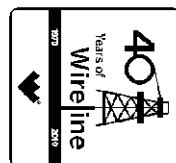




Weatherford

COMPACT PHOTO DENSITY COMPENSATED NEUTRON LOG



COMPANY	O'BRIEN ENERGY		
WELL	CROOKED CREEK #3-8		
FIELD	ANGELL SOUTH		
PROVINCE/COUNTY	MEADE		
COUNTRY/STATE	UNITED STATES / KANSAS		
LOCATION	660' FSL & 1650' FEL		
SEC	TWP	RGE	Other Services
8	33S	29W	MAI/MFE
API Number	15-119-21291		MML
Permit Number			
Permanent Datum G.L., Elevation 2687 feet			Elevations:
Log Measured From K.B. @ 12 FEET above Permanent Datum			KB 2699.00
Drilling Measured From K.B.			DF 2697.00
			GL 2687.00
Date	12-MAY-2011		
Run Number	ONE		
Depth Driller	6330.00	feet	
Depth Logger	6330.00	feet	
First Reading	6308.00	feet	
Last Reading	4000.00	feet	
Casing Driller	1496.00	feet	
Casing Logger	1496.00	feet	
Bit Size	7.880	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	8.90 lb/USg	53.00 CP	
PH / Fluid Loss	10.50	7.80 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.36 @ 91.0	ohm-m	
Rmf @ Measured Temp	0.29 @ 91.0	ohm-m	
Rmc @ Measured Temp	0.43 @ 91.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.27 @120.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	120.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	13025	LIB	
Recorded By	JUSTIN SCHEFFE		
Witnessed By	ROGER PEARSON		
S.O.	3529189		
	PETER DEBENHAM		

BOREHOLE RECORD

Last Edited: 12-MAY-2011 10:30

Bit Size inches	Depth From feet	Depth To feet
7.880	1496.00	6330.00

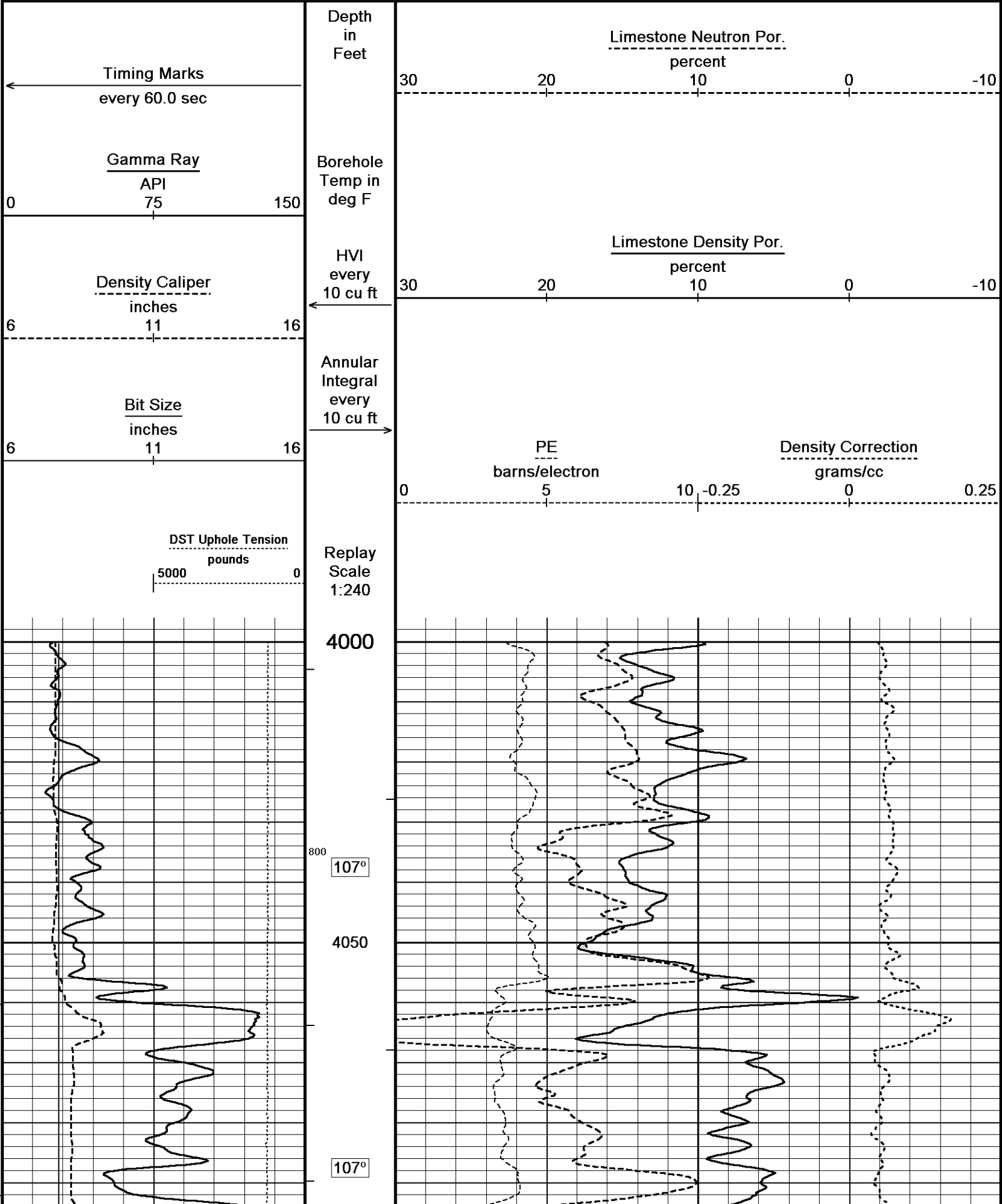
CASING RECORD

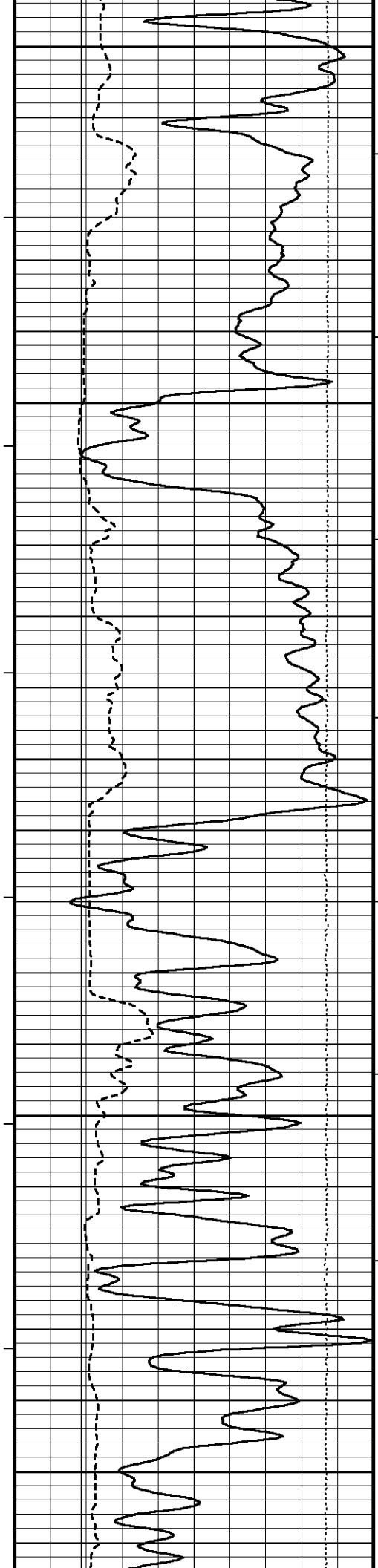
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	1496.00	24.00

REMARKS

Tools Run: MAI, MPD, MCG, MDN, MFE, MML,
Hardware: MPD: 8 inch profile plate used. MAI and MFE: 0.5 inch standoffs used. MDN: Dual Eccentralizer used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Borhole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Annular volume with 4.5 inch production casing 560 Cubic Feet
Total hole volume to top of detail section 810 Cubic feet
Service order #3529189
Rig: Duke #6
Engineer: Justin Scheffe
Operator(s): Ken Rinehart

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.





4100

107°

4150

108°

4200

500

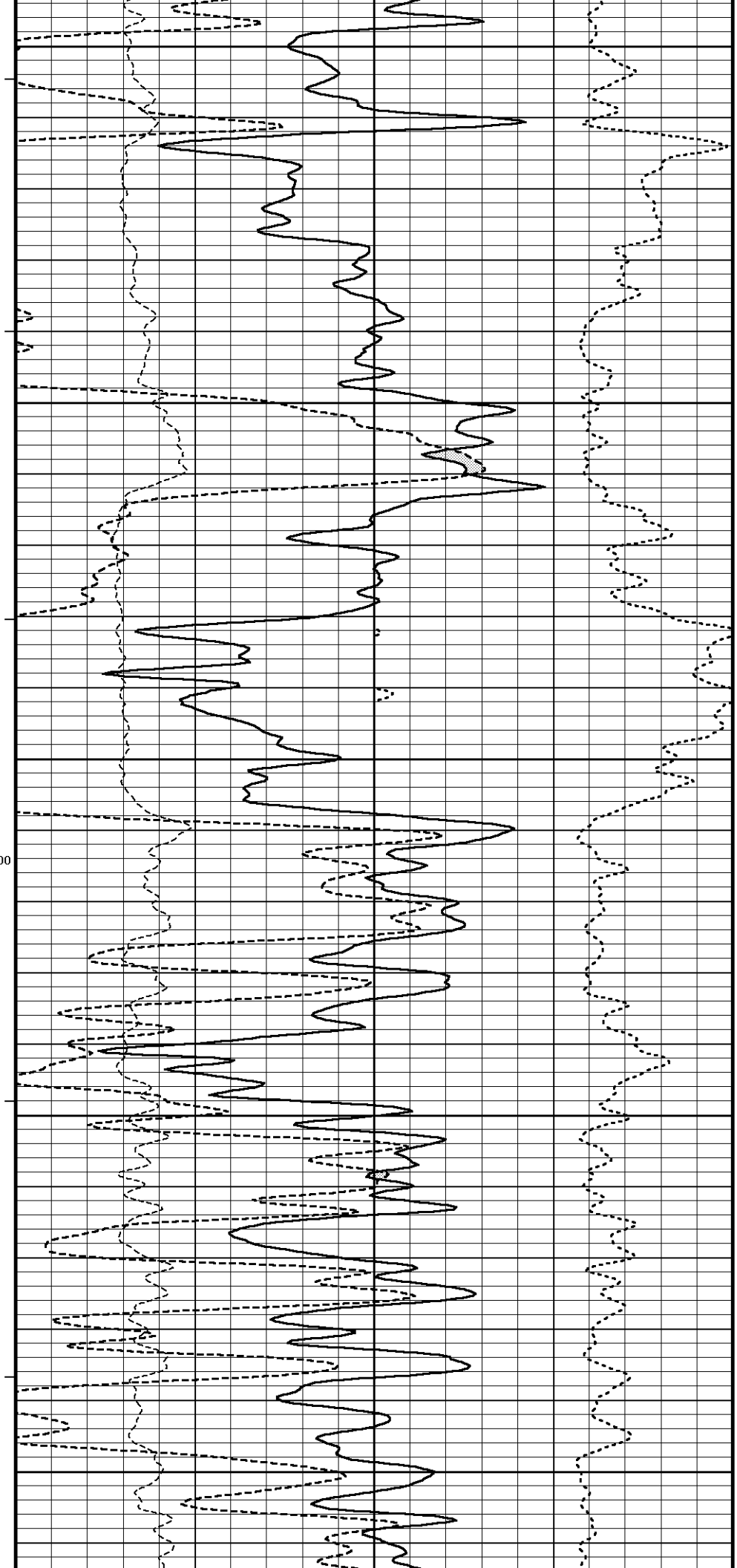
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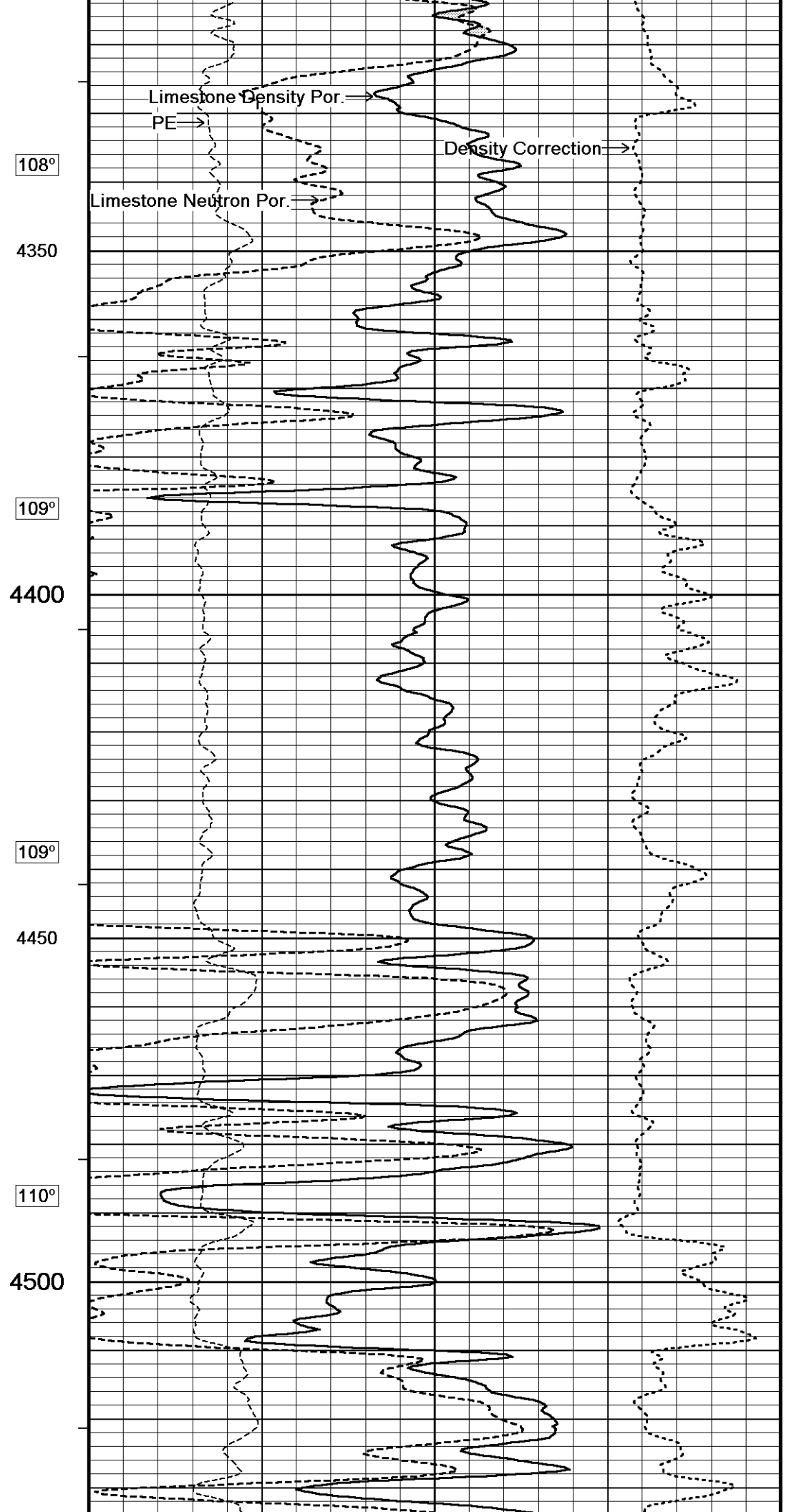
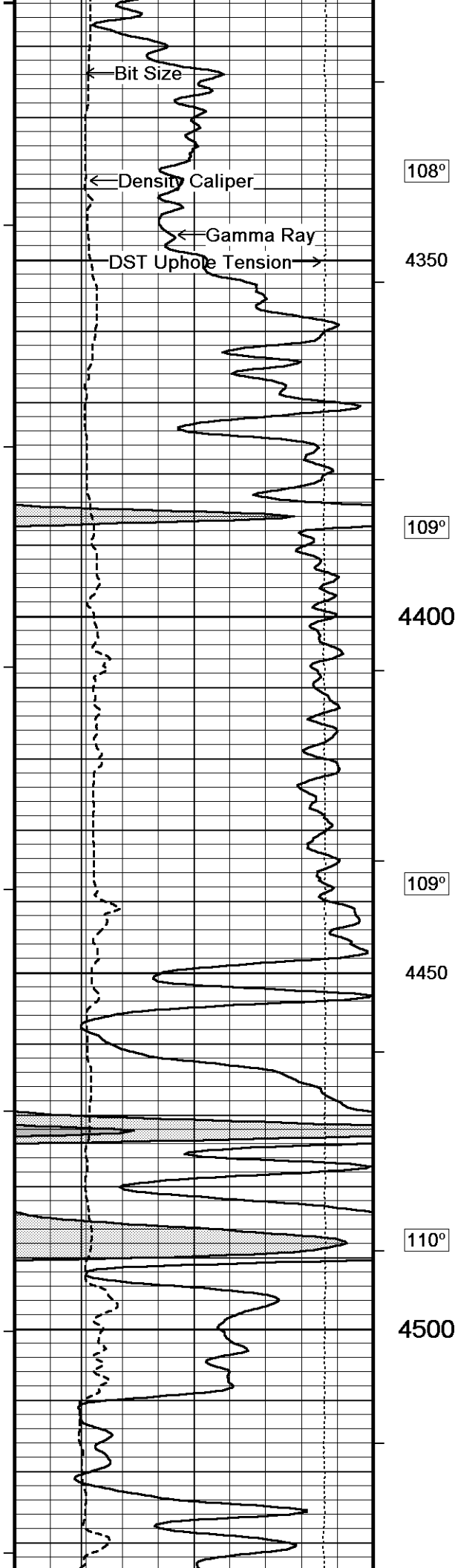
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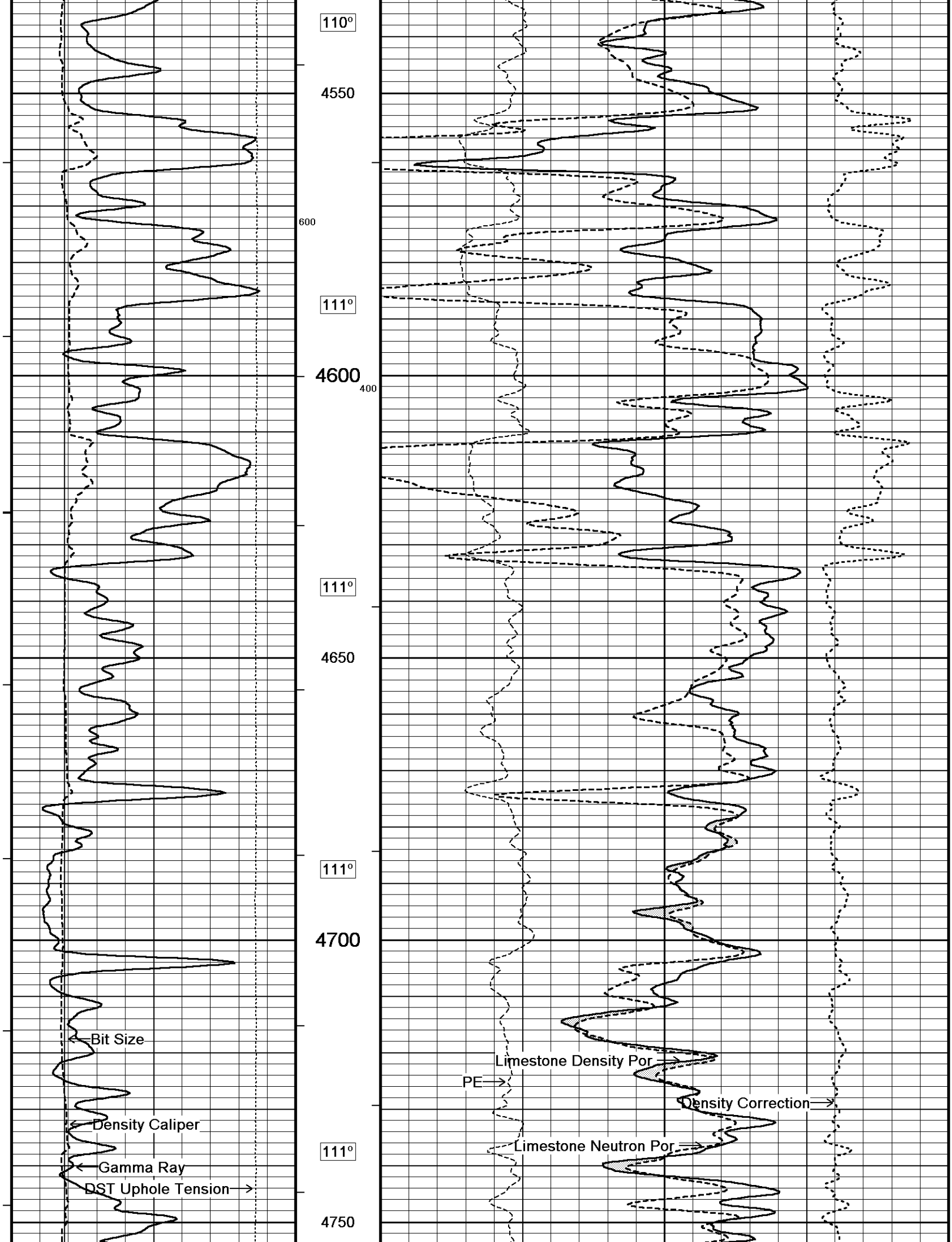
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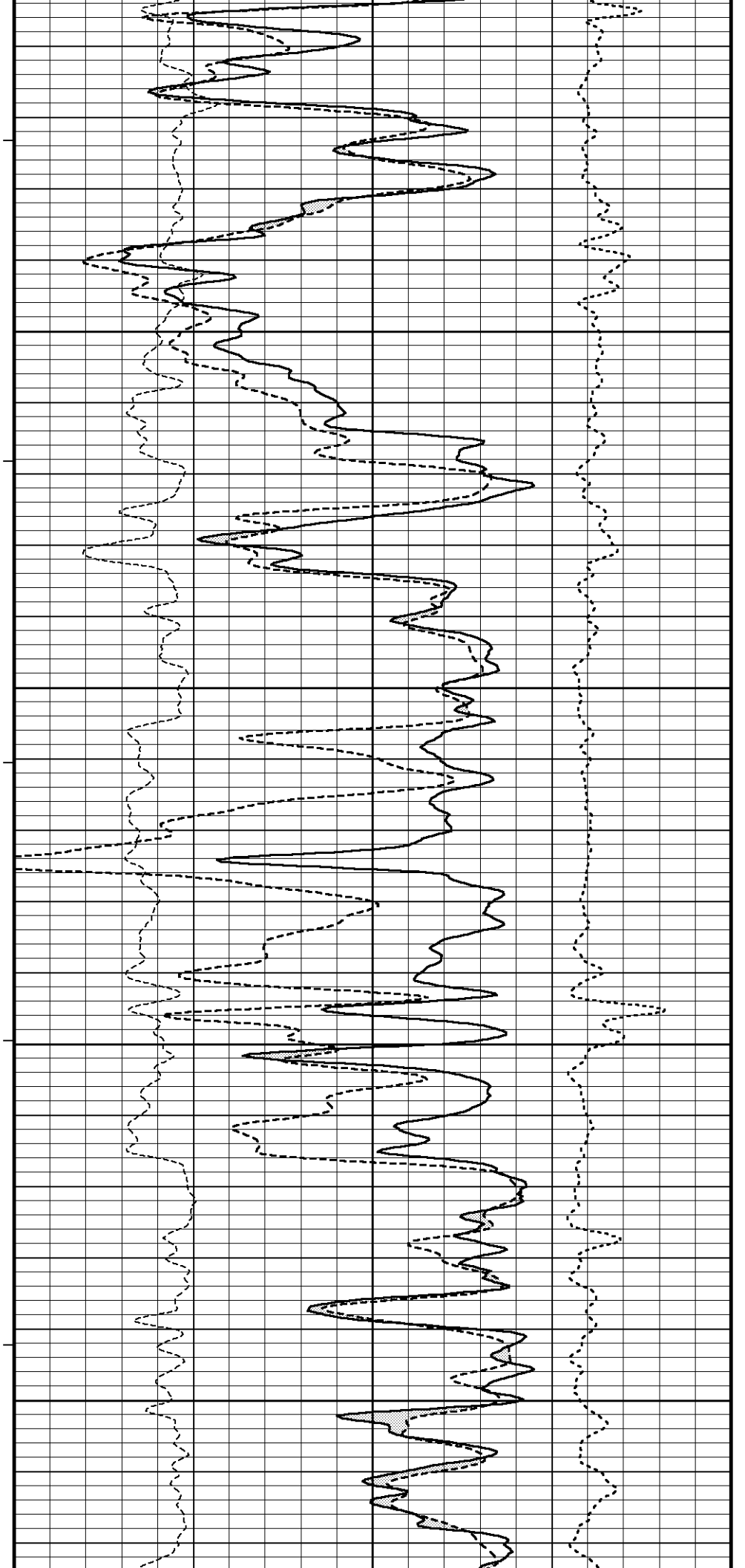
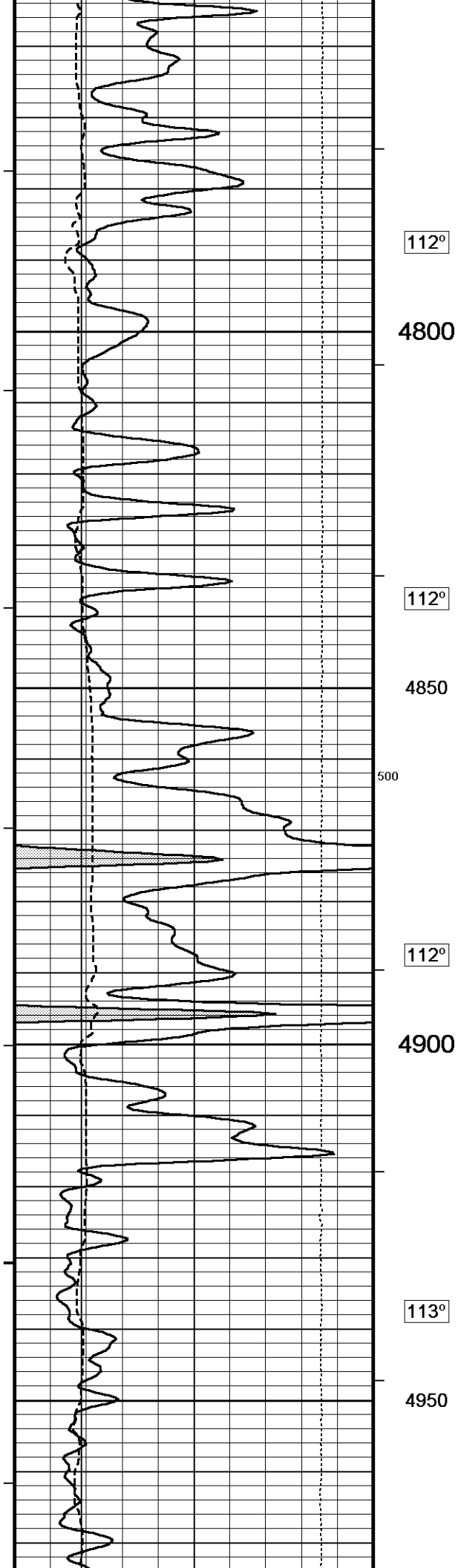
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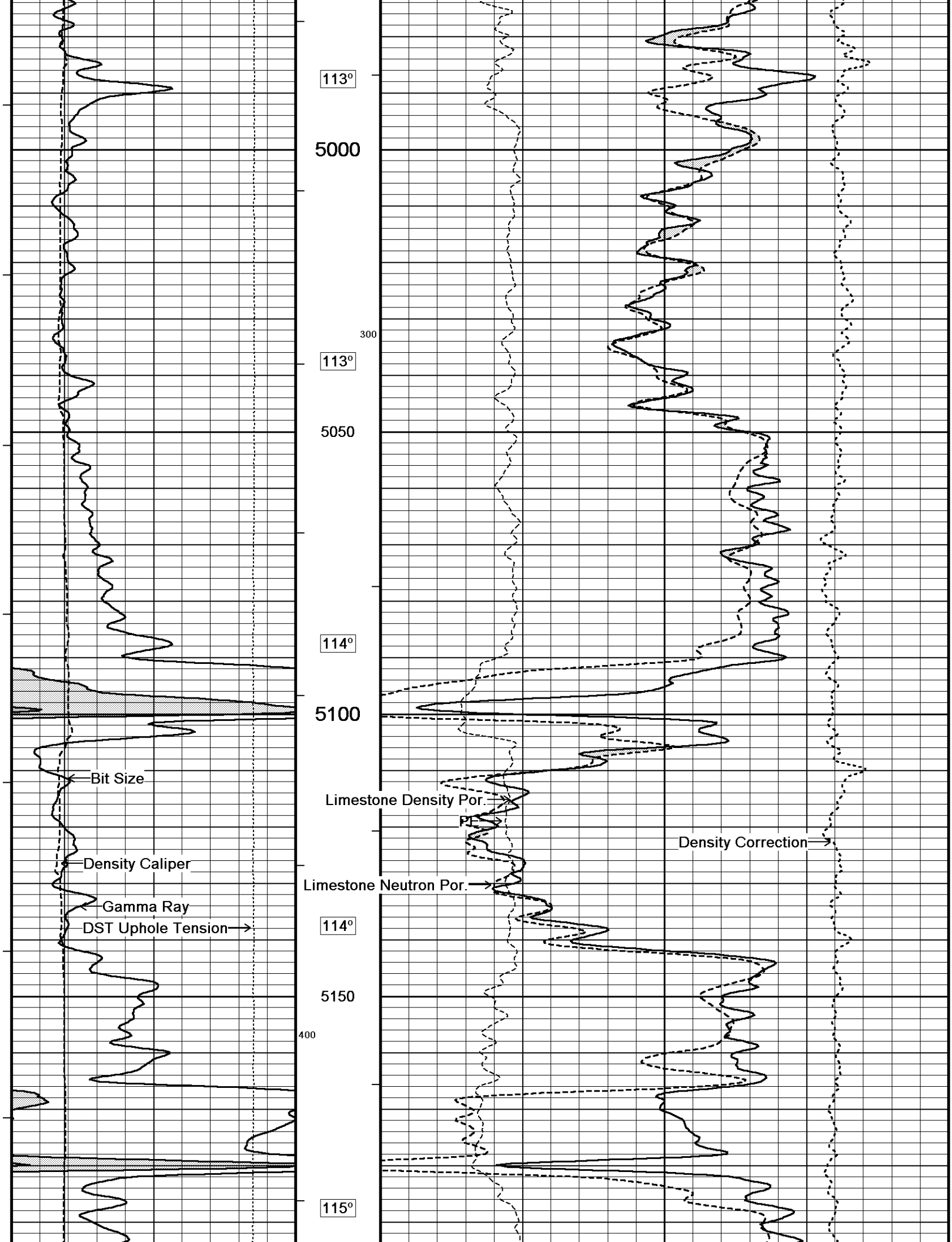
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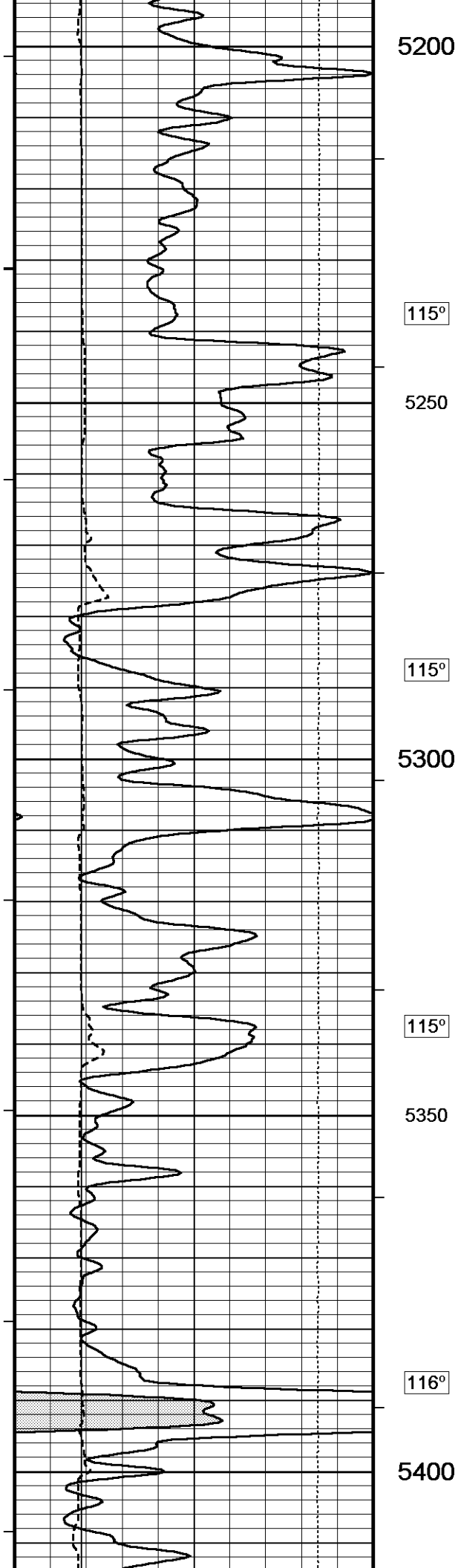












