



PIONEER
Pioneer Energy Services

**DUAL INDUCTION
LOG**

Company MURFIN DRILLING COMPANY, INC.
Well FRISBIE B #1-15
Field WILDCAT
County RAWLINS
State KANSAS

Company MURFIN DRILLING COMPANY, INC.
Well FRISBIE B #1-15
Field WILDCAT
County RAWLINS
State KANSAS

Location: API #: 15-153-21213-00-00
660' FSL & 1610' FWL
SEC 15 TWP 2S RGE 35W
Permanent Datum GROUND LEVEL Elevation 3142'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING
Other Services
CNL/CDL
MEL/BHCS
Elevation
K.B. 3147'
D.F. N/A
G.L. 3142'

| | |
|------------------------|---------------|
| Date | 10/7/2018 |
| Run Number | ONE |
| Depth Driller | 4815' |
| Depth Logger | 4817' |
| Bottom Logged Interval | 4816' |
| Top Log Interval | 0' |
| Casing Driller | 8.625" @ 303' |
| Casing Logger | 299' |
| Bit Size | 7.875" |
| Type Fluid in Hole | CHEMICAL |
| Salinity, ppm CL | 1000 |
| Density / Viscosity | 9.1 56 |
| pH / Fluid Loss | 11.0 6.0 |
| Source of Sample | FLOWLINE |
| Rm @ Meas. Temp | 1.10 @ 60 |
| Rmt @ Meas. Temp | 0.83 @ 60 |
| Rmc @ Meas. Temp | 1.49 @ 60 |
| Source of Rmf / Rmc | CHARTS |
| Rm @ BHT | 0.53 @ 124 |
| Operating Rig Time | 5 HOURS |
| Max Rec. Temp. F | 124 |
| Equipment Number | 91 |
| Location | HAYS |
| Recorded By | D. SCHMIDT |
| Witnessed By | KEN LEBLANC |

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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,
5 NORTH, EAST 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: D. SCHMIDT | Operator: | Primary Witness: KEN LEBLANC | Secondary Witness: |
| Operator: | Operator: | Secondary Witness: | Secondary Witness: |
| Operator: | | Secondary Witness: | |

| Sensor | Offset (ft) | Schematic | Description | Length (ft) | O.D. (in) | Weight (lb) |
|--------------------|-------------------------|-----------|--|-------------|-----------|-------------|
| GR | 40.58 | | GR-M&W (89) | 3.00 | 3.50 | 50.00 |
| CNLSC CNSSC | 37.48 36.73 | | CNT-M&W (207-MW) | 5.50 | 3.50 | 100.00 |
| LSD DCAL SSD | 28.43 28.42 27.93 | | CDL-M&W (144-84) | 8.50 | 4.00 | 250.00 |
| MCAL MI MN | 19.83 19.83 19.83 | | ML-PSIML (PSI-01) GO Micro log tools converted to Simplec electronics | 7.58 | 4.00 | 65.00 |
| RLL3F RLL3 | 15.80 15.80 | | DIL-PSI HIGH TEMP (967 (HT)) | 18.50 | 3.50 | 220.00 |
| CILD | 8.00 | | | | | |
| CILM | 4.70 | | | | | |
| SP | 0.20 | | | | | |

Dataset: murfin_frisbie b 1-15.db: field/well/STKML/pass4.1
 Total length: 43.08 ft
 Total weight: 685.00 lb
 O.D.: 4.00 in

Log Variables

DatabaseC:\ProgramData\Warrior\Data\murfin_frisbie b 1-15.db

Dataset field/well/STKML/pass4.1/_vars_

Top - Bottom

| | | | | | | | |
|------------------|-----------------|----------------|--------------|------------------|------------------|---------------|-------------------|
| M | A | SZCOR | NPORSEL | FLUIDDEN g/cc | MATRXDEN g/cc | SPSHIFT mV | SNDERRM mmho/m |
| 2 | 1 | Off | Limestone | 1 | 2.71 | 440 | 0 |
| SNDERR mmho/m | SRFTEMP degF | CASETHCK in | CASEOD in | PERFS | BOTTEMP degF | BOREID in | TDEPTH ft |
| 0 | 50 | 0 | 5.5 | 0 | 124 | 7.875 | 4817 |

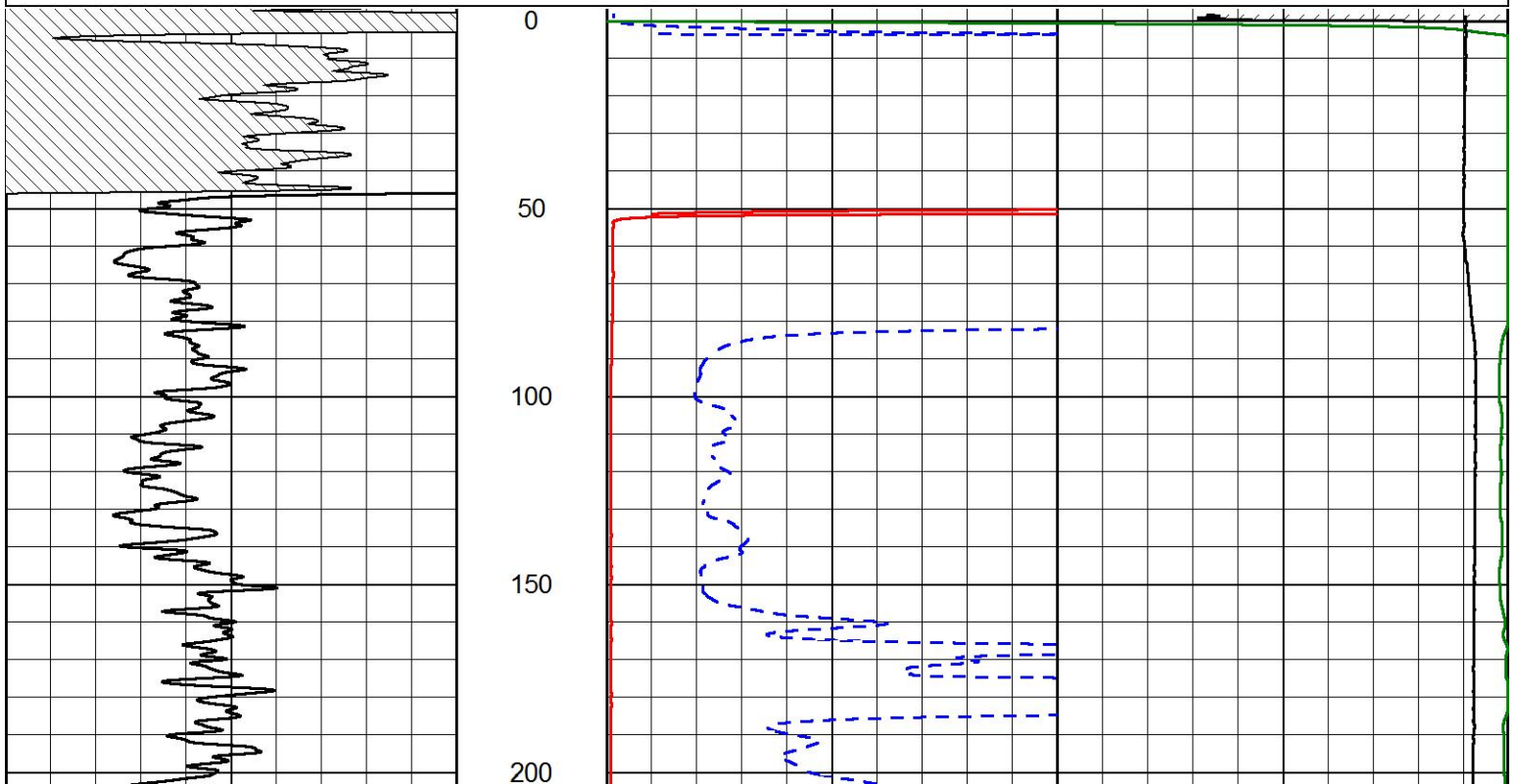


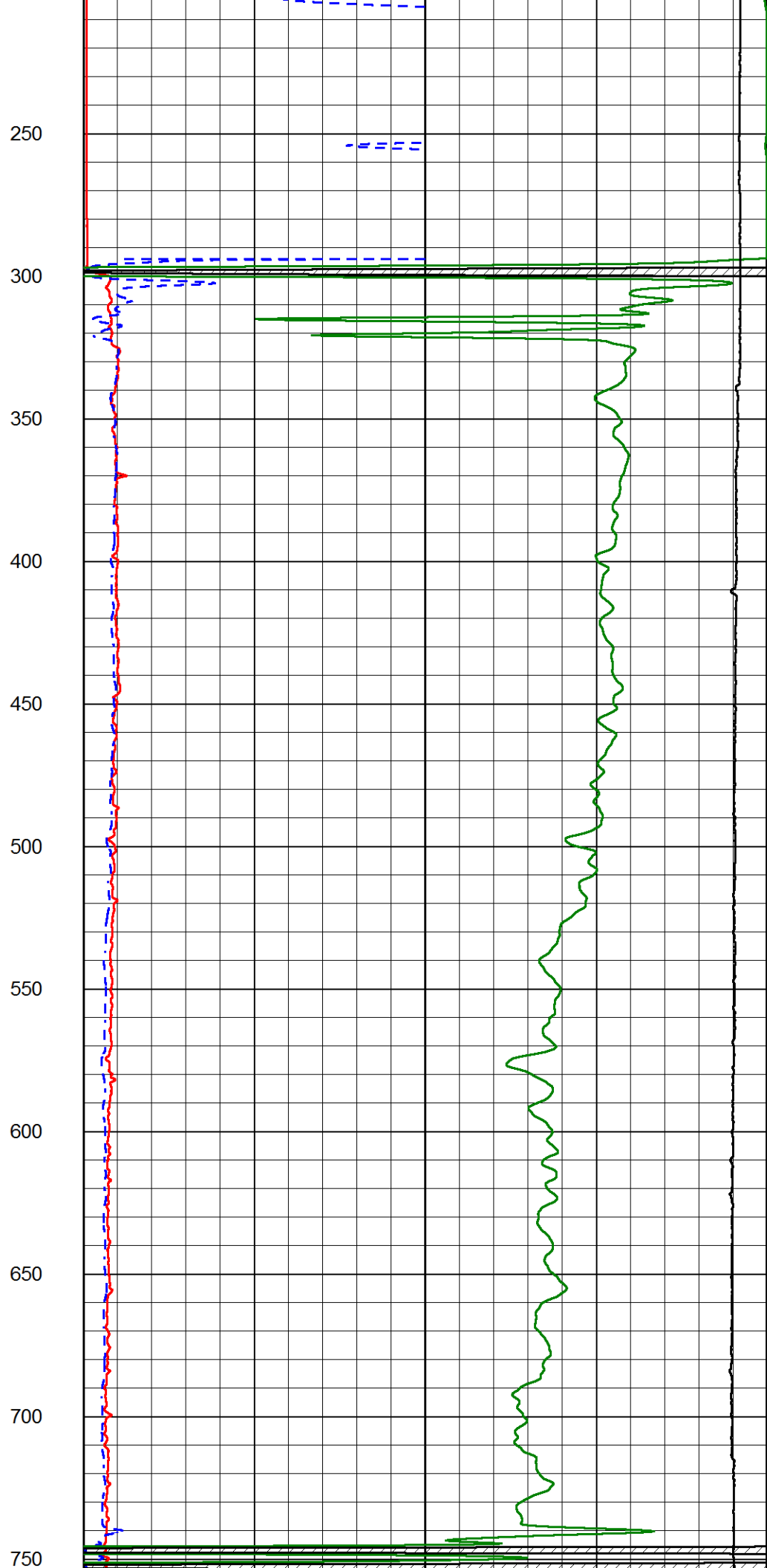
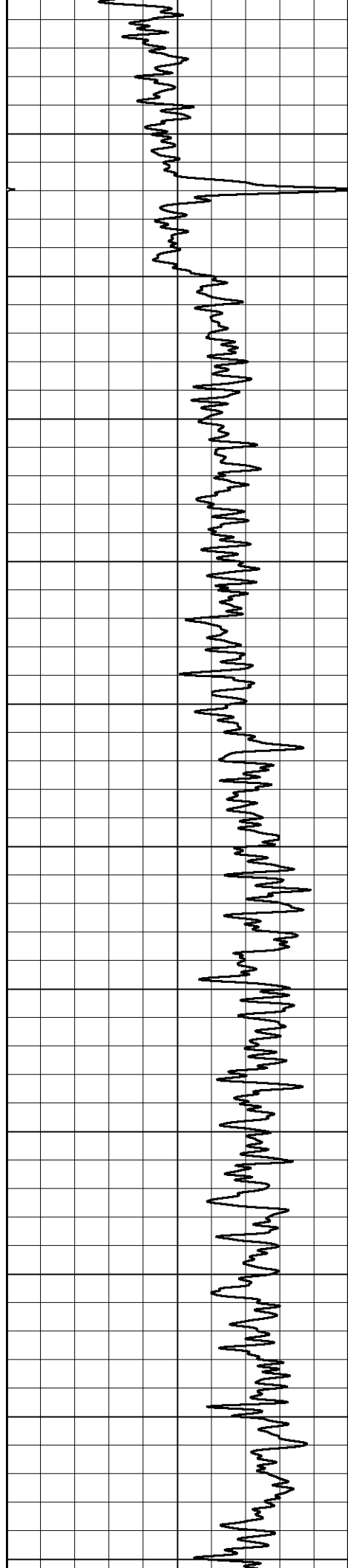
PIONEER
Pioneer Energy Services

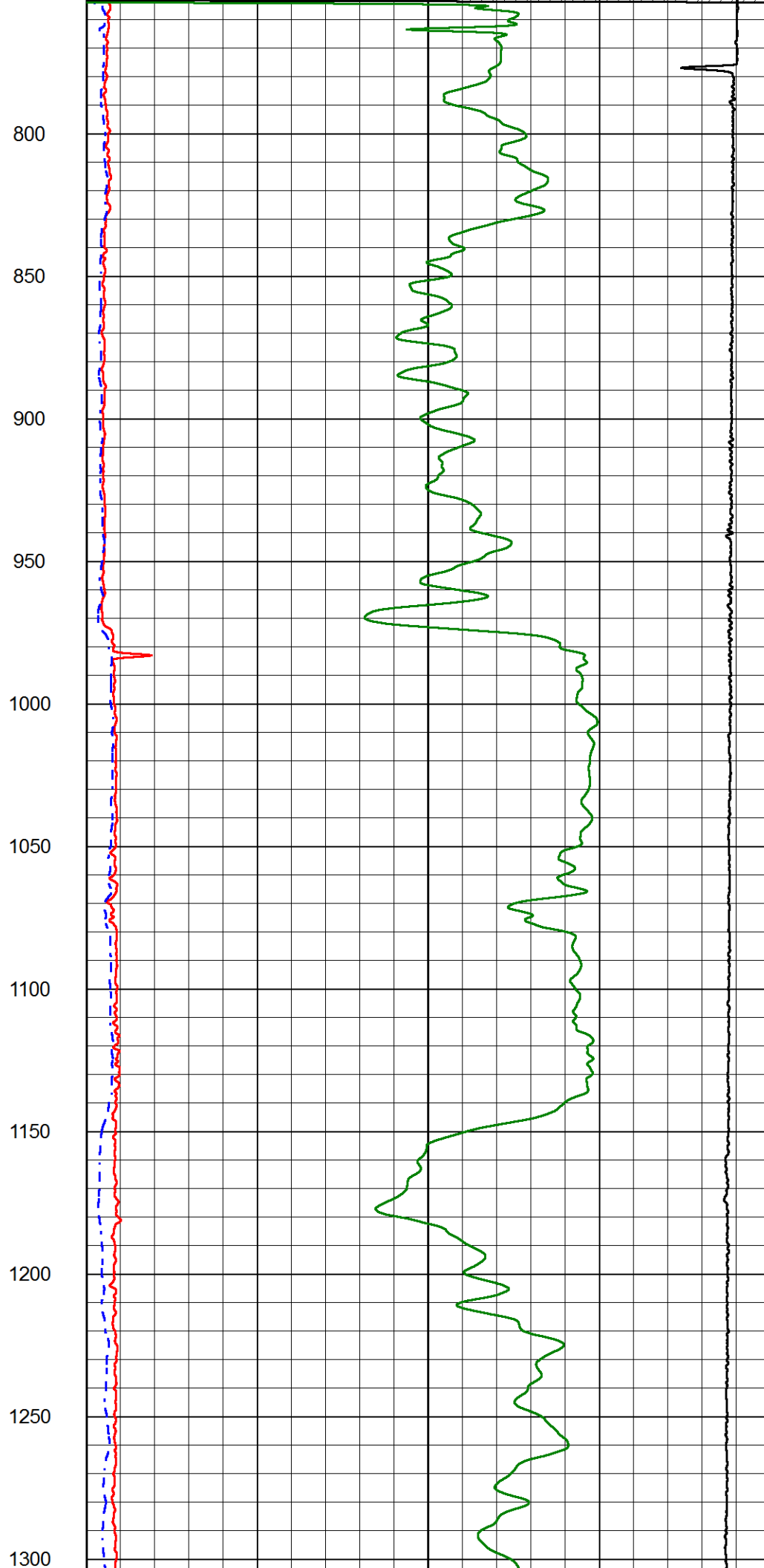
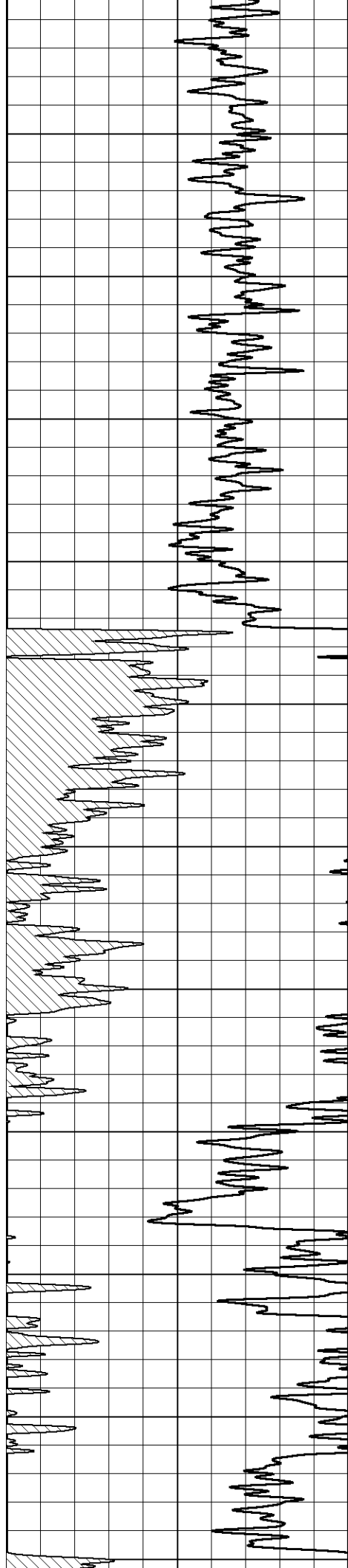
MAIN PASS

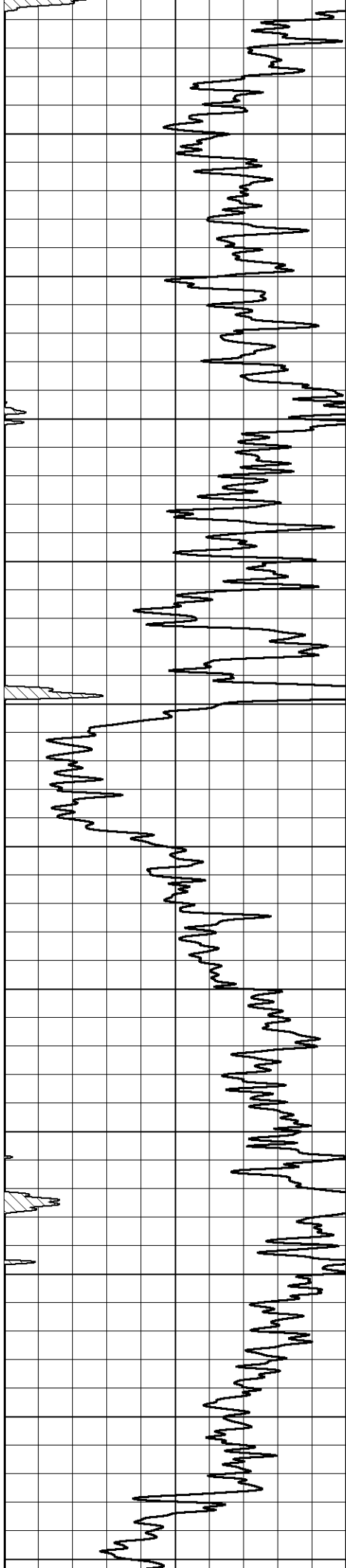
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 Dataset Pathname STKML/pass4.1
 Presentation Format dil2in
 Dataset Creation Sun Oct 07 22:22:04 2018
 Charted by Depth in Feet scaled 1:600

| | | | |
|---------------------|-------|--------------------------|-----|
| GAMMA RAY (GAPI) | 1000 | CONDUCTIVITY (mmho/m) | 0 |
| | 15000 | Line Tension (lb) | 0 |
| | 0 | RLL3 (Ohm-m) | 50 |
| | 0 | DEEP RESISTIVITY (Ohm-m) | 50 |
| | 50 | RLL3 (Ohm-m) | 500 |
| | 50 | Deep Resistivity (Ohm-m) | 500 |

