



**PIONEER**

Pioneer Energy Services

## DUAL INDUCTION LOG

Company PICKRELL DRILLING COMPANY, INC.  
Well ALBIN "I" NO. 3  
Field CASTLE ROCK  
County GOVE  
State KANSAS

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County GOVE State KANSAS

Location: API #: 15-063-22296-00-00

1,505' FSL & 1,675' FWL

SEC 28 TWP 14S RGE 27W

Permanent Datum GROUND LEVEL Elevation 2470'  
Log Measured From KELLY BUSHING  
Drilling Measured From KELLY BUSHING

Other Services  
CNL/CDL  
MEL  
Elevation  
K.B. 2477'  
D.F. N/A  
G.L. 2470'

Date 11/11/2016

|                        |               |  |  |
|------------------------|---------------|--|--|
| Run Number             | ONE           |  |  |
| Depth Driller          | 4305'         |  |  |
| Depth Logger           | 4303'         |  |  |
| Bottom Logged Interval | 4302'         |  |  |
| Top Log Interval       | 200'          |  |  |
| Casing Driller         | 8.625" @ 207' |  |  |
| Casing Logger          | 207'          |  |  |
| Bit Size               | 7.875"        |  |  |
| Type Fluid in Hole     | CHEMICAL      |  |  |
| Salinity, ppm CL       | 3000          |  |  |
| Density / Viscosity    | 9.5 51        |  |  |
| pH / Fluid Loss        | 9.0 10.6      |  |  |
| Source of Sample       | FLOWLINE      |  |  |
| Rm @ Meas. Temp        | .98 @ 68      |  |  |
| Rmt @ Meas. Temp       | .74 @ 68      |  |  |
| Rmc @ Meas. Temp       | 1.32 @ 68     |  |  |
| Source of Rmt / Rmc    | CHARTS        |  |  |
| Rm @ BHT               | .56 @ 119     |  |  |
| Operating Rig Time     | 2 1/2 HOURS   |  |  |
| Max Rec. Temp. F       | 119 DEG F.    |  |  |
| Equipment Number       | 108           |  |  |
| Location               | COLBY         |  |  |
| Recorded By            | J. LONG       |  |  |
| Witnessed By           | AARON YOUNG   |  |  |

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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.

PARK (I-70 PARK EXIT), 2 1/2 SOUTH, 2 EAST, 18 1/4 SOUTH, EAST INTO

Log Measured From: KELLY BUSHING 7 Ft. Above Permanent Datum

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

### Your Pioneer Energy Services Crew

Engineer: J. LONG  
Operator: M. HISS  
Operator:  
Operator:

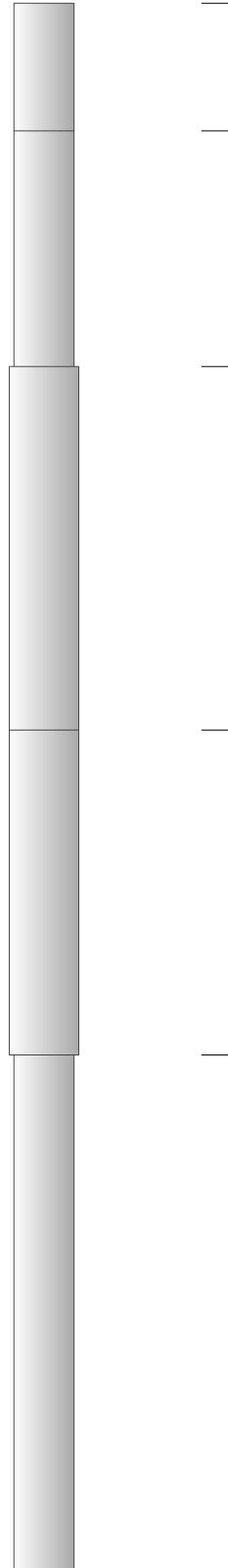
### This Log Record Was Witnessed By

Primary Witness: AARON YOUNG  
Secondary Witness:  
Secondary Witness:  
Secondary Witness:

DatabaseC:\ProgramData\Warrior\Data\pickrell\drilling\_albin\_i\_3.db  
Dataset field/well/stackmel/pass3.1/\_vars\_

**Top - Bottom**

|           |              |                  |                   |                |                  |       |                  |
|-----------|--------------|------------------|-------------------|----------------|------------------|-------|------------------|
| A         | BOREID<br>in | BOTTEMP<br>degF  | CASEOD<br>in      | CASETHCK<br>in | FLUIDDEN<br>g/cc | M     | MATRXDEN<br>g/cc |
| 1         | 7.875        | 119              | 5.5               | 0              | 1                | 2     | 2.71             |
| NPORSEL   | PERFS        | SNDERR<br>mmho/m | SNDERRM<br>mmho/m | SPSHIFT<br>mV  | SRFTEMP<br>degF  | SZCOR | TDEPTH<br>ft     |
| Limestone | 0            | 0                | 0                 | -245           | 58               | Off   | 4303             |

| Sensor             | Offset (ft)             | Schematic                                                                          | Description                                          | Length (ft) | O.D. (in) | Weight (lb) |
|--------------------|-------------------------|------------------------------------------------------------------------------------|------------------------------------------------------|-------------|-----------|-------------|
| GR                 | 40.58                   |  | GR-M&W (89-M&W)                                      | 3.00        | 3.50      | 50.00       |
| CNLSC<br>CNSSC     | 37.48<br>36.73          |                                                                                    | CNT-M&W (tk10-MW)                                    | 5.50        | 3.50      | 100.00      |
| LSD<br>DCAL<br>SSD | 28.43<br>28.42<br>27.93 |                                                                                    | CDL-M&W (168-986)                                    | 8.50        | 4.00      | 250.00      |
| MCAL<br>MI<br>MN   | 19.83<br>19.83<br>19.83 |                                                                                    | ML-PSI STKBL ML (PSI-02)<br>Stackable Microlog Tools | 7.58        | 4.00      | 65.00       |
| RLL3<br>RLL3F      | 15.80<br>15.79          |                                                                                    | DIL-M&W (1987)                                       | 18.50       | 3.50      | 220.00      |
| CILD               | 8.00                    |                                                                                    |                                                      |             |           |             |

CILM

4.70

SP

0.20

Dataset: pickrelldrilling\_albin\_i\_3.db: field/well/stackmel/pass3  
Total length: 43.08 ft  
Total weight: 685.00 lb  
O.D.: 4.00 in



## 2" SCALE RESISTIVITY

### MAIN PASS

Database File pickrelldrilling\_albin\_i\_3.db  
Dataset Pathname stackmel/pass3.2  
Presentation Format dil2in  
Dataset Creation Fri Nov 11 16:14:21 2016  
Charted by Depth in Feet scaled 1:600

