



**Weatherford**

**COMPACT PHOTO DENSITY  
COMPENSATED NEUTRON  
MICRORESISTIVITY LOG**

COMPANY				MURFIN DRILLING COMPANY INC.			
WELL				ROGUE #10-25			
FIELD				WILDCAT			
PROVINCE/COUNTY				LINCOLN			
COUNTRY/STATE				U.S.A. / COLORADO			
LOCATION				2299' FSL & 1647' FEL			
SEC 25	TWP 9S	RGE 56W	Other Services		MSS		
Latitude		MAI/MFE					
Longitude							
API Number		05-073-06736					
Permanent Datum GL, Elevation 5303 feet						Elevations: KB 5316.00 DF 5314.00 GL 5303.00	
Log Measured From KB, 13.00 feet above Permanent Datum							
Drilling Measured From KB							
Date	07-FEB-2018						
Run Number	ONE						
Service Order	4558-205041941						
Depth Driller	8187.00					feet	
Depth Logger	7776.00					feet	
First Reading	7742.00					feet	
Last Reading	4200.00					feet	
Casing Driller	475.00					feet	
Casing Logger	478.00					feet	
Bit Size	7.875					inches	
Hole Fluid Type	CHEMICAL						
Density / Viscosity	9.20		lb/USg	80.00	CP		
PH / Fluid Loss	8.50			8.50	ml/30Min		
Sample Source	FLOWLINE						
Rm @ Measured Temp	1.39 @ 75.0					ohm-m	
Rmf @ Measured Temp	1.11 @ 75.0					ohm-m	
Rmc @ Measured Temp	1.67 @ 75.0					ohm-m	
Source Rmf / Rmc	CALC			CALC			
Rm @ BHT	0.62 @168.0					ohm-m	
Time Since Circulation	6 HOURS						
Max Recorded Temp	168.00					deg F	
Equipment / Base	13244			LIB			
Recorded By	ADAM SILL						
Witnessed By	GREGG SMITH						

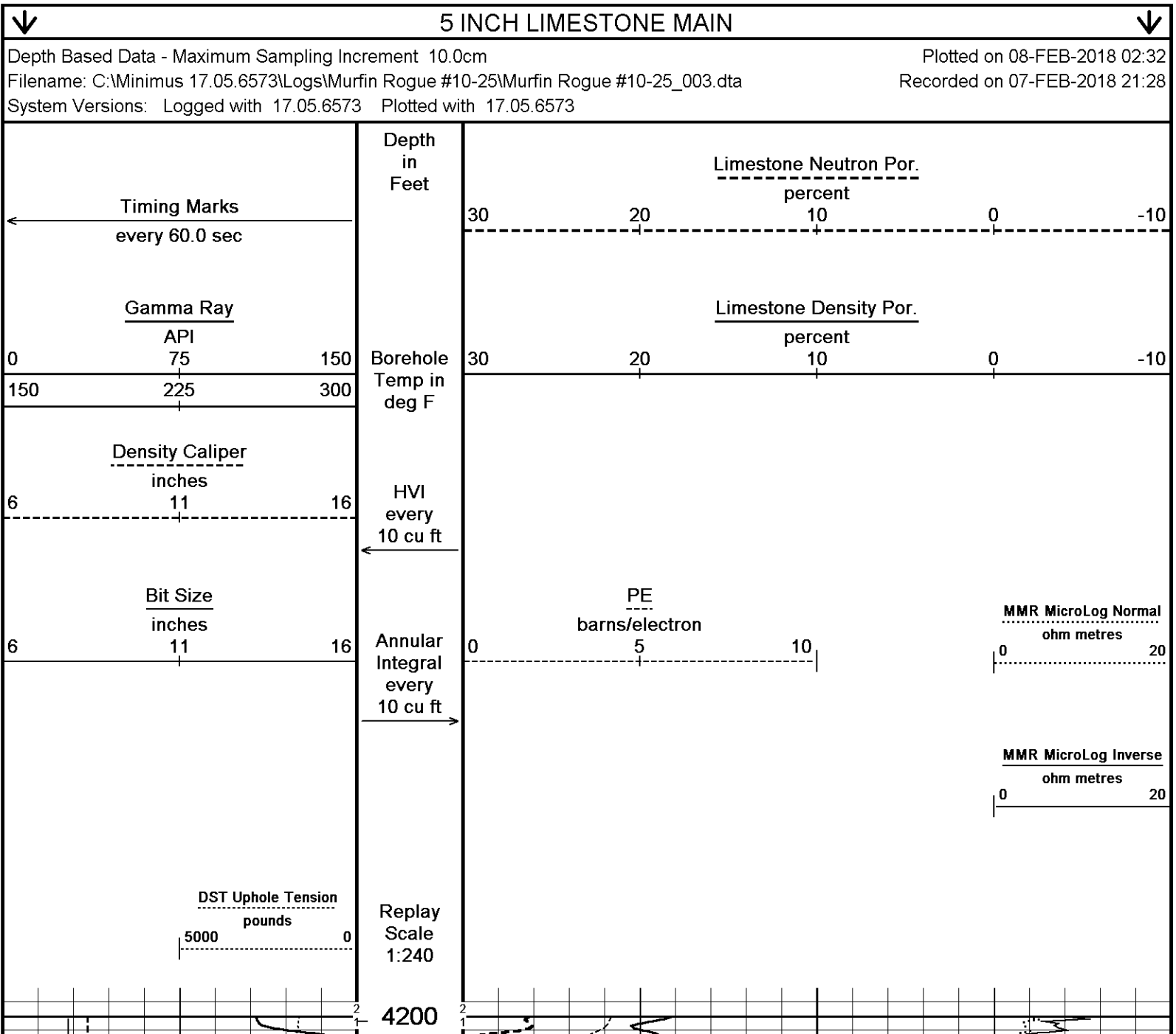
BOREHOLE RECORD					Last Edited: 07-FEB-2018 12:40
Bit Size inches		Depth From feet		Depth To feet	
7.875		475.00		8187.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	475.00	24.00	

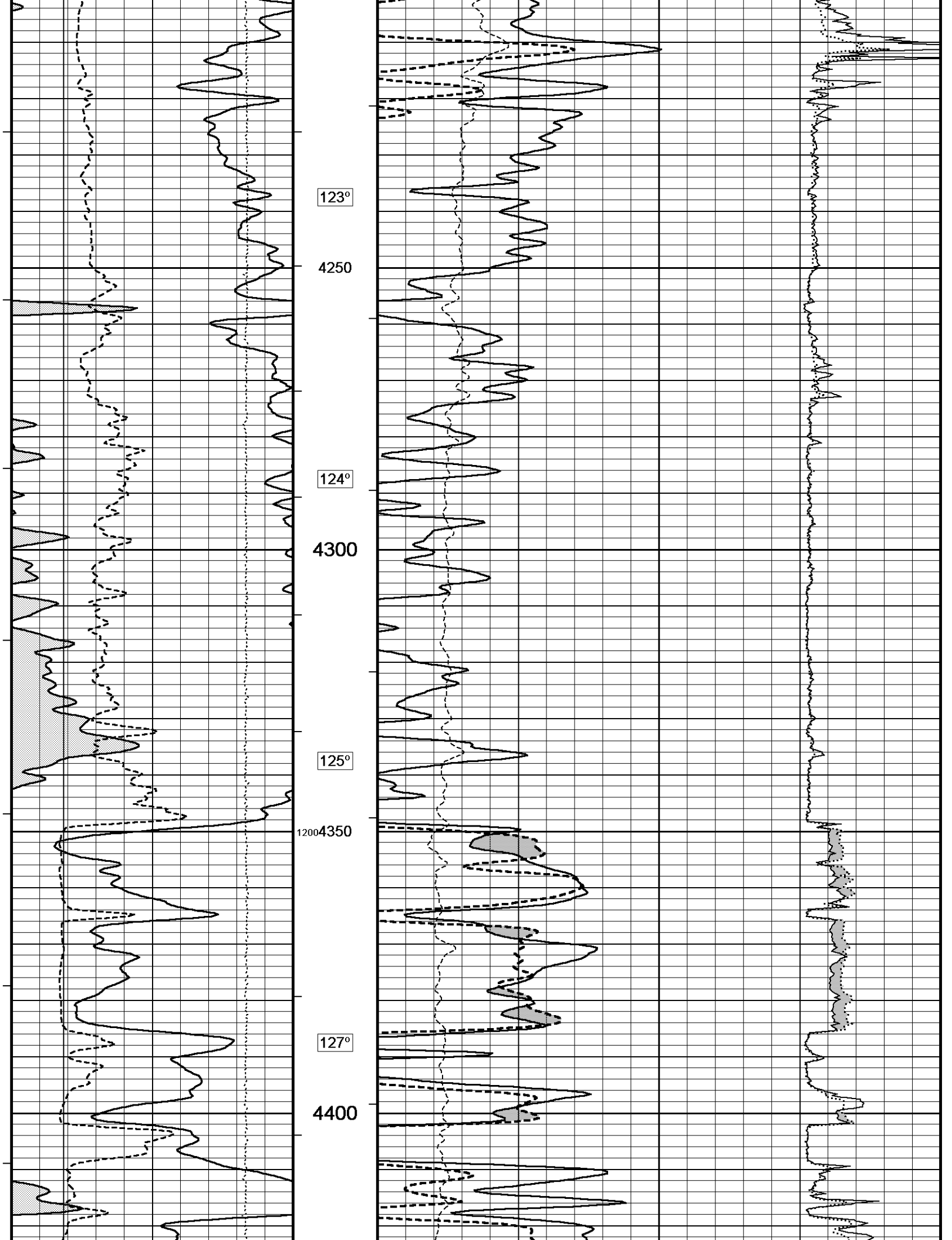
REMARKS
- SOFTWARE ISSUE: WLS 17.05.6573.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- 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: 3682 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 4200 FEET: 685 CU.FT.

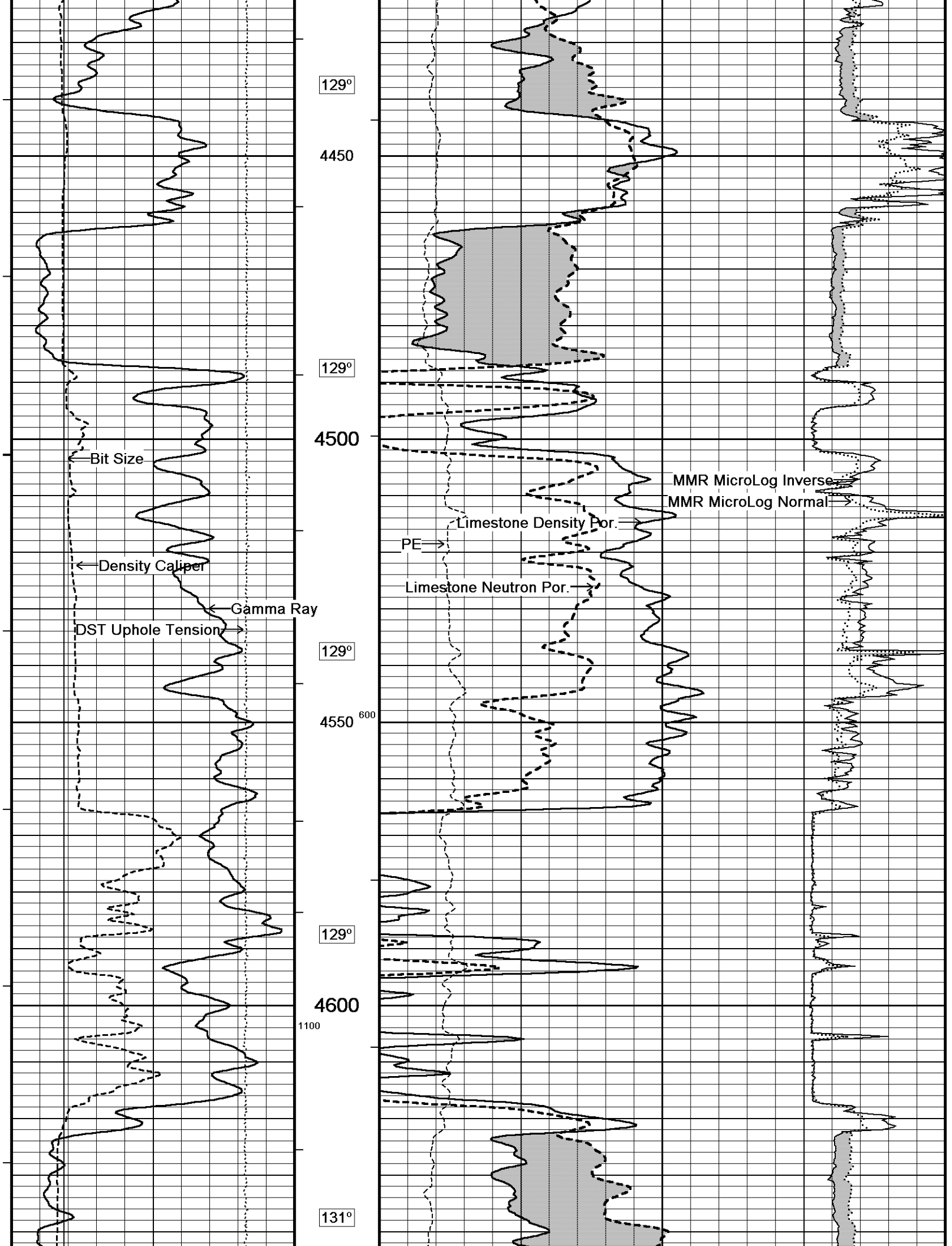
- RIG: MURFIN #25.  
- ENGINEER: A. SILL.  
- OPERATOR: B. TOVAR.

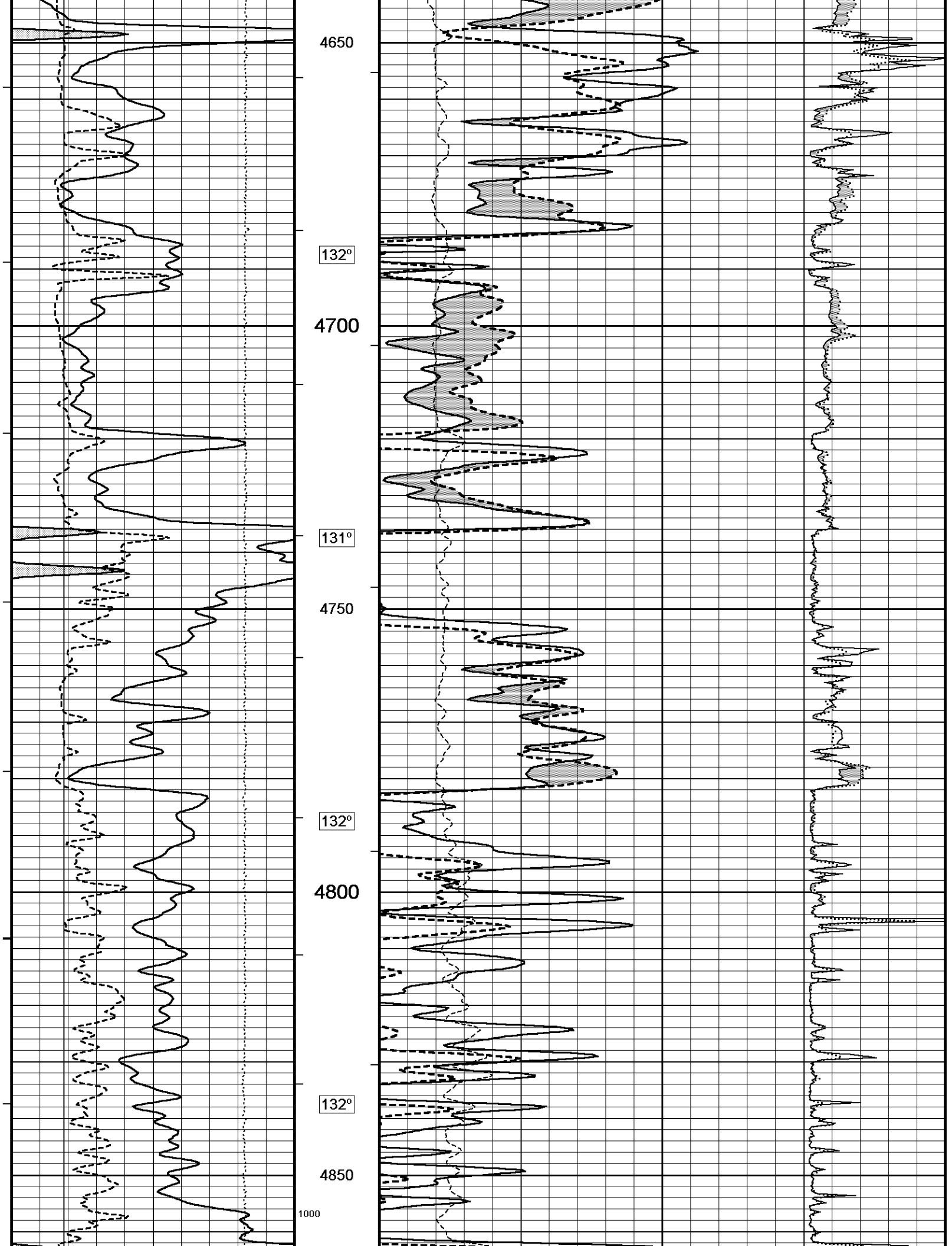
\*\*\*\* BRIDGED OFF AT 7776 FEET AND WAS INSTRUCTED TO LOG OUT FROM THERE WITHOUT A REPEAT SECTION. \*\*\*\*

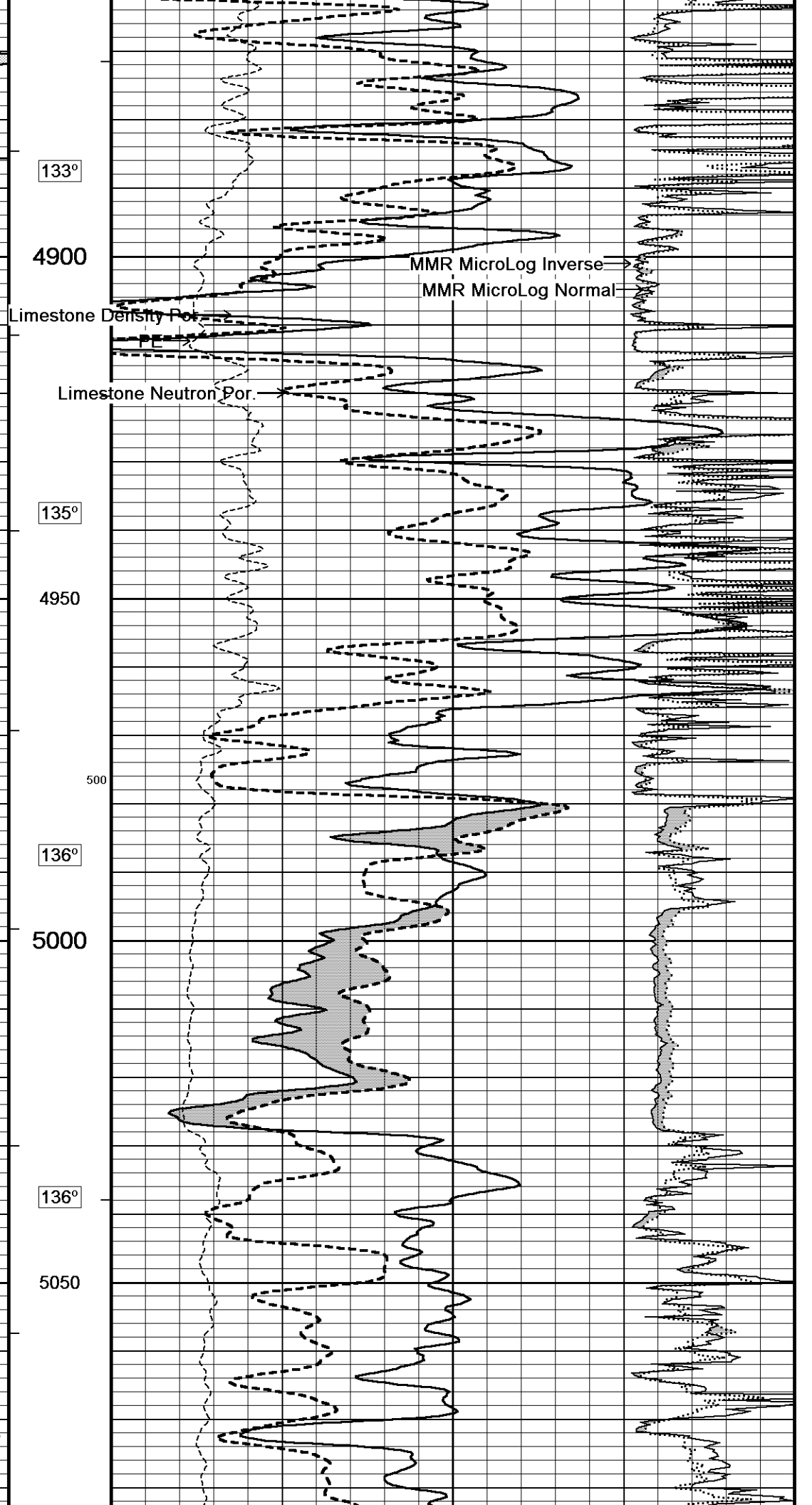
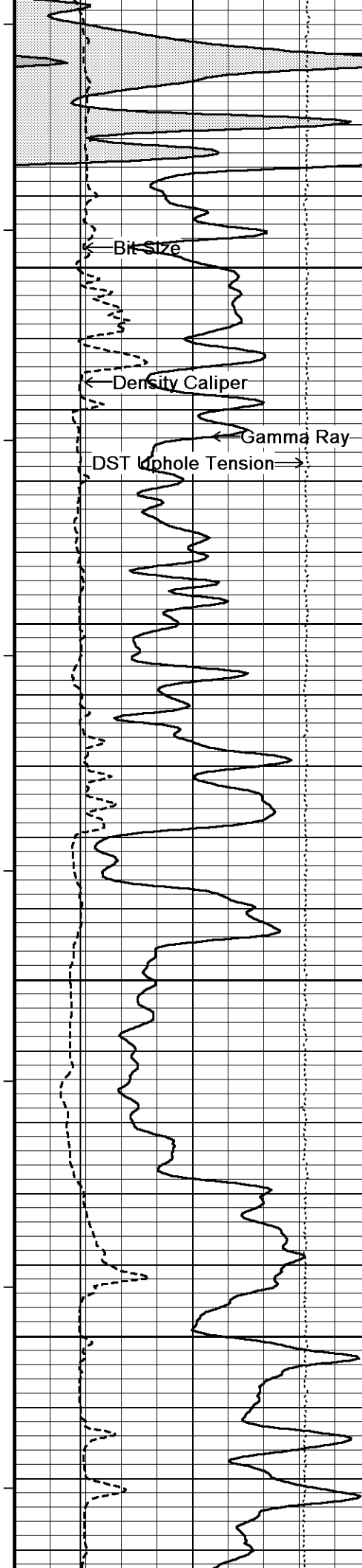
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will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

