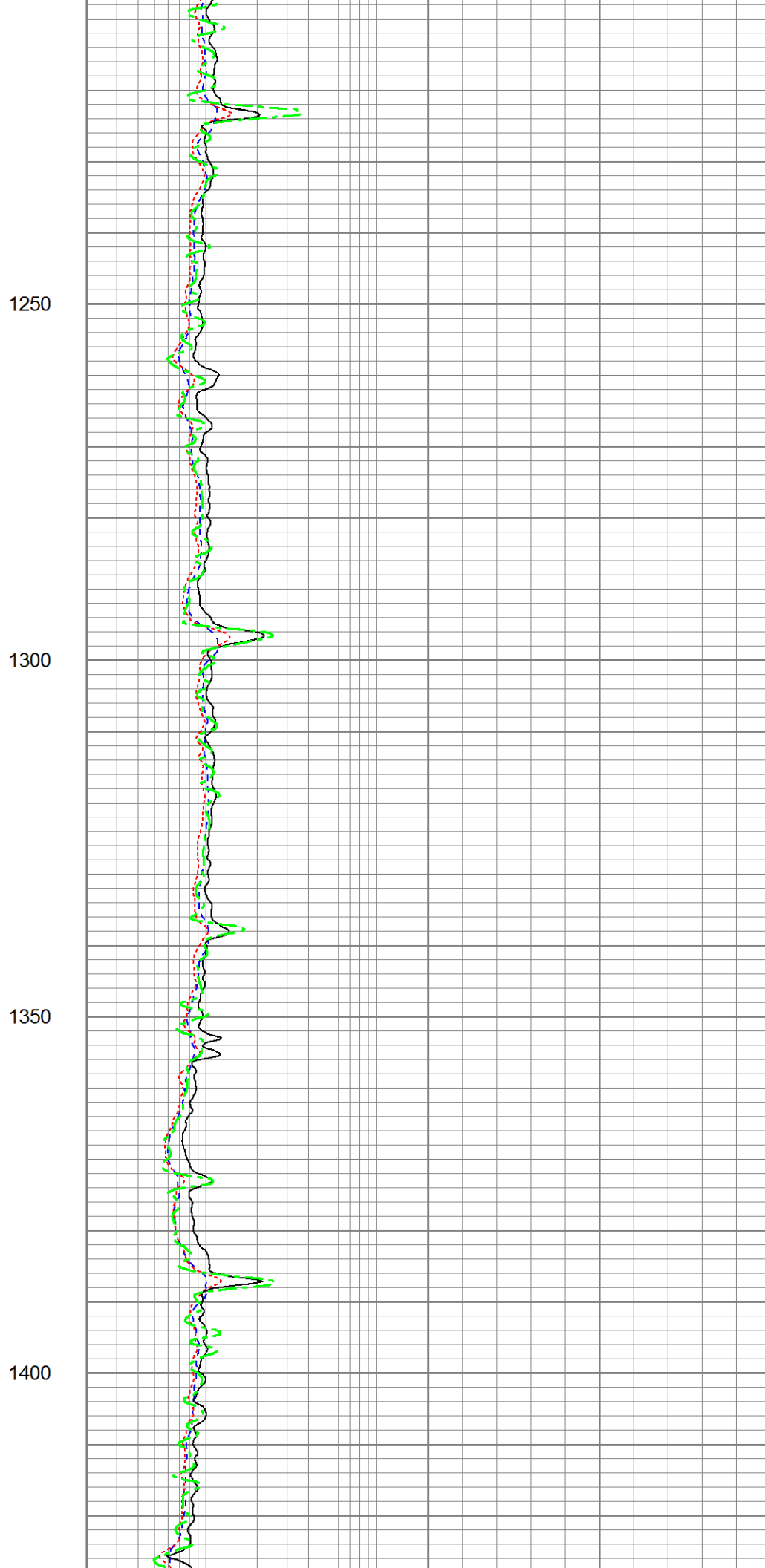
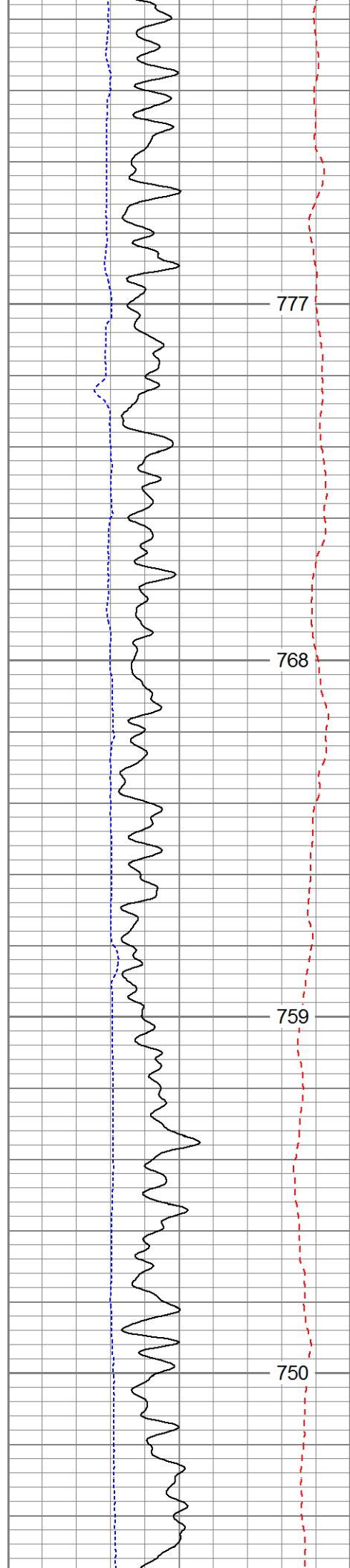
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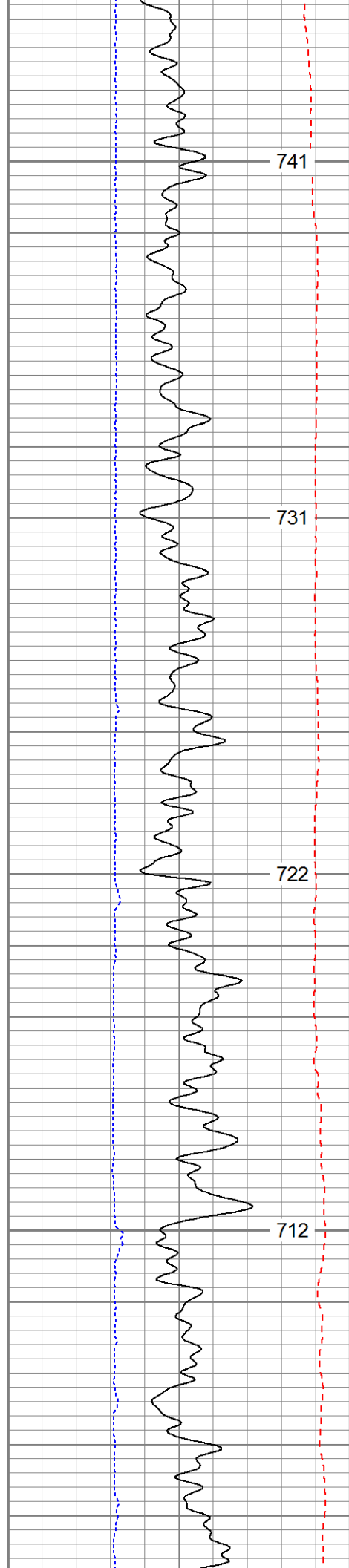
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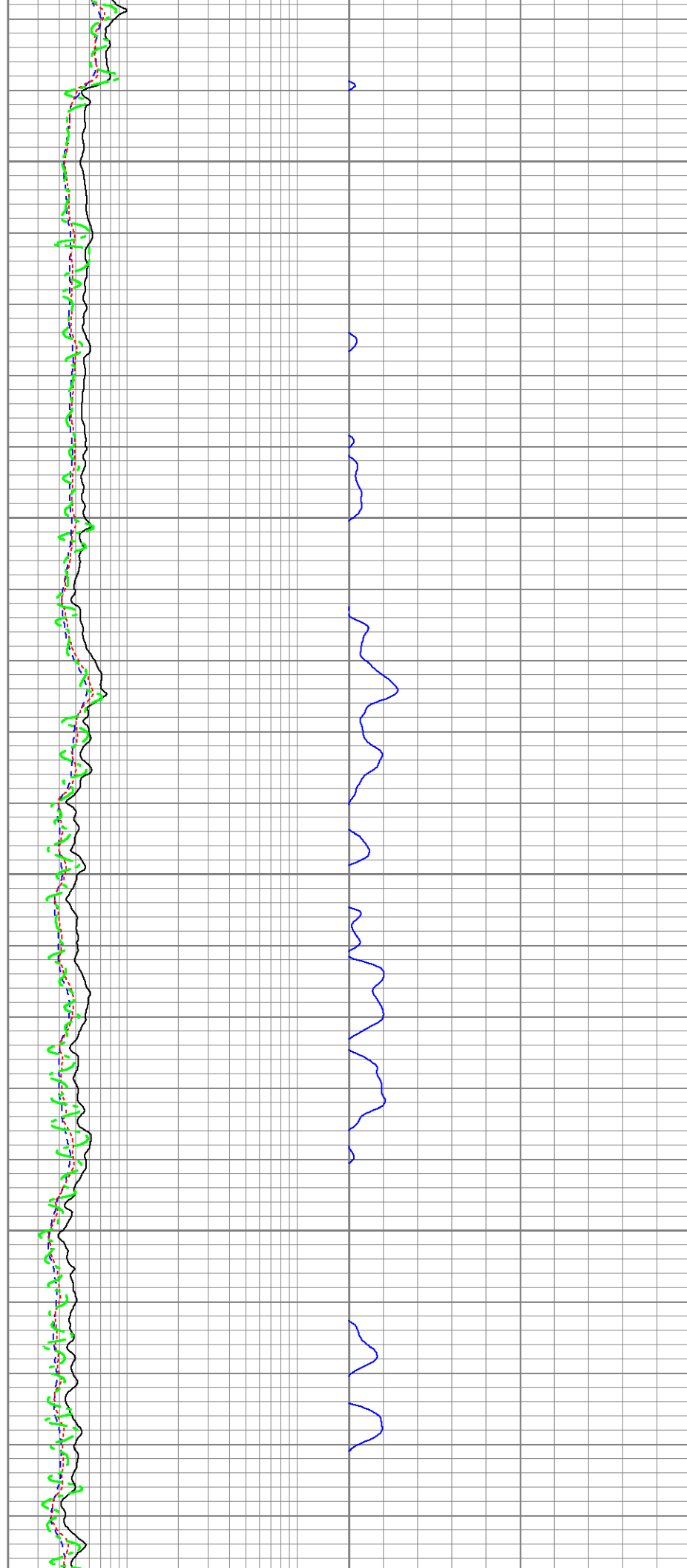


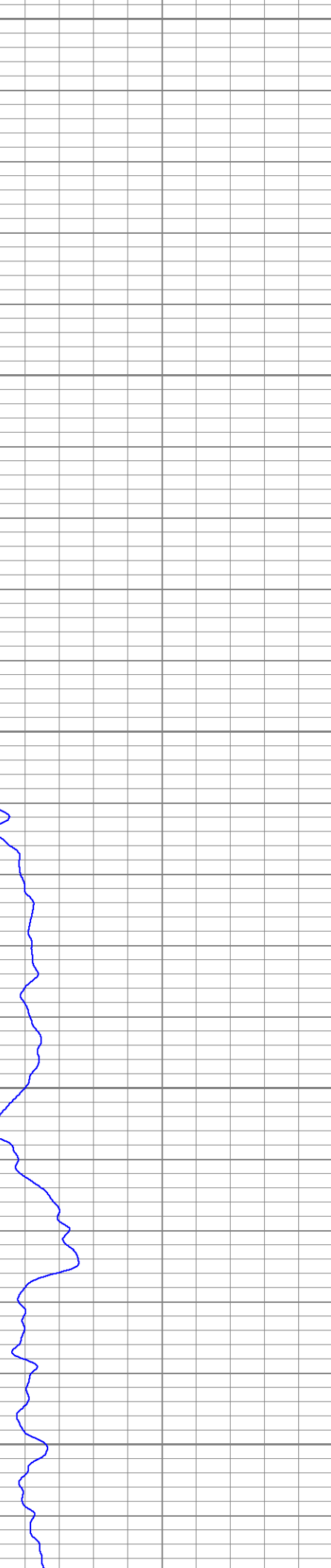
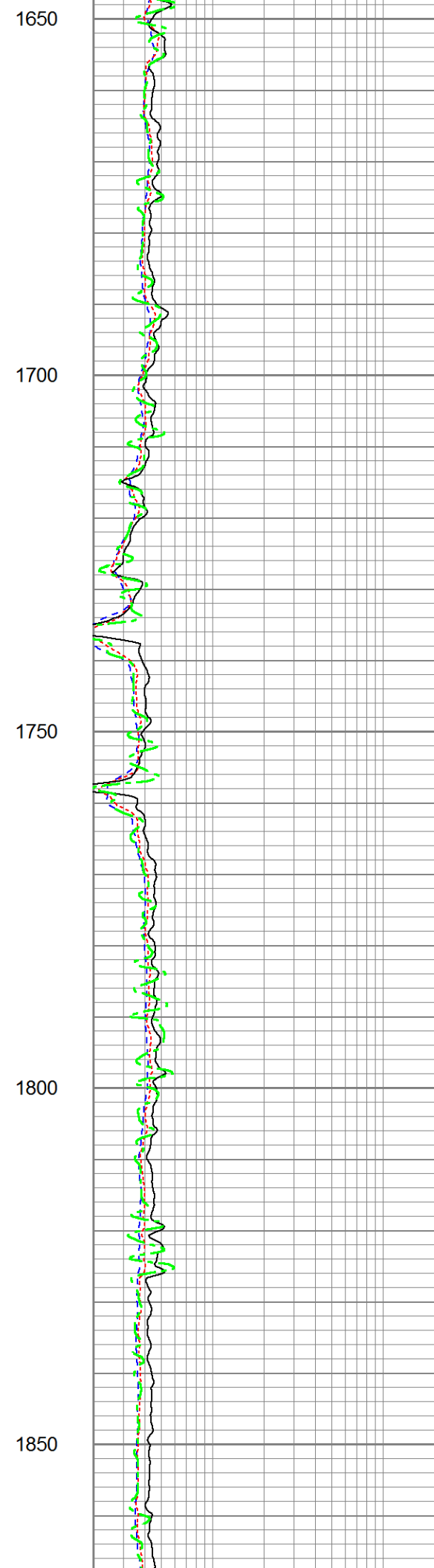
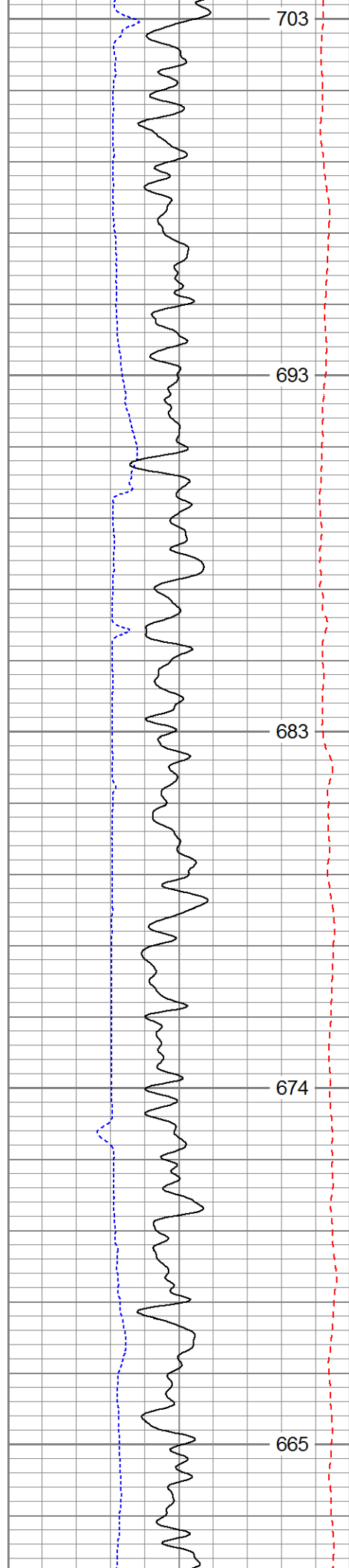
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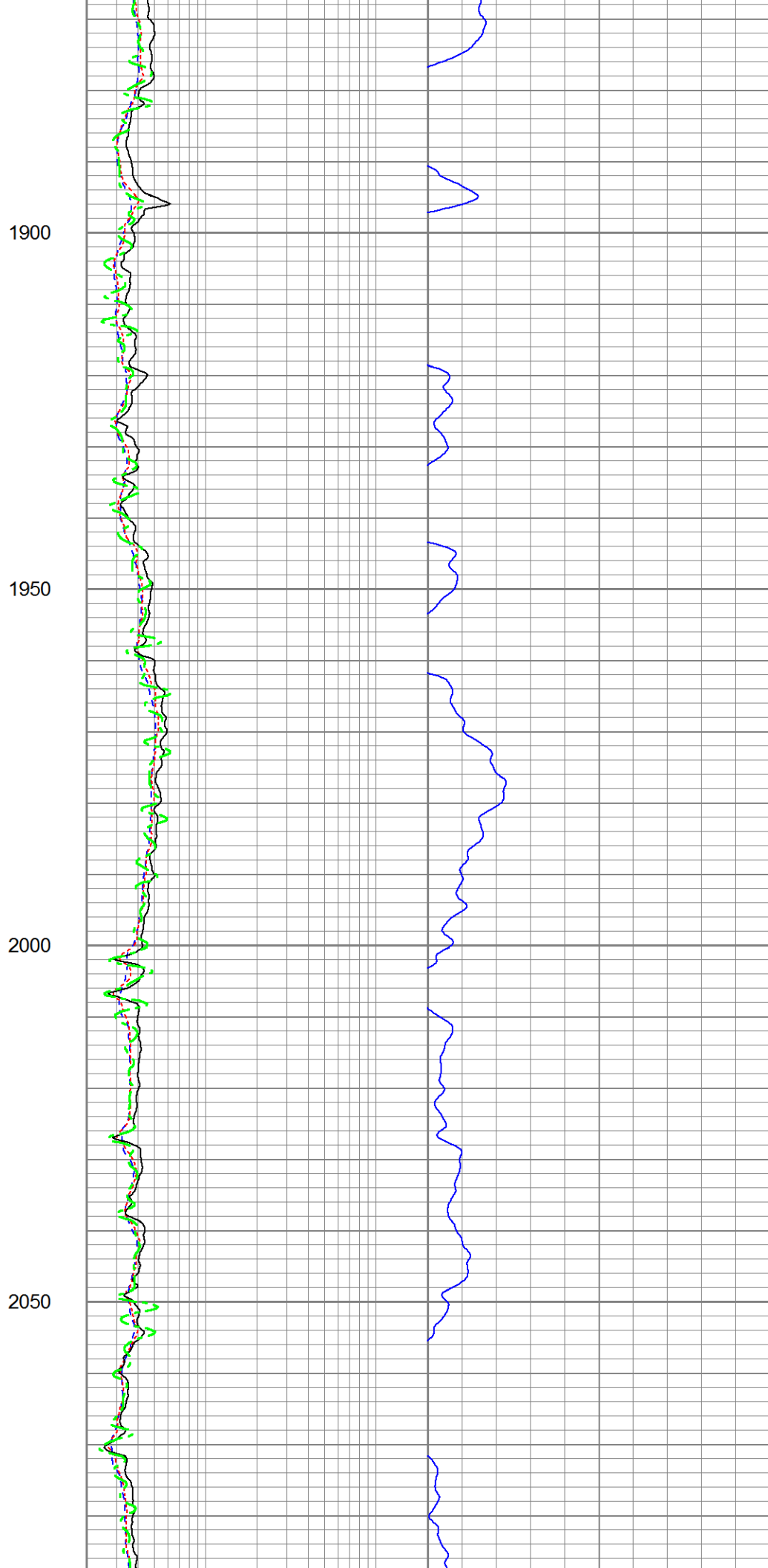
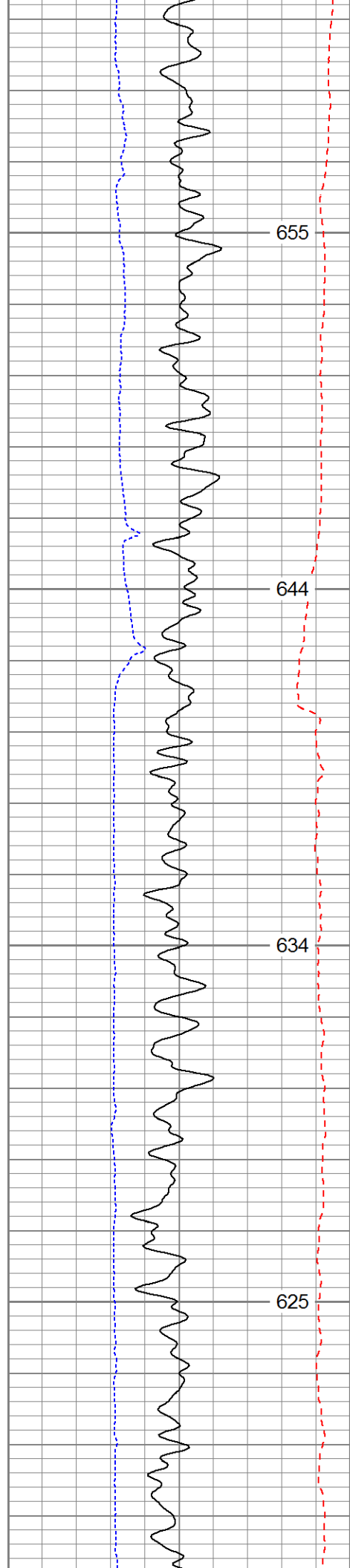
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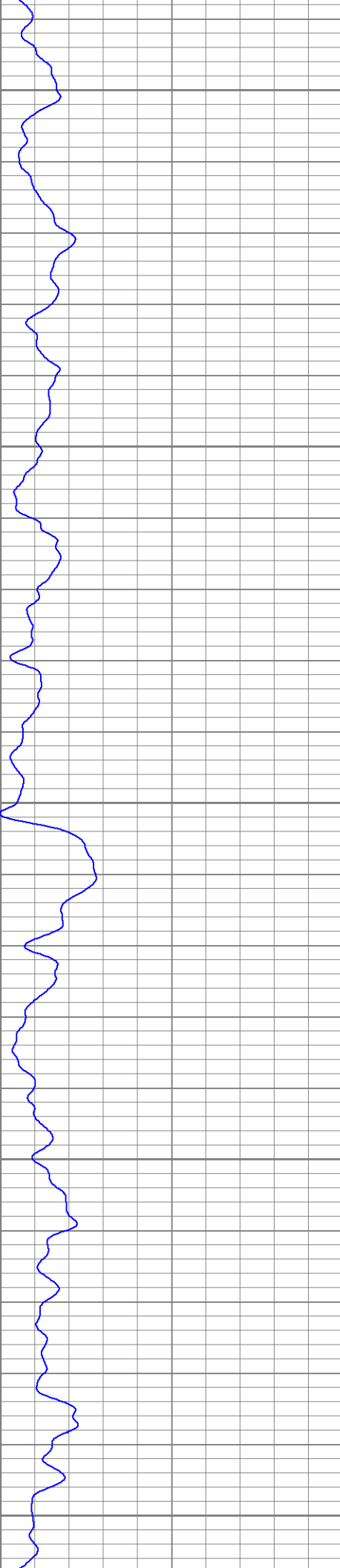
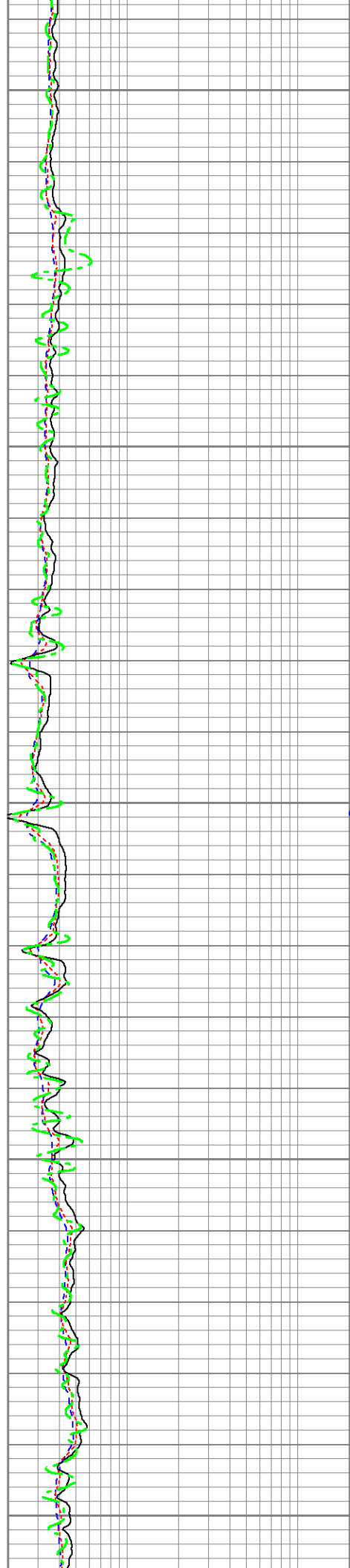
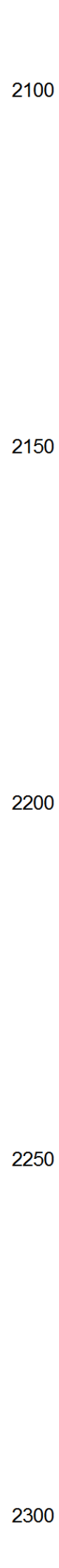
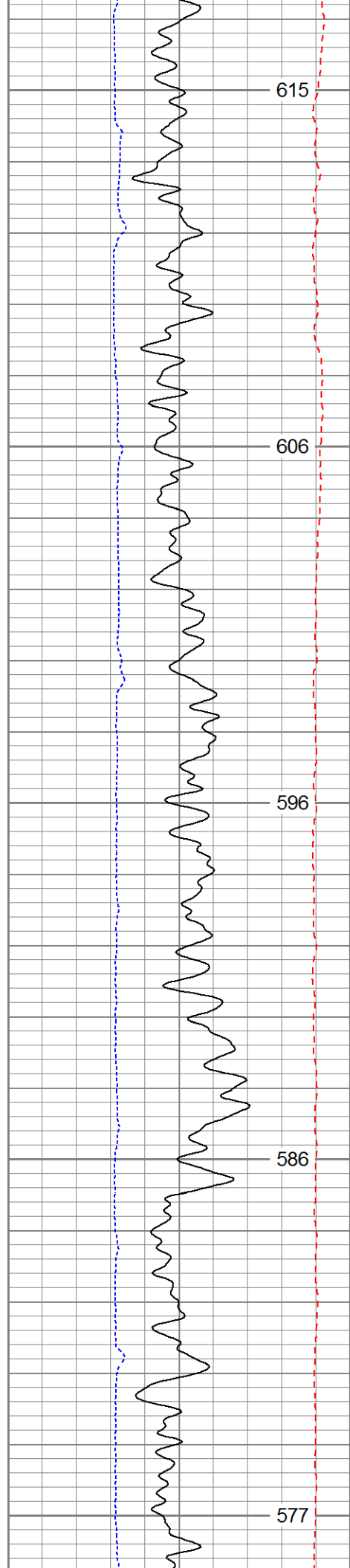
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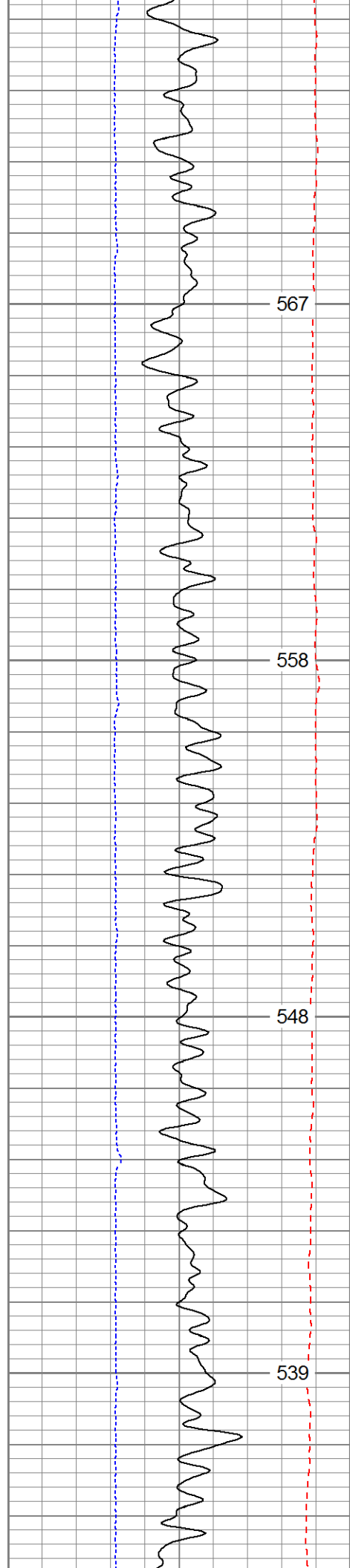
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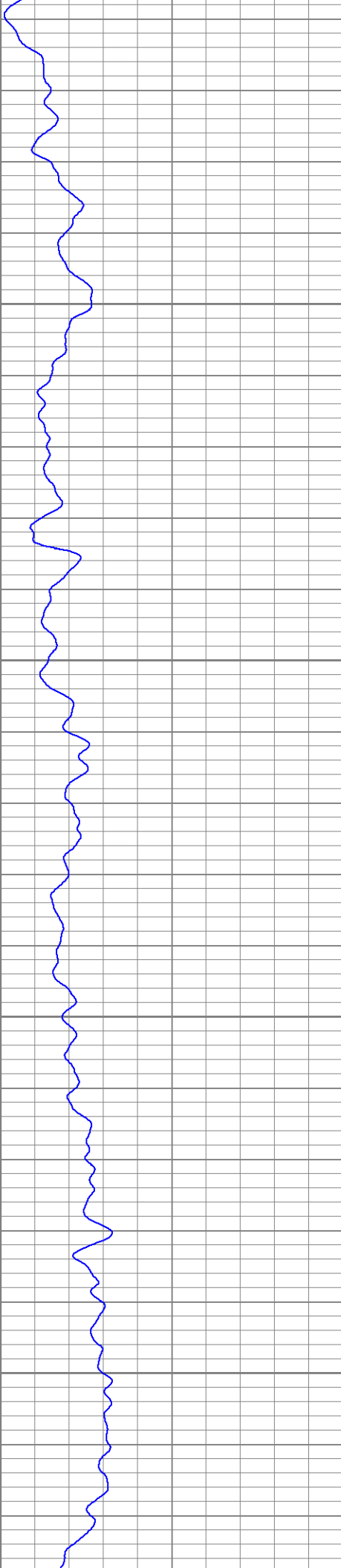
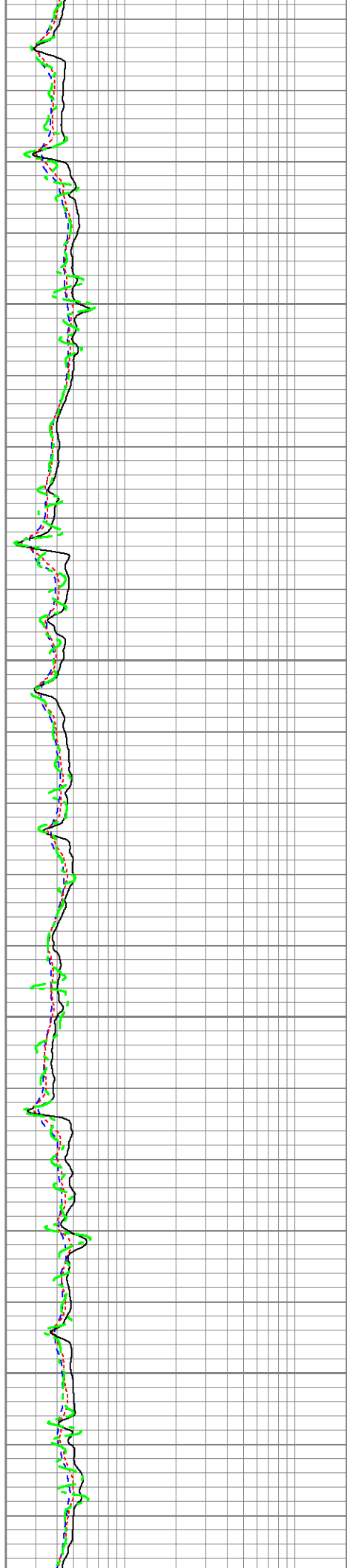


