



Weatherford

MICRORESISTIVITY LOG

COMPANY		O'BRIEN ENERGY RESOURCES CORP.			
WELL		VAIL OFFSET #4-30			
FIELD		SINGLEY			
PROVINCE/COUNTY		MEADE			
COUNTRY/STATE		U.S.A. / KANSAS			
LOCATION		2305' FSL & 2305' FEL			
SEC	TWP	RGE	Other Services		MAI/MFE
30	33S	29W	MPD/MDN		
API Number		15-119-21322			
Permit Number					
Permanent Datum GL, Elevation 2672 feet					Elevations: KB 2684.00 DF 2682.00 GL 2672.00
Log Measured From KB					
Drilling Measured From KB					
Date	17-AUG-2012				
Run Number	ONE				
Depth Driller	6354.00				feet
Depth Logger	6358.00				feet
First Reading	6325.00				feet
Last Reading	4000.00				feet
Casing Driller	1493.00				feet
Casing Logger	1494.00				feet
Bit Size	7.875				inches
Hole Fluid Type	WBM				
Density / Viscosity	9.00 lb/USg		65.00 CP		
PH / Fluid Loss	12.00		7.00 ml/30Min		
Sample Source	FLOWLINE				
Rm @ Measured Temp	0.98 @ 96.0				ohm-m
Rmf @ Measured Temp	0.78 @ 96.0				ohm-m
Rmc @ Measured Temp	1.18 @ 96.0				ohm-m
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.74 @130.0		ohm-m		
Time Since Circulation	5 HOURS				
Max Recorded Temp	130.00		deg F		
Equipment Name	COMPACT				
Equipment / Base	13057	LIB			
Recorded By	ADAM SILL				WITNESS-PAUL WIEMANN
Witnessed By	ROGER PEARSON				PETER DEBENHAM
S.O. # / JOB #	3537827				LB12-218

BOREHOLE RECORD				Last Edited: 17-AUG-2012 03:50
Bit Size inches		Depth From feet		Depth To feet
7.875		1493.00		6354.00
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	1493.00	24.00

REMARKS
- SOFTWARE ISSUE: WLS 13.02.6600.
- MCG, MML, MDN, MPD, MFE, MAI RAN IN COMBINATION.
- HARDWARE: DUAL BOWSPRING USED ON MDN.
0.5 INCH STANDOFF USED ON MFE.
0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 1961 CU. FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH PRODUCTION CASING FROM TD TO 4000 FT: 565 CU. FT.
- SERVICE ORDER # 3537827

SERVICE ORDER # 0001021.
- RIG: DUKE #6.
- ENGINEER: A. SILL.
- OPERATOR(S): B. REEVES.

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, 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. These interpretations are also subject to our general terms and conditions in our price schedule.

↓

5 INCH MAIN

↓

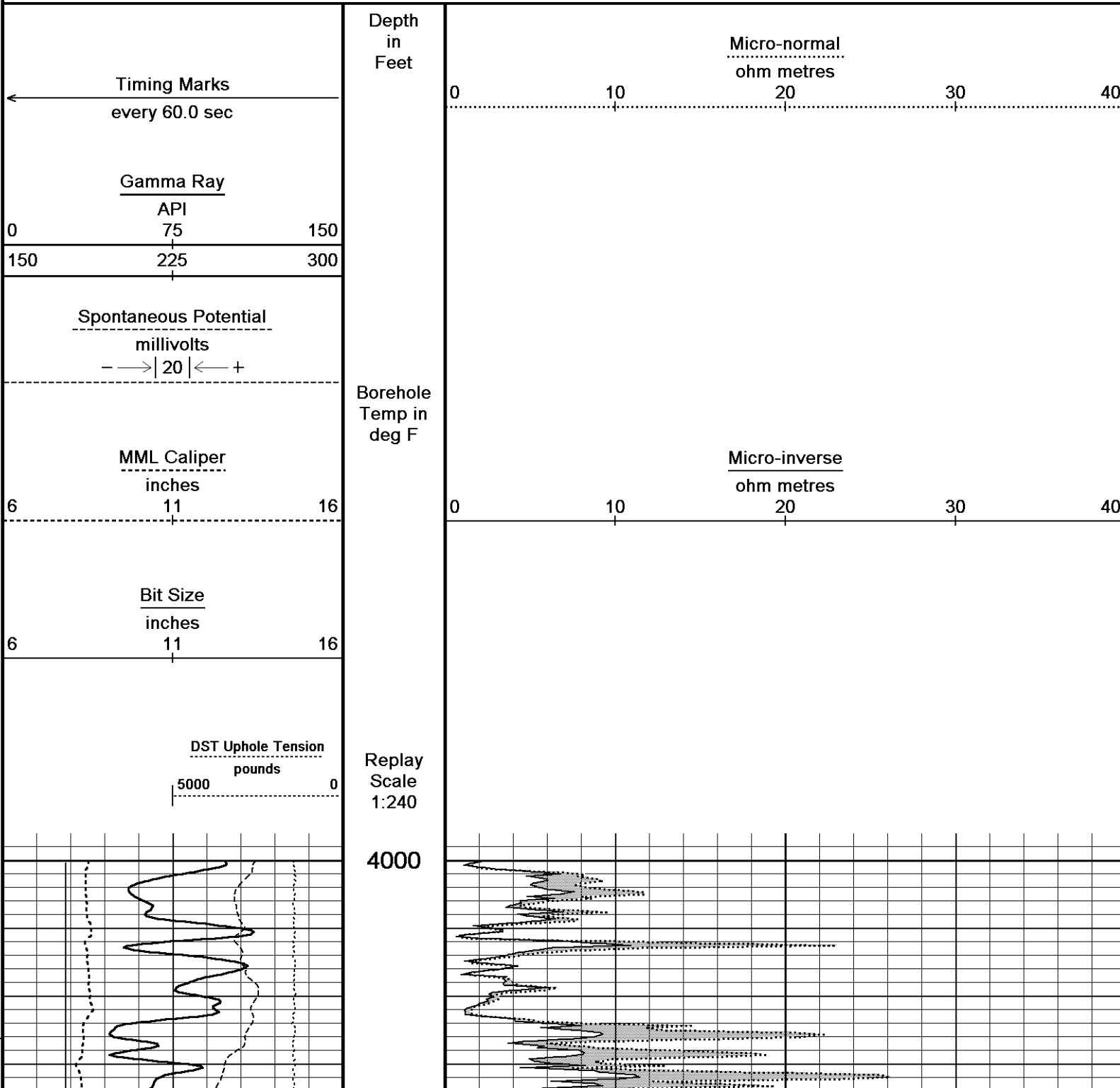
Depth Based Data - Maximum Sampling Increment 10.0cm

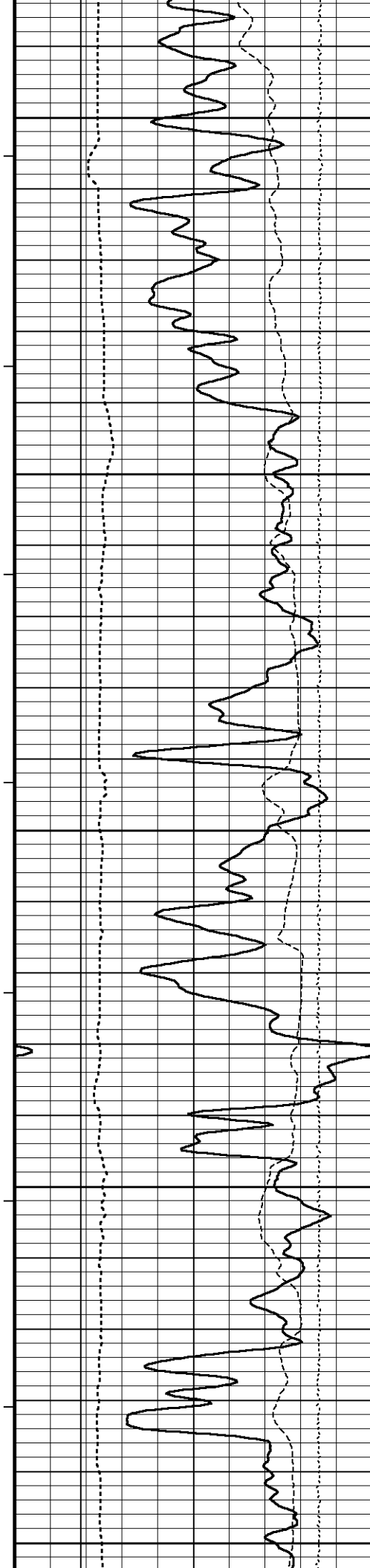
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Filename: C:\Minimus 13.02.6600\Data\O'Brien Vail Offset #4-30\O'Brien Vail Offset #4-30_003.dta

Recorded on 17-AUG-2012 06:57

System Versions: Logged with 13.02.6600 Processed with 13.02.6600 Plotted with 13.02.6600





113°

4050

114°

4100

114°

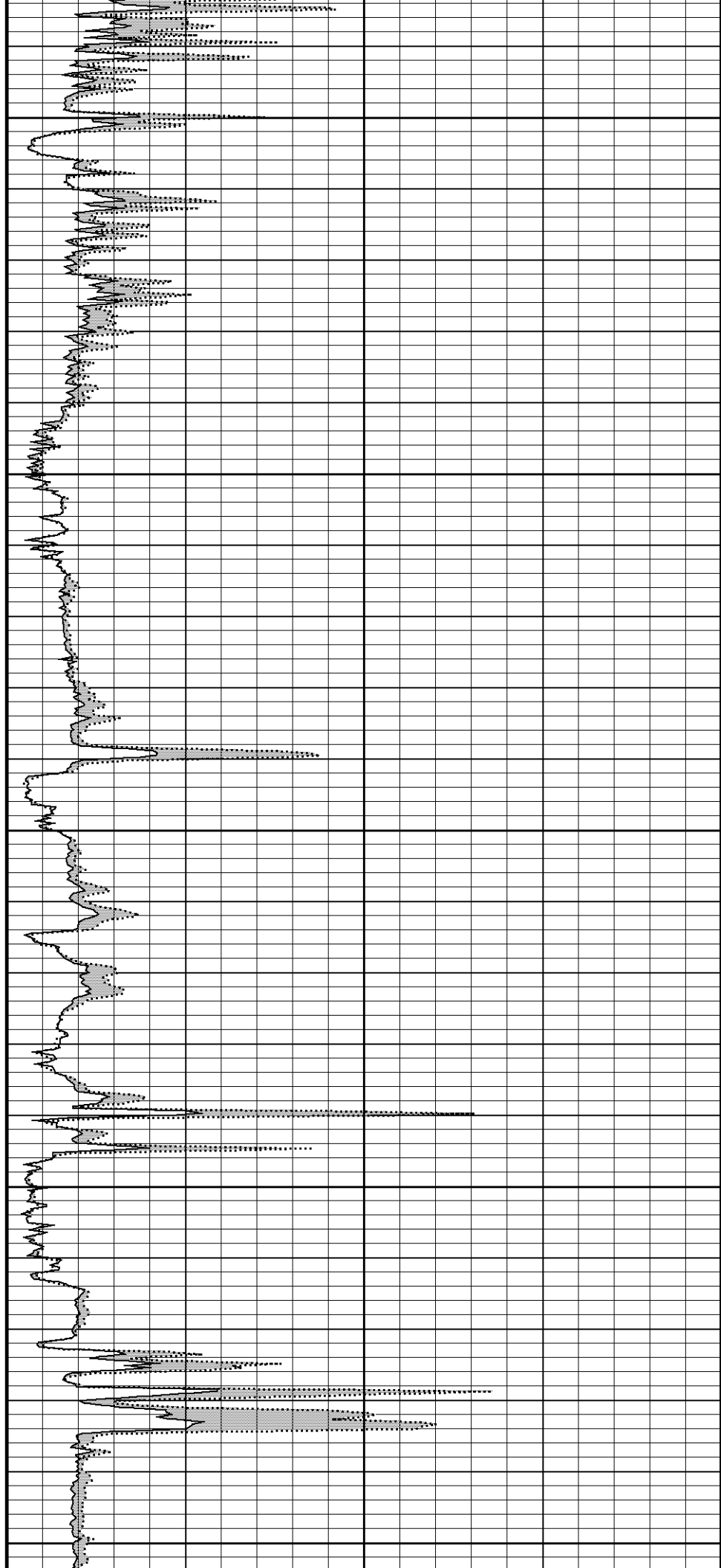
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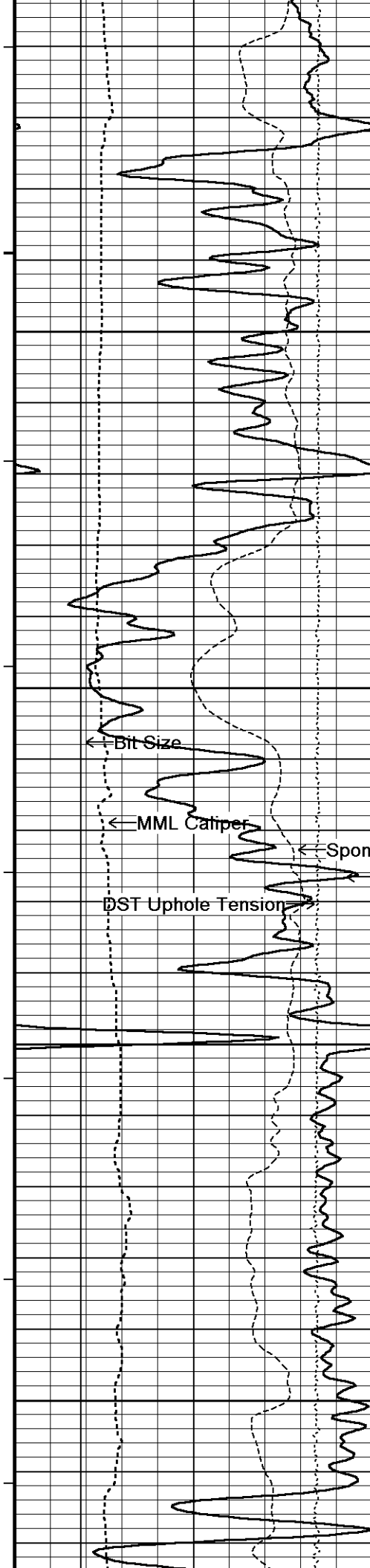
114°

4200

115°

4250





115°

4300

116°

4350

Micro-inverse

Micro-normal

Spontaneous Potential

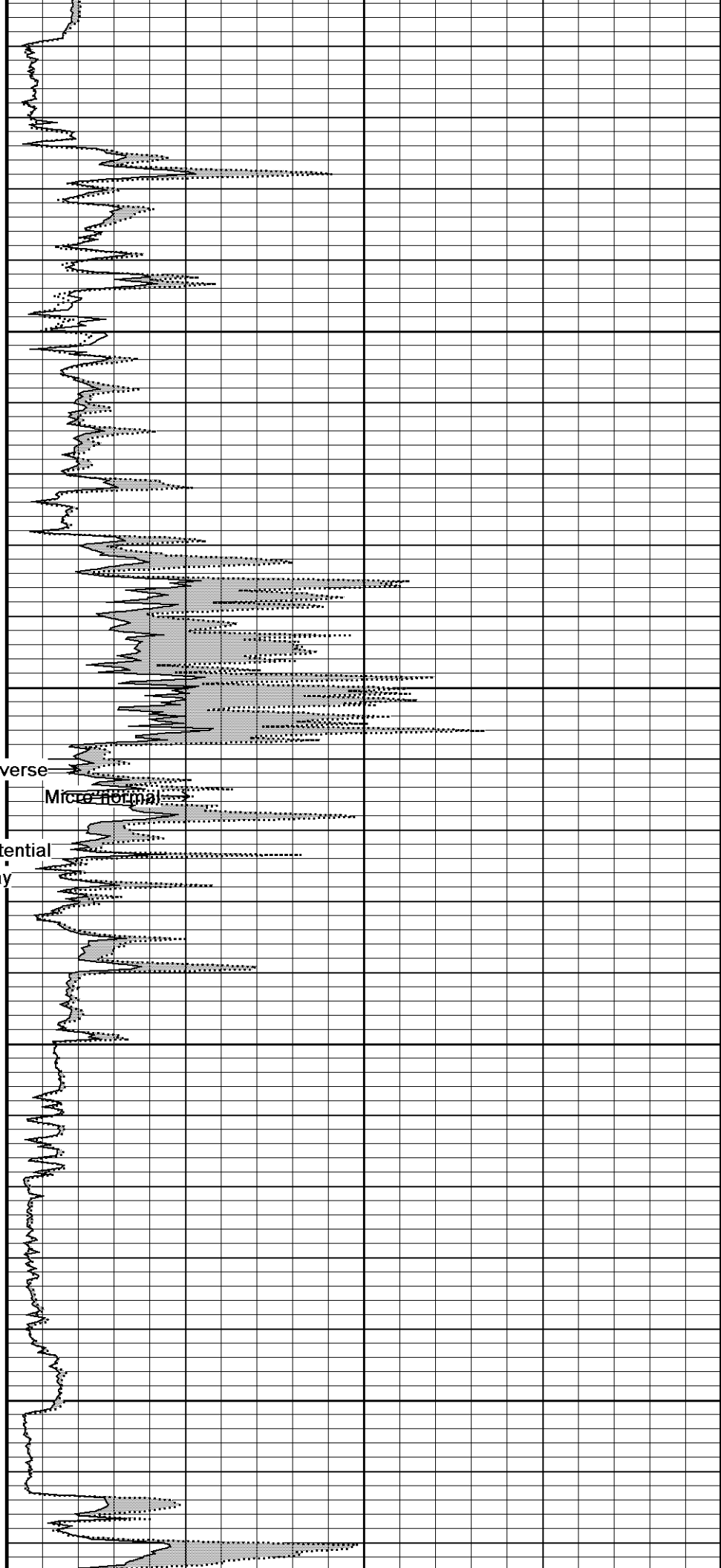
Gamma Ray

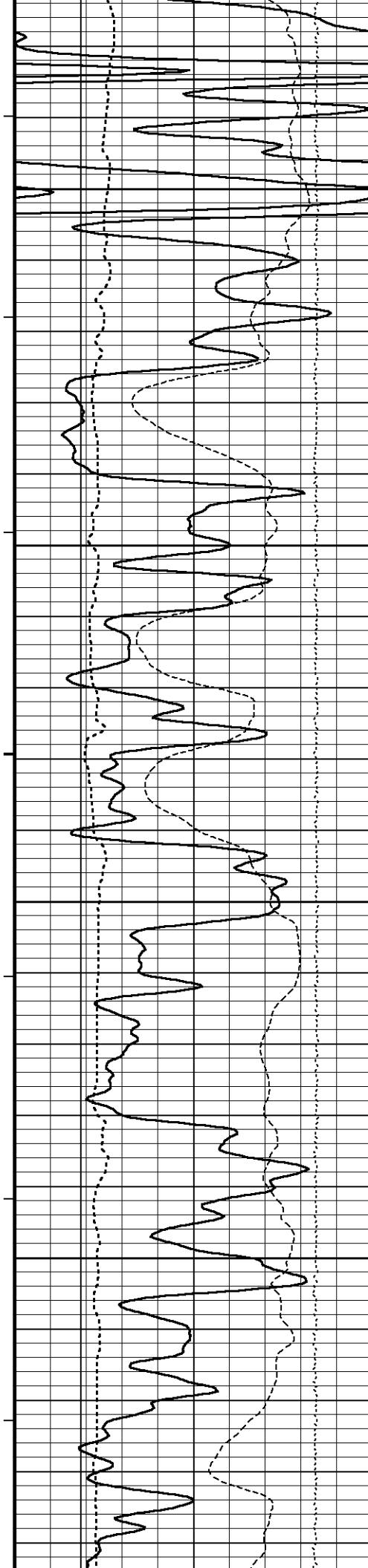
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4400

117°

4450





117°

4500

117°

4550

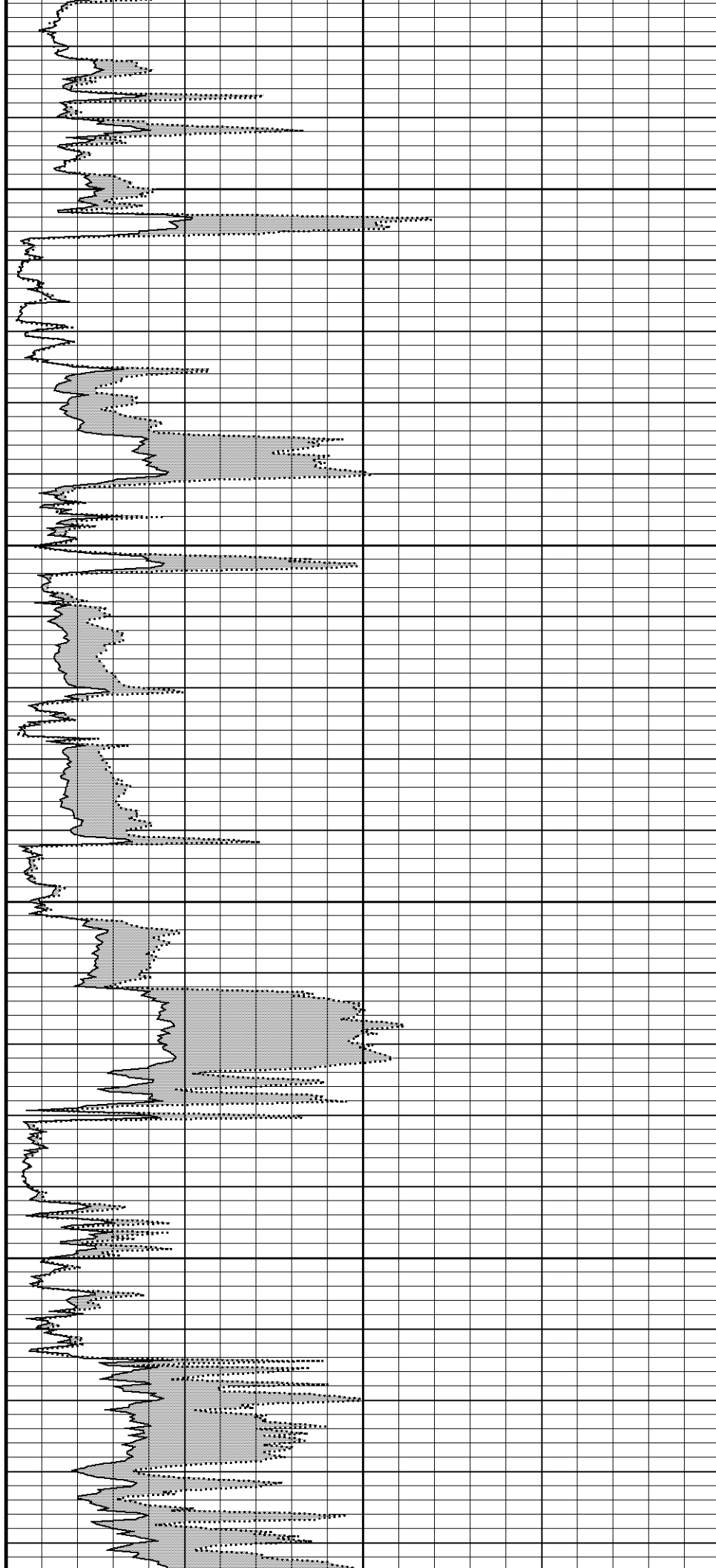
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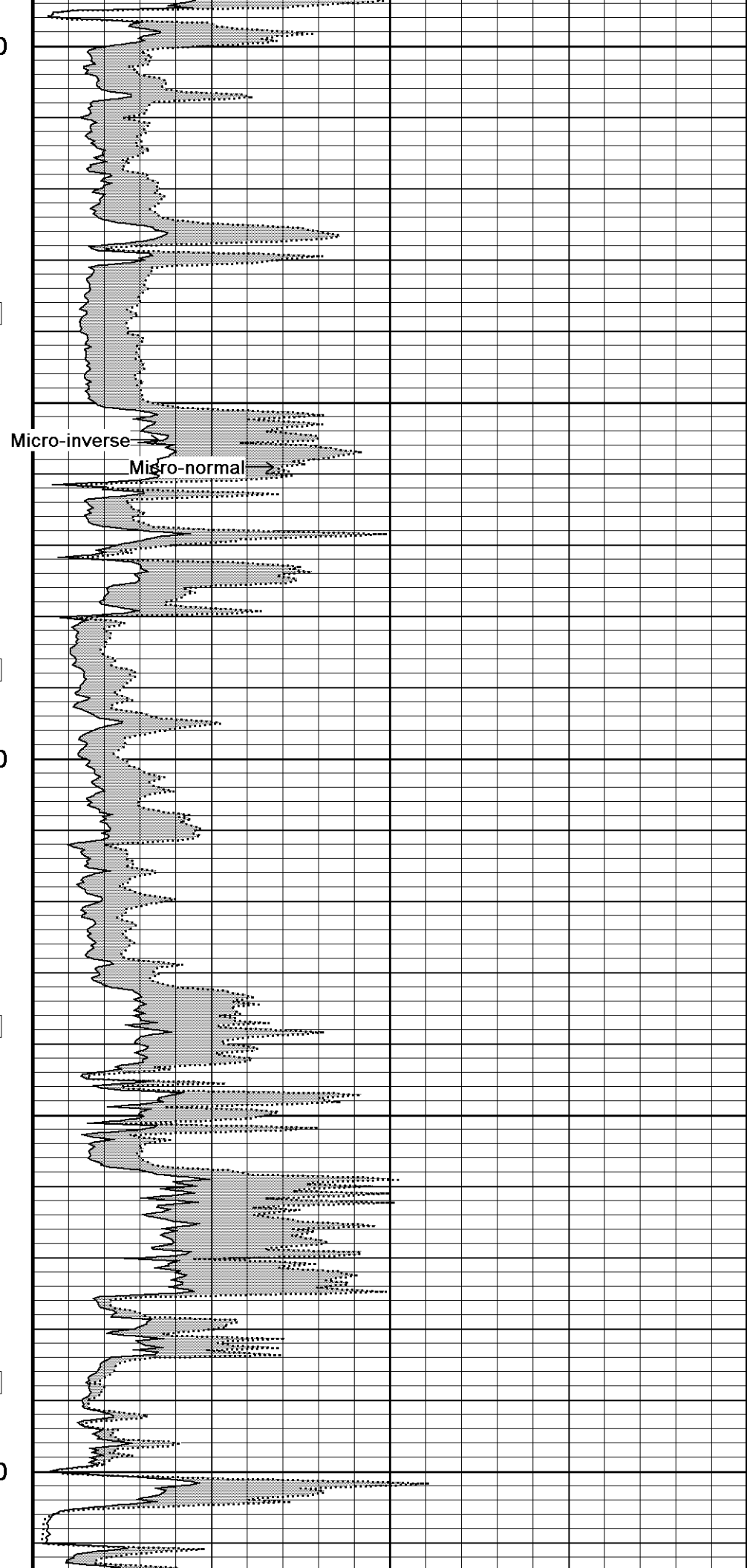
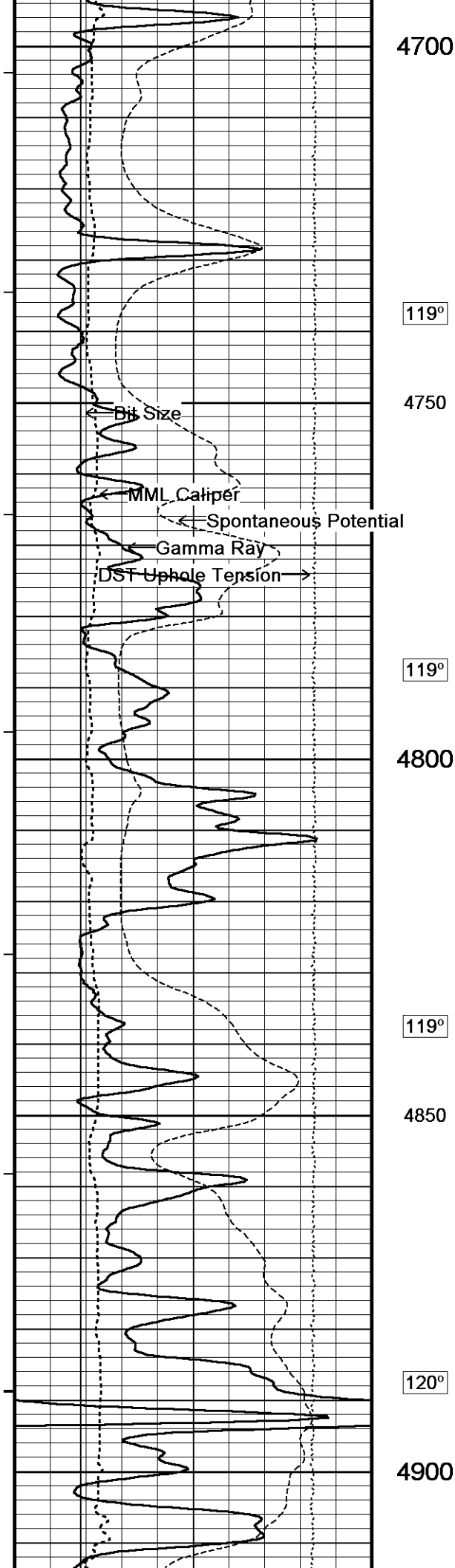
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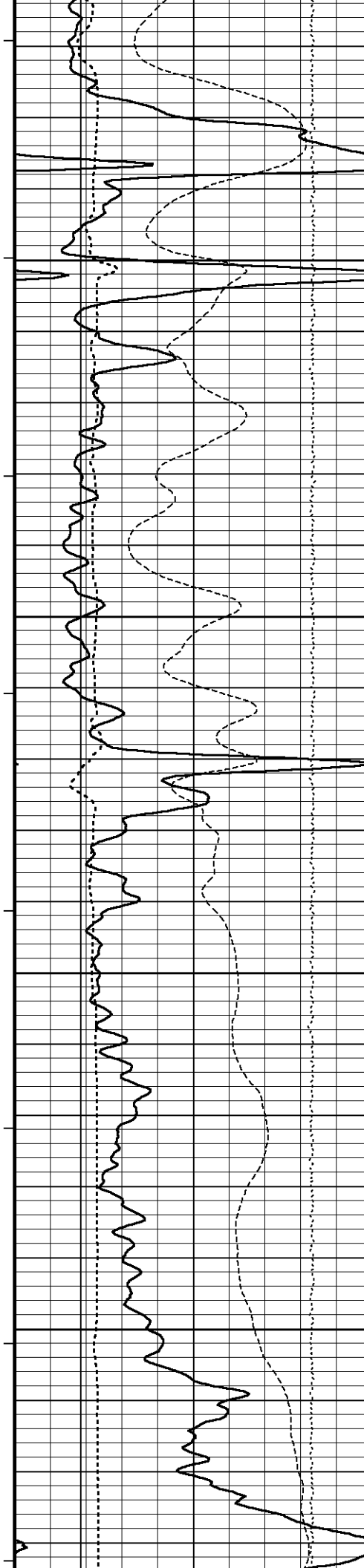
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4650

119°







120°

4950

120°

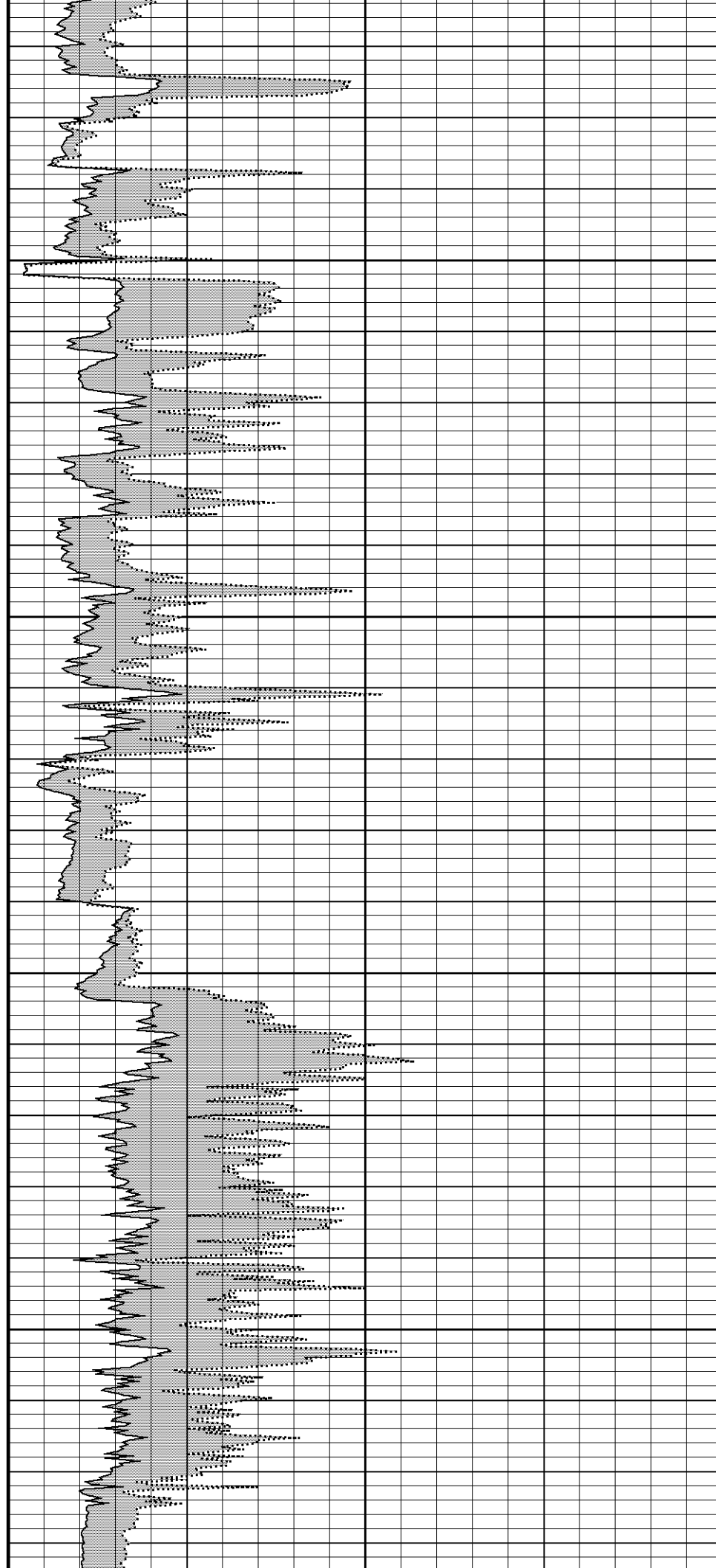
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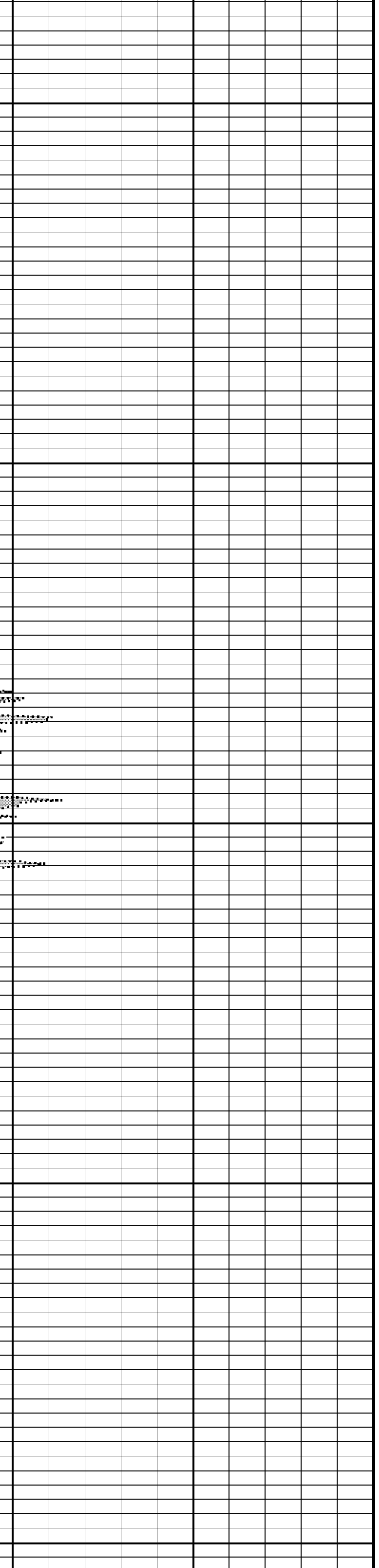
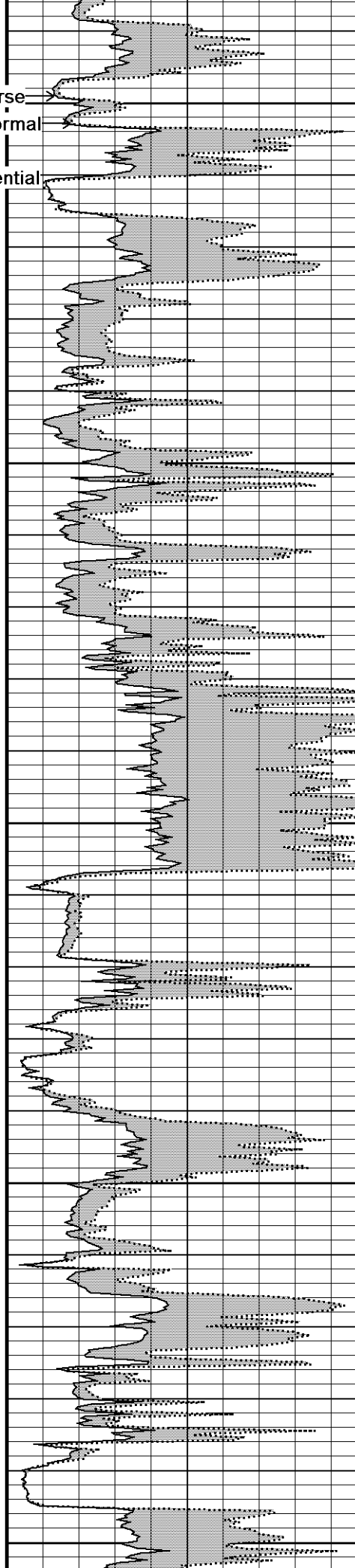
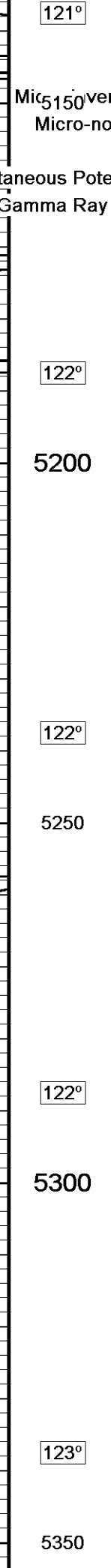
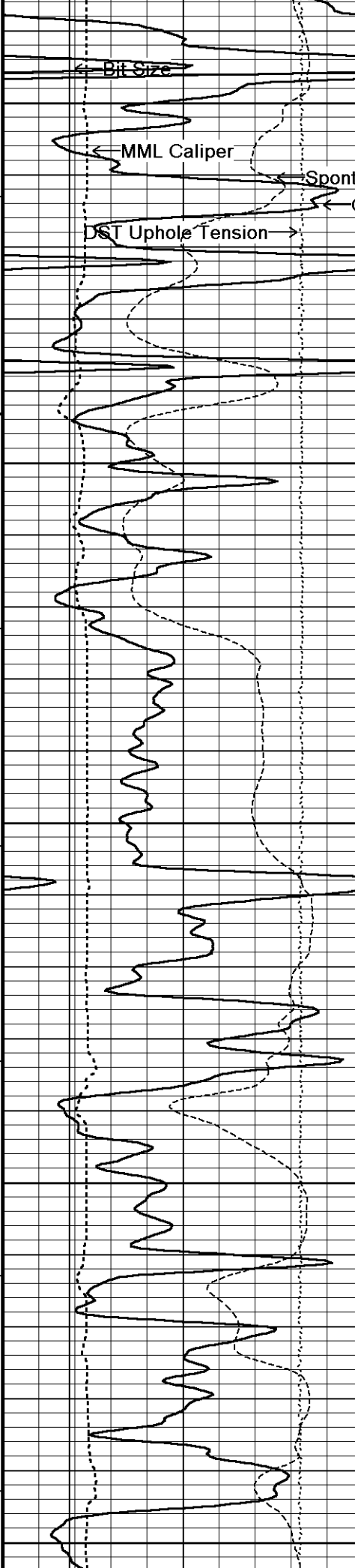
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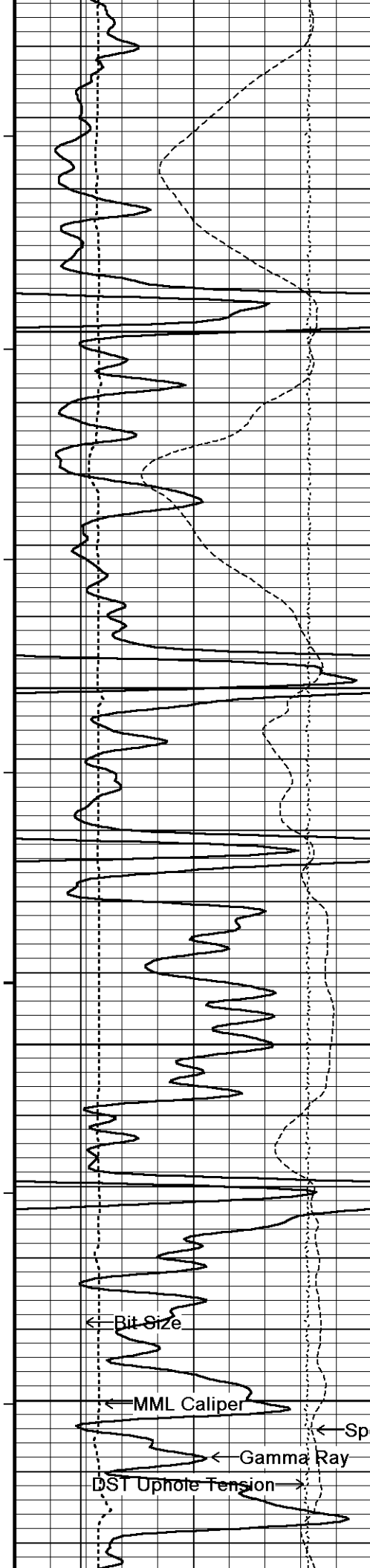
5050

121°

5100







123°

5400

123°

5450

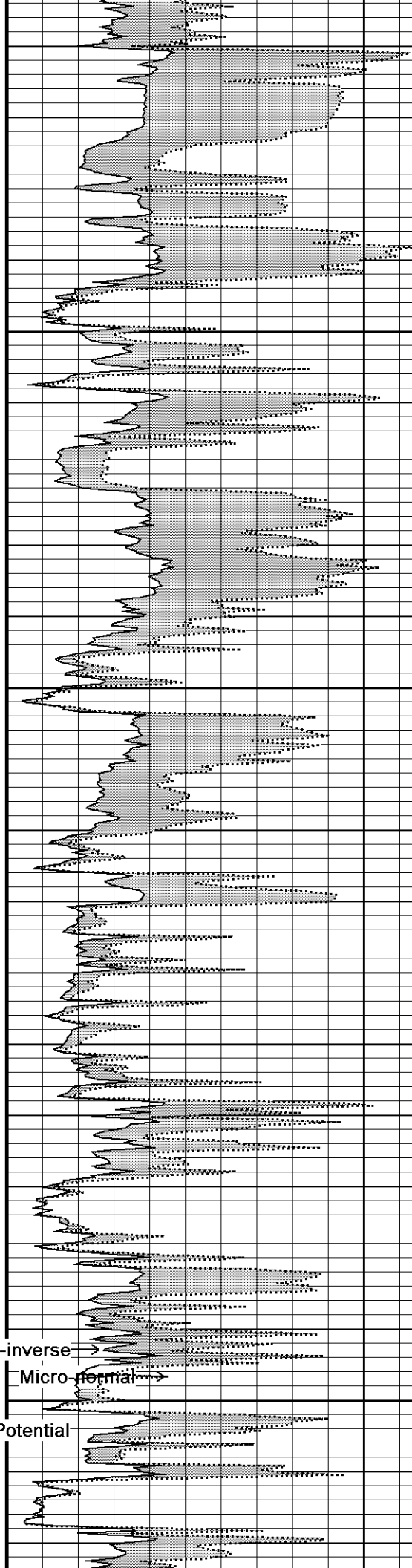
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5500

124°

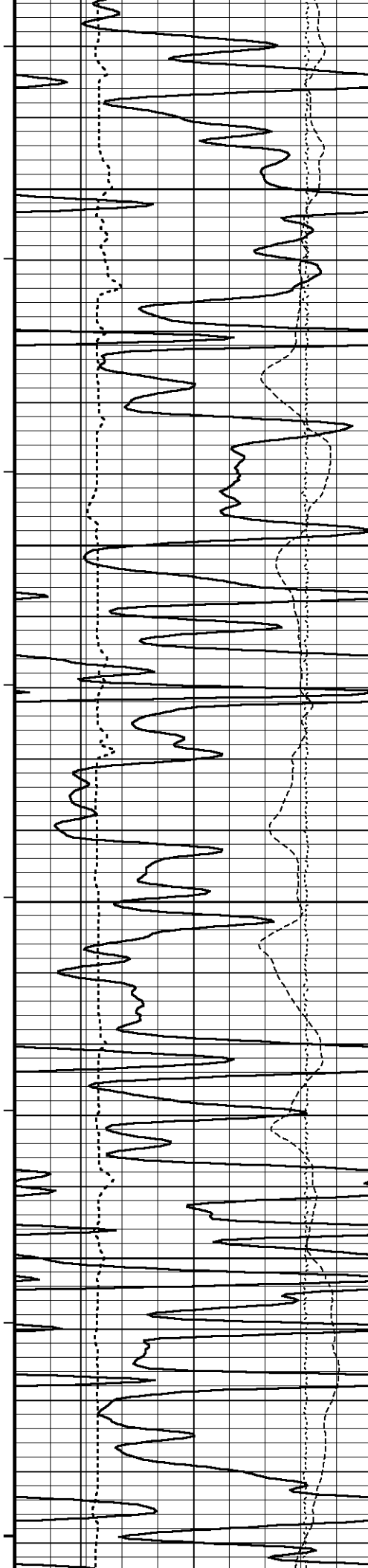
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Spontaneous Potential



Micro-inverse

Micro-normal



124°

5600

124°

5650

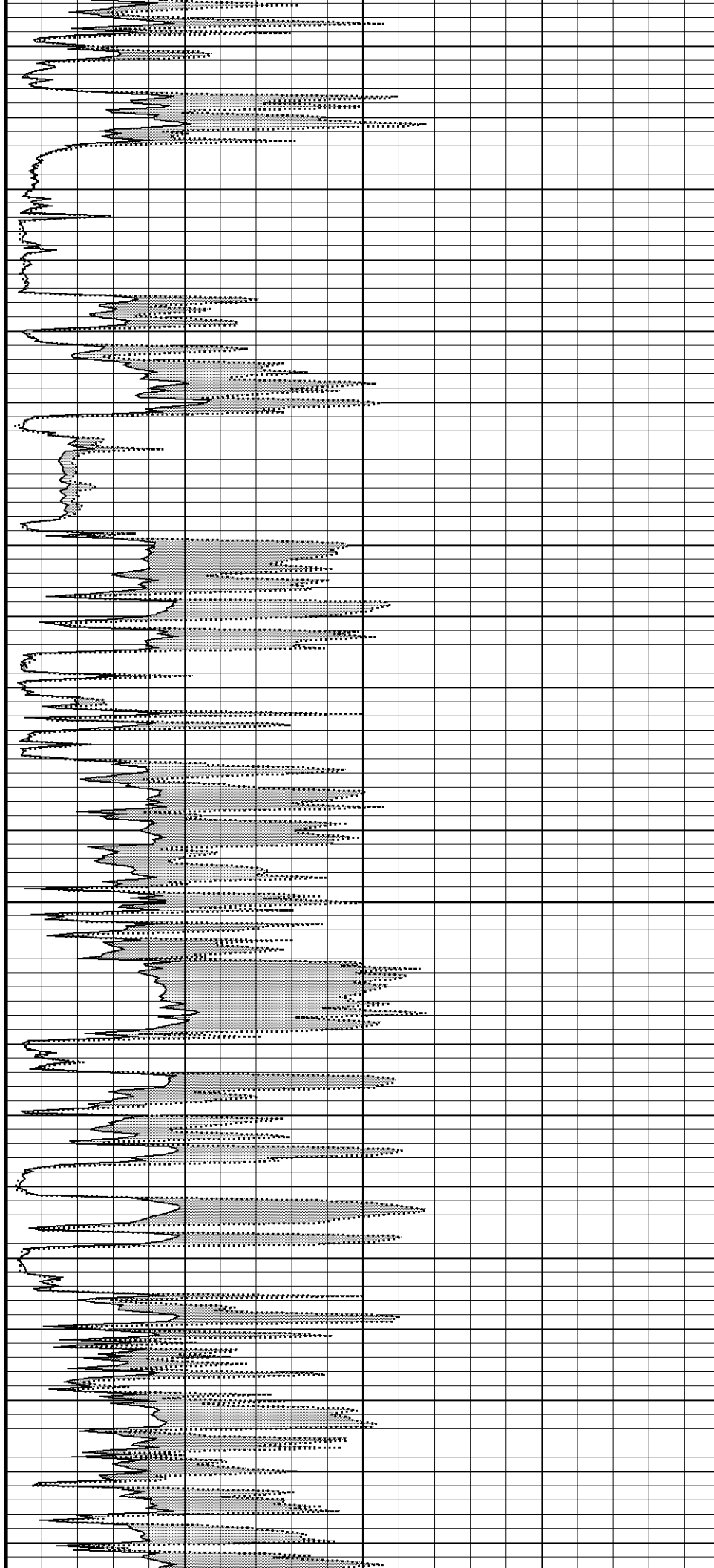
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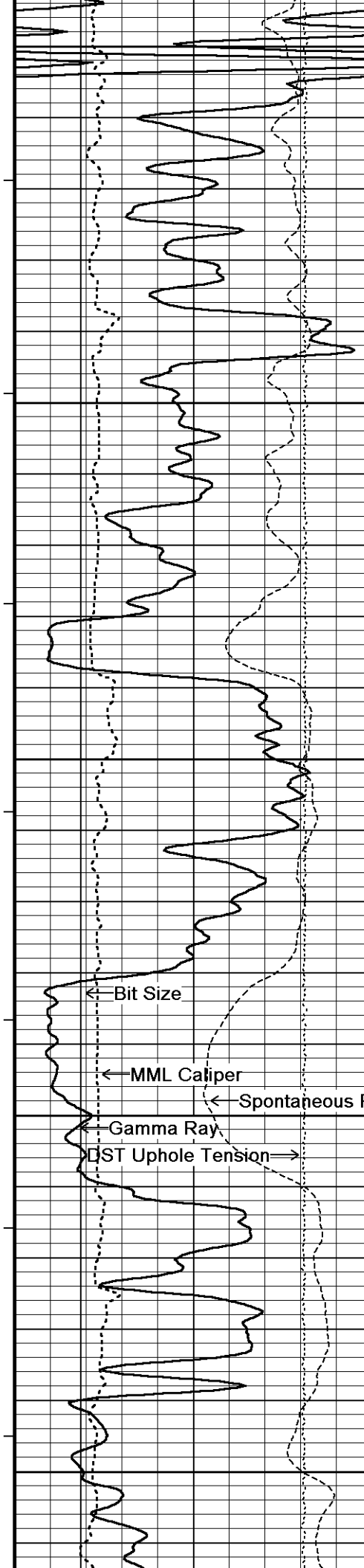
5700

125°

5750

126°





5800

126°

5850

126°

5900

126°

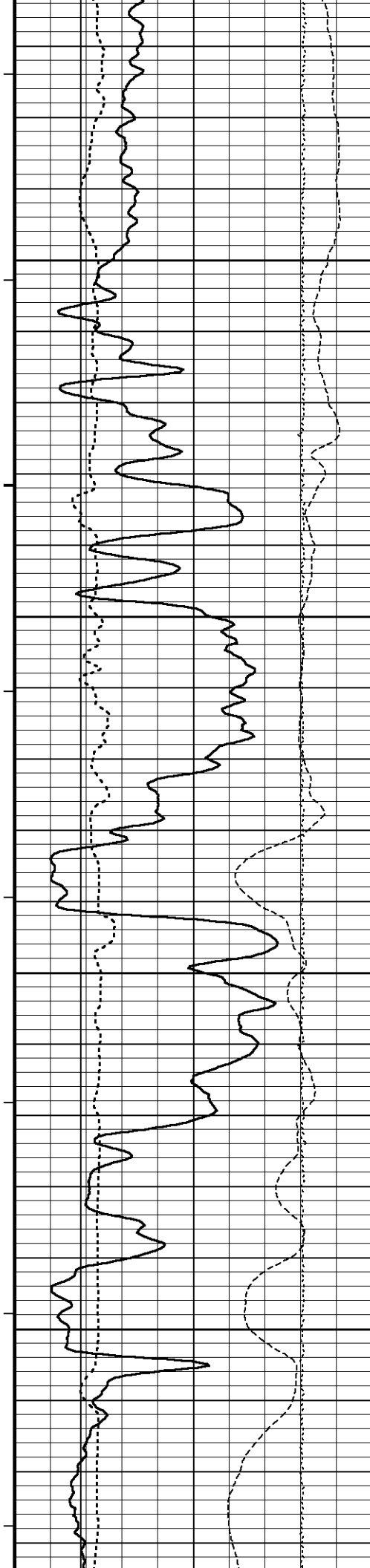
5950

126°

6000

Micro-inverse

Micro-normal



126°

6050

127°

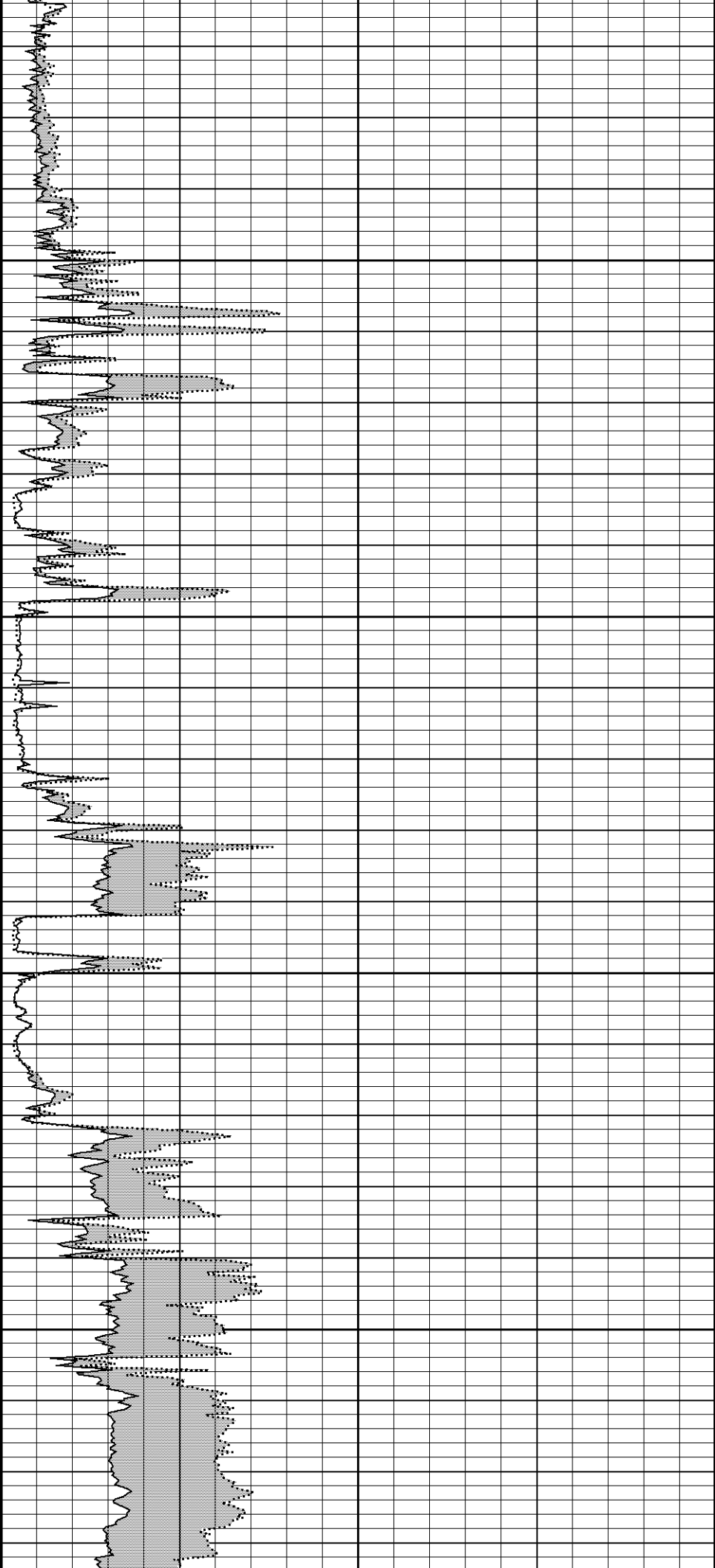
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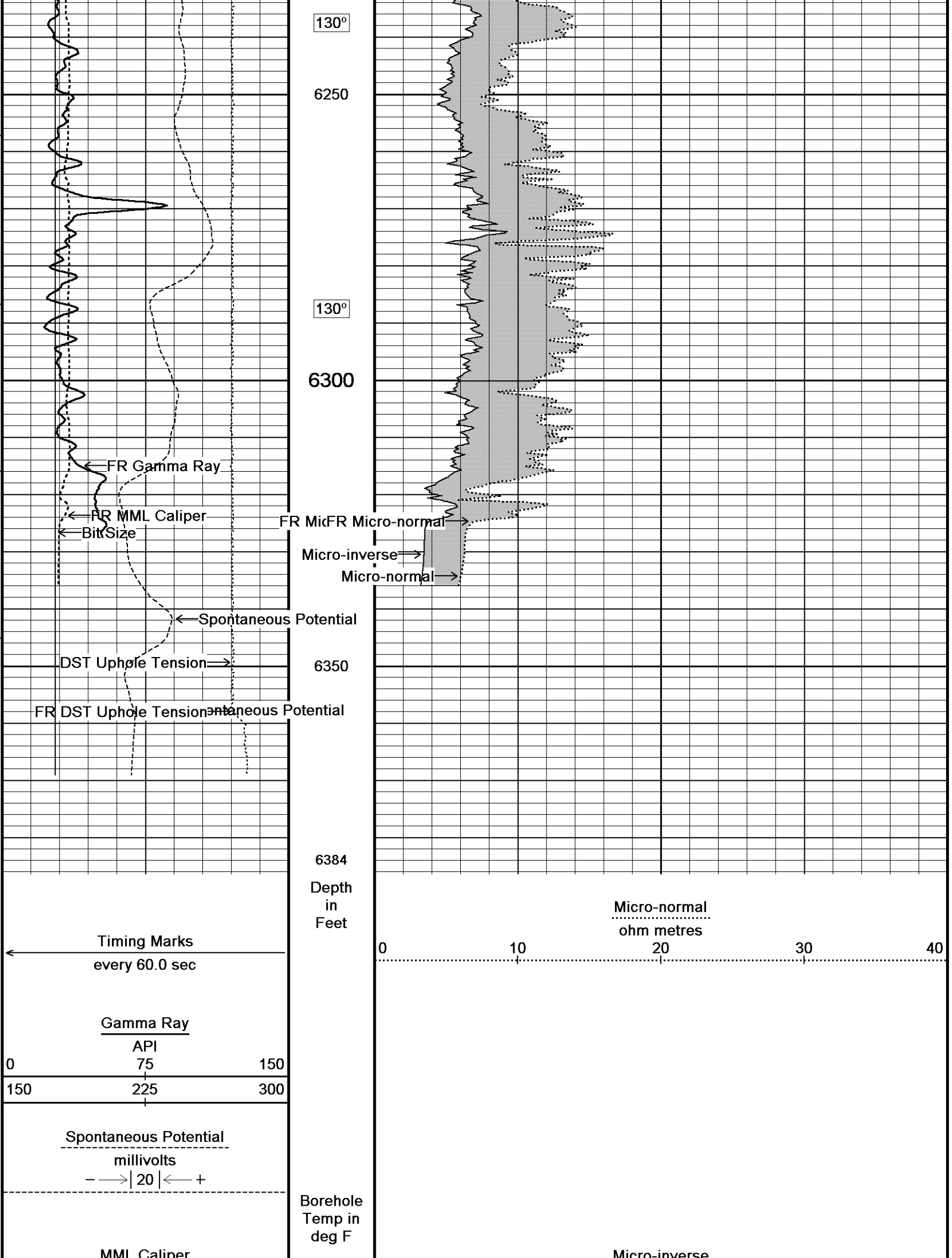
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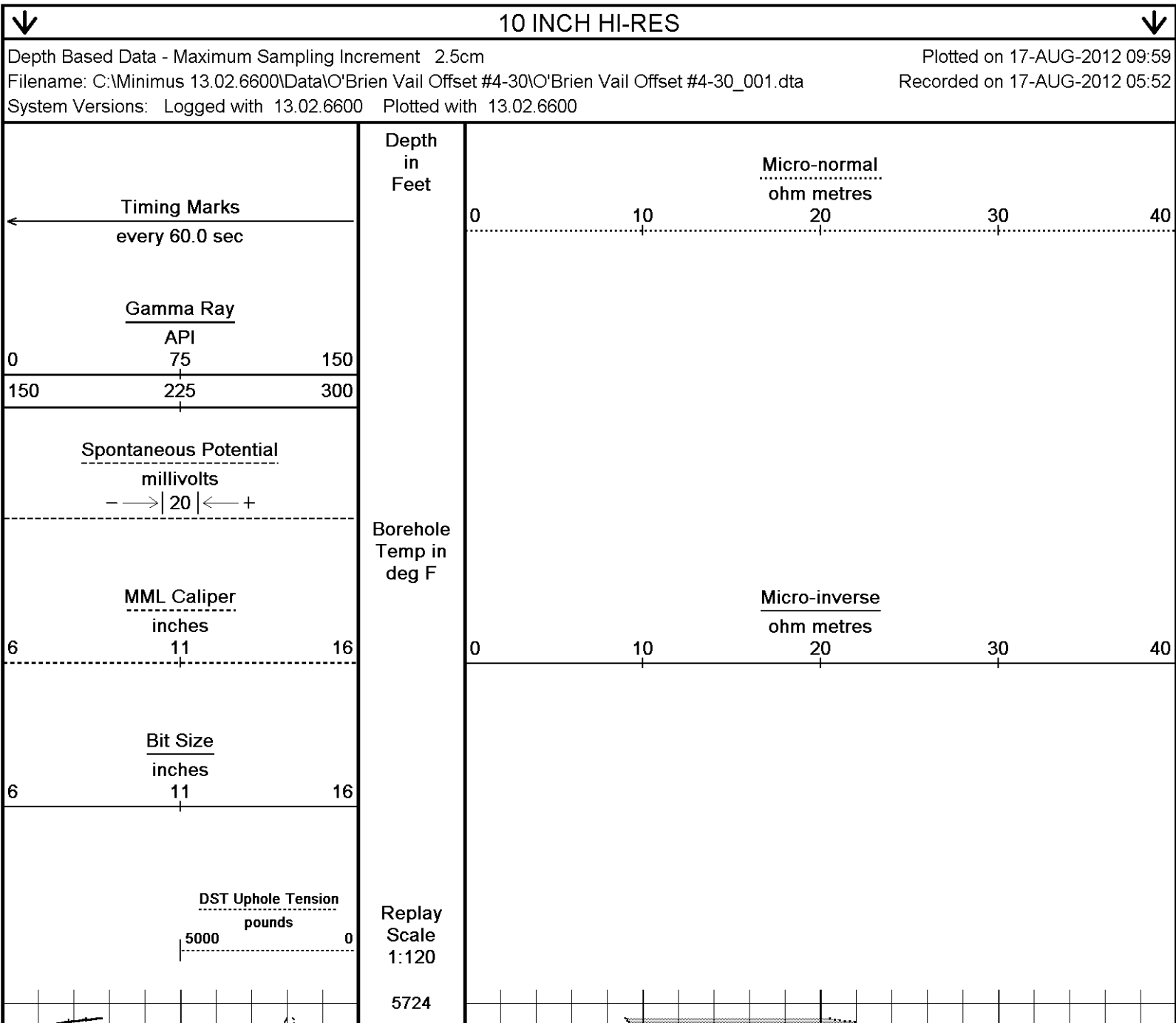
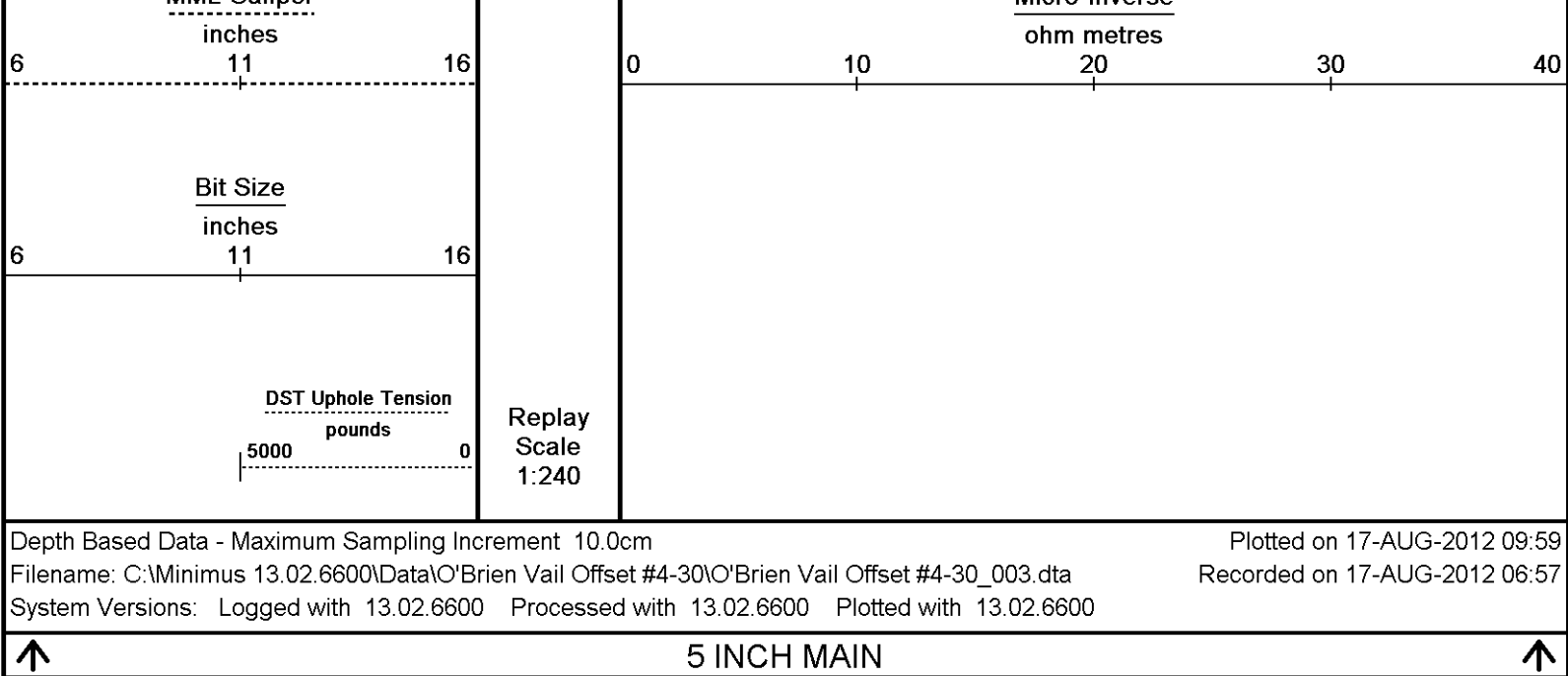
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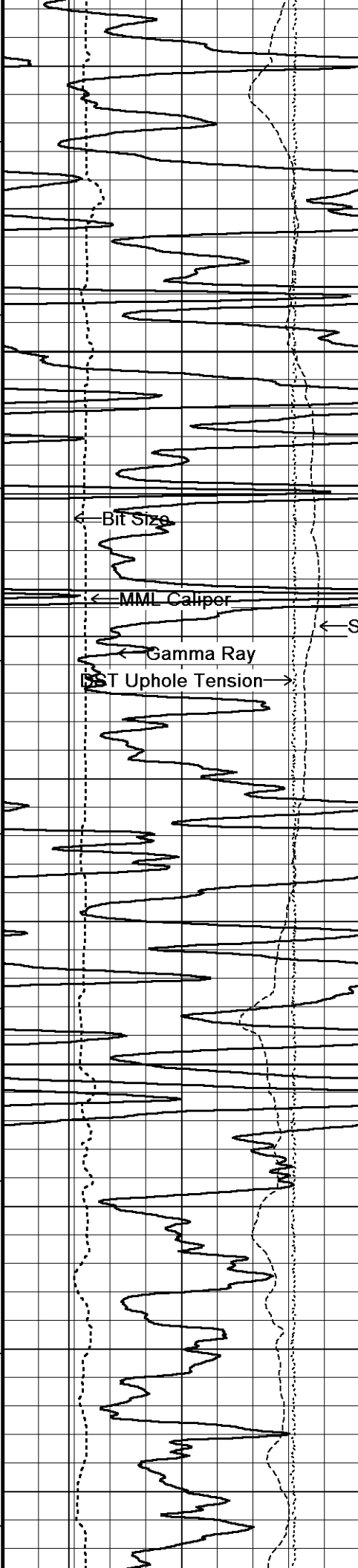
129°

6200









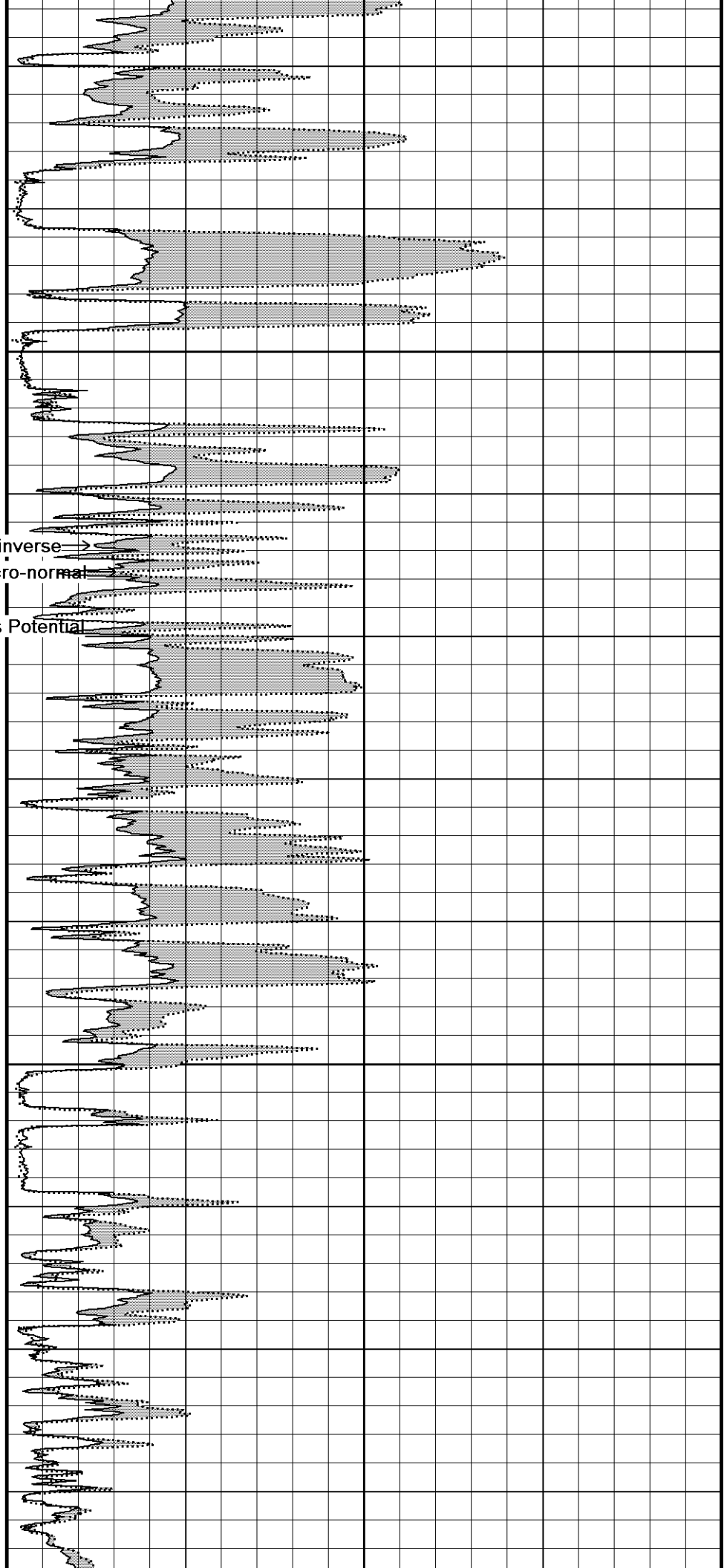
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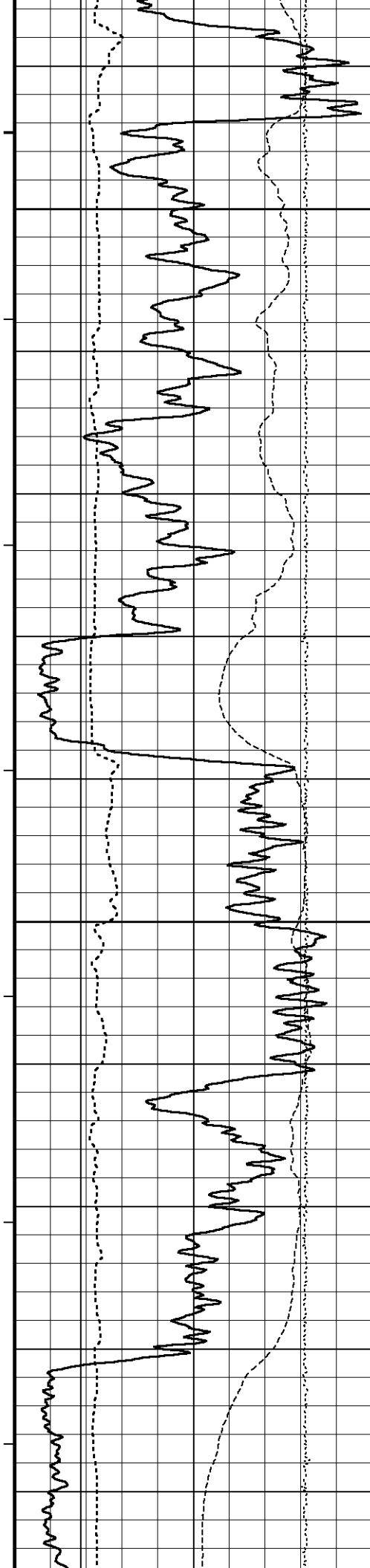
Micro-inverse
Micro-normal

← Spontaneous Potential

125°

5800





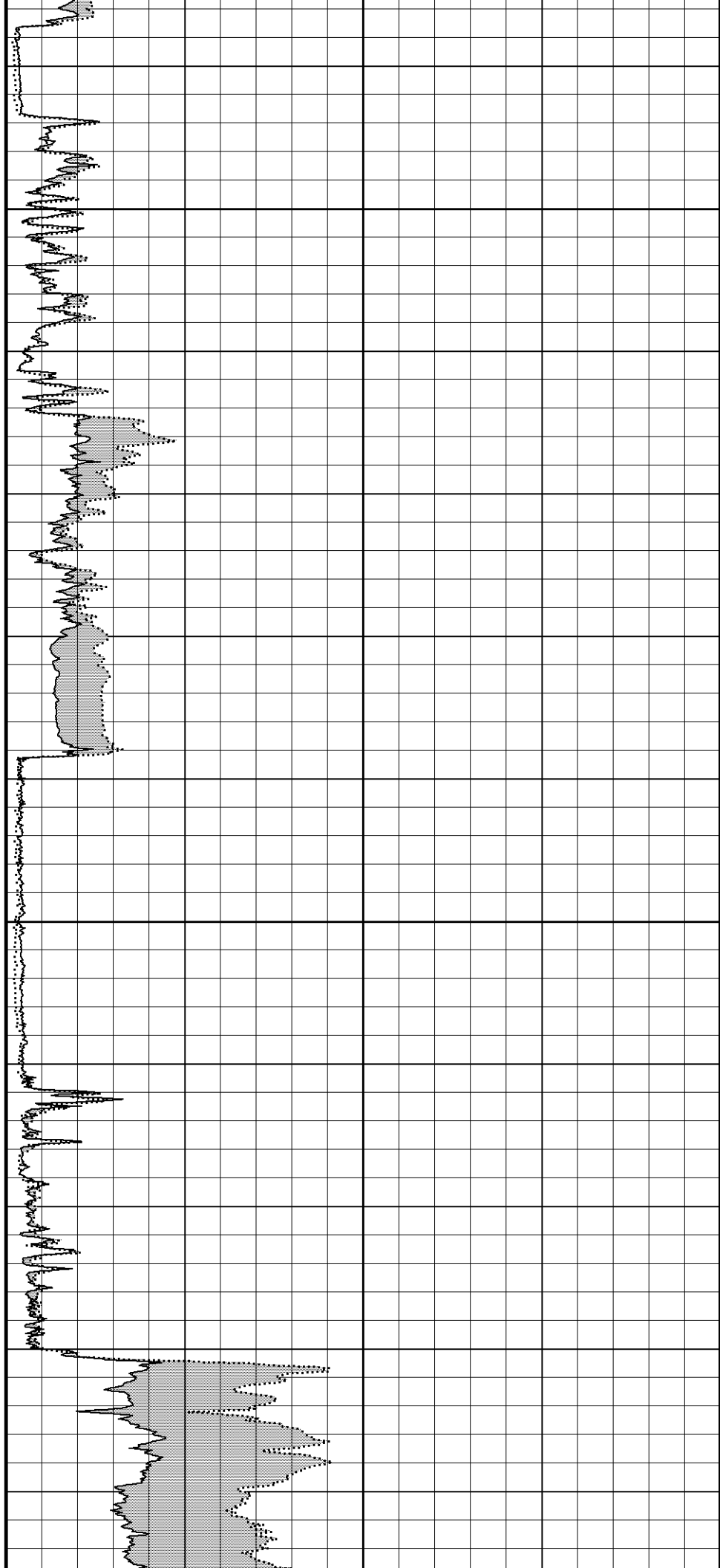
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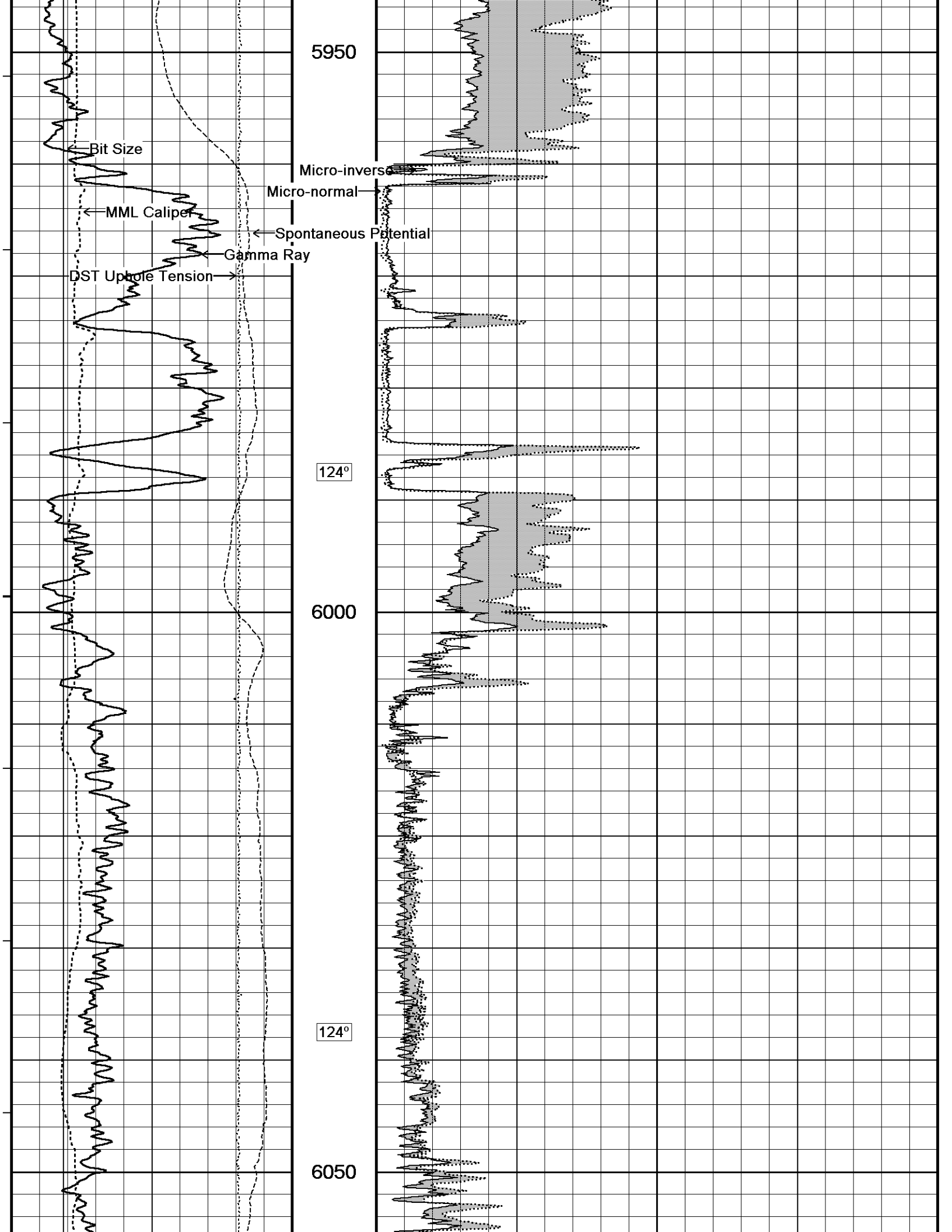
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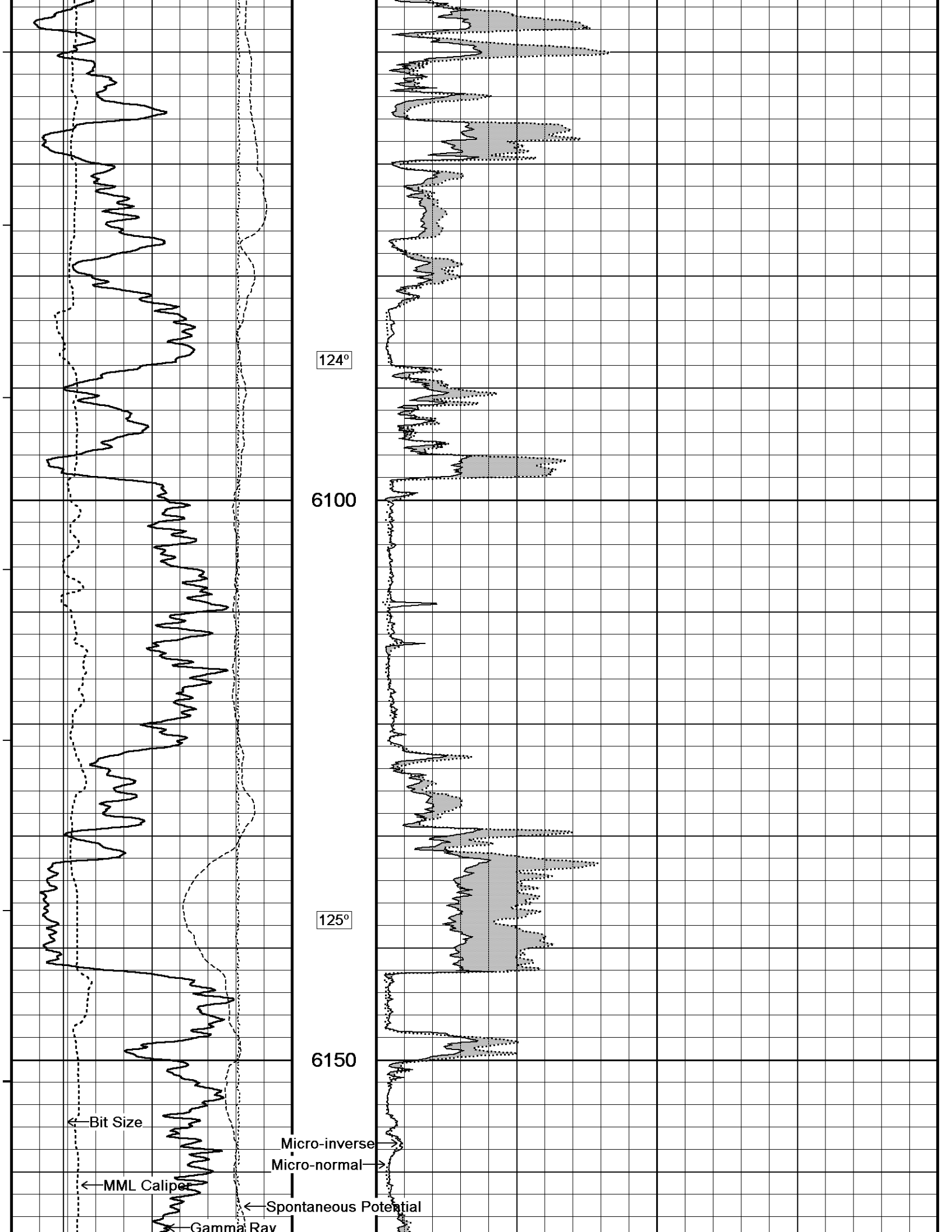
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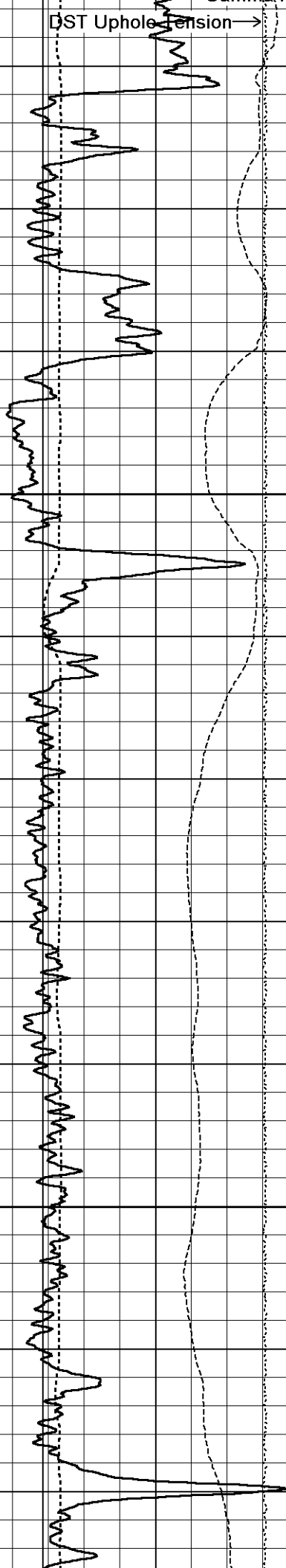
5900

125°







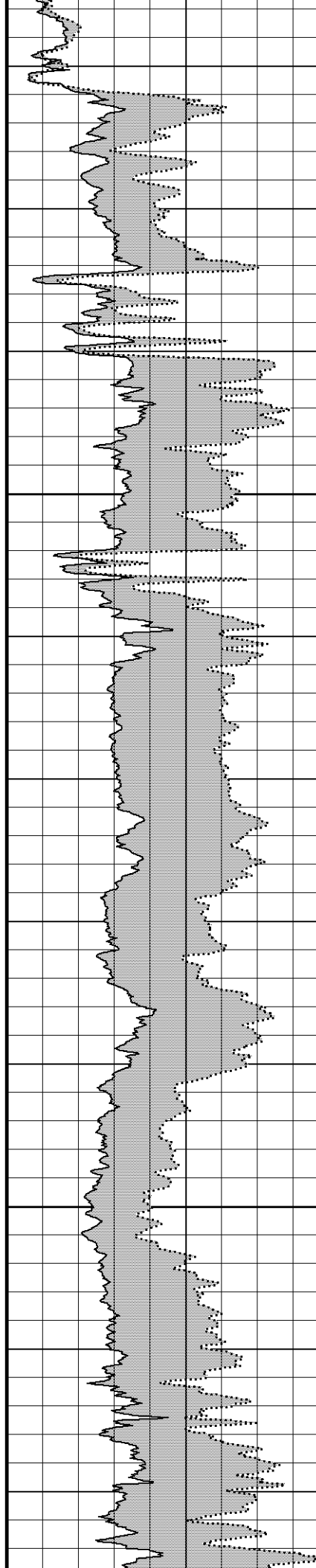


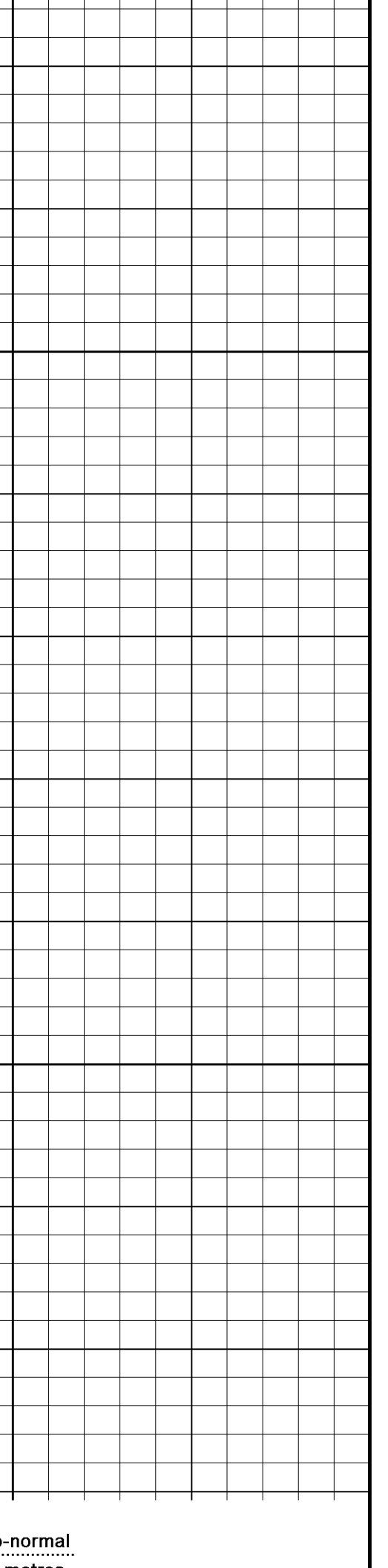
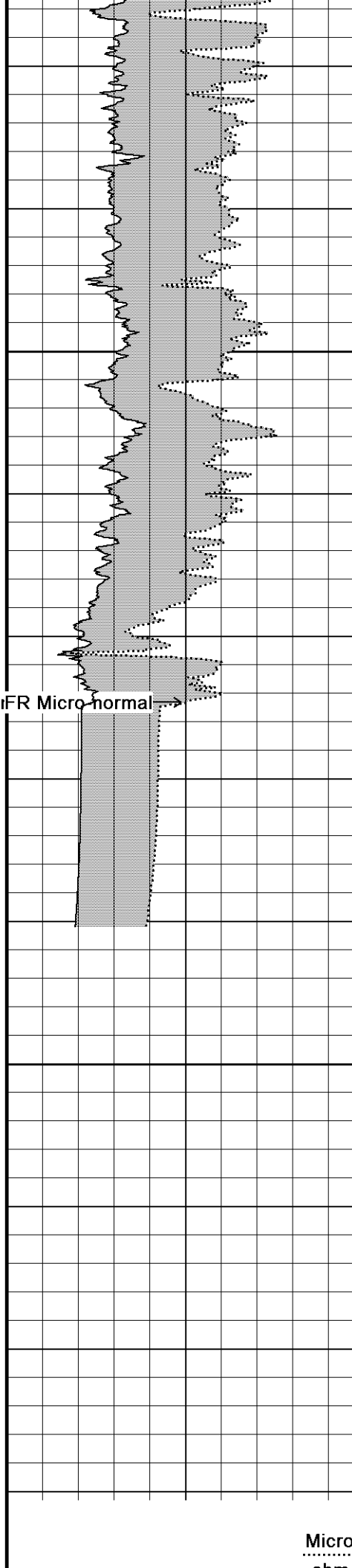
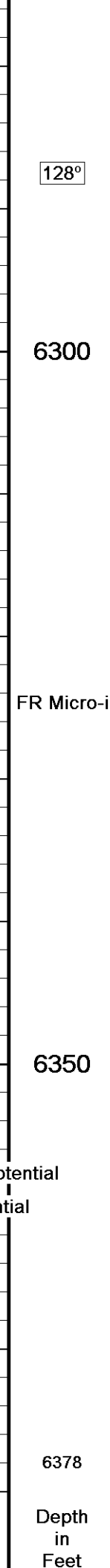
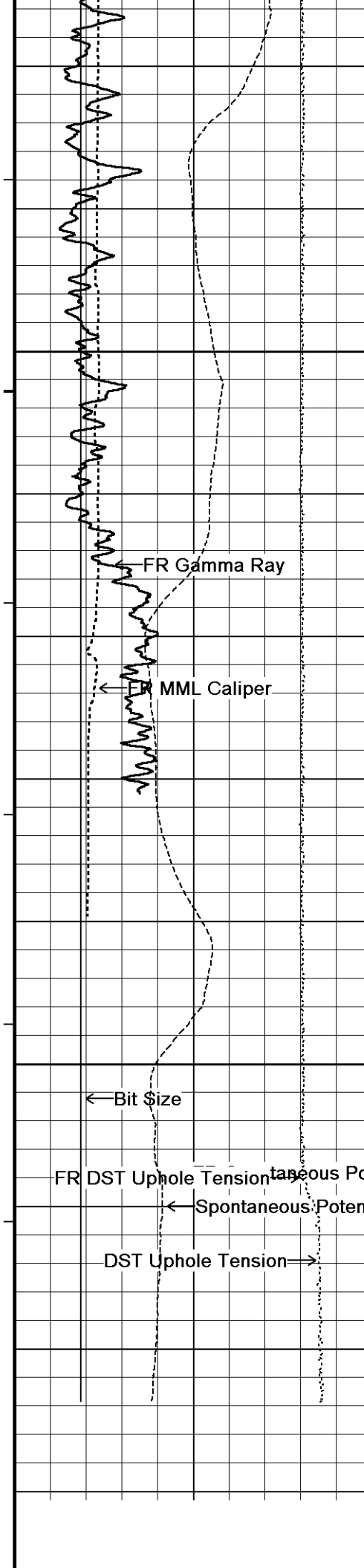
126°

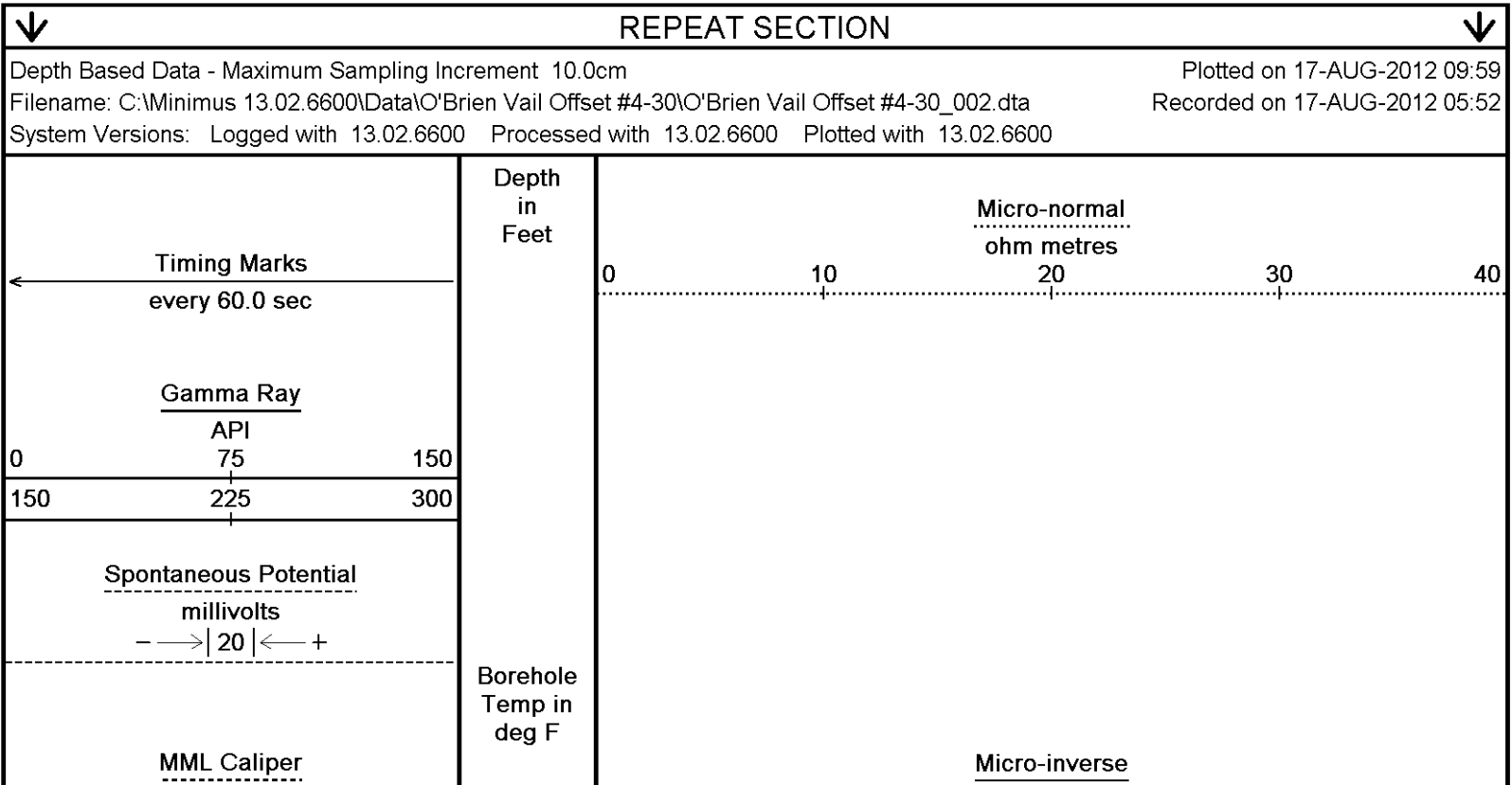
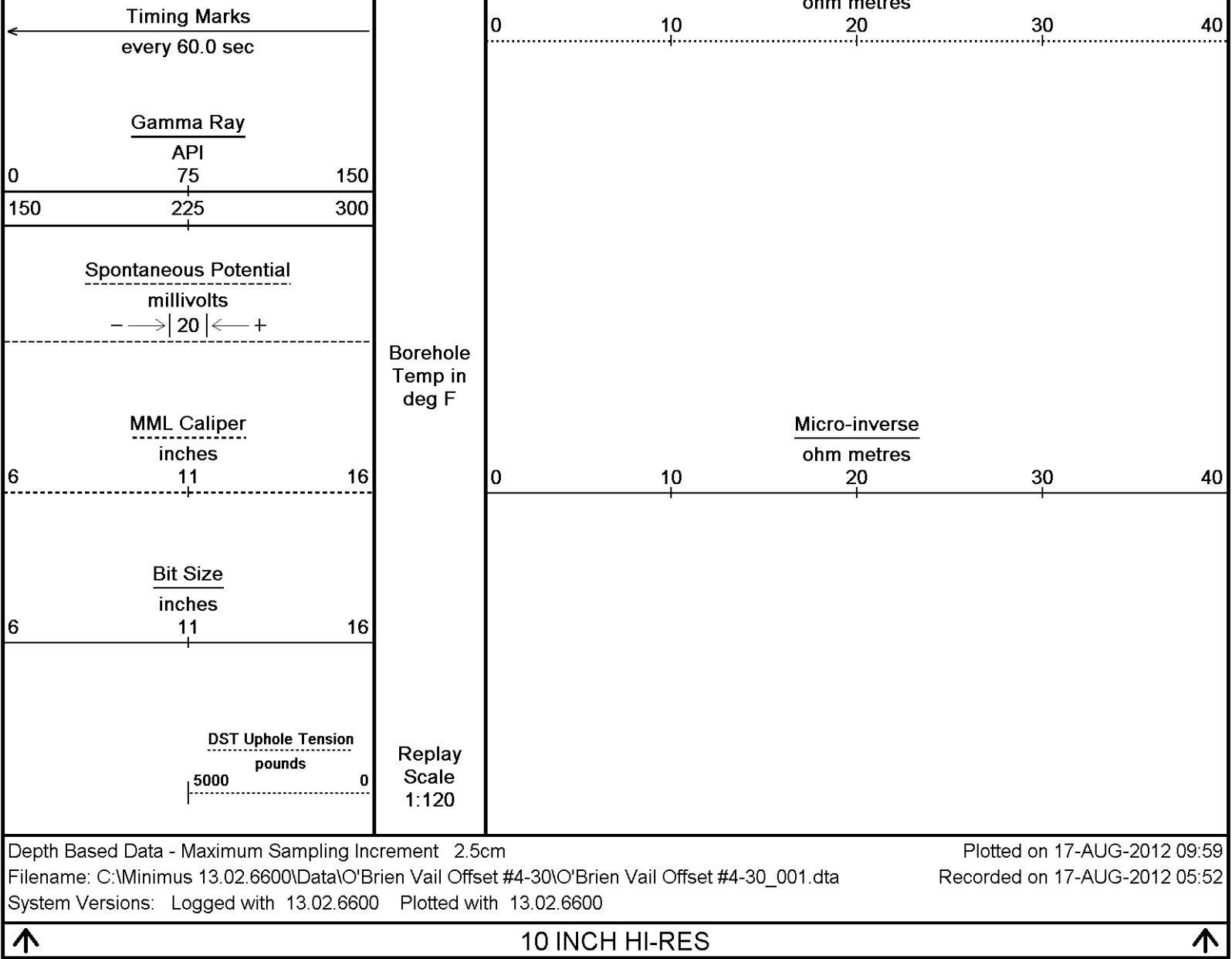
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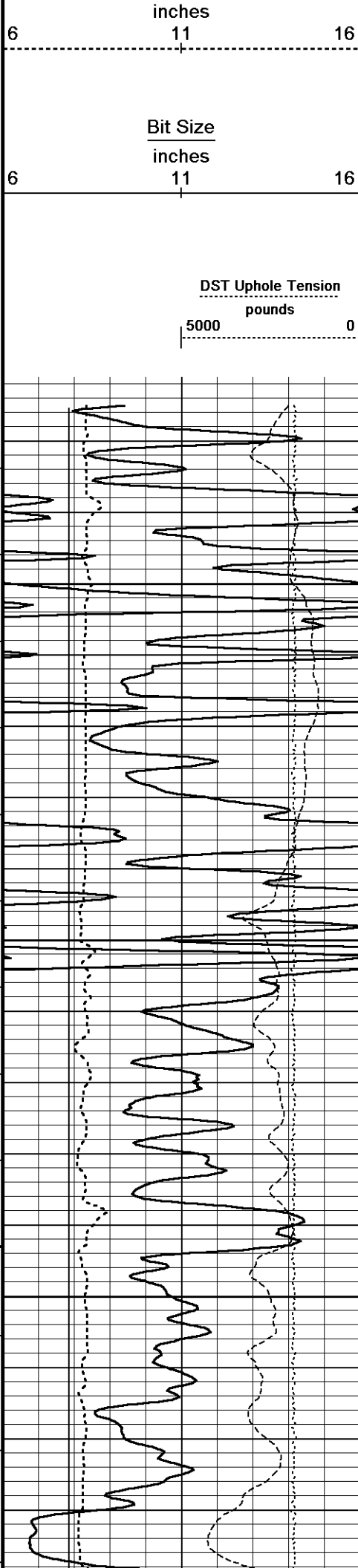
128°

6250









Replay
Scale
1:240

5724

5750

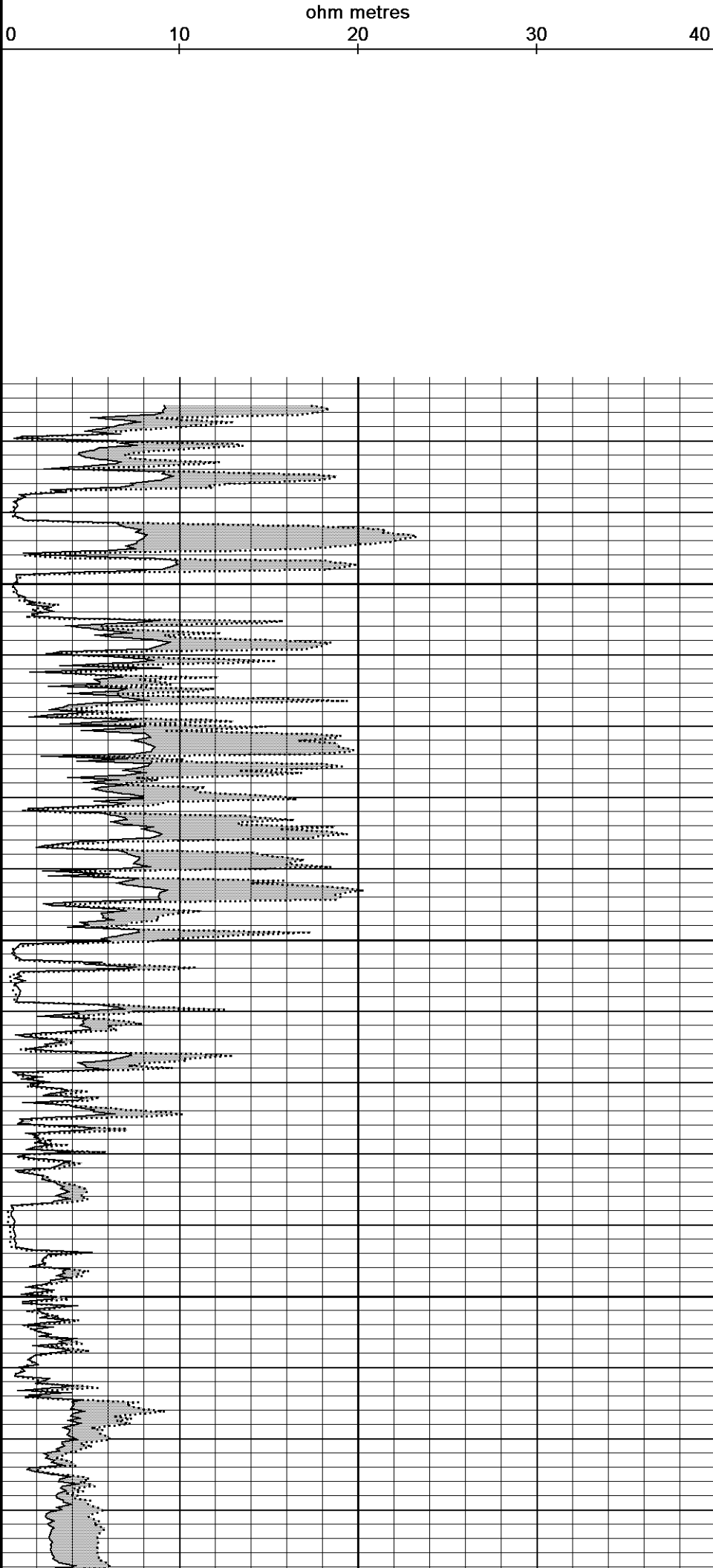
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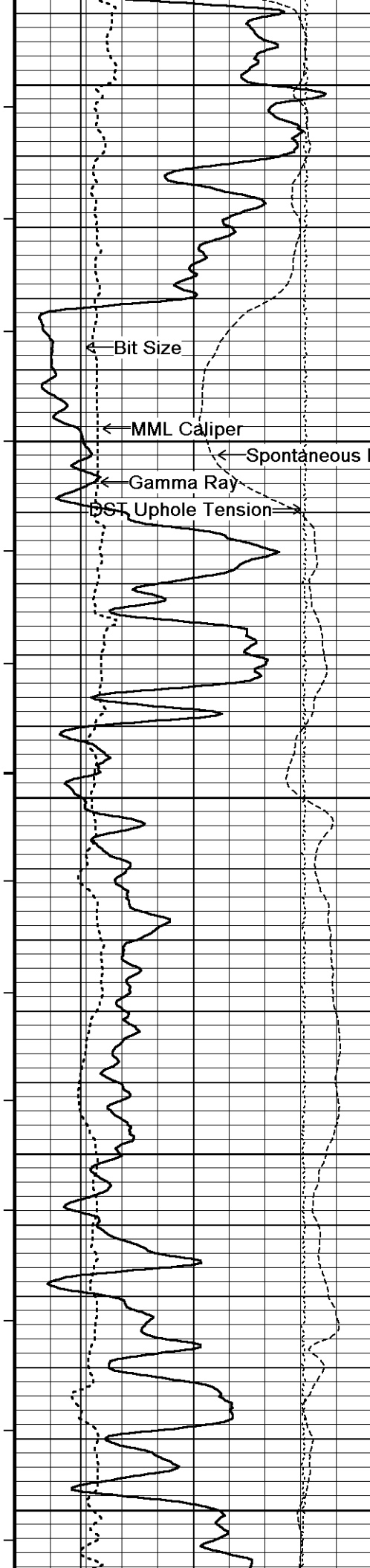
5800

125°

5850

125°





5900

125°

Micro-inverse

Micro-normal

5950

124°

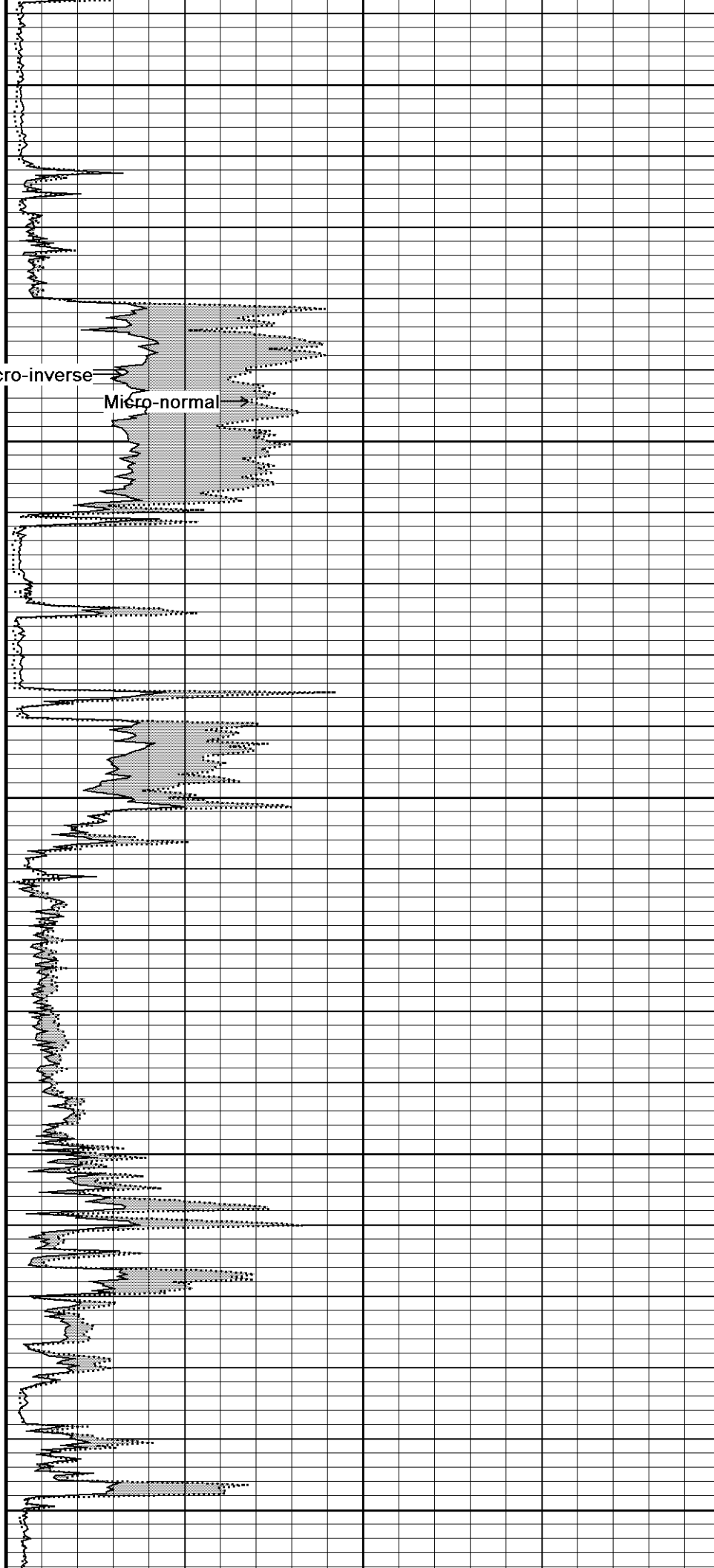
6000

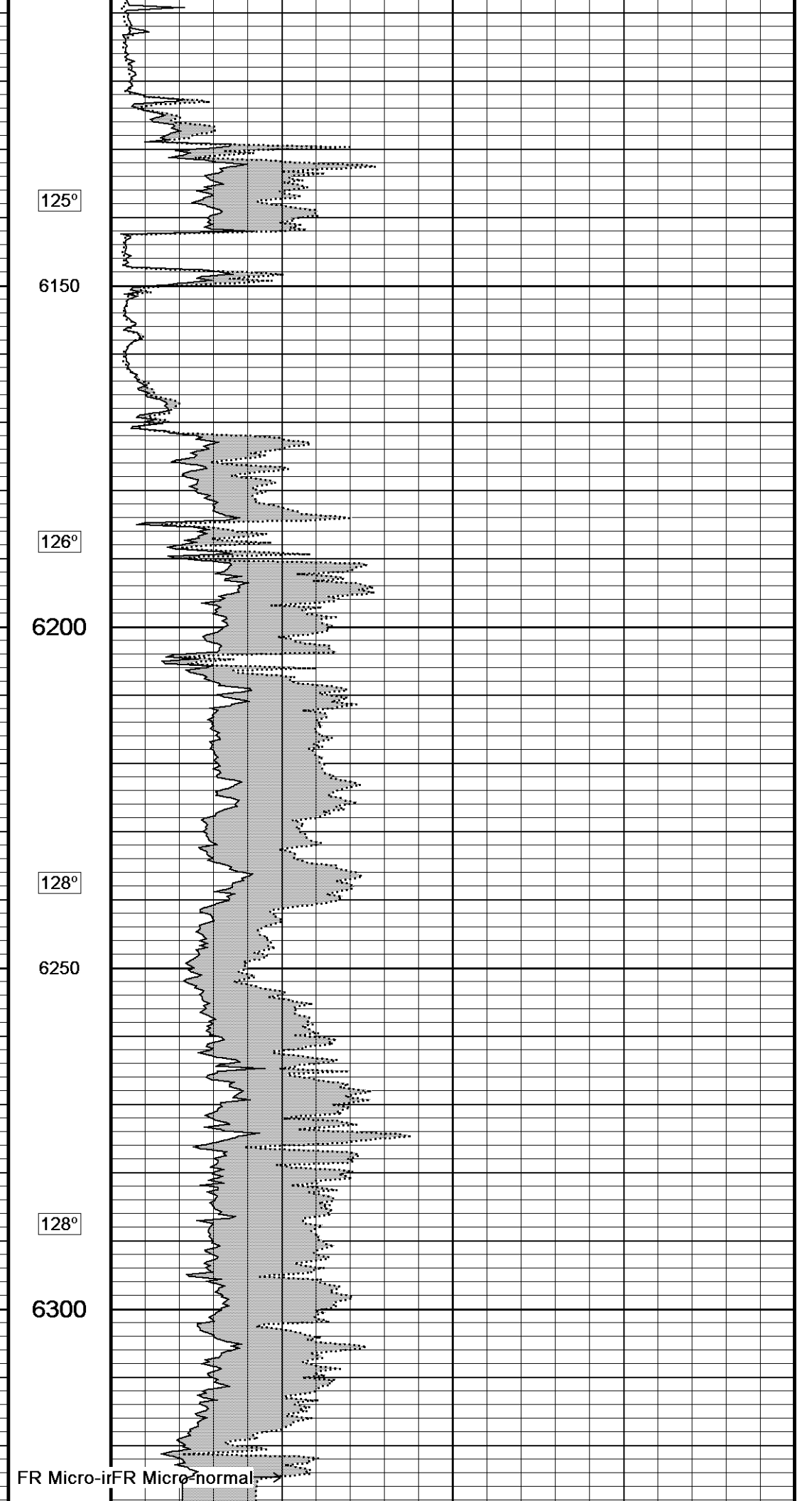
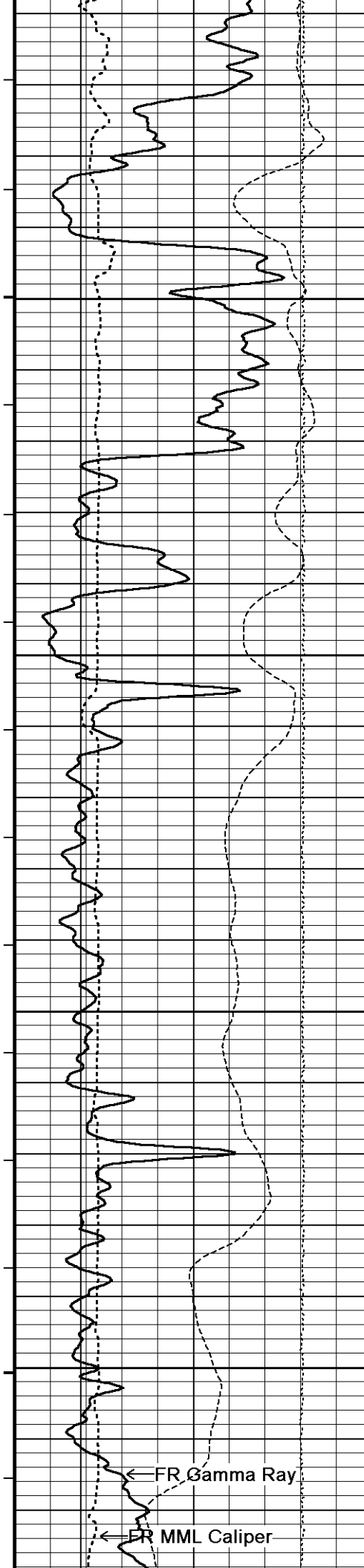
124°

6050

124°

6100





125°

6150

126°

6200

128°

6250

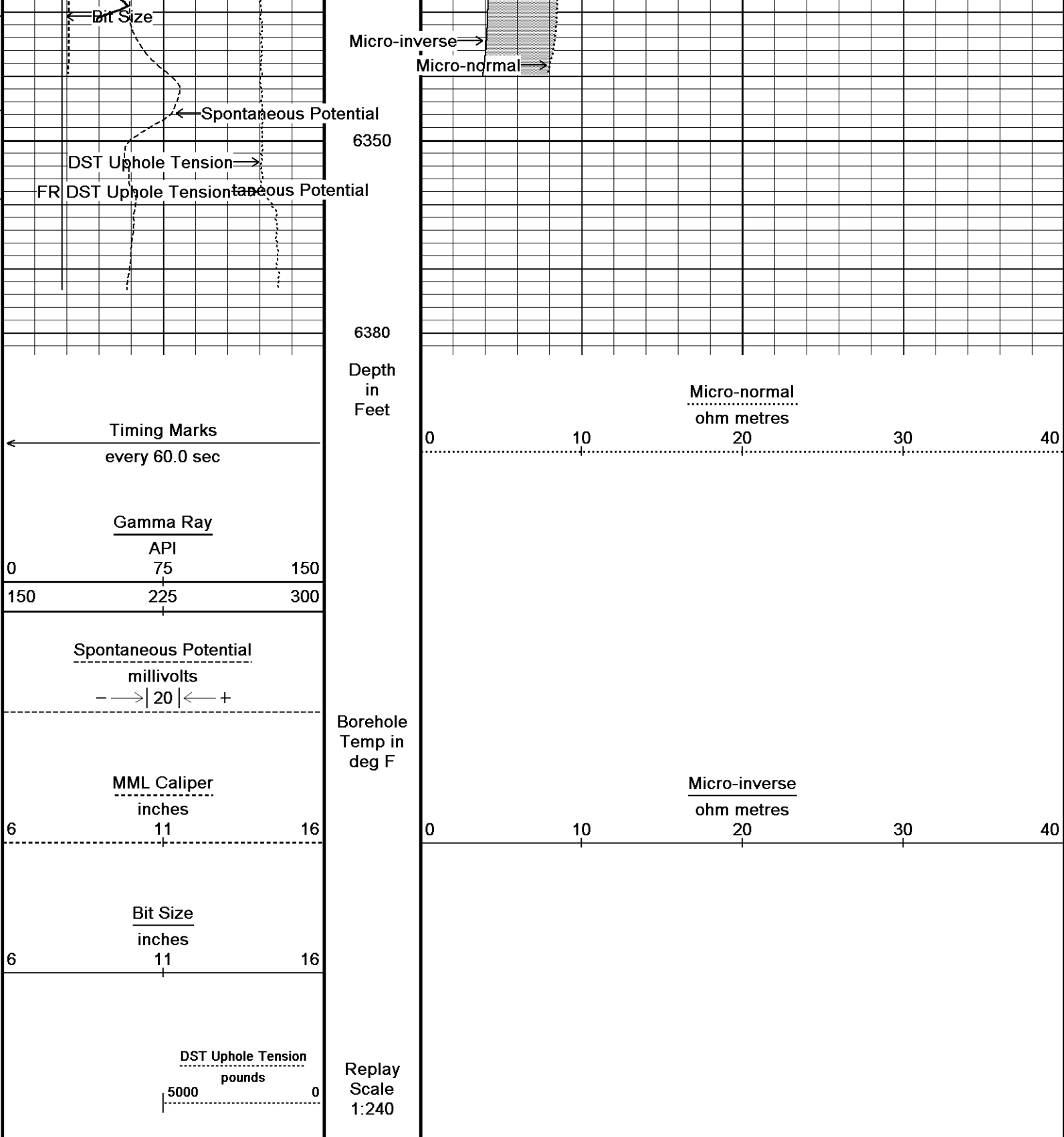
128°

6300

← FR Gamma Ray

← FR MML Caliper

FR Micro-irFR Micro-normal →



Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.02.6600\Data\O'Brien Vail Offset #4-30\O'Brien Vail Offset #4-30_002.dta
System Versions: Logged with 13.02.6600 Processed with 13.02.6600 Plotted with 13.02.6600
Plotted on 17-AUG-2012 09:59
Recorded on 17-AUG-2012 05:52

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION
C:\Minimus 13.02.6600\Data\O'Brien Vail Offset #4-30\O'Brien Vail Offset #4-30_003.dta

General Constants All 000
Last Edited on 17-AUG-2012,03:22

General Parameters

Mud Resistivity	0.980	ohm-metres
Mud Resistivity Temperature	96.000	degrees F
Water Level	0.000	feet
Density/Neutron 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	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Four Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Gamma Calibration MCG-C 208		Field Calibration on 16-AUG-2012 15:15
	Measured	Calibrated (API)
Background	60	42
Calibrator (Gross)	1092	767
Calibrator (Net)	1032	725

Gamma Constants MCG-C 208		Last Edited on 17-AUG-2012,03:22
Gamma Calibrator Number	GR38	
Mud Density	1.08	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

High Resolution Temperature Calibration MCG-C 208		Field Calibration on 03-AUG-2012,16:18
	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MCG-C 208		Last Edited on
Pre-filter Length	11	

Caliper Calibration MML-A 16		Base Calibration on 11-AUG-2012 21:31
		Field Calibration on 16-AUG-2012 15:01
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	14022	5.98
2	17220	7.97
3	20419	9.86
4	24325	11.92
5	0	0.00
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	6.02	5.98

Micro Normal and Micro Inverse Calibration MML-A 16					Base Calibration on 11-AUG-2012 21:40	
					Field Check on 16-AUG-2012 15:03	
Base Calibration						
		Measured		Calibrated (ohm-m)		
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2		
Micro Normal	12.3	60.3	5.0	25.0		
Micro Inverse	15.6	78.4	5.0	25.0		
Channel	Base Check (ohm-m)			Field Check (ohm-m)		
Micro Normal	62.8			62.8		
Micro Inverse	48.2			48.2		

Micro Normal and Micro Inverse Constants MML-A 16		Last Edited on 17-AUG-2012,03:22
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	1.0000	

Micro Normal K Factor
Micro Inverse K Factor
Standoff Offset

1.0000
1.0000
N/A inches

DOWNHOLE EQUIPMENT

C:\Minimus 13.02.6600\Data\O'Brien Vail Offset #4-30\O'Brien Vail Offset #4-30_003.dta

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

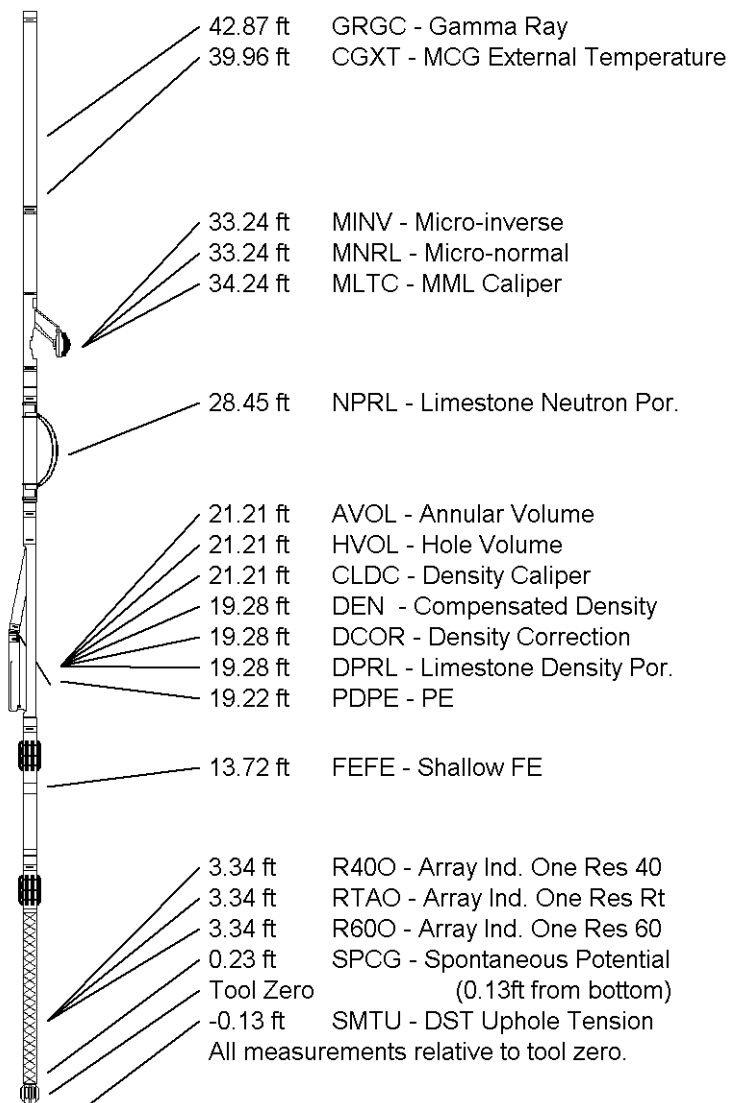
Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 48.16 ft Weight: 383.6 lb



COMPANY	O'BRIEN ENERGY RESOURCES CORP.
WELL	VAIL OFFSET #4-30
FIELD	SINGLEY
PROVINCE/COUNTY	MEADE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2684.00	feet	First Reading	6325.00	feet
Elevation Drill Floor	2682.00	feet	Depth Driller	6354.00	feet
Elevation Ground Level	2672.00	feet	Depth Logger	6358.00	feet



Weatherford®

MICRORESISTIVITY LOG

