MICRORESISTIVITY LOG

COMPANY	GRAND MESA OPERATING COMPANY
WELL	APC MARTIN #1-3
FIELD	WILDCAT
PROVINCE/COUNTY	LINCOLN
COUNTRY/STATE	U.S.A. / COLORADO
LOCATION	1743' FSL & 1539' FEL

SEC	TWP	RGE	Other Services
3	10S	55W	MAI/MFE MPD/MDN
			MSS

API Number 05-073-06488-00
Permit Number

Permanent Datum GL, Elevation 5237 feet
Log Measured From KB
Drilling Measured From KB

Elevations:	feet
KB	5250.00
DF	5248.00
GL	5237.00

Date	28-NOV-2012			
Run Number	ONE			
Service Order	3537785			
Depth Driller	7900.00	feet		
Depth Logger	7901.00	feet		
First Reading	7855.00	feet		
Last Reading	6400.00	feet		
Casing Driller	395.00	feet		
Casing Logger	391.00	inches		
Bit Size	7.875			
Hole Fluid Type	CHEMICAL	lb/USg		
Density / Viscosity	9.40 lb/USg	76.00 CP		
PH / Fluid Loss	10.00	10.00		
Sample Source	FLOWLINE			
Rm @ Measured Temp	1.22 @ 96.0	ohm-m		
Rmf @ Measured Temp	0.98 @ 96.0	ohm-m		
Rmc @ Measured Temp	1.46 @ 96.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.71 @169.0	ohm-m		
Time Since Circulation	5 HOURS			
Max Recorded Temp	169.00	deg F		
Equipment / Base	13096	LIB		
Recorded By	ADAM SILL			
Witnessed By	BOB SCHRIEBER			
JOB #	LB12-313			

BOREHOLE RECORD

Last Edited: 28-NOV-2012 11:53

Bit Size inches	Depth From feet	Depth To feet
17.500	0.00	80.00
12.250	80.00	395.00
7.875	395.00	7900.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
CONDUCT	13.375	0.00	80.00	48.00
SURFACE	8.625	0.00	395.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 13.04.8492.

- MCG, MML, MDN, MPD, MFE, MSS, MAI RAN IN COMBINATION.
  - HARDWARE: DUAL BOWSPRING USED ON MDN.
  0.5 INCH STANDOFF USED ON MFE.
  TWO 0.5 INCH STANDOFFS USED ON MSS.
  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: 3643 CU. FT.

- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 3643 CU. FT.

- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO 3000 FT: 962 CU. FT.

- SERVICE ORDER # 3537785.

- RIG: MURFIN #25.

- ENGINEER: A. SILL.

- OPERATOR(S): N. ADAME, R. VENEGAS.

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 — Plotted on 30-NOV-2012 13:34

Filename: C:\Minimus 13.04.8492\Data\...\Grand Mesa Operating Company APC Martin #1-3 Main2.dta — Recorded on 28-NOV-2012 14:50

