# DUAL INDUCTION LOG

Company PATTERSON ENERGY, LLC.
Well ZWILLICH #2
Field LORRAINE
County ELLSWORTH State Kansas

Company PATTERSON ENERGY, LLC.
Well ZWILLICH #2
Field LORRAINE
County ELLSWORTH
State Kansas

Location: API # : 15 053 21380

1320' FNL & 2310' FEL

SEC 23 TWP 17S RGE 9W

Other Services
CDNL
ML

Elevation
K.B. 1783
D.F. 1781
G.L. 1778

| | | | |
|---|---|---|---|
| Permanent Datum | Ground Level | Elevation | 1778 |
| Log Measured From | KB 5' AGL | | |
| Drilling Measured From | KB | | |

| | | | |
|---|---|---|---|
| Date | 5/23/22 | | |
| Run Number | One | | |
| Depth Driller | 3570 | | |
| Depth Logger | 3569 | | |
| Bottom Logged Interval | 3567 | | |
| Top Log Interval | 00 | | |
| Casing Driller | 8 5/8" @ 260 | | |
| Casing Logger | 260 | | |
| Bit Size | 7 7/8" | | |
| Type Fluid in Hole | Chemical | | |
| Density / Viscosity | 9.3/65 | | |
| pH / Fluid Loss | 9.5/8.4 | | |
| Source of Sample | Calculated | | |
| Rm @ Meas. Temp | .6@70degf | | |
| Rmf @ Meas. Temp | .45@70degf | | |
| Rmc @ Meas. Temp | .72@70degf | | |
| Source of Rmf / Rmc | Calculated | | |
| Rm @ BHT | .42@100degf | | |
| Time Circulation Stopped | 1:30 a.m | | |
| Time Logger on Bottom | 4:30 a.m | | |
| Maximum Recorded Temperature | 100degf | | |
| Equipment Number | T127 | | |
| Location | Hays, KS | | |
| Recorded By | GUS PFANENSTIEL | | |
| Witnessed By | AUSTIN KLAUS | | |

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, 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. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

SOUTH OF LORRAINE TO V RD EAST 1.5 MILES SOUTH INTO.

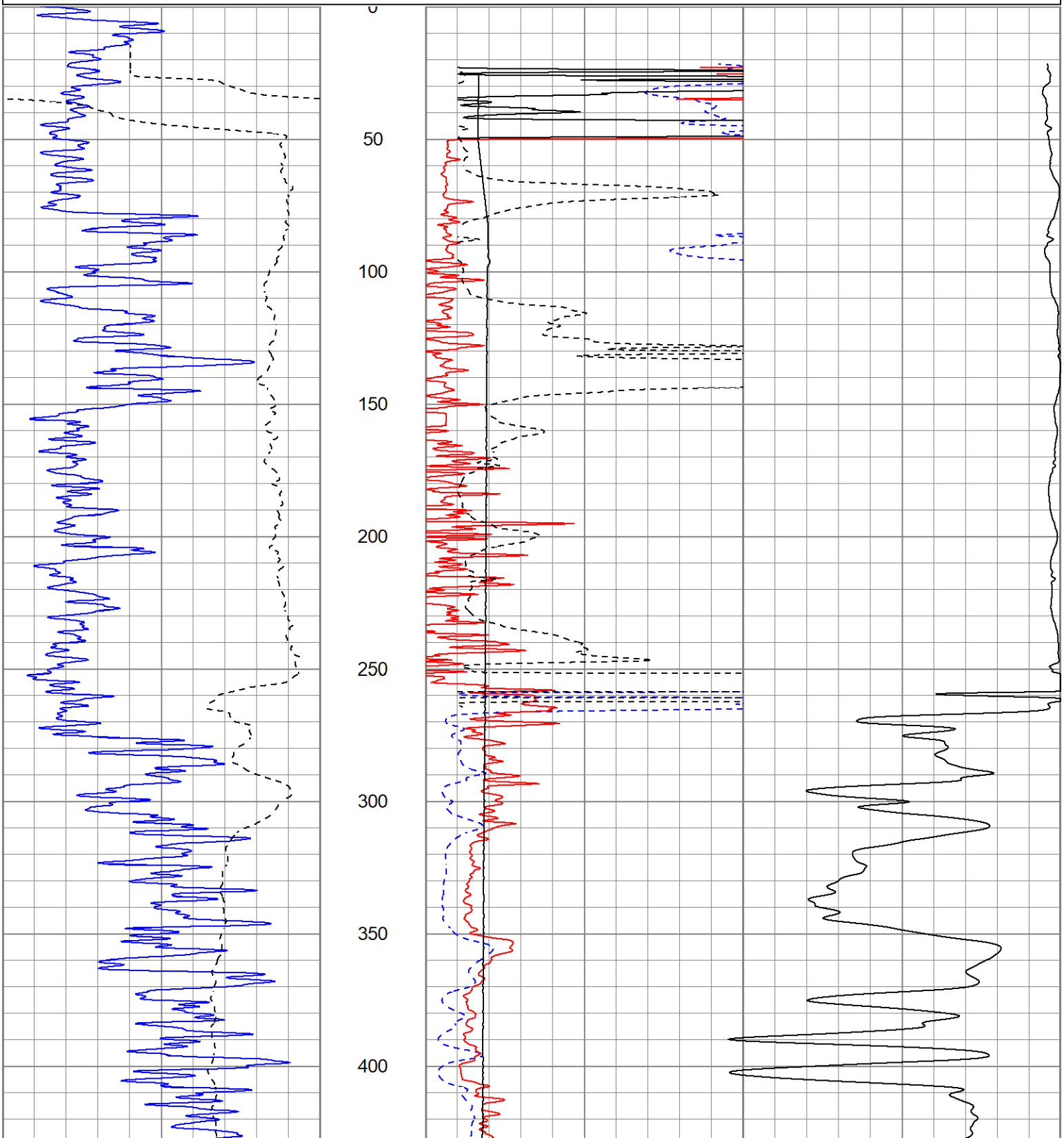
Thanks for using Gemini Wireline LLC
785-625-1182

