



Weatherford

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

COMPANY

SANRIDGE ENERGY

WELL

4J RANCH 3408 #1-33H

FIELD

BOUSE

PROVINCE/COUNTY

HARPER

COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

200' FSL & 1980' FEL

SEC

TWP

33

34S

8W

Other Services

MAI

API Number

15-077-21906

Permit Number

Permanent Datum G.L., Elevation 1246 feet

Log Measured From KB

Drilling Measured From K.B. @ 16 FEET

Date

28-FEB-2013

Run Number

ONE

Service Order

3539542

Depth Driller

9138.00

Depth Logger

9138.00

First Reading

9076.00

Last Reading

2500.00

Casing Driller

5242.00

Casing Logger

5242.00

Bit Size

6.125

Hole Fluid Type

WBM

Density / Viscosity

8.40 lb/USg

PH / Fluid Loss

9.60

Sample Source

FLOWLINE

Rm @ Measured Temp

0.87 @ 71.0

Rmf @ Measured Temp

0.70 @ 71.0

Rmc @ Measured Temp

1.04 @ 71.0

Source Rmf / Rmc

CALC

Rm @ BHT

0.51 @ 122.0

Time Since Circulation

1 HOUR

Max Recorded Temp

122.00

Equipment / Base

18077

Recorded By

STEVEN TOTTEY

Witnessed By

JUSTIN LYNCH

Elevations:
KB 1262.00
DF 1262.00
GL 1246.00

BOREHOLE RECORD

Last Edited: 01-MAR-2013 03:34

Bit Size
inches

8.750

6.125

Depth From
feet

0.00

5242.00

Depth To
feet

5242.00

9138.00

CASING RECORD

Type

Size
inches

7.000

Depth From
feet

0.00

Shoe Depth
feet

5242.00

Weight
pounds/ft

23.00

REMARKS

LOGGED WITH WLS 13.04.8492

LOGGED USING MESSENGER SHUTTLE METHOD OF DEPLOYMENT

TOOLS RAN: SRT-69,,200V MBS-114,MMSE133,MTI-076, MGS-142,MCL-063,SKJ-472,SHA-438,MIS-608, MDN-391, MPD-394,MIS-607, SHA-167, SKJ-479,, MAI-170 RAN IN COMBINATION

HARDWARE: MAI: MIS-B 0.5" STANDOFF USED ABOVE MAI, ISA STAND-OFF RAN BELOW MAI

MFE: MIS-B 0.5" STANDOFF USED ABOVE MFE

MDN: MIS-A DOUBLE BOWSPRING USED ABOVE MDN.

MPD: 4INCH PROFILE PLATE USED, MIS-A SINGLE BOWSPRING USED BELOW MPD

2.71 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST

DRILL PIPE DEPTH DURING DEPLOYMENT: 9029

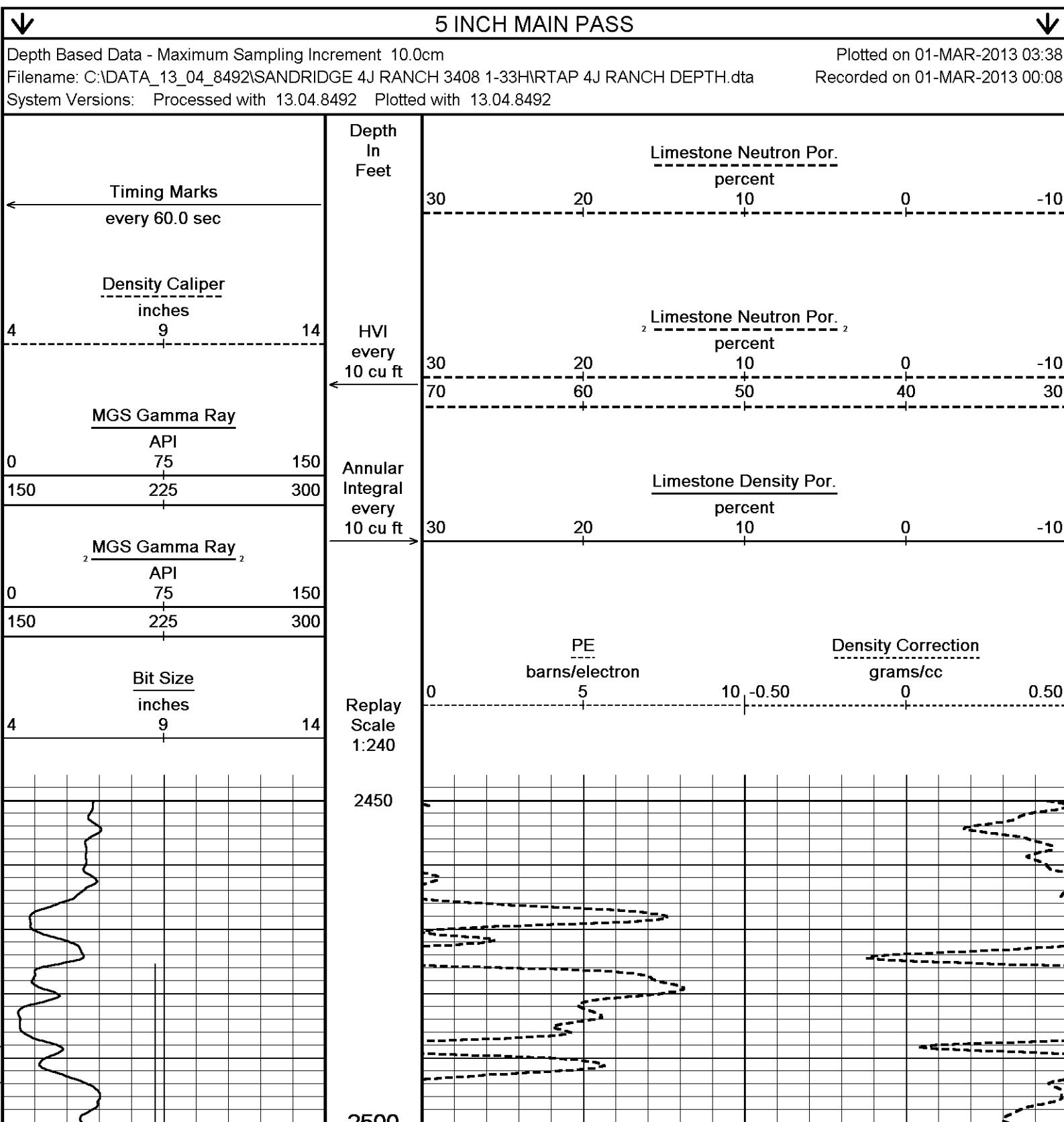
DRILL FILE DEPTH BORING DEPARTMENT: 5025
LOGGING TOOL DEPTH AFTER DEPLOYMENT: 9112

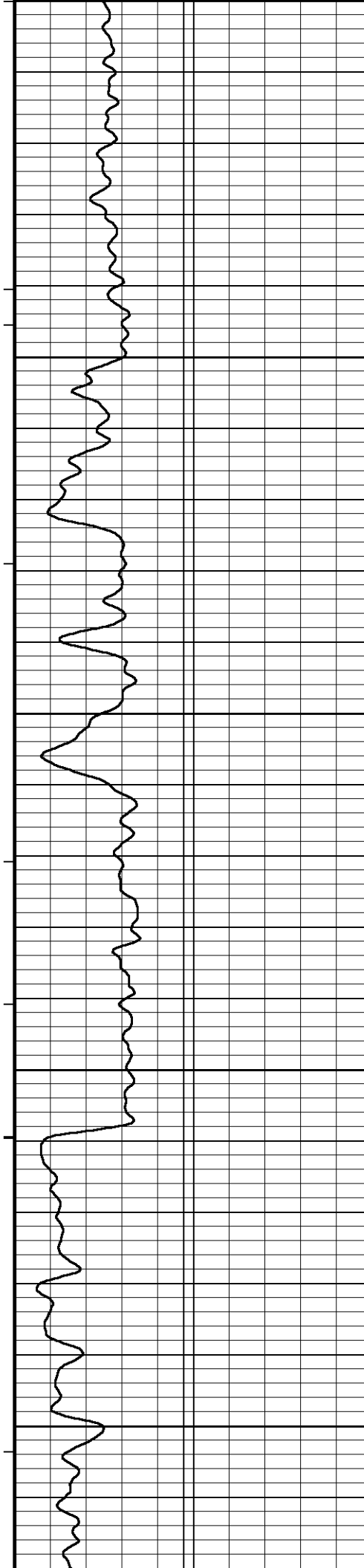
OPERATORS: SHAWN WORLEY AND DREW TURNER

RIG: UNIT #9

LOG RESPONSES EFFECTED BY HOLE RUGOSITY

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.





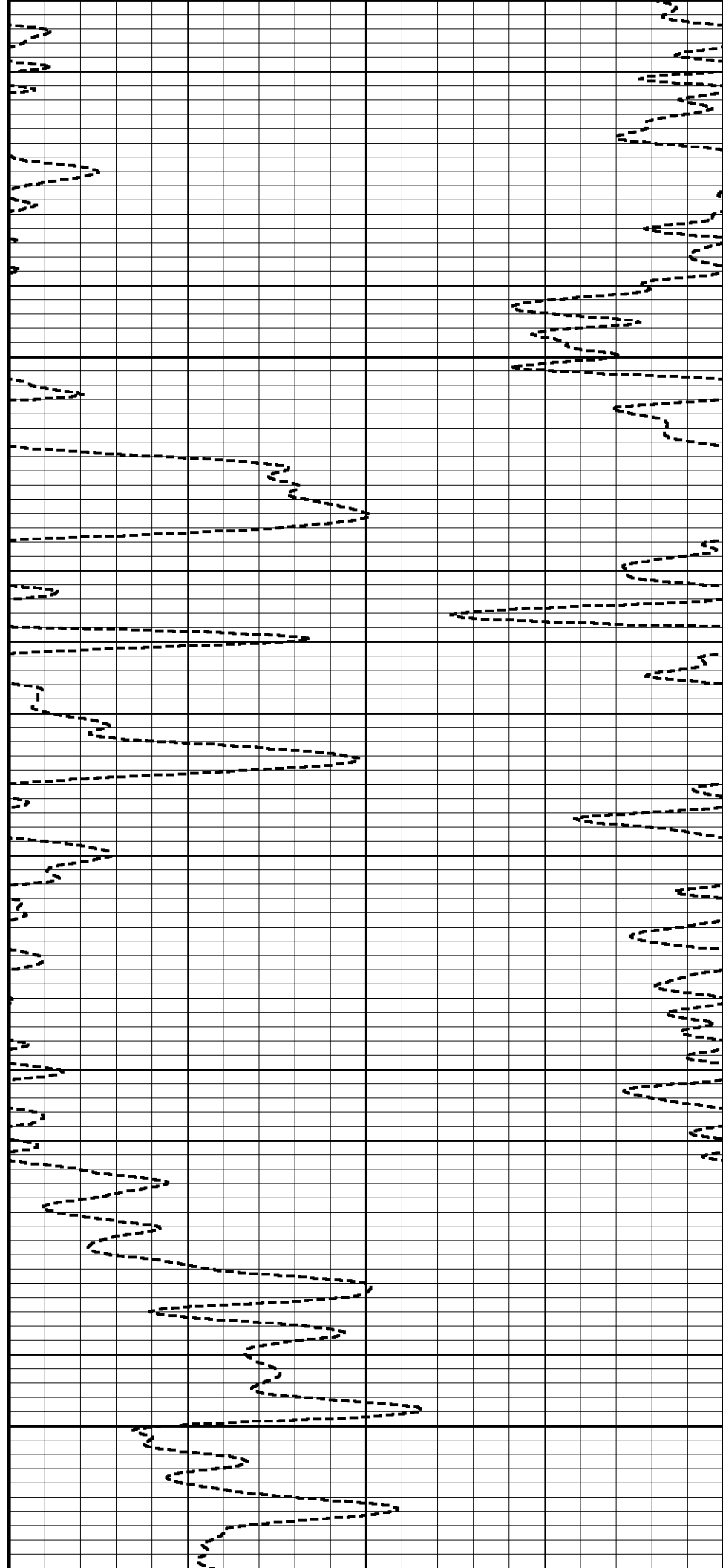
2500

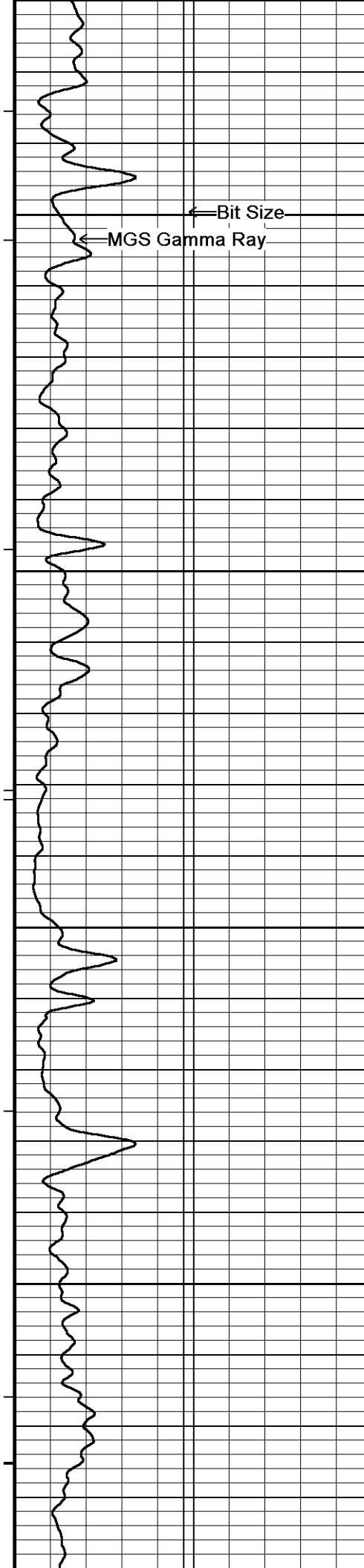
2550

2600

2650

2700





2750

2800

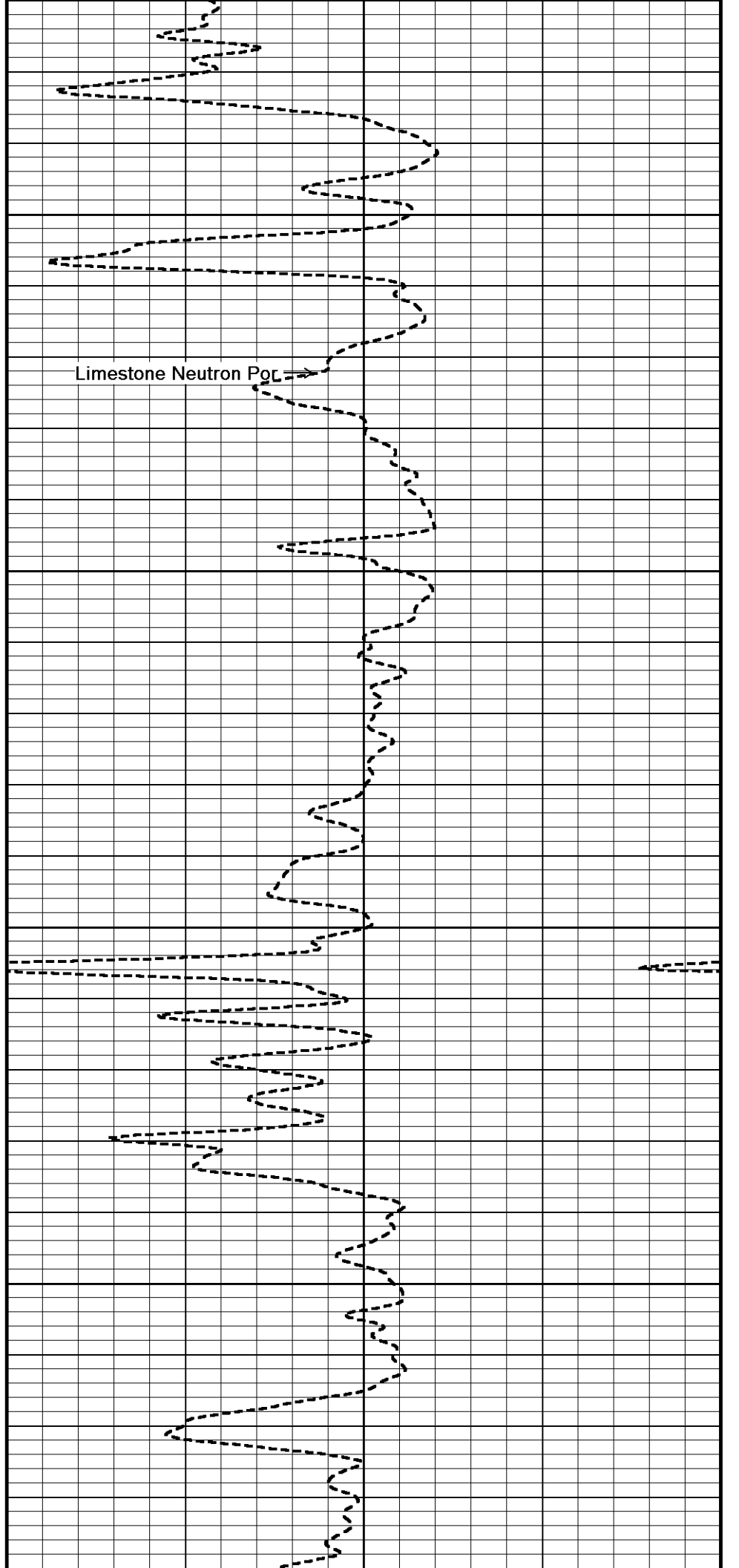
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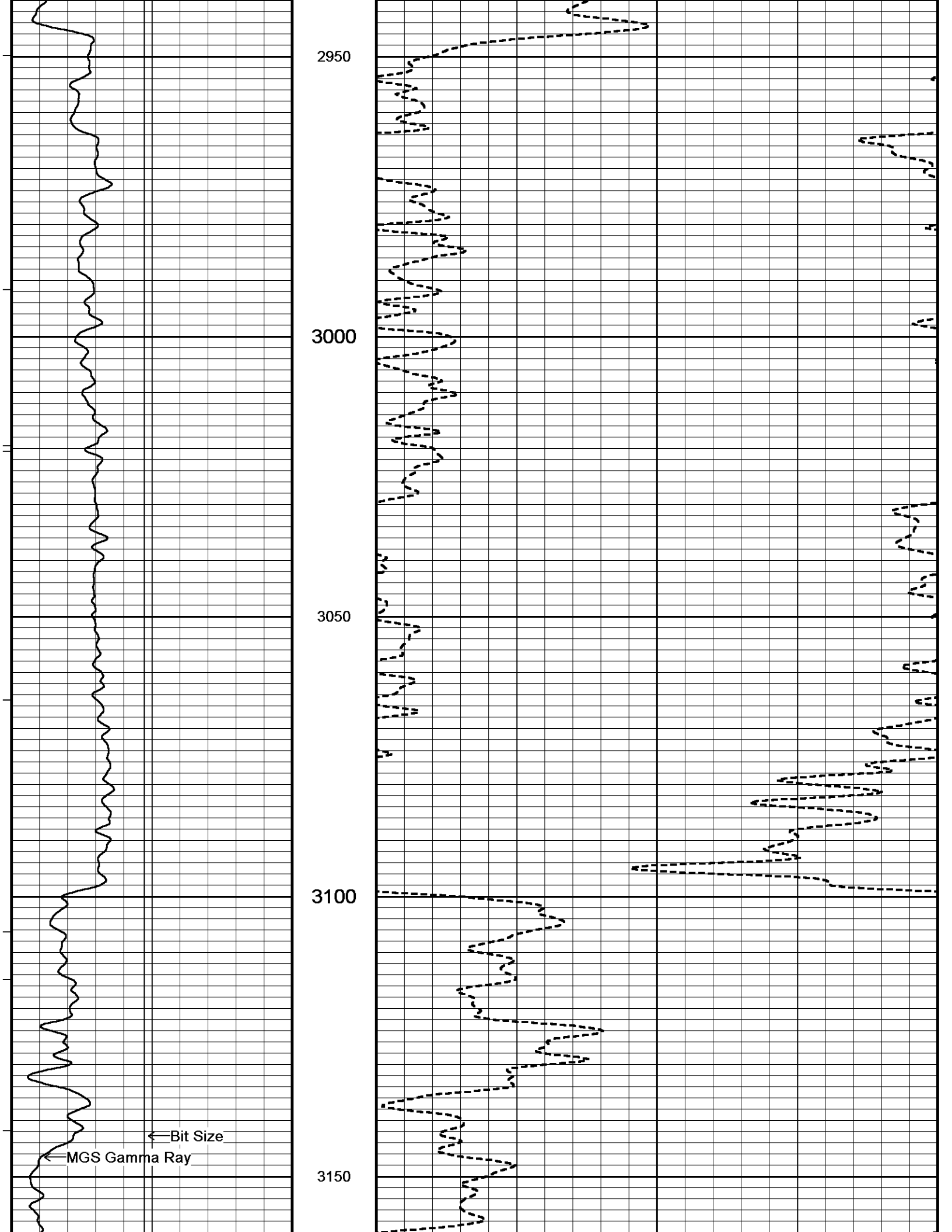
2900

← Bit Size

← MGS Gamma Ray

Limestone Neutron Pgr. →





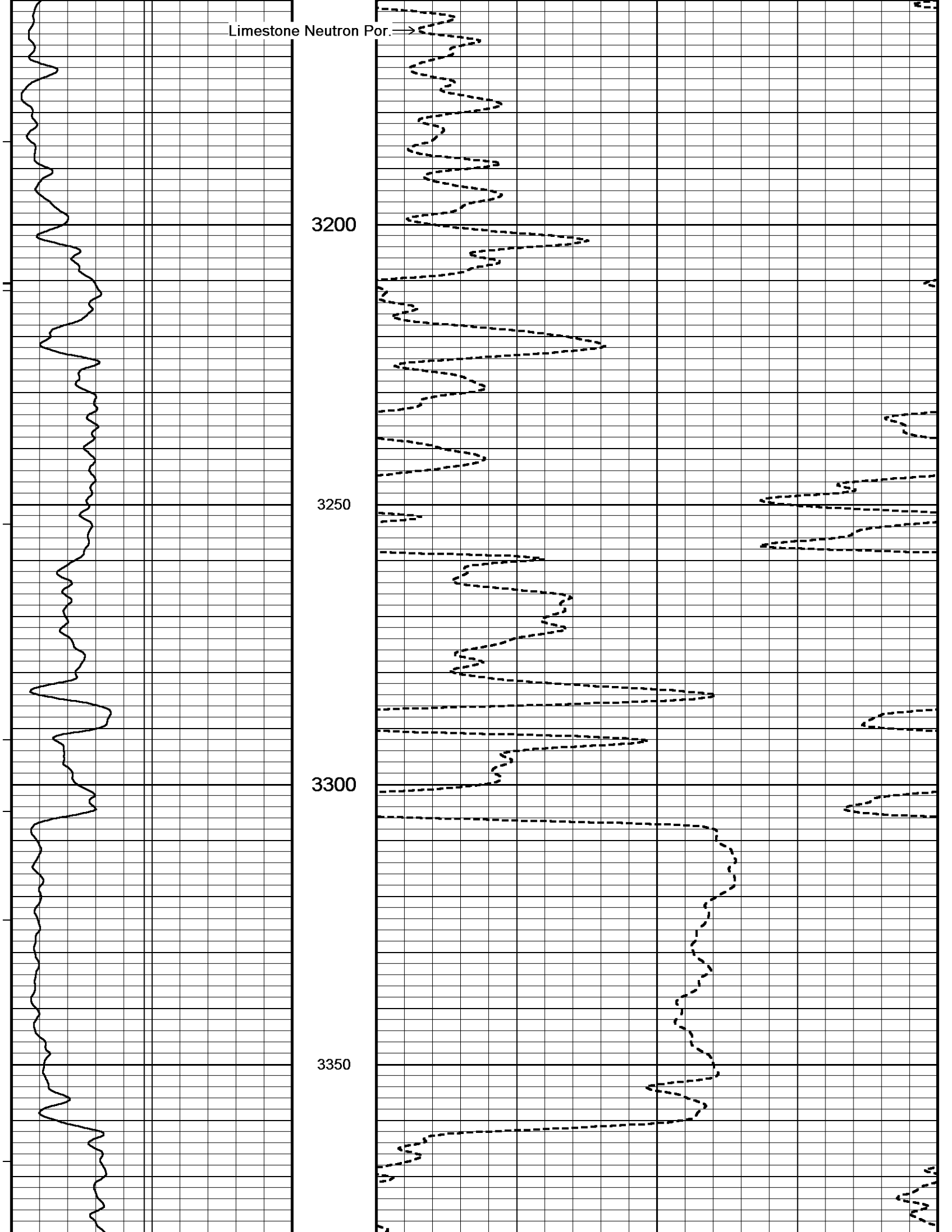
Limestone Neutron Por. →

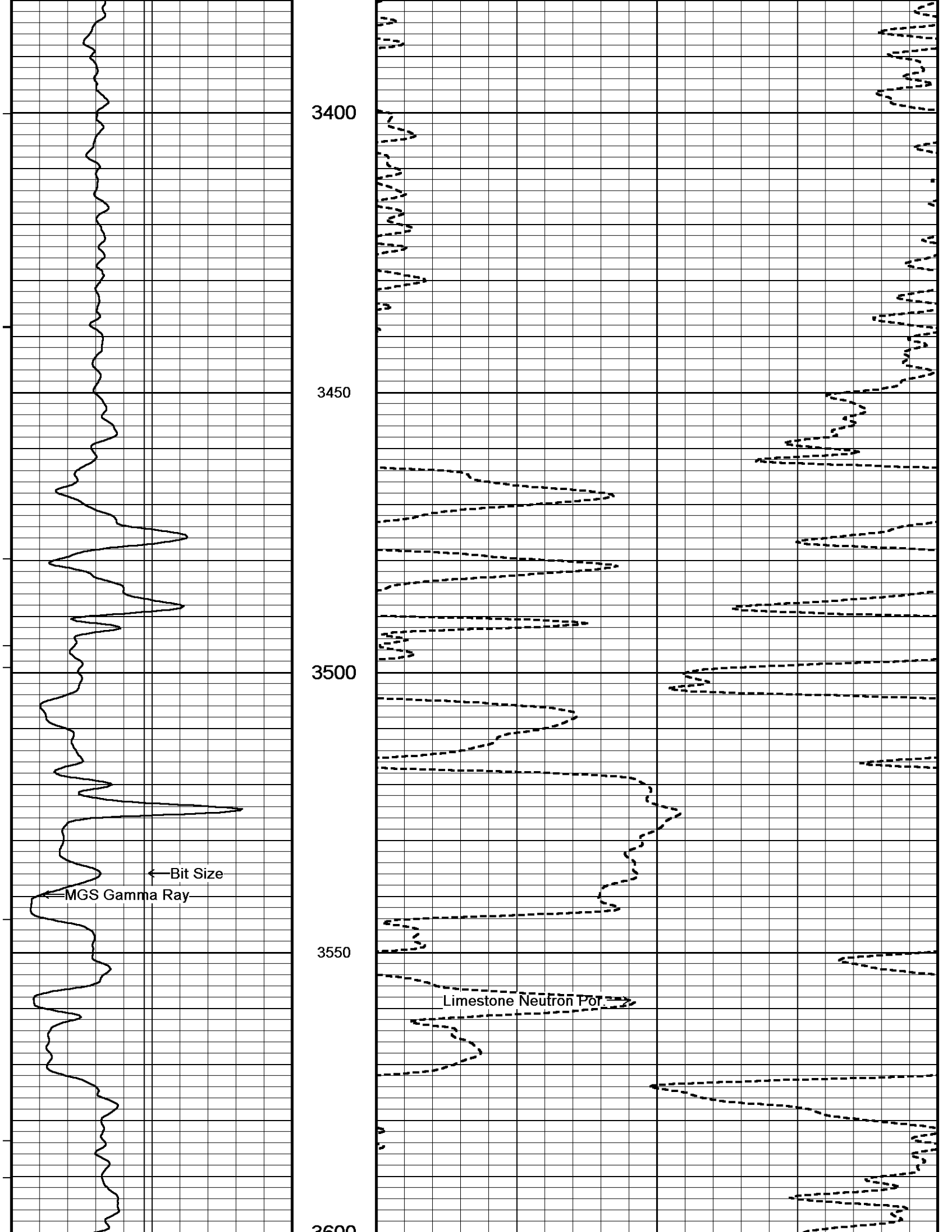
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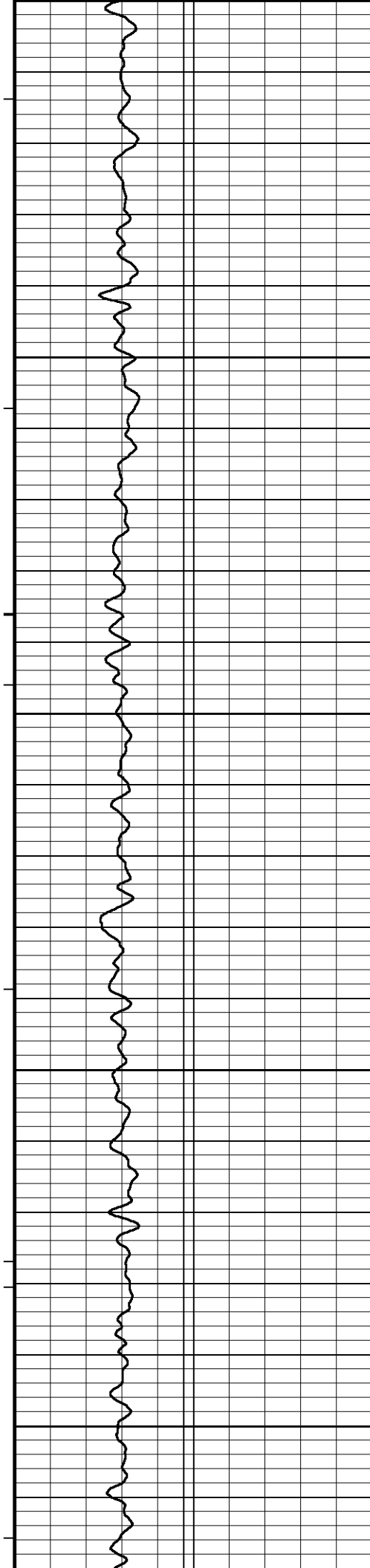
3250

