



**PIONEER**  
Pioneer Energy Services

**MICRORESISTIVITY  
LOG**

Company **MURFIN DRILLING COMPANY, INC.**  
Well **ANTHOLZ A #1-2**  
Field **WILDCAT**  
County **CHEYENNE** State **KANSAS**

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Well **ANTHOLZ A #1-2**  
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Location: **API #: 15-023-21475-00-00**  
**SE SE SE**  
**330' FEL & 330' FSL**  
**SEC 2 TWP 2S RGE 37W**  
Permanent Datum **GROUND LEVEL Elevation 3395'**  
Log Measured From **KELLY BUSHING**  
Drilling Measured From **KELLY BUSHING**  
Other Services  
**CNL/CDL**  
**DIL/BHCS**  
Elevation  
K.B. **3400'**  
D.F. **N/A**  
G.L. **3395'**

Date	2/4/2018
Run Number	TWO
Depth Driller	4950'
Depth Logger	4951'
Bottom Logged Interval	4950'
Top Log Interval	4000'
Casing Driller	8.625" @ 345'
Casing Logger	343'
Bit Size	7.875"
Type Fluid in Hole	CHEMICAL
Salinity, ppm CL	900
Density / Viscosity	9.4 56
pH / Fluid Loss	10.5 7.8
Source of Sample	FLOWLINE
Rm @ Meas. Temp	1.2 @ 62
Rmt @ Meas. Temp	0.9 @ 62
Rmc @ Meas. Temp	1.62 @ 62
Source of Rmf / Rmc	CHARTS
Rm @ BHT	0.59 @ 126
Operating Rig Time	4 HOURS
Max Rec. Temp. F	126 DEG F
Equipment Number	108
Location	HAYS
Recorded By	T. MARTIN
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**

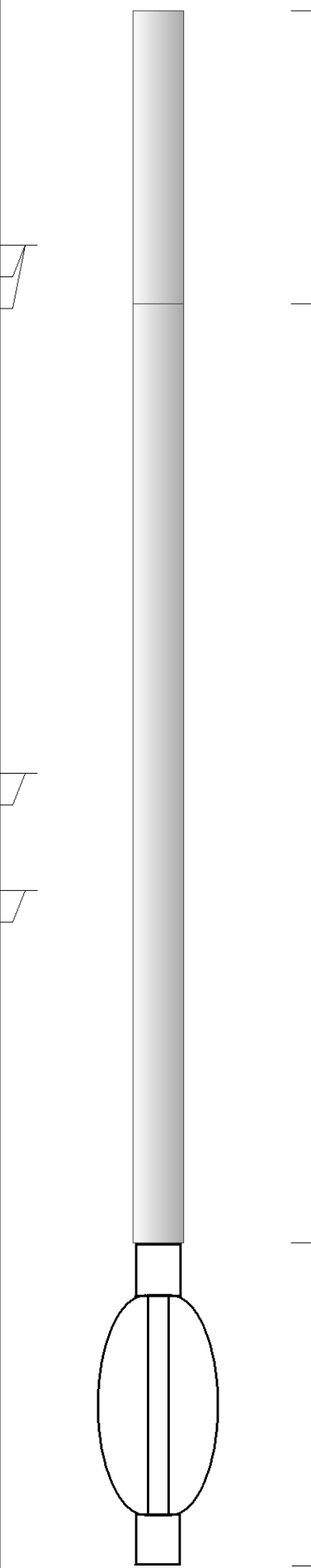
**N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.**

**MCDONALD, 7 N ON RD 3 TO RD W, 3 W TO RD 34, 1 N, 0.1 W, N INTO**

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

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

<b>Your Pioneer Energy Services Crew</b>	<b>This Log Record Was Witnessed By</b>
Engineer: <b>T. MARTIN</b>	Primary Witness: <b>SAMAN SHARIFAIE</b>
Operator:	Secondary Witness:
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
MCAL MI MN	22.50 22.50 22.50		ML-Armadillo (Armadillo-1) Pengo micro log tool mandrel with Armadillo Electronics	5.00	3.50	100.00
WVF4 WVF1	13.50 13.50		SLT-PENGO (0001)	16.00	3.50	300.00
WVF3 WVF2	11.50 11.50					
			CENT-PENGO	5.50	3.00	70.00

Dataset: murfin\_antholz a\_#1-2.db: field/well/sonmel/pass3  
 Total length: 26.50 ft  
 Total weight: 470.00 lb  
 O.D.: 3.50 in

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\murfin\_antholz\_a\_#1-2.db  
 Dataset field/well/stack/pass3.1/\_vars\_

## Top - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	126	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	-160	10	Off	4951

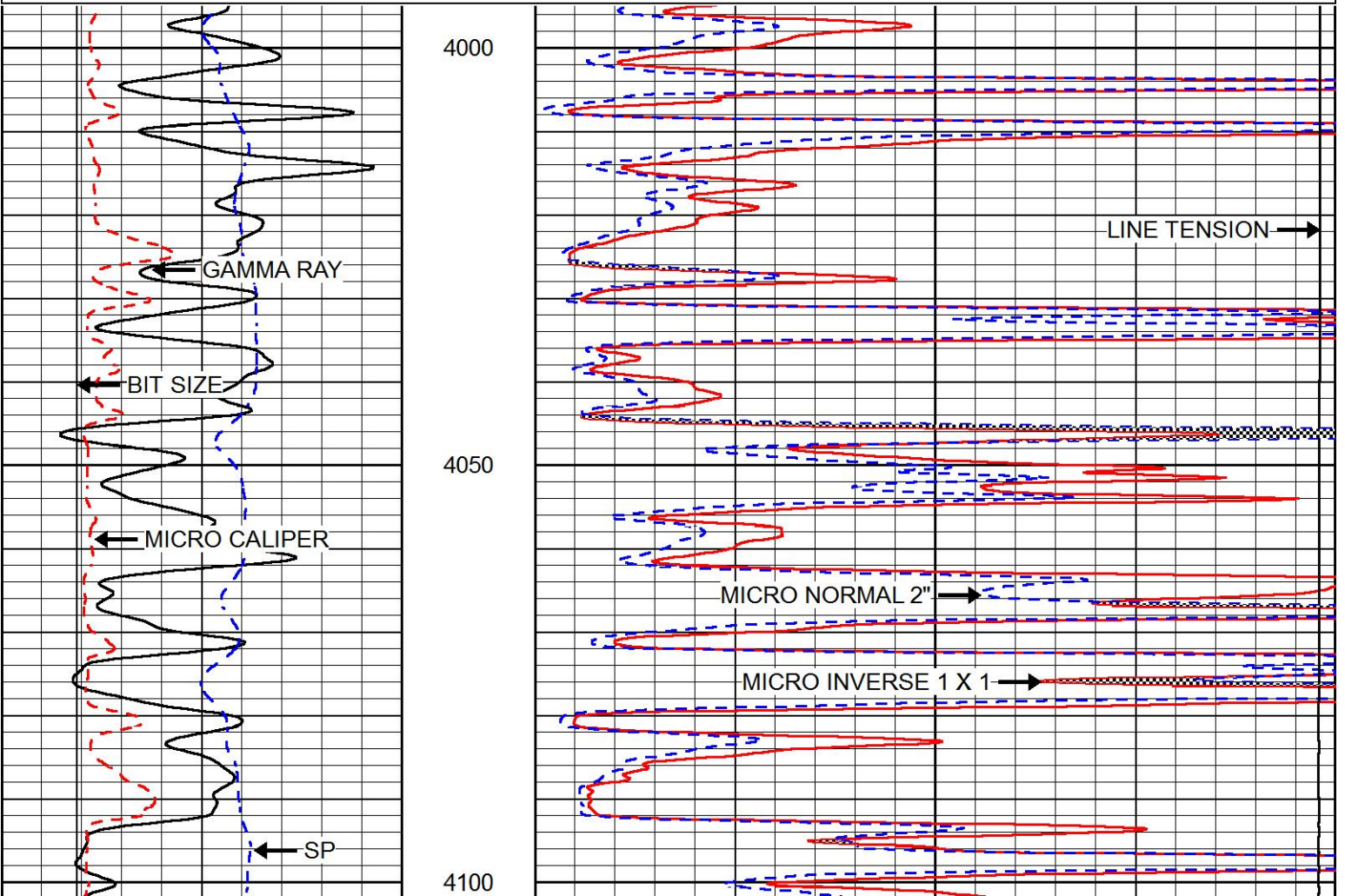


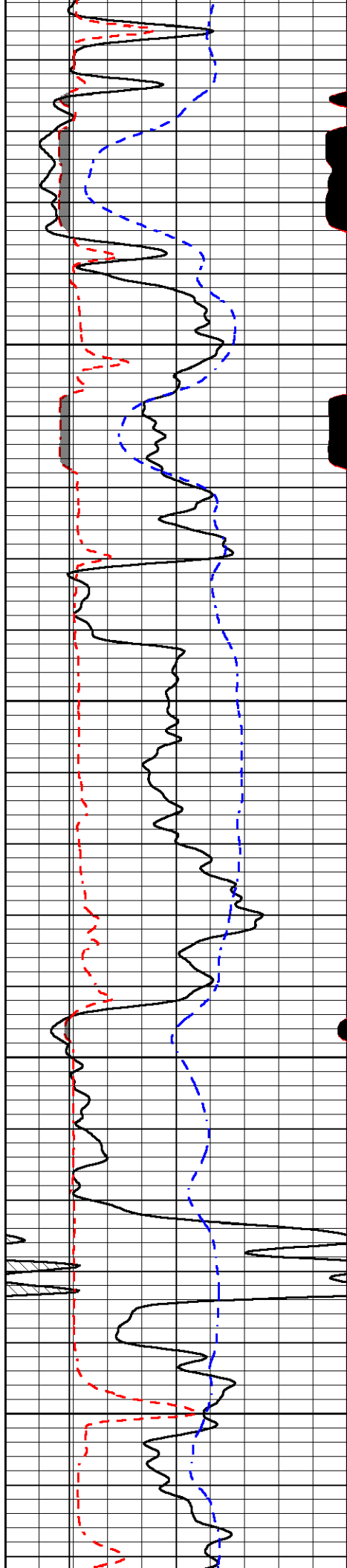
# MAIN PASS

Database File murfin\_antholz\_a\_#1-2.db  
 Dataset Pathname stack/pass3.1  
 Presentation Format micro  
 Dataset Creation Sun Feb 04 12:53:28 2018  
 Charted by Depth in Feet scaled 1:240

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



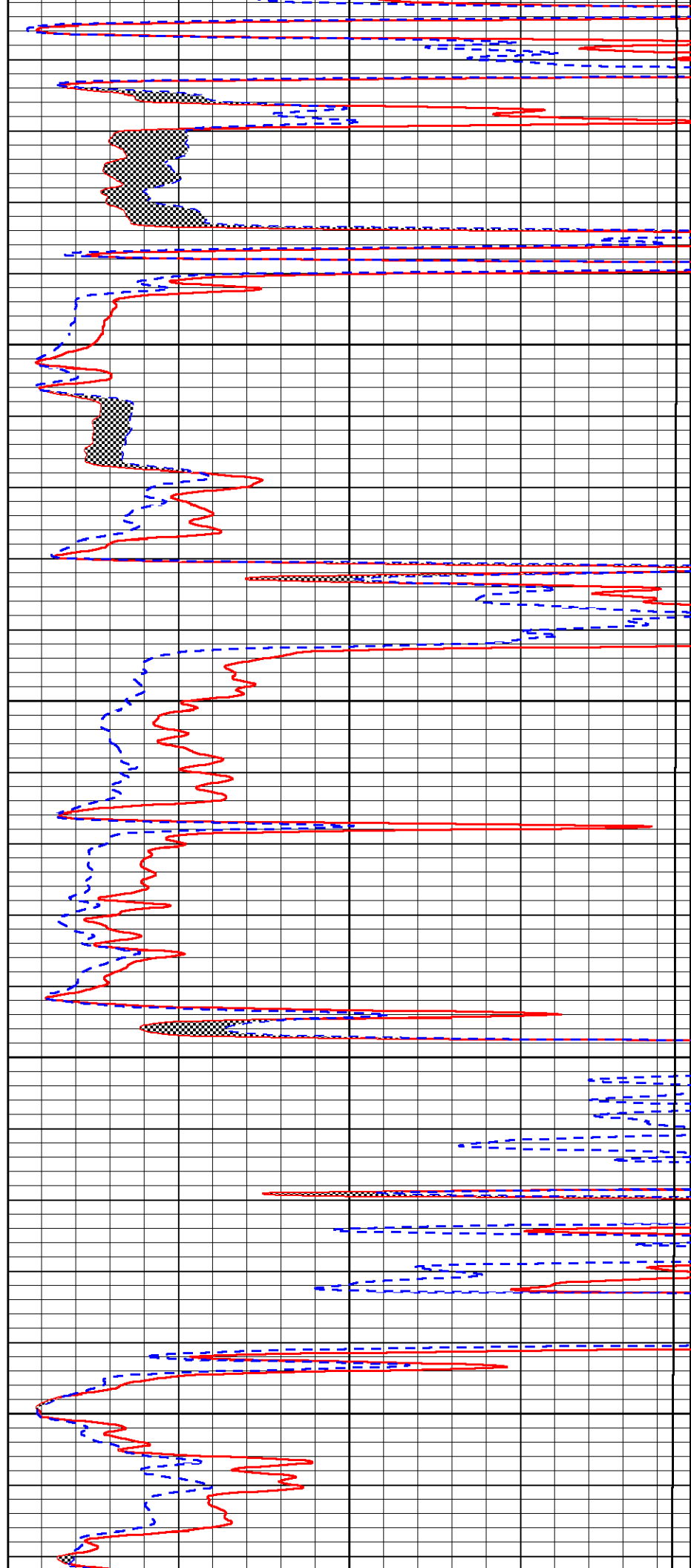


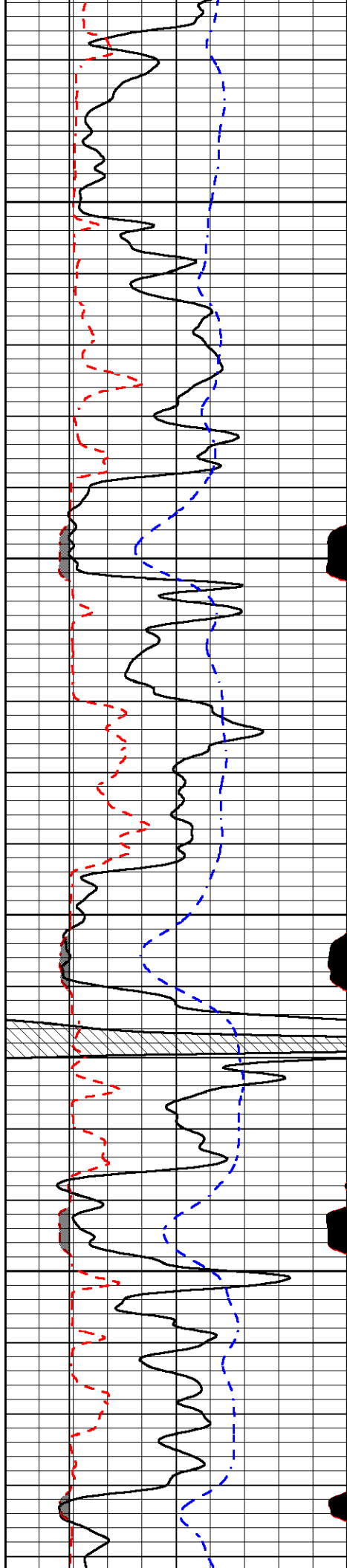
4150

4200

4250

4300



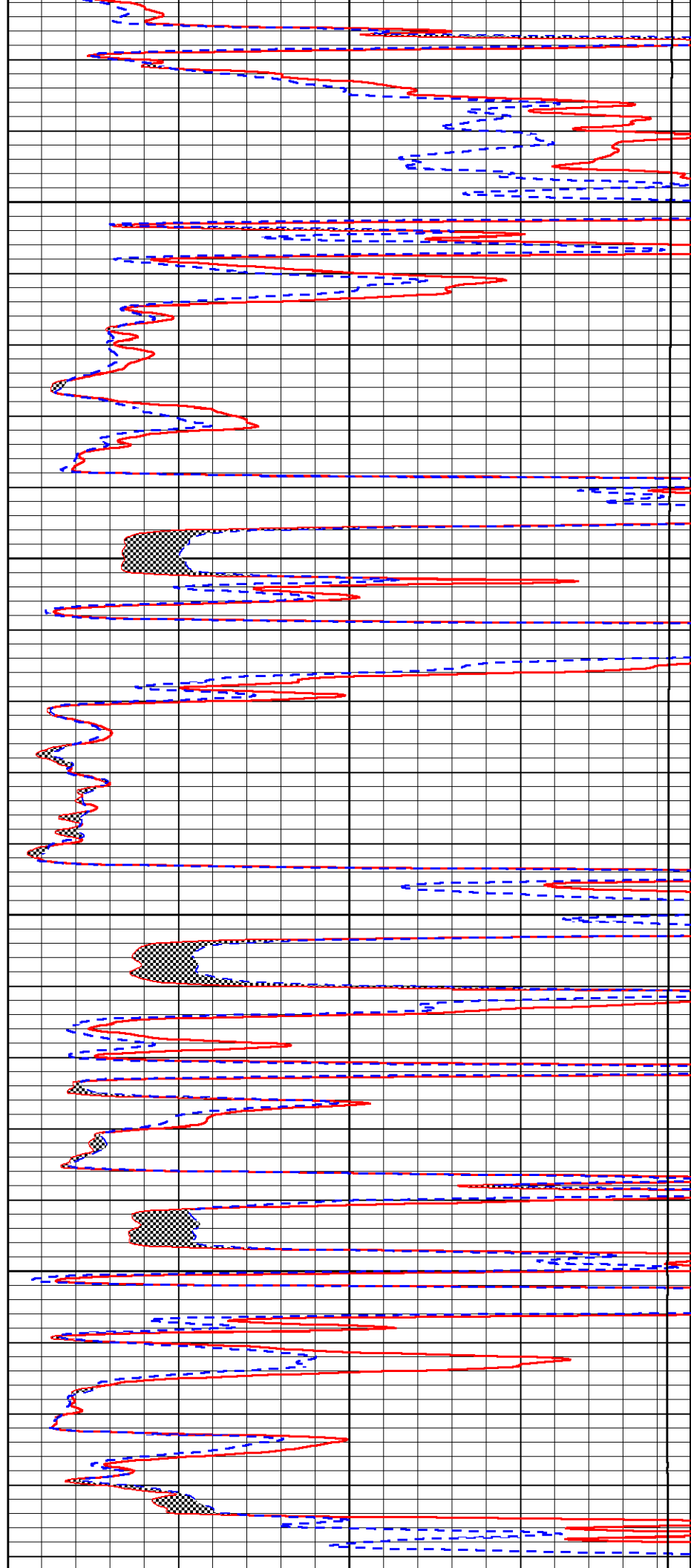


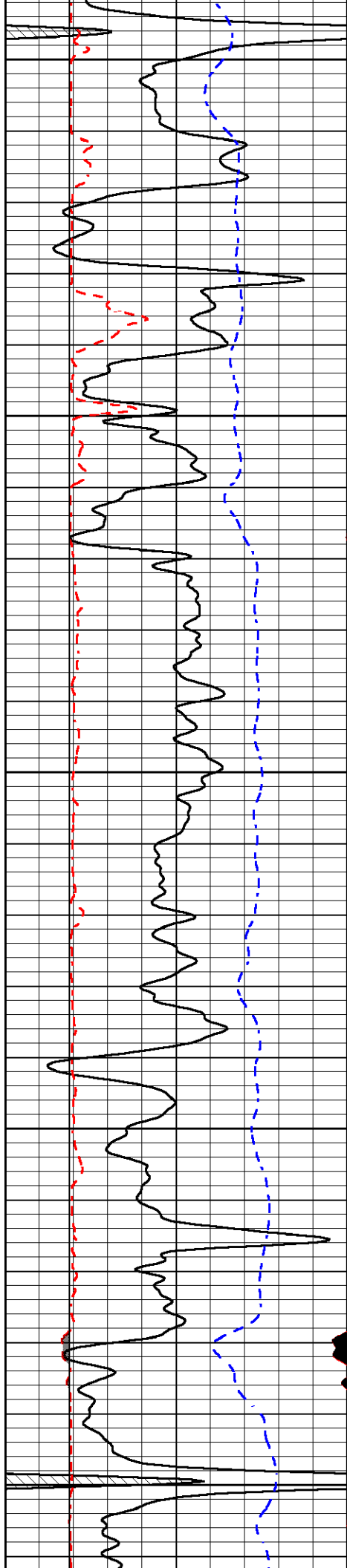
4350

4400

4450

4500





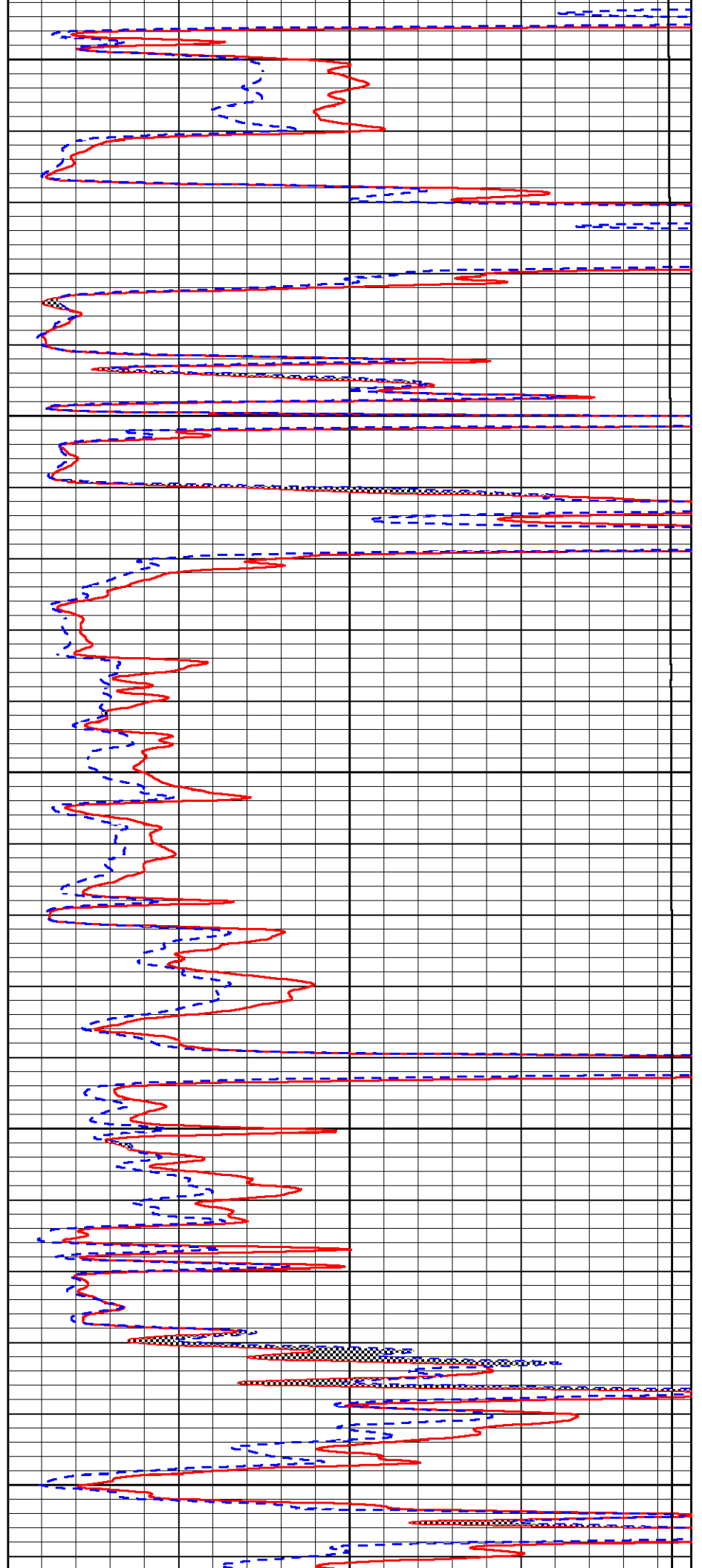
4550

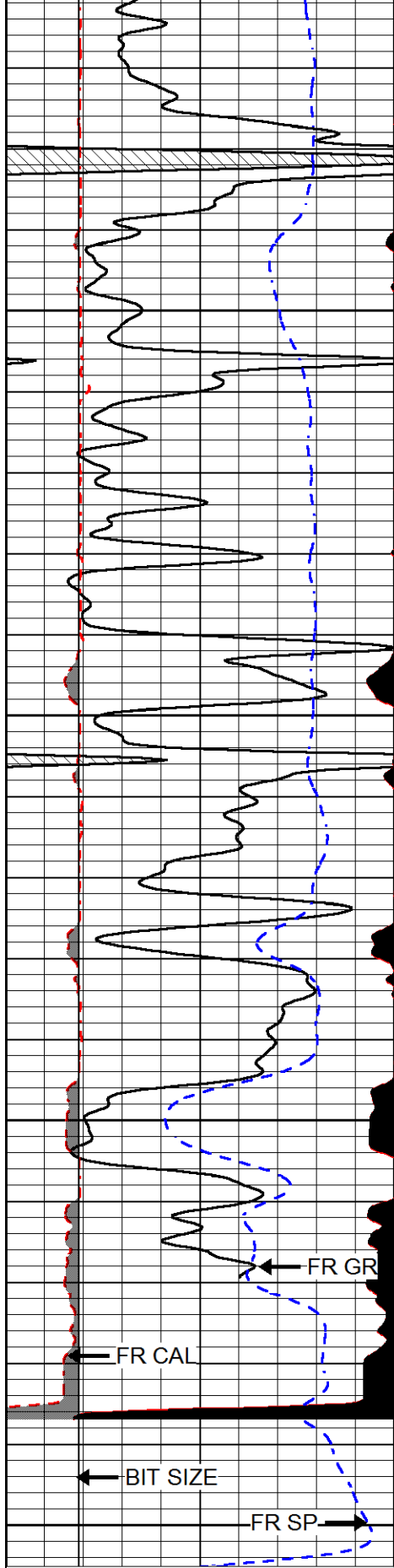
4600

4650

4700

4750





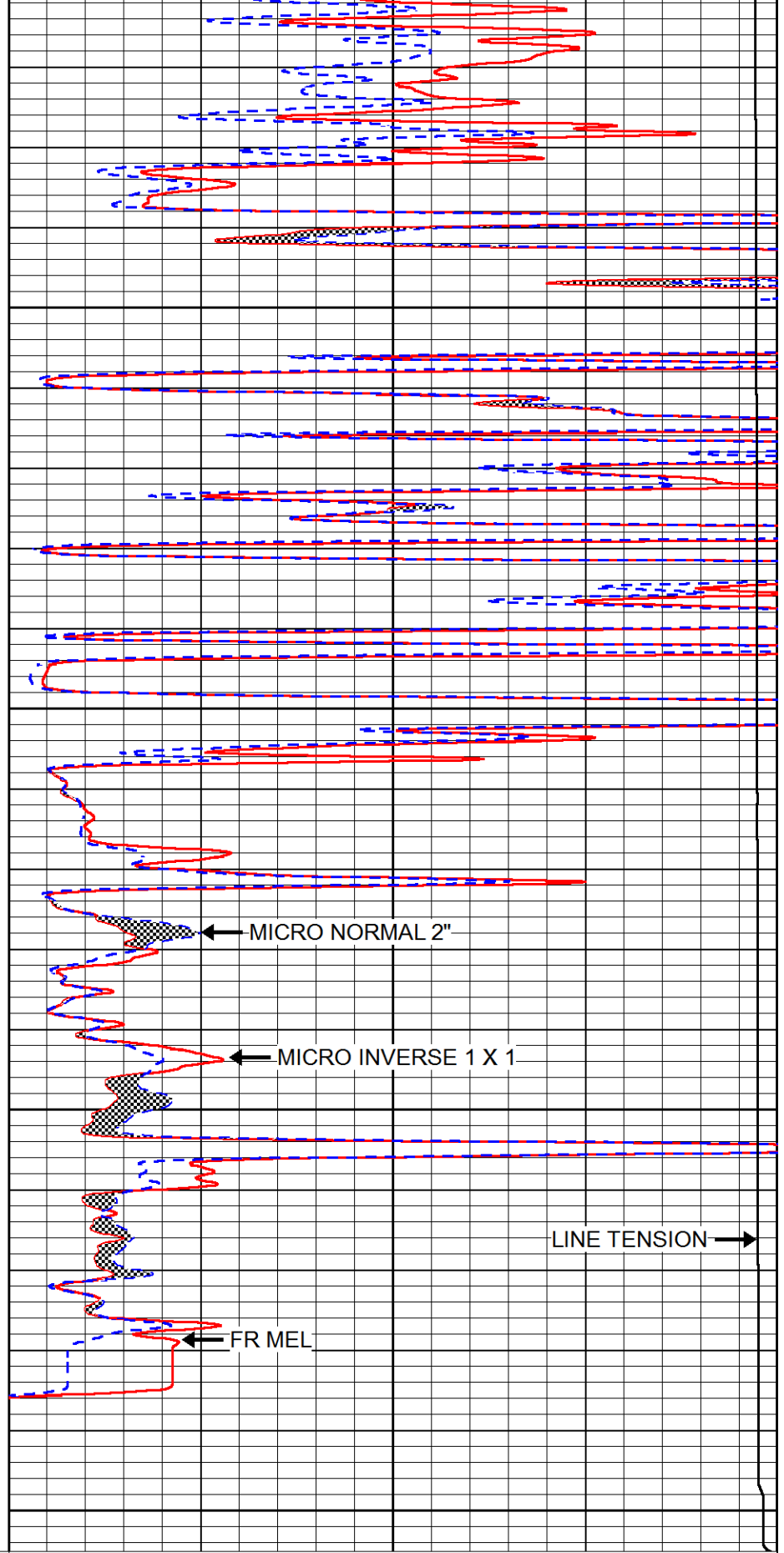
4800

4850

4900

4950

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



MICRO NORMAL 2"

MICRO INVERSE 1 X 1

FR MEL

LINE TENSION

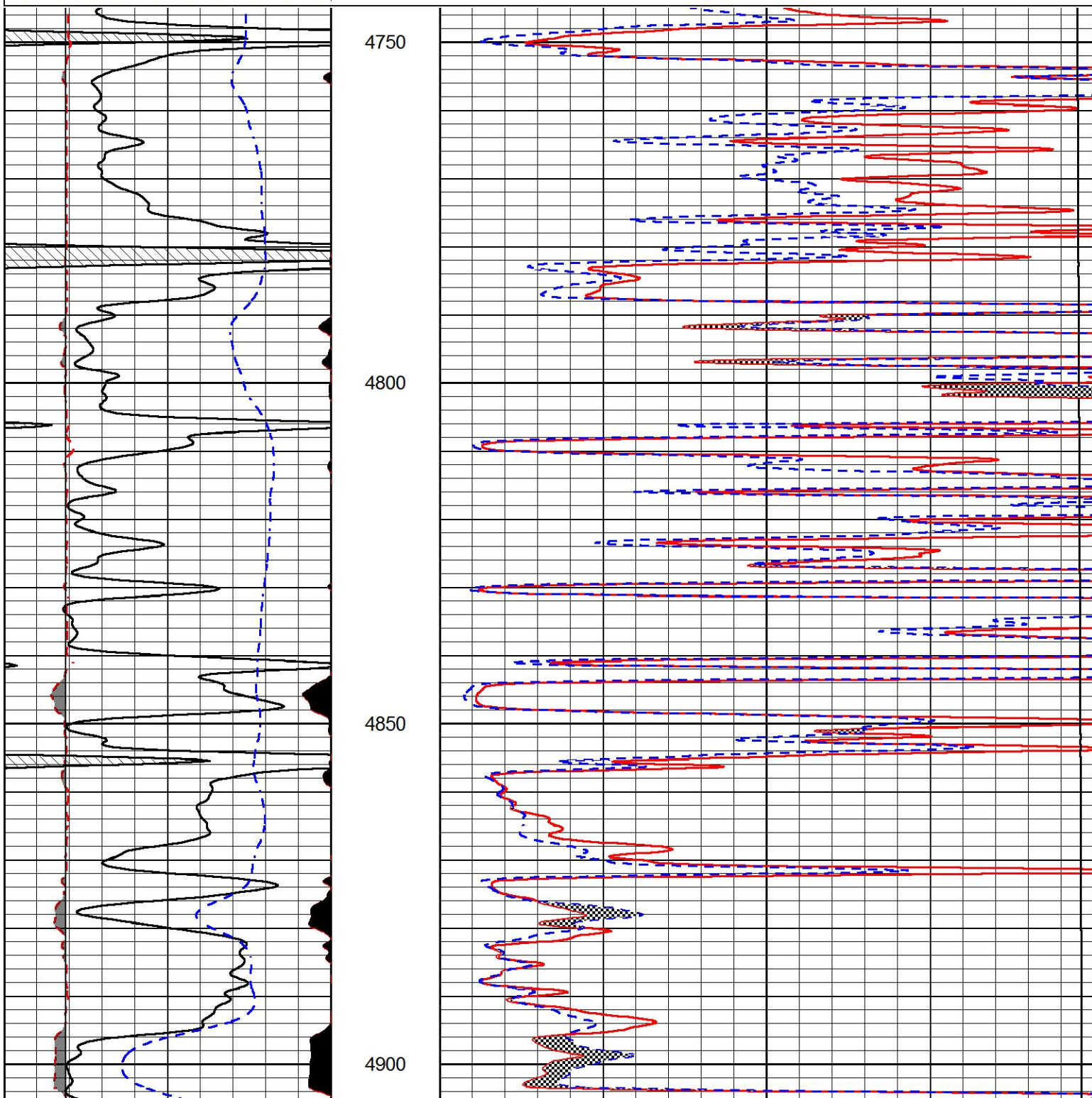
0	MICRO INVERSE 1 X 1 (Ohm-m)	40
0	MICRO NORMAL 2" (Ohm-m)	40
15000	LINE TENSION (lb)	0

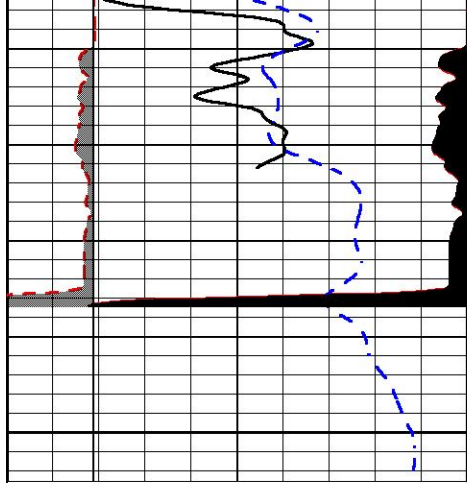
# REPEAT SECTION

Database File      murfin\_antholz a\_#1-2.db  
 Dataset Pathname    stack/pass2.1  
 Presentation Format   micro  
 Dataset Creation     Sun Feb 04 11:51:51 2018  
 Charted by          Depth in Feet scaled 1:240

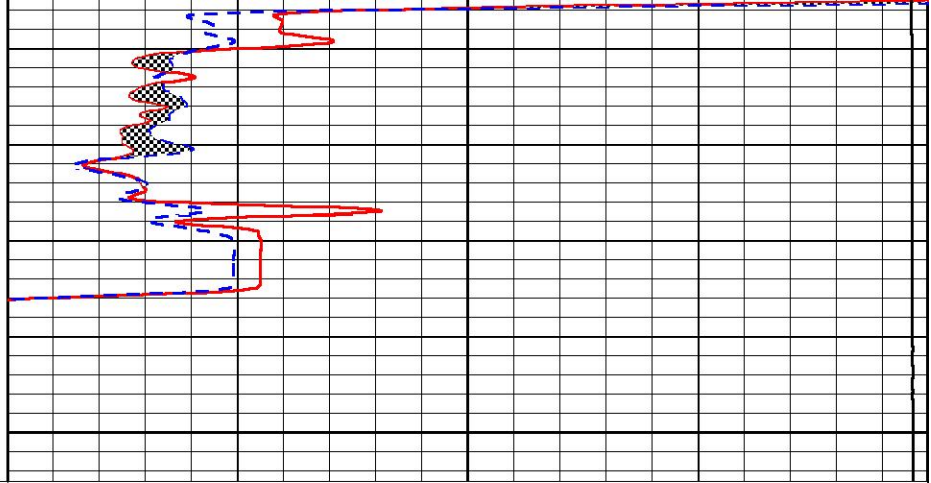
0	GAMMA RAY (GAPI)	150
6	MICRO CALIPER (in)	16
6	BIT SIZE (in)	16
-200	SP (mV)	0

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





4950



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

### Calibration Report

Database File murfin\_antholz\_a\_#1-2.db  
 Dataset Pathname sonmel/pass3.1  
 Dataset Creation Sun Feb 04 14:07:21 2018

### Microlog Calibration Report

Serial-Model:  
 Performed:

Armadillo-1-Armadillo  
 Fri Nov 18 11:19:49 2016

	Readings			References			Results	
	Zero	Cal		Zero	Cal		m	b
Normal	0.0122	1.0361	V	0.0000	10.0000	Ohm-m	30.0000	-1.3000
Inverse	-0.0037	0.9549	V	0.0000	10.0000	Ohm-m	20.0000	-1.3000
Caliper	1.1139	8.3644	V	5.0000	19.0000	in	1.9309	3.7493



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