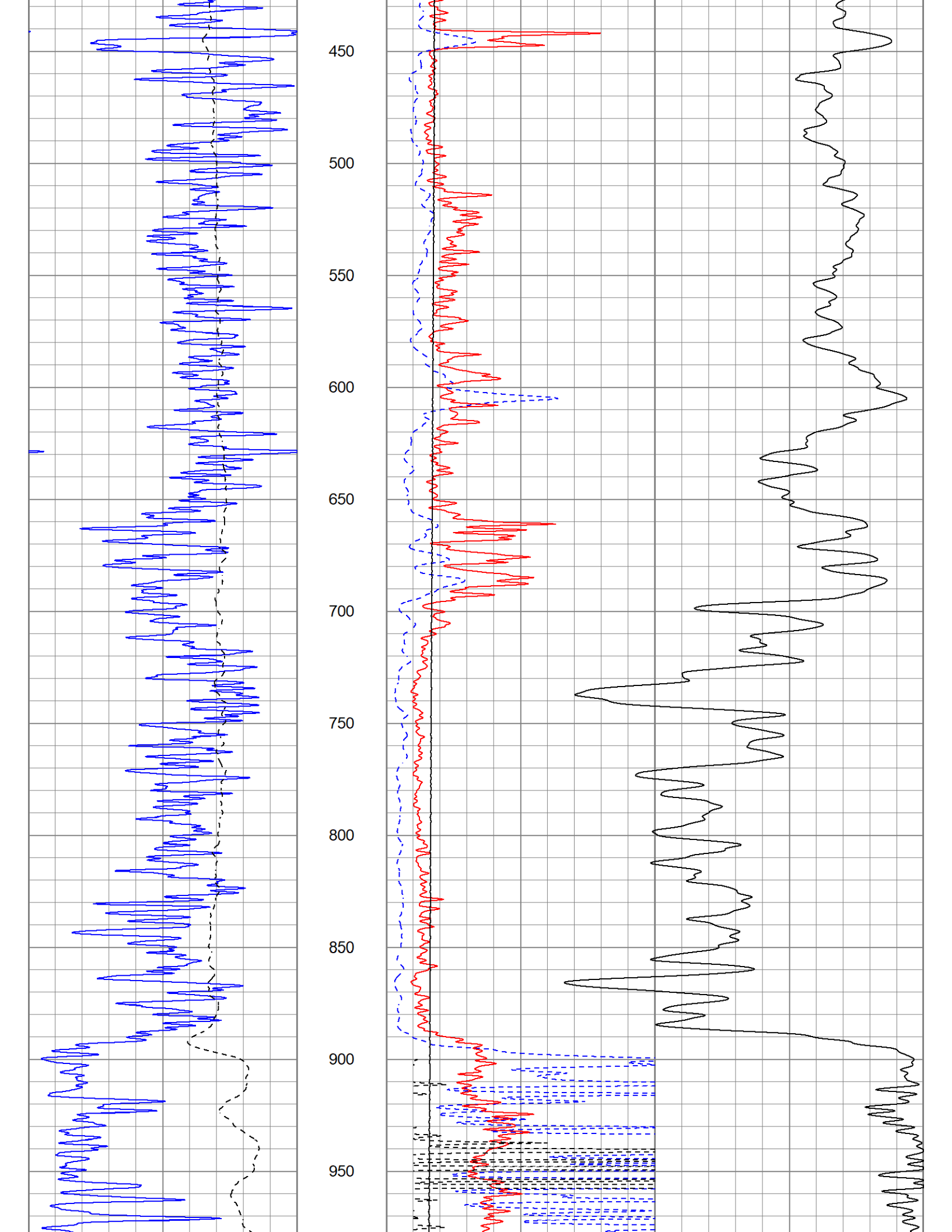
MAIN PASS

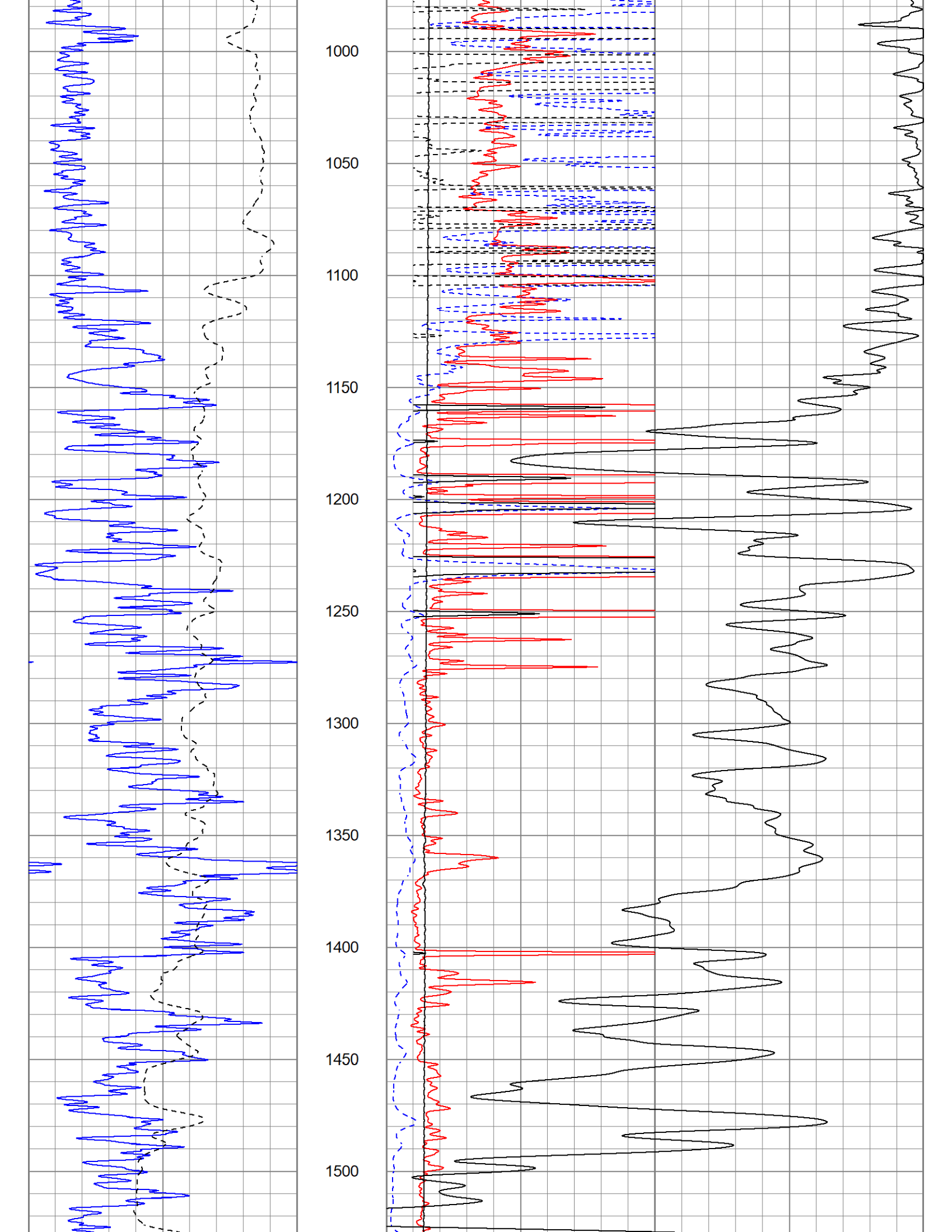
| | |
|---|---|
| Database File | pezwillich#2oh.db |
| Dataset Pathname | pass3.1 |
| Presentation Format | kdillinn |
| Dataset Creation | Mon May 23 06:59:40 2022 |
| Charted by | Depth in Feet scaled 1:600 |

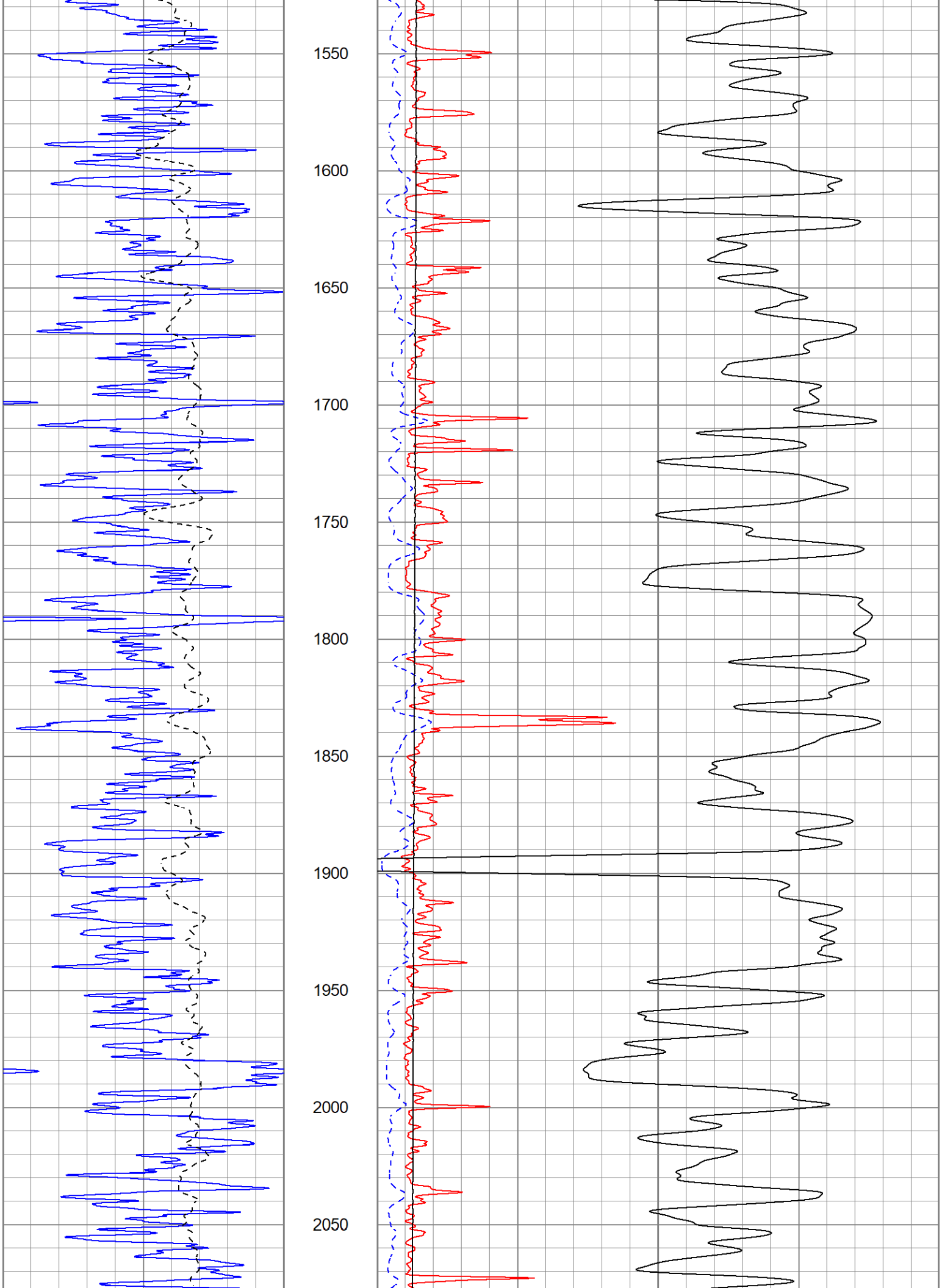
| | | |
|---|---|---|
| 0 | GR (GAPI) | 150 |
| -100 | SP (mV) | 100 |

