



**PIONEER**  
Pioneer Energy Services

**MICRORESISTIVITY  
LOG**

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

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County **CHEYENNE**  
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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  
**CNL/CDL  
DIL/BHCS**  
Elevation  
K.B. **3443'**  
D.F. **N/A**  
G.L. **3438'**

|                        |                 |
|------------------------|-----------------|
| Date                   | 1/16/2020       |
| Run Number             | ONE             |
| Depth Driller          | 5100'           |
| Depth Logger           | 5103'           |
| Bottom Logged Interval | 5102'           |
| Top Log Interval       | 4000'           |
| Casing Driller         | 8.625" @ 388'   |
| Casing Logger          | 387'            |
| Bit Size               | 7.875"          |
| Type Fluid in Hole     | CHEMICAL        |
| Salinity, ppm CL       | 1300            |
| Density / Viscosity    | 9.1 57          |
| pH / Fluid Loss        | 11.0 6.0        |
| Source of Sample       | FLOWLINE        |
| Rm @ Meas. Temp        | 1.10 @ 67       |
| Rmt @ Meas. Temp       | .83 @ 67        |
| Rmc @ Meas. Temp       | 1.49 @ 67       |
| Source of Rmf / Rmc    | CHARTS          |
| Rm @ BHT               | .58 @ 12        |
| Operating Rig Time     | 4 HOURS         |
| Max Rec. Temp. F       | 127 DEGF        |
| Equipment Number       | P-108           |
| Location               | HAYS            |
| Recorded By            | J. HENRICKSON   |
| Witnessed By           | SAMAN SHARIFAIE |

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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.pioneerres.com      785-625-3858**

**Your Pioneer Energy Services Crew**

**Engineer: J. HENRICKSON**  
**Operator:**  
**Operator:**  
**Operator:**

**This Log Record Was Witnessed By**

**Primary Witness: SAMAN SHARIFAIE**  
**Secondary Witness:**  
**Secondary Witness:**  
**Secondary Witness:**

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\murfir\_burr\_1\_6.db  
 Dataset field/well/stackml/pass3.1/\_vars\_

## Top - Bottom

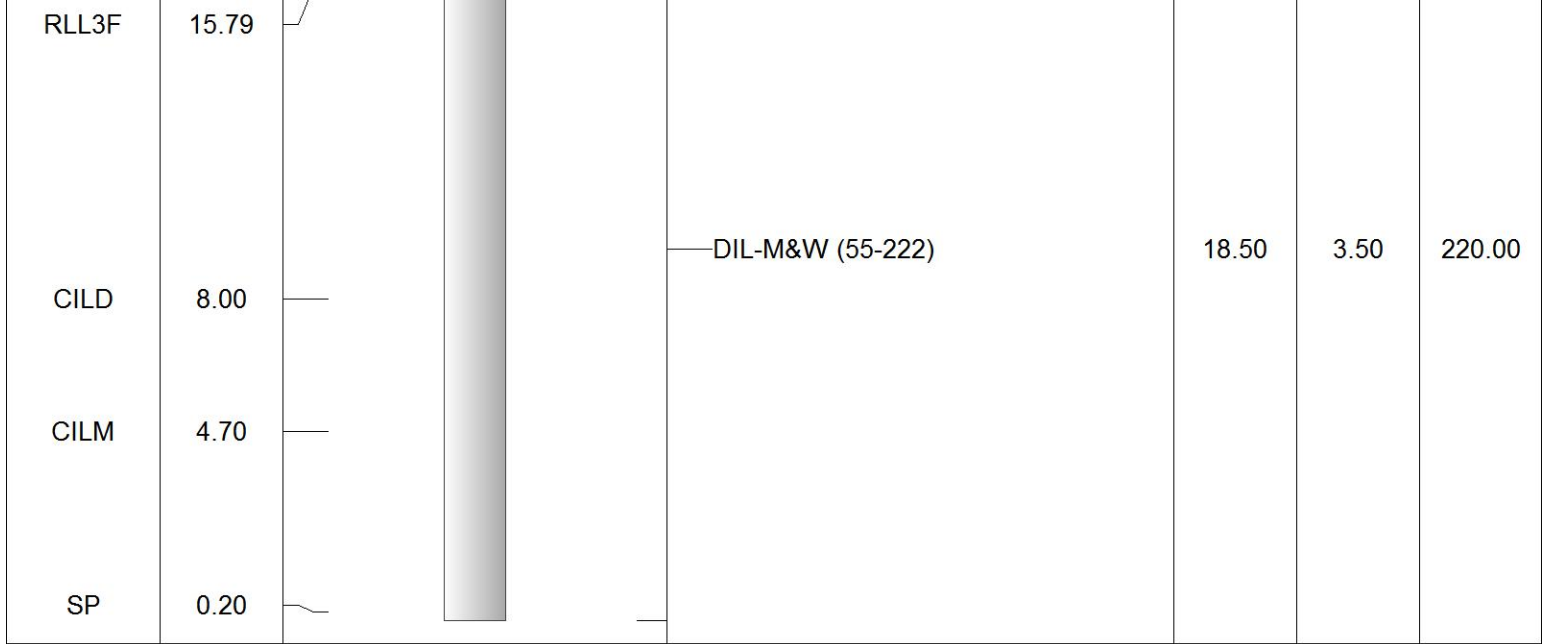
|           |              |                  |                   |                |                  |       |                  |
|-----------|--------------|------------------|-------------------|----------------|------------------|-------|------------------|
| A         | BOREID<br>in | BOTTEMP<br>degF  | CASEOD<br>in      | CASETHCK<br>in | FLUIDDEN<br>g/cc | M     | MATRXDEN<br>g/cc |
| 1         | 7.875        | 127              | 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                 | 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)<br>Stackable Microlog Tools | 11.50     | 4.00        | 215.00 |
| MCAL   | 20.87       |           |                   |  |           |             |        |
| MI     | 20.87       |           |                   |  |           |             |        |
| MN     | 20.87       |           |                   |  |           |             |        |
| RLL3   | 15.80       |           |                   |  |           |             |        |



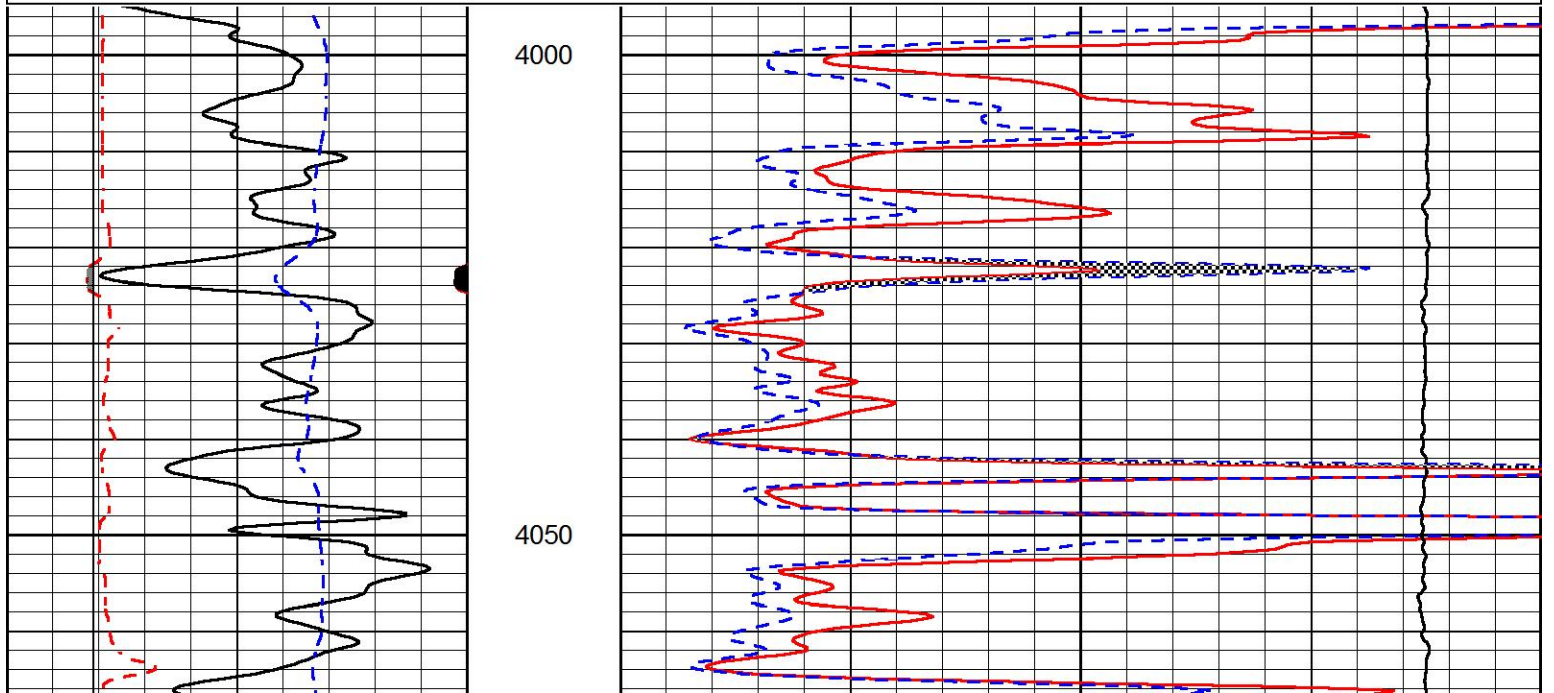
Dataset: murfin\_burr\_1\_6.db: field/well/stackml/pass3.1  
 Total length: 47.00 ft  
 Total weight: 835.00 lb  
 O.D.: 4.00 in

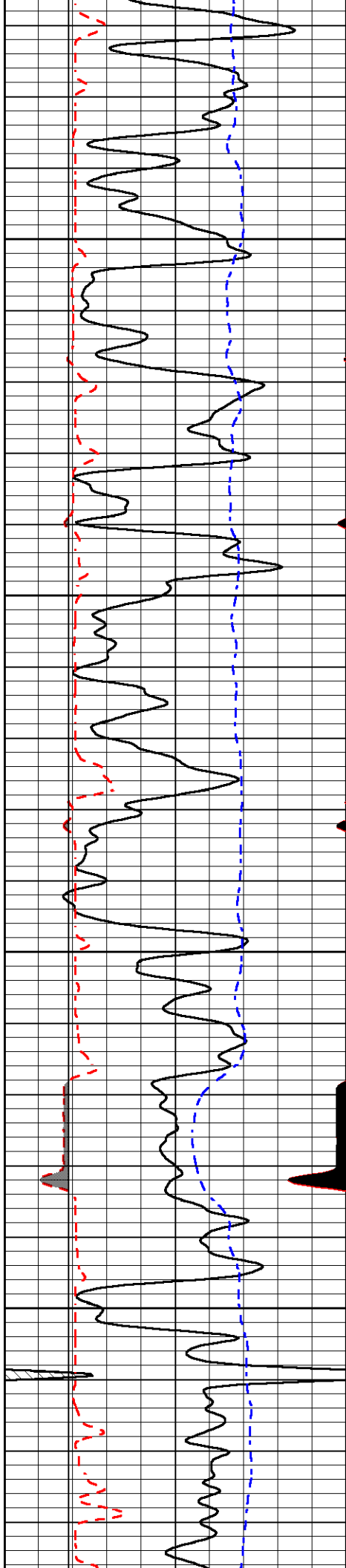


# MAIN PASS

Database File: murfin\_burr\_1\_6.db  
 Dataset Pathname: stackml/pass3.1  
 Presentation Format: micro  
 Dataset Creation: Fri Jan 17 00:32:42 2020  
 Charted by: Depth in Feet scaled 1:240

|      |                    |     |       |                             |    |
|------|--------------------|-----|-------|-----------------------------|----|
| 0    | GAMMA RAY (GAPI)   | 150 | 0     | MICRO INVERSE 1 X 1 (Ohm-m) | 40 |
| 6    | MICRO CALIPER (in) | 16  | 0     | MICRO NORMAL 2" (Ohm-m)     | 40 |
| 6    | BIT SIZE (in)      | 16  | 15000 | LINE TENSION (lb)           | 0  |
| -200 | SP (mV)            | 0   |       |                             |    |



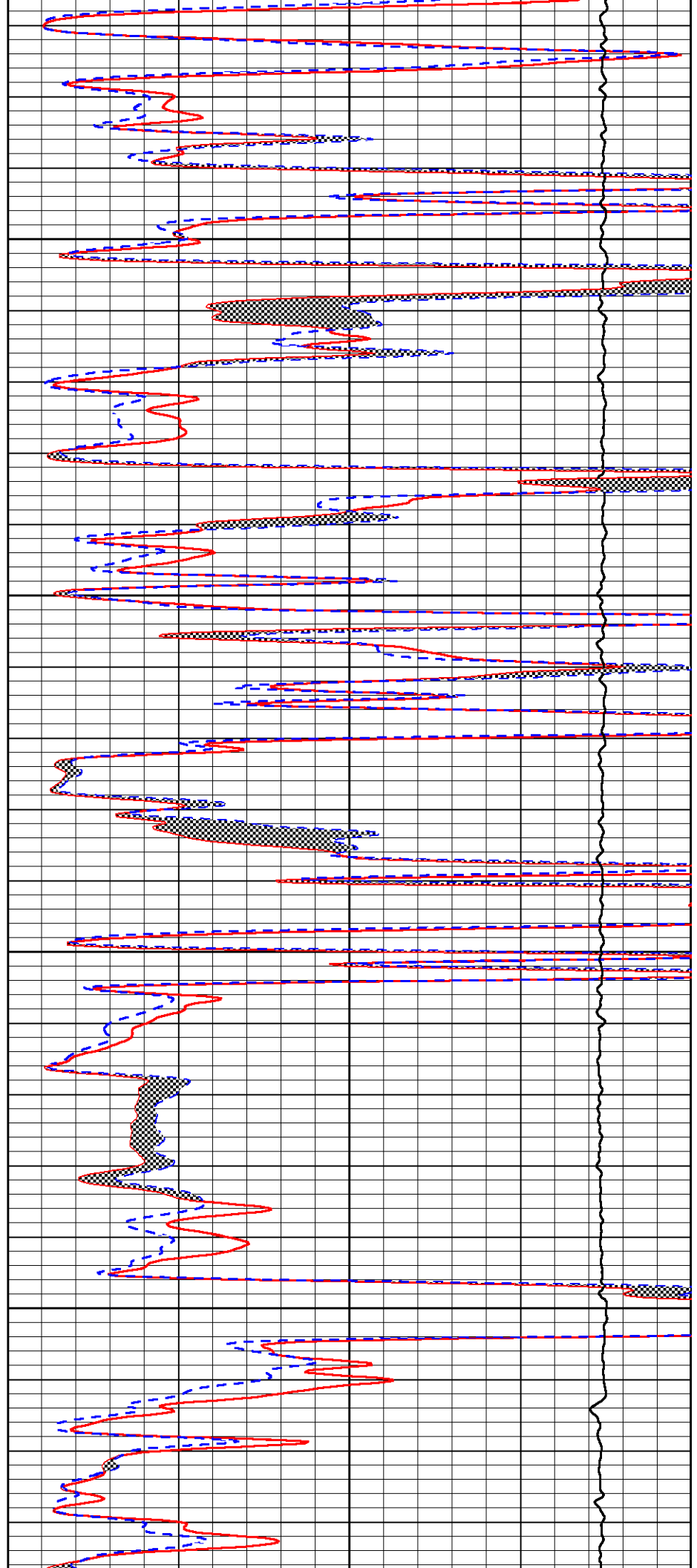


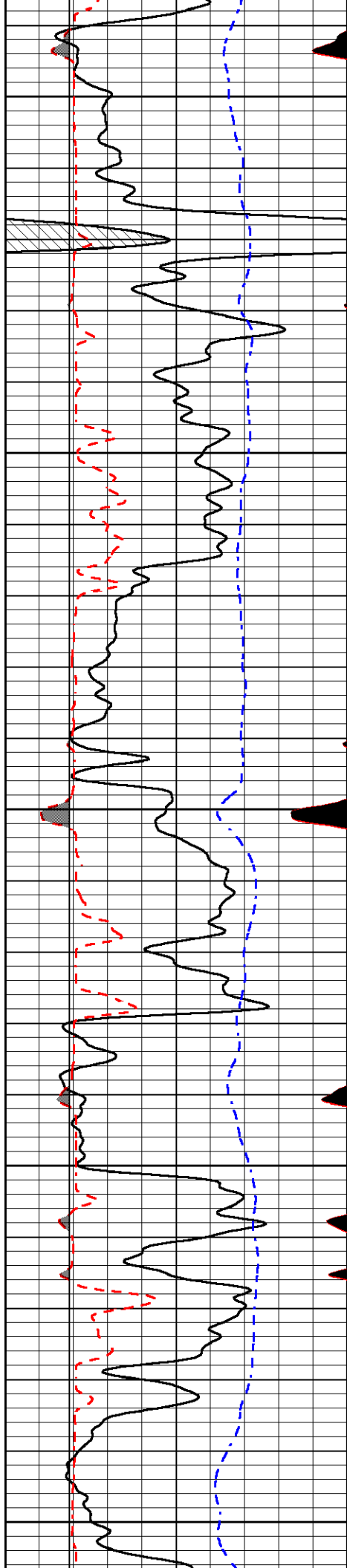
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4150

4200

4250





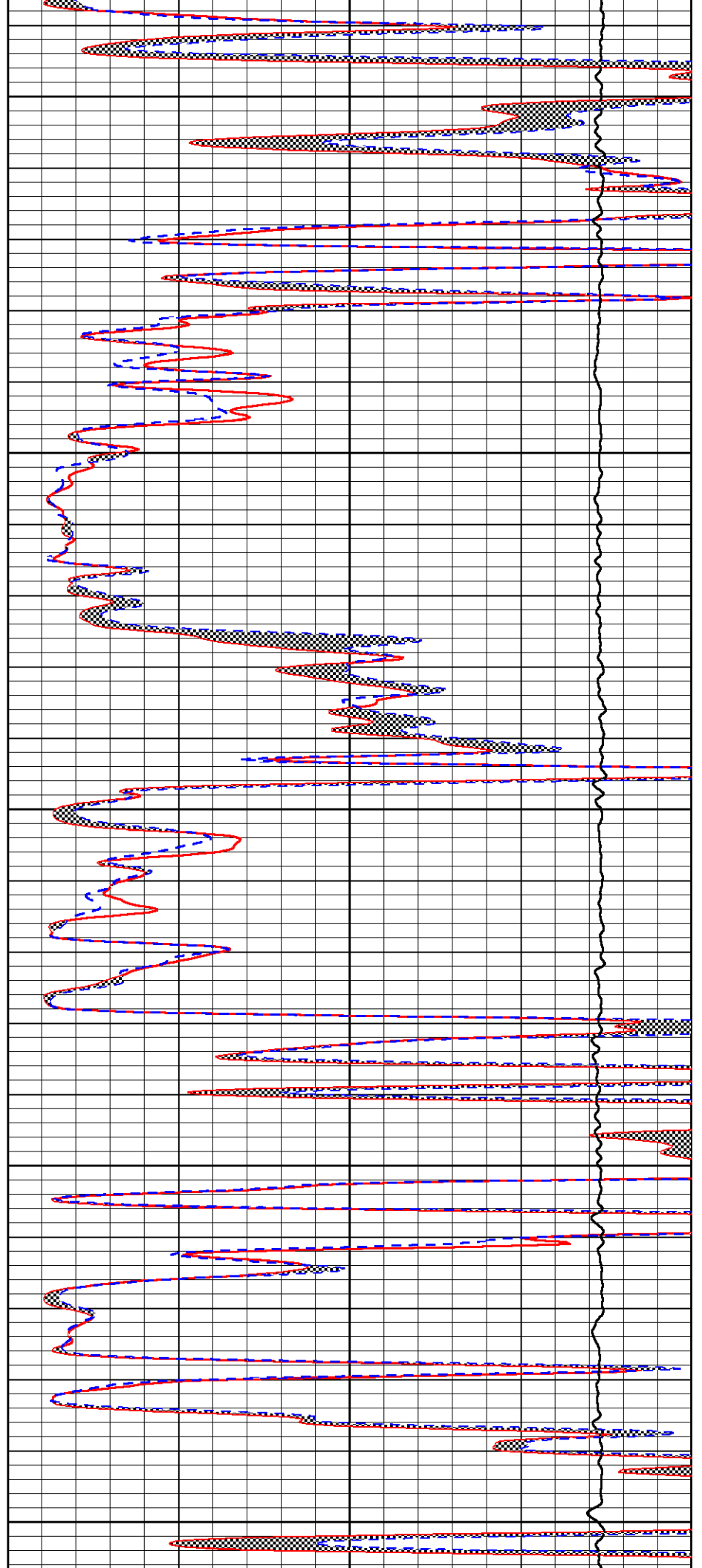
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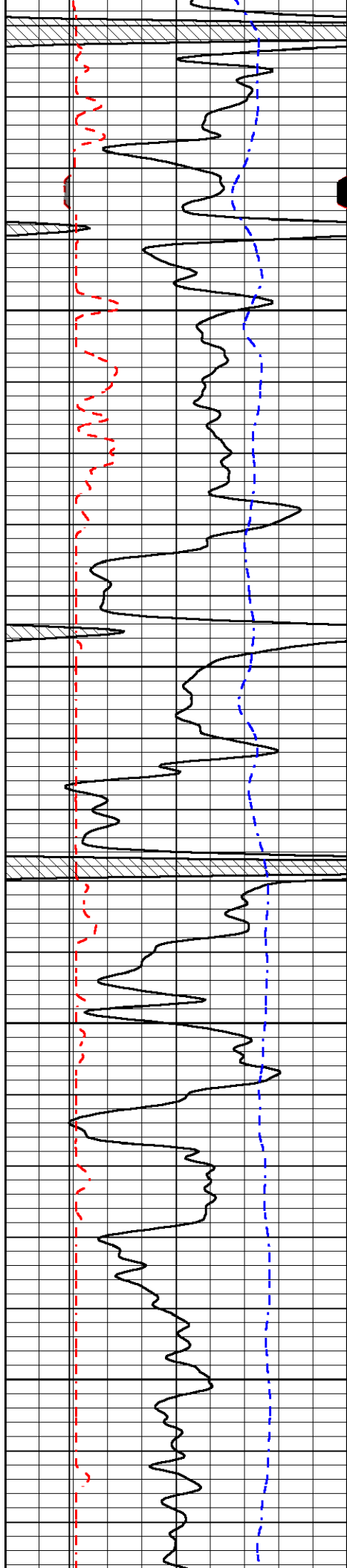
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4400

4450

4500



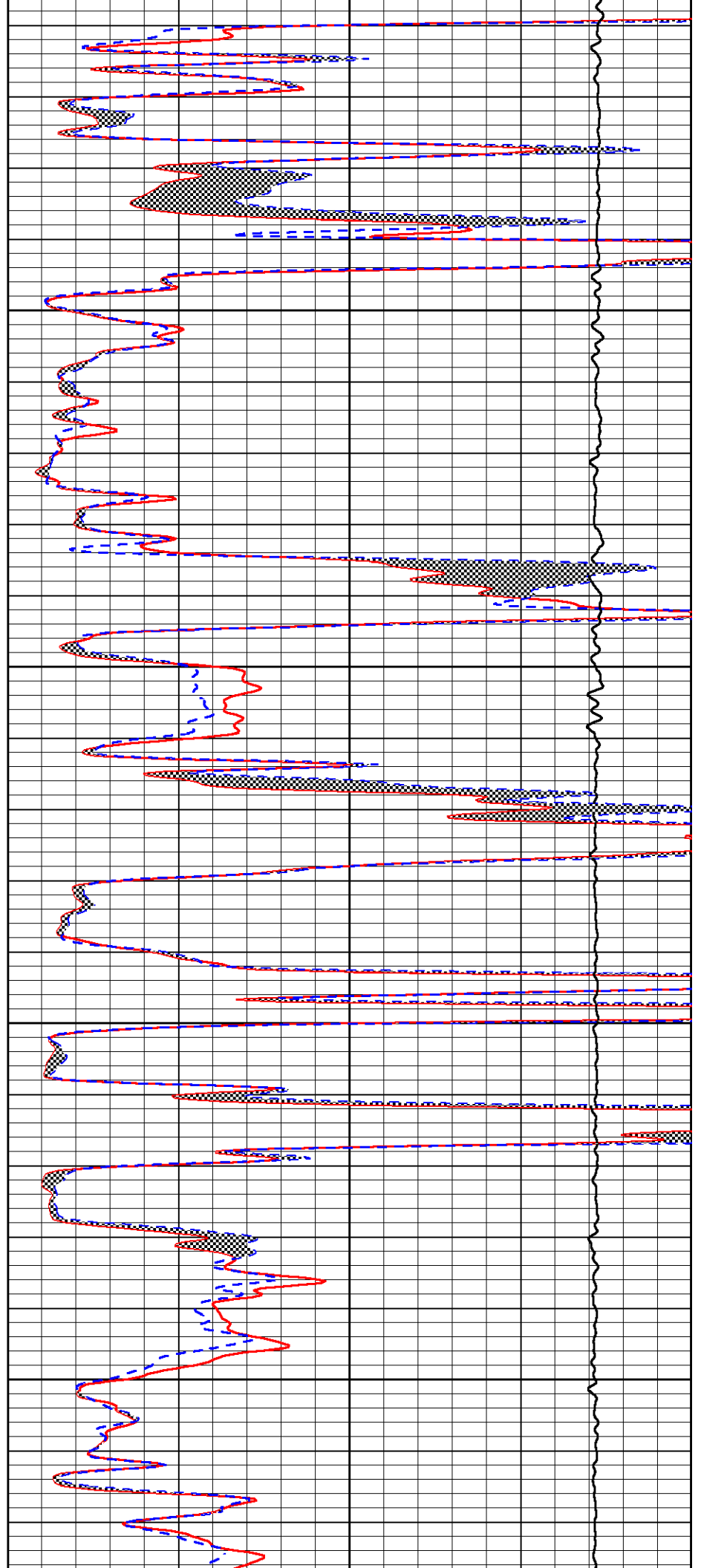


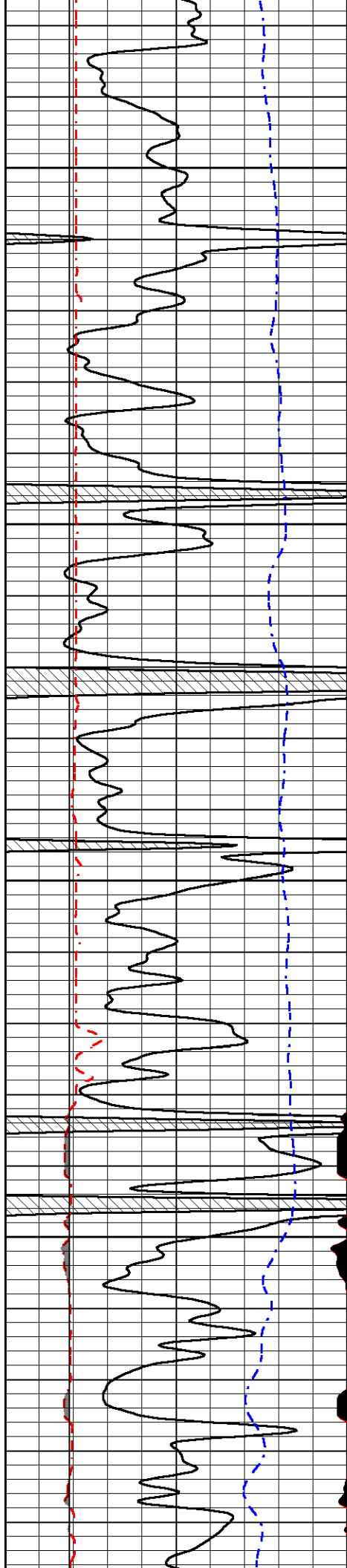
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4600

4650

4700



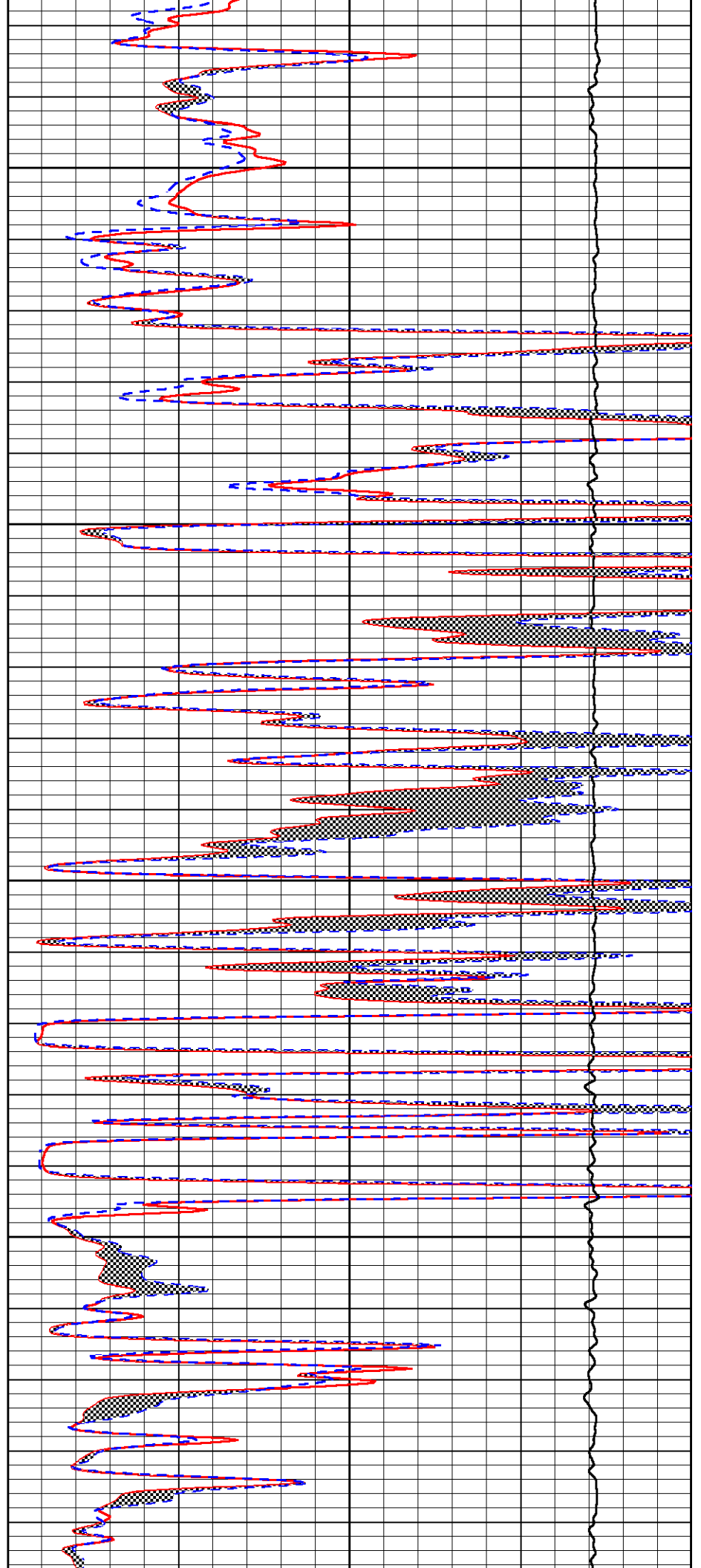


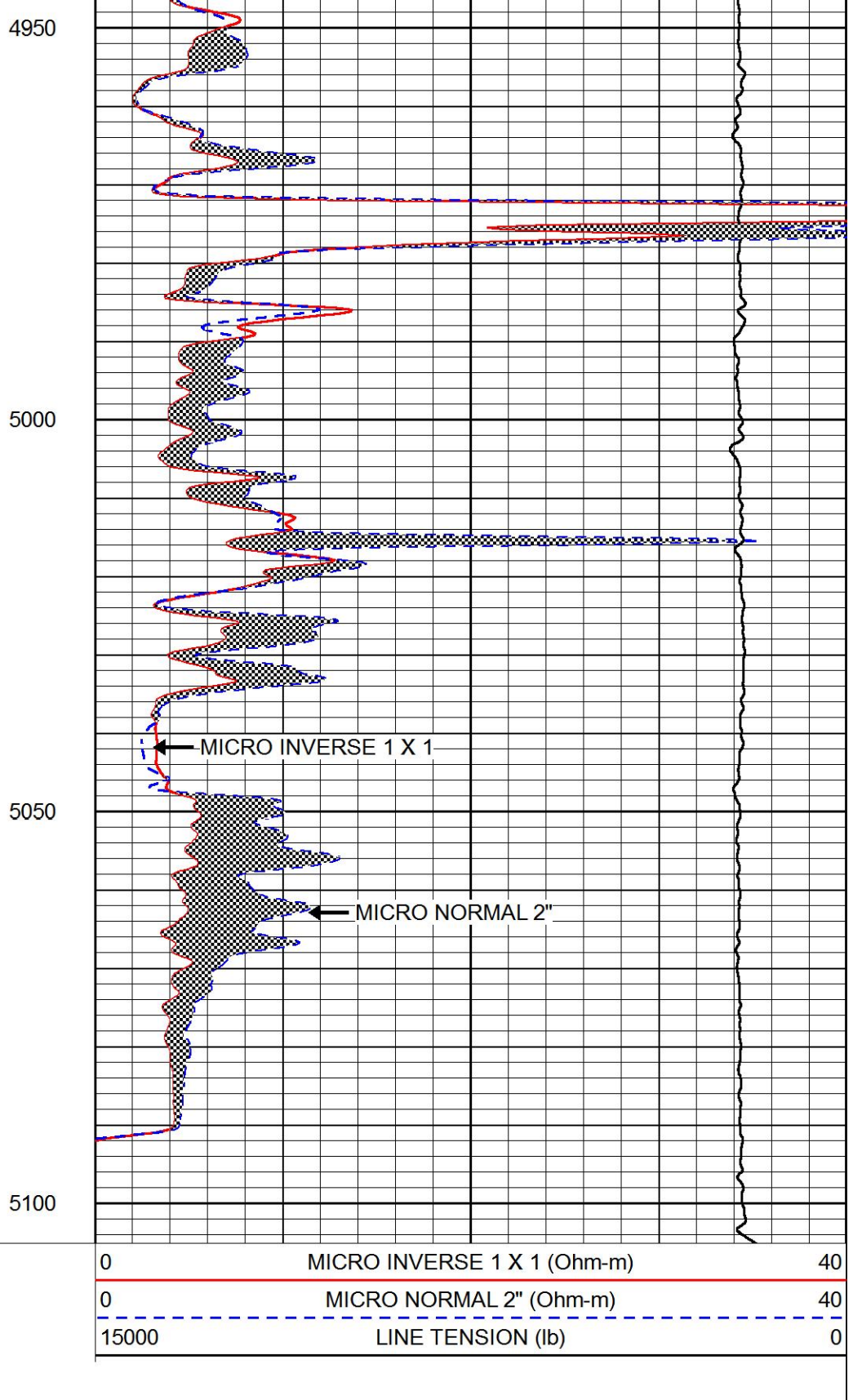
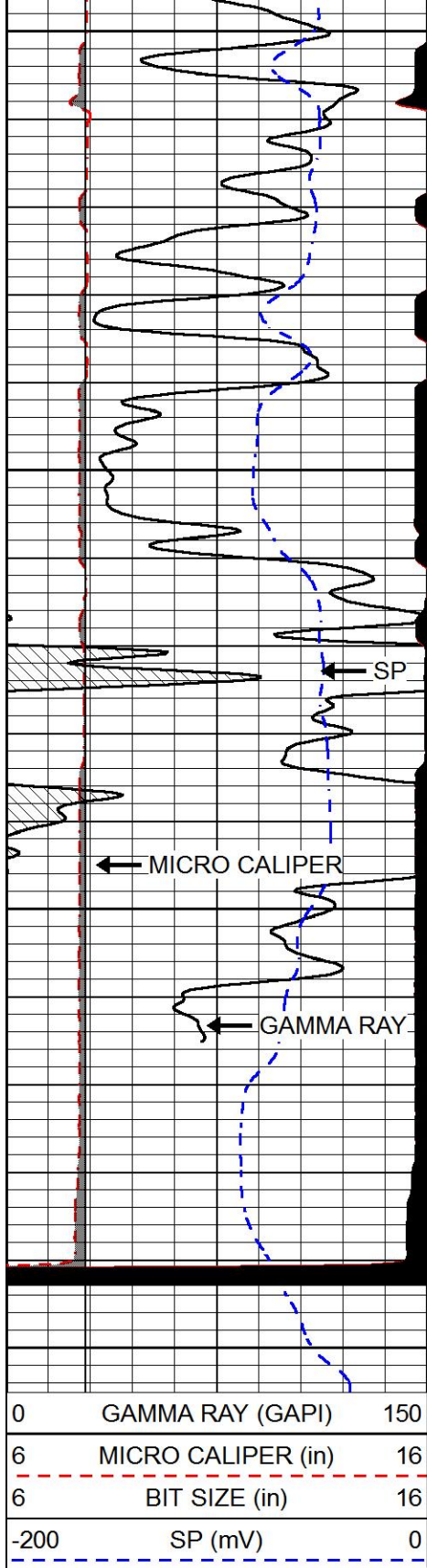
4750

4800

4850

4900



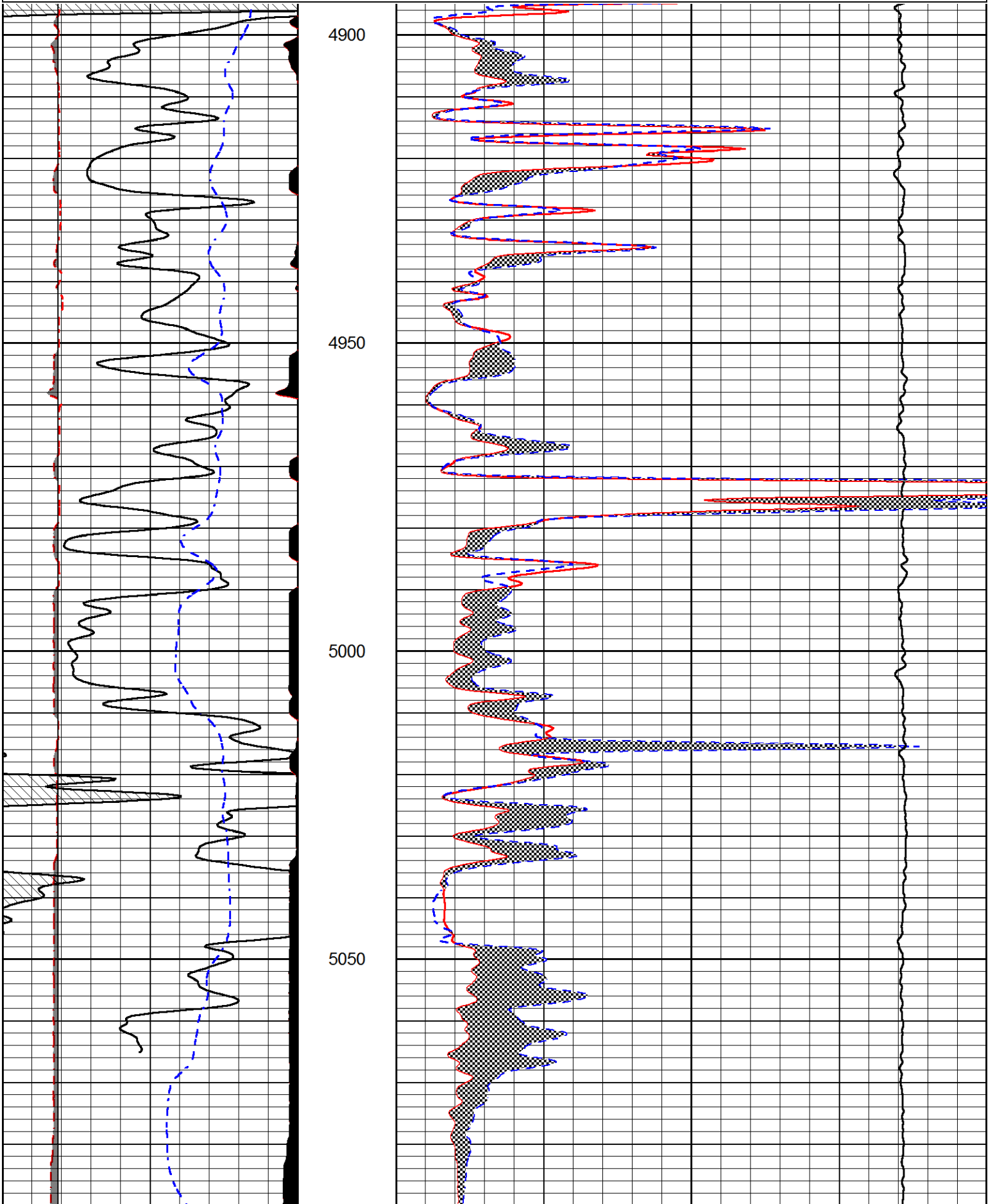


# REPEAT SECTION

Database File: murfin\_burr\_1\_6.db  
 Dataset Pathname: stackml/pass2.1  
 Presentation Format: micro  
 Dataset Creation: Thu Jan 16 23:42:43 2020  
 Charted by: Depth in Feet scaled 1:0.10

|      |                    |     |
|------|--------------------|-----|
| 0    | GAMMA RAY (GAPI)   | 150 |
| 6    | MICRO CALIPER (in) | 16  |
| 6    | BIT SIZE (in)      | 16  |
| -200 | SP (mV)            | 0   |

|       |                             |    |
|-------|-----------------------------|----|
| 0     | MICRO INVERSE 1 X 1 (Ohm-m) | 40 |
| 0     | MICRO NORMAL 2" (Ohm-m)     | 40 |
| 15000 | LINE TENSION (lb)           | 0  |



|      |                    |     |
|------|--------------------|-----|
| 0    | GAMMA RAY (GAPI)   | 150 |
| 6    | MICRO CALIPER (in) | 16  |
| 6    | BIT SIZE (in)      | 16  |
| -200 | SP (mV)            | 0   |

5100

|       |                             |    |
|-------|-----------------------------|----|
| 0     | MICRO INVERSE 1 X 1 (Ohm-m) | 40 |
| 0     | MICRO NORMAL 2" (Ohm-m)     | 40 |
| 15000 | LINE TENSION (lb)           | 0  |



|         |                               |
|---------|-------------------------------|
| Company | MURFIN DRILLING COMPANY, INC. |
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| County  | CHEYENNE                      |
| State   | KANSAS                        |