

**Weatherford****CML MESSENGER SHUTTLE
COMPACT PHOTO DENSITY
COMPENSATED NEUTRON LOG**

COMPANY				SANDRIDGE ENERGY	
WELL				SEAN 3119 4-18H	
FIELD				ARLIE	
PROVINCE/COUNTY				COMANCHE	
COUNTRY/STATE				U.S.A. / KANSAS	
LOCATION				SHL: 200' FSL & 2280' FWL BHL: 330' FNL & 1980' FWL	
SEC	TWP	RGE	Other Services		
18	31S	19W	MA/IMFE		
API Number		15-033-21695-01			
Permit Number					
Permanent Datum G.L., Elevation 2124 feet				Elevations:	
Log Measured From KB				KB 2143.60	
Drilling Measured From K.B. @ 18.5 FEET				DF	
Date	18-MAR-2013			GL 2124.00	
Run Number	ONE				
Service Order	3535473				
Depth Driller	9555.00			feet	
Depth Logger	9555.00			feet	
First Reading	9500.00			feet	
Last Reading	5050.00			feet	
Casing Driller	5584.00			feet	
Casing Logger	5590.00			feet	
Bit Size	6.125			inches	
Hole Fluid Type	FWM				
Density / Viscosity	8.60 g/cc		23.00 CP		
PH / Fluid Loss	10.00				
Sample Source	FLOWLINE				
Rm @ Measured Temp	2.45 @ 66.2		ohm-m		
Rmf @ Measured Temp	1.96 @ 66.2		ohm-m		
Rmc @ Measured Temp	2.94 @ 66.2		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	1.34 @124.0		ohm-m		
Time Since Circulation	1 HOUR				
Max Recorded Temp	124.00		deg F		
Equipment / Base	18063		CASPER		
Recorded By	K. SALLER				
Witnessed By					
S.O. # / JOB #	3535473				

BOREHOLE RECORD				Last Edited: 18-MAR-2013 04:01
Bit Size inches	Depth From feet		Depth To feet	
9.625	0.00		5584.00	
6.125	5584.00		9555.00	
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
INTERMED	7.000	0.00	5584.00	29.00

REMARKS
LOGGED WITH WLS VER 13.04 SOFTWARE
WELL LOGGED USING 200V MEMORY MESSENGER DEPLOYMENT SYSTEM
HARDWARE: MPD: 4"PROFILE PLATE, MIS-A SINGLE SPRING DECENTRALIZER BELOW MDN: MISD DOUBLE SPRING DECENTRALIZER RAN ABOVE
2.71 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER REQUEST

LOGGING TOOL DEPTH AFTER DEPLOYMENT: 9534FT

TIGHT PULLS, BOREHOLE SIZE, AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY

4.5 INCH CASING USED TO CALCULATE ANNULAR HOLE VOLUME

BOREHOLE VOLUME TD TO INTERMEDIATE CASING = 840 CU FT

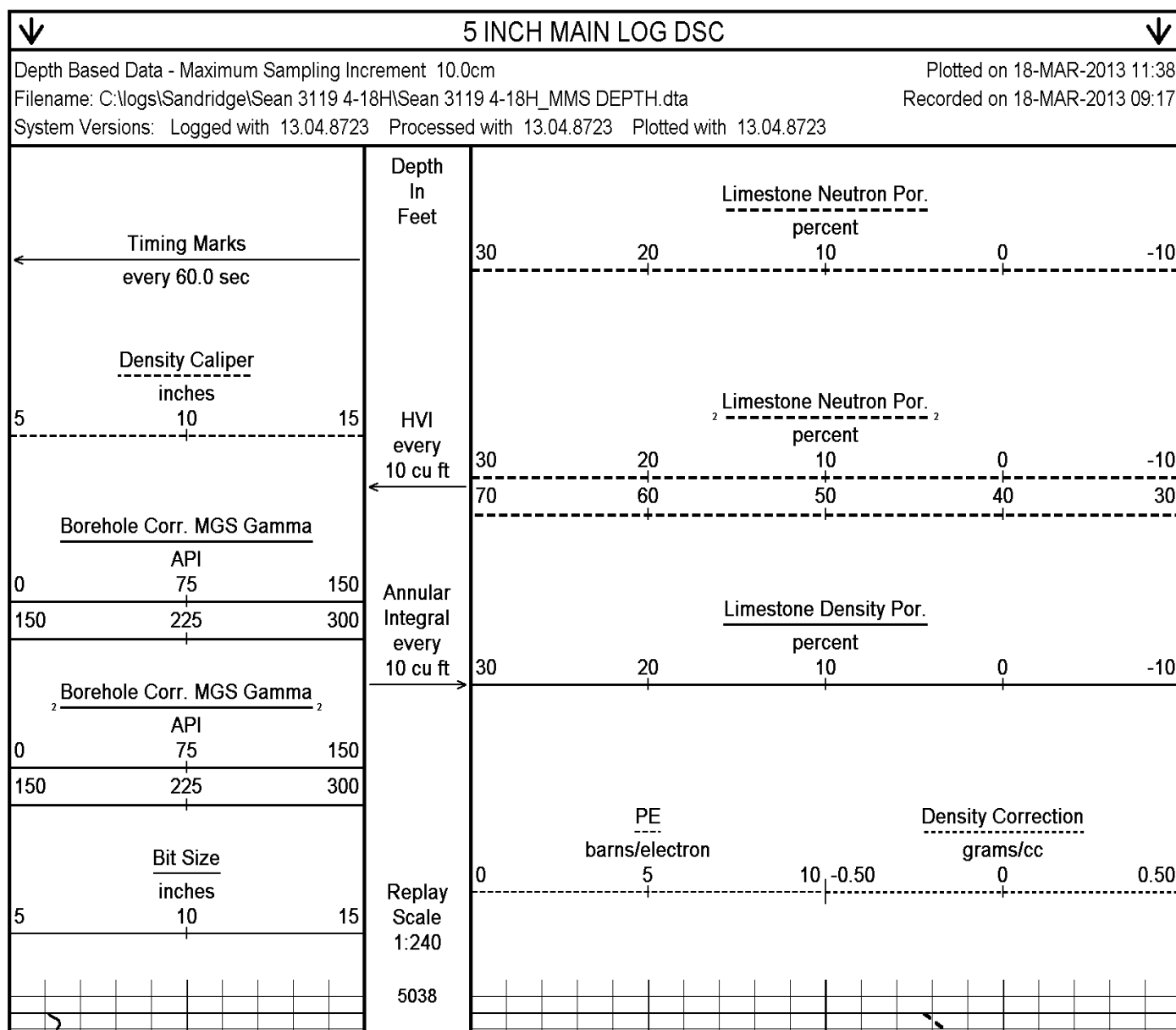
ANNULAR VOLUME FROM TD TO INTERMEDIATE CASING = 410 CU FT

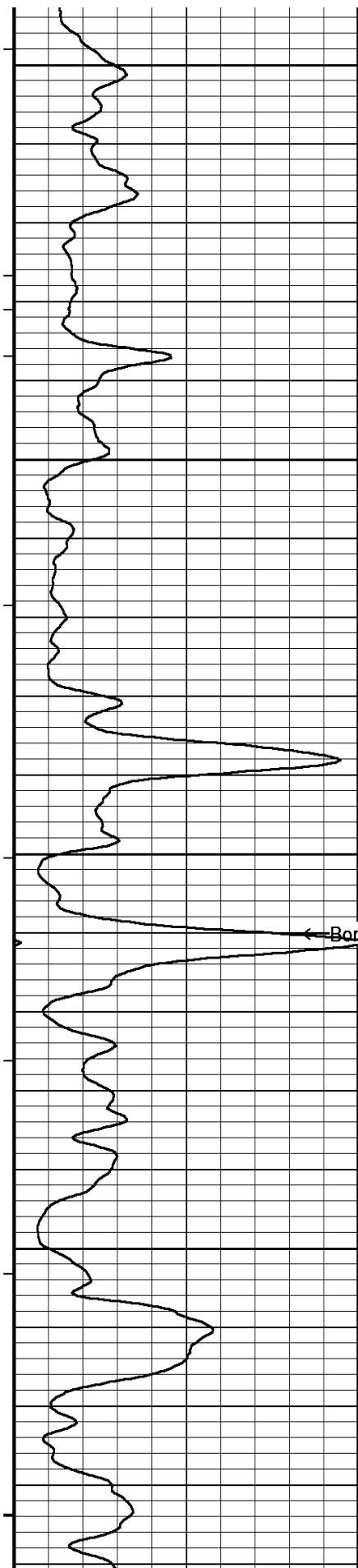
SERVICE ORDER #: 3535473

RIG: LARIAT 38

OPERATORS: J. GOODMAN, H. TAYLOR

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.





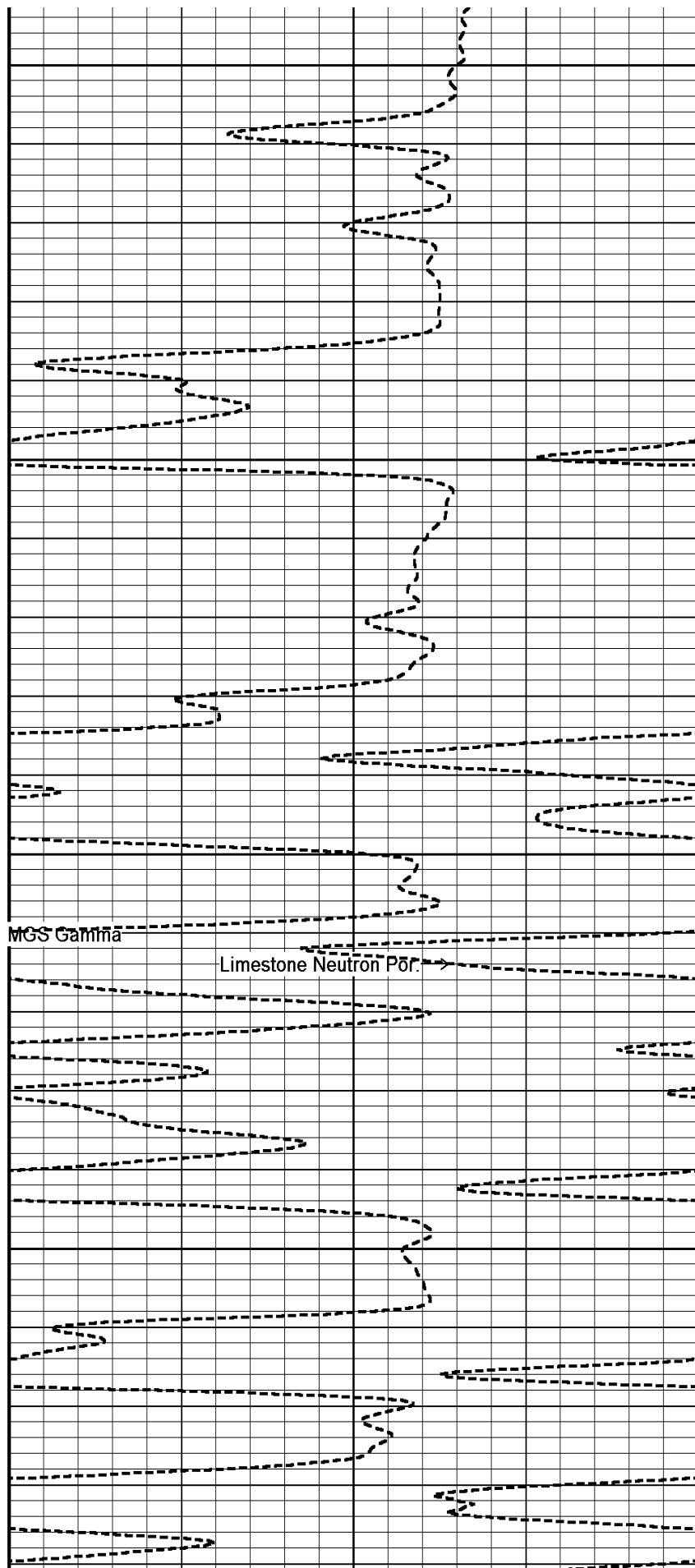
5050

5100

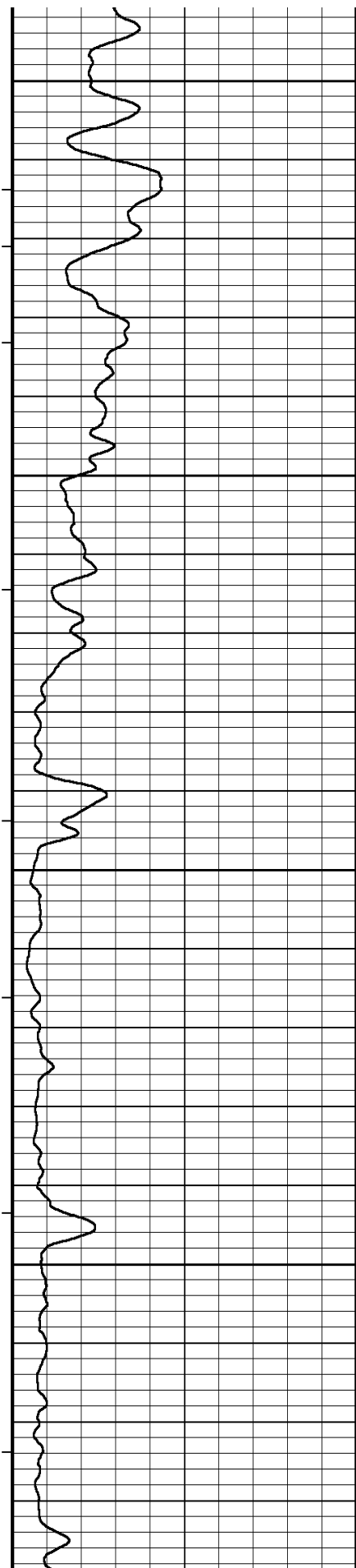
5150

← Borehole Corr. MGS Gamma

5200



Limestone Neutron Por. →

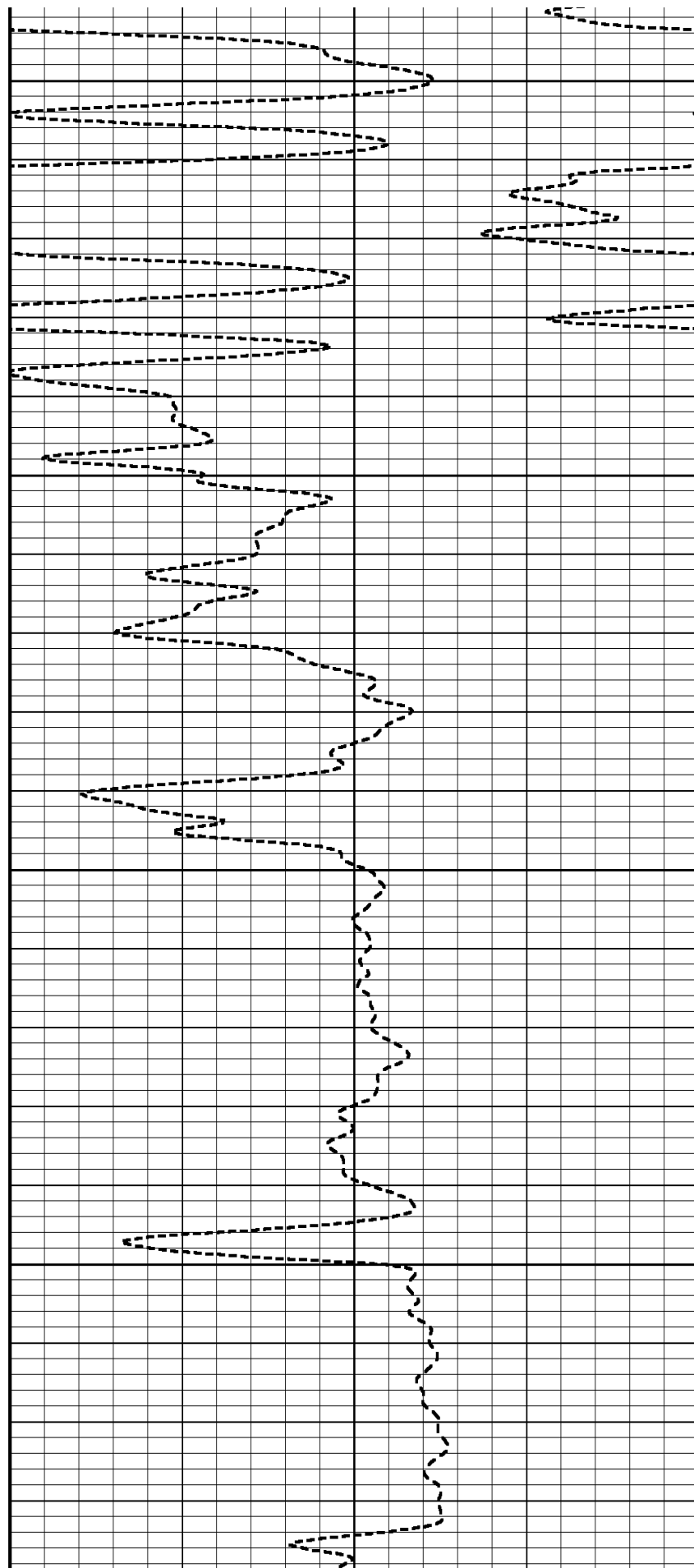


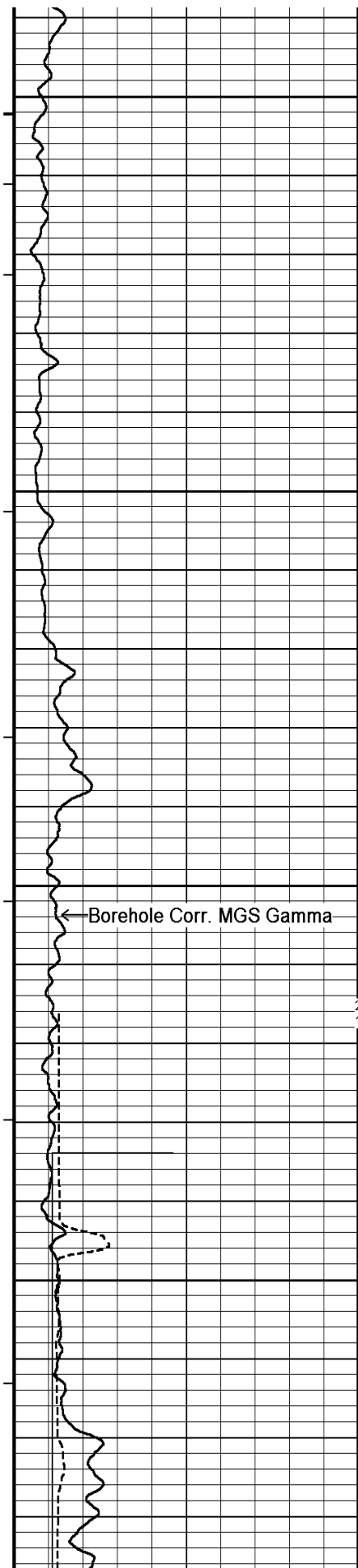
5250

5300

5350

5400





5450

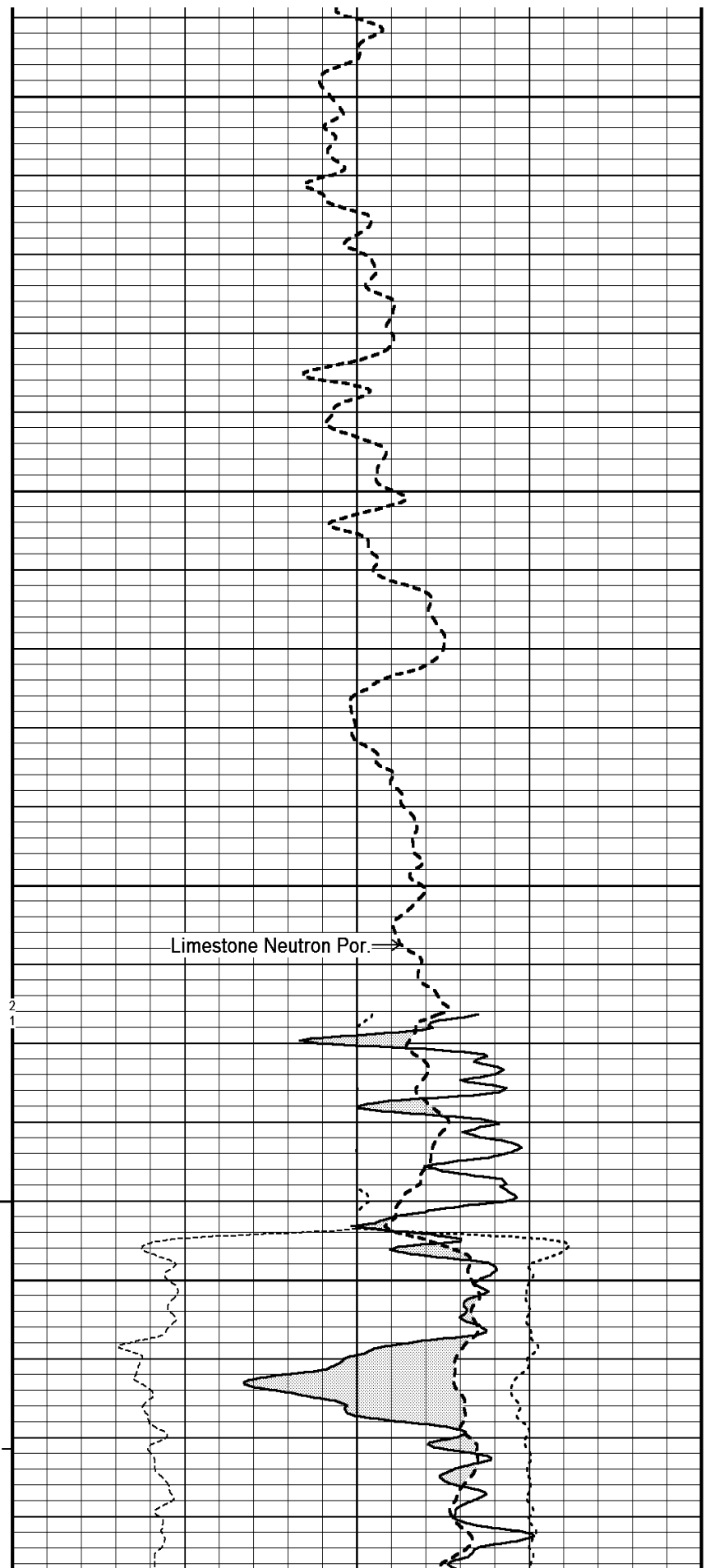
5500

5550

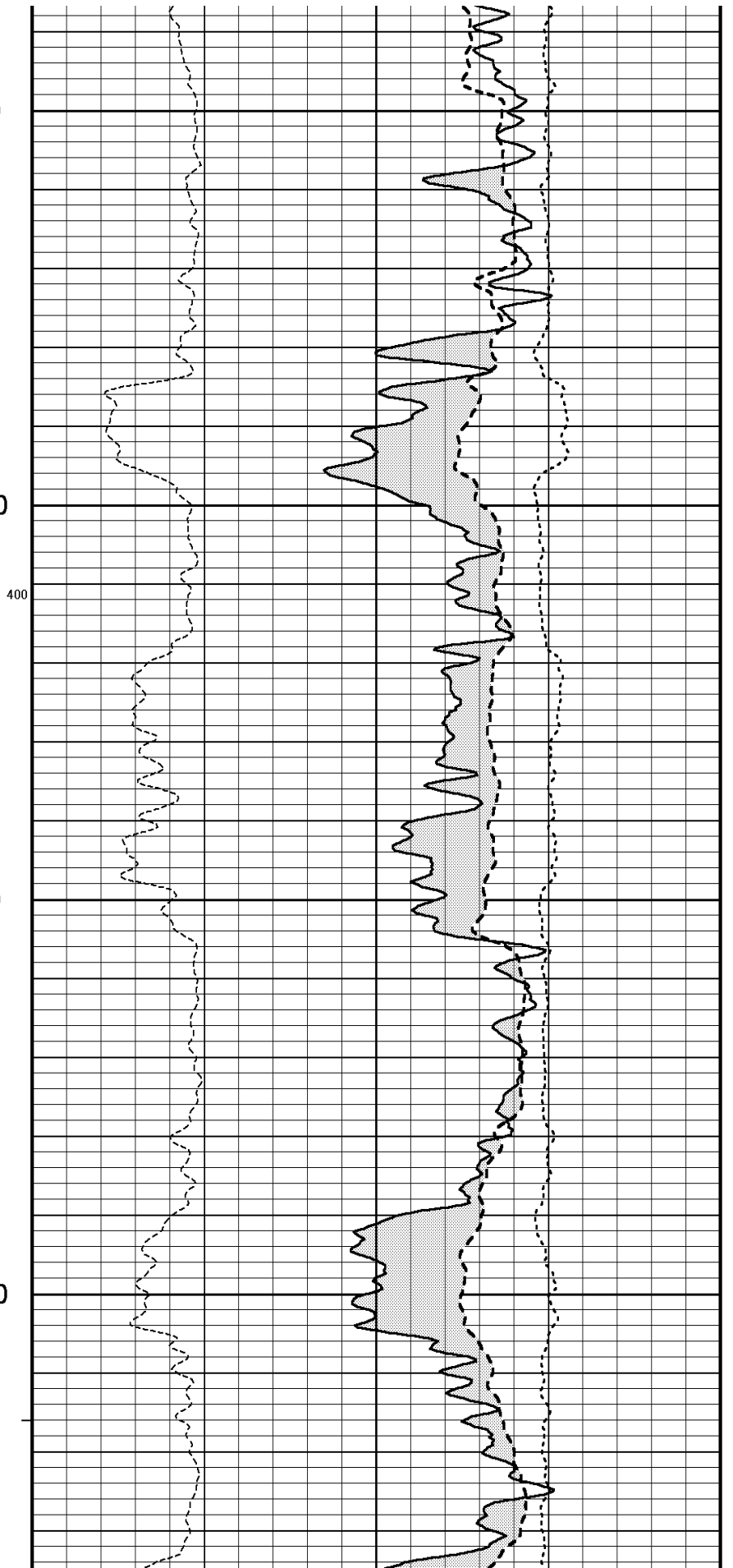
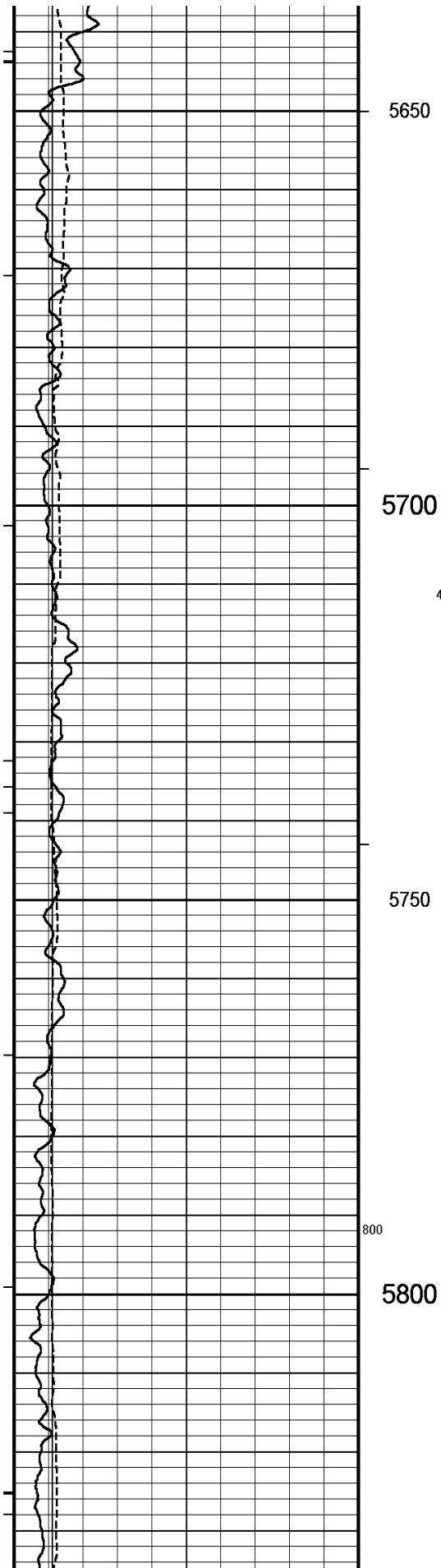
Borehole Corr. MGS Gamma

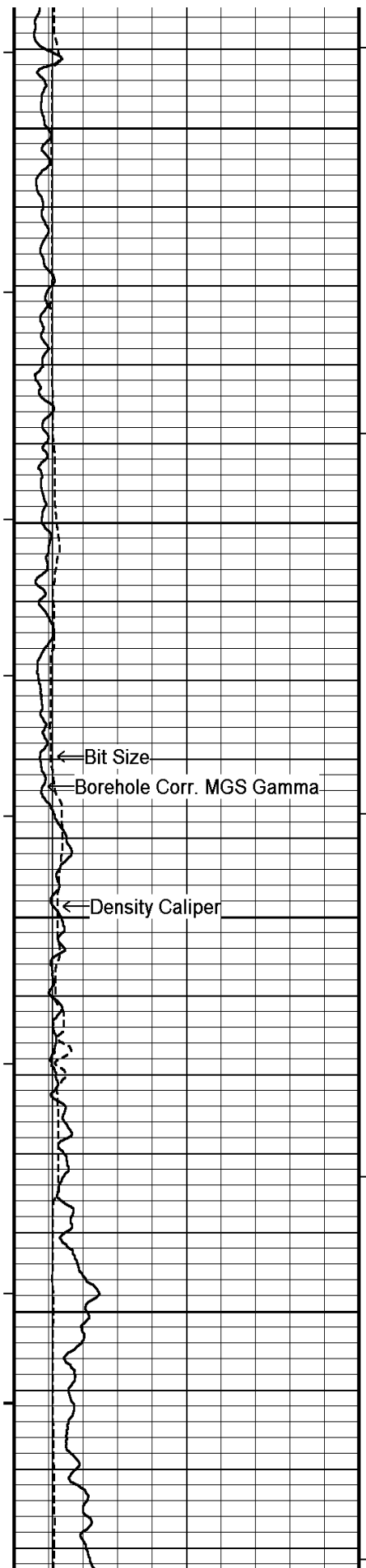
Casing
Shoe

5600



Limestone Neutron Por.