5200

115°

5250

115°

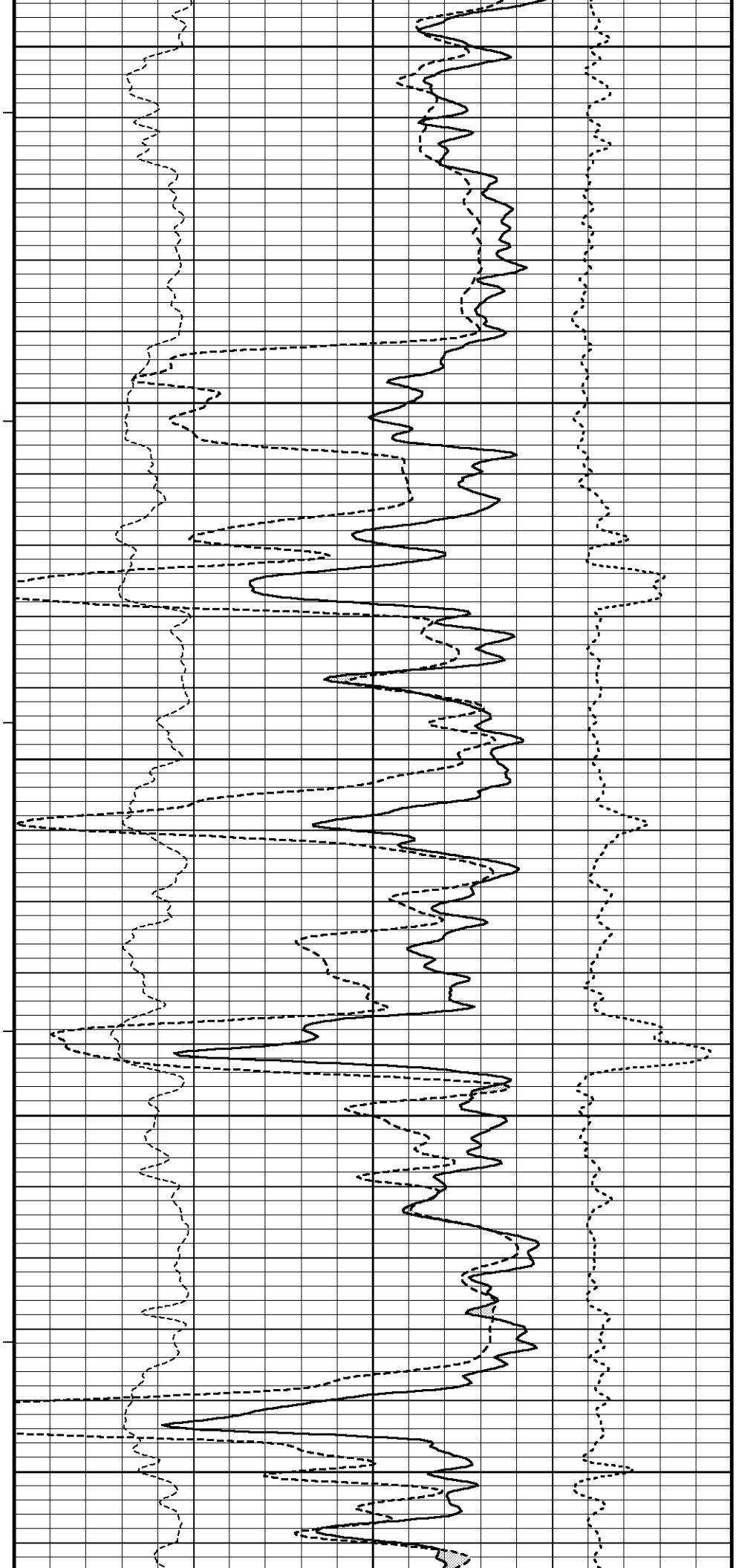
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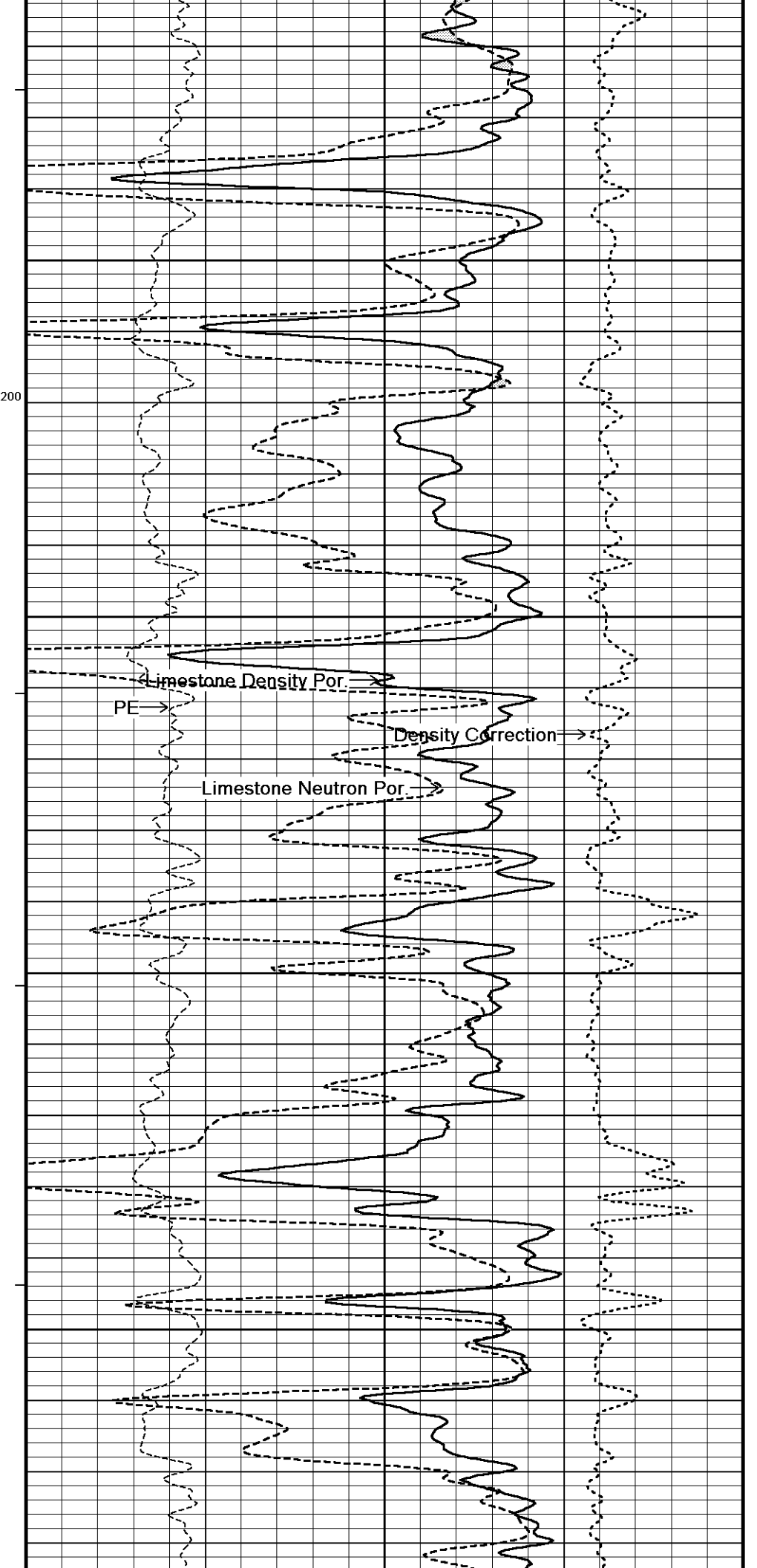
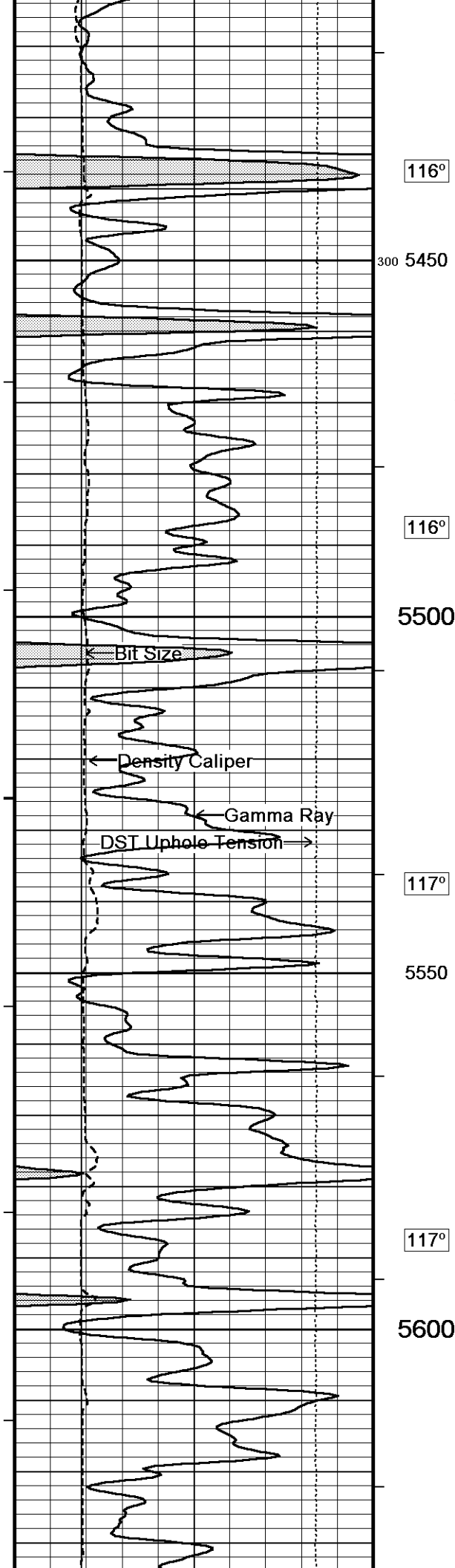
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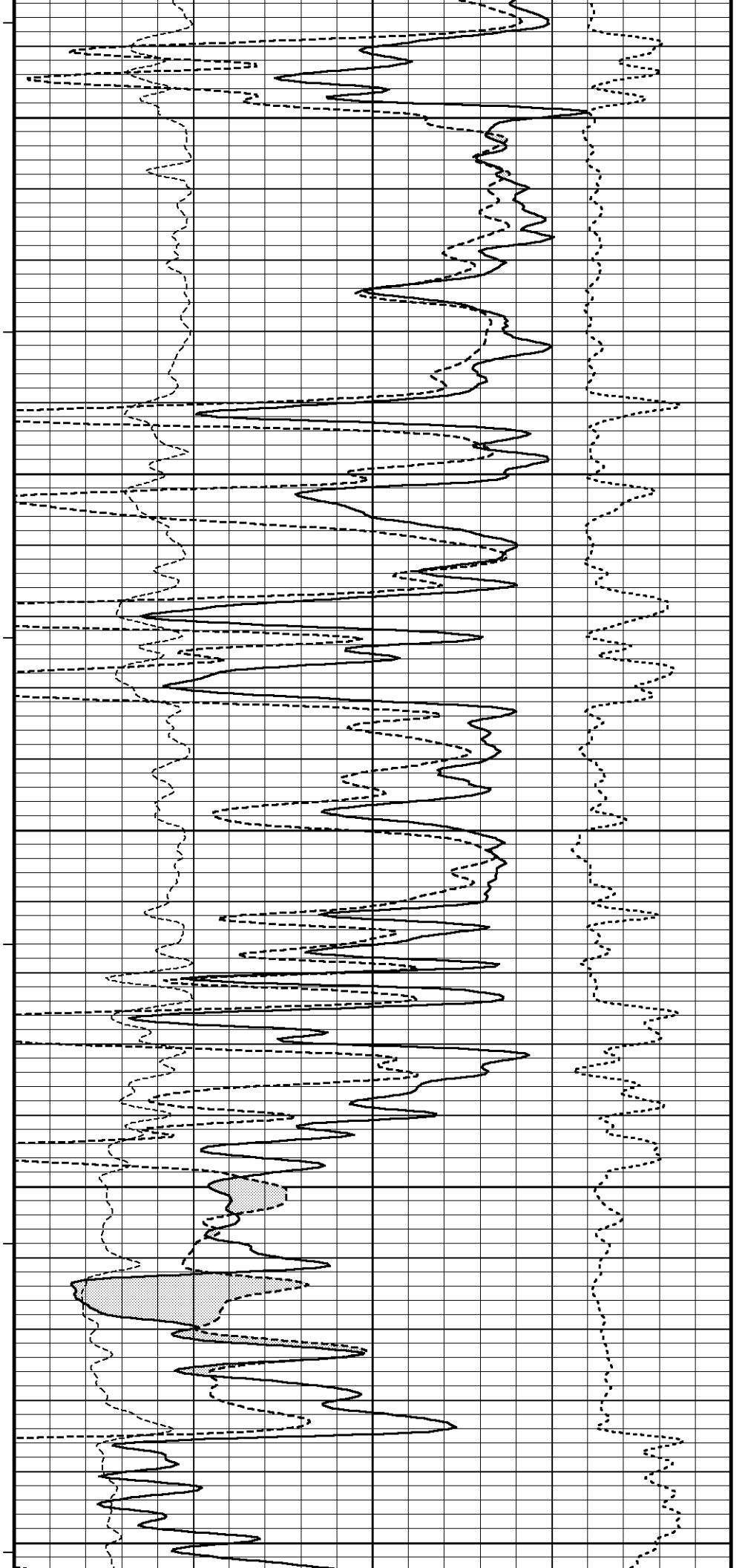
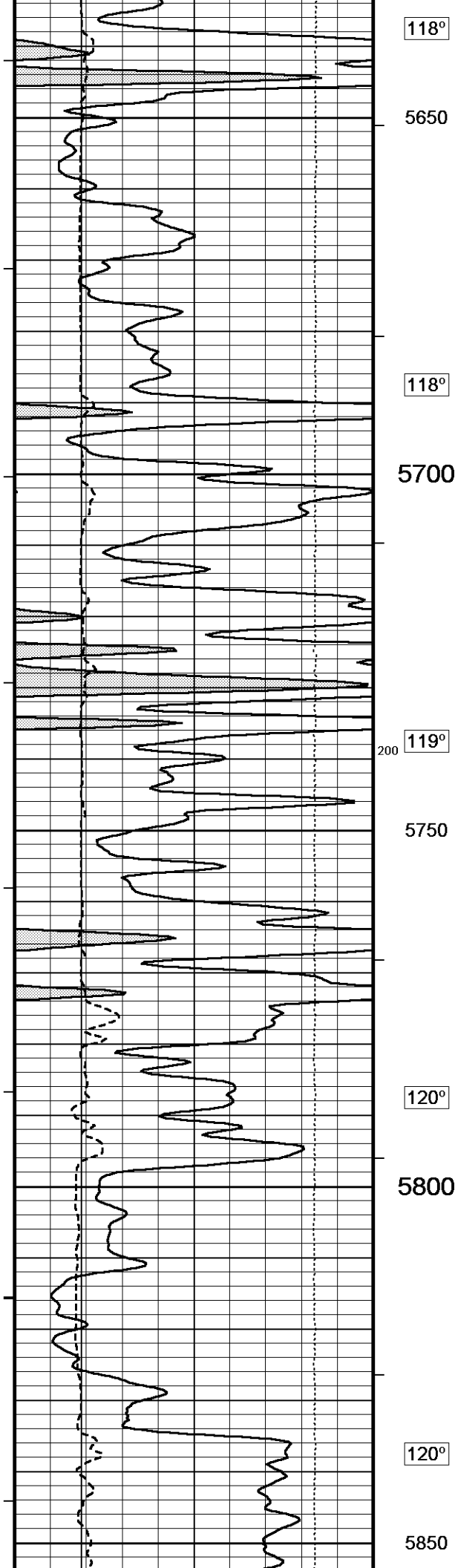
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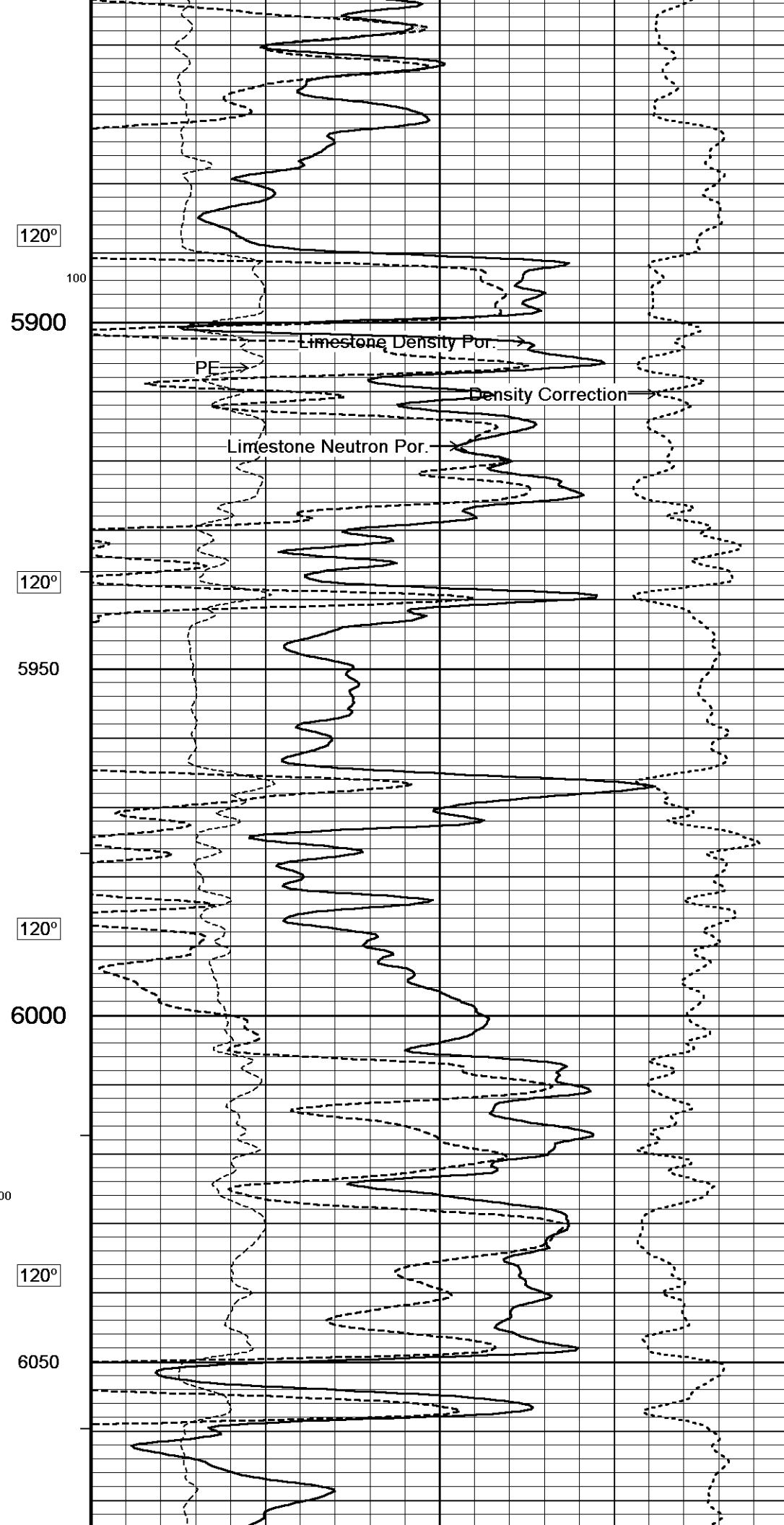
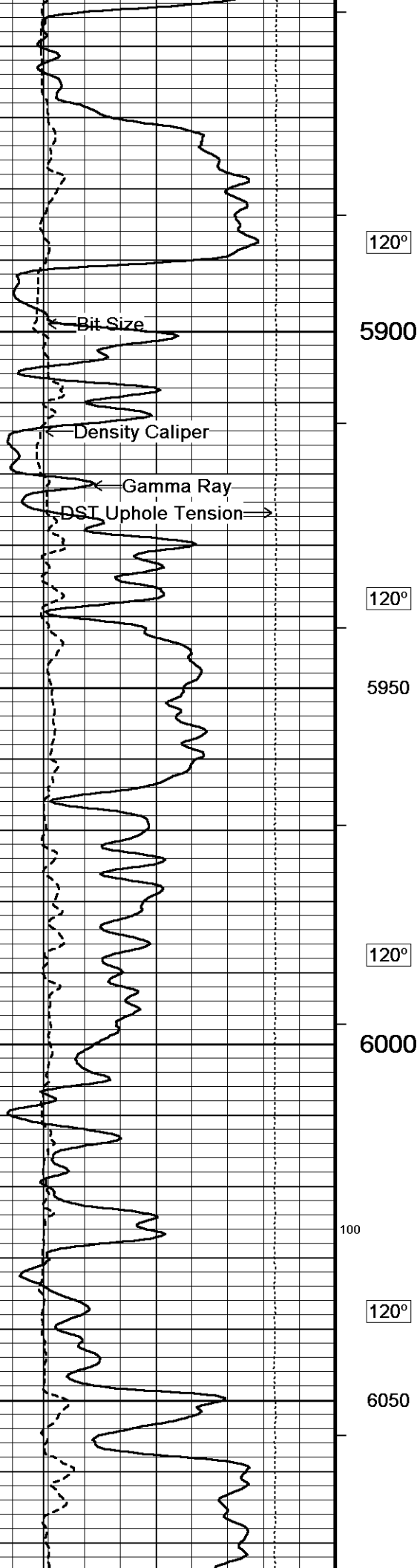
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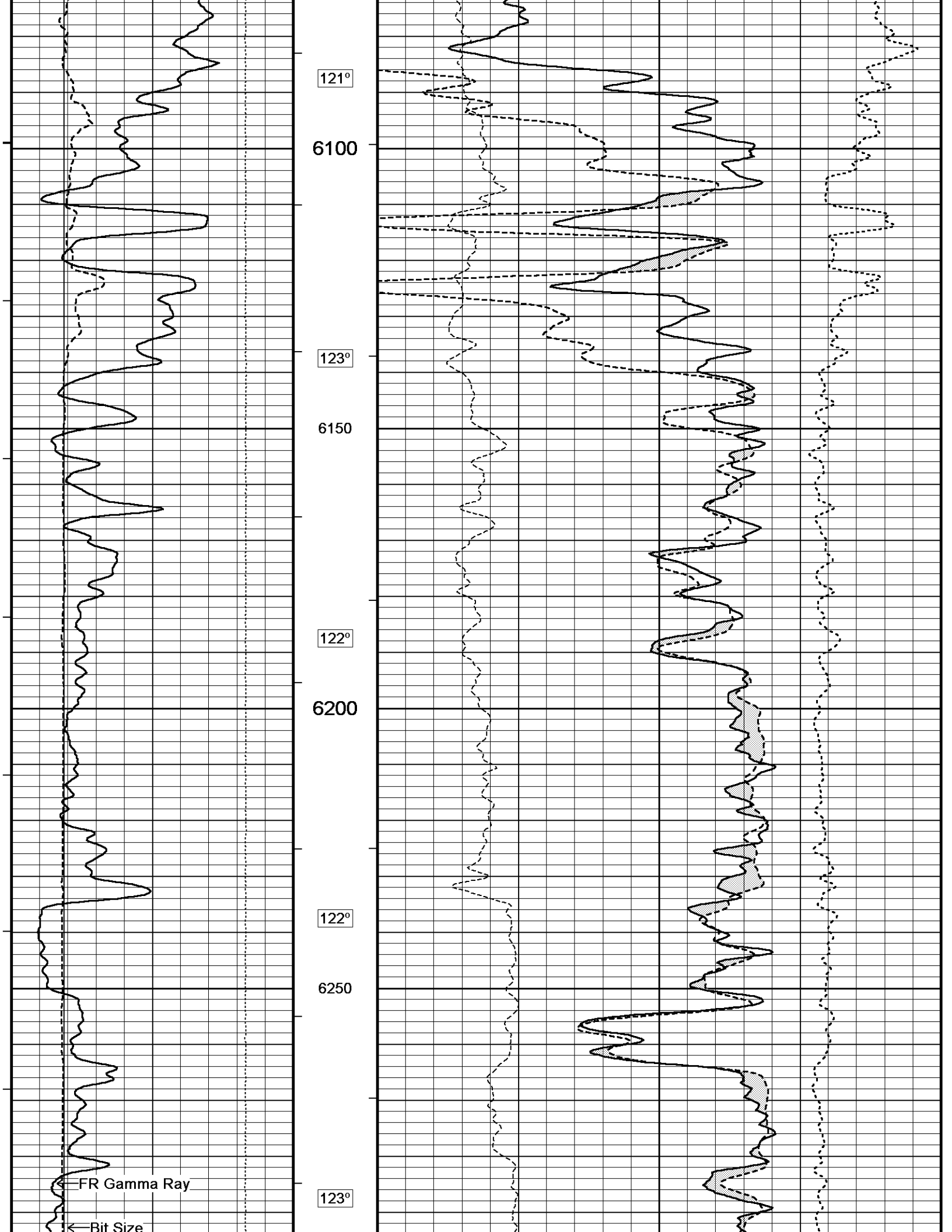
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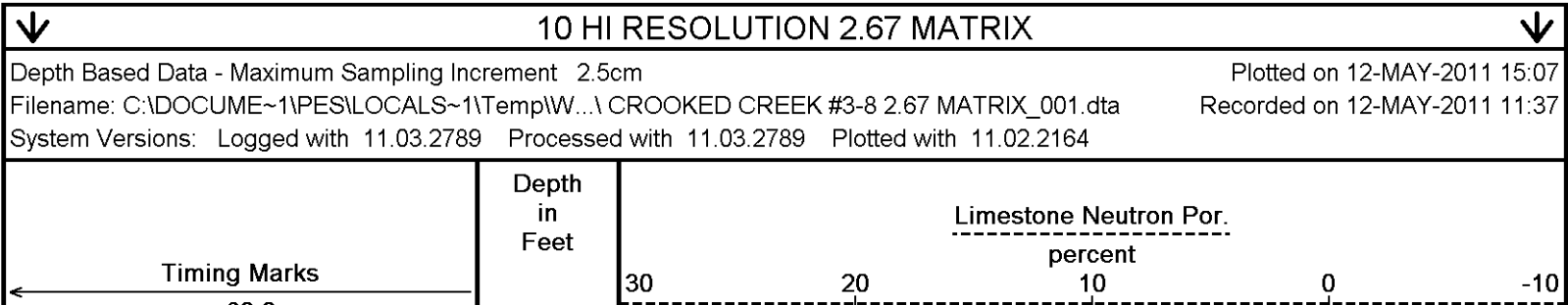
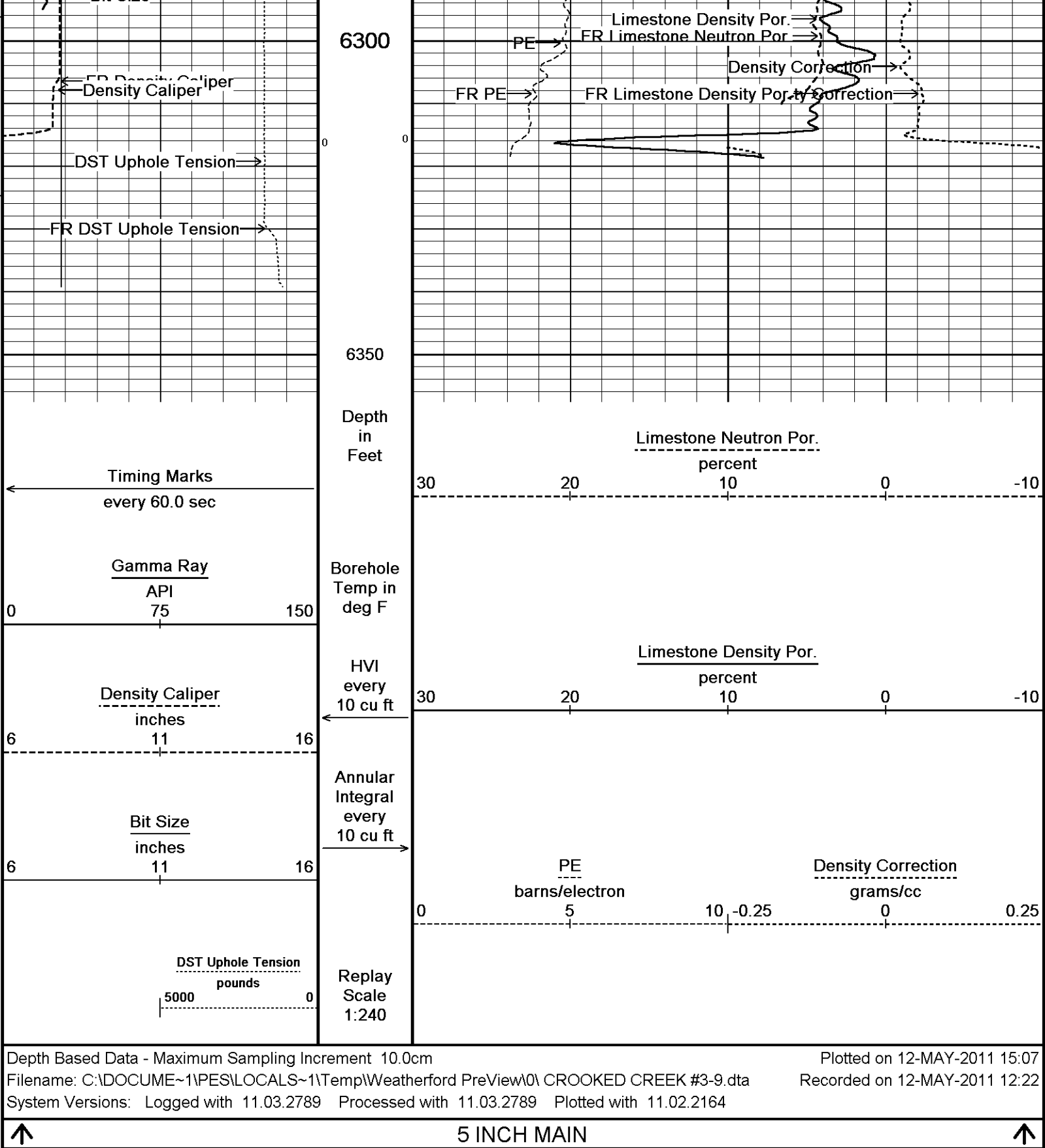












every 60.0 sec

Gamma Ray

API

75

0

150

Borehole
Temp in
deg F

HVI

every
10 cu ft

Limestone Density Por.

percent

30

20

10

0

-10

Density Caliper
inches

6

11

16

Annular
Integral
every
10 cu ft

Bit Size

inches

6

11

16

PE
barns/electron

Density Correction
grams/cc

0

5

10 -0.25

0

0.25

DST Uphole Tension
pounds

5000

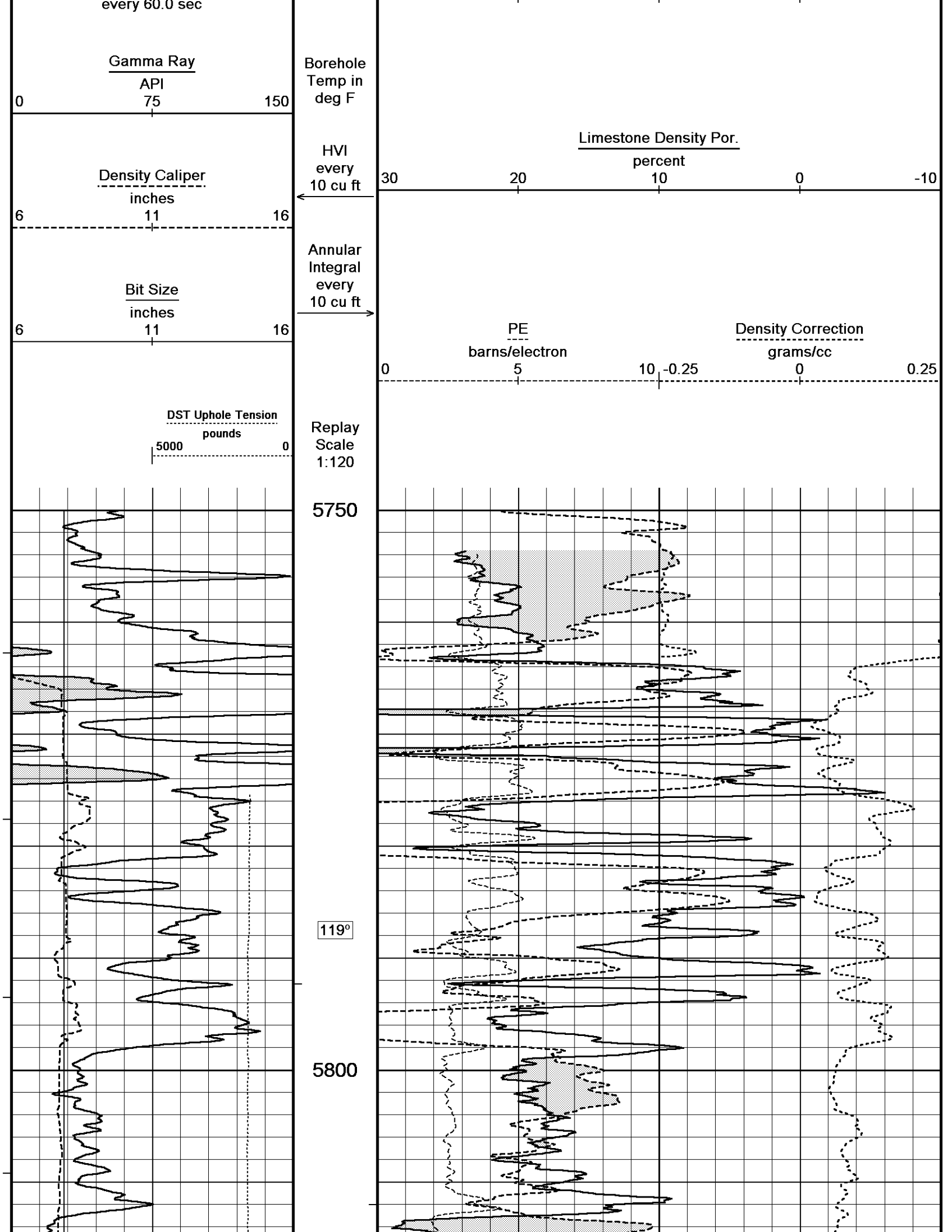
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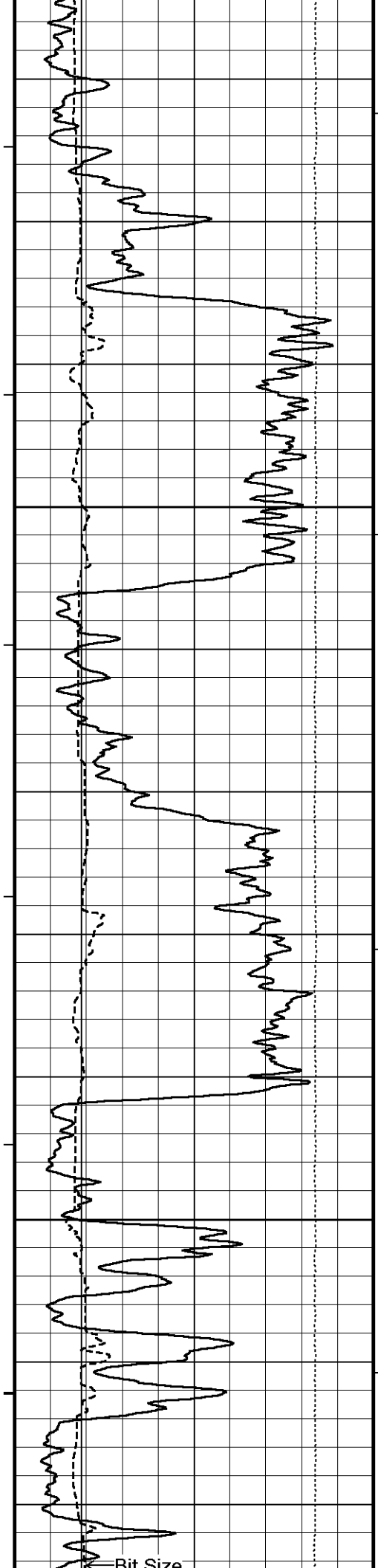
Replay
Scale
1:120

5750

119°

5800



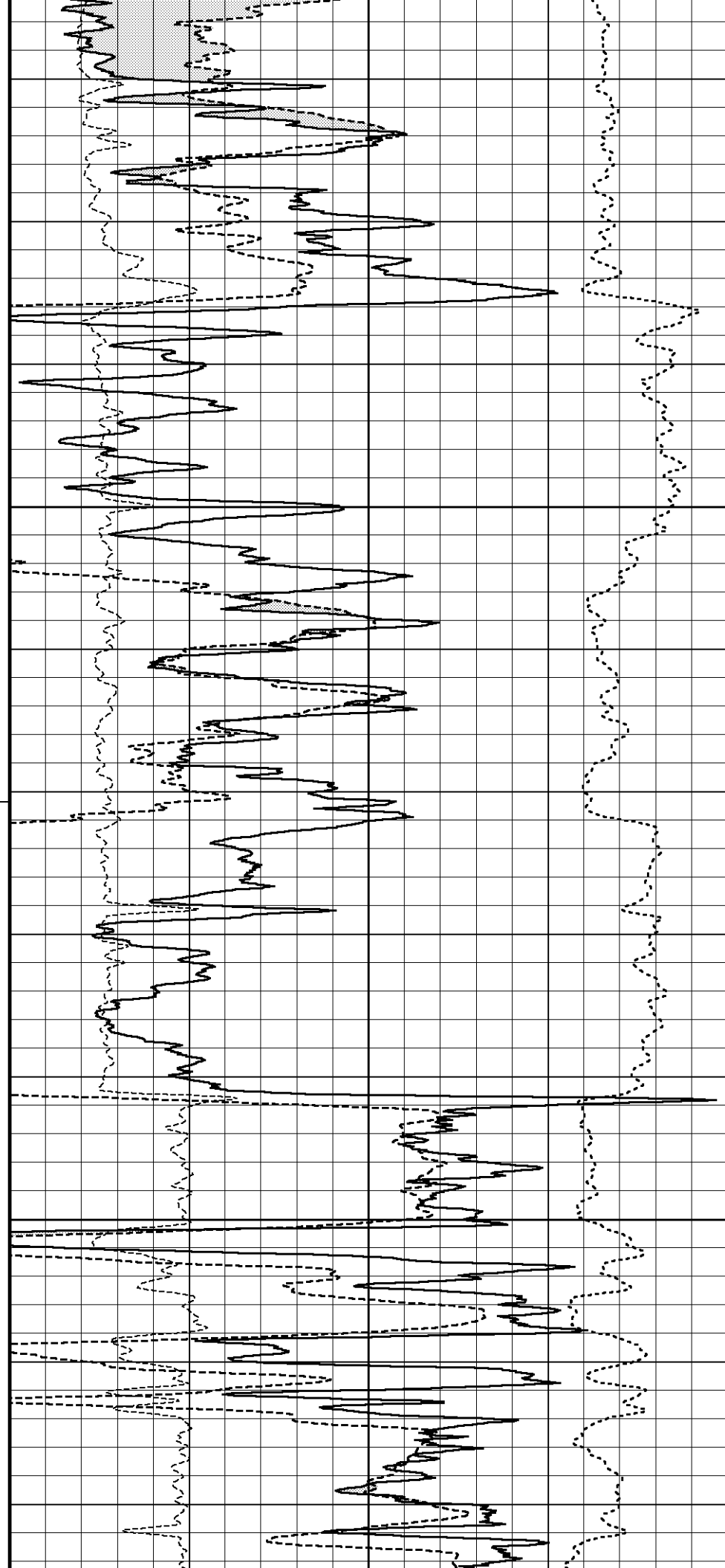


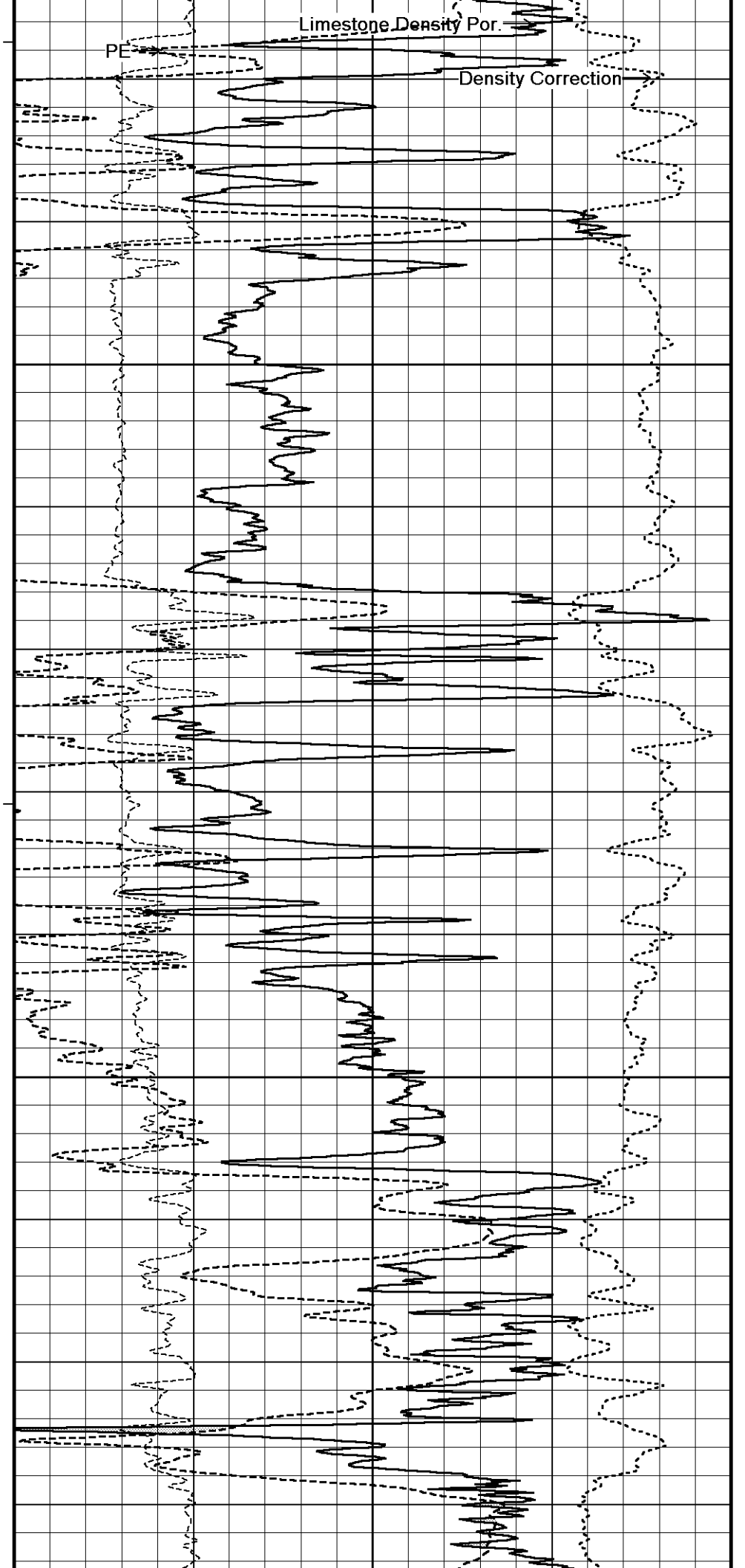
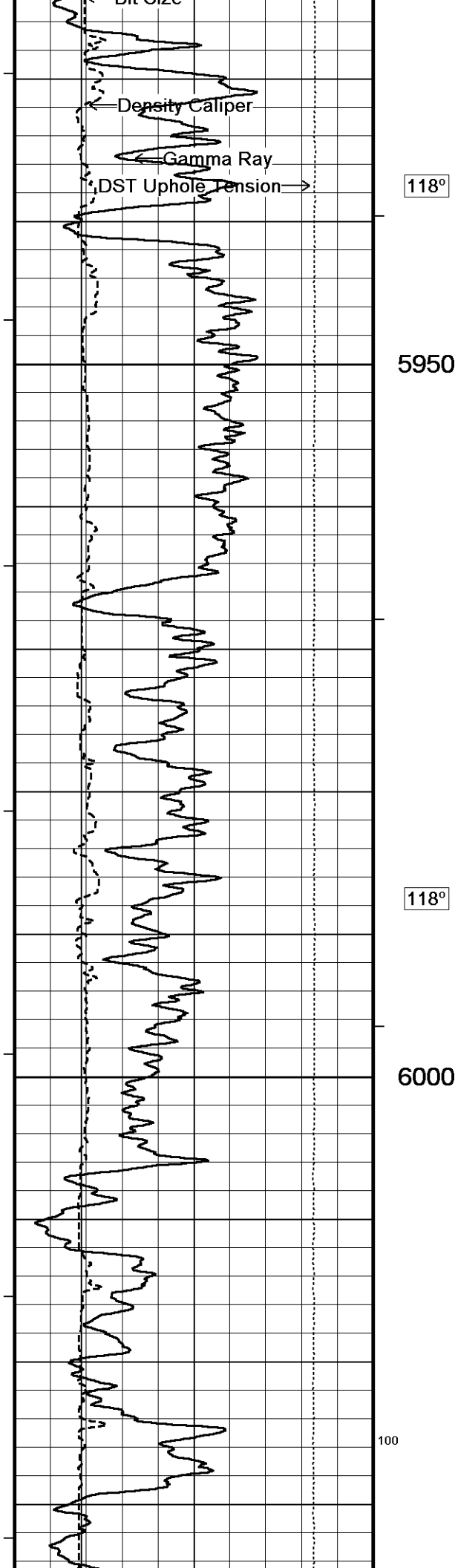
118°

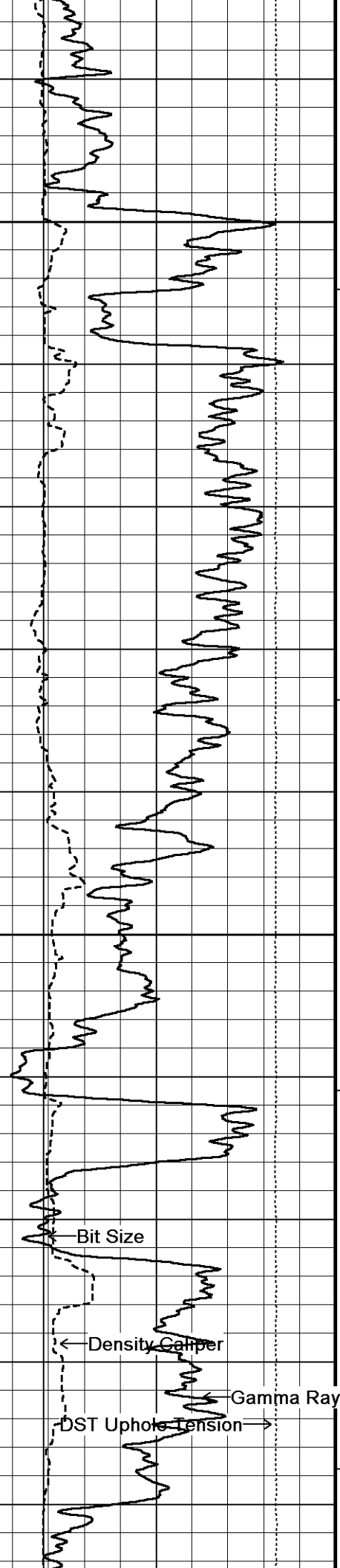
5850

118°

5900







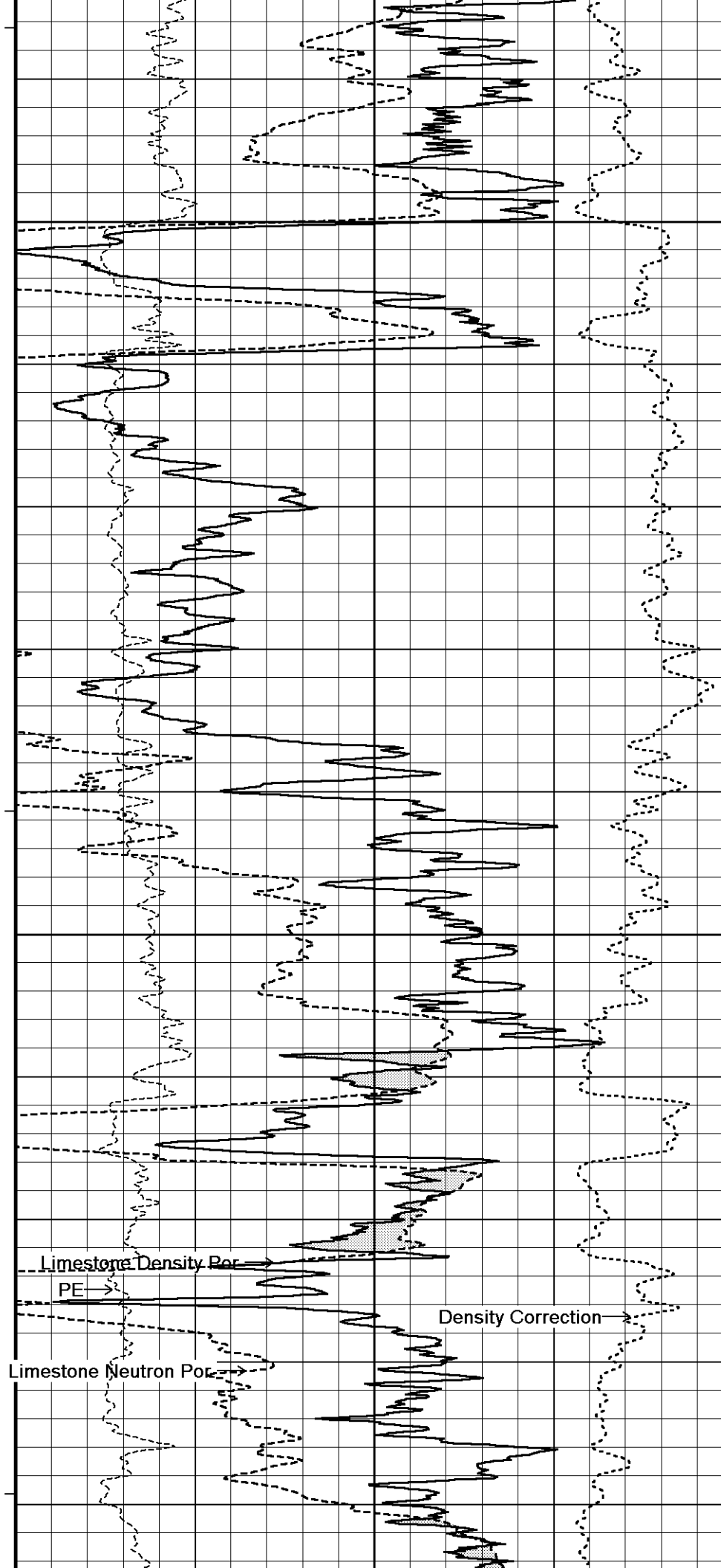
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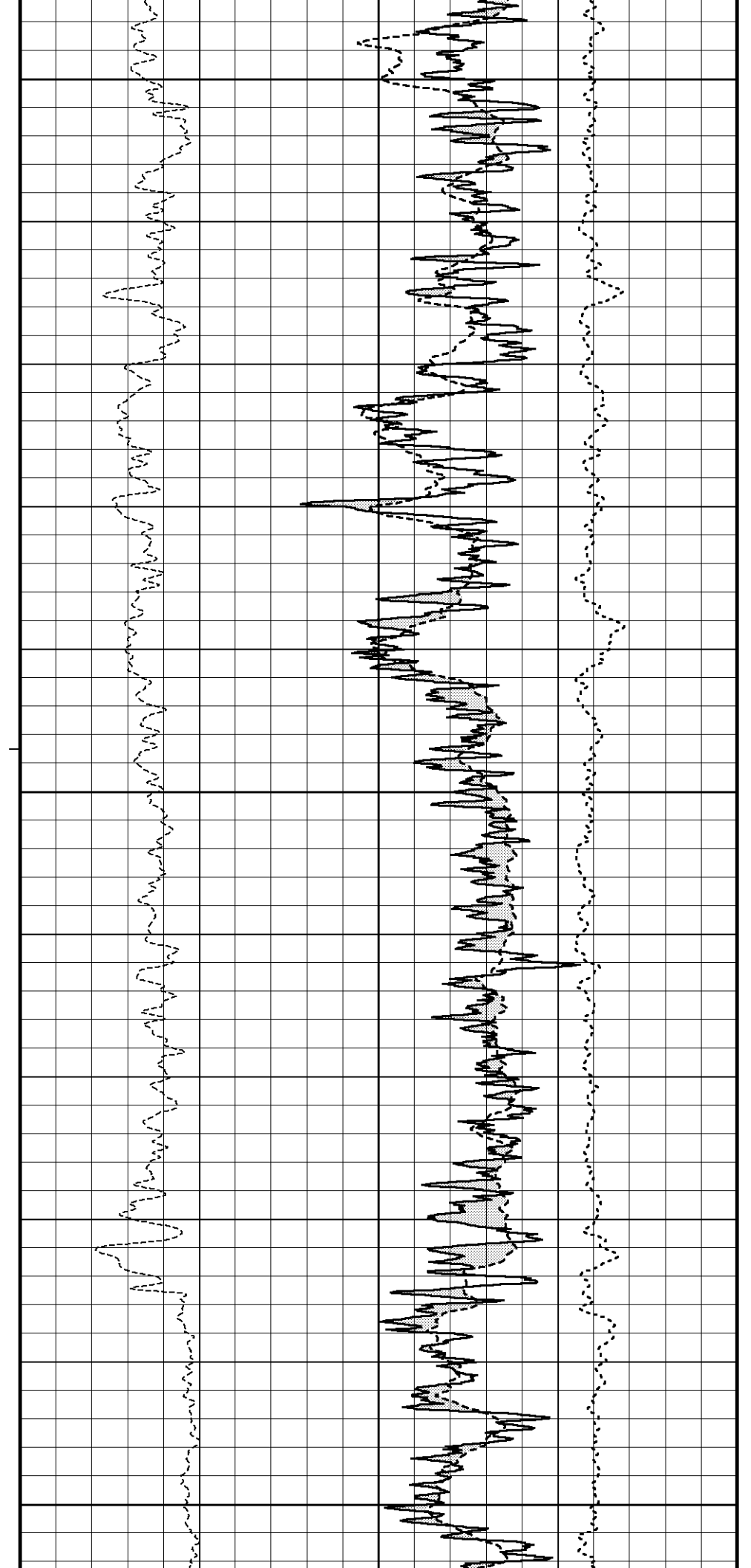
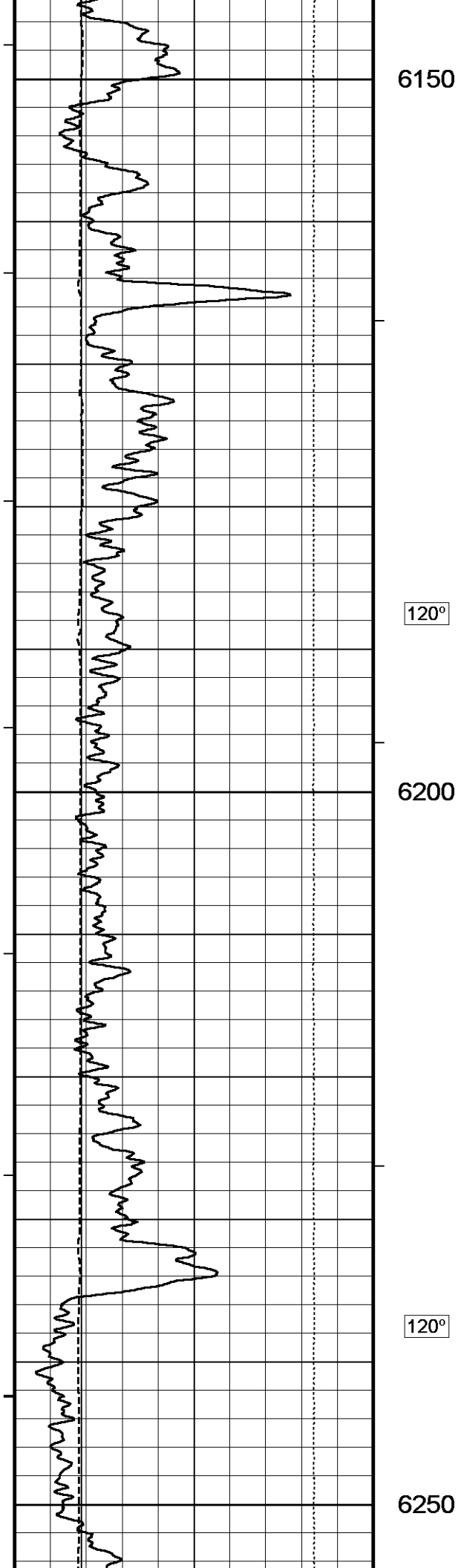
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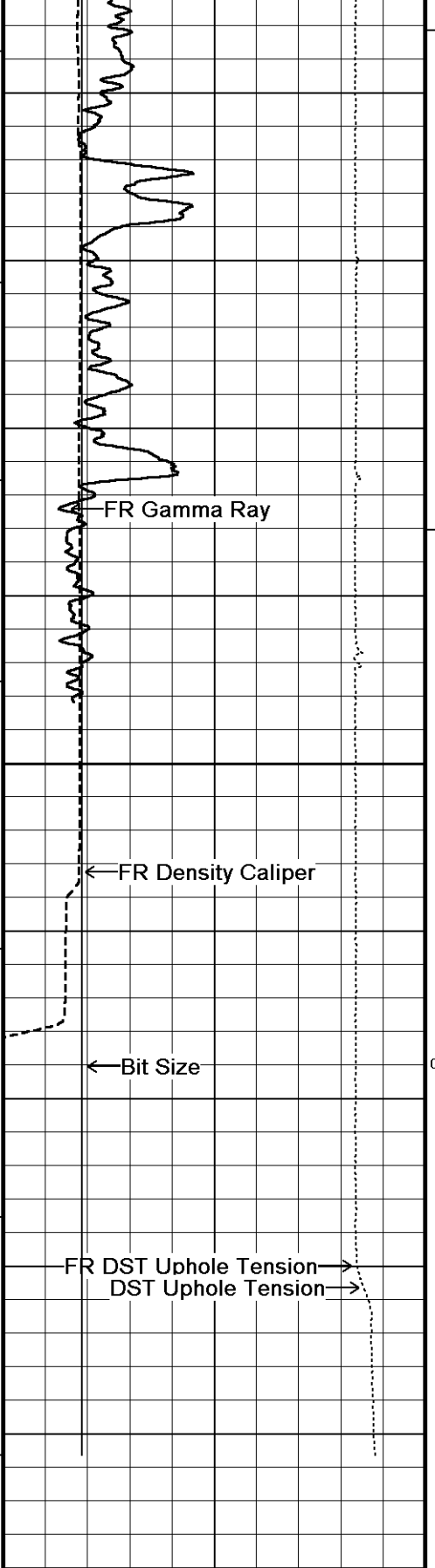
119°

6100

119°







120°

6300

0

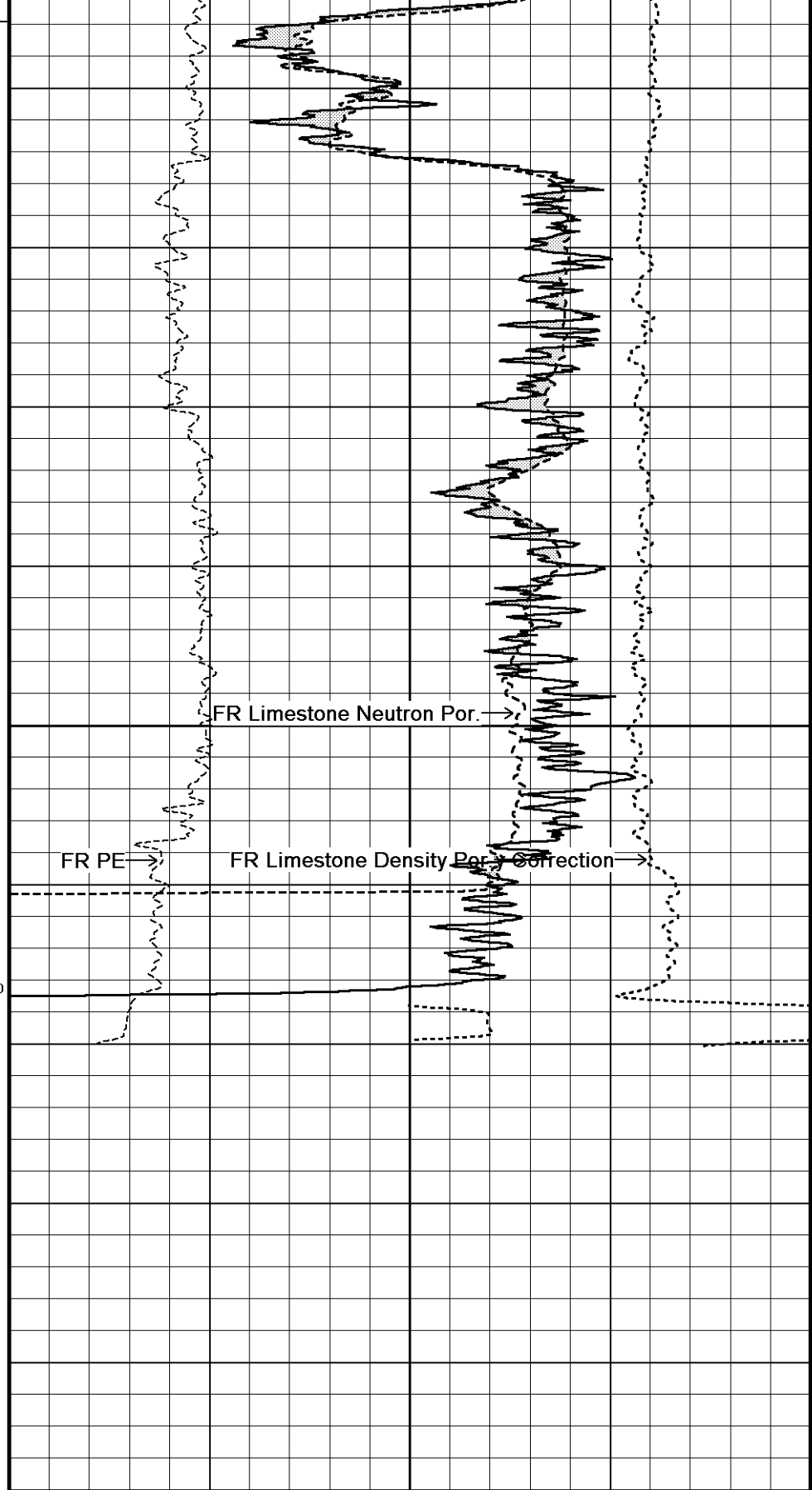
6346

Depth
in
Feet

Timing Marks
every 60.0 sec

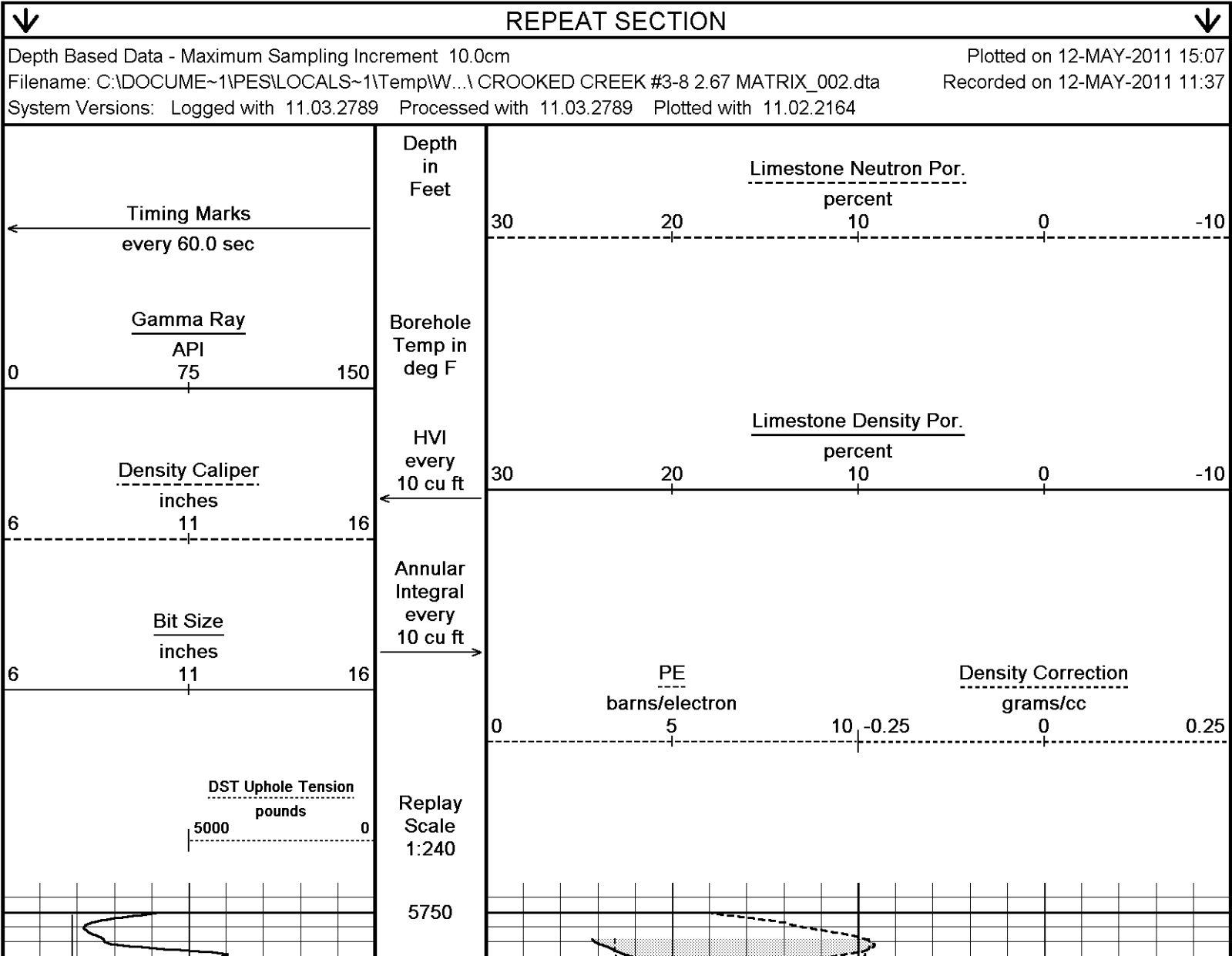
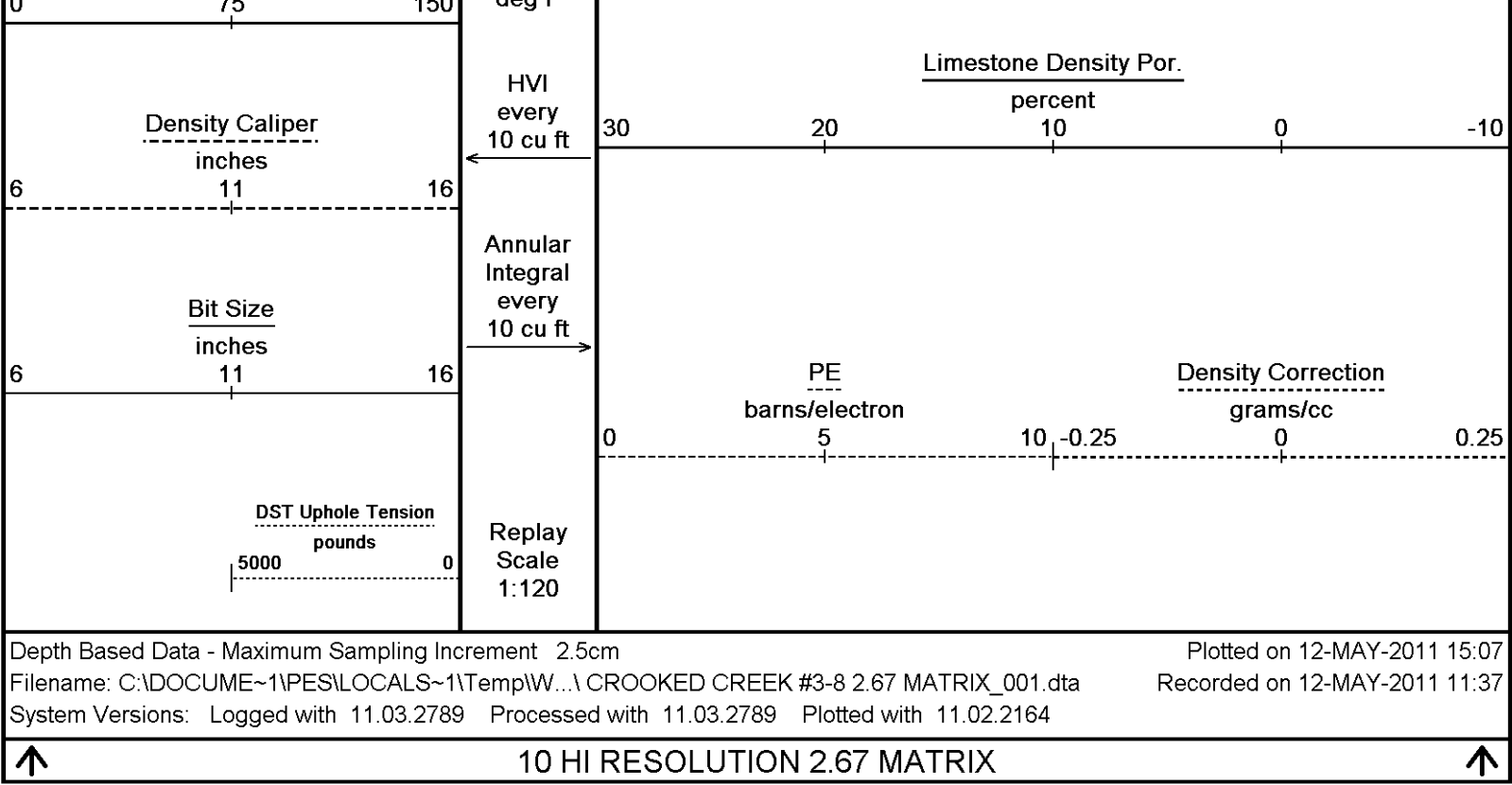
Gamma Ray
API
75 150

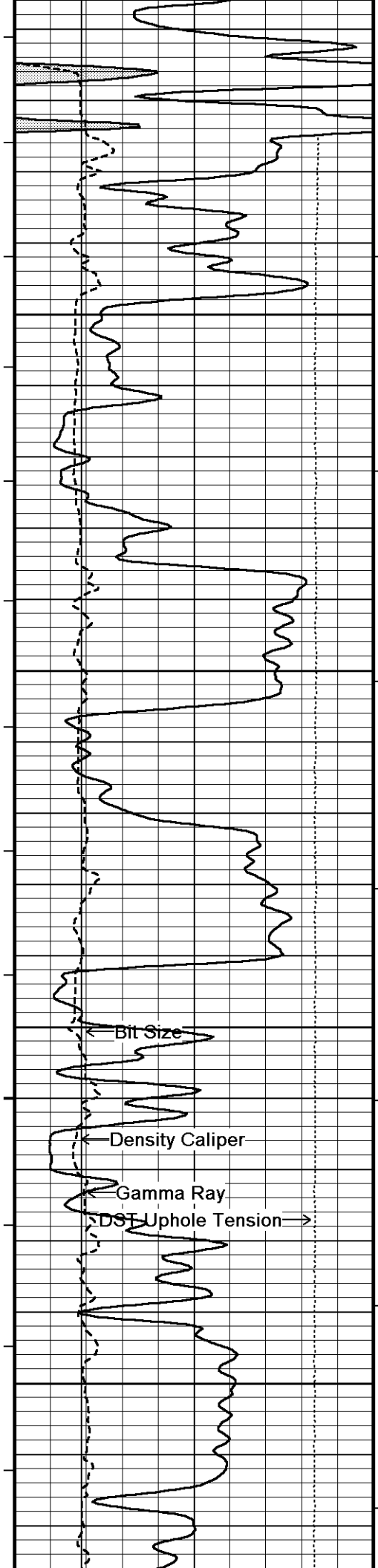
Borehole
Temp in
deg F



Limestone Neutron Por.
percent

30 20 10 0 -10





118°

5800

118°

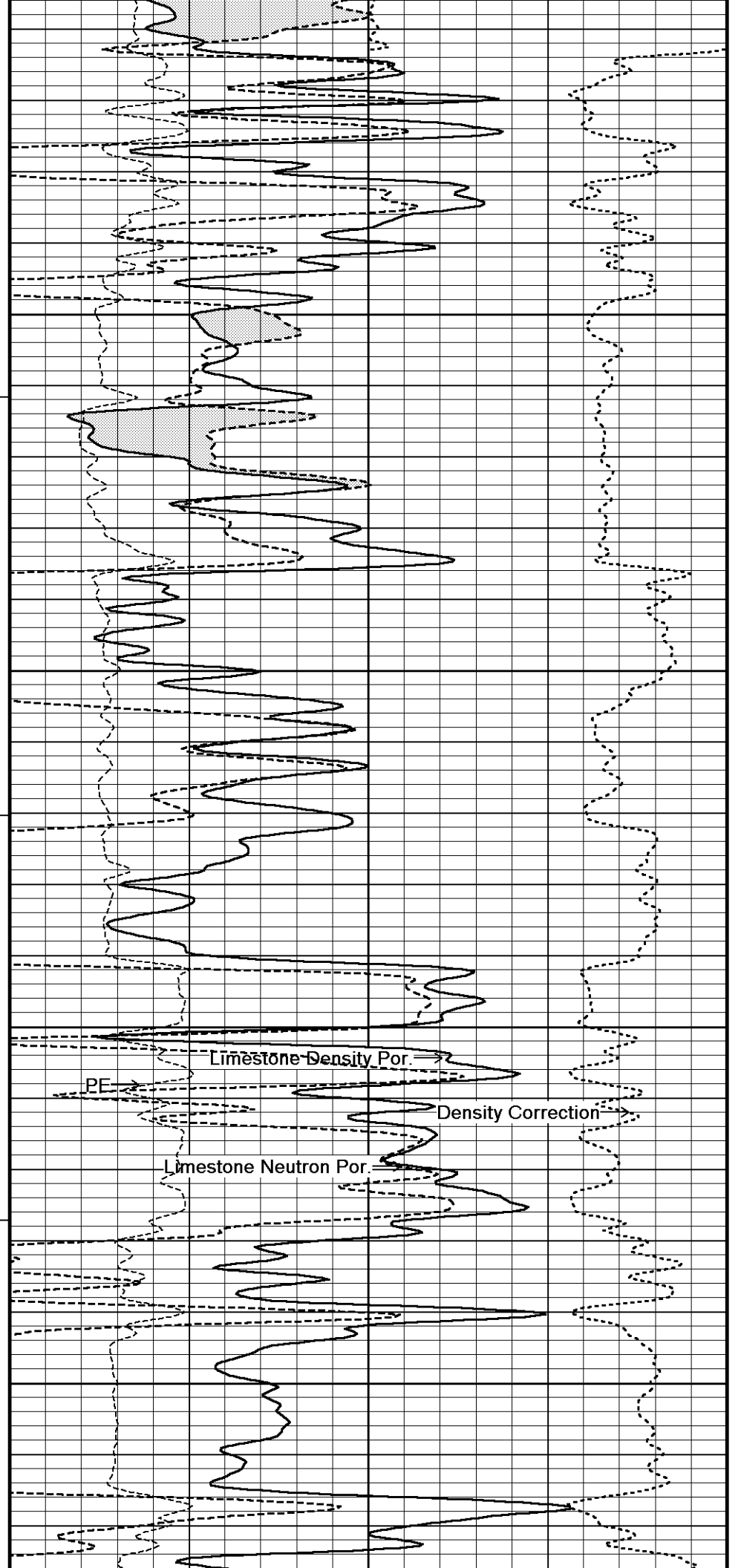
5850

118°

5900

118°

5950

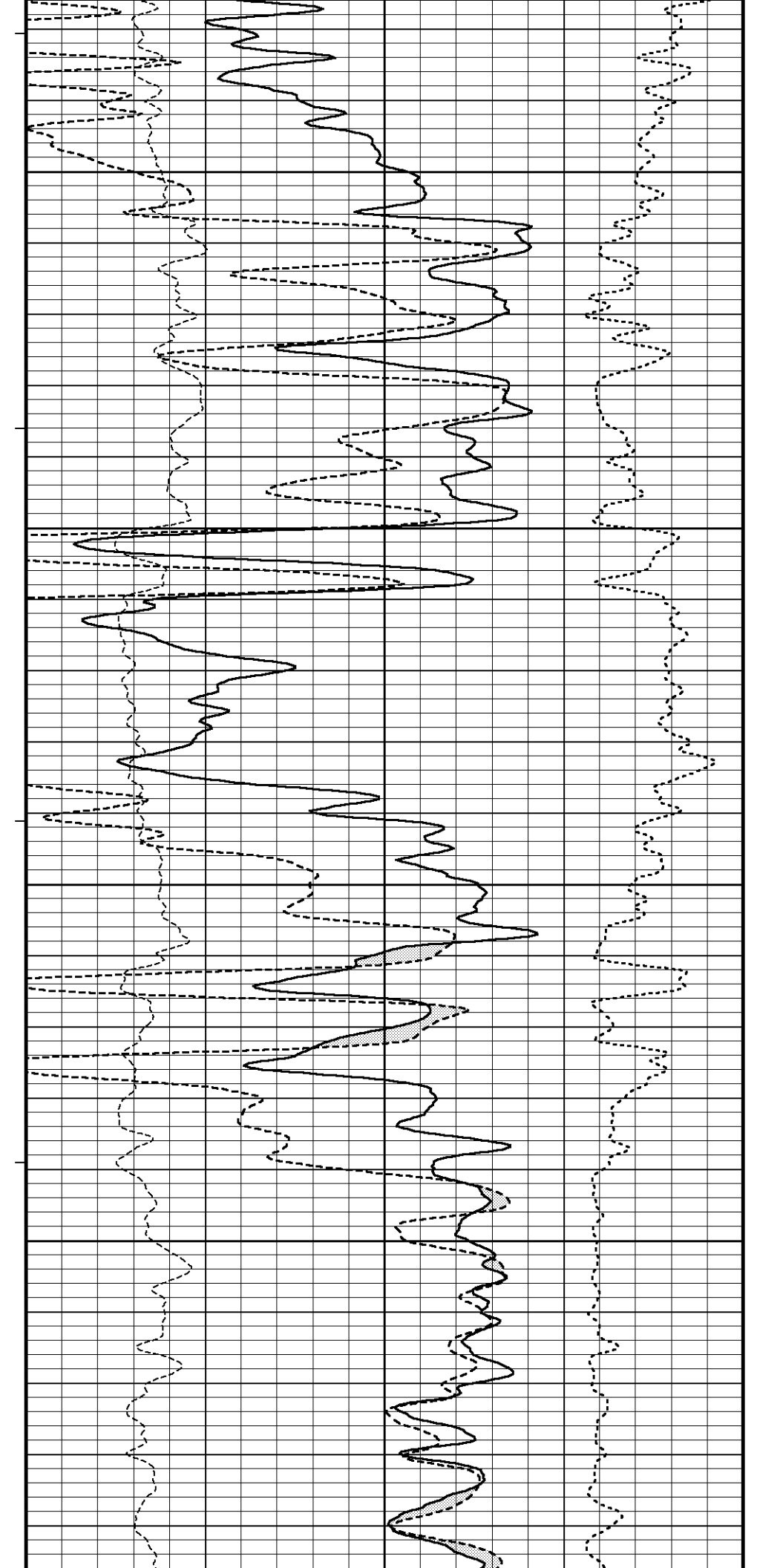
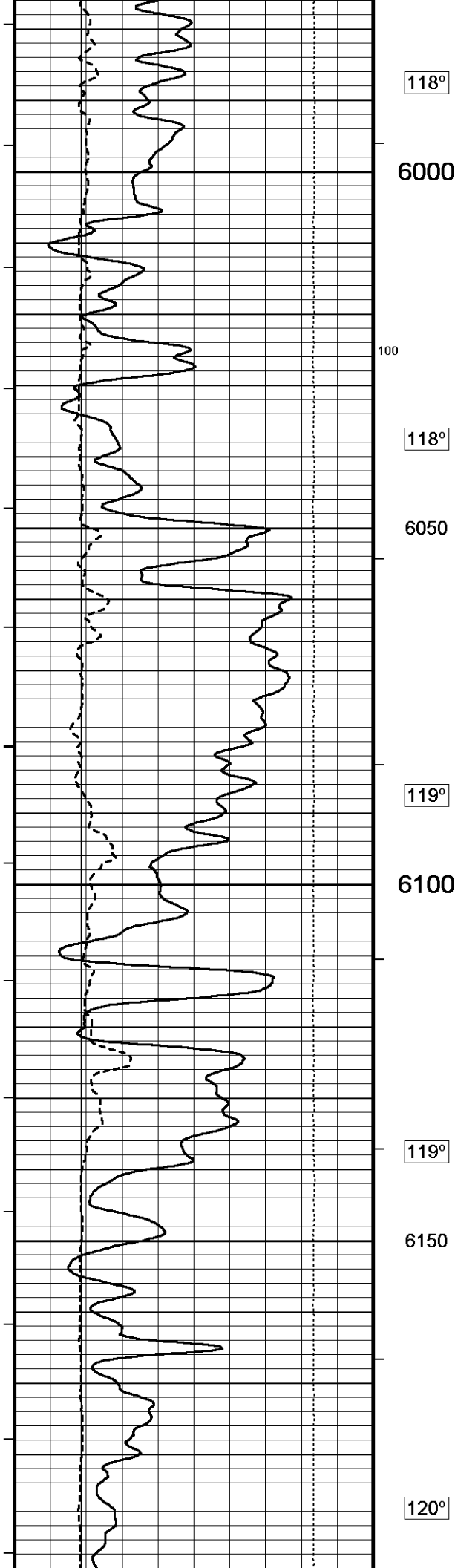


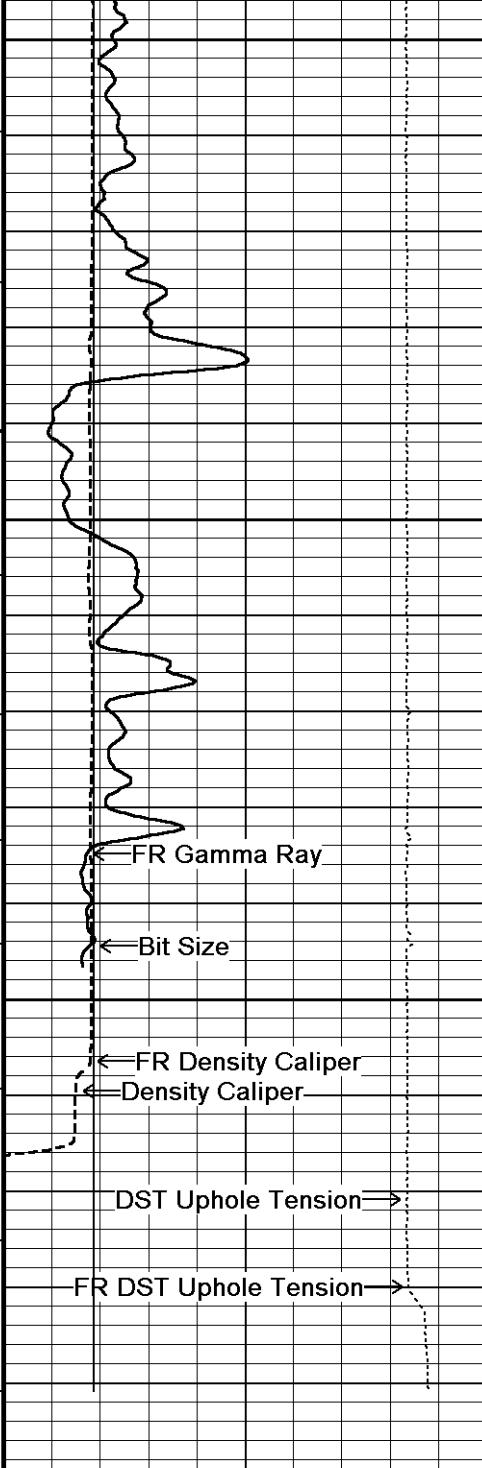
Limestone Density Por.

PE

Limestone Neutron Por.

Density Correction





6200

120°

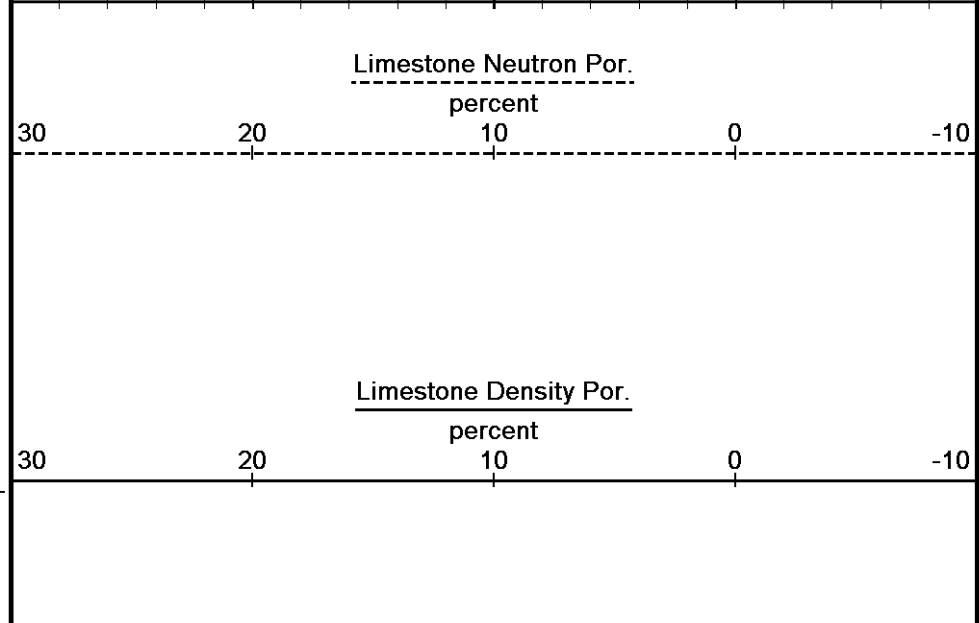
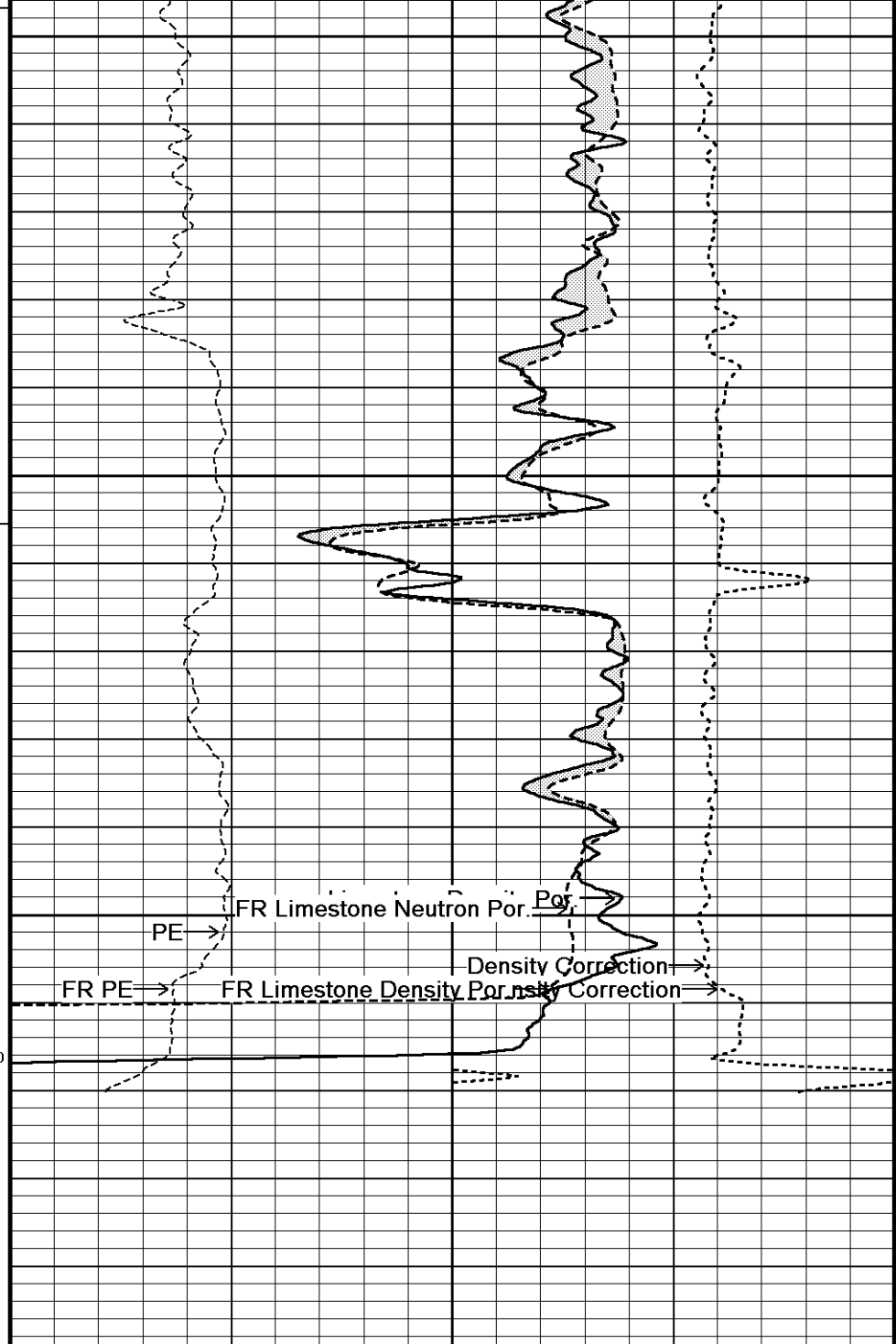
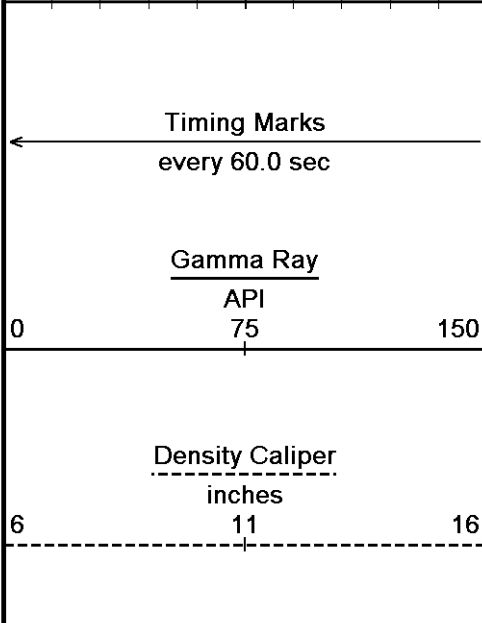
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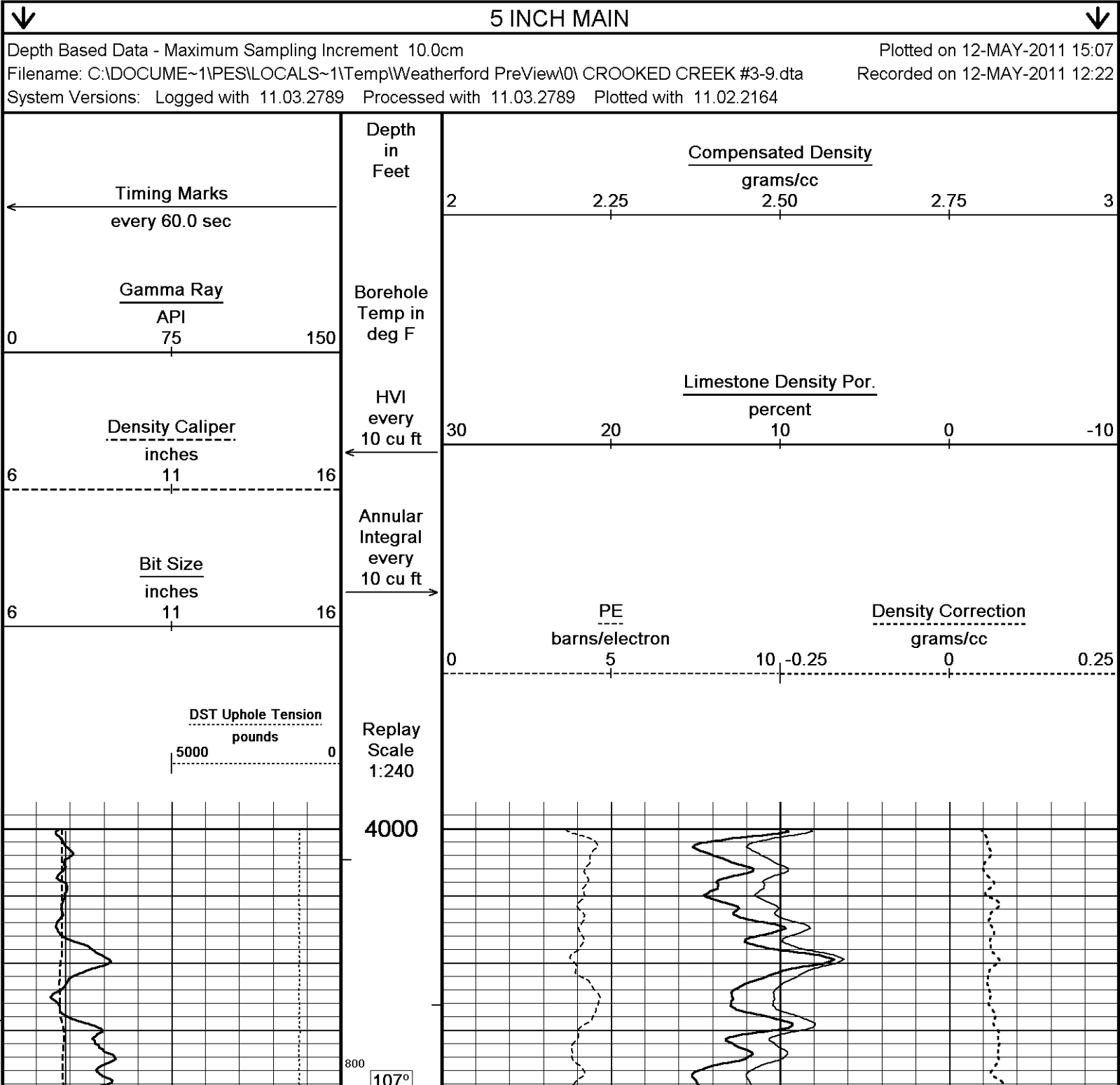
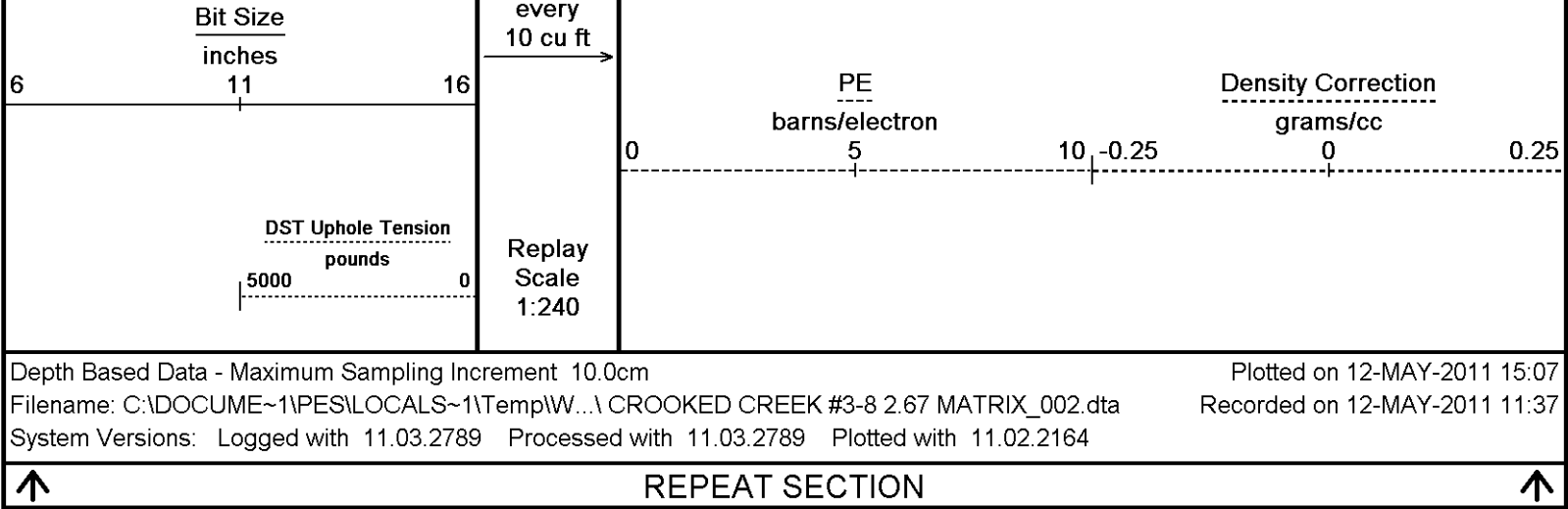
120°

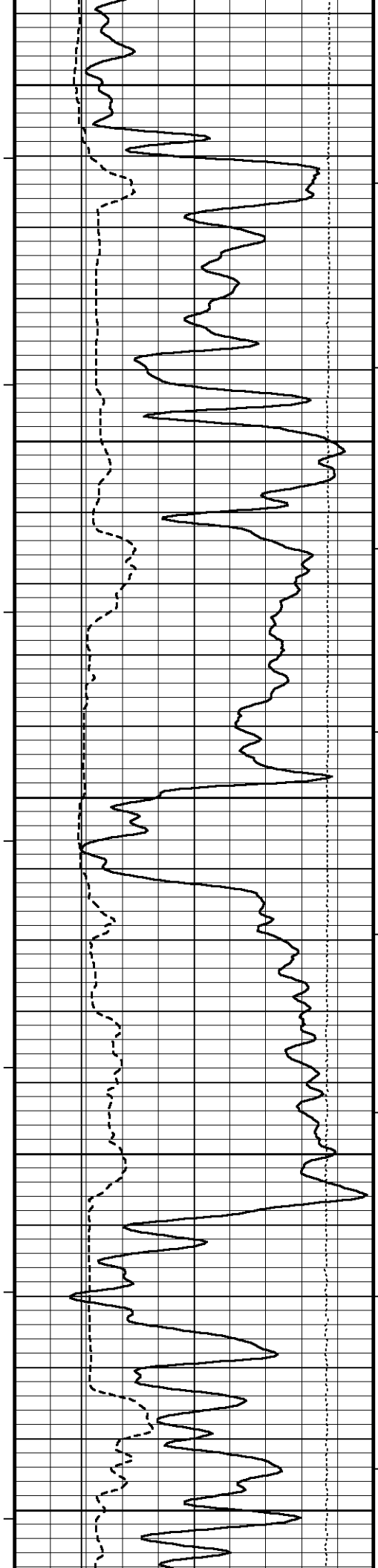
6300

0

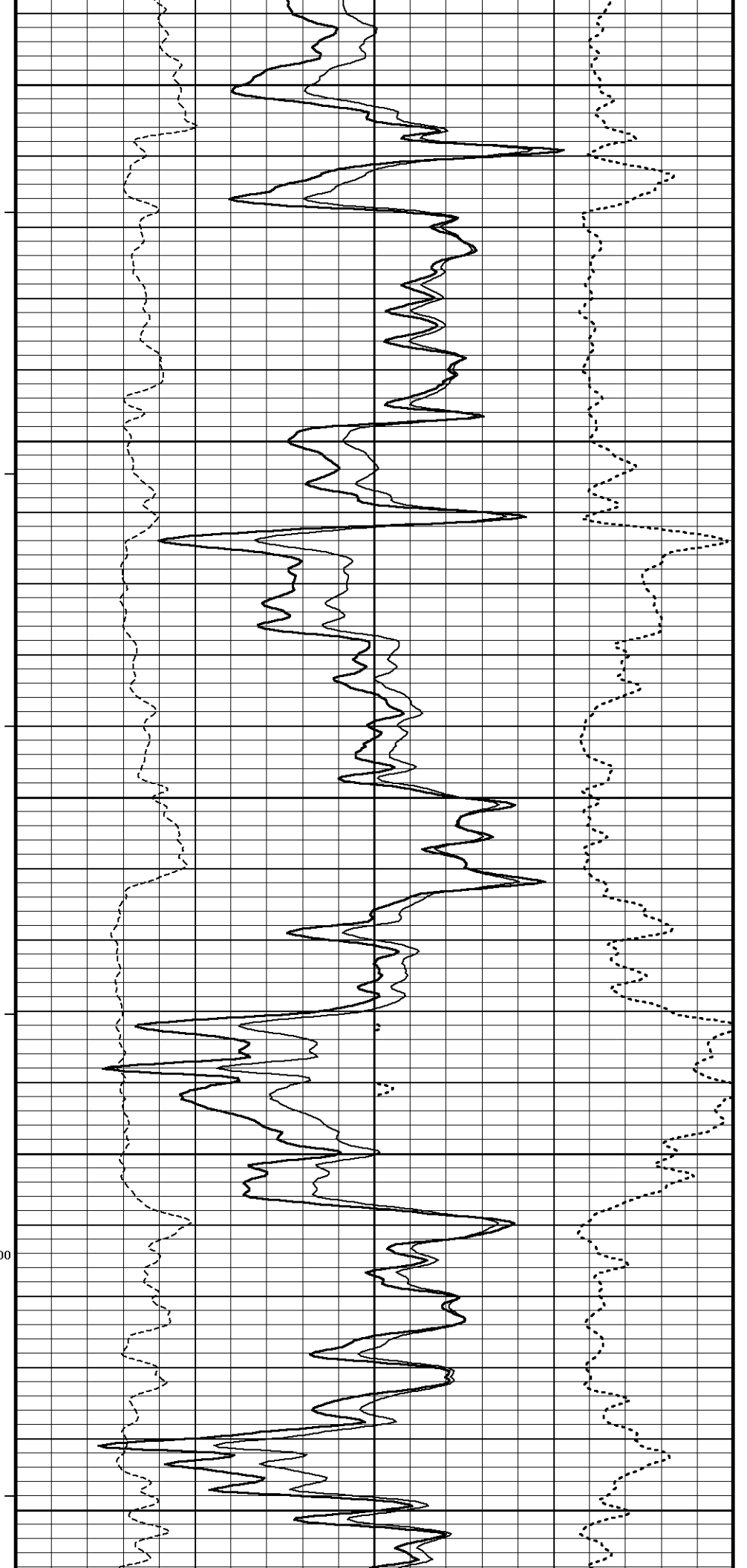
6350
Depth
in
Feet

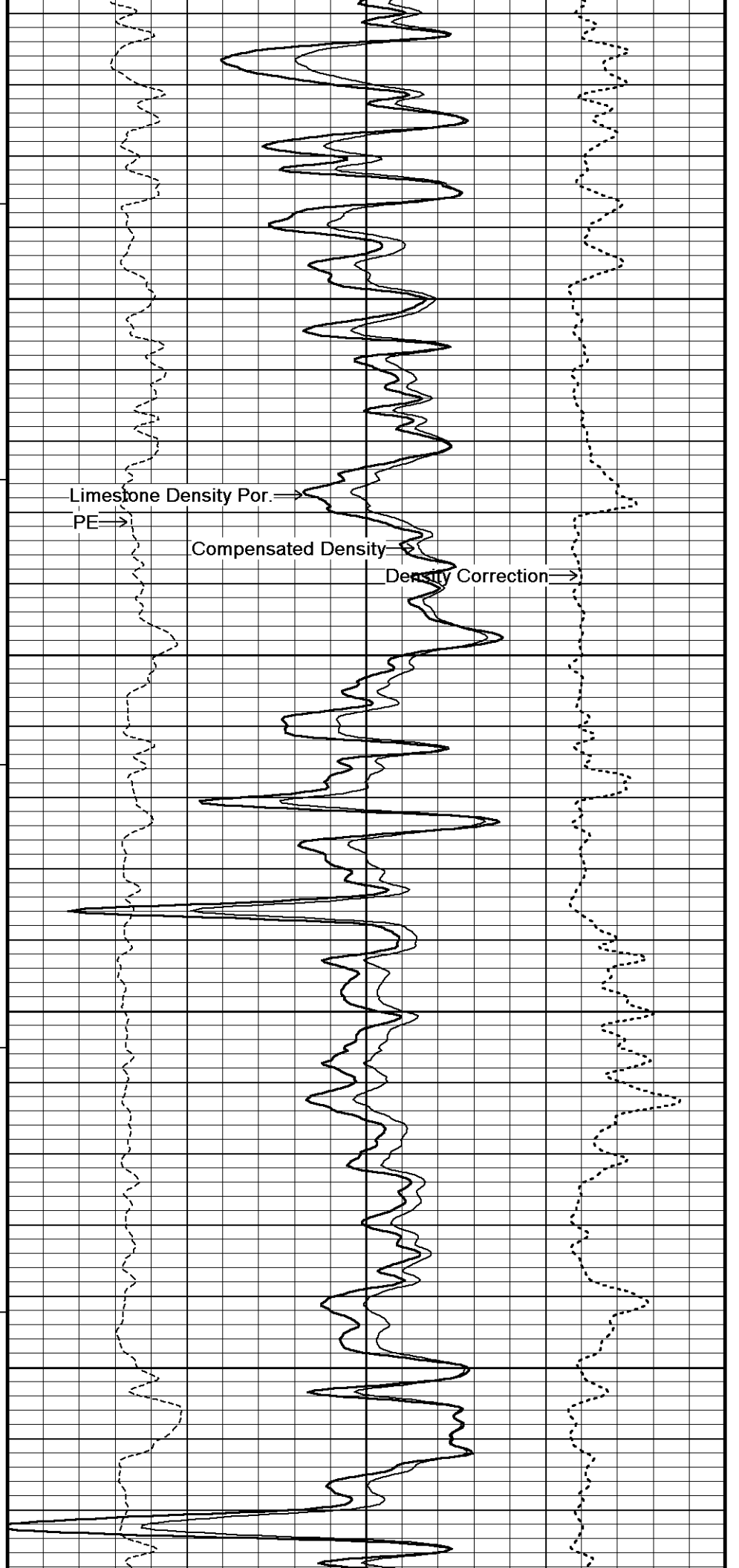
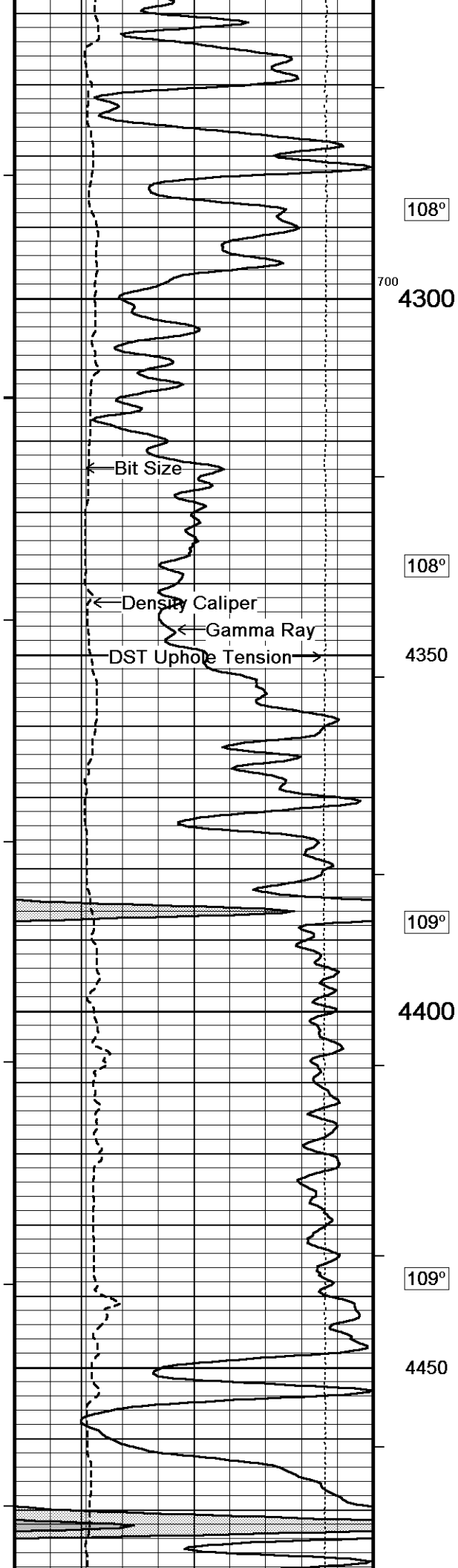


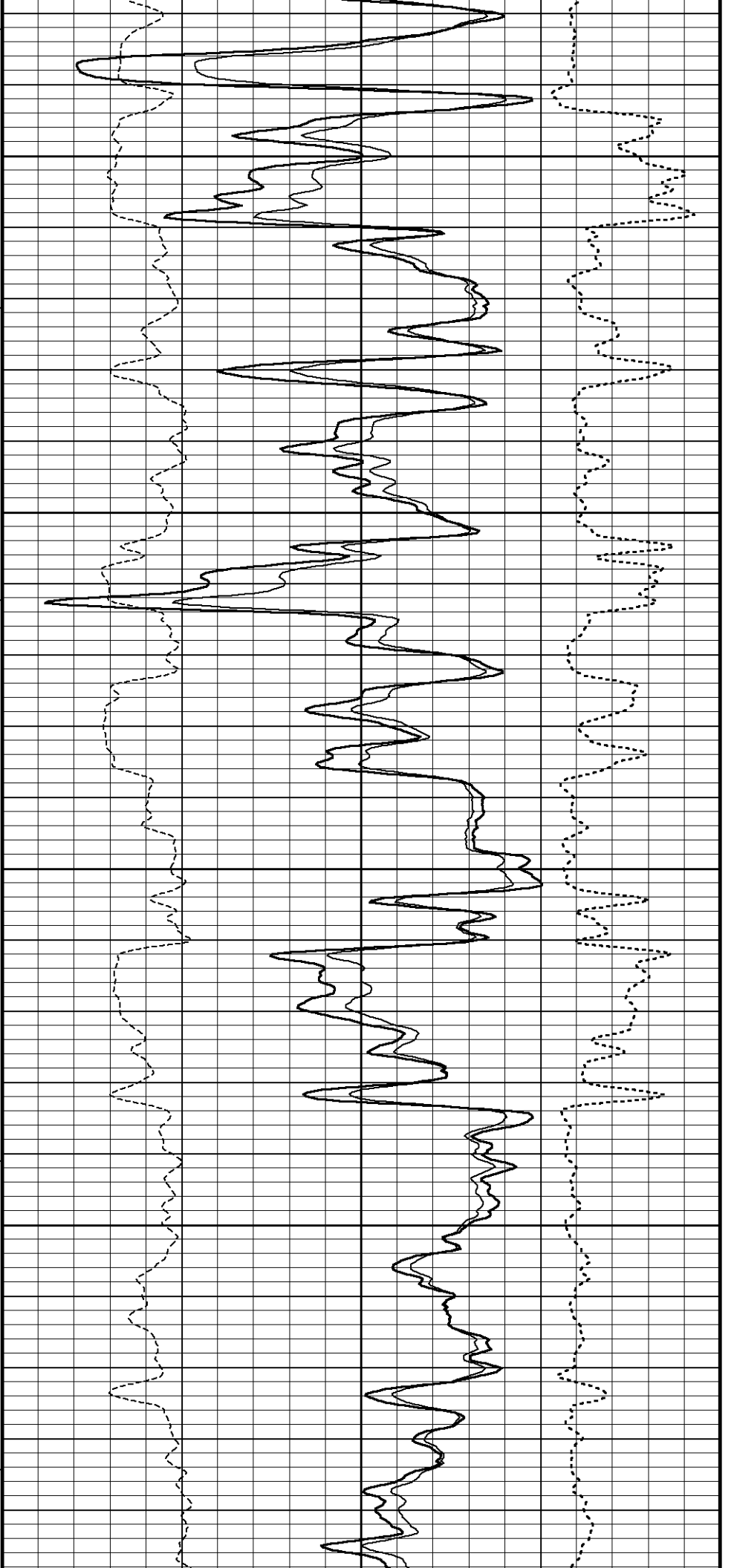
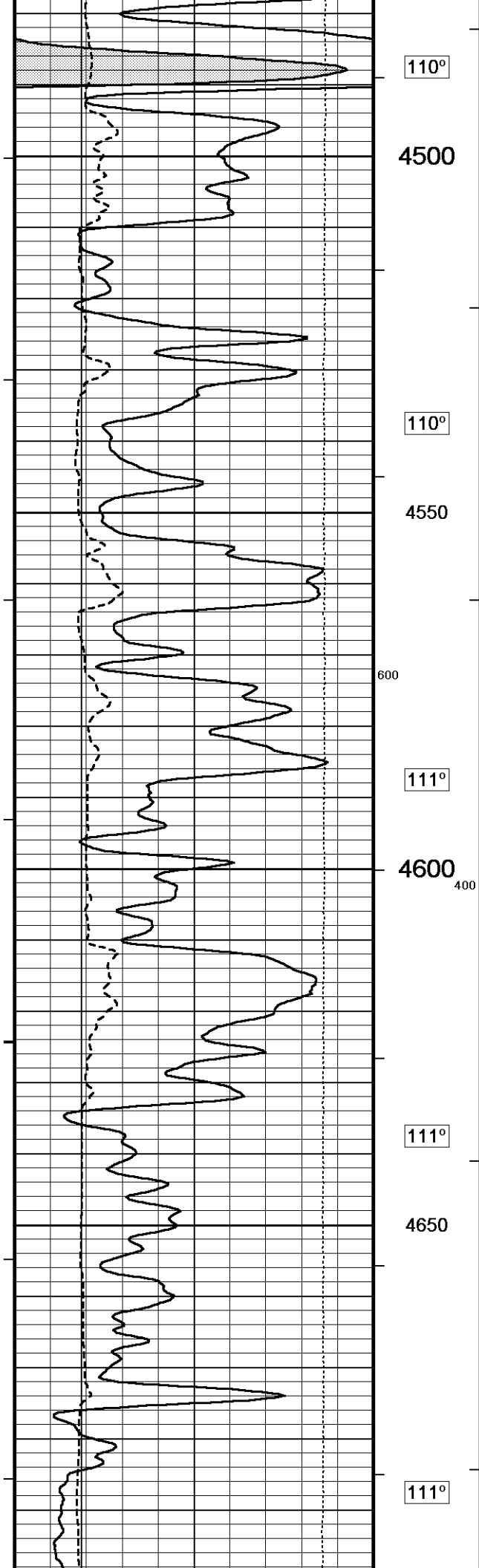


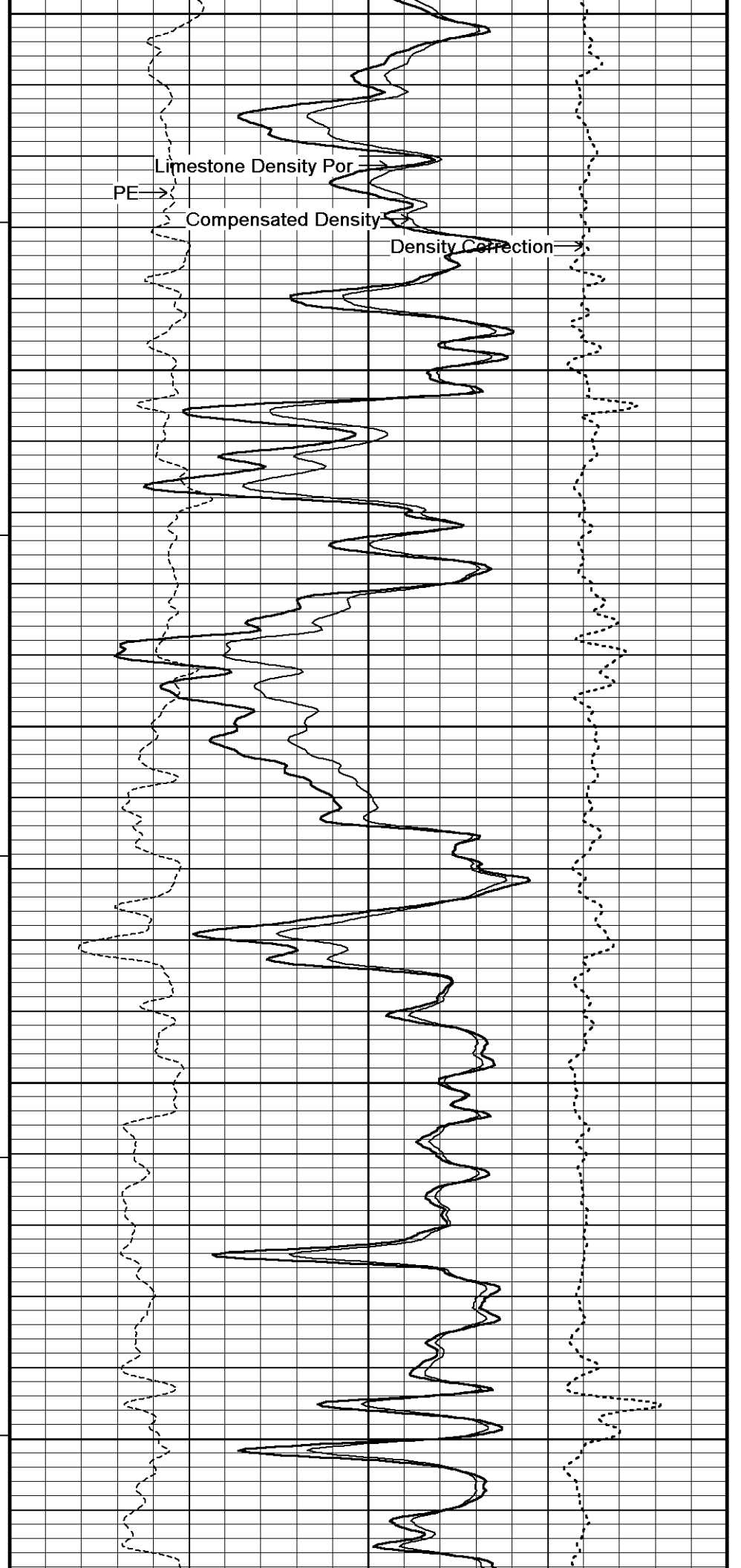
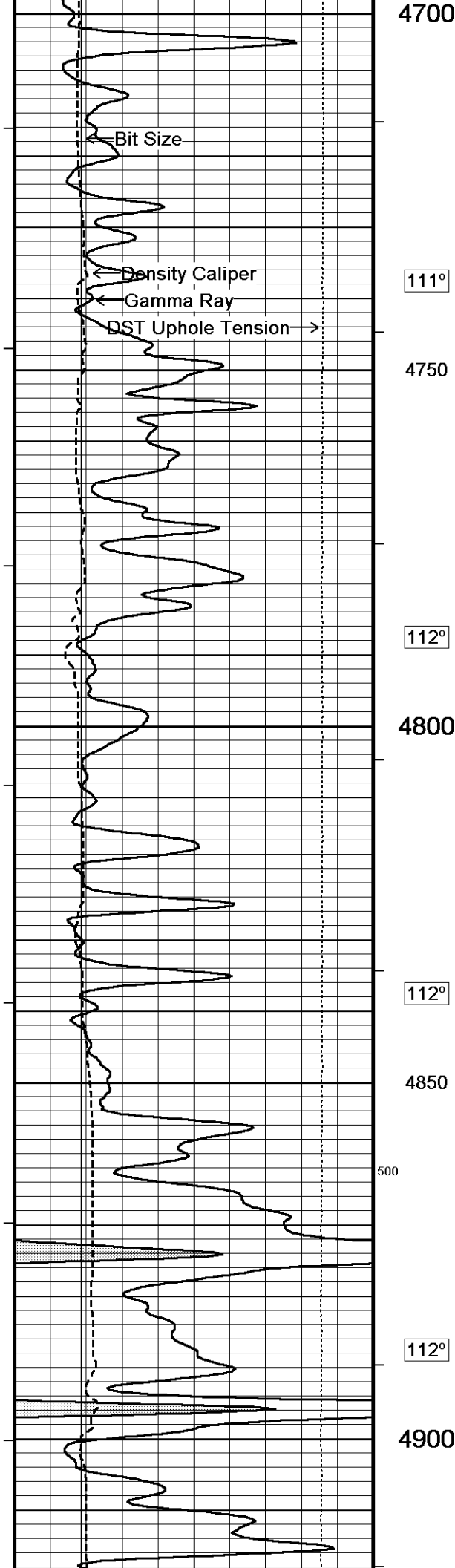


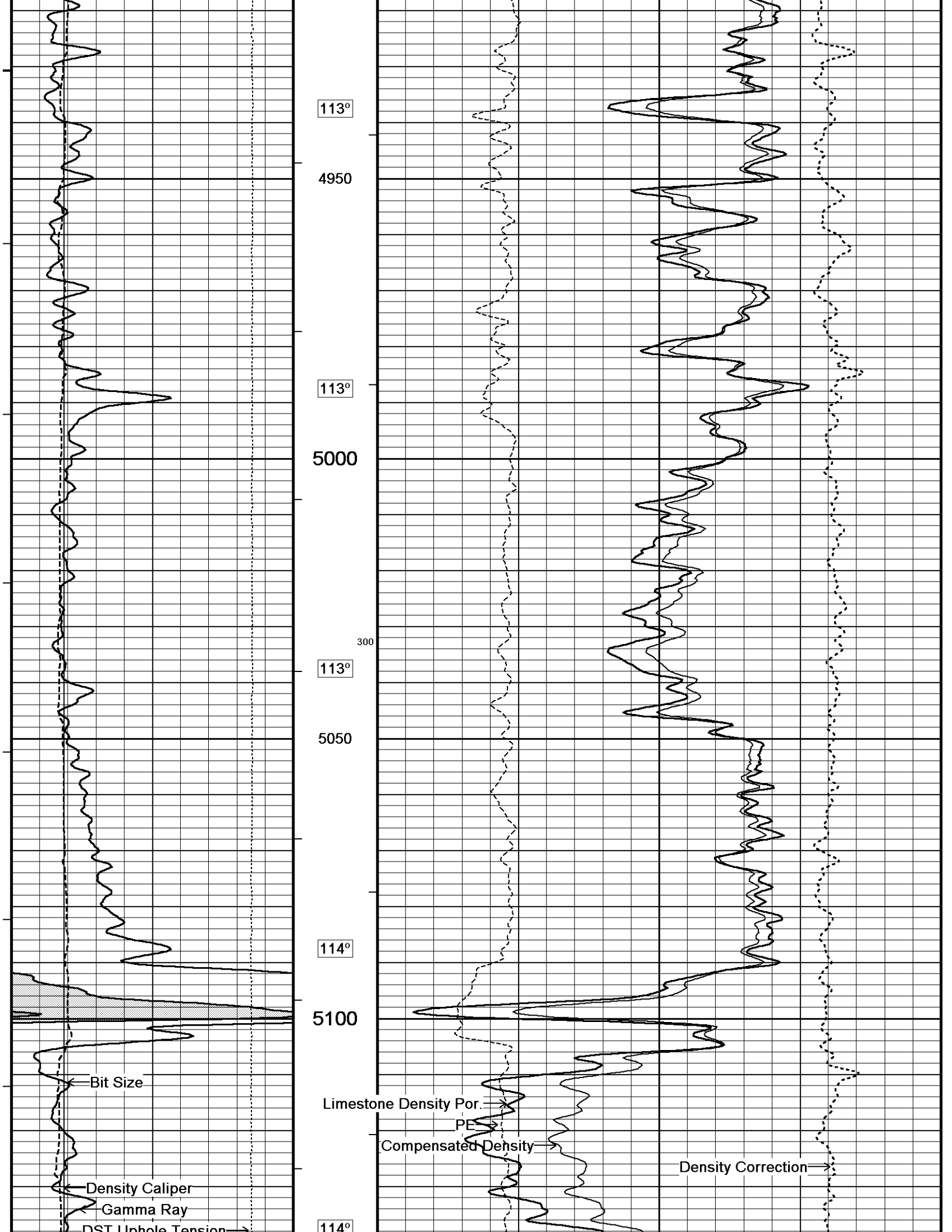
4050 107° 4100 107° 4150 108° 4200 500 108° 4250

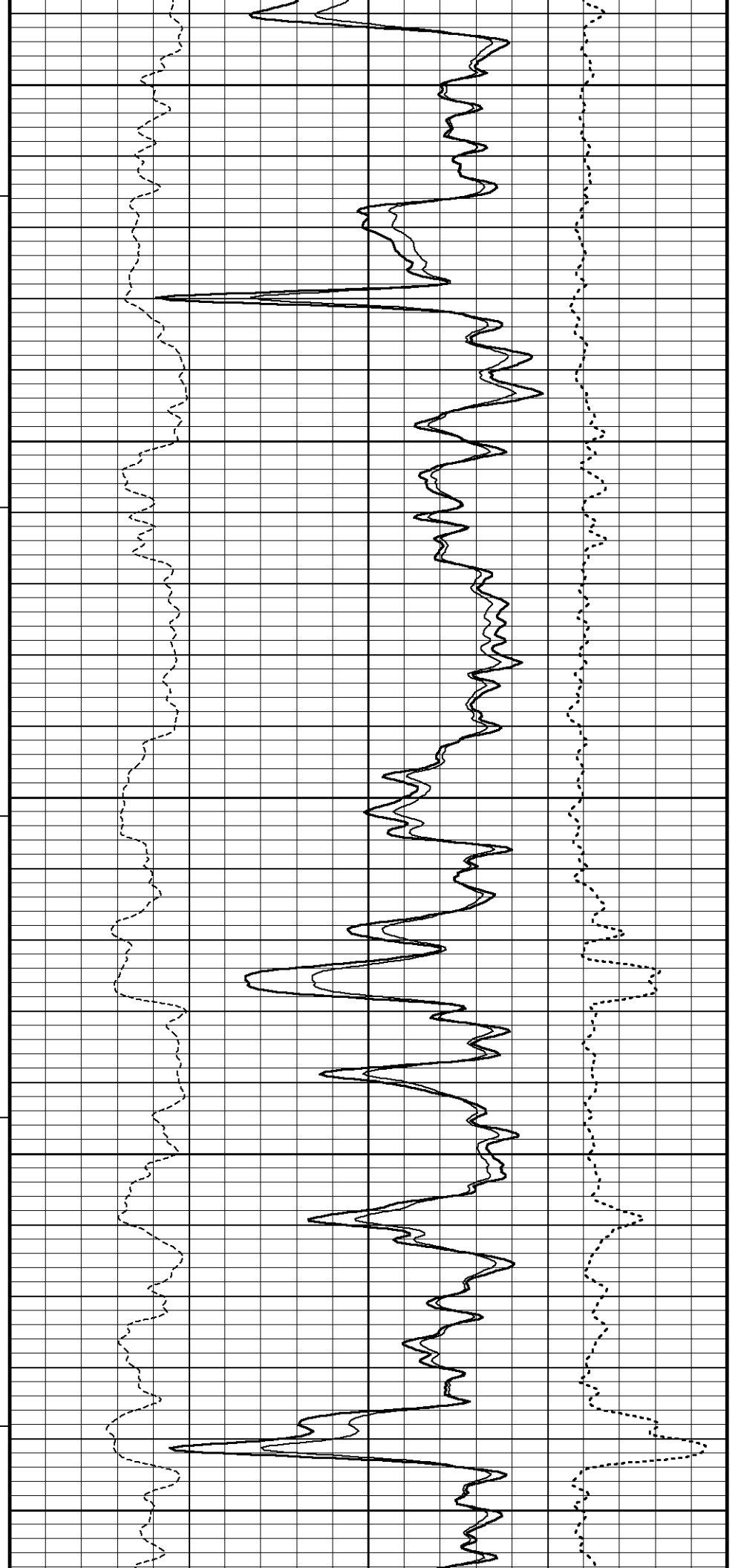
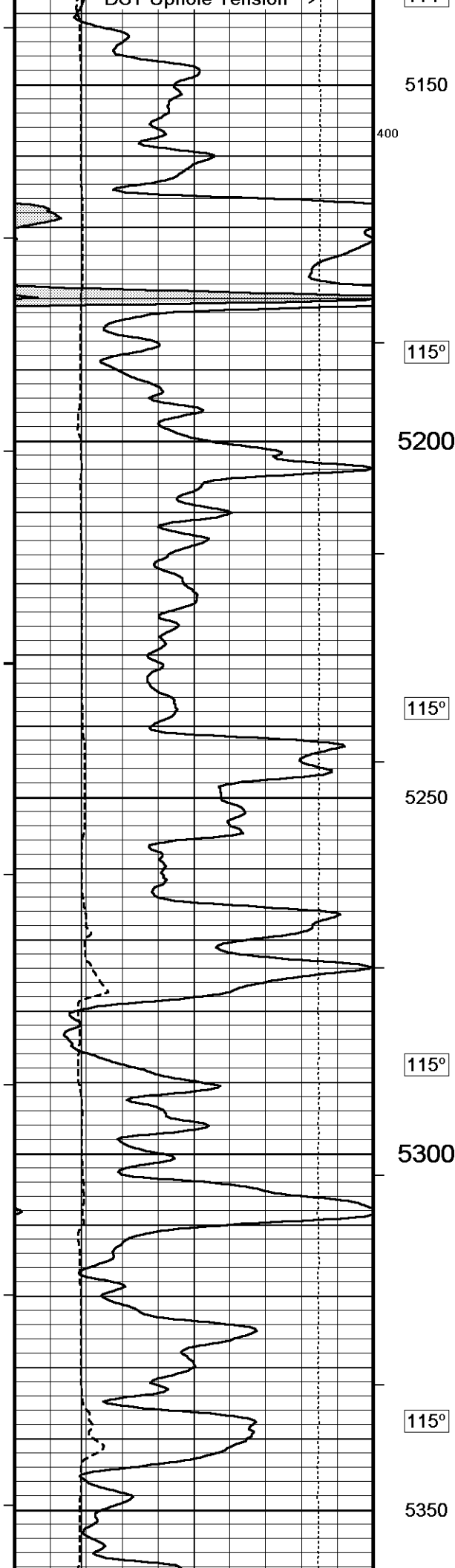


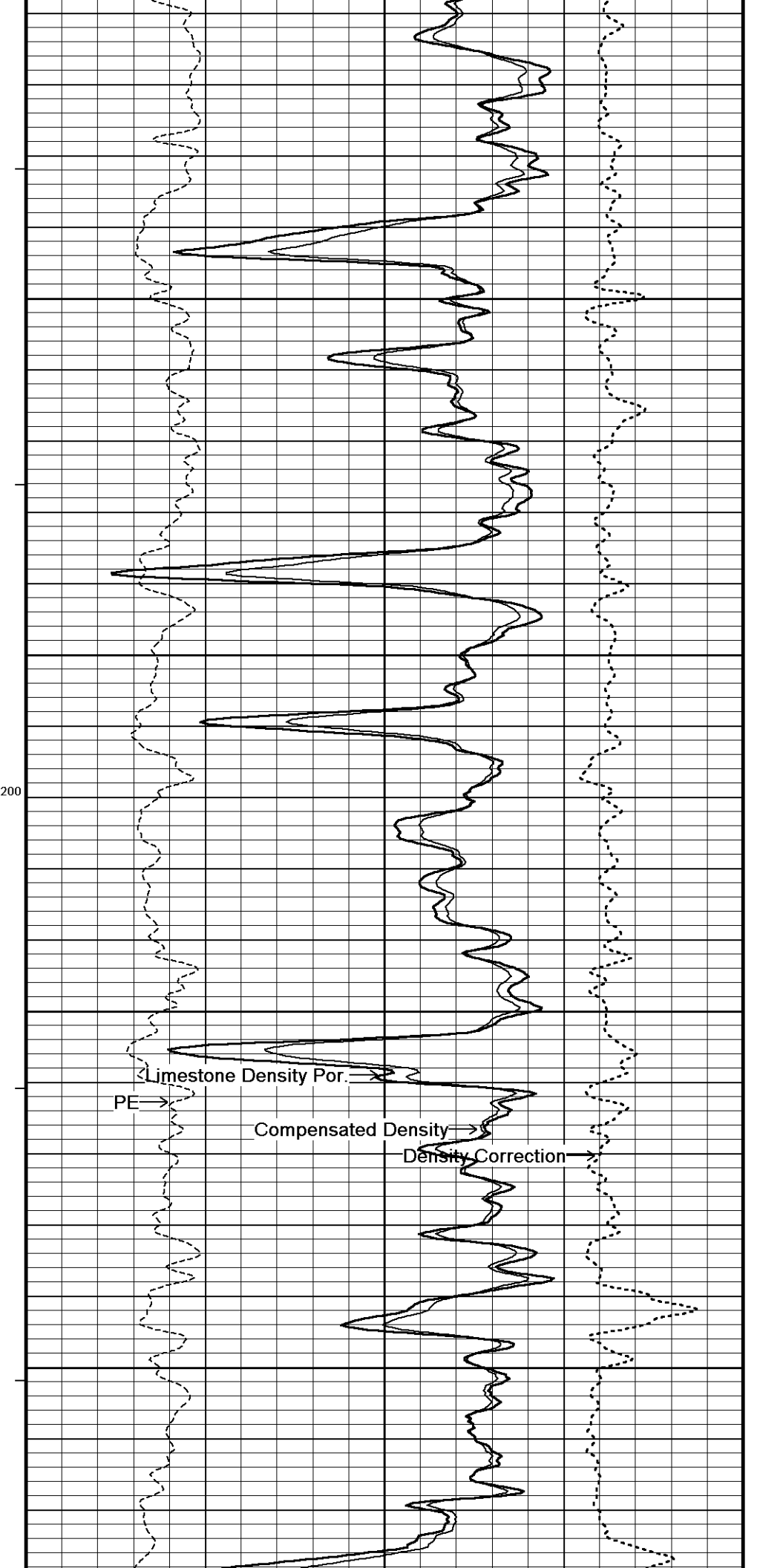
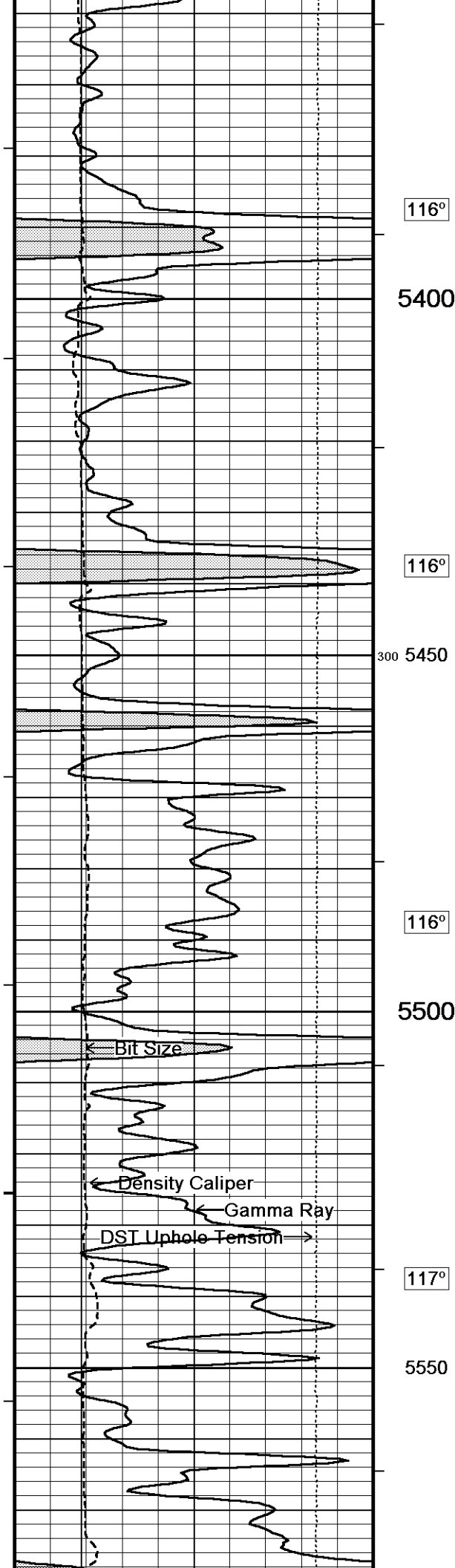


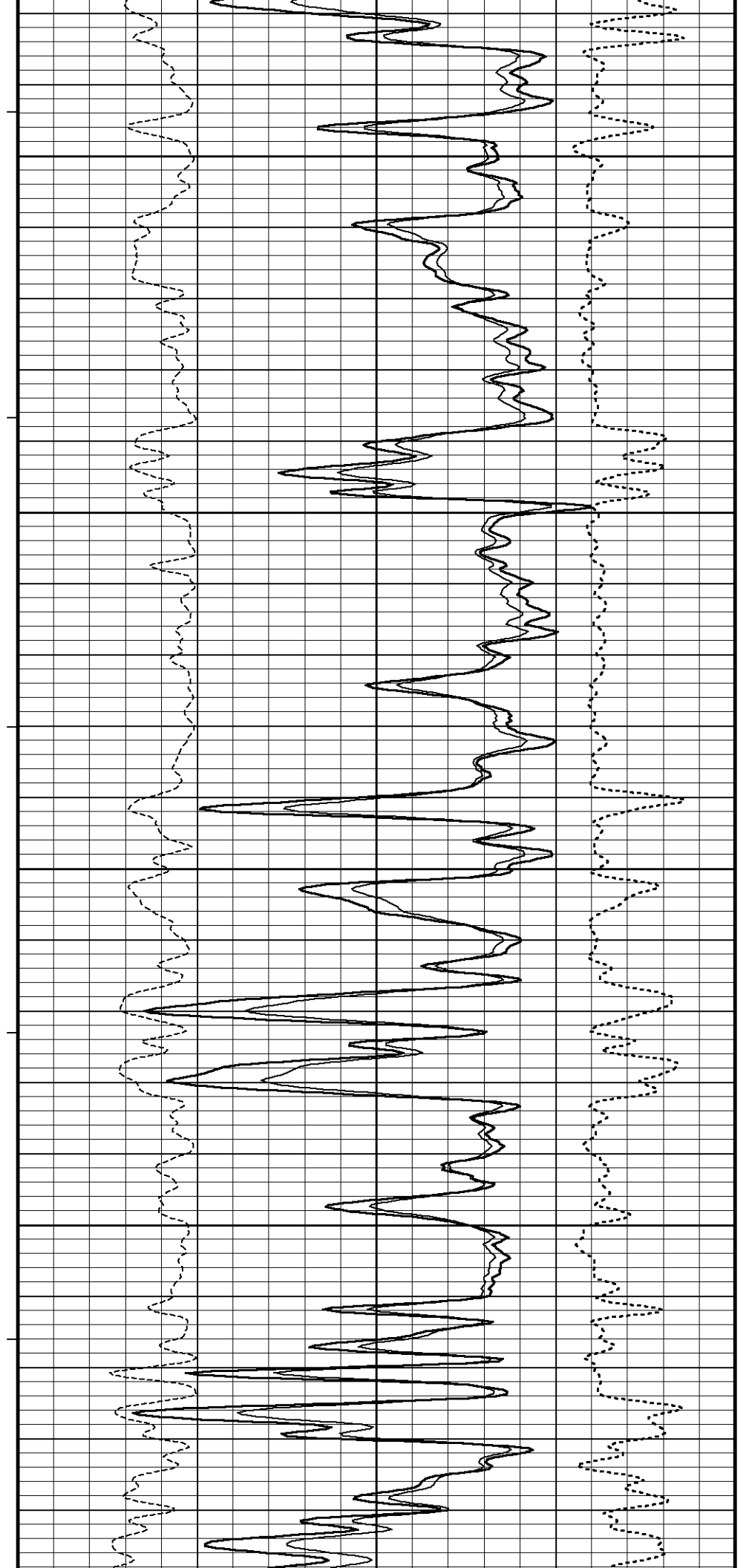
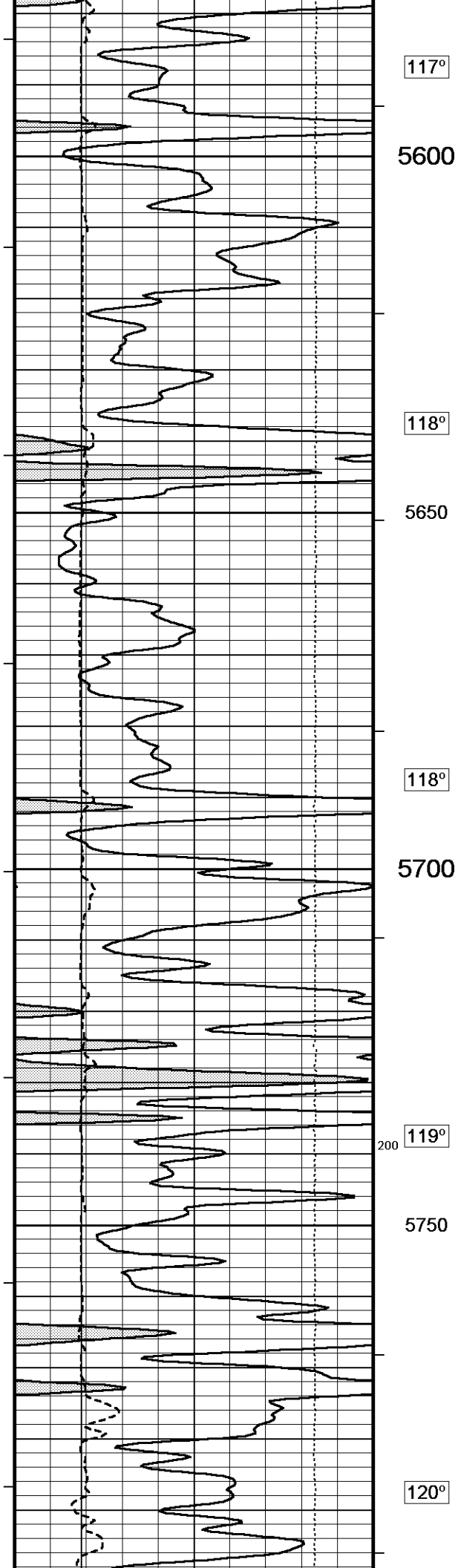


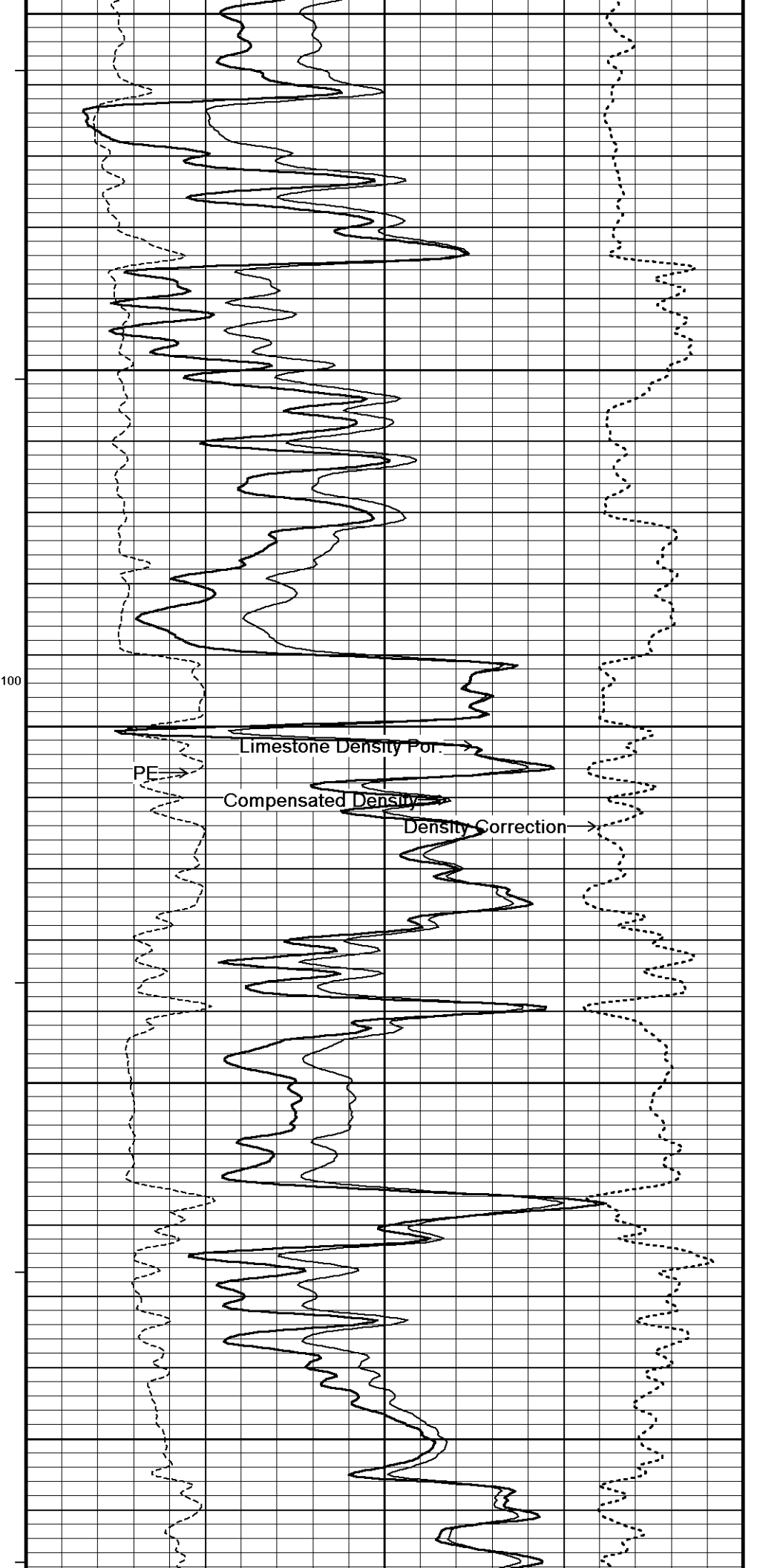
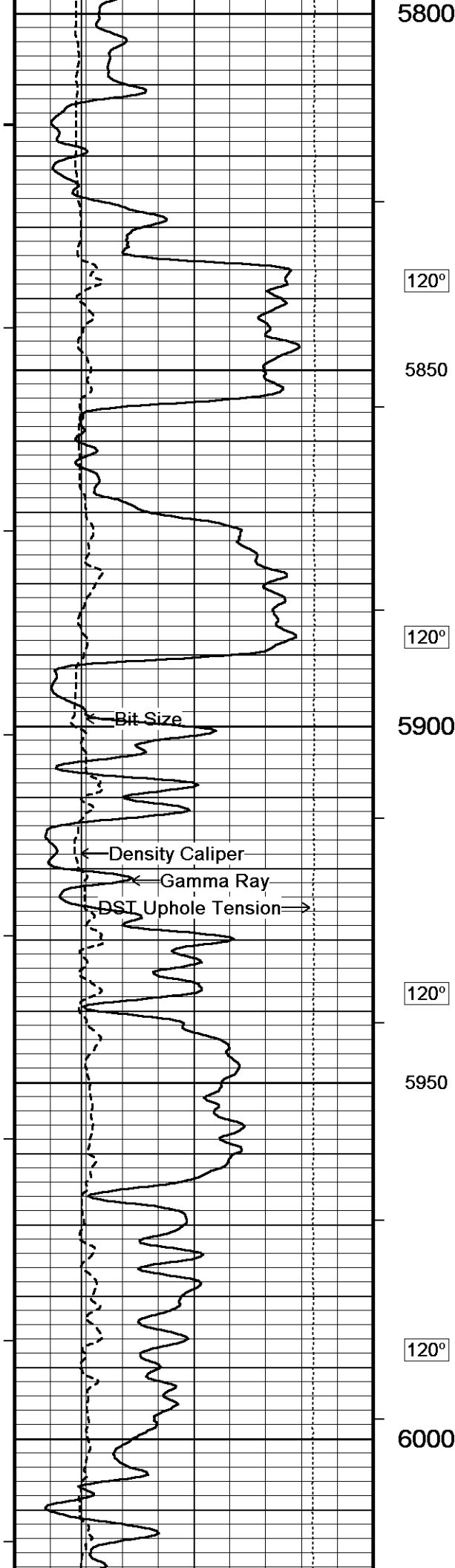


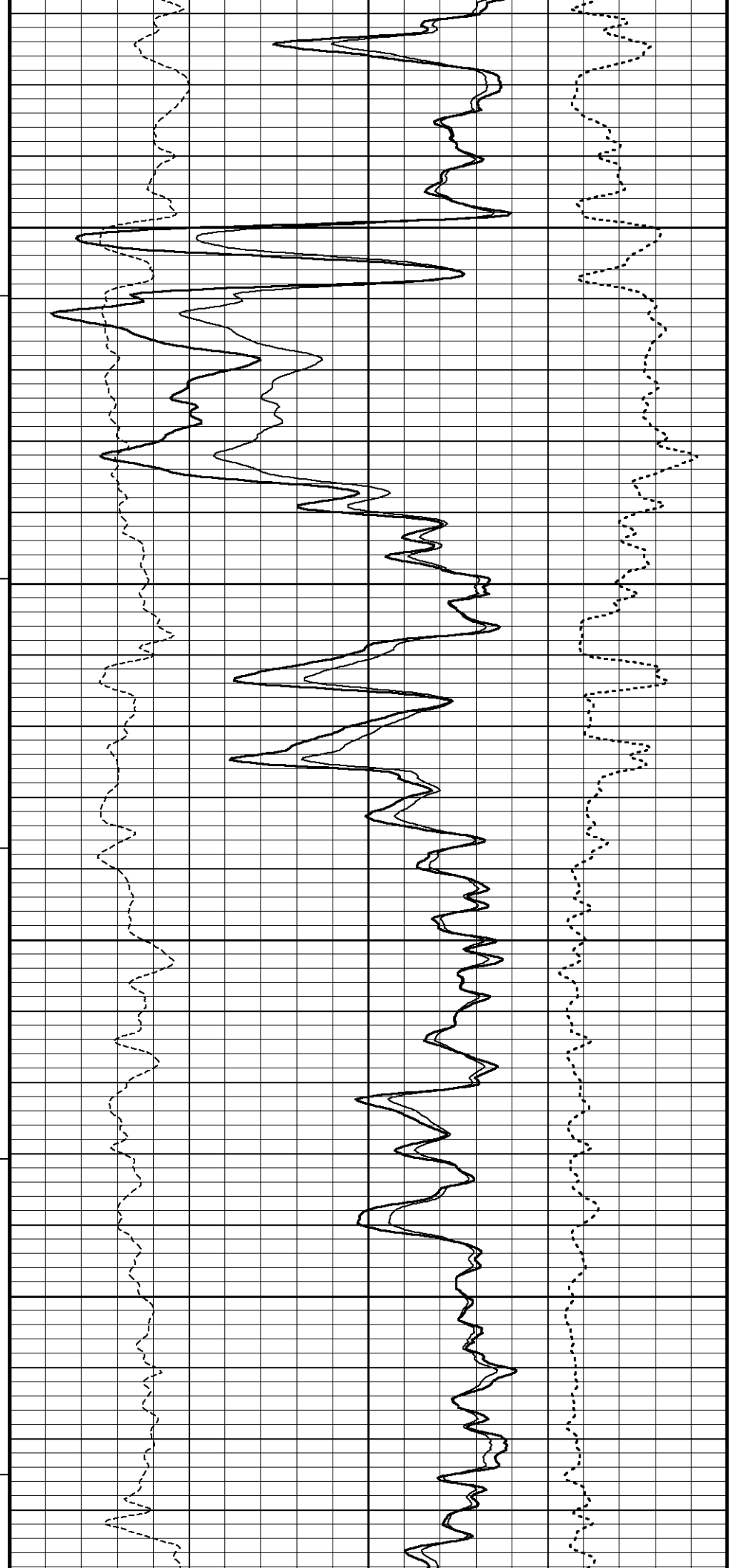
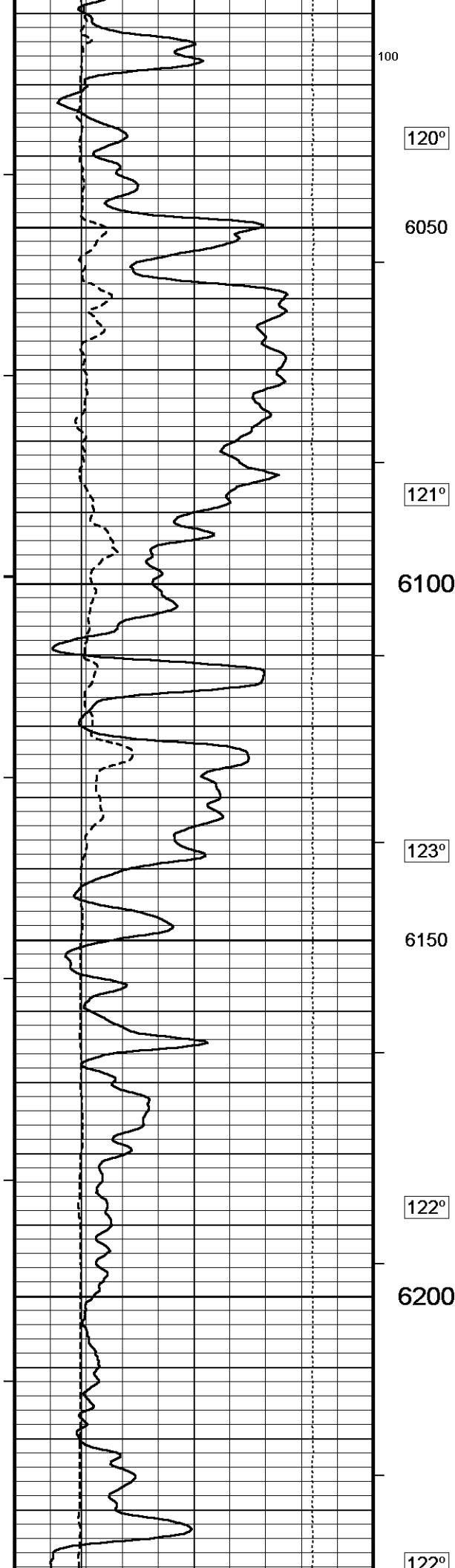


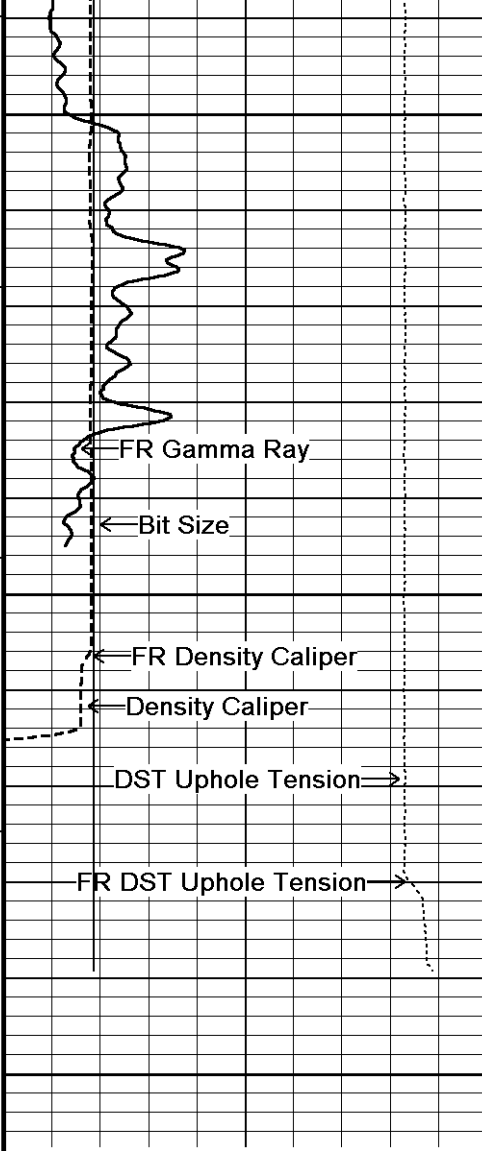




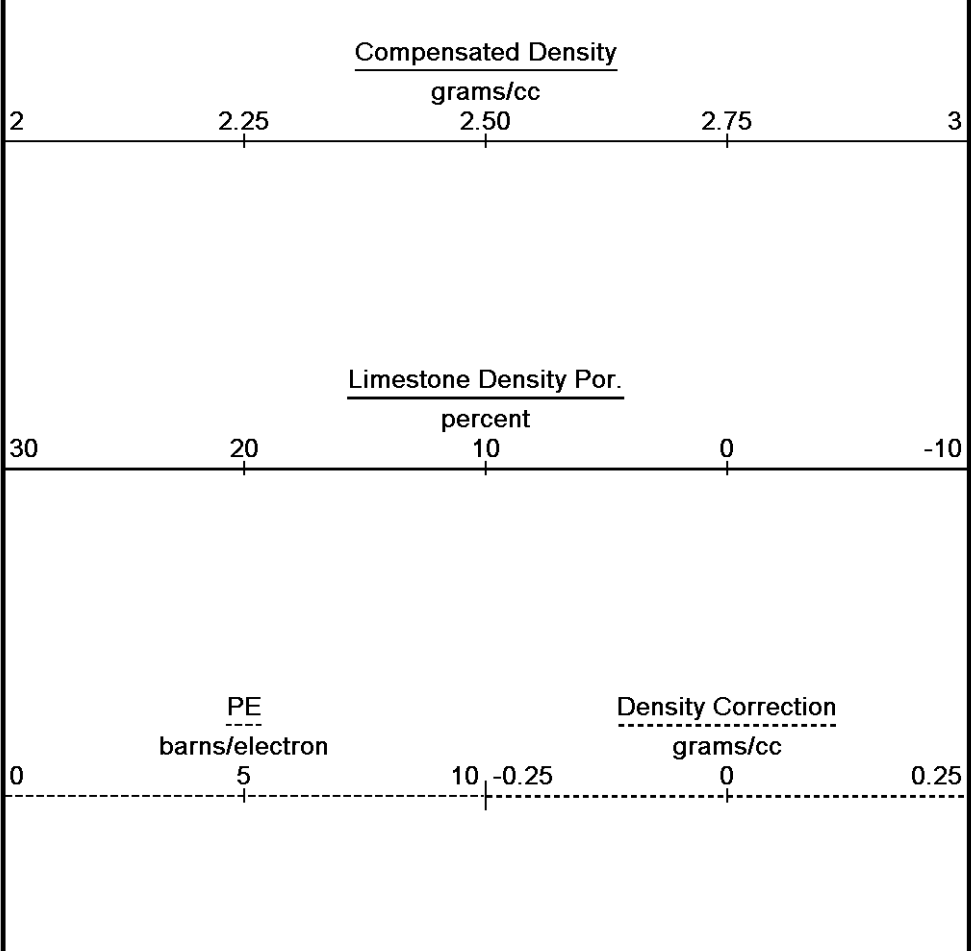
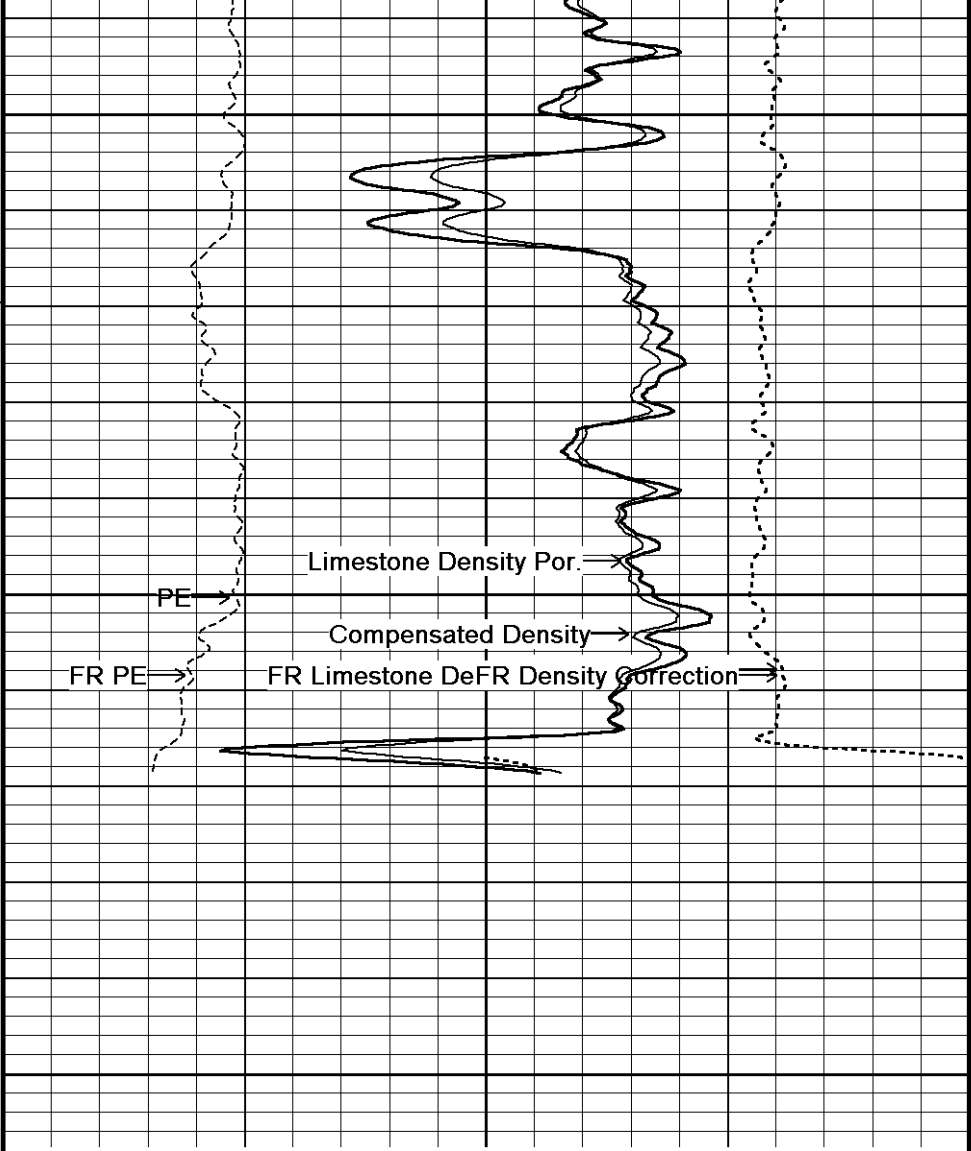
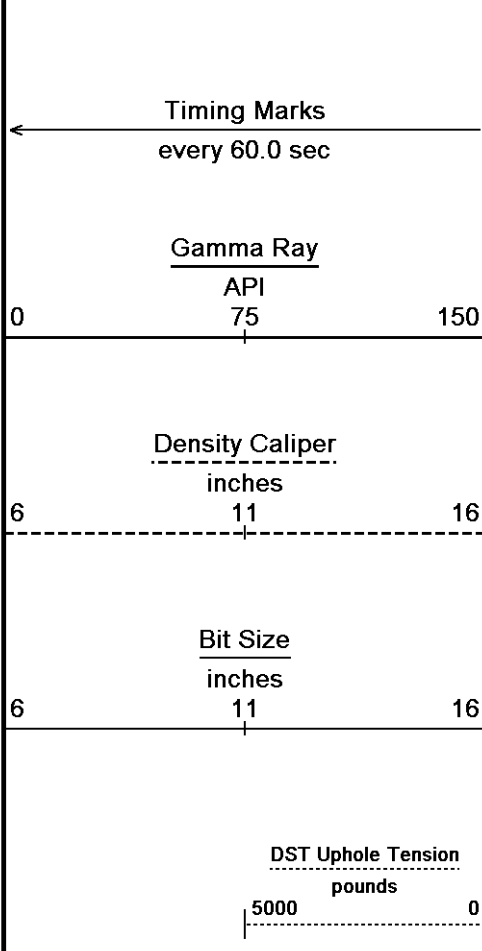








6250
123°
6300
6350
Depth in Feet



↑

5 INCH MAIN

↑

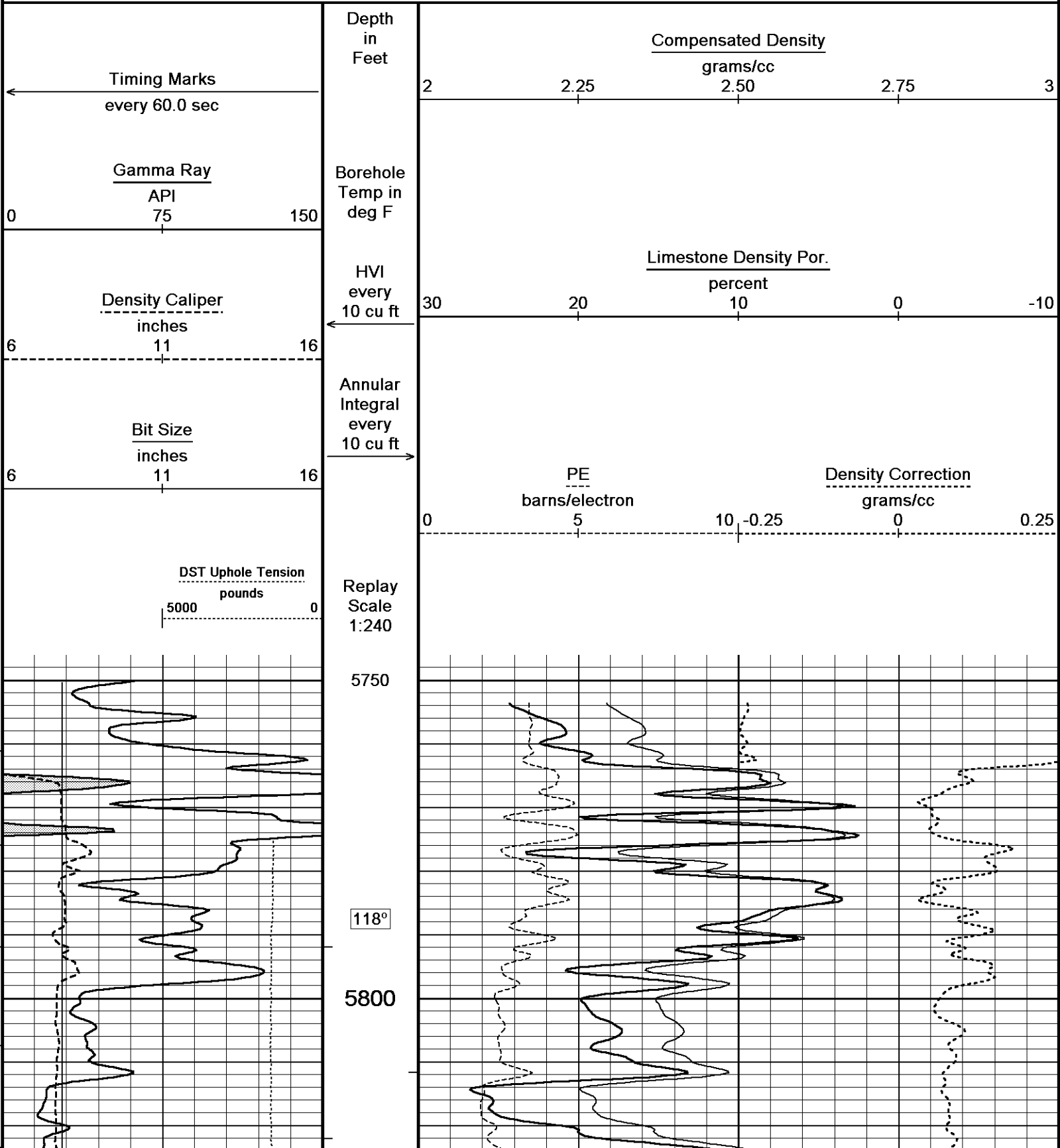
↓

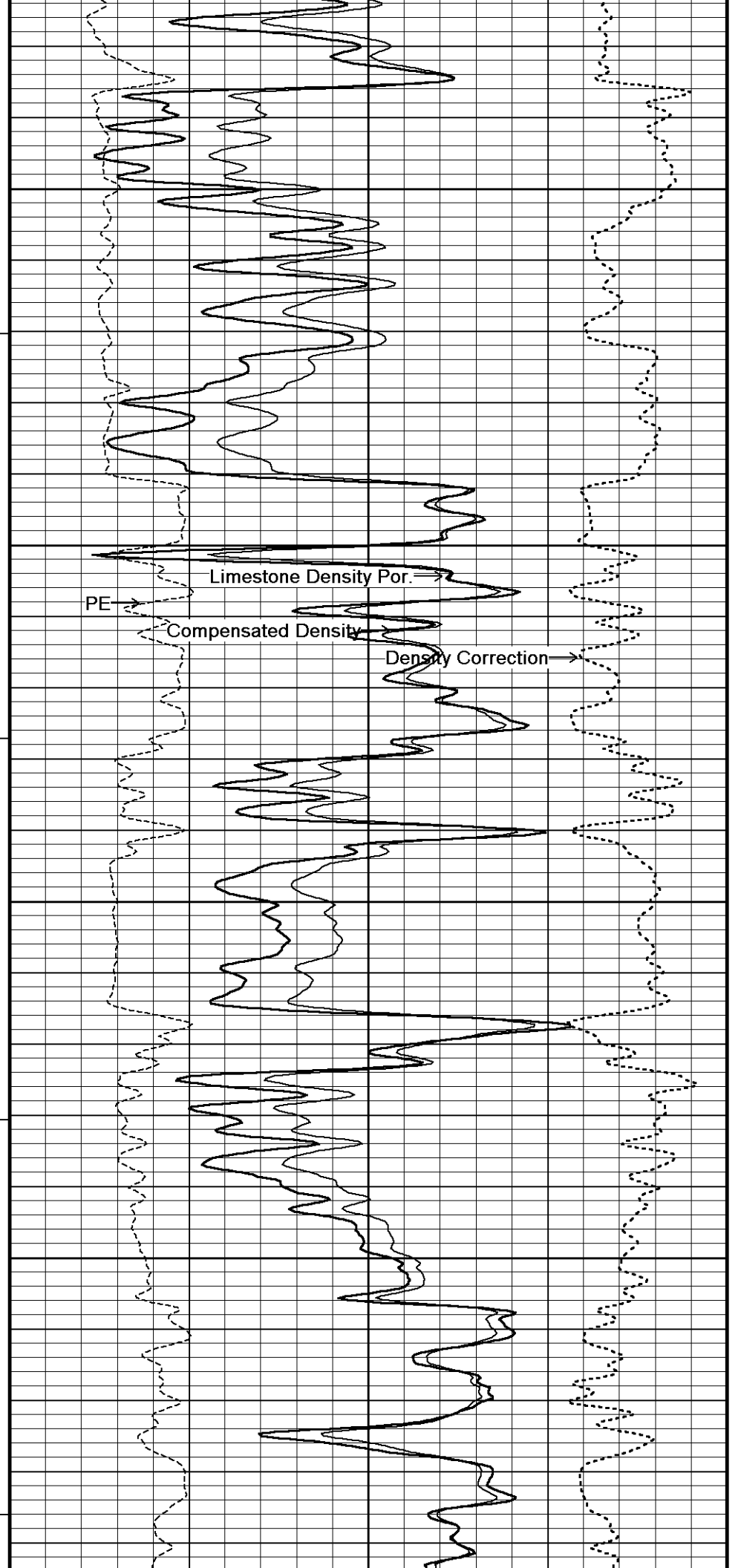
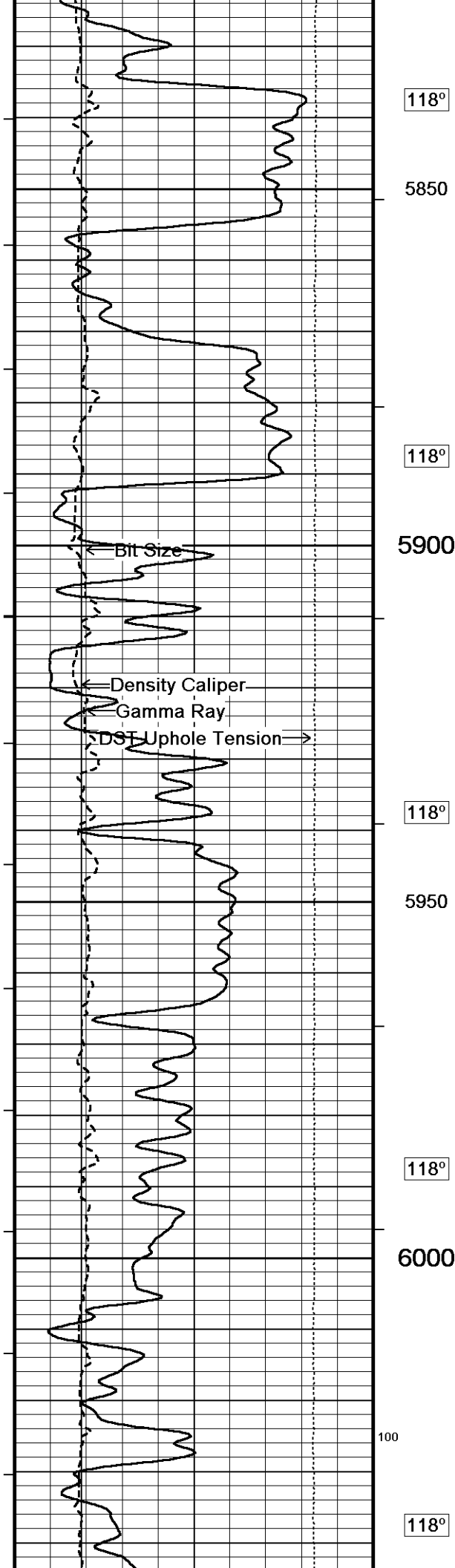
REPEAT SECTION

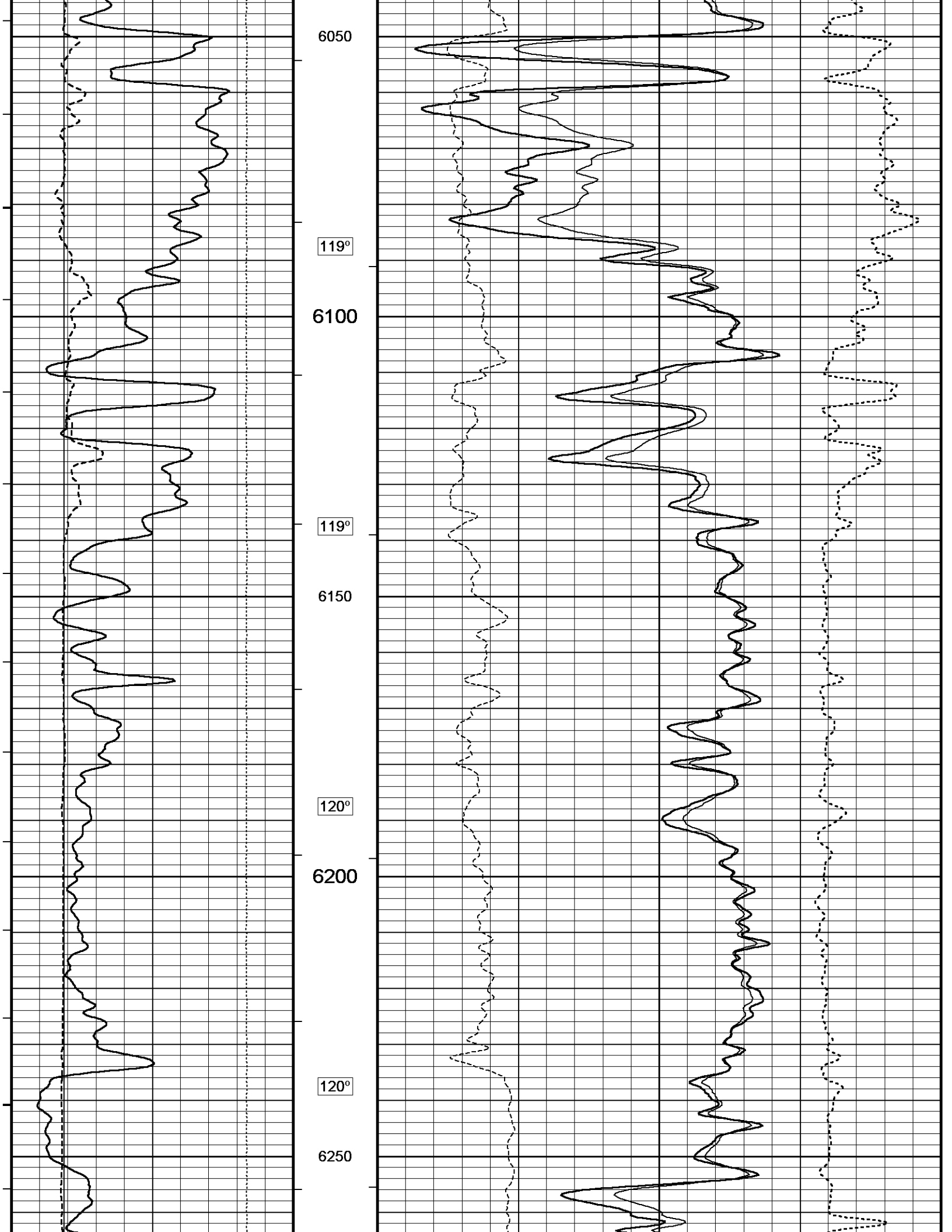
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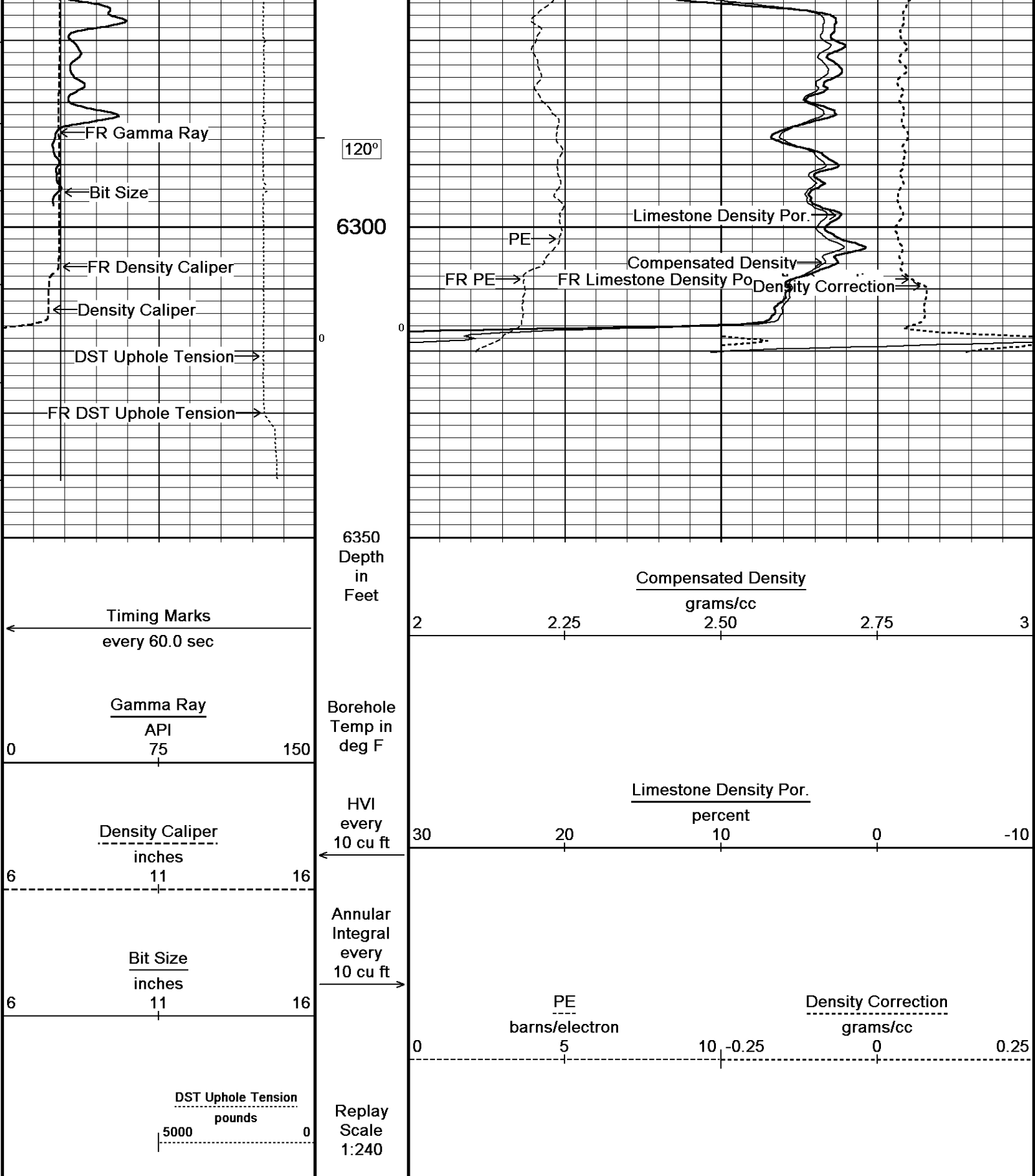
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\DOCUME~1\PES\LOCALS~1\Temp\W... \CROOKED CREEK #3-8 2.67 MATRIX_002.dta
System Versions: Logged with 11.03.2789 Processed with 11.03.2789 Plotted with 11.02.2164

Plotted on 12-MAY-2011 15:07
Recorded on 12-MAY-2011 11:37









Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\DOCUME~1\PES\LOCALS~1\TempW... \ CROOKED CREEK #3-8 2.67 MATRIX_002.dta
System Versions: Logged with 11.03.2789 Processed with 11.03.2789 Plotted with 11.02.2164

Plotted on 12-MAY-2011 15:07
Recorded on 12-MAY-2011 11:37

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION
C:\DOCUME~1\PES\LOCALS~1\TempWeatherford PreView\0\ CROOKED CREEK #3-8.dta

General Parameters

Mud Resistivity	0.360	ohm-metres
Mud Resistivity Temperature	91.000	degrees F
Water Level	0.000	feet
Density/Neutron 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. One Res Rt	
RWA Constant A	1.000	
RWA Constant M	2.000	

Down-hole Tension Calibration All 000

Field Calibration on 30-JUN-2010

Reading No	Measured	Calibrated (lbs)
1	14112.01	10.00
2	15164.79	427.00

Down-hole Tension Calibration SMS 0

Field Calibration on 30-JUN-2010

Reading No	Measured	Calibrated (lbs)
1	14112.01	10.00
2	15164.79	427.00

High Resolution Temperature Calibration MCG-C 139

Field Calibration on 03-SEP-2010,11:23

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

High Resolution Temperature Constants MCG-C 139

Last Edited on

Pre-filter Length	11
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SP Calibration MCG-C 139

Field Calibration on 04-MAR-2011 06:37

	Measured	Calibrated (mV)
Reference 1	103.7	100.0
Reference 2	-96.9	-100.0

Gamma Calibration MCG-C 139

Field Calibration on 03-MAY-2011 10:00

	Measured	Calibrated (API)
Background	65	43
Calibrator (Gross)	1142	768
Calibrator (Net)	1077	725

Gamma Constants MCG-C 139

Last Edited on 08-MAY-2011,18:39

Gamma Calibrator Number	grc38	
Mud Density	1.09	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 11-MAR-2011 11:10

Field Check on 25-APR-2011 20:38

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.2	2.6	12.8
Micro Inverse	15.6	78.3	1.7	8.4

Channel	Base Check (ohm-m)		Field Check (ohm-m)	
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Micro Normal	32.1	32.1
Micro Inverse	16.3	16.3
Micro Normal and Micro Inverse Constants MML-A 16		Last Edited on 11-APR-2011,09:08
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	0.5110	
Micro Inverse K Factor	0.3380	
Standoff Offset	N/A	inches
Caliper Calibration MML-A 16		Base Calibration on 11-MAR-2011 11:20 Field Calibration on 03-MAY-2011 09:52
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13875	5.98
2	17350	7.97
3	20581	9.86
4	24656	11.92
5	0	0.00
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	6.05	5.98
Neutron Calibration MDN-A.B 66		Base Calibration on 11-MAR-2011 13:54 Field Check on 03-MAY-2011 09:48
Base Calibration		
	Measured	Calibrated (cps)
	Near Far	Near Far
	3091 97	3714 110
Ratio	31.957	33.764
Field Calibrator at Base		Calibrated (cps)
		1660 2371
Ratio		0.700
Field Check		Calibrated (cps)
		1651 2372
Ratio		0.696
Neutron Constants MDN-A.B 66		Last Edited on 08-MAY-2011,18:39
Neutron Source Id	P58125B	
Neutron Jig Number	5824NE	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.09	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	Constant Value	
Formation Pressure	0.00	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	
FE Calibration MFE-A.A 52		Base Calibration on 11-MAR-2011 10:55 Field Check on 25-APR-2011 20:34
Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	965.7	126.8
Base Check		279.9
Field Check		279.9
FE Constants MFE-A A 52		Last Edited on 28-APR-2011 22:25

Induction Constants MAI-A.A 167		Last Edited on 20-APR-2011,22:20	
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	

High Resolution Temperature Calibration MAI-A.A 167			Field Calibration on 17-JAN-2011,18:32
	Measured	Calibrated(Deg F)	
Lower	1.00	33.80	
Upper	11.00	51.80	

High Resolution Temperature Constants MAI-A.A 167		Last Edited on
Pre-filter Length	11	

Induction Calibration MAI-A.A 167					Base Calibration on 11-MAR-2011,09:58	
					Field Check on 25-APR-2011 20:33	
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	0.0	0.0	12.0	3842.1		
2	0.0	0.0	29.3	3480.2		
3	0.0	0.0	28.9	3055.9		
4	0.0	0.0	19.7	2083.5		
Deep	0.0	0.0	18.4	2050.7		
Medium	0.0	0.0	42.1	3995.2		
Shallow	0.0	0.0	42.5	5059.1		
Array Temperature		0.0		57.8	Deg F	

Induction Constants MAI-A.A 167				Last Edited on 24-APR-2011,22:39	
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		45.00		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	

Caliper Calibration MPD-B 35

Base Calibration on 11-MAR-2011 11:34

Field Calibration on 03-MAY-2011 09:34

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17936	3.99
2	28079	5.98
3	38384	7.97
4	48048	9.86
5	59047	11.92
6	N/A	N/A

Field Calibration

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

Photo Density Calibration MPD-B 35

Base Calibration on 11-MAR-2011 11:54

Field Check on 03-MAY-2011 09:41

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	57876	27553	59556	30836
Reference 2	23524	2615	24941	2541

Field Check at Base

1175.2	1398.5
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Field Check

1175.2	1388.6
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PE Calibration

Base Calibration	Measured		Calibrated
	WS	WH	Ratio
Background	211	1039	
Reference 1	21426	57673	0.375
Reference 2	6234	23377	0.270

Field Check at Base

211.2	1039.0
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Field Check

211.0	1039.0
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Density Constants MPD-B 35

Last Edited on 08-MAY-2011,18:40

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	1.09 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 (ft)
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:\DOCUME~1\PES\LOCALS~1\Temp\Weatherford PreView\0\ CROOKED CREEK #3-8.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-C 139 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-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

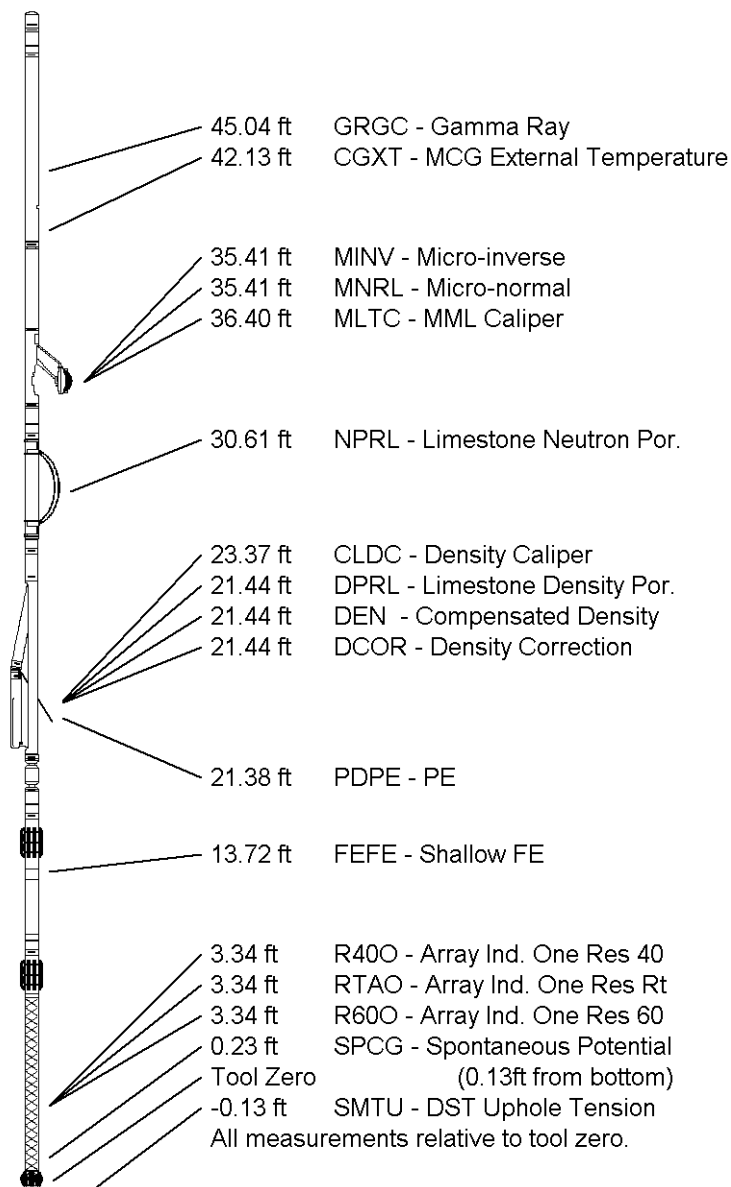
Compact Density/Caliper
MPD-B 35 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 52 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: 51.90 ft Weight: 423.3 lb



COMPANY

O'BRIEN ENERGY

WELL

CROOKED CREEK #3-8

FIELD

ANGELL SOUTH

PROVINCE/COUNTY

MEADE

COUNTRY/STATE

UNITED STATES / KANSAS

Elevation Kelly Bushing	2699.00	feet
Elevation Drill Floor	2697.00	feet
Elevation Ground Level	2687.00	feet

First Reading	6308.00	feet
Depth Driller	6330.00	feet
Depth Logger	6330.00	feet



COMPACT PHOTO DENSITY

COMPENSATED NEUTRON