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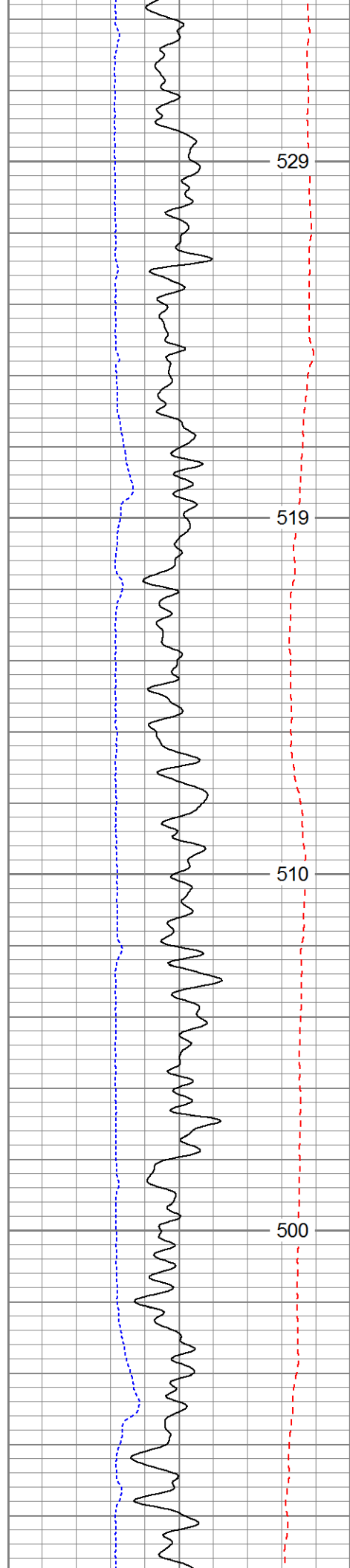
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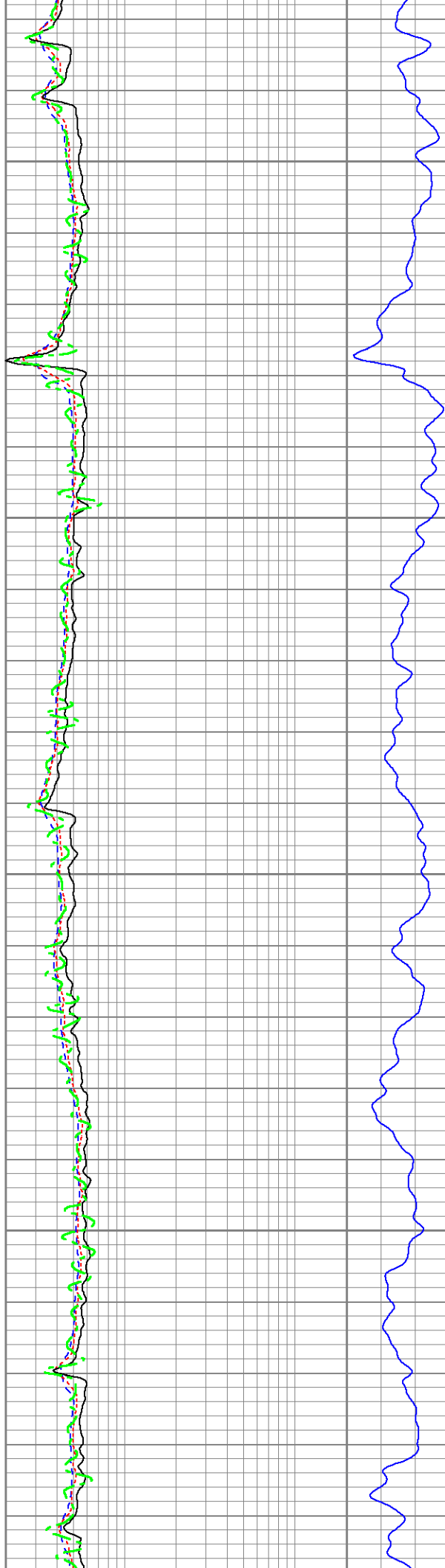


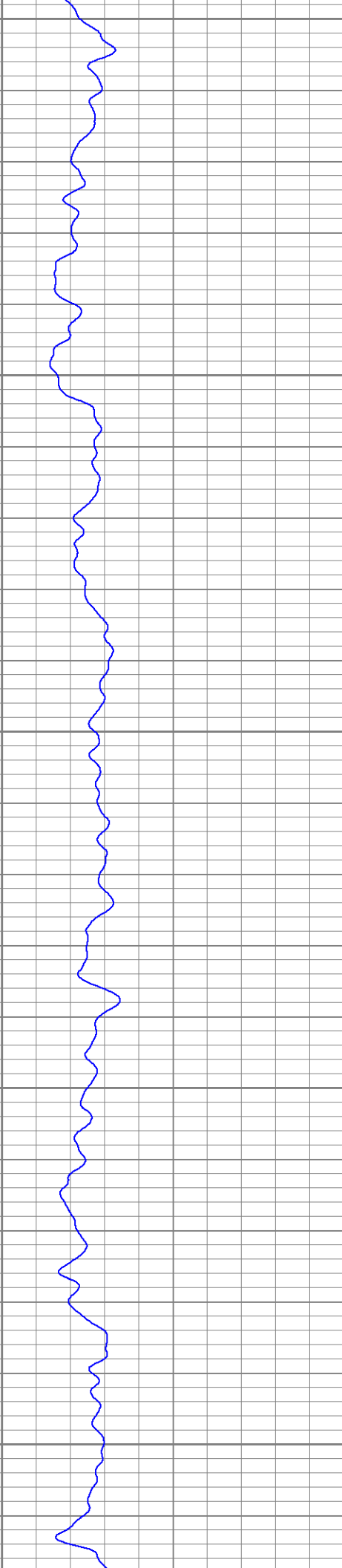
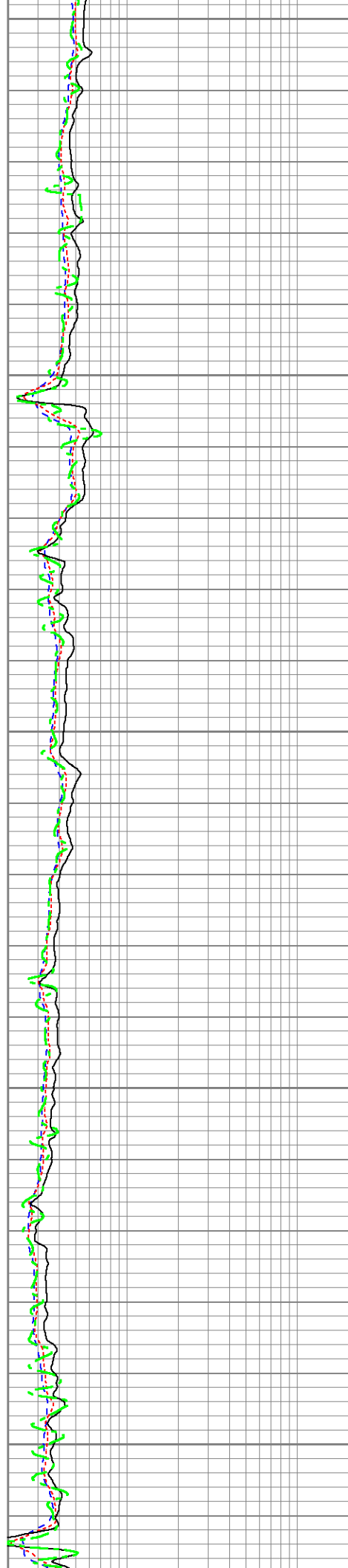
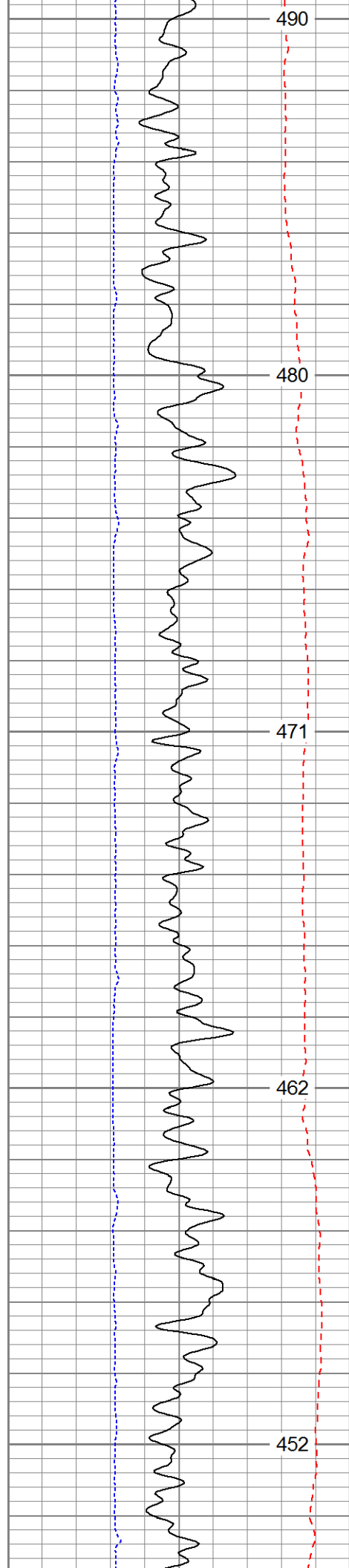
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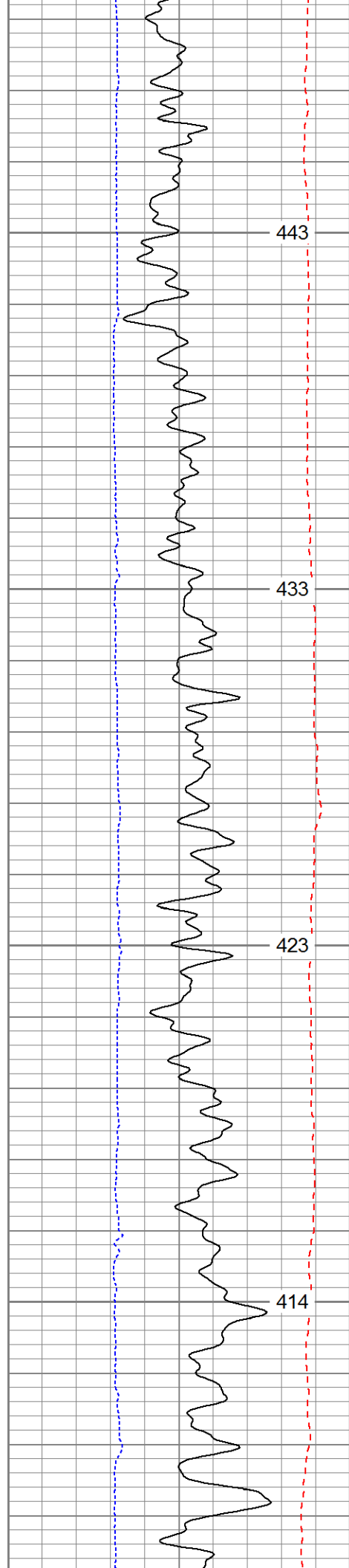
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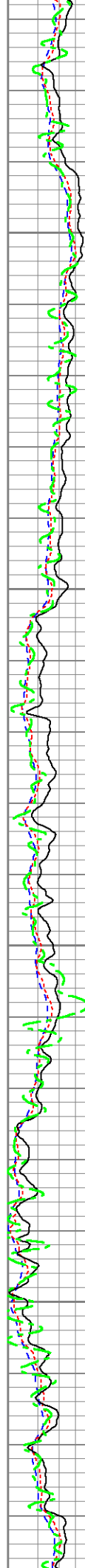


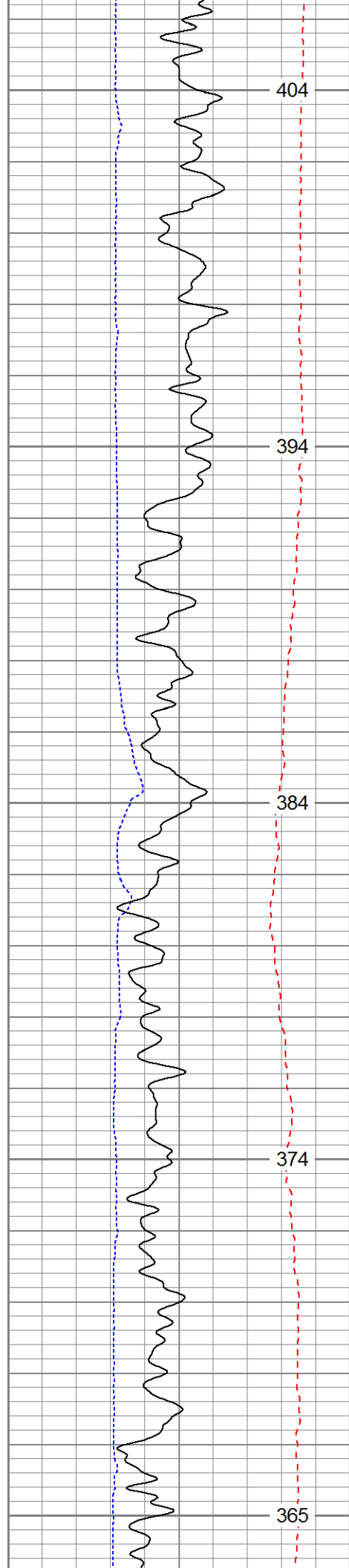
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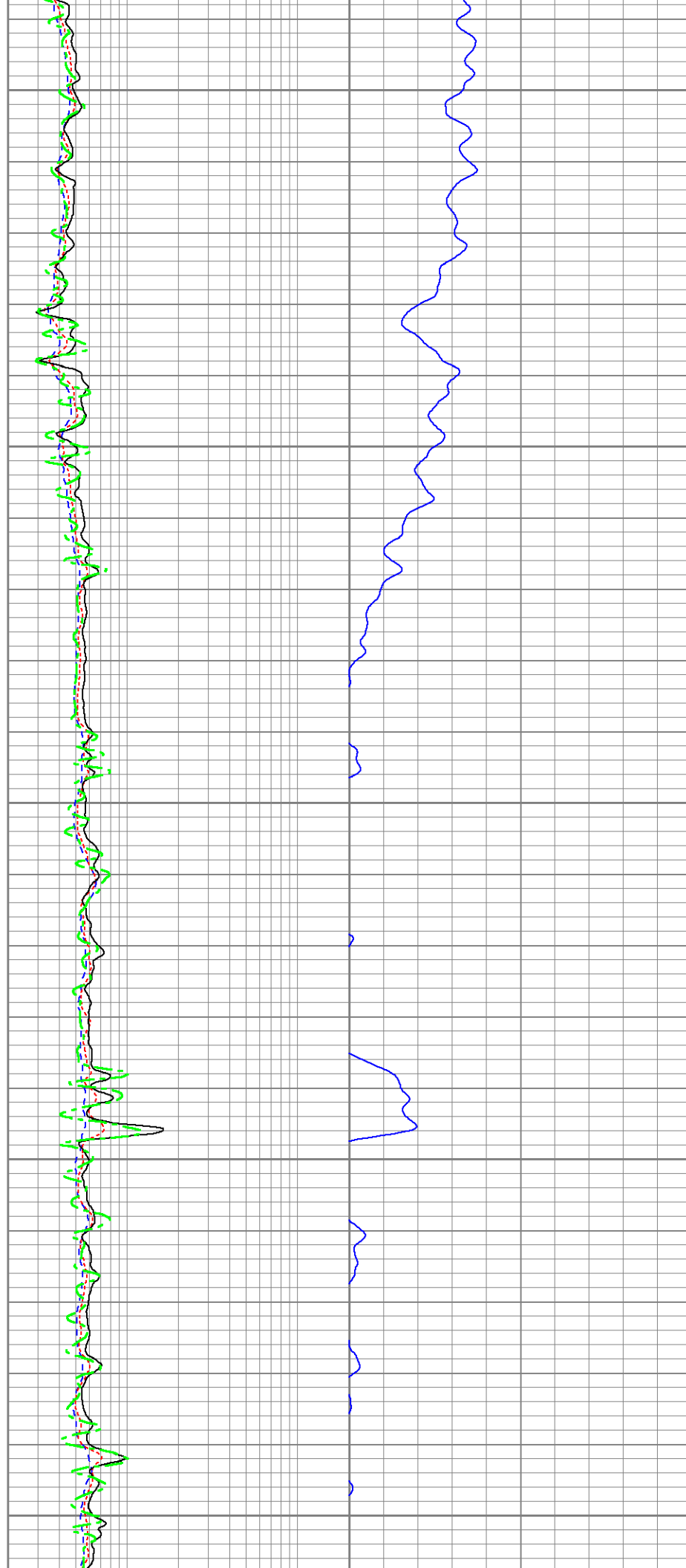
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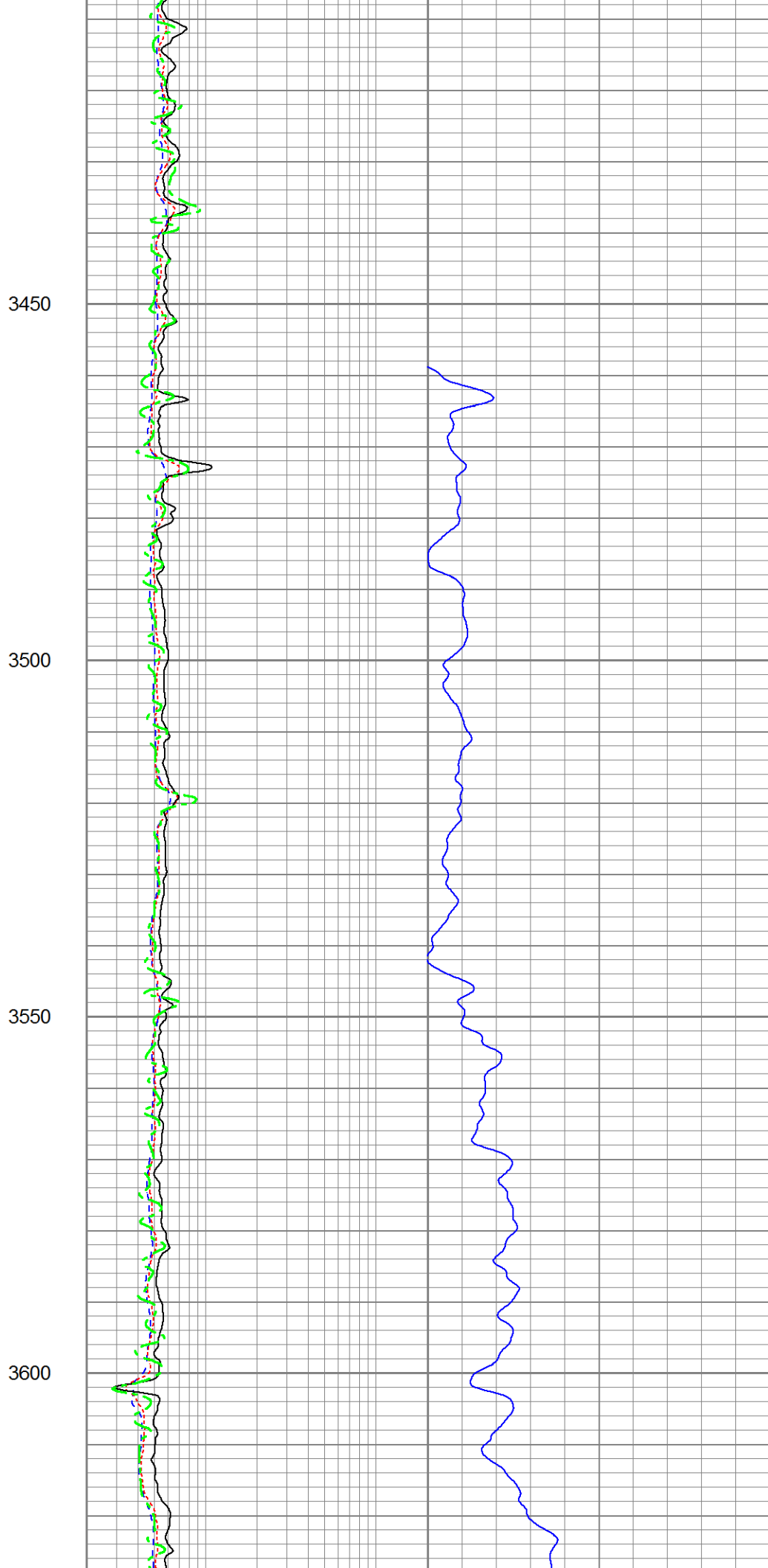
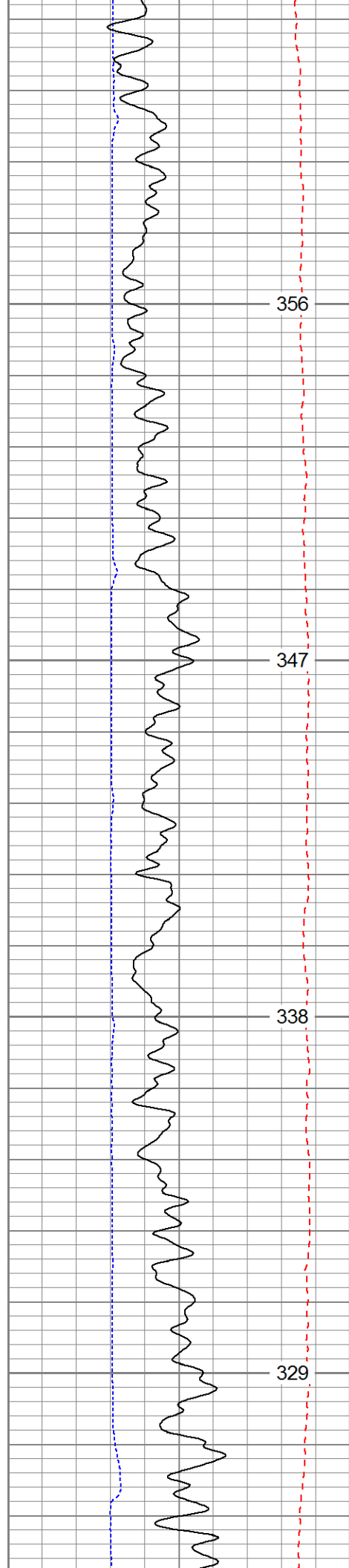
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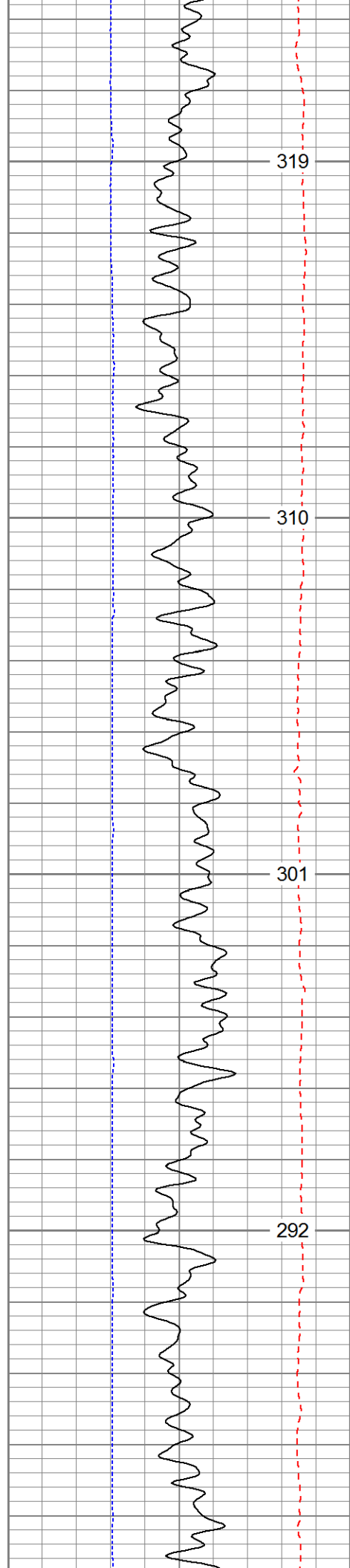
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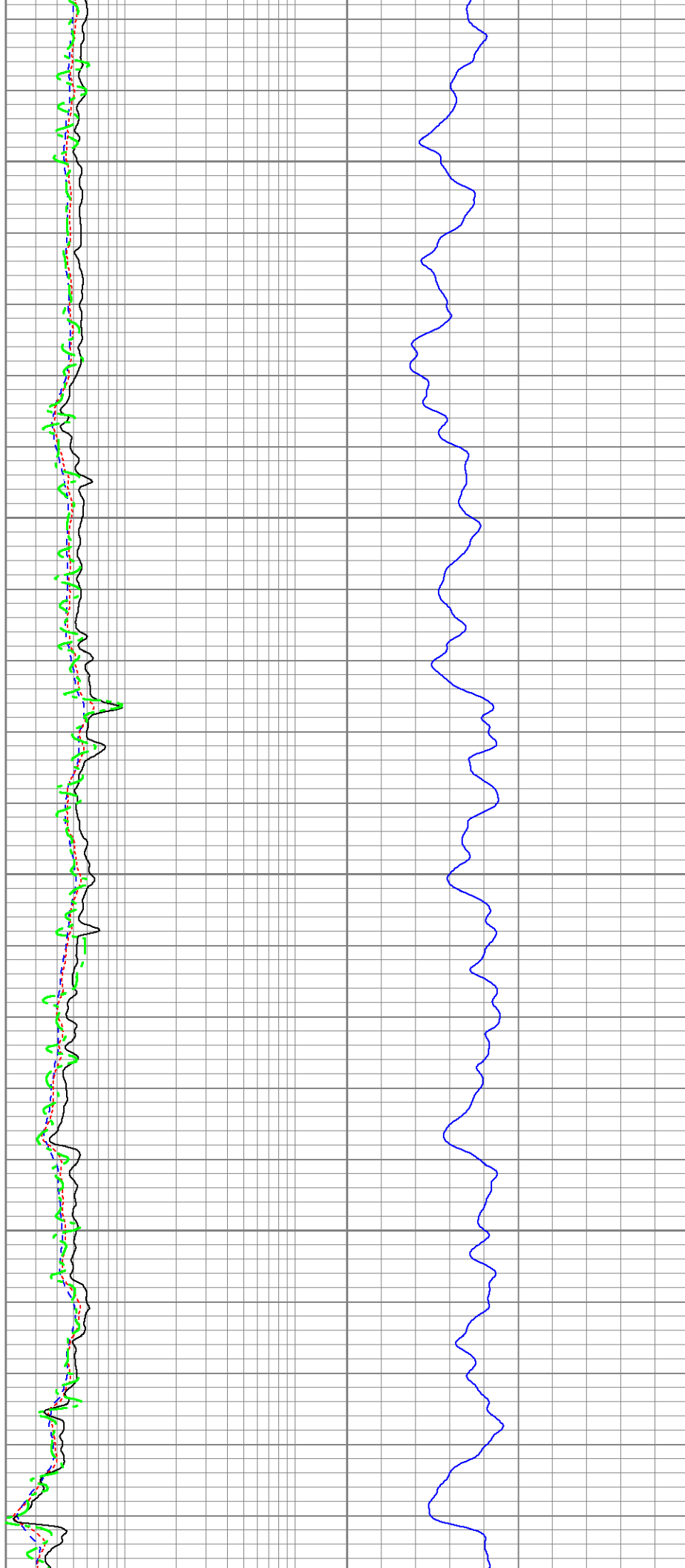


