



**PIONEER**

Pioneer Energy Services

## DUAL INDUCTION LOG

Company MURFIN DRILLING COMPANY, INC.

Well KOPRIVA #1-14  
Field WILDCAT  
County RAWLINS  
State KANSAS

Company MURFIN DRILLING COMPANY, INC.  
Well KOPRIVA #1-14  
Field WILDCAT  
County RAWLINS State KANSAS

Location: API #: 15-153-21191-00-00

1320' FNL & 1980' FWL

SEC 14 TWP 2S RGE 35W

Permanent Datum GROUND LEVEL Elevation 3196'  
Log Measured From KELLY BUSHING  
Drilling Measured From KELLY BUSHING

Other Services  
CNL/CDL  
MEL/BHCS  
Elevation  
K.B. 3201'  
D.F. N/A  
G.L. 3196'

Date 6/18/2017

Run Number ONE

Depth Driller 4855'

Depth Logger 4856'

Bottom Logged Interval 4855'

Top Log Interval 0'

Casing Driller 8.625" @ 253'

Casing Logger 255'

Bit Size 7.875"

Type Fluid in Hole CHEMICAL

Salinity, ppm CL 1800

Density / Viscosity 9.0 87

pH / Fluid Loss 10.5 6.8

Source of Sample FLOWLINE

Rm @ Meas. Temp 0.90 @ 80

Rmf @ Meas. Temp 0.68 @ 80

Rmc @ Meas. Temp 1.22 @ 80

Source of Rmf / Rmc CHARTS

Rm @ BHT 0.58 @ 125

Operating Rig Time 5 HOURS

Max Rec. Temp. F 125

Equipment Number 91

Location HAYS

Recorded By D. SCHMIDT

Witnessed By ROCKY MILFORD

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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.

BEARDSLEY,  
NORTH TO W RD, 1 1/2 EAST,  
SOUTH 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

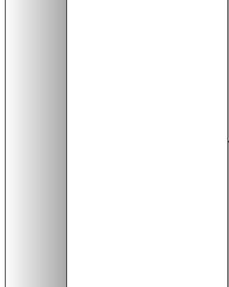
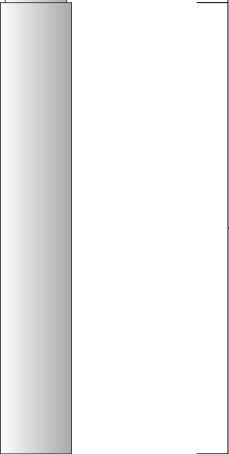
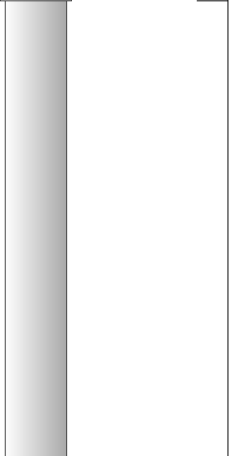
Engineer: D. SCHMIDT  
Operator:  
Operator:  
Operator:

### This Log Record Was Witnessed By

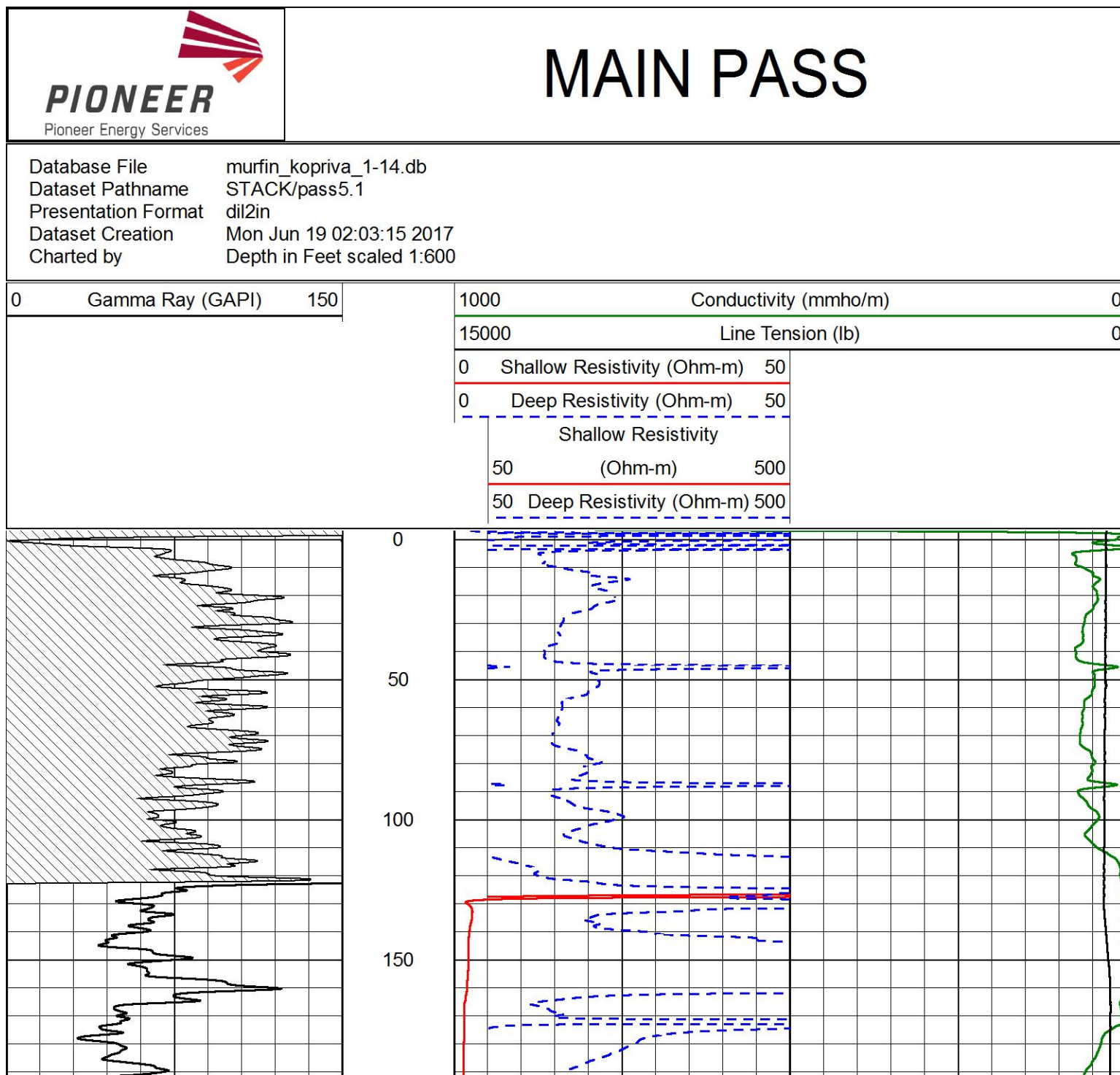
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Secondary Witness:  
Secondary Witness:  
Secondary Witness:

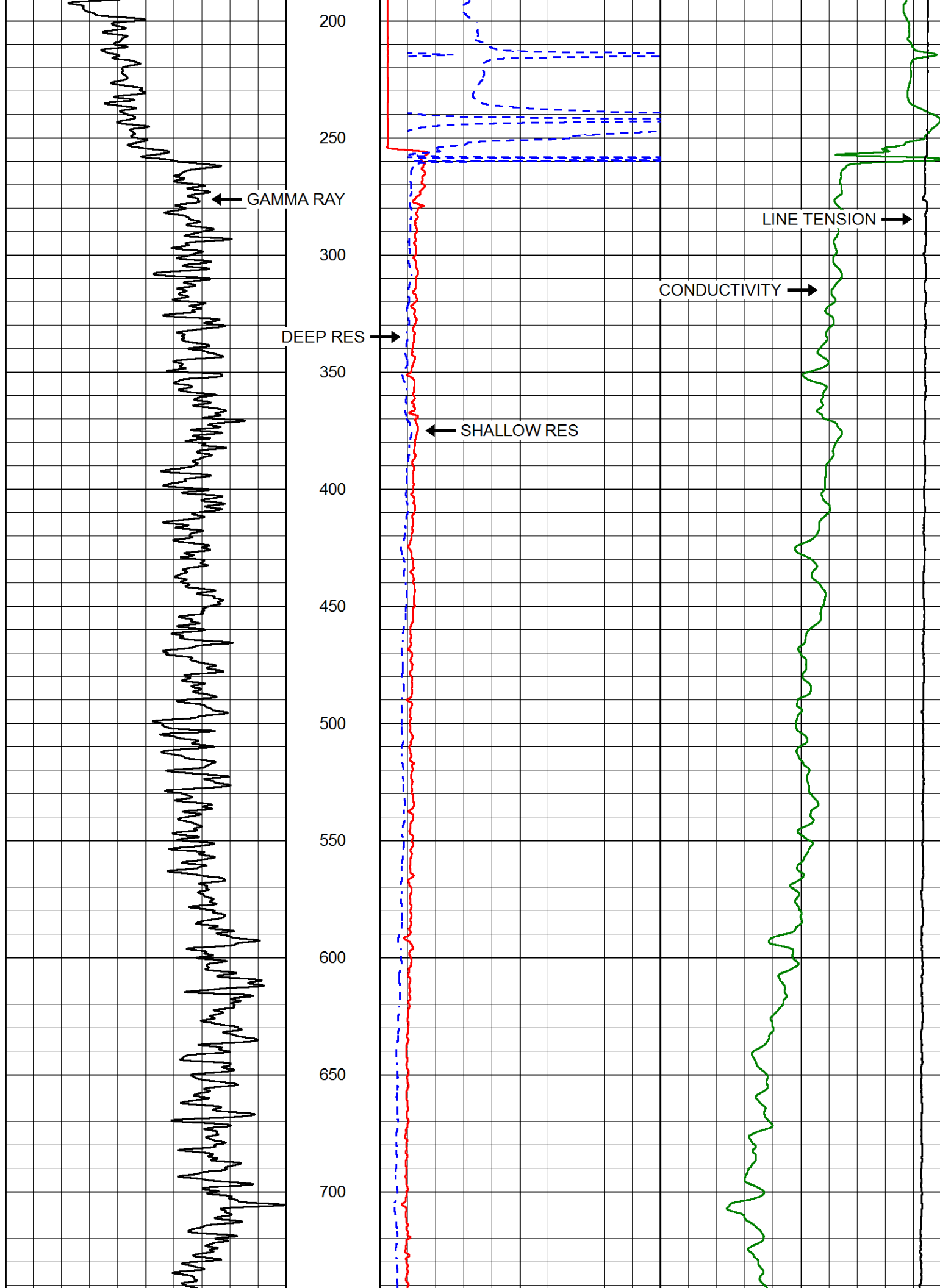
Top - Bottom

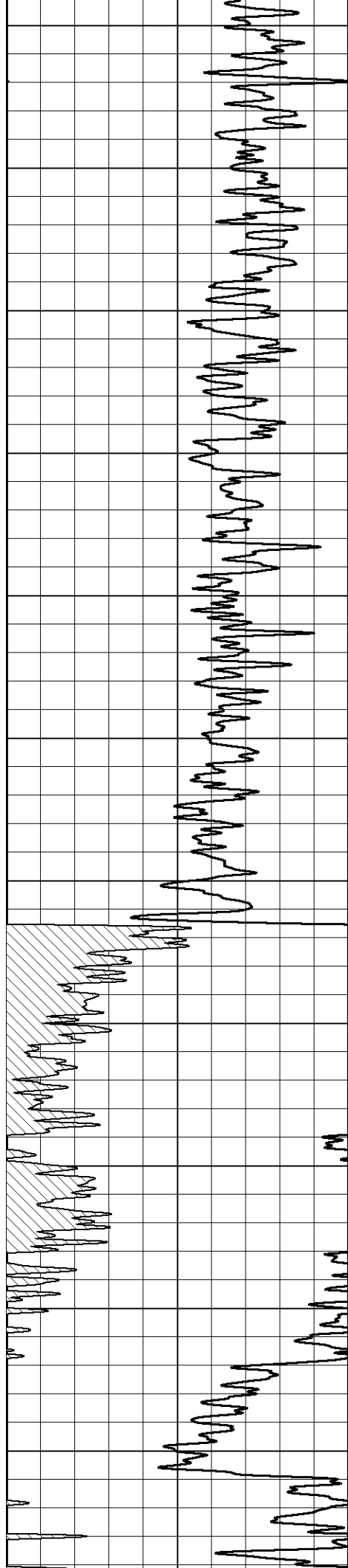
|                  |                 |                |              |                  |                  |                 |                   |
|------------------|-----------------|----------------|--------------|------------------|------------------|-----------------|-------------------|
| M                | A               | SZCOR          | NPORSEL      | FLUIDDEN<br>g/cc | MATRXDEN<br>g/cc | SPSHIFT<br>mV   | SNDERRM<br>mmho/m |
| 2                | 1               | Off            | Limestone    | 1                | 2.71             | 155             | 0                 |
| SNDERR<br>mmho/m | SRFTEMP<br>degF | CASETHCK<br>in | CASEOD<br>in | PERFS            | TDEPTH<br>ft     | BOTTEMP<br>degF | BOREID<br>in      |
| 0                | 80              | 0              | 5.5          | 0                | 0                | 125             | 7.875             |

| Sensor             | Offset (ft)             | Schematic                                                                           | Description       | Length (ft) | O.D. (in) | Weight (lb) |
|--------------------|-------------------------|-------------------------------------------------------------------------------------|-------------------|-------------|-----------|-------------|
| GR                 | 33.00                   |    | GR-M&W (89)       | 3.00        | 3.50      | 50.00       |
| CNLSC<br>CNSSC     | 29.90<br>29.15          |   | CNT-M&W (207-MW)  | 5.50        | 3.50      | 100.00      |
| LSD<br>DCAL<br>SSD | 20.85<br>20.83<br>20.35 |  | CDL-M&W (90-1031) | 8.50        | 4.00      | 250.00      |
| RLL3F<br>RLL3      | 15.80<br>15.80          |  | DIL-M&W (PSI 91)  | 18.50       | 3.50      | 220.00      |
| CILD               | 8.00                    |  |                   |             |           |             |

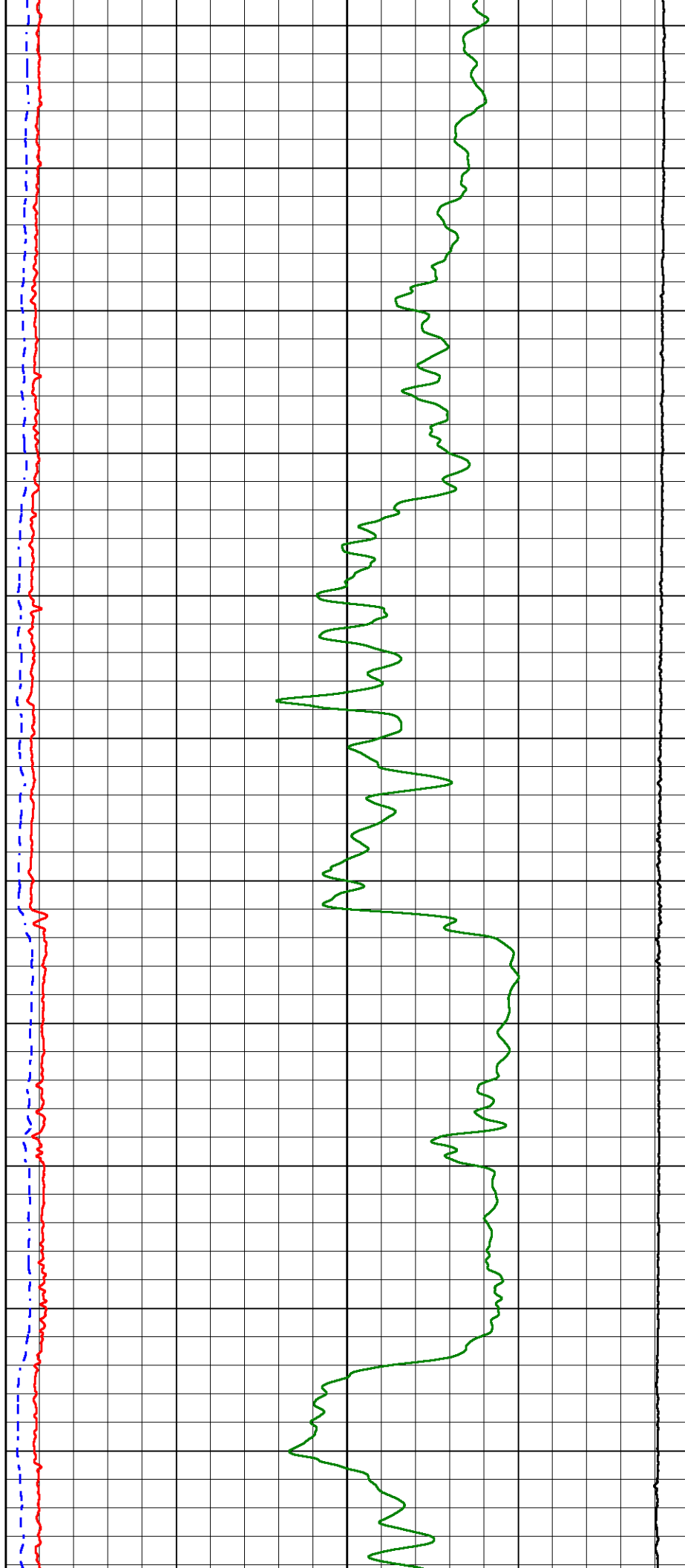
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|---------------------------------------------------------------------------------------------------------------------------------|------|--|--|--|--|--|--|--|--|
| CILM                                                                                                                            | 4.70 |  |  |  |  |  |  |  |  |
| SP                                                                                                                              | 0.20 |  |  |  |  |  |  |  |  |
| Dataset: murfin_kopriva_1-14.db: field/well/STACK/pass4.5<br>Total length: 35.50 ft<br>Total weight: 620.00 lb<br>O.D.: 4.00 in |      |  |  |  |  |  |  |  |  |