System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
– → | 20 | ← +

MML Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth in Feet

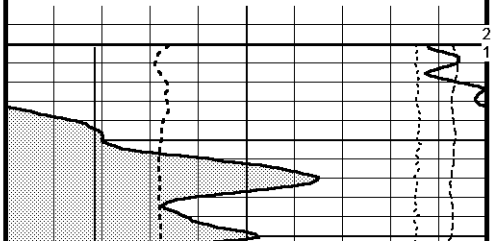
Borehole Temp in deg F

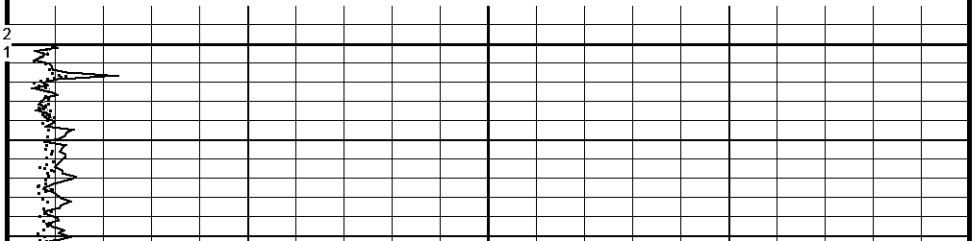
Replay Scale 1:240

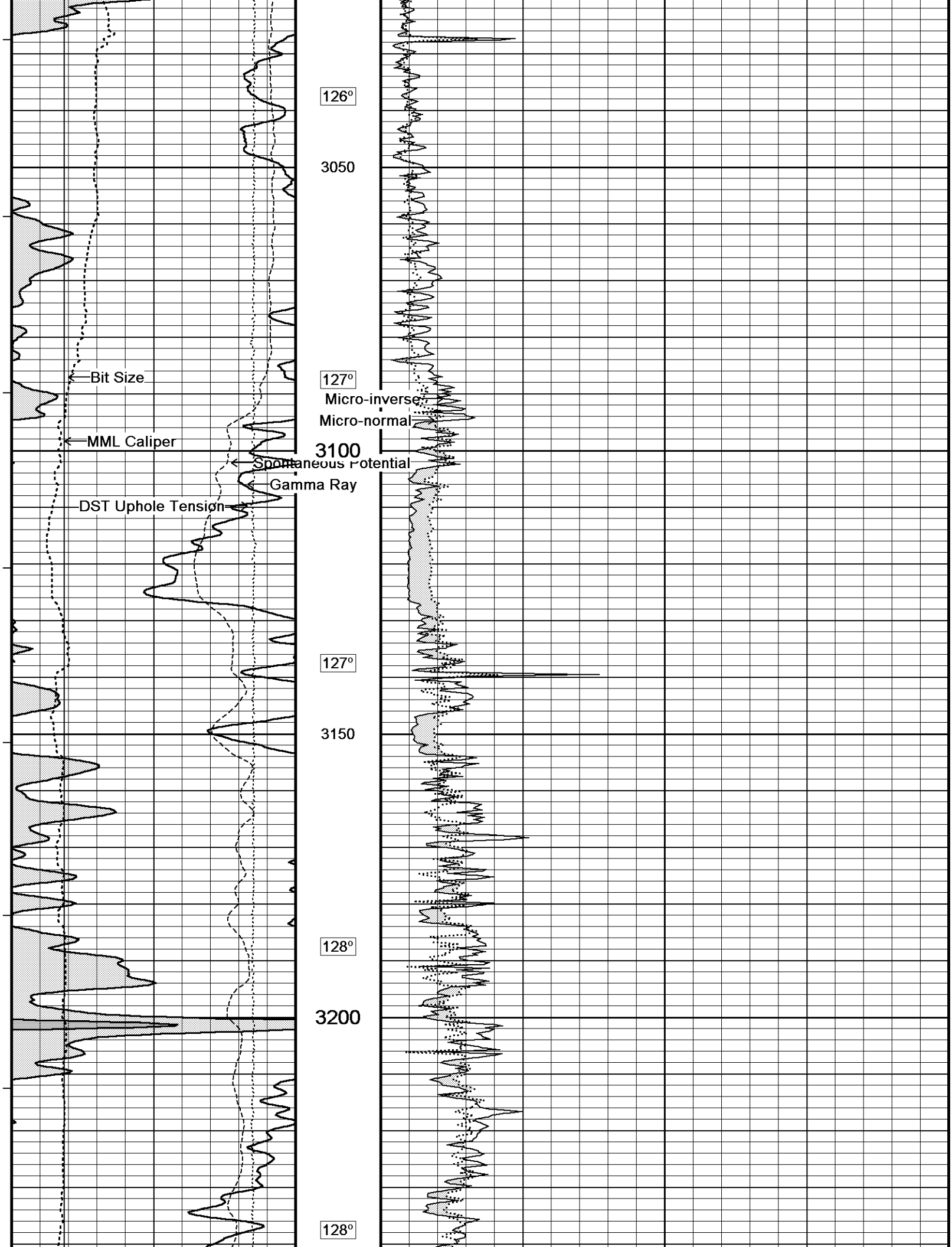
Micro-normal
ohm metres
0 10 20 30 40

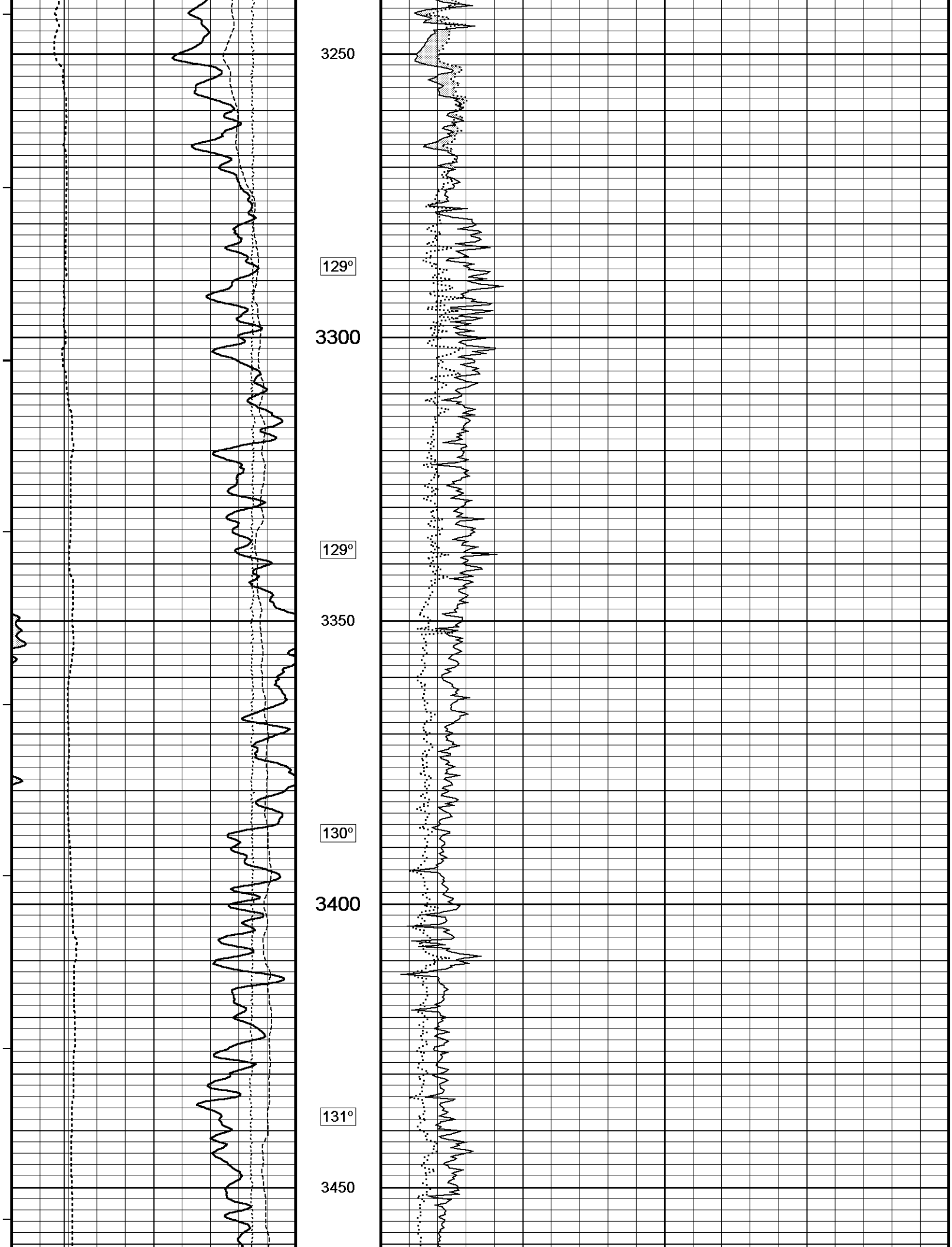
Micro-inverse
ohm metres
0 10 20 30 40

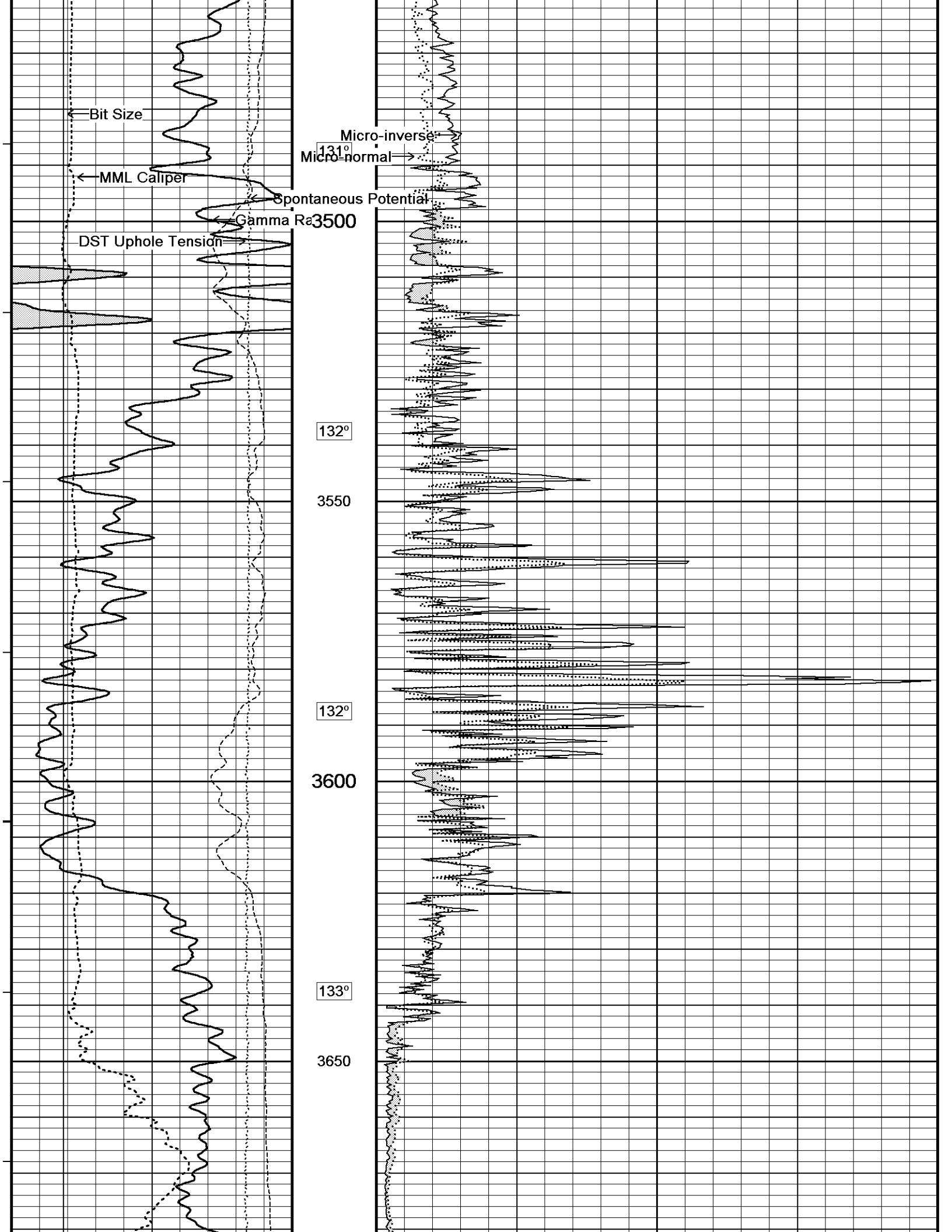
3000

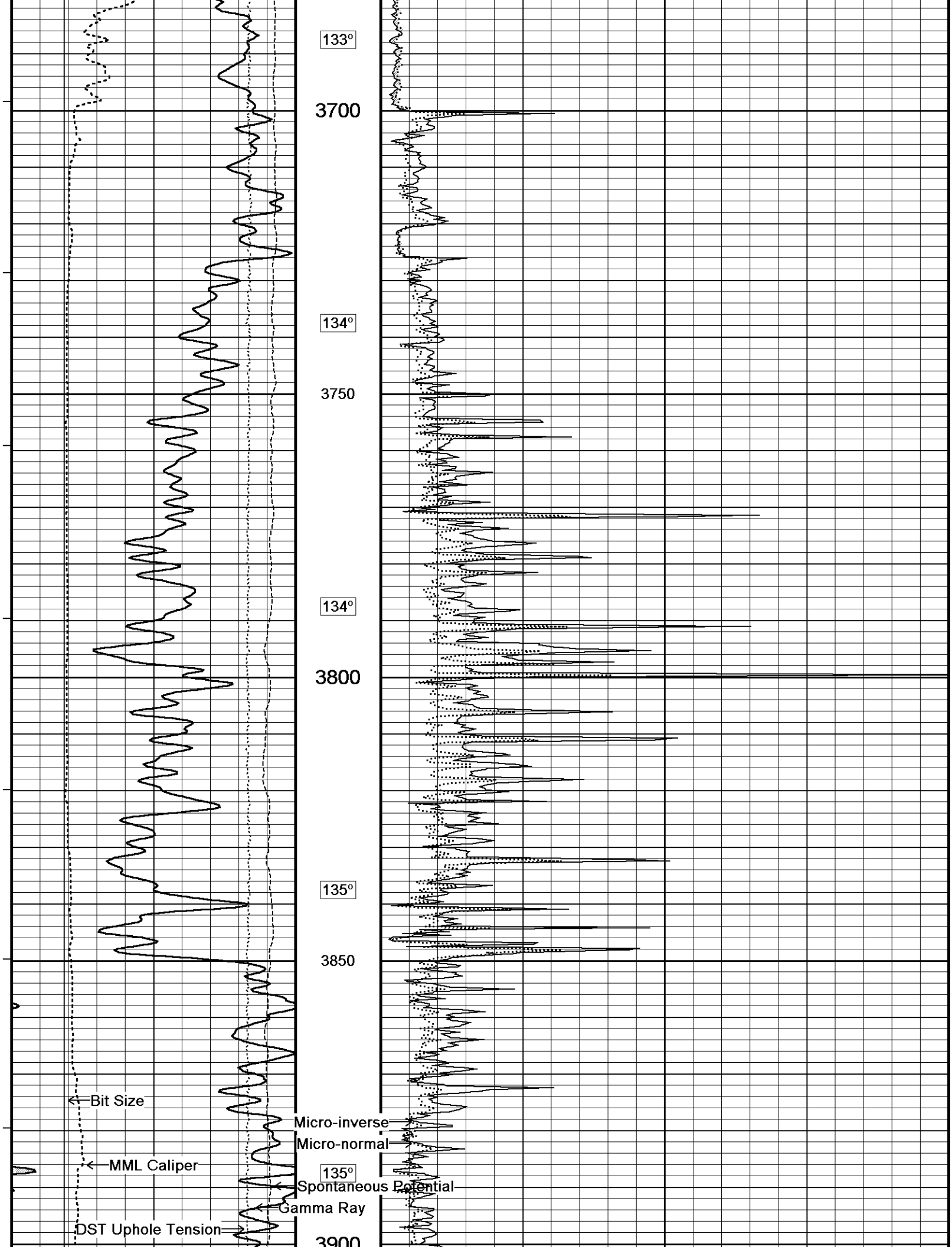


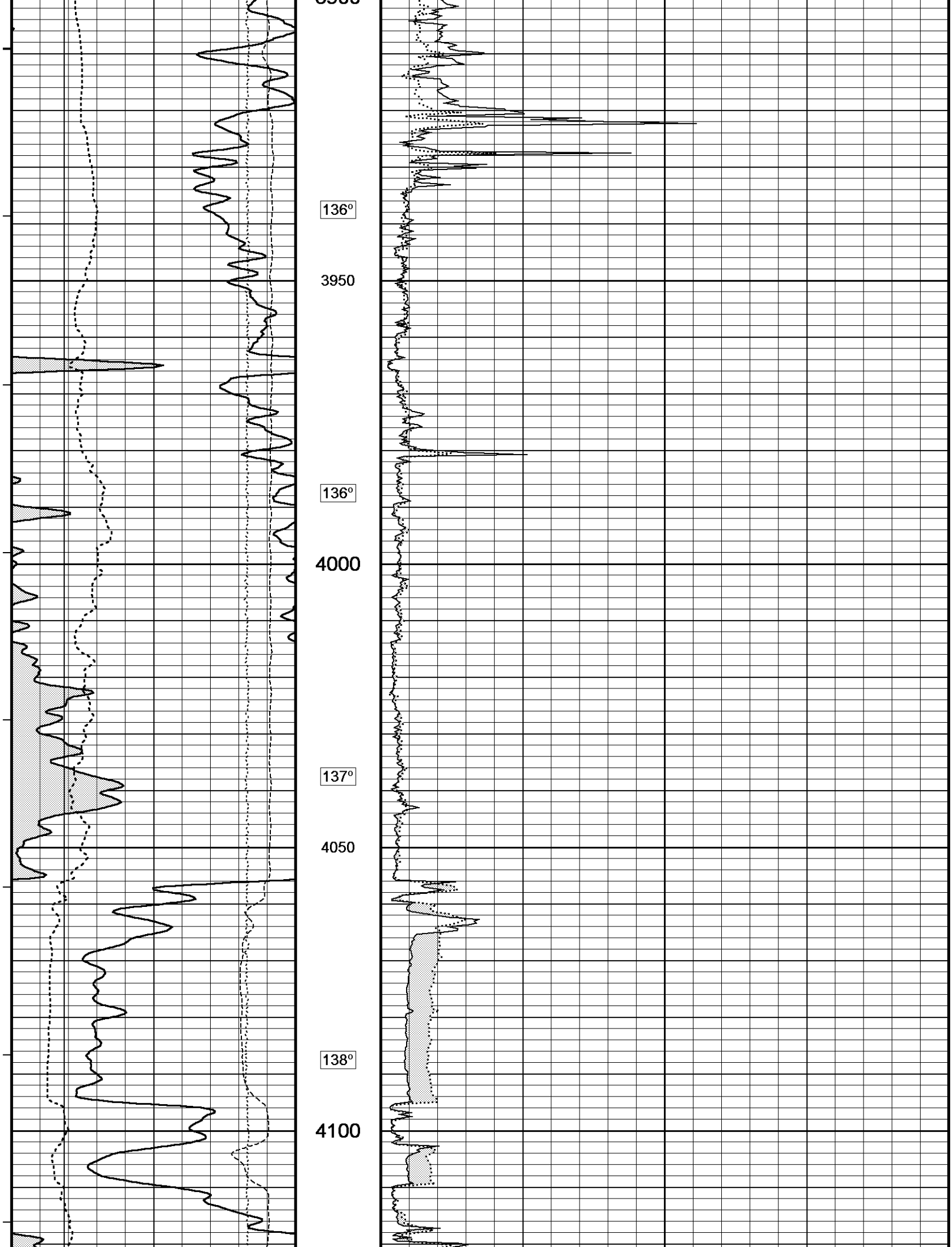


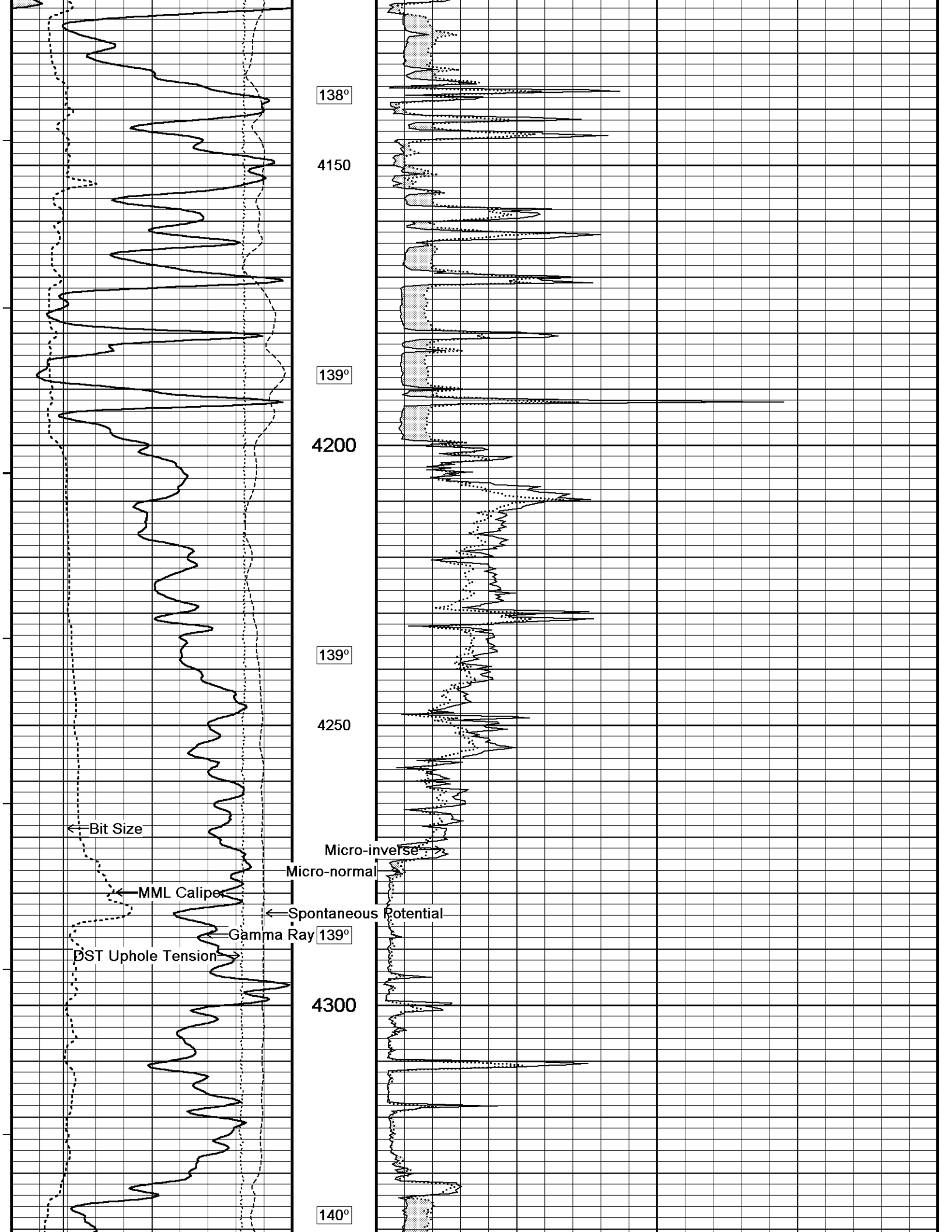

126°
3050
Bit Size
127°
Micro-inverse
Micro-normal
MML Caliper
3100
Spontaneous Potential
Gamma Ray
DST Uphole Tension
127°
3150
128°
3200
128°

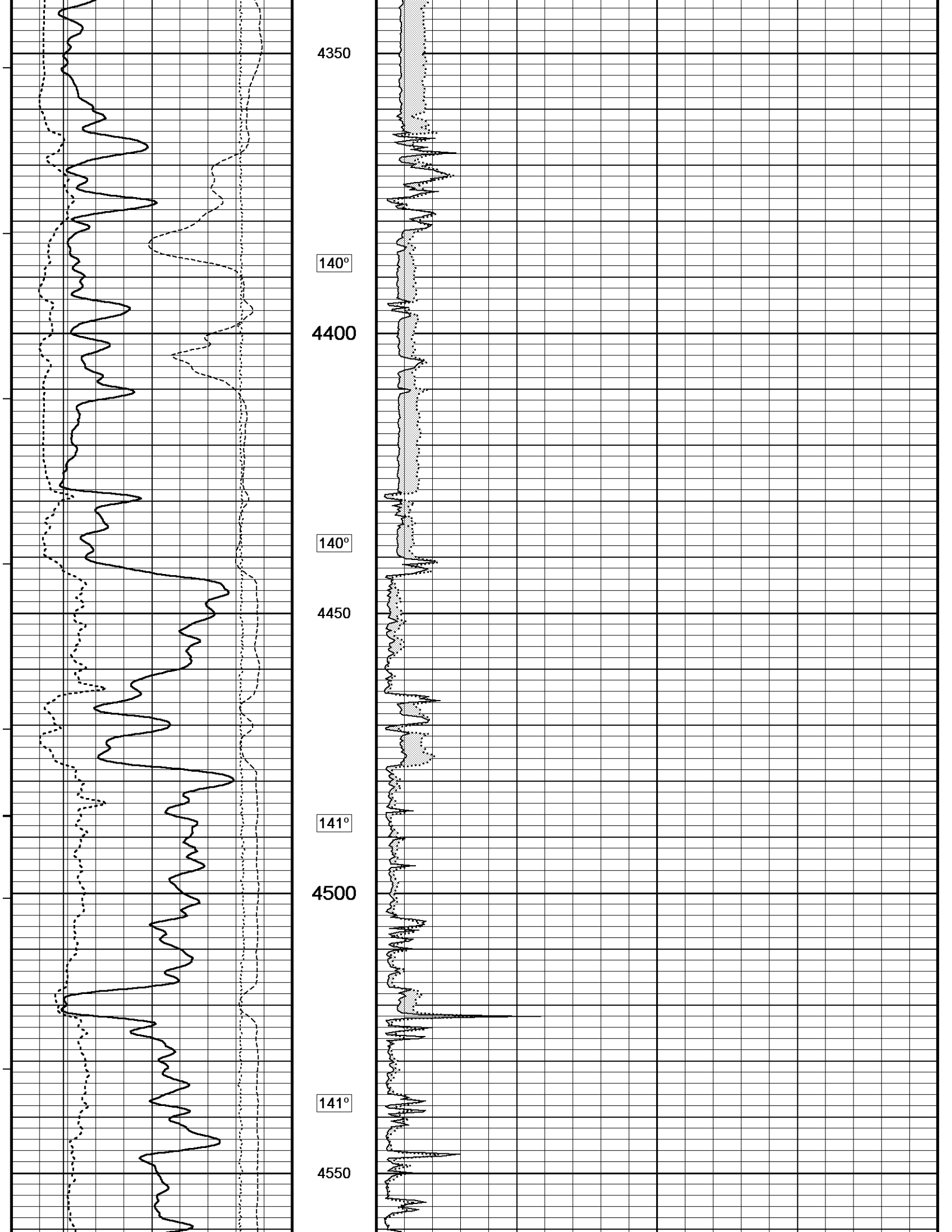

3250
129°
3300
129°
3350
130°
3400
131°
3450

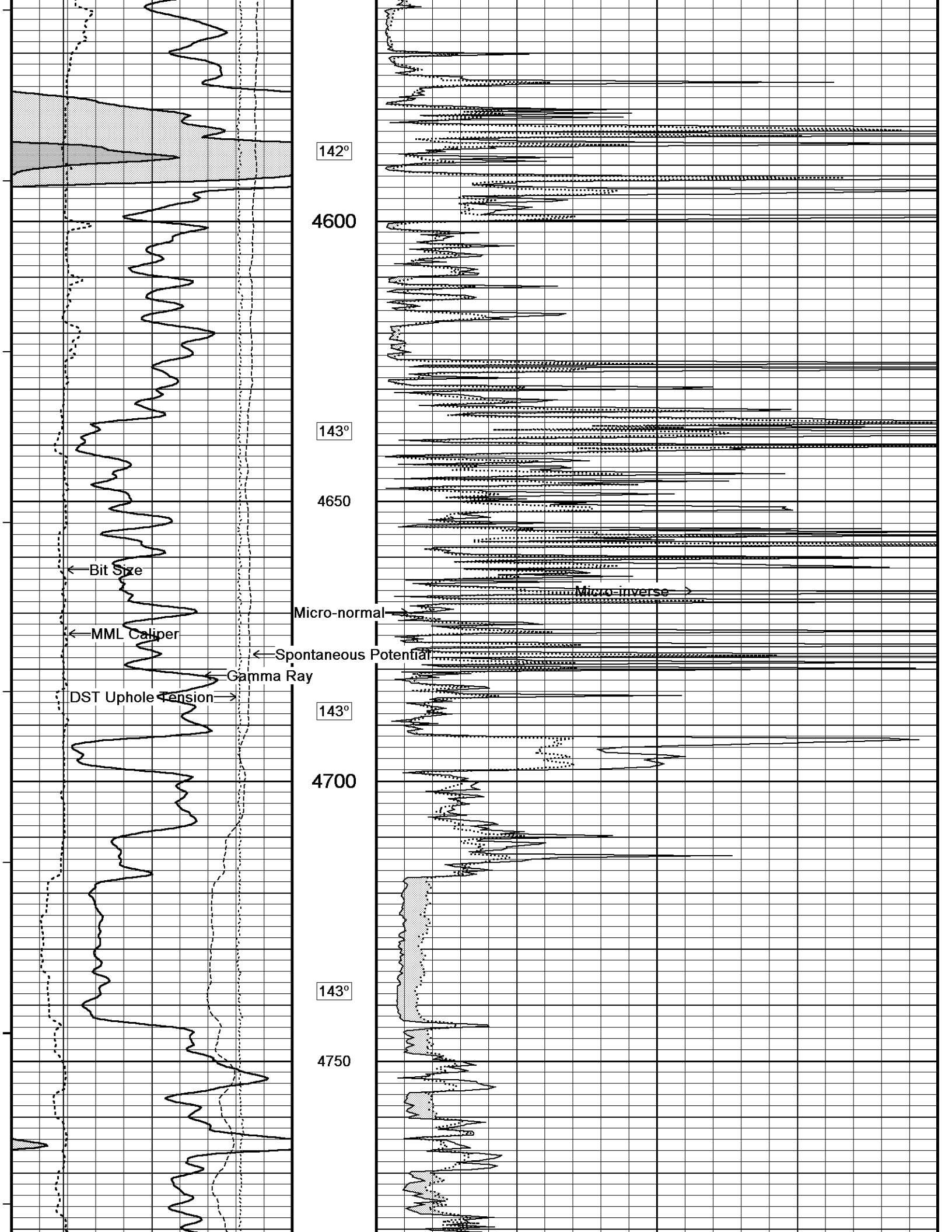

Bit Size
MML Caliper
DST Uphole Tension
Micro-inverse
Micro-normal
131°
Spontaneous Potential
Gamma Ra
3500
132°
3550
132°
3600
133°
3650

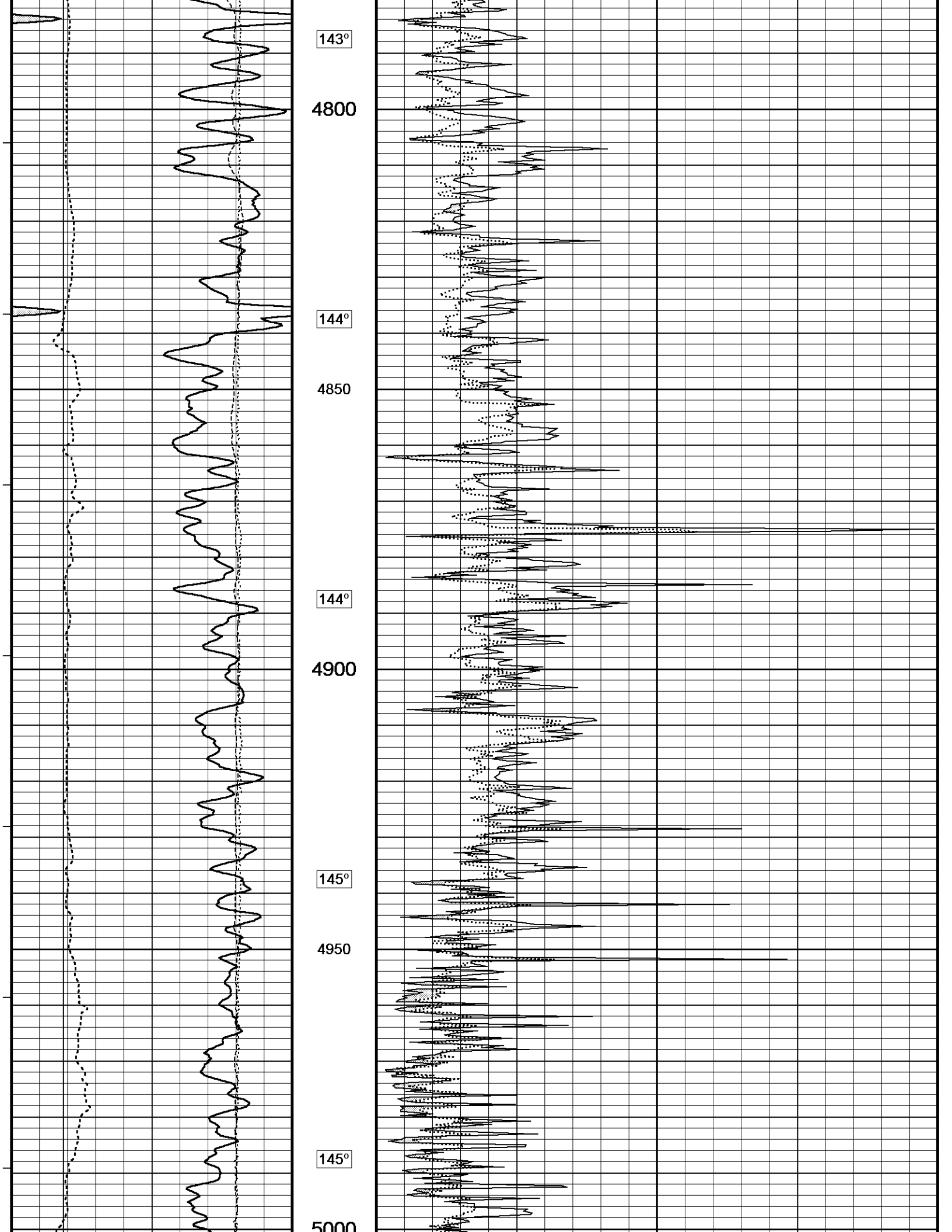

133°
3700
134°
3750
134°
3800
135°
3850
135°
3900
Bit Size
MML Caliper
DST Uphole Tension
Micro-inverse
Micro-normal
Spontaneous Potential
Gamma Ray

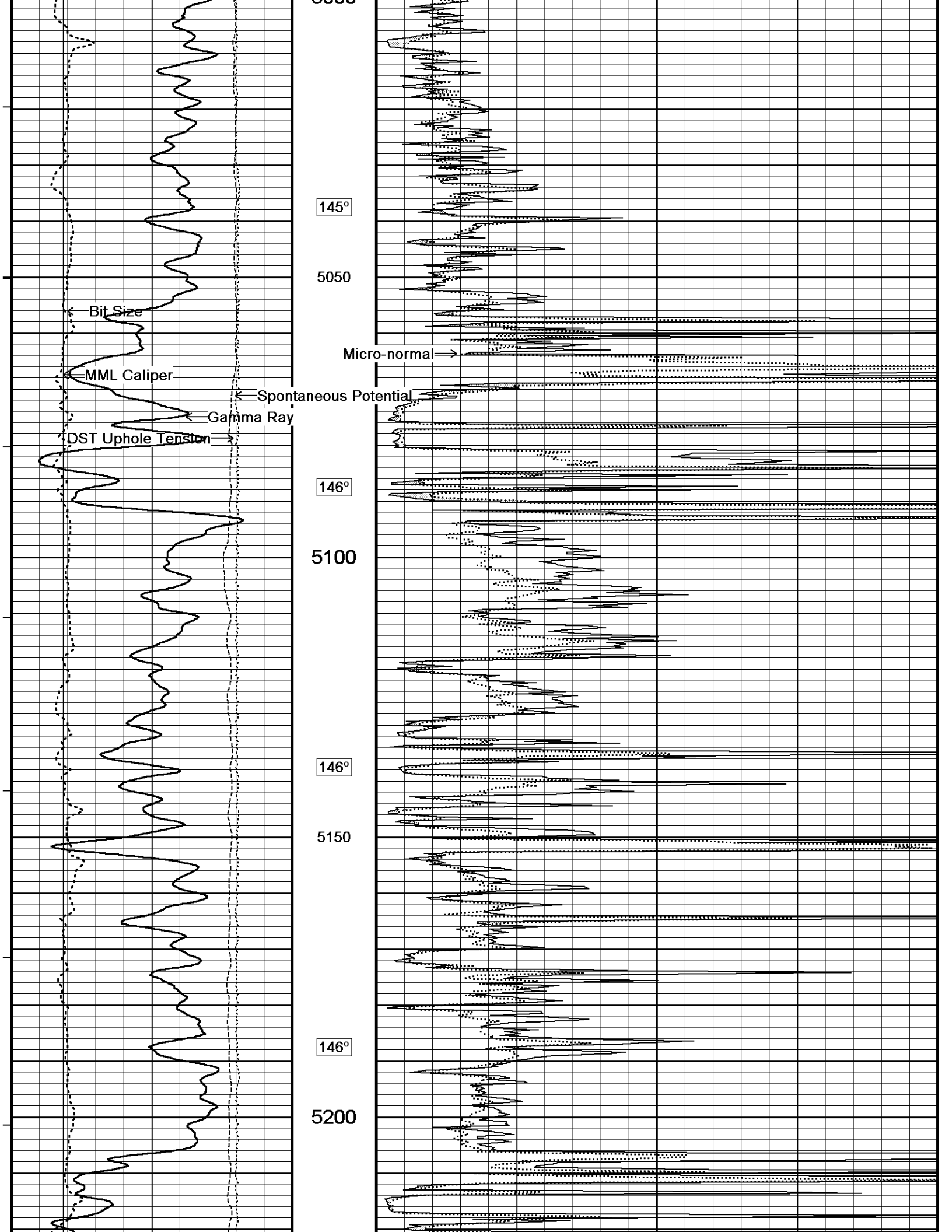

136°
3950
136°
4000
137°
4050
138°
4100

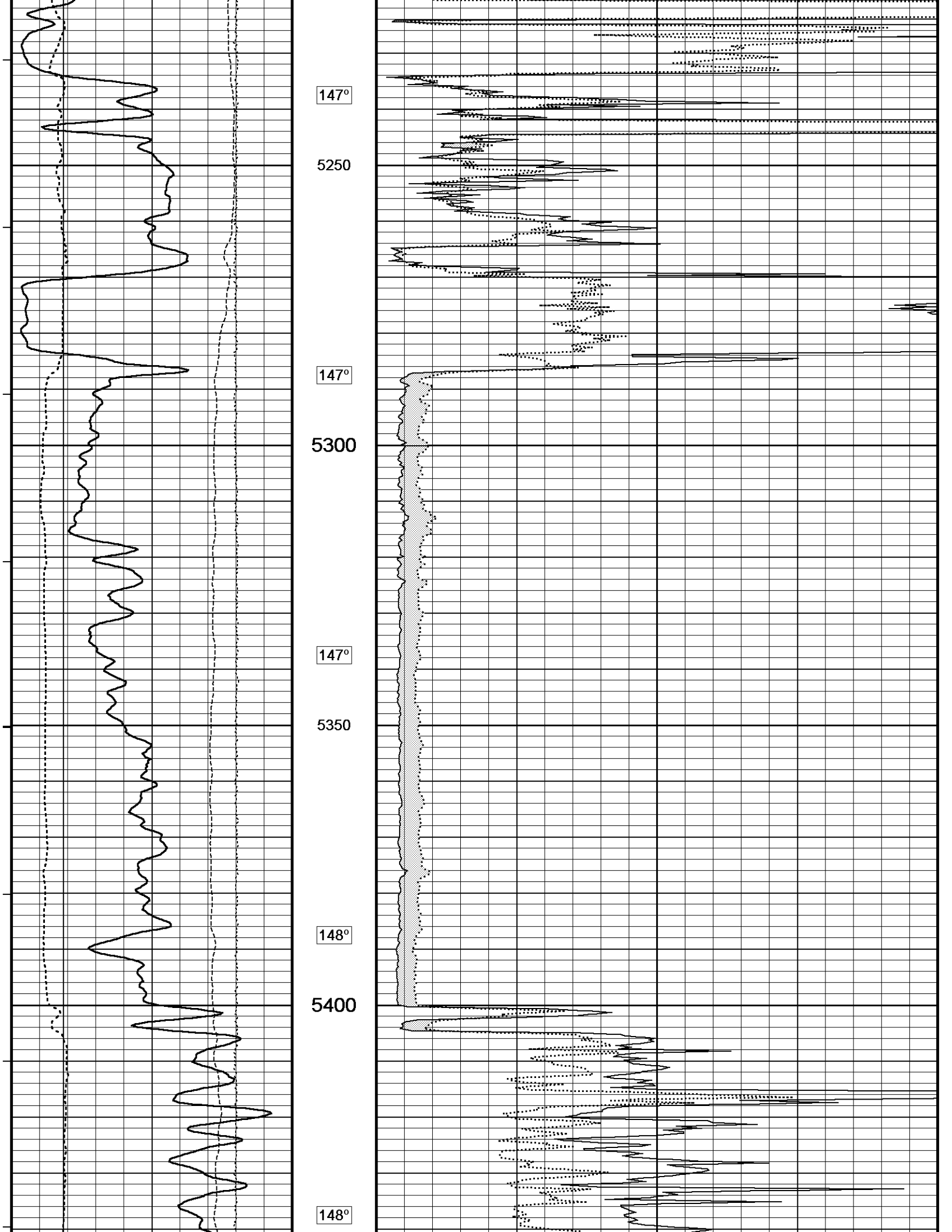

138°
4150
139°
4200
139°
4250
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
139°
DST Uphole Tension
4300
140°

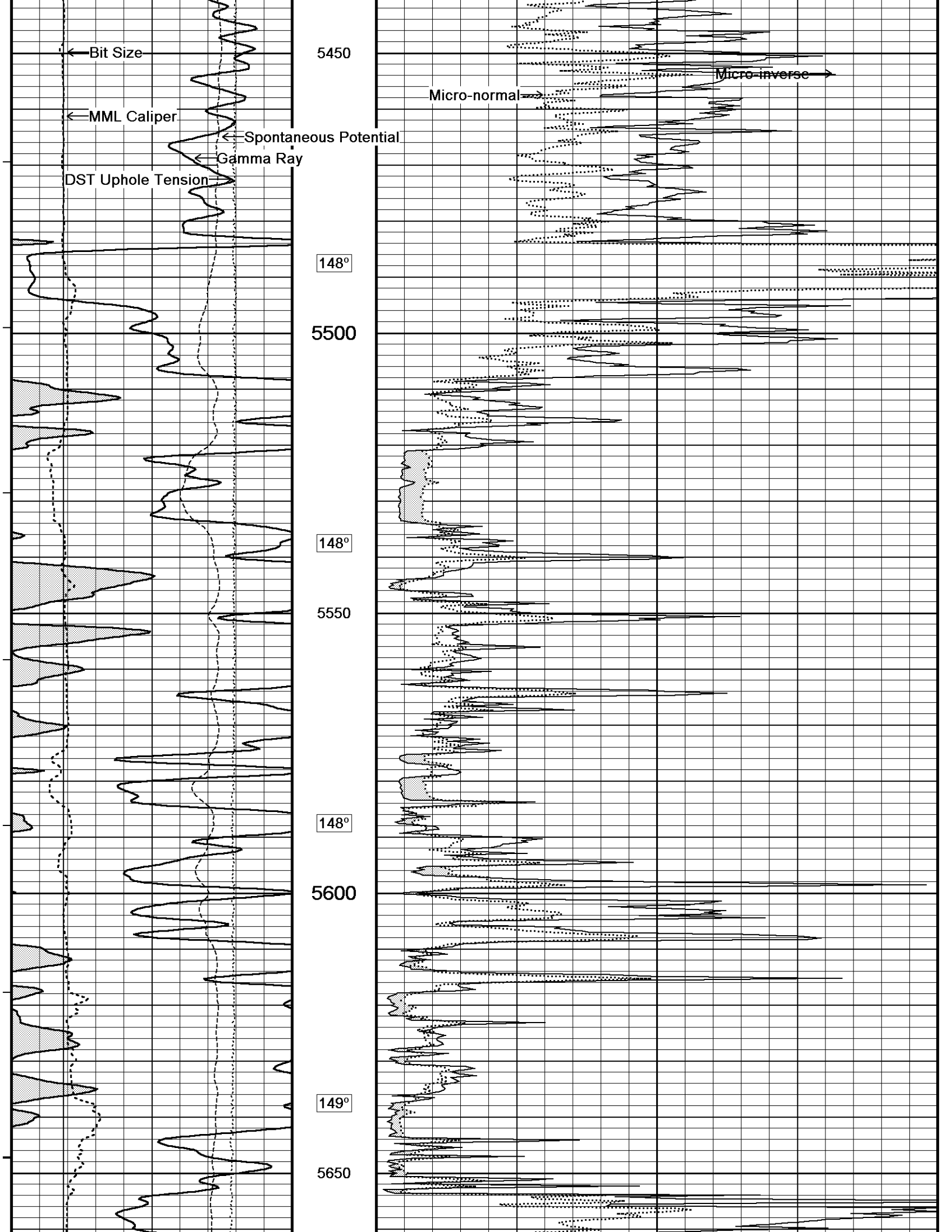

4350
140°
4400
140°
4450
141°
4500
141°
4550

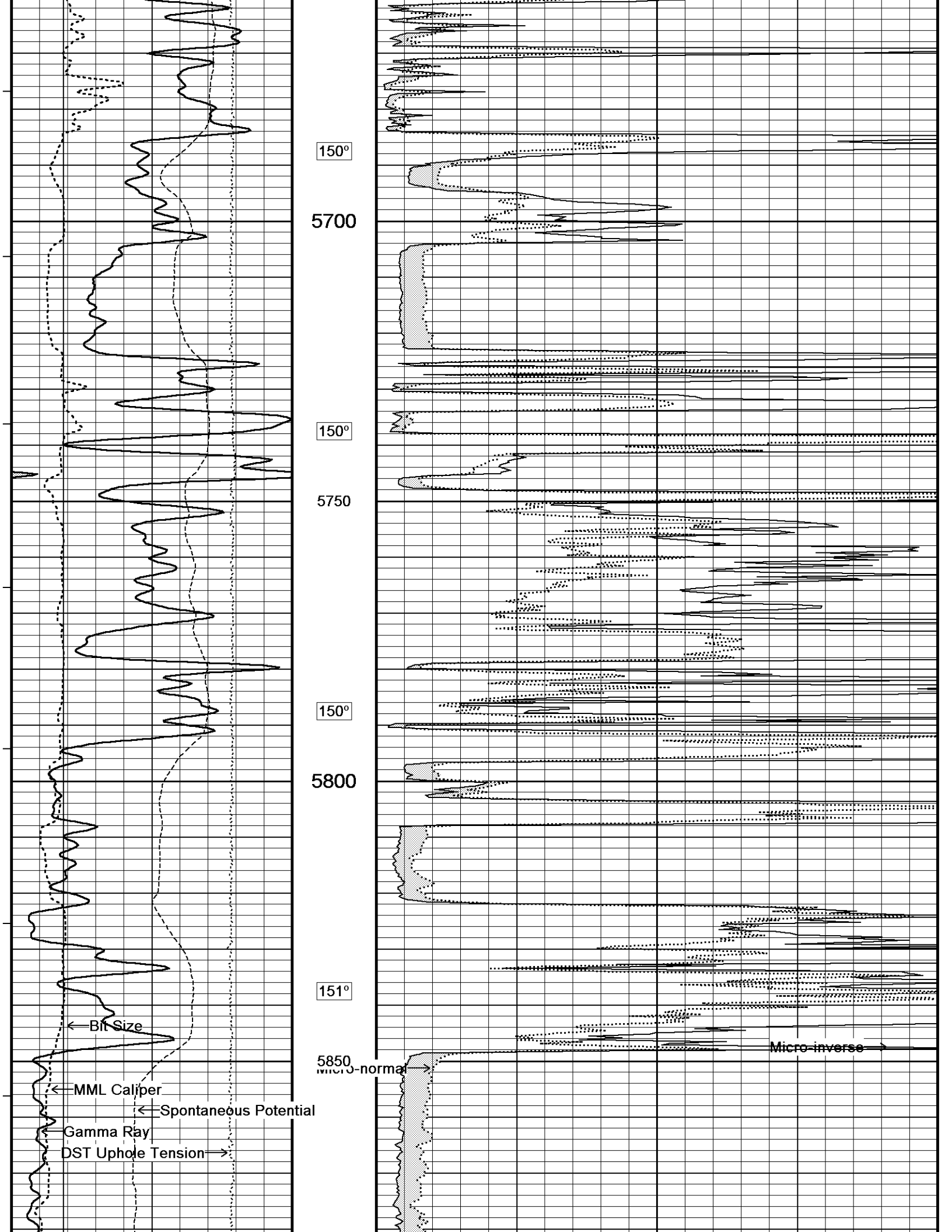

142°
4600
143°
4650
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
143°
4700
143°
4750

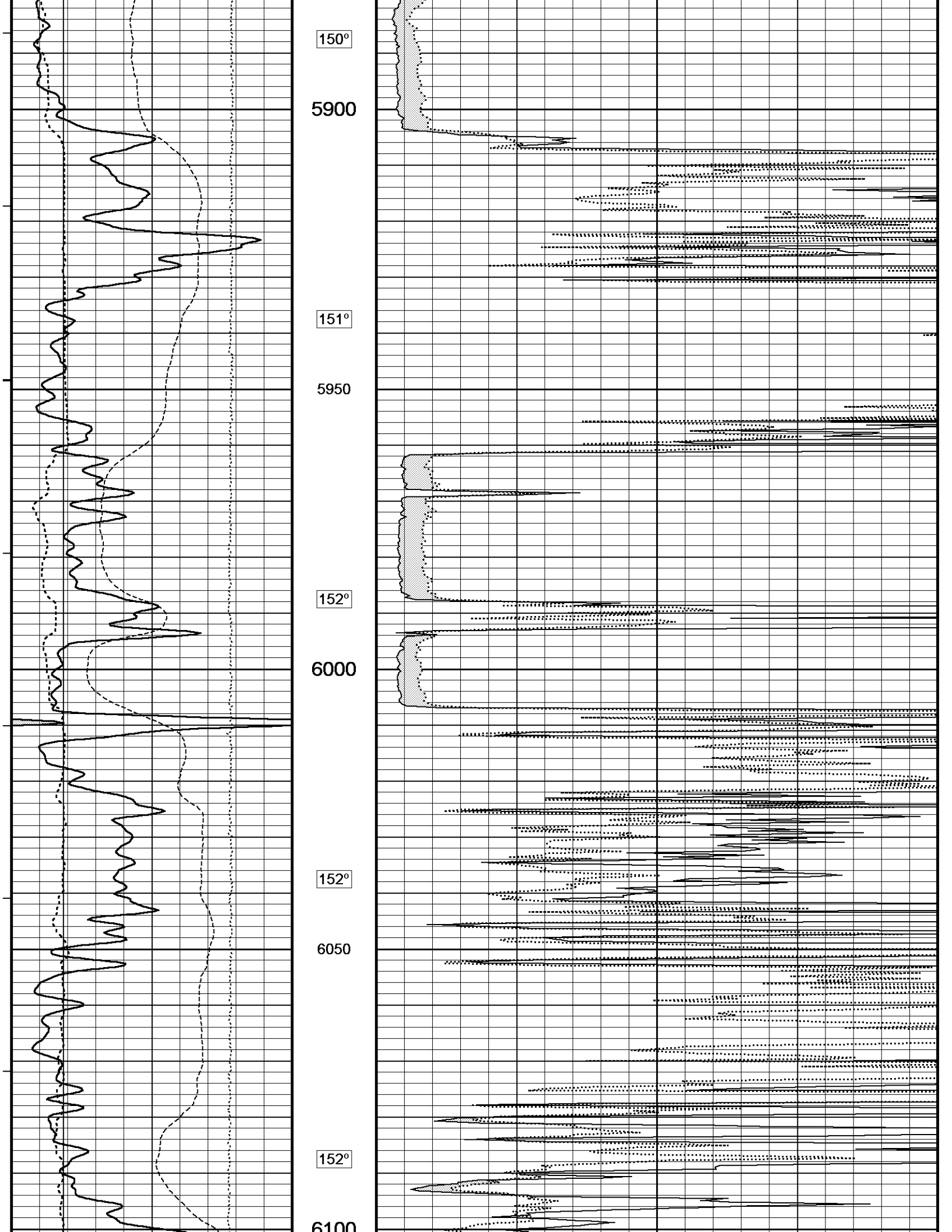

143°
4800
144°
4850
144°
4900
145°
4950
145°
5000

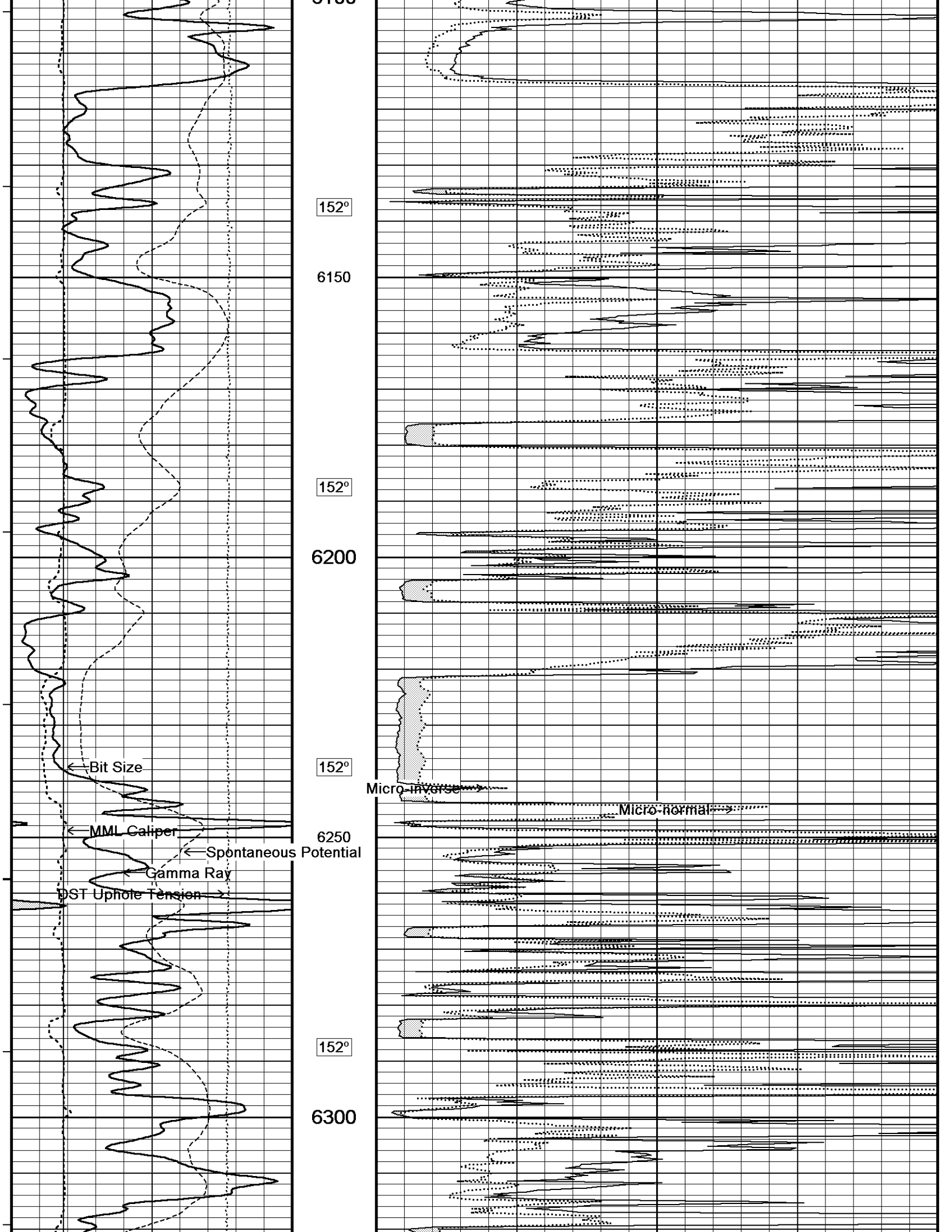

145°
5050
Bit Size
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
146°
5100
146°
5150
146°
5200

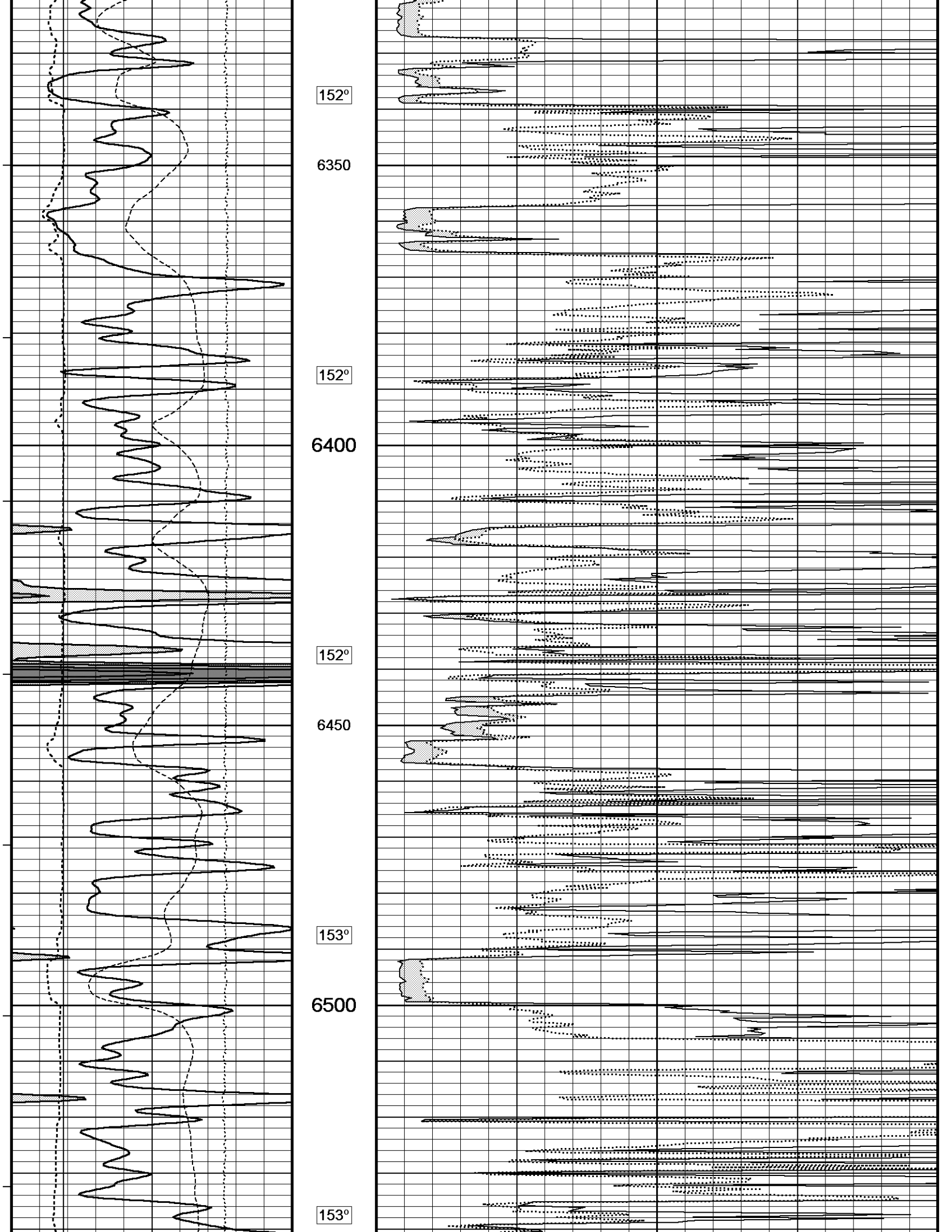

147°
5250
147°
5300
147°
5350
148°
5400
148°

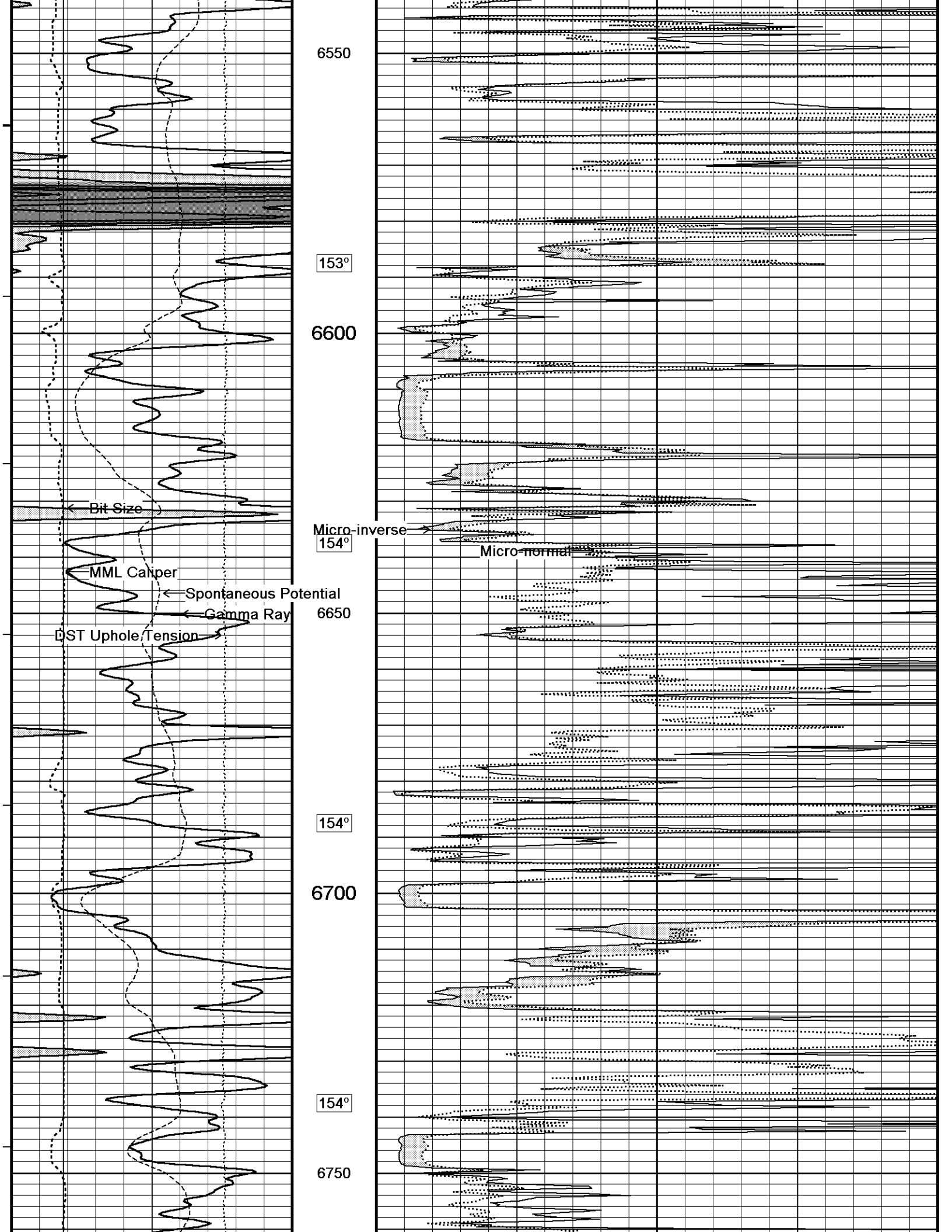

Bit Size
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Micro-normal
Micro-inverse
5450
148°
5500
148°
5550
148°
5600
149°
5650

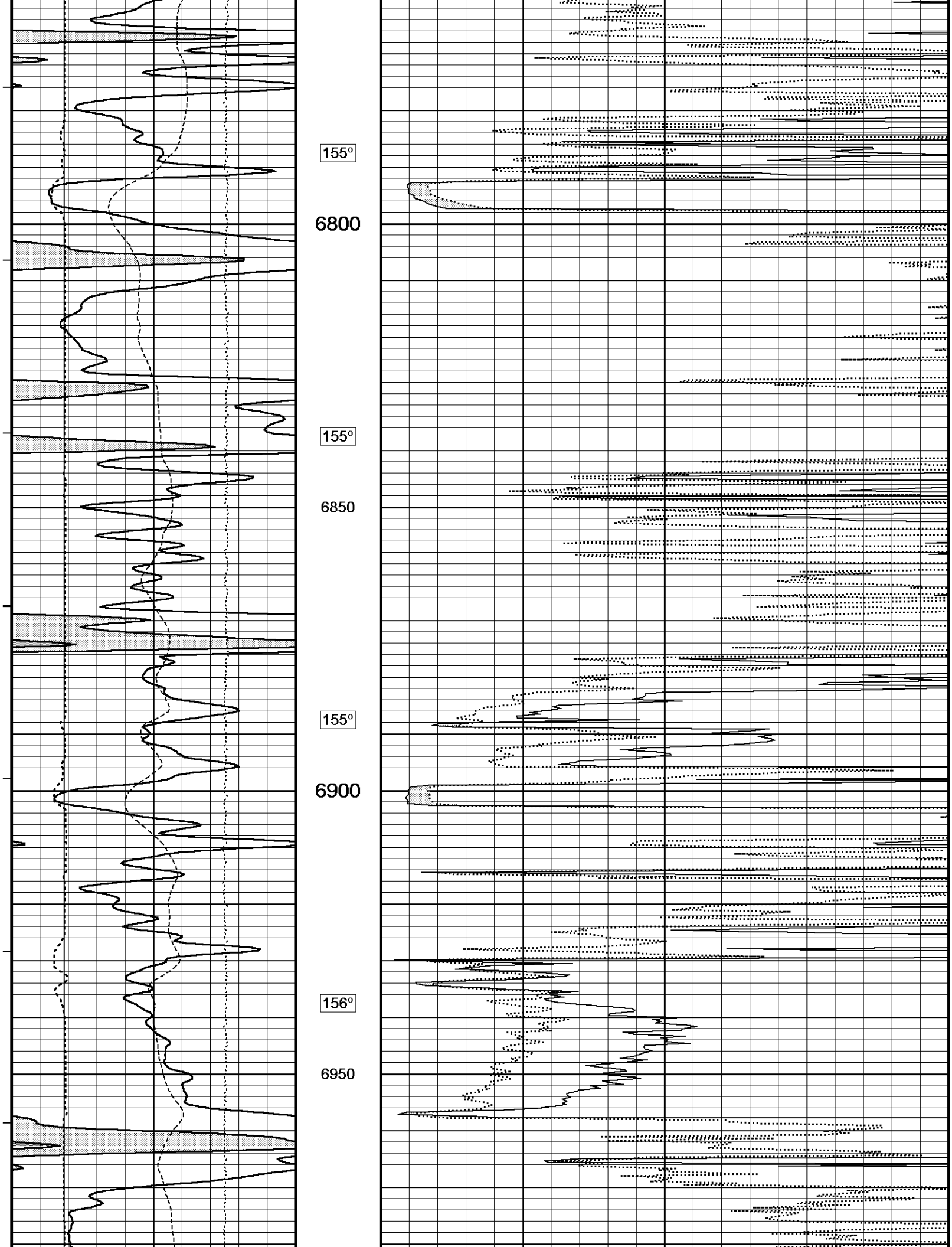

150°
5700
150°
5750
150°
5800
151°
5850
Bit Size
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Micro-normal
Micro-inverse

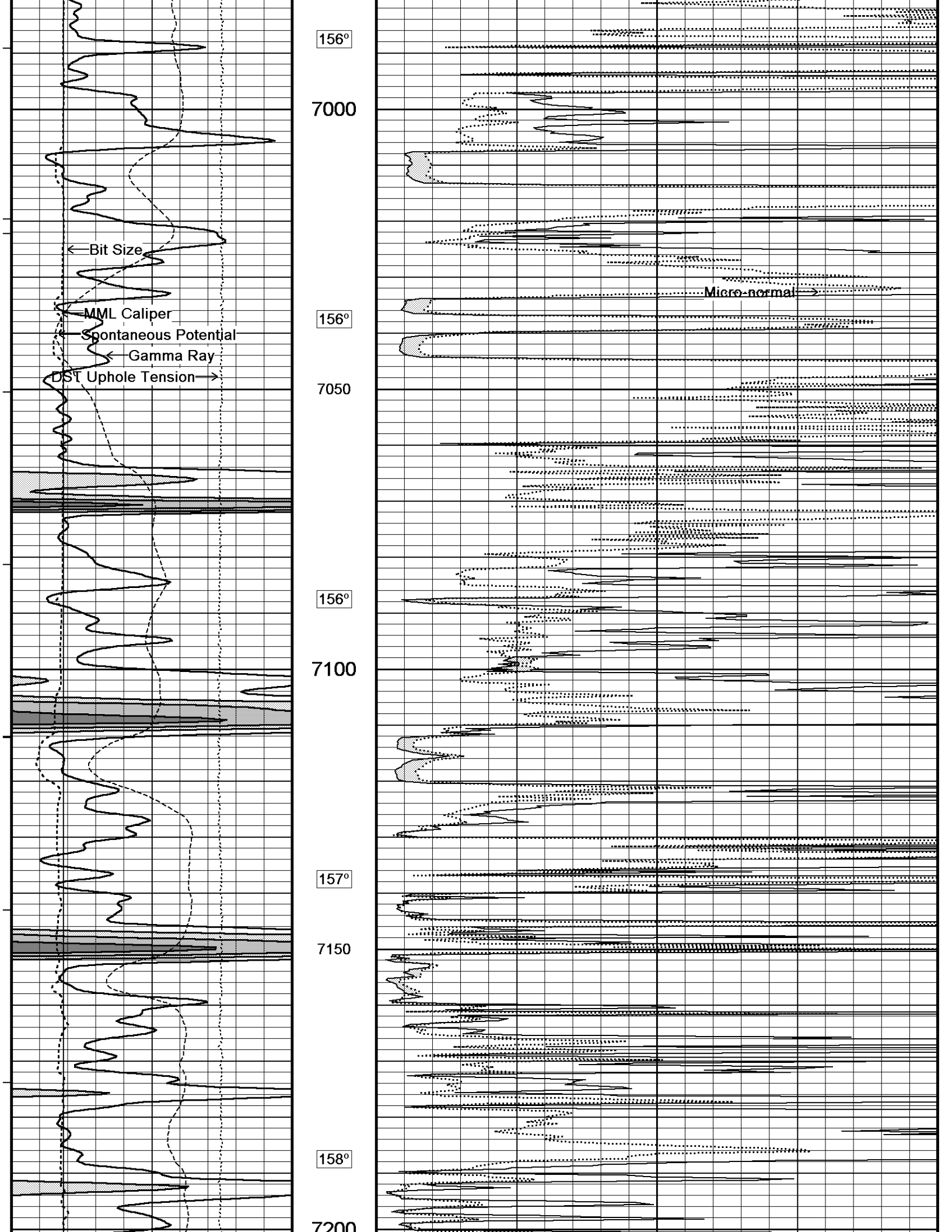

150°
5900
151°
5950
152°
6000
152°
6050
152°
6100

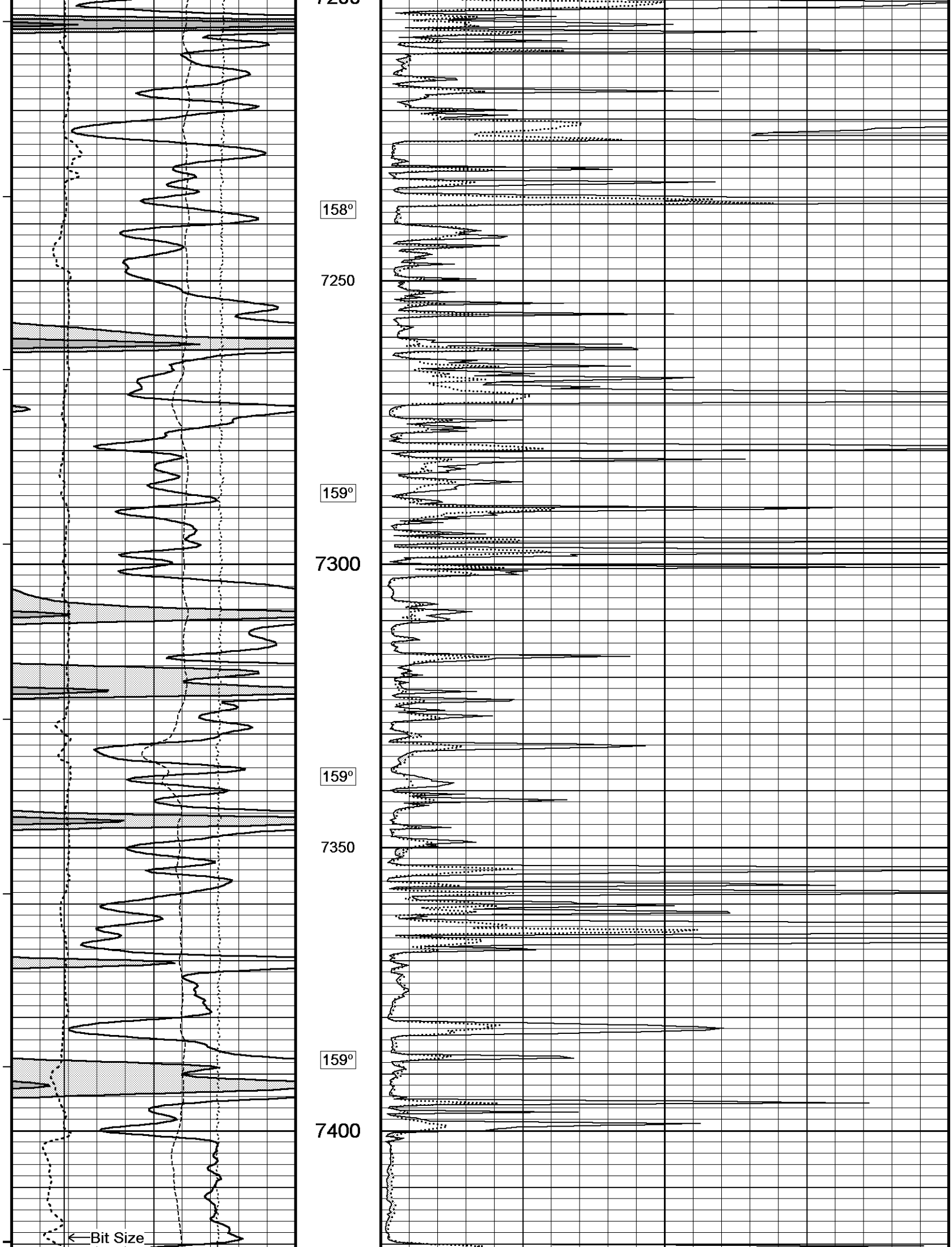

152°
6150
152°
6200
152°
Bit Size
Micro-inverse
Micro-normal
MML Caliper
6250
Spontaneous Potential
Gamma Ray
DST Uphole Tension
152°
6300

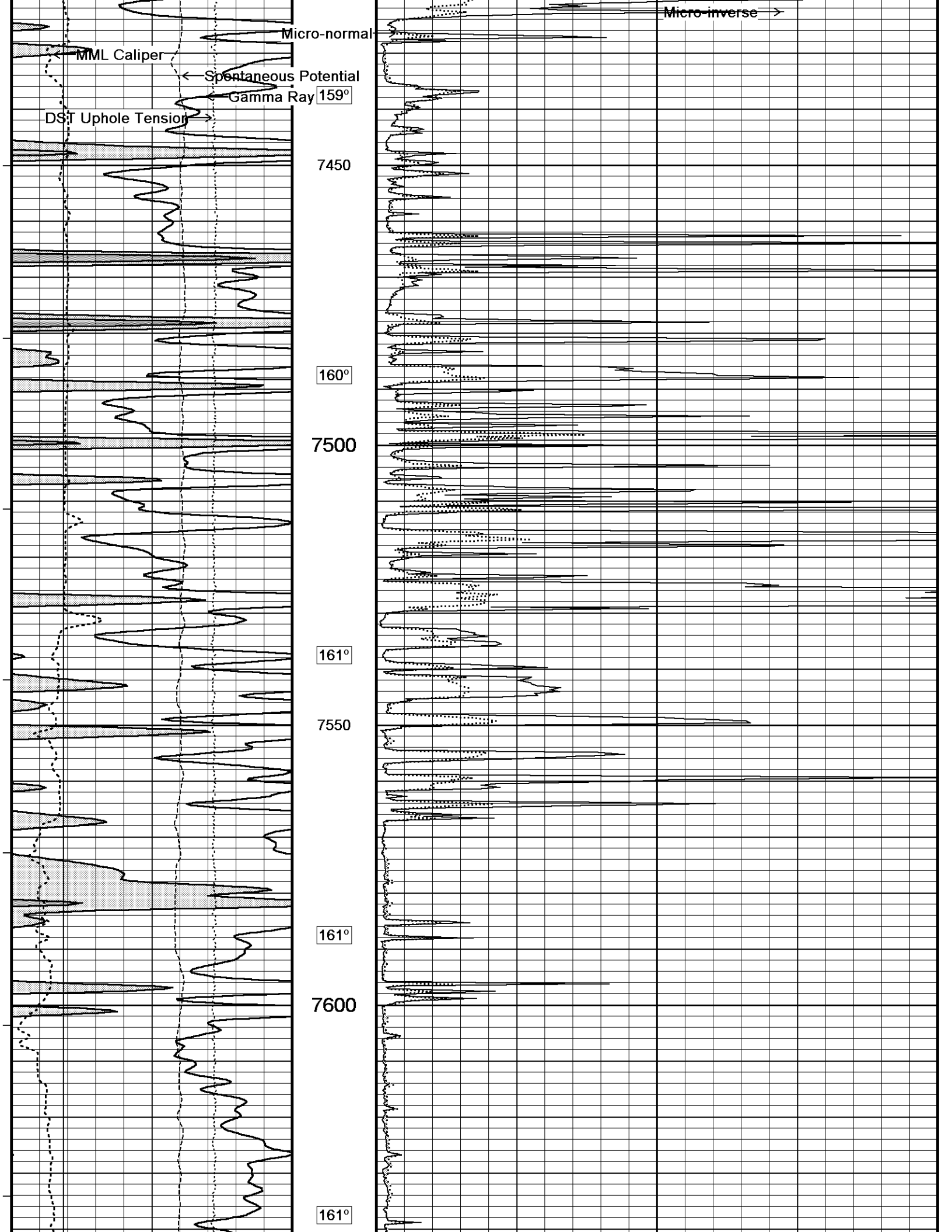

152°
6350
152°
6400
152°
6450
153°
6500
153°

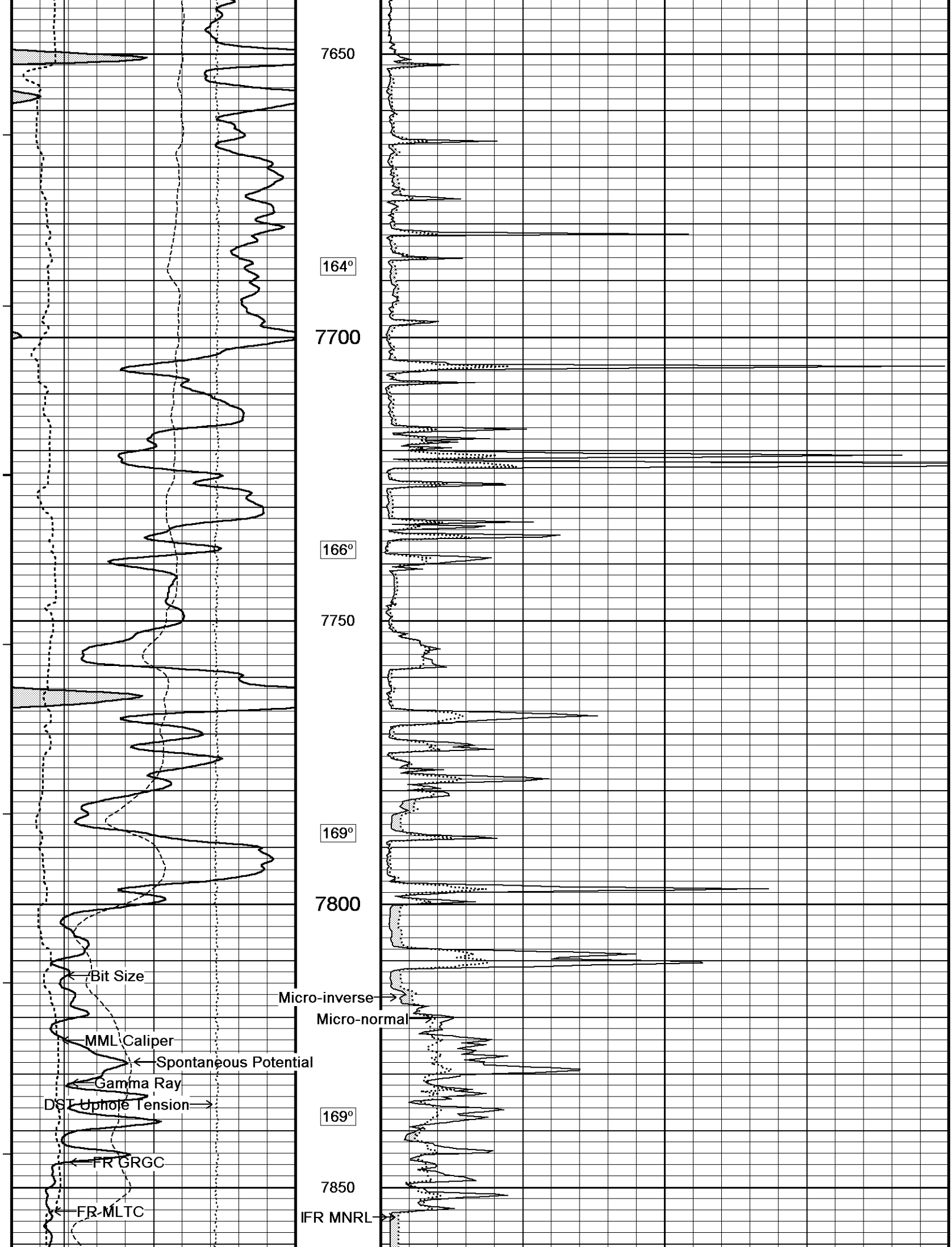

6550
153°
6600
Bit Size
Micro-inverse
154°
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
6650
DST Uphole Tension
154°
6700
154°
6750

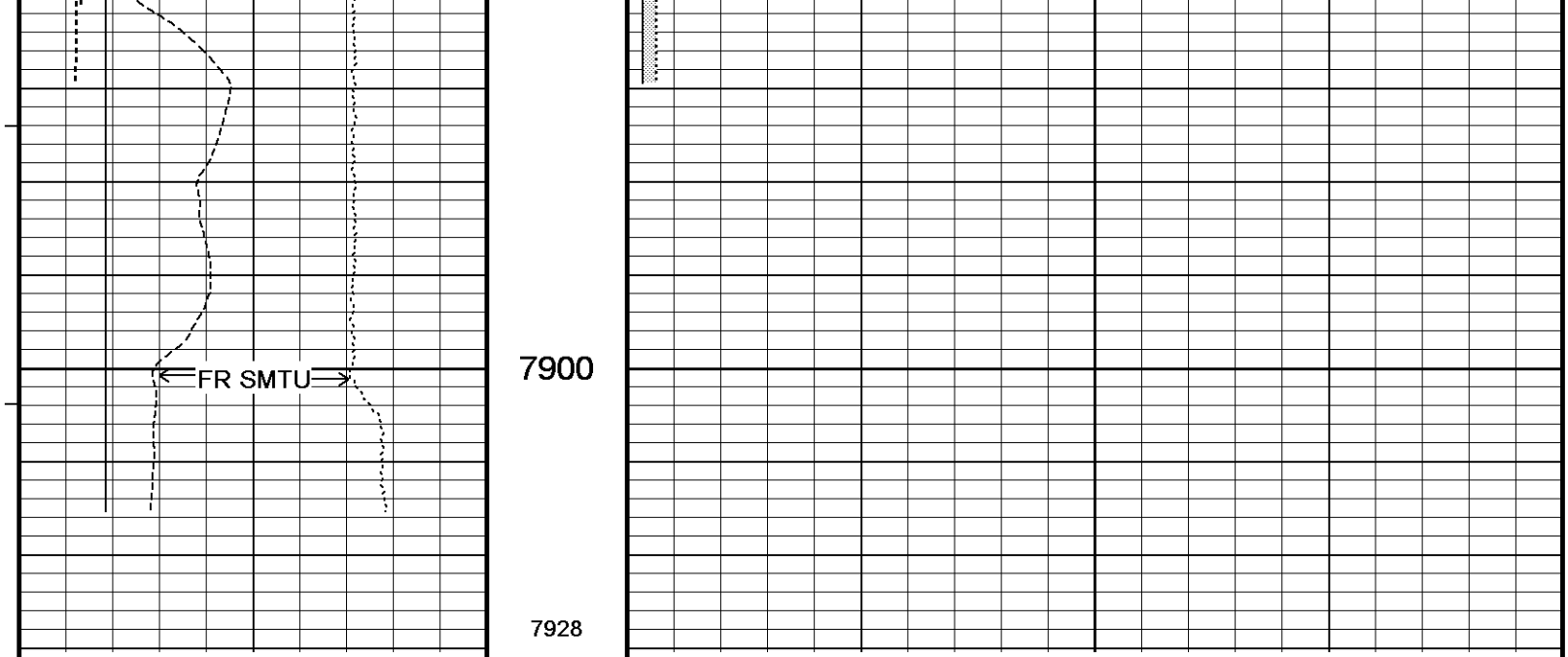

155°
6800
155°
6850
155°
6900
156°
6950


156°
7000
Bit Size
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Micro-normal
156°
7050
156°
7100
157°
7150
158°
7200


158°
7250
159°
7300
159°
7350
159°
7400
Bit Size


Micro-normal
Micro-inverse
MML Caliper
Spontaneous Potential
Gamma Ray
159°
DST Uphole Tension
7450
160°
7500
161°
7550
161°
7600
161°


7650
164°
7700
166°
7750
169°
7800
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
169°
FR GRGC
7850
FR-MLTC
IFR MNRL



7900

7928

Depth in Feet

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
− → | 20 | ← +

MML Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Borehole Temp in deg F

Replay Scale 1:240

Micro-normal
ohm metres
0 10 20 30 40

Micro-inverse
ohm metres
0 10 20 30 40

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 30-NOV-2012 13:34
Filename: C:\Minimus 13.04.8492\Data\...\Grand Mesa Operating Company APC Martin #1-3 Main2.dta
Recorded on 28-NOV-2012 14:50
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 30-NOV-2012 13:34
Filename: C:\Minimus 13.04.8492\Data...\Grand Mesa Operating Company APC Martin #1-3 Repeat.dta
Recorded on 28-NOV-2012 13:47
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
– → | 20 | ← +

MML Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

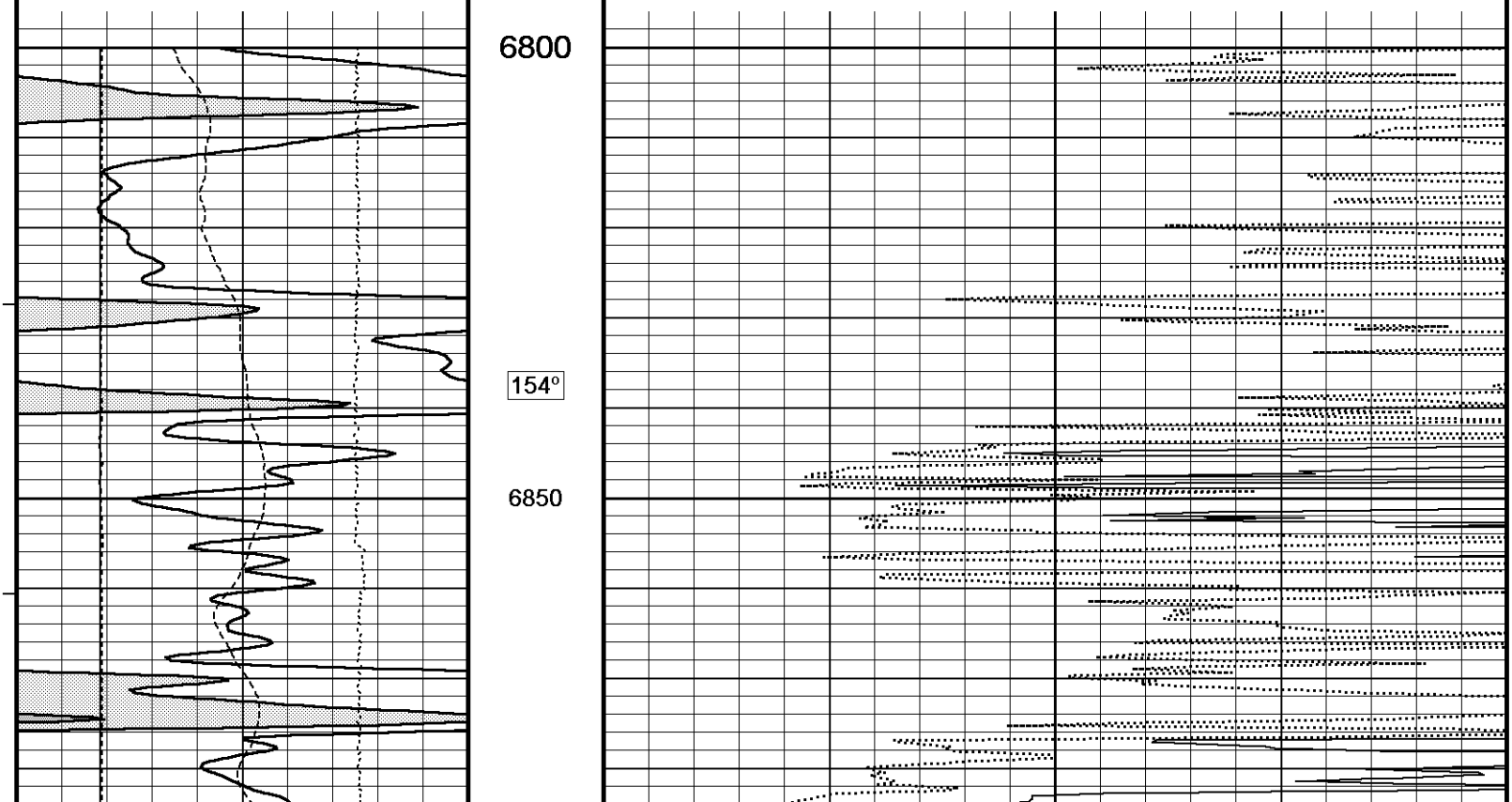
Depth in Feet

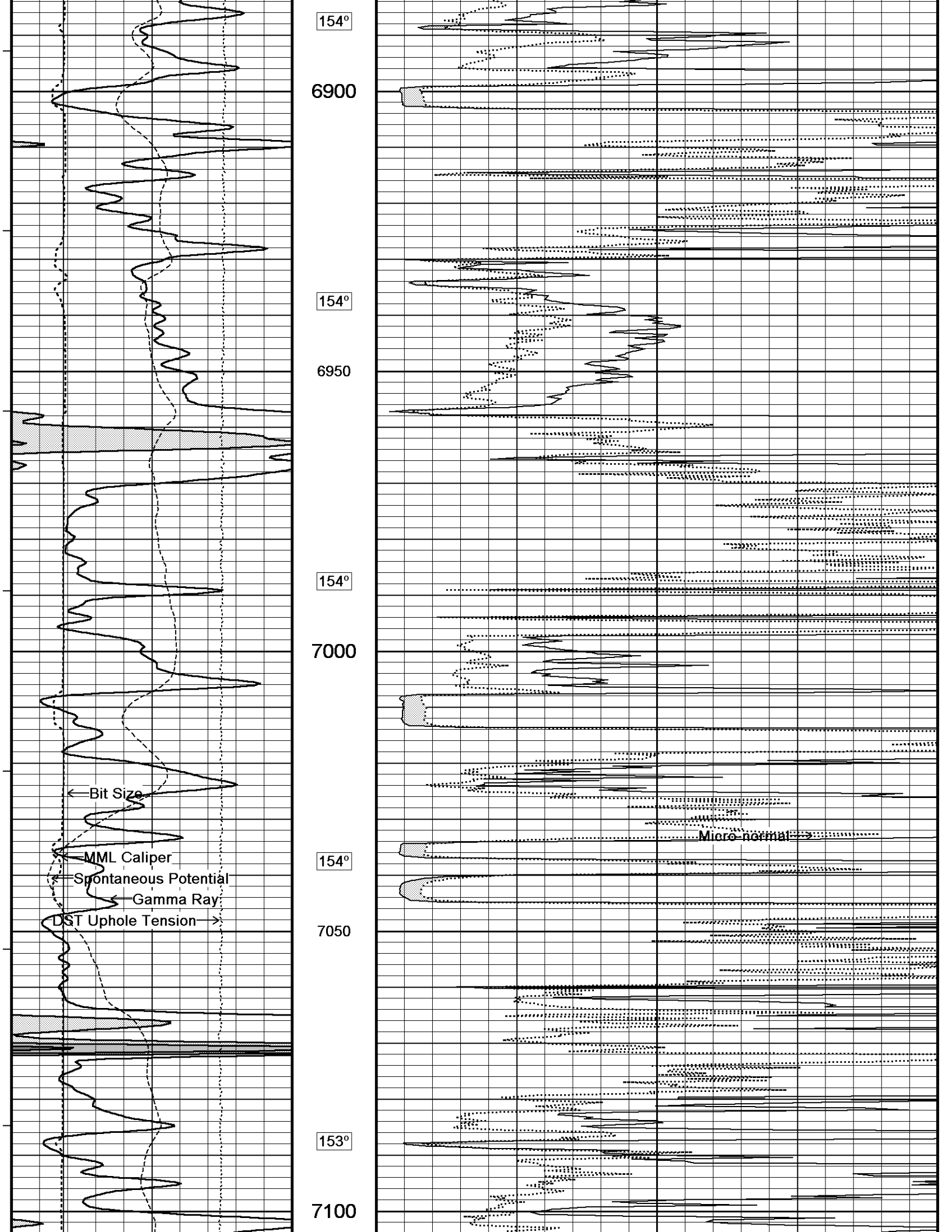
Borehole Temp in deg F

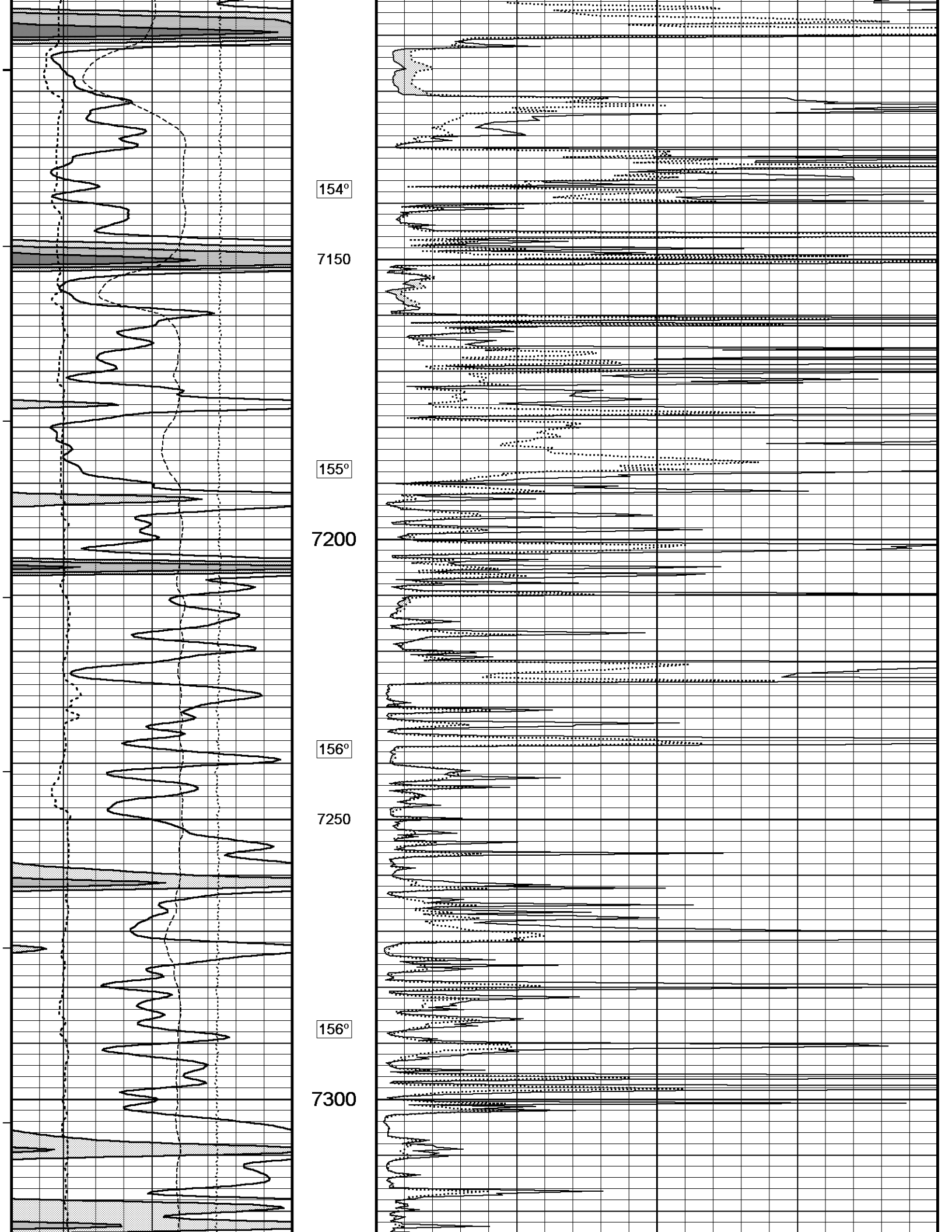
Replay Scale 1:240

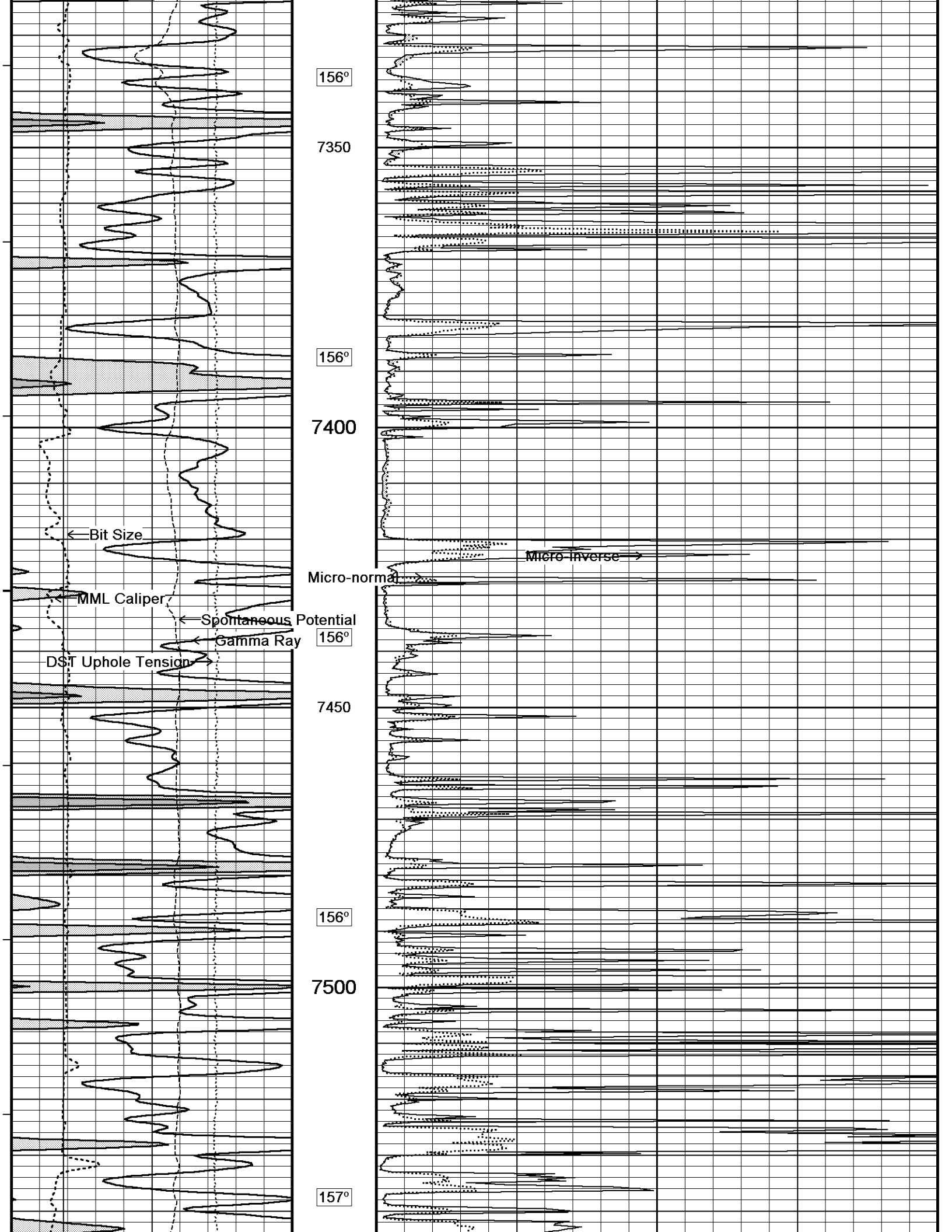
Micro-normal
ohm metres
0 10 20 30 40

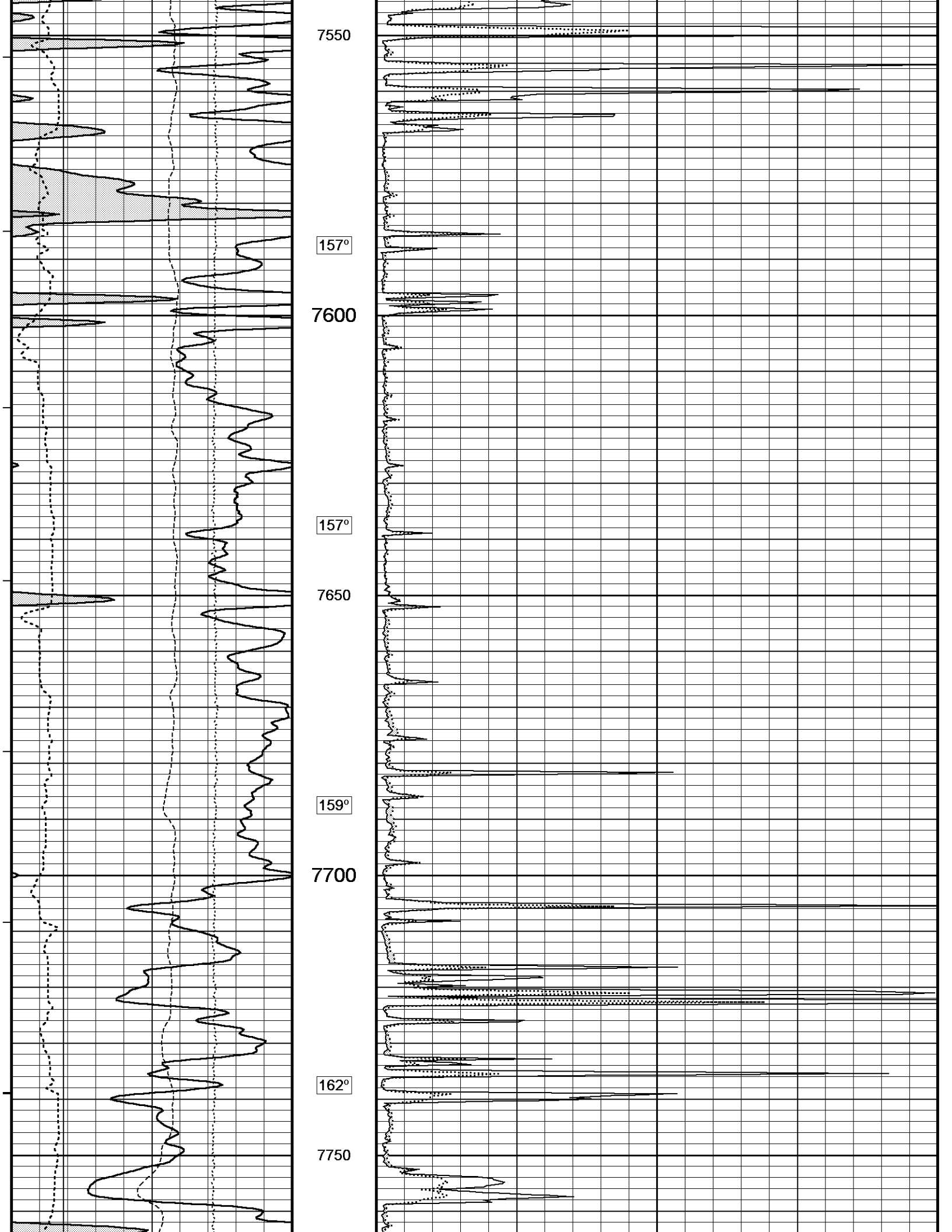
Micro-inverse
ohm metres
0 10 20 30 40

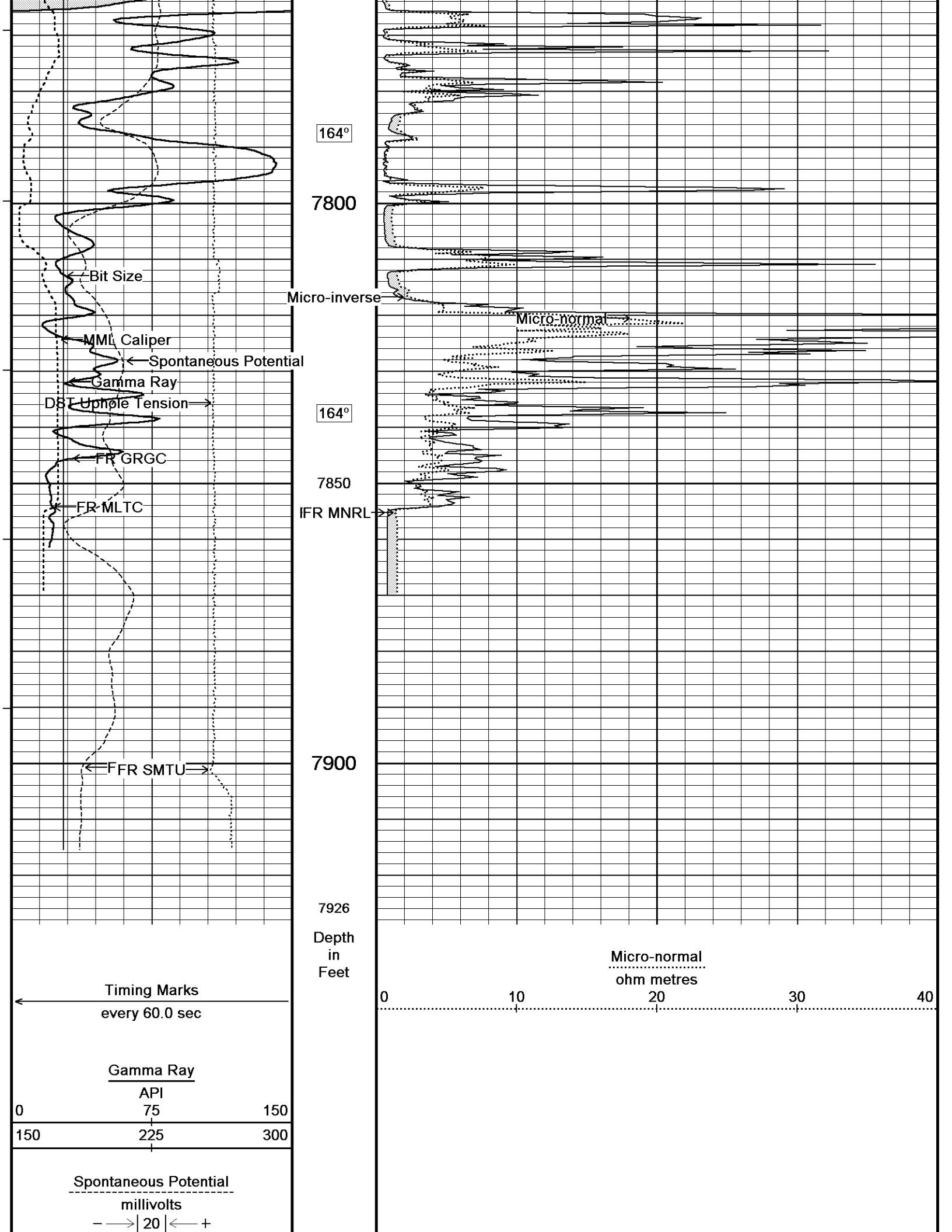


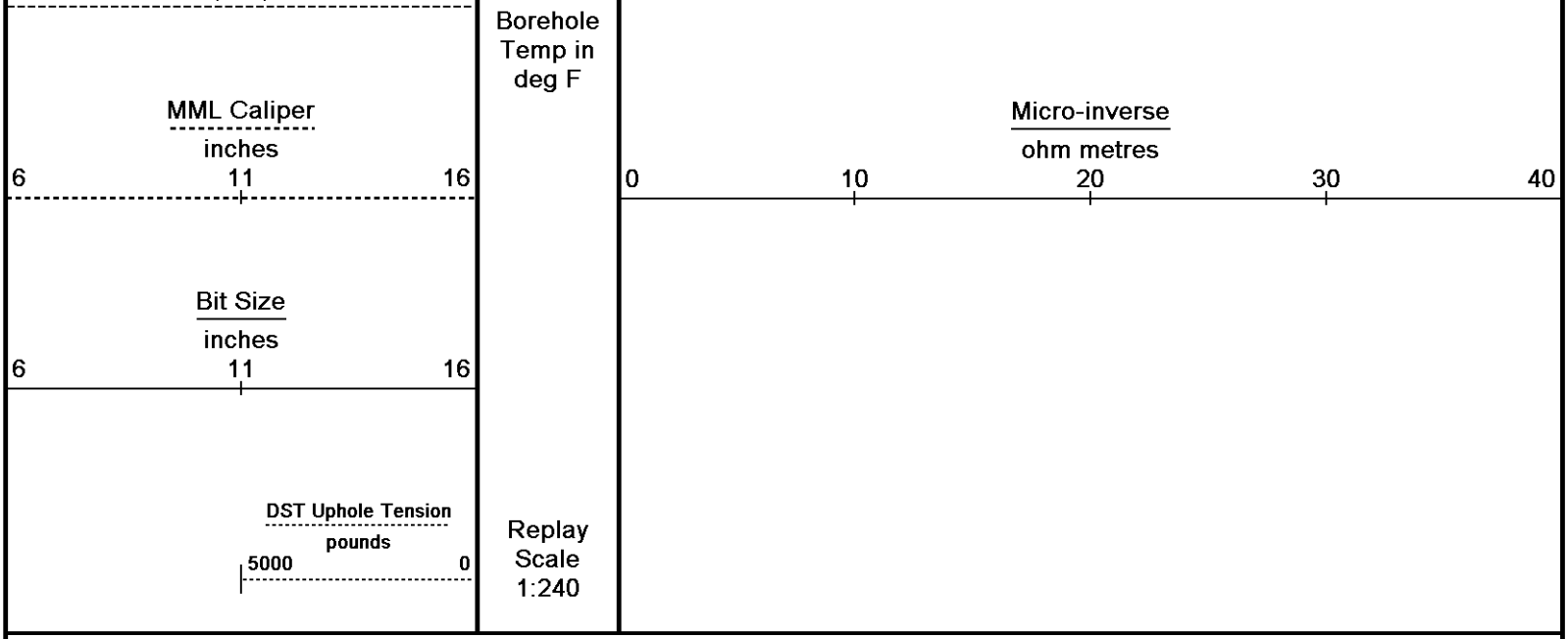

154°
6900
154°
6950
154°
7000
Bit Size
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Micro-normal
154°
7050
153°
7100


154°
7150
155°
7200
156°
7250
156°
7300


156°
7350
156°
7400
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
156°
Gamma Ray
DST Uphole Tension
7450
156°
7500
157°


7550
157°
7600
157°
7650
159°
7700
162°
7750


164°
7800
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
164°
FR GRGC
7850
FR MLTC
IFR MNRL
7900
FFR SMTU
7926
Depth
in
Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Spontaneous Potential
millivolts
− → | 20 | ← +
Micro-normal
ohm metres
0
10
20
30
40



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 30-NOV-2012 13:34

Filename: C:\Minimus 13.04.8492\Data...\Grand Mesa Operating Company APC Martin #1-3 Repeat.dta — Recorded on 28-NOV-2012 13:47

System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 13.04.8492\Data\Grand Mesa Operating Company APC ...\Grand Mesa Operating Company APC Martin #1-3 Main2.dta

General Constants All 000

Last Edited on 28-NOV-2012,19:26

General Parameters		
Mud Resistivity	1.220	ohm-metres
Mud Resistivity Temperature	96.000	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	Base Density Porosity	
Resistivity used	Array Ind. Four Res Rt	
RWA Constant A	1.000	
RWA Constant M	2.000	

High Resolution Temperature Calibration MCG-D.K 442

Field Calibration on 08-NOV-2012,09:48

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-D.K 442

Last Edited on 08-NOV-2012,09:48

Pre-filter Length	11

Gamma Calibration MCG-D.K 442

Field Calibration on 27-NOV-2012 16:06

	Measured	Calibrated (API)
Background	70	47
Calibrator (Gross)	1147	772
Calibrator (Net)	1077	725

Gamma Constants MCG-D.K 442

Last Edited on 28-NOV-2012,11:55

Gamma Calibrator Number	GRC38	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 08-NOV-2012 09:16
Field Check on 27-NOV-2012 15:48

Base Calibration

Channel	Measured Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1	Calibrated (ohm-m) Resistor 2
Micro Normal	12.2	59.9	5.0	25.0
Micro Inverse	15.6	78.0	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	63.3	63.3
Micro Inverse	48.5	48.5

Micro Normal and Micro Inverse Constants MML-A 16

Last Edited on 27-NOV-2012,22:19

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	1.0000	
Micro Inverse K Factor	1.0000	
Standoff Offset	N/A	inches

Caliper Calibration MML-A 16

Base Calibration on 08-NOV-2012 09:06
Field Calibration on 27-NOV-2012 15:46

Base Calibration

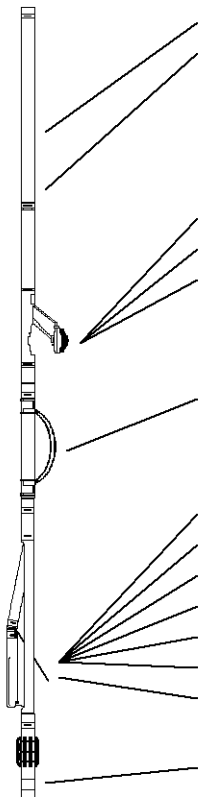
Reading No	Measured	Calibrator Size (in)
1	13968	5.98
2	17082	7.97
3	20284	9.86
4	24165	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.07	5.98

DOWNHOLE EQUIPMENT

C:\Minimus 13.04.8492\Data\Grand Mesa Operating Company APC ...\Grand Mesa Operating Company APC Martin #1-3 Main2.dta



Compact Comms Gamma
MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in
- 55.39 ft GRGC - Gamma Ray
- 52.48 ft CGXT - MCG External Temperature

Compact Micro-log
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in
- 45.76 ft MINV - Micro-inverse
- 45.76 ft MNRL - Micro-normal
- 46.76 ft MLTC - MML Caliper

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in
- 40.97 ft NPRL - Limestone Neutron Por.

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in
- 33.73 ft AVOL - Annular Volume
- 33.73 ft HVOL - Hole Volume
- 33.73 ft CLDC - Density Caliper
- 31.80 ft DPRL - Limestone Density Por.
- 31.80 ft DEN - Compensated Density
- 31.80 ft DCOR - Density Correction
- 31.74 ft PDPE - PE

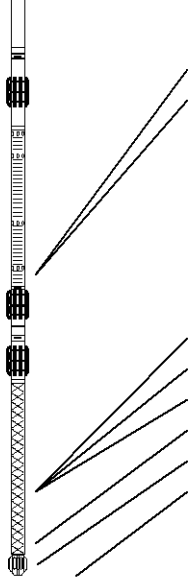
Compact Focussed Electric
- 26.24 ft FEFE - Shallow FE

MI E-B.J 555 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-A.A 126 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 60.68 ft Weight: 456.4 lb



12.96 ft	DT35 - 3-5' Compensated Sonic
12.96 ft	SPRL - Wyllie Lime. Sonic Por.

3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	RTAO - Array Ind. One Res Rt
3.34 ft	R60O - Array Ind. One Res 60
0.23 ft	SPCG - Spontaneous Potential
Tool Zero	(0.13ft from bottom)
-0.13 ft	SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING COMPANY
WELL	APC MARTIN #1-3
FIELD	WILDCAT
PROVINCE/COUNTY	LINCOLN
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	5250.00	feet	First Reading	7855.00	feet
Elevation Drill Floor	5248.00	feet	Depth Driller	7900.00	feet
Elevation Ground Level	5237.00	feet	Depth Logger	7901.00	feet

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