3300

3350







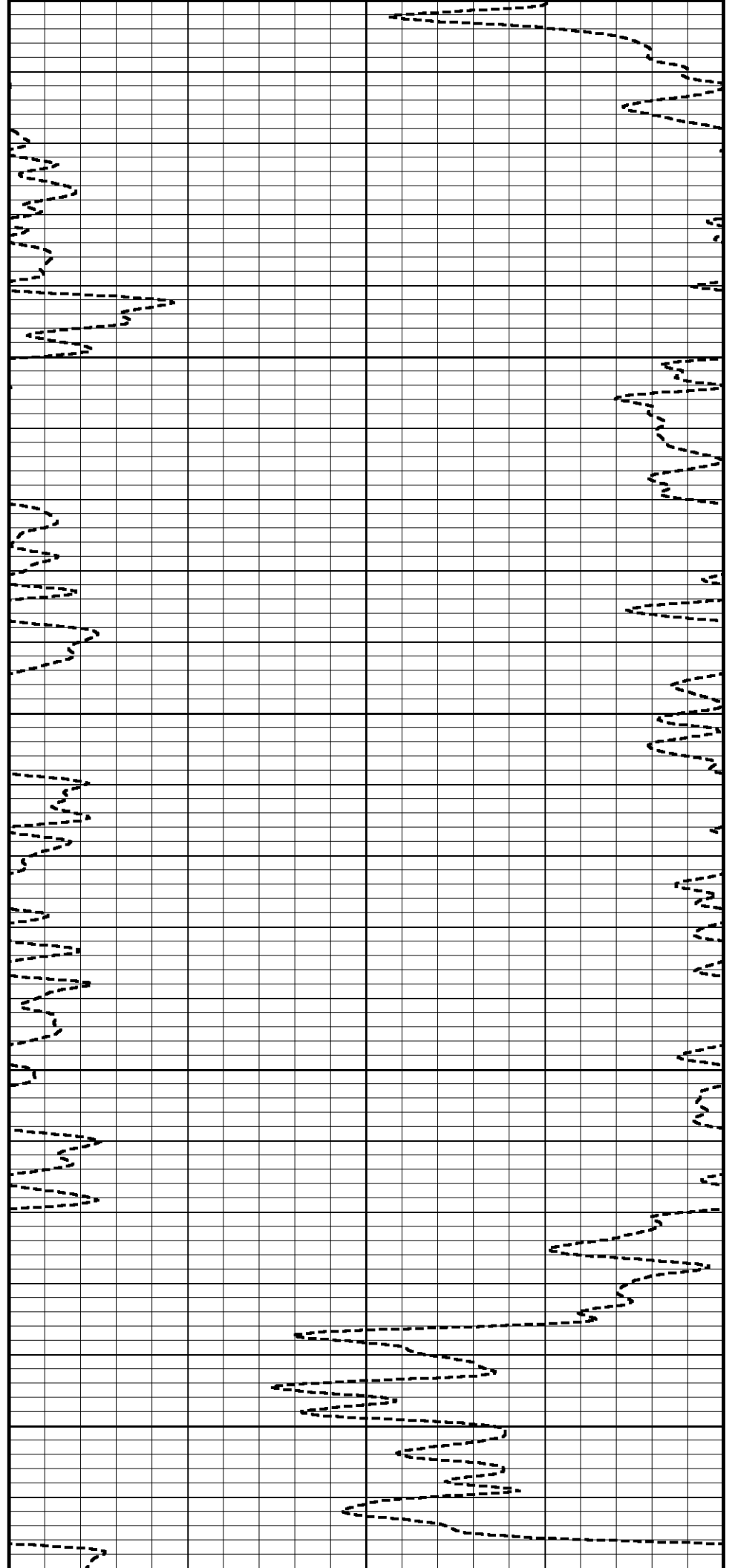
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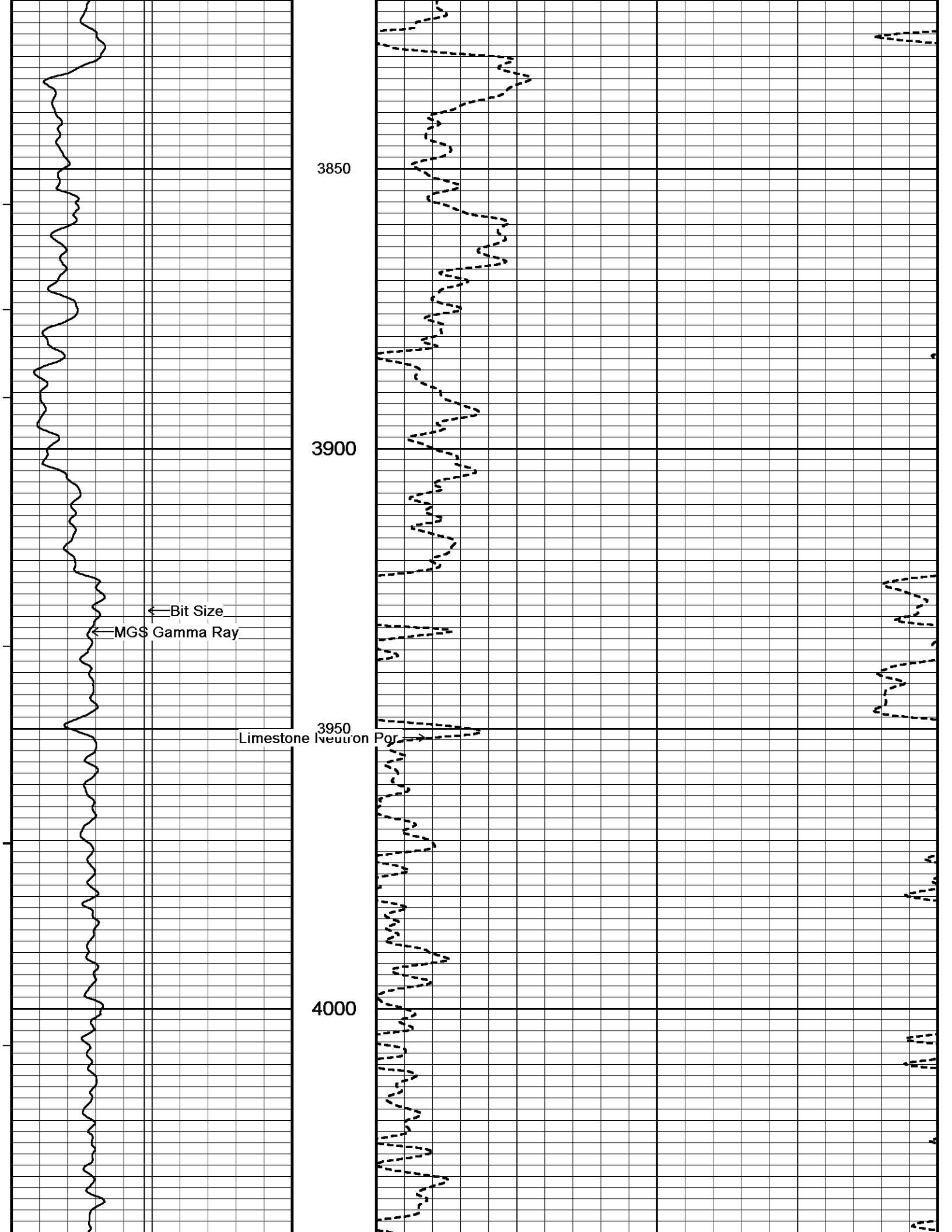
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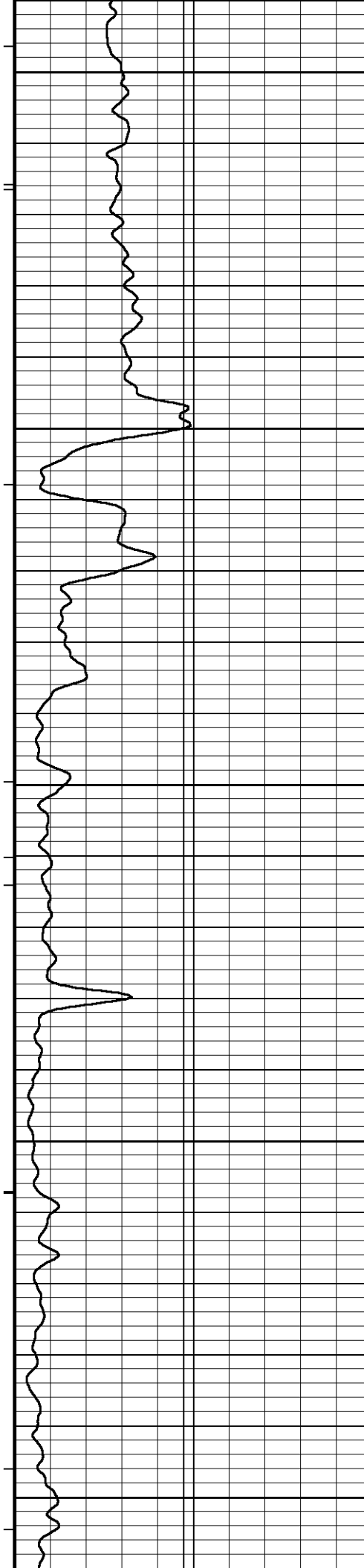
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3750

3800







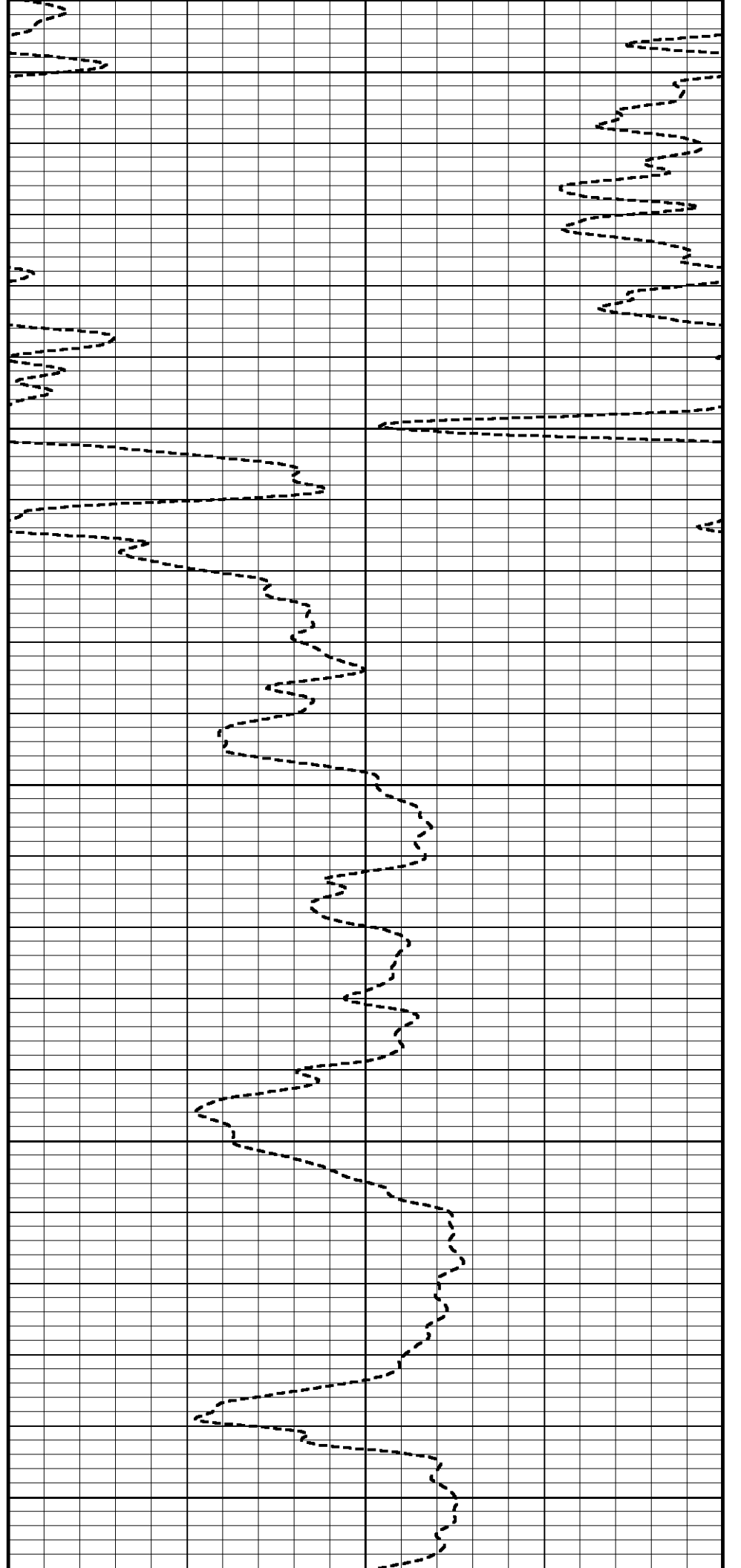
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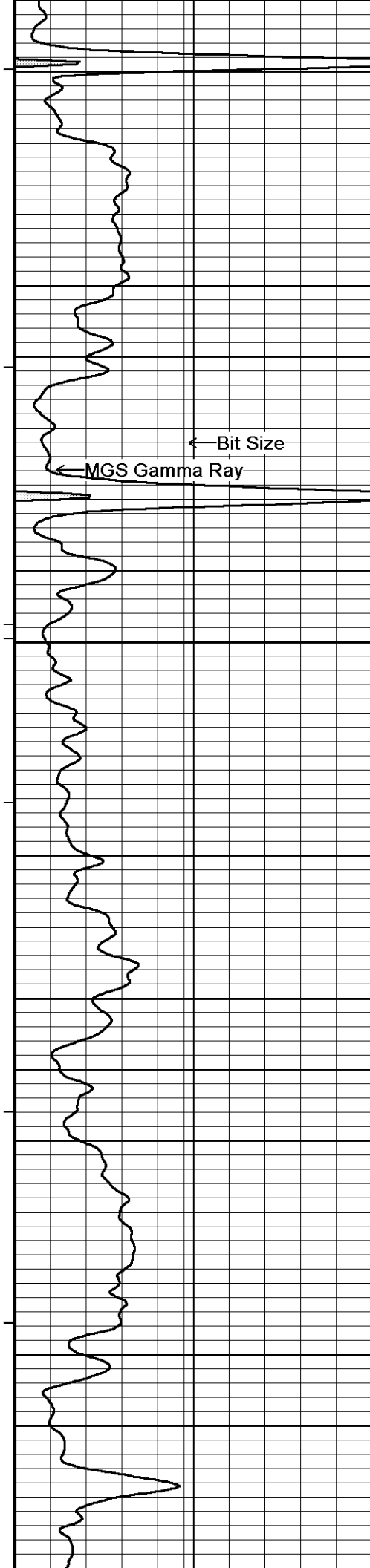
4100

4150

4200

4250



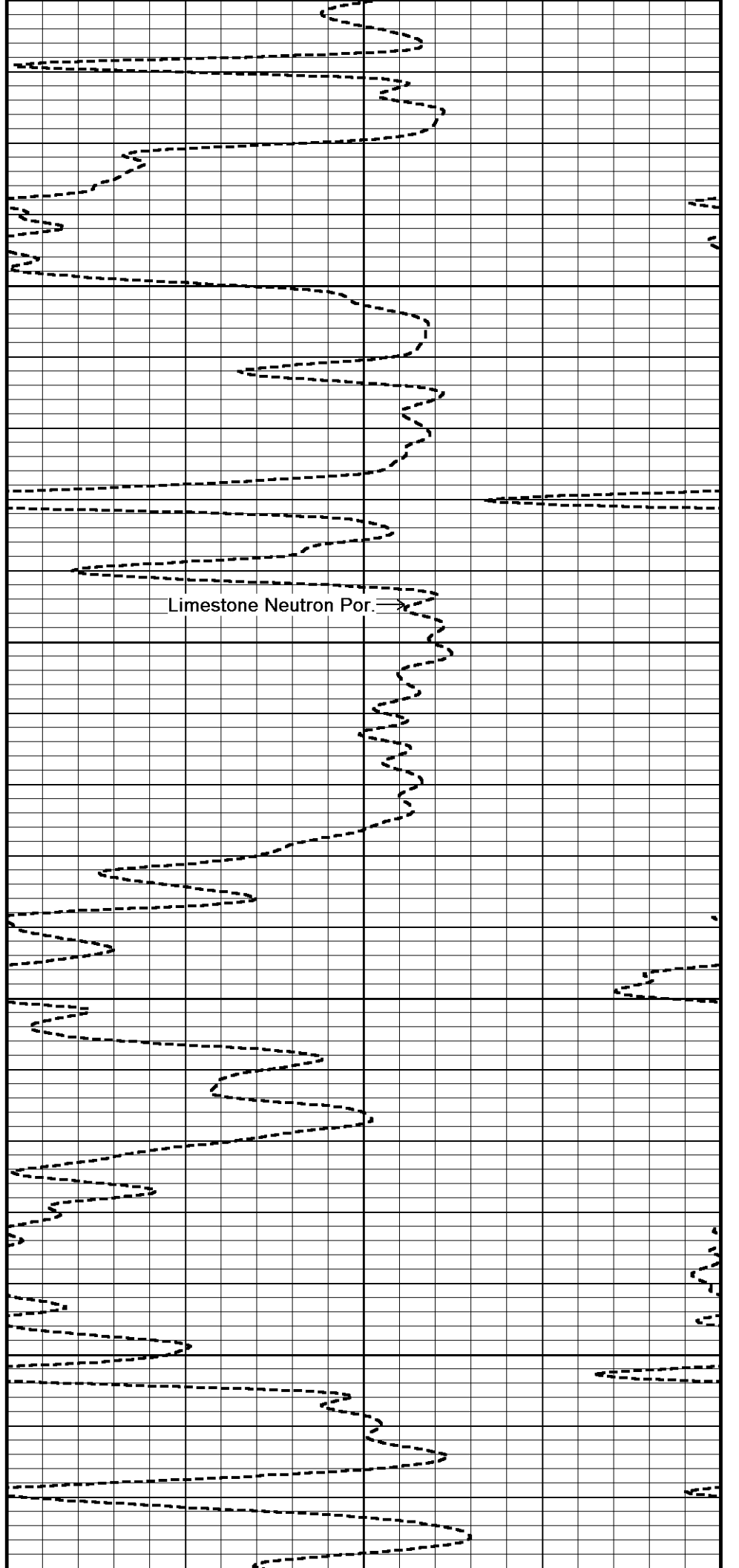


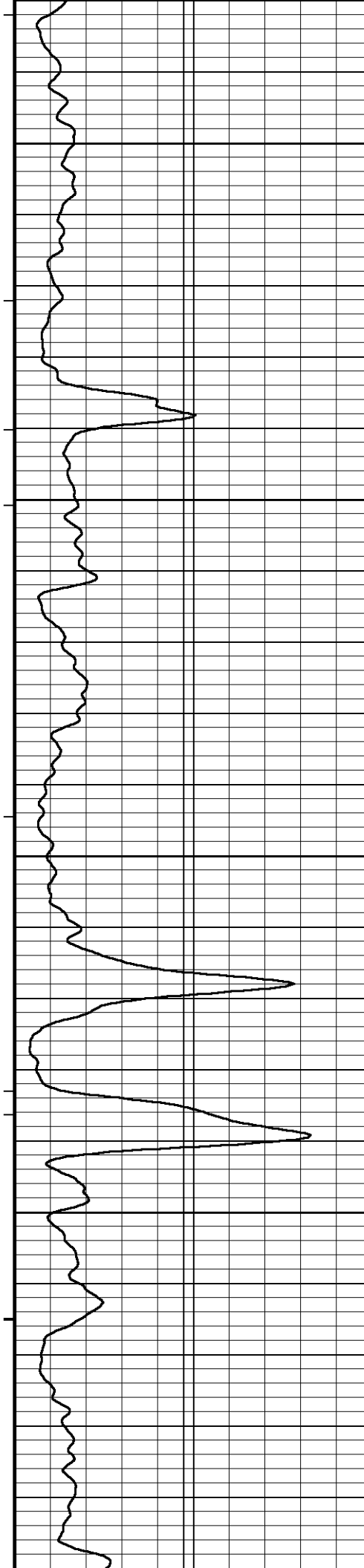
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4350

4400

4450





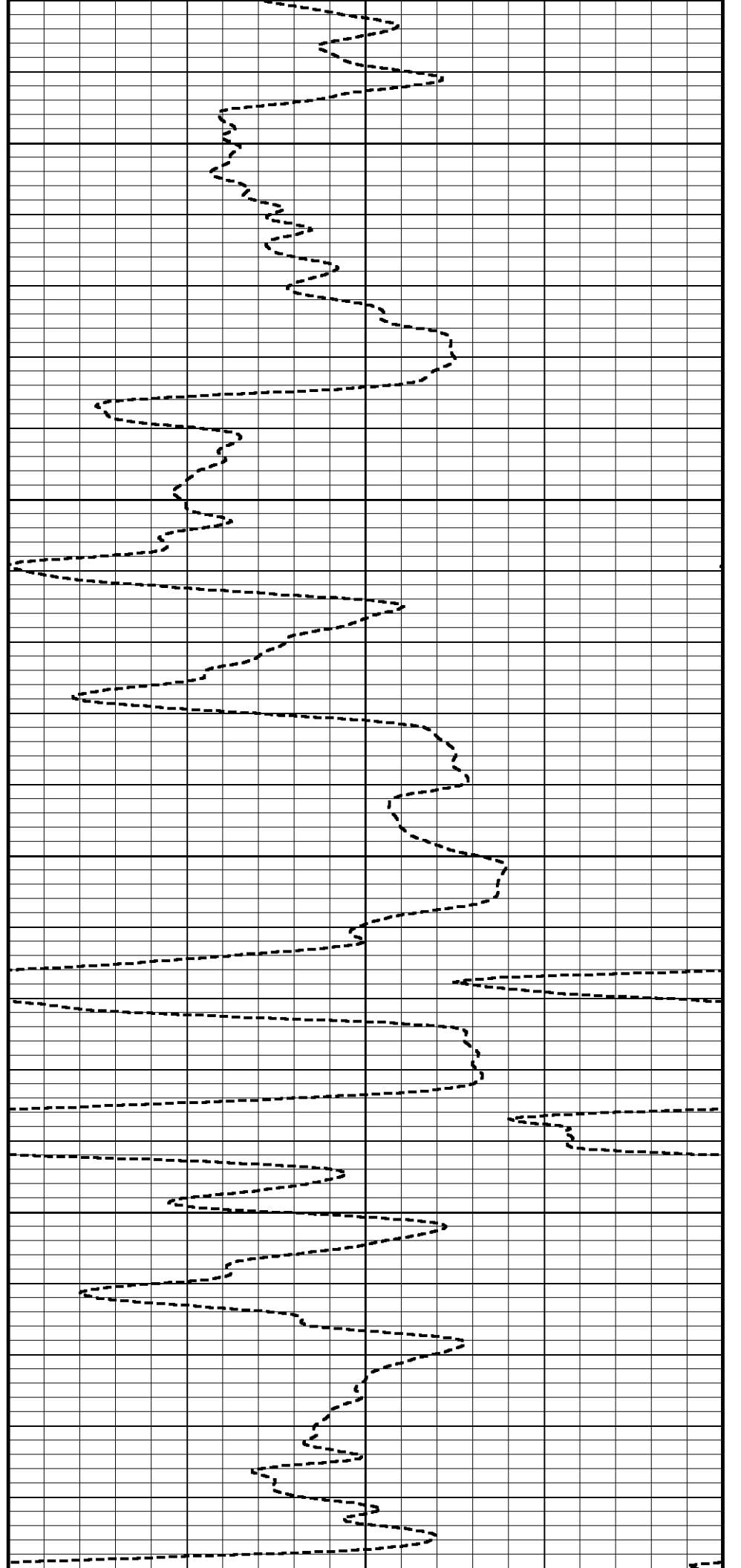
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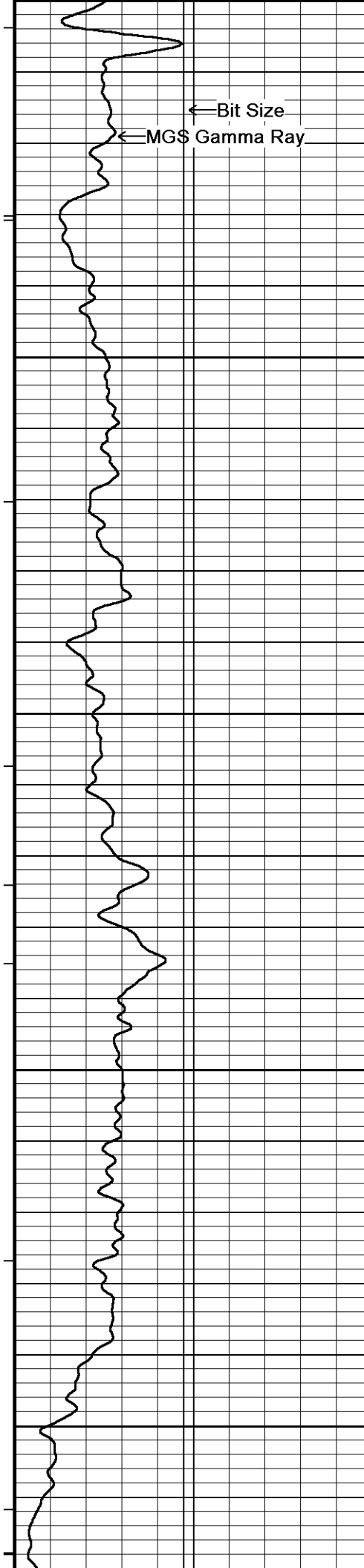
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4600

4650

4700





4700

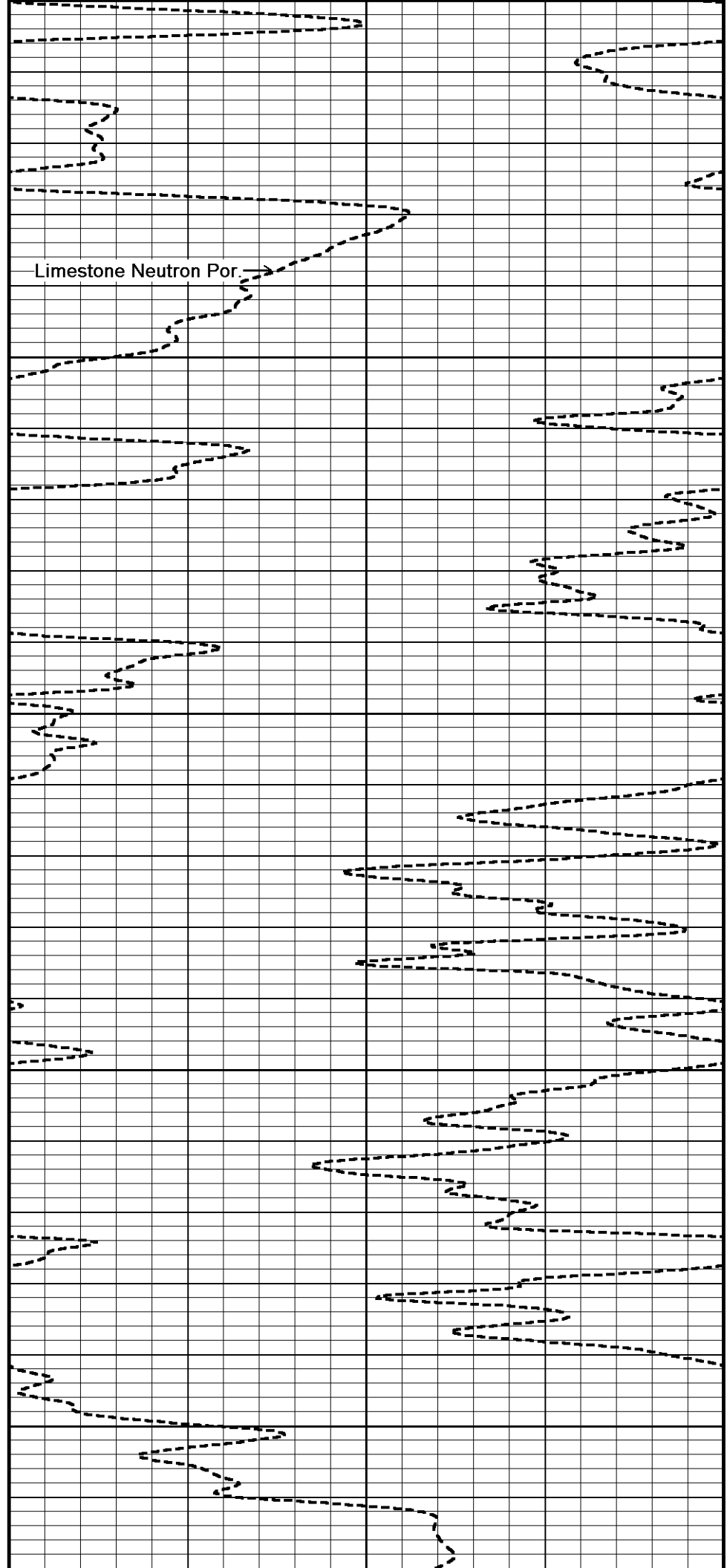
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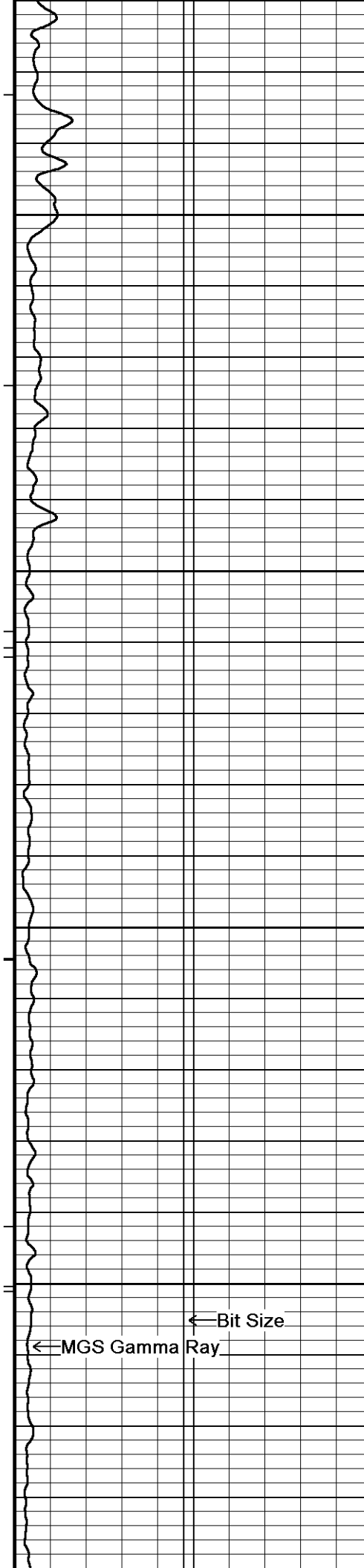
4800

4850

4900

Limestone Neutron Por →





4950

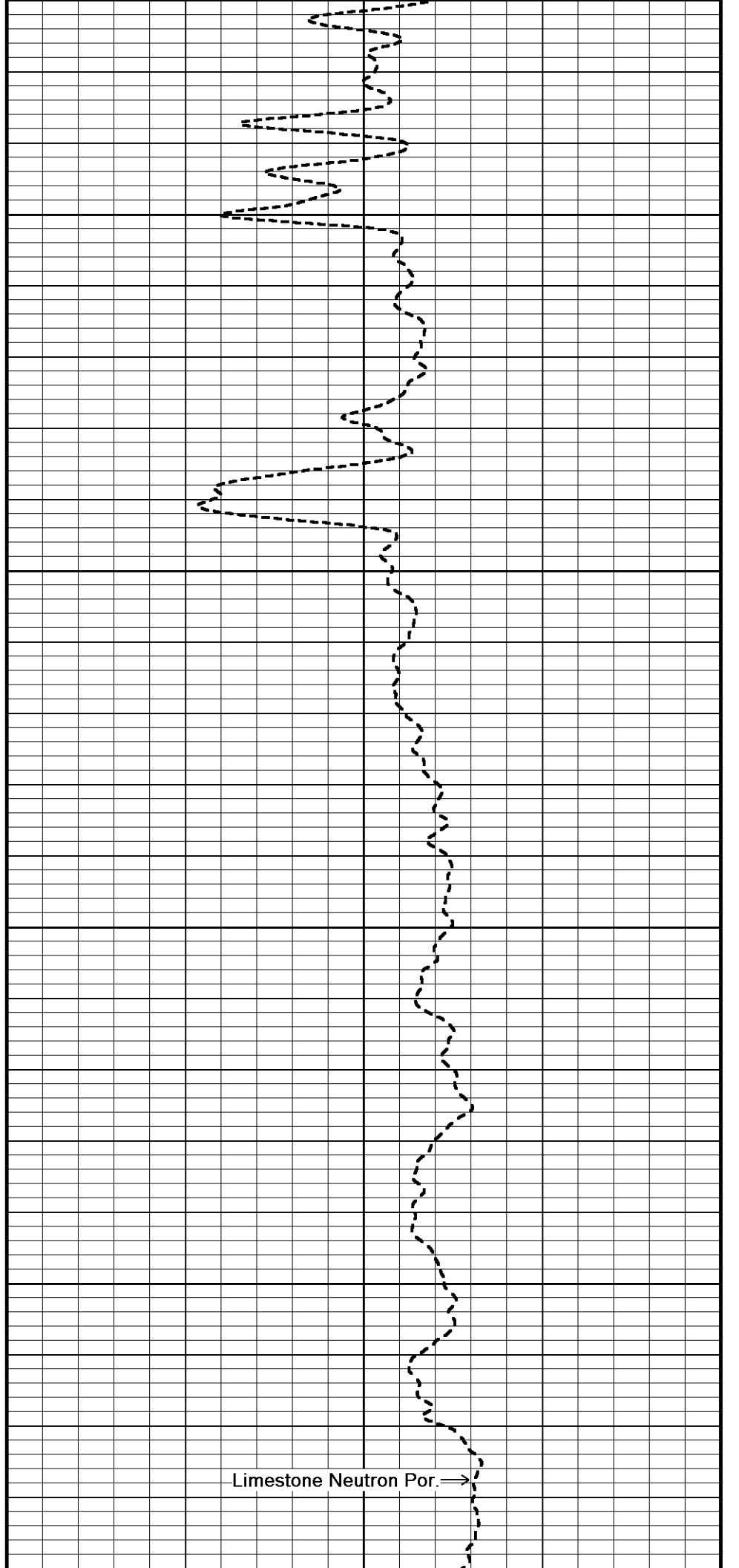
5000

5050

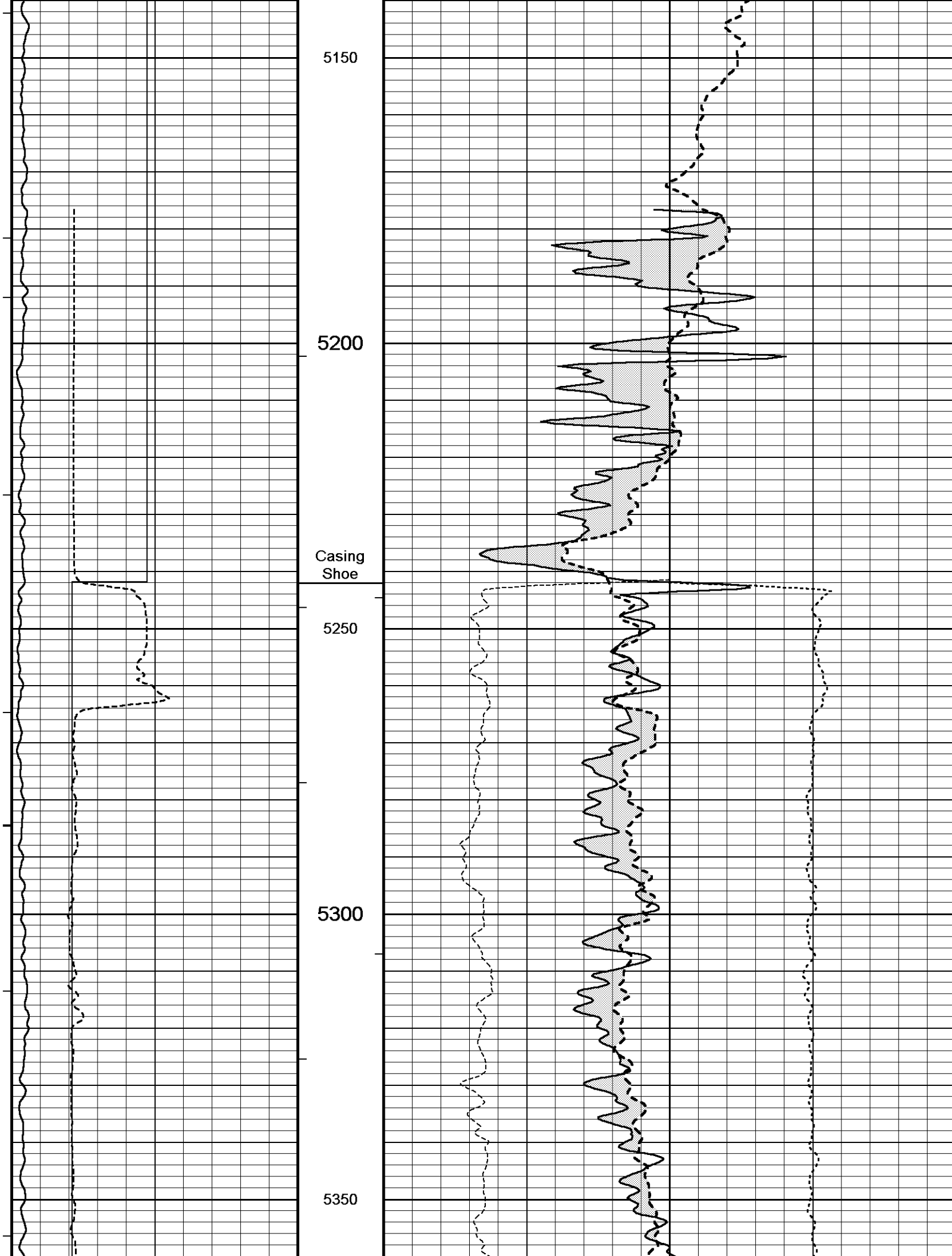
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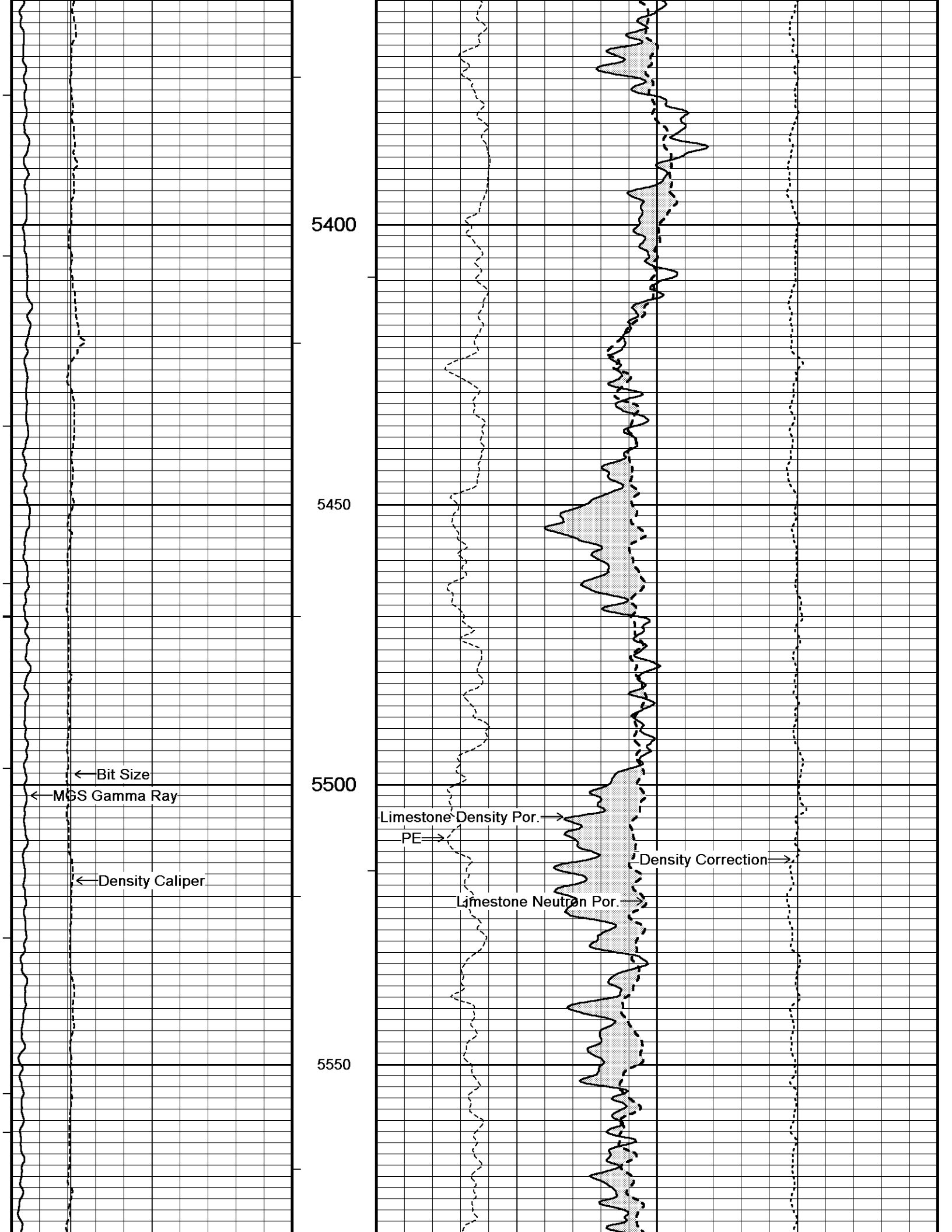
← Bit Size

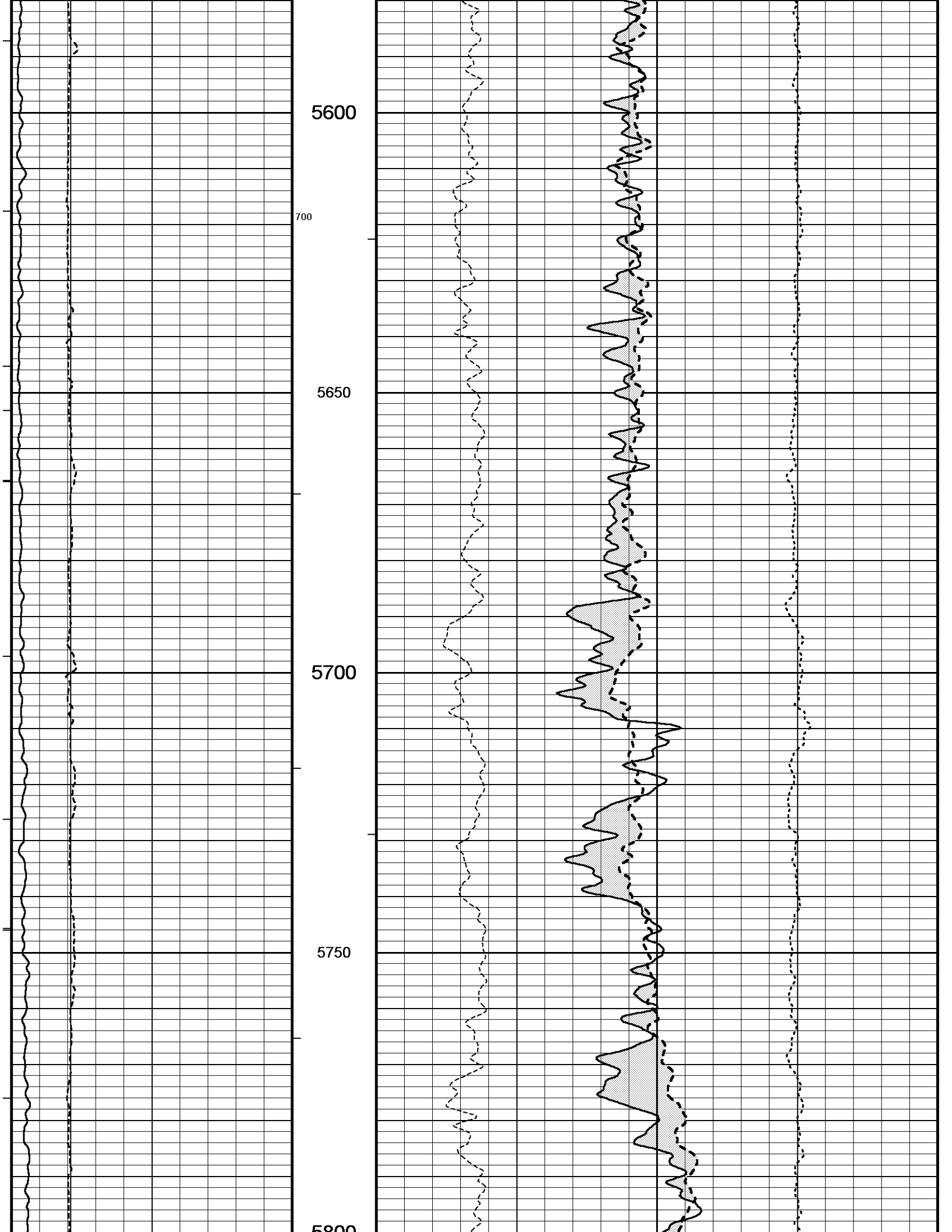
← MGS Gamma Ray

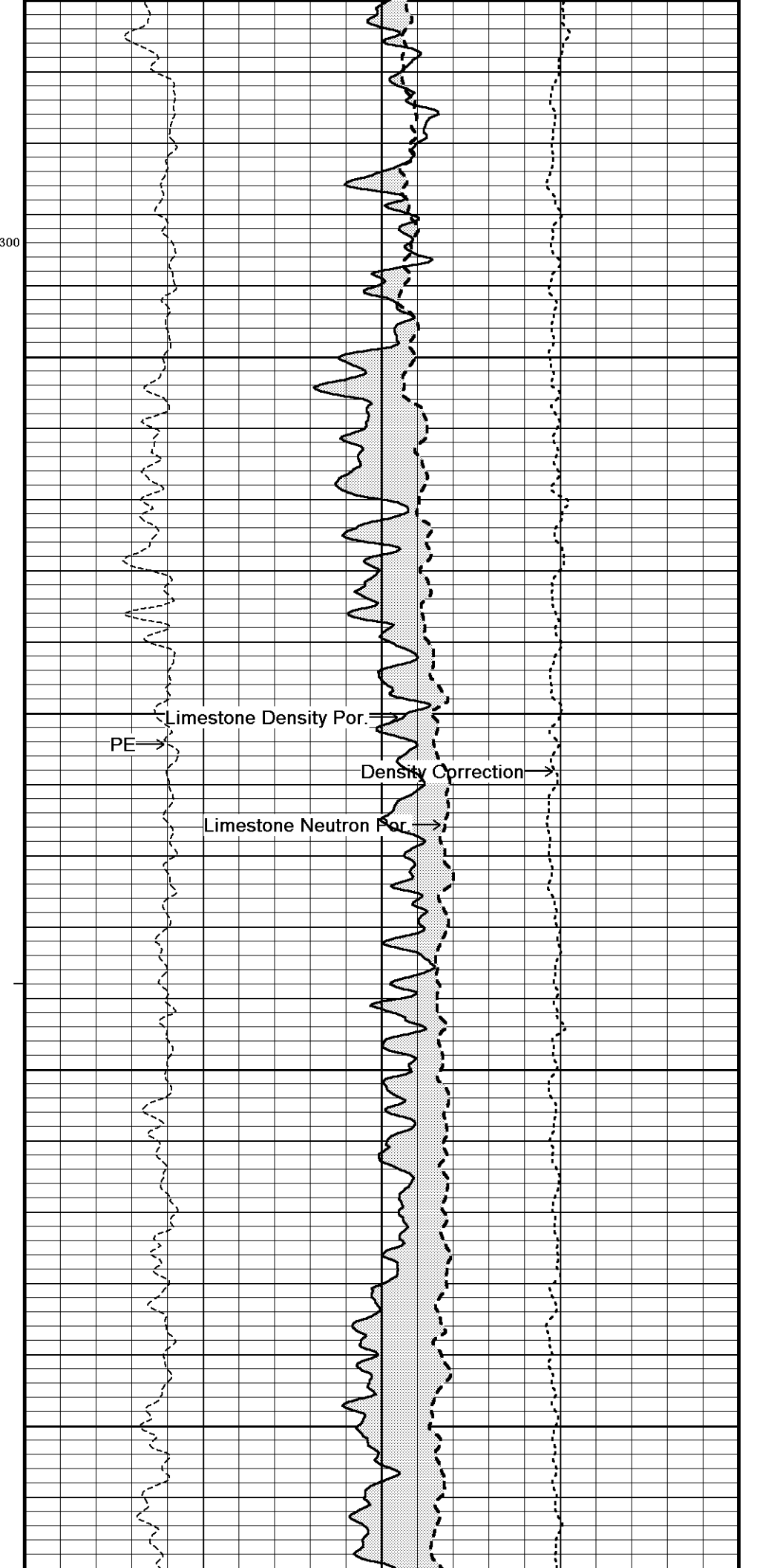
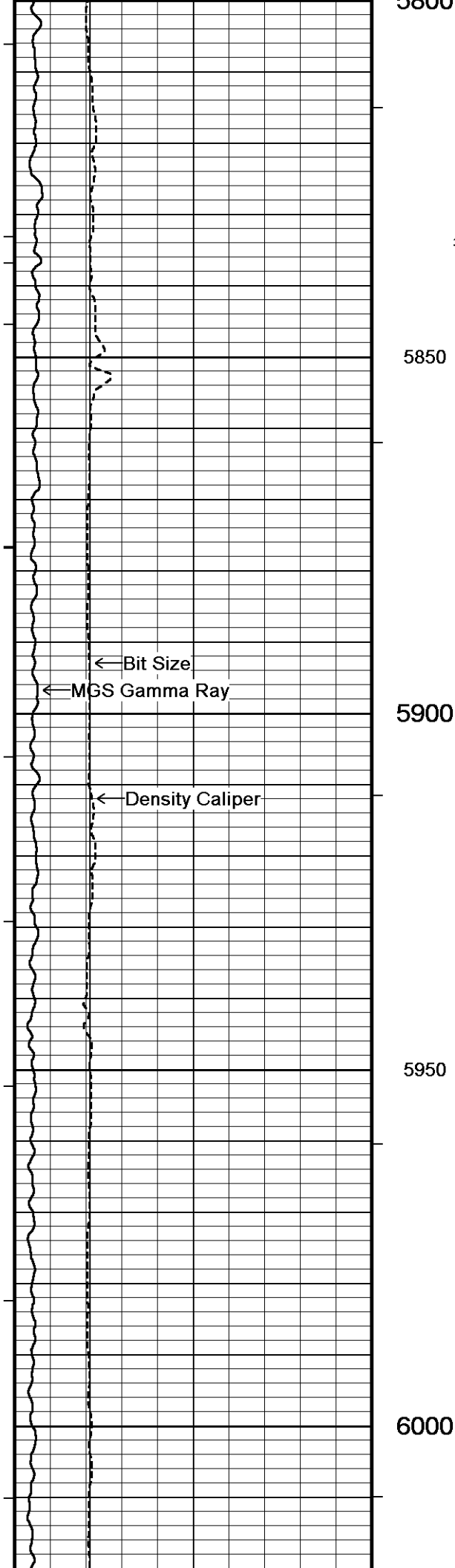


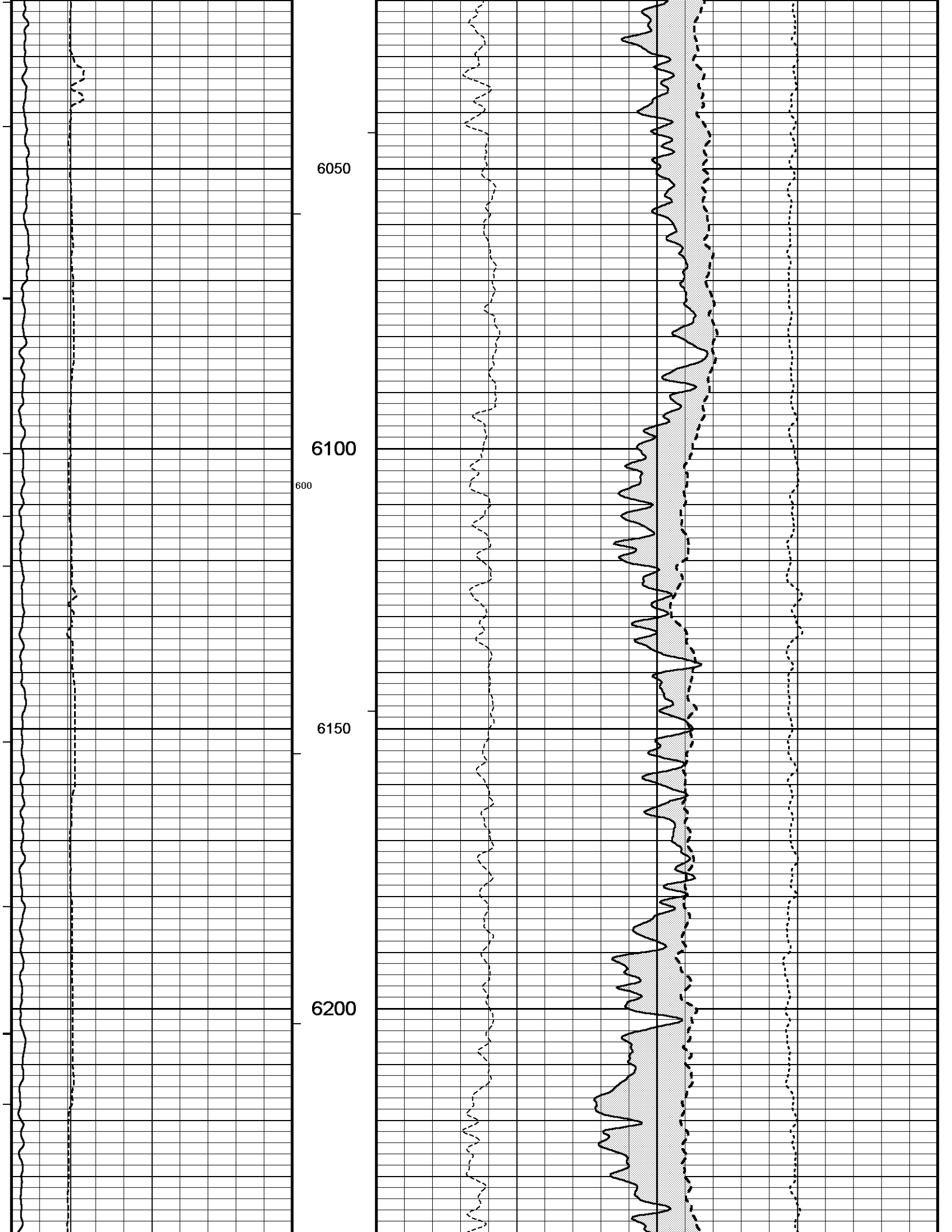
Limestone Neutron Por. →

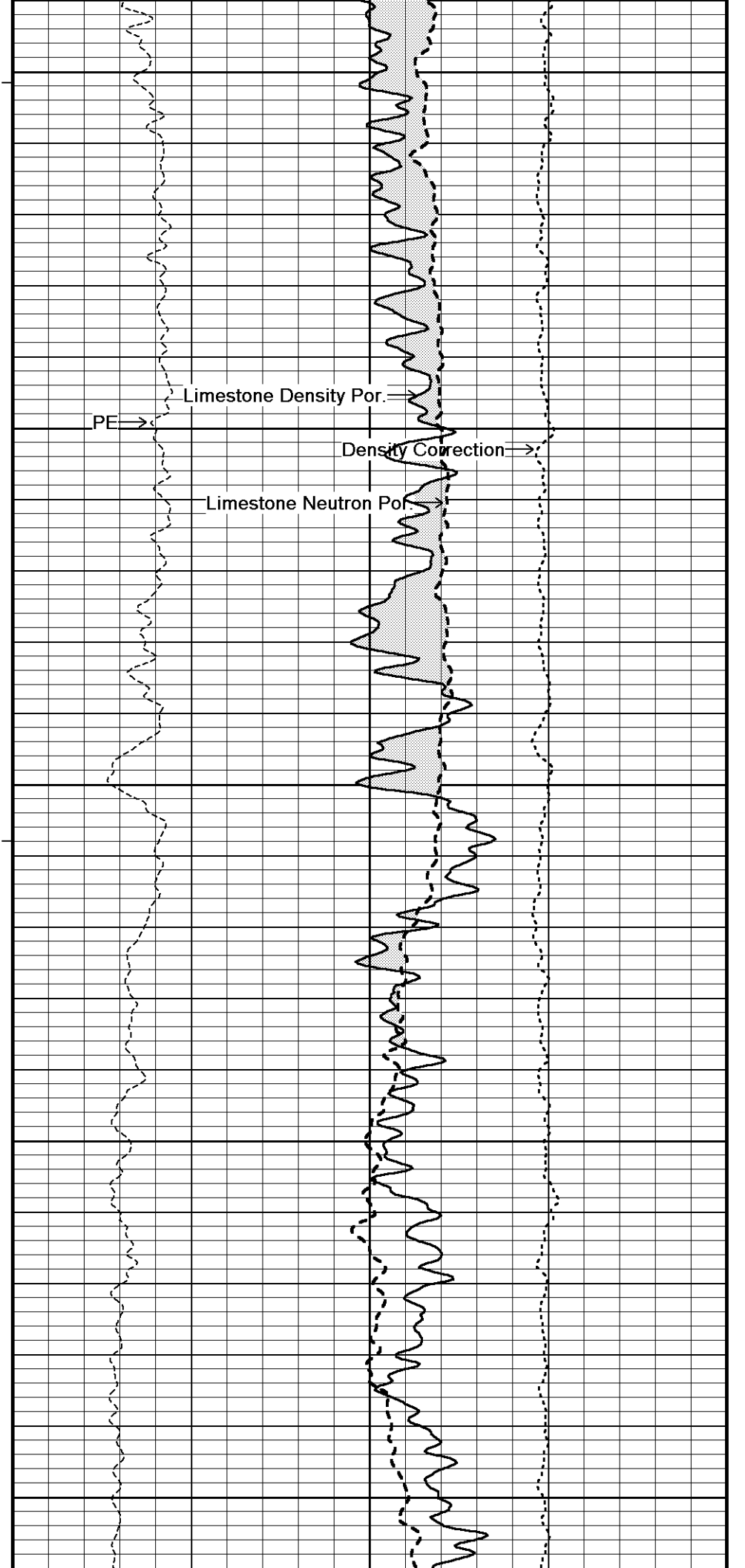
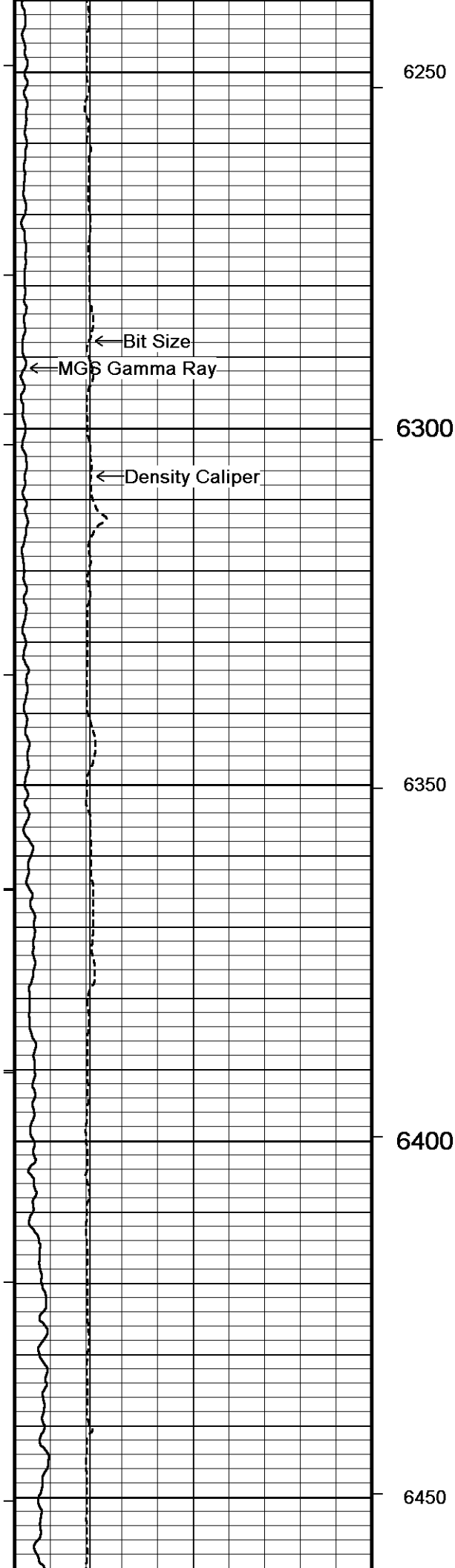


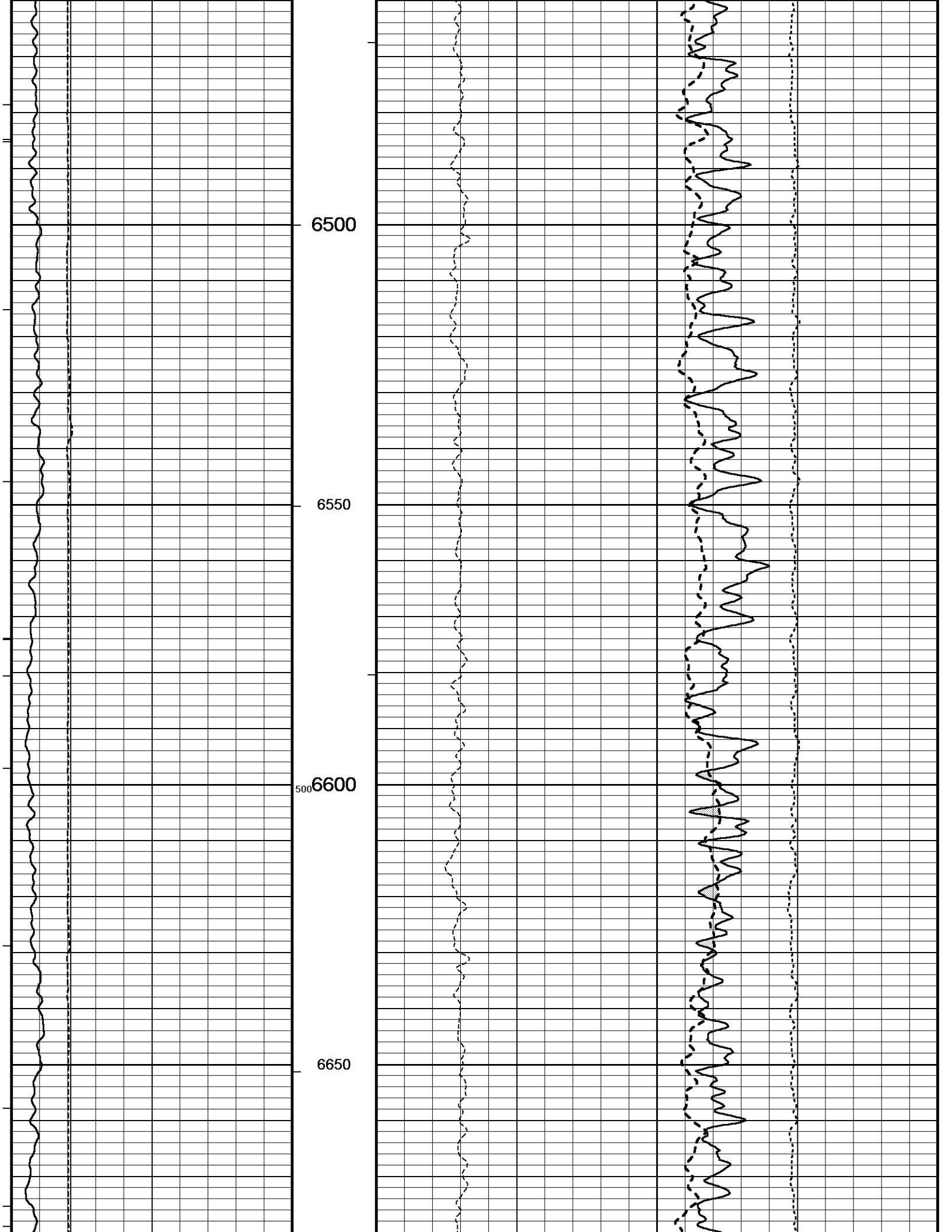


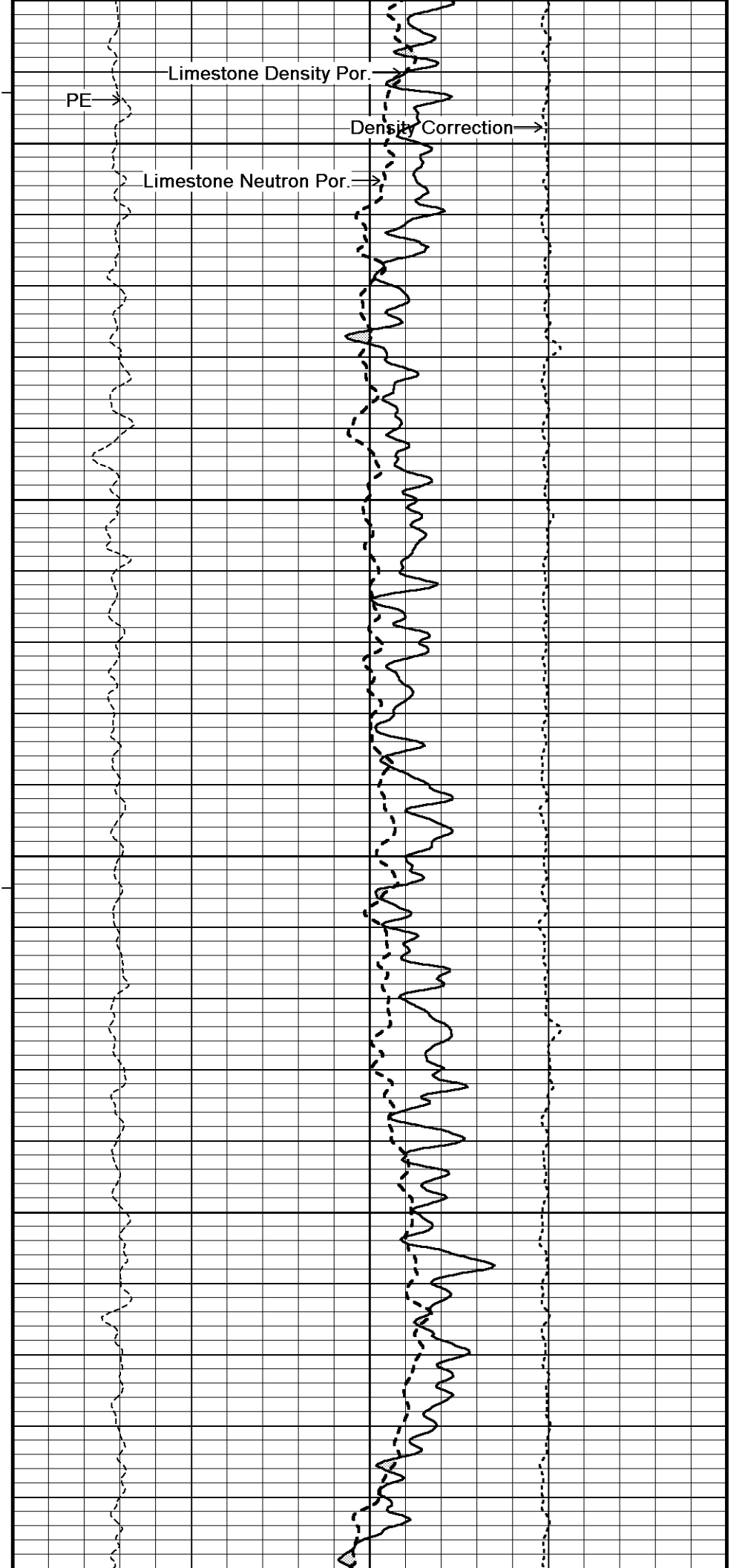
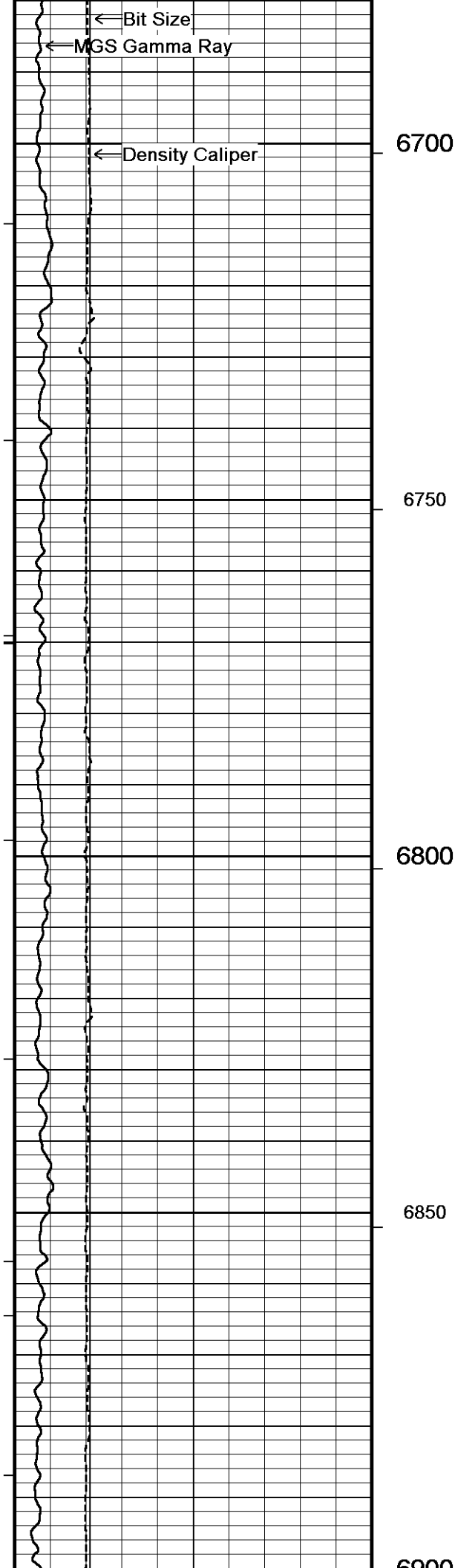


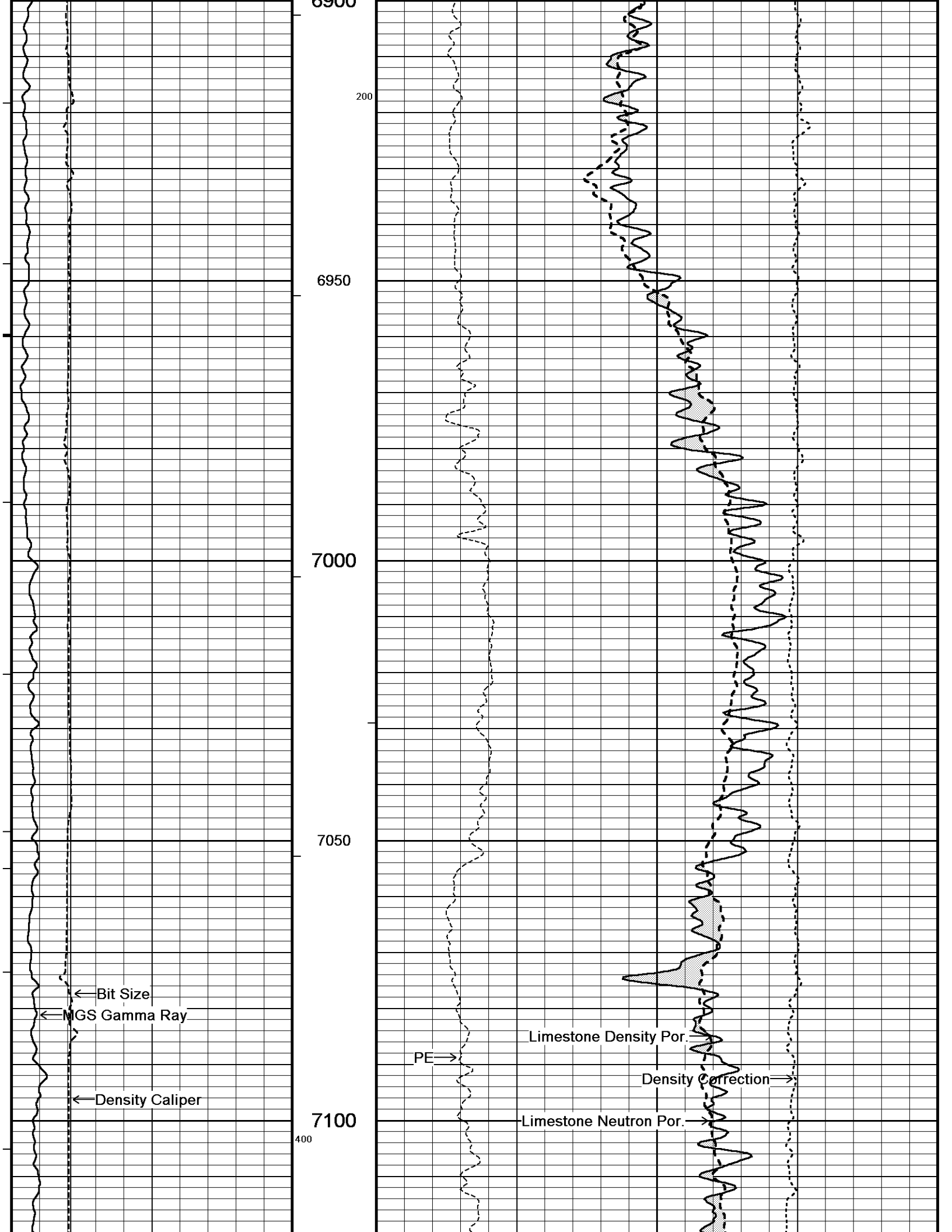


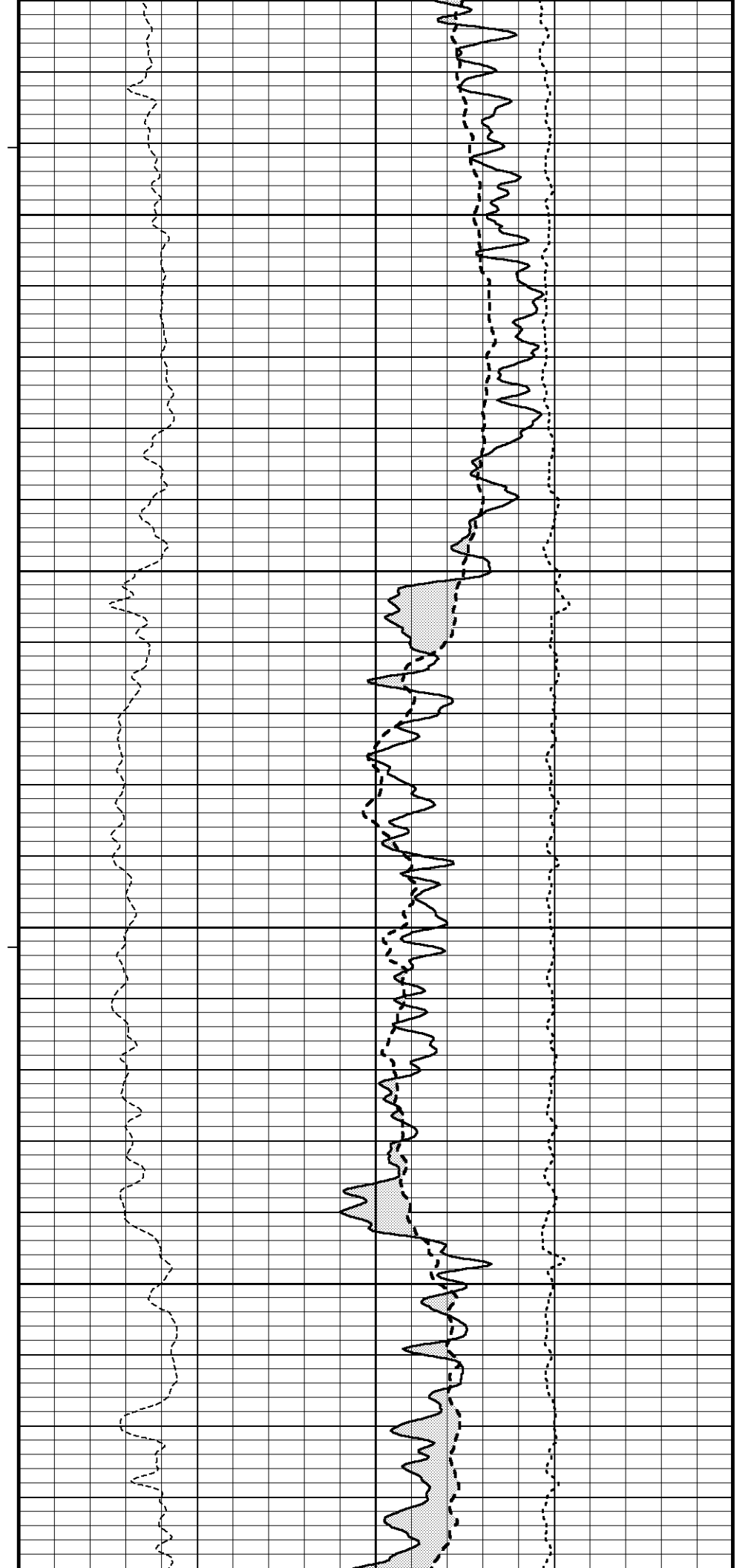
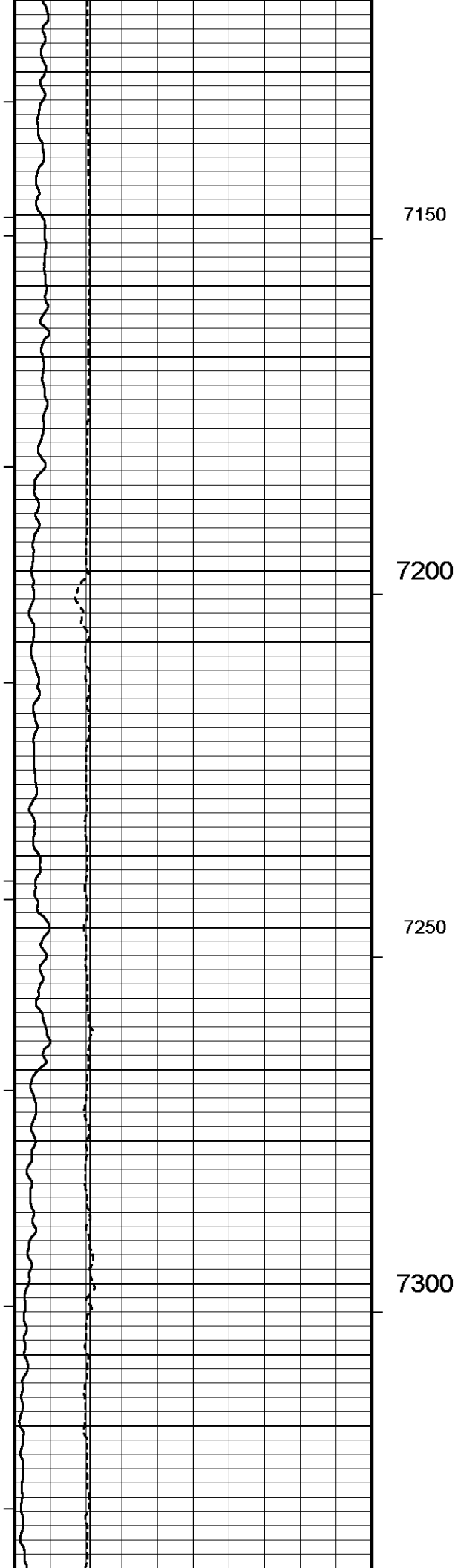


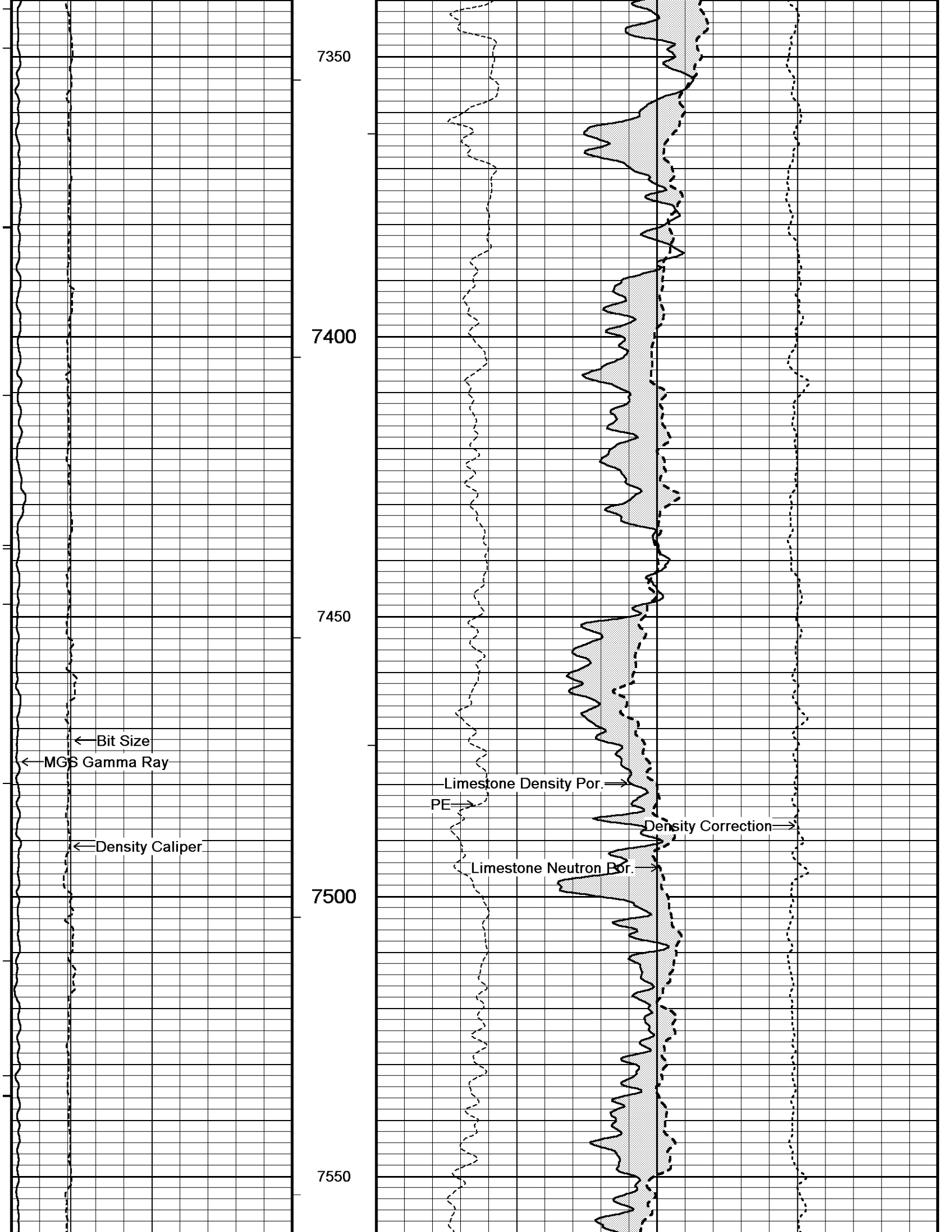


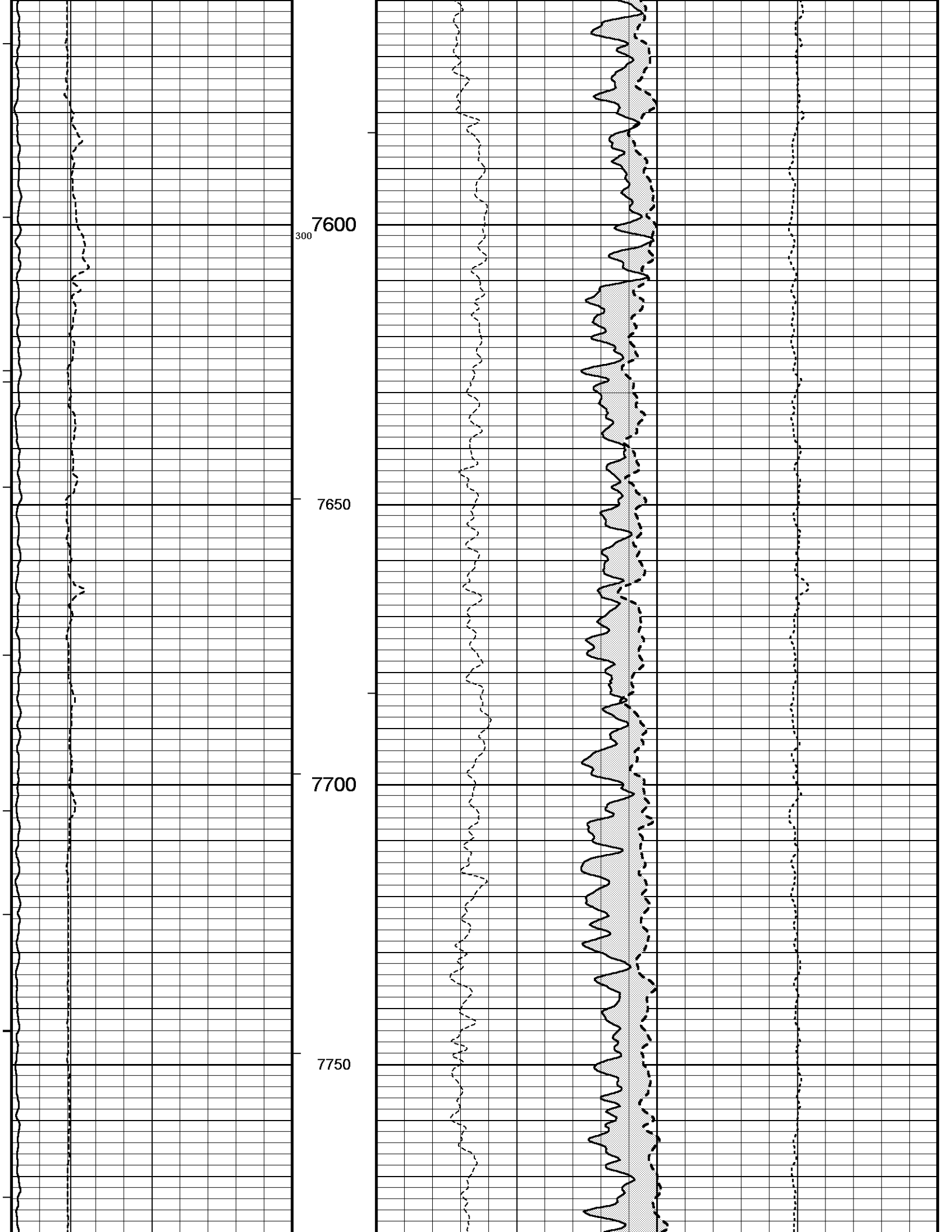


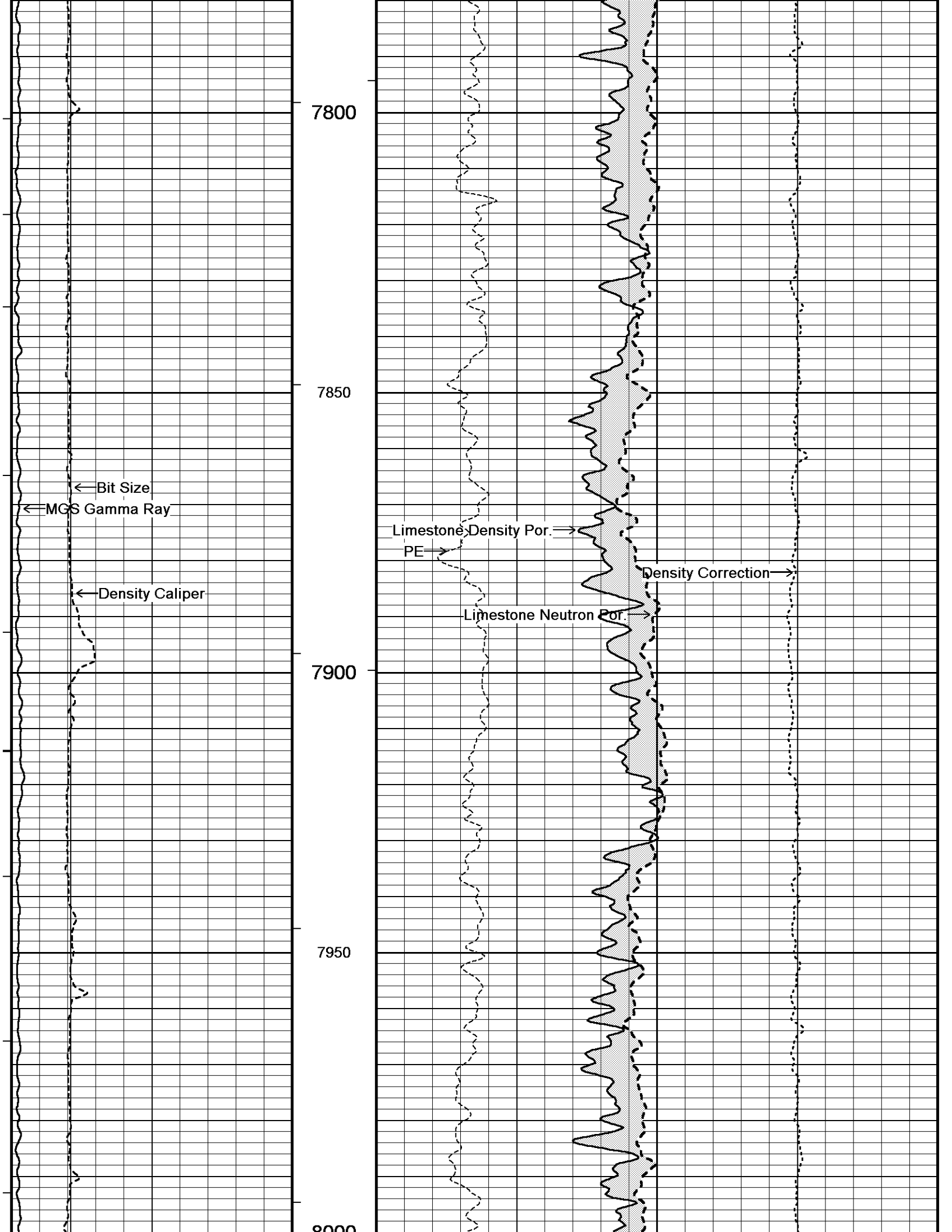


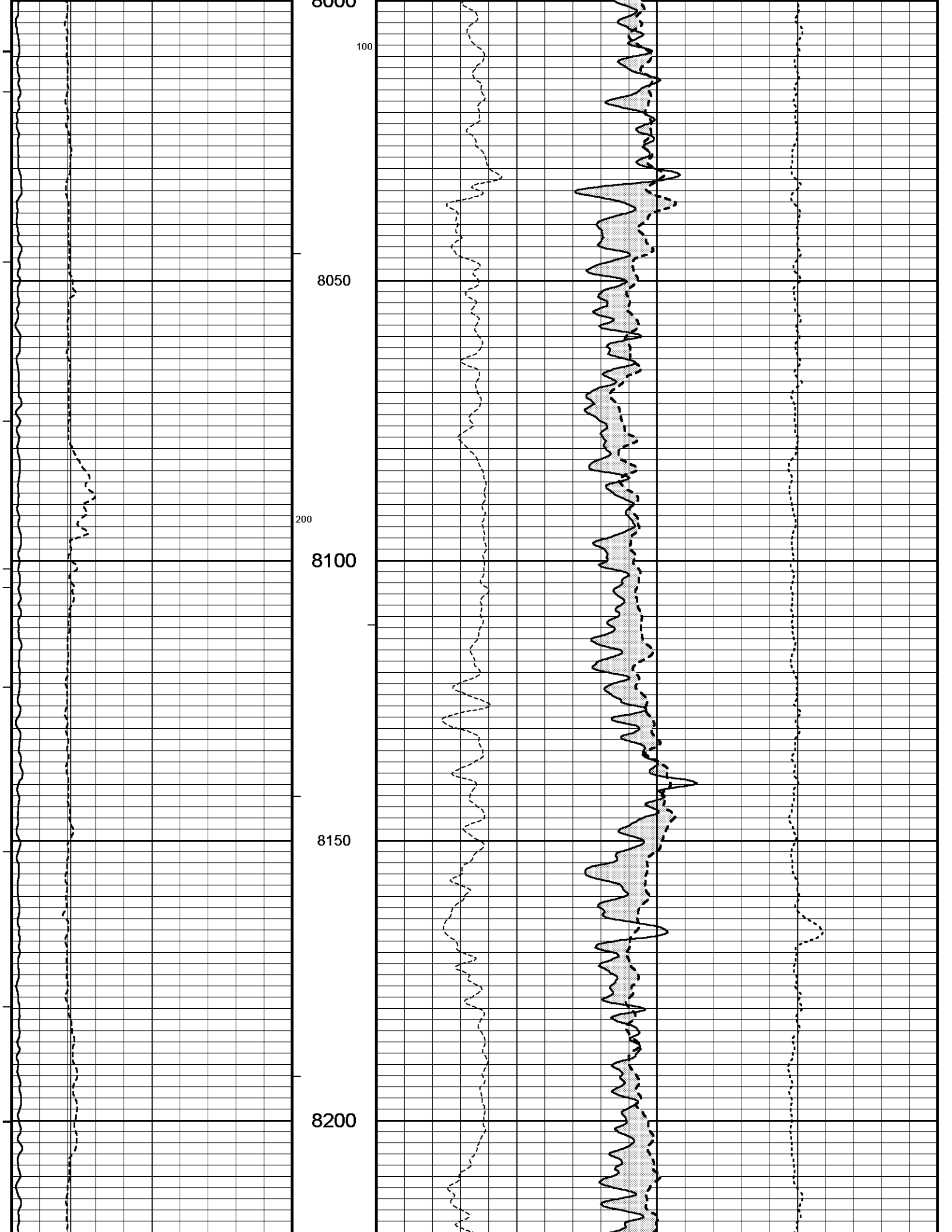


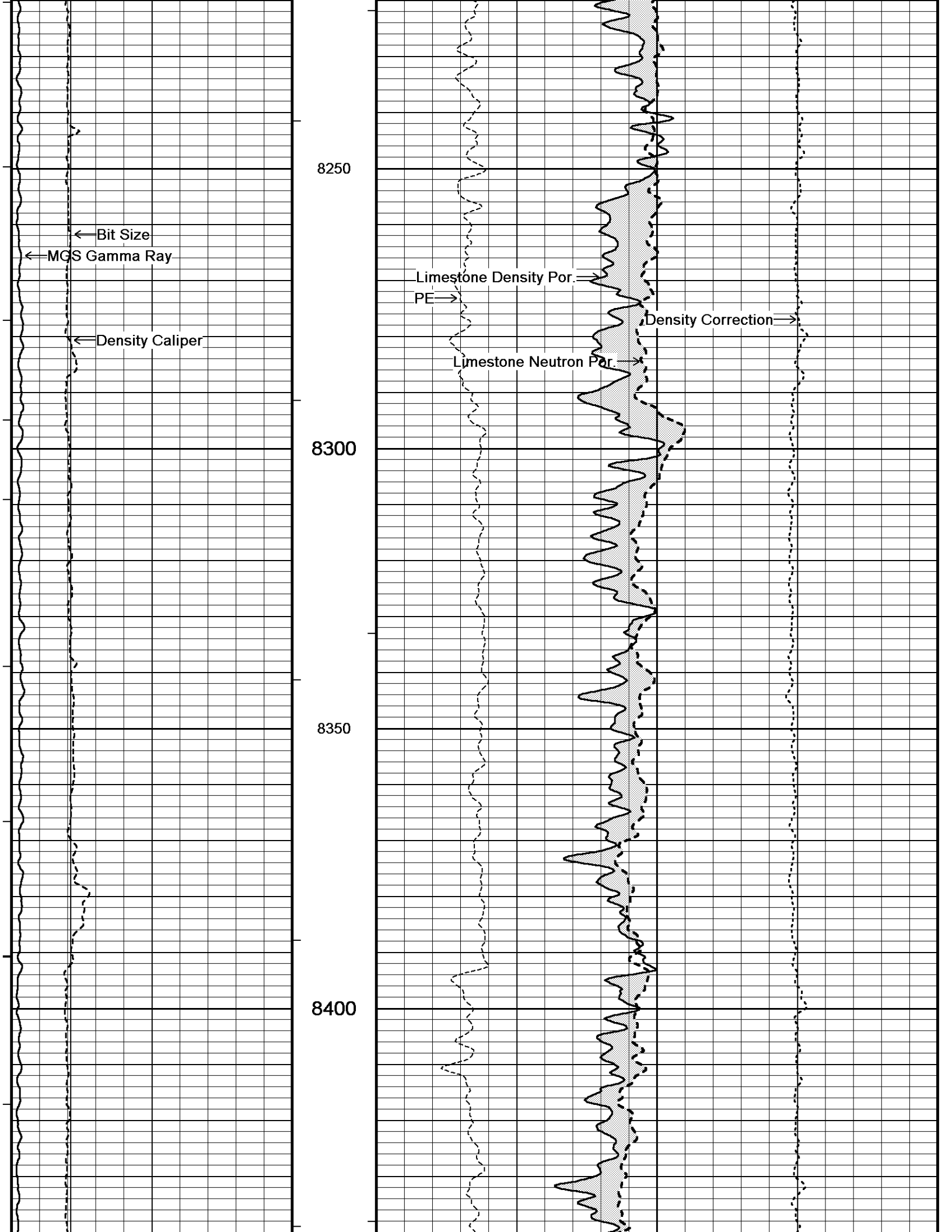


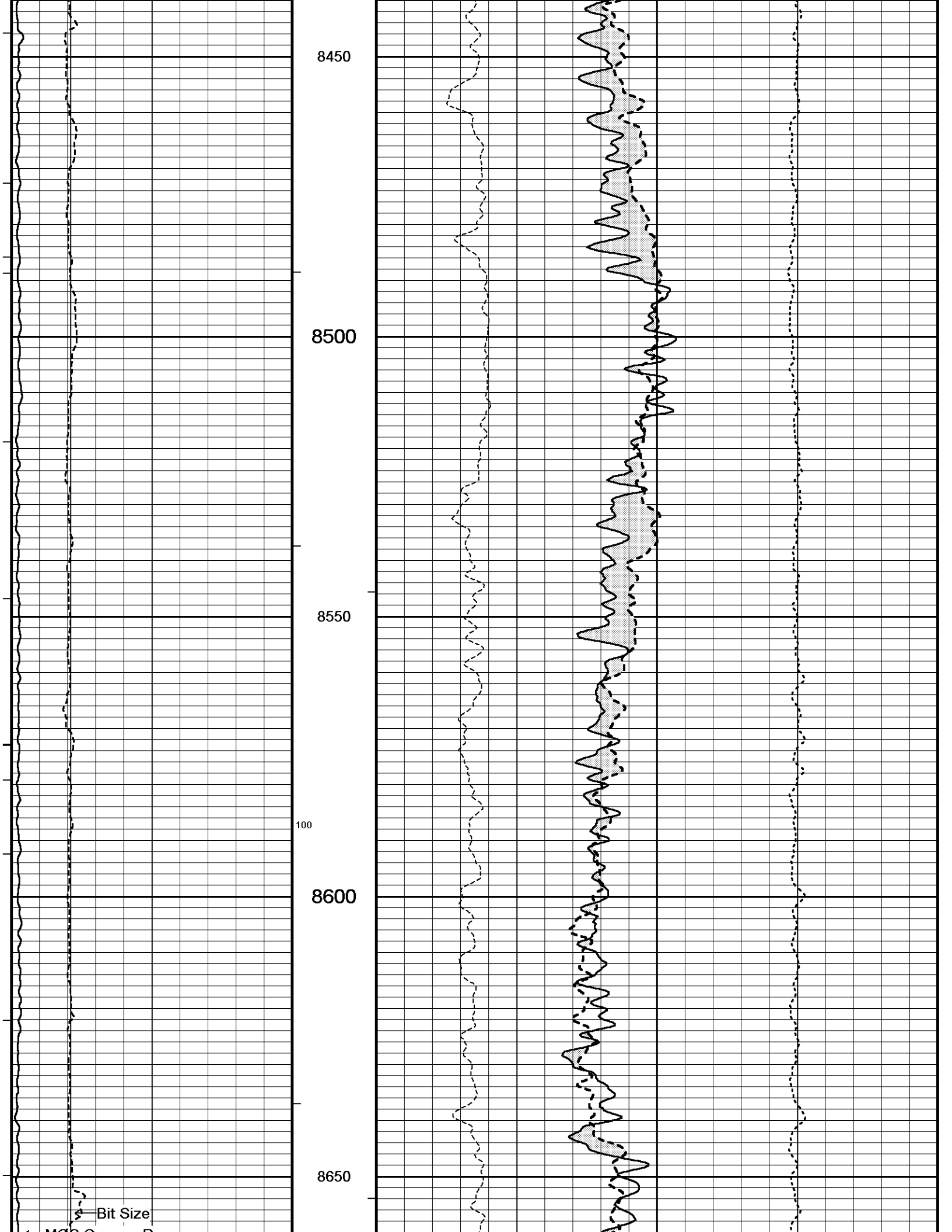


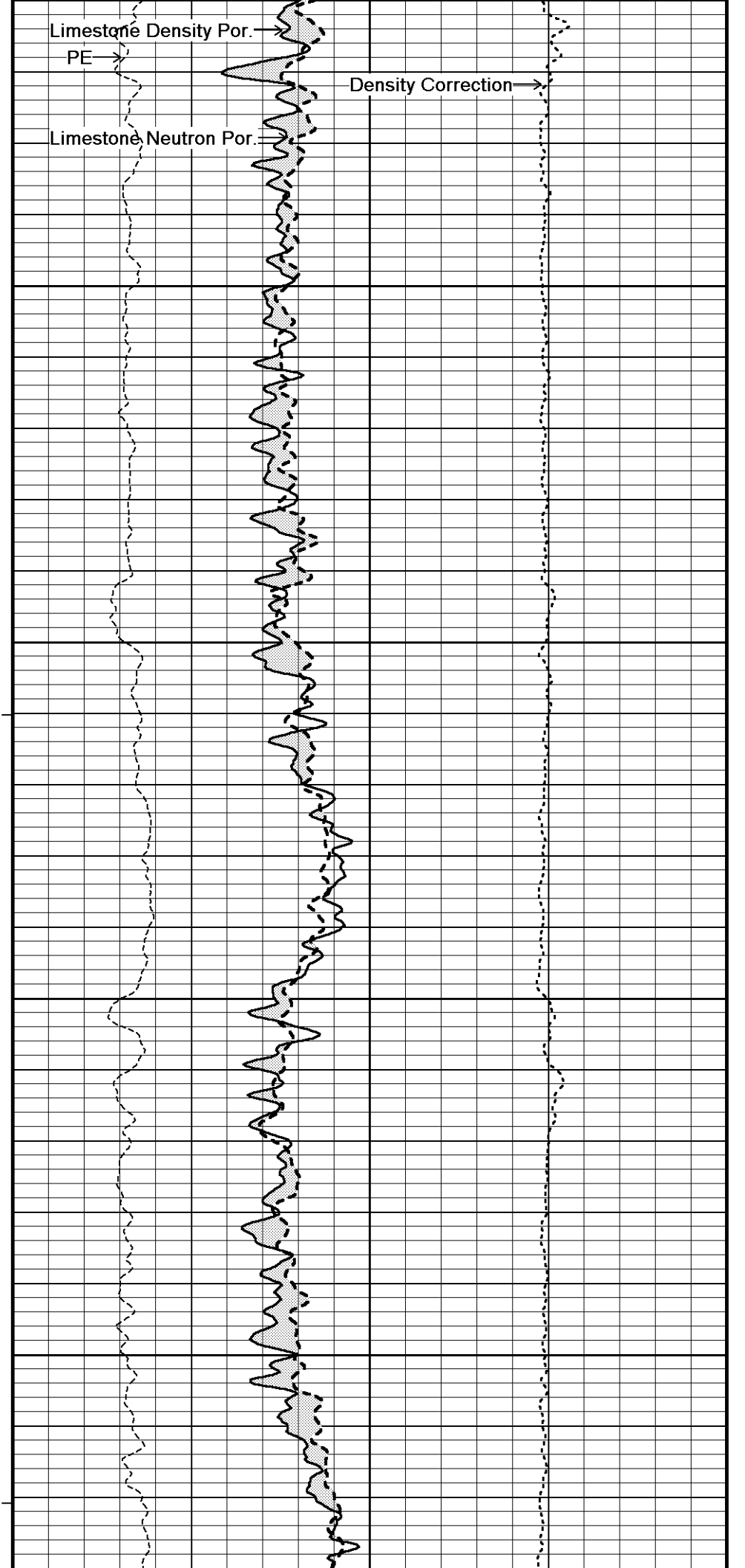
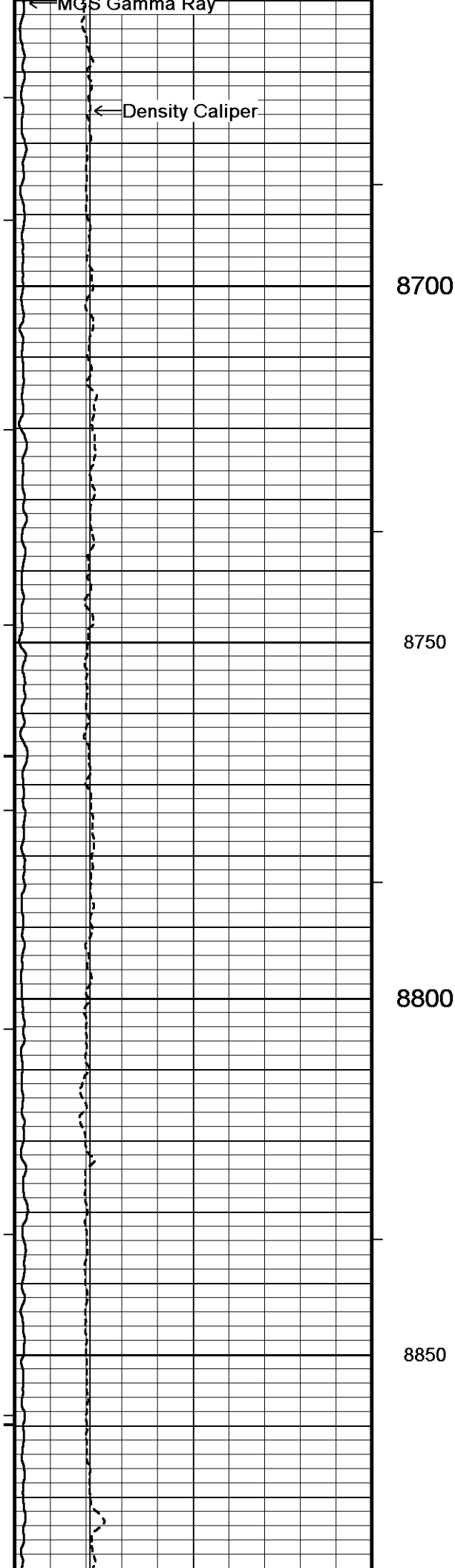


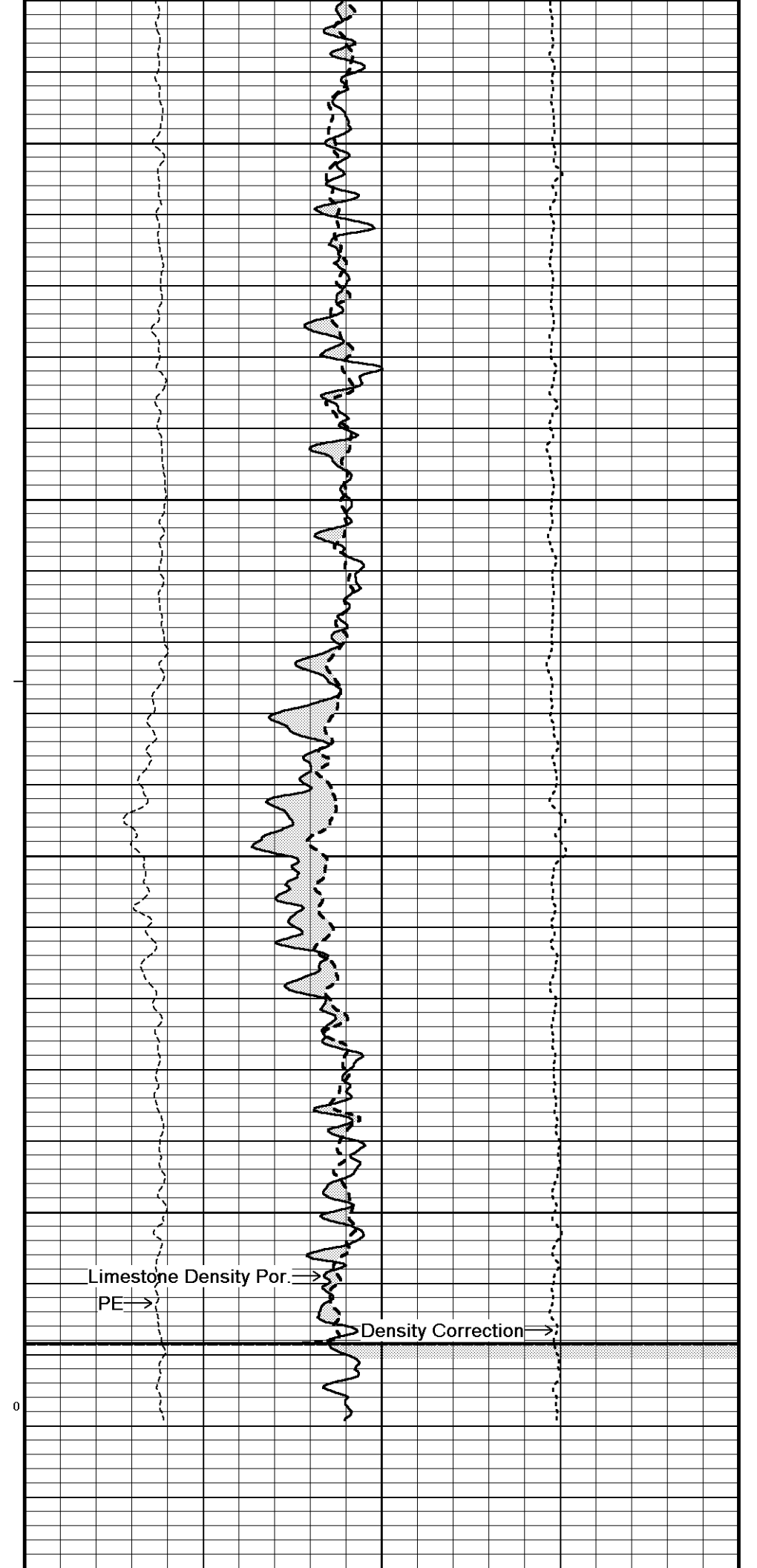
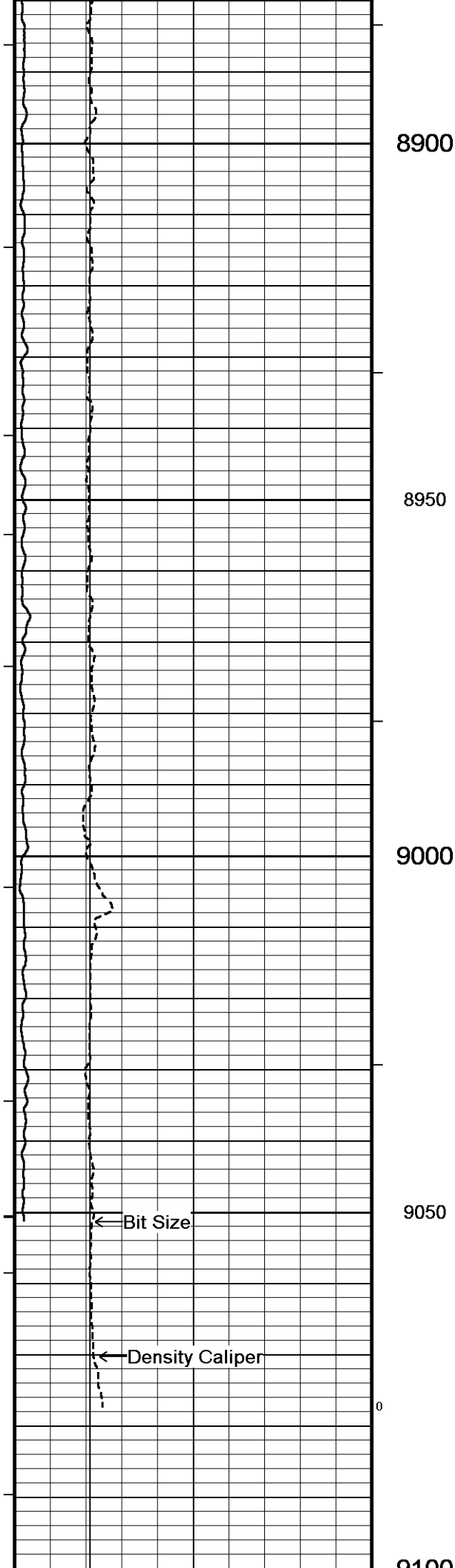


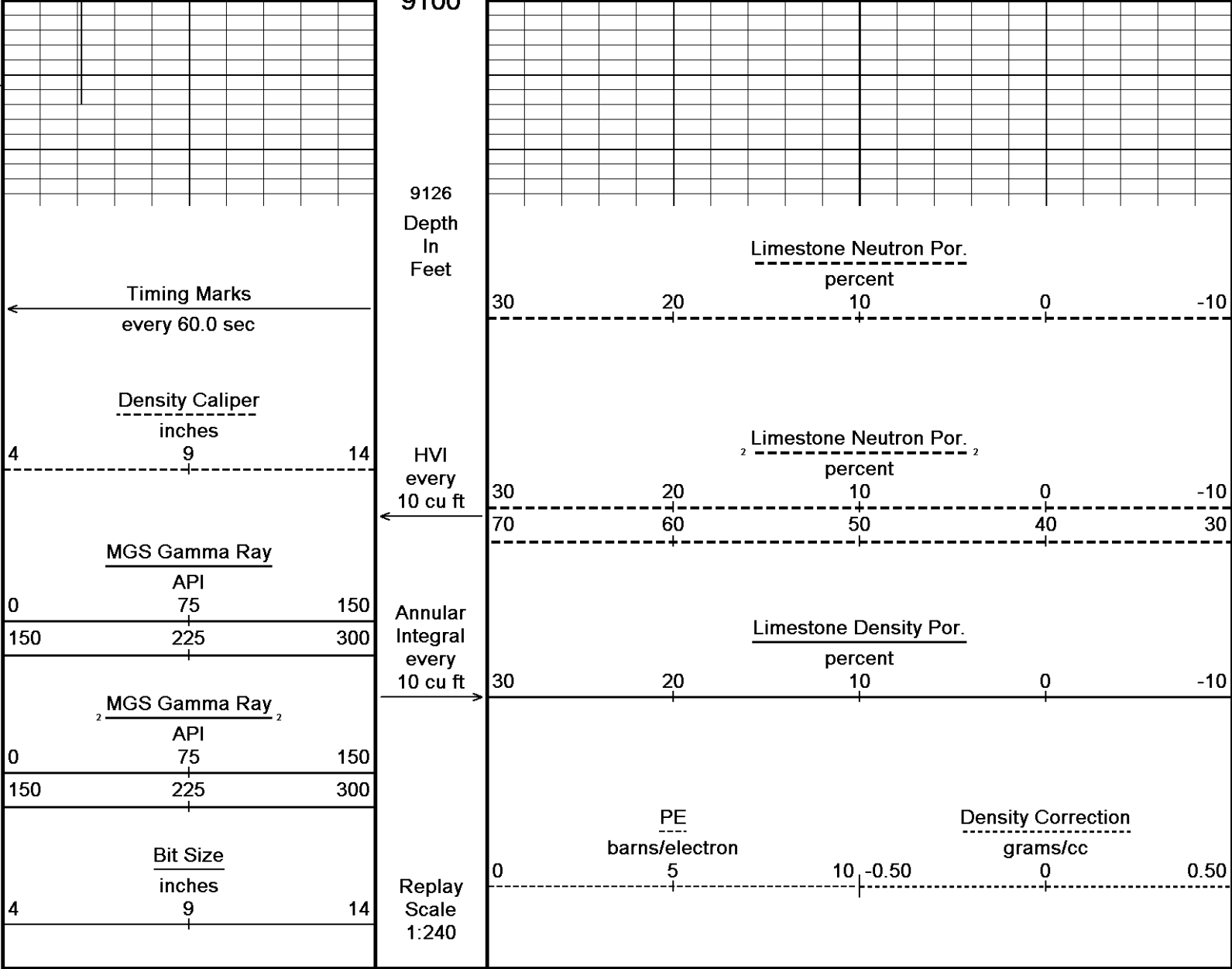












Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 01-MAR-2013 03:38

Filename: C:\DATA_13_04_8492\SANDRIDGE 4J RANCH 3408 1-33H\RTAP 4J RANCH DEPTH.dta

Recorded on 01-MAR-2013 00:08

System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

5 INCH MAIN PASS

5 INCH BULK DENSITY

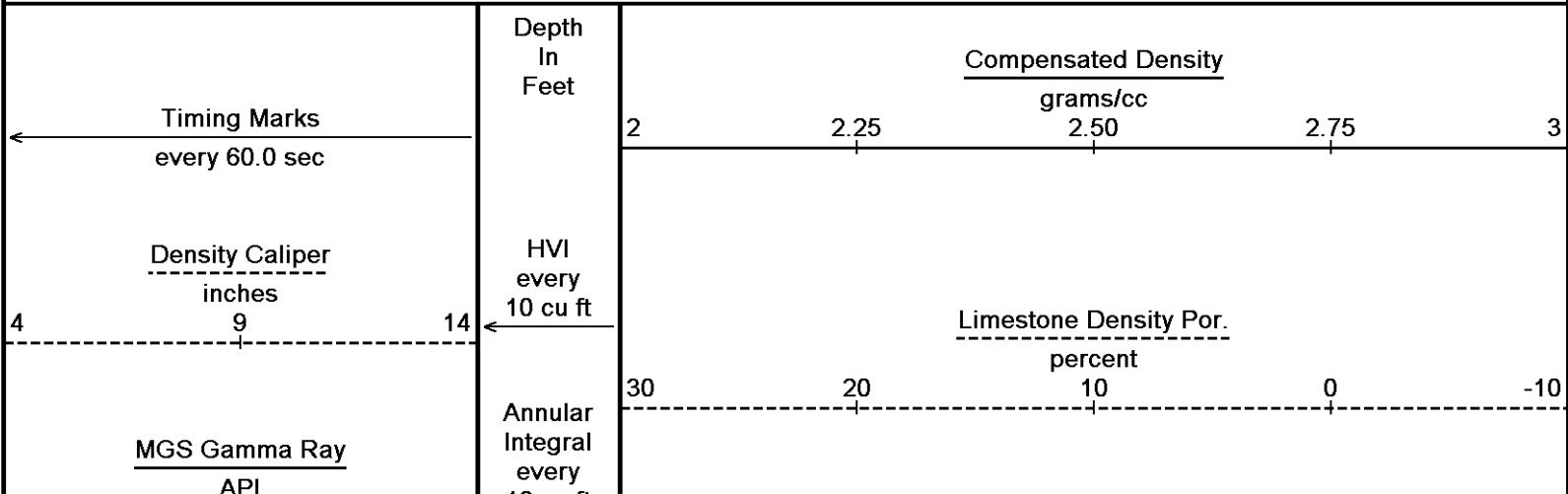
Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 01-MAR-2013 03:38

Filename: C:\DATA_13_04_8492\SANDRIDGE 4J RANCH 3408 1-33H\RTAP 4J RANCH DEPTH.dta

Recorded on 01-MAR-2013 00:08

System Versions: Processed with 13.04.8492 Plotted with 13.04.8492



0 75 150
150 225 300

Bit Size
inches
9

4 14

10 cu ft →

Replay
Scale
1:240

5200

Casing
Shoe

5250

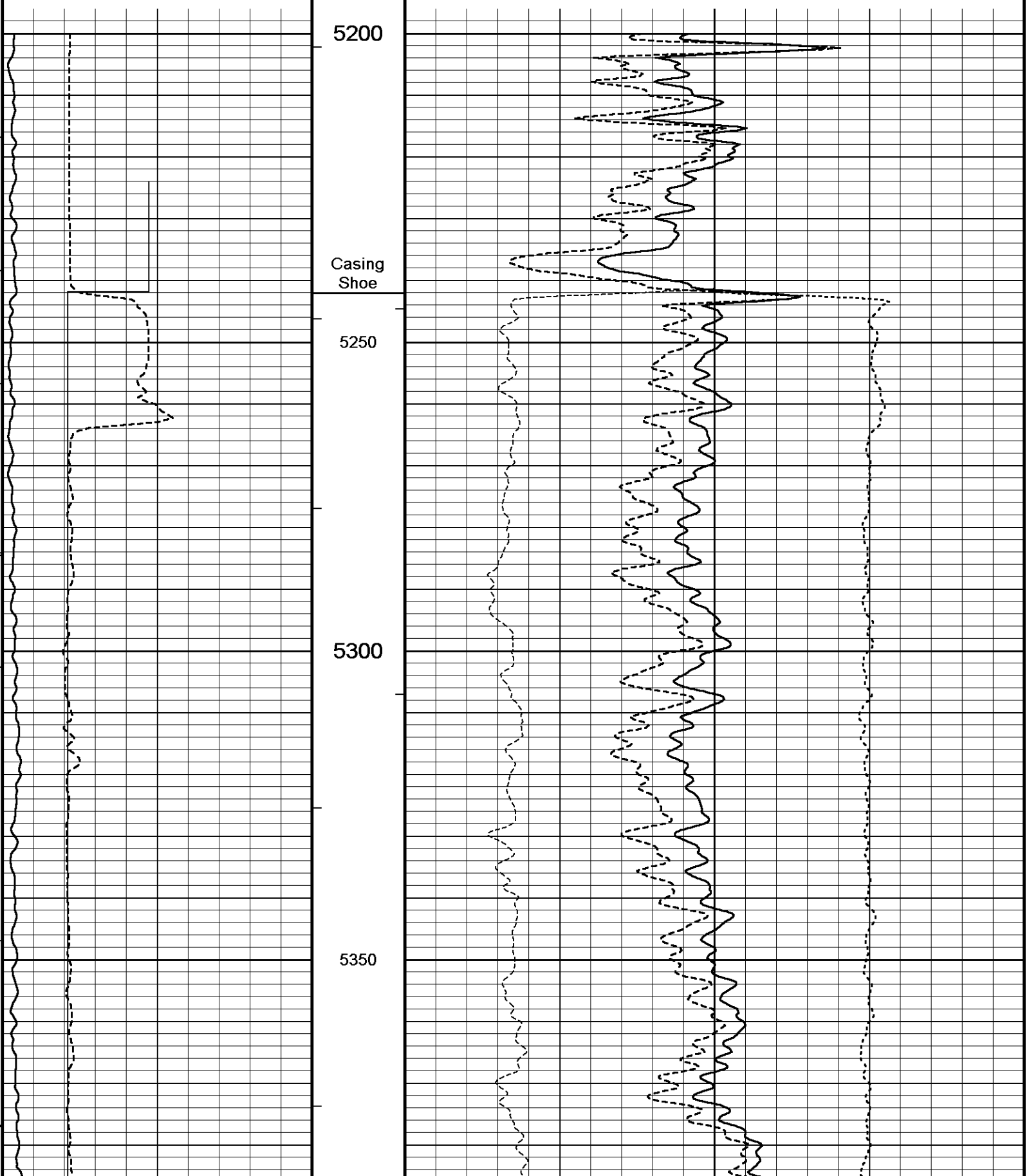
5300

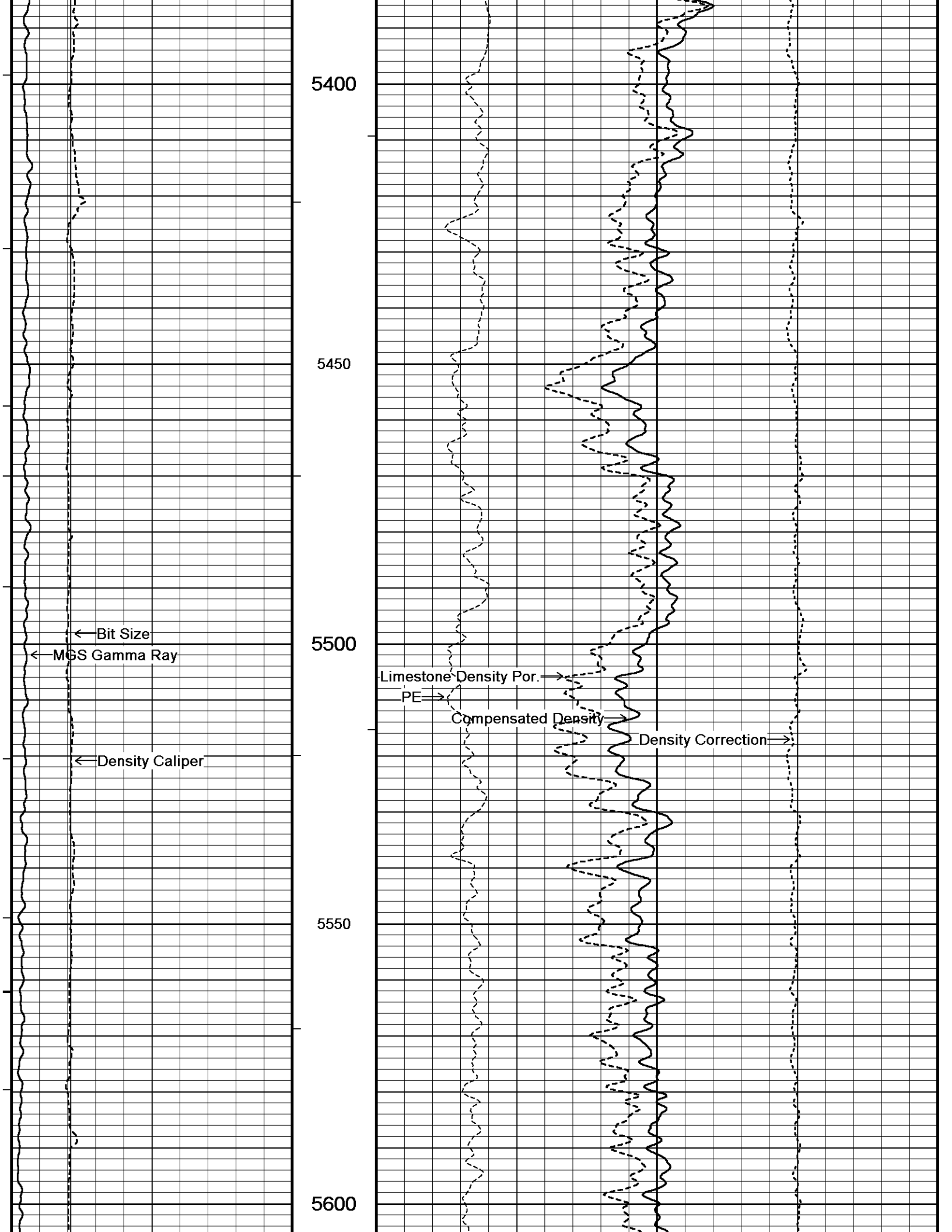
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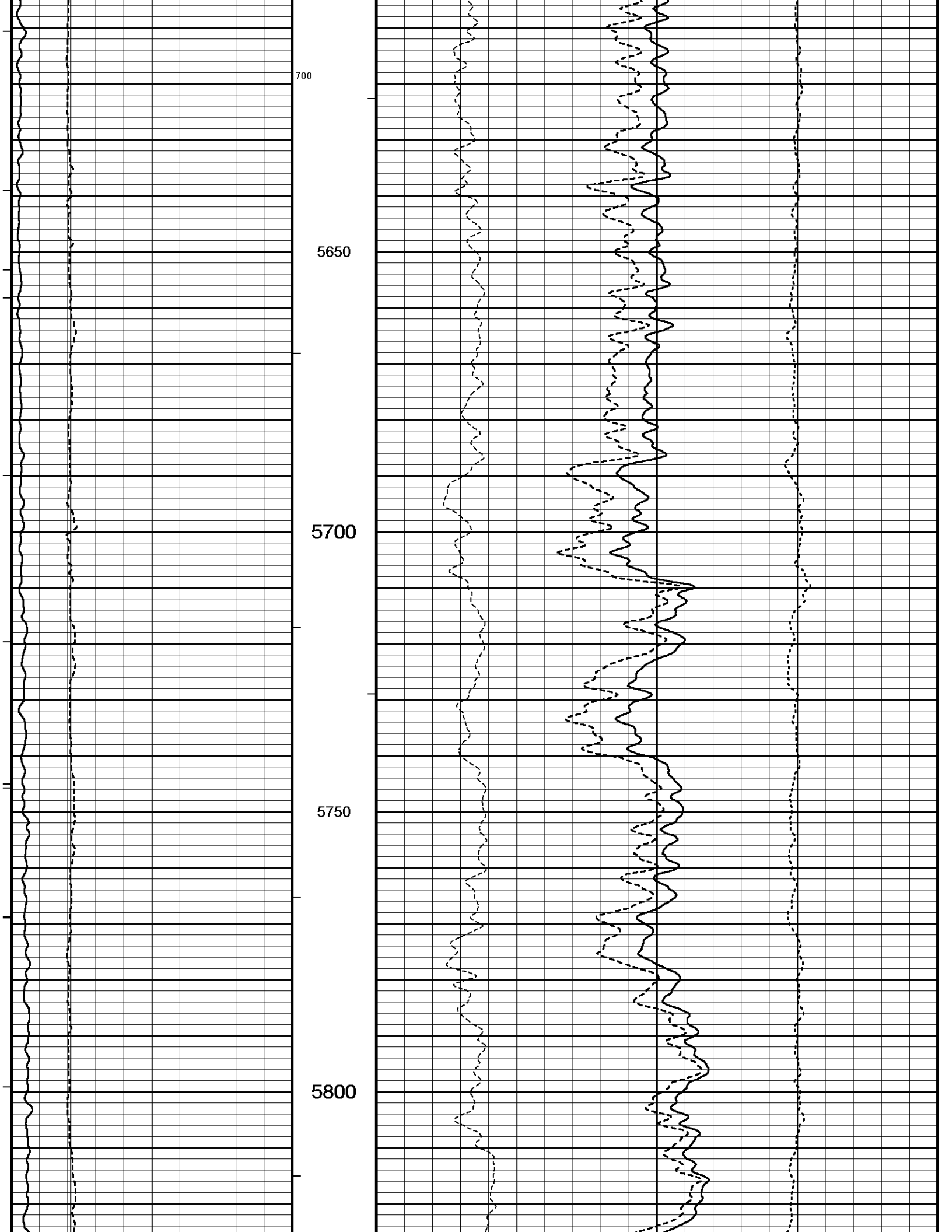
PE
barns/electron

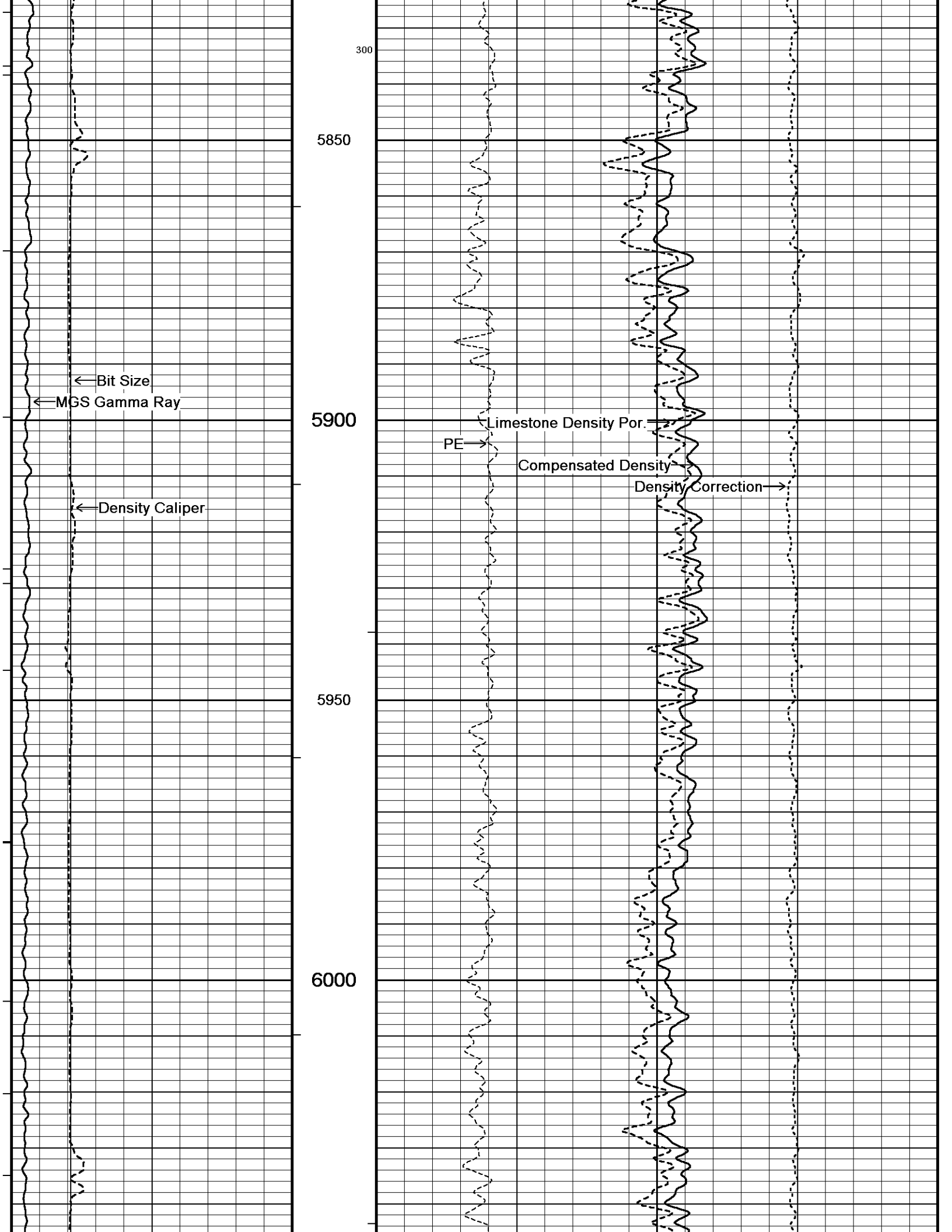
Density Correction
grams/cc

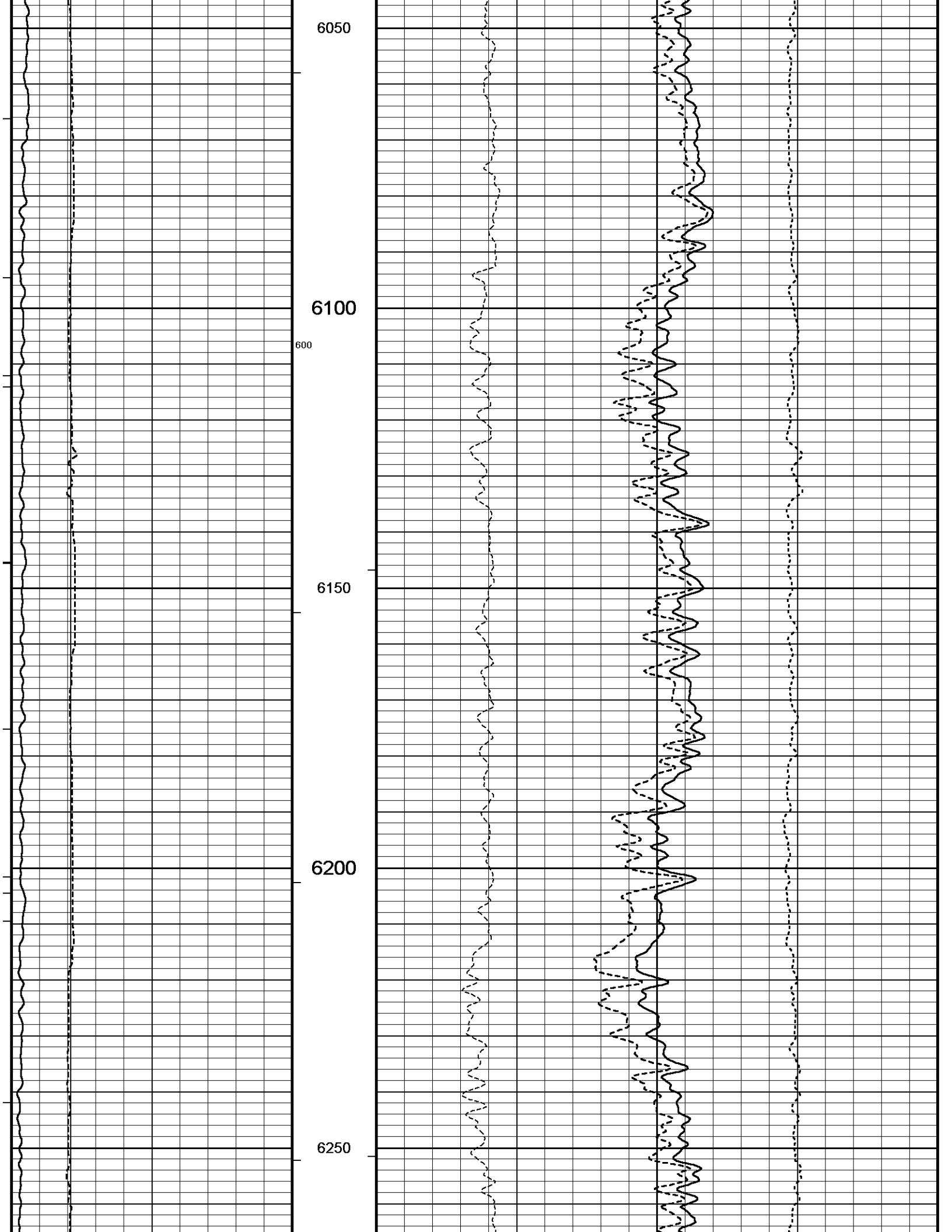
0 5 10 -0.50 0 0.50

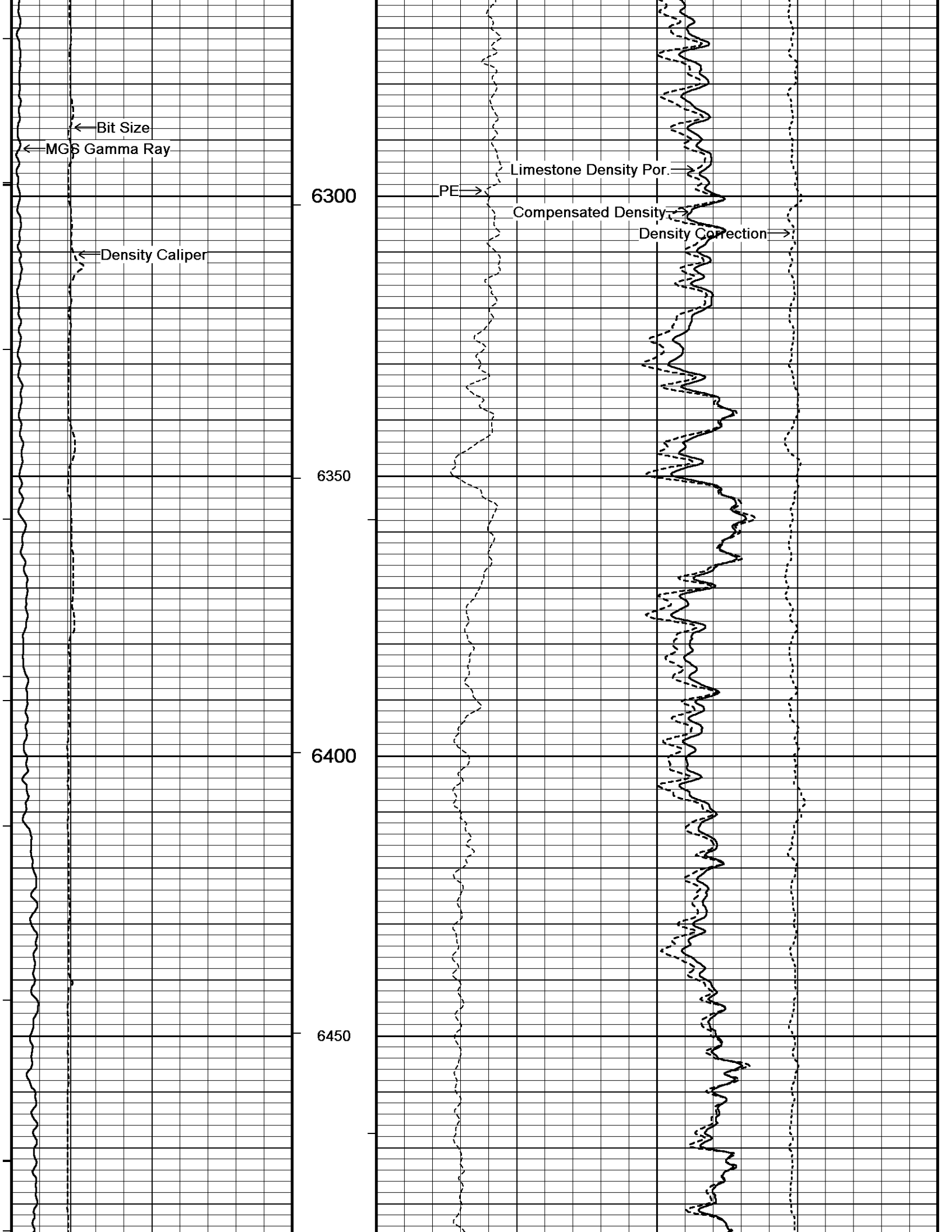


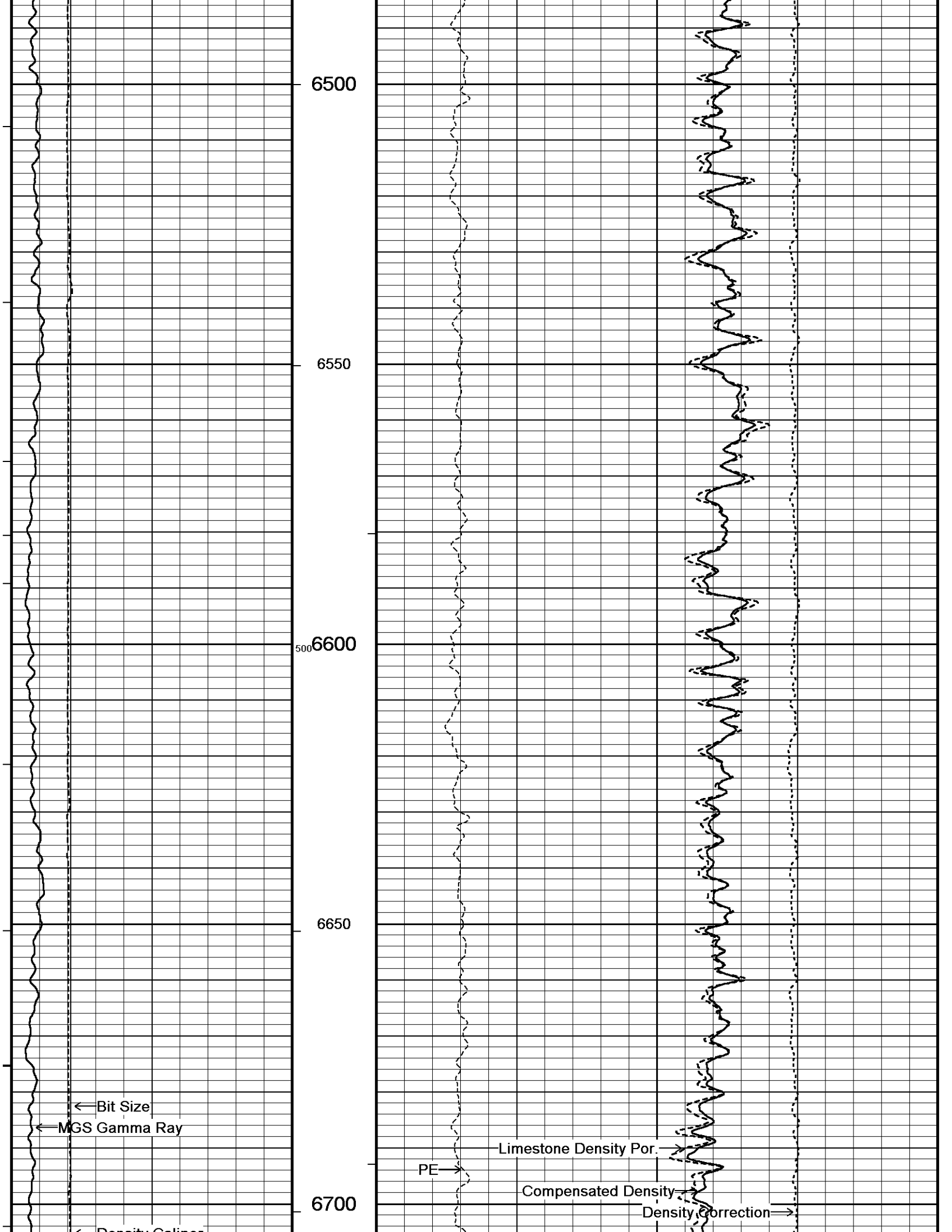


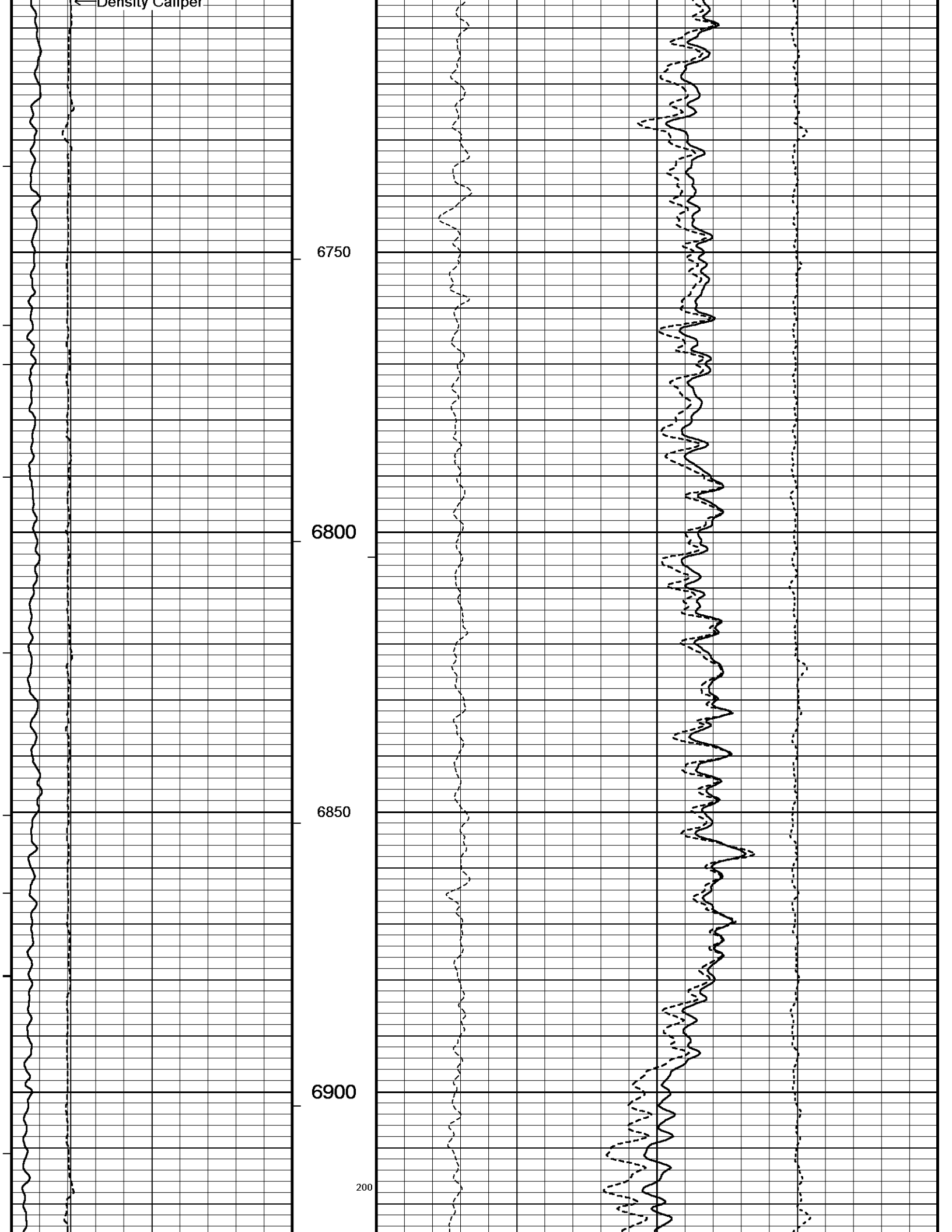


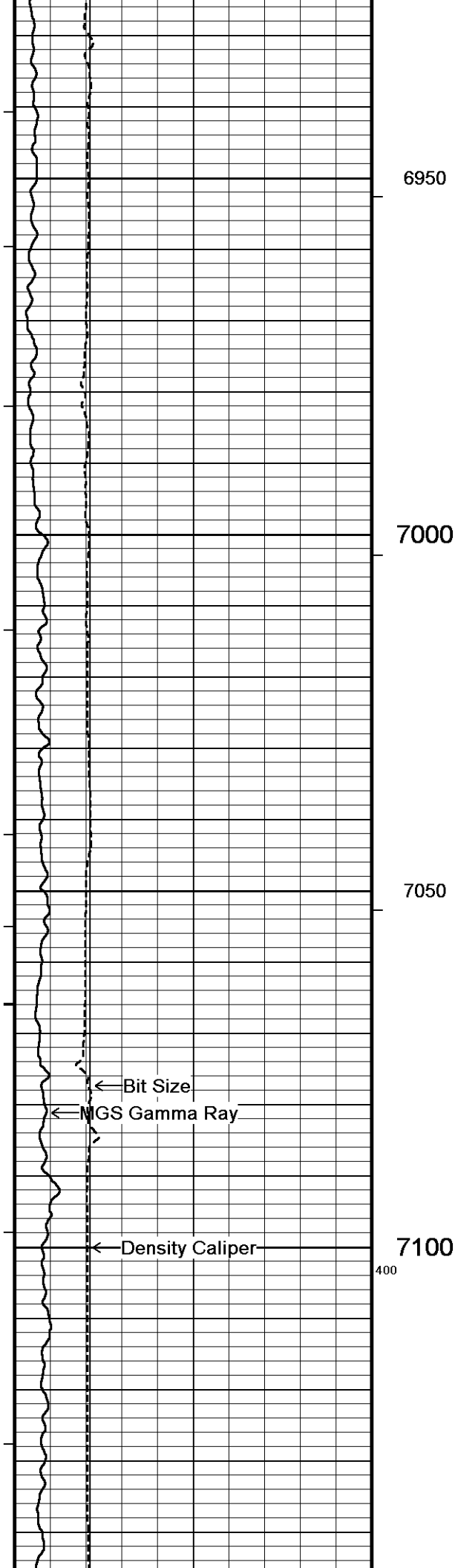












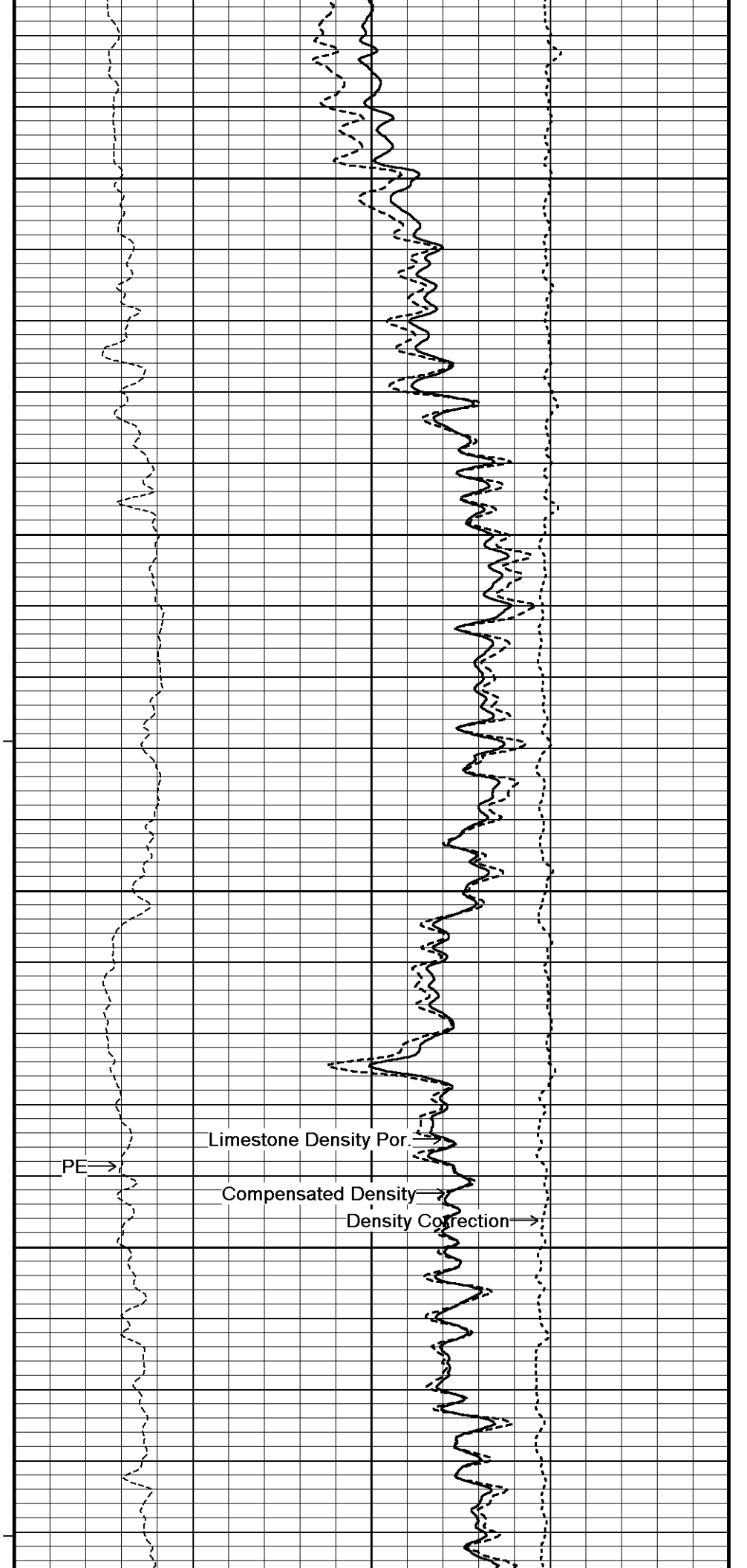
6950

7000

7050

7100

400

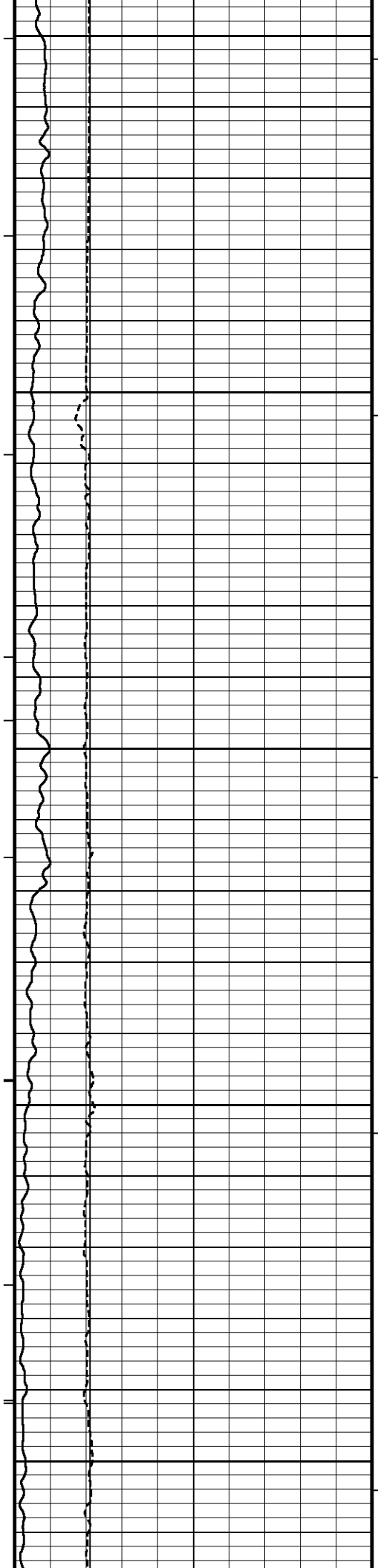


PE

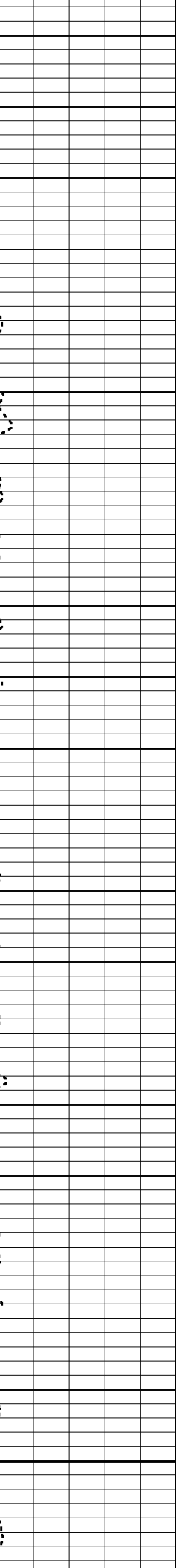
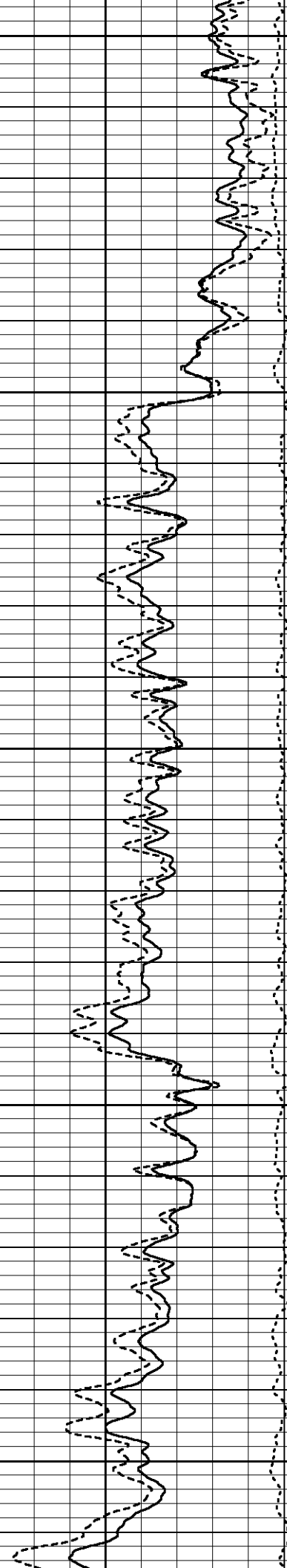
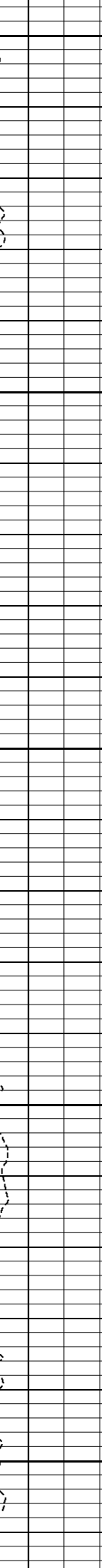
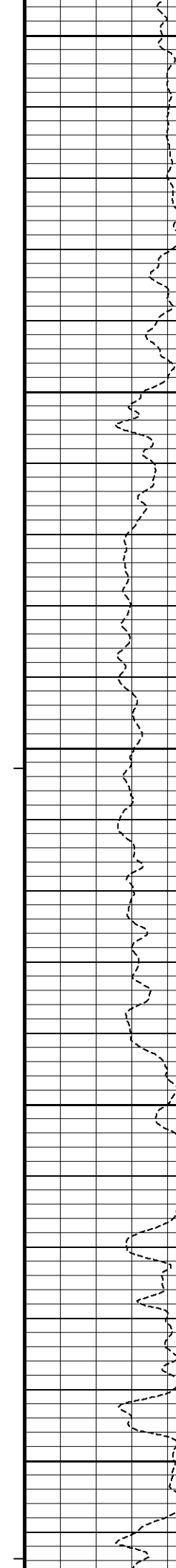
Limestone Density Por

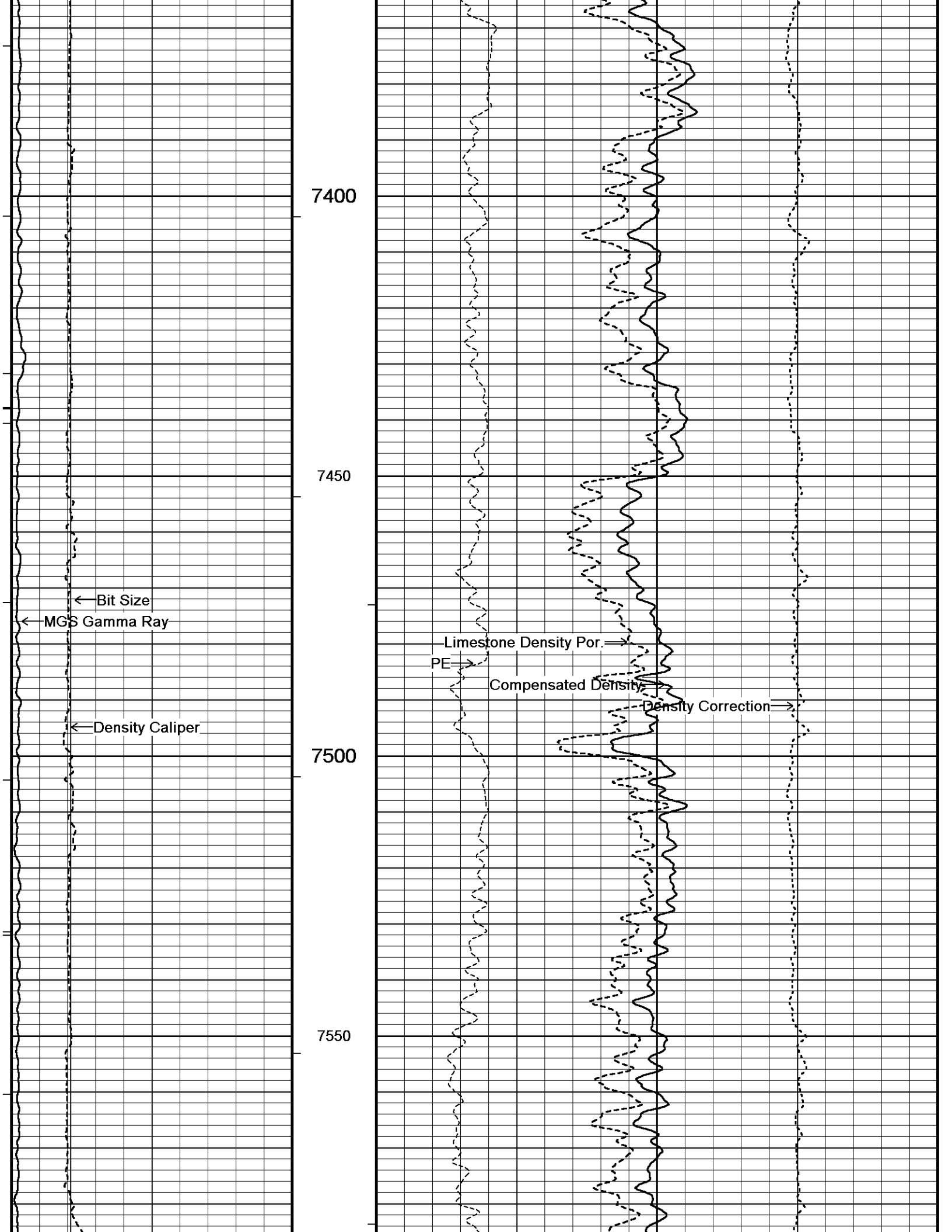
Compensated Density

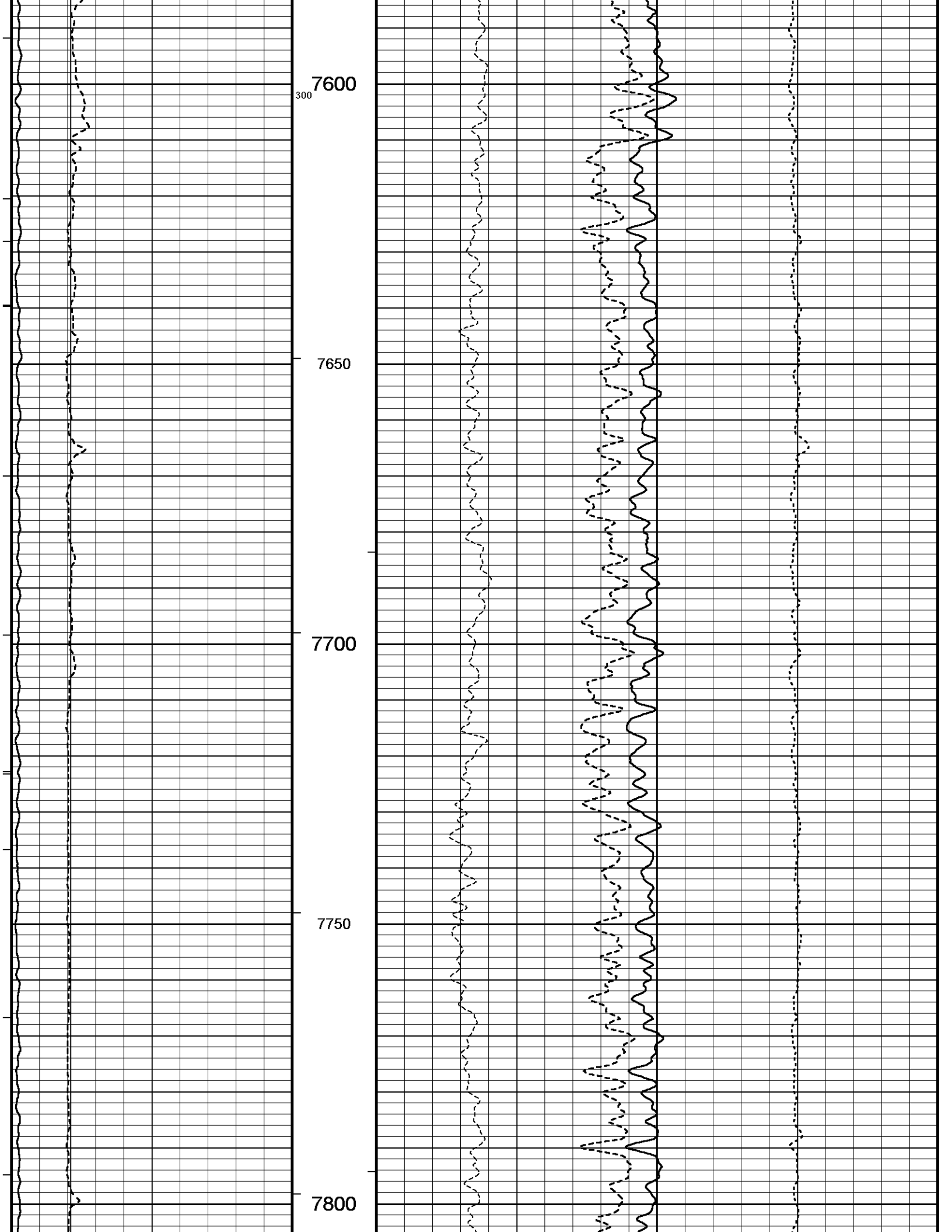
Density Correction

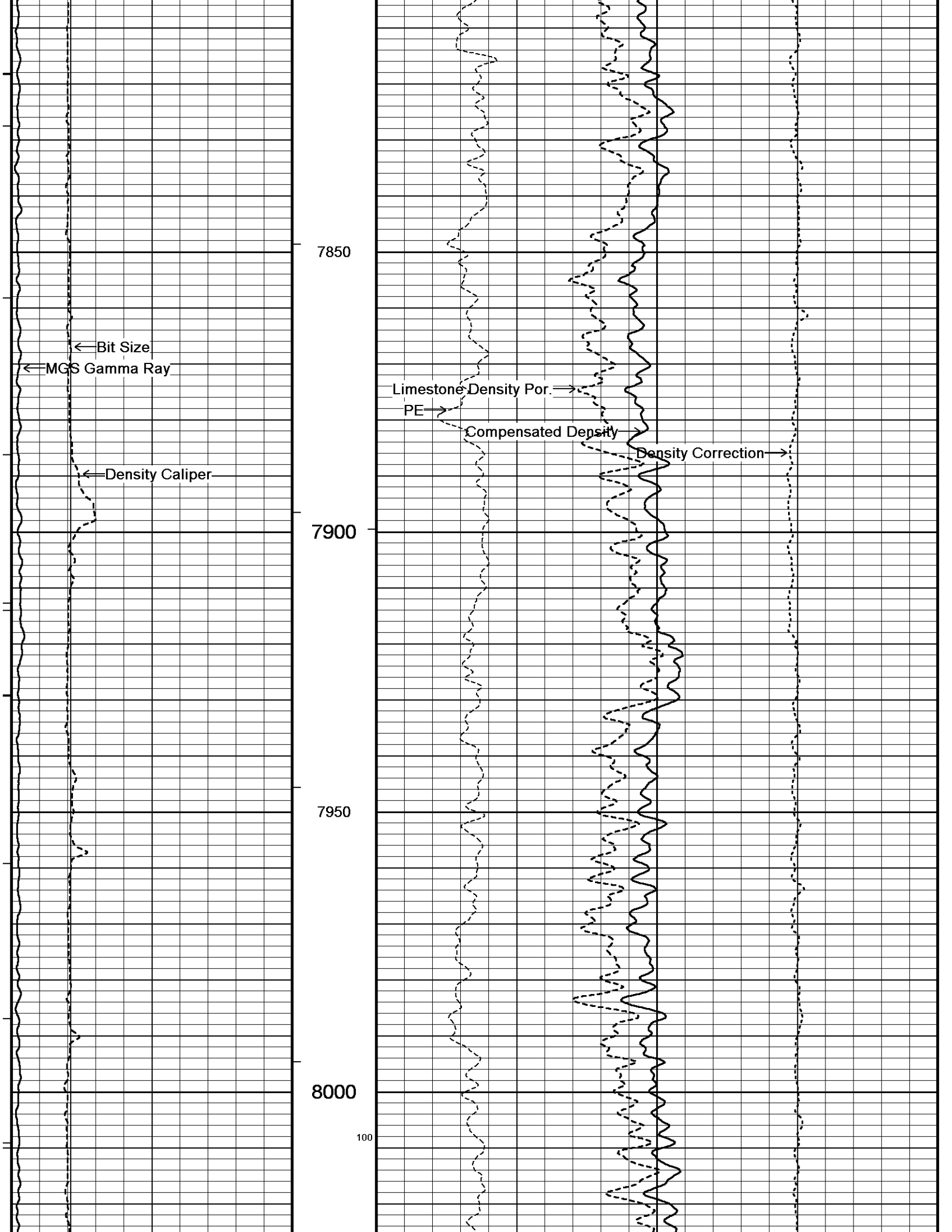


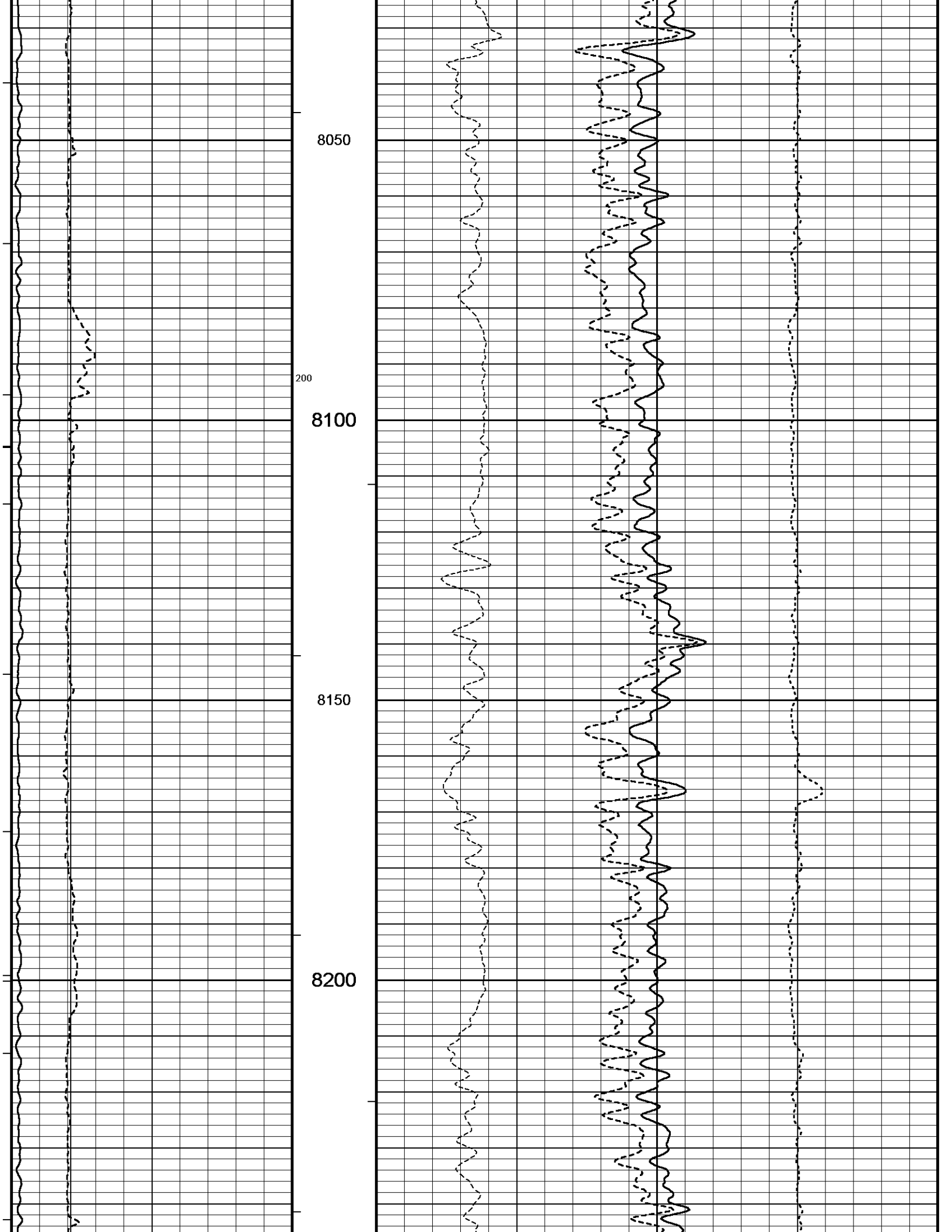
7150
7200
7250
7300
7350

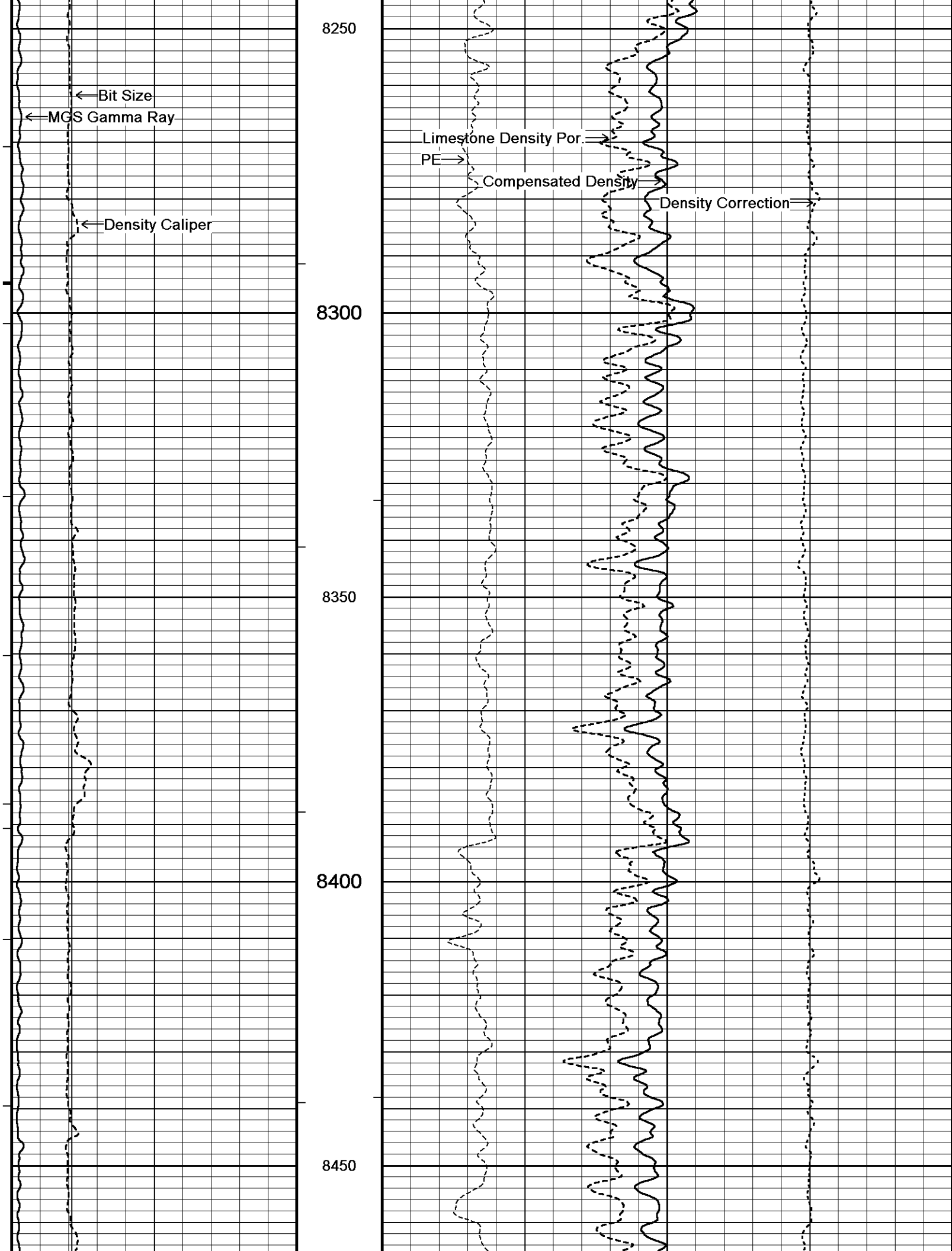


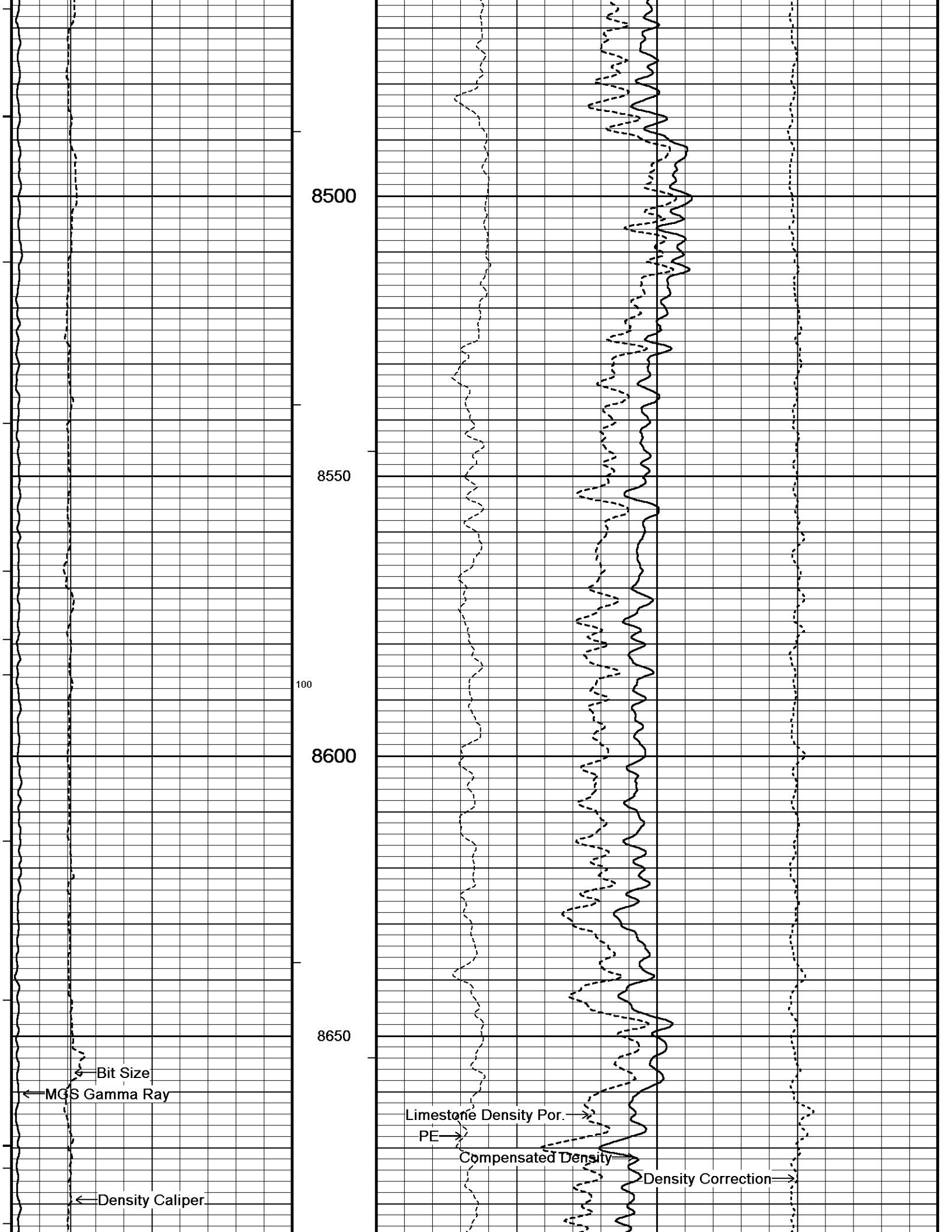


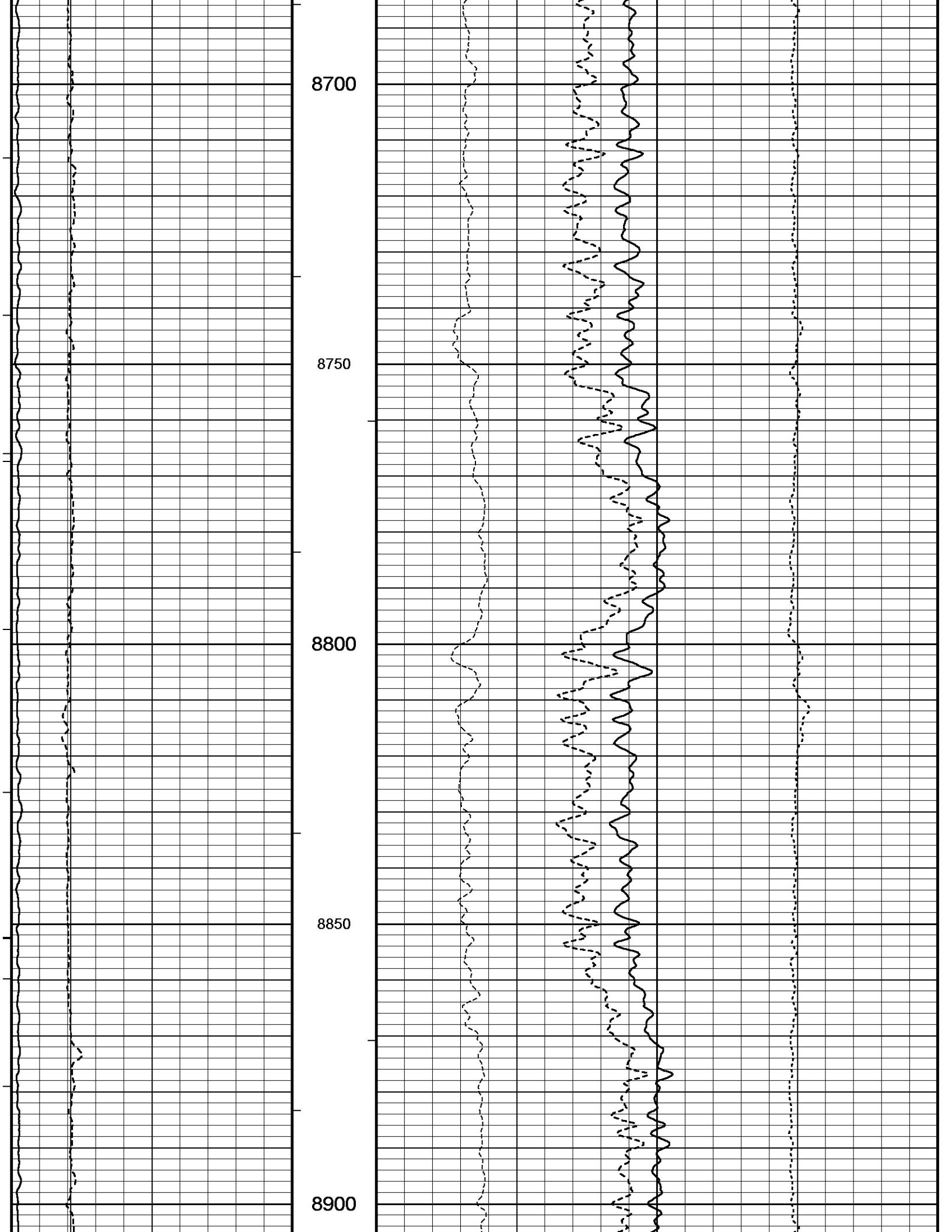


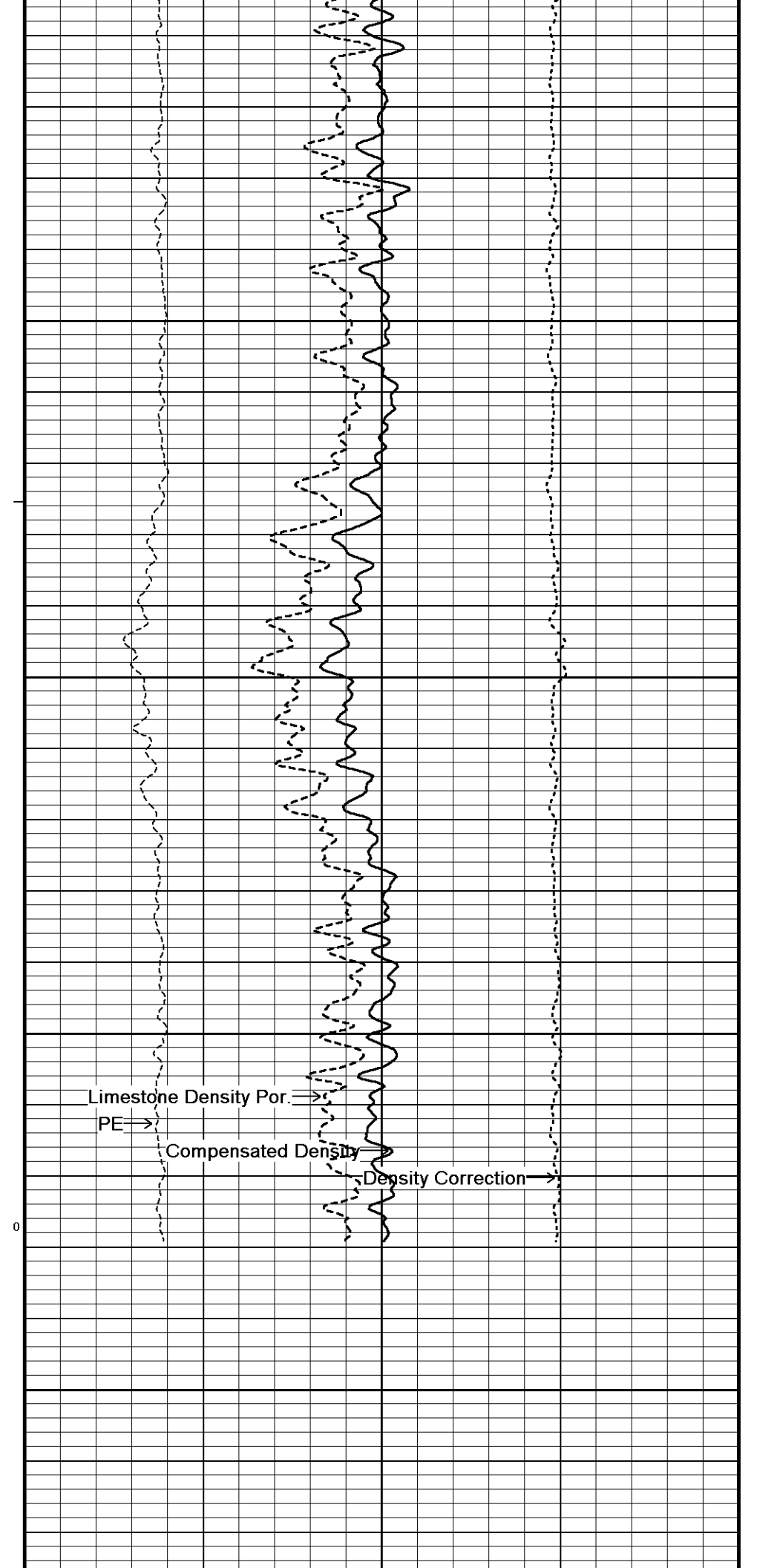
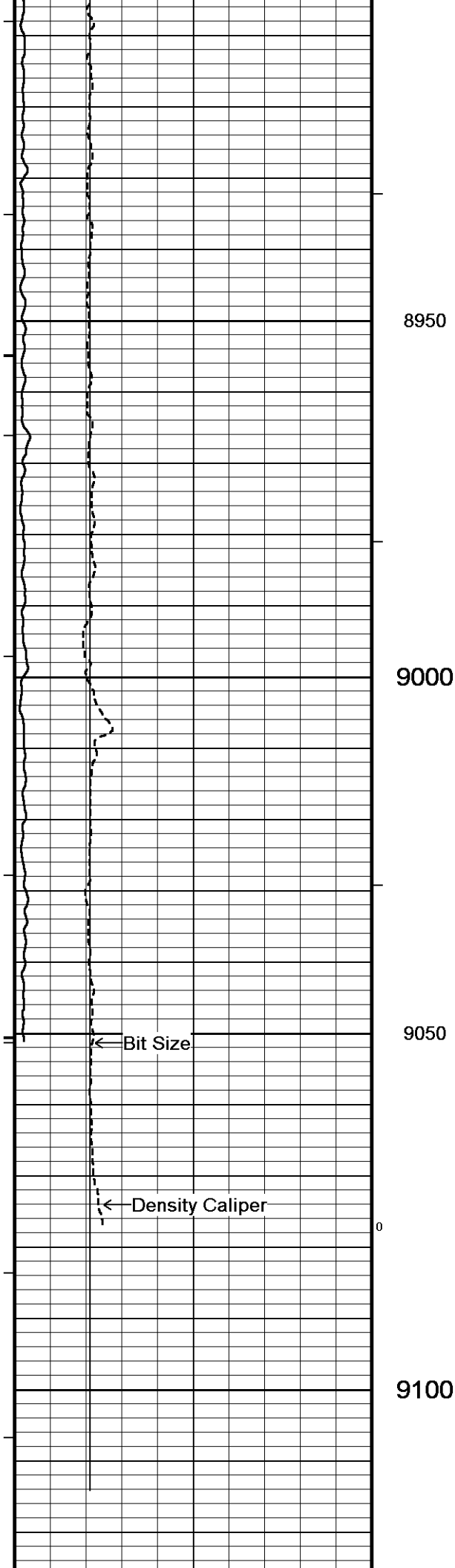












0.0	0.069	0.073	0.062	0.063	0.042	0.021	0.021
3000.0	5.240	5.253	5.235	5.245	5.219	5.228	5.199
6000.0	10.422	10.442	10.421	10.439	10.408	10.425	10.388
9000.0	15.616	15.637	15.619	15.638	15.609	15.627	15.593
12000.0	20.827	20.839	20.834	20.843	20.828	20.838	20.815
15000.0	26.051		26.060		26.056		26.046
SP Calibration MGS-C.J 142							
		Measured		Calibrated (mV)		Field Calibration on 18-JAN-2013,11:54	
Reference 1		100.0		100.0			
Reference 2		-100.0		-100.0			
High Resolution Temperature Calibration MGS-C.J 142							
		Measured		Calibrated(Deg F)		Field Calibration on 18-JAN-2013,11:54	
Lower		0.00		0.00			
Upper		0.00		0.00			
High Resolution Temperature Constants MGS-C.J 142							
						Last Edited on 18-JAN-2013,11:54	
Pre-filter Length			11				
Gamma Calibration MGS-C.J 142							
		Measured		Calibrated (API)		Field Calibration on 18-FEB-2013 10:05	
Background		40		15			
Calibrator (Gross)		1868		711			
Calibrator (Net)		1828		696			
Gamma Constants MGS-C.J 142							
						Last Edited on 31-JAN-2013,15:26	
Gamma Calibrator Number			036				
Mud Density			1.02	gm/cc			
Caliper Source for Processing		Density Caliper					
Tool Position		Eccentred					
Concentration of KCl			0.00	kppm			
Neutron Calibration MDN-B.J 391							
						Base Calibration on 04-FEB-2013 09:37	
Base Calibration						Field Check on 27-FEB-2013 20:44	
		Measured		Calibrated (cps)			
	Near	Far		Near	Far		
	3127	94		3714	110		
Ratio		33.324		33.764			
Field Calibrator at Base				Calibrated (cps)			
				2292	3445		
Ratio				0.665			
Field Check				Calibrated (cps)			
Ratio				0.661			
Neutron Constants MDN-B.J 391							
						Last Edited on 27-FEB-2013,20:38	
Neutron Source Id			N1055				
Neutron Jig Number			N639				
Epithermal Neutron			No				
Caliper Source for Processing		Bit Size					
Stand-off			0.00	inches			
Mud Density			1.02	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			20.00	degrees F			
Mud Salinity			4.40	kppm			
Salinity Correction		Not Applied					
Formation Fluid Salinity Source			None				
Formation Fluid Salinity			N/A	kppm			

FE Calibration MFE-A.A 134

Base Calibration on 06-JAN-2013,21:47

Field Check on 27-FEB-2013 20:23

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	972.5	126.8
Base Check		279.1
Field Check		278.9

FE Constants MFE-A.A 134

Last Edited on 27-FEB-2013,20:22

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-A.A 170

Field Calibration on 14-JAN-2013,12:49

	Measured	Calibrated(Deg F)
Lower	0.00	10.00
Upper	100.00	100.00

High Resolution Temperature Constants MAI-A.A 170

Last Edited on 18-FEB-2013,09:48

Pre-filter Length	11
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Induction Calibration MAI-A.A 170

Base Calibration on 02-FEB-2012 17:42

Field Check on 27-FEB-2013 20:21

Base Calibration

Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel		Low	High	Low	High
1		17.7	487.1	9.3	966.2
2		6.2	384.7	7.6	821.4
3		3.7	266.1	5.2	566.0
4		2.2	136.5	2.6	279.2

Array Temperature	72.1	Deg F
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Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			10.0	3750.8
2			29.5	3528.7
3			27.3	2996.6
4			18.5	2042.3
Deep			15.5	1905.0
Medium			41.1	3980.7
Shallow			45.7	5289.9

Array Temperature	40.0	Deg F
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Induction Constants MAI-A.A 170

Last Edited on 01-MAR-2013,00:15

Induction Model	RtAP-WBM	
Caliper for Borehole Corr.	Bit Size	
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

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 166

Base Calibration on 02-JAN-2013 13:59

Field Calibration on 24-JAN-2013 18:30

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13888	4.02
2	22271	6.00
3	30944	8.03
4	38940	10.02
5	48352	12.01
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.12	6.00

Photo Density Calibration MPD-B 166

Base Calibration on 27-FEB-2013,20:31

Field Check on 27-FEB-2013 20:38

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	49795	21888	59869	31110
Reference 2	20626	2381	24557	2522

Field Check at Base

1172.4	1342.2
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Field Check

1168.8	1343.5
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PE Calibration

Base Calibration	Measured		Calibrated
	WS	WH	Ratio
Background	212	1049	
Reference 1	20253	49611	0.413
Reference 2	5714	20492	0.283
			0.369
			0.271

Field Check at Base

211.9	1049.4
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Field Check

212.6	1049.0
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Density Constants MPD-B 166

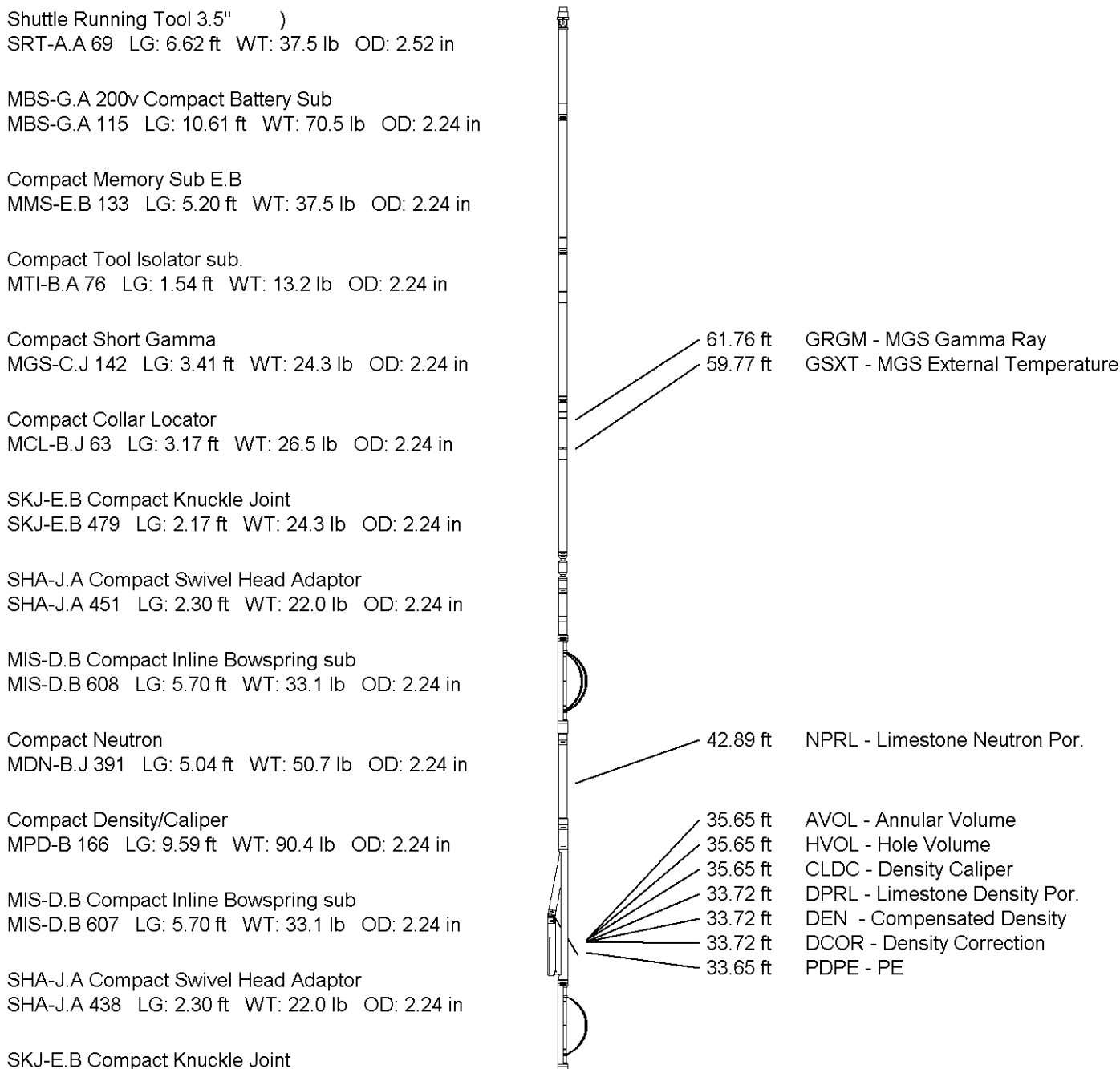
Last Edited on 05-JAN-2013,01:11

Density Source Id	236
Nylon Calibrator Number	633
Aluminium Calibrator Number	633
Density Shoe Profile	4 inch

Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.01	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	

DOWNHOLE EQUIPMENT

C:\DATA_13_04_8492\SANDRIDGE 4J RANCH 3408 1-33HIRTAP 4J RANCH DEPTH.dta



SKJ-E.B 478 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub

MIS-E.B 597 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Focussed Electric

MFE-A.A 134 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub

MIS-E.B 596 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction

MAI-A.A 170 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 88.36 ft Weight: 637.1 lb



3.34 ft CTAF - Array Ind. Four Cond Ct
3.34 ft R20F - Array Ind. Four Res 20
3.34 ft R60F - Array Ind. Four Res 60
3.34 ft R40F - Array Ind. Four Res 40
3.34 ft R30F - Array Ind. Four Res 30
3.34 ft R85F - Array Ind. Four Res 85
3.34 ft RTAF - Array Ind. Four Res Rt
Tool Zero (1.84ft from bottom)
All measurements relative to tool zero.

COMPANY	SANRIDGE ENERGY
WELL	4J RANCH 3408 #1-33H
FIELD	BOUSE
PROVINCE/COUNTY	HARPER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1262.00	feet	First Reading	9076.00	feet
Elevation Drill Floor	1262.00	feet	Depth Driller	9138.00	feet
Elevation Ground Level	1246.00	feet	Depth Logger	9138.00	feet



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COMPACT PHOTO DENSITY
COMPENSATED NEUTRON LOG