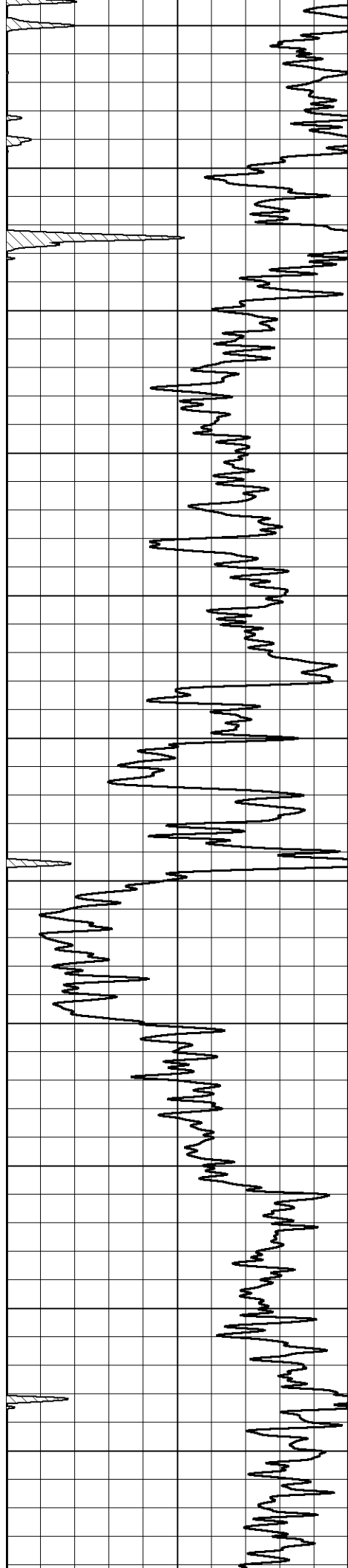




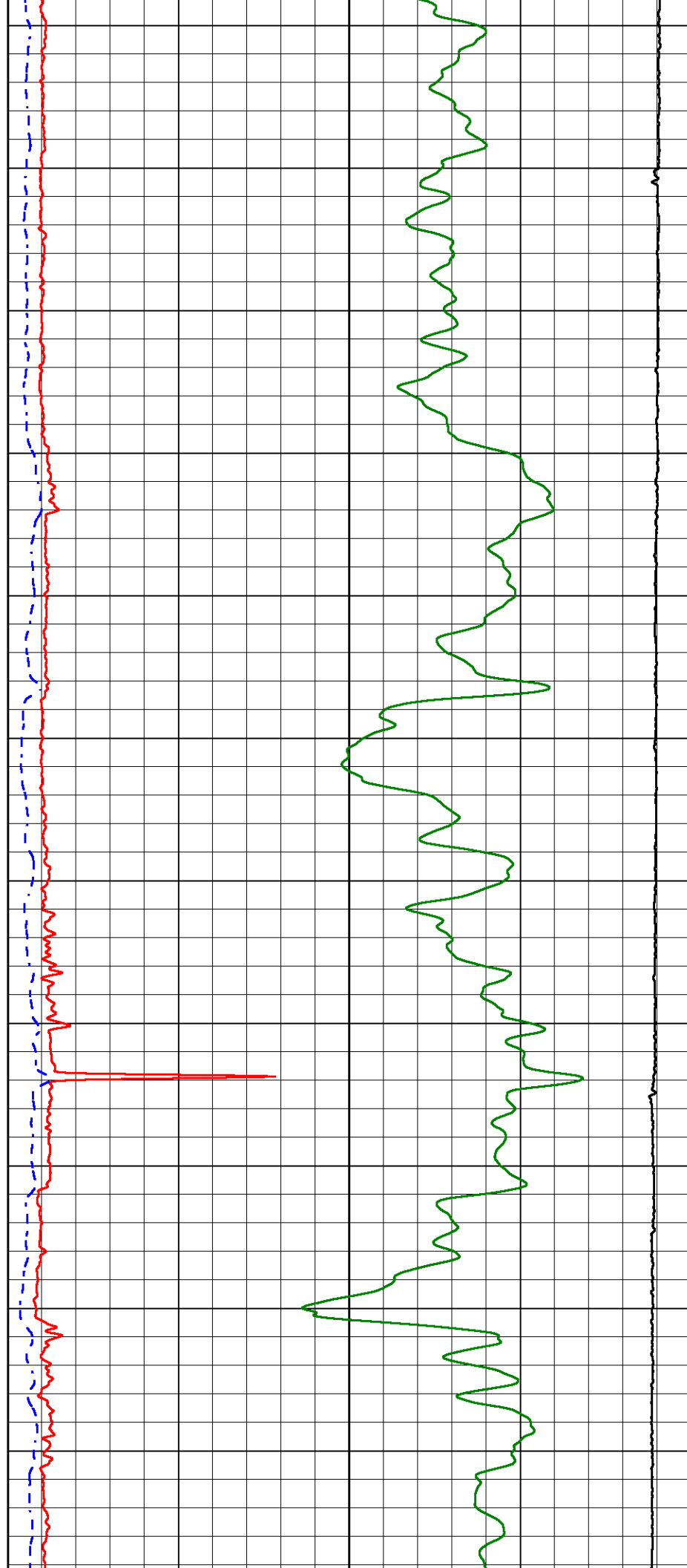


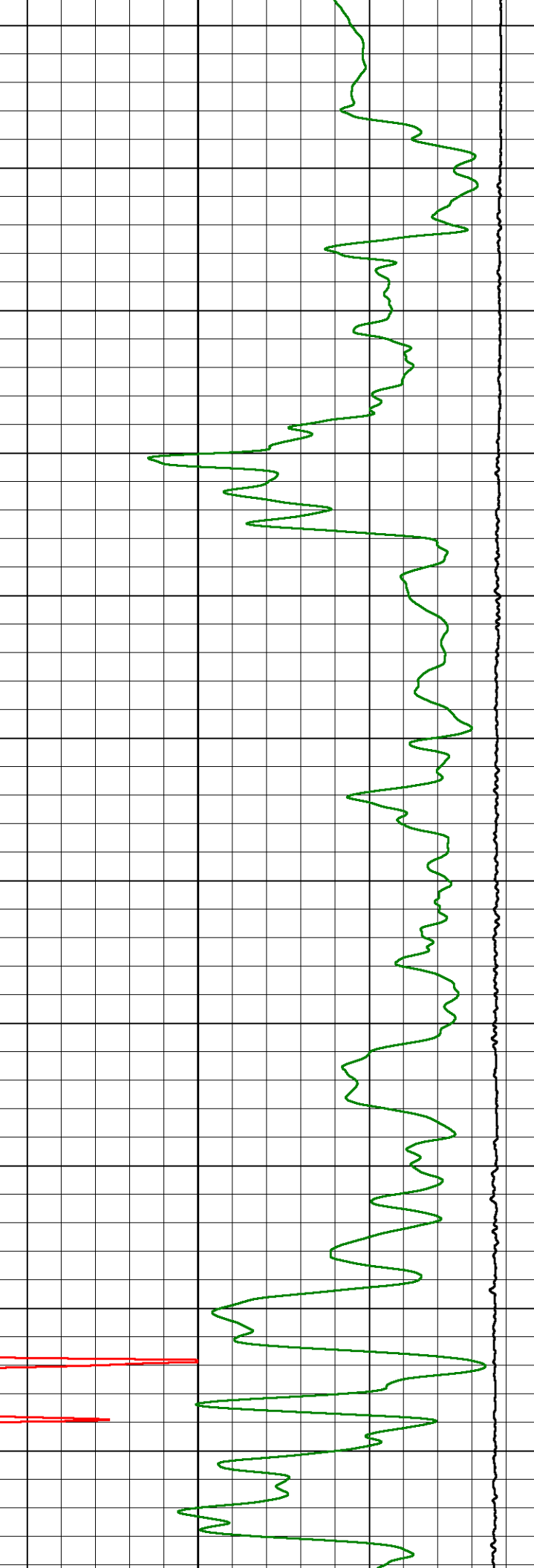
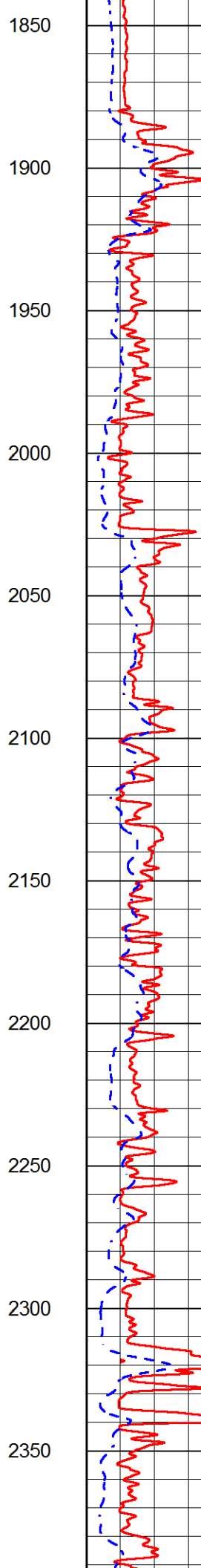
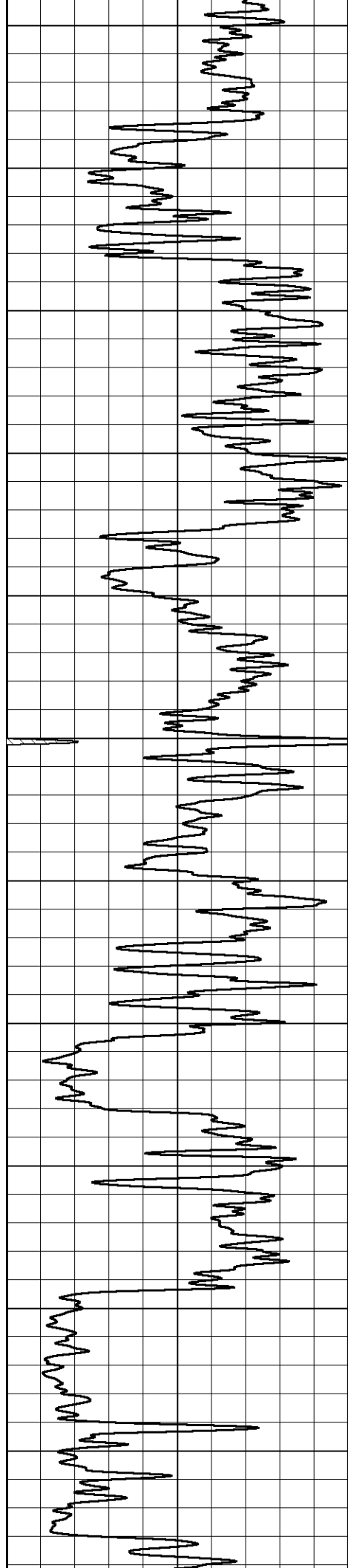
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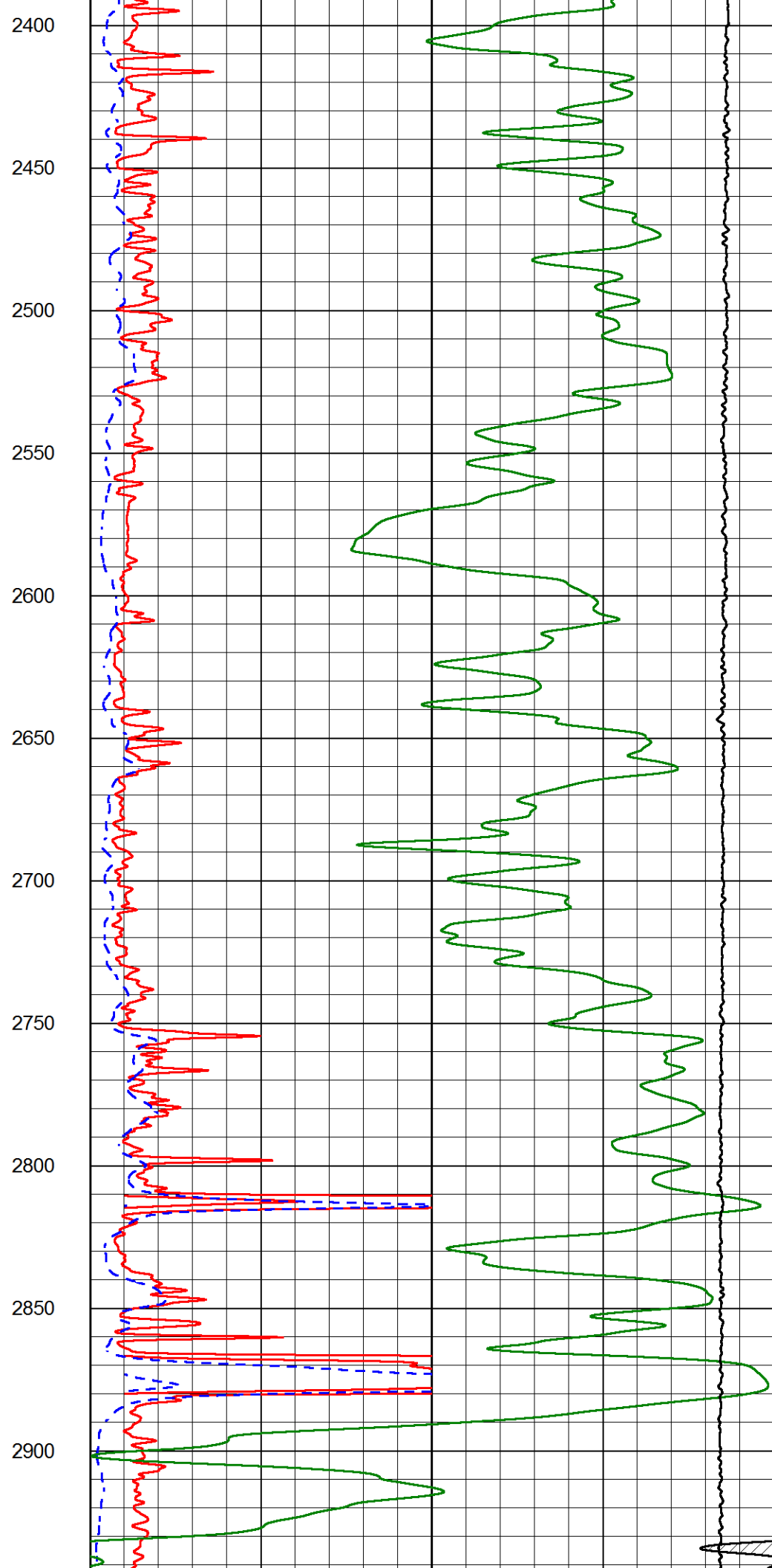
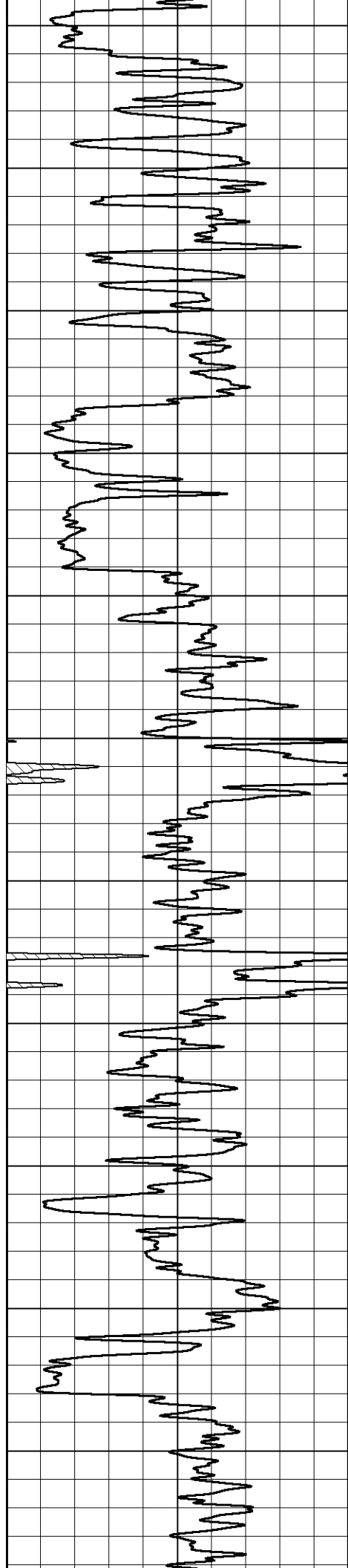


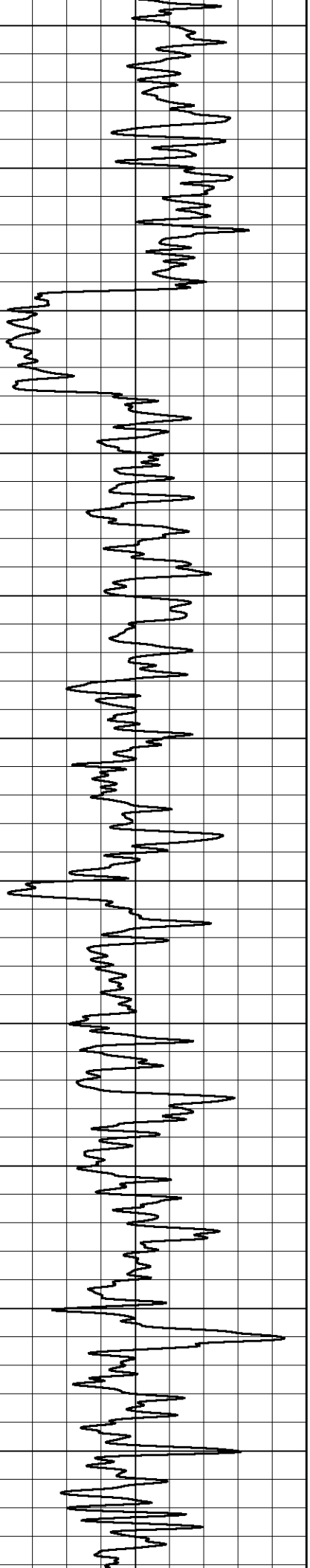
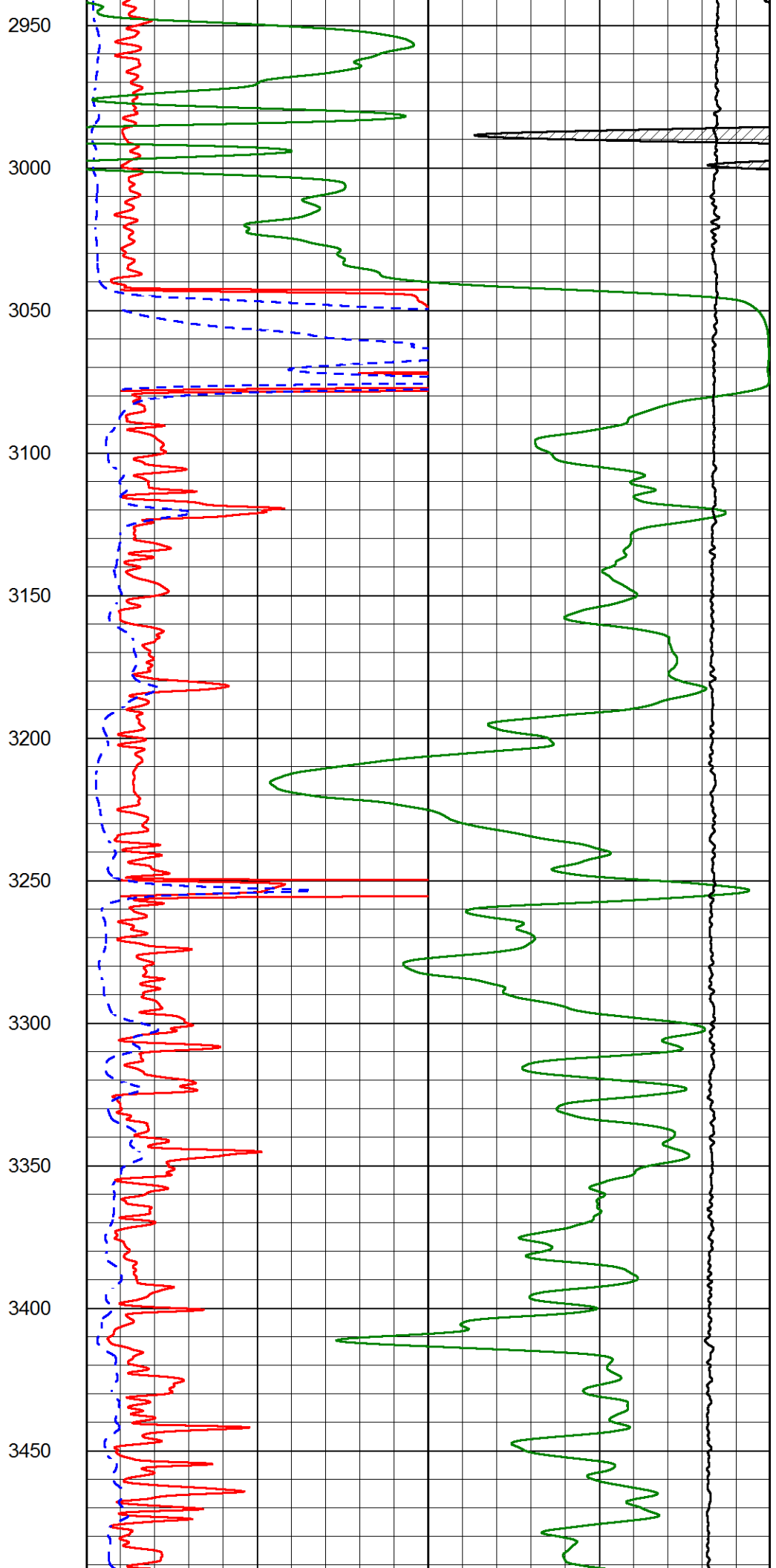


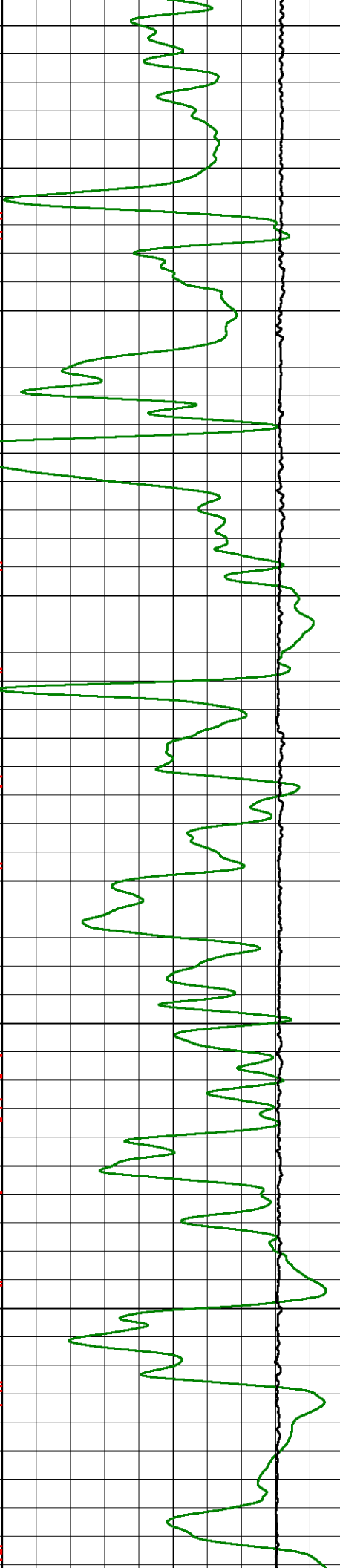
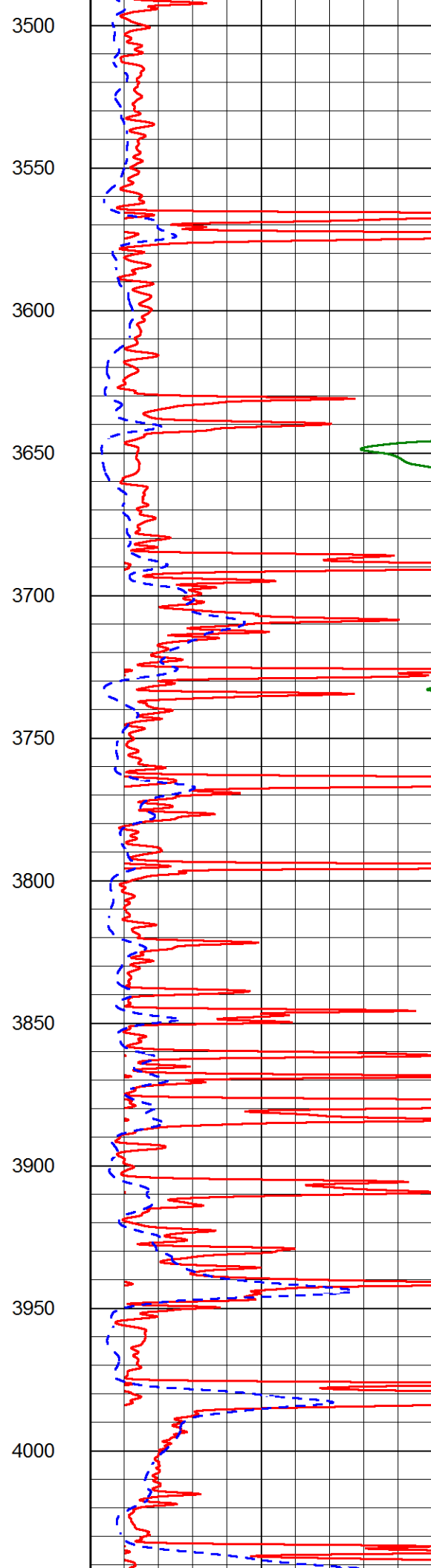
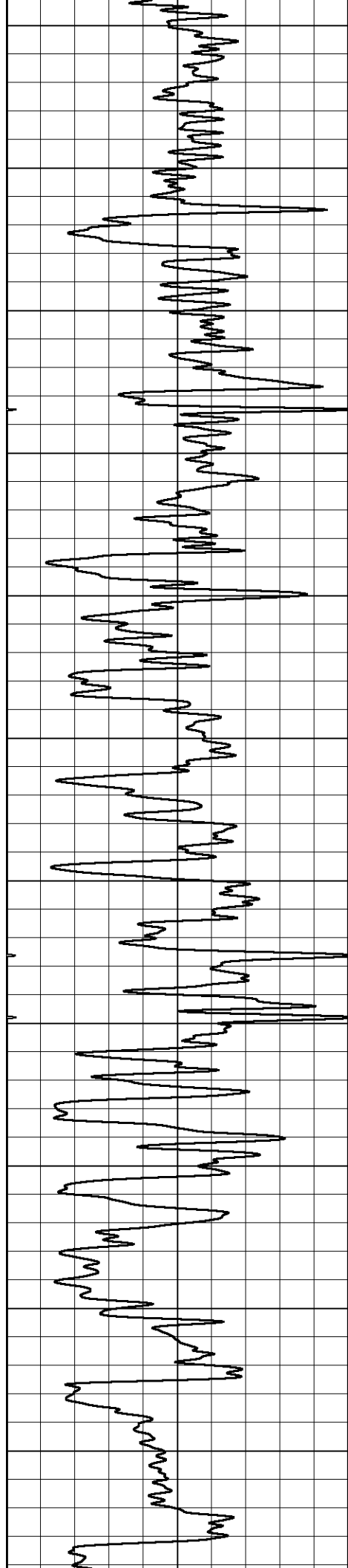
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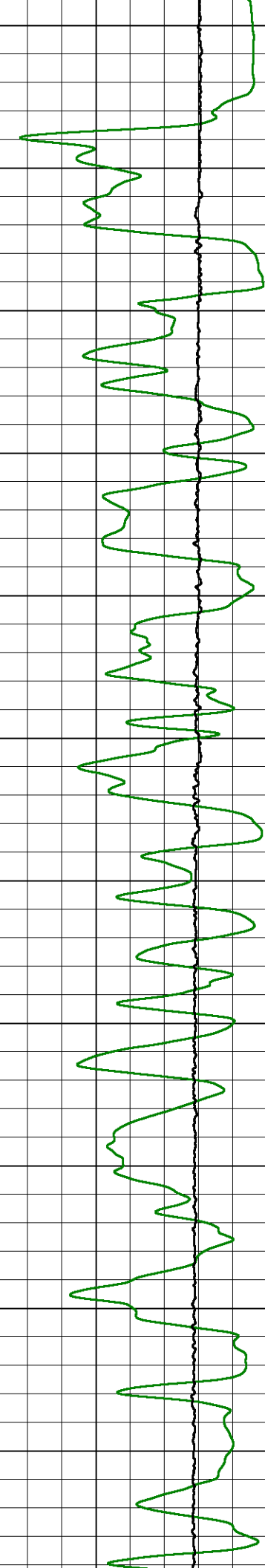
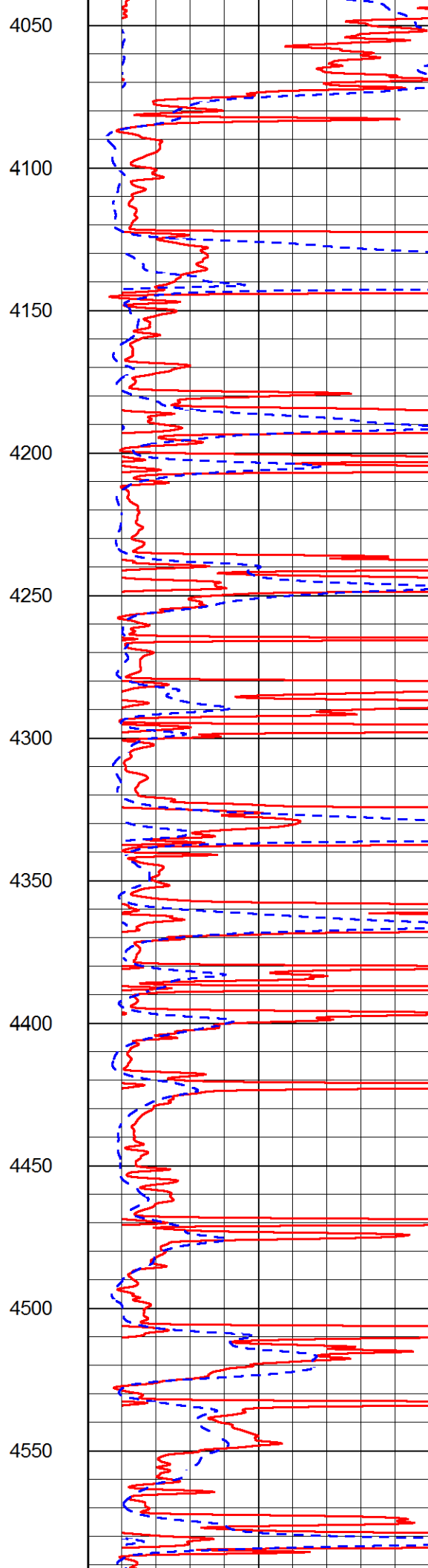
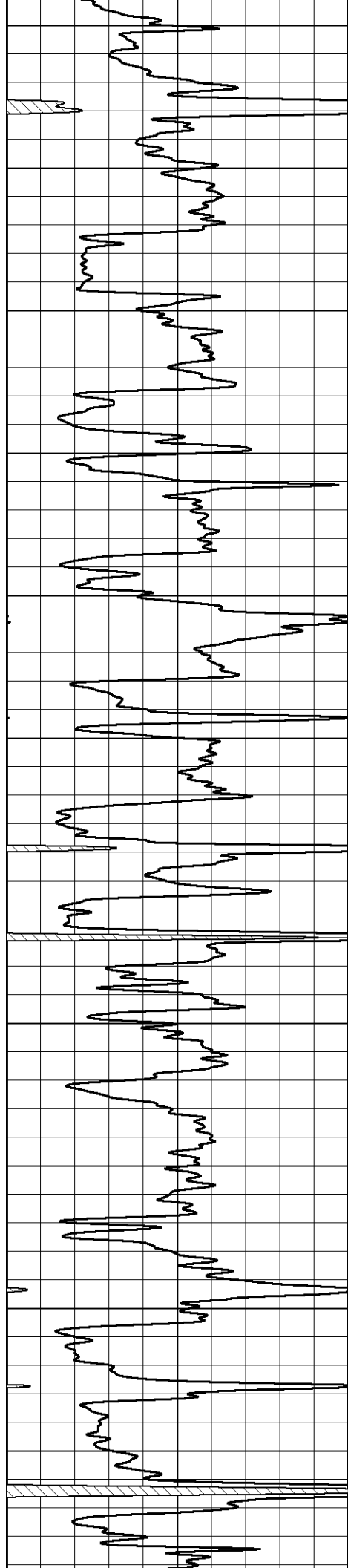


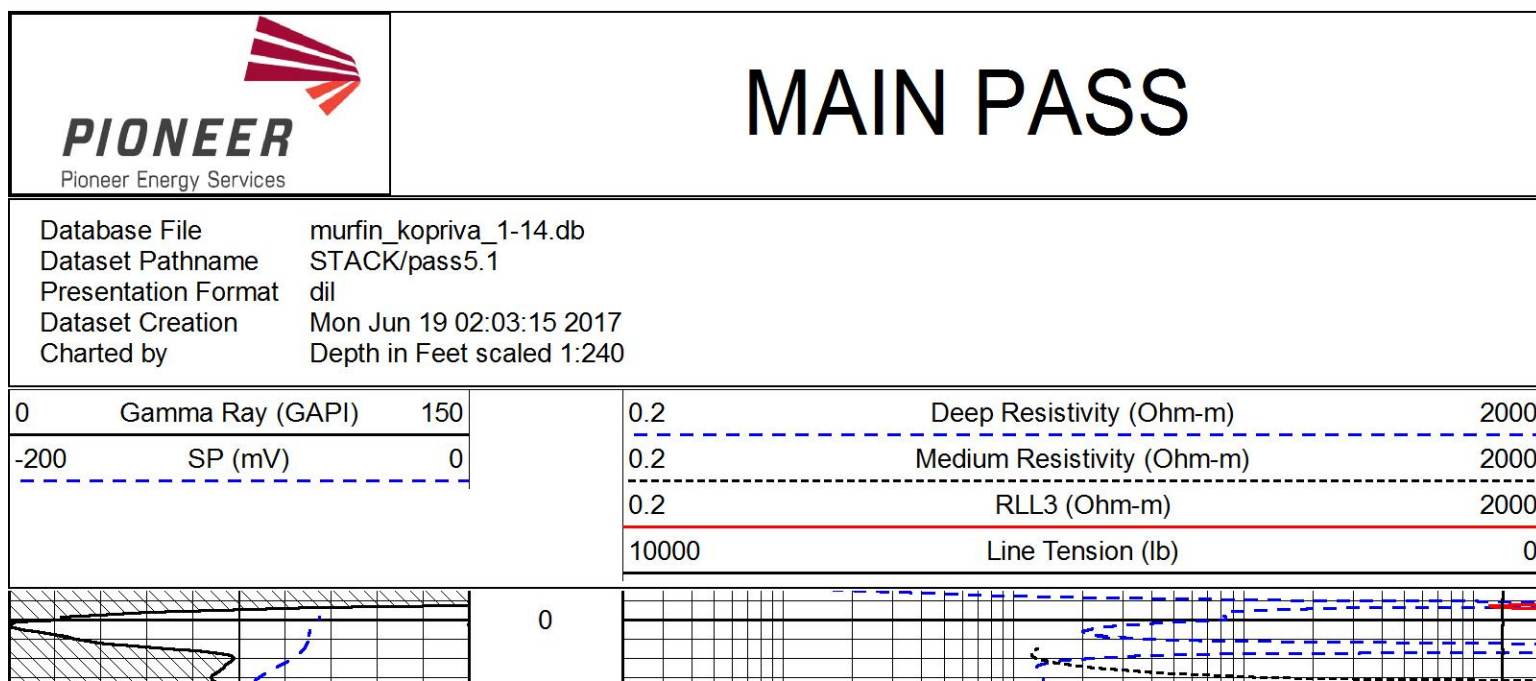
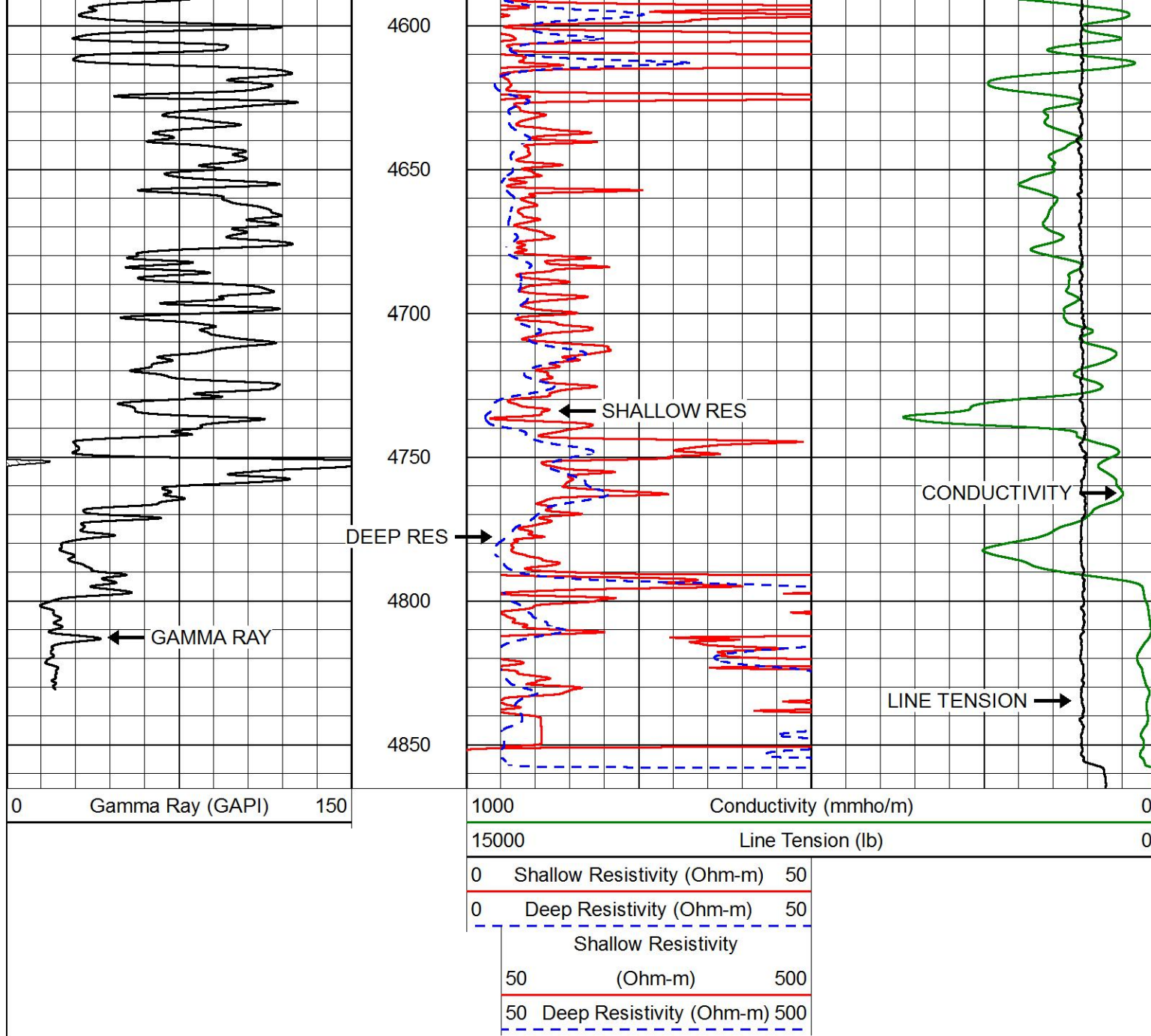


