



DUAL COMP POROSITY LOG

Pioneer Energy Services

Company MURFIN DRILLING COMPANY, INC.
 Well BURR #1-6
 Field WILDCAT
 County CHEYENNE
 State KANSAS

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 Field WILDCAT
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Location: API #: 15-023-21530-00-00
 990' FSL & 330' FEL
 SEC 6 TWP 3S RGE 37W
 Permanent Datum GROUND LEVEL Elevation 3438'
 Log Measured From KELLY BUSHING
 Drilling Measured From KELLY BUSHING
 Other Services DIL/MEL BHCS
 Elevation K.B. 3443'
 D.F. N/A
 G.L. 3438'

| | | | | | | | |
|------------------------|-----------------|------|------|--------|------|------|------|
| Date | 1/16/2020 | | | | | | |
| Run Number | ONE | | | | | | |
| Type Log | CNL/CDL | | | | | | |
| Depth Driller | 5100' | | | | | | |
| Depth Logger | 5103' | | | | | | |
| Bottom Logged Interval | 5070' | | | | | | |
| Top Logged Interval | 4000' | | | | | | |
| Type Fluid In Hole | CHEMICAL | | | | | | |
| Salinity, PPM CL | 1300 | | | | | | |
| Density | 9.1 | | | | | | |
| Level | FULL | | | | | | |
| Max. Rec. Temp. F | 127 DEG/F | | | | | | |
| Operating Rig Time | 4 HOURS | | | | | | |
| Equipment -- Location | P-108 HAYS | | | | | | |
| Recorded By | J. HENRICKSON | | | | | | |
| Witnessed By | SAMAN SHARIFAIE | | | | | | |
| Borehole Record | | | | | | | |
| Run No. | Bit | From | To | Size | Wgt. | From | To |
| ONE | 12.25" | 0 | 388' | 8.625" | 23# | 0 | 388' |
| TWO | 7.875" | 388' | | | | | |
| Casing Record | | | | | | | |

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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.
 BIRD CITY KANSAS
 EAST TO 30 RD, 4 1/4 NORTH, WEST INTO

Log Measured From: KELLY BUSHING 5 Ft. Above Permanent Datum

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

| | | | |
|-----------------------------------|-----------|----------------------------------|--------------------|
| Your Pioneer Energy Services Crew | | This Log Record Was Witnessed By | |
| Engineer: J. HENRICKSON | Operator: | Primary Witness: SAMAN SHARIFAIE | Secondary Witness: |
| Operator: | Operator: | Secondary Witness: | Secondary Witness: |
| Operator: | | Secondary Witness: | |

Log Variables

DatabaseC:\ProgramData\Warrior\Data\murfir_burr_1_6.db
 Dataset field/well/stackml/pass3.1/_vars_

Top - Bottom

| | | | | | | | |
|-----------|--------------|------------------|-------------------|----------------|------------------|-------|------------------|
| A | BOREID in | BOTTEMP degF | CASEOD in | CASETHCK in | FLUIDDEN g/cc | M | MATRXDEN g/cc |
| 1 | 7.875 | 127 | 5.5 | 0 | 1 | 2 | 2.71 |
| NPORSEL | PERFS | SNDERR mmho/m | SNDERRM mmho/m | SPSHIFT mV | SRFTEMP degF | SZCOR | TDEPTH ft |
| Limestone | 0 | 0 | 0 | 380 | 0 | Off | 5103 |

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

| Sensor | Offset (ft) | Schematic | Description | Length (ft) | O.D. (in) | Weight (lb) | |
|--------|-------------|-----------|-------------------|--|-----------|-------------|--------|
| GR | 44.50 | | GR-M&W (89-M&W) | 3.00 | 3.50 | 50.00 | |
| CNLSC | 41.40 | | CNT-M&W (tk10-MW) | 5.50 | 3.50 | 100.00 | |
| CNSSC | 40.65 | | | | | | |
| | | | | CDL-M&W (934-229) | 8.50 | 4.00 | 250.00 |
| LSD | 32.35 | | | | | | |
| DCAL | 32.33 | | | | | | |
| SSD | 31.85 | | | | | | |
| | | | | ML-PSI UDM ML (UDM-01) Stackable Microlog Tools | 11.50 | 4.00 | 215.00 |
| MCAL | 20.87 | | | | | | |
| MI | 20.87 | | | | | | |
| MN | 20.87 | | | | | | |
| RLL3 | 15.80 | | | | | | |

| | | | | | |
|-------|-------|--|------------------|-------|------|
| RLL3F | 15.79 | | | | |
| CILD | 8.00 | | DIL-M&W (55-222) | 18.50 | 3.50 |
| CILM | 4.70 | | | | |
| SP | 0.20 | | | | |

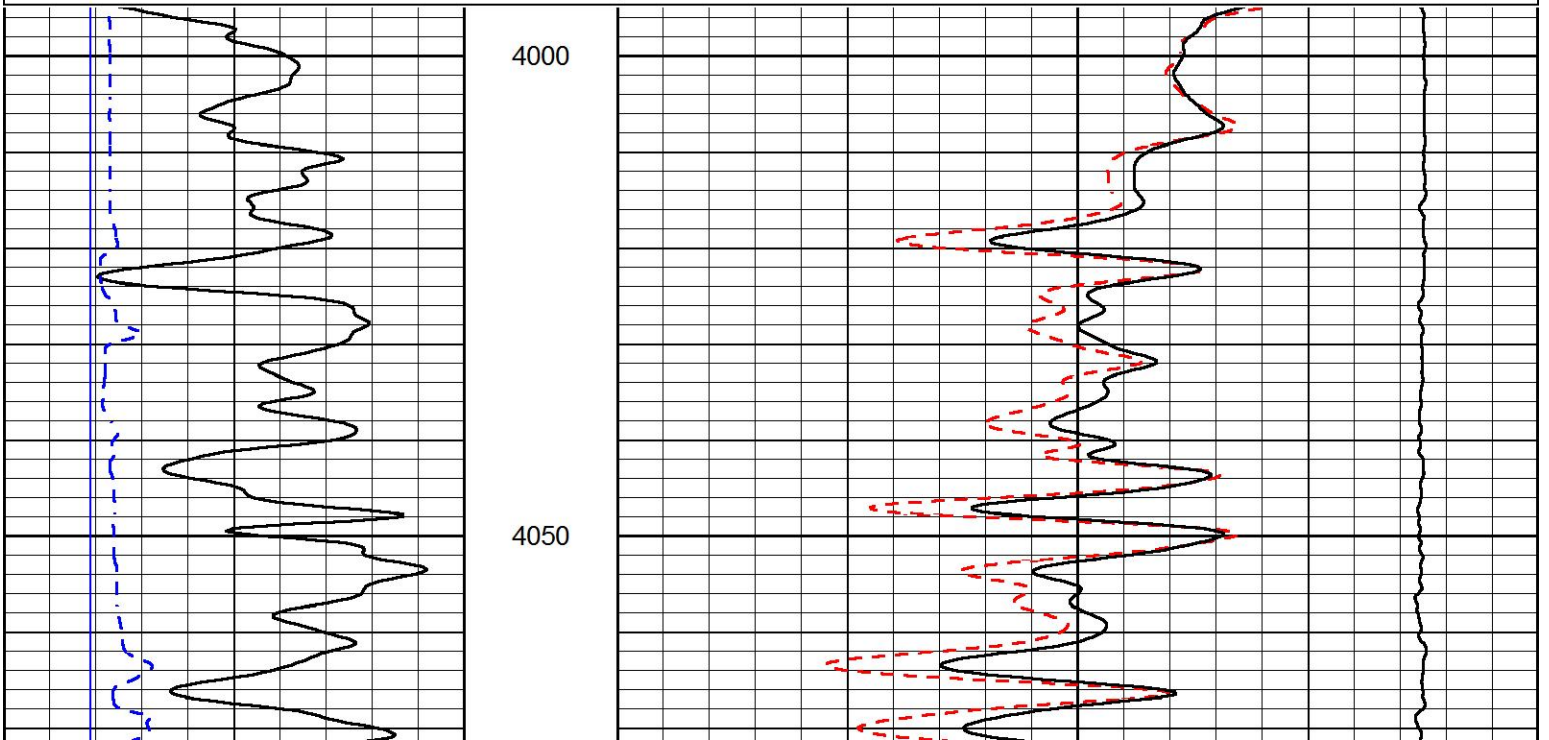
Dataset: murfin_burr_1_6.db: field/well/stackml/pass3.1
 Total length: 47.00 ft
 Total weight: 835.00 lb
 O.D.: 4.00 in

