



Weatherford

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY		O'BRIEN ENERGY RESOURCES CORP.	
WELL		CLAYTON #2-28	
FIELD		SINGLEY	
PROVINCE/COUNTY		MEADE	
COUNTRY/STATE		U.S.A. / KANSAS	
LOCATION		335' FSL & 2281' FWL	
SEC	TWP	RGE	Other Services
28	33S	29W	MAI/MFE
API Number		15-119-21346	
Permit Number			
Permanent Datum GL, Elevation 2591 feet			Elevations:
Log Measured From KB			KB 2602.00
Drilling Measured From KB			DF 2601.00
			GL 2591.00
Date	25-JUL-2013		
Run Number	ONE		
Service Order	3539951		
Depth Driller	6400.00		feet
Depth Logger	6395.00		feet
First Reading	6376.00		feet
Last Reading	4000.00		feet
Casing Driller	1451.00		feet
Casing Logger	1448.00		feet
Bit Size	7.875		inches
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.30 lb/USg		60.00 CP
PH / Fluid Loss	9.50		8.40 ml/30Min
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.81 @ 99.0		ohm-m
Rmf @ Measured Temp	0.65 @ 99.0		ohm-m
Rmc @ Measured Temp	0.97 @ 99.0		ohm-m
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.59 @136.0		ohm-m
Time Since Circulation	6 HOURS		
Max Recorded Temp	136.00		deg F
Equipment / Base	13096	LIB	
Recorded By	ADAM SILL		
Witnessed By	ROGER PEARSON		PETER DEBENHAM
JOB #	LB13-211		

BOREHOLE RECORD				Last Edited: 25-JUL-2013 02:08
Bit Size inches		Depth From feet		Depth To feet
7.875		1451.00		6400.00
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	1451.00	24.00

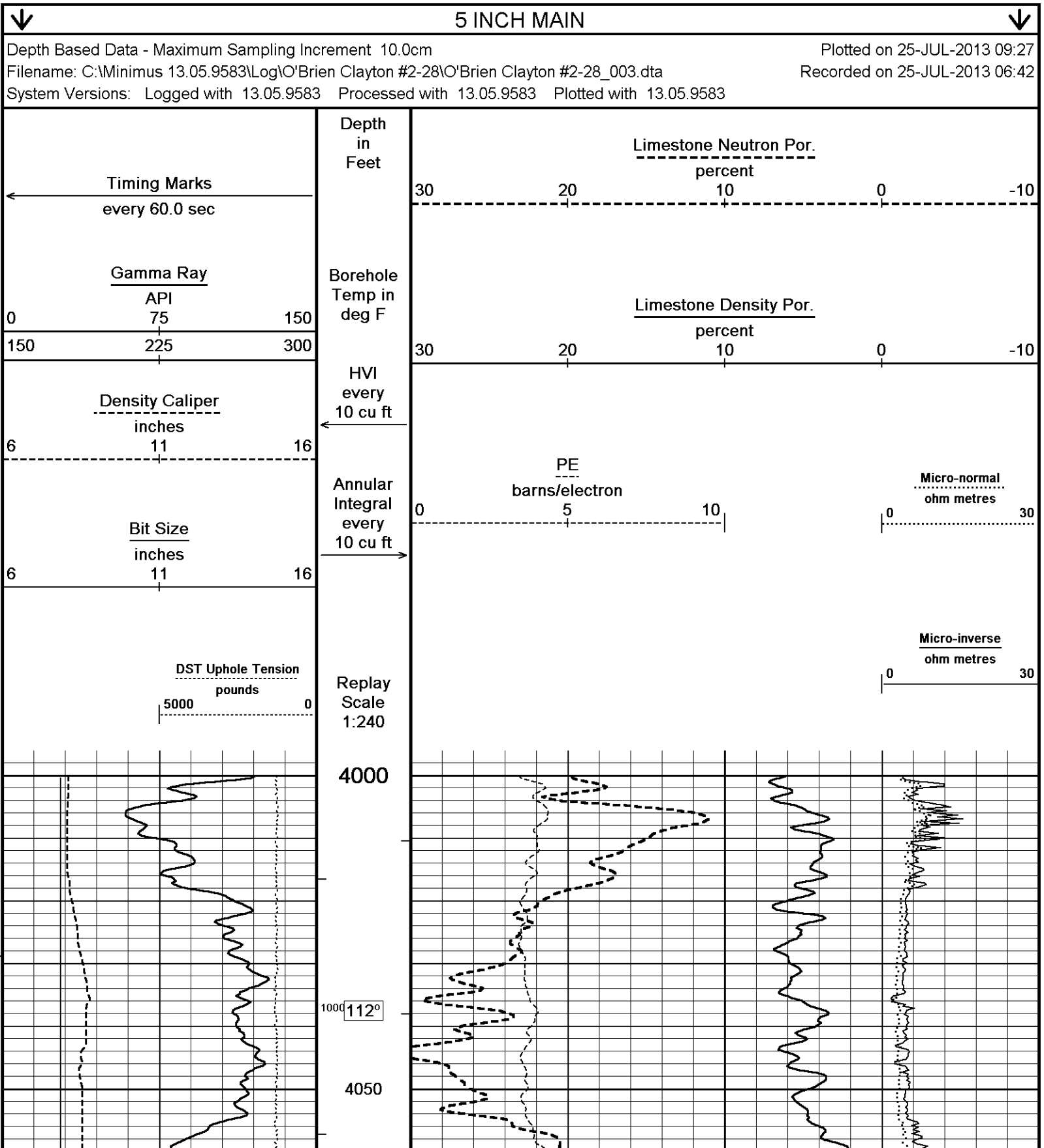
REMARKS
- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 2390 CU. FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH CASING FROM TD TO 4000 FEET: 755 CU. FT.
- RIG: DUKE #6

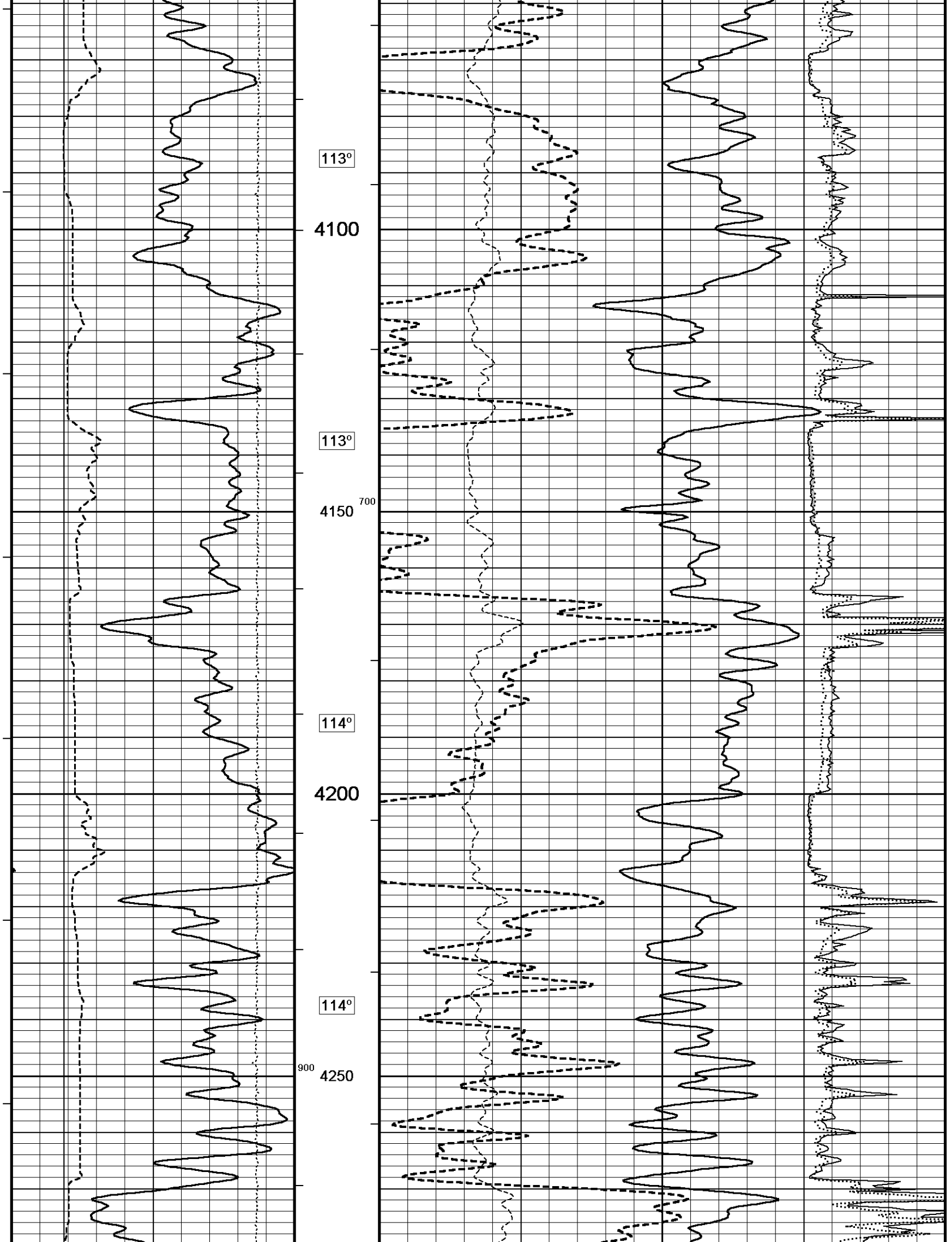
LOG: DORE.WC.

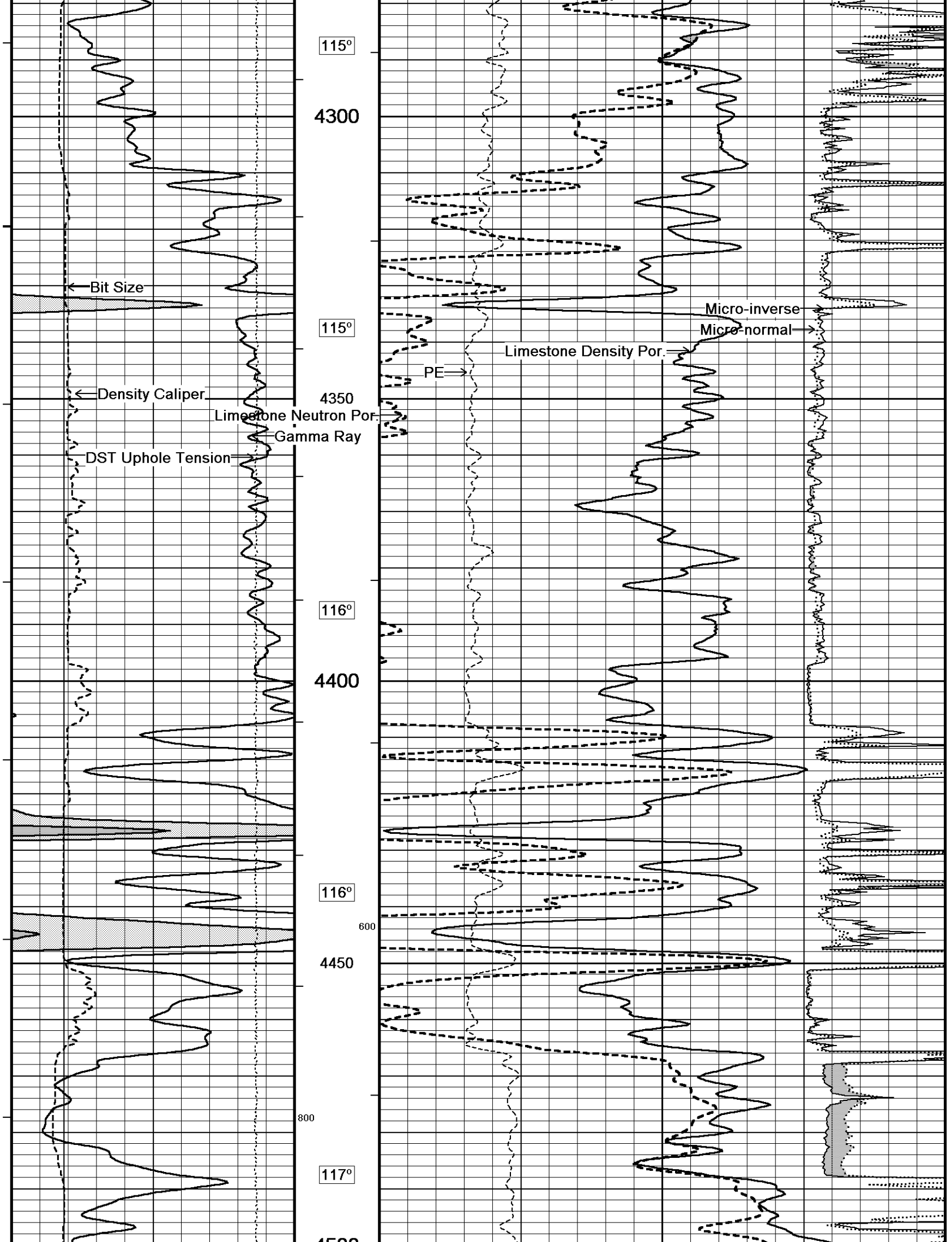
- ENGINEER: A. SILL.

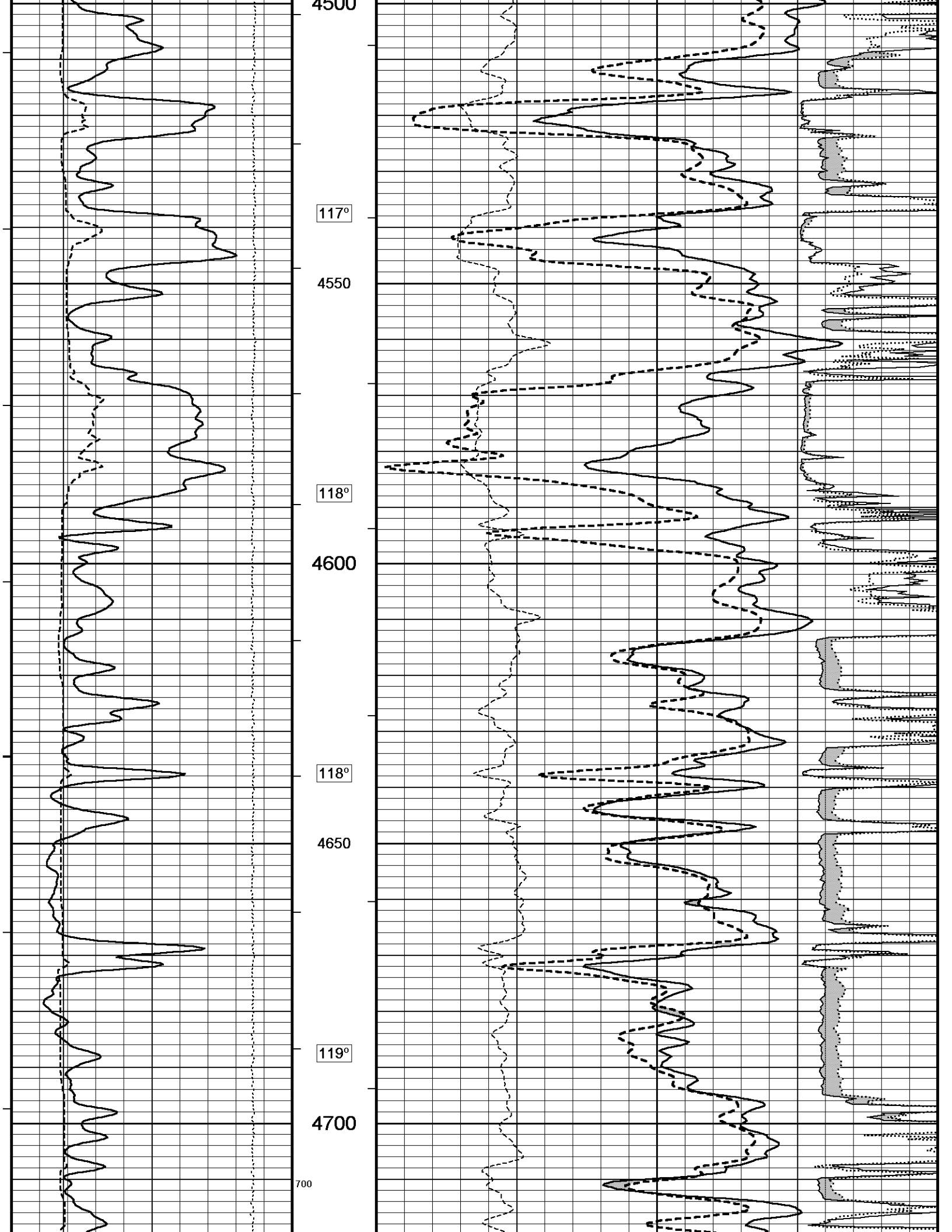
- OPERATOR(S): N. ADAME.

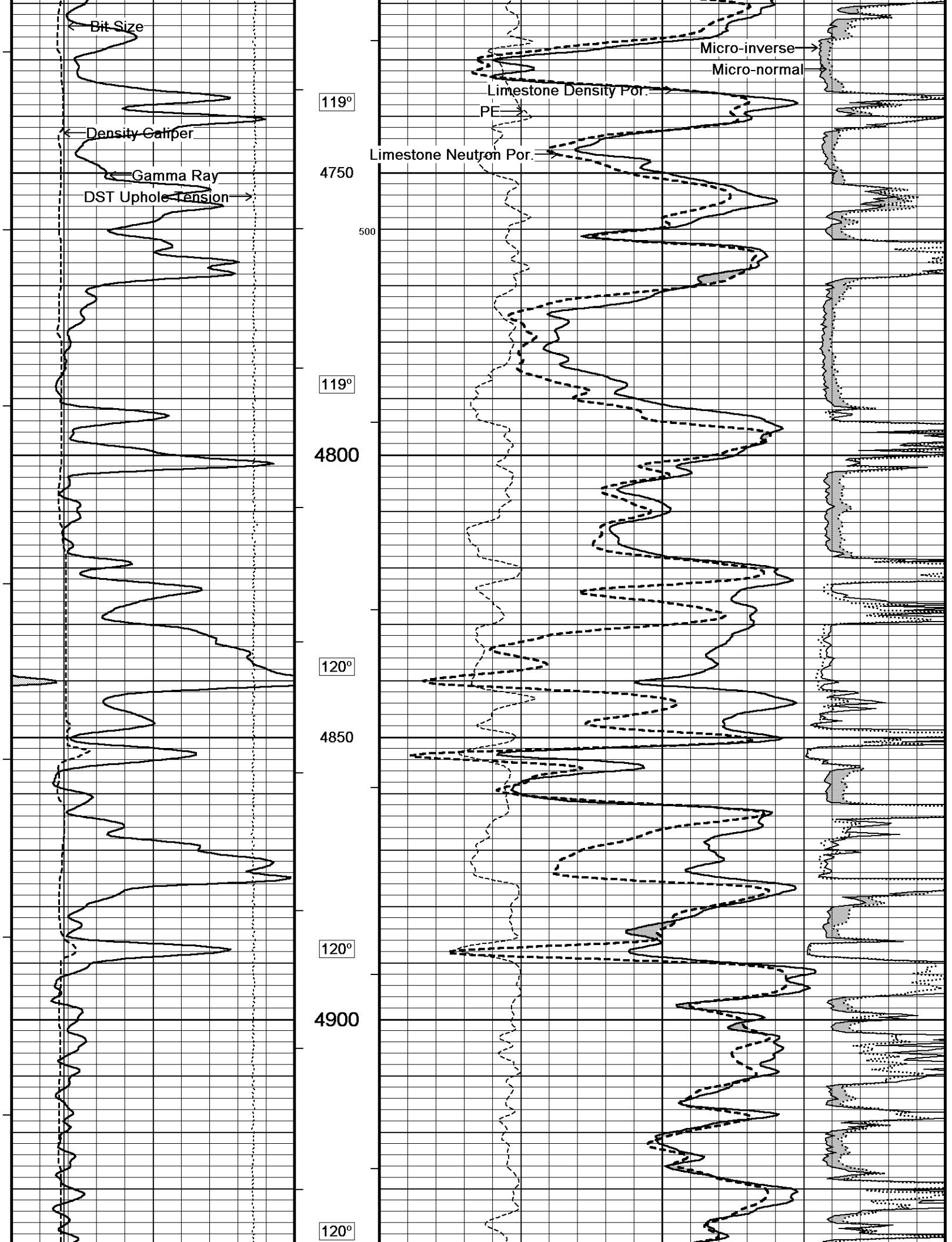
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, 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.

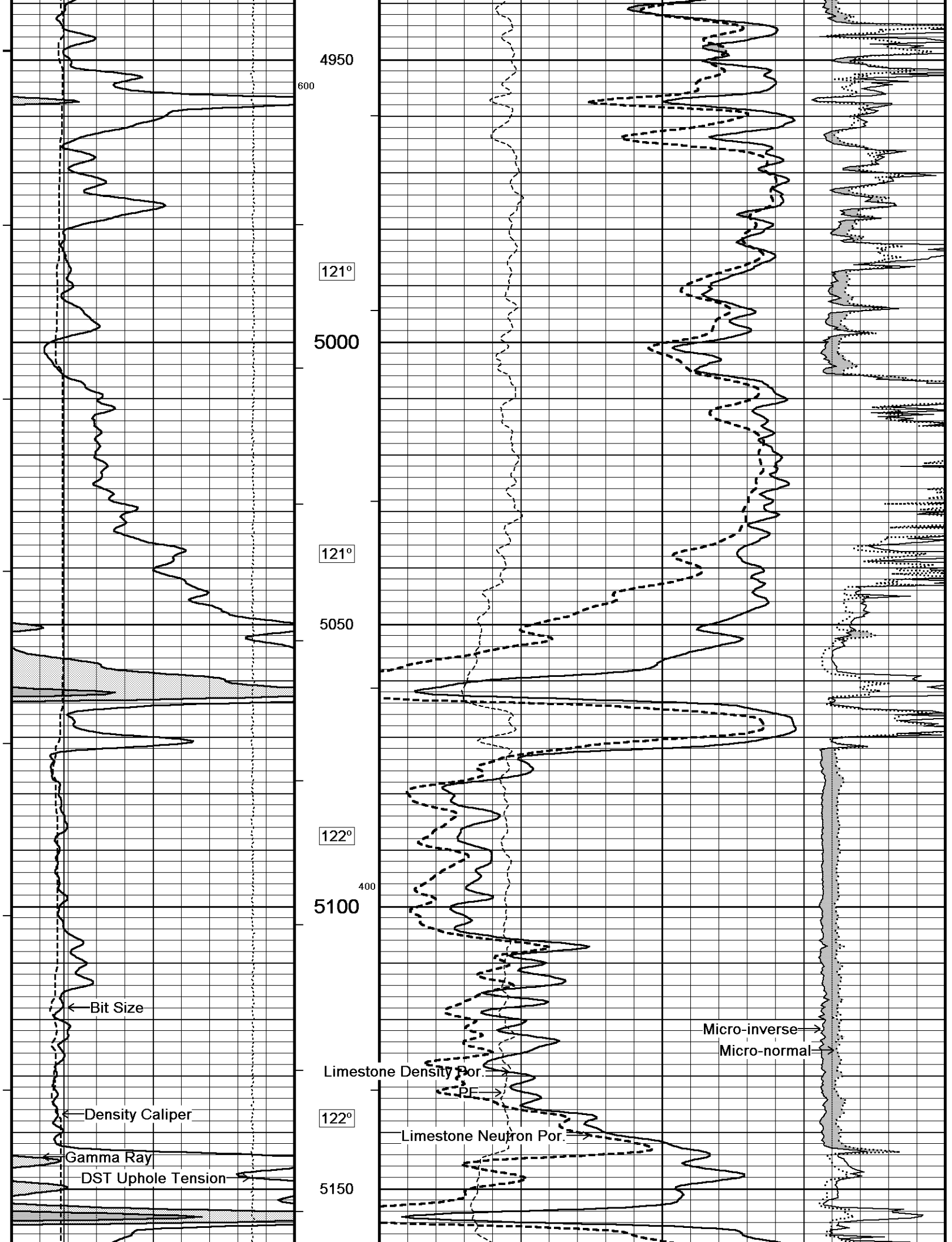


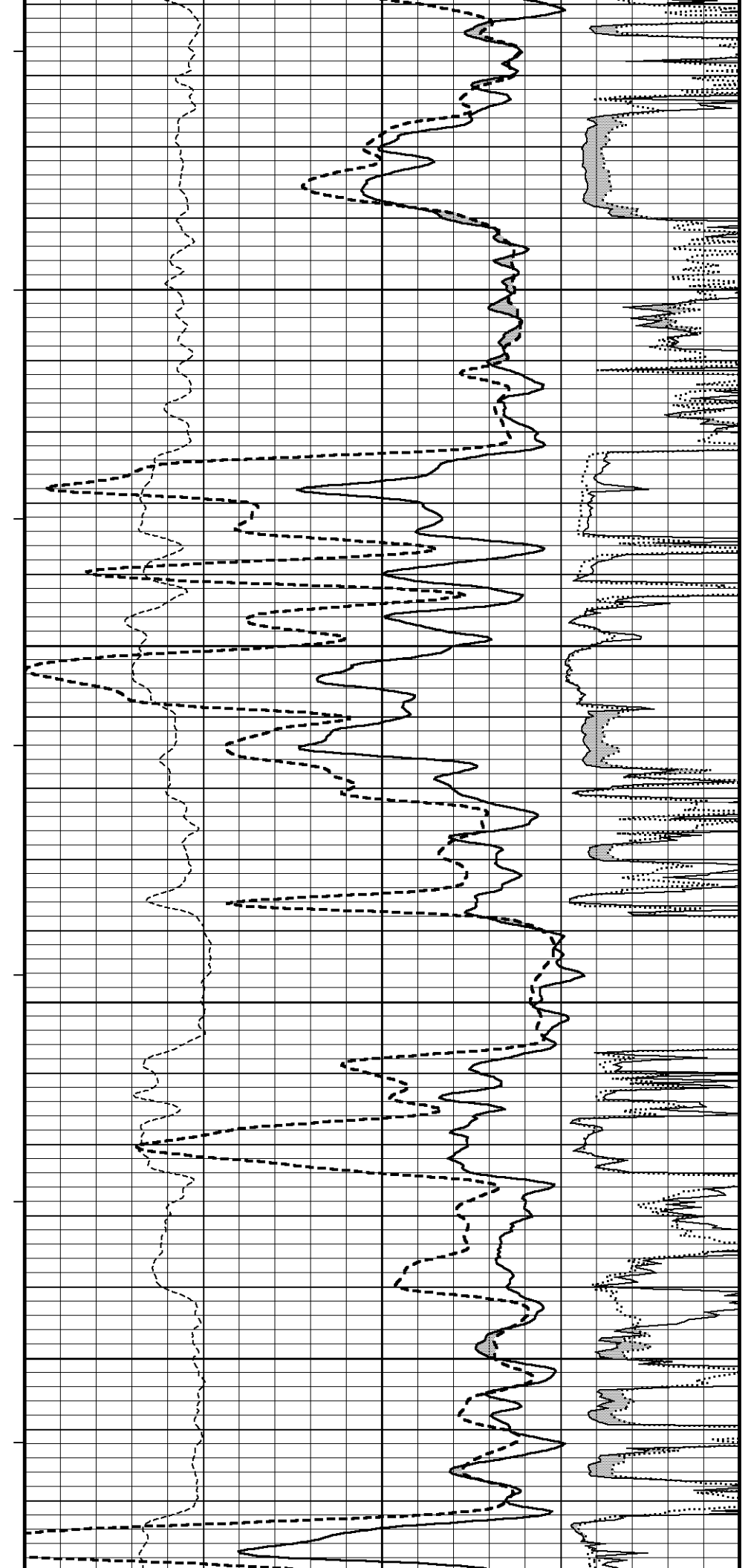
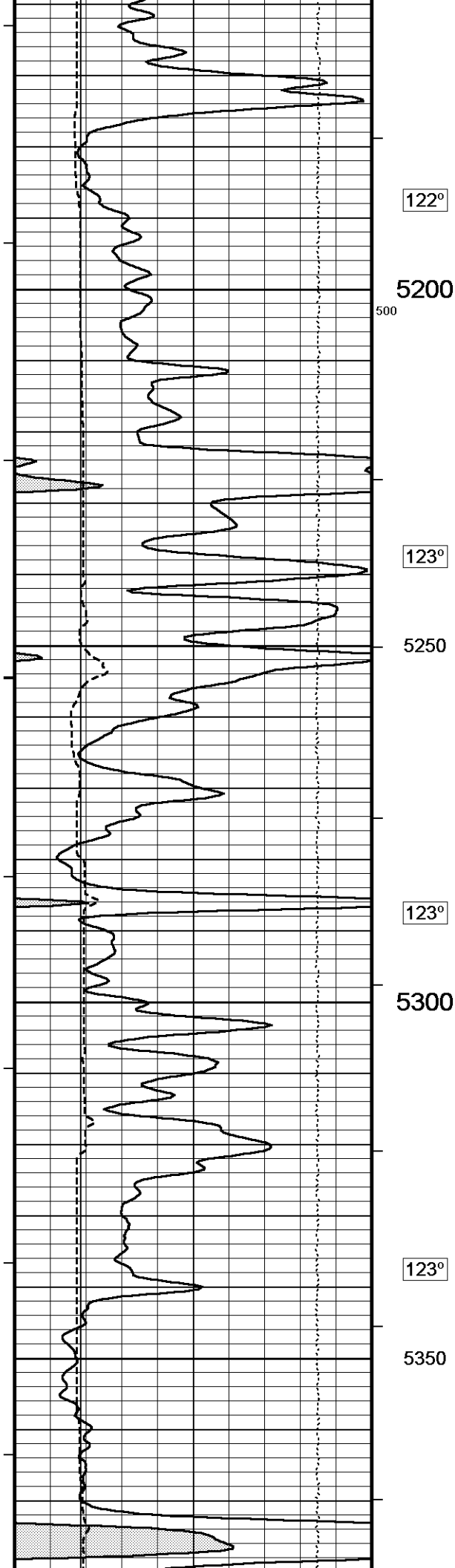