0 GAMMA RAY (GAPI) 150

1000 CONDUCTIVITY (mmho/m) 0

#### SHALLOW RESISTIVITY

0 (Ohm-m) 50

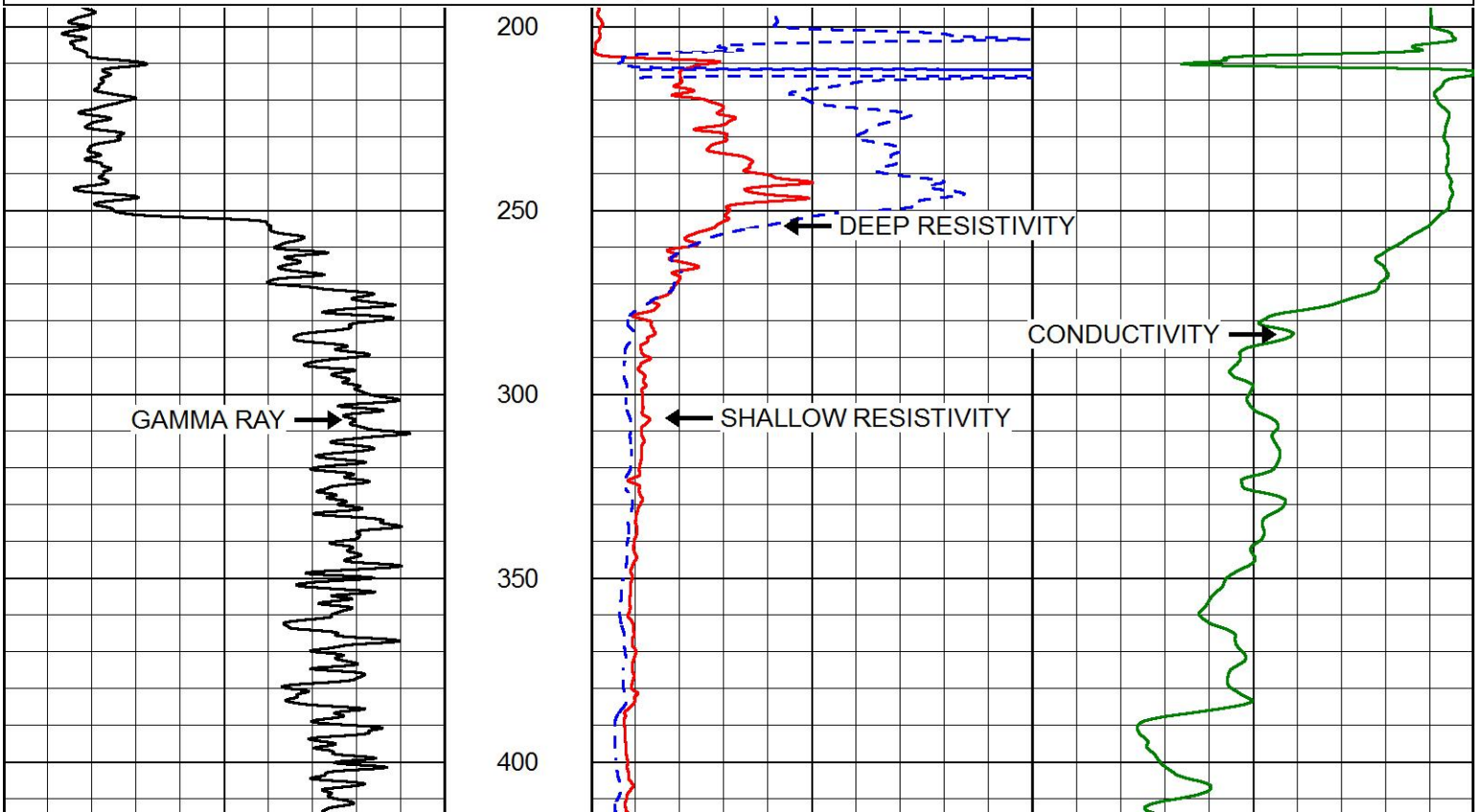
0 DEEP RESISTIVITY (Ohm-m) 50

#### SHALLOW RESISTIVITY

50 (Ohm-m) 500

#### DEEP RESISTIVITY

50 (Ohm-m) 500



450

500

550

600

650

700

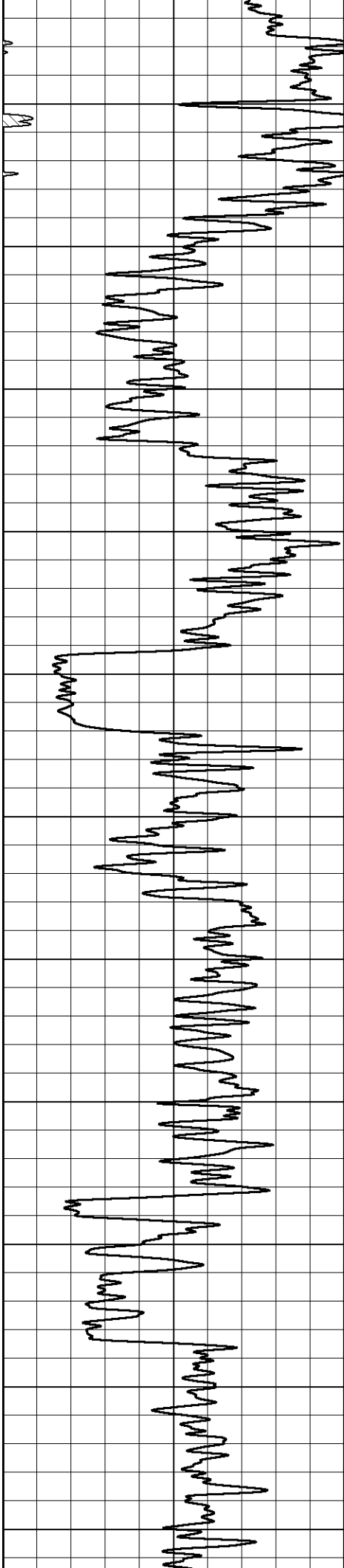
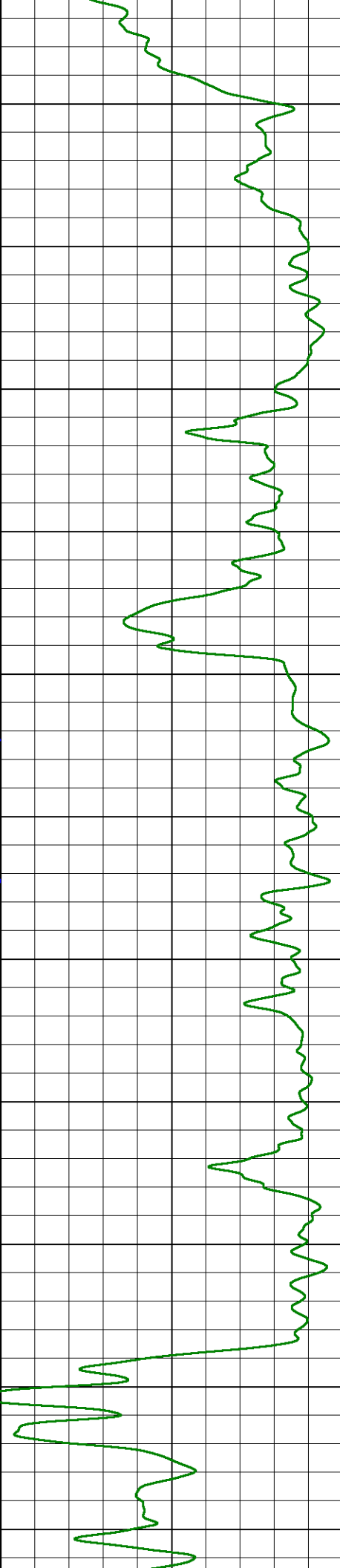
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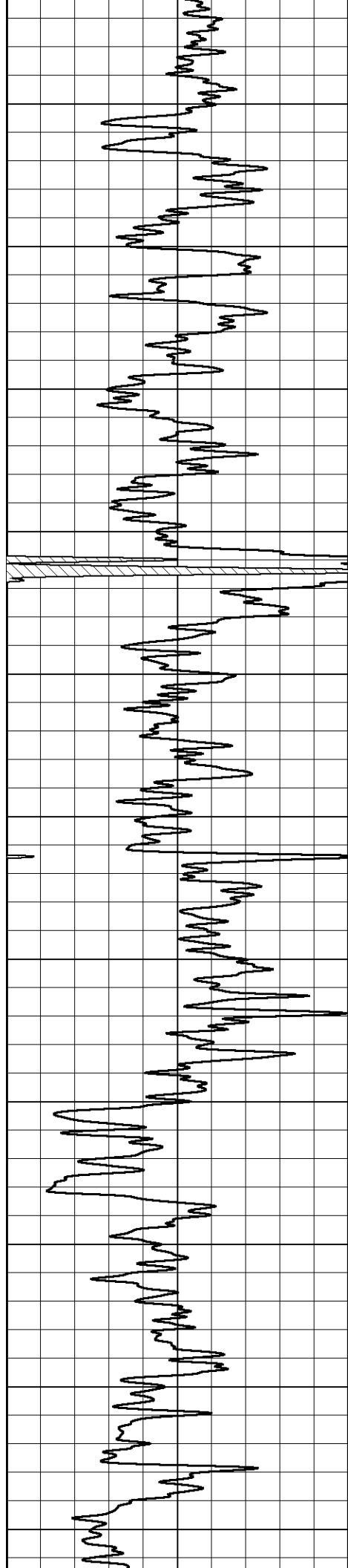
800