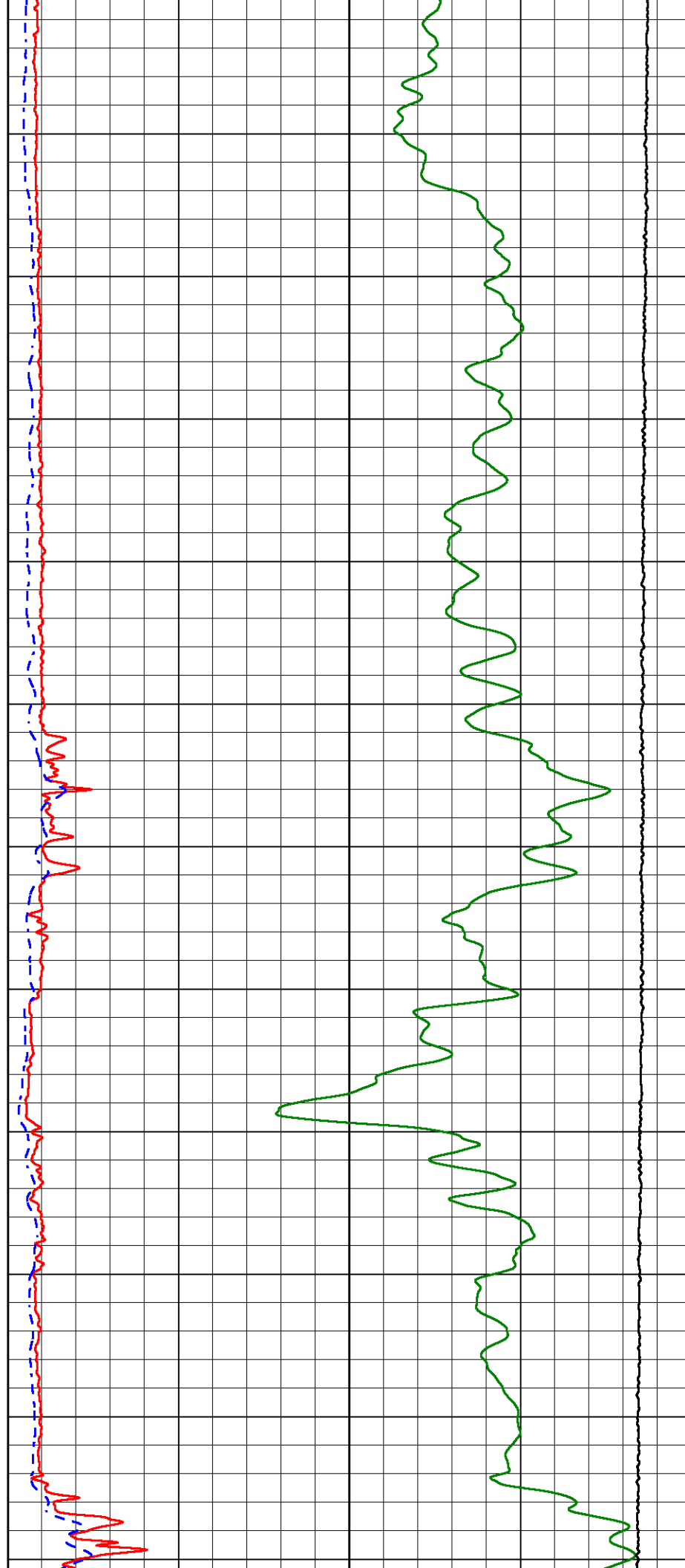


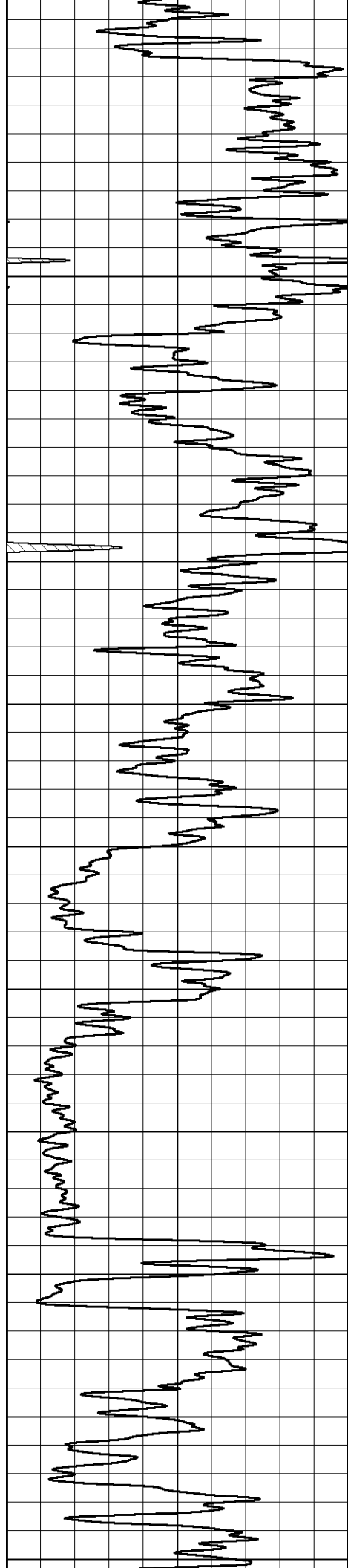




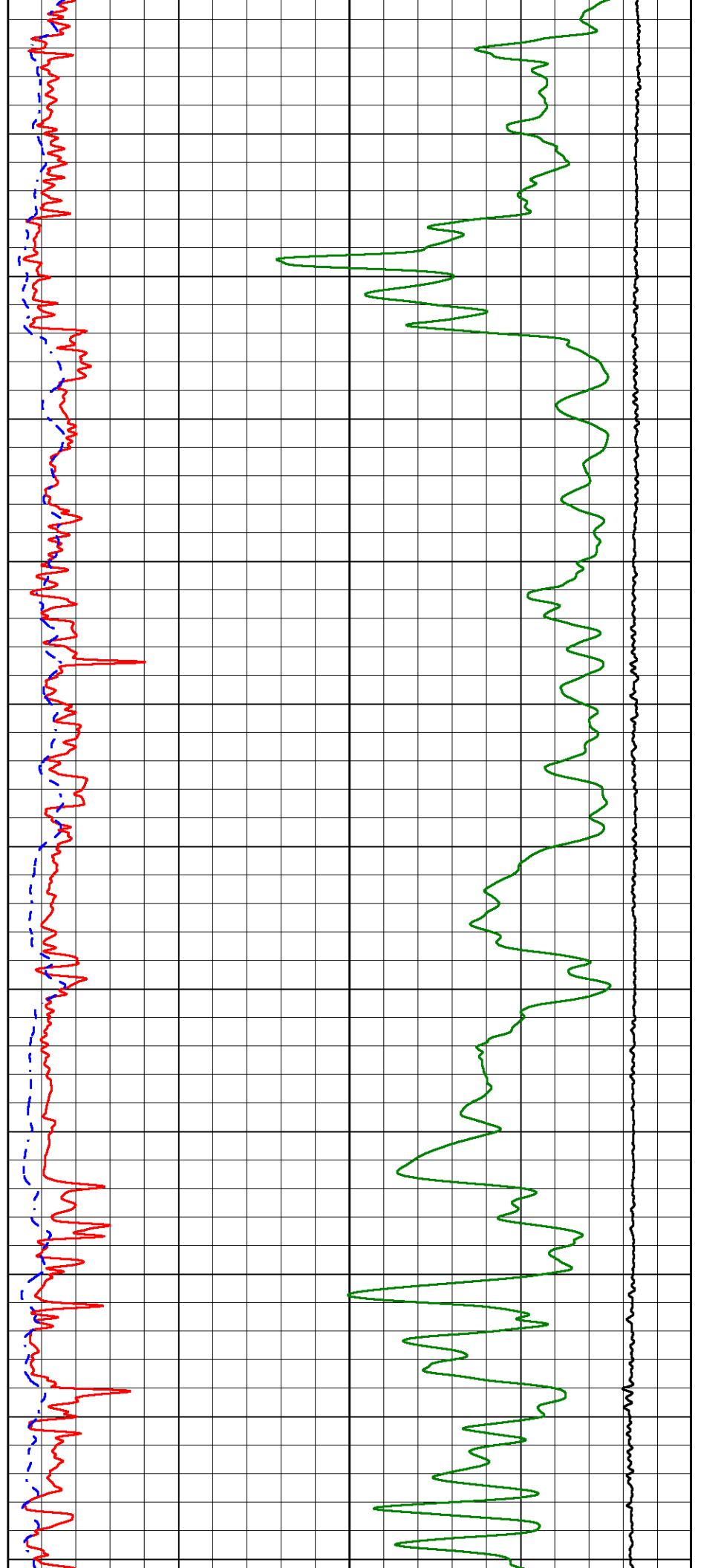


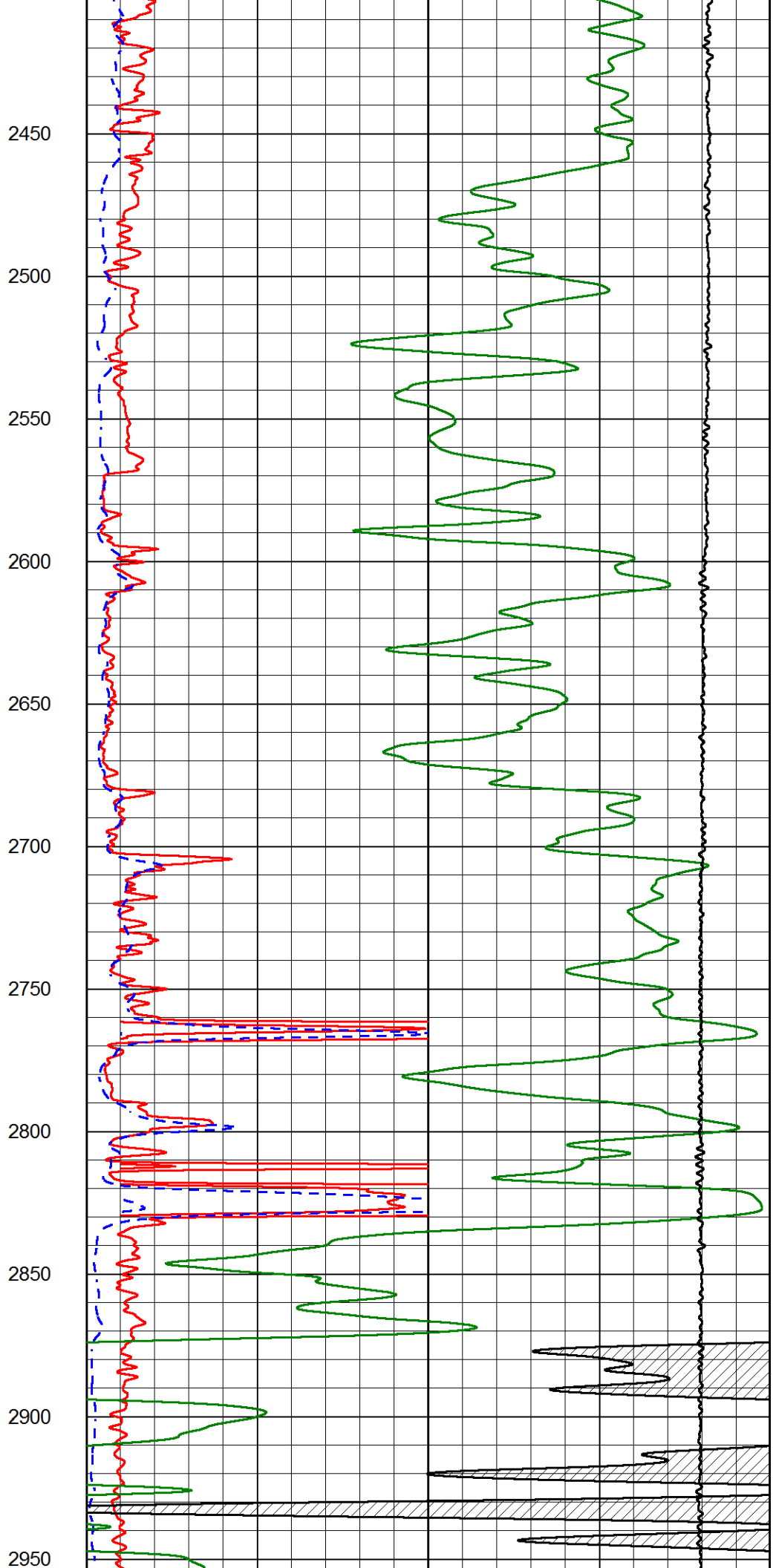
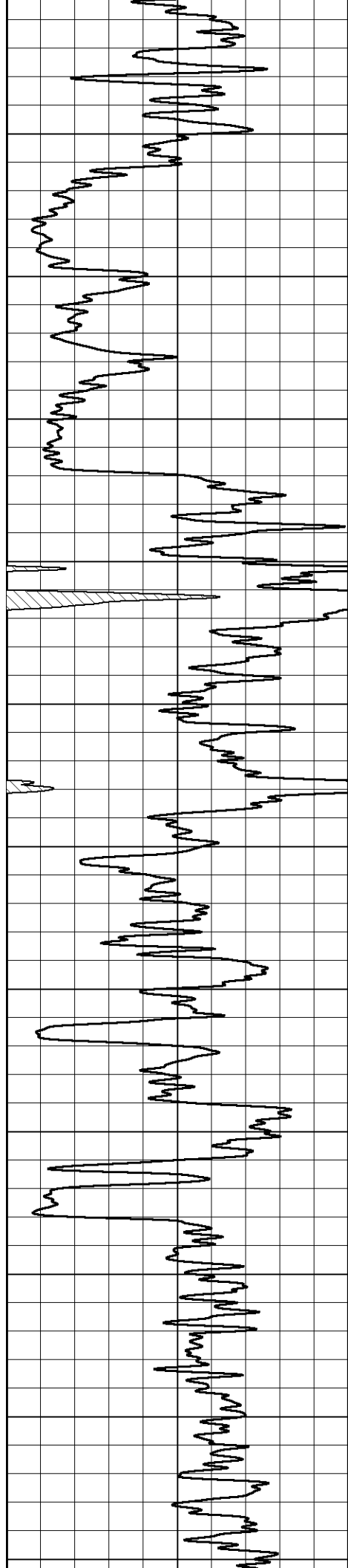
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1650
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1750
1800
1850

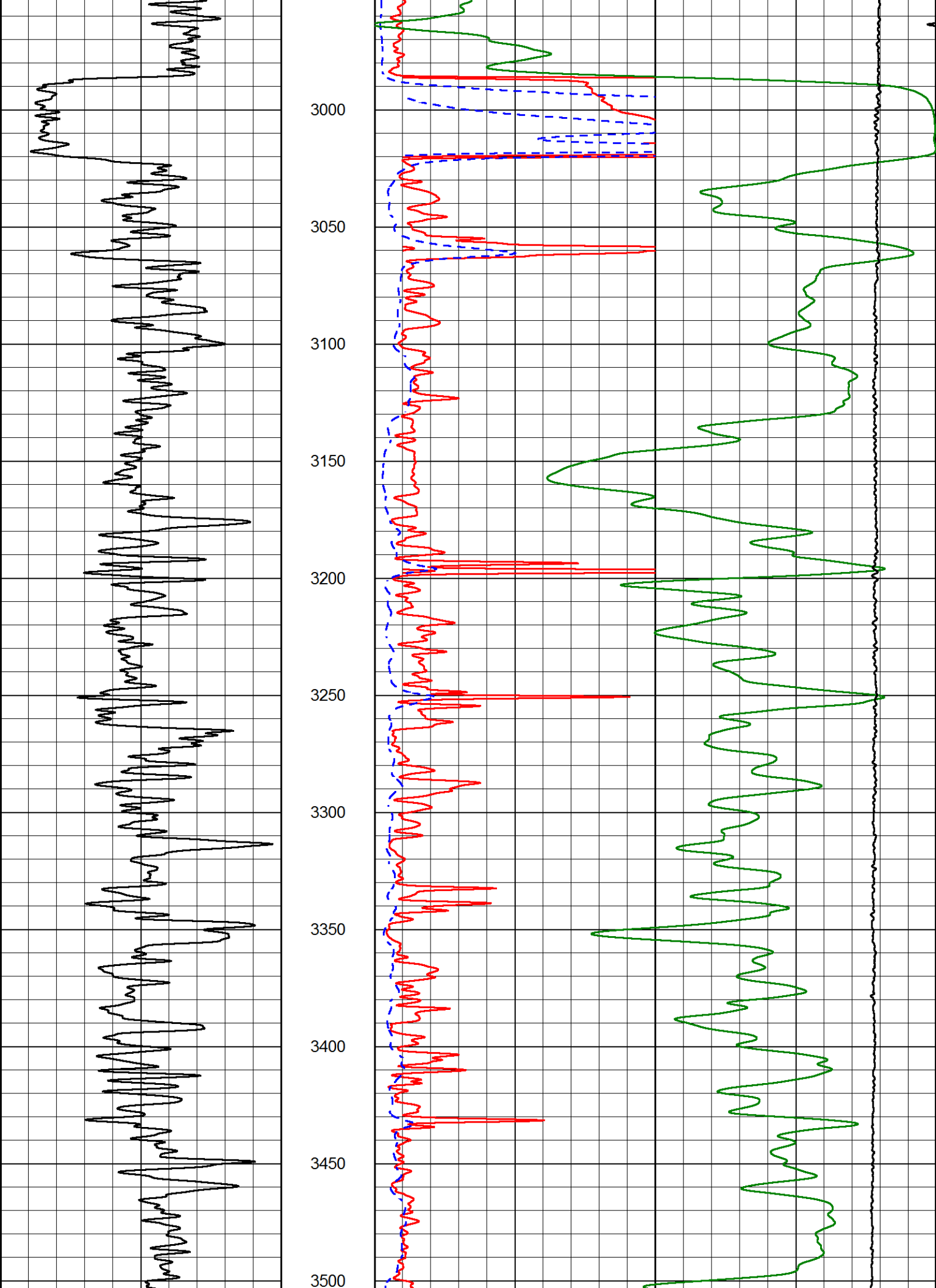


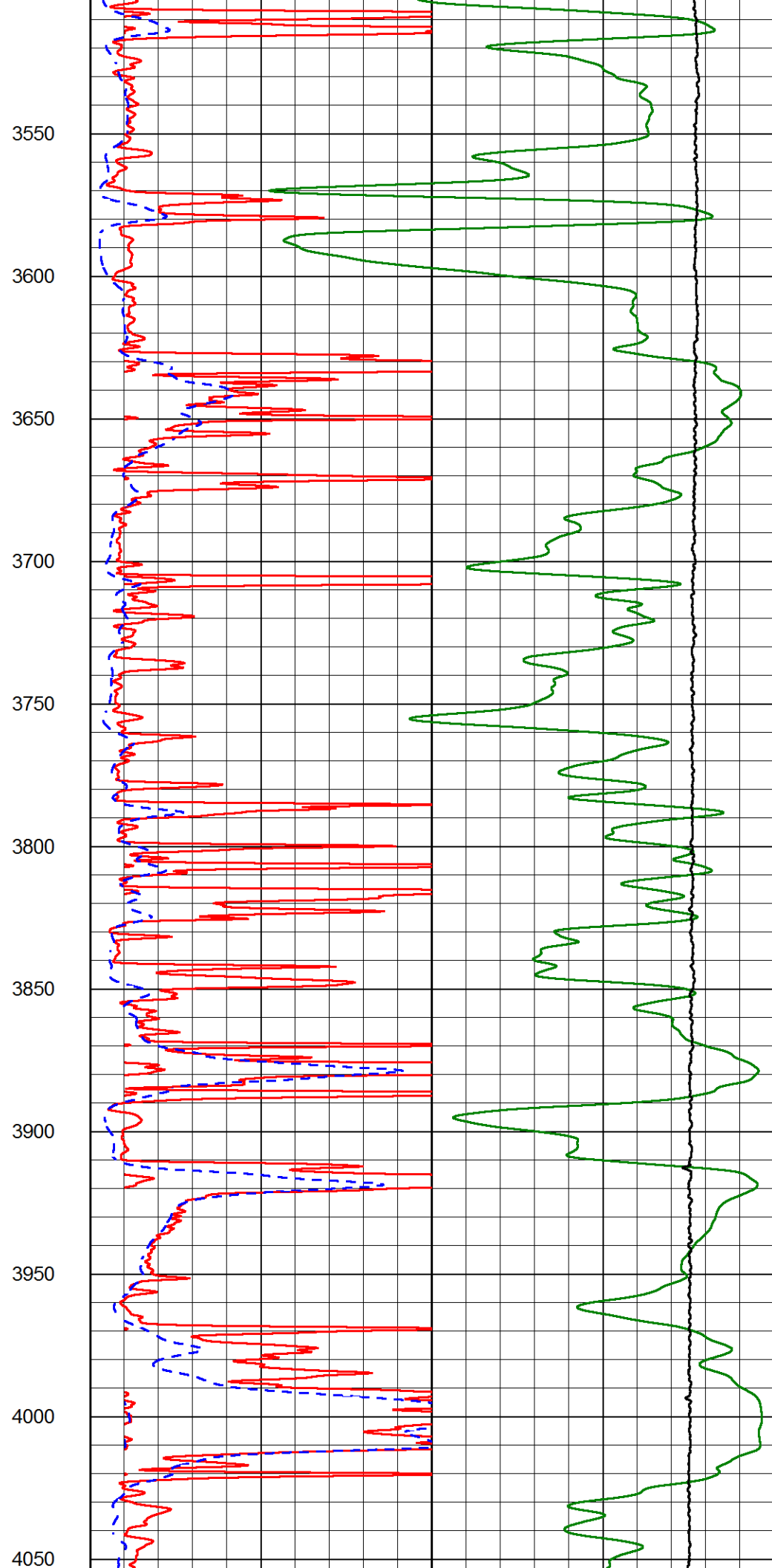
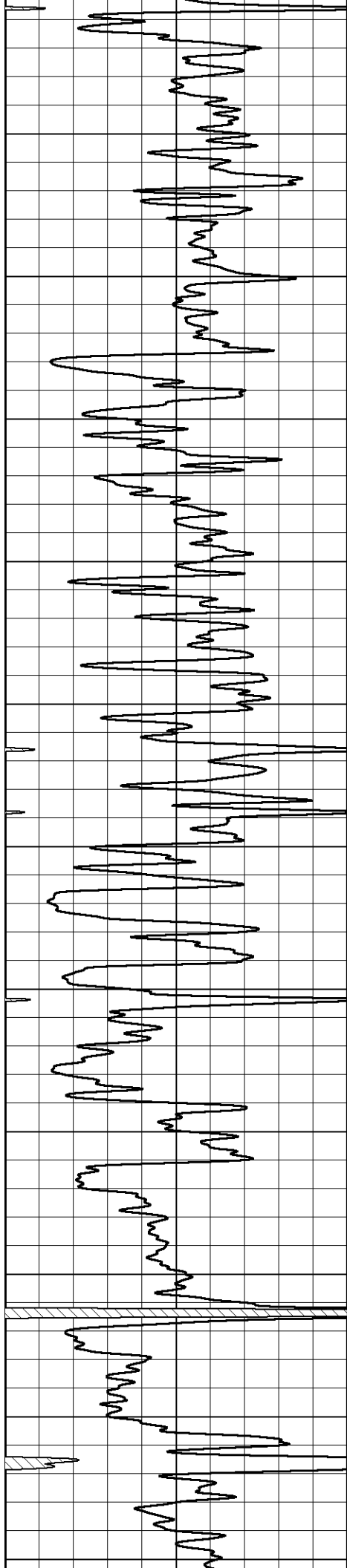


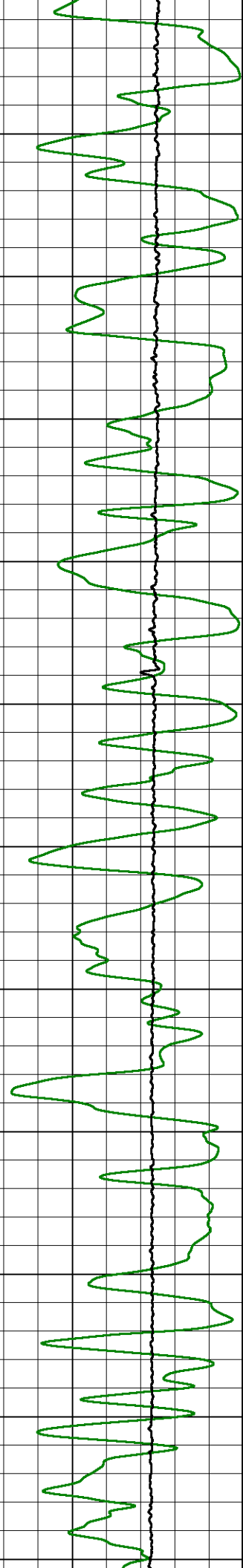
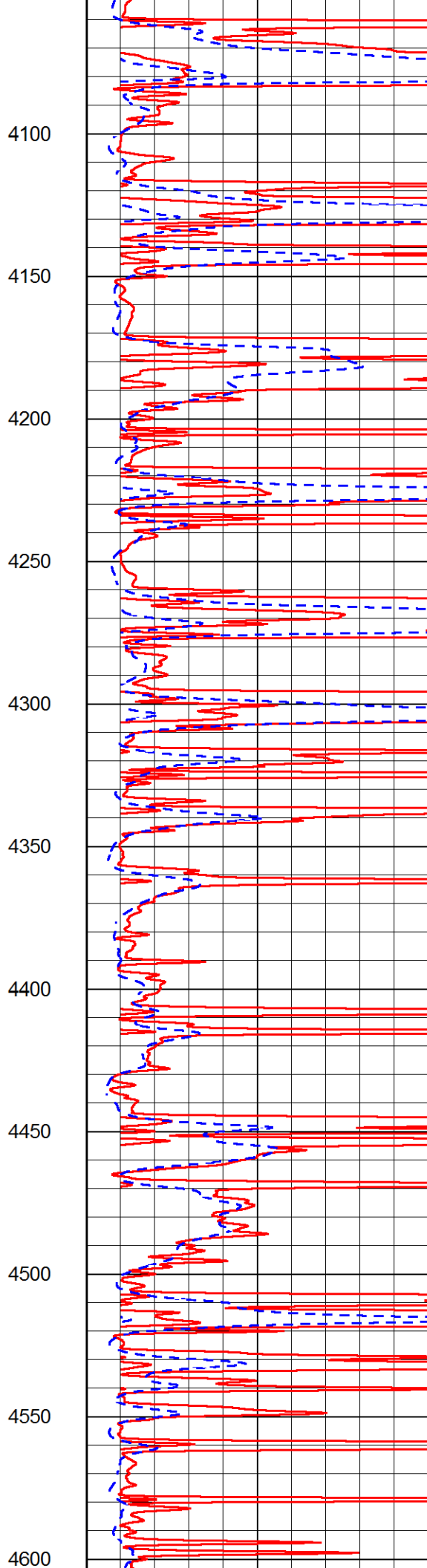
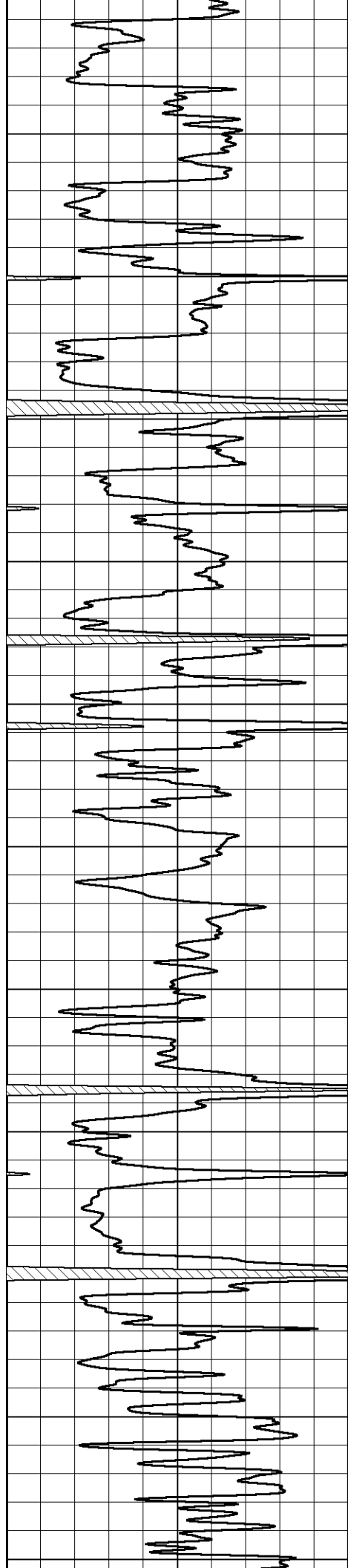
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1950
2000
2050
2100
2150
2200
2250
2300
2350
2400

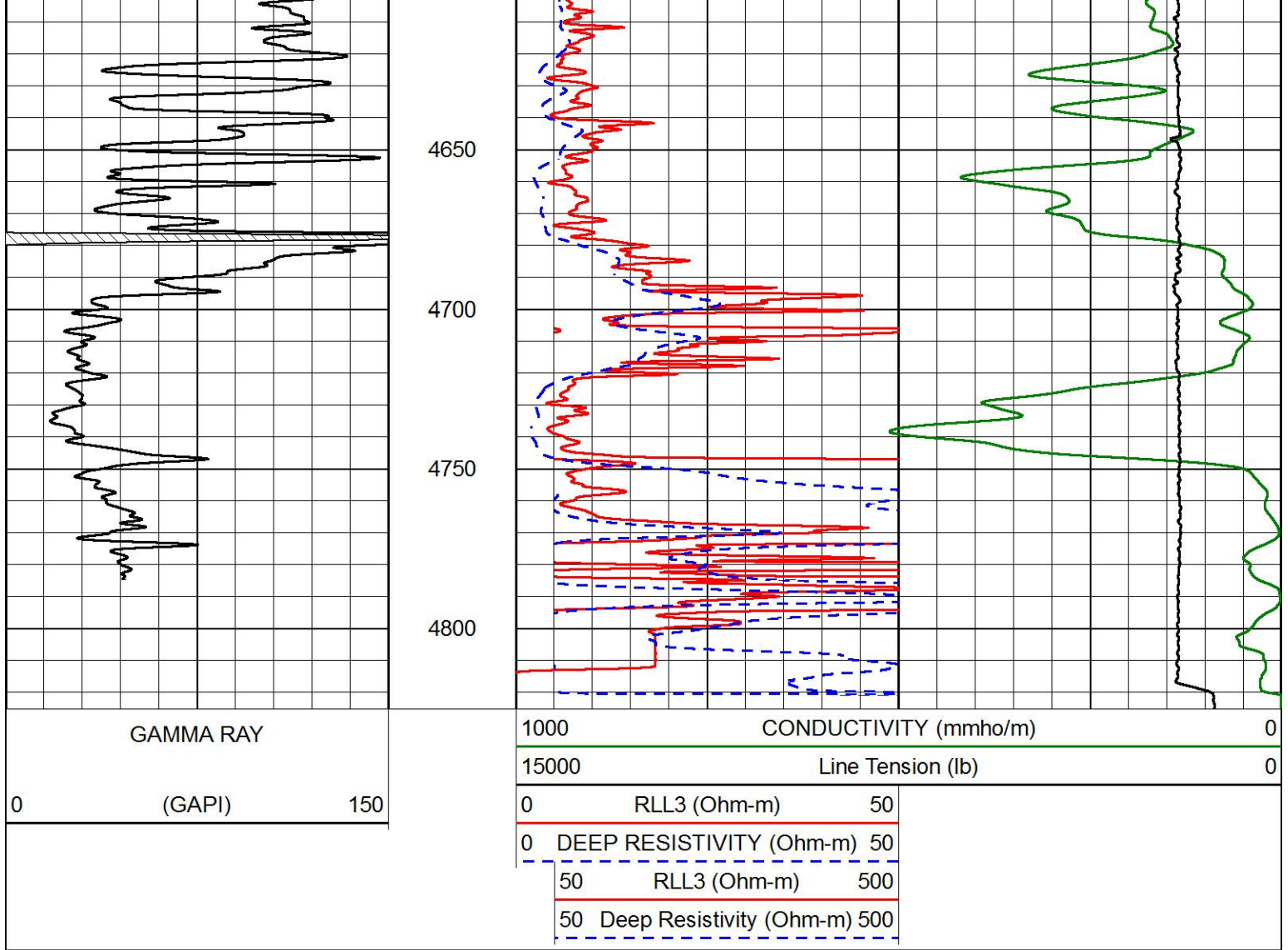








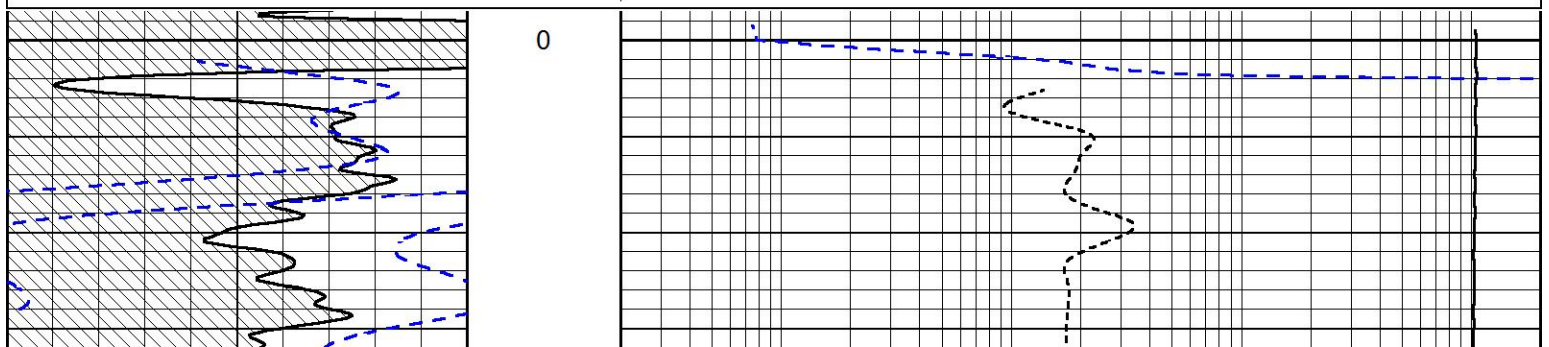


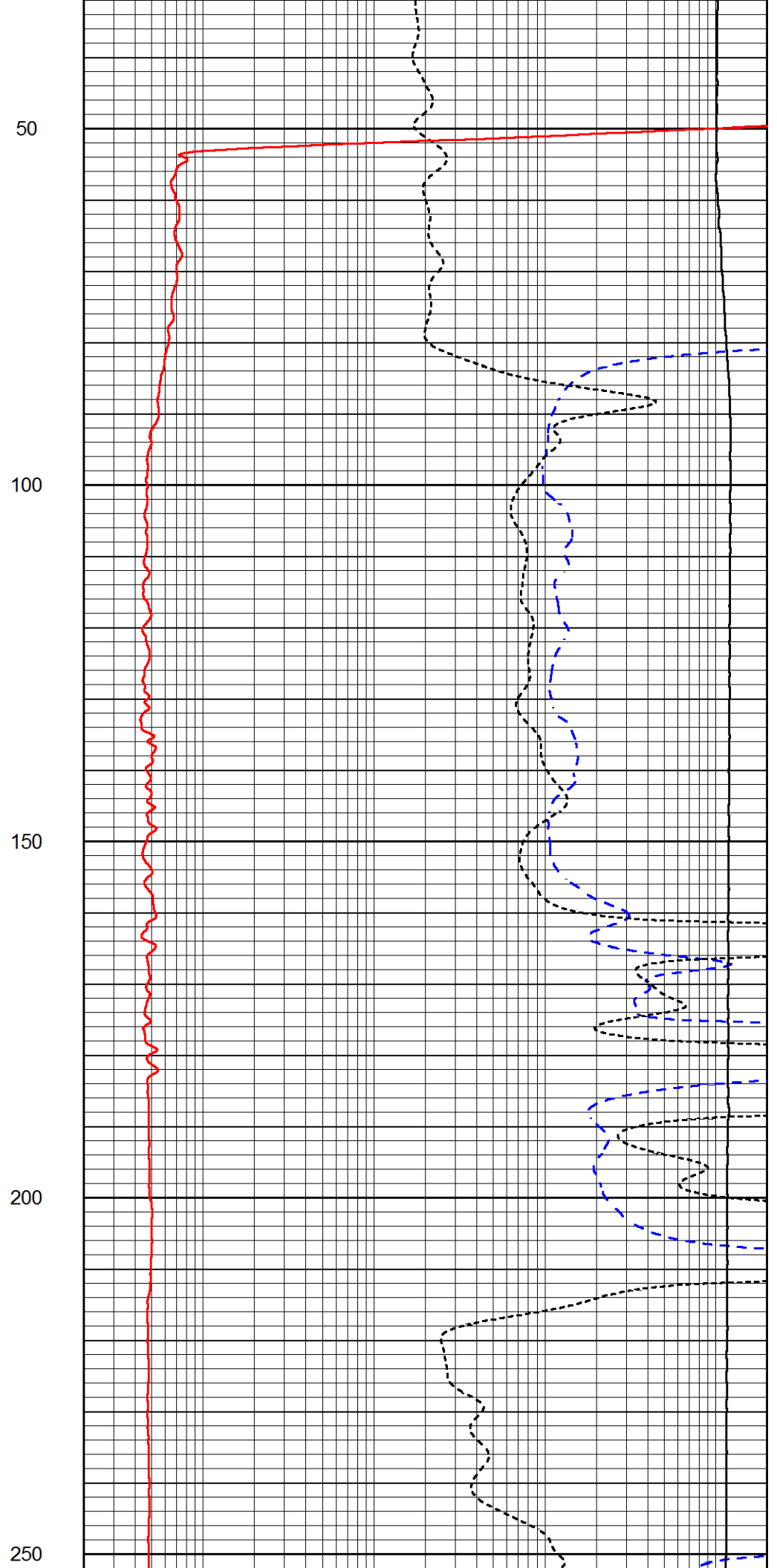
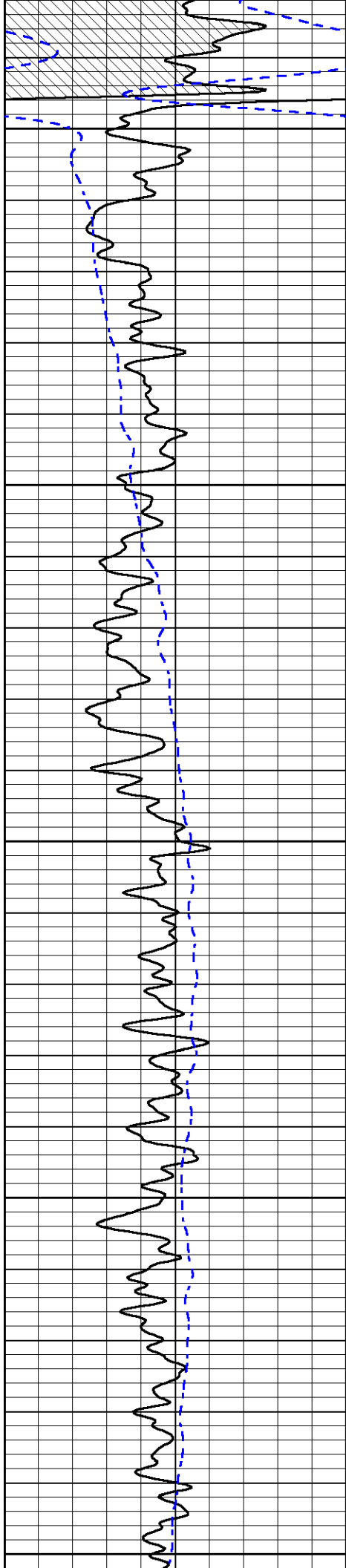


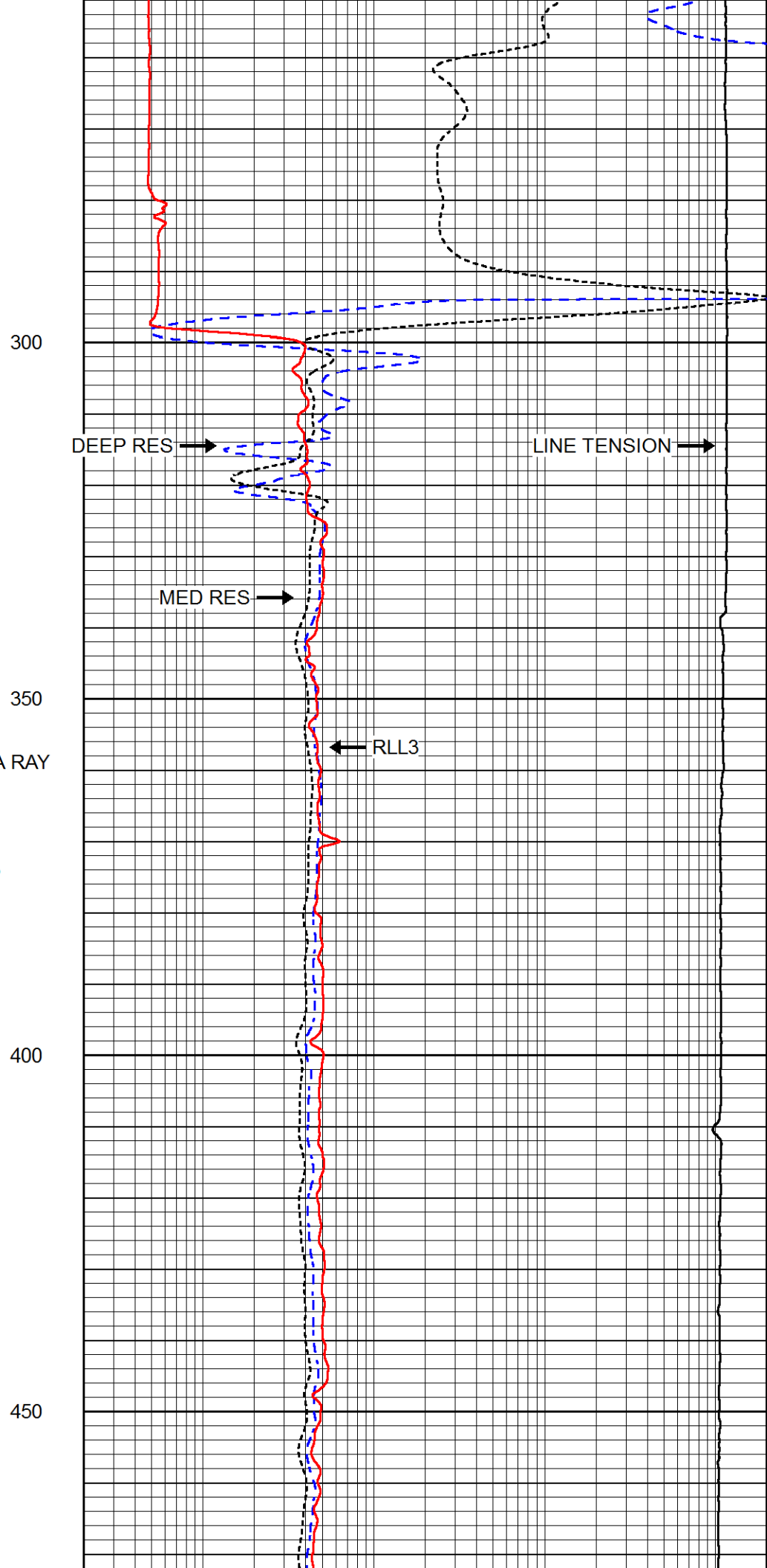
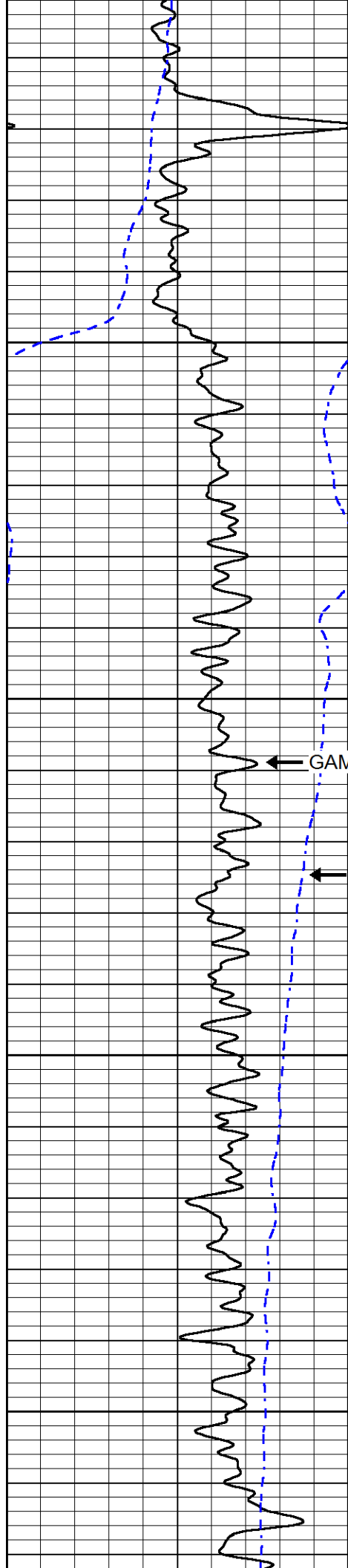
MAIN PASS