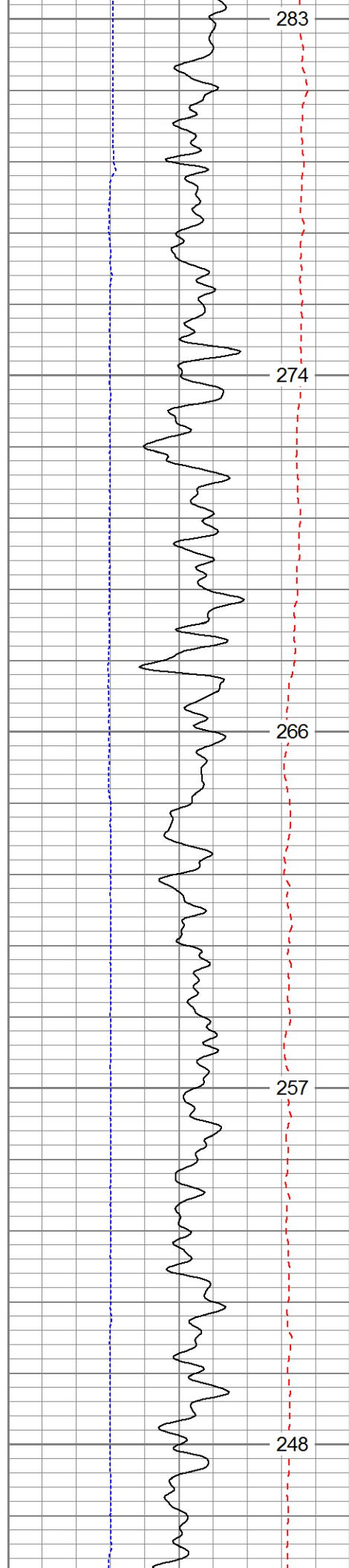
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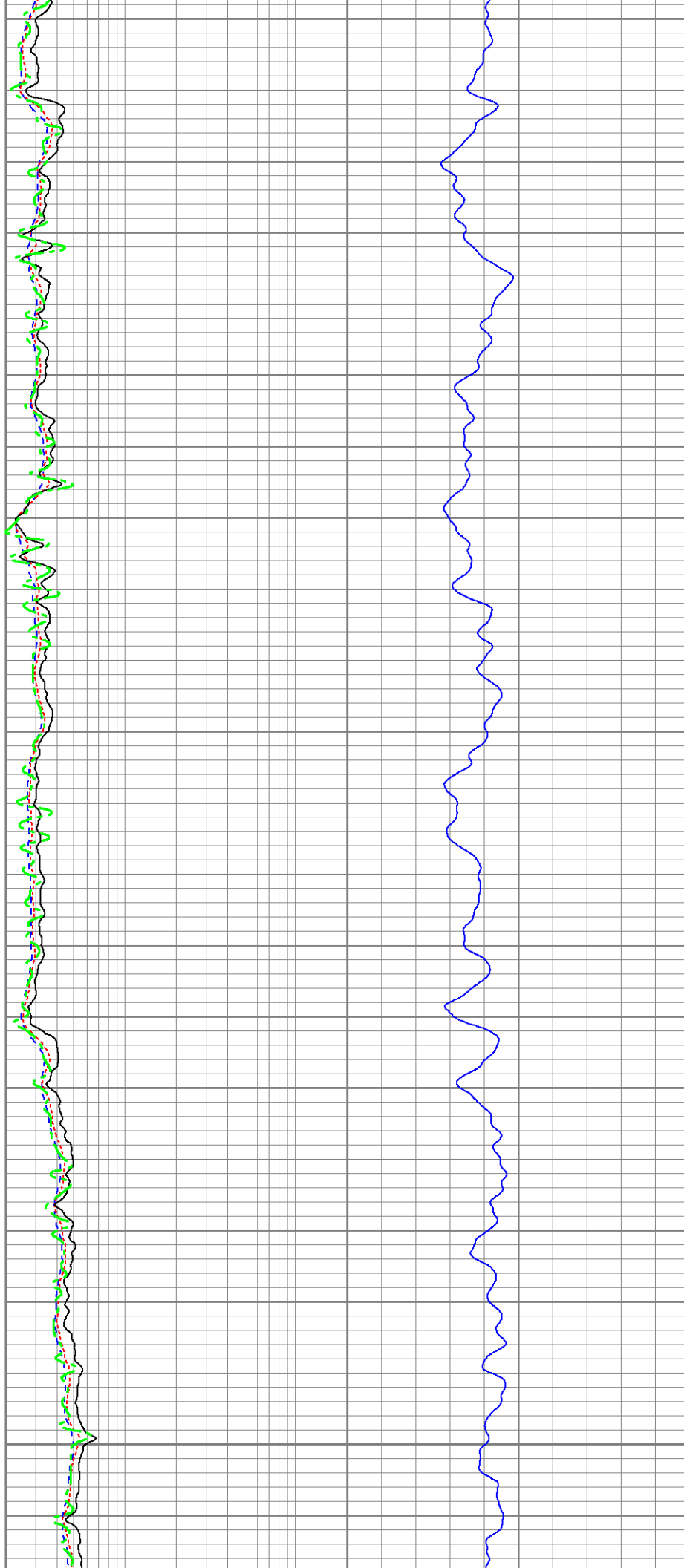
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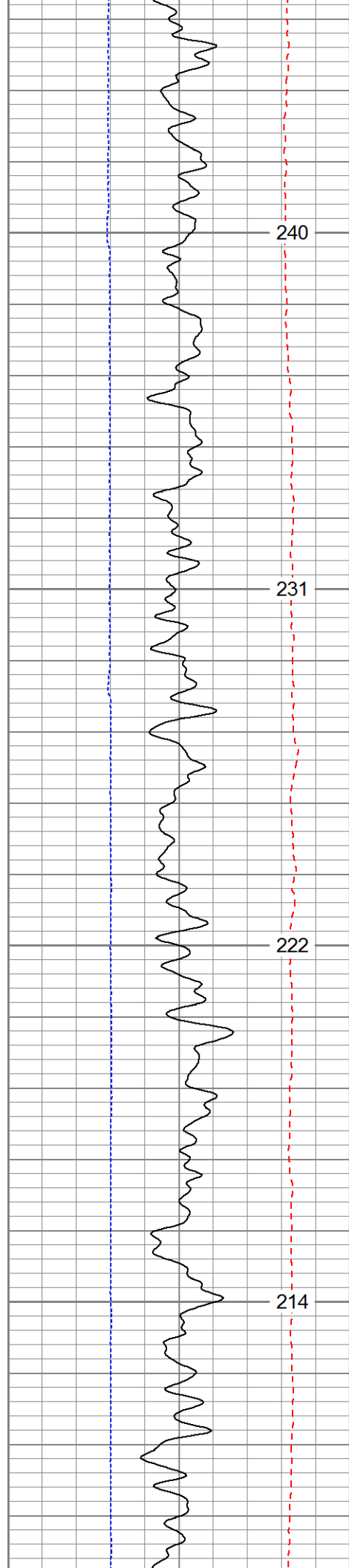
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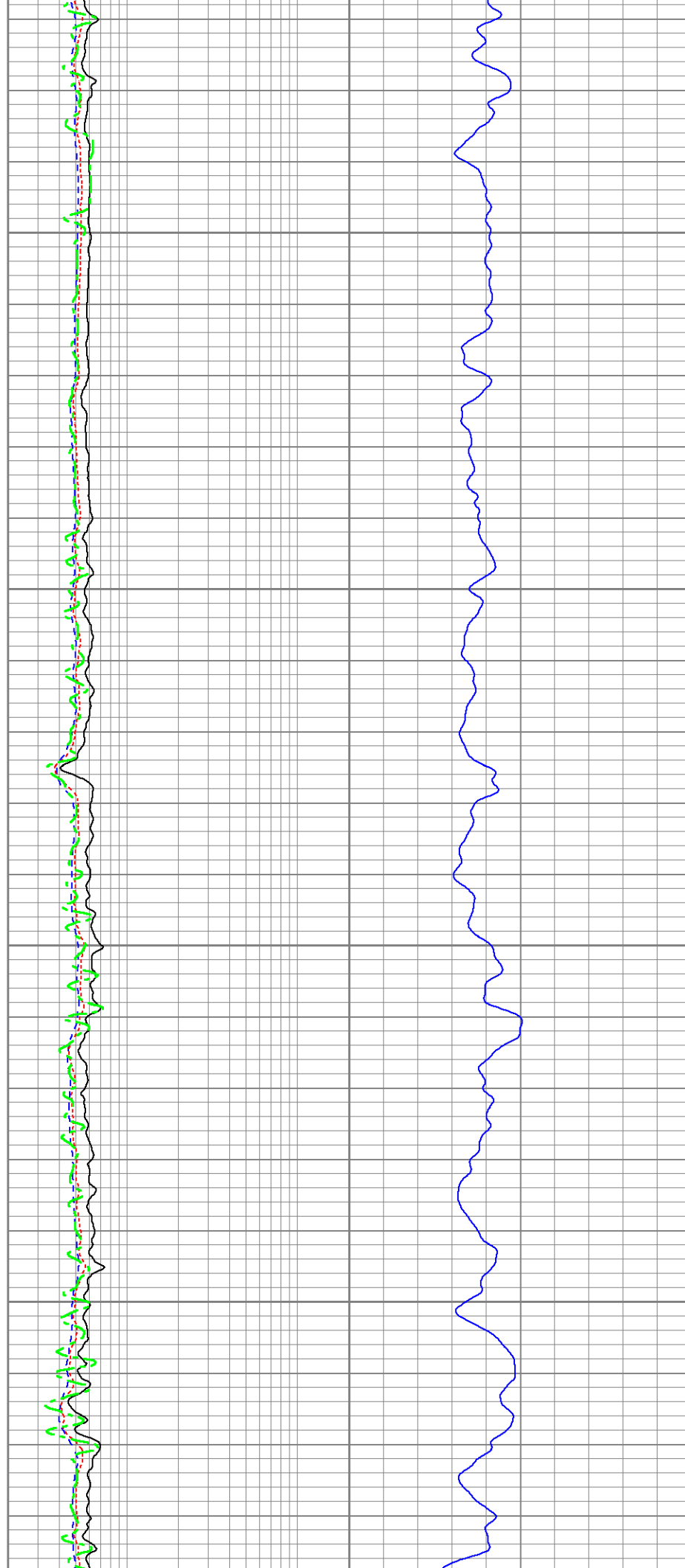


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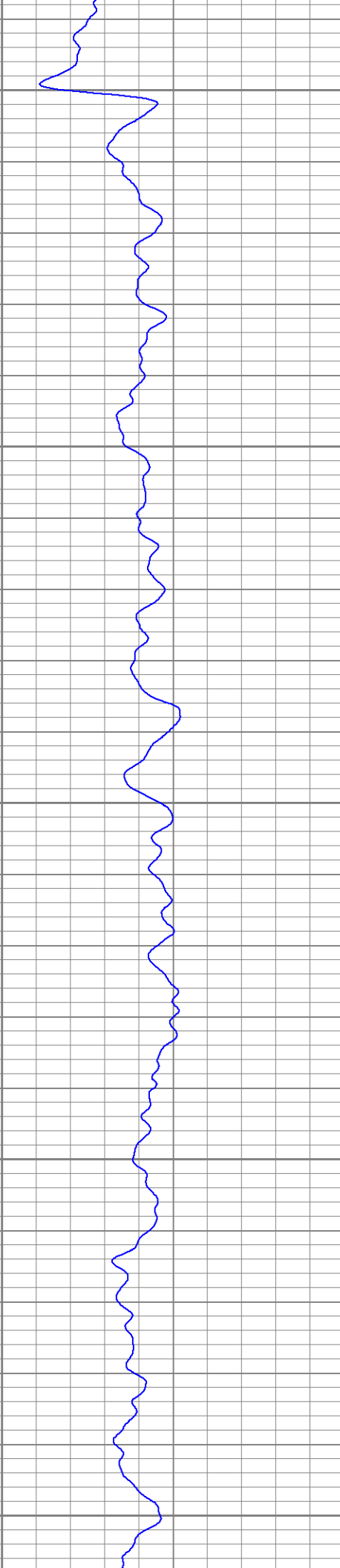
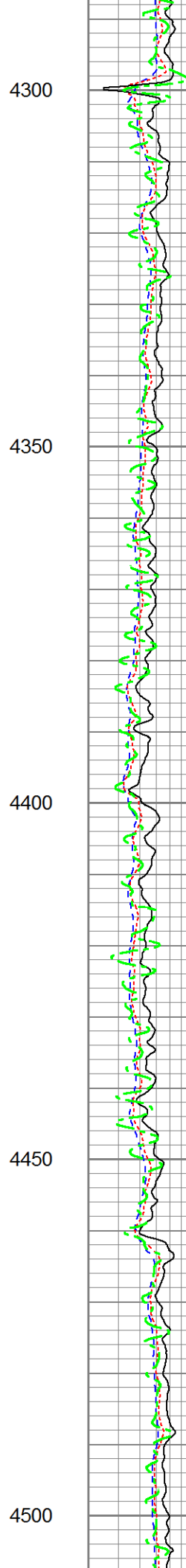
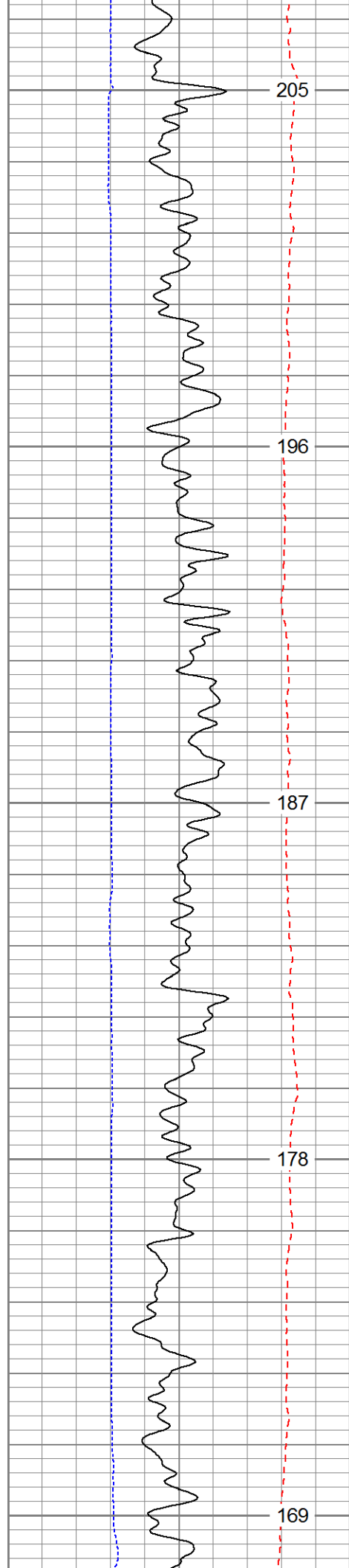
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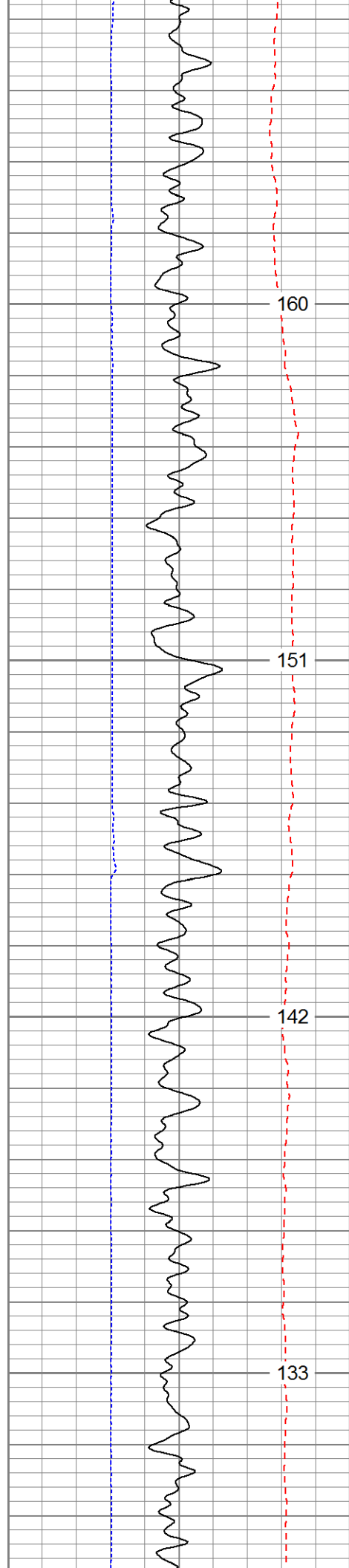
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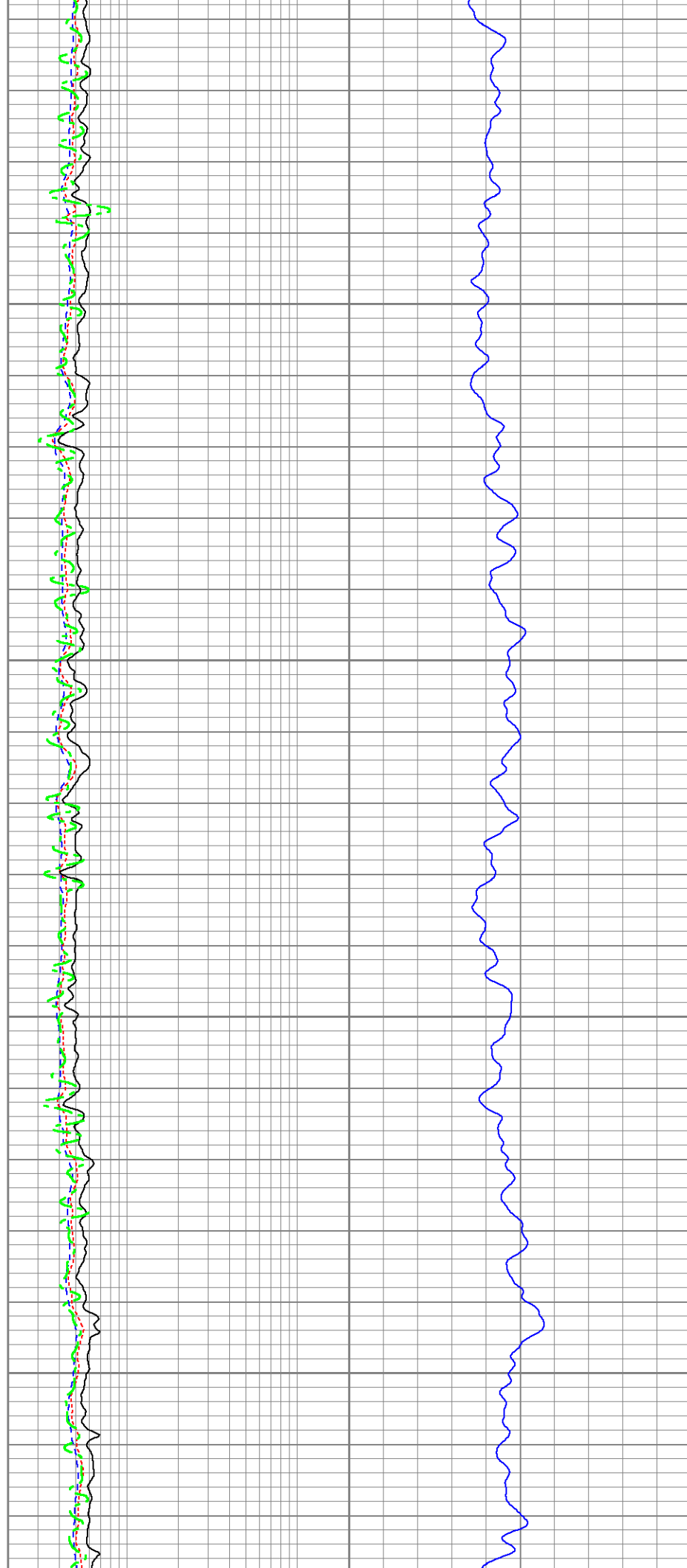


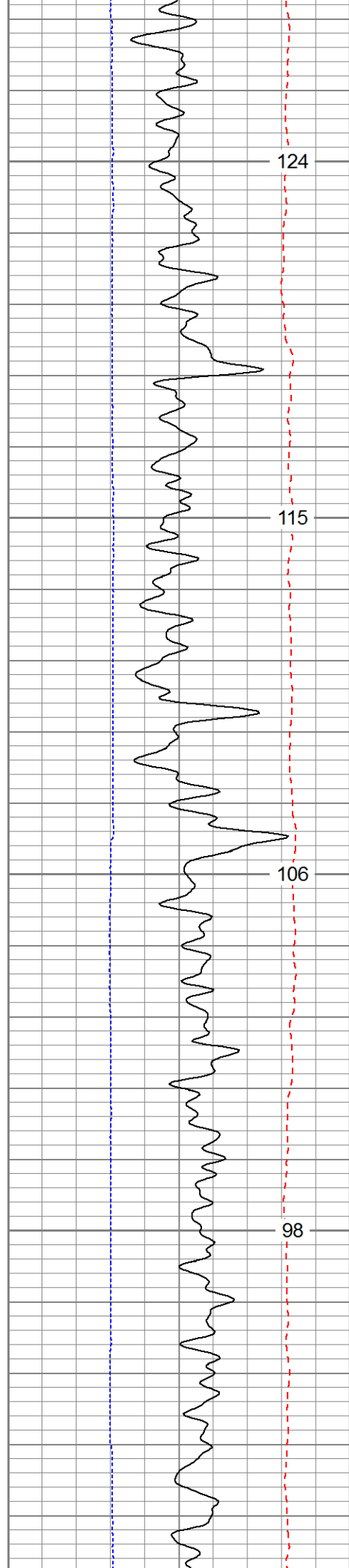
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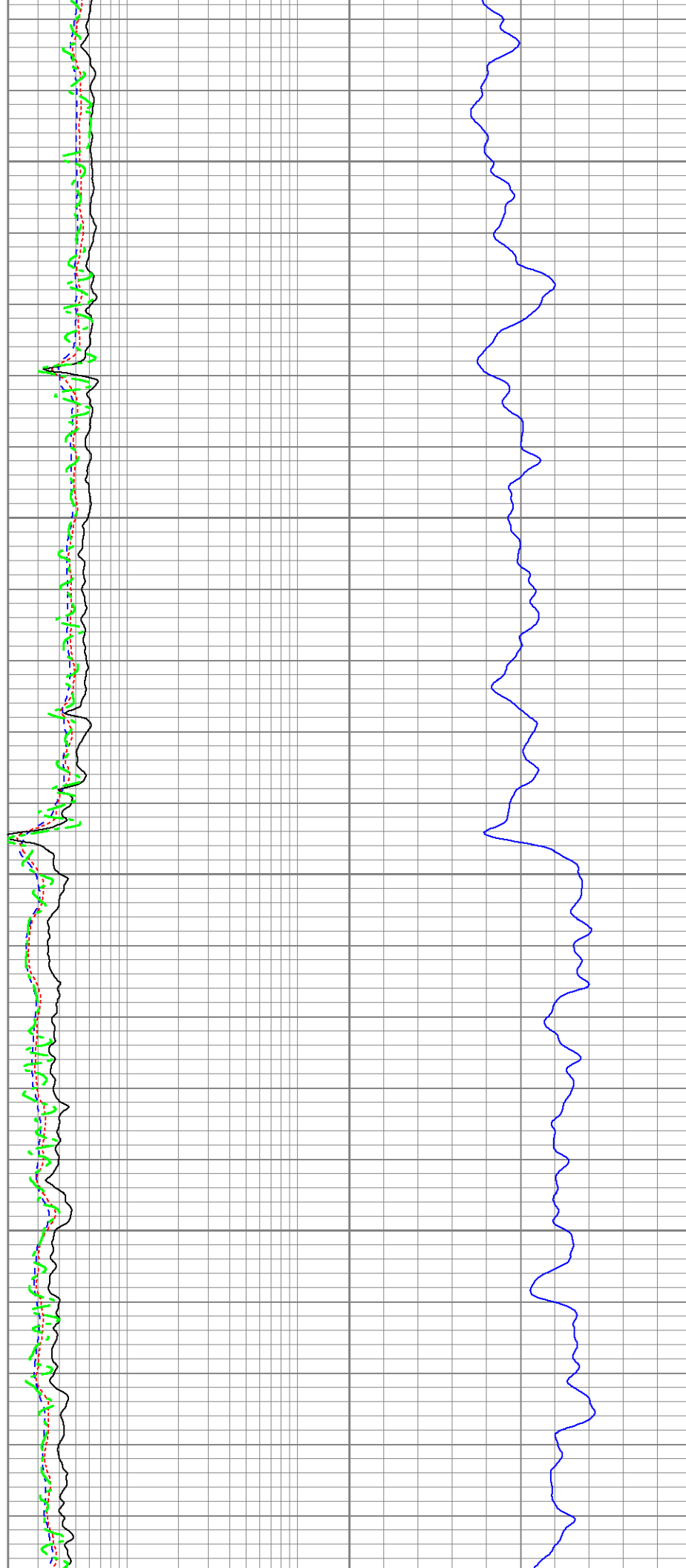


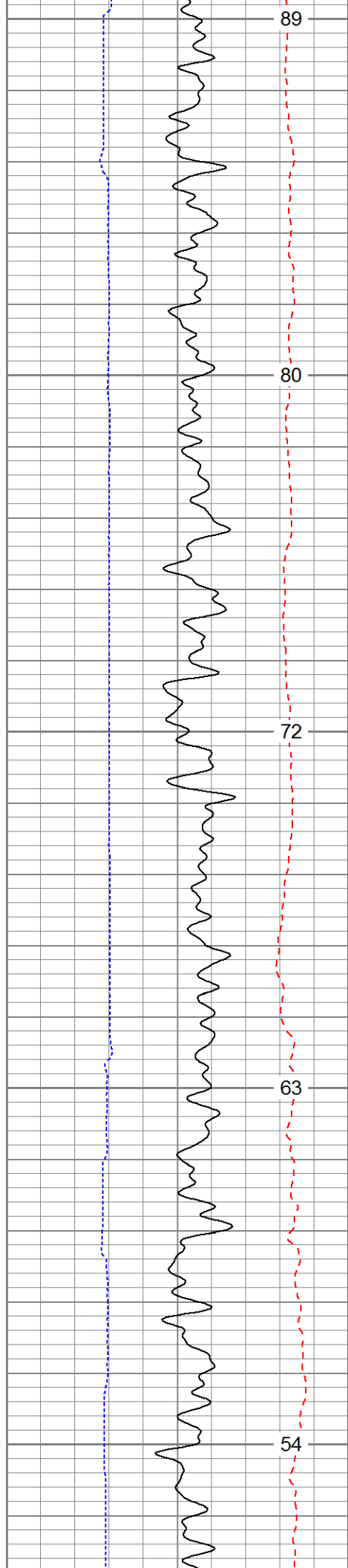
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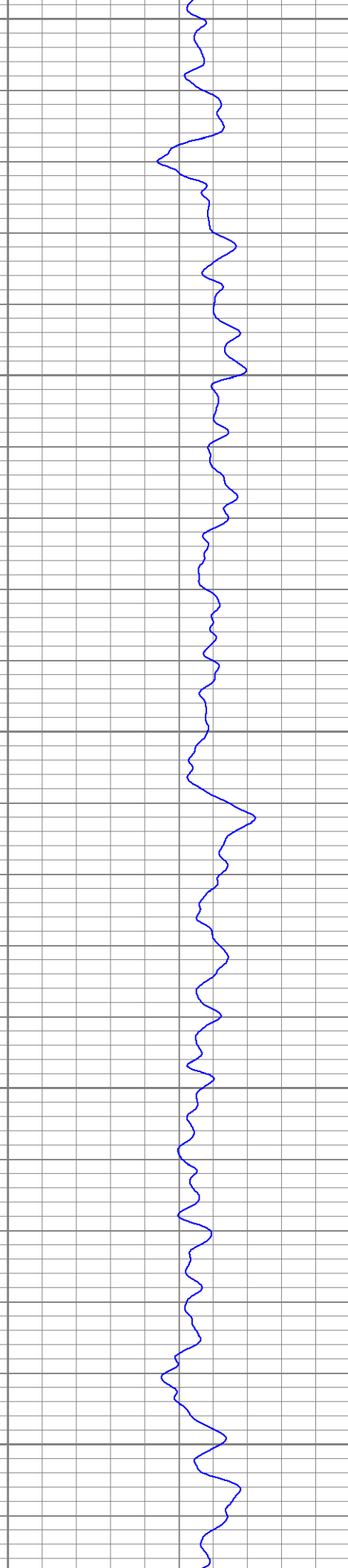
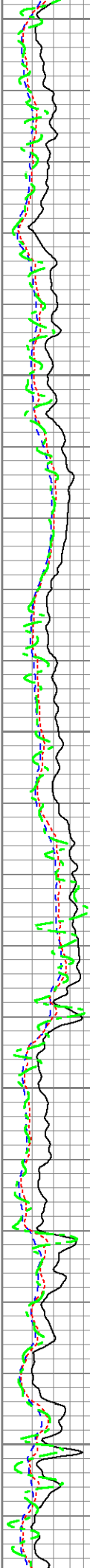
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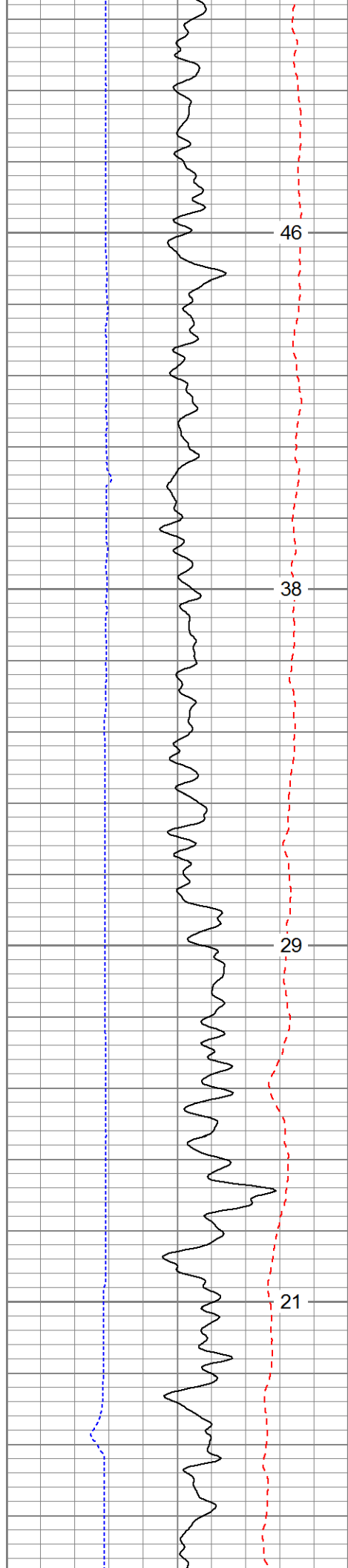
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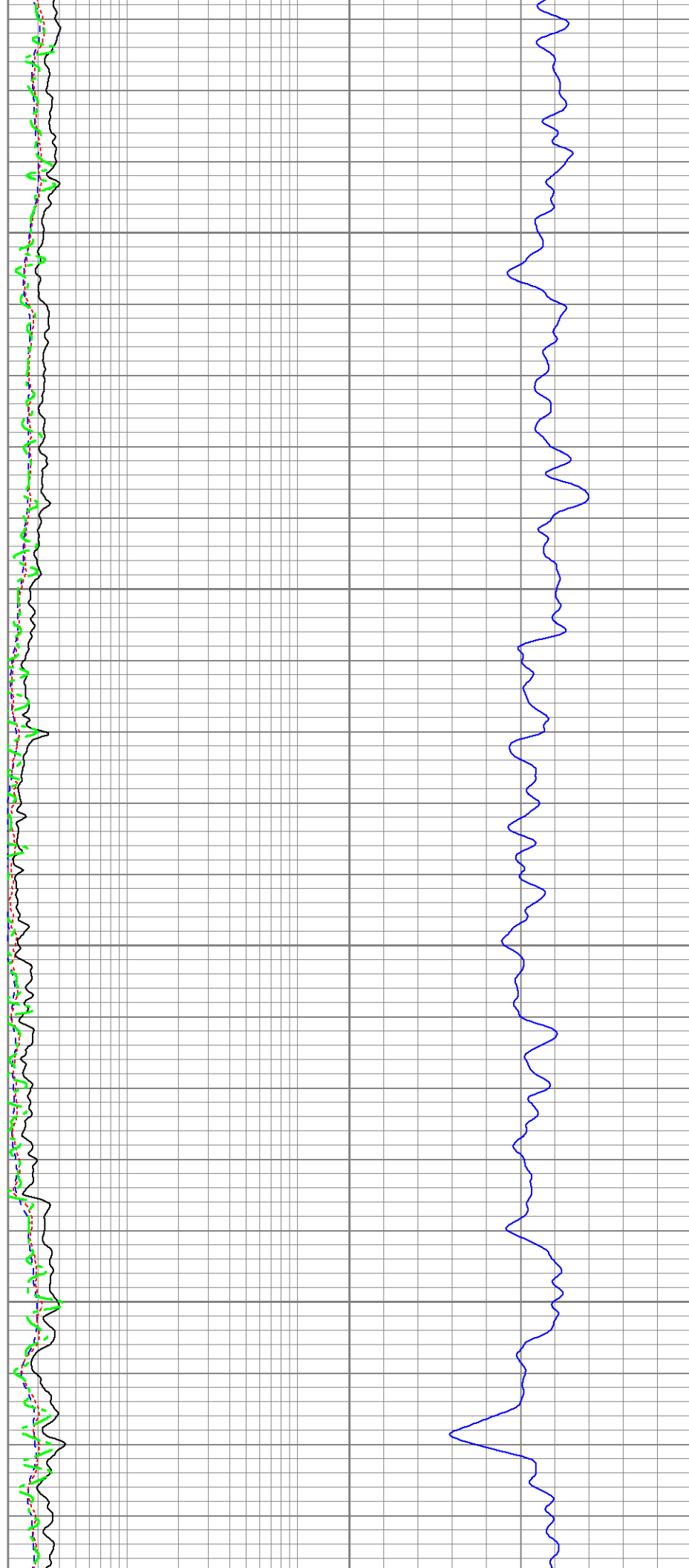
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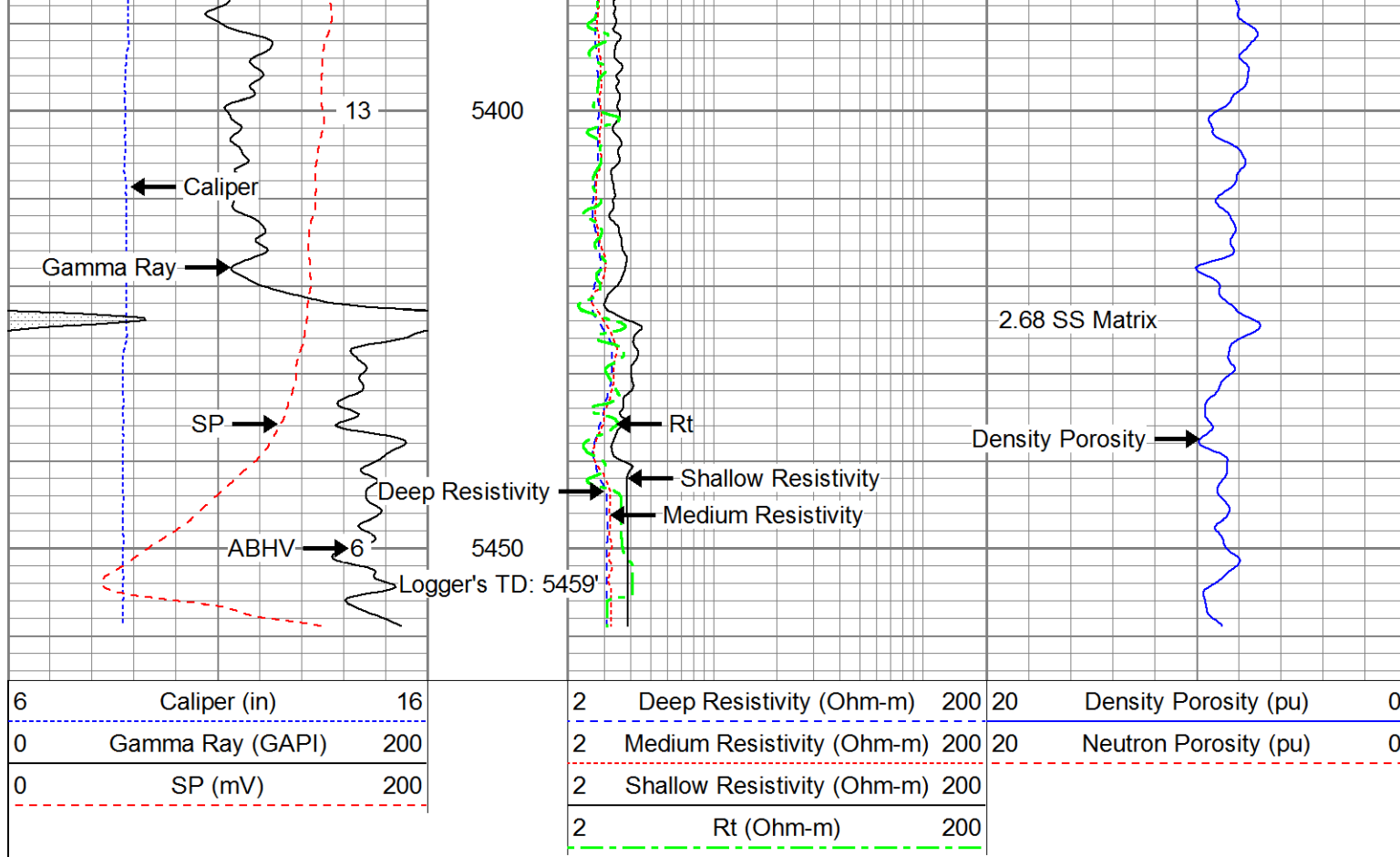
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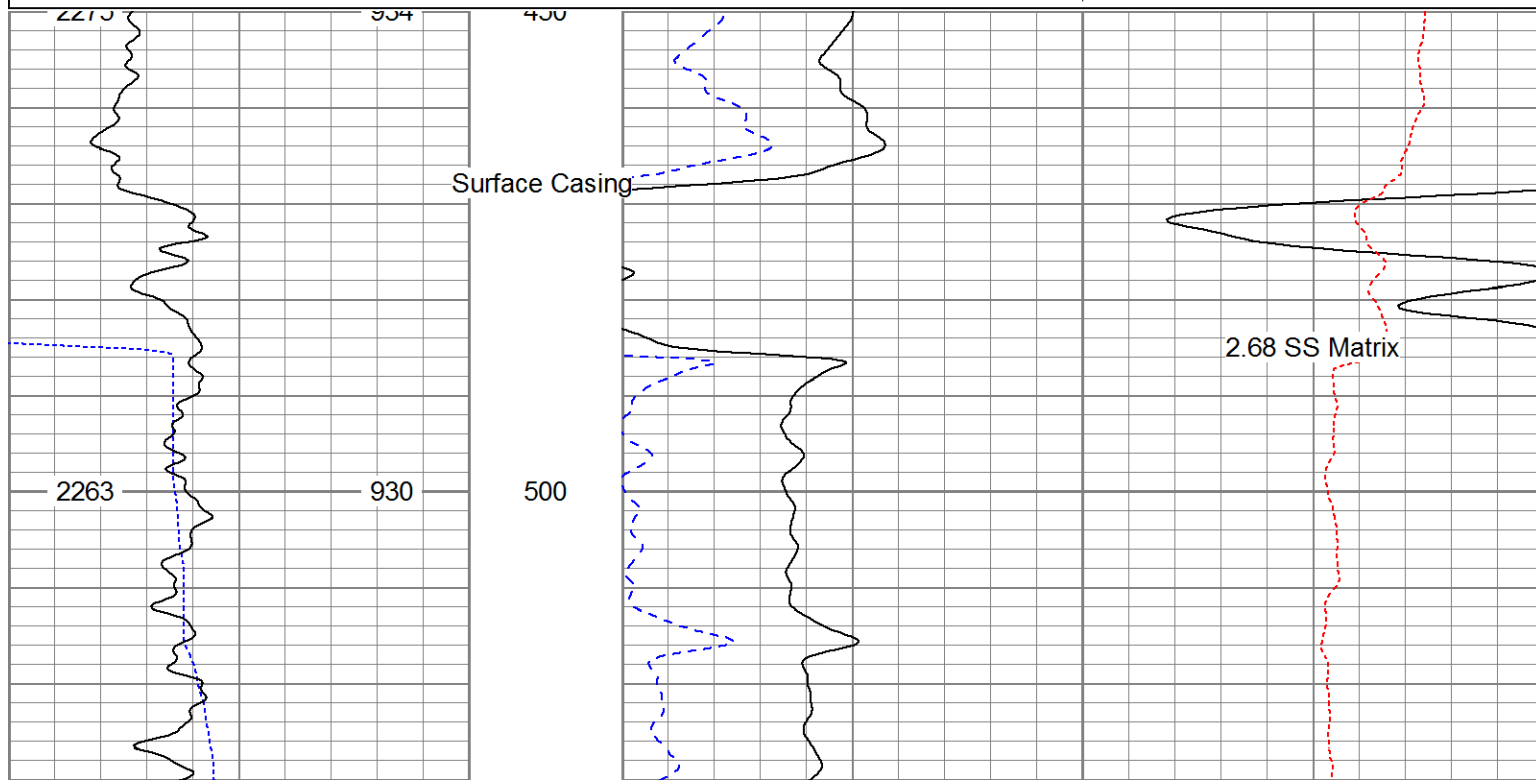
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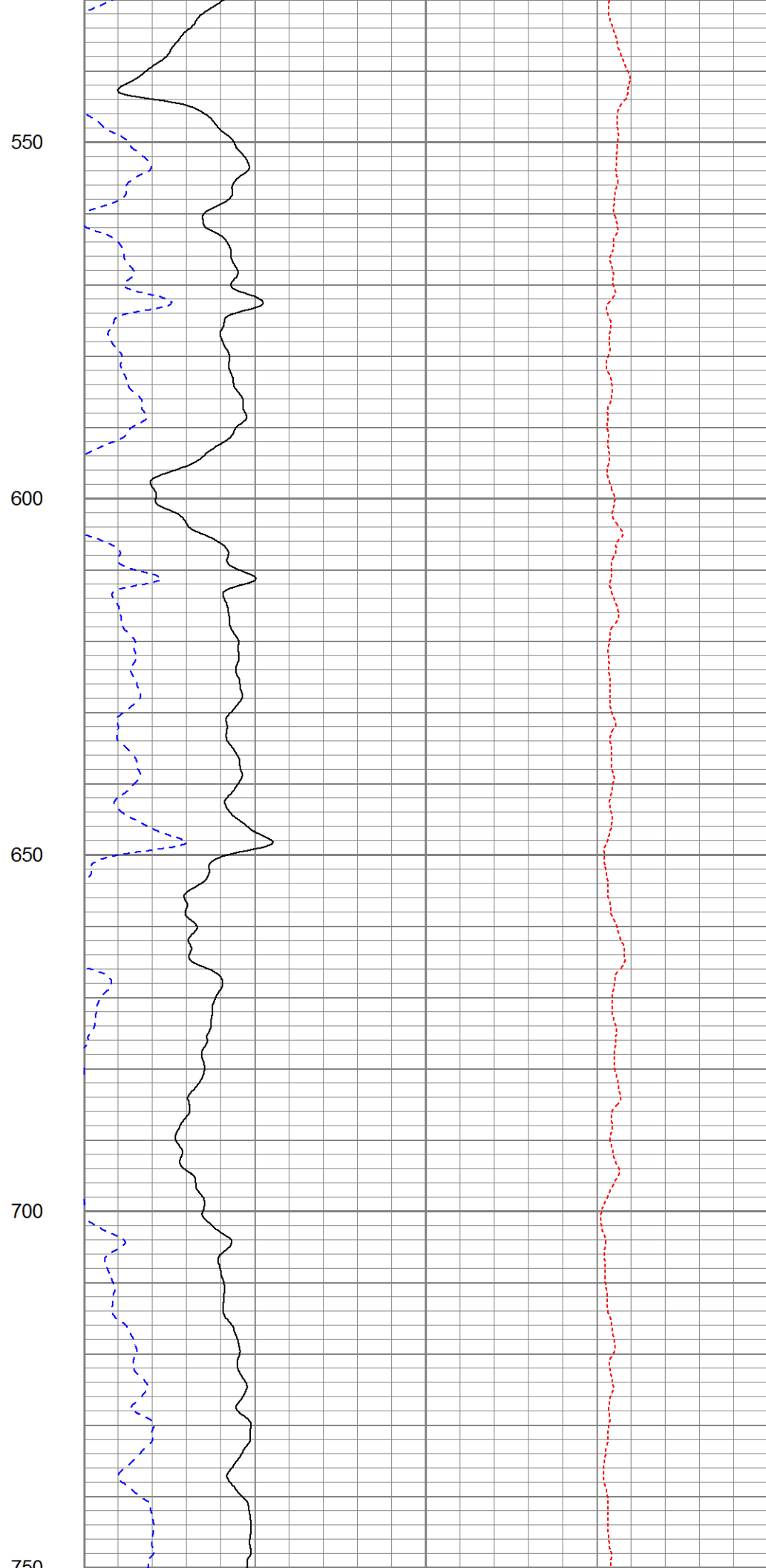
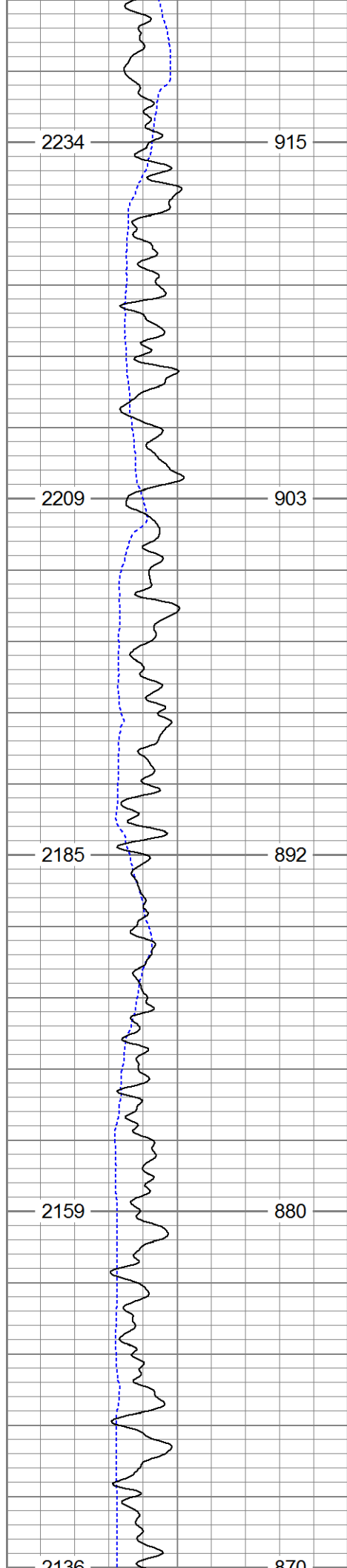


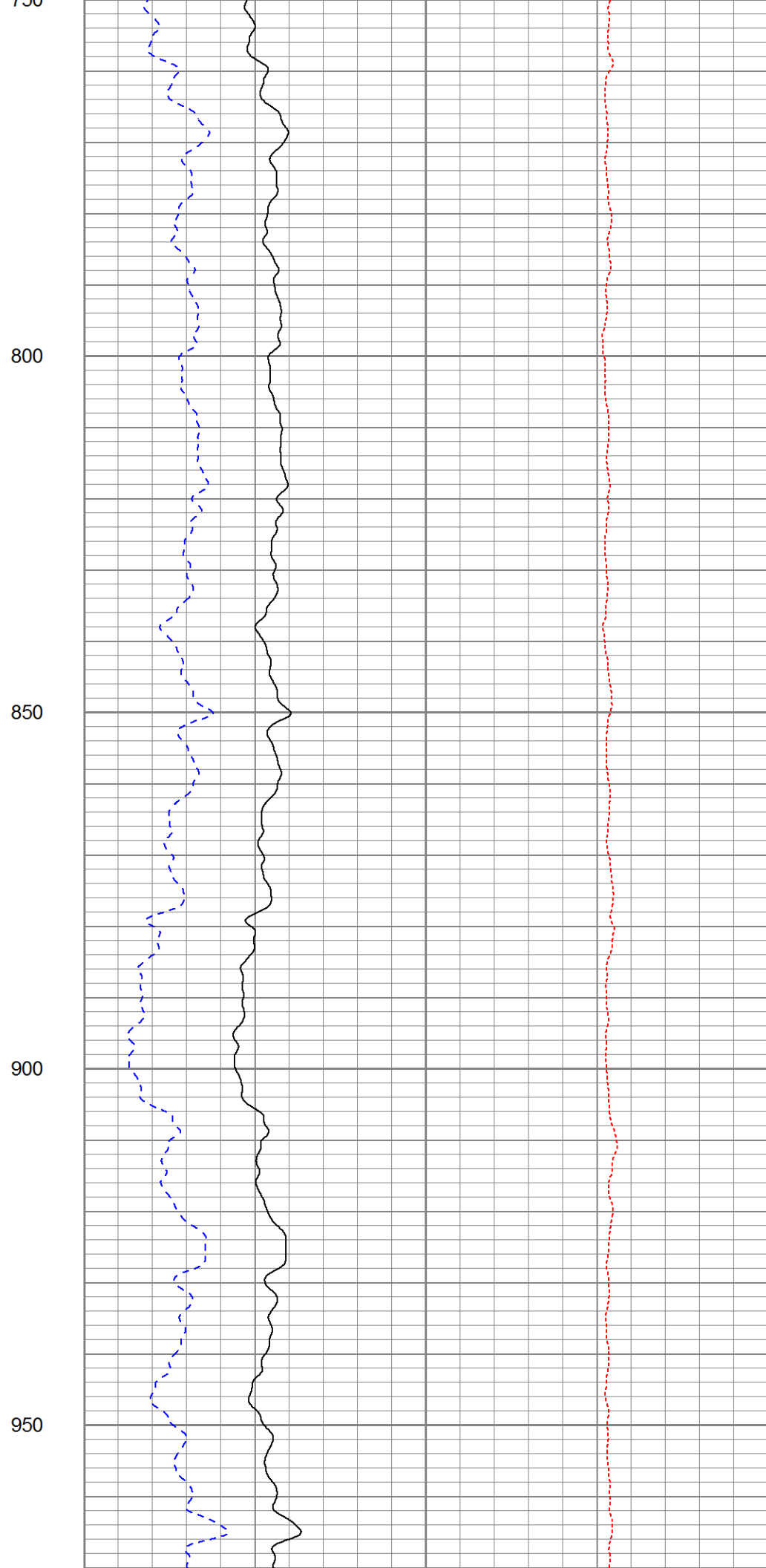
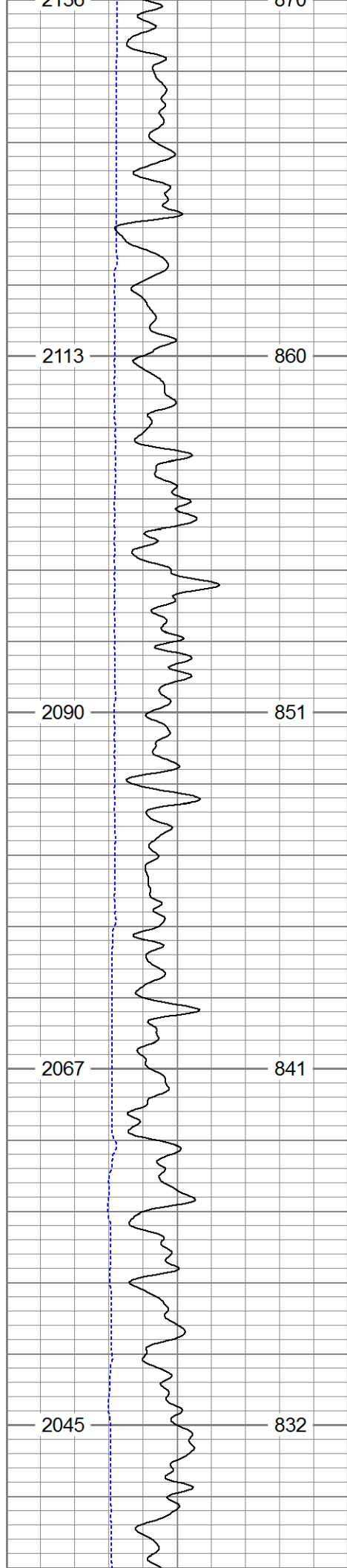


Database File: 13510.db  
 Dataset Pathname: Final  
 Presentation Format: cdl  
 Dataset Creation: Wed Jun 04 14:38:19 2014  
 Charted by: Depth in Feet scaled 1:240

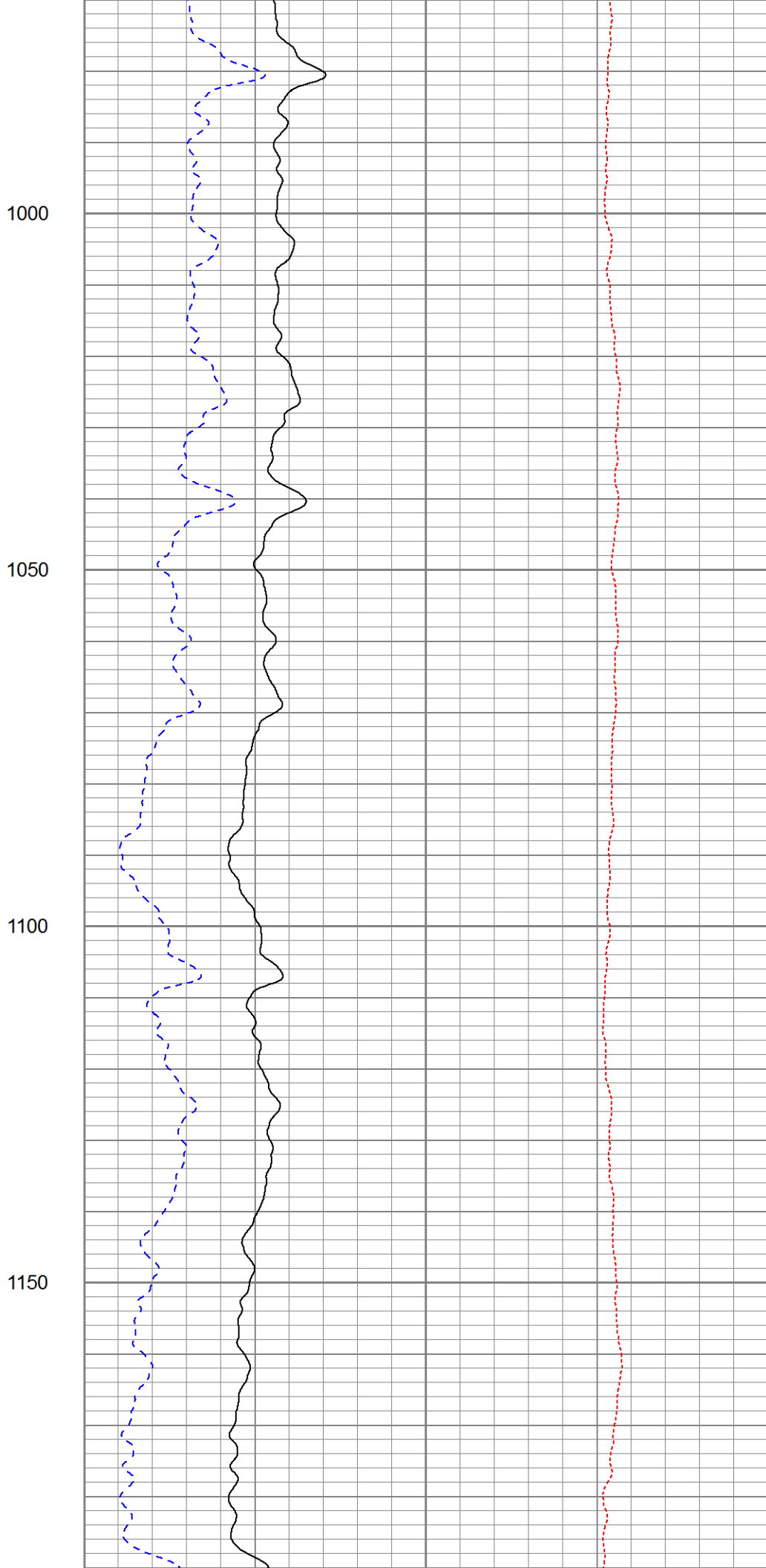
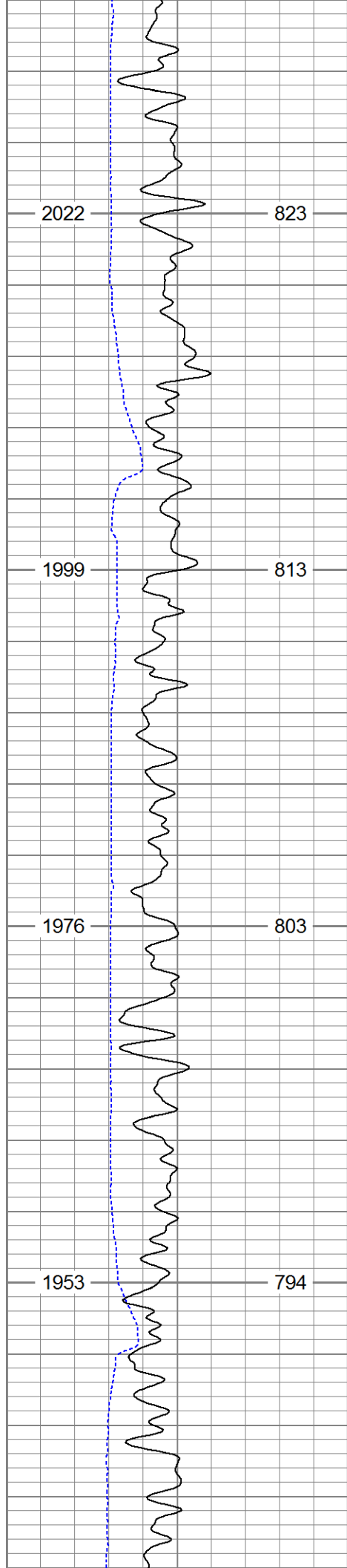
6	Caliper (in)	16	2	Bulk Density (g/cc)	3
0	Gamma Ray (GAPI)	200	30	Density Porosity (pu)	-10
			-0.5		0.5
			Correction (g/cc)		

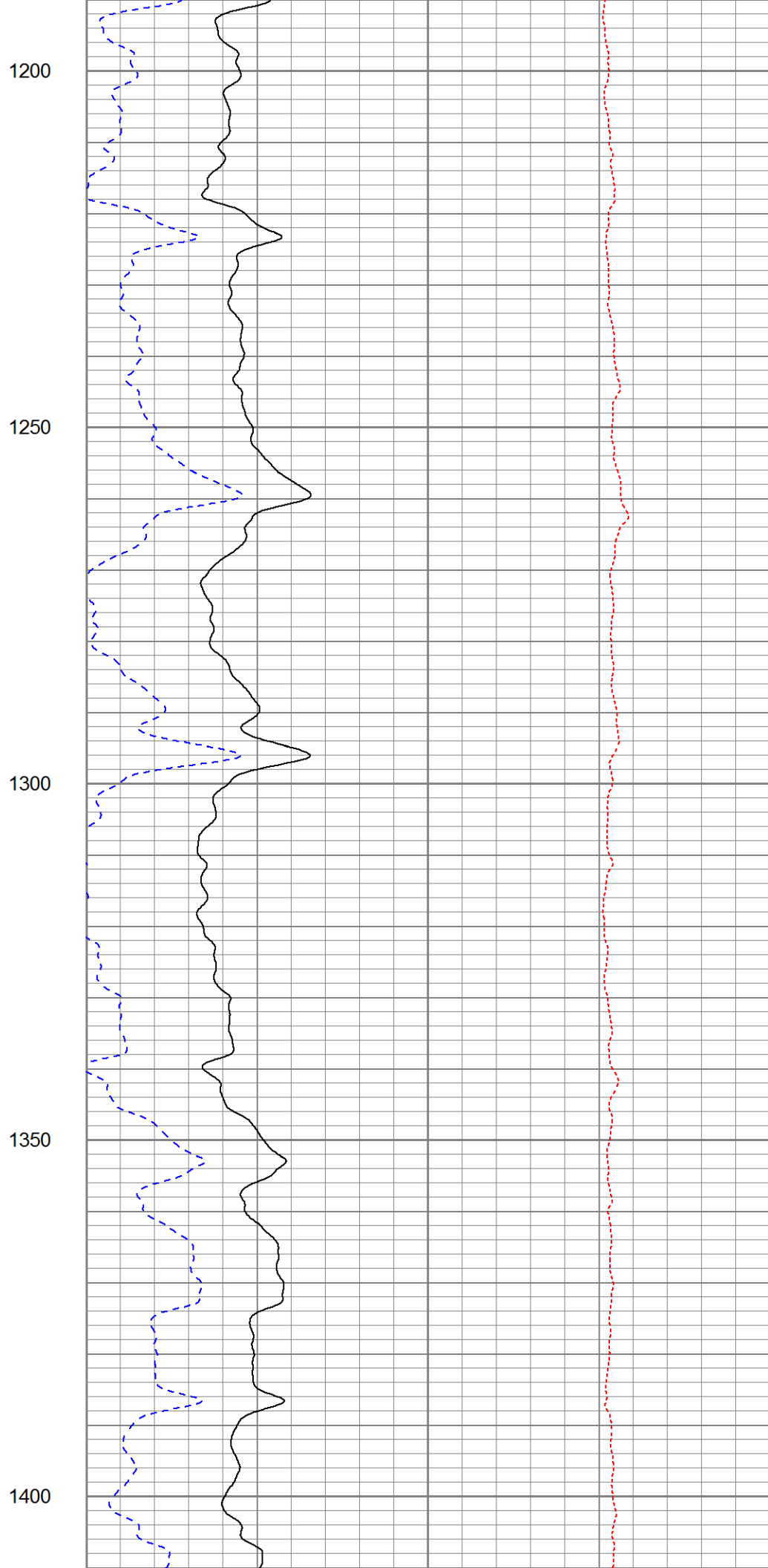
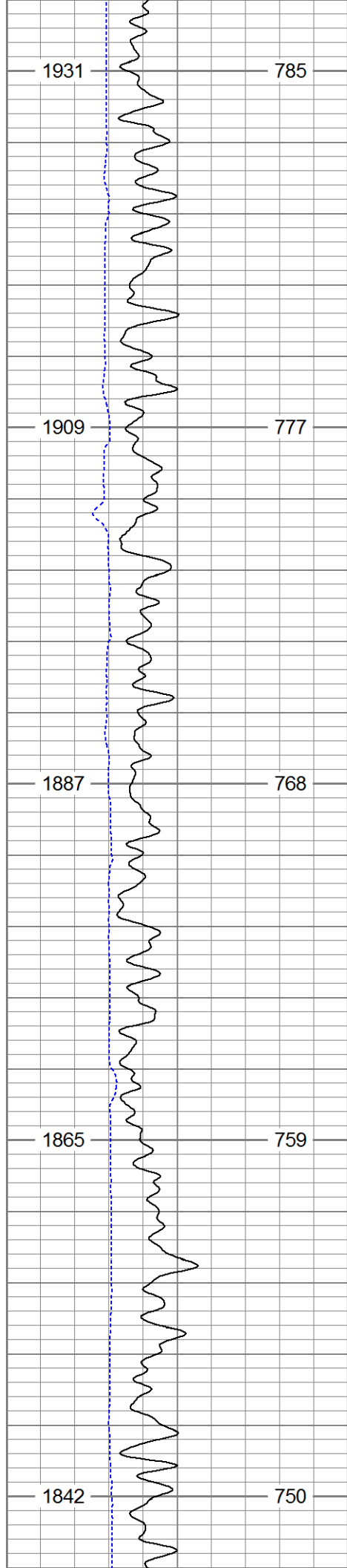


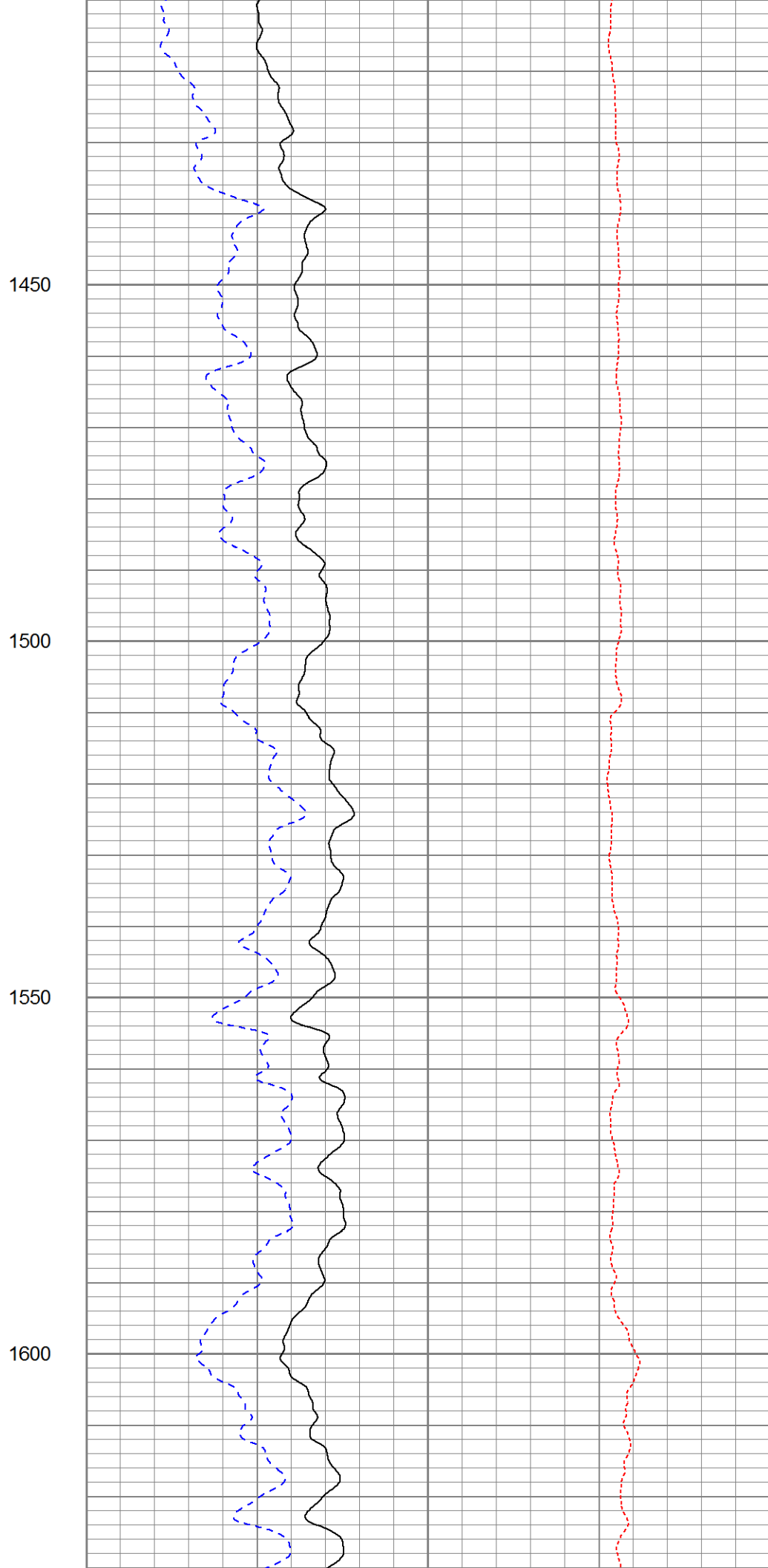
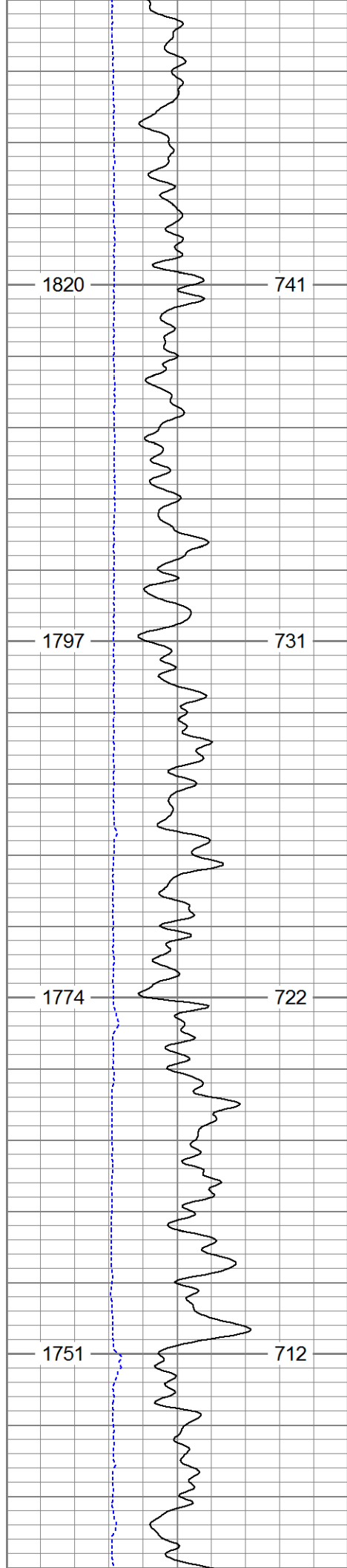


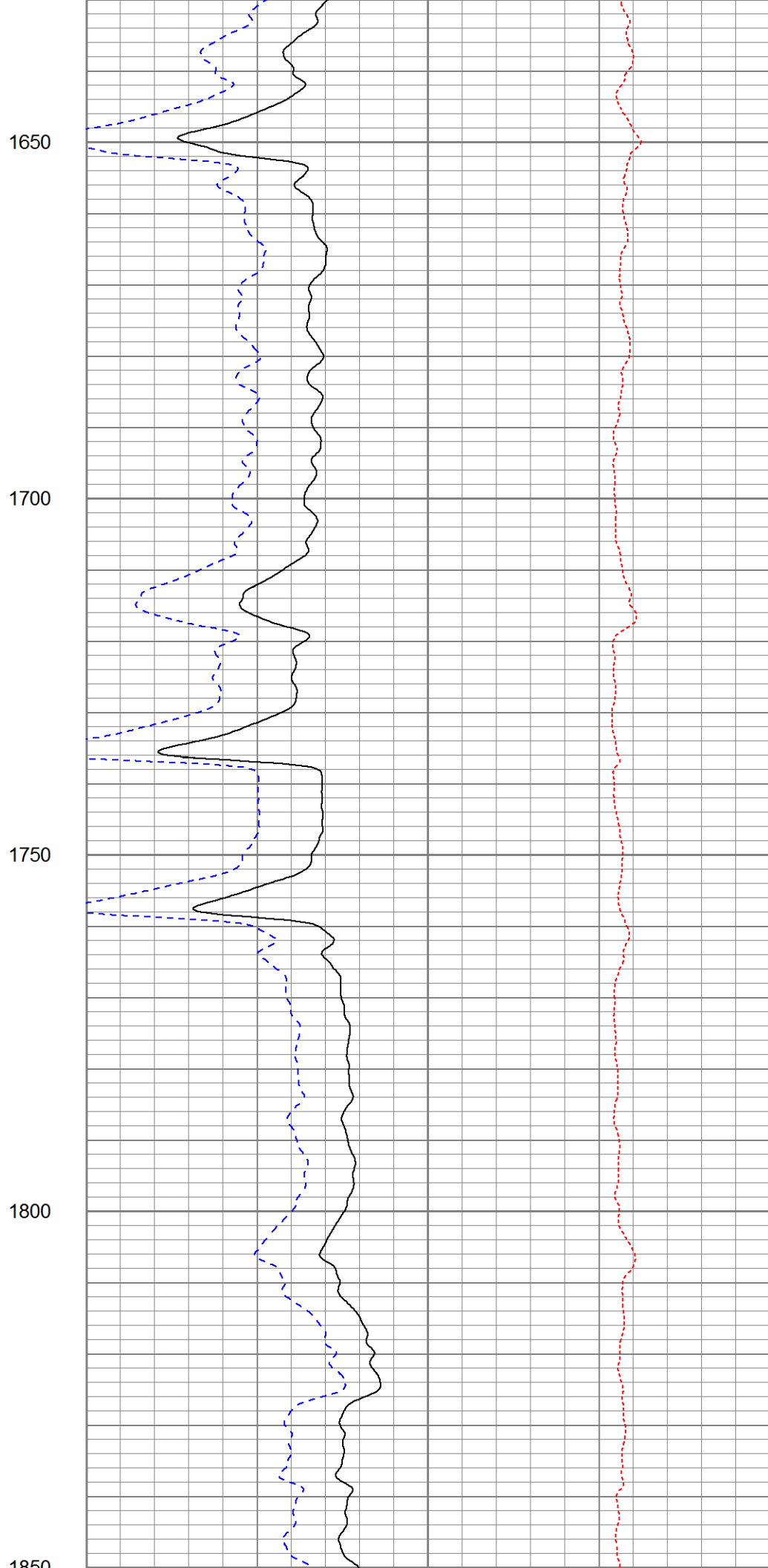
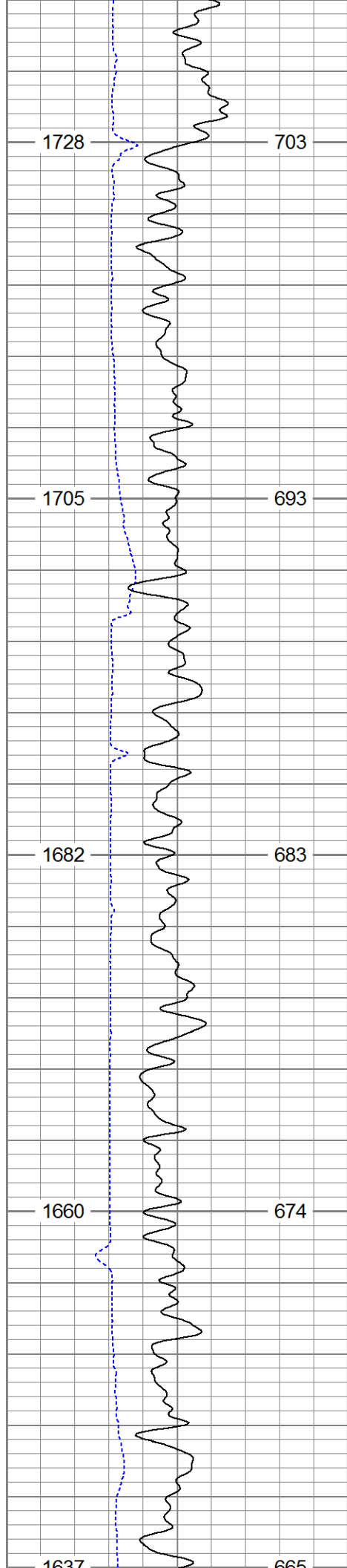


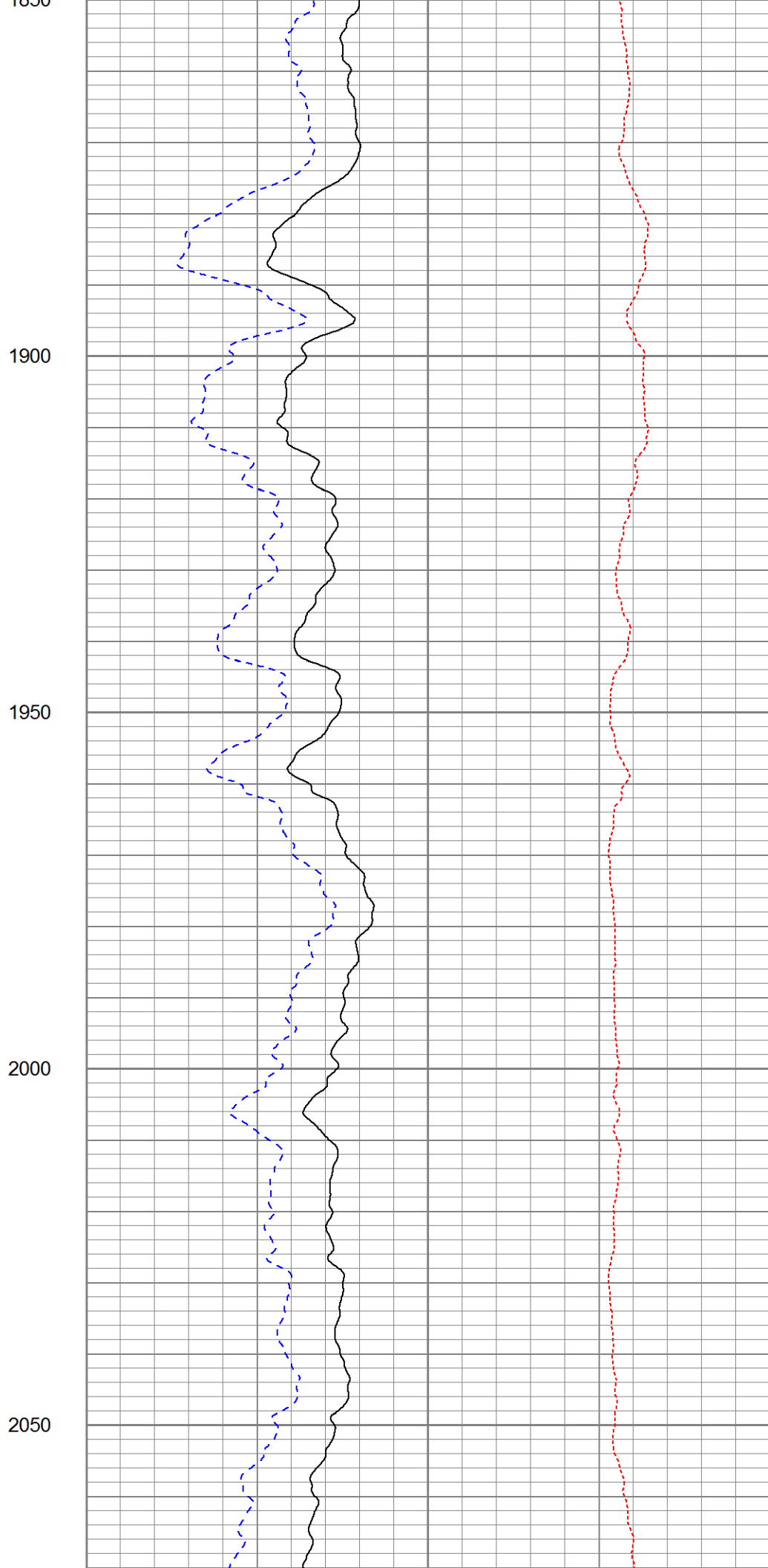
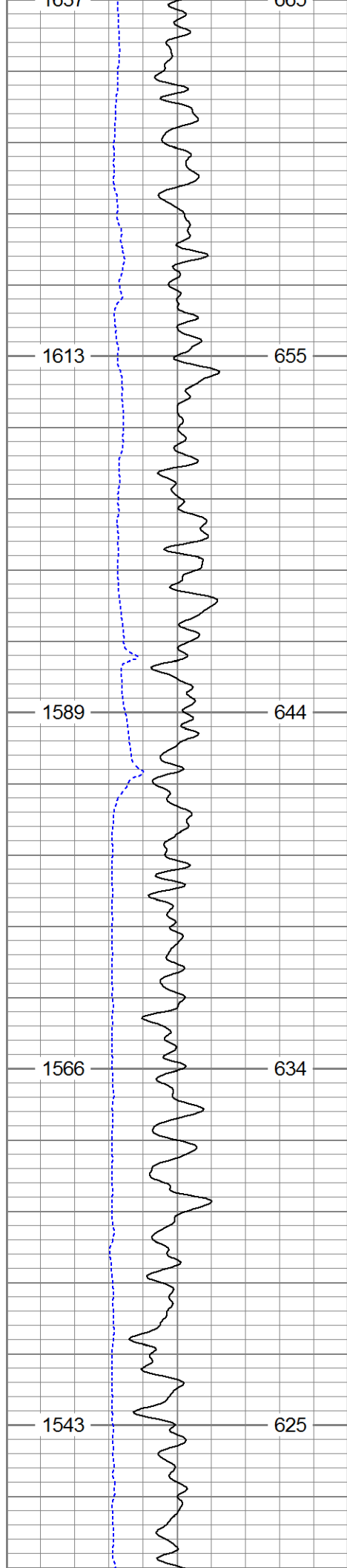


