



Weatherford[®]

MICRORESISTIVITY LOG

COMPANY			PETROSANTANDER (USA), INC.		
WELL			SCOTT #6-13		
FIELD			CHRISTABELLE		
PROVINCE/COUNTY			KEARNY		
COUNTRY/STATE			U.S.A. / KANSAS		
LOCATION			660' FNL & 330' FWL		
SEC 13	TWP 21S	RGE 35W	Other Services		MPD/MDN
Latitude		MAI/MFE			
Longitude					
API Number		15-093-21924			
Permanent Datum GL, Elevation 3094 feet					
Log Measured From KB					
Drilling Measured From KB @ 12 FEET					
Date	13-AUG-2014		Elevations: feet		
Run Number	ONE		KB 3106.00		
Service Order	7606-95087167		DF 3104.00		
Depth Driller	5010.00		GL 3094.00		
Depth Logger	5012.00				
First Reading	4978.76				
Last Reading	523.00				
Casing Driller	521.00				
Casing Logger	523.00				
Bit Size	7.875				
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.15 lb/USg		50.00 CP		
PH / Fluid Loss	9.50		10.00 ml/30Min		
Sample Source	MUDPIT				
Rm @ Measured Temp	0.71 @ 75.0		ohm-m		
Rmf @ Measured Temp	0.57 @ 75.0		ohm-m		
Rmc @ Measured Temp	0.85 @ 75.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.47 @116.0		ohm-m		
Time Since Circulation	4 HOURS				
Max Recorded Temp	116.00		deg F		
Equipment / Base	13057		LIB		
Recorded By	BEN WELDIN				
Witnessed By	WES HANSEN				
JOB #	LB14-232				

BOREHOLE RECORD					Last Edited: 13-AUG-2014 01:21
Bit Size inches		Depth From feet		Depth To feet	
12.250		0.00		521.00	
7.875		521.00		5010.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	521.00	24.00	

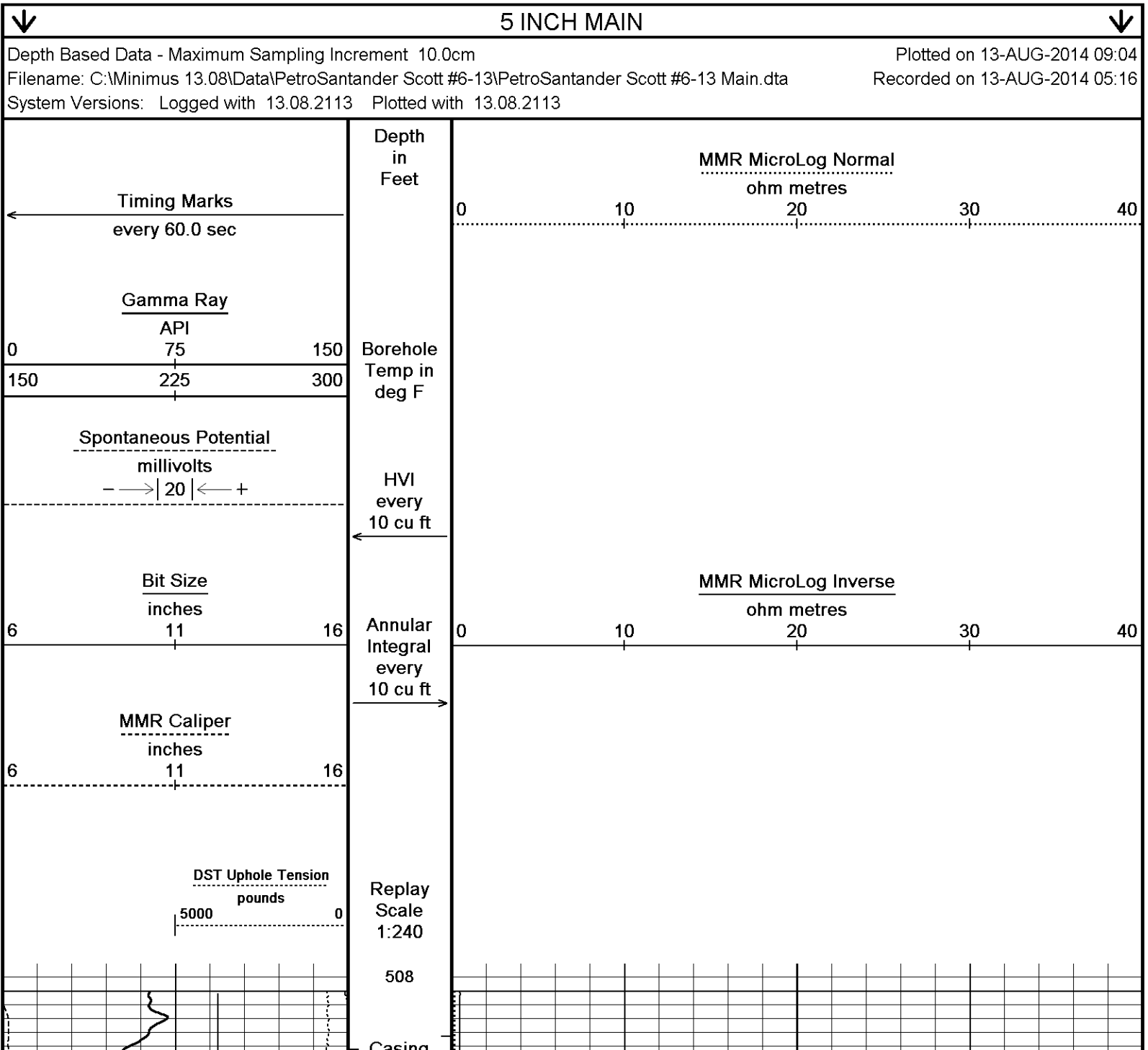
REMARKS
- SOFTWARE ISSUE: WLS 13.08.2113.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 2170 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 1430 CU.FT.

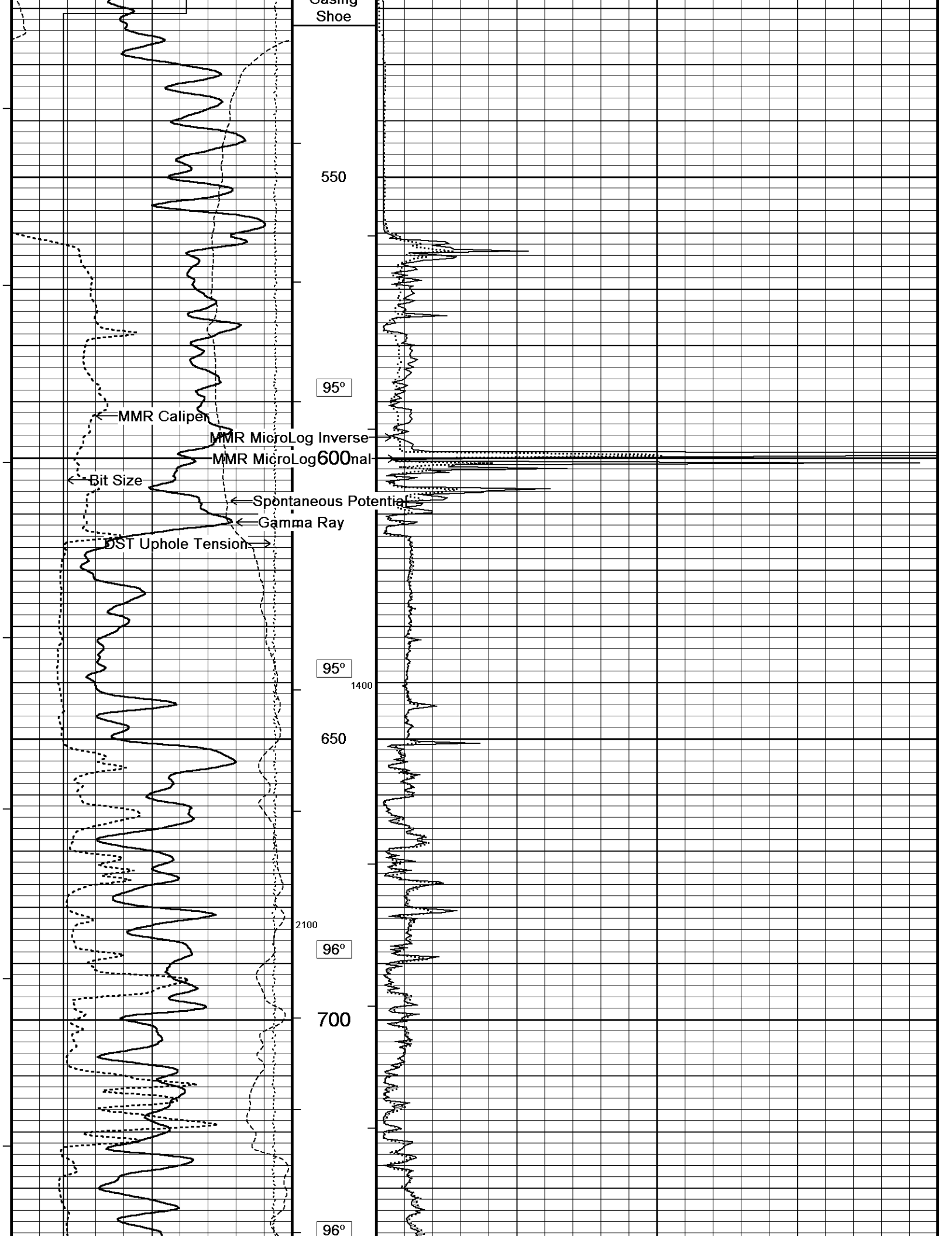
- RIG: VAL RIG #1

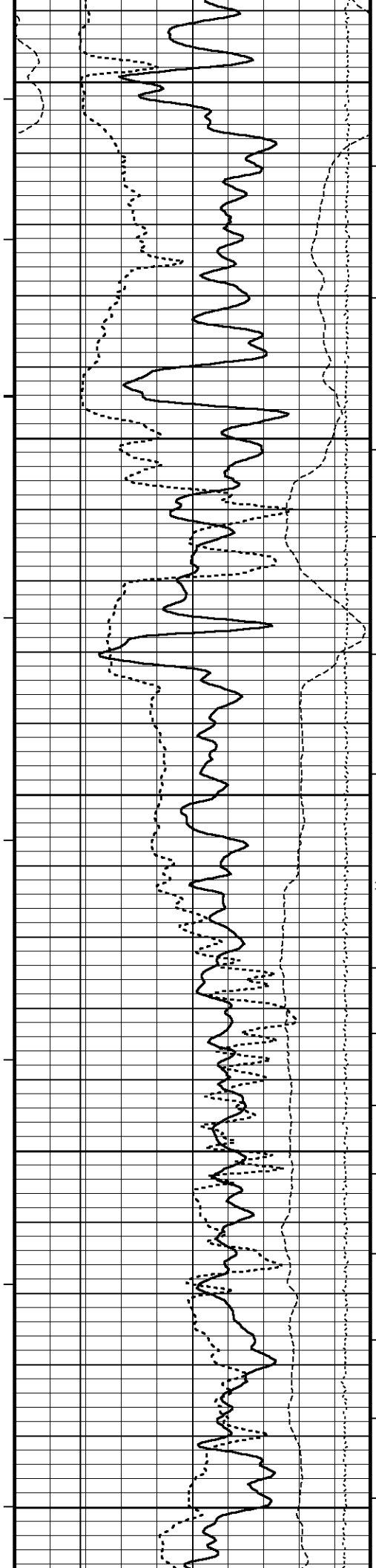
- ENGINEER: BEN WELDIN

- OPERATOR: KEN RINEHART

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.







750

96°

800

97°

850

2000

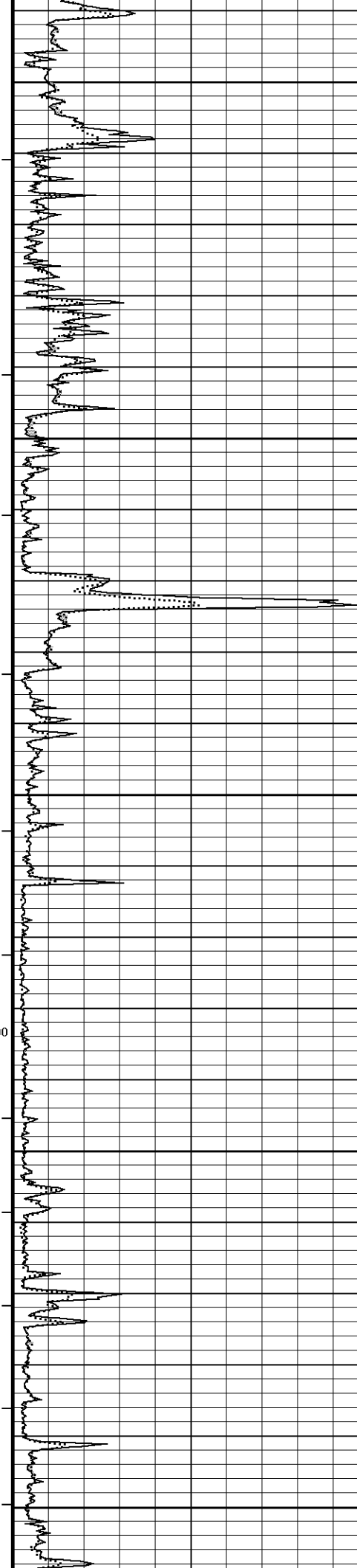
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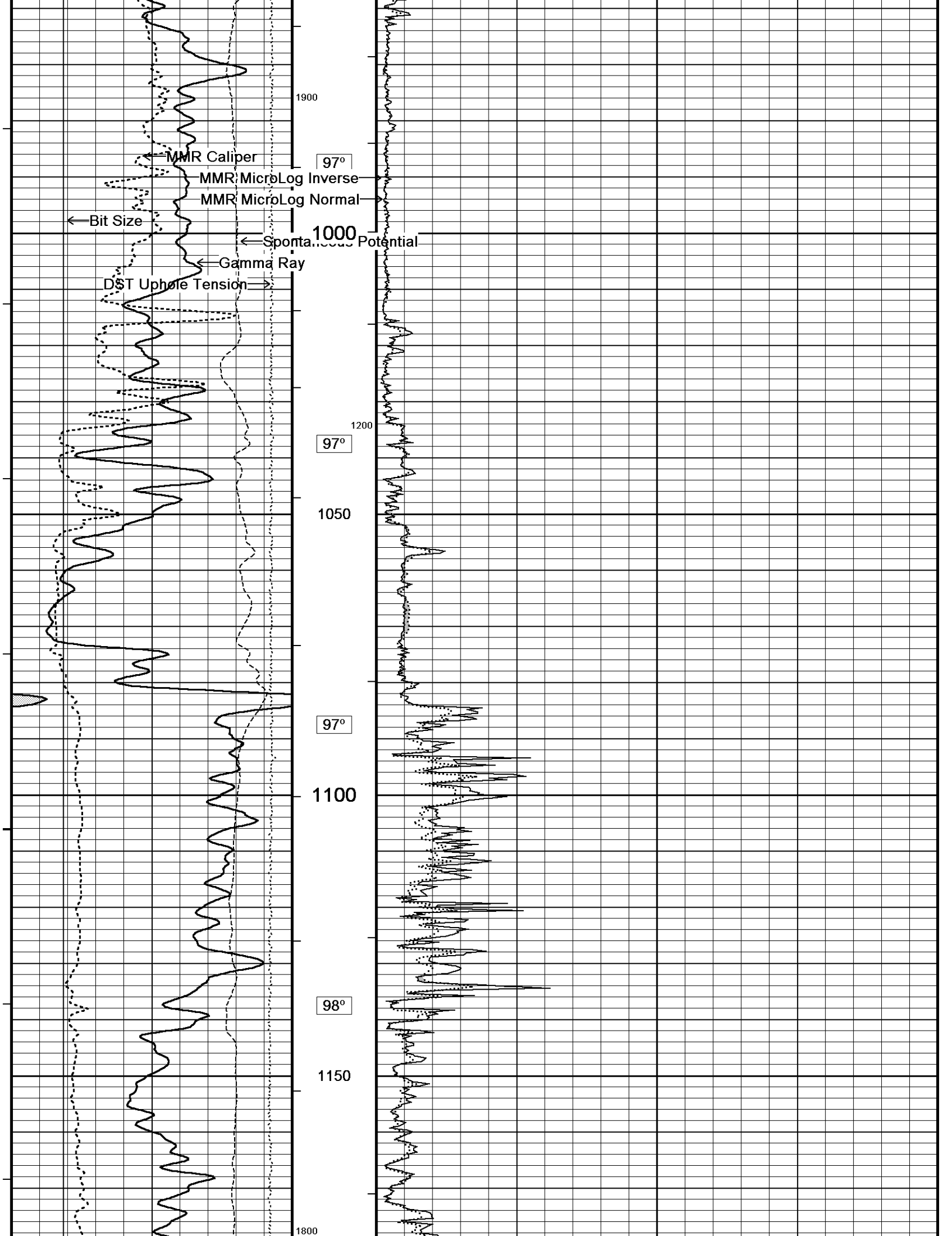
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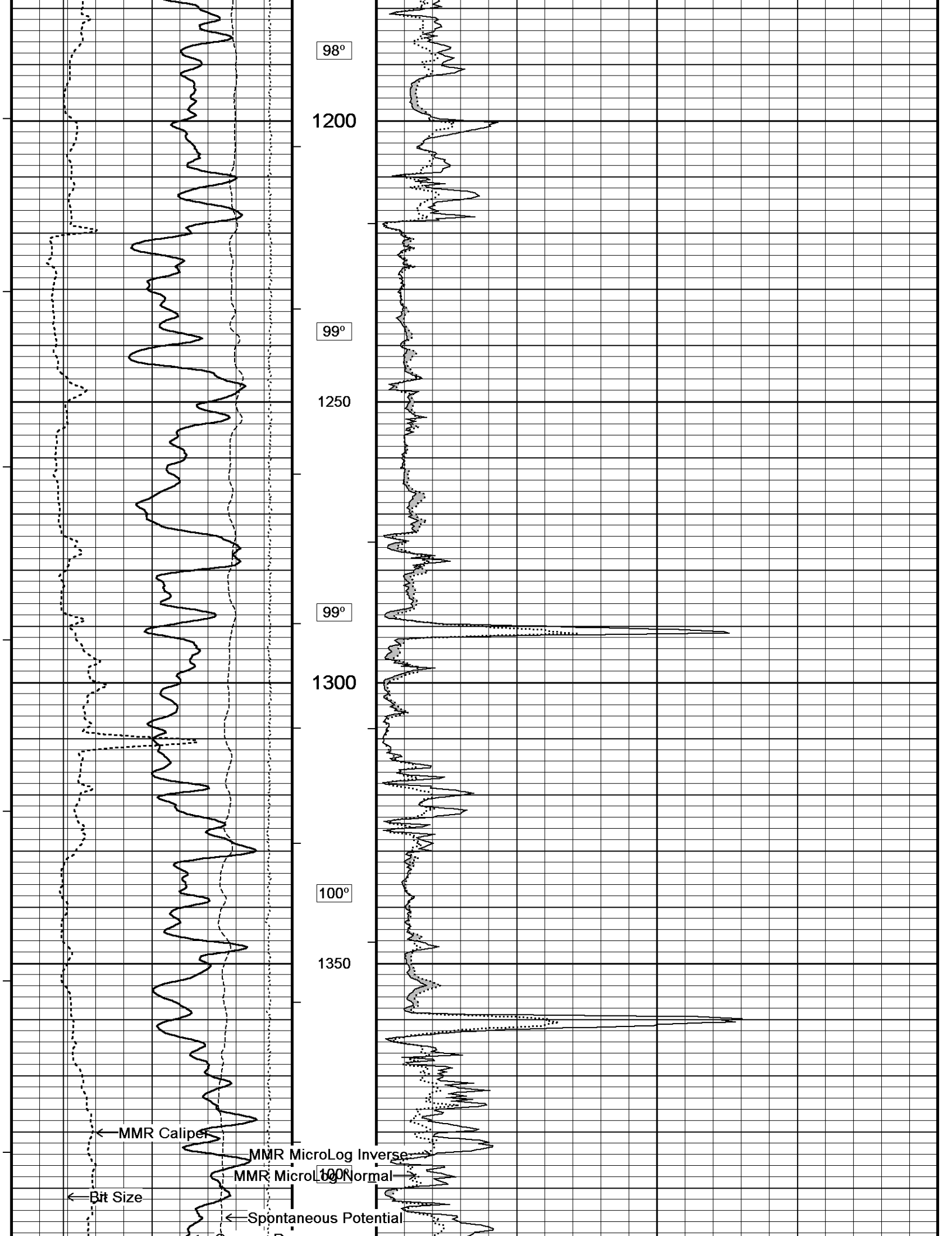
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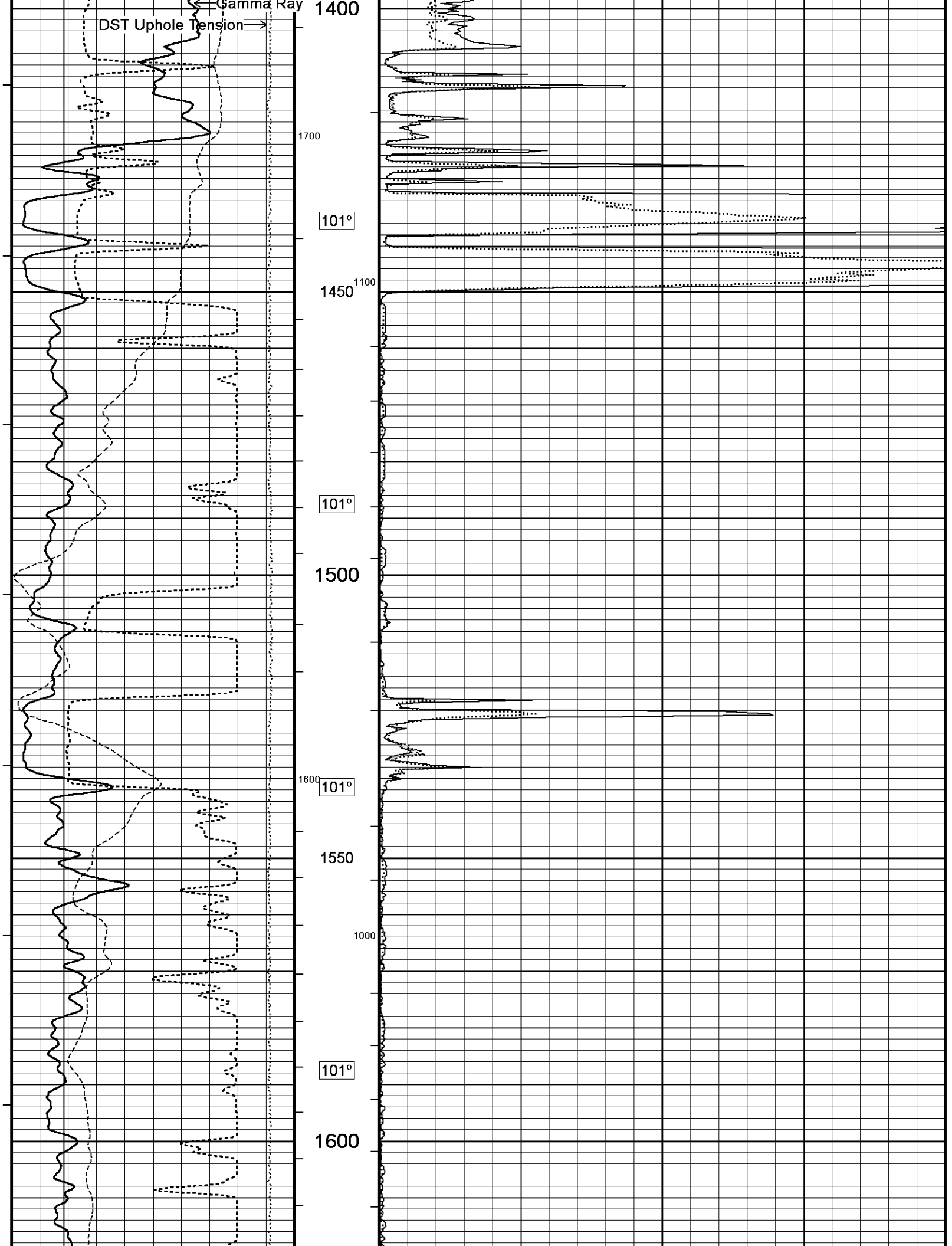
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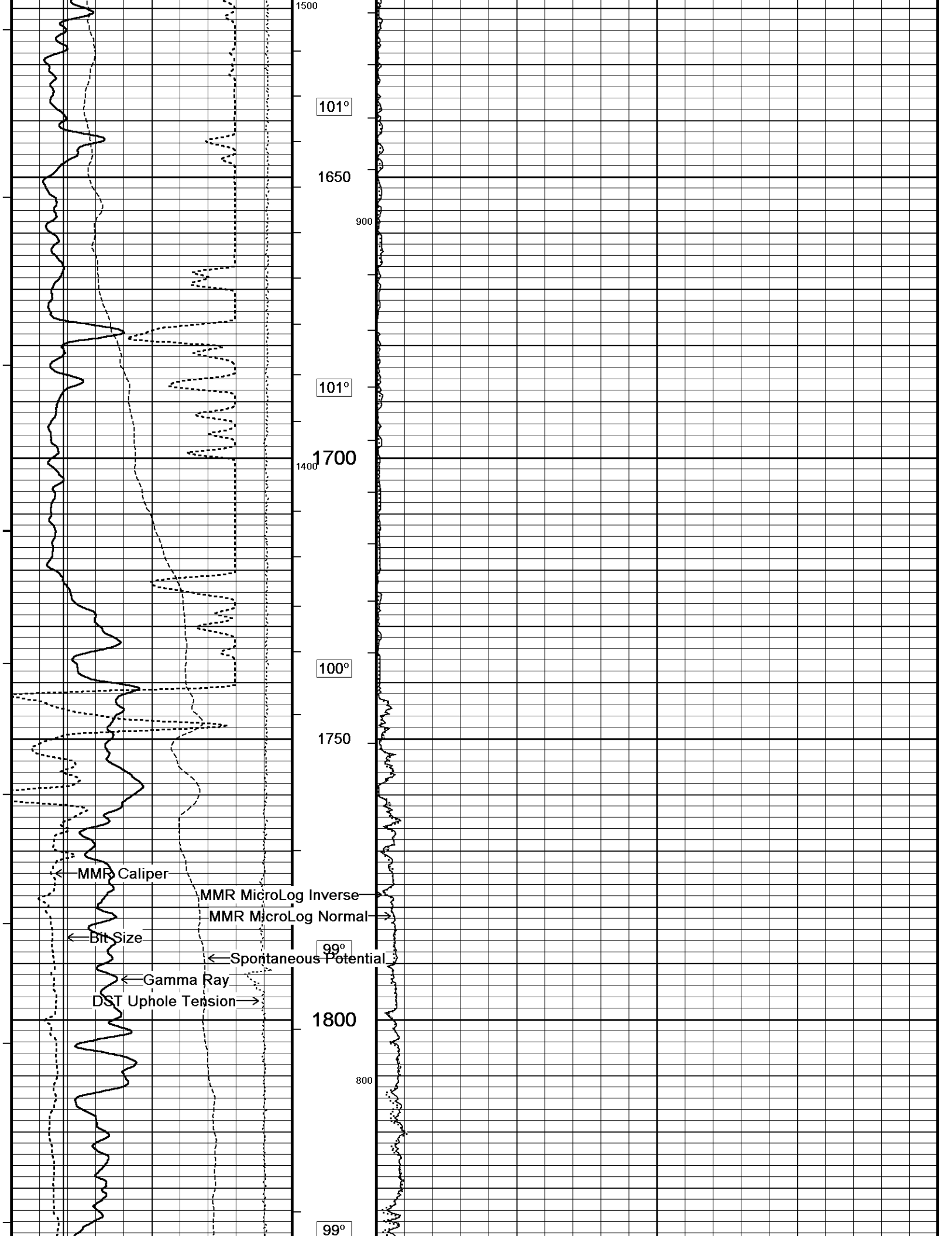
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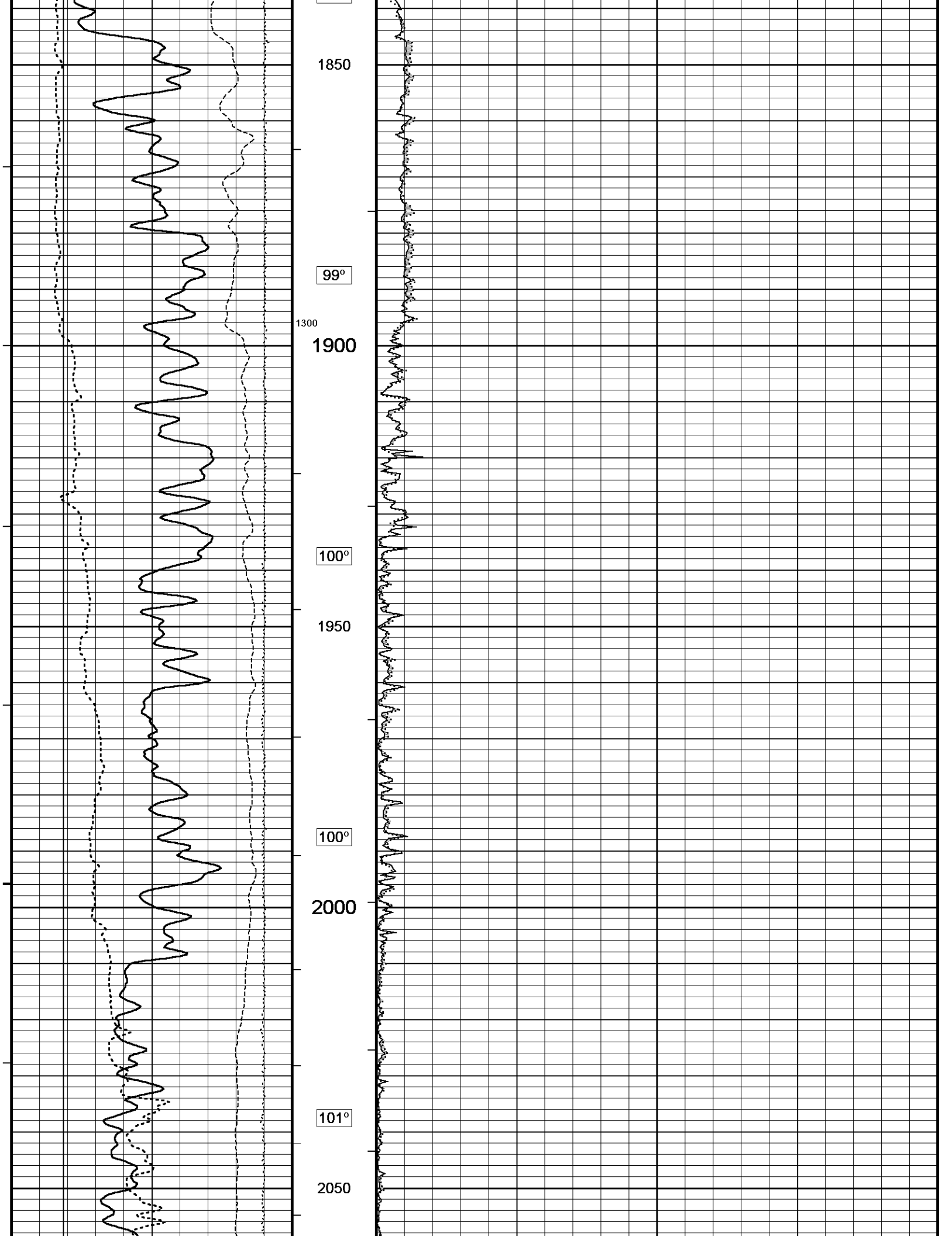


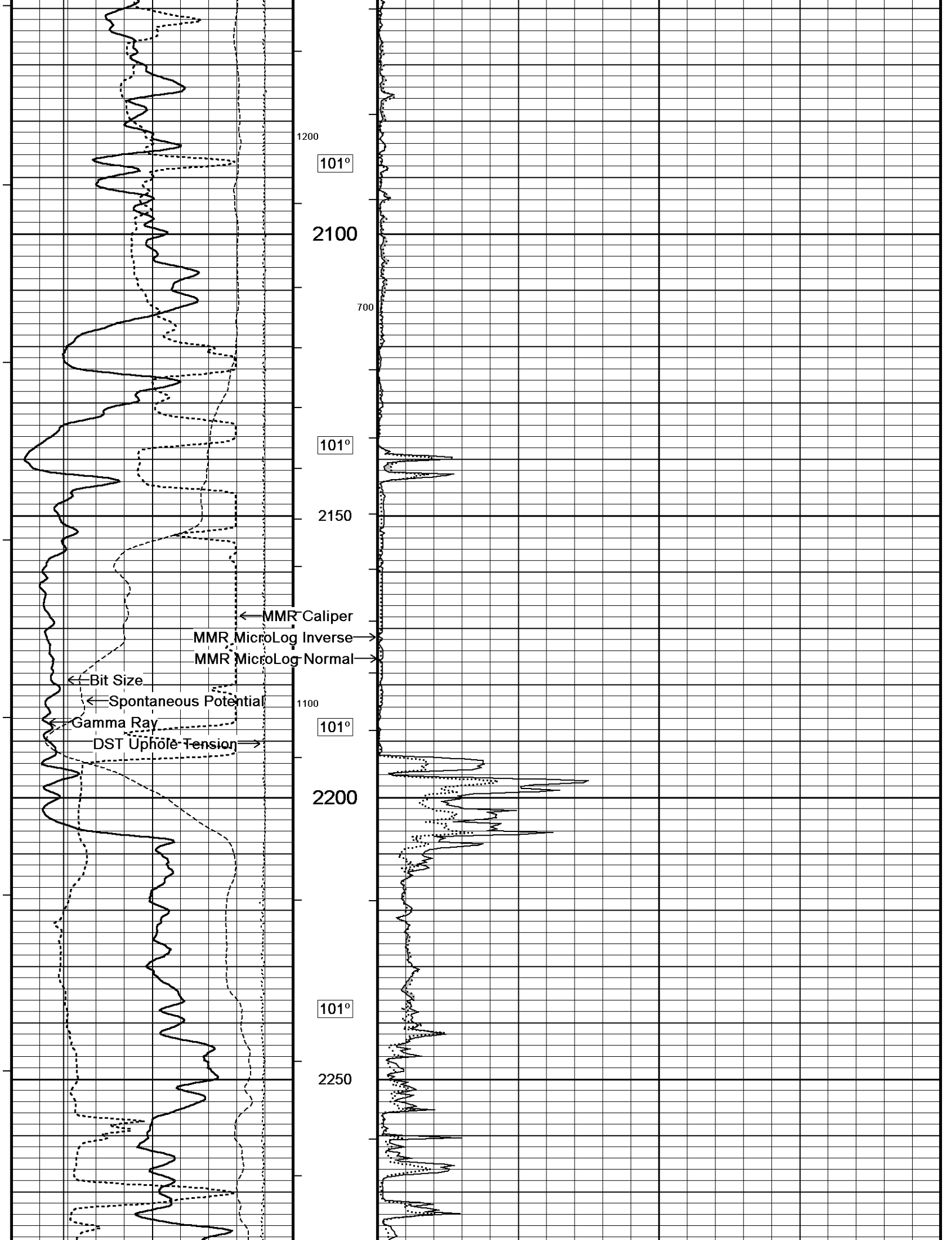


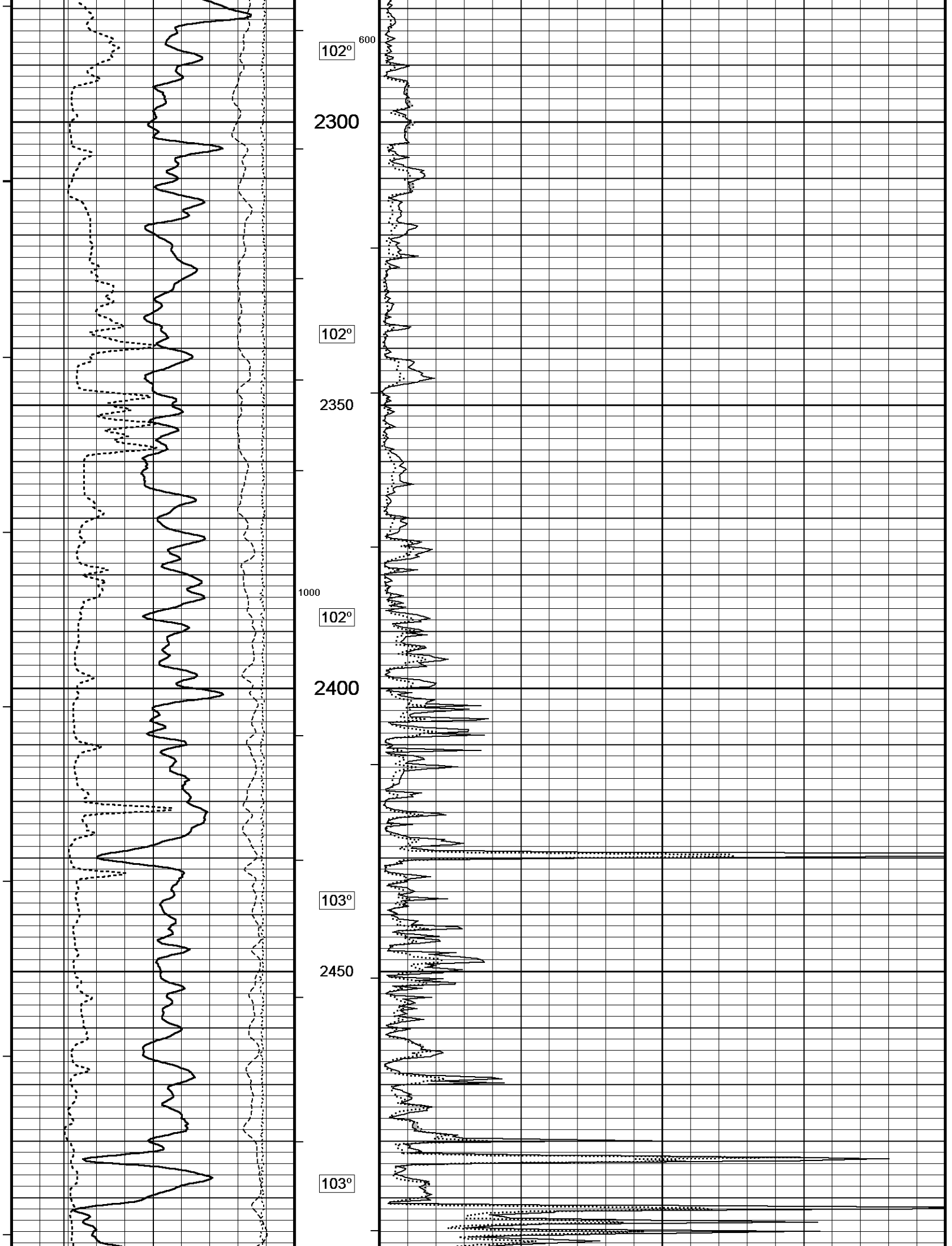


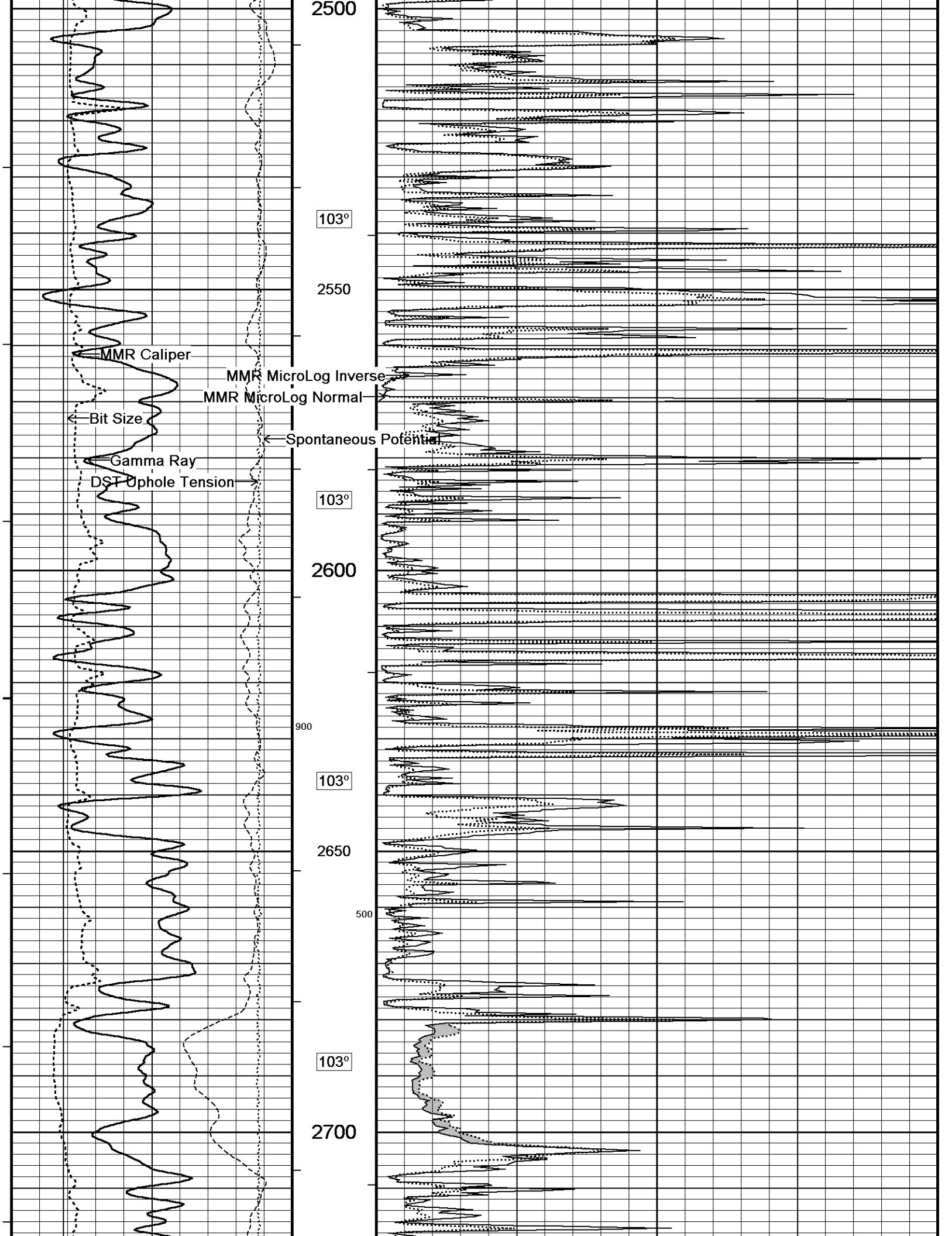


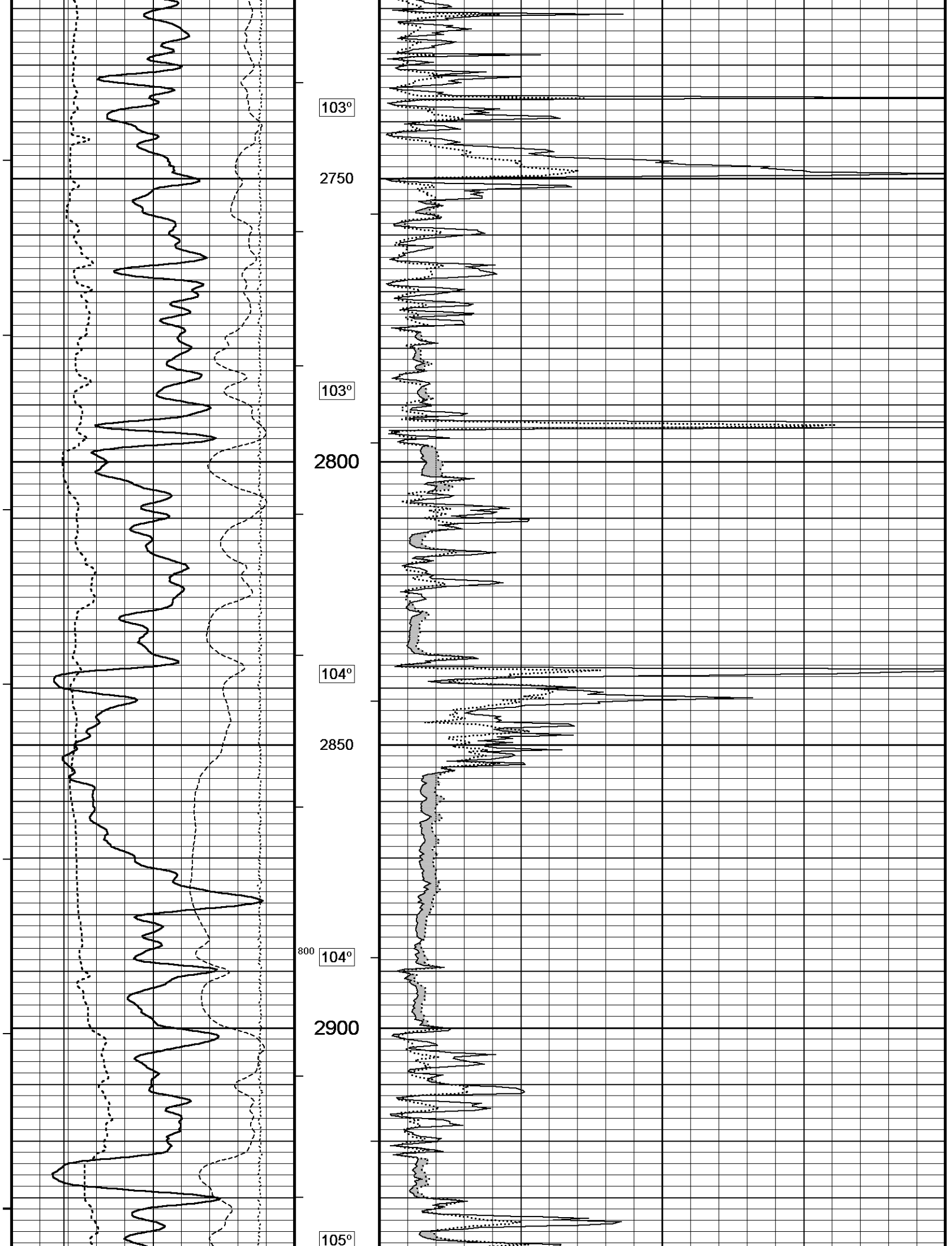


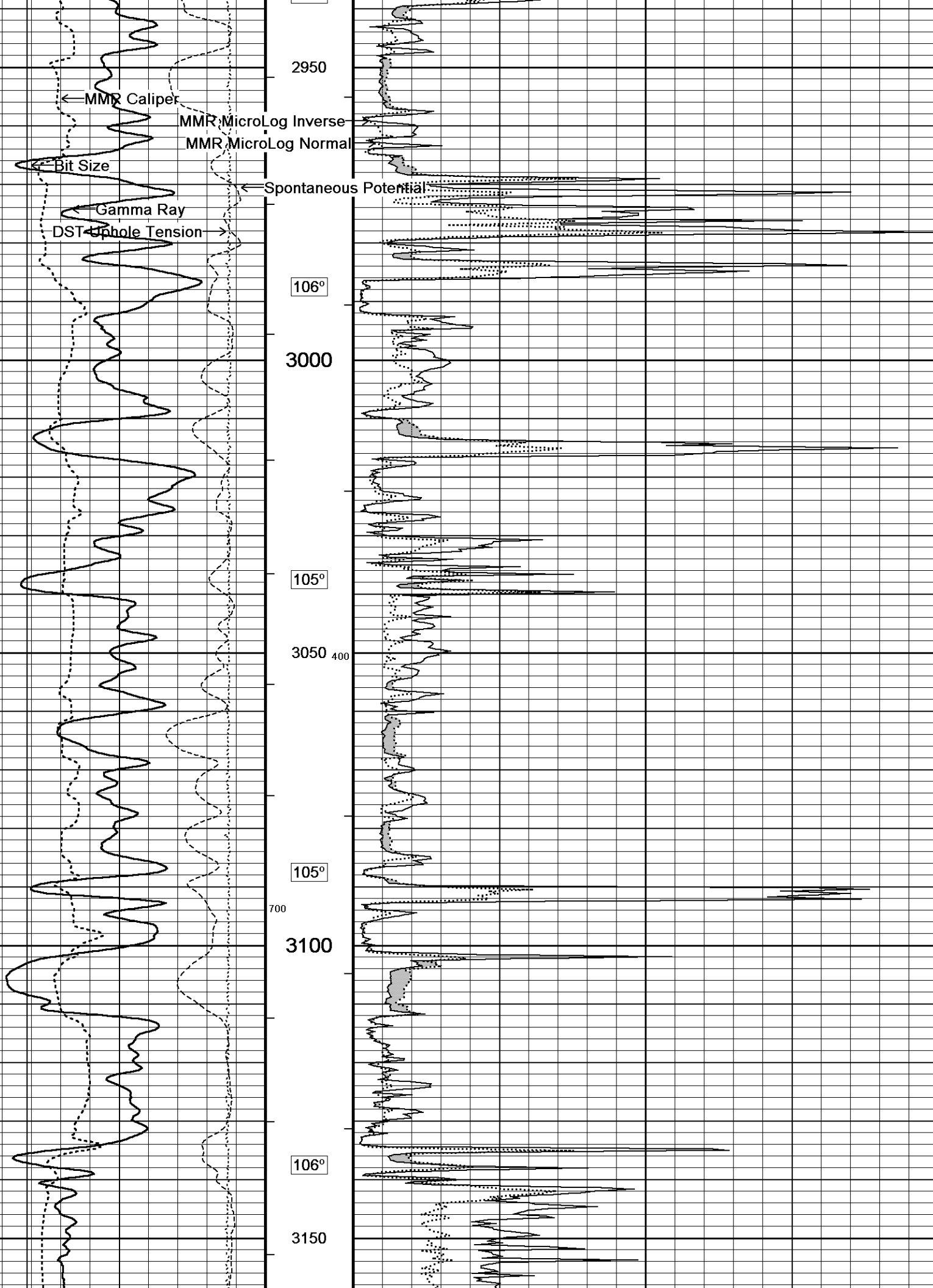


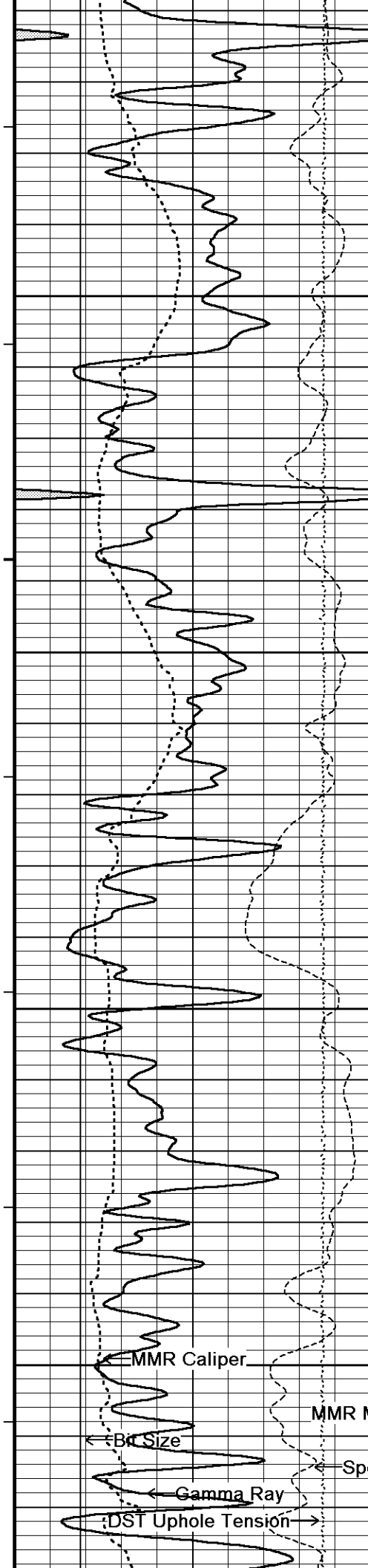




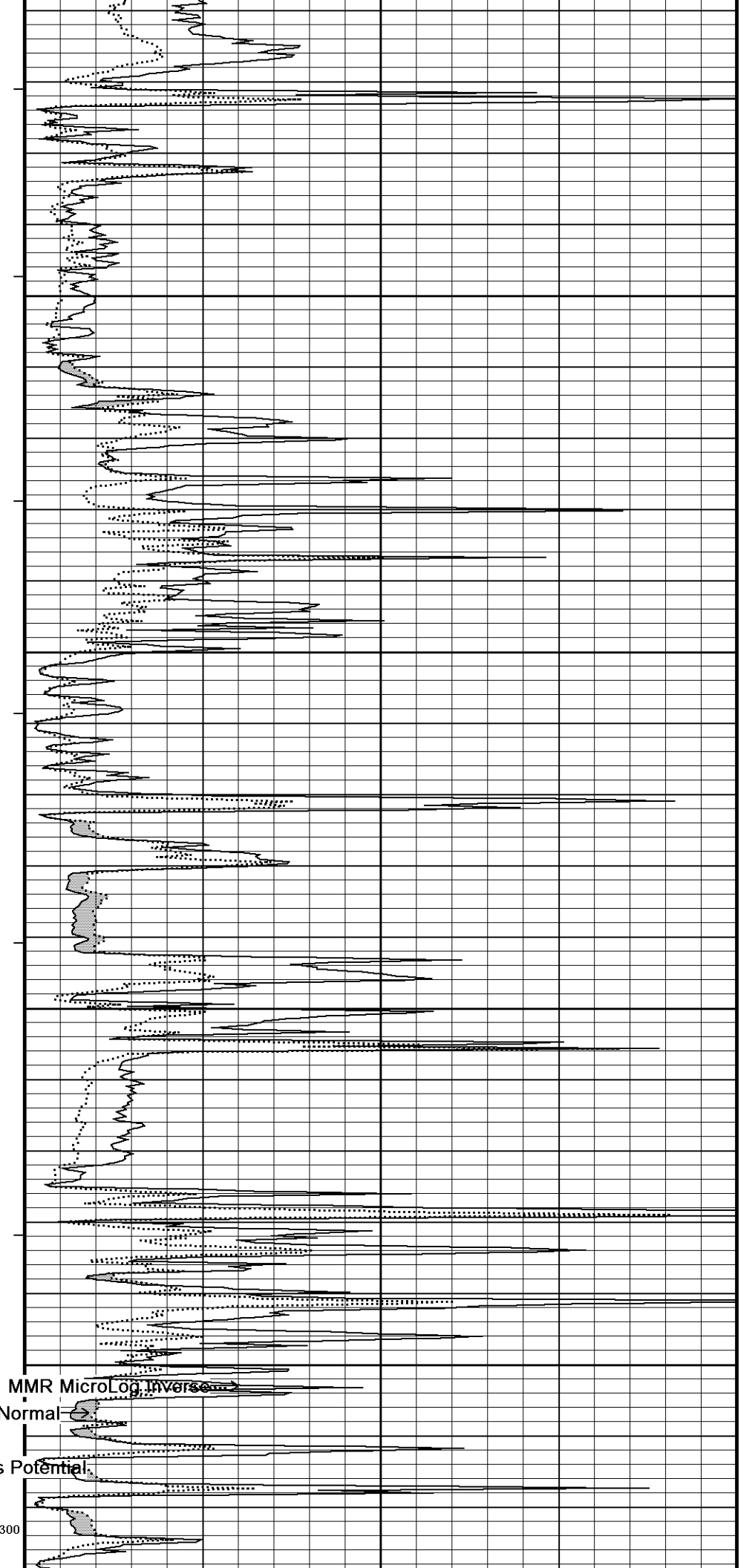








3200
3250
3300
3350



106°

106°

106°

107°

MMR Caliper

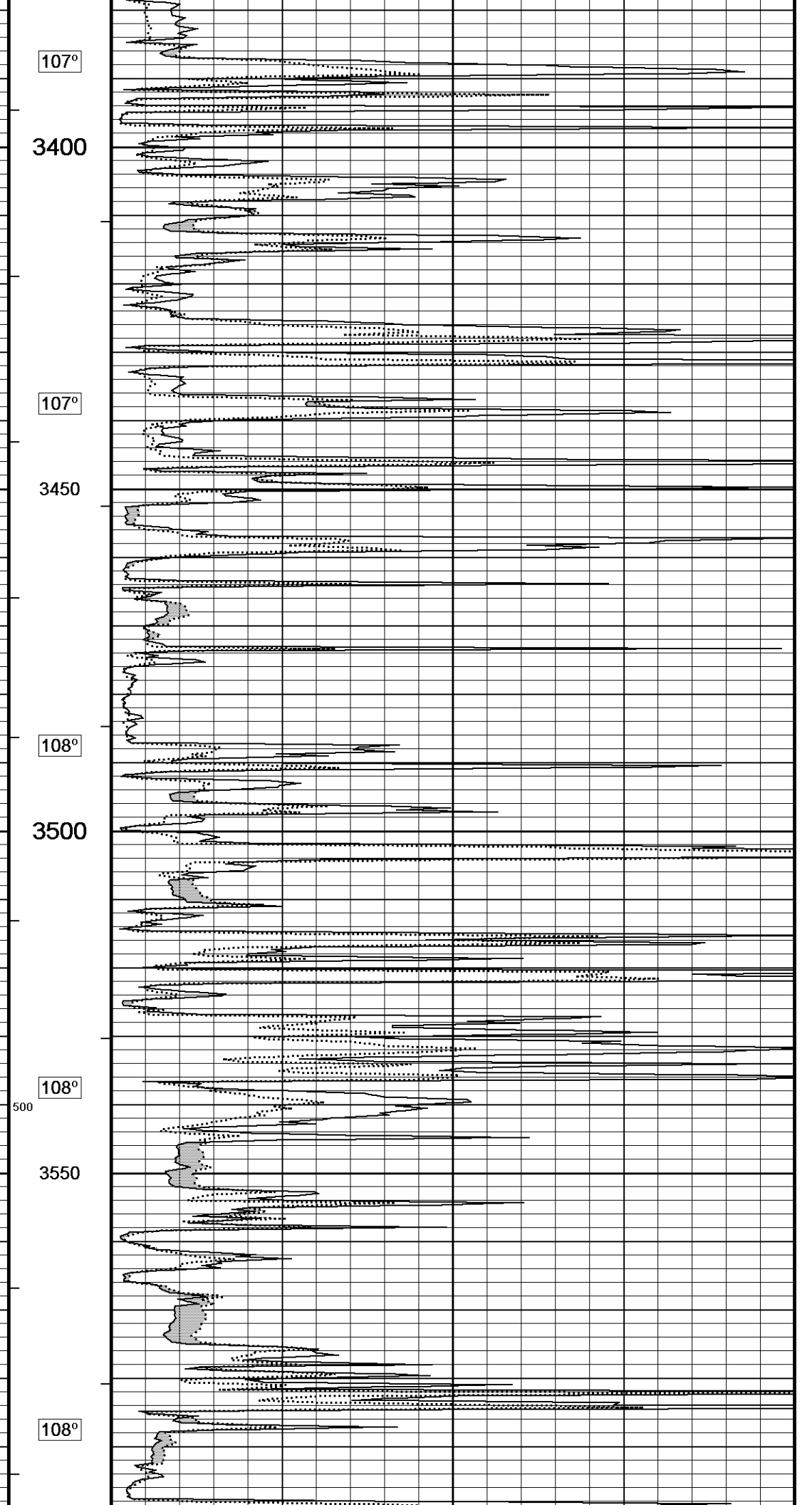
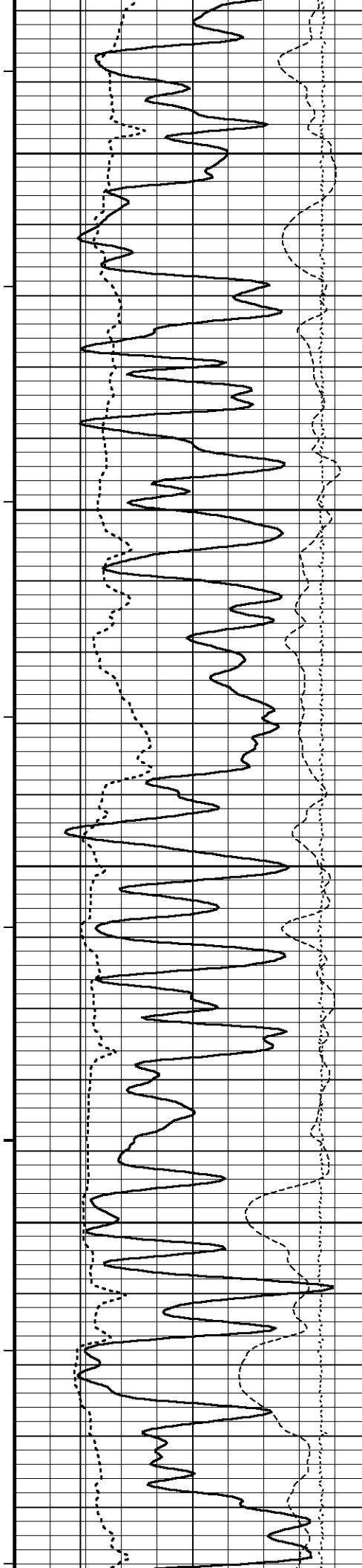
MMR MicroLog Normal

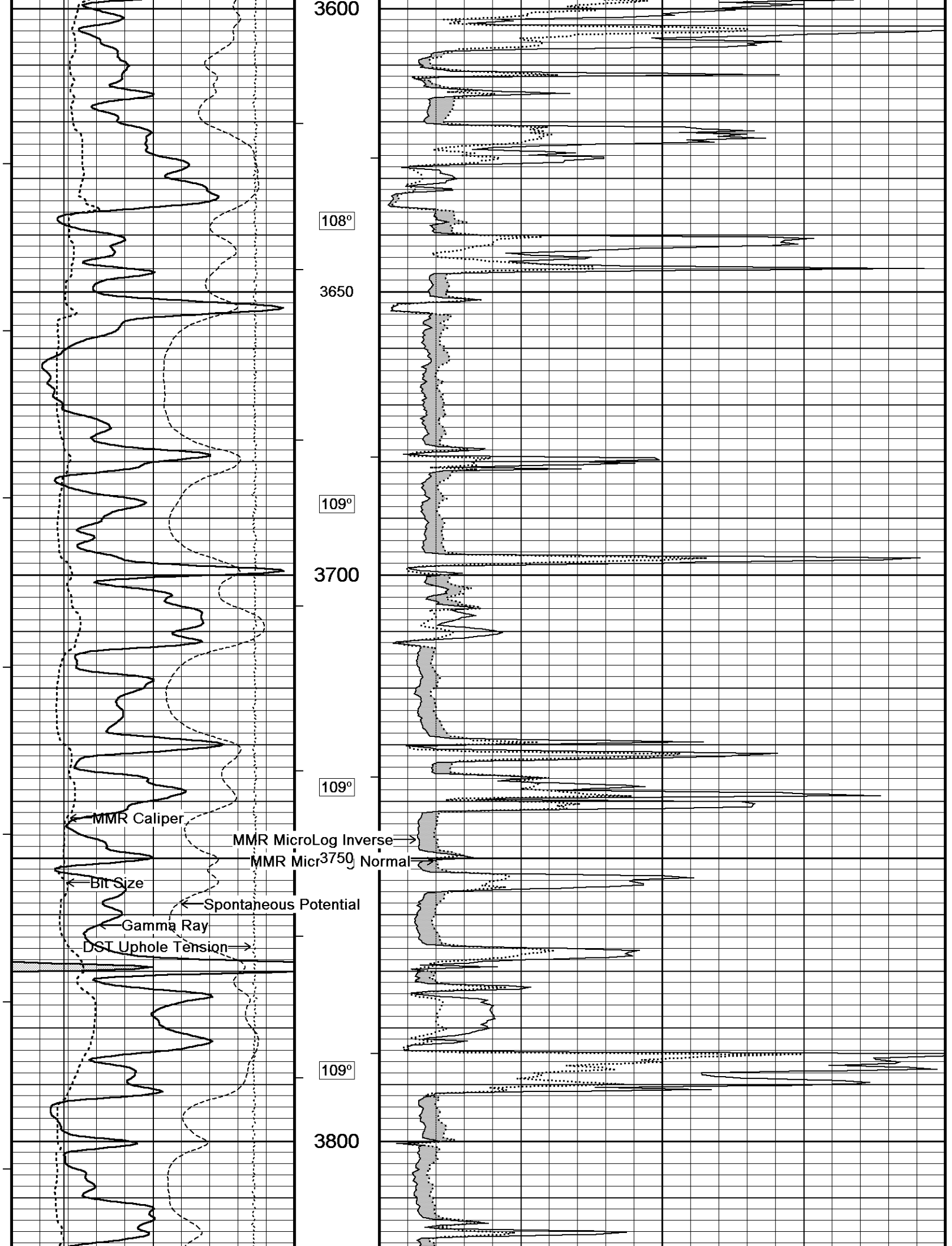
MMR MicroLog Inverse

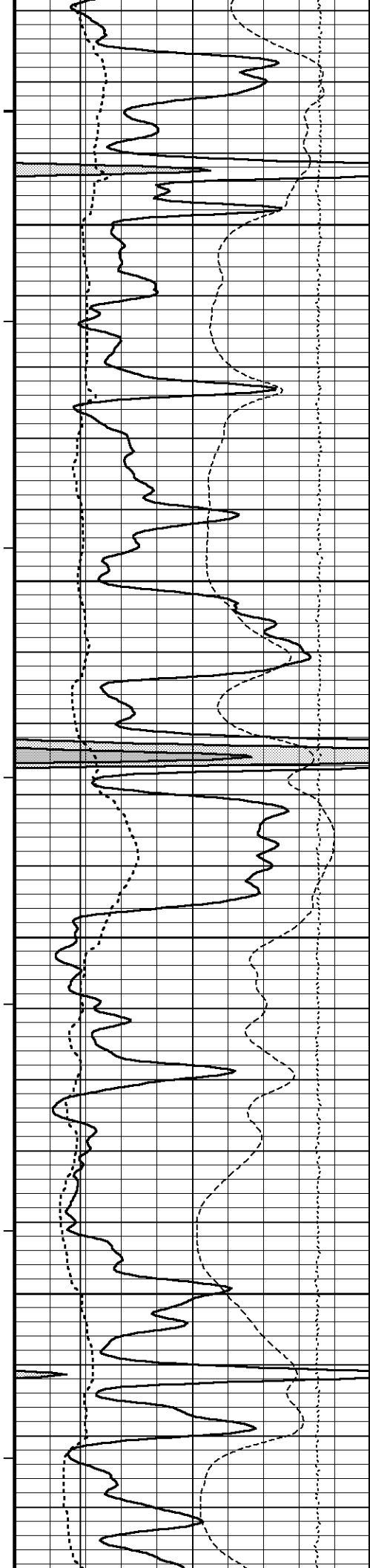
Gamma Ray

DST Uphole Tension

Spontaneous Potential







109°

3850

110°

3900

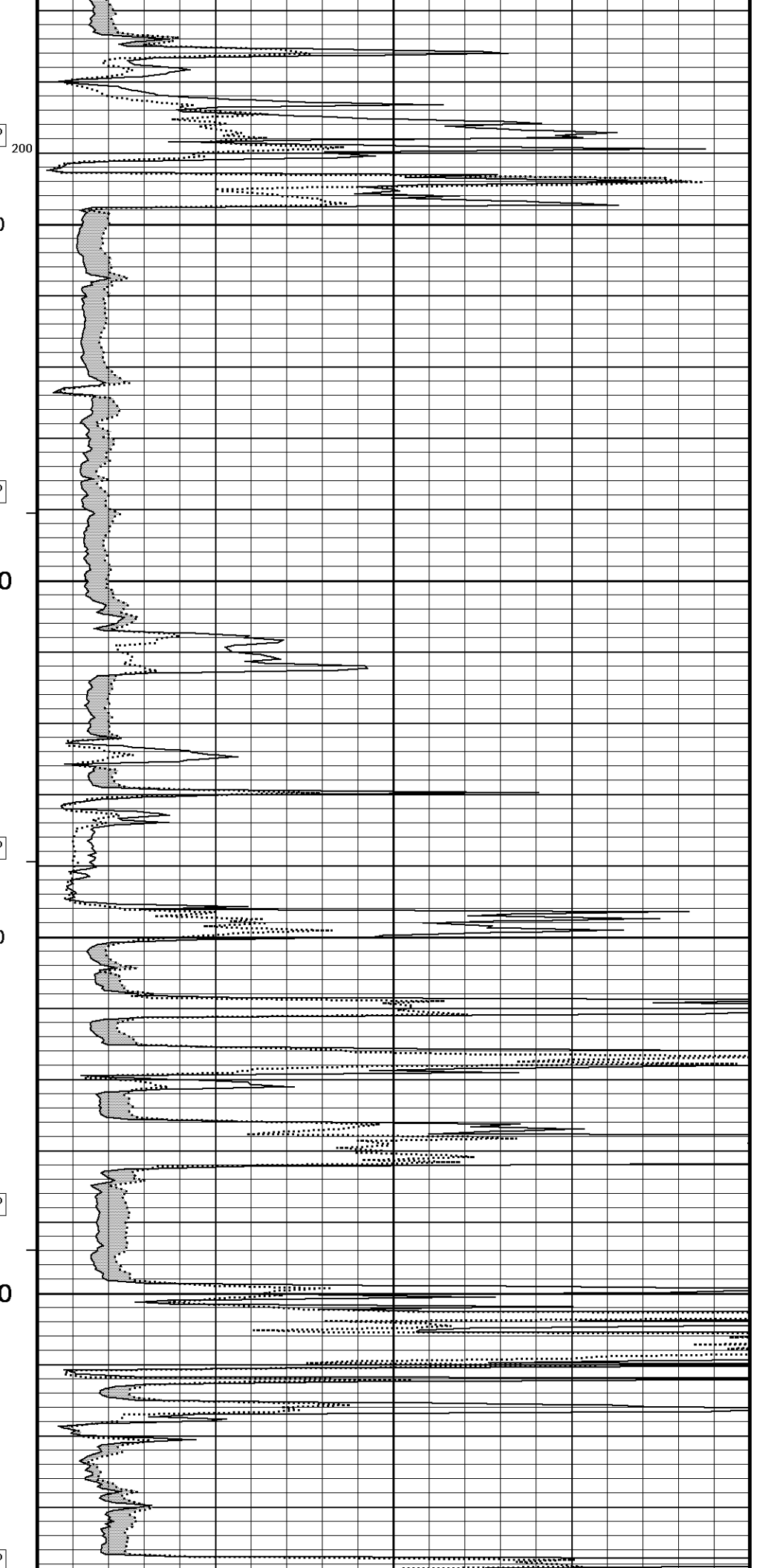
110°

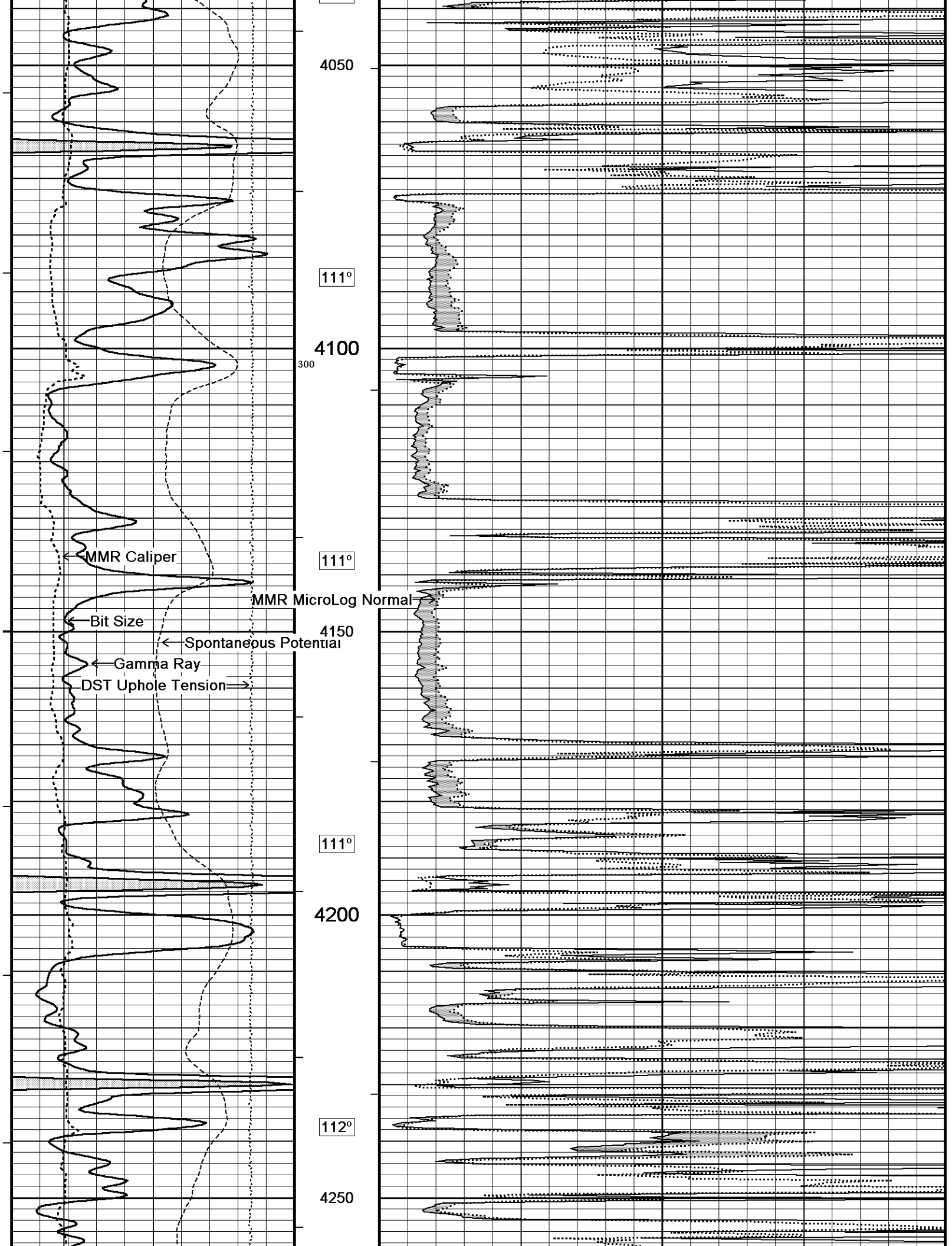
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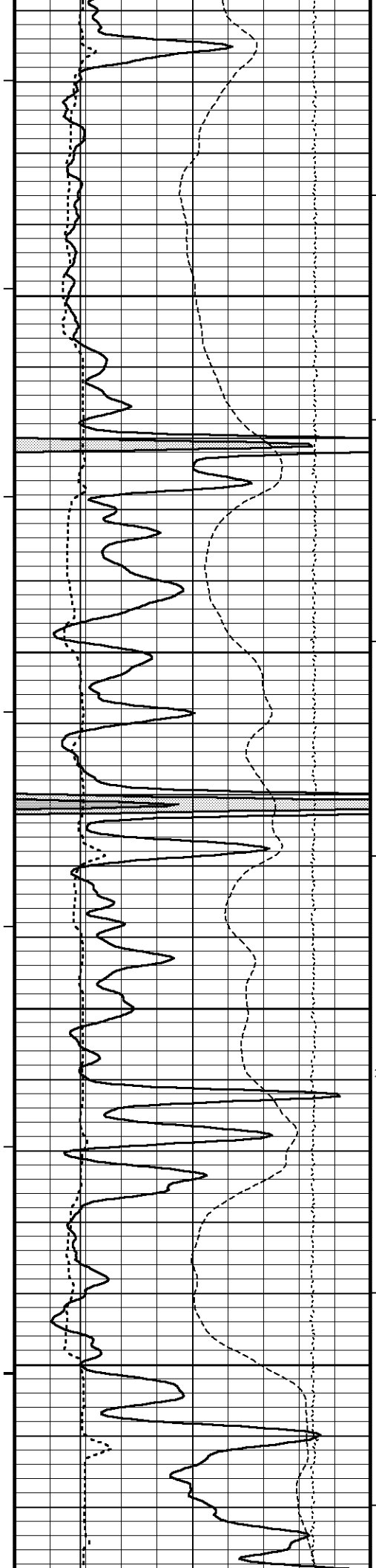
110°

4000

111°







112°

4300

112°

4350

112°

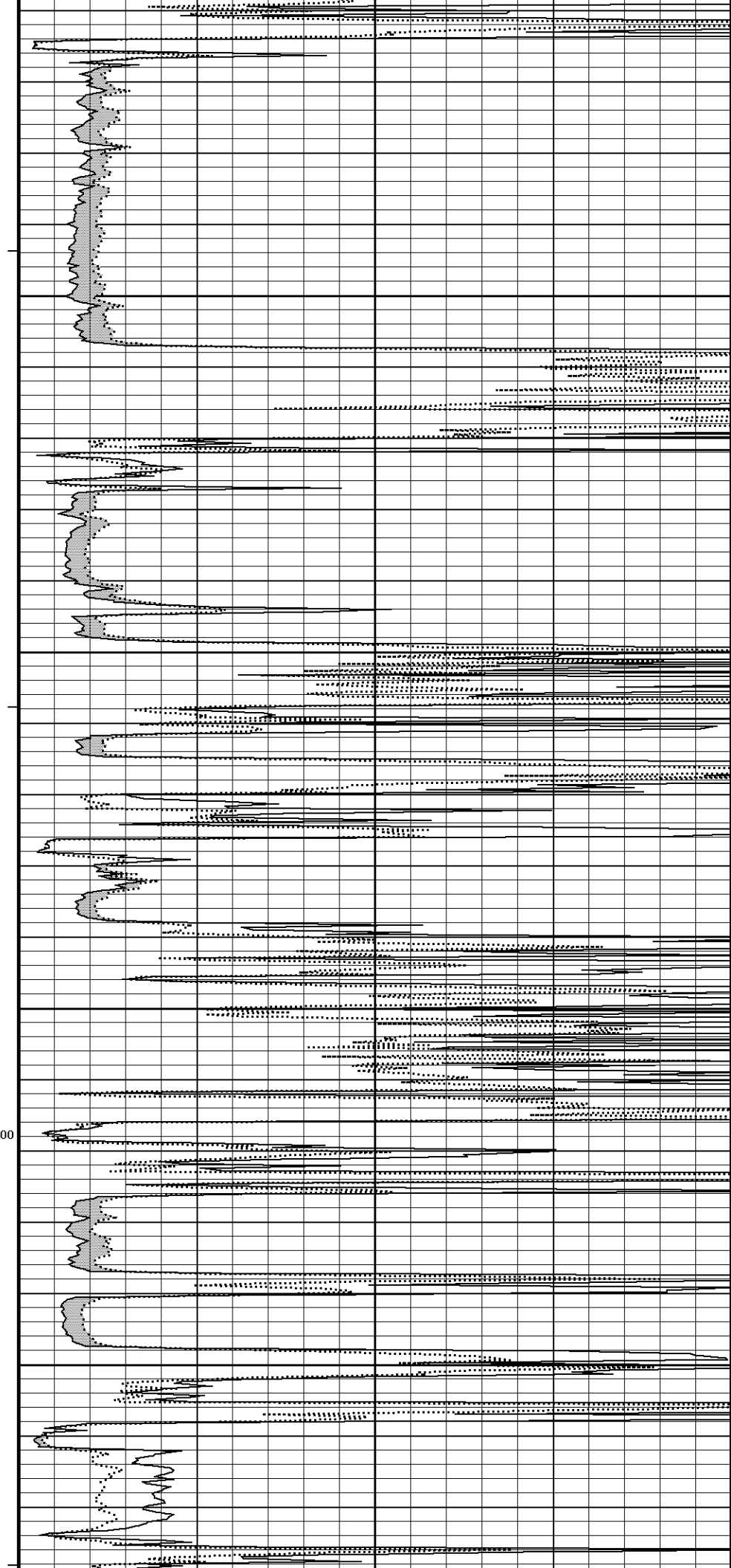
4400

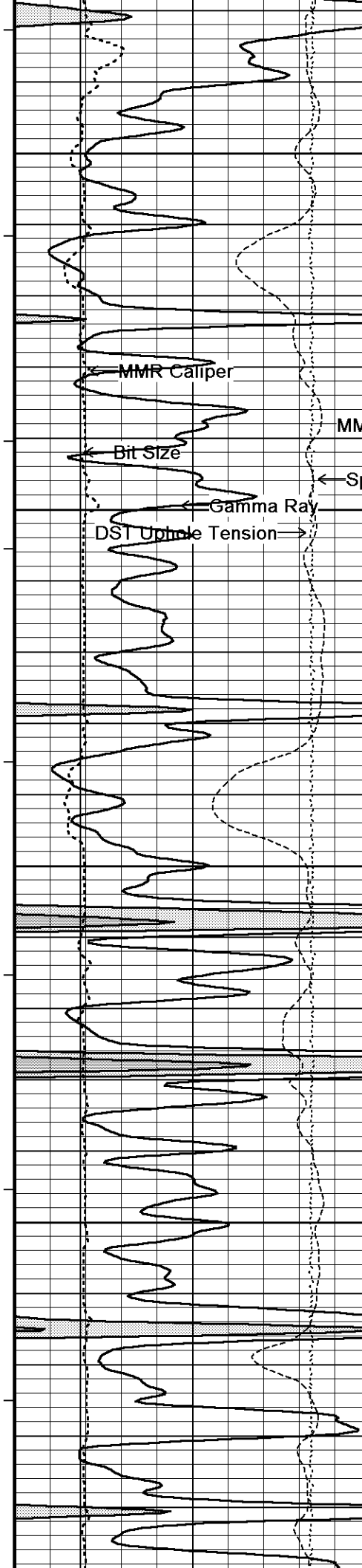
200

100

113°

4450





113°

4500

114°

4550

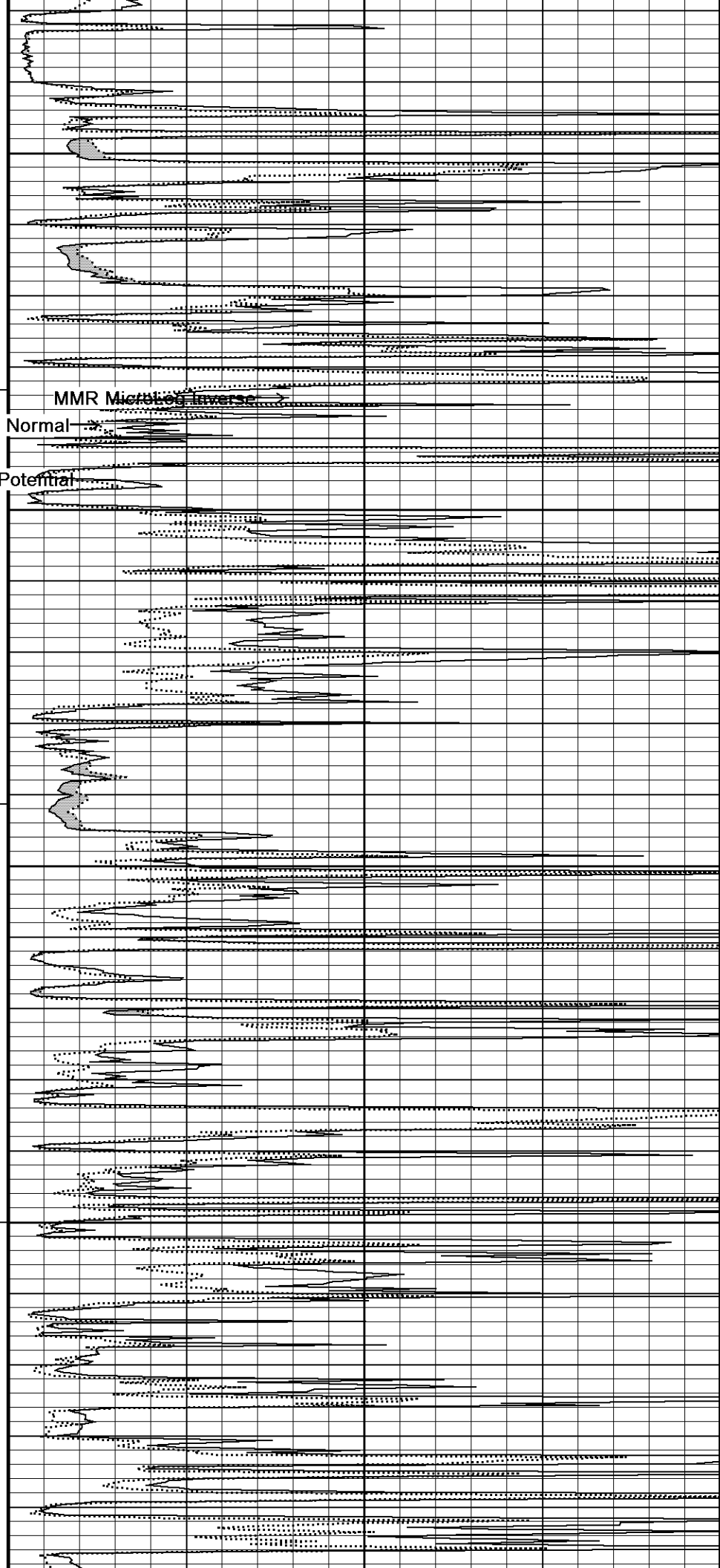
114°

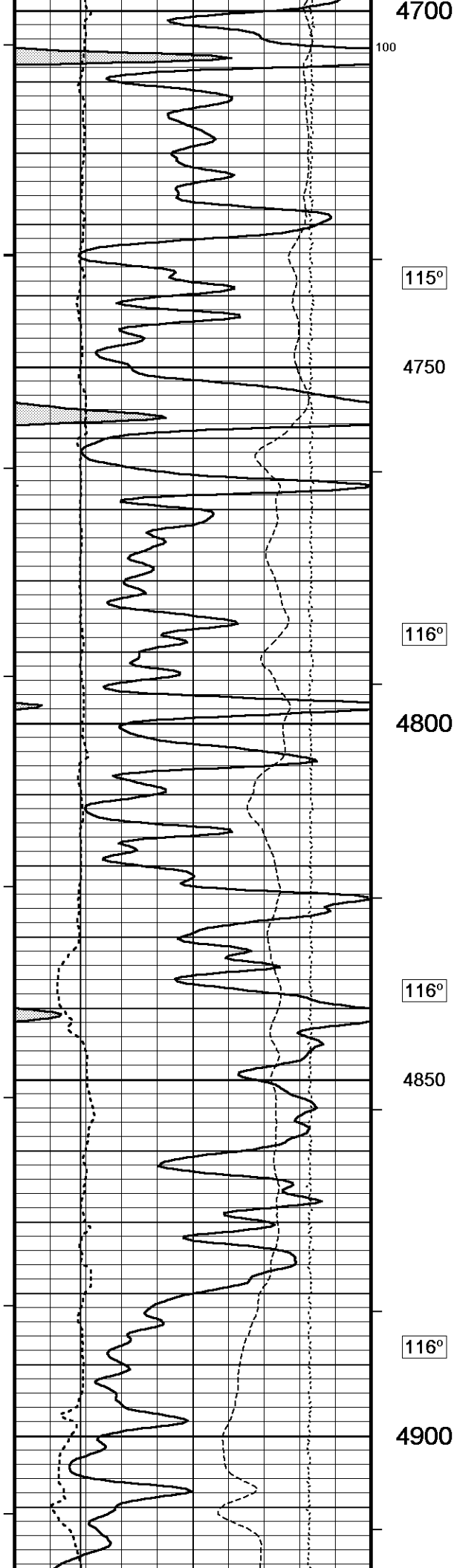
4600

114°

4650

115°





4700

100

115°

4750

116°

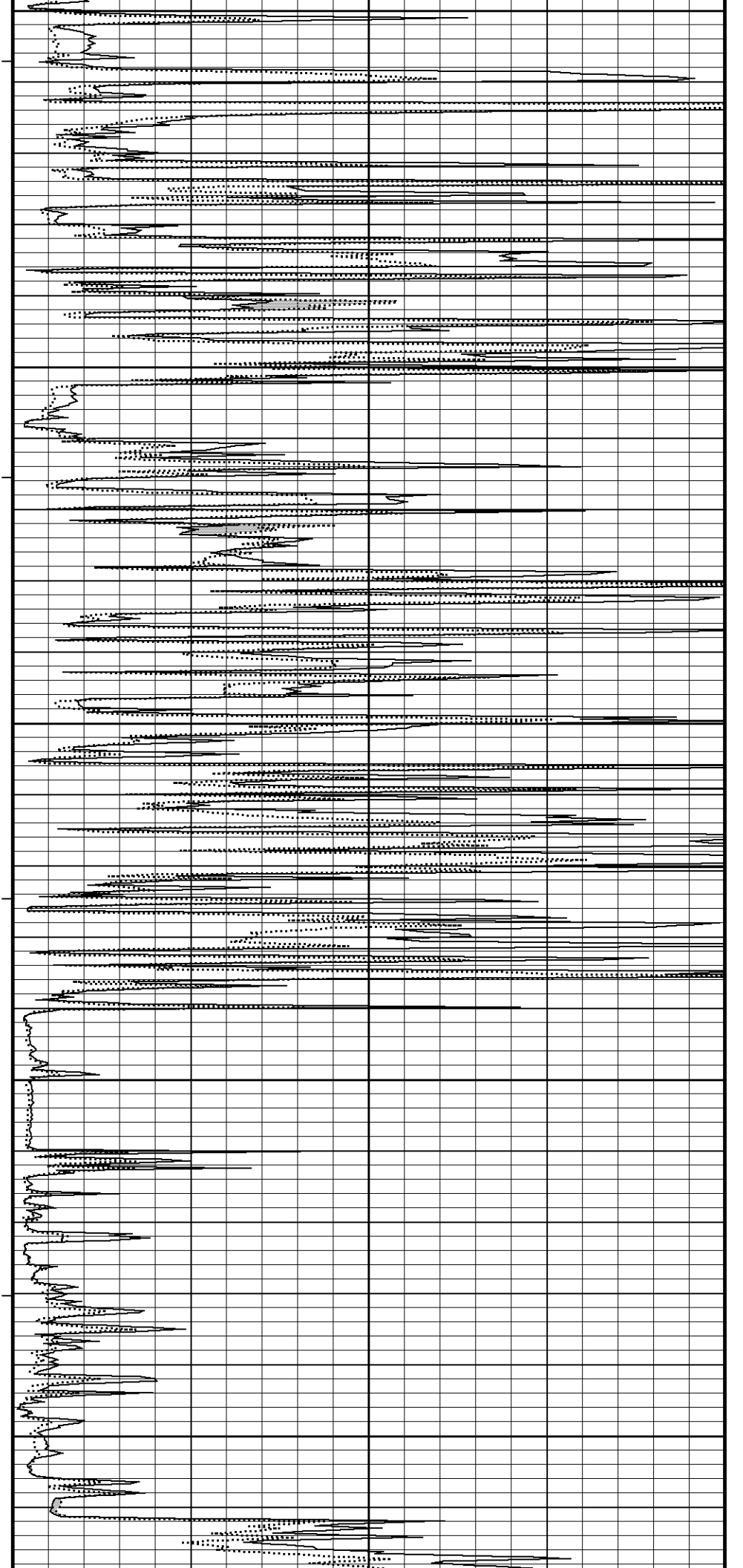
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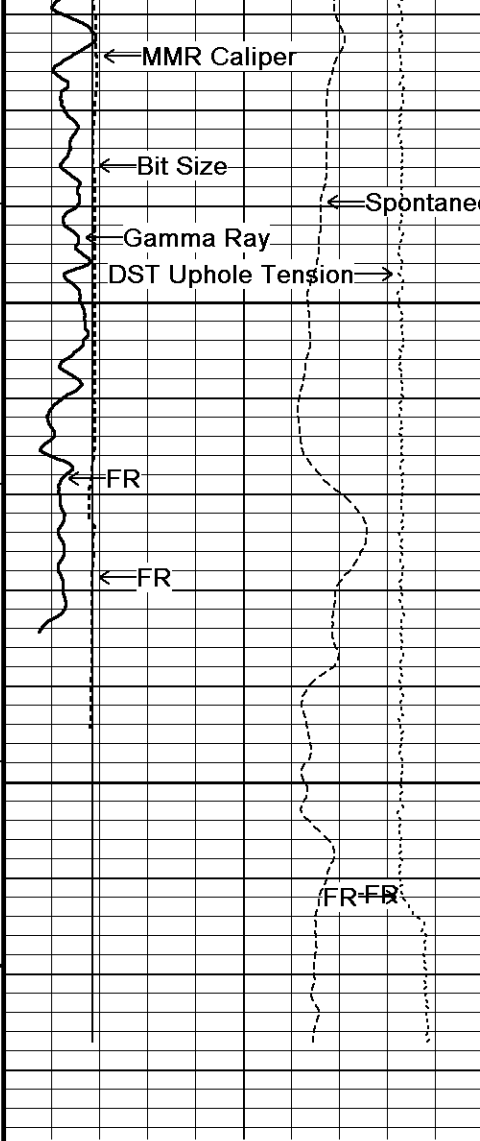
116°

4850

116°

4900





116°

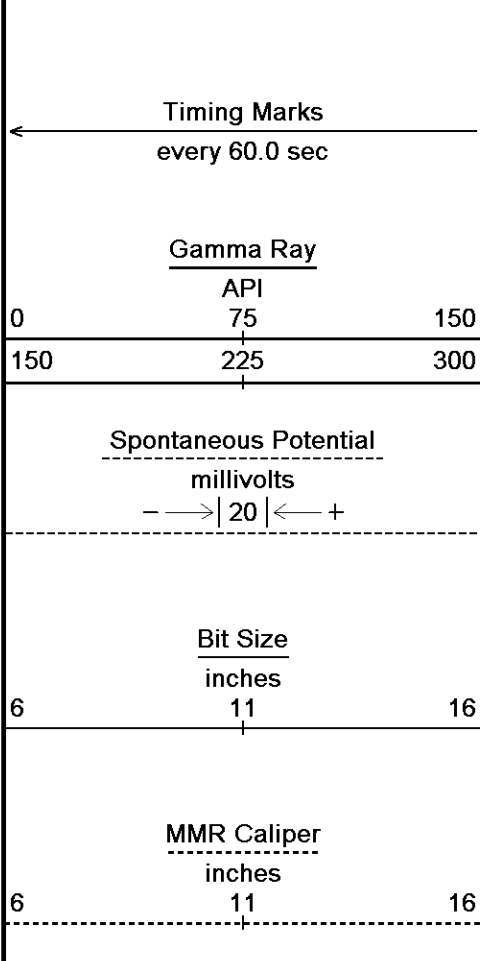
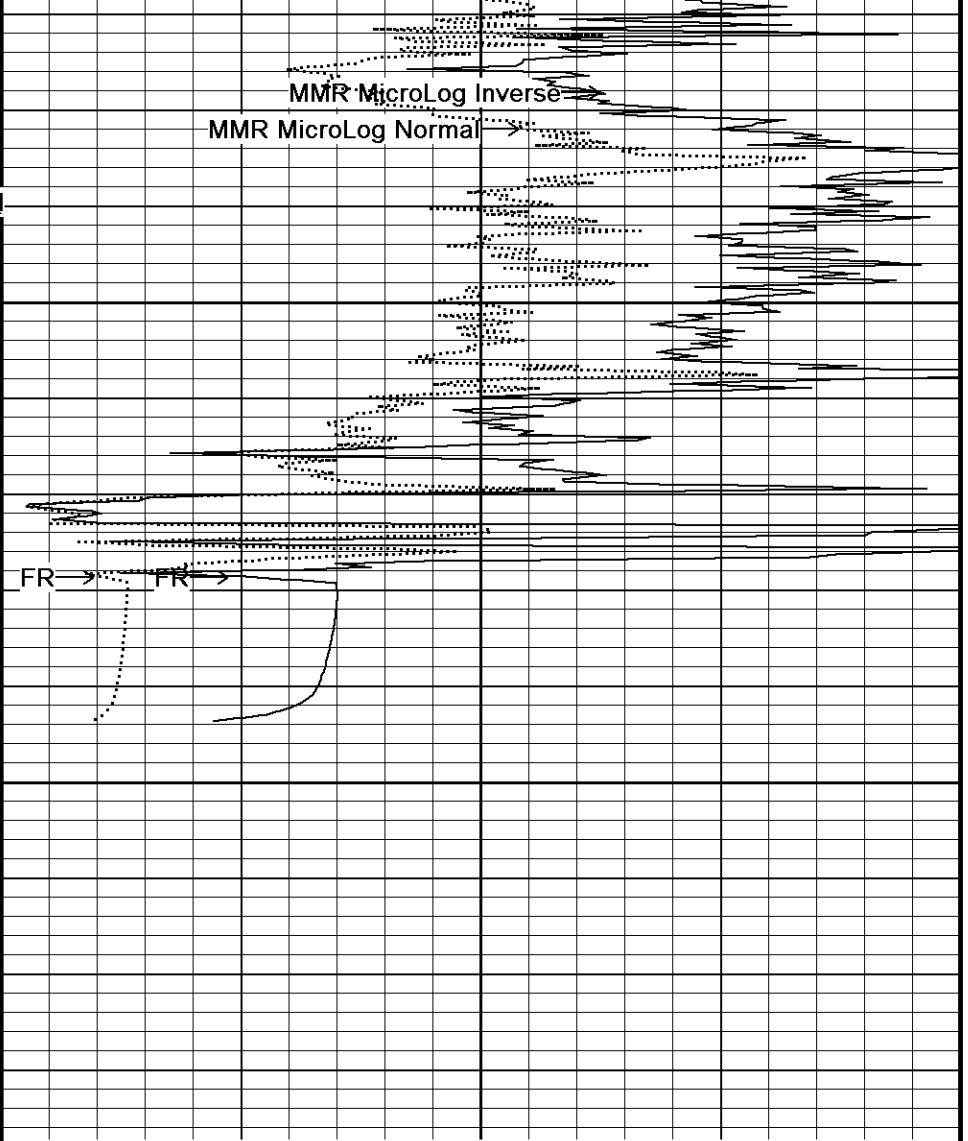
4950

5000

0

0

TD

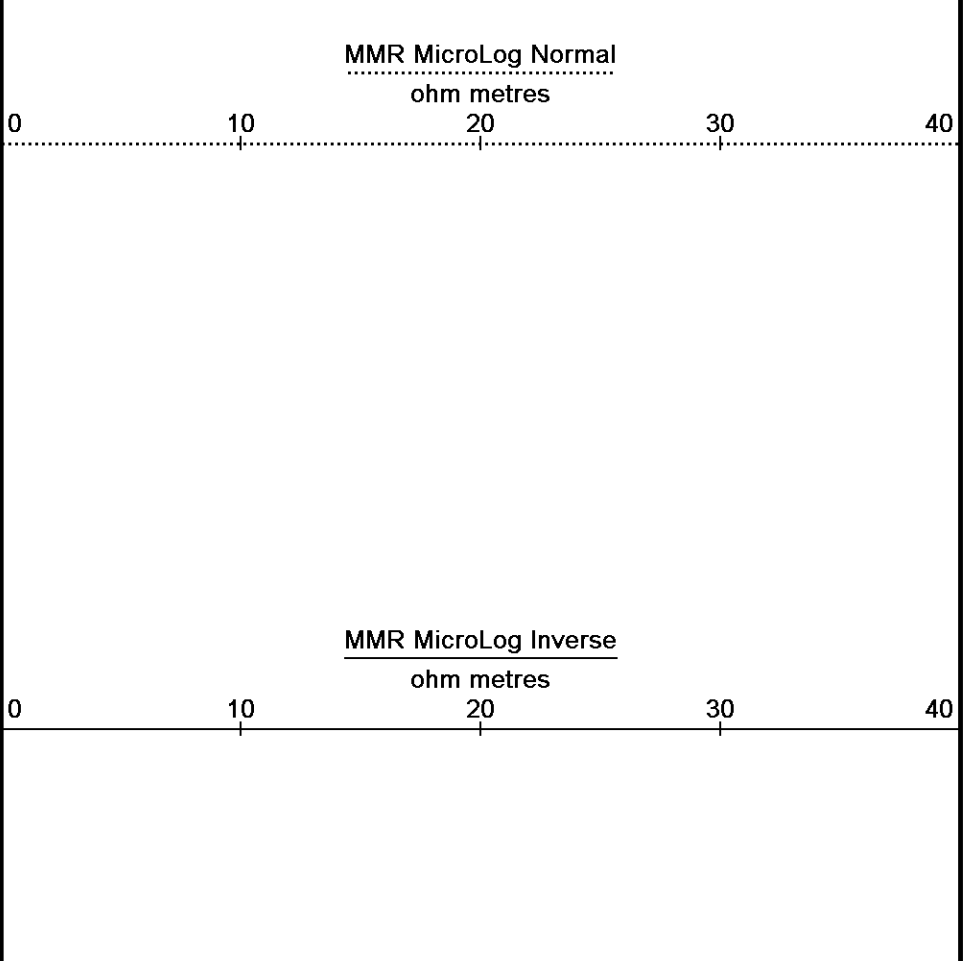


Depth
in
Feet

Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft



DST Uphole Tension
pounds

50000

Replay
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08\Data\PetroSantander Scott #6-13\PetroSantander Scott #6-13 Main.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

Plotted on 13-AUG-2014 09:04
Recorded on 13-AUG-2014 05:16

5 INCH MAIN

Timing Marks
every 60.0 sec

Gamma Ray
API

075150
150225300

Spontaneous Potential
millivolts
- -> 20 | <- +

Bit Size
inches

61116

MMR Caliper
inches

61116

DST Uphole Tension
pounds

50000

Depth
in
Feet

Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Replay
Scale
1:240

4818

4850

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08\Data\PetroSantander Scott #6-13\PetroSantander Scott #6-13 Repeat.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

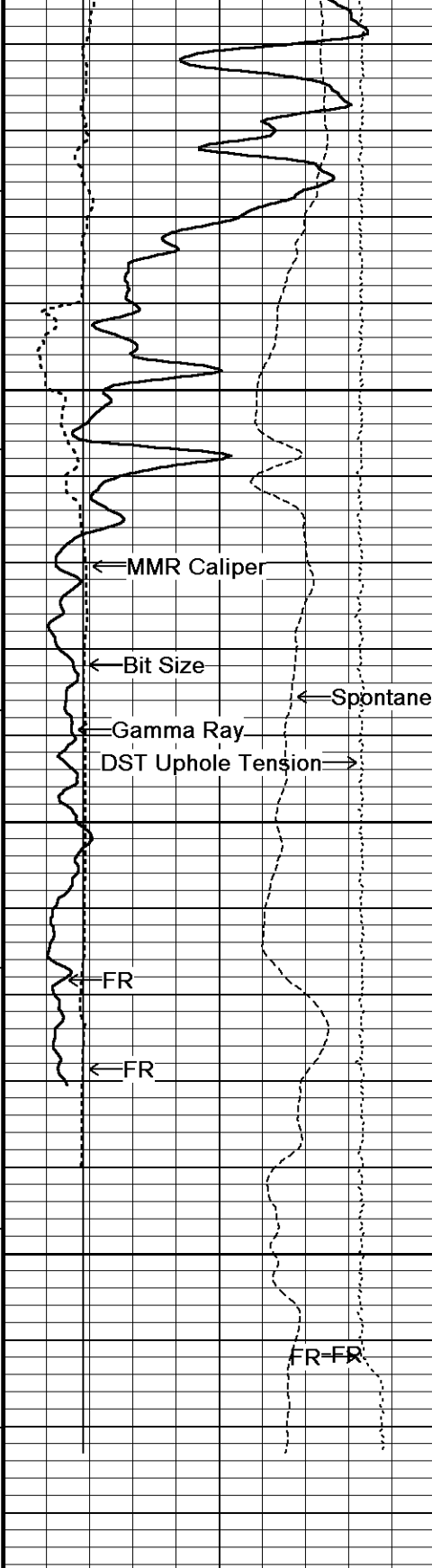
Plotted on 13-AUG-2014 09:04
Recorded on 13-AUG-2014 04:51

MMR MicroLog Normal
ohm metres

010203040

MMR MicroLog Inverse
ohm metres

010203040



116°

4900

116°

4950

5000

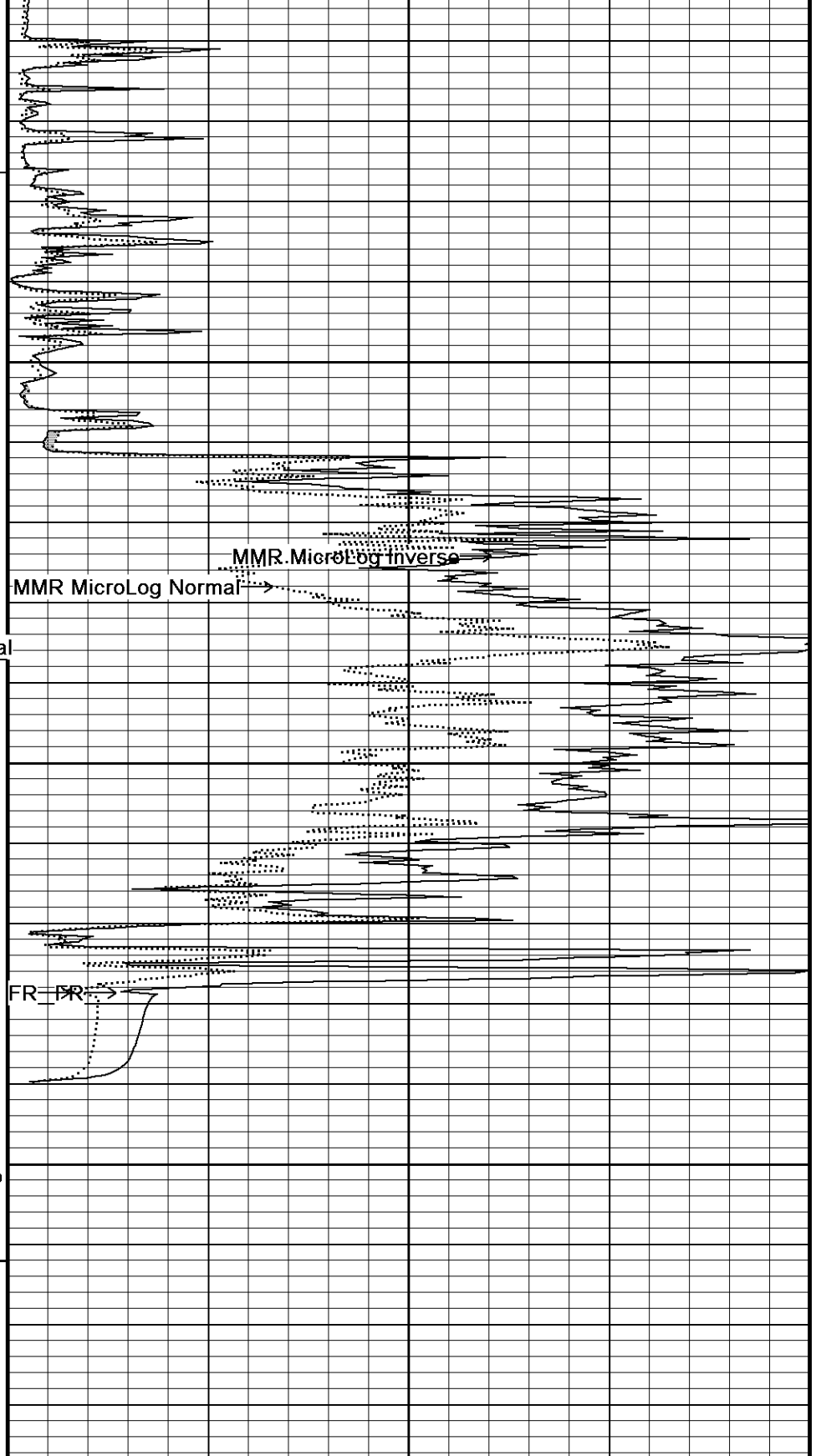
TD

Depth
in
Feet

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Borehole
Temp in

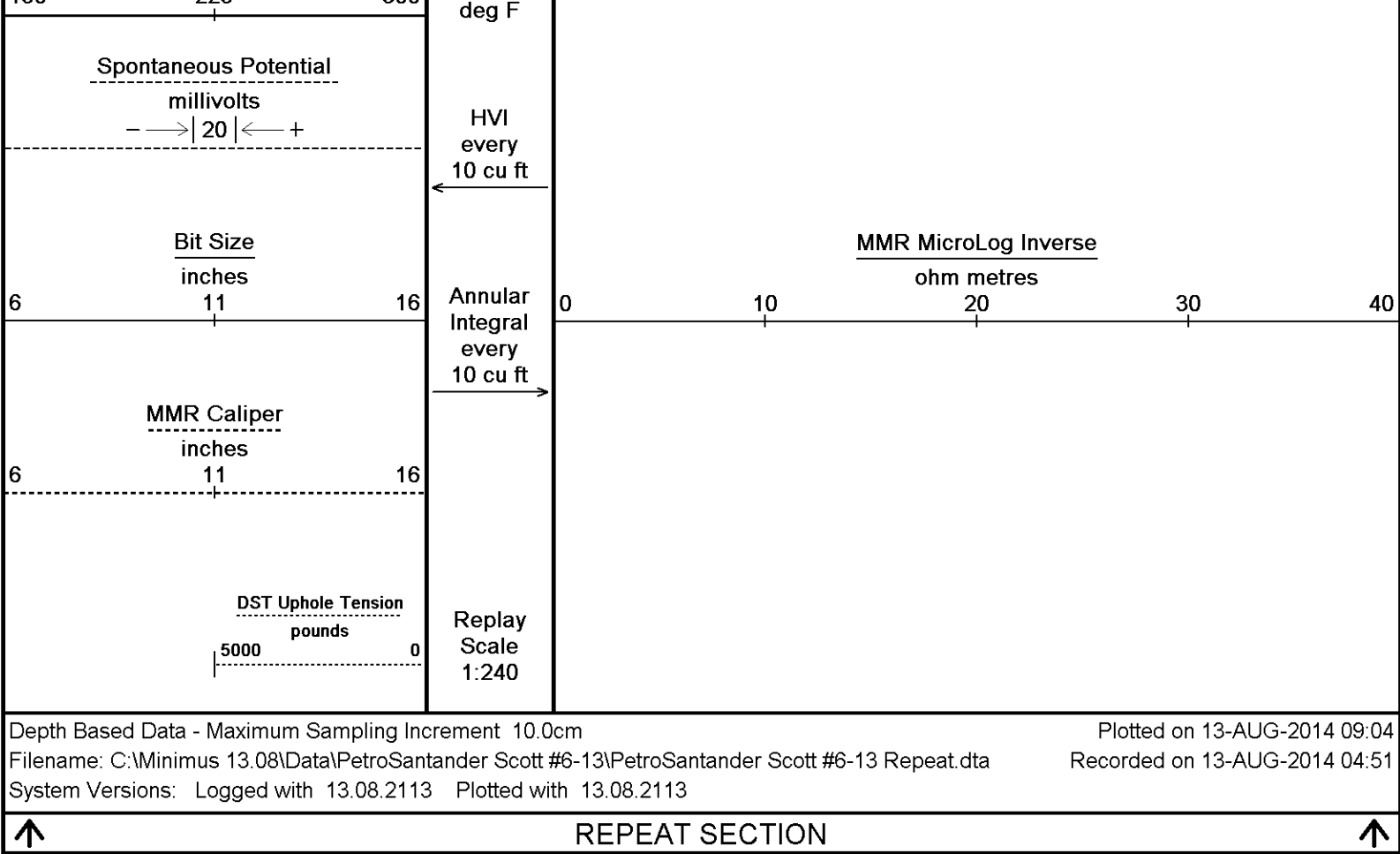


MMR MicroLog Inverse
MMR MicroLog Normal

FR FR

MMR MicroLog Normal
ohm metres

0 10 20 30 40



BEFORE SURVEY CALIBRATION		
C:\Minimus 13.08\Data\PetroSantander Scott #6-13\PetroSantander Scott #6-13 Main.dta		
General Constants All 000		Last Edited on 13-AUG-2014,04:11
General Parameters		
Mud Resistivity	0.710	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	5.500	inches
Caliper for Differential Caliper	Density 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-D.K 443		Field Calibration on 05-MAR-2014,20:50
	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00
High Resolution Temperature Constants MCG-D.K 443		Last Edited on 22-JUL-2014,11:40
Pre-filter Length	11	
Gamma Calibration MCG-D.K 443		Field Calibration on 12-AUG-2014 20:37

Measured Calibrated (API)

Background	73	49
Calibrator (Gross)	1156	774
Calibrator (Net)	1083	725

Gamma Constants MCG-D.K 443

Last Edited on 13-AUG-2014,01:20

Gamma Calibrator Number	GRC38	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

Caliper Calibration MMR-A 11

Base Calibration on 07-AUG-2014 16:28
Field Calibration on 12-AUG-2014 19:57

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13912	5.98
2	17046	7.97
3	20284	9.86
4	24184	11.92
5	0	0.00
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	8.01	7.97

Micro Normal and Micro Inverse Calibration MMR-A 11

Base Calibration on 07-AUG-2014 16:39
Field Check on 12-AUG-2014 19:56

Base Calibration				
		Measured	Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.2	49.9	5.1	25.6
Micro Inverse	10.0	49.4	3.4	16.9
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	93.7		93.7	
Micro Inverse	62.3		62.3	

Micro Normal and Micro Inverse Constants MMR-A 11

Last Edited on 10-JUL-2014,16:35

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 MPD-B 104

Base Calibration on 12-AUG-2014 21:09
Field Calibration on 12-AUG-2014 21:10

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	12248	3.99
2	21021	5.98
3	29619	7.97
4	37847	9.86
5	46921	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	7.94	7.97

DOWNHOLE EQUIPMENT

C:\Minimus 13.08\Data\PetroSantander Scott #6-13\PetroSantander Scott #6-13 Main.dta

3/8" Triple Cone Cable Head (MCB C A)
MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.244 in



Compact Comms Gamma
MCG-D.K 443 LG: 8.70 ft WT: 63.9 lb OD: 2.240 in

Compact Micro-Resistivity
MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

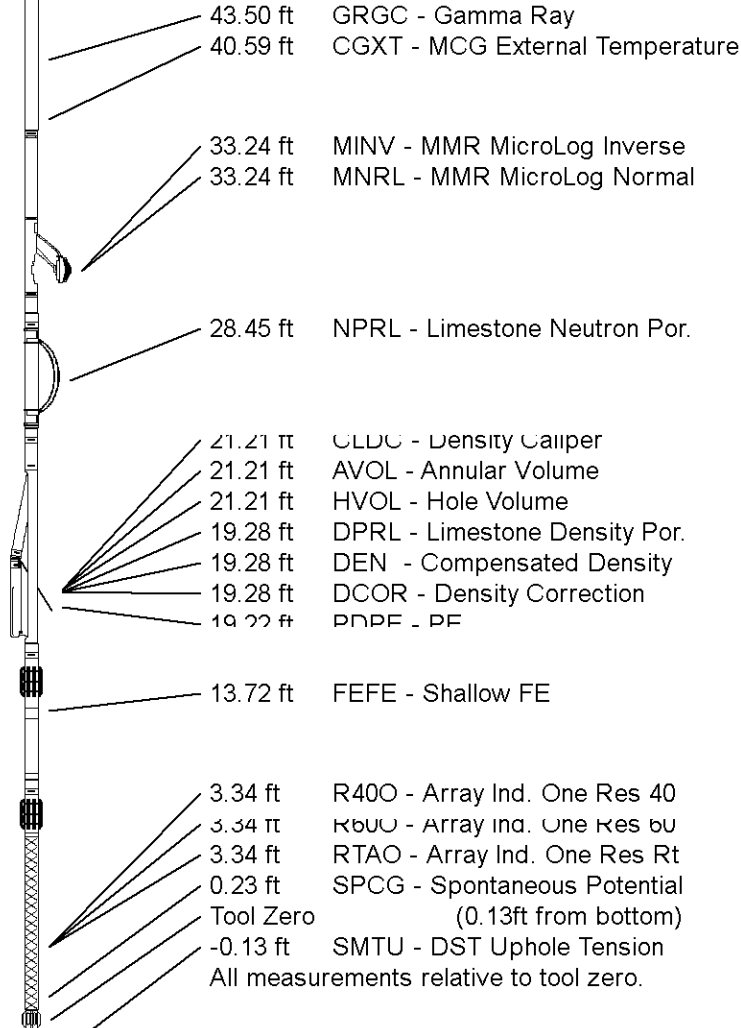
Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.240 in

Compact Density/Caliper
MPD-B 104 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.240 in

Compact Induction
MAI-A.A 158 LG: 10.81 ft WT: 48.5 lb OD: 2.240 in

Total Length: 50.36 ft Weight: 399.0 lb



COMPANY	PETROSANTANDER (USA), INC.
WELL	SCOTT #6-13
FIELD	CHRISTABELLE
PROVINCE/COUNTY	KEARNY
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3106.00	feet	First Reading	4978.76	feet
Elevation Drill Floor	3104.00	feet	Depth Driller	5010.00	feet
Elevation Ground Level	3094.00	feet	Depth Logger	5012.00	feet



Weatherford®

MICRORESISTIVITY LOG