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Pioneer Energy Services

# DUAL INDUCTION LOG

Company MURFIN DRILLING COMPANY, INC.
Well MEARS B #1-11
Field WILDCAT
County CHEYENNE State KANSAS

Location: API # : 15-023-21468-00-00
N2 SE NE SE
1800' FSL & 330' FEL
SEC 11 TWP 2S RGE 37W

Other Services
CNL/CDL
MEL/BHCS

Elevation
K.B. 3396'
D.F. N/A
G.L. 3391'

Permanent Datum GROUND LEVEL Elevation 3391'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING

Company MURFIN DRILLING COMPANY, INC.
Well MEARS B #1-11
Field WILDCAT
County CHEYENNE
State KANSAS

| | | | |
|---|---|---|---|
| Date | 7/29/2017 | | |
| Run Number | ONE | | |
| Depth Driller | 4900' | | |
| Depth Logger | 4900' | | |
| Bottom Logged Interval | 4899' | | |
| Top Log Interval | 00' | | |
| Casing Driller | 8.625" @ 346' | | |
| Casing Logger | 344' | | |
| Bit Size | 7.875" | | |
| Type Fluid in Hole | CHEMICAL | | |
| Salinity,ppm CL | 800 | | |
| Density / Viscosity | 9.1 56 | | |
| pH / Fluid Loss | 10.5 7.2 | | |
| Source of Sample | FLOWLINE | | |
| Rm @ Meas. Temp | 0.6 @ 85 | | |
| Rmf @ Meas. Temp | 0.45 @ 85 | | |
| Rmc @ Meas. Temp | 0.81 @ 85 | | |
| Source of Rmf / Rmc | CHARTS | | |
| Rm @ BHT | 0.41 @ 125 | | |
| Operating Rig Time | 4 1/2 HOURS | | |
| Max Rec. Temp. F | 125 DEG F | | |
| Equipment Number | 108 | | |
| Location | HAYS | | |
| Recorded By | T. MARTIN | | |
| Witnessed By | STEVE MILLER | | |

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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.

MCDONALD, 2 W TO CO LINE,
7.6 N TO RD W, 1 W, 1/4 N, W INTO

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

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

| Your Pioneer Energy Services Crew | This Log Record Was Witnessed By |
|---|---|
| Engineer: T. MARTIN | Primary Witness: STEVE MILLER |
| Operator: | Secondary Witness: |
| Operator: | Secondary Witness: |
| Operator: | Secondary Witness: |

| Sensor | Offset (ft) | Schematic | Description | Length (ft) | O.D. (in) | Weight (lb |
|---|---|---|---|---|---|---|

| Sensor | Offset (ft) | Schematic | Description | Length (ft) | O.D. (in) | Weight (lb |
|---|---|---|---|---|---|---|
| | | | GR-M&W (89-M&W) | 3.00 | 3.50 | 50.00 |
| GR | 33.00 | | | | | |
| CNLSC | 29.90 | | CNT-M&W (tk10-MW) | 5.50 | 3.50 | 100.00 |
| CNSSC | 29.15 | | | | | |
| | | | CDL-M&W (168-986) | 8.50 | 4.00 | 250.00 |
| LSD | 20.85 | | | | | |
| DCAL | 20.83 | | | | | |
| SSD | 20.35 | | | | | |
| RLL3 | 15.80 | | | | | |
| RLL3F | 15.79 | | | | | |
| | | | DIL-M&W (1987) | 18.50 | 3.50 | 220.00 |
| CILD | 8.00 | | | | | |
| CILM | 4.70 | | | | | |
| SP | 0.20 | | | | | |

Dataset: murfin_mears b_#1-11.db: field/well/stack/pass3.1
Total length: 35.50 ft
Total weight: 620.00 lb
O.D.: 4.00 in

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\murfin_mears b_#1-11.db
Dataset field/well/stack/pass3.1/_vars_

**Top - Bottom**

| A | BOREID in | BOTTEMP degF | CASEOD in | CASETHCK in | FLUIDDEN g/cc | M | MATRXDEN g/cc |
|---|---|---|---|---|---|---|---|
| 1 | 7.875 | 125 | 5.5 | 0 | 1 | 2 | 2.71 |

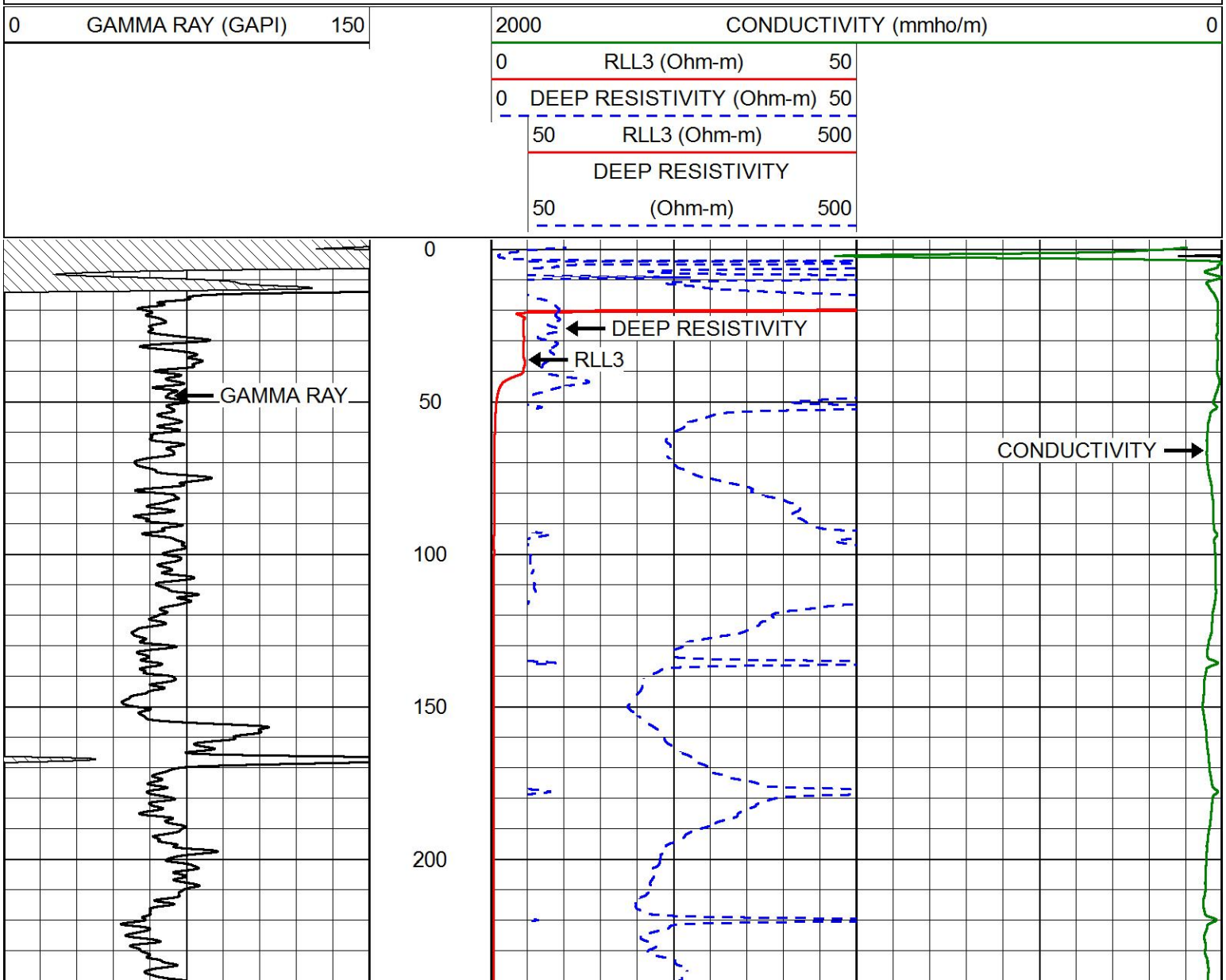
| NPORSEL | PERFS | SNDERR mmho/m | SNDERRM mmho/m | SPSHIFT mV | SRFTEMP degF | SZCOR | TDEPTH ft |
|---|---|---|---|---|---|---|---|
| Limestone | 0 | 0 | 0 | -520 | 80 | Off | 4900 |

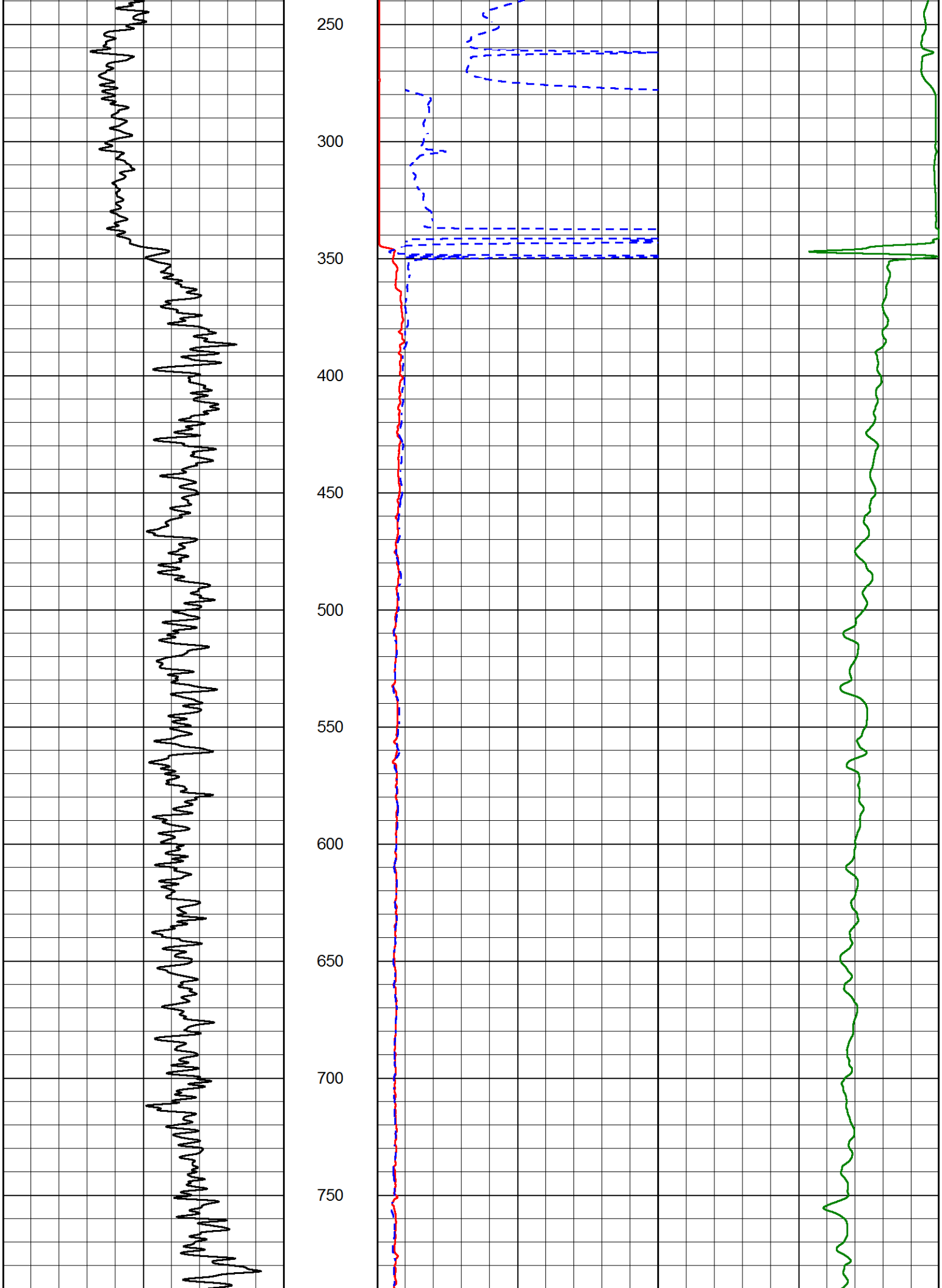
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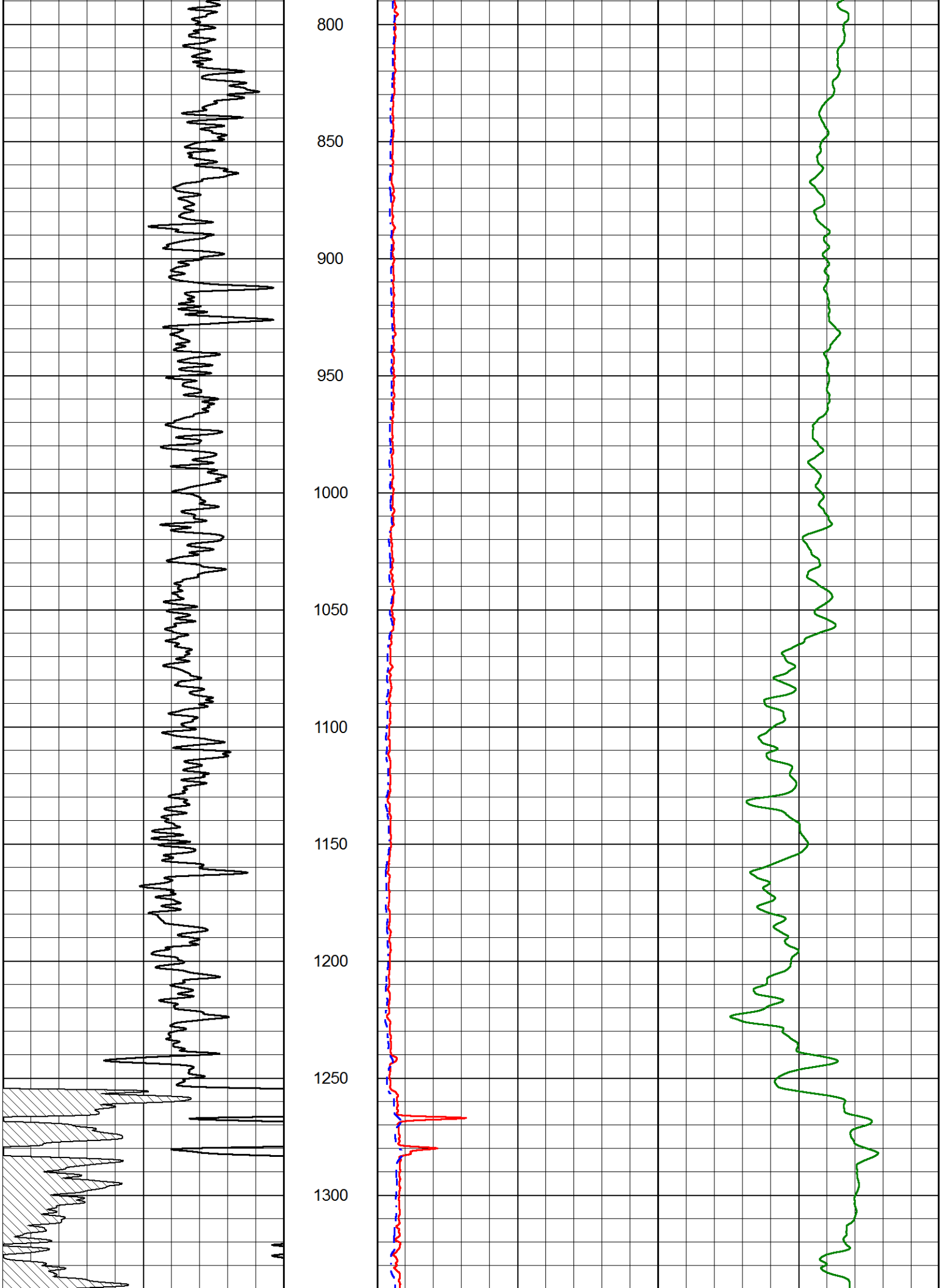
# 2" SCALE RESISTIVITY

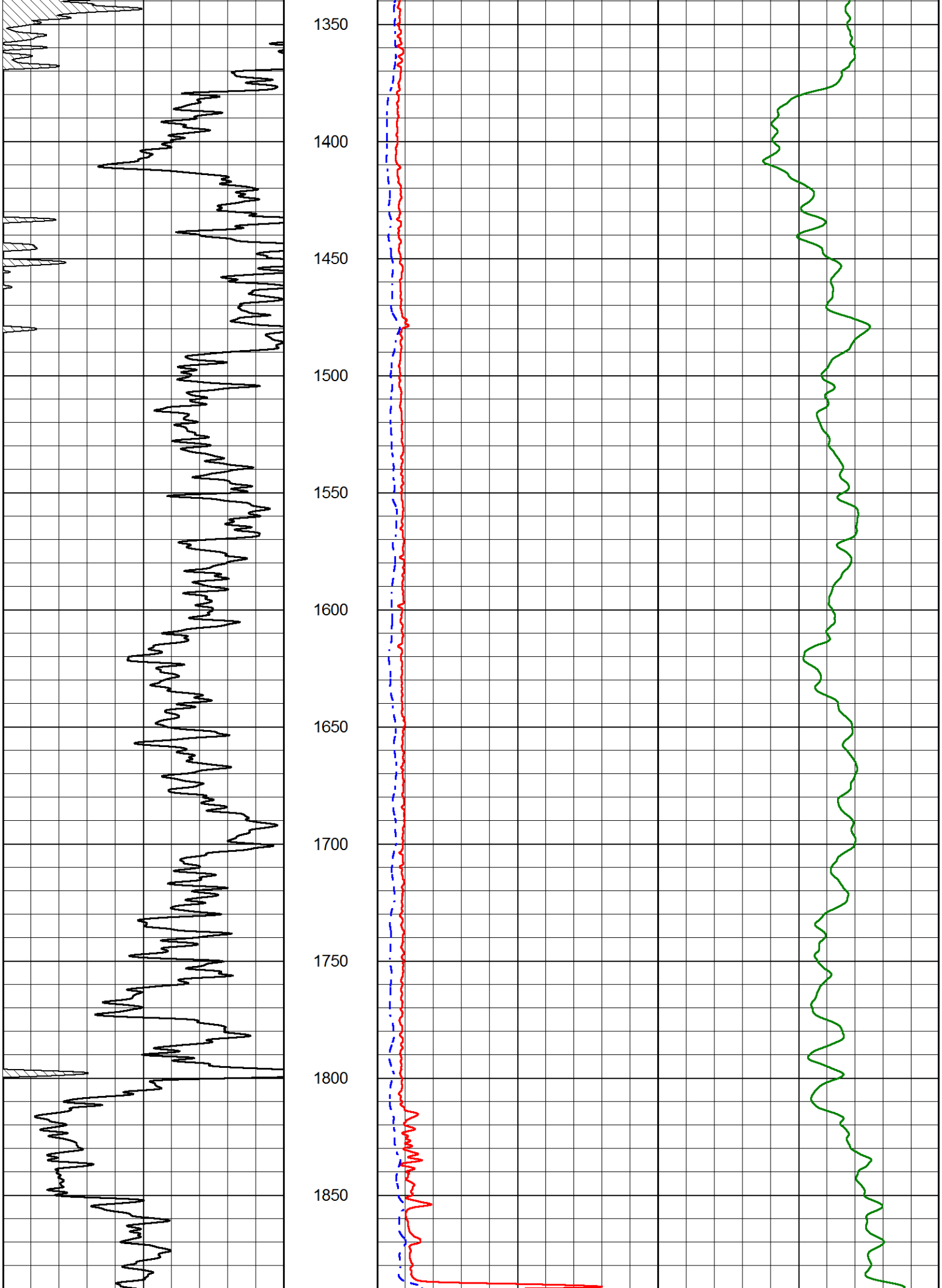
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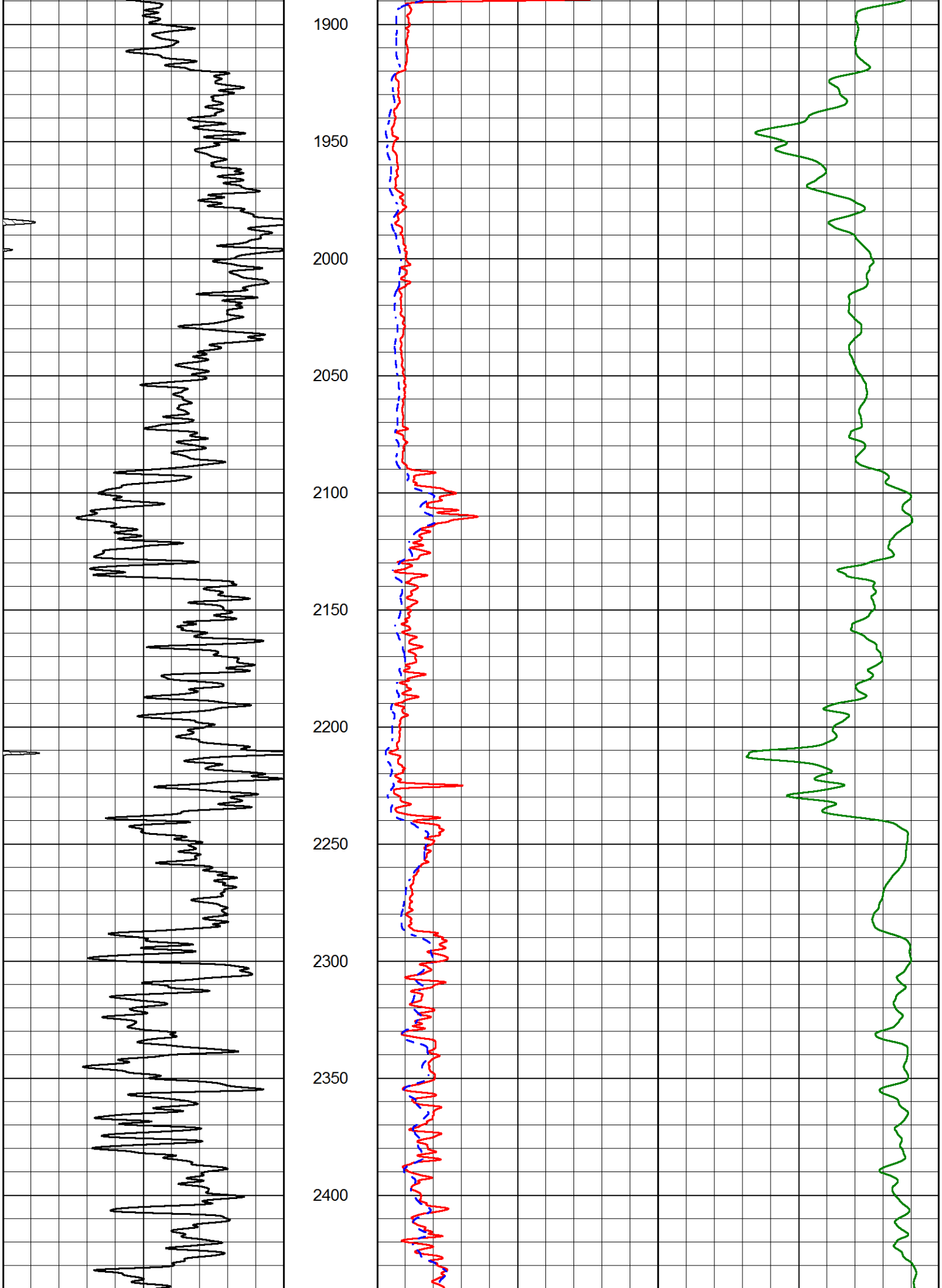
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|---|---|
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| Dataset Pathname | stack/pass3.2 |
| Presentation Format | dil2in |
| Dataset Creation | Sat Jul 29 04:11:51 2017 |
| Charted by | Depth in Feet scaled 1:600 |

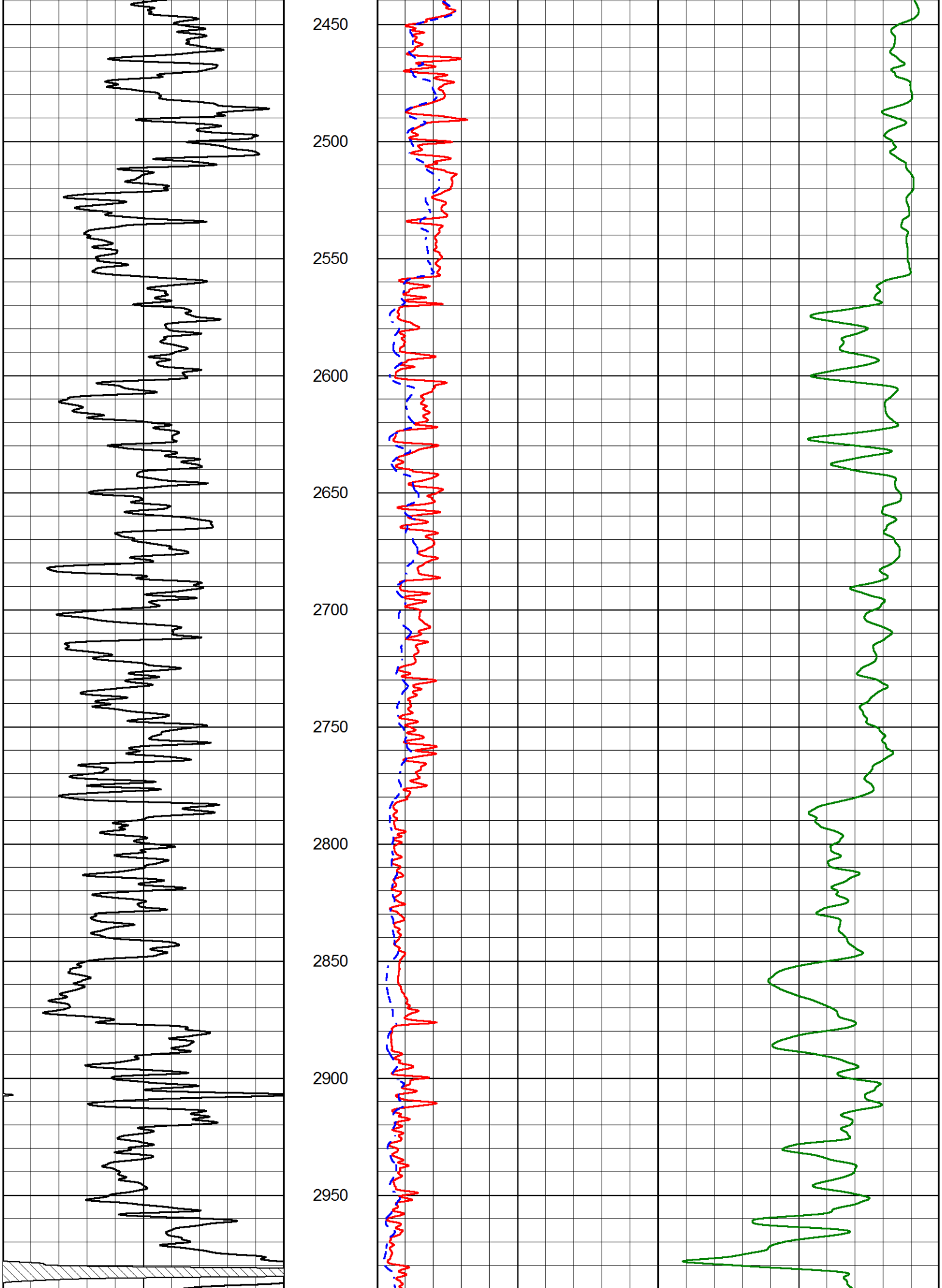


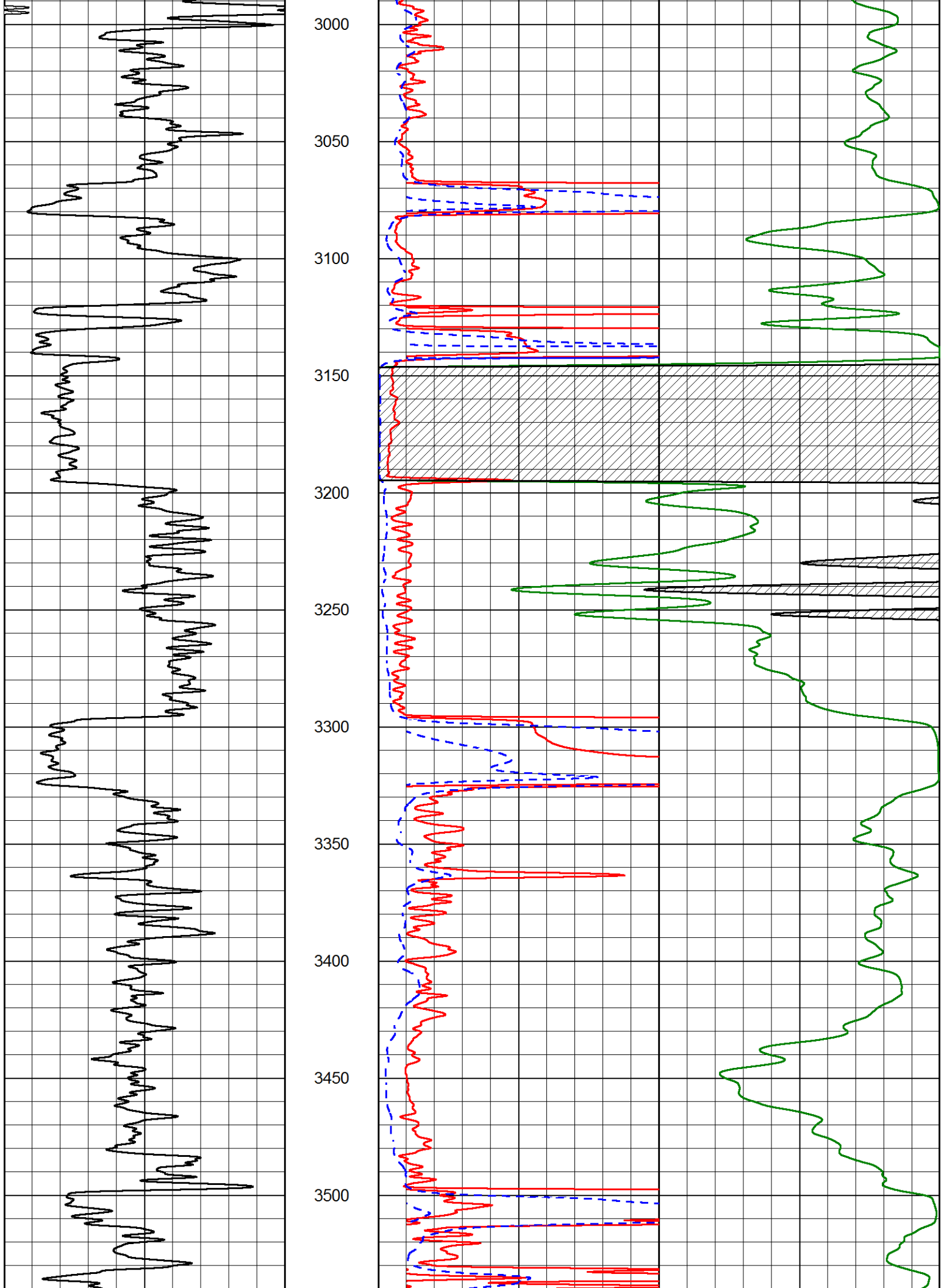

250
300
350
400
450
500
550
600
650
700
750

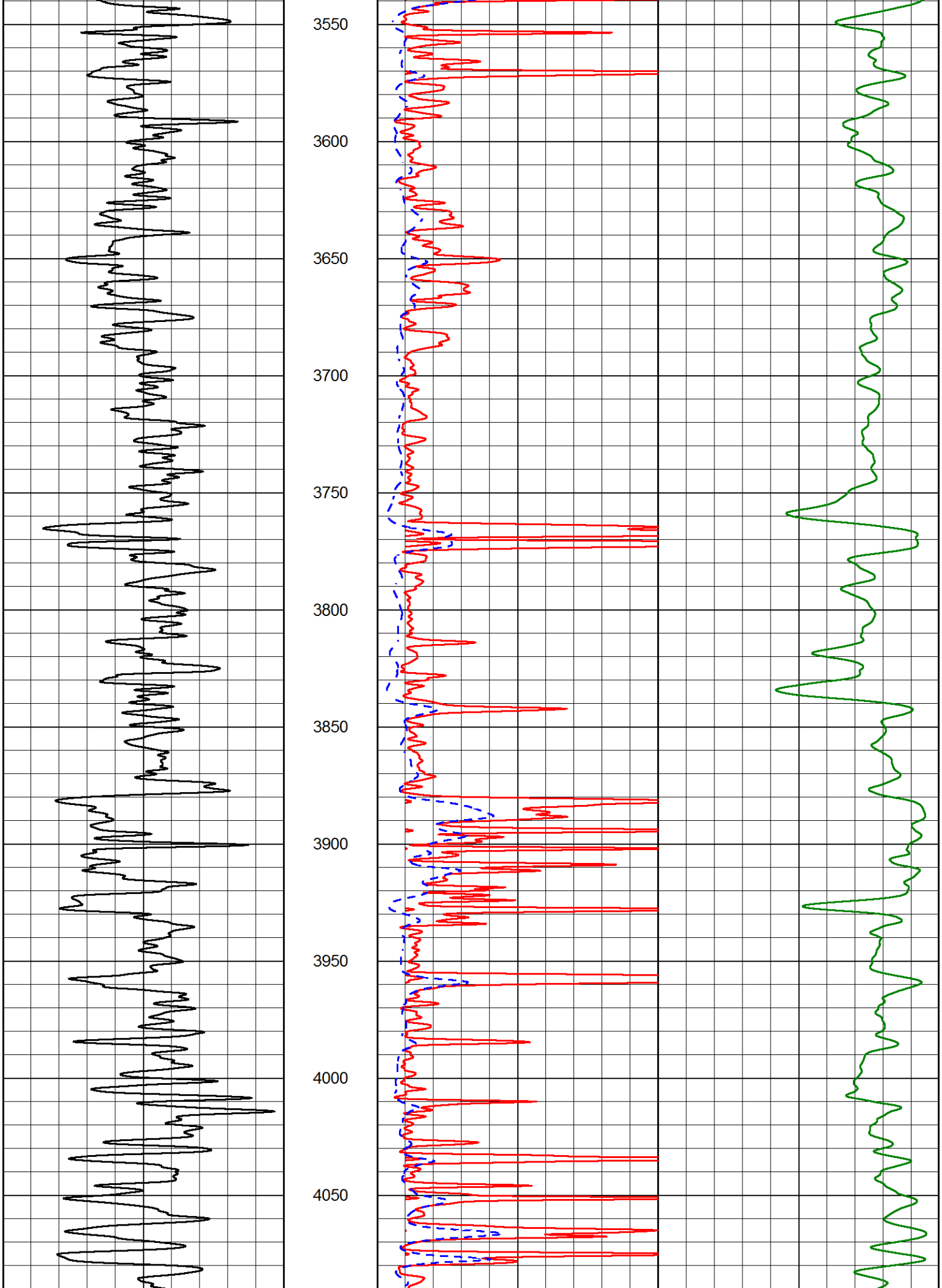

800
850
900
950
1000
1050
1100
1150
1200
1250
1300

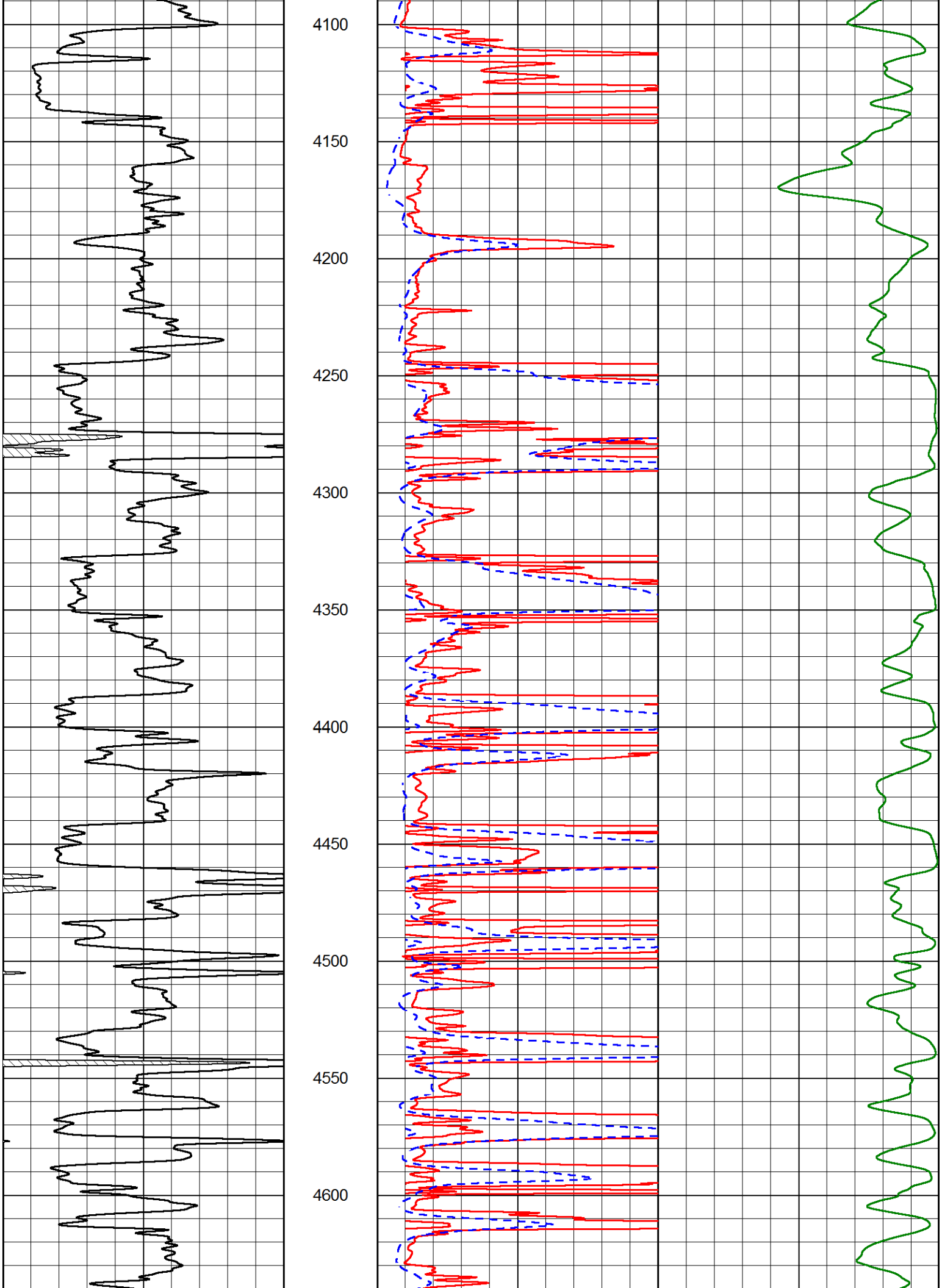

1350
1400
1450
1500
1550
1600
1650
1700
1750
1800
1850

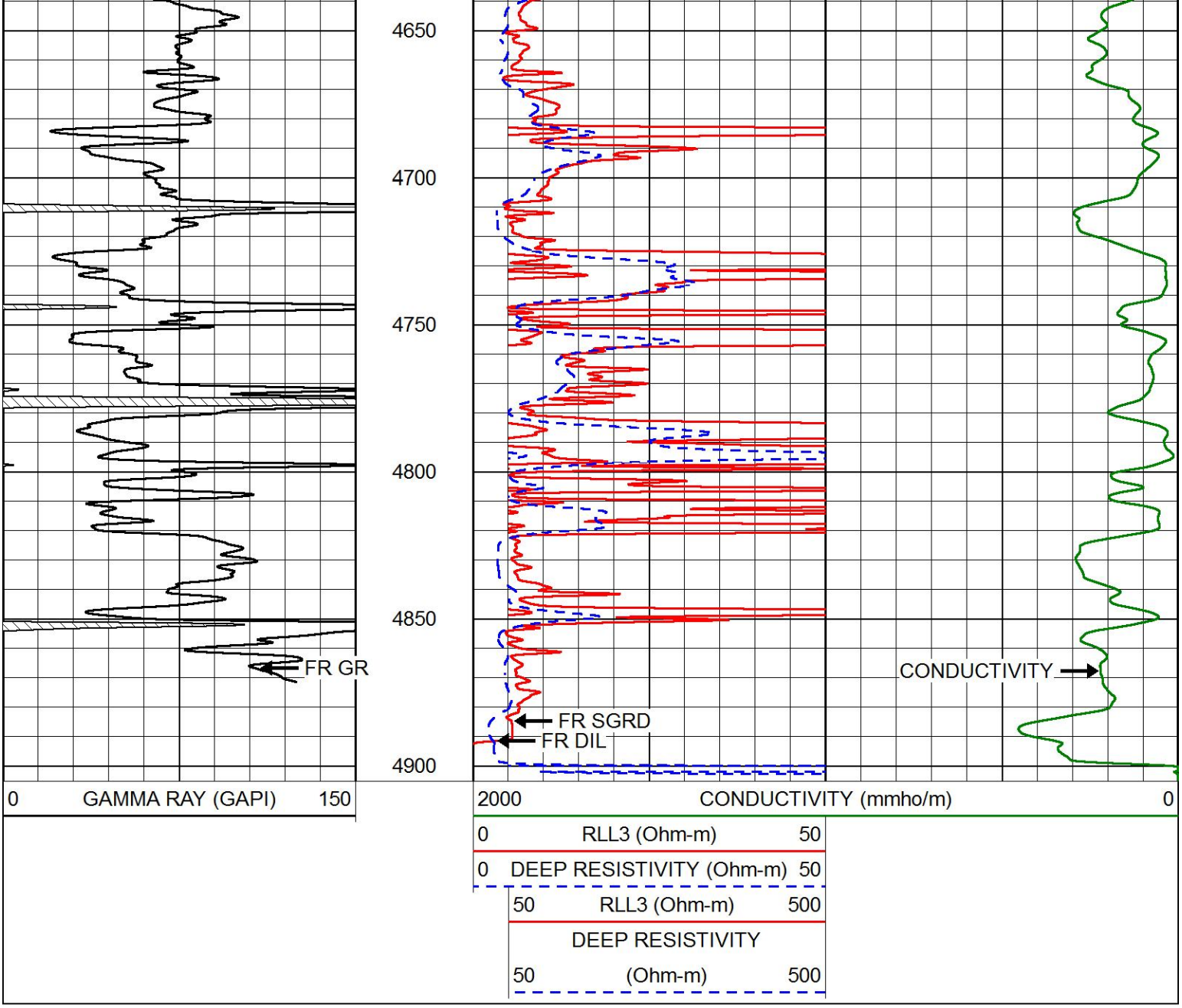

1900
1950
2000
2050
2100
2150
2200
2250
2300
2350
2400


2450
2500
2550
2600
2650
2700
2750
2800
2850
2900
2950


3000
3050
3100
3150
3200
3250
3300
3350
3400
3450
3500


3550
3600
3650
3700
3750
3800
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4450
4500
4550
4600



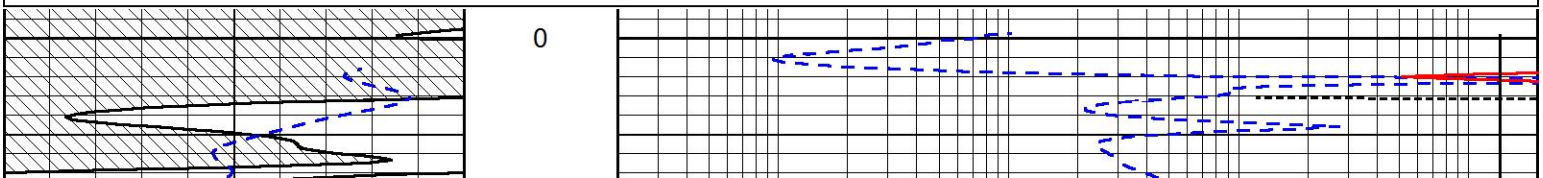

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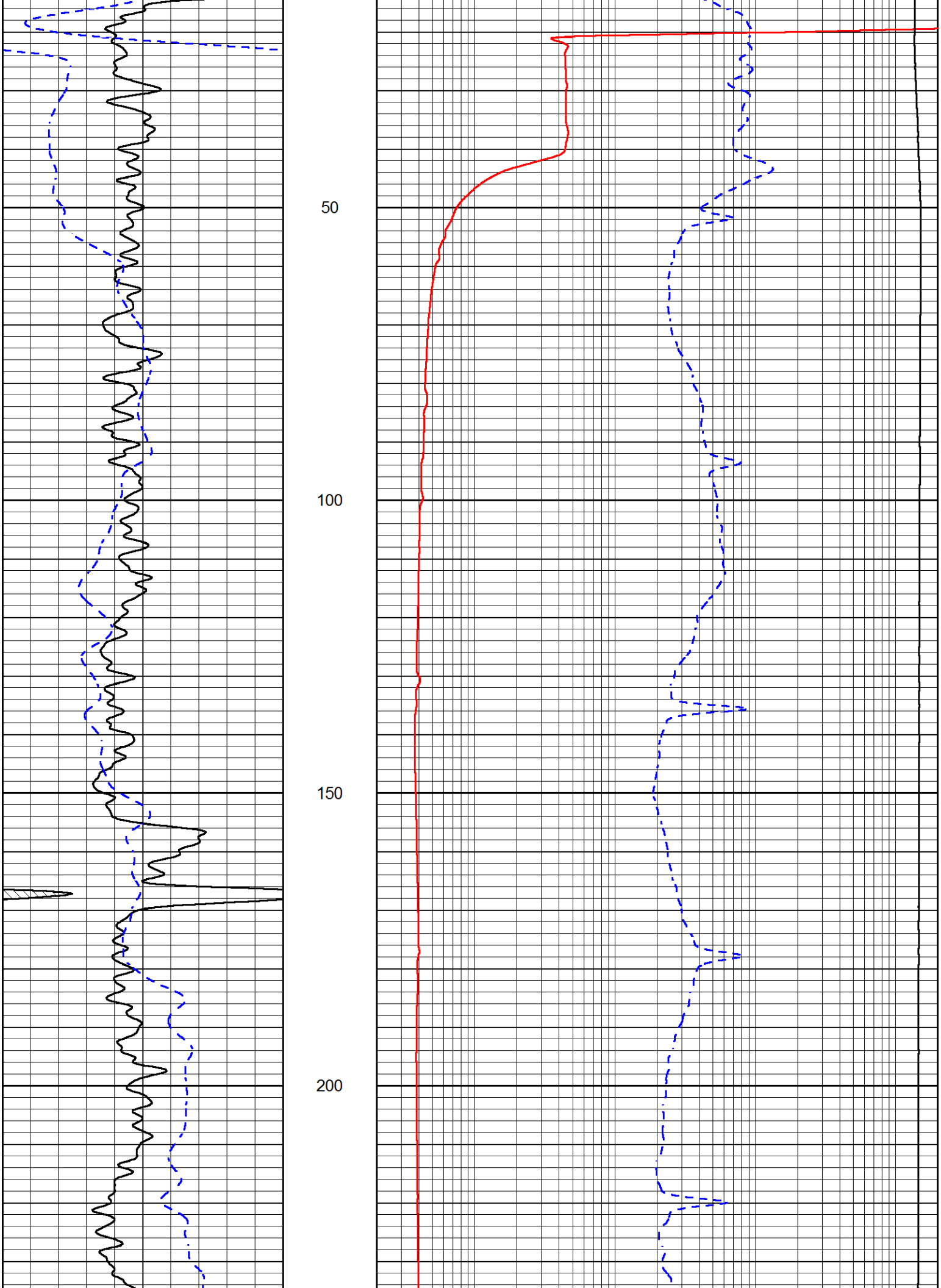
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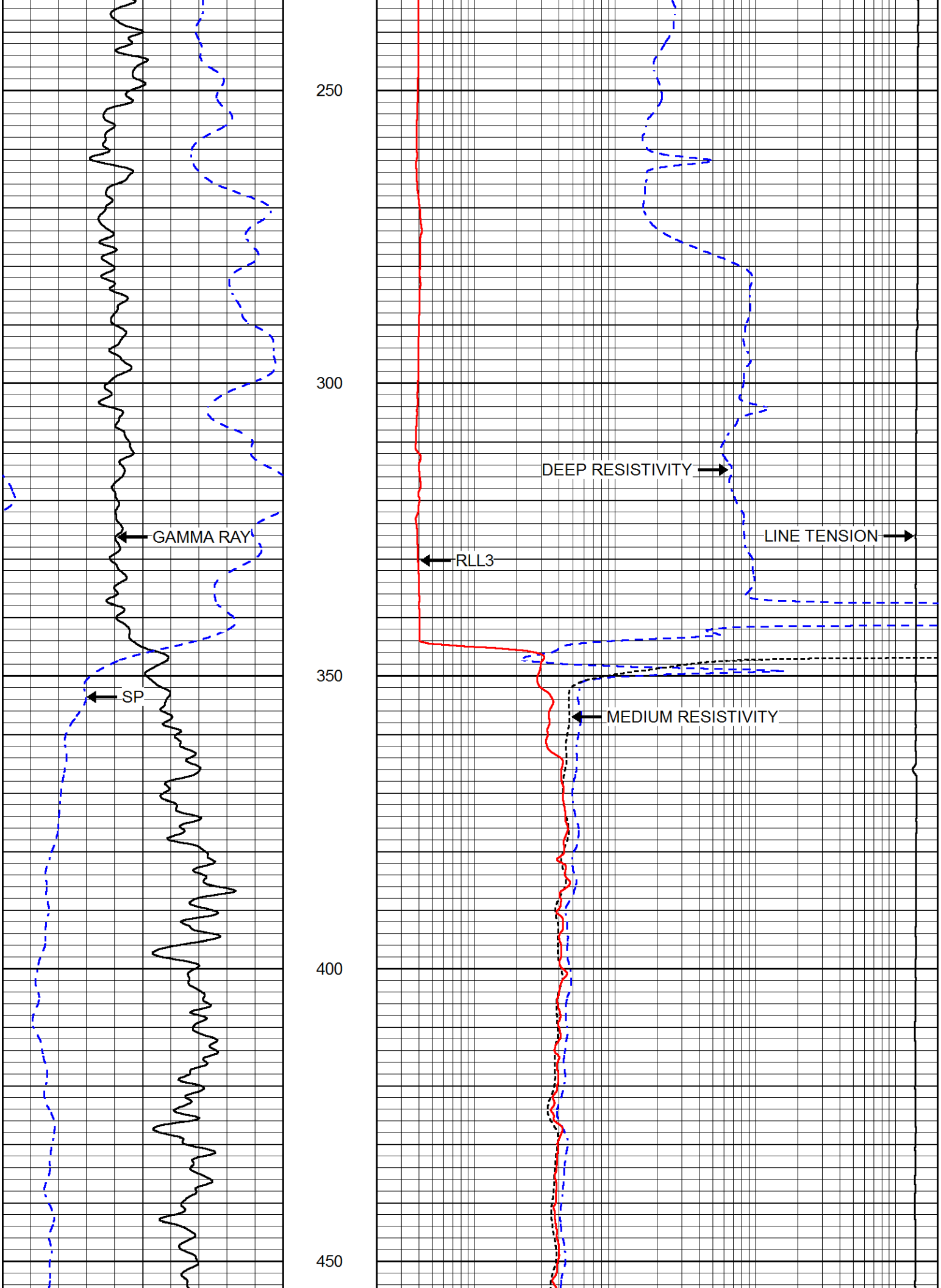
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|---|---|
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| Dataset Pathname | stack/pass3.1 |
| Presentation Format | dil |
| Dataset Creation | Sat Jul 29 04:12:39 2017 |
| Charted by | Depth in Feet scaled 1:240 |

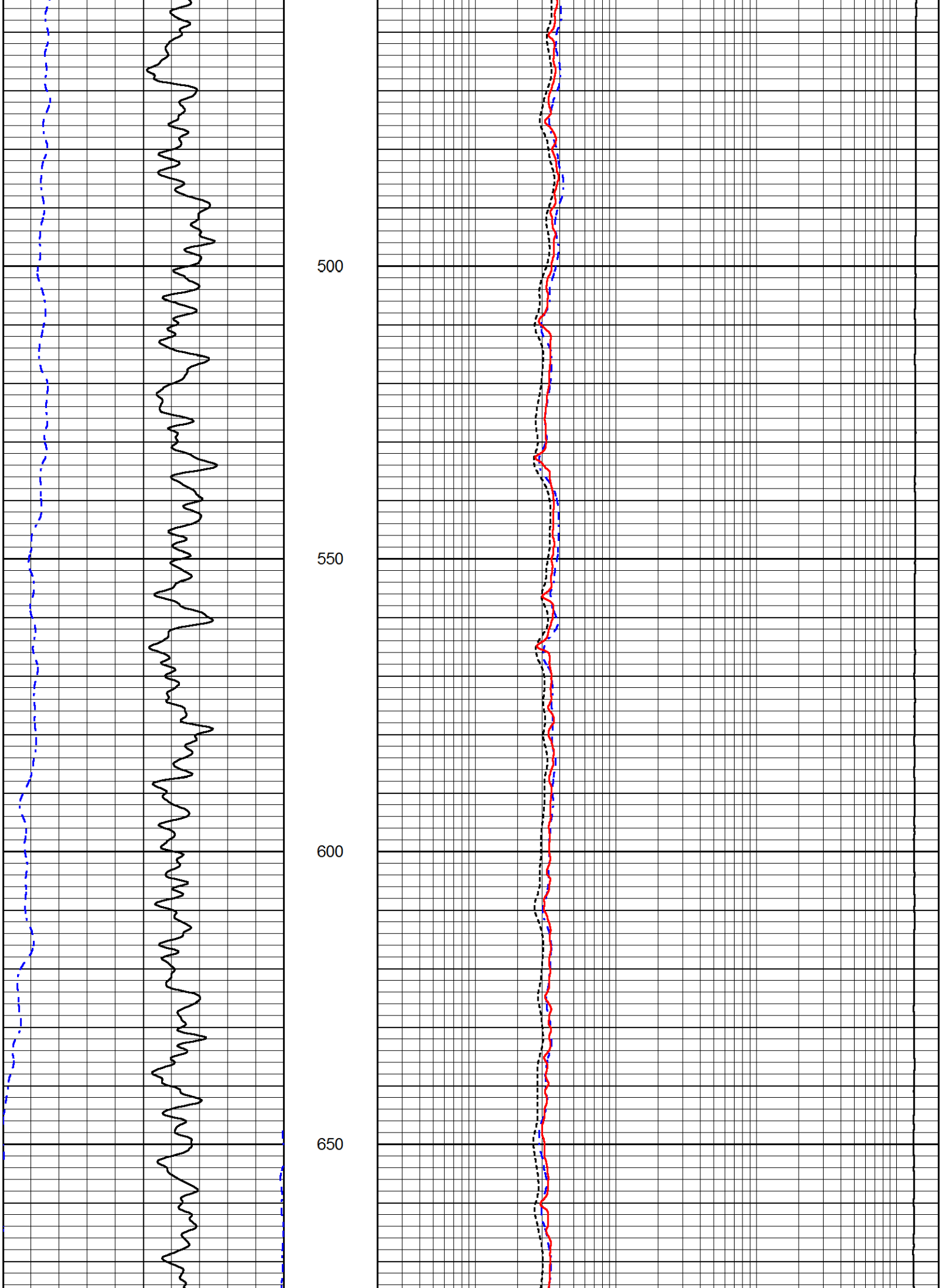
| | | |
|---|---|---|
| 0 | GAMMA RAY (GAPI) | 150 |
| -200 | SP (mV) | 0 |

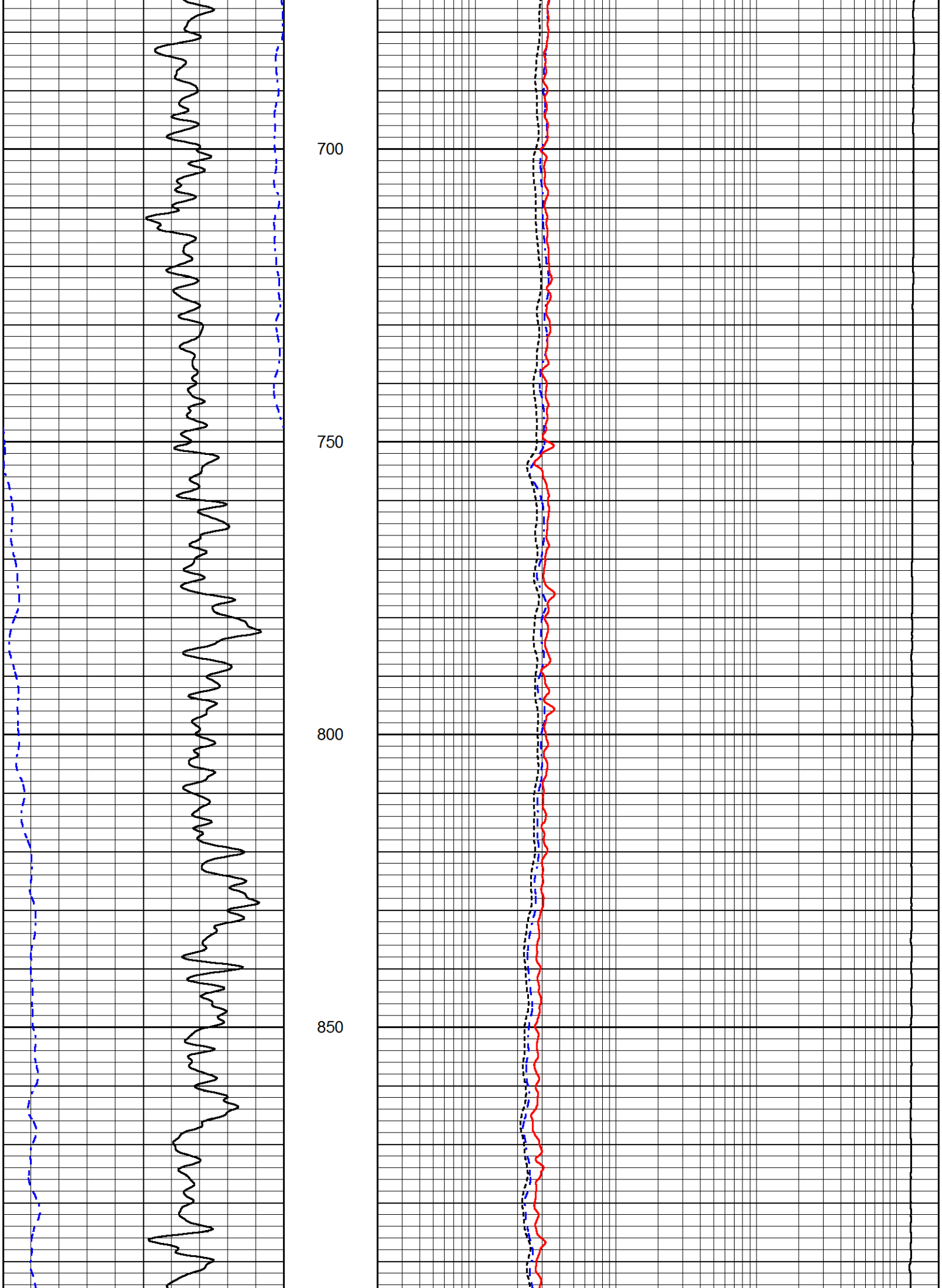
| | | |
|---|---|---|
| 0.2 | DEEP RESISTIVITY (Ohm-m) | 2000 |
| 0.2 | MEDIUM RESISTIVITY (Ohm-m) | 2000 |
| 0.2 | RLL3 (Ohm-m) | 2000 |
| 15000 | LINE TENSION (lb) | 0 |

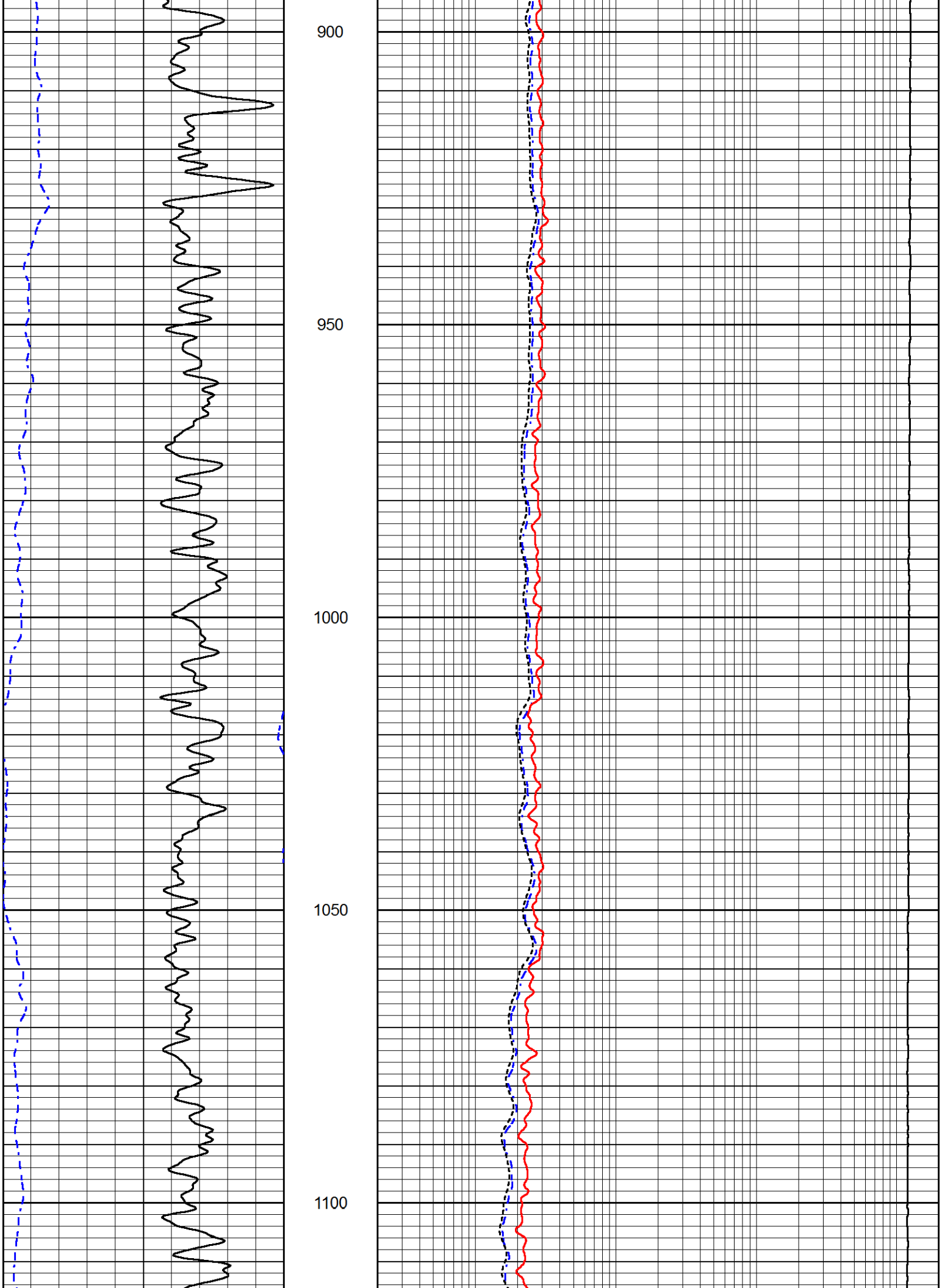


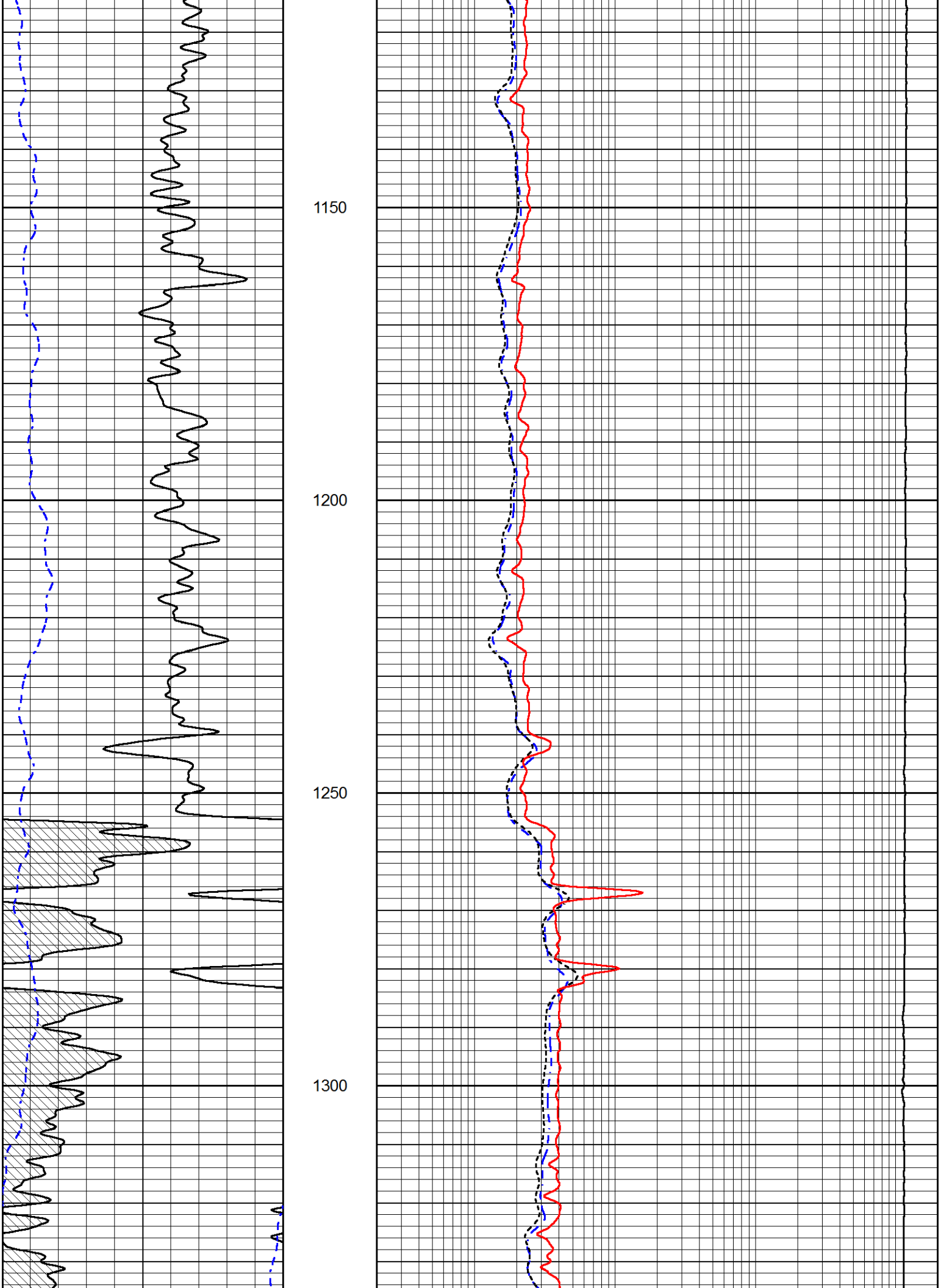

50
100
150
200

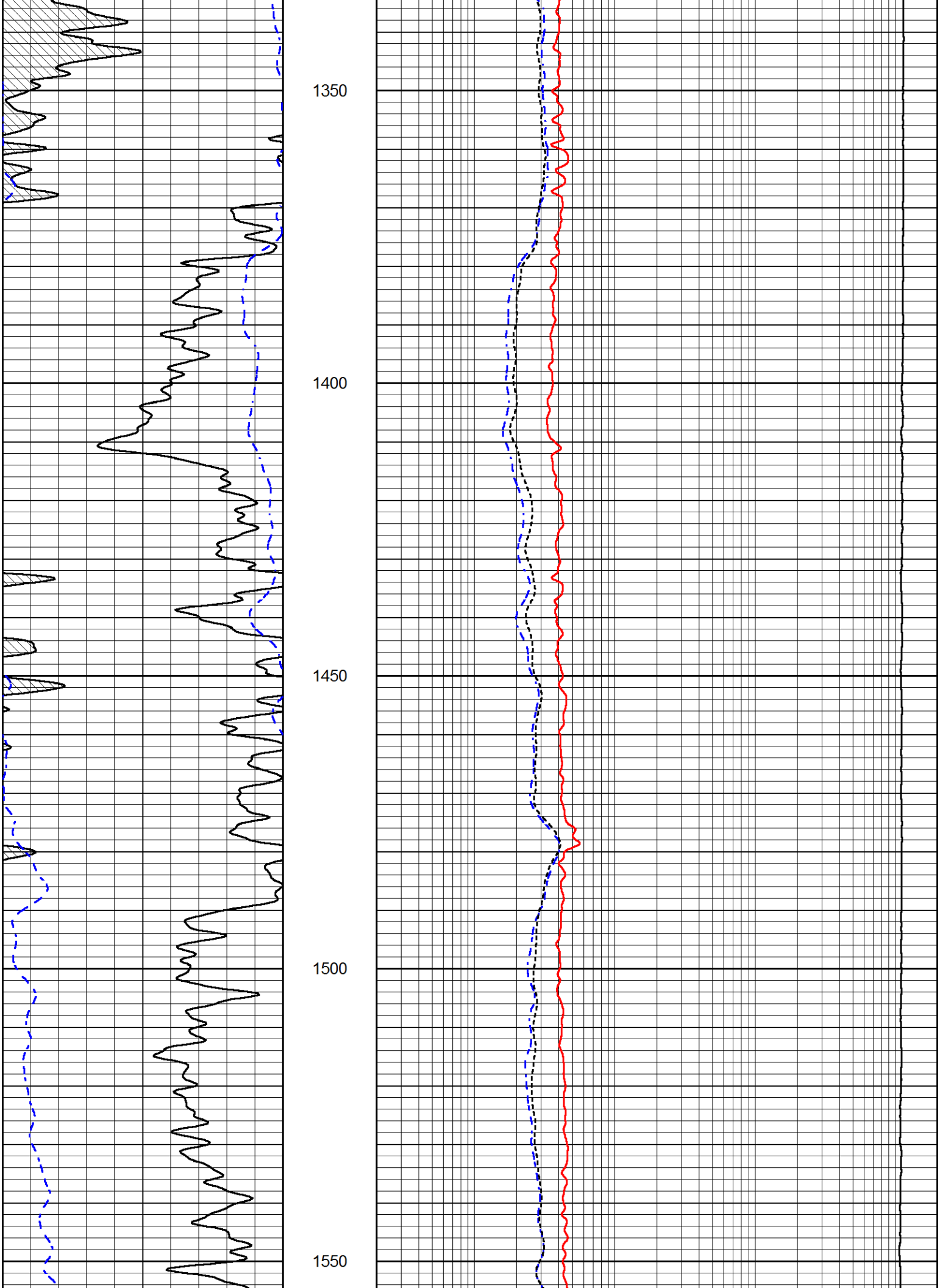

250
300
350
400
450
GAMMA RAY
SP
DEEP RESISTIVITY
LINE TENSION
RLL3
MEDIUM RESISTIVITY

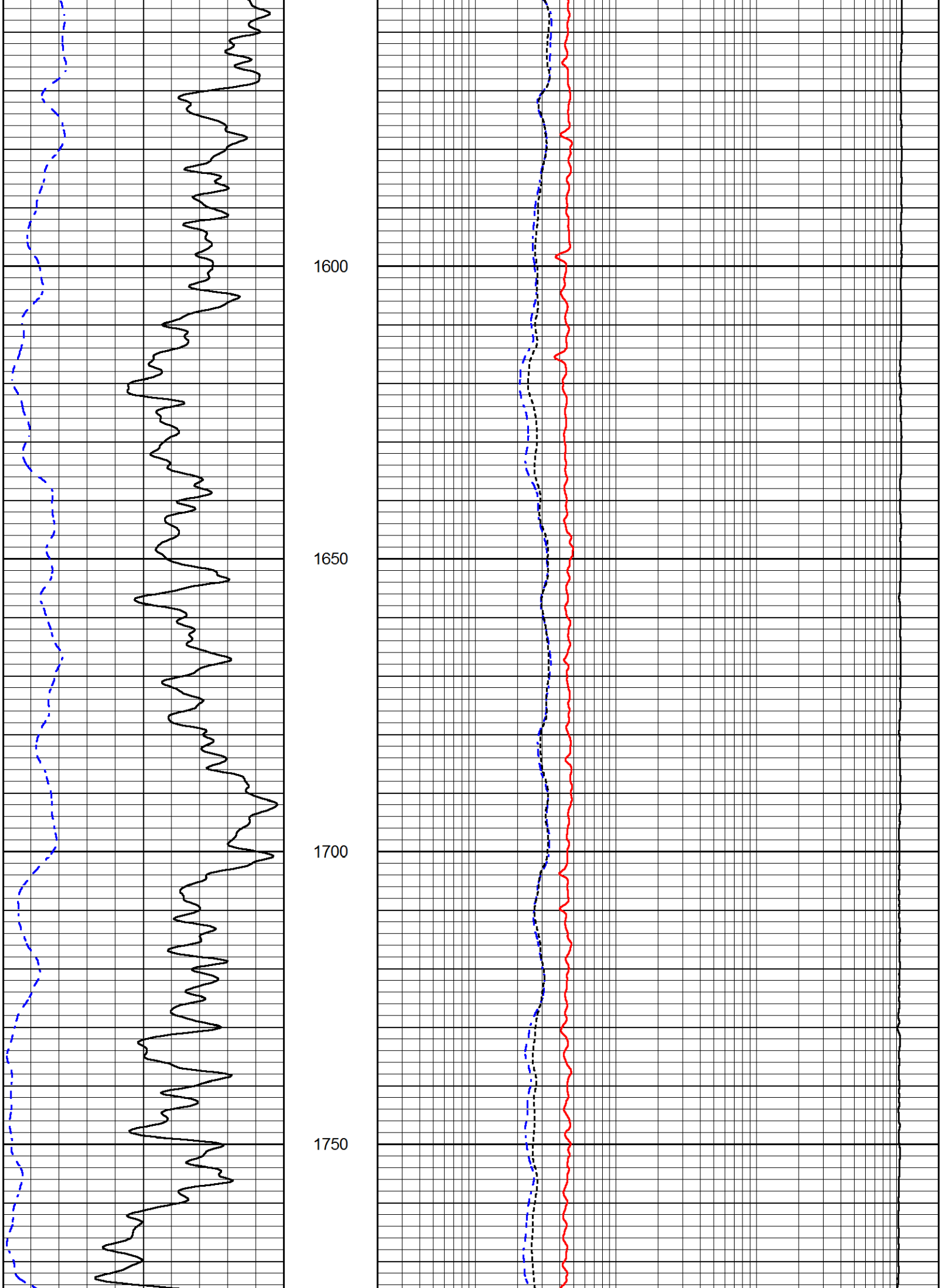

500
550
600
650

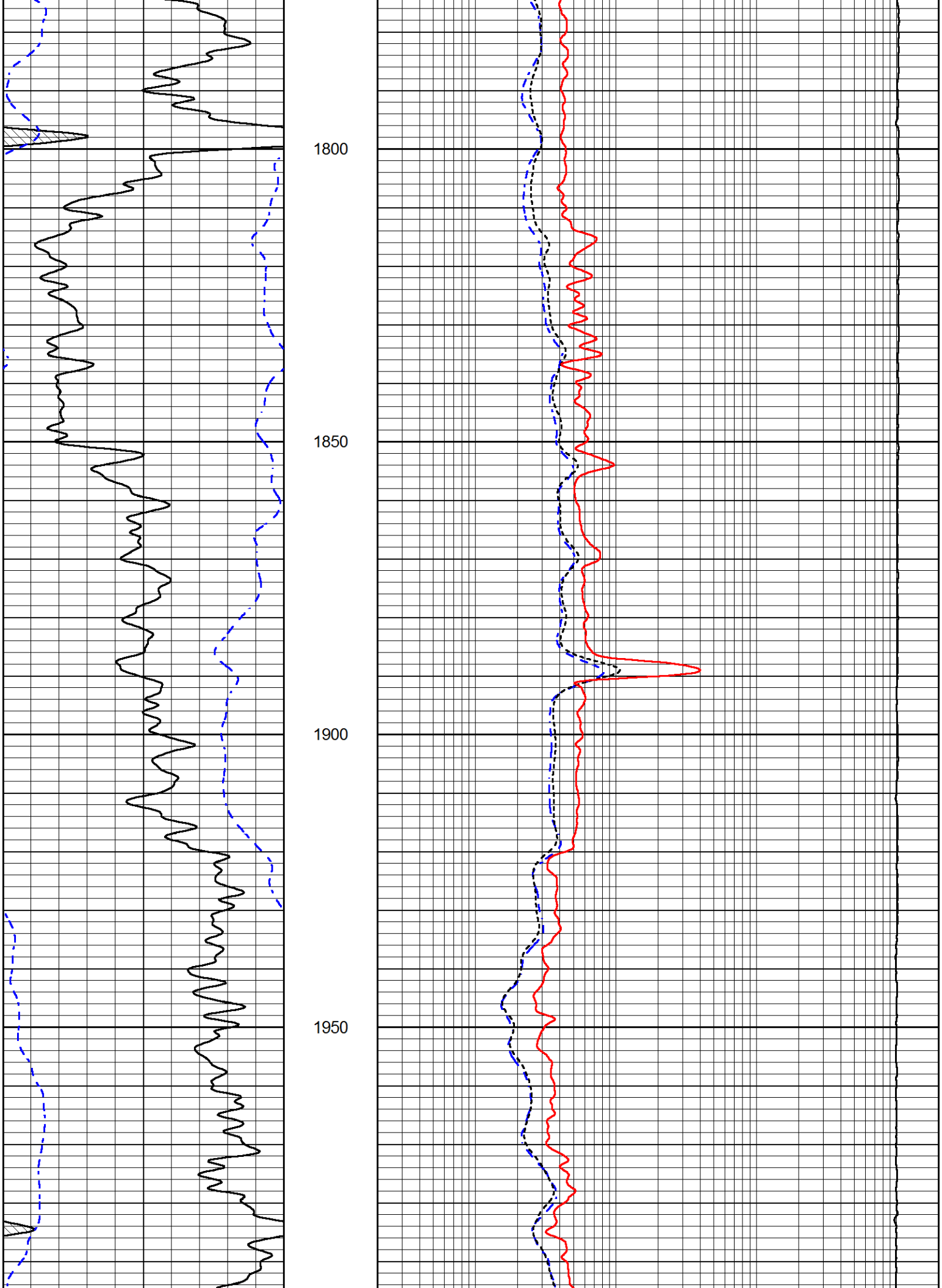

700
750
800
850

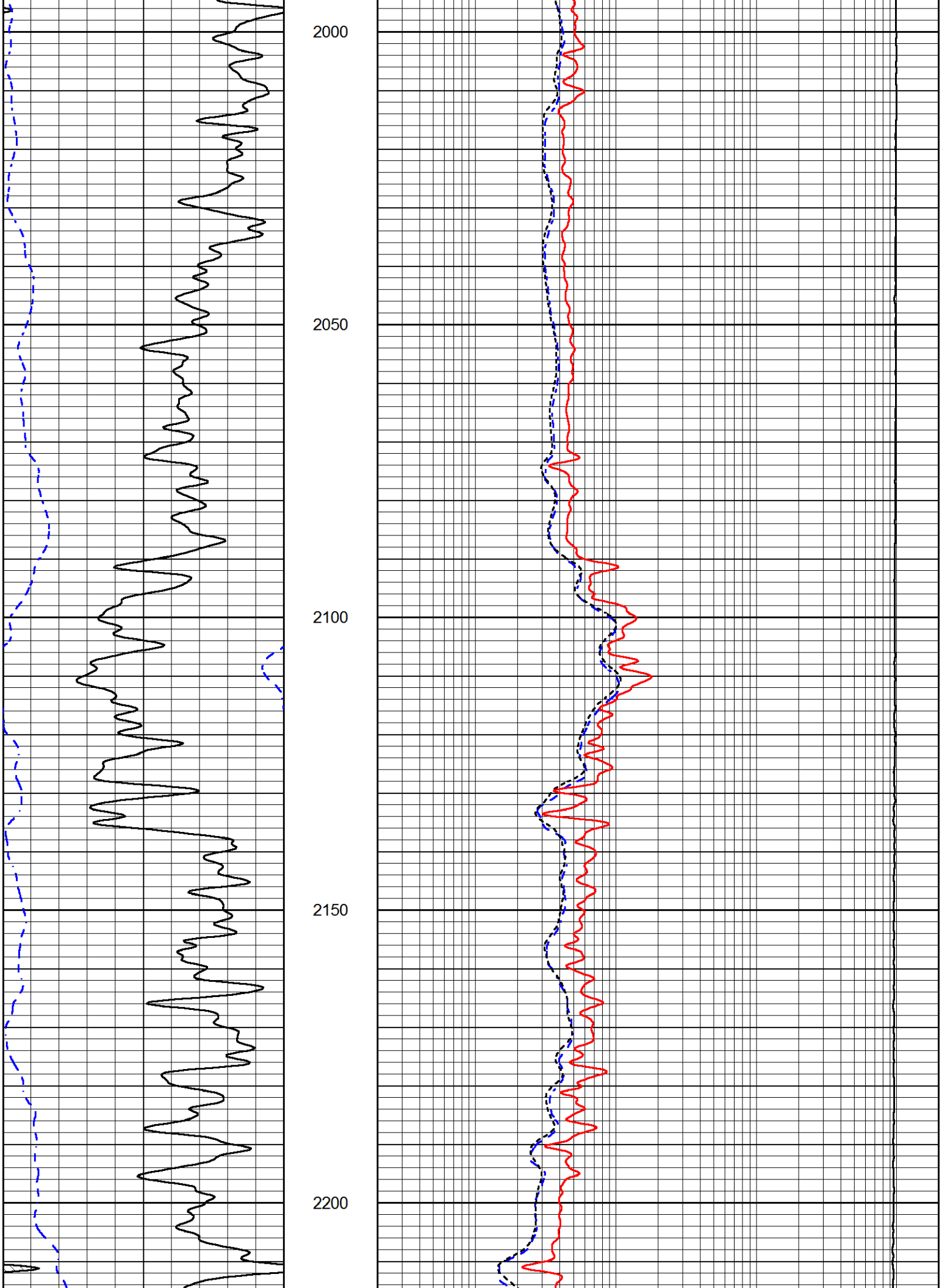

900
950
1000
1050
1100

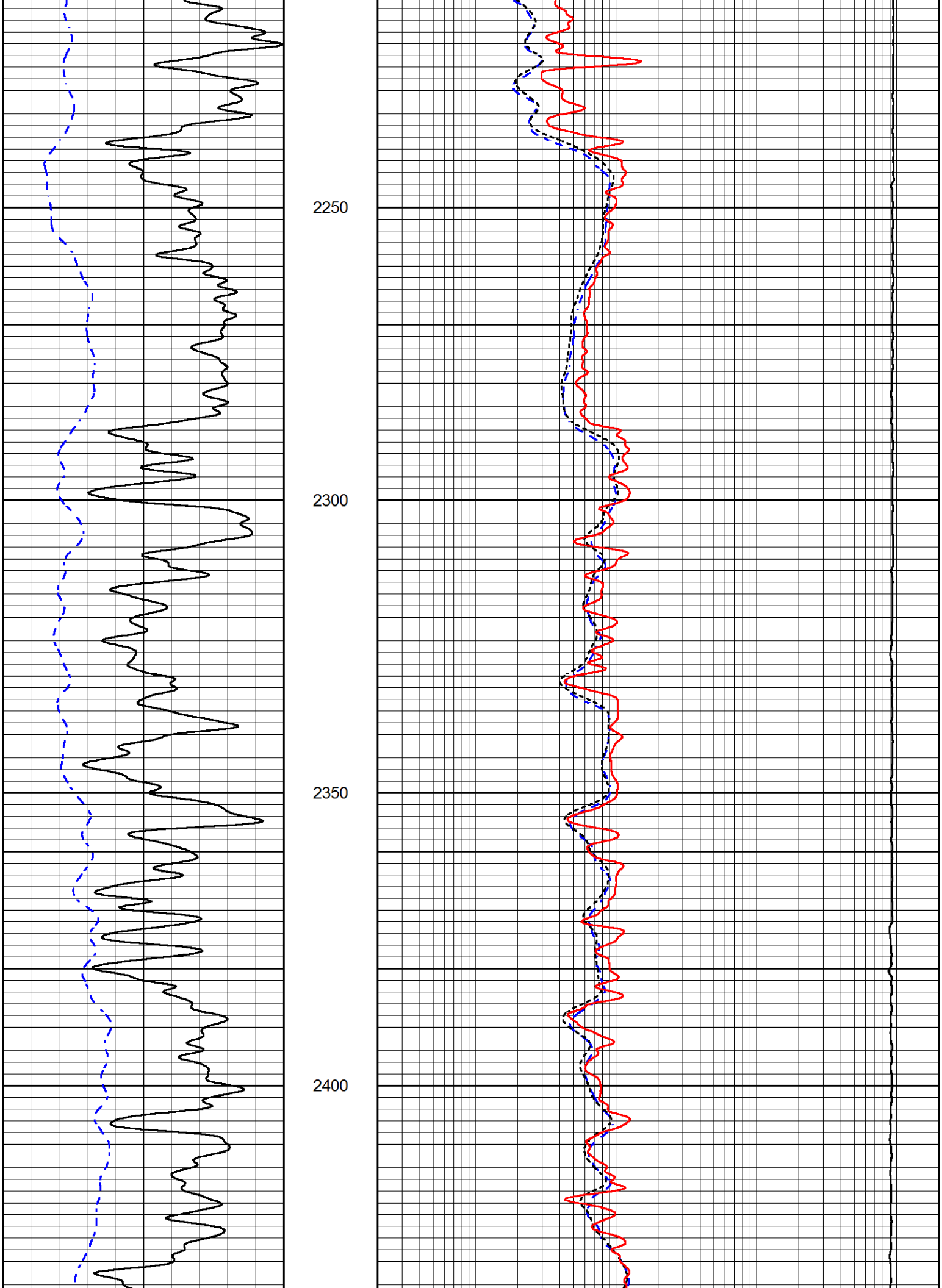

1150
1200
1250
1300

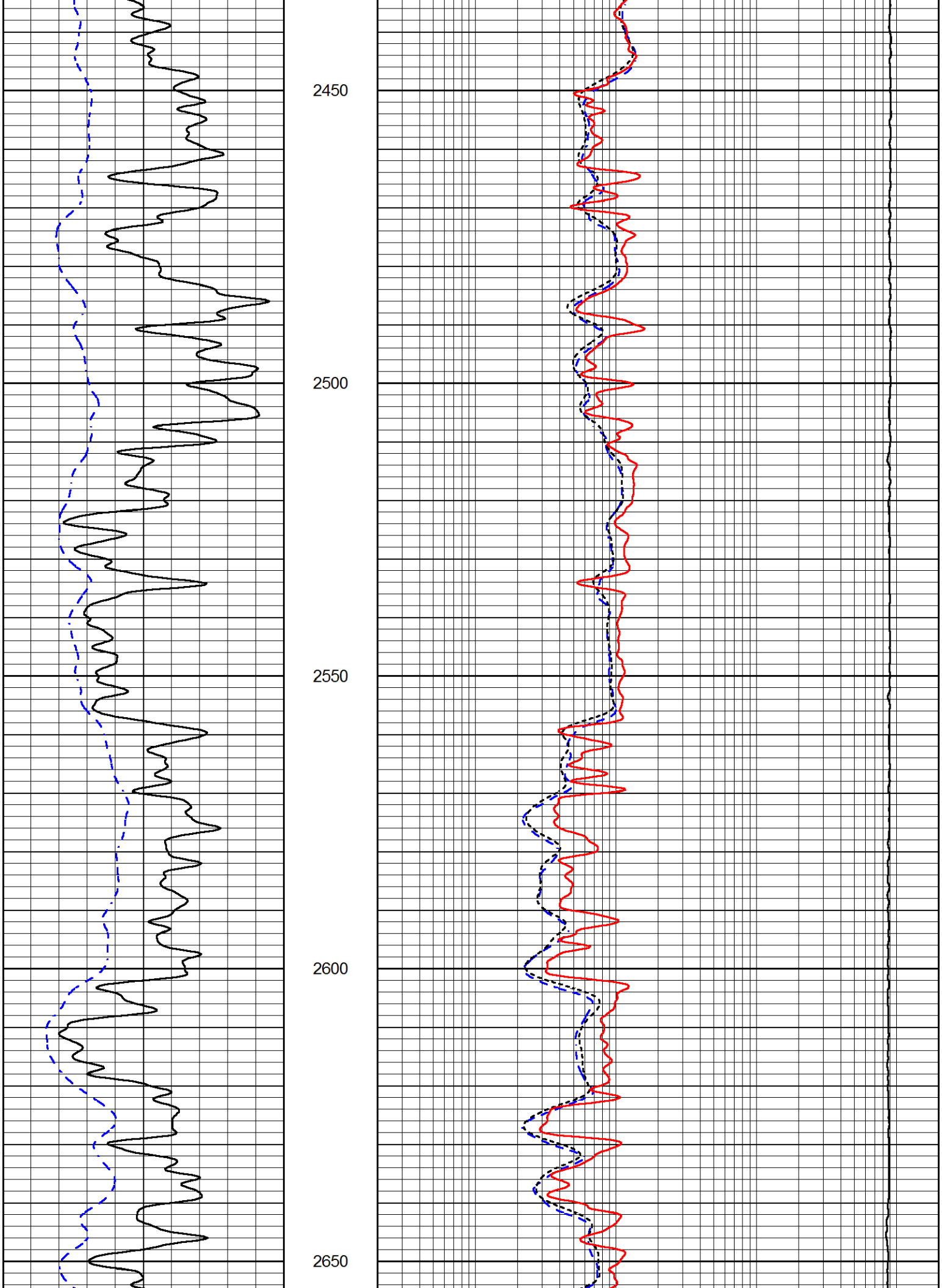

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1400
1450
1500
1550

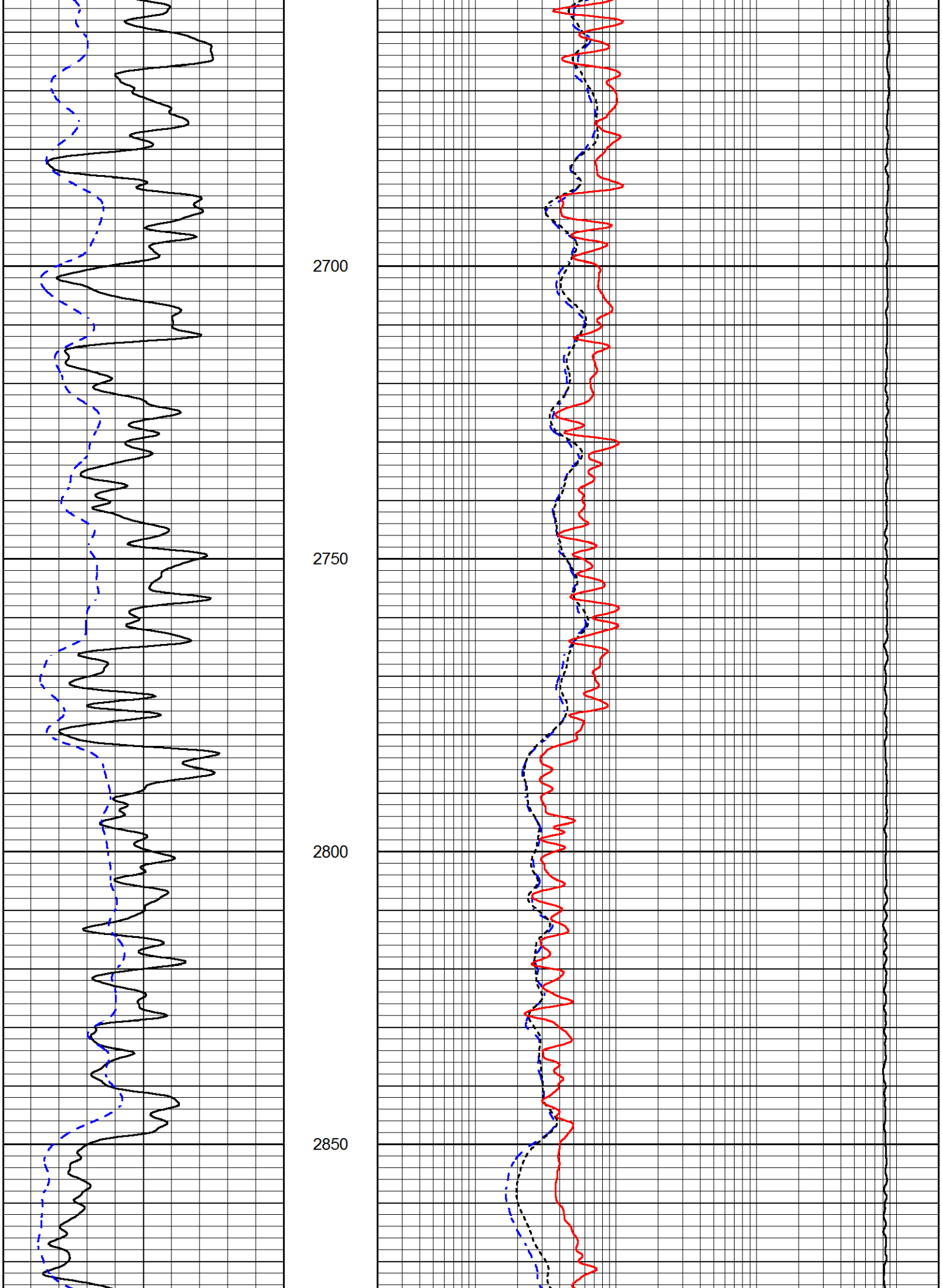

1600
1650
1700
1750

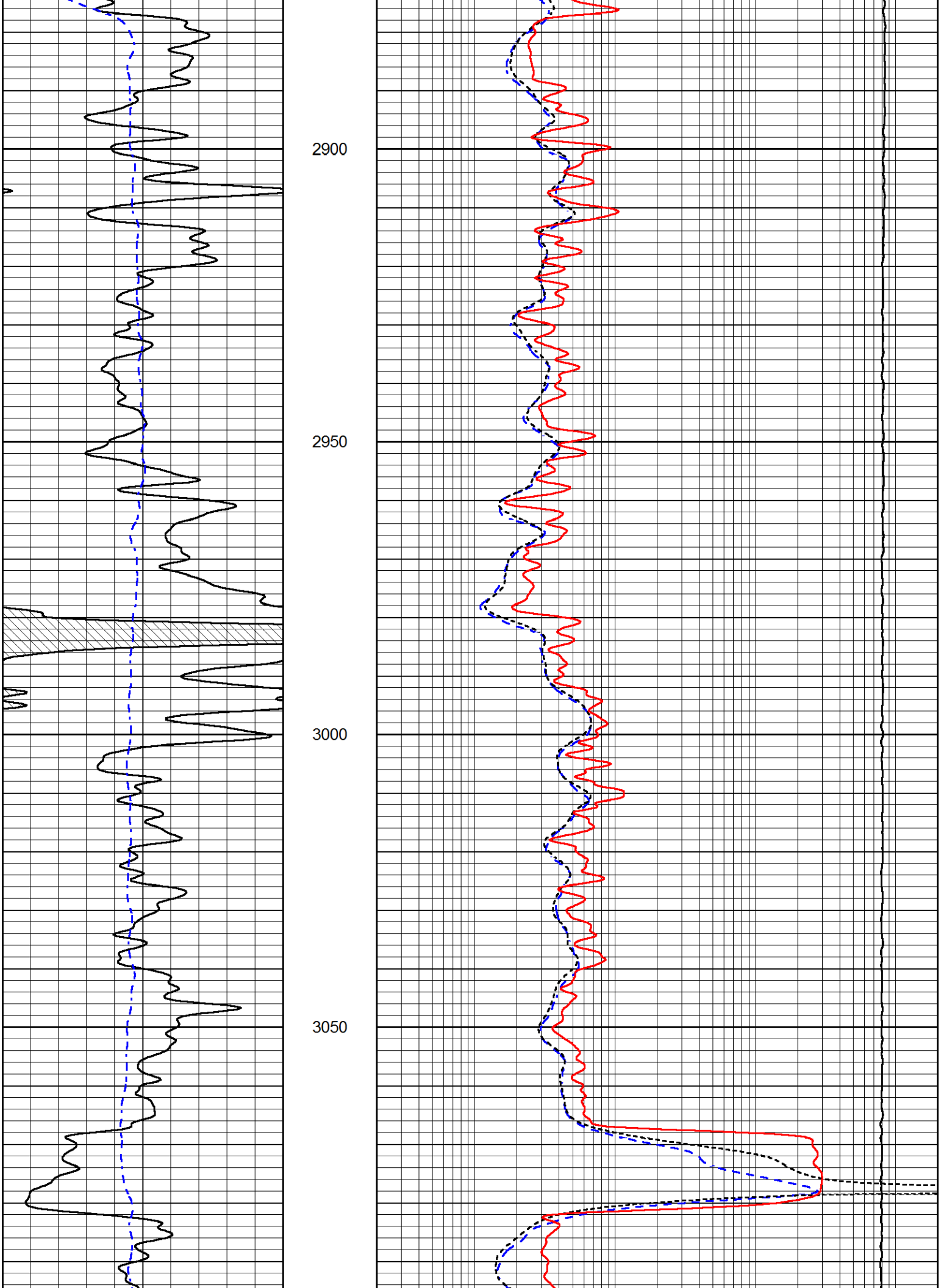

1800
1850
1900
1950

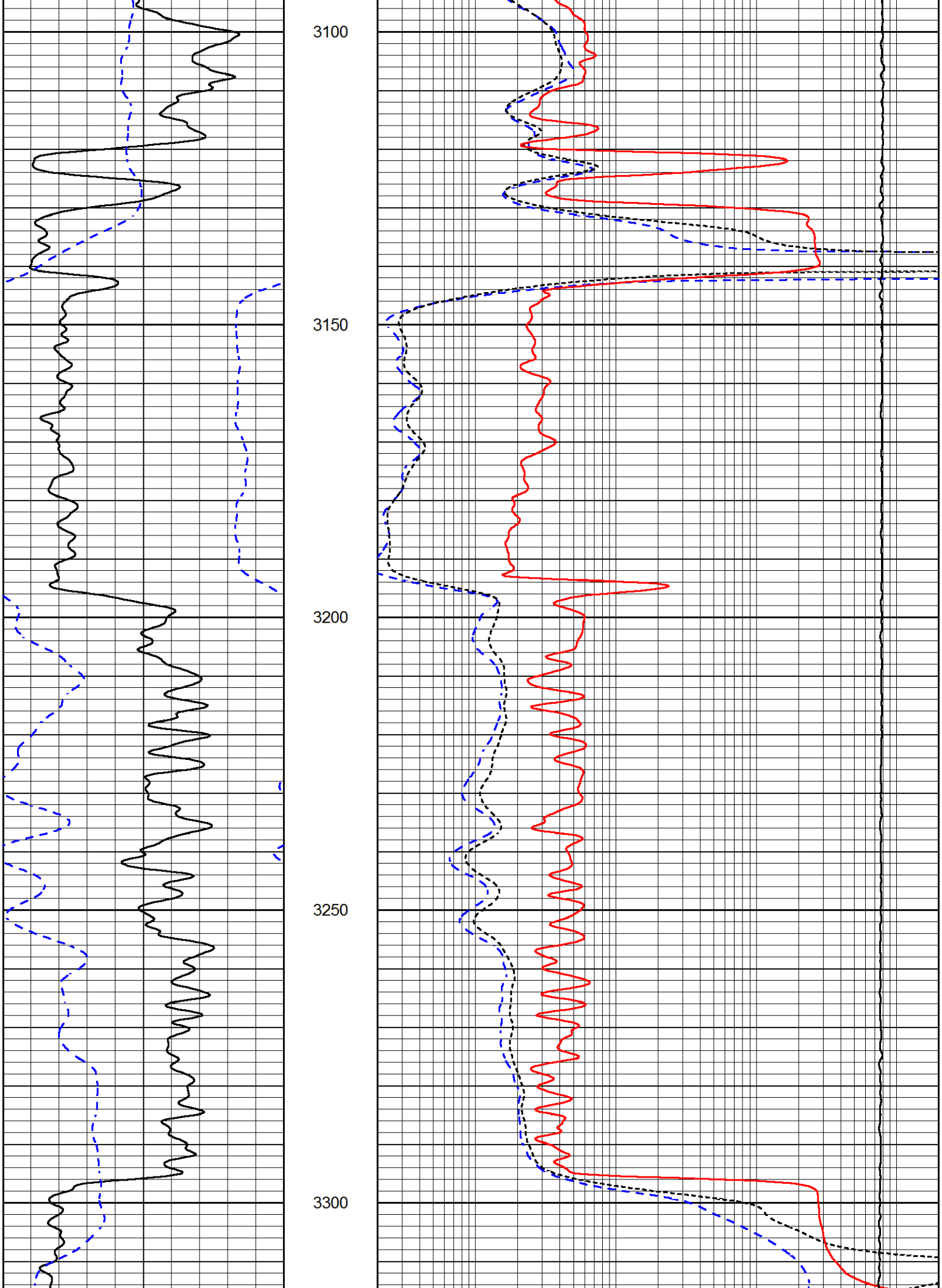

2000
2050
2100
2150
2200

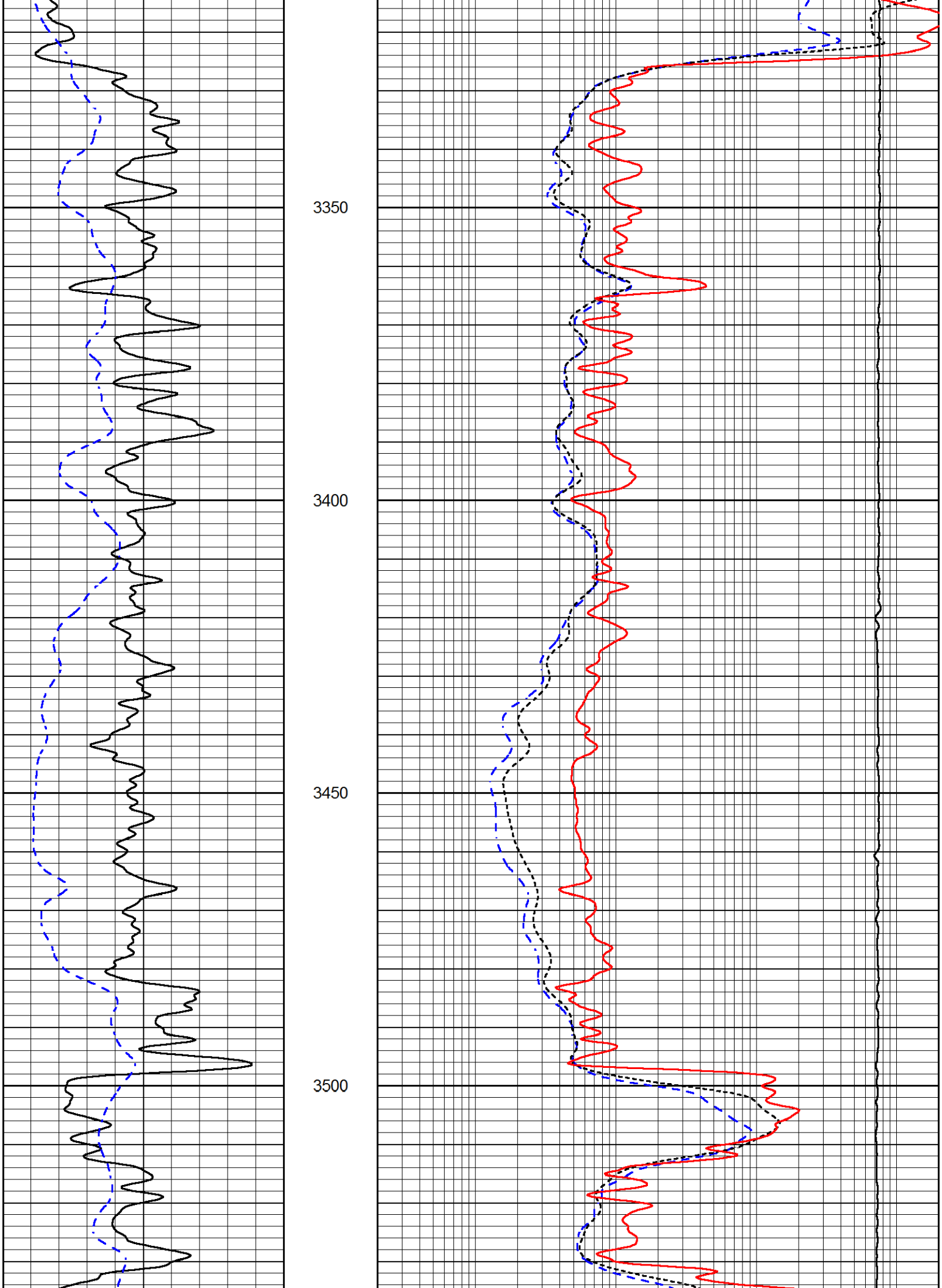

2250
2300
2350
2400

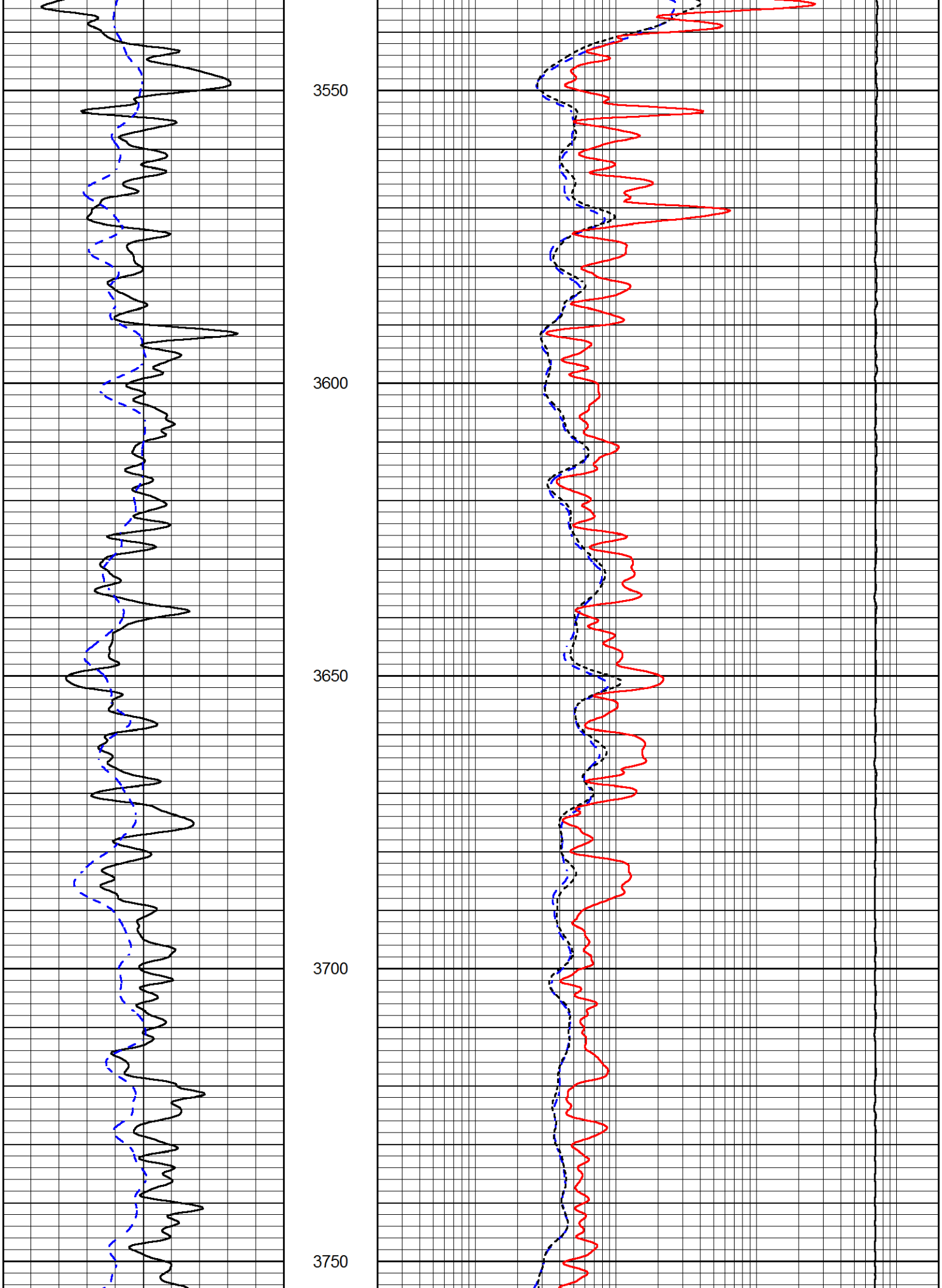