850

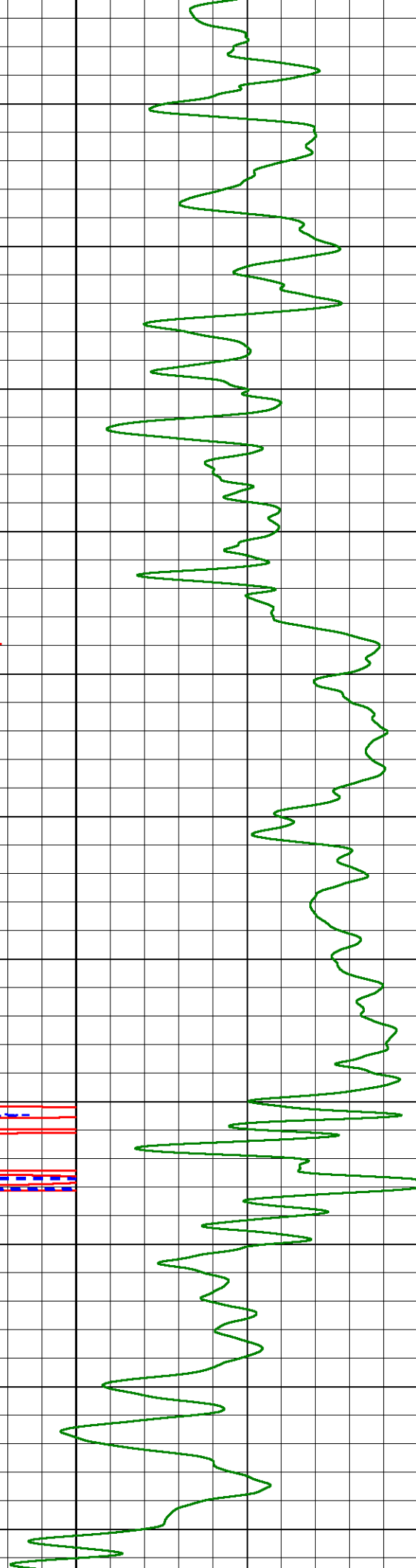
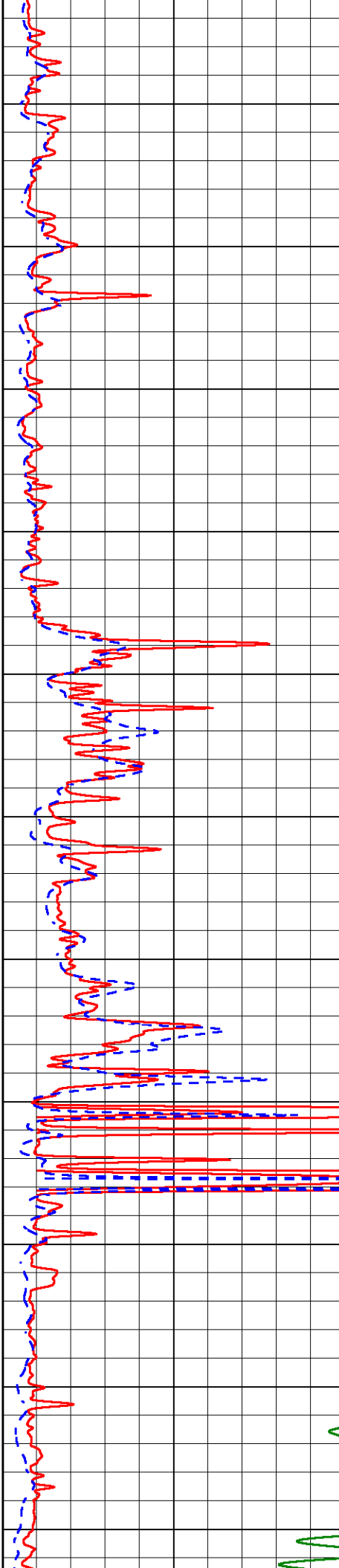
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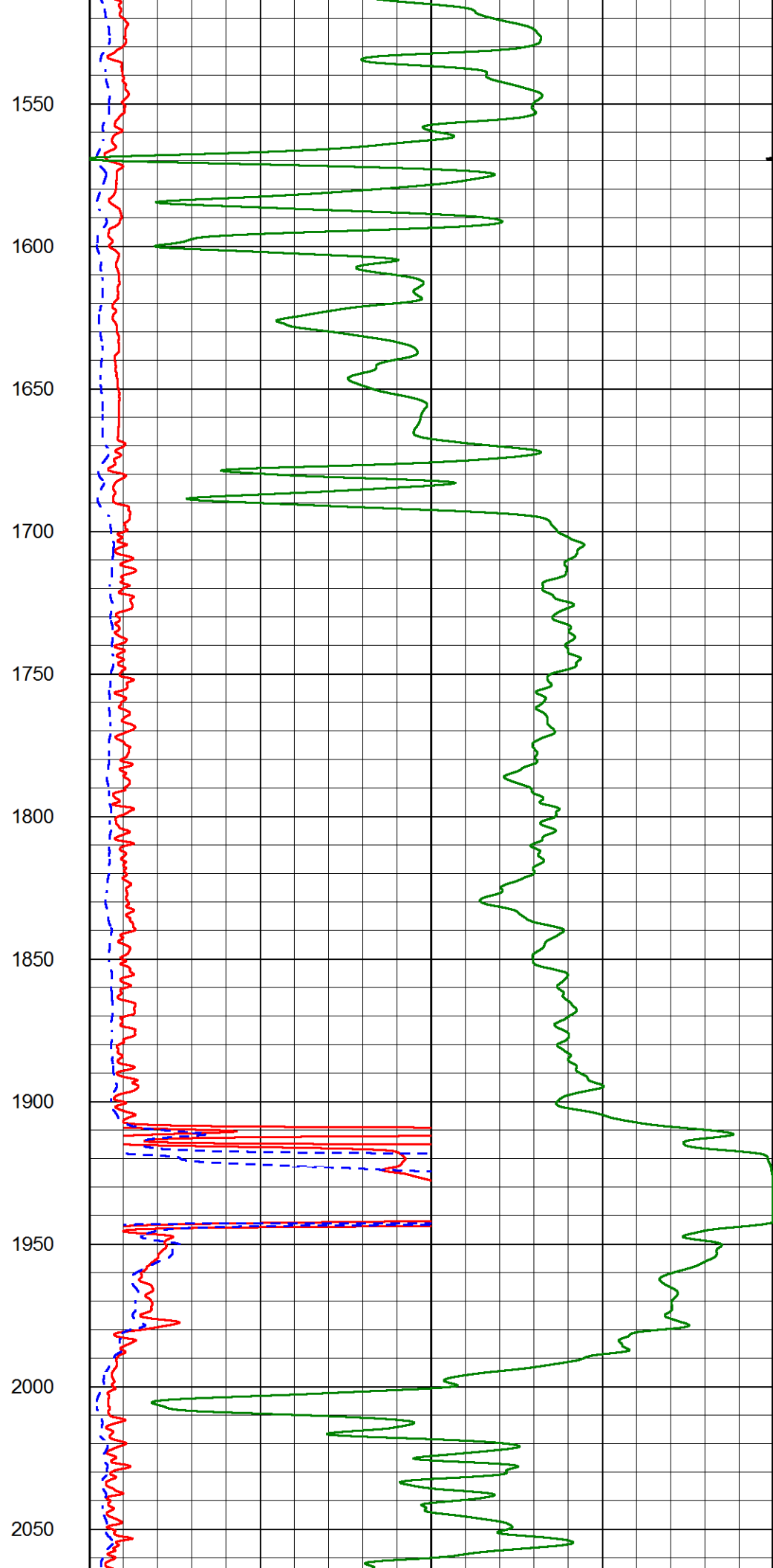
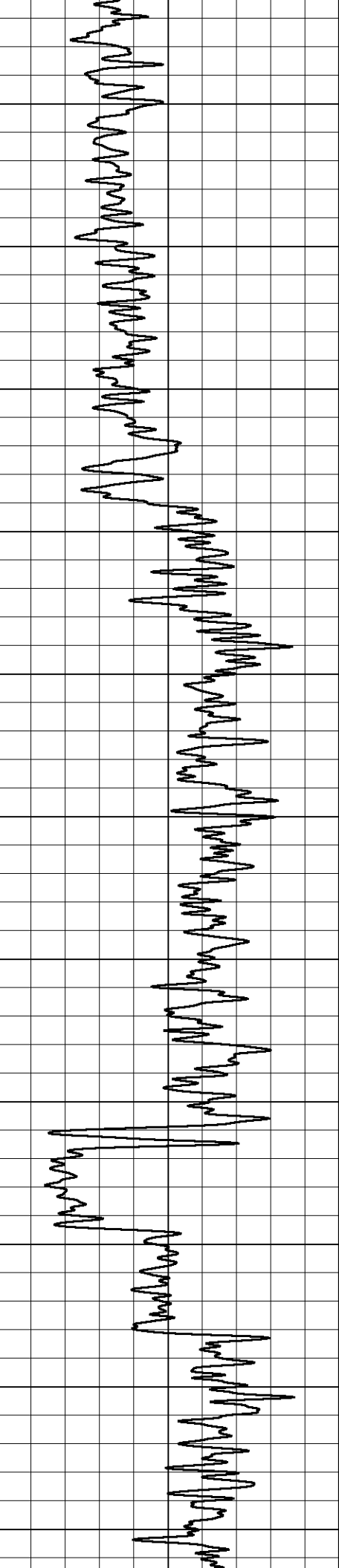
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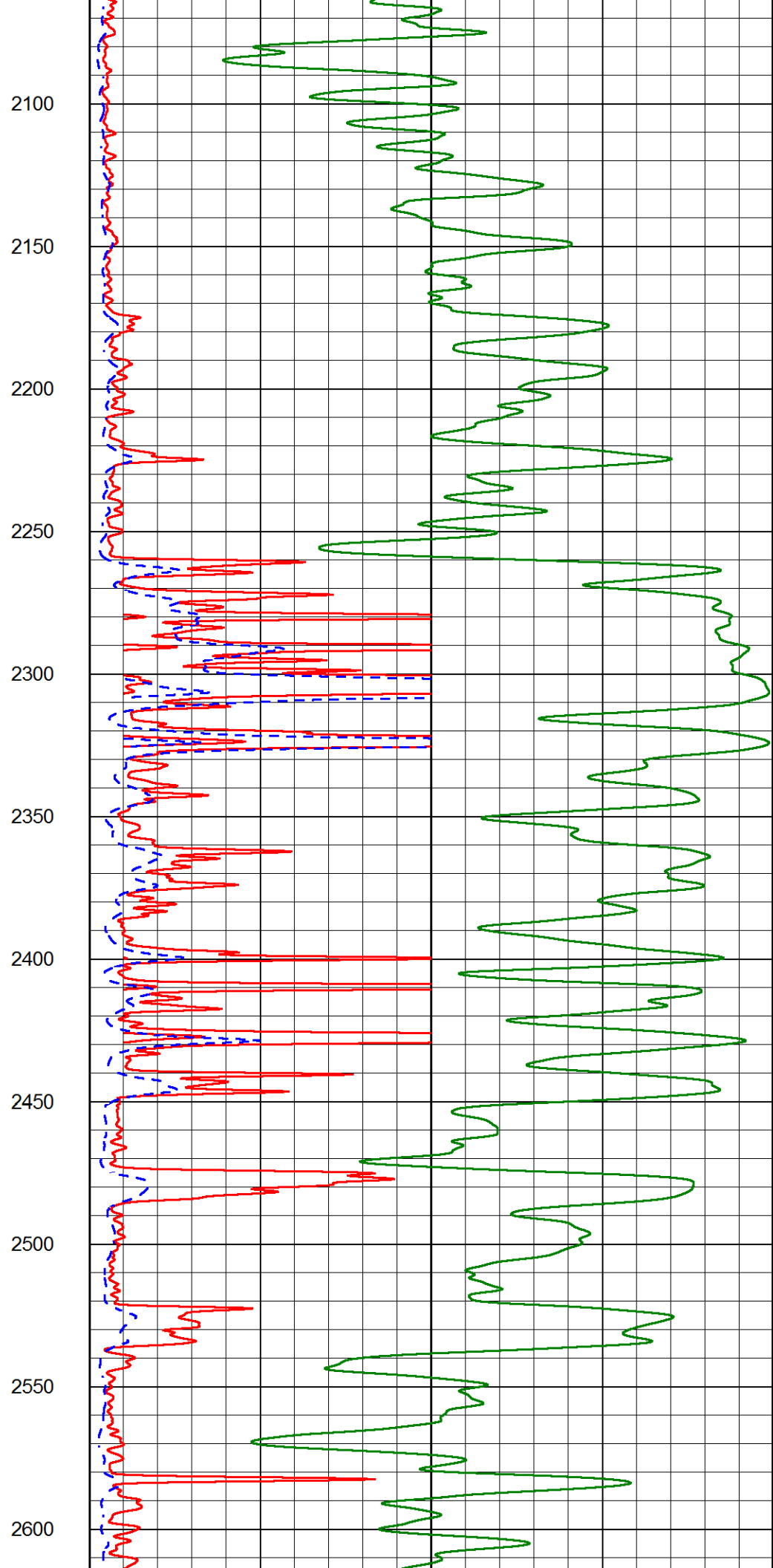
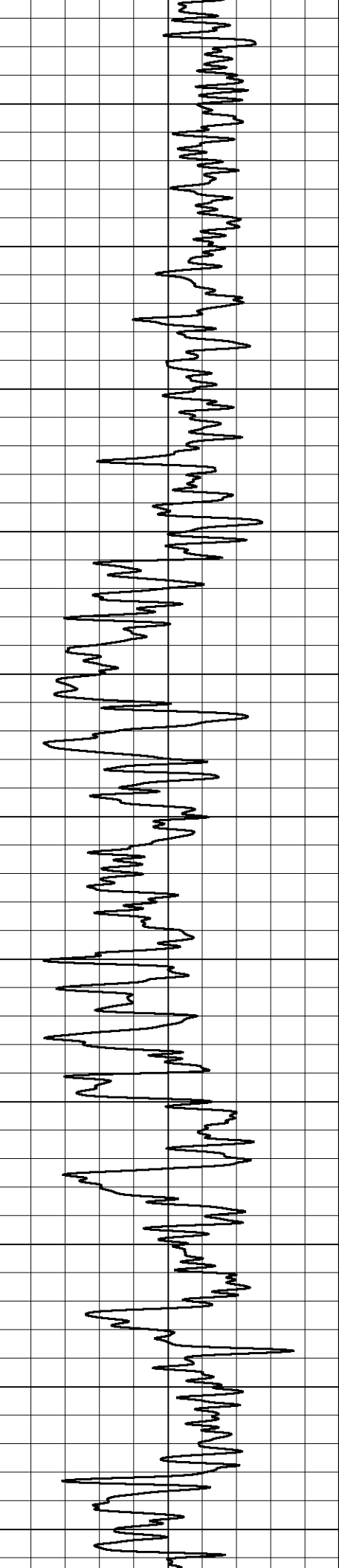


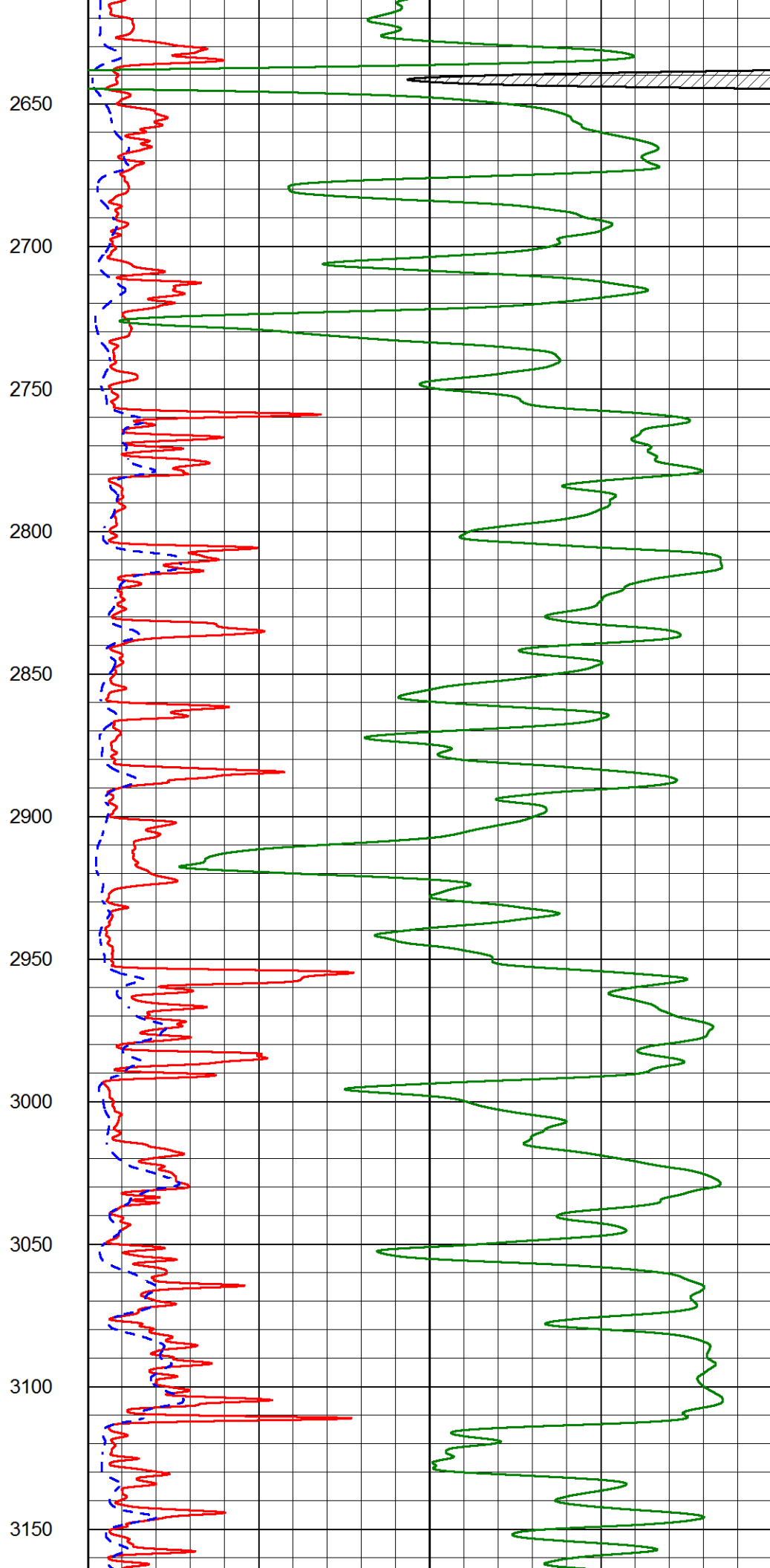
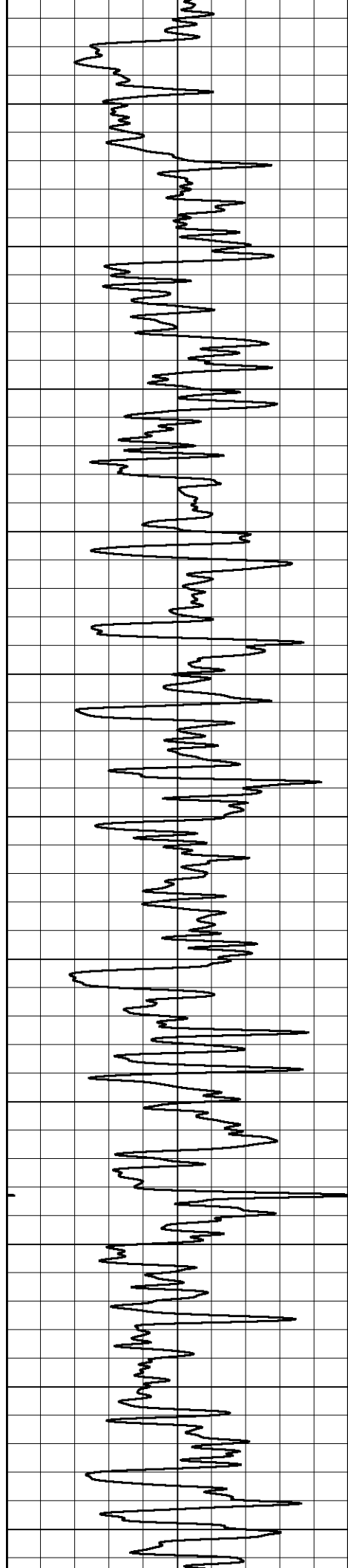


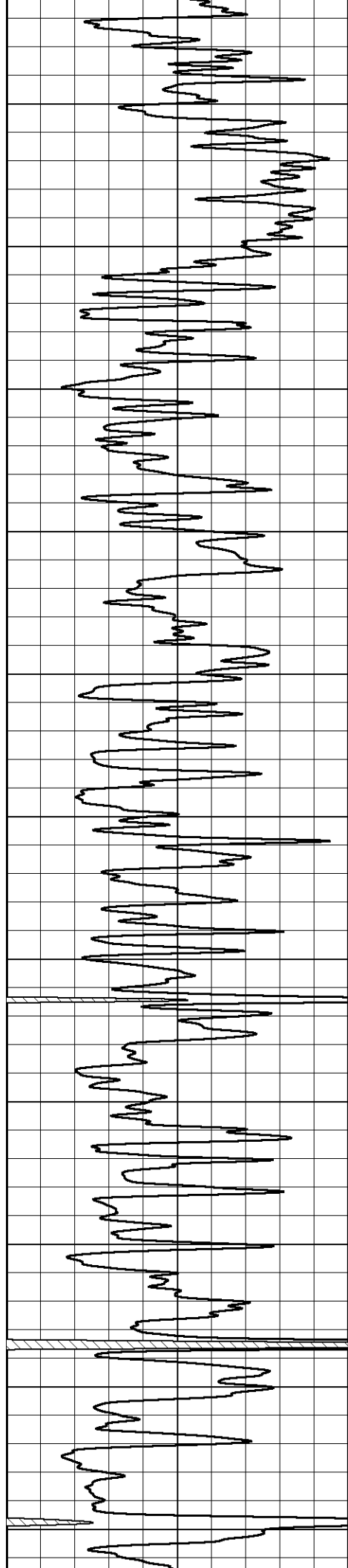
1000  
1050  
1100  
1150  
1200  
1250  
1300  
1350  
1400  
1450  
1500











3200

3250

3300

3350

3400

3450

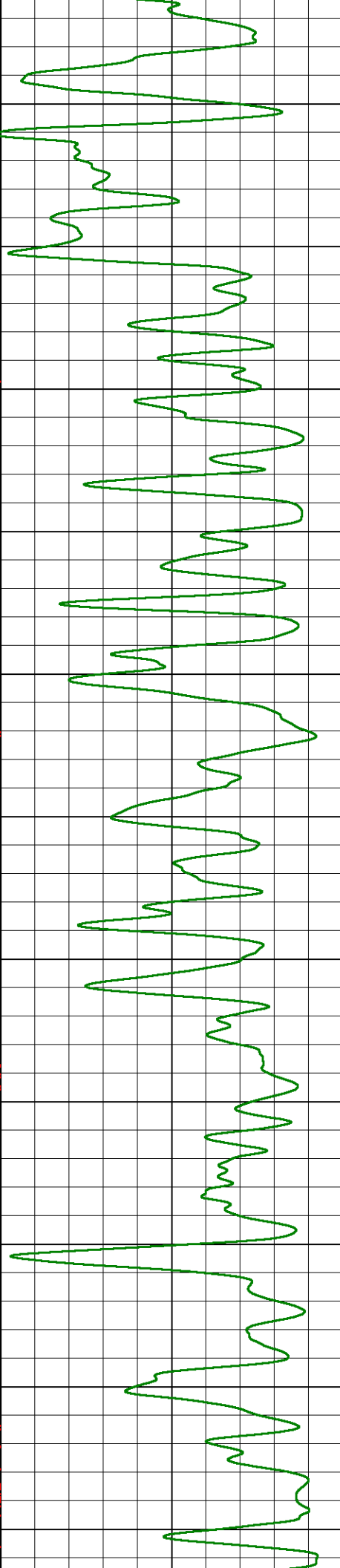
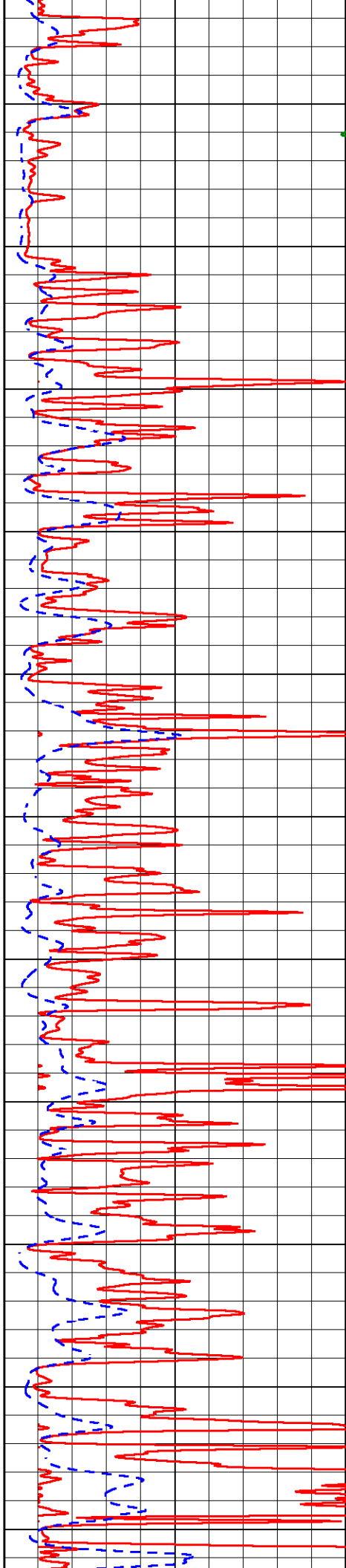
3500

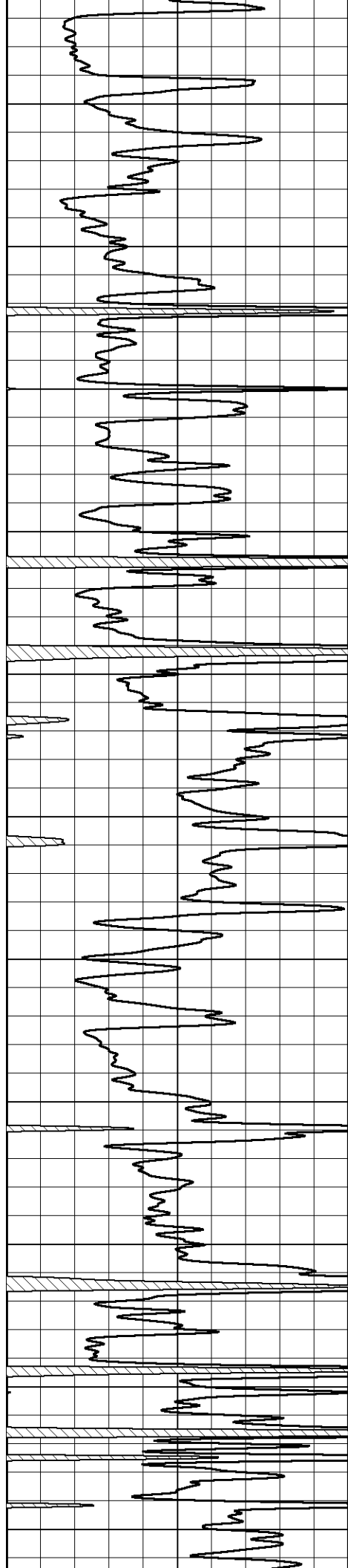
3550

3600

3650

3700





3750

3800

3850

3900

3950

4000

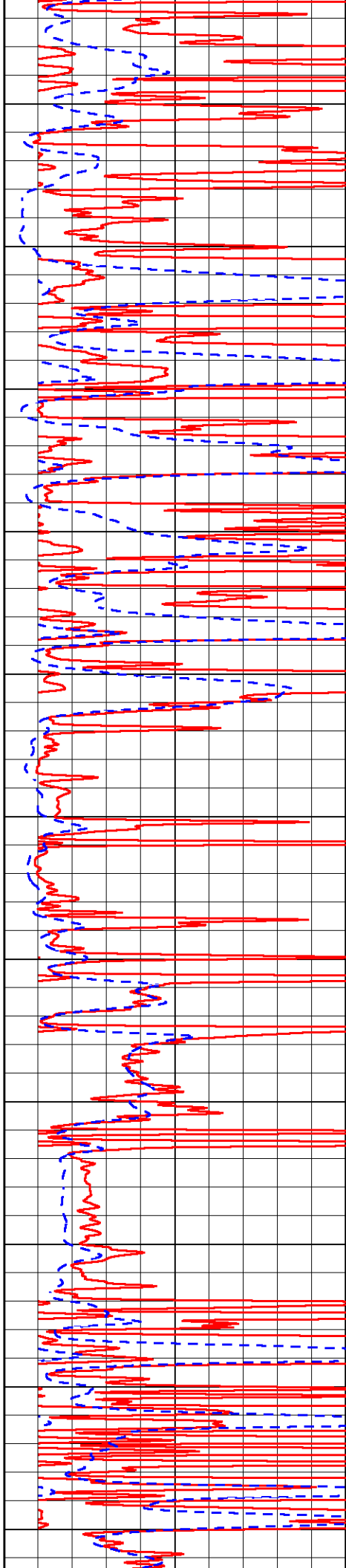
4050

4100

4150

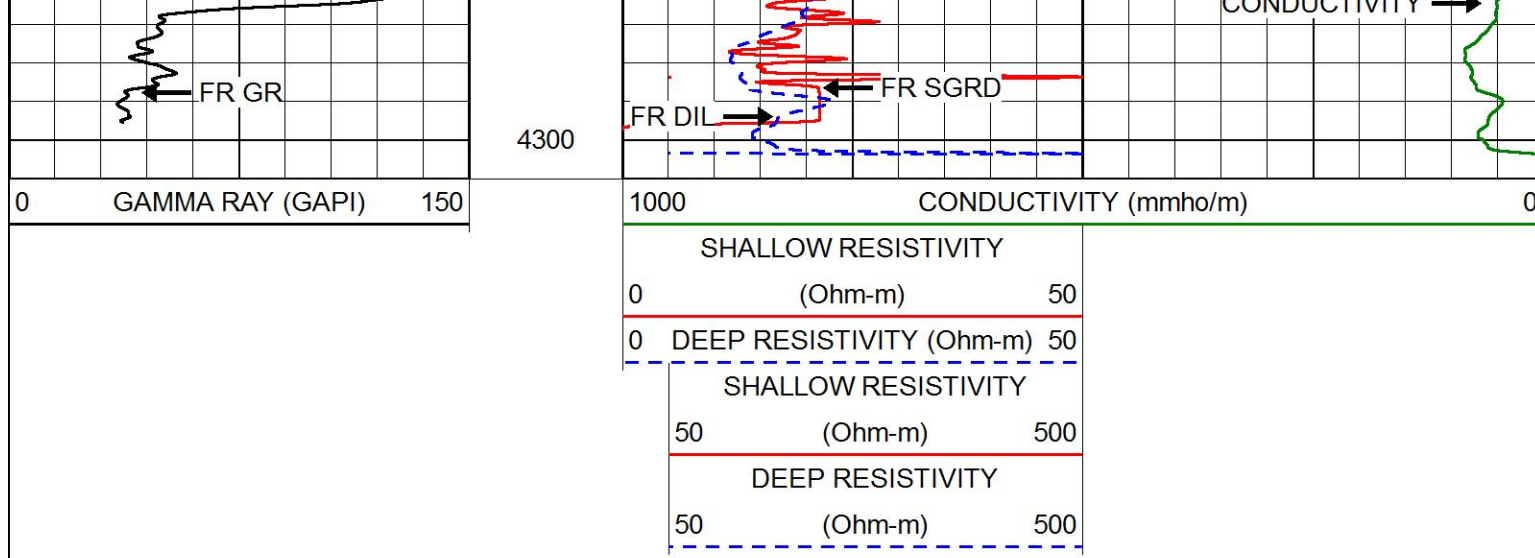
4200

4250



CONDUCTIVITY







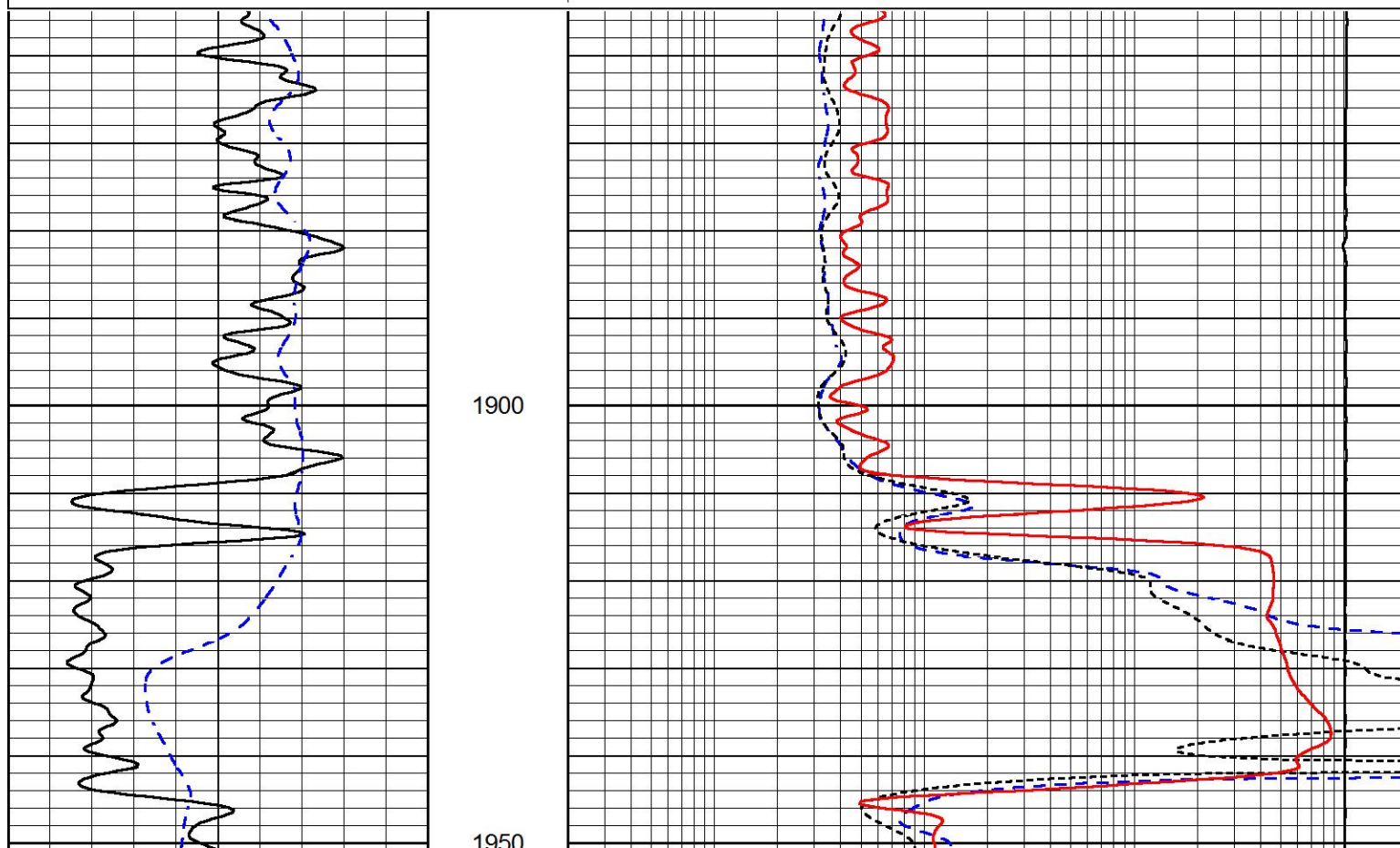
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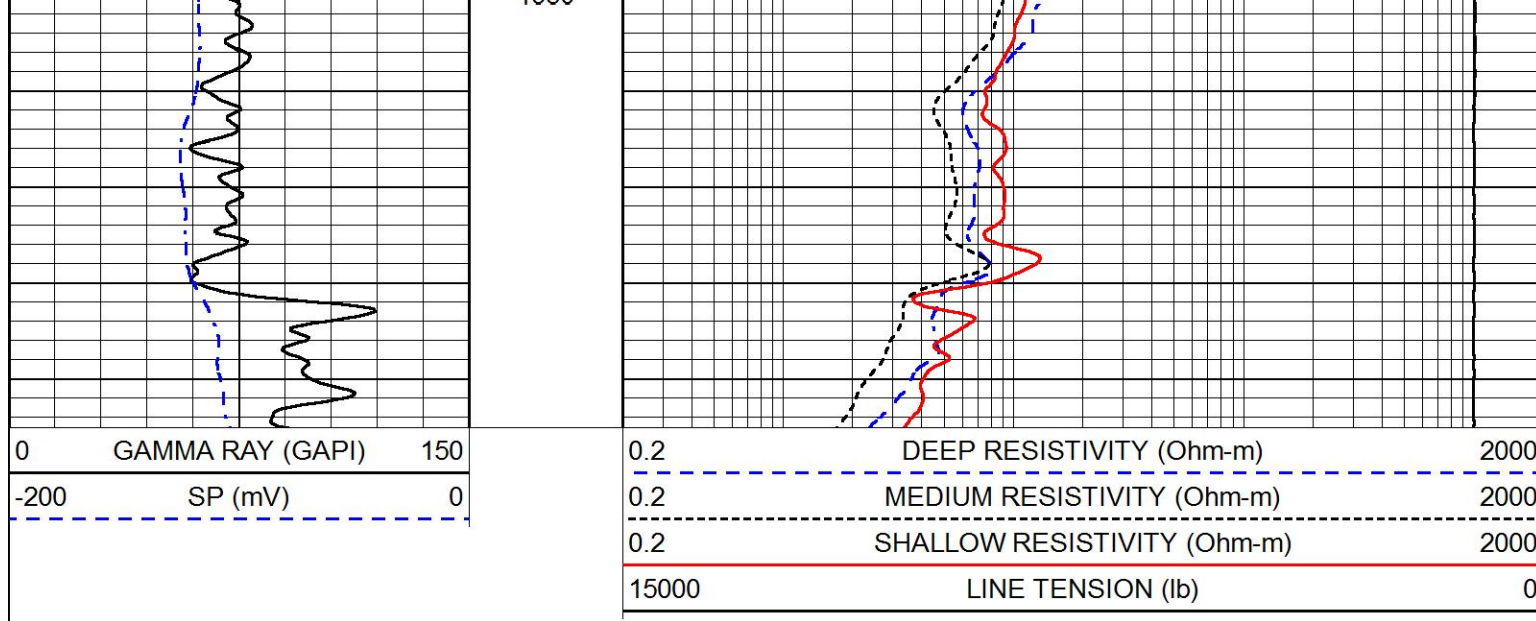
## ANHYDRITE SECTION

### MAIN PASS

|                     |                               |
|---------------------|-------------------------------|
| Database File       | pickrelldrilling_albin_i_3.db |
| Dataset Pathname    | stackmel/pass3.4              |
| Presentation Format | dil                           |
| Dataset Creation    | Fri Nov 11 15:58:03 2016      |
| 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 SHALLOW RESISTIVITY (Ohm-m) 2000 |
|                        | 15000 LINE TENSION (lb) 0            |



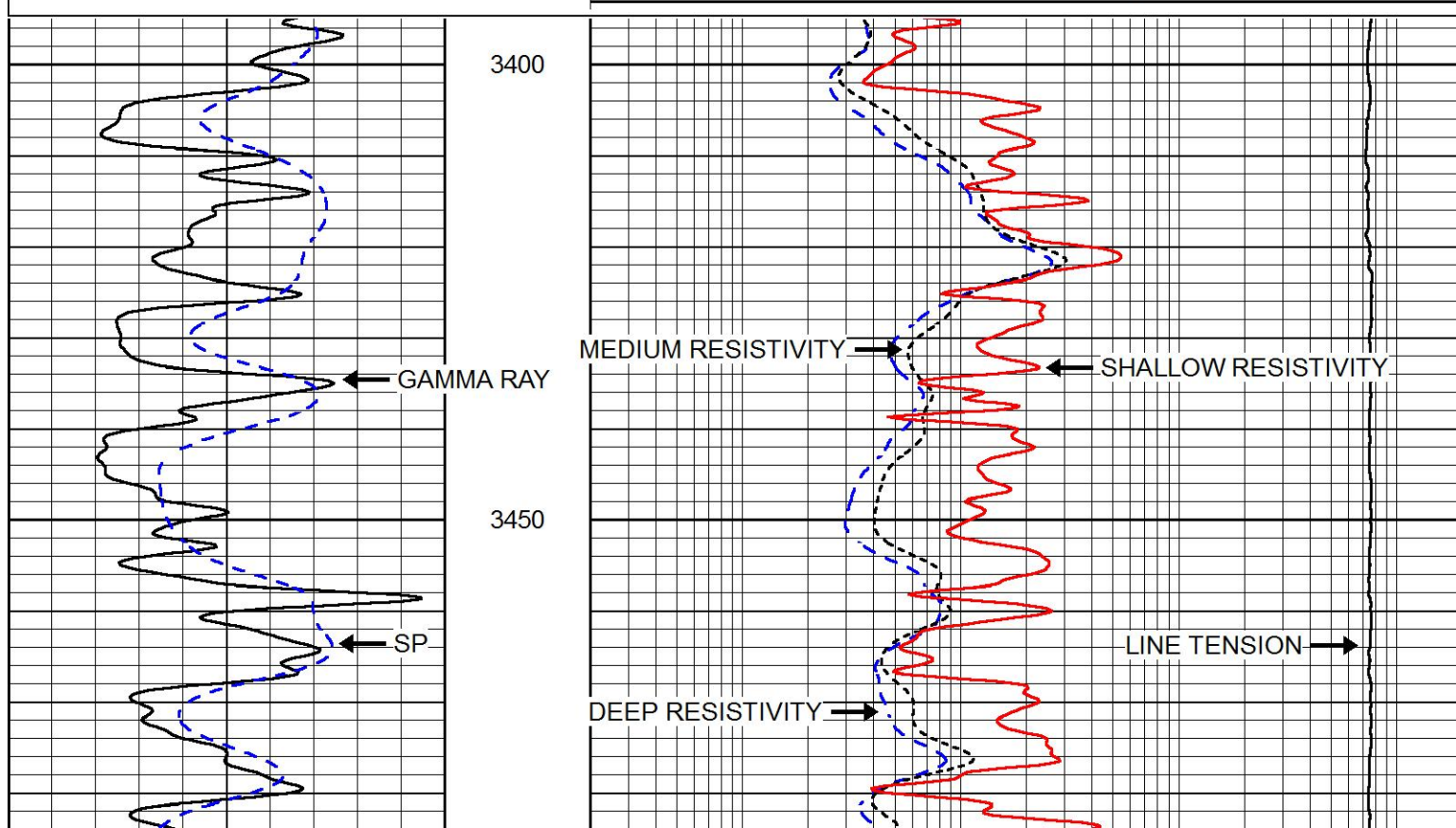
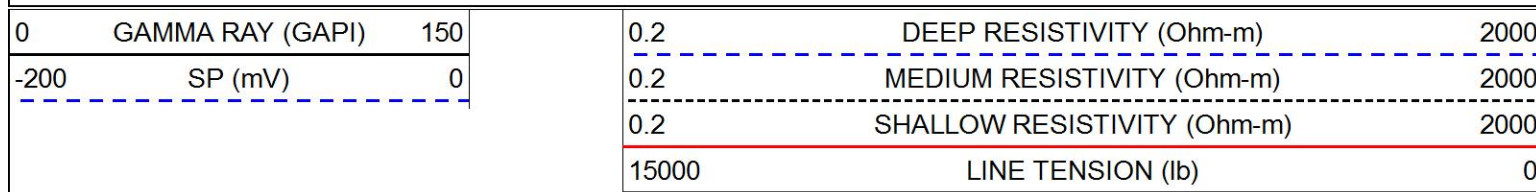


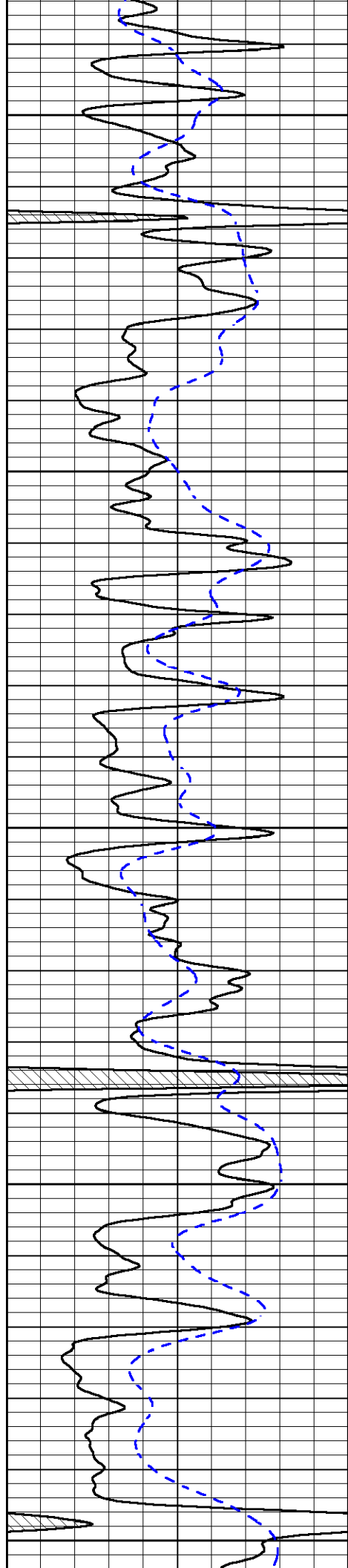


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# MAIN PASS

|                     |                               |
|---------------------|-------------------------------|
| Database File       | pickrelldrilling_albin_i_3.db |
| Dataset Pathname    | stackmel/pass3.1              |
| Presentation Format | dil                           |
| Dataset Creation    | Fri Nov 11 15:46:09 2016      |
| Charted by          | Depth in Feet scaled 1:240    |





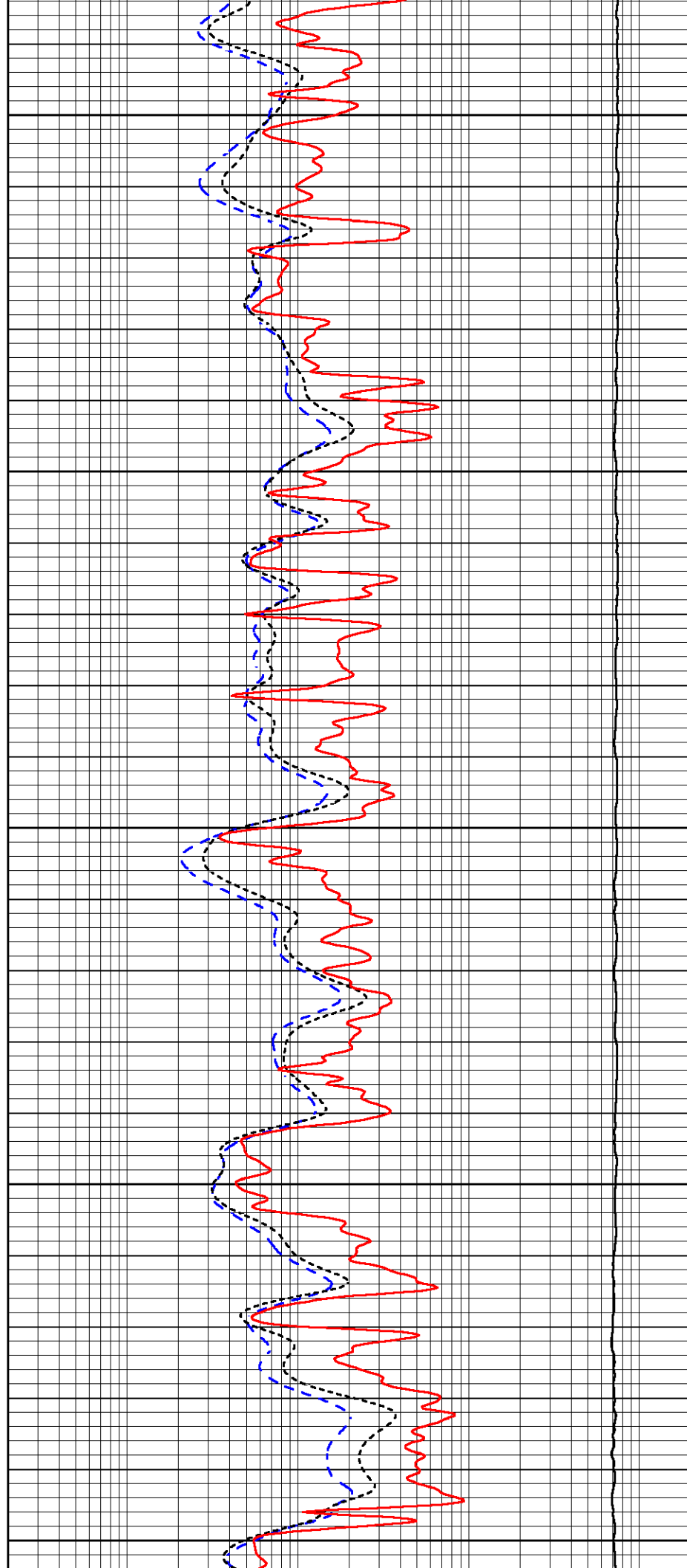
3500

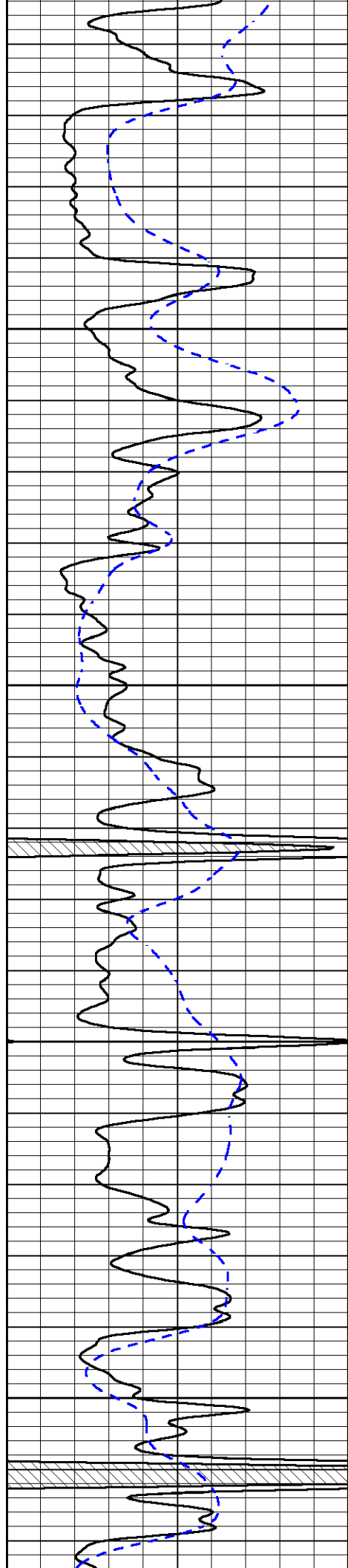
3550

3600

3650

3700



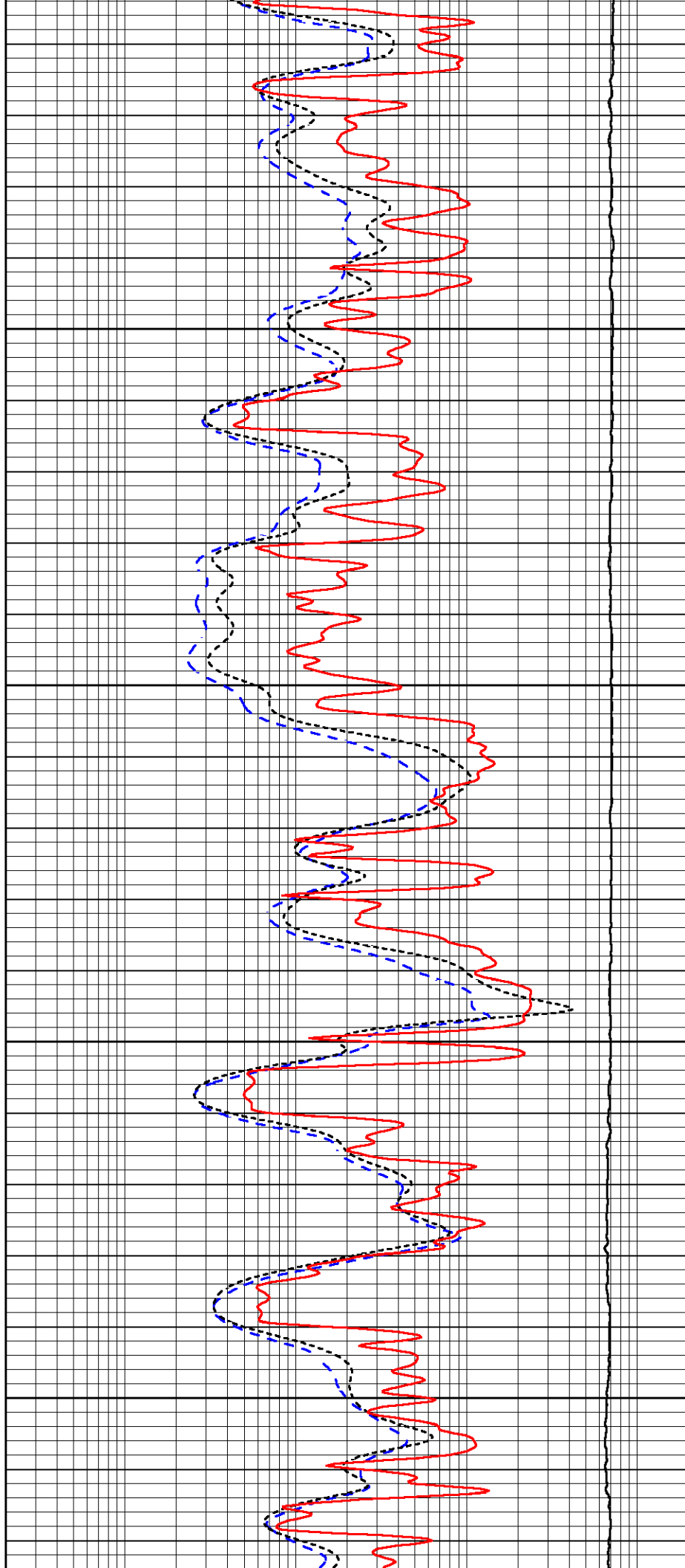


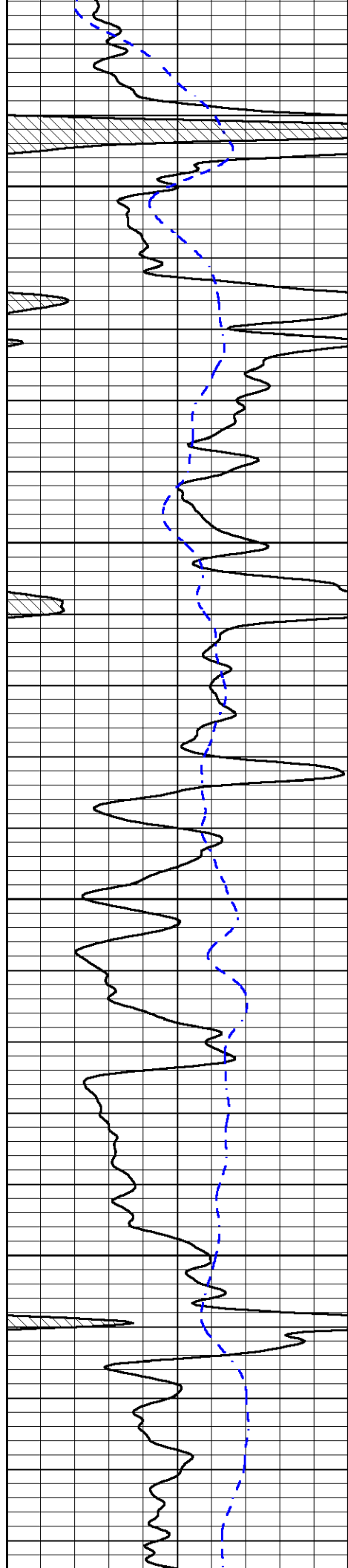
3750

3800

3850

3900



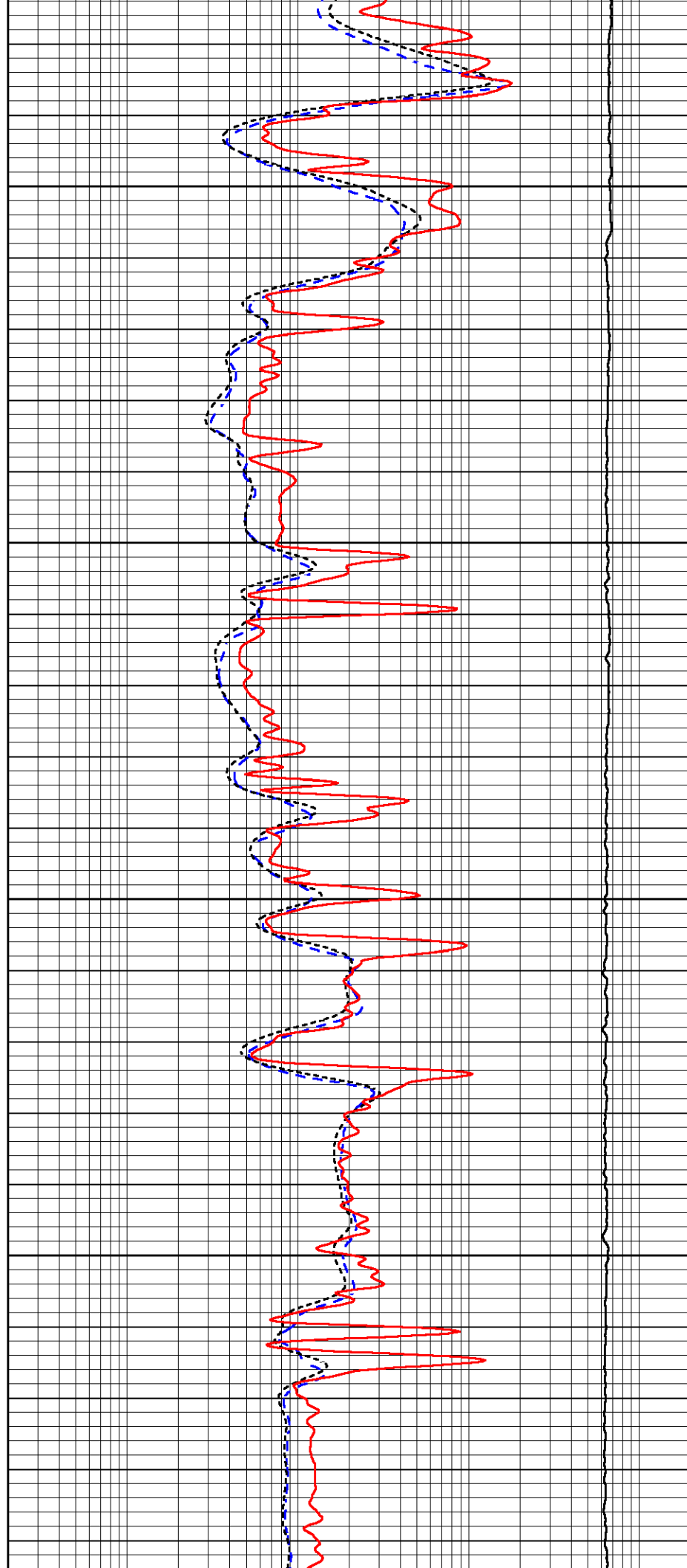


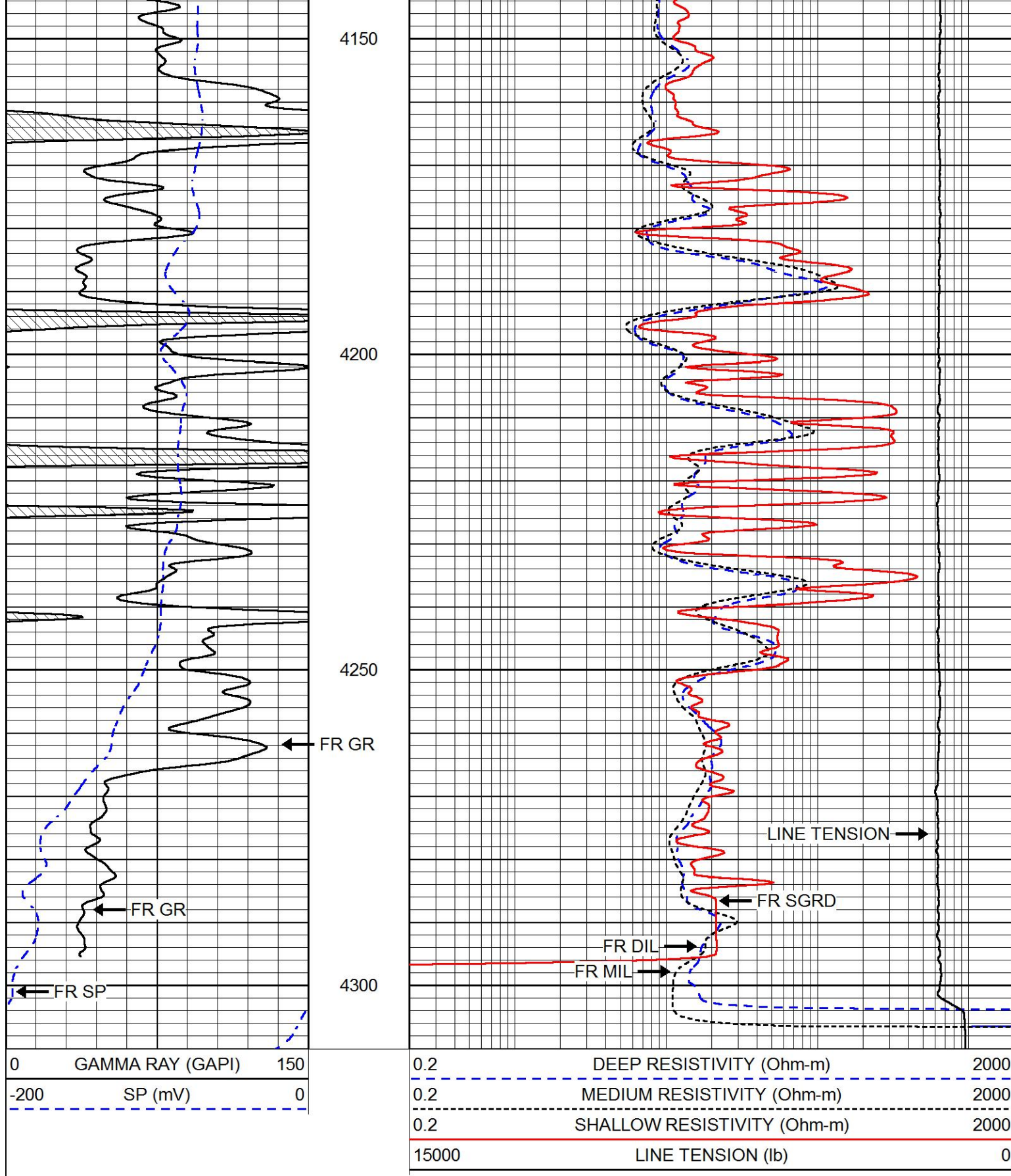
3950

4000

4050

4100

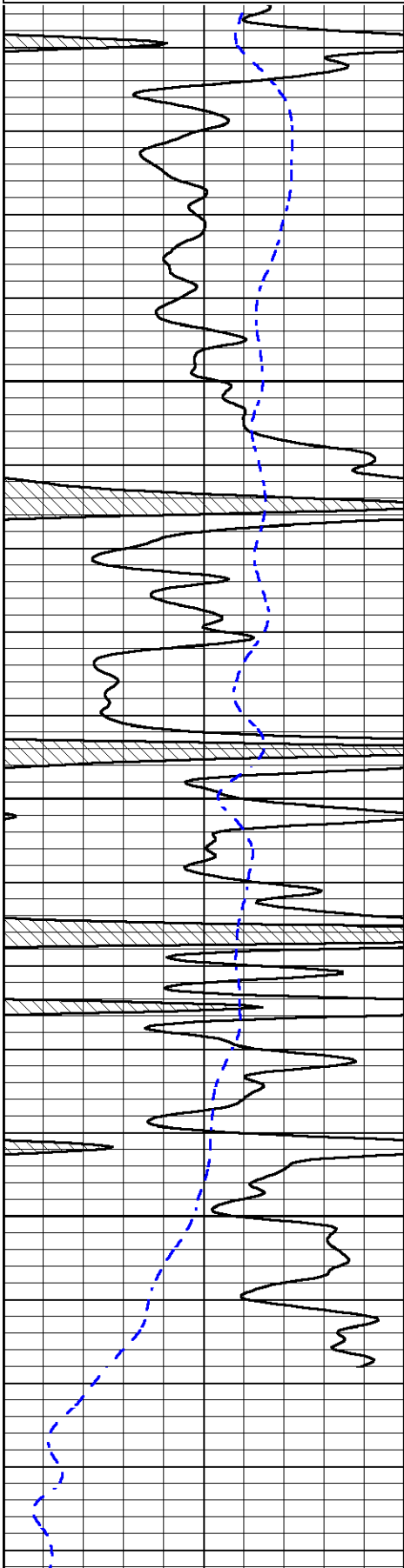




# REPEAT SECTION

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

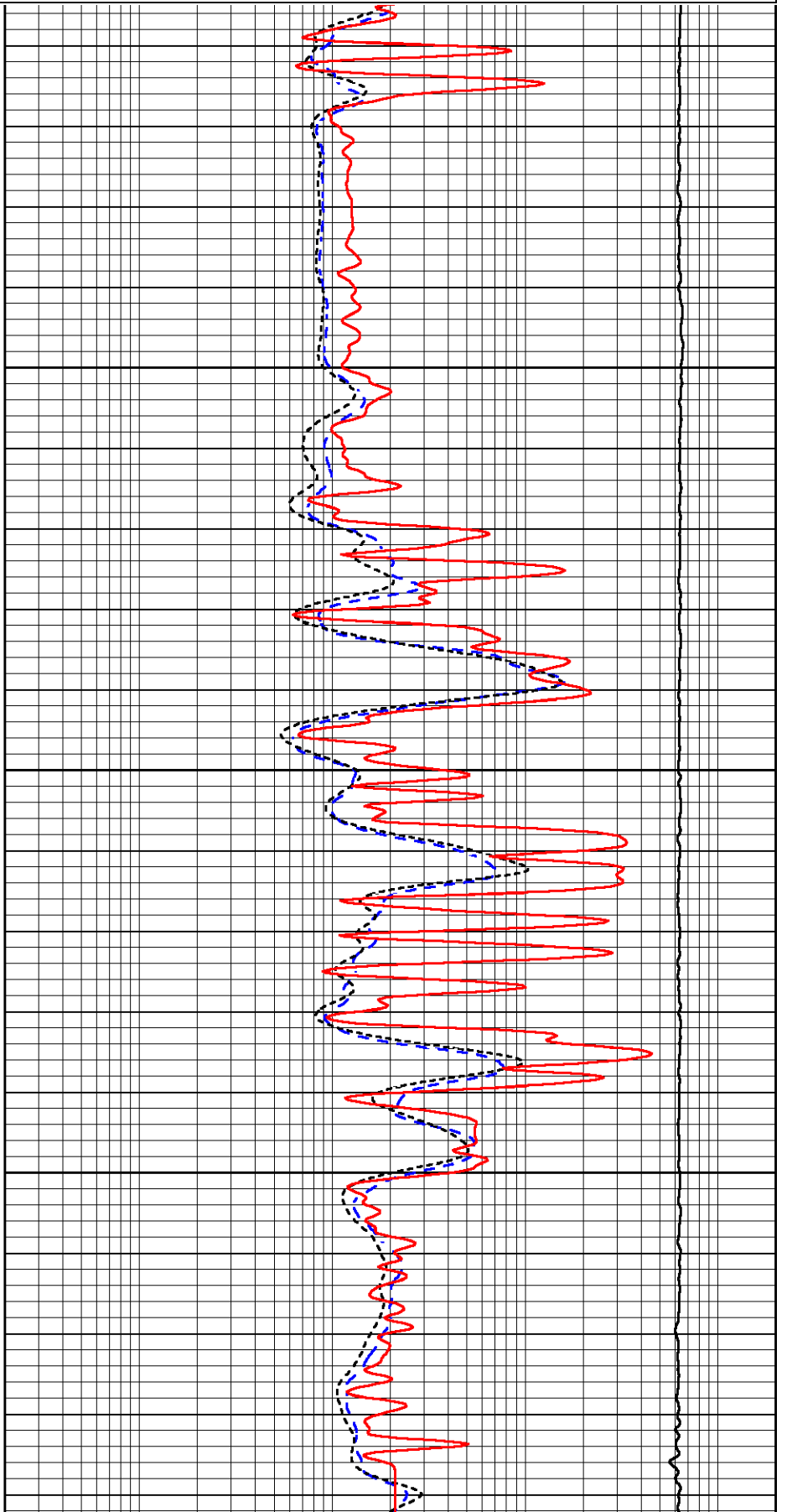
|       |                             |      |
|-------|-----------------------------|------|
| 0.2   | DEEP RESISTIVITY (Ohm-m)    | 2000 |
| 0.2   | MEDIUM RESISTIVITY (Ohm-m)  | 2000 |
| 0.2   | SHALLOW RESISTIVITY (Ohm-m) | 2000 |
| 15000 | LINE TENSION (lb)           | 0    |

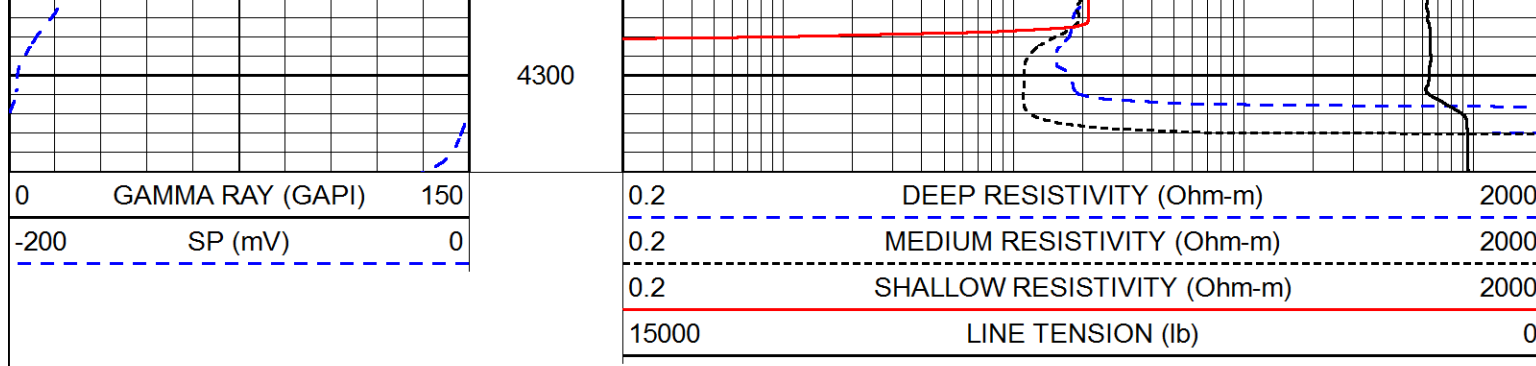


4150

4200

4250





| Calibration Report |                               |
|--------------------|-------------------------------|
| Database File      | pickrelldrilling_albin_i_3.db |
| Dataset Pathname   | stackmel/pass2                |
| Dataset Creation   | Fri Nov 11 14:53:44 2016      |

### Dual Induction Calibration Report

|                        |                          |
|------------------------|--------------------------|
| Serial-Model:          | 1987-M&W                 |
| Calibration Performed: | Tue Aug 30 16:23:58 2016 |

|        |  | Readings |          |  |  | References |         |        |  | Results |          |
|--------|--|----------|----------|--|--|------------|---------|--------|--|---------|----------|
| Loop:  |  | Air      | Loop     |  |  | Air        | Loop    |        |  | Gain    | Offset   |
| Deep   |  | 178.615  | 710.235  |  |  | 0.000      | 255.800 | mmho/m |  | 0.530   | -36.500  |
| Medium |  | 161.982  | 1441.110 |  |  | 0.000      | 255.800 | mmho/m |  | 0.440   | -110.500 |

### Compensated Density Calibration Report

|                               |                          |
|-------------------------------|--------------------------|
| Serial-Model:                 | 168-986-M&W              |
| Source / Verifier:            | /                        |
| Master Calibration Performed: | Tue Aug 30 15:13:17 2016 |

| 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: | Sat Oct 1 10:01:53 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: | Fri Sep 30 22:06:47 2016 |          |
| Calibrator Value:      | 1000.0                   | GAPI     |
| Background Reading:    | 0.0                      | cps      |
| Calibrator Reading:    | 6.2                      | cps      |
| Sensitivity:           | 0.5200                   | GAPI/cps |



|         |                                 |
|---------|---------------------------------|
| Company | PICKRELL DRILLING COMPANY, INC. |
| Well    | ALBIN "I" NO. 3                 |
| Field   | CASTLE ROCK                     |
| County  | GOVE                            |
| State   | KANSAS                          |