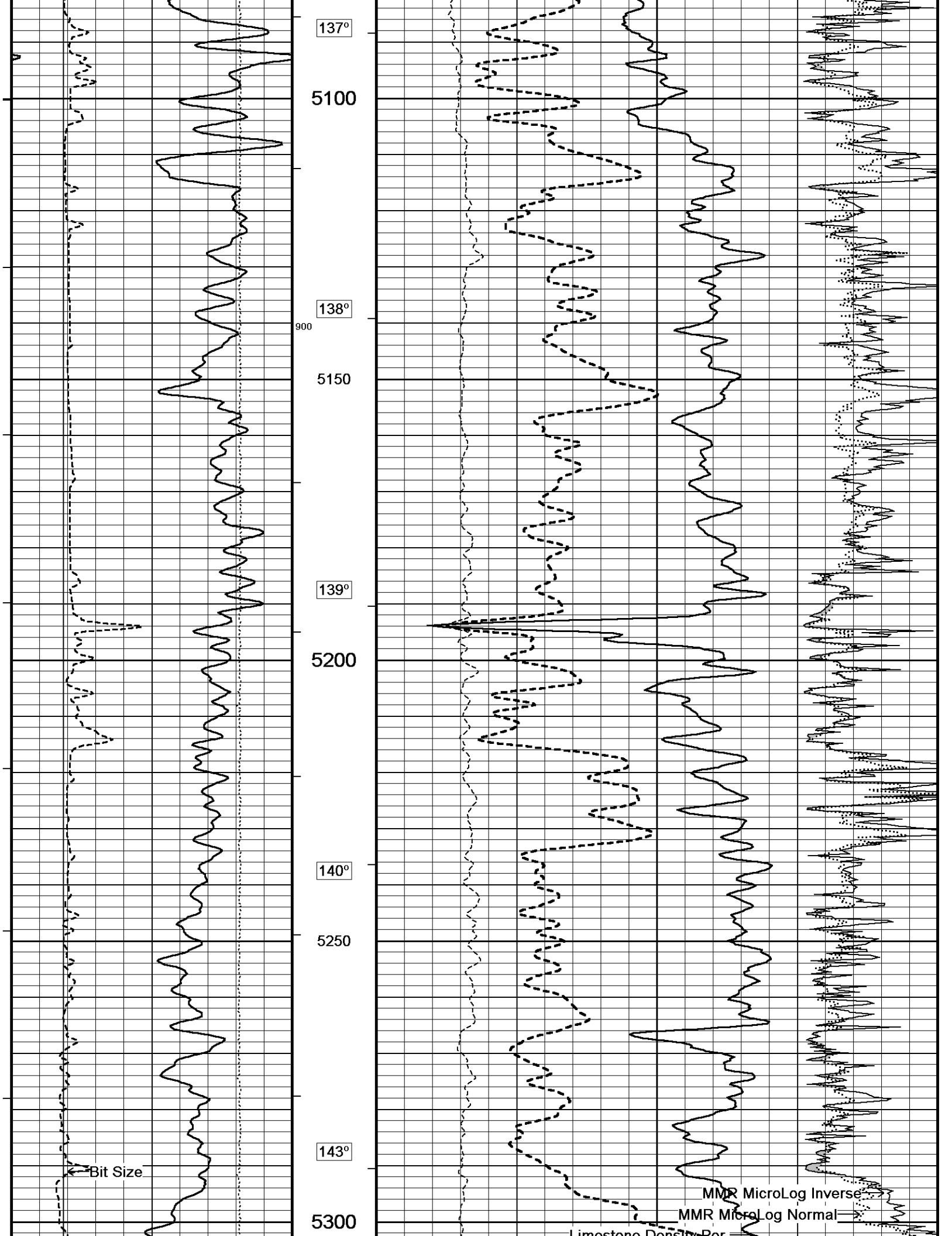


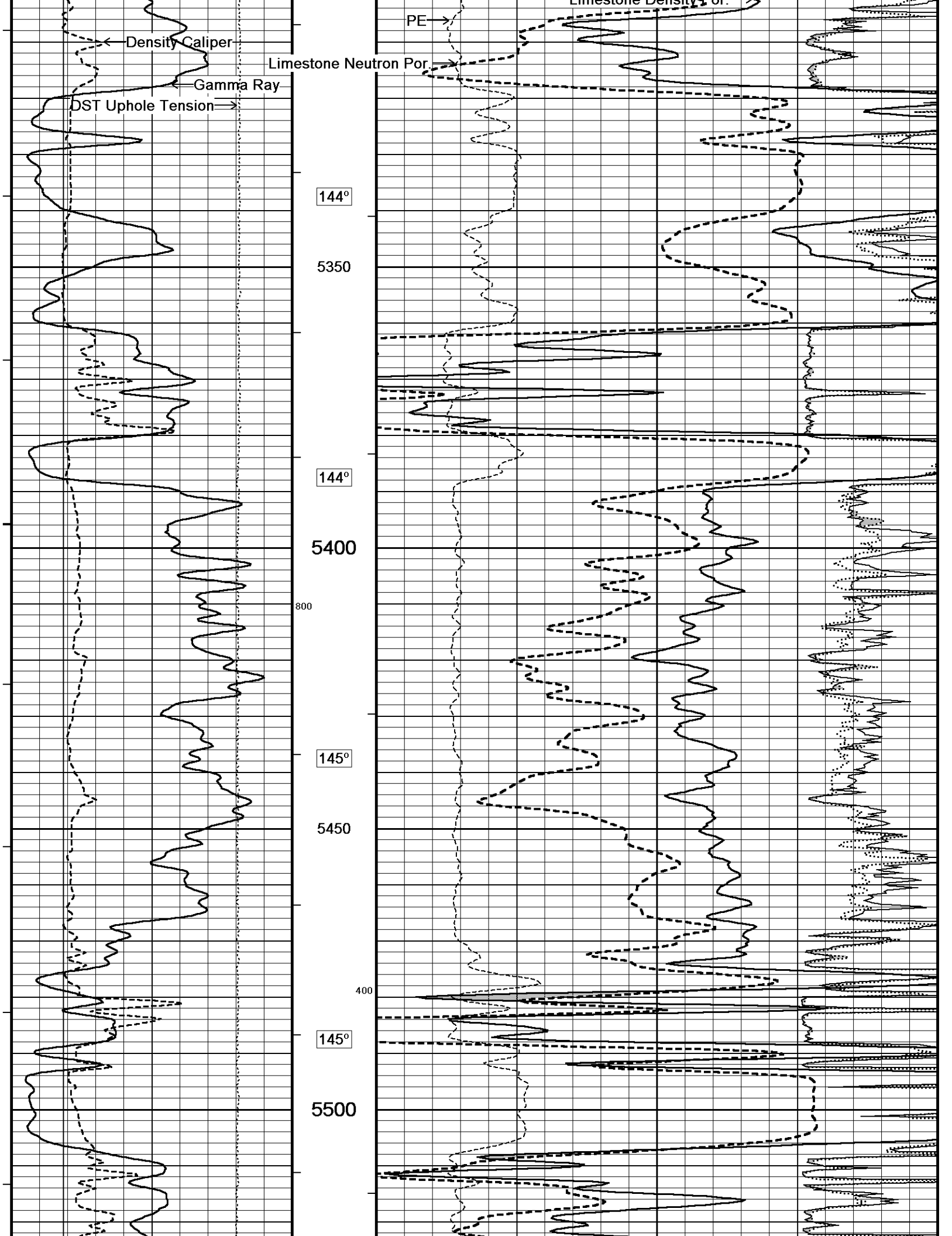


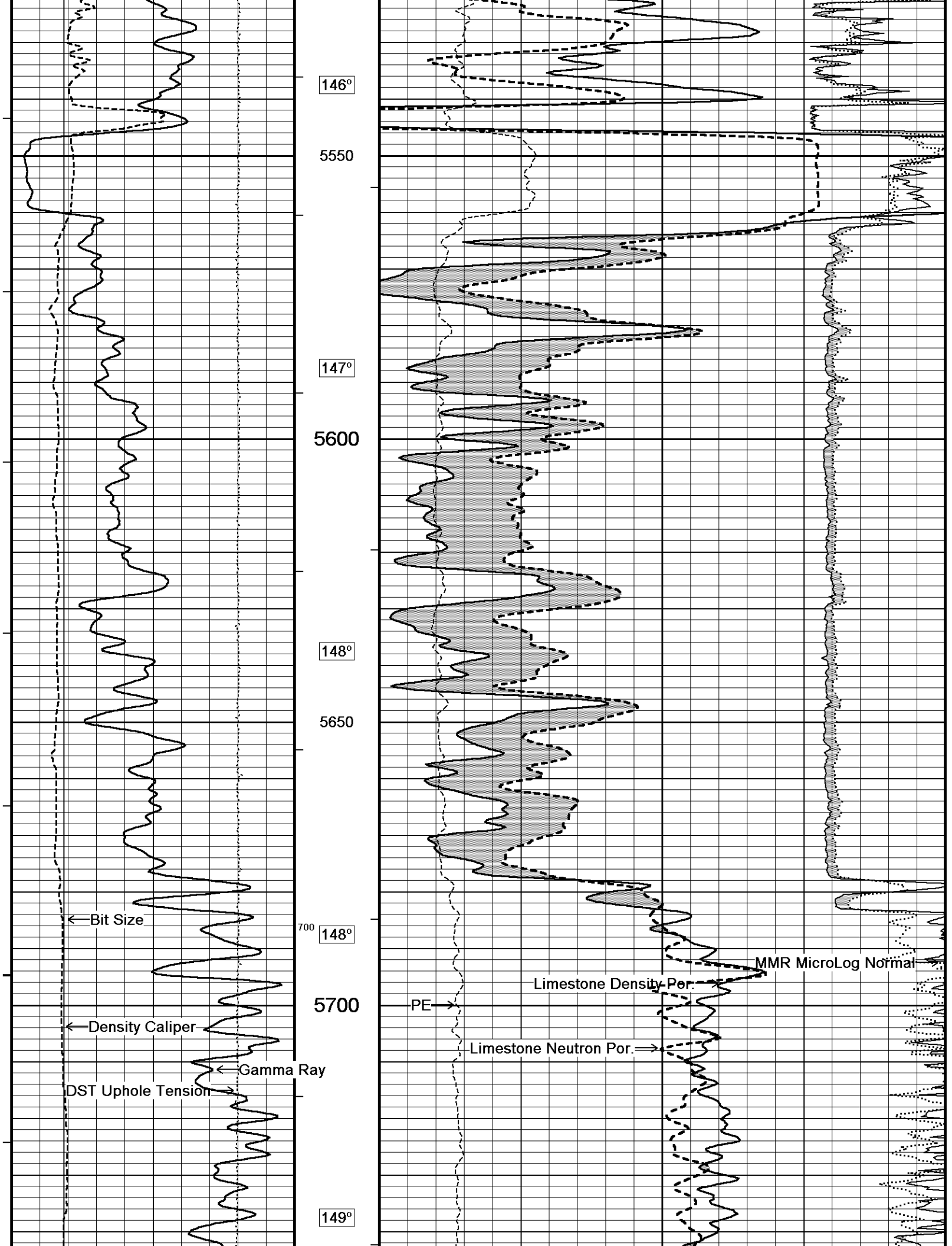


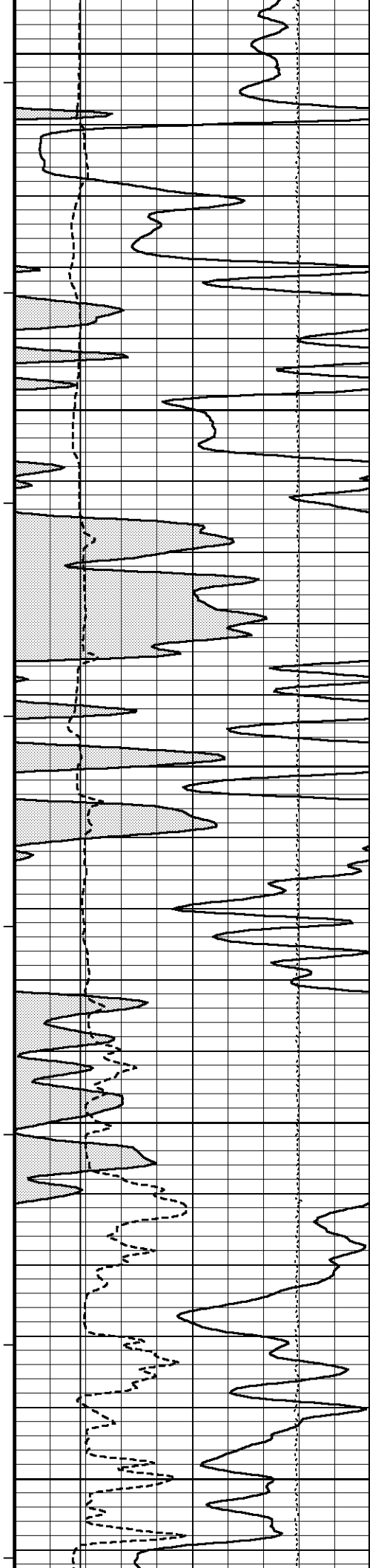












5750

149°

5800

149°

5850

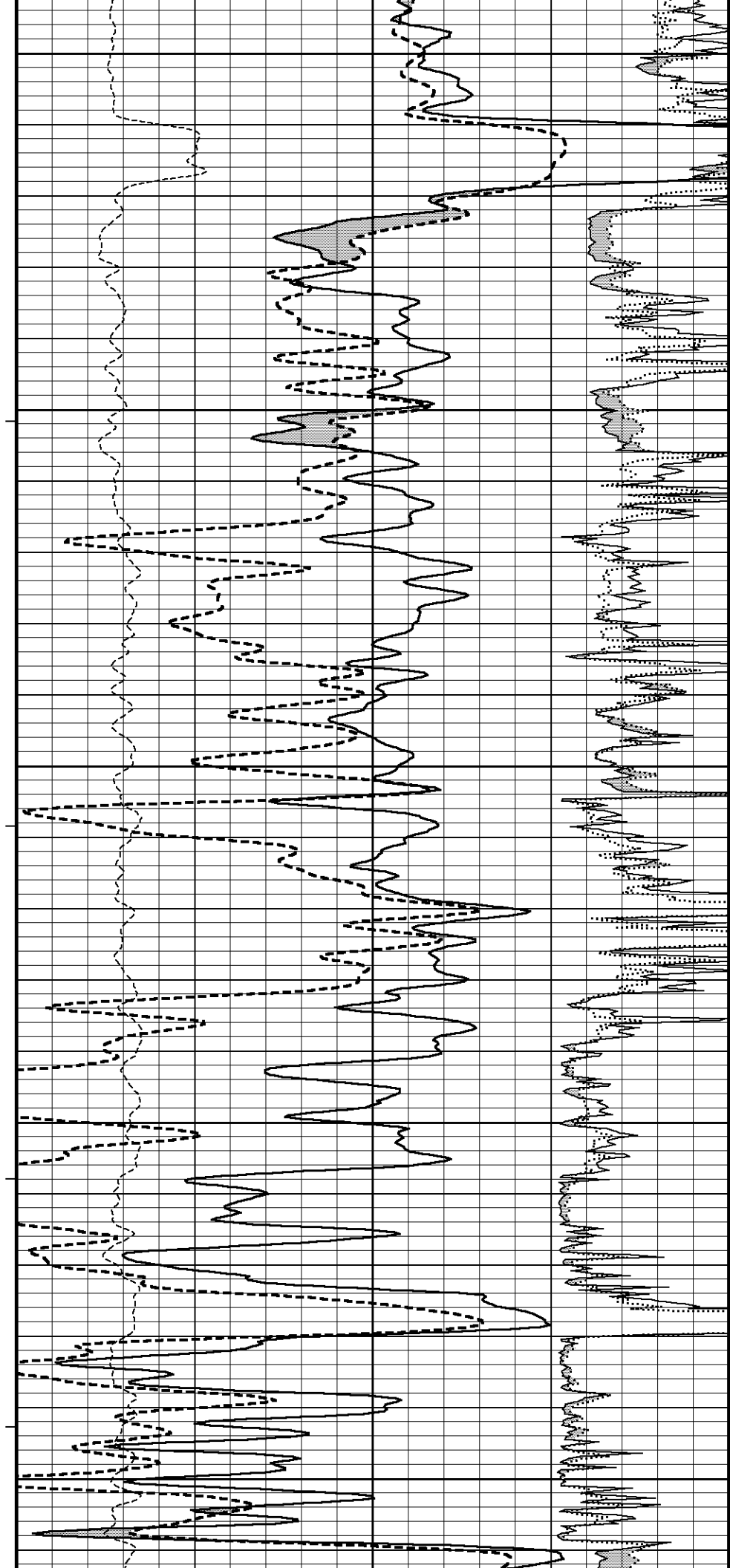
150°

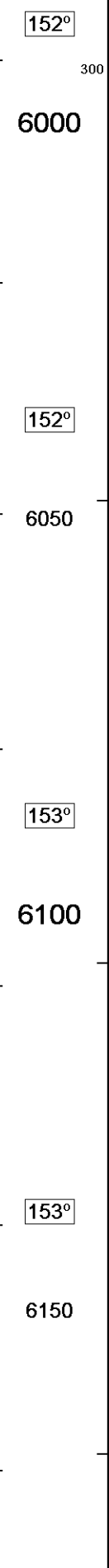
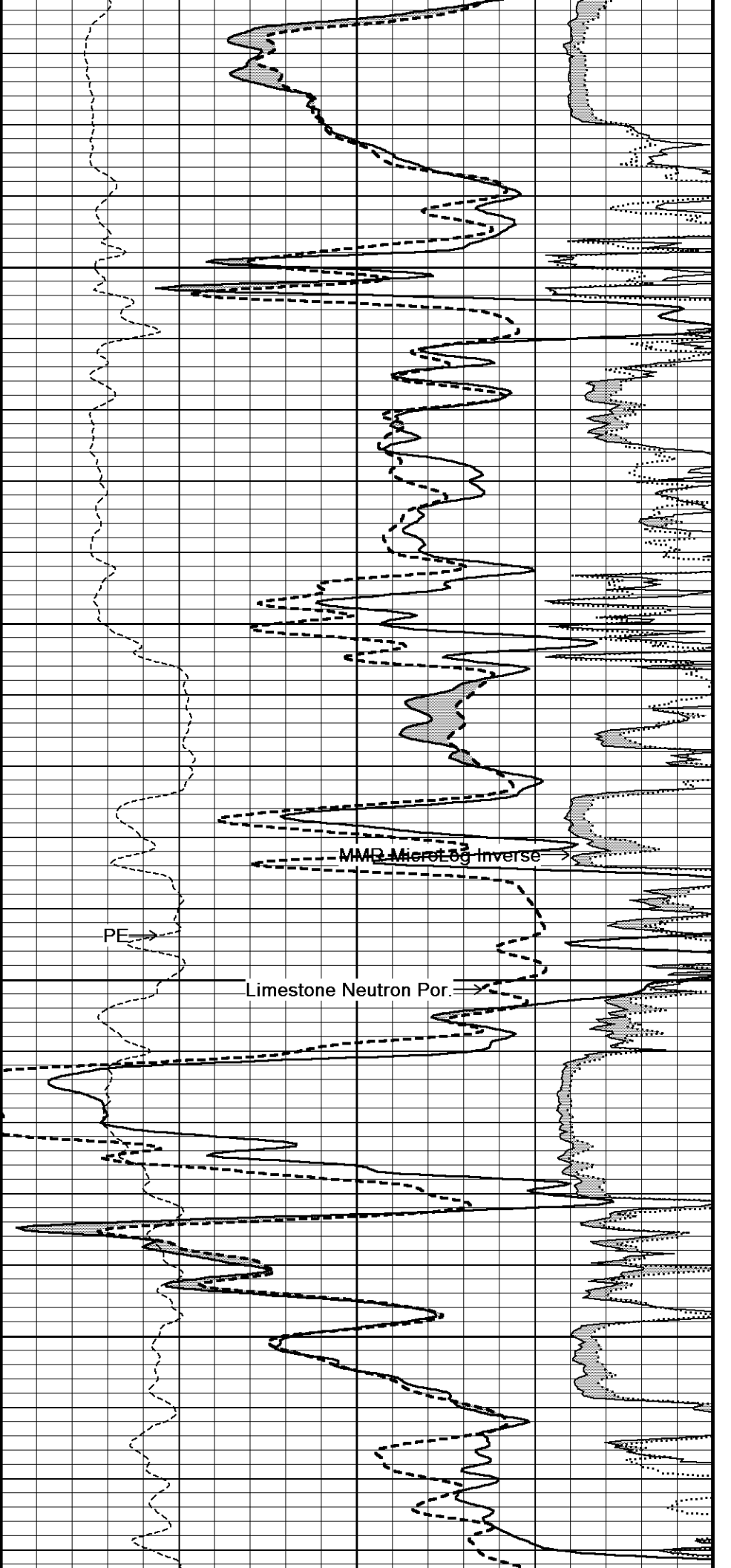
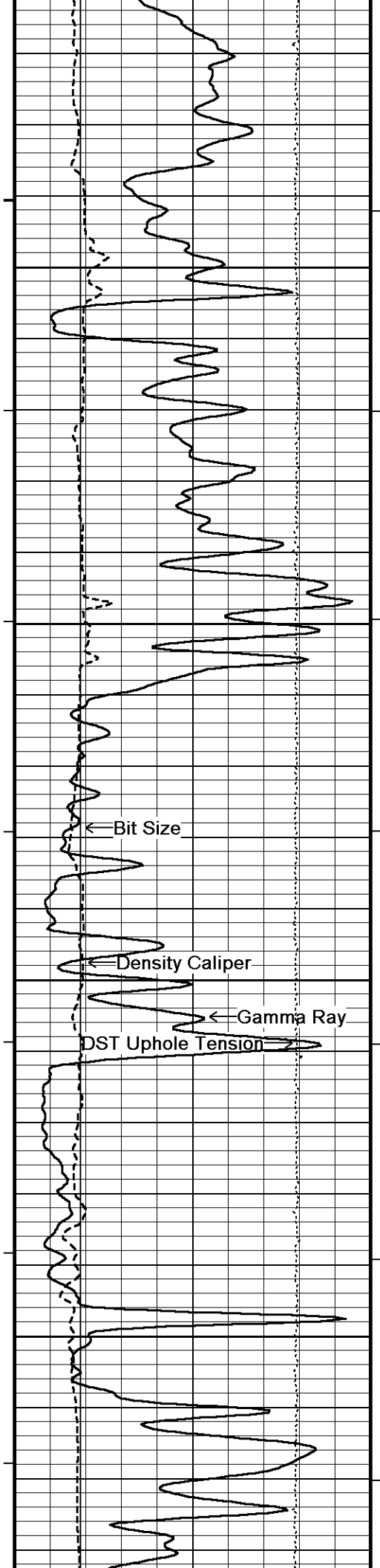
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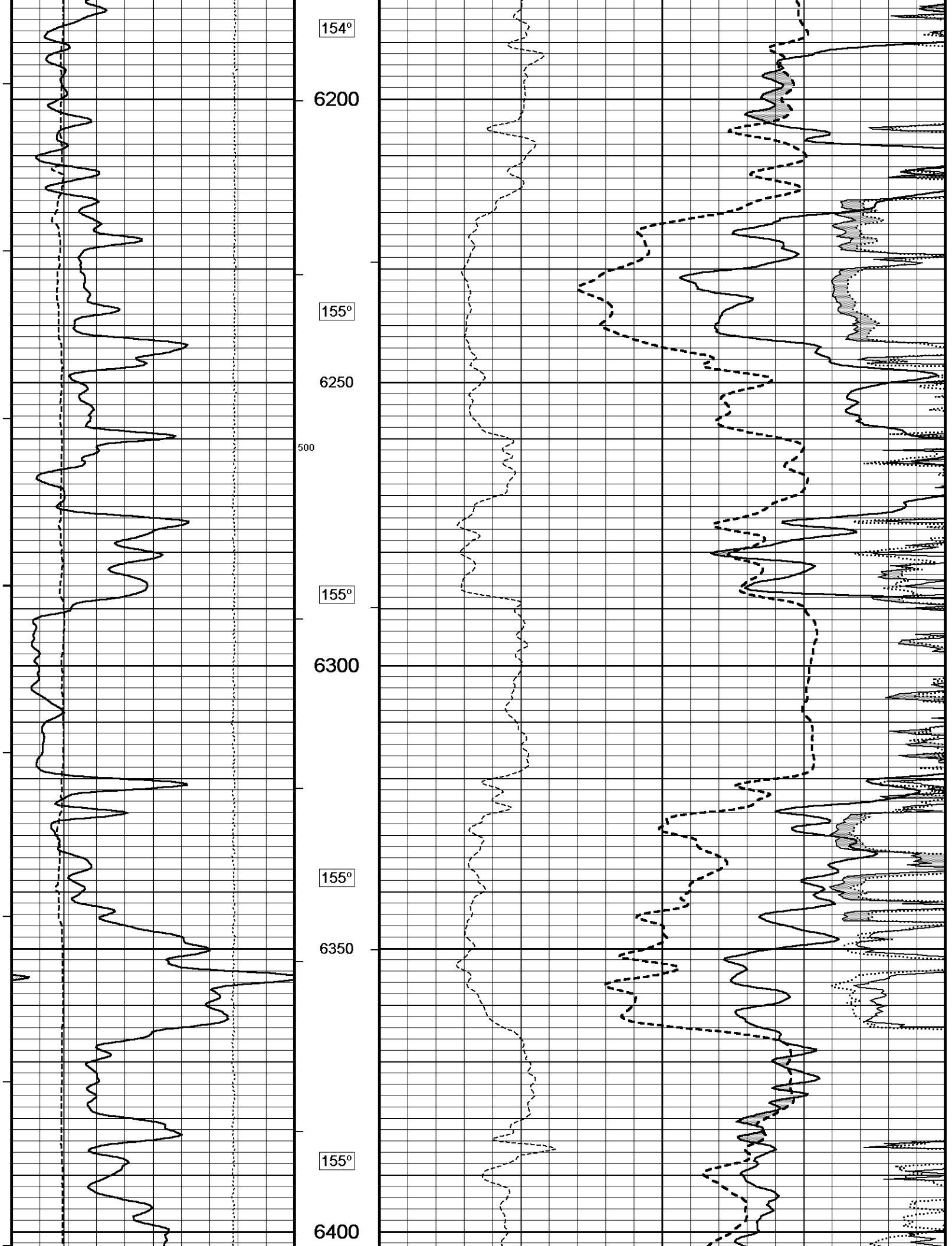
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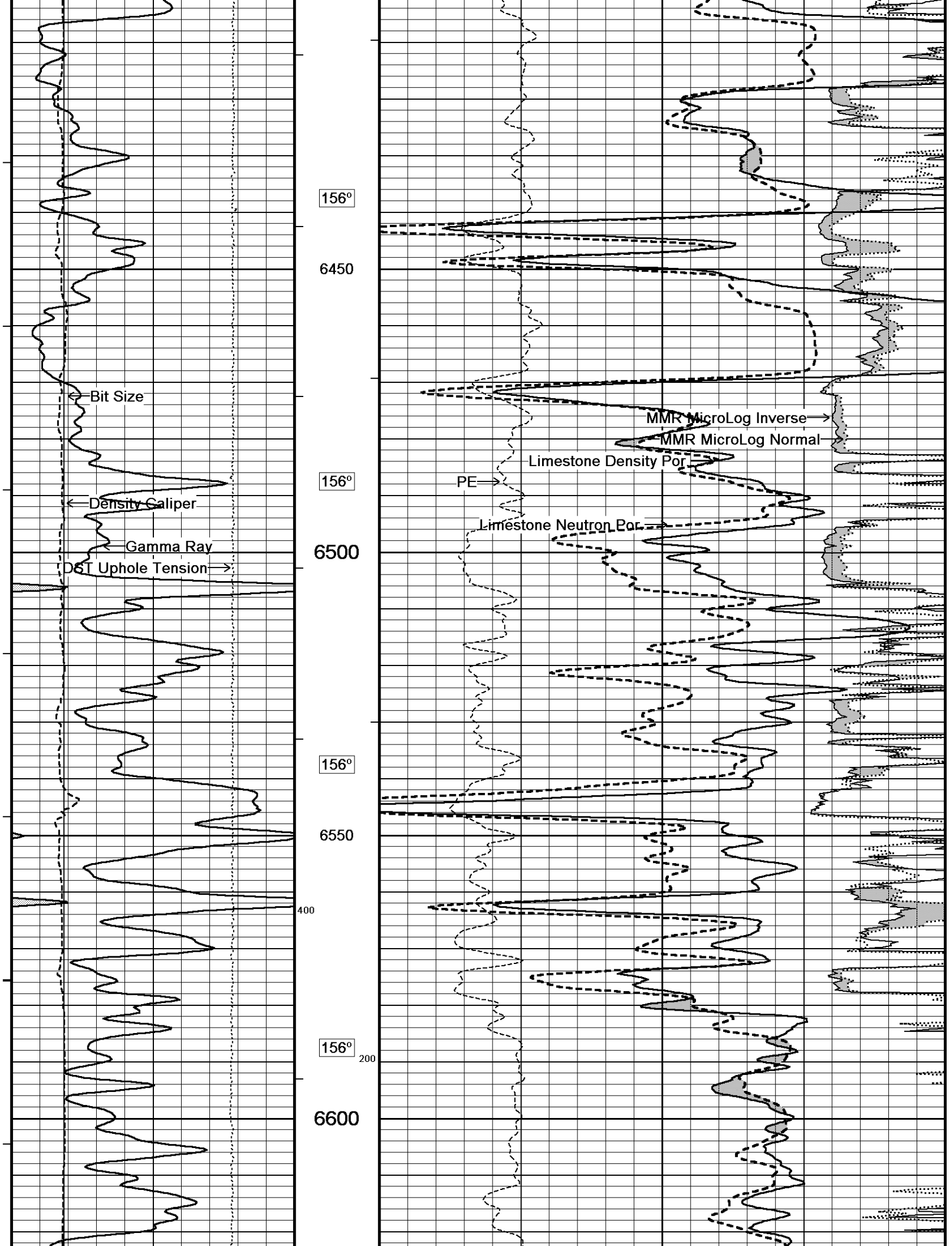
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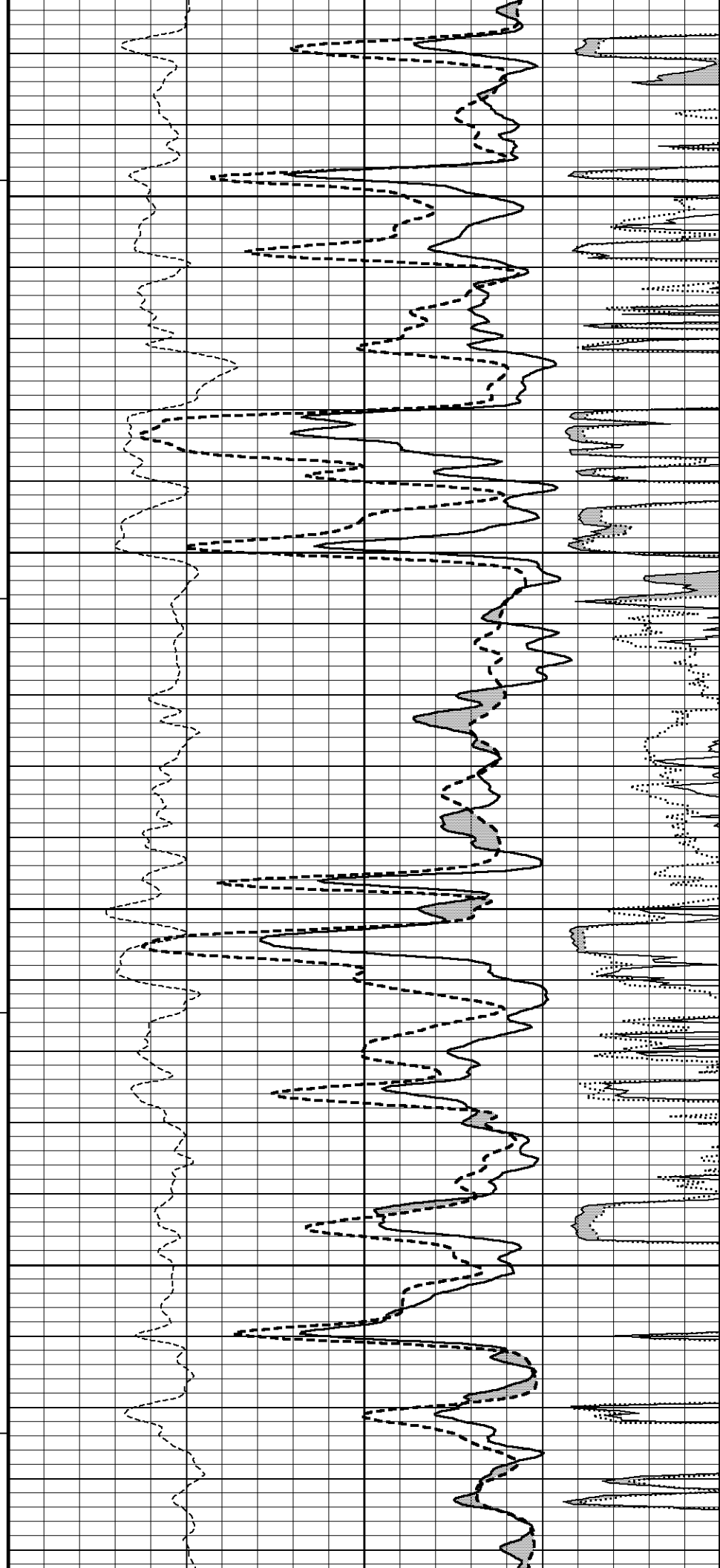
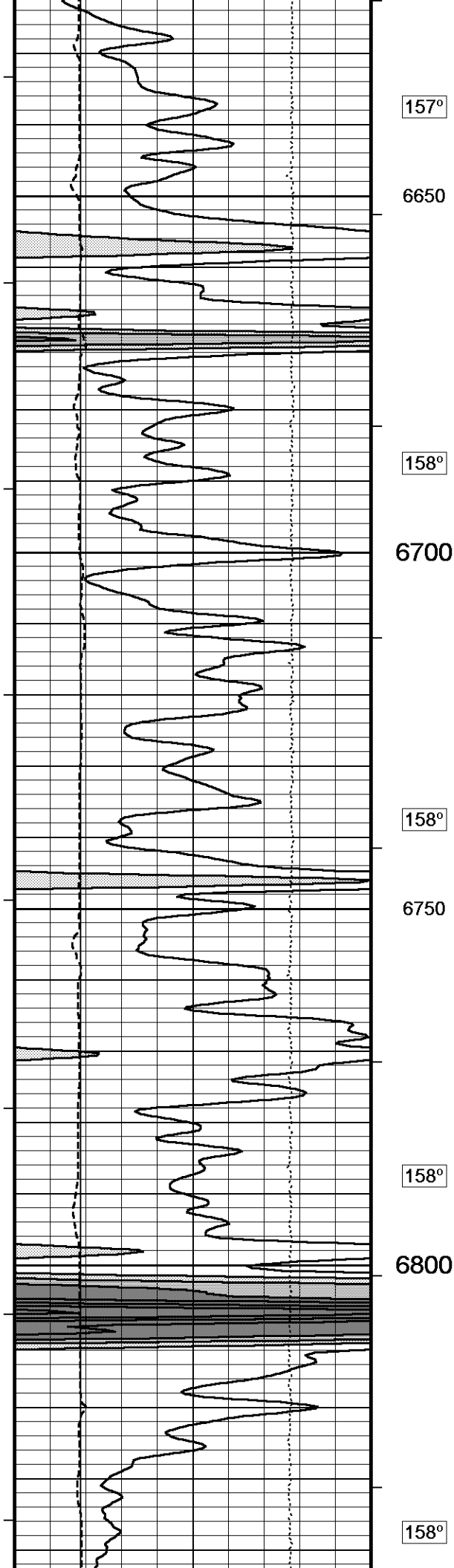
600

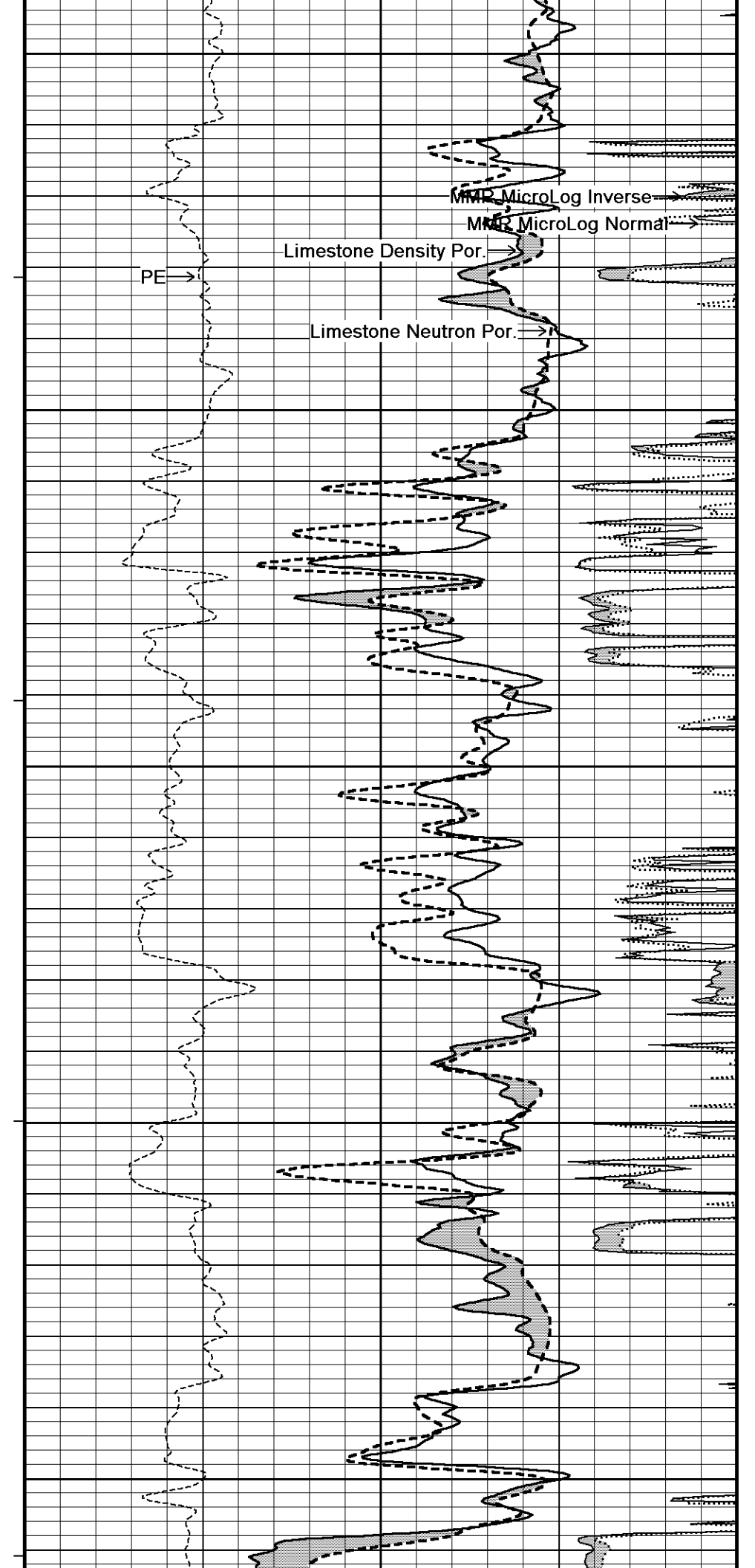
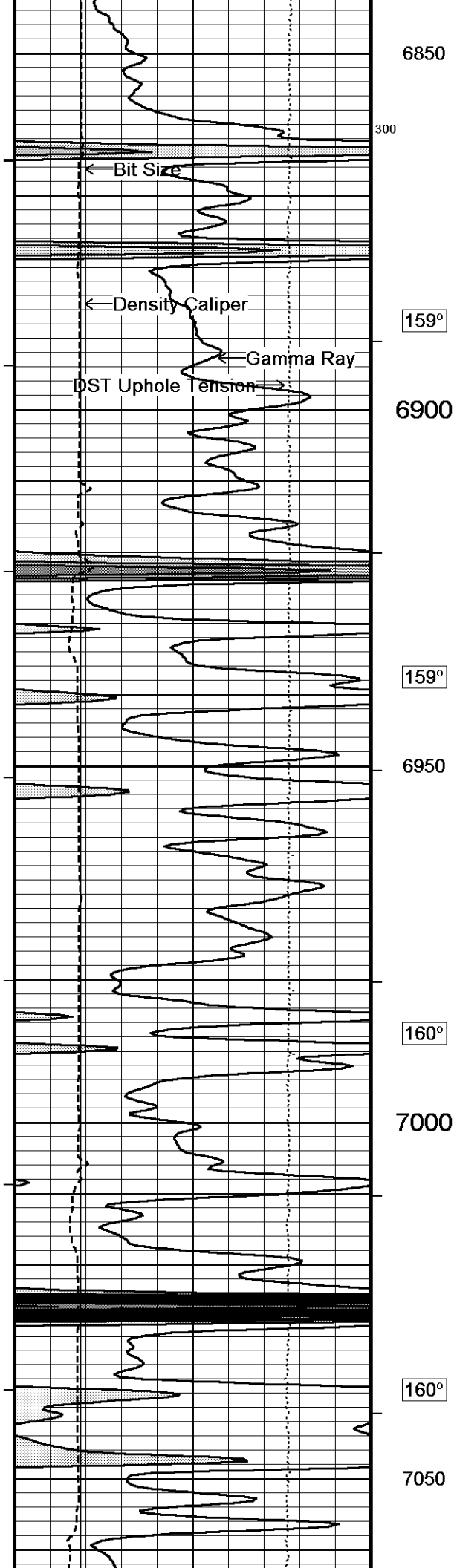


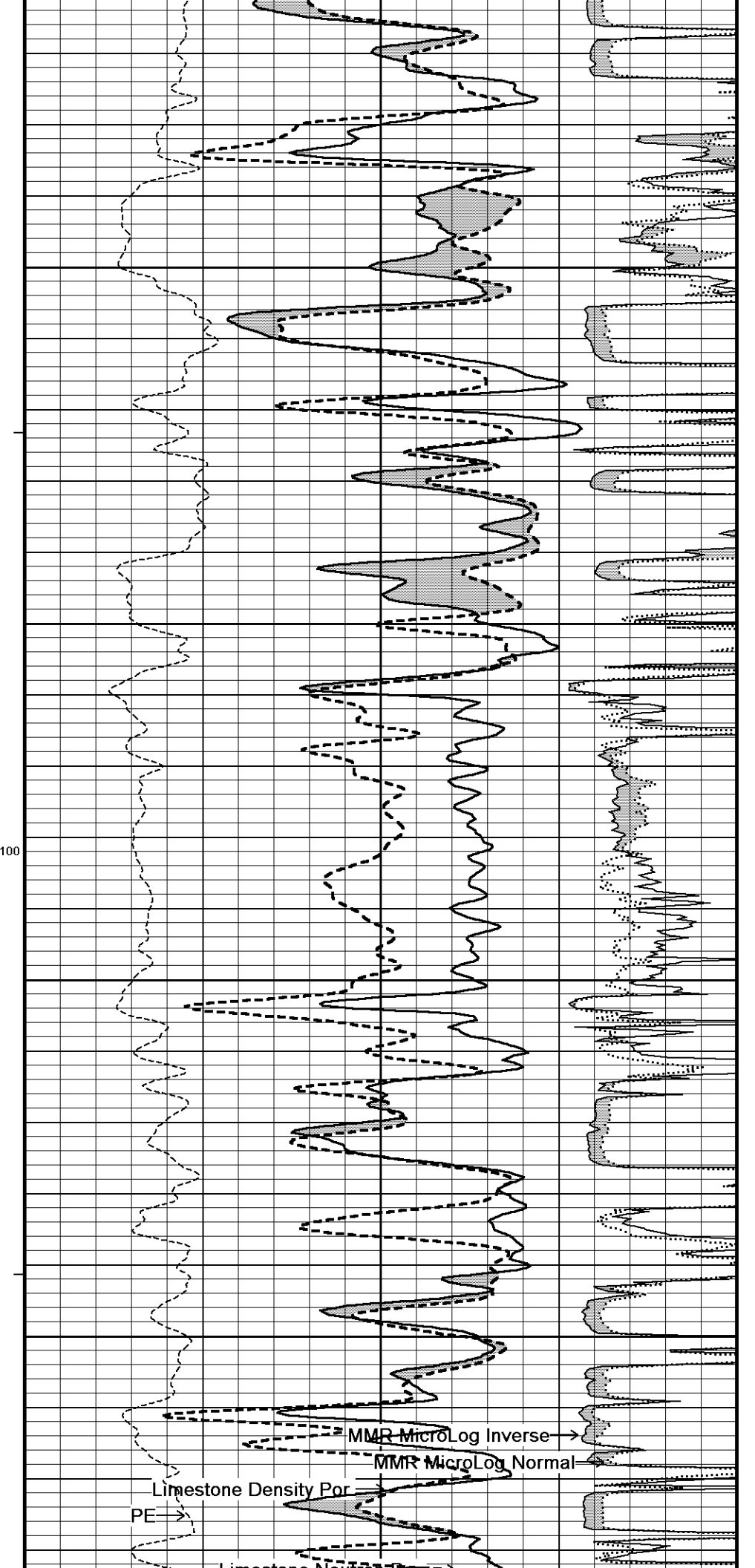
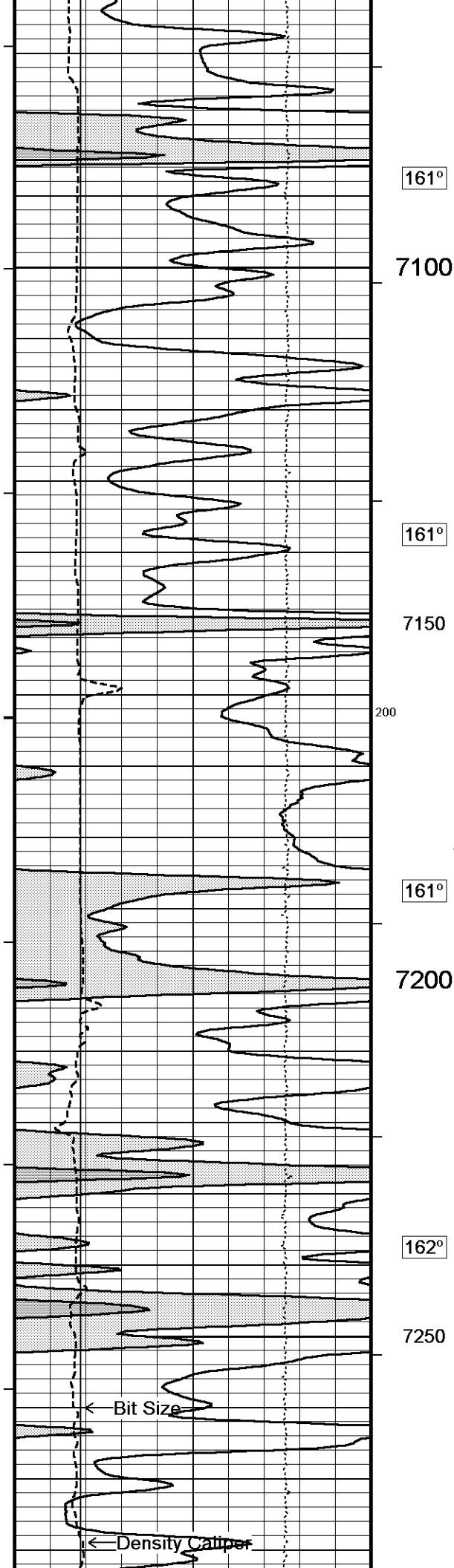


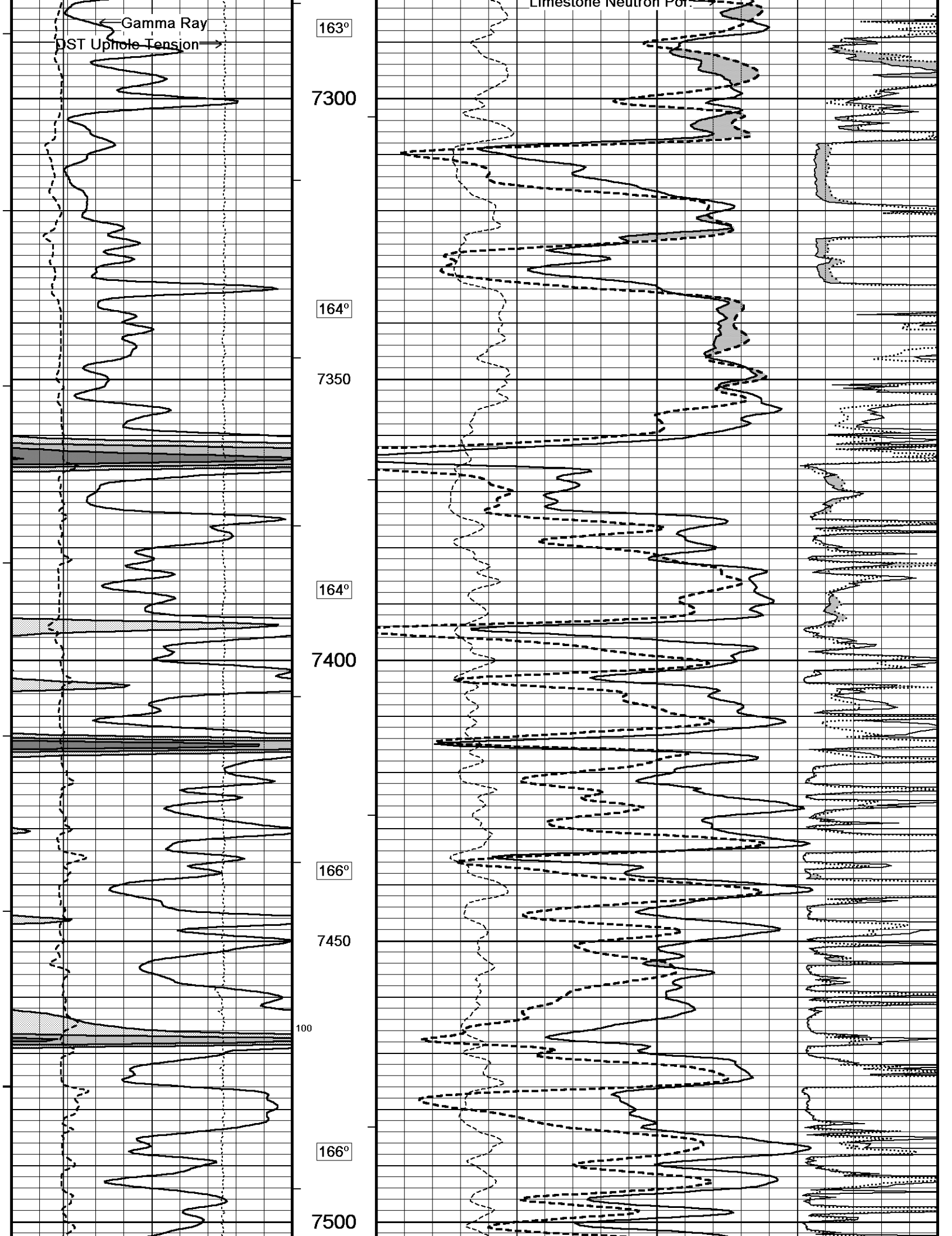














167°

7550

167°

7600

168°

7650

168°

7700

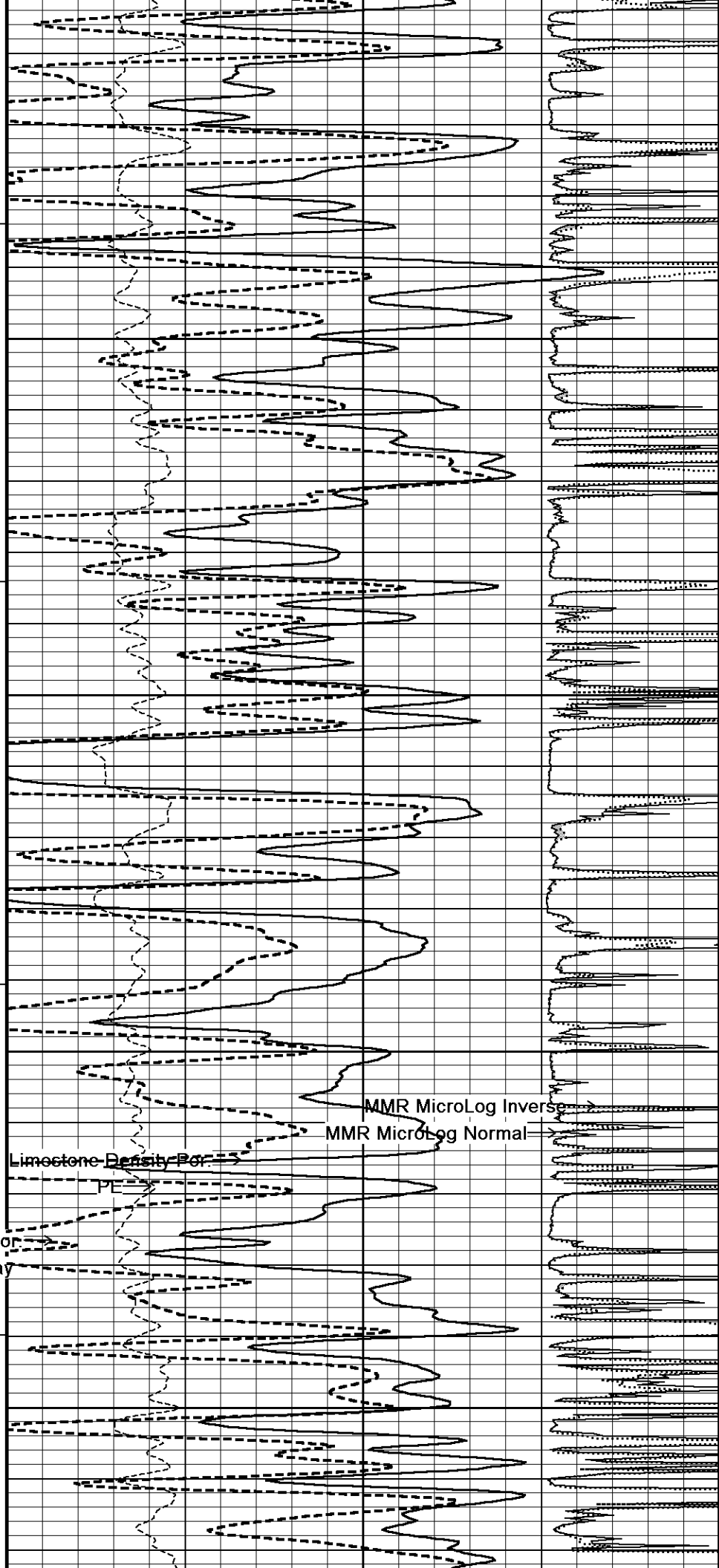
Bit Size

Density Caliper

Limestone Neutron Por

DST Uphole Tension

PR

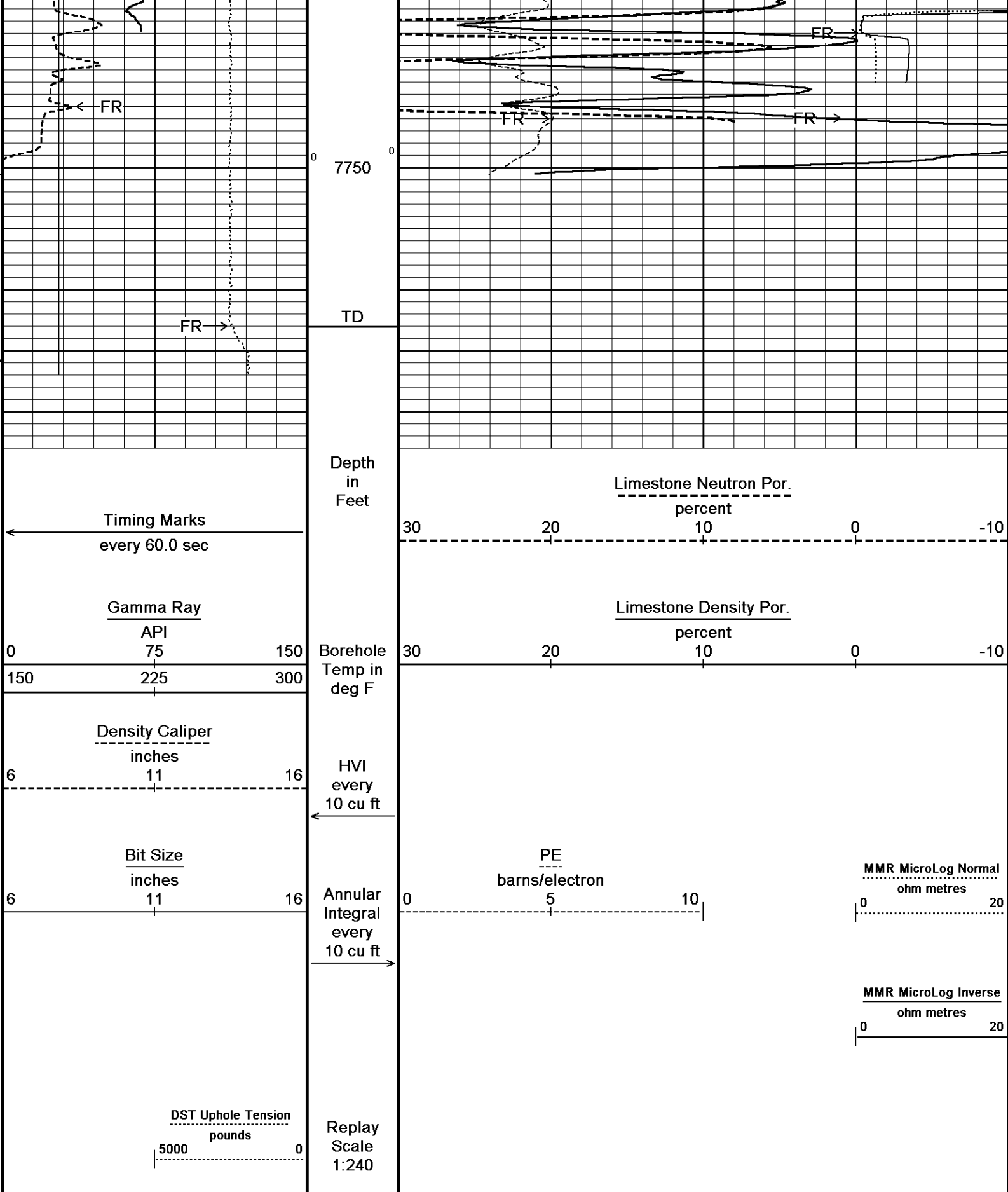


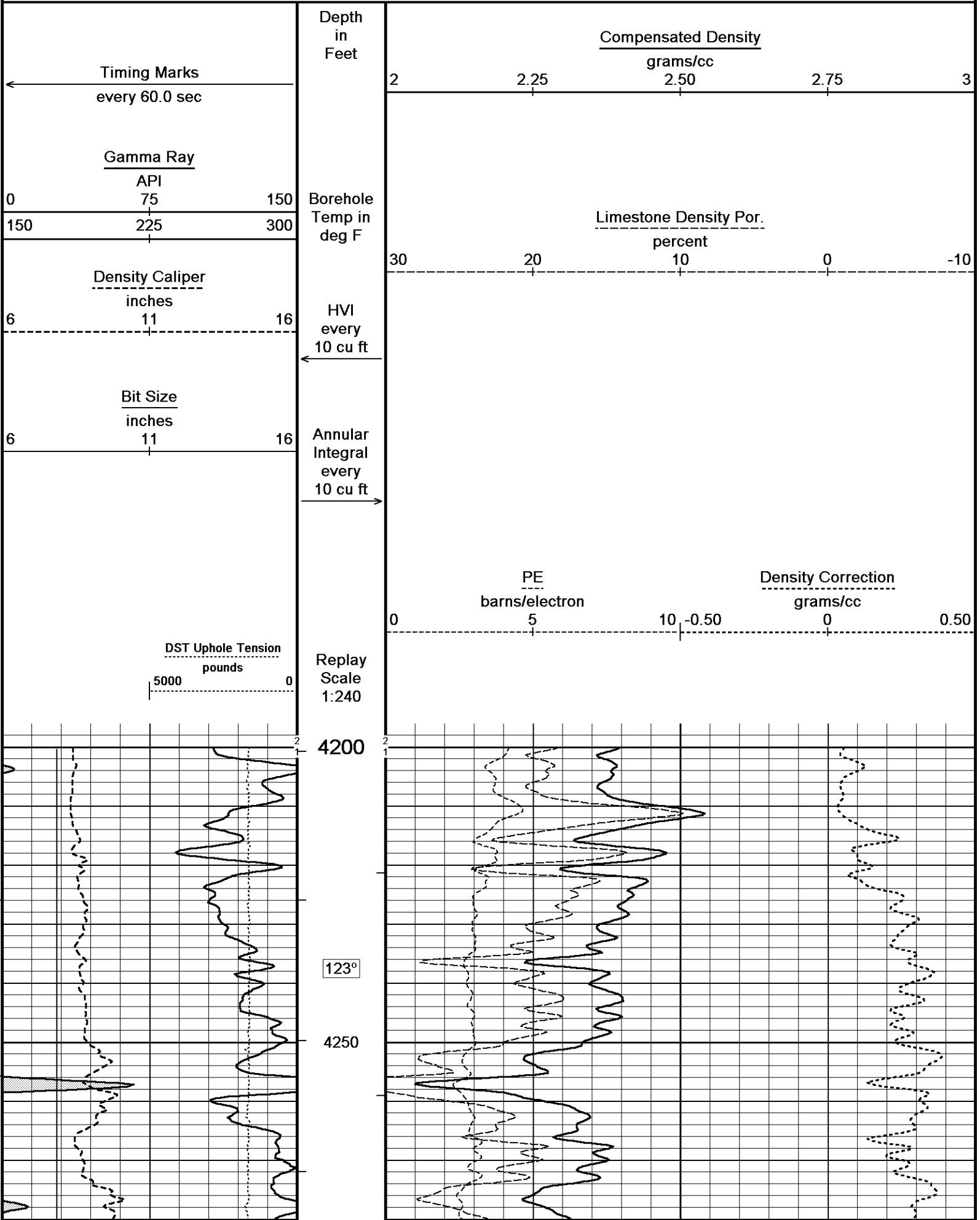
Limestone Density Por

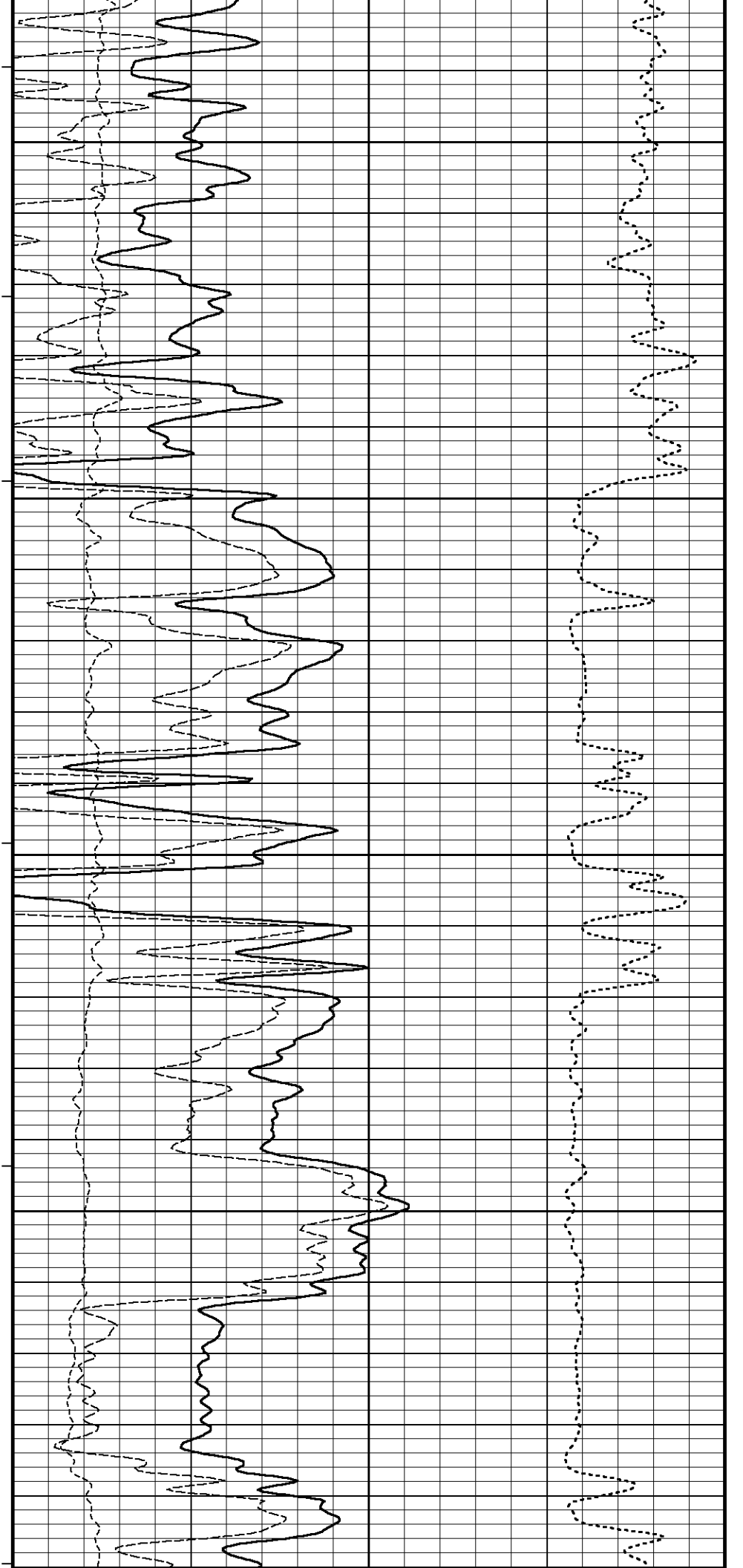
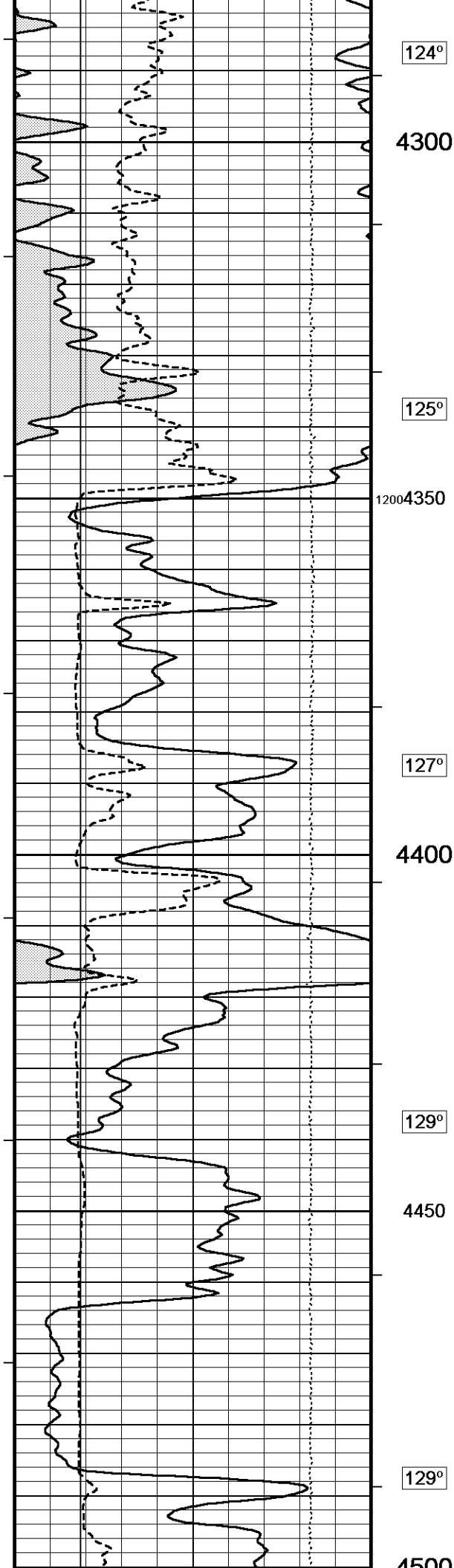
PE

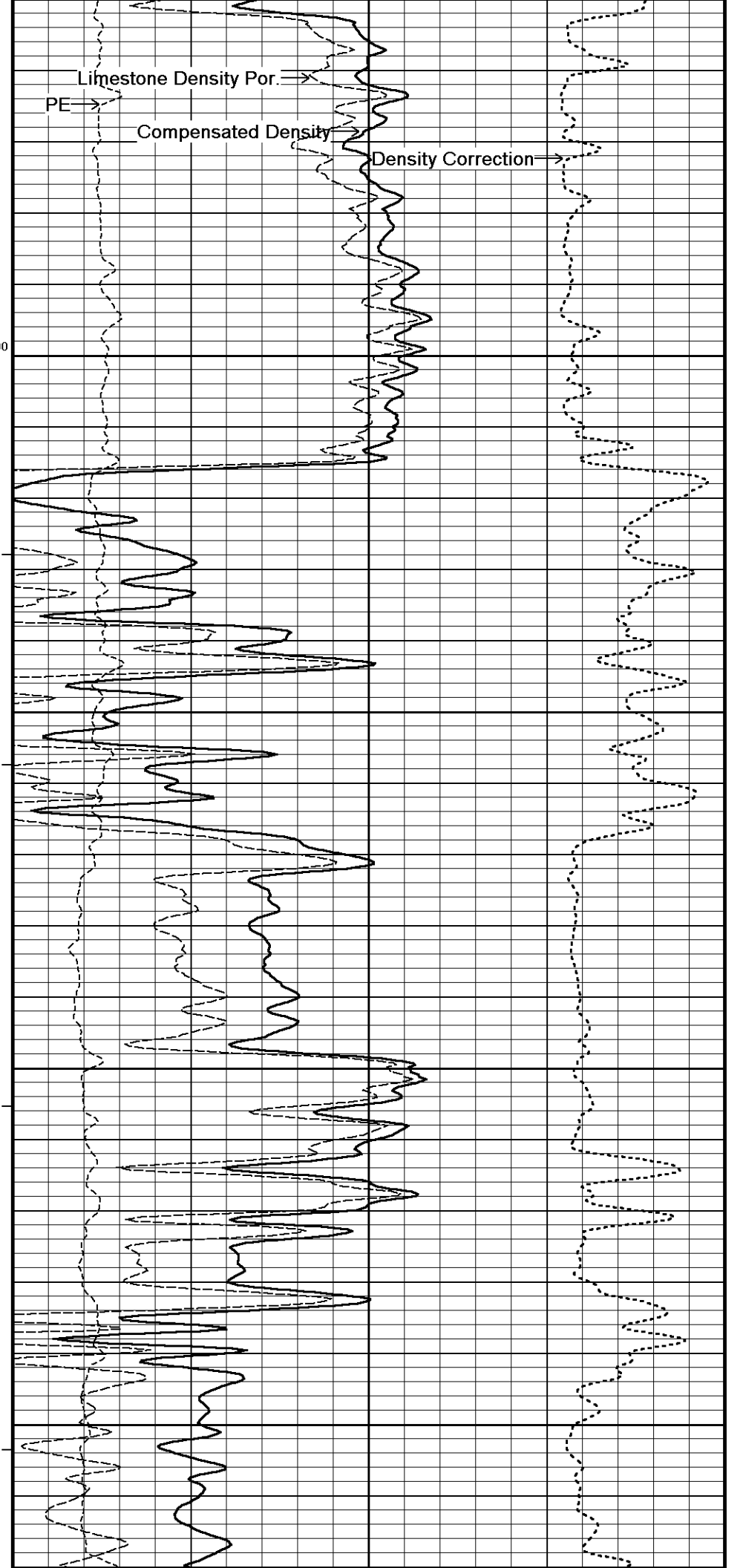
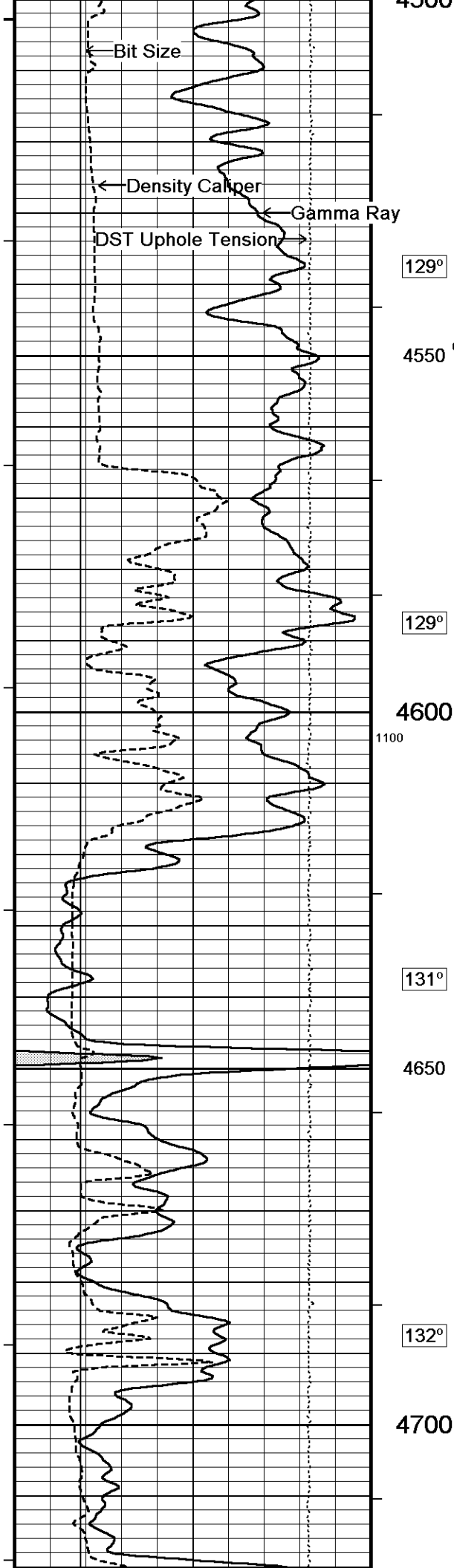
MMR MicroLog Inverse

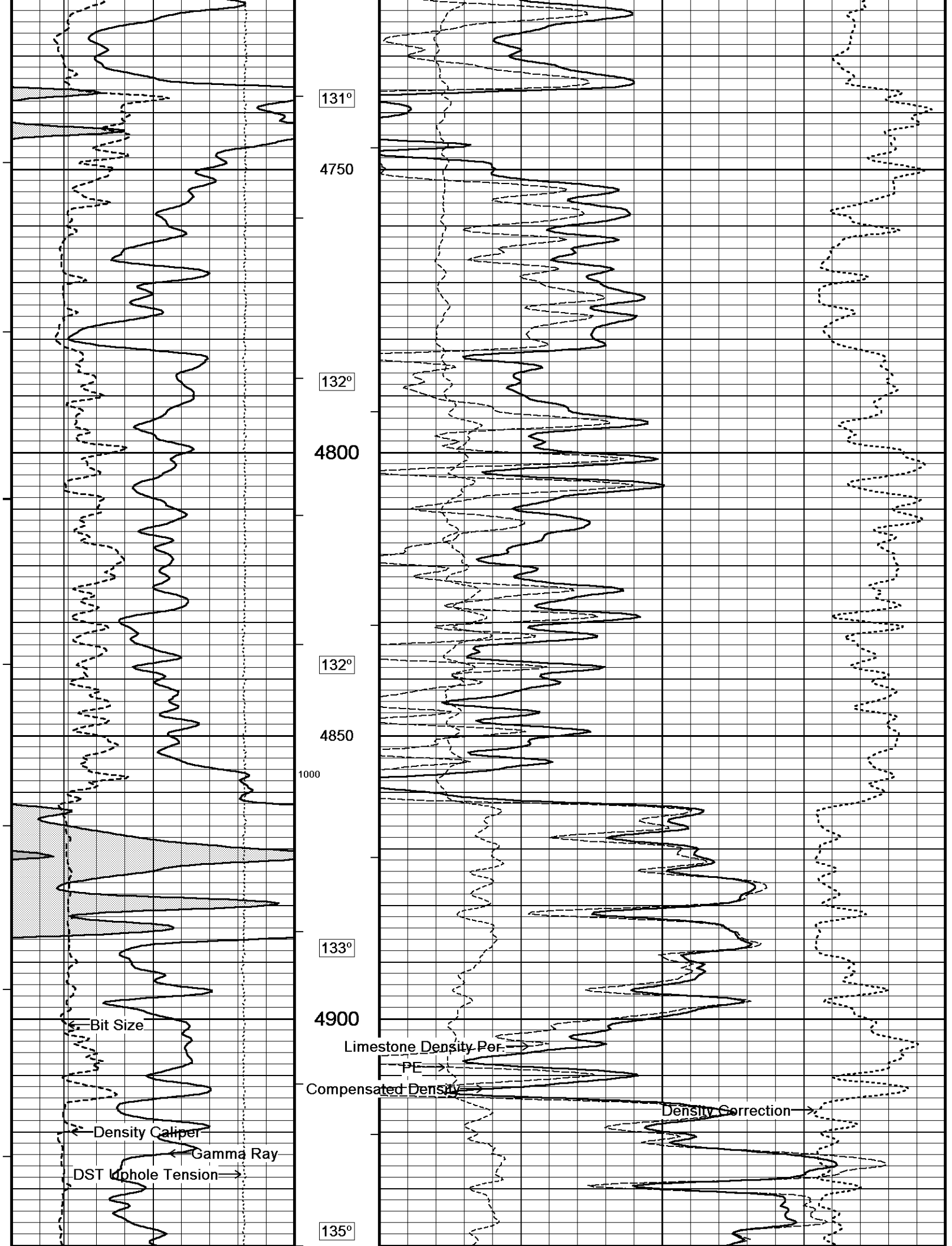
MMR MicroLog Normal

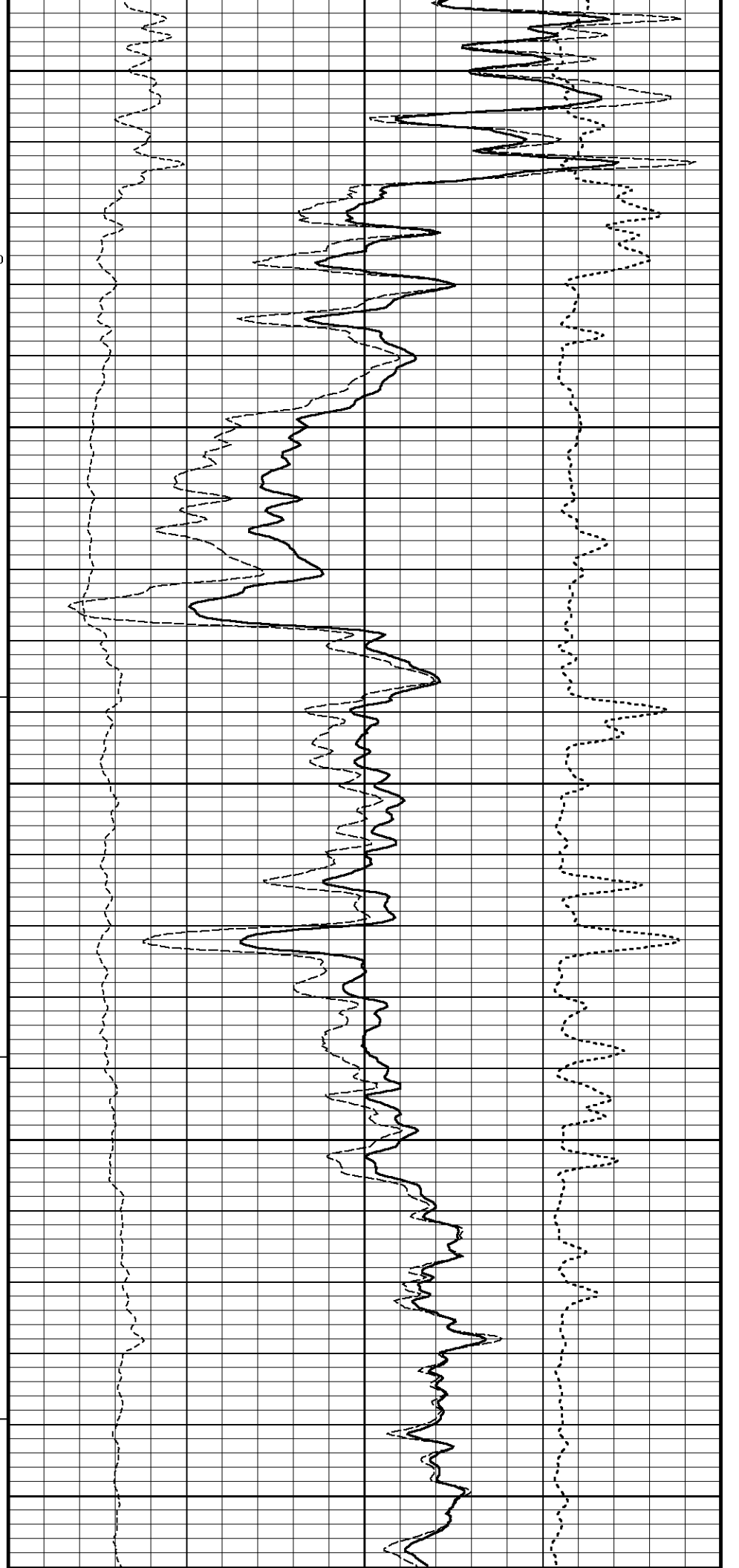
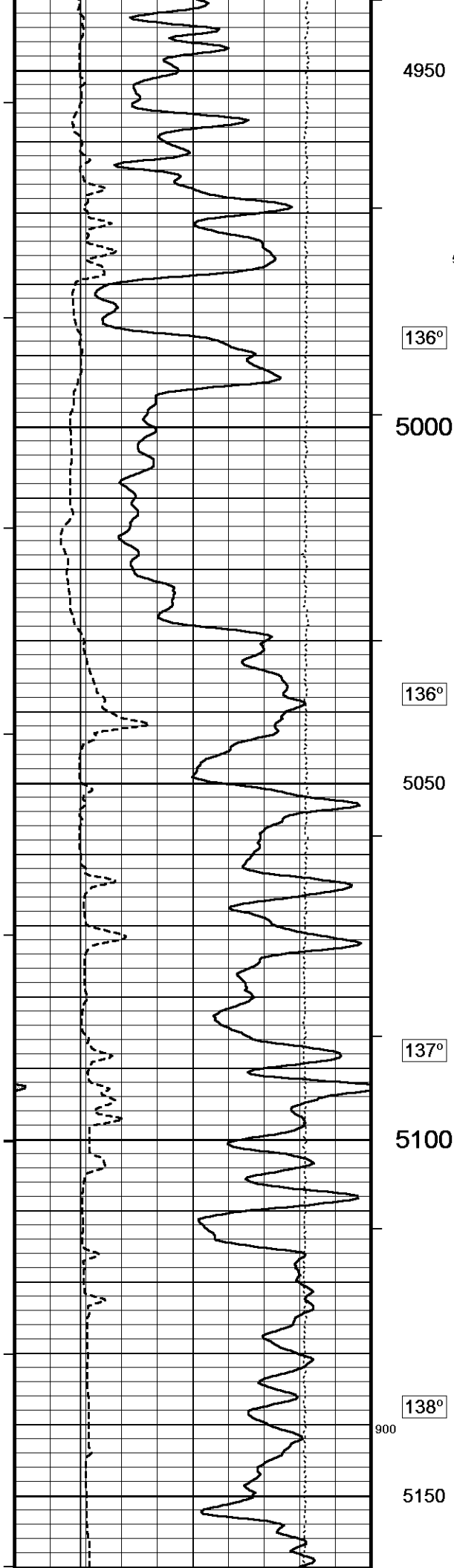


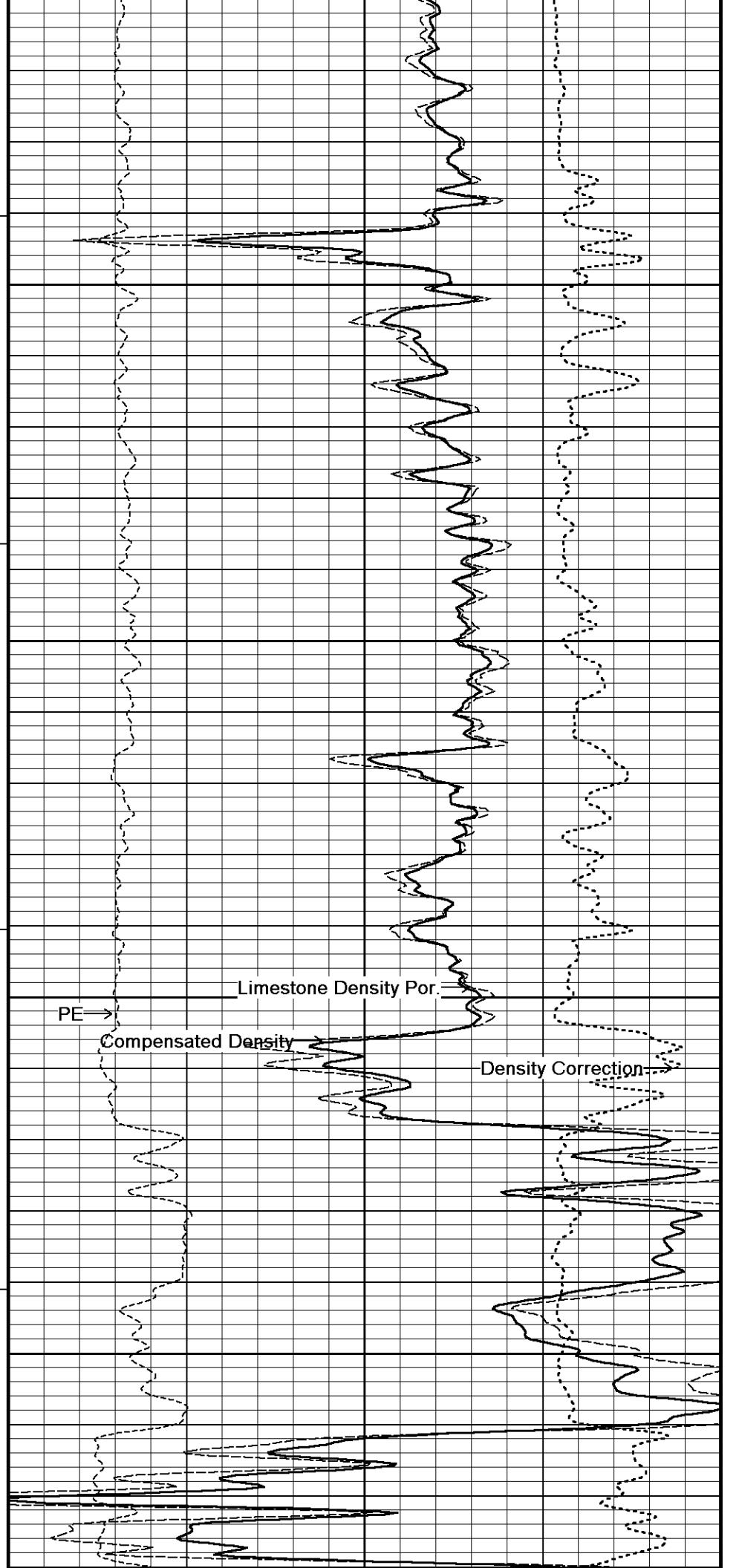
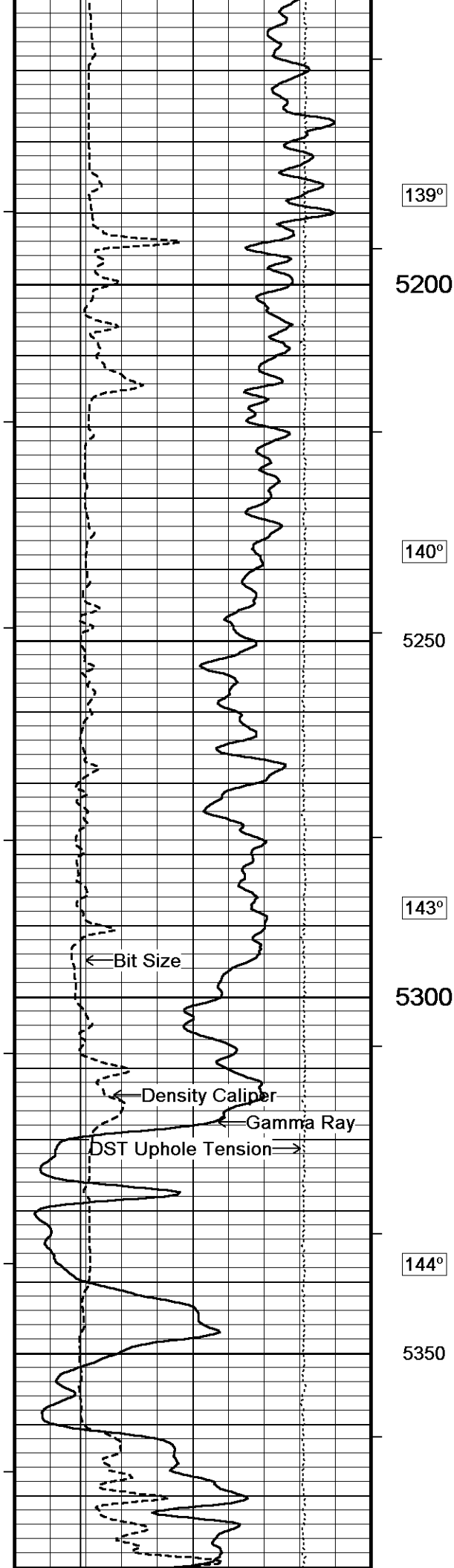


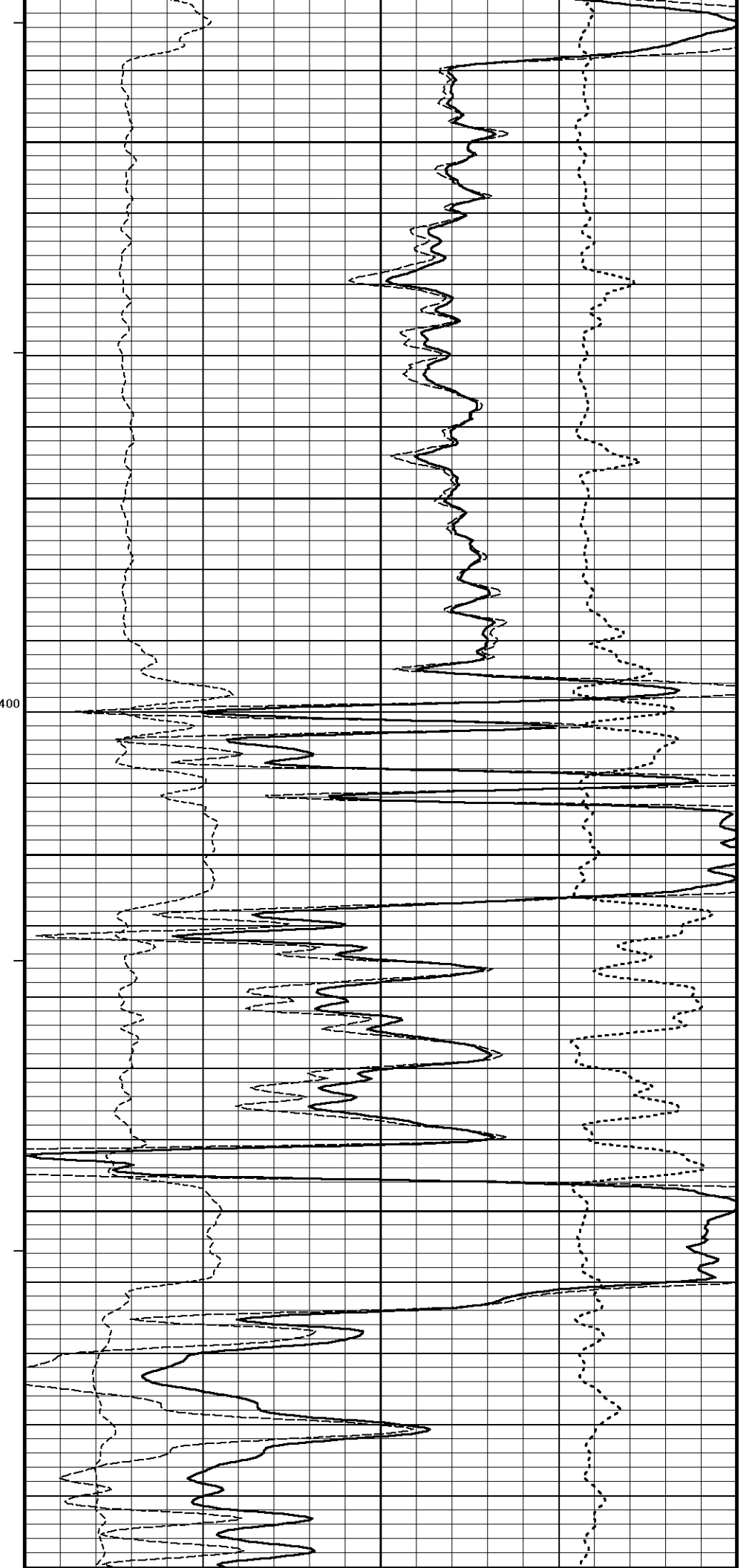
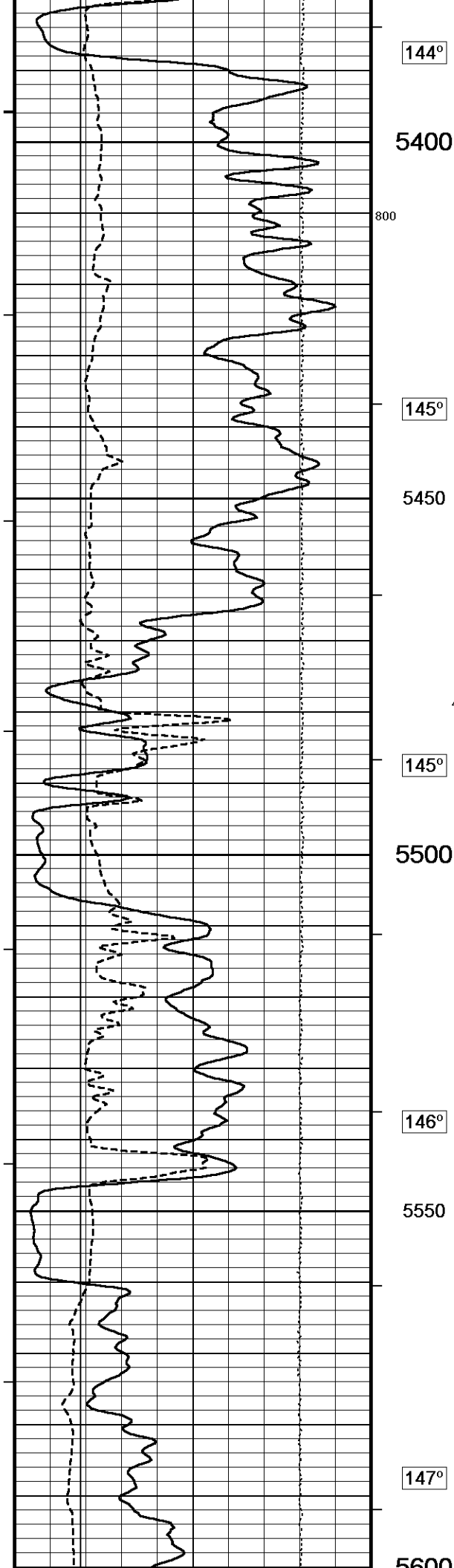