2450
2500
2550
2600
2650

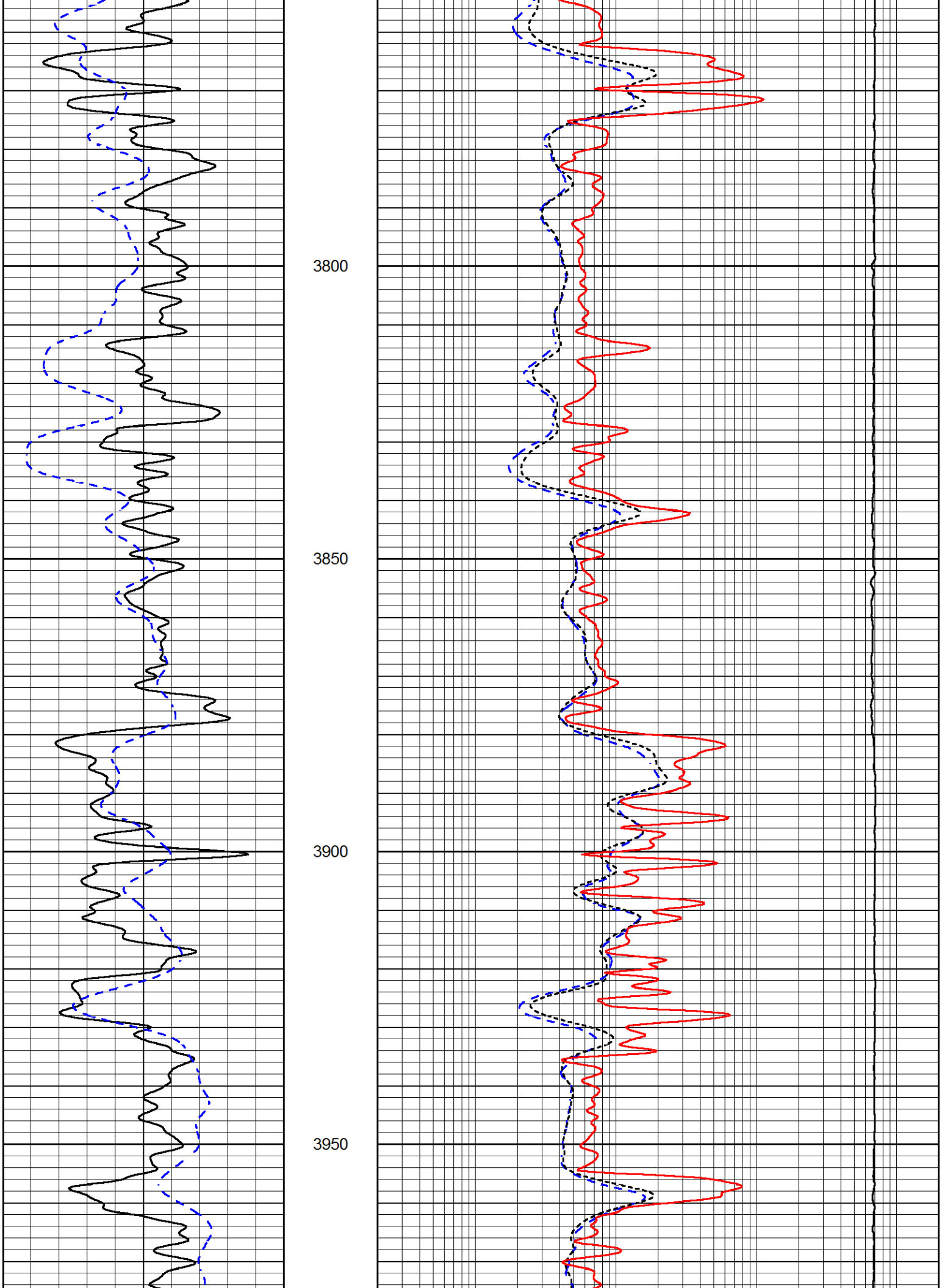

2700
2750
2800
2850

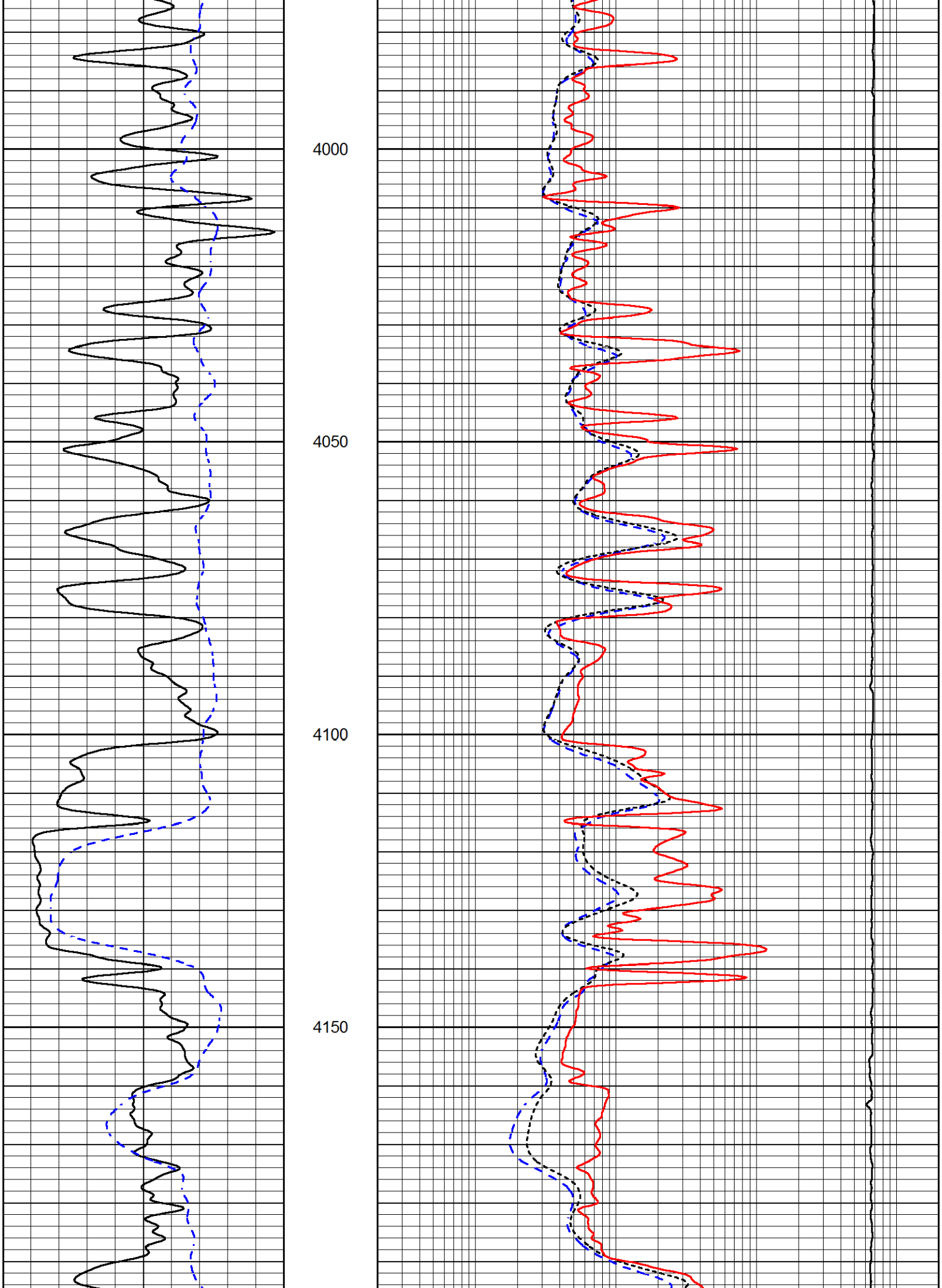

2900
2950
3000
3050

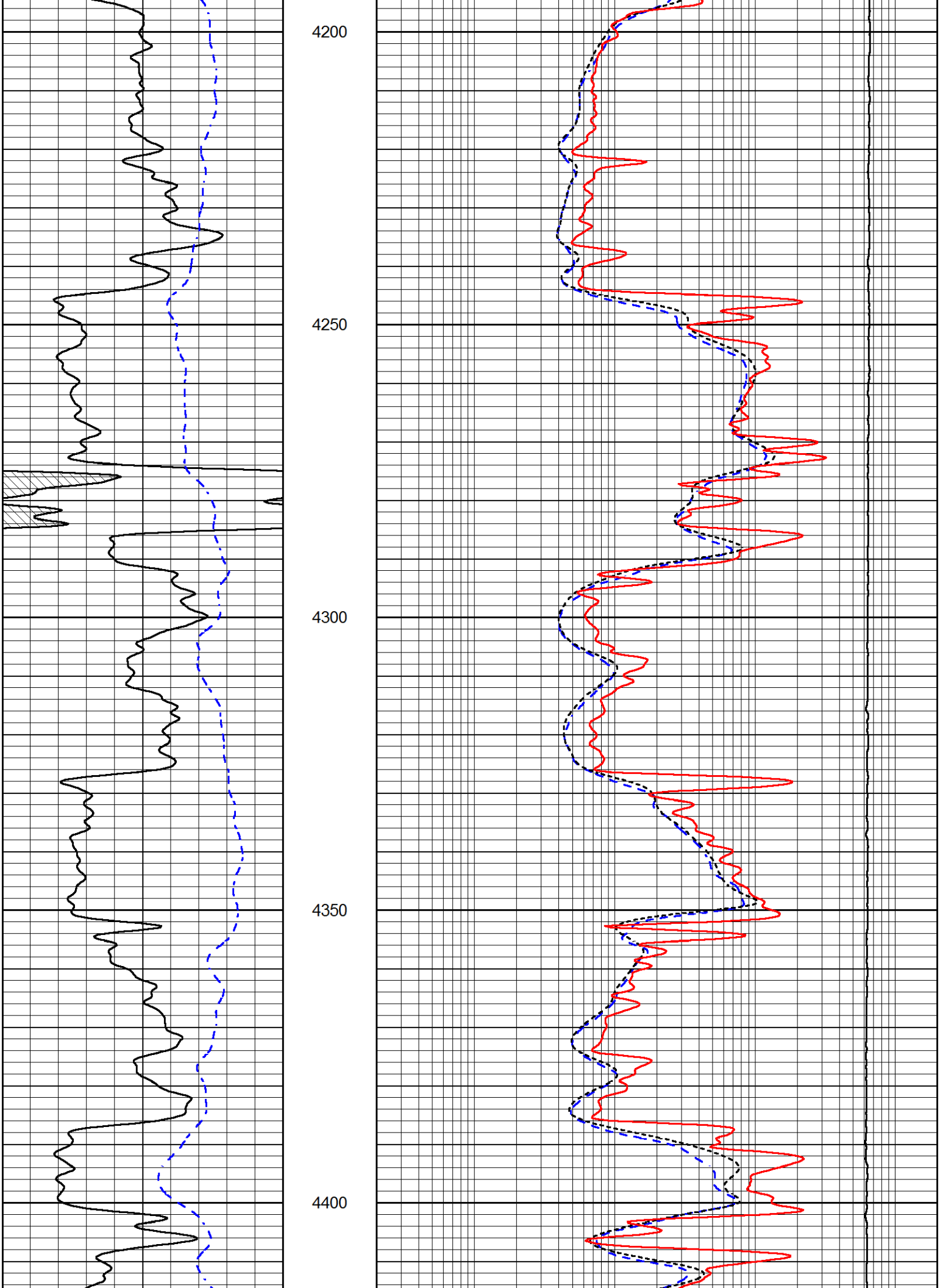

3100
3150
3200
3250
3300

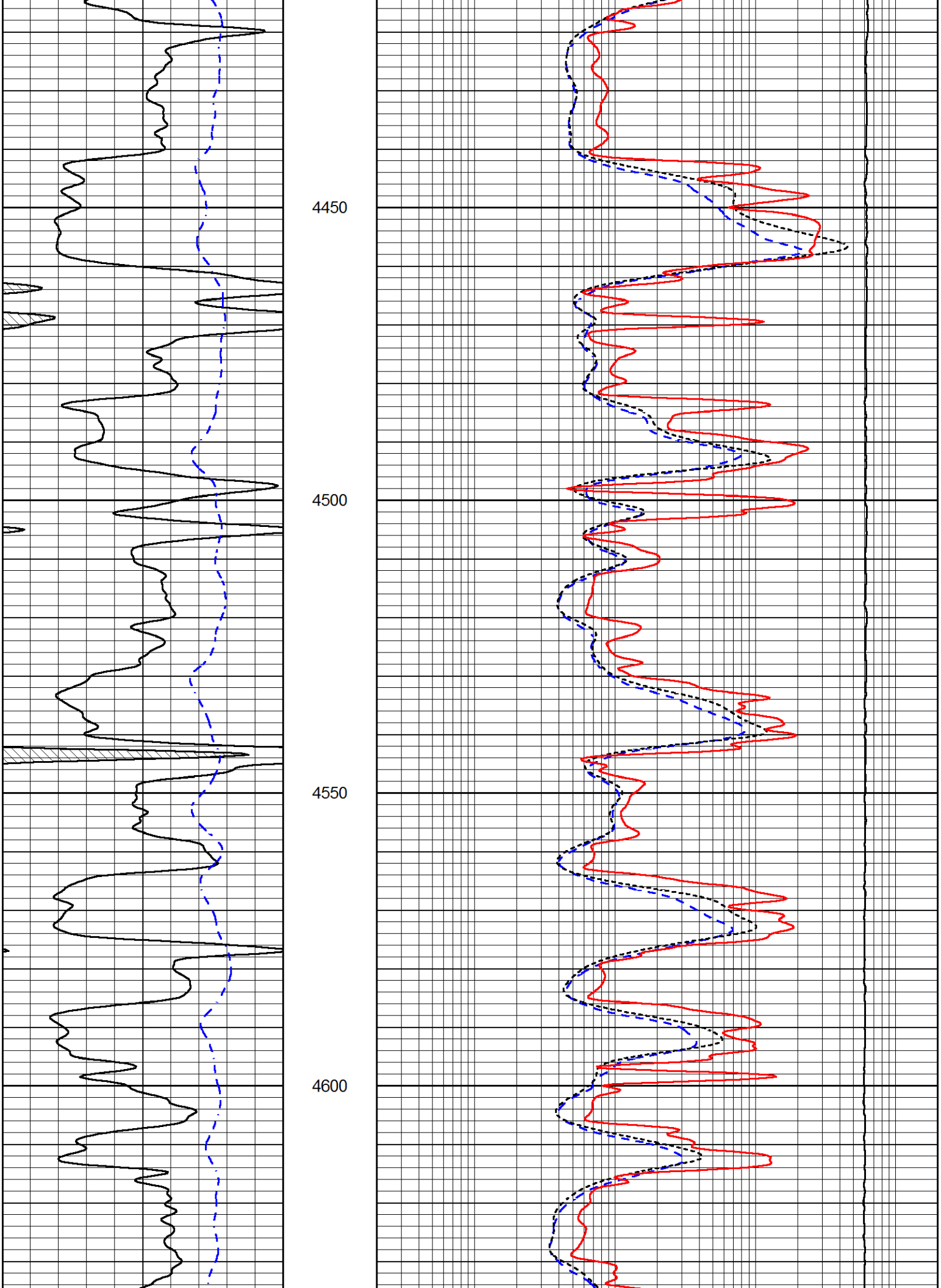

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3400
3450
3500

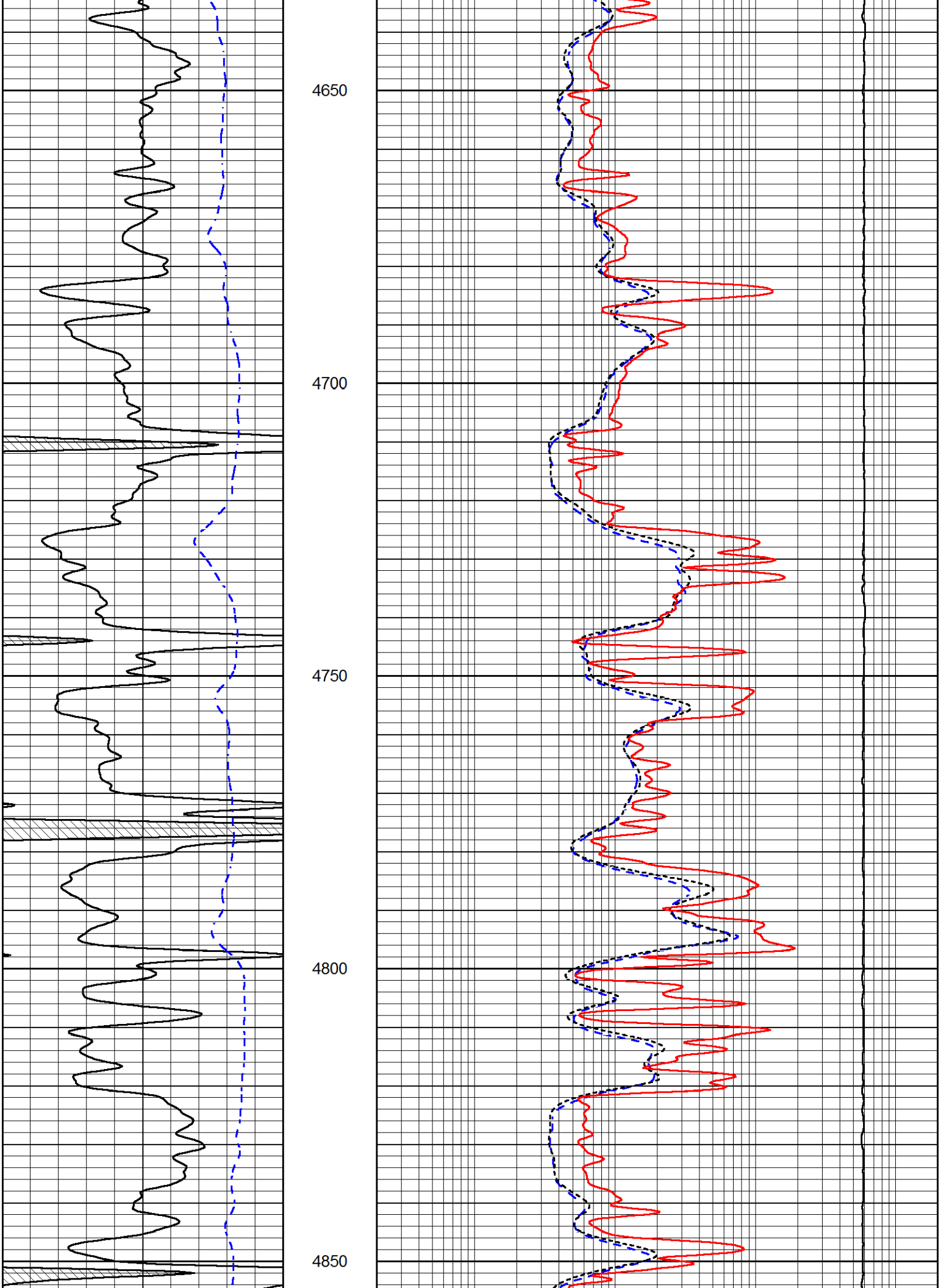

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3600
3650
3700
3750

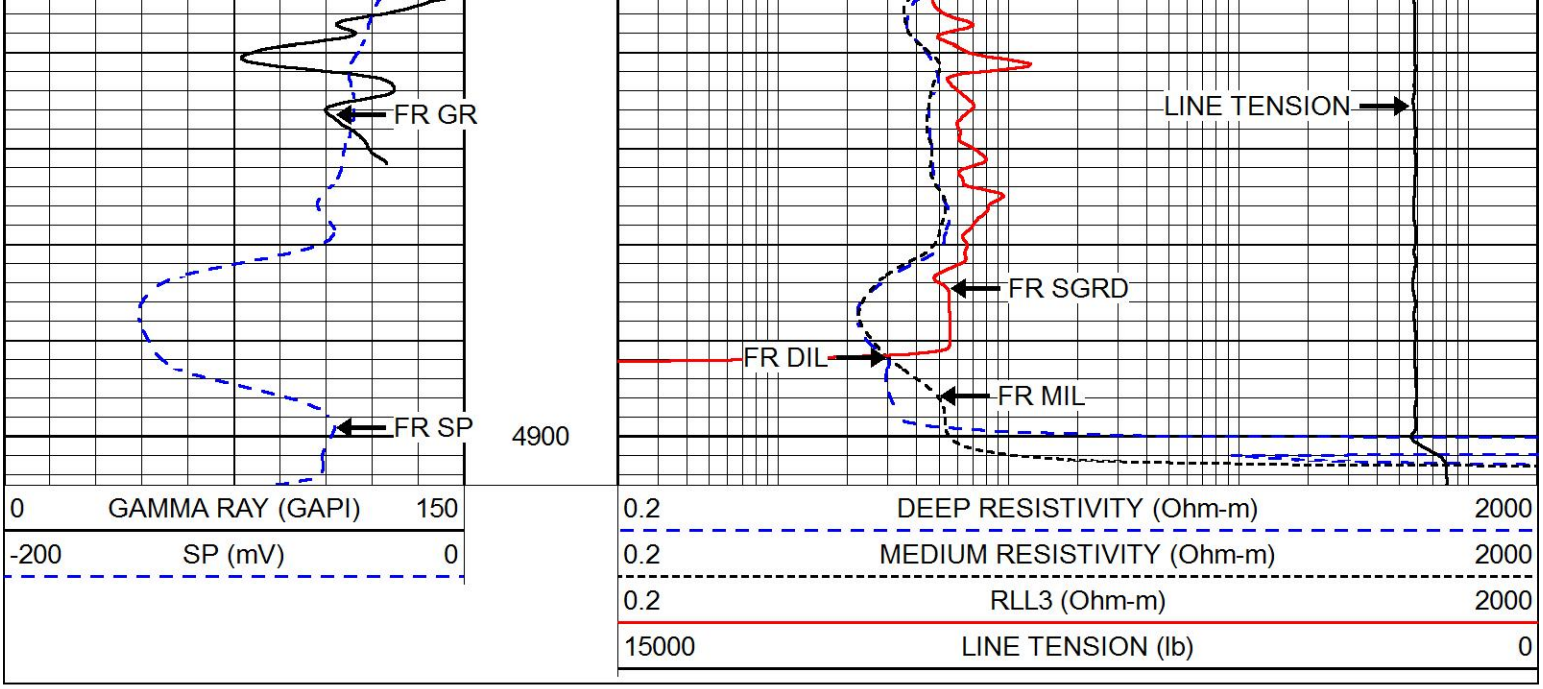

3800
3850
3900
3950


4000
4050
4100
4150


4200
4250
4300
4350
4400


4450
4500
4550
4600


4650
4700
4750
4800
4850




| | | |
|---|---|---|
| 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 |

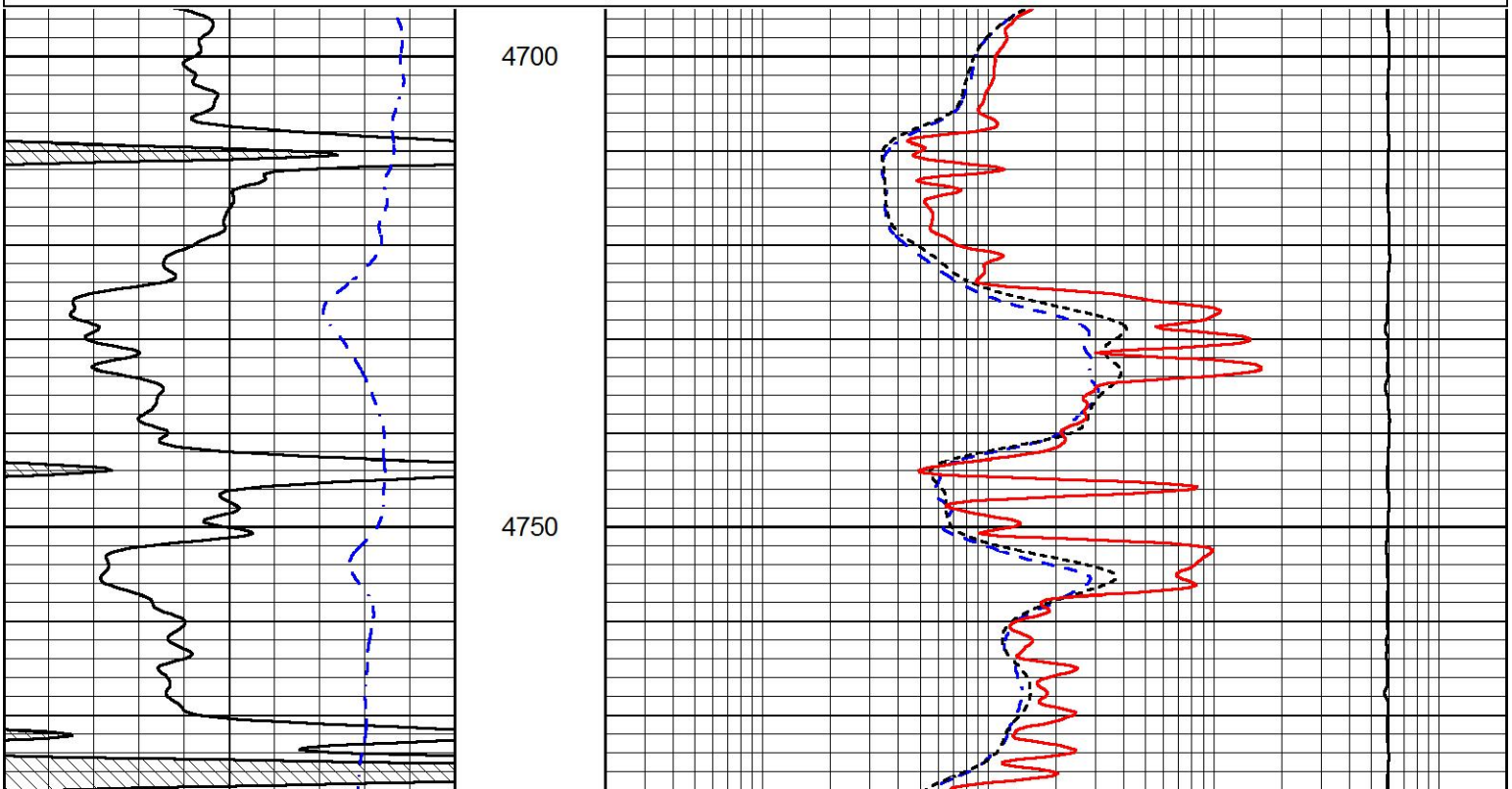
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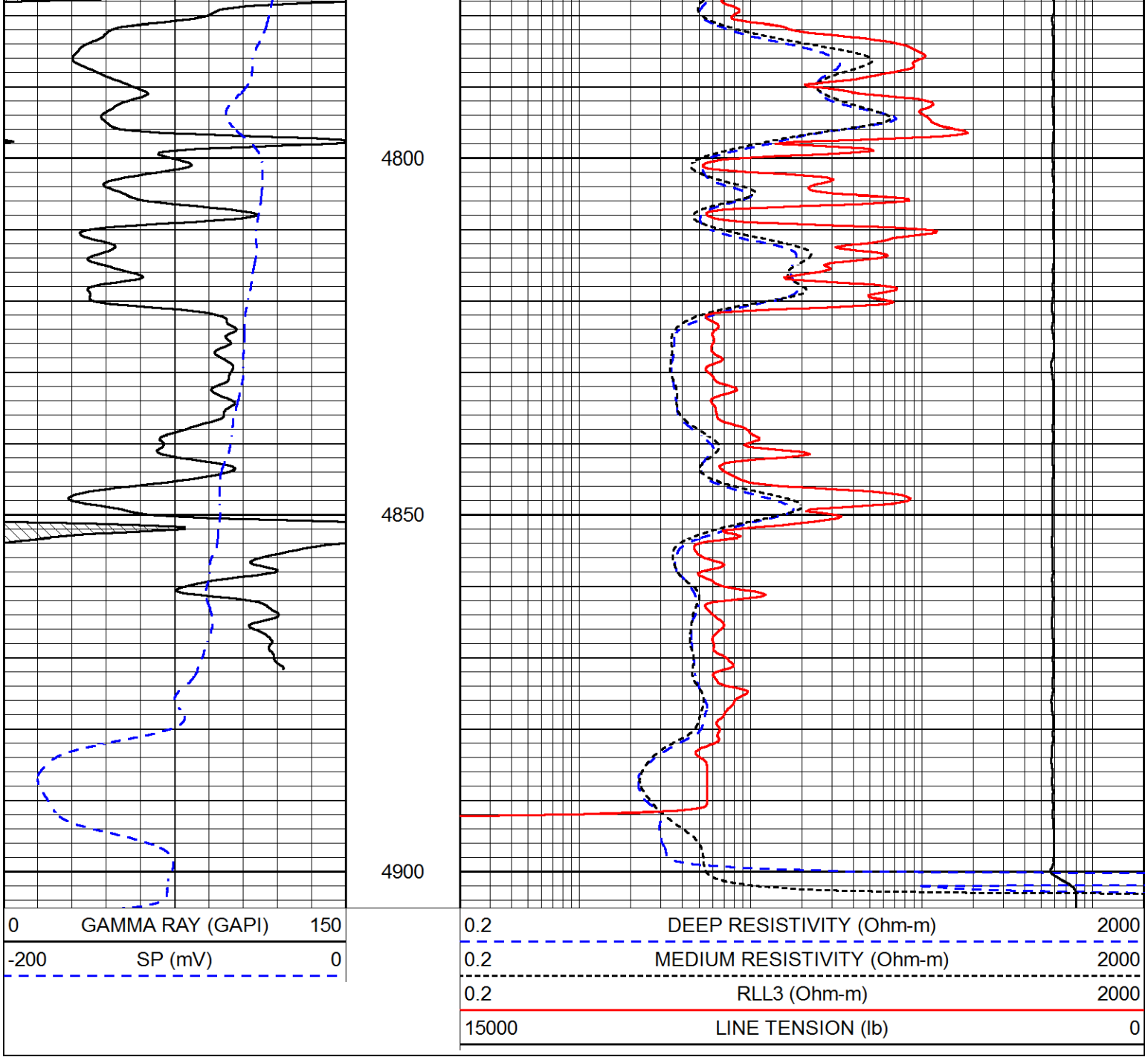
# REPEAT SECTION

| | |
|---|---|
| Database File | murfin_mears b_#1-11.db |
| Dataset Pathname | stack/pass2.1 |
| Presentation Format | dil |
| Dataset Creation | Sat Jul 29 03:32:54 2017 |
| 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 |






## Calibration Report

| | |
|---|---|
| Database File | murfin_mears b_#1-11.db |
| Dataset Pathname | stack/pass3.1 |
| Dataset Creation | Sat Jul 29 04:12:39 2017 |

## Dual Induction Calibration Report

| | |
|---|---|
| Serial-Model: | 1987-M&W |
| Calibration Performed: | Tue Apr 11 16:07:38 2017 |

| | Readings | | References | | | Results | |
|---|---|---|---|---|---|---|---|
| Loop: | Air | Loop | Air | Loop | | Gain | Offset |
| Deep | 178.615 | 710.235 | 0.000 | 255.800 | mmho/m | 0.530 | -38.500 |
| Medium | 161.982 | 1441.110 | 0.000 | 255.800 | mmho/m | 0.440 | -108.500 |

## Compensated Density Calibration Report

| | |
|---|---|
| Serial-Model: | 168-986-M&W |
| Source / Verifier: | / |
| Master Calibration Performed: | Tue Apr 11 16:07:47 2017 |

Master Calibration

| | Density | | Far Detector | Near Detector | |
|---|---|---|---|---|---|
| Magnesium | 1.755 | g/cc | 4691.86 | 4818.19 | cps |
| Aluminum | 2.675 | g/cc | 859.57 | 3020.22 | cps |

Spine Angle = 74.61 Density/Spine Ratio = 0.523

| | Size | | Reading |
|---|---|---|---|
| Small Ring | 4.00 | in | 1.03 |
| Large Ring | 14.00 | in | 1.23 |

## 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 Apr 11 16:08:01 2017 | |
| Calibrator Value: | 1000.0 | GAPI |
| Background Reading: | 0.0 | cps |
| Calibrator Reading: | 6.2 | cps |
| Sensitivity: | 0.5200 | GAPI/cps |

PIONEER
Pioneer Energy Services

| | |
|---|---|
| Company | MURFIN DRILLING COMPANY, INC. |
| Well | MEARS B #1-11 |
| Field | WILDCAT |
| County | CHEYENNE |
| State | KANSAS |