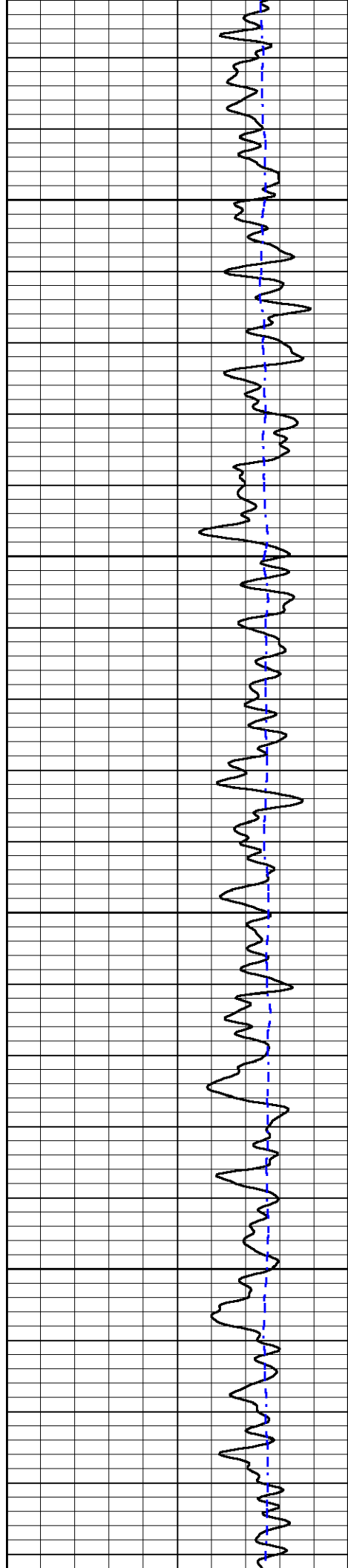
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 Dataset Pathname: STKML/pass4.1
 Presentation Format: dil
 Dataset Creation: Sun Oct 07 22:22:04 2018
 Charted by: Depth in Feet scaled 1:240

| | | | | | |
|------|------------------|-----|-------|----------------------------|------|
| 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 |
| | | | 10000 | LINE TENSION (lb) | 0 |







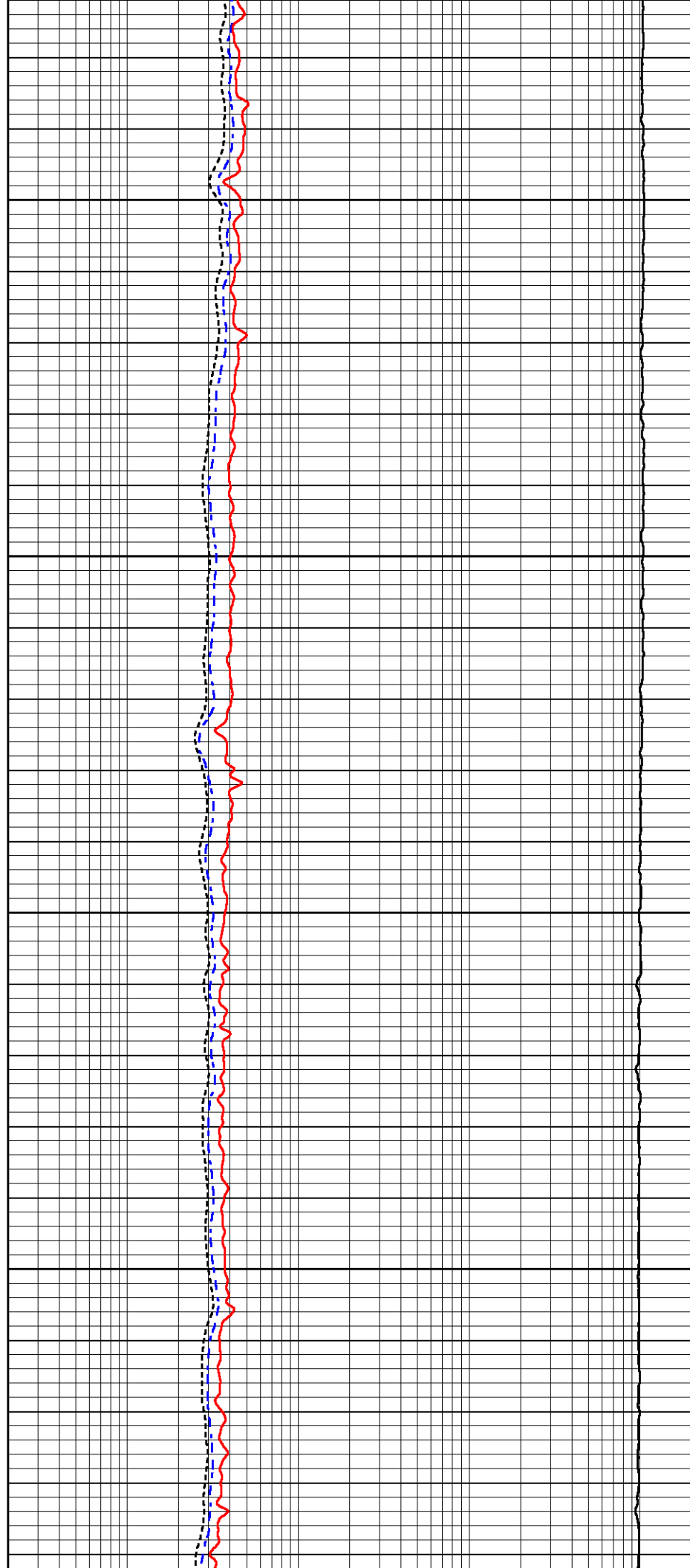


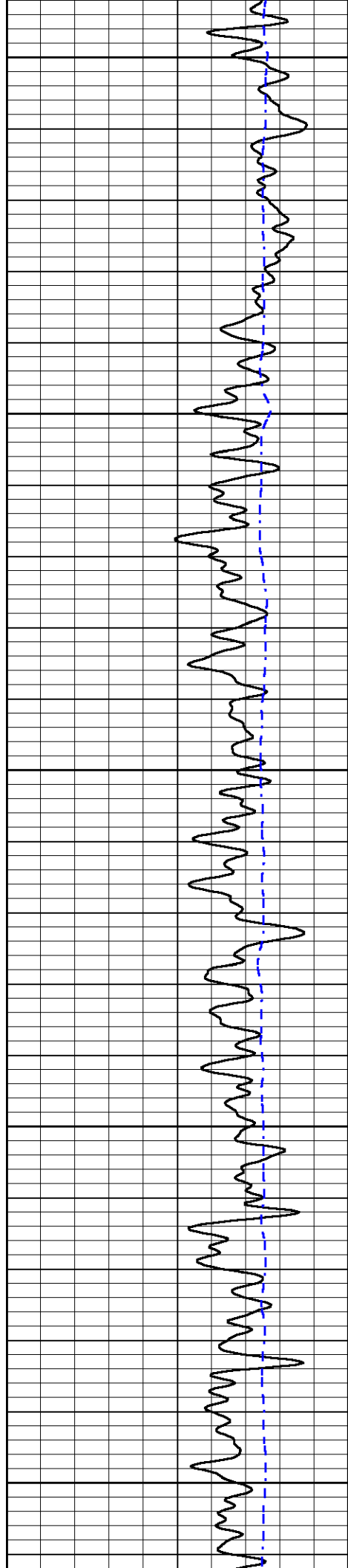
500

550

600

650





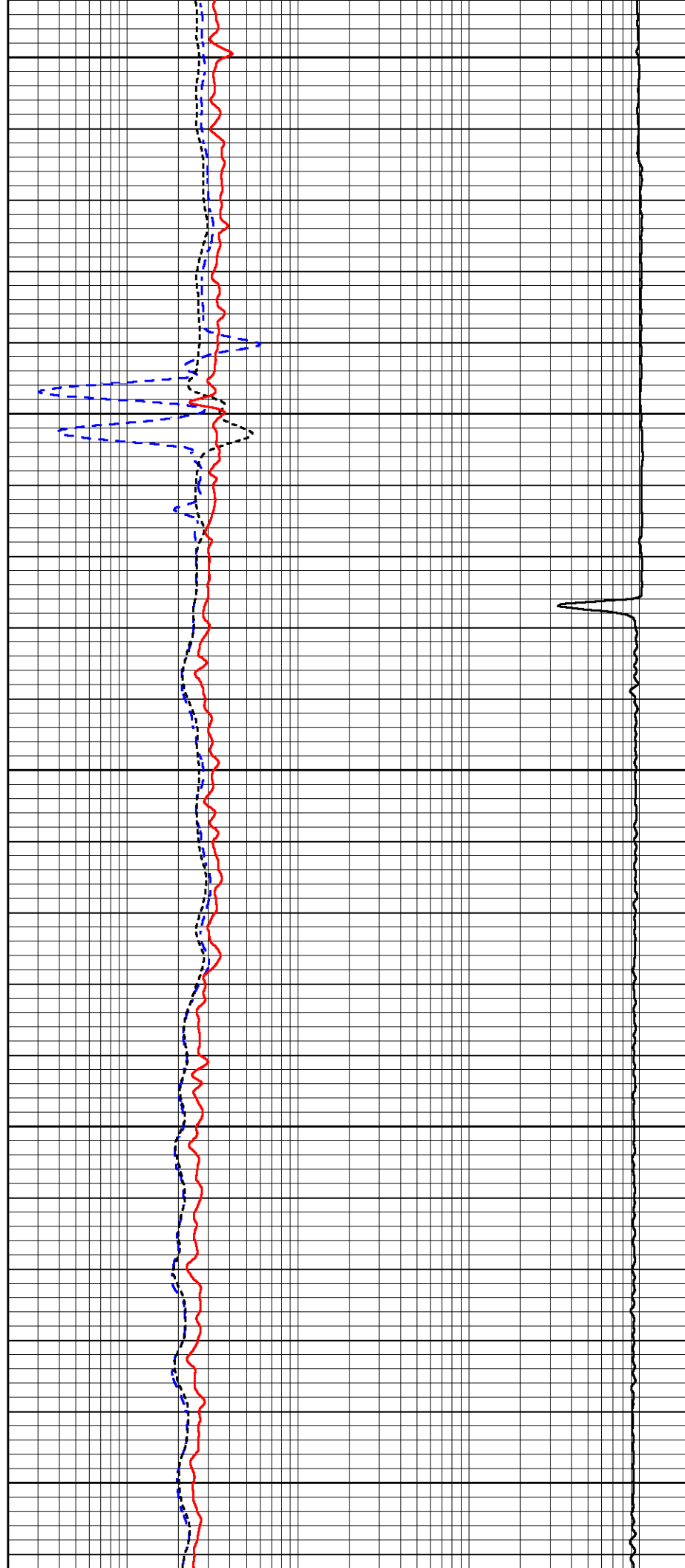
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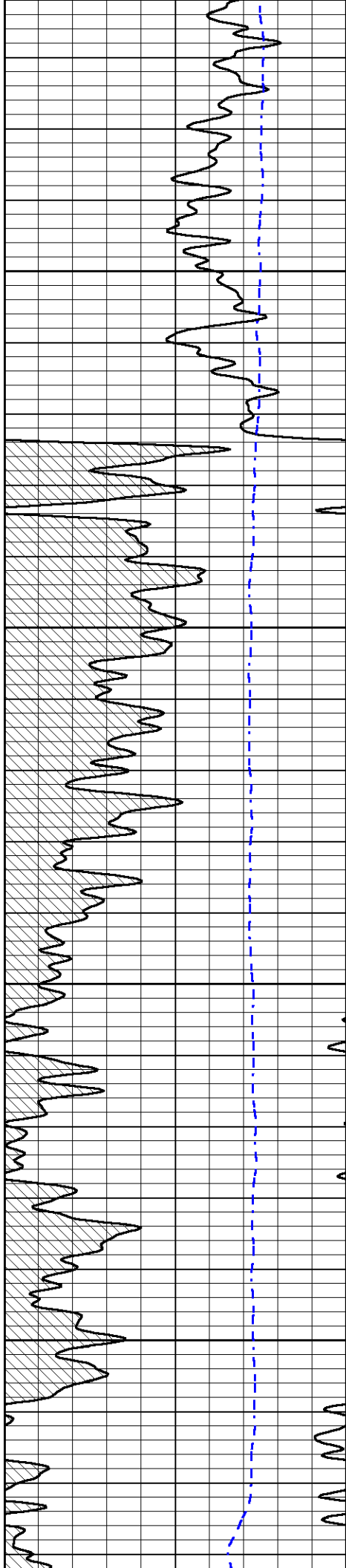
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800

850

900



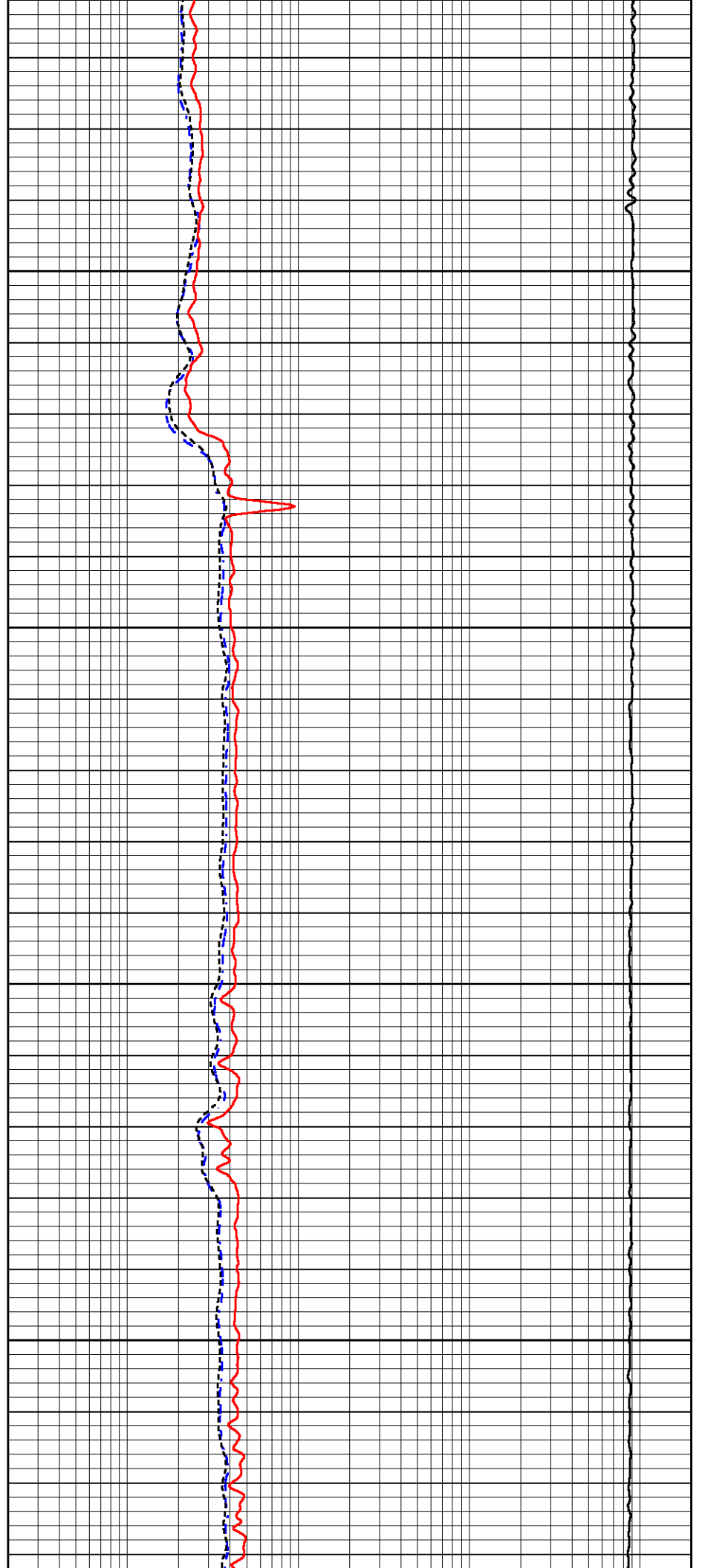


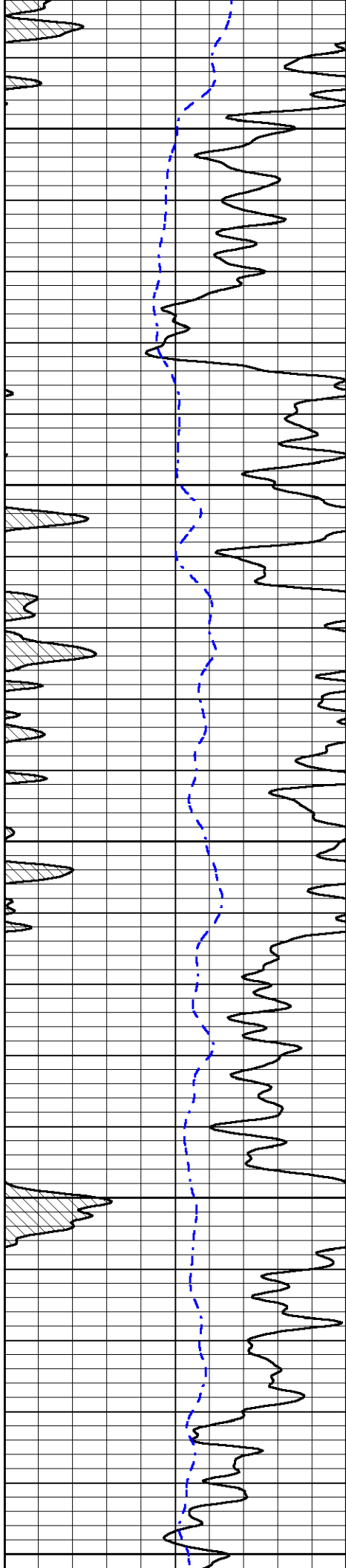
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1000

1050

1100





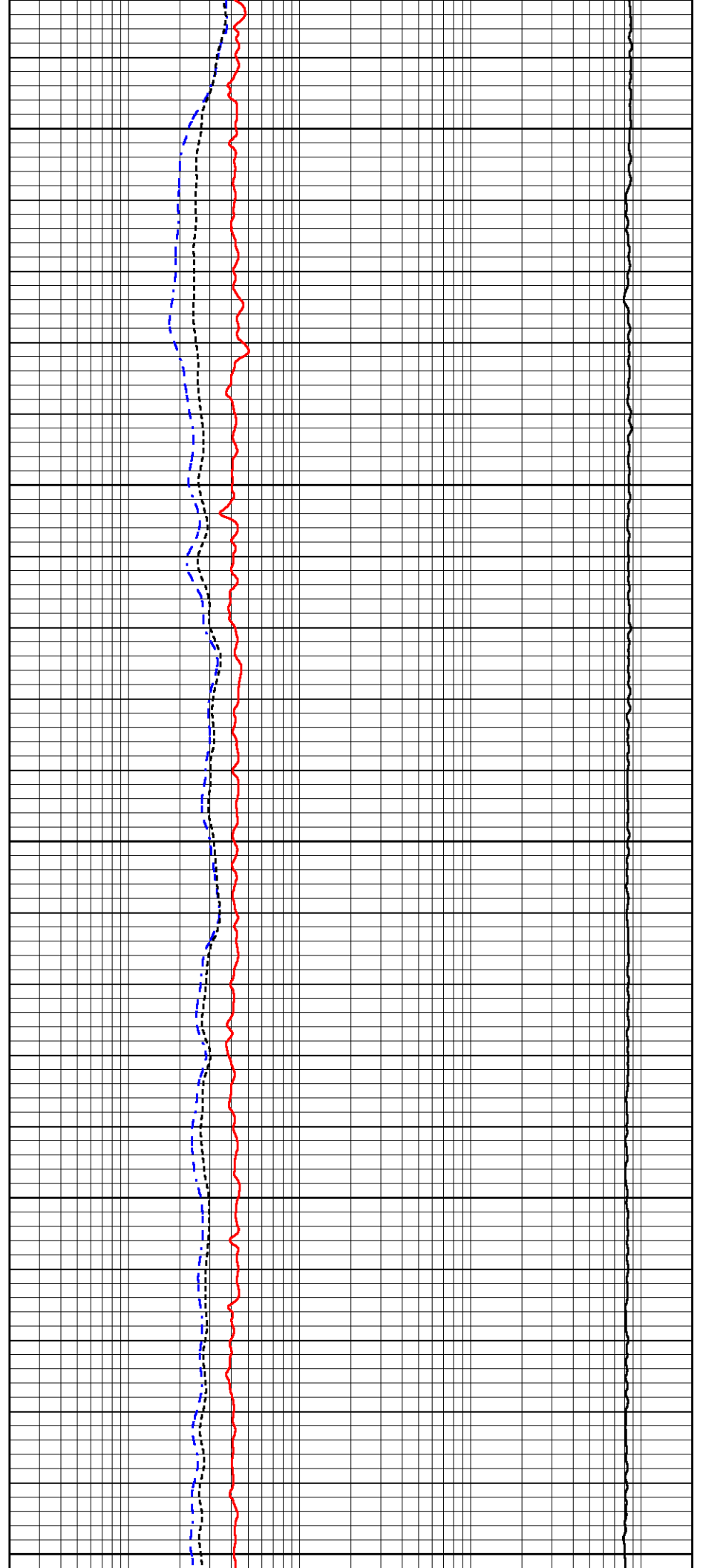
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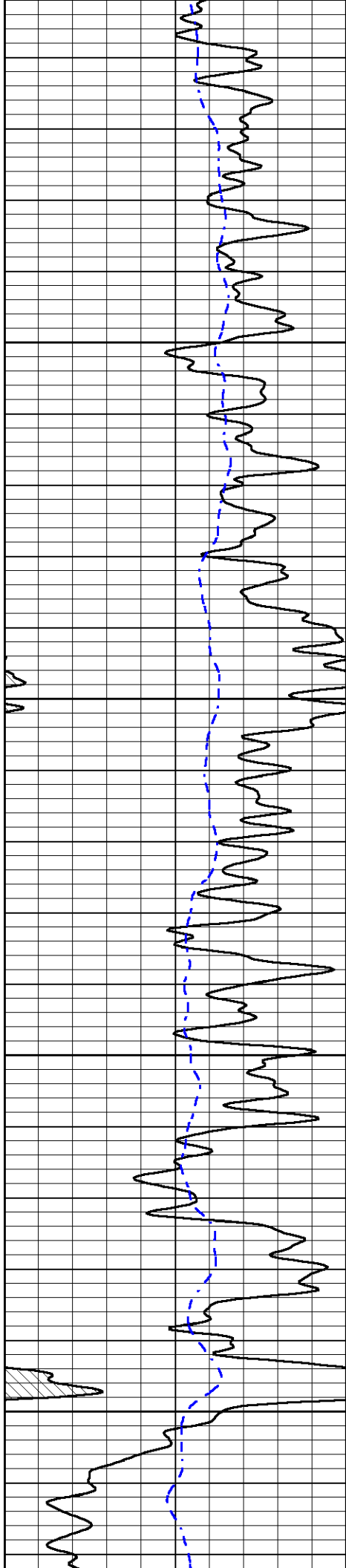
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1300

1350



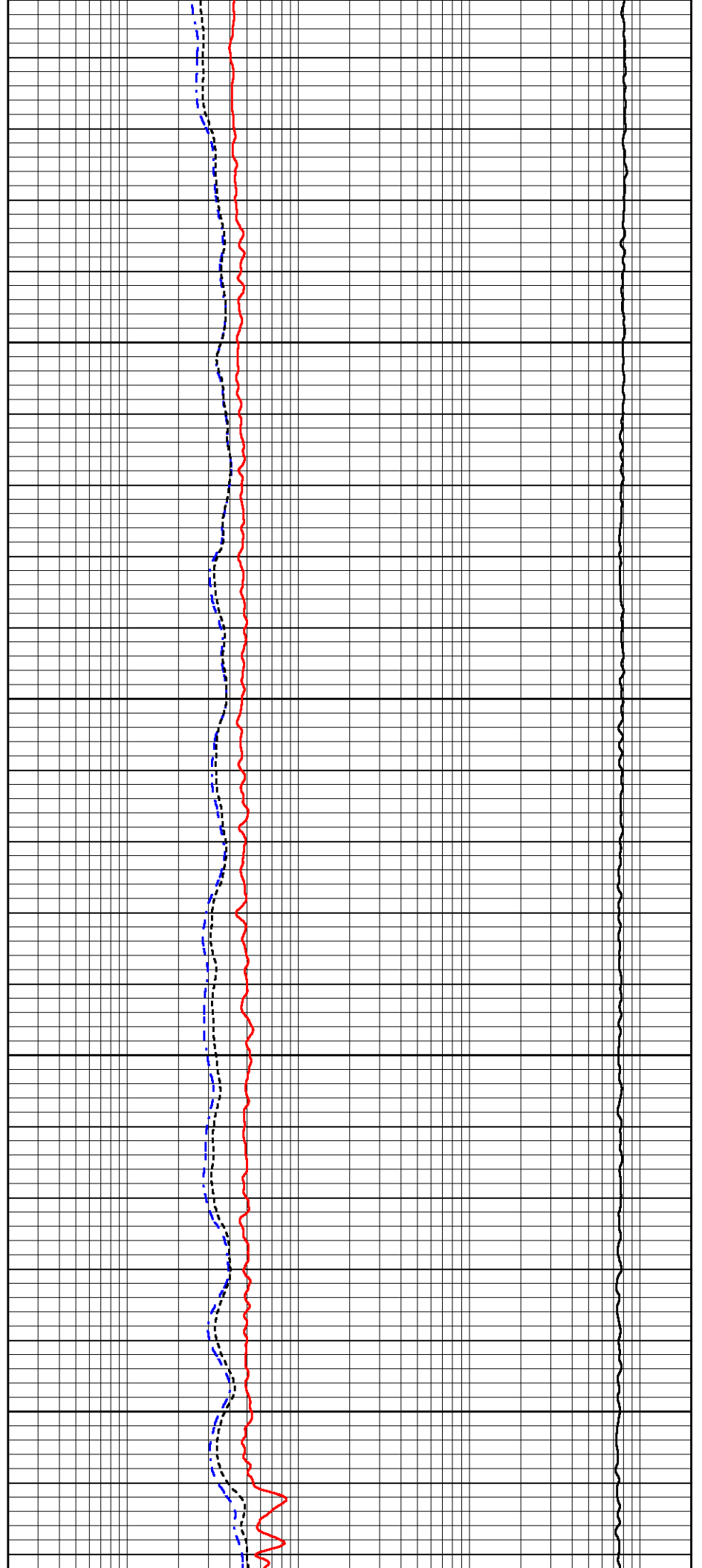


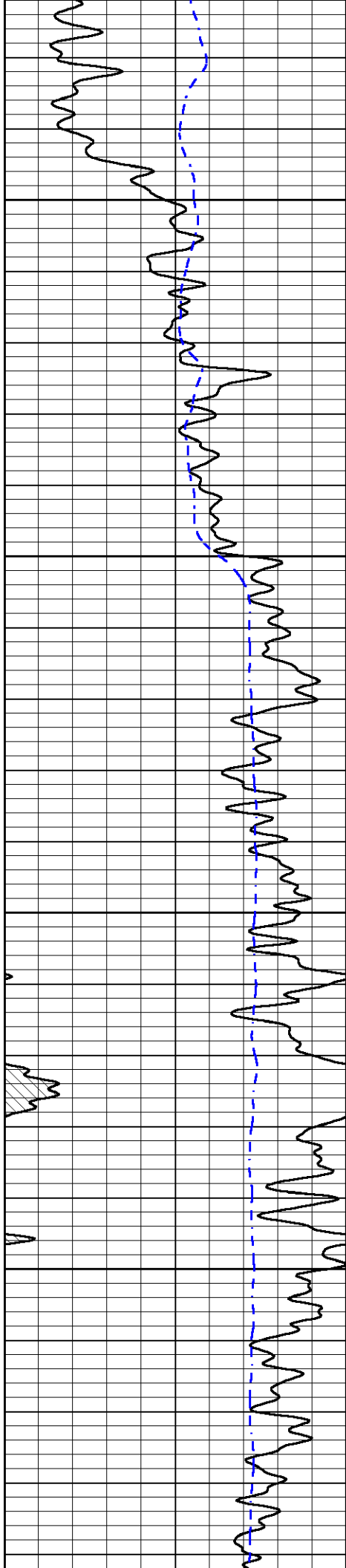
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1450

1500

1550



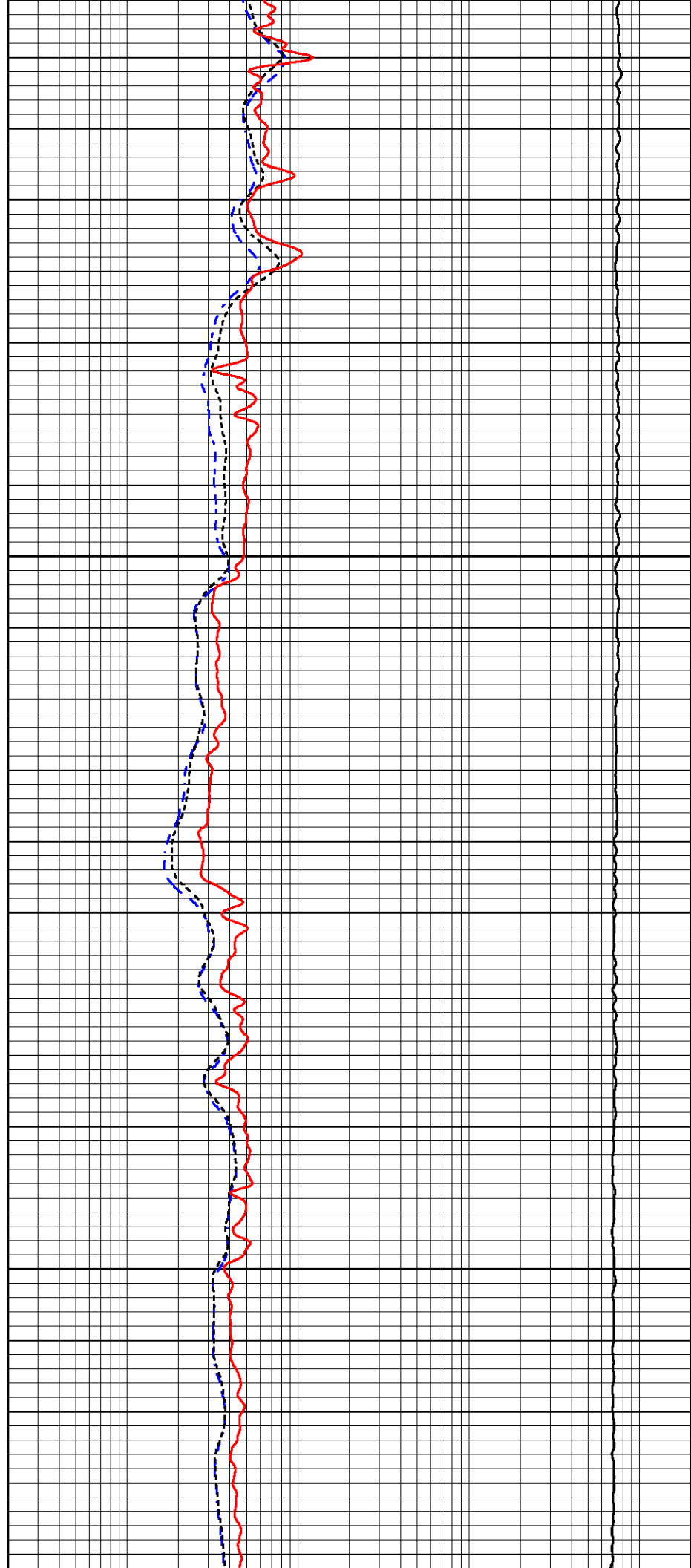


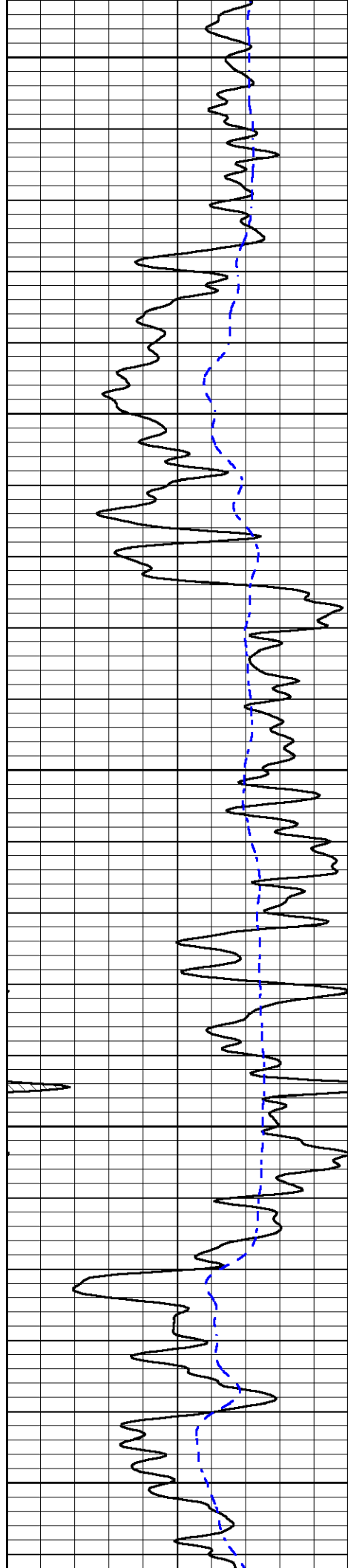
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1650

1700

1750





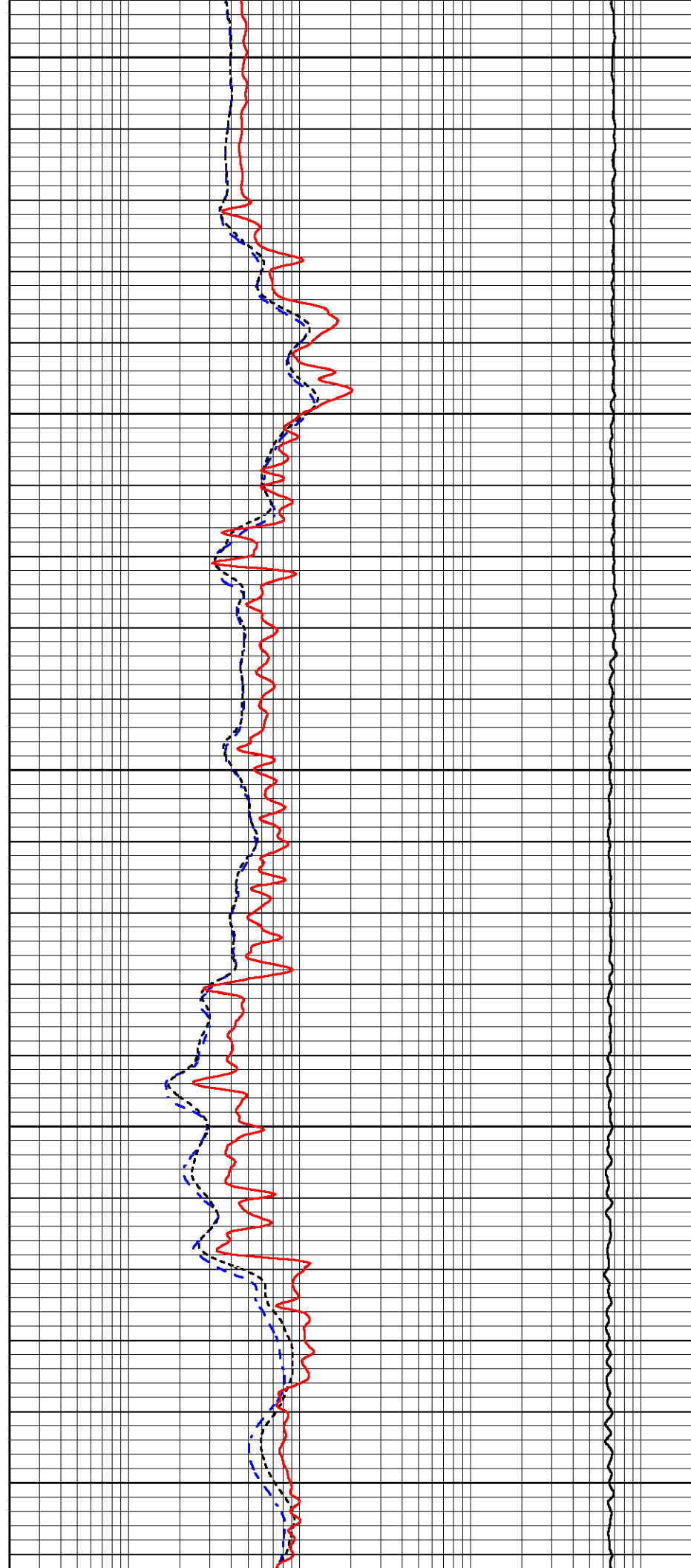
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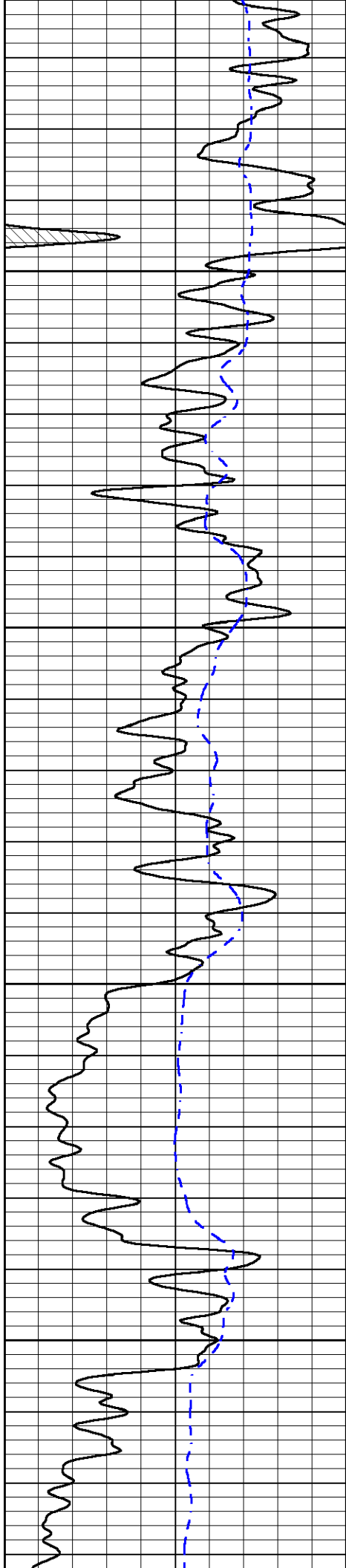
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1900

1950

2000



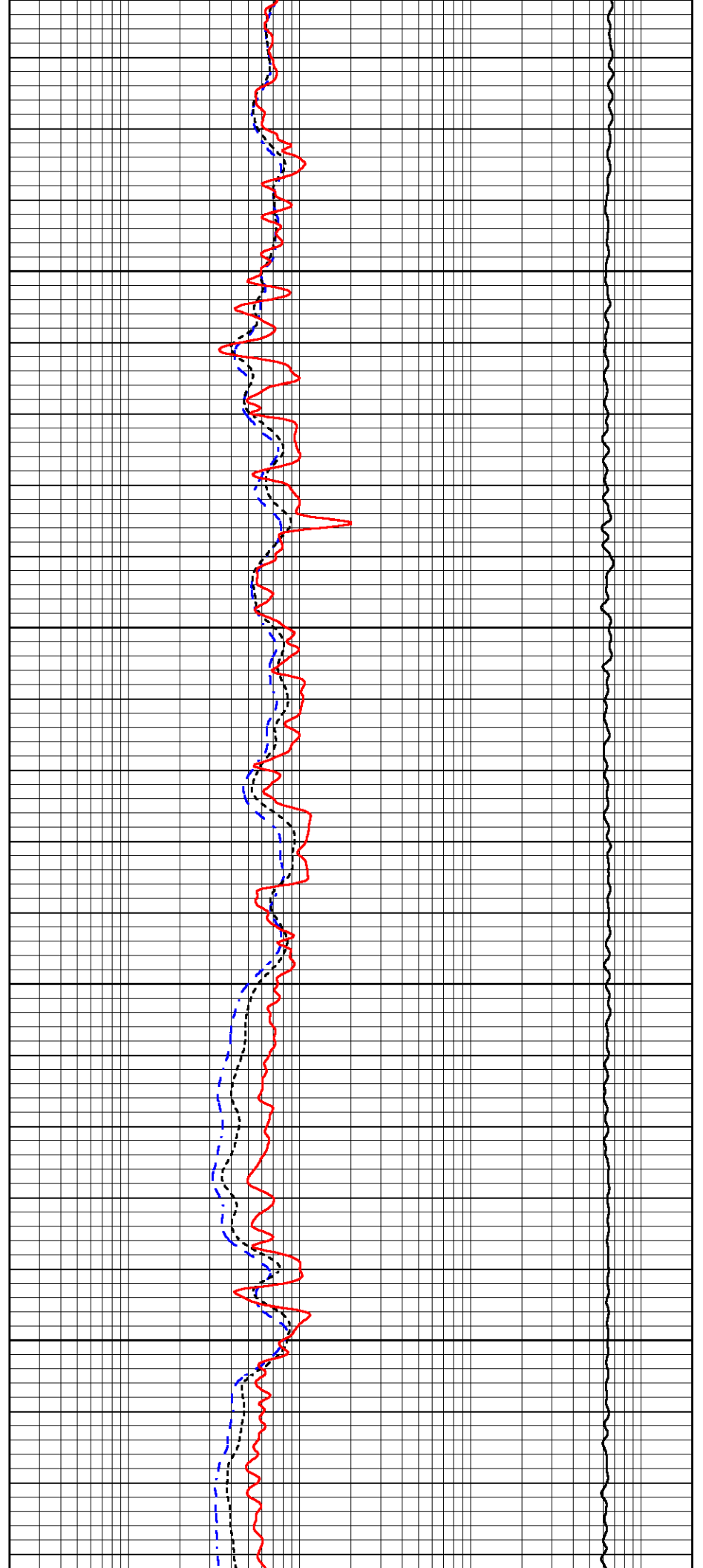


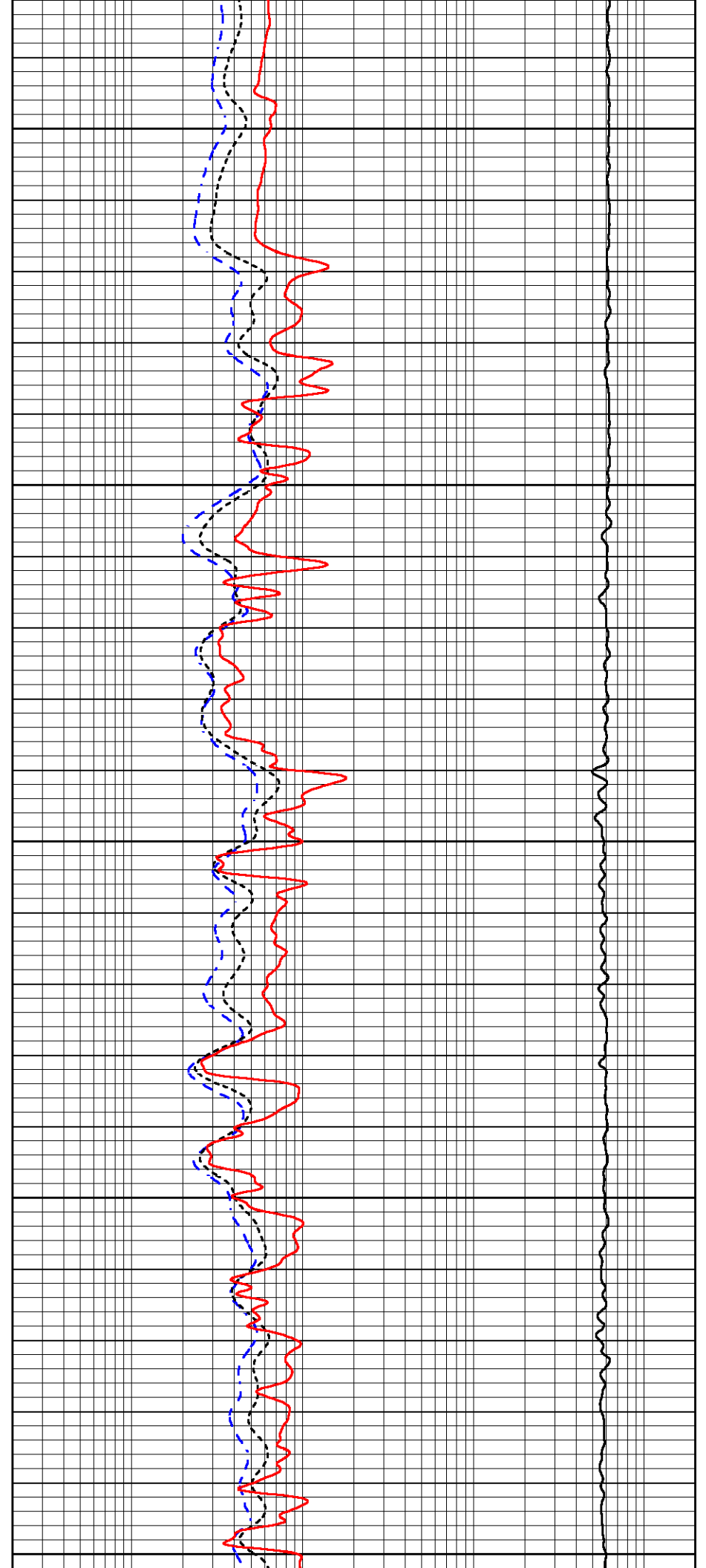
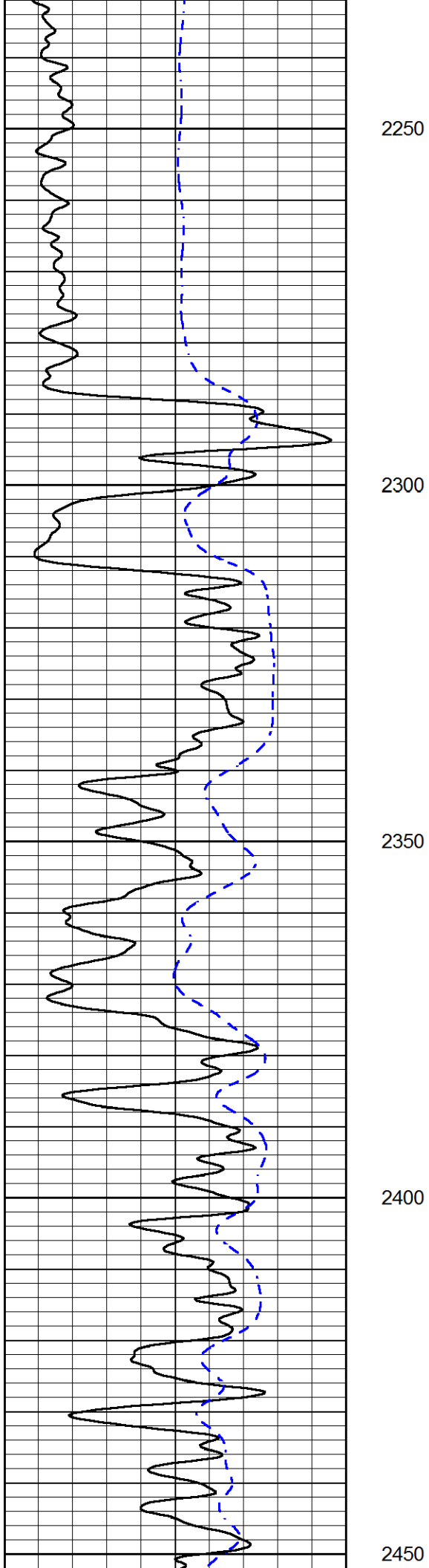
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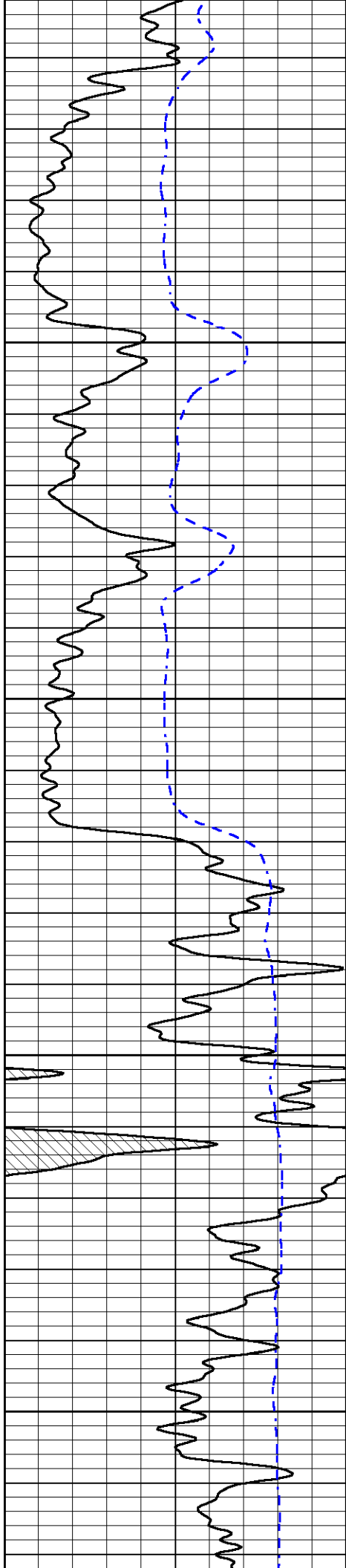
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2150

2200





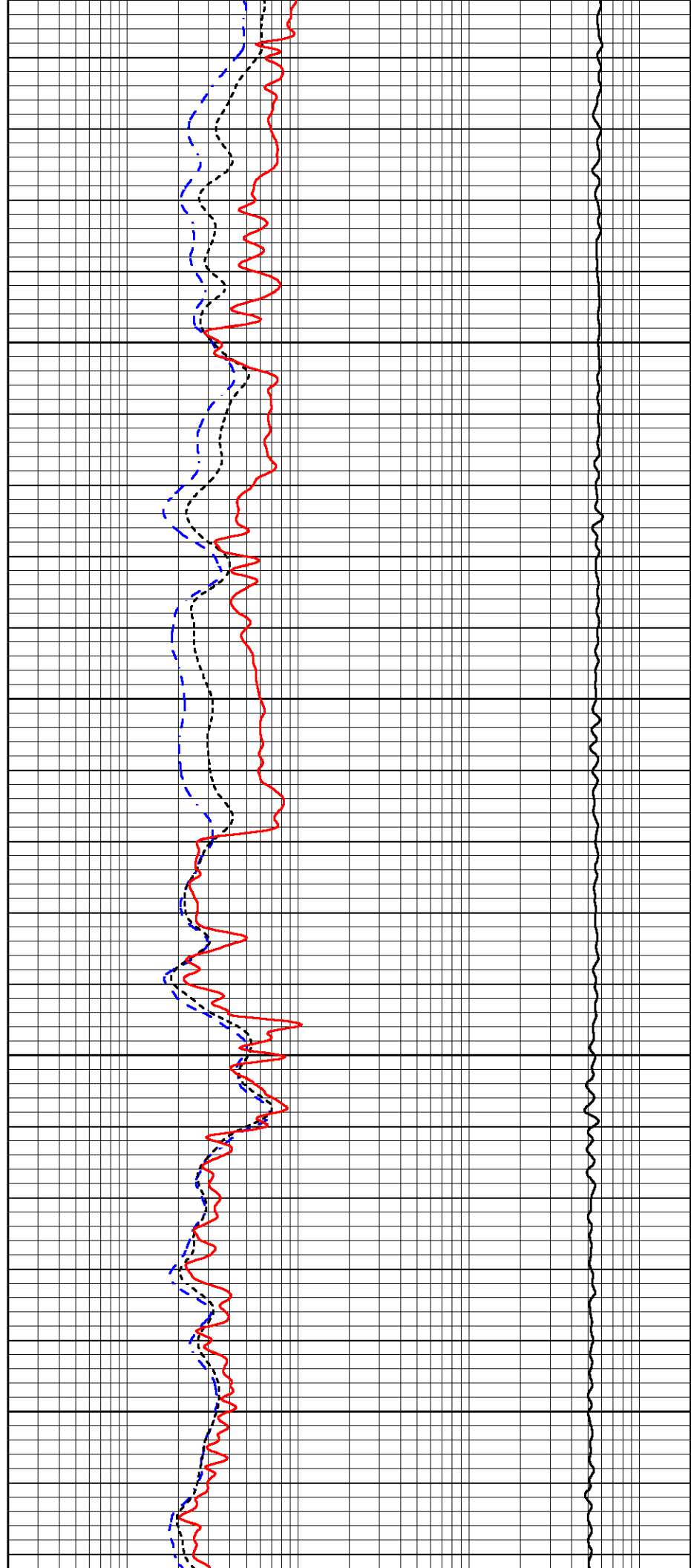


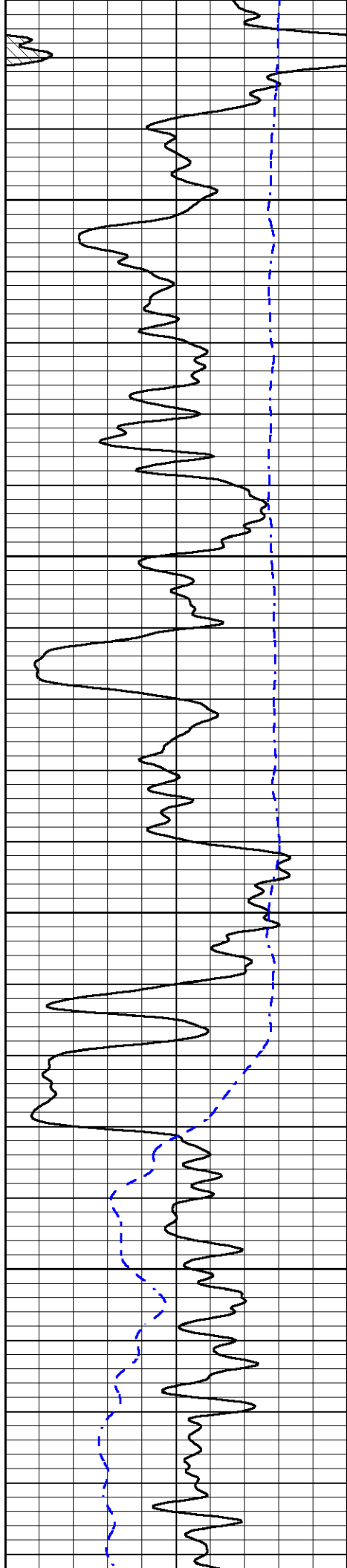
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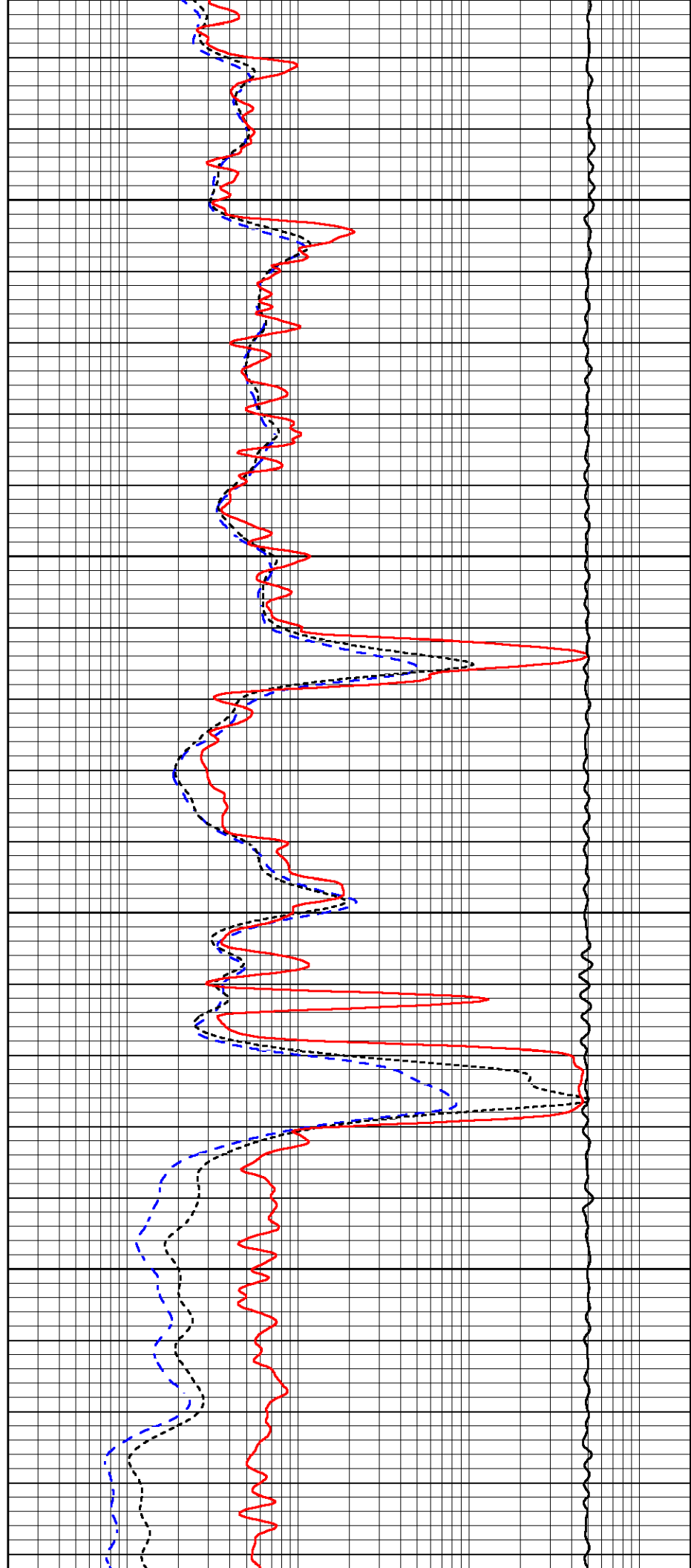


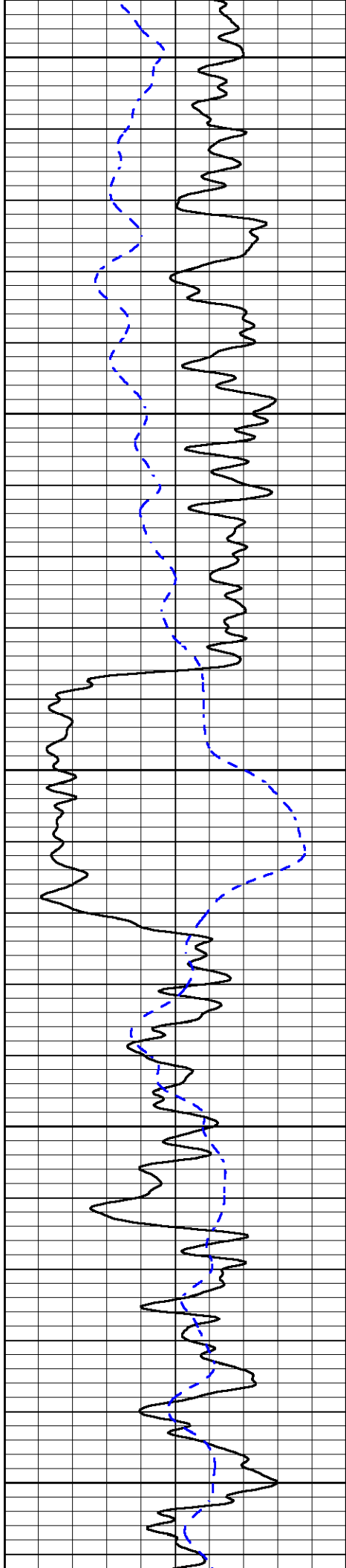
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2750

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2850





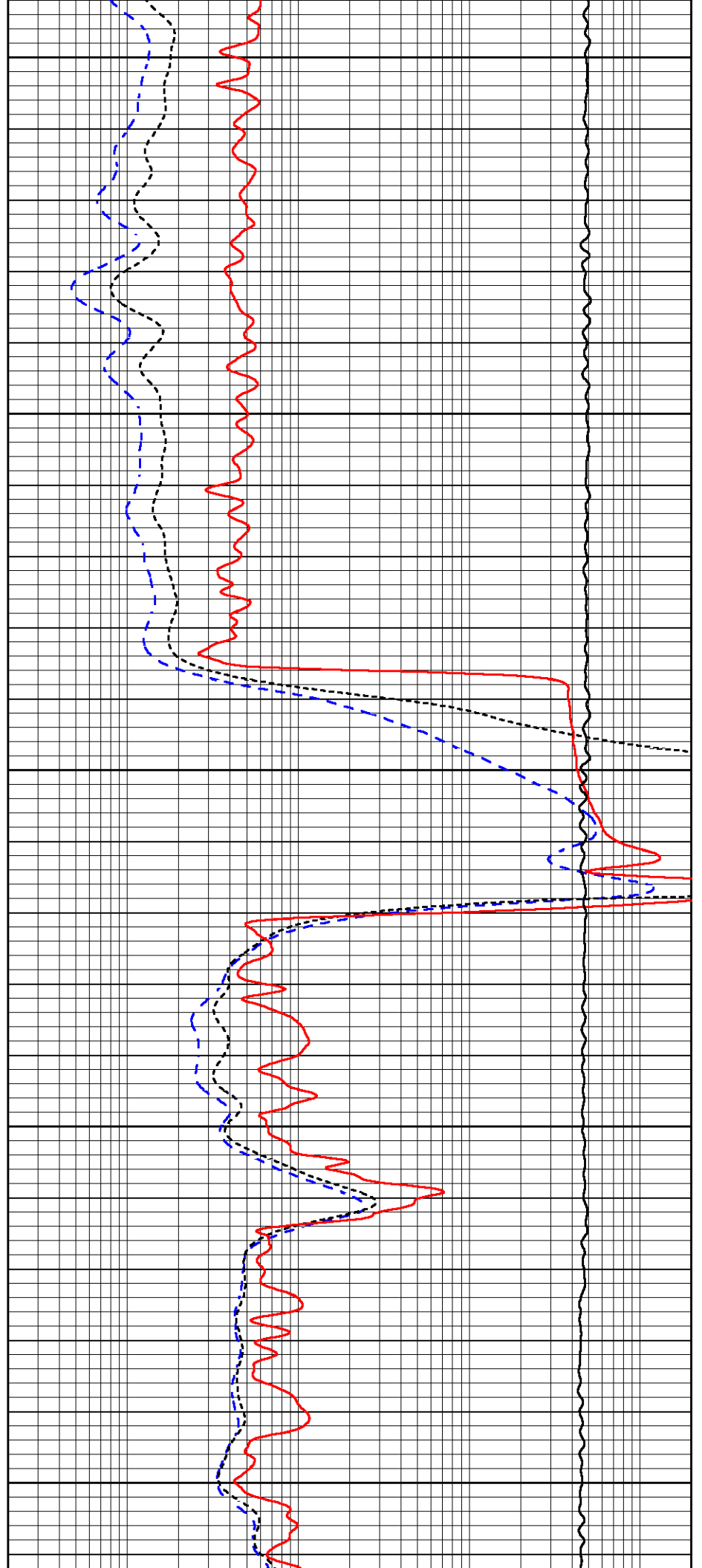
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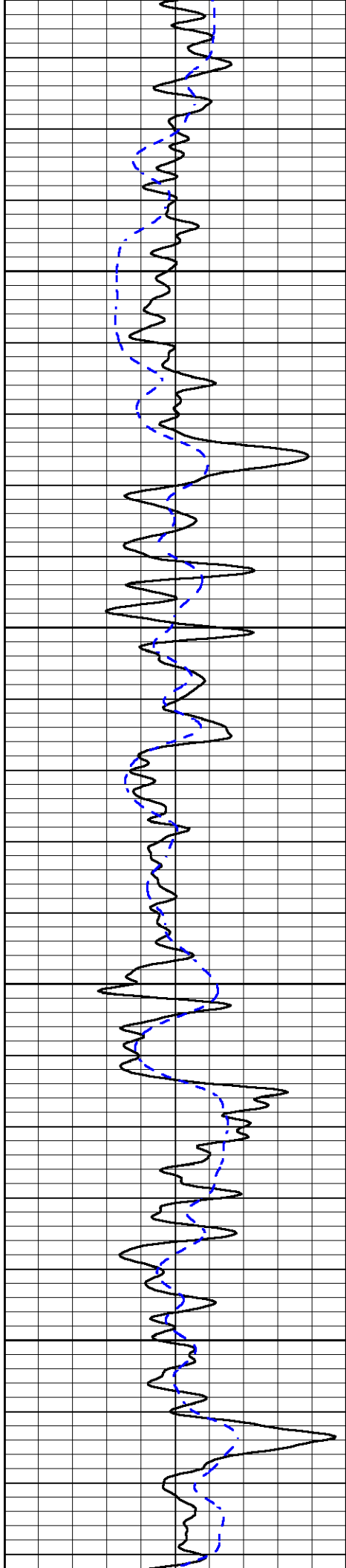
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3000

3050

3100



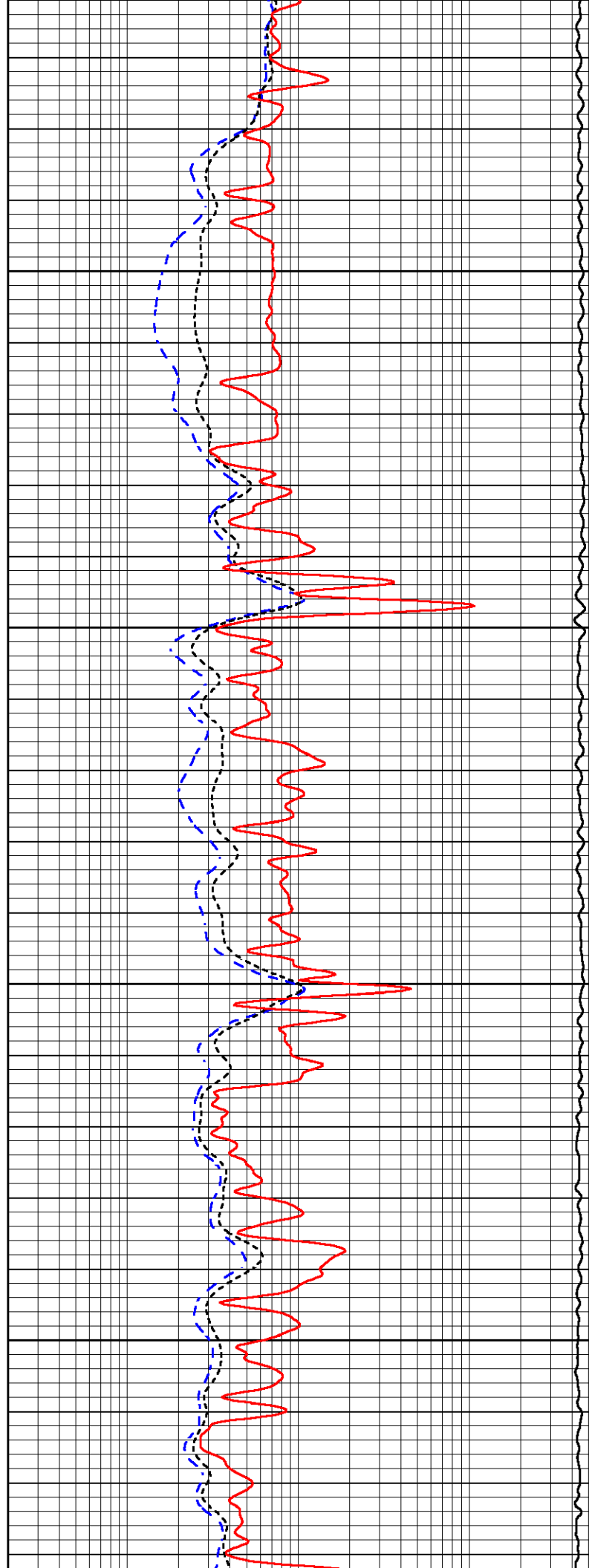


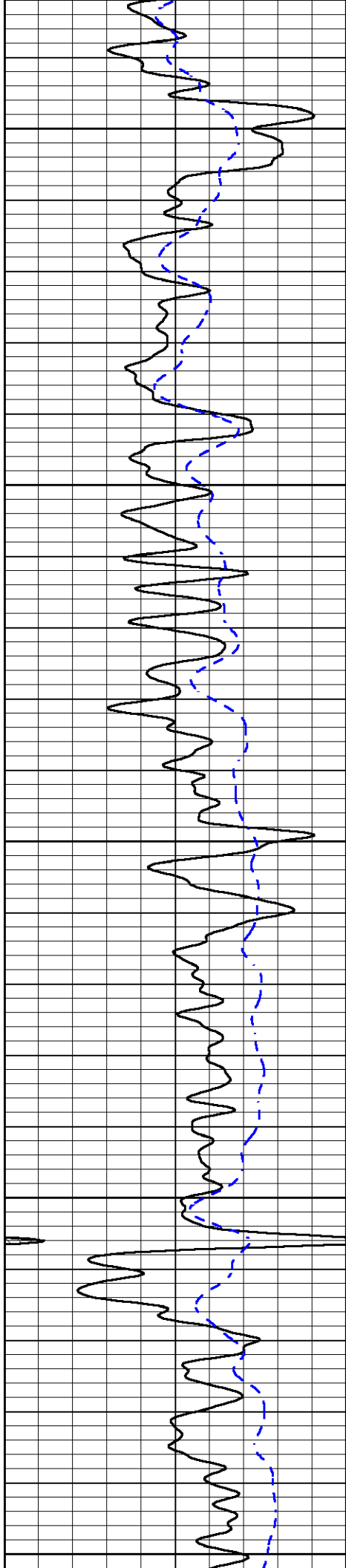
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3200

3250

3300





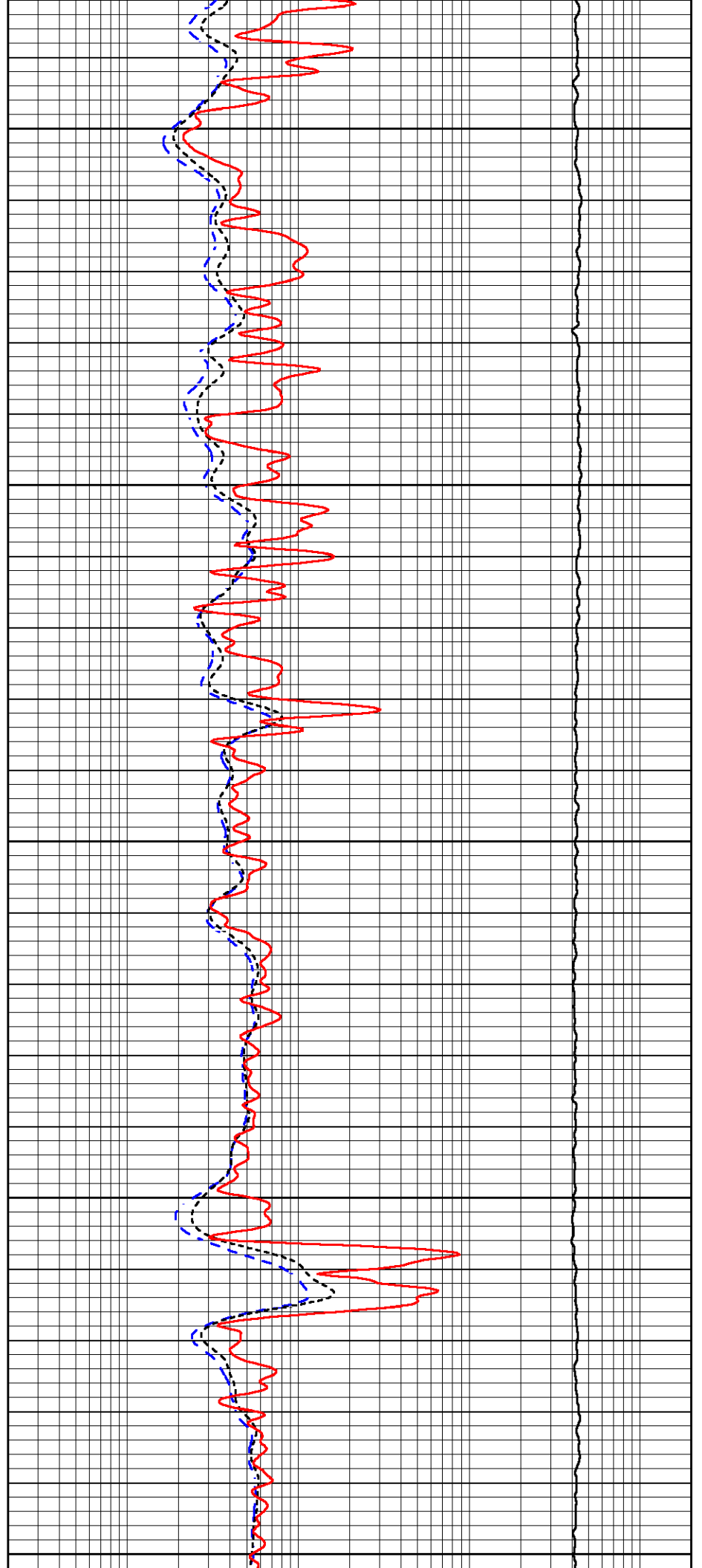
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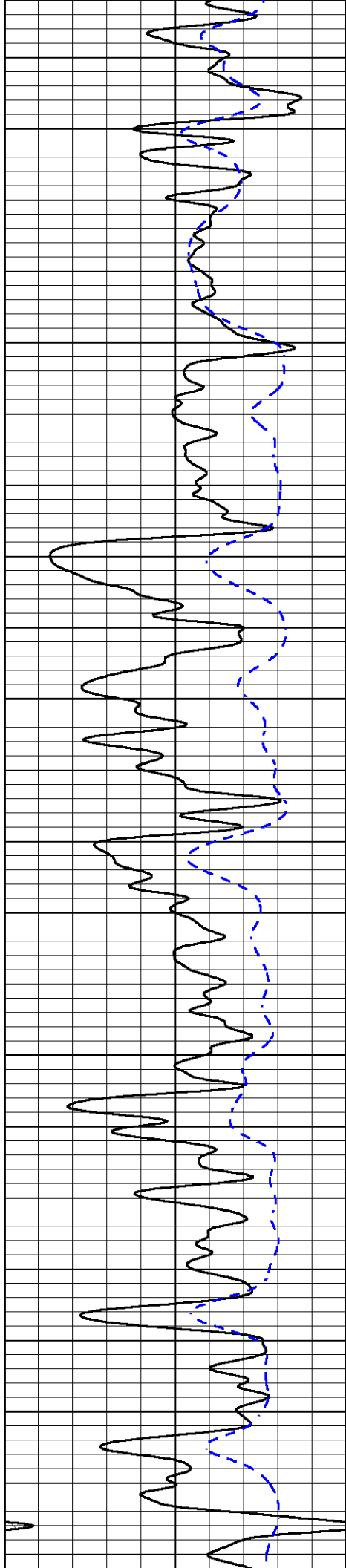
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3450

3500

3550



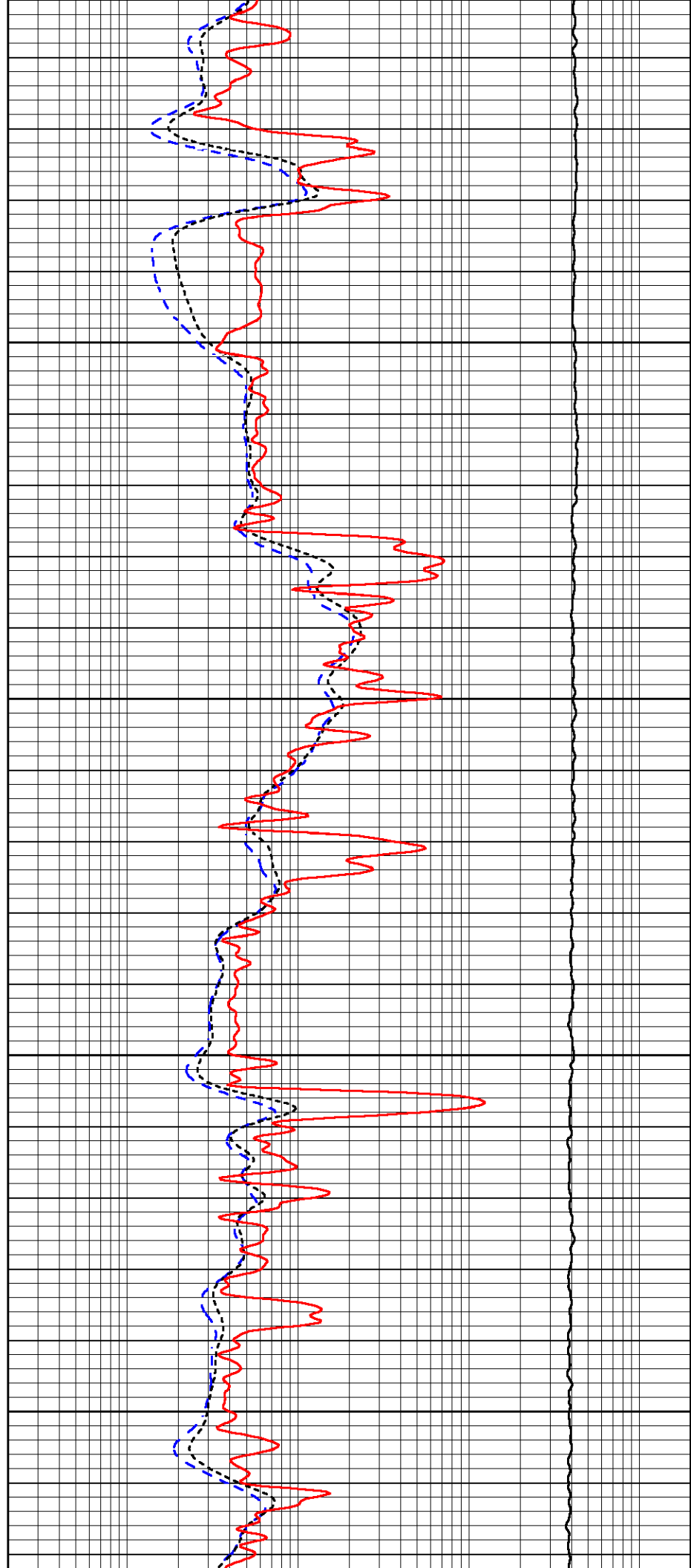


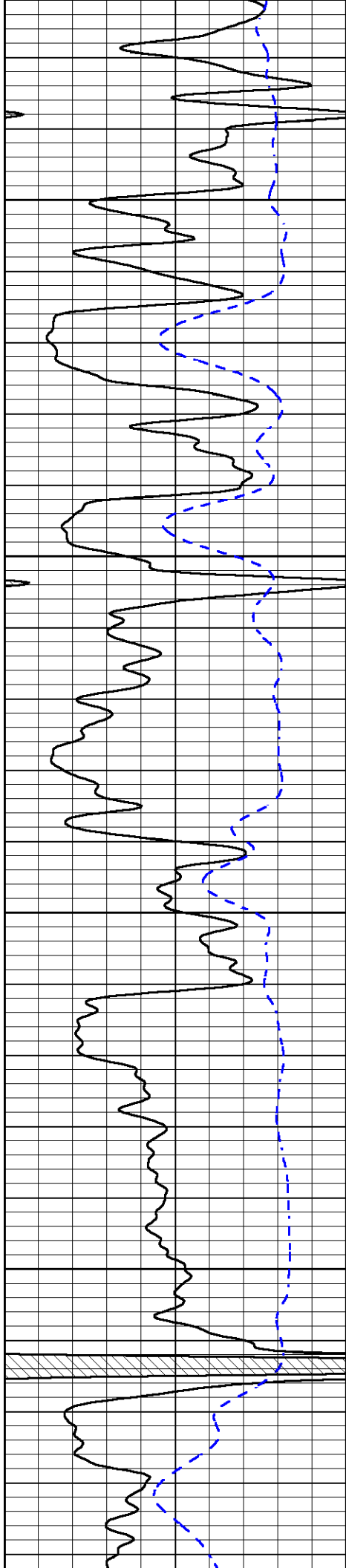
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3650

3700

3750



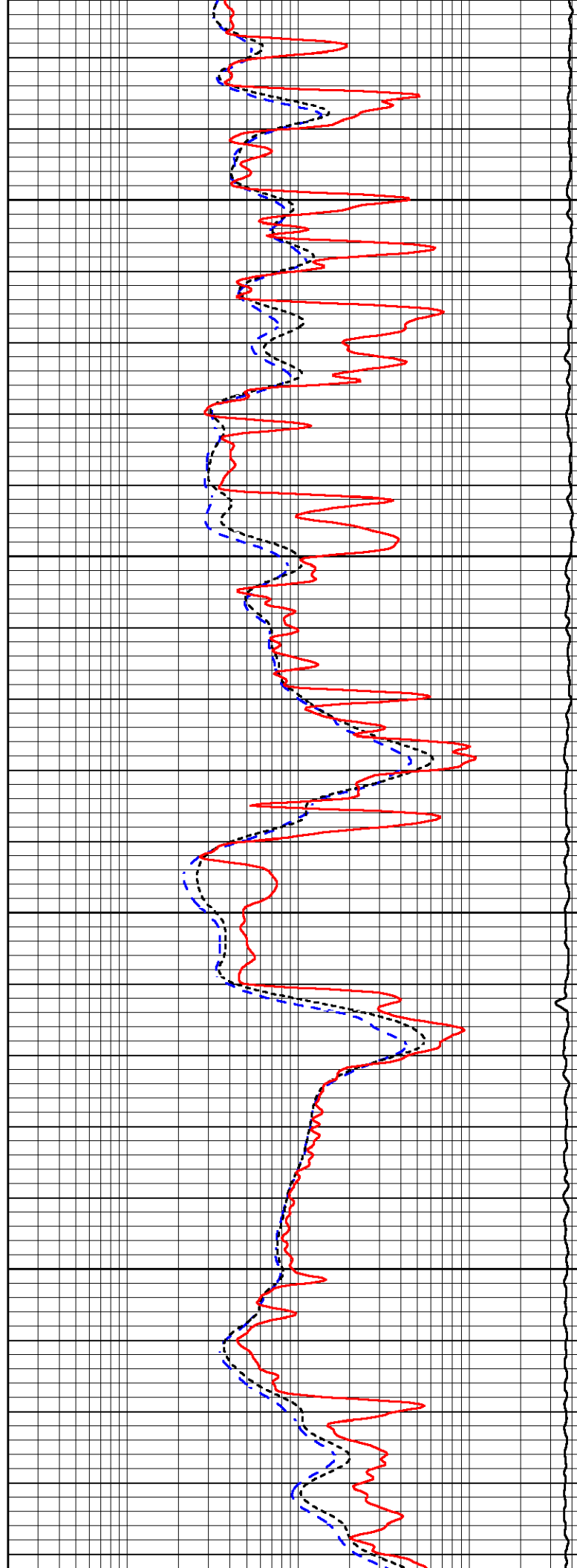


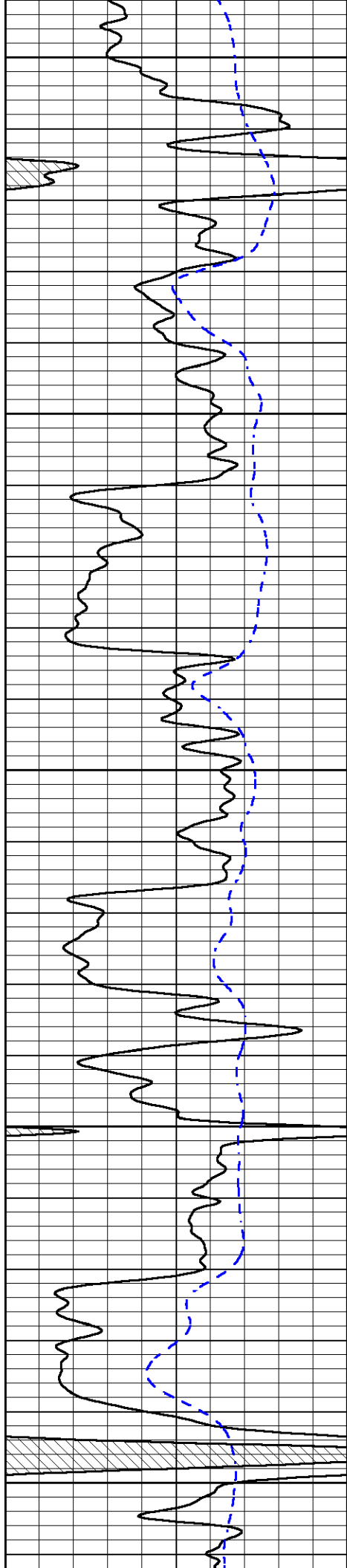
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3850

3900

3950





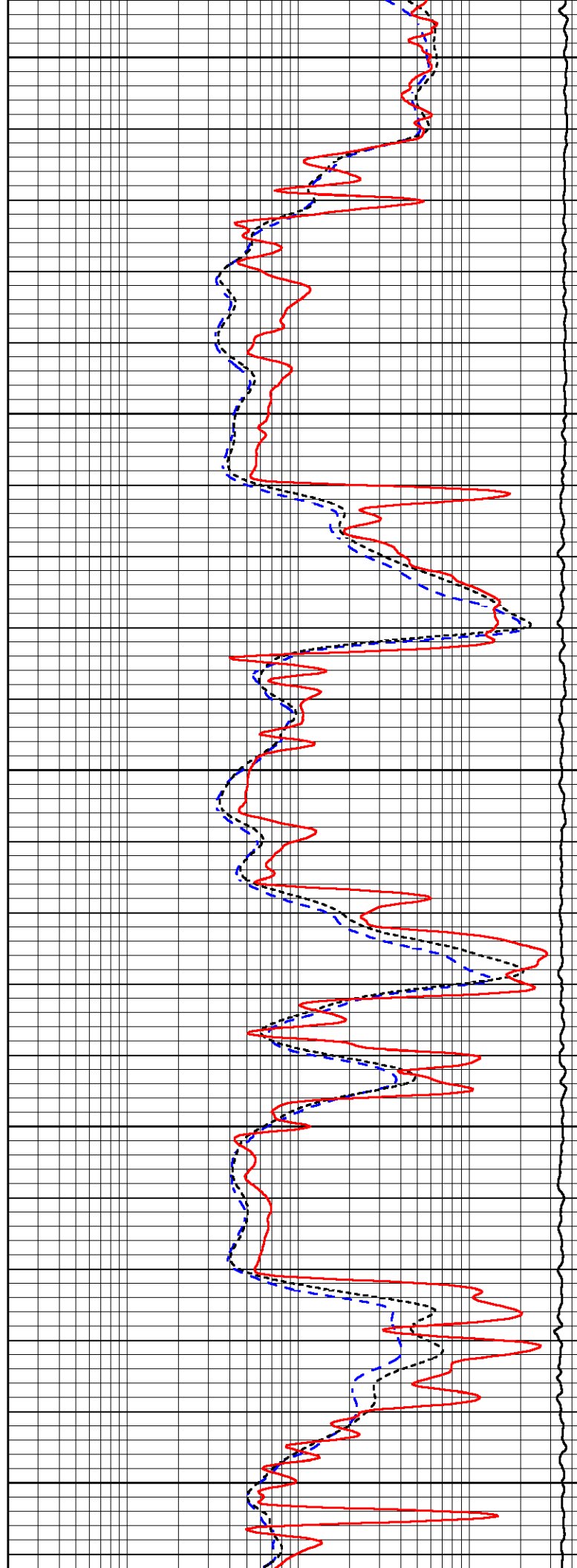
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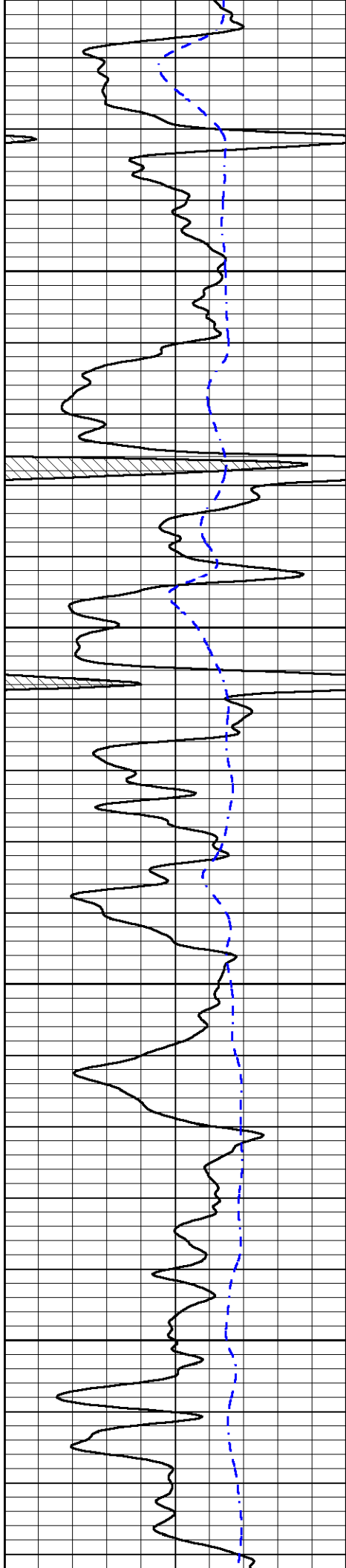
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4100

4150

4200



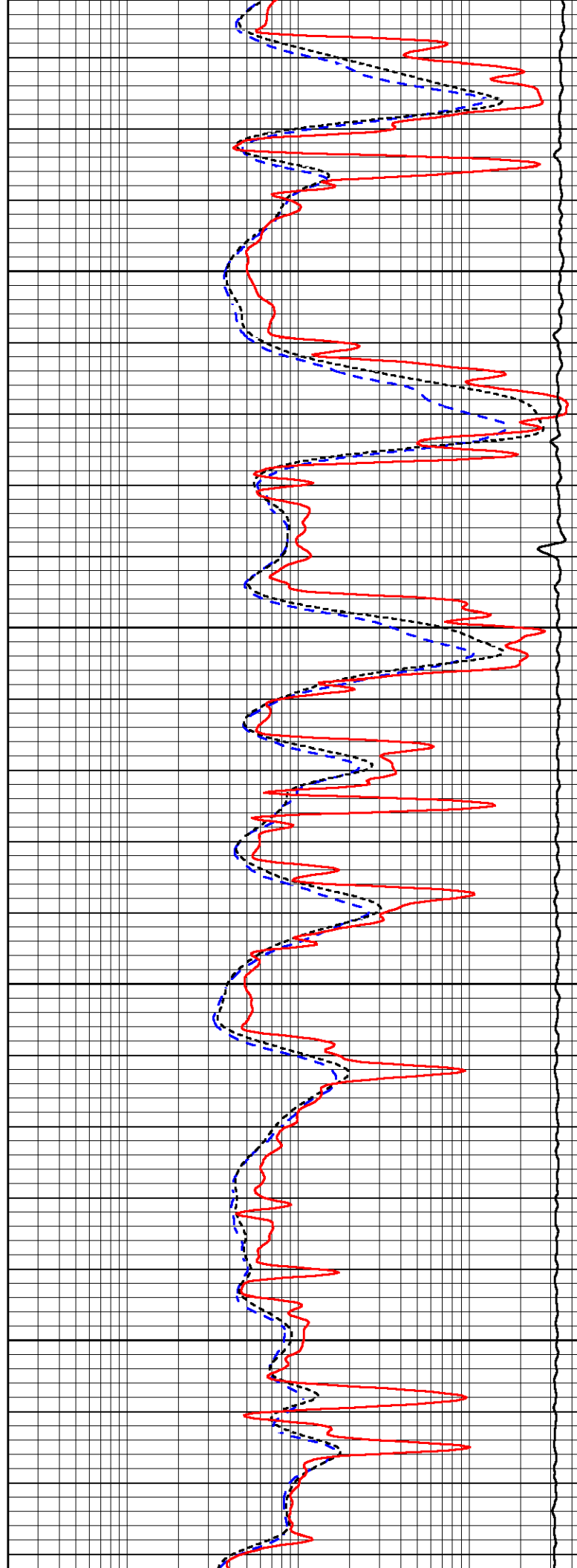


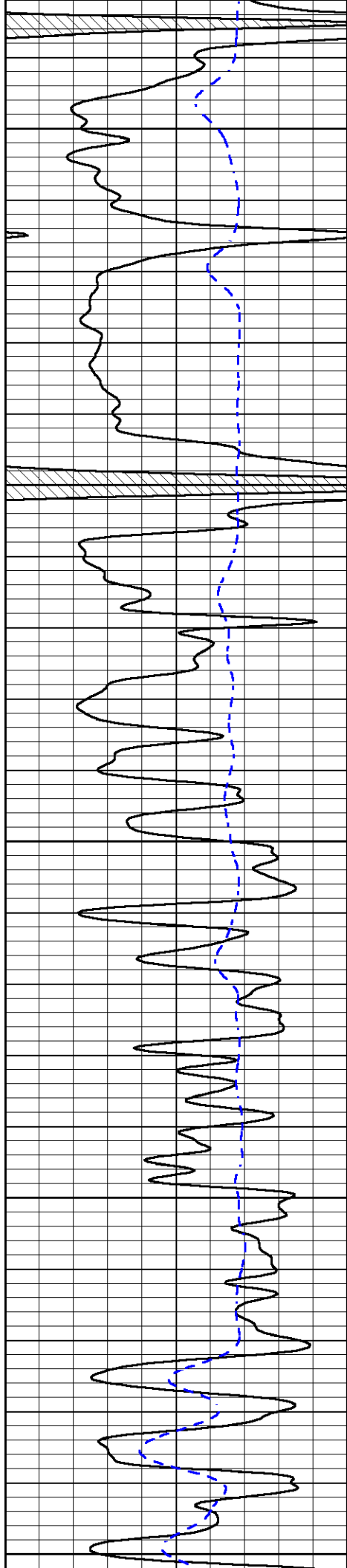
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4350

4400





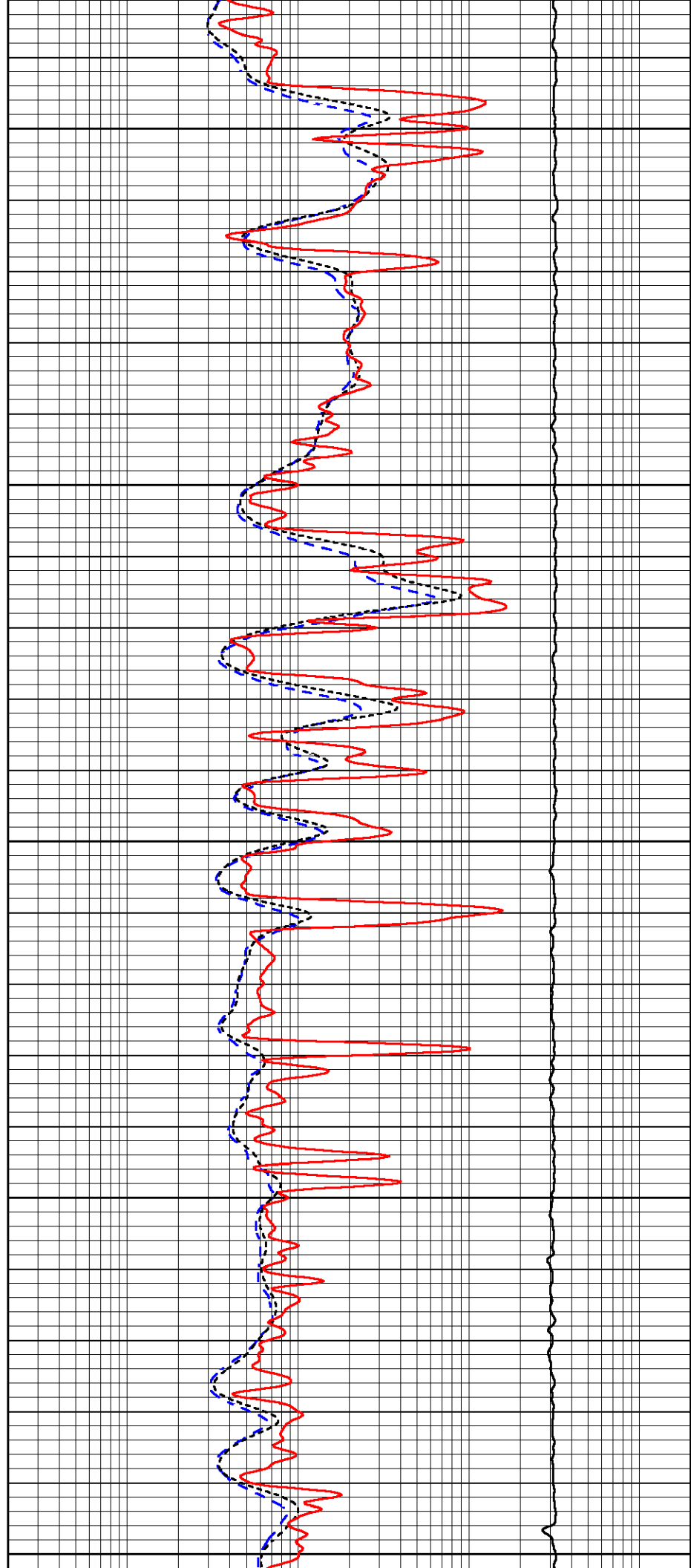
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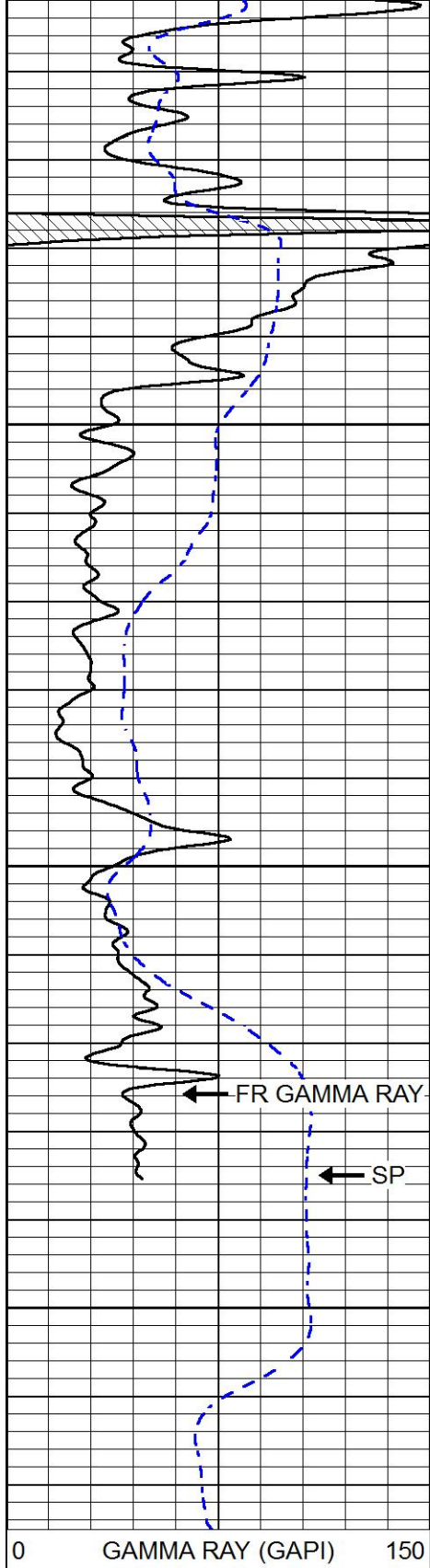
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4550

4600

4650





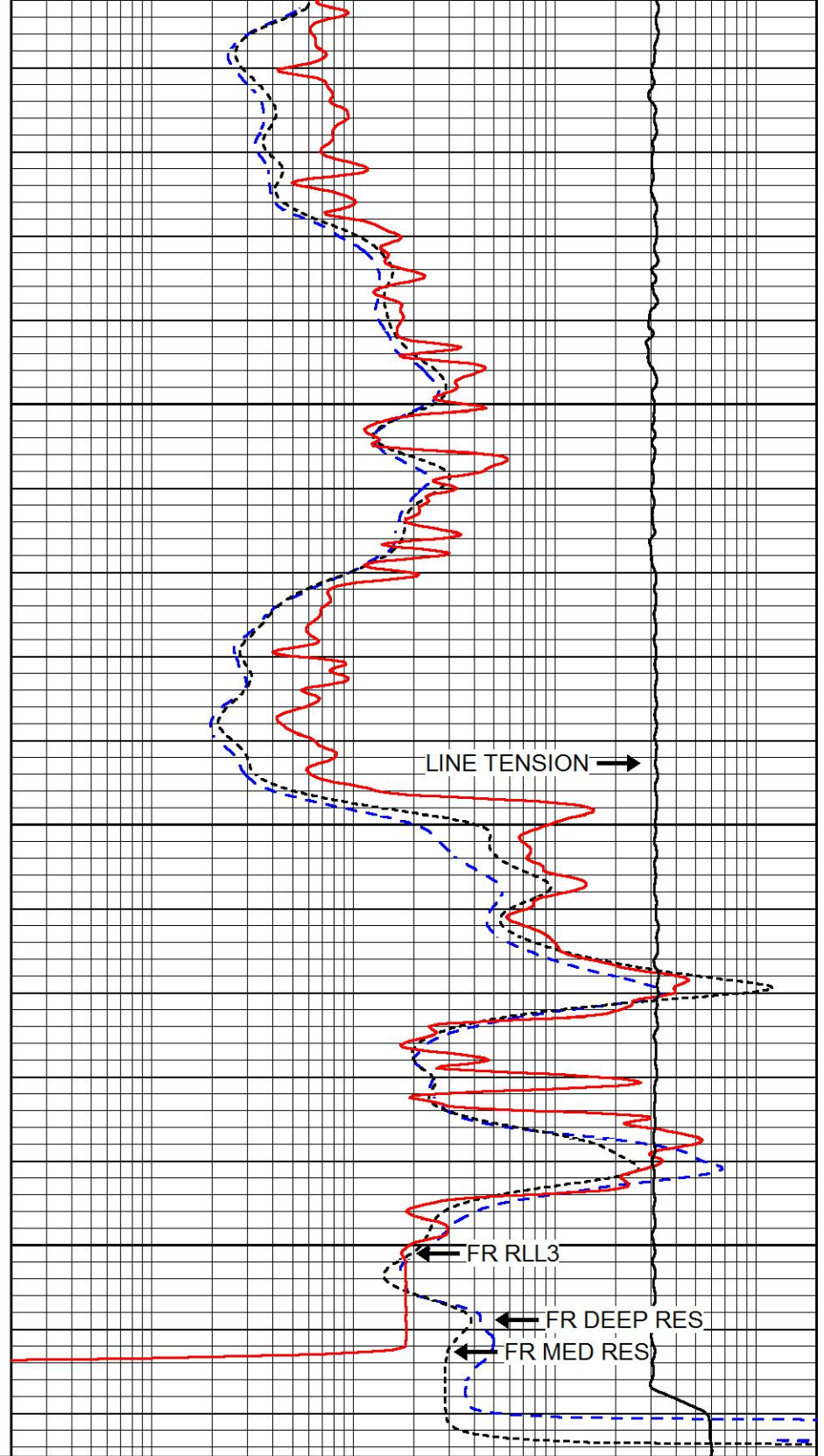
0 GAMMA RAY (GAPI) 150

-200 SP (mV) 0

4700

4750

4800



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

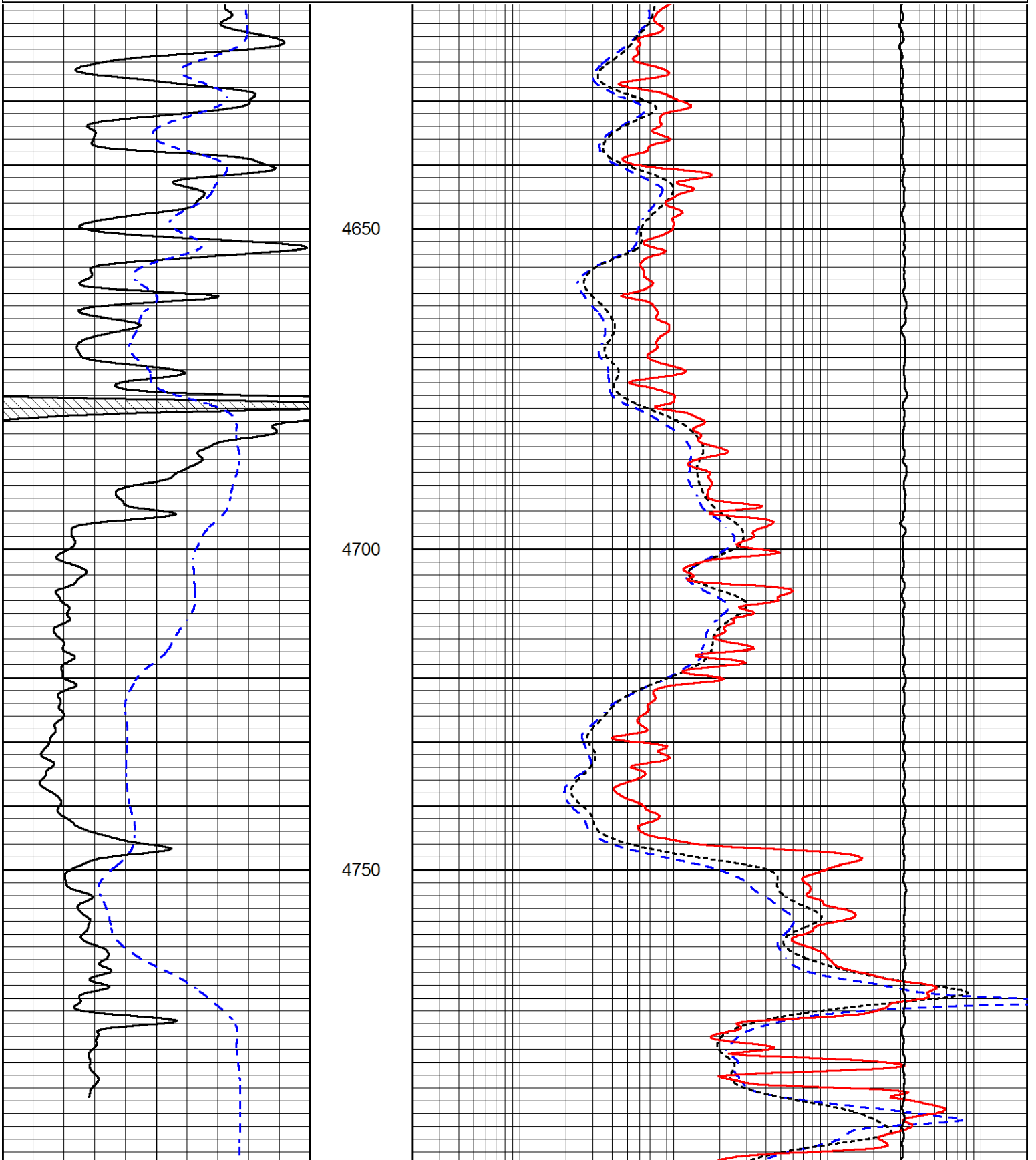


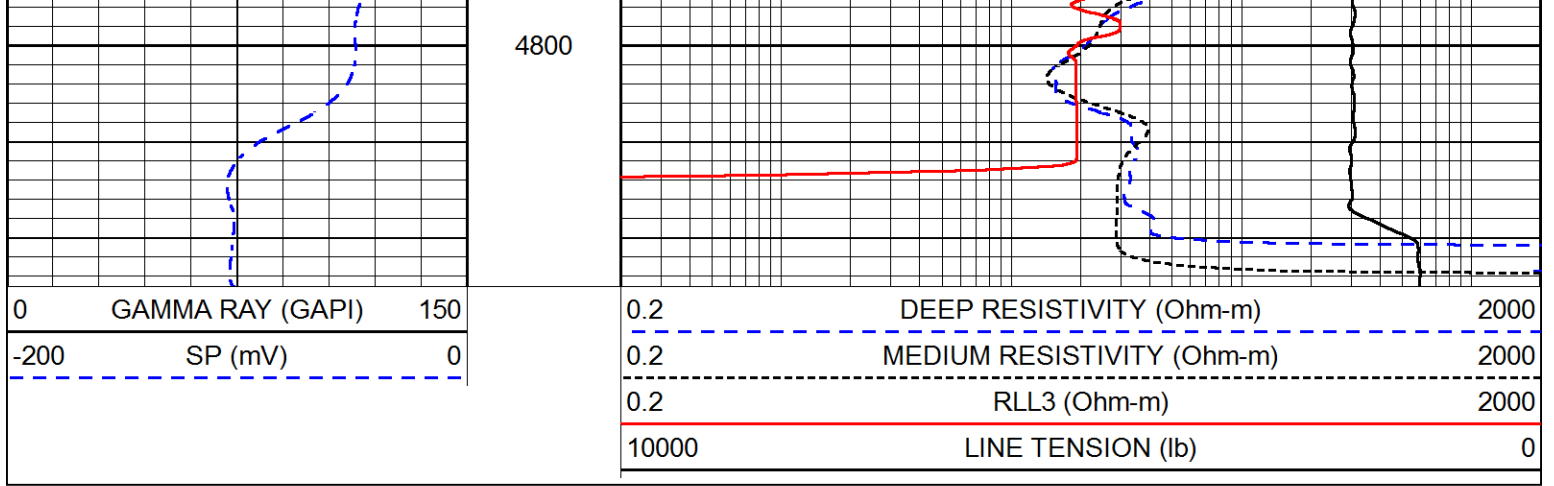
REPEAT SECTION

Database File murfin_frisbie b 1-15.db
 Dataset Pathname STKML/pass3.3
 Presentation Format dil
 Dataset Creation Sun Oct 07 19:32:58 2018
 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 |
| 10000 | LINE TENSION (lb) | 0 |





Calibration Report

Database File murfin_frisbie b 1-15.db
 Dataset Pathname STKML/pass4.1
 Dataset Creation Sun Oct 07 22:22:04 2018

Dual Induction Calibration Report

Serial-Model: 967 (HT)-PSI HIGH TEMP
 Calibration Performed: Sun Oct 07 19:24:22 2018

| Loop: | Readings | | References | | | Results | |
|--------|----------|----------|------------|---------|--------|---------|---------|
| | Air | Loop | Air | Loop | | Gain | Offset |
| Deep | 167.000 | 835.000 | 0.000 | 255.800 | mmho/m | 0.565 | -19.250 |
| Medium | 0.000 | 1348.000 | 142.000 | 255.800 | mmho/m | 0.390 | -40.000 |

Microlog Calibration Report

Serial-Model: PSI-01-PSIML
 Performed: Sat Sep 08 05:17:35 2018

| | Readings | | References | | | Results | |
|---------|----------|--------|------------|---------|-------|------------|----------|
| | Zero | Cal | Zero | Cal | | m | b |
| Normal | 0.0000 | 1.0000 | 0.0000 | 1.0000 | Ohm-m | 18000.0000 | -1.0000 |
| Inverse | 0.0000 | 1.0000 | 0.0000 | 1.0000 | Ohm-m | 21500.0000 | -0.6000 |
| Caliper | 1.0001 | 1.1397 | 6.5000 | 18.5000 | in | 70.0000 | -65.8500 |

Compensated Density Calibration Report

Serial-Model: 144-84-M&W
 Source / Verifier: 16955B / 2ci
 Master Calibration Performed: Thu Aug 30 10:10:19 2018

Master Calibration

| | Density | | Far Detector | Near Detector | |
|-----------|---------|------|--------------|---------------|-----|
| Magnesium | 1.755 | g/cc | 4867.47 | 6031.92 | cps |
| Aluminum | 2.650 | g/cc | 906.23 | 3806.99 | cps |

Spine Angle = 74.69

Density/Spine Ratio = 0.514

| | Size | | Reading |
|------------|-------|----|---------|
| Small Ring | 5.00 | in | 0.70 |
| Large Ring | 15.00 | in | 0.04 |

Compensated Neutron Calibration Report

Serial Number: 207-MW
 Tool Model: M&W
 Calibration Performed: FRI AUG 24 10:30:30 2018

| 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: Fri Aug 24 11:16:10 2018

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 FRISBIE B #1-15
 Field WILDCAT
 County RAWLINS
 State KANSAS