



Weatherford

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY			FIML NATURAL RESOURCES, LLC.		
WELL			HIBBERT 4D-20-2029		
FIELD			WILDCAT		
PROVINCE/COUNTY LANE			U.S.A. / KANSAS		
COUNTRY/STATE			1235' FNL & 1000' FNL		
LOCATION					
SEC 20	TWP 20S	RGE 29W	Other Services		MML
Latitude			MPD/MDN		
Longitude			MAI/MFE		
API Number	15-101-22502		MSS		
Permanent Datum GL, Elevation 2882 feet					
Log Measured From KB					
Drilling Measured From KB @ 10 FEET					
Date	12-APR-2014				
Run Number	ONE				
Service Order	5872-84492996				
Depth Driller	4900.00		feet		
Depth Logger	4902.00		feet		
First Reading	4870.00		feet		
Last Reading	439.00		feet		
Casing Driller	437.00		feet		
Casing Logger	439.00		feet		
Bit Size	7.875		inches		
Hole Fluid Type	CHEM				
Density / Viscosity	9.30 lb/USg		55.00 CP		
PH / Fluid Loss	10.50		7.00 ml/30Min		
Sample Source	PIT				
Rm @ Measured Temp	0.80 @ 96.0		ohm-m		
Rmf @ Measured Temp	0.64 @ 96.0		ohm-m		
Rmc @ Measured Temp	0.96 @ 96.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.65 @ 117.0		ohm-m		
Time Since Circulation	4 HRS				
Max Recorded Temp	117.00		deg F		
Equipment / Base	13057		LIB		
Recorded By	D. COLE				
Witnessed By	G. DOKE		K. TALBOT		
JOB #	LB 14-111				

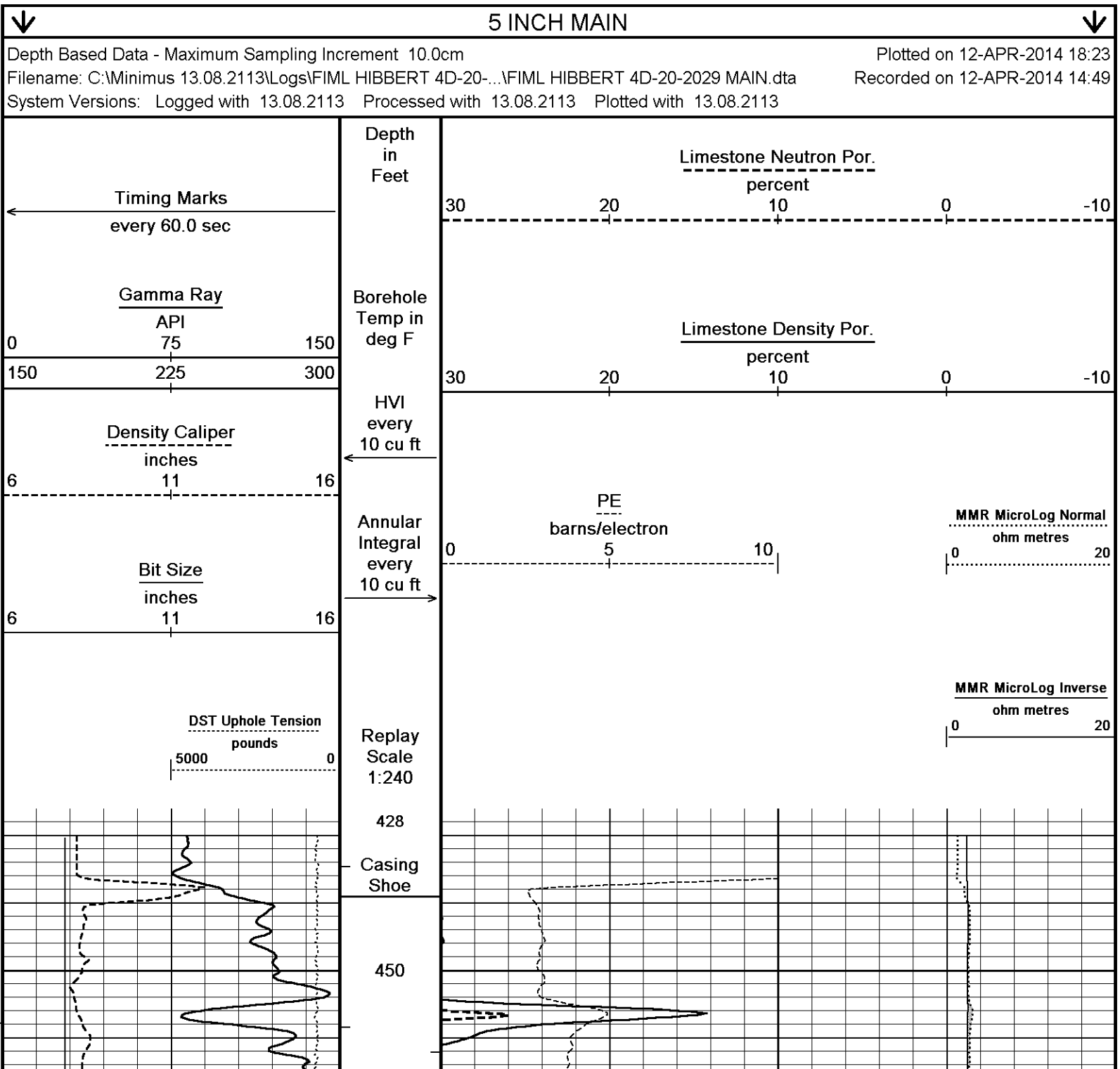
BOREHOLE RECORD			Last Edited: 12-APR-2014 11:38	
Bit Size inches	Depth From feet		Depth To feet	
7.875	437.00		4900.00	
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
CASING	8.625	0.00	437.00	24.00

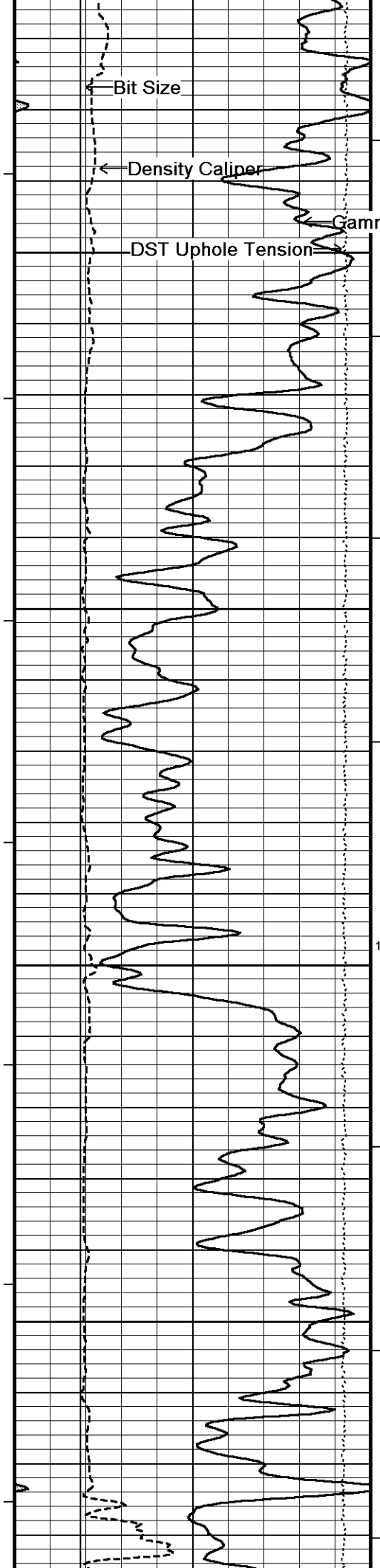
REMARKS
- SOFTWARE ISSUE: WLS 13.08.211.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS AND MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE 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: 1760 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 1025 CU.FT.

- RIG: HD 2

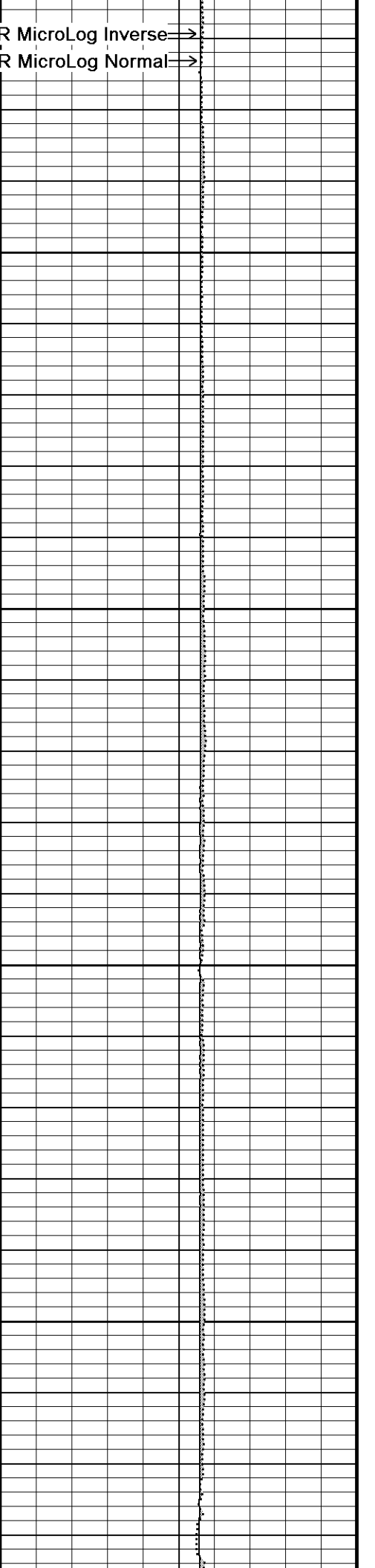
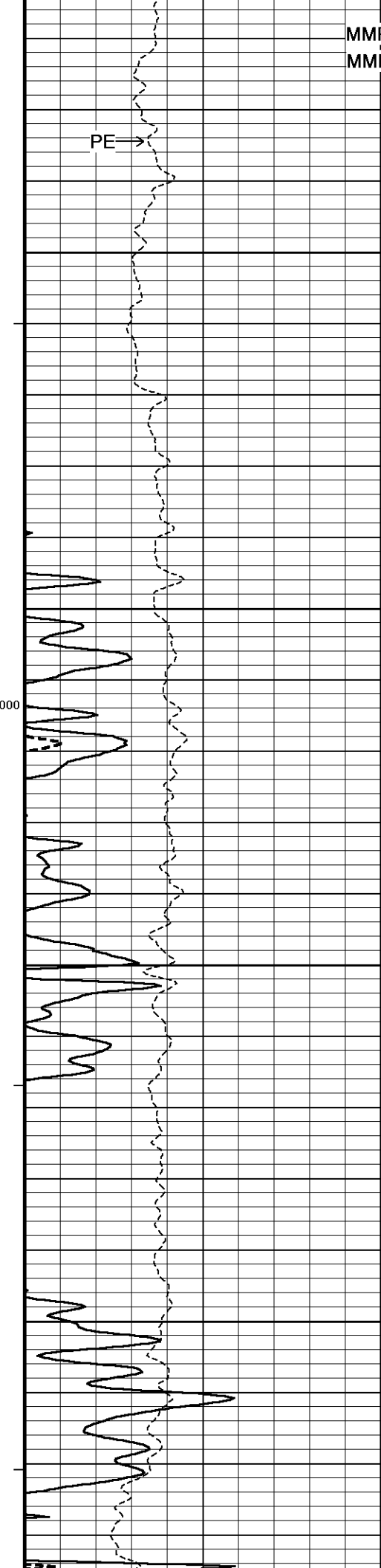
- OPERATOR: J. DUNLAP.

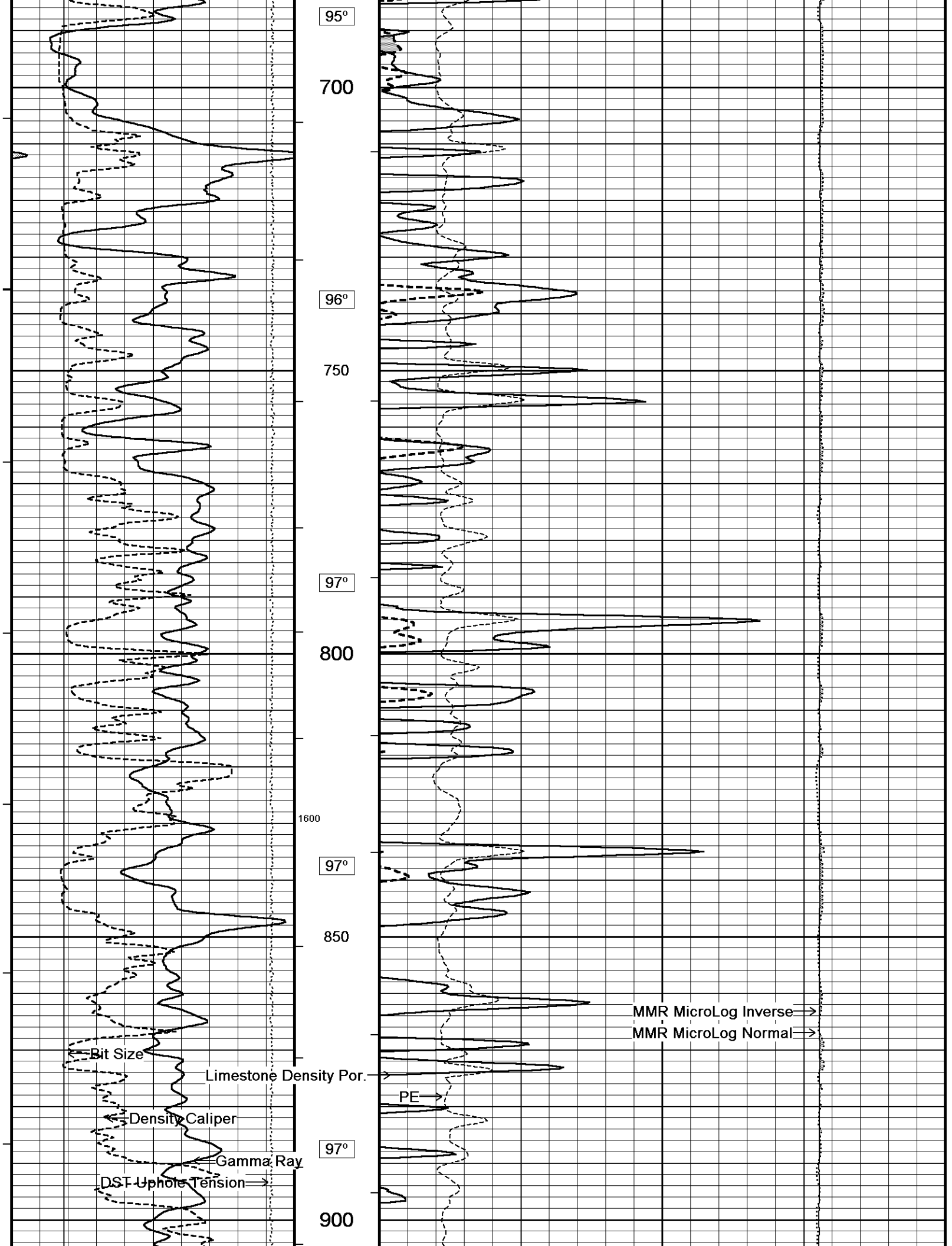
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will 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.

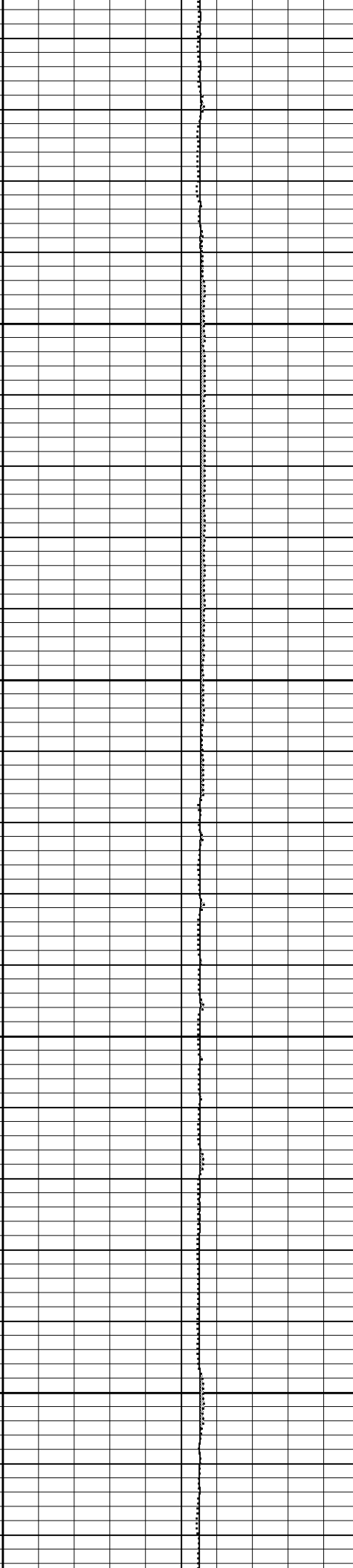
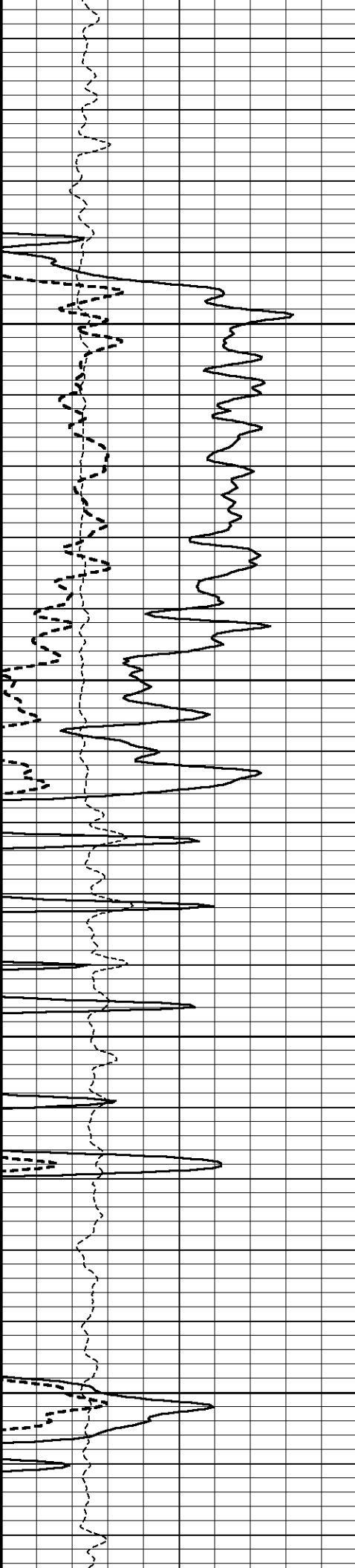
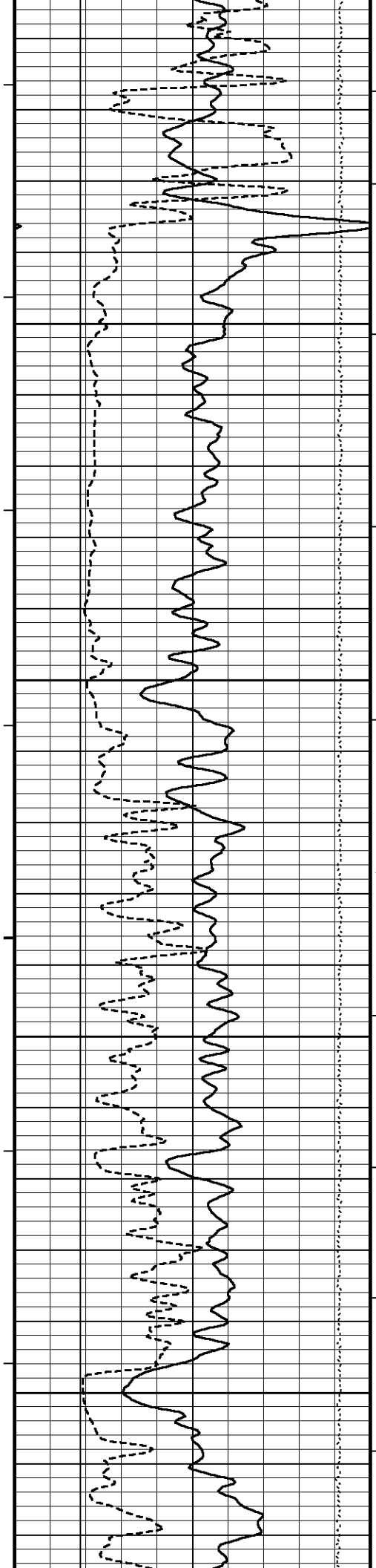


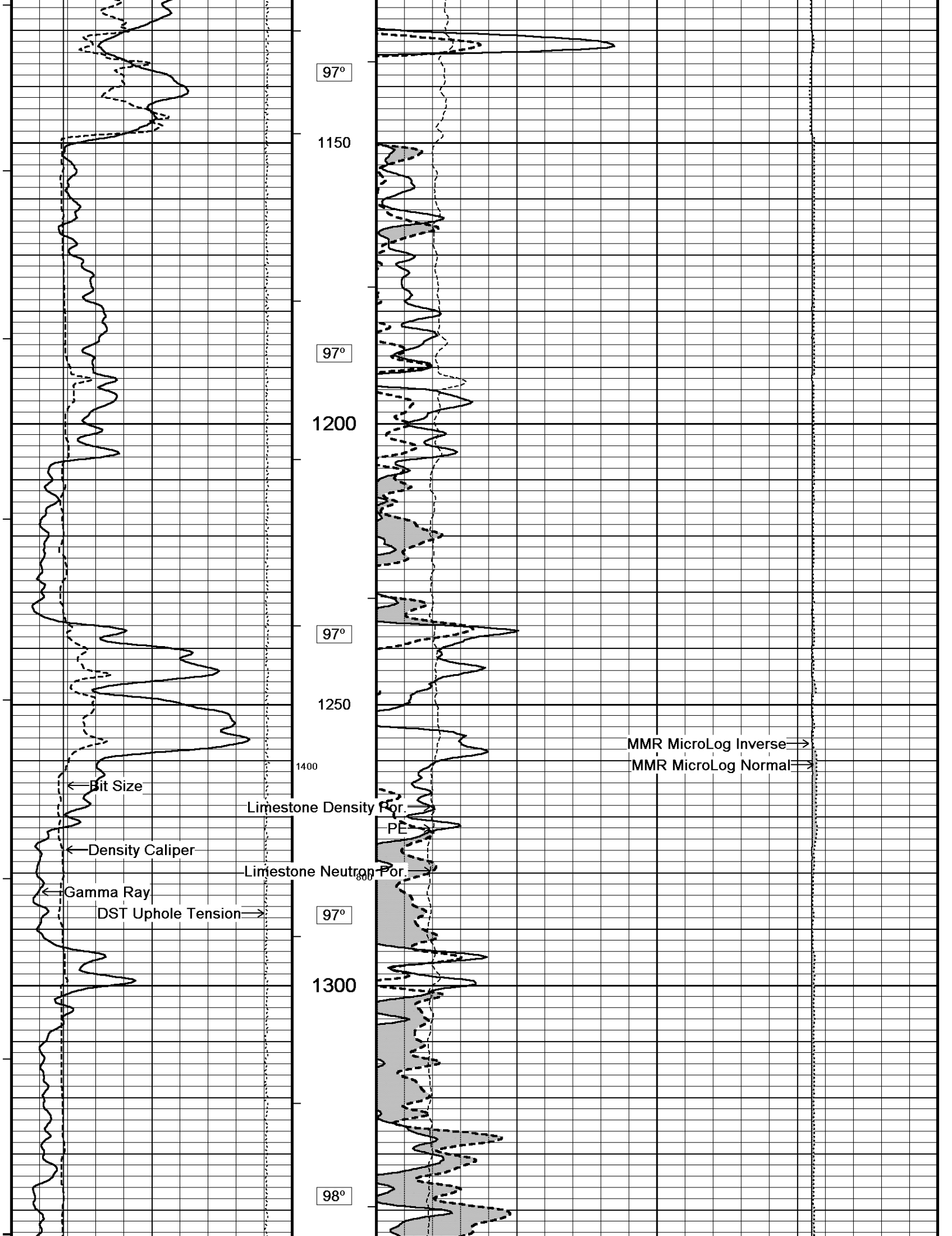


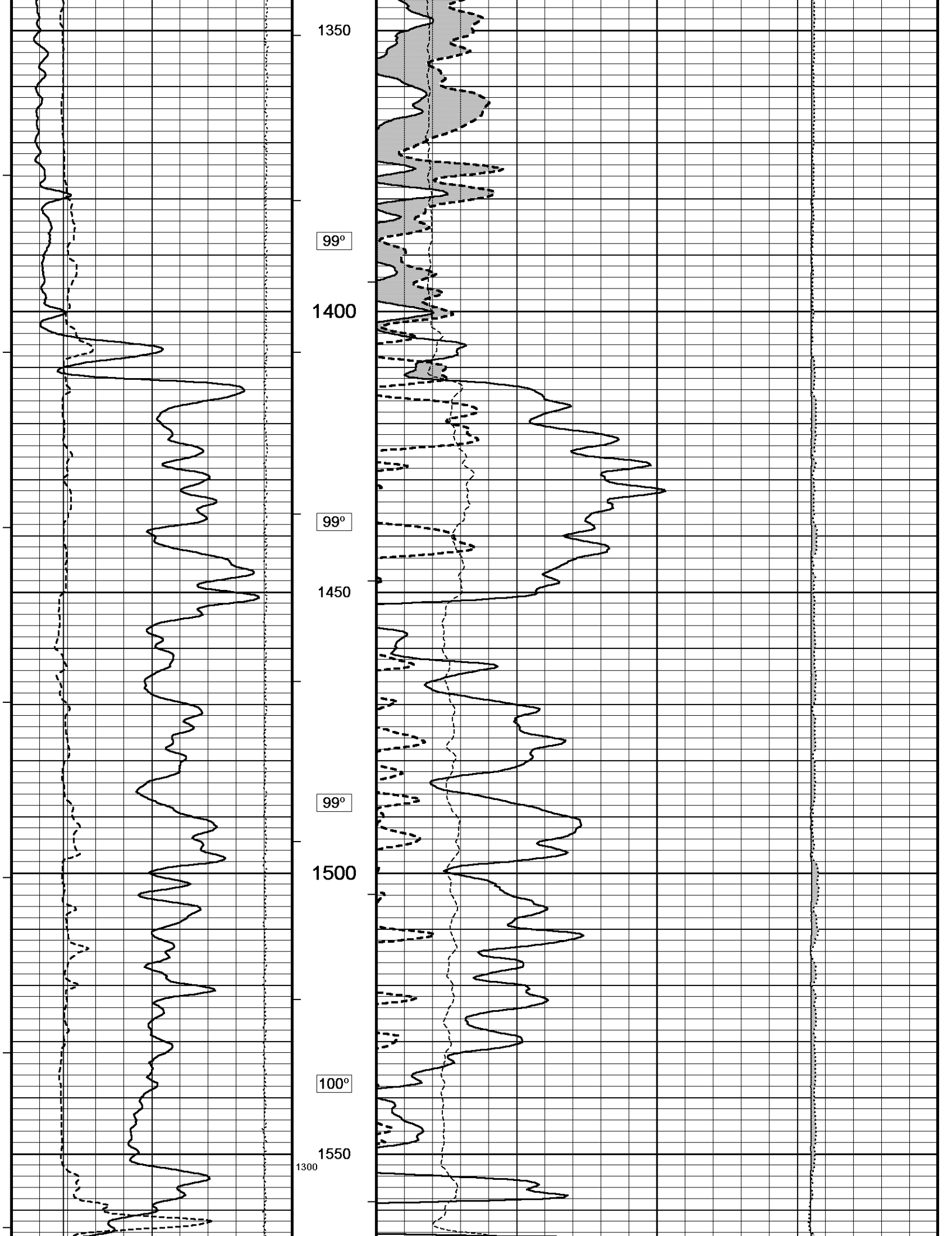
94°
500
550
1000
1700
600
95°
650

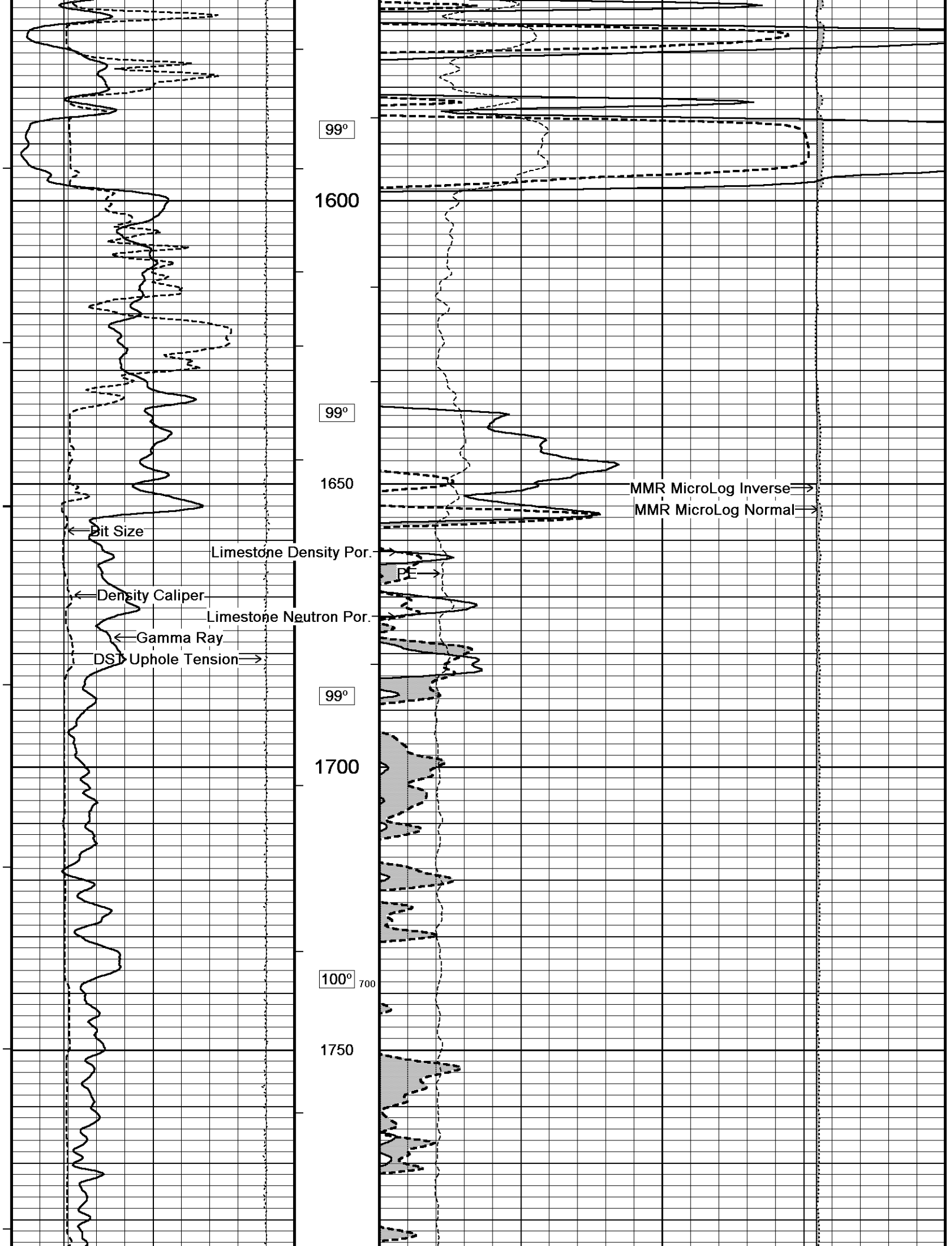


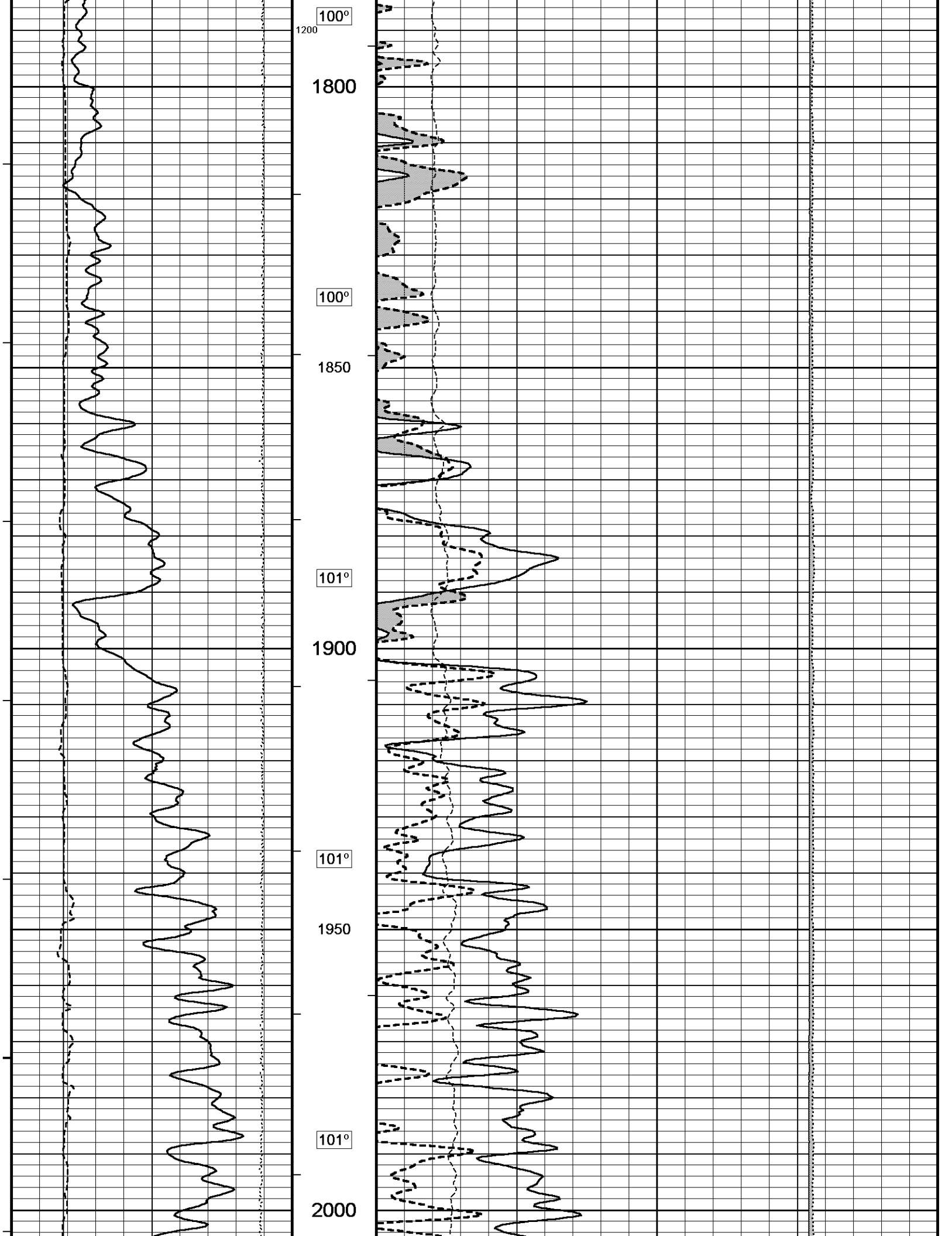


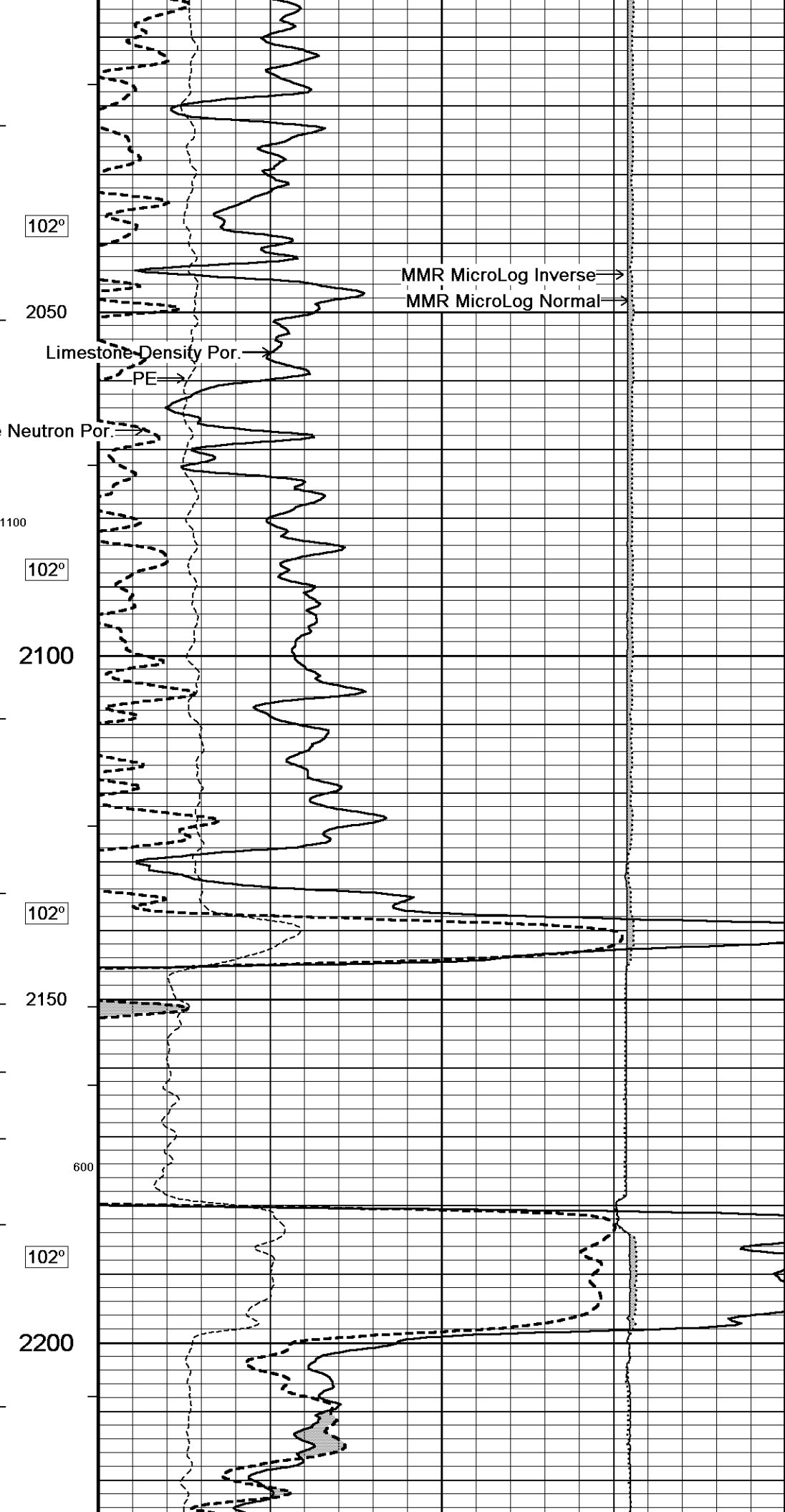
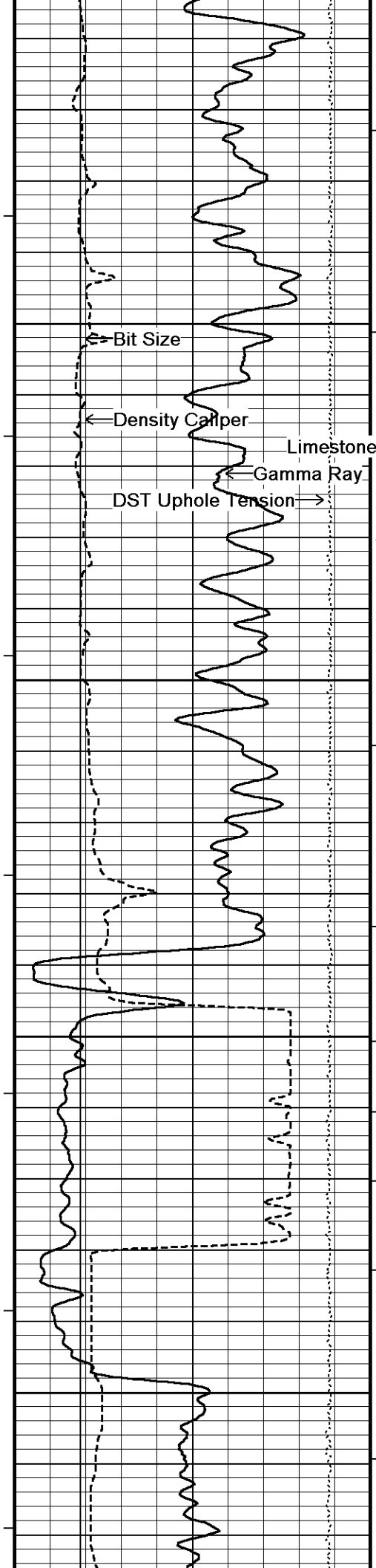


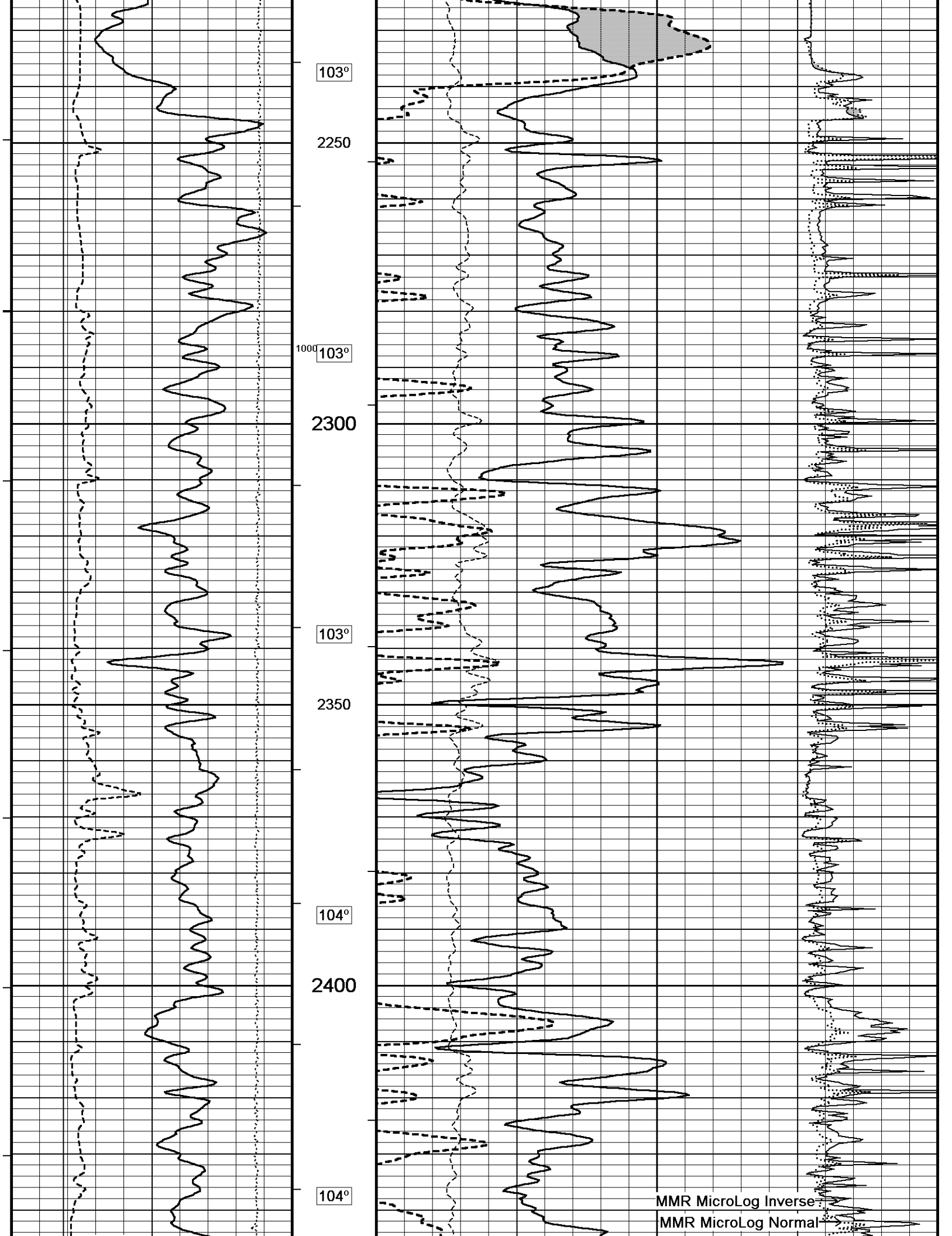


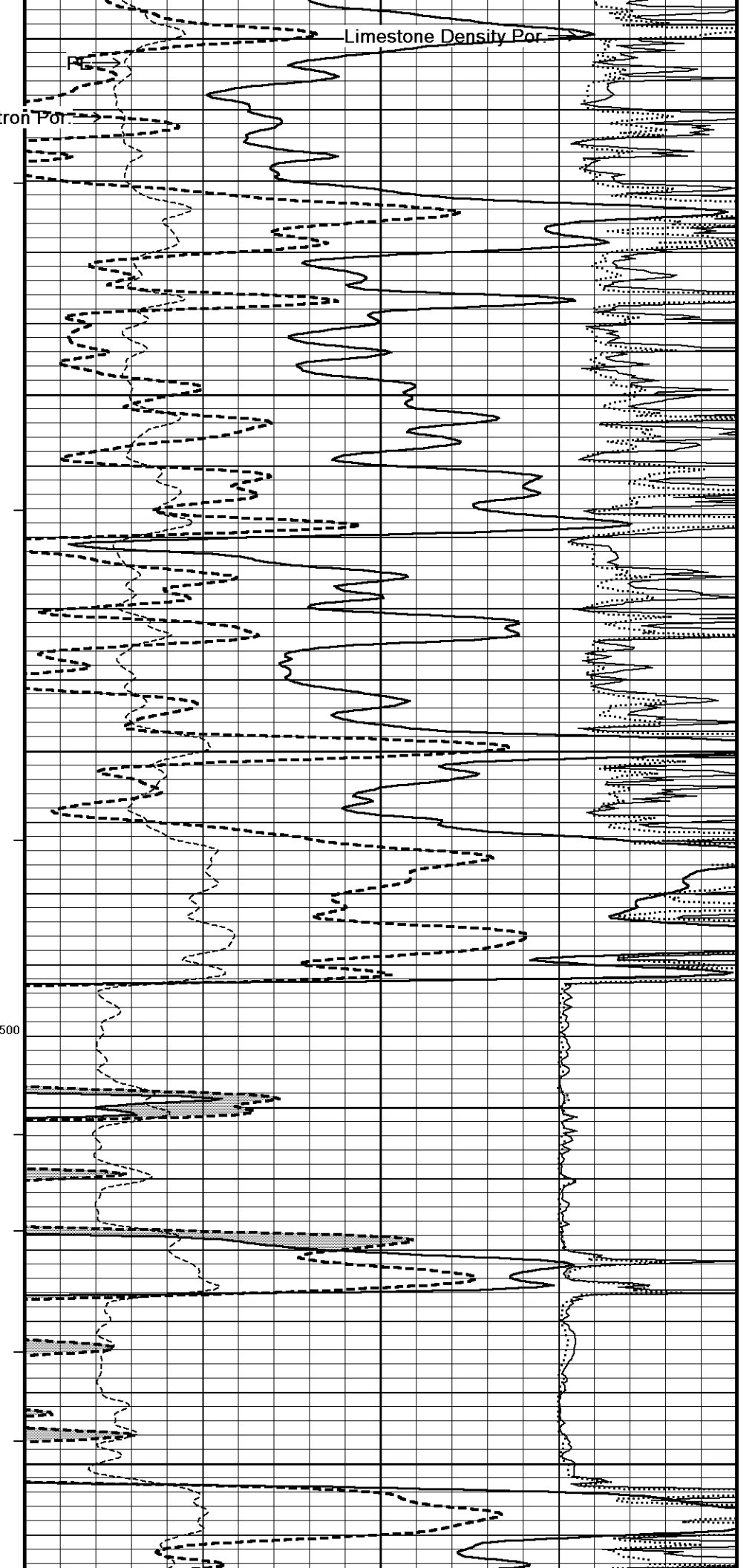
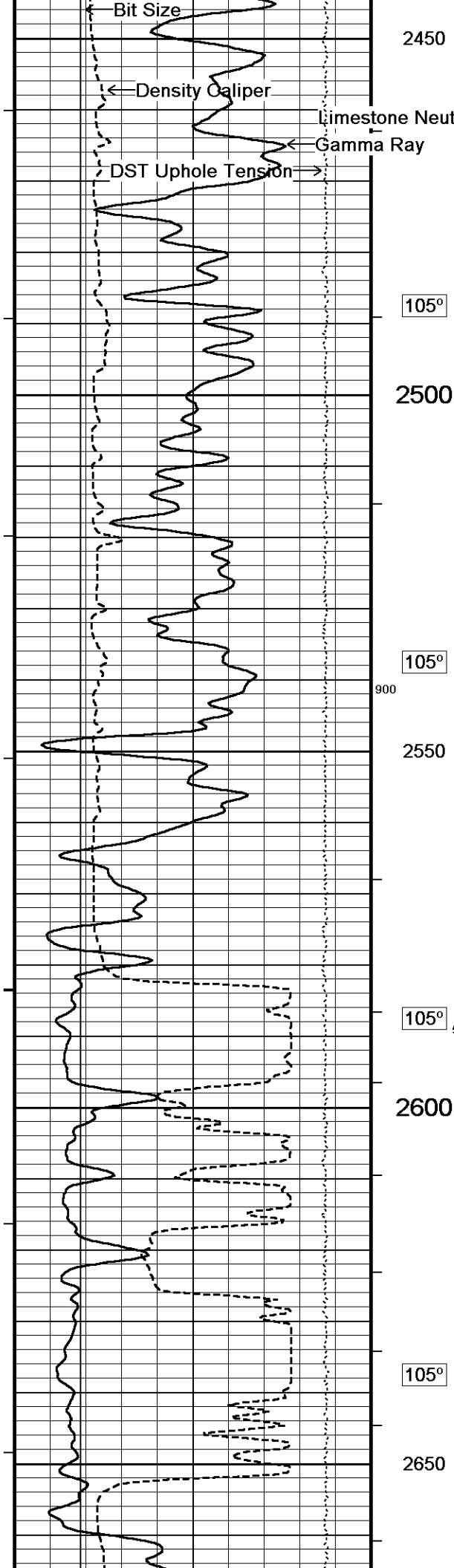


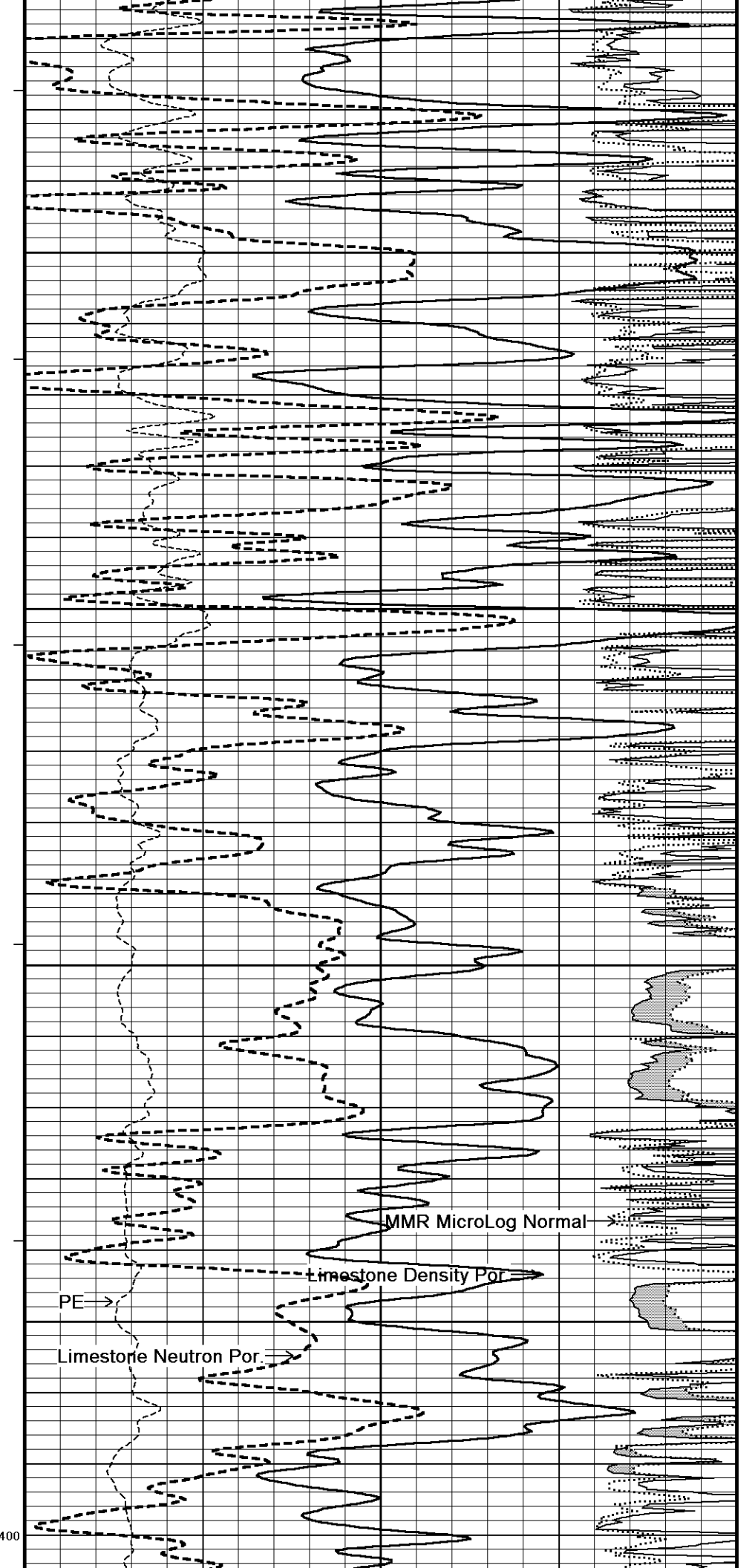
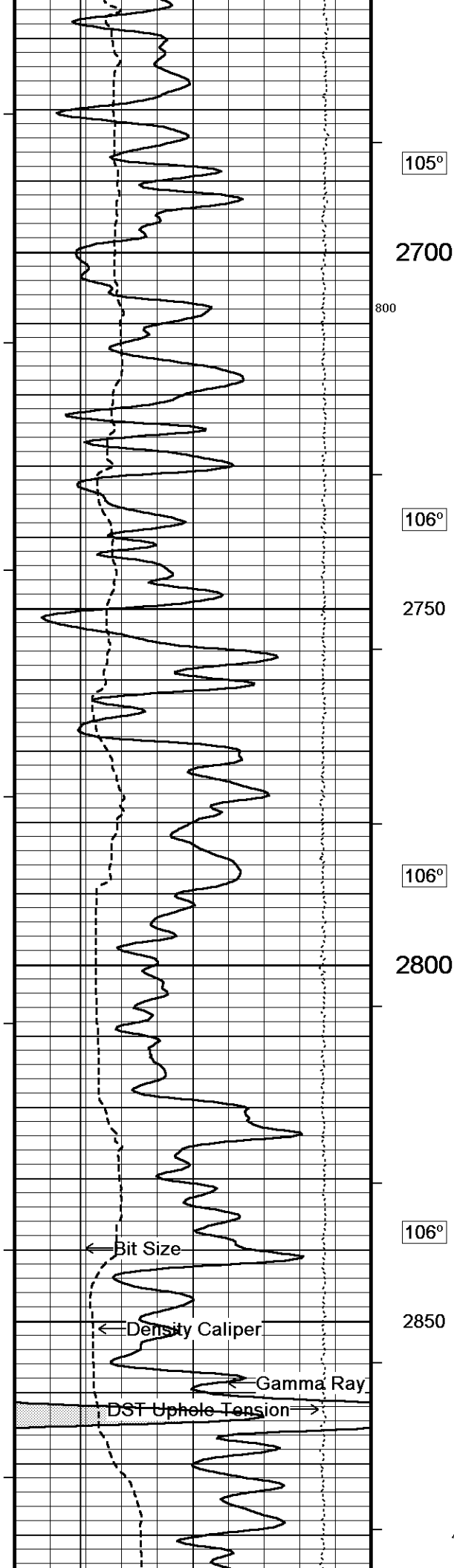


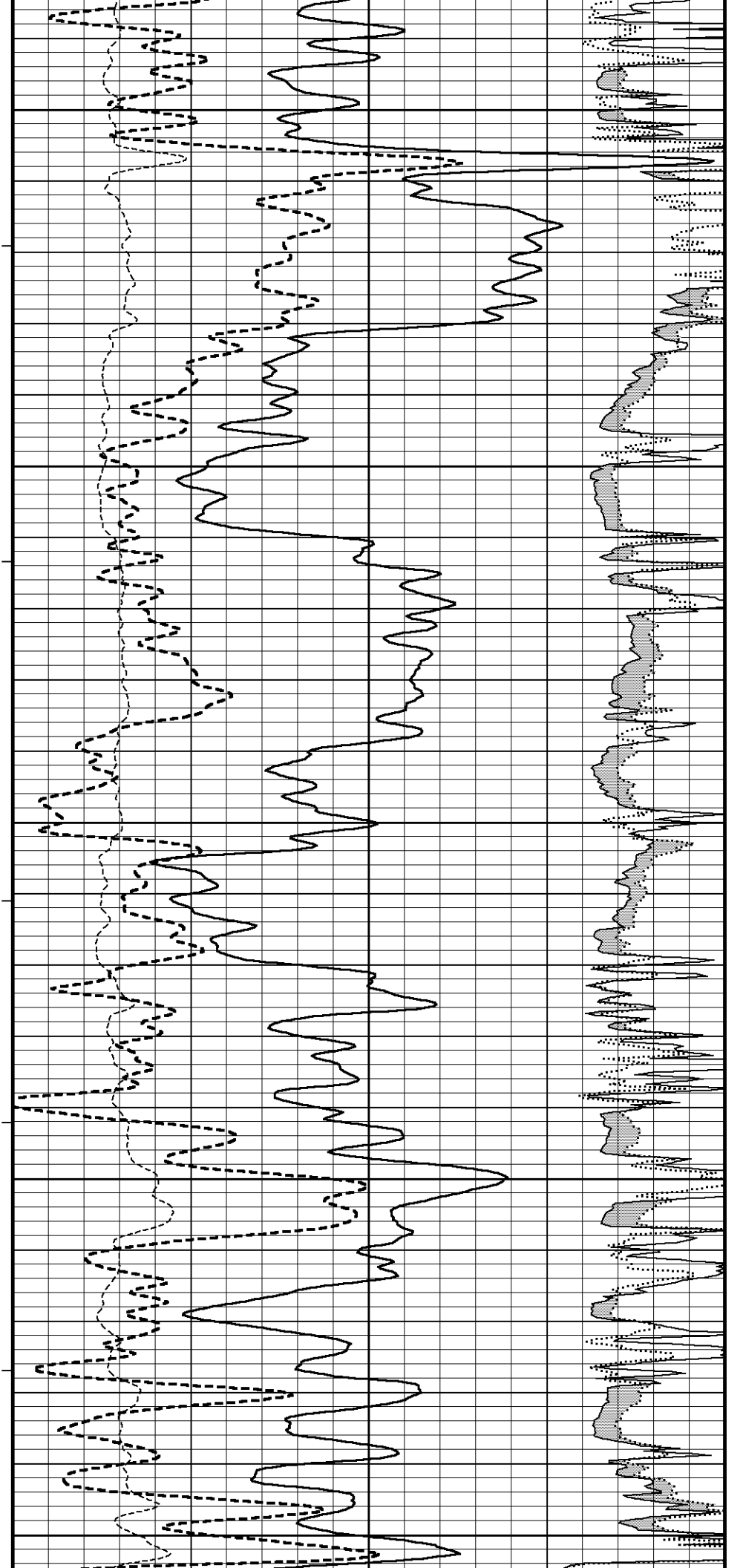
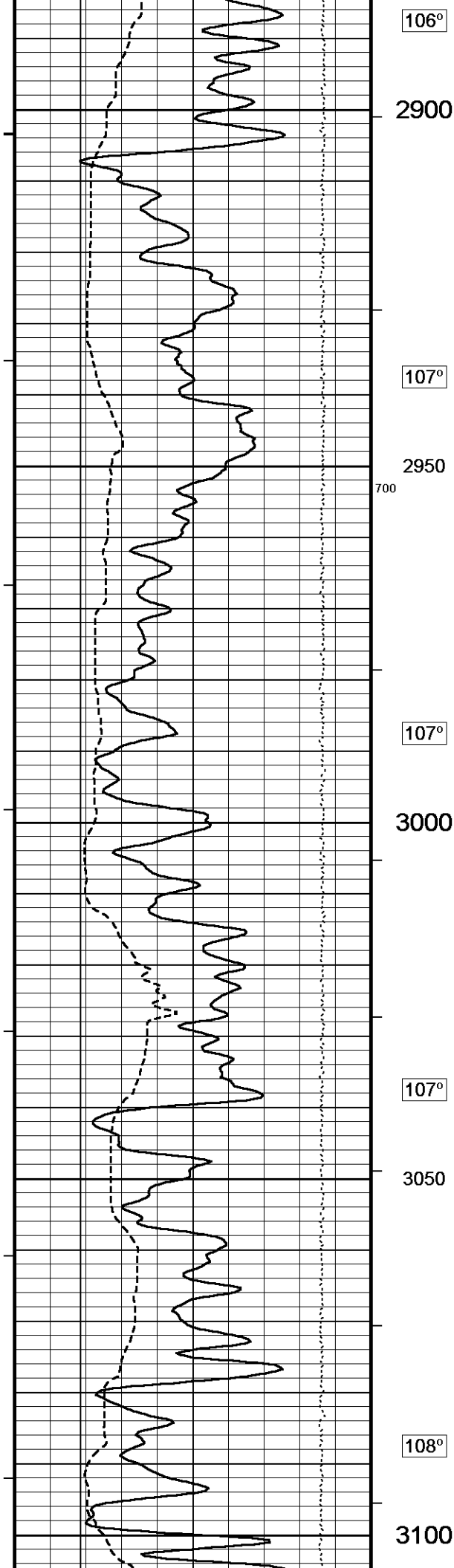