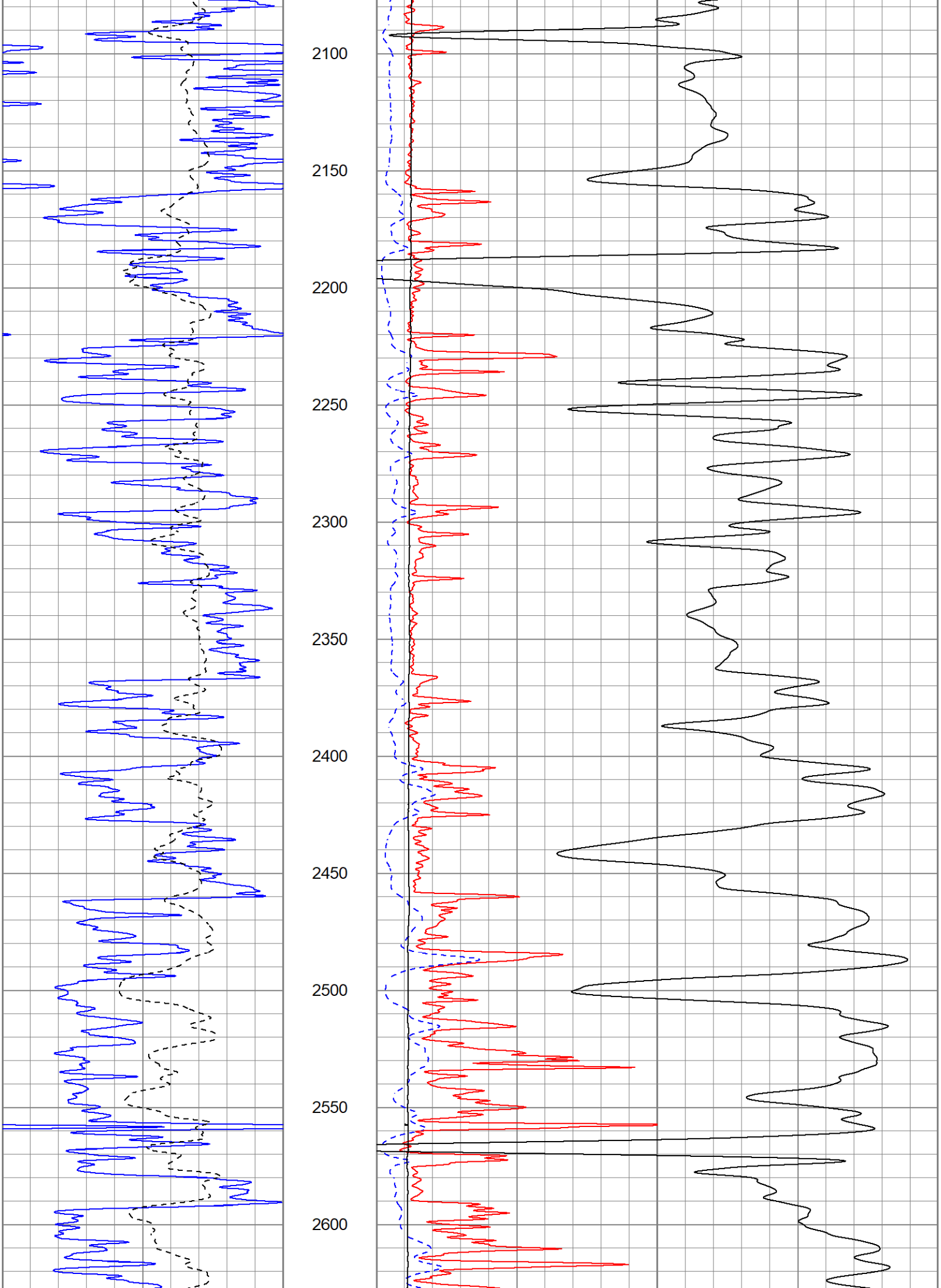
| | | |
|---|---|---|
| 1000 | CILD (mmho/m) | 0 |
| 10000 | LTEN (lb) | 0 |
| 0 | RILD (Ohm-m) | 50 |
| 0 | RLL3 (Ohm-m) | 50 |
| 50 | RILD x 10 (Ohm-m) | 500 |
| 50 | RLL3 x 10 (Ohm-m) | 500 |

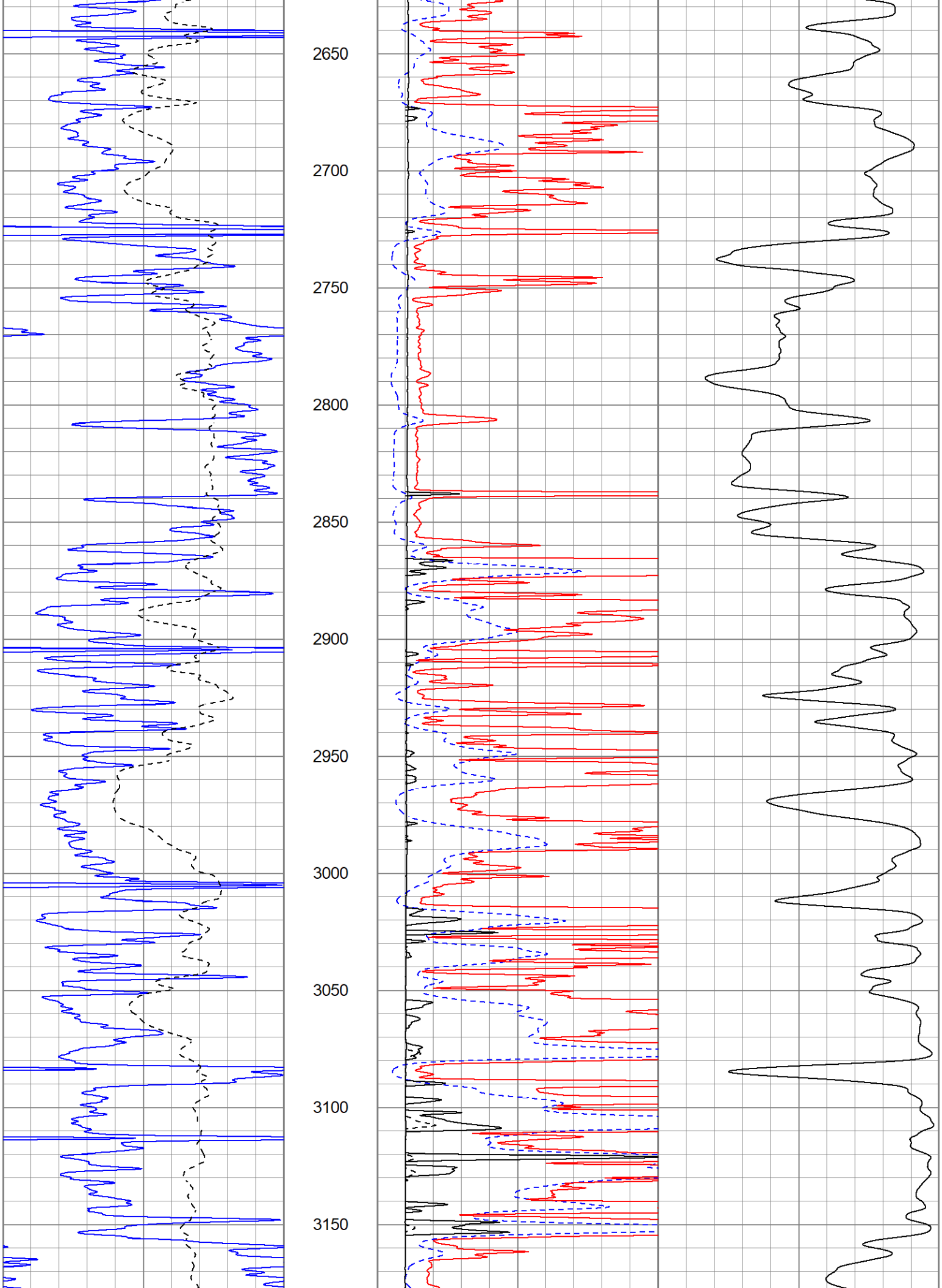


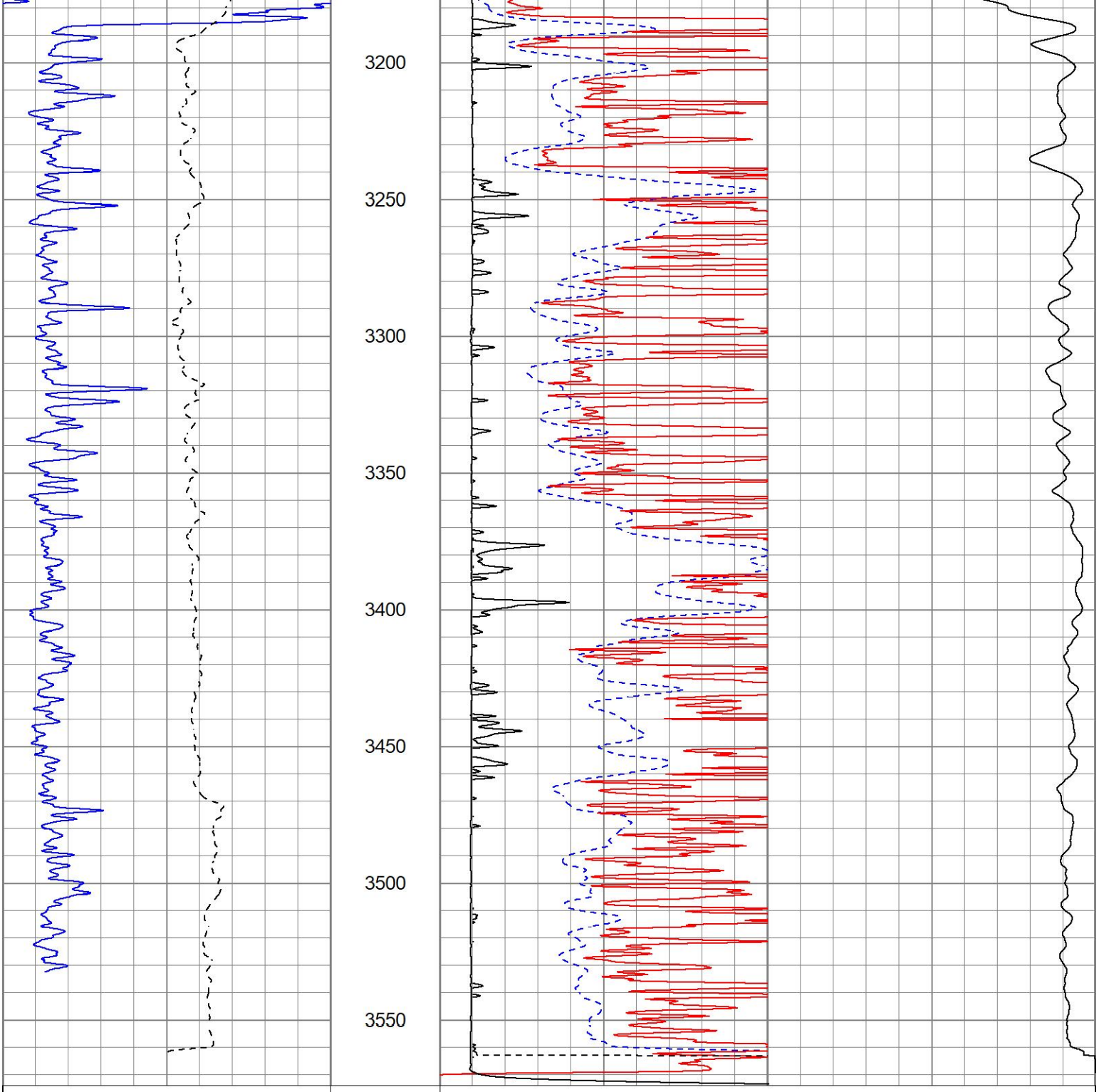

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3150

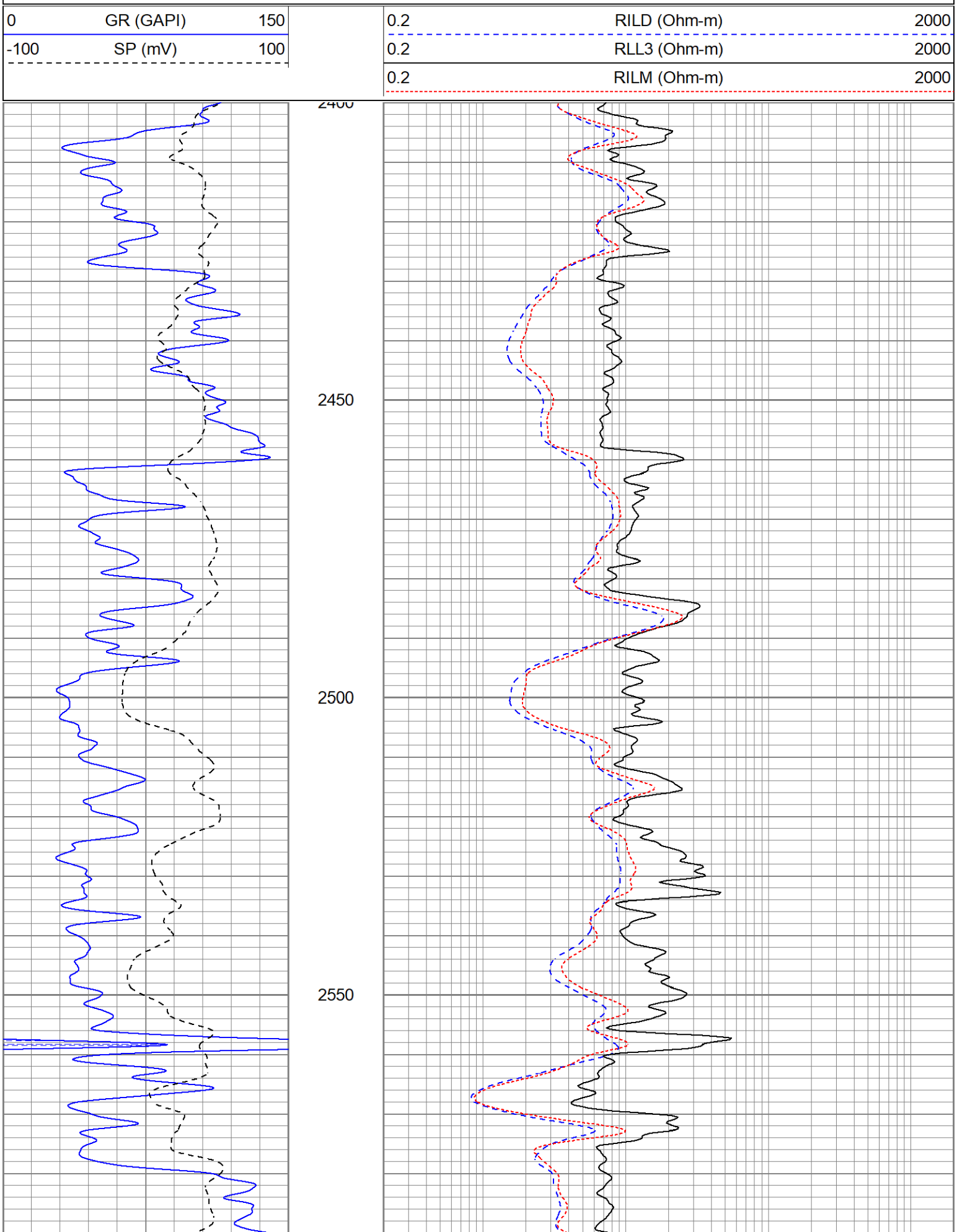


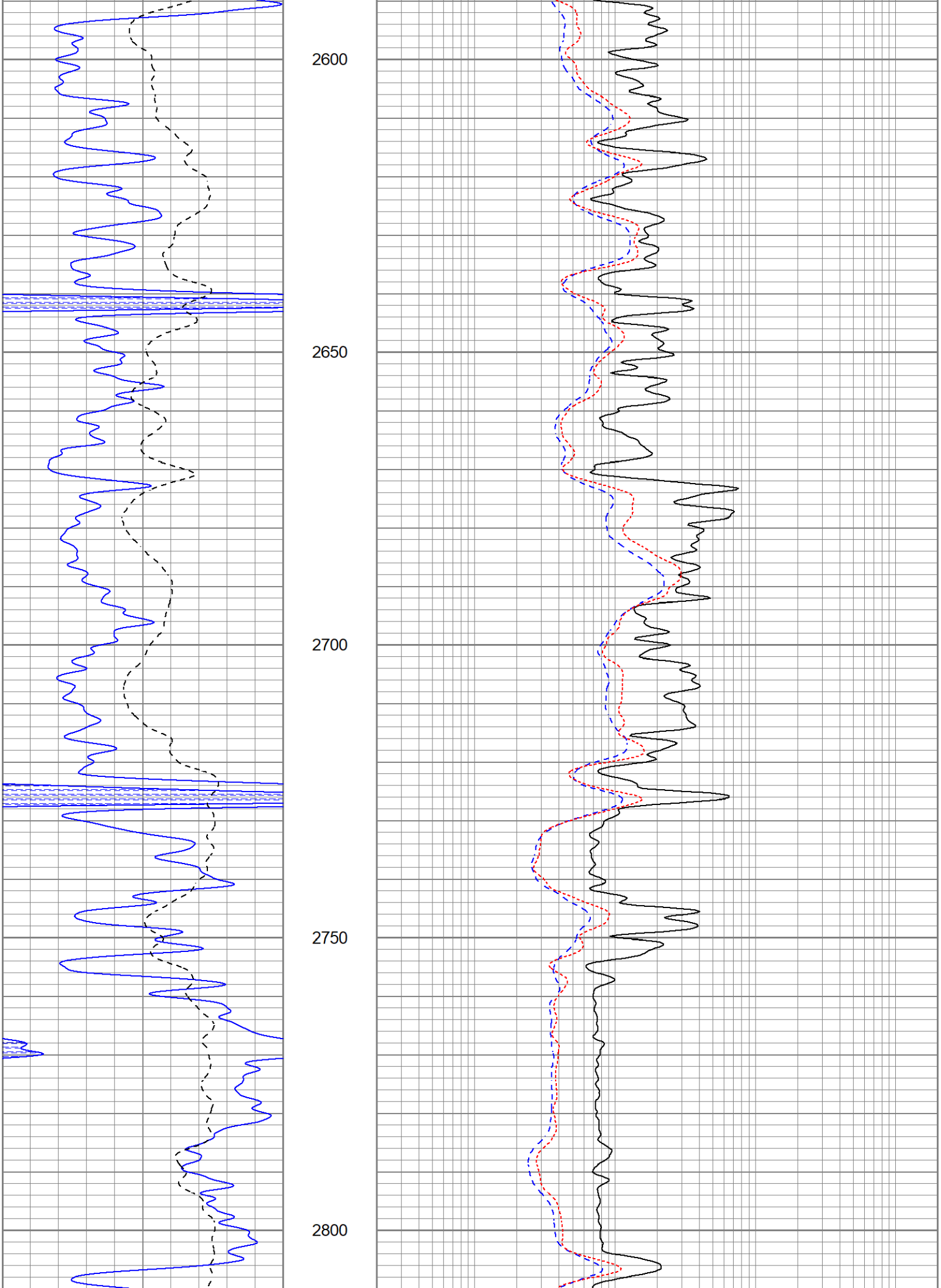

GEMINI WIRELINE

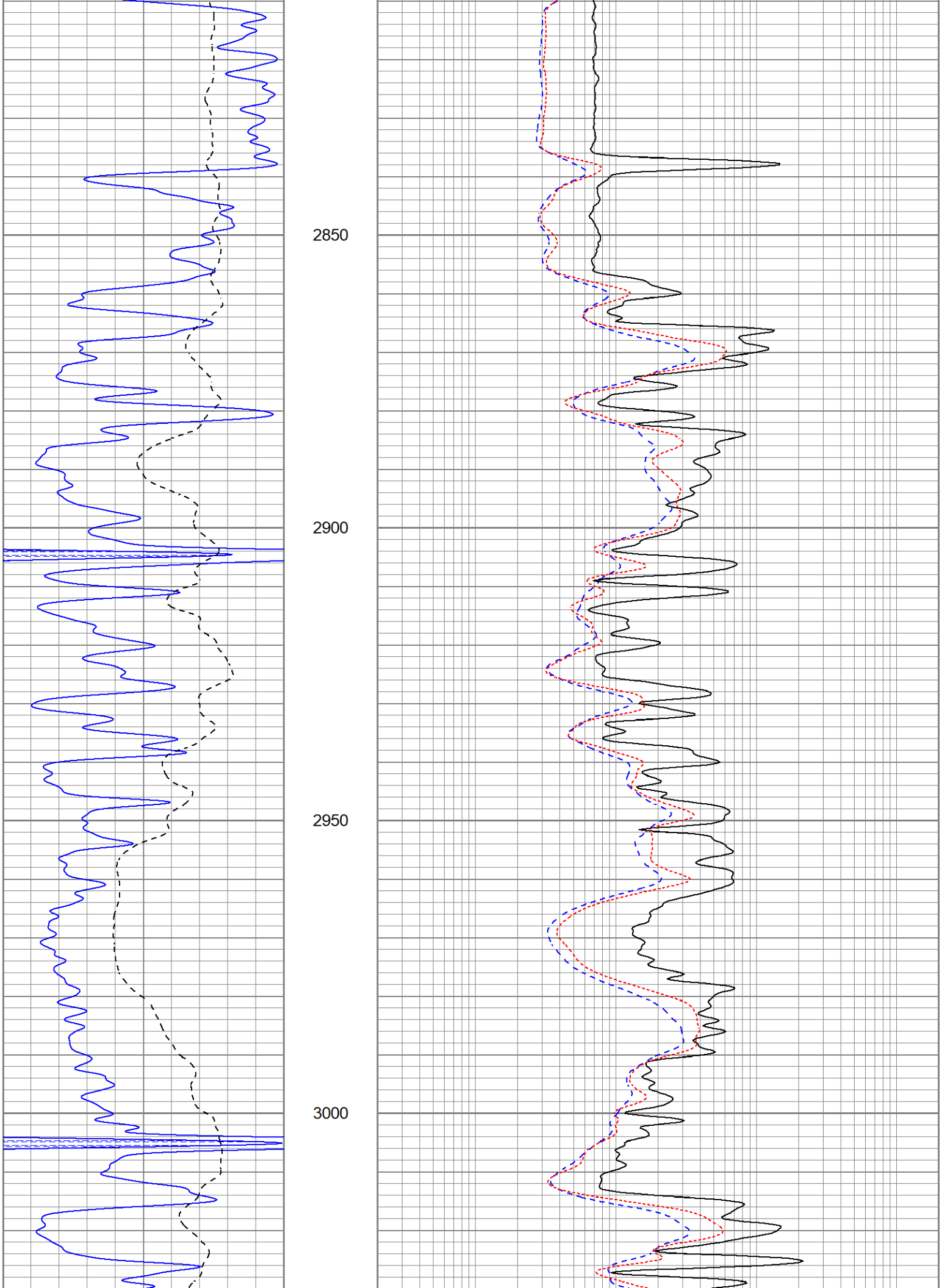
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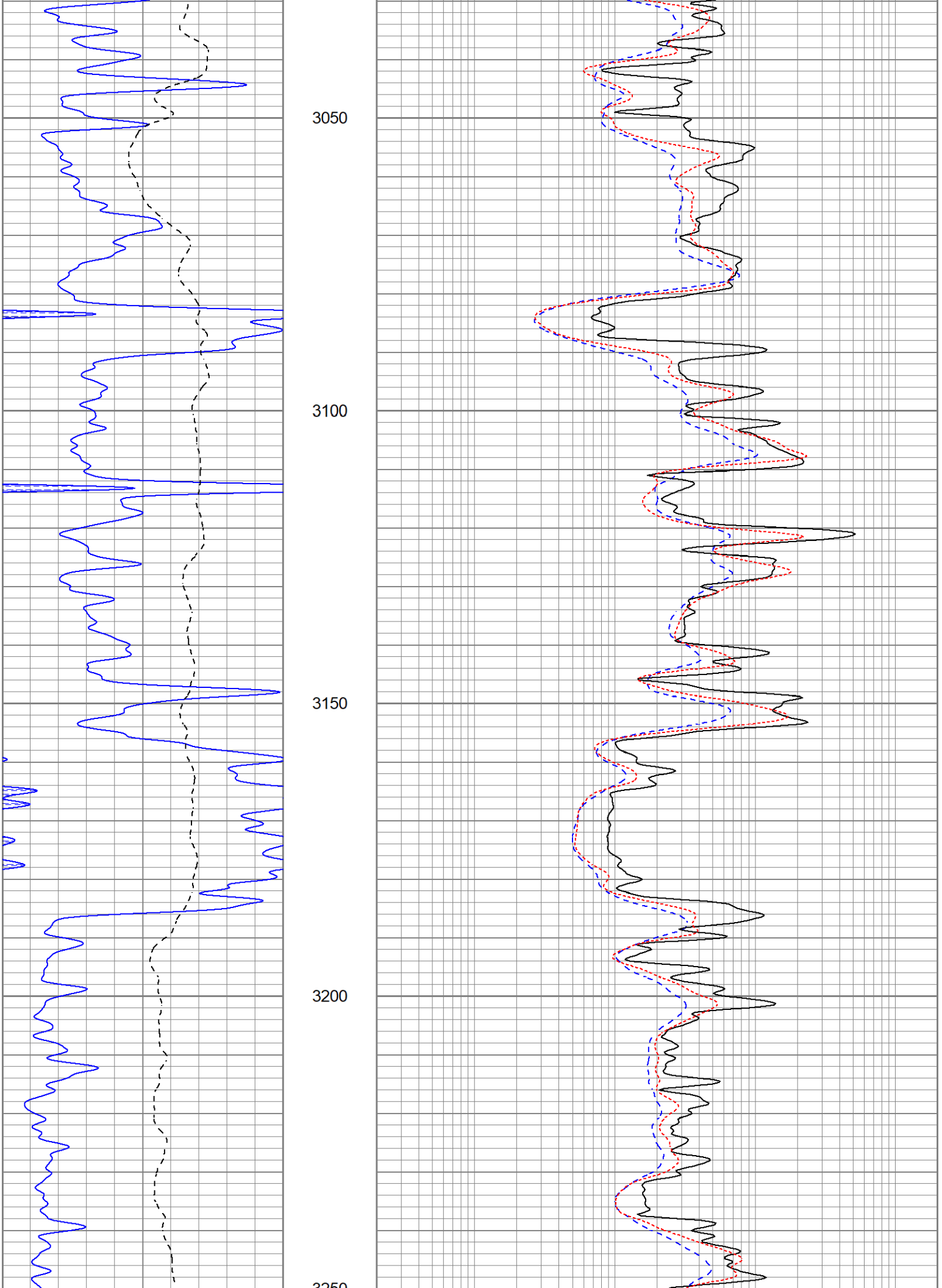
| | |
|---|---|
| Database File | pezwillich#2oh.db |

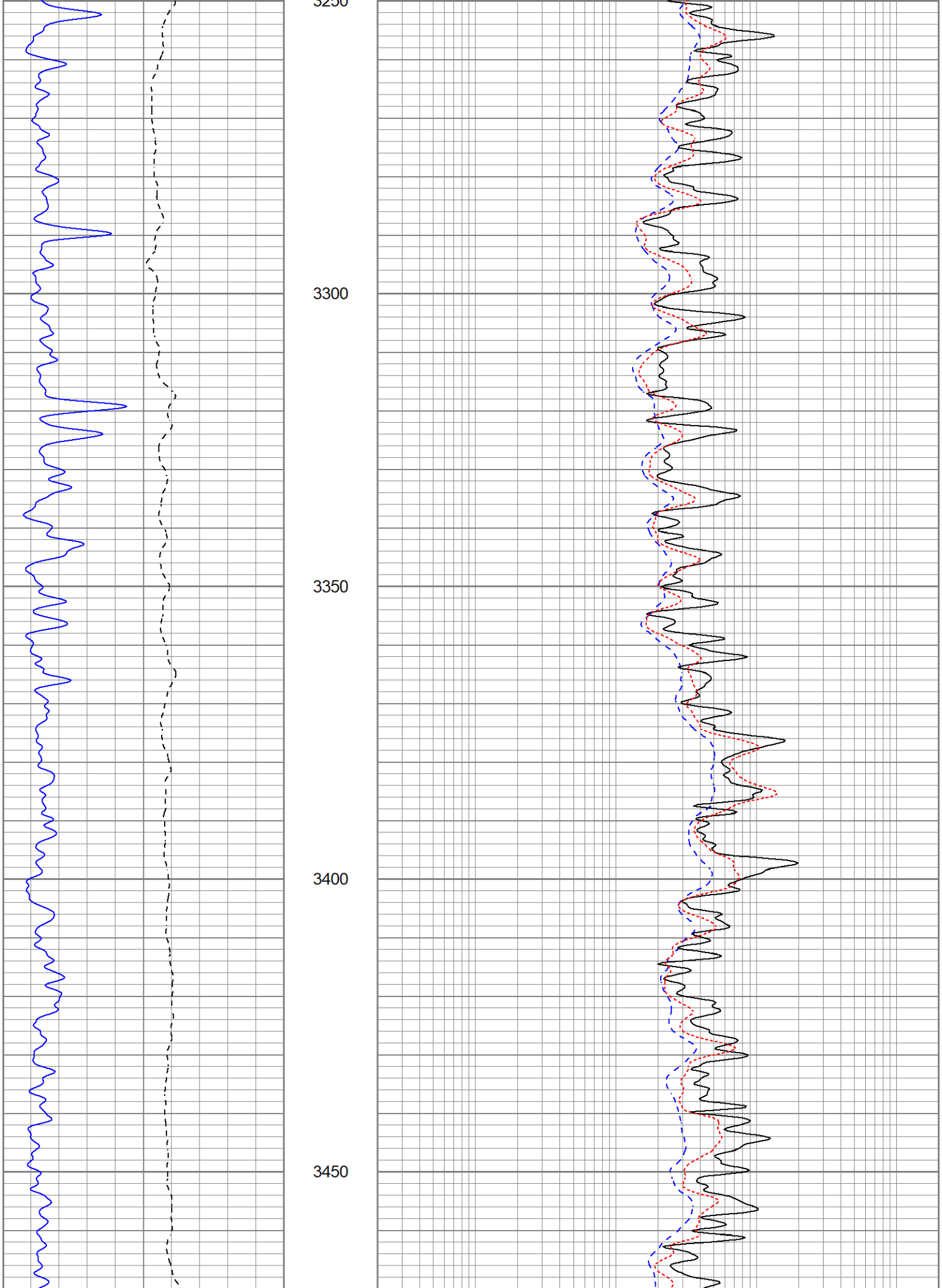
| | |
|---|---|
| Dataset Pathname | pass3.1 |
| Presentation Format | kdil |
| Dataset Creation | Mon May 23 06:59:40 2022 |
| Charted by | Depth in Feet scaled 1:240 |

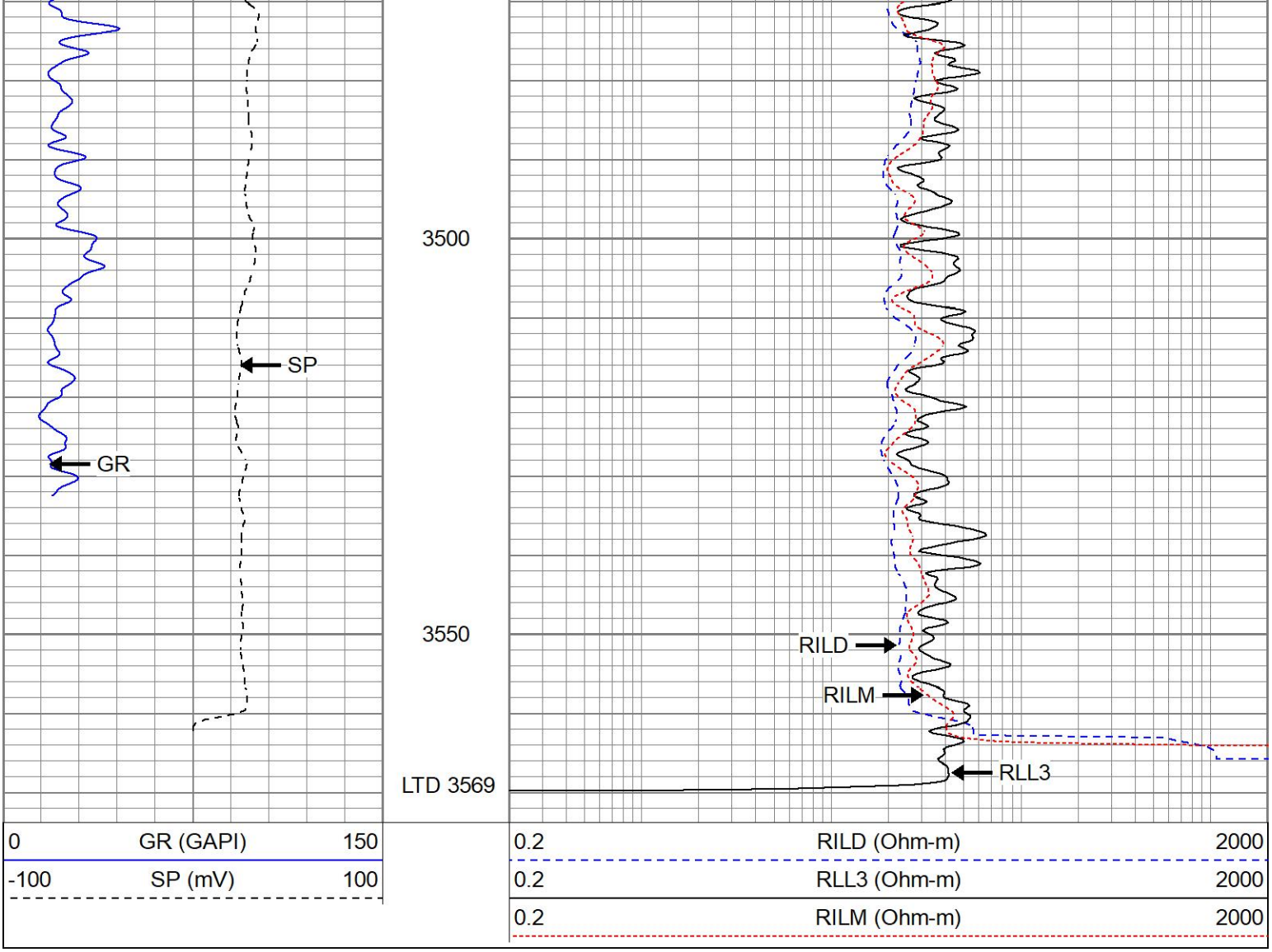



2600
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3450




| | | |
|---|---|---|
| 0 | GR (GAPI) | 150 |
| -100 | SP (mV) | 100 |

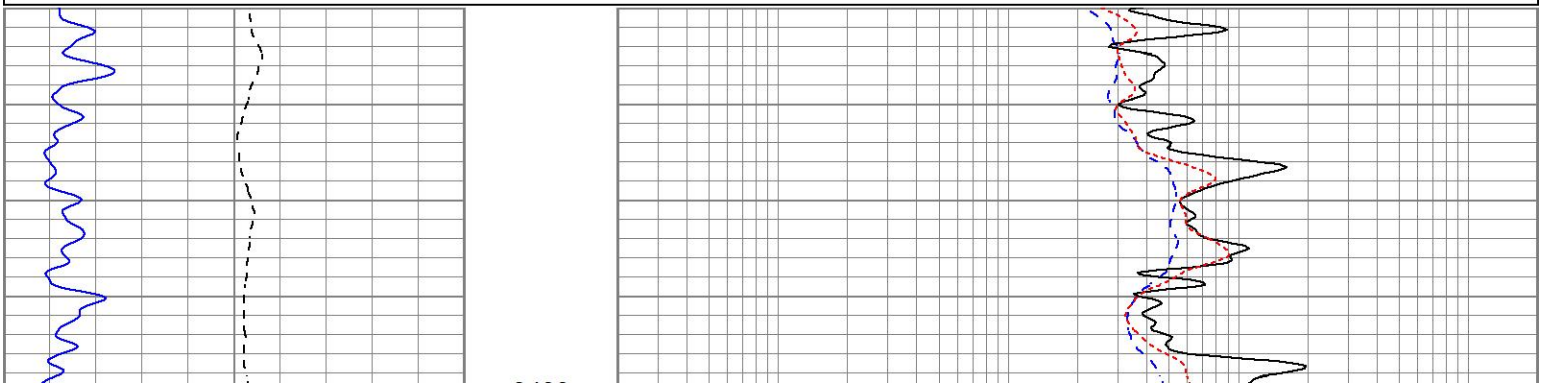
| | | |
|---|---|---|
| 0.2 | RILD (Ohm-m) | 2000 |
| 0.2 | RLL3 (Ohm-m) | 2000 |
| 0.2 | RILM (Ohm-m) | 2000 |

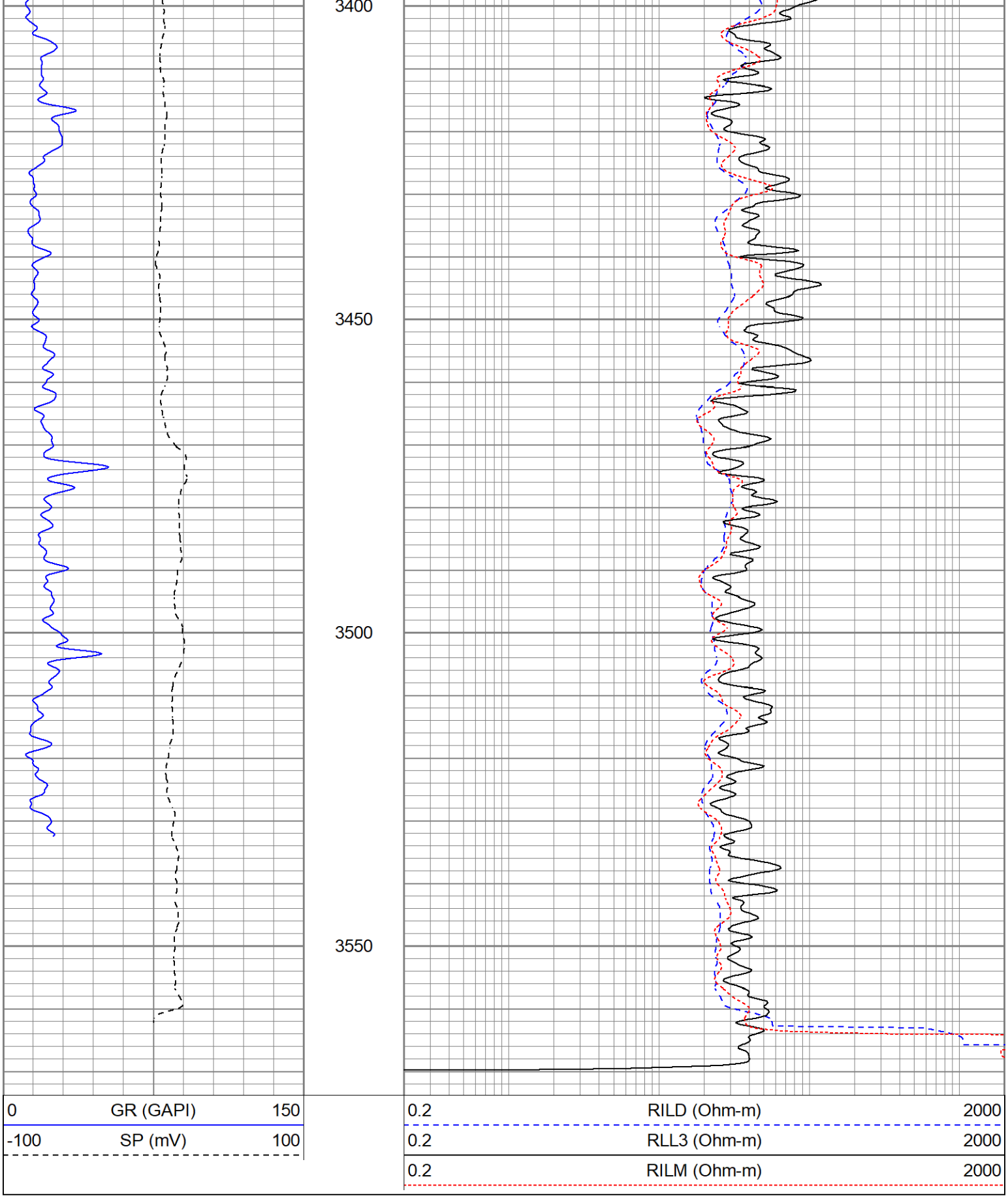
# REPEAT SECTION

| | |
|---|---|
| Database File | pezwillich#2oh.db |
| Dataset Pathname | pass2RP |
| Presentation Format | kdil |
| Dataset Creation | Mon May 23 07:21:23 2022 |
| Charted by | Depth in Feet scaled 1:240 |

| | | |
|---|---|---|
| 0 | GR (GAPI) | 150 |
| -100 | SP (mV) | 100 |

| | | |
|---|---|---|
| 0.2 | RILD (Ohm-m) | 2000 |
| 0.2 | RLL3 (Ohm-m) | 2000 |
| 0.2 | RILM (Ohm-m) | 2000 |






Calibration Report

| | |
|---|---|
| Database File | pezwillich#2oh.db |
| Dataset Pathname | pass2RP |
| Dataset Creation | Mon May 23 07:21:23 2022 |

Dual Induction Calibration Report

| | |
|---|---|
| Serial-Model: | 0352-ADM |
| Surface Cal Performed: | Mon Sep 20 22:00:42 2021 |
| Downhole Cal Performed: | Wed Mar 30 09:59:17 2022 |
| After Survey Verification Performed: | Wed Mar 30 09:59:17 2022 |

## Surface Calibration

| | Readings | | | References | | | Results | |
|---|---|---|---|---|---|---|---|---|
| Loop: | Air | Loop | | Air | Loop | | m | b |
| Deep | 0.018 | 0.672 | V | 0.000 | 350.000 | mmho/m | 535.475 | -9.896 |
| Medium | 0.003 | 0.769 | V | 0.000 | 400.000 | mmho/m | 522.607 | -1.745 |
| Internal: | Zero | Cal | | Zero | Cal | | m | b |
| Deep | 0.018 | 0.672 | V | 0.000 | 350.000 | mmho/m | 535.240 | -9.549 |
| Medium | 0.003 | 0.768 | V | 0.000 | 550.000 | mmho/m | 718.637 | -2.088 |

## Downhole Calibration

| | Readings | | | References | | | Results | |
|---|---|---|---|---|---|---|---|---|
| Internal: | Zero | Cal | | Zero | Cal | | m | b |
| Deep | -9.739 | 334.888 | mmho/m | -0.343 | 349.810 | mmho/m | 1.016 | 9.552 |
| Medium | -0.093 | 389.879 | mmho/m | -0.226 | 399.745 | mmho/m | 1.026 | -0.132 |
| Shallow | 2.545 | 0.014 | V | 500.000 | 2.000 | Ohm-m | 196.757 | -0.781 |

## After Survey Verification

| | Readings | | | Targets | | | Results | |
|---|---|---|---|---|---|---|---|---|
| Internal: | Zero | Cal | | Zero | Cal | | m' | b' |
| Deep | 0.000 | 0.000 | mmho/m | -9.739 | 334.888 | mmho/m | 1.016 | 9.552 |
| Medium | 0.000 | 0.000 | mmho/m | -0.093 | 389.879 | mmho/m | 1.026 | -0.132 |
| Shallow | 0.000 | 0.000 | Ohm-m | 500.000 | 2.000 | Ohm-m | 1.000 | 0.000 |

## Neutron Calibration Report

| | | |
|---|---|---|
| Serial Number: | AD5139 | |
| Tool Model: | ADMY5139 | |
| Performed: | (Not Performed) | |
| Calibrator Value: | 1 | NAPI |
| Calibrator Reading: | 1 | cps |
| Sensitivity: | 1 | NAPI/cps |

## Temperature Calibration Report

| | | | | |
|---|---|---|---|---|
| Serial Number: | 111 | | | |
| Tool Model: | ADTS1 | | | |
| Performed: | (Not Performed) | | | |
| | Reference | | Reading | |
| Low Reference: | 0.00 | degF | 0.00 | degF |
| High Reference: | 1.00 | degF | 1.00 | degF |
| Gain: | 1.00 | | | |
| Offset: | 0.00 | | | |
| Delta Spacing | 1 | | | |

## Inclinometer Calibration Report

Performed: Thu Feb 17 11:11:25 2022

| | Low Read. | High Read. | Low Ref. | High Ref. | |
|---|---|---|---|---|---|
| X Accelerometer | 205.00 | 1843.00 | -1.00 | 1.00 | gee |
| Y Accelerometer | 205.00 | 1843.00 | -1.00 | 1.00 | gee |
| Z Accelerometer | | | | | gee |

## Gamma Ray Calibration Report

| | | |
|---|---|---|
| Serial Number: | 111 | |
| Tool Model: | ADTS1 | |
| Performed: | (Not Performed) | |
| Calibrator Value: | 1.0 | GAPI |
| Background Reading: | 0.0 | cps |
| Calibrator Reading: | 1.0 | cps |
| Sensitivity: | 1.0000 | GAPI/cps |