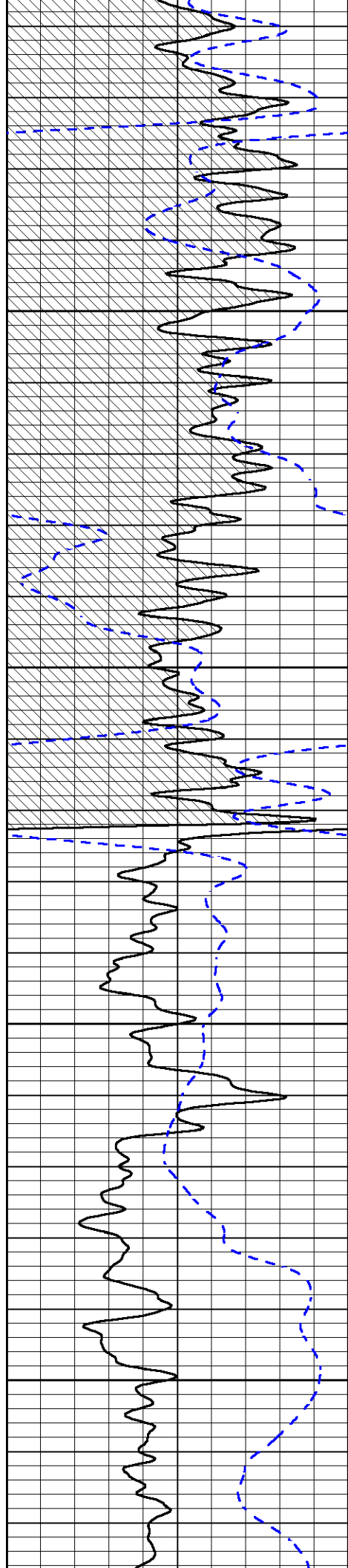










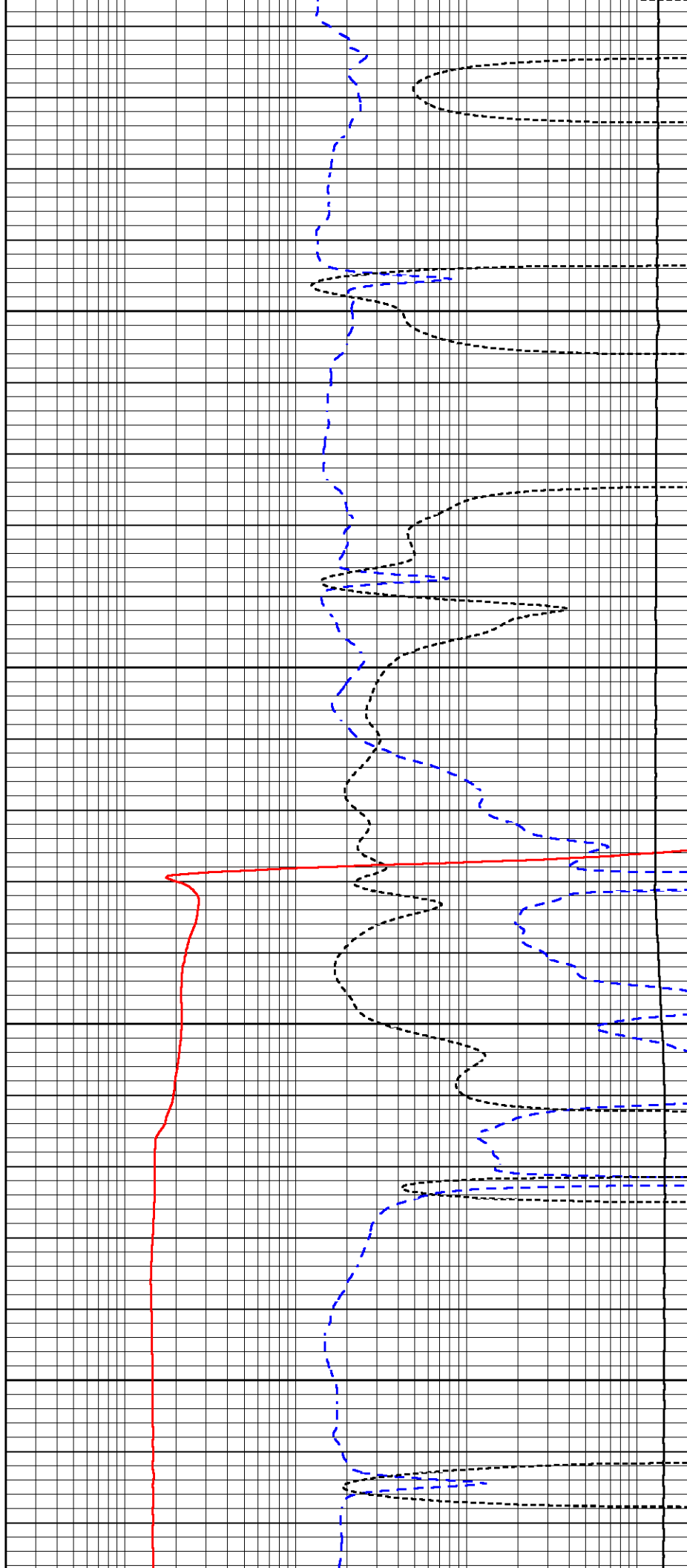


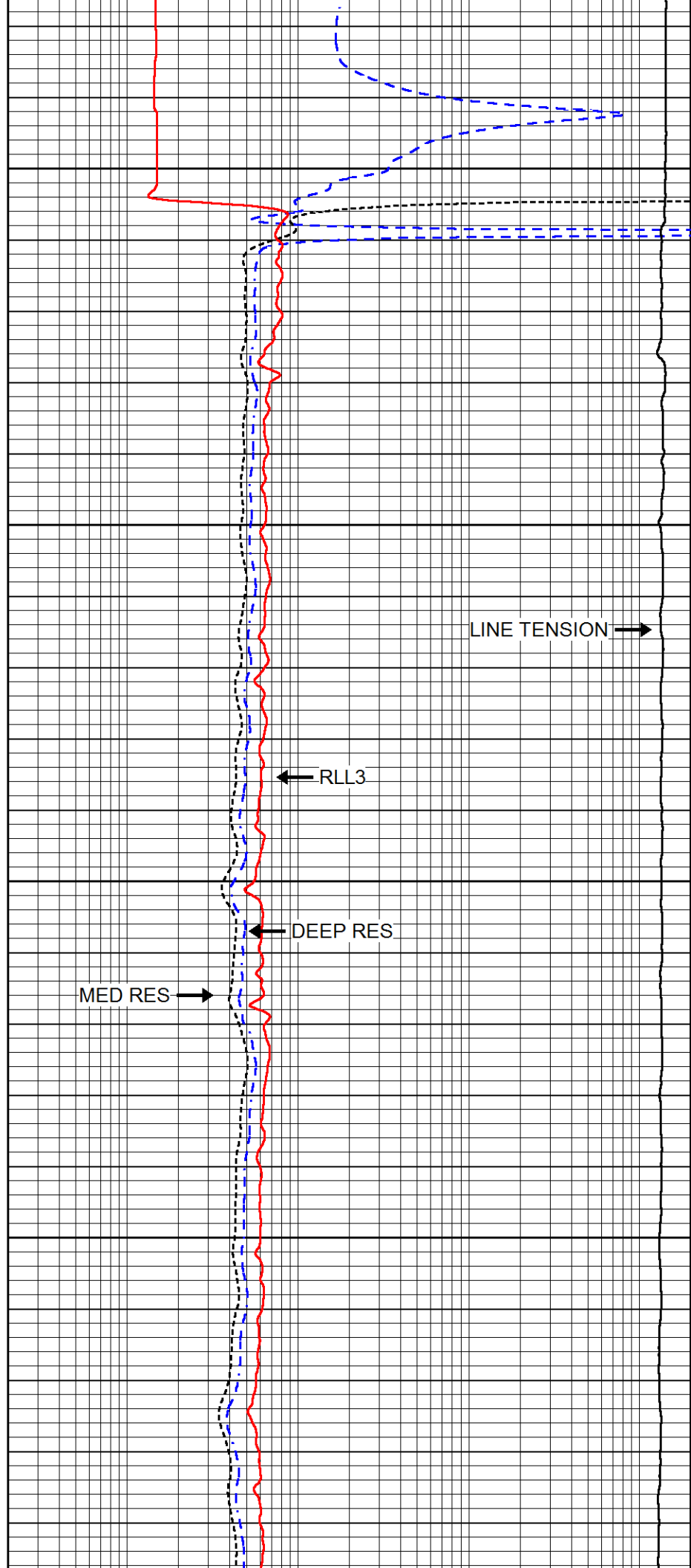
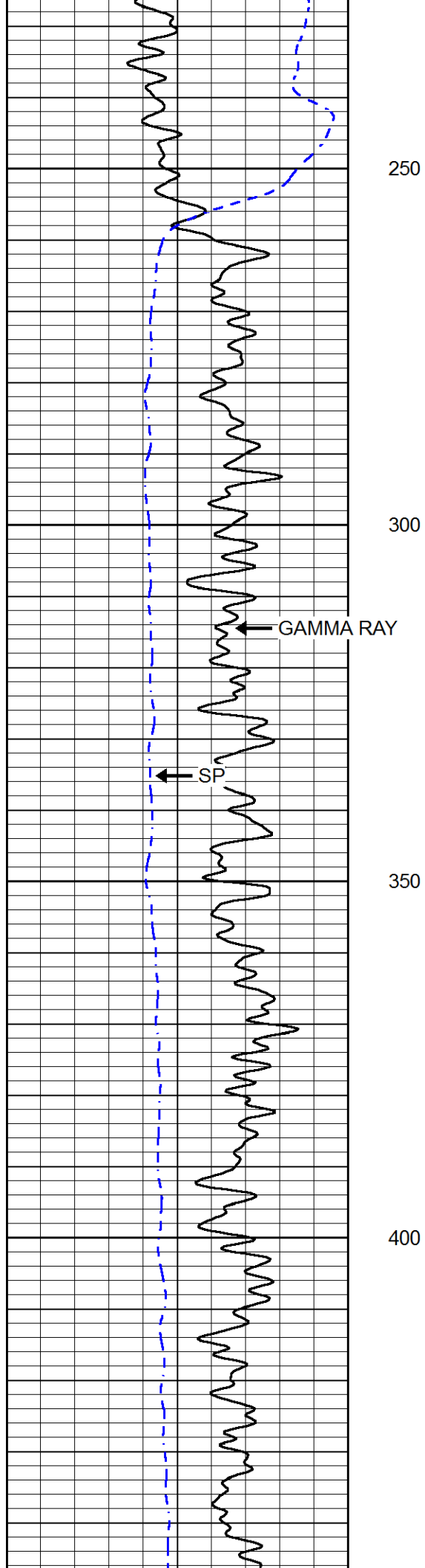
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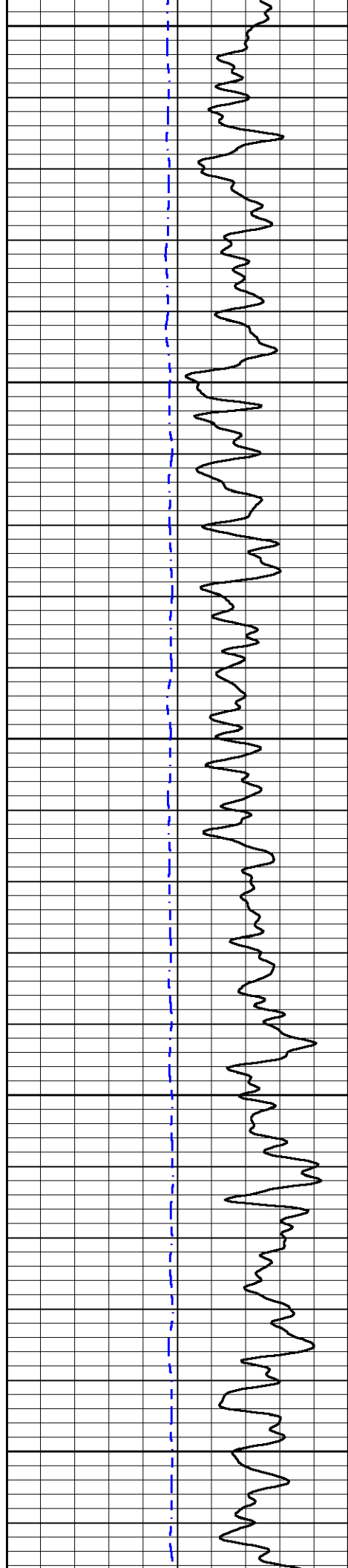
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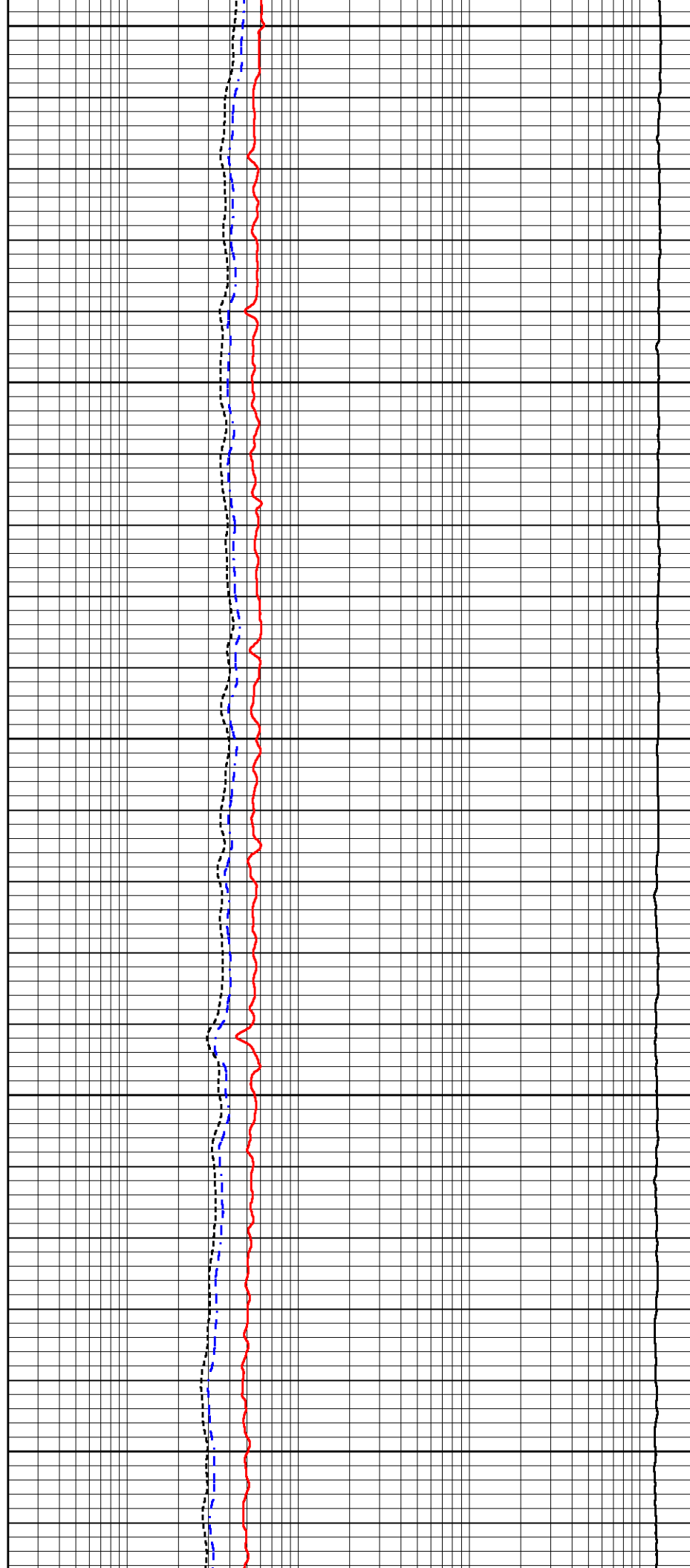
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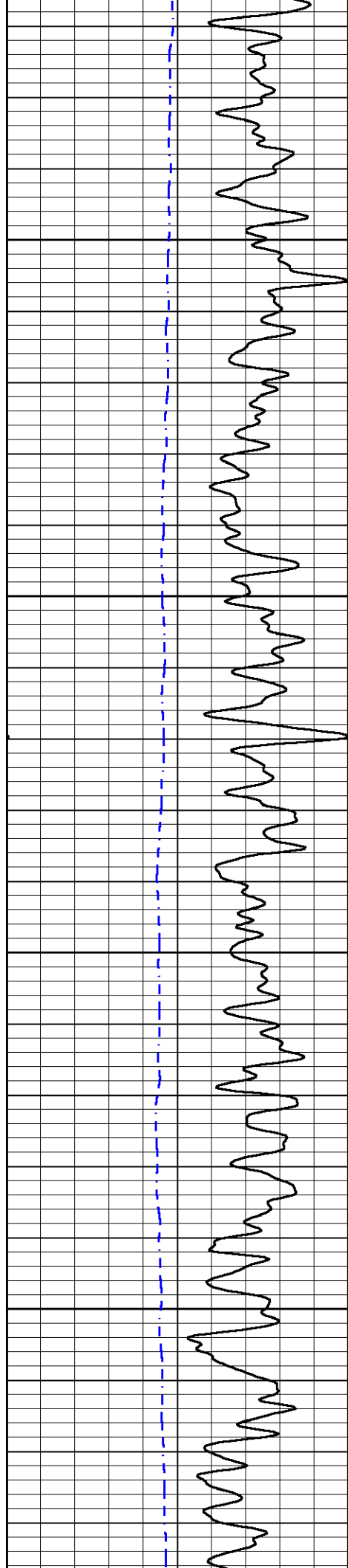
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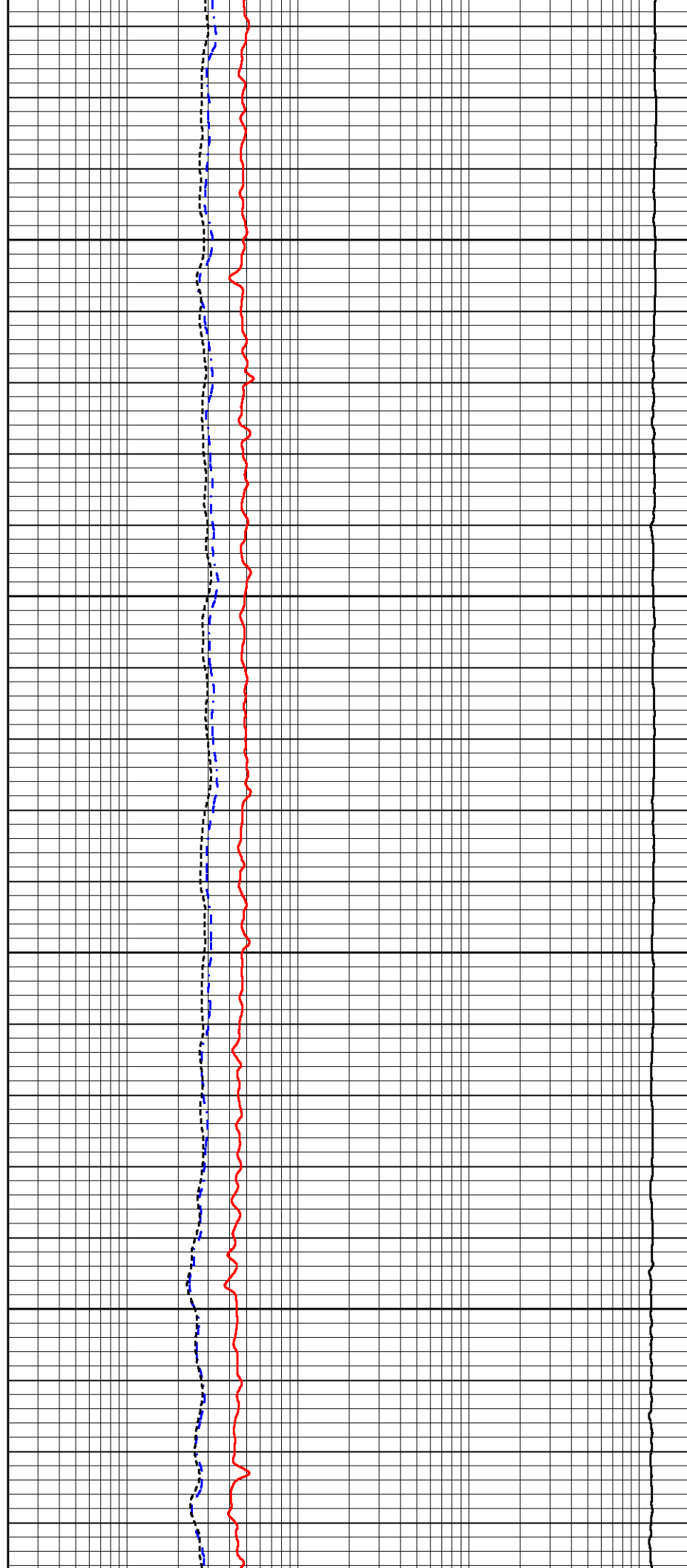


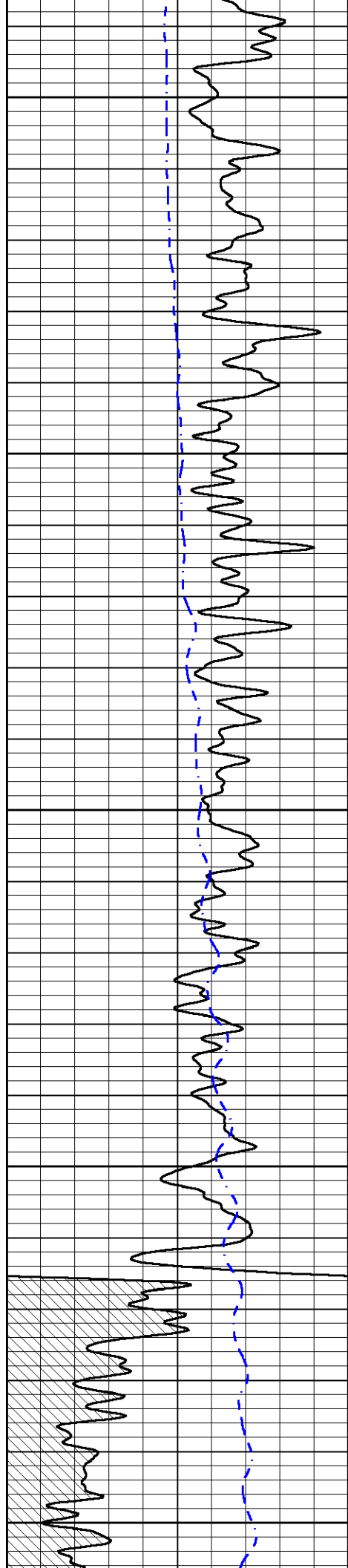
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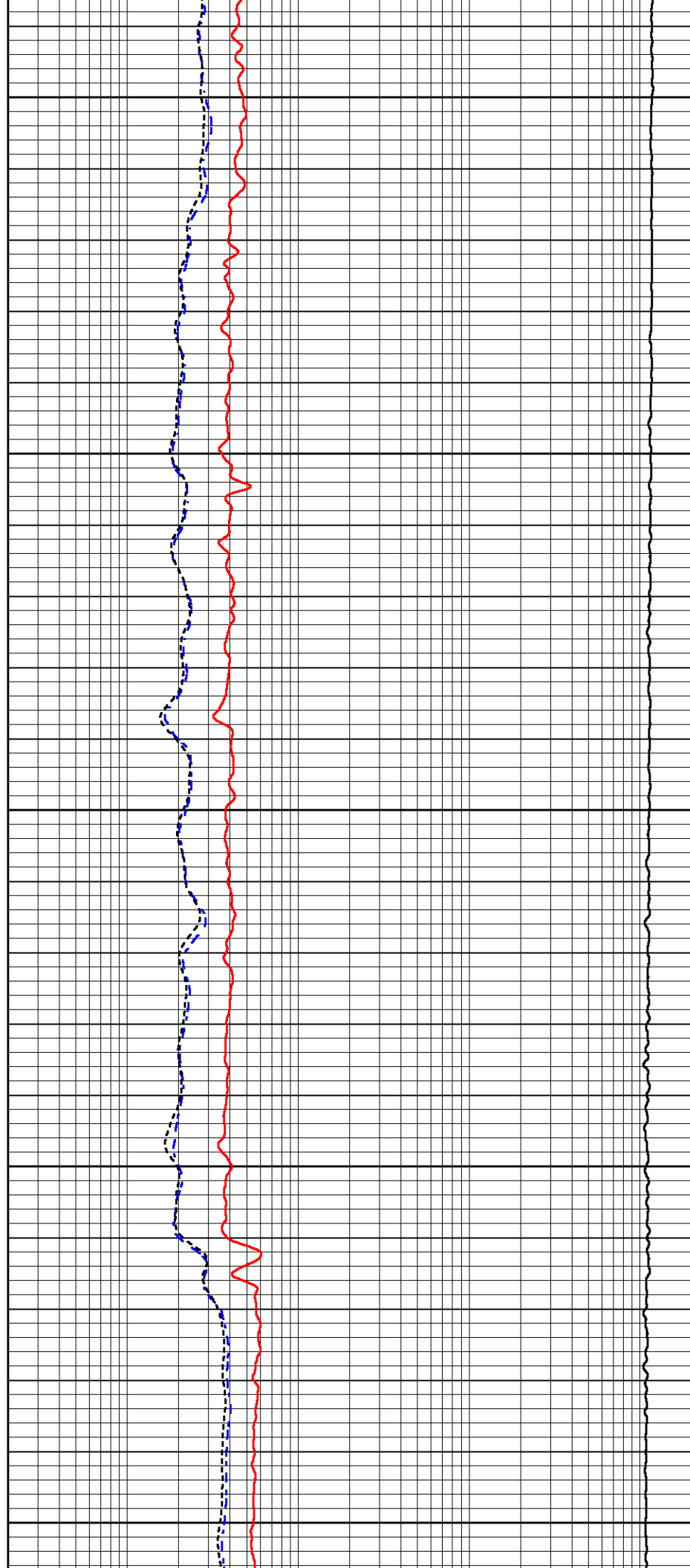
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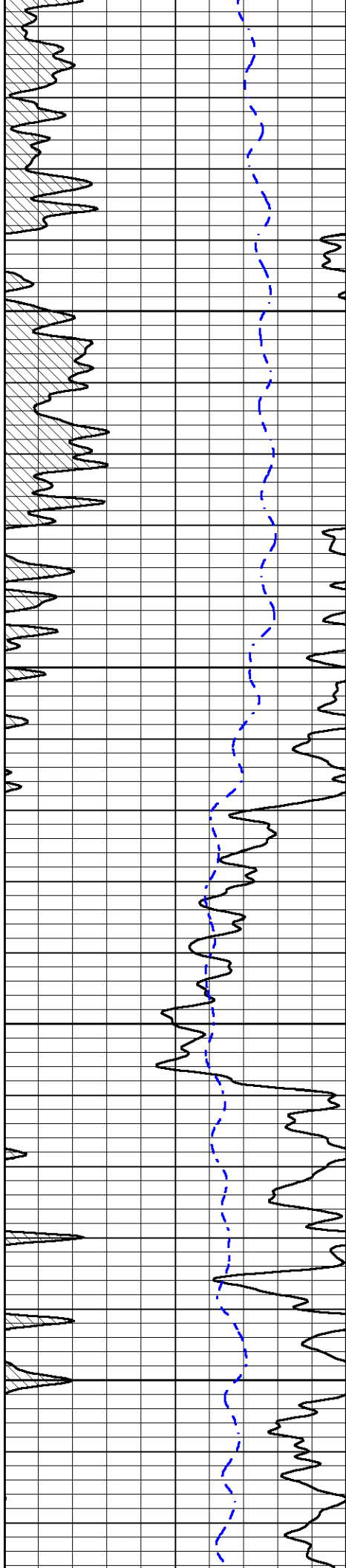
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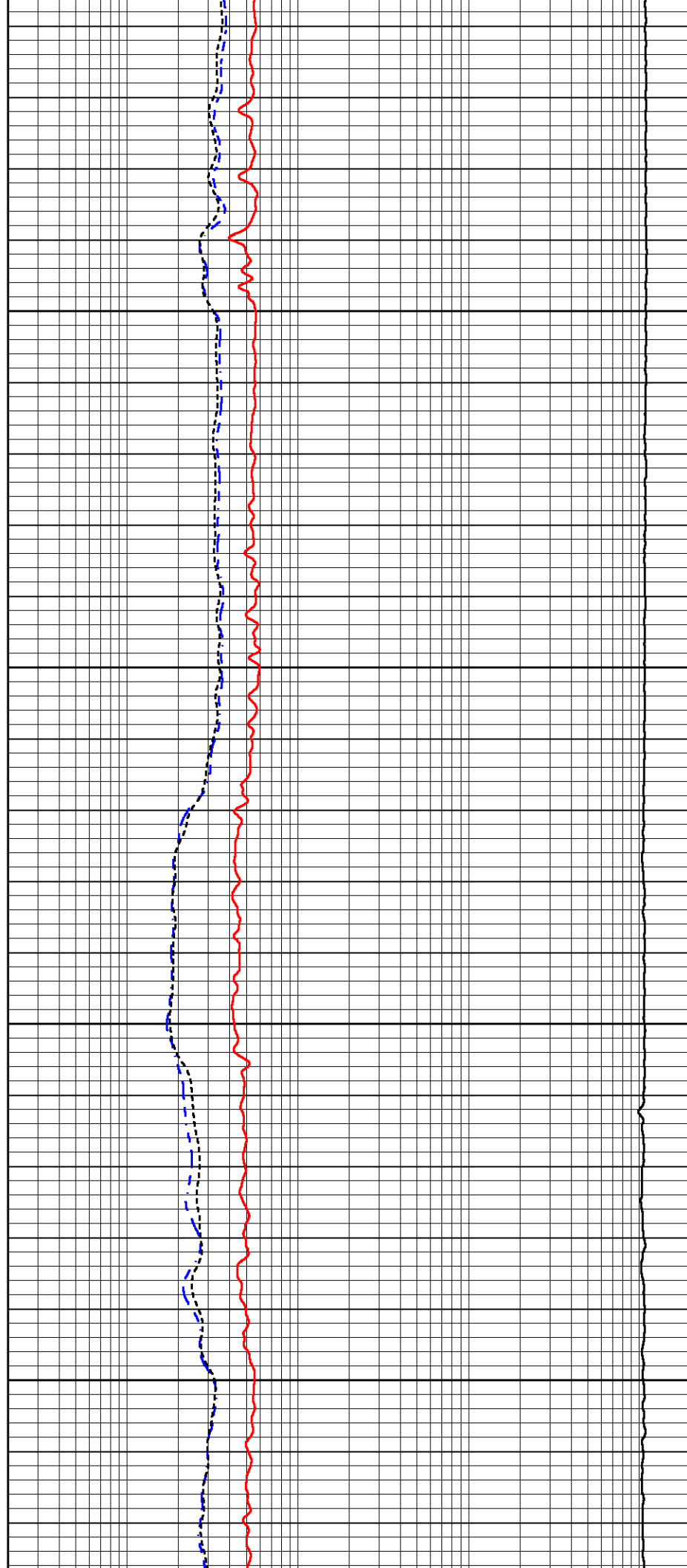


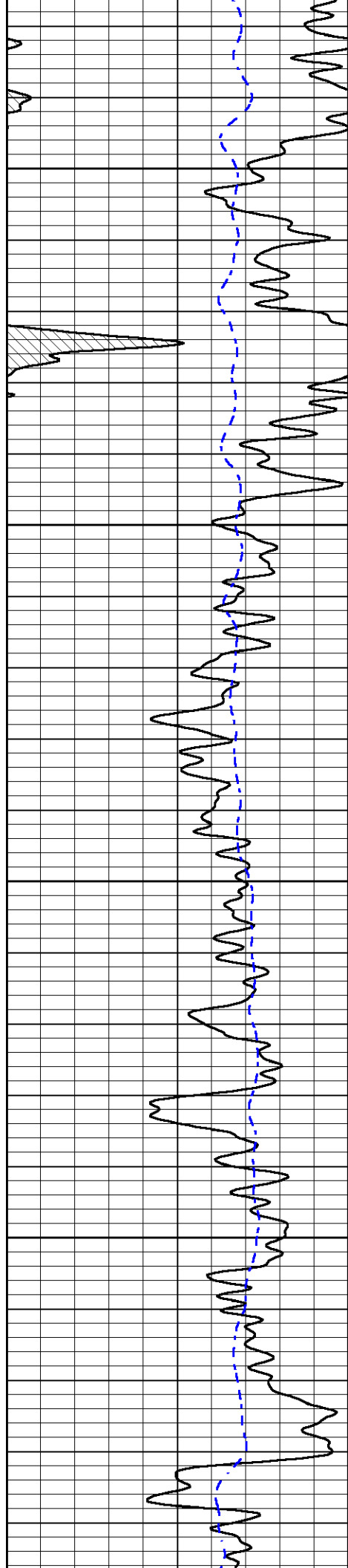
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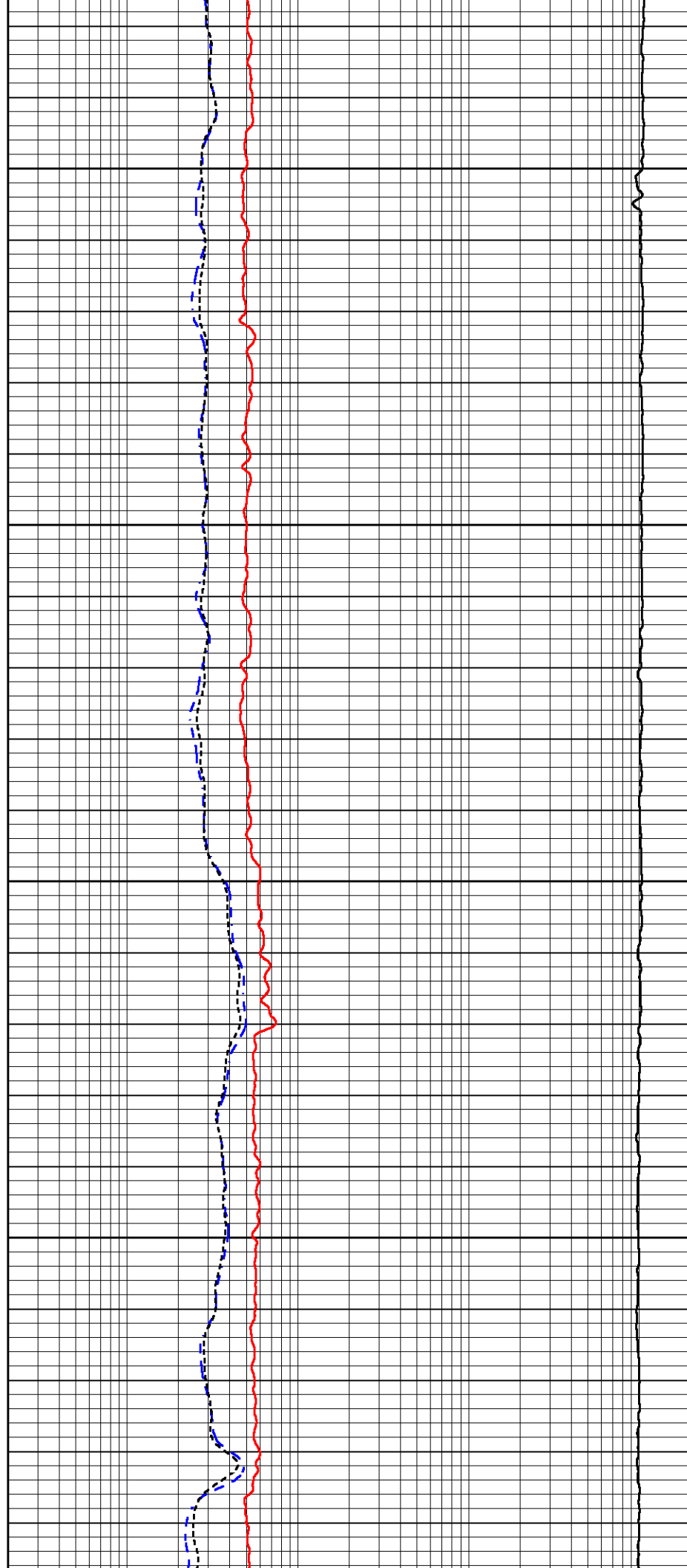


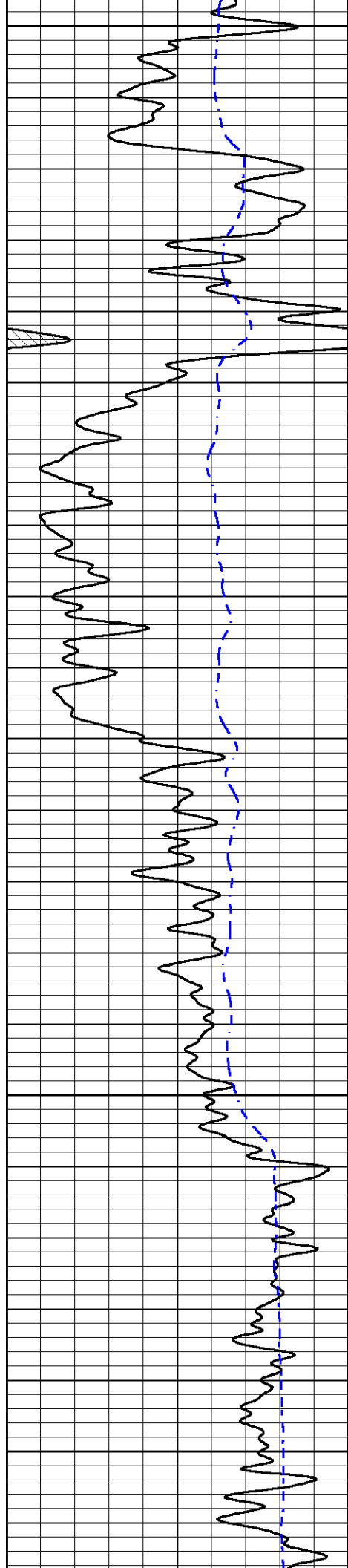
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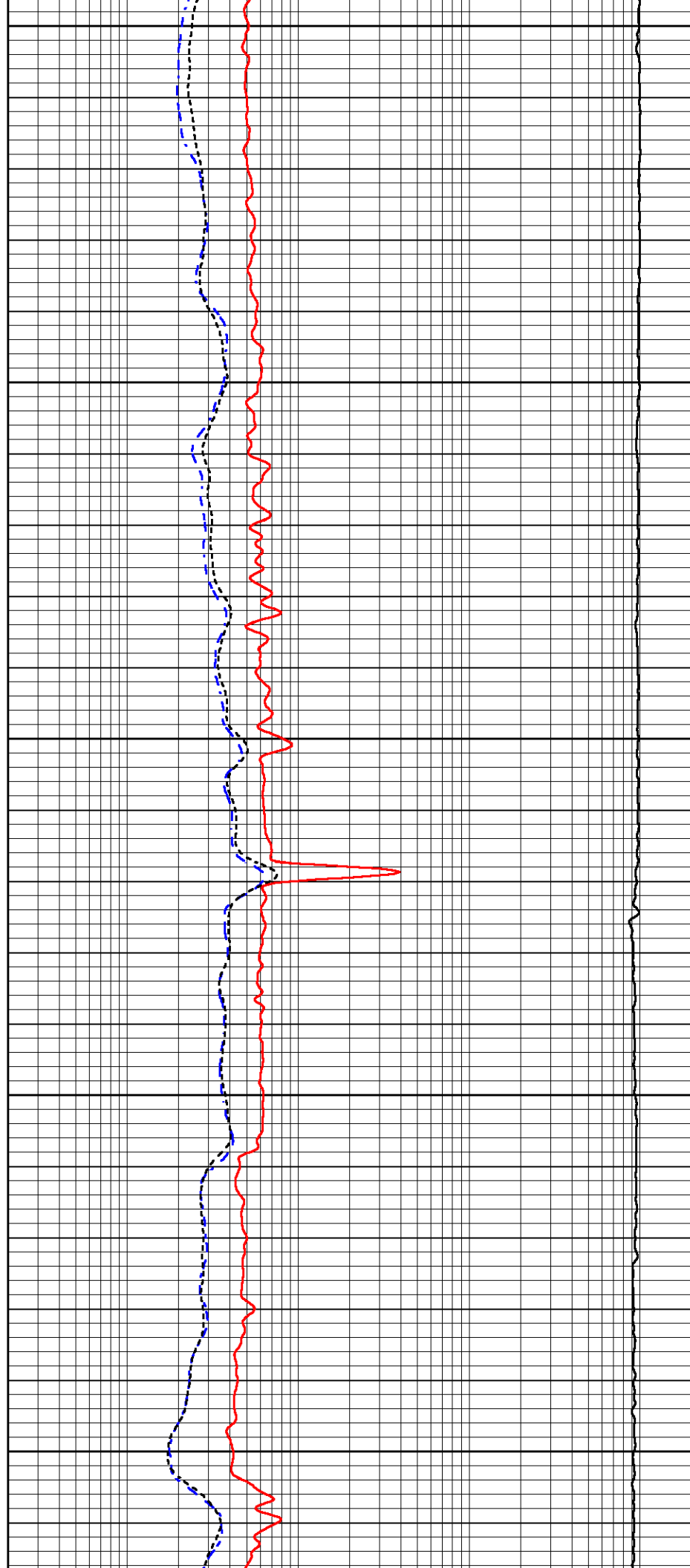
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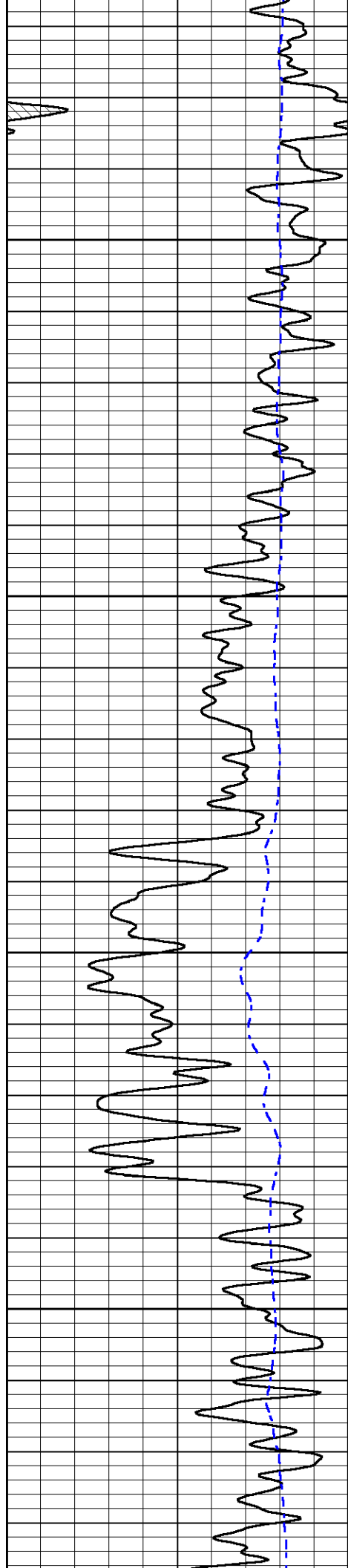
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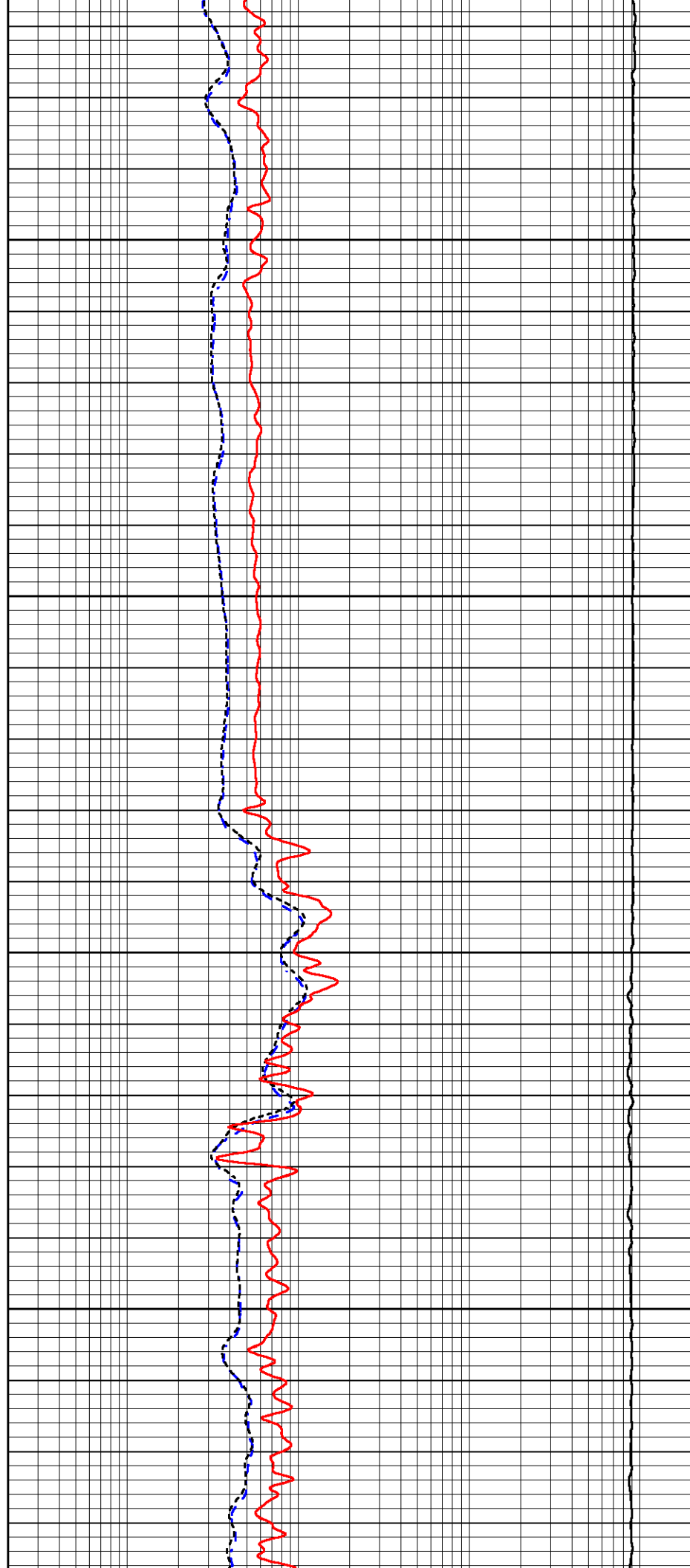


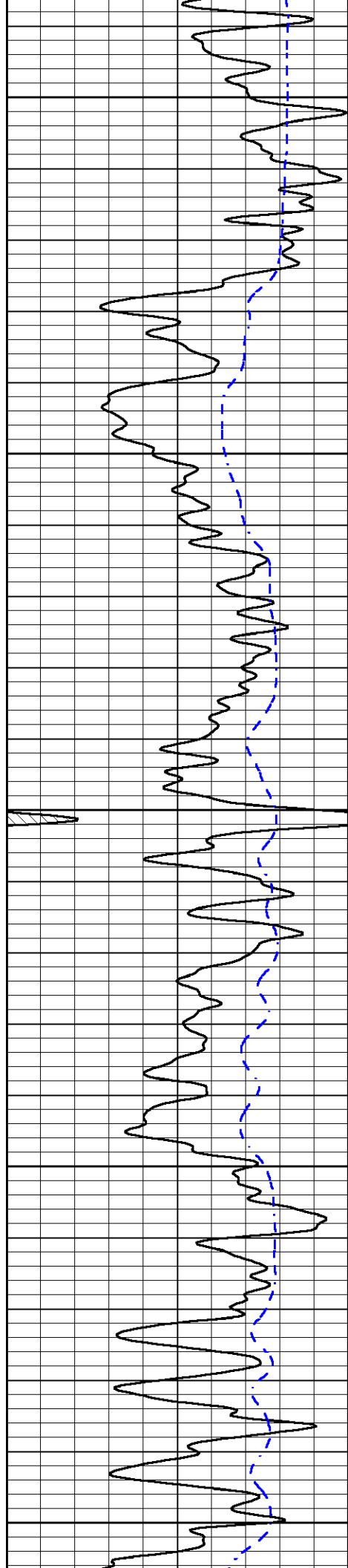
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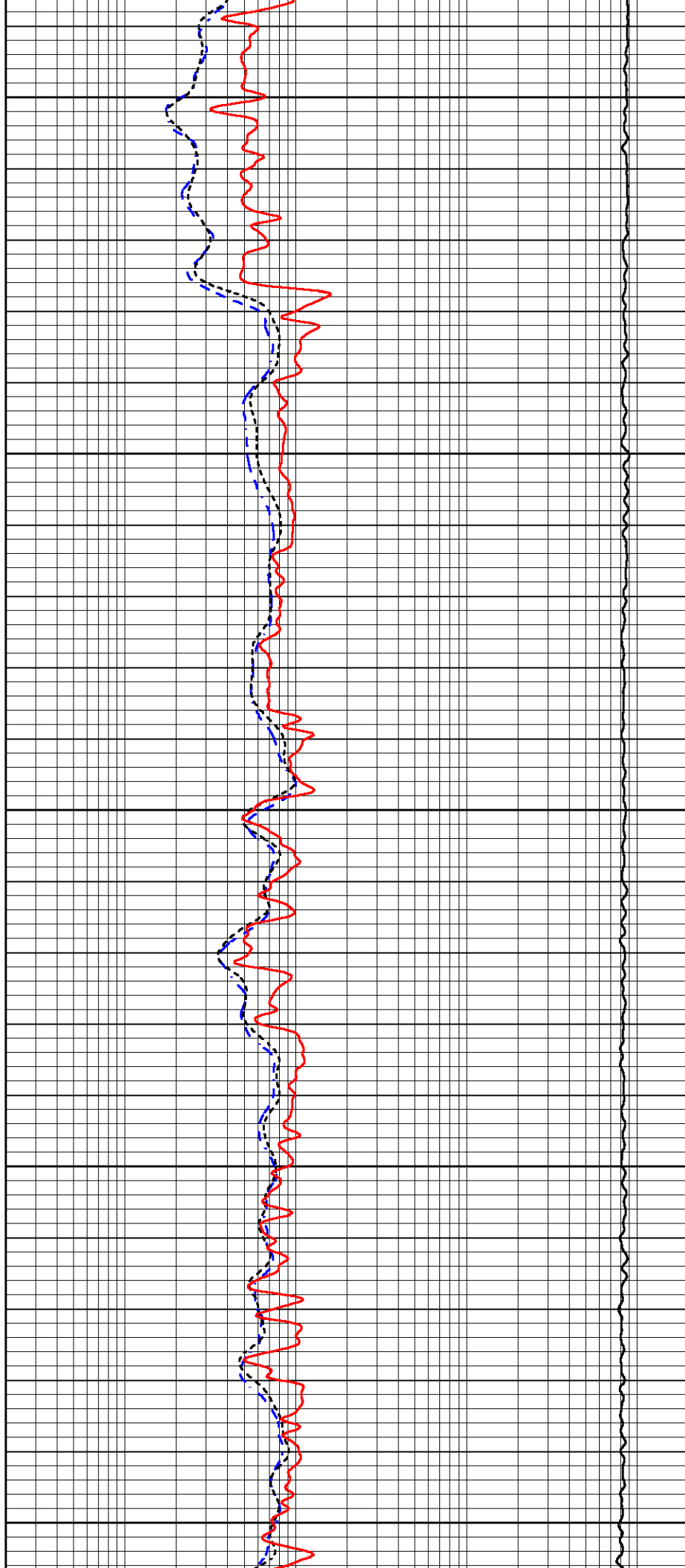
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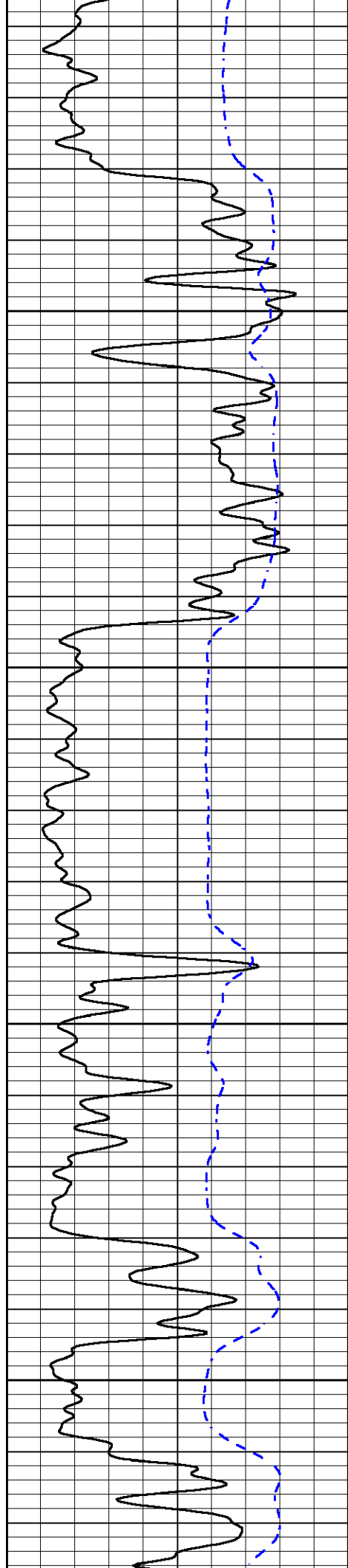
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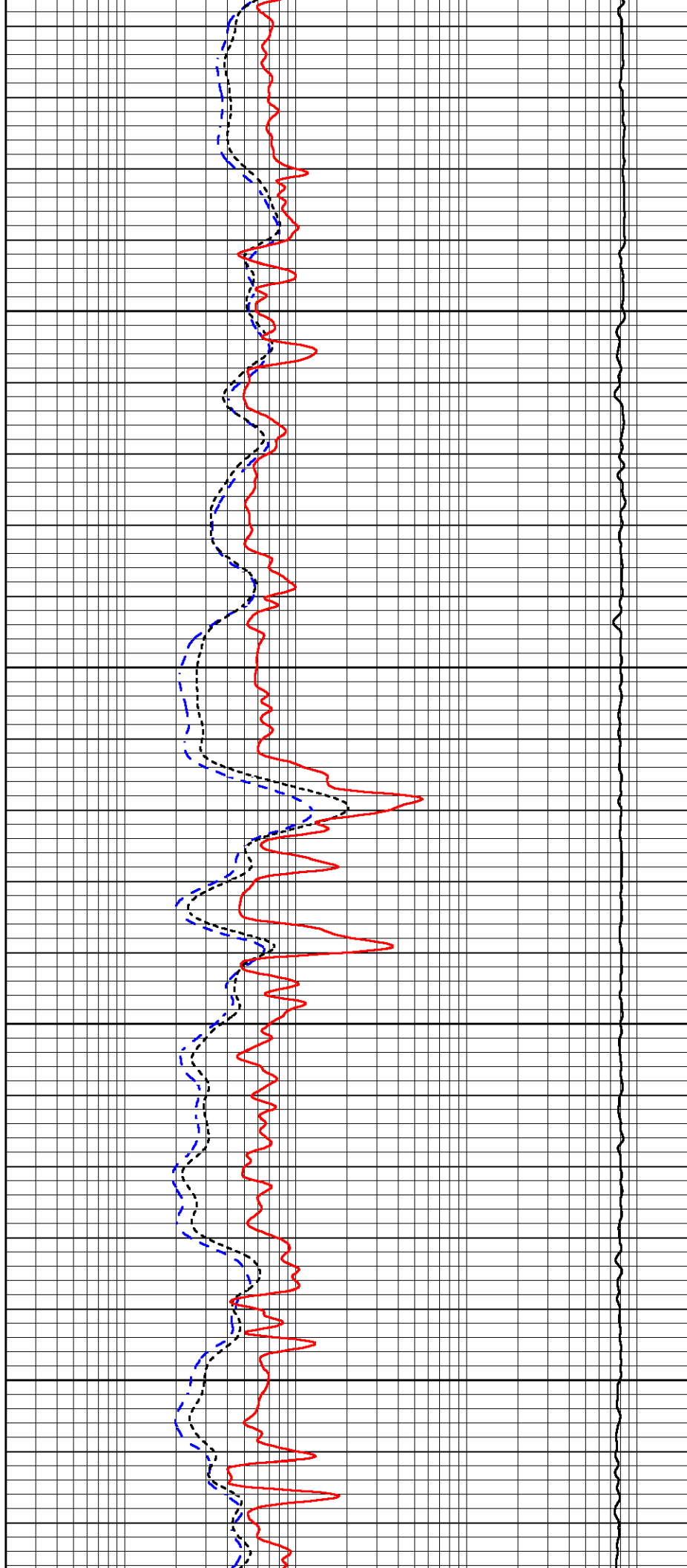


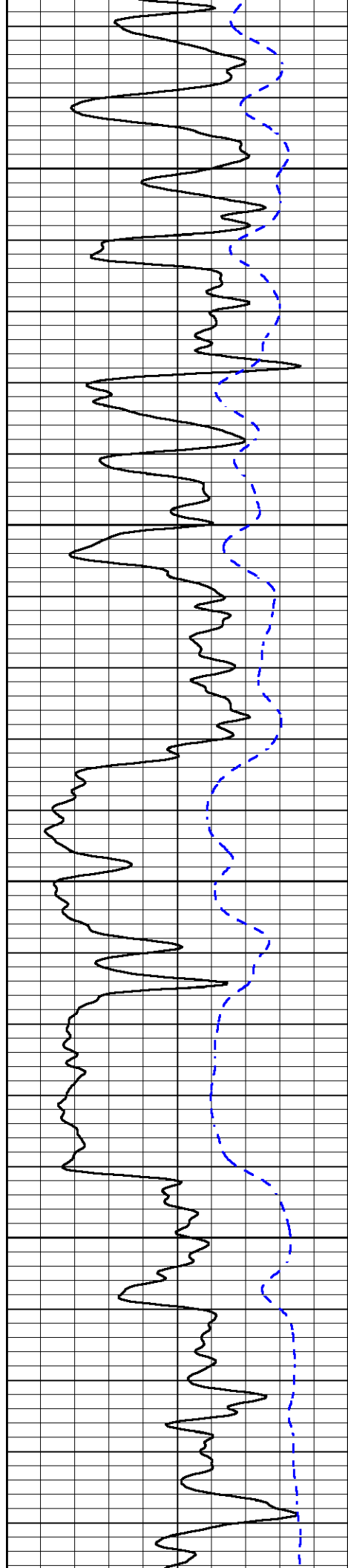
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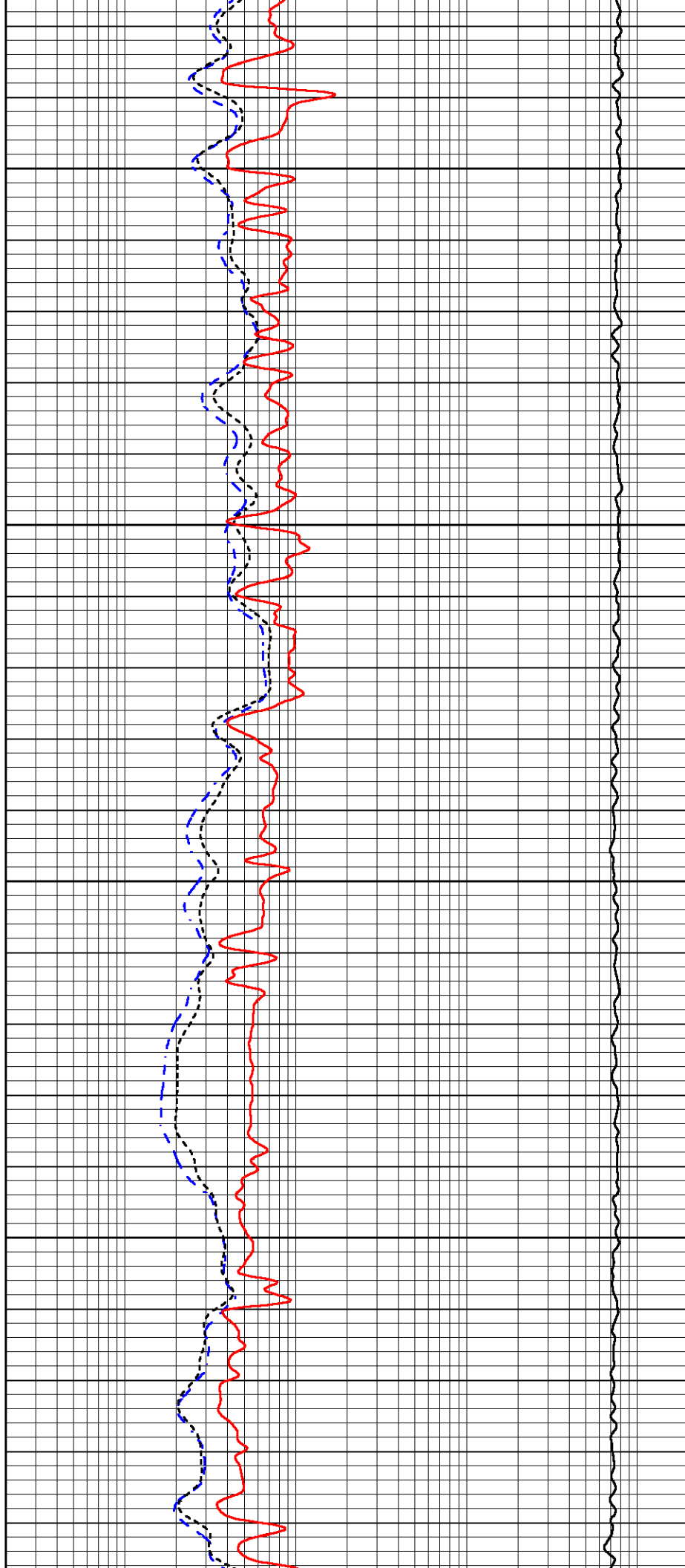


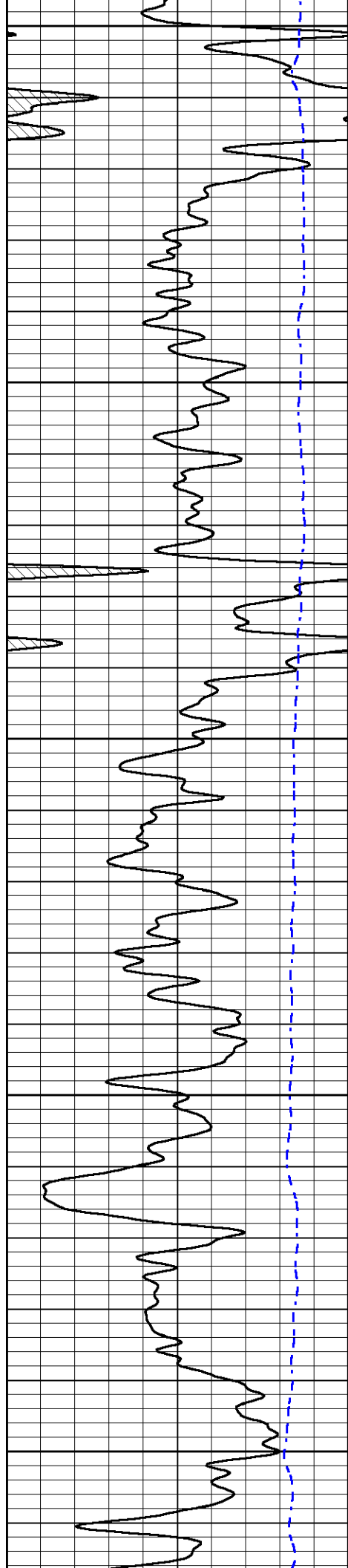
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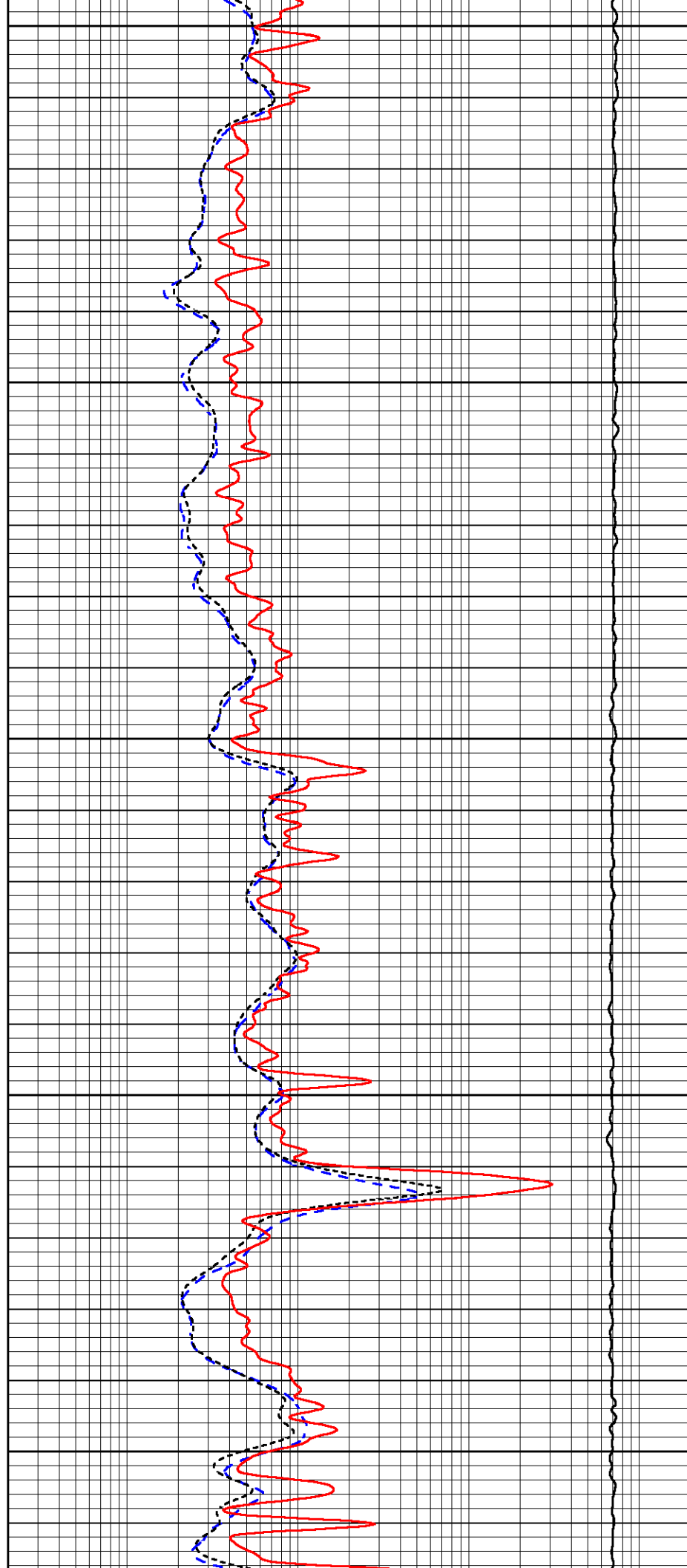
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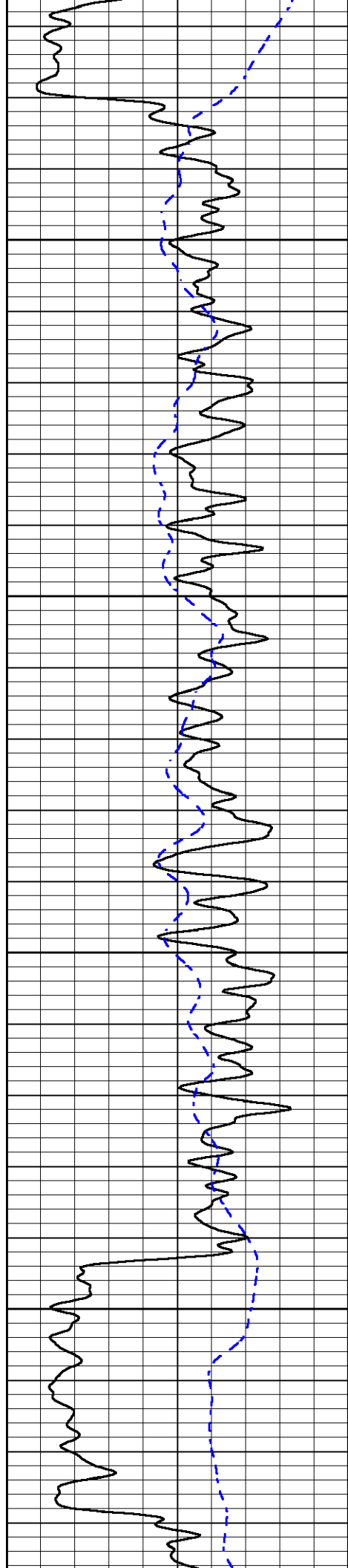
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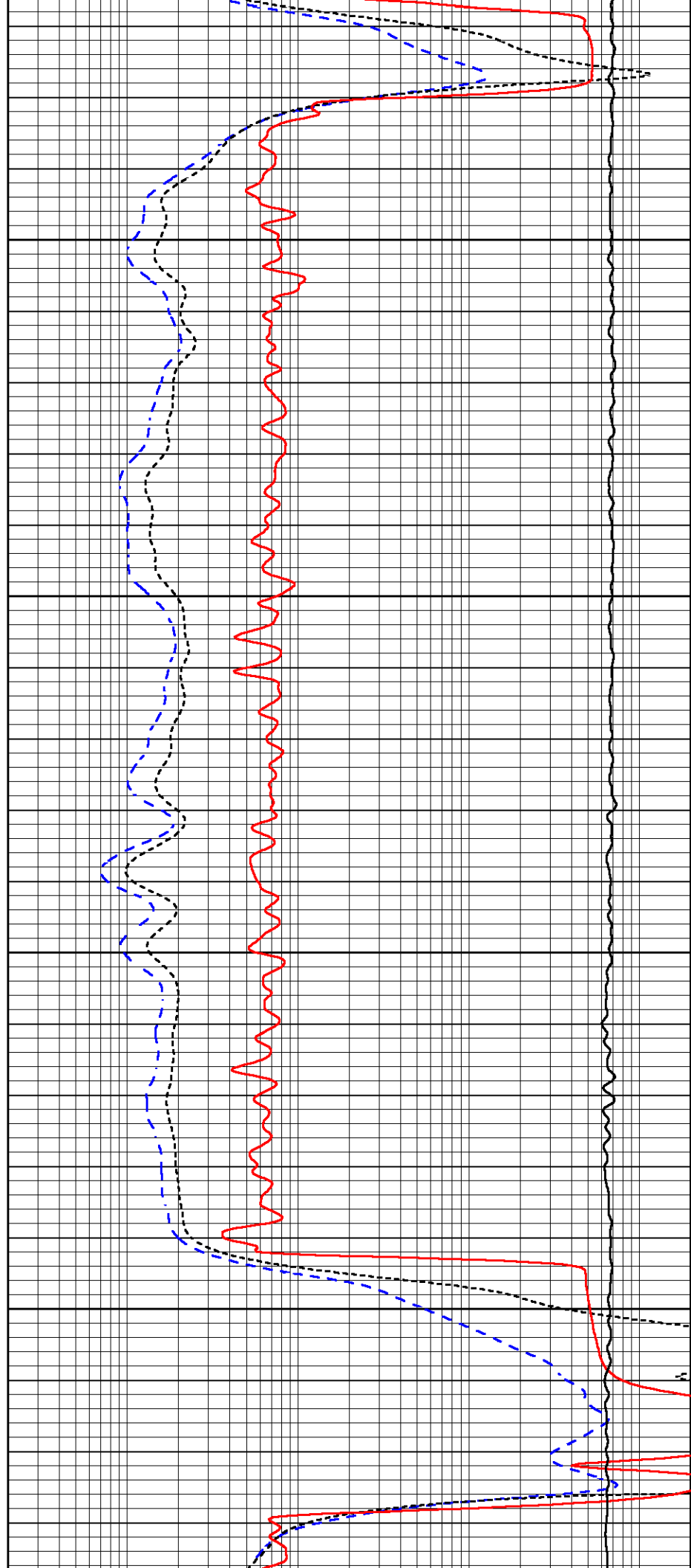


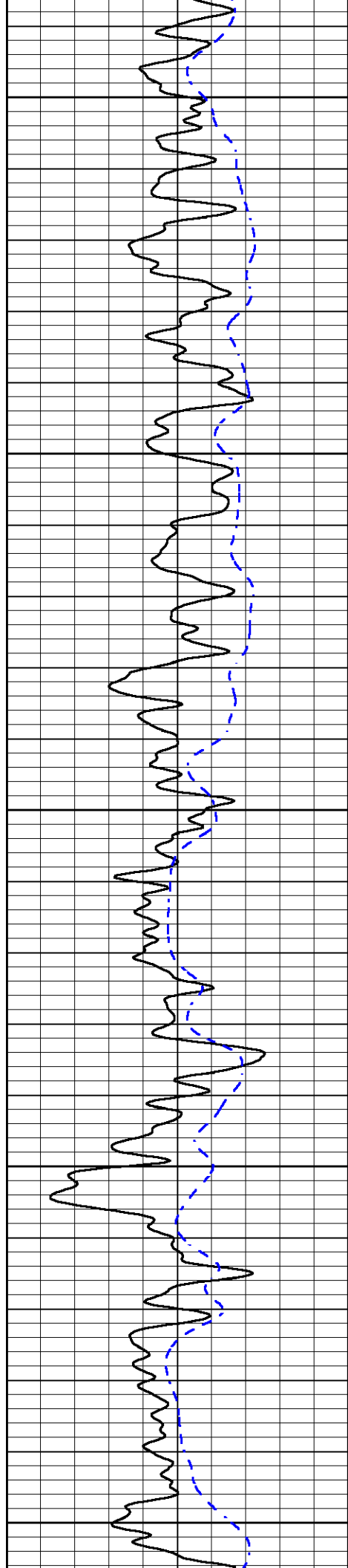
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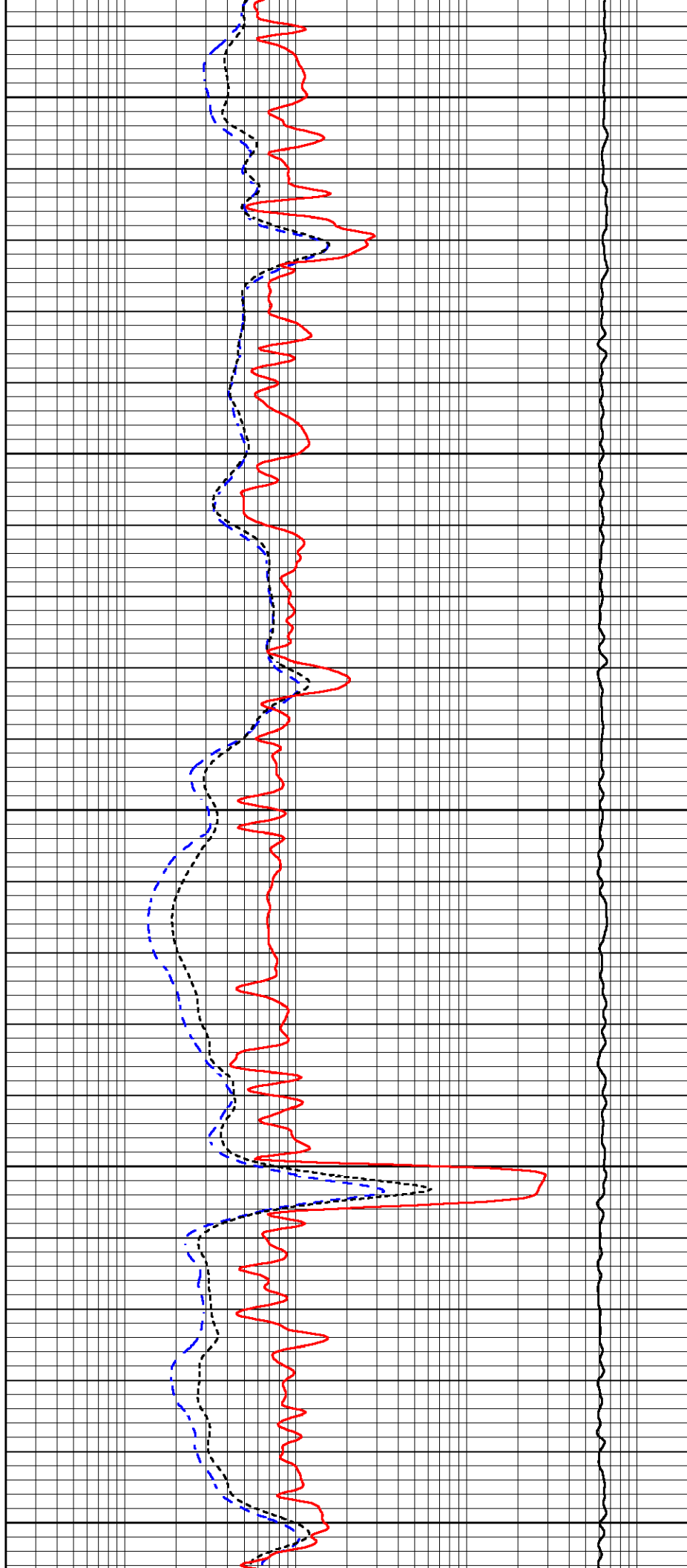
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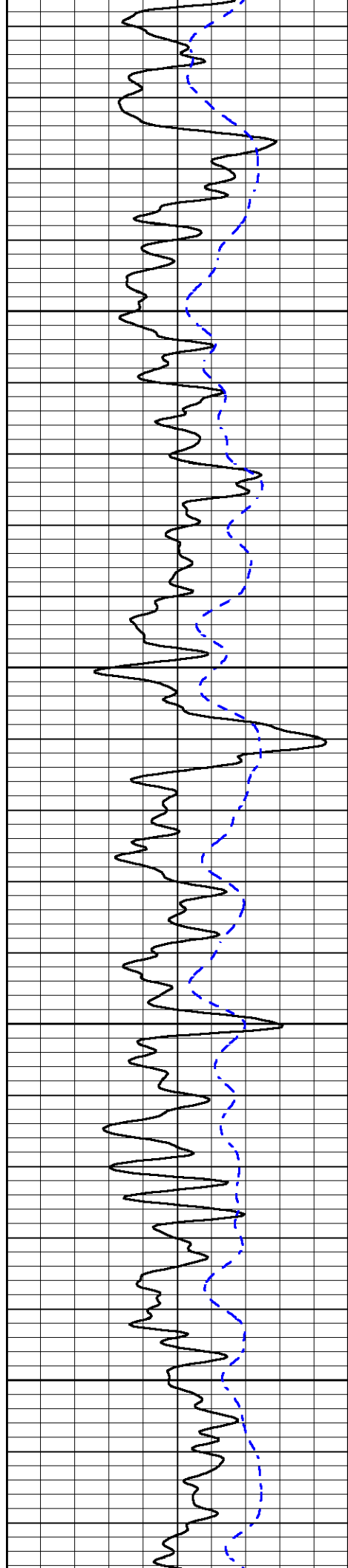
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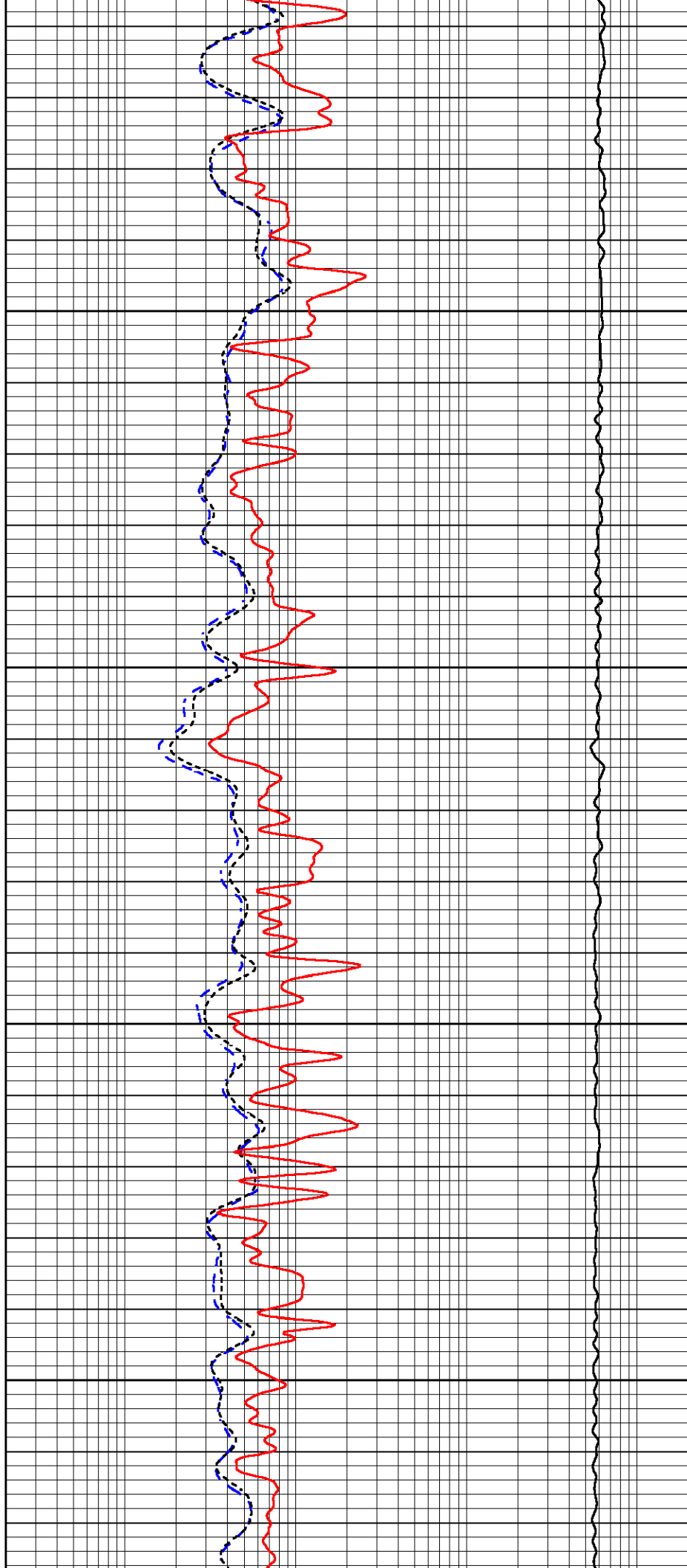


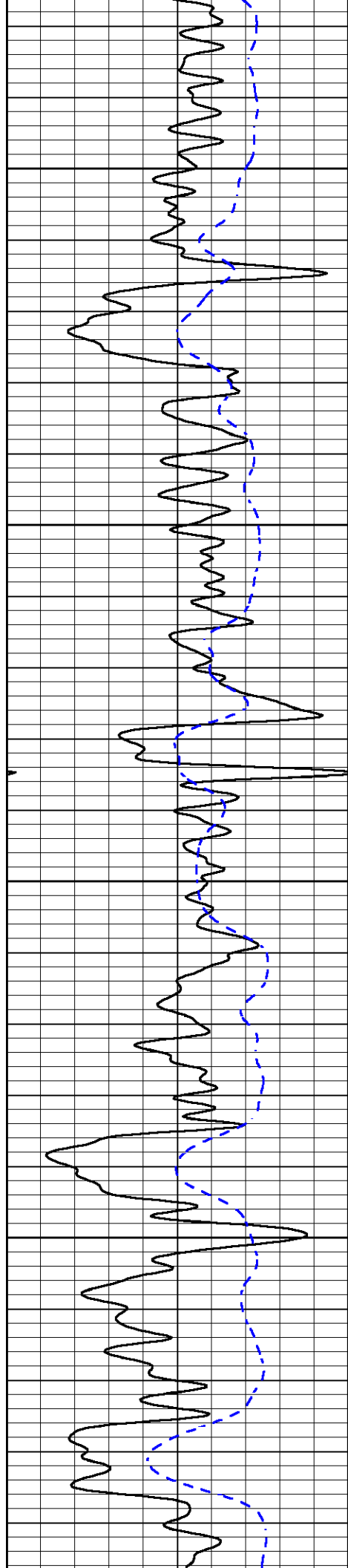
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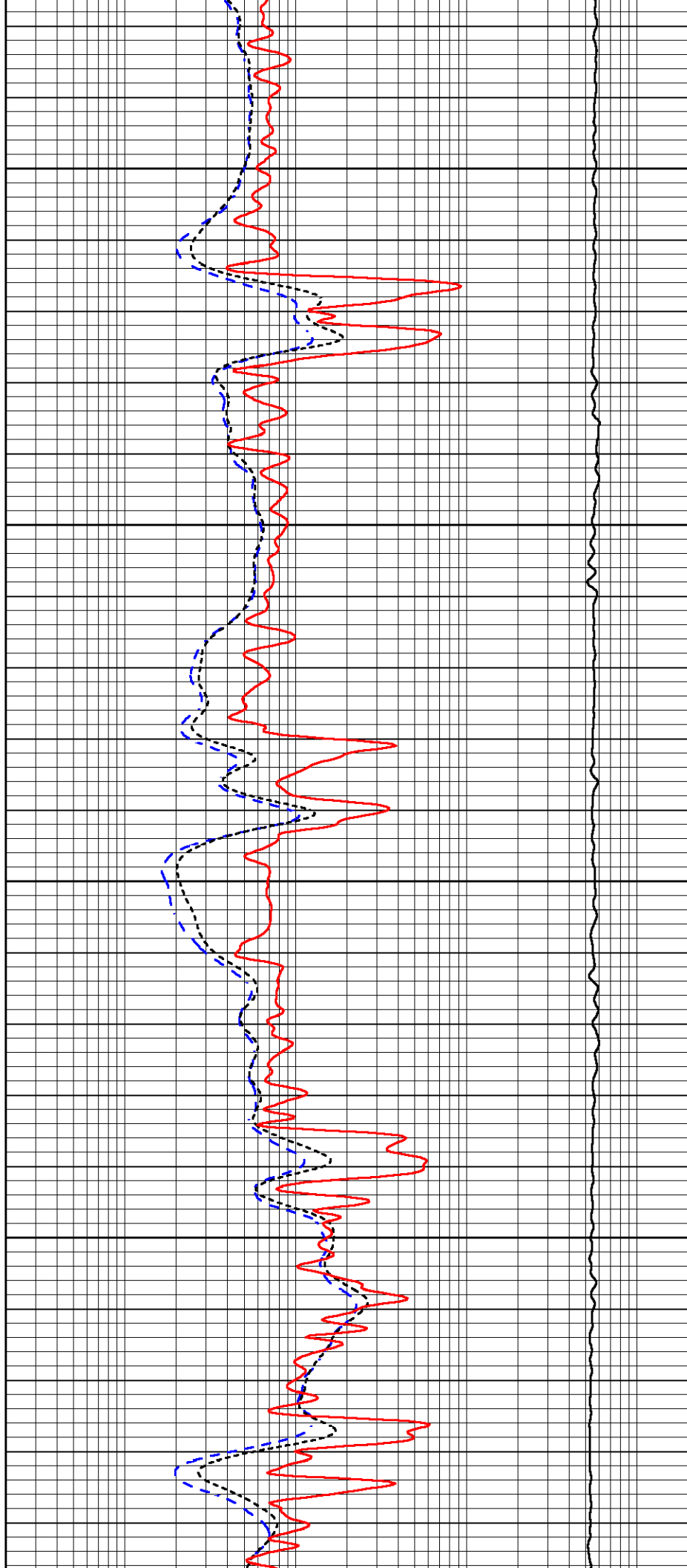


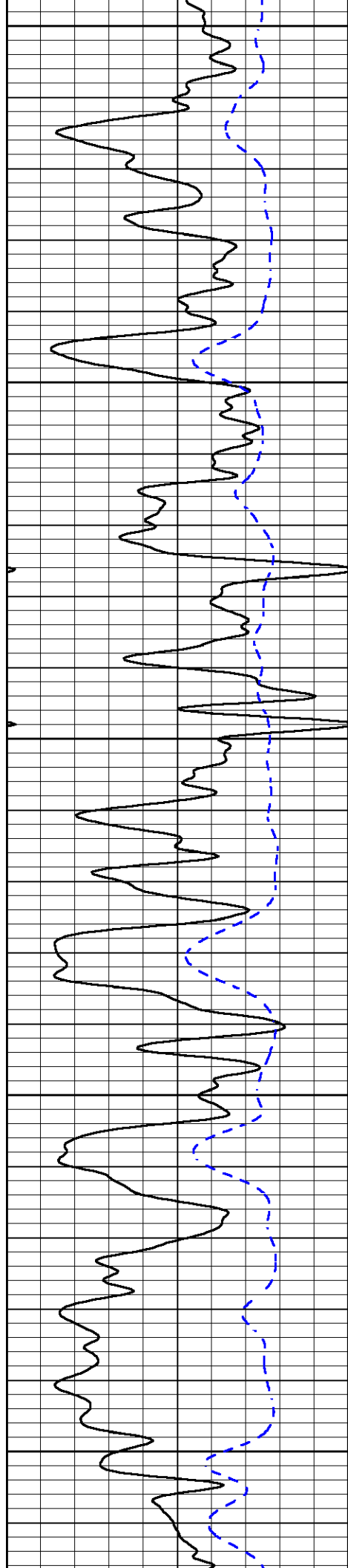
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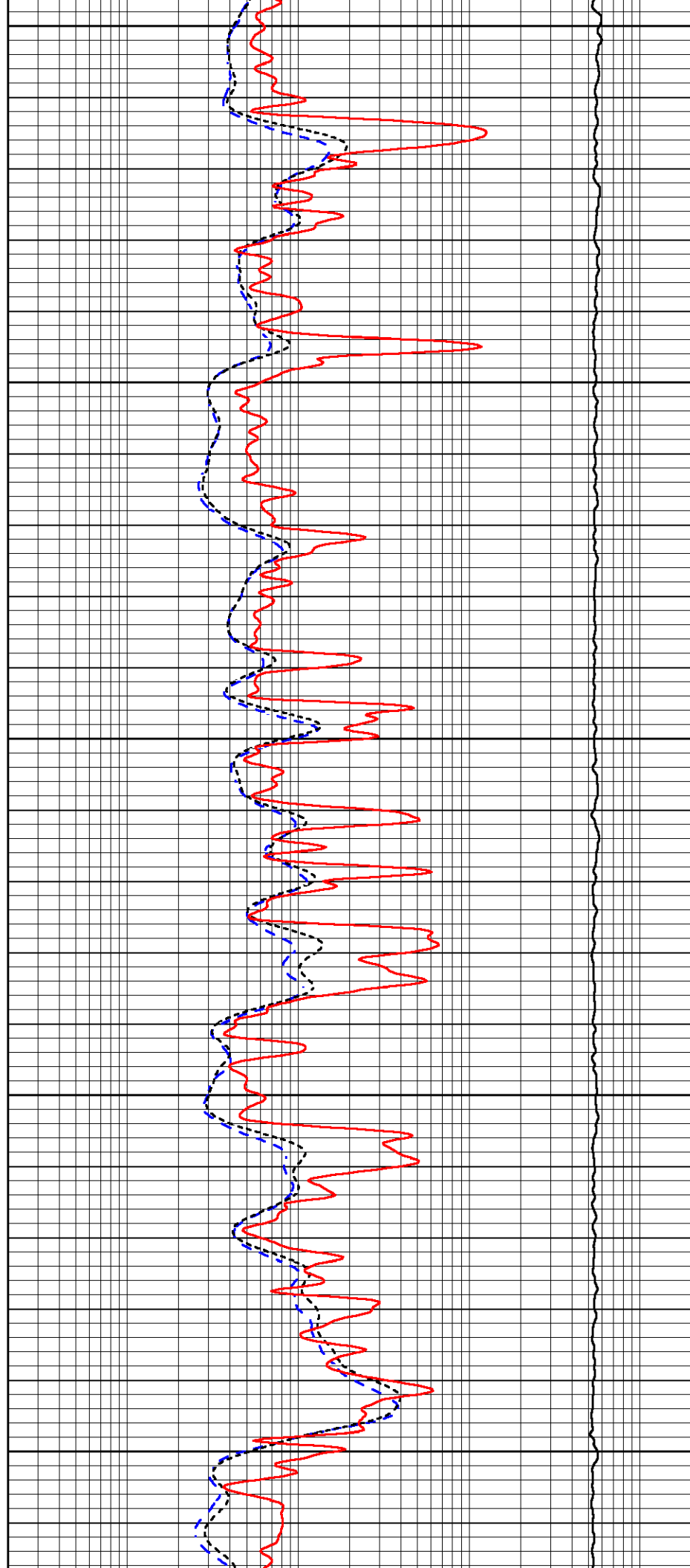
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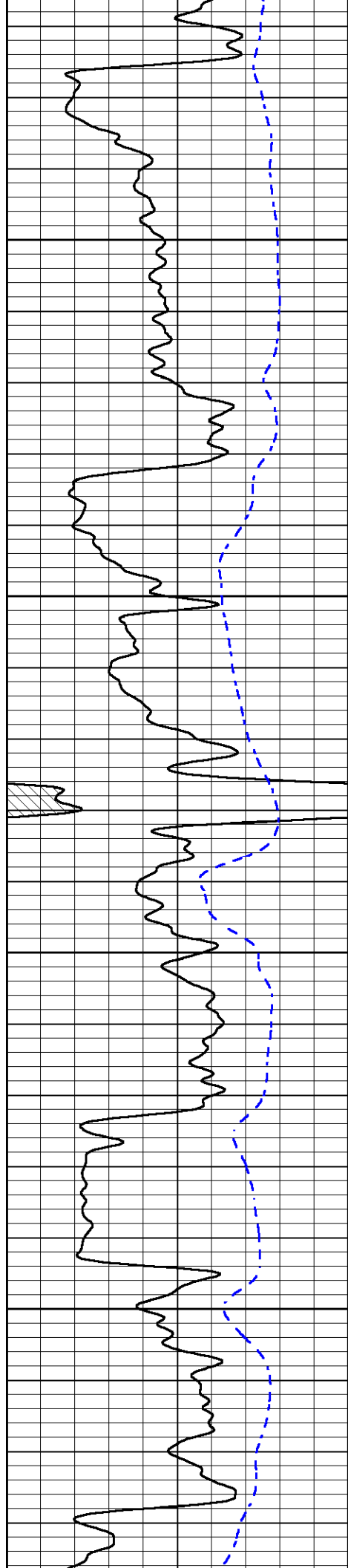
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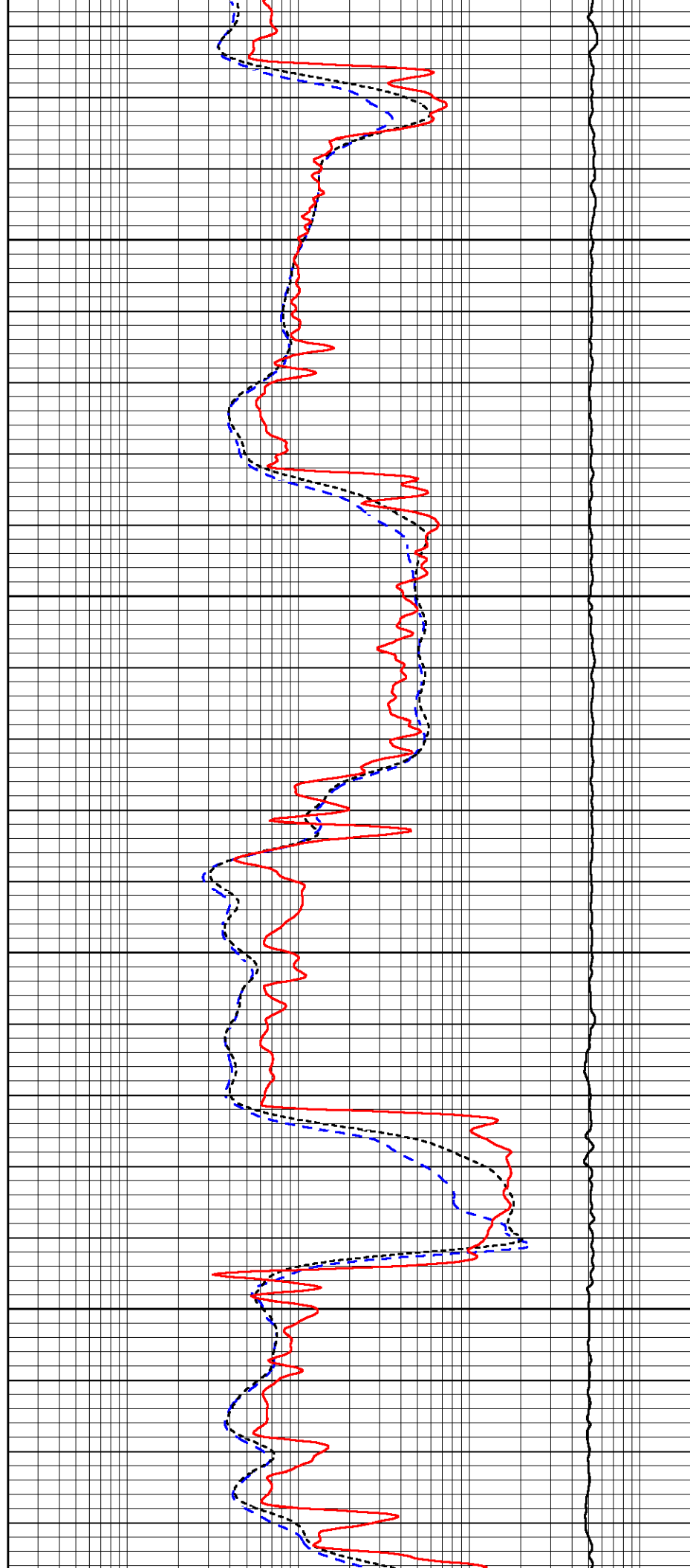


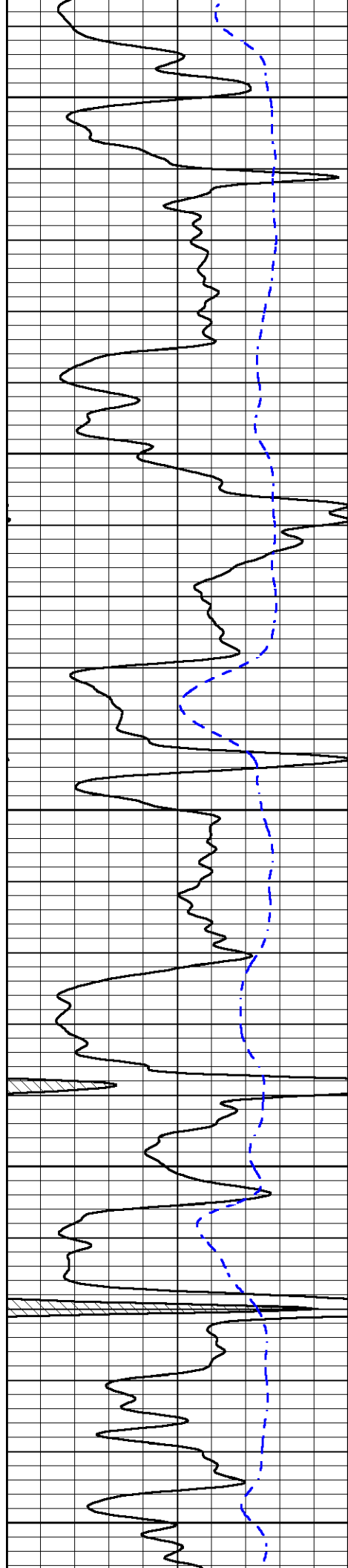
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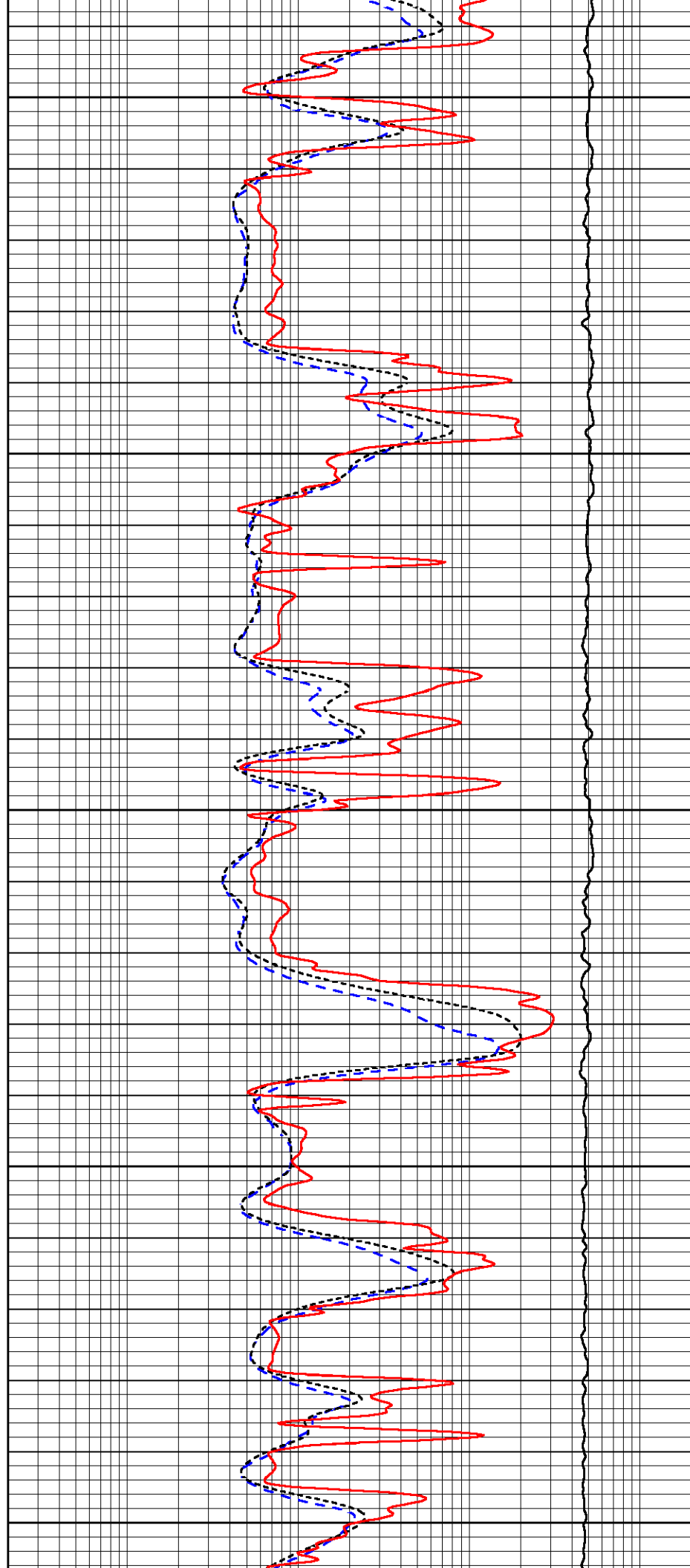
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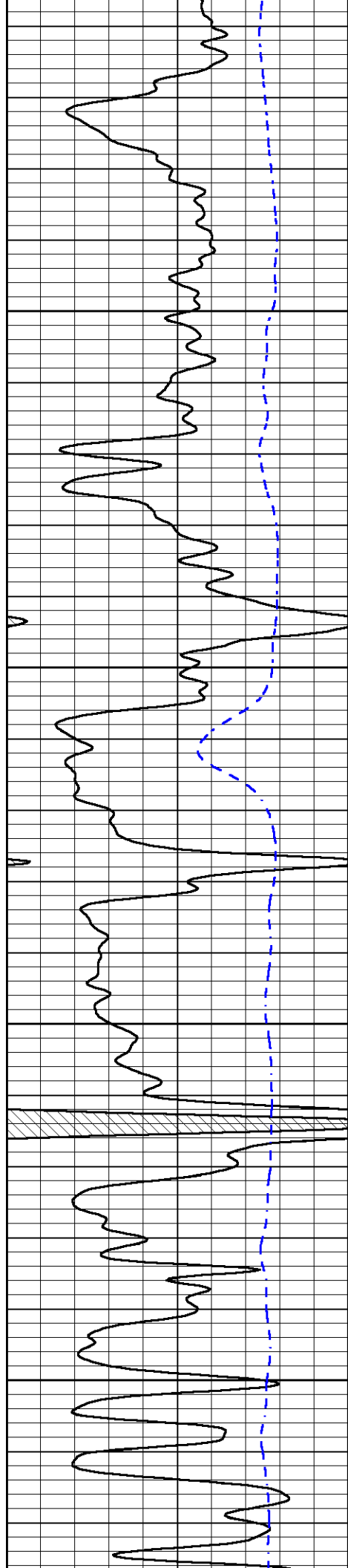
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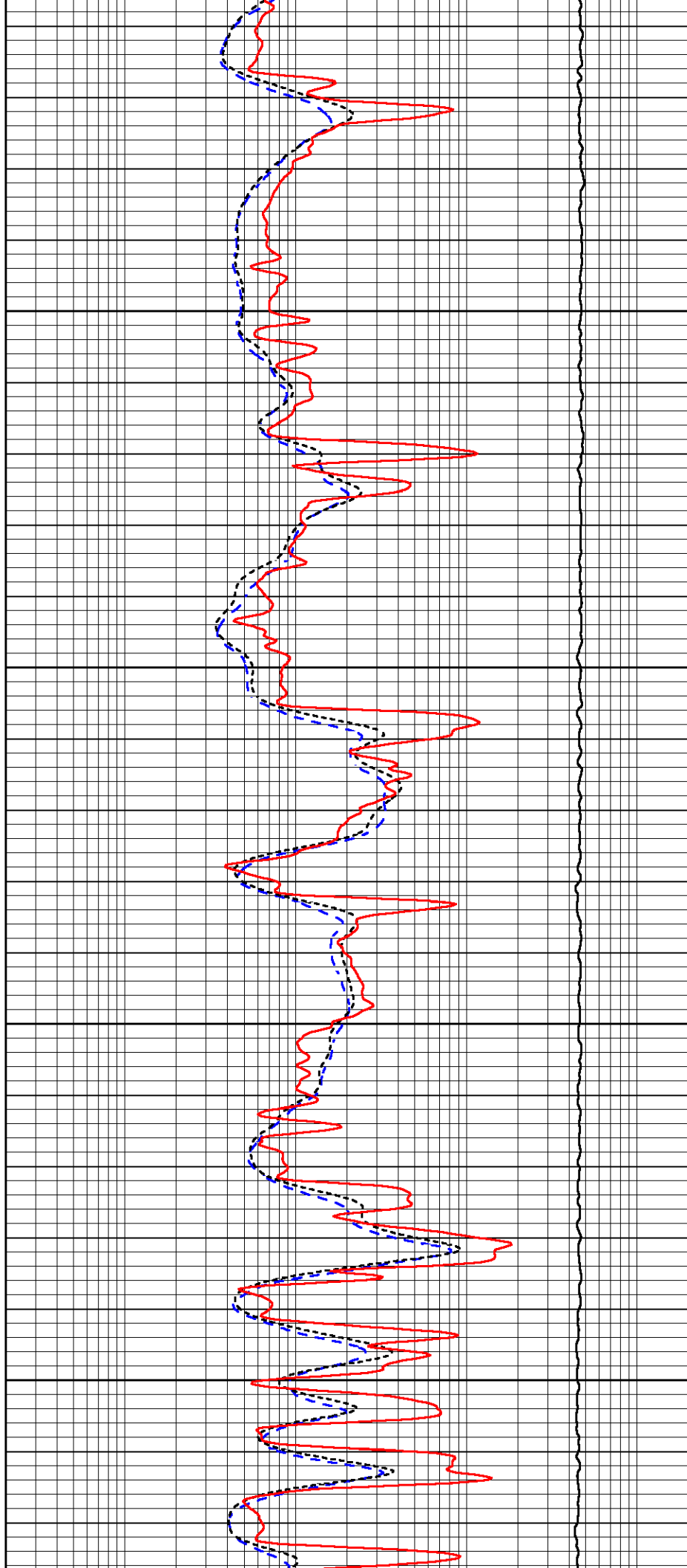


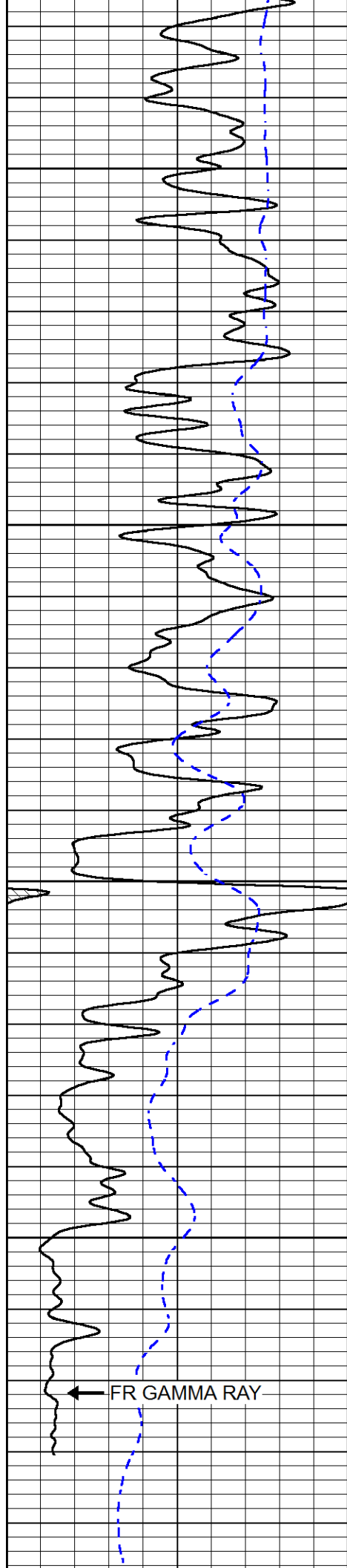
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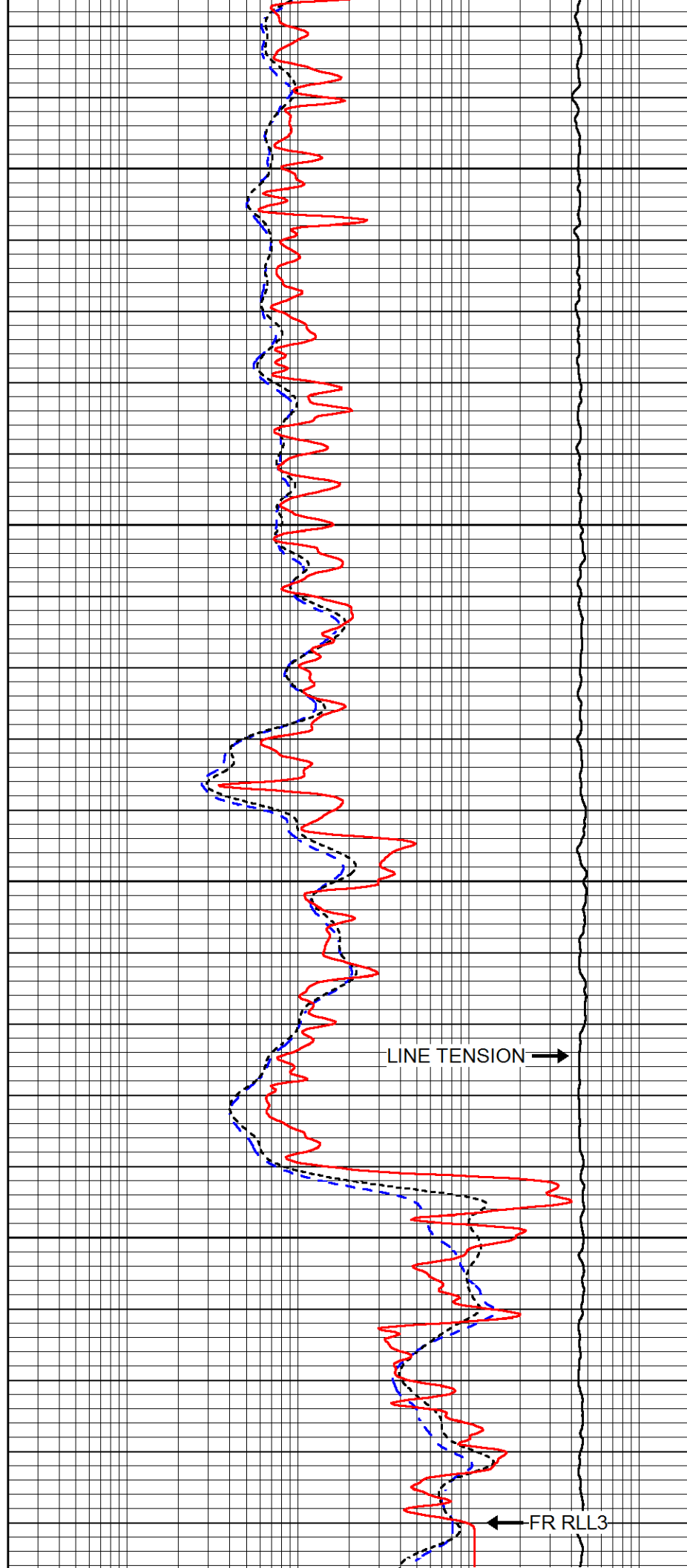


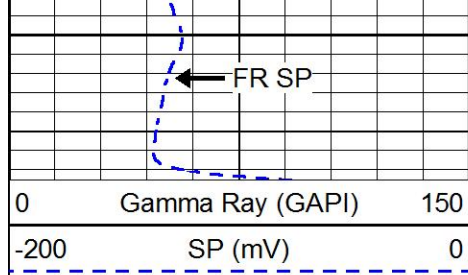
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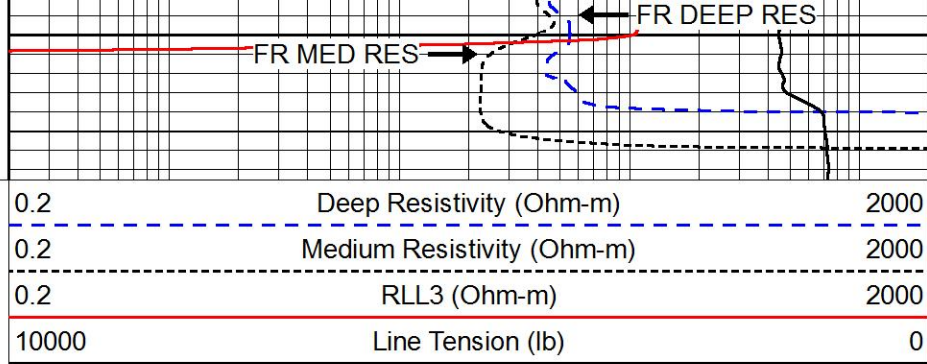
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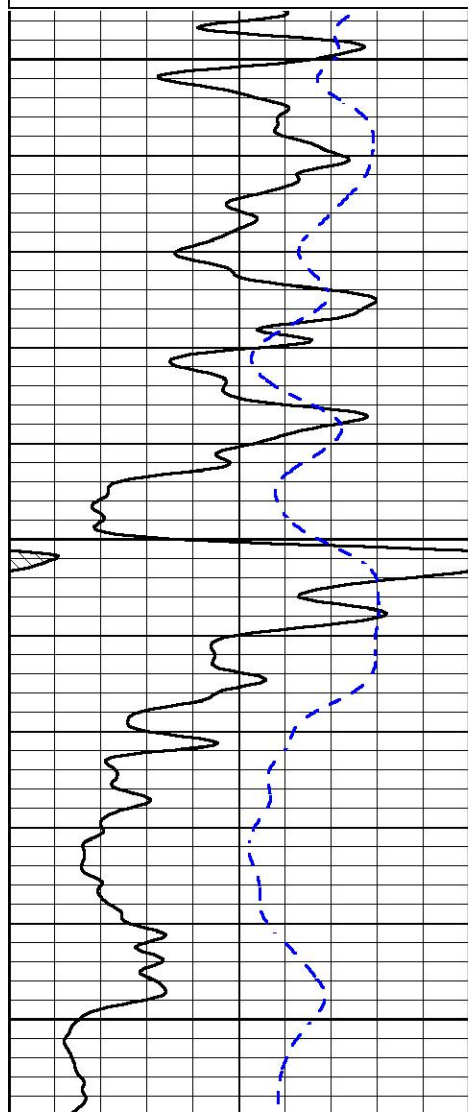
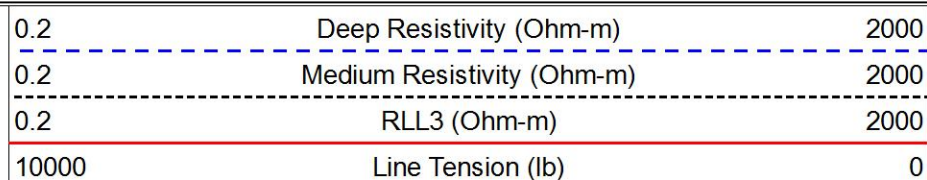
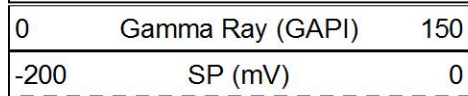


4850



# REPEAT SECTION

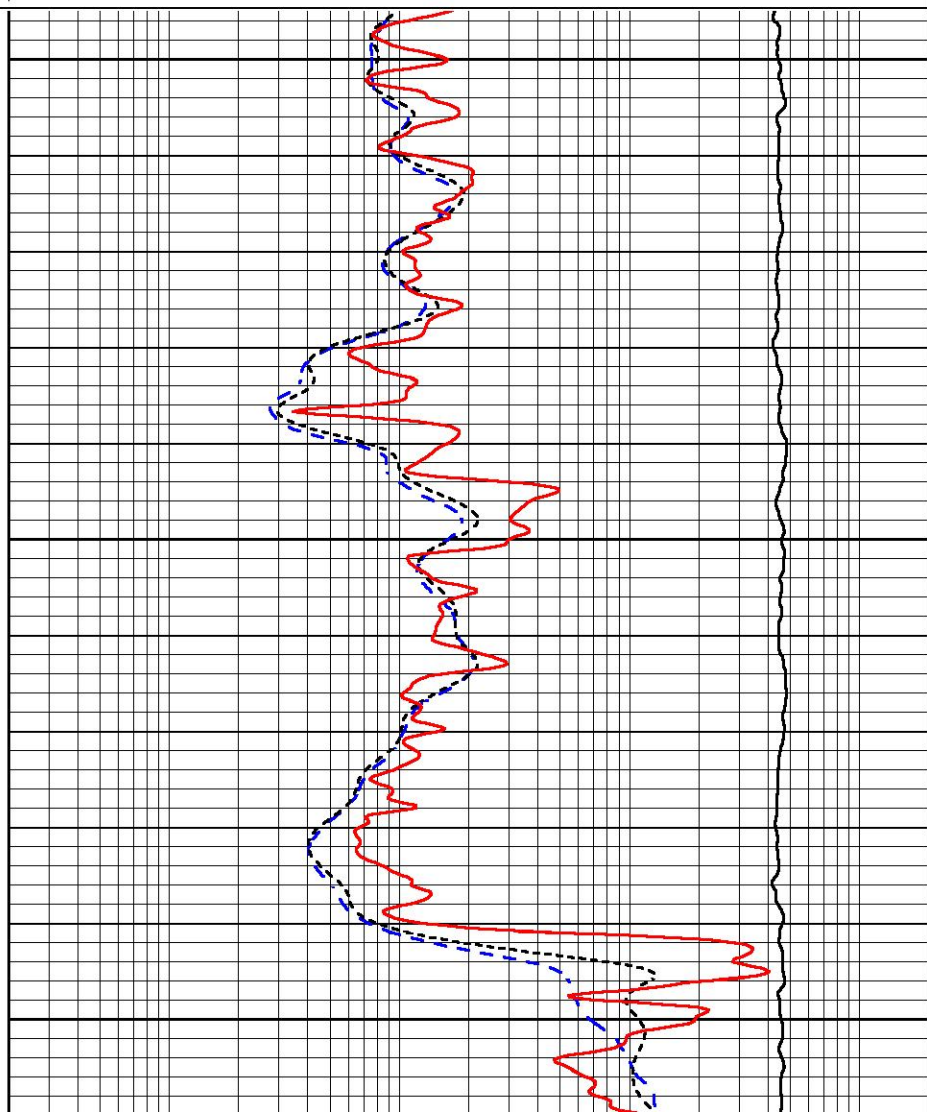
Database File      murfin\_kopriva\_1-14.db  
Dataset Pathname      STACK/pass3.1  
Presentation Format      dil  
Dataset Creation      Mon Jun 19 01:17:11 2017  
Charted by      Depth in Feet scaled 1:240

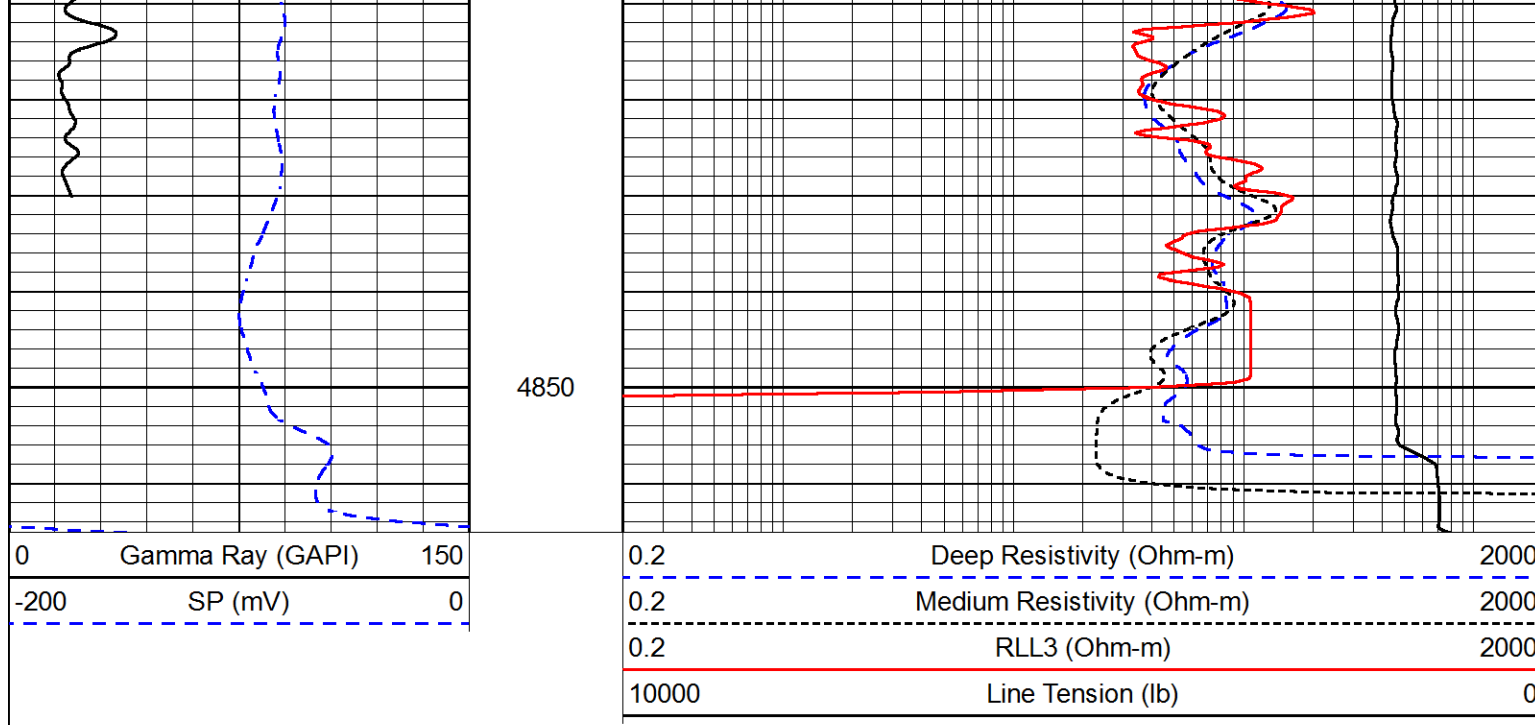


4700

4750

4800





| Calibration Report |                          |
|--------------------|--------------------------|
| Database File      | murfin_kopriva_1-14.db   |
| Dataset Pathname   | STACK/pass4.5            |
| Dataset Creation   | Mon Jun 19 01:14:52 2017 |

| Dual Induction Calibration Report |                          |
|-----------------------------------|--------------------------|
| Serial-Model:                     | PSI 91-M&W               |
| Calibration Performed:            | Sat Jun 17 12:42:37 2017 |

| Loop:  | Readings |          | References |         |        | Results |         |
|--------|----------|----------|------------|---------|--------|---------|---------|
|        | Air      | Loop     | Air        | Loop    |        | Gain    | Offset  |
| Deep   | 166.796  | 835.089  | 0.000      | 255.800 | mmho/m | 0.420   | -32.000 |
| Medium | 142.009  | 1348.560 | 0.000      | 255.800 | mmho/m | 0.360   | -31.000 |

| Compensated Density Calibration Report |                          |
|----------------------------------------|--------------------------|
| Serial-Model:                          | 90-1031-M&W              |
| Source / Verifier:                     | 16955B / 2ci             |
| Master Calibration Performed:          | Sat Jun 17 12:42:56 2017 |

| Master Calibration  |         |      |                             |               |     |
|---------------------|---------|------|-----------------------------|---------------|-----|
|                     | Density |      | Far Detector                | Near Detector |     |
|                     |         |      |                             |               |     |
| Magnesium           | 1.755   | g/cc | 5174.18                     | 6425.27       | cps |
| Aluminum            | 2.665   | g/cc | 963.17                      | 4037.42       | cps |
| Spine Angle = 74.55 |         |      | Density/Spine Ratio = 0.522 |               |     |
|                     | Size    |      | Reading                     |               |     |
|                     |         |      |                             |               |     |
| Small Ring          | 8.00    | in   | 1.84                        |               |     |
| Large Ring          | 22.00   | in   | 1.46                        |               |     |

| Compensated Neutron Calibration Report |  |
|----------------------------------------|--|
|----------------------------------------|--|

## Compensated Neutron Calibration Report

Serial Number: 207-MW  
Tool Model: M&W  
Calibration Performed: Sat Jun 17 10:30:30 2017

| 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  
Tool Model: M&W  
Calibration Performed: Sat Jun 17 12:44:49 2017

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
Calibrator Reading: 1.0 cps

Sensitivity: 0.6000 GAPI/cps



Company MURFIN DRILLING COMPANY, INC.  
Well KOPRIVA #1-14  
Field WILDCAT  
County RAWLINS  
State KANSAS