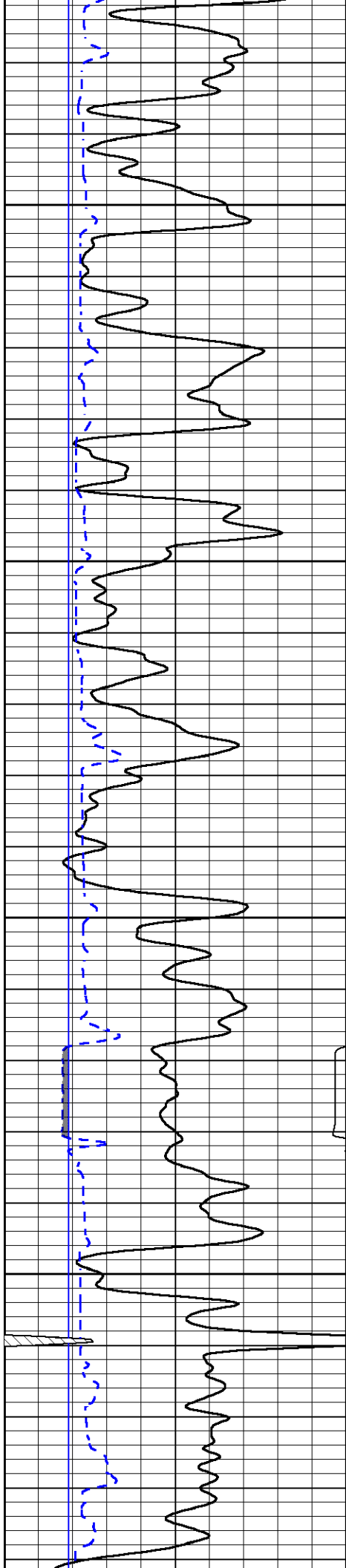


MAIN PASS

Database File: murfin_burr_1_6.db
 Dataset Pathname: stackml/pass3.1
 Presentation Format: cdl
 Dataset Creation: Fri Jan 17 00:32:42 2020
 Charted by: Depth in Feet scaled 1:240

| | | | | | |
|---|------------------|-----|-------|--------------------------|-----|
| 0 | GAMMA RAY (GAPI) | 150 | 30 | COMPENSATED DENSITY (pu) | -10 |
| 6 | CALIPER (in) | 16 | 2 | BULK DENSITY (g/cc) | 3 |
| | | | 15000 | LINE TENSION (lb) | 0 |



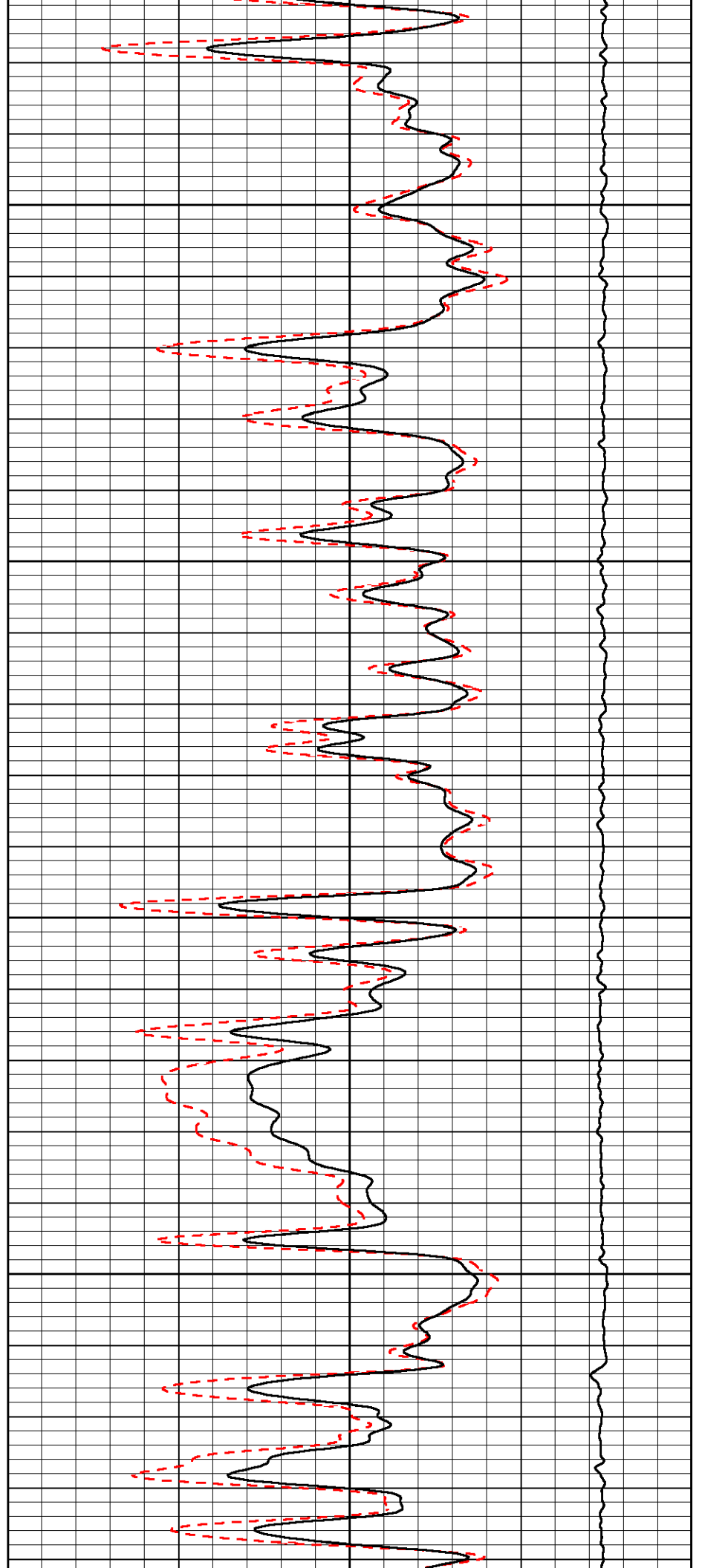


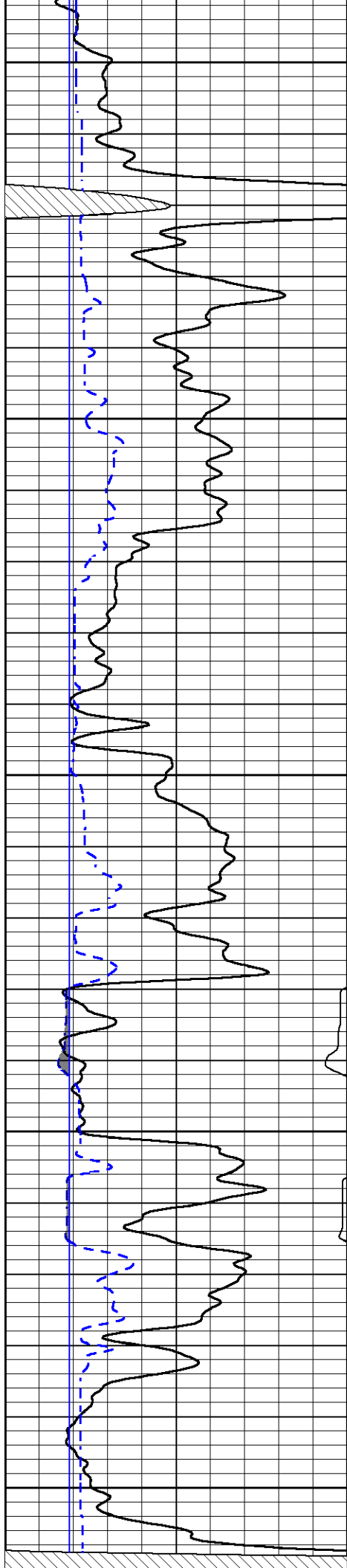
4100

4150

4200

4250





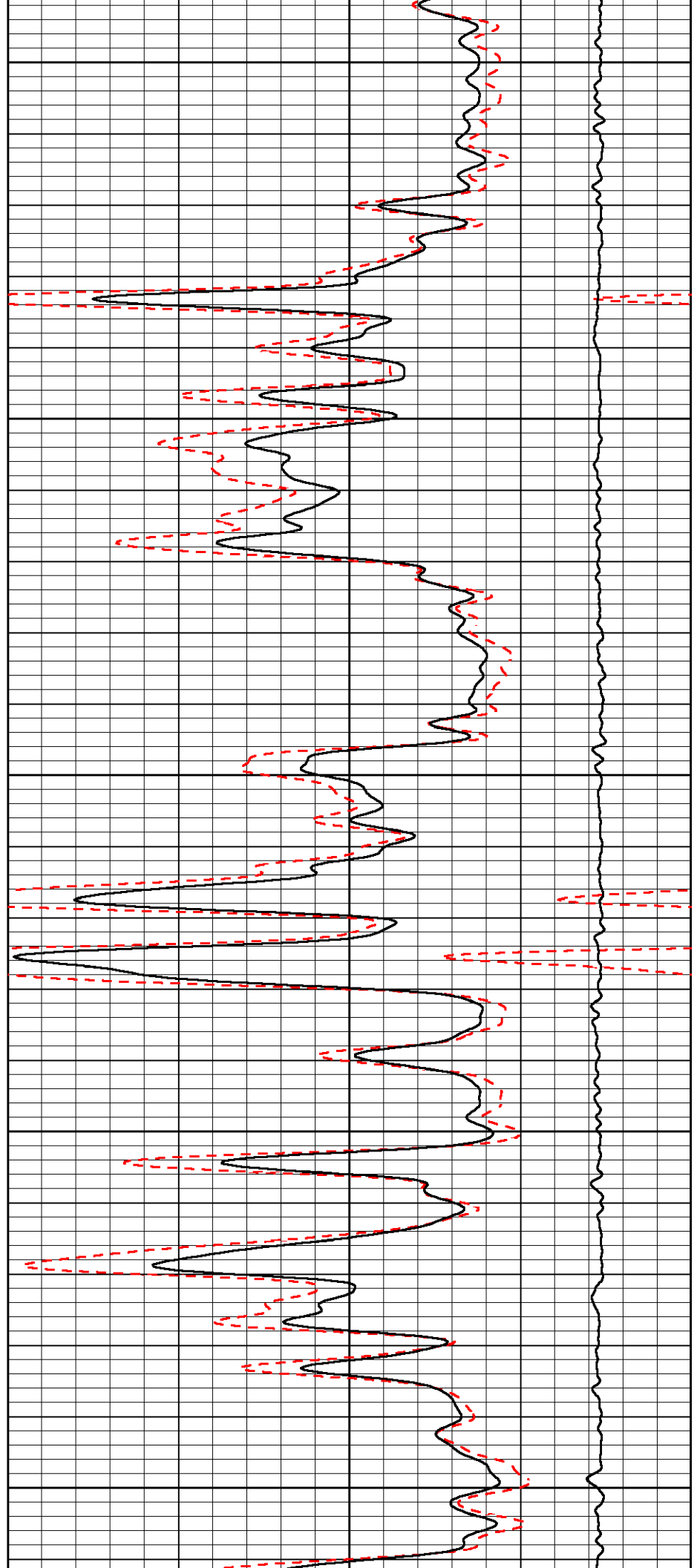
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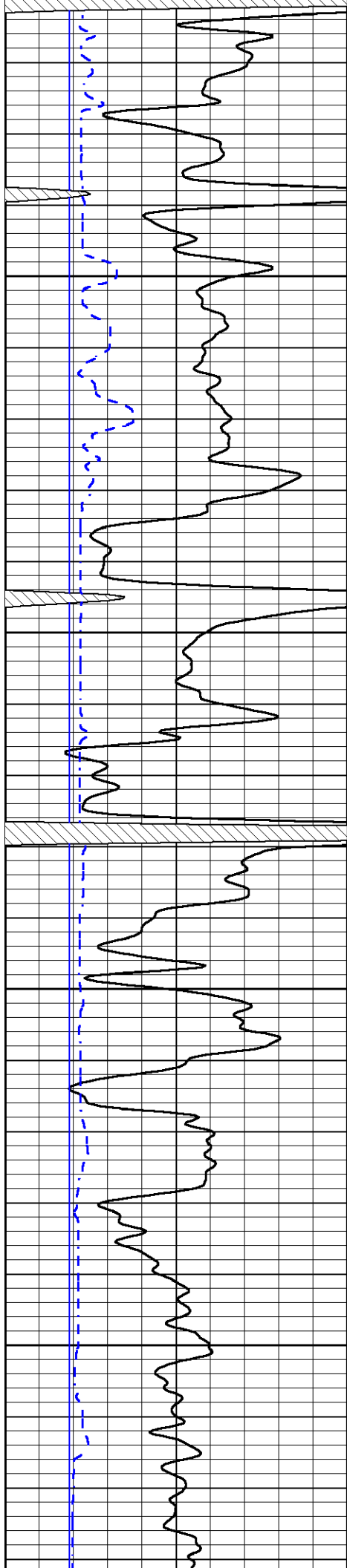
4350

4400

4450

4500



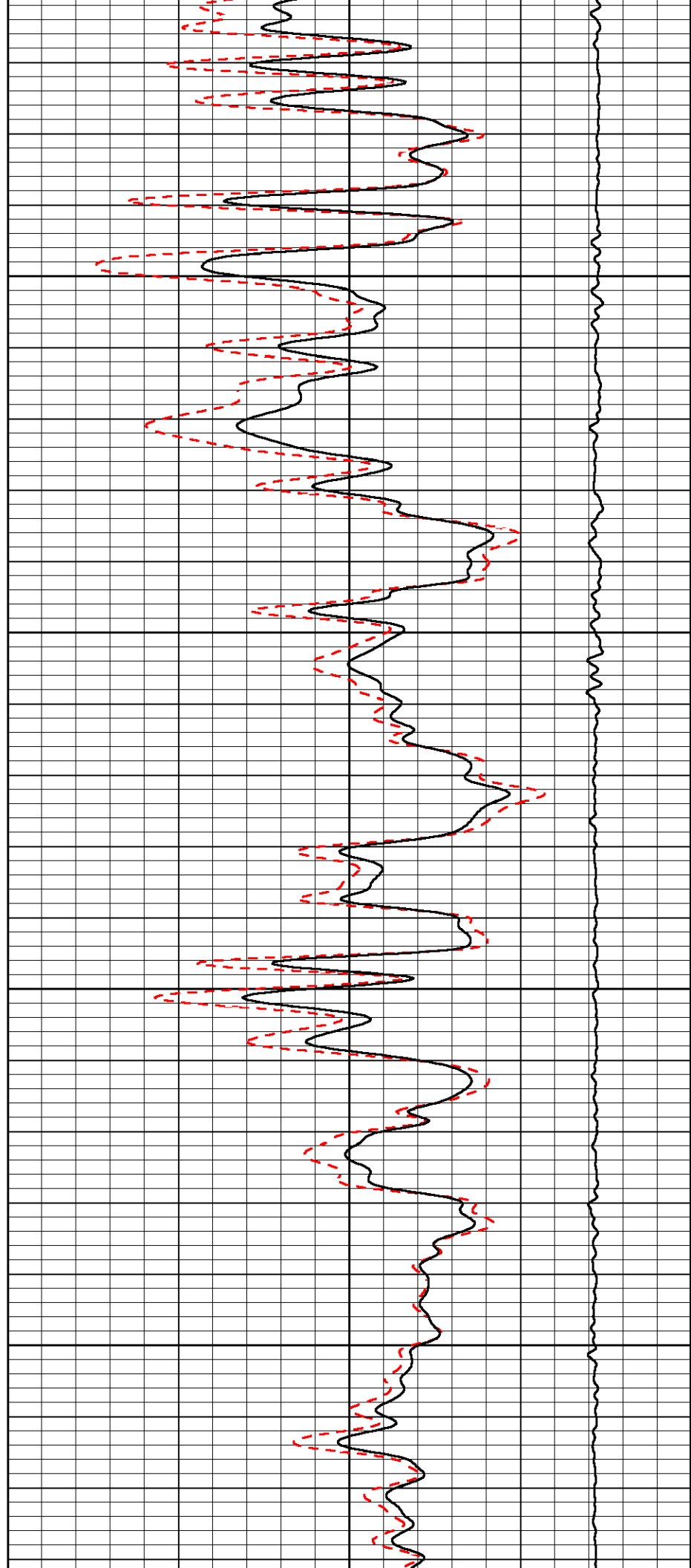


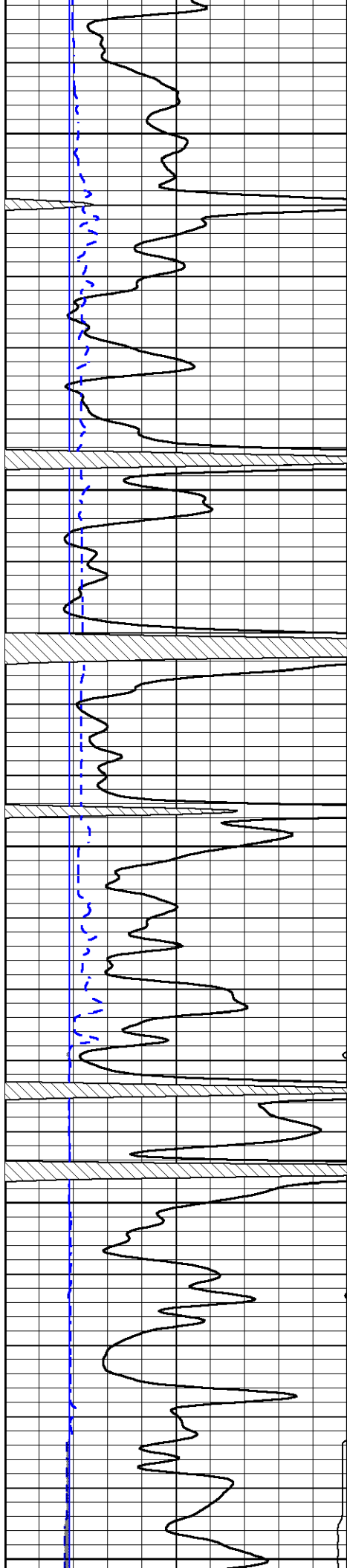
4550

4600

4650

4700





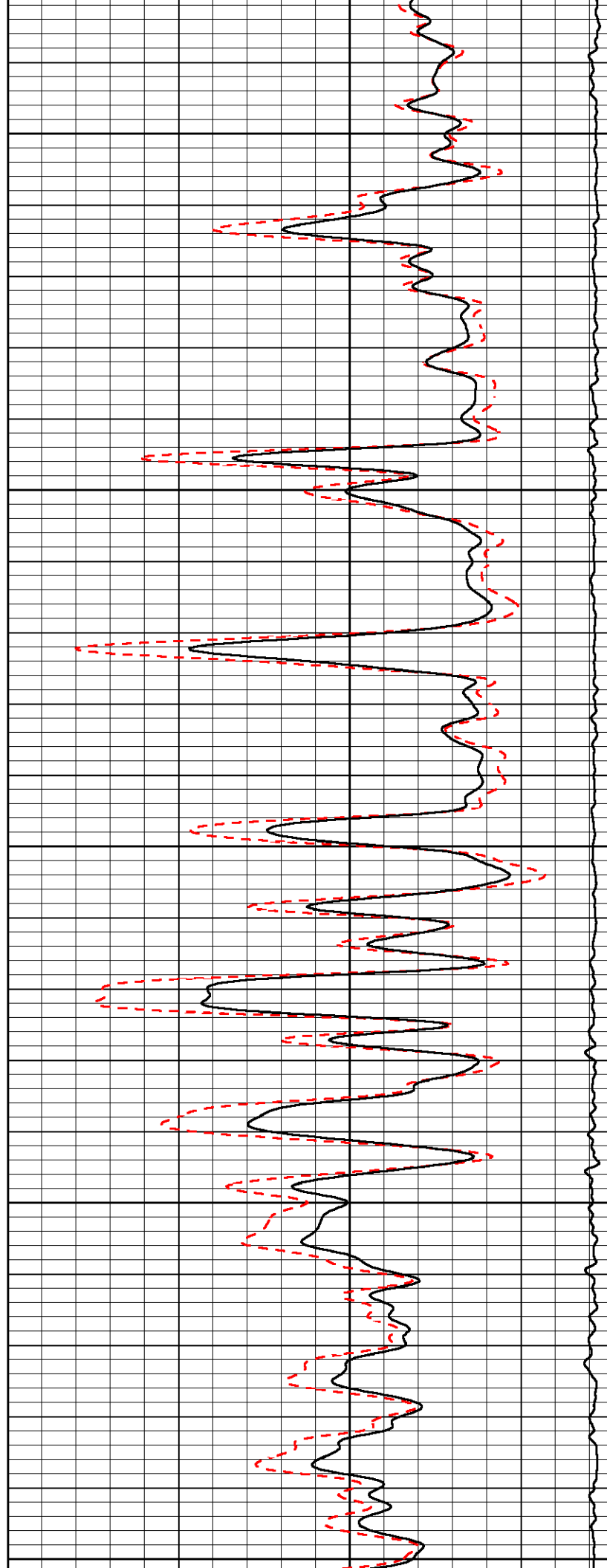
4750

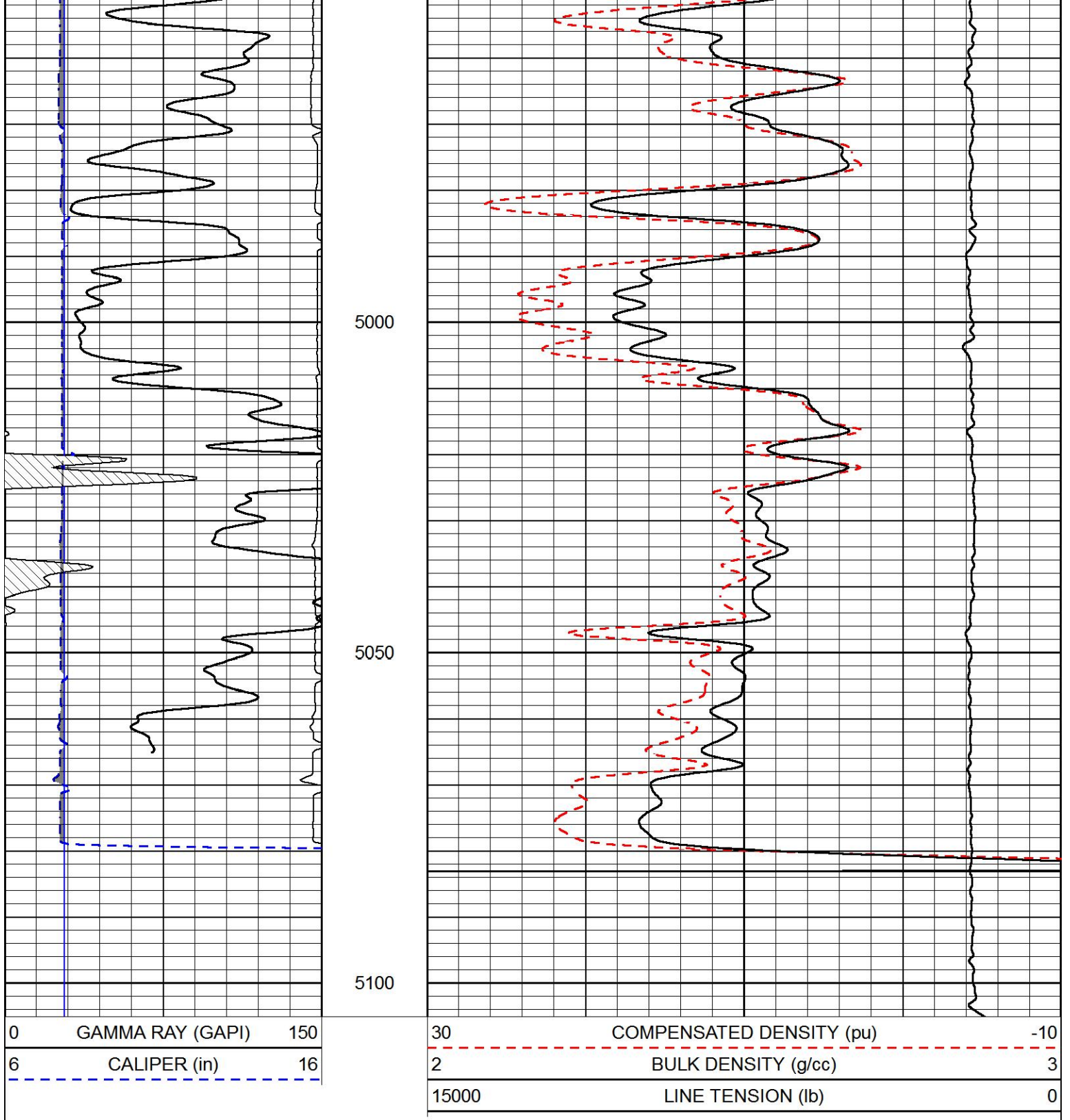
4800

4850

4900

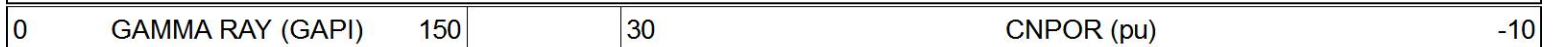
4950





MAIN PASS

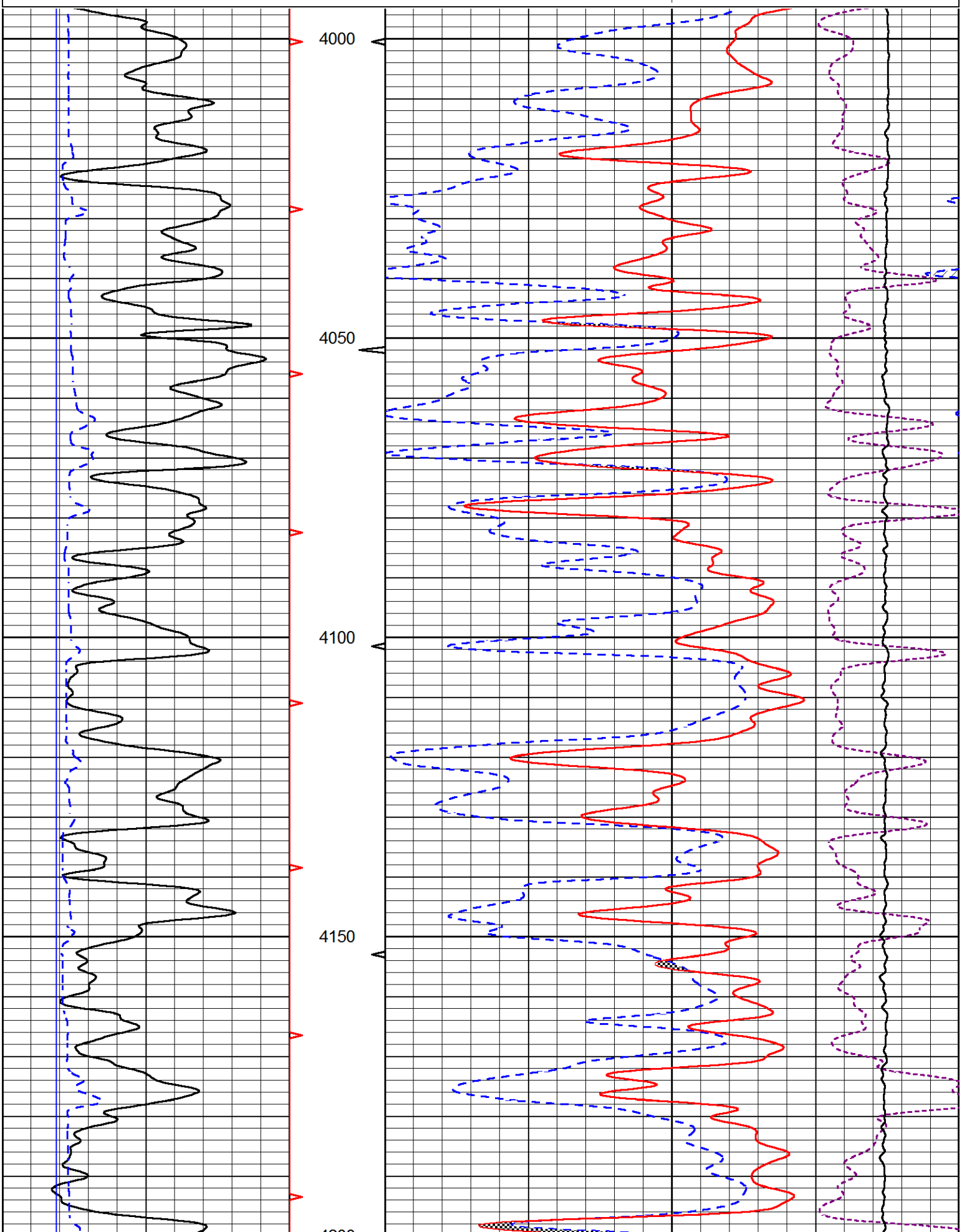
Database File murfin_burr_1_6.db
 Dataset Pathname stackml/pass3.1
 Presentation Format cndlspec
 Dataset Creation Fri Jan 17 00:32:42 2020
 Charted by Depth in Feet scaled 1:240

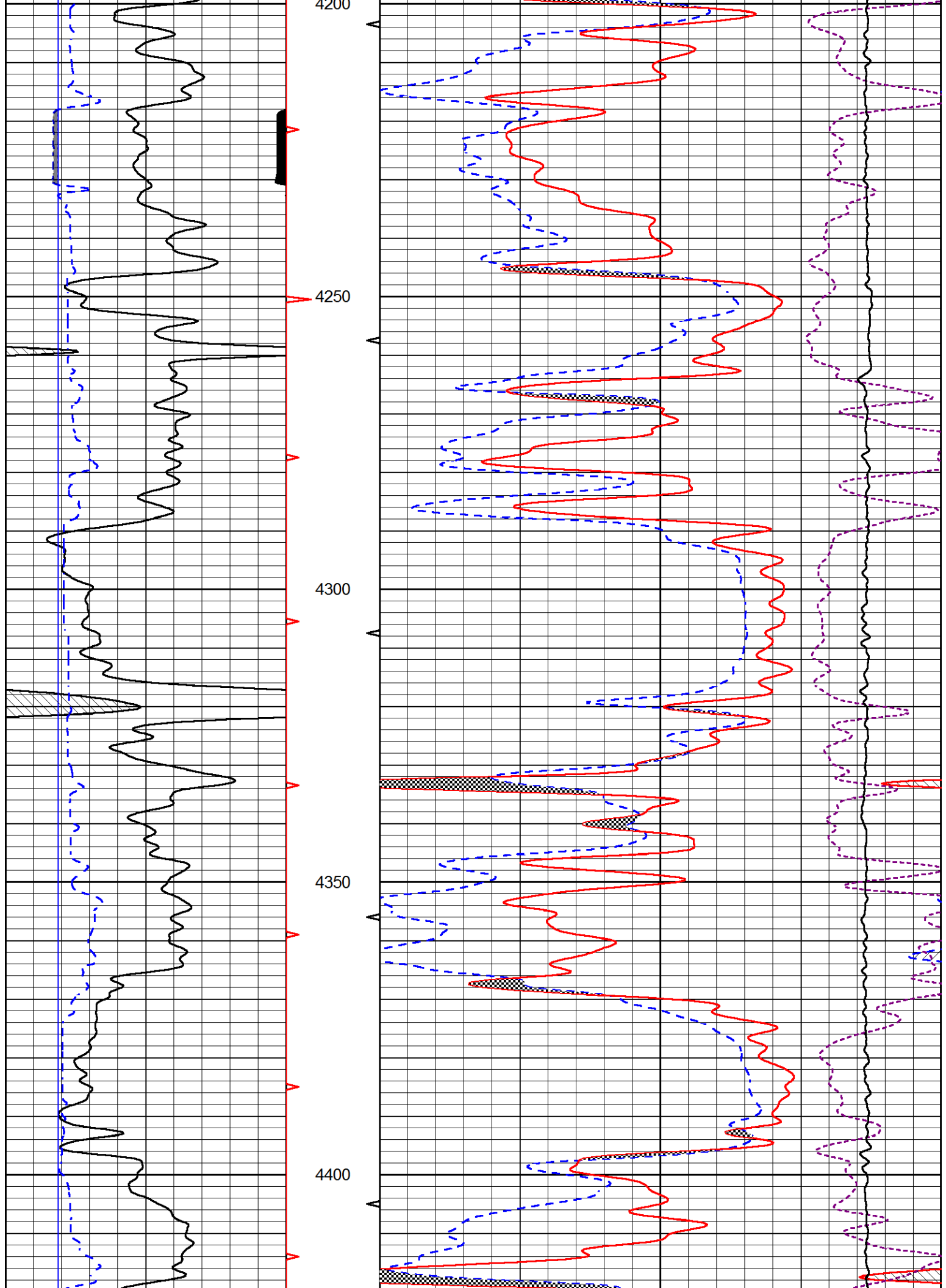


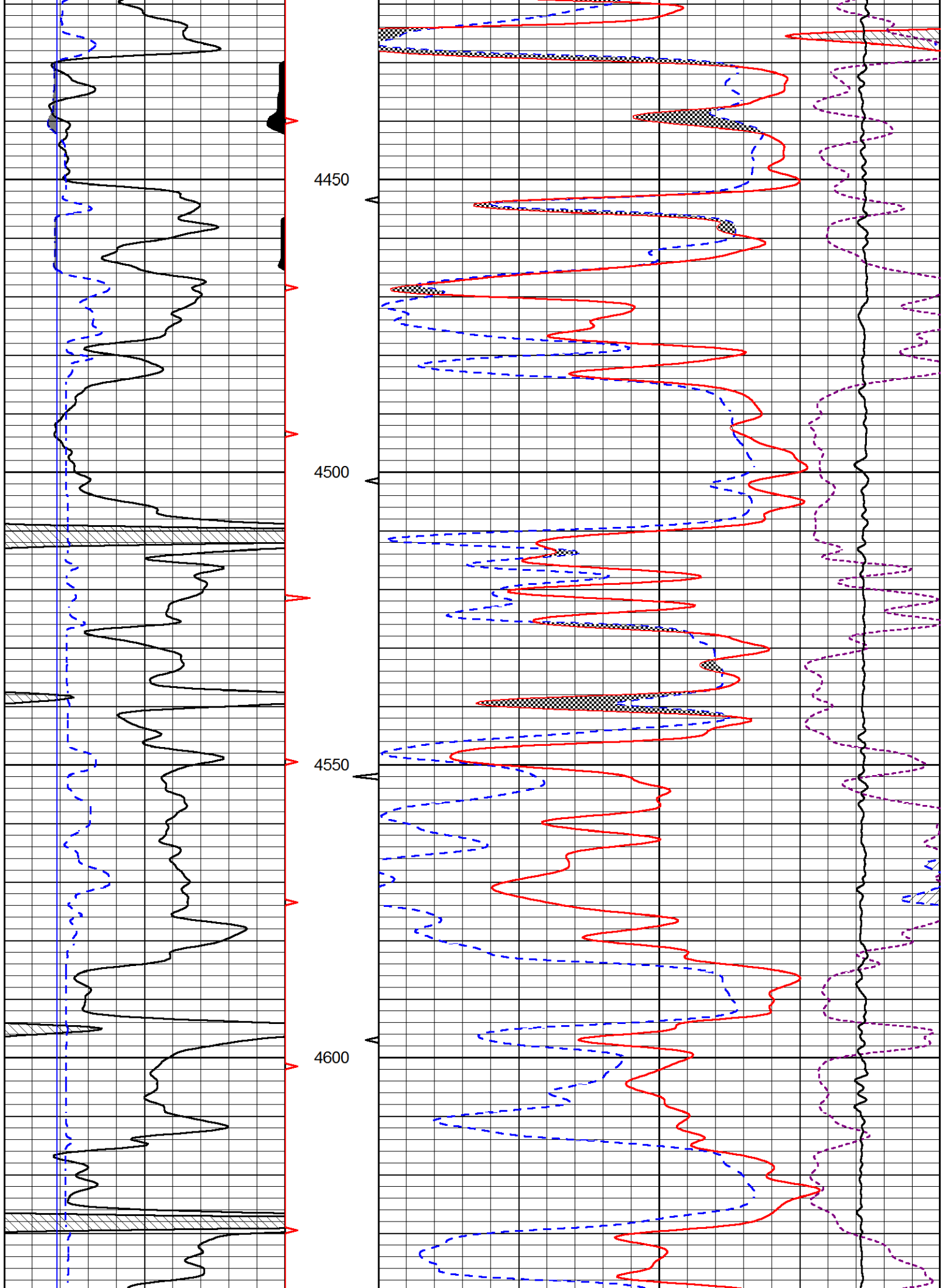
| | | |
|---|---------------|----|
| 6 | dcal (in) | 16 |
| 6 | BIT SIZE (in) | 16 |

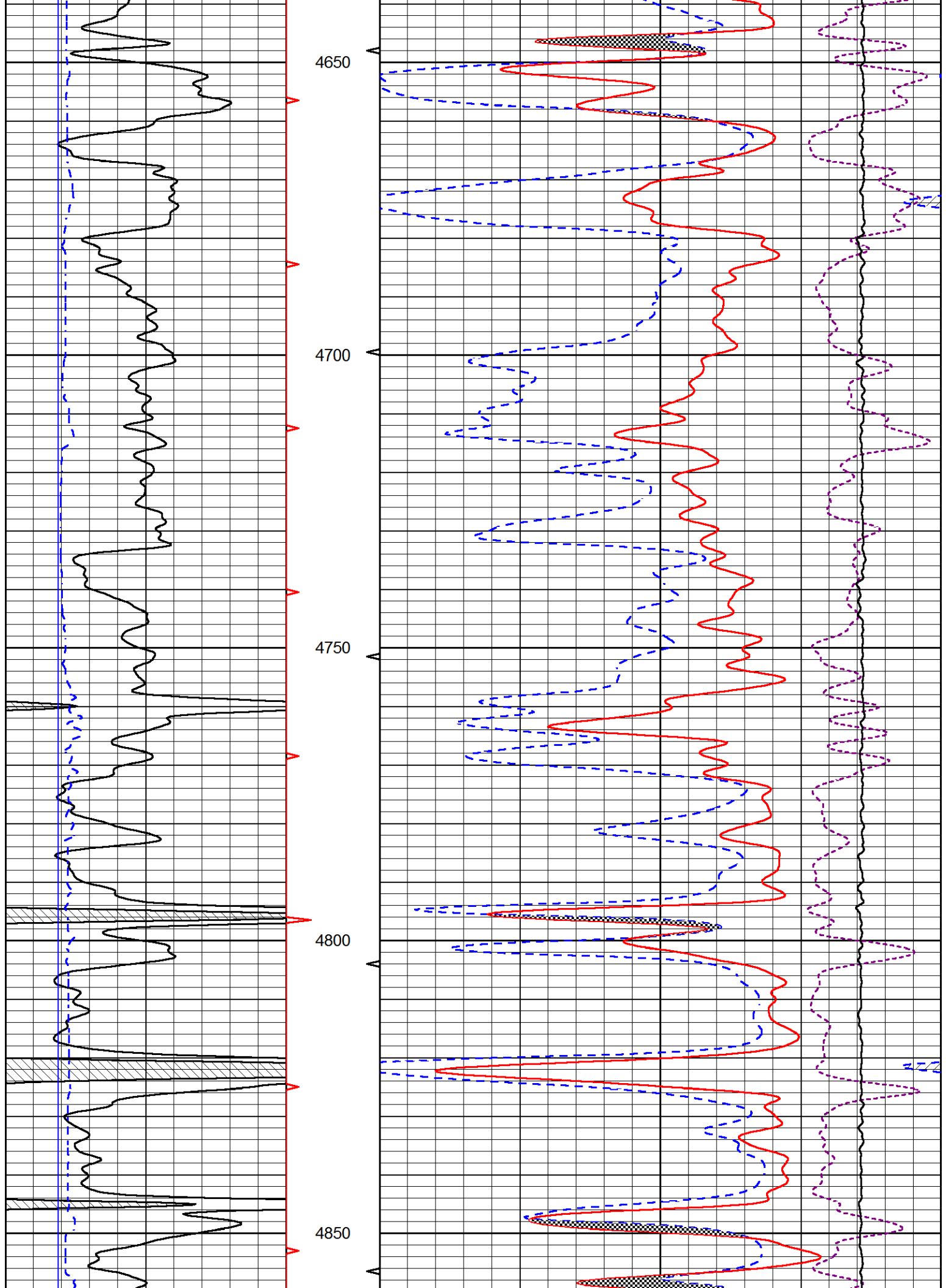
| | | |
|-------|-------------------|-----|
| 30 | DPOR (pu) | -10 |
| 15000 | LINE TENSION (lb) | 0 |

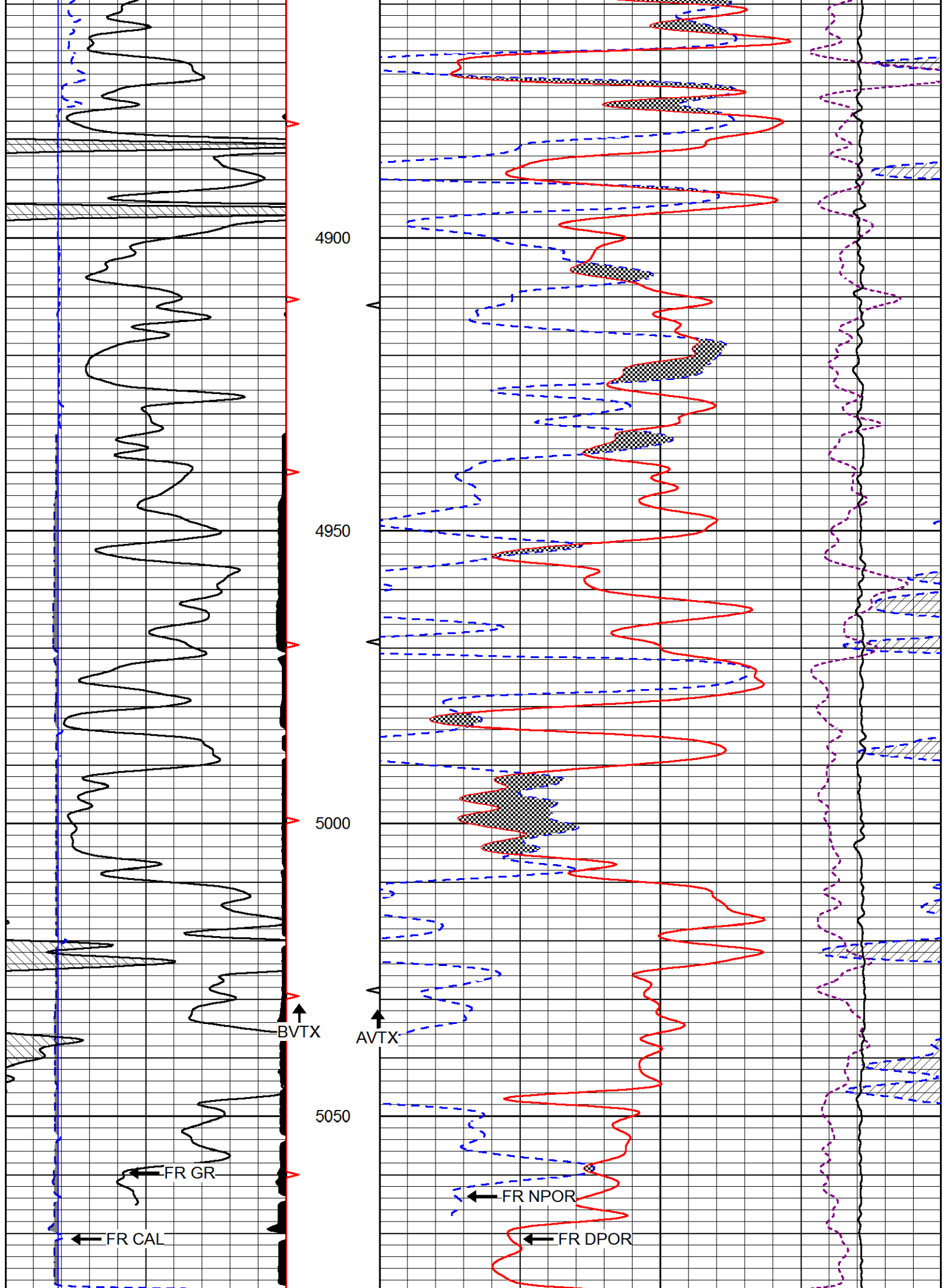
| | | |
|-------|-------------|------|
| -0.25 | RHOC (g/cc) | 0.25 |
|-------|-------------|------|

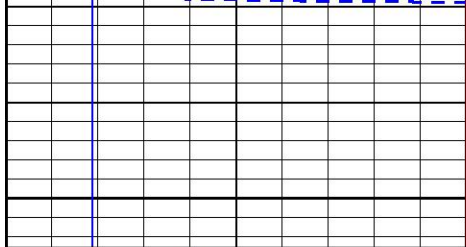




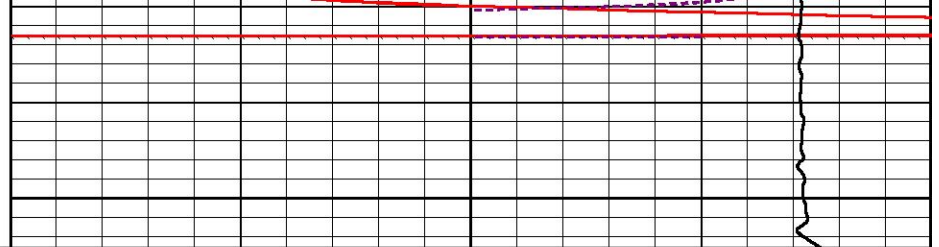








5100



| | | |
|---|------------------|-----|
| 0 | GAMMA RAY (GAPI) | 150 |
| 6 | dcal (in) | 16 |
| 6 | BIT SIZE (in) | 16 |

| | | |
|-------|-------------------|------|
| 30 | CNPOR (pu) | -10 |
| 30 | DPOR (pu) | -10 |
| 15000 | LINE TENSION (lb) | 0 |
| -0.25 | RHOC (g/cc) | 0.25 |

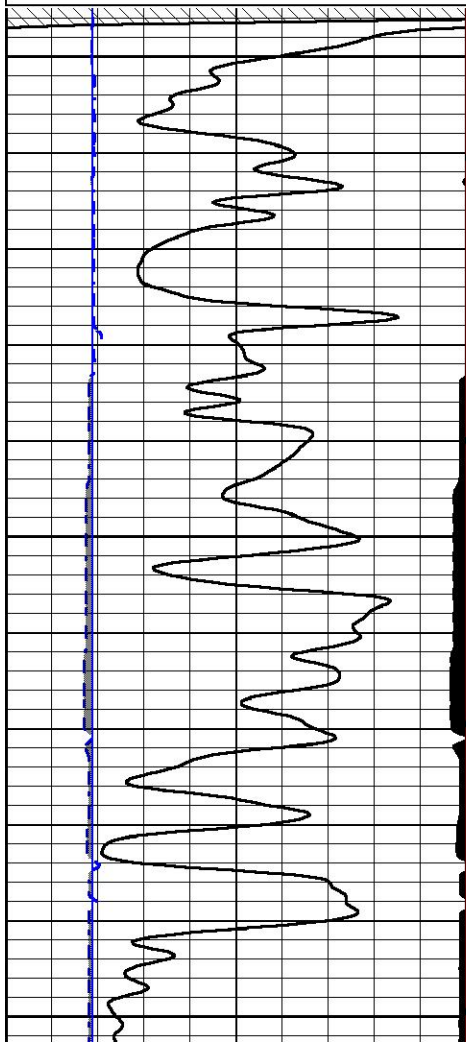


REPEAT SECTION

Database File murfin_burr_1_6.db
 Dataset Pathname stackml/pass2.1
 Presentation Format cndlspec
 Dataset Creation Thu Jan 16 23:42:43 2020
 Charted by Depth in Feet scaled 1:240

| | | |
|---|------------------|-----|
| 0 | GAMMA RAY (GAPI) | 150 |
| 6 | dcal (in) | 16 |
| 6 | BIT SIZE (in) | 16 |

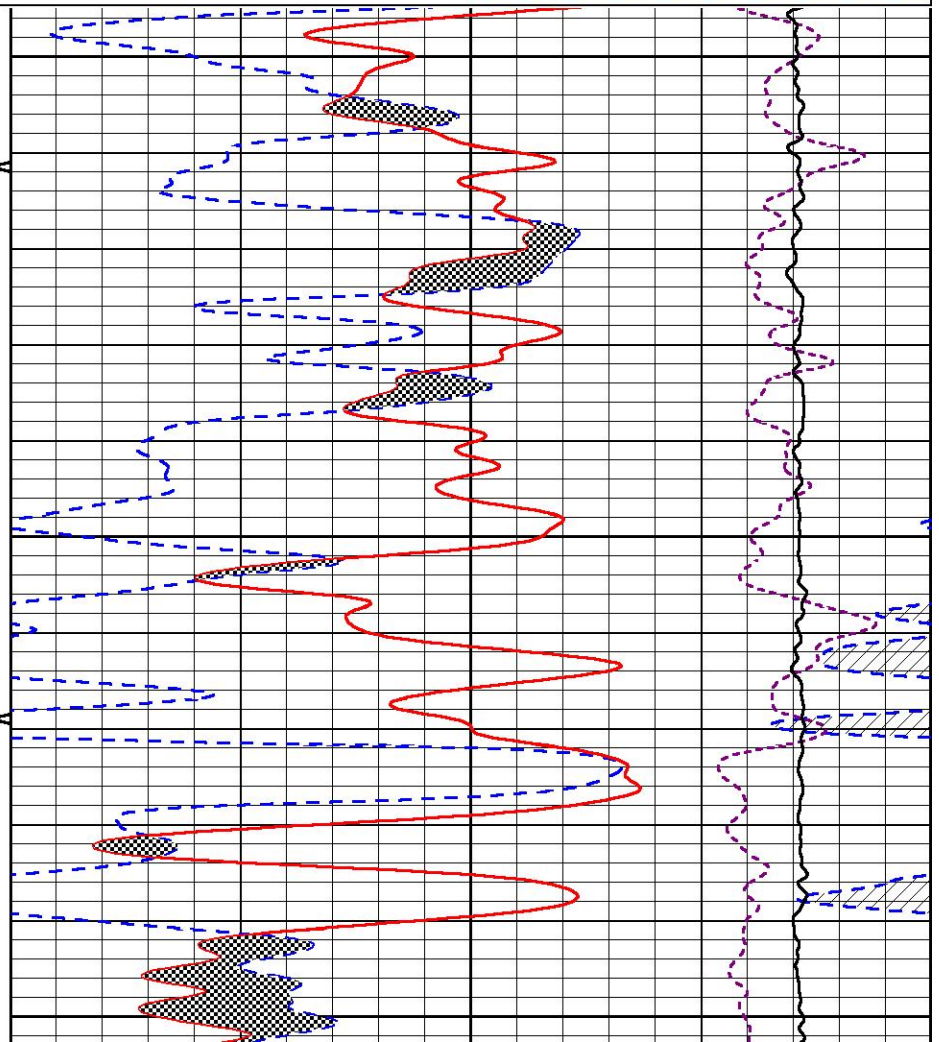
| | | |
|-------|-------------------|------|
| 30 | CNPOR (pu) | -10 |
| 30 | DPOR (pu) | -10 |
| 15000 | LINE TENSION (lb) | 0 |
| -0.25 | RHOC (g/cc) | 0.25 |

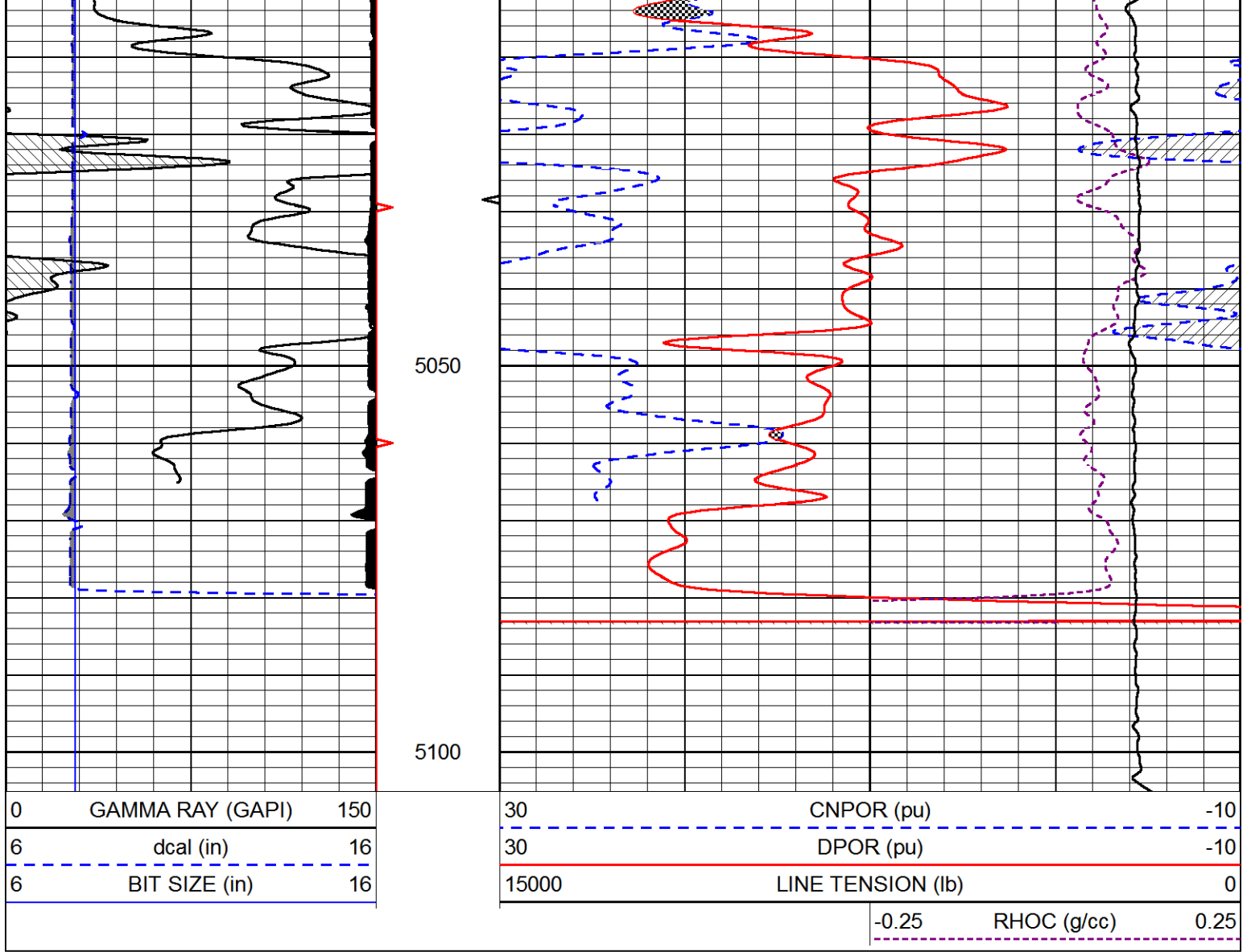


4900

4950

5000





Calibration Report

Database File murfin_burr_1_6.db
 Dataset Pathname stackml/pass3.1
 Dataset Creation Fri Jan 17 00:32:42 2020

Dual Induction Calibration Report

Serial-Model: 55-222-M&W
 Calibration Performed: Tue Dec 10 05:11:10 2019

| Loop: | Readings | | References | | | Results | |
|--------|----------|----------|------------|---------|--------|---------|---------|
| | Air | Loop | Air | Loop | | Gain | Offset |
| Deep | 167.000 | 835.000 | 0.000 | 255.800 | mmho/m | 0.500 | -41.000 |
| Medium | 0.000 | 1348.000 | 142.000 | 255.800 | mmho/m | 0.370 | -15.000 |

Microlog Calibration Report

Serial-Model: UDM-01-PSI UDM ML
 Performed: Fri May 31 06:10:42 2019

| Readings | | References | | Results | |
|----------|-----|------------|-----|---------|---|
| Zero | Cal | Zero | Cal | m | b |

| | | | | | | | |
|---------|--------|--------|--------|---------|-------|------------|----------|
| Normal | 0.0000 | 1.0000 | 0.0000 | 1.0000 | Ohm-m | 25000.0000 | -1.0000 |
| Inverse | 0.0000 | 1.0000 | 0.0000 | 1.0000 | Ohm-m | 25000.0000 | -0.4000 |
| Caliper | 1.0019 | 1.2642 | 8.0000 | 22.0000 | in | 53.3774 | -47.4000 |

Compensated Density Calibration Report

Serial-Model: 934-229-M&W
Source / Verifier: 21170B /
Master Calibration Performed: Thu Dec 19 15:46:53 2019

Master Calibration

| | Density | | Far Detector | Near Detector | |
|---------------------|---------|------|-----------------------------|---------------|-----|
| Magnesium | 1.755 | g/cc | 3391.68 | 2392.26 | cps |
| Aluminum | 2.670 | g/cc | 645.86 | 1568.99 | cps |
| Spine Angle = 75.73 | | | Density/Spine Ratio = 0.535 | | |
| | Size | | Reading | | |
| Small Ring | 4.00 | in | 1.39 | | |
| Large Ring | 14.00 | in | 1.04 | | |

Compensated Neutron Calibration Report

Serial Number: tk10-MW
Tool Model: M&W
Calibration Performed: Wed Nov 16 11:21:36 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: Tue Dec 10 05:11:34 2019

Calibrator Value: 1000.0 GAPI

Background Reading: 0.0 cps
Calibrator Reading: 6.2 cps

Sensitivity: 0.5200 GAPI/cps



PIONEER
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