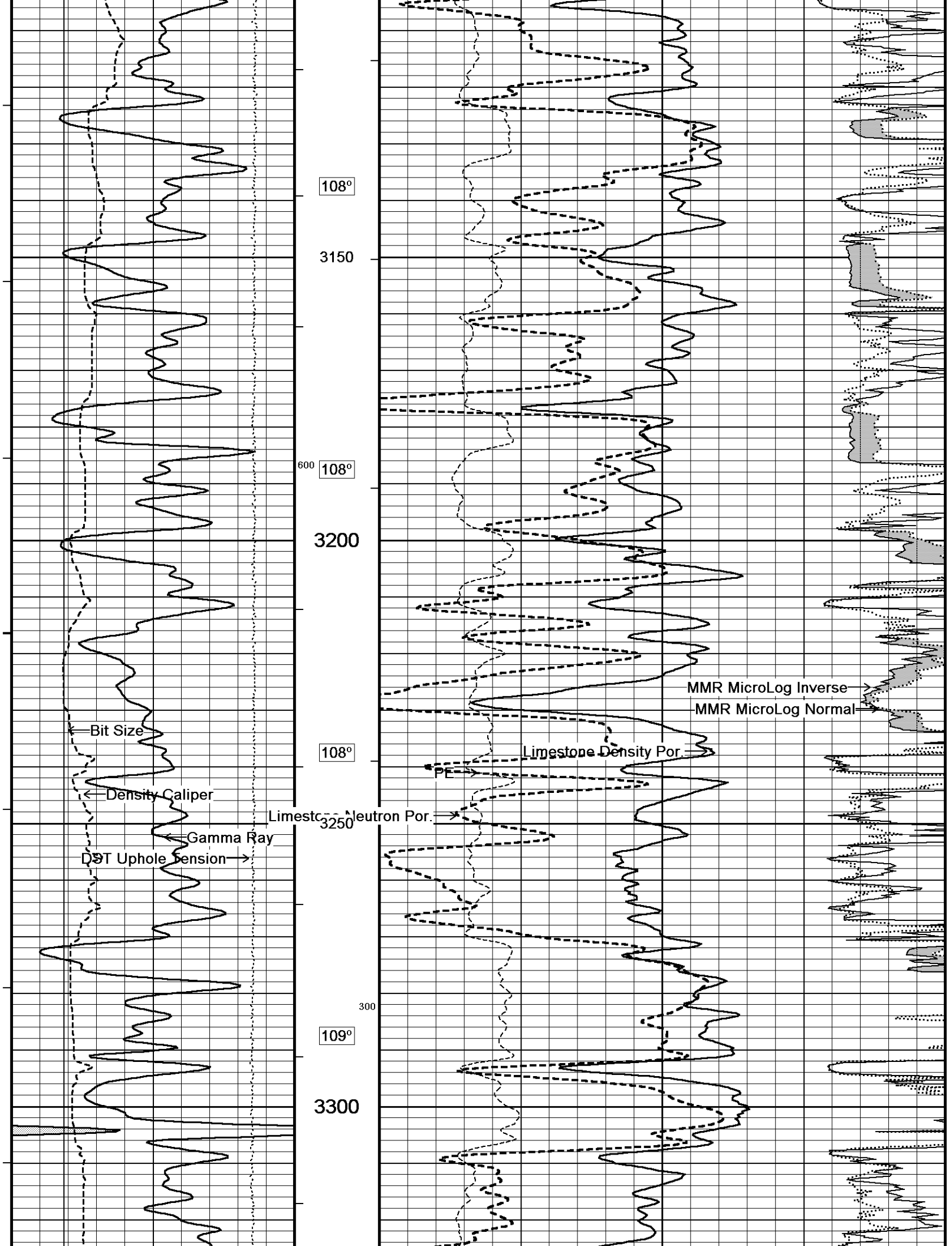


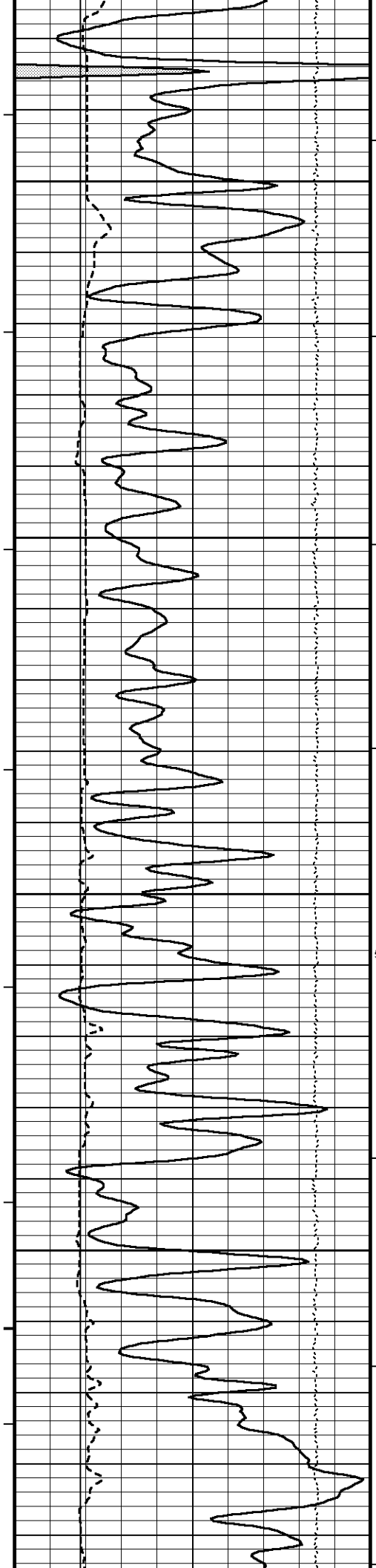




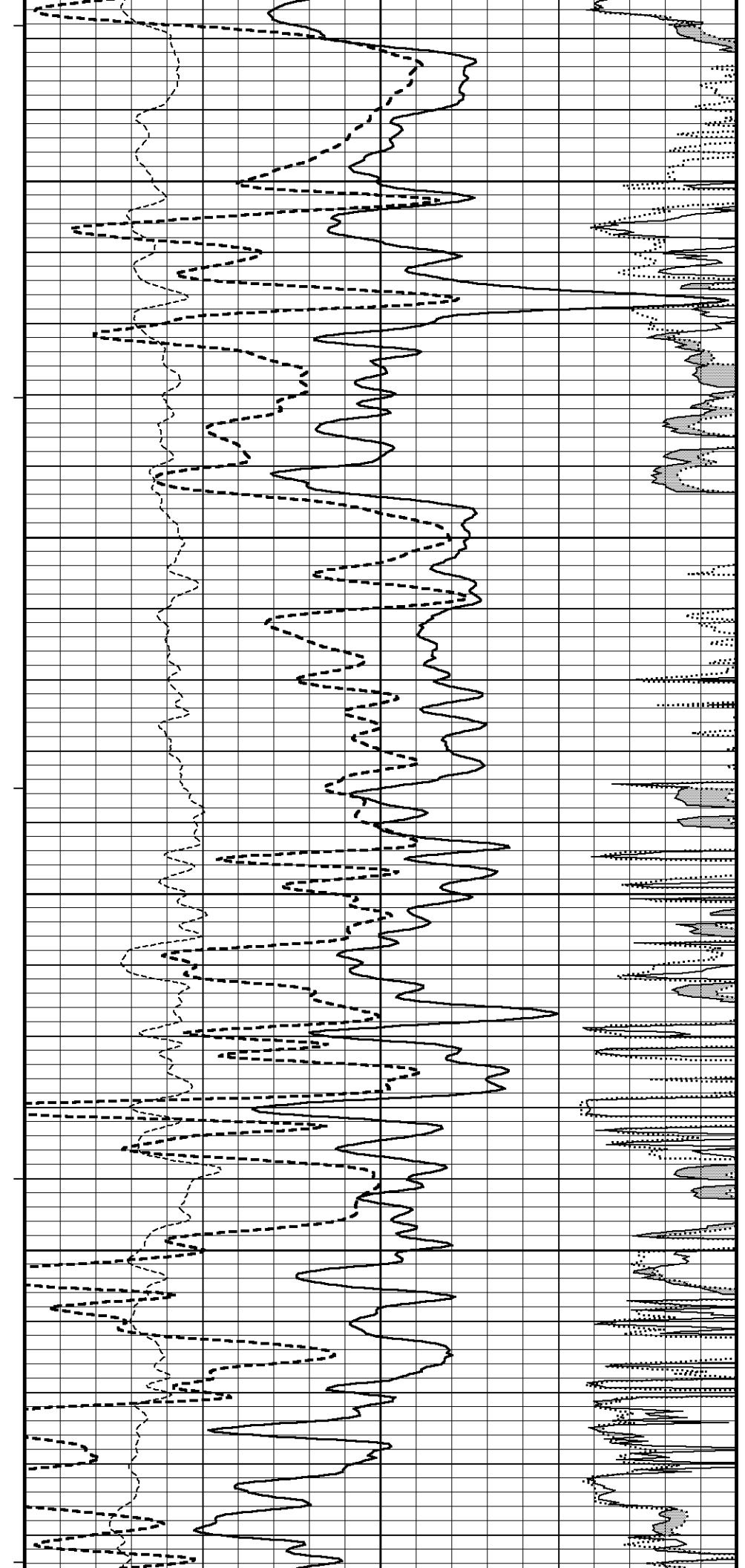


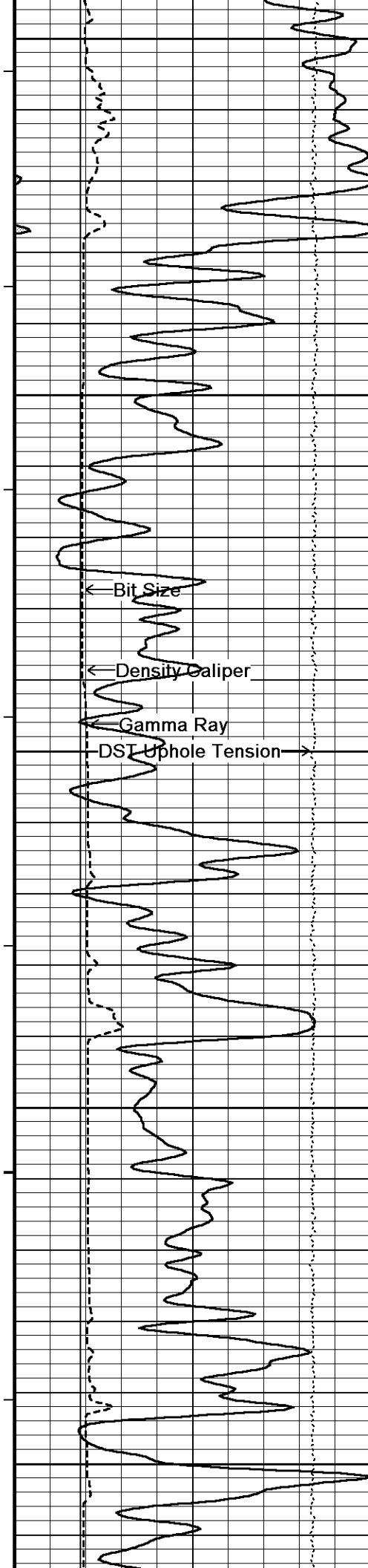






109°
3350
109°
3400
110°
3450
500
110°
3500
110°





3550

111°

3600

111°

3650

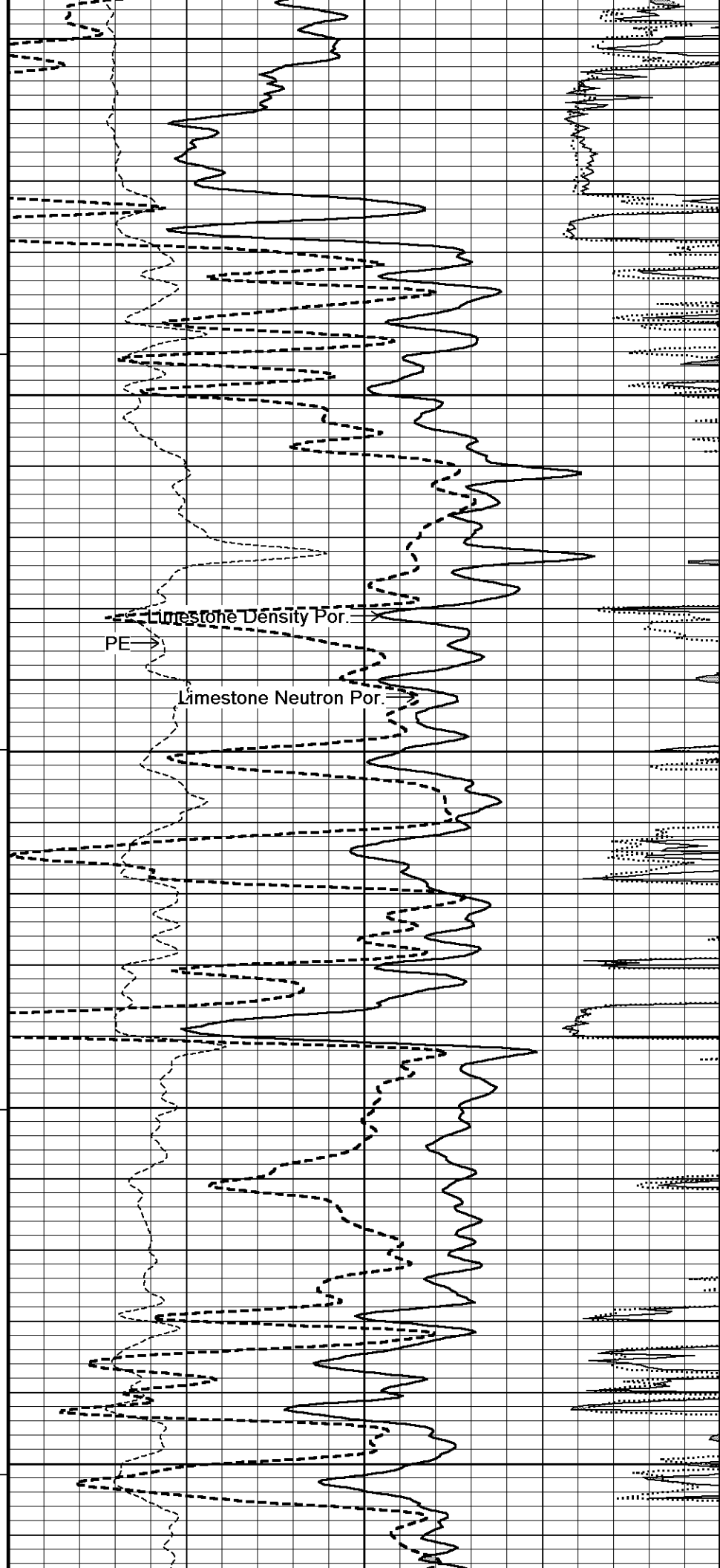
111°

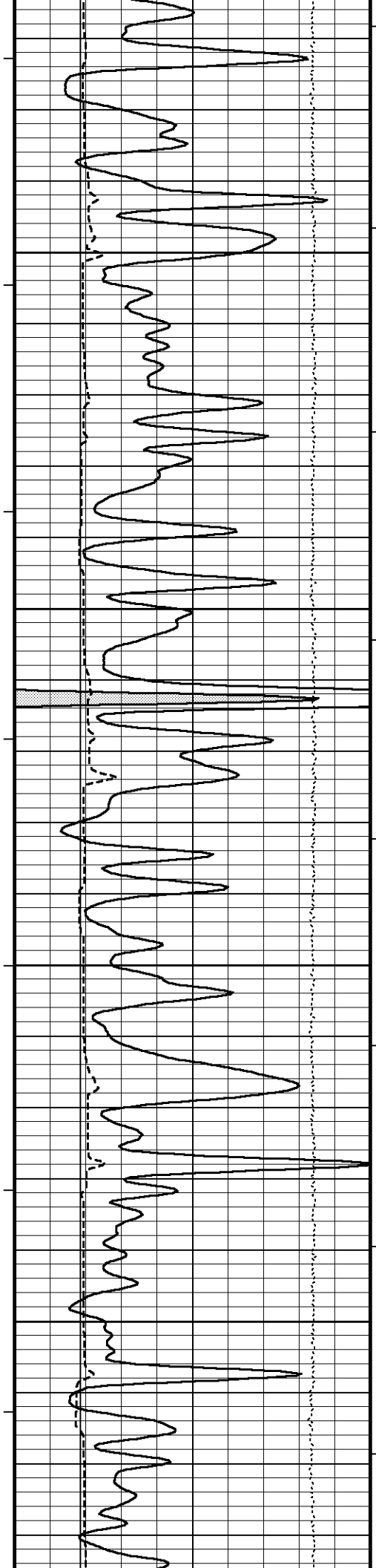
3700

112°

400

3750





112°

3800

200

112°

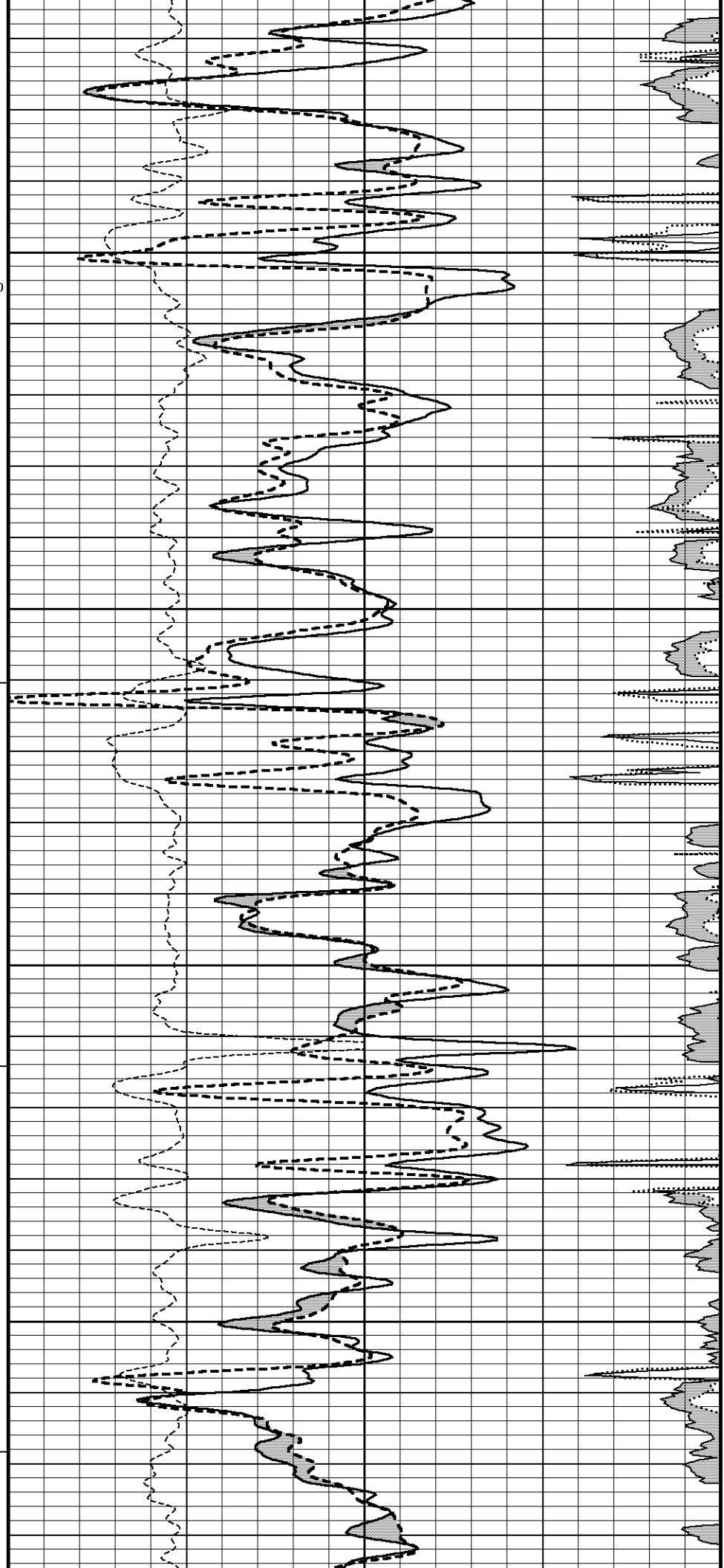
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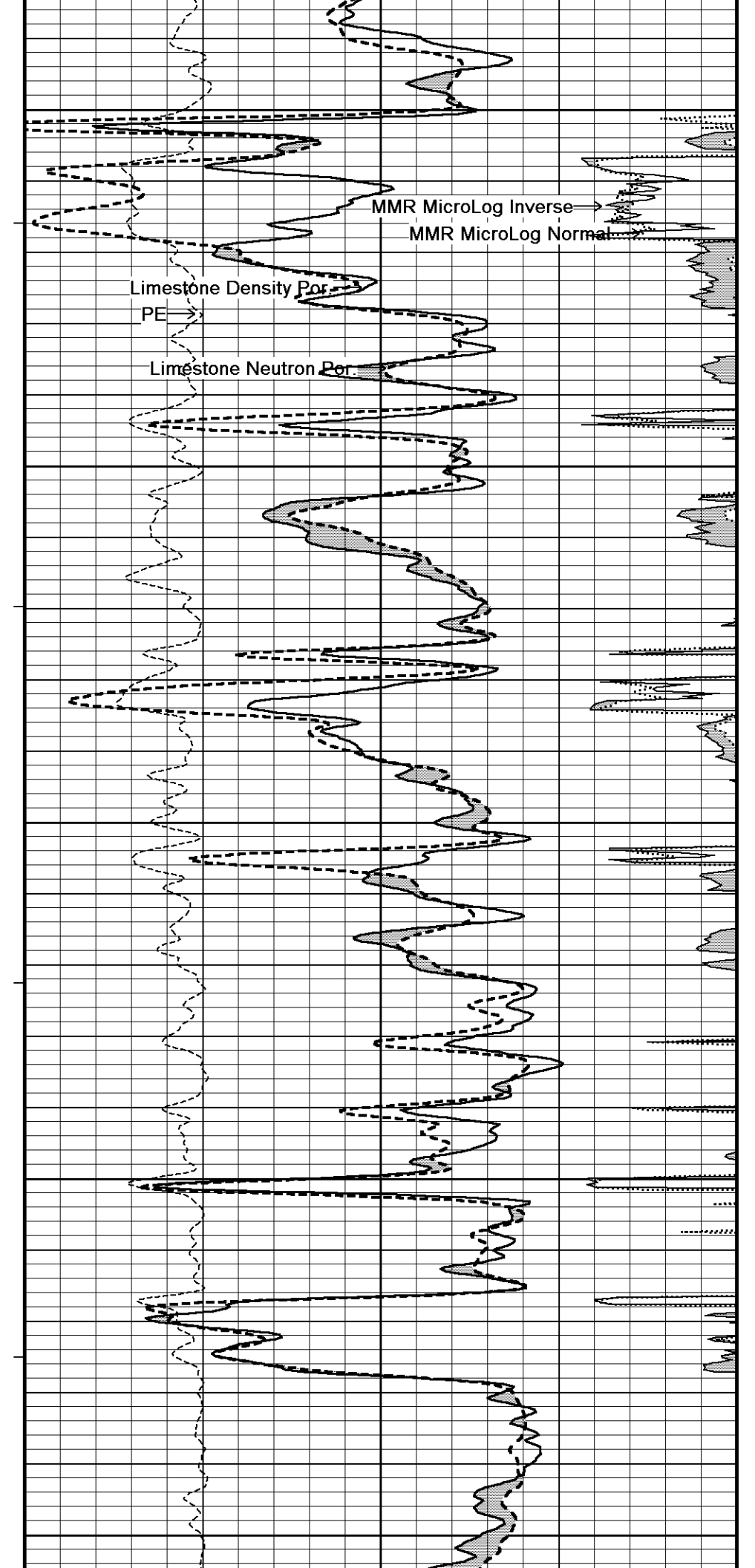
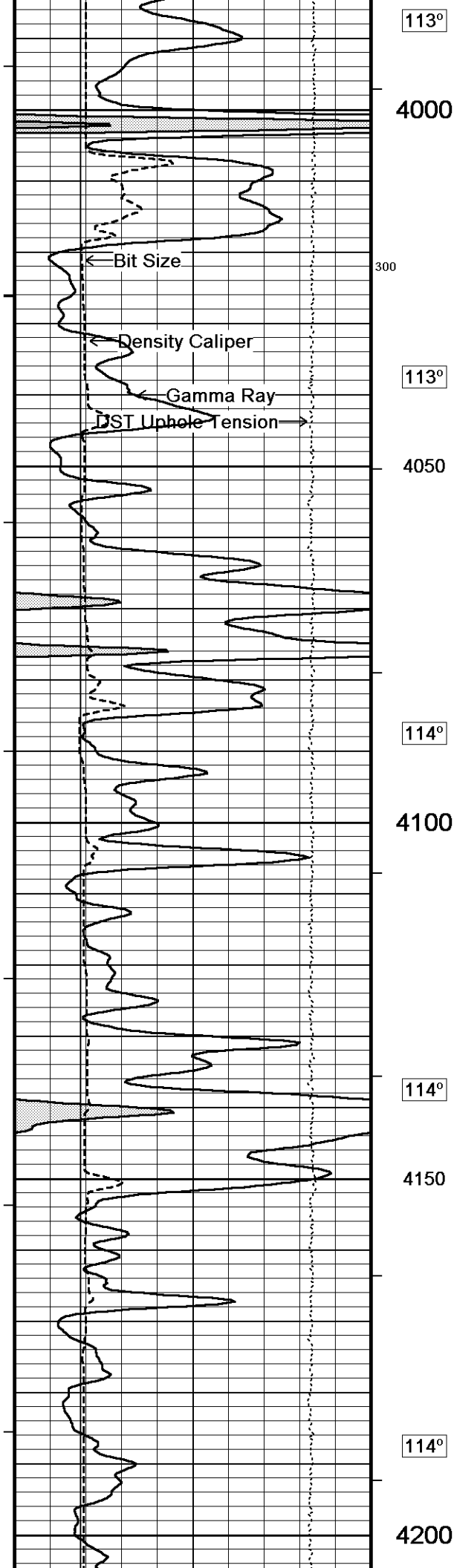
113°

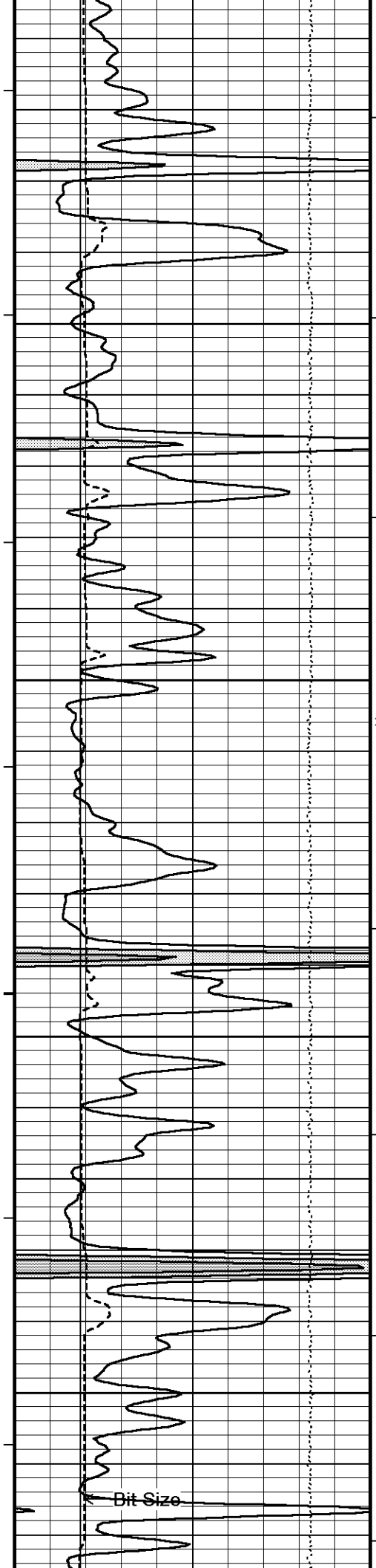
3900

113°

3950







114°

4250

115°

4300

200

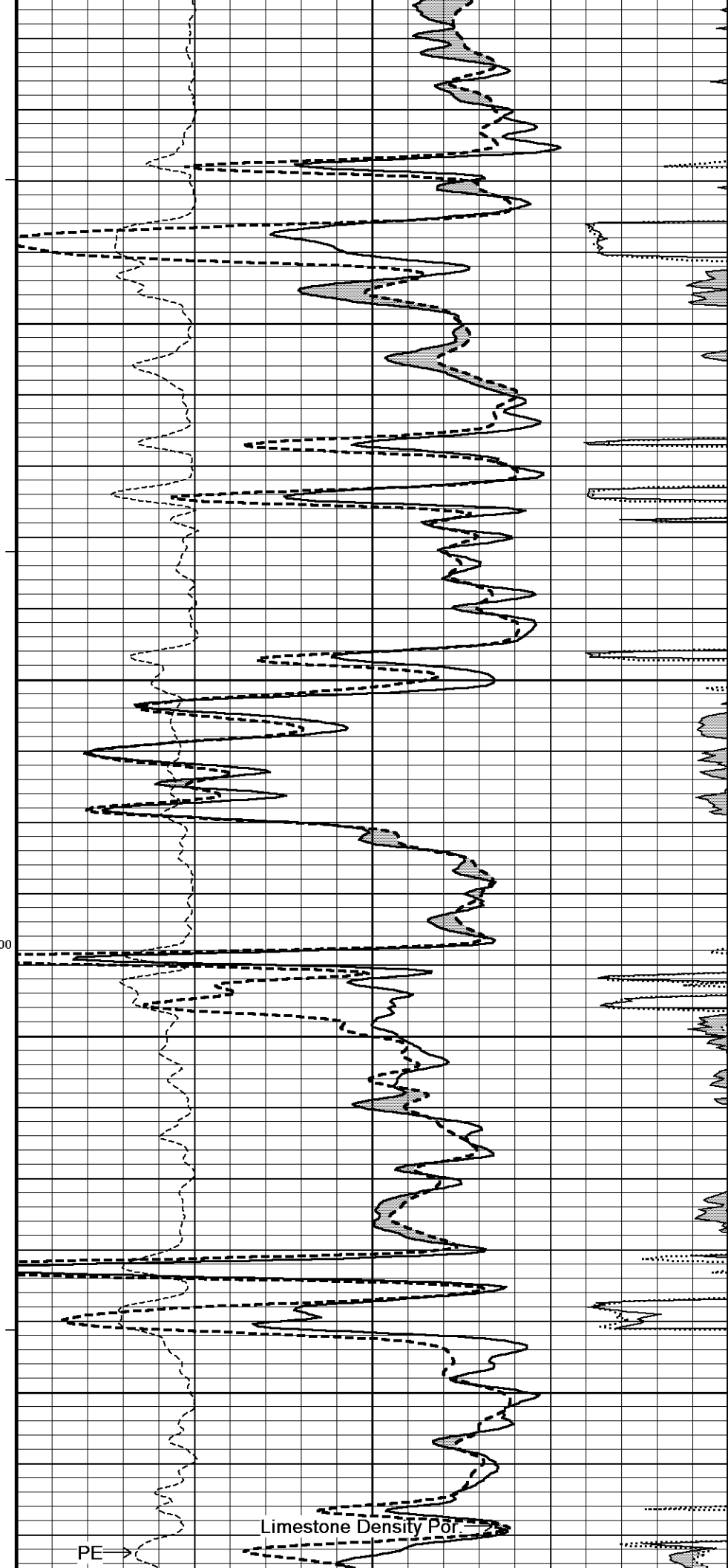
115°

4350

115°

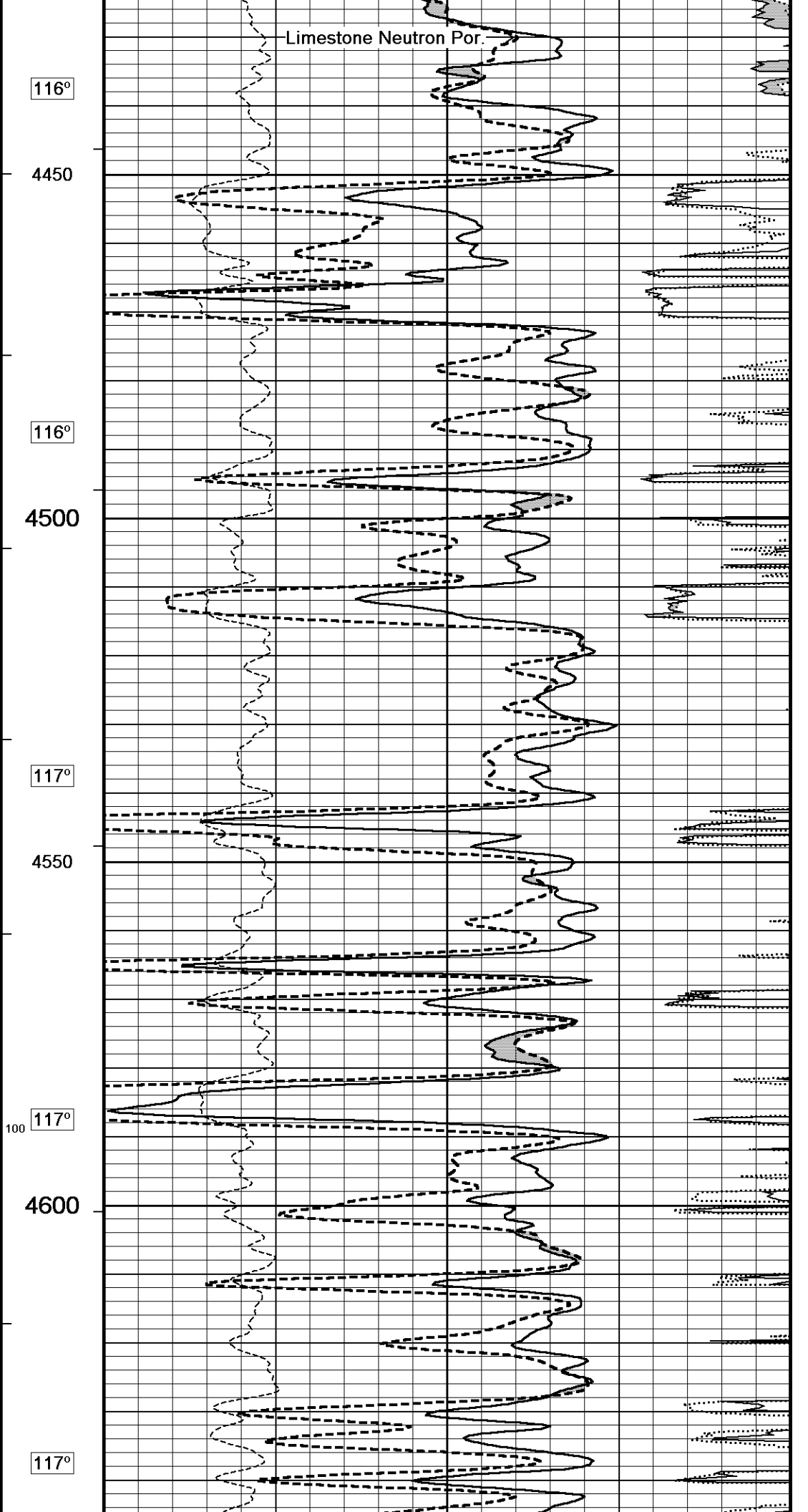
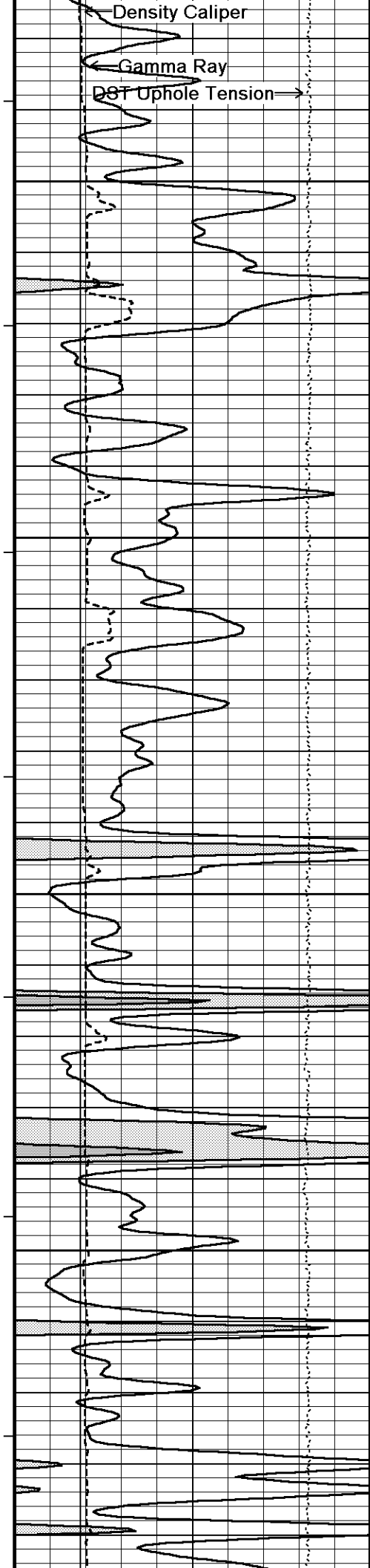
4400

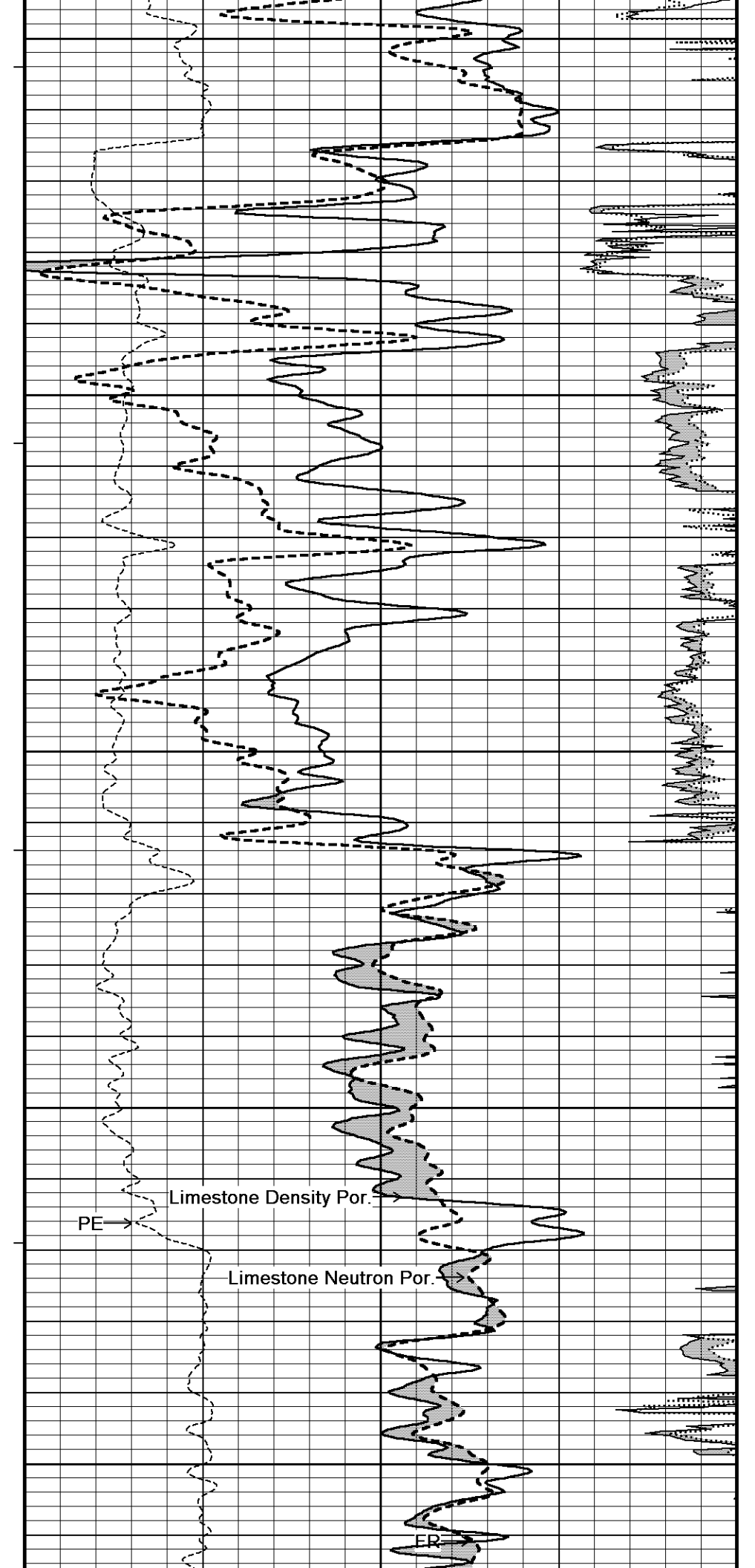
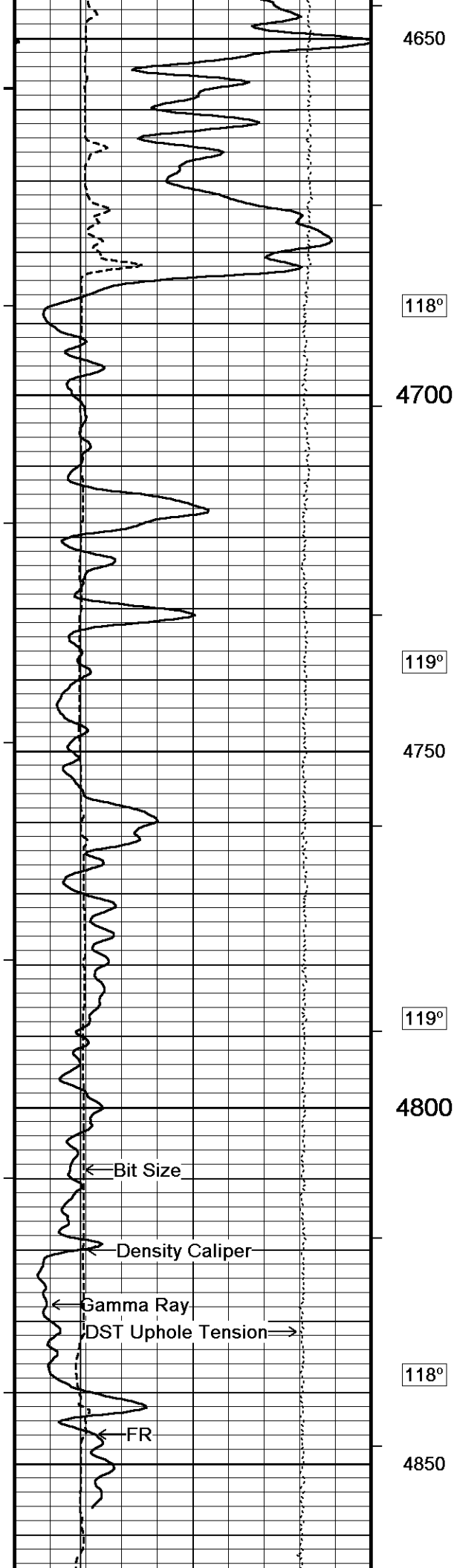
Bit Size

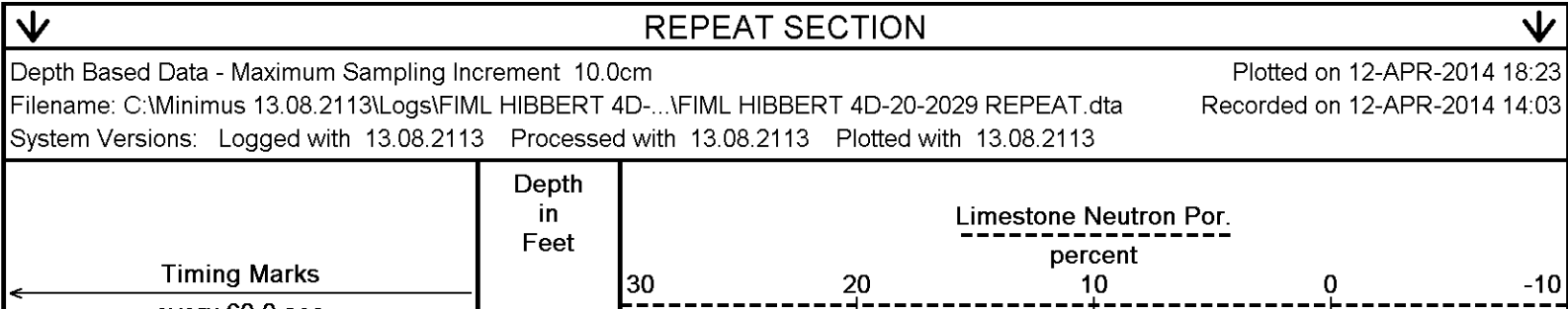
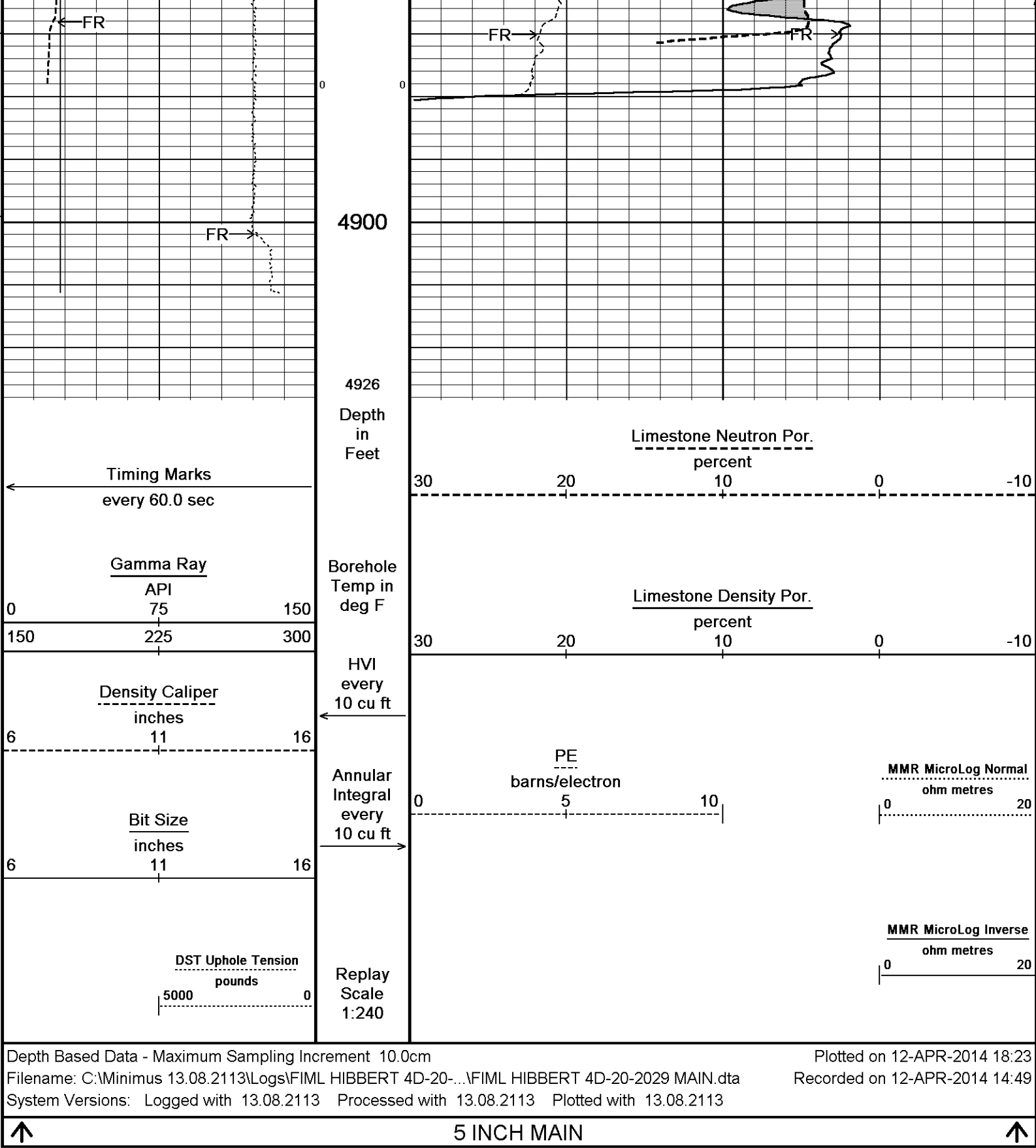


PE

Limestone Density Por







every 60.0 sec

Gamma Ray

API

75

225

0

150

300

Density Caliper

inches

11

6

16

Bit Size

inches

11

6

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

3900

112°

3950

113°

4000

300

Limestone Density Por.

percent

30

20

10

0

-10

PE

barns/electron

0

5

10

MMR MicroLog Normal
ohm metres

0

20

MMR MicroLog Inverse
ohm metres

0

20

Limestone Density Por.

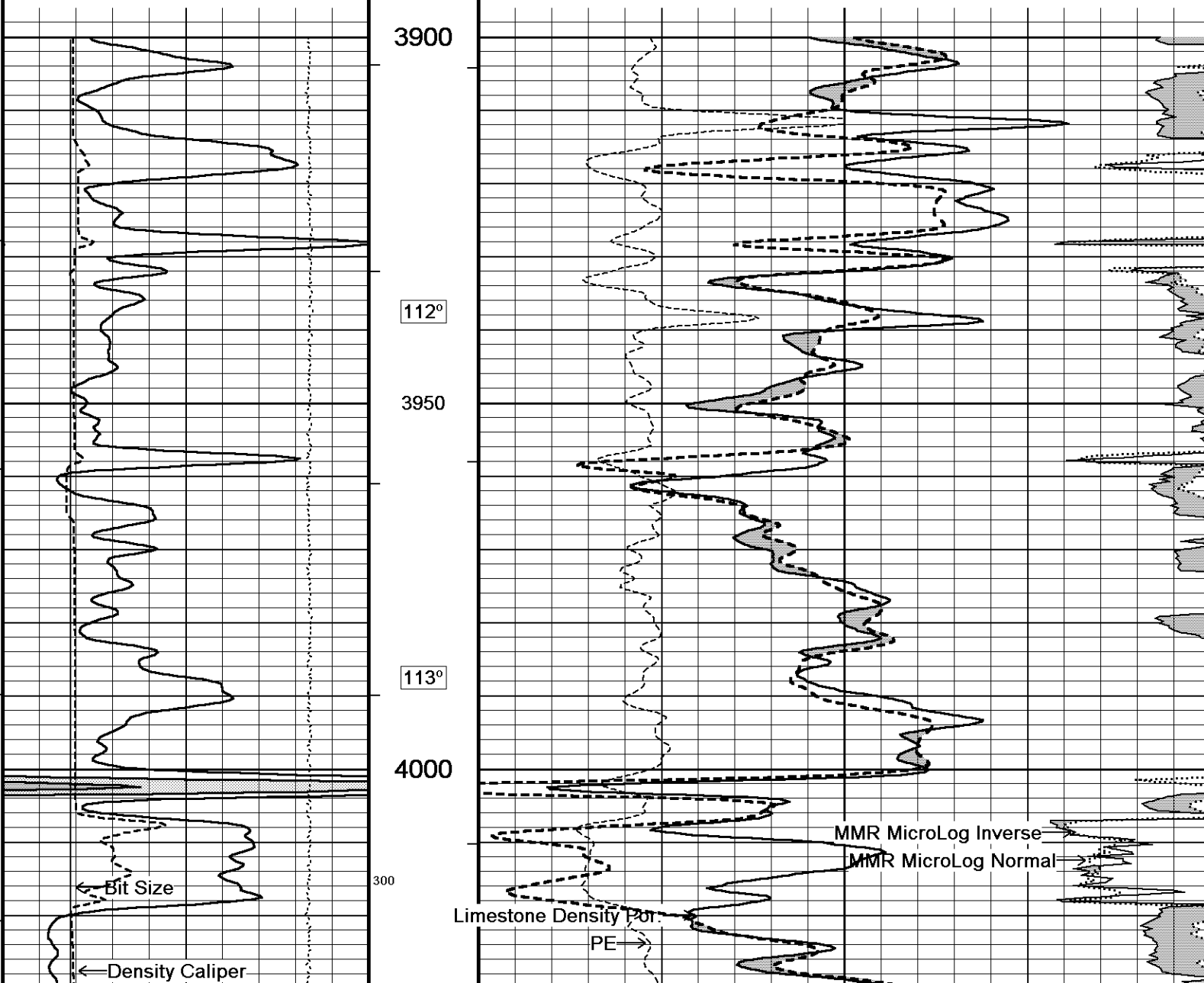
PE

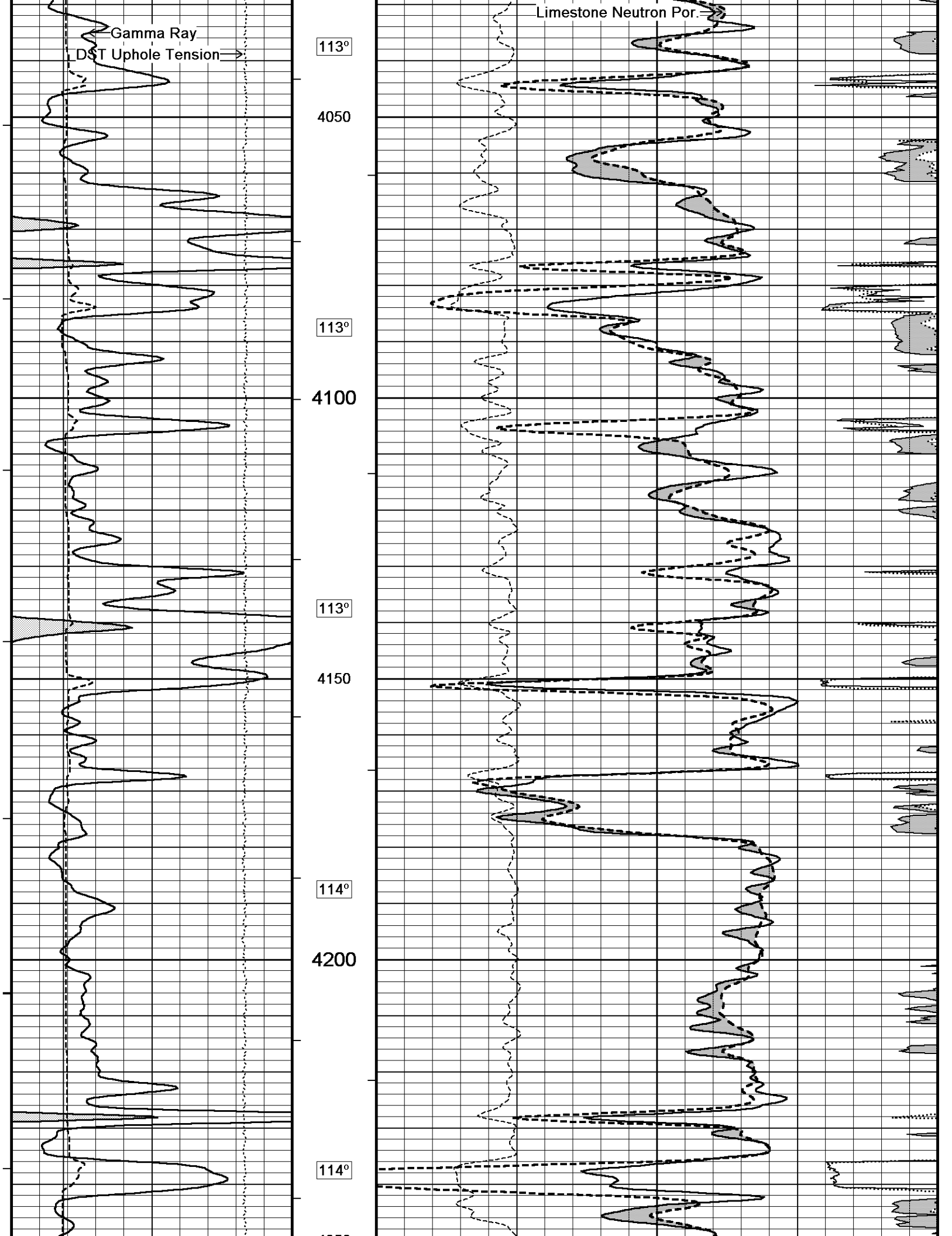
MMR MicroLog Inverse

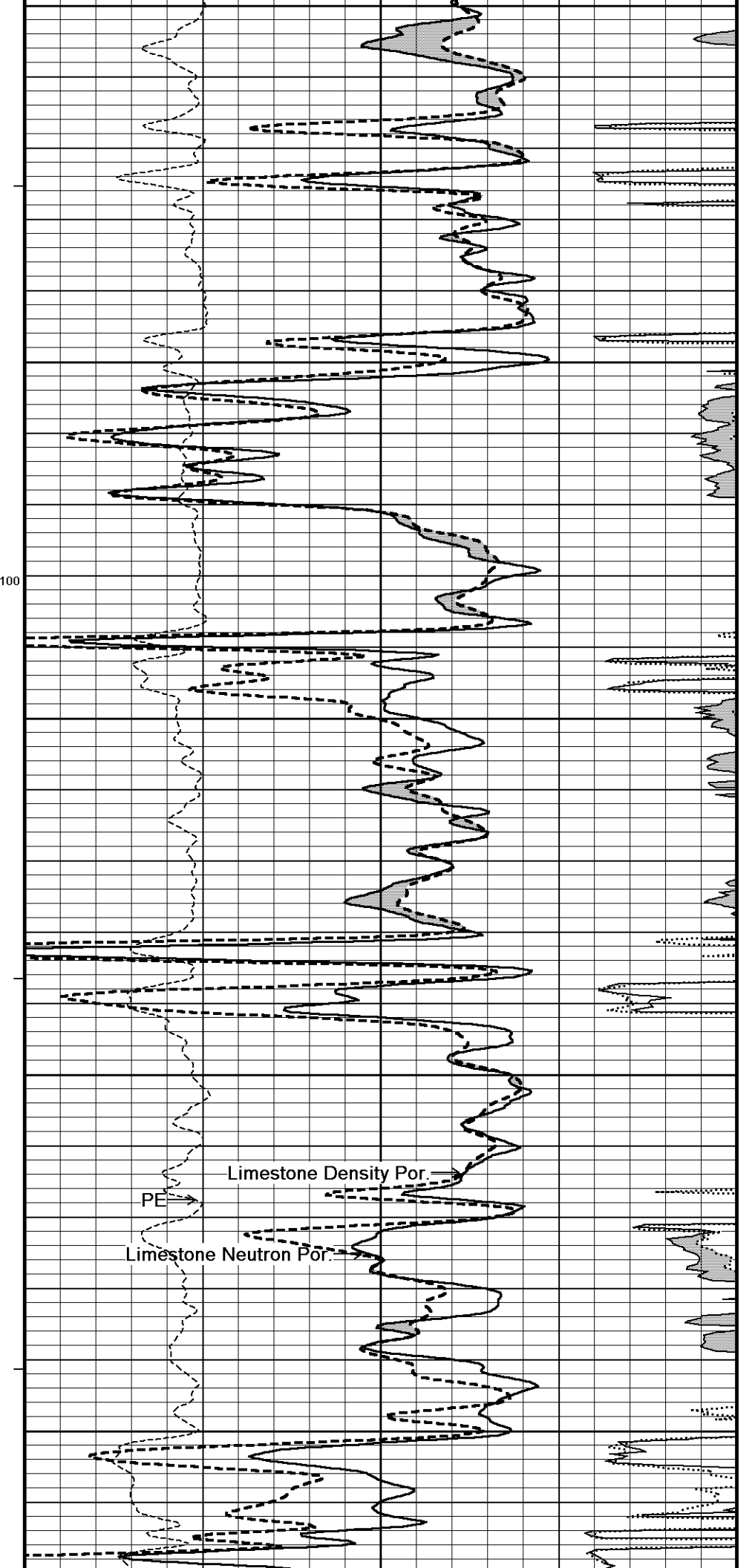
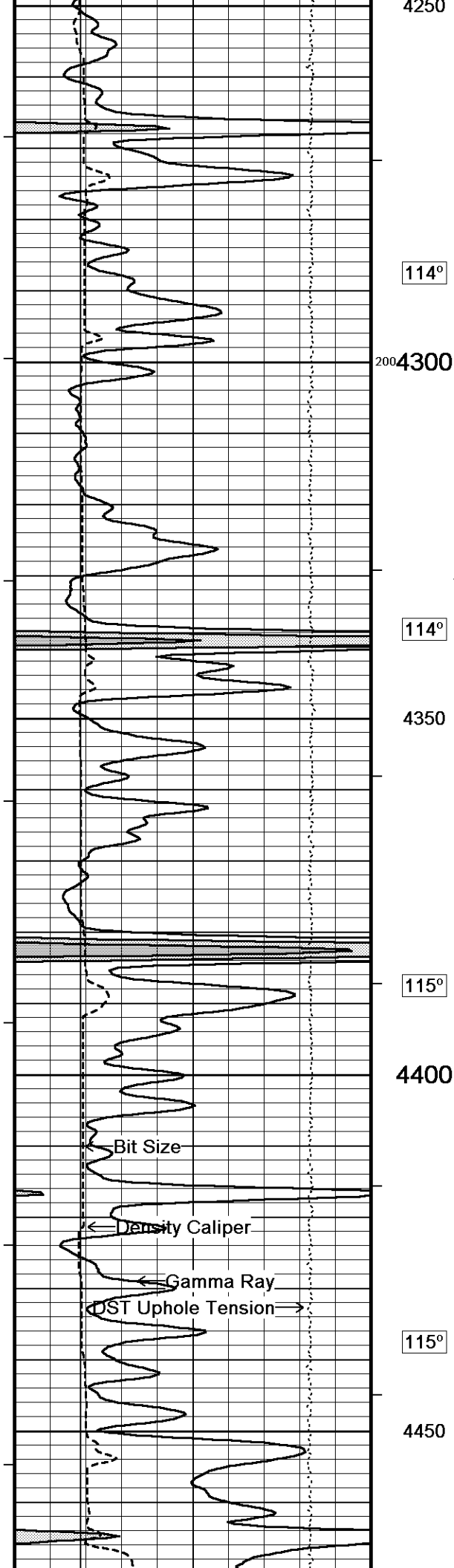
MMR MicroLog Normal

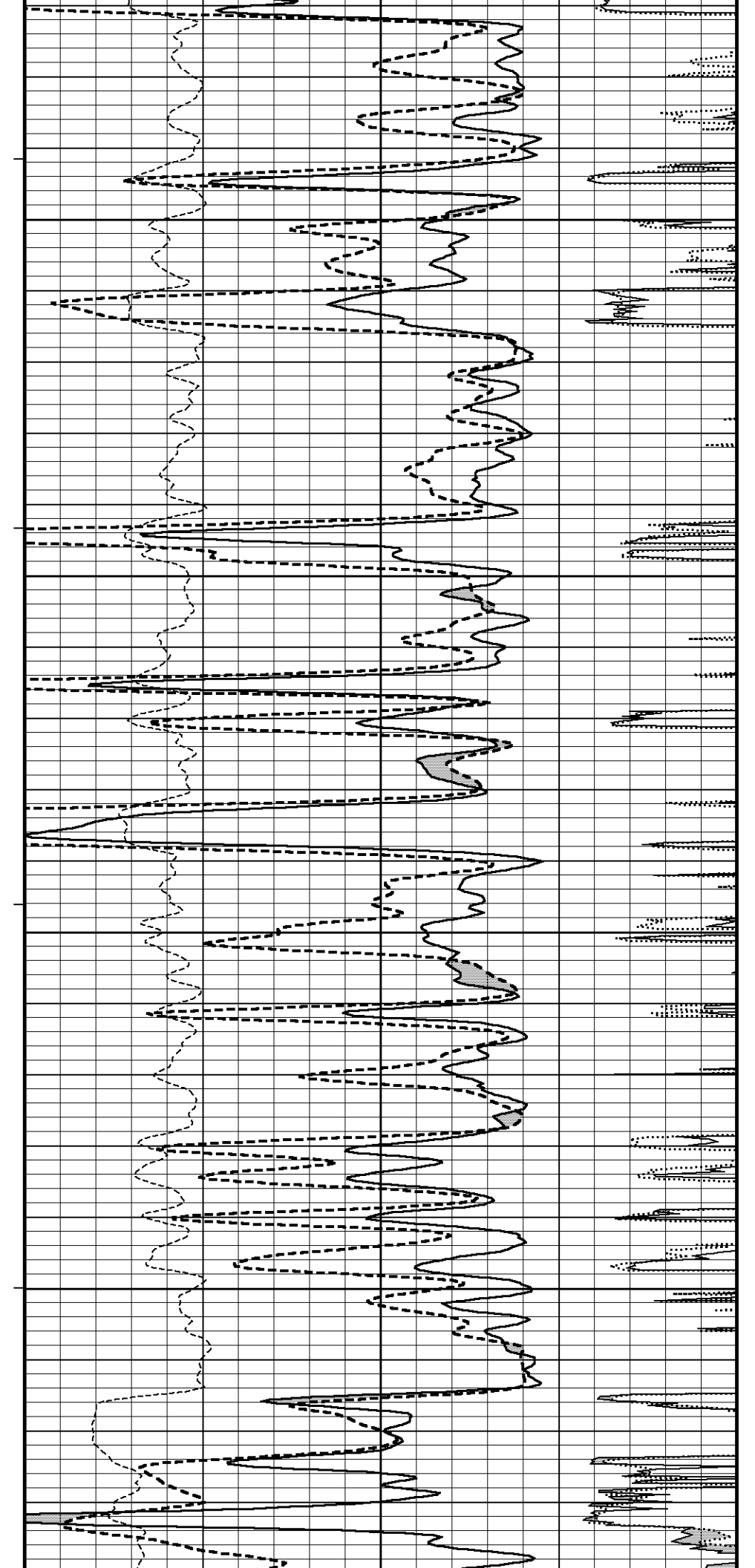
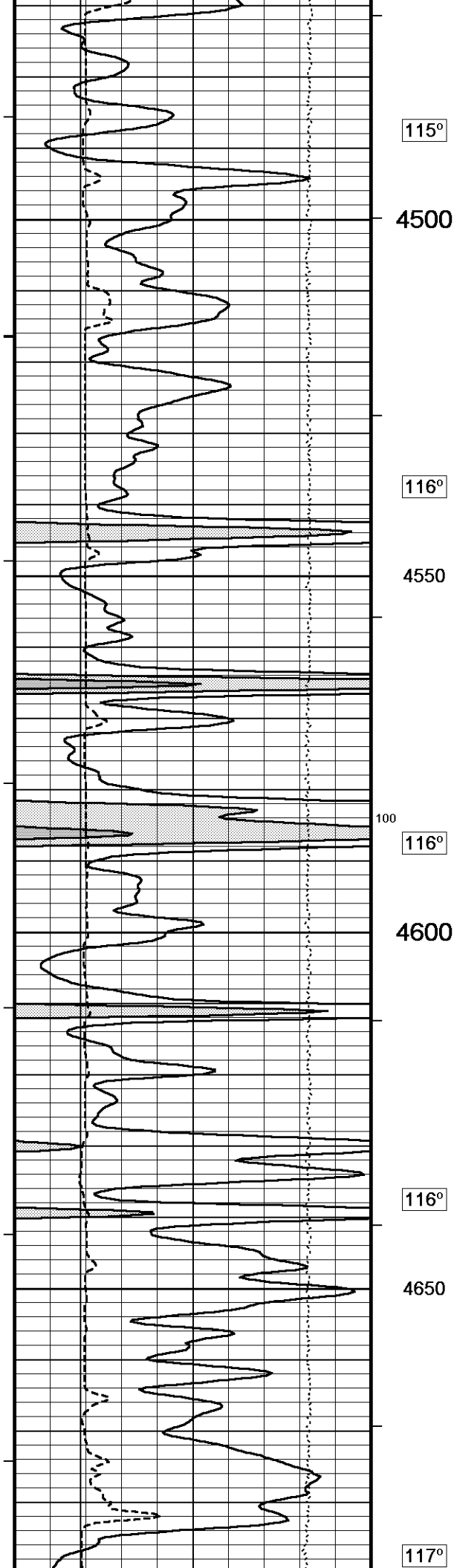
← Bit Size

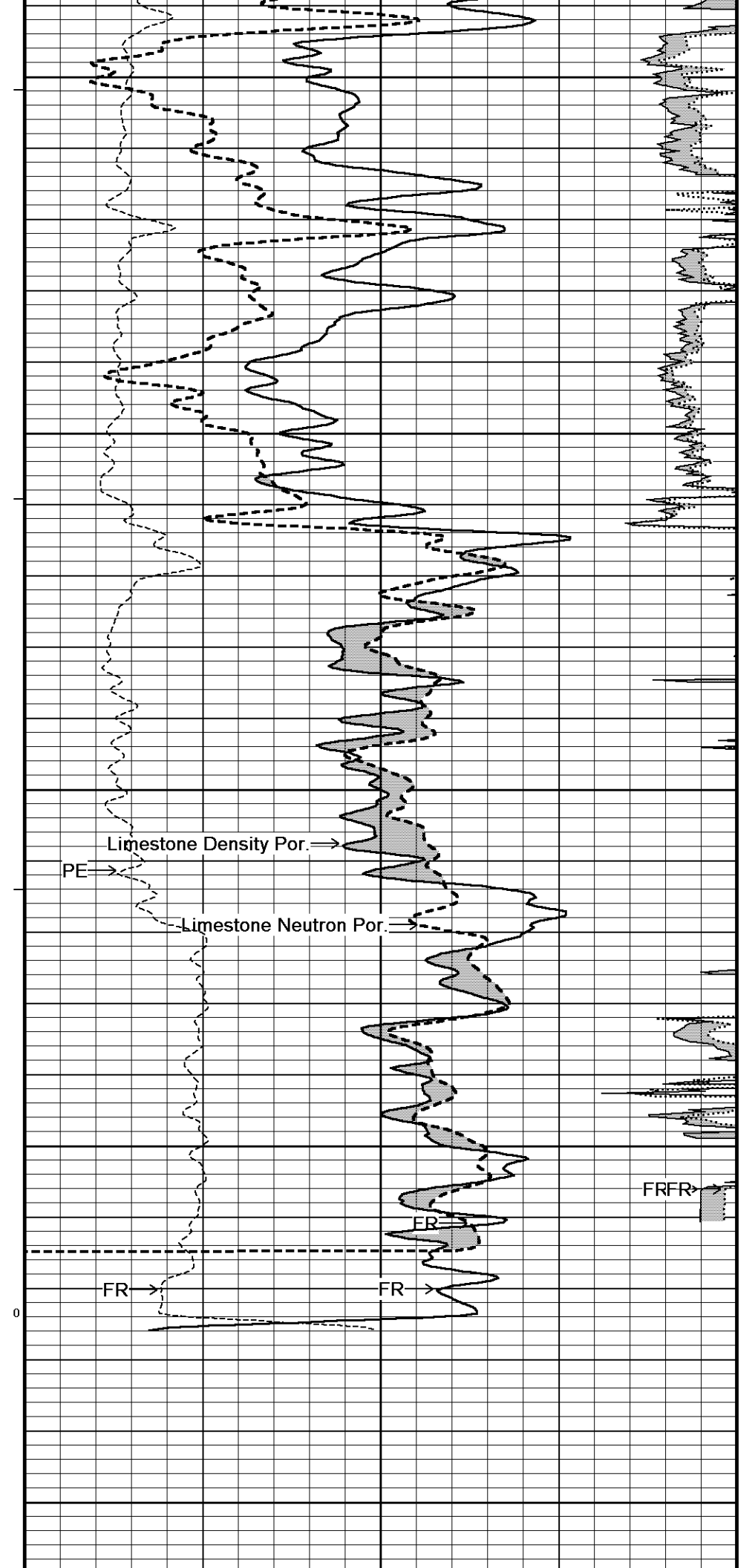
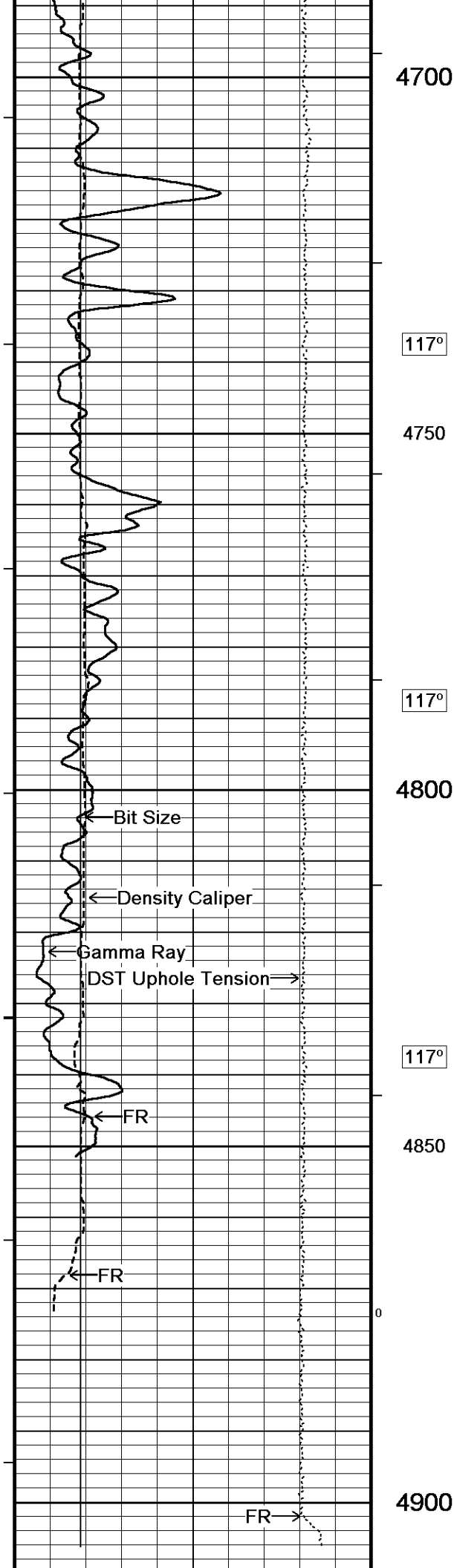
← Density Caliper

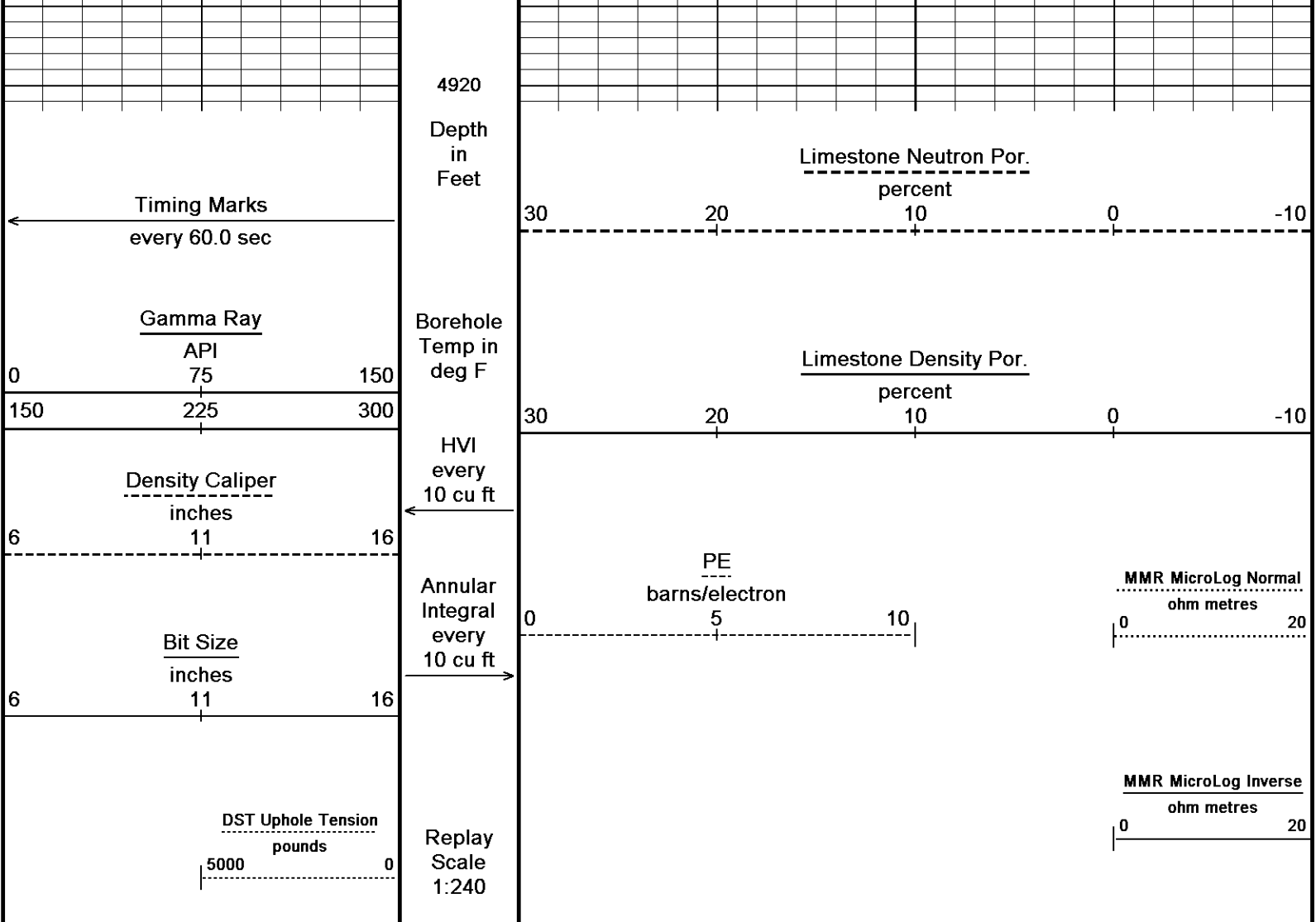












Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Logs\FIML HIBBERT 4D-...\FIML HIBBERT 4D-20-2029 REPEAT.dta
System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

Plotted on 12-APR-2014 18:23
Recorded on 12-APR-2014 14:03

↑

REPEAT SECTION

↑

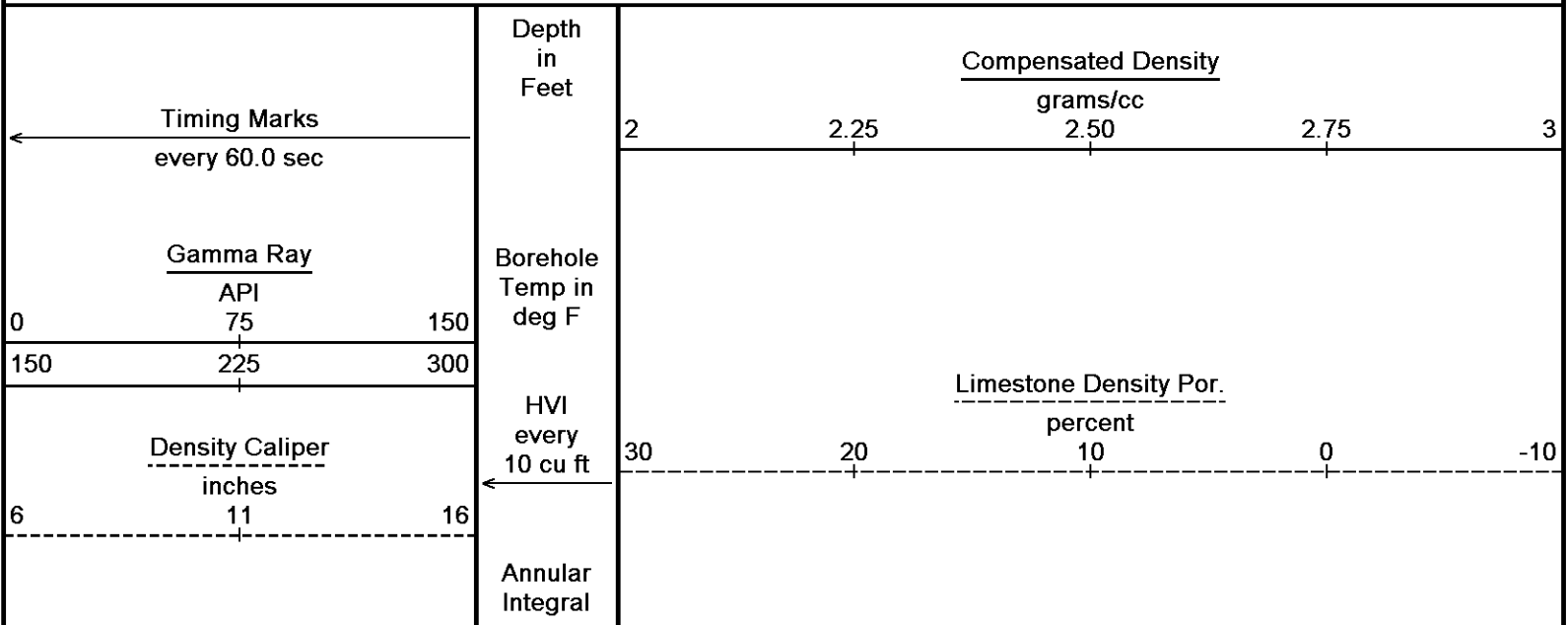
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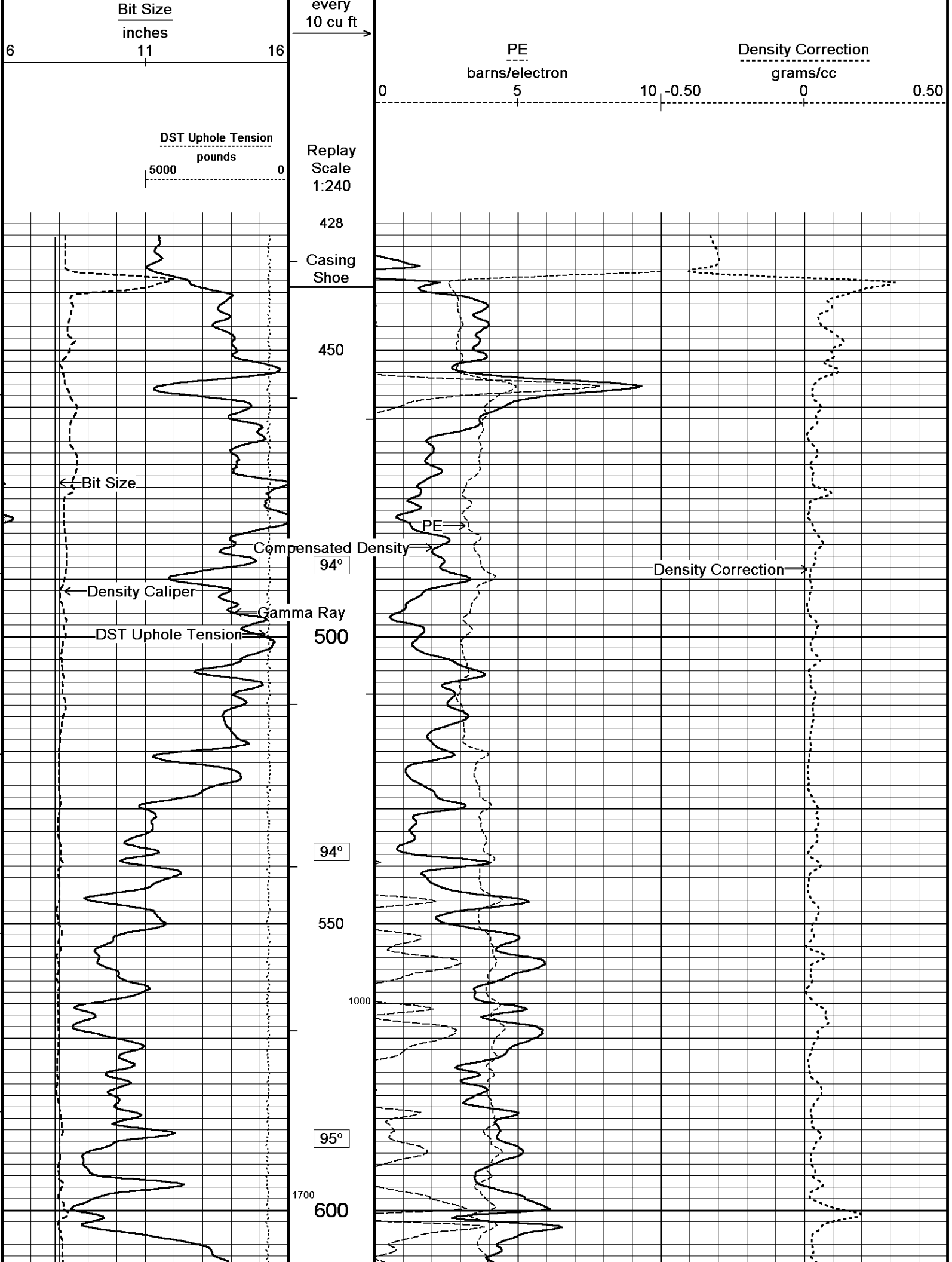
5 INCH MAIN

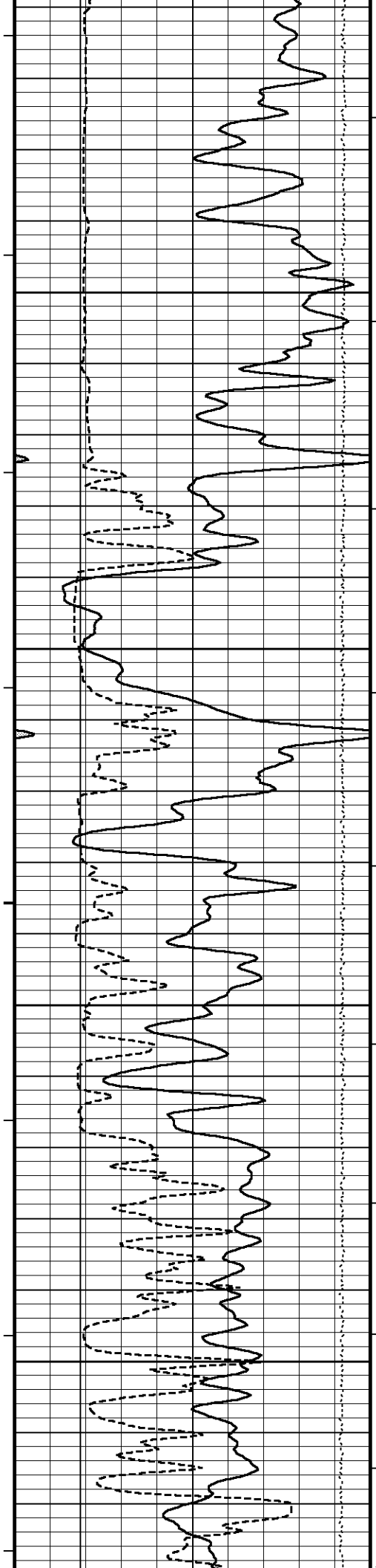
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Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Logs\FIML HIBBERT 4D-20-...\FIML HIBBERT 4D-20-2029 MAIN.dta
System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

Plotted on 12-APR-2014 18:23
Recorded on 12-APR-2014 14:49







95°

650

95°

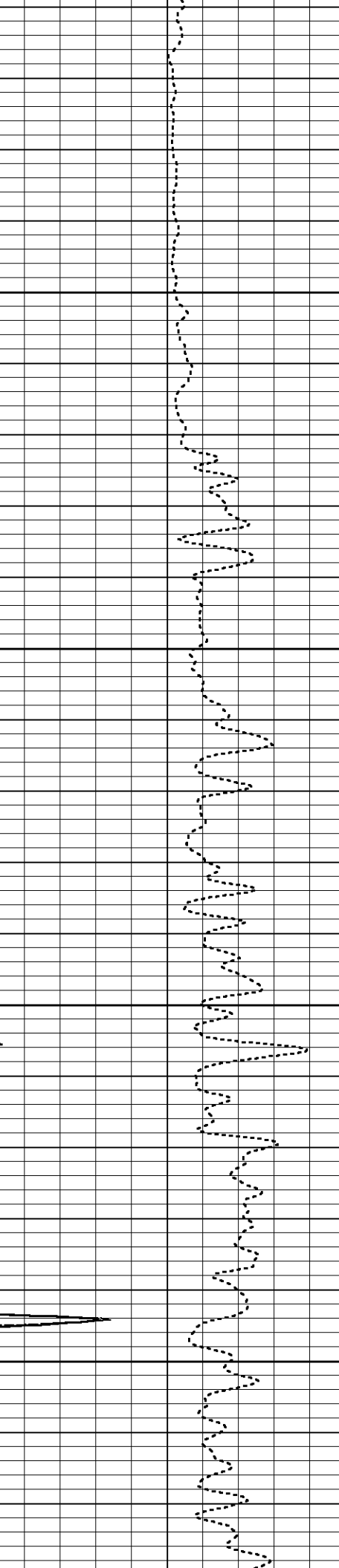
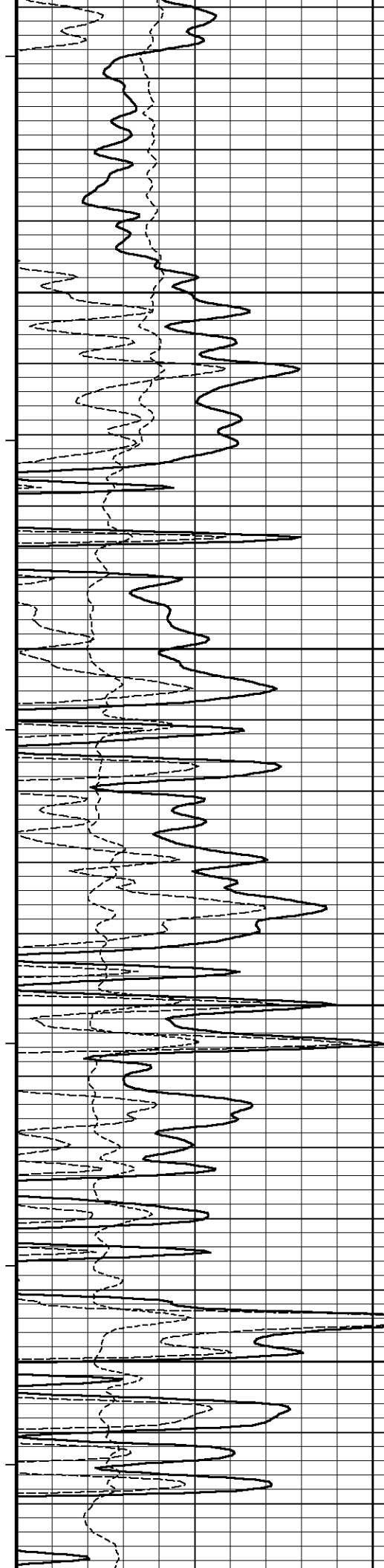
700

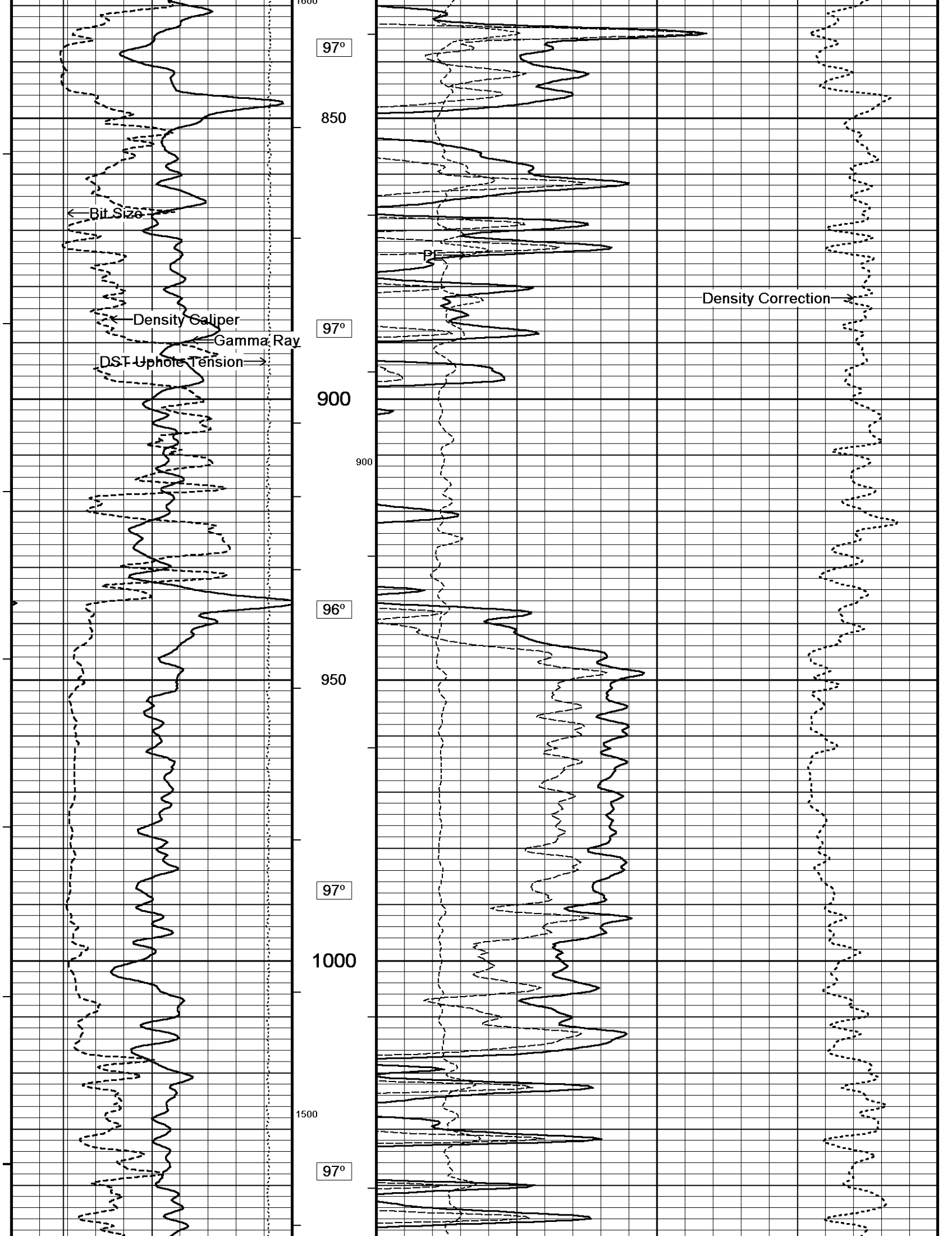
96°

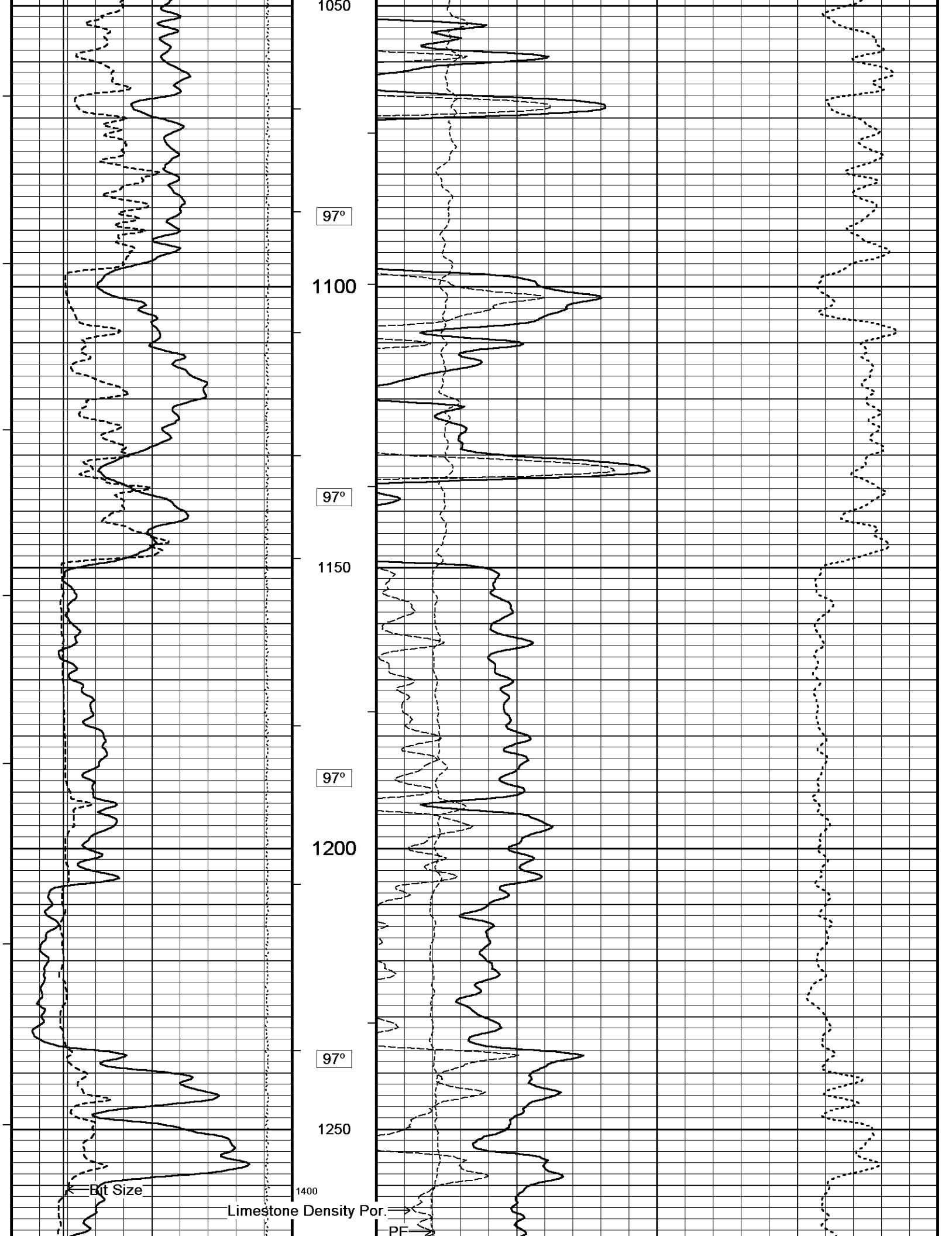
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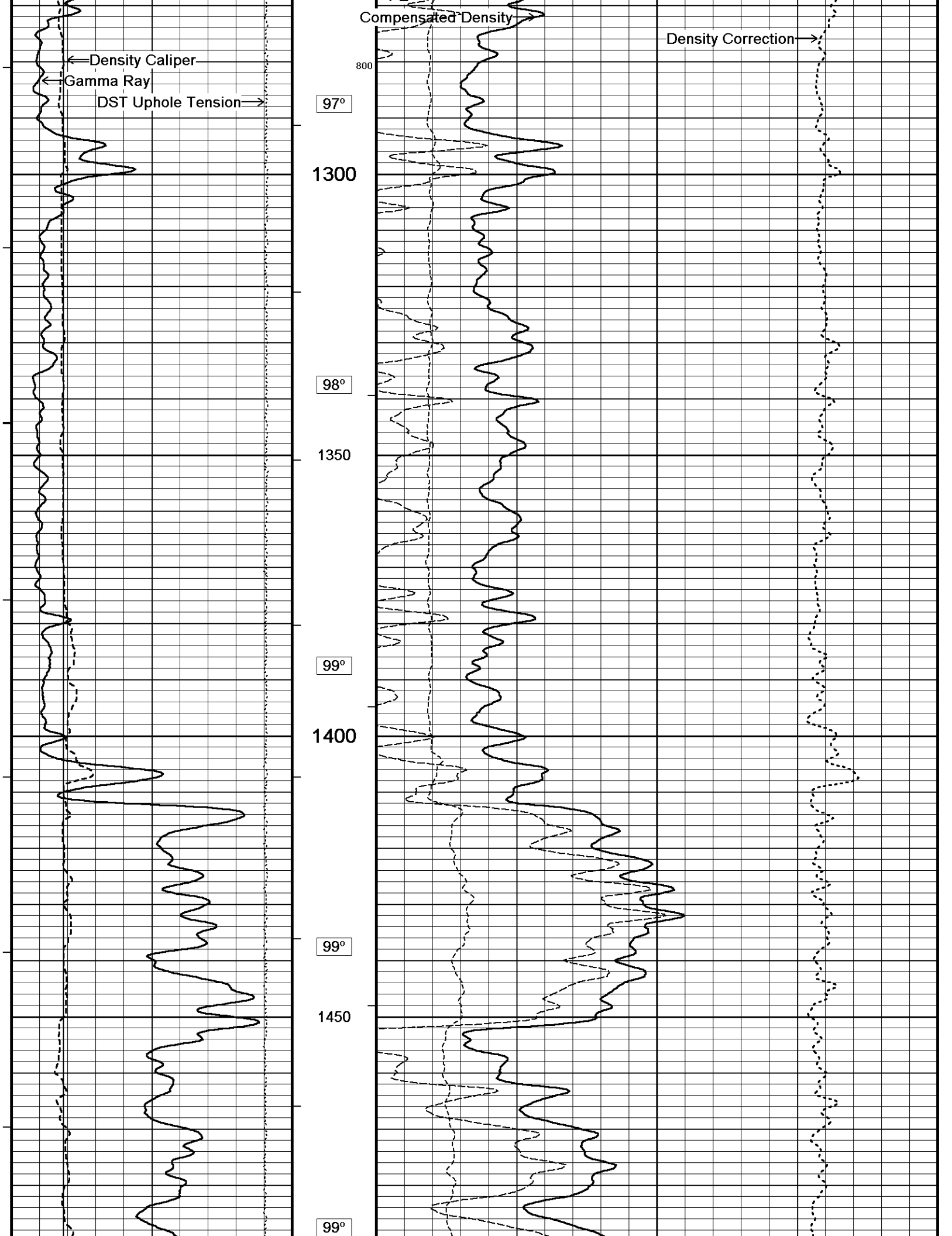
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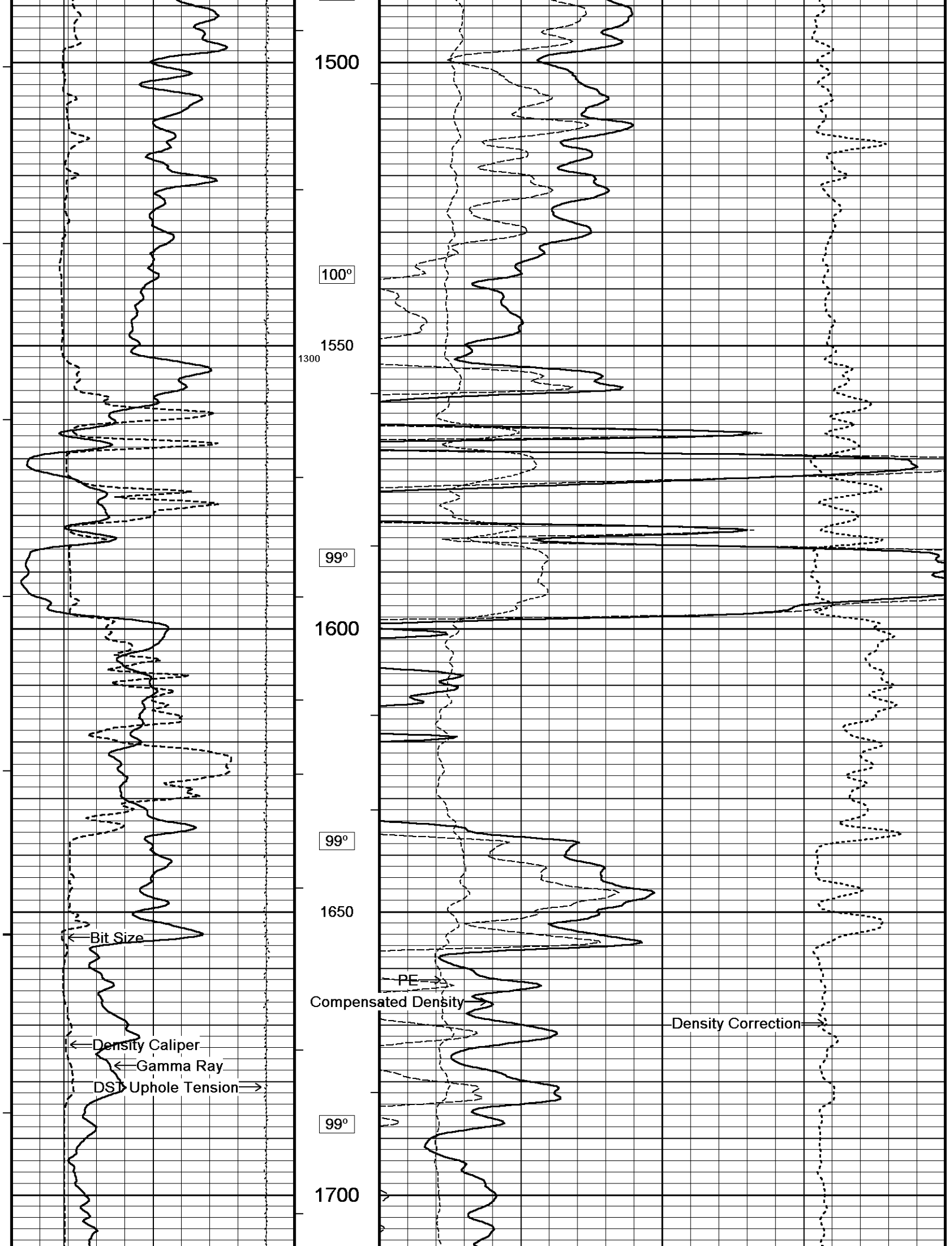
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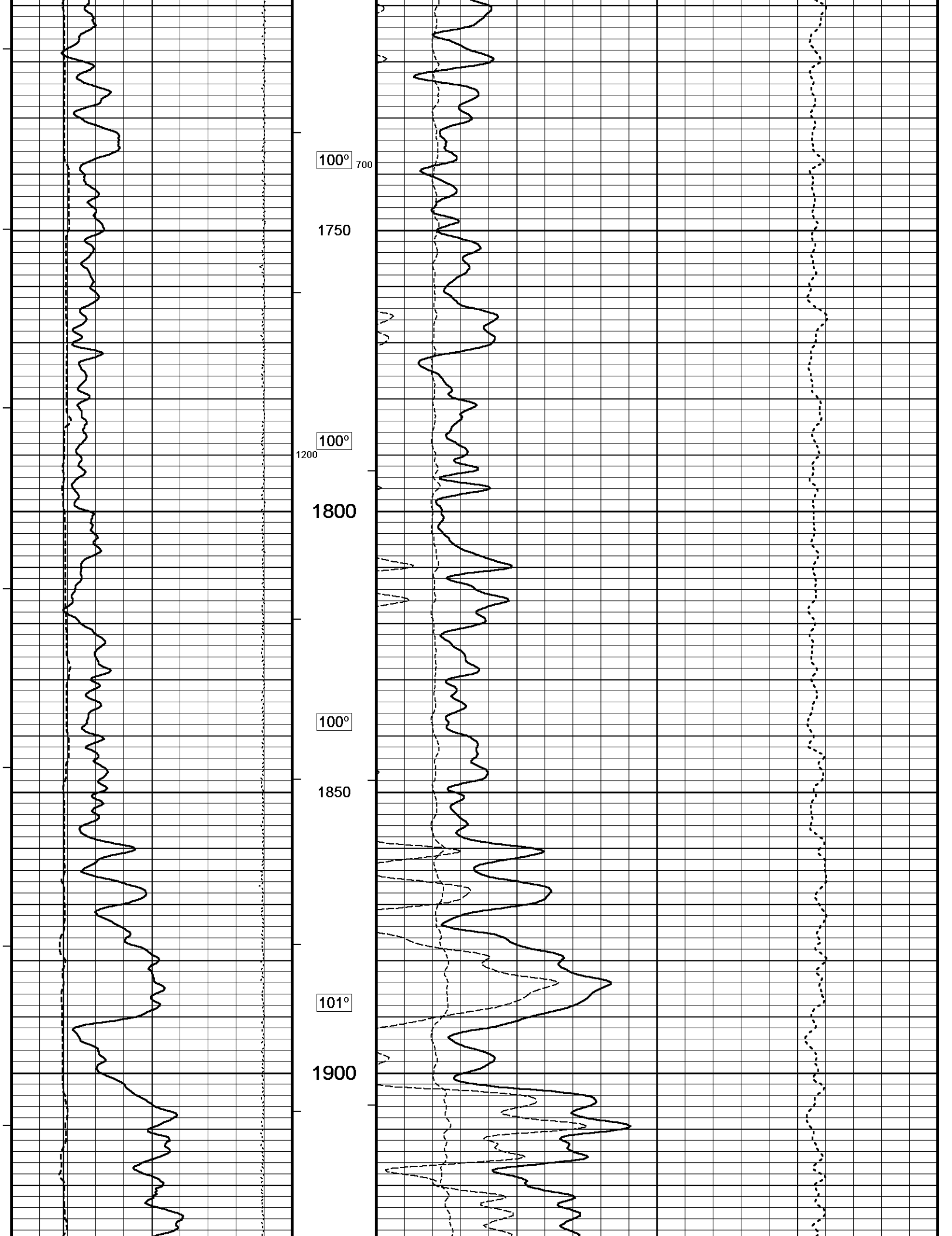


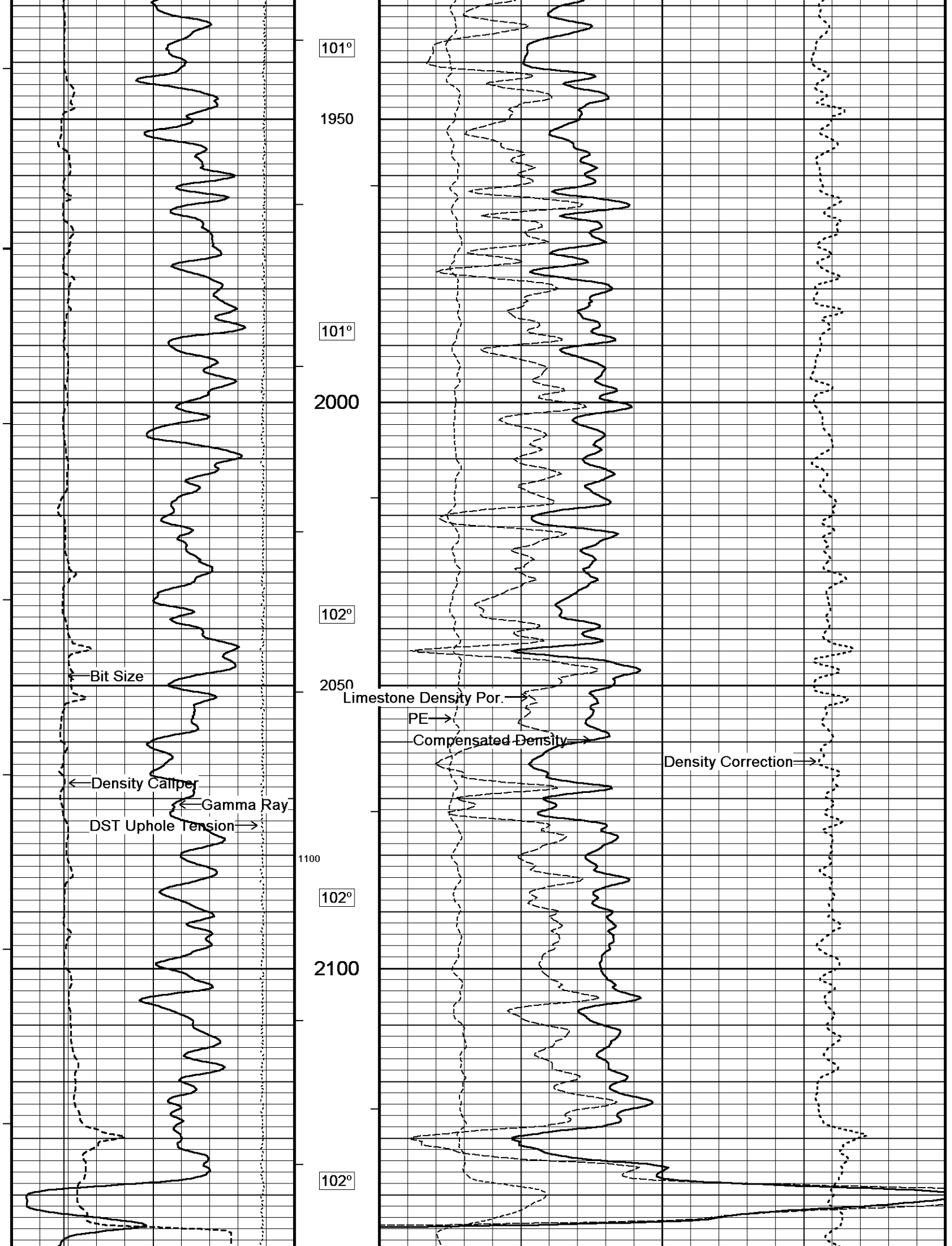


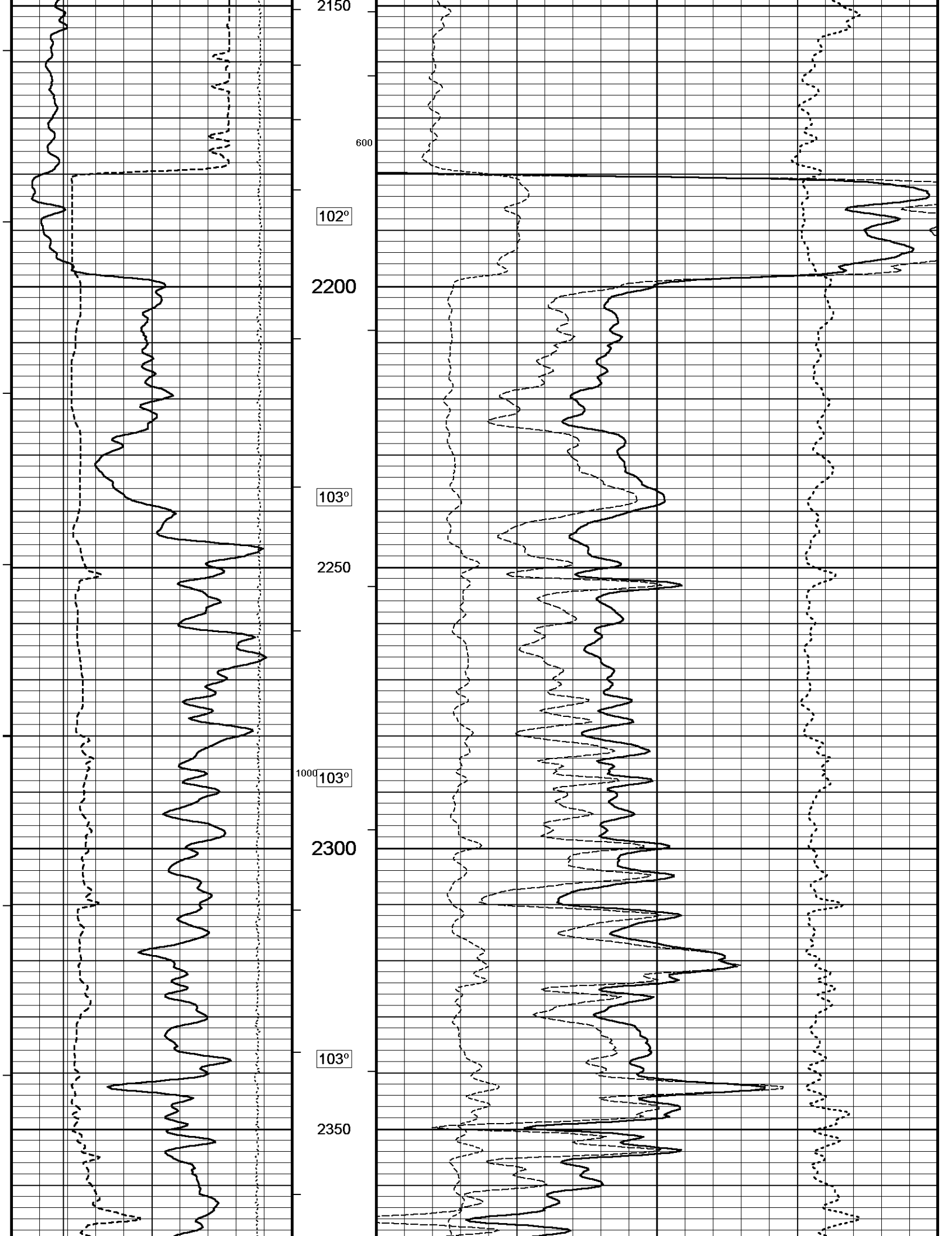


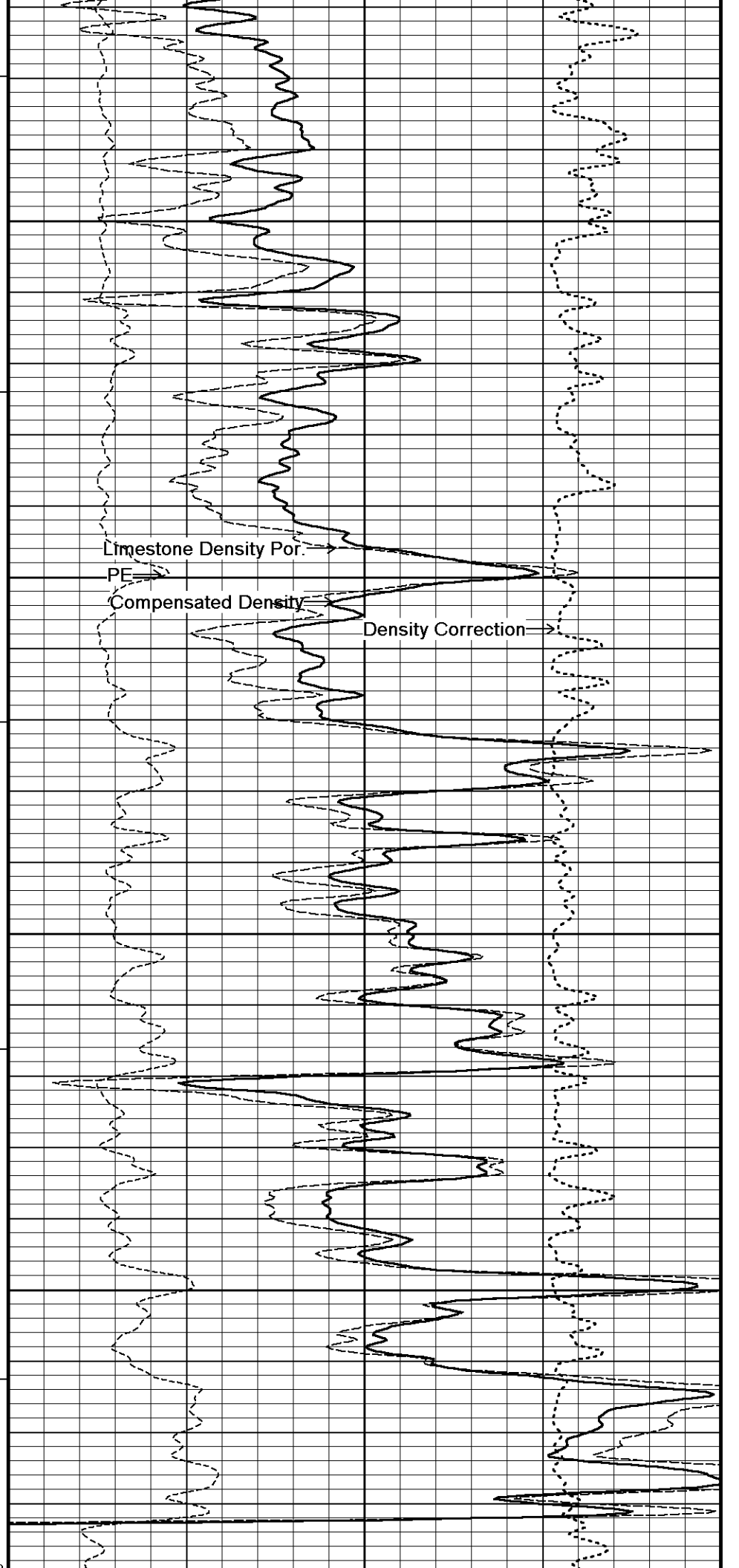
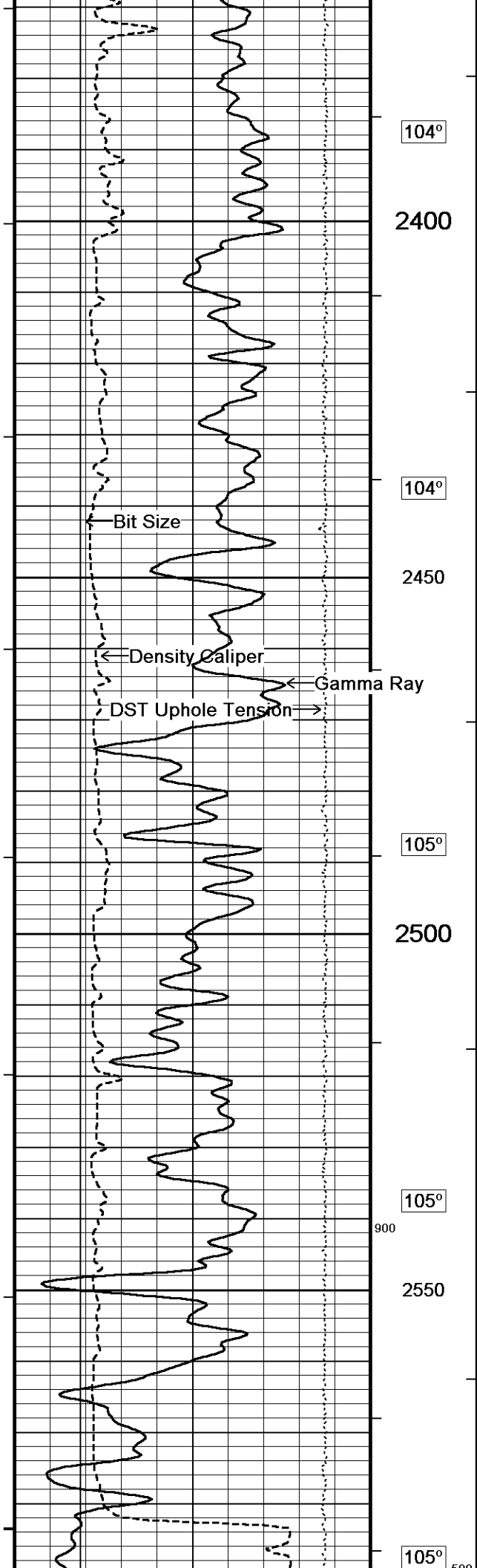


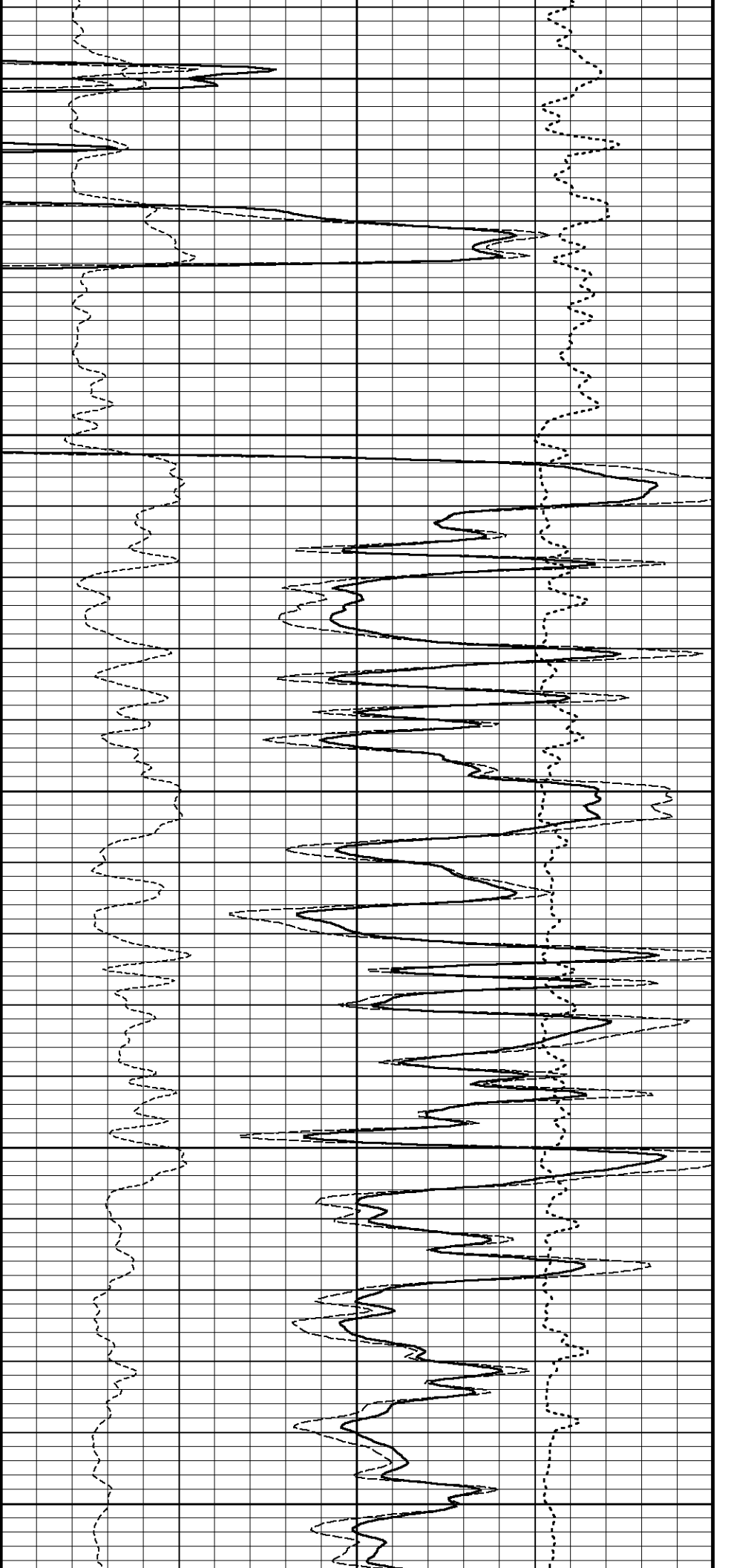
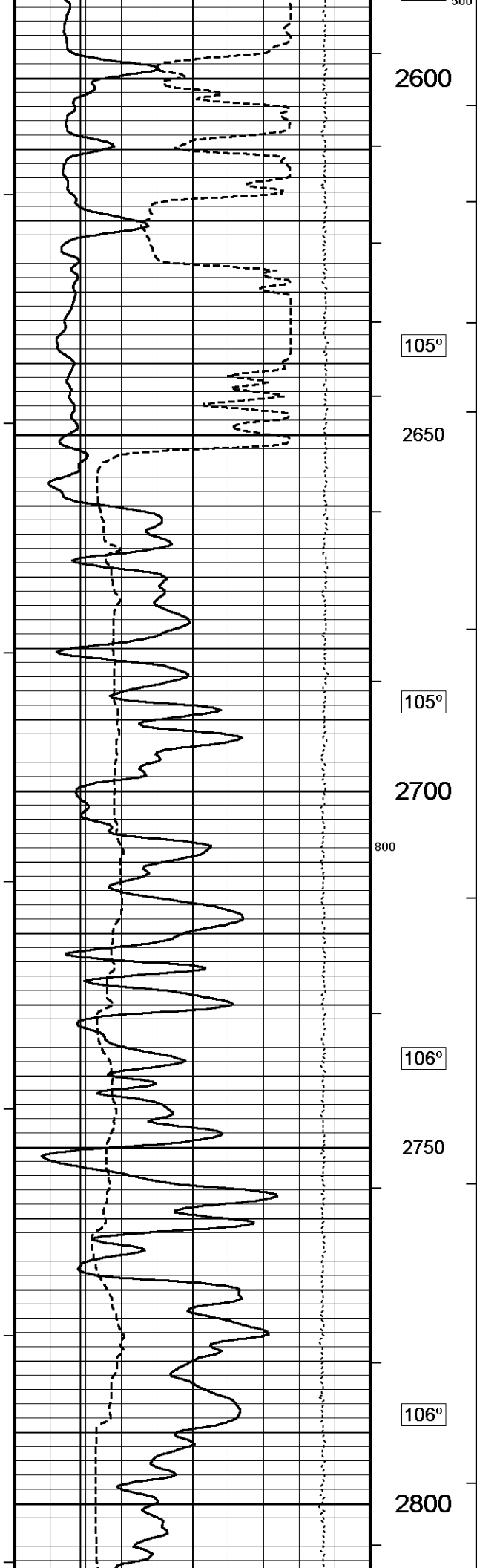


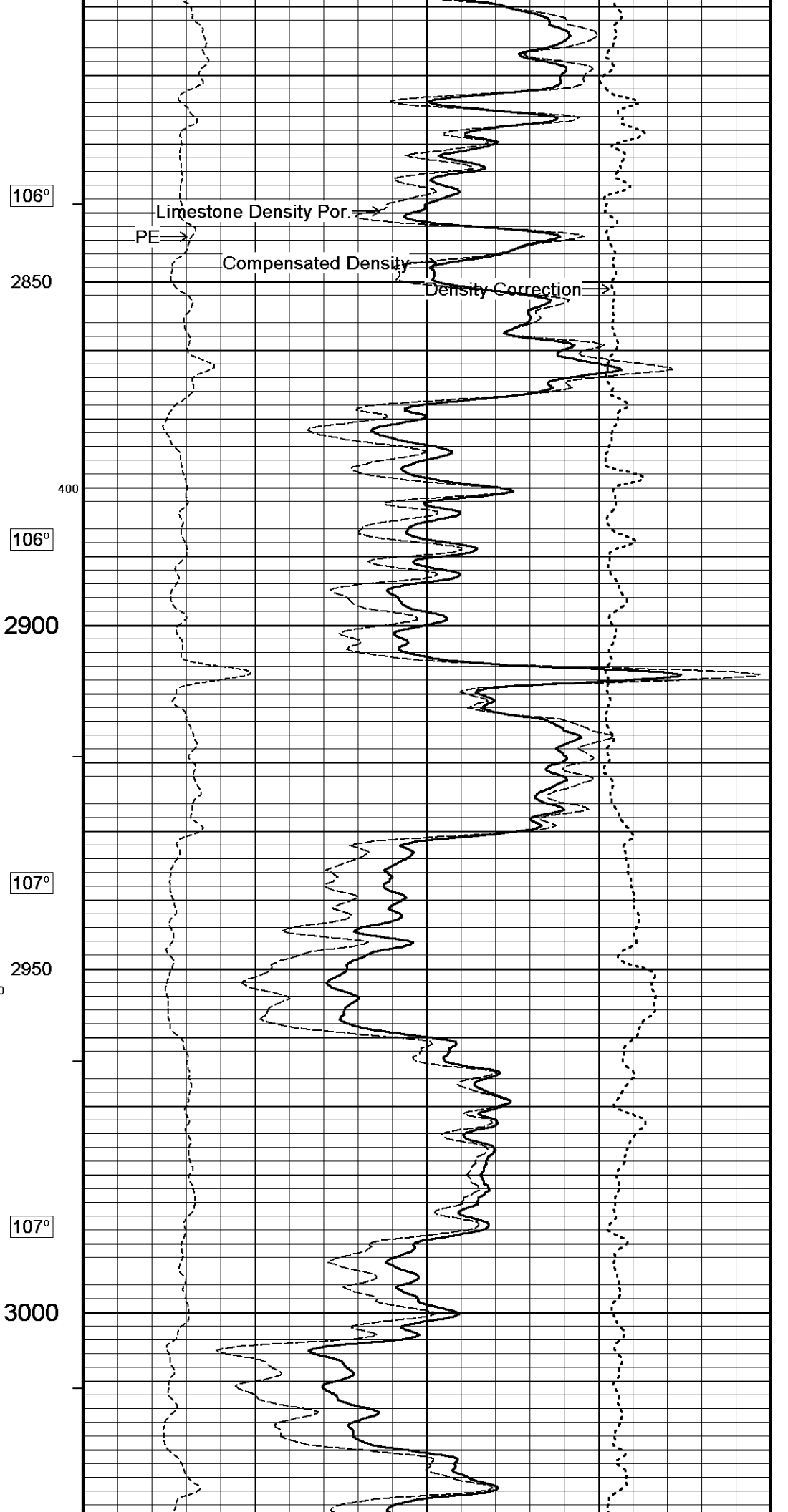
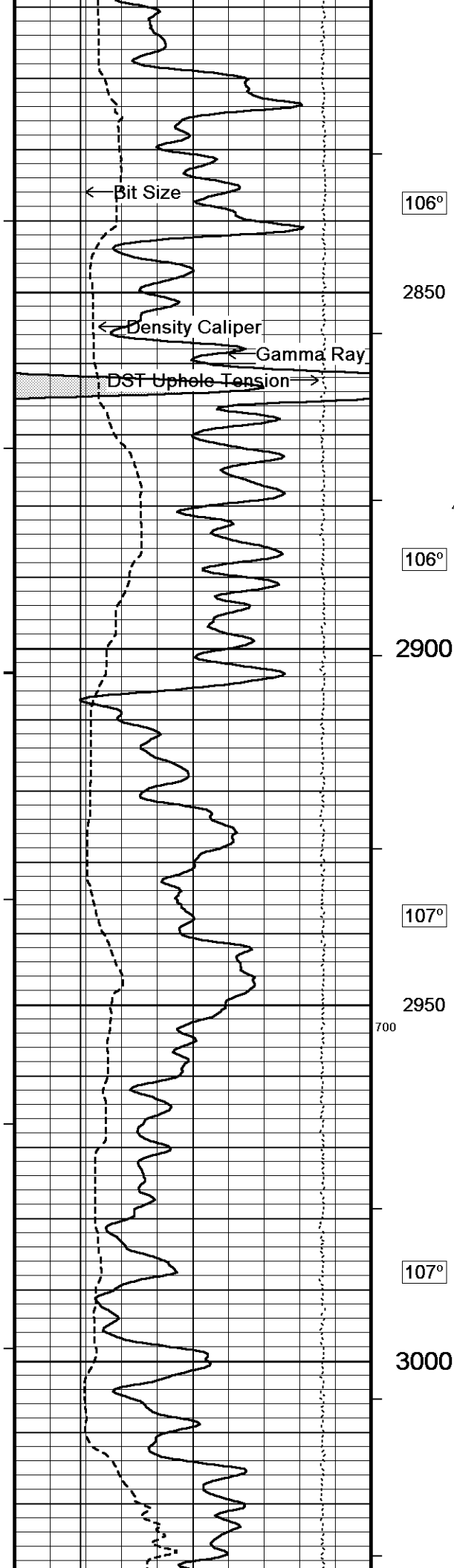


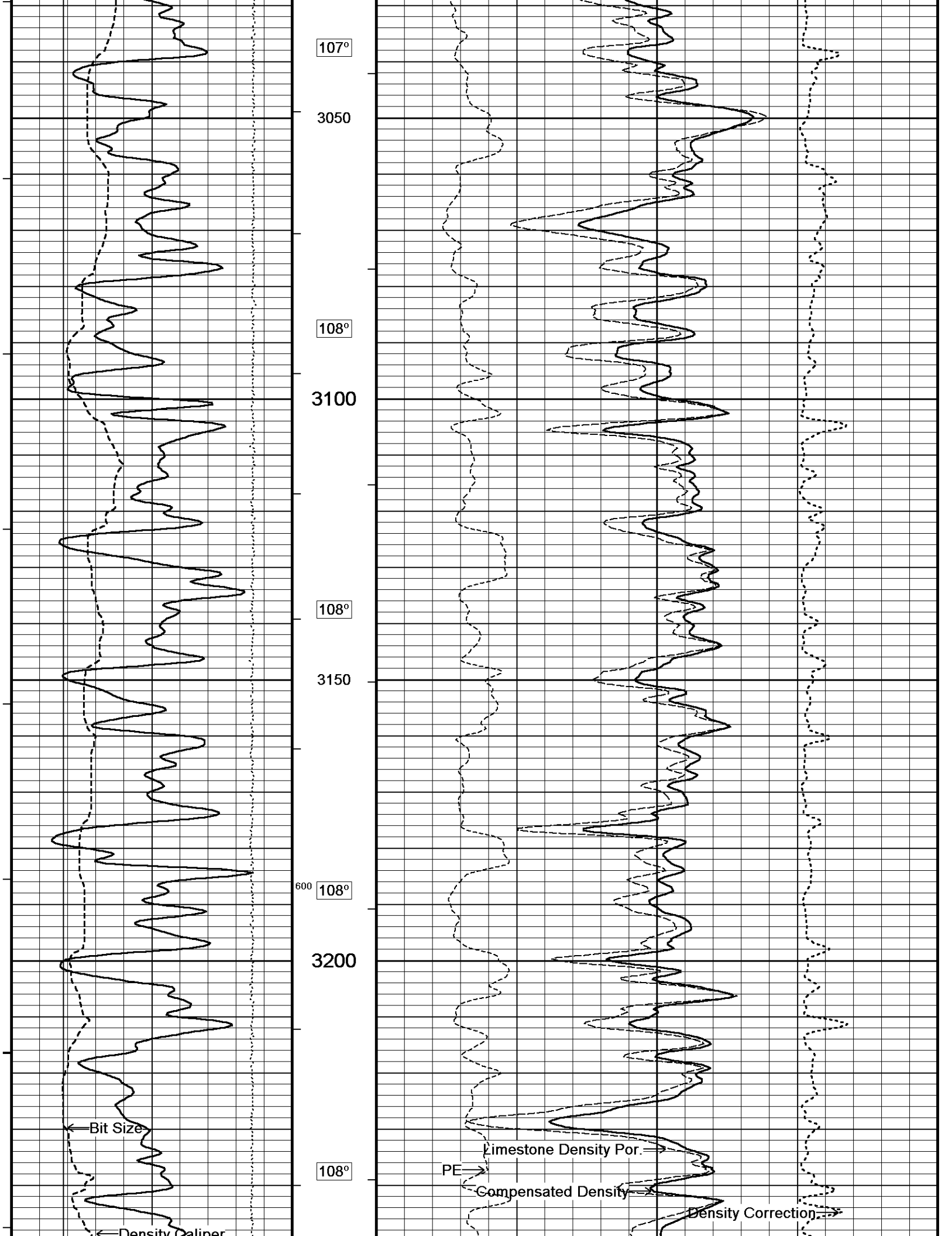


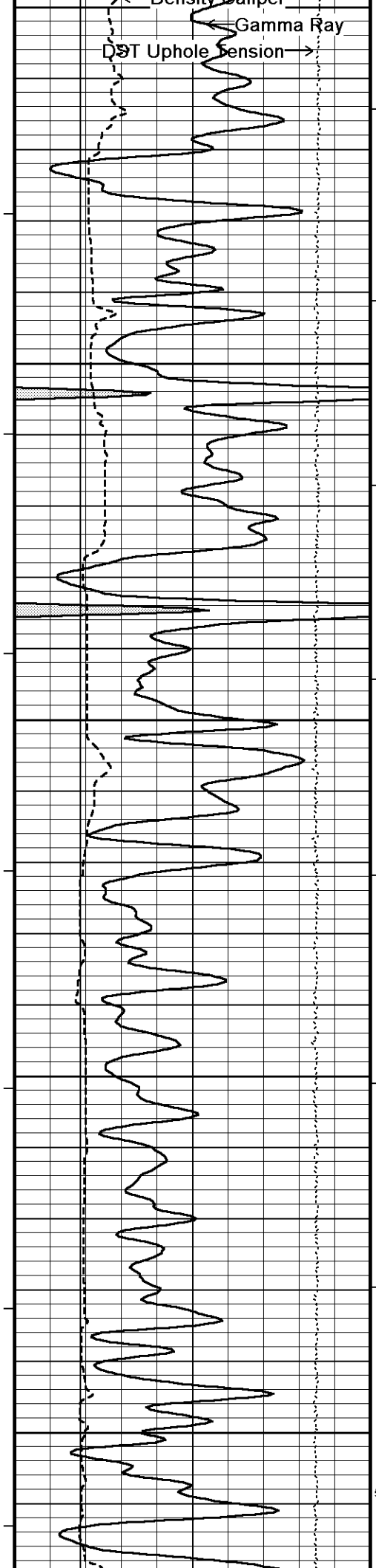




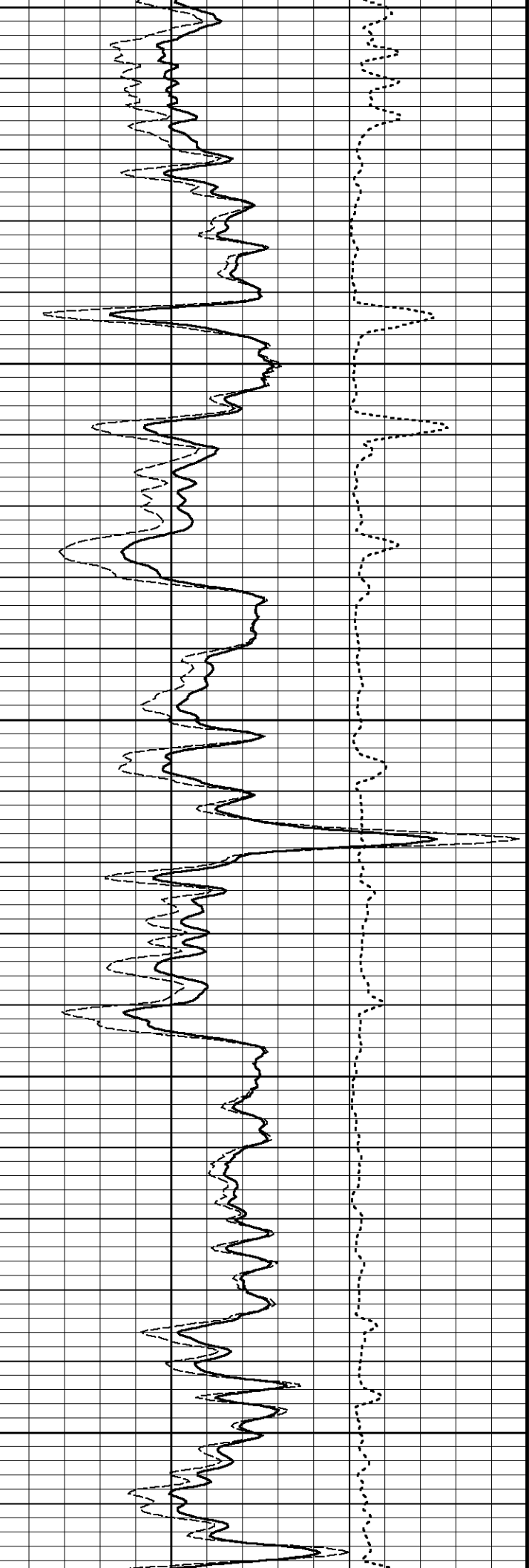
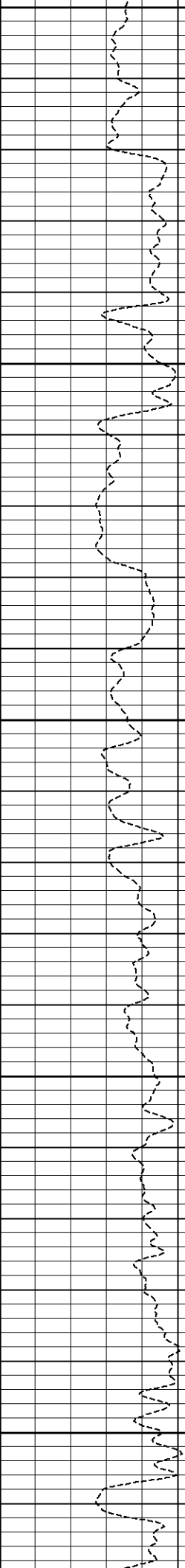


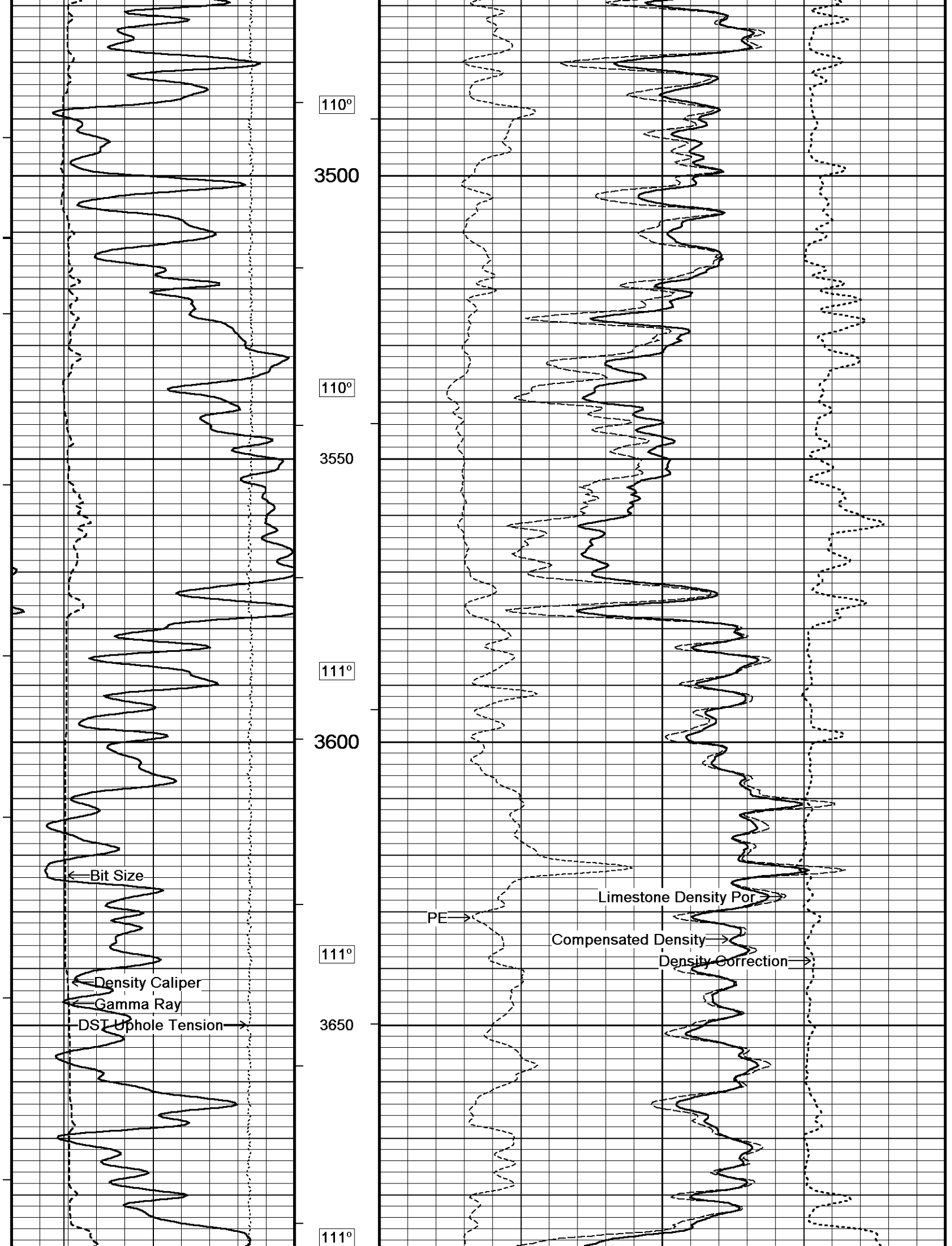


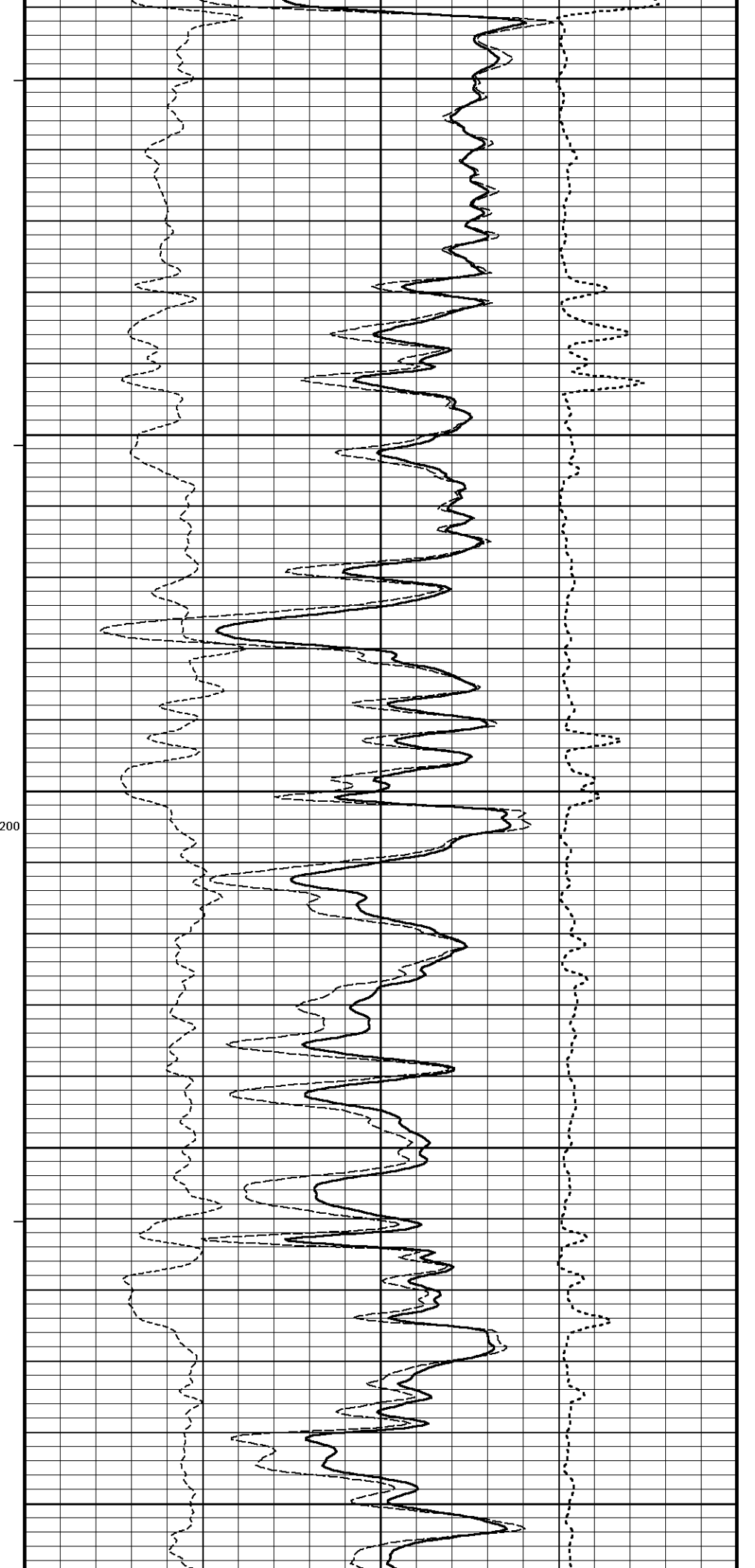
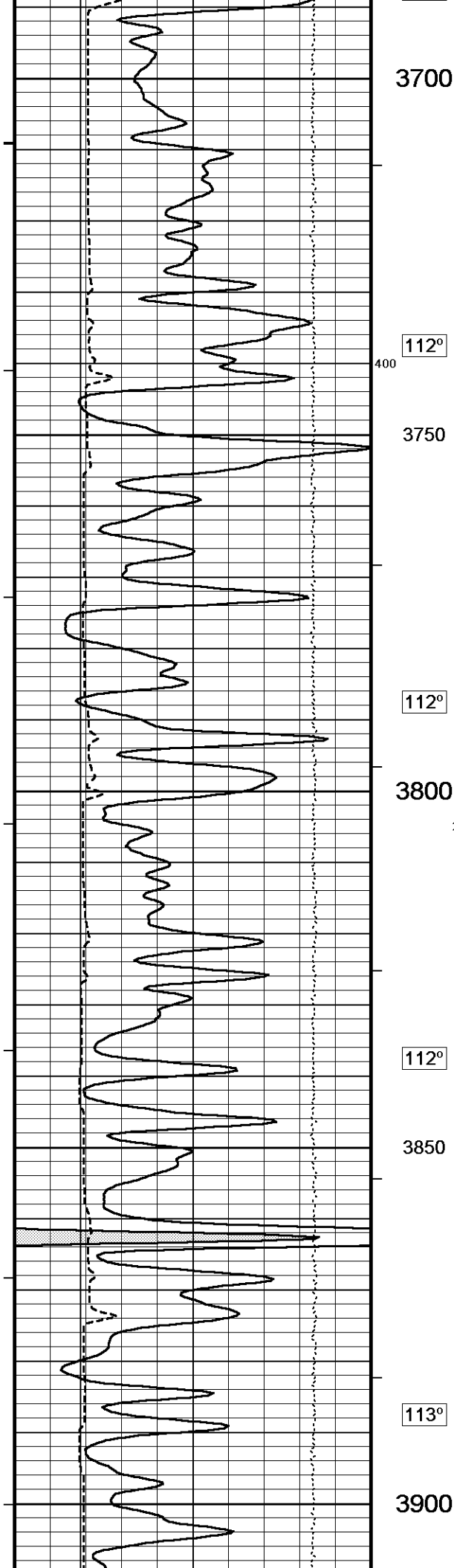


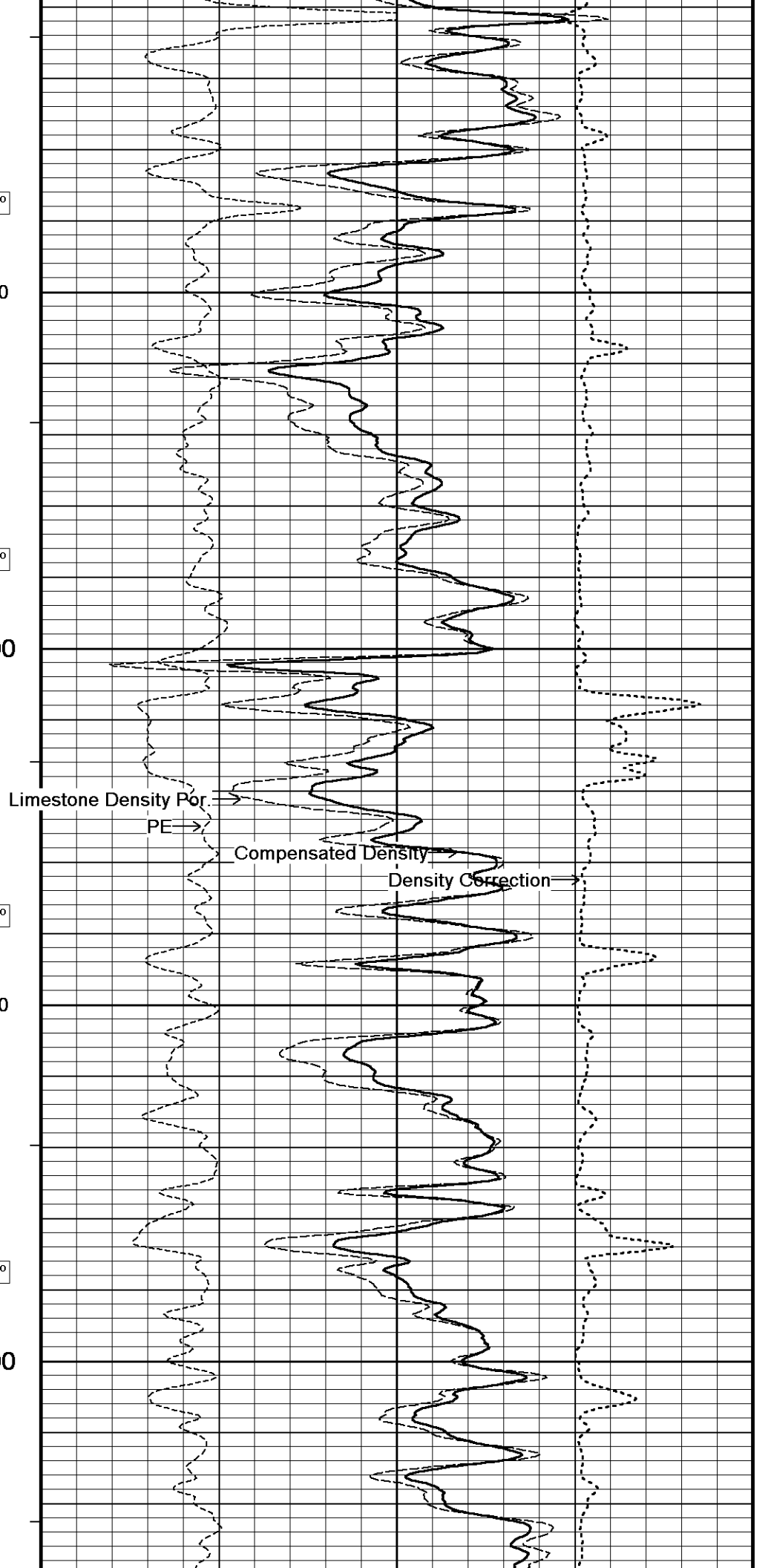
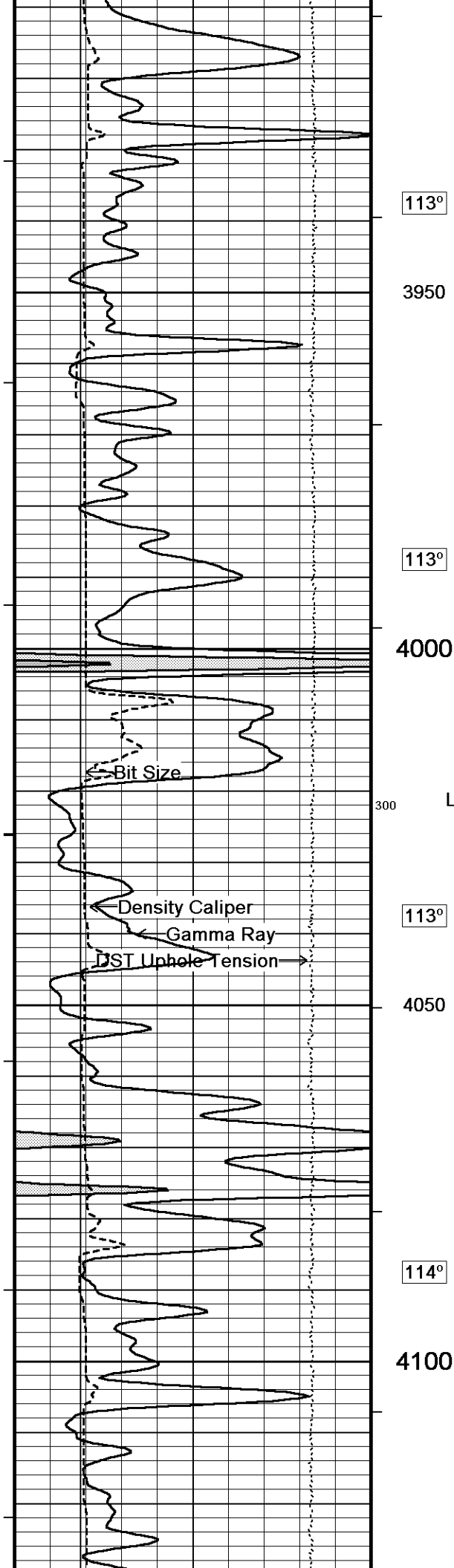


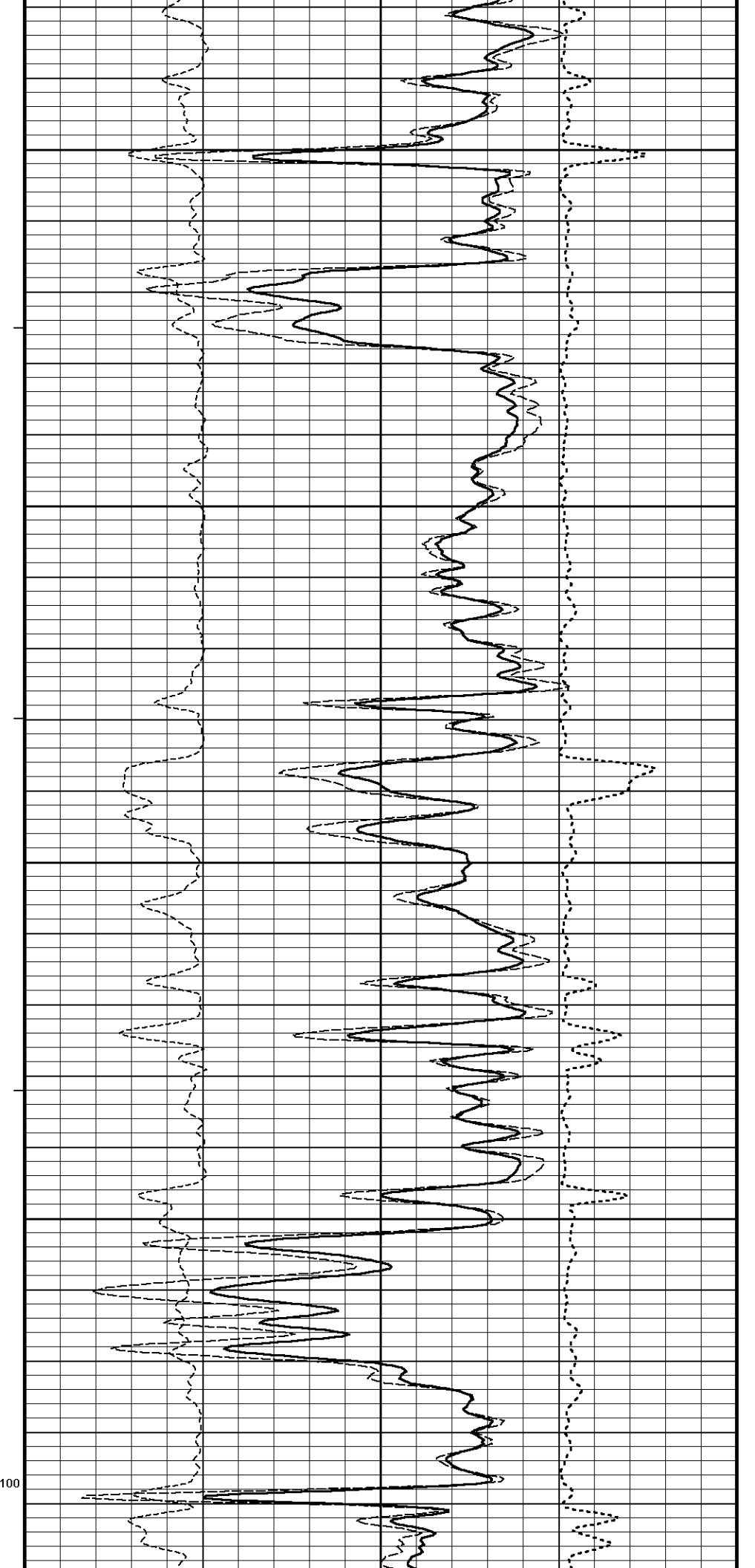
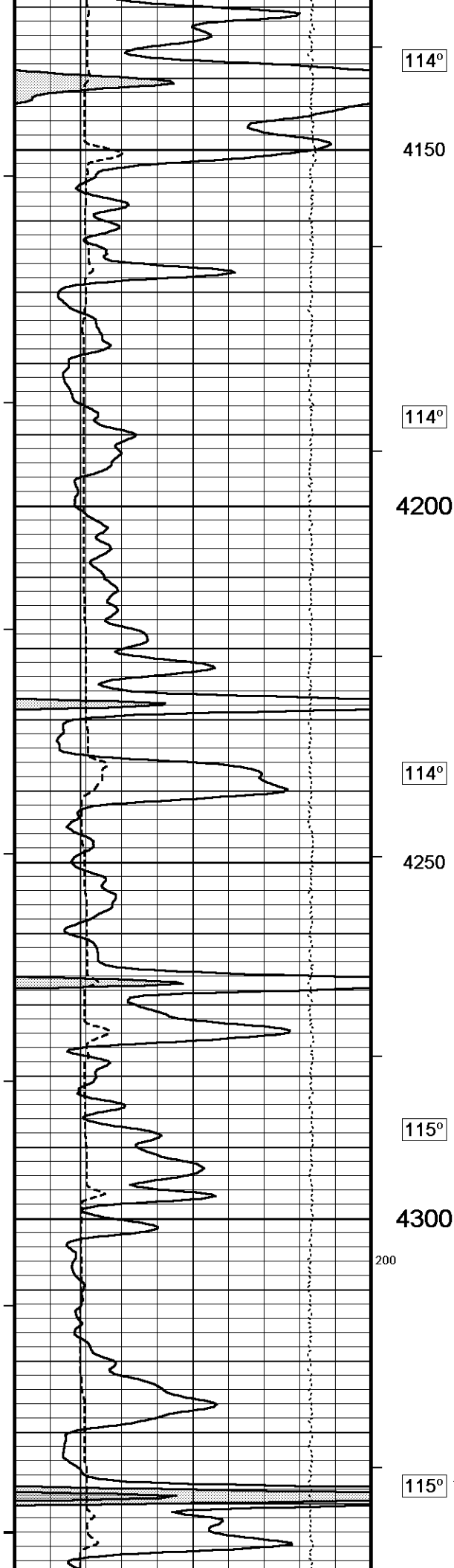
3250
3300
3350
3400
3450
500

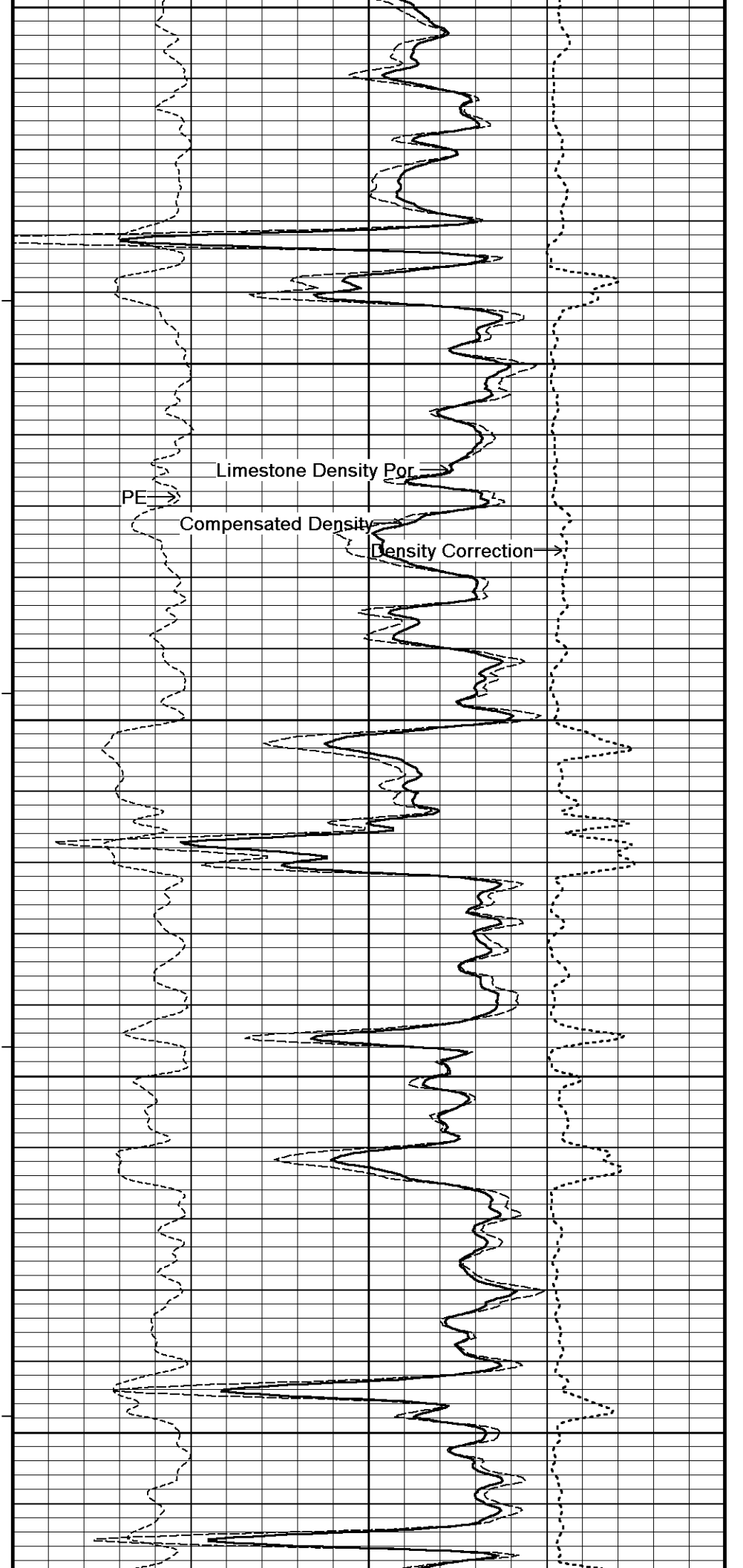
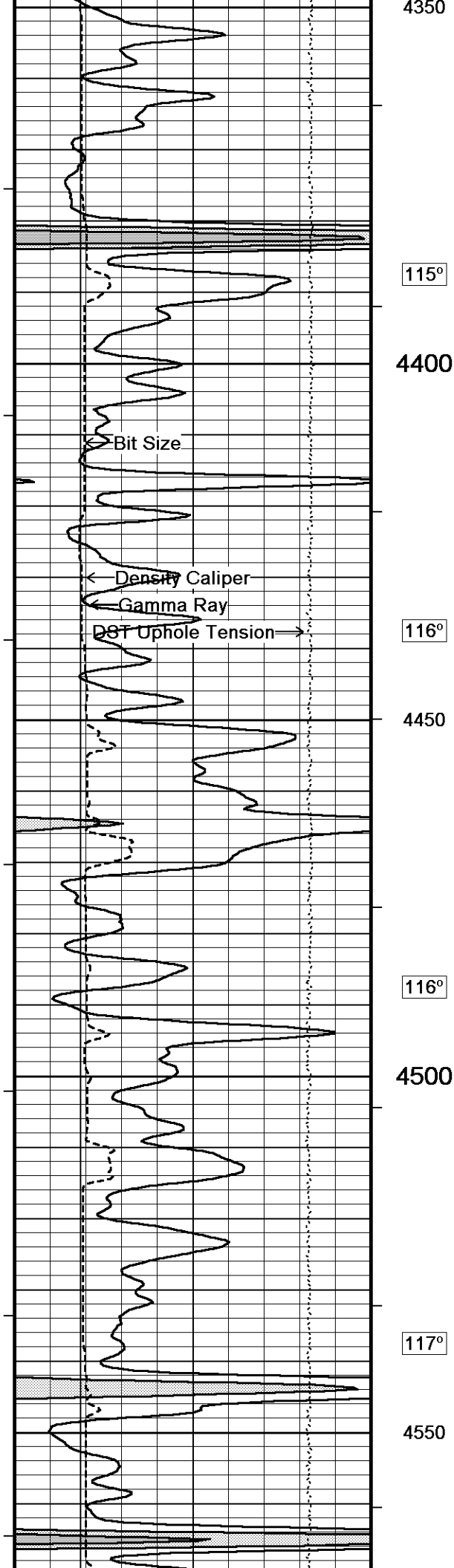


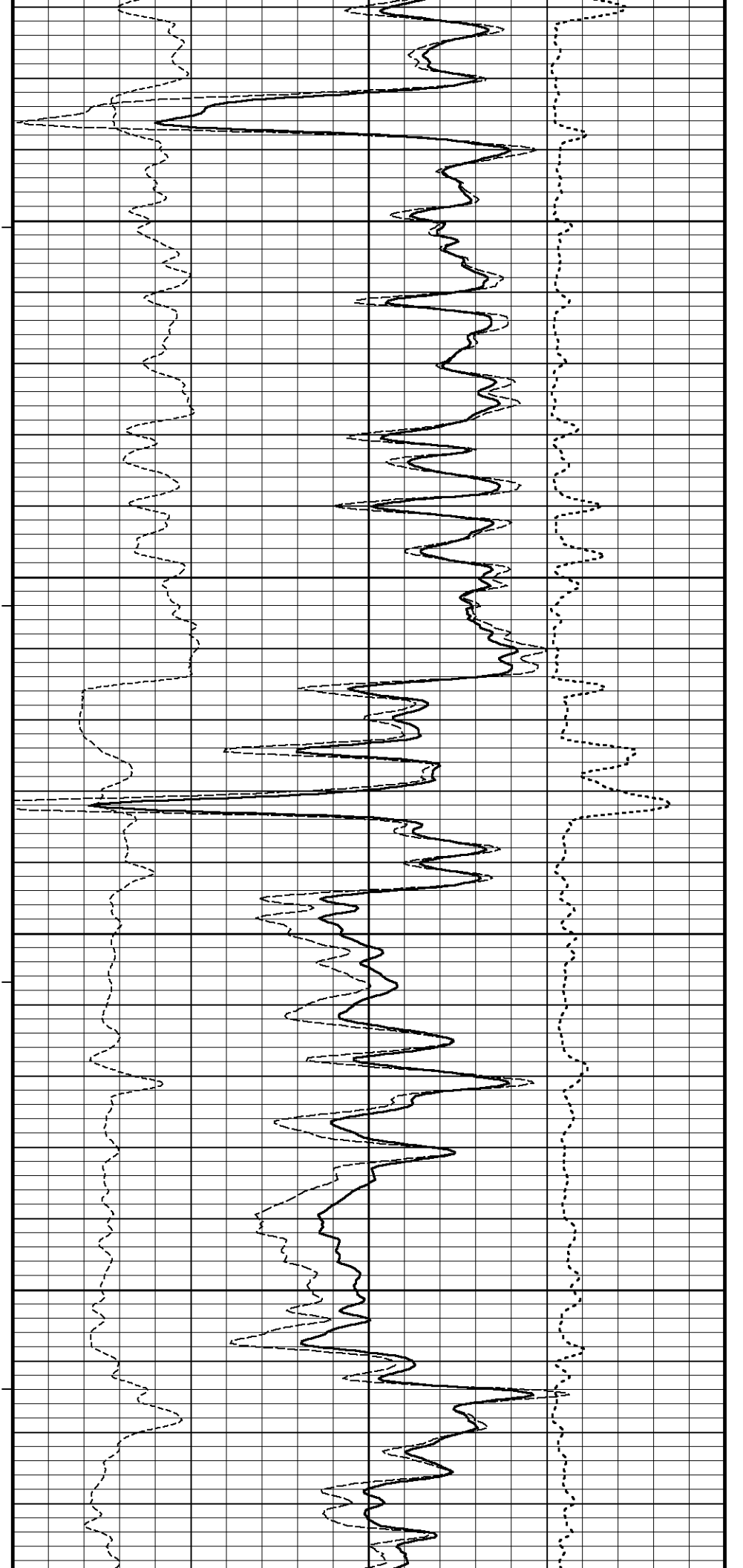
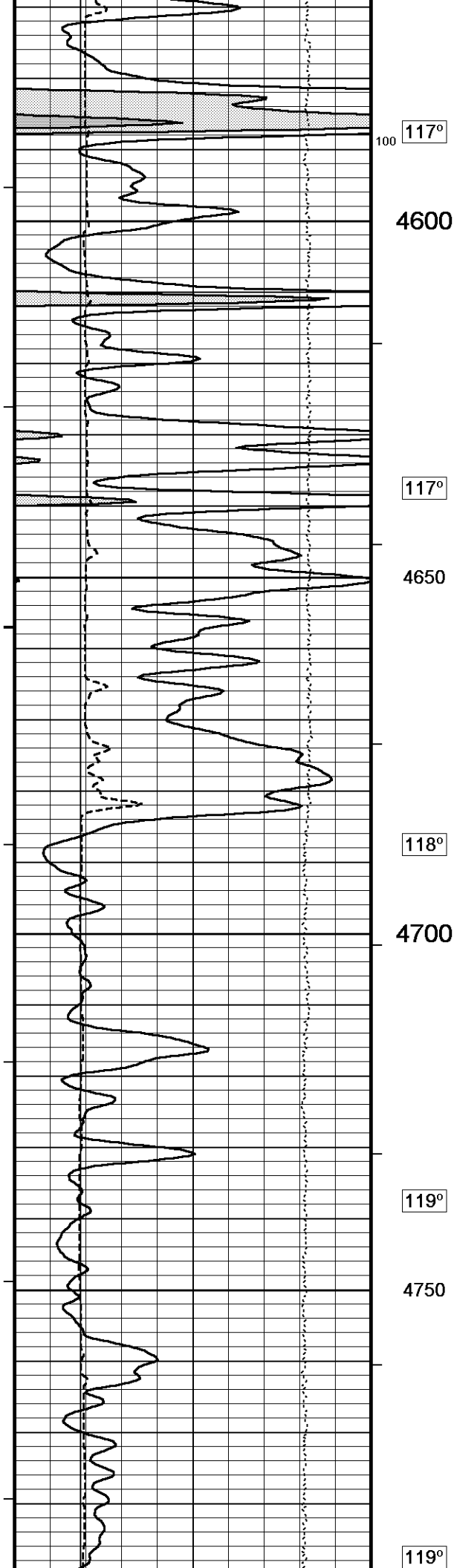


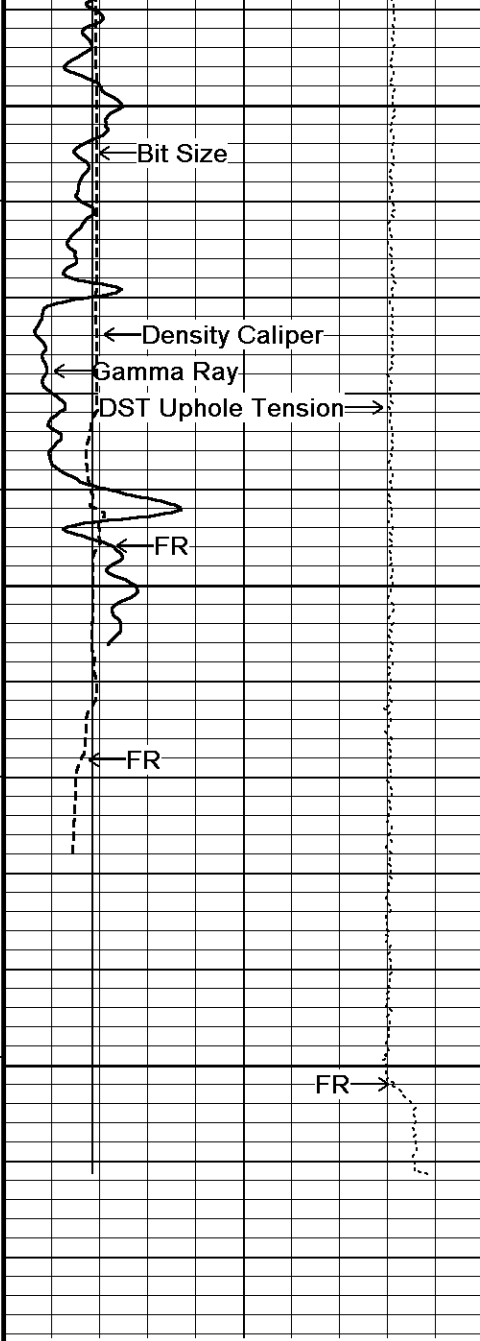












4800

118°

4850

4900

4926

Depth
in
Feet

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

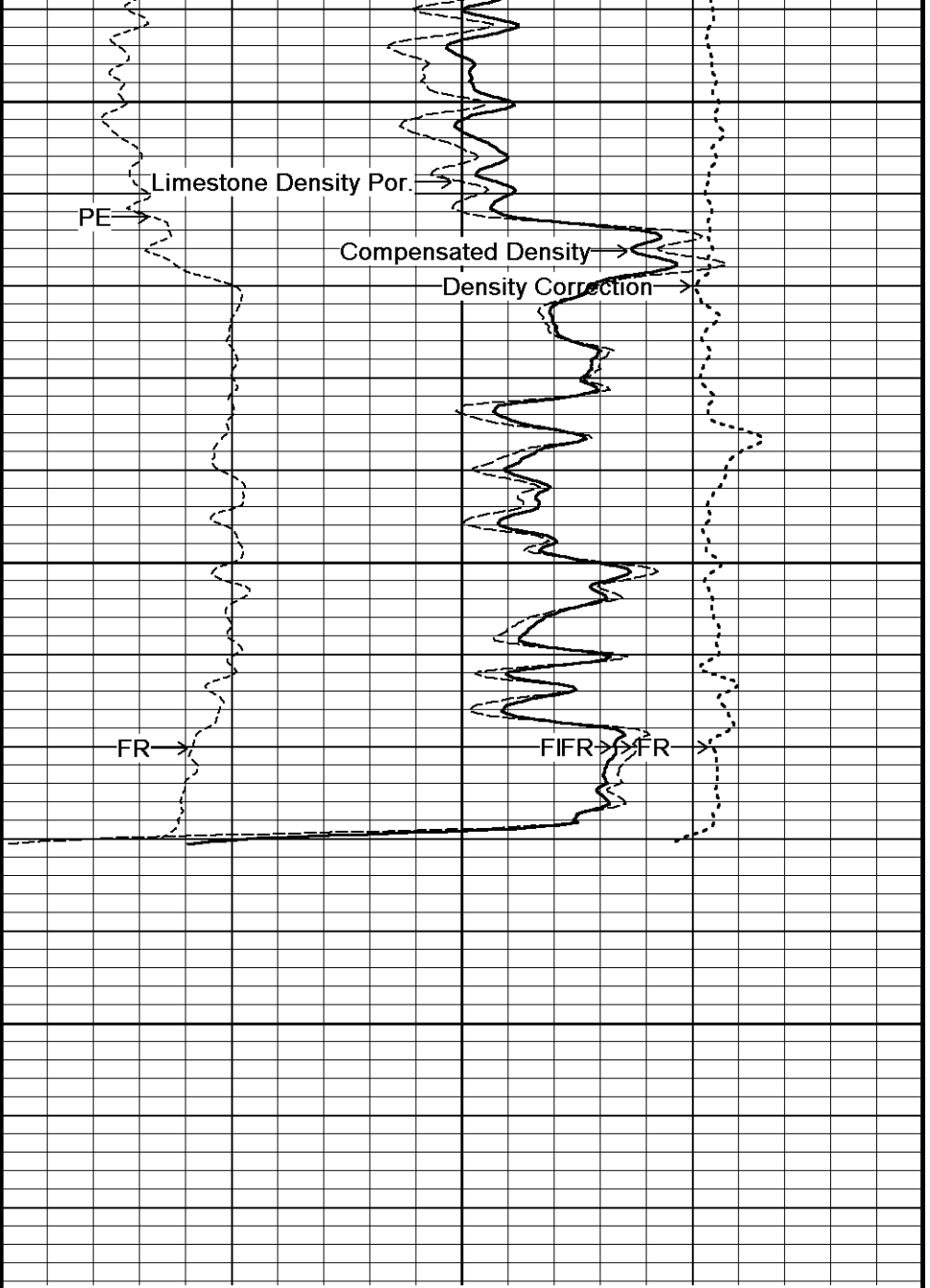
Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
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

PE
barns/electron
Density Correction
grams/cc

Replay
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 12-APR-2014 18:23

Filename: C:\Minimus 13.08.2113\Log\FI ML HIBBERT 4D-20-...\FI ML HIBBERT 4D-20-2029 MAIN.dta

Recorded on 12-APR-2014 14:49

System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113



5 INCH MAIN



REPEAT SECTION



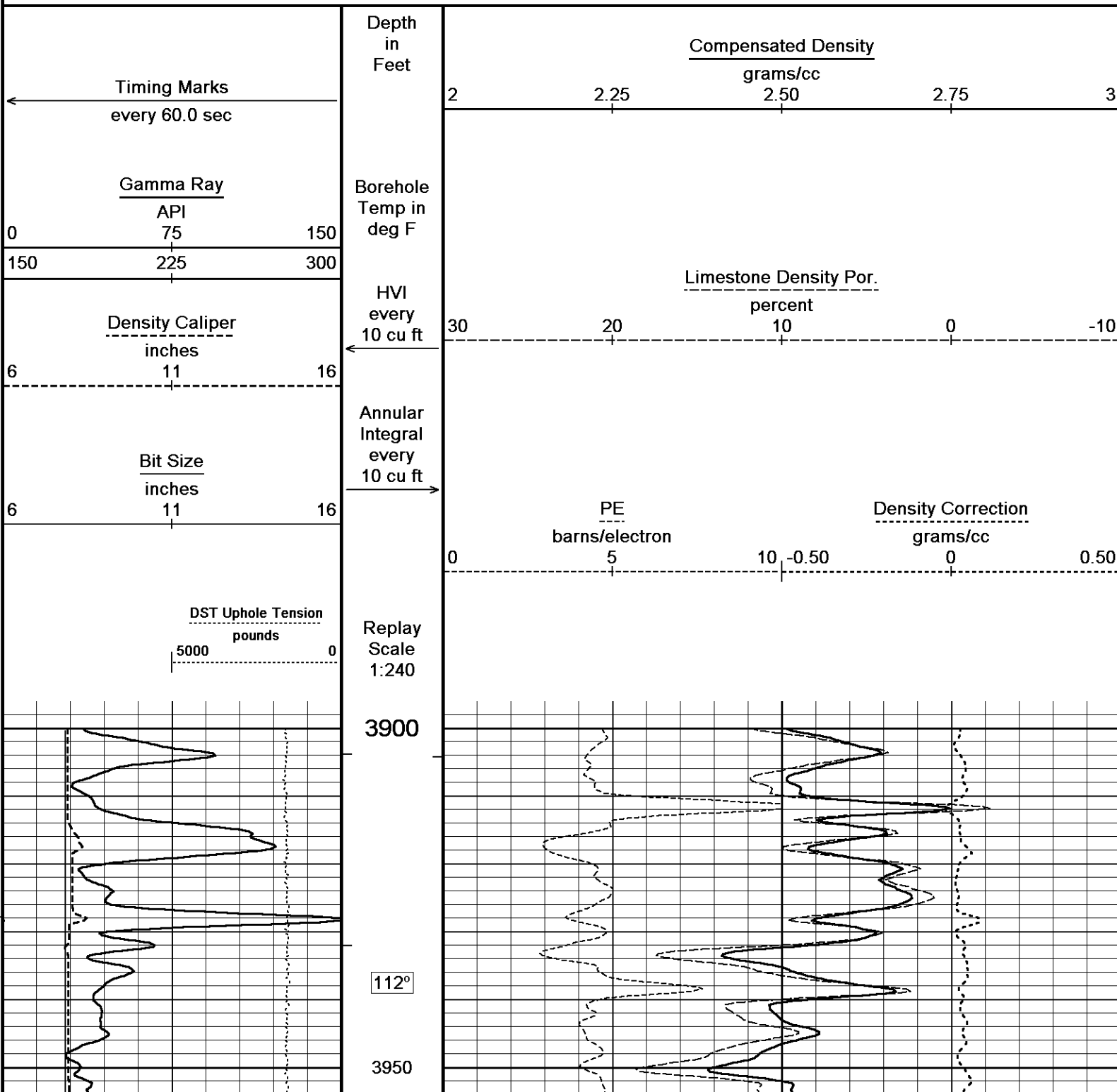
Depth Based Data - Maximum Sampling Increment 10.0cm

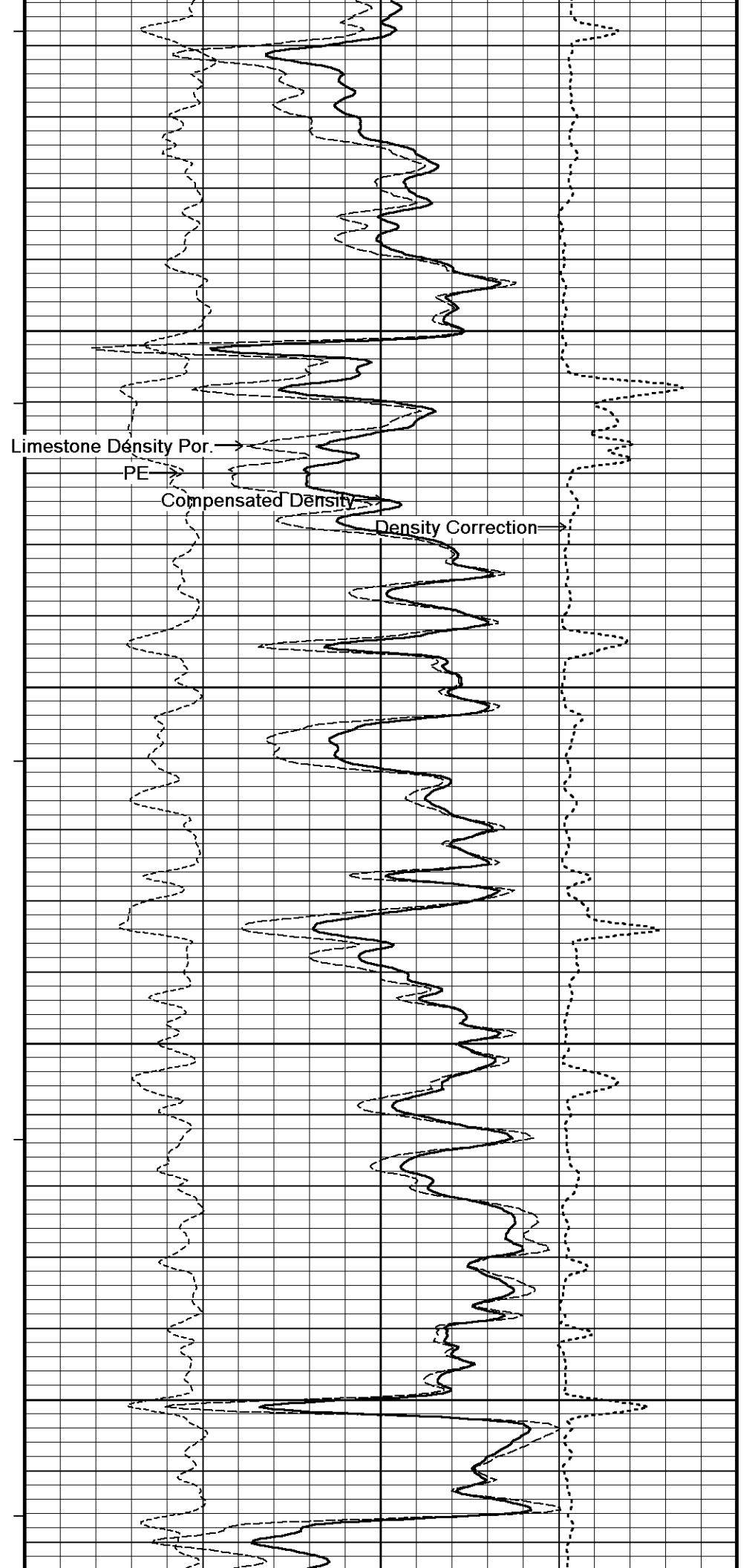
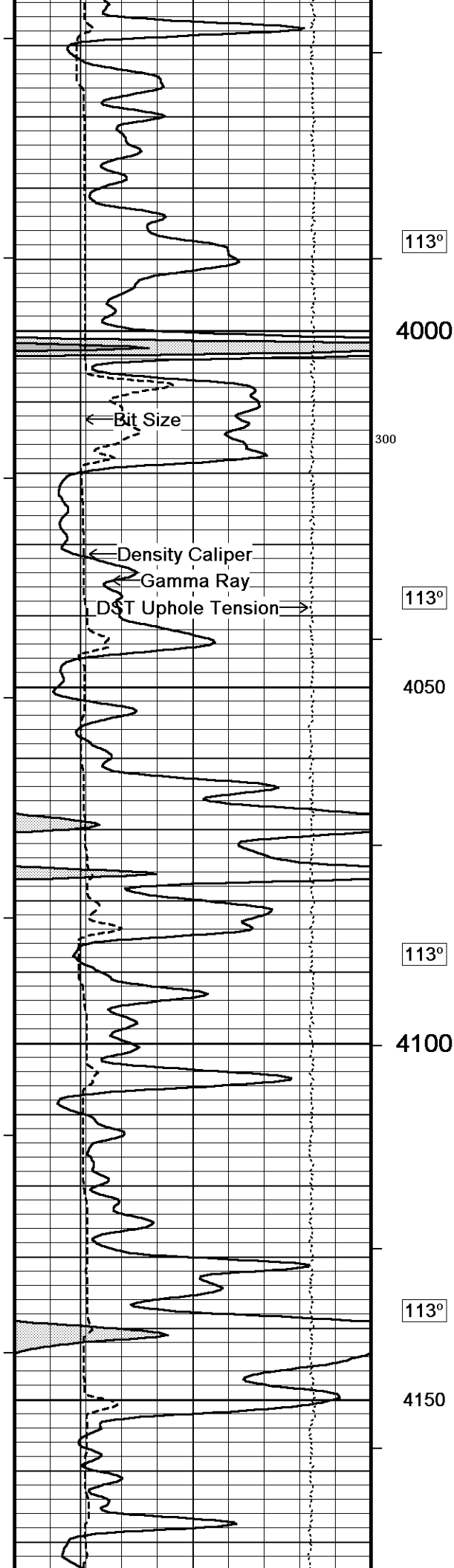
Plotted on 12-APR-2014 18:23

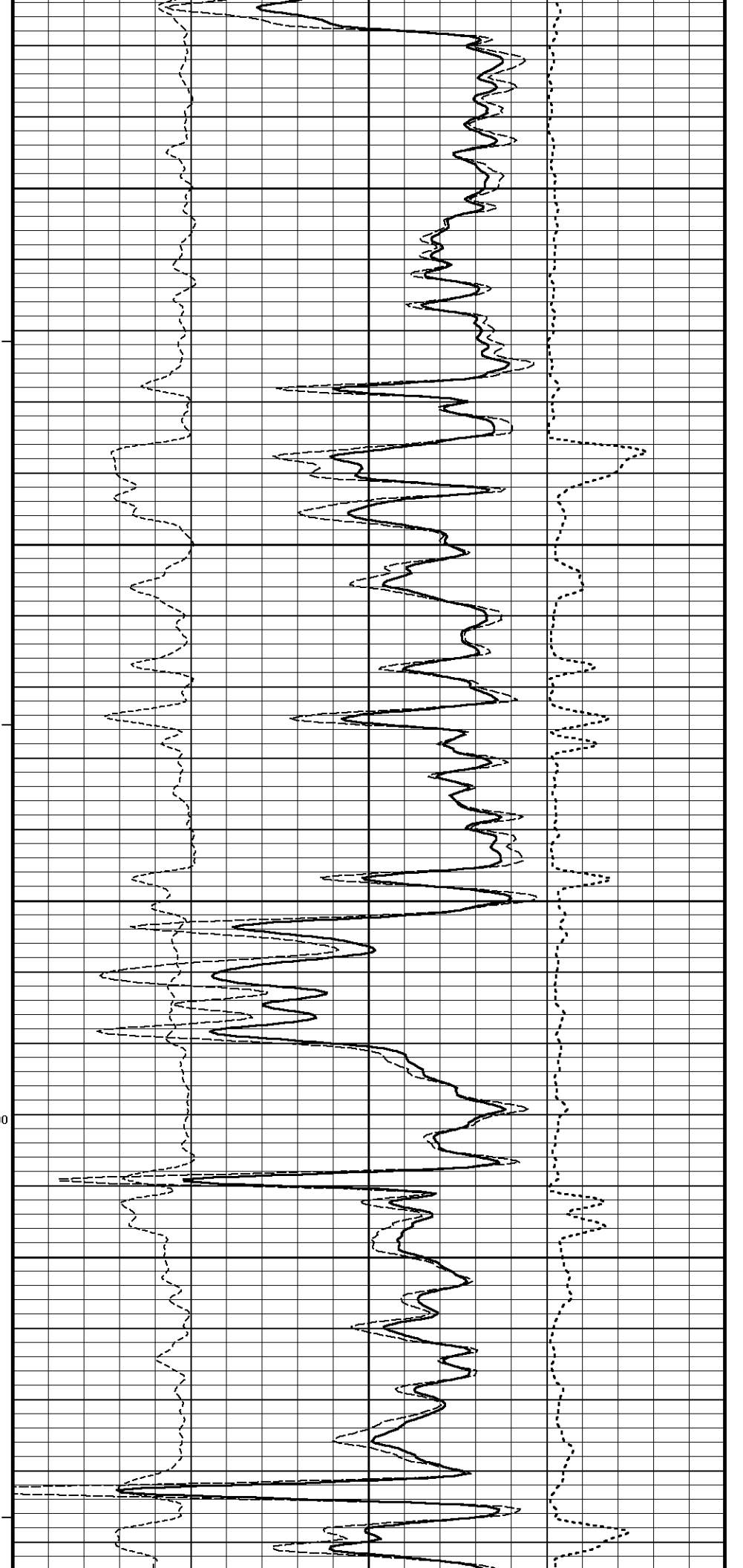
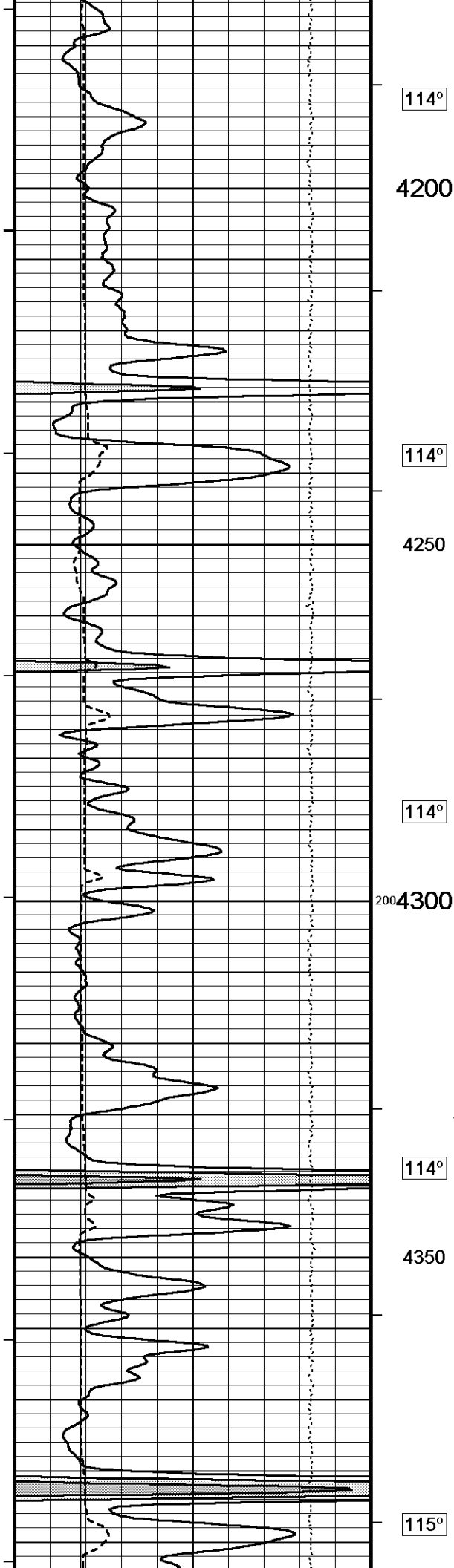
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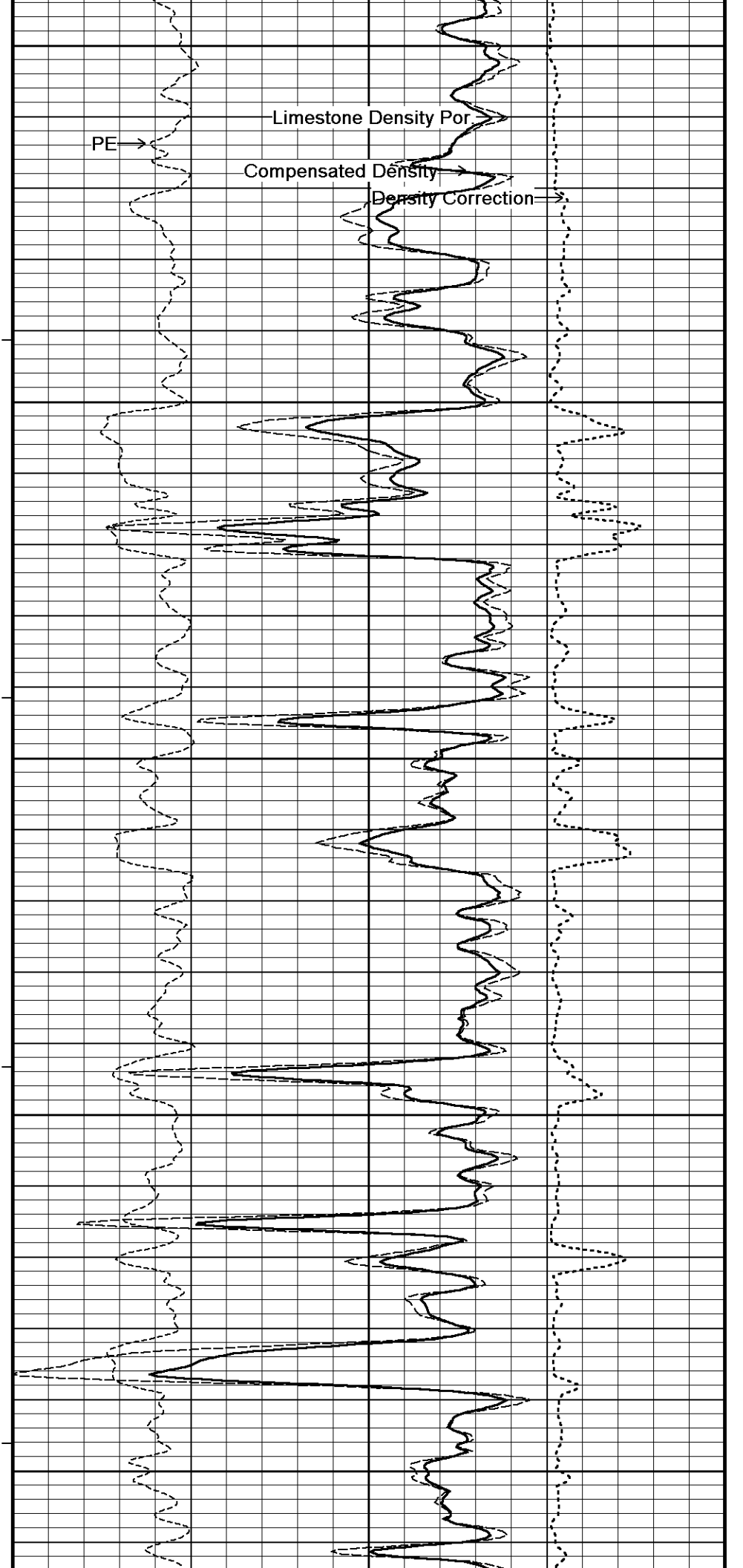
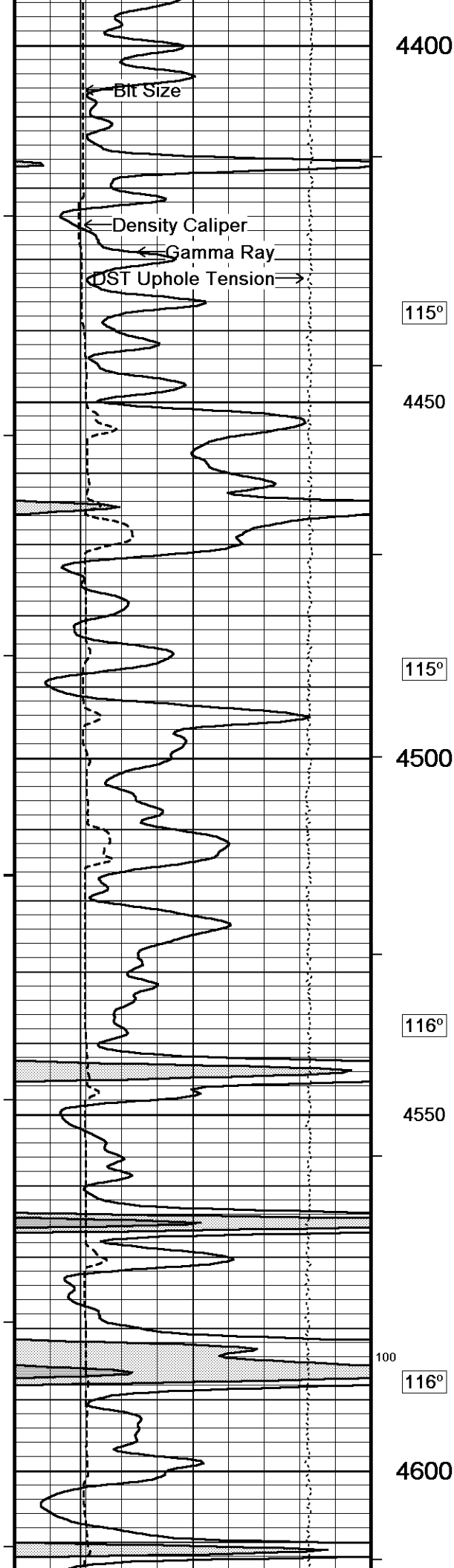
Recorded on 12-APR-2014 14:03

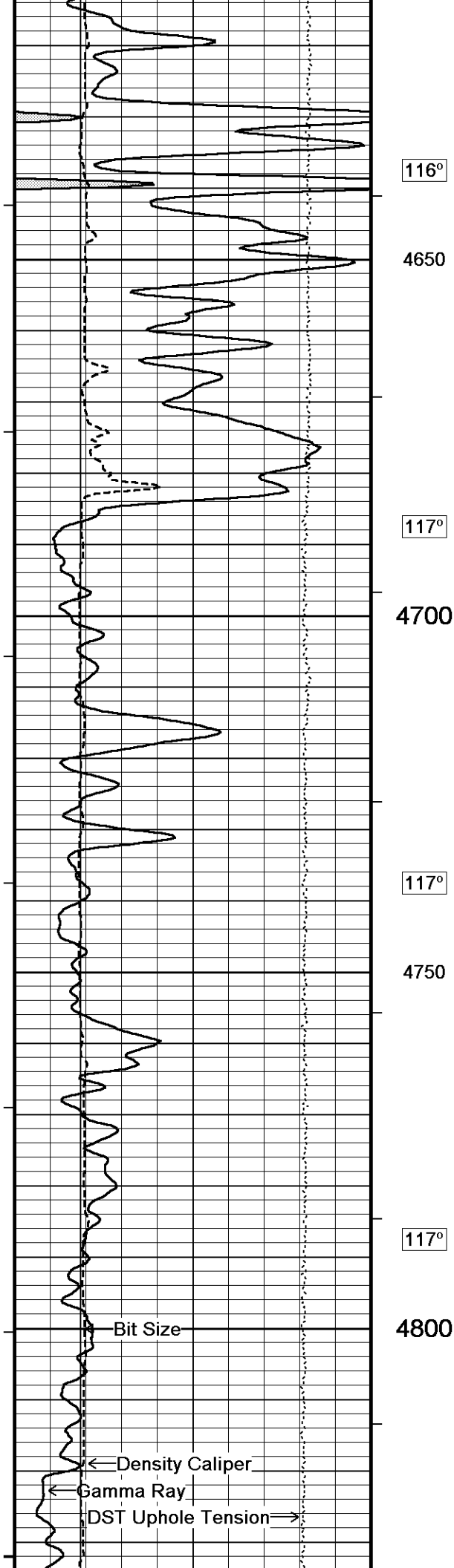
System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113











116°

4650

117°

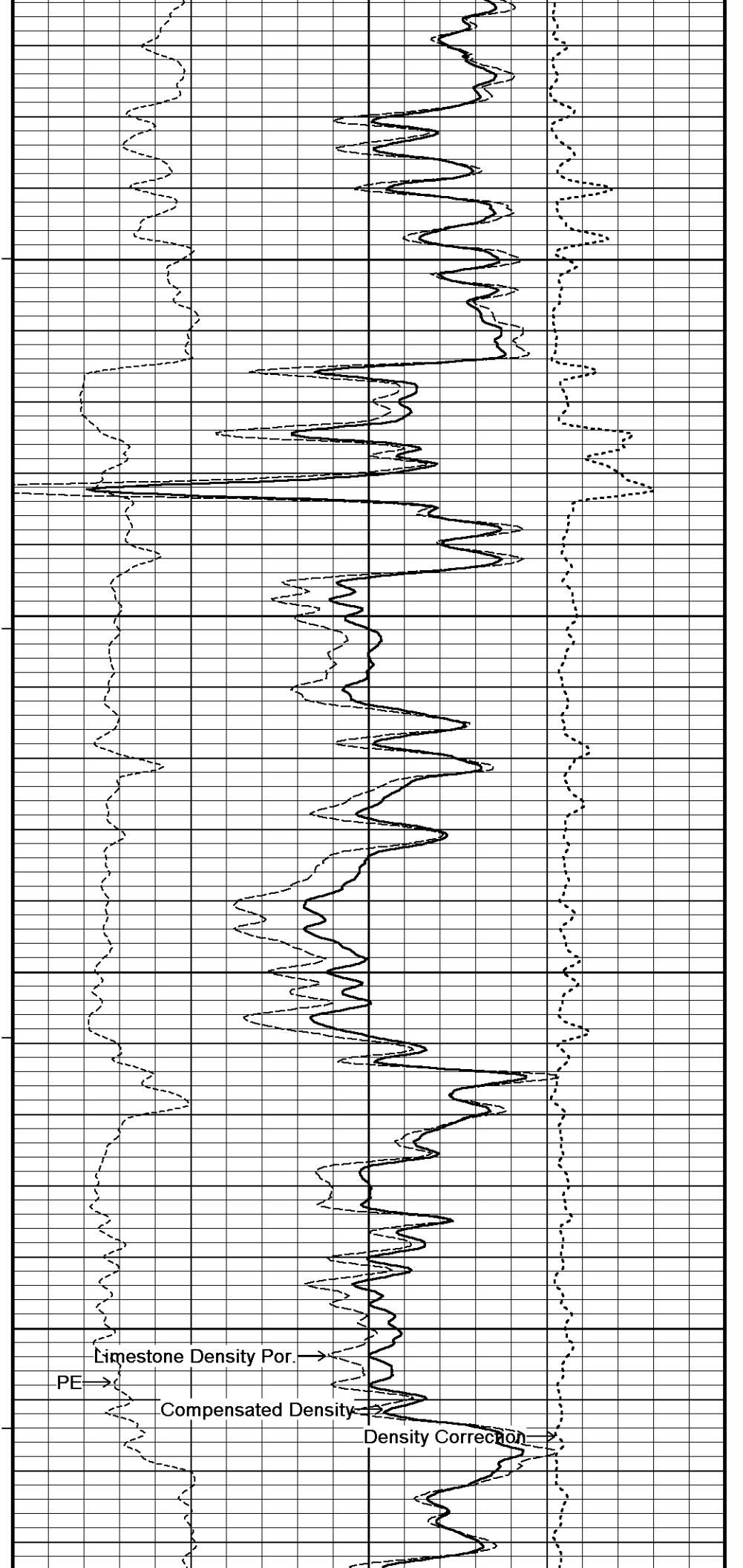
4700

117°

4750

117°

4800

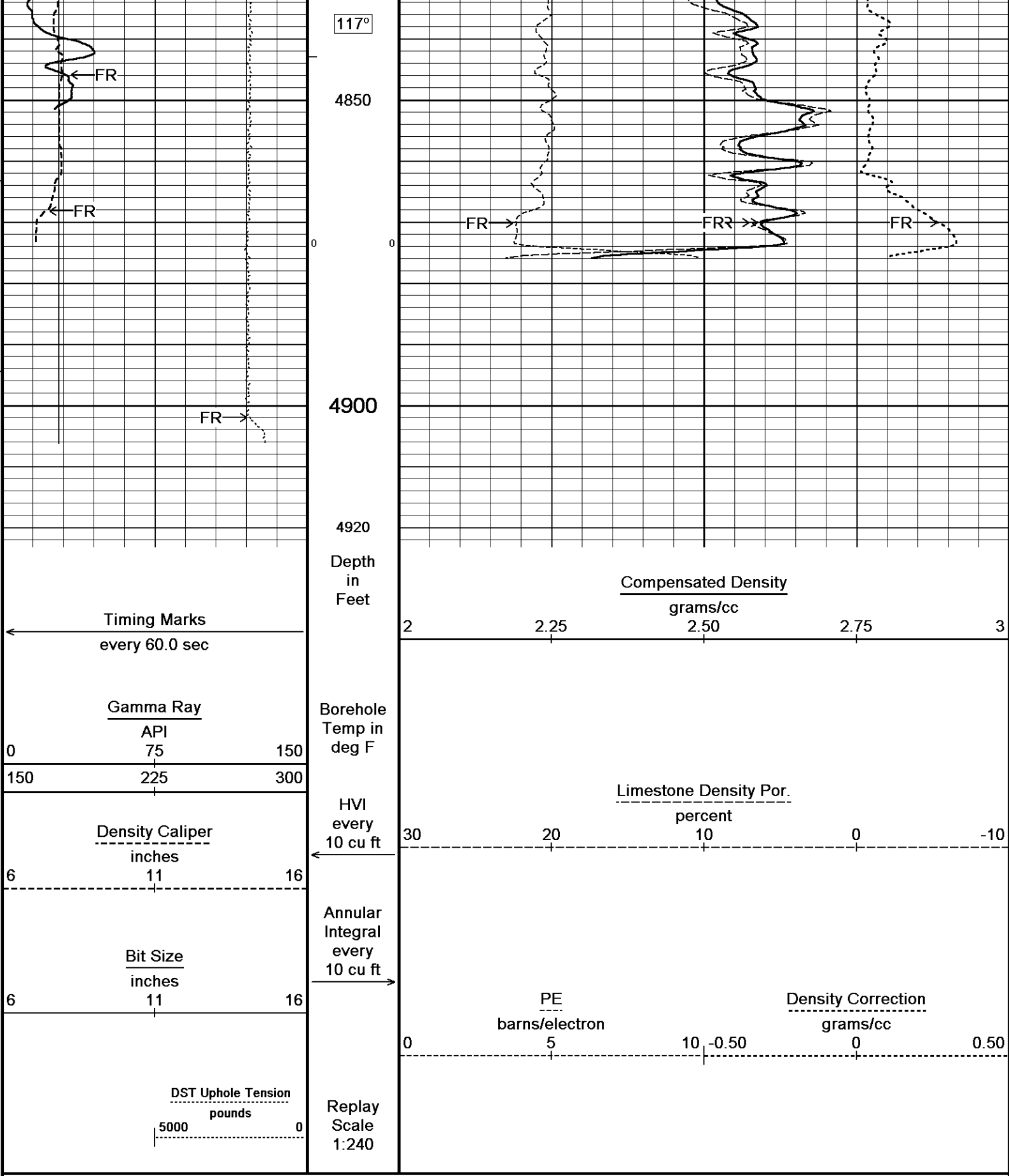


Limestone Density Por.

PE

Compensated Density

Density Correction



General Constants All 000

Last Edited on 12-APR-2014,13:35

General Parameters

Mud Resistivity	0.800	ohm-metres
Mud Resistivity Temperature	96.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Water Level Switch	

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	MMR 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
SW/APOR Tool Source	0.000

Gamma Calibration MCG-D.K 443

Field Calibration on 10-APR-2014 11:55

	Measured	Calibrated (API)
Background	75	49
Calibrator (Gross)	1183	774
Calibrator (Net)	1108	725

Gamma Constants MCG-D.K 443

Last Edited on 12-APR-2014,13:35

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 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 05-MAR-2014,20:50

Pre-filter Length	11
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Photo Density Calibration MPD-B 31

Base Calibration on 02-APR-2014 10:28

Field Check on 10-APR-2014 11:34

Density Calibration

Base Calibration

		Measured		Calibrated (sdu)
	Near	Far	Near	Far
Background	661	814		
Reference 1	43693	22248	59556	30836
Reference 2	17883	1854	24941	2541

Field Check at Base

661.2	814.3
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Field Check

664.3	817.1
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PE Calibration

Base Calibration

		Measured		Calibrated
	WS	WH	Ratio	Ratio
Background	122	585		
Reference 1	18087	43581	0.418	0.371
Reference 2	5283	17800	0.300	0.272

Field Check at Base
122.3 585.3

Field Check
121.5 587.7

Density Constants MPD-B 31

Last Edited on 12-APR-2014,13:36

Density Source Id	254	
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	

Caliper Calibration MPD-B 31

Base Calibration on 02-APR-2014 10:39
Field Calibration on 10-APR-2014 11:42

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	18192	3.99
2	27035	5.98
3	35696	7.97
4	44016	9.86
5	53216	11.92
6	N/A	N/A

Field Calibration	Measured Caliper (in)	Actual Caliper (in)
	7.91	7.97

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Logs\FIML HIBBERT 4D-20-2029\FIML HIBBERT 4D-20-2029 REPEAT.dta

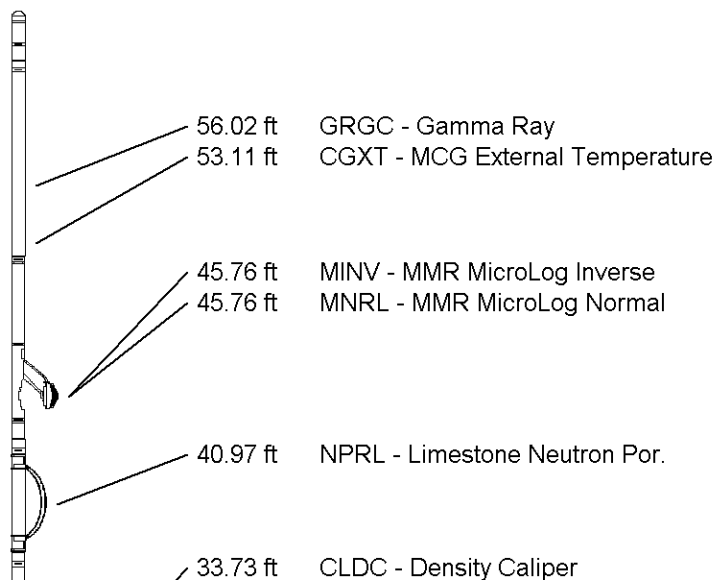
MCB-A 11B Tension Cablehead
MCB-A 170 LG: 2.18 ft WT: 19.8 lb OD: 2.240 in

Compact Comms Gamma
MCG-D.K 443 LG: 8.70 ft WT: 63.9 lb OD: 2.244 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: 2.244 in

Compact Density/Caliper



MPD-B 31 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: 2.244 in

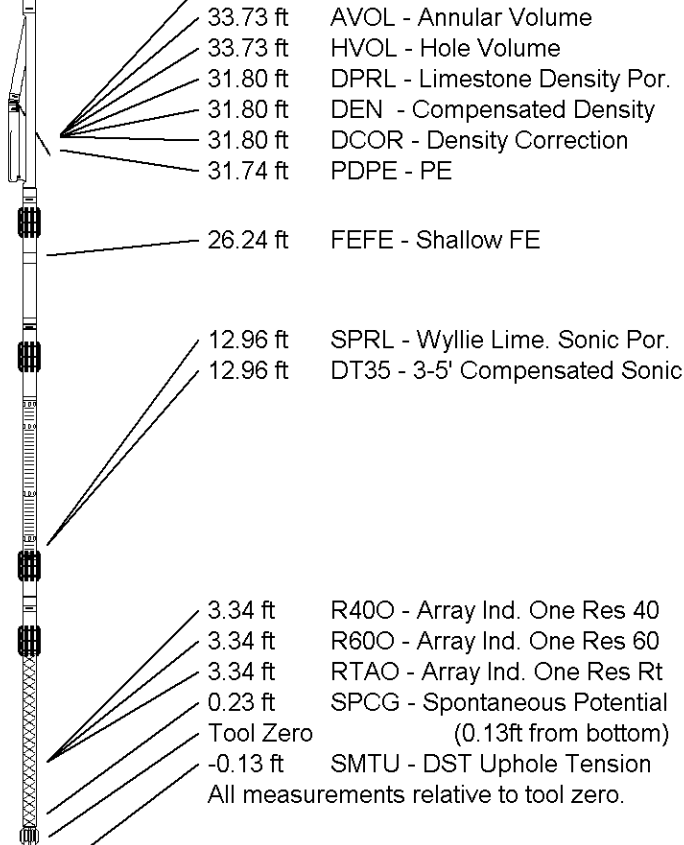
Compact Sonic

MSS-A.A 126 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction

MAI-A.A 158 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.48 ft Weight: 476.2 lb



COMPANY

FIML NATURAL RESOURCES, LLC.

WELL

HIBBERT 4D-20-2029

FIELD

WILDCAT

PROVINCE/COUNTY

LANE

COUNTRY/STATE

U.S.A. / KANSAS

Elevation Kelly Bushing	2892.00	feet
Elevation Drill Floor	2890.00	feet
Elevation Ground Level	2882.00	feet

First Reading	4870.00	feet
Depth Driller	4900.00	feet
Depth Logger	4902.00	feet



Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG