



## DUAL INDUCTION LOG

MIDWEST WIRELINE

Company Castle Resources, Inc.

Well Hartwich #1

Field

County Wabaunsee State Kansas

Location: API #: 15-197-20323-00-00

2070 FNL & 3880 FEL

SEC 12 TWP 11S RGE 10E

CNL/CDL  
MEL/BHCS

Other Services

Permanent Datum Ground Level Elevation 1246  
Log Measured From Kelly Bushing  
Drilling Measured From Kelly Bushing

Elevation  
K.B. 1251  
D.F.  
G.L. 1246

Date 1/27/2024

Run Number One

Depth Driller 2845

Depth Logger 2844

Bottom Logged Interval 2843

Top Log Interval 300

Casing Driller 8.625 @ 307

Casing Logger 307

Bit Size 7.875

Type Fluid in Hole Chemical

Salinity, ppm CL 1000

Density / Viscosity 9.3 50

pH / Fluid Loss 11.8 8.8

Source of Sample FLOWLINE

Rm @ Meas. Temp 0.80 @ 55

Rmt @ Meas. Temp 0.60 @ 55

Rmc @ Meas. Temp 1.08 @ 55

Source of Rmt / Rmc CHARTS

Rm @ BHT 0.42 @ 104

Operating Rig Time 5 Hours

Max Rec. Temp. F 104

Equipment Number 110

Location HAYS

Recorded By D. Schmidt

Witnessed By Jerry Green

<<< Fold Here >>>

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

I-70 & Wabaunsee Exit,  
4 North to Homestead,  
2 1/4 East, South and West to location

Log Measured From: Kelly Bushing

Ft. Above Permanent Datum

THANK YOU FOR USING MIDWEST WIRELINE LLC  
785-625-3858

### Your Midwest Wireline Crew

Engineer: D. Schmidt  
Operator:  
Operator:  
Operator:

### This Log Record Was Witnessed By

Primary Witness: Jerry Green  
Secondary Witness:  
Secondary Witness:  
Secondary Witness:

| Sensor                                                                                                                        | Offset (ft)    | Schematic |  | Description           | Length (ft) | O.D. (in) | Weight (lb) |
|-------------------------------------------------------------------------------------------------------------------------------|----------------|-----------|--|-----------------------|-------------|-----------|-------------|
| GR                                                                                                                            | 40.33          |           |  | GR-M&W (105)          | 3.00        | 3.50      | 50.00       |
| CNLSC<br>CNSSC                                                                                                                | 37.23<br>36.48 |           |  | CNT-M&W (210)         | 5.00        | 3.50      | 100.00      |
| LSD<br>DCAL<br>SSD                                                                                                            | 28.18          |           |  | CDL-M&W (303-03)      | 8.50        | 4.00      | 250.00      |
|                                                                                                                               | 28.17          |           |  | ML-PSI STKBL ML (402) | 7.58        | 4.00      | 65.00       |
|                                                                                                                               | 27.68          |           |  |                       |             |           |             |
| MCAL<br>MI<br>MN                                                                                                              | 19.58          |           |  |                       |             |           |             |
|                                                                                                                               | 19.58          |           |  |                       |             |           |             |
|                                                                                                                               | 19.58          |           |  |                       |             |           |             |
| RLL3F<br>RLL3                                                                                                                 | 15.50          |           |  | DIL-M&W (504 HT)      | 18.25       | 3.50      | 220.00      |
|                                                                                                                               | 15.50          |           |  |                       |             |           |             |
| CILD                                                                                                                          | 8.33           |           |  |                       |             |           |             |
|                                                                                                                               | 4.50           |           |  |                       |             |           |             |
| SP                                                                                                                            | 0.20           |           |  |                       |             |           |             |
| Dataset: castle_hartwich 1.db: field/well/stkml/pass5.1<br>Total length: 42.33 ft<br>Total weight: 685.00 lb<br>O.D.: 4.00 in |                |           |  |                       |             |           |             |

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\castle\_hartwich 1.db  
Dataset field/well/stkml/pass5.1/\_vars\_

## Top - Bottom

|           |        |         |         |          |          |       |          |
|-----------|--------|---------|---------|----------|----------|-------|----------|
| A         | BOREID | BOTTEMP | CASEOD  | CASETHCK | FLUIDDEN | M     | MATRXDEN |
| 1         | in     | degF    | in      | in       | g/cc     | 2     | g/cc     |
|           | 7.875  | 100     | 5.5     | 0        | 1        |       | 2.71     |
| NPORSEL   | PERFS  | SNDERR  | SNDERRM | SPSHIFT  | SRFTEMP  | SZCOR | TDEPTH   |
| Limestone | No     | mmho/m  | mmho/m  | mV       | degF     | Off   | ft       |
|           |        | 8       | -4      | -185     | 40       |       | 0        |

## Variable Description

A : Cement Factor (a)  
BOREID : Borehole I.D.  
BOTTEMP : Bottom Hole Temperature  
CASEOD : Casing O.D.  
CASETHCK : Casing Thickness  
FLUIDDEN : Fluid Density  
M : Cement Exp (m)  
MATRXDEN : Matrix Density

NPORSEL : Neutron Porosity Curve Select  
PERFS : Perforation Flag  
SNDERR : Deep Sonde Error Correction  
SNDERRM : Medium Sonde Error Correction  
SPSHIFT : S.P. Baseline Offset  
SRFTEMP : Surface Temperature  
SZCOR : CN Size Cor. ?  
TDEPTH : Total Depth

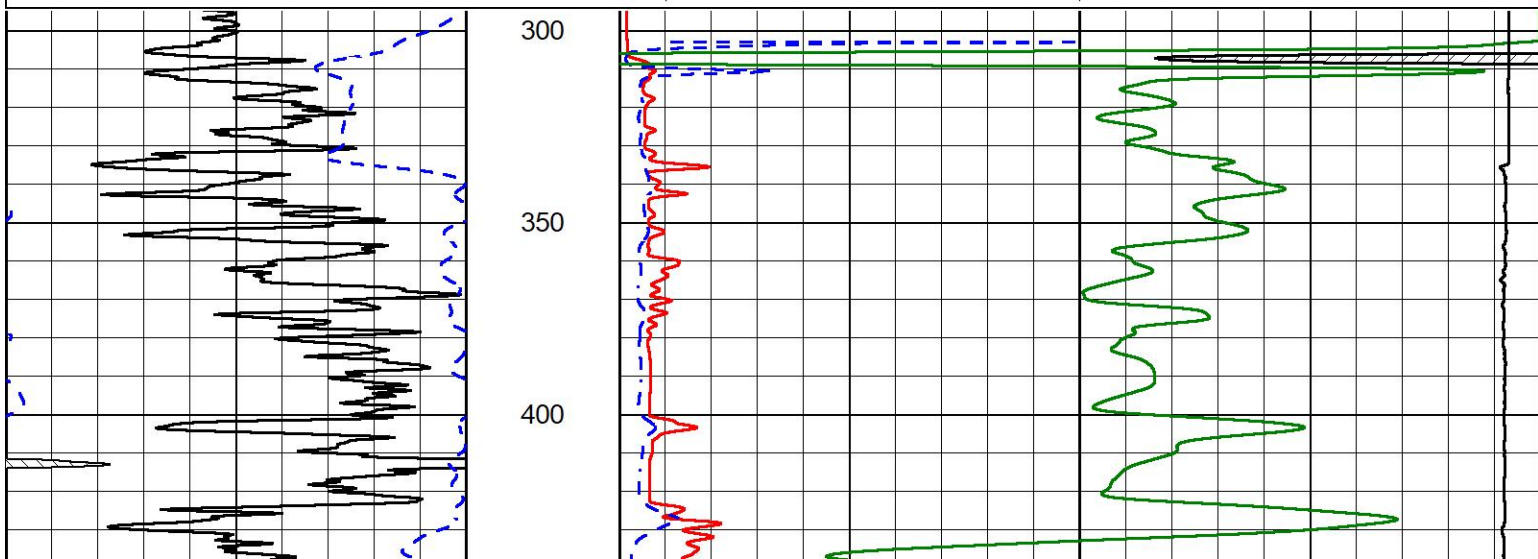


## 2" SCALE RESISTIVITY

### MAIN PASS

Database File castle\_hartwich 1.db  
Dataset Pathname stkml/pass5.3  
Presentation Format \_dil2in  
Dataset Creation Sat Jan 27 16:32:30 2024  
Charted by Depth in Feet scaled 1:600

|      |                  |     |                     |                             |     |
|------|------------------|-----|---------------------|-----------------------------|-----|
| 0    | Gamma Ray (GAPI) | 150 | 1000                | Conductivity (mmho/m)       | 0   |
| -200 | SP (mV)          | 0   | 15000               | Line Tension (lb)           | 0   |
|      |                  |     | 0                   | Shallow Resistivity (Ohm-m) | 50  |
|      |                  |     | 0                   | Deep Resistivity (Ohm-m)    | 50  |
|      |                  |     | Shallow Resistivity |                             |     |
|      |                  |     | 50                  | (Ohm-m)                     | 200 |
|      |                  |     | 50                  | Deep Resistivity (Ohm-m)    | 200 |



450

500

550

600

650

700

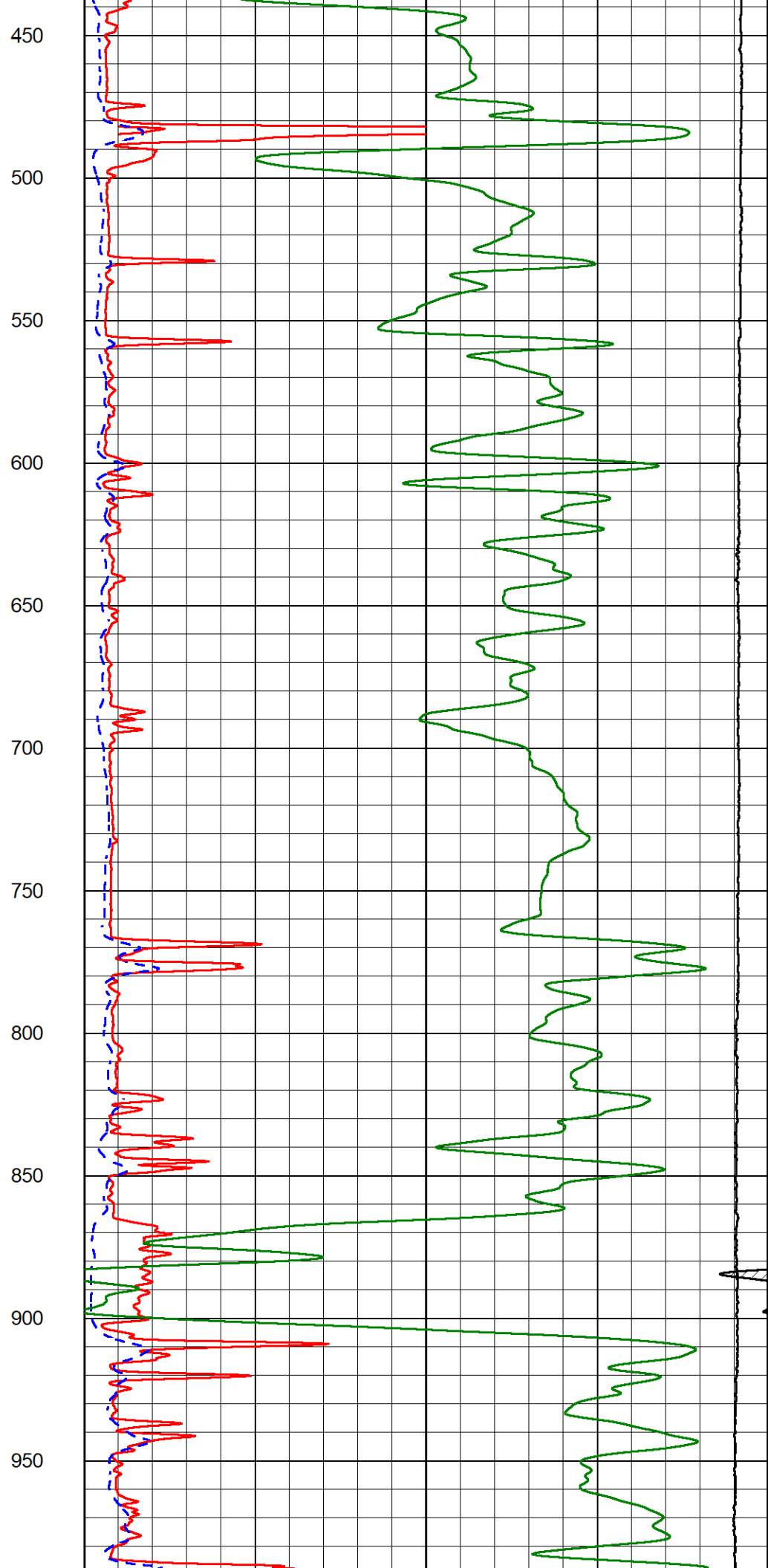
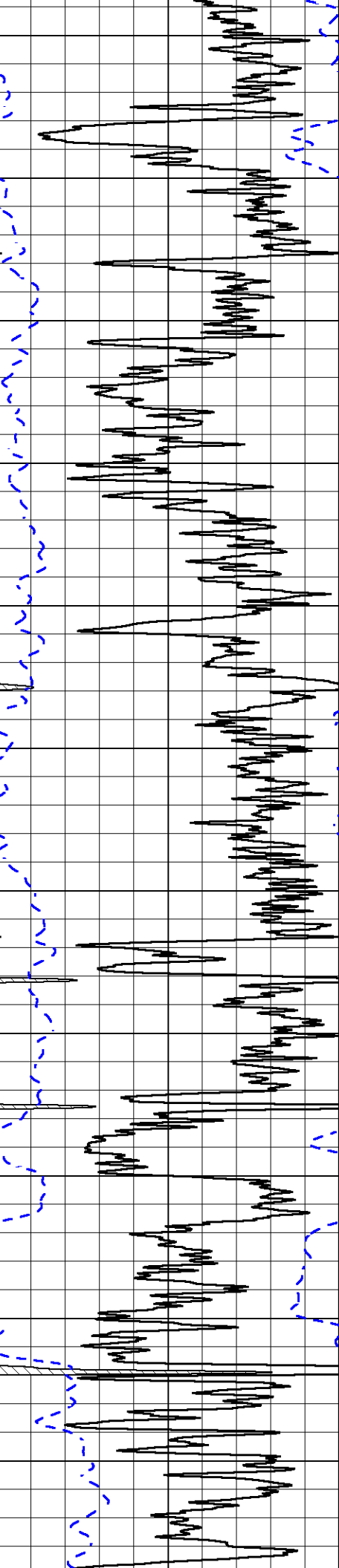
750

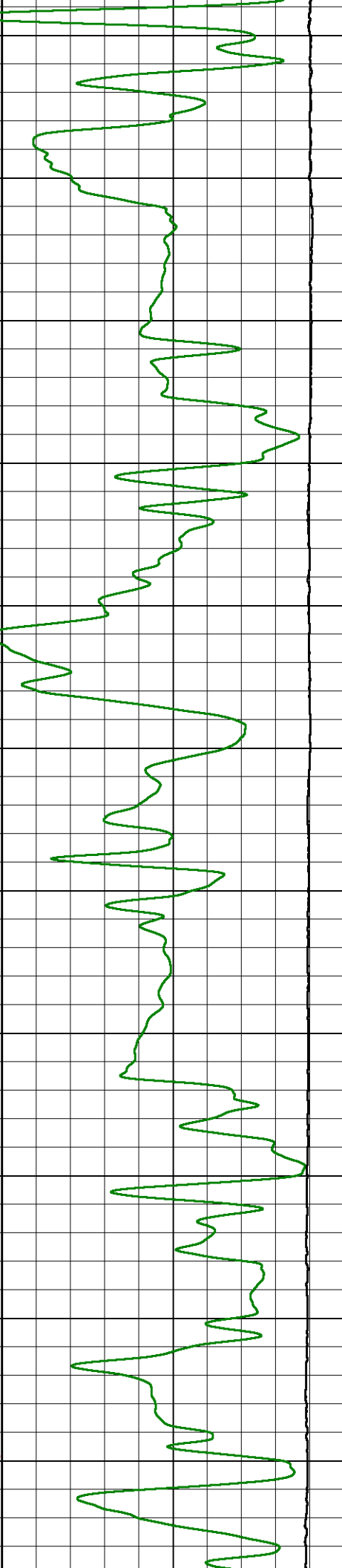
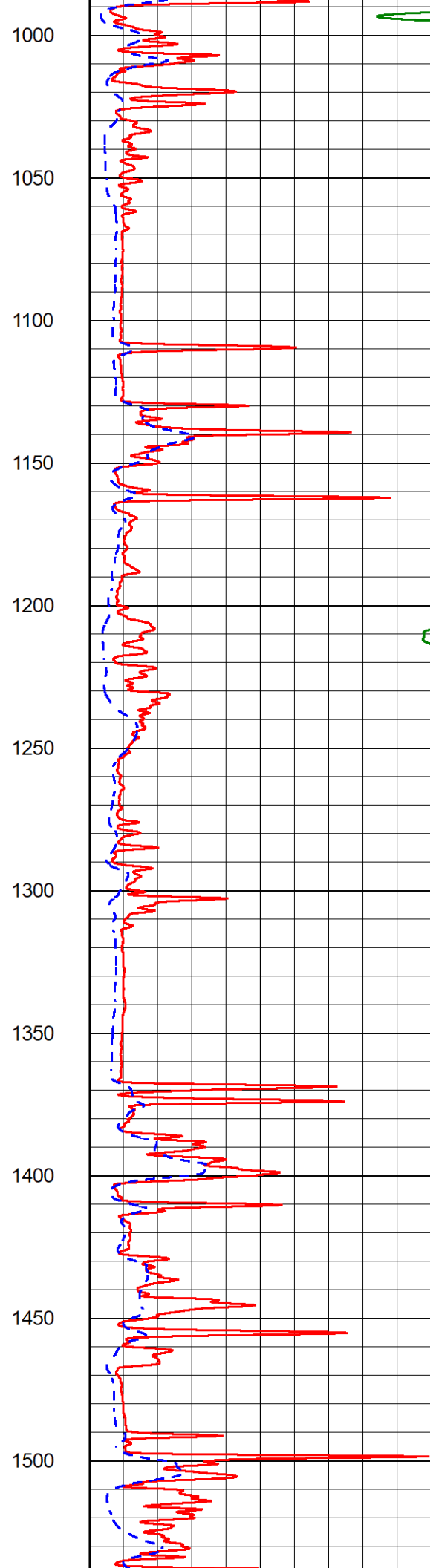
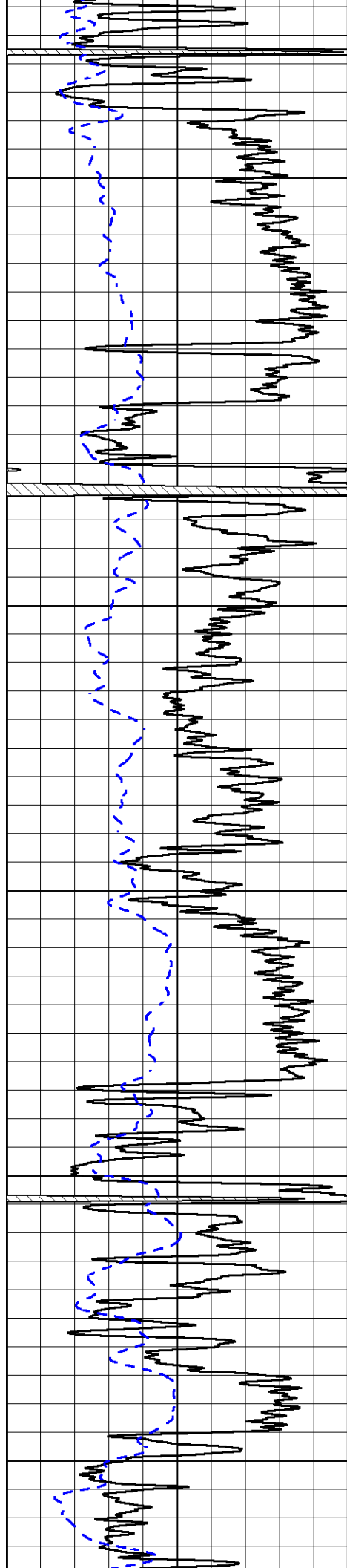
800

850

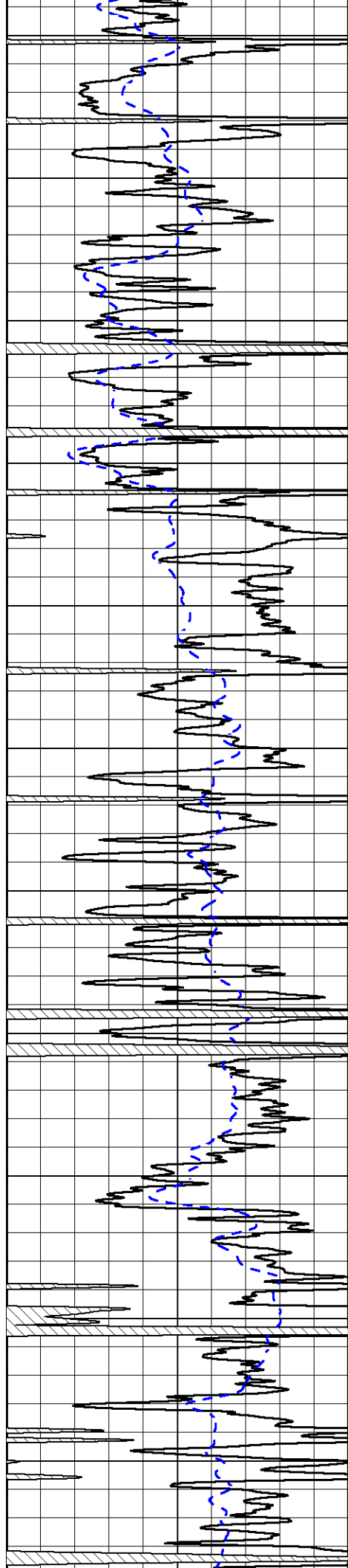
900

950









1550

1600

1650

1700

1750

1800

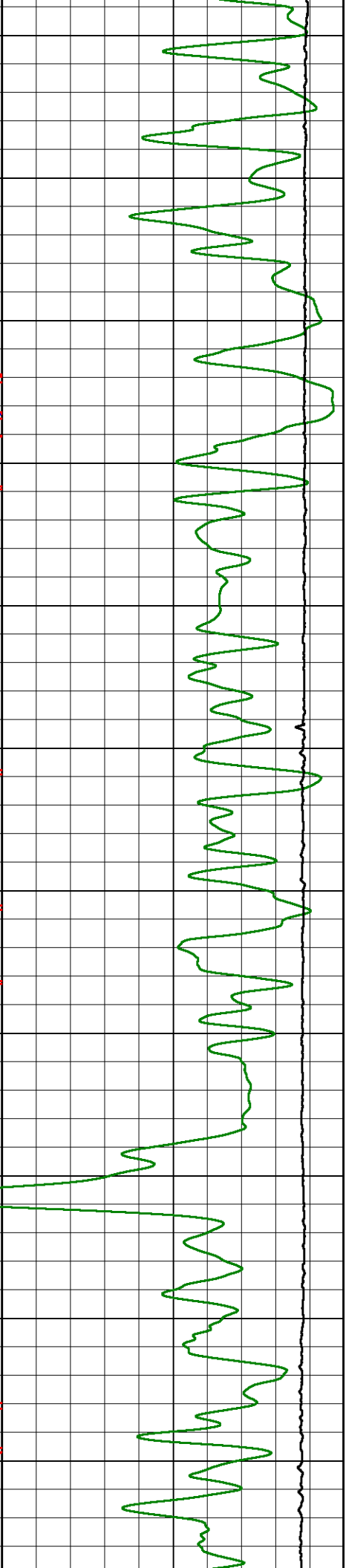
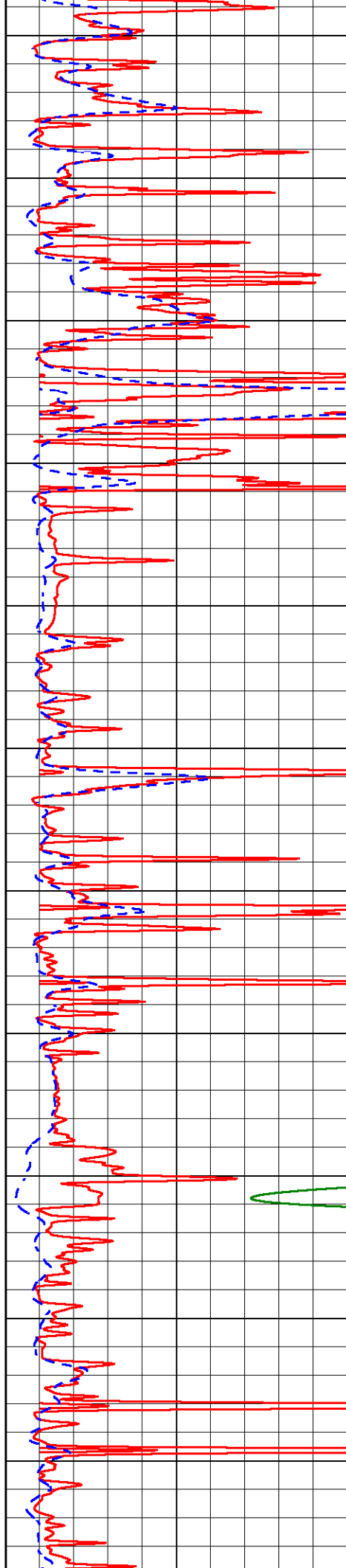
1850

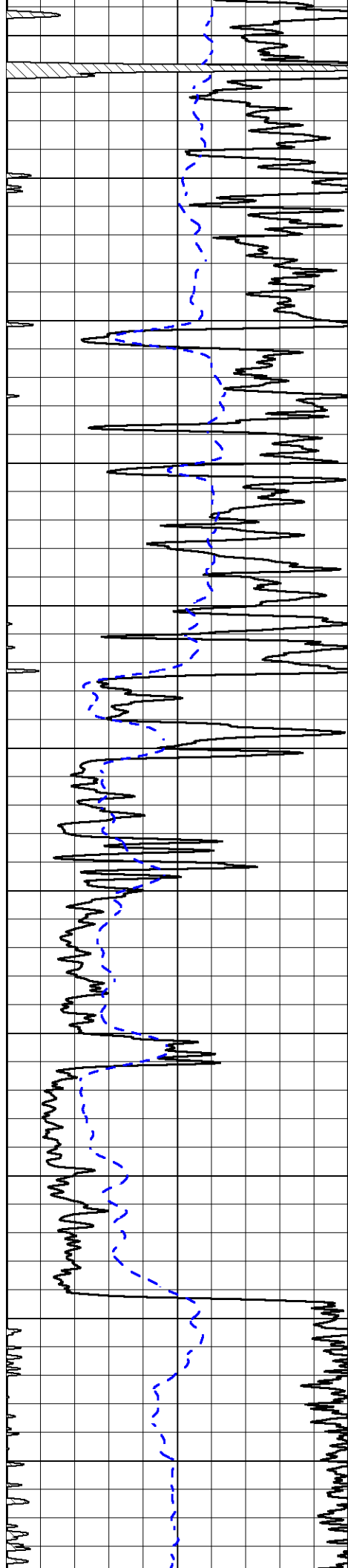
1900

1950

2000

2050





2100

2150

2200

2250

2300

2350

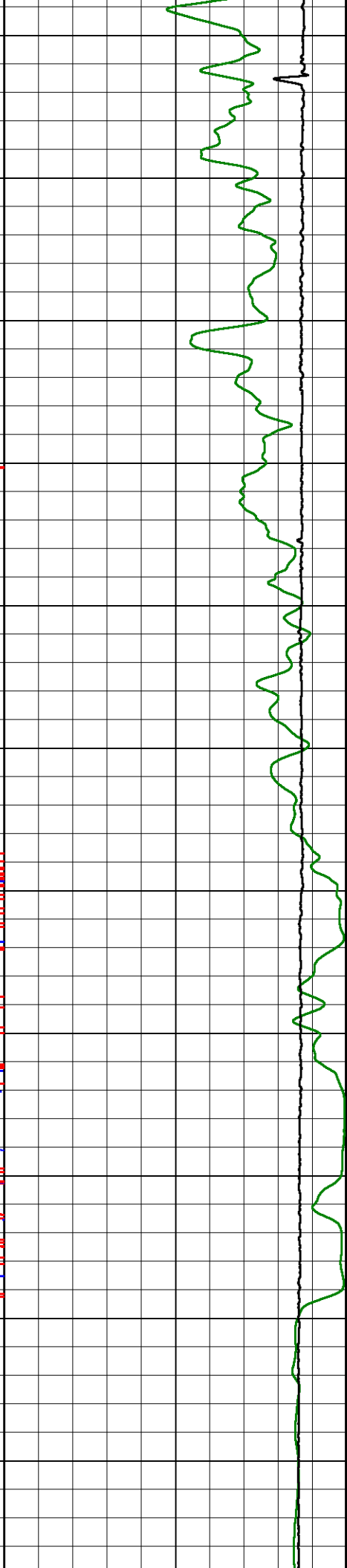
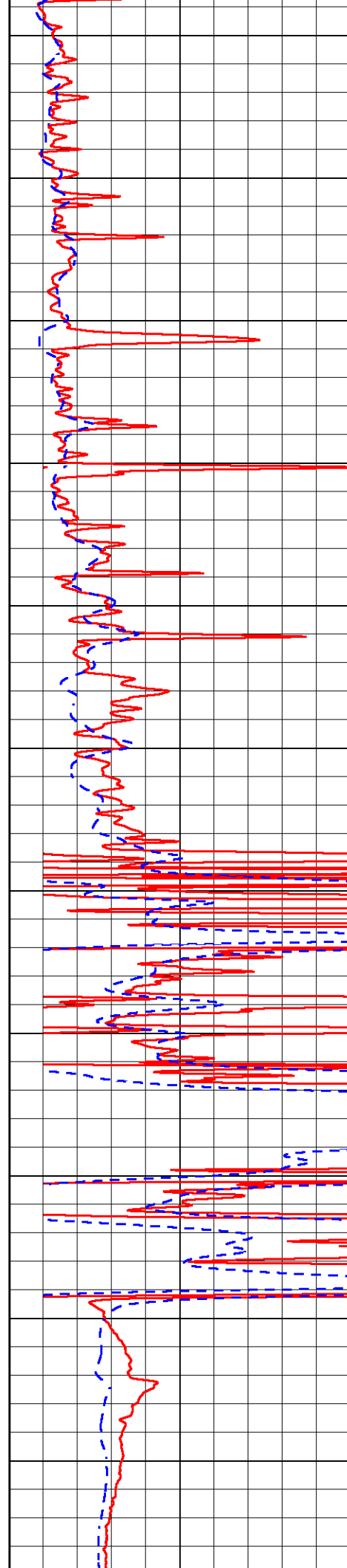
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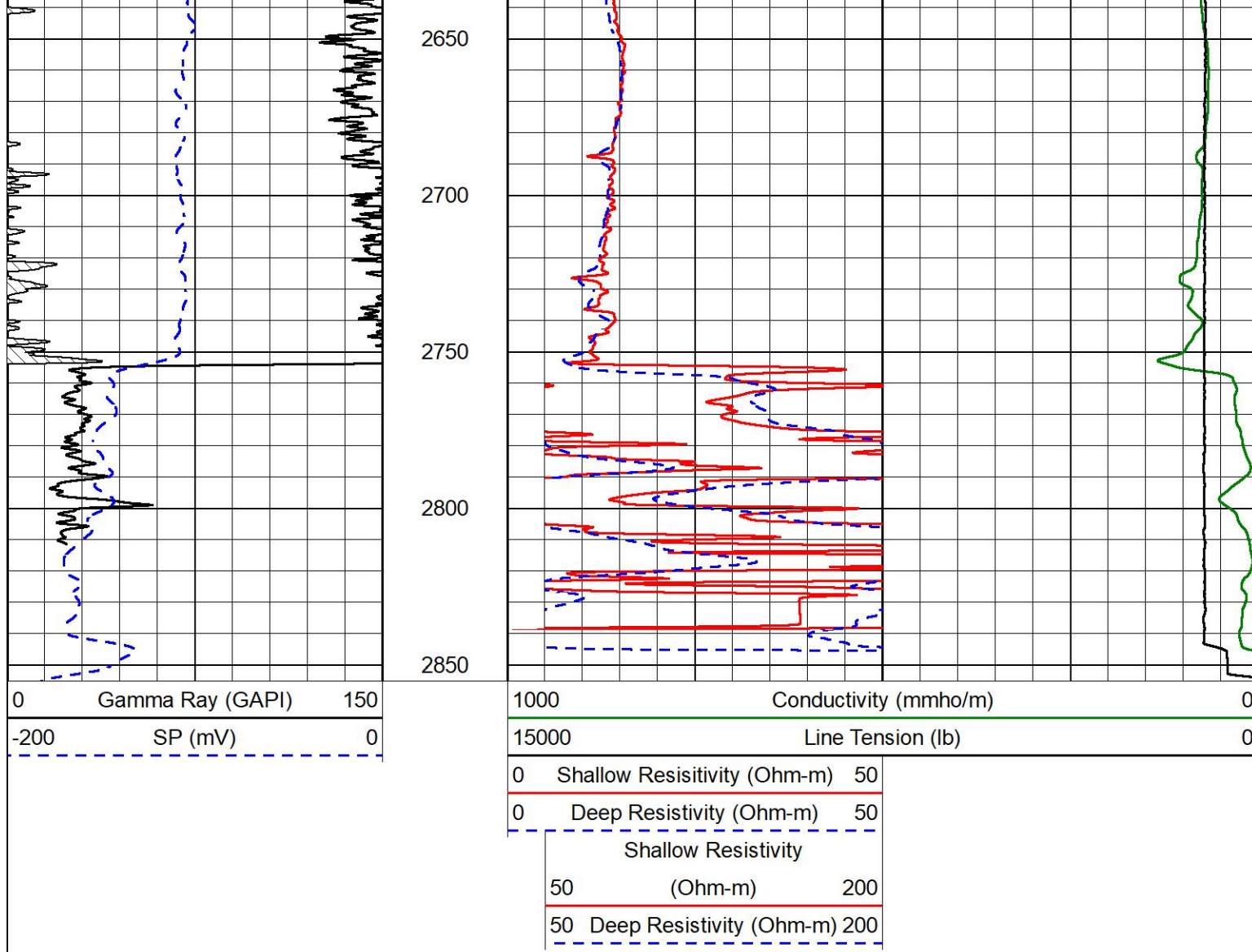
2450

2500

2550

2600

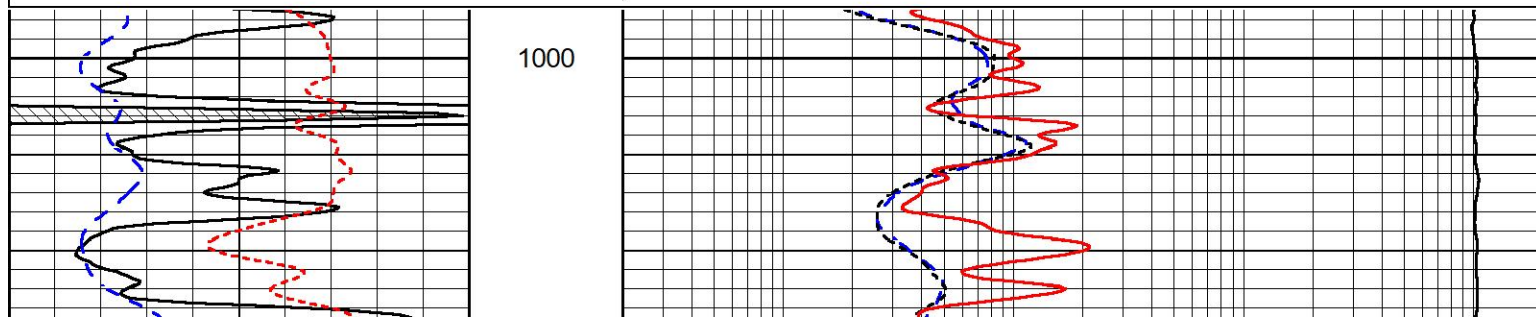
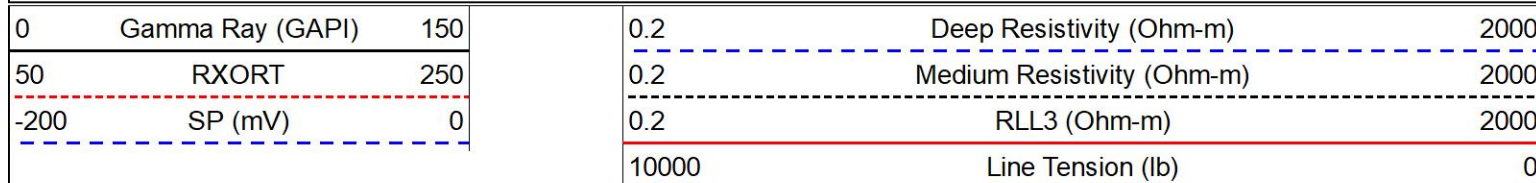




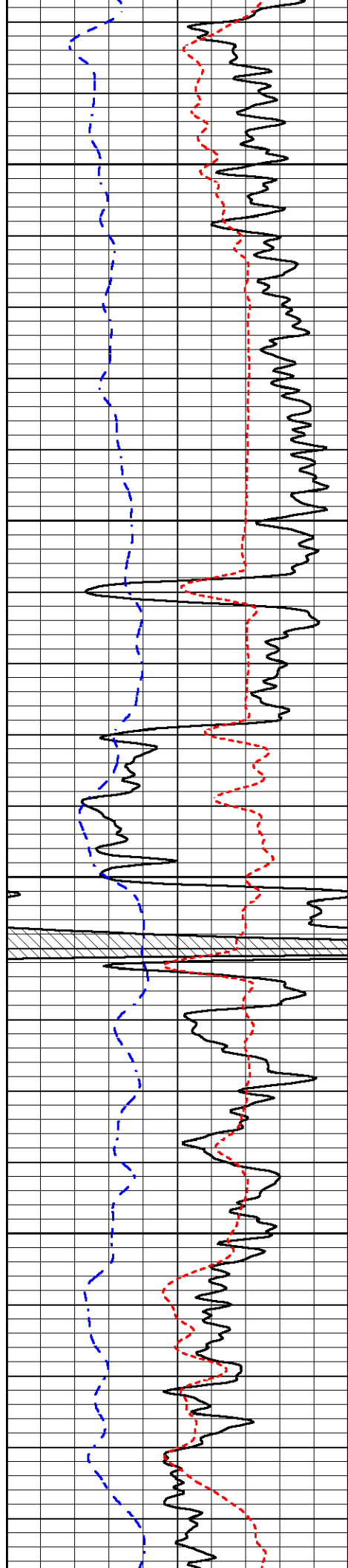
## DETAIL SECTION

### MAIN PASS

Database File castle\_hartwich 1.db  
 Dataset Pathname stkml/pass5.1  
 Presentation Format \_dil  
 Dataset Creation Sat Jan 27 16:30:05 2024  
 Charted by Depth in Feet scaled 1:240