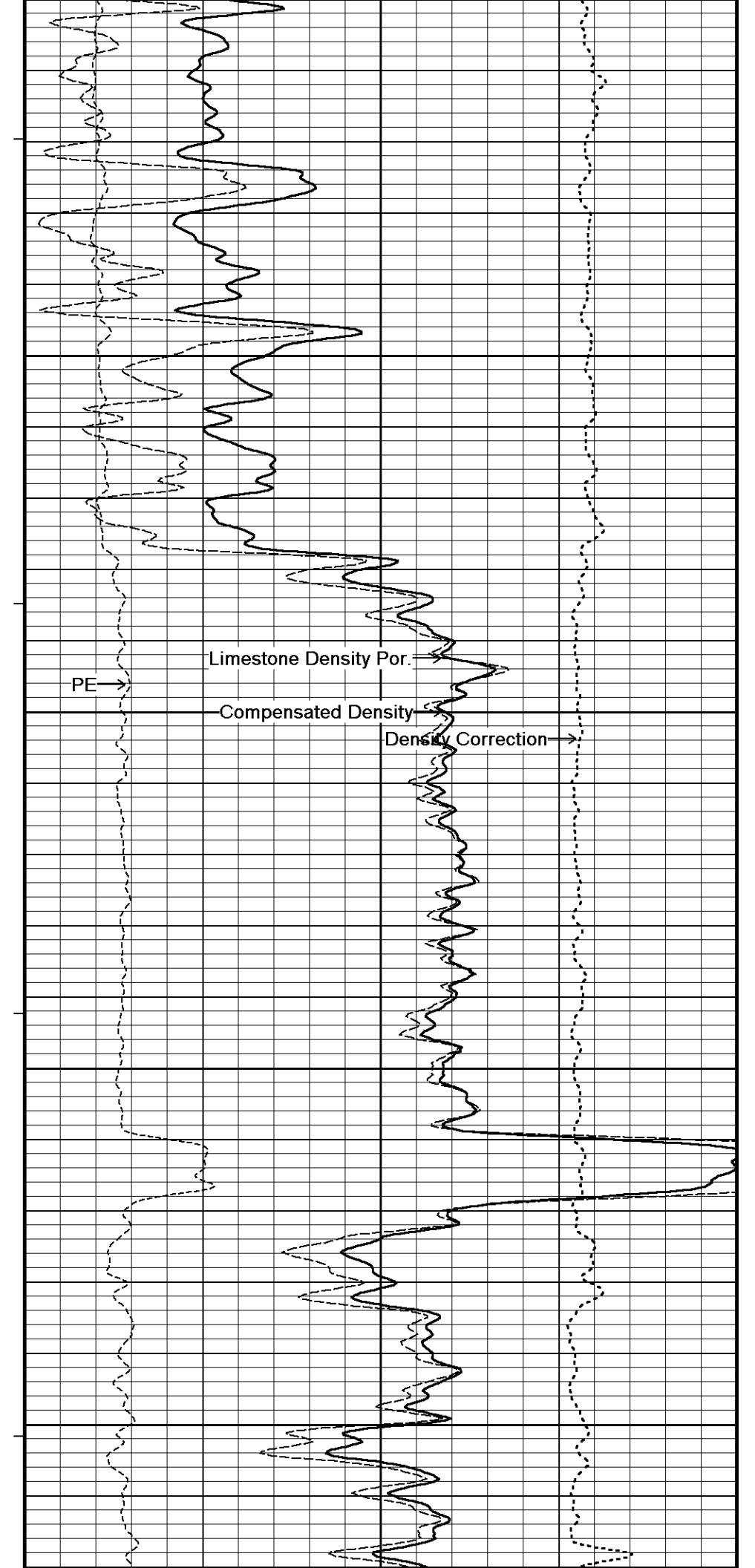
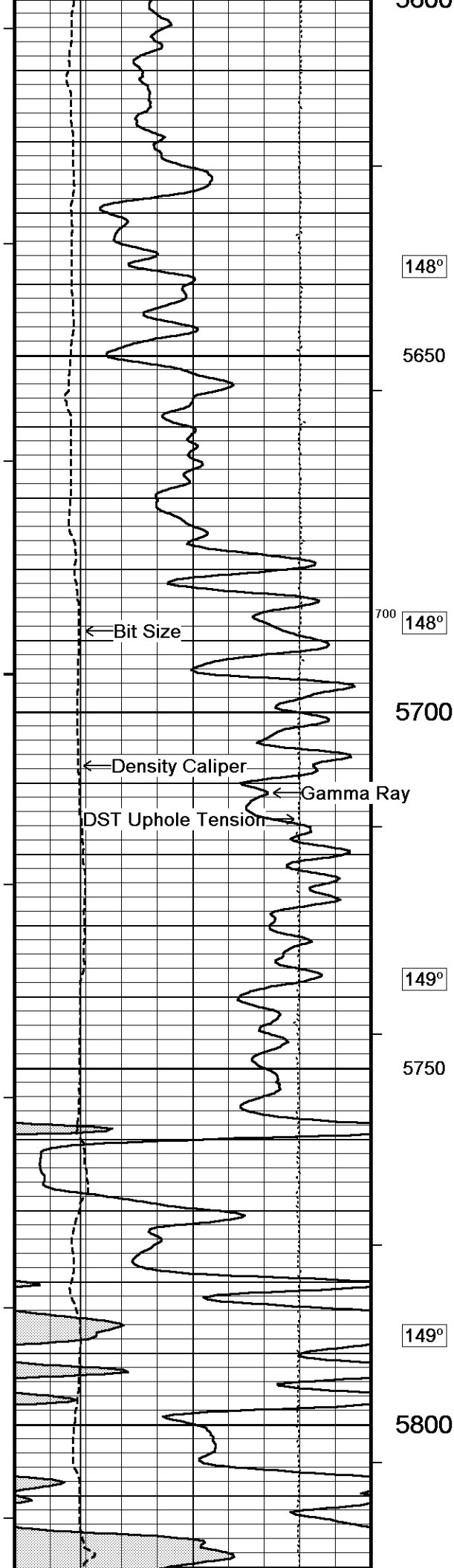


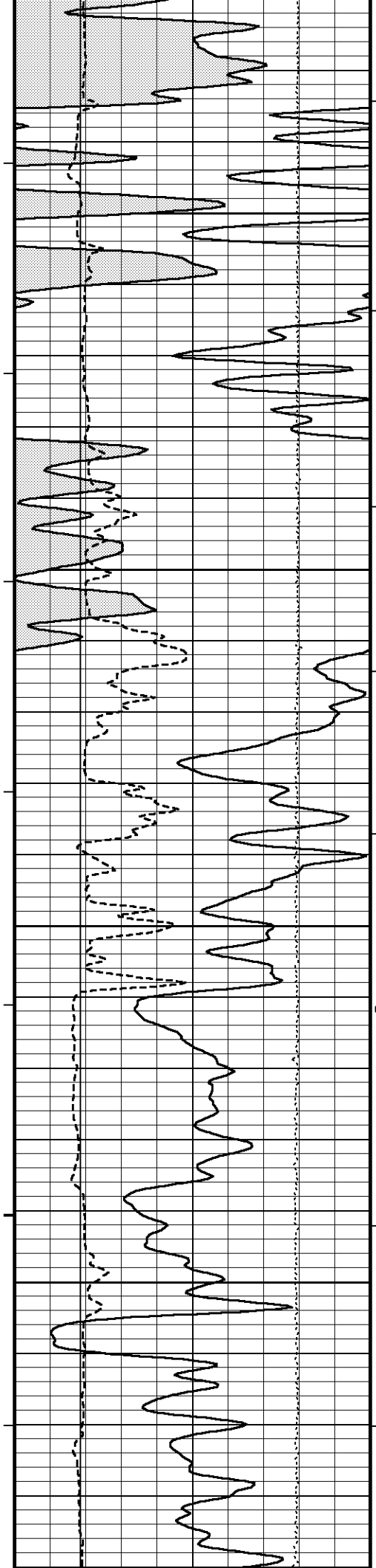












149°

5850

150°

5900

151°

5950

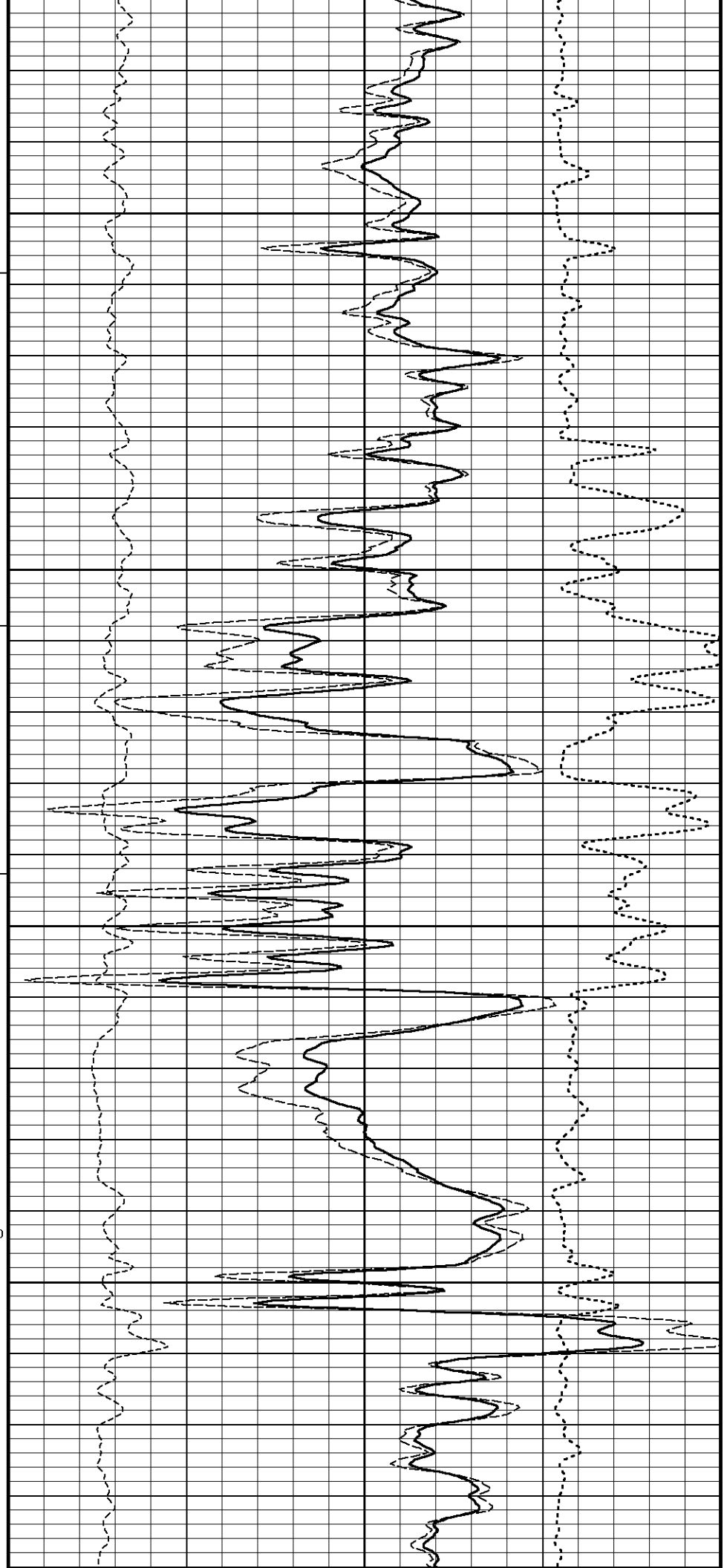
600

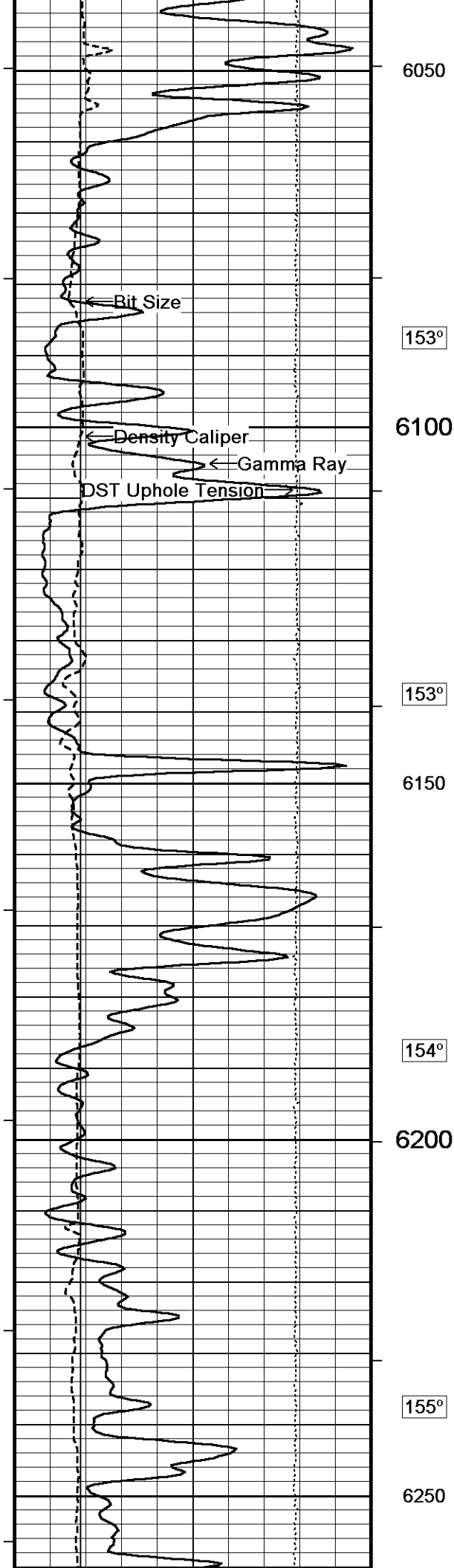
152°

300

6000

152°





6050

153°

6100

153°

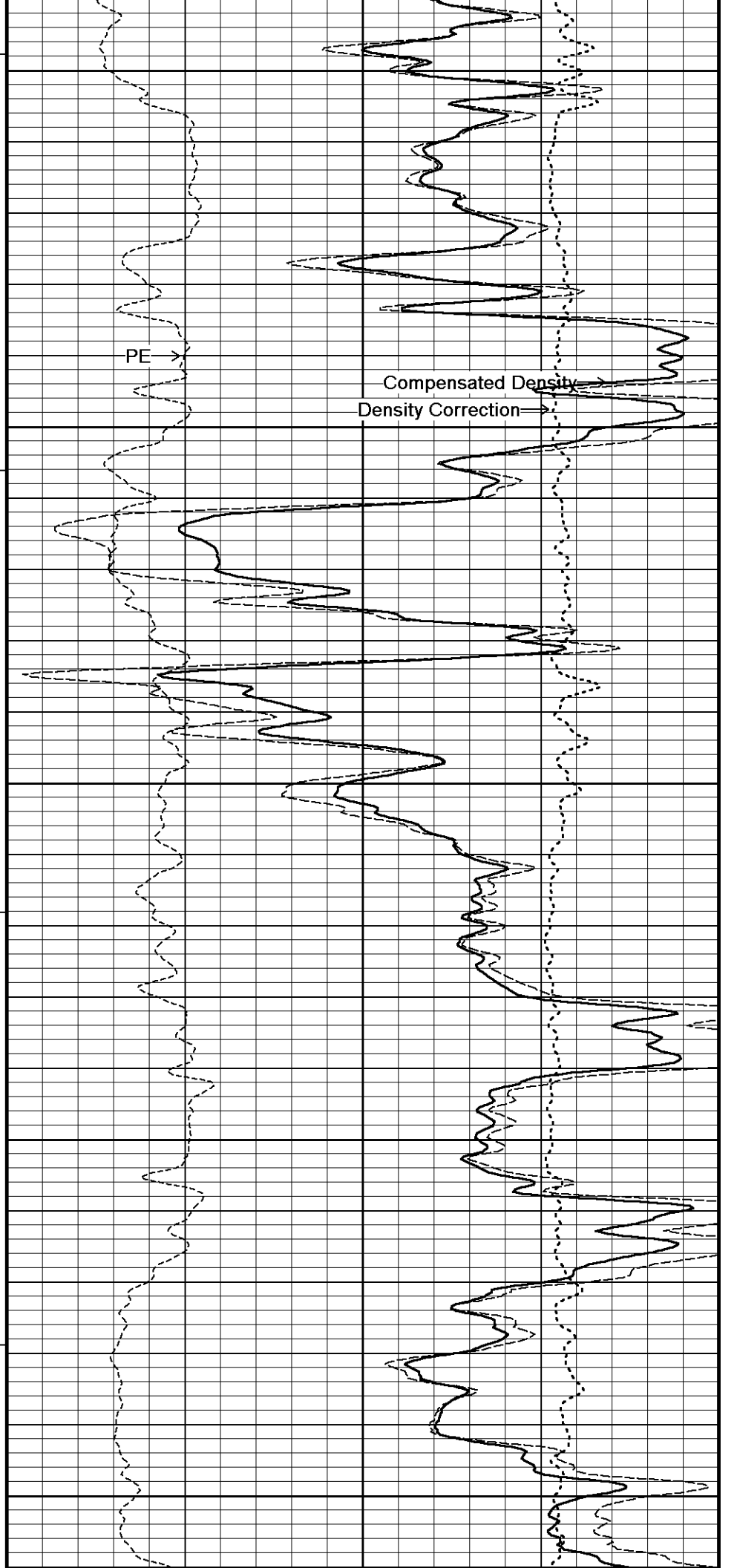
6150

154°

6200

155°

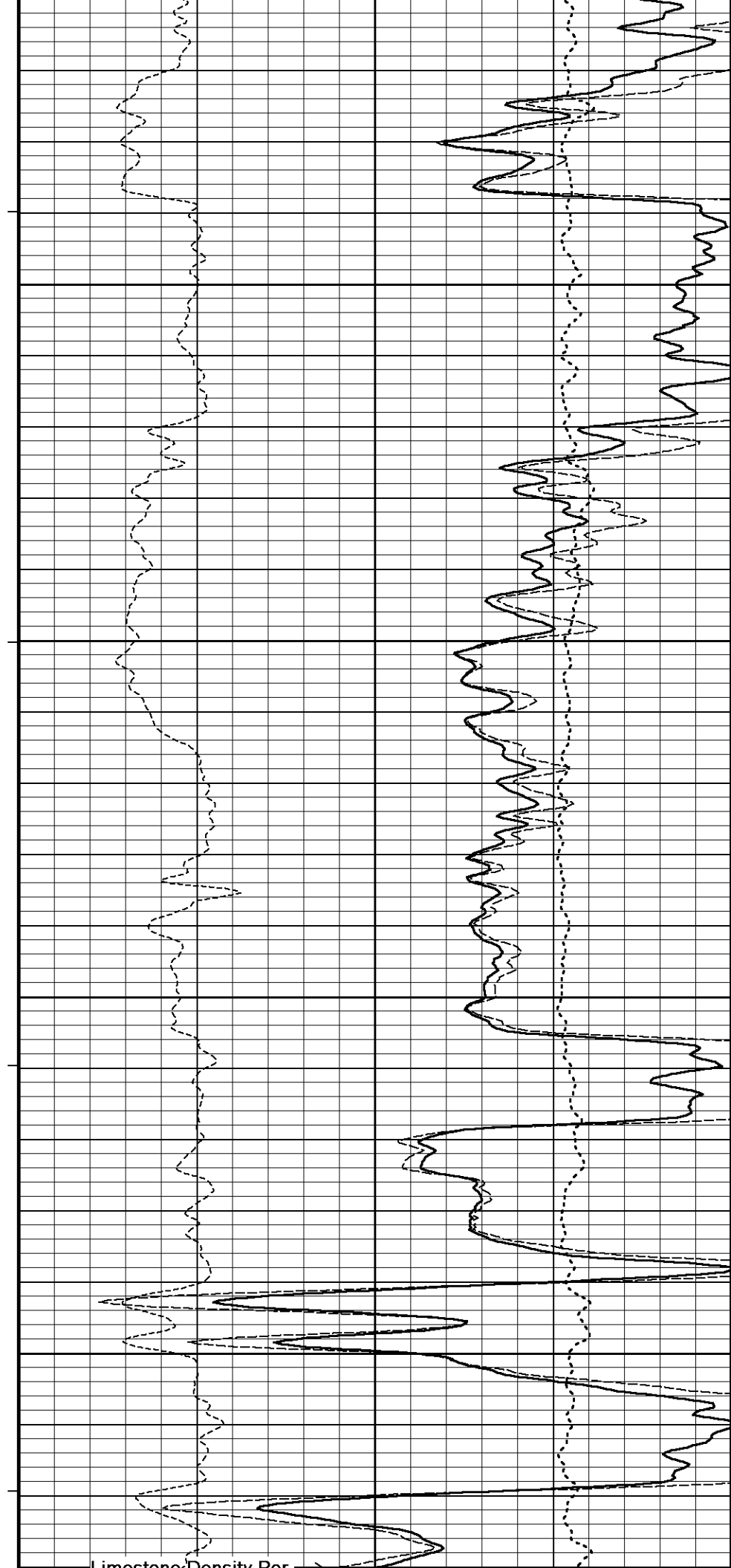
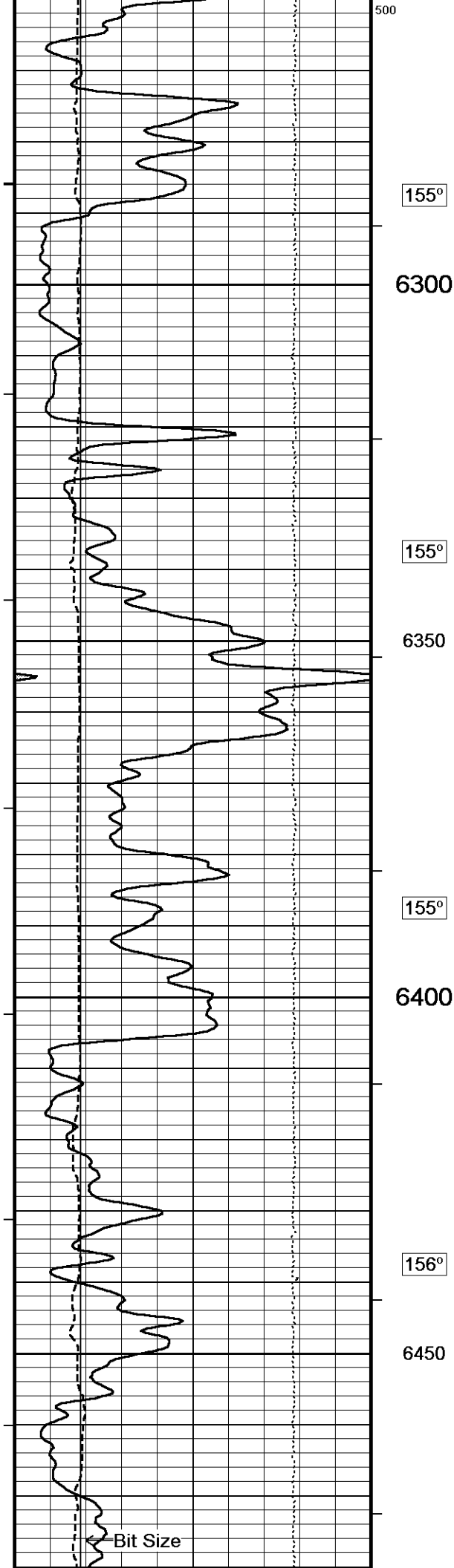
6250

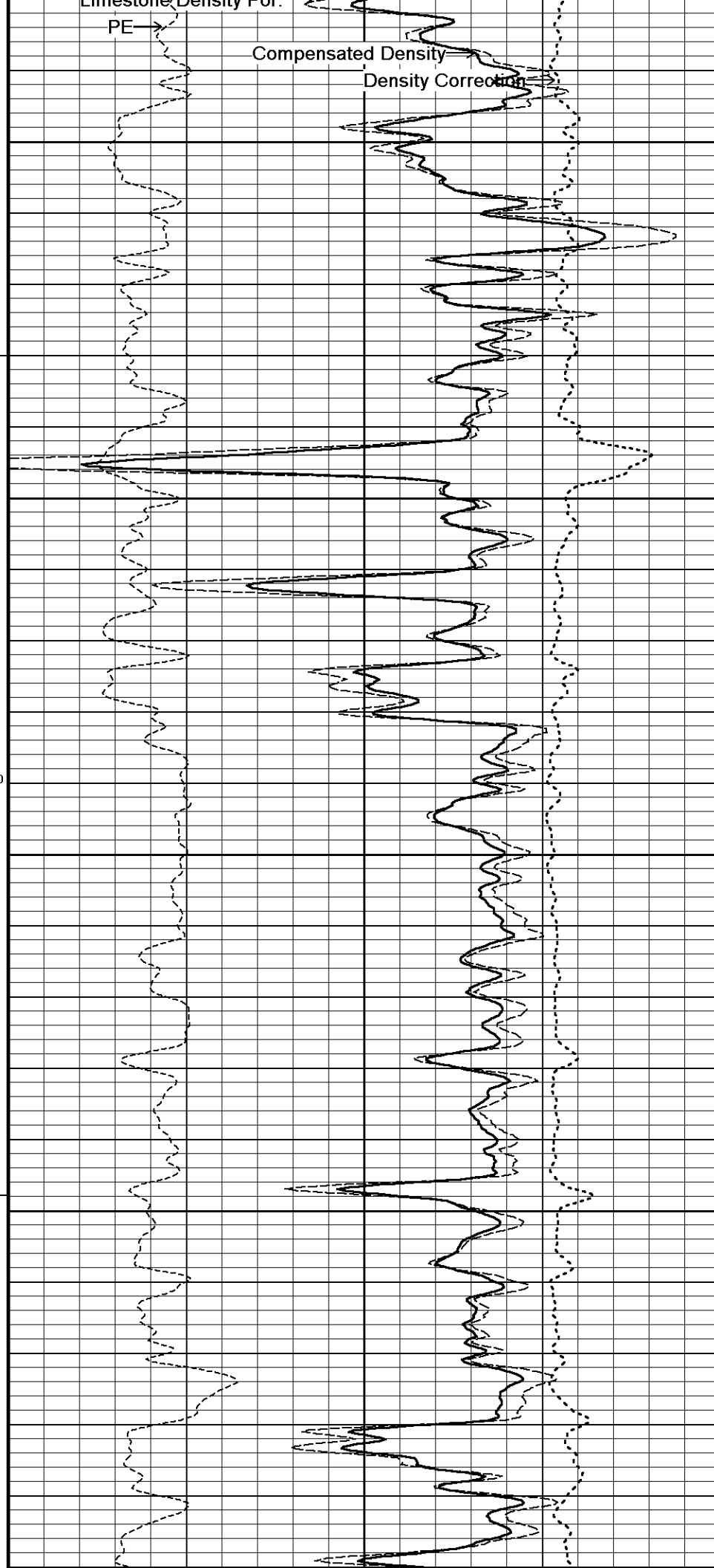
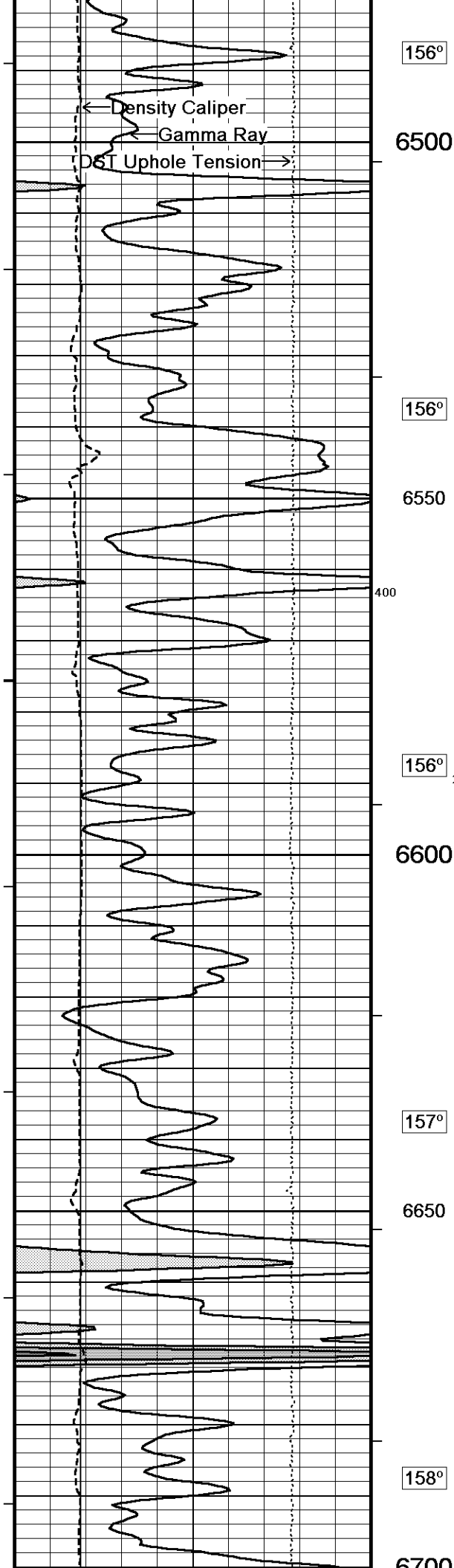


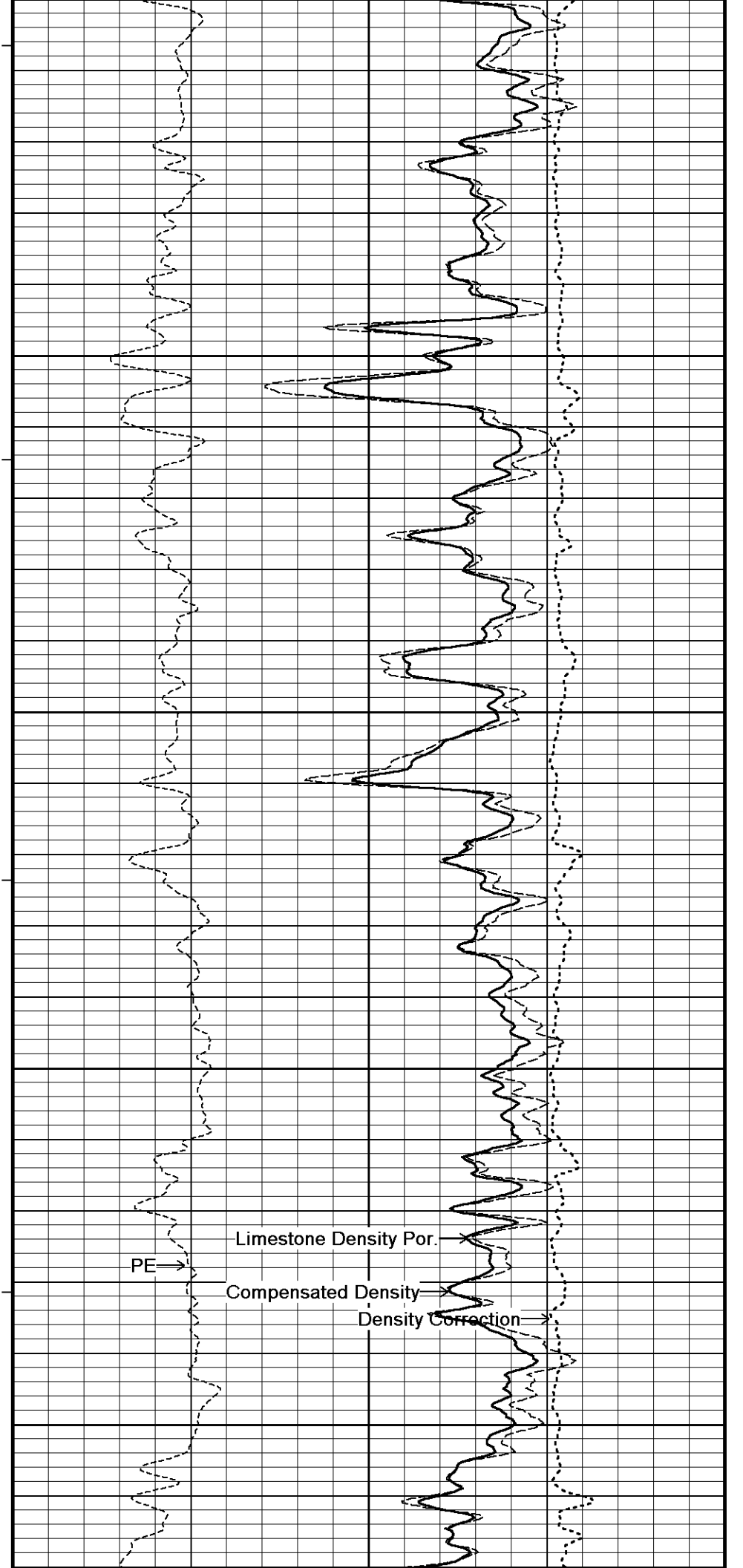
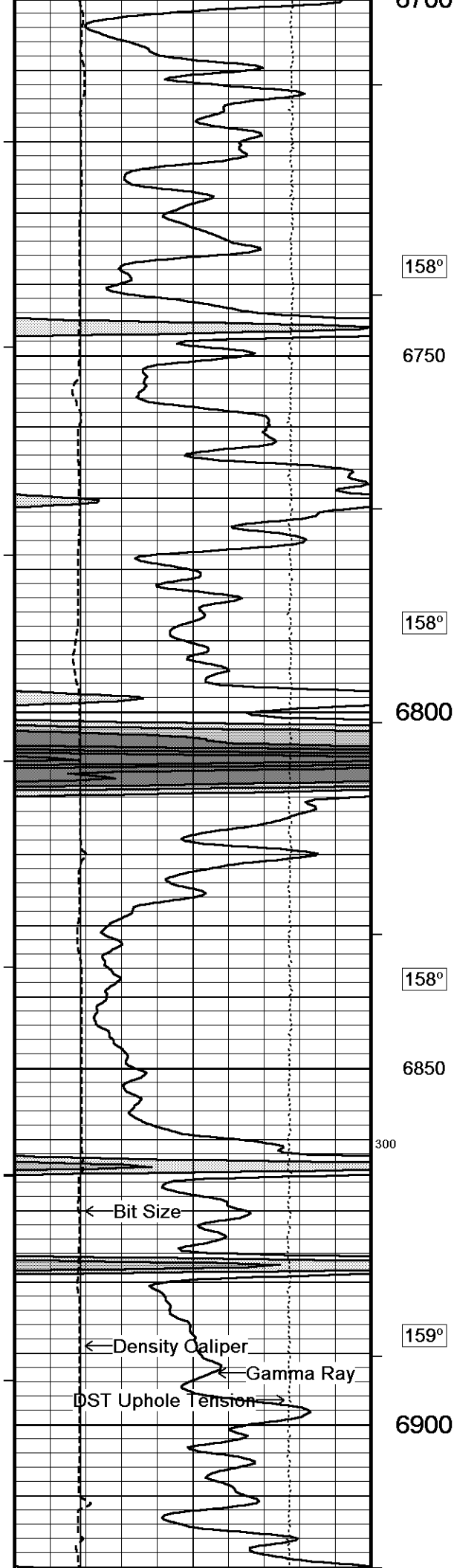
PE

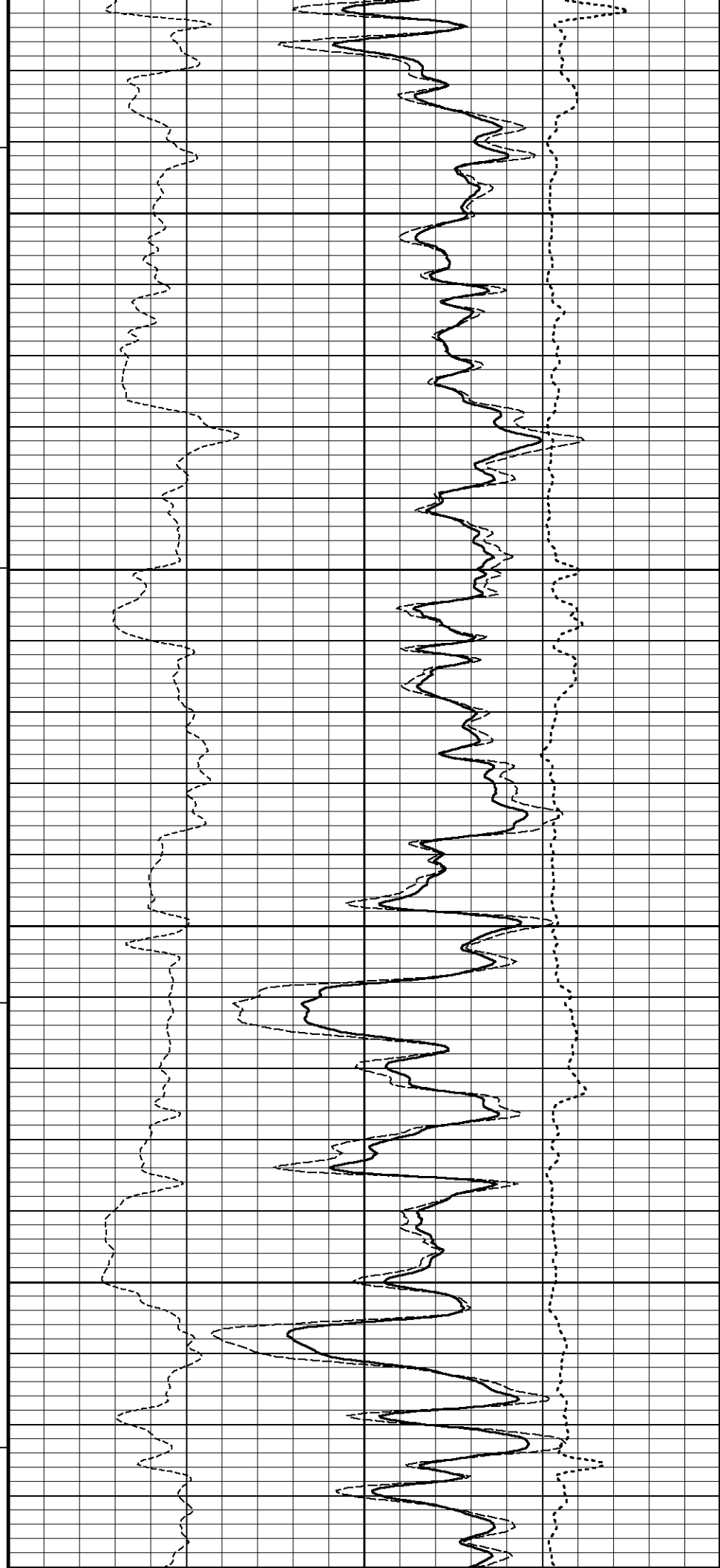
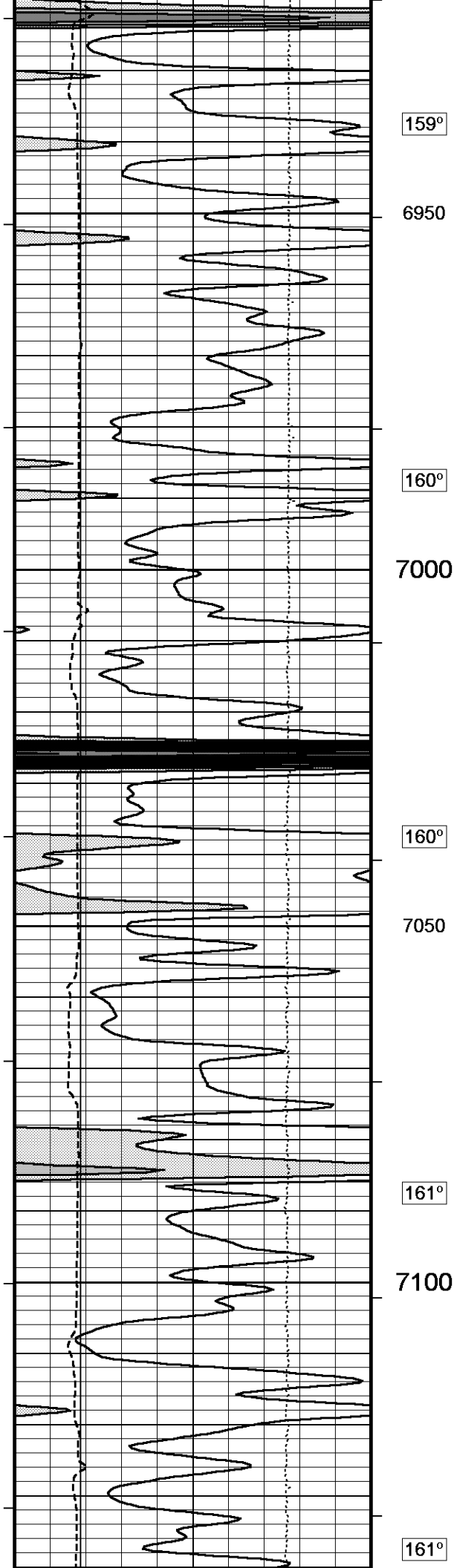
Compensated Density

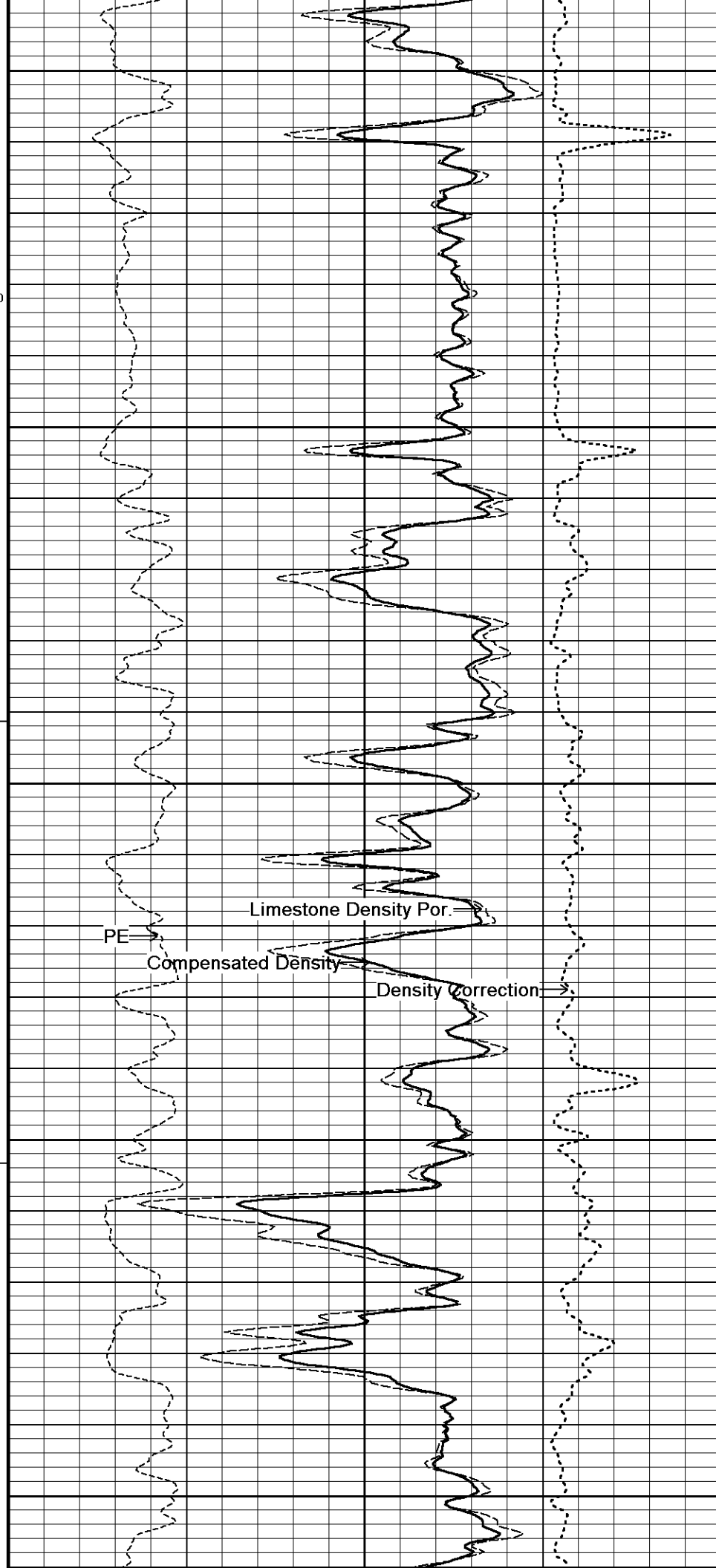
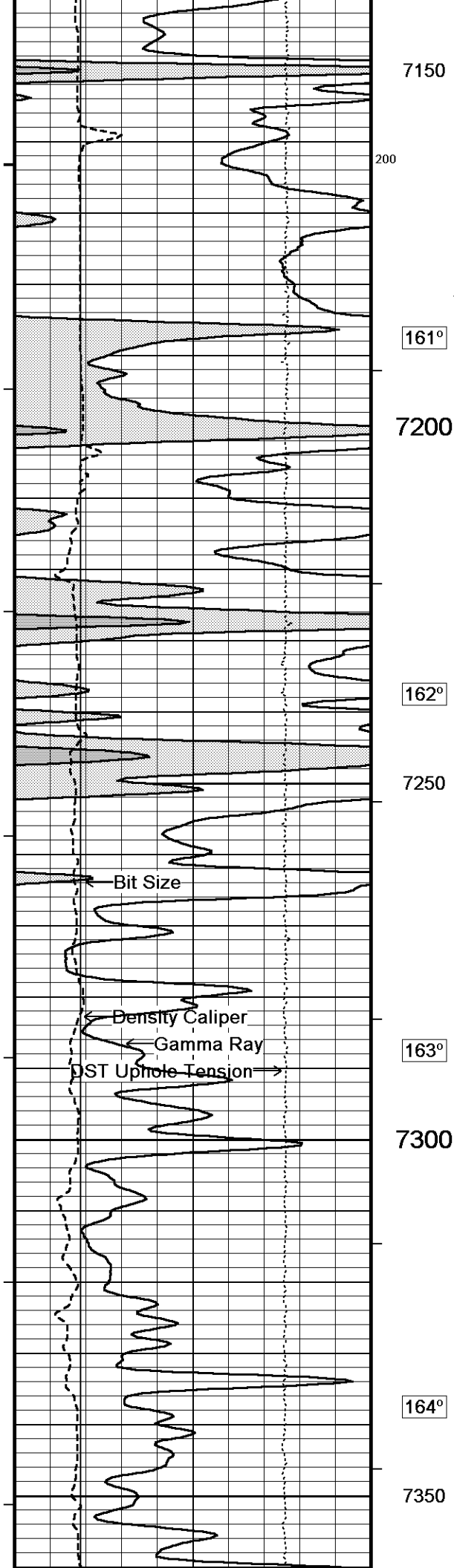
Density Correction

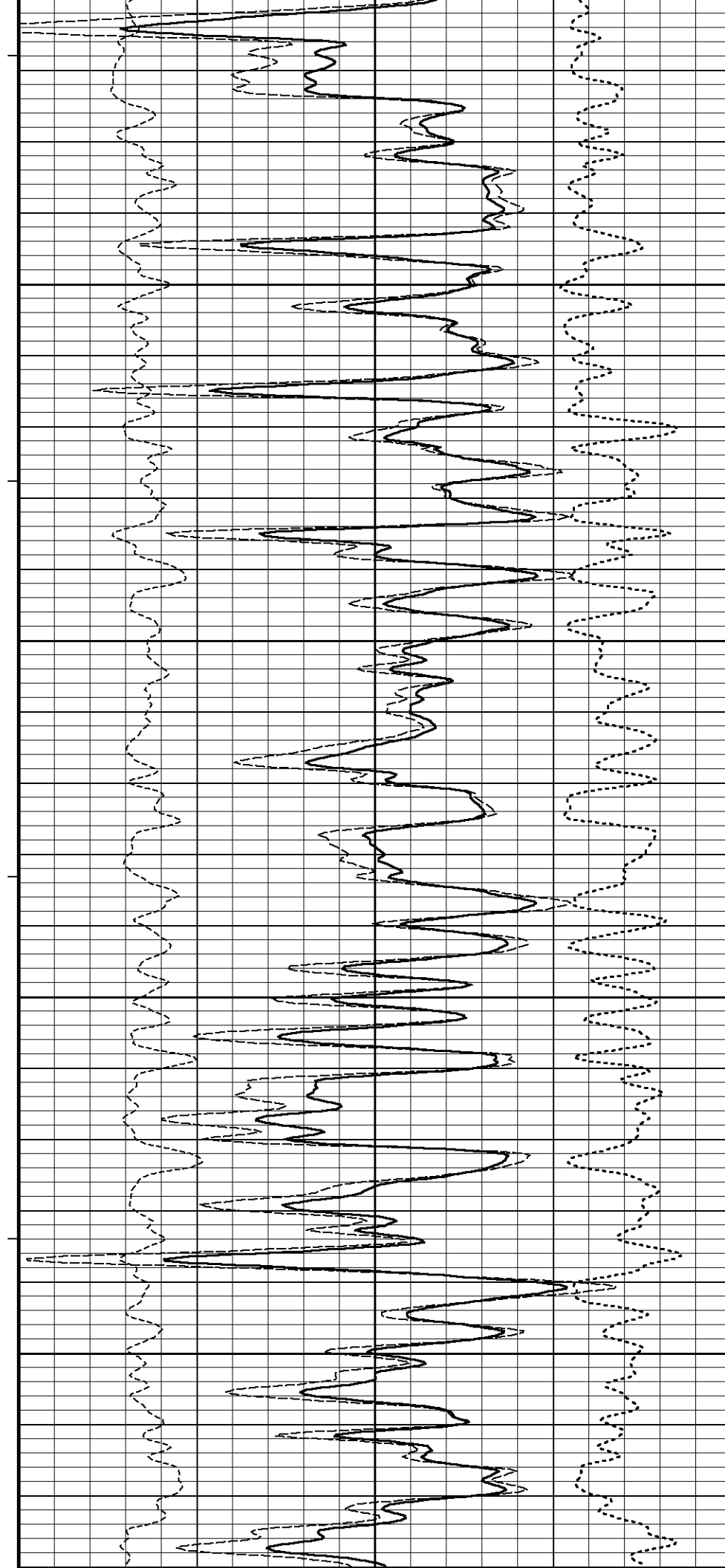
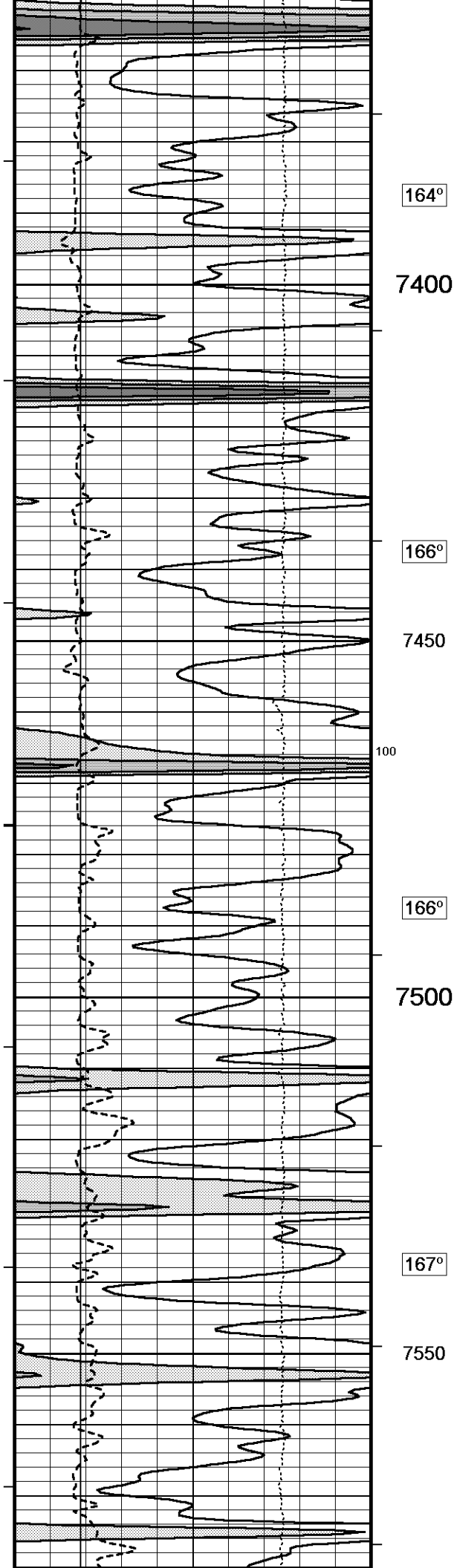


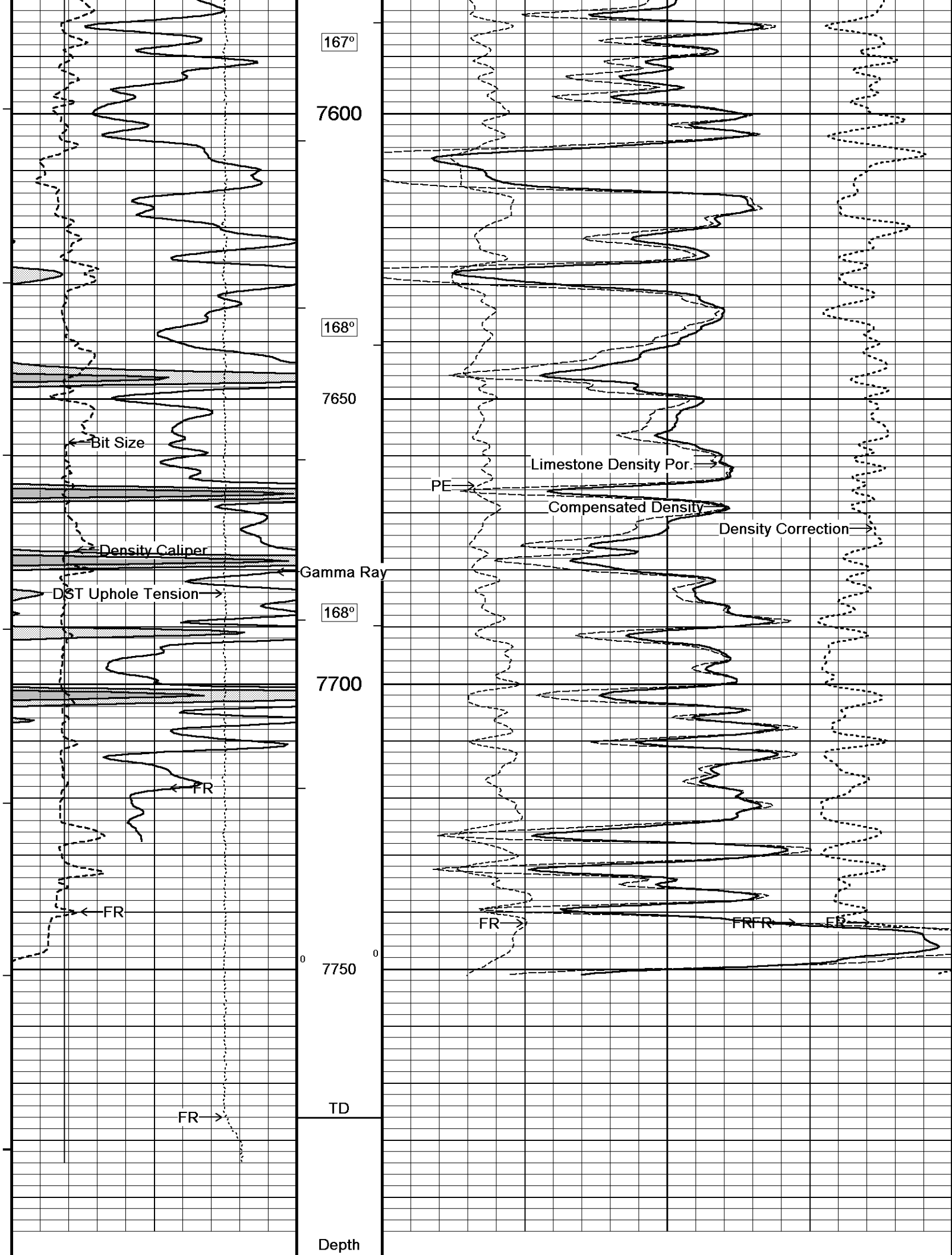


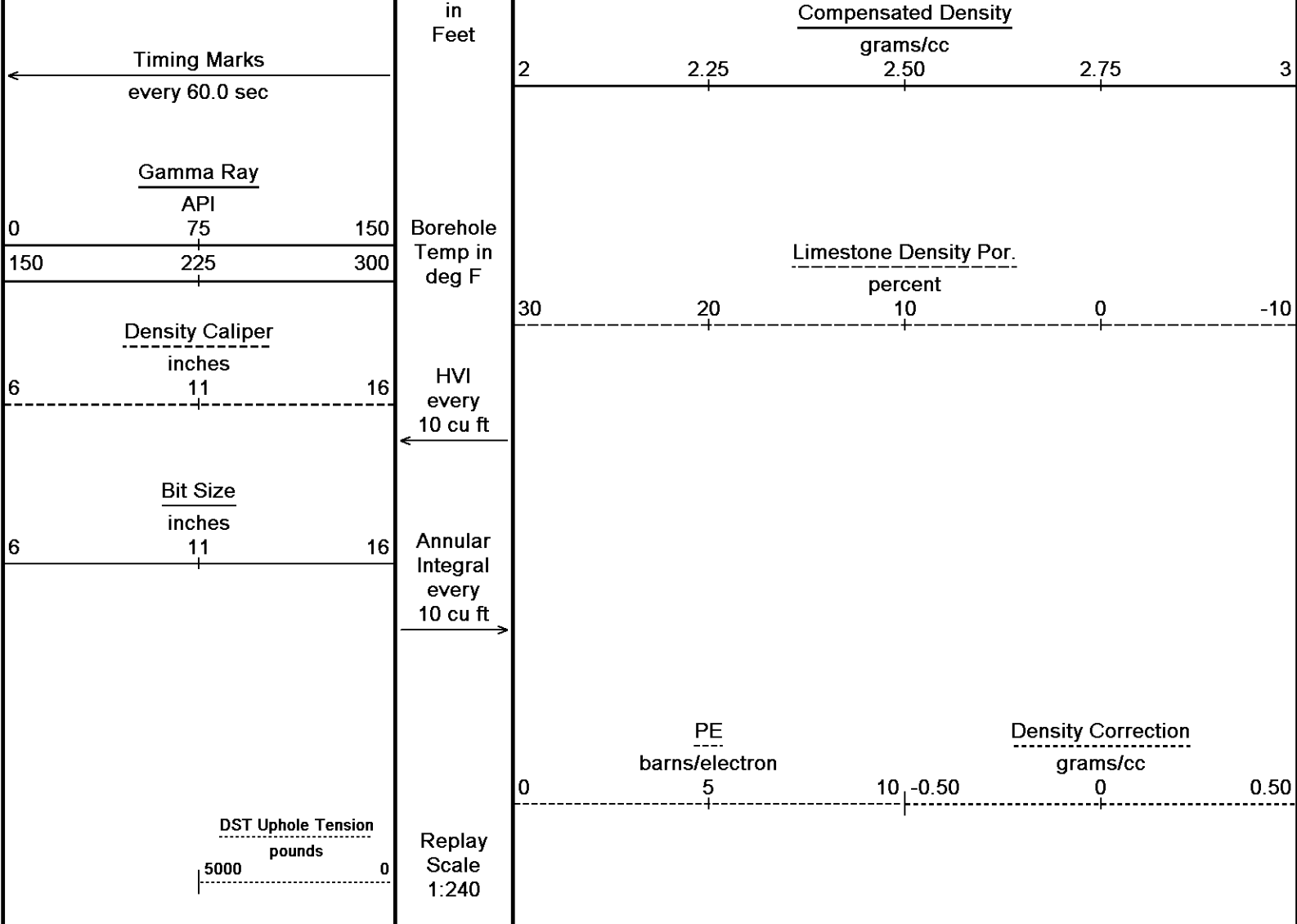












Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 08-FEB-2018 02:32

Filename: C:\Minimus 17.05.6573\Logs\Murfin Rogue #10-25\Murfin Rogue #10-25\_003.dta

Recorded on 07-FEB-2018 21:28

System Versions: Logged with 17.05.6573 Plotted with 17.05.6573

↑

5 INCH BULK DENSITY MAIN

↑

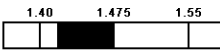
BEFORE SURVEY CALIBRATION		
C:\Minimus 17.05.6573\Logs\Murfin Rogue #10-25\Murfin Rogue #10-25_003.dta		
General Constants All 000		Last Edited on 07-FEB-2018,12:18
General Parameters		
Mud Resistivity	1.390	ohm-metres
Mud Resistivity Temperature	75.000	degrees F
Water Level	0.000	feet
Borehole Fluid 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	0.620	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

## Gamma Calibration MCG-C 123

Field Calibration on 06-FEB-2018,21:03

	Measured	Calibrated (API)
Background	90	64
Calibrator (Gross)	737	520
Calibrator (Net)	646	456

## Gamma Calibration Tolerances MCG-C 123

Ratio 1.417  Counts/API

## Gamma Constants MCG-C 123

Last Edited on 07-FEB-2018,10:21

Gamma Calibrator Number	MCGGRCC141	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

## High Resolution Temperature Calibration MCG-C 123

Field Calibration on 22-JAN-2018,19:40

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

## High Resolution Temperature Constants MCG-C 123

Last Edited on 22-SEP-2015,11:43

Pre-filter Length 11

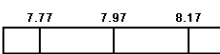
## Caliper Calibration MPD-C.A 271

Base Calibration on 22-JAN-2018 20:14

Field Calibration on 06-FEB-2018 20:57

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13926	3.99
2	23856	5.98
3	33858	7.97
4	43568	9.86
5	54687	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	7.97	7.97

## Caliper Calibration Tolerances MPD-C.A 271

Short Arm Field Cal. 7.97  in

## Photo Density Calibration MPD-C.A 271

Base Calibration on 22-JAN-2018 20:44

Field Check on 06-FEB-2018 21:01

Density Calibration				
Base Calibration				
	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1069	1236		
Reference 1	48678	24228	59556	30836
Reference 2	19639	2320	24941	2541
Field Check at Base				
	1068.7	1236.1		
Field Check				
	1075.6	1236.6		

## PE Calibration

Base Calibration				
	WS	Measured	WH	Calibrated
		Ratio		Ratio
Background	194	963		
Reference 1	18395	48520	0.383	0.371
Reference 2	5319	19524	0.276	0.272

Field Check at Base

193.9


963.3


Field Check

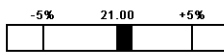
192.8

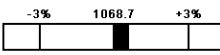
970.4

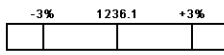
## Photo Density Calibration Tolerances MPD-C.A 271

Near Density Ratio 2.56 

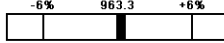
PE Calibration 0.098 

Far Density Ratio 21.22 

Near Den. Field Check 1075.6 

Far Den. Field Check 1236.6 

PE WS Field Check 192.8 

PE WH Field Check 970.4 

## Density Constants MPD-C.A 271

Last Edited on 07-FEB-2018,10:21

Density Source Id P50557B  
 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 1.10 gm/cc  
 Mud Density Type  
 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  
 Precision Enhanced Density Processing Not Applied

Matrixdensity(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	0.00

## DOWNHOLE EQUIPMENT

C:\Minimus 17.05.6573\Logs\Murfin Rogue #10-25\Murfin Rogue #10-25\_003.dta

Cablehead, 11 pin  
 CBH-C 0 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

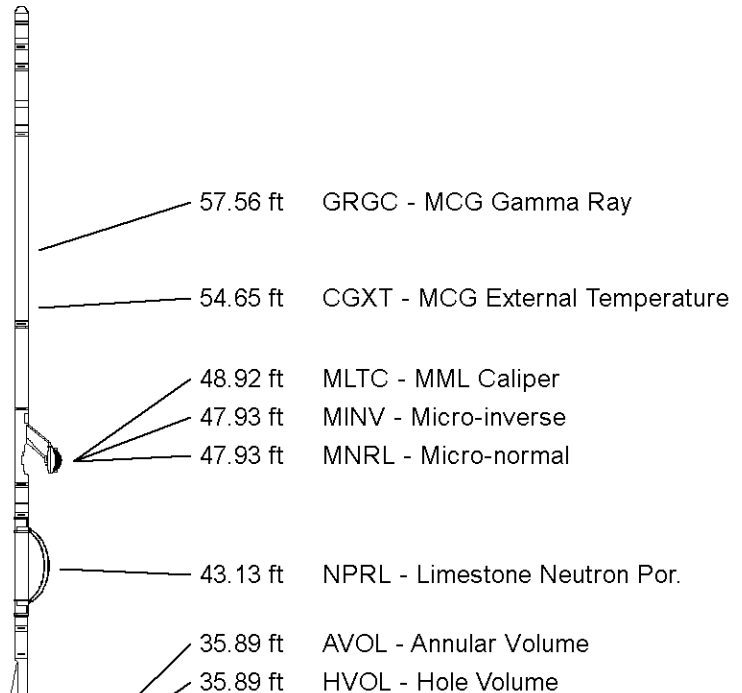
Compact Swivel Head Adaptor  
 SHA-F 48 LG: 2.74 ft WT: 26.5 lb OD: 2.244 in

Compact Comms Gamma  
 MCG-C 123 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-log  
 MML-A 2 LG: 7.97 ft WT: 81.6 lb OD: 2.244 in

Compact Neutron  
 MDN-A.B 114 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper  
 MPD-C.A 271 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in



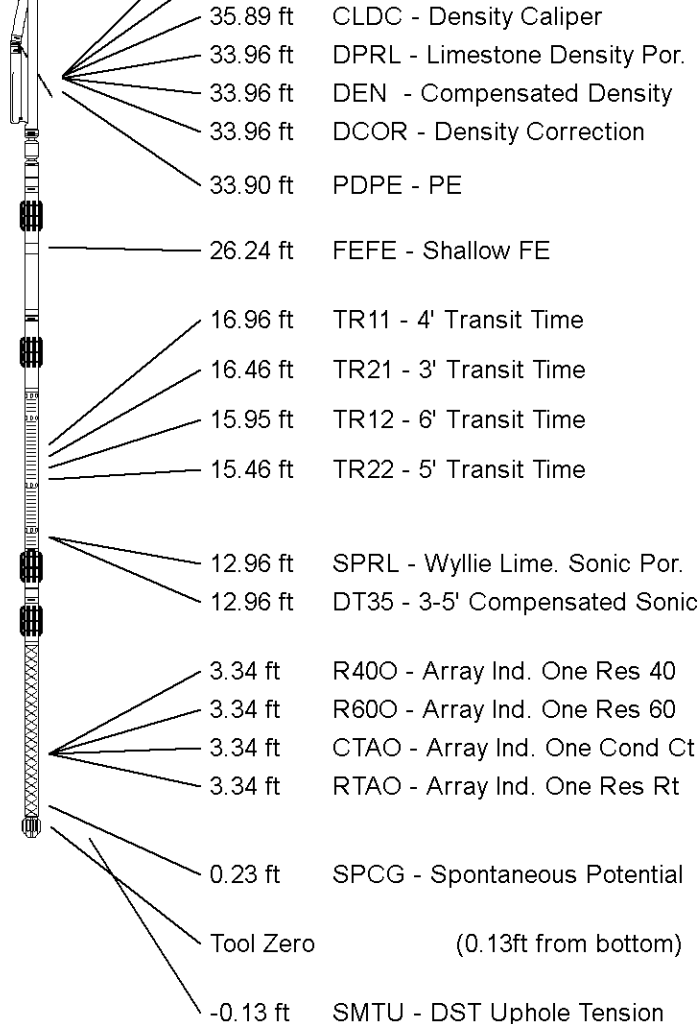
Compact Knuckle Joint  
SKJ-E.B 732 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Focussed Electric  
MFE-A.A 135 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 45 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 67.98 ft Weight: 531.3 lb



All measurements relative to tool zero.

COMPANY	MURFIN DRILLING COMPANY INC.
WELL	ROGUE #10-25
FIELD	WILDCAT
PROVINCE/COUNTY	LINCOLN
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	5316	feet	First Reading	7742.00	feet
Elevation Drill Floor	5314	feet	Depth Driller	8187.00	feet
Elevation Ground Level	5303	feet	Depth Logger	7776.00	feet



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COMPACT PHOTO DENSITY  
COMPENSATED NEUTRON  
MICRORESISTIVITY LOG