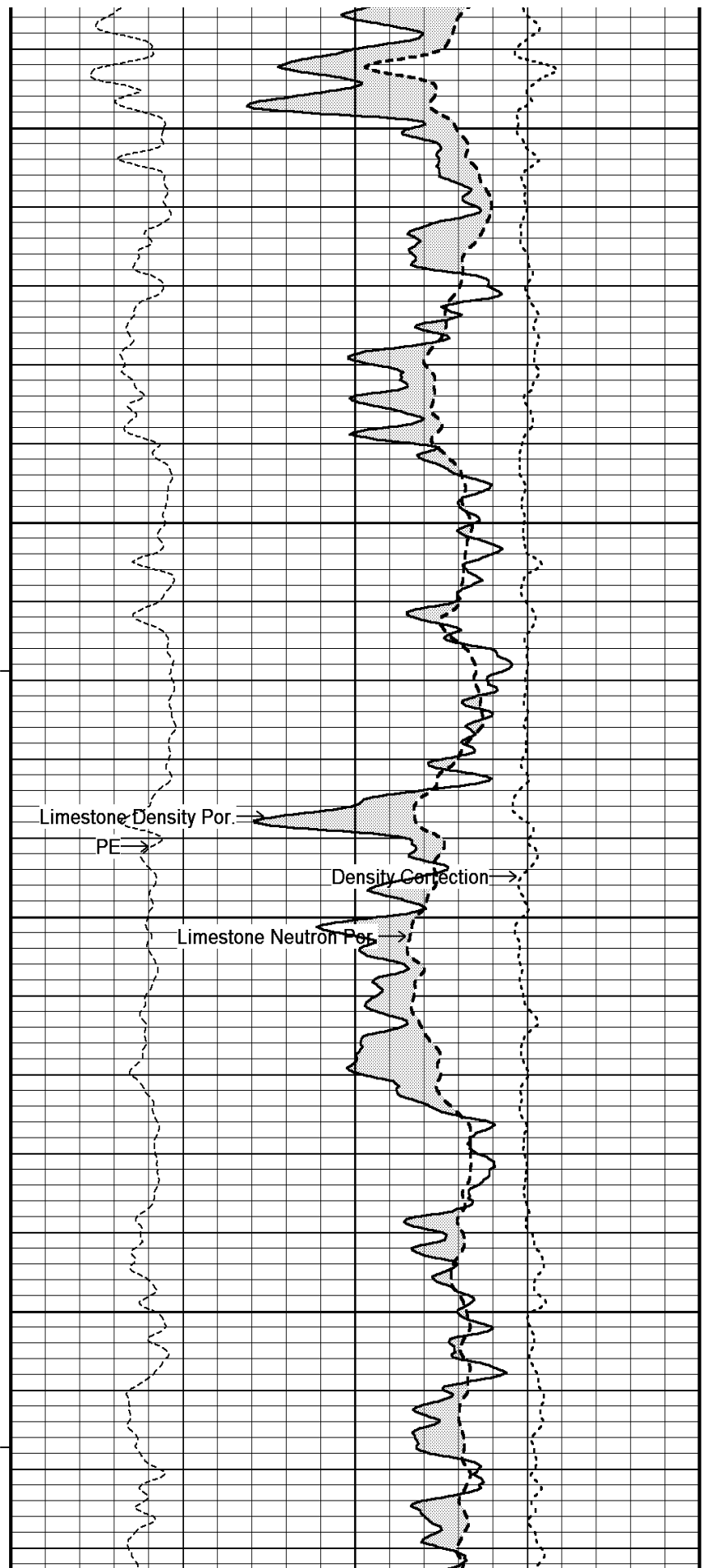


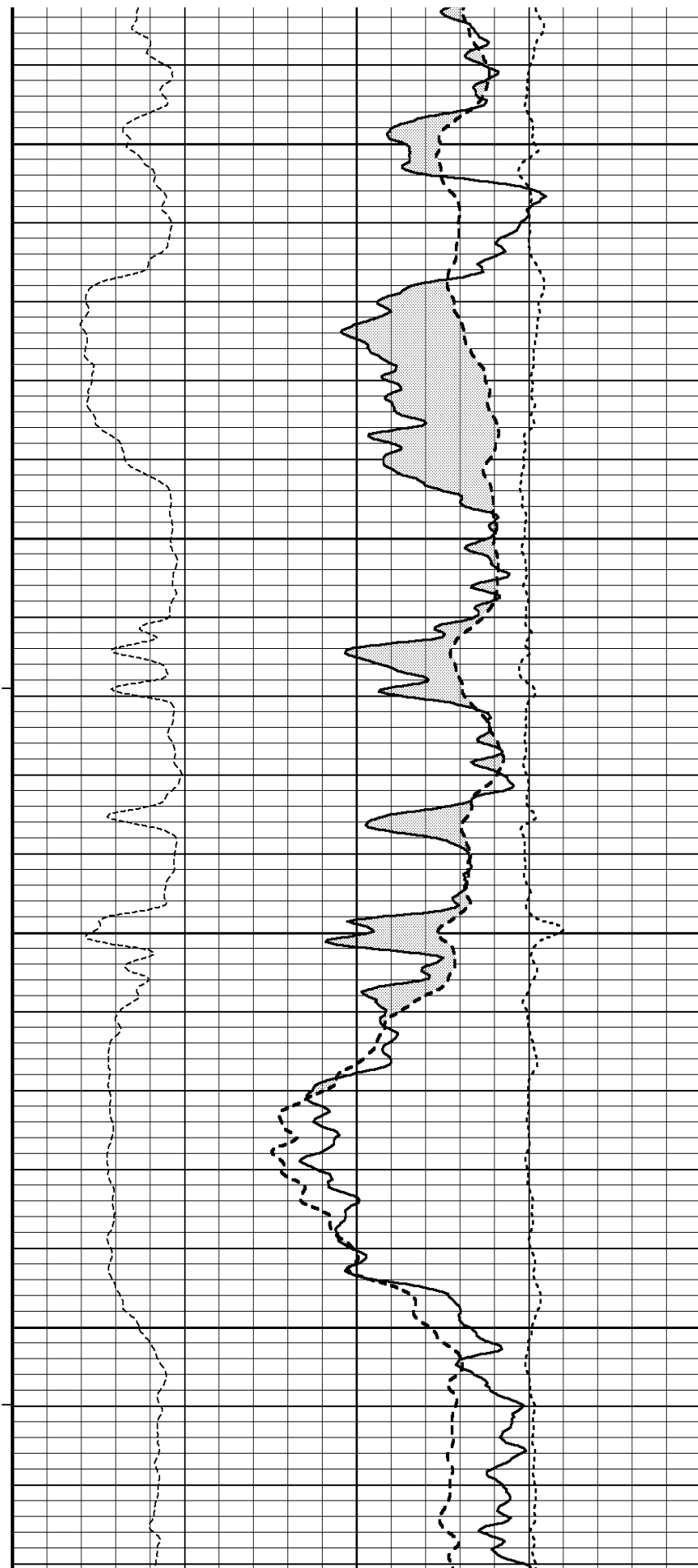
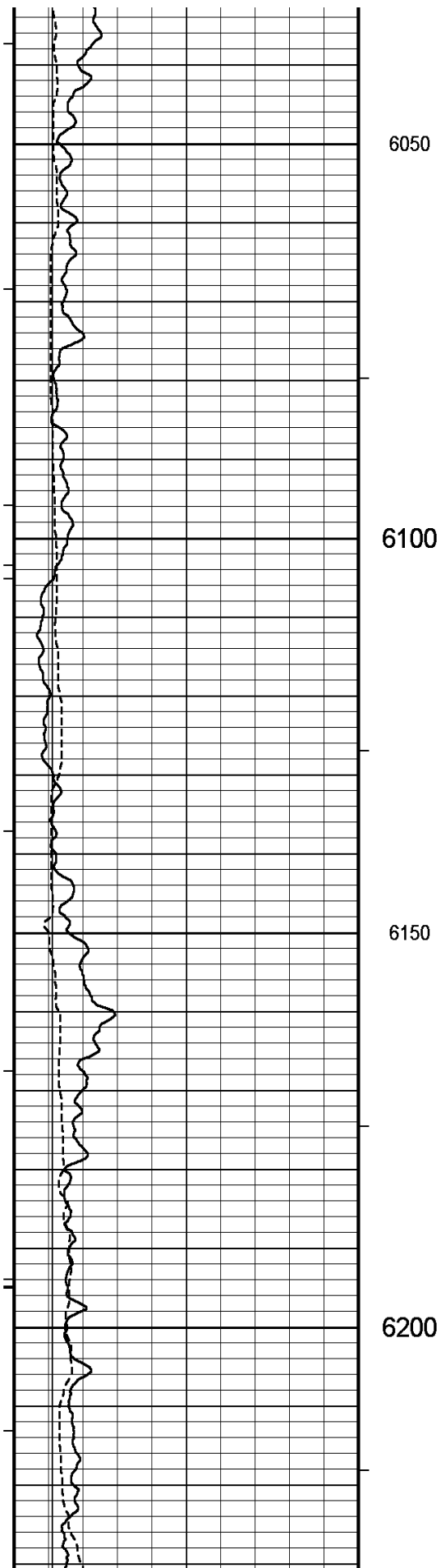
5850

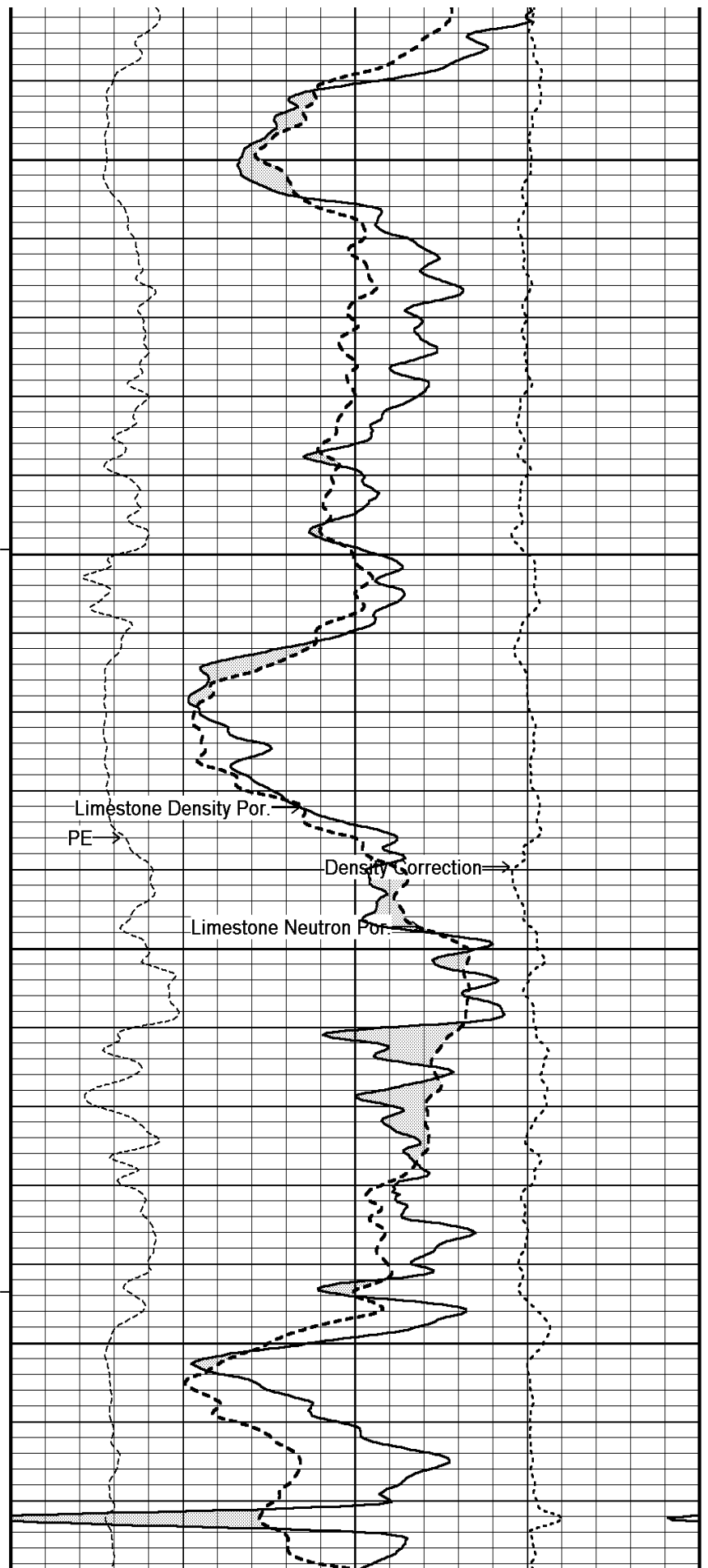
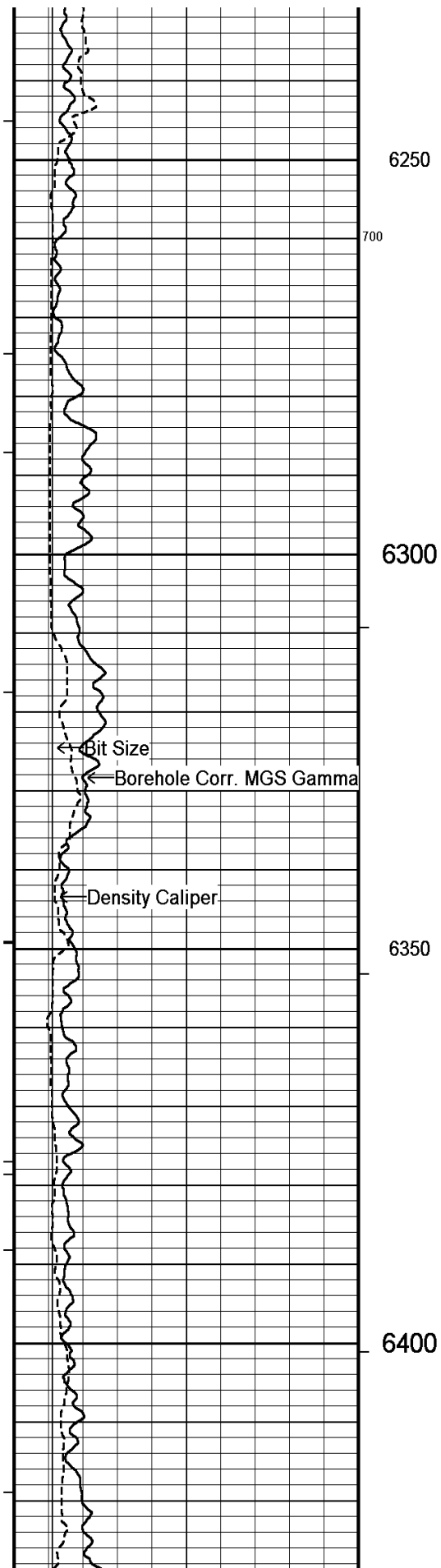
5900

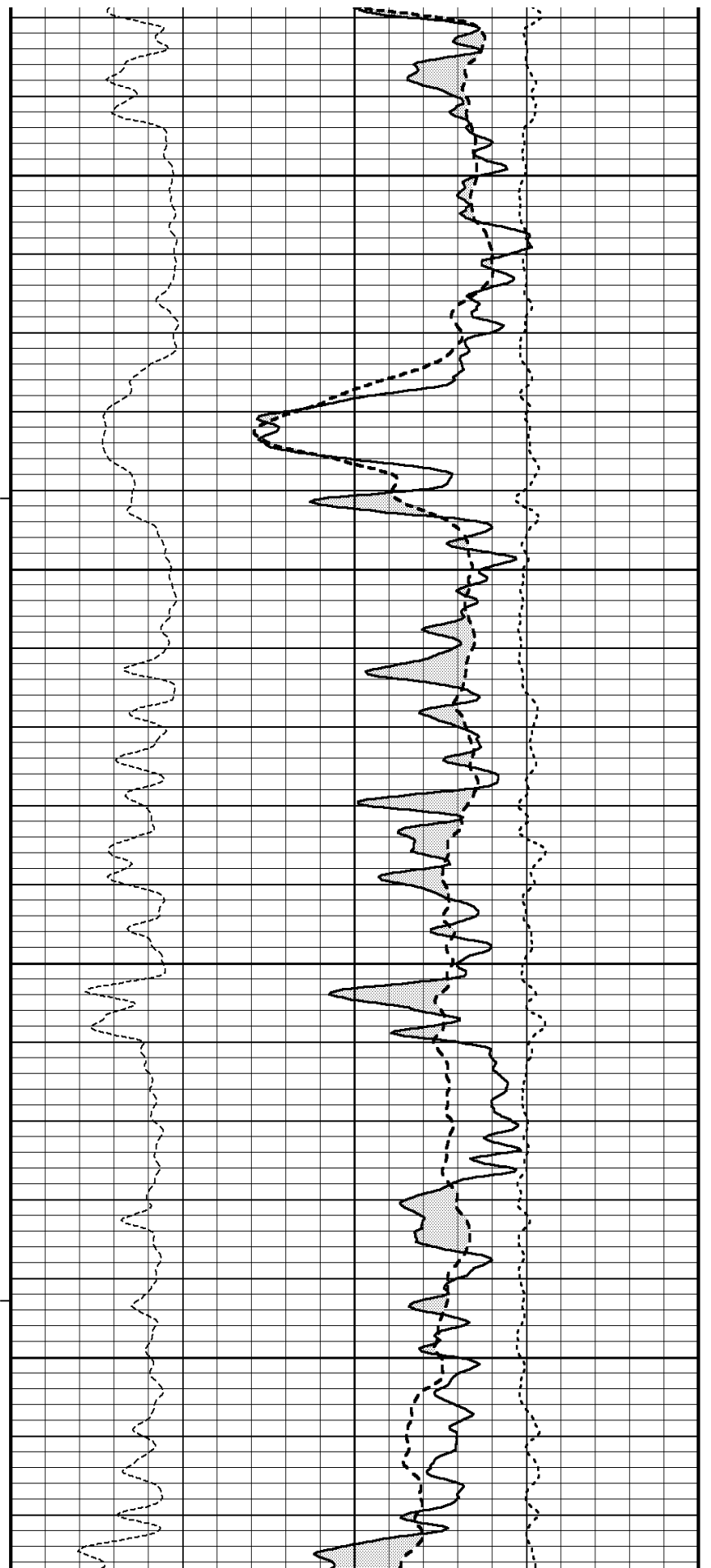
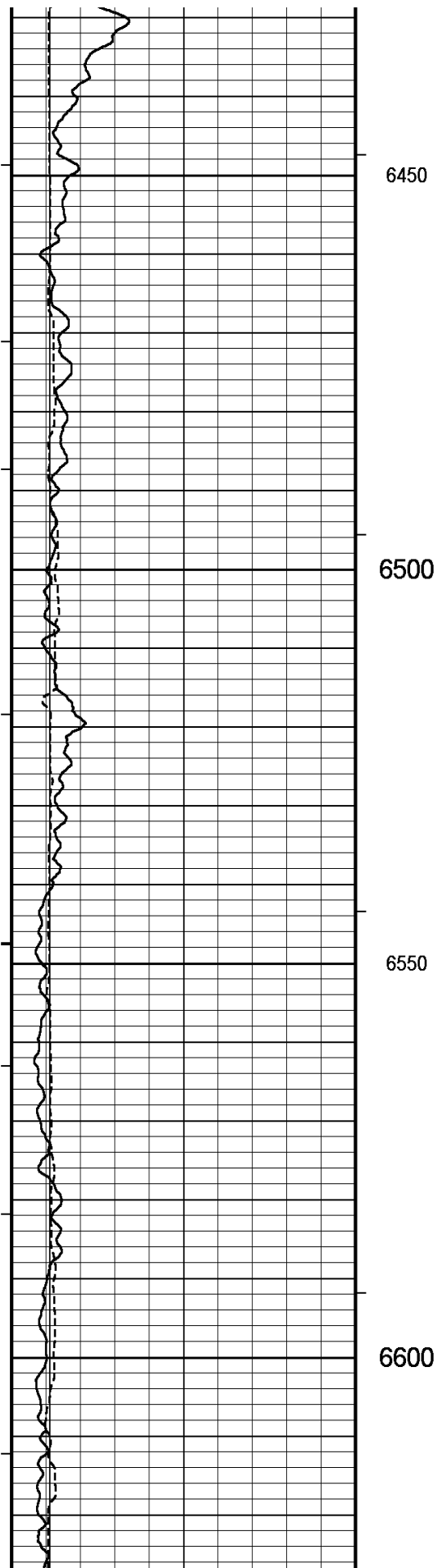
5950

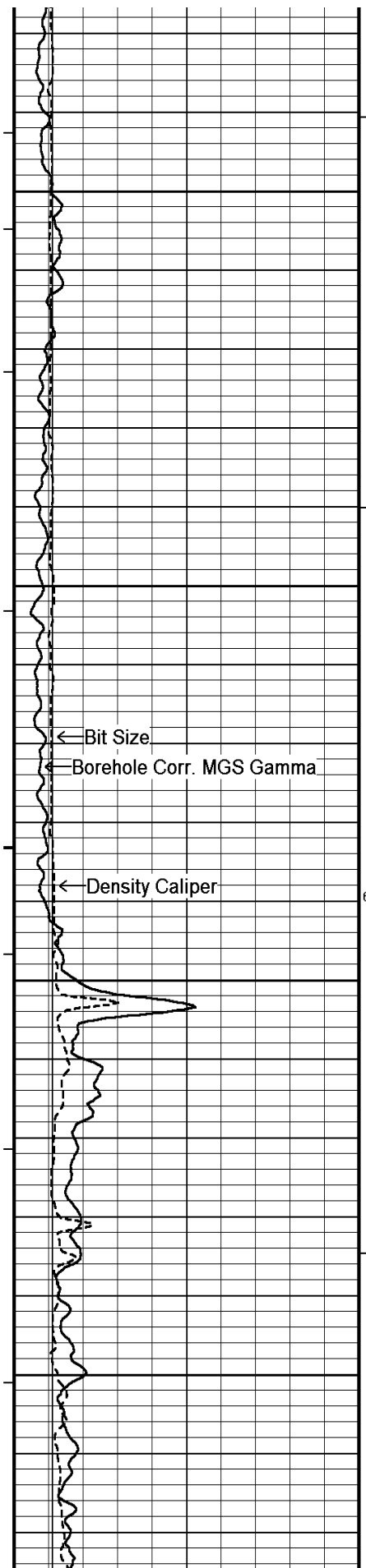
6000











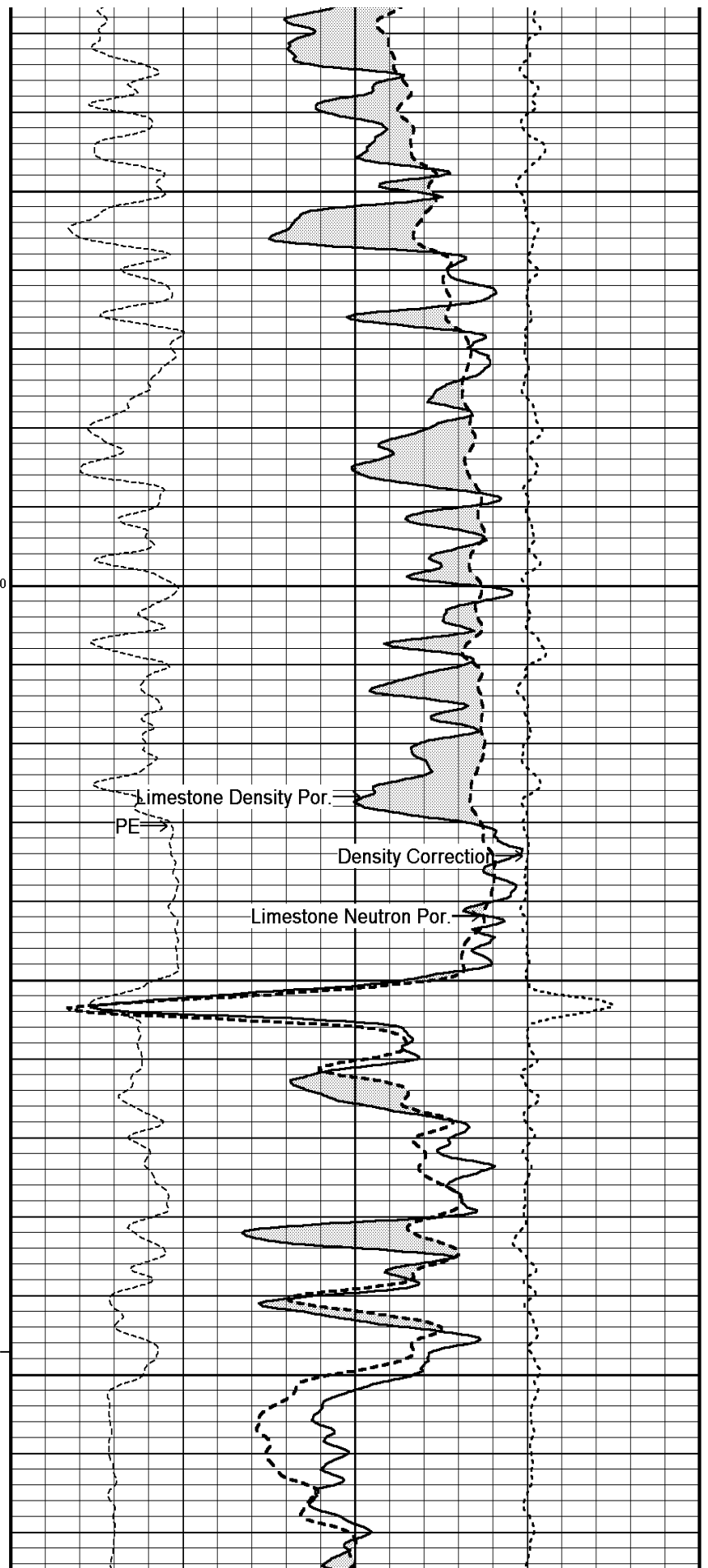
6650

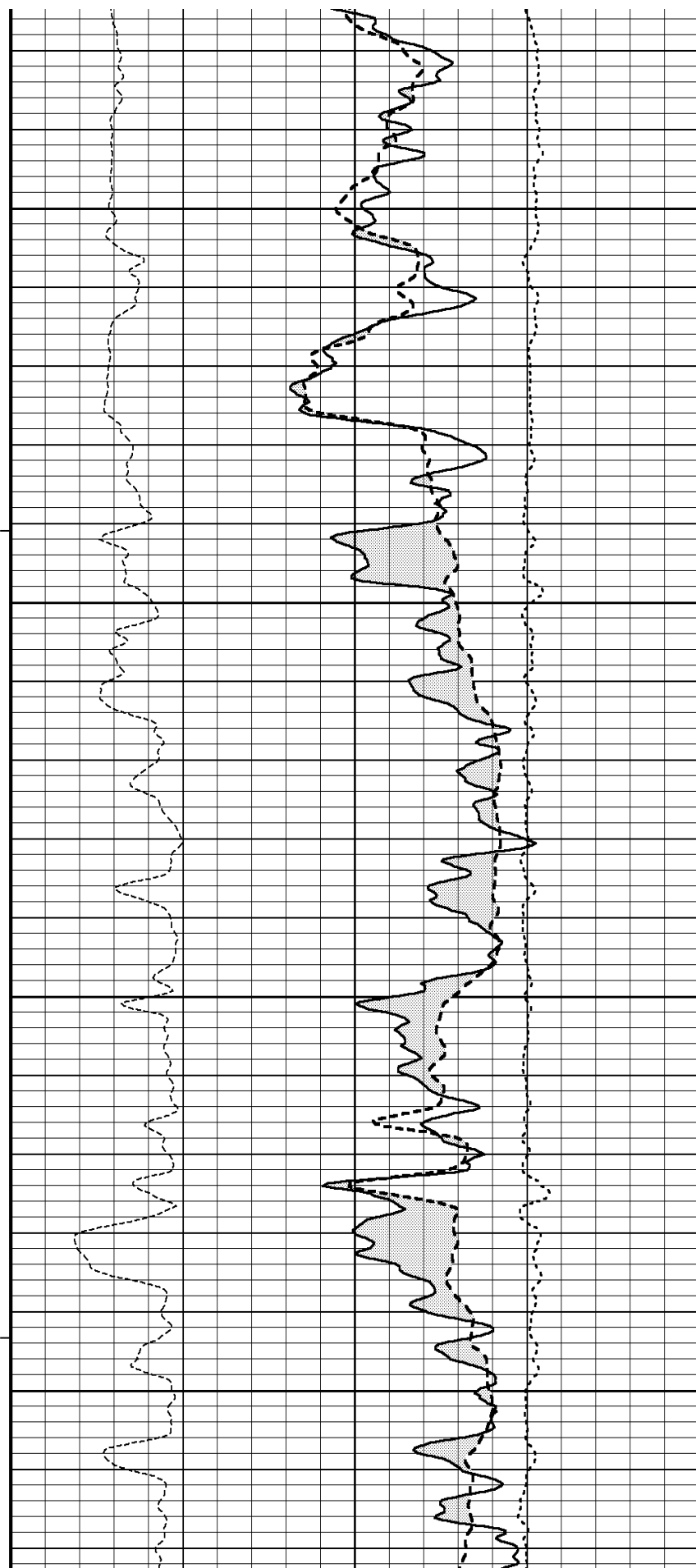
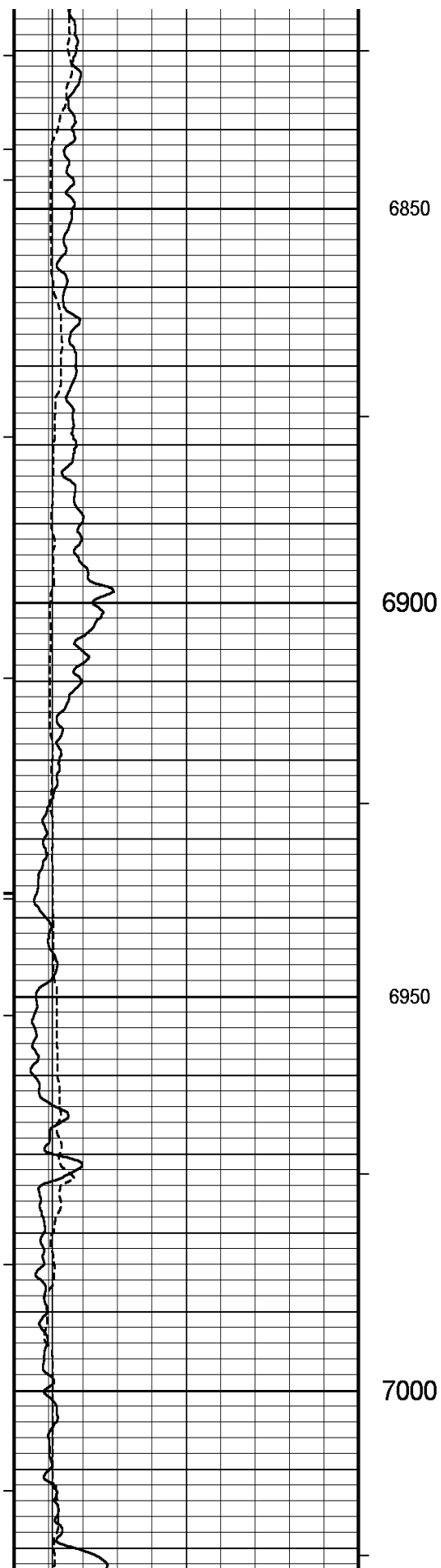
6700³⁰⁰

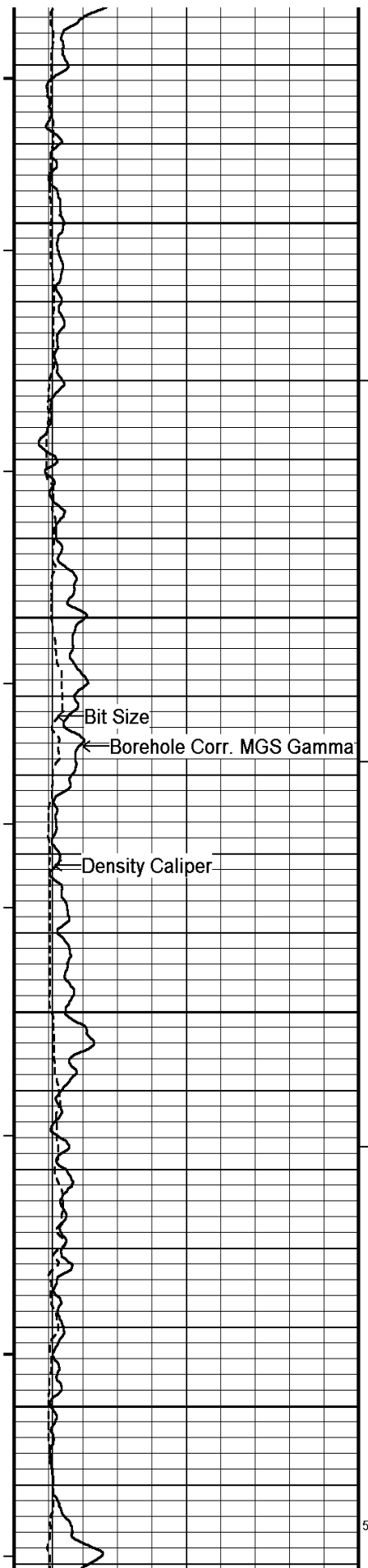
600

6750

6800





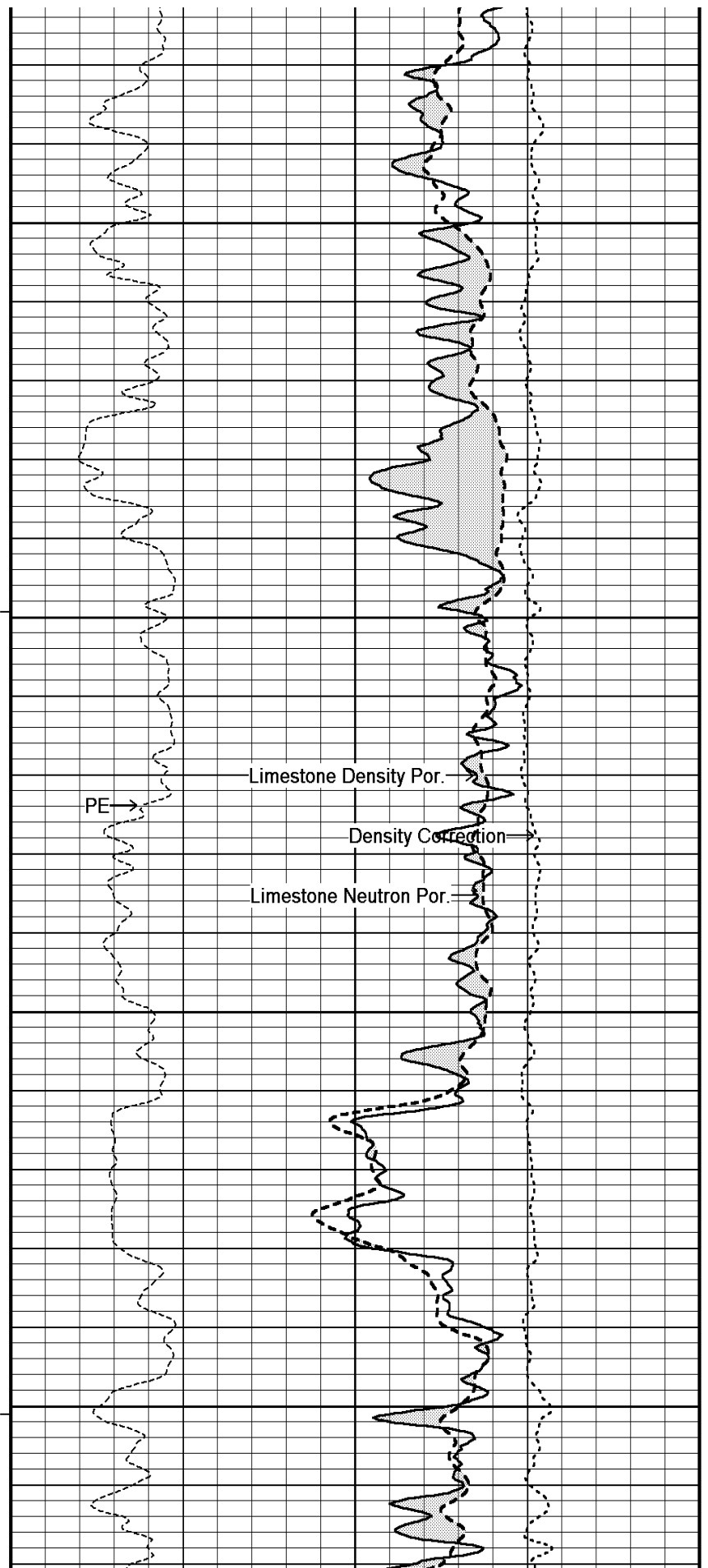


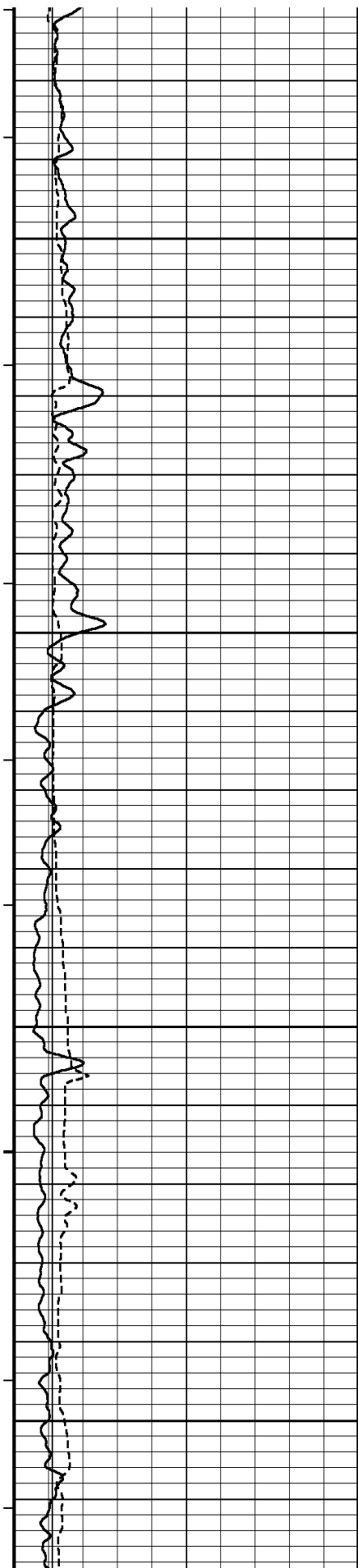
7050

7100

7150

7200



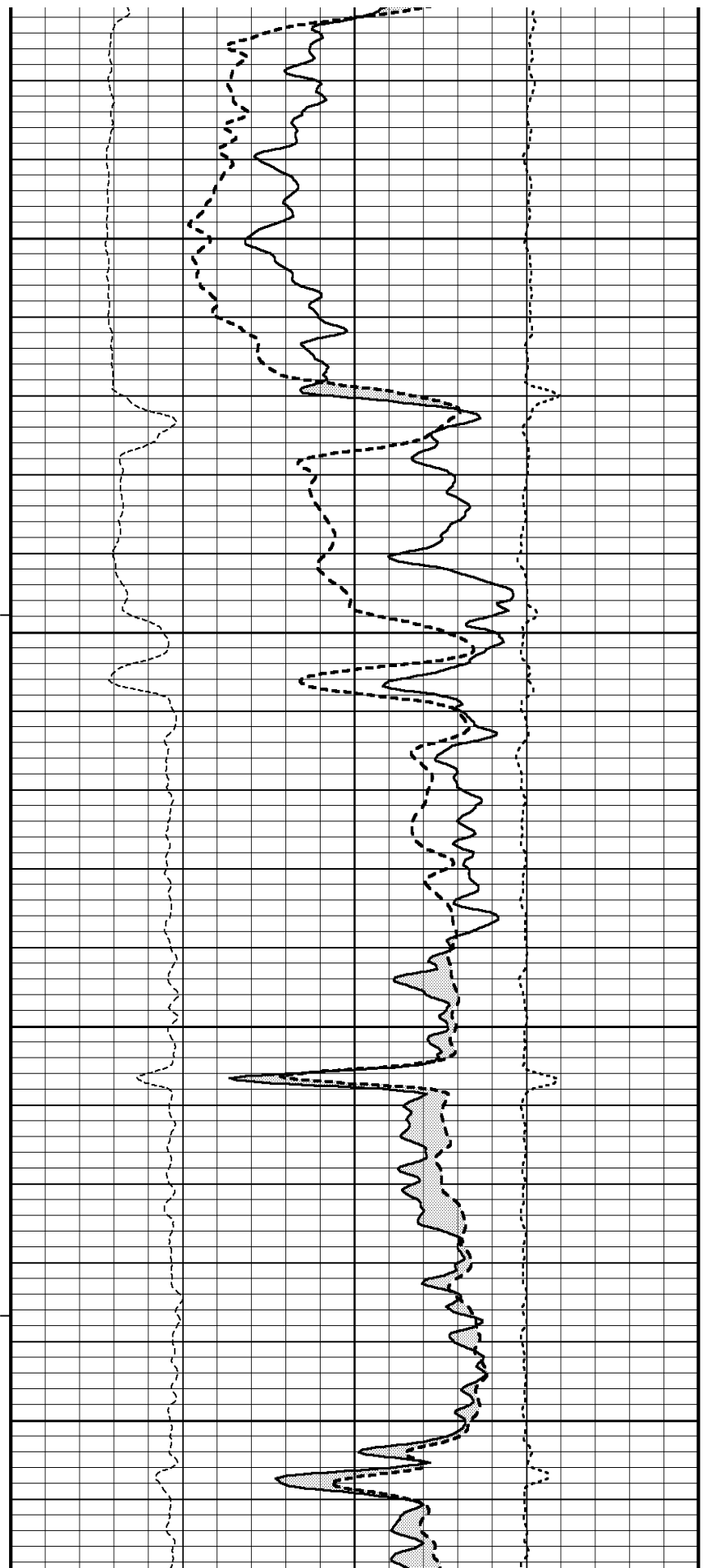


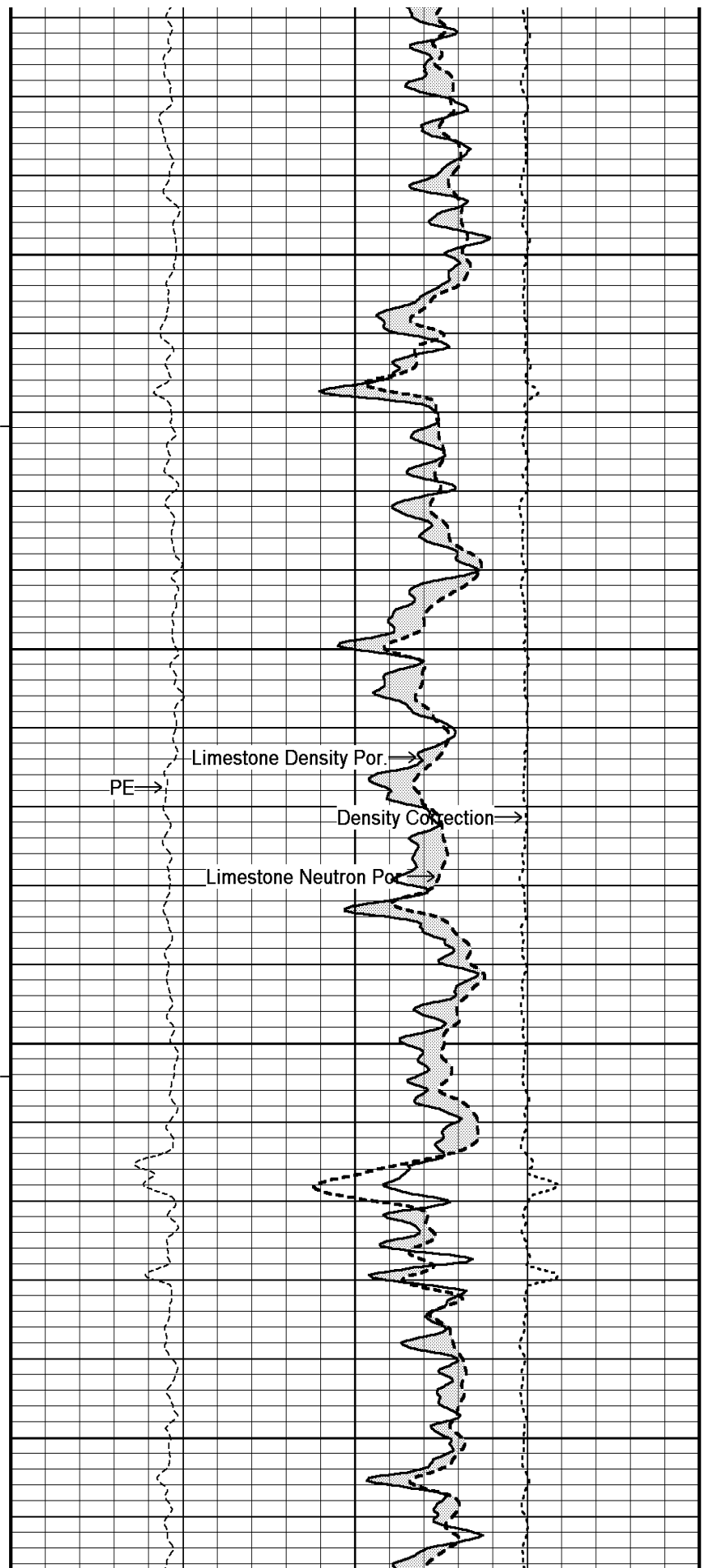
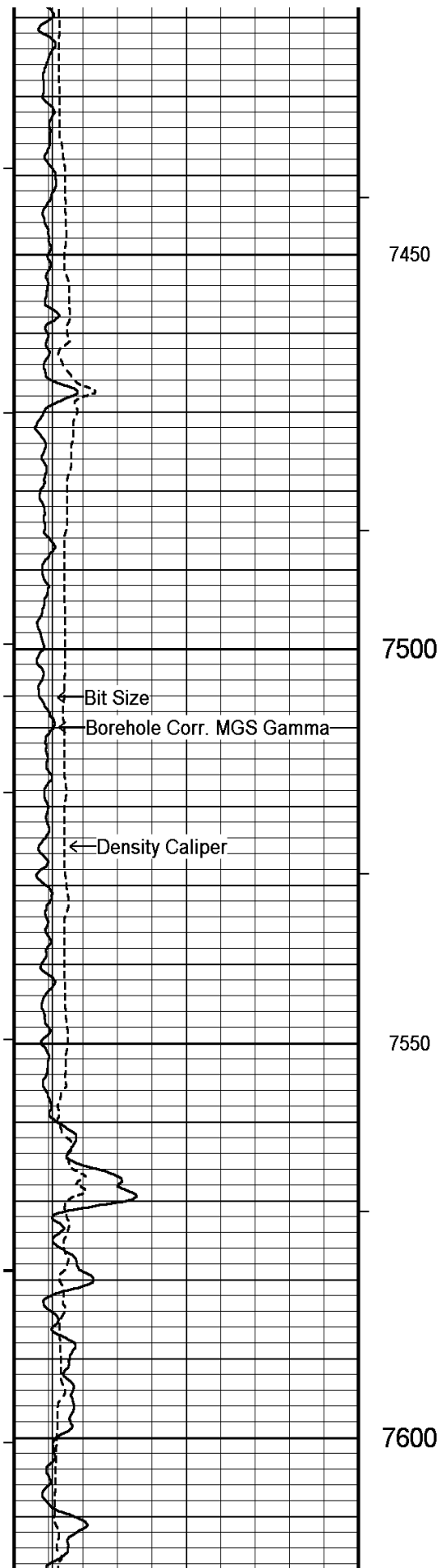
7250

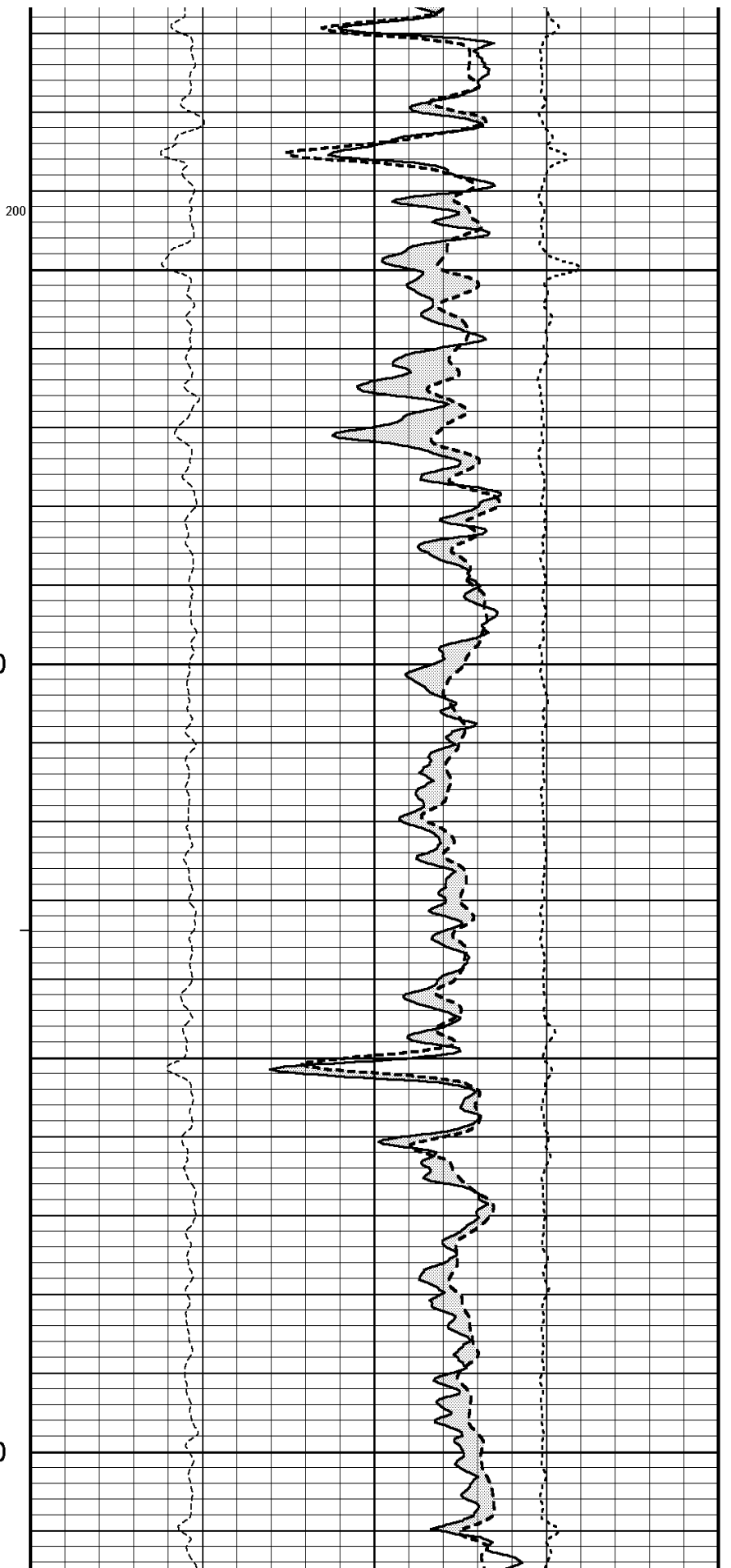
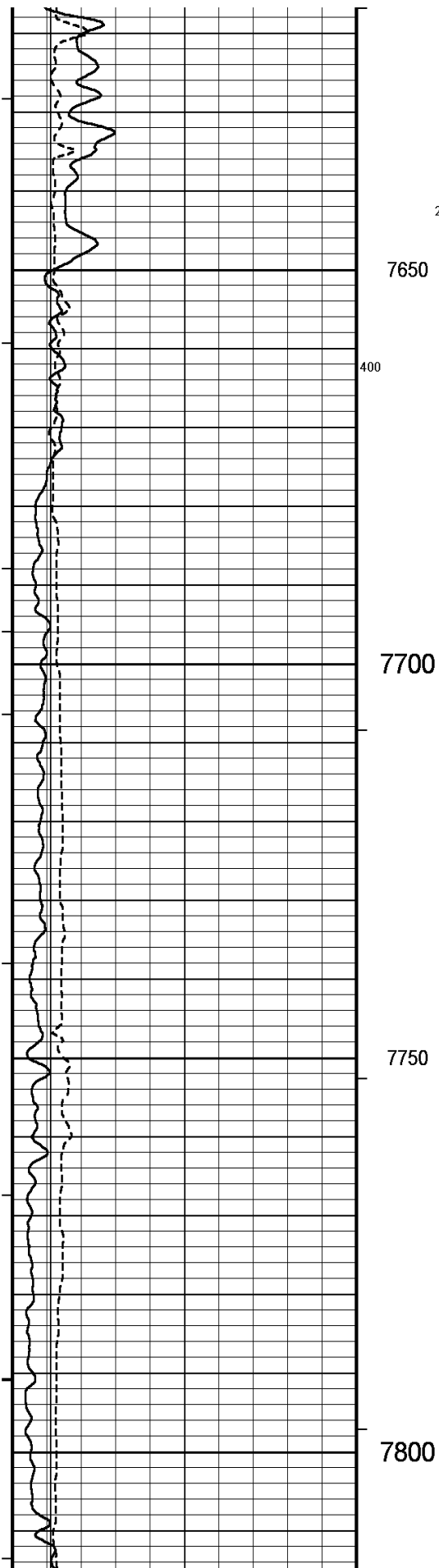
7300

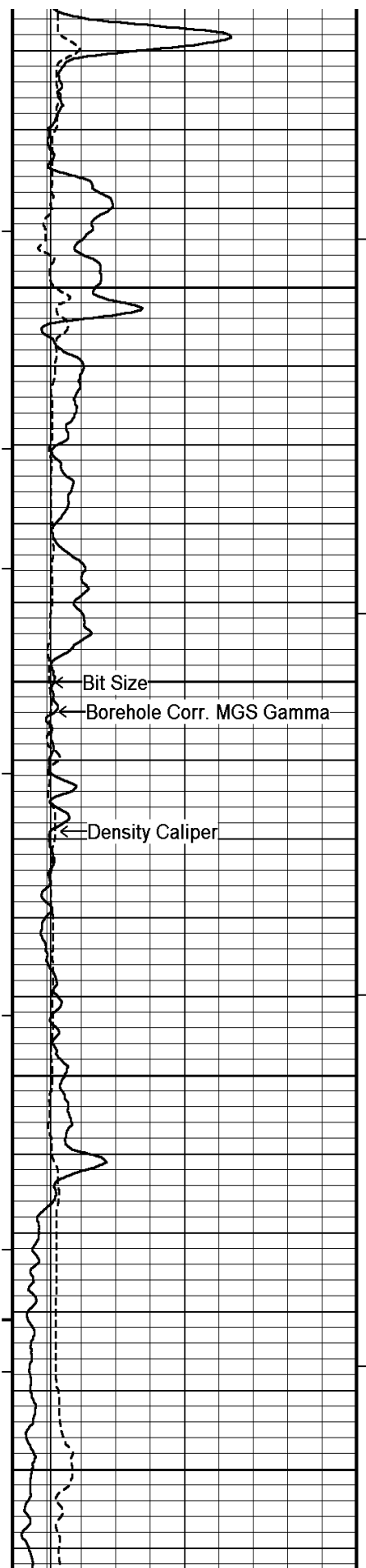
7350

7400







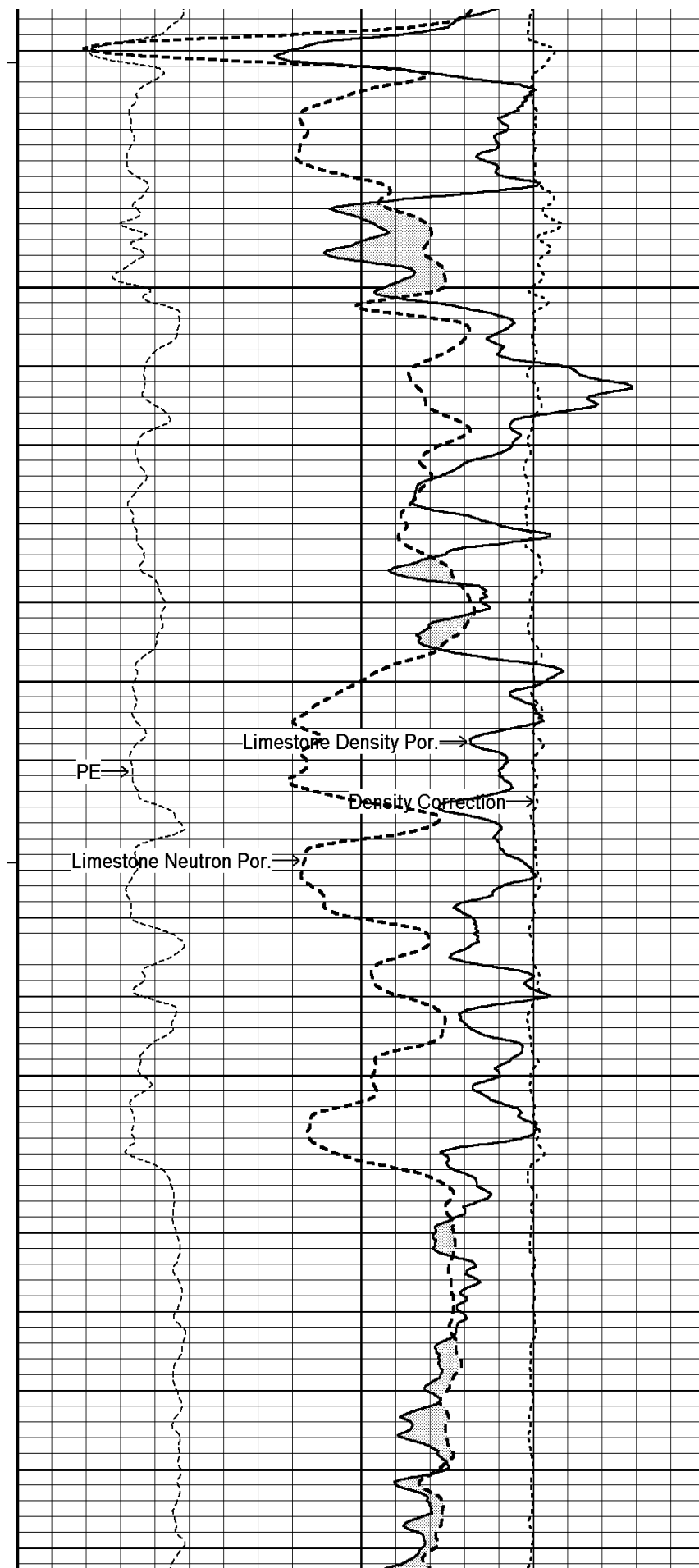


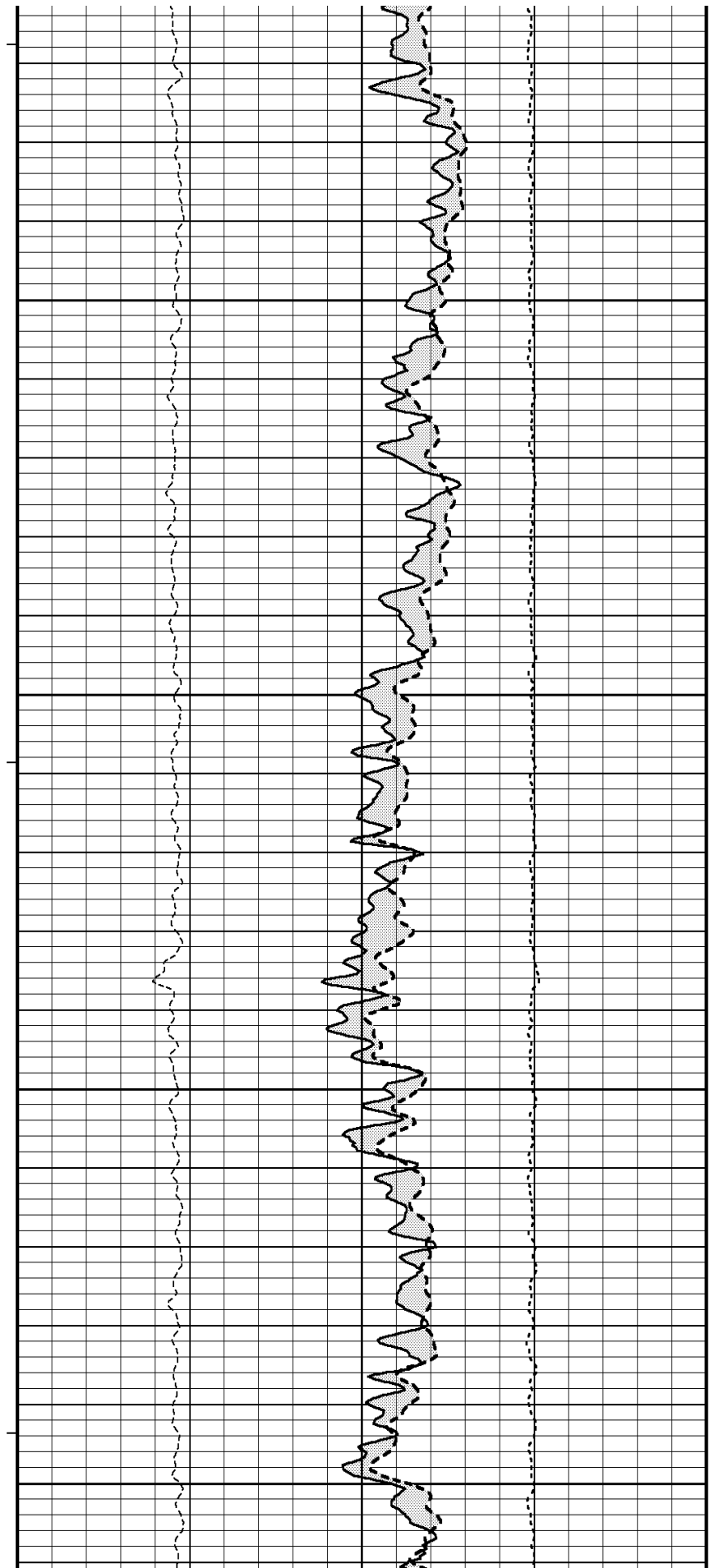
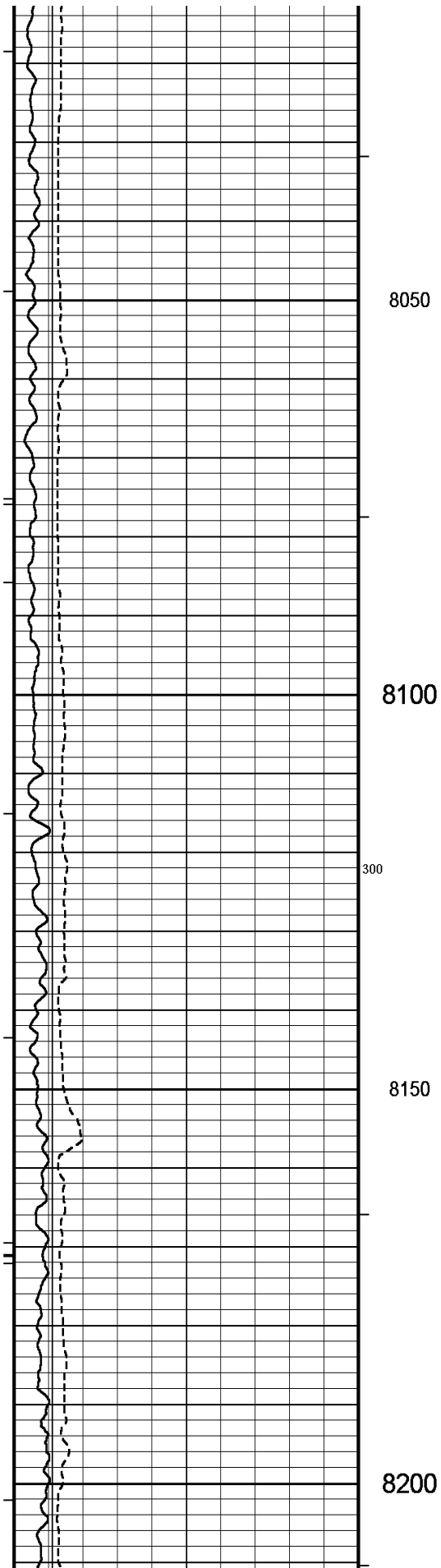
7850

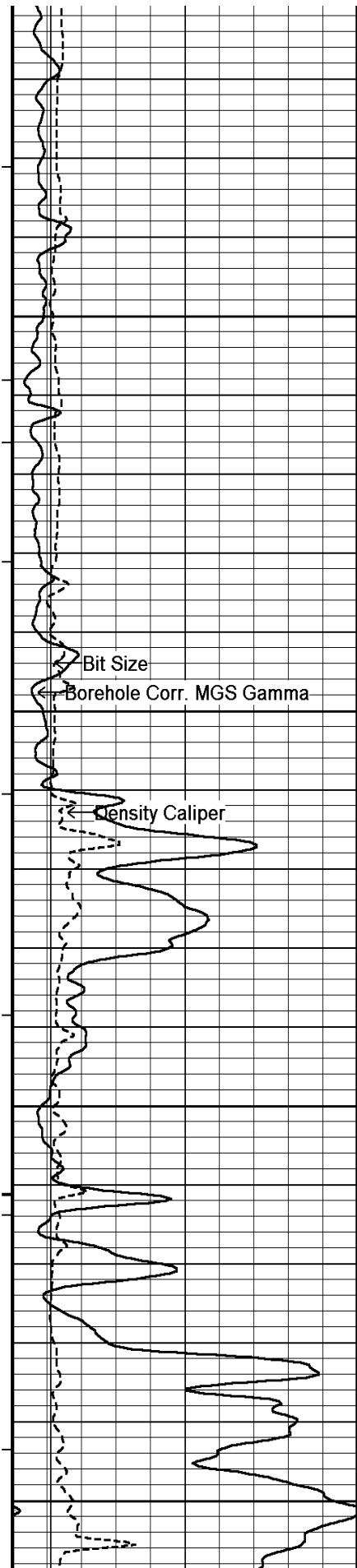
7900

7950

8000







8250

8300

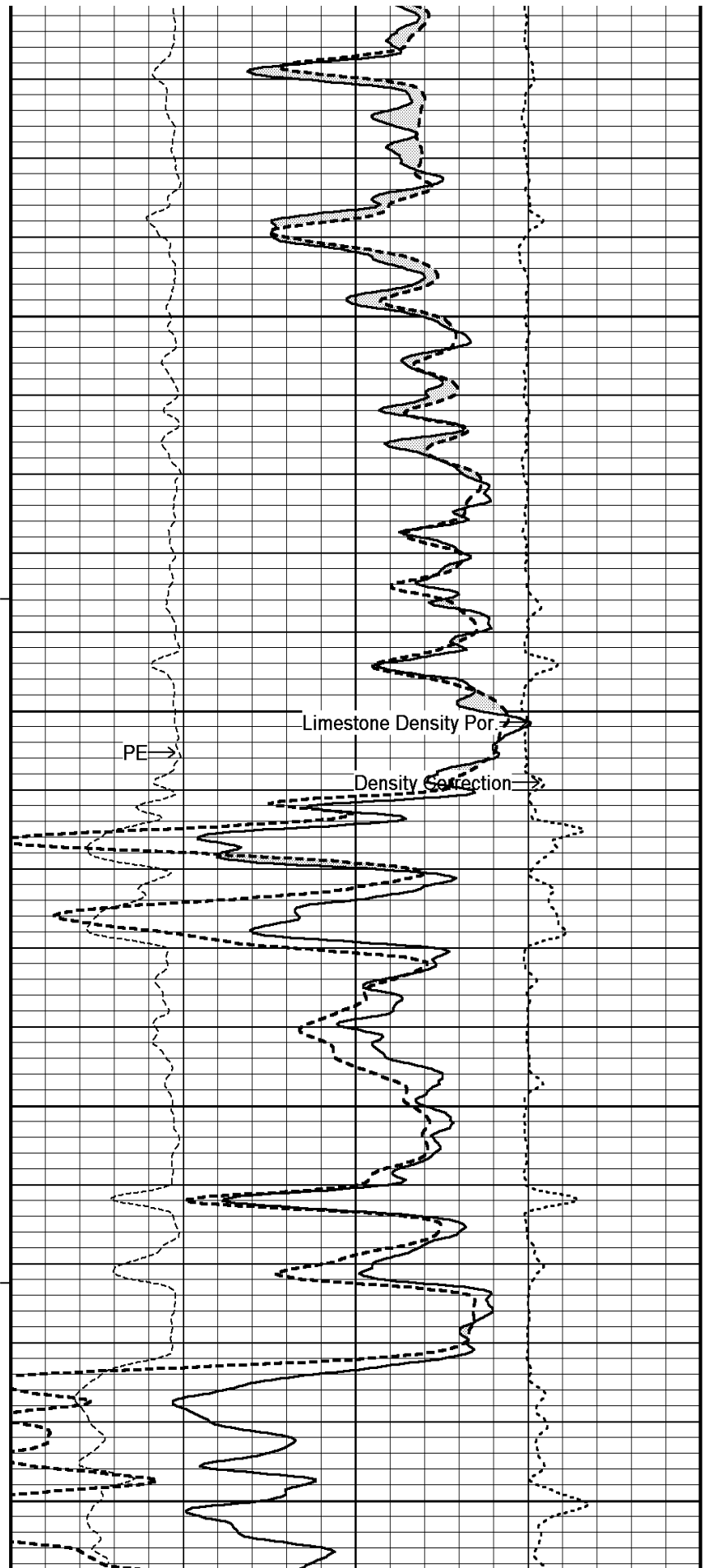
8350

8400

Bit Size

Borehole Corr. MGS Gamma

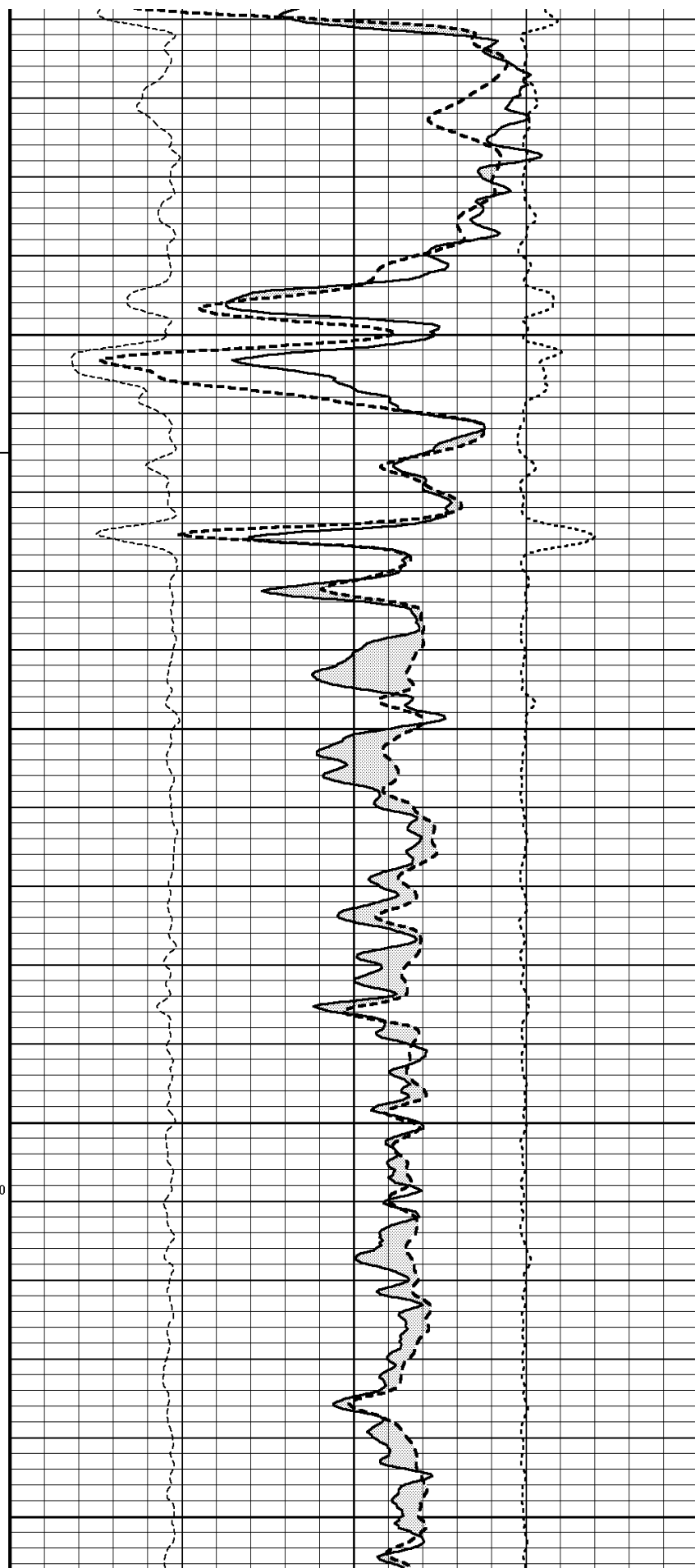
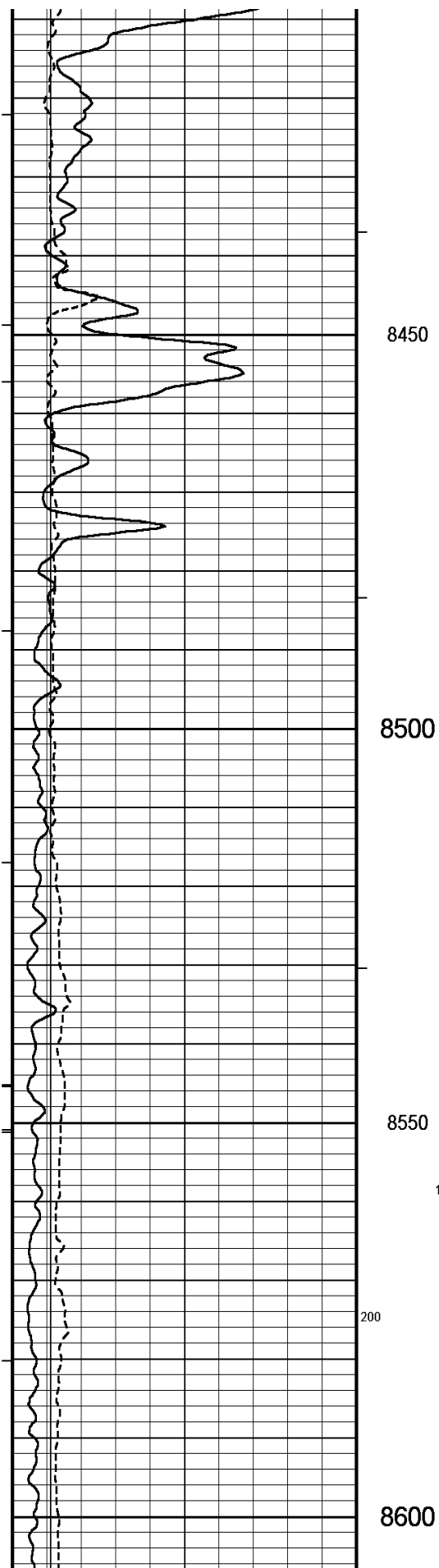
Density Caliper

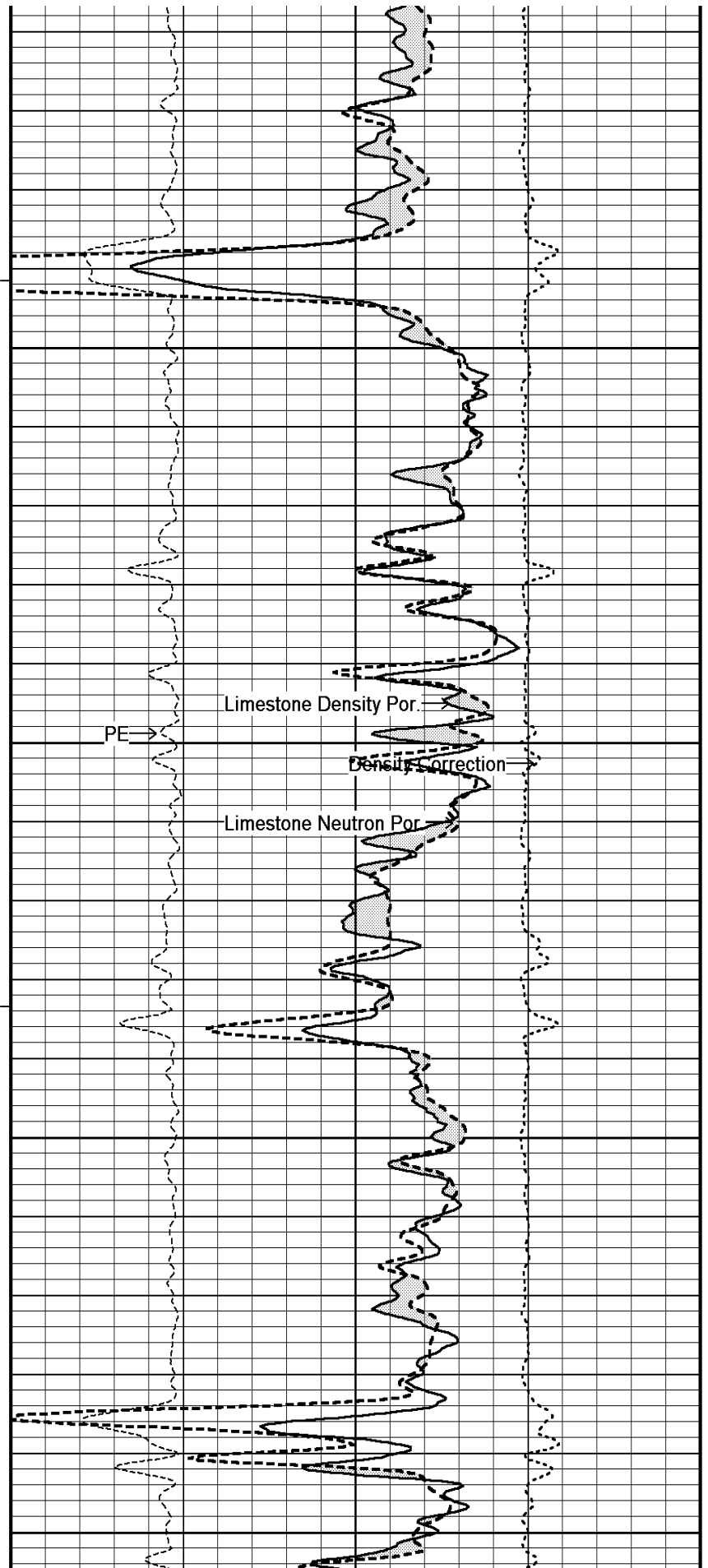
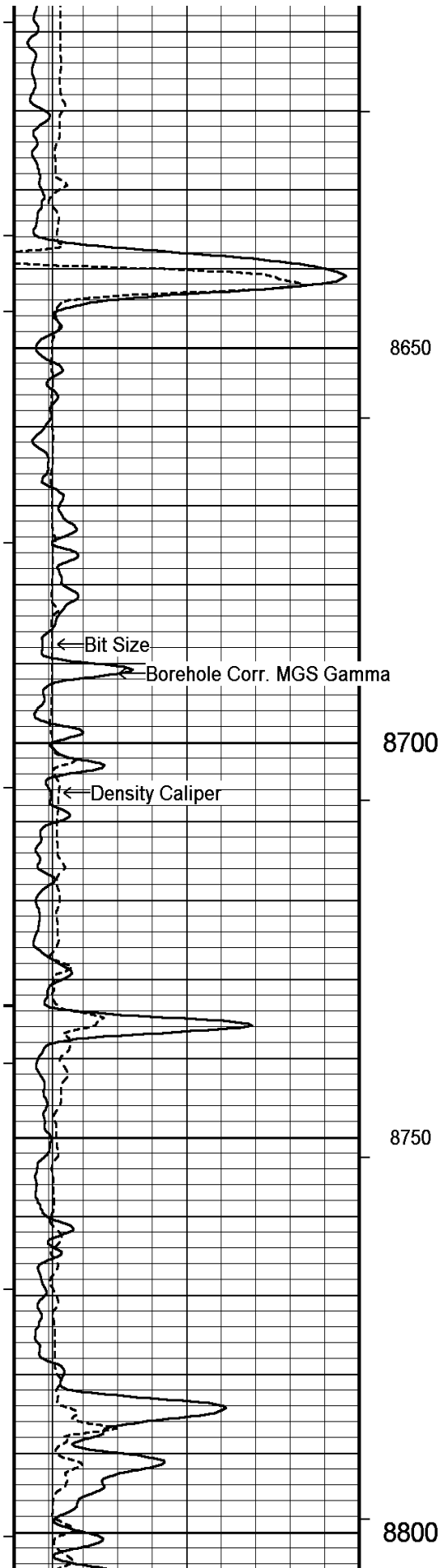


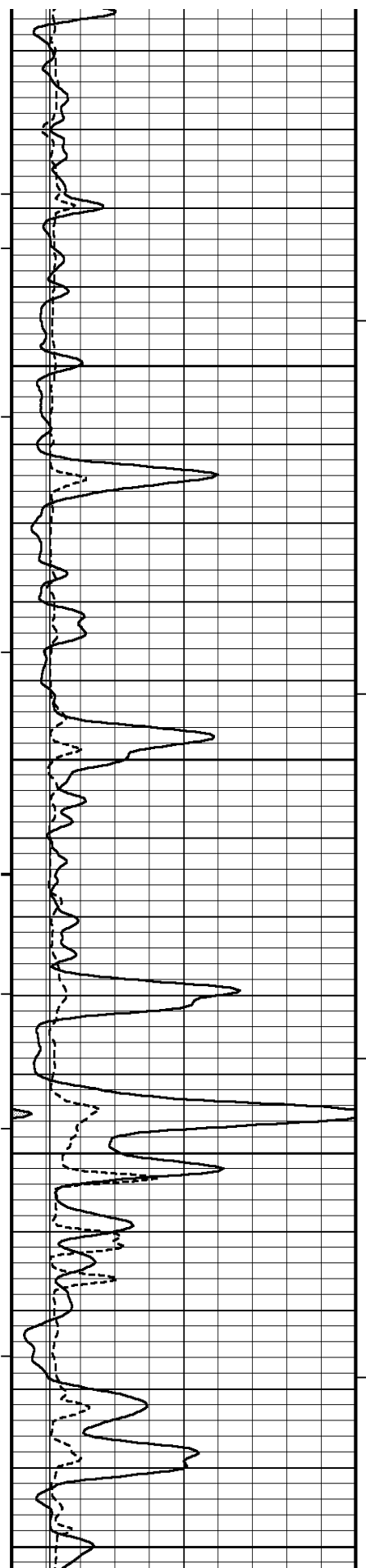
PE

Limestone Density Por.

Density Correction





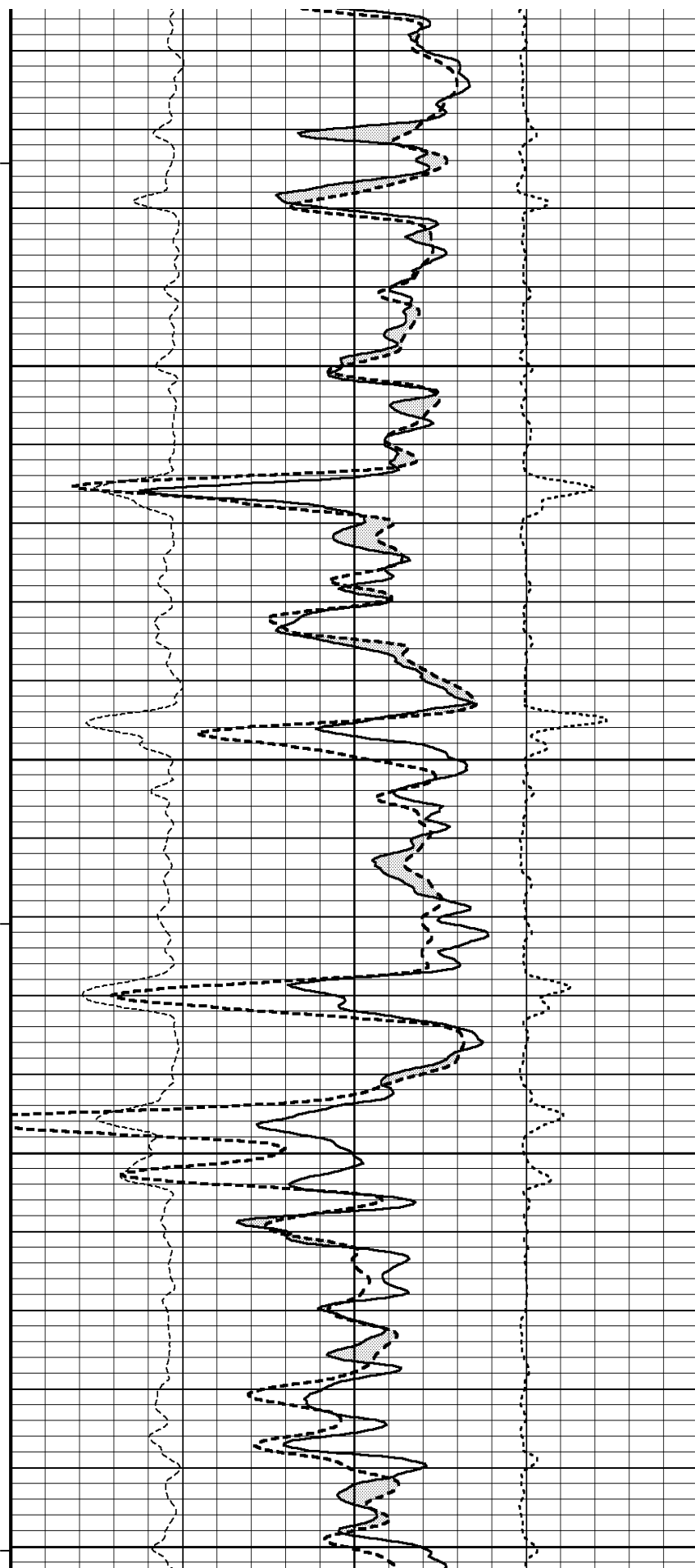


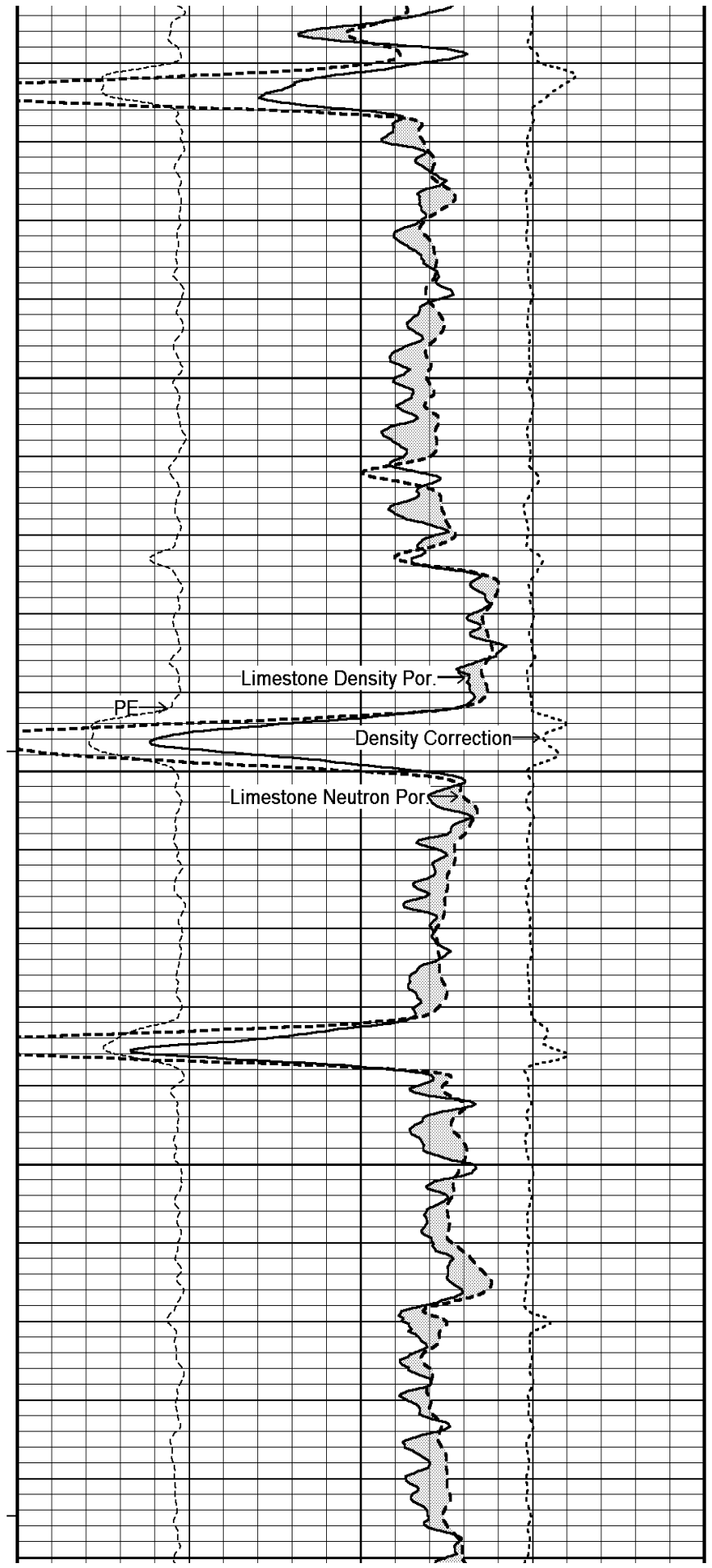
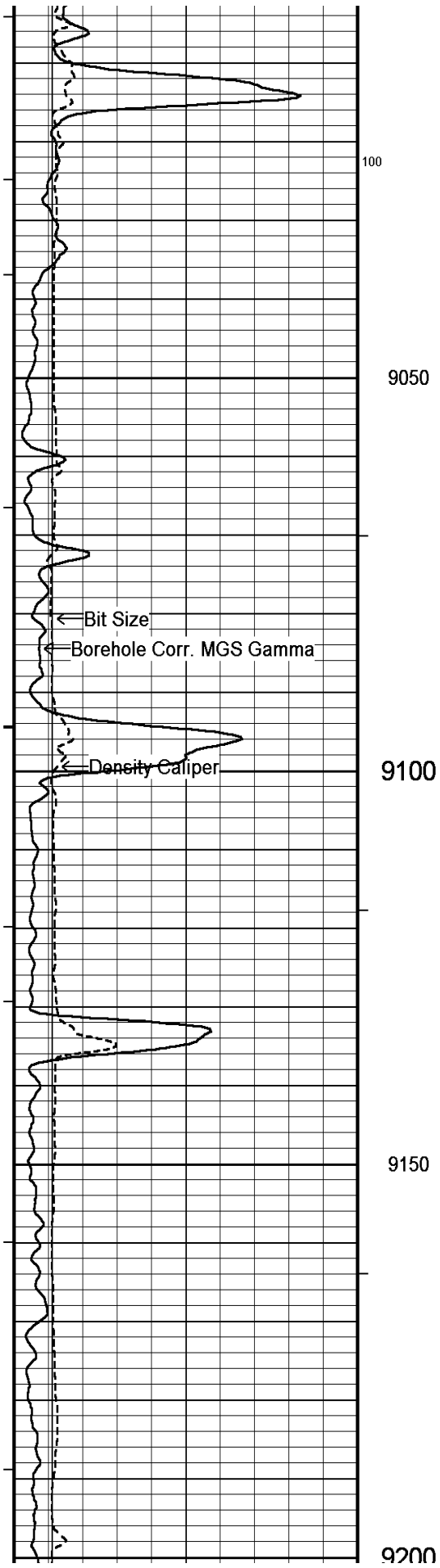
8850

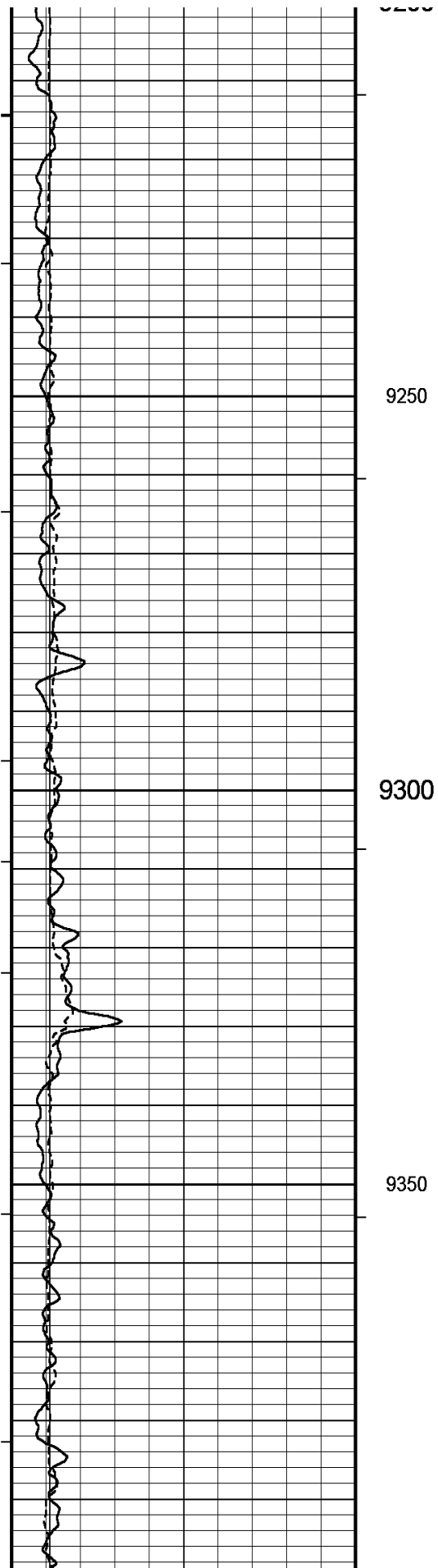
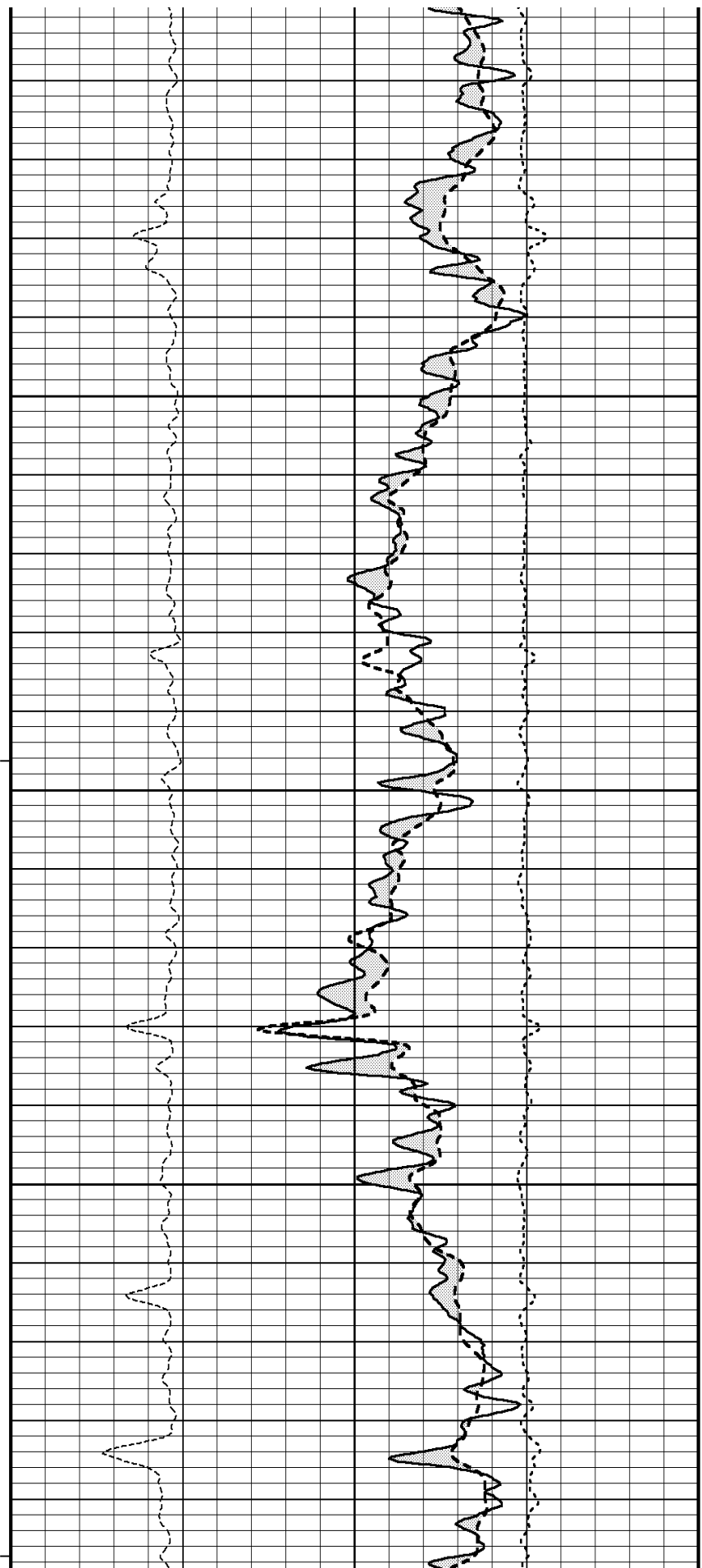
8900

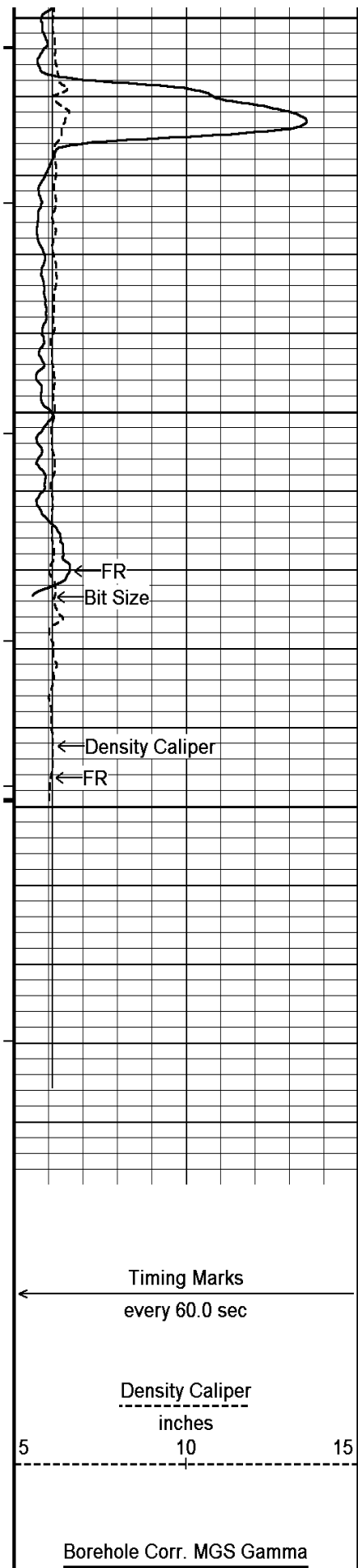
8950

9000









9400

9450

9500

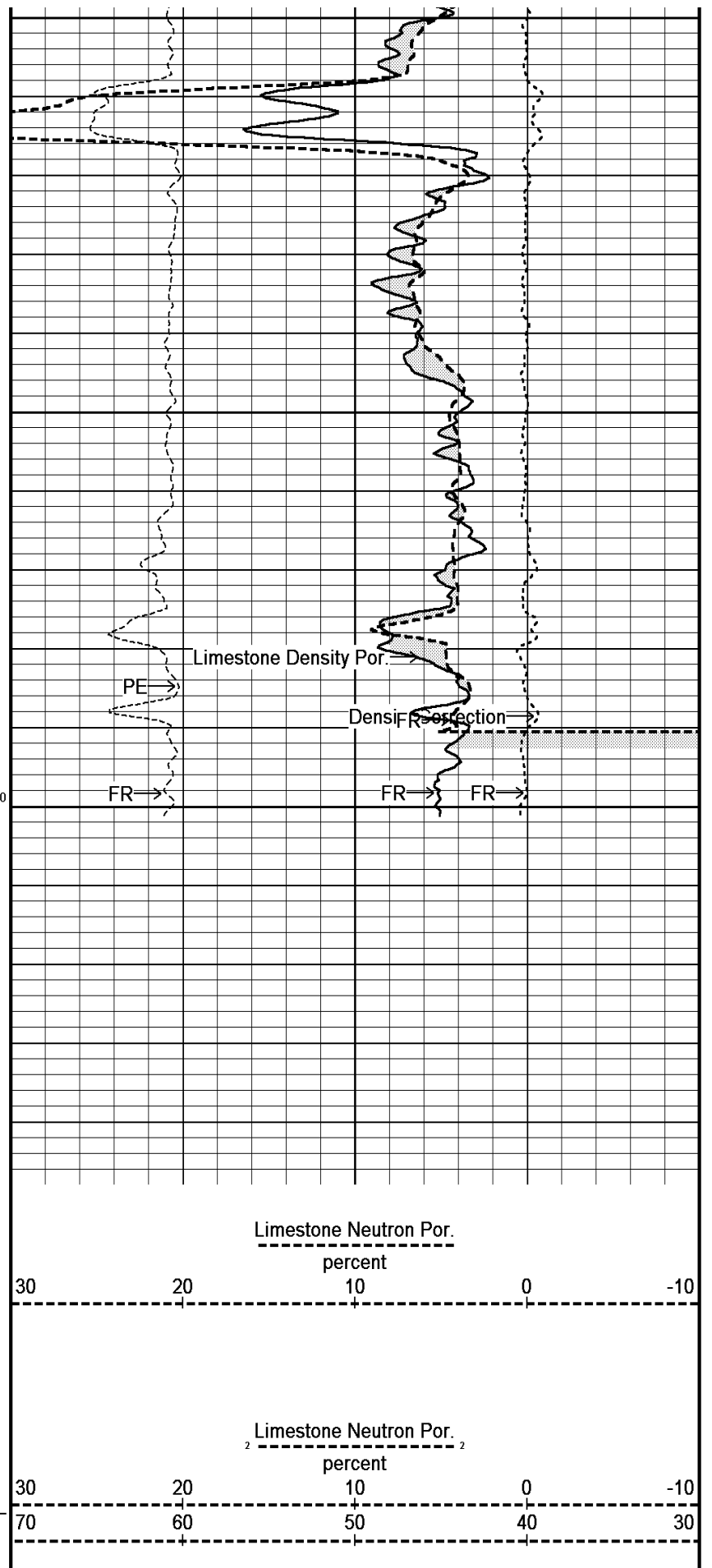
9546
Depth
In
Feet

Timing Marks
every 60.0 sec

Density Caliper
inches

HVI
every
10 cu ft

Borehole Corr. MGS Gamma



Limestone Density Por.

Density Correction

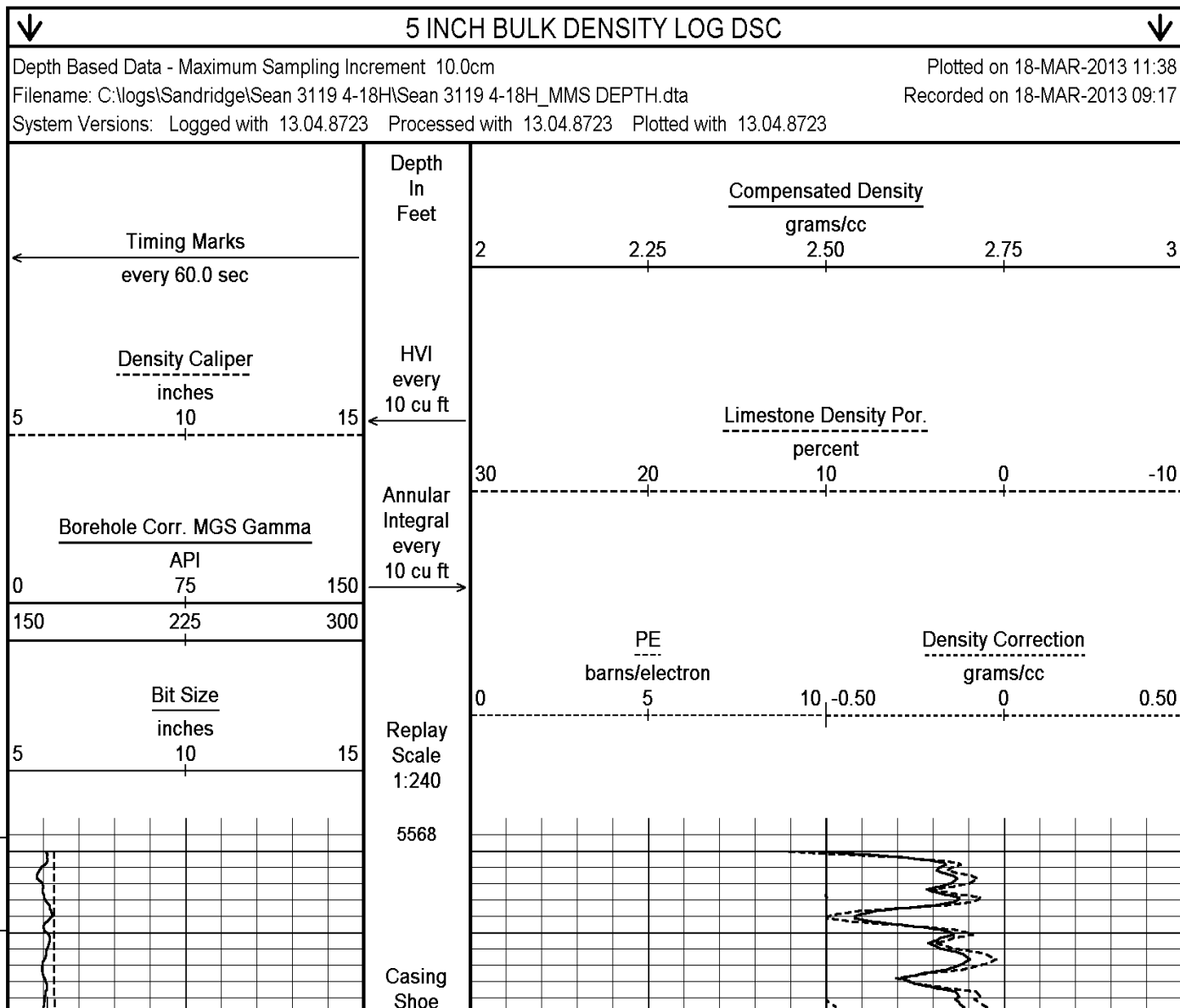
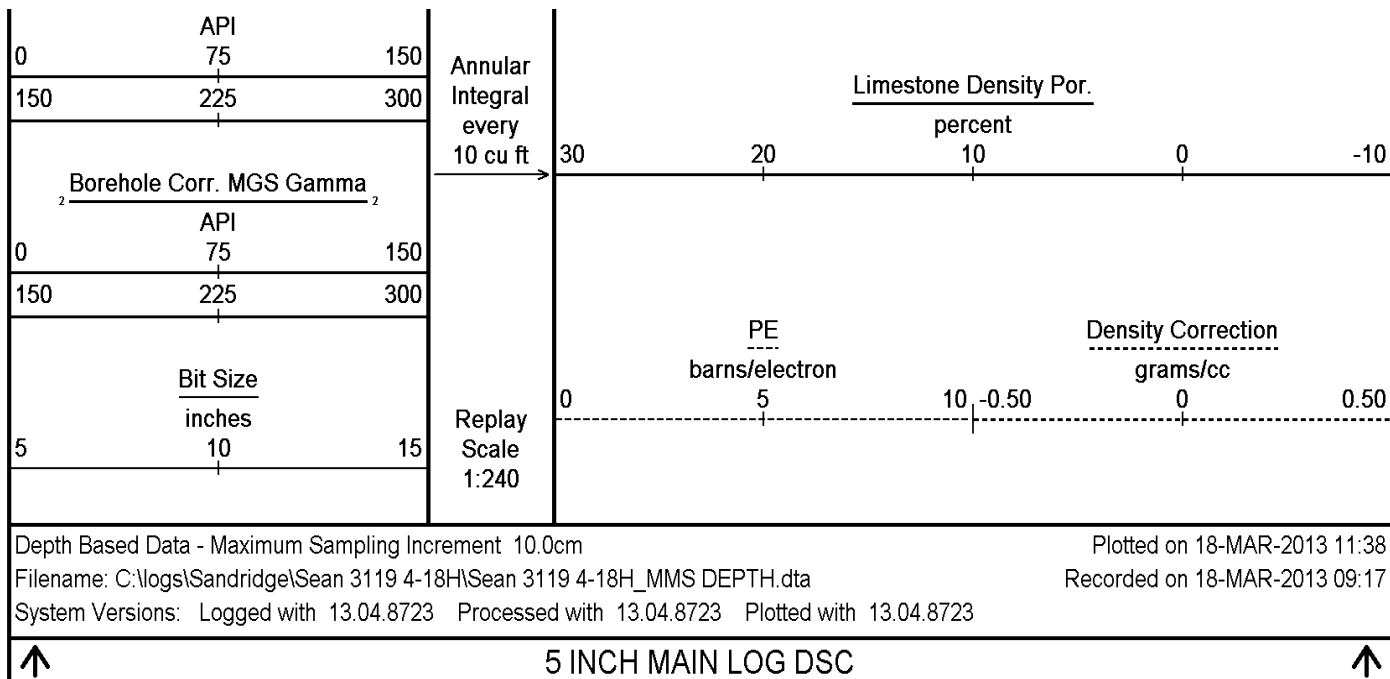
FR

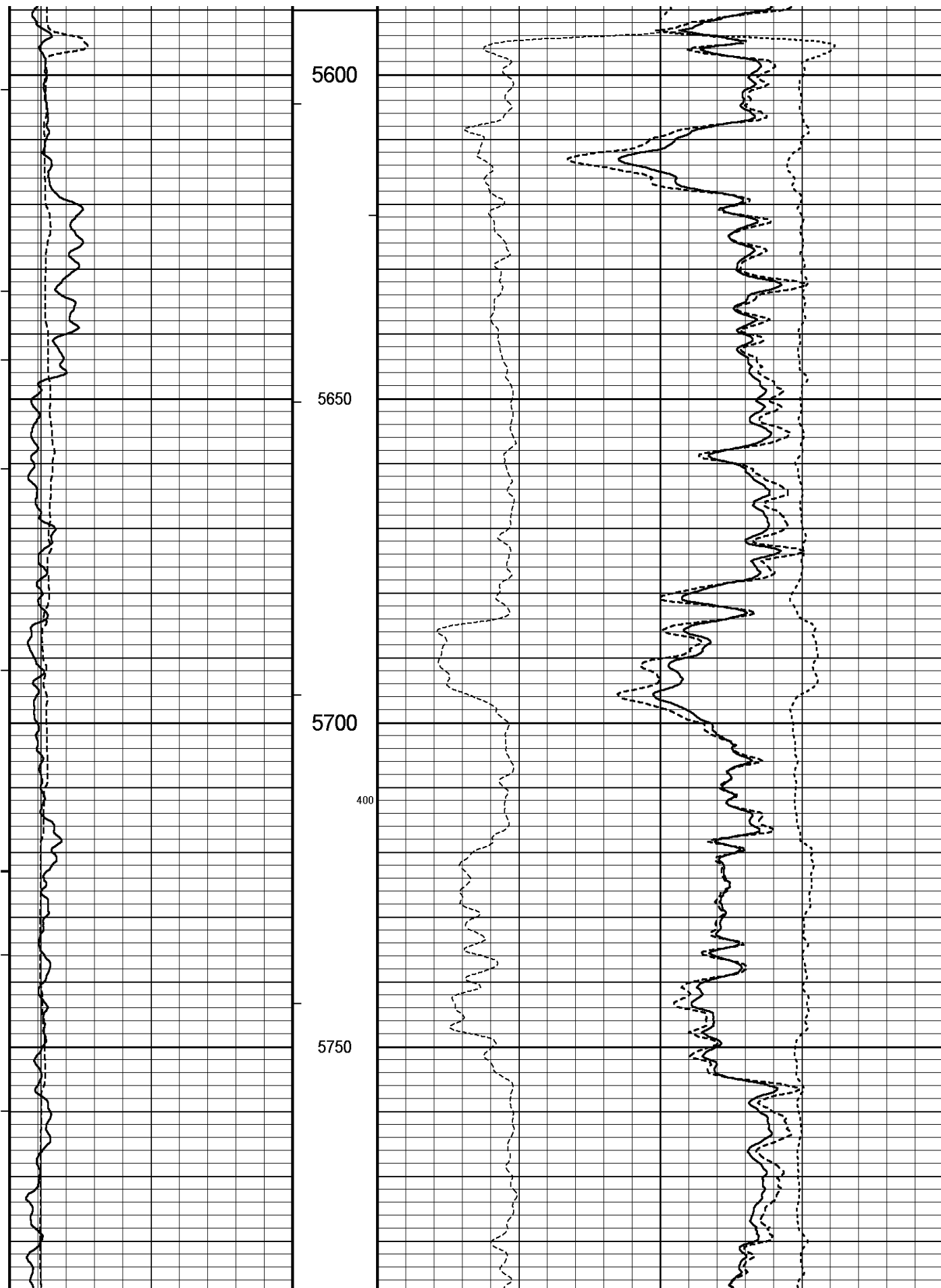
FR

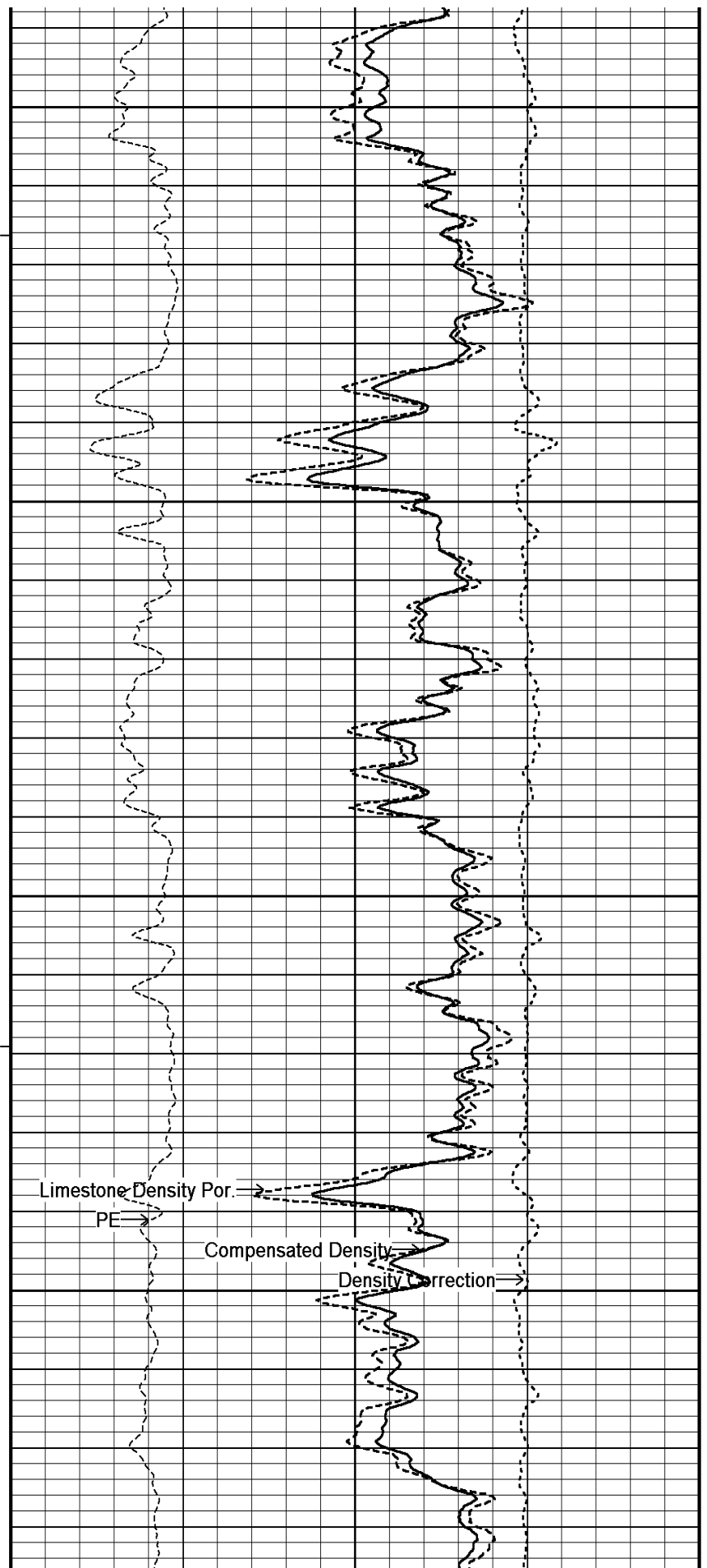
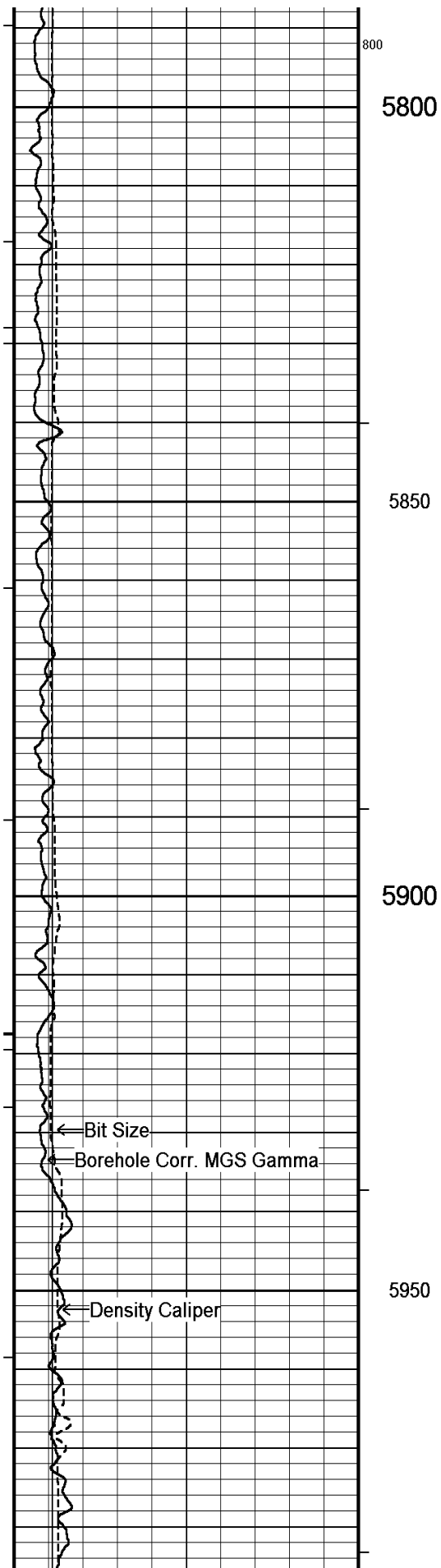
FR

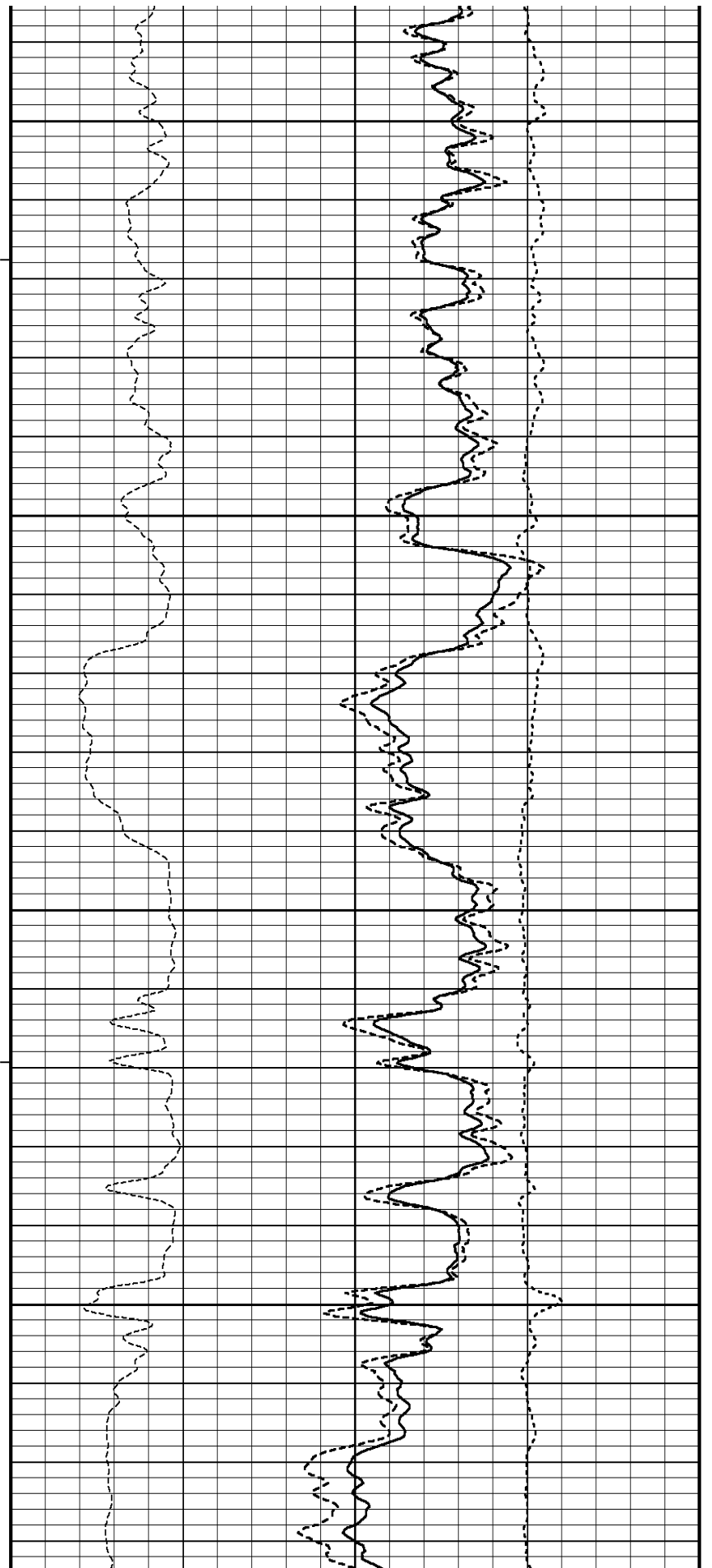
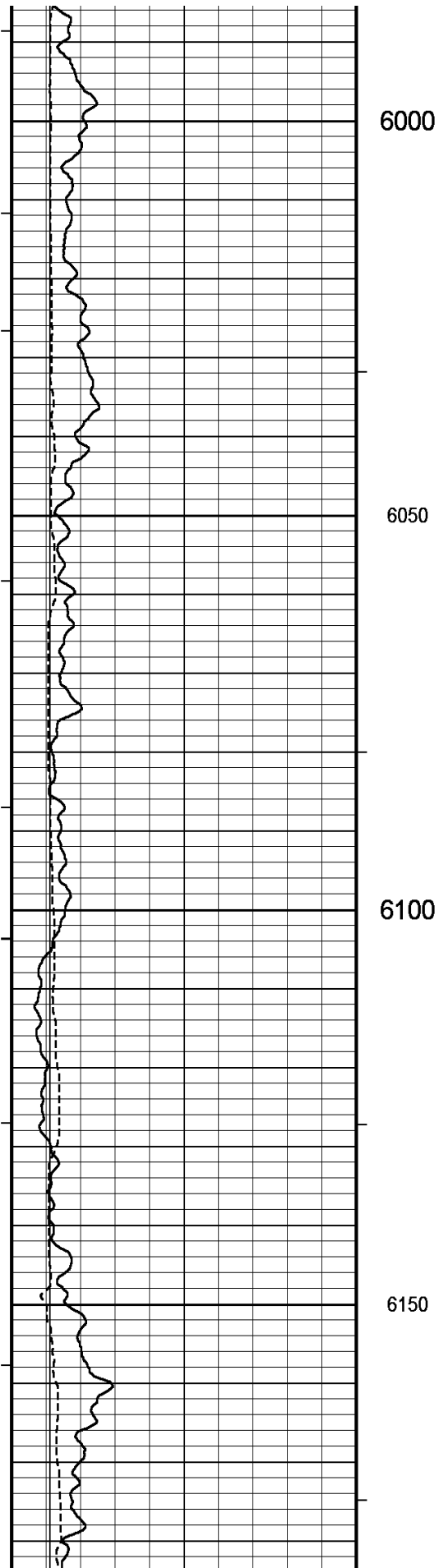
Limestone Neutron Por.
percent

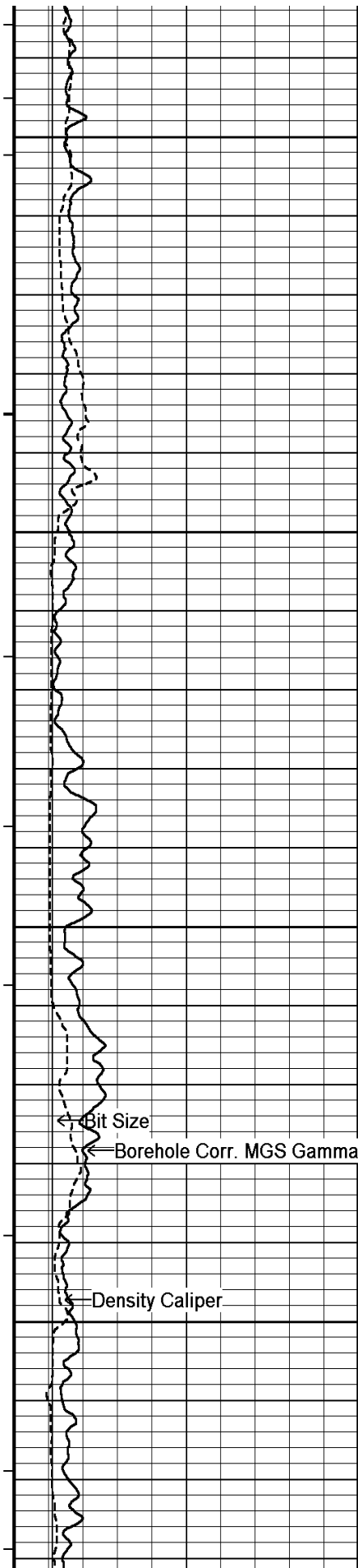
Limestone Neutron Por.
percent











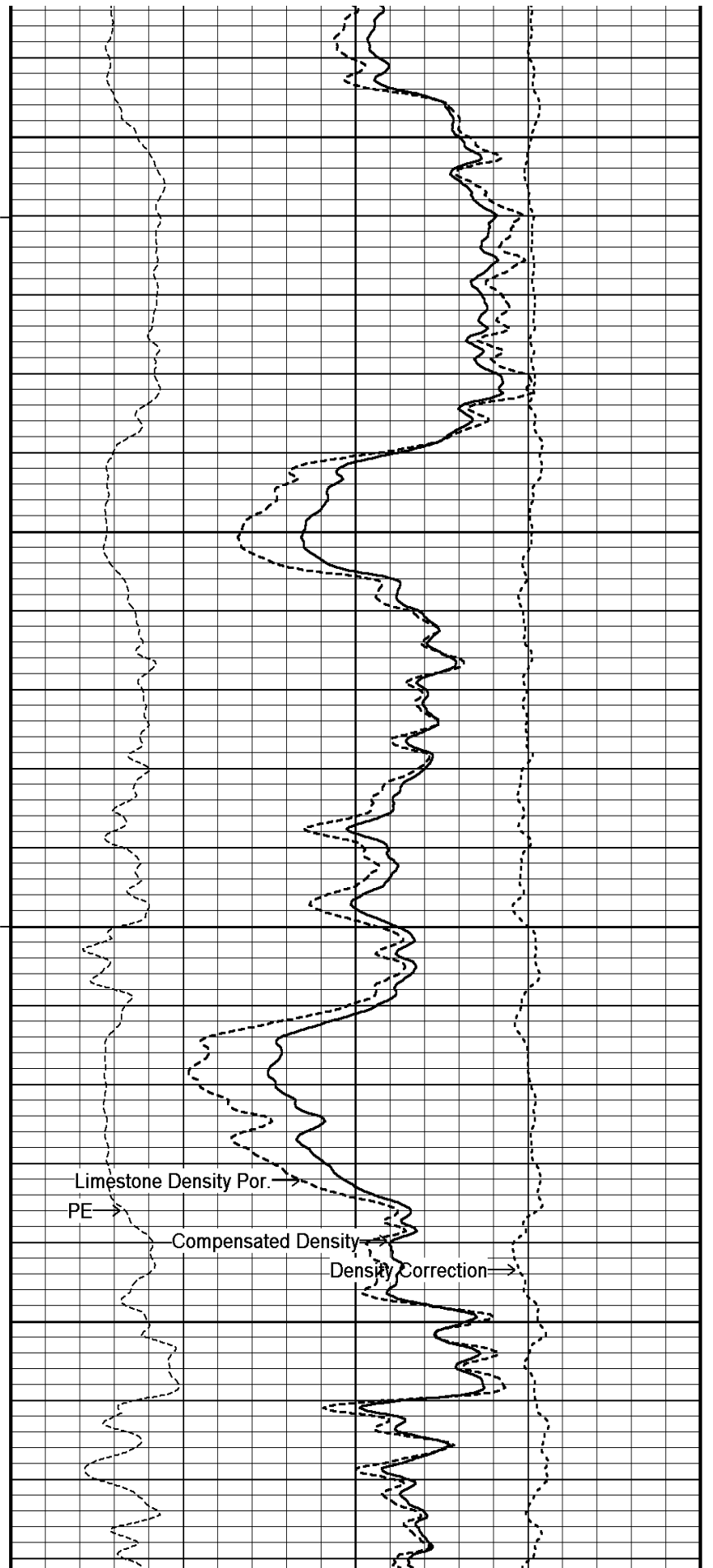
6200

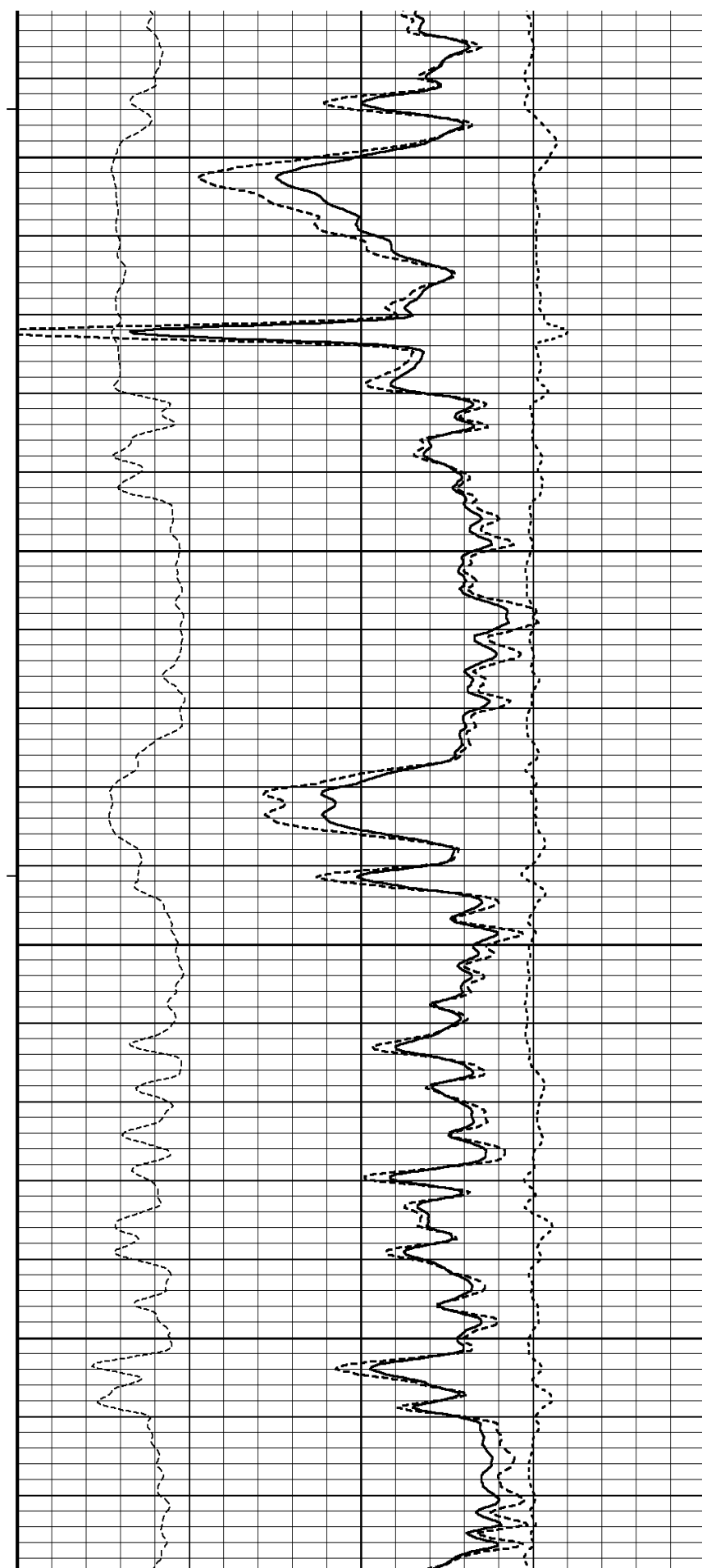
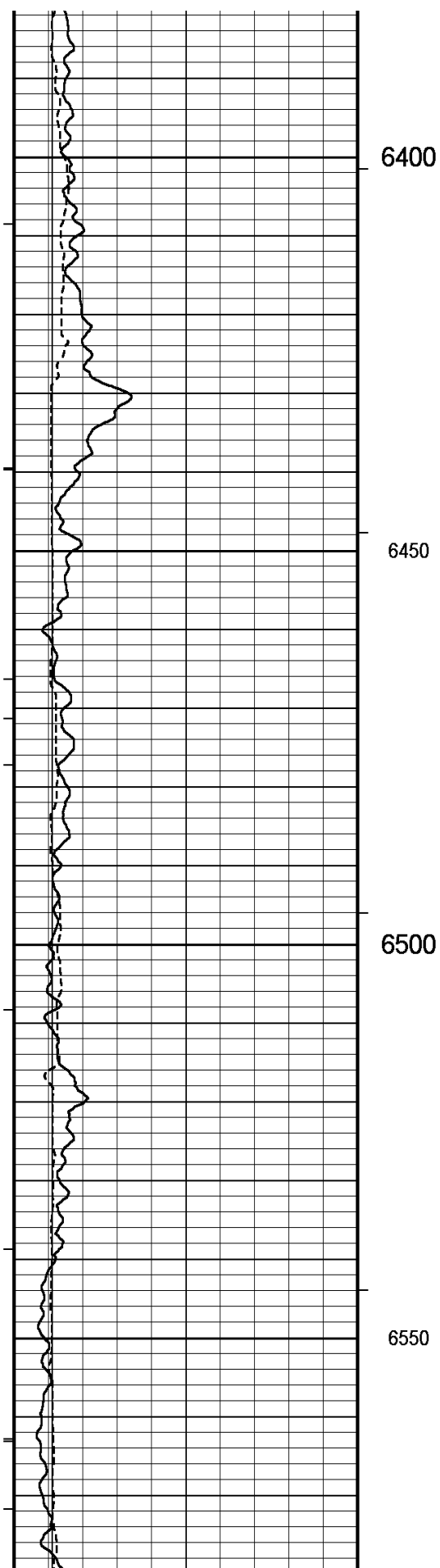
6250

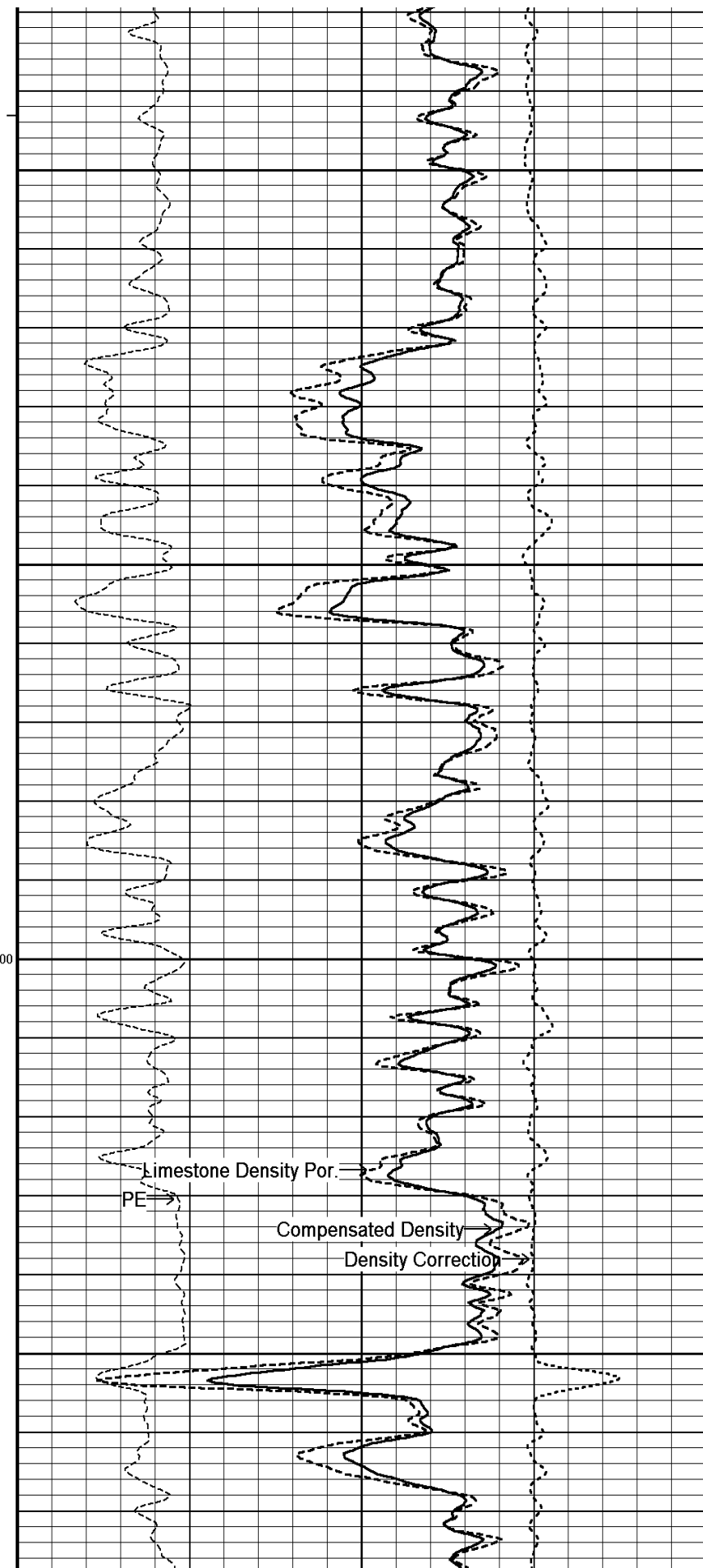
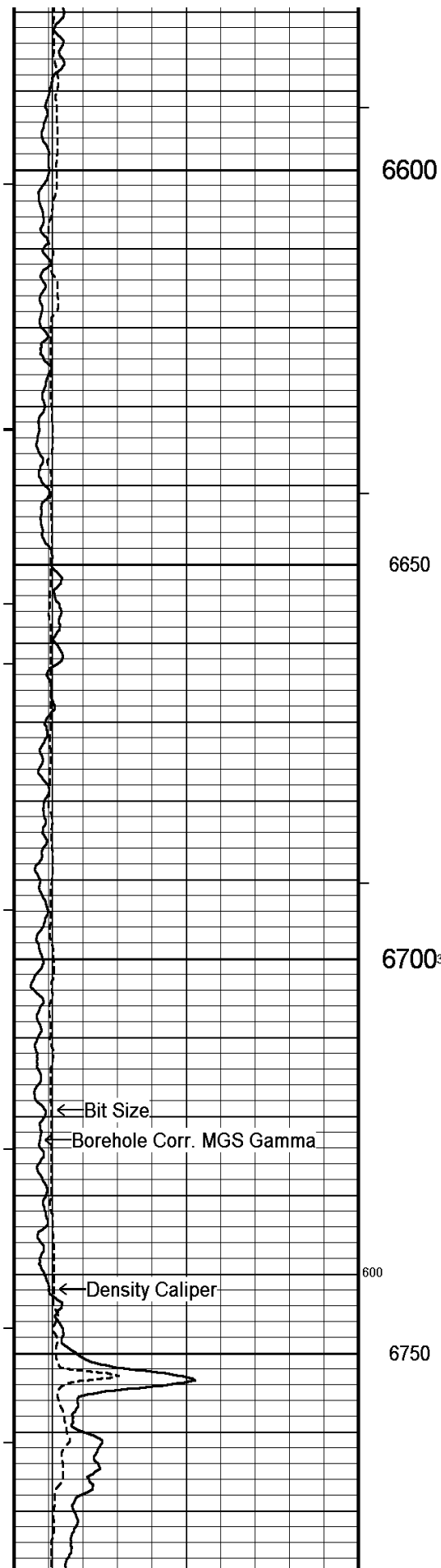
700

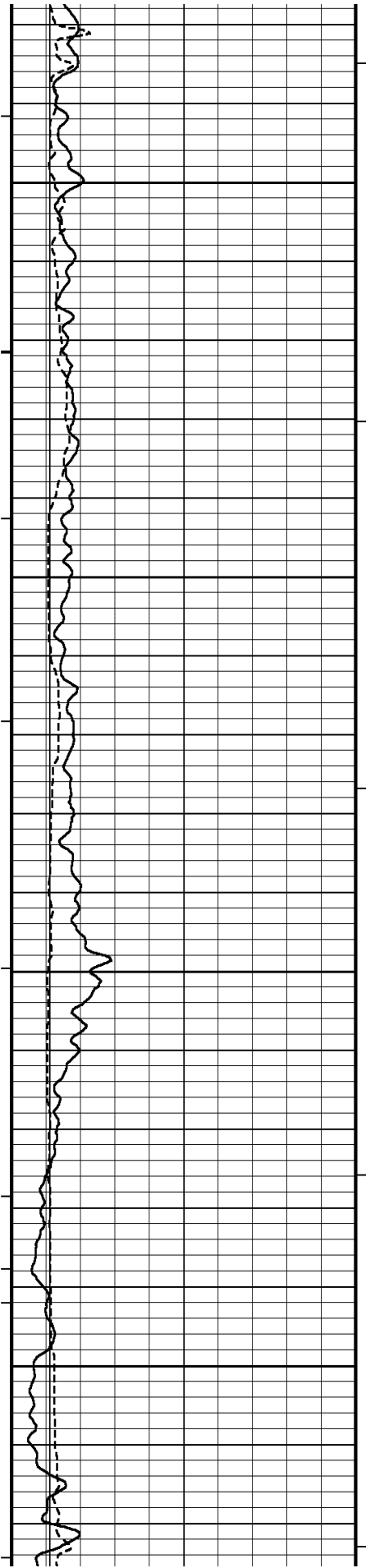
6300

6350







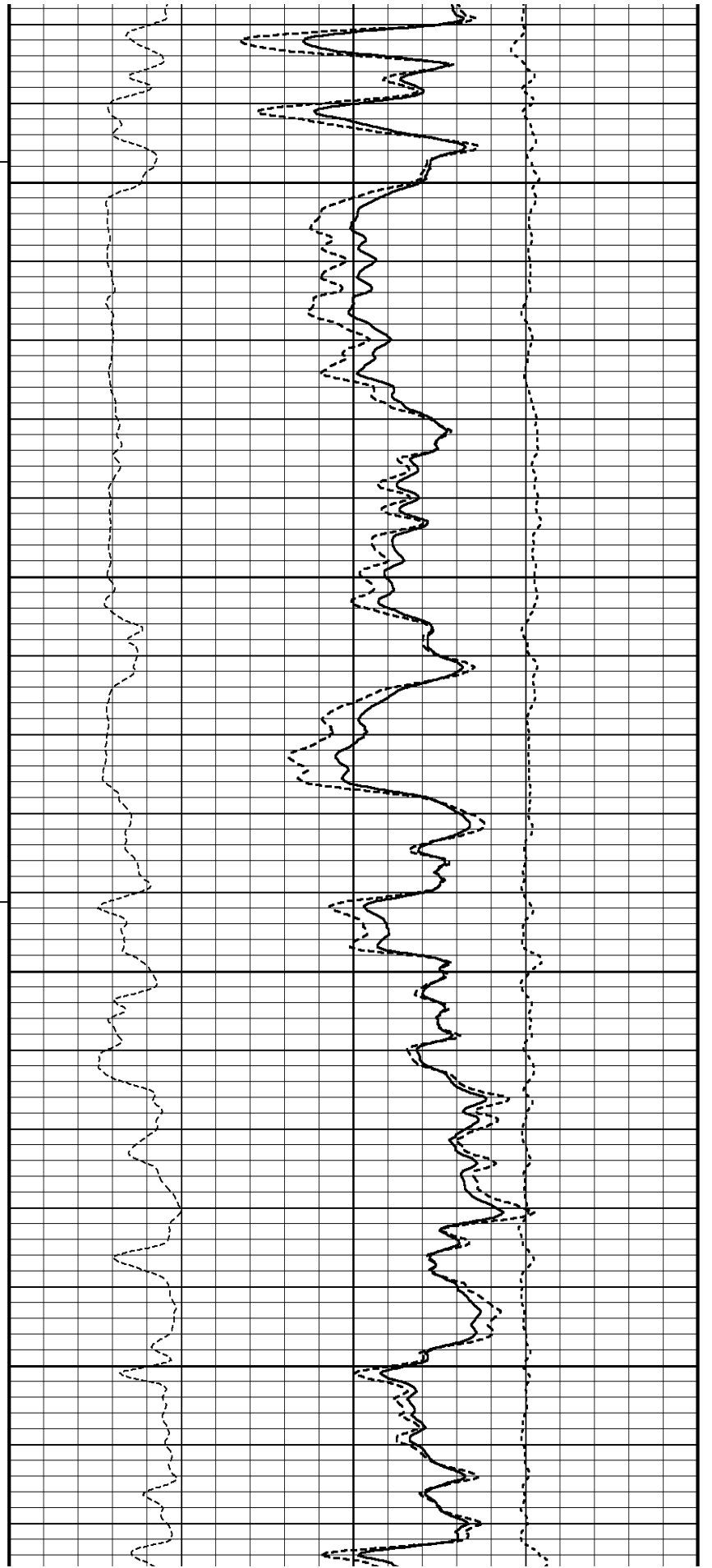


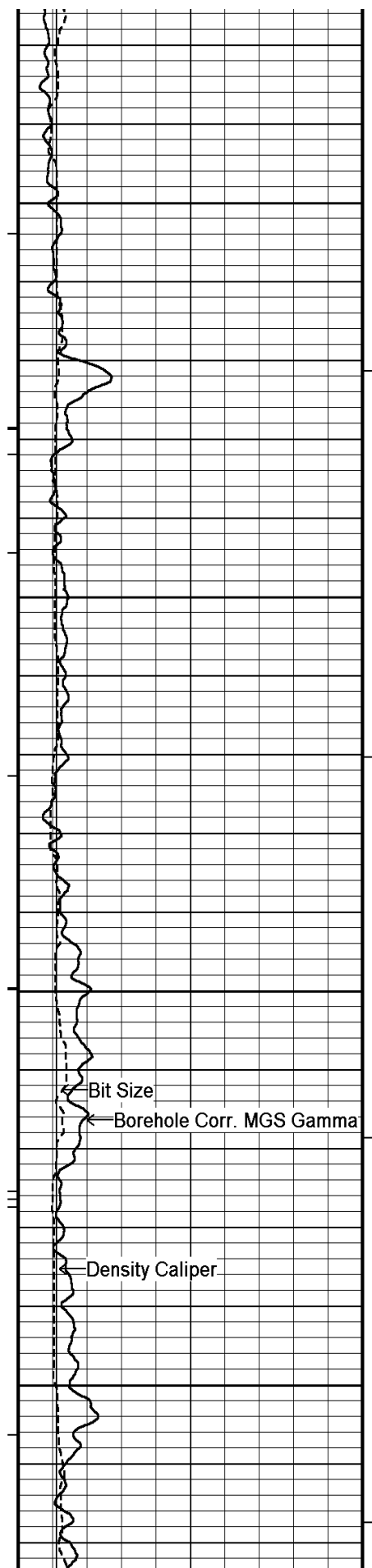
6800

6850

6900

6950





7000

7050

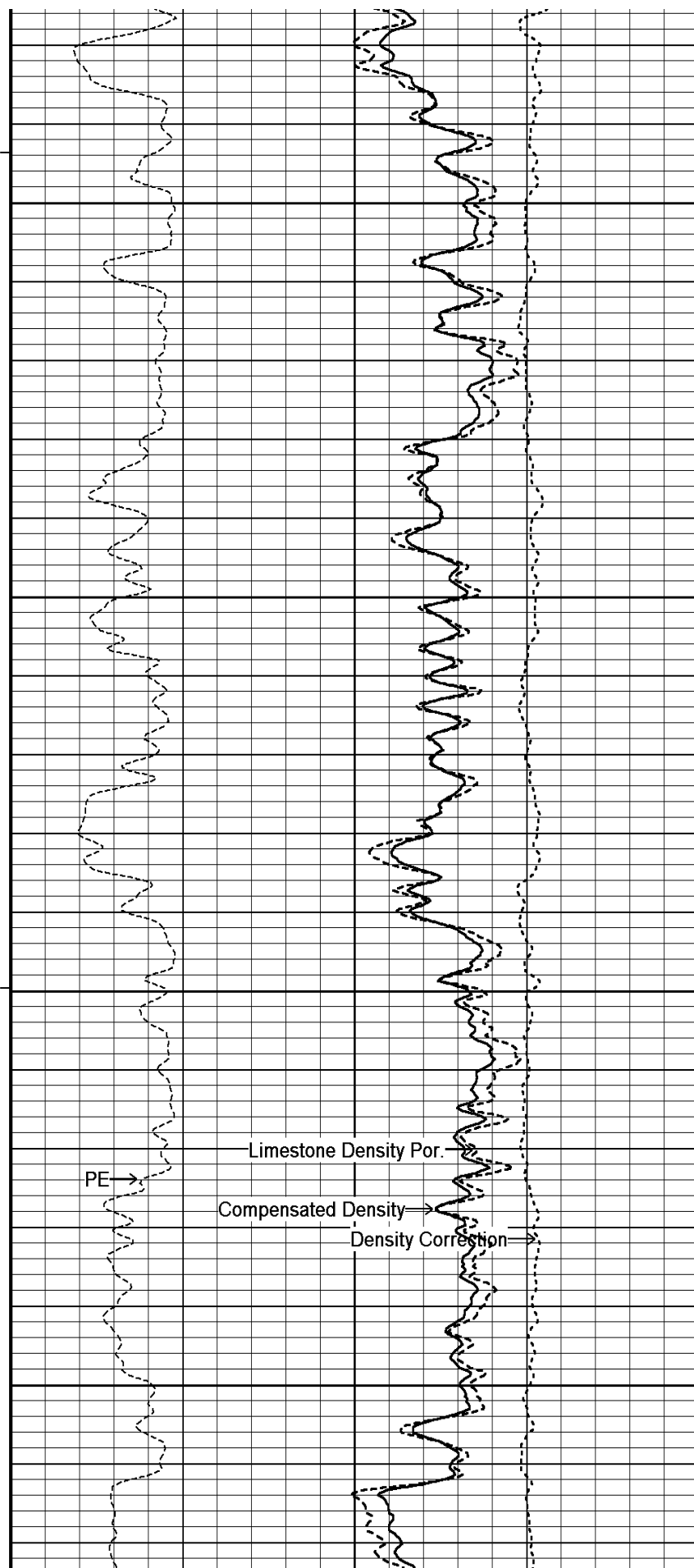
7100

7150

Bit Size

Borehole Corr. MGS Gamma

Density Caliper

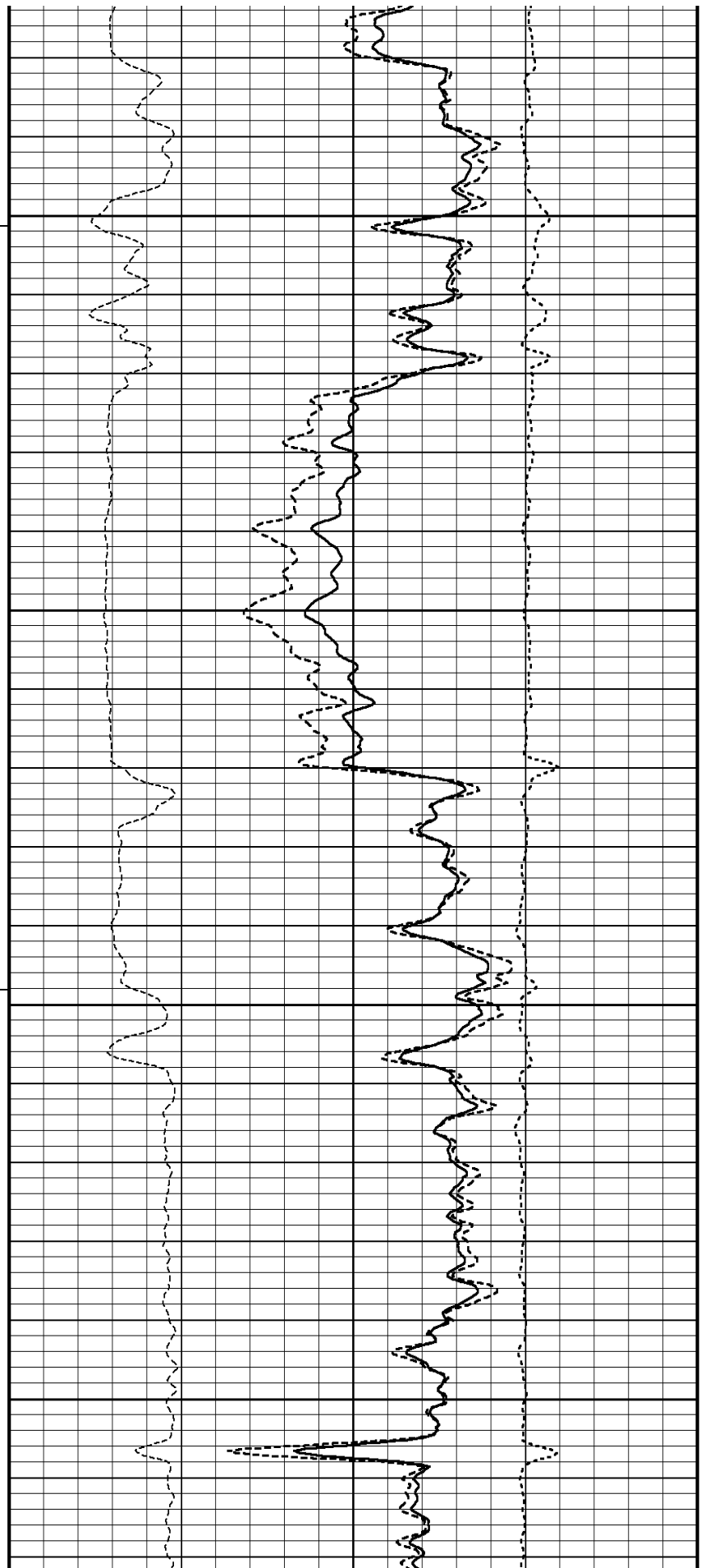
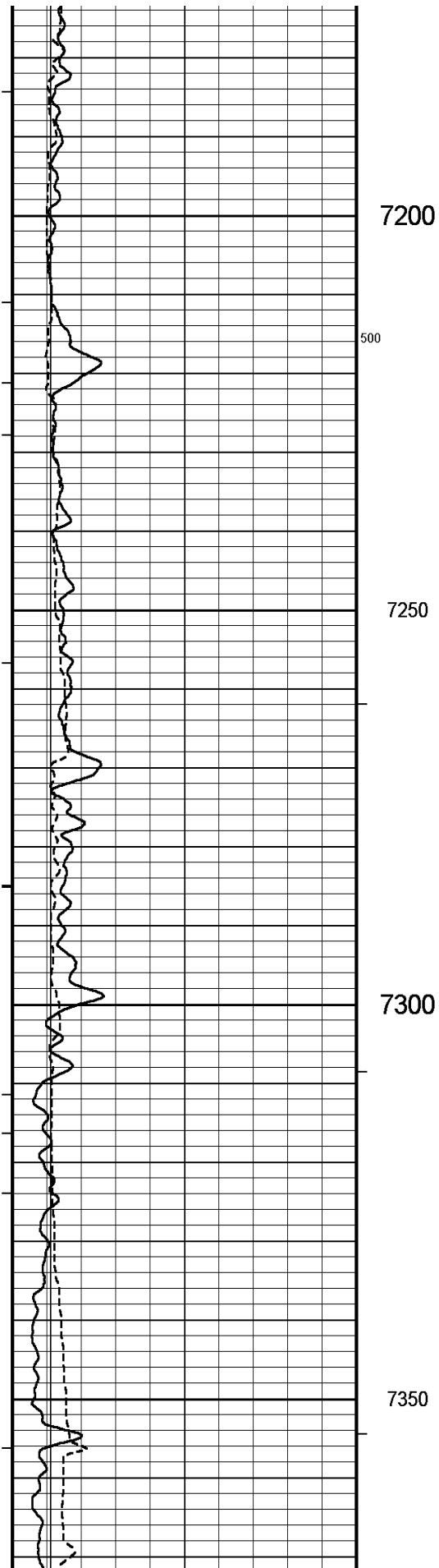


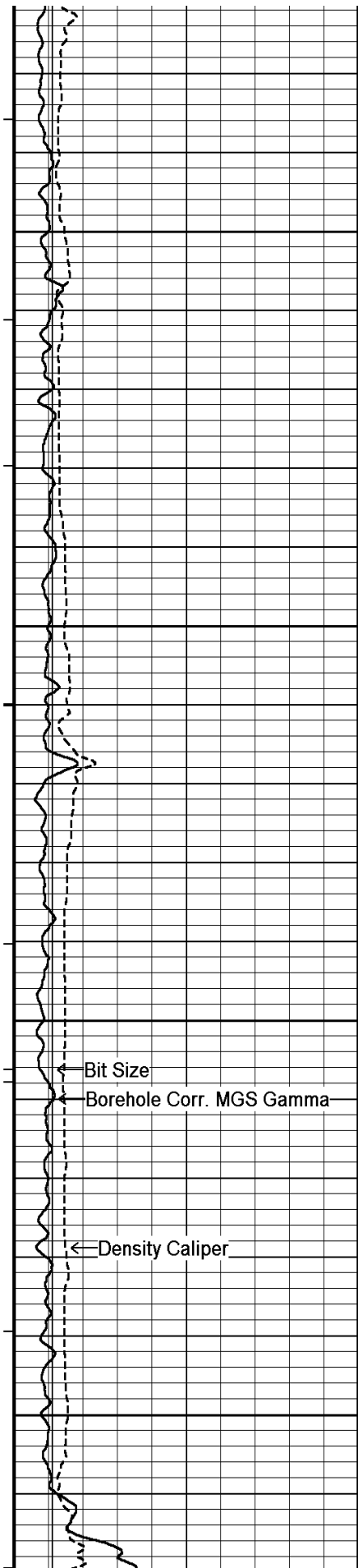
PE

Limestone Density Por.

Compensated Density

Density Correction



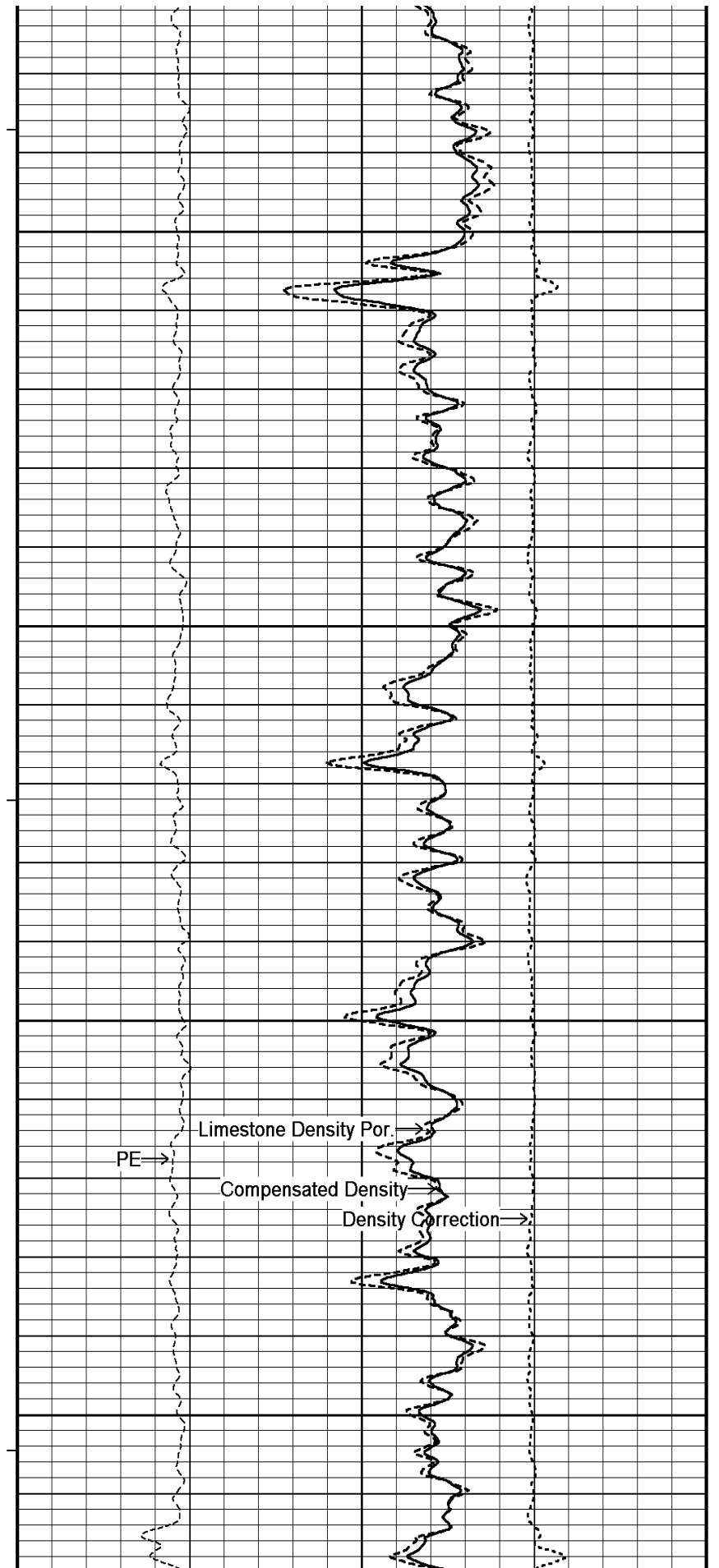


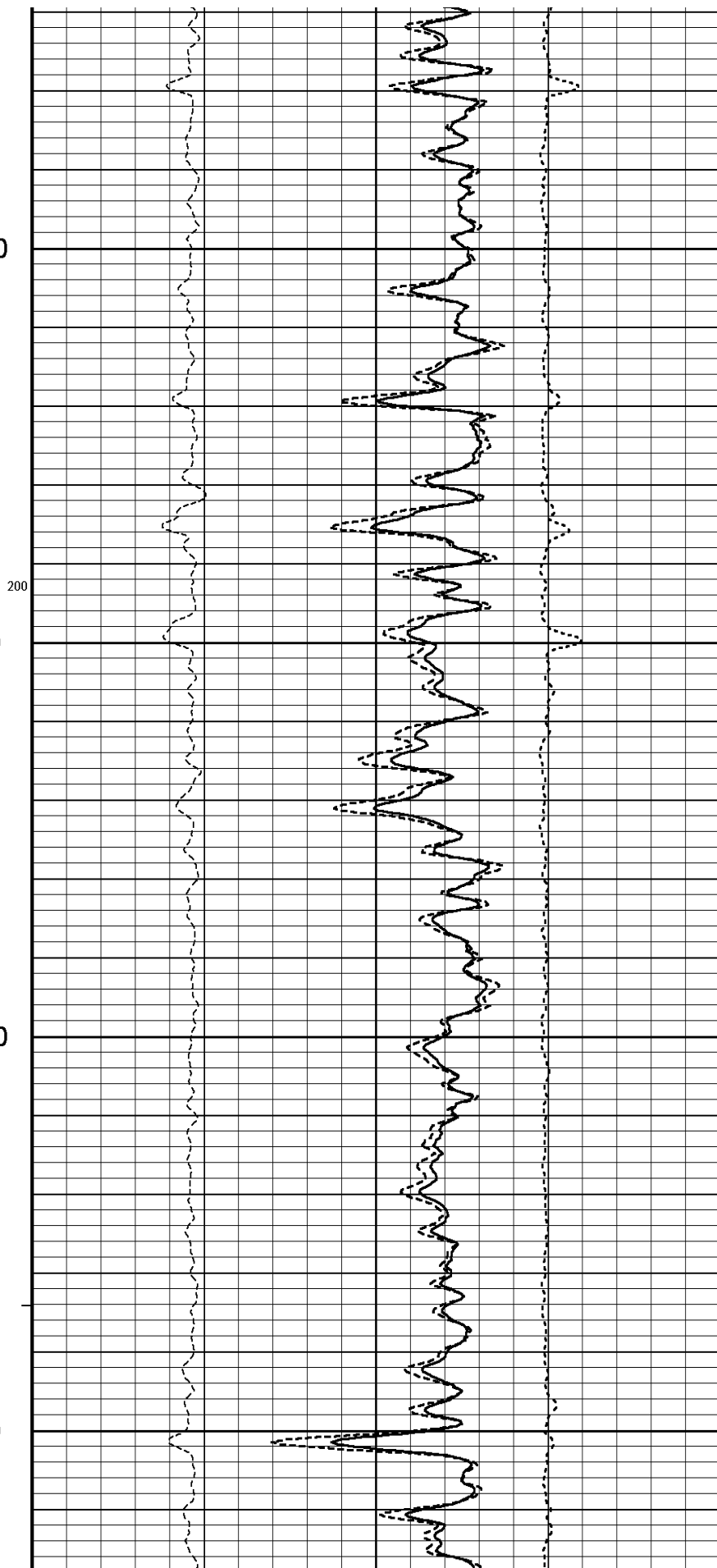
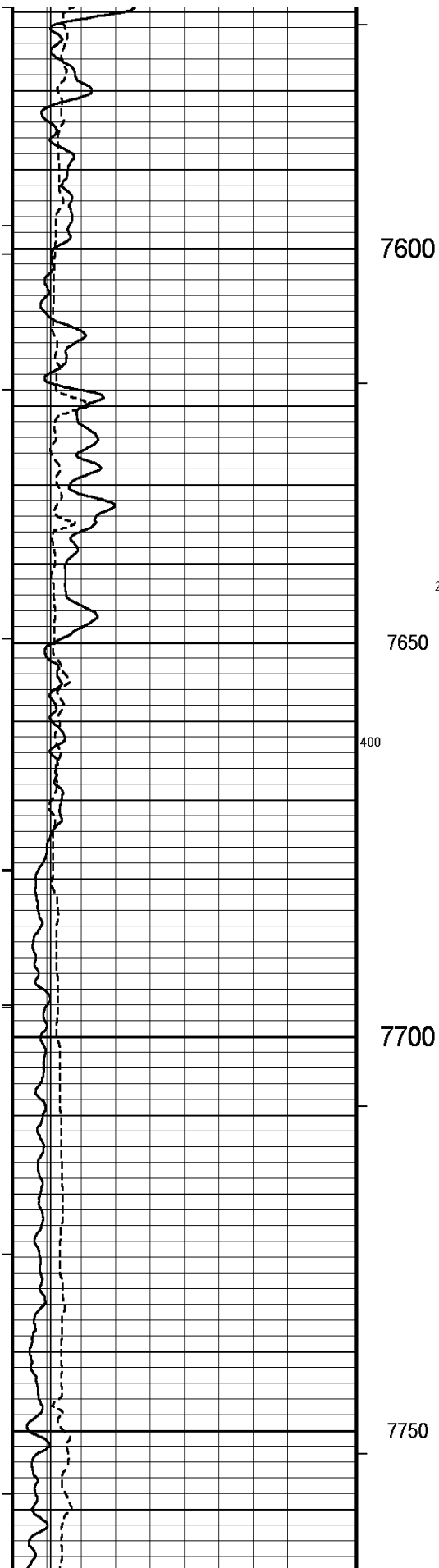
7400

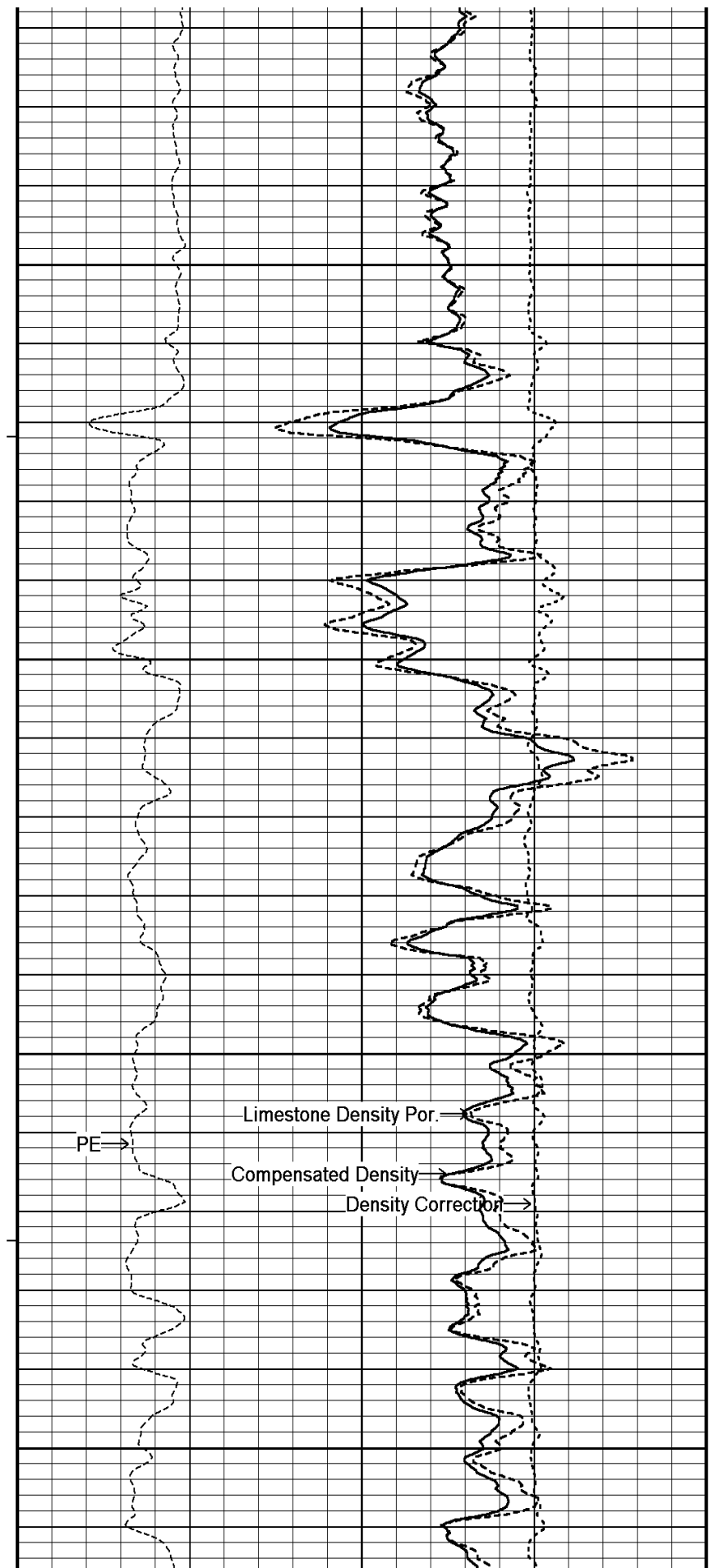
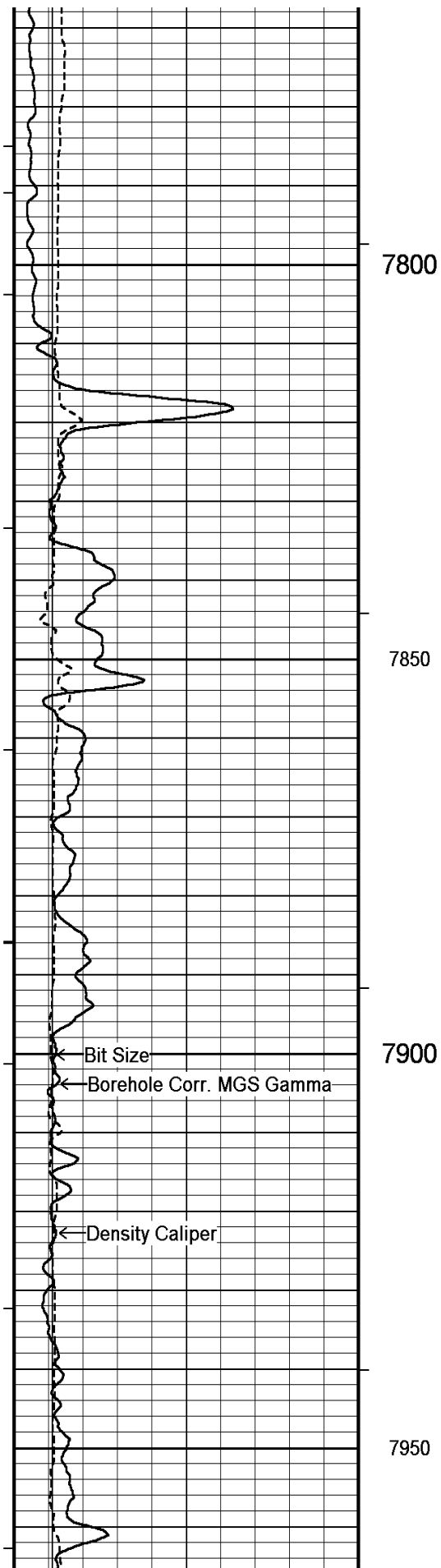
7450

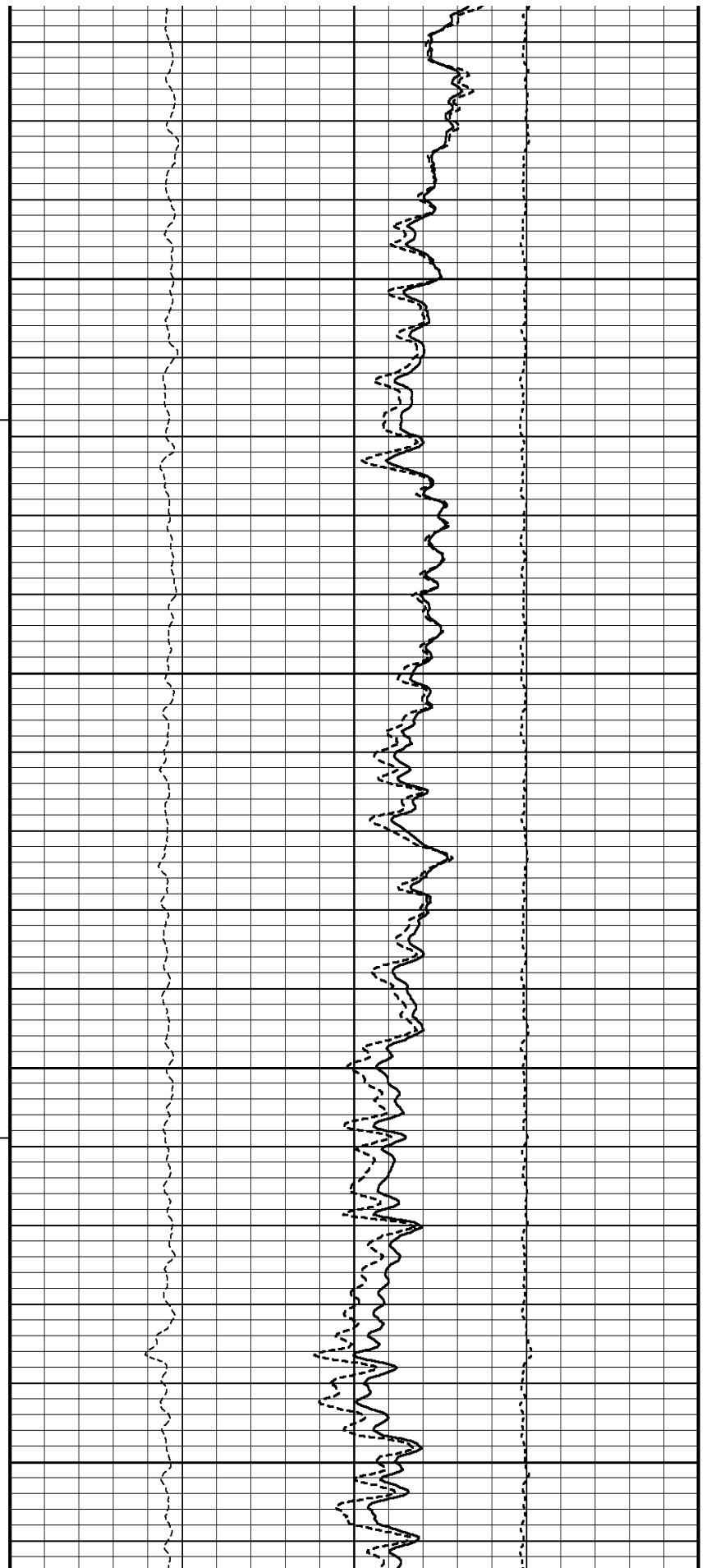
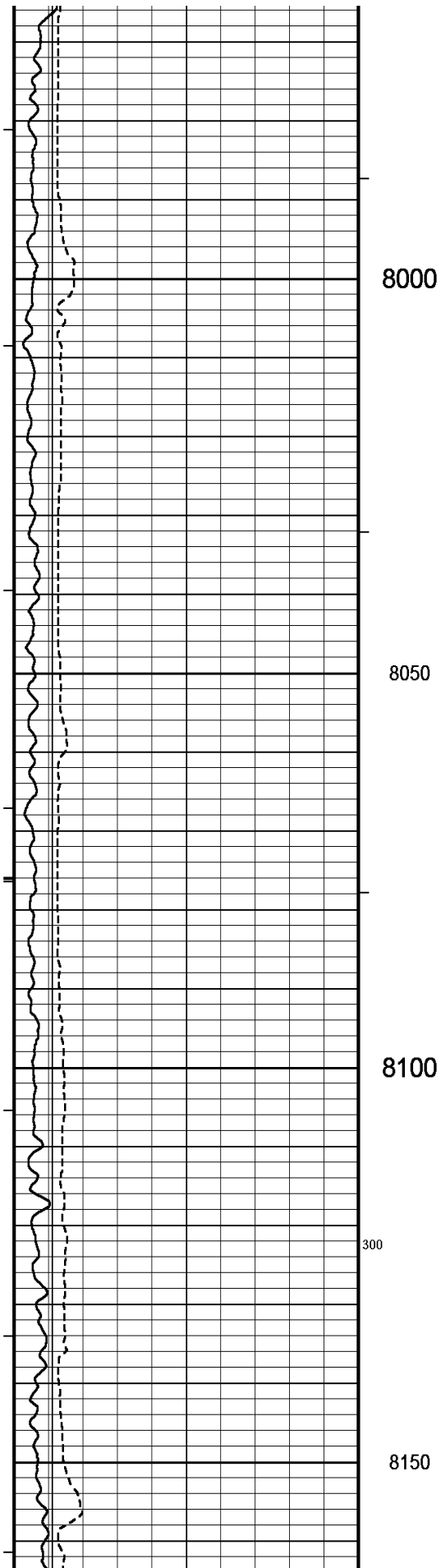
7500

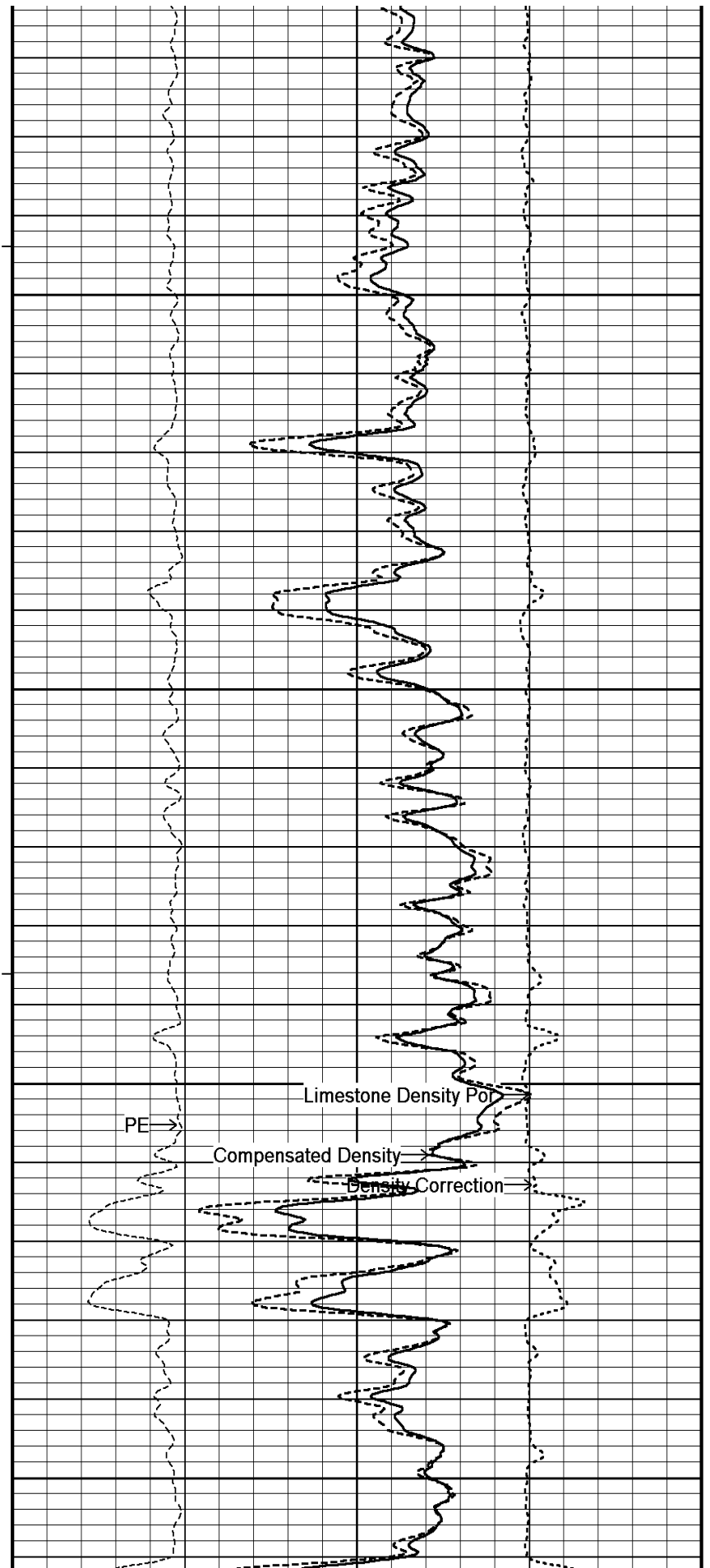
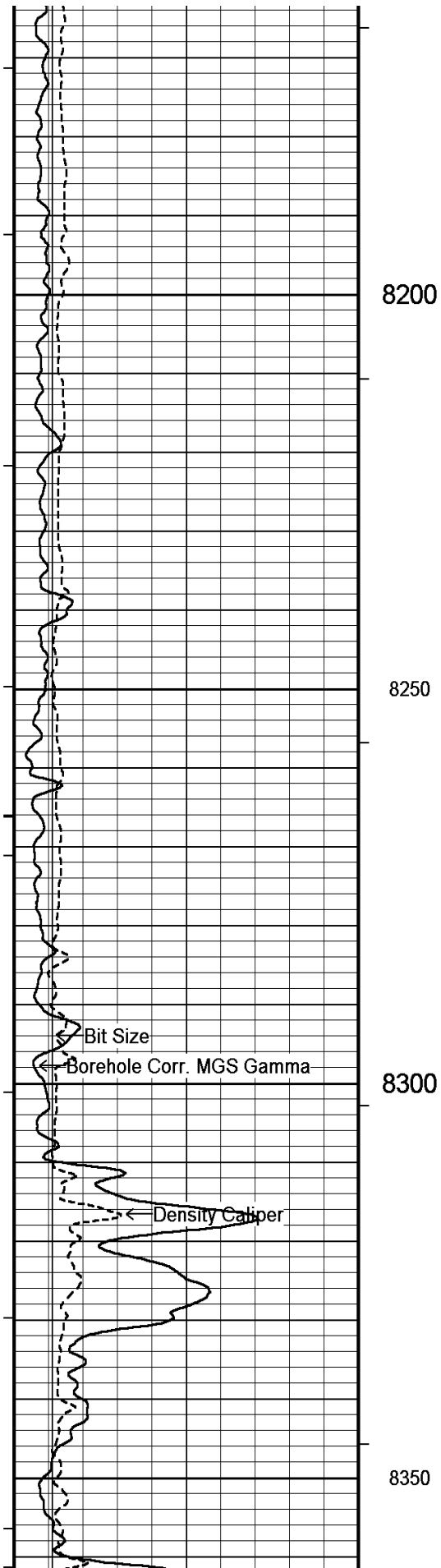
7550

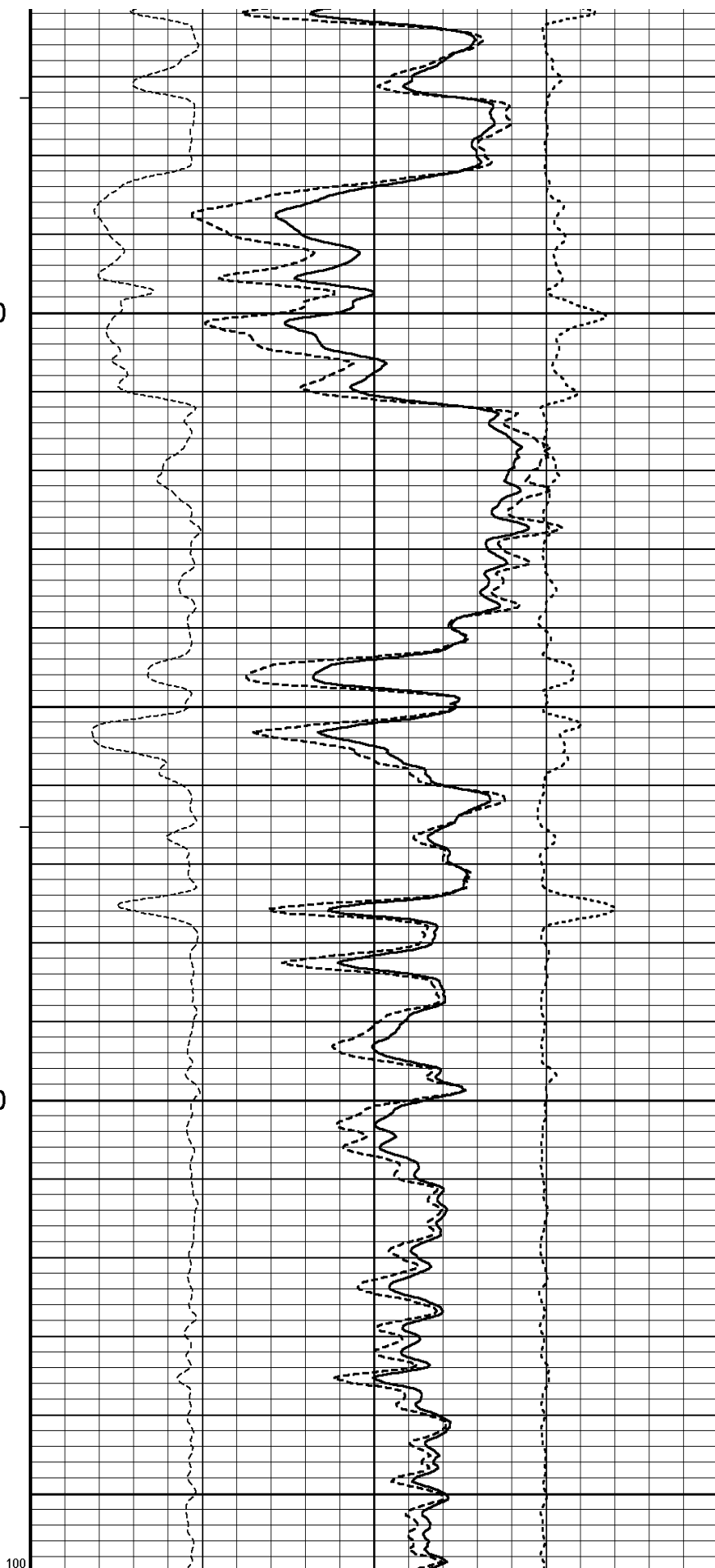
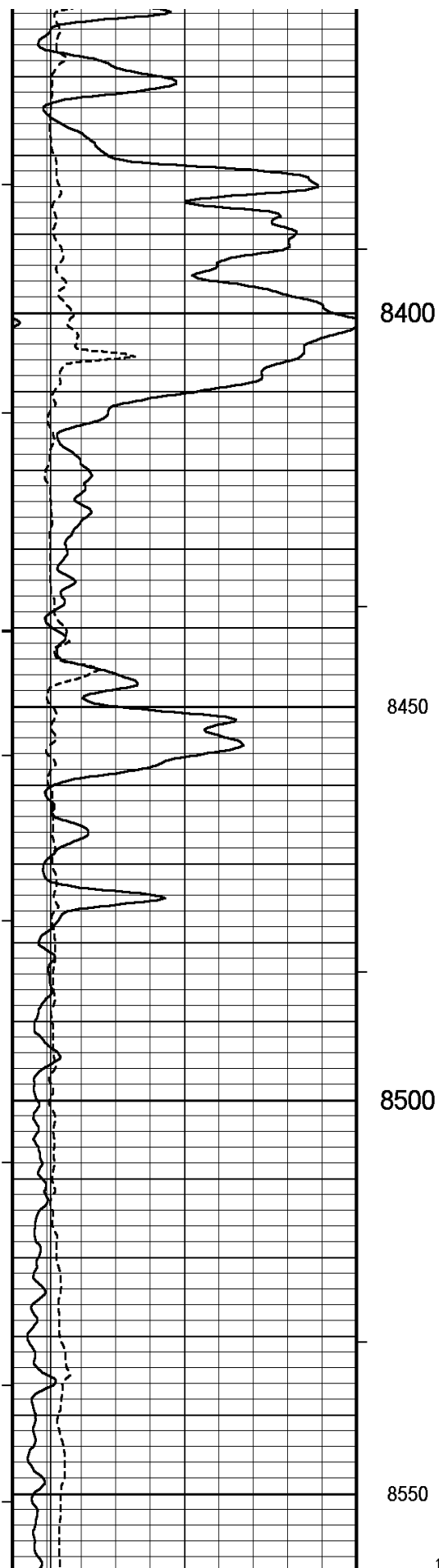


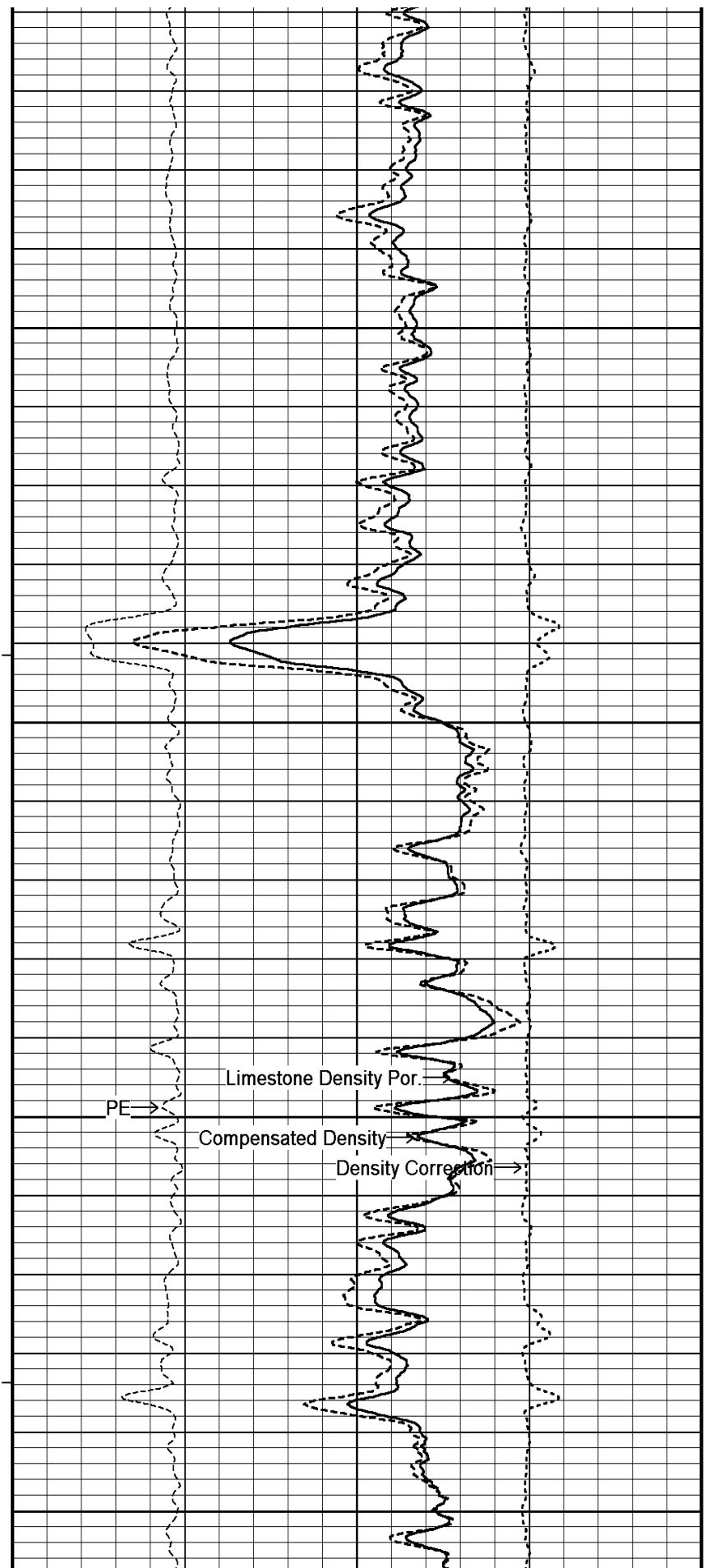
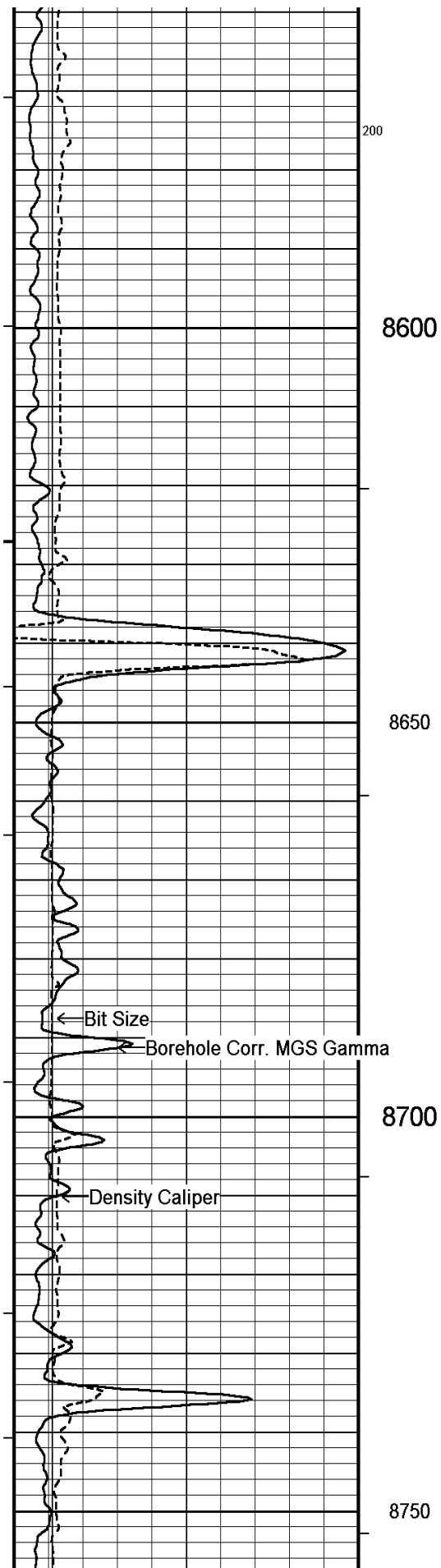


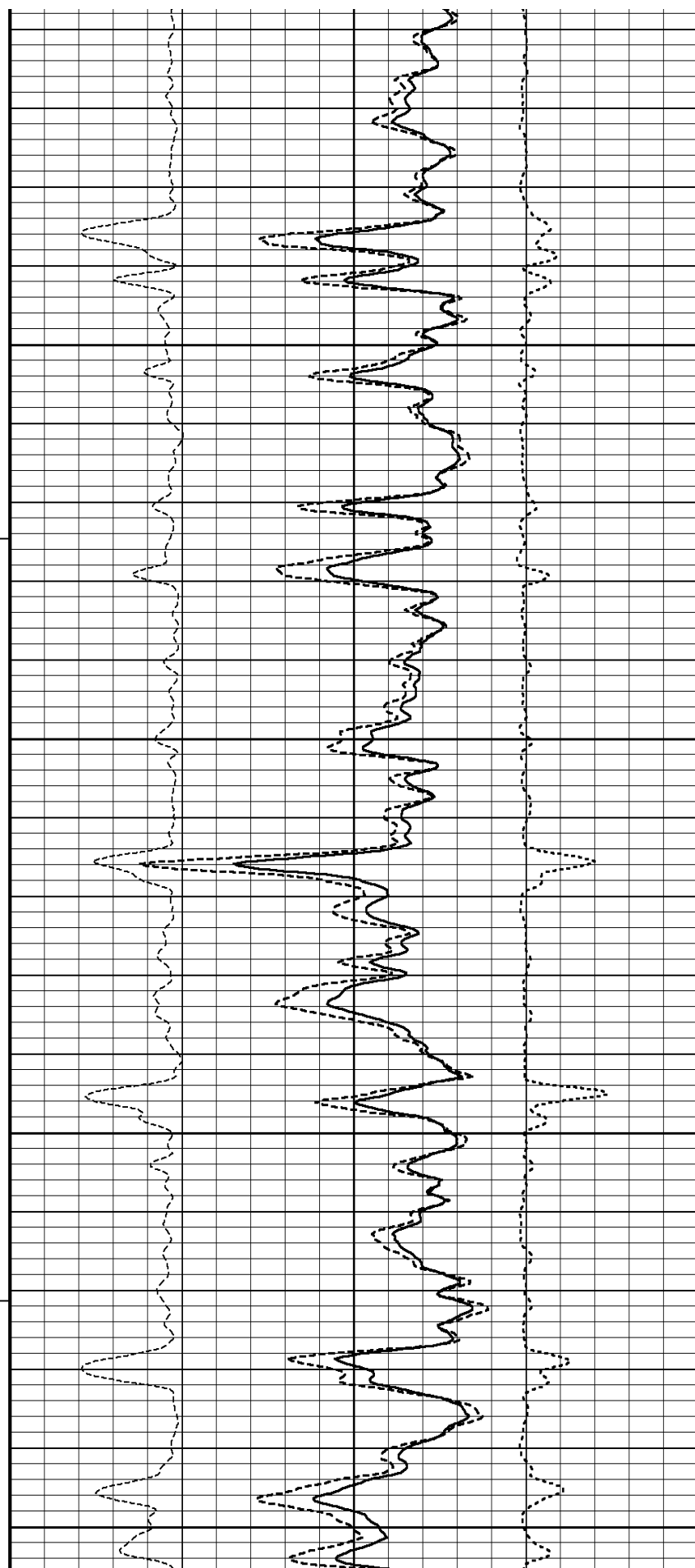
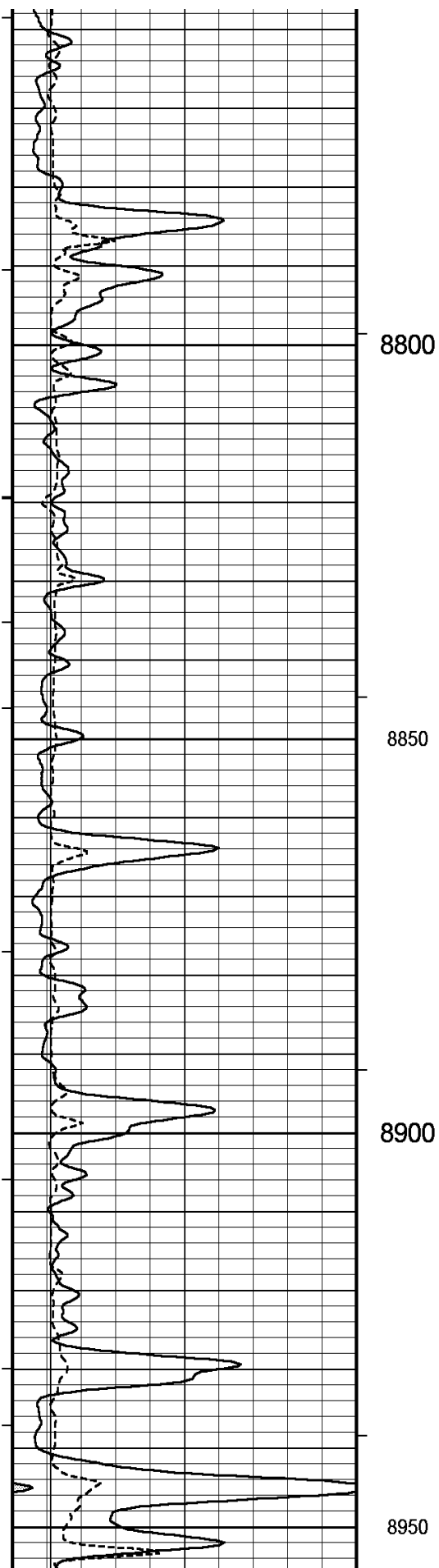


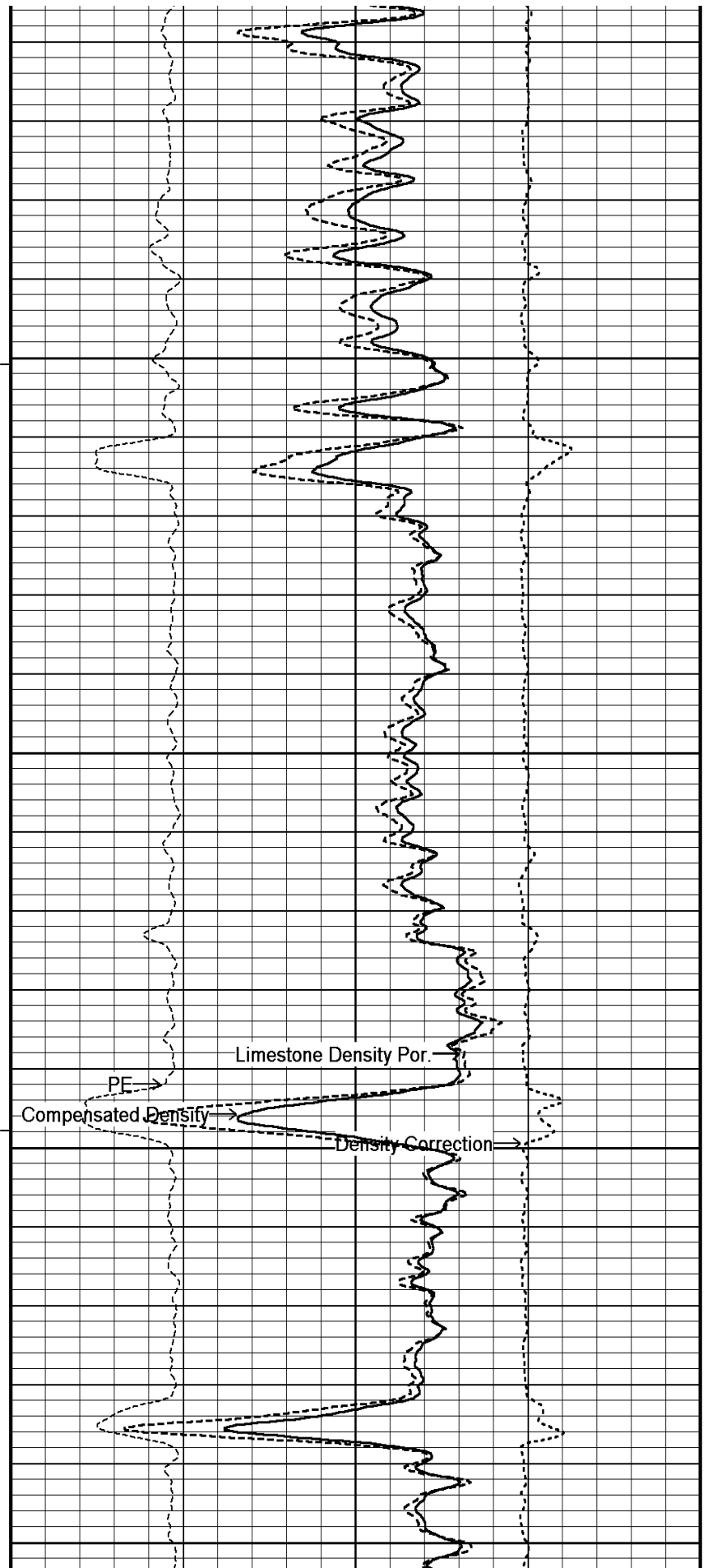
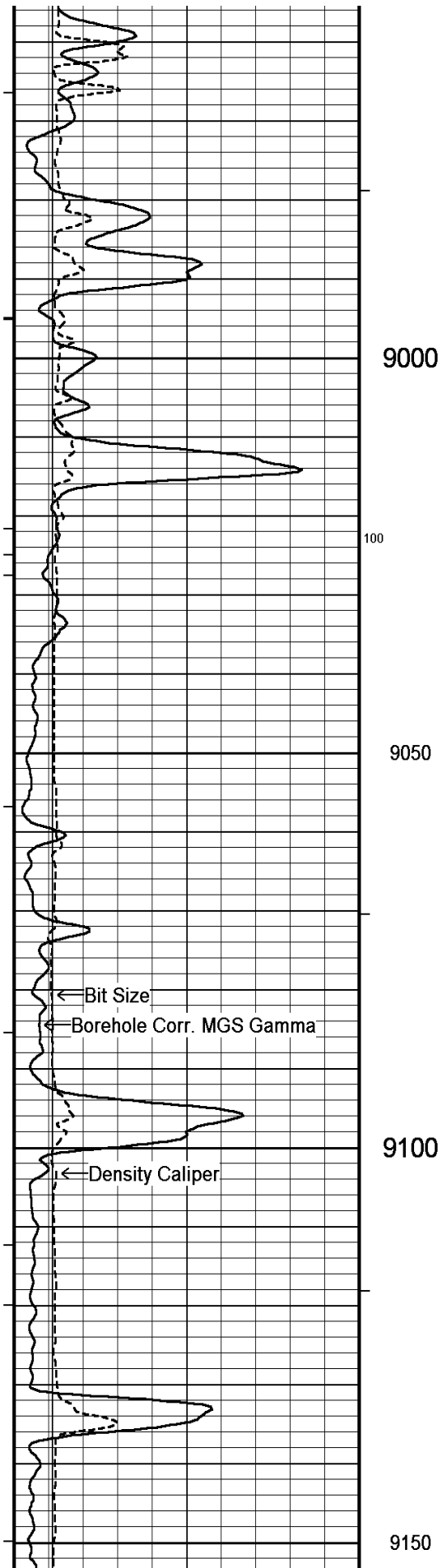


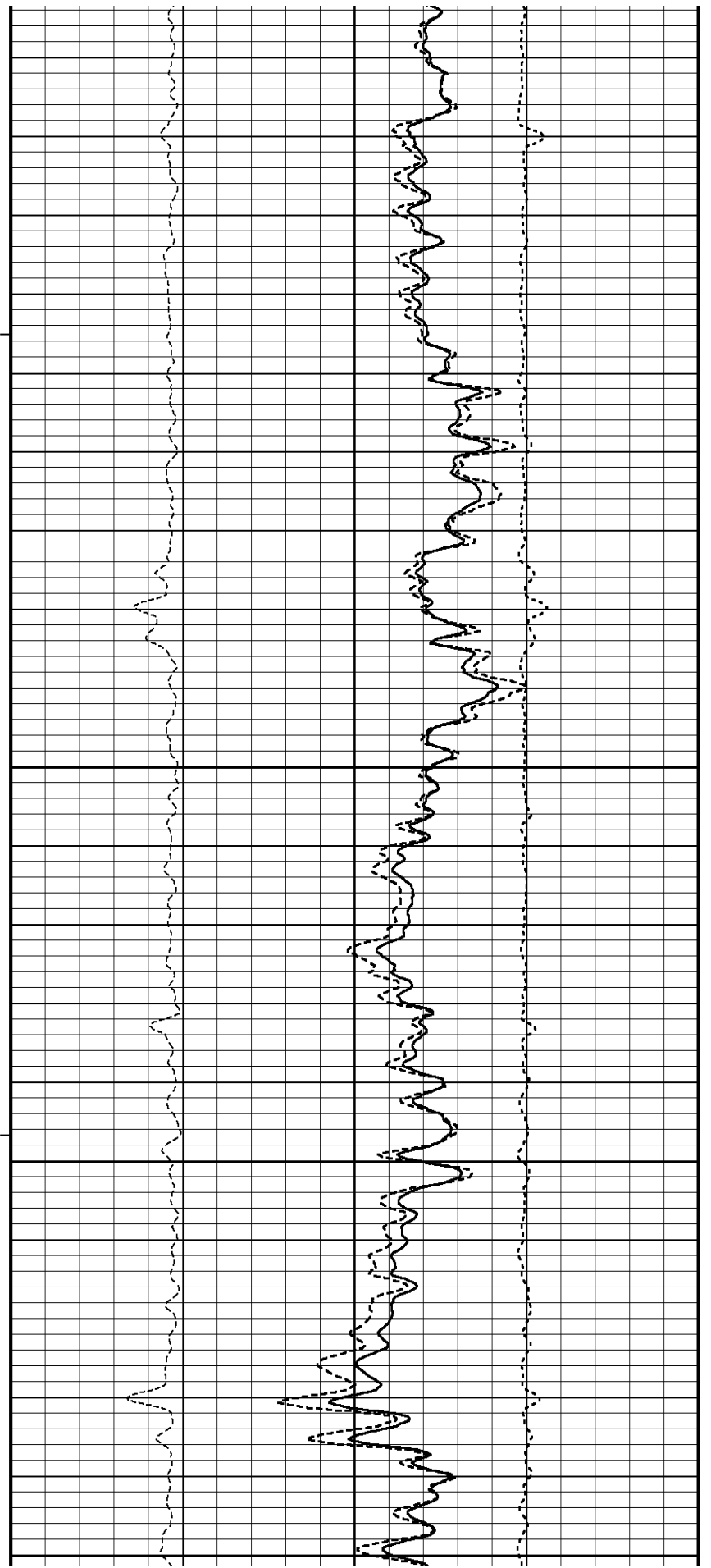
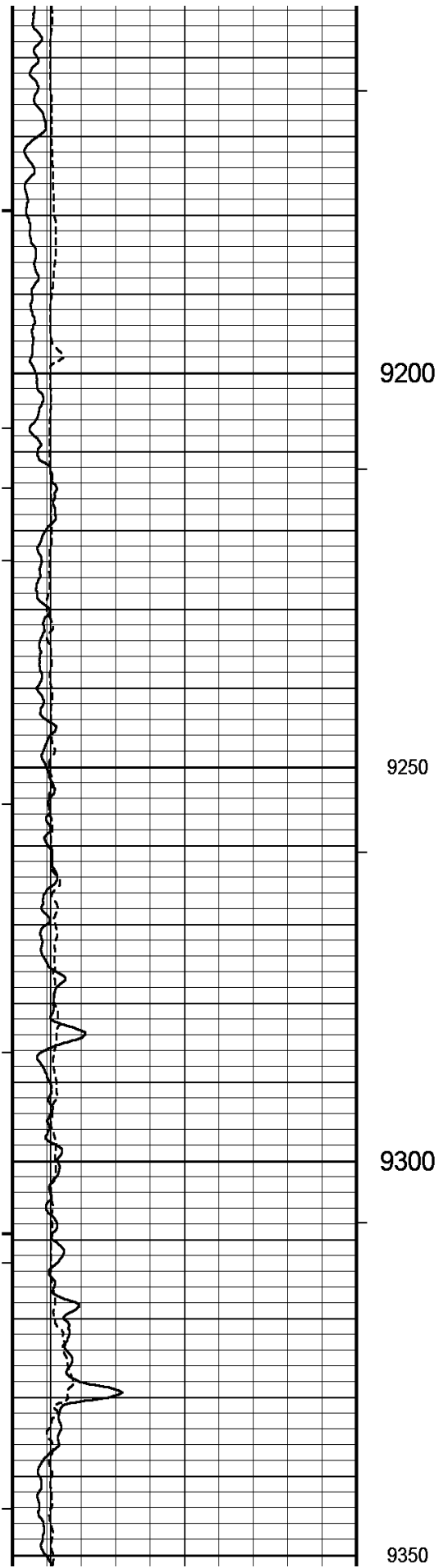


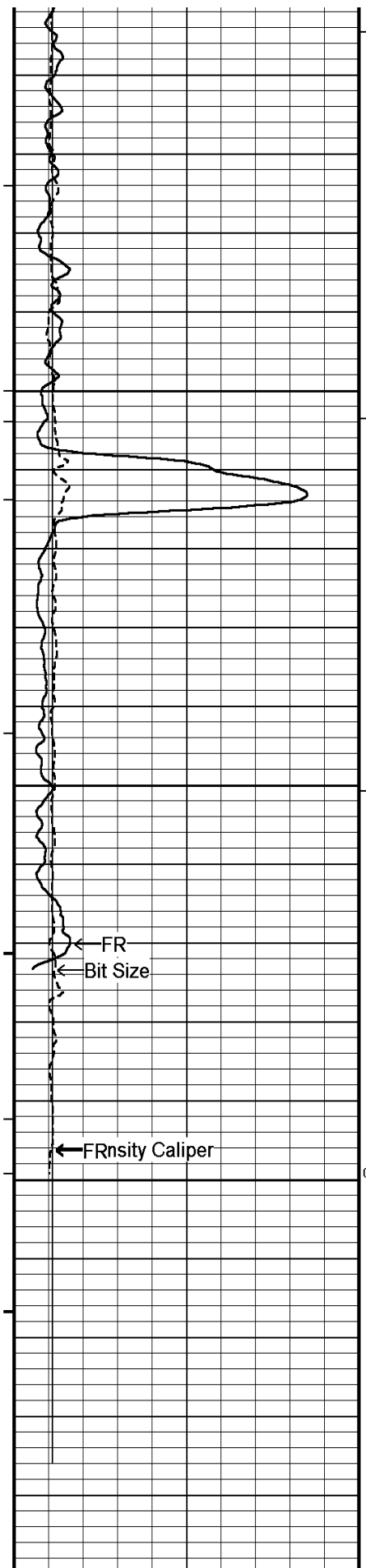












9400

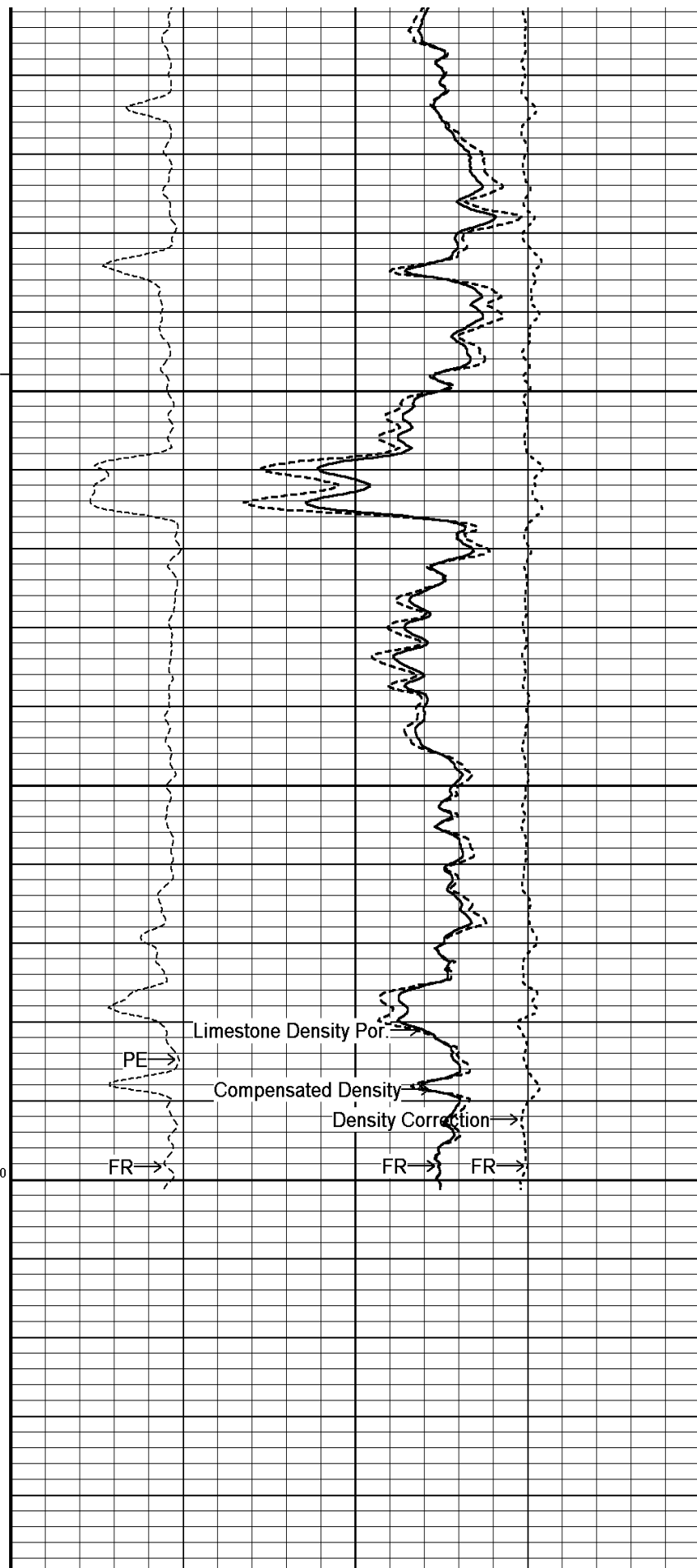
9450

9500

9548

← FR
← Bit Size

← Density Caliper



Limestone Density Por.

Compensated Density

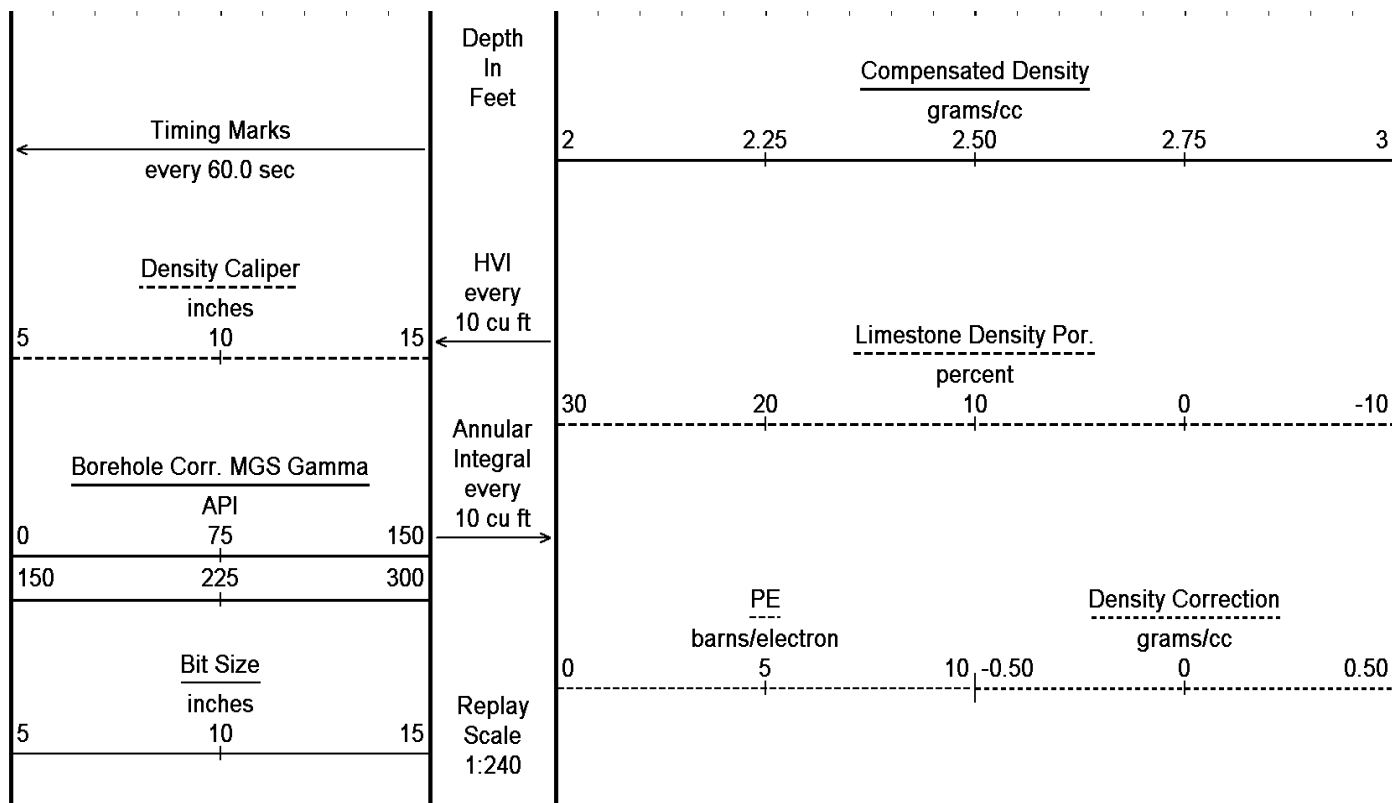
Density Correction

PE →

FR →

FR →

FR →



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 18-MAR-2013 11:38

Filename: C:\logs\Sandridge\Sean 3119 4-18H\Sean 3119 4-18H_MMS DEPTH.dta

Recorded on 18-MAR-2013 09:17

System Versions: Logged with 13.04.8723 Processed with 13.04.8723 Plotted with 13.04.8723

↑ 5 INCH BULK DENSITY LOG DSC ↑

BEFORE SURVEY CALIBRATION

C:\logs\Sandridge\Sean 3119 4-18H\Sean 3119 4-18H_MMS DEPTH.dta

General Constants All 000

Last Edited on 18-MAR-2013,05:00

General Parameters

Mud Resistivity	2.450	ohm-metres
Mud Resistivity Temperature	66.200	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. One Res Rt
RWA Constant A	0.610
RWA Constant M	2.150

Down-hole Tension Calibration SMS 0

Field Calibration on 16-AUG-2012 17:34

Reading No	Measured	
1	15060.53	0.00
2	17539.73	1400.00

Strain Gauge Constants MMS-E.B 160

Last Edited on

Atmospheric Pressure	14.70	psi
Serial Number	0	
Calibration Date	000000000000	
Base Check Date		
Dead Weight Serial Number	0	
Dead Weight Gravitational Correction	1.0	
Temperature	75.0	150.0
Pressure psia	Inc.	Dec.
0.0	0.000	0.000
2000.0	0.000	0.000
4000.0	0.000	0.000
6000.0	0.000	0.000
8000.0	0.000	0.000
10000.0	0.000	0.000

MMS Parameters MMS-E.B 160

Last Edited on 17-MAR-2013 14:50

Logging Parameters

Firmware Version	2v40	
Caliper Open On	MAI	
Caliper Open Delay		minutes
Caliper Closed On	Unknown	
Caliper Closed Delay	N/A	minutes
Sample Rate	0.50	seconds
Use Deep Sleep	No	
Delay Deep Sleep	N/A	
Deep Sleep Wake Time	N/A	minutes
Deep Sleep Wake on Temperature	N/A	
Deep Sleep Wake Temperature	N/A	degrees C
Deep Sleep Wake on Pressure	N/A	
Deep Sleep Wake Pressure	N/A	psi
MMI Pad Pressure	0.0	

Release Parameters

Pulse Duration Base Level	40.0	seconds
Pulse Duration Transition Time	20.0	seconds
Pulse Duration Status Pulse From	40.0	seconds
Pulse Duration Caliper Close From	140.0	seconds
Pulse Duration Caliper Open From	200.0	seconds
Pulse Duration Release Pulse From	280.0	seconds
Pulse Duration Release Pulse To	400.0	seconds
Pulse Release Duration	120.0	seconds
Pulse Discriminator Pressure Band	269.0	seconds
Pulse Pressure Discriminator	607.0	seconds
Use Negative Pulsing	No	
Good Status Reply Open Hole	65535.0	seconds
Good Status Reply Cased Hole	40.0	seconds
Bad Status Reply	100.0	seconds
Status Pulse To	60.0	seconds
Caliper Close To		seconds
Caliper Open To	220.0	seconds

Configuration

MMS,MGS,MDN,MPD,MPD,MFE,MAI

High Resolution Temperature Calibration MGS-C.J 141

Field Calibration on 18-MAR-2013,04:01

	Measured	Calibrated(Deg F)
Lower	10.00	10.00
Upper	50.00	50.00

High Resolution Temperature Constants MGS-C.J 141			Last Edited on 18-MAR-2013,04:00		
Pre-filter Length	11				
Gamma Calibration MGS-C.J 141			Field Calibration on 17-MAR-2013 13:59		
	Measured	Calibrated (API)			
Background	139	102			
Calibrator (Gross)	870	636			
Calibrator (Net)	731	534			
Gamma Constants MGS-C.J 141			Last Edited on 18-MAR-2013,04:00		
Gamma Calibrator Number	GRCC225				
Mud Density	1.03	gm/cc			
Caliper Source for Processing	Density Caliper				
Tool Position	Eccentred				
Concentration of KCl	0.00	kppm			
Neutron Calibration MDN-B.J 430			Base Calibration on 13-MAR-2013 14:27 Field Check on 17-MAR-2013 13:54		
Base Calibration					
	Measured		Calibrated (cps)		
	Near	Far	Near	Far	
	2863	88	3714	110	
Ratio	32.451		33.764		
Field Calibrator at Base			Calibrated (cps)		
			0	0	
Ratio					
Field Check			Calibrated (cps)		
			2347	3465	
Ratio			0.678		
Neutron Constants MDN-B.J 430			Last Edited on 18-MAR-2013,04:00		
Neutron Source Id	P31131B				
Neutron Jig Number	NJ6630				
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	None				
Temperature	N/A	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 314			Base Calibration on 13-MAR-2013 17:21 Field Check on 17-MAR-2013 13:49		
Base Calibration					
	Measured		Calibrated (ohm-m)		
Reference 1	0.0		0.0		
Reference 2	971.4		126.8		
Base Check			278.3		

Field Check		278.1	
FE Constants MFE-B.J 314		Last Edited on 18-MAR-2013,03:58	
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.	MGS External Temperature		
Stand-off	0.5	inches	

High Resolution Temperature Calibration MAI-B.J 376		Field Calibration on 11-OCT-2012,22:38	
	Measured	Calibrated(Deg F)	
Lower	0.00	0.00	
Upper	50.00	50.00	

High Resolution Temperature Constants MAI-B.J 376		Last Edited on	
Pre-filter Length	11		

Induction Calibration MAI-B.J 376		Base Calibration on 22-FEB-2012 08:07			
		Field Check on 17-MAR-2013 13:46			
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	16.4	461.5	9.3	966.2	
2	5.9	377.0	7.6	821.4	
3	3.1	255.4	5.2	566.0	
4	1.7	130.3	2.6	279.2	
Array Temperature		73.8	Deg F		
Channel		Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High	
1	0.0	0.0	13.8	3944.6	
2	0.0	0.0	30.7	3583.4	
3	0.0	0.0	29.8	3102.6	
4	0.0	0.0	20.5	2124.1	
Deep			18.8	2052.3	
Medium			43.1	4062.1	
Shallow			45.0	5259.0	
Array Temperature		0.0	54.2	Deg F	

Induction Constants MAI-B.J 376		Last Edited on 18-MAR-2013,05:01	
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	6.0000		
Stand-off Fin Angle	60.00	degrees	
Stand-off Fin Width	0.5000	inches	
Borehole Corr. Rm Source	Temperature Corr		
Temp. for Rm Corr.	MGS 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
DRM4	0.0000	DRC4	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-C.J 378		Base Calibration on 14-MAR-2013 14:43 Field Calibration on 17-MAR-2013 13:42			
Base Calibration					
Reading No	Measured	Calibrator Size (in)			
1	14752	4.01			
2	22768	5.97			
3	30992	7.96			
4	39120	9.86			
5	48416	11.92			
6	N/A	N/A			
Field Calibration					
	Measured Caliper (in)	Actual Caliper (in)			
	5.97	5.97			
Photo Density Calibration MPD-C.J 378		Base Calibration on 14-MAR-2013,14:32 Field Check on 17-MAR-2013 13:38			
Density Calibration					
Base Calibration		Measured		Calibrated (sdu)	
	Near	Far	Near	Far	
Reference 1	55428	25934	59443	30683	
Reference 2	22287	2417	25113	2508	
Field Check at Base					
	1182.5	1274.0			
Field Check					
	1185.8	1272.3			
PE Calibration					
Base Calibration		Measured		Calibrated	
	WS	WH	Ratio	Ratio	
Background	217	1057			
Reference 1	22725	55230	0.415	0.372	
Reference 2	6229	22151	0.285	0.268	
Field Check at Base					
	217.2	1057.3			
Field Check					
	217.6	1058.9			
Density Constants MPD-C.J 378		Last Edited on 18-MAR-2013,03:59			

Density Source Id	P21136B	
Nylon Calibrator Number	DNCE 652	
Aluminium Calibrator Number	DACD 659	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.03	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)	
2.68	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:\logs\Sandridge\Sean 3119 4-18H\Sean 3119 4-18H_MMS DEPTH.dta

Shuttle Running Tool 3.5")
 SRT-A.A 34 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in

MBS-F.A 200v Compact Battery Sub
 MBS-F.A 123 LG: 17.06 ft WT: 123.5 lb OD: 2.24 in

Compact Memory Sub E.B
 MMS-E.B 160 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

Compact Tool Isolator sub.
 MTI-B.A 64 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in

Compact Short Gamma
 MGS-C.J 141 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator
 MCL-B.J 53 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

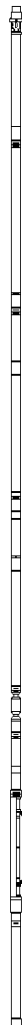
SKJ-E.B Compact Knuckle Joint
 SKJ-E.B 537 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor
 SHA-J.B 597 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
 MIS-D.B 702 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
 MDN-B.J 430 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper



61.76 ft GRGM - MGS Gamma Ray
 59.77 ft GSXT - MGS External Temperature

42.89 ft NPRL - Limestone Neutron Por.
 35.65 ft CLDC - Density Caliper

MPD-C.J 378 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub

MIS-D.B 654 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-J.A Compact Swivel Head Adaptor

SHA-J.A 397 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint

SKJ-E.B 611 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub

MIS-E.B 692 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Focussed Electric

MFE-B.J 314 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

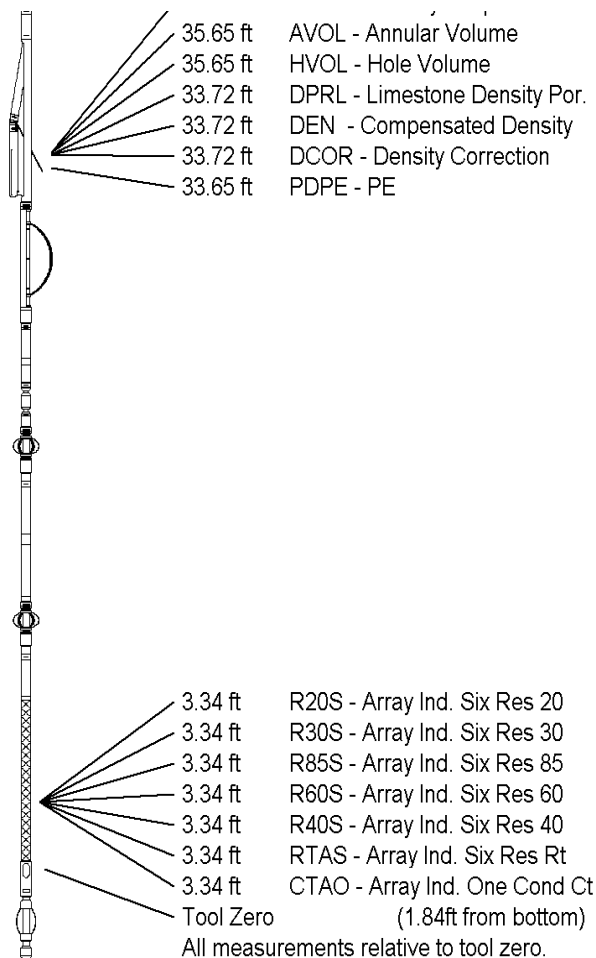
MIS-E.B Compact Inline Standoff sub

MIS-E.B 689 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction

MAI-B.J 376 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 94.81 ft Weight: 690.0 lb



COMPANY SANDRIDGE ENERGY

WELL SEAN 3119 4-18H

FIELD ARLIE

PROVINCE/COUNTY COMANCHE

COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2143.60	feet	First Reading	9500.00	feet
Elevation Drill Floor		feet	Depth Driller	9555.00	feet
Elevation Ground Level	2124.00	feet	Depth Logger	9555.00	feet



Weatherford®

CML MESSENGER SHUTTLE

COMPACT PHOTO DENSITY

COMPENSATED NEUTRON LOG