COMPACT PHOTO DENSITY COMPENSATED NEUTRON MICRORESISTIVITY LOG

Weatherford®

COMPANY	GRAND MESA OPERATING COMPANY
WELL	K-M #1-2
FIELD	WILDCAT
PROVINCE/COUNTY	WASHINGTON
COUNTRY/STATE	UNITED STATES / COLORADO
LOCATION	2384' FNL & 2540' FWL

SEC	TWP	RGE	Other Services
2	2S	52W	MAI/MFE
API Number 05-121-11033			MML
Permit Number			

Permanent Datum G.L., Elevation 4672 feet
Log Measured From KB
Drilling Measured From K.B. @ 10 FEET

Elevations:	feet
KB	4682.00
DF	4680.00
GL	4672.00

Date	07-OCT-2013			02-NOV-2013		
Run Number	ONE			TWO		
Service Order	3541093			3541093		
Depth Driller	4485.00	feet		7720.00	feet	
Depth Logger	4482.00	feet		7718.00	feet	
First Reading	4462.00	feet		7686.00	feet	
Last Reading	3480.00	feet		3400.00	feet	
Casing Driller	396.00	feet		396.00	feet	
Casing Logger	396.00	feet		396.00	feet	
Bit Size	7.880	inches		7.880	inches	
Hole Fluid Type	CHEMICAL			CHEMICAL		
Density / Viscosity	9.30	lb/USg	50.00 CP	9.30	lb/USg	67.00 CP
PH / Fluid Loss	8.50		6.40 ml/30Min	9.00		10.80 ml/30Min
Sample Source	MUDPIT			MUDPIT		
Rm @ Measured Temp	2.34 @ 75.0	ohm-m		2.34 @ 75.0	ohm-m	
Rmf @ Measured Temp	1.87 @ 75.0	ohm-m		1.87 @ 75.0	ohm-m	
Rmc @ Measured Temp	2.81 @ 75.0	ohm-m		2.81 @ 75.0	ohm-m	
Source Rmf / Rmc	CALC		CALC	CALC		CALC
Rm @ BHT	1.34 @131.0	ohm-m		0.93 @189.0	ohm-m	
Time Since Circulation	4 HOURS			5 HOURS		
Max Recorded Temp	131.00	deg F		189.00	deg F	
Equipment / Base	13096		LIB	13244		
Recorded By	W. STAMBAUGH			W. STAMBAUGH		
Witnessed By	BOB SCHREIBER			BOB SCHREIBER		
JOB#	LB13-282			LB13-313		

Last Edited: 02-NOV-2013 19:47

BOREHOLE RECORD

Bit Size inches	Depth From feet	Depth To feet
7.880	396.00	7270.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	396.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 13.05.9583.
-RUN #1 07-OCT-2013
- 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.
-RUN #2 02-NOV-2013
-4 DEGREE DEVIATION AT 4700' ANOTHER 4 DEGREE DEVIATION AT 6500' TO 6900' FEET.
-ORIGNAL TD WAS 7433' 530' OF COLLARS SET IN HOLE,
-WHIPSTOCK SET IN THE 6500' TO 6900' INTERVAL AND HOLE KICKED OFF AROUND 6600'.
- MCG, MFE, MAI RUN IN COMBINATION ON FIRST RUN OF RUN #2.
-MCG, MML, MDN, MPD, MSS RUN IN COMBINATION ON SECOND RUN OF RUN #2.
NO REPEAT SECTION ON FINAL ATTEMPT DUE TO CUSTOMER CONCERNS ABOUT HOLE CONDITONS,
AFTER BRIDGING OFF AT 5650' ON THE WAY IN THE HOLE.
HARDWARE: DUAL BOWSPRING USED ON MDN.
0.5 INCH STANDOFF USED ON MSS.

- 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 AT 396 FEET: 1460 CU. FT.

- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO SURFACE CASING AT 396 FEET: 790 CU. FT.

DRILLING RIG: MURFIN DRILLING #14

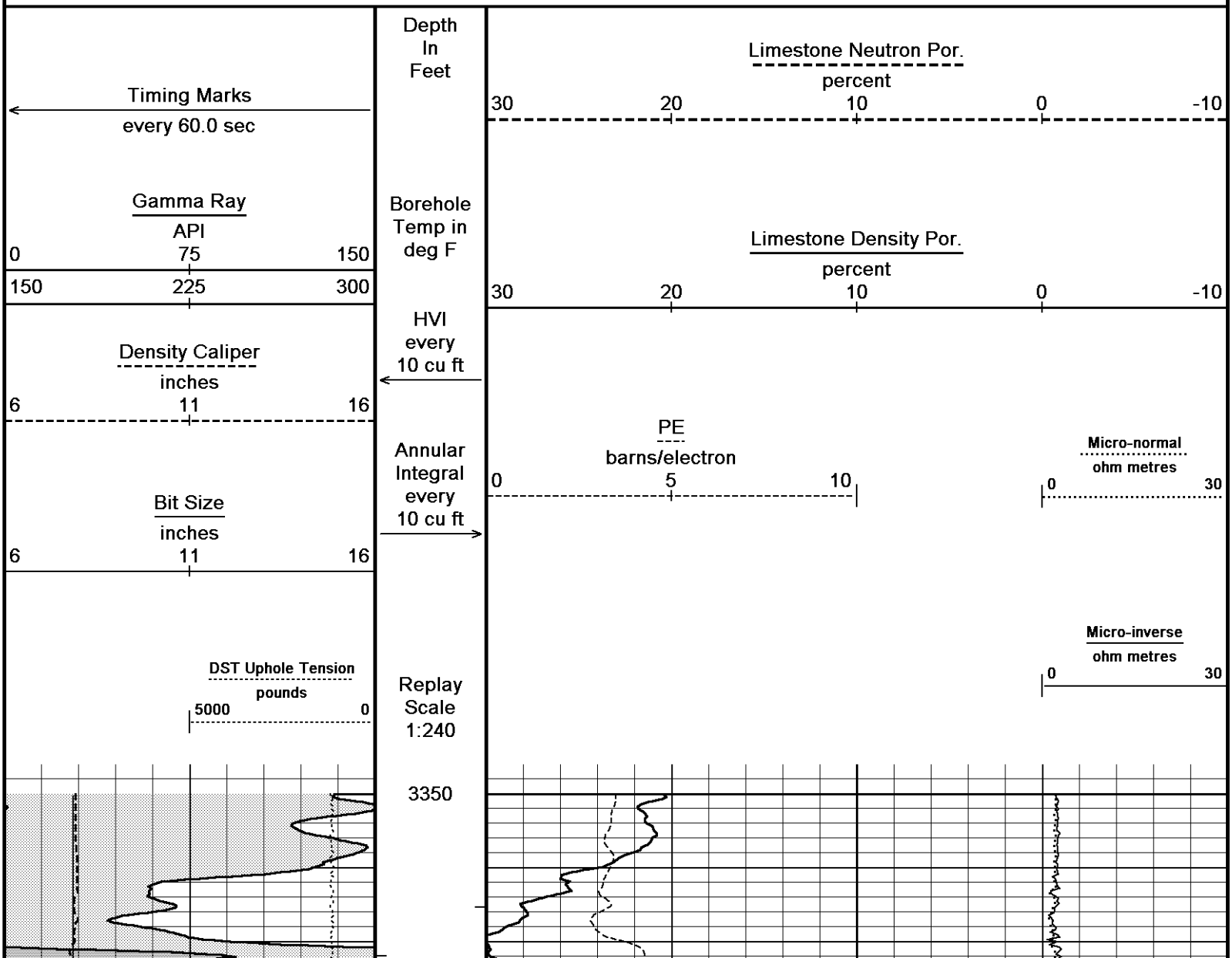
- (FIRST AND SECOND RUN) ENGINEER: W. STAMBAUGH

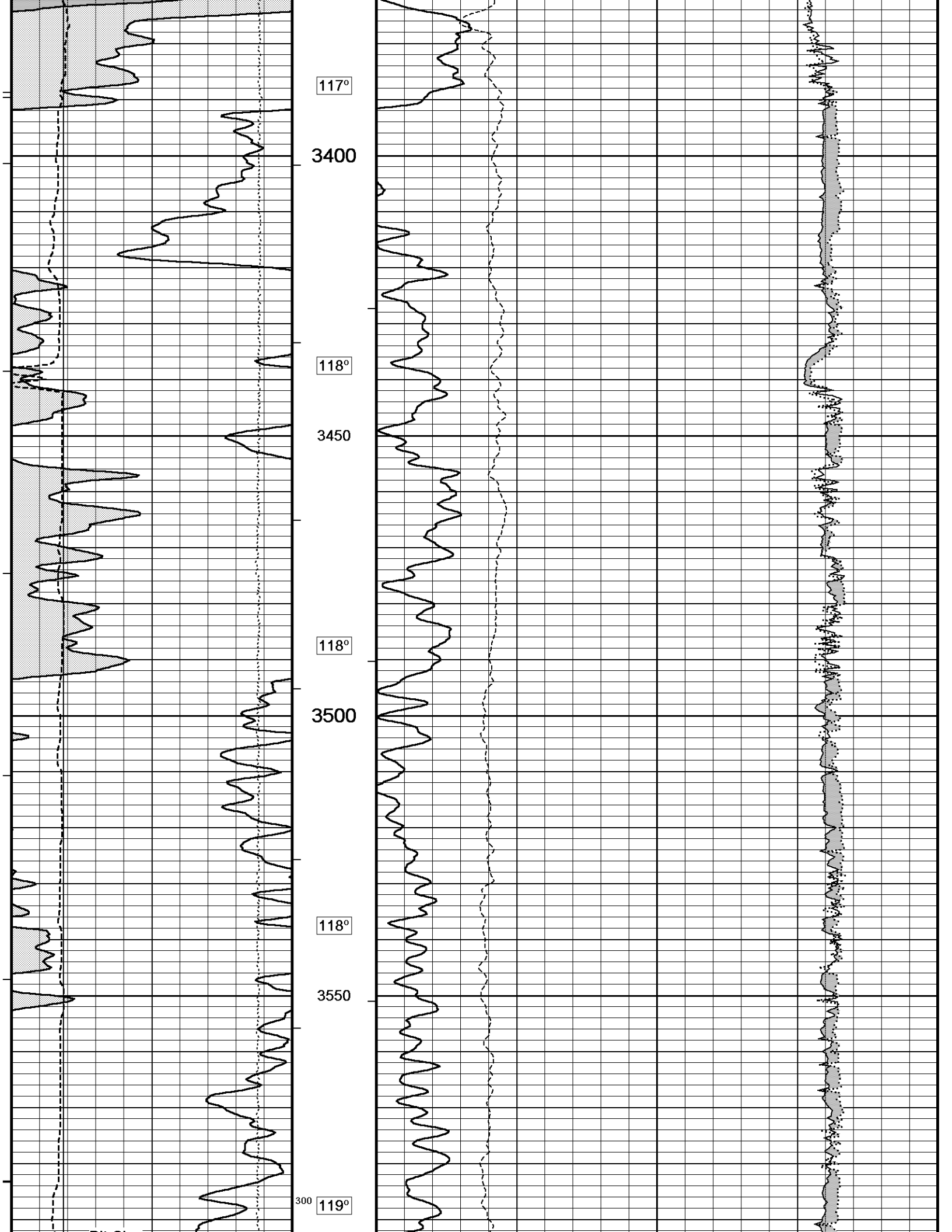
- FIRST RUN OPERATOR(S): J. DUNLAP, D. CANADAY.
- SECOND RUN OPERATOR(S): K. RINEHART, D. CANADAY.

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 03-NOV-2013 17:53
Filename: C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second...\Grand Mesa K-M #1-2_002.dta — Recorded on 08-OCT-2013 00:46
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

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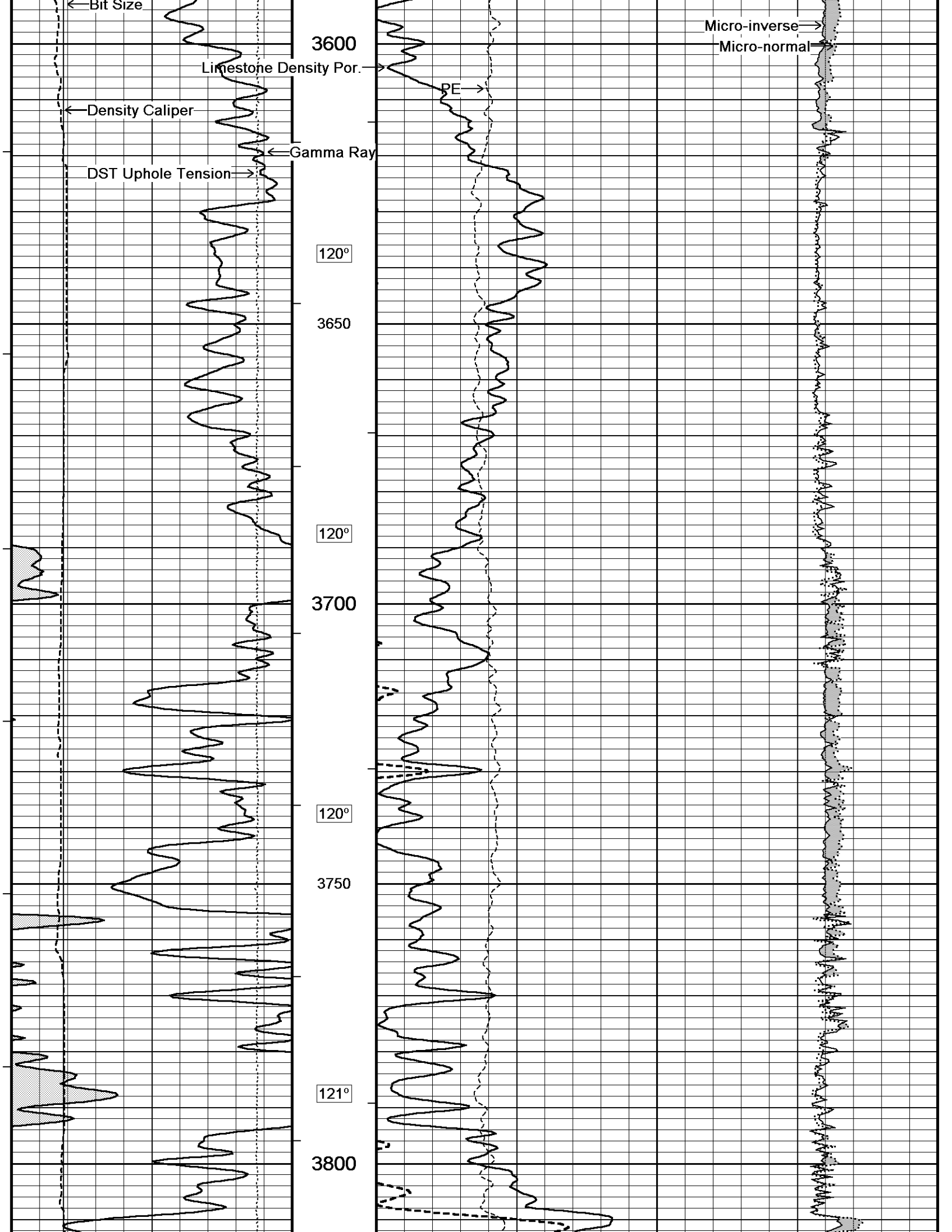
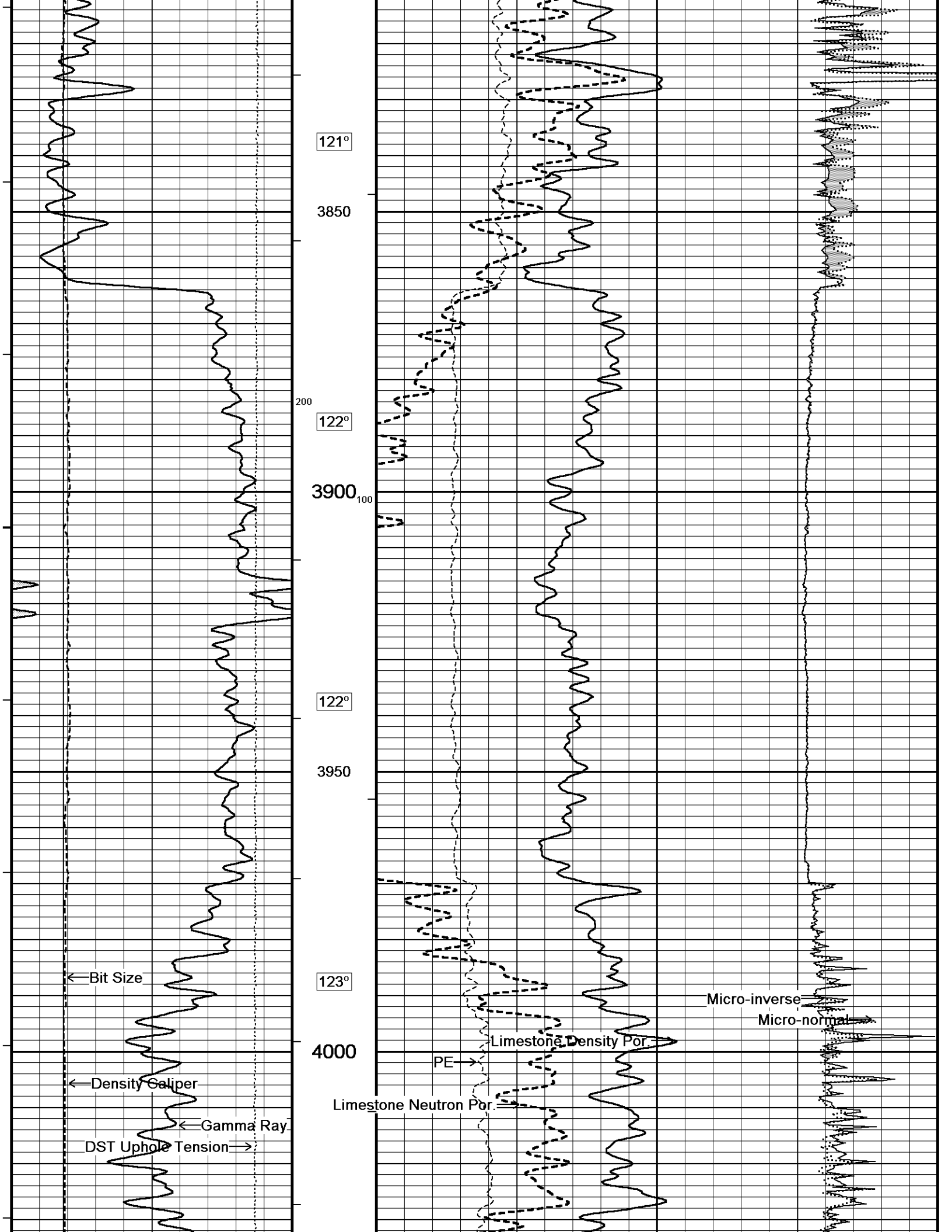
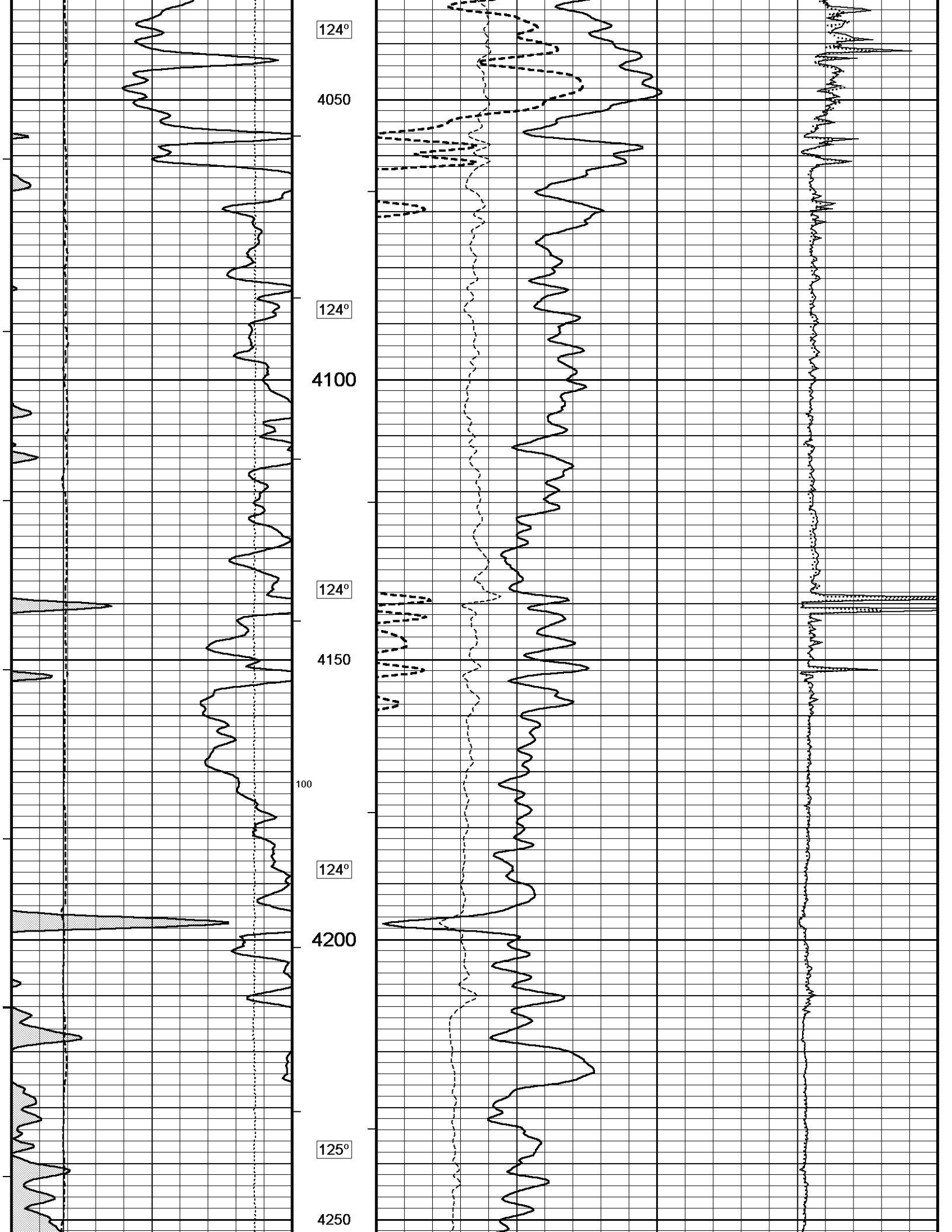
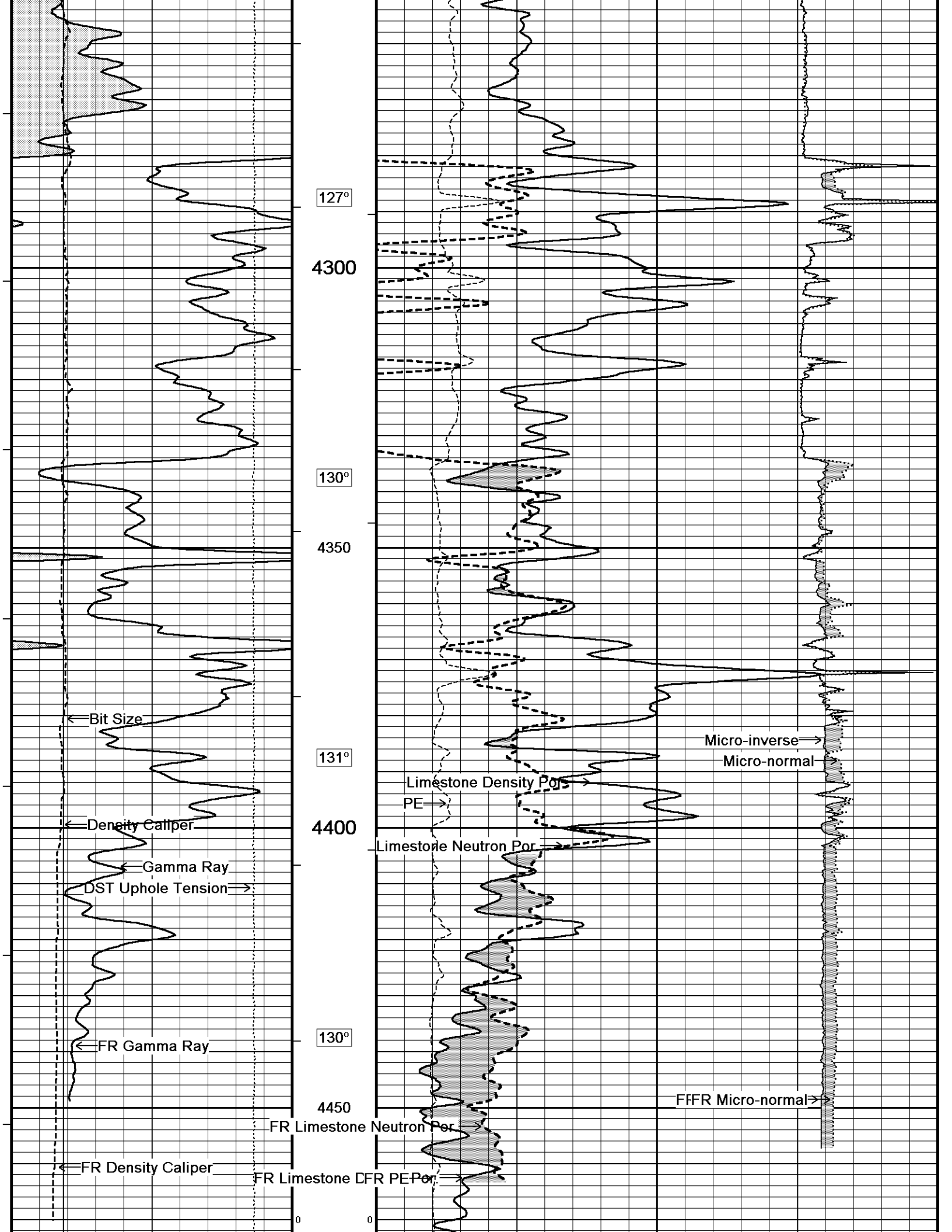
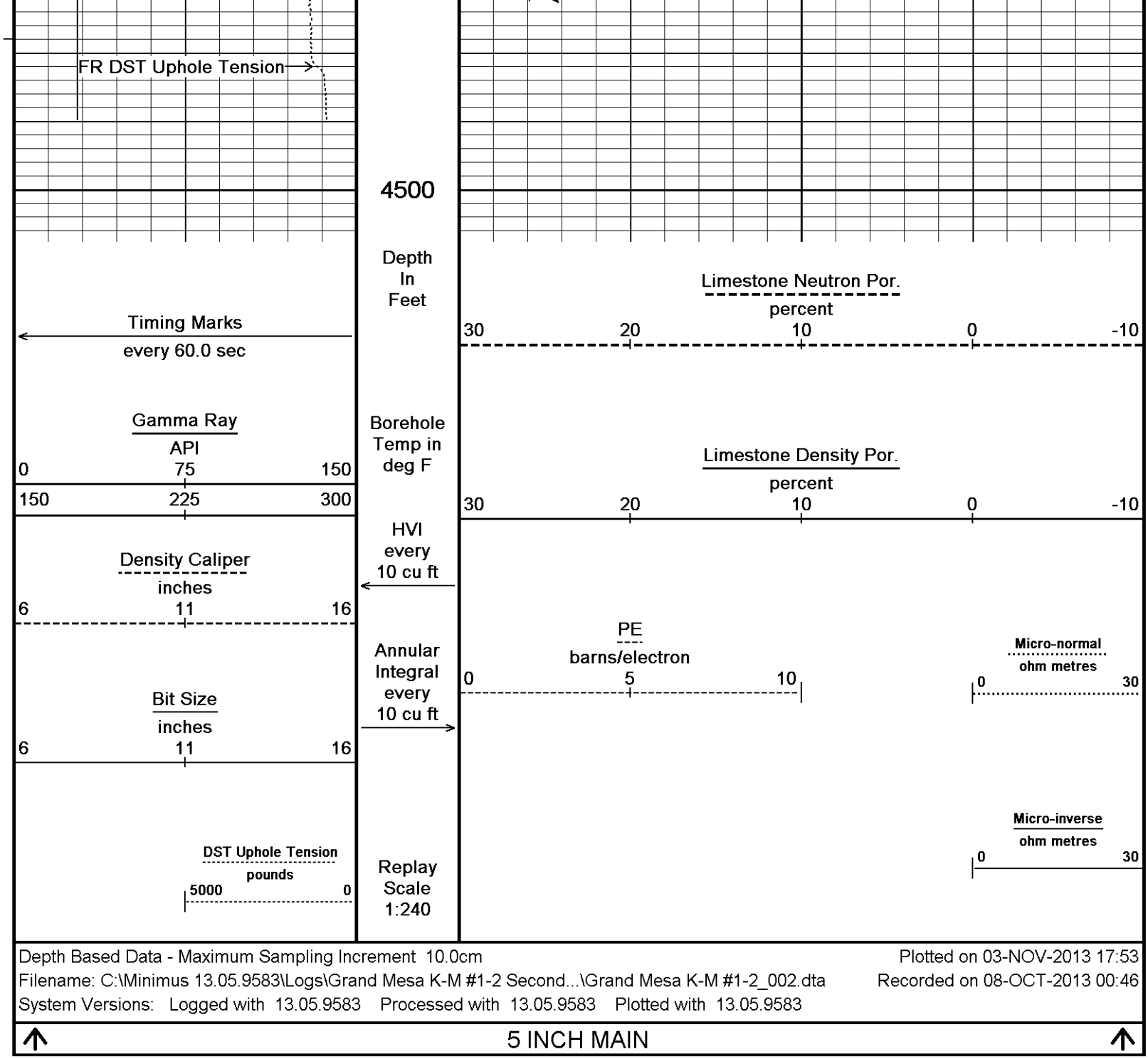
3400
118°
3450
118°
3500
118°
3550
300
119°


Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
Limestone Density Por.
PE
Micro-inverse
Micro-normal
3600
3650
3700
3750
3800
120°
120°
120°
121°


121°
3850
200
122°
3900
100
122°
3950
123°
4000
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
Limestone Density Por.
PE
Limestone Neutron Por.
Micro-inverse
Micro-normal


124°
4050
124°
4100
124°
4150
100
124°
4200
125°
4250


127°
4300
130°
4350
131°
4400
130°
4450
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
FR Gamma Ray
FR Density Caliper
Limestone Density Por
PE
Limestone Neutron Por
FR Limestone Neutron Por
FR Limestone DFR PEPor
Micro-inverse
Micro-normal
FFFR Micro-normal
0
0



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-NOV-2013 17:53

Filename: C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second...\Grand Mesa K-M #1-2_002.dta — Recorded on 08-OCT-2013 00:46

System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

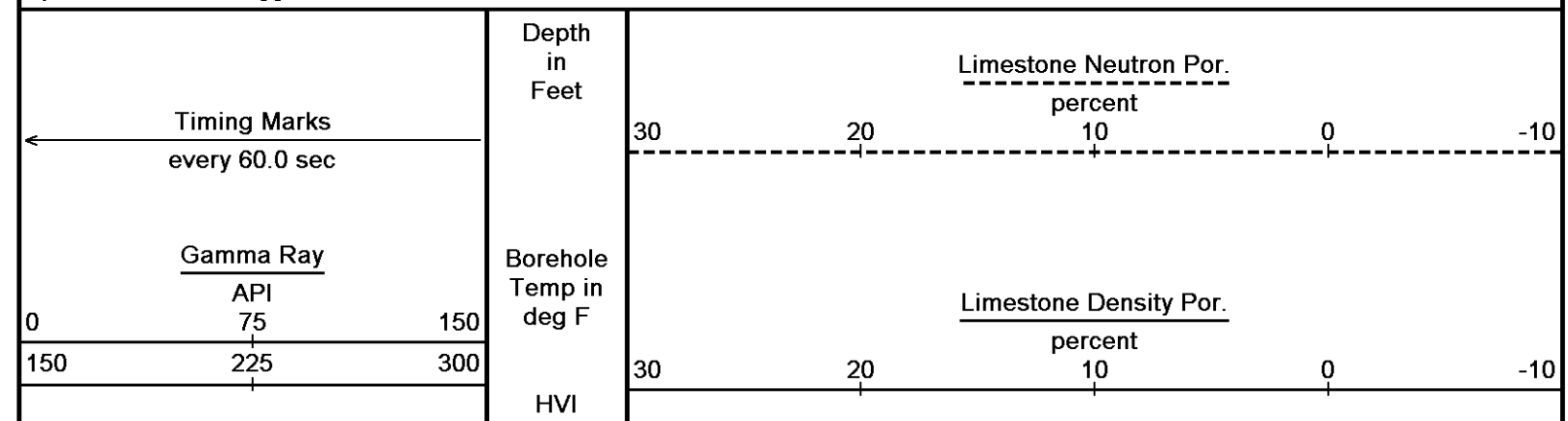
5 INCH MAIN

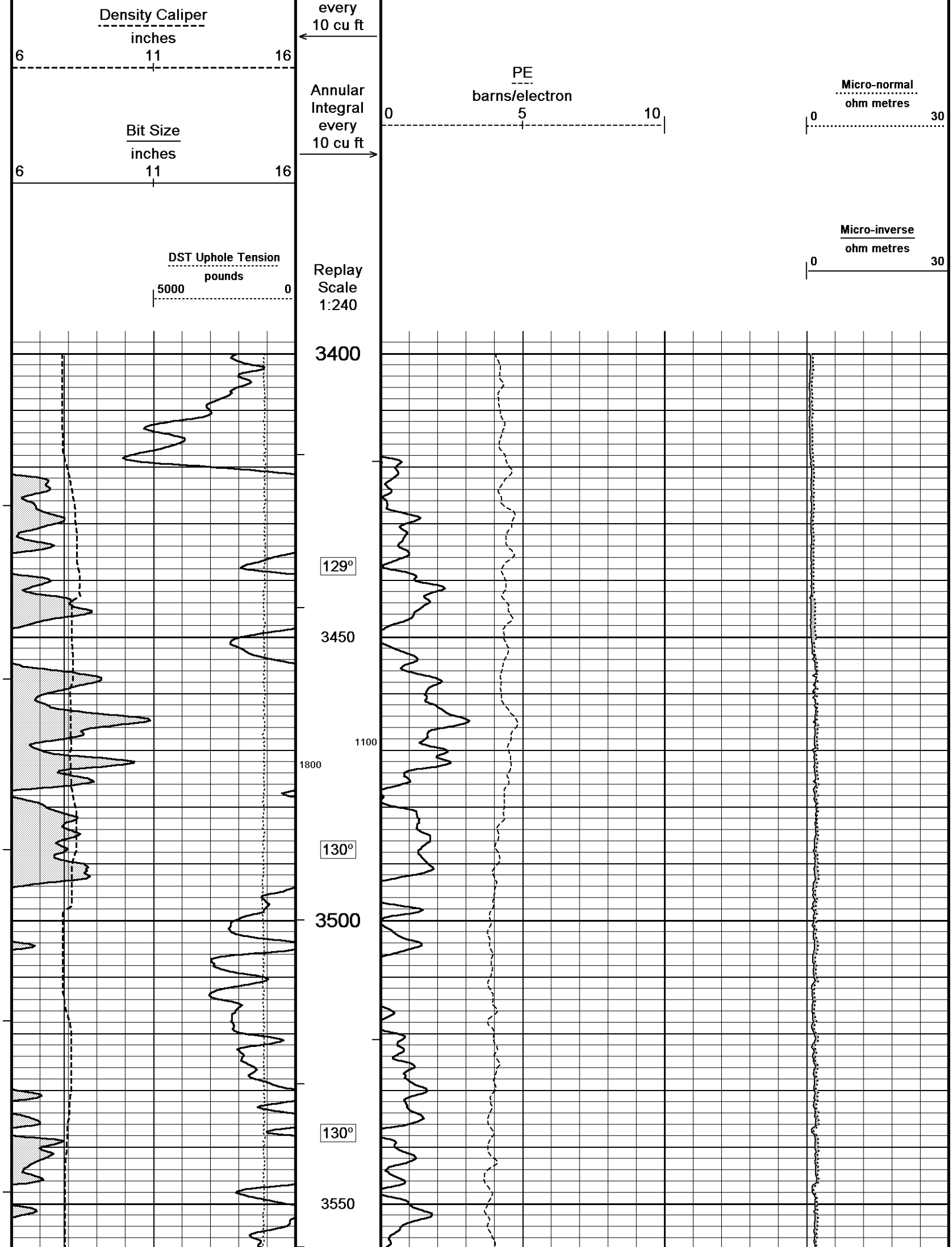
5 INCH MAIN LOG 2ND RUN

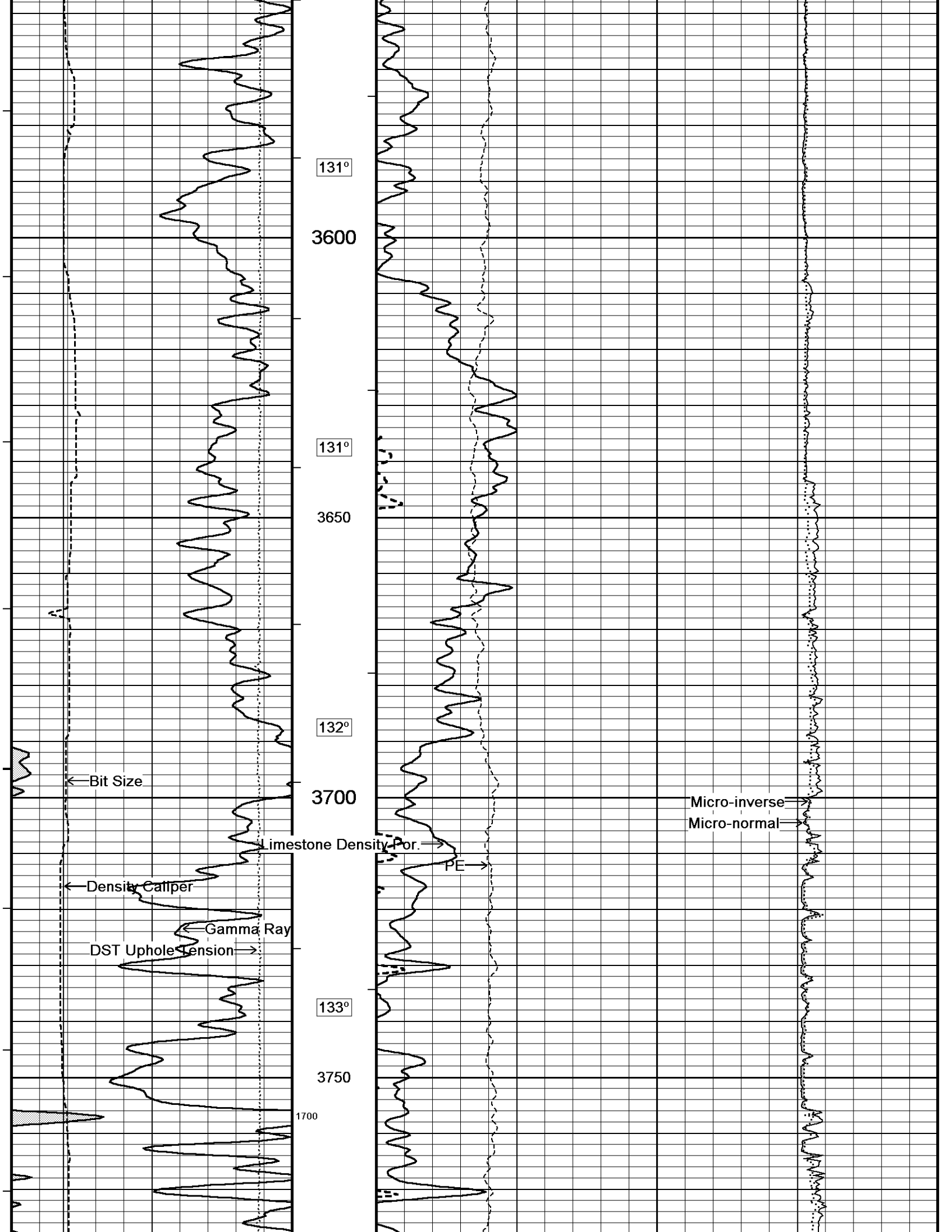
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-NOV-2013 17:53

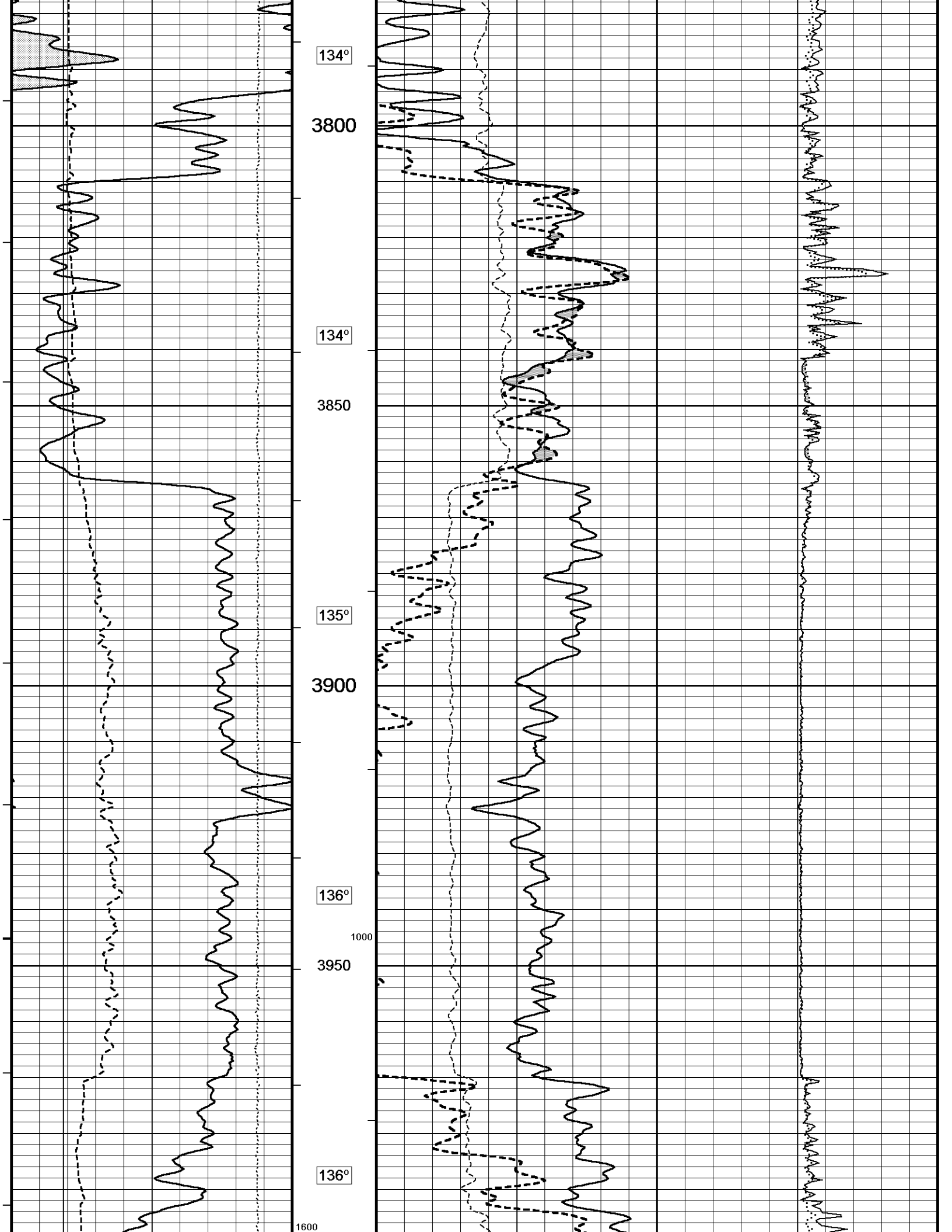
Filename: C:\Minimus 13.05.9583\Logs\Grand ...\Grand Mesa K-M #1-2 2nd run mml mdn mpd mss.dta — Recorded on 03-NOV-2013 11:00

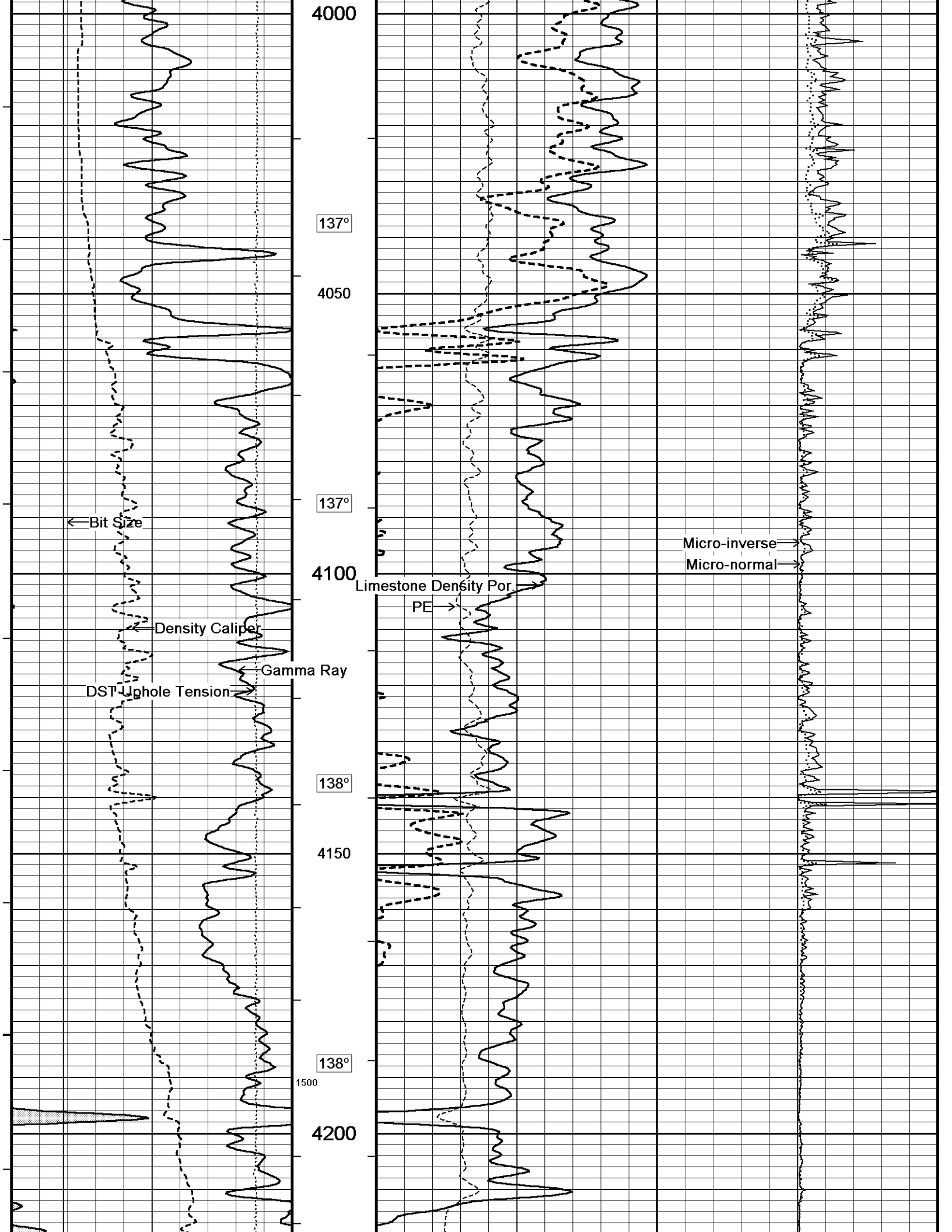
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

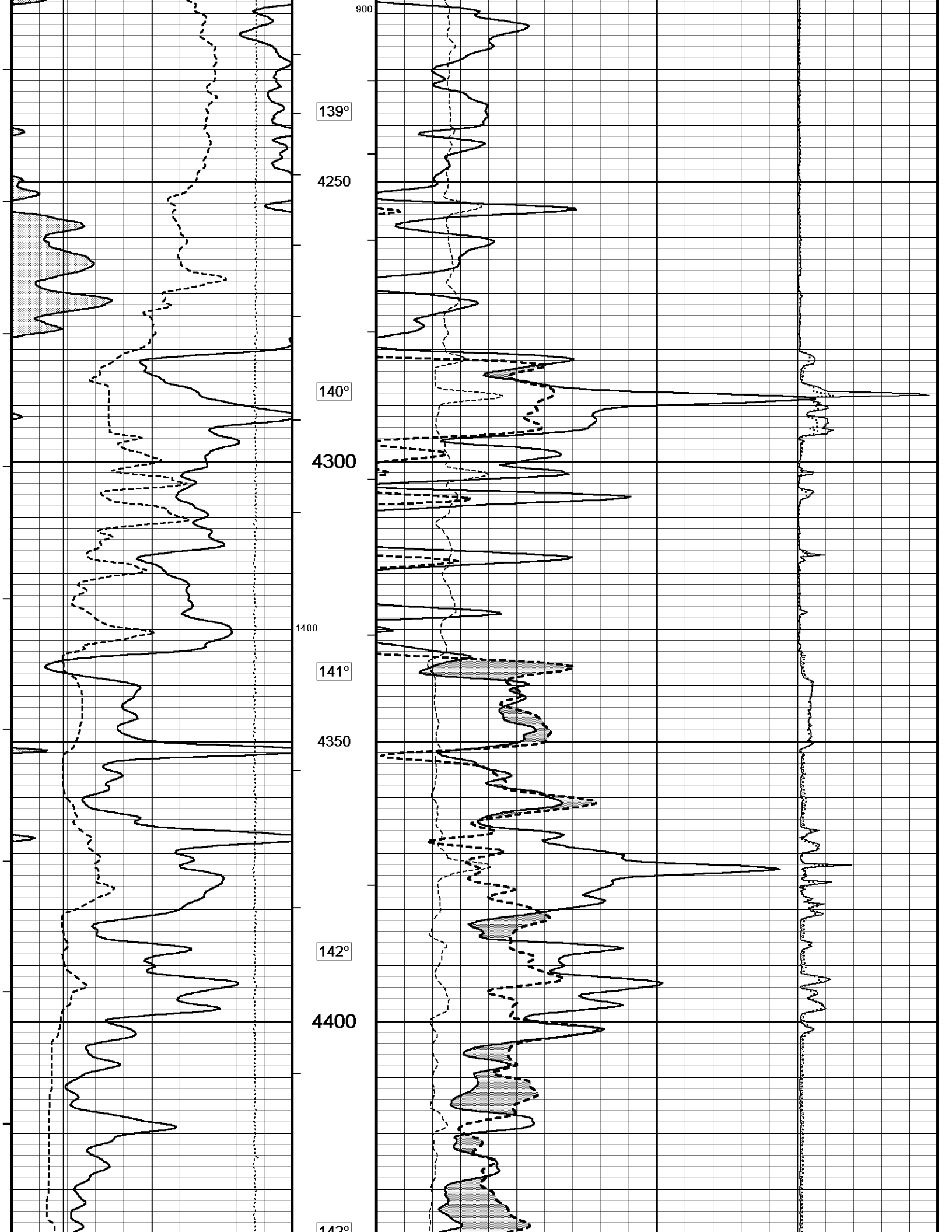


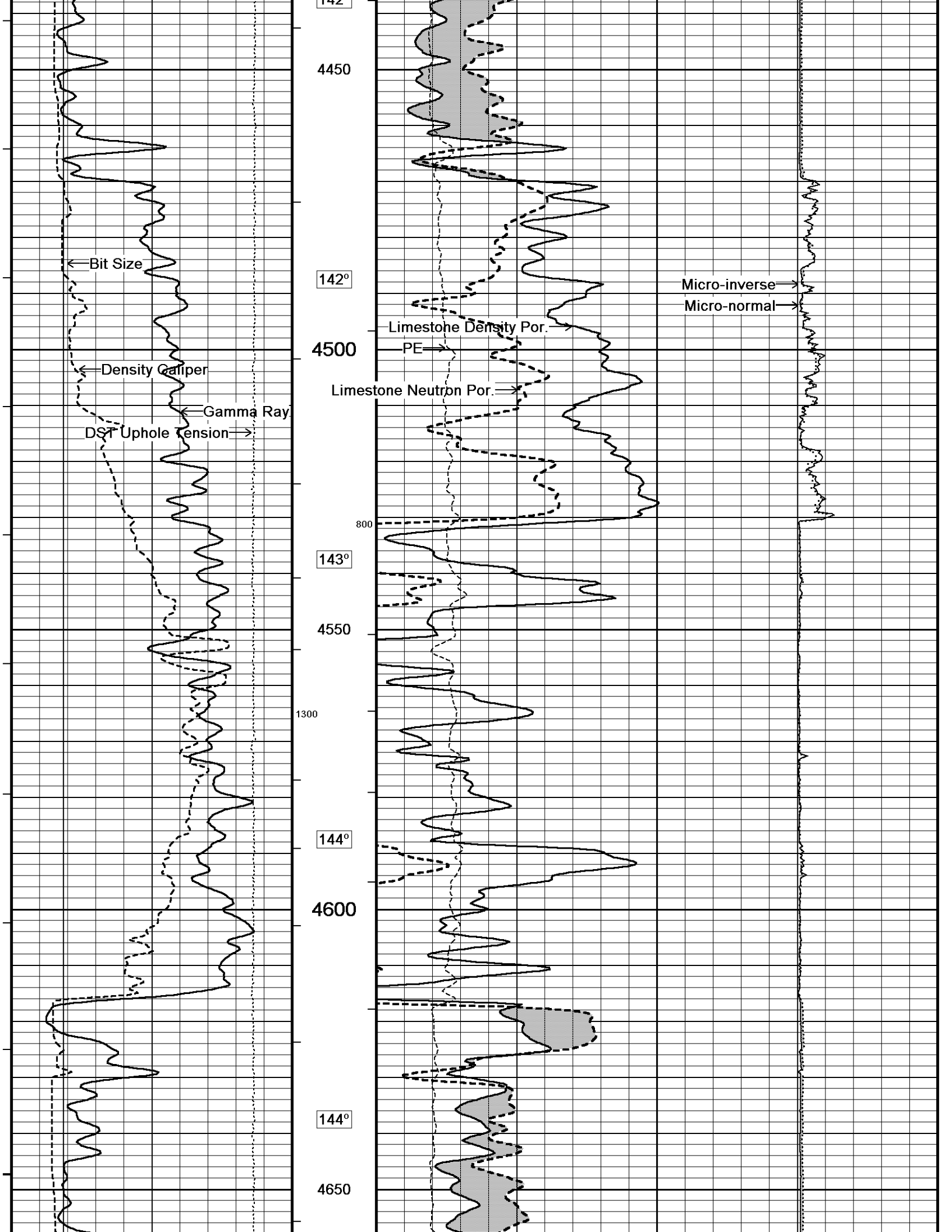

Density Caliper
inches
6
11
16
Bit Size
inches
6
11
16
DST Uphole Tension
pounds
5000
0
every
10 cu ft
Annular
Integral
every
10 cu ft
Replay
Scale
1:240
PE
barns/electron
0
5
10
Micro-normal
ohm metres
0
30
Micro-inverse
ohm metres
0
30
3400
129°
3450
1100
1800
130°
3500
130°
3550

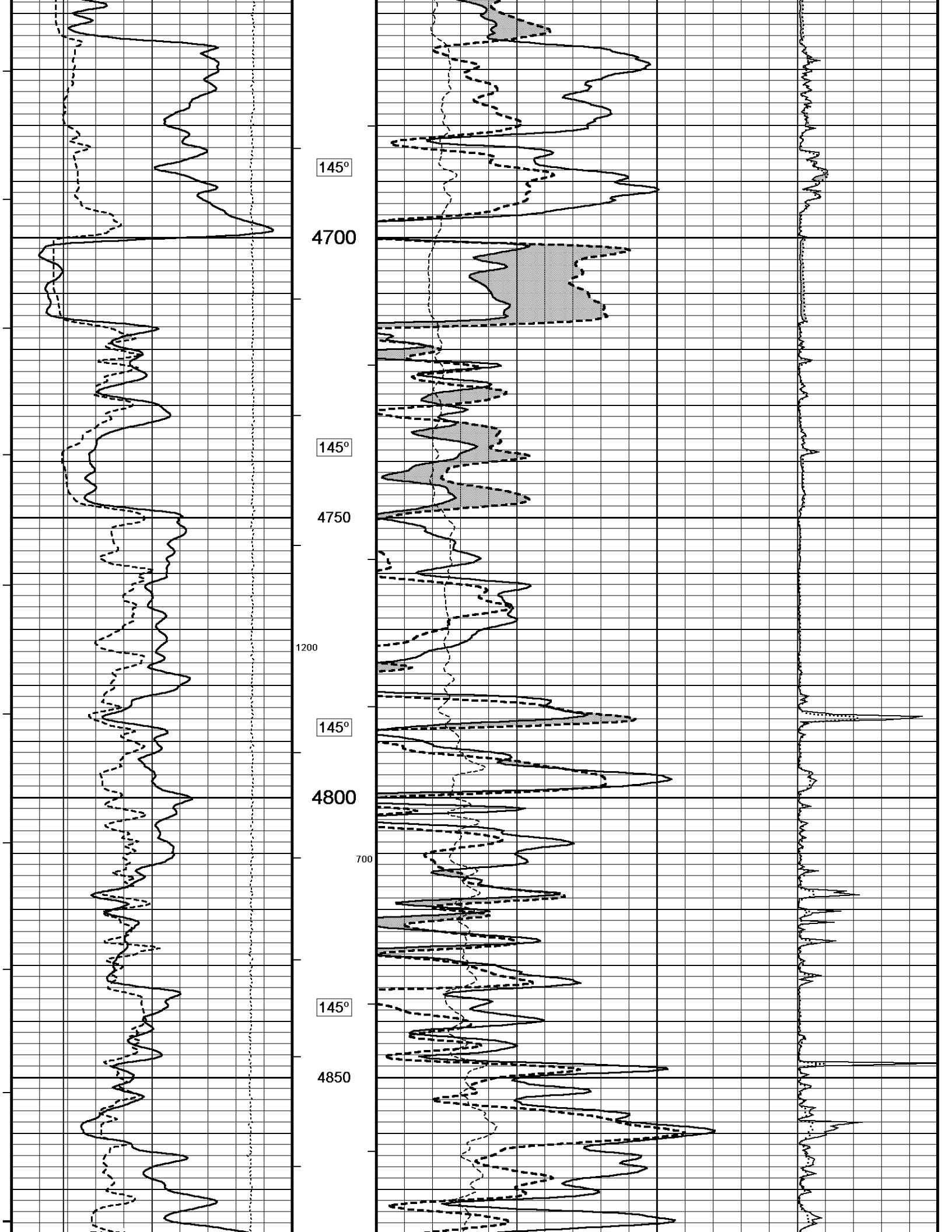

131°
3600
131°
3650
132°
Bit Size
3700
Limestone Density Por.
PE
Density Caliper
Gamma Ray
DST Uphole Tension
133°
3750
1700
Micro-inverse
Micro-normal

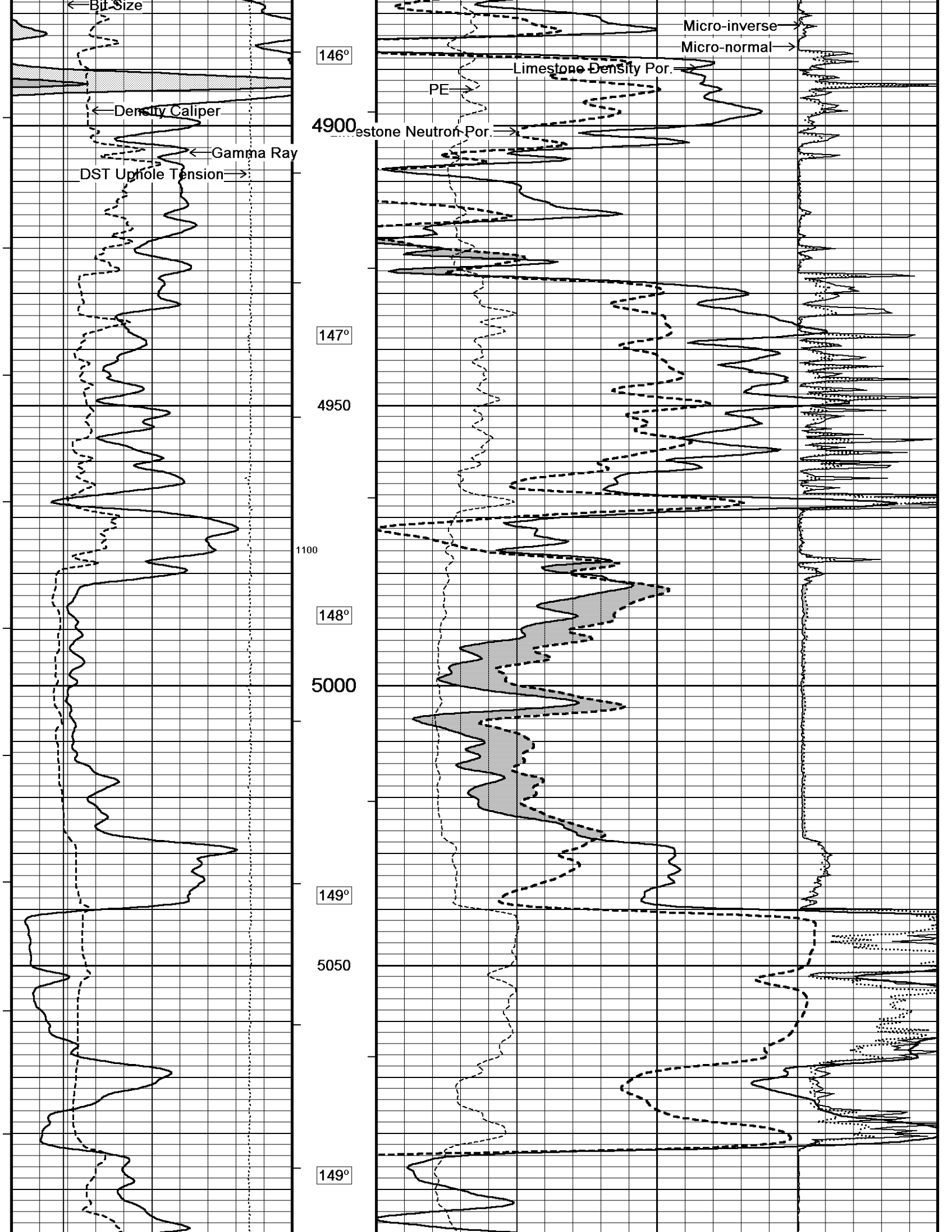

134°
3800
134°
3850
135°
3900
136°
1000
3950
136°
1600

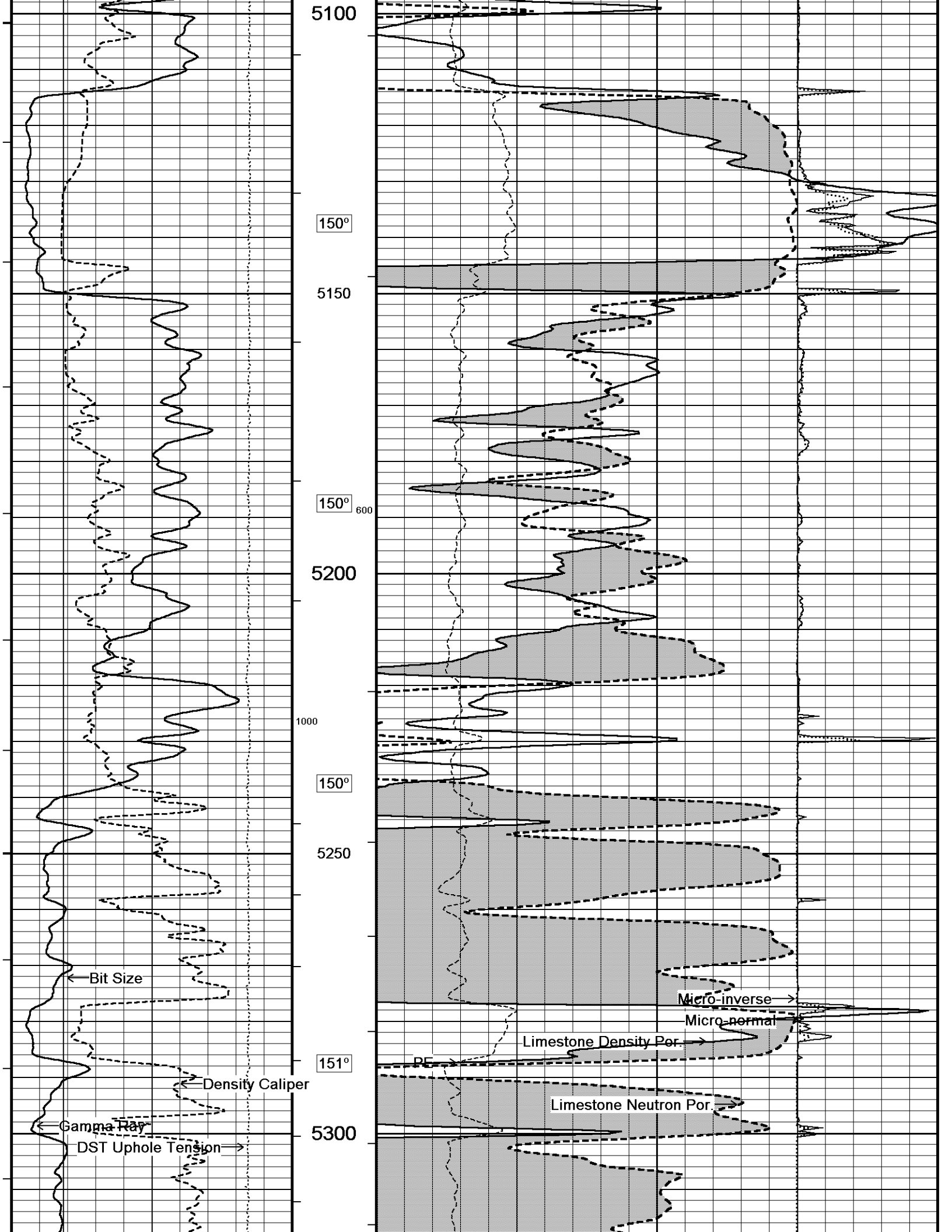

4000
137°
4050
137°
Bit Size
Micro-inverse
Micro-normal
4100
Limestone Density Por
PE
Density Caliper
Gamma Ray
DST Uphole Tension
138°
4150
138°
1500
4200

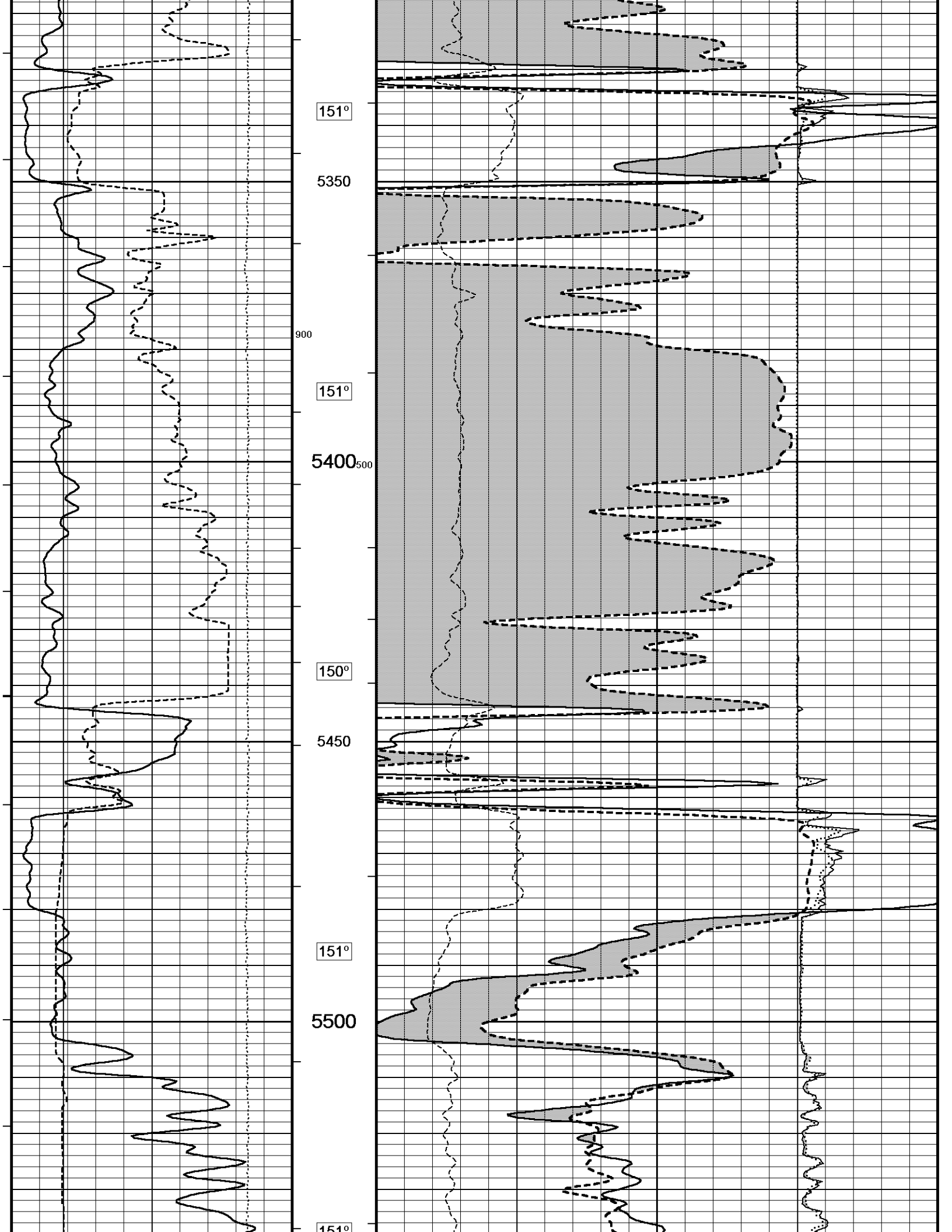

900
139°
4250
140°
4300
1400
141°
4350
142°
4400
142°

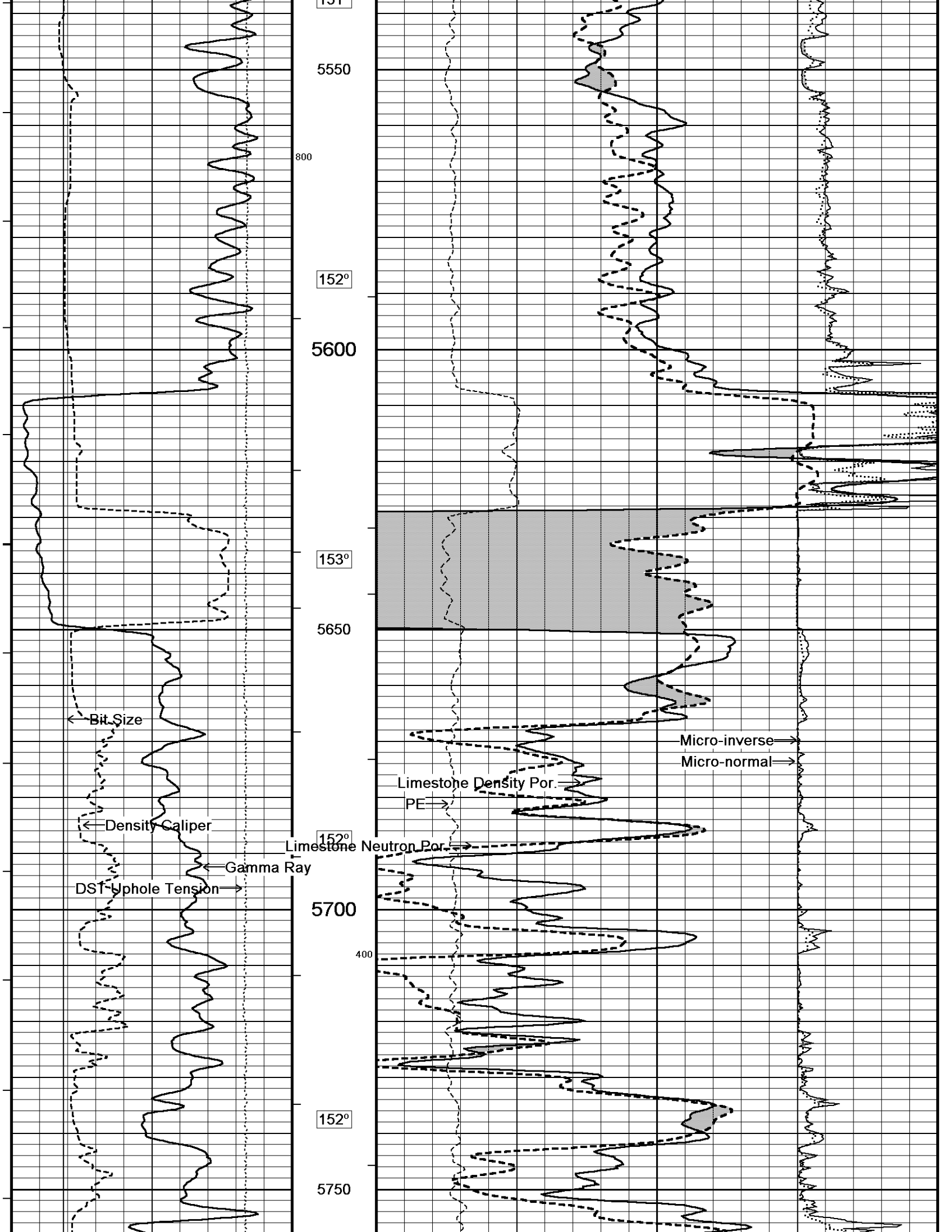

142
4450
Bit Size
142°
Micro-inverse
Micro-normal
Limestone Density Por.
4500
PE
Density Caliper
Limestone Neutron Por.
Gamma Ray
DST Uphole Tension
800
143°
4550
1300
144°
4600
144°
4650

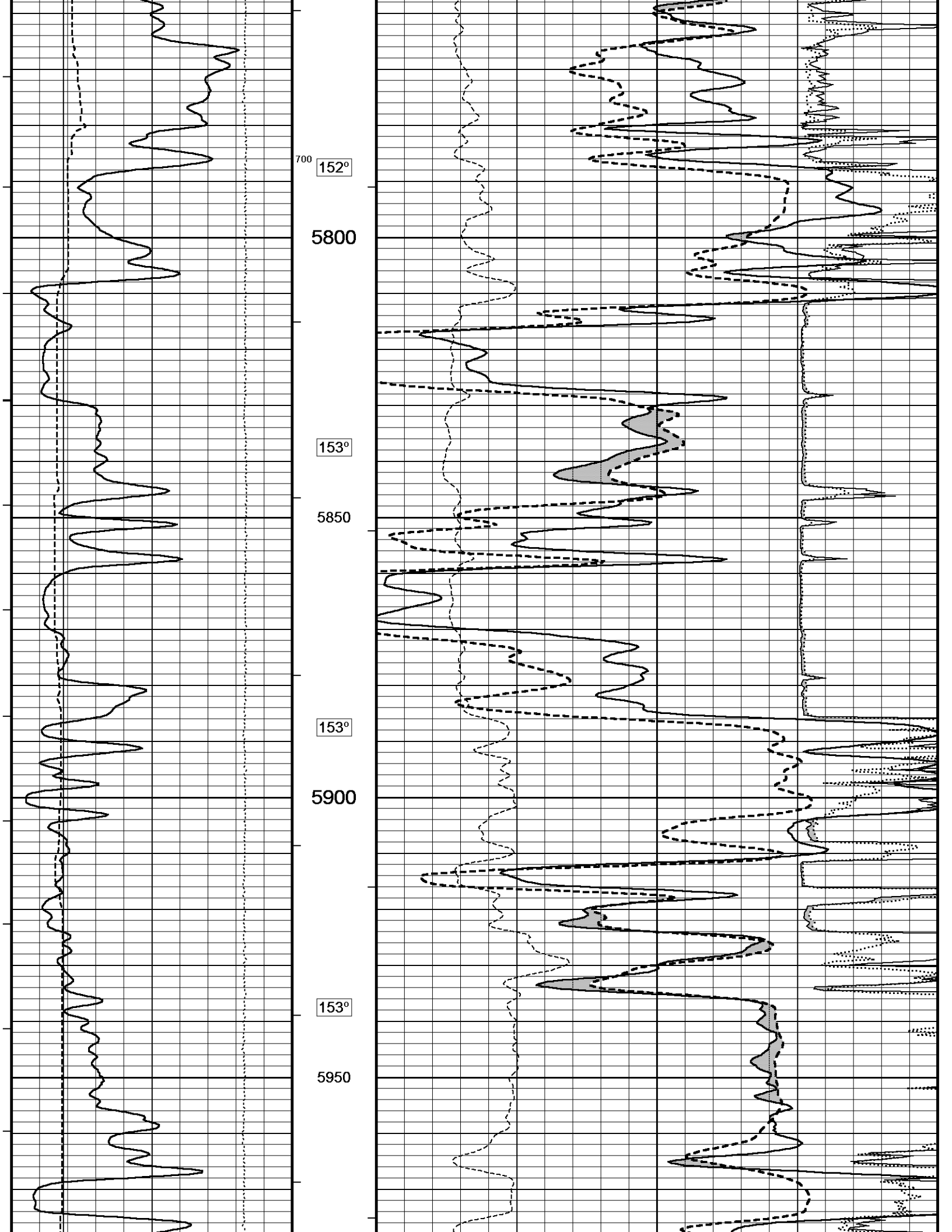

145°
4700
145°
4750
1200
145°
4800
700
145°
4850

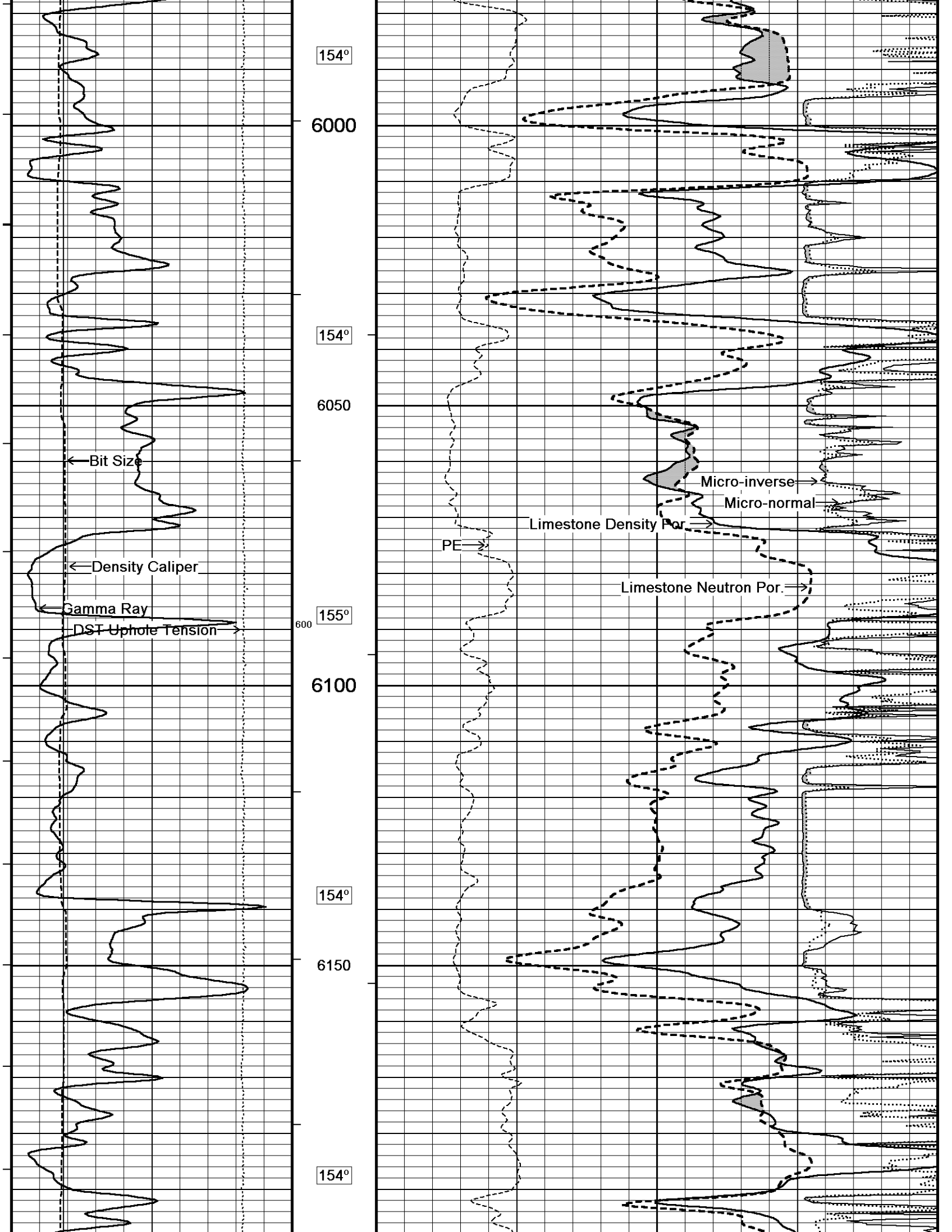

Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
146°
4900
147°
4950
1100
148°
5000
149°
5050
149°
Micro-inverse
Micro-normal
Limestone Density Por.
PE
Limestone Neutron Por.

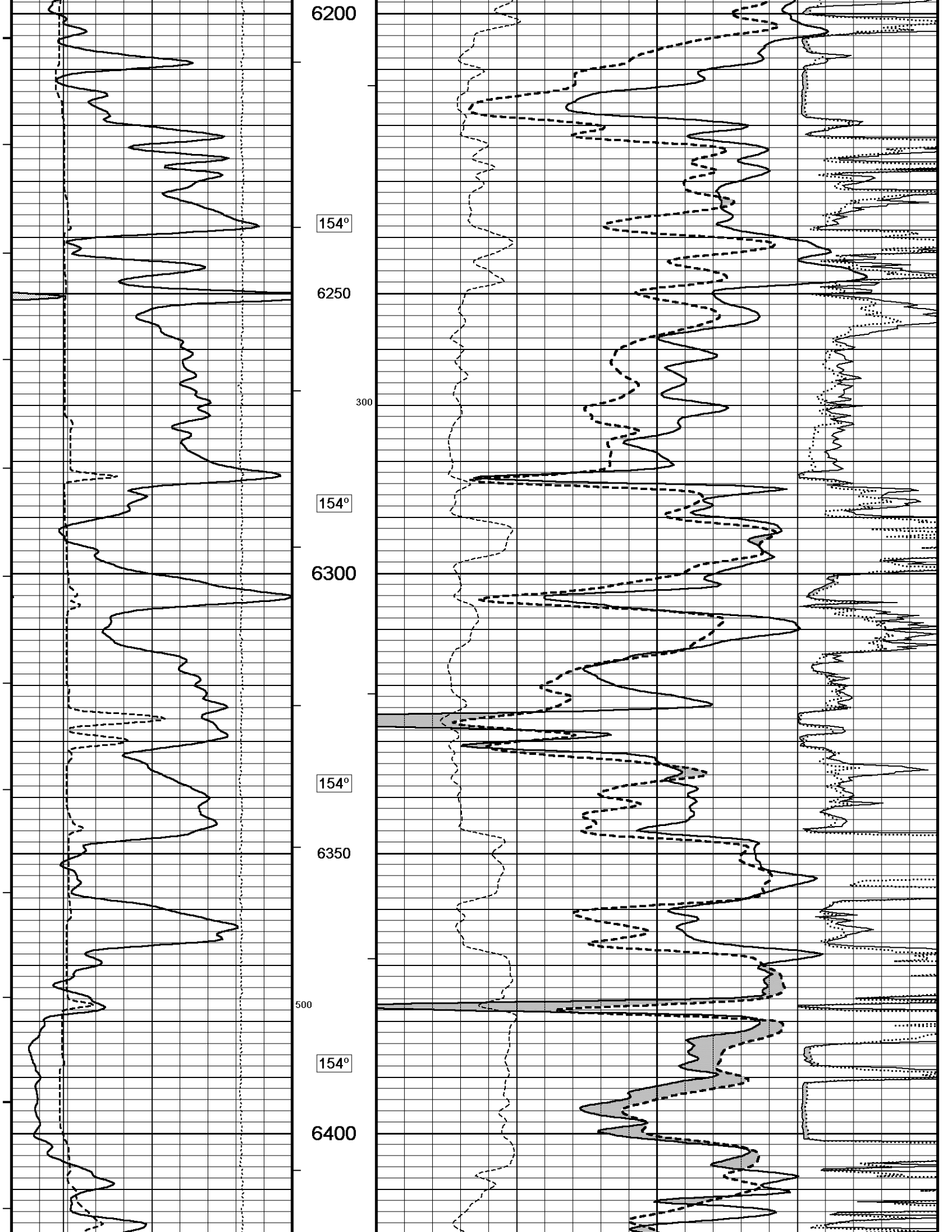

5100
150°
5150
150°
600
5200
1000
150°
5250
Bit Size
Micro-inverse
Micro-normal
Limestone Density Por
151°
PE
Density Caliper
Limestone Neutron Por
Gamma Ray
5300
DST Uphole Tension

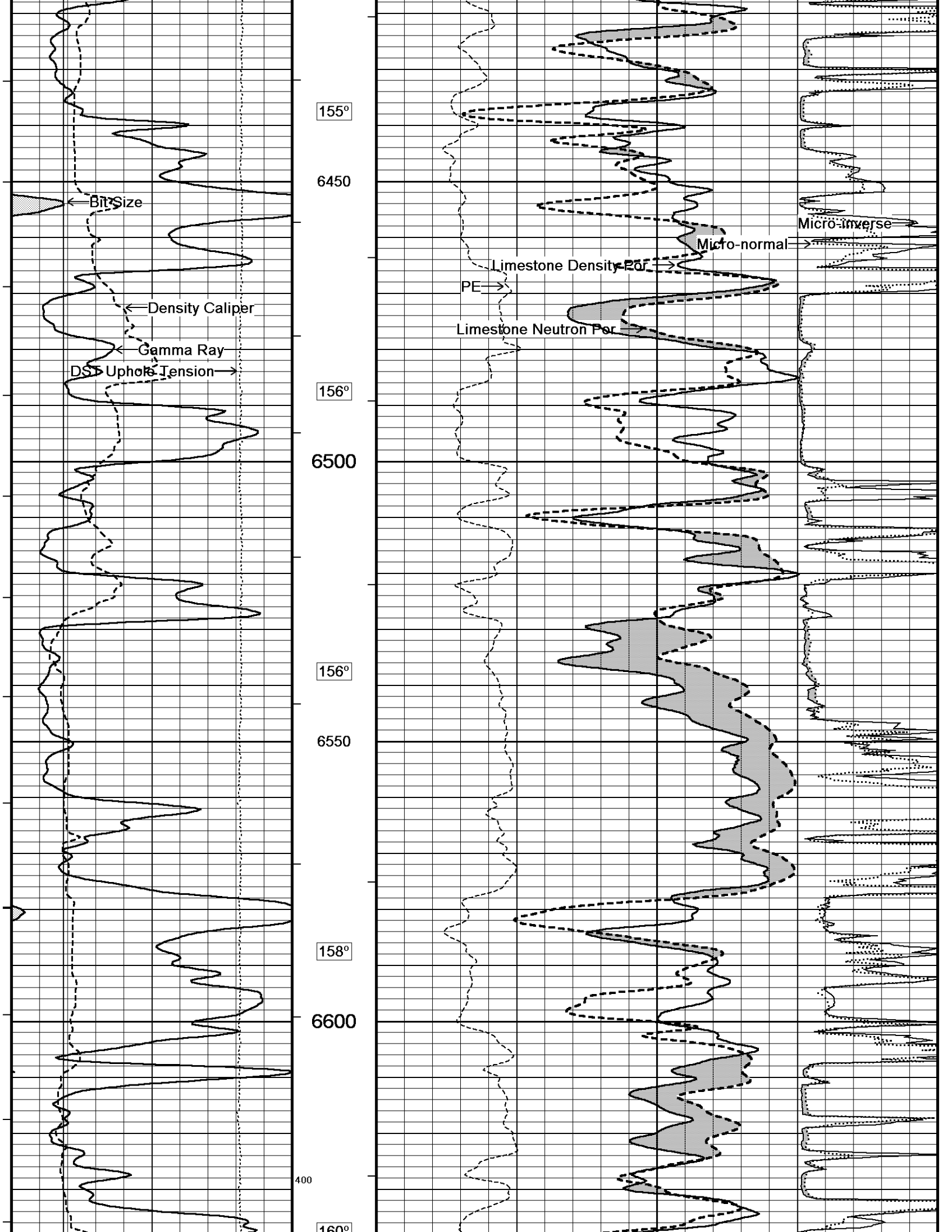

151°
5350
900
151°
5400
500
150°
5450
151°
5500
151°

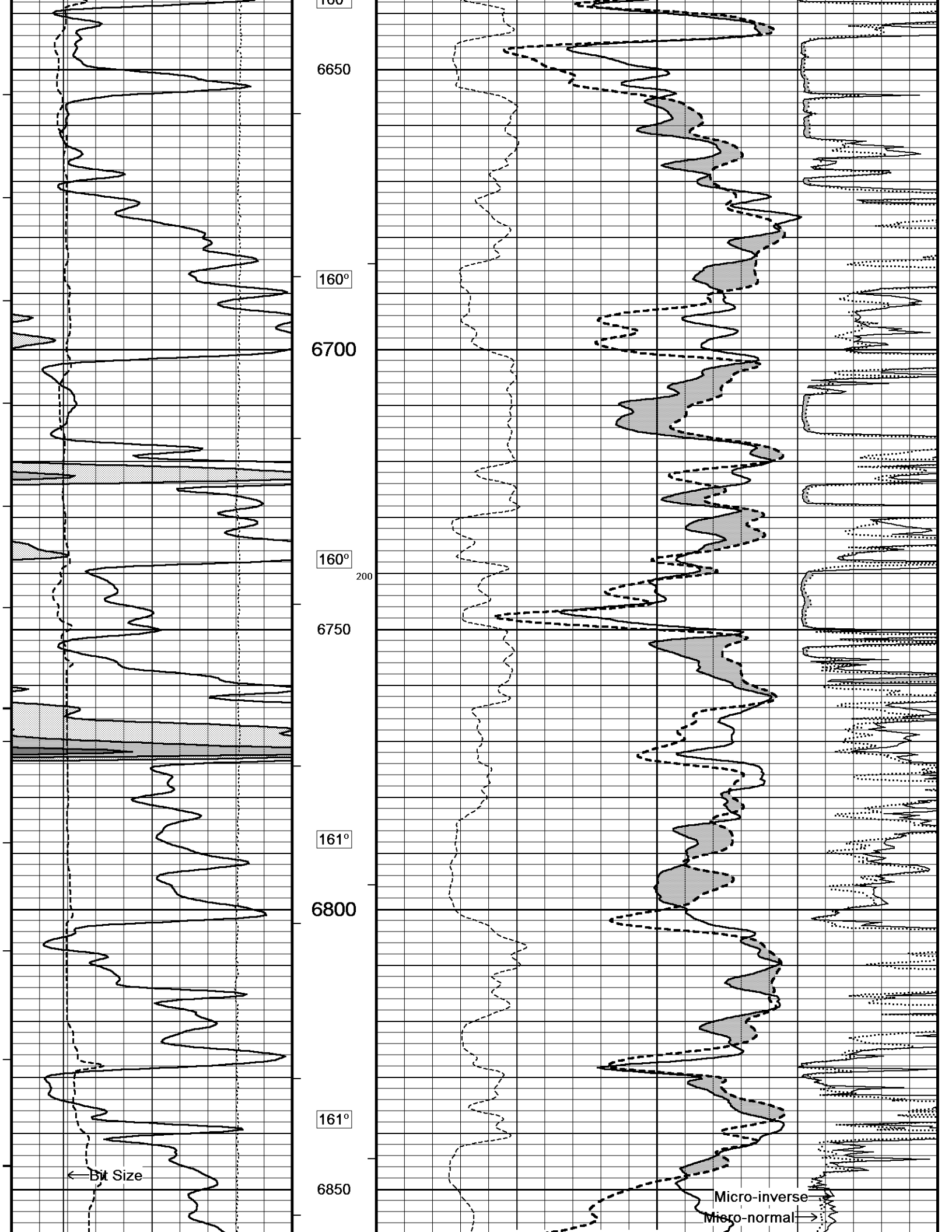

5550
800
152°
5600
153°
5650
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
152°
5700
400
152°
5750
Micro-inverse
Micro-normal
Limestone Density Por.
PE
Limestone Neutron Por.

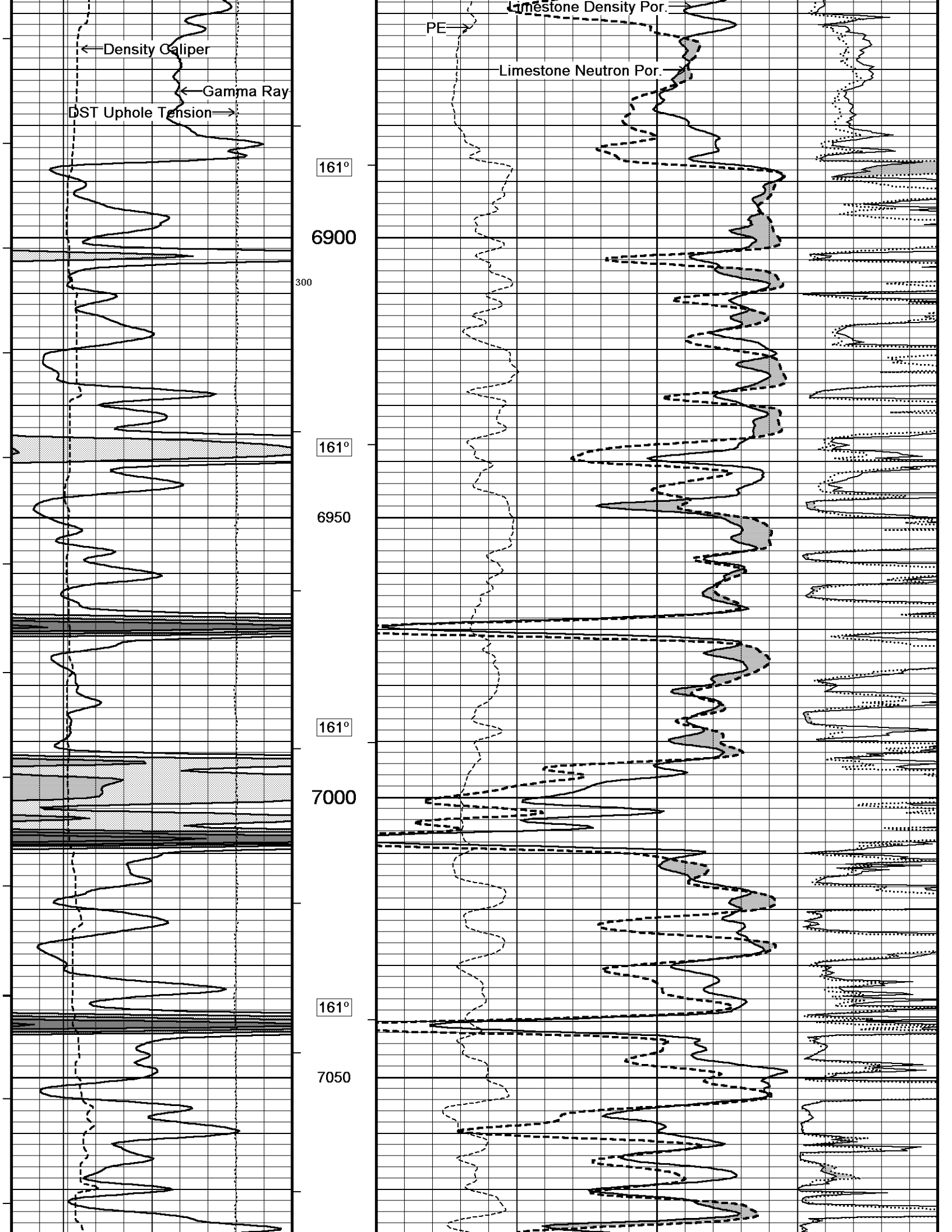

700
152°
5800
153°
5850
153°
5900
153°
5950

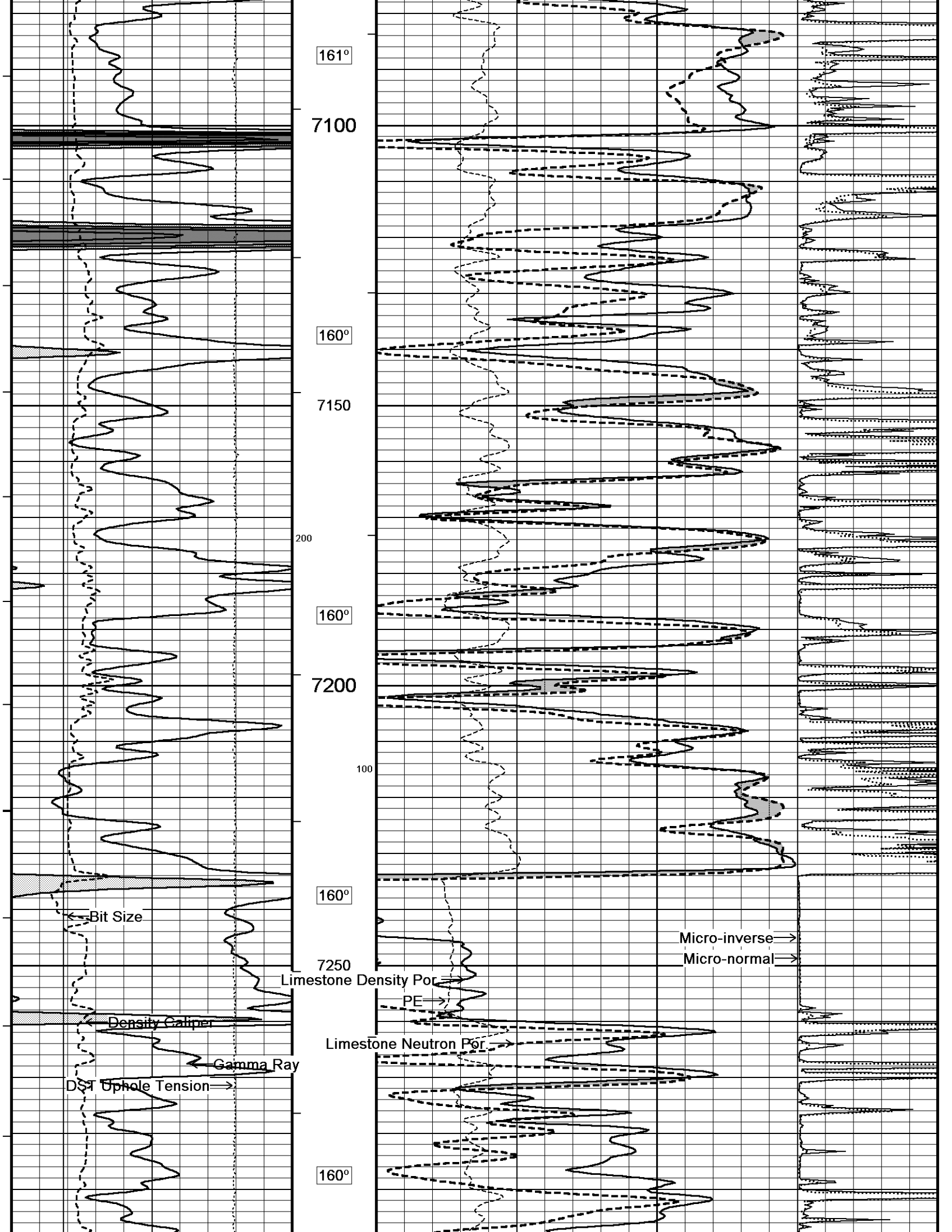

154°
6000
154°
6050
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
155°
600
6100
154°
6150
154°
Micro-inverse
Micro-normal
Limestone Density Por.
PE
Limestone Neutron Por.

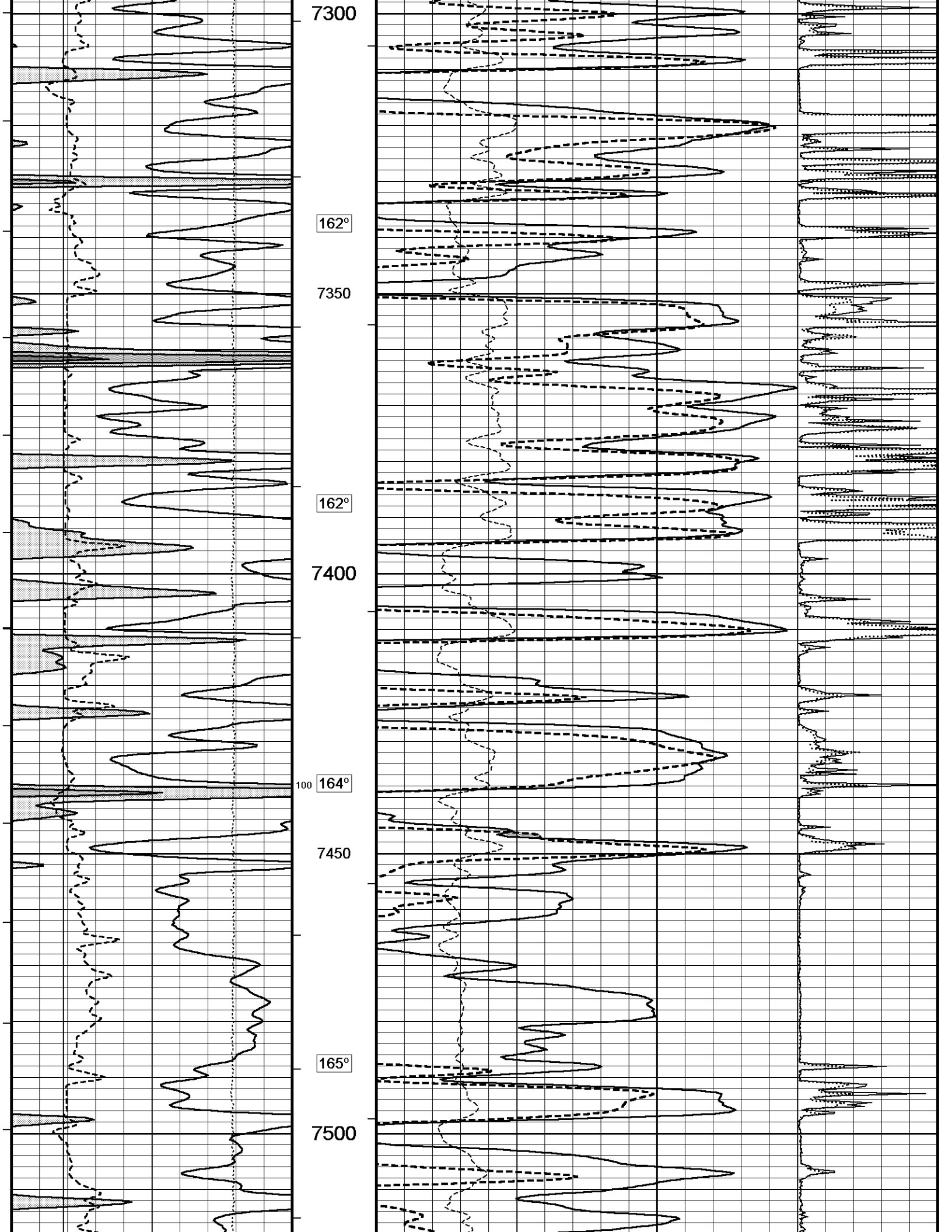

6200
154°
6250
300
154°
6300
154°
6350
500
154°
6400

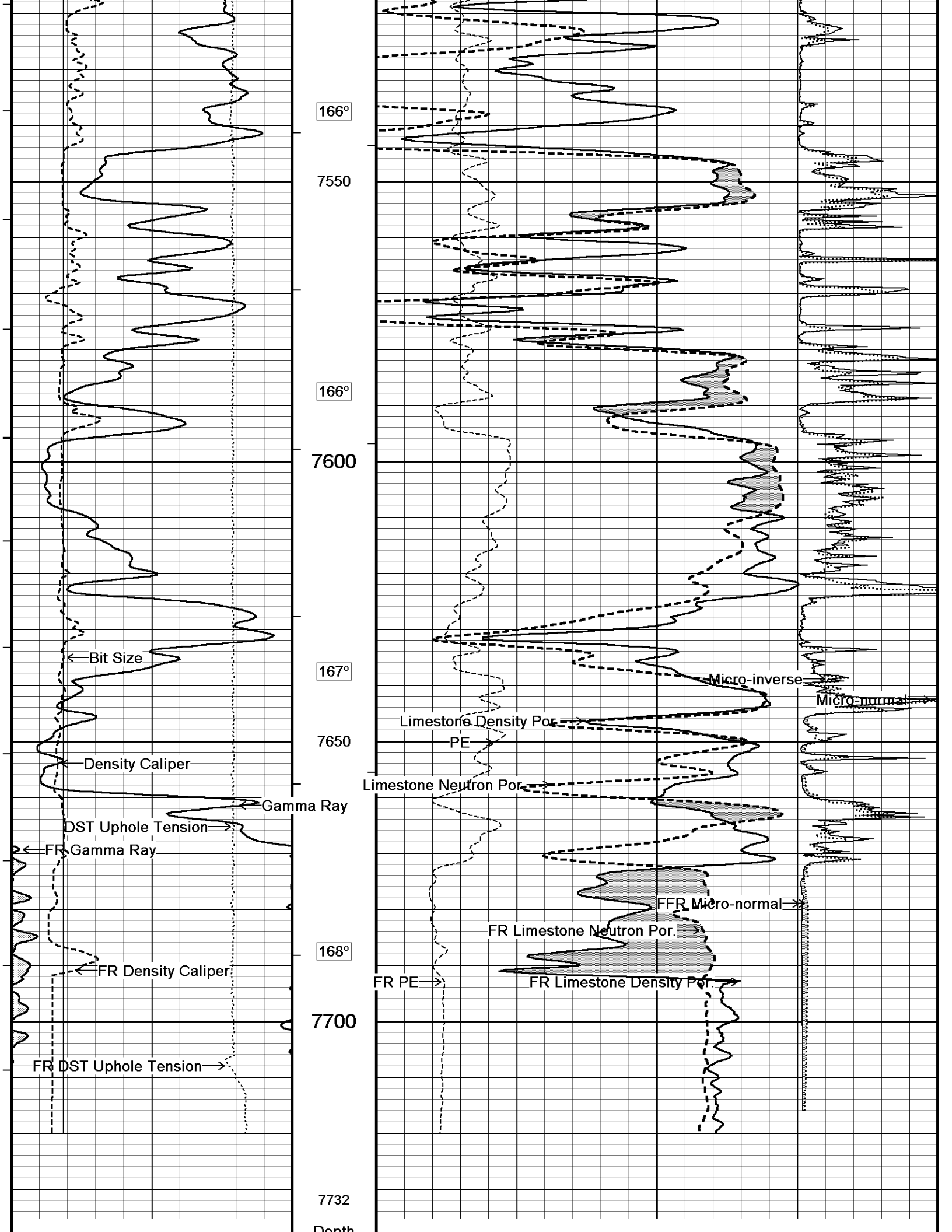

155°
6450
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
156°
6500
156°
6550
158°
6600
400
160°
Micro-inverse
Micro-normal
Limestone Density Por
PE
Limestone Neutron Por


6650
160°
6700
160°
200
6750
161°
6800
161°
6850
← Bit Size
Micro-inverse
Micro-normal


Density Caliper
Gamma Ray
DST Uphole Tension
Limestone Density Por.
PE
Limestone Neutron Por.
161°
6900
300
161°
6950
161°
7000
161°
7050


161°
7100
160°
7150
200
160°
7200
100
160°
Bit Size
7250
Limestone Density Por
PE
Density Caliper
Limestone Neutron Por
Gamma Ray
DST Uphole Tension
160°
Micro-inverse
Micro-normal


7300
162°
7350
162°
7400
100
164°
7450
165°
7500


166°
7550
166°
7600
167°
7650
168°
7700
7732
Depth
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
FR Gamma Ray
FR Density Caliper
FR DST Uphole Tension
Micro-inverse
Micro-normal
Limestone Density Por.
PE
Limestone Neutron Por.
FFR Micro-normal
FR Limestone Neutron Por.
FR PE
FR Limestone Density Por.

Depth in Feet

Timing Marks
every 60.0 sec

Limestone Neutron Por.
percent
30 20 10 0 -10

Gamma Ray
API
0 75 150
150 225 300

Borehole Temp in deg F

Limestone Density Por.
percent
30 20 10 0 -10

HVI every 10 cu ft

Density Caliper
inches
6 11 16

Annular Integral every 10 cu ft

PE
barns/electron
0 5 10

Micro-normal
ohm metres
0 30

Bit Size
inches
6 11 16

Micro-inverse
ohm metres
0 30

DST Uphole Tension
pounds
5000 0

Replay Scale 1:240

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-NOV-2013 17:53
Filename: C:\Minimus 13.05.9583\Logs\Grand ...\Grand Mesa K-M #1-2 2nd run mml mdn mpd mss.dta — Recorded on 03-NOV-2013 11:00
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

5 INCH MAIN LOG 2ND RUN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-NOV-2013 17:53
Filename: C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second...\Grand Mesa K-M #1-2_001.dta — Recorded on 08-OCT-2013 00:21
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

Depth in Feet

Timing Marks
every 60.0 sec

Limestone Neutron Por.
percent
30 20 10 0 -10

Gamma Ray
API
0 75 150
150 225 300

Borehole Temp in deg F

Limestone Density Por.
percent
30 20 10 0 -10

HVI every 10 cu ft

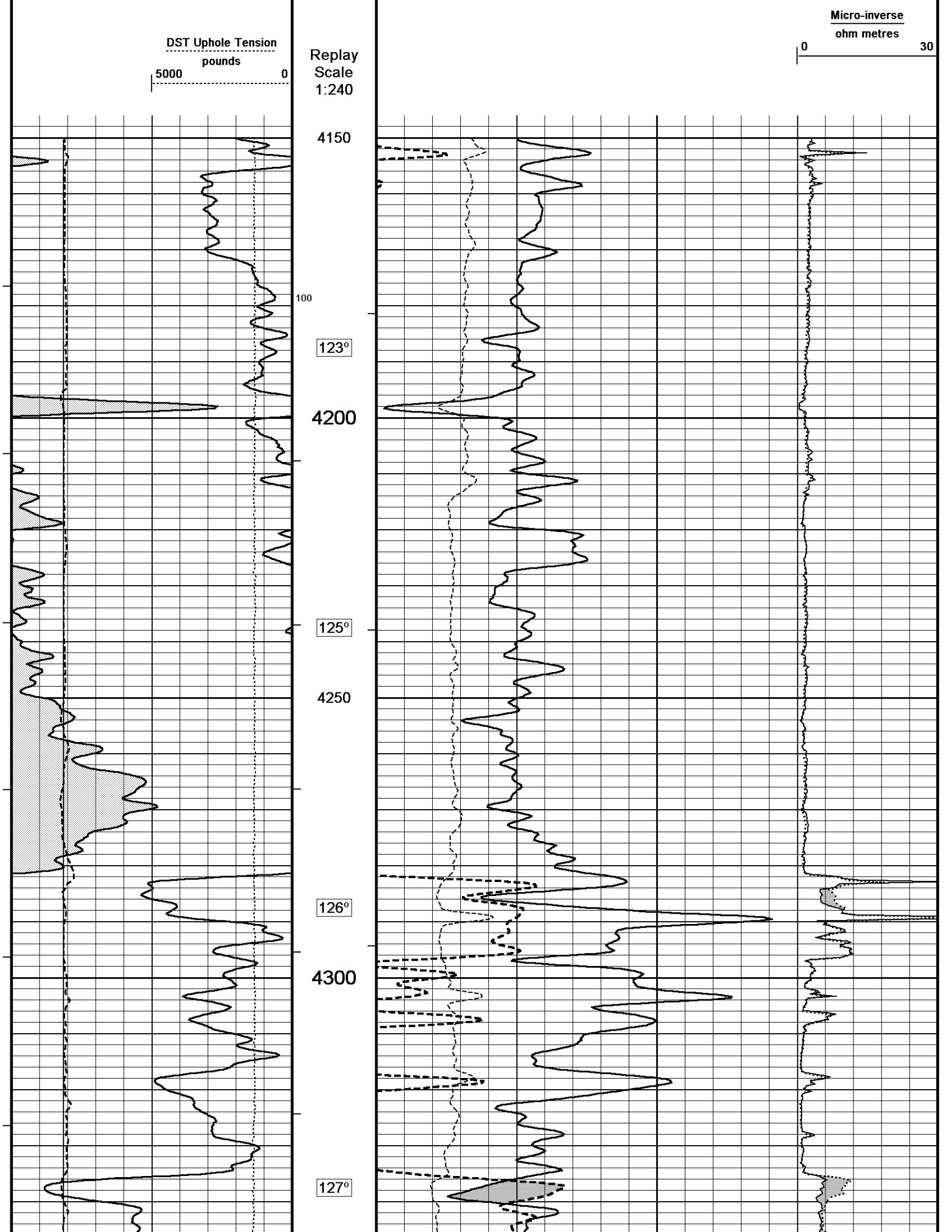
Density Caliper
inches
6 11 16

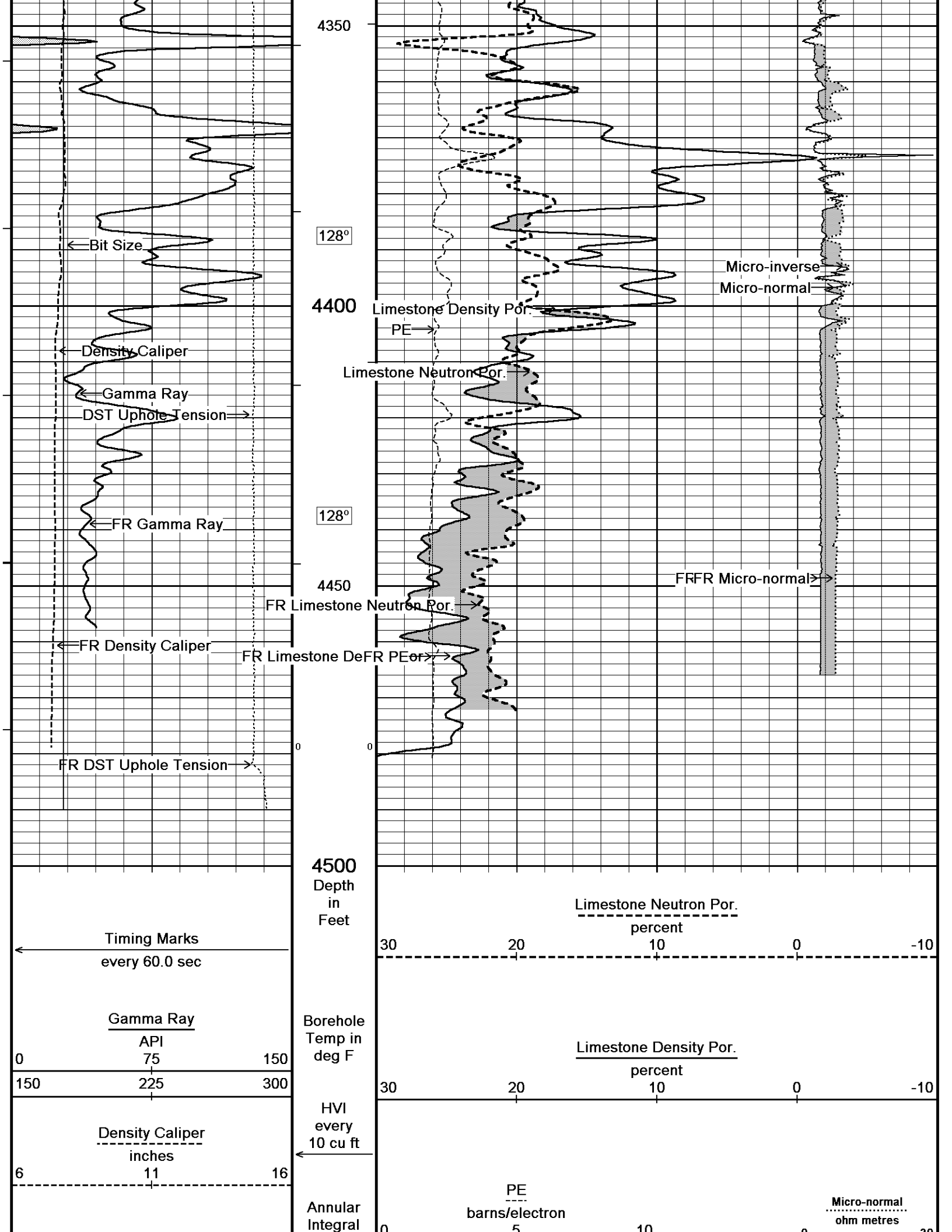
Annular Integral every 10 cu ft

PE
barns/electron
0 5 10

Micro-normal
ohm metres
0 30

Bit Size
inches
6 11 16


DST Uphole Tension
pounds
5000
0
Replay
Scale
1:240
Micro-inverse
ohm metres
0
30
4150
100
123°
4200
125°
4250
126°
4300
127°


4350
128°
Bit Size
Micro-inverse
Micro-normal
4400
Limestone Density Por.
PE
Density Caliper
Limestone Neutron Por.
Gamma Ray
DST Uphole Tension
128°
FR Gamma Ray
4450
FRFR Micro-normal
FR Limestone Neutron Por.
FR Density Caliper
FR Limestone DeFR PEor
0
0
FR DST Uphole Tension
4500
Depth
in
Feet
Limestone Neutron Por.
percent
30
20
10
0
-10
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Borehole
Temp in
deg F
Limestone Density Por.
percent
30
20
10
0
-10
HVI
every
10 cu ft
Density Caliper
inches
6
11
16
Annular
Integral
PE
barns/electron
0
5
10
Micro-normal
ohm metres

Bit Size
inches
6 11 16

every
10 cu ft

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

Micro-inverse
ohm metres
0 30

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-NOV-2013 17:53
Filename: C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second...\Grand Mesa K-M #1-2_001.dta — Recorded on 08-OCT-2013 00:21
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

REPEAT SECTION

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-NOV-2013 17:53
Filename: C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second...\Grand Mesa K-M #1-2_002.dta — Recorded on 08-OCT-2013 00:46
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

Depth
In
Feet

Timing Marks
every 60.0 sec

Compensated Density
grams/cc
2 2.25 2.50 2.75 3

Gamma Ray
API
0 75 150
150 225 300

Borehole
Temp in
deg F

Limestone Density Por.
percent
30 20 10 0 -10

HVI
every
10 cu ft

Density Caliper
inches
6 11 16

Annular
Integral
every
10 cu ft

Bit Size
inches
6 11 16

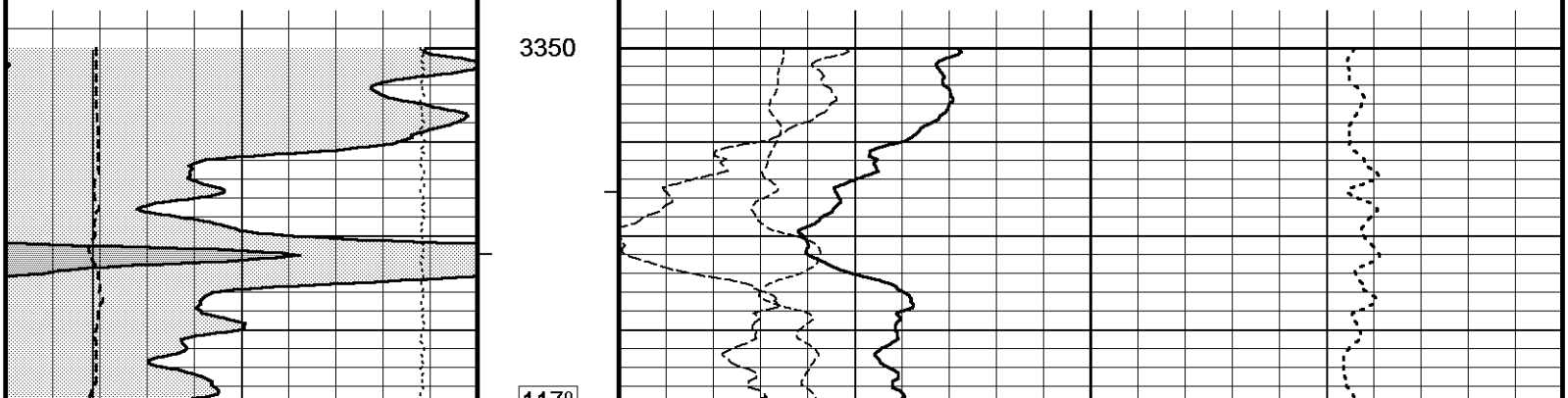
PE
barns/electron
0 5 10

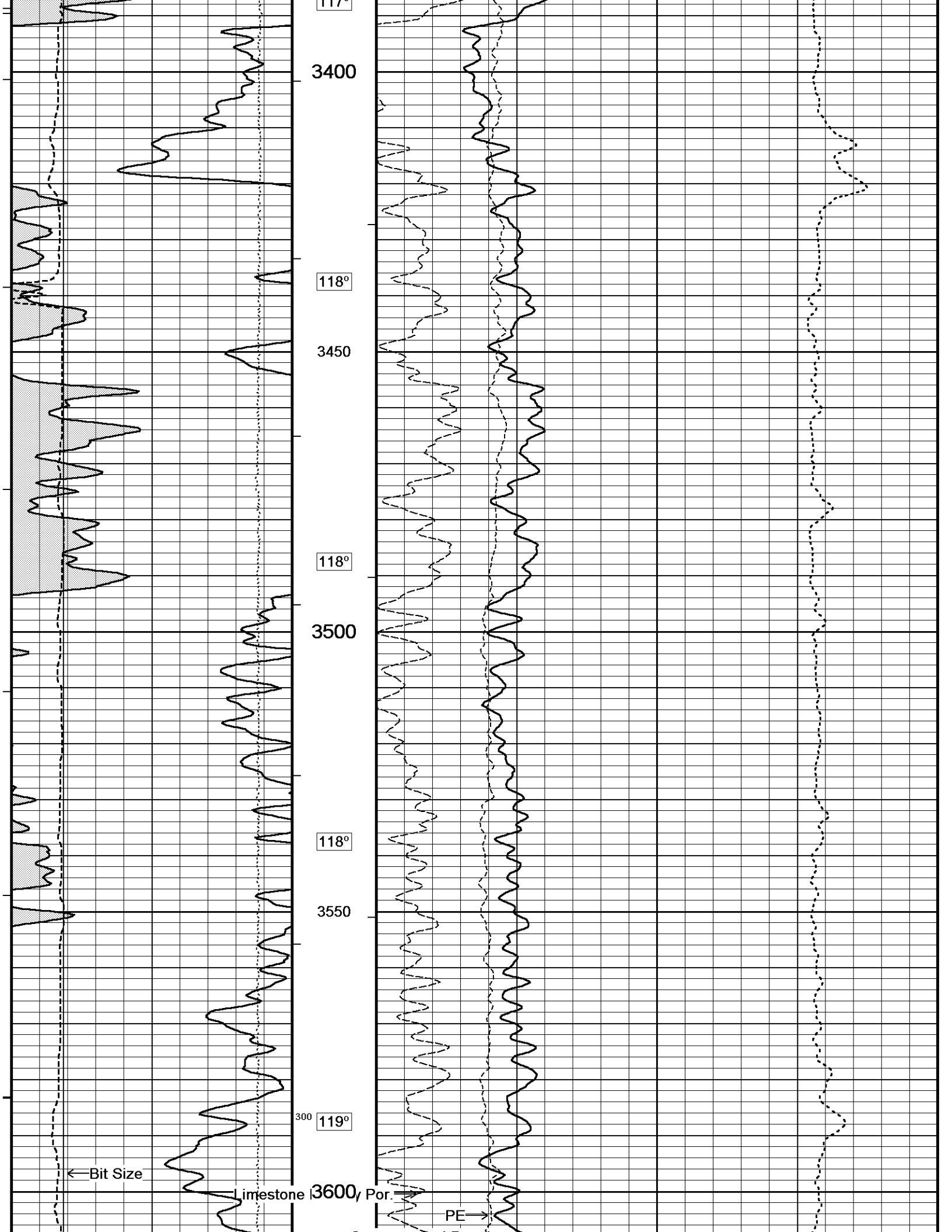
Density Correction
grams/cc
-0.50 0 0.50

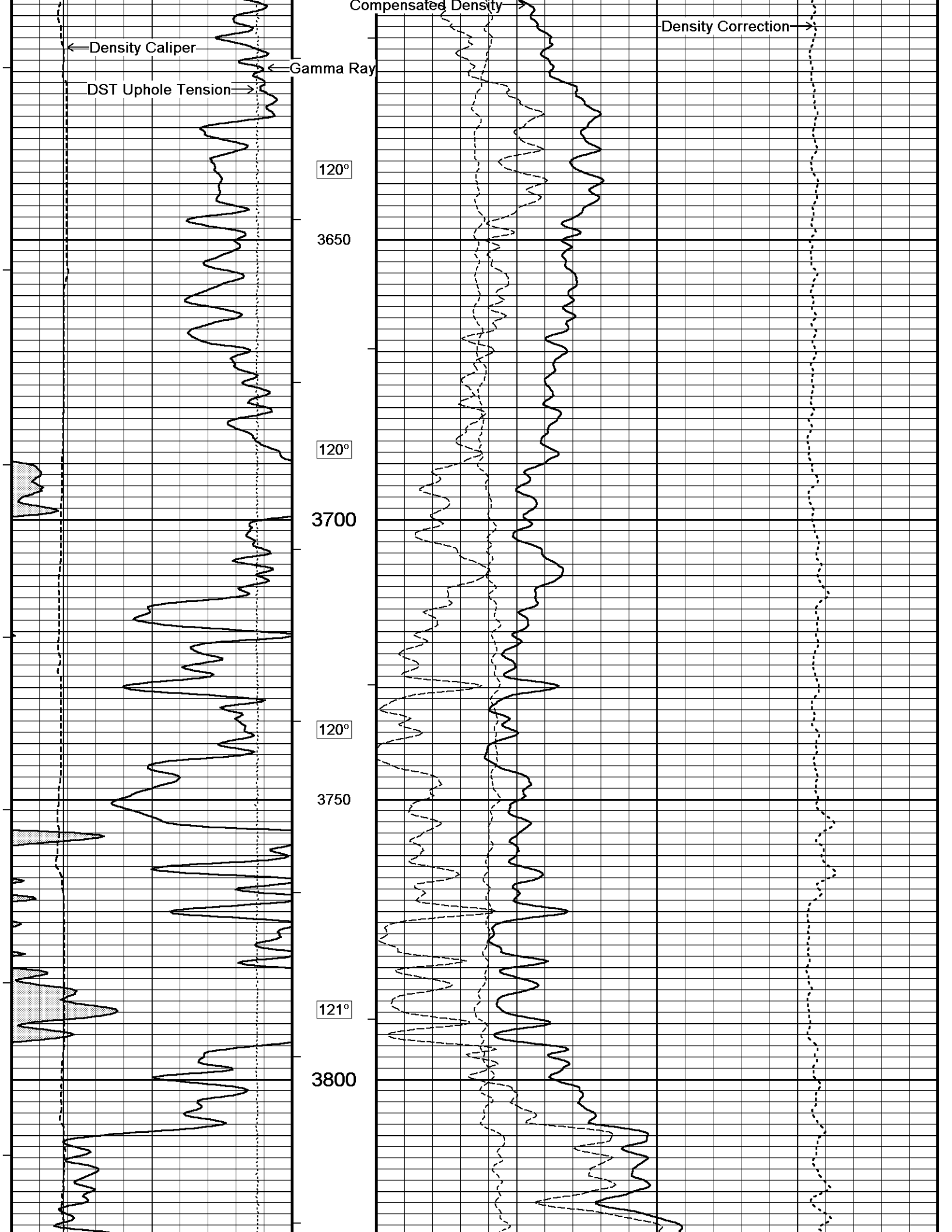
DST Uphole Tension
pounds
5000 0

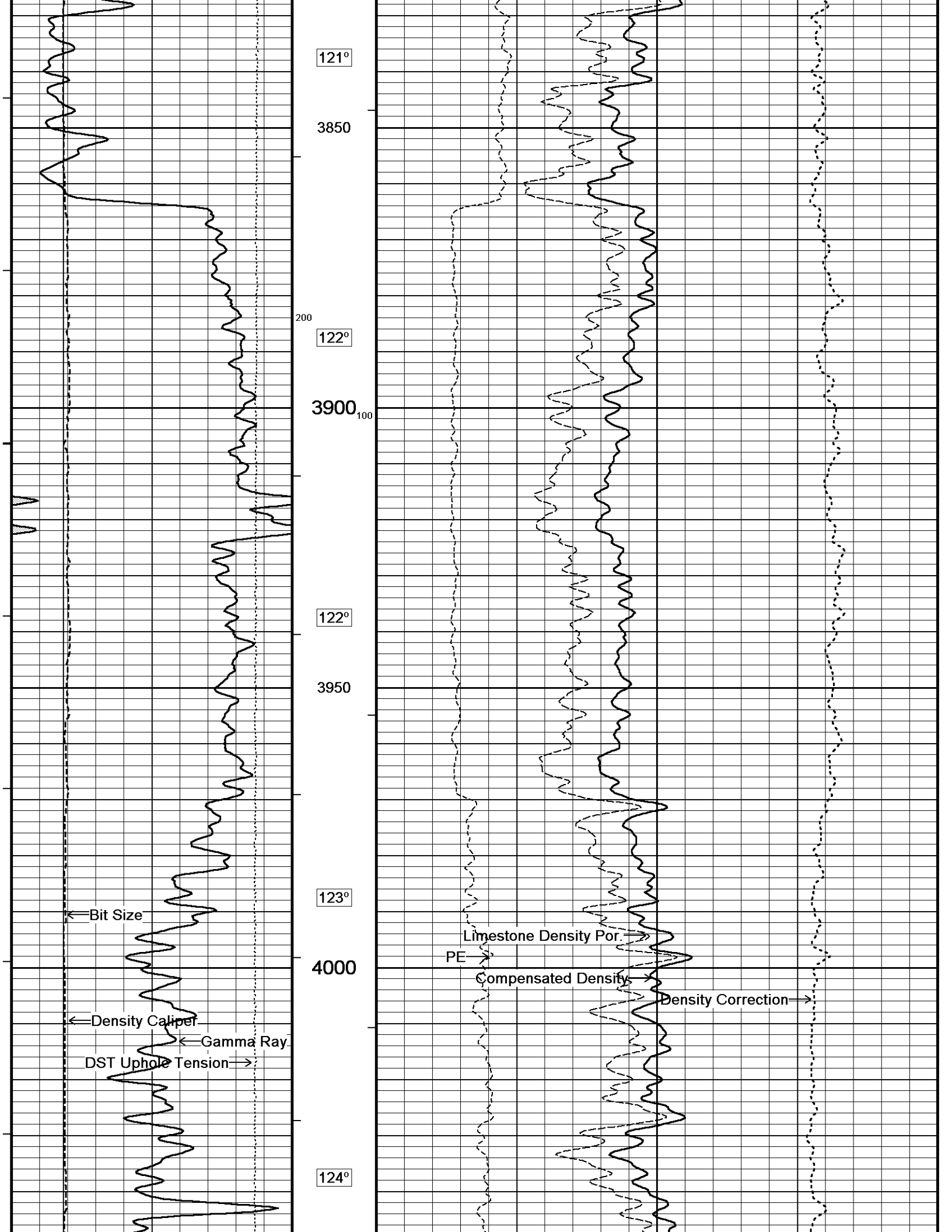
Replay
Scale
1:240

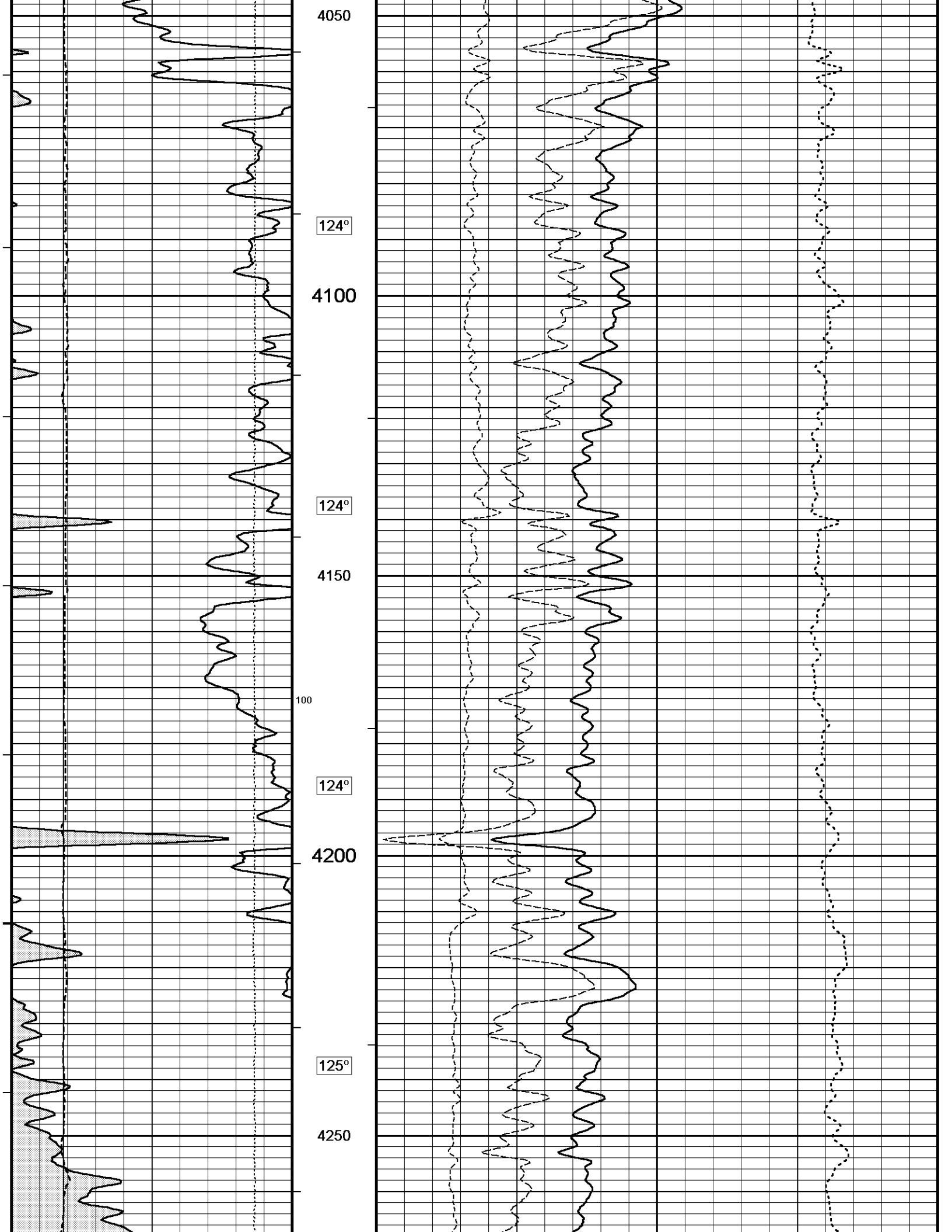
3350

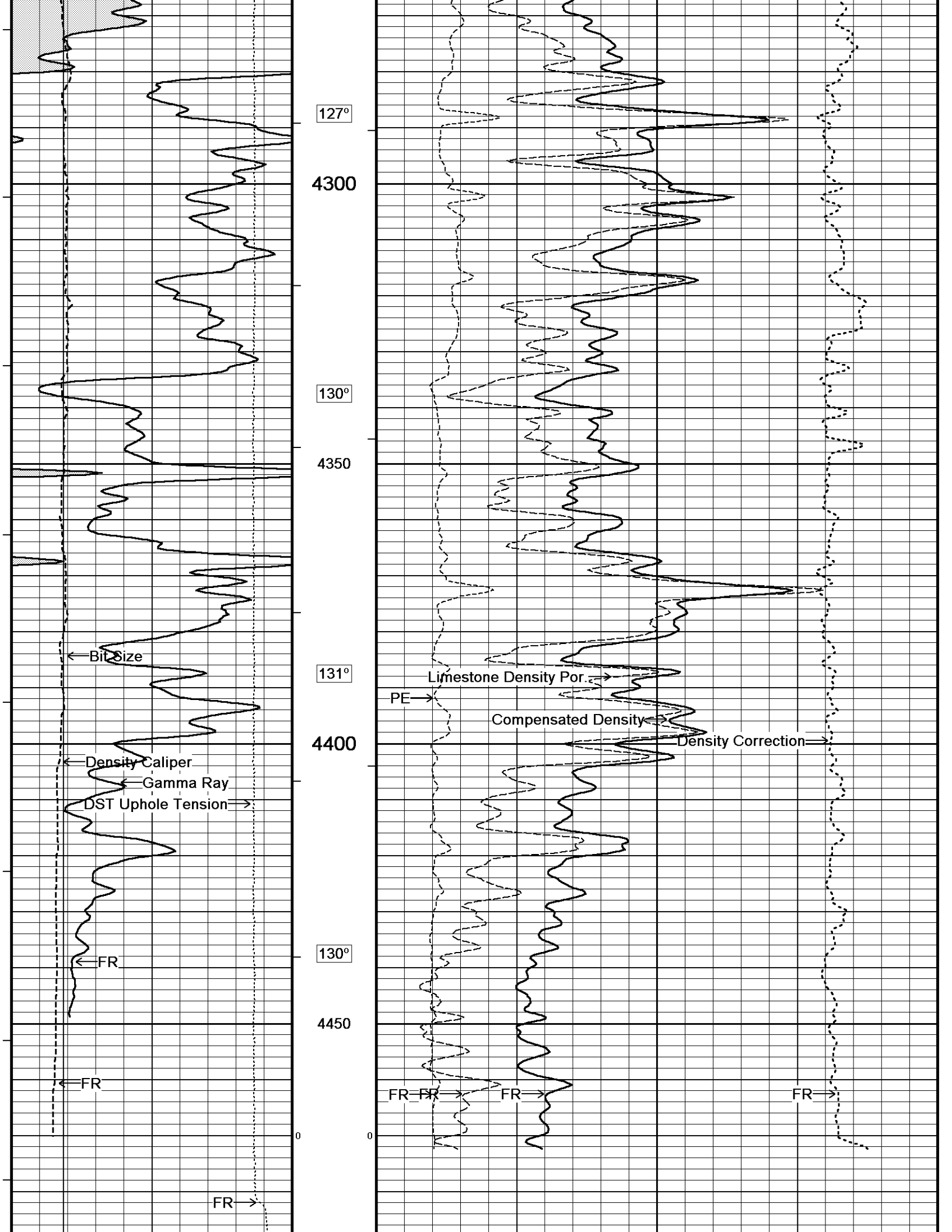


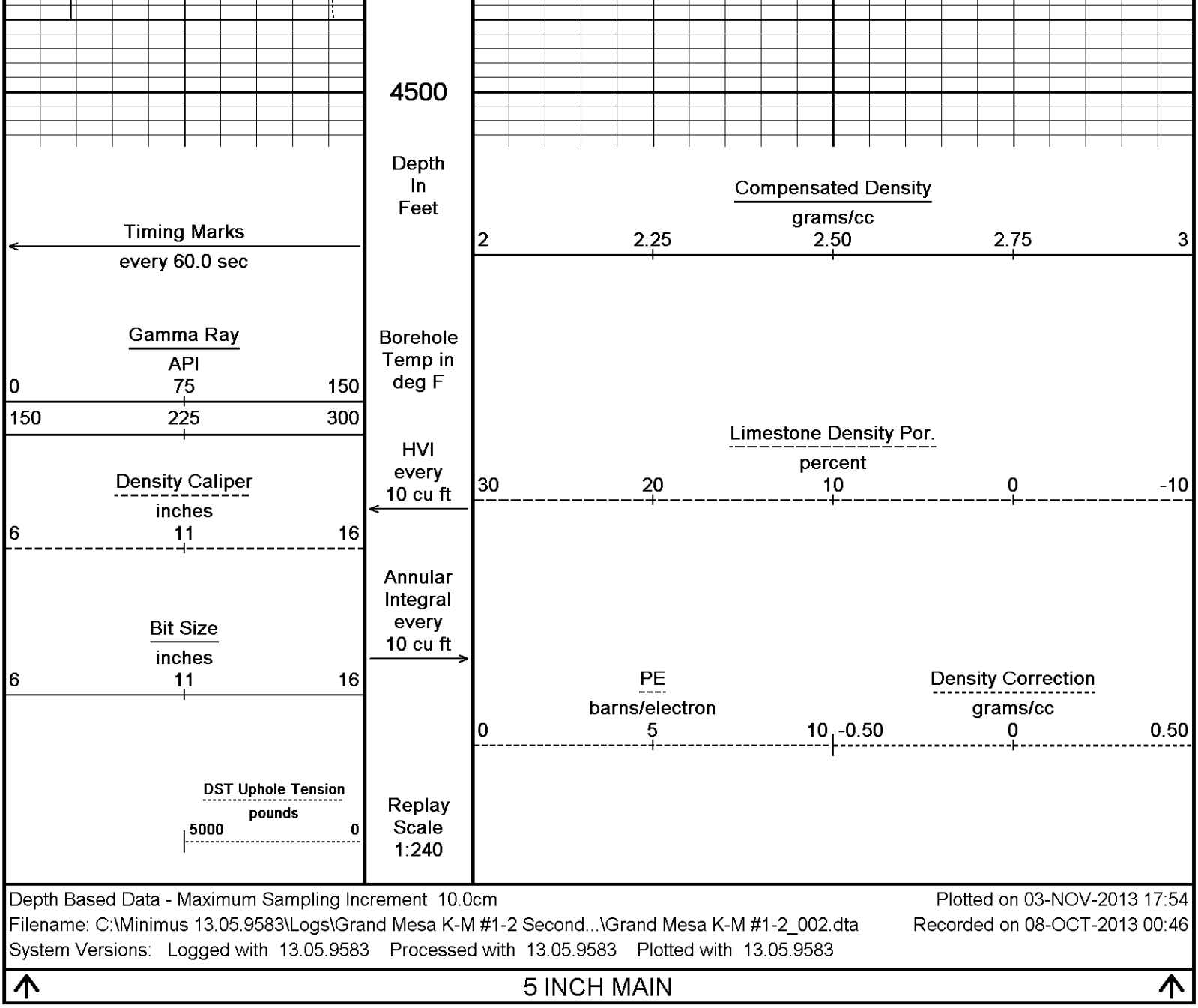

117°
3400
118°
3450
118°
3500
118°
3550
300
119°
Bit Size
Limestone
3600
Por.
PE


Density Caliper
Gamma Ray
DST Uphole Tension
Compensated Density
Density Correction
120°
3650
120°
3700
120°
3750
121°
3800


121°
3850
200
122°
3900
100
122°
3950
123°
4000
124°
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
Limestone Density Por
PE
Compensated Density
Density Correction


4050
124°
4100
124°
4150
100
124°
4200
125°
4250


127°
4300
130°
4350
131°
4400
130°
4450
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
FR
FR
FR
0
Limestone Density Por.
PE
Compensated Density
Density Correction
FR
FR
FR
FR
0

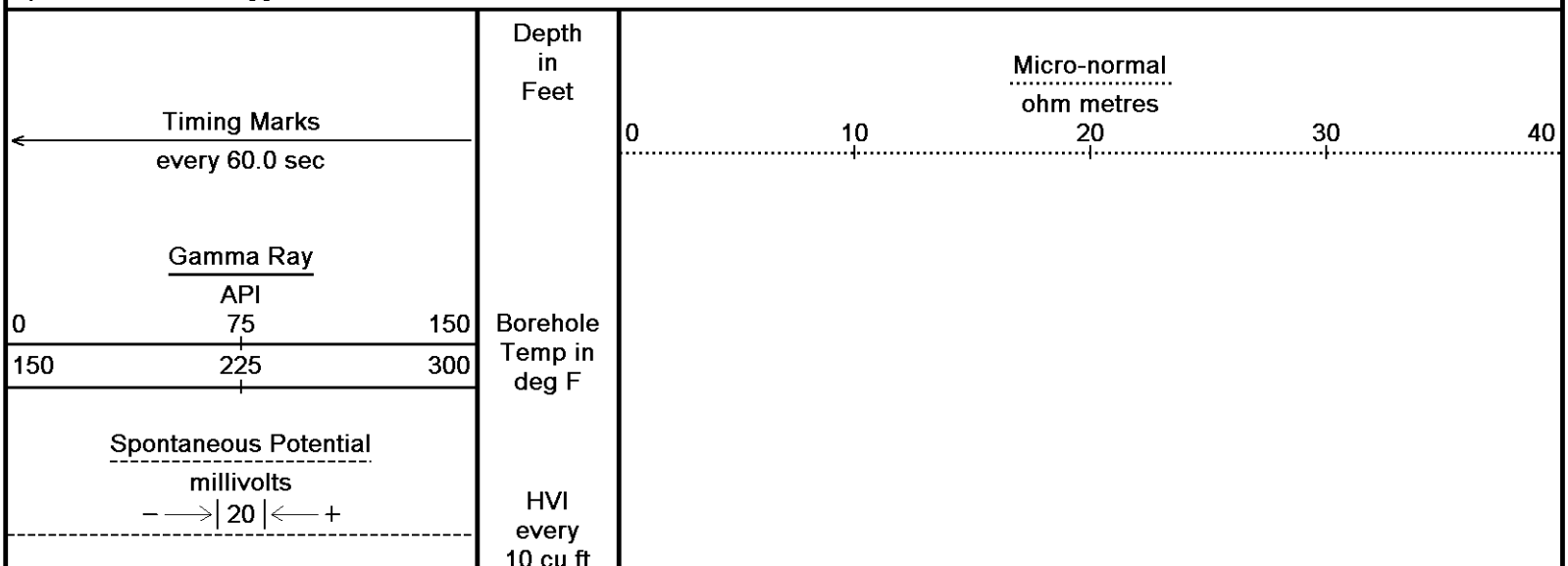


Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-NOV-2013 17:54
Filename: C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second...\Grand Mesa K-M #1-2_002.dta — Recorded on 08-OCT-2013 00:46
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

5 INCH MAIN

5 INCH MAIN LOG 2ND RUN

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-NOV-2013 17:54
Filename: C:\Minimus 13.05.9583\Logs\Grand ...\Grand Mesa K-M #1-2 2nd run mml mdn mpd mss.dta — Recorded on 03-NOV-2013 11:00
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583



MML Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Annular Integral every 10 cu ft

Replay Scale 1:240

Micro-inverse
ohm metres
0 10 20 30 40

3400

129°

3450

1100

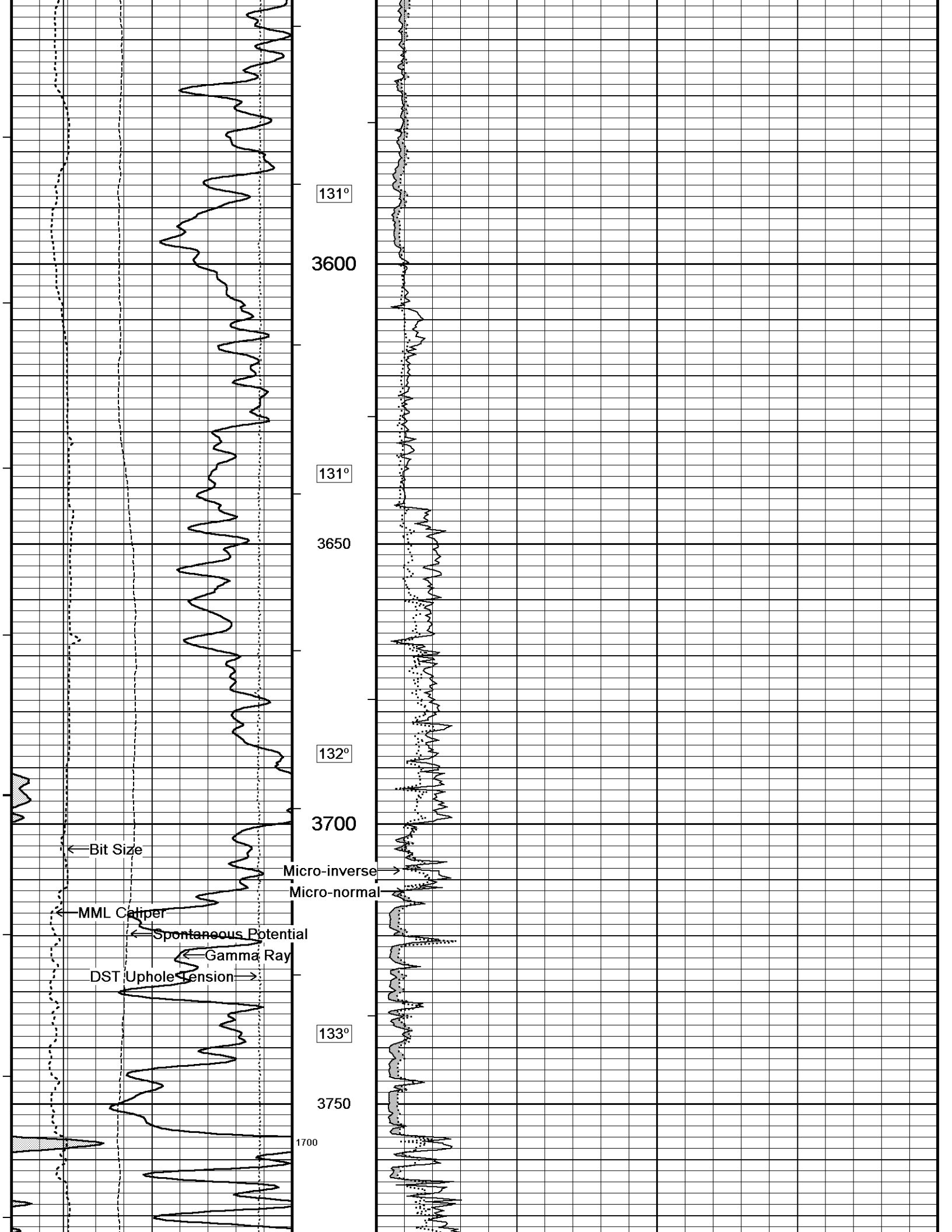
1800

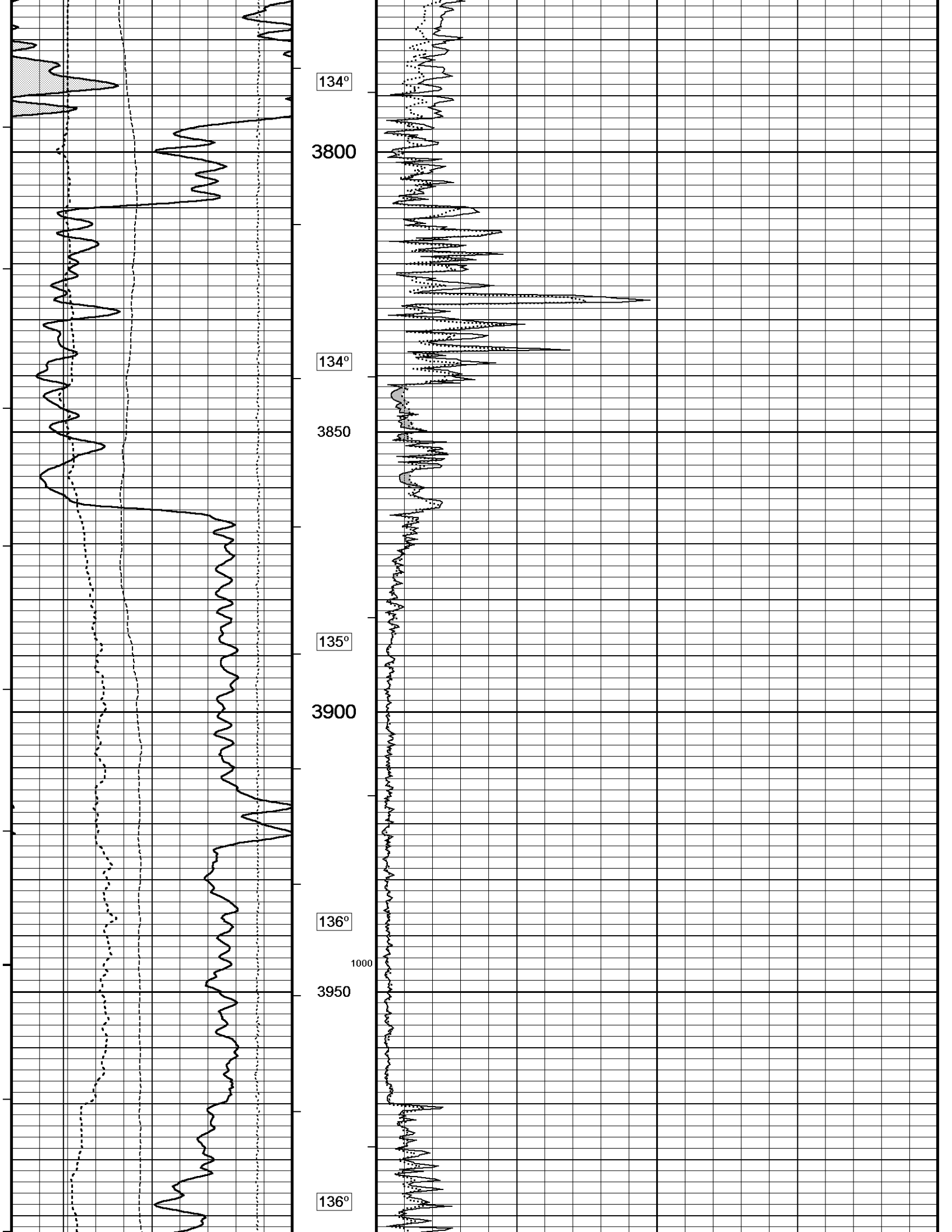
130°

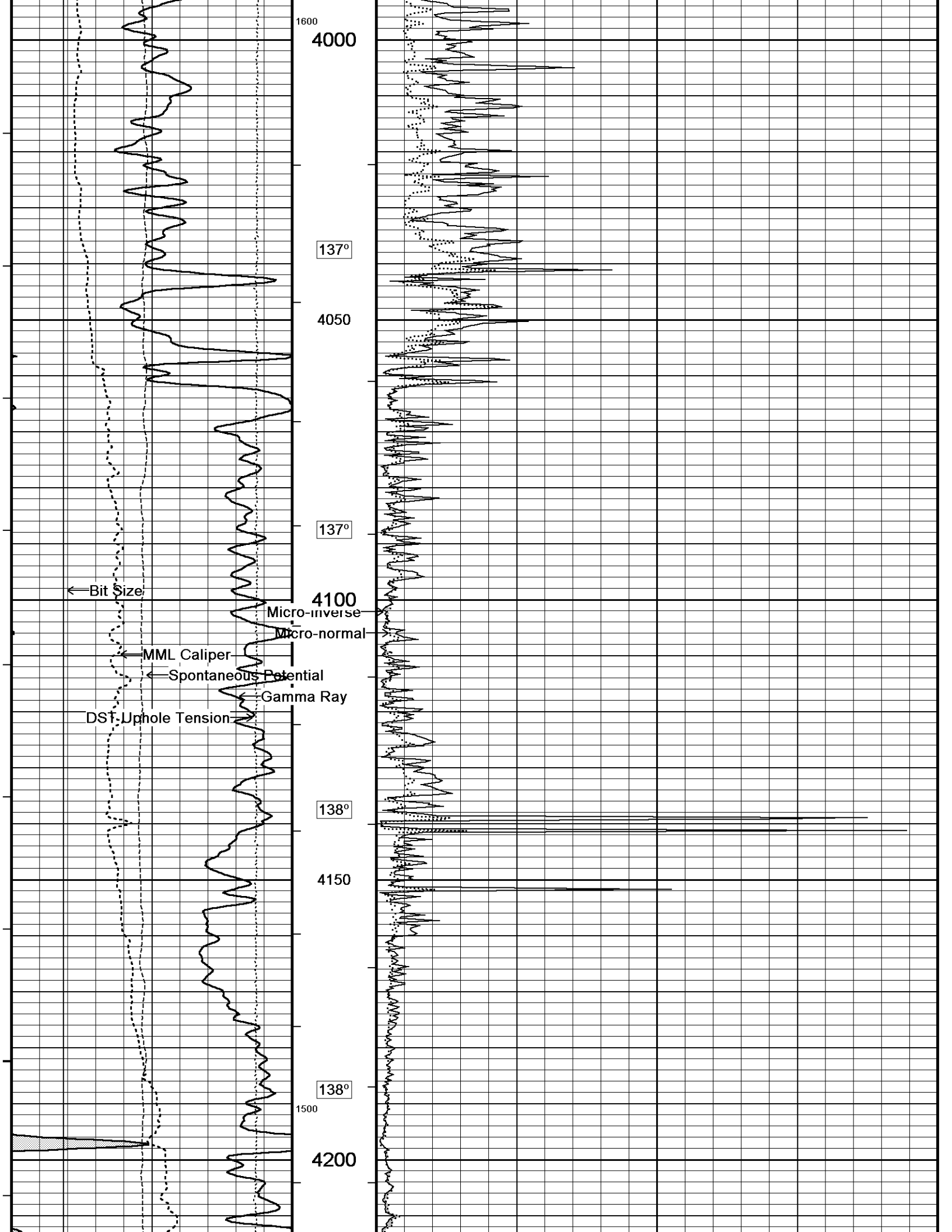
3500

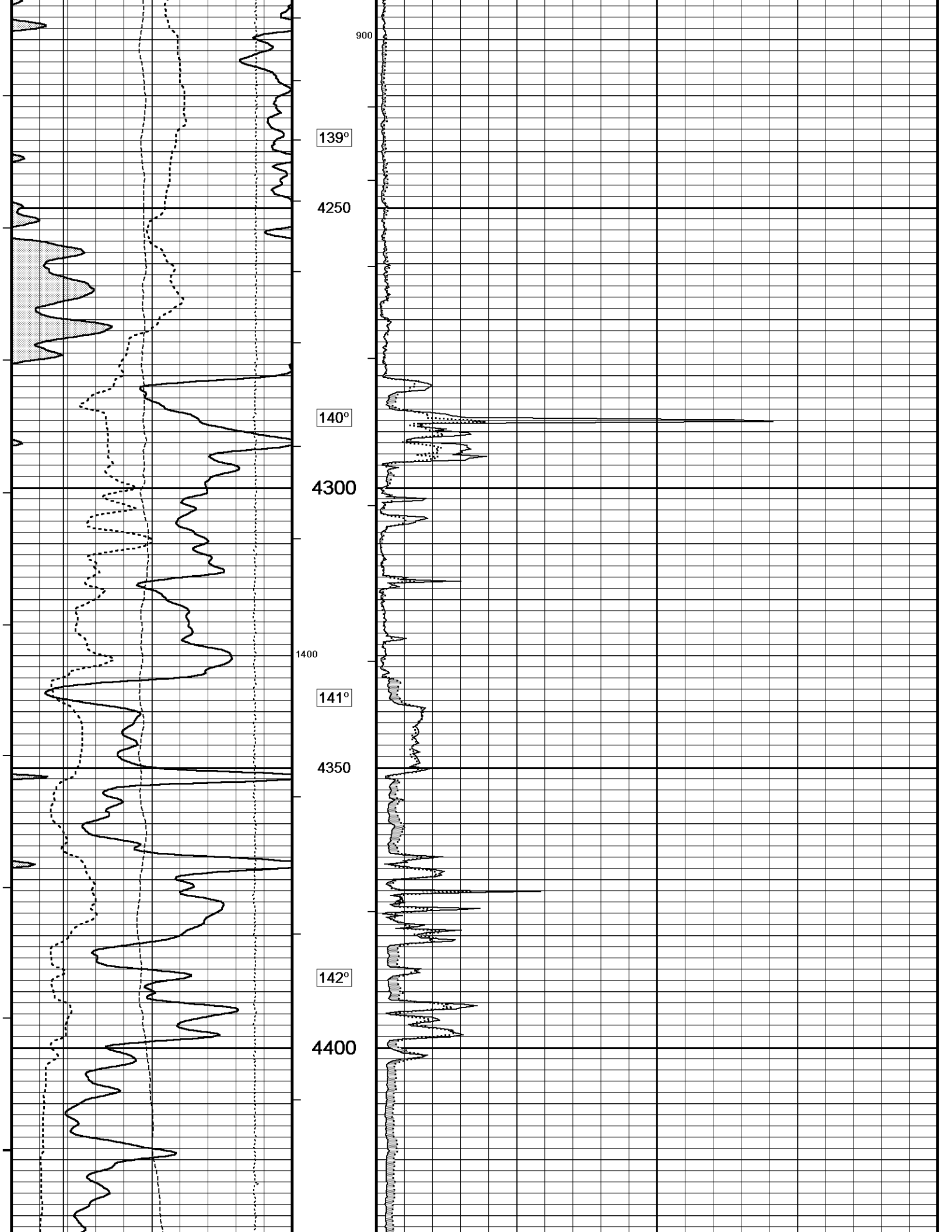
130°

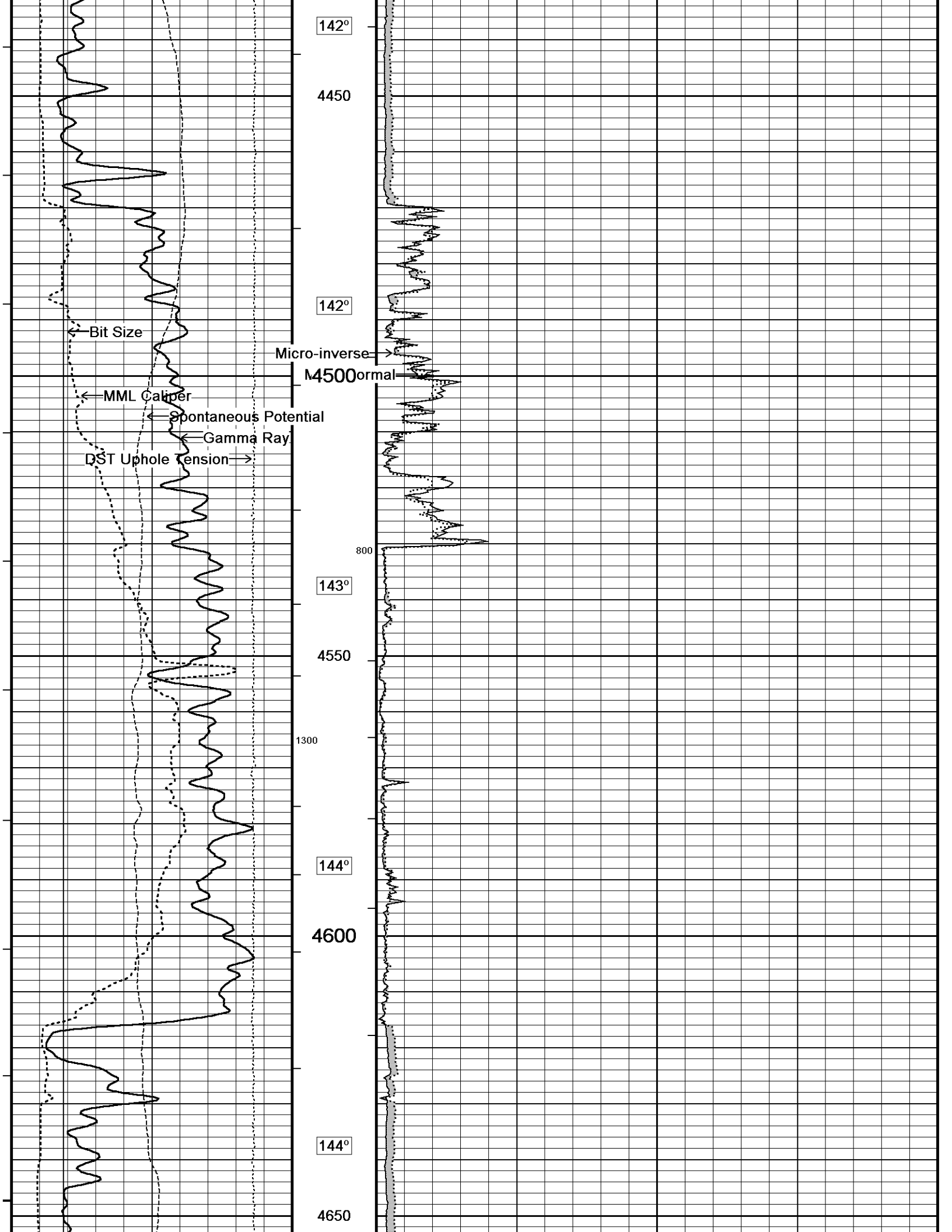
3550

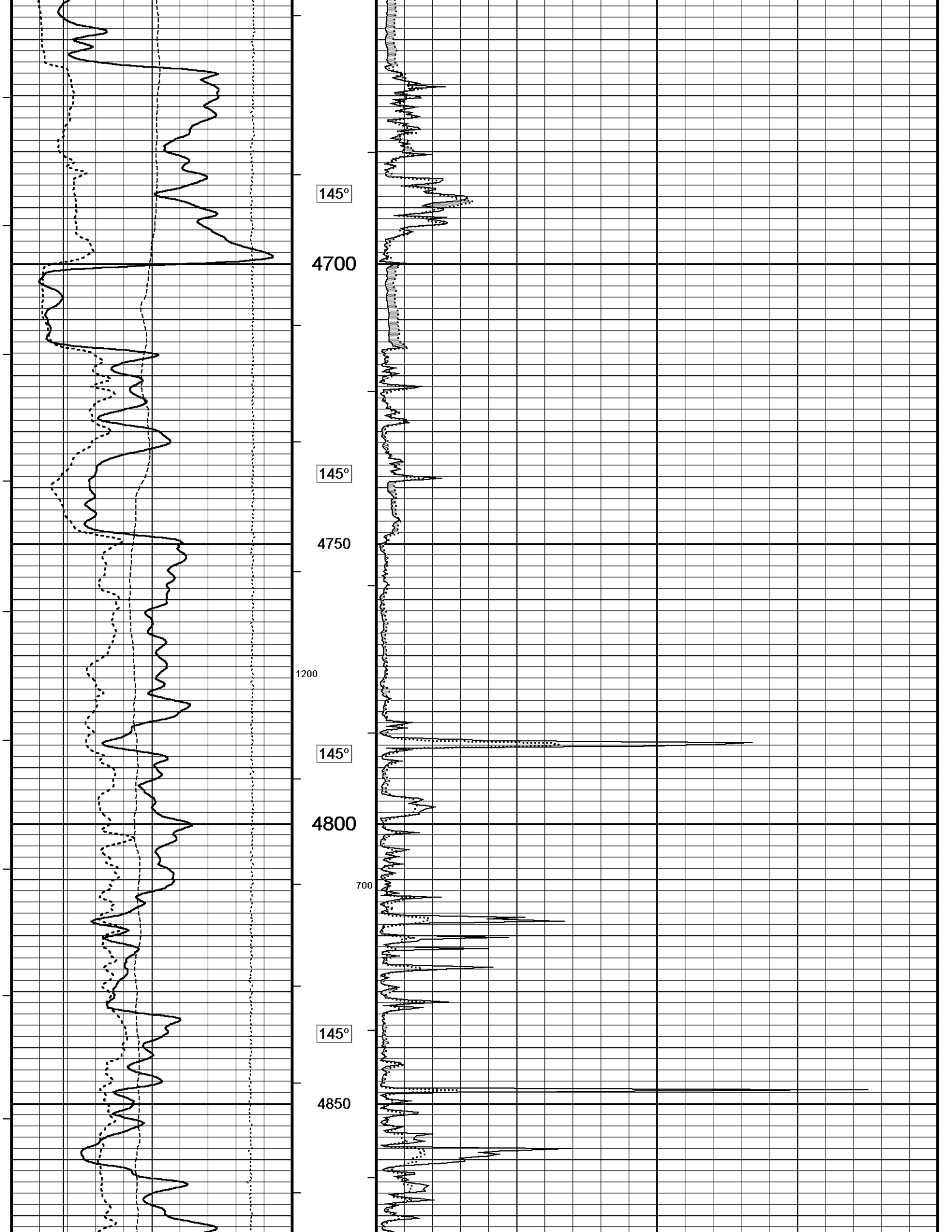

131°
3600
131°
3650
132°
3700
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
133°
3750
1700

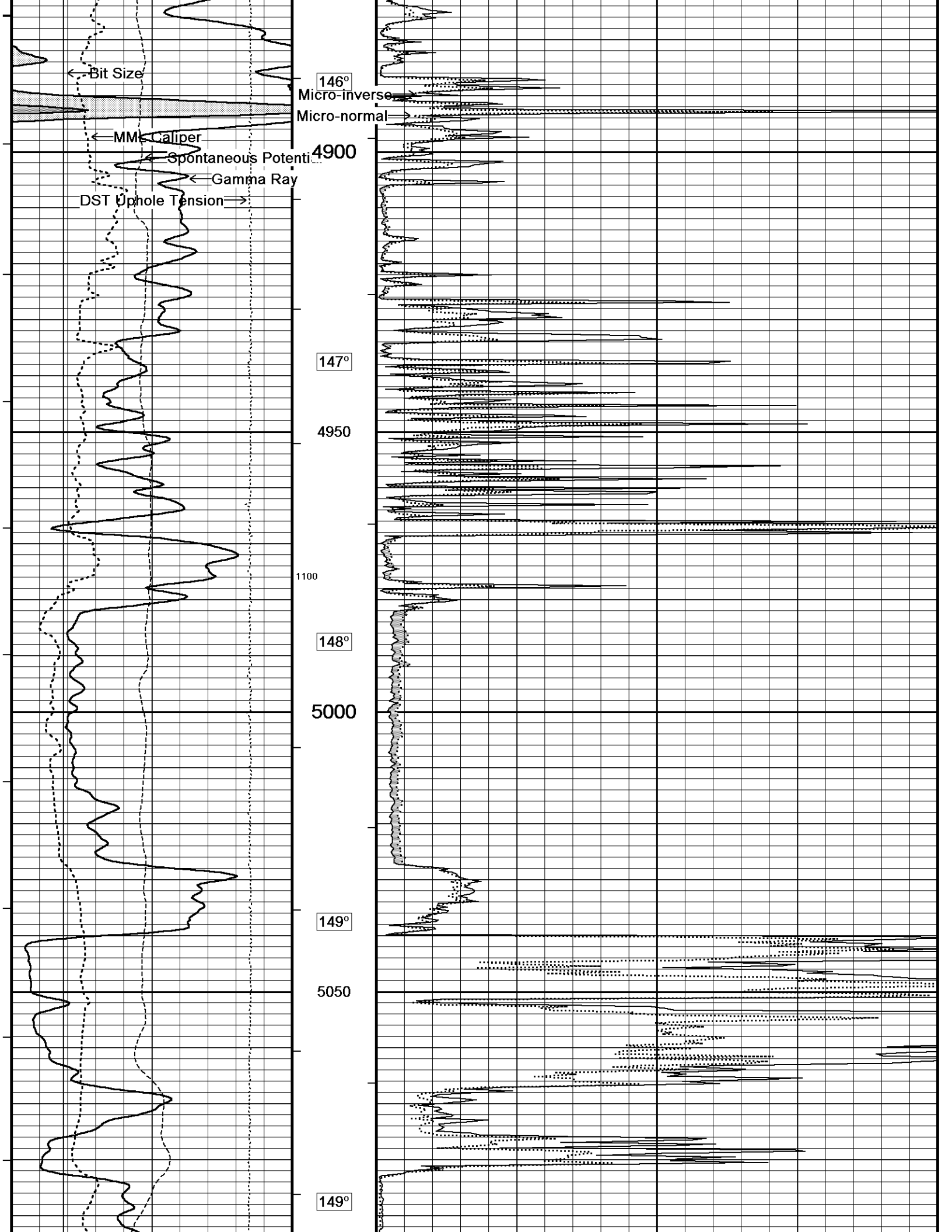

134°
3800
134°
3850
135°
3900
136°
1000
3950
136°

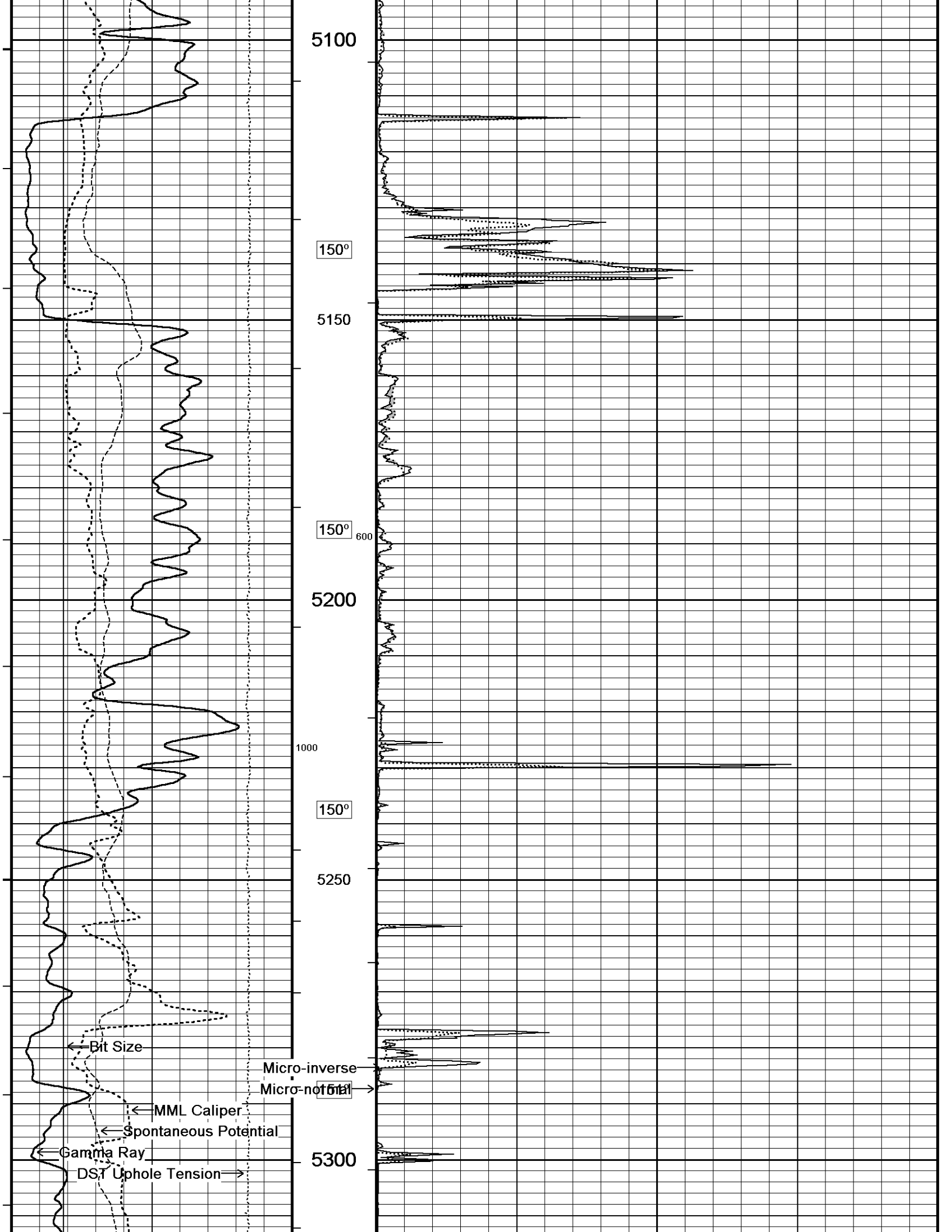

1600
4000
137°
4050
137°
Bit Size
4100
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
138°
4150
138°
1500
4200

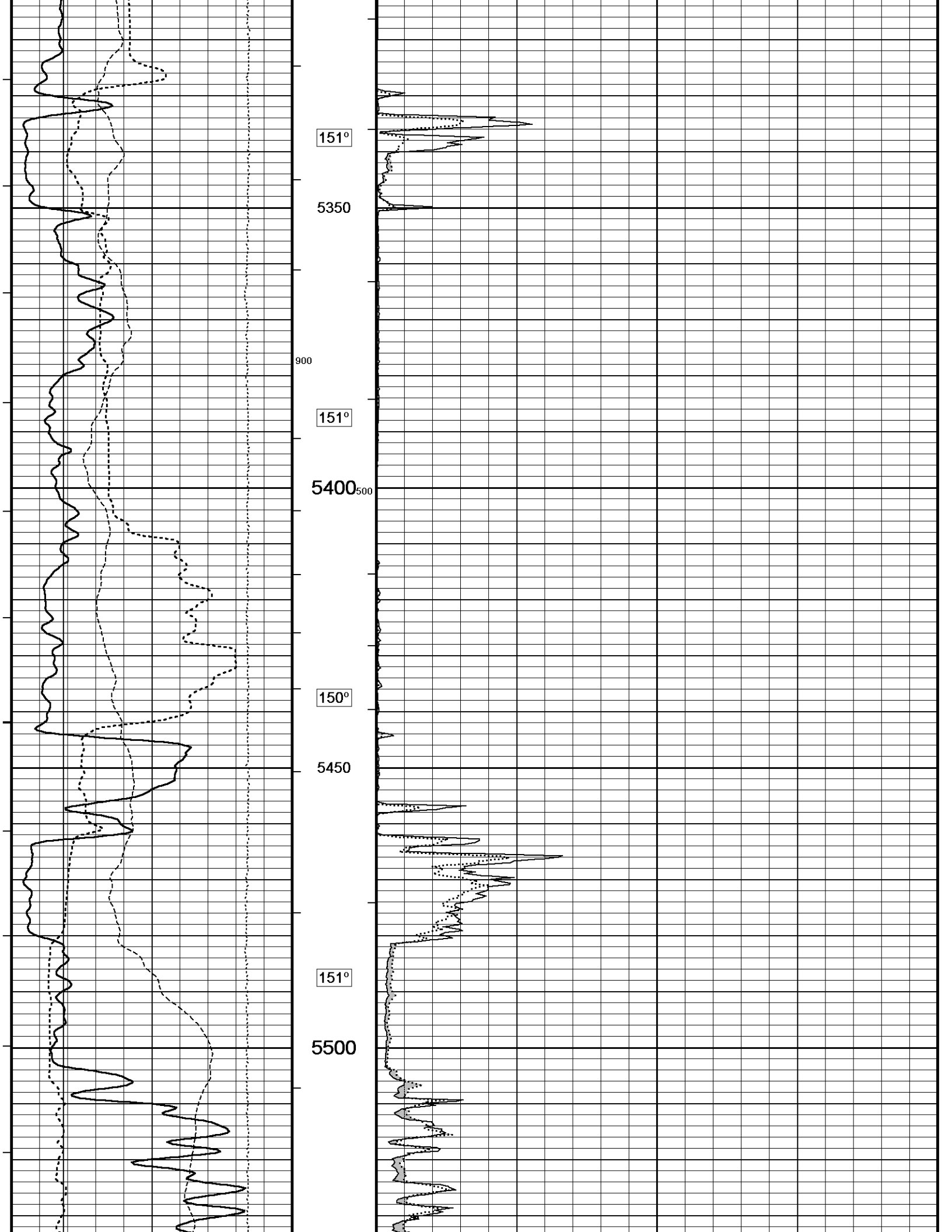

900
139°
4250
140°
4300
1400
141°
4350
142°
4400

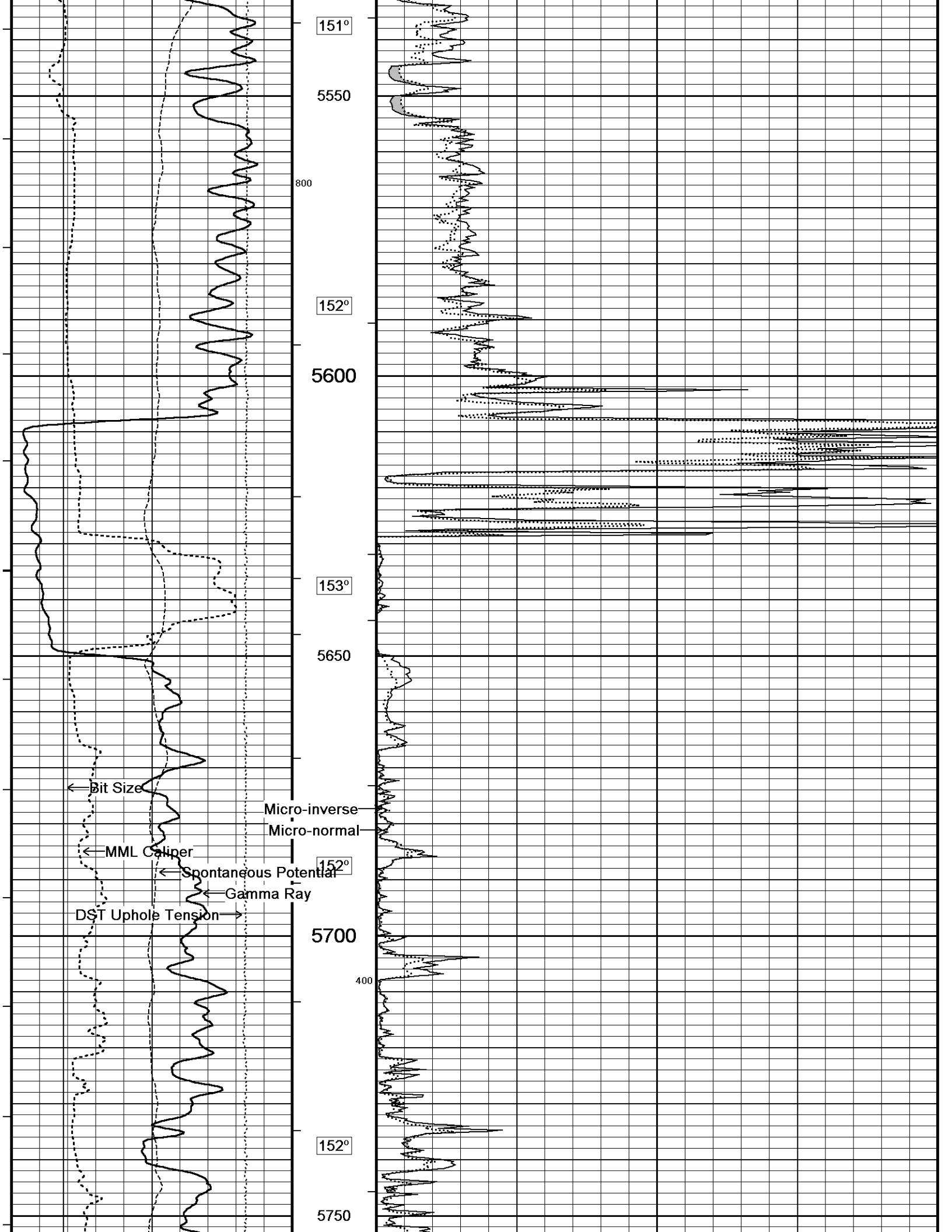

142°
4450
142°
Bit Size
Micro-inverse
4500
Normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
800
143°
4550
1300
144°
4600
144°
4650

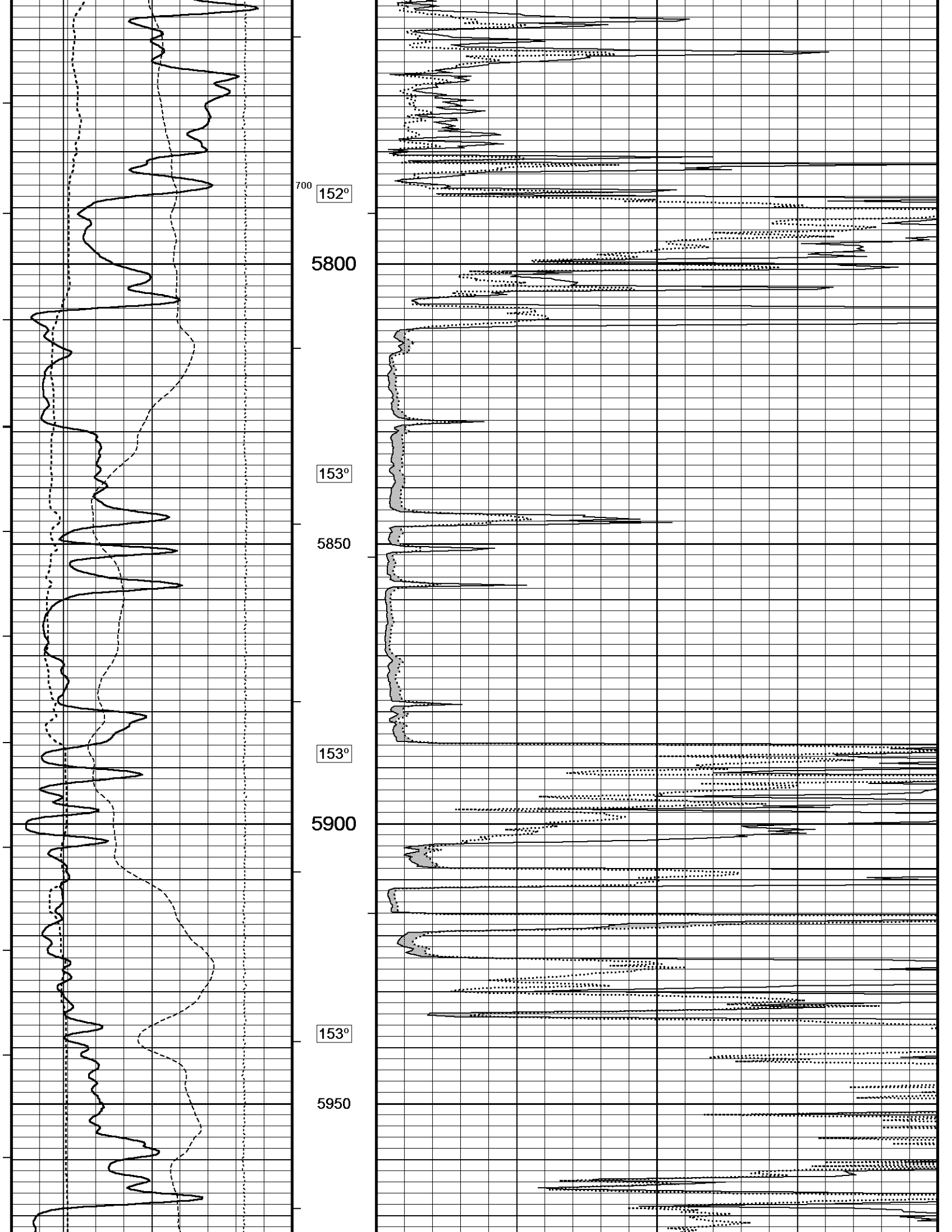

145°
4700
145°
4750
1200
145°
4800
700
145°
4850

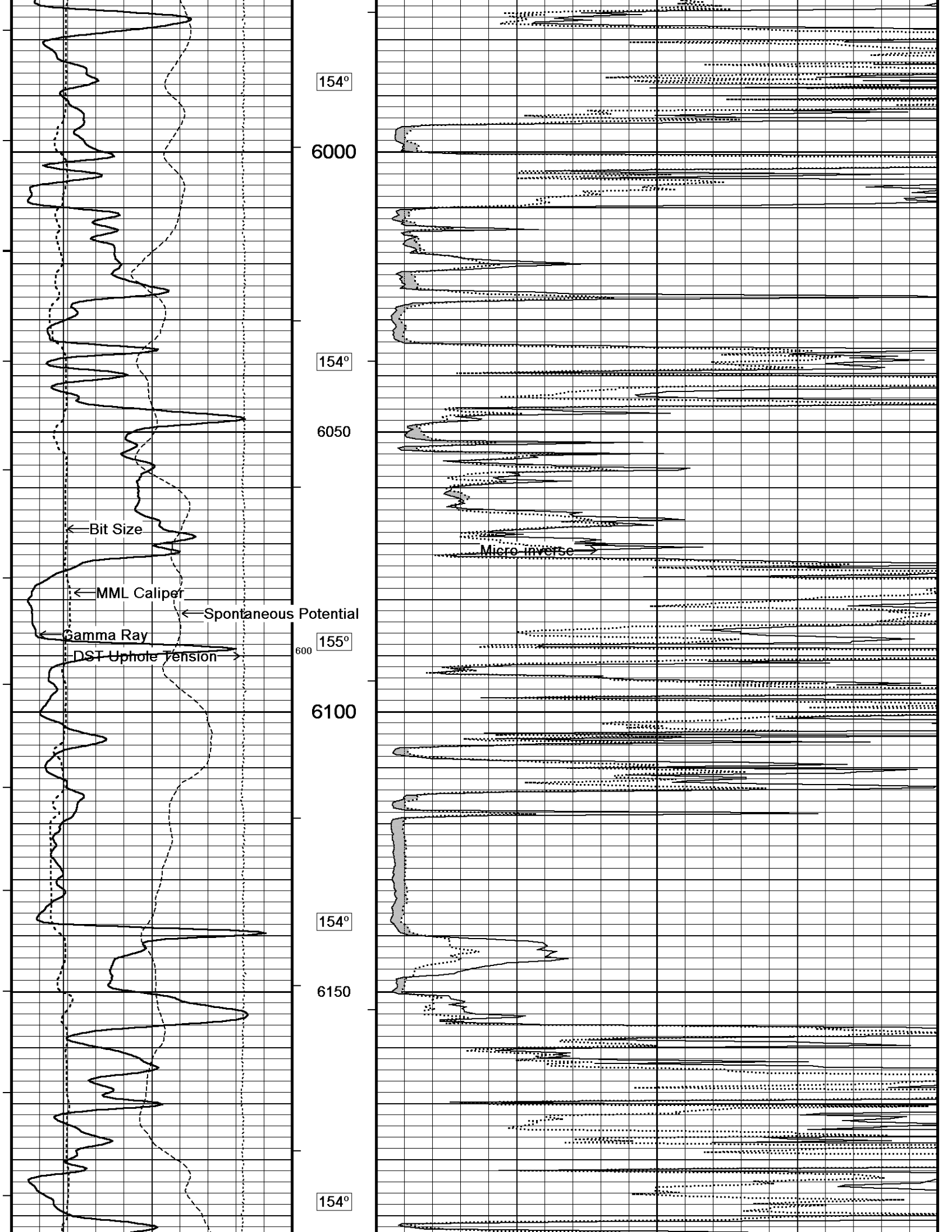

Bit Size
MMC Caliper
Spontaneous Potenti
Gamma Ray
DST Uphole Tension
146°
Micro-inverse
Micro-normal
4900
147°
4950
1100
148°
5000
149°
5050
149°

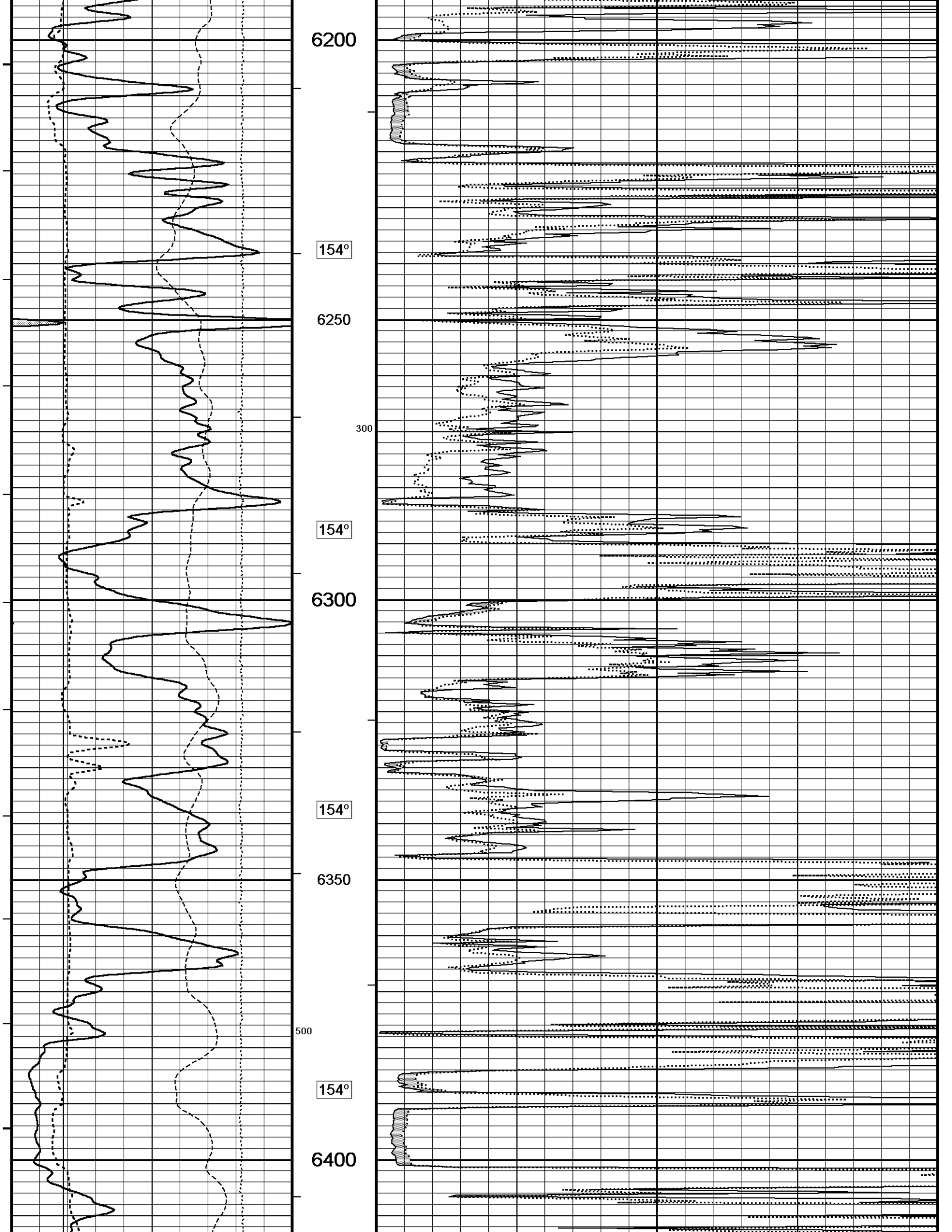

5100
150°
5150
150°
600
5200
1000
150°
5250
Bit Size
Micro-inverse
Micro-normal
150°
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
5300

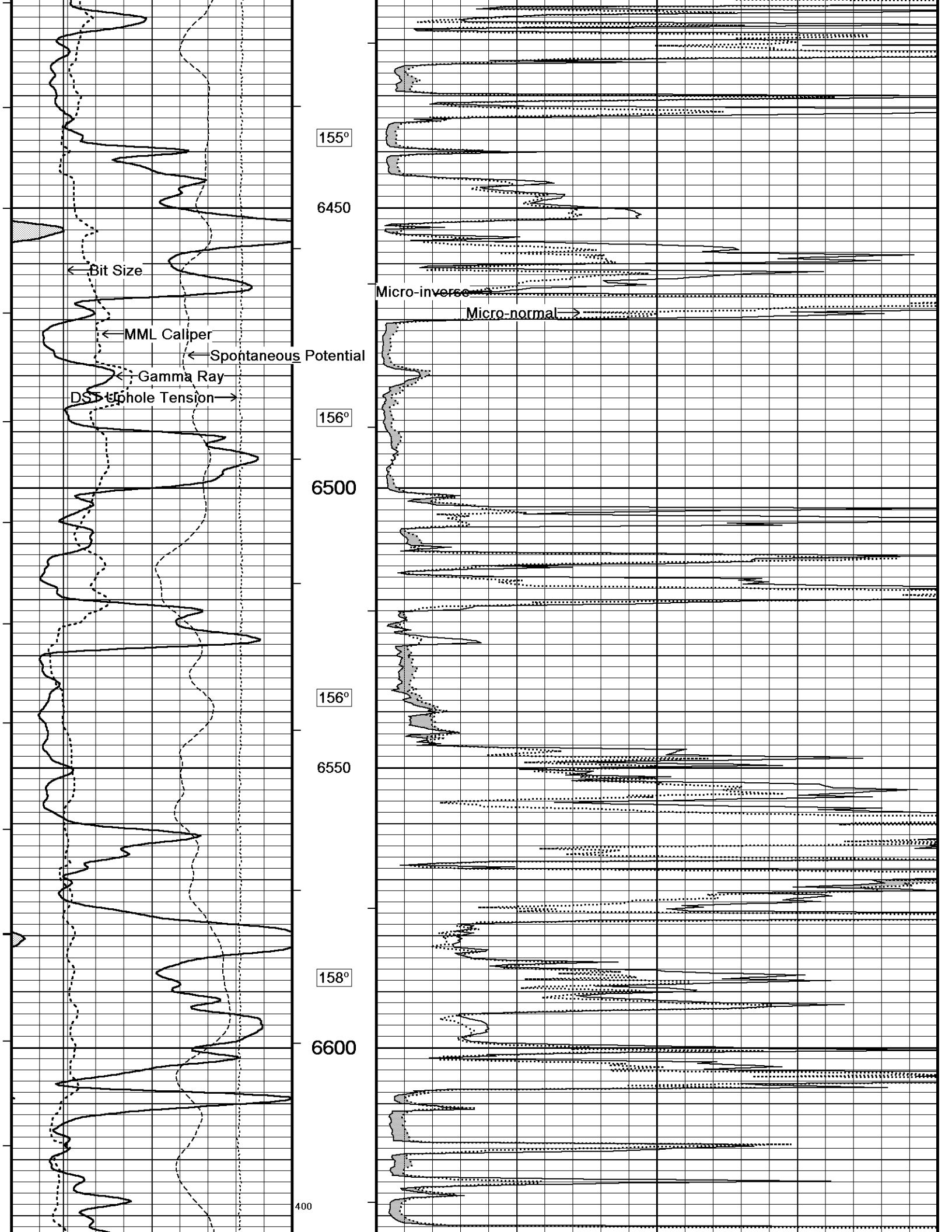

151°
5350
900
151°
5400
500
150°
5450
151°
5500

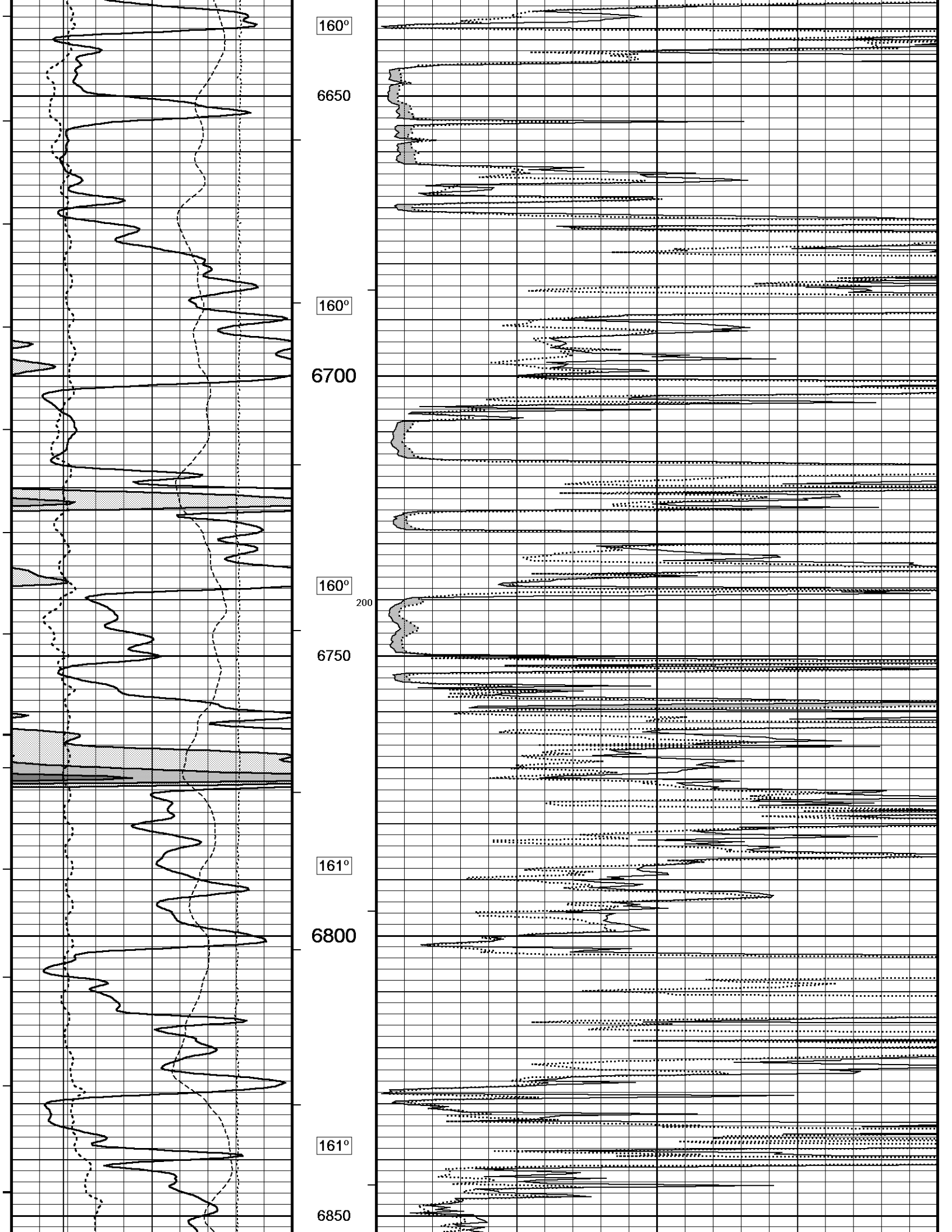

151°
5550
800
152°
5600
153°
5650
Bit Size
Micro-inverse
Micro-normal
MML Caliper
152°
Spontaneous Potential
Gamma Ray
DST Uphole Tension
5700
400
152°
5750

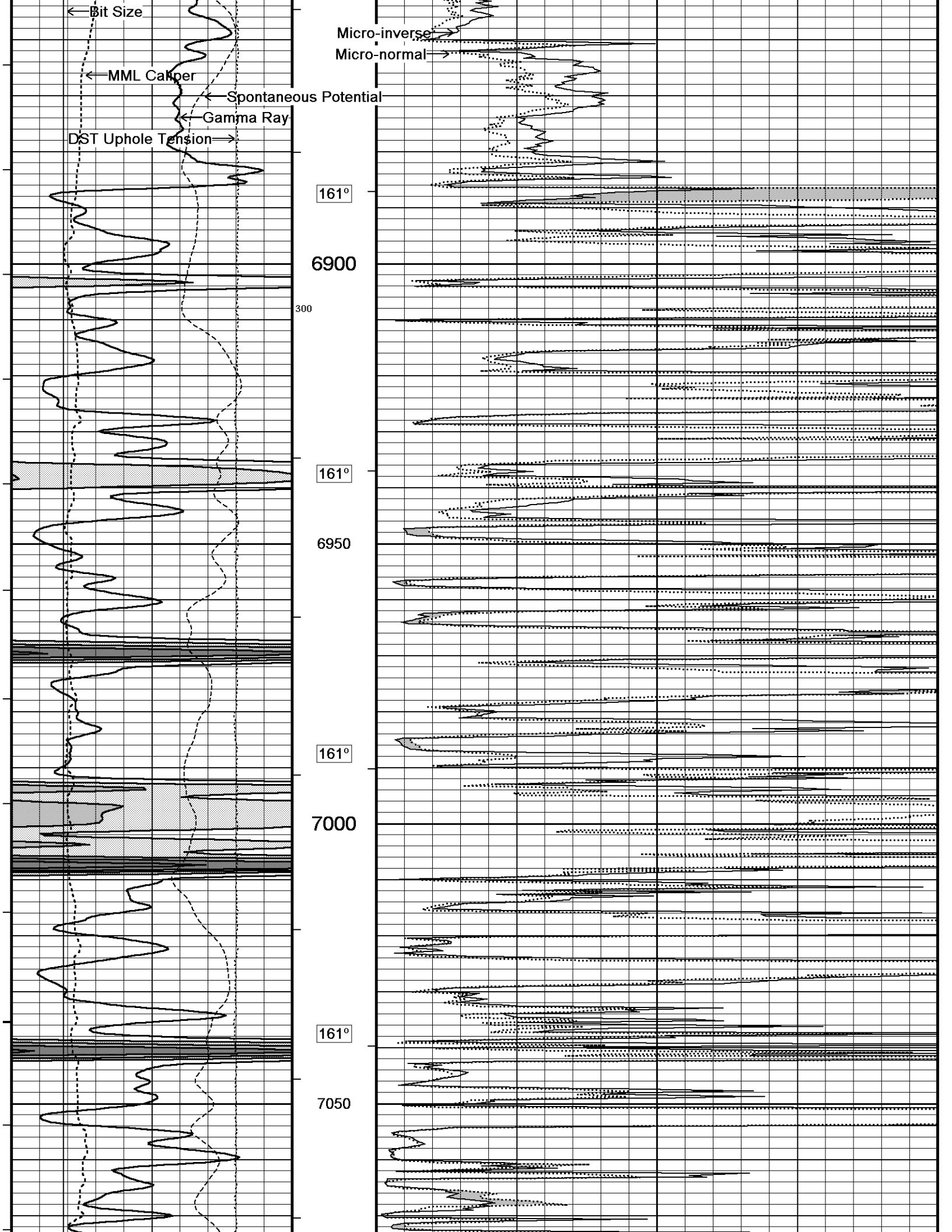

700
152°
5800
153°
5850
153°
5900
153°
5950

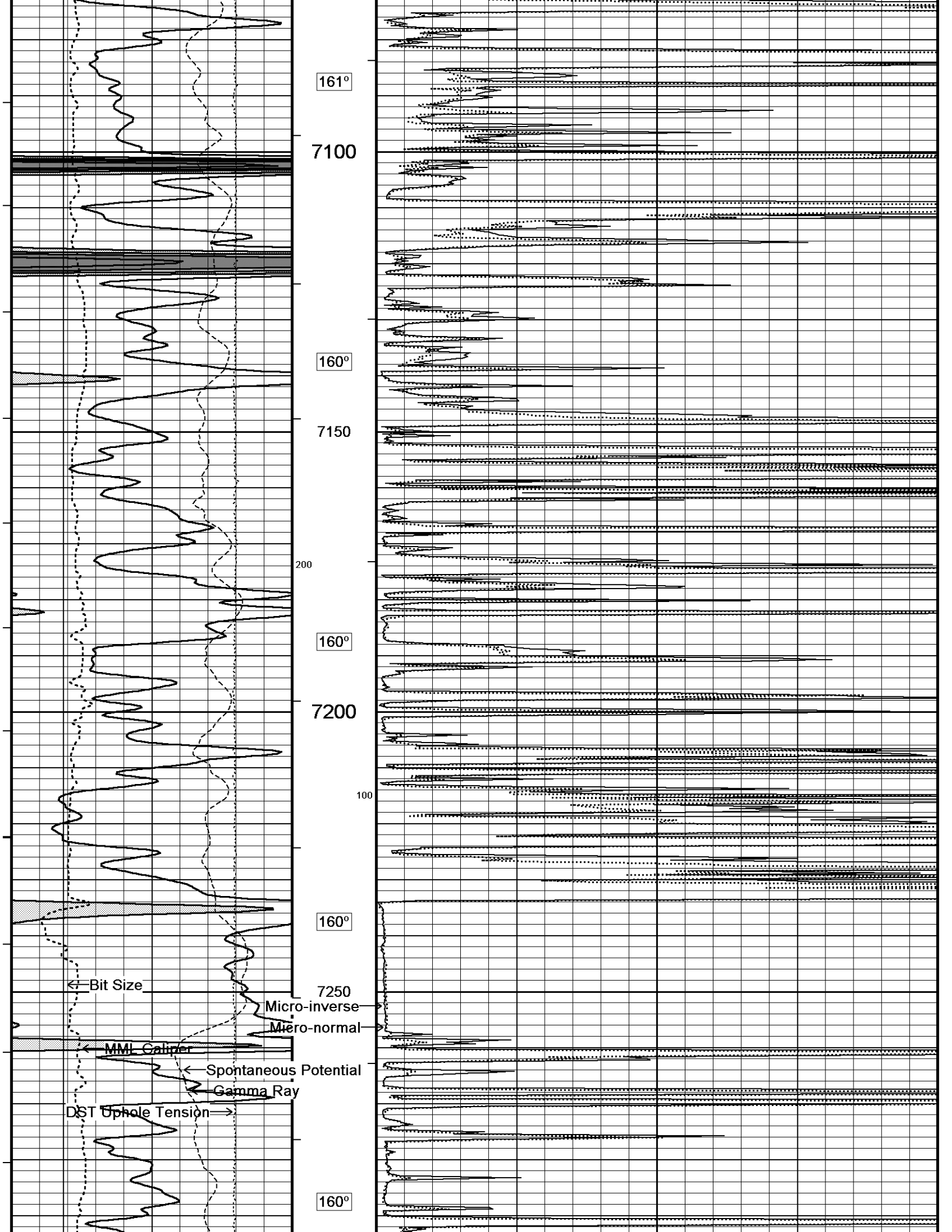

154°
6000
154°
6050
Bit Size
Micro-inverse
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
600
155°
6100
154°
6150
154°

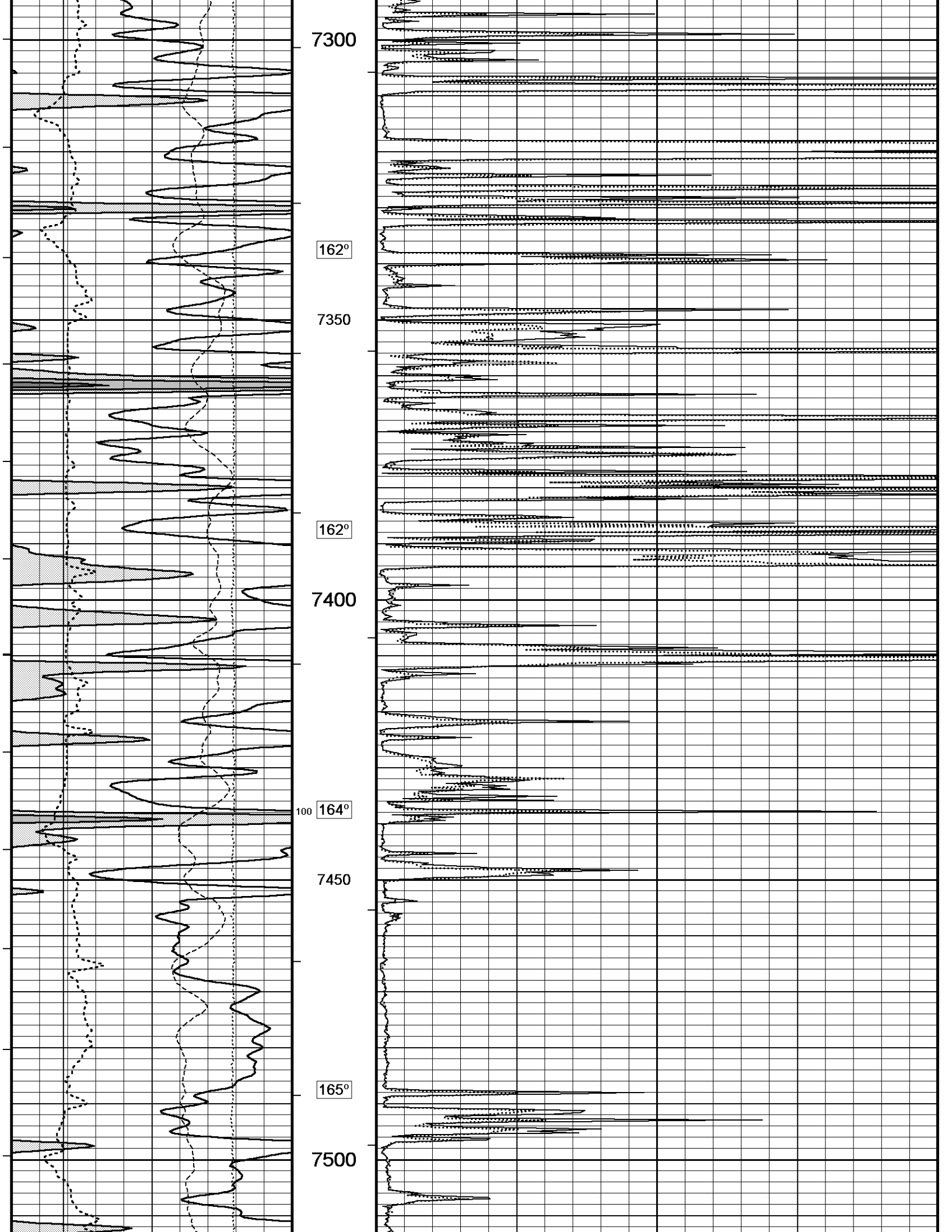

6200
154°
6250
300
154°
6300
154°
6350
500
154°
6400

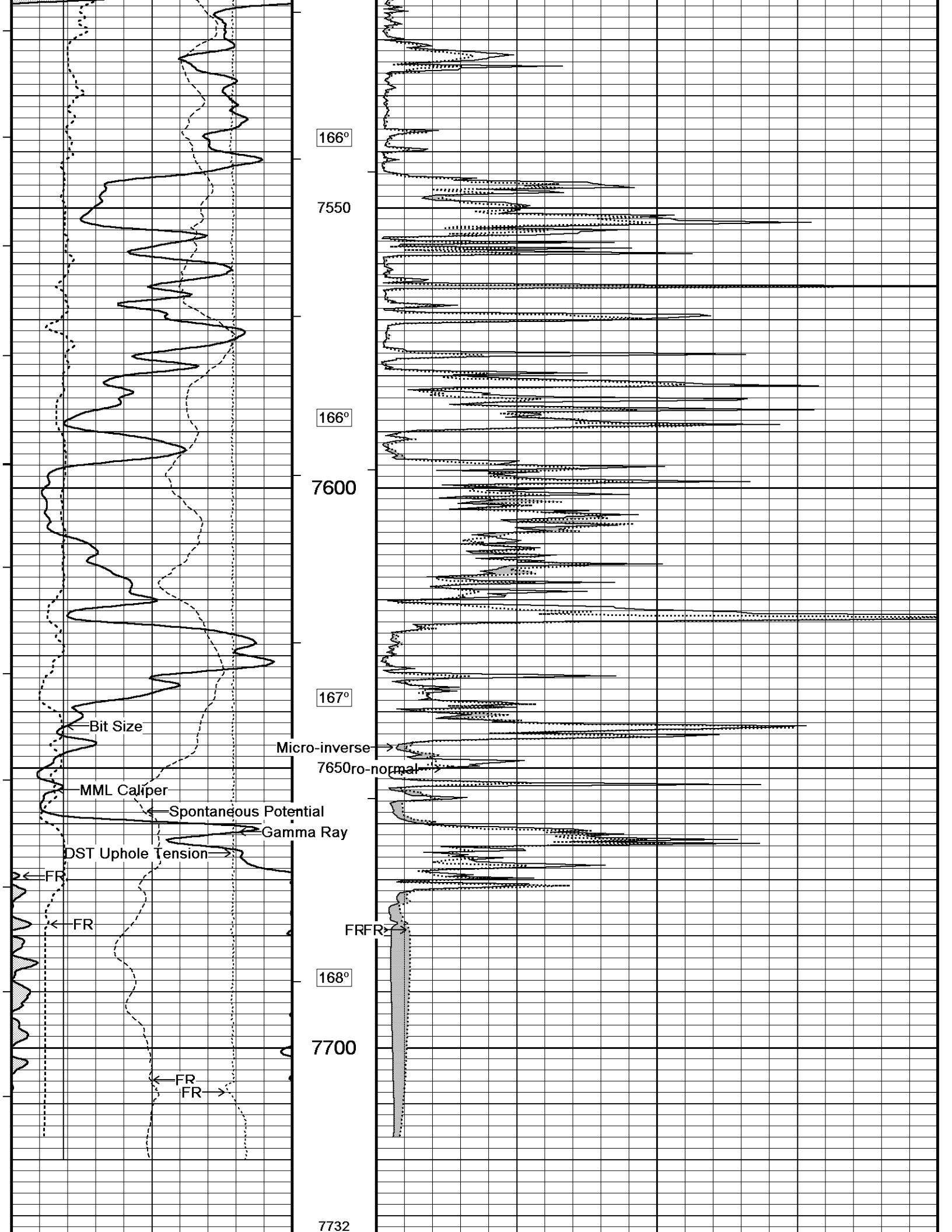

155°
6450
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
156°
6500
156°
6550
158°
6600
400


160°
6650
160°
6700
160°
200
6750
161°
6800
161°
6850


Bit Size
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Micro-inverse
Micro-normal
161°
6900
300
161°
6950
161°
7000
161°
7050


161°
7100
160°
7150
200
160°
7200
100
160°
7250
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
160°


7300
162°
7350
162°
7400
100
164°
7450
165°
7500


166°
7550
166°
7600
167°
Bit Size
Micro-inverse
7650ro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
FR
FR
FRFR
168°
7700
FR
FR
7732

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

HVI every 10 cu ft

Annular Integral every 10 cu ft

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 03-NOV-2013 17:54
Filename: C:\Minimus 13.05.9583\Logs\Grand ...\Grand Mesa K-M #1-2 2nd run mml mdn mpd mss.dta — Recorded on 03-NOV-2013 11:00
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

↑ 5 INCH MAIN LOG 2ND RUN ↑

↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-NOV-2013 17:54
Filename: C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second...\Grand Mesa K-M #1-2_001.dta — Recorded on 08-OCT-2013 00:21
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

Depth in Feet

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

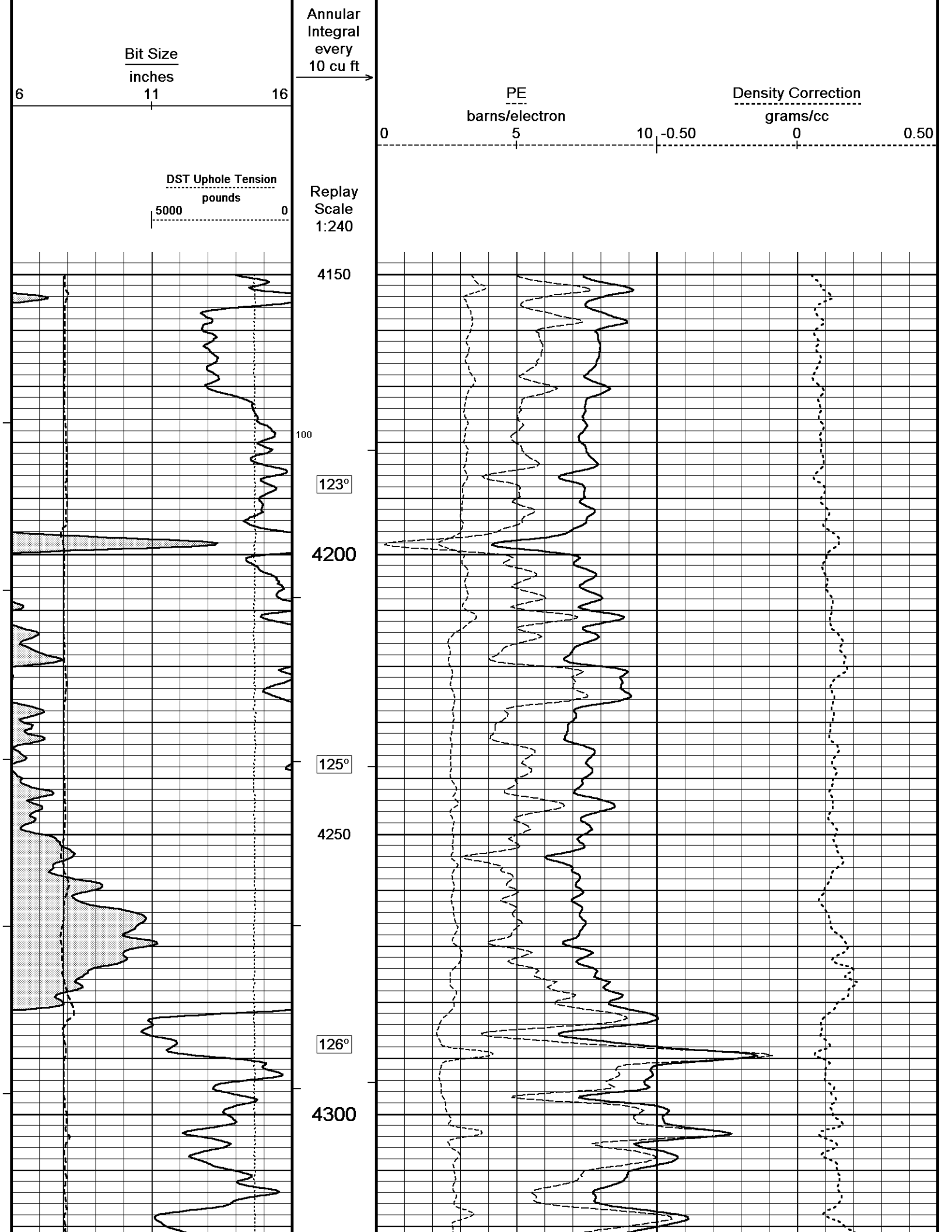
Density Caliper
inches
6 11 16

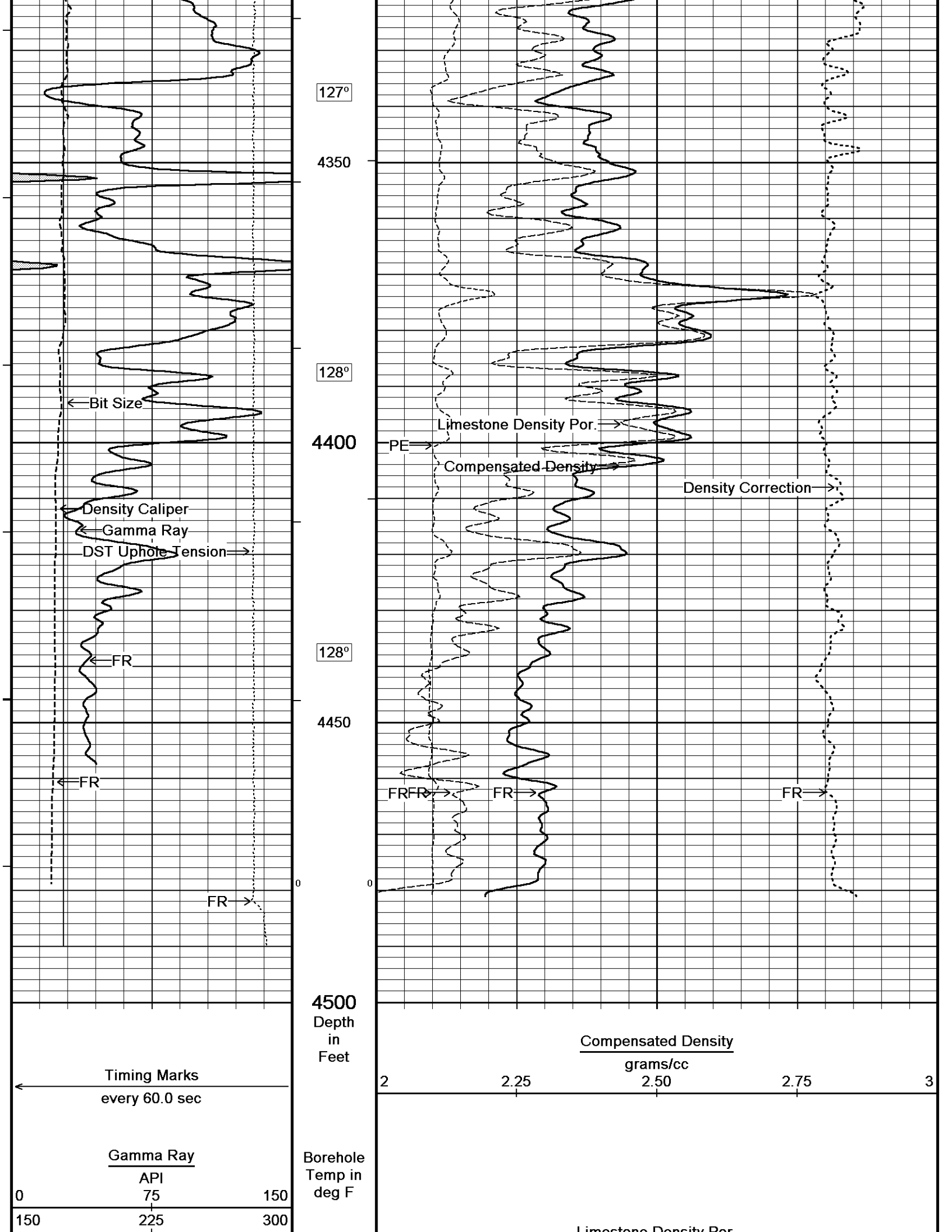
Borehole Temp in deg F

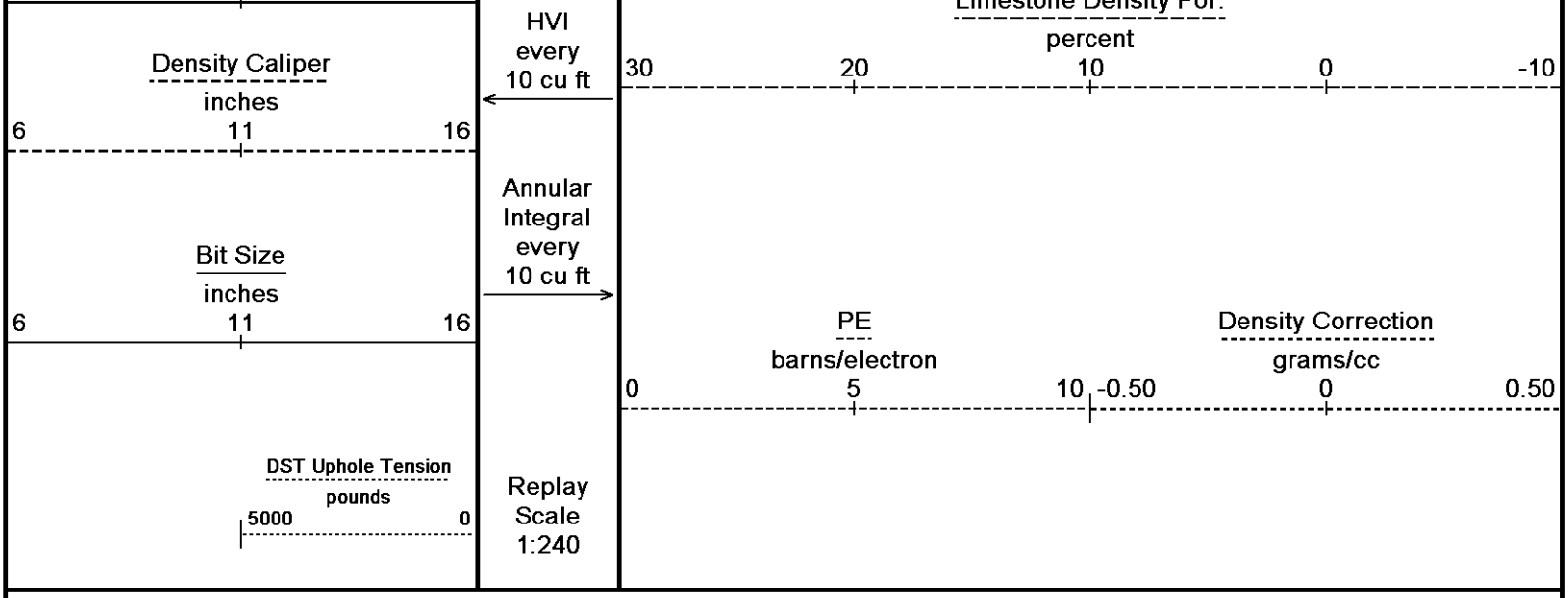
HVI every 10 cu ft

Compensated Density
grams/cc
2 2.25 2.50 2.75 3

Limestone Density Por.
percent
30 20 10 0 -10


Bit Size
inches
6
11
16
Annular Integral every 10 cu ft
PE
barns/electron
0
5
10
Density Correction
grams/cc
-0.50
0
0.50
DST Uphole Tension
pounds
5000
0
Replay Scale 1:240
4150
100
123°
4200
125°
4250
126°
4300


127°
4350
128°
Bit Size
4400
Density Caliper
Gamma Ray
DST Uphole Tension
128°
FR
4450
FR
0
FR
4500
Depth in Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Borehole Temp in deg F
Limestone Density Por.
PE
Compensated Density
Density Correction
FR
FR
FR
FR
0
Compensated Density
grams/cc
2
2.25
2.50
2.75
3
Limestone Density Por.



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 03-NOV-2013 17:54

Filename: C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second...\Grand Mesa K-M #1-2_001.dta — Recorded on 08-OCT-2013 00:21

System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second Run\K-M #1-2 First Run data\Grand Mesa K-M #1-2_002.dta

General Constants All 000

Last Edited on 07-OCT-2013,23:46

General Parameters		
Mud Resistivity	2.340	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	Base Density Porosity	
Resistivity used	Array Ind. Six Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

Gamma Calibration MCG-D.K 469

Field Calibration on 01-OCT-2013 14:45

	Measured	Calibrated (API)
Background	67	45
Calibrator (Gross)	1147	770
Calibrator (Net)	1079	725

Gamma Constants MCG-D.K 469

Last Edited on 07-OCT-2013,21:36

Gamma Calibrator Number	GRC38	
Mud Density	1.11	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

High Resolution Temperature Calibration MCG-D.K 469

Field Calibration on 18-AUG-2013,02:35

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

High Resolution Temperature Constants MCG-D.K 469

Last Edited on 18-AUG-2013,02:35

Pre-filter Length	11

Caliper Calibration MPD-B 64

Base Calibration on 02-OCT-2013 15:52
Field Calibration on 02-OCT-2013 15:54

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	16381	3.99
2	25151	5.98
3	33629	7.97
4	41918	9.86
5	51268	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.96	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 02-OCT-2013 16:14
Field Check on 02-OCT-2013 16:22

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	60377	33815	59556	30836
Reference 2	25205	2910	24941	2541

Field Check at Base

1160.4	1343.0

Field Check

1163.9	1347.8

PE Calibration

Base Calibration	Measured			Calibrated
	WS	WH	Ratio	Ratio
Background	209	1031		
Reference 1	22936	60176	0.384	0.371
Reference 2	6851	25064	0.276	0.272

Field Check at Base

209.0	1030.6

Field Check

209.9	1032.6

Density Constants MPD-B 64

Last Edited on 07-OCT-2013,21:36

Density Source Id	18235B	
Nylon Calibrator Number	DNCE695	
Aluminium Calibrator Number	DACD698	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.11	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	

Matrix density (gm/cc)	Depth (m)
2.71	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

0.00	0.00
0.00	0.00
0.00	

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second Run\K-M #1-2 First Run data\Grand Mesa K-M #1-2_002.dta

3/8" Triple Cone Cable Head (MCB C A)
MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

Compact Comms Gamma
MCG-D.K 469 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

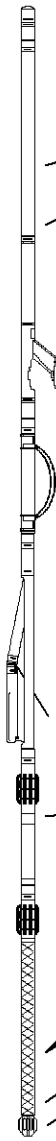
Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 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: 49.73 ft Weight: 399.0 lb



42.87 ft	GRGC - Gamma Ray
39.96 ft	CGXT - MCG External Temperature
33.24 ft	MINV - Micro-inverse
33.24 ft	MNRL - Micro-normal
34.24 ft	MLTC - MML Caliper
28.45 ft	NPRL - Limestone Neutron Por.
21.21 ft	AVOL - Annular Volume
21.21 ft	HVOL - Hole Volume
21.21 ft	CLDC - Density Caliper
19.28 ft	DEN - Compensated Density
19.28 ft	DCOR - Density Correction
19.28 ft	DPRL - Limestone Density Por.
19.22 ft	PDPE - PE
13.72 ft	FEFE - Shallow FE
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	R1AO - 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.

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second Run\K-M #1-2 F...\Grand Mesa K-M #1-2 2nd run mml mdn mpd mss.dta

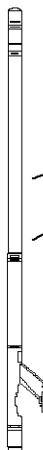
3/8" Triple Cone Cable Head (MCB F B)
MCB-F.B 9 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

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-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper



36.38 ft	GRGC - Gamma Ray
33.47 ft	CGXT - MCG External Temperature
26.76 ft	MINV - Micro-inverse
26.76 ft	MNRL - Micro-normal
27.75 ft	MLTC - MML Caliper
21.96 ft	NPRL - Limestone Neutron Por.

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

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

Total Length: 45.39 ft Weight: 374.8 lb

14.72 ft	AVOL - Annular Volume
14.72 ft	HVOL - Hole Volume
14.72 ft	CLDC - Density Caliper
12.79 ft	DPRL - Limestone Density Por.
12.79 ft	DEN - Compensated Density
12.79 ft	DCOR - Density Correction
12.73 ft	PDPE - PE
4.00 ft	TR11 - 4' Transit Time
3.50 ft	TR21 - 3' Transit Time
3.00 ft	TR12 - 6' Transit Time
2.50 ft	TR22 - 5' Transit Time
0.00 ft	DT35 - 3-5' Compensated Sonic
0.00 ft	DT46 - 4-6' Compensated Sonic
0.00 ft	DT34 - 3-4' Compensated Sonic
0.00 ft	SPRL - Wyllie Lime. Sonic Por.
0.00 ft	DT56 - 5-6' Compensated Sonic
0.00 ft	DT45 - 4-5' Compensated Sonic
Tool Zero	(2.28ft from bottom)
-2.28 ft	SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING COMPANY
WELL	K-M #1-2
FIELD	WILDCAT
PROVINCE/COUNTY	WASHINGTON
COUNTRY/STATE	UNITED STATES / COLORADO

Elevation Kelly Bushing	4682.00	feet	First Reading	4462.00	feet
Elevation Drill Floor	4680.00	feet	Depth Driller	4485.00	feet
Elevation Ground Level	4672.00	feet	Depth Logger	4482.00	feet

Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG