



MIDWEST WIRELINE

# DUAL INDUCTION LOG

Company American Warrior, Inc.  
 Well Hall #1-21  
 Field Shaeffer-RothGarn  
 County Stafford  
 State Kansas

Company American Warrior, Inc.  
 Well Hall #1-21  
 Field Shaeffer-RothGarn  
 County Stafford State Kansas

Location: 602 FNL & 1337 FEL  
 API #: 15-185-24115-00-00  
 SEC 21 TWP 21S RGE 13W  
 Permanent Datum Ground Level Elevation 1887  
 Log Measured From Kelly Bushing  
 Drilling Measured From Kelly Bushing  
 Other Services  
 CNL/CDL  
 MEL  
 Elevation  
 K.B. 1900  
 D.F.  
 G.L. 1887

|                        |              |
|------------------------|--------------|
| Date                   | 8/29/2022    |
| Run Number             | One          |
| Depth Driller          | 3986         |
| Depth Logger           | 3978         |
| Bottom Logged Interval | 3977         |
| Top Log Interval       | 350          |
| Casing Driller         | 8:625 @ 352  |
| Casing Logger          | 351          |
| Bit Size               | 7.875        |
| Type Fluid in Hole     | Chemical     |
| Salinity, ppm CL       | 8500         |
| Density / Viscosity    | 8.9 50       |
| pH / Fluid Loss        | 11.5 8.8     |
| Source of Sample       | Flowline     |
| Rm @ Meas. Temp        | 0.40 @ 82    |
| Rmt @ Meas. Temp       | 0.30 @ 82    |
| Rmc @ Meas. Temp       | 0.54 @ 82    |
| Source of Rmf / Rmc    | Charts       |
| Rm @ BHT               | 0.28 @ 116   |
| Operating Rig Time     | 3 Hours      |
| Max Rec. Temp. F       | 116          |
| Equipment Number       | 24           |
| Location               | Hays         |
| Recorded By            | D. Schmidt   |
| Witnessed By           | Jim Musgrove |

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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.

Great Bend,  
 South to county line, 3 South, 1/4 West,  
 South into

Log Measured From: Kelly Bushing 13 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: Jim Musgrove  
 Secondary Witness:  
 Secondary Witness:  
 Secondary Witness:

| Sensor             | Offset (ft)             | Schematic | Description      | Length (ft) | O.D. (in) | Weight (lb) |
|--------------------|-------------------------|-----------|------------------|-------------|-----------|-------------|
| GR                 | 40.33                   |           | GR-M&W (106)     | 3.00        | 3.50      | 50.00       |
| CNLSC<br>CNSSC     | 37.23<br>36.48          |           | CNT-M&W (207-MW) | 5.00        | 3.50      | 100.00      |
| LSD<br>DCAL<br>SSD | 28.18<br>28.17<br>27.68 |           | CDL-M&W (307-11) | 8.50        | 4.00      | 250.00      |
| ML-PSIML (402)     |                         |           | ML-PSIML (402)   | 7.58        | 4.00      | 65.00       |
| MCAL<br>MI<br>MN   | 19.58<br>19.58<br>19.58 |           |                  |             |           |             |
| RLL3F<br>RLL3      | 15.50<br>15.50          |           |                  |             |           |             |
| DIL-M&W (501 HT)   |                         |           | DIL-M&W (501 HT) | 18.25       | 3.50      | 220.00      |
| CILD               | 8.33                    |           |                  |             |           |             |
| CILM               | 4.50                    |           |                  |             |           |             |
| SP                 | 0.20                    |           |                  |             |           |             |

Dataset: amwar\_hall 1-21.db: field/well/stkml/pass3.10  
 Total length: 42.33 ft  
 Total weight: 685.00 lb  
 O.D.: 4.00 in

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\amwar\_hall 1-21.db  
 Dataset field/well/stkml/pass3.10/\_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        | 116              | 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                 | 110            | 80               | Off   | 3978             |

## 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

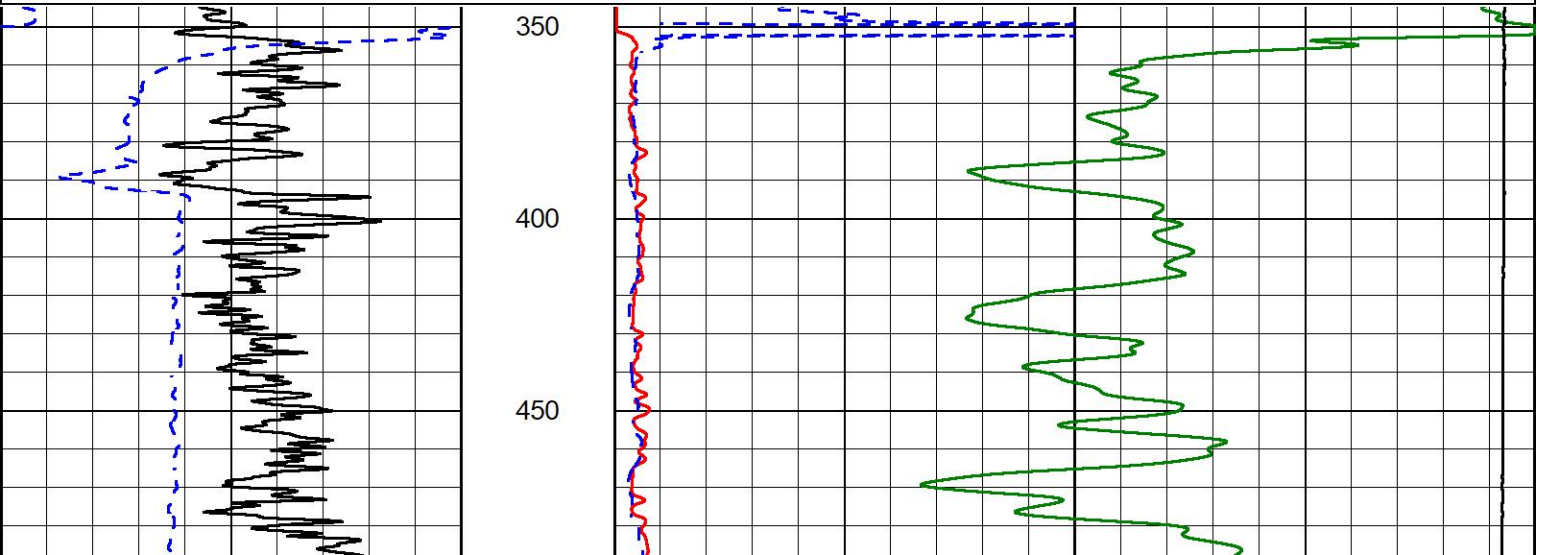


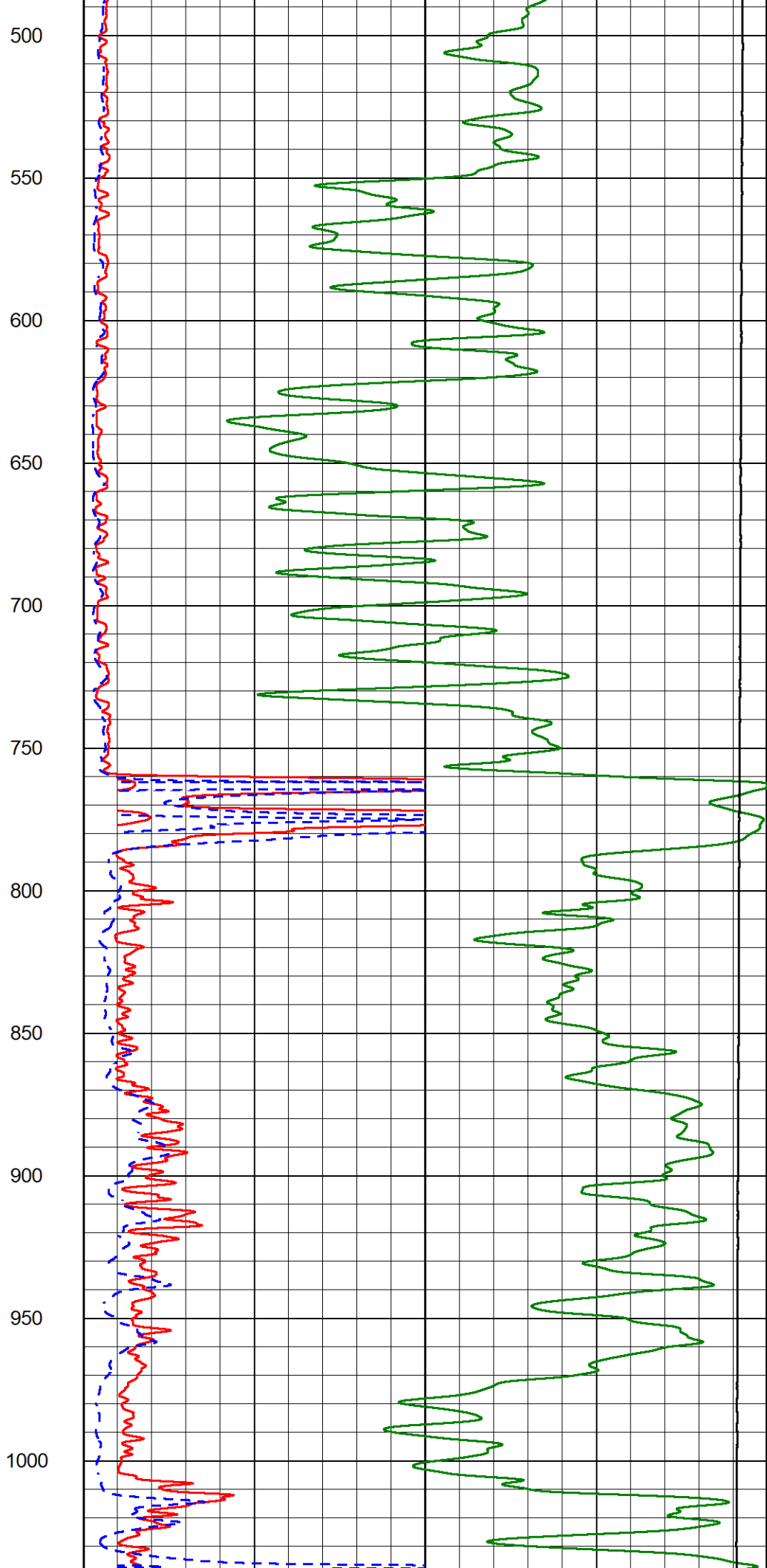
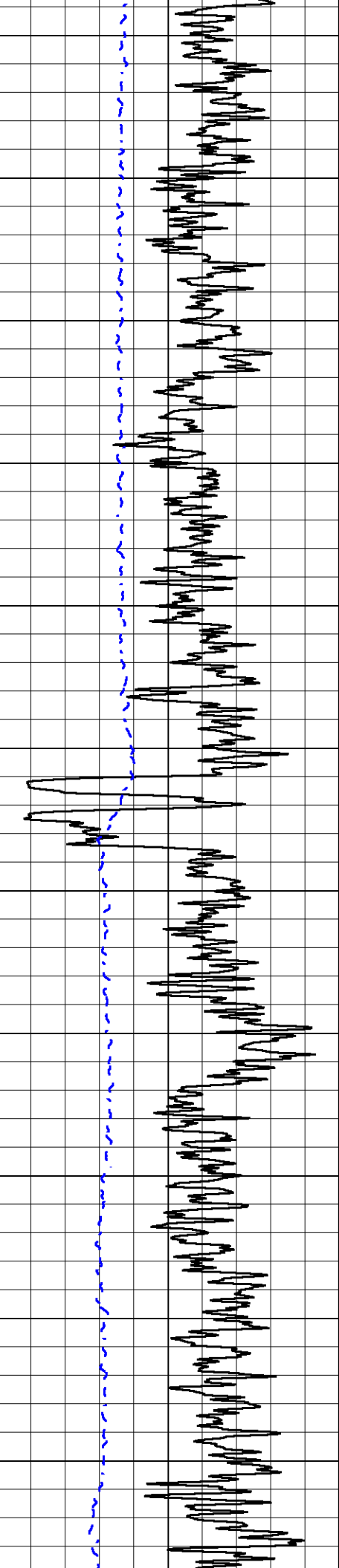
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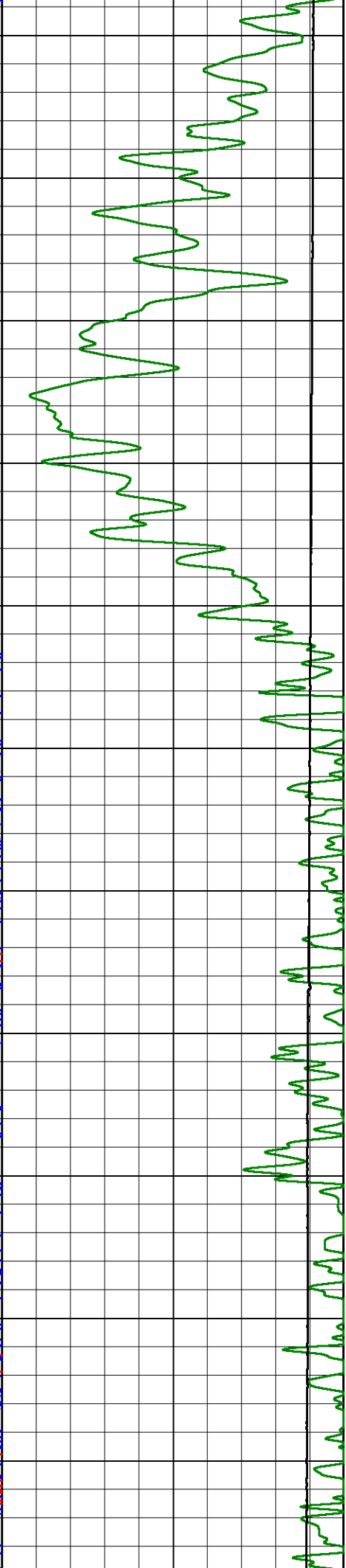
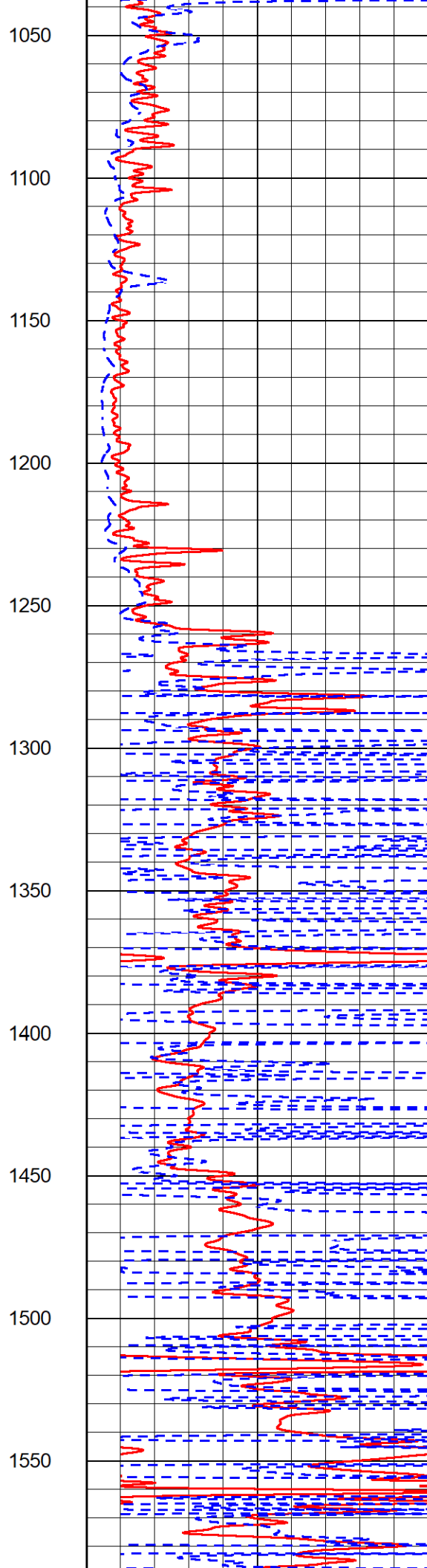
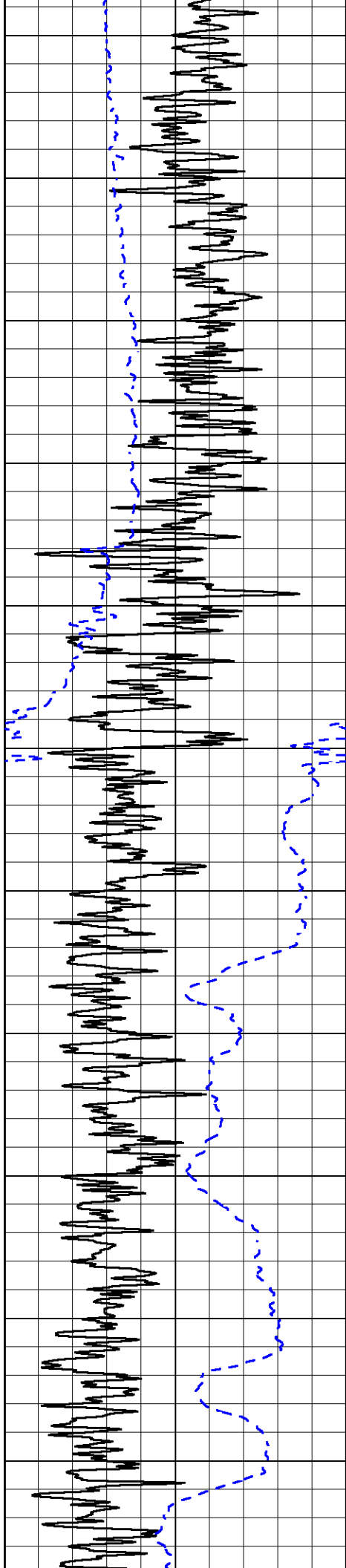
### MAIN PASS

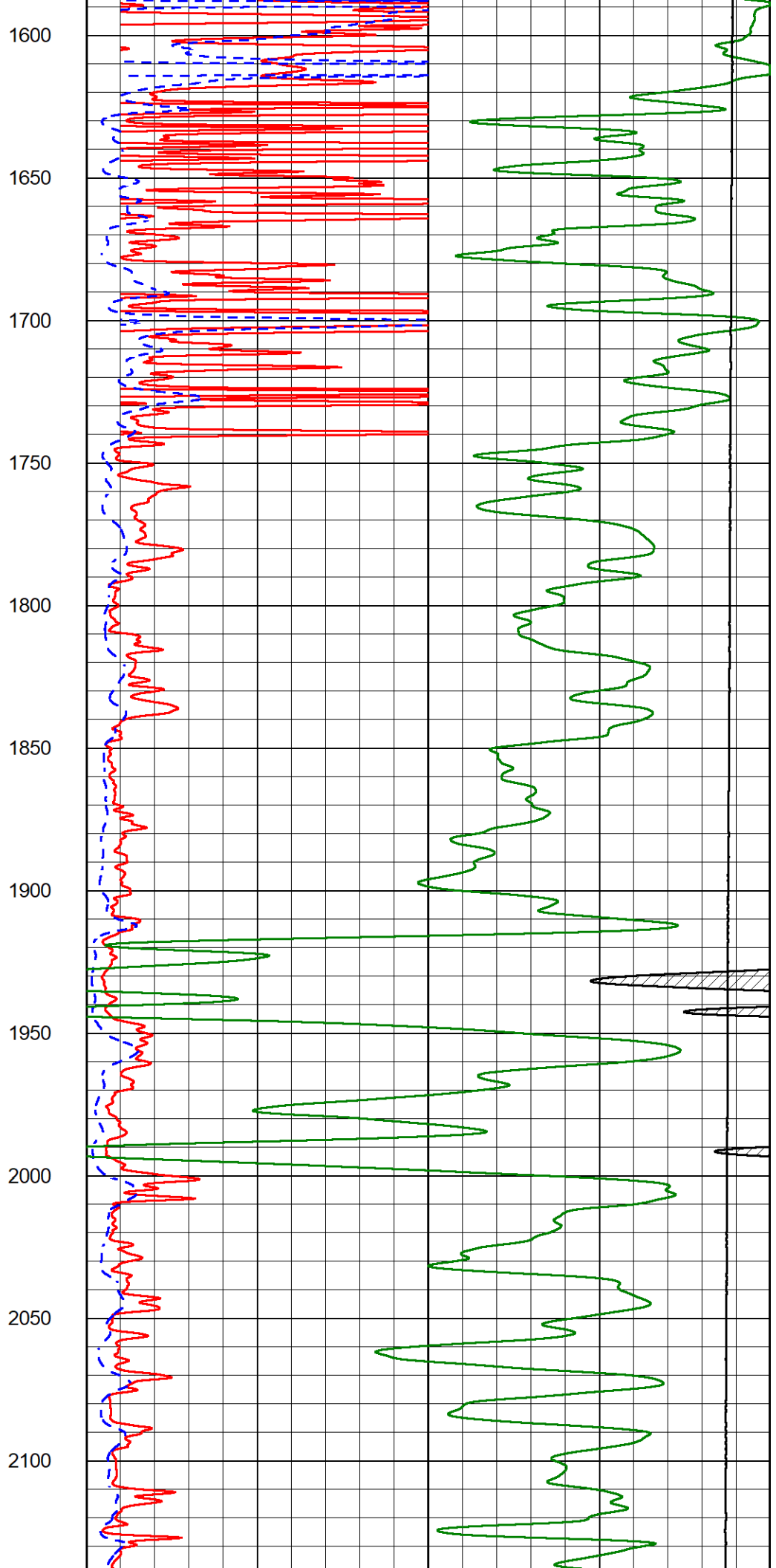
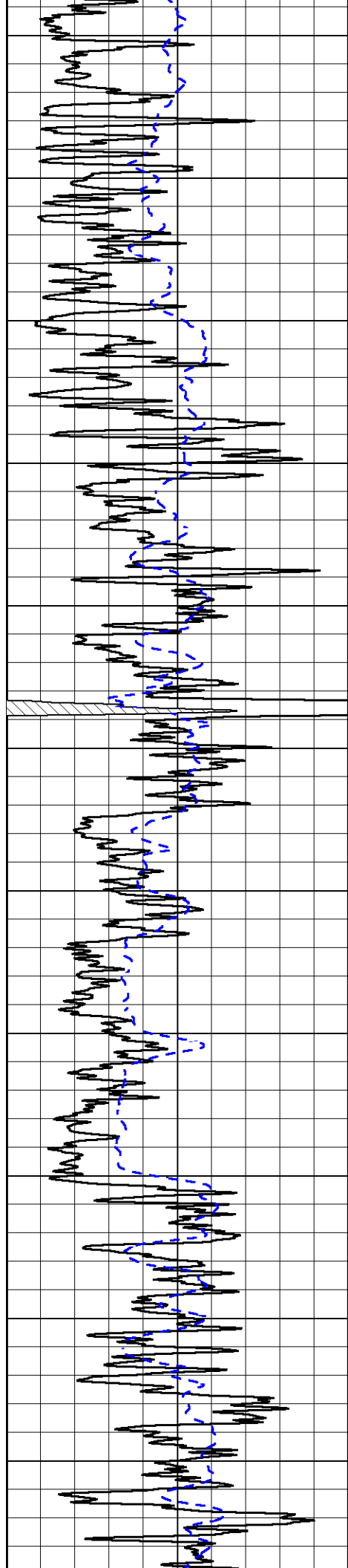
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 Presentation Format \_dil2in  
 Dataset Creation Mon Aug 29 10:37:19 2022  
 Charted by Depth in Feet scaled 1:600

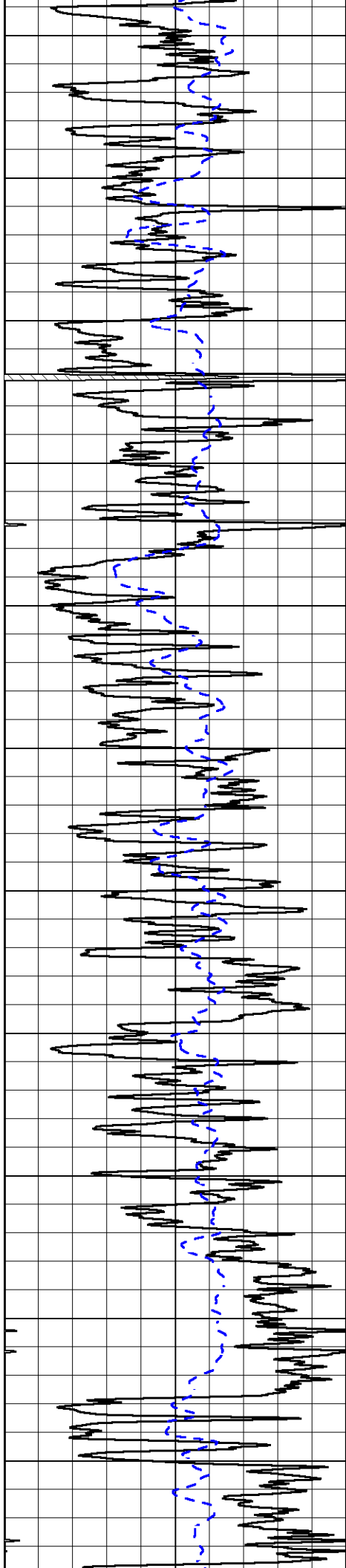
|      |                  |                     |                             |                       |   |
|------|------------------|---------------------|-----------------------------|-----------------------|---|
| 0    | Gamma Ray (GAPI) | 150                 | 1000                        | Conductivity (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                   |   |



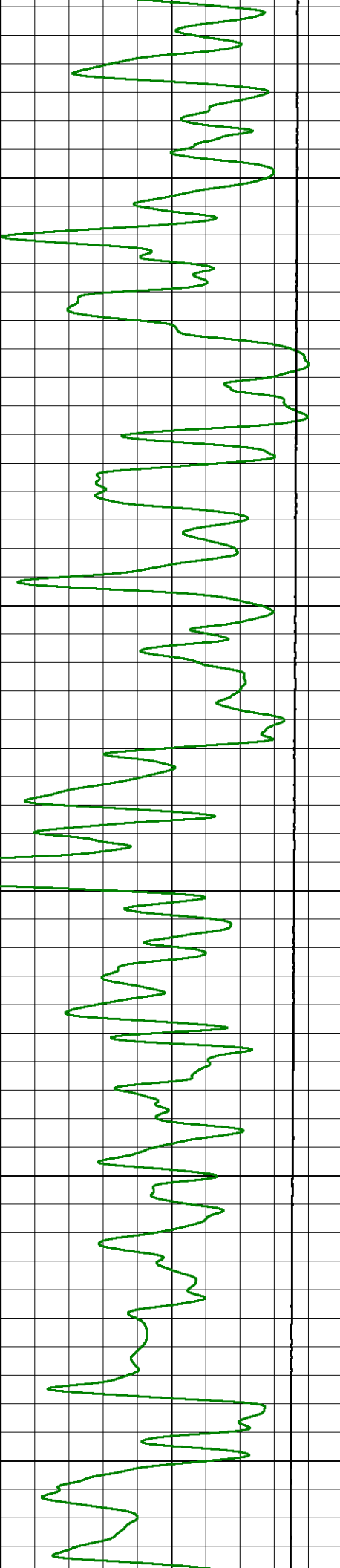
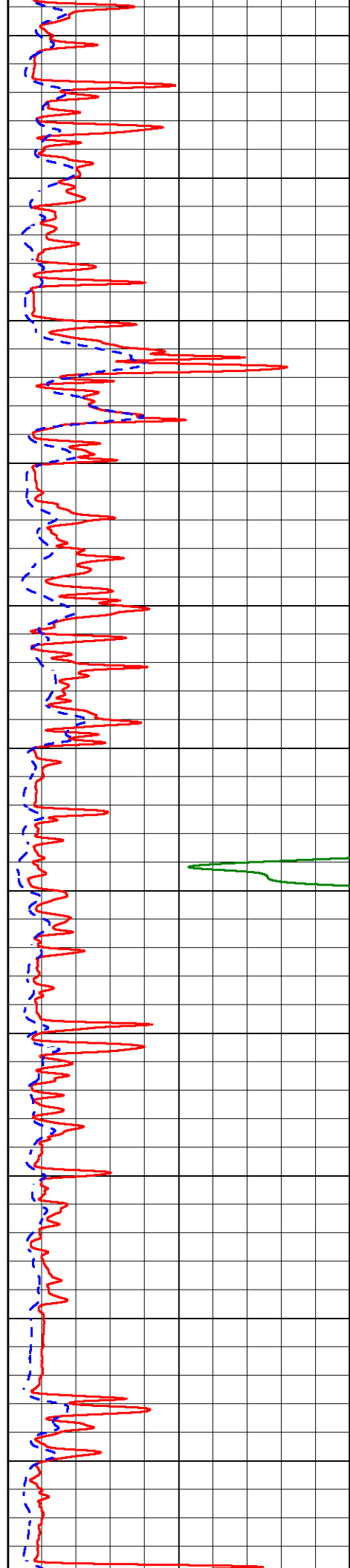


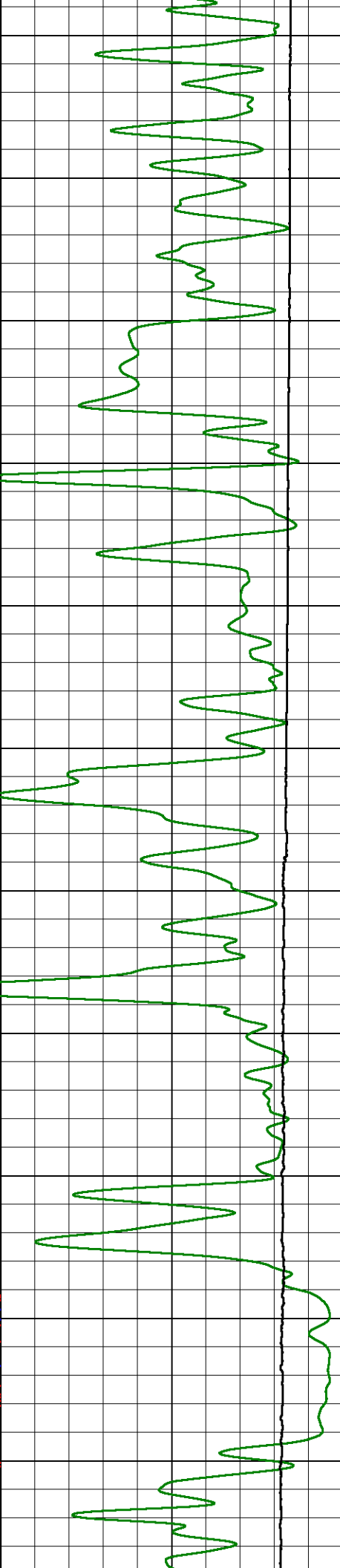
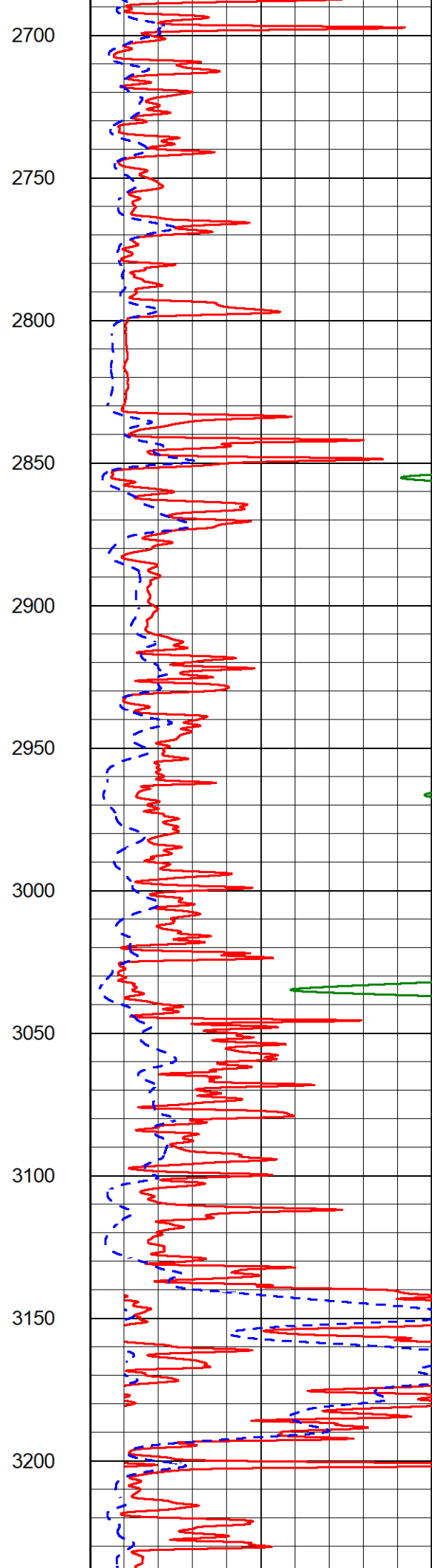
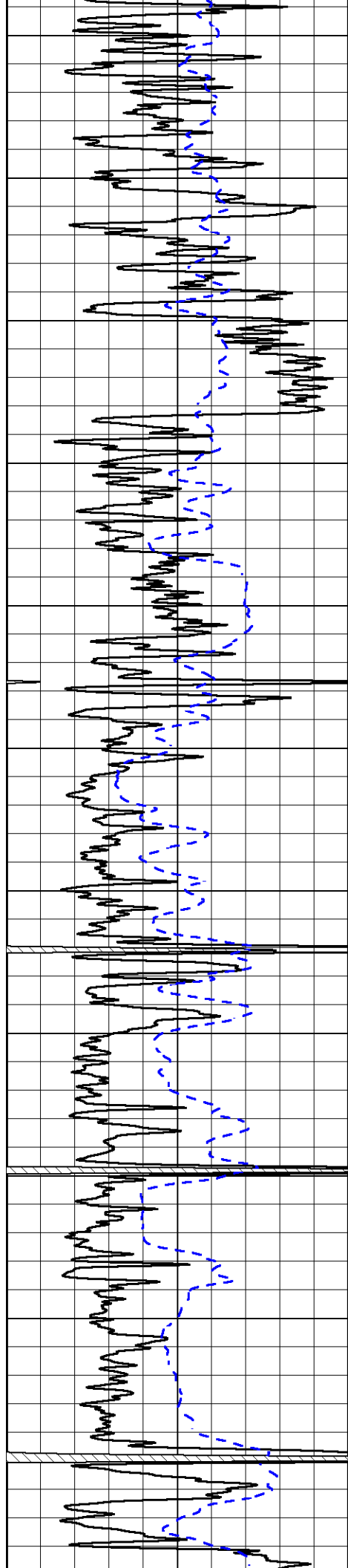