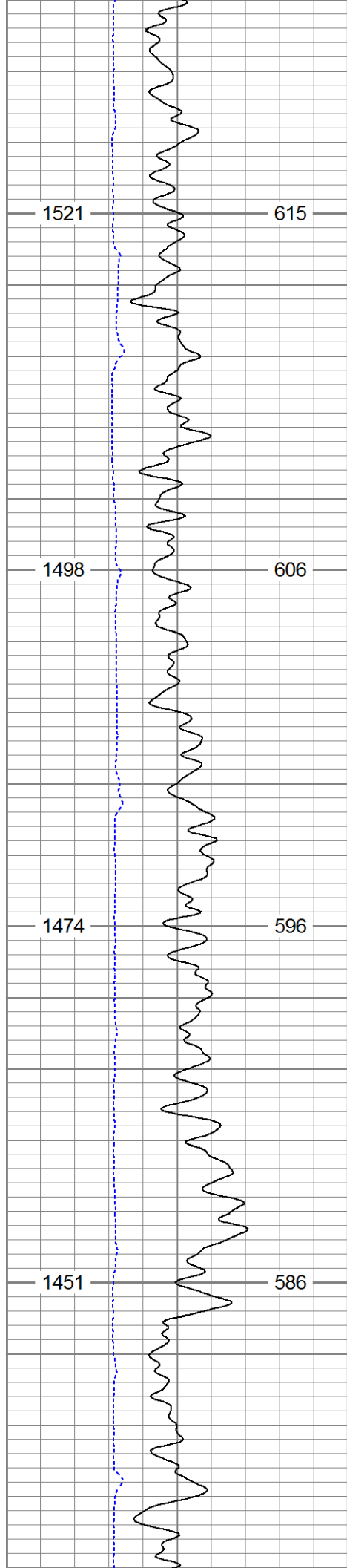










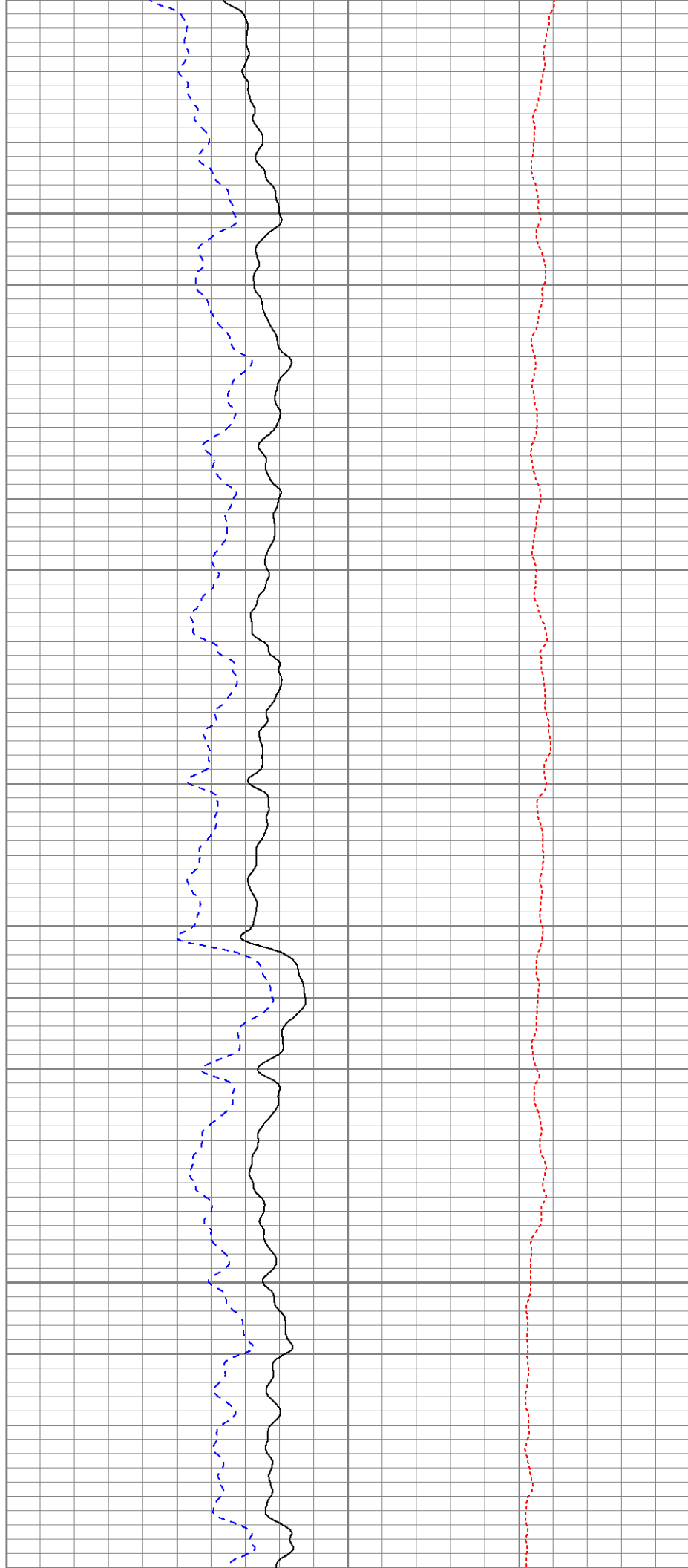


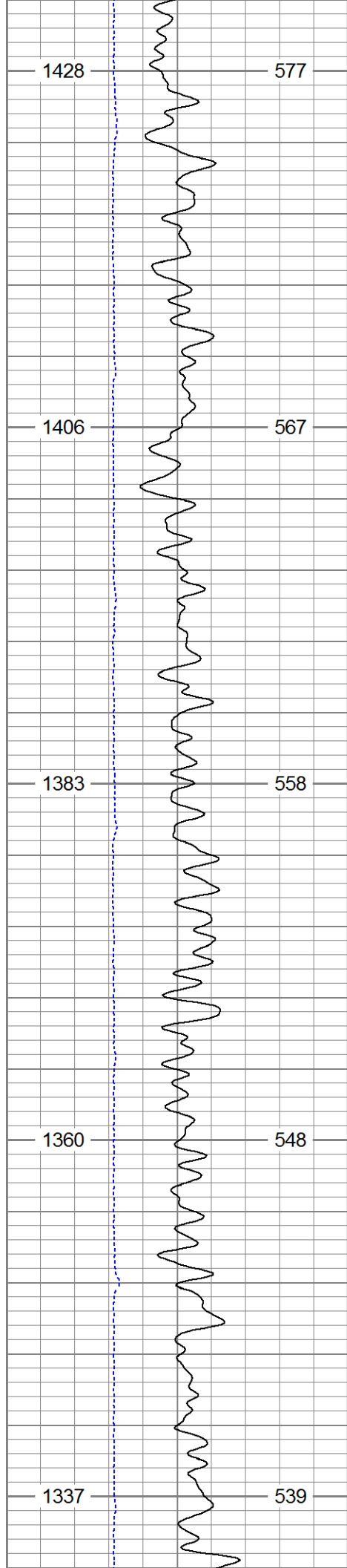
2100

2150

2200

2250





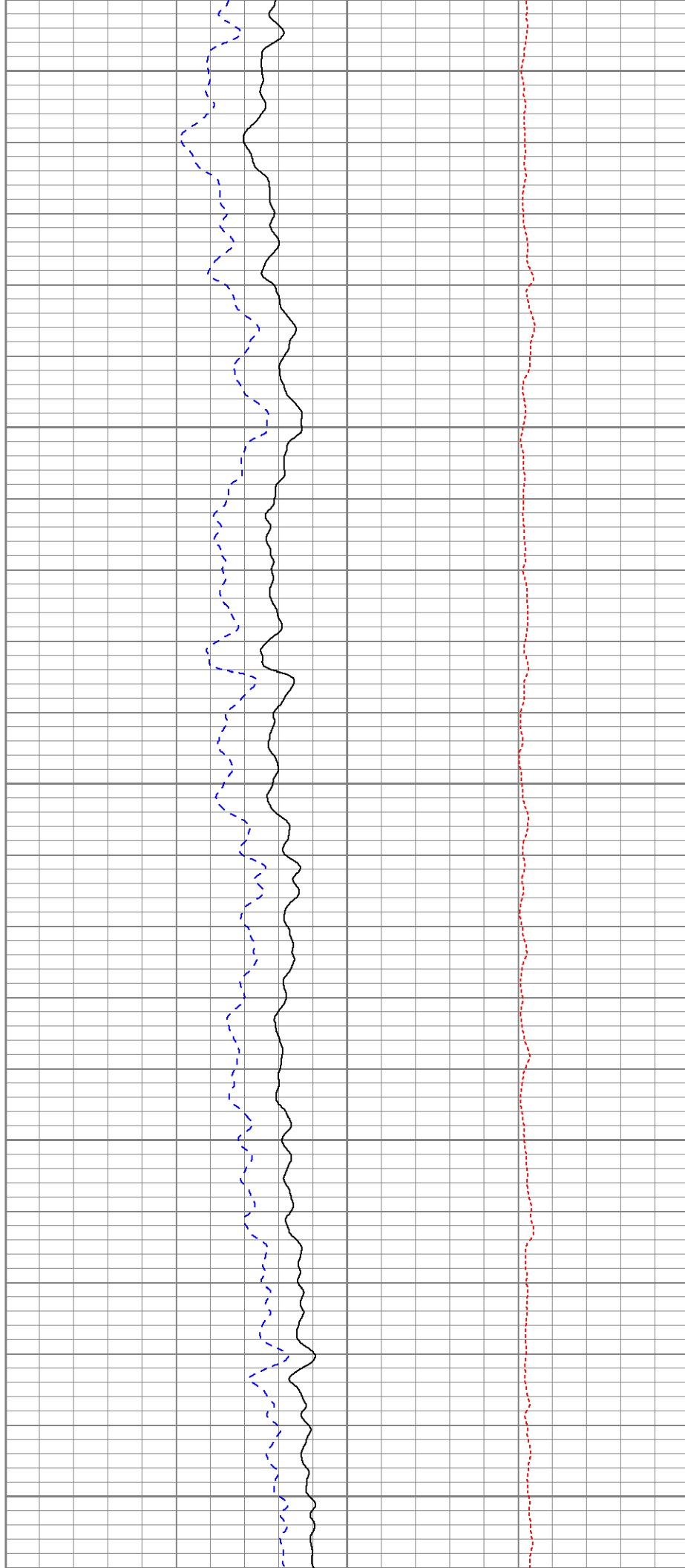
2300

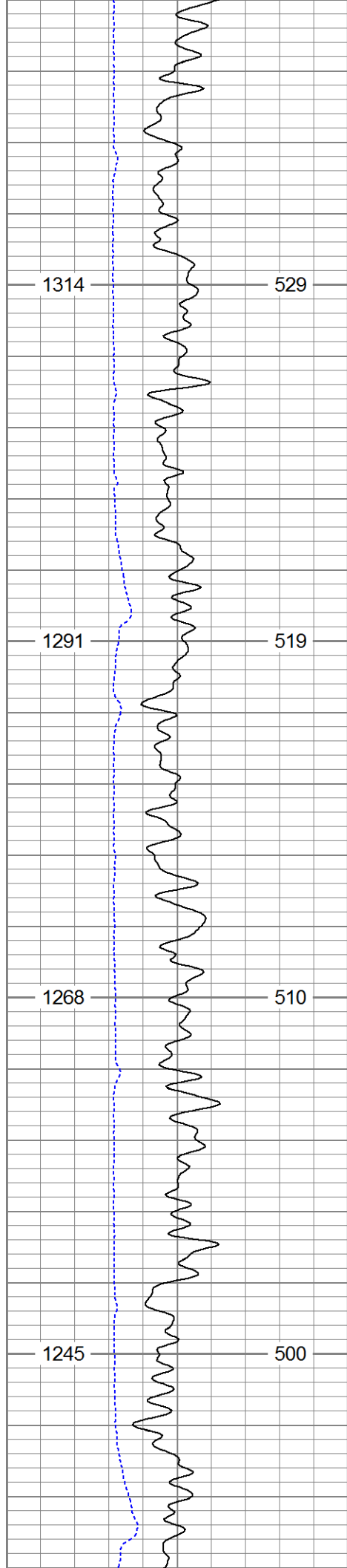
2350

2400

2450

2500



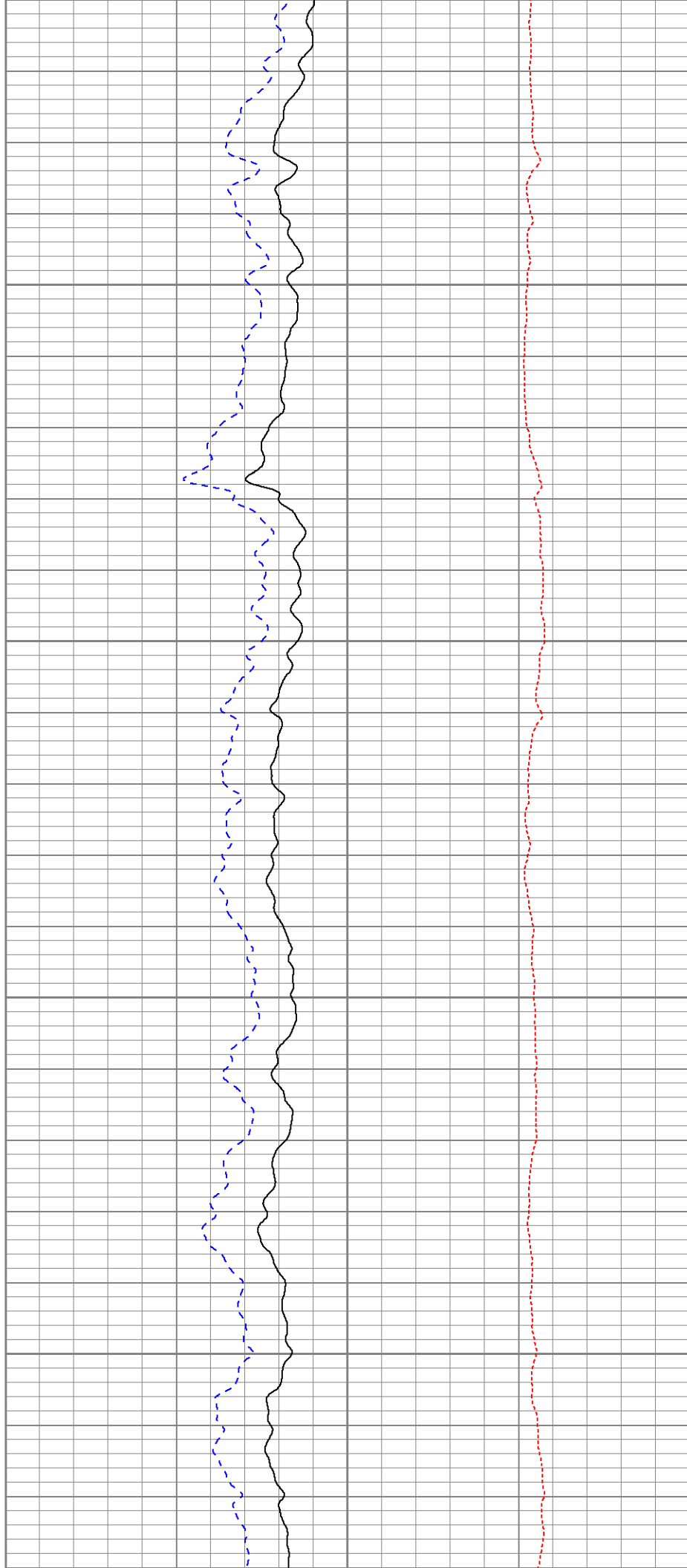


2550

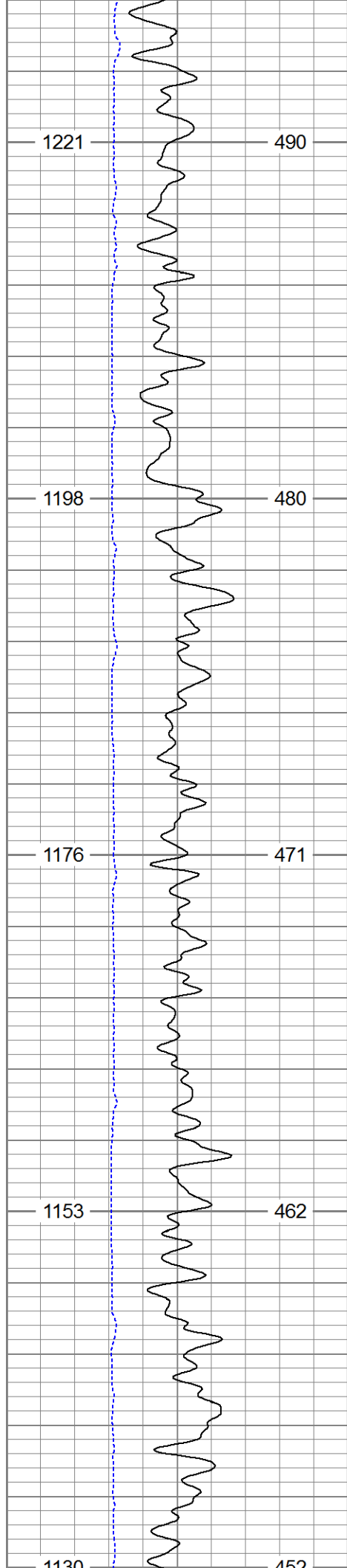
2600

2650

2700







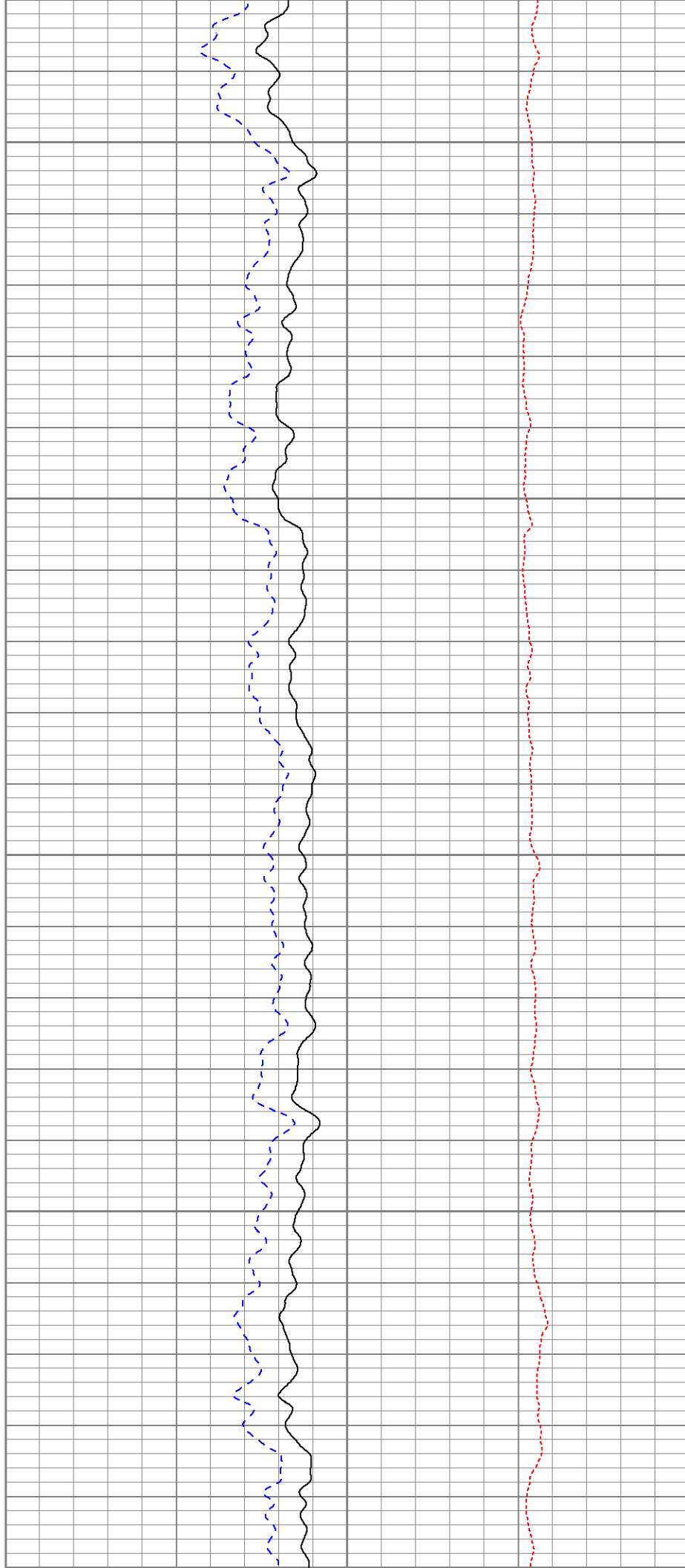
2750

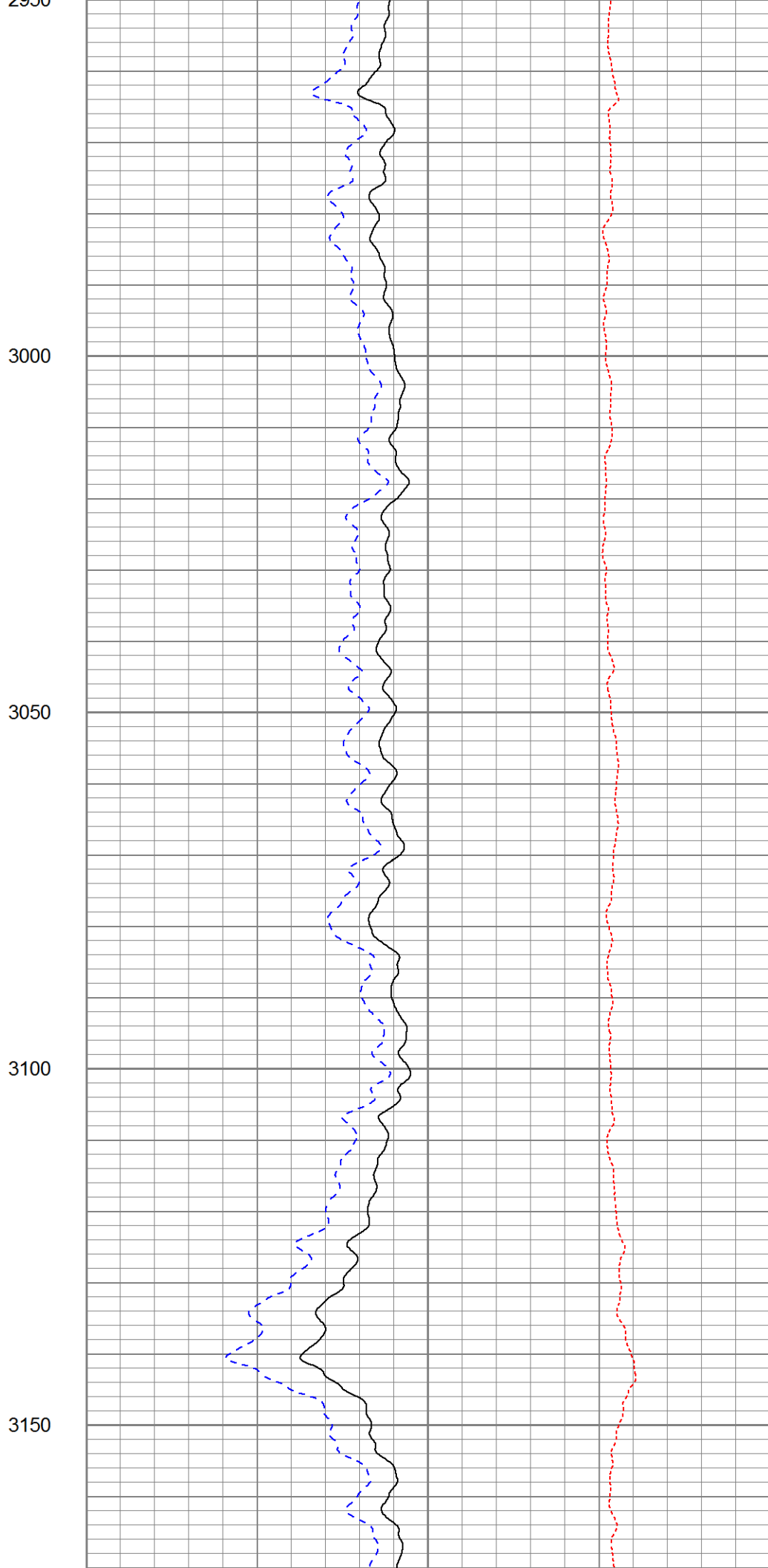
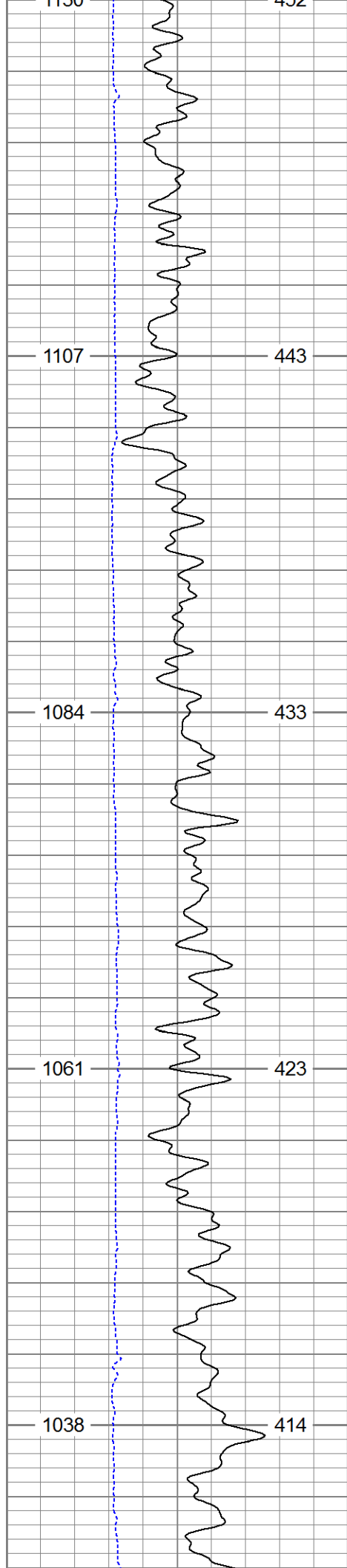
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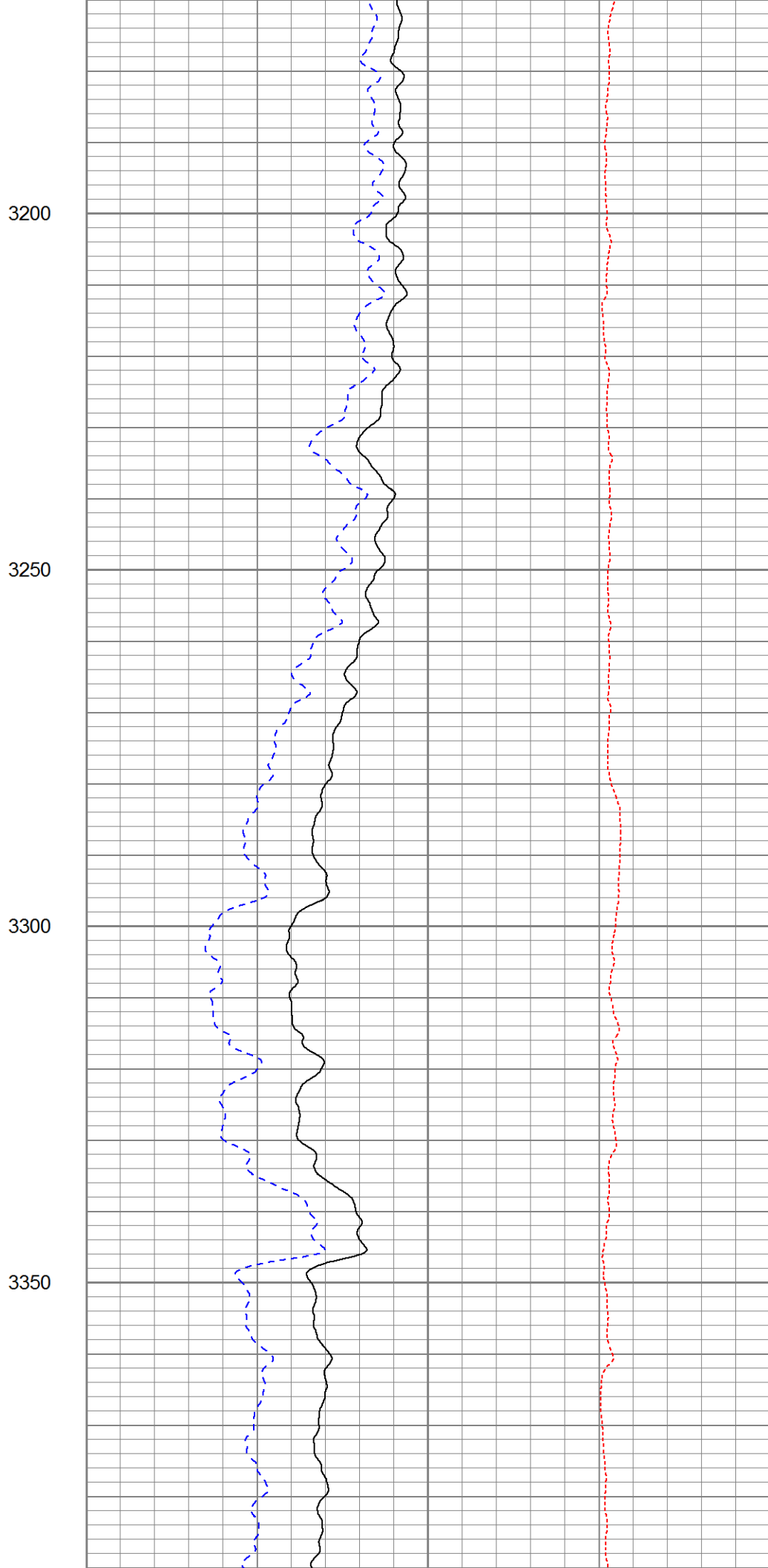
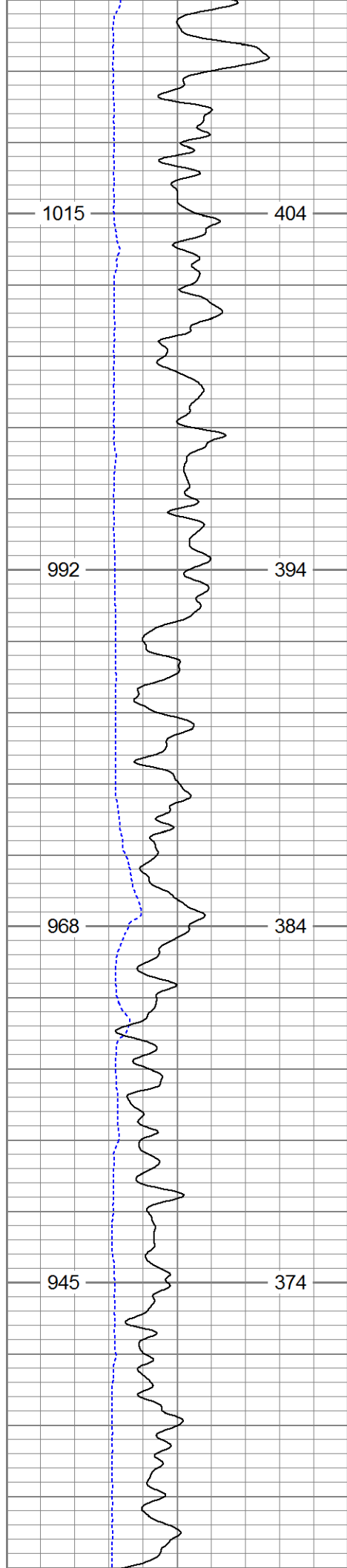
2850

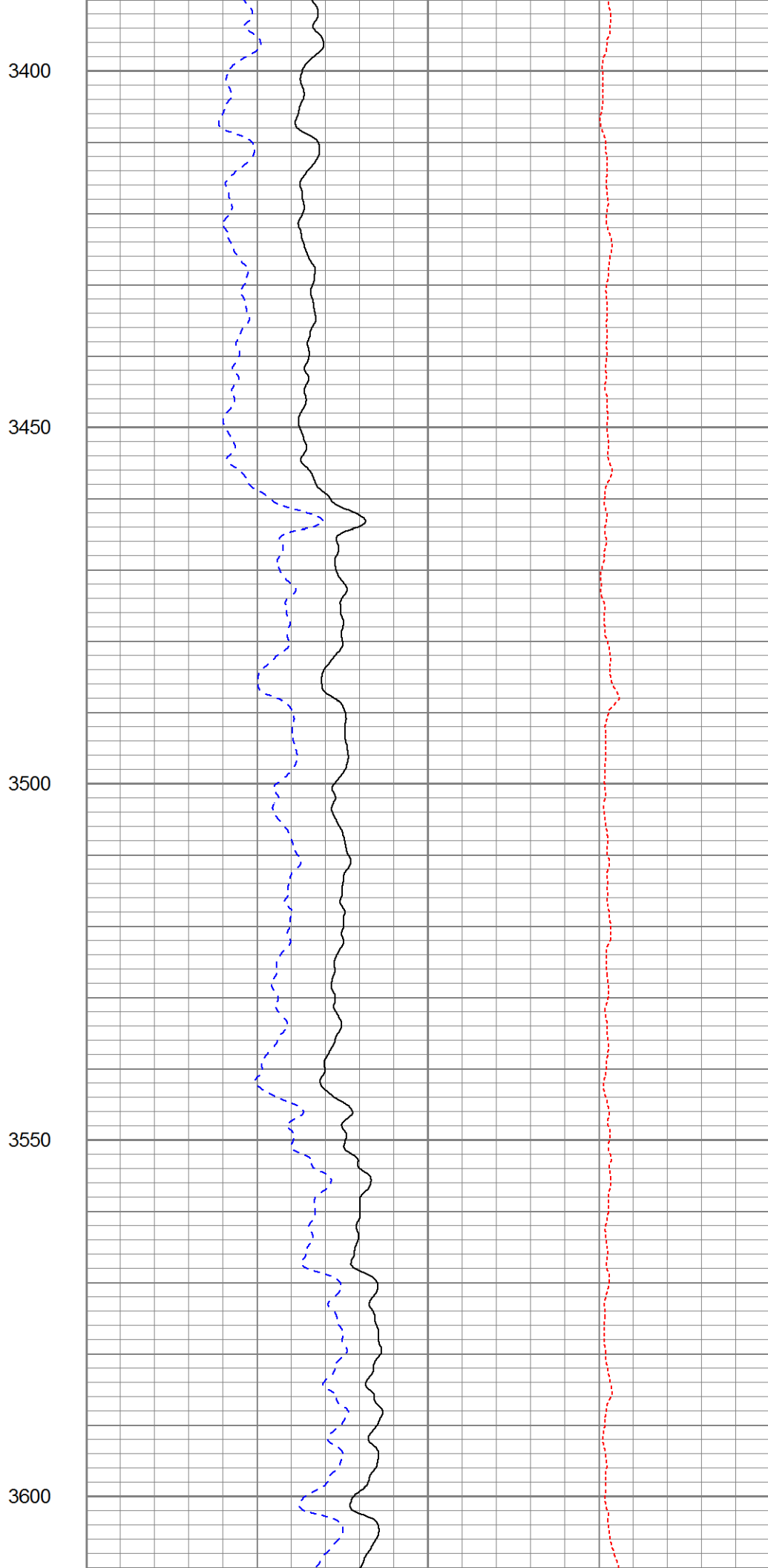
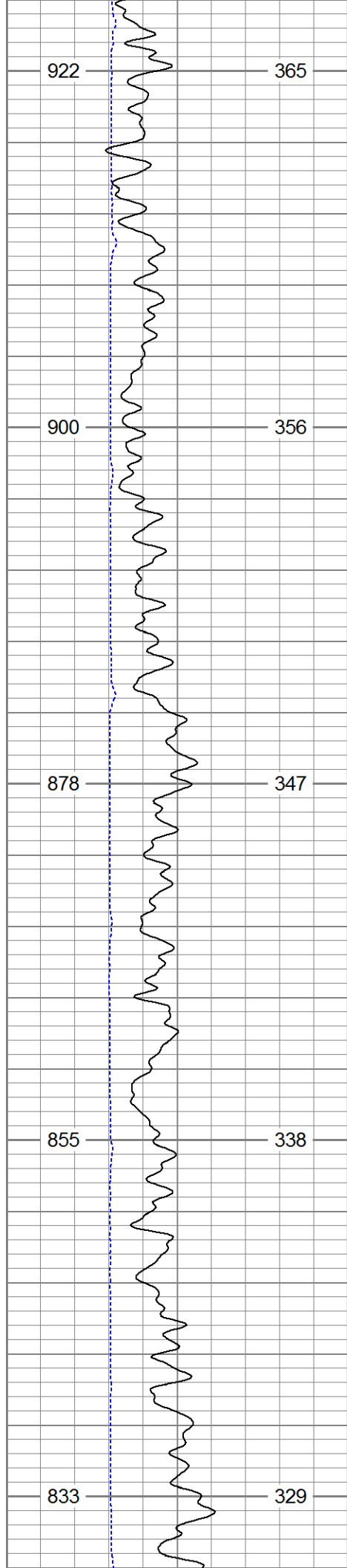
2900

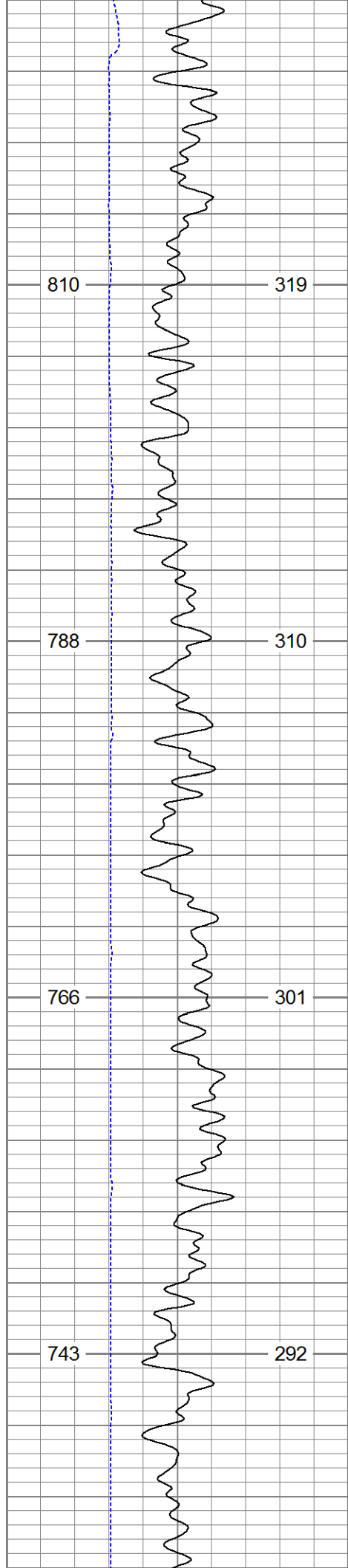
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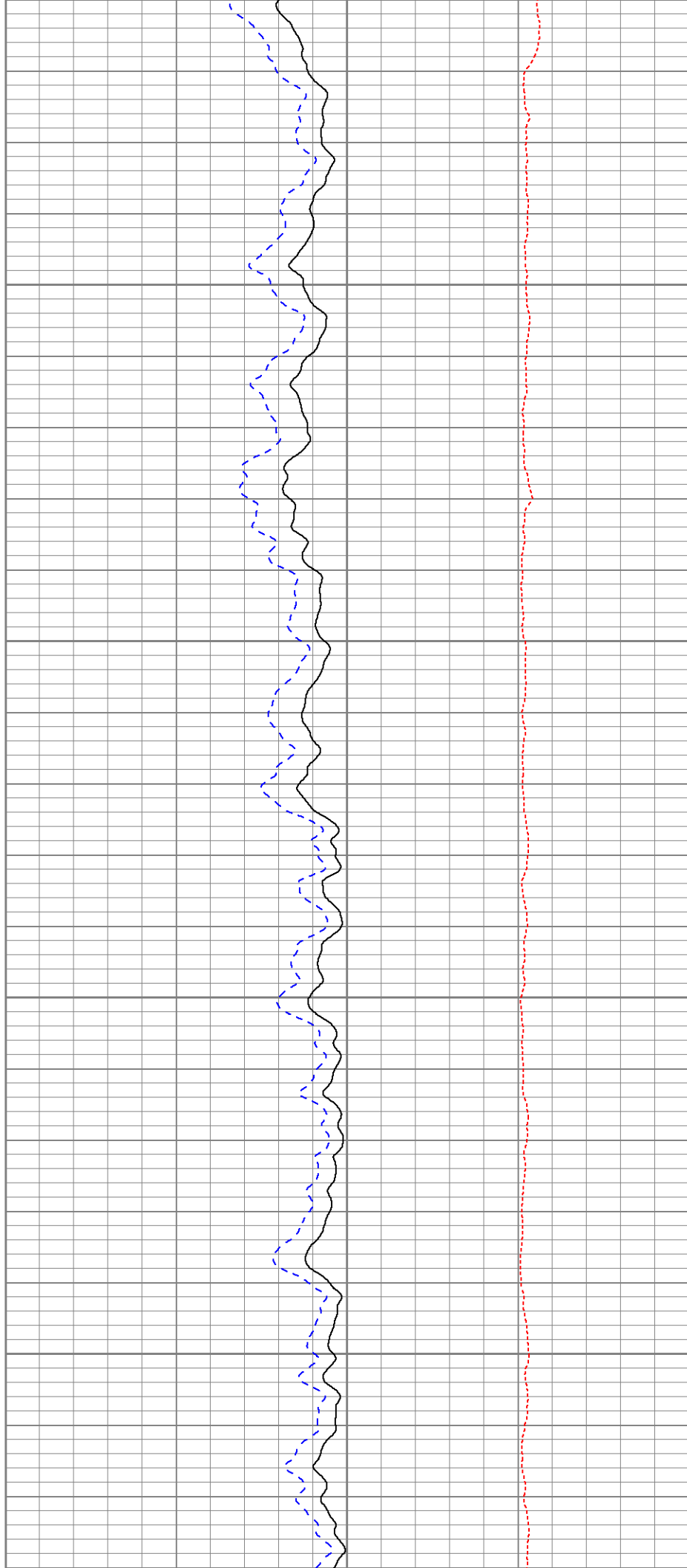


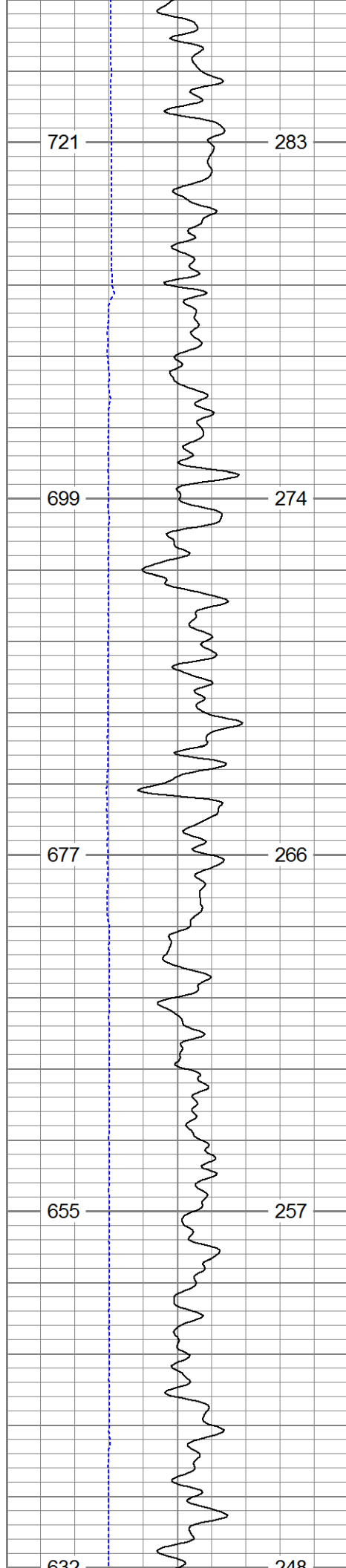
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3700

3750

3800





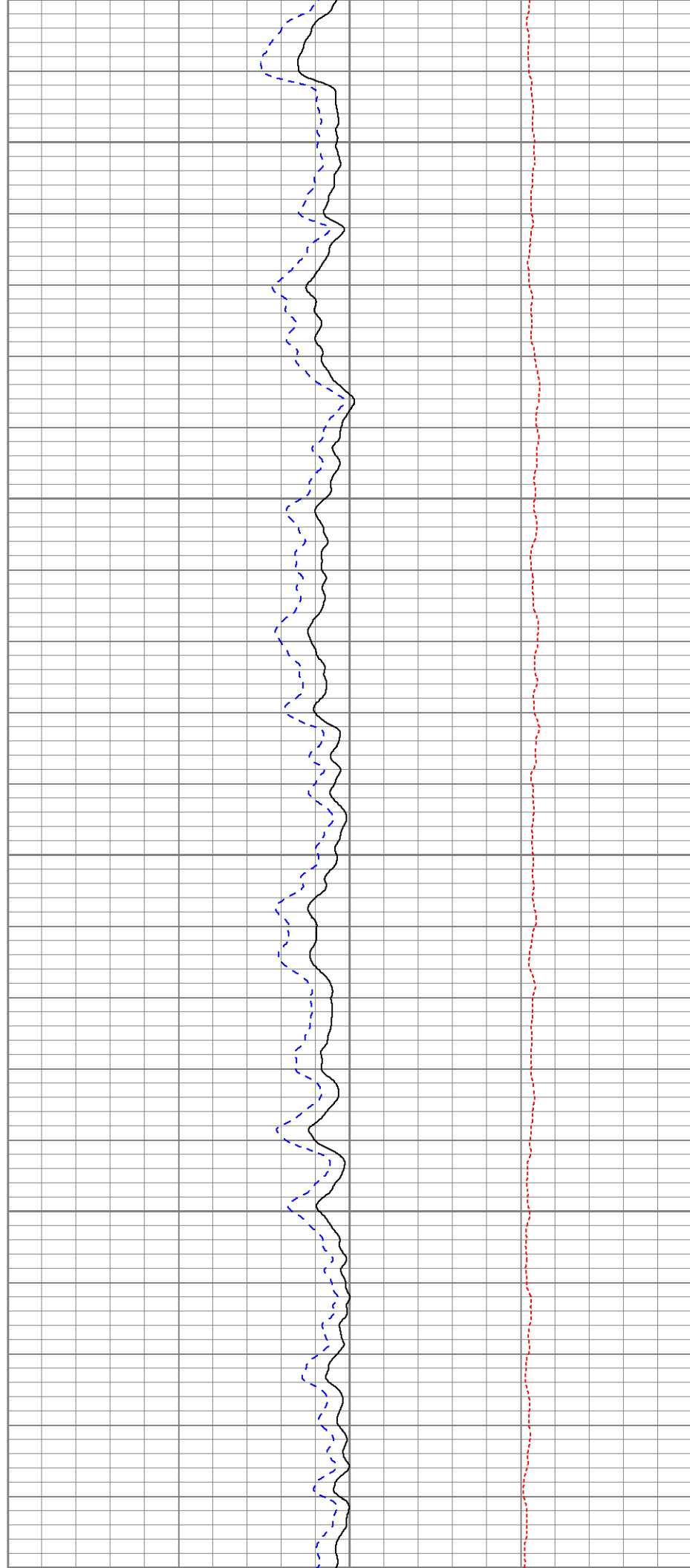
3850

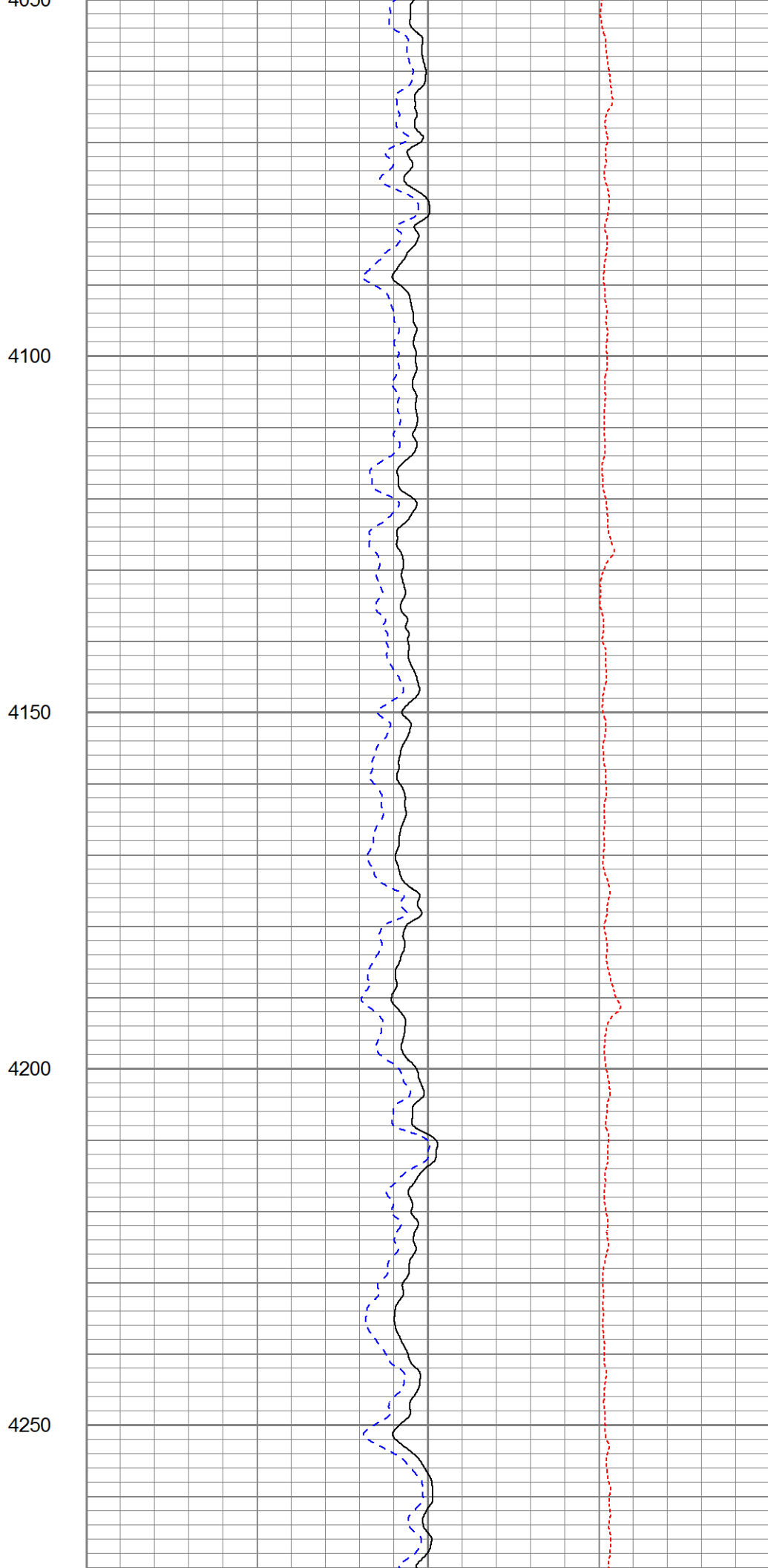
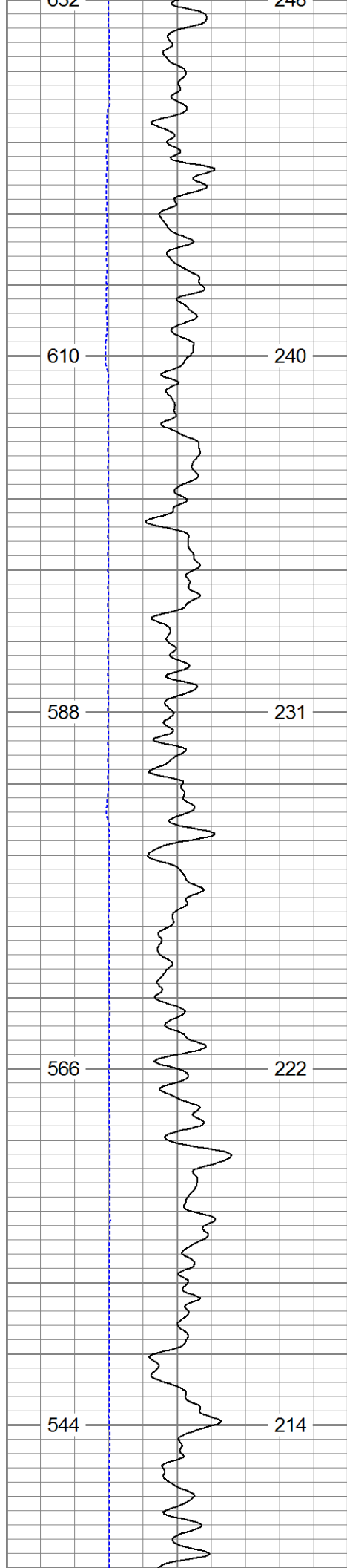
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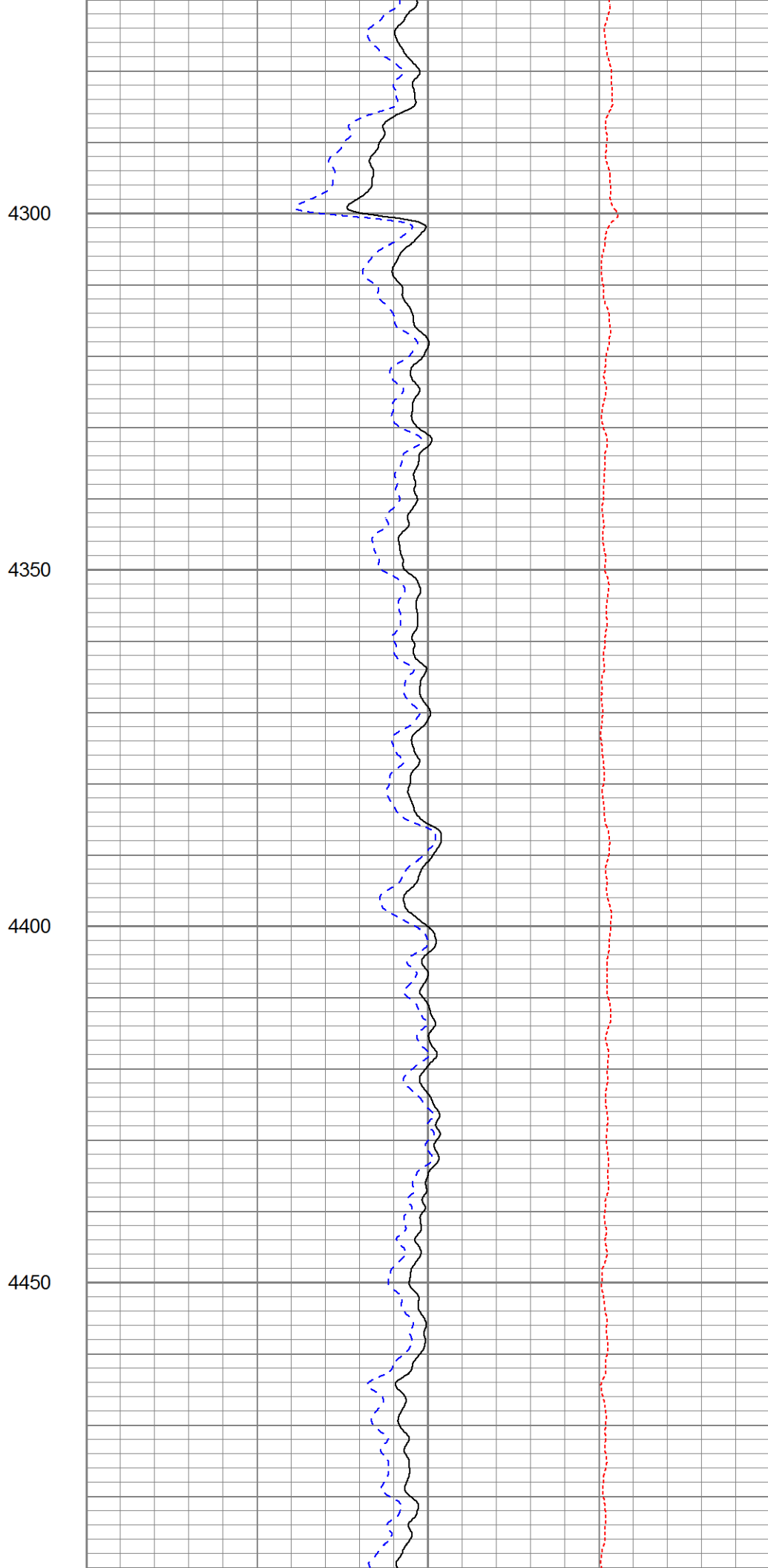
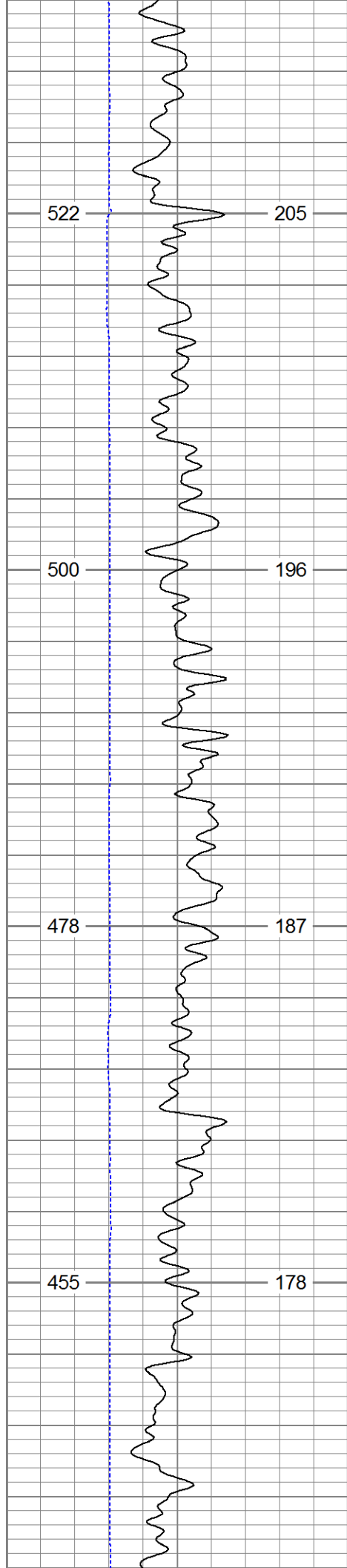
3950

4000

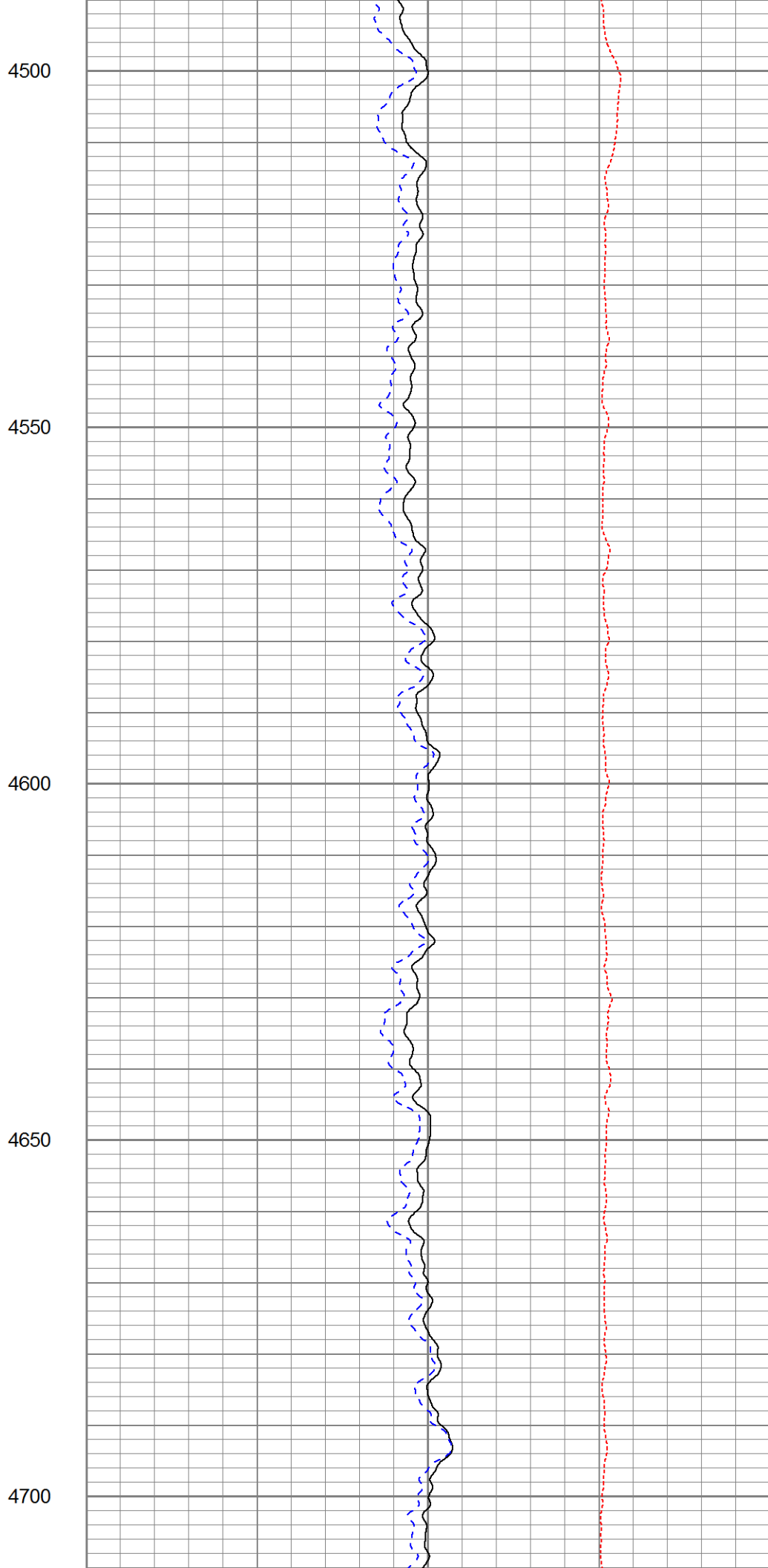
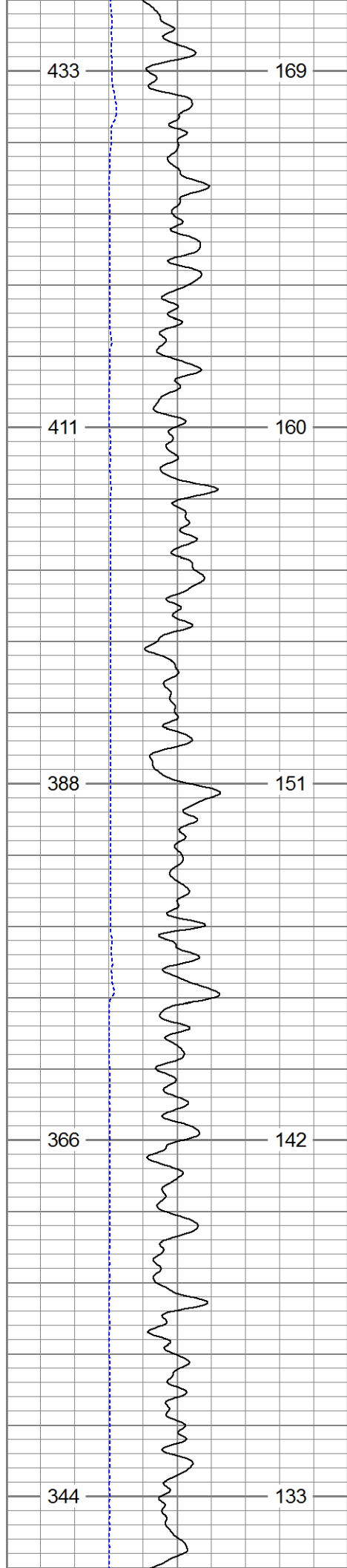
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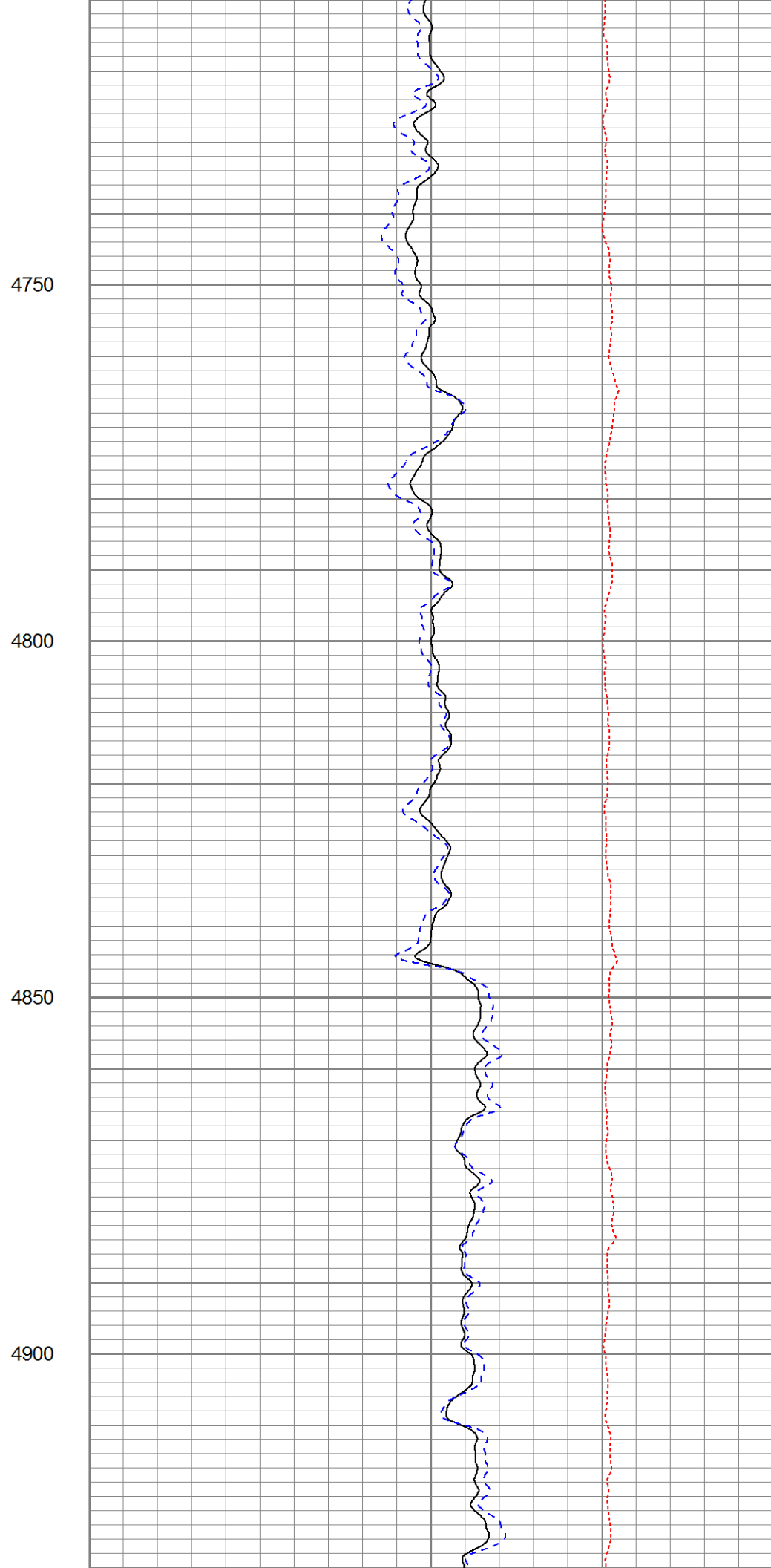
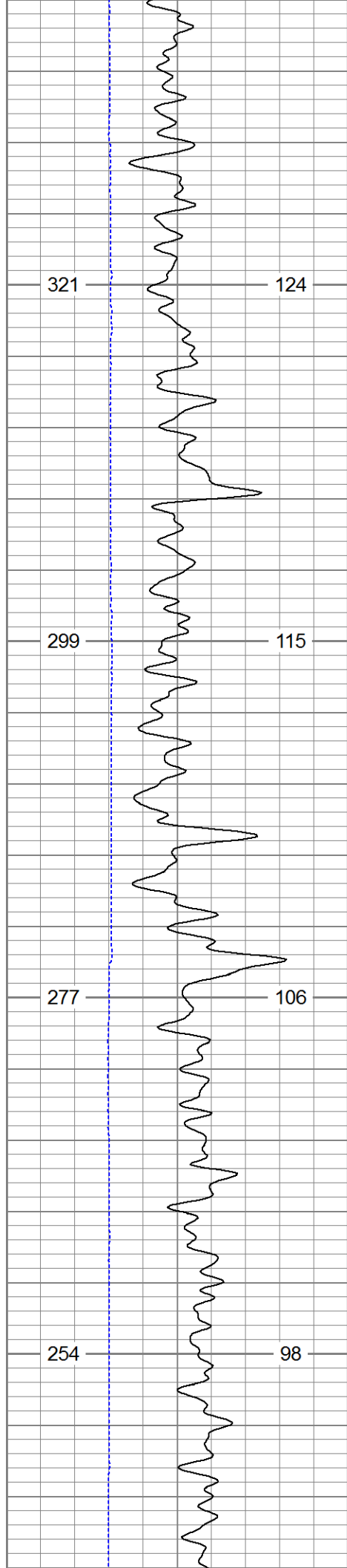


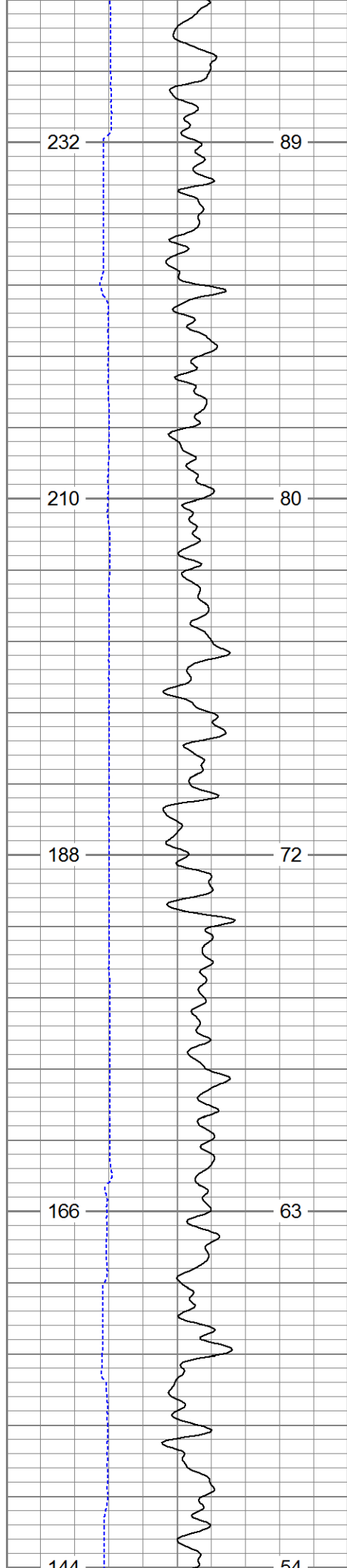












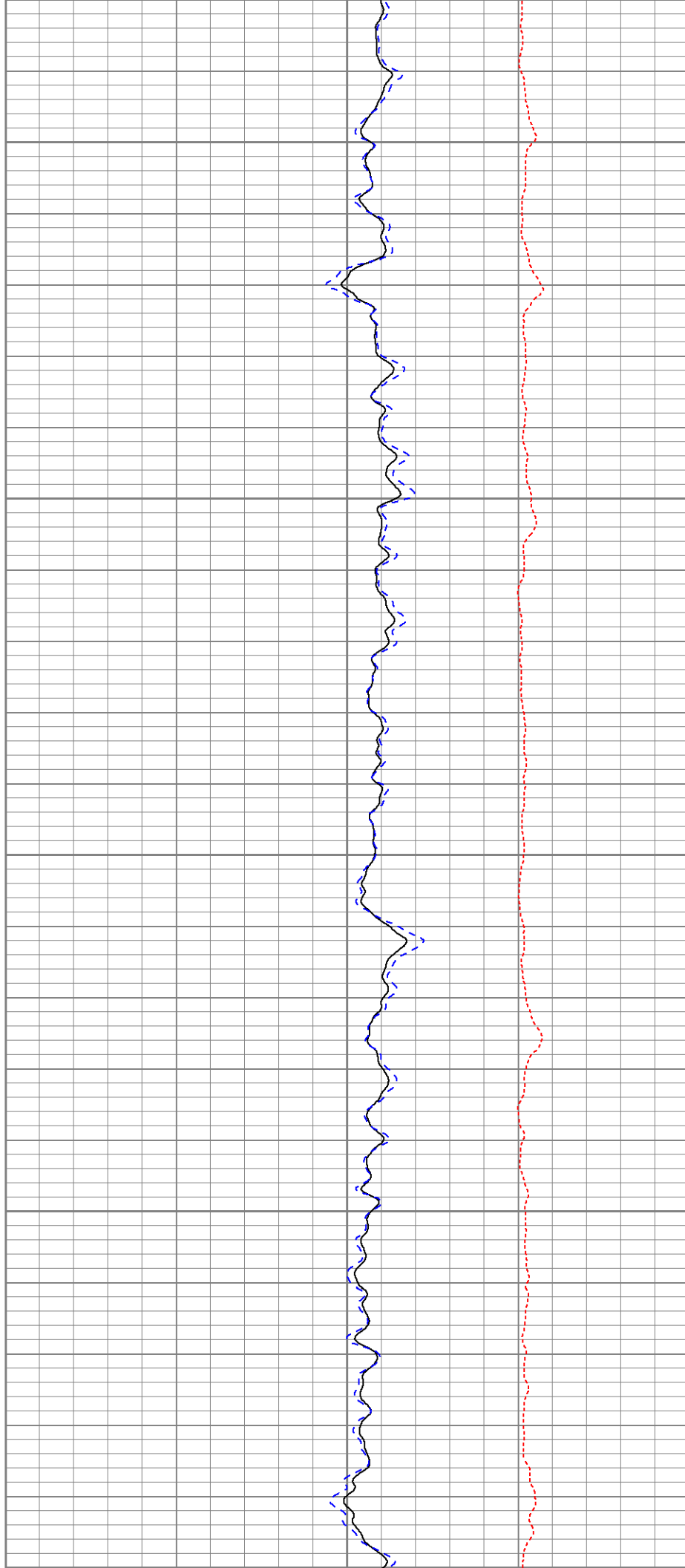
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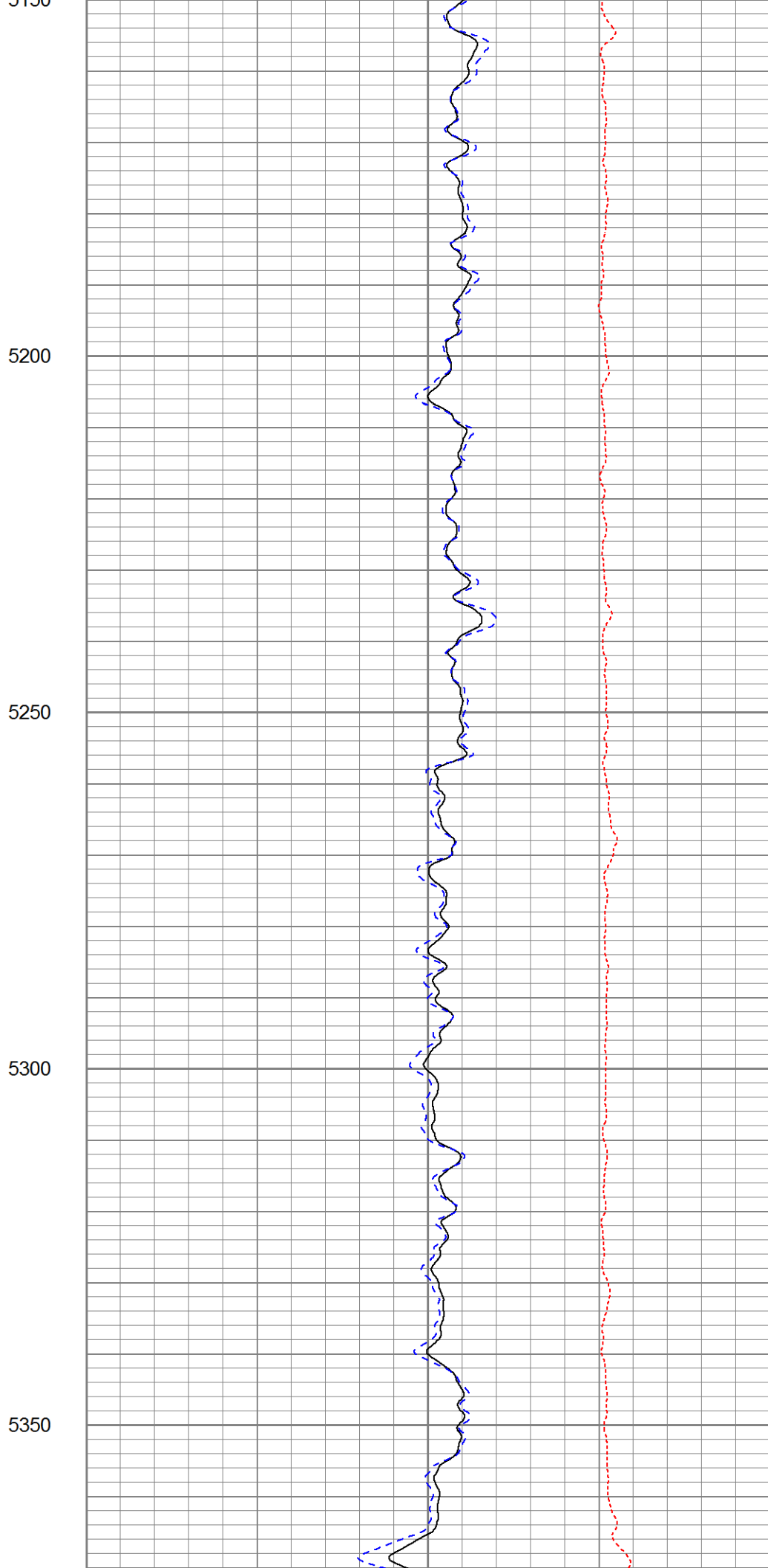
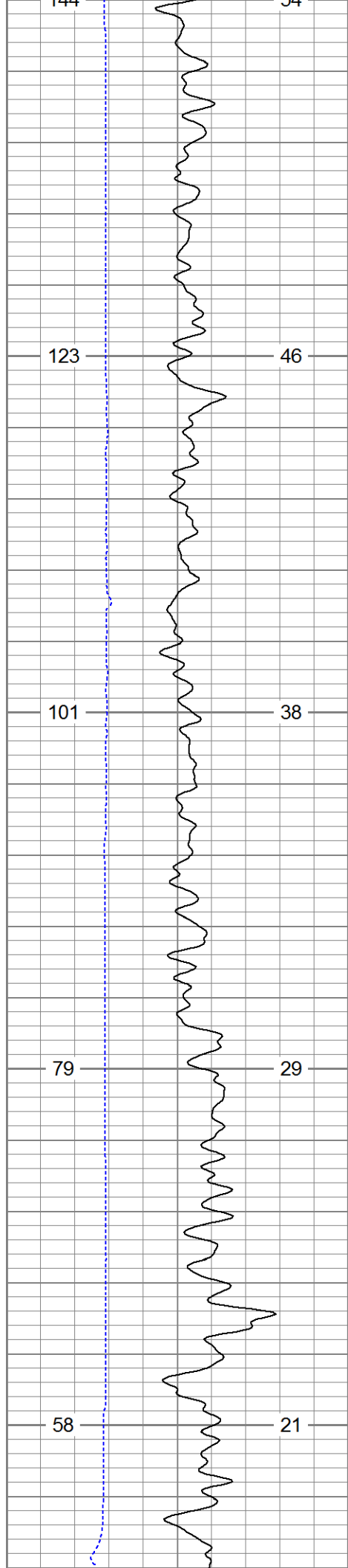
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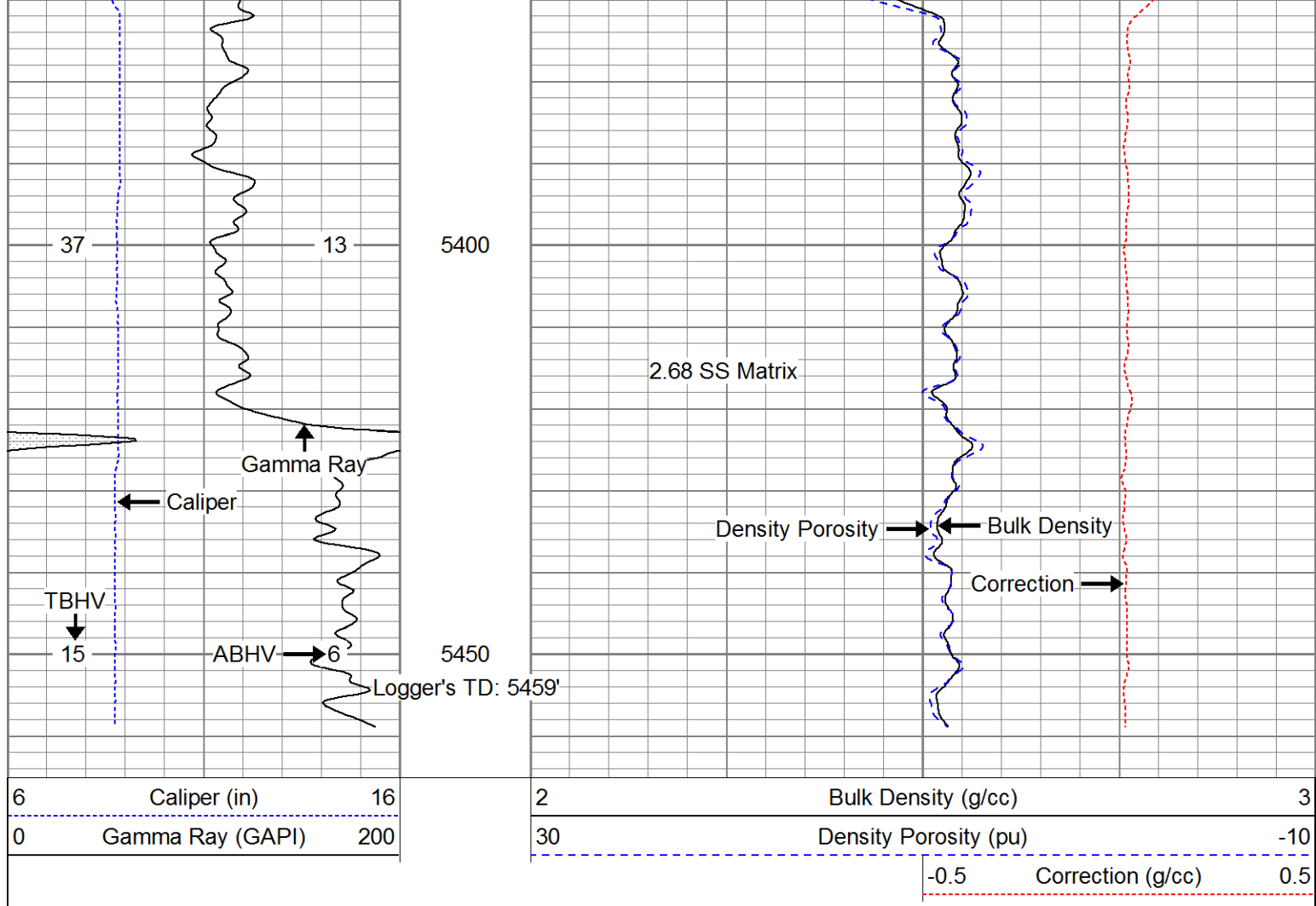
5050

5100

5150







### Calibration Report

Database File: 13510.db  
 Dataset Pathname: Final  
 Dataset Creation: Wed Jun 04 14:38:19 2014

### Dual Induction Calibration Report

Serial-Model: 1011-PSI  
 Surface Cal Performed:

Loop:	Readings		References		Results	
	Air	Loop	Air	Loop	m	b
Deep	0.000	1.000	0.000	1.000	mmho/m	0.510
Medium	0.000	1.000	0.000	1.000	mmho/m	-28.000

### Compensated Density Calibration Report

Serial-Model: 934-PSI  
 Source / Verifier: 4400 / PSI  
 Master Calibration Performed: Wed Jun 04 12:14:34 2014  
 Before Survey Verification Performed:  
 After Survey Verification Performed:

### Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.750	g/cc	4883.27	3645.80	cps

Magnesium	1.750	g/cc	1000.27	cps
Aluminum	2.690	g/cc	915.83	cps
			2377.06	cps
Spine Angle = 75.67		Density/Spine Ratio = 0.544		
	Size		Reading	
Small Ring	4.50	in	1.80	
Large Ring	13.00	in	1.46	

Before Survey Verification				
	Target		Measured	
		g/cc		g/cc
		g/cc		g/cc
		g/cc		g/cc

After Survey Verification				
	Target		Measured	
		g/cc		g/cc
		g/cc		g/cc
		g/cc		g/cc

Compensated Neutron Calibration Report

Serial Number:	853
Tool Model:	PSI

CALIBRATION						
	Detector	Readings		Target		Normalization
	Short Space	1.00	cps	1.00	cps	1.9000
	Long Space	1.00	cps	1.00	cps	2.0400

PRE-SURVEY VERIFICATION						
	Detector	Readings		Measured		Target
1)	Short Space		cps			
	Long Space		cps	pu		pu
2)	Short Space		cps			
	Long Space		cps	pu		
3)	Short Space		cps			
	Long Space		cps	pu		

POST-SURVEY VERIFICATION						
	Detector	Readings		Measured		Target
1)	Short Space		cps			
	Long Space		cps	pu		pu
2)	Short Space		cps			
	Long Space		cps	pu		pu
3)	Short Space		cps			
	Long Space		cps	pu		pu

Gamma Ray Calibration Report

Serial Number:	923
Tool Model:	PSI
Performed:	Wed Jun 04 12:14:51 2014

Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	0.6600	GAPI/cps