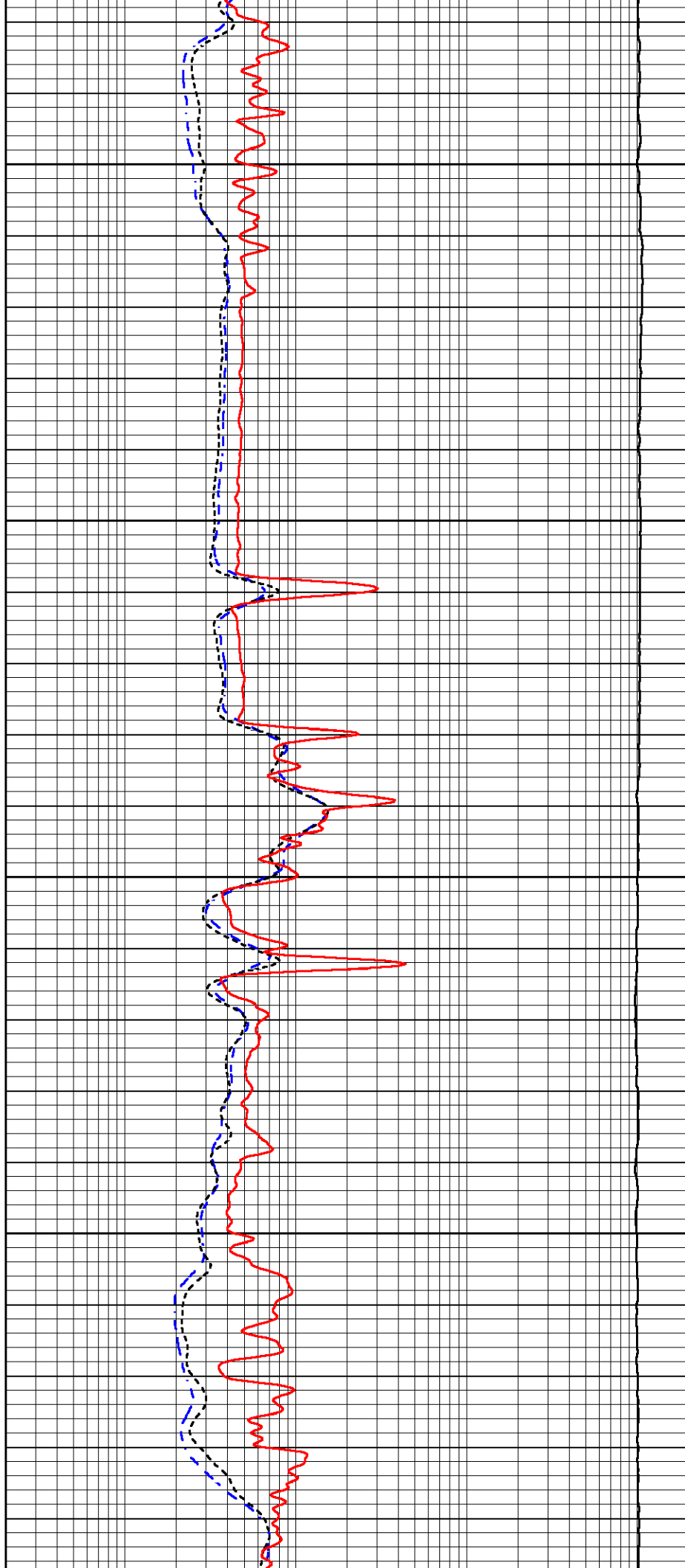


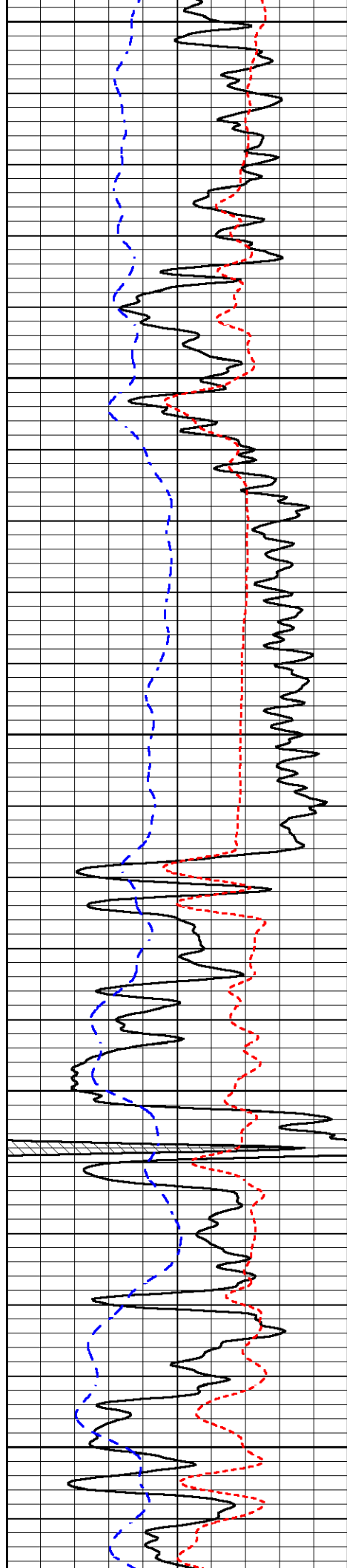
1050

1100

1150

1200





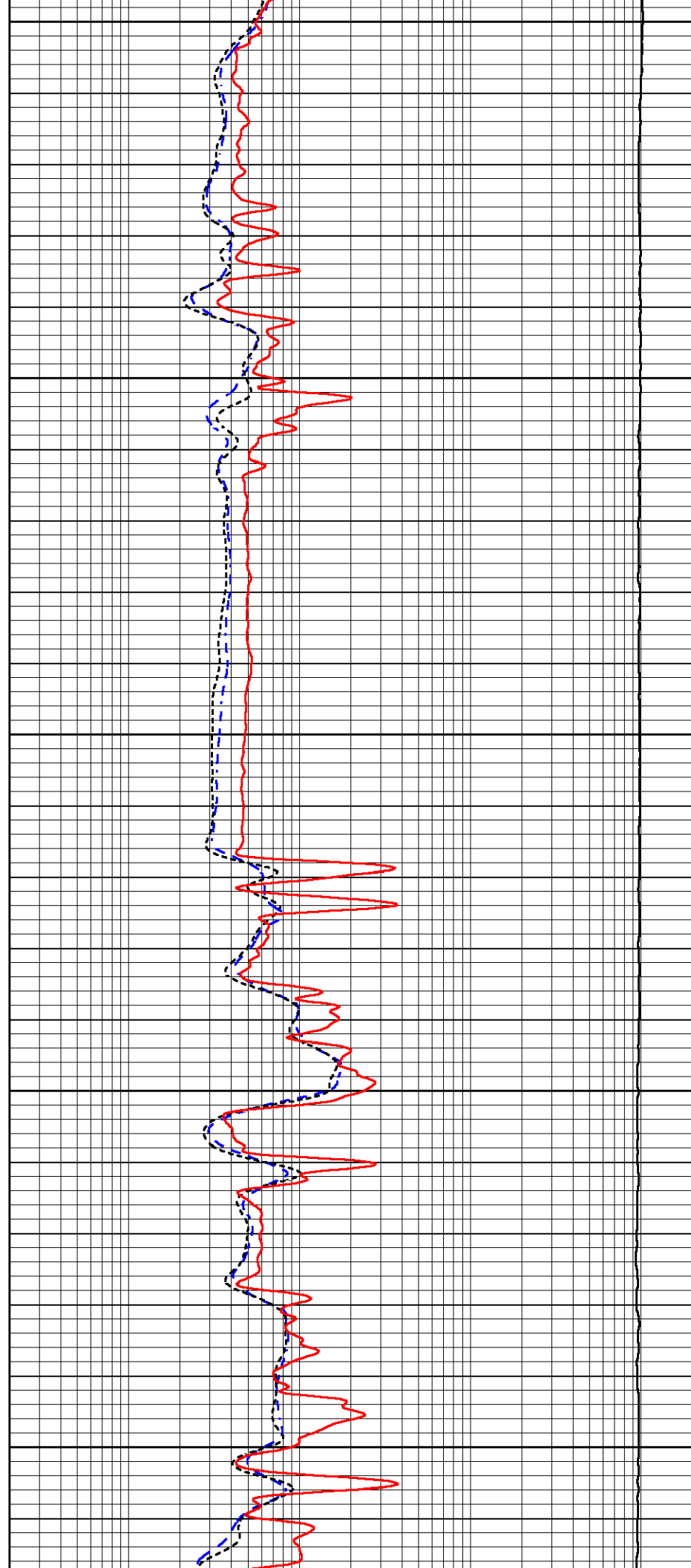
1250

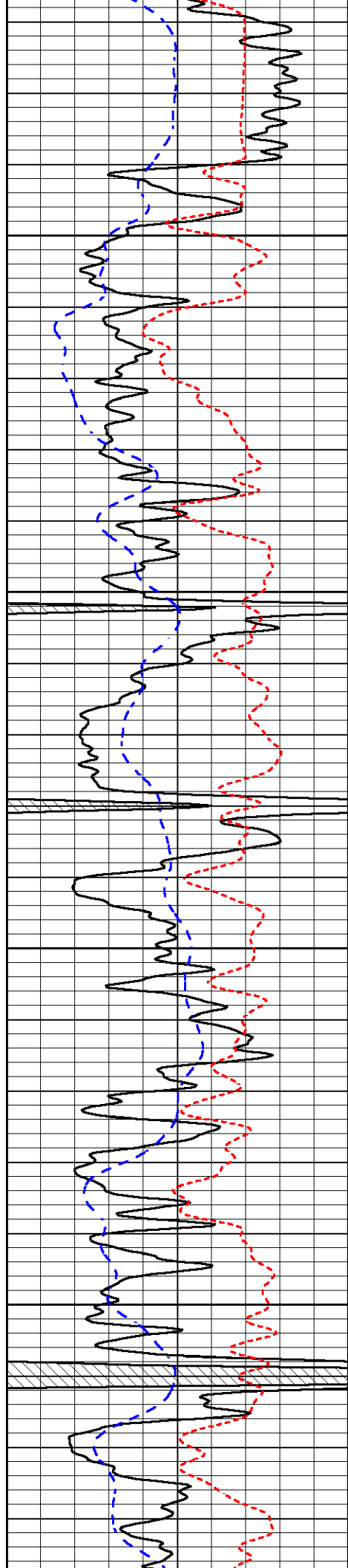
1300

1350

1400

1450



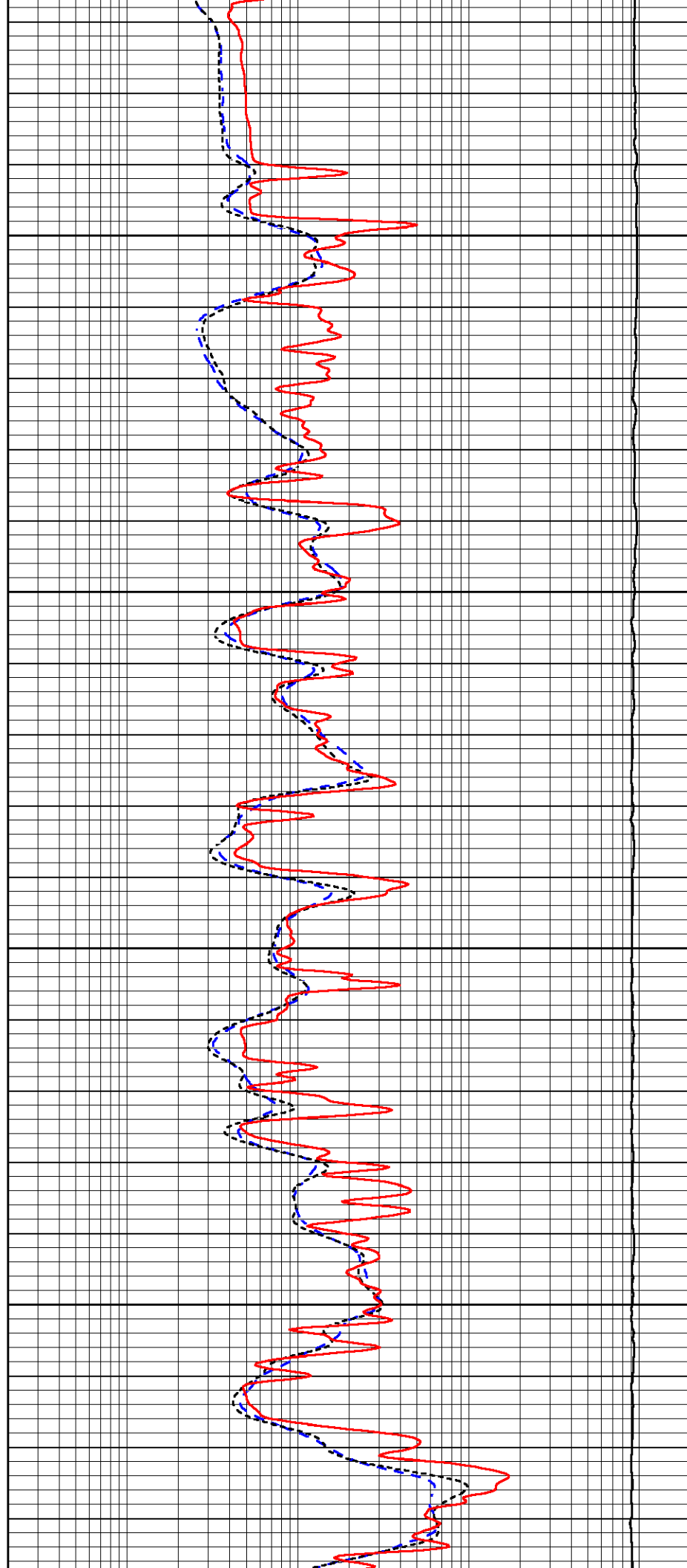


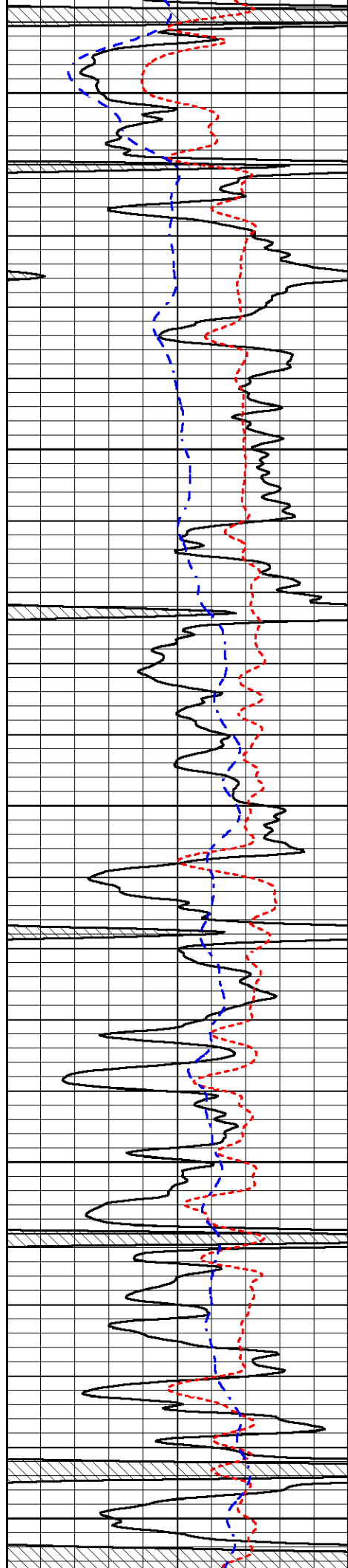
1500

1550

1600

1650





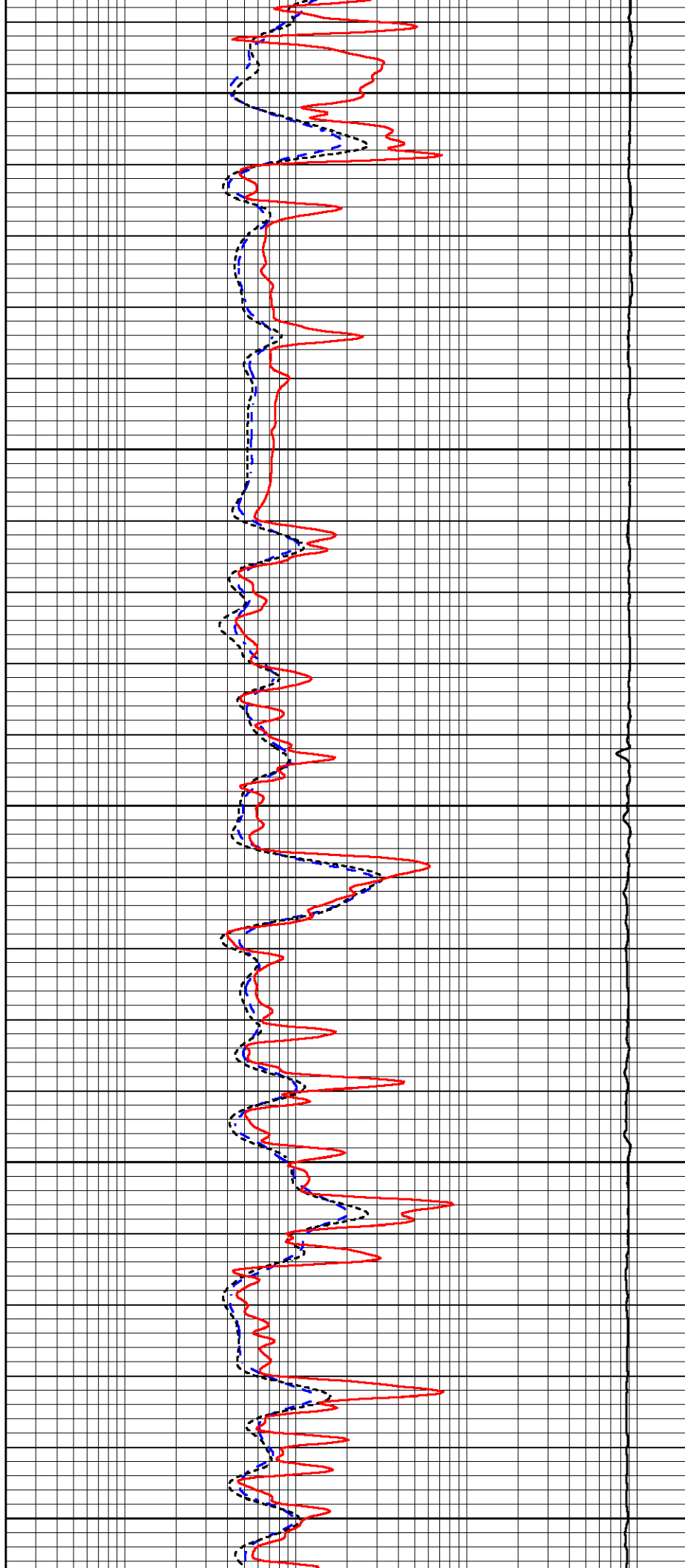
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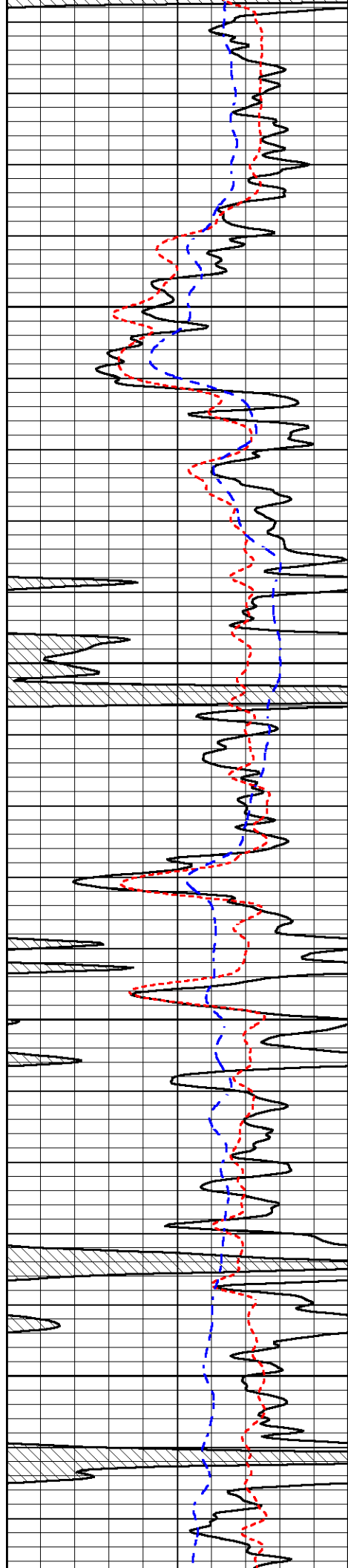
1750

1800

1850

1900



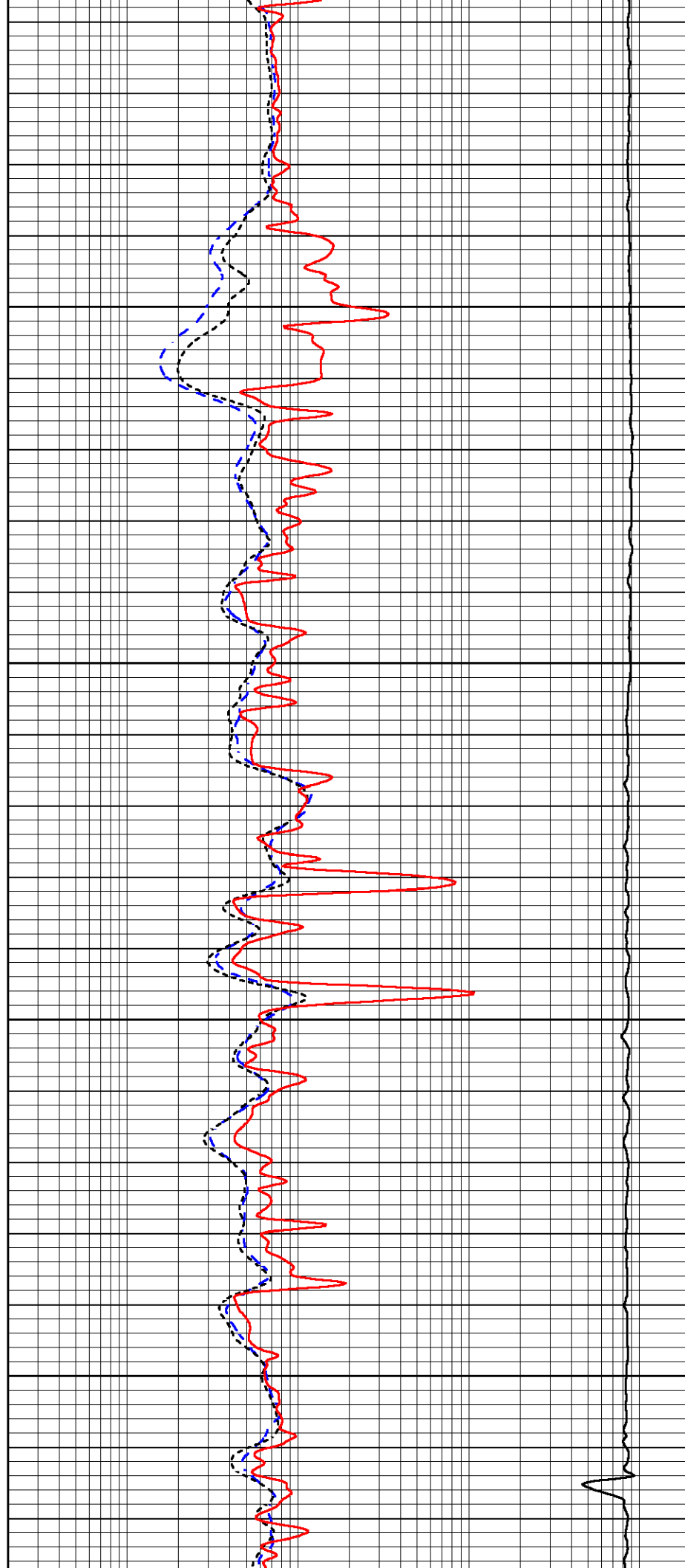


1950

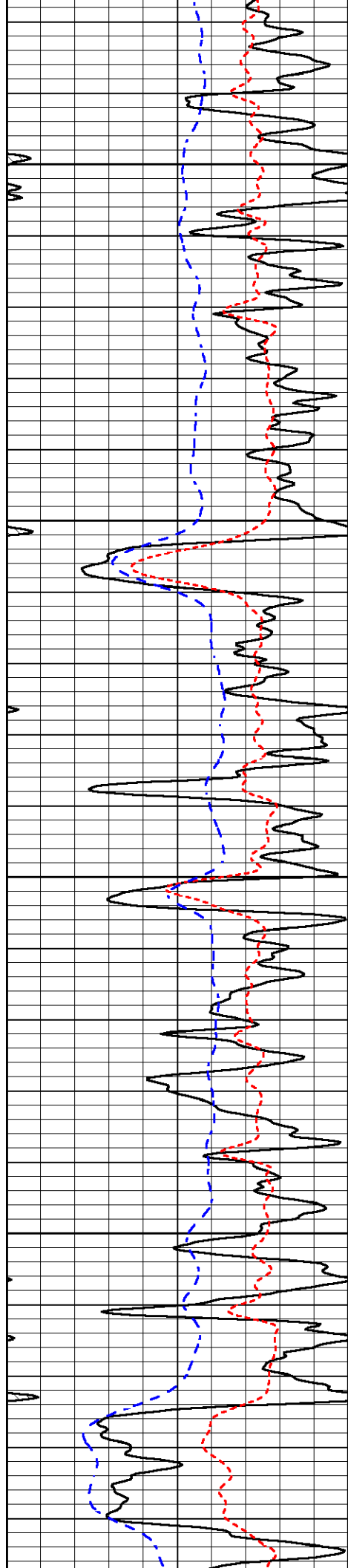
2000

2050

2100





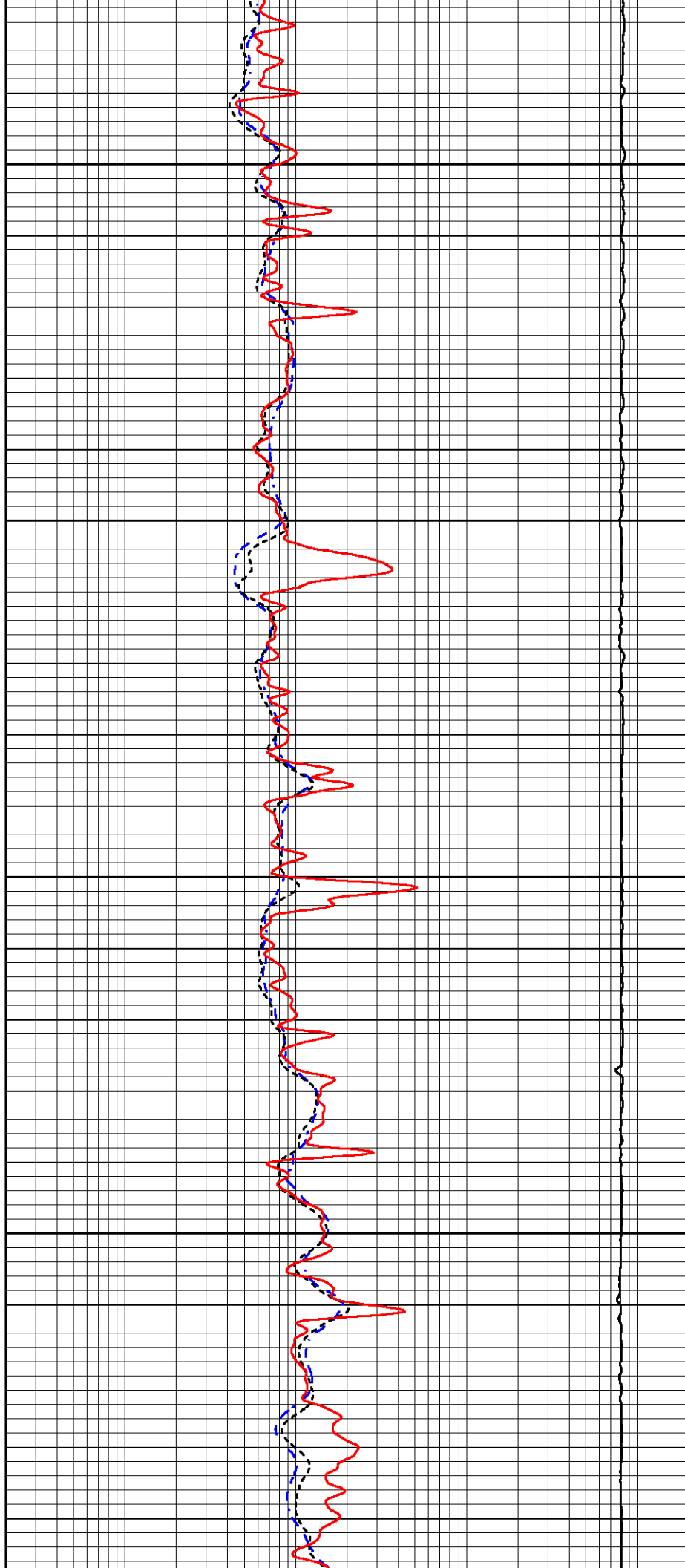


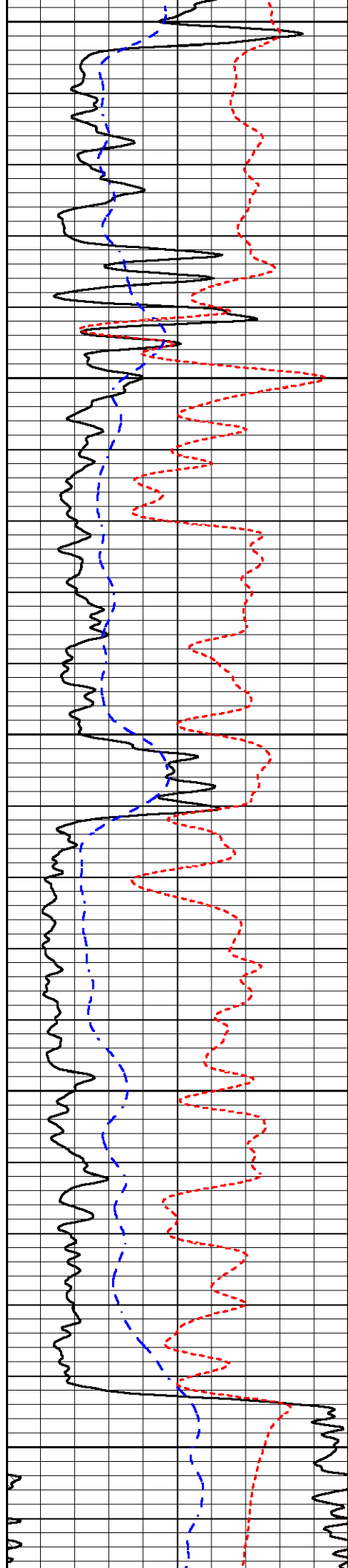
2150

2200

2250

2300





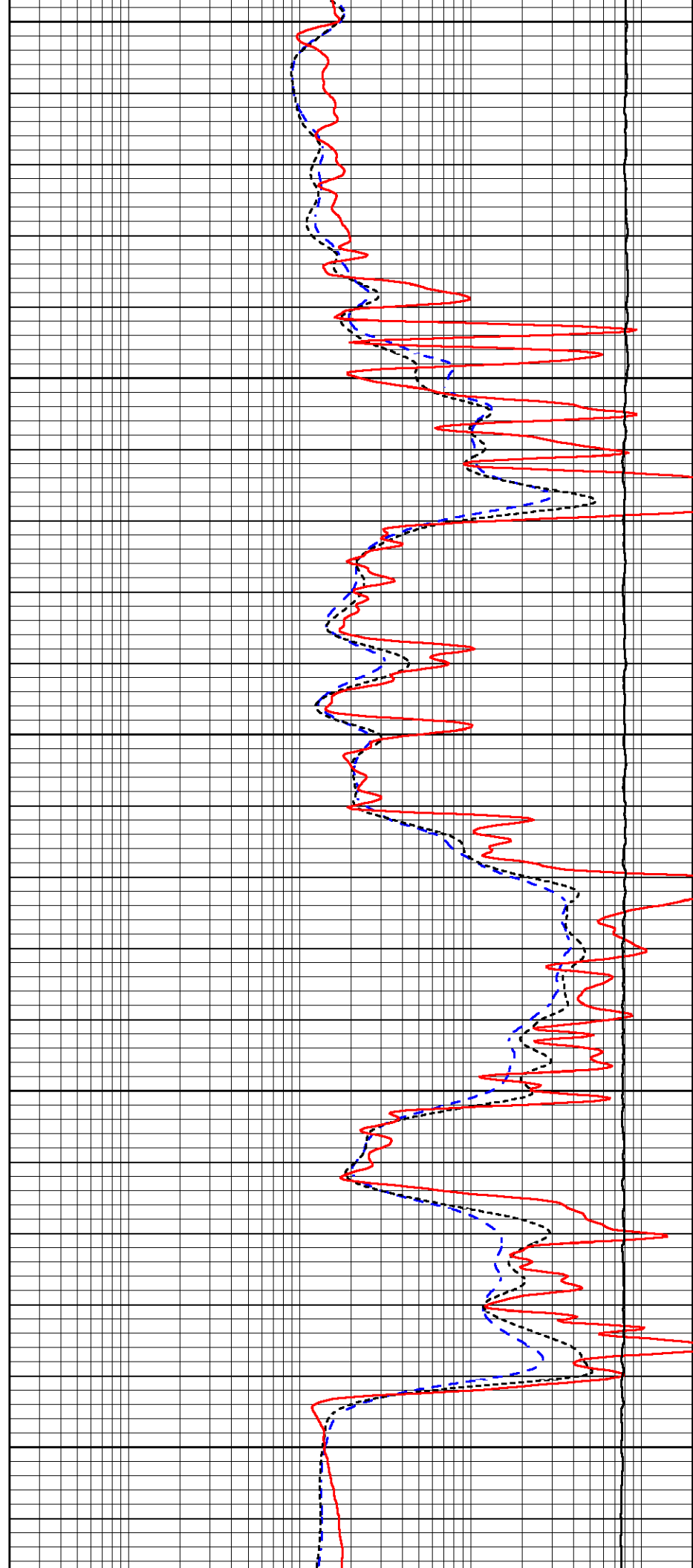
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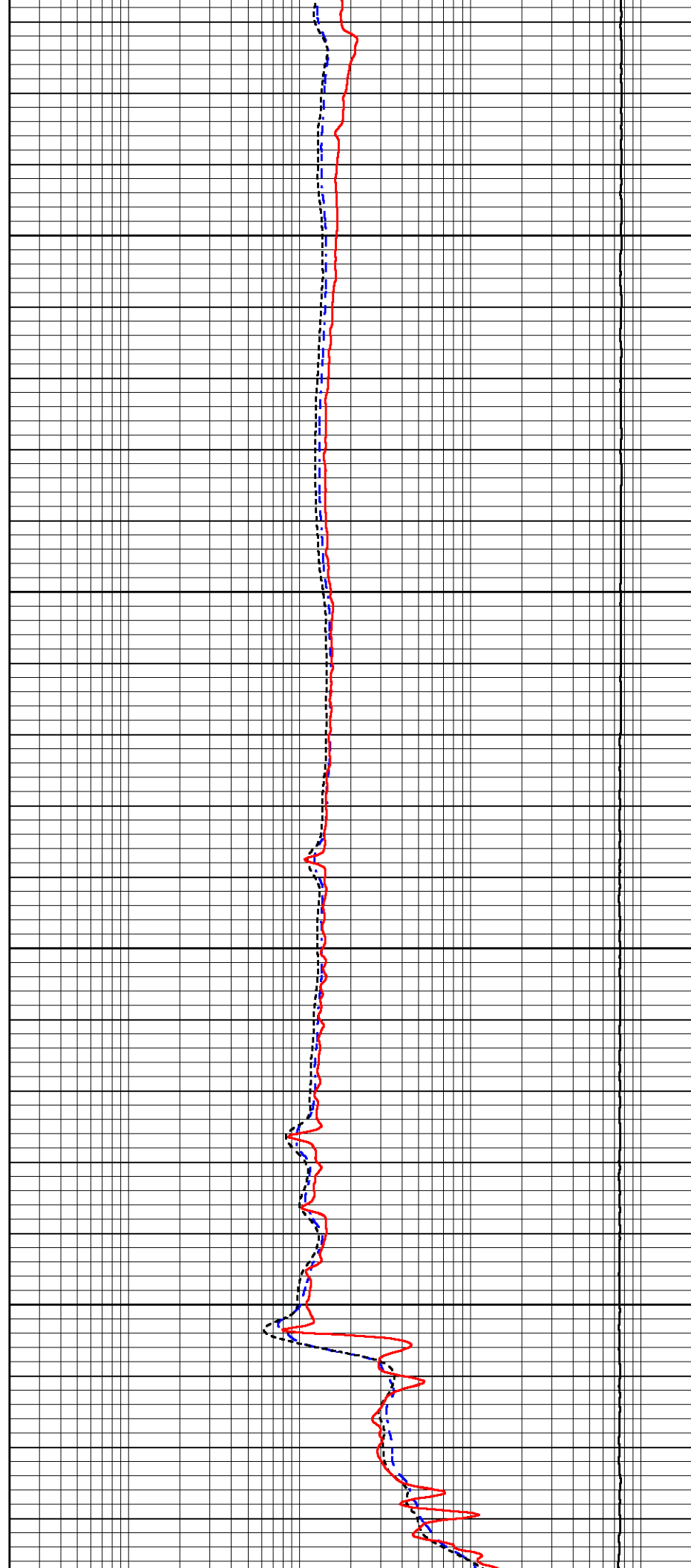
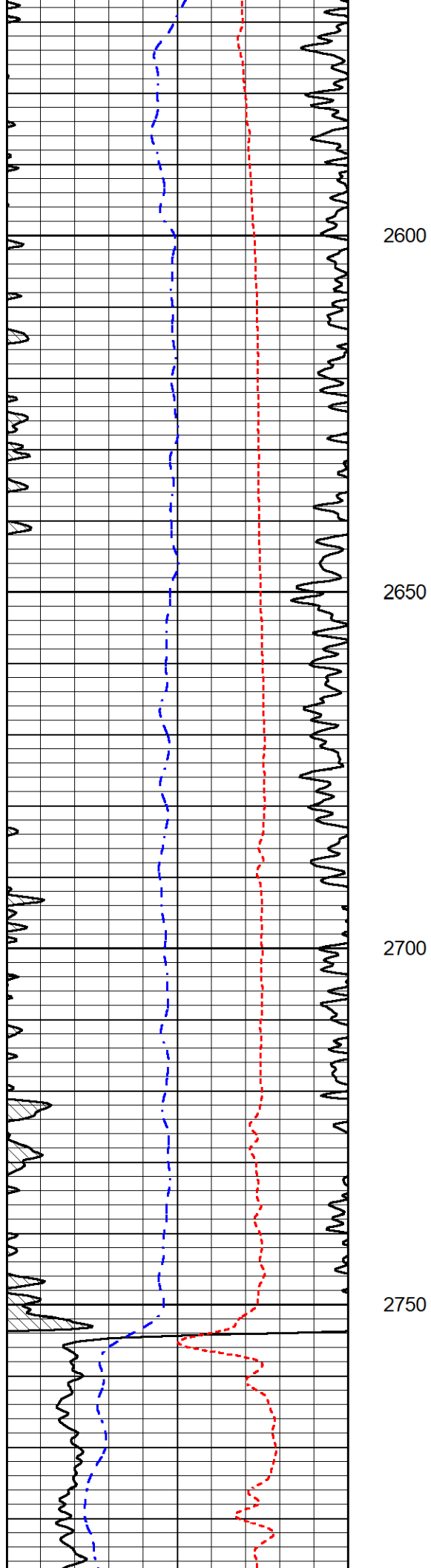
2400

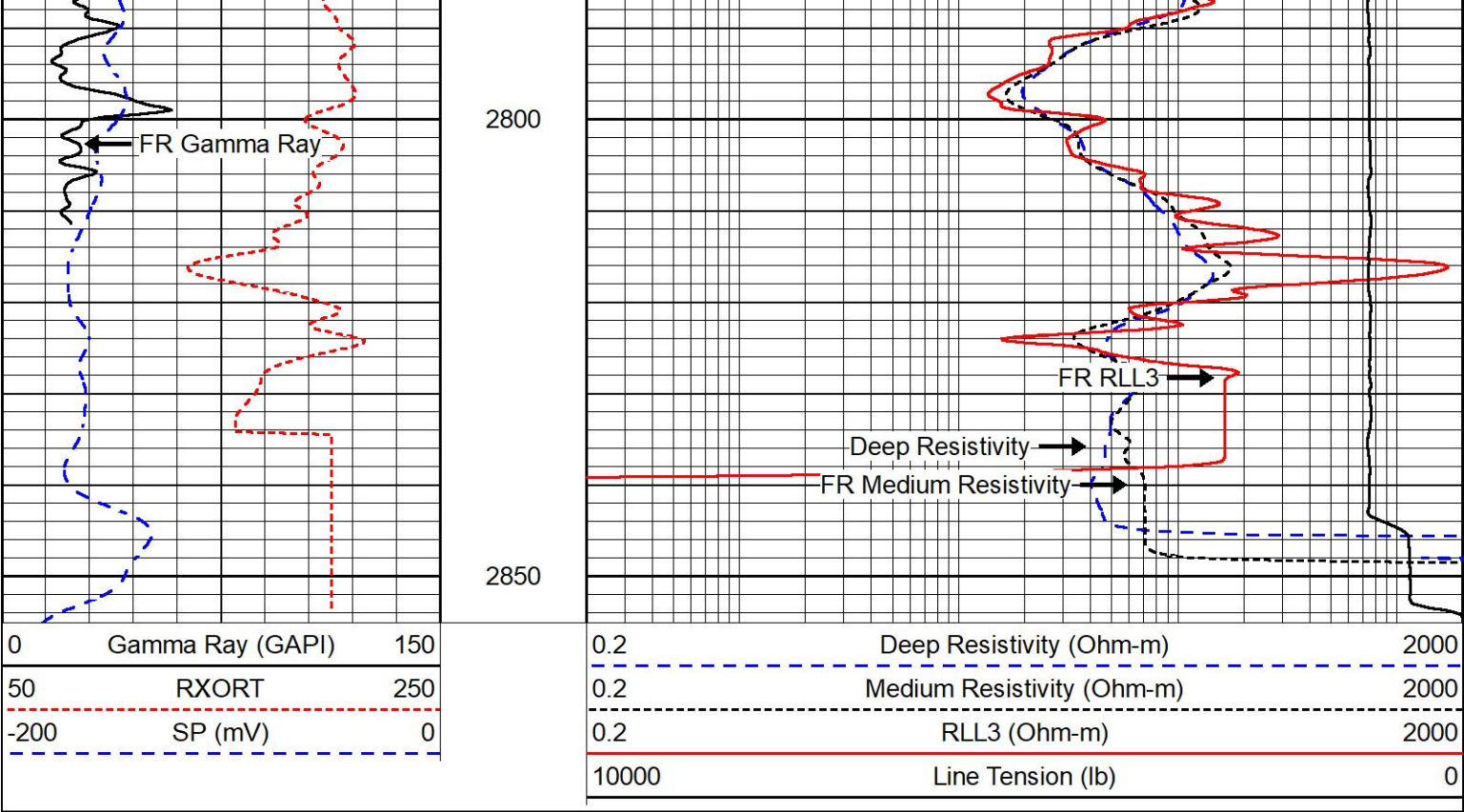
2450

2500

2550



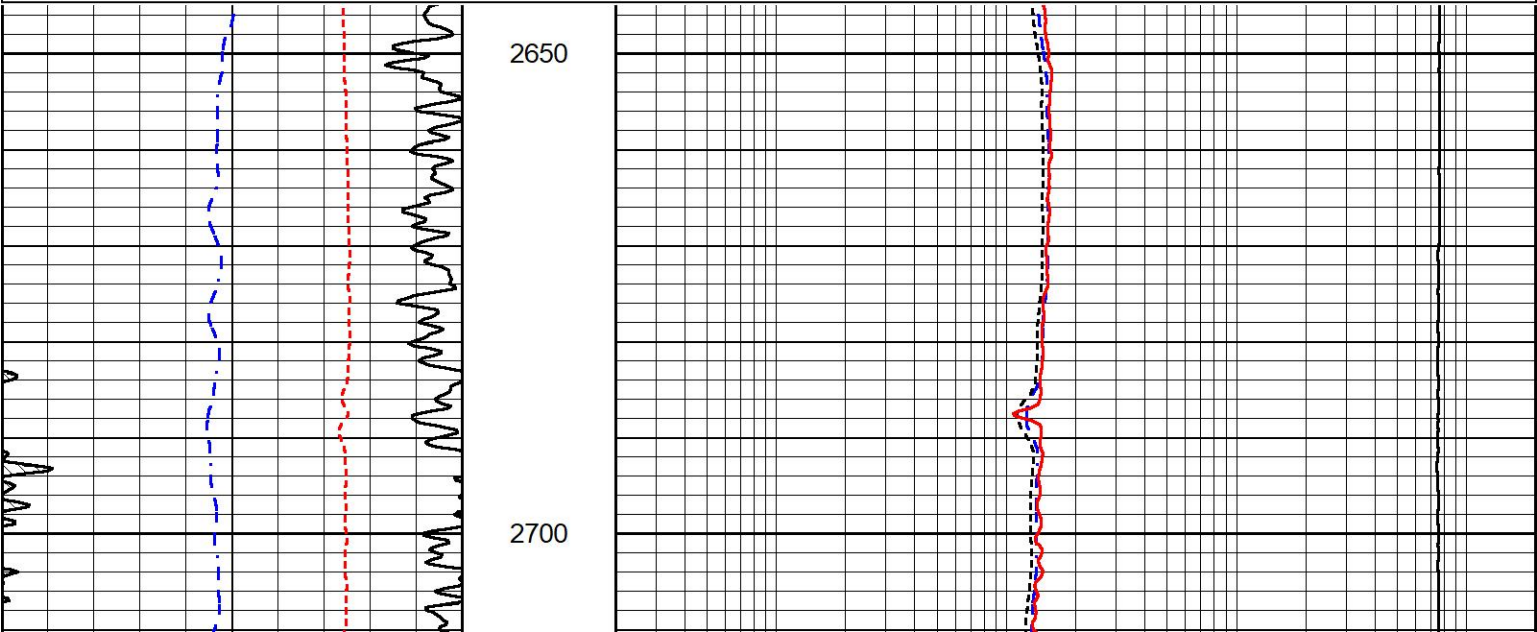
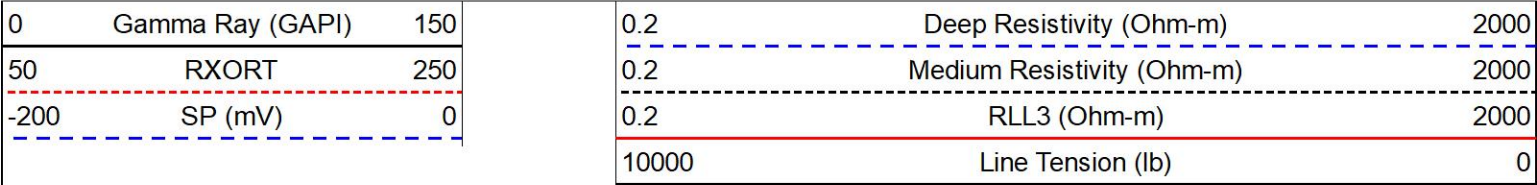


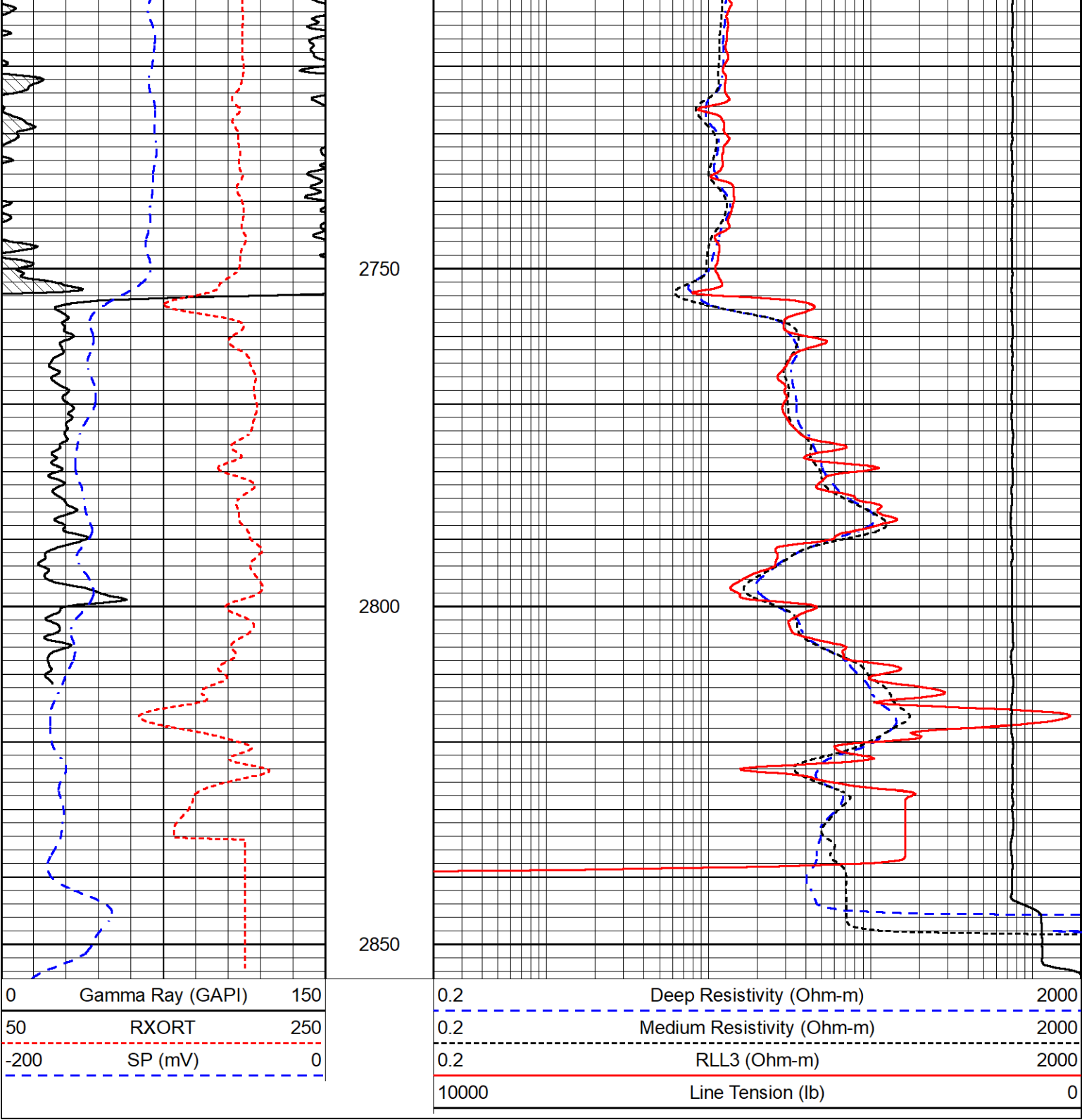


## REPEAT SECTION

### REPEAT PASS

Database File castle\_hartwich 1.db  
Dataset Pathname stkml/pass4.1  
Presentation Format \_dil  
Dataset Creation Sat Jan 27 15:56:38 2024  
Charted by Depth in Feet scaled 1:240





| Calibration Report                |     |                          |     |         |   |   |
|-----------------------------------|-----|--------------------------|-----|---------|---|---|
| Database File                     |     | castle_hartwich 1.db     |     |         |   |   |
| Dataset Pathname                  |     | stkml/pass5.1            |     |         |   |   |
| Dataset Creation                  |     | Sat Jan 27 16:30:05 2024 |     |         |   |   |
| Dual Induction Calibration Report |     |                          |     |         |   |   |
| Serial-Model:                     |     | 504 HT-M&W               |     |         |   |   |
| Surface Cal Performed:            |     | Thu Dec 21 06:11:24 2023 |     |         |   |   |
| Readings                          |     | References               |     | Results |   |   |
| Loop:                             | Air | Loop                     | Air | Loop    | m | b |

|        |         |          |       |         |        |       |         |
|--------|---------|----------|-------|---------|--------|-------|---------|
| Deep   | 178.615 | 710.235  | 0.000 | 255.800 | mmho/m | 1.300 | -17.500 |
| Medium | 161.982 | 1441.110 | 0.000 | 255.800 | mmho/m | 0.950 | -38.000 |

Microlog Calibration Report

|                             |                                             |
|-----------------------------|---------------------------------------------|
| Serial-Model:<br>Performed: | 402-PSI STKBL ML<br>Sat Dec 2 02:32:23 2023 |
|-----------------------------|---------------------------------------------|

|         | Readings |        | References |         |       | Results    |          |
|---------|----------|--------|------------|---------|-------|------------|----------|
|         | Zero     | Cal    | Zero       | Cal     |       | m          | b        |
|         |          |        |            |         |       |            |          |
| Normal  | 0.0037   | 0.0043 | 0.0000     | 10.0000 | Ohm-m | 13000.0000 | -0.7000  |
| Inverse | 0.1208   | 0.0013 | 0.0000     | 10.0000 | Ohm-m | 11000.0000 | -0.1000  |
| Caliper | 1.0046   | 1.1419 | 5.5000     | 20.0000 | in    | 50.0000    | -44.5250 |

Compensated Density Calibration Report

|                                                             |                                                  |
|-------------------------------------------------------------|--------------------------------------------------|
| Serial-Model:<br>Source #:<br>Master Calibration Performed: | 303-03-M&W<br>21170B<br>Fri Dec 15 14:46:43 2023 |
|-------------------------------------------------------------|--------------------------------------------------|

|                    |                     |      |  |                             |               |     |
|--------------------|---------------------|------|--|-----------------------------|---------------|-----|
| Master Calibration |                     |      |  |                             |               |     |
|                    | Density             |      |  | Far Detector                | Near Detector |     |
|                    |                     |      |  |                             |               |     |
| Magnesium          | 1.680               | g/cc |  | 5466.68                     | 7555.42       | cps |
| Aluminum           | 2.585               | g/cc |  | 1173.67                     | 5050.86       | cps |
|                    | Spine Angle = 75.33 |      |  | Density/Spine Ratio = 0.569 |               |     |
|                    | Size                |      |  | Reading                     |               |     |
|                    |                     |      |  |                             |               |     |
| Small Ring         | 4.00                | in   |  | 1.17                        |               |     |
| Large Ring         | 14.00               | in   |  | 1.07                        |               |     |

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Compensated Neutron Calibration Report

|                               |            |
|-------------------------------|------------|
| Serial Number:<br>Tool Model: | 210<br>M&W |
|-------------------------------|------------|

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

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Gamma Ray Calibration Report

|                     |                          |          |
|---------------------|--------------------------|----------|
| Serial Number:      | 105                      |          |
| Tool Model:         | M&W                      |          |
| Performed:          | Sat Oct 21 23:48:19 2023 |          |
| Calibrator Value:   | 500.0                    | GAPI     |
| Background Reading: | 24.0                     | cps      |
| Calibrator Reading: | 637.0                    | cps      |
| Sensitivity:        | 0.6000                   | GAPI/cps |

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





|         |                        |
|---------|------------------------|
| Company | Castle Resources, Inc. |
| Well    | Hartwich #1            |
| Field   |                        |
| County  | Wabaunsee              |
| State   | Kansas                 |