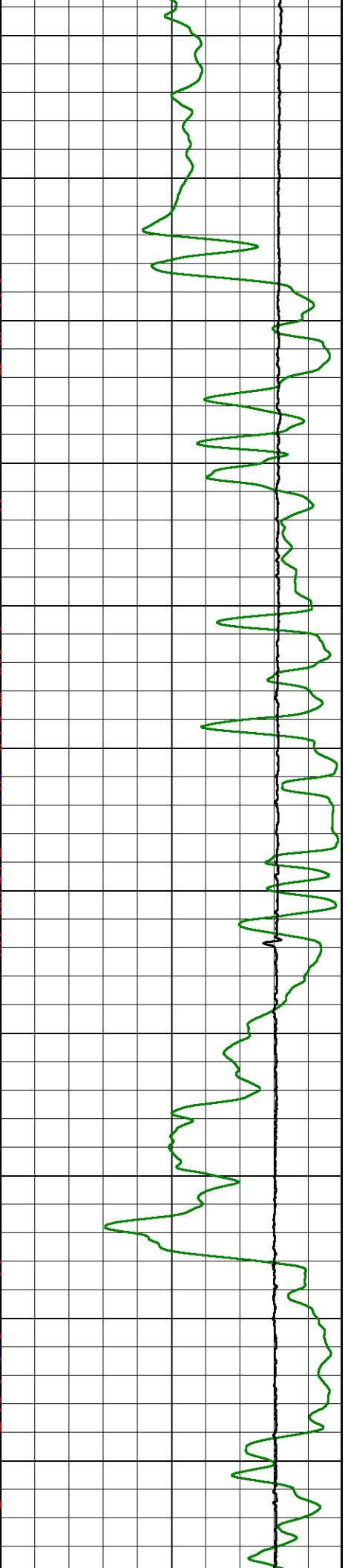
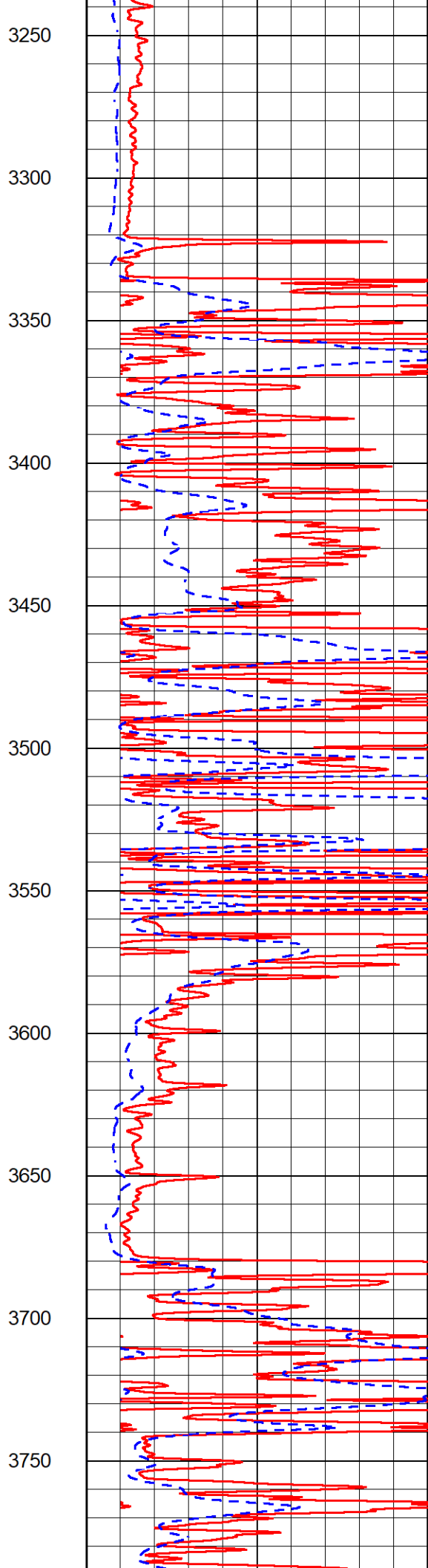
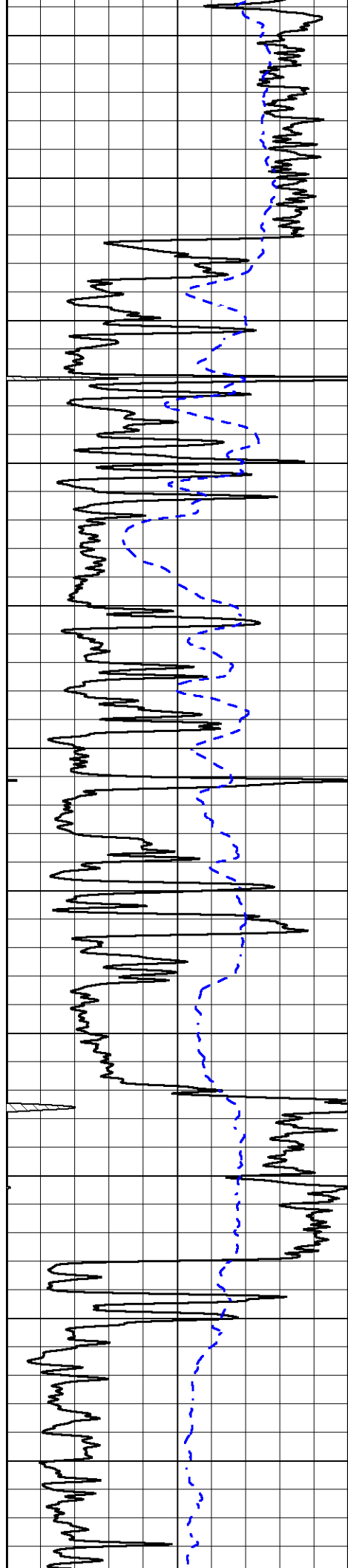


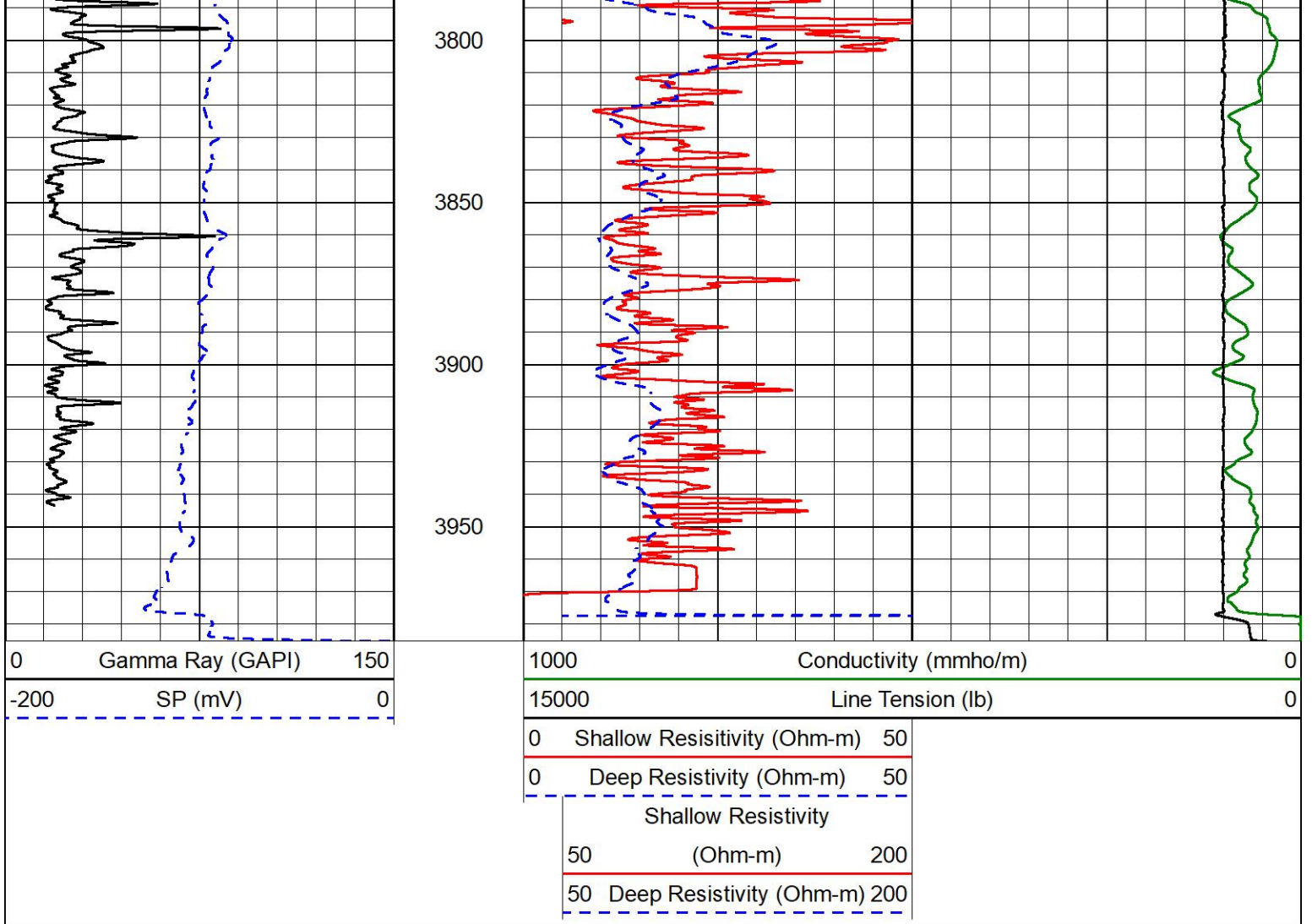


2150  
2200  
2250  
2300  
2350  
2400  
2450  
2500  
2550  
2600  
2650





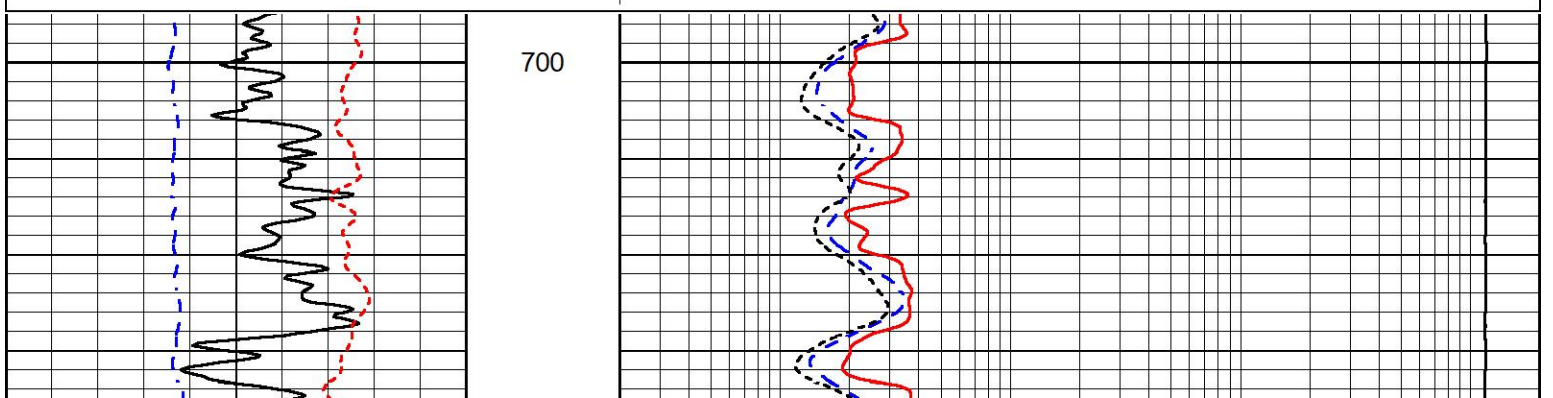
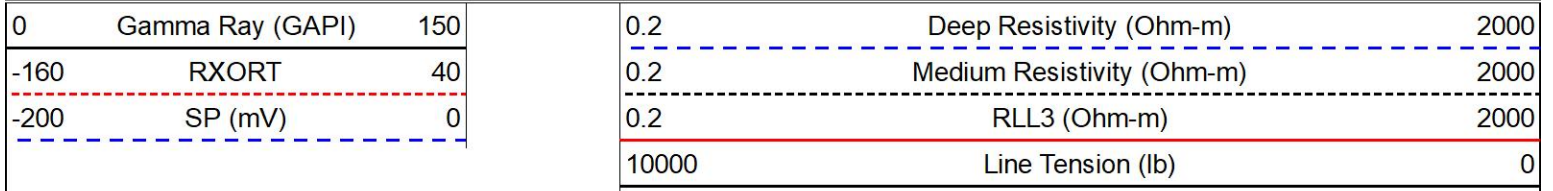


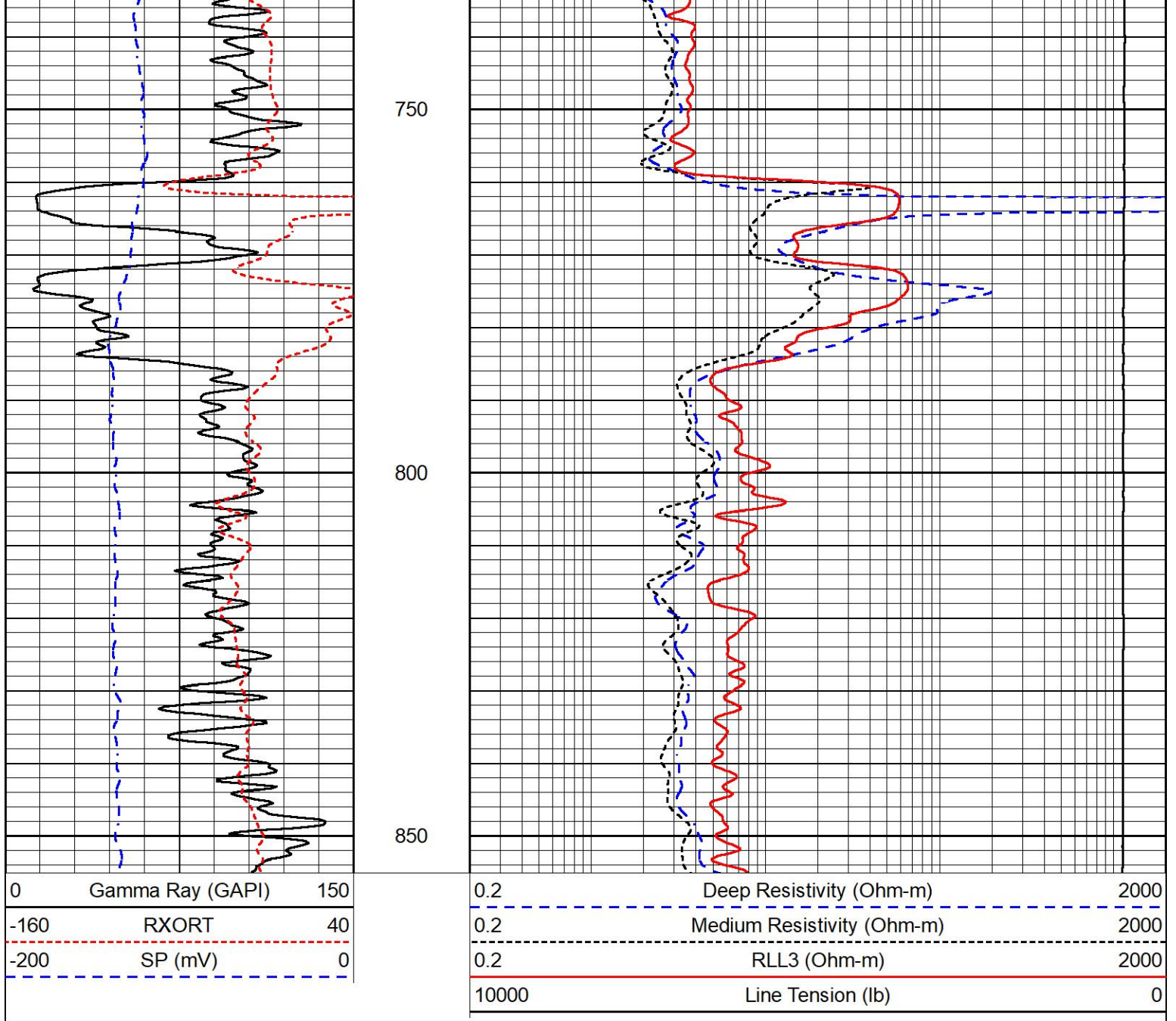


# ANHYDRITE SECTION

## MAIN PASS

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 Presentation Format \_dil  
 Dataset Creation Mon Aug 29 10:37:25 2022  
 Charted by Depth in Feet scaled 1:240

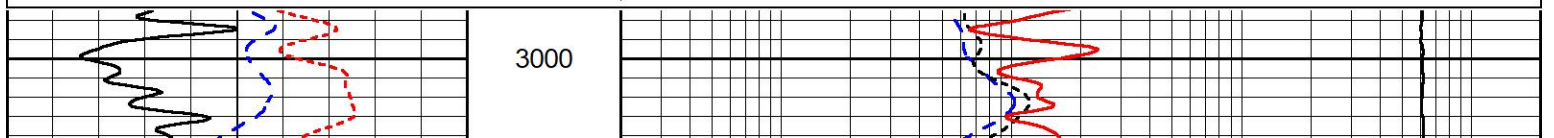
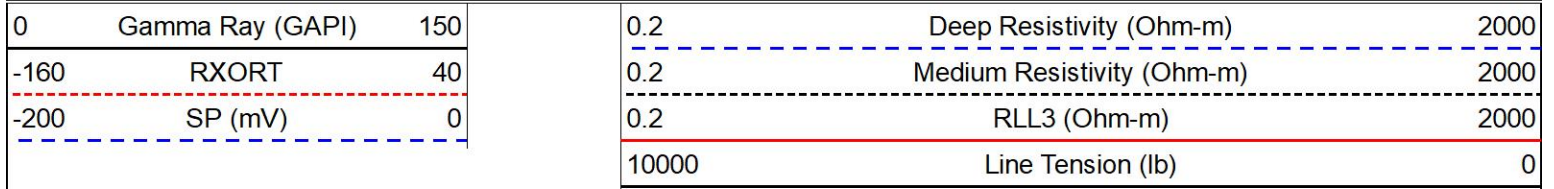


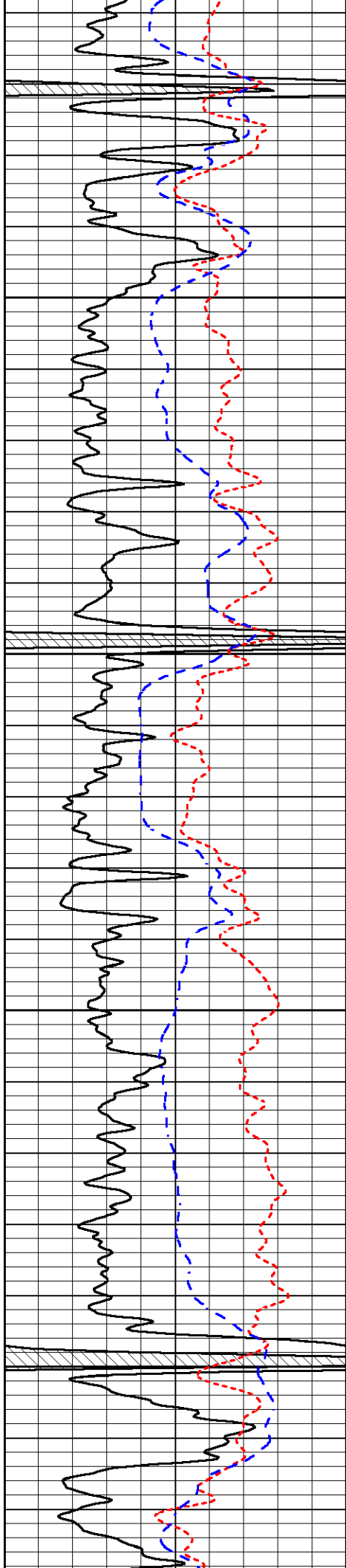


## DETAIL SECTION

### MAIN PASS

Database File      amwar\_hall 1-21.db  
 Dataset Pathname    stkml/pass3.1  
 Presentation Format    \_dil  
 Dataset Creation      Mon Aug 29 10:35:01 2022  
 Charted by            Depth in Feet scaled 1:240



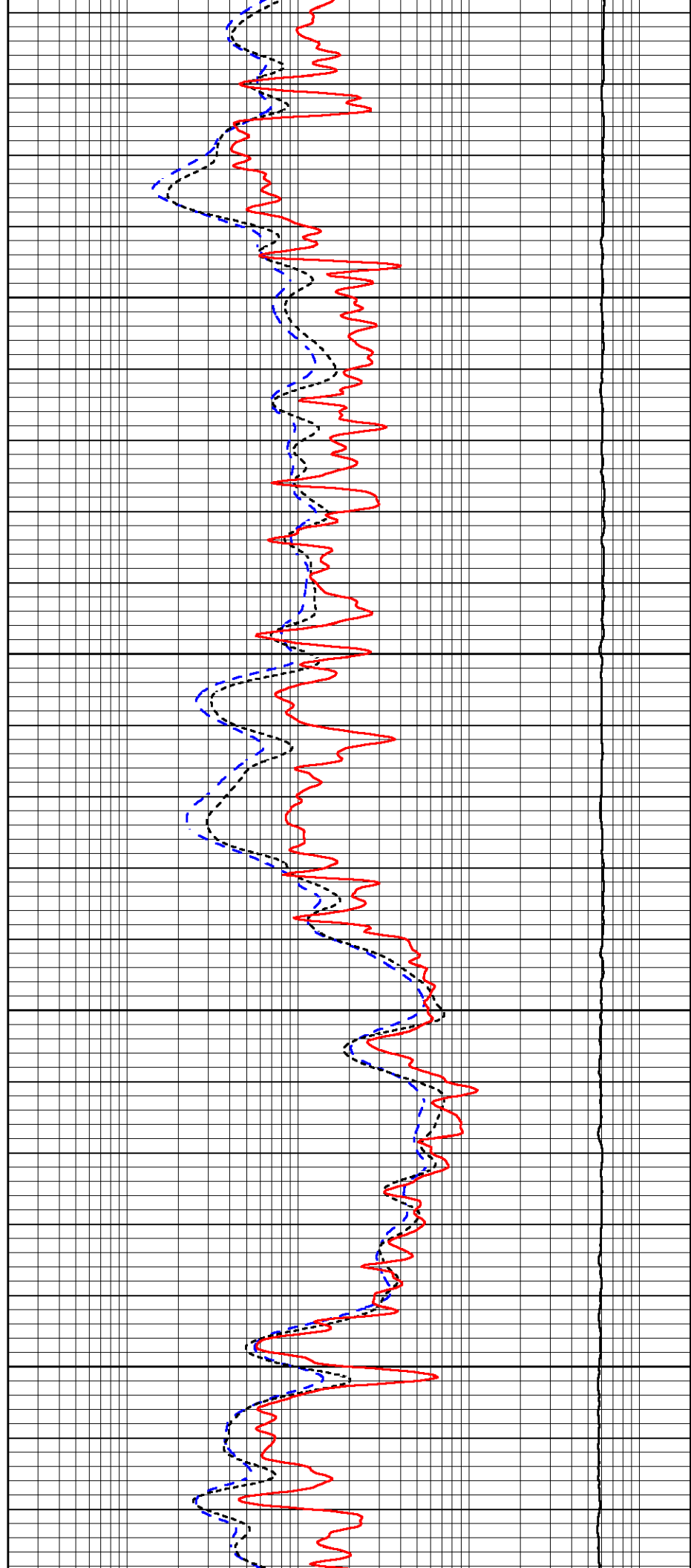


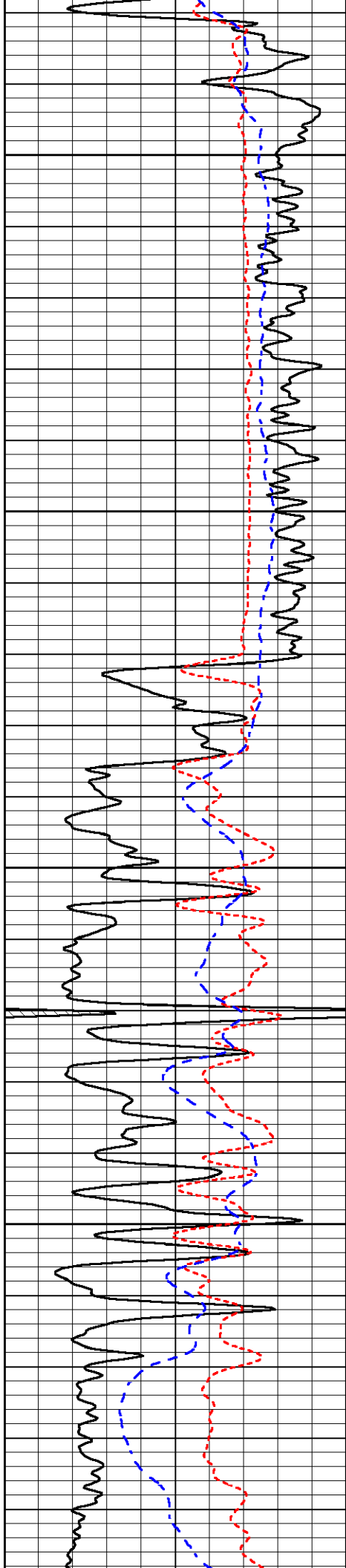
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3100

3150

3200



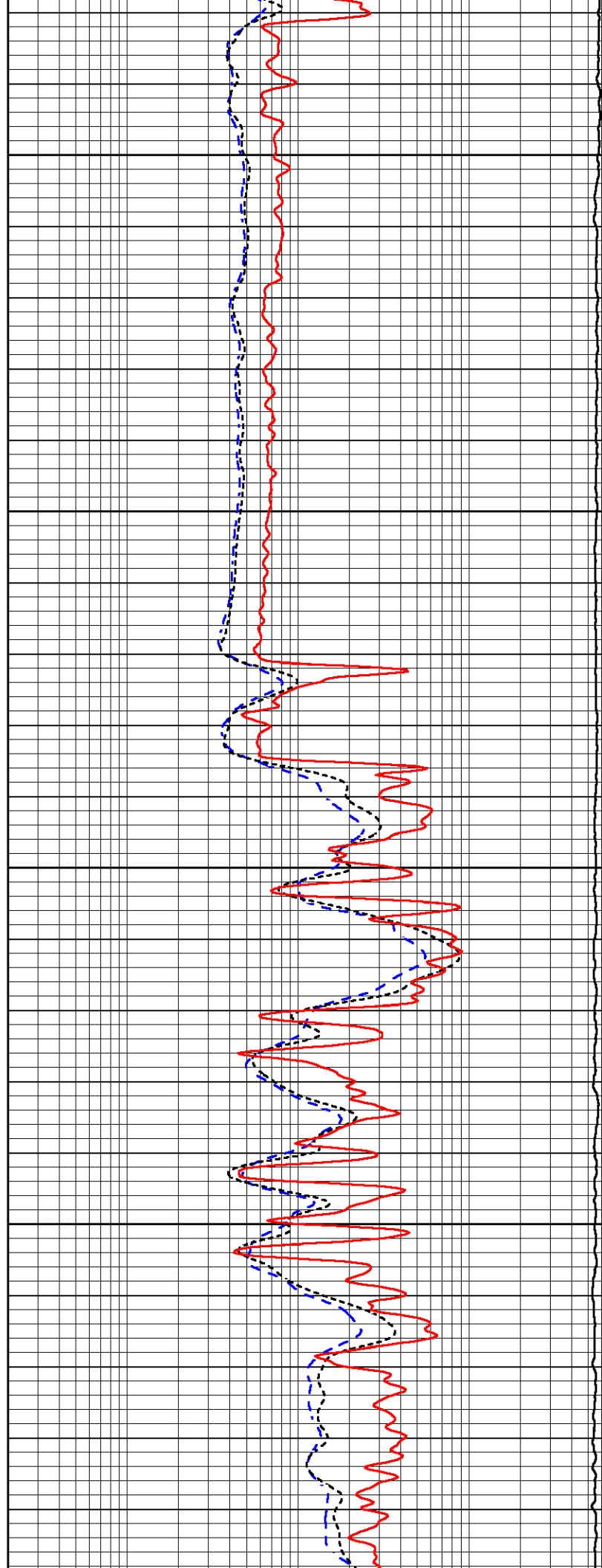


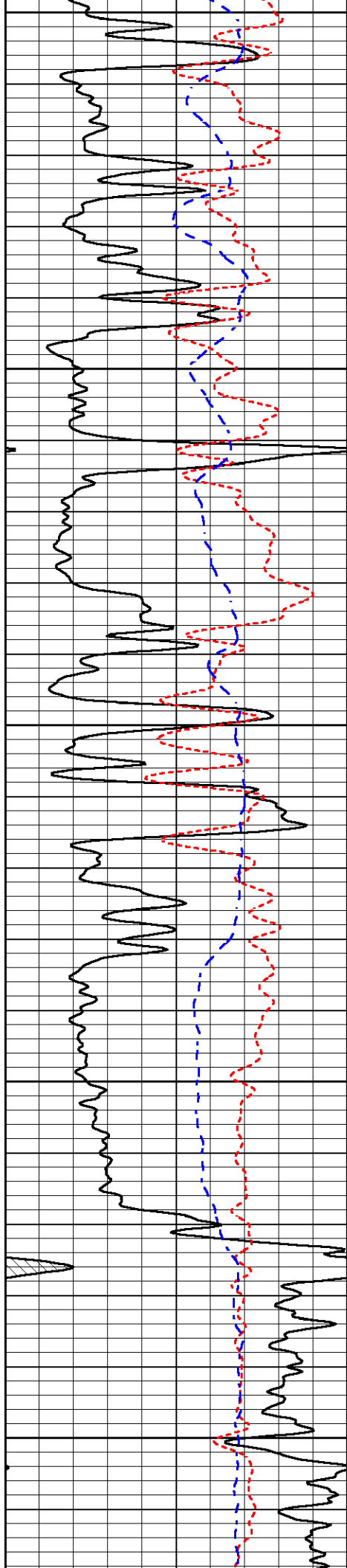
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3300

3350

3400





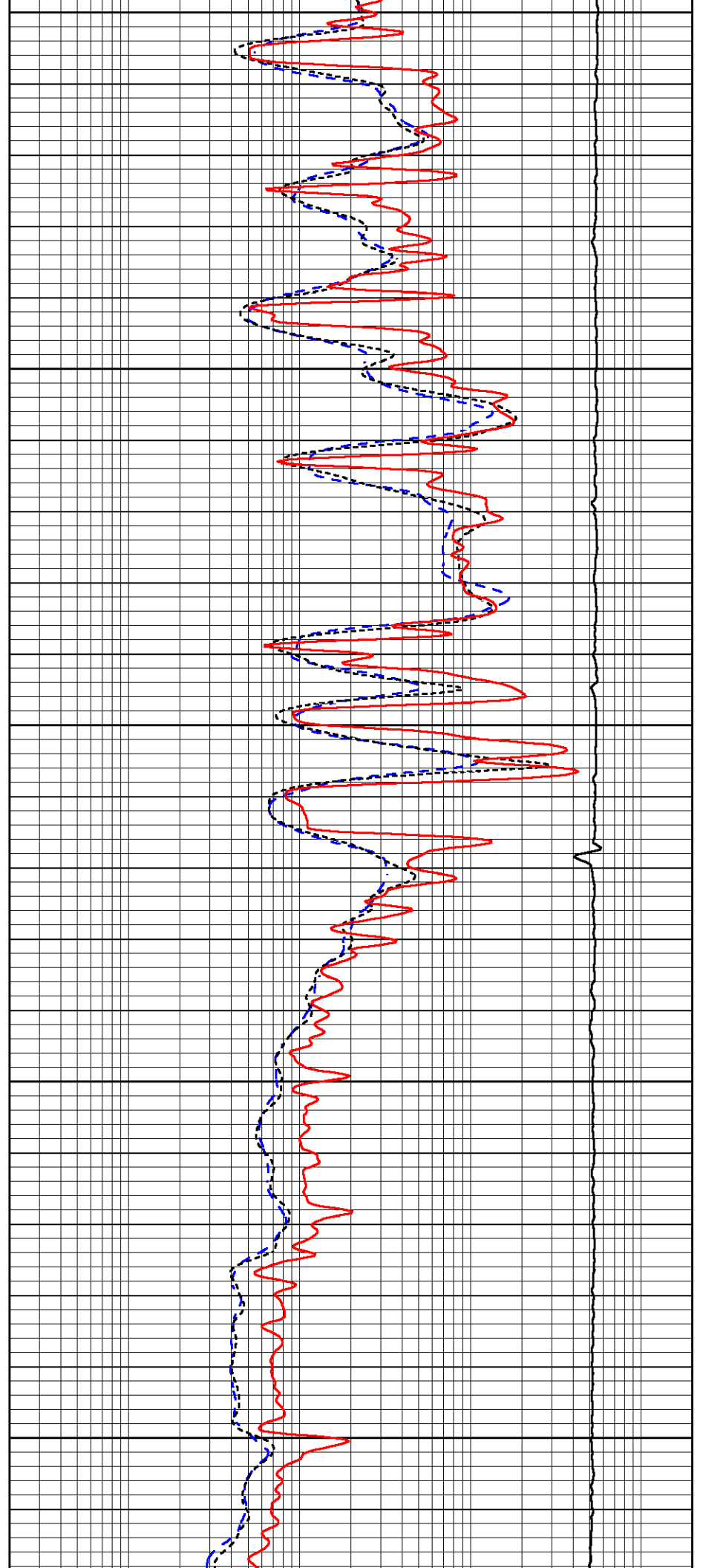
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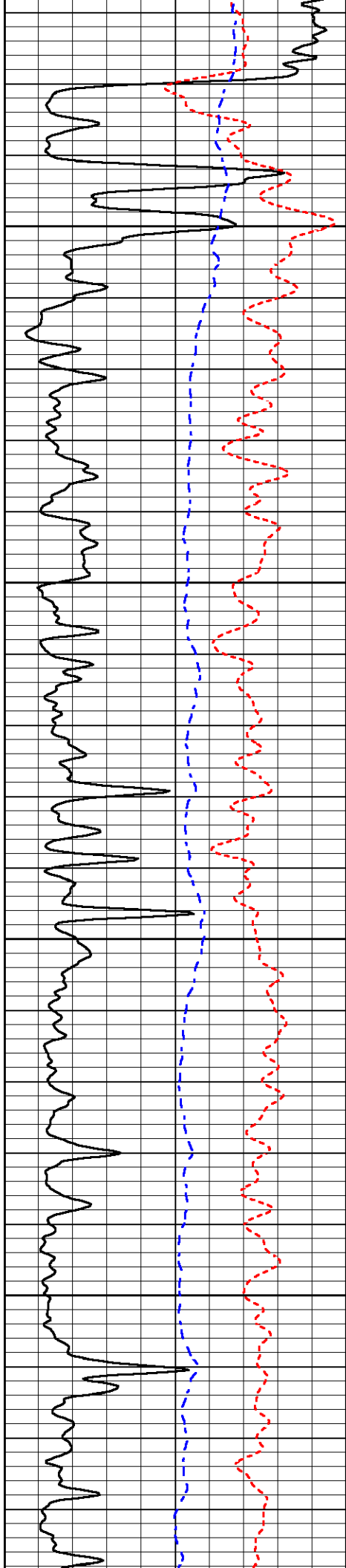
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3550

3600

3650



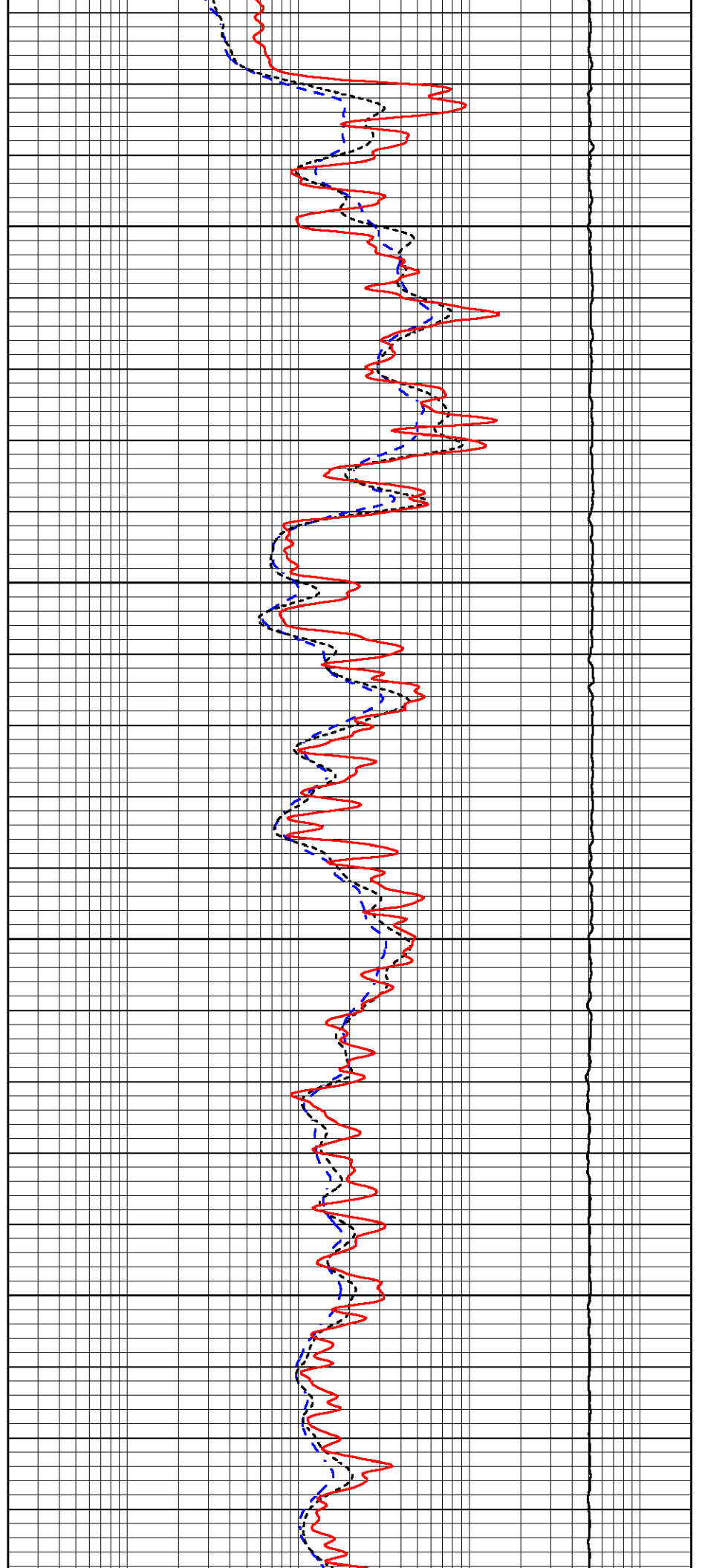


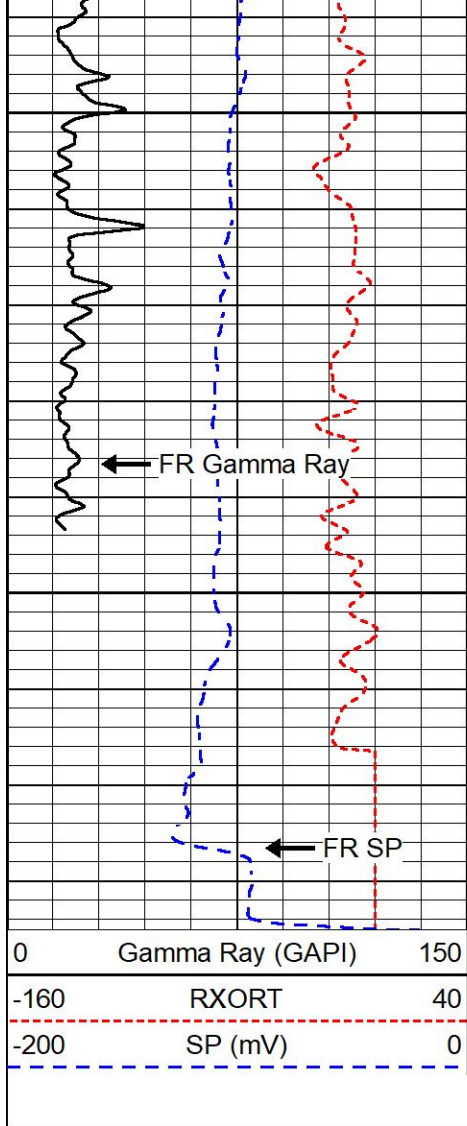
3700

3750

3800

3850



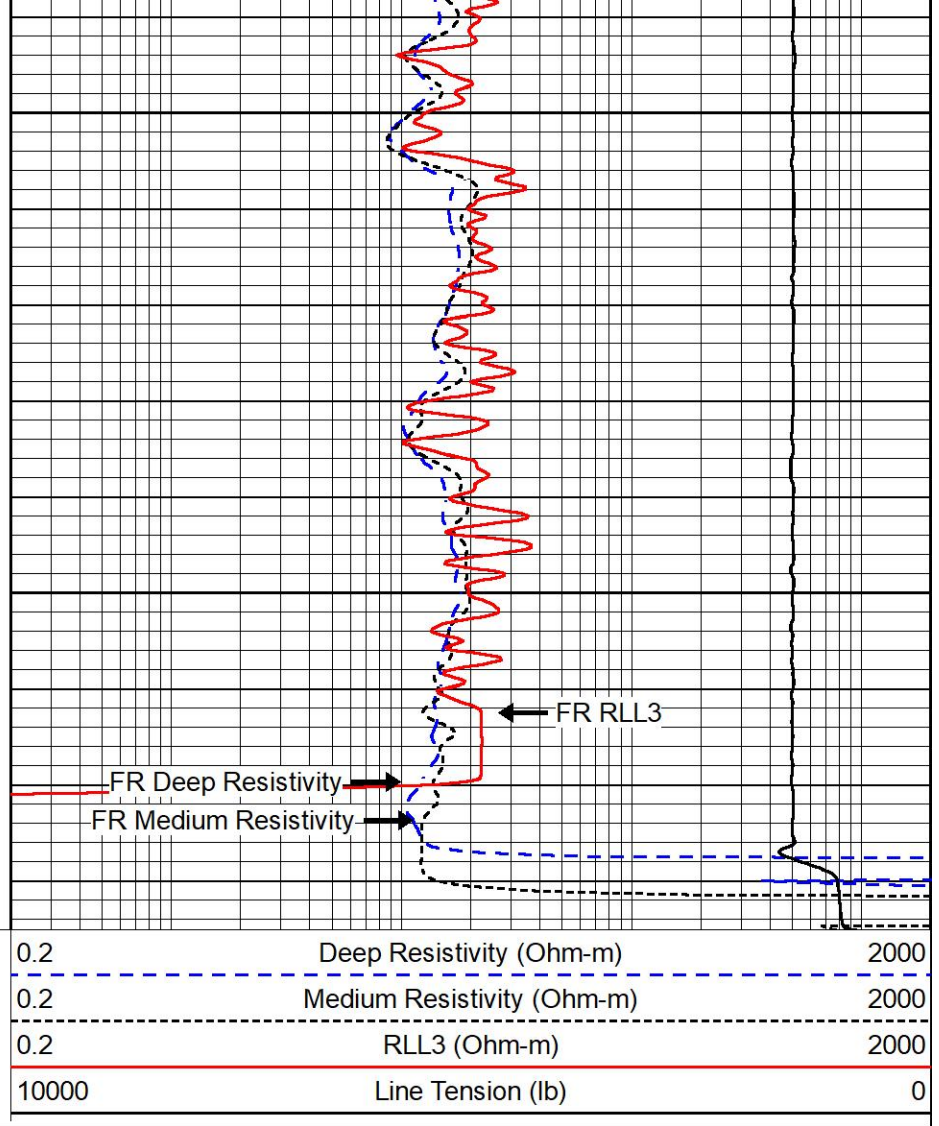


3900

3950

FR Gamma Ray

FR SP



FR RLL3

FR Deep Resistivity

FR Medium Resistivity

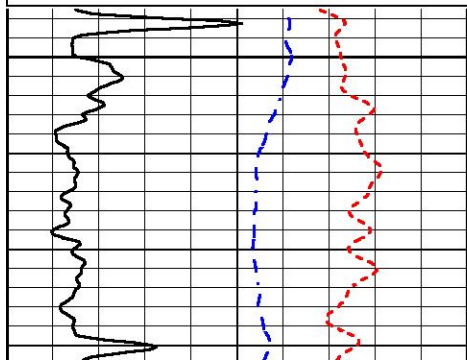
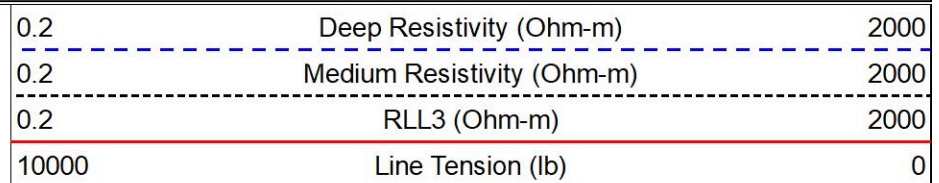
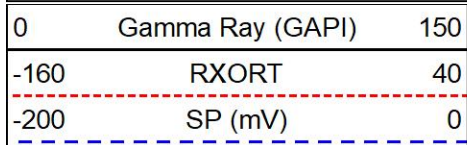


MIDWEST WIRELINE

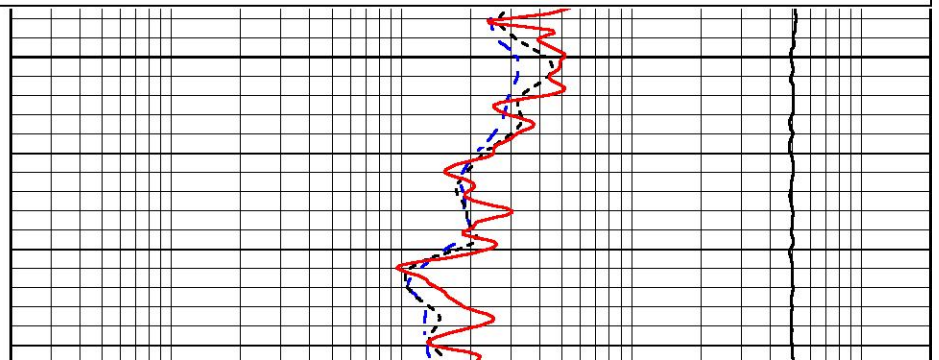
# REPEAT SECTION

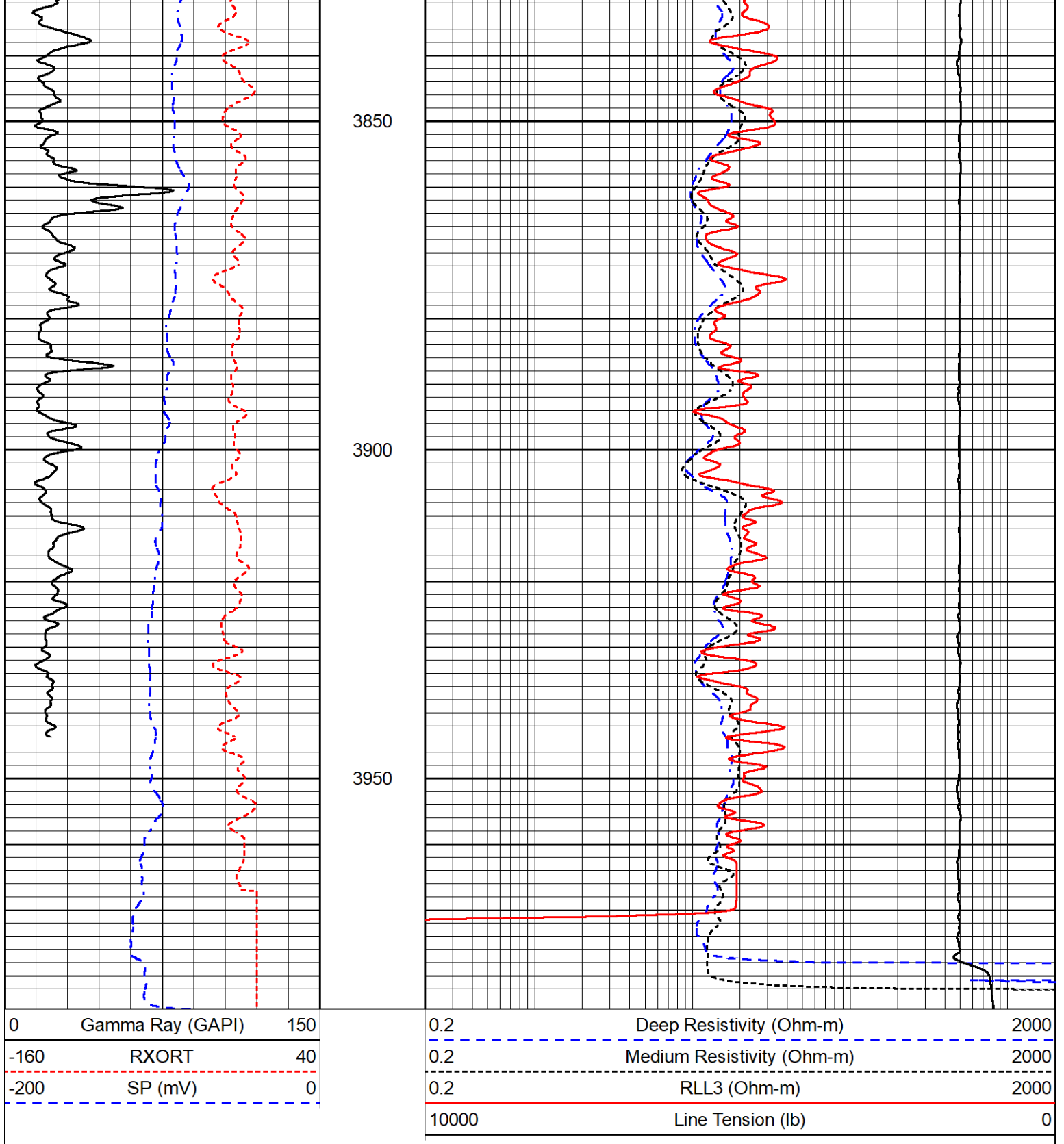
## REPEAT PASS

Database File amwar\_hall 1-21.db  
 Dataset Pathname stkml/pass2.10  
 Presentation Format \_dil  
 Dataset Creation Mon Aug 29 09:53:24 2022  
 Charted by Depth in Feet scaled 1:240



3800





Calibration Report

Database File      amwar\_hall 1-21.db  
 Dataset Pathname    stkml/pass3.10  
 Dataset Creation    Mon Aug 29 09:51:35 2022

Dual Induction Calibration Report

Serial-Model:                      501 HT-M&W  
 Surface Cal Performed:            Sat Aug 27 21:37:29 2022

Readings

References

Results

| Loop:  | Air     | Loop     | Air   | Loop    |        | m     | b       |
|--------|---------|----------|-------|---------|--------|-------|---------|
| Deep   | 83.639  | 487.104  | 0.000 | 183.000 | mmho/m | 0.455 | -37.000 |
| Medium | 113.335 | 1585.690 | 0.000 | 442.000 | mmho/m | 0.305 | -35.000 |

Microlog Calibration Report

Serial-Model: 402-PSIML  
 Performed: Sun Jul 17 13:11:21 2022

|         | Readings |        | References |         |       | Results    |          |
|---------|----------|--------|------------|---------|-------|------------|----------|
|         | Zero     | Cal    | Zero       | Cal     |       | m          | b        |
| Normal  | 0.0000   | 1.0000 | 0.0000     | 1.0000  | Ohm-m | 20000.0000 | 0.0000   |
| Inverse | 0.0000   | 1.0000 | 0.0000     | 1.0000  | Ohm-m | 24000.0000 | 0.2000   |
| Caliper | 1.0052   | 1.0858 | 5.0000     | 16.5000 | in    | 65.0000    | -59.8500 |

Compensated Density Calibration Report

Serial-Model: 307-11-M&W  
 Source #: 20762B  
 Master Calibration Performed: Sat Aug 27 10:20:16 2022

Master Calibration

|                     | Density |      | Far Detector                | Near Detector |     |
|---------------------|---------|------|-----------------------------|---------------|-----|
| Magnesium           | 1.755   | g/cc | 3600.52                     | 4768.22       | cps |
| Aluminum            | 2.670   | g/cc | 693.98                      | 3106.20       | cps |
| Spine Angle = 75.41 |         |      | Density/Spine Ratio = 0.538 |               |     |
|                     | Size    |      | Reading                     |               |     |
| Small Ring          | 6.00    | in   | 1.16                        |               |     |
| Large Ring          | 18.00   | in   | 1.01                        |               |     |

Compensated Neutron Calibration Report

Serial Number: 207-MW  
 Tool Model: 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        |

PRE-SURVEY VERIFICATION

|    | Detector    | Readings | Measured | Target |
|----|-------------|----------|----------|--------|
| 1) | Short Space | cps      |          |        |
|    | Long Space  | cps      | pu       | pu     |
| 2) | Short Space | cps      |          |        |
|    | Long Space  | cps      | pu       |        |
| 3) | Short Space | cps      |          |        |
|    | Long Space  | cps      | pu       |        |

POST SURVEY VERIFICATION

POST-SURVEY VERIFICATION

|    | Detector                  | Readings   | Measured | Target |
|----|---------------------------|------------|----------|--------|
| 1) | Short Space<br>Long Space | cps<br>cps | pu       | pu     |
| 2) | Short Space<br>Long Space | cps<br>cps | pu       | pu     |
| 3) | Short Space<br>Long Space | cps<br>cps | pu       | pu     |

Gamma Ray Calibration Report

|                     |                         |          |
|---------------------|-------------------------|----------|
| Serial Number:      | 106                     |          |
| Tool Model:         | M&W                     |          |
| Performed:          | Fri Dec 3 15:10:46 2021 |          |
| Calibrator Value:   | 500.0                   | GAPI     |
| Background Reading: | 24.0                    | cps      |
| Calibrator Reading: | 637.0                   | cps      |
| Sensitivity:        | 0.5500                  | GAPI/cps |



|                |                        |
|----------------|------------------------|
| <b>Company</b> | American Warrior, Inc. |
| <b>Well</b>    | Hall #1-21             |
| <b>Field</b>   | Shaeffer-RothGarn      |
| <b>County</b>  | Stafford               |
| <b>State</b>   | Kansas                 |