



Weatherford[®]

MICRORESISTIVITY LOG

COMPANY	O'BRIEN ENERGY RESOURCES CORP.		
WELL	STOLTZFUS 1-34		
FIELD	MOHLER		
PROVINCE/COUNTY	MEADE		
COUNTRY/STATE	U.S.A. / KANSAS		
LOCATION	335' FNL & 335' FWL		
SEC 34	TWP 33N	RGE 29W	Other Services
Latitude			MAI/MFE
Longitude			MPD/MDN
API Number	15-119-21392		
Permanent Datum GL, Elevation	2539 feet		
Log Measured From	KB		Elevations: KB 2552.00
Drilling Measured From	KB @ 13 feet		DF 2550.00
			GL 2539.00
Date	02-SEP-2015		
Run Number	ONE		
Service Order	7884-128390013		
Depth Driller	6400.00	feet	
Depth Logger	6399.00	feet	
First Reading	6366.00	feet	
Last Reading	4000.00	feet	
Casing Driller	1496.00	feet	
Casing Logger	1493.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	WBM		
Density / Viscosity	9.10 lb/USg	71.00 CP	
PH / Fluid Loss	11.50	7.40 ml/30Min	
Sample Source	MUD PIT		
Rm @ Measured Temp	1.32 @ 75.0	ohm-m	
Rmf @ Measured Temp	1.05 @ 75.0	ohm-m	
Rmc @ Measured Temp	1.58 @ 75.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.76 @ 132.0	ohm-m	
Time Since Circulation	3 HOURS		
Max Recorded Temp	132.00	deg F	
Equipment / Base	13096	LIB	
Recorded By	MILES WILKINS		
Witnessed By	ROGER PEARSON		
JOB #:	LB15-119		PETE DEEBHAM

BOREHOLE RECORD

Last Edited: 02-SEP-2015 11:13

Bit Size inches	Depth From feet	Depth To feet
7.875	1496.00	6400.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	1496.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 15.01.3109.
- TOOL STRING: MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION.
- HARDWARE: MDN: DUAL BOWSPRING ECCENTRALIZER.
MFE: 1 X 0.5 INCH STANDOFF.
MAI: 2 X 0.5 INCH STANDOFF.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- REPEAT AND HIGH RESOLUTION SECTIONS PLOTTED ON SANDSTONE MATRIX PER CUSTOMER REQUEST.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- HIGH RESOLUTION LOGS REQUESTED FROM TD TO 5650 FT.

- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING.: 1800 CU. FT.

- ANNULAR HOLE VOLUME WITH 4.5 INCH CASING FROM TD TO SURFACE CASING: 1259 CU. FT.

- SERVICE ORDER # 7884-128390013.

- RIG: DUKE DRILLING #7.

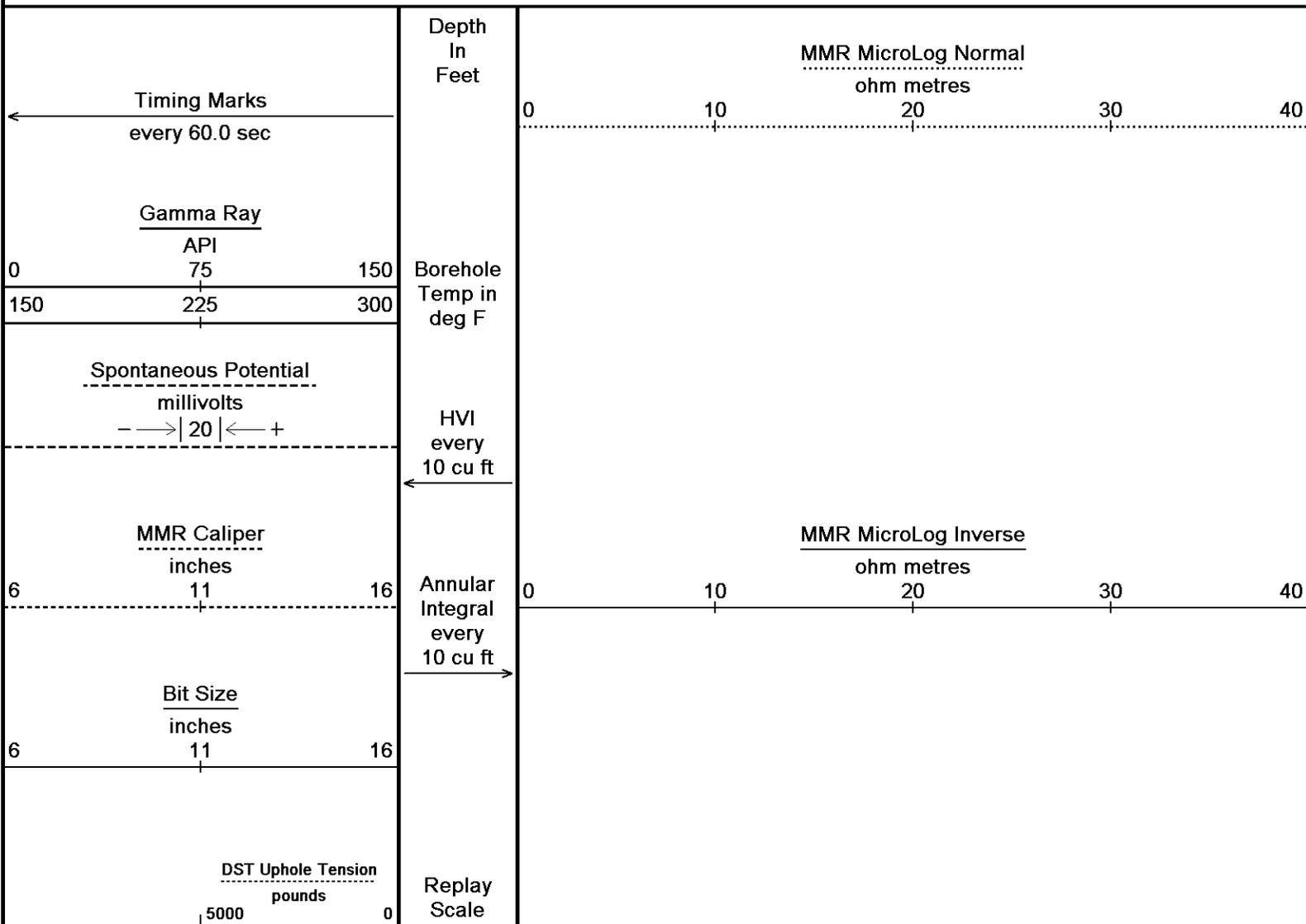
- ENGINEER: MILES WILKINS.

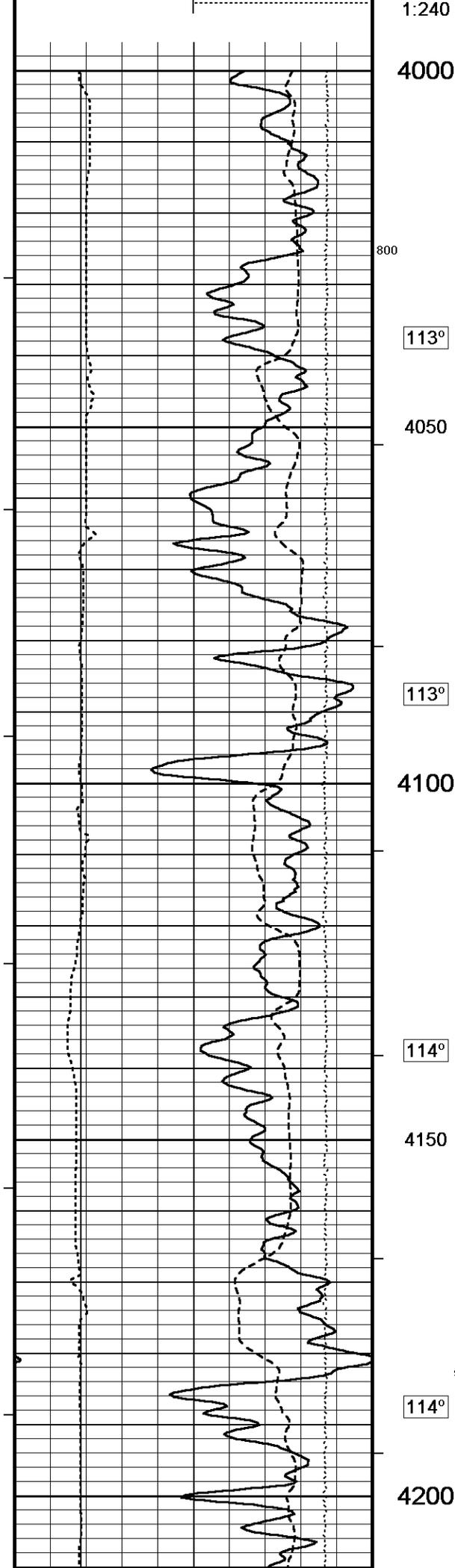
- OPERATORS: JOHN LAPOINT _NICK ADAME.

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 02-SEP-2015 17:57
 Filename: C:\Minimus 15.01.3109\Log Data\O'Brien Stoltzfus 1-34\O'Brien Stoltzfus 1-34 Main Pass.dta Recorded on 02-SEP-2015 14:55
 System Versions: Logged with 15.01.3109 Processed with 15.01.3109 Plotted with 15.01.3109





113°

4050

113°

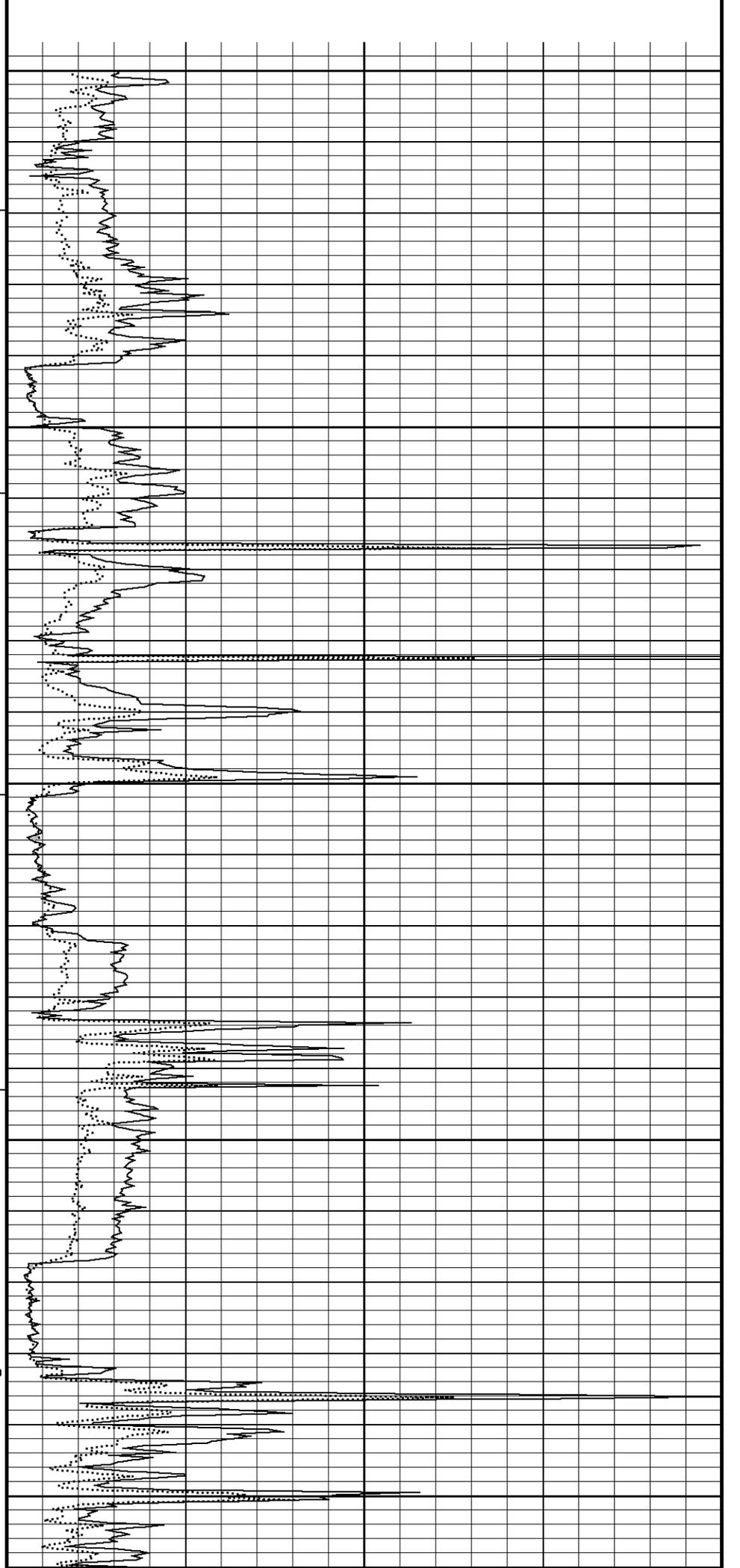
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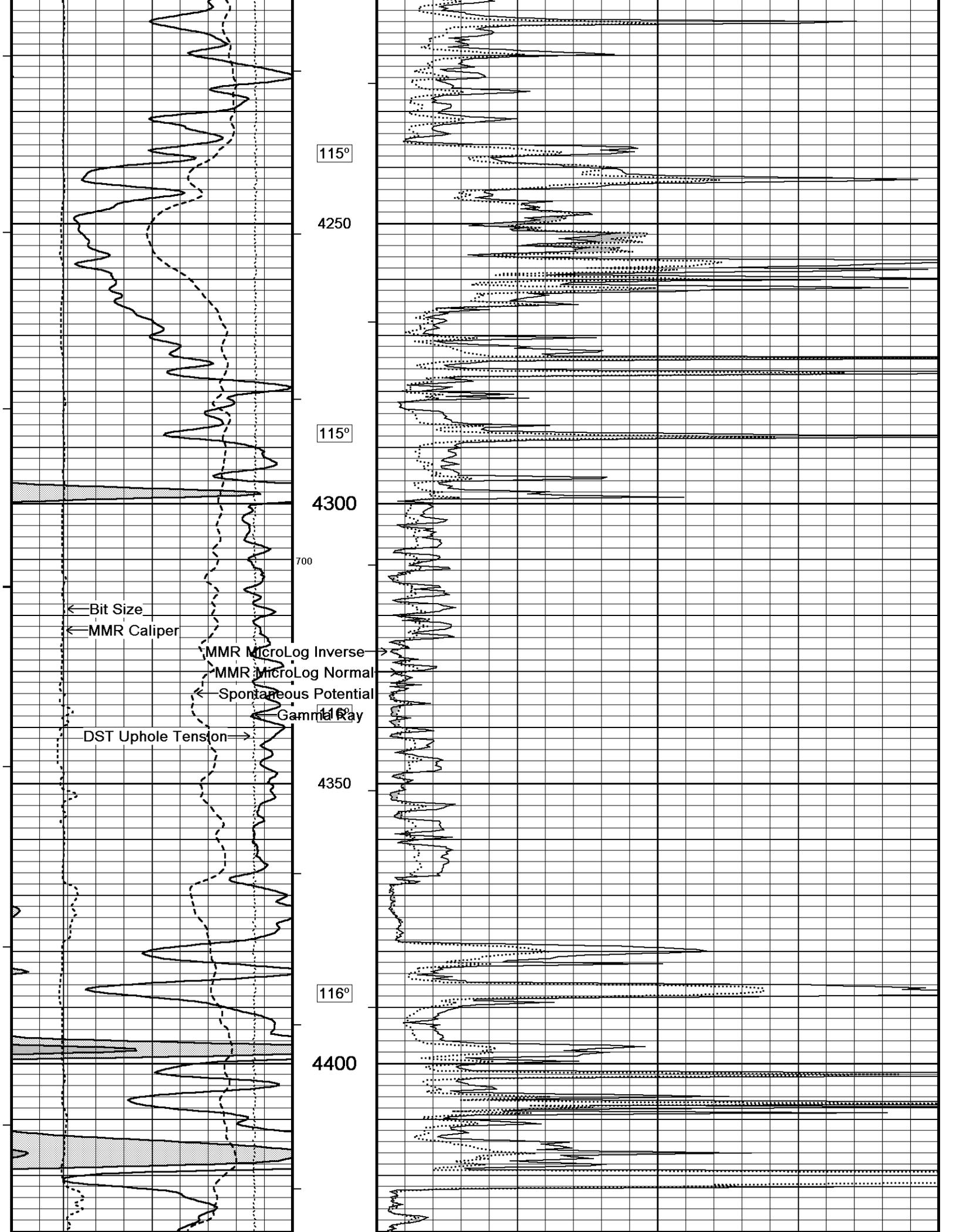
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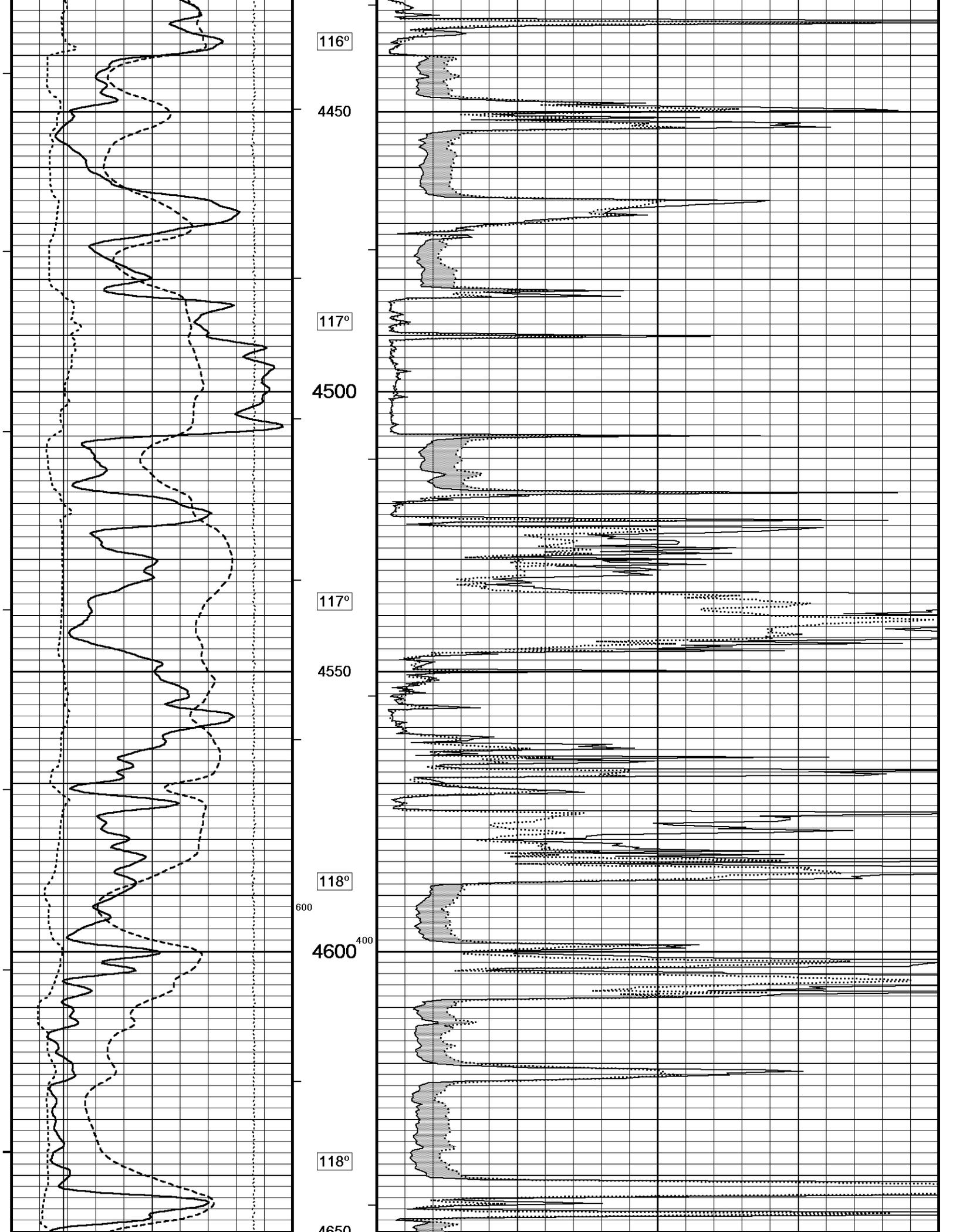
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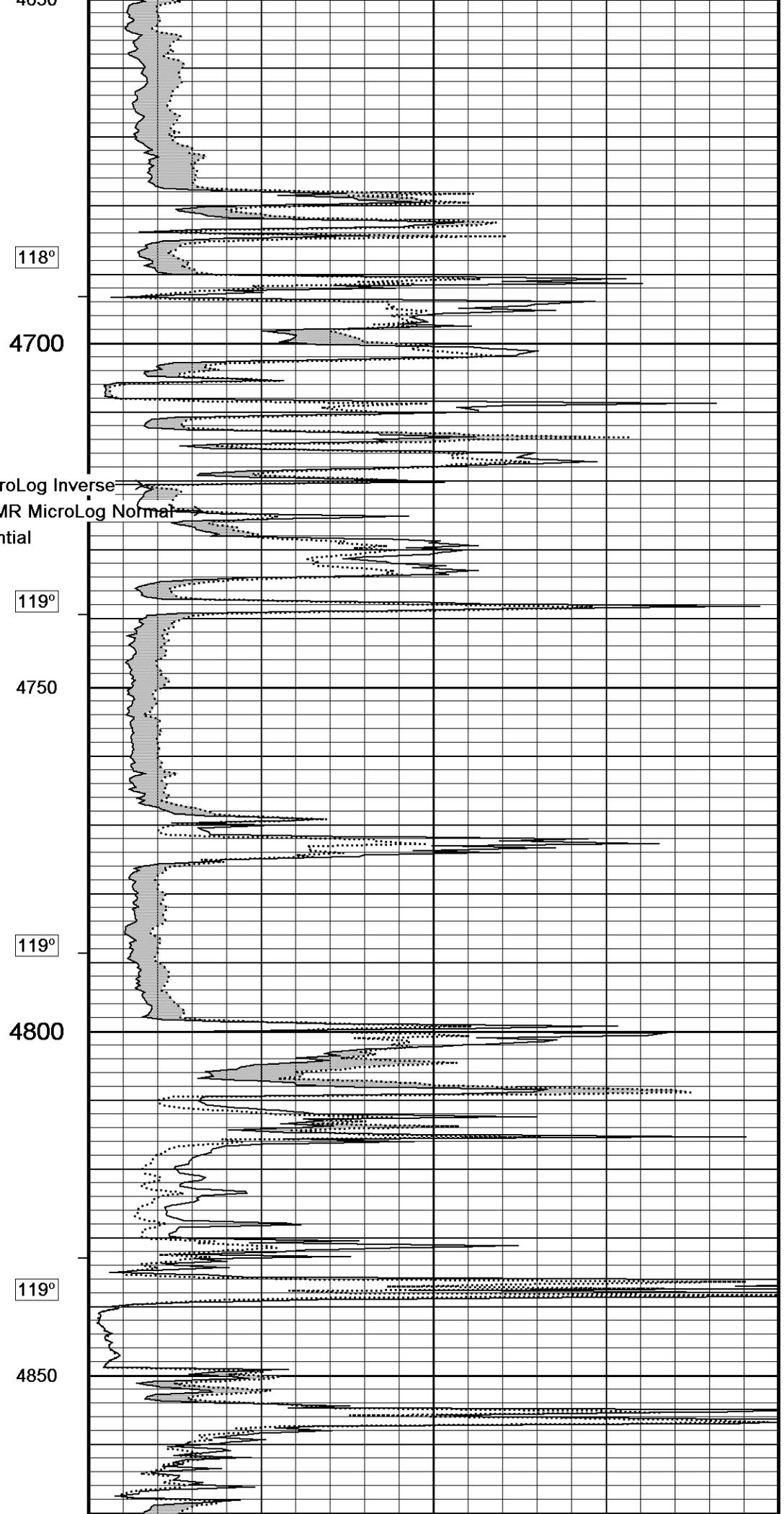
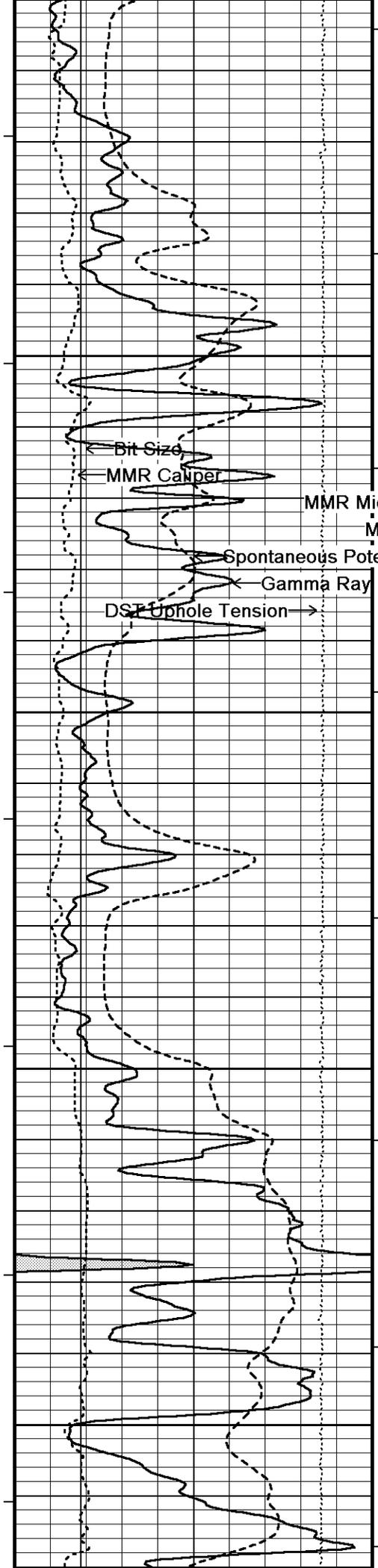
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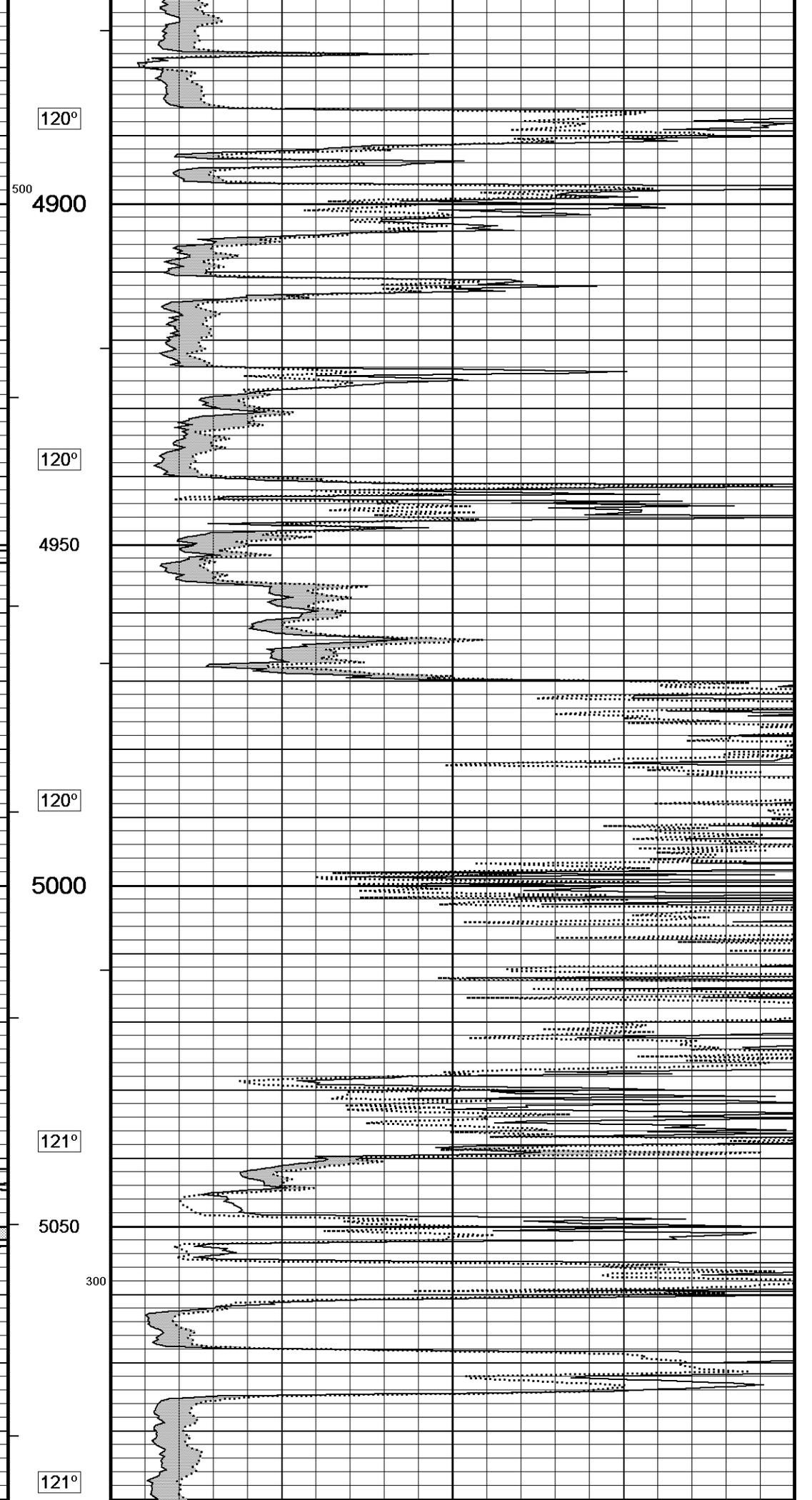
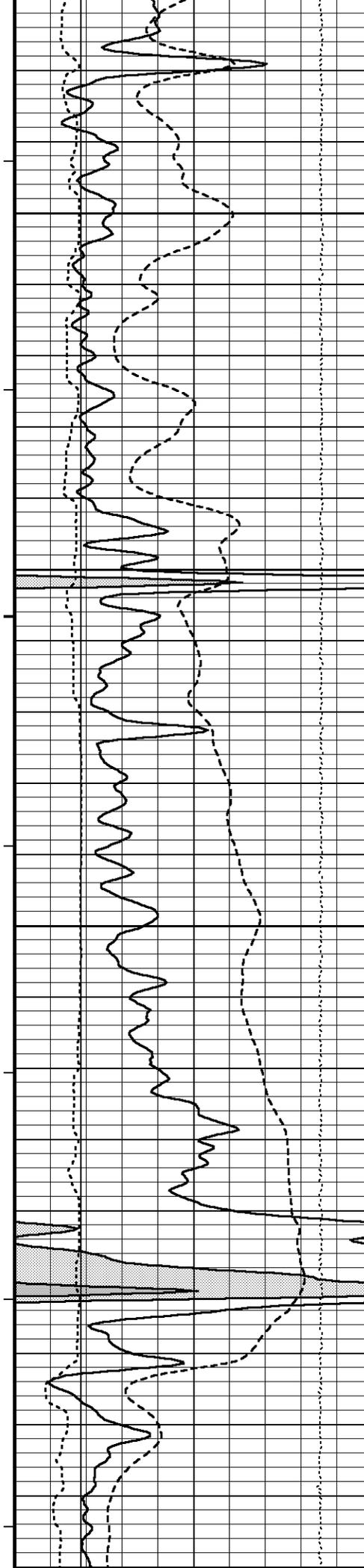
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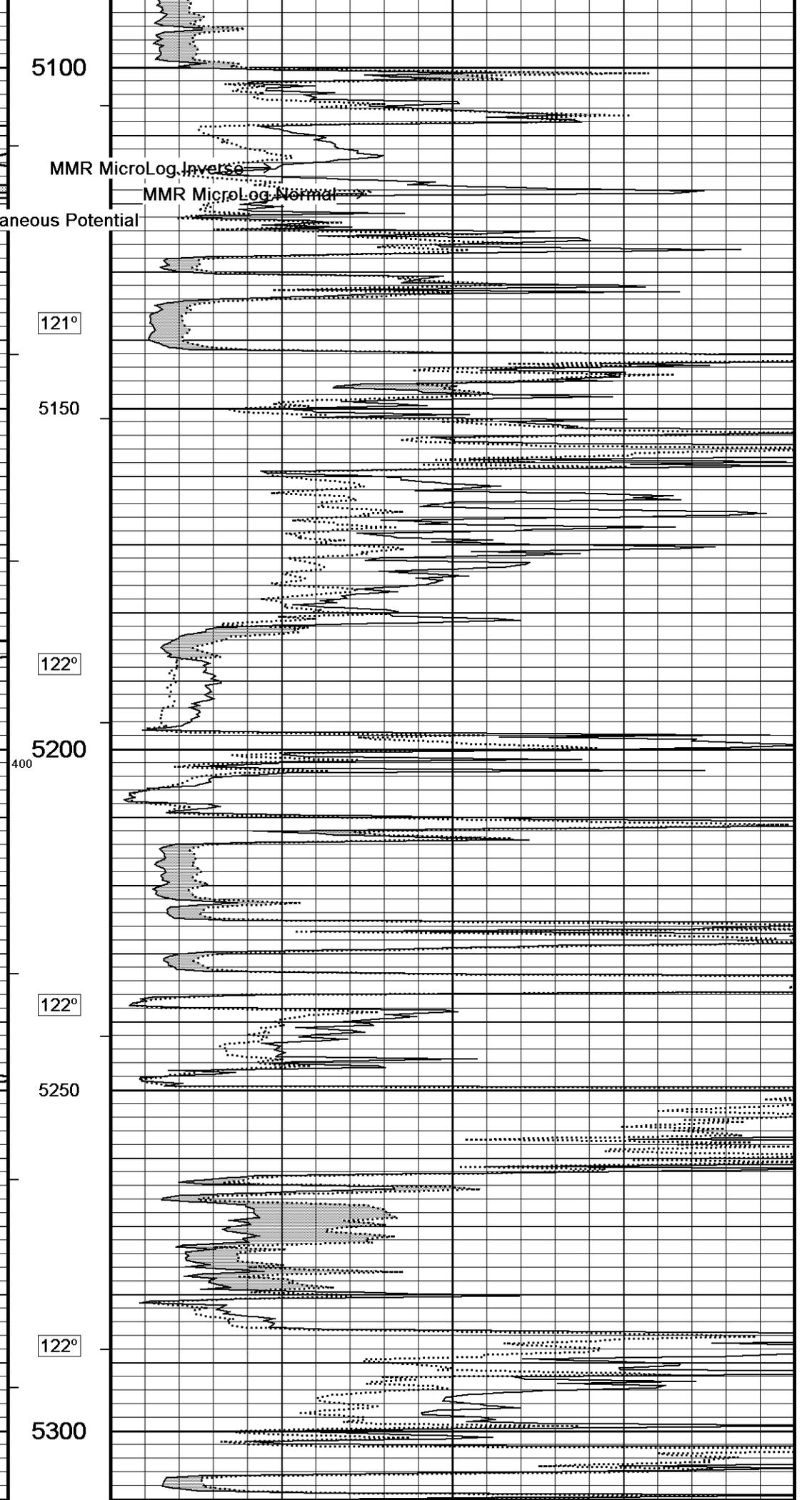
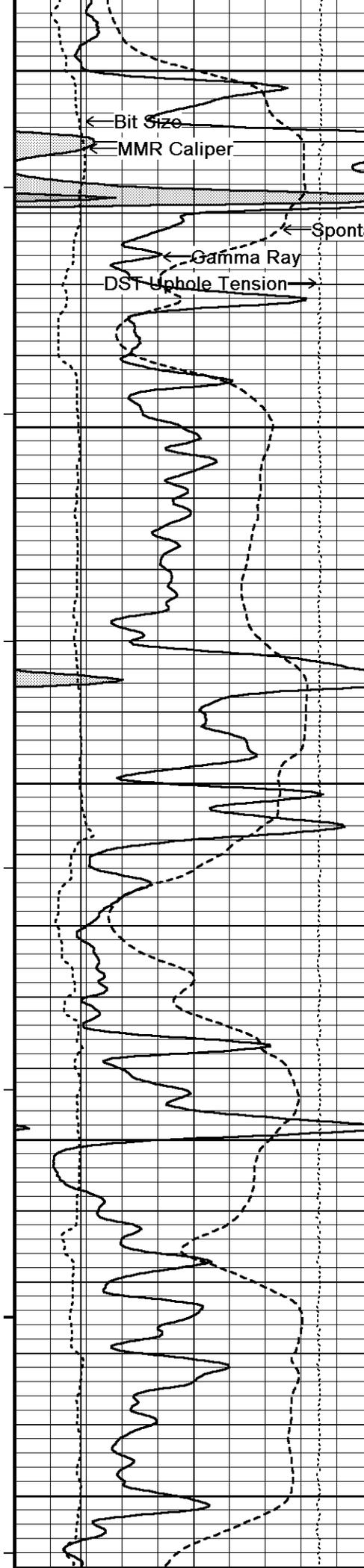


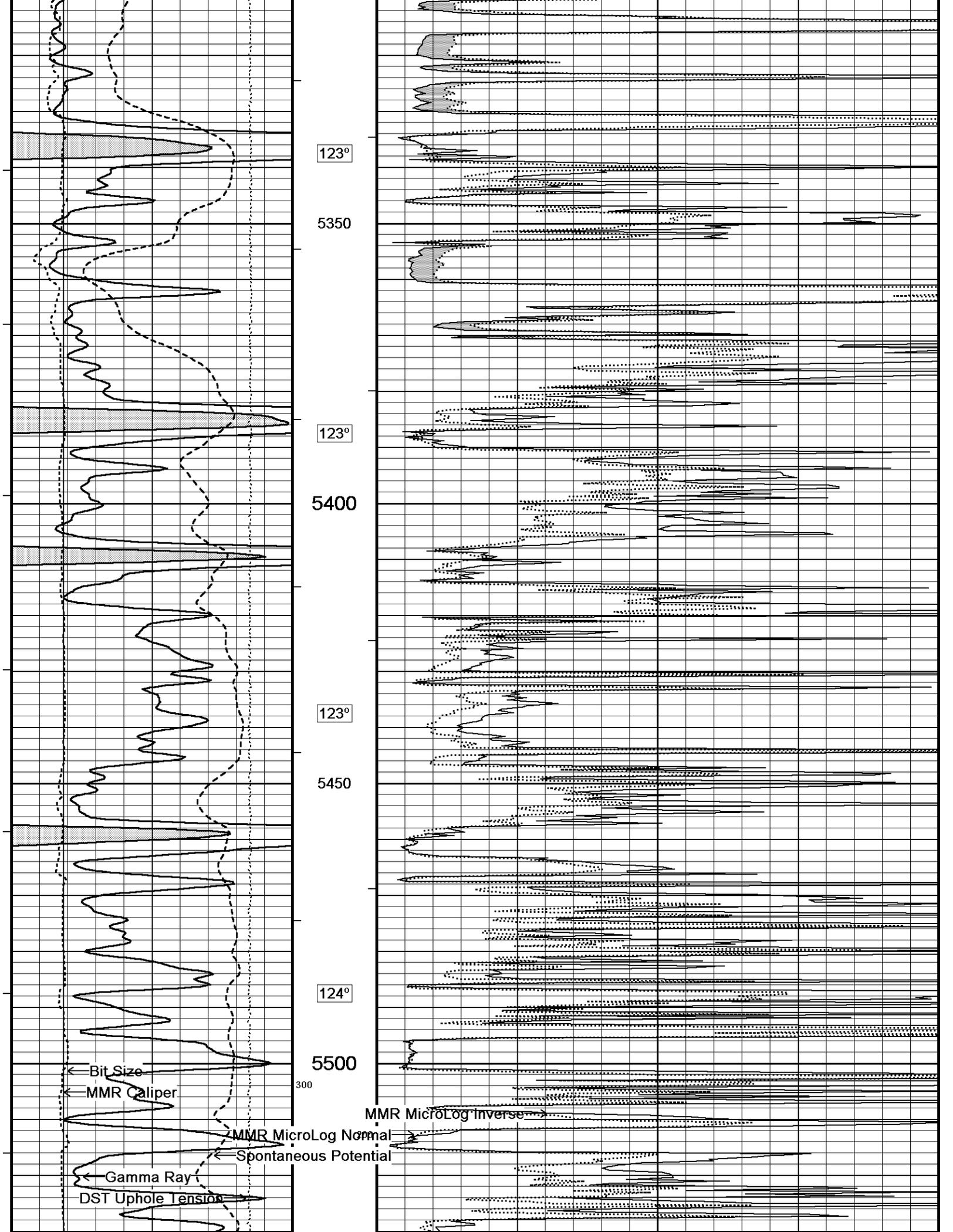


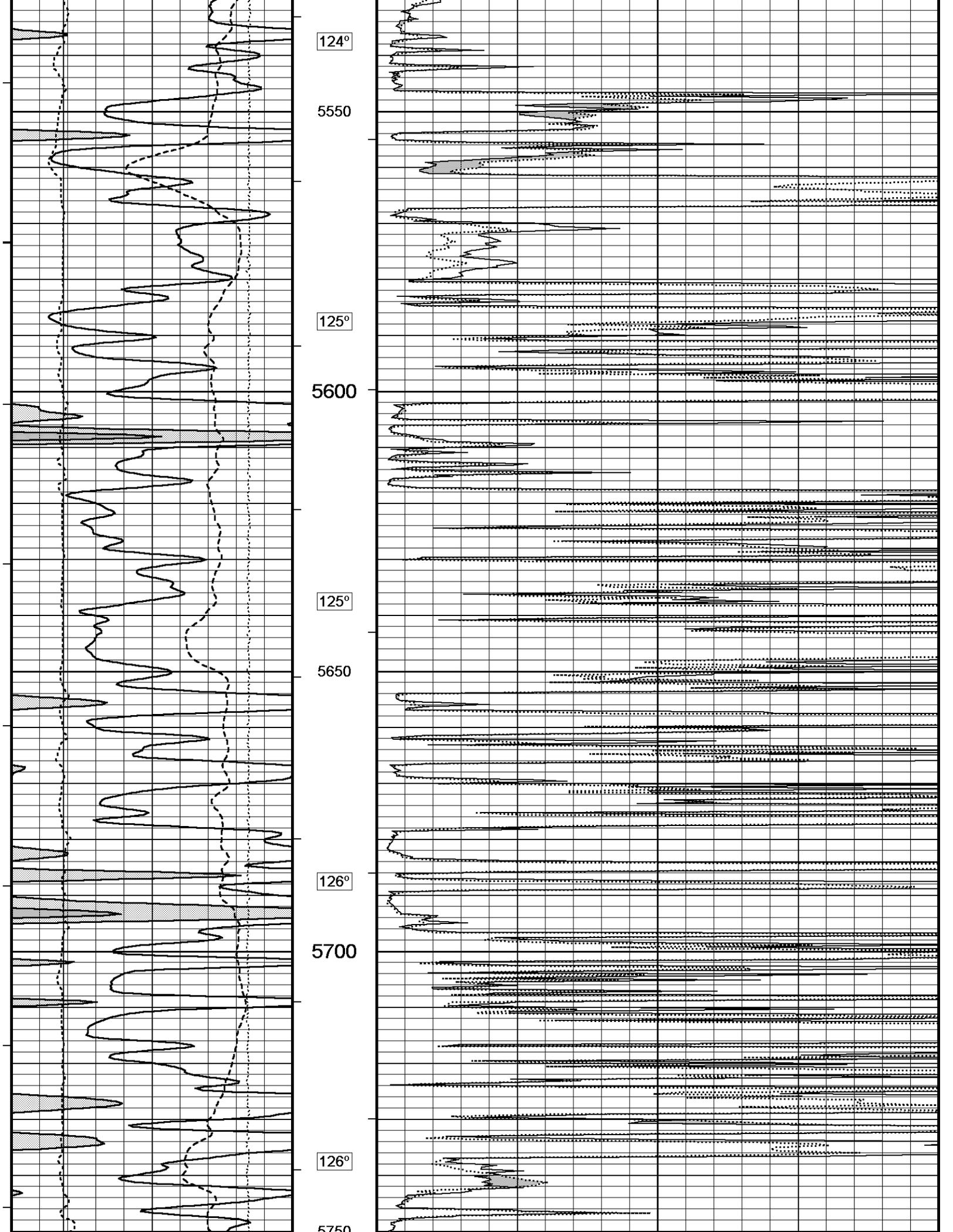


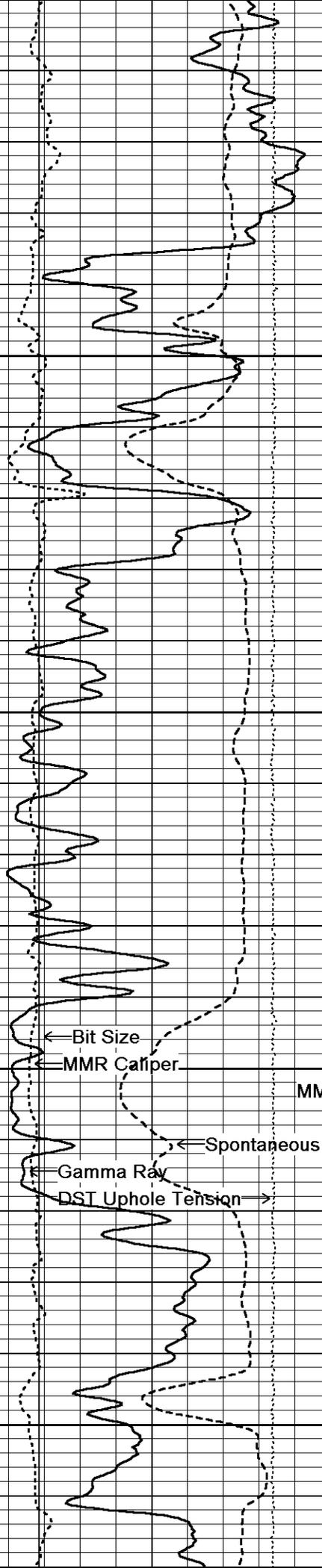




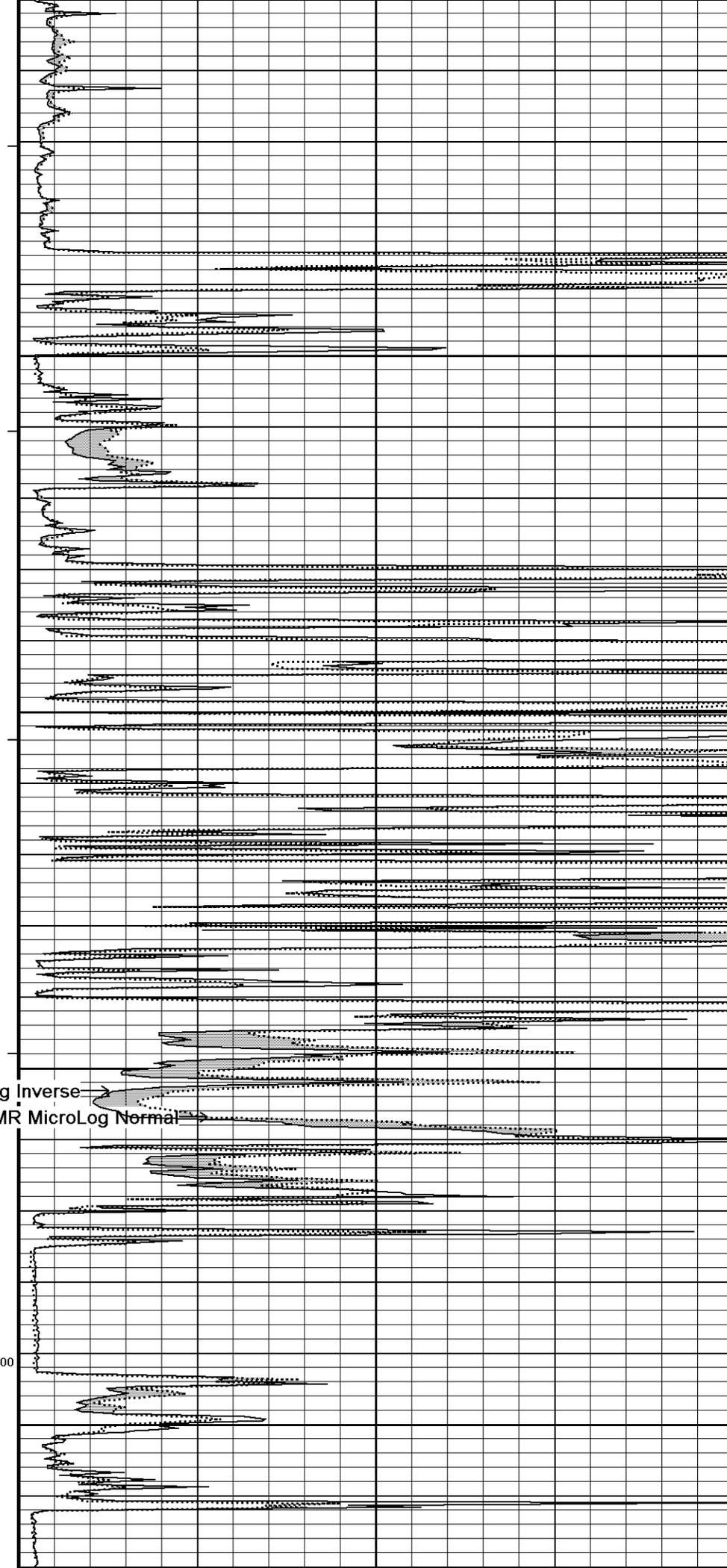








5750
126°
200
5800
126°
5850
127°
5900
127°
100
5950



← Bit Size

← MMR Caliper

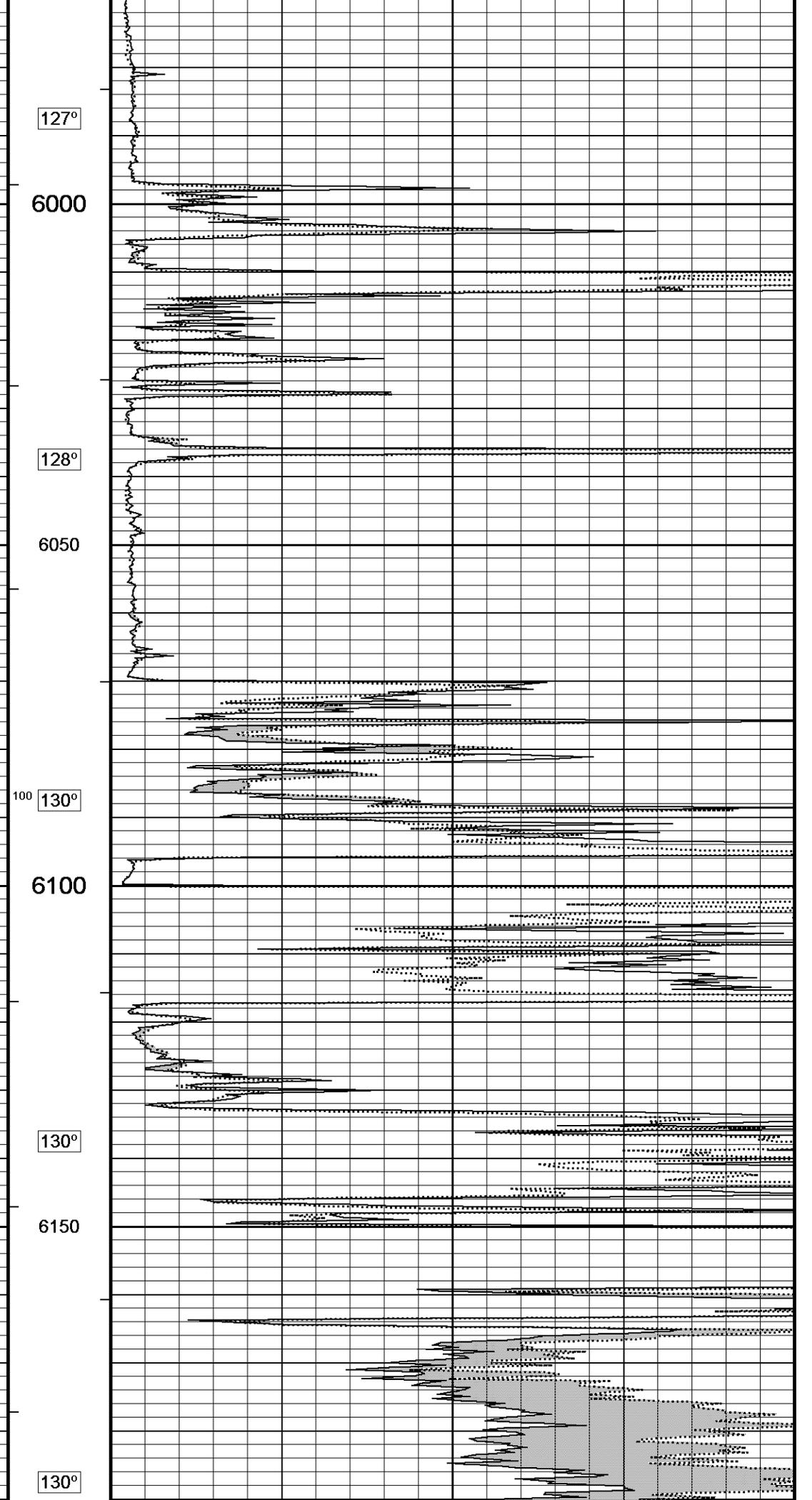
MMR MicroLog Inverse →

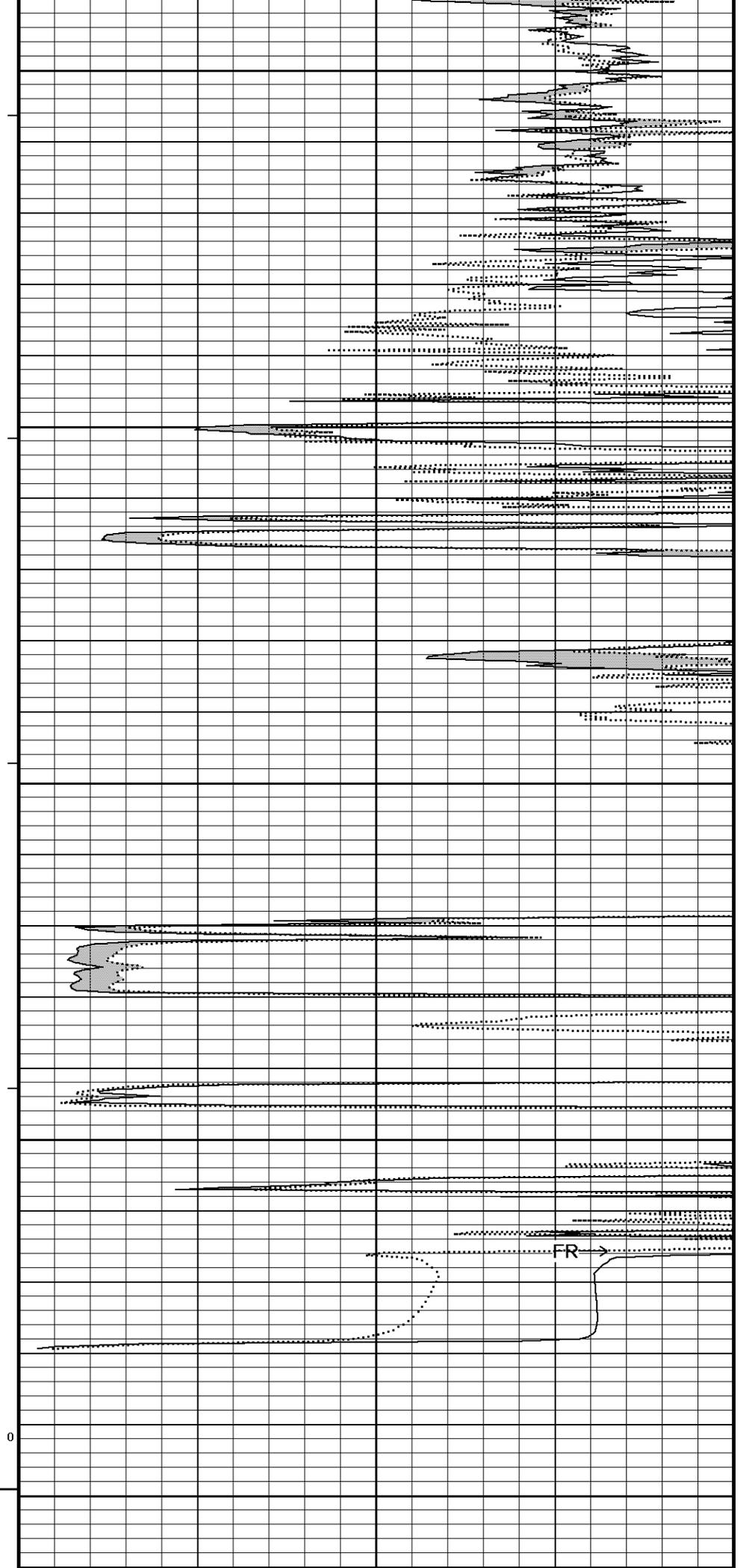
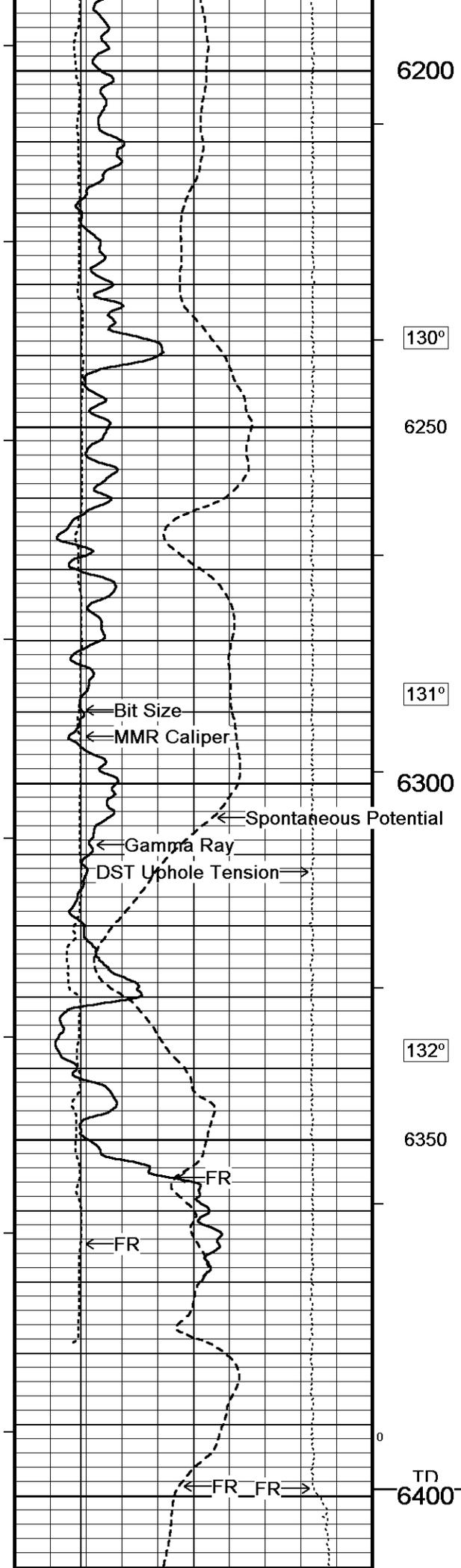
MMR MicroLog Normal →

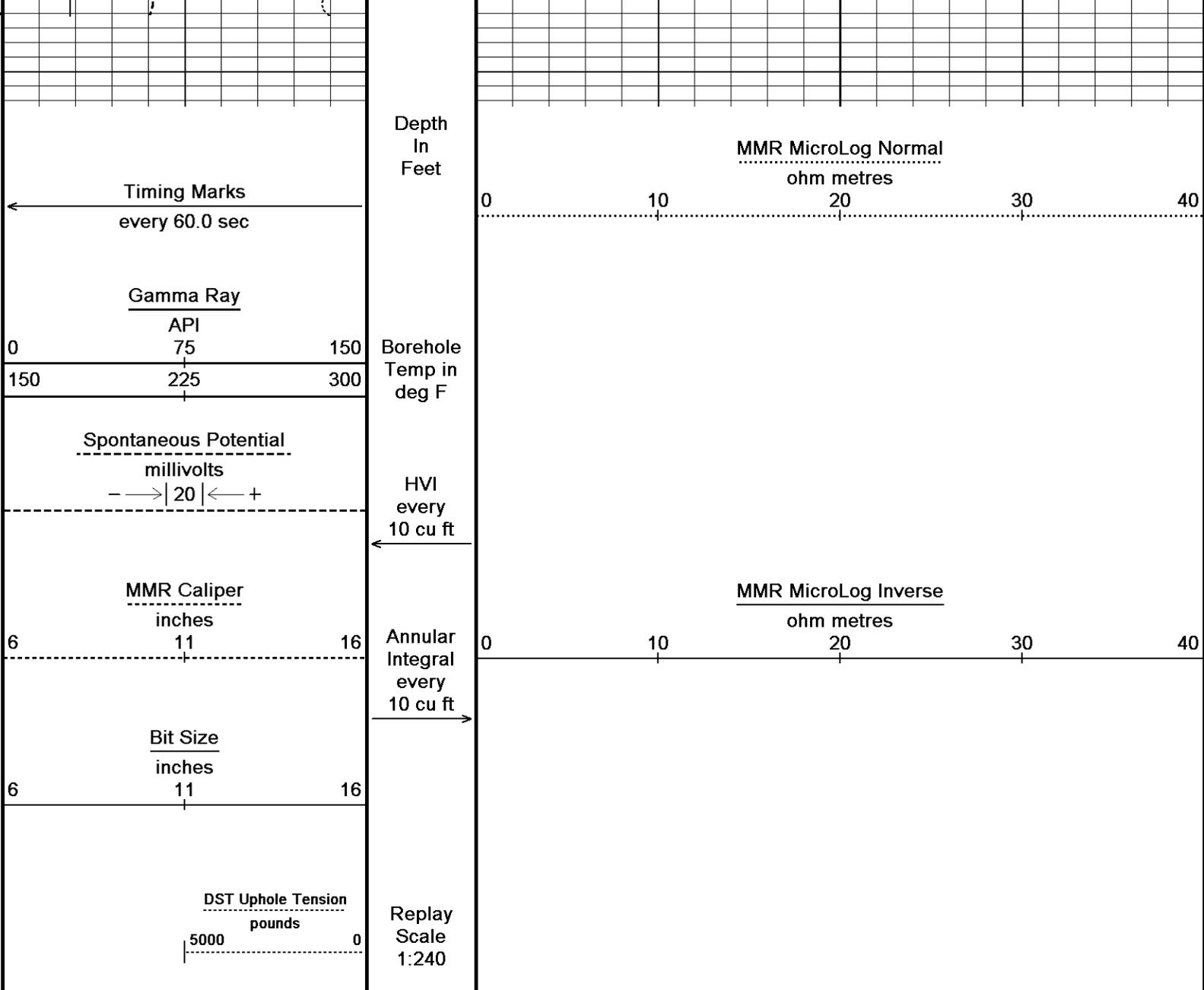
← Spontaneous Potential

← Gamma Ray

← DST Uphole Tension →





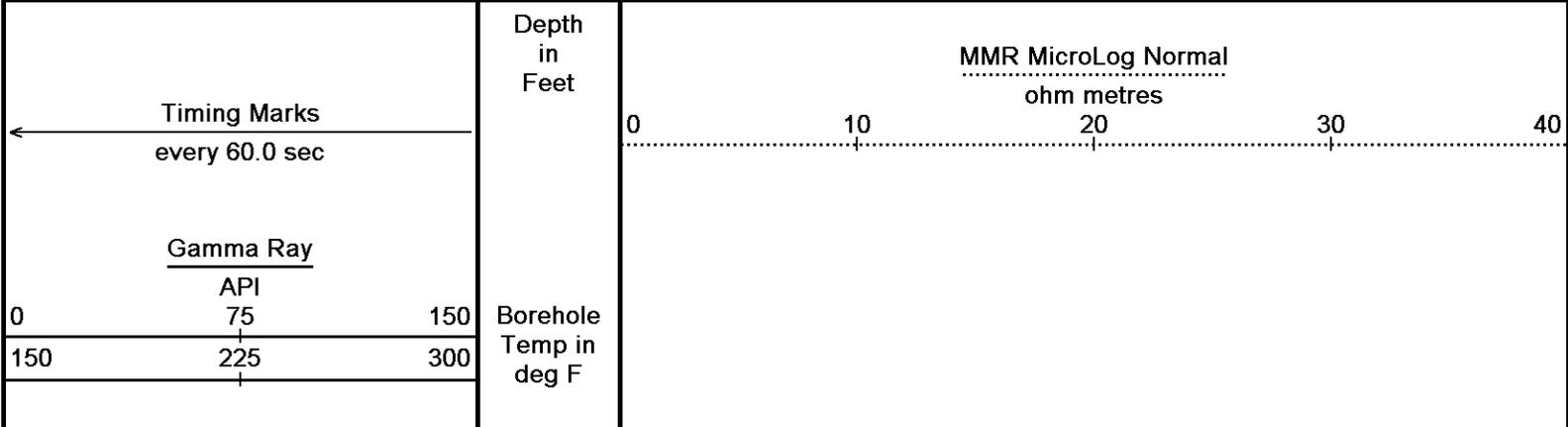


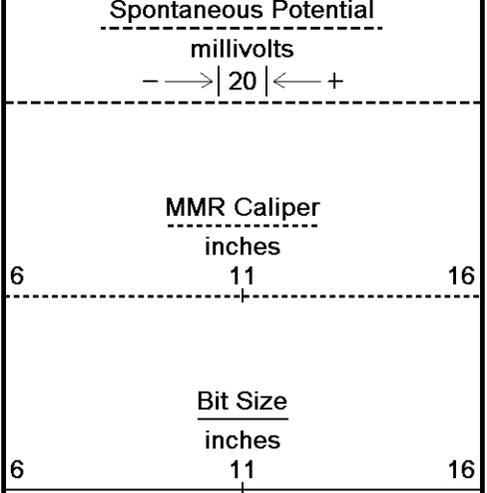
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 02-SEP-2015 17:57
 Filename: C:\Minimus 15.01.3109\Log Data\O'Brien Stoltzfus 1-34\O'Brien Stoltzfus 1-34 Main Pass.dta Recorded on 02-SEP-2015 14:55
 System Versions: Logged with 15.01.3109 Processed with 15.01.3109 Plotted with 15.01.3109

↑ **5 INCH MAIN** ↑

↓ **REPEAT SECTION** ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 02-SEP-2015 17:57
 Filename: C:\Minimus 15.01.3109\Log Data\O'Brien Stoltzfus 1-34\O'Brien Stoltzfus 1-34 Repeat.dta Recorded on 02-SEP-2015 13:29
 System Versions: Logged with 15.01.3109 Processed with 15.01.3109 Plotted with 15.01.3109



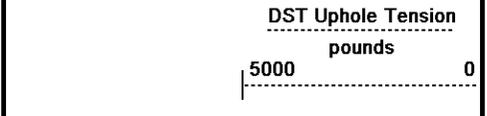
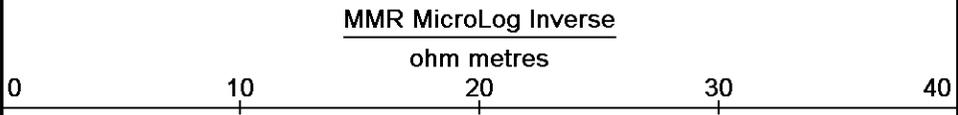


HVI
every
10 cu ft

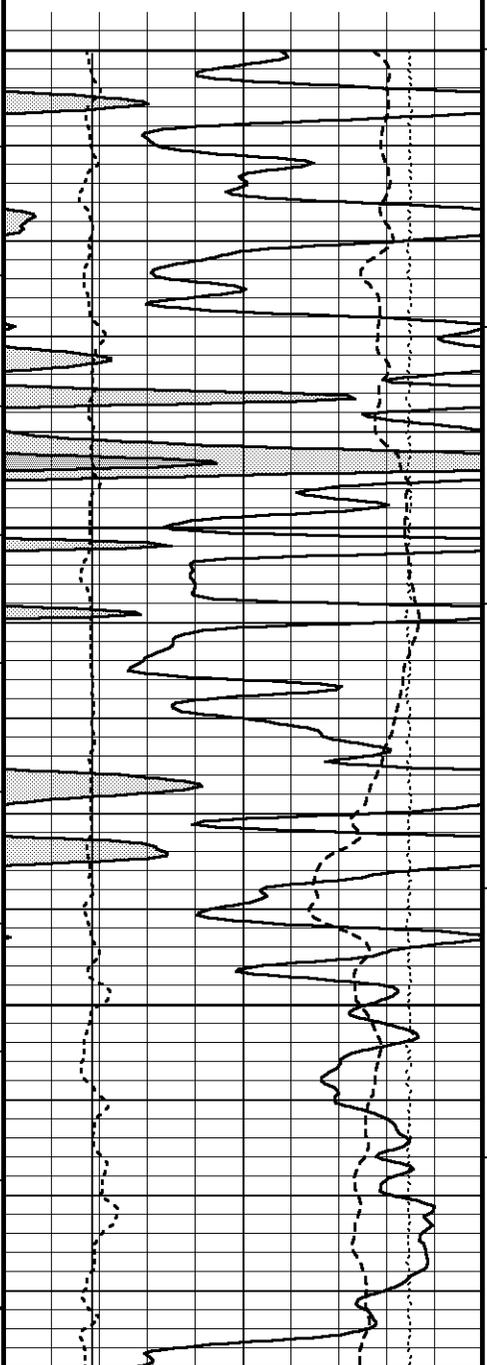
←

Annular
Integral
every
10 cu ft

→



Replay
Scale
1:240



5650

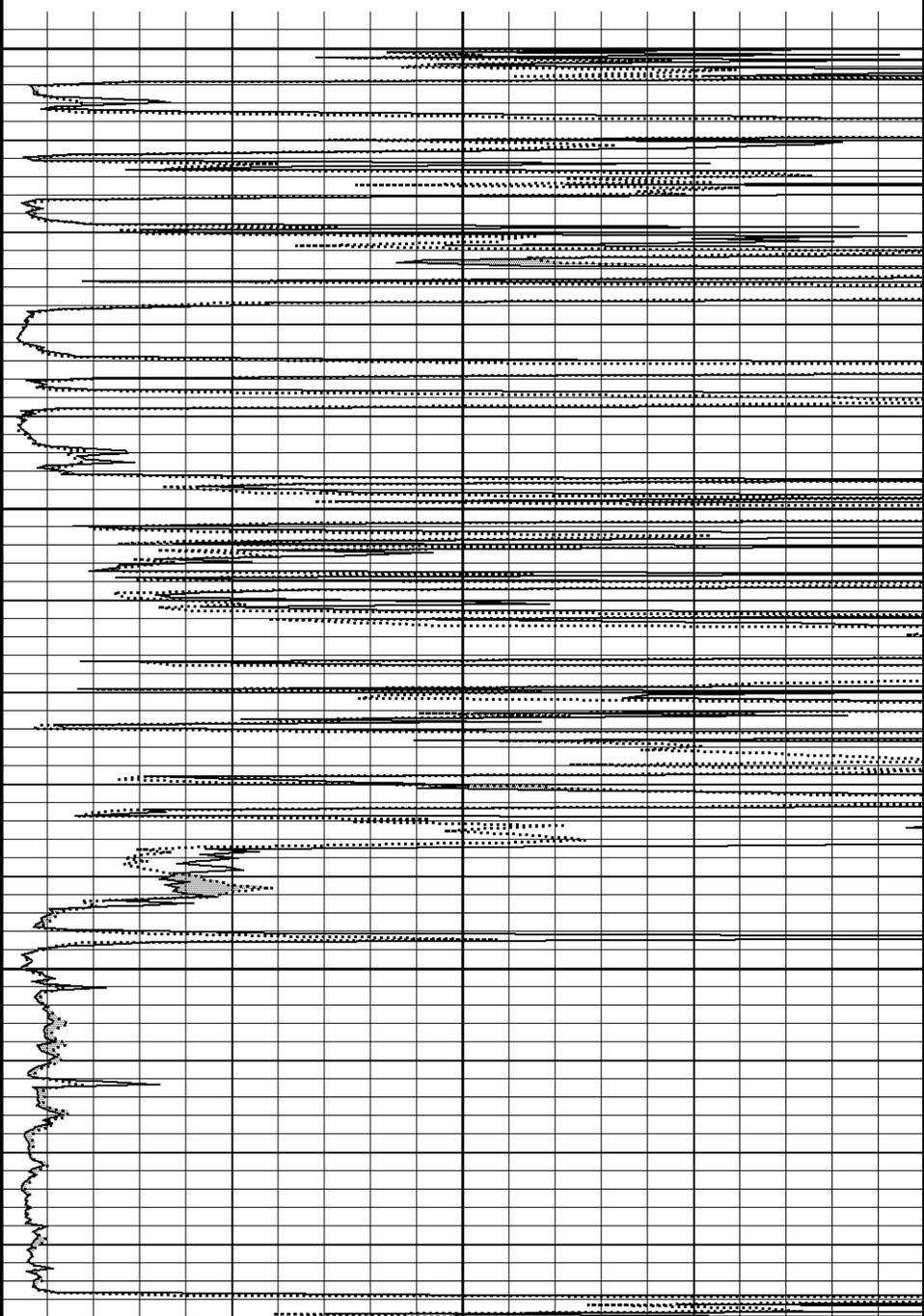
125°

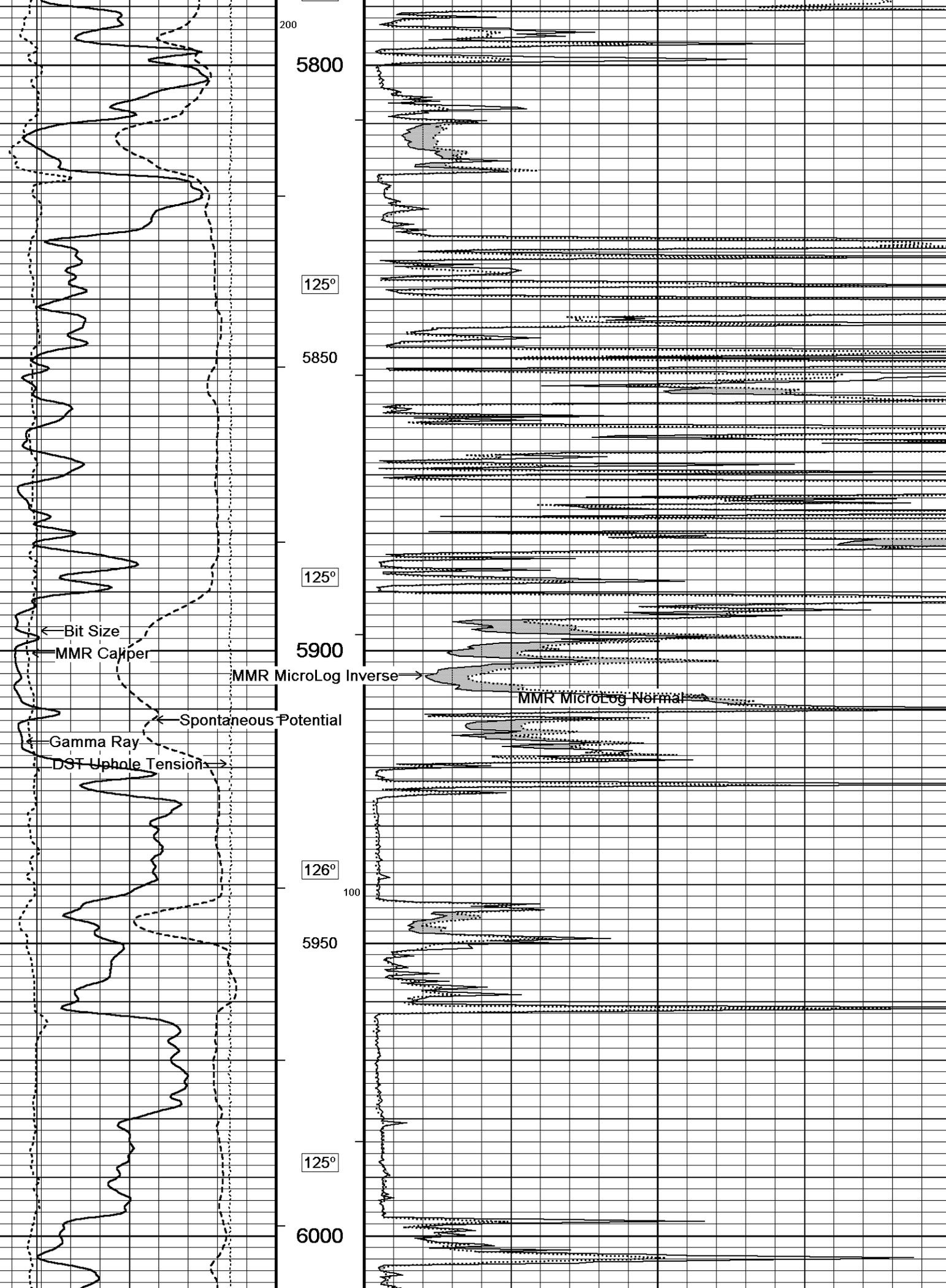
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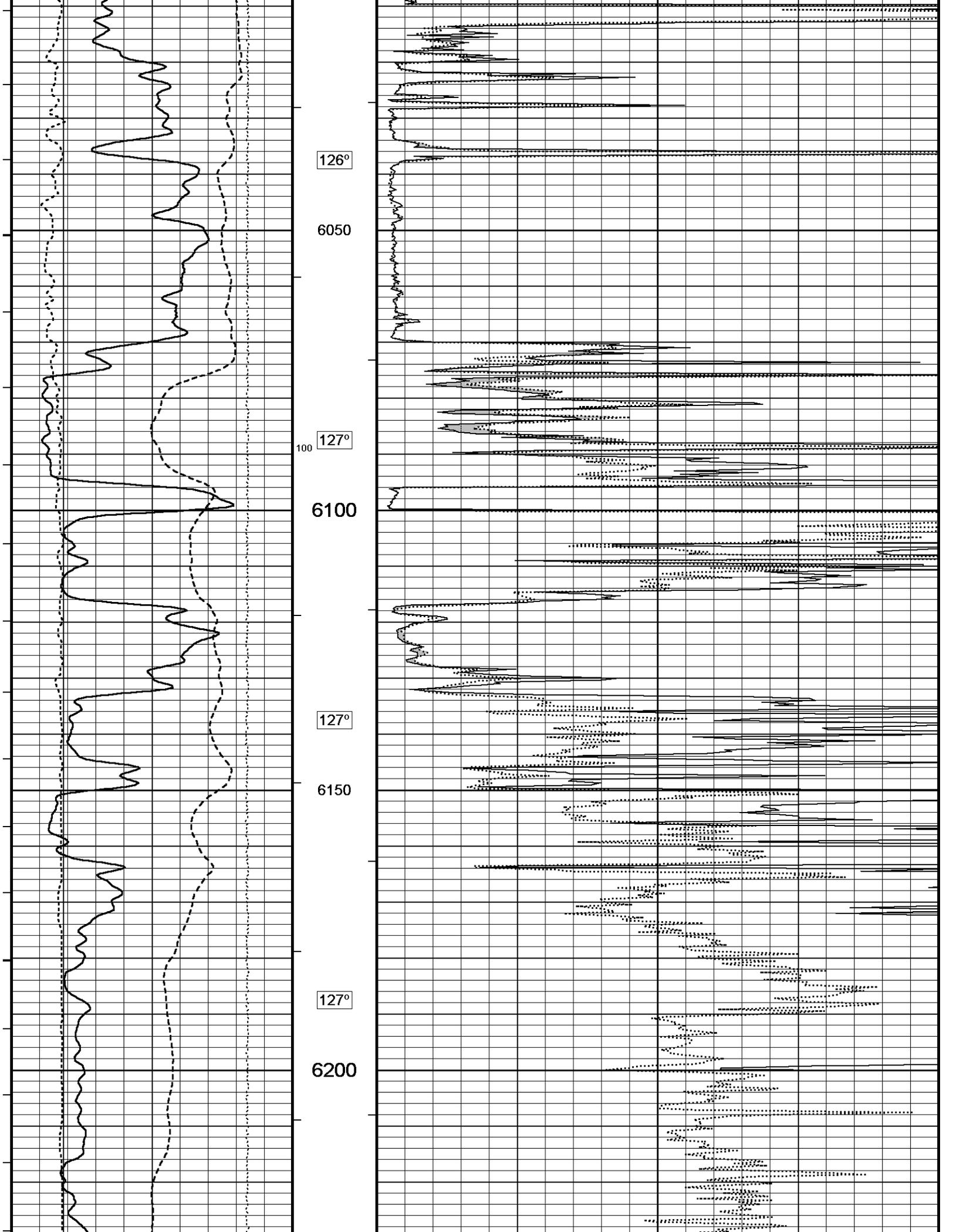
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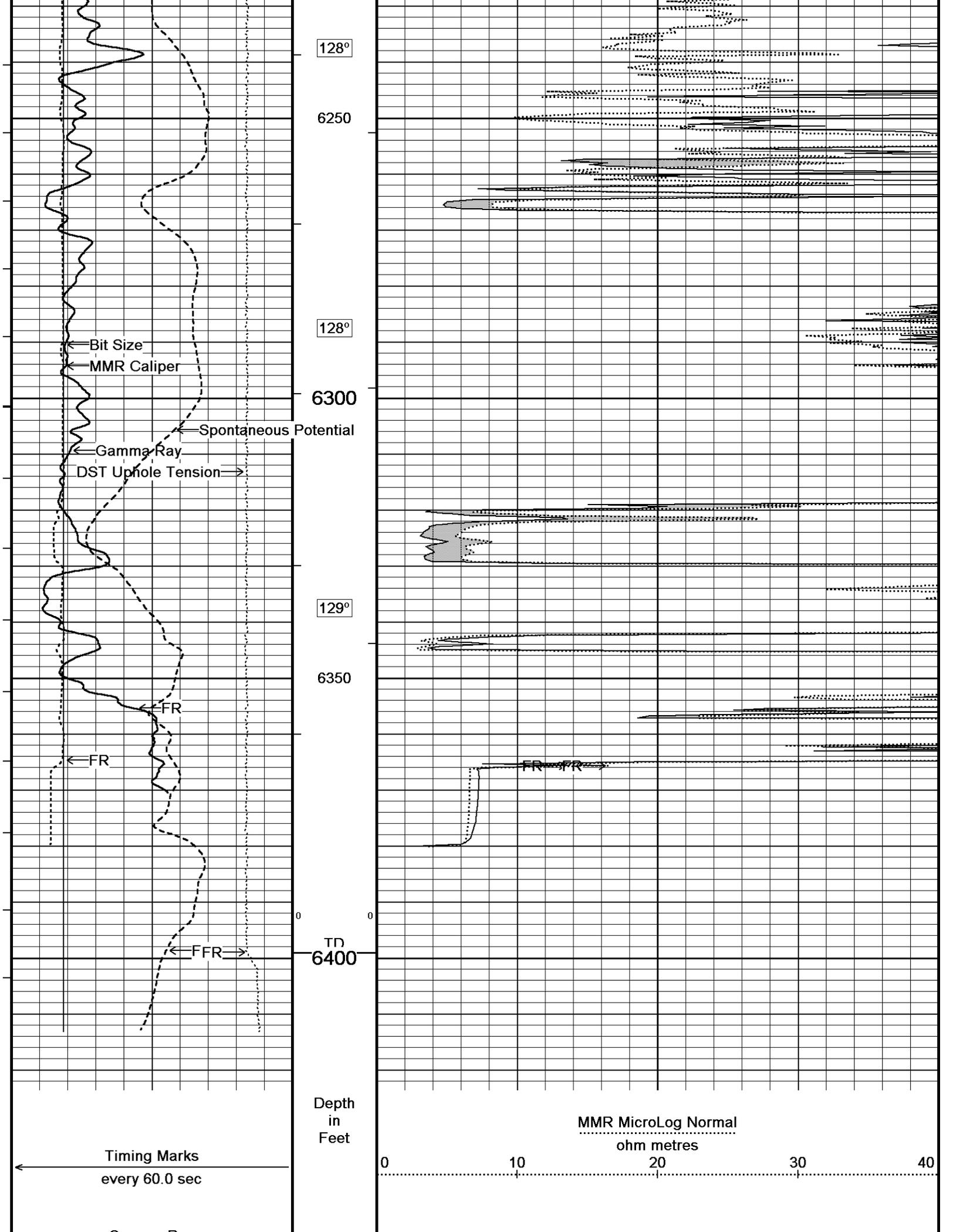
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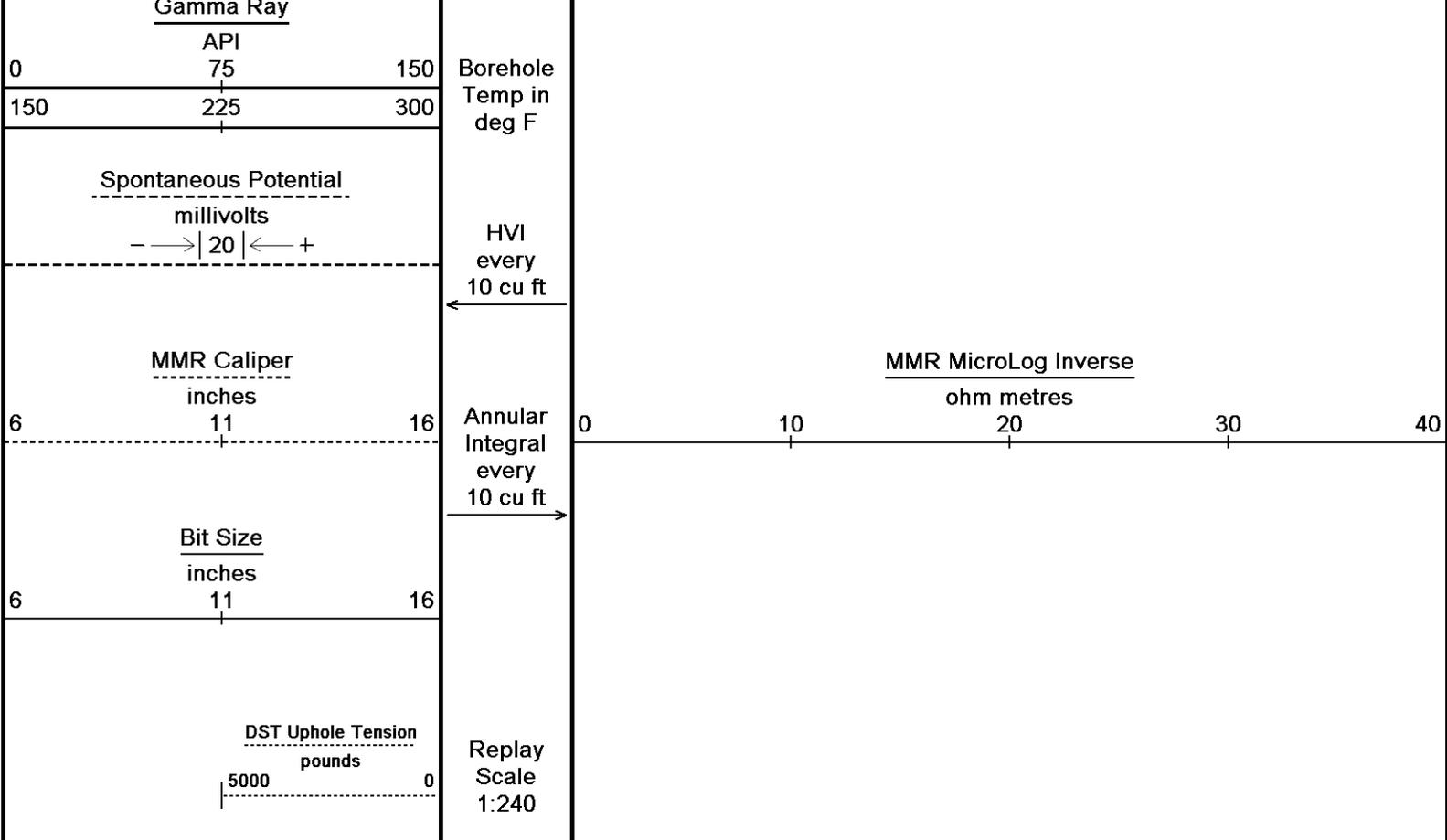
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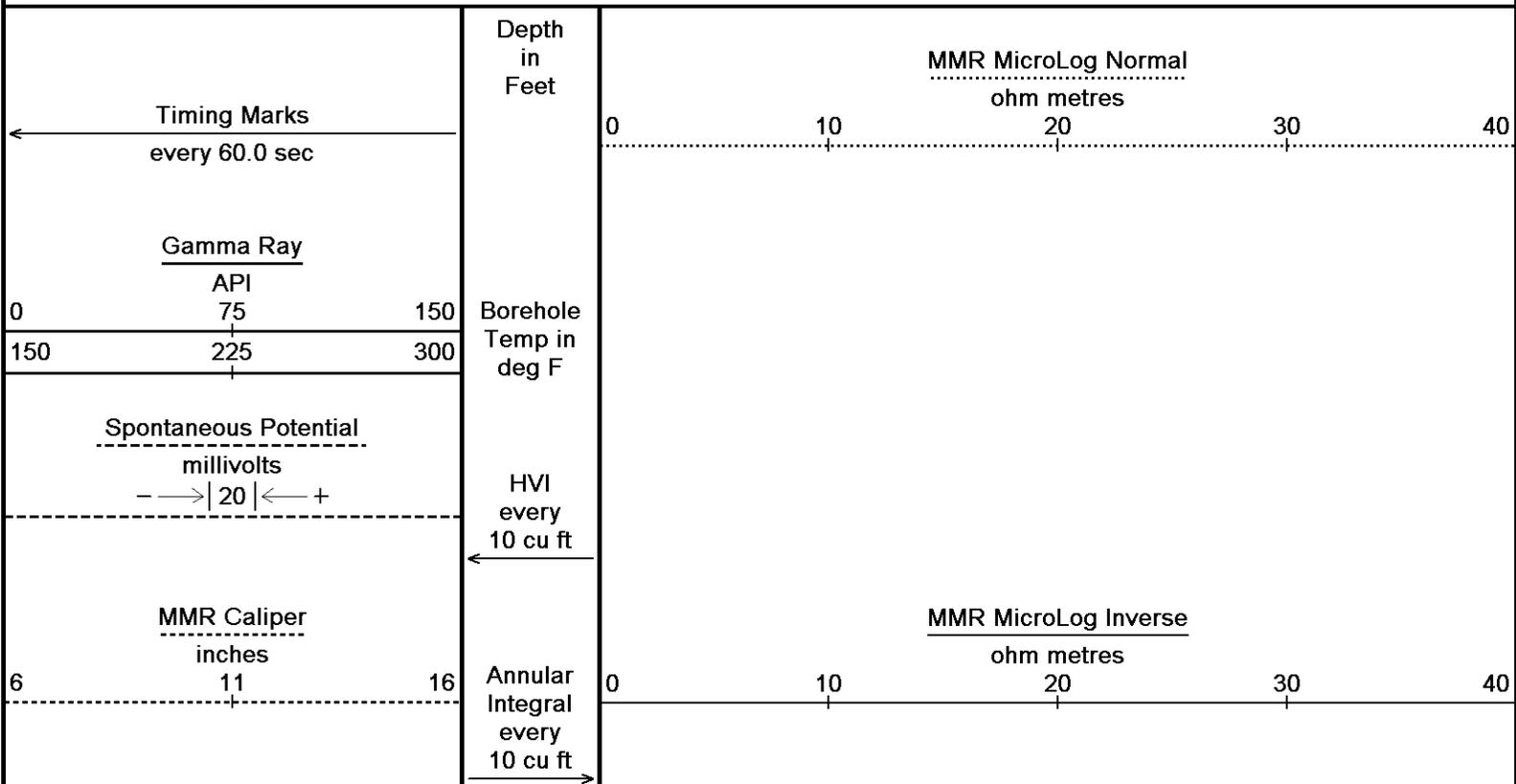


Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 02-SEP-2015 17:57
 Filename: C:\Minimus 15.01.3109\Log Data\O'Brien Stoltzfus 1-34\O'Brien Stoltzfus 1-34 Repeat.dta Recorded on 02-SEP-2015 13:29
 System Versions: Logged with 15.01.3109 Processed with 15.01.3109 Plotted with 15.01.3109

↑ **REPEAT SECTION** ↑

↓ **10 INCH HIGH RESOLUTION** ↓

Depth Based Data - Maximum Sampling Increment 2.5cm Plotted on 02-SEP-2015 17:57
 Filename: C:\Minimus 15.01.3109\Log Data\O'Brien Stoltzfus...O'Brien Stoltzfus 1-34 High Resolution.dta Recorded on 02-SEP-2015 13:29
 System Versions: Logged with 15.01.3109 Plotted with 15.01.3109

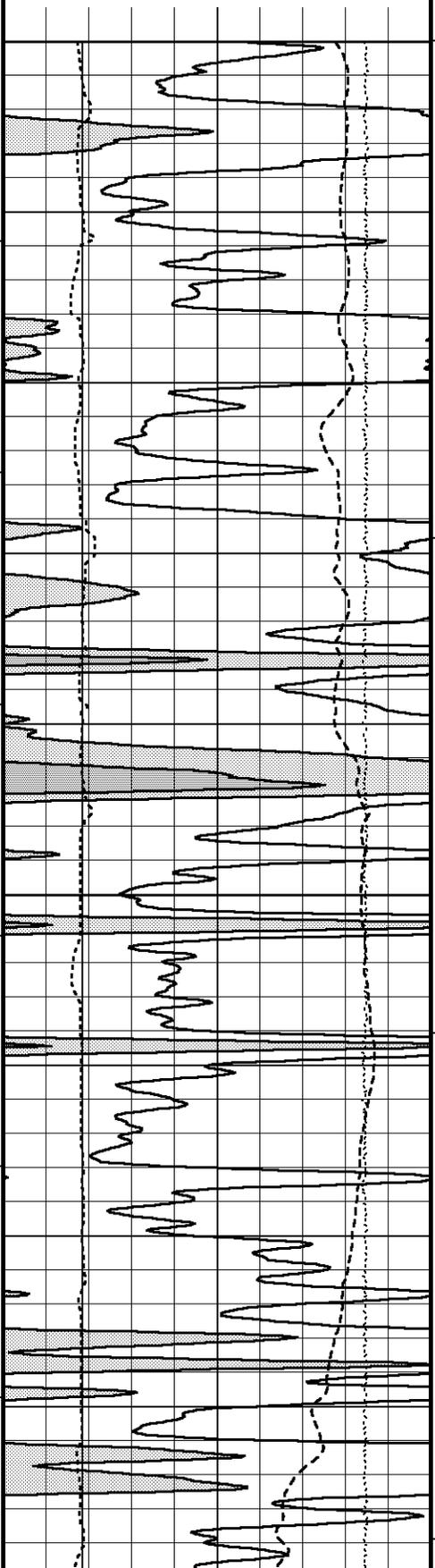


Bit Size
inches

6 11 16

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:120

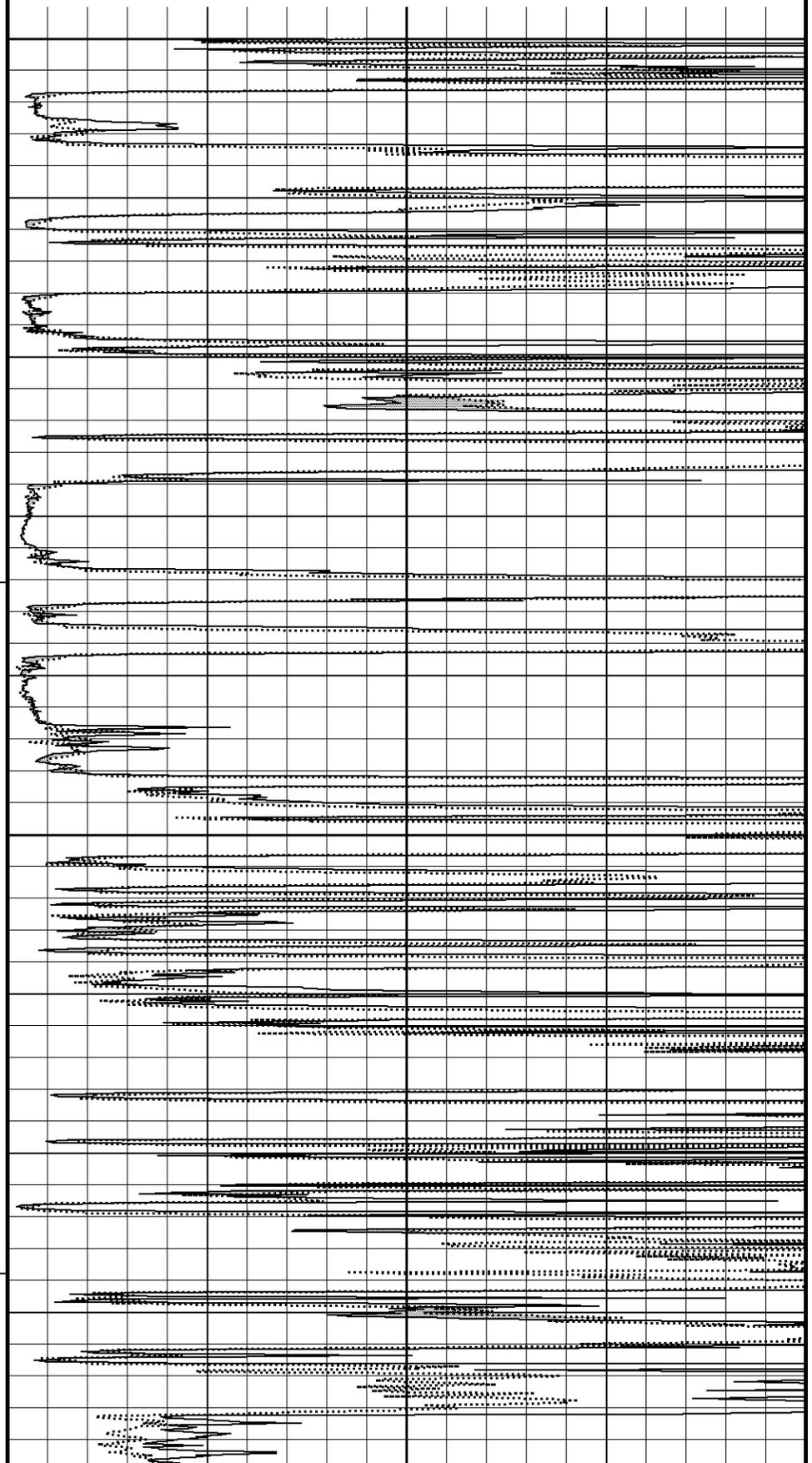


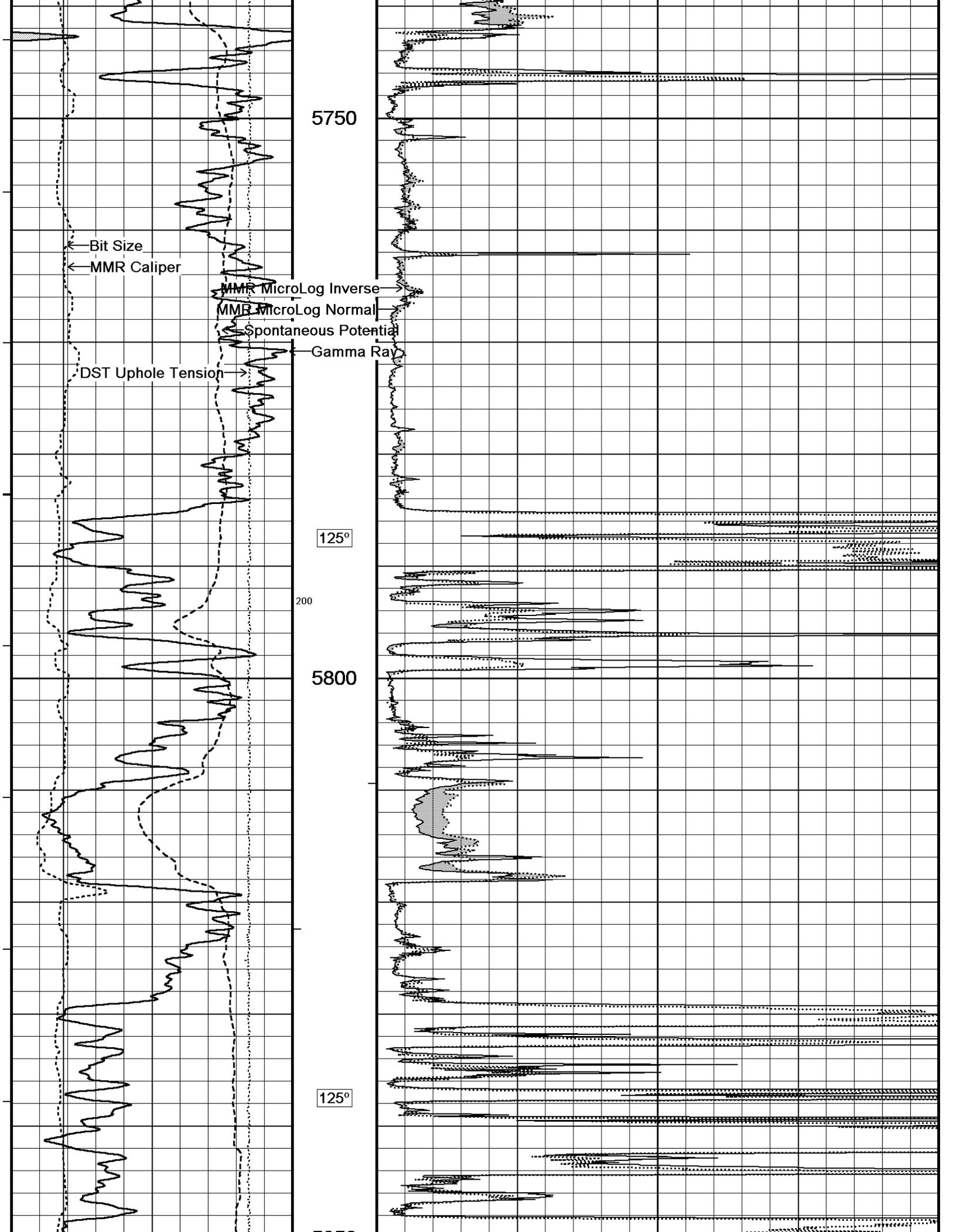
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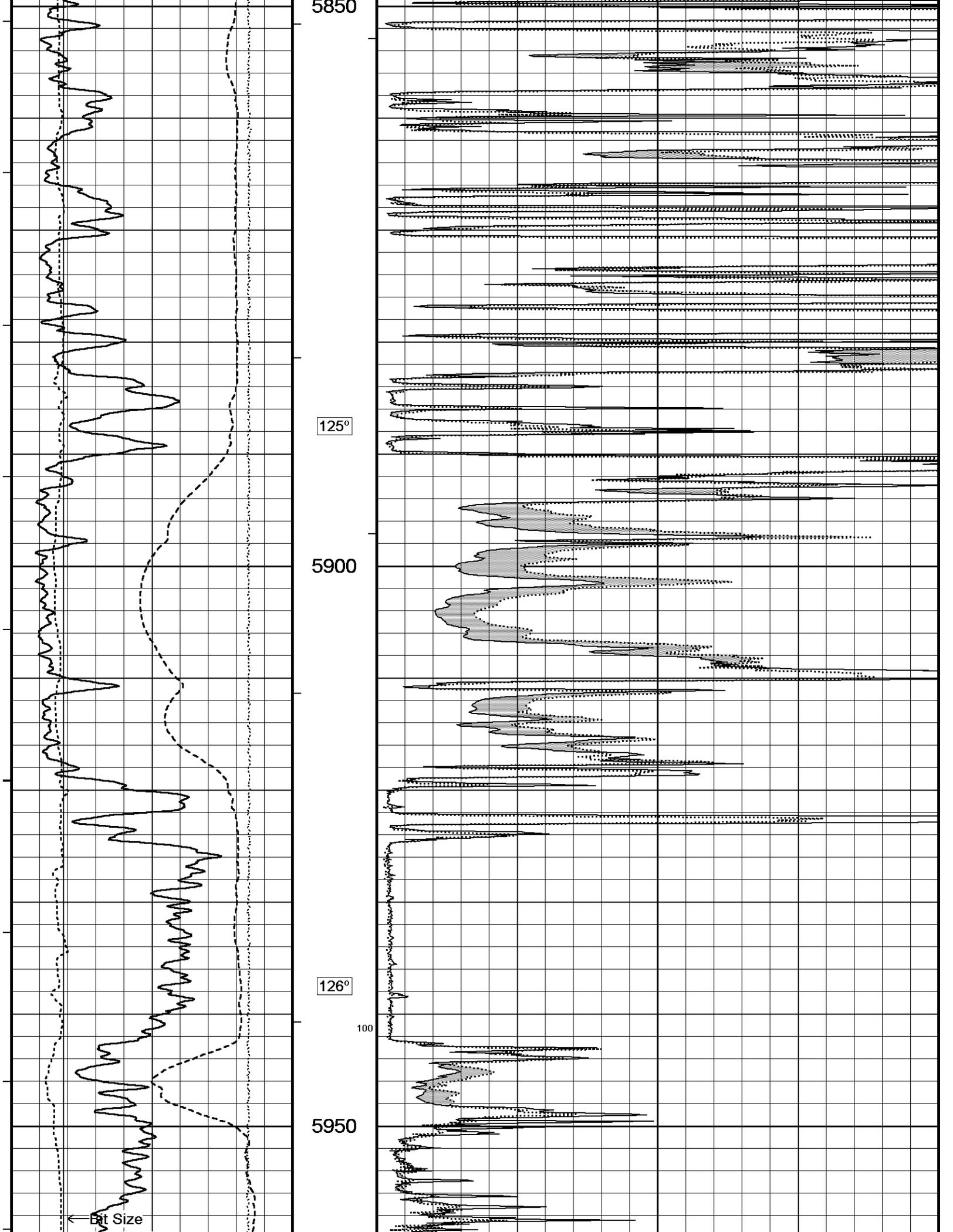
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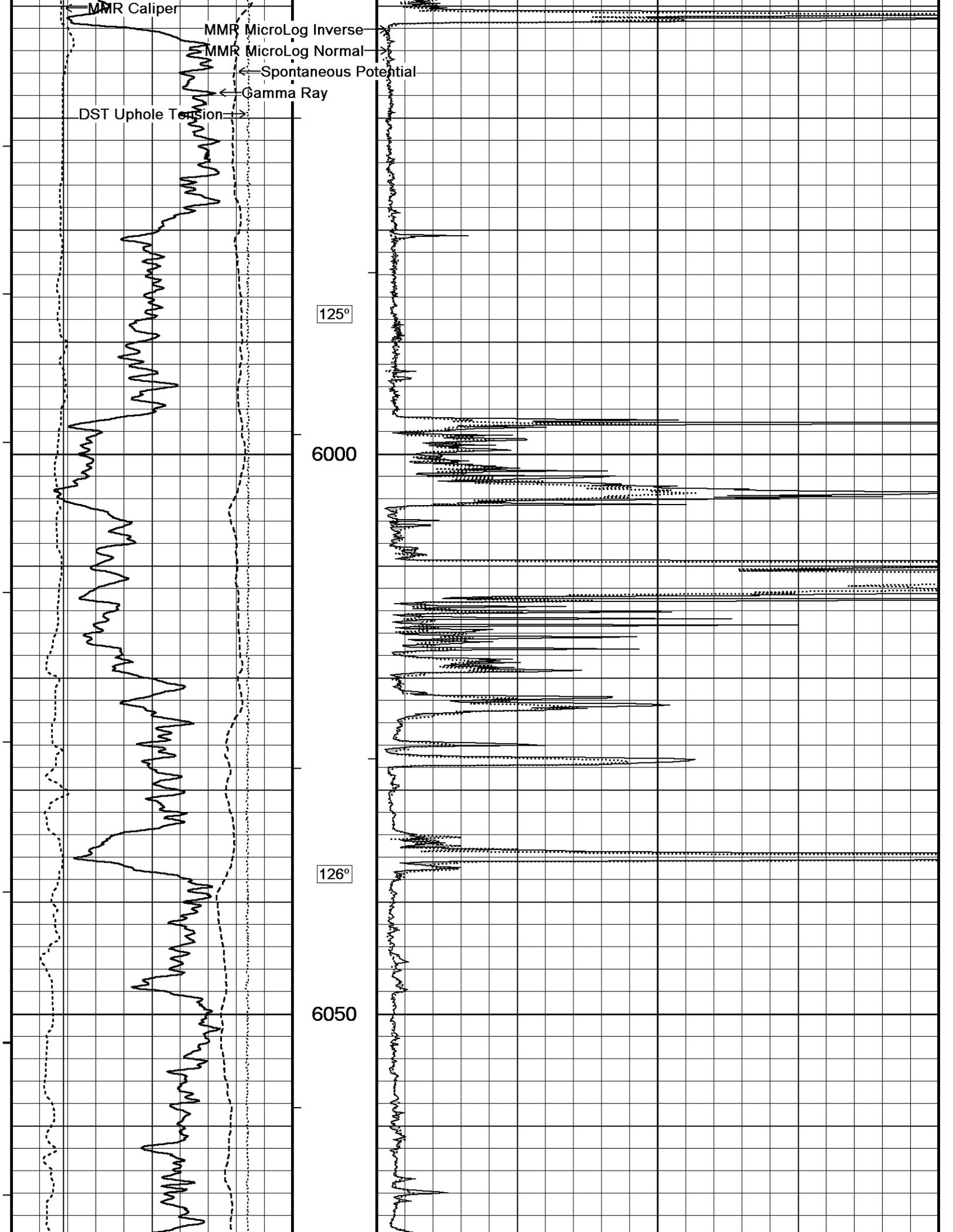
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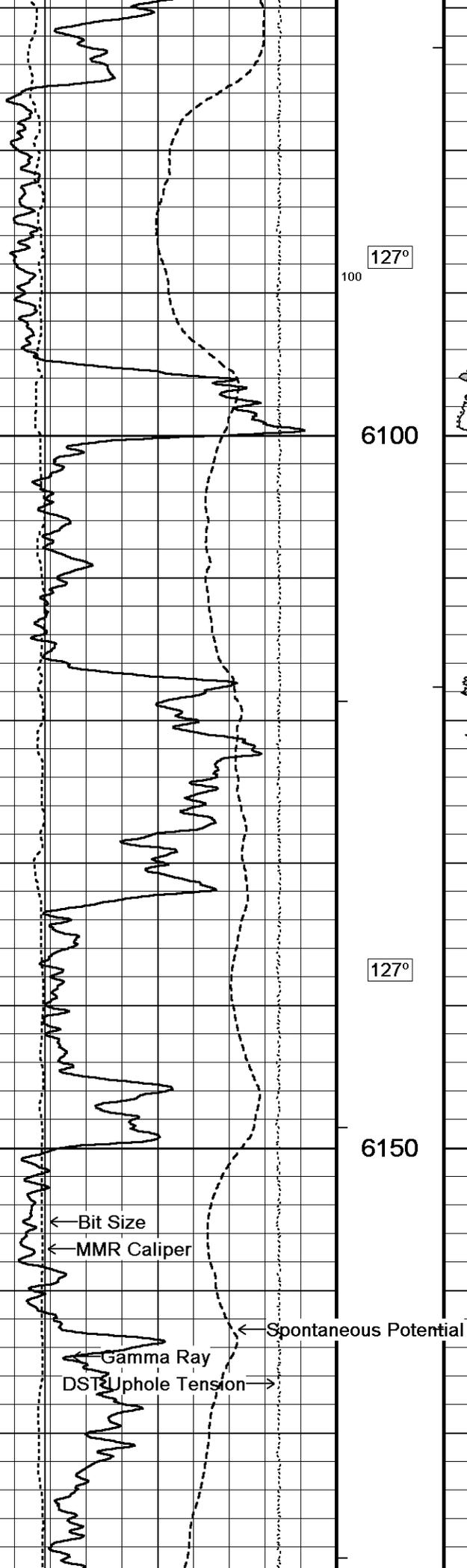
125°











127°

100

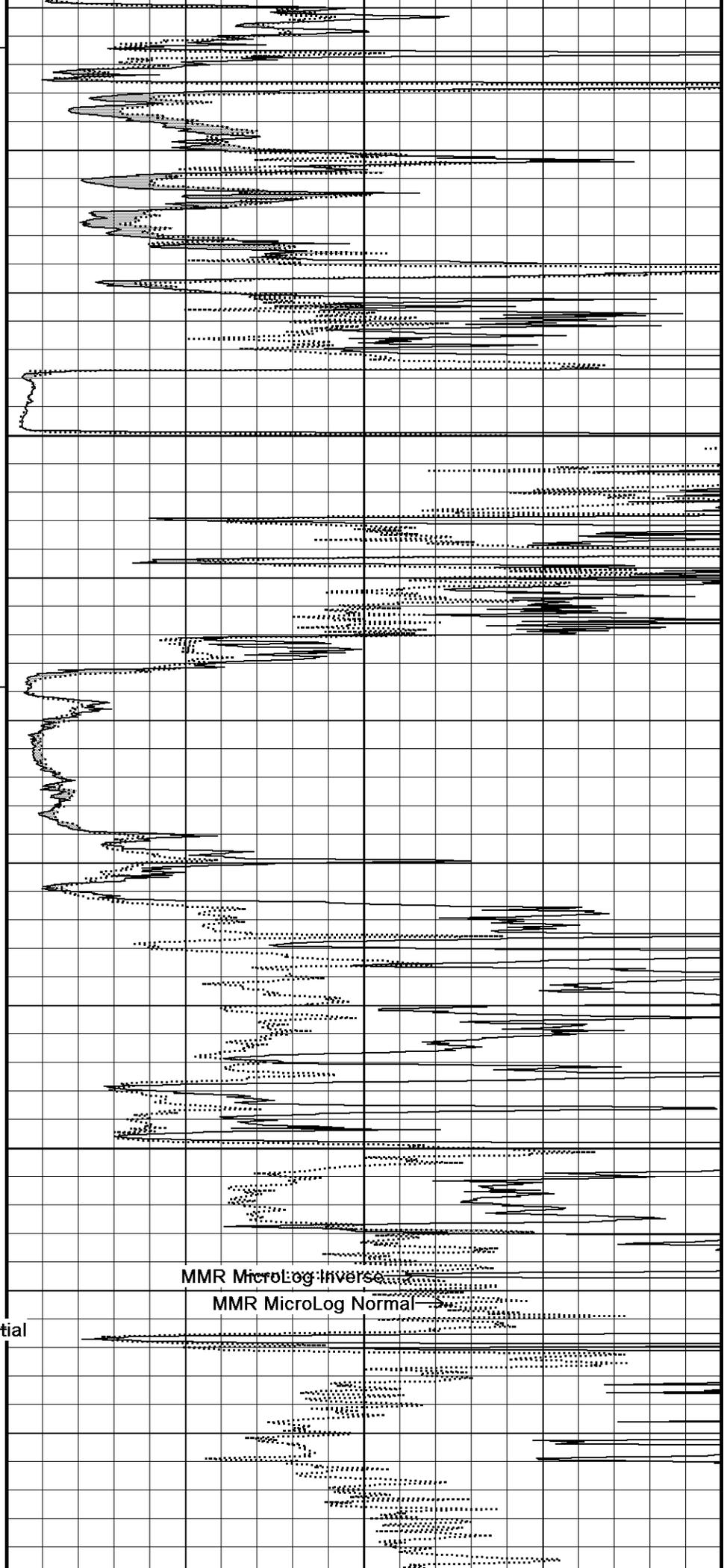
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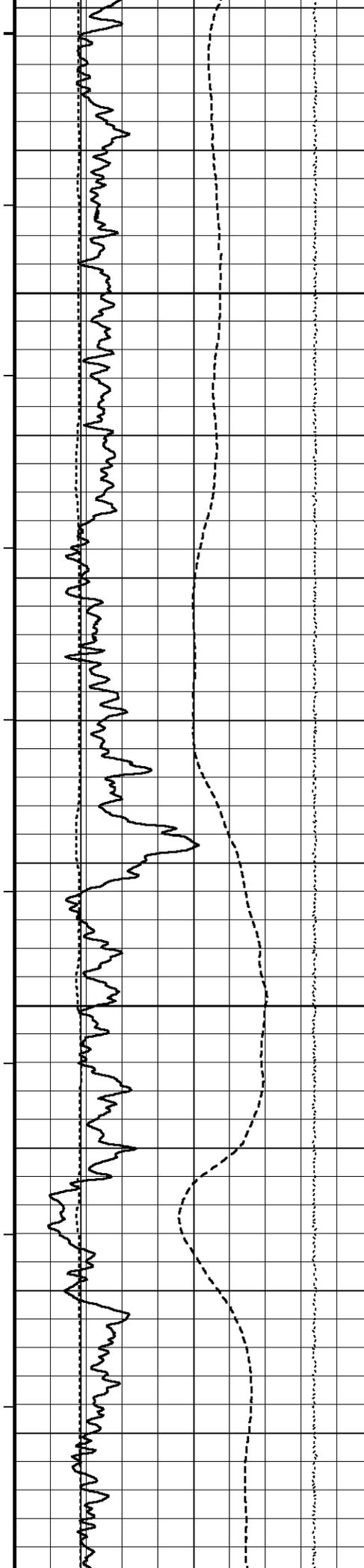
127°

6150

MMR MicroLog Inverse

MMR MicroLog Normal





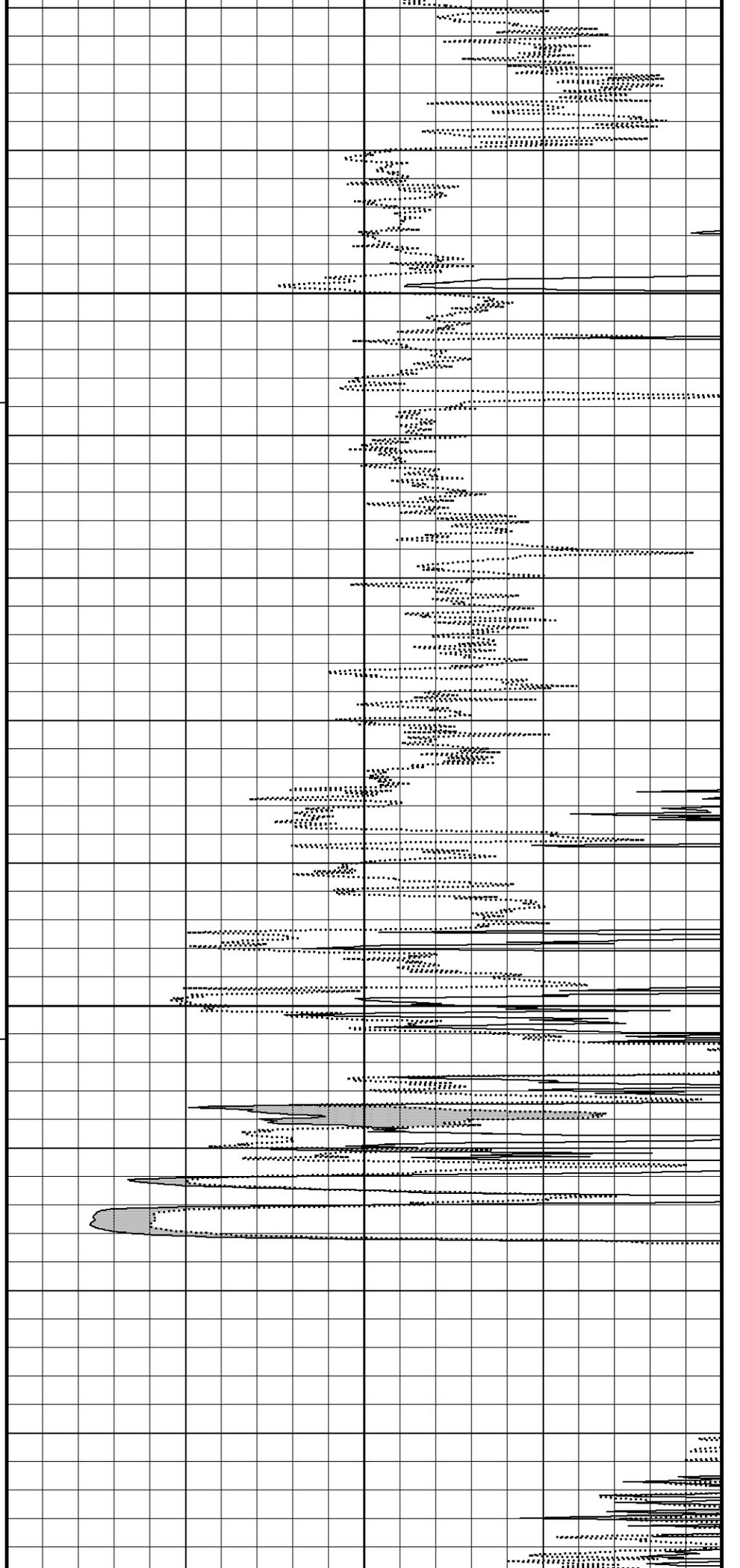
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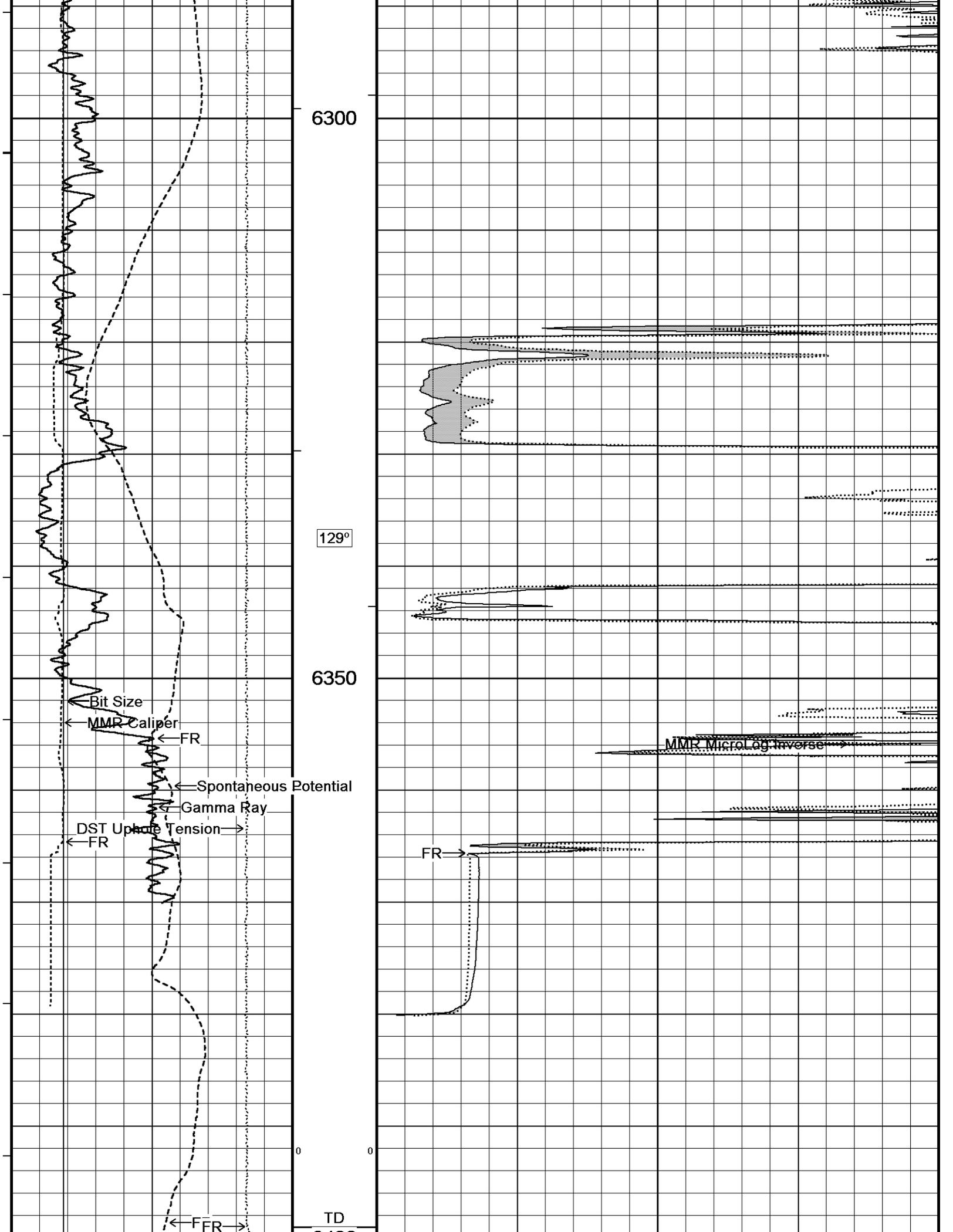
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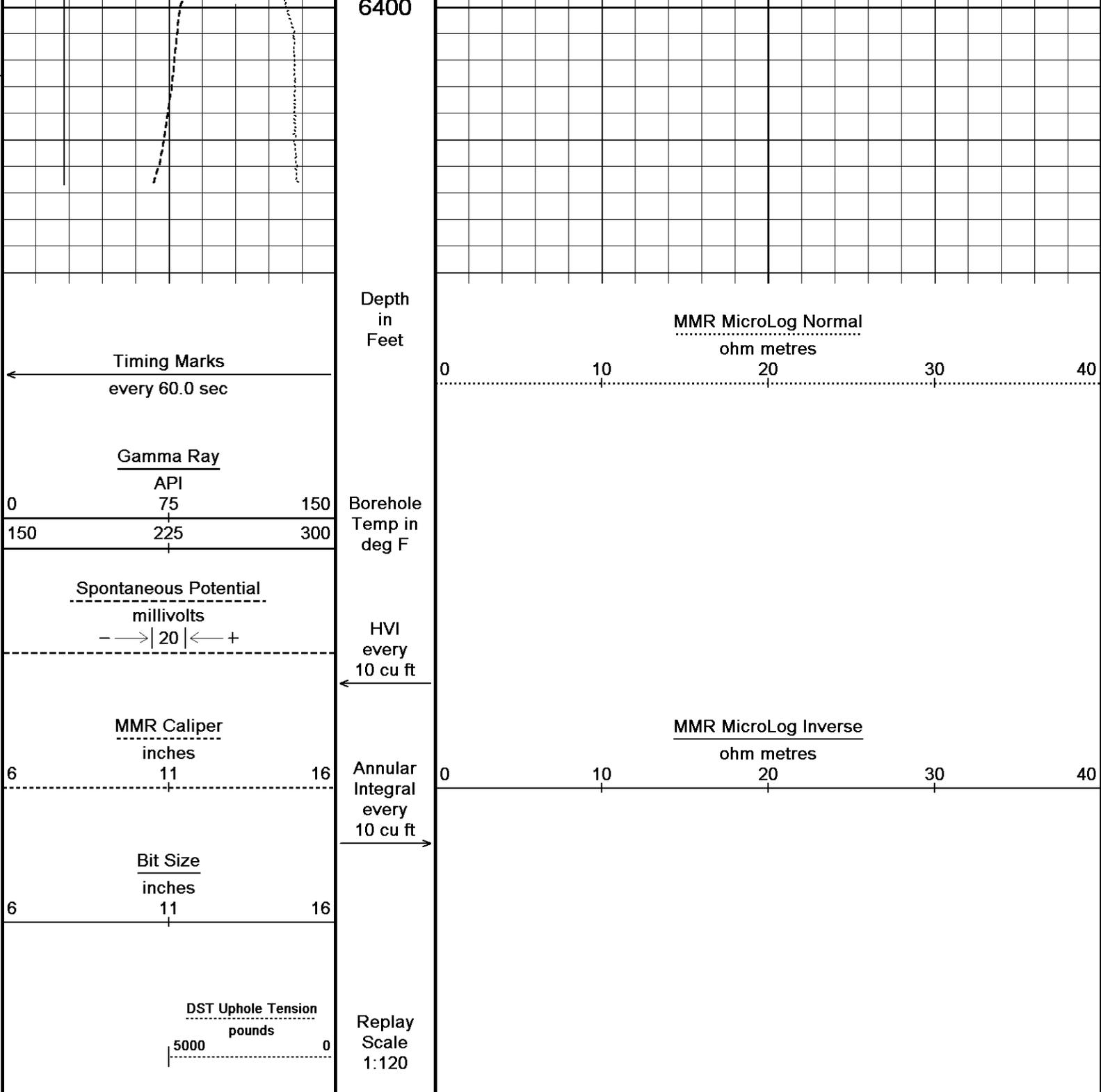
128°

6250

128°







Depth Based Data - Maximum Sampling Increment 2.5cm
 Plotted on 02-SEP-2015 17:57
 Filename: C:\Minimus 15.01.3109\Log Data\O'Brien Stoltzfus 1-34\O'Brien Stoltzfus 1-34 High Resolution.dta
 Recorded on 02-SEP-2015 13:29
 System Versions: Logged with 15.01.3109 Plotted with 15.01.3109

↑ 10 INCH HIGH RESOLUTION ↑

BEFORE SURVEY CALIBRATION
 C:\Minimus 15.01.3109\Log Data\O'Brien Stoltzfus 1-34\O'Brien Stoltzfus 1-34 Repeat.dta

General Constants All 000 Last Edited on 02-SEP-2015,11:28

General Parameters		
Mud Resistivity	1.320	ohm-metres
Mud Resistivity Temperature	75.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters
 HVOL Method Single Caliper
 HVOL Caliper 1 Density Caliper
 HVOL Caliper 2 N/A
 Annular Volume Diameter 4.500 inches
 Caliper for Differential Caliper MMR Caliper

Rwa Parameters
 Porosity used Crossplot Porosity
 Resistivity used Array Ind. One Res Rt
 RWA Constant A 0.610
 RWA Constant M 2.150
 SW/APOR Tool Source 0.000

High Resolution Temperature Calibration MCG-B 39

Field Calibration on 21-DEC-2014,10:31

	Measured	Calibrated(Deg F)
Lower	10.00	10.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-B 39

Last Edited on 28-AUG-2014,01:02

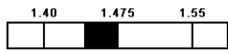
Pre-filter Length 11

Gamma Calibration MCG-B 39

Field Calibration on 01-SEP-2015 20:56

	Measured	Calibrated (API)
Background	71	49
Calibrator (Gross)	1115	774
Calibrator (Net)	1044	725

Gamma Calibration Tolerances MCG-B 39

Ratio 1.441  Counts/API

Gamma Constants MCG-B 39

Last Edited on 02-SEP-2015,11:29

Gamma Calibrator Number GRC038
 GRC-M Calibrator Jig in Use? NO
 Inactive Background Jig in Use? NO
 Mud Density 1.09 gm/cc
 Caliper Source for Processing Density Caliper
 Tool Position Eccentred
 Potassium Equivalence Chloride
 K Mud Concentration 0.00 %

Micro Normal and Micro Inverse Calibration MMR-B.A 98

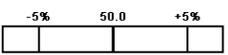
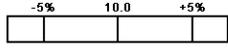
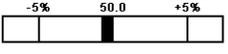
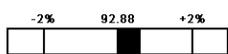
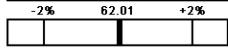
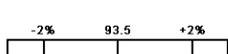
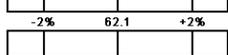
Base Calibration on 07-AUG-2015 07:58
 Field Check on 01-SEP-2015 20:29

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.3	50.1	5.1	25.6
Micro Inverse	10.0	49.6	3.4	16.9

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	93.5	93.5
Micro Inverse	62.1	62.1

Micro Normal & Micro Inverse Calibration Tolerance MMR-B.A 98

Micro Normal Res. 1	10.3		ohm	Micro Normal Res. 2	50.1		ohm
Micro Inverse Res. 1	10.0		ohm	Micro Inverse Res. 2	49.6		ohm
Micro Normal Base Check	93.5		ohm-m				
Micro Inverse Base Check	62.1		ohm-m				
Micro Normal Field Check	93.5		ohm-m				
Micro Inverse Field Check	62.1		ohm-m				

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	0.5110	
Micro Inverse K Factor	0.3380	
Standoff Offset	0.0000	inches

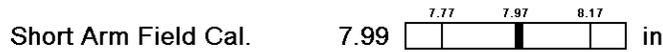
Caliper Calibration MMR-B.A 98

Base Calibration on 07-AUG-2015 07:45
Field Calibration on 01-SEP-2015 20:31

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13869	5.96
2	17187	7.98
3	20382	9.85
4	24426	11.92
5	0	0.00
6	N/A	N/A

Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	7.99	7.97

Caliper Calibration Tolerances MMR-B.A 98



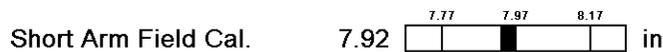
Caliper Calibration MPD-C.A 216

Base Calibration on 07-AUG-2015 11:34
Field Calibration on 01-SEP-2015 20:26

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	20064	3.99
2	30304	5.98
3	40448	7.97
4	50192	9.86
5	61024	11.92
6	N/A	N/A

Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	7.92	7.97

Caliper Calibration Tolerances MPD-C.A 216



DOWNHOLE EQUIPMENT

C:\Minimus 15.01.3109\Log Data\O'Brien Stoltzfus 1-34\O'Brien Stoltzfus 1-34 Repeat.dta

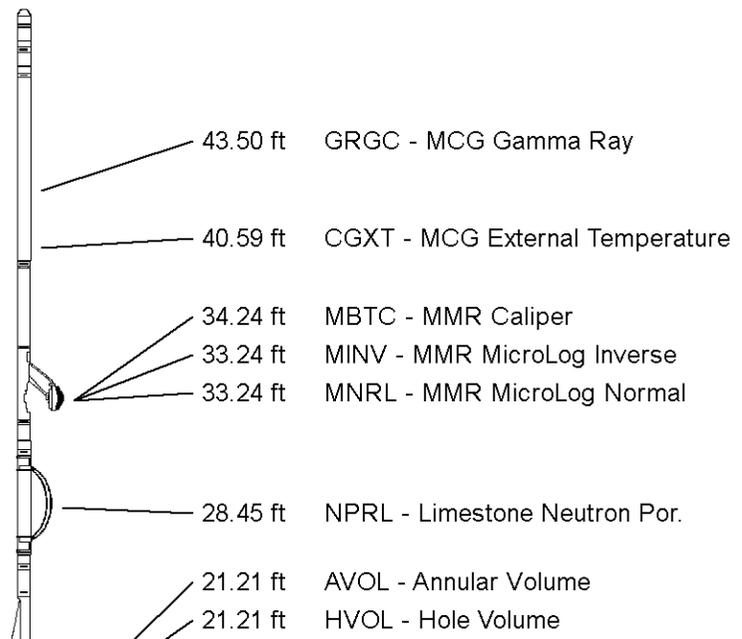
CBH-C, Cablehead, 11 pin
CBH-CA 233 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Comms Gamma
MCG-B 39 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-B.A 98 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

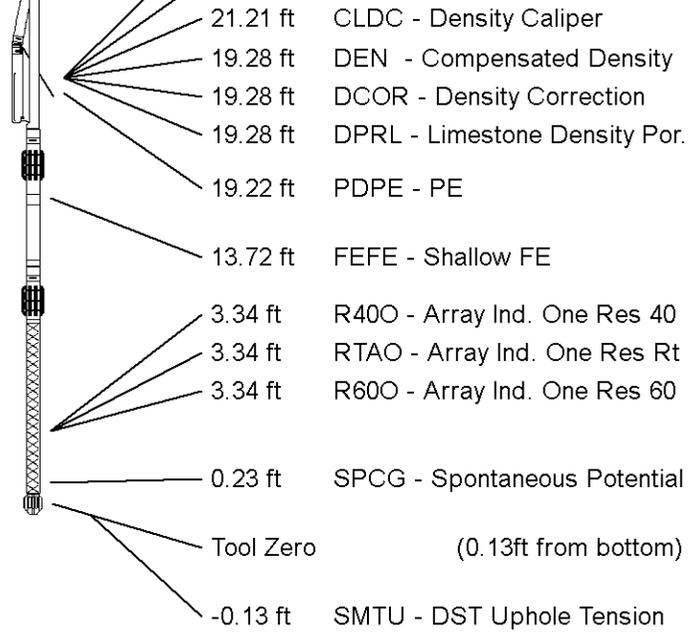
Compact Density/Caliper
MPD-C.A 216 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in



Compact Focussed Electric
 MFE-A.A 135 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Induction
 MAI-A.A 111 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 51.18 ft Weight: 407.9 lb



All measurements relative to tool zero.

COMPANY	O'BRIEN ENERGY RESOURCES CORP.
WELL	STOLTZFUS 1-34
FIELD	MOHLER
PROVINCE/COUNTY	MEADE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2552.00	feet	First Reading	6366.00	feet
Elevation Drill Floor	2550.00	feet	Depth Driller	6400.00	feet
Elevation Ground Level	2539.00	feet	Depth Logger	6399.00	feet



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