

## DUAL INDUCTION LOG

MIDWEST WIRELINE

|                                     |                   |                                 |                   |
|-------------------------------------|-------------------|---------------------------------|-------------------|
| Company Darrah Oil Company, LLC     |                   | Company Darrah Oil Company, LLC |                   |
| Well                                | Knopp #9-13       | Well                            | Knopp #9-13       |
| Field                               | Bridges Northeast | Field                           | Bridges Northeast |
| County                              | Logan             | County                          | Logan             |
| State                               | Kansas            | State                           | Kansas            |
| Location: API #: 15-109-21636-00-00 |                   | Other Services                  |                   |
| SW SW NW NE<br>1155 FNL & 2475 FEL  |                   | CNL/CDL<br>MEL                  |                   |
| Permanent Datum                     | Ground Level      | Elevation                       | 2815              |
| Log Measured From                   | Kelly Bushing     | K.B.                            | 2824              |
| Drilling Measured From              | Kelly Bushing     | D.F.                            |                   |
|                                     |                   | G.L.                            | 2815              |
| Date                                | 7/19/2022         |                                 |                   |
| Run Number                          | One               |                                 |                   |
| Depth Driller                       | 4665              |                                 |                   |
| Depth Logger                        | 4674              |                                 |                   |
| Bottom Logged Interval              | 4673              |                                 |                   |
| Top Log Interval                    | 200               |                                 |                   |
| Casing Driller                      | 8.625 @ 232       |                                 |                   |
| Casing Logger                       | 236               |                                 |                   |
| Bit Size                            | 7.875             |                                 |                   |
| Type Fluid in Hole                  | Chemical          |                                 |                   |
| Salinity, ppm CL                    | 3000              |                                 |                   |
| Density / Viscosity                 | 9.0               | 76                              |                   |
| pH / Fluid Loss                     | 10.5              | 9.6                             |                   |
| Source of Sample                    | FLOWLINE          |                                 |                   |
| Rm @ Meas. Temp                     | 0.70 @ 86         |                                 |                   |
| Rmt @ Meas. Temp                    | 0.53 @ 86         |                                 |                   |
| Rmc @ Meas. Temp                    | 0.95 @ 86         |                                 |                   |
| Source of Rmt / Rmc                 | CHARTS            |                                 |                   |
| Rm @ BHT                            | 0.49 @ 123        |                                 |                   |
| Operating Rig Time                  | 3 Hours           |                                 |                   |
| Max Rec. Temp. F                    | 123               |                                 |                   |
| Equipment Number                    | P-108             |                                 |                   |
| Location                            | HAYS              |                                 |                   |
| Recorded By                         | D. Schmidt        |                                 |                   |
| Witnessed By                        | Macklin Armstrong |                                 |                   |

<<< 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.

Oakley,  
South to Jayhawk Rd, 1 East, 3/4 North,  
East and South into

Log Measured From: Kelly Bushing 9 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: Macklin Armstrong  
Secondary Witness:  
Secondary Witness:  
Secondary Witness:



# Log Variables

DatabaseC:\ProgramData\Warrior\Data\darrah\_knopp 9-13.db  
Dataset field/well/stack/pass2.2/\_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 | 0      | mmho/m  | mmho/m  | mV       | degF     | Off   | ft       |
|           |        | 0       | 0       | 375      | 80       |       | 4674     |

## 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

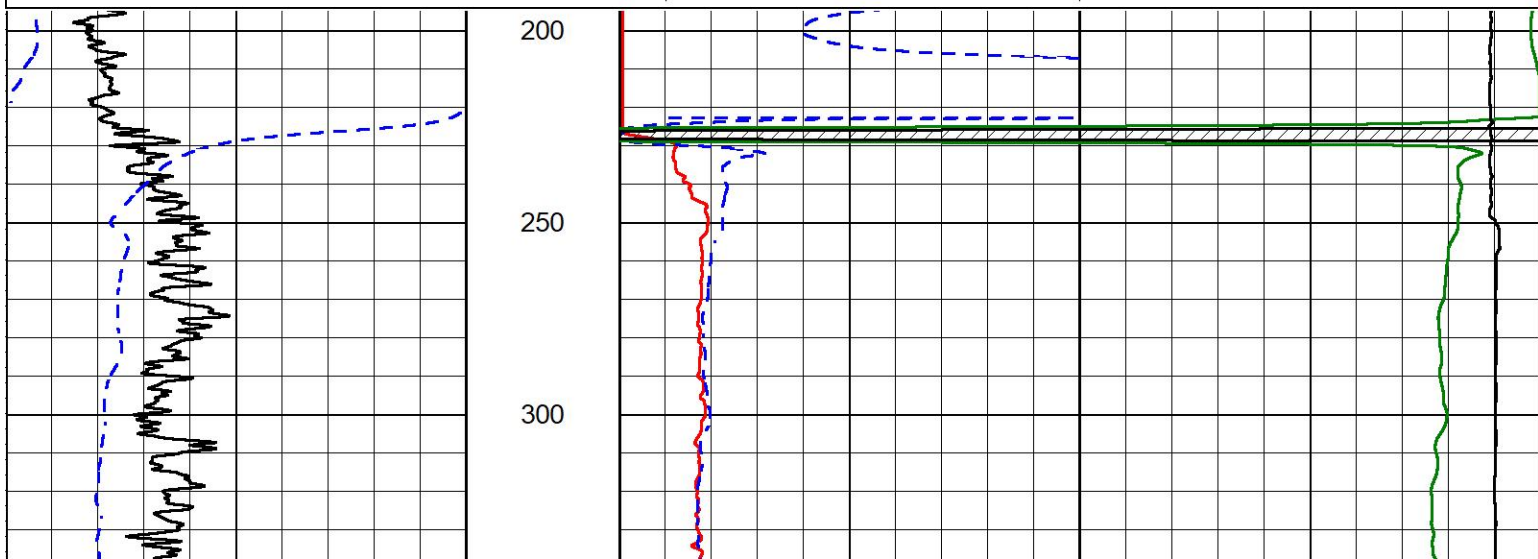


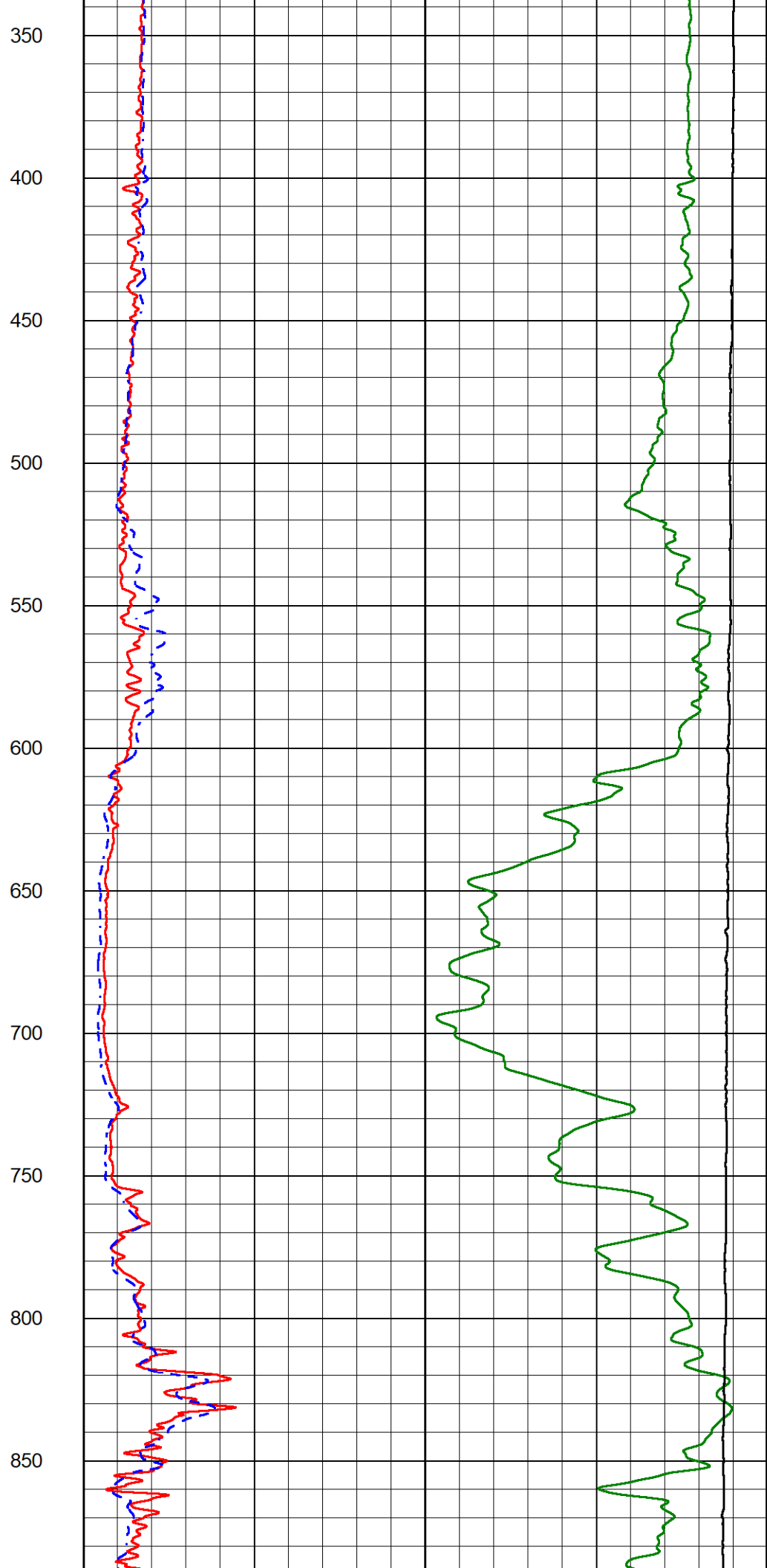
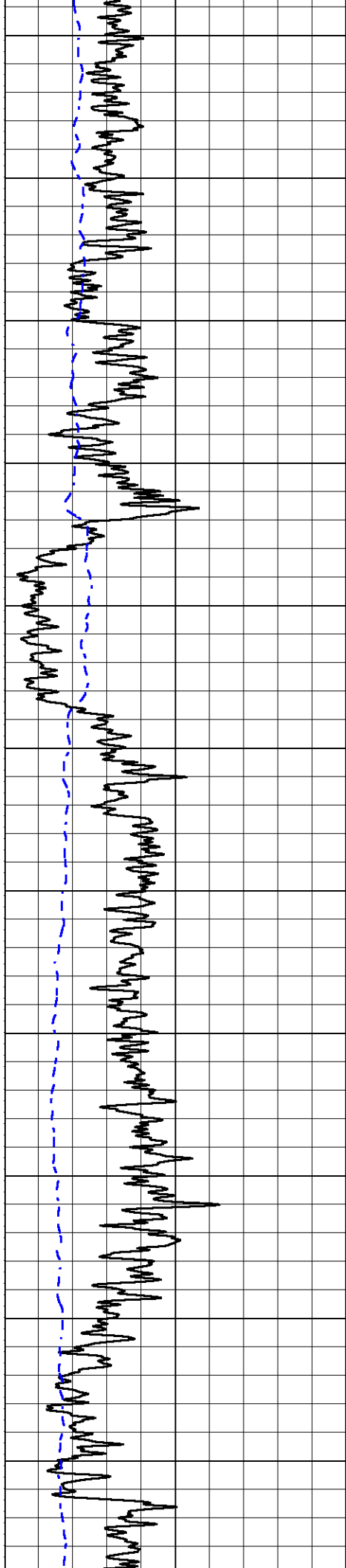
## 2" SCALE RESISTIVITY

### MAIN PASS

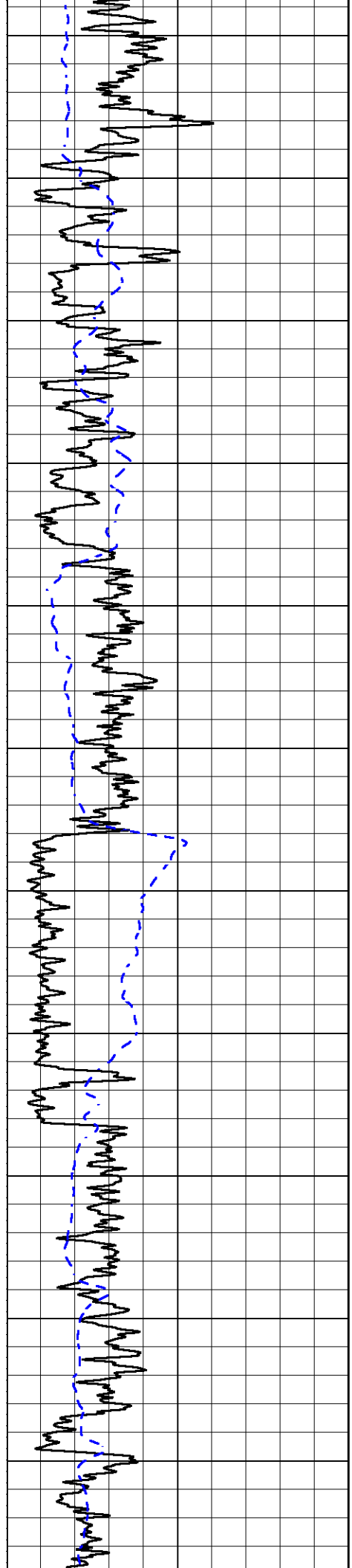
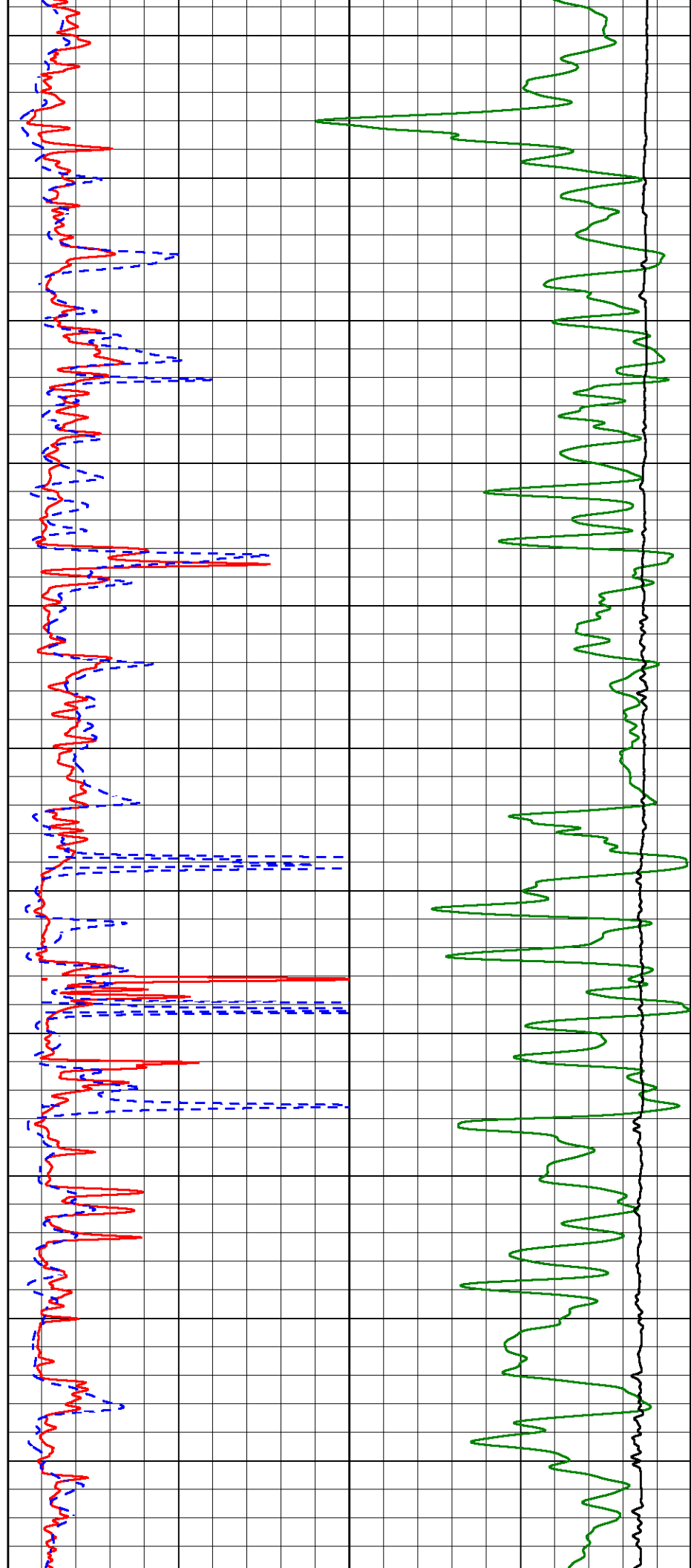
Database File darrah\_knopp 9-13.db  
Dataset Pathname stack/pass3.3  
Presentation Format \_dil2in  
Dataset Creation Tue Jul 19 08:15:53 2022  
Charted by Depth in Feet scaled 1:600

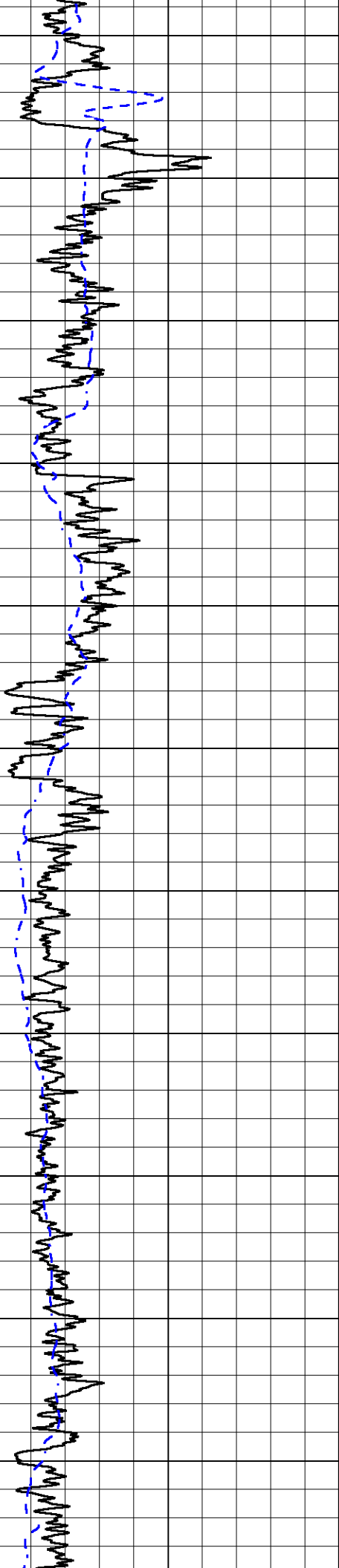
|      |                  |     |                     |                             |     |
|------|------------------|-----|---------------------|-----------------------------|-----|
| 0    | Gamma Ray (GAPI) | 300 | 1000                | Conductivity (mmho/m)       | 0   |
| -200 | SP (mV)          | 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 |





900  
950  
1000  
1050  
1100  
1150  
1200  
1250  
1300  
1350  
1400





1450

1500

1550

1600

1650

1700

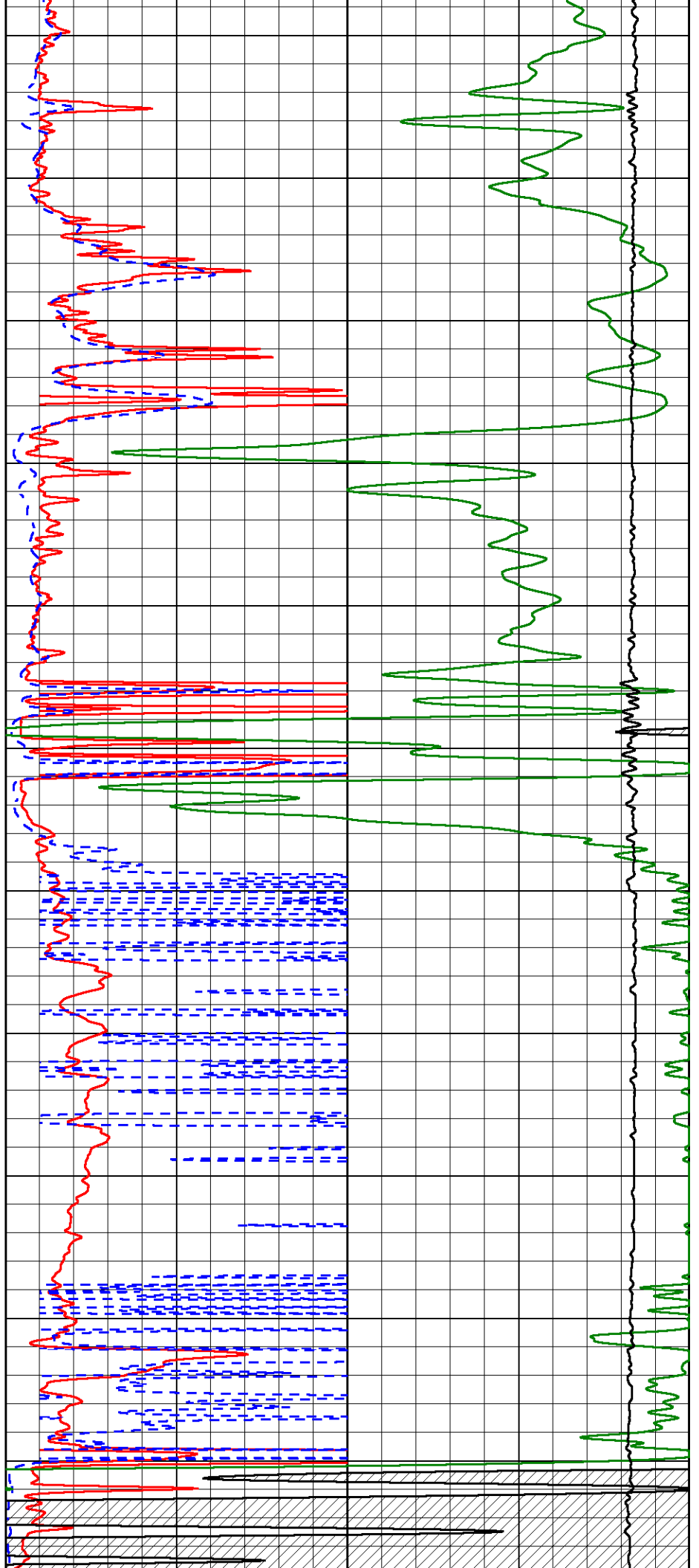
1750

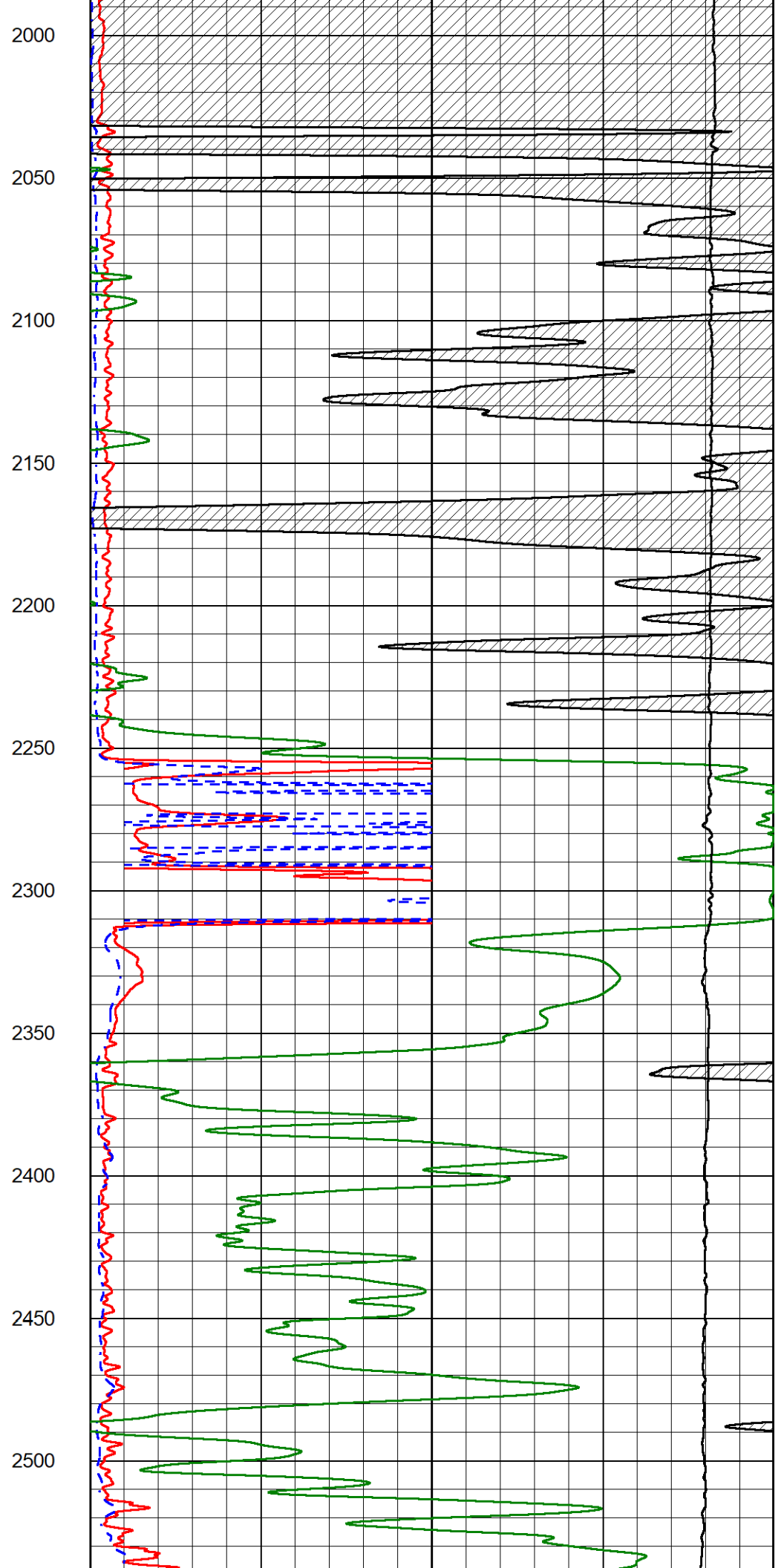
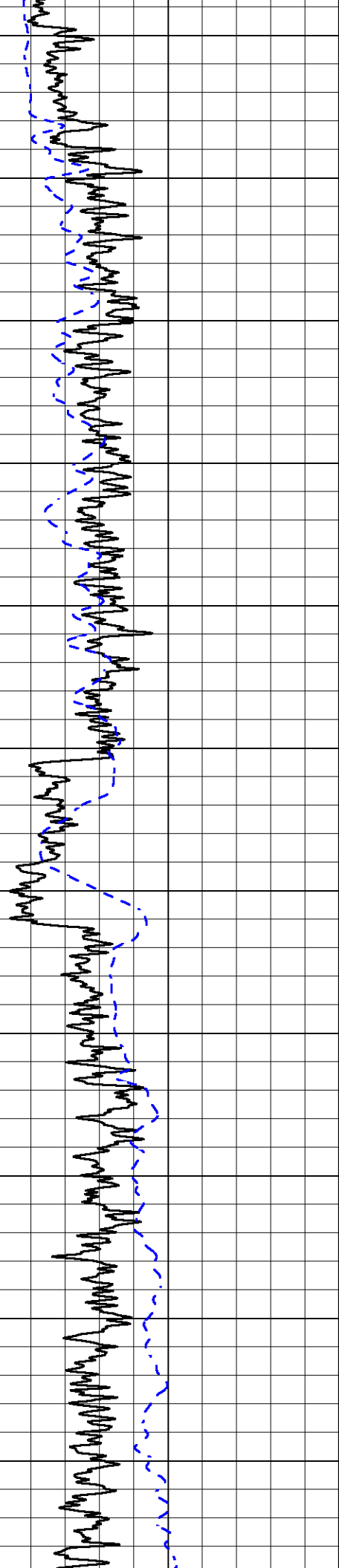
1800

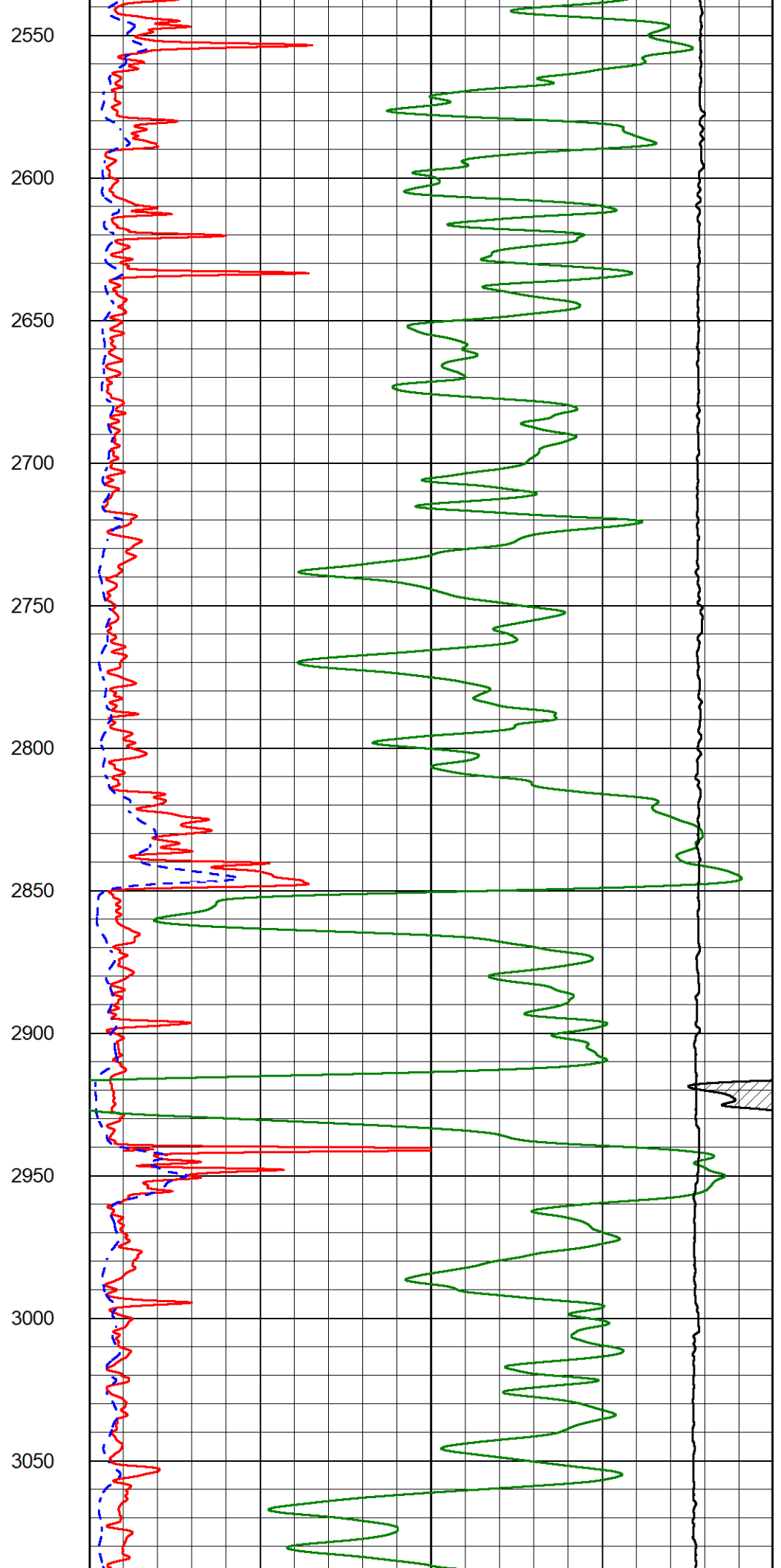
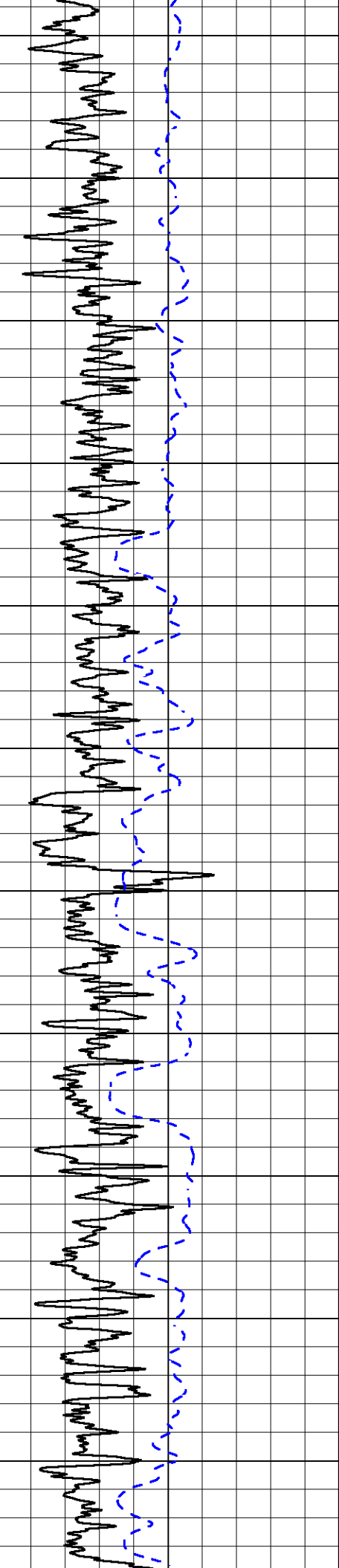
1850

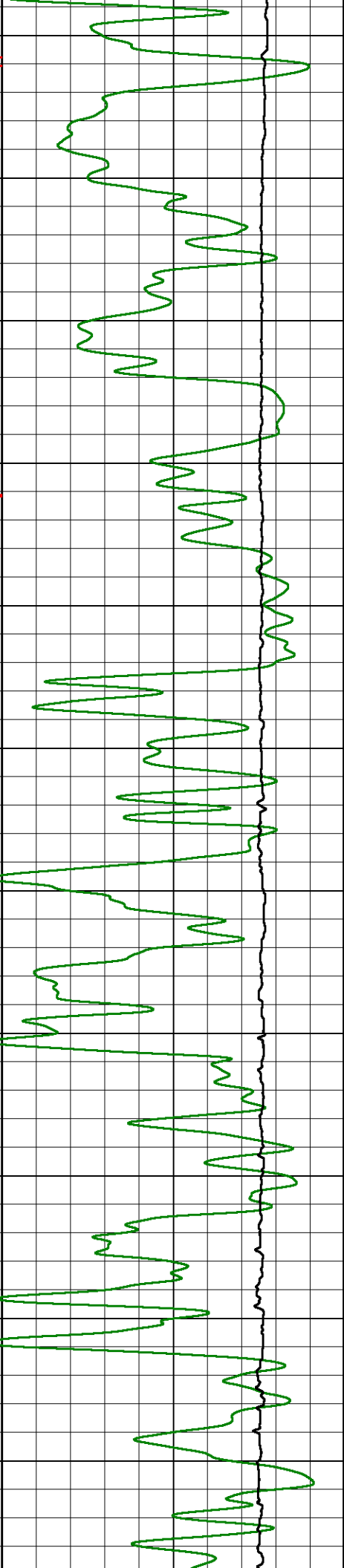
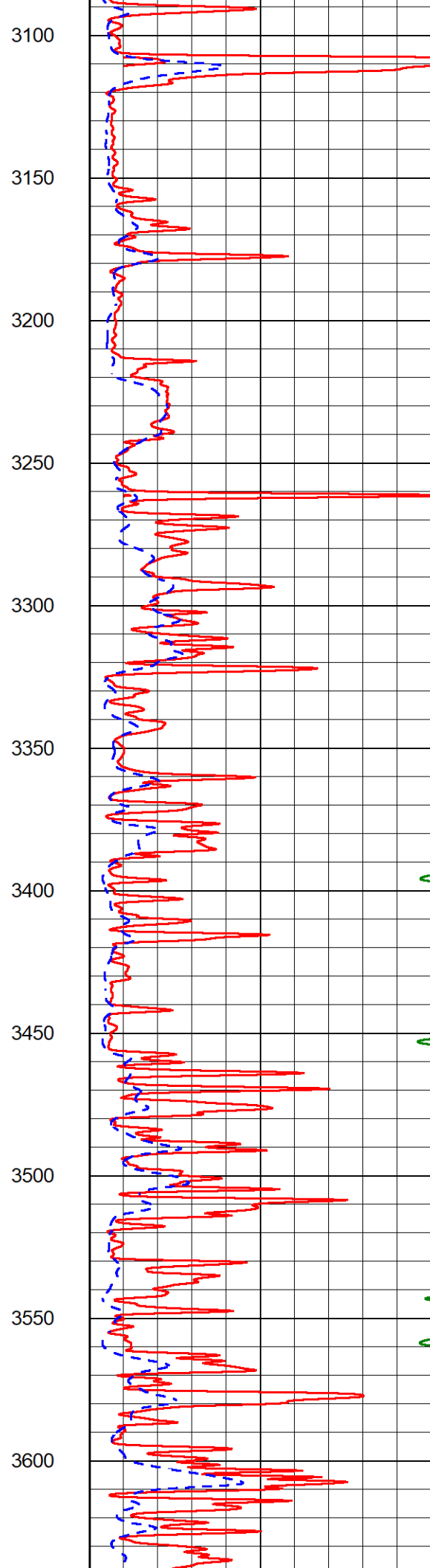
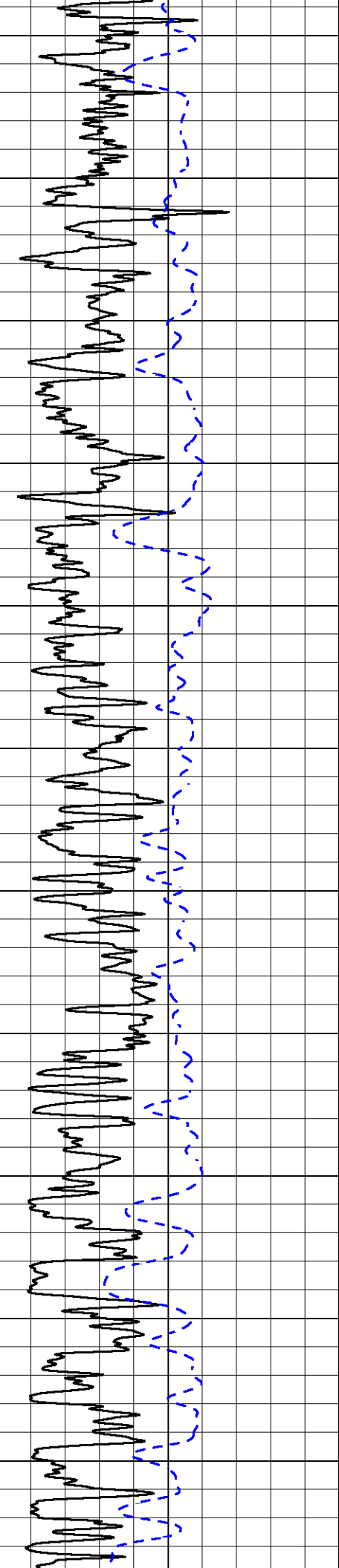
1900

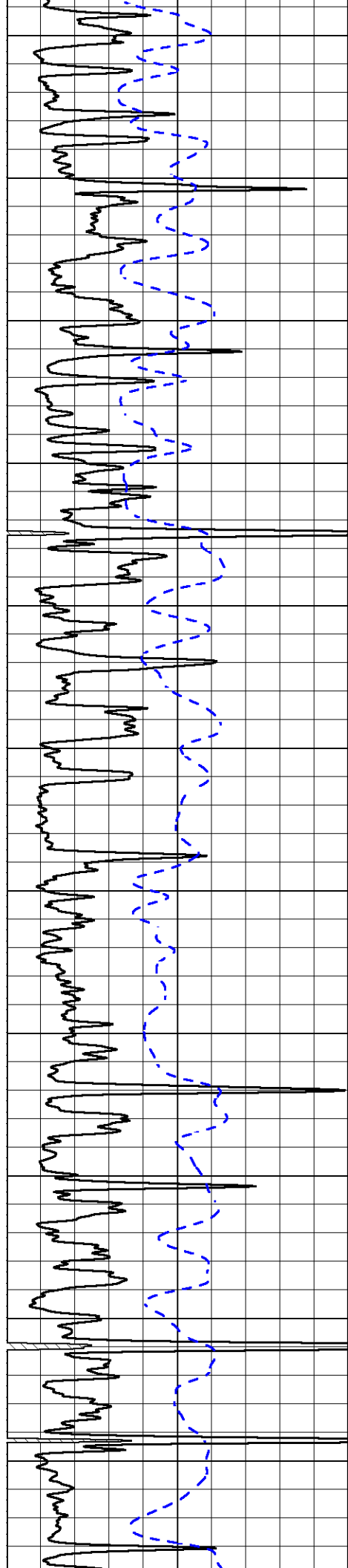
1950



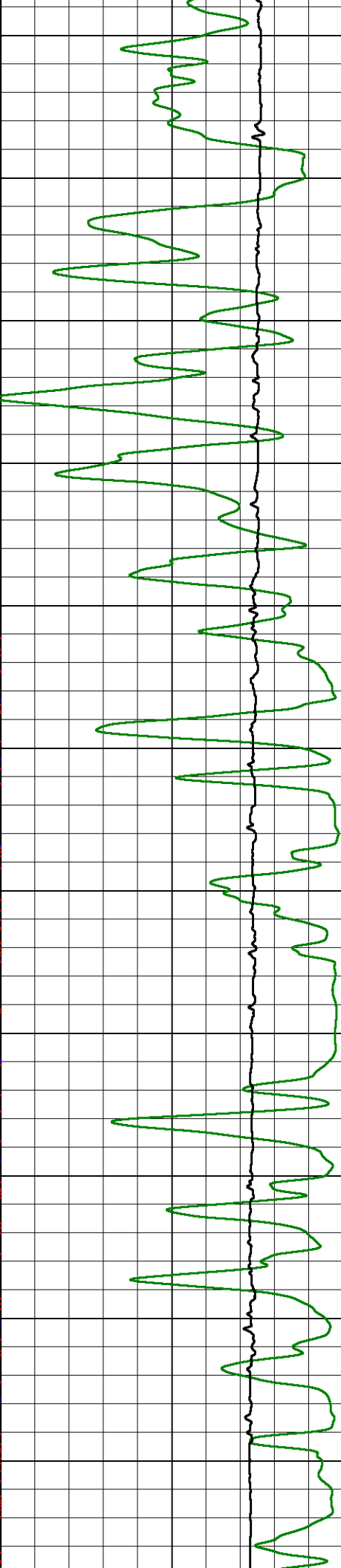
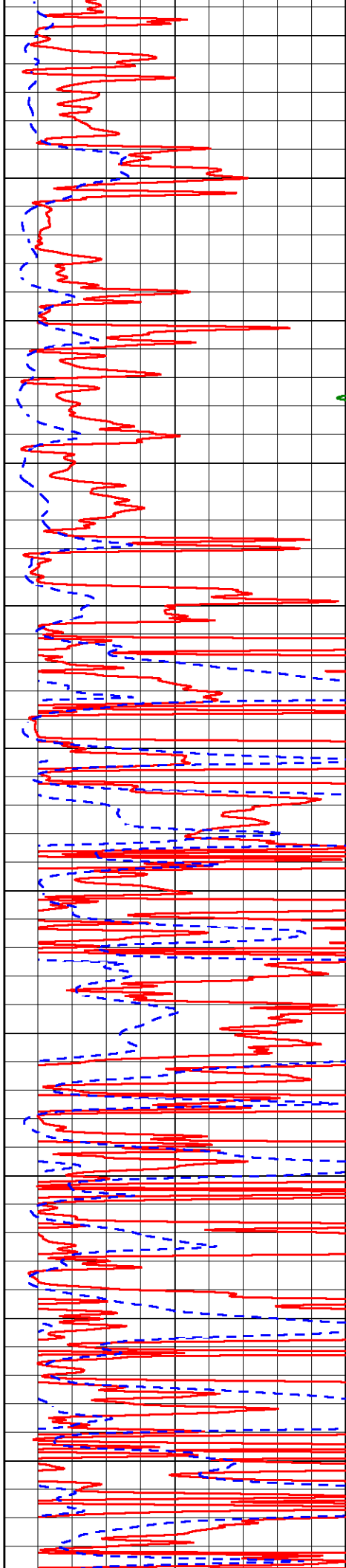


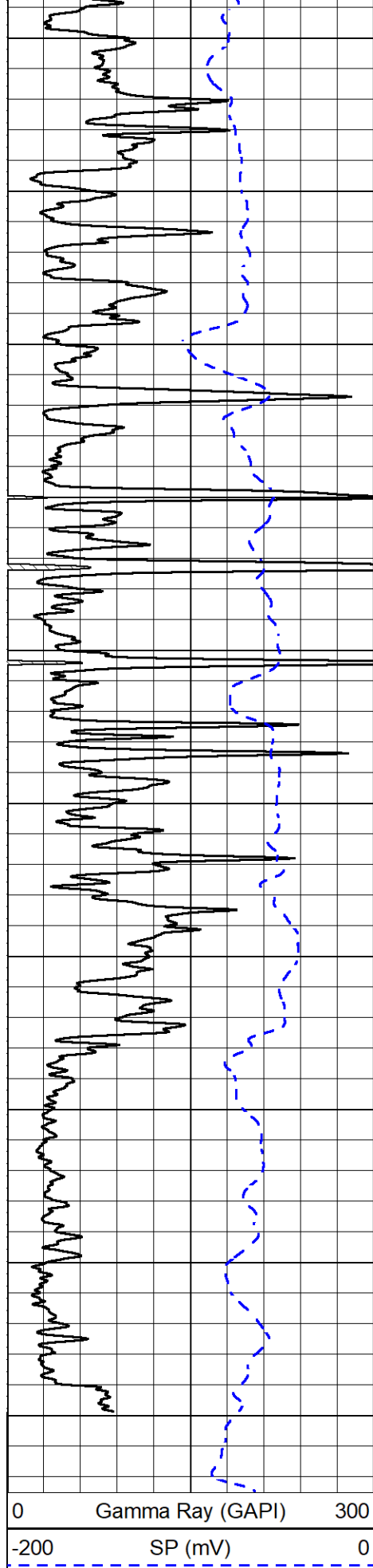




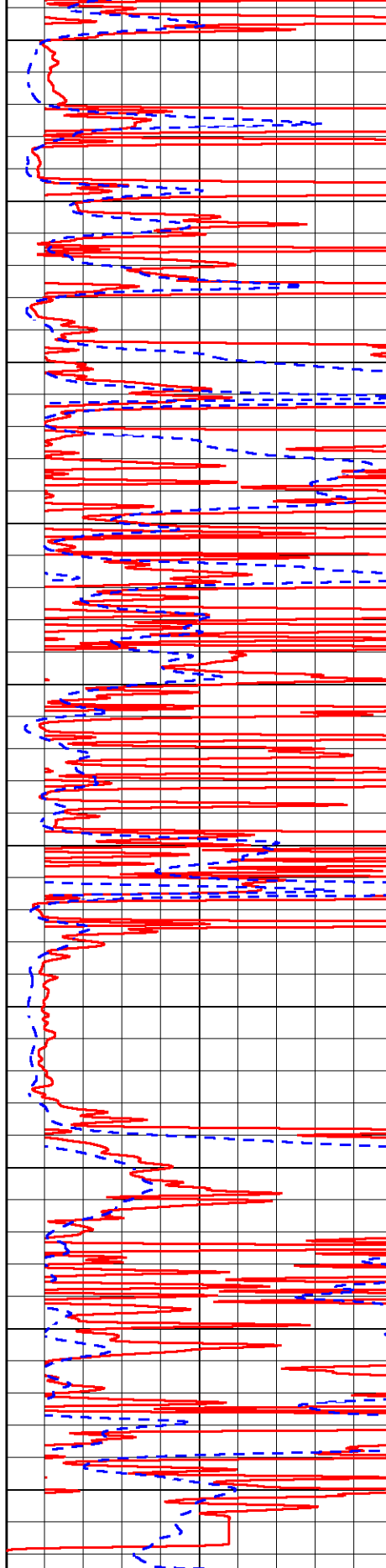


3650  
3700  
3750  
3800  
3850  
3900  
3950  
4000  
4050  
4100  
4150





4200  
4250  
4300  
4350  
4400  
4450  
4500  
4550  
4600  
4650



0 Gamma Ray (GAPI) 300  
-200 SP (mV) 0

1000 Conductivity (mmho/m) 15000  
15000 Line Tension (lb) 0

0 Shallow Resistivity (Ohm-m) 50  
0 Deep Resistivity (Ohm-m) 50  
Shallow Resistivity



MIDWEST WIRELINE

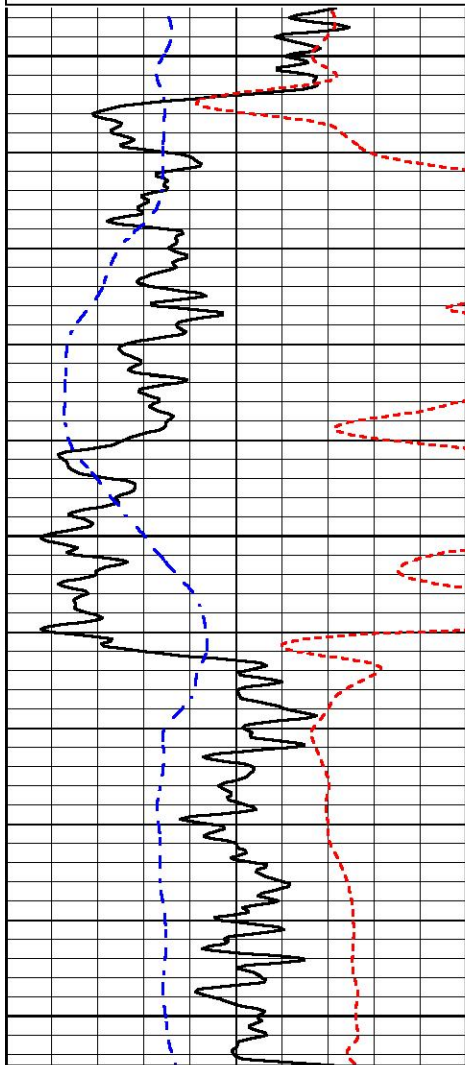
# ANHYDRITE SECTION

## MAIN PASS

Database File darrah\_knopp 9-13.db  
Dataset Pathname stack/pass3.4  
Presentation Format \_dil  
Dataset Creation Tue Jul 19 08:16:02 2022  
Charted by Depth in Feet scaled 1:240

|      |                  |     |
|------|------------------|-----|
| 0    | Gamma Ray (GAPI) | 150 |
| -160 | RXORT            | 40  |
| -200 | SP (mV)          | 0   |

|       |                            |      |
|-------|----------------------------|------|
| 0.2   | Deep Resistivity (Ohm-m)   | 2000 |
| 0.2   | Medium Resistivity (Ohm-m) | 2000 |
| 0.2   | RLL3 (Ohm-m)               | 2000 |
| 10000 | Line Tension (lb)          | 0    |

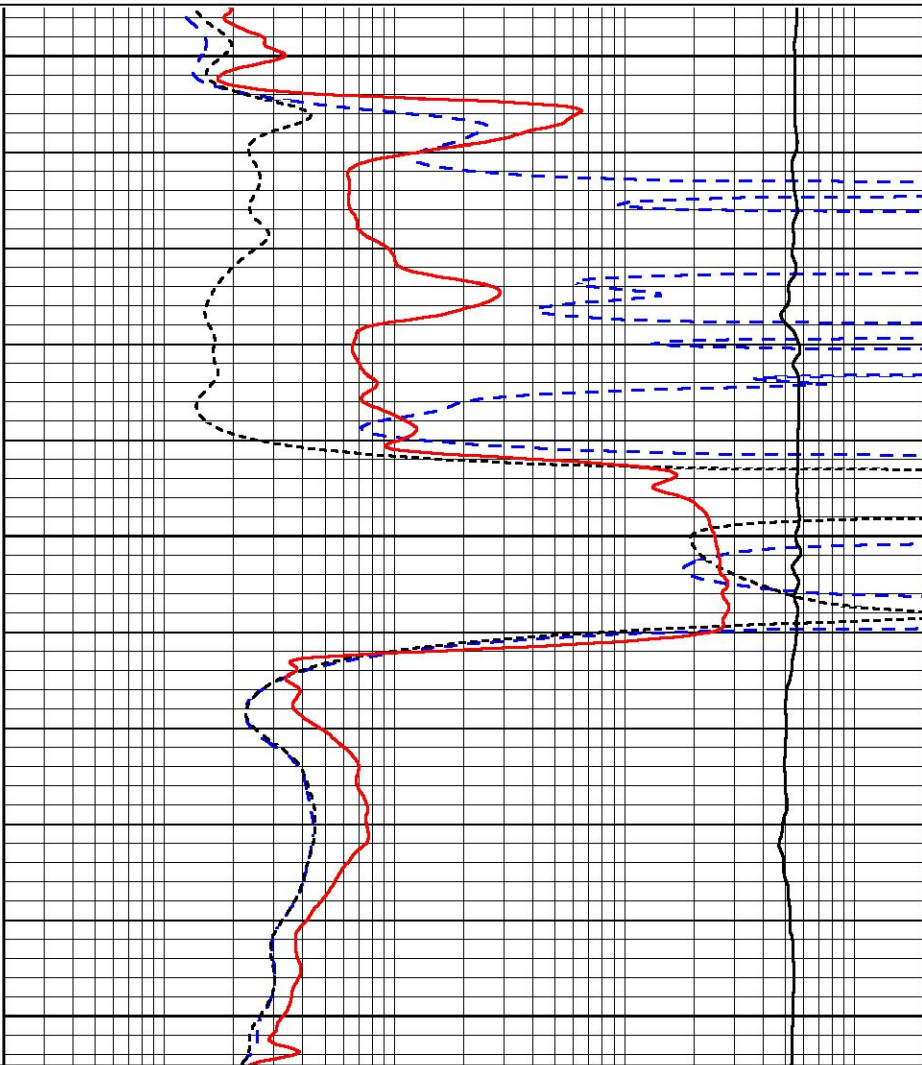


2250

2300

2350

|      |                  |     |
|------|------------------|-----|
| 0    | Gamma Ray (GAPI) | 150 |
| -160 | RXORT            | 40  |
| -200 | SP (mV)          | 0   |



|       |                            |      |
|-------|----------------------------|------|
| 0.2   | Deep Resistivity (Ohm-m)   | 2000 |
| 0.2   | Medium Resistivity (Ohm-m) | 2000 |
| 0.2   | RLL3 (Ohm-m)               | 2000 |
| 10000 | Line Tension (lb)          | 0    |



## DETAIL SECTION

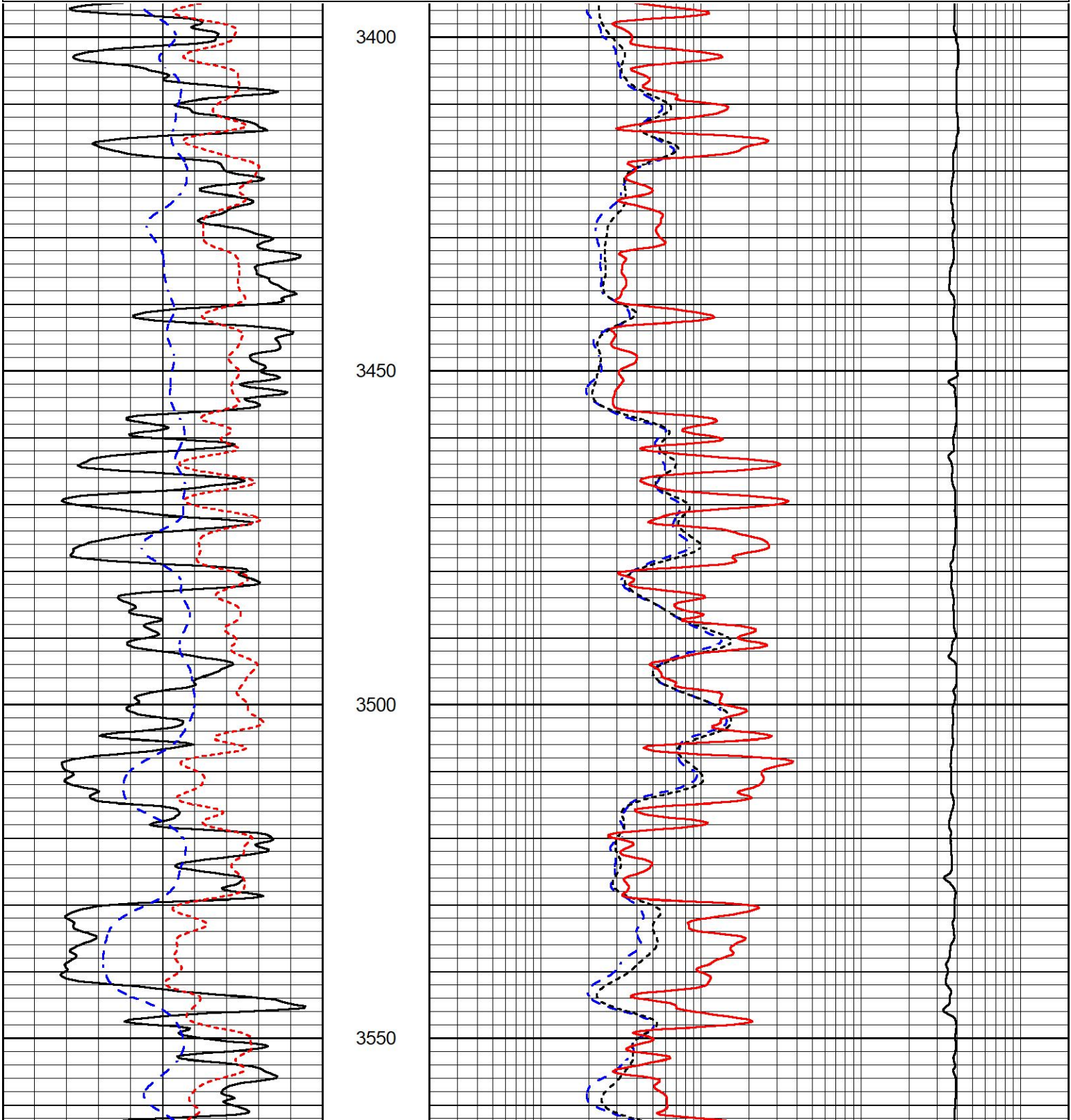


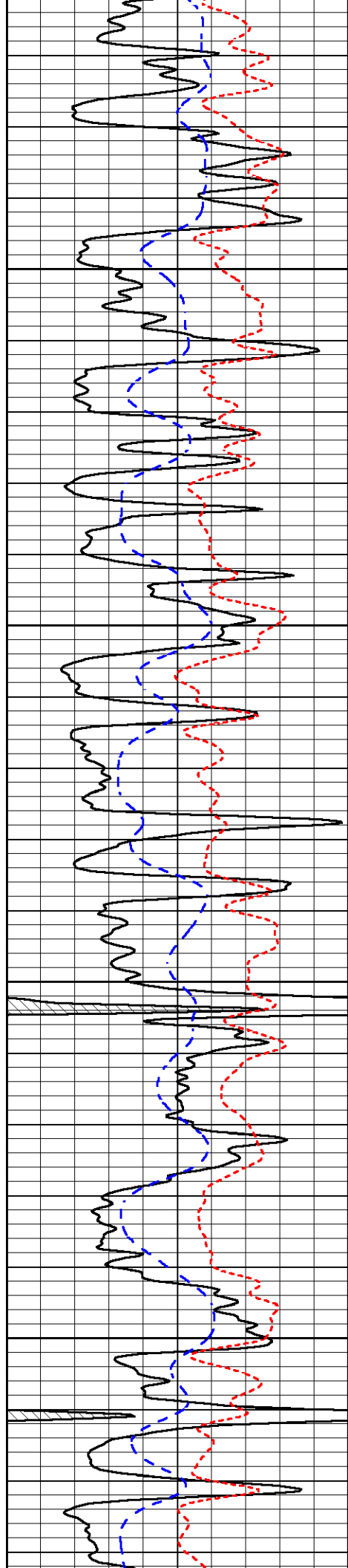
MAIN PASS

Database File        darrah\_knopp 9-13.db  
Dataset Pathname    stack/pass3.1  
Presentation Format   \_dil  
Dataset Creation     Tue Jul 19 08:15:34 2022  
Charted by           Depth in Feet scaled 1:240

|      |                  |     |
|------|------------------|-----|
| 0    | Gamma Ray (GAPI) | 150 |
| -160 | RXORT            | 40  |
| -200 | SP (mV)          | 0   |

|       |                            |      |
|-------|----------------------------|------|
| 0.2   | Deep Resistivity (Ohm-m)   | 2000 |
| 0.2   | Medium Resistivity (Ohm-m) | 2000 |
| 0.2   | RLL3 (Ohm-m)               | 2000 |
| 10000 | Line Tension (lb)          | 0    |



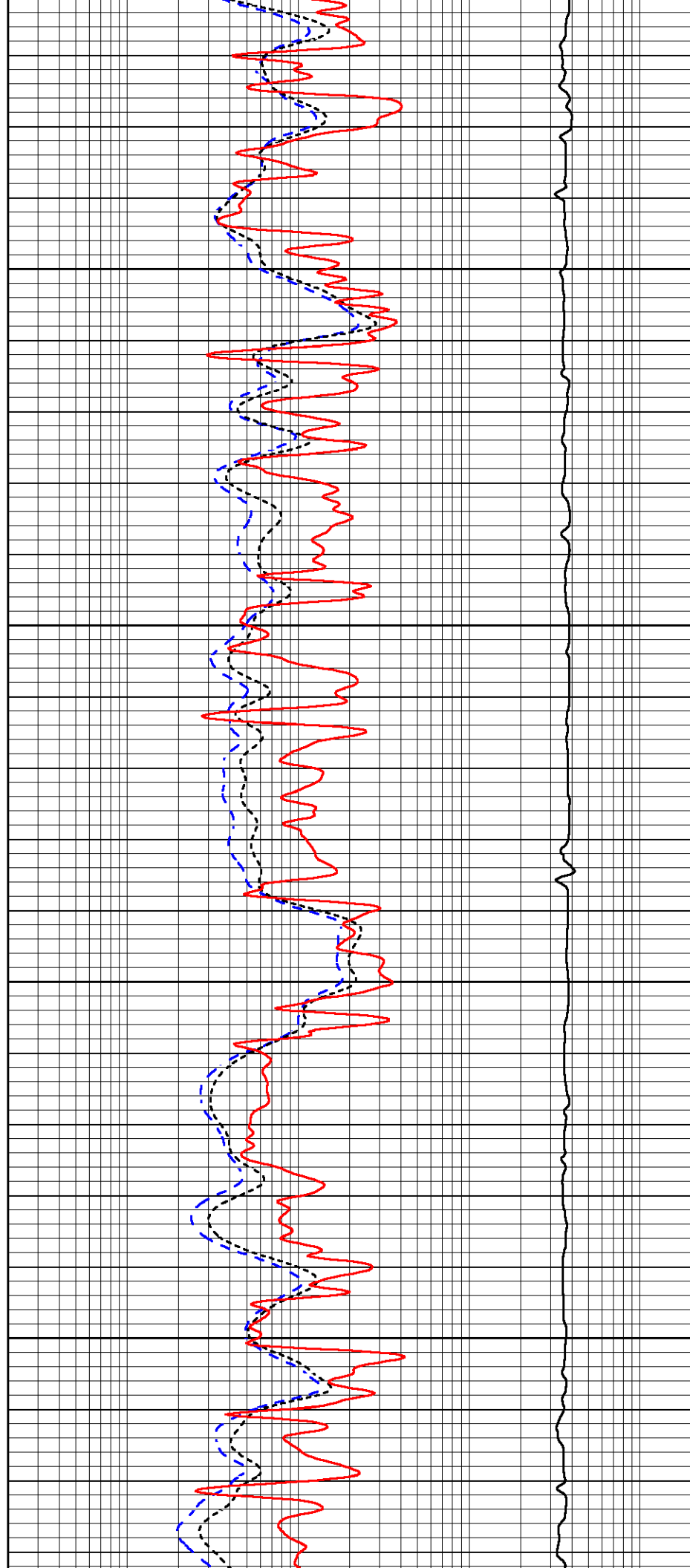


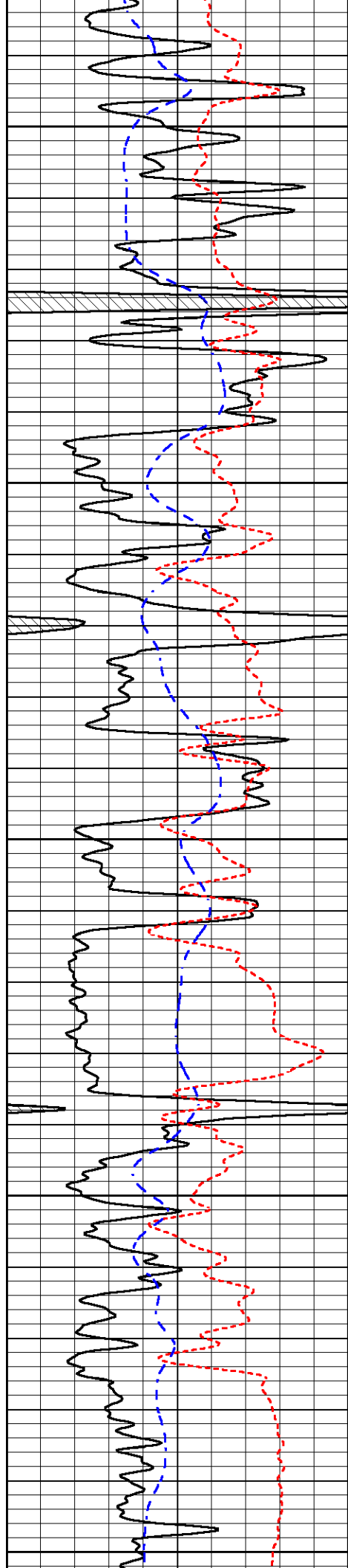
3600

3650

3700

3750





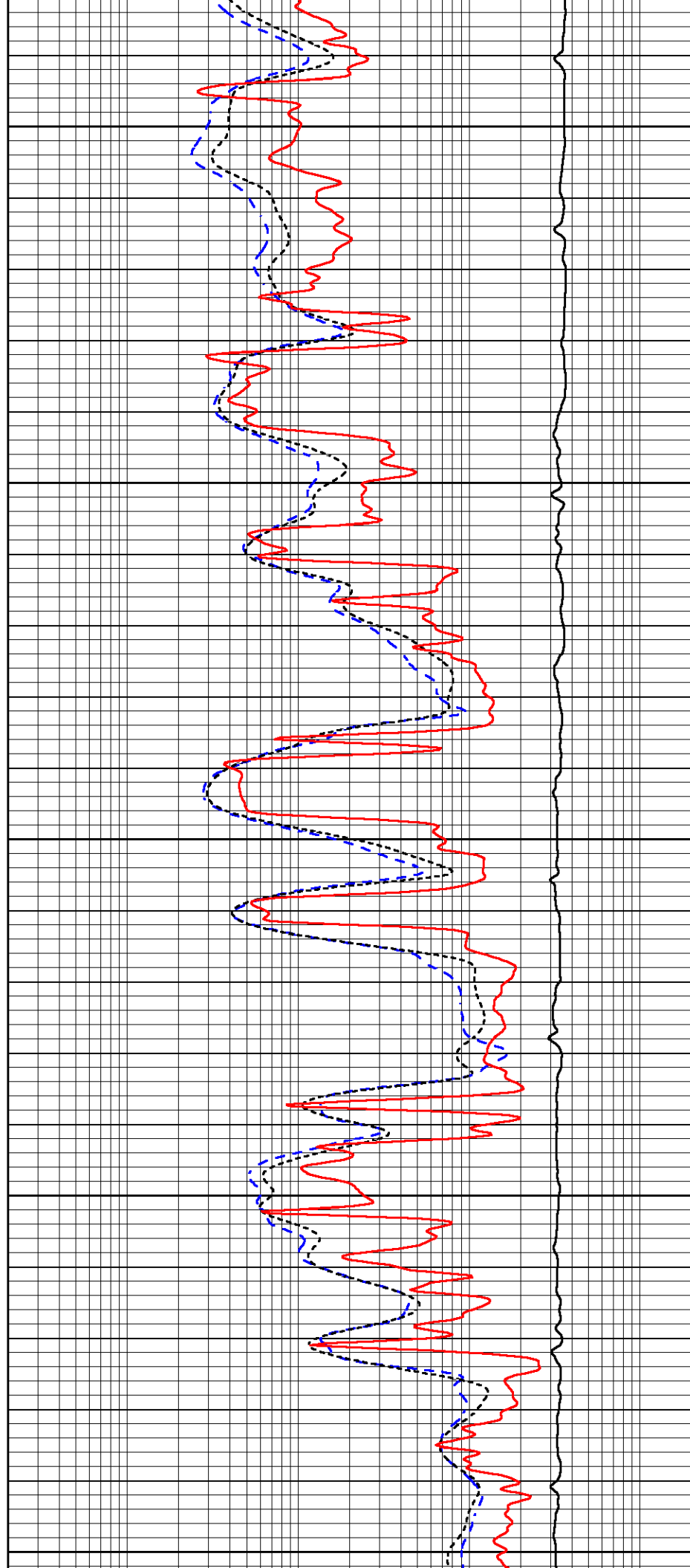
3800

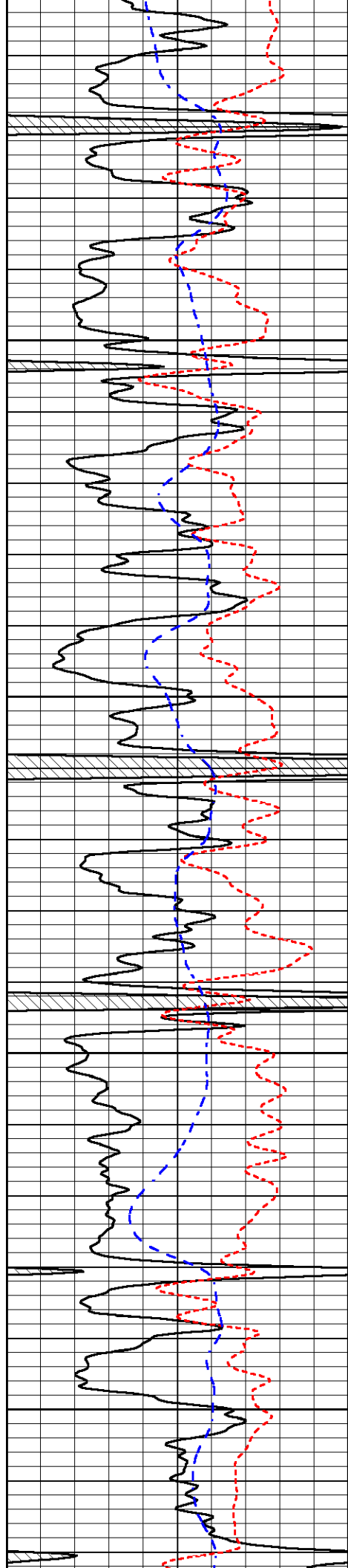
3850

3900

3950

4000



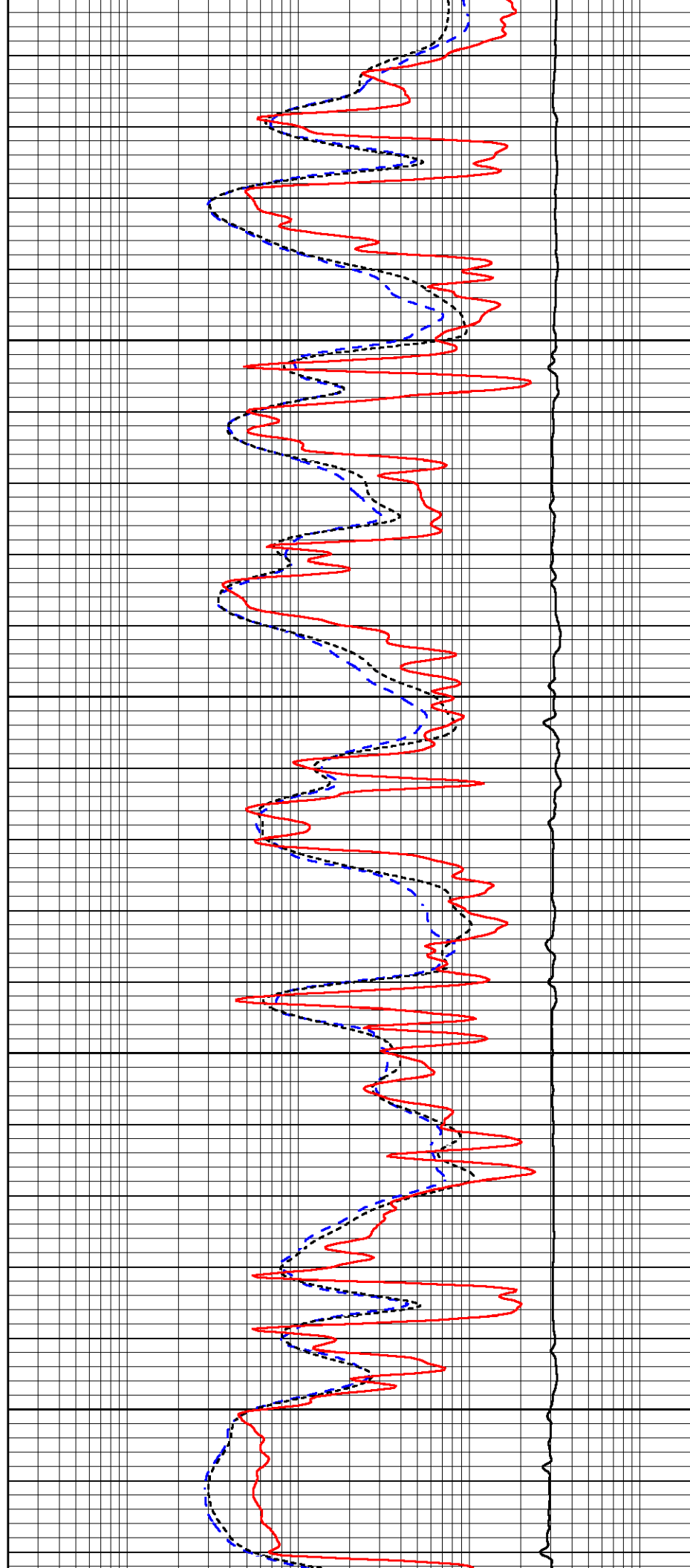


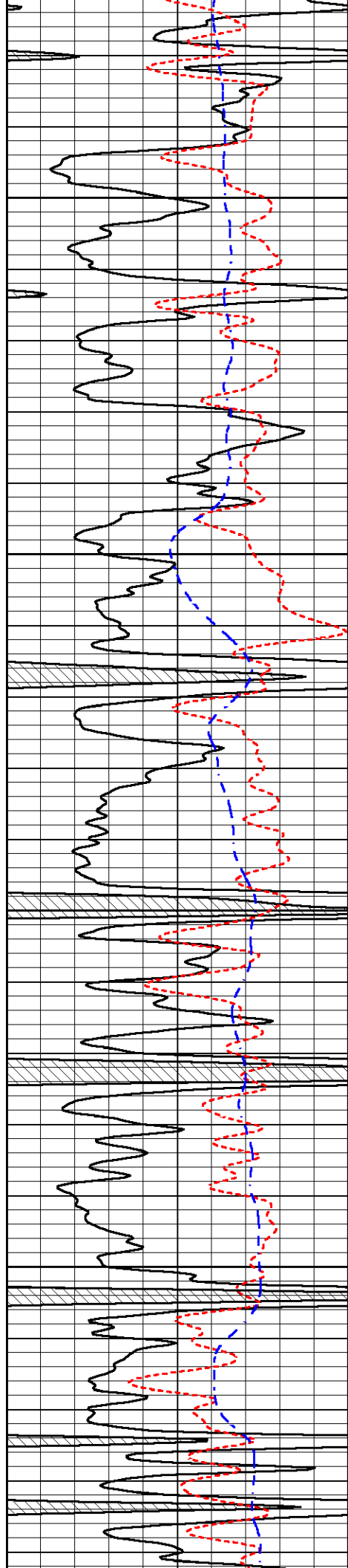
4050

4100

4150

4200



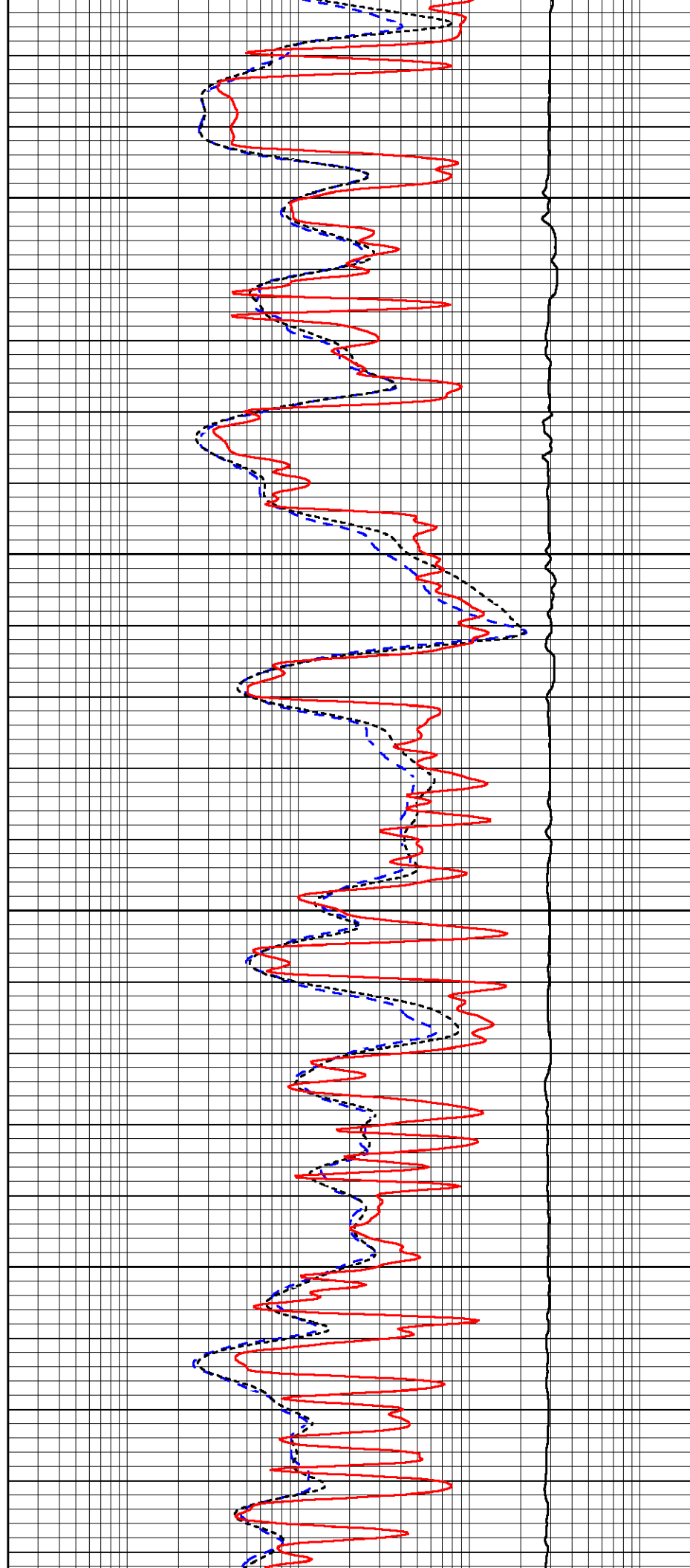


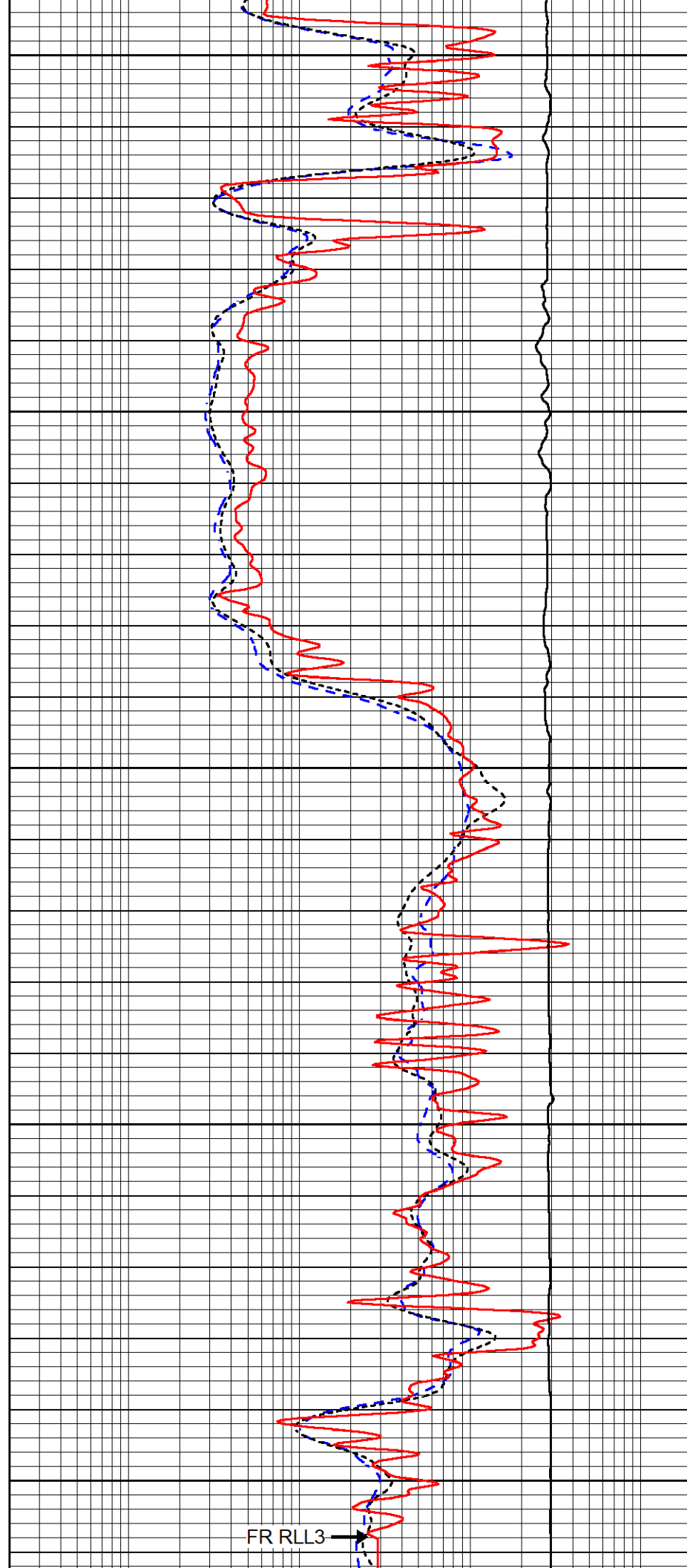
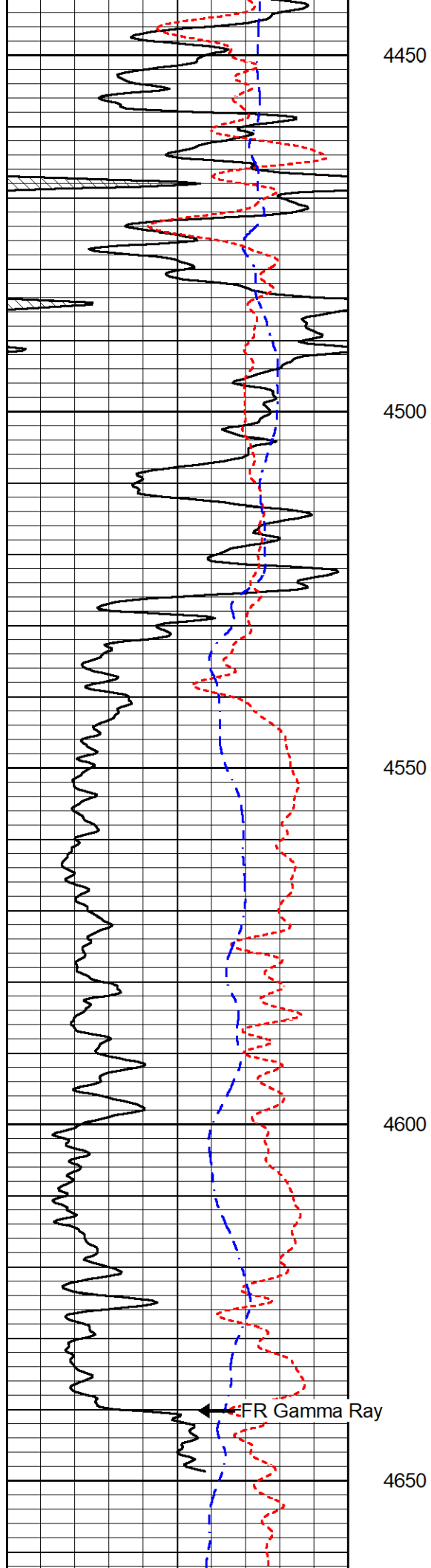
4250

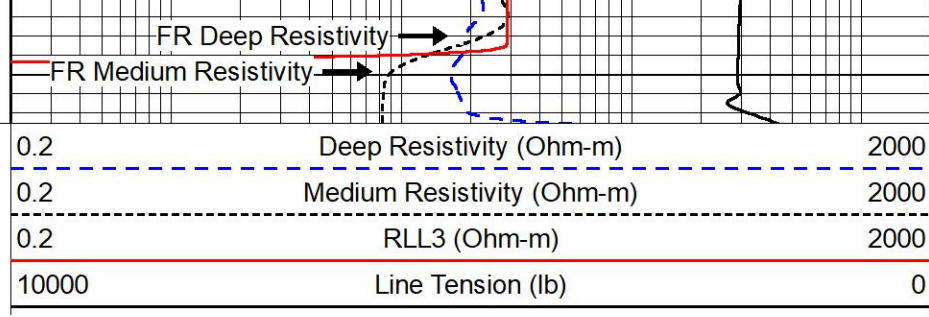
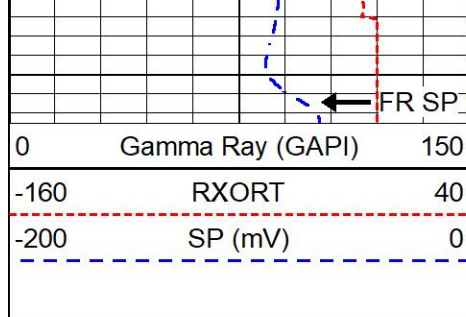
4300

4350

4400





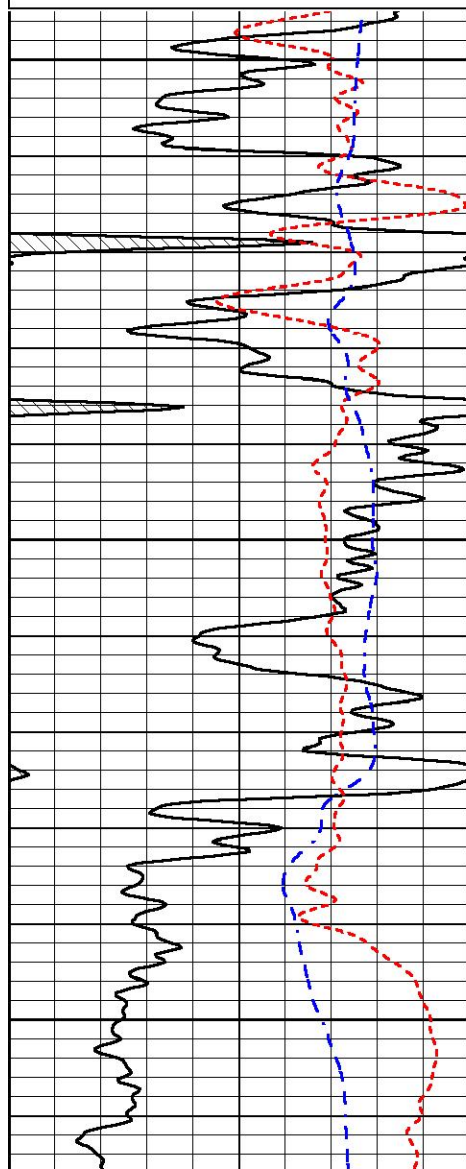
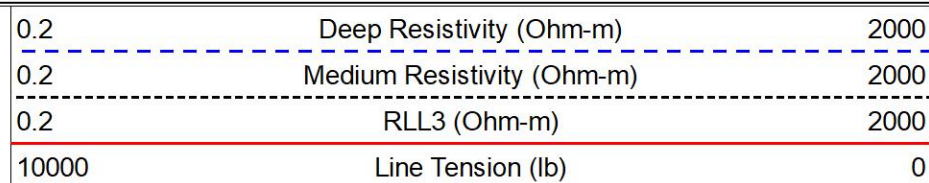
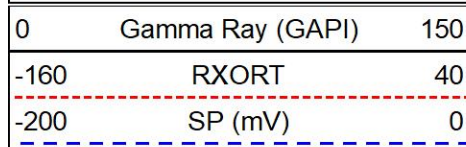


MIDWEST WIRELINE

## REPEAT SECTION

### REPEAT PASS

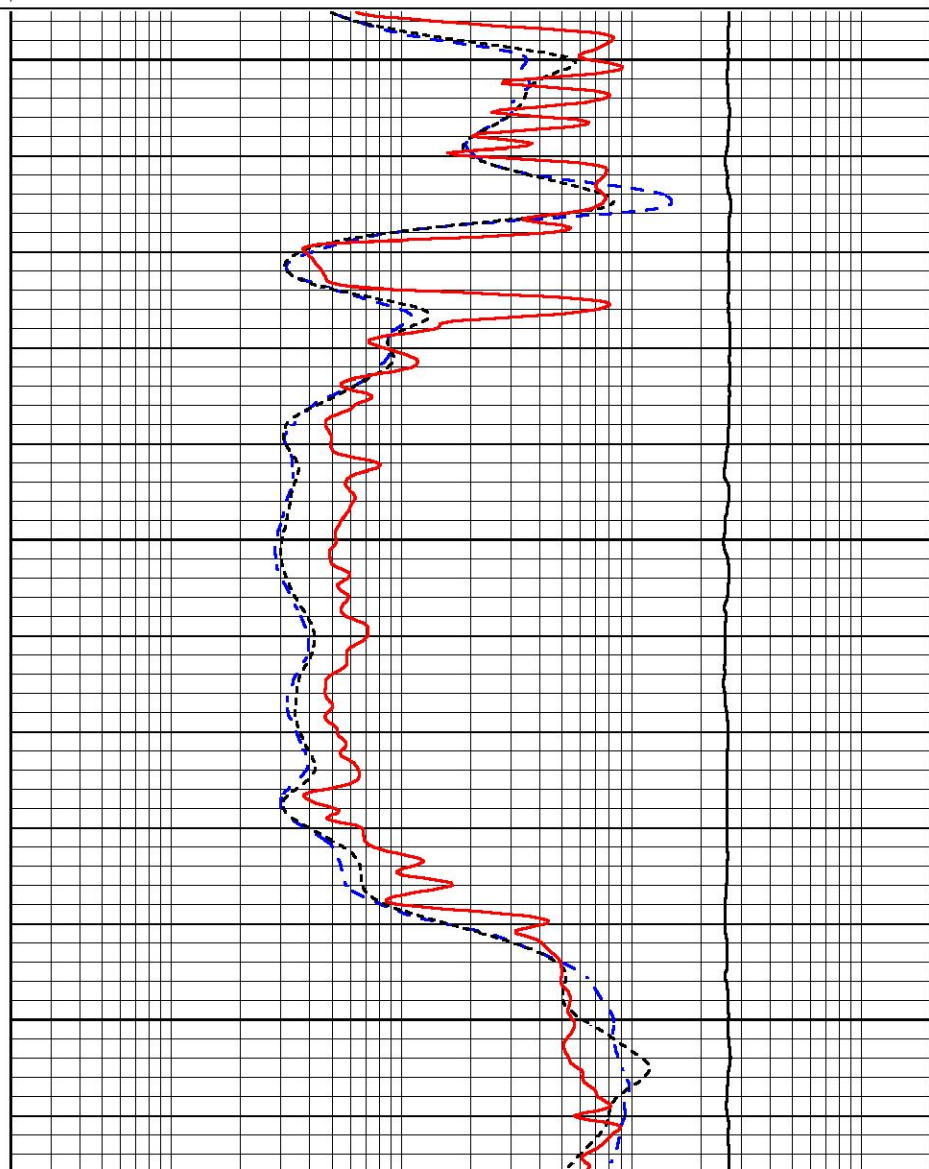
Database File darrah\_knopp 9-13.db  
 Dataset Pathname stkml/pass2.1  
 Presentation Format \_dil  
 Dataset Creation Tue Jul 19 07:28:29 2022  
 Charted by Depth in Feet scaled 1:240

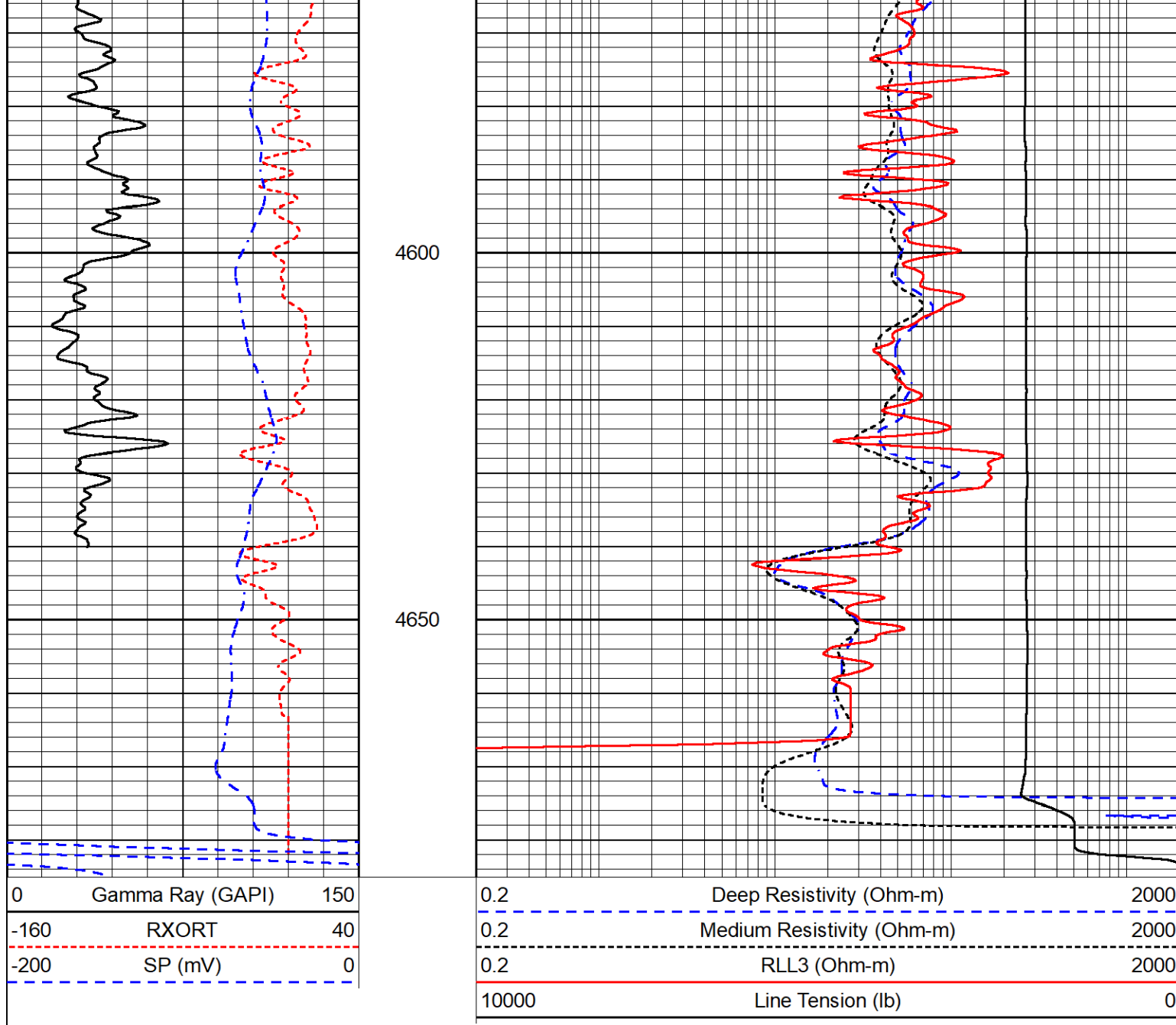


4450

4500

4550





### Calibration Report

Database File: darrah\_knopp 9-13.db  
 Dataset Pathname: stack/pass2.2  
 Dataset Creation: Tue Jul 19 07:23:54 2022

### Dual Induction Calibration Report

Serial-Model: 504 HT-M&W  
 Surface Cal Performed: Wed Jun 29 12:51:29 2022

| Loop:  | Readings |          | References |         |        | Results |         |
|--------|----------|----------|------------|---------|--------|---------|---------|
|        | Air      | Loop     | Air        | Loop    |        | m       | b       |
| Deep   | 178.615  | 710.235  | 0.000      | 255.800 | mmho/m | 0.650   | -16.000 |
| Medium | 161.982  | 1441.110 | 0.000      | 255.800 | mmho/m | 0.450   | -45.000 |

### Compensated Density Calibration Report

Serial-Model: 304-04-M&W  
 Source #: 21170B

Source #:  
Master Calibration Performed:

21170D  
Sun May 29 09:31:45 2022

#### Master Calibration

|                     | Density |      | Far Detector                | Near Detector |     |
|---------------------|---------|------|-----------------------------|---------------|-----|
| Magnesium           | 1.755   | g/cc | 6392.84                     | 8538.69       | cps |
| Aluminum            | 2.685   | g/cc | 1184.69                     | 5433.63       | cps |
| Spine Angle = 74.99 |         |      | Density/Spine Ratio = 0.533 |               |     |
|                     | Size    |      | Reading                     |               |     |
| Small Ring          | 4.00    | in   | 1.15                        |               |     |
| Large Ring          | 14.00   | in   | 1.02                        |               |     |

#### Compensated Neutron Calibration Report

|                               |                         |
|-------------------------------|-------------------------|
| Serial-Model:                 | 210-M&W                 |
| Source #:                     | N-1238                  |
| Master Calibration Performed: | Fri Dec 3 09:16:24 2021 |

#### Master 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        |

#### Gamma Ray Calibration Report

|                     |                         |          |
|---------------------|-------------------------|----------|
| Serial Number:      | 103                     |          |
| Tool Model:         | M&W                     |          |
| Performed:          | Fri Dec 3 12:13:24 2021 |          |
| Calibrator Value:   | 500.0                   | GAPI     |
| Background Reading: | 28.0                    | cps      |
| Calibrator Reading: | 986.0                   | cps      |
| Sensitivity:        | 0.5700                  | GAPI/cps |



|         |                         |
|---------|-------------------------|
| Company | Darrah Oil Company, LLC |
| Well    | Knopp #9-13             |
| Field   | Bridges Northeast       |
| County  | Logan                   |
| State   | Kansas                  |