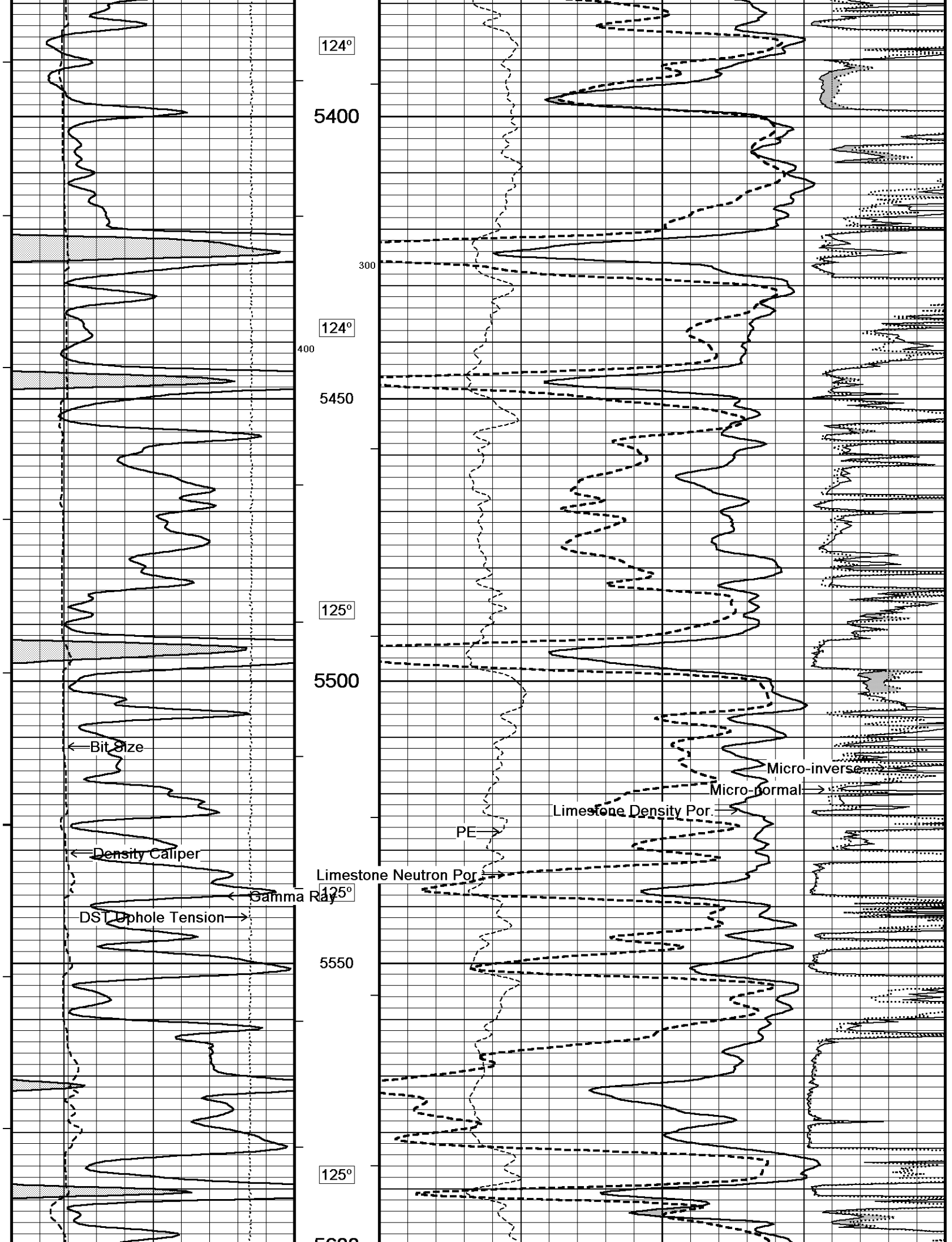


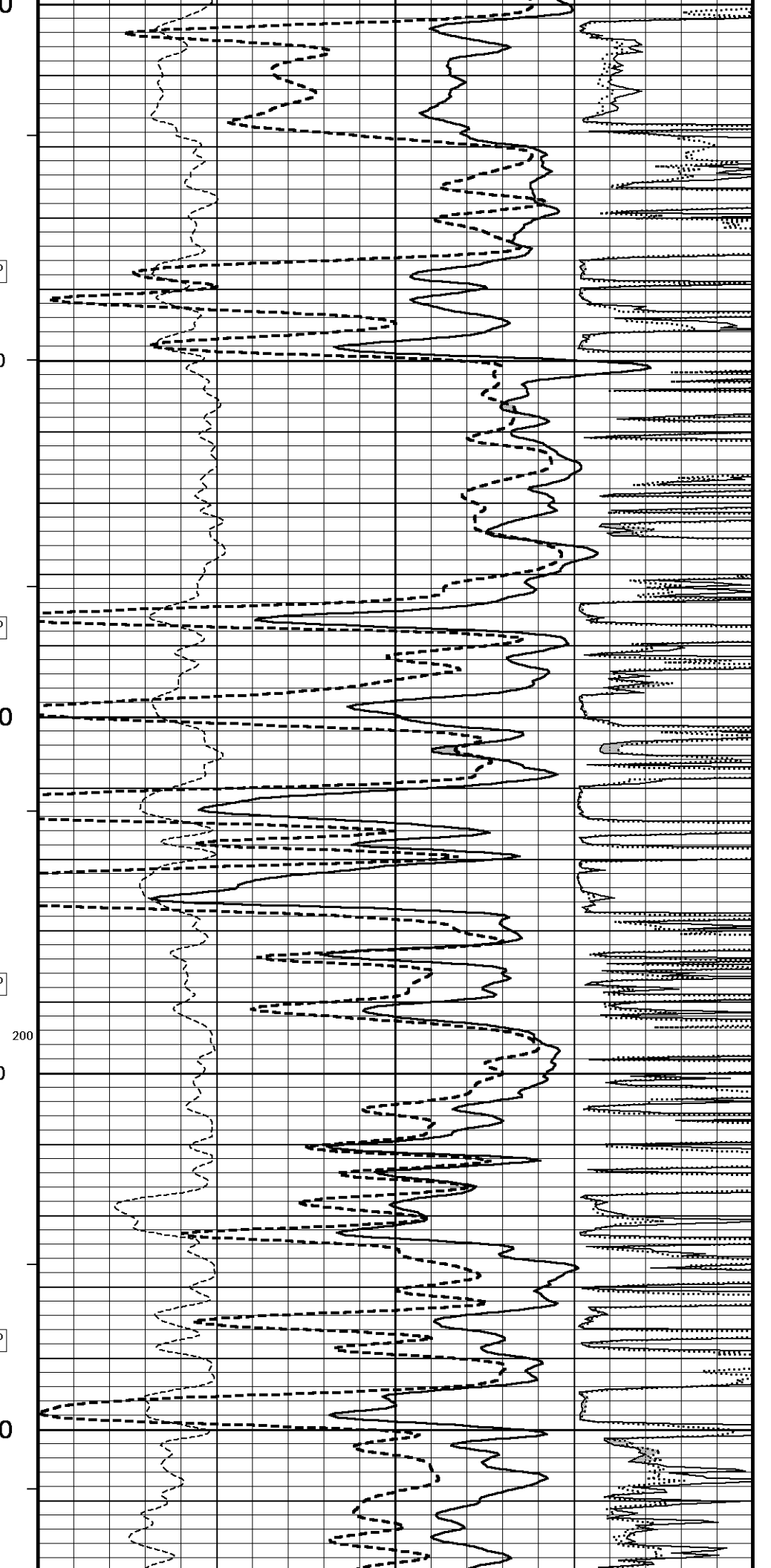
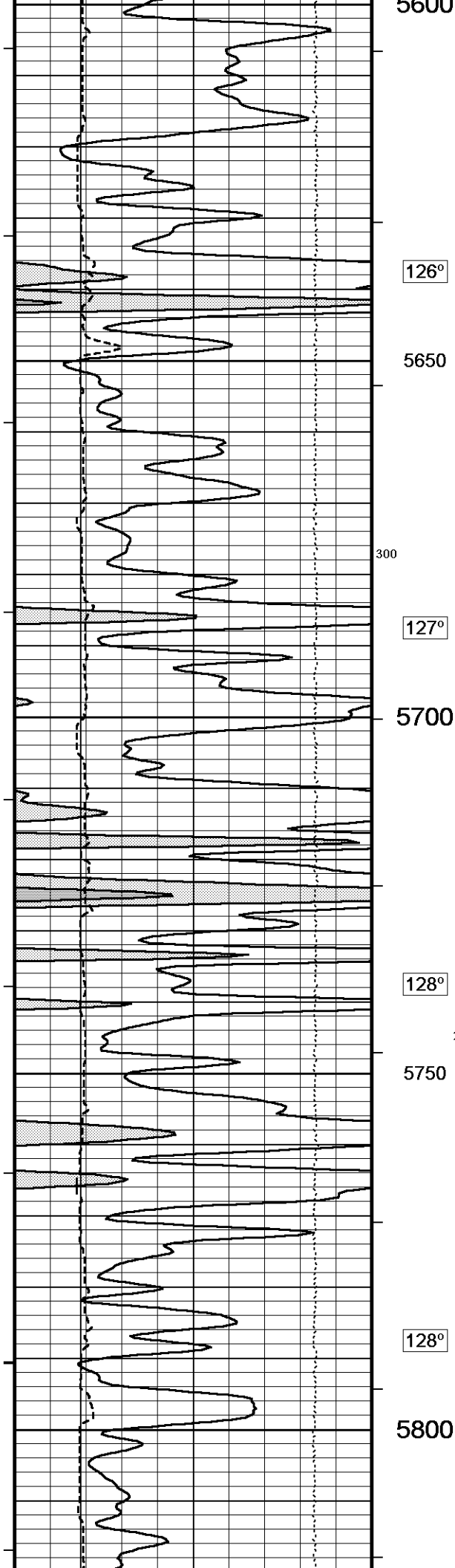


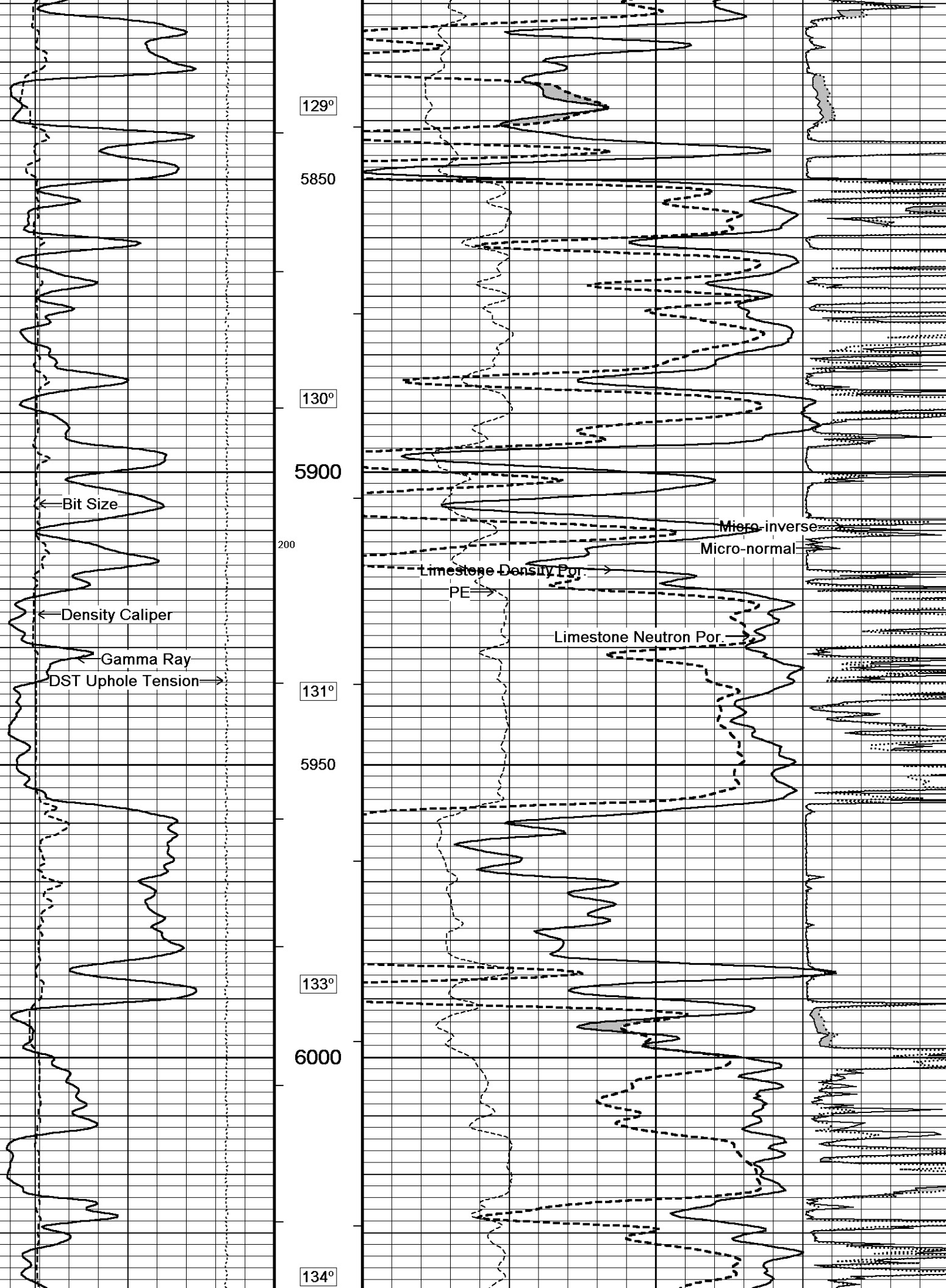


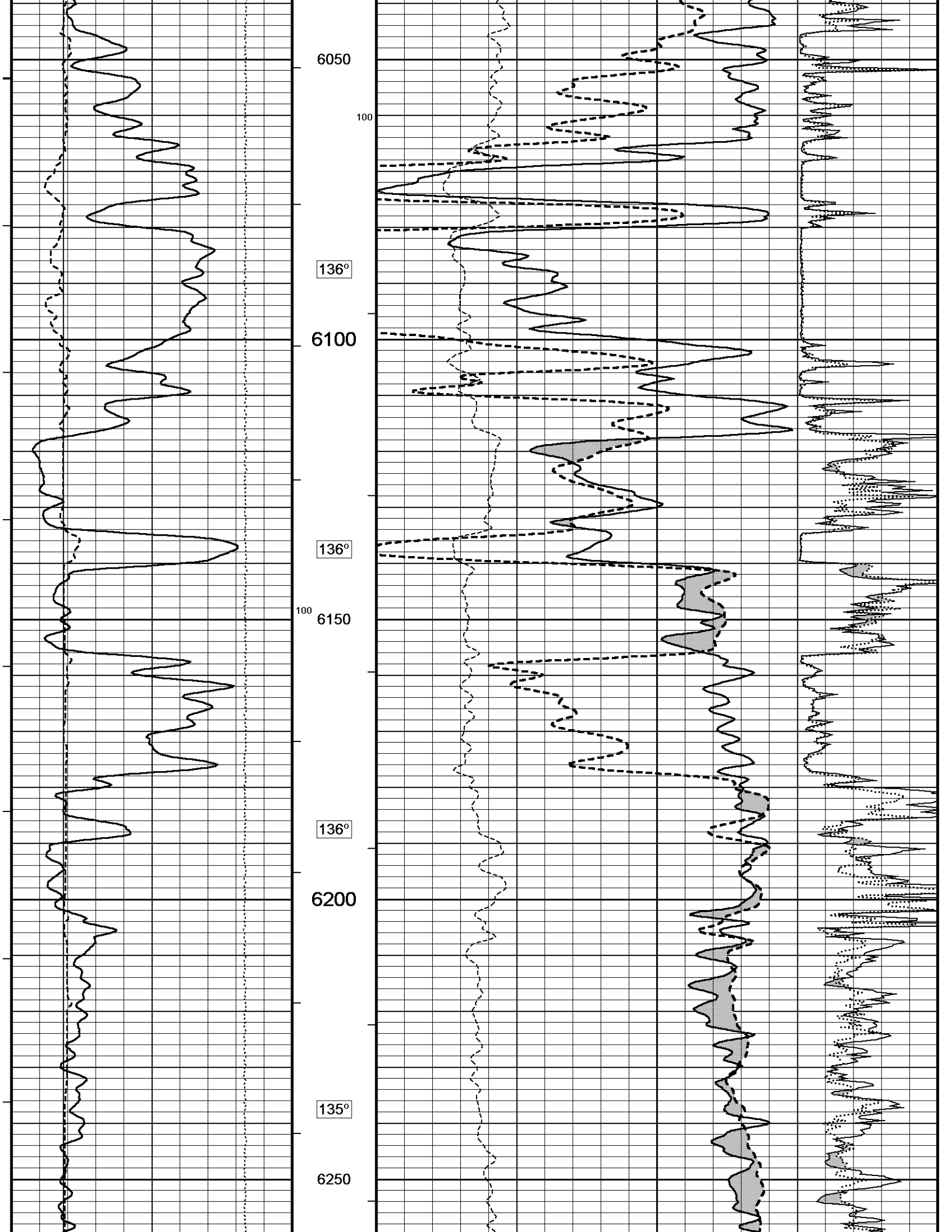


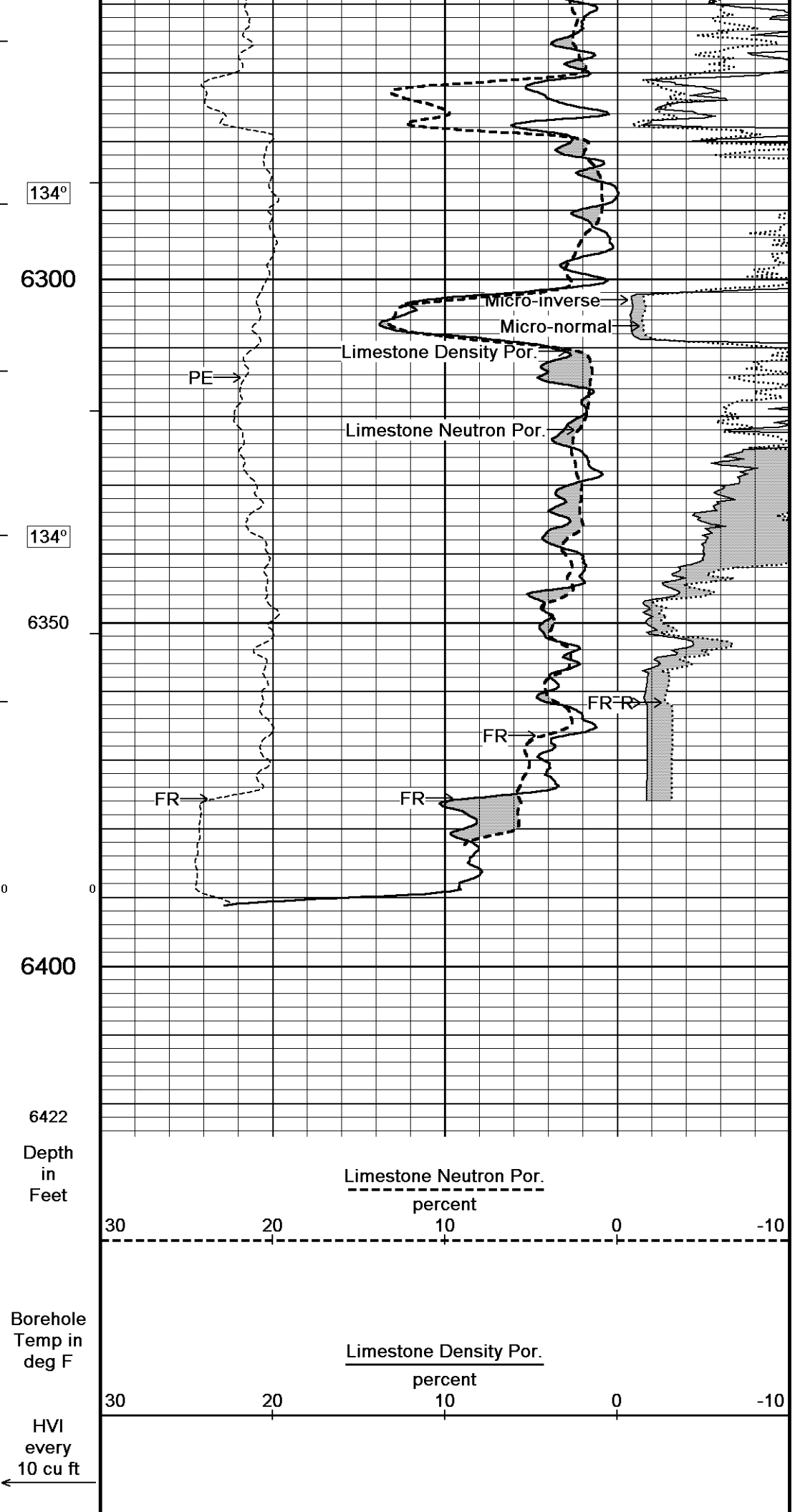
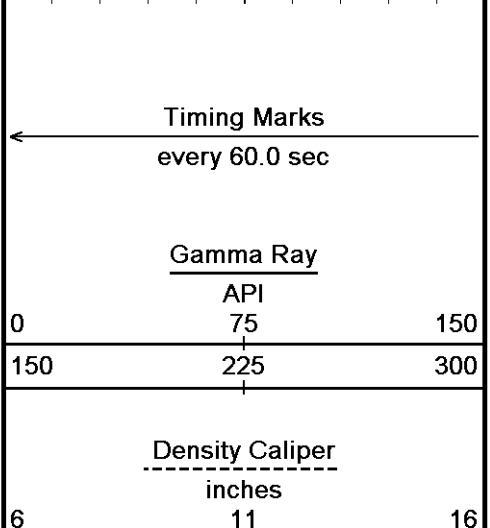
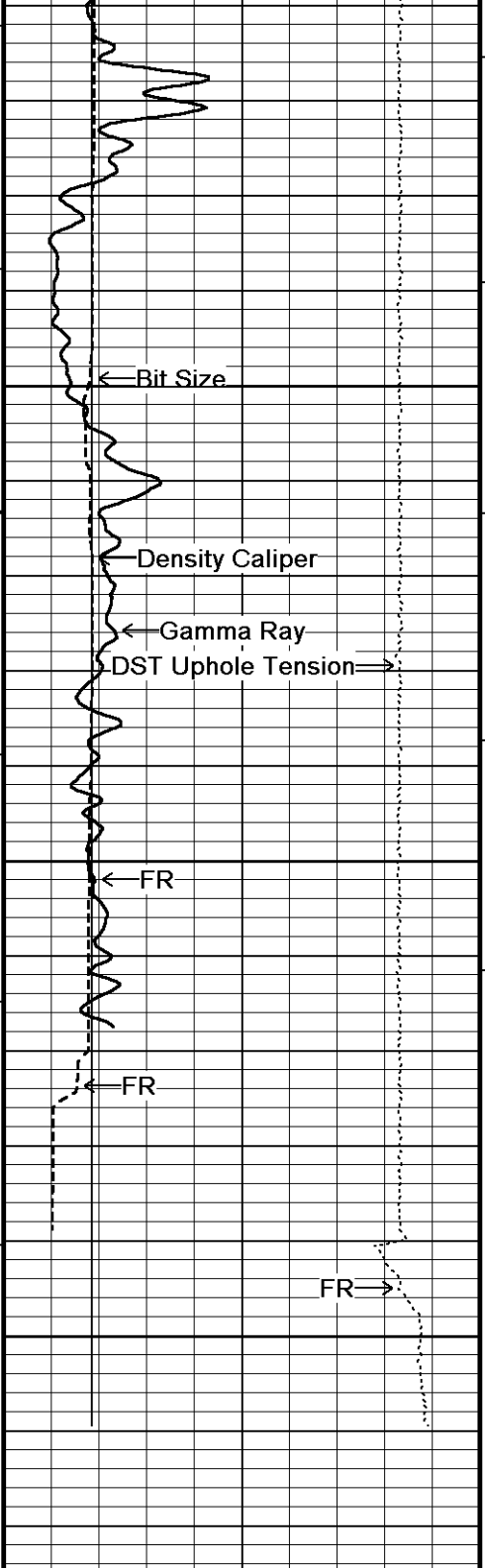


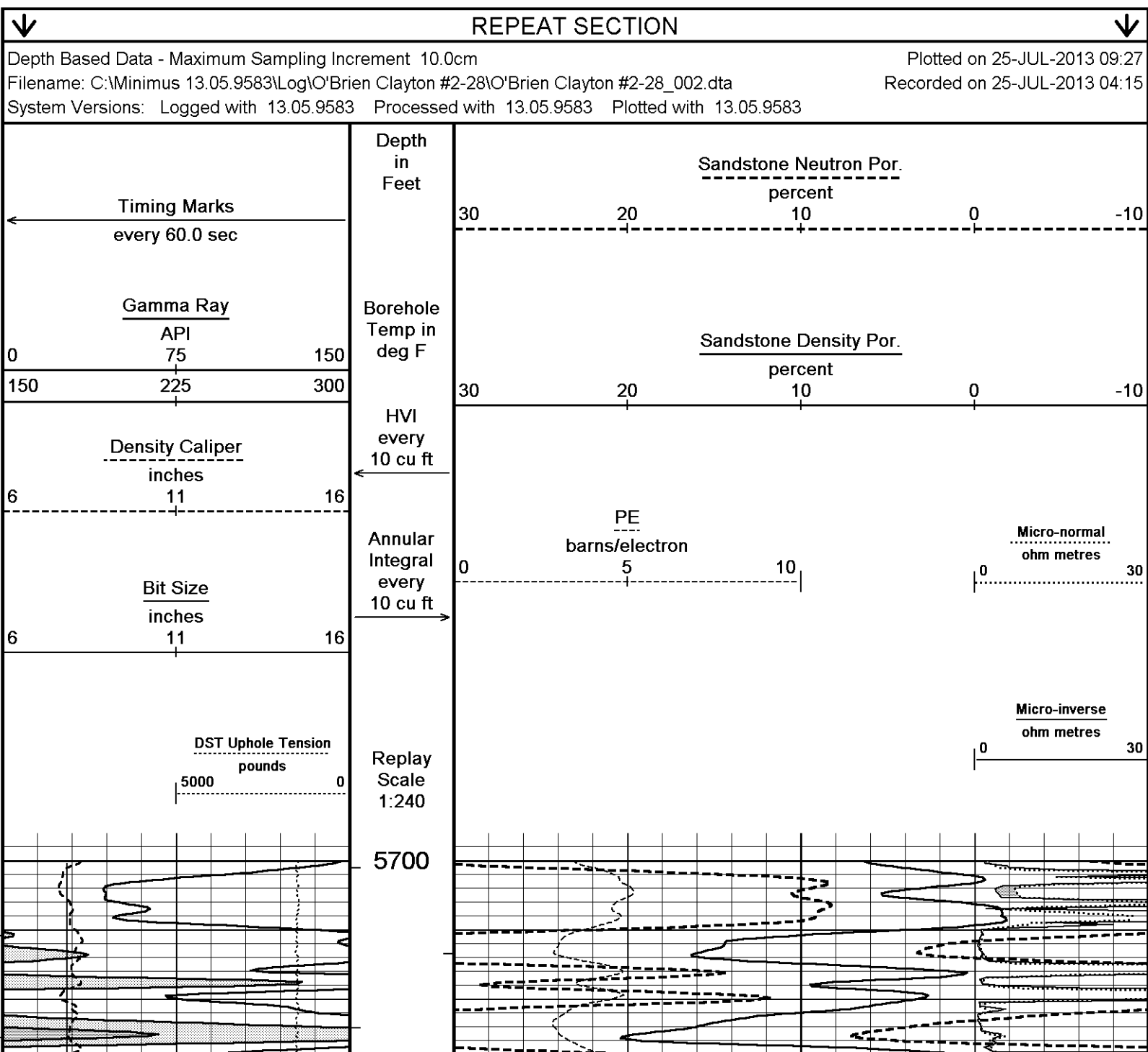
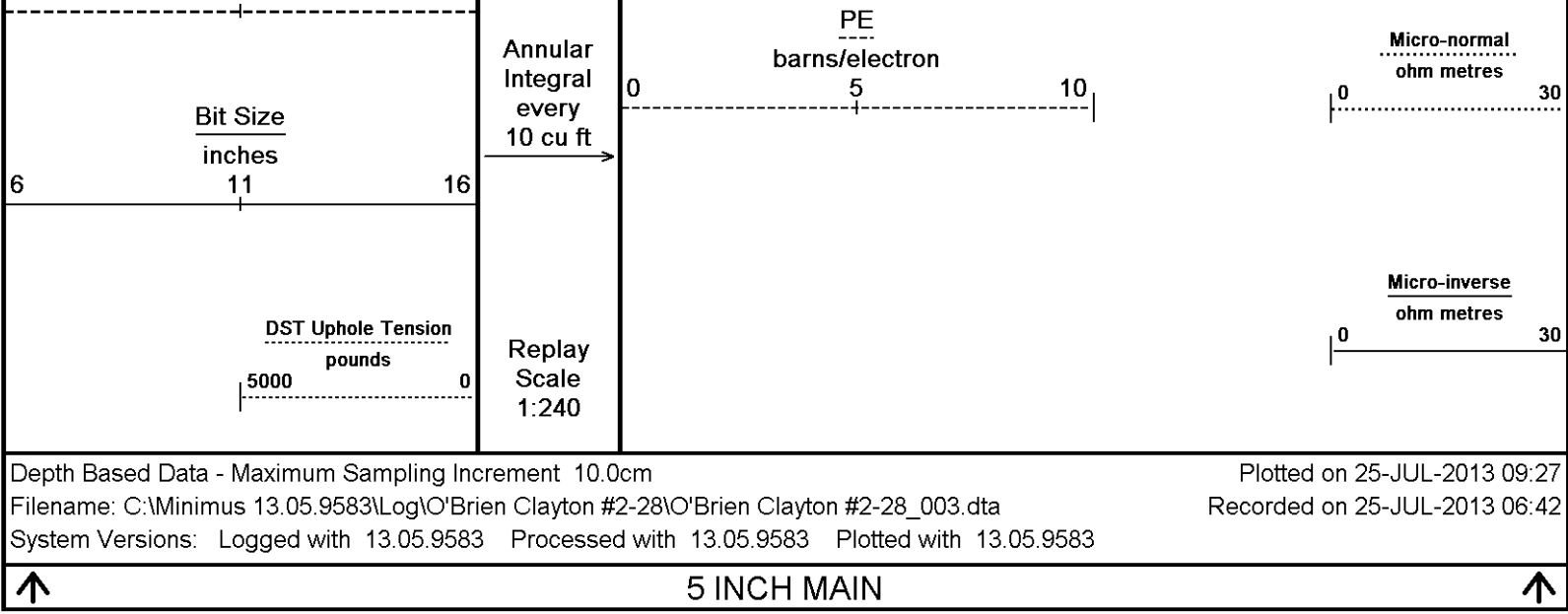


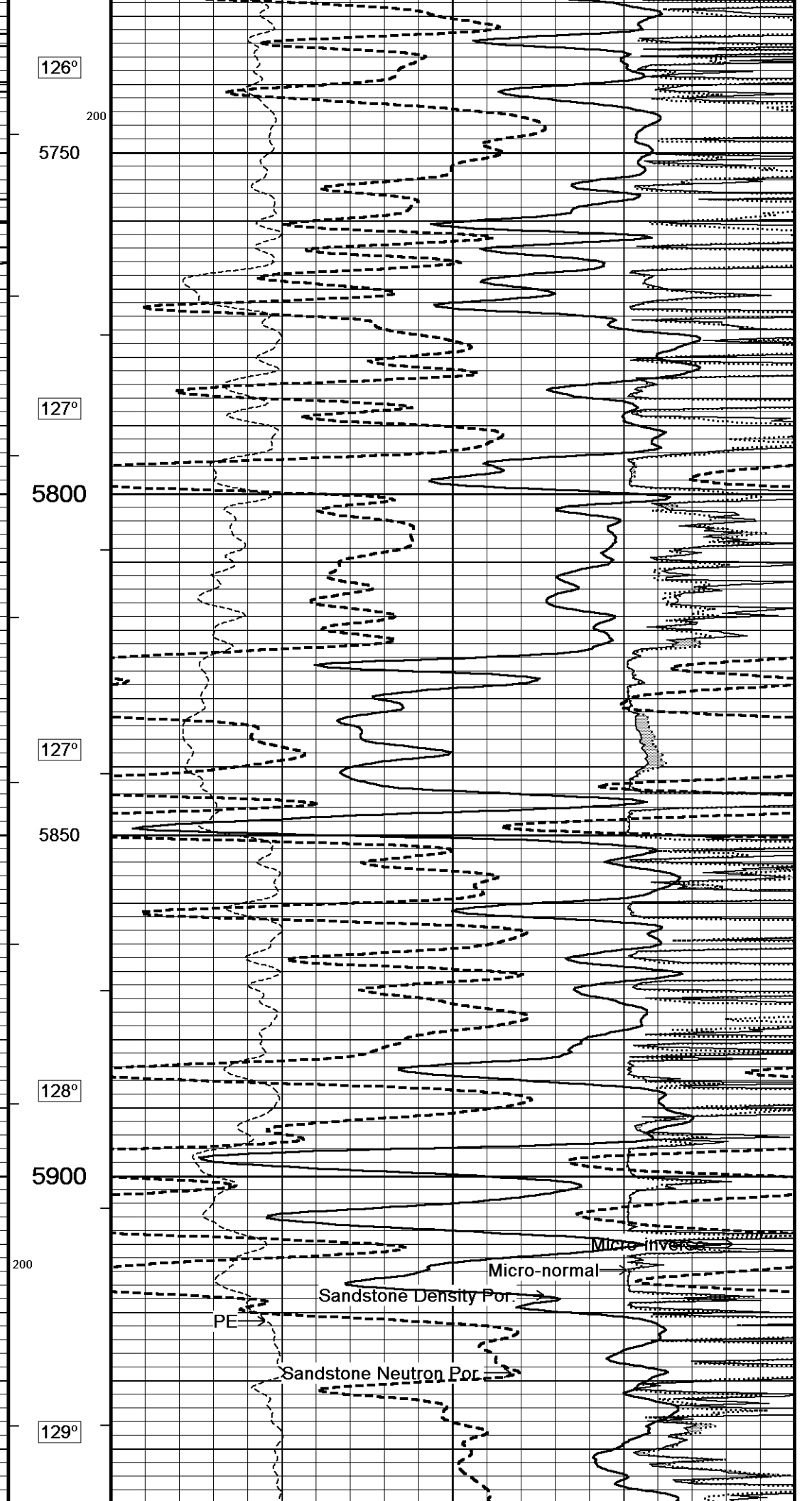
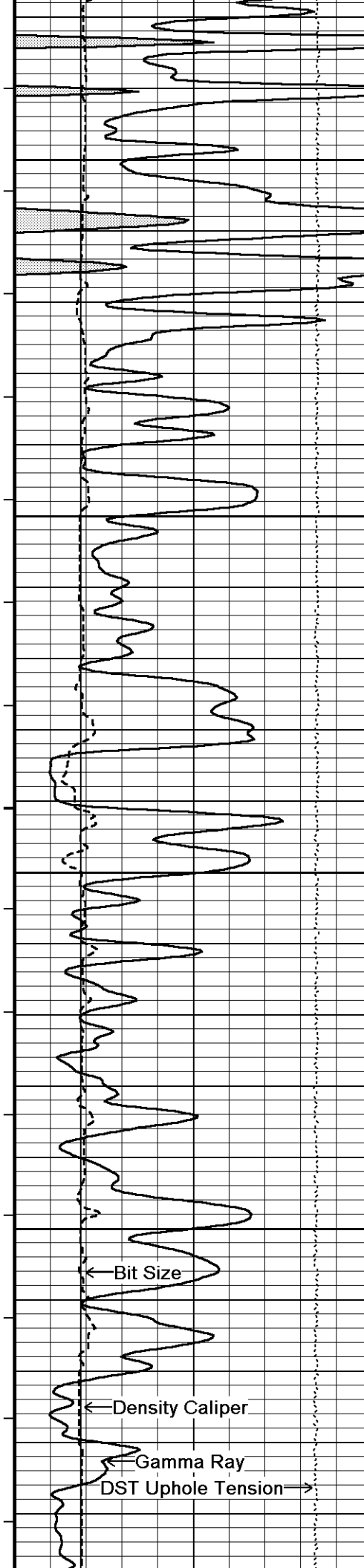












126°

5750

127°

5800

127°

5850

128°

5900

129°

200

200

Bit Size

Density Caliper

Gamma Ray

DST Uphole Tension

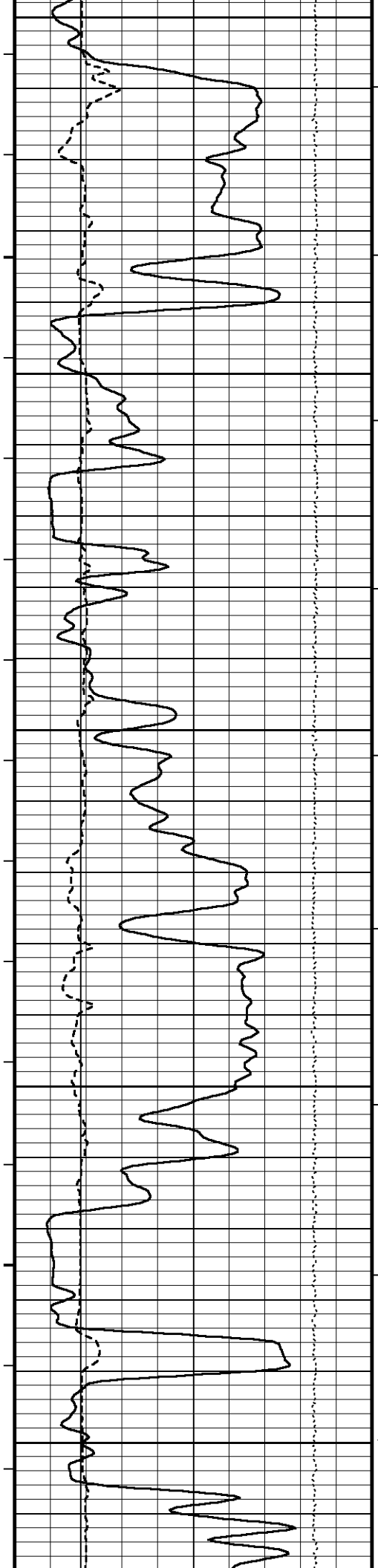
PE

Sandstone Density Por.

Sandstone Neutron Por.

Micro-normal

Micro-inverse



5950

131°

6000

134°

6050

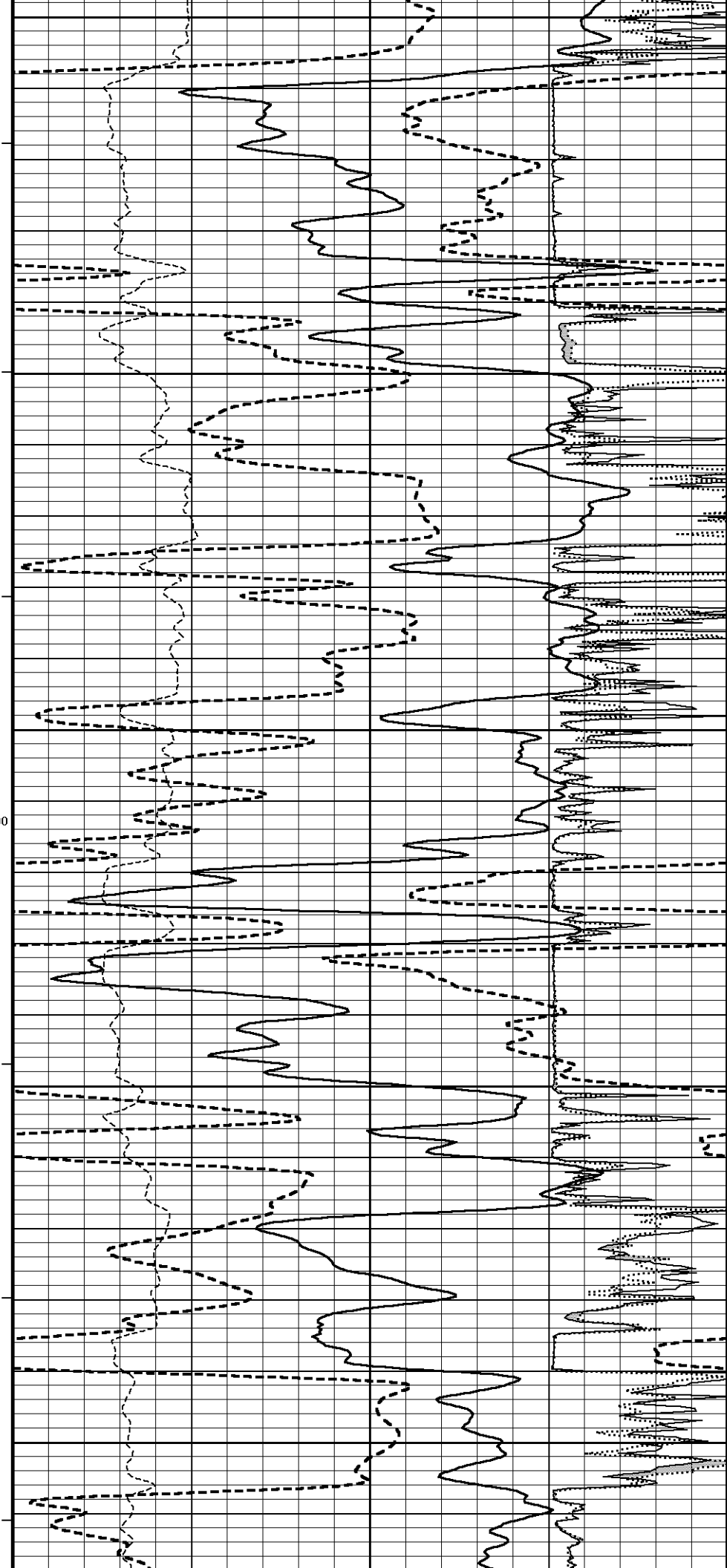
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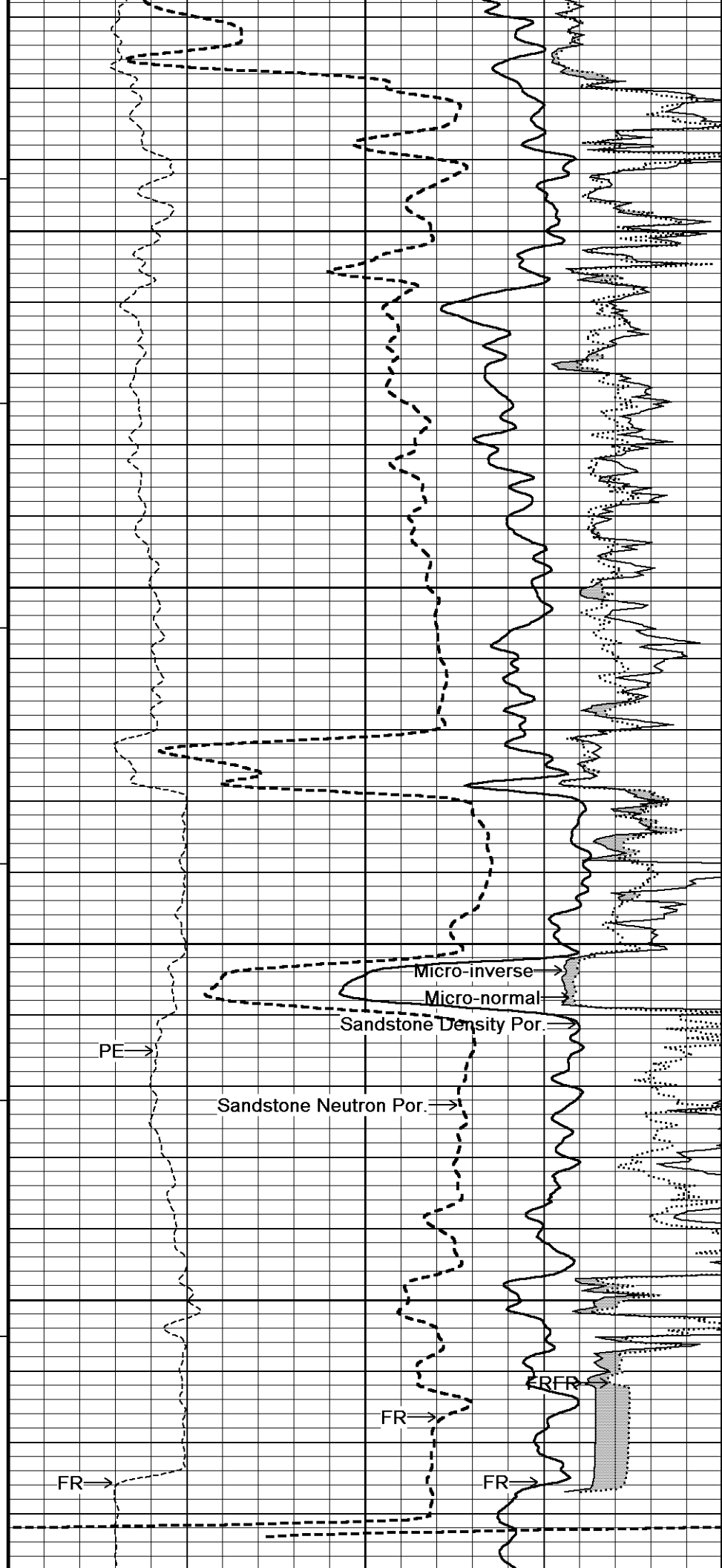
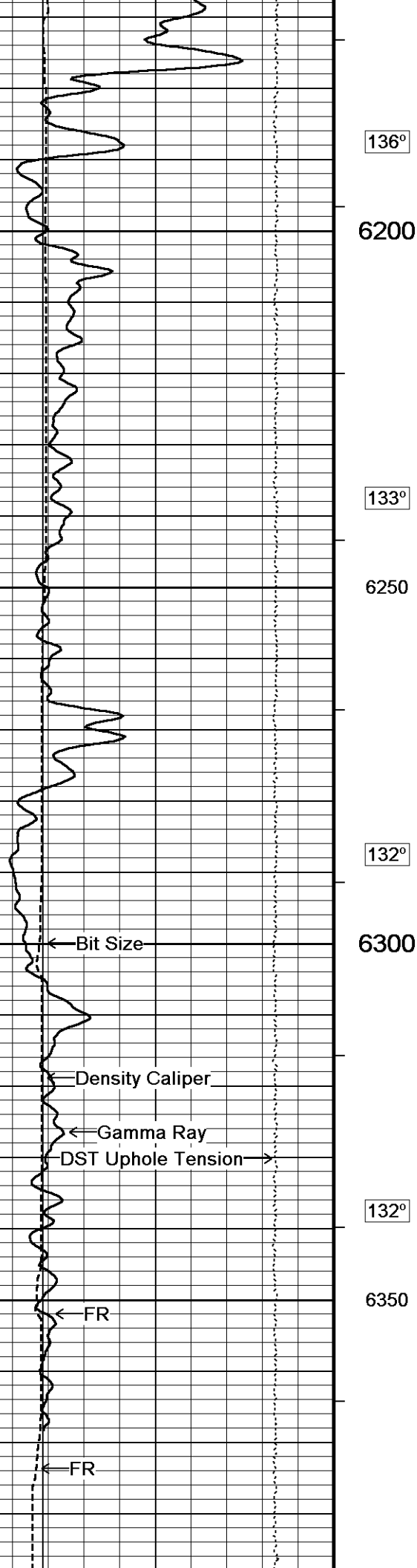
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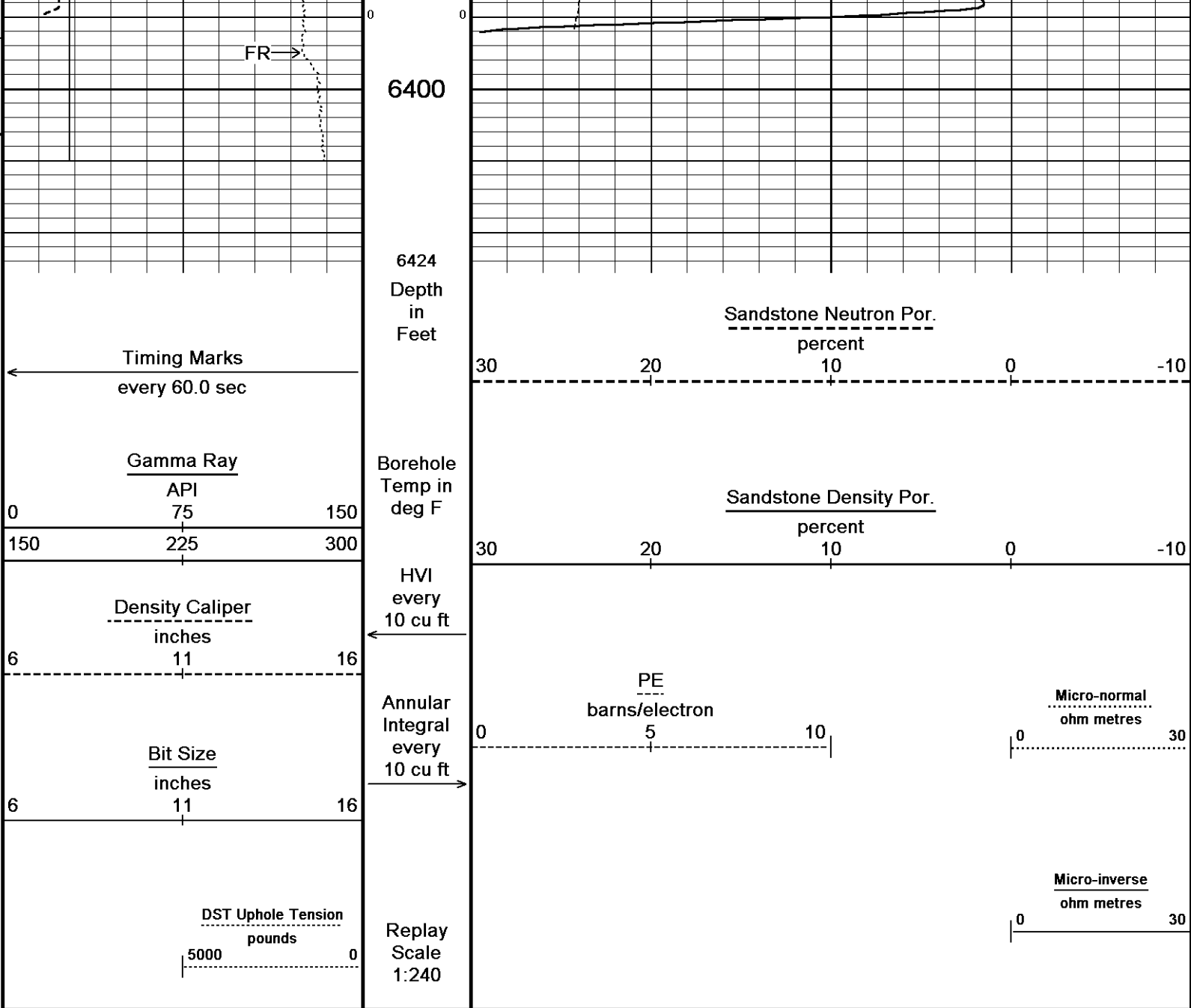
6100

136°

100 6150







Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_002.dta
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

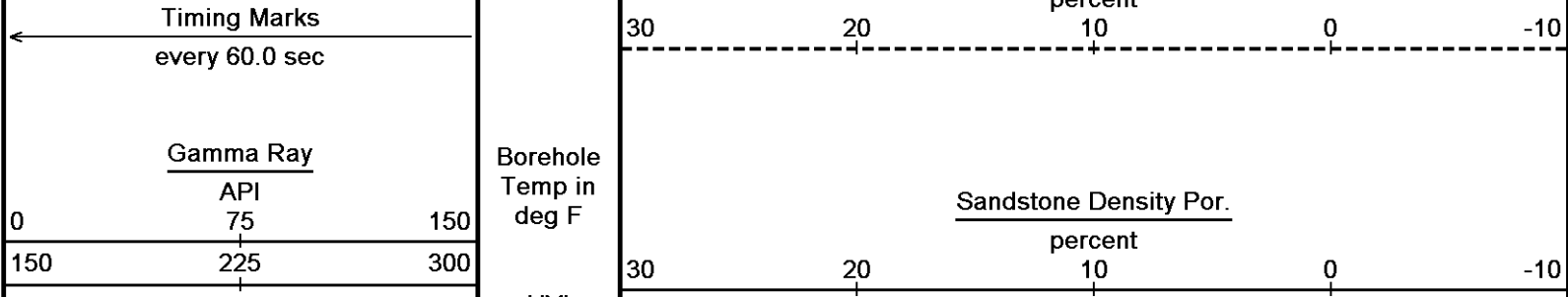
Plotted on 25-JUL-2013 09:27
Recorded on 25-JUL-2013 04:15

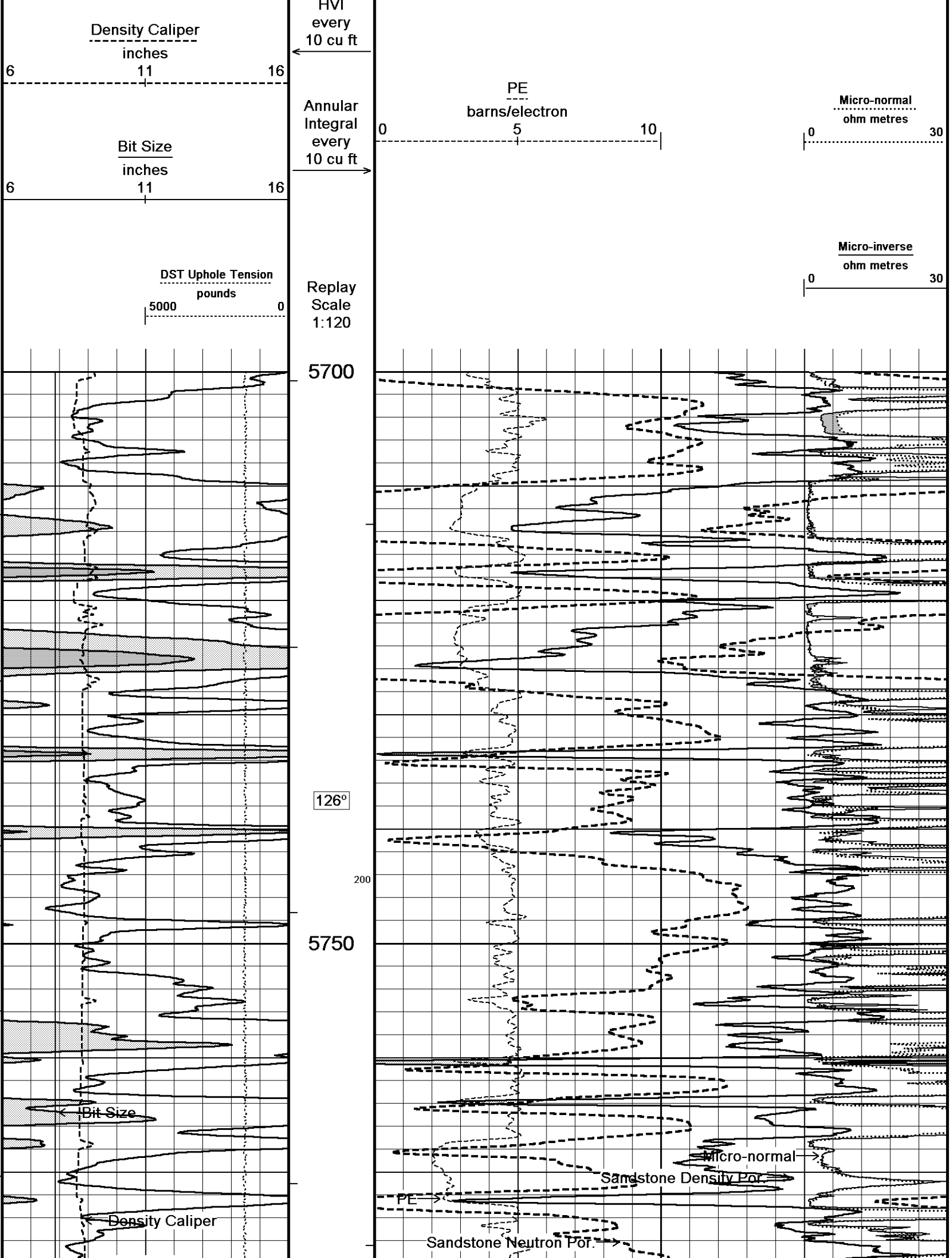
↑ REPEAT SECTION ↑

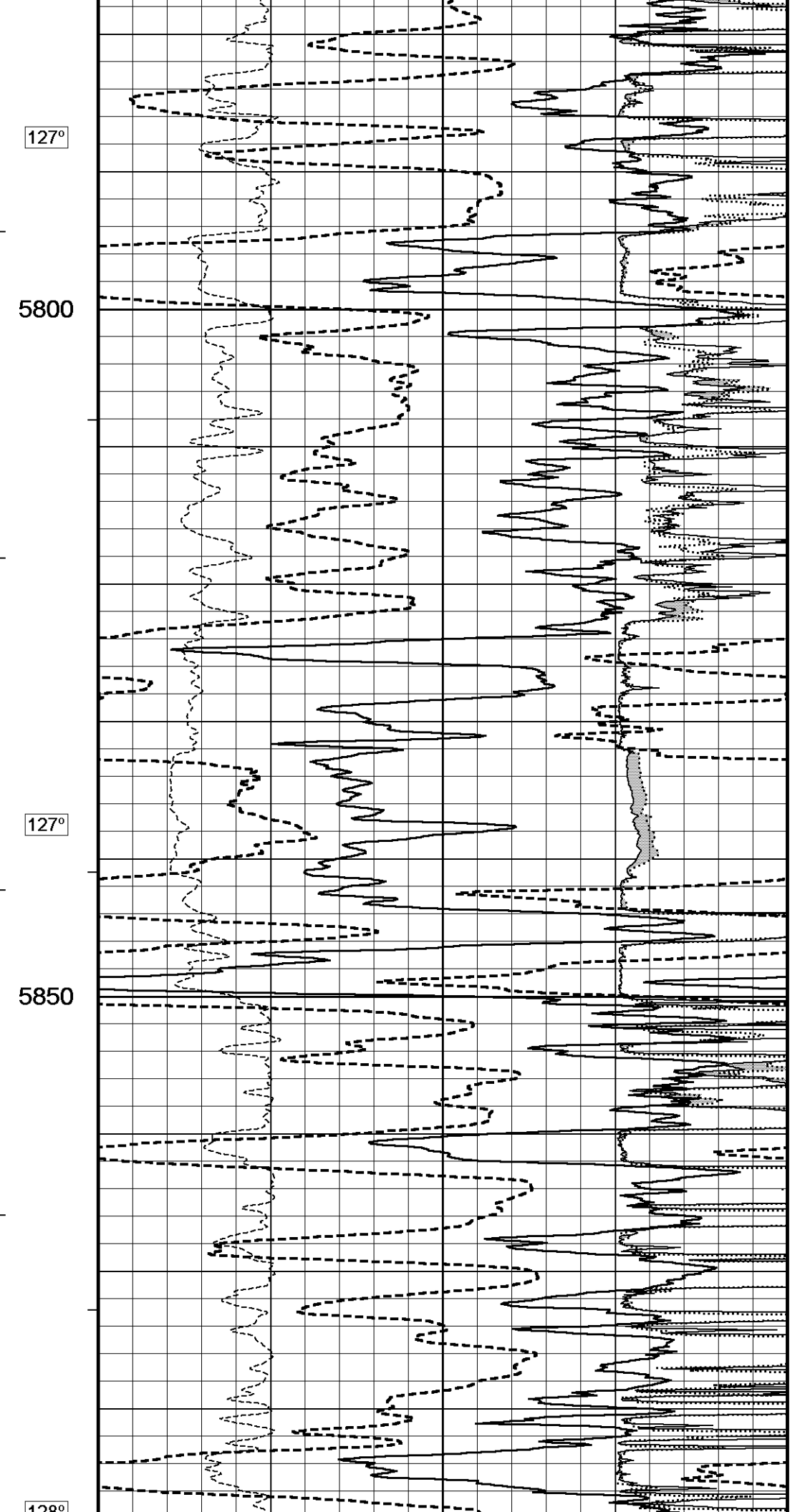
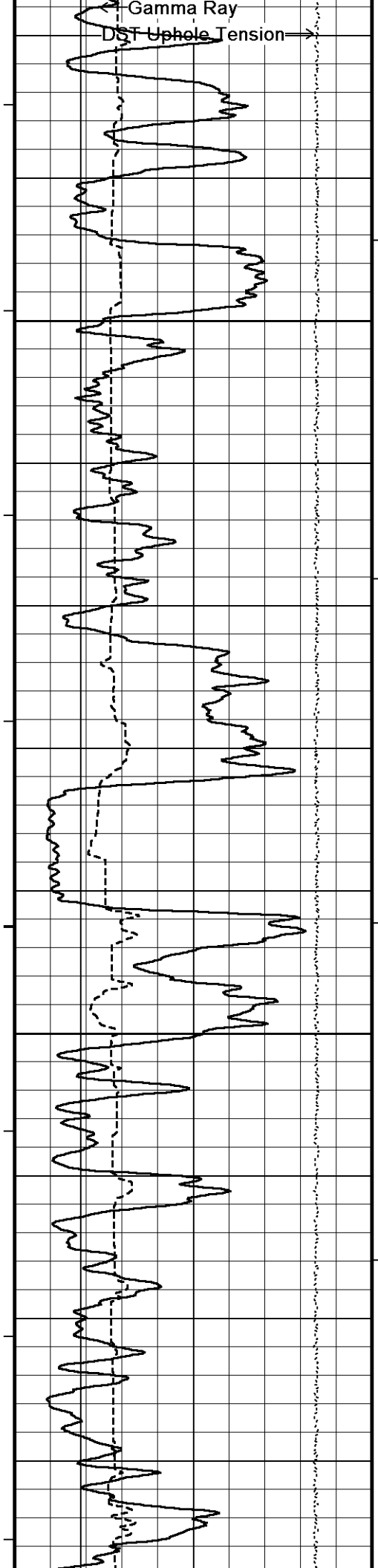
↓ 10 INCH HI-RES ↓

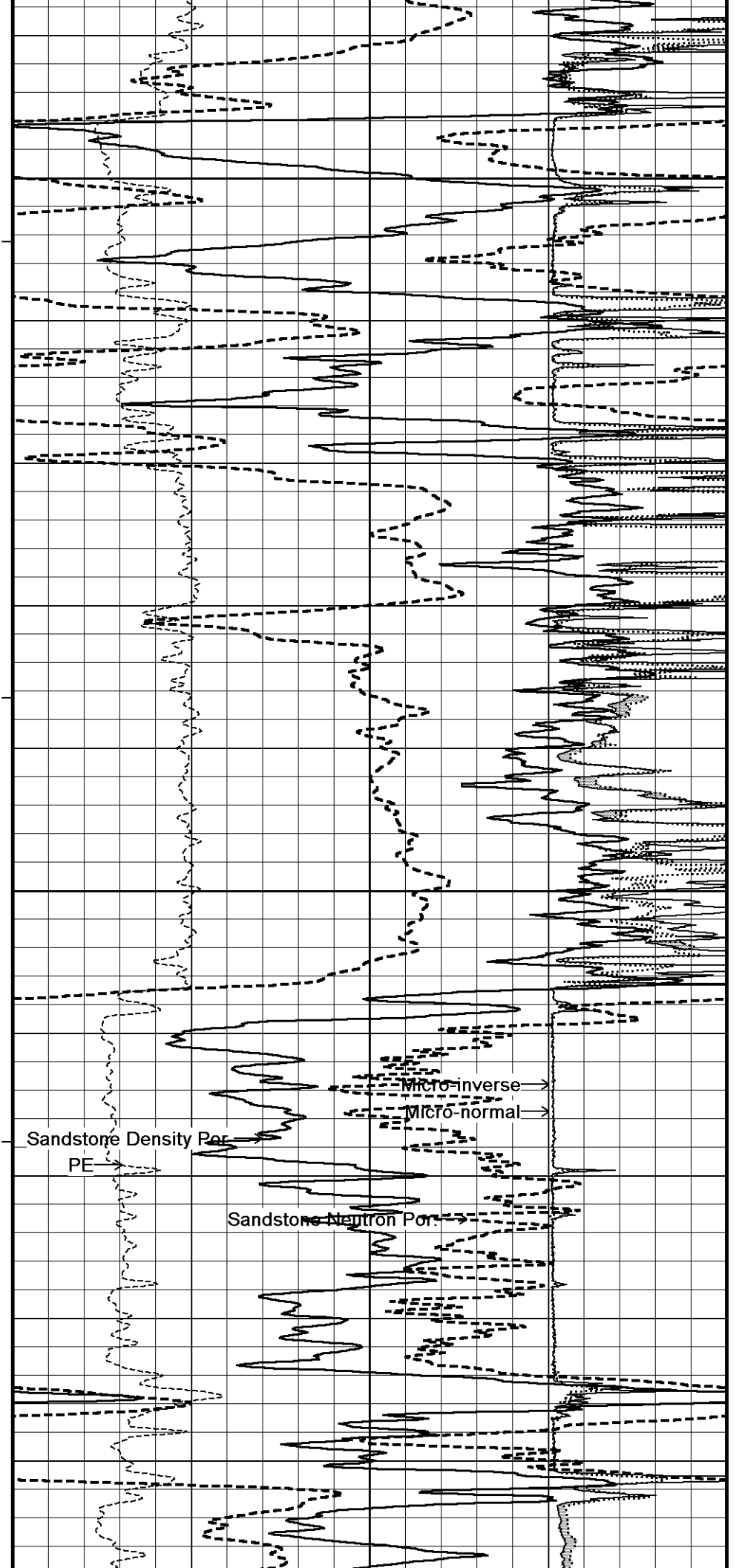
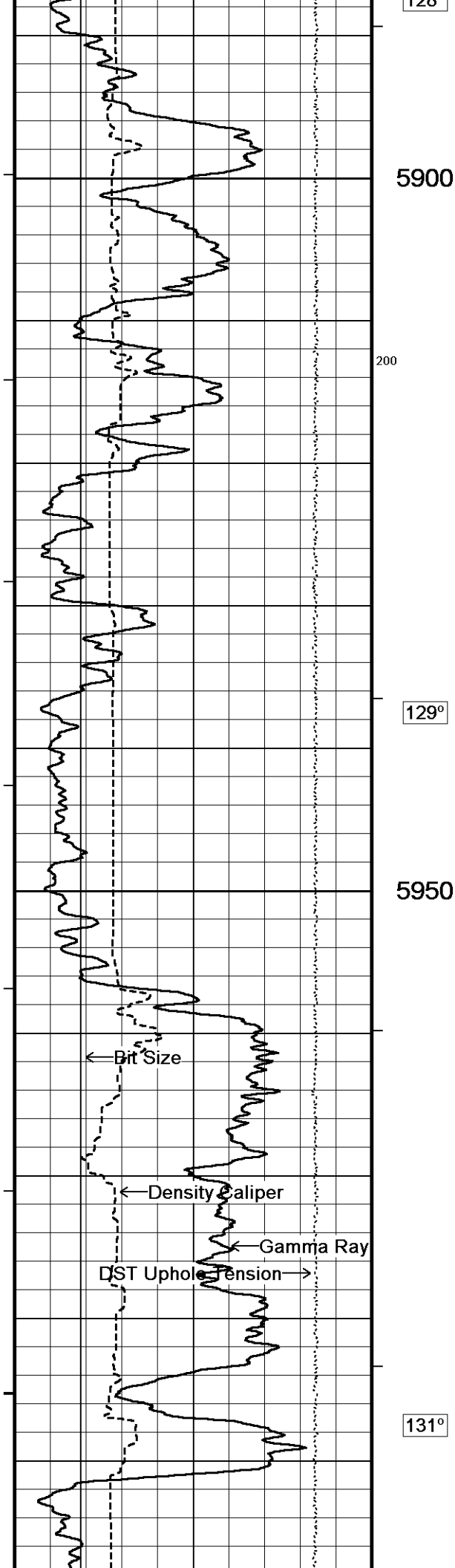
Depth Based Data - Maximum Sampling Increment 2.5cm
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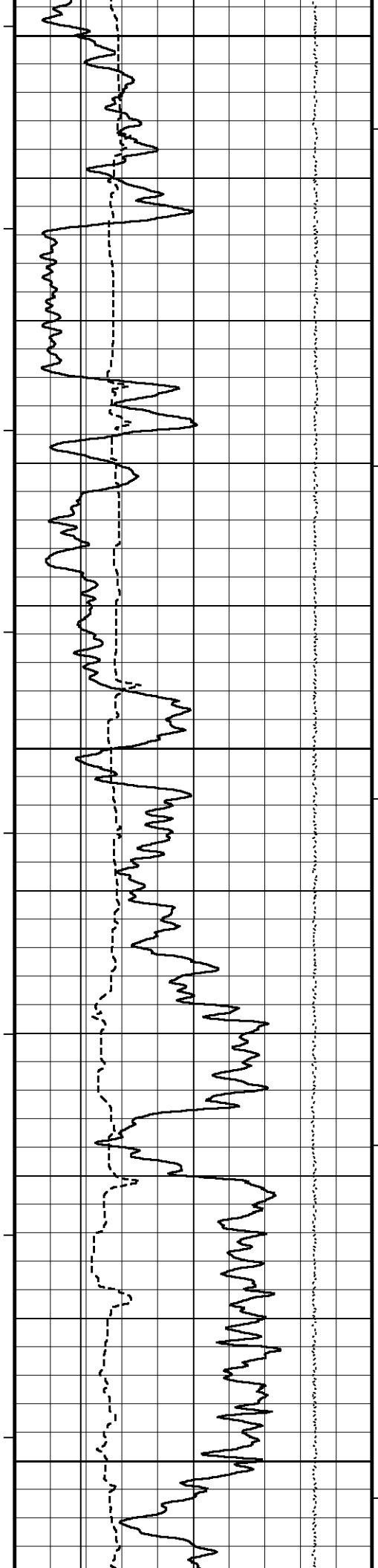
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Recorded on 25-JUL-2013 04:15











6000

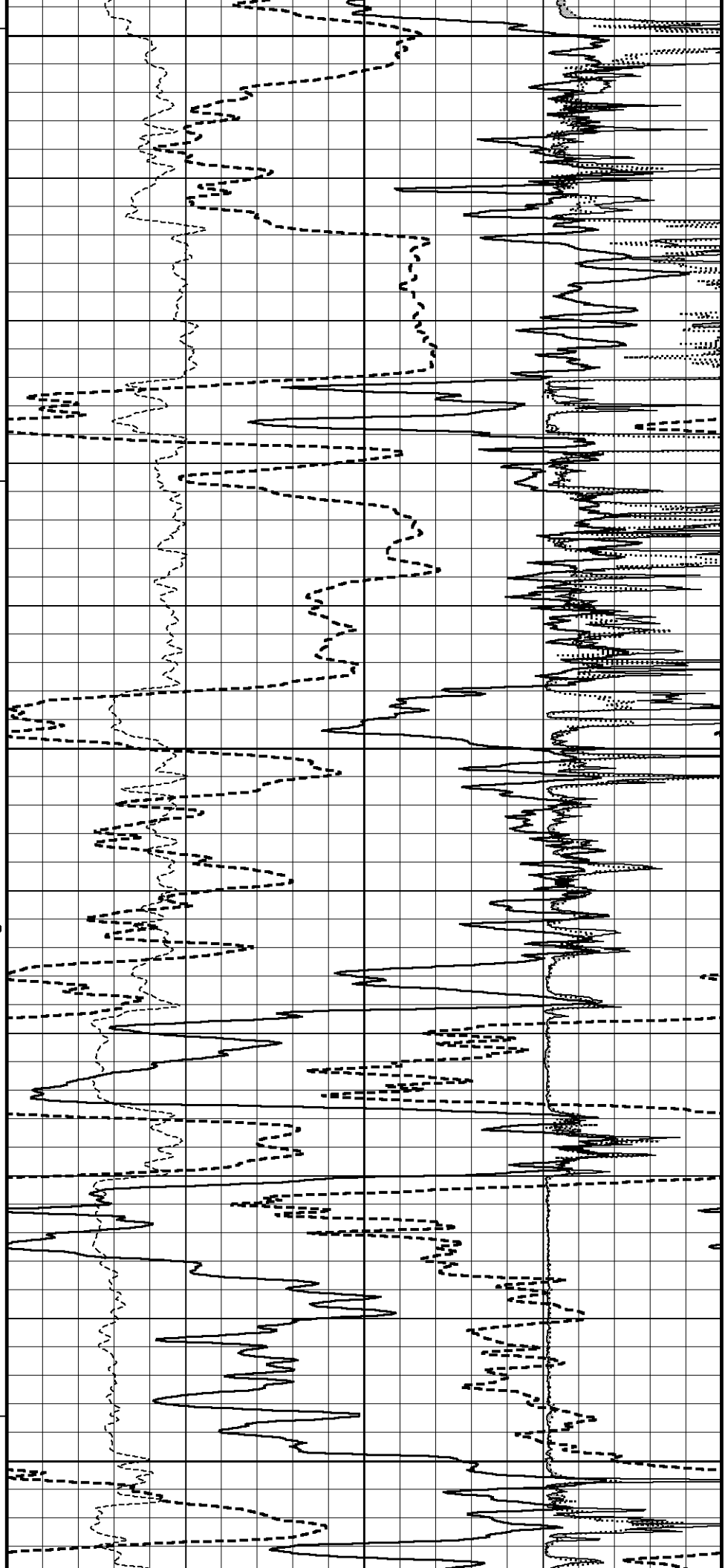
134°

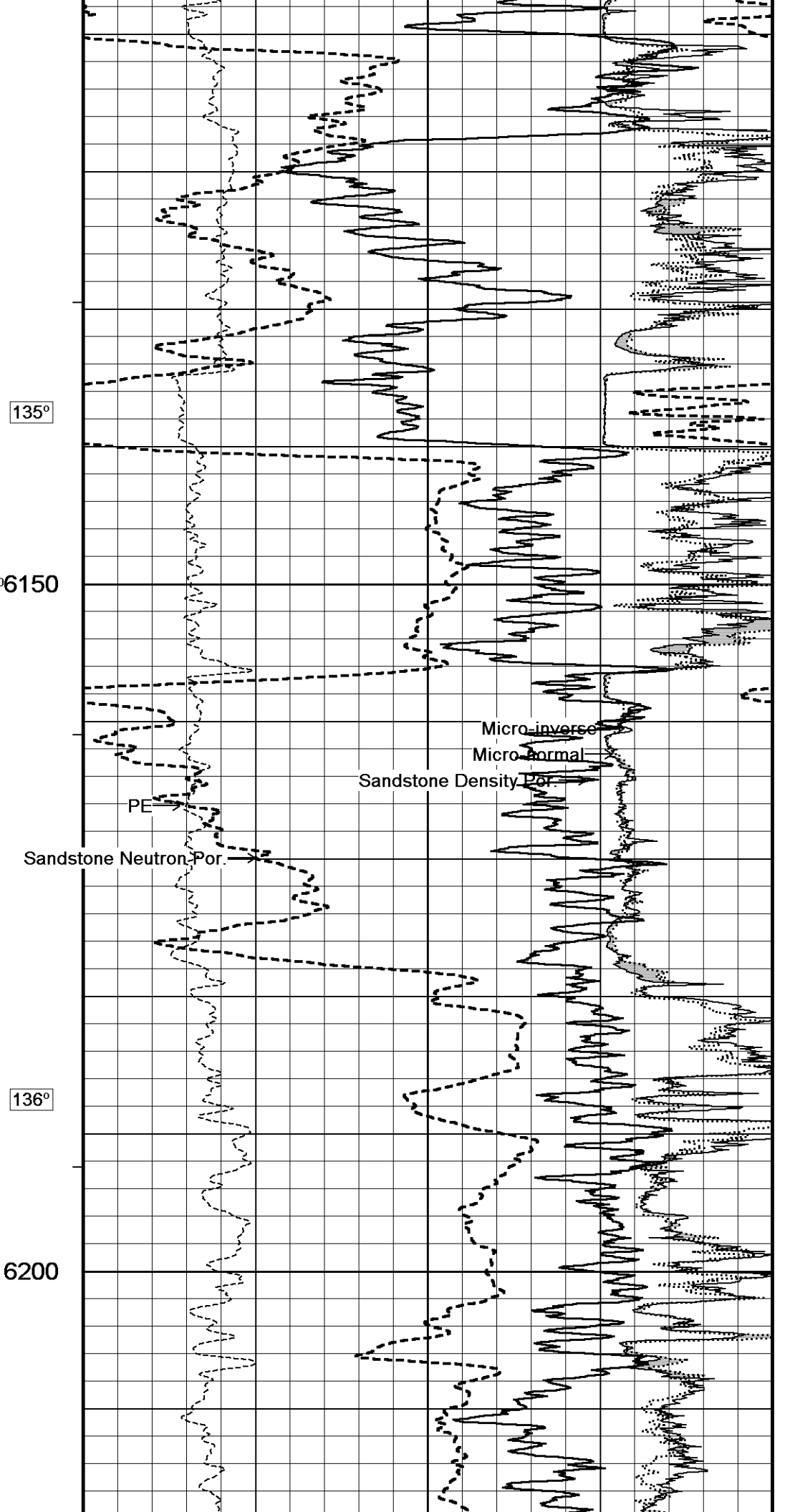
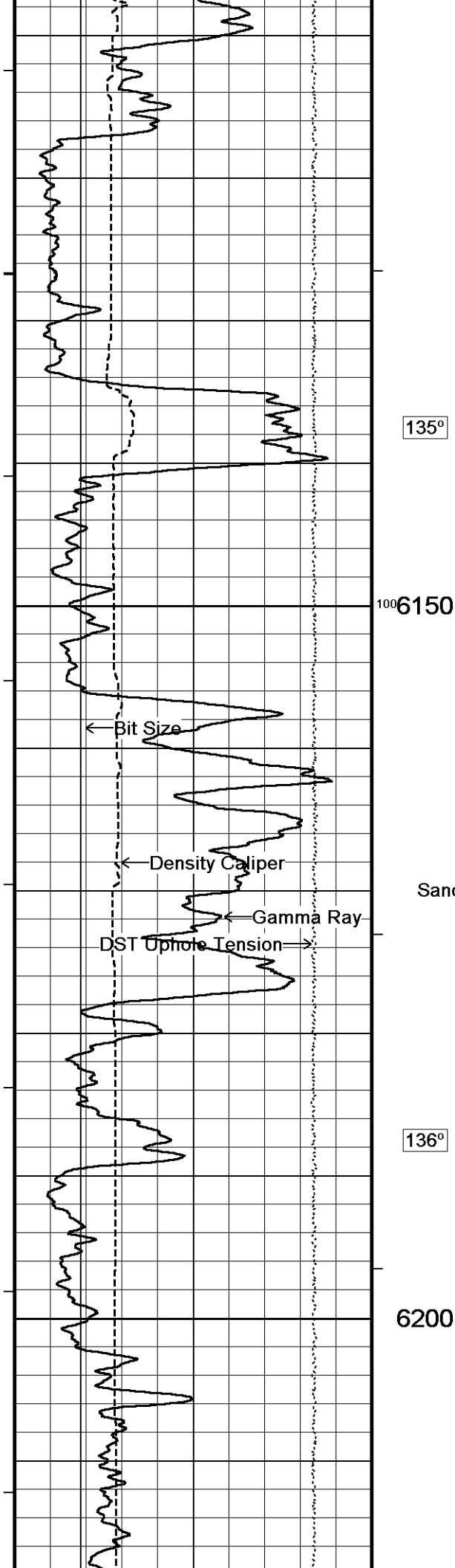
6050

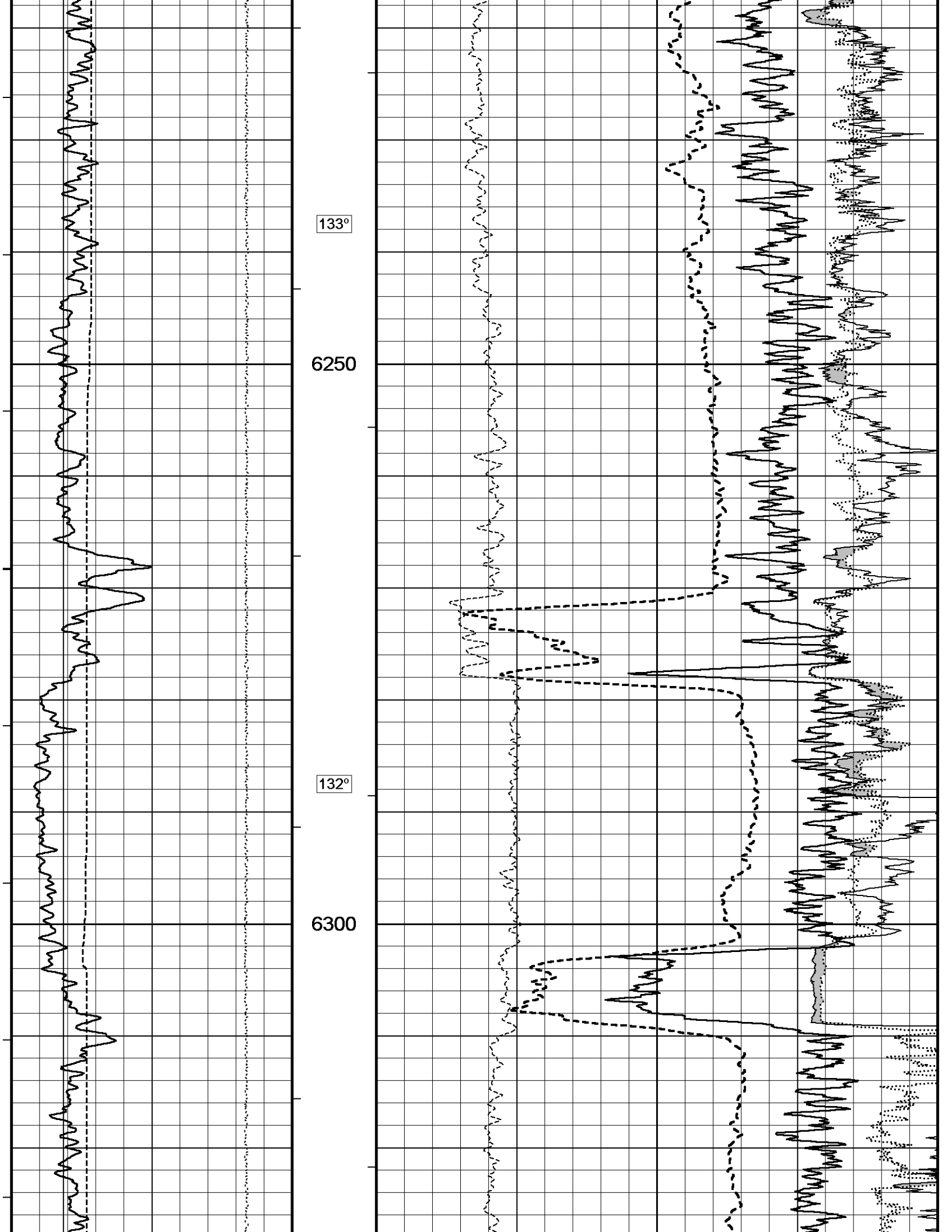
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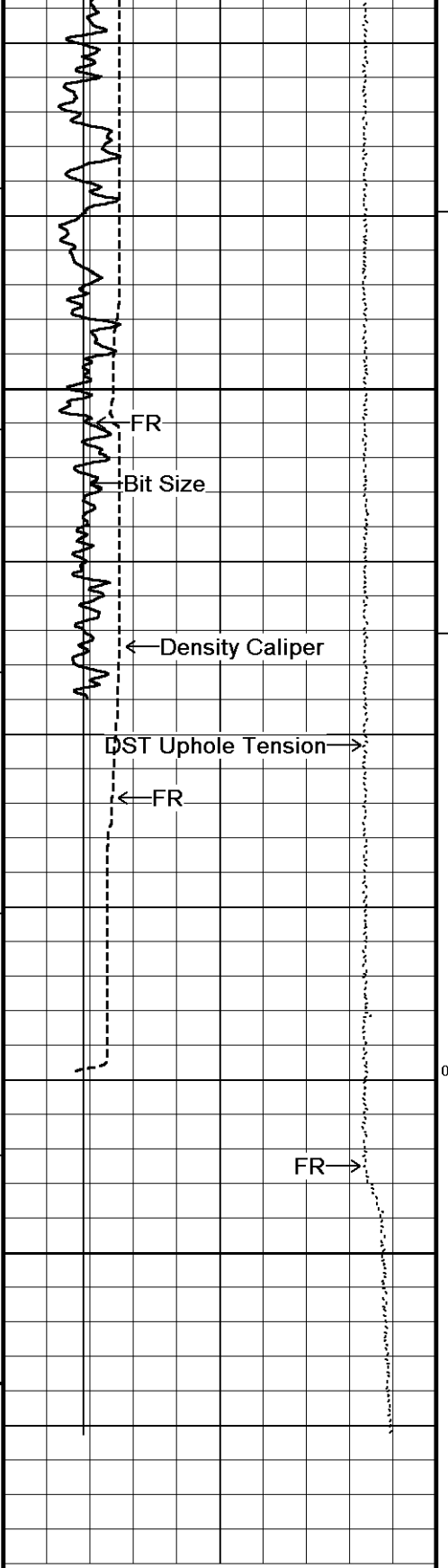
134°

6100









132°

6350

6400

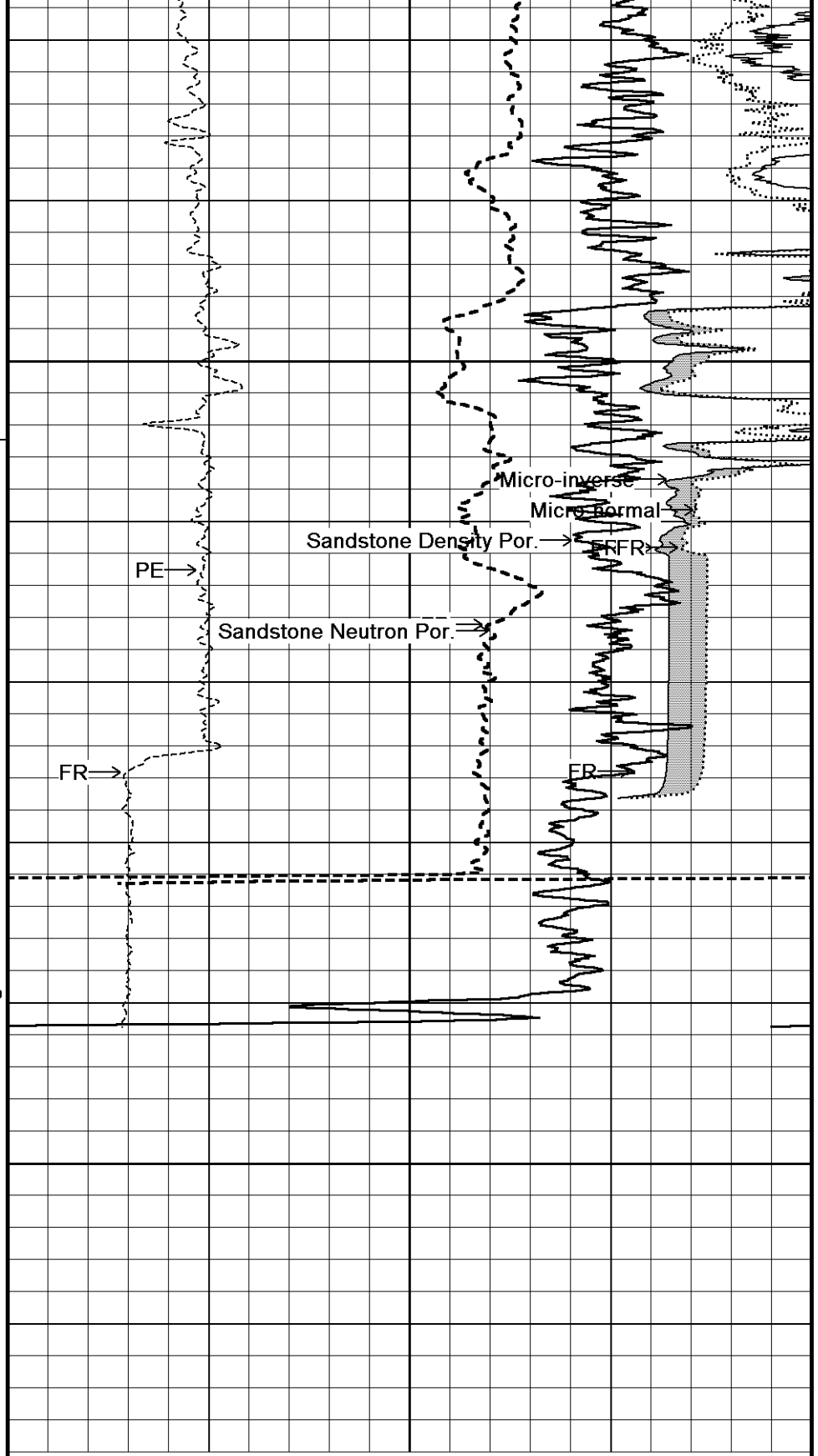
6416

Depth
in
Feet

Timing Marks
every 60.0 sec

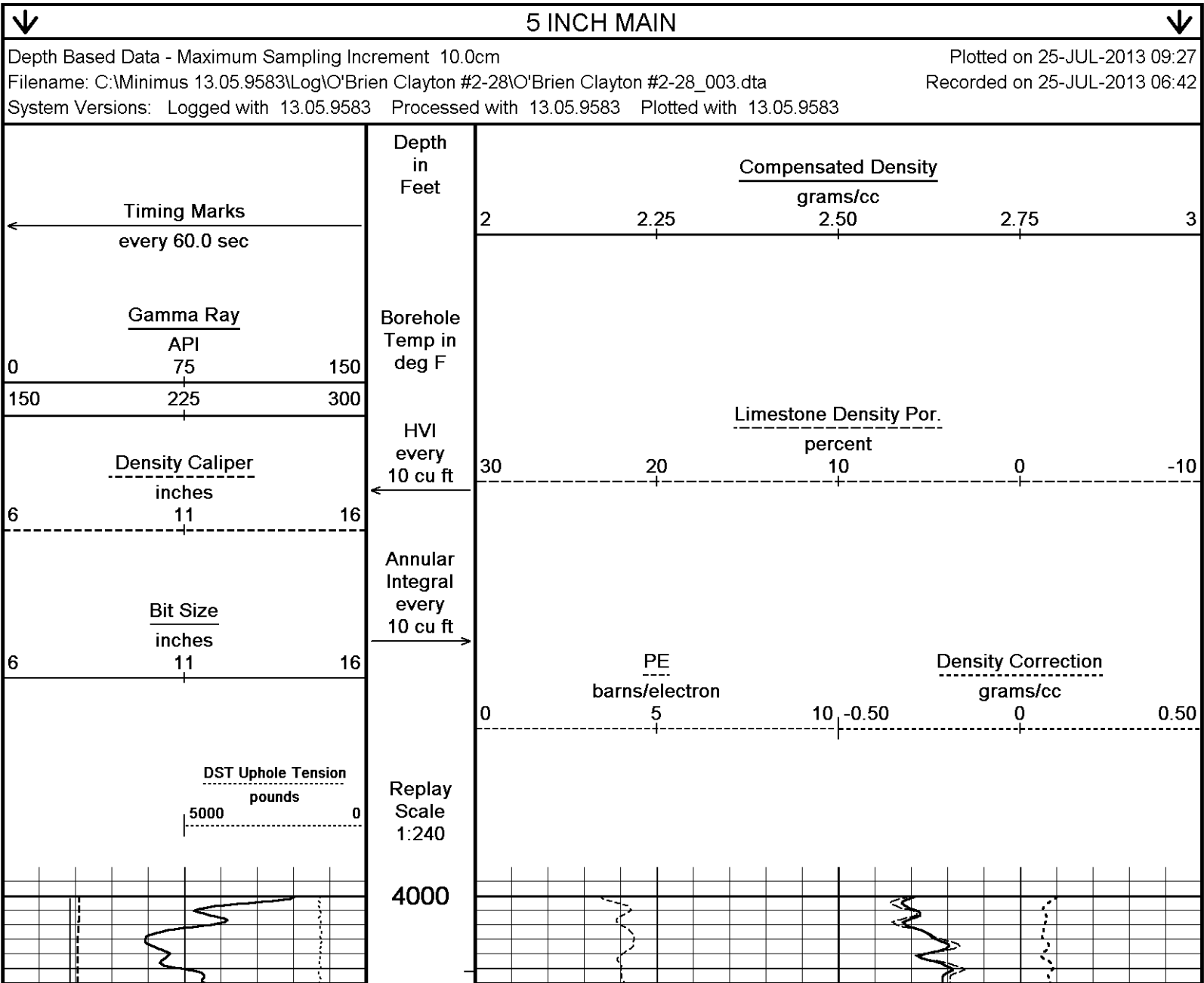
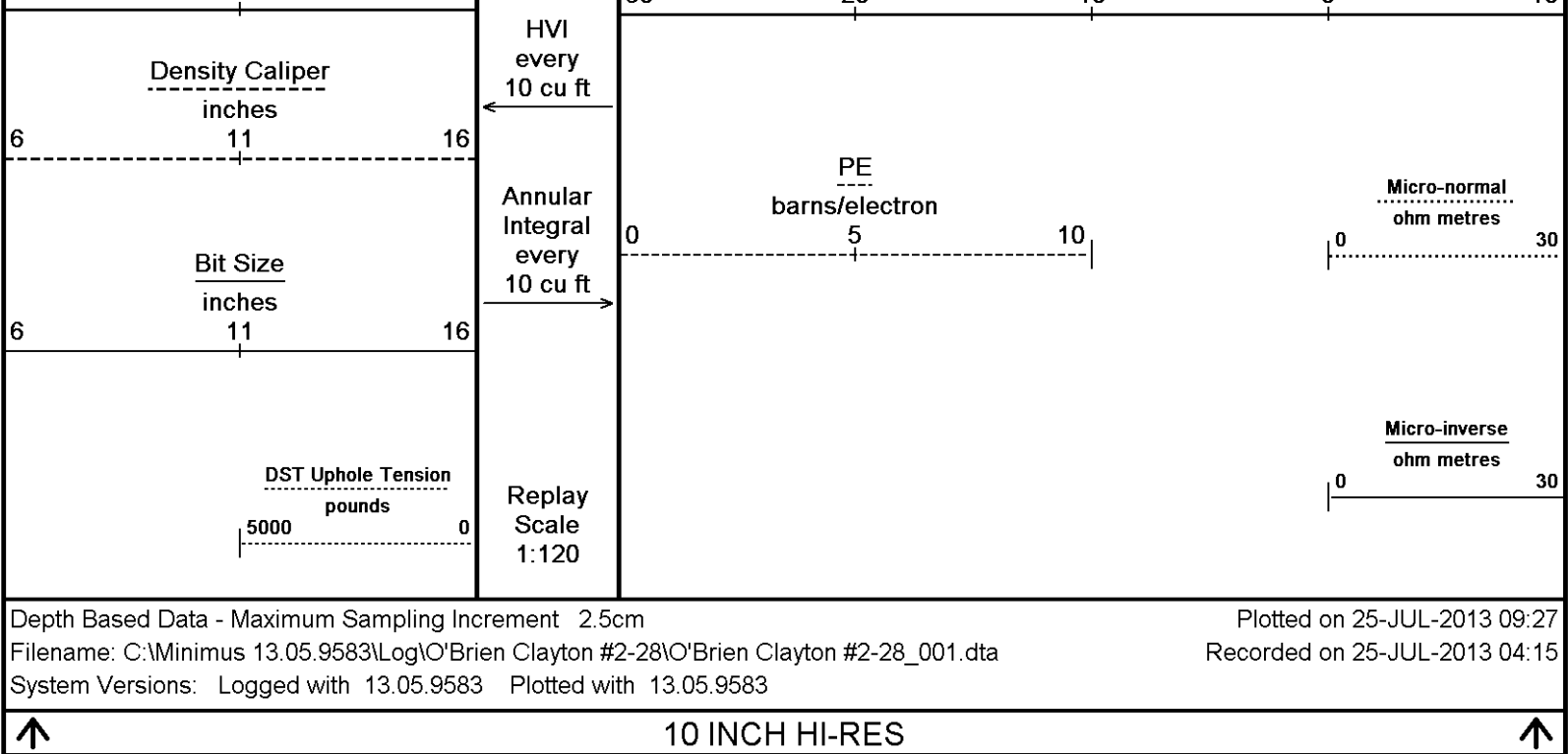
Gamma Ray
API
0 75 150
150 225 300

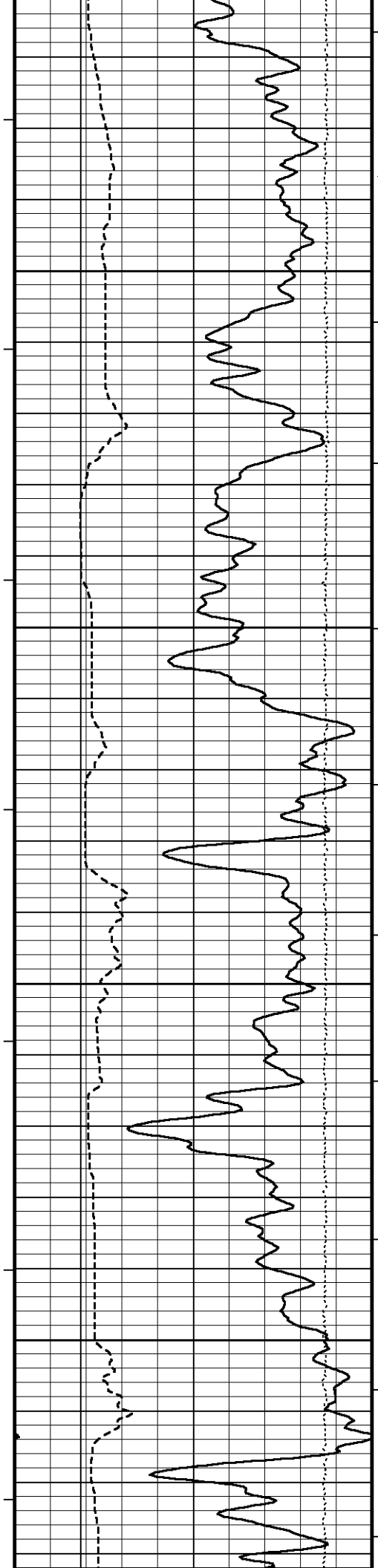
Borehole
Temp in
deg F



Sandstone Neutron Por.
percent
30 20 10 0 -10

Sandstone Density Por.
percent
30 20 10 0 -10





1000 112°

4050

113°

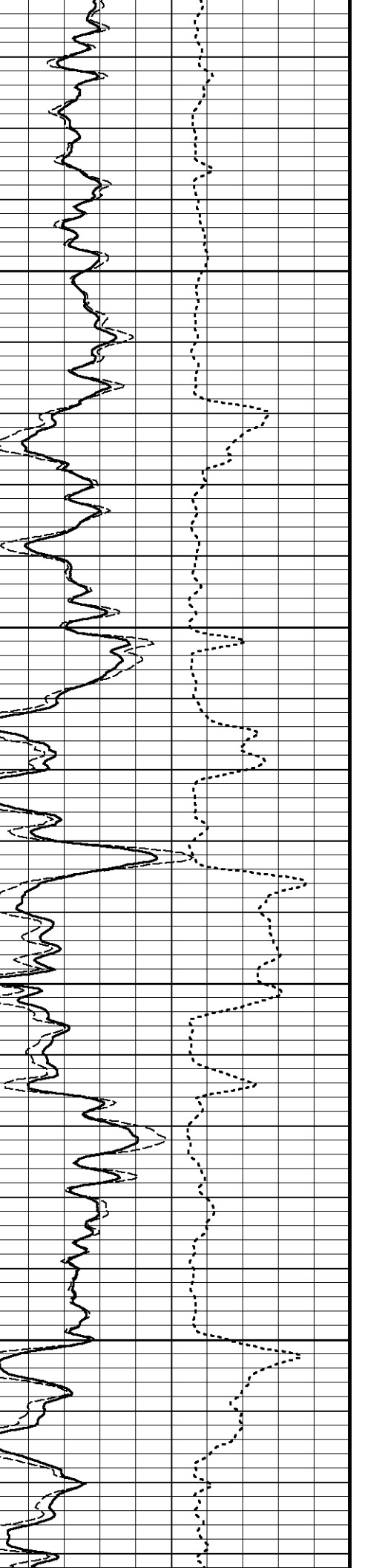
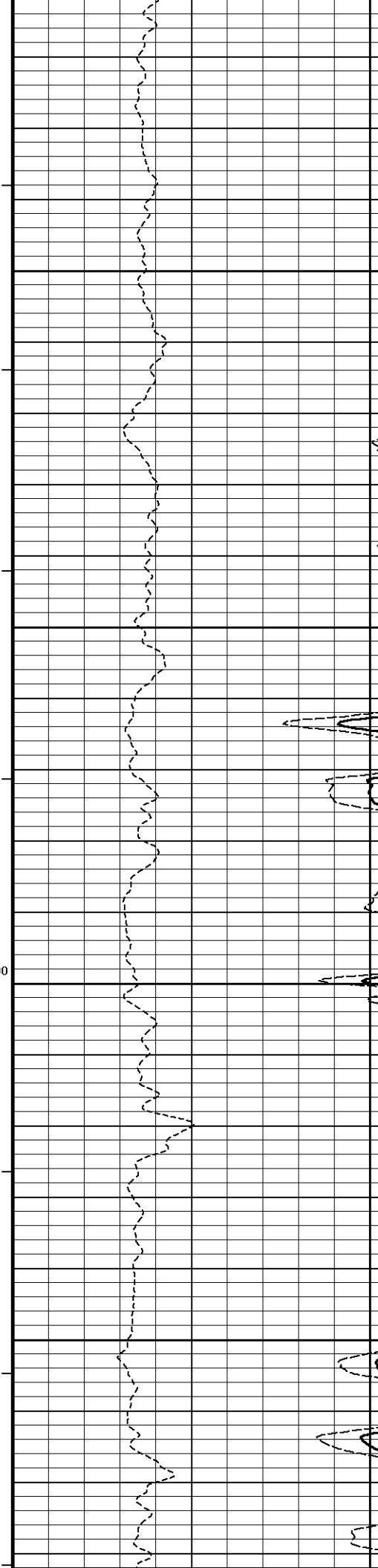
4100

113°

4150 700

114°

4200



1000 112°

4050

113°

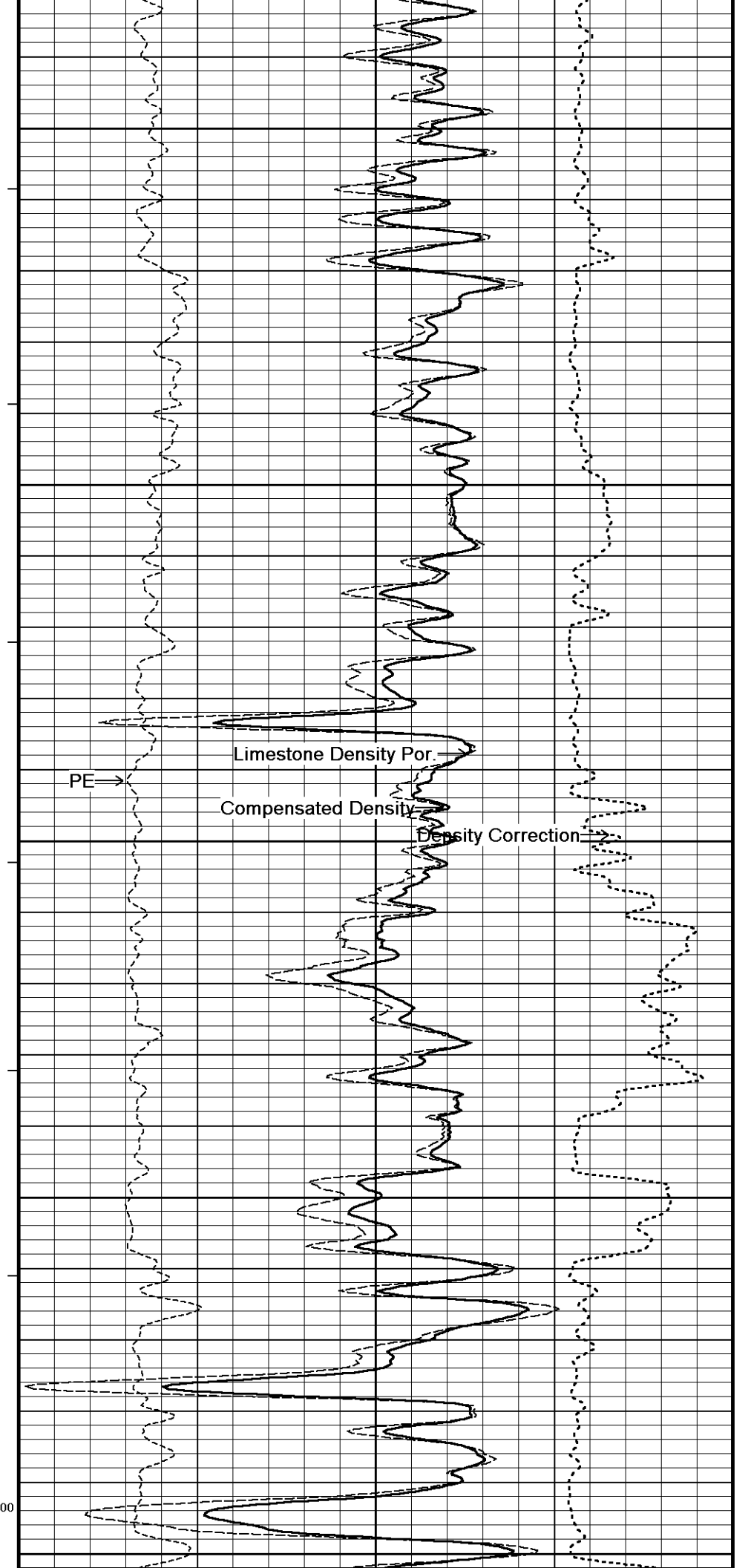
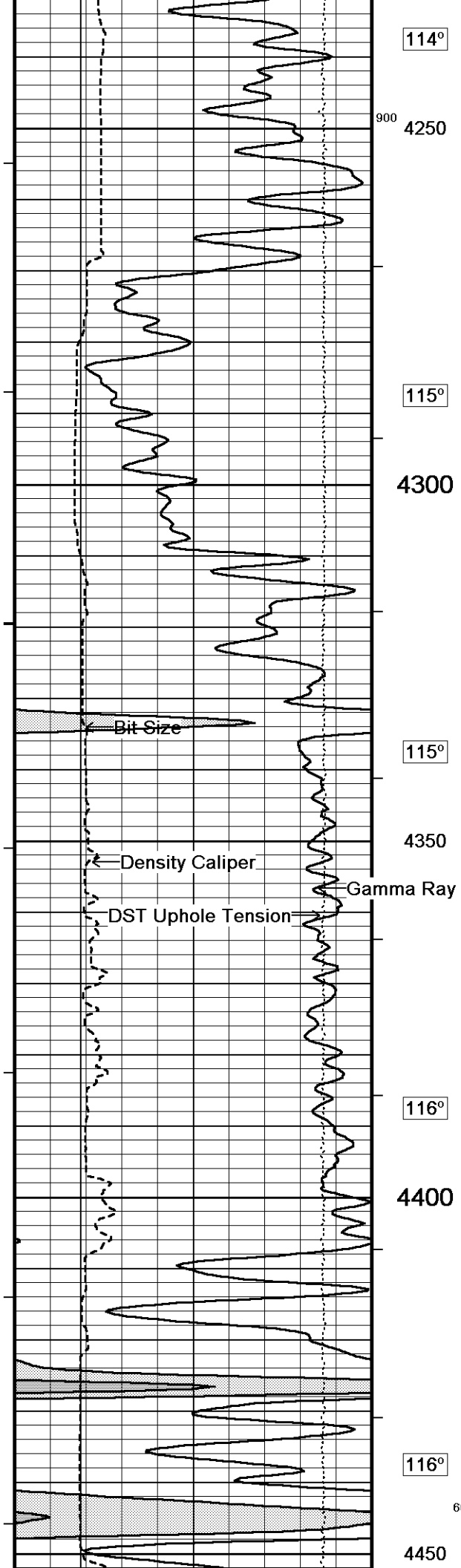
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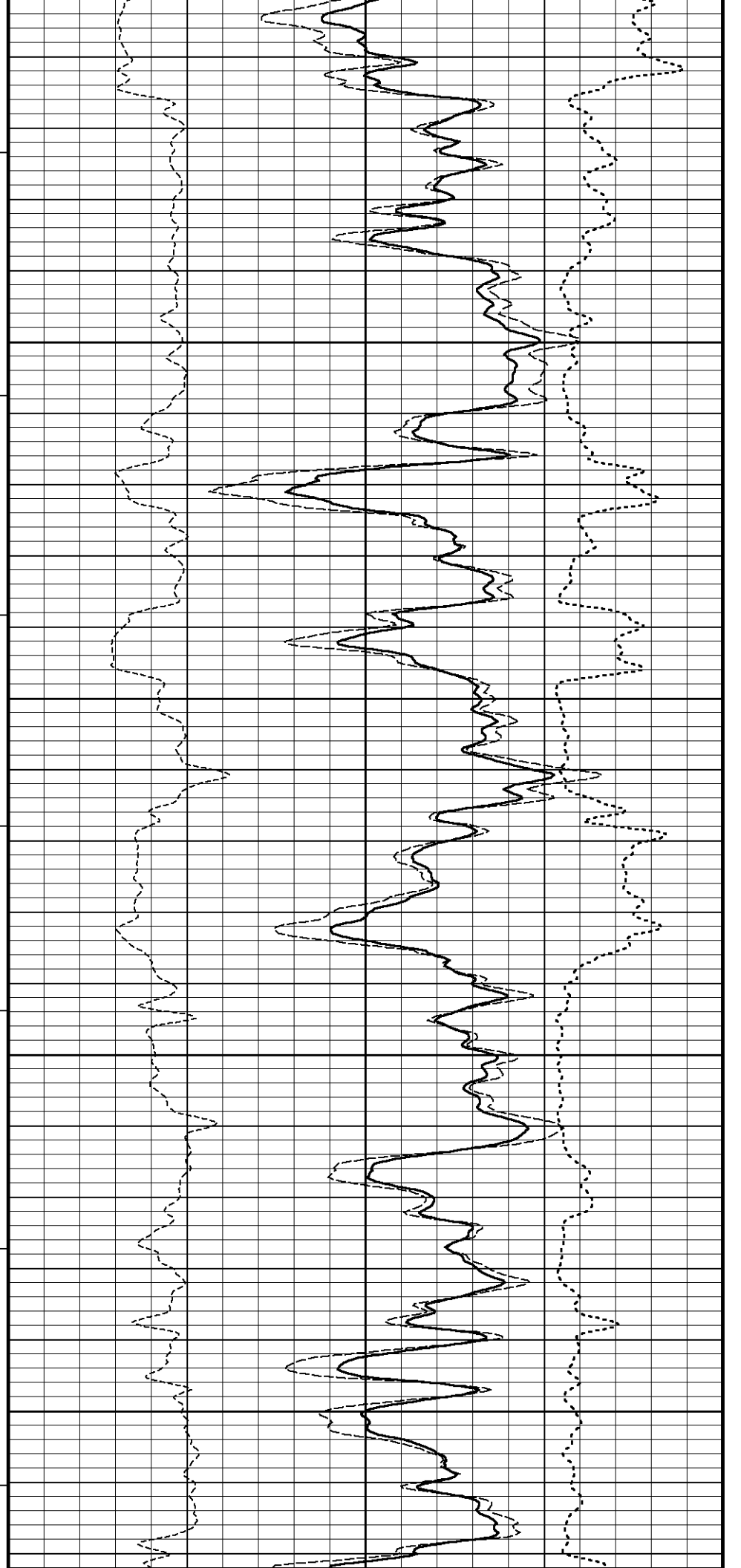
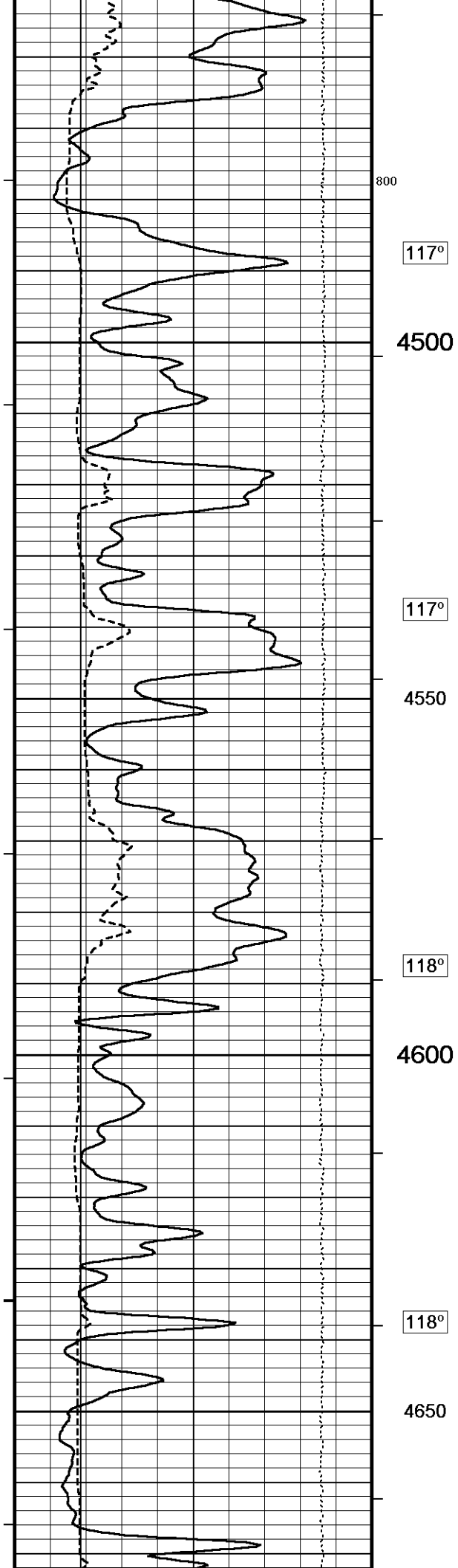
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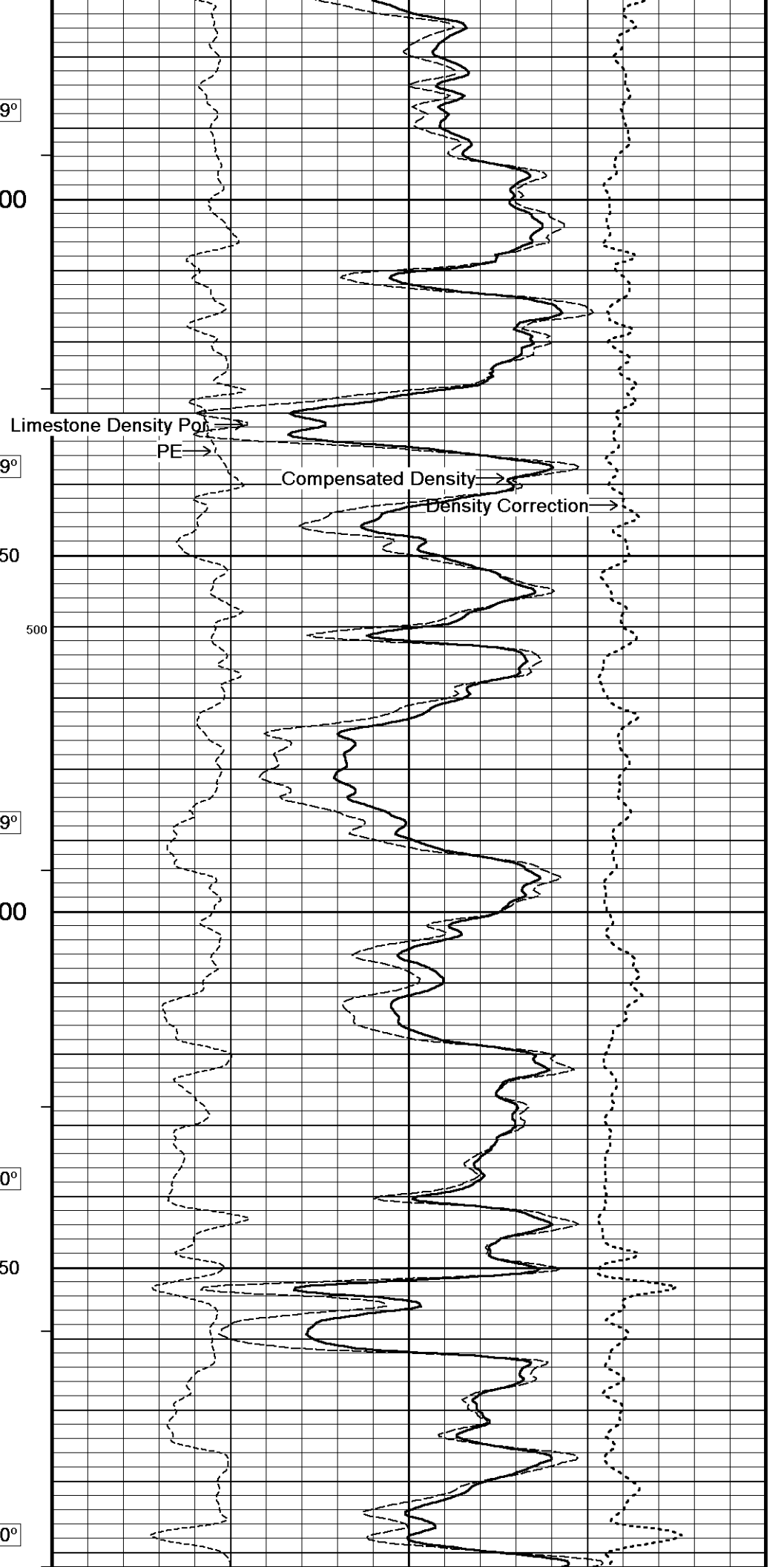
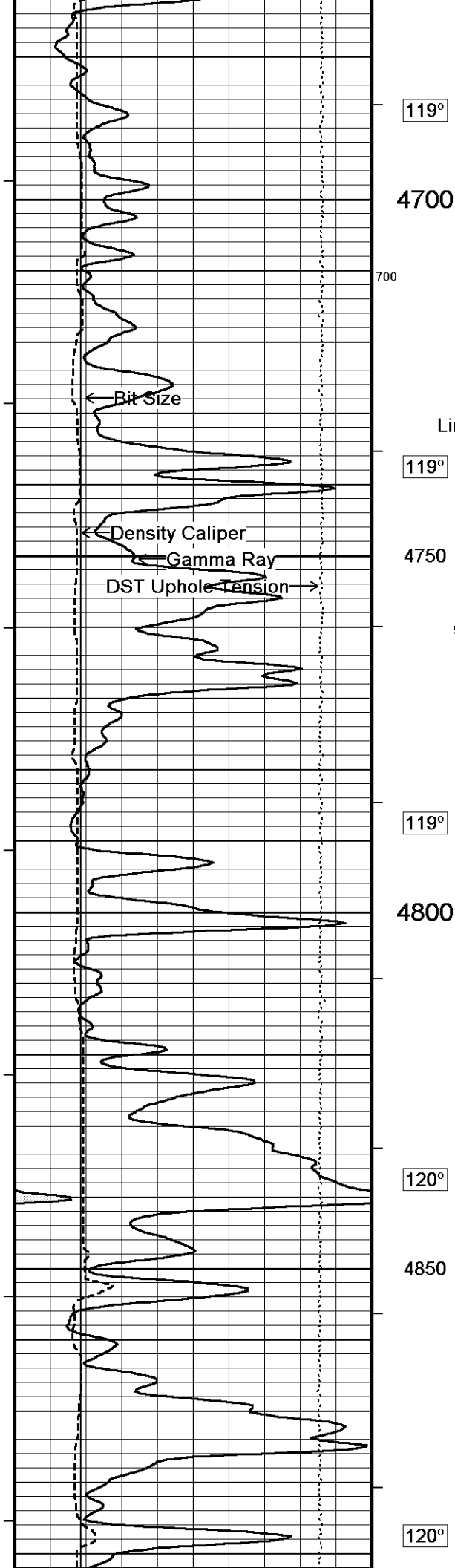
4150 700

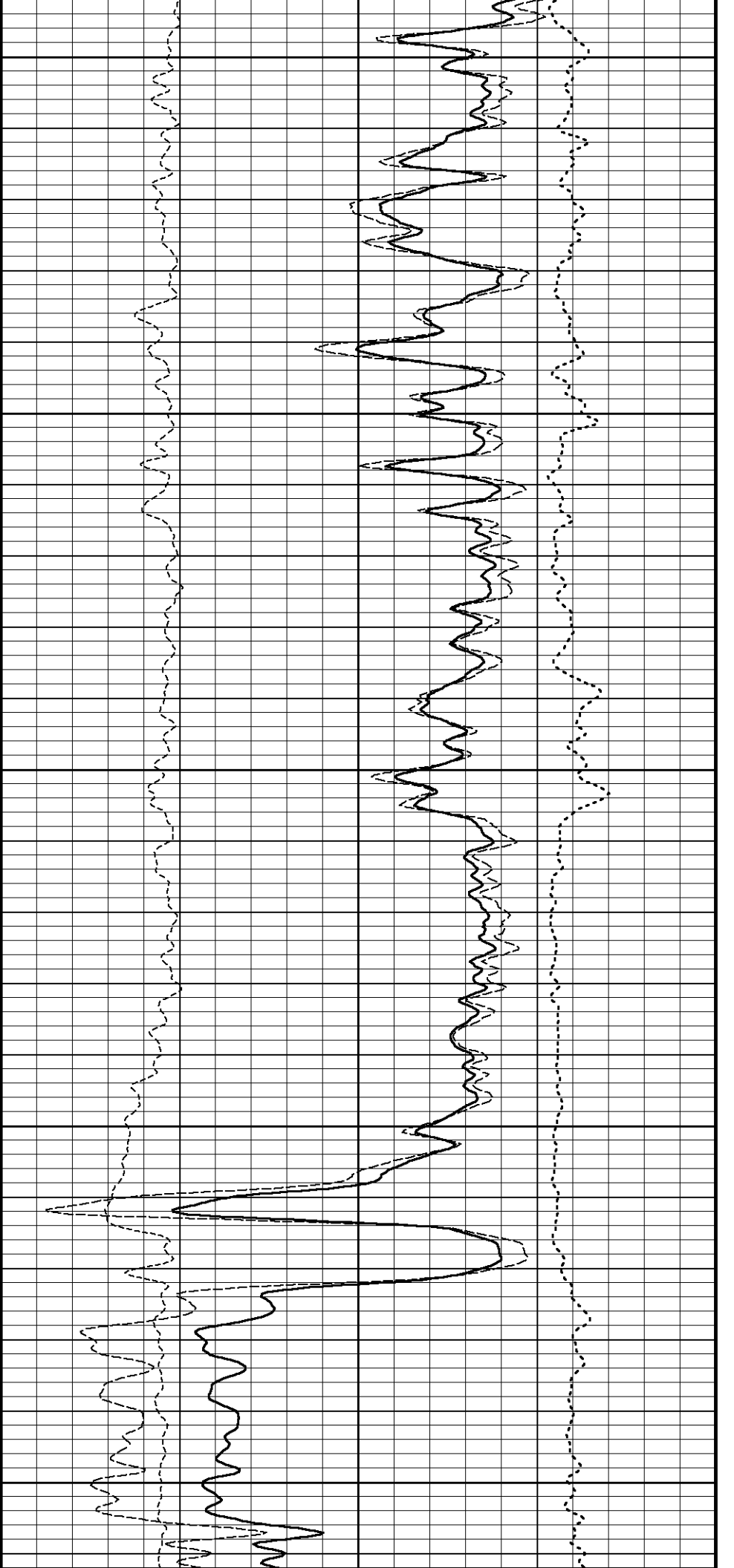
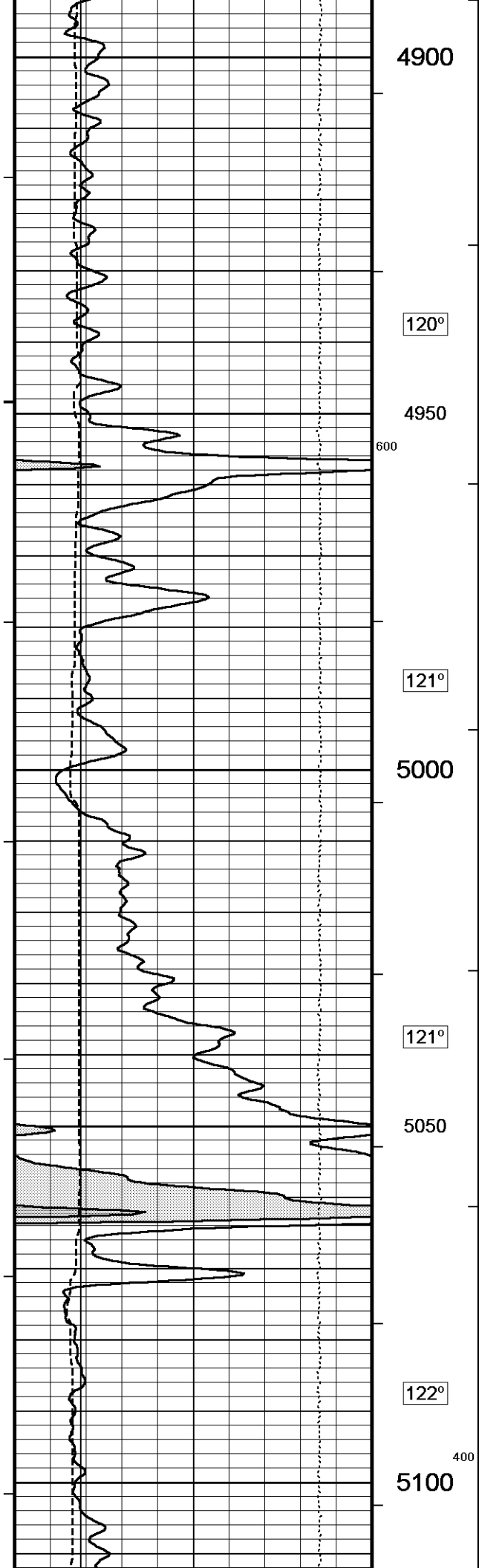
114°

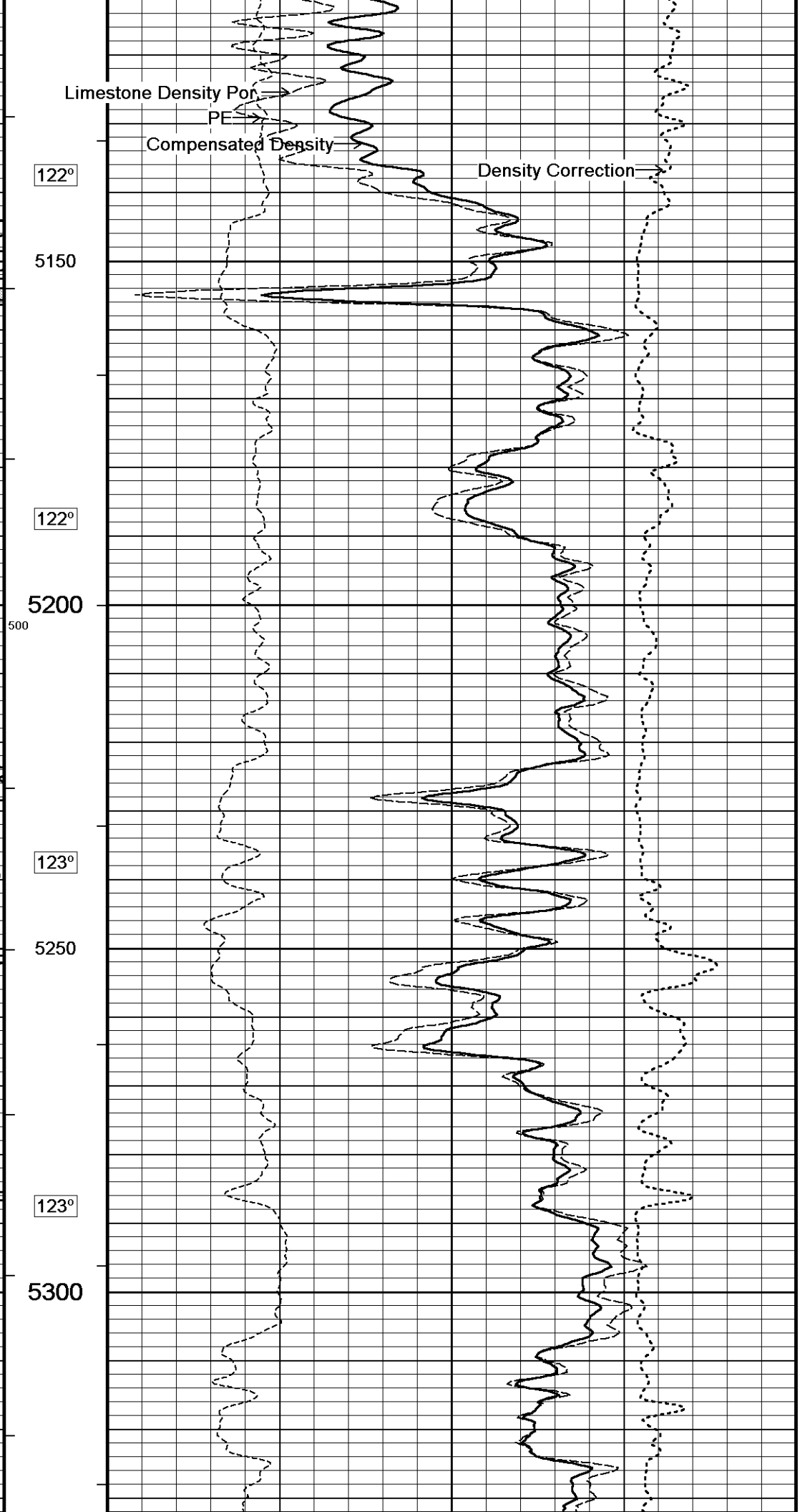
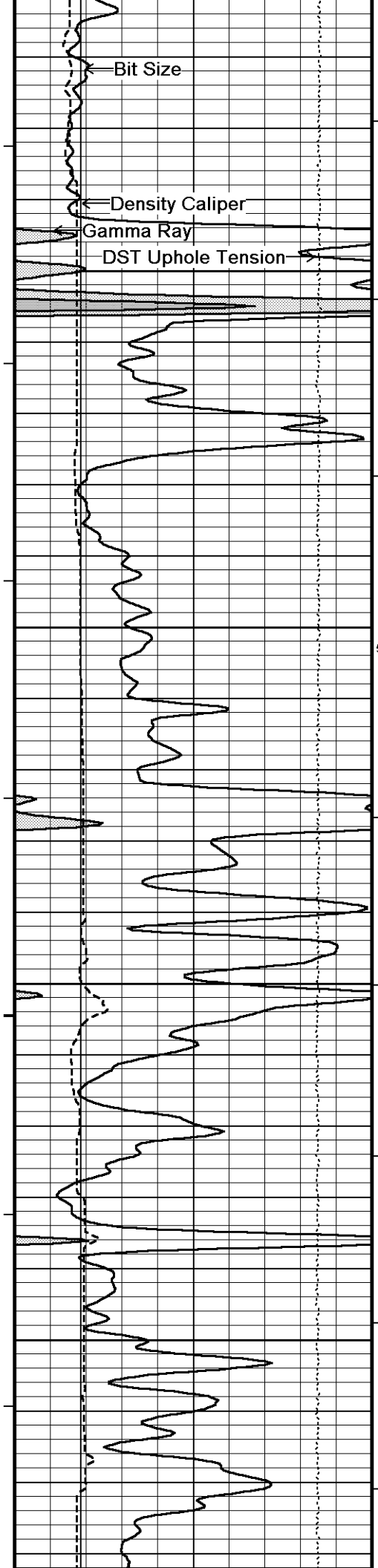
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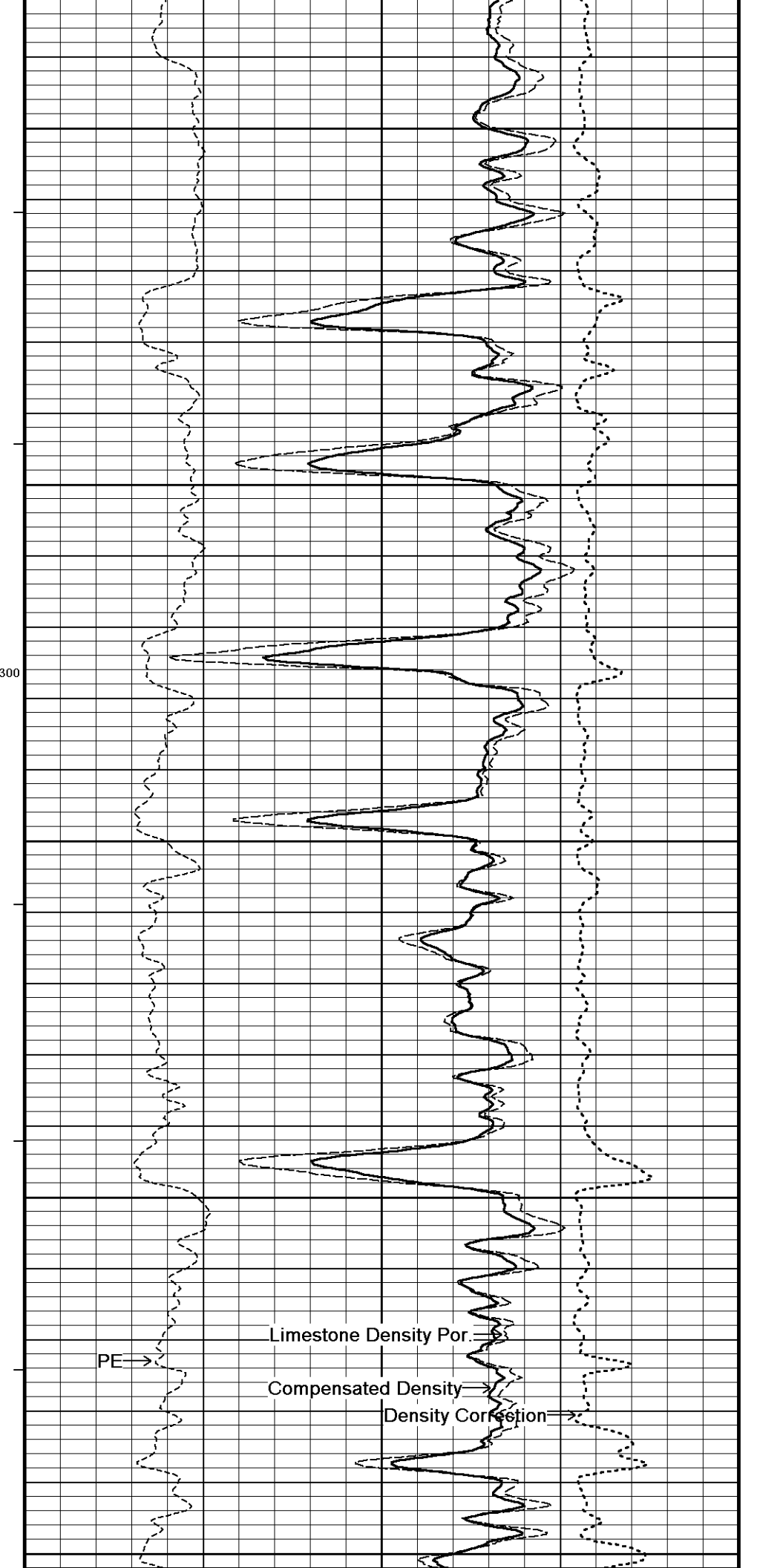
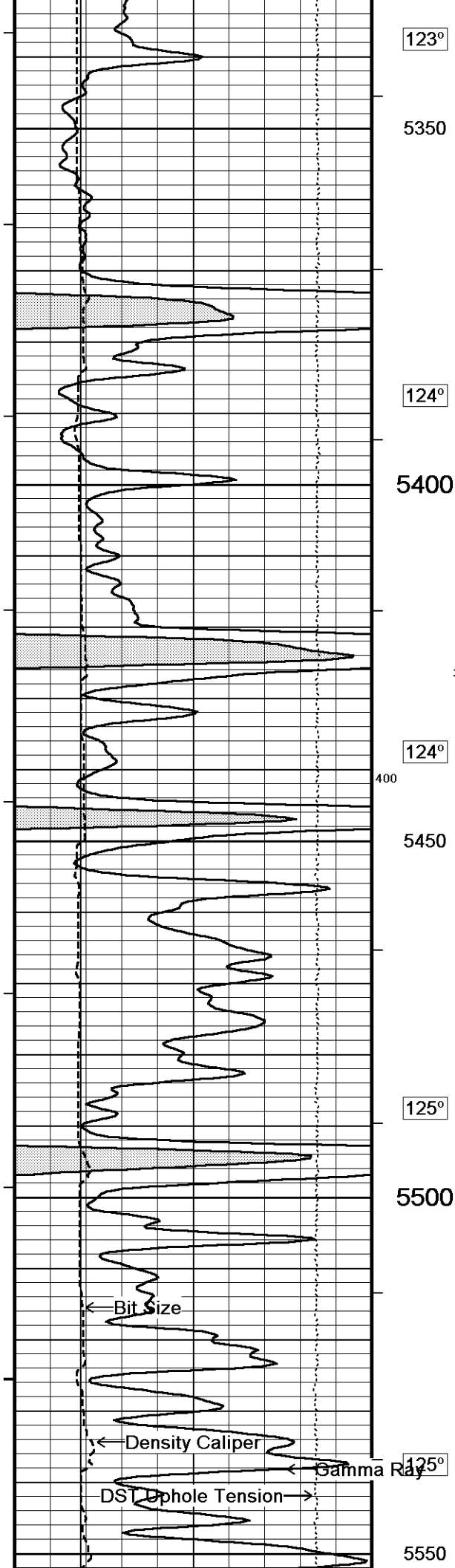


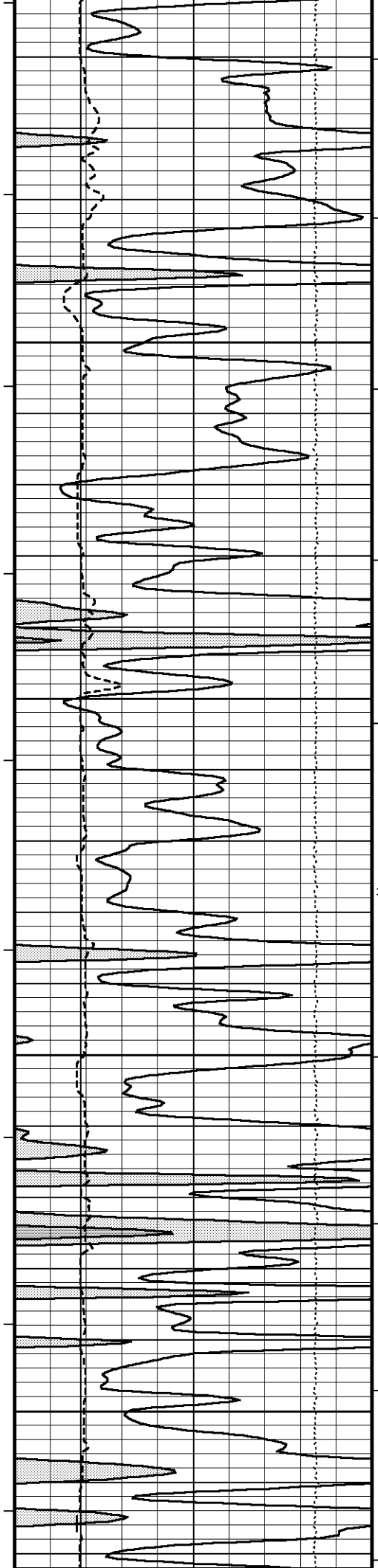












125°

5600

126°

5650

300

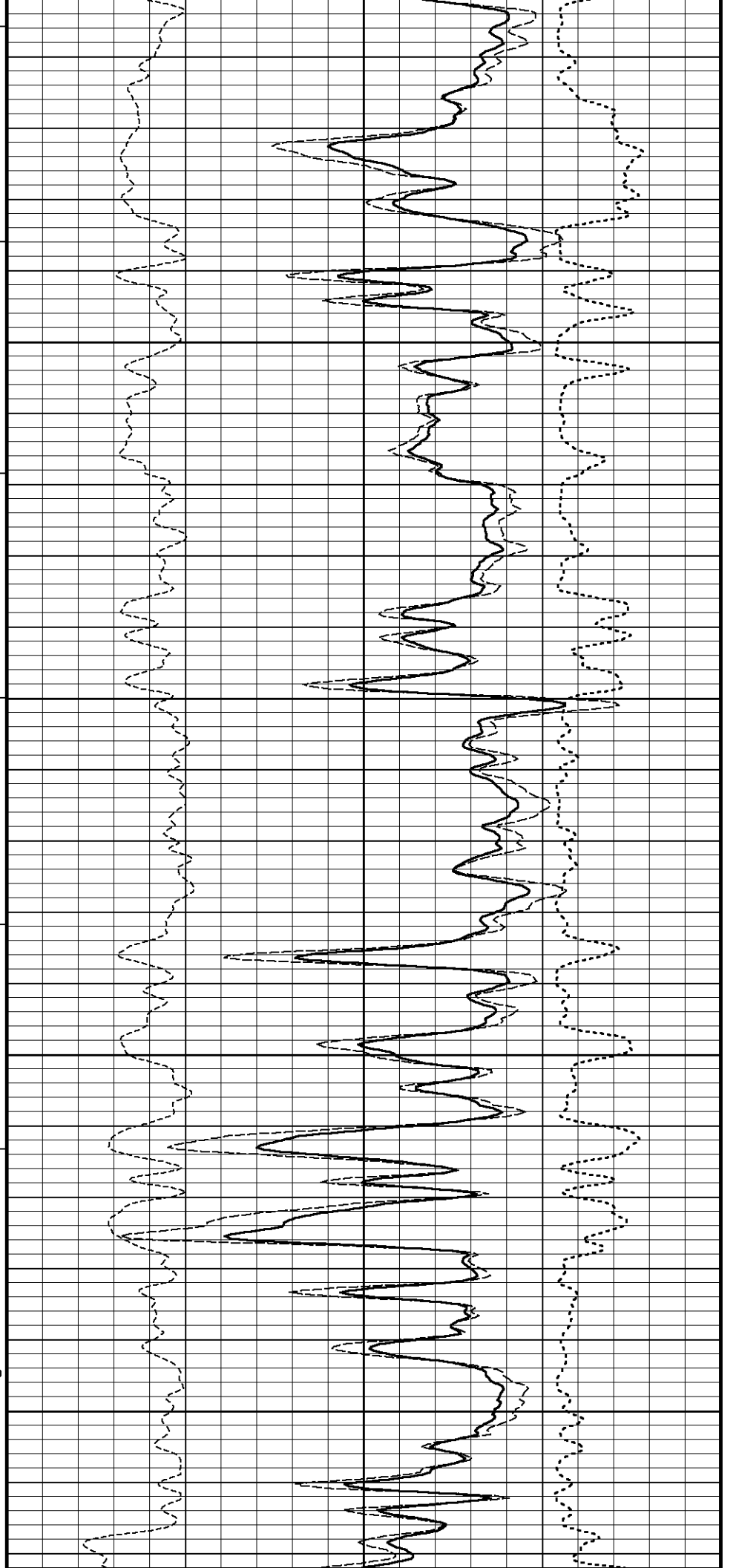
127°

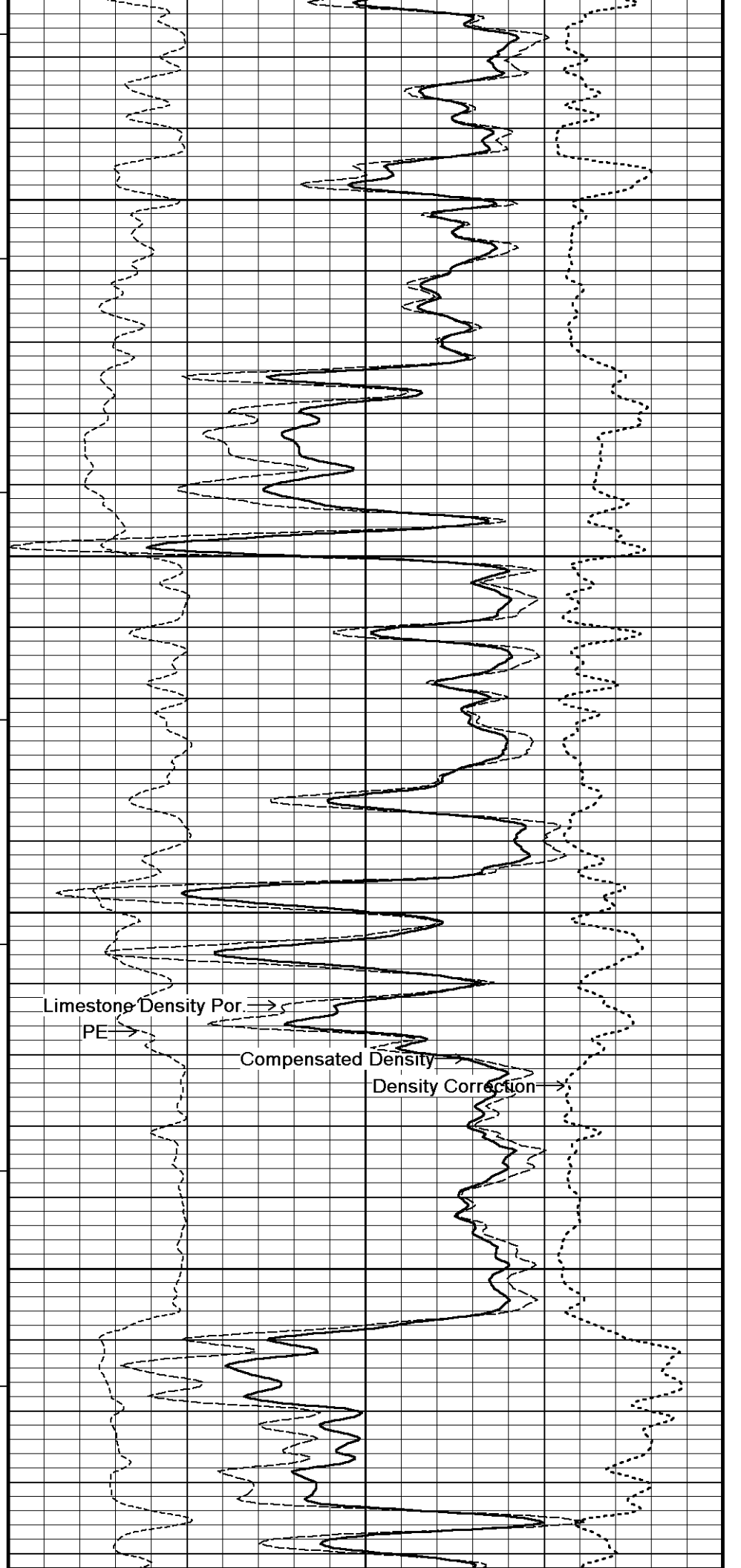
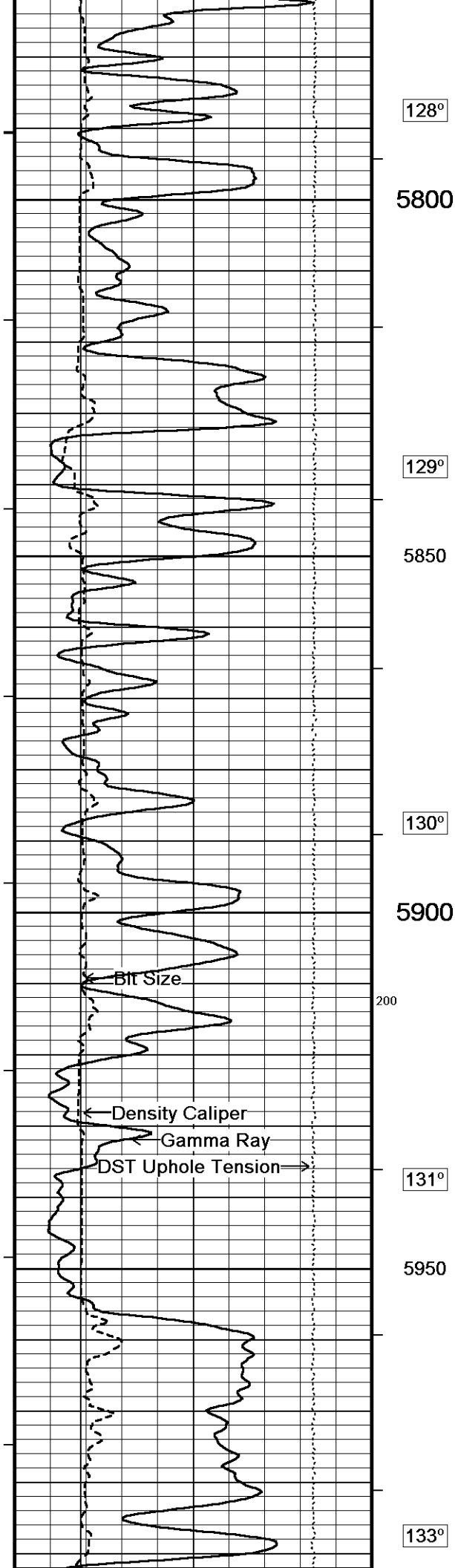
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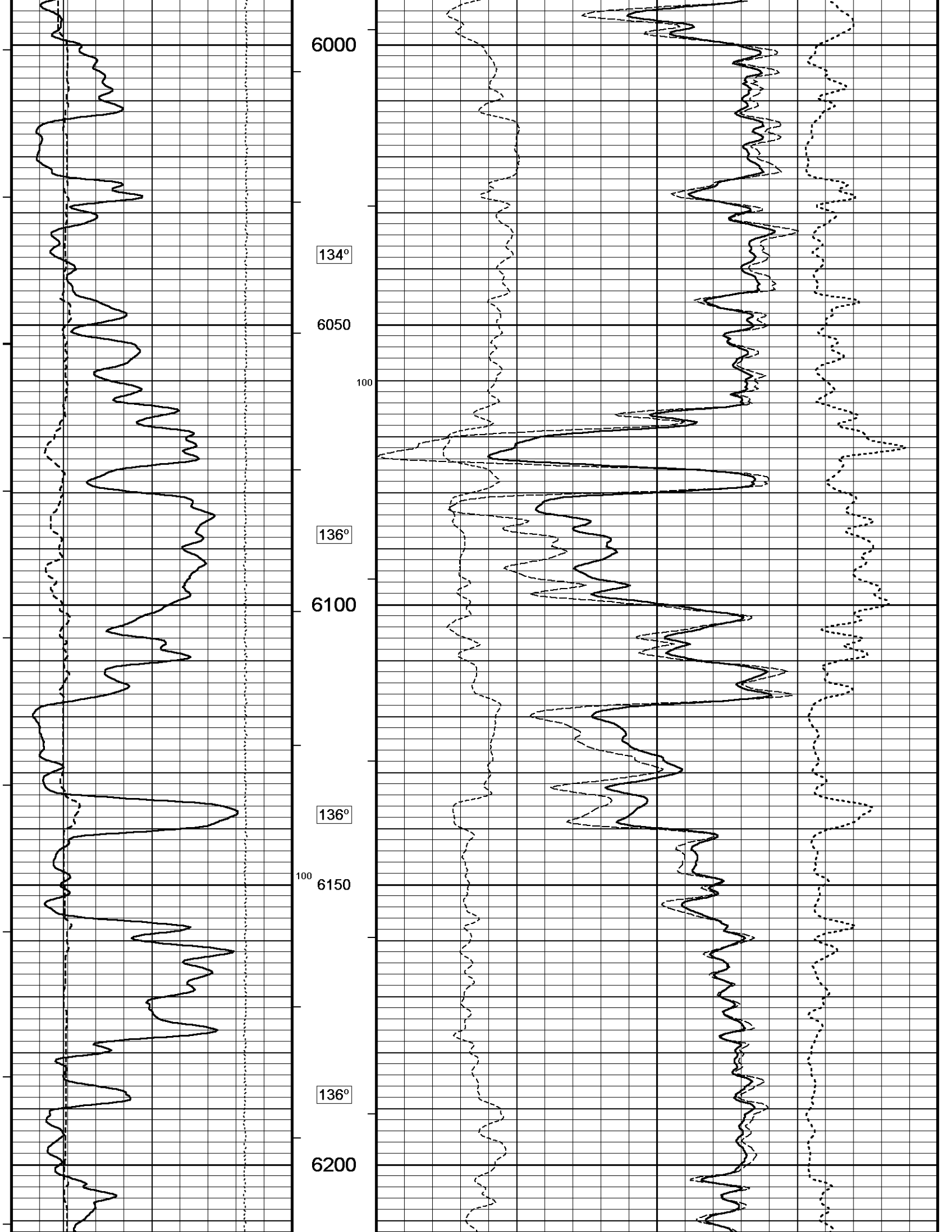
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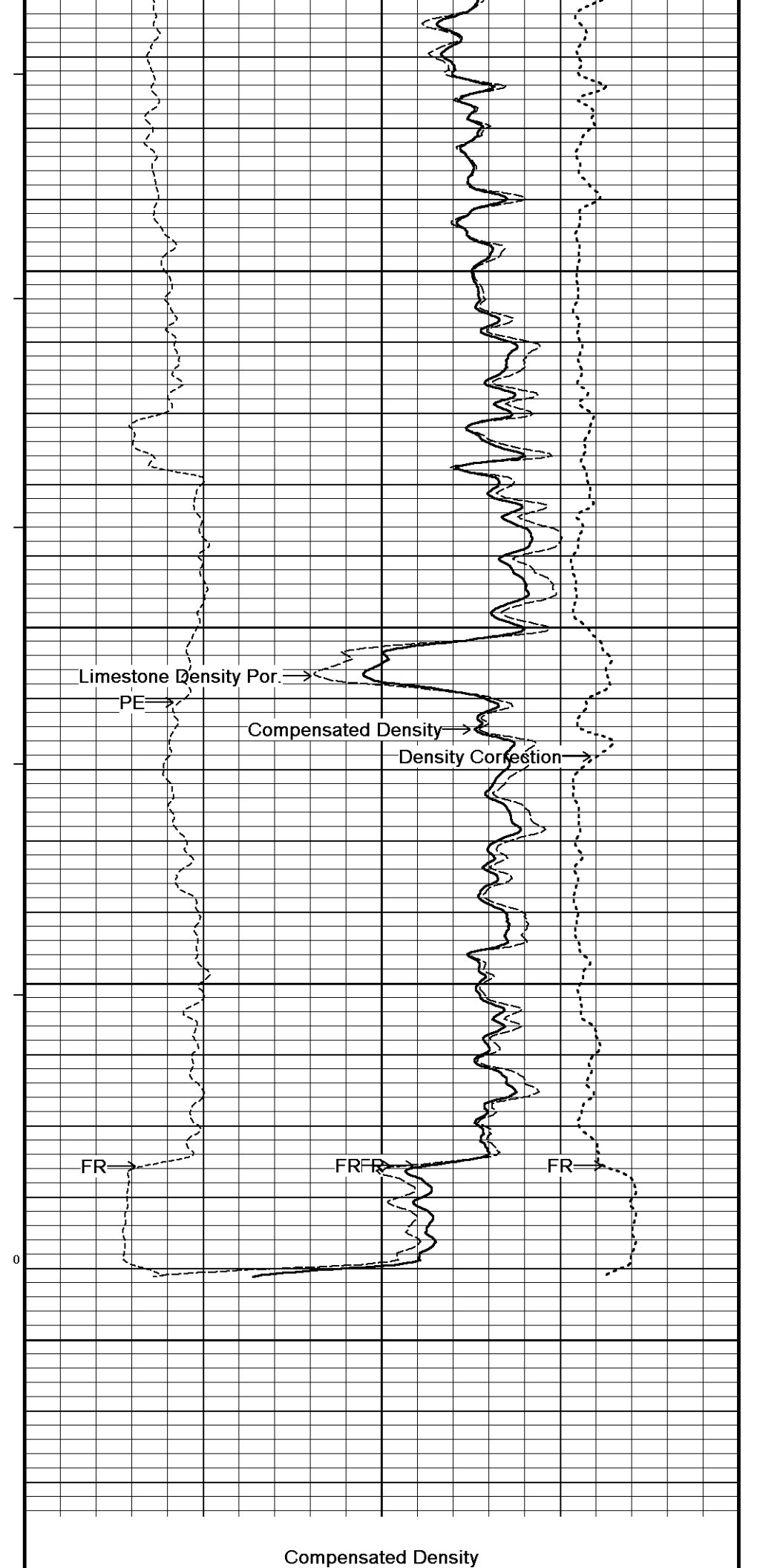
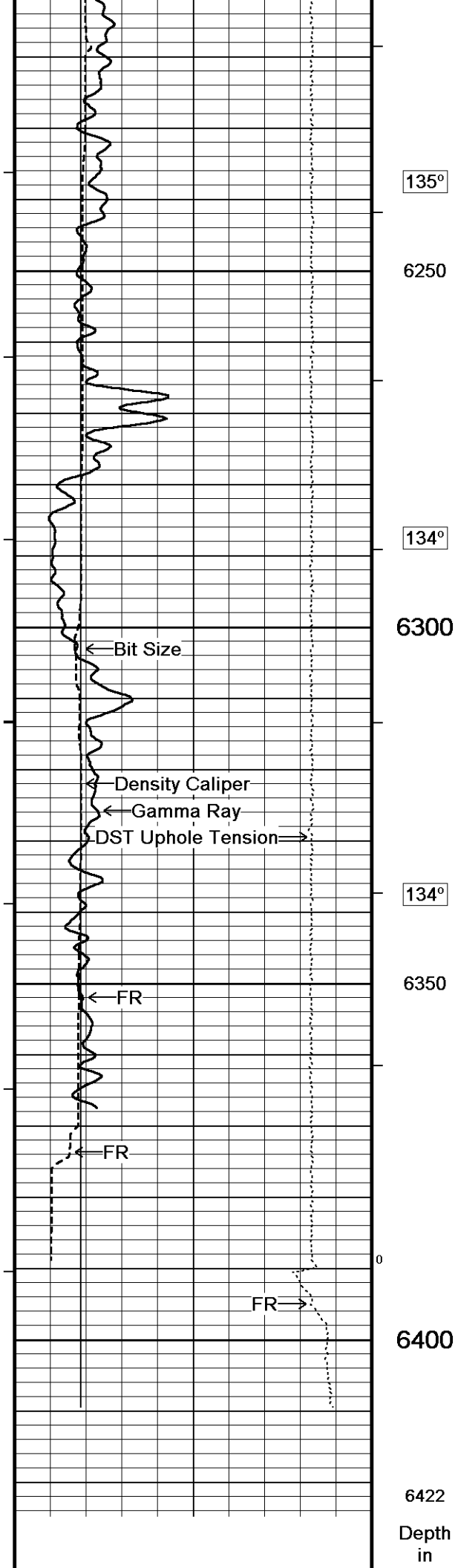
200

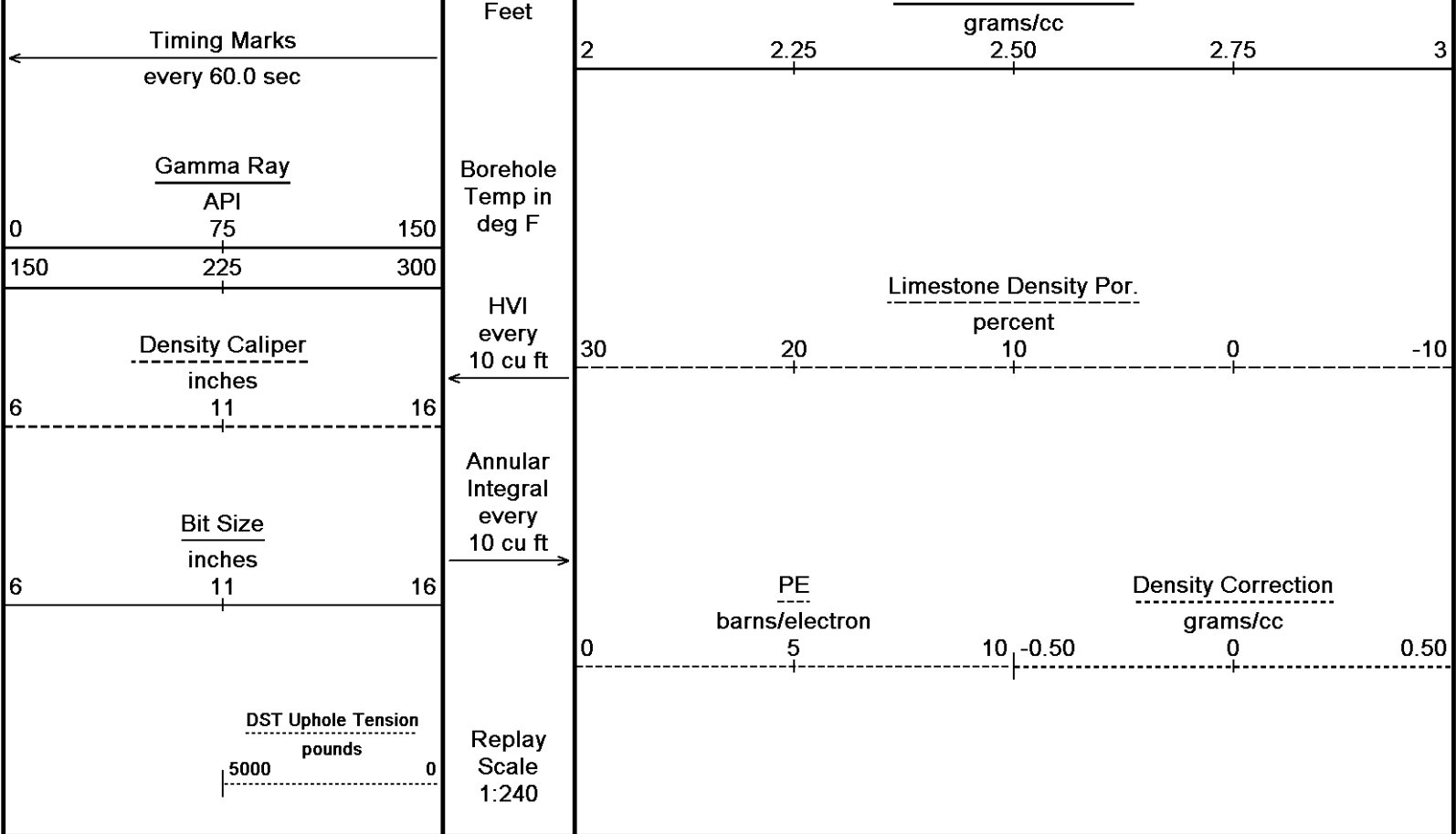
5750









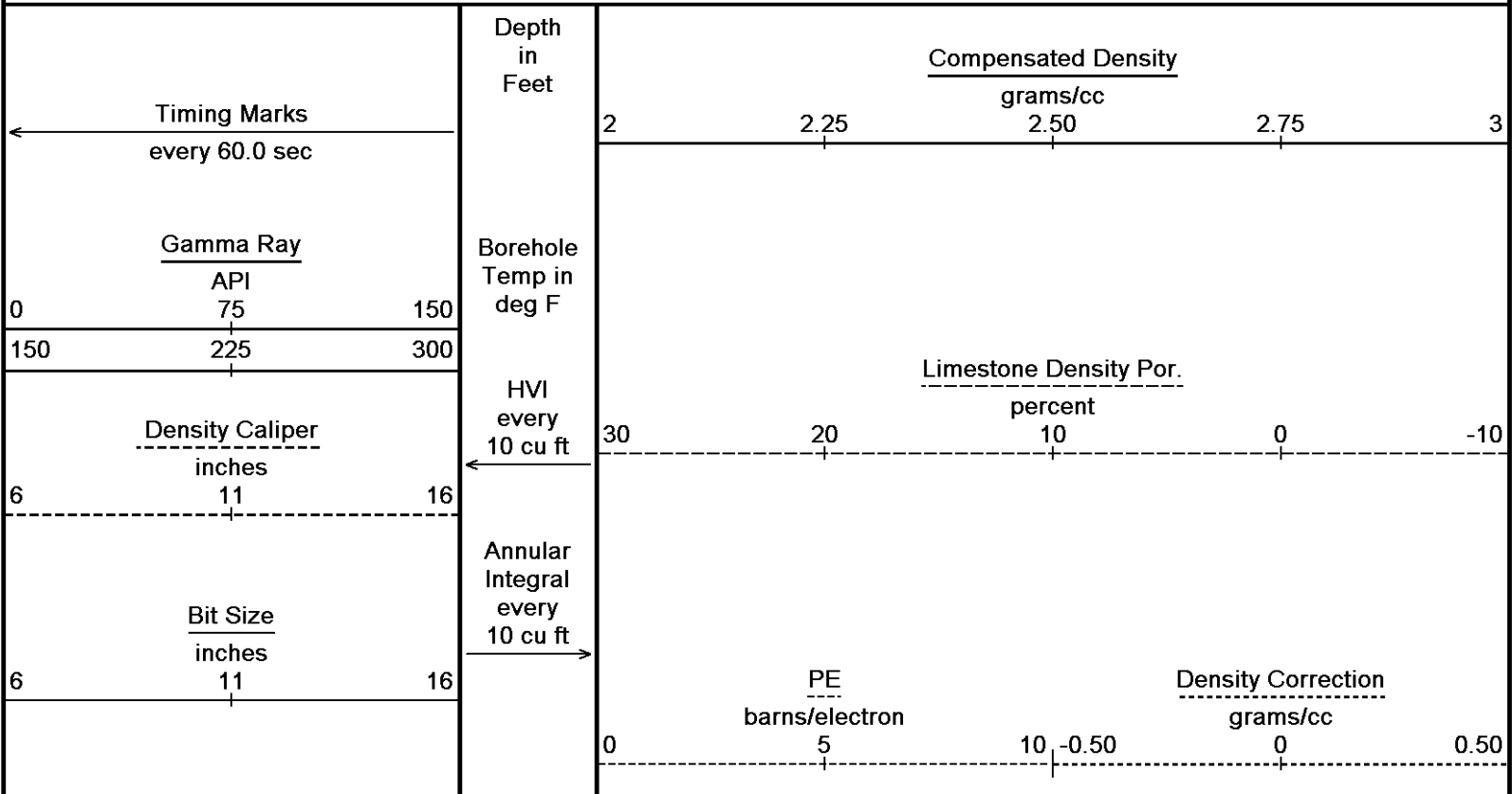


Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 25-JUL-2013 09:27
 Filename: C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_003.dta Recorded on 25-JUL-2013 06:42
 System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

↑ 5 INCH MAIN ↑

↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 25-JUL-2013 09:27
 Filename: C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_002.dta Recorded on 25-JUL-2013 04:15
 System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583



DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

5700

126°

200

5750

127°

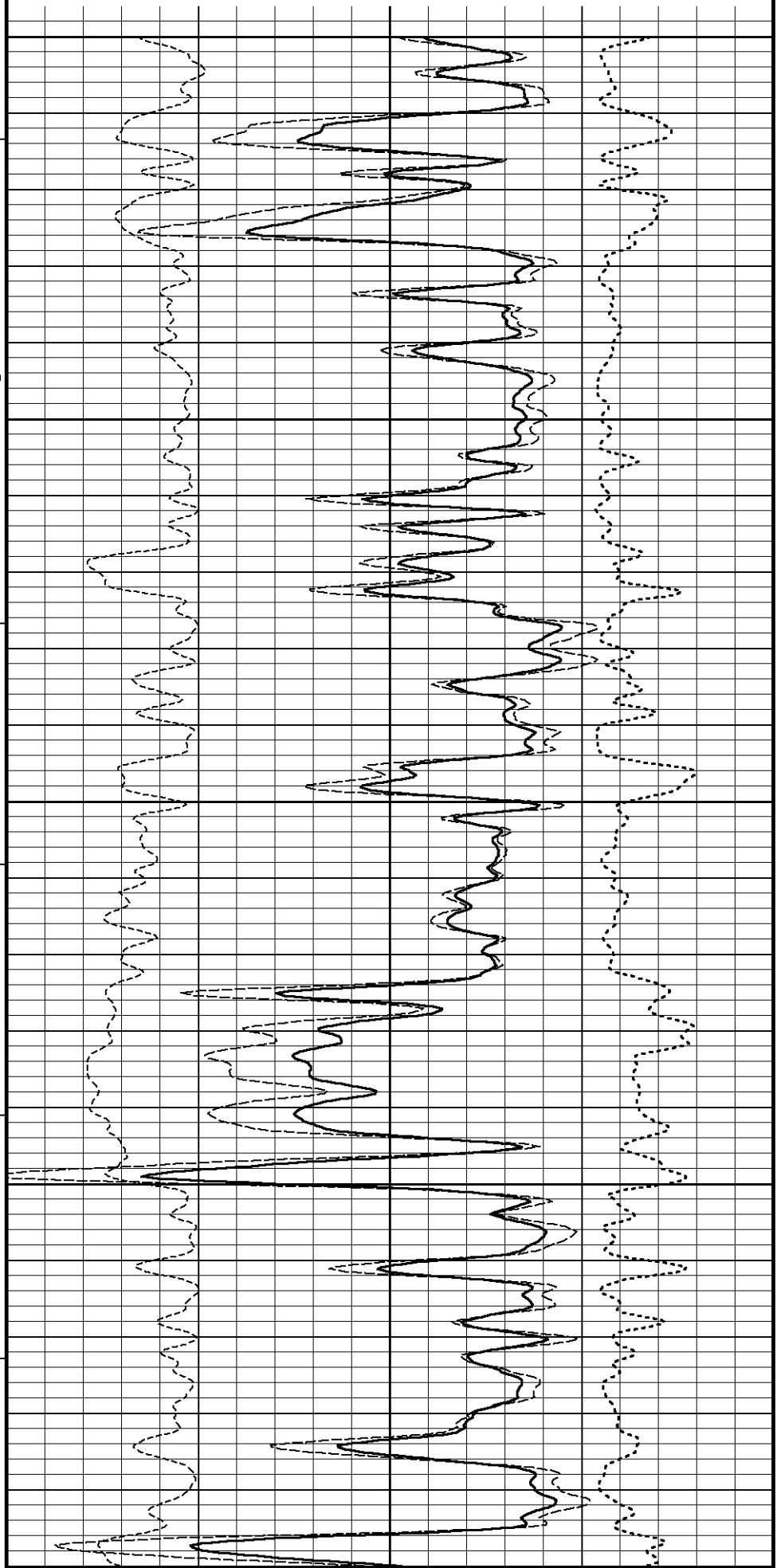
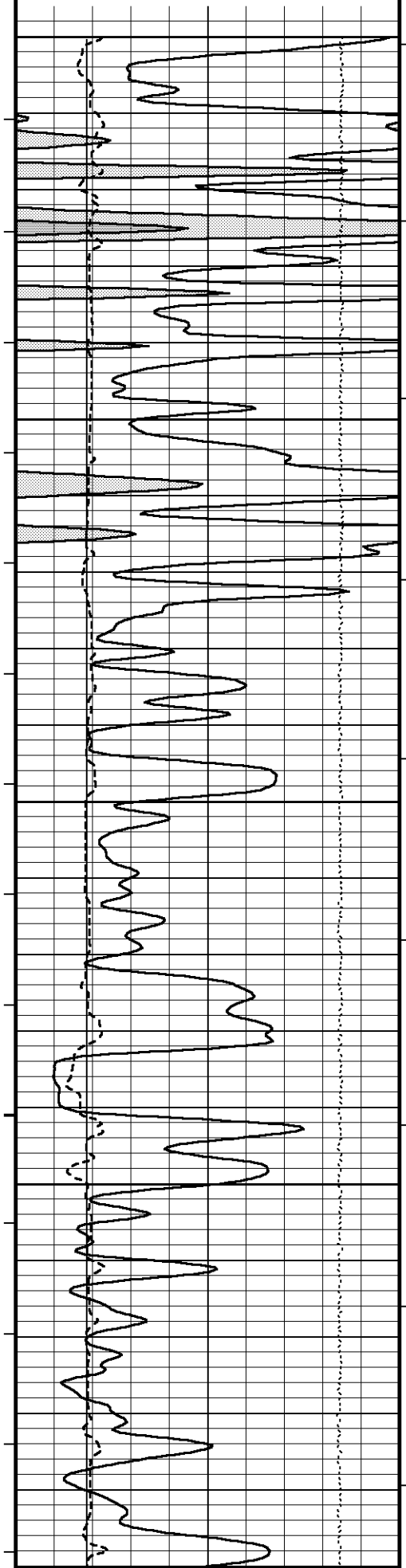
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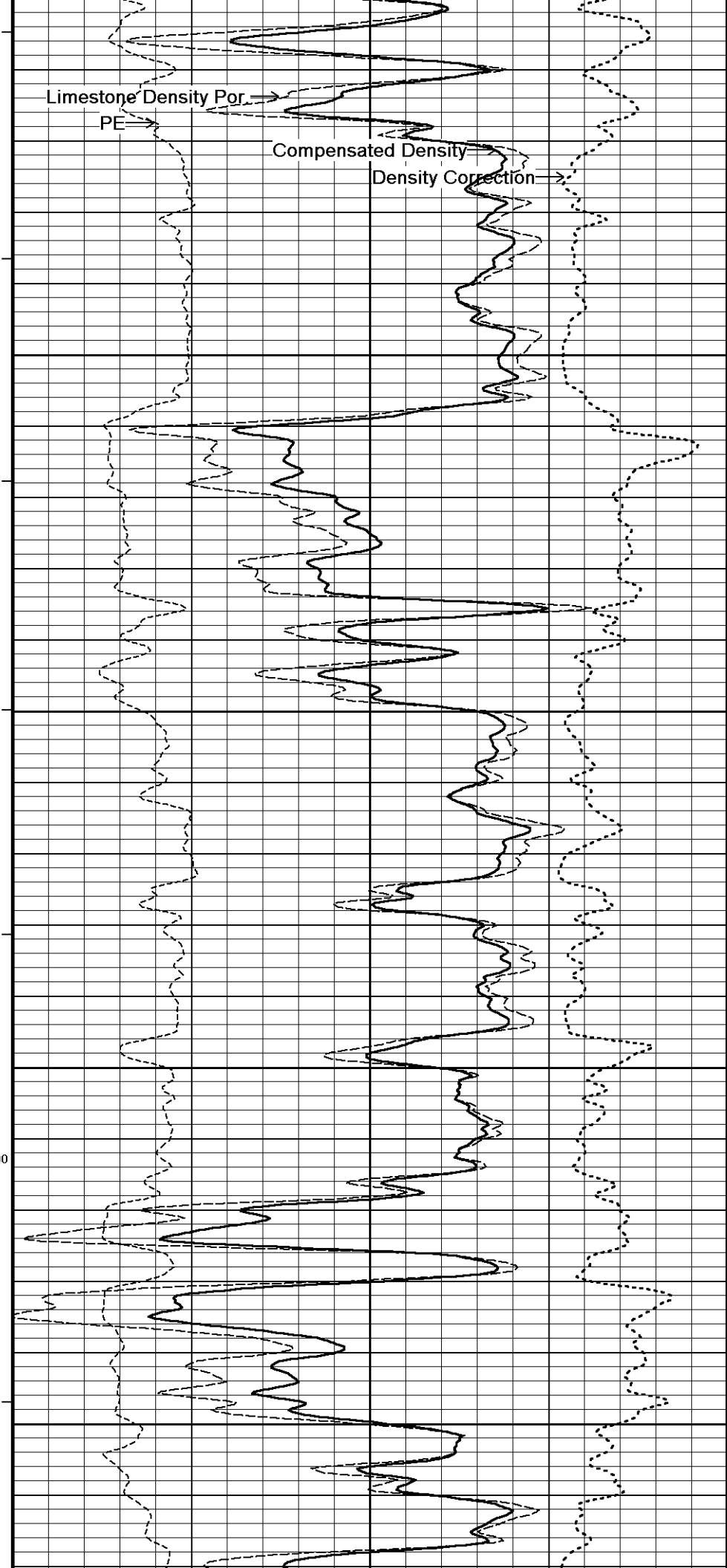
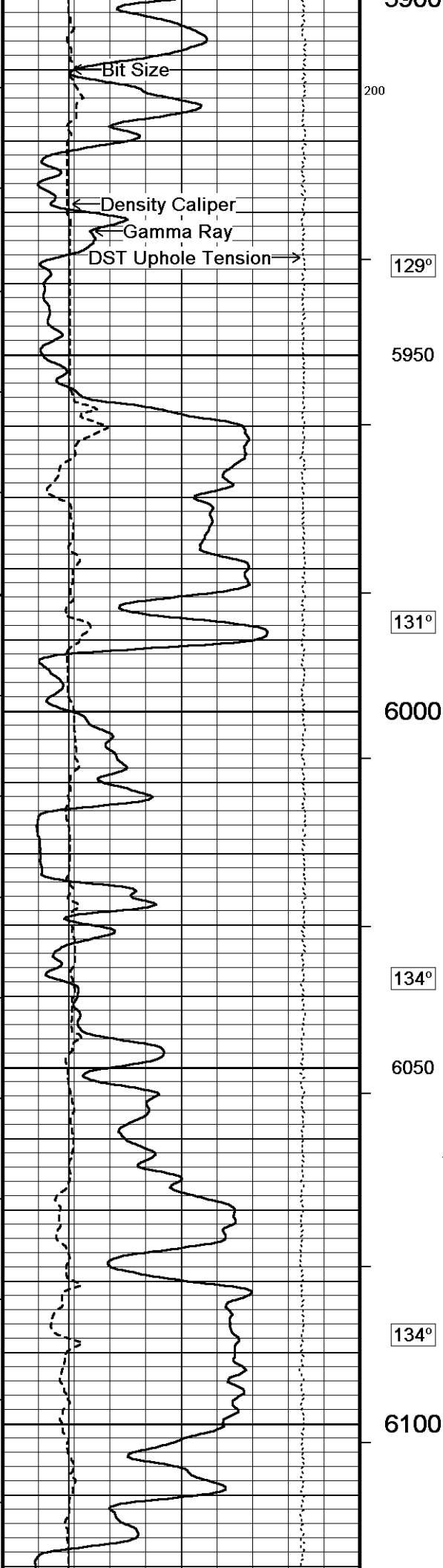
127°

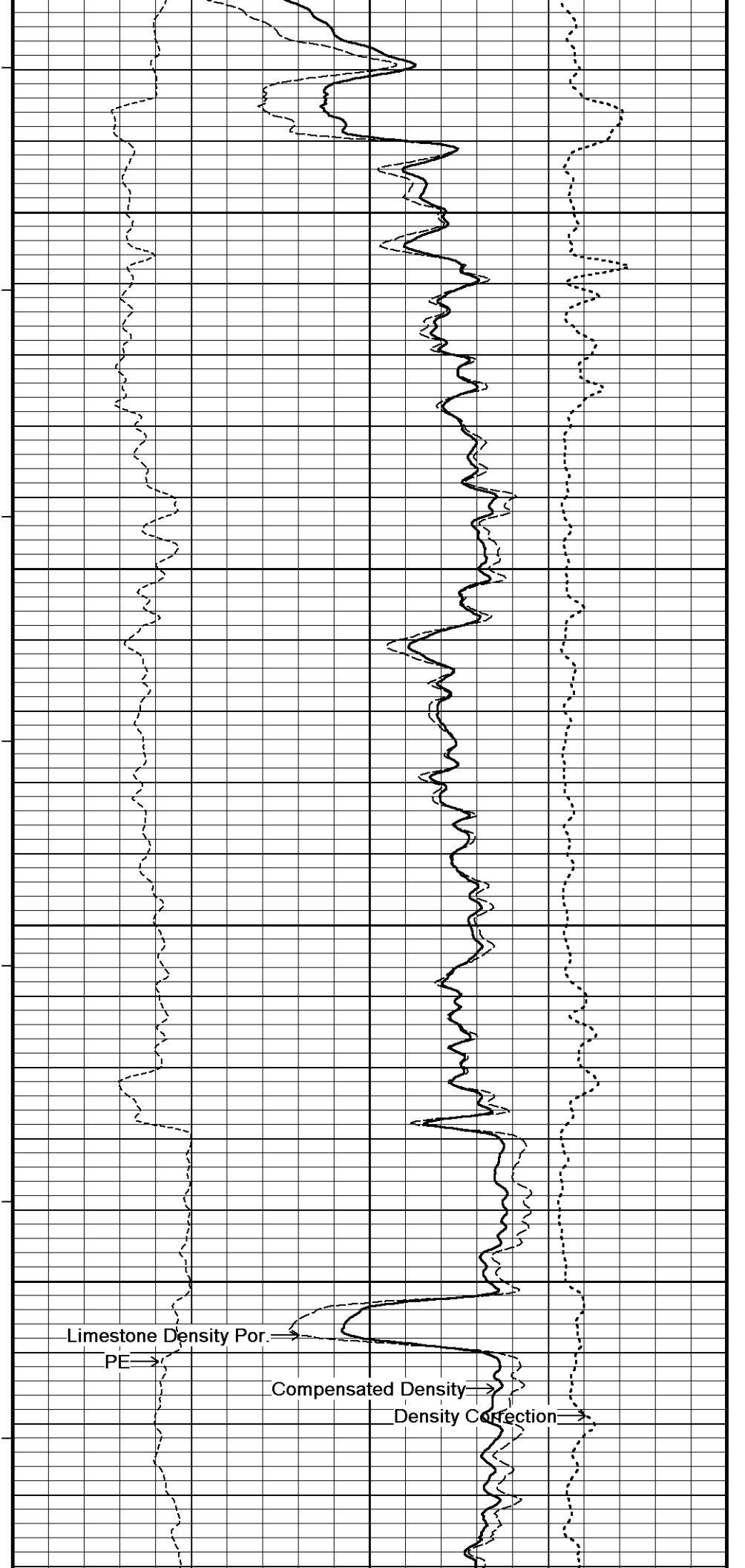
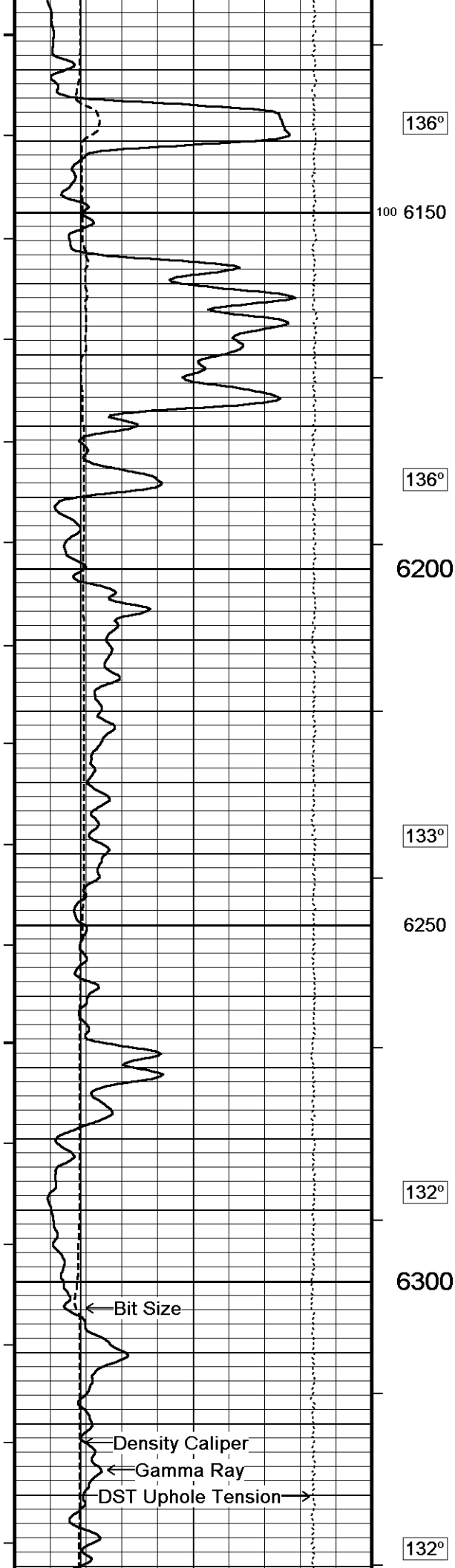
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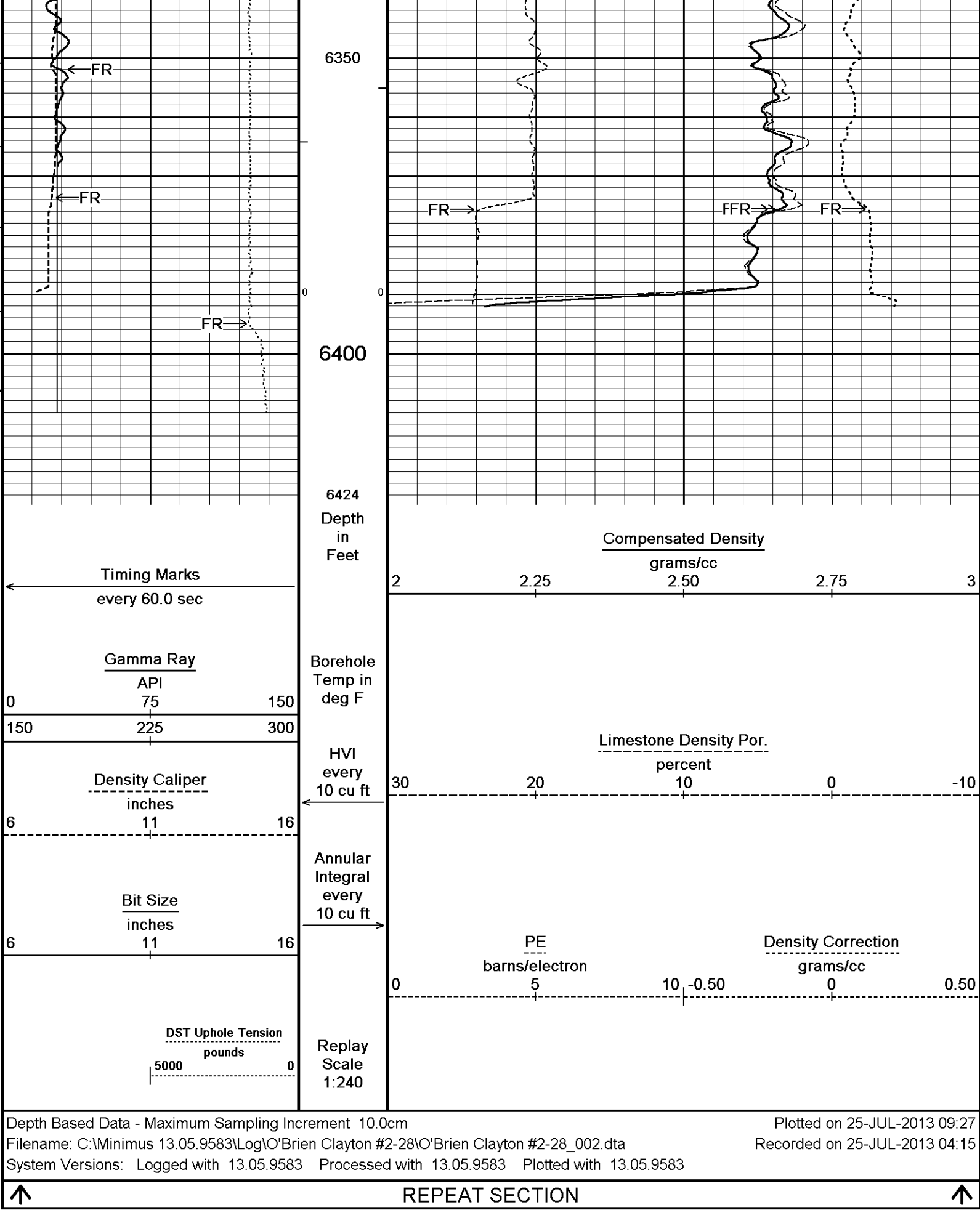
128°

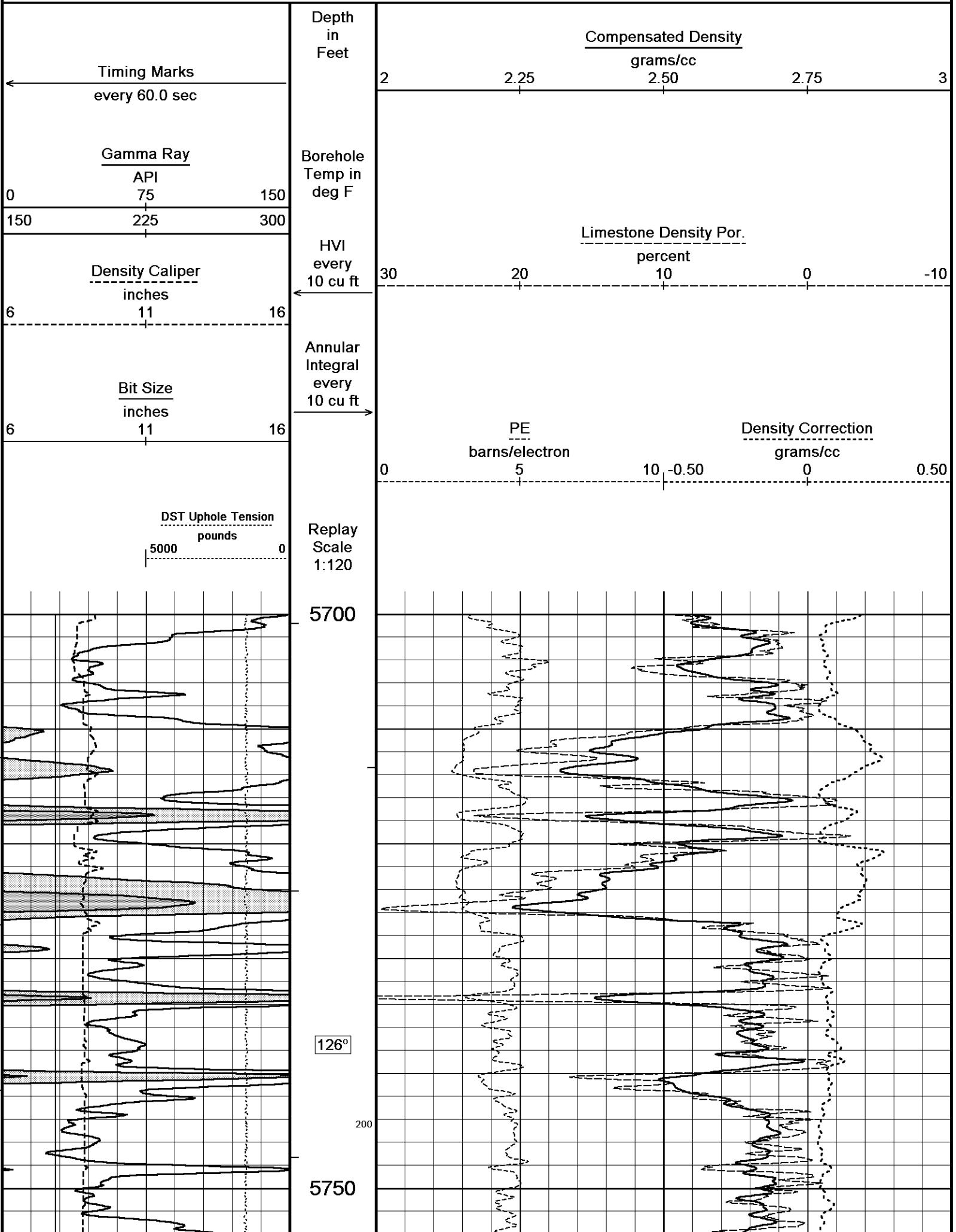
5900

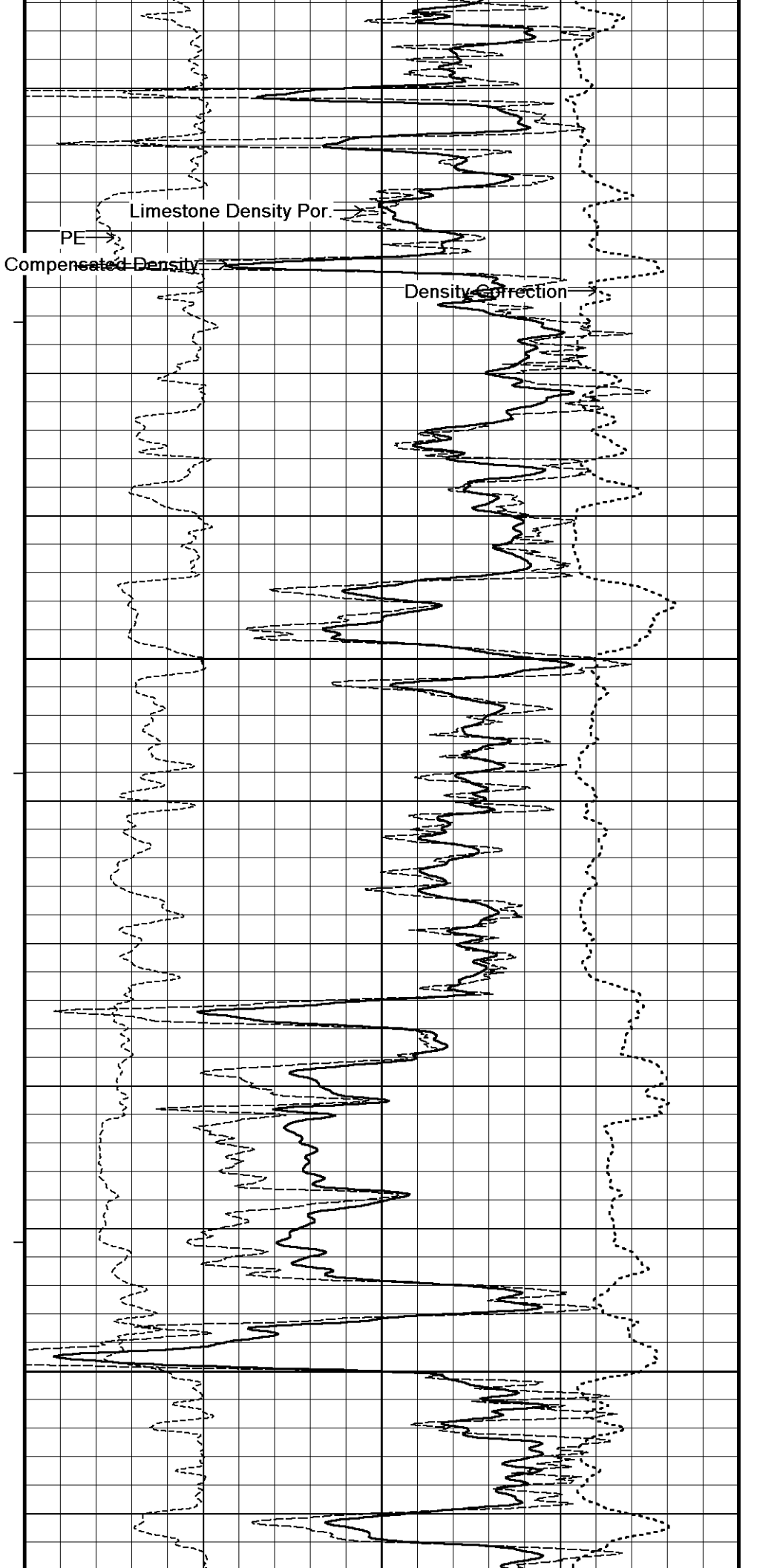
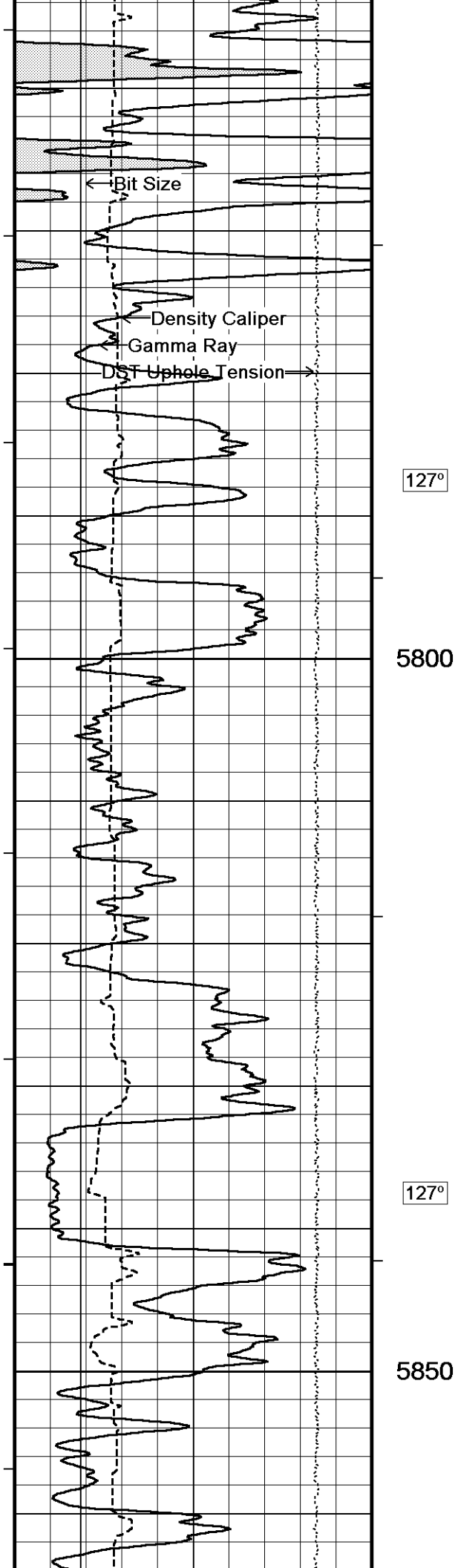


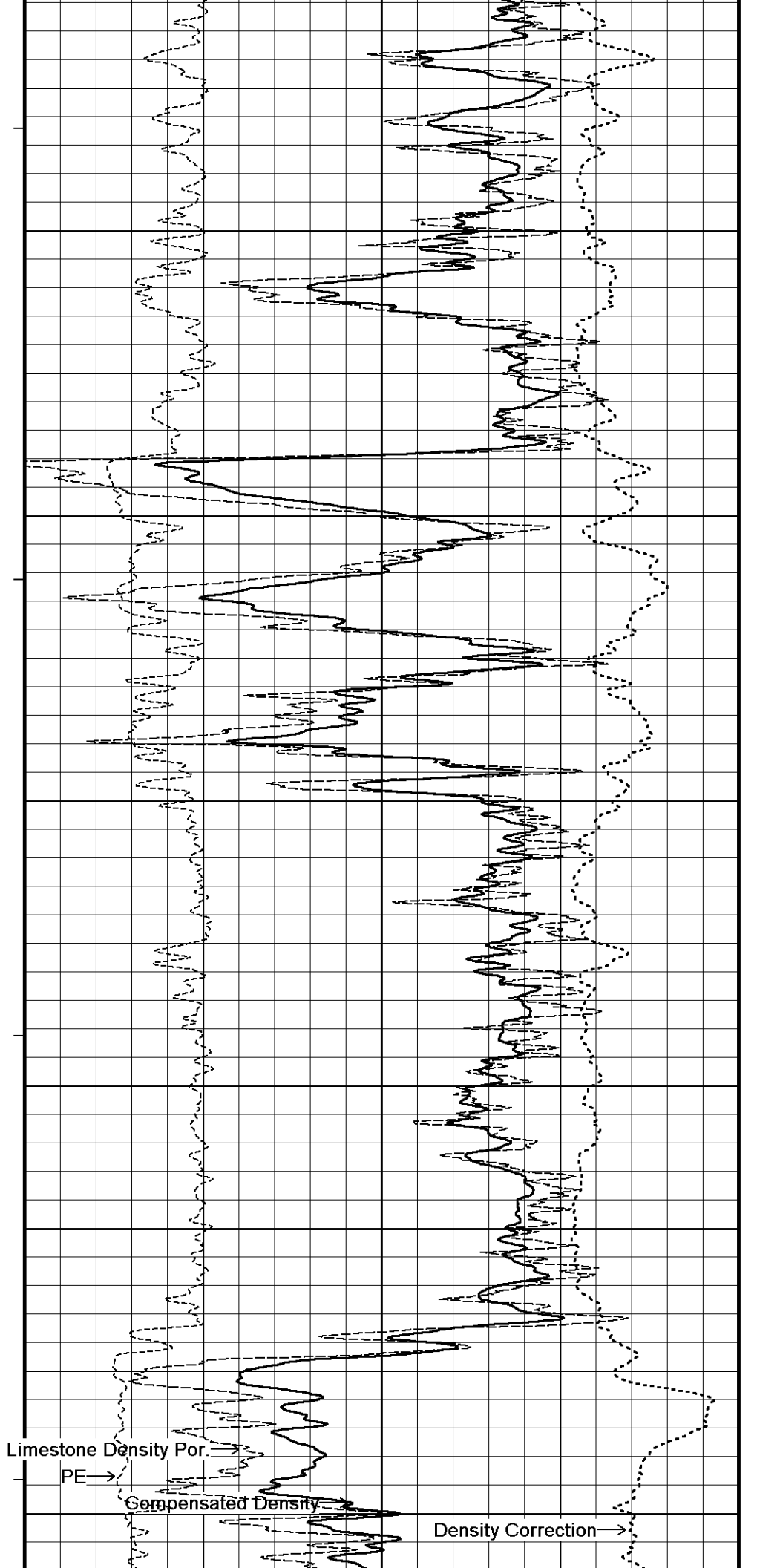
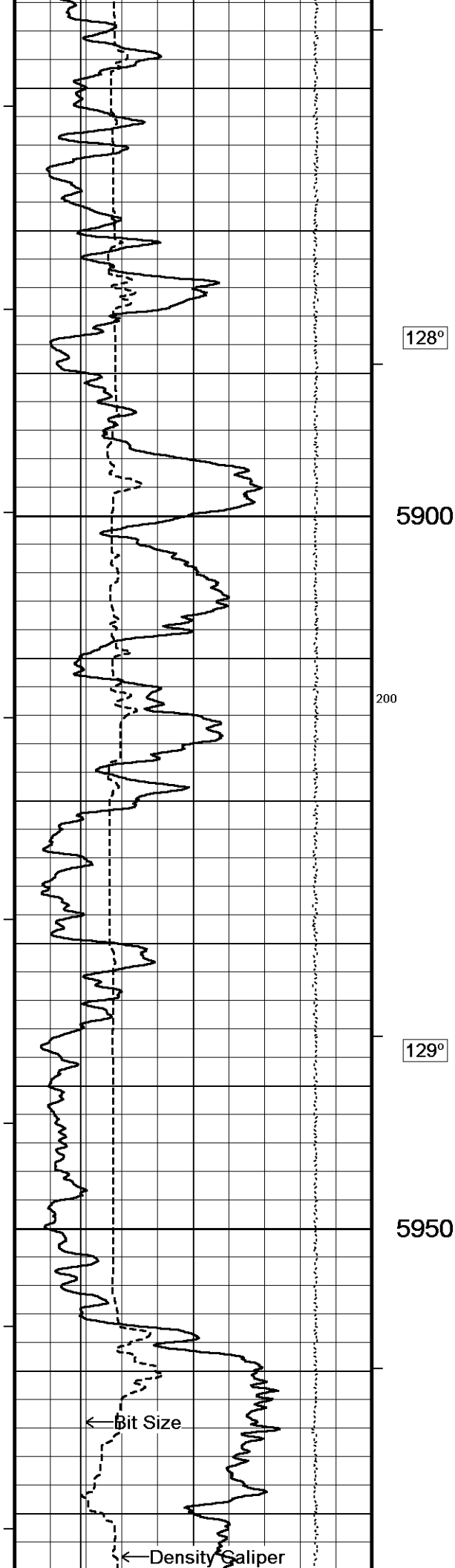


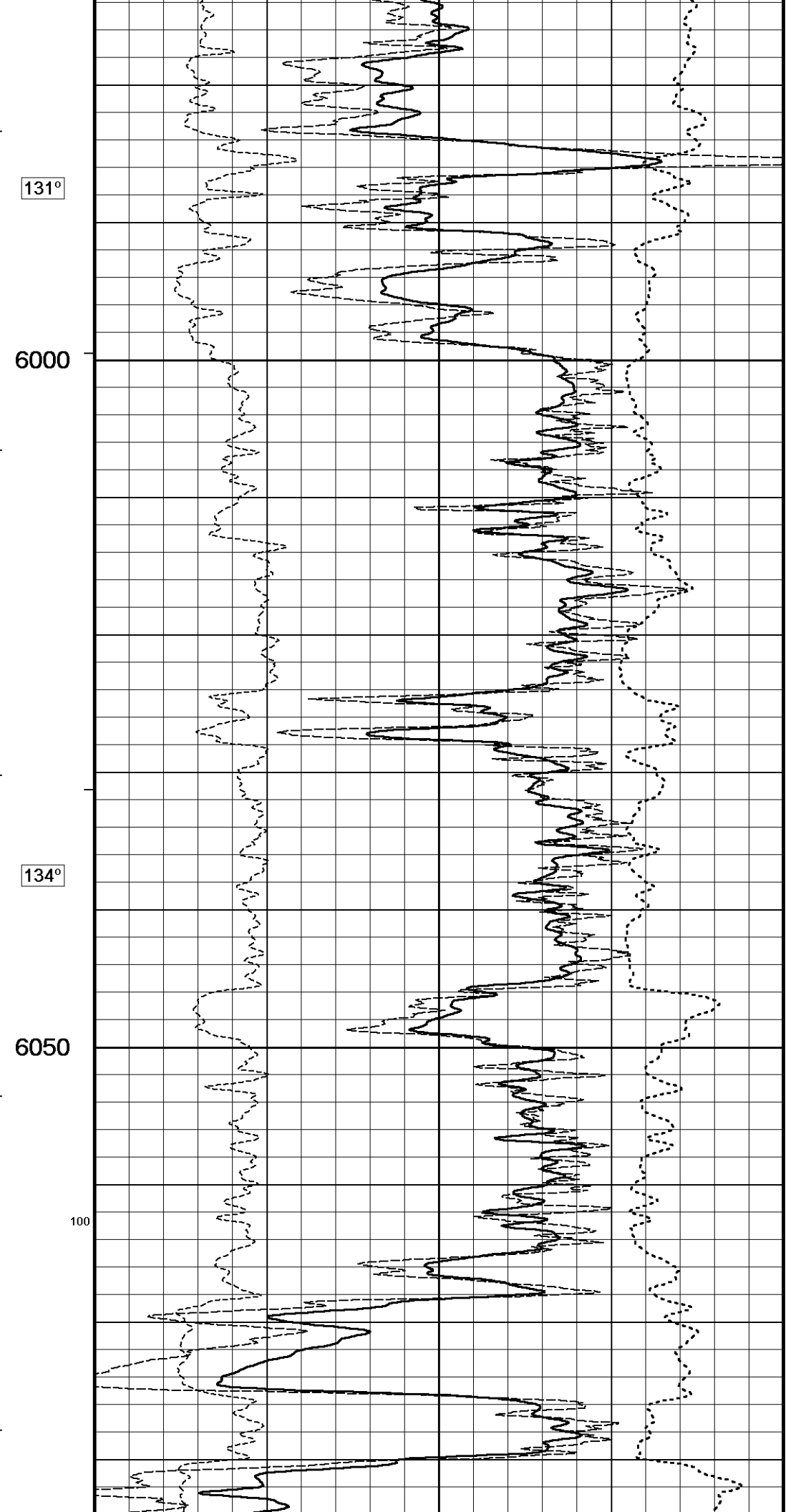
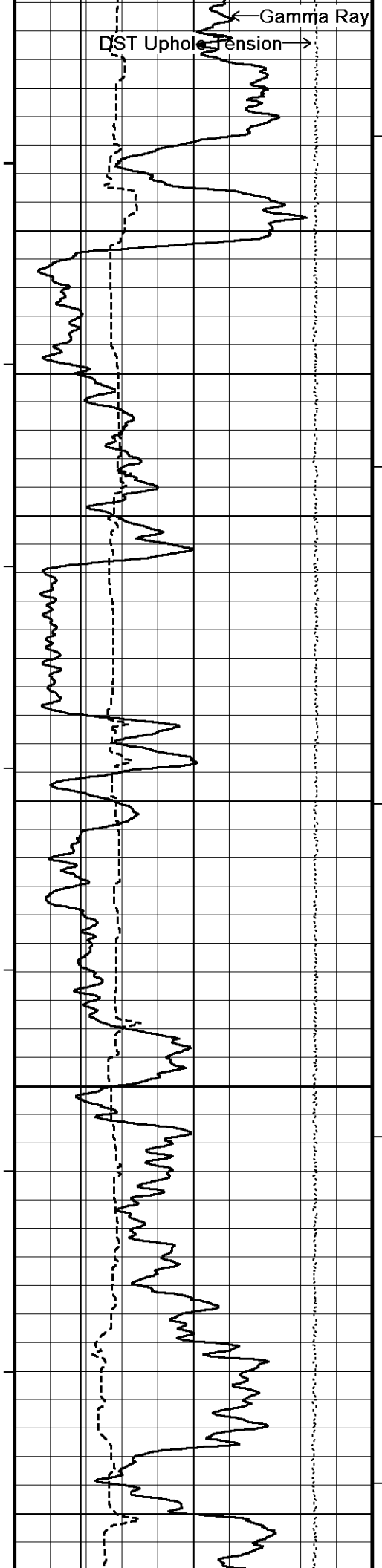


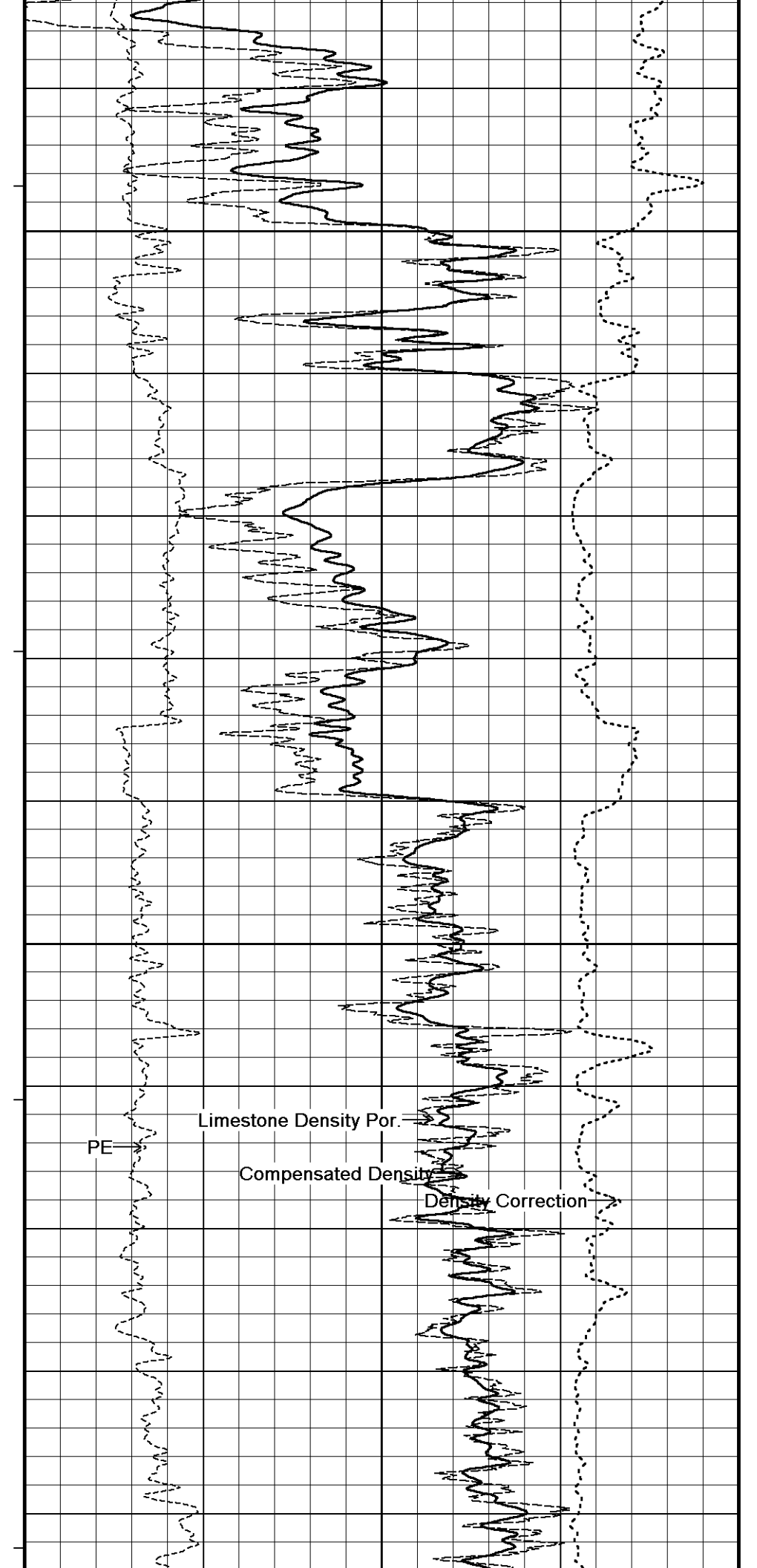
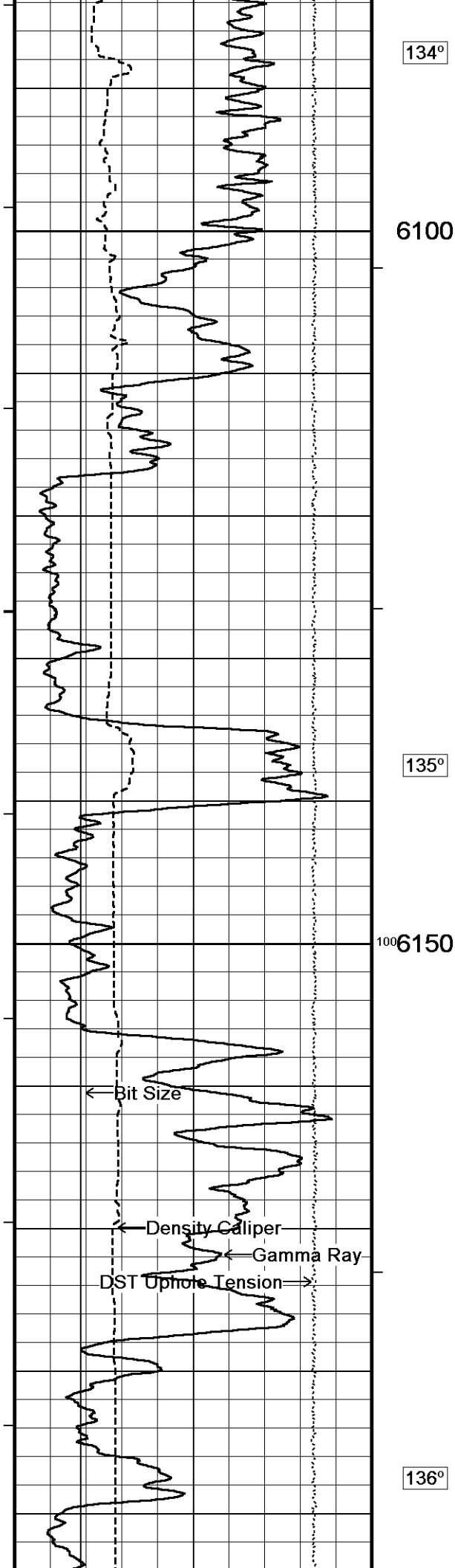


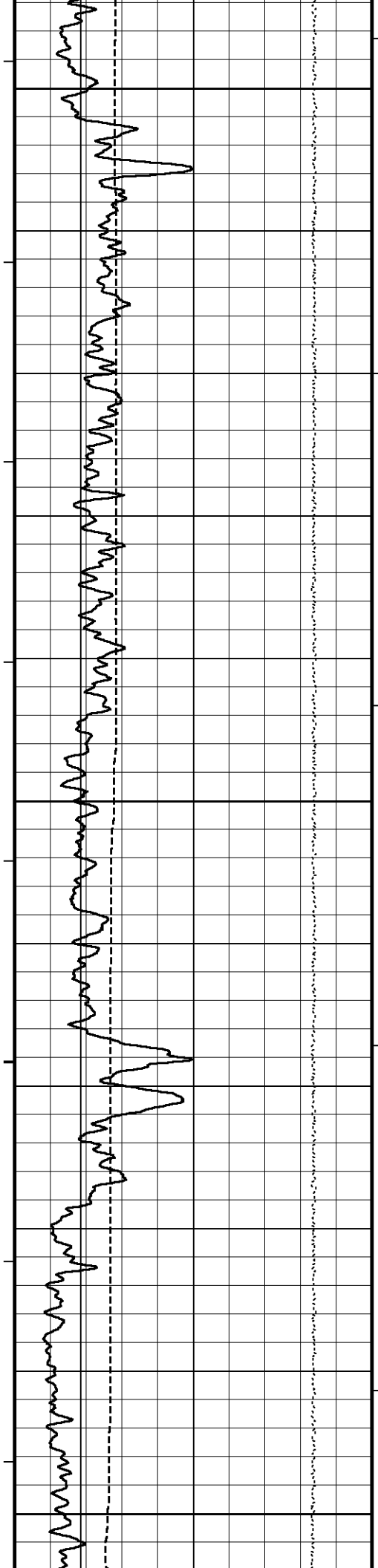












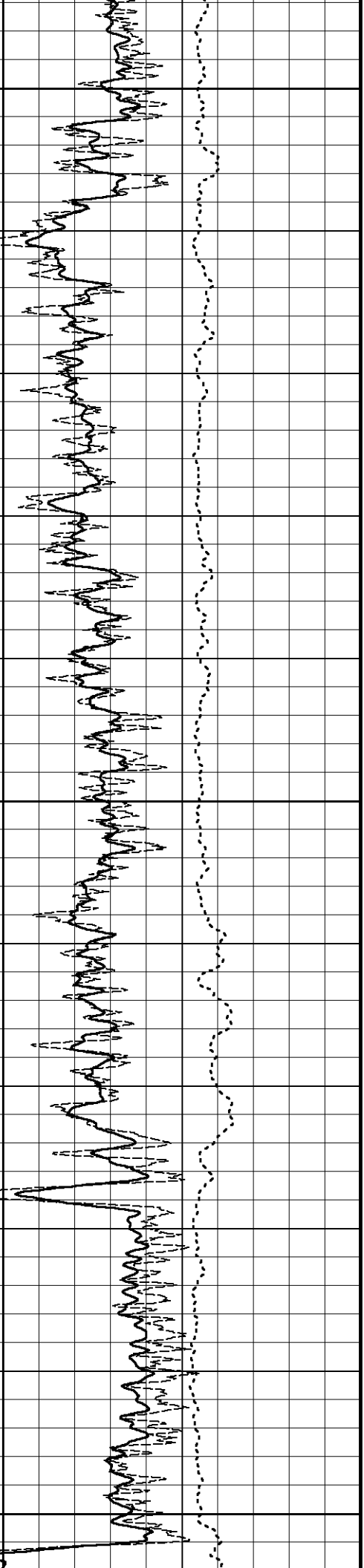
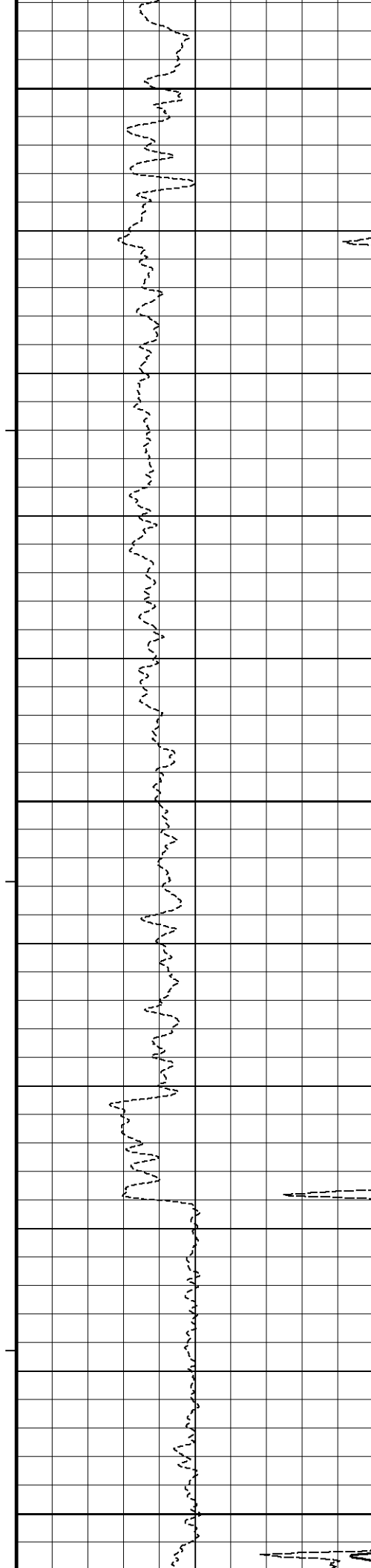
6200

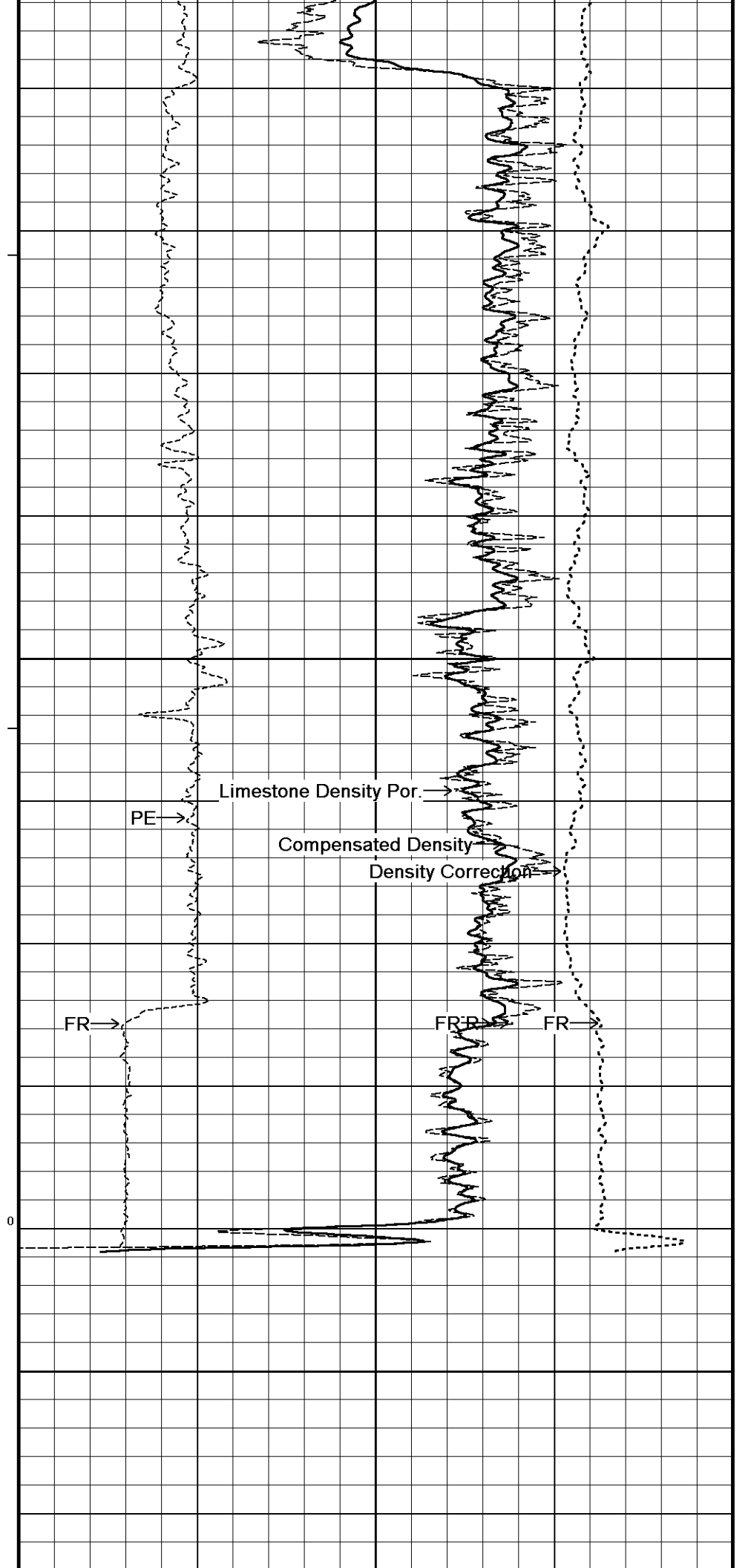
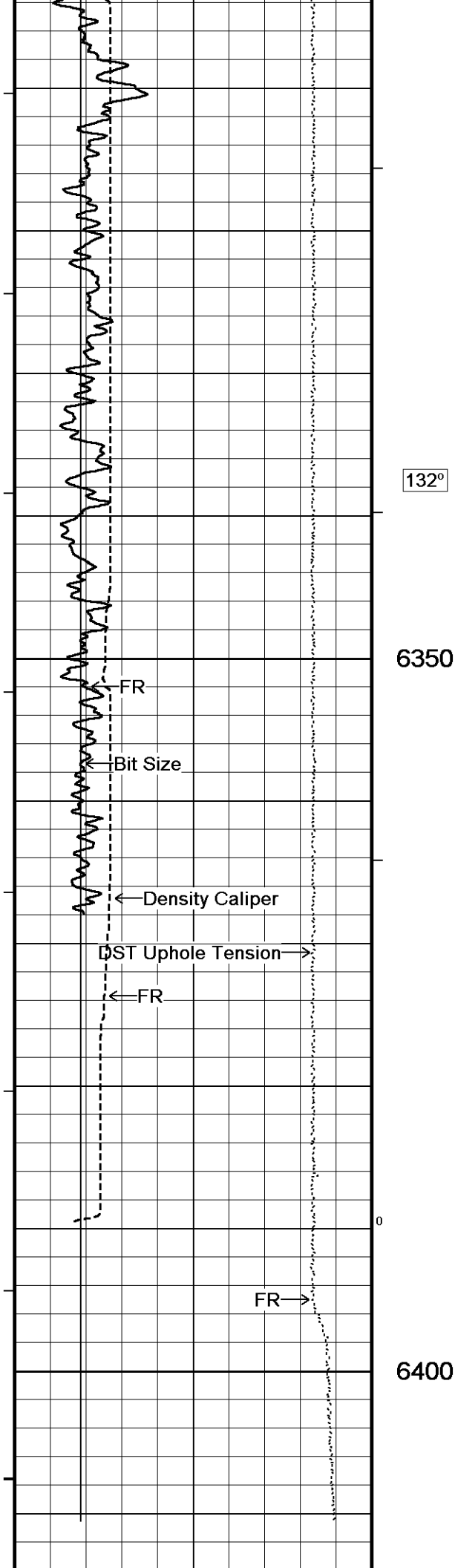
133°

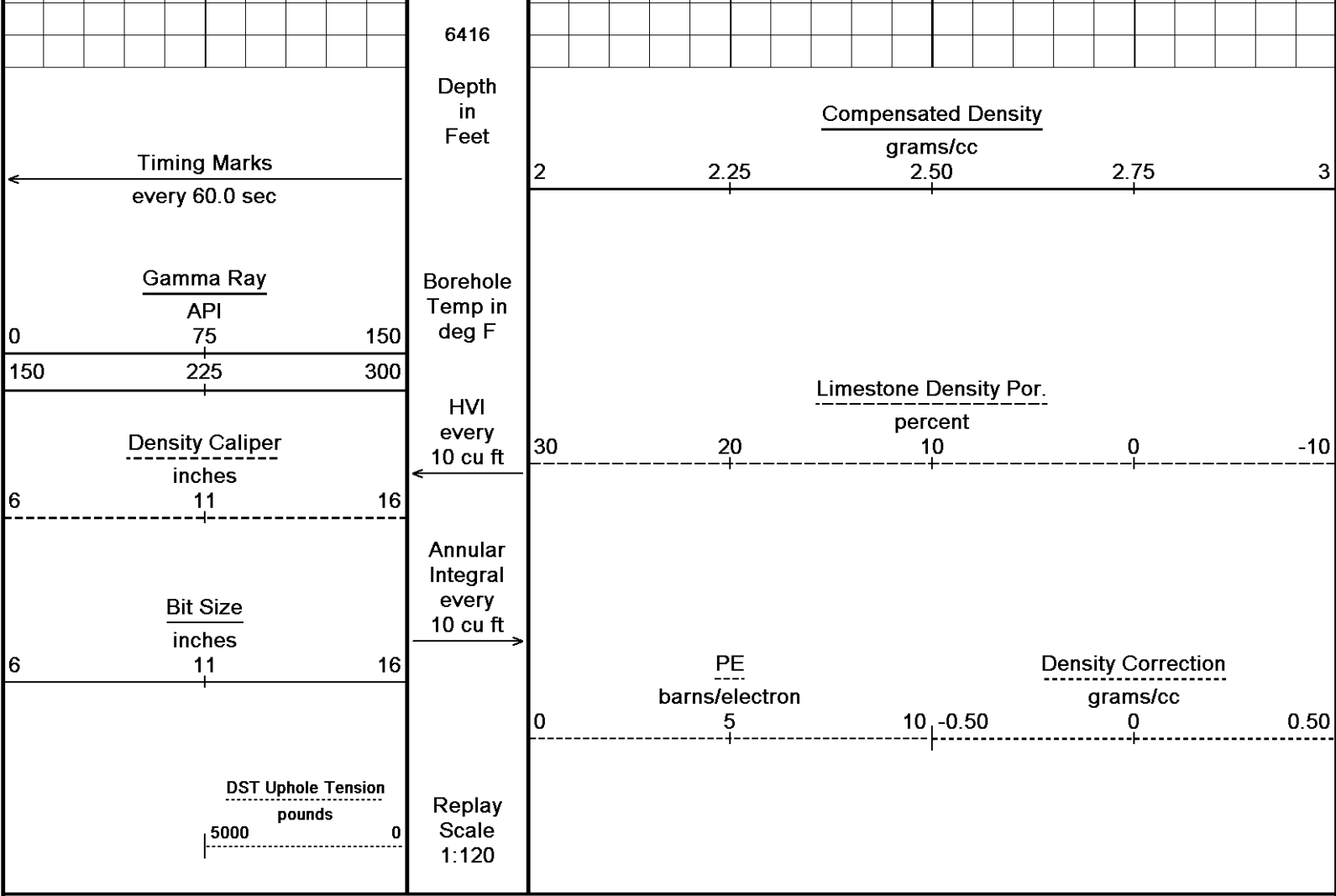
6250

132°

6300







Depth Based Data - Maximum Sampling Increment 2.5cm
Filename: C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_001.dta
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

10 INCH HI-RES

BEFORE SURVEY CALIBRATION		
C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_002.dta		
General Constants All 000		Last Edited on 25-JUL-2013,03:30
General Parameters		
Mud Resistivity	0.810	ohm-metres
Mud Resistivity Temperature	99.000	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	4.500	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	

Down-hole Tension Calibration SMS 0		Field Calibration on 21-JUL-2013 20:00
Reading No	Measured	Calibrated (lbs)

1	13811.52	0.00	
2	14365.27	471.80	
Gamma Calibration MCG-B 39			Field Calibration on 24-JUL-2013 13:57
	Measured	Calibrated (API)	
Background	68	46	
Calibrator (Gross)	1137	771	
Calibrator (Net)	1070	725	
Gamma Constants MCG-B 39			Last Edited on 25-JUL-2013,02:10
Gamma Calibrator Number	GRC38		
Mud Density	1.12	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl		kppm	
K Mud Type	Chloride		
K Mud Concentration	0.00	%	
SP Calibration MCG-B 39			Field Calibration on 11-JUN-2013,10:13
	Measured	Calibrated (mV)	
Reference 1	105.8	100.0	
Reference 2	-94.3	-100.0	
High Resolution Temperature Calibration MCG-B 39			Field Calibration on 11-JUN-2013,10:13
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MCG-B 39			Last Edited on 11-JUN-2013,10:13
Pre-filter Length	11		
Caliper Calibration MML-A 3			Base Calibration on 05-JUN-2013 15:43 Field Calibration on 04-JUL-2013 09:18
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	14624	5.98	
2	17958	7.97	
3	21263	9.86	
4	25213	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.11	5.98	
Micro Normal and Micro Inverse Calibration MML-A 3			Base Calibration on 05-JUN-2013 15:36 Field Check on 04-JUL-2013 09:20
Base Calibration			
	Measured	Calibrated (ohm-m)	
Channel	Resistor 1 Resistor 2	Resistor 1 Resistor 2	
Micro Normal	12.2 60.2	5.0 25.0	
Micro Inverse	15.7 78.3	5.0 25.0	
Channel	Base Check (ohm-m)	Field Check (ohm-m)	
Micro Normal	63.0	63.0	
Micro Inverse	48.2	48.2	
Micro Normal and Micro Inverse Constants MML-A 3			Last Edited on 25-JUL-2013,02:10
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159		
Micro Normal K Factor	1.0000		
Micro Inverse K Factor	1.0000		
Standoff Offset	N/A	inches	
Neutron Calibration MDN-A.B 66			Base Calibration on 22-MAY-2013 15:00 Field Check on 04-JUL-2013 09:34
Base Calibration			
	Measured	Calibrated (cps)	

	Near	Far	Near	Far
	3145	98	3714	110
Ratio	32.215		33.764	
Field Calibrator at Base	Calibrated (cps)			
	1654		2365	
Ratio	0.699			
Field Check	Calibrated (cps)			
	1643		2364	
Ratio	0.698			

Neutron Constants MDN-A.B 66			Last Edited on 25-JUL-2013,02:10		
Neutron Source Id	P0204NN				
Neutron Jig Number	5824NE				
Epithermal Neutron	No				
Caliper Source for Processing	Density Caliper				
Stand-off	0.00		inches		
Mud Density	1.00		gm/cc		
Limestone Sigma	7.10		cu		
Sandstone Sigma	4.26		cu		
Dolomite Sigma	4.70		cu		
Formation Pressure Source	None				
Formation Pressure	N/A		kpsi		
Temperature Source	Constant Value				
Temperature	68.00		degrees F		
Mud Salinity	0.00		kppm		
Salinity Correction	Not Applied				
Formation Fluid Salinity Source	None				
Formation Fluid Salinity	N/A		kppm		
Barite Mud Correction	Not Applied				

FE Calibration MFE-B.J 353		Base Calibration on 22-MAY-2013 08:22 Field Check on 04-JUL-2013 09:10	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	964.9	126.8	
Base Check		280.9	
Field Check		280.8	

FE Constants MFE-B.J 353			Last Edited on 25-JUL-2013,02:09		
Running Mode		No Sleeve			
MFE K Factor		0.1268			
Caliper Source for FE correction		Density Caliper			
Caliper Value for FE correction		N/A		inches	
Rm Source for FE correction		Temperature Corr			
Temp. for Rm Corr.		MCG External Temperature			
Stand-off		0.5		inches	

Induction Calibration MAI-A.A 167			Base Calibration on 19-APR-2013,13:41 Field Check on 04-JUL-2013 09:04		
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	17.3	474.2	9.3	966.2	
2	6.3	388.4	7.6	821.4	
3	3.3	259.4	5.2	566.0	
4	1.9	133.0	2.6	279.2	
Array Temperature		76.8	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1			13.1	3839.2	
2			29.6	3477.2	
3			29.1	3053.5	
4			19.8	2082.0	

Deep	18.6	2049.4	
Medium	42.2	3991.9	
Shallow	43.0	5054.3	
Array Temperature		74.2	Deg F

Induction Constants MAI-A.A 167

Last Edited on 25-JUL-2013,02:09

Induction Model		RtAP-WBM	
Caliper for Borehole Corr.		Density Caliper	
Hole Size for Borehole Correction		N/A	inches
Tool Centred		No	
Stand-off Type		Fins	
Stand-off		0.50	inches
Number of Fins on Stand-off		8.0000	
Stand-off Fin Angle		60.00	degrees
Stand-off Fin Width		0.5000	inches
Borehole Corr. Rm Source		Temperature Corr	
Temp. for Rm Corr.		MCG External Temperature	
Squasher Start		0.0020	mhos/metre
Squasher Offset		N/A	mhos/metre
Borehole Normalisation			
DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000
Calibration Site Corrections			
Channel 1		0.00	mmhos/metre
Channel 2		0.00	mmhos/metre
Channel 3		0.00	mmhos/metre
Channel 4		0.00	mmhos/metre
Apparent Porosity and Water Saturation Constants			
Archie Constant (A)		1.00	
Cementation Exponent (M)		2.00	
Saturation Exponent (N)		2.00	
Saturation of Water for Apor		100.00	percent
Resistivity of Water for Apor and Sw		0.05	ohm-m
Resistivity of Mud Filtrate for Sw		0.00	ohm-m
Source for Rt		0.00	
Source for Rxo		0.00	

High Resolution Temperature Calibration MAI-A.A 167

Field Calibration on 02-JUL-2013,03:28

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MAI-A.A 167

Last Edited on 02-JUL-2013,03:28

Pre-filter Length	11
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Caliper Calibration MPD-B 64

Base Calibration on 10-JUL-2013 09:51

Field Calibration on 10-JUL-2013 09:52

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	15217	3.99
2	24188	5.98
3	32870	7.97
4	41232	9.86
5	50592	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.93	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 10-JUL-2013 10:09

Field Check on 10-JUL-2013 10:16

Density Calibration**Base Calibration**

	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	60252	33858	59556	30836
Reference 2	25108	2914	24941	2541

Field Check at Base

1163.0 1342.8

Field Check

1165.4 1350.2

PE Calibration**Base Calibration**

	WS	Measured		Calibrated	
		WH	Ratio	Ratio	
Background	211	1034			
Reference 1	22924	60048	0.385	0.371	
Reference 2	6861	24971	0.278	0.272	

Field Check at Base

210.7 1033.8

Field Check

209.9 1034.2

Density Constants MPD-B 64

Last Edited on 25-JUL-2013,02:10

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	1.12 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

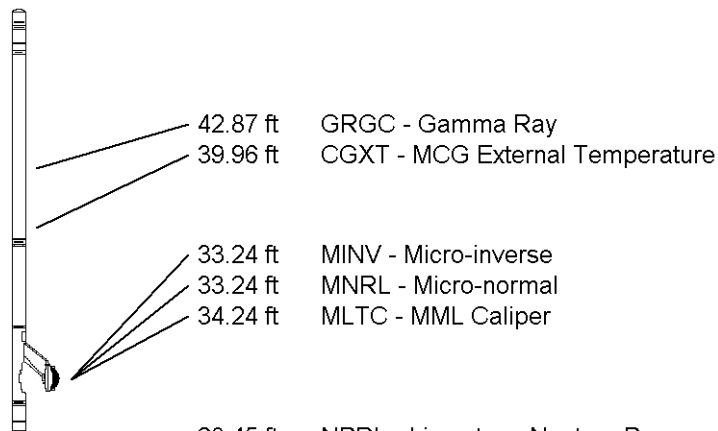
DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_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-B 39 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
 29.45 ft MNRL - Limestone Neutron Porosity

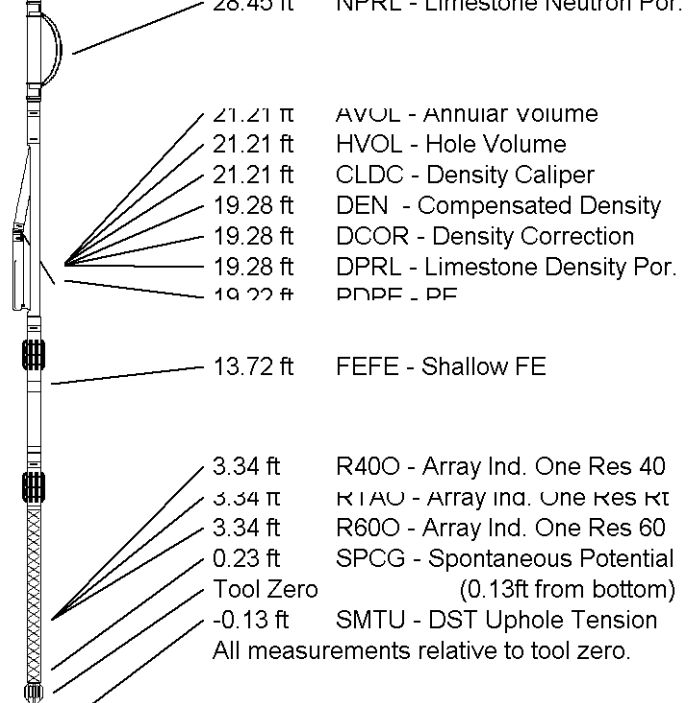
Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

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



COMPANY	O'BRIEN ENERGY RESOURCES CORP.
WELL	CLAYTON #2-28
FIELD	SINGLEY
PROVINCE/COUNTY	MEADE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2602.00	feet	First Reading	6376.00	feet
Elevation Drill Floor	2601.00	feet	Depth Driller	6400.00	feet
Elevation Ground Level	2591.00	feet	Depth Logger	6395.00	feet



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COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG