

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

COMPANY

WHITTING OIL AND GAS CORPORATION

WELL

RAZOR 21A-2814B

FIELD

WILDCAT

PROVINCE/COUNTY WELD

COUNTRY/STATE

U.S.A. / COLORADO

LOCATION

SHL: 405' FNL & 661' FEL

SEC 21

TWP 10N

RGE 58W

Other Services
MAI
CMI

API Number

05-123-37854

Permanent Datum G.L., Elevation 4833 feet

Log Measured From KB

Drilling Measured From K.B. @ 17.3 FEET

Date

19-SEP-2013

Elevations:
KB 4850.30
DF 4849.30
GL 4833.00

Run Number

ONE

Service Order

3535723

Depth Driller

12721.00 feet

Depth Logger

12721.00 feet

First Reading

12644.00 feet

Last Reading

6203.00 feet

Casing Driller

6203.00 feet

Casing Logger

6203.00 feet

Bit Size

6.000

inches

Hole Fluid Type

WBM

Density / Viscosity

9.30 lb/USg 46.00 CP

PH / Fluid Loss

8.00 4.80 ml/30Min

Sample Source

FLOWLINE

Rm @ Measured Temp

1.70 @ 70.0 ohm-m

Rmf @ Measured Temp

1.28 @ 70.0 ohm-m

Rmc @ Measured Temp

2.55 @ 70.0 ohm-m

Source Rmf / Rmc

CALC CALC

Rm @ BHT

0.59 @ 207.0 ohm-m

Time Since Circulation

1 HOUR

Max Recorded Temp

207.00 deg F

Equipment / Base

18088 OKC

Recorded By

M. JOHNSON

Witnessed By

P. BUCKNAM

BOREHOLE RECORD

Last Edited: 19-SEP-2013 15:57

Bit Size
inches

6.000

Depth From
feet

6203.00

Depth To
feet

12721.00

CASING RECORD

Type

Size
inches

7.000

Depth From
feet

0.00

Shoe Depth
feet

6203.00

Weight
pounds/ft

26.00

REMARKS

LOGGED WITH WLS 13.06.9804

LOGGED USING MESSENGER SHUTTLE METHOD OF DEPLOYMENT

TOOLS RAN: SRT-67, SKJ-589, MBS 1, MBS 2, 200V MBS-134, MMSE174, MTI-55, MGS-170, MCL-064, SKJ-348, SHA-635, MIS-768, MDN-214, MPD-497, MIS-770, SHA-579, SKJ-657, MIS-023, MIM-263, MIE 263, MIS-276, SKJ-654, MAI-494 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 MP

2.71 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST

LONGITUDE: -103.863442

LATITUDE: 40.830067

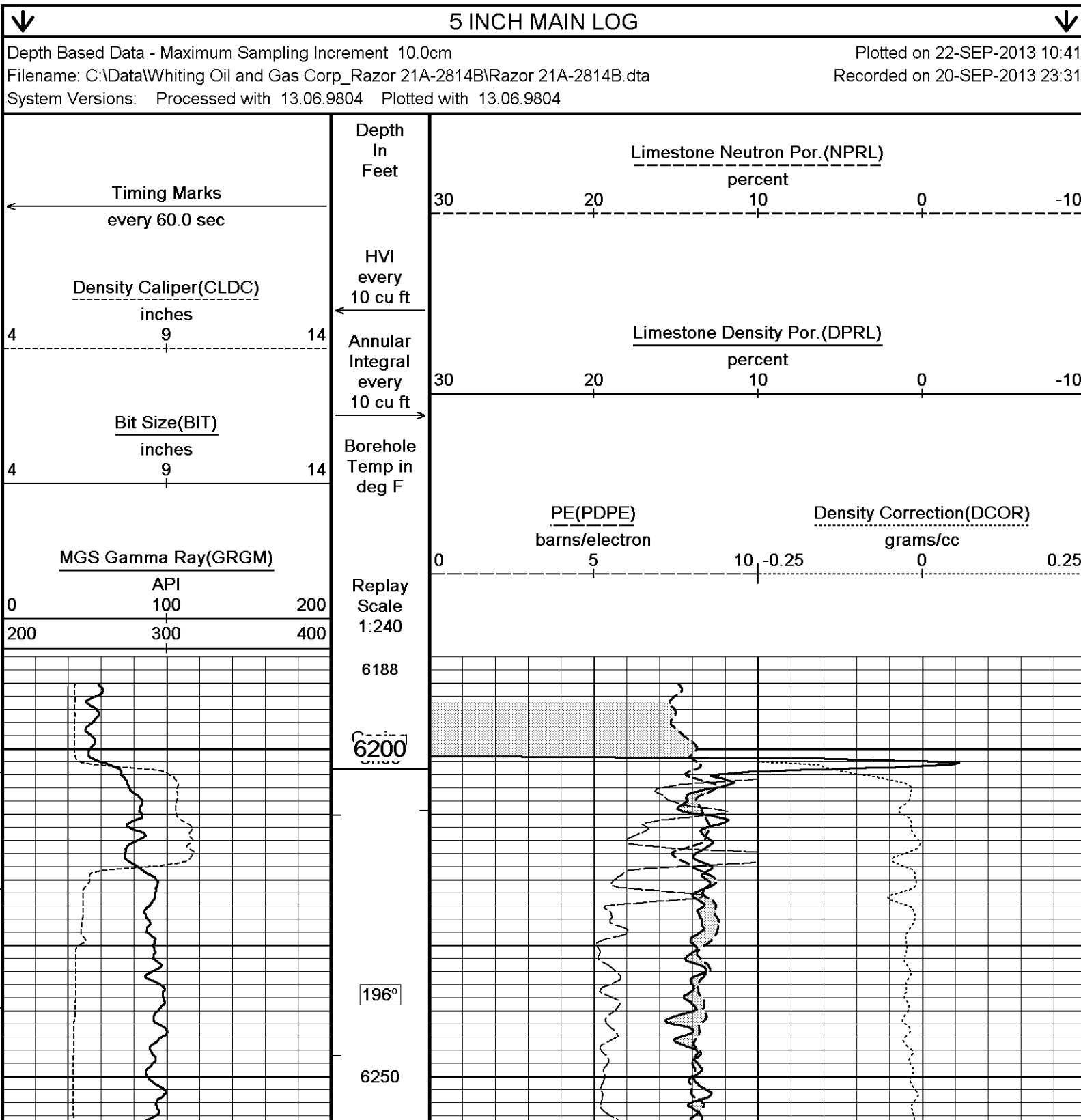
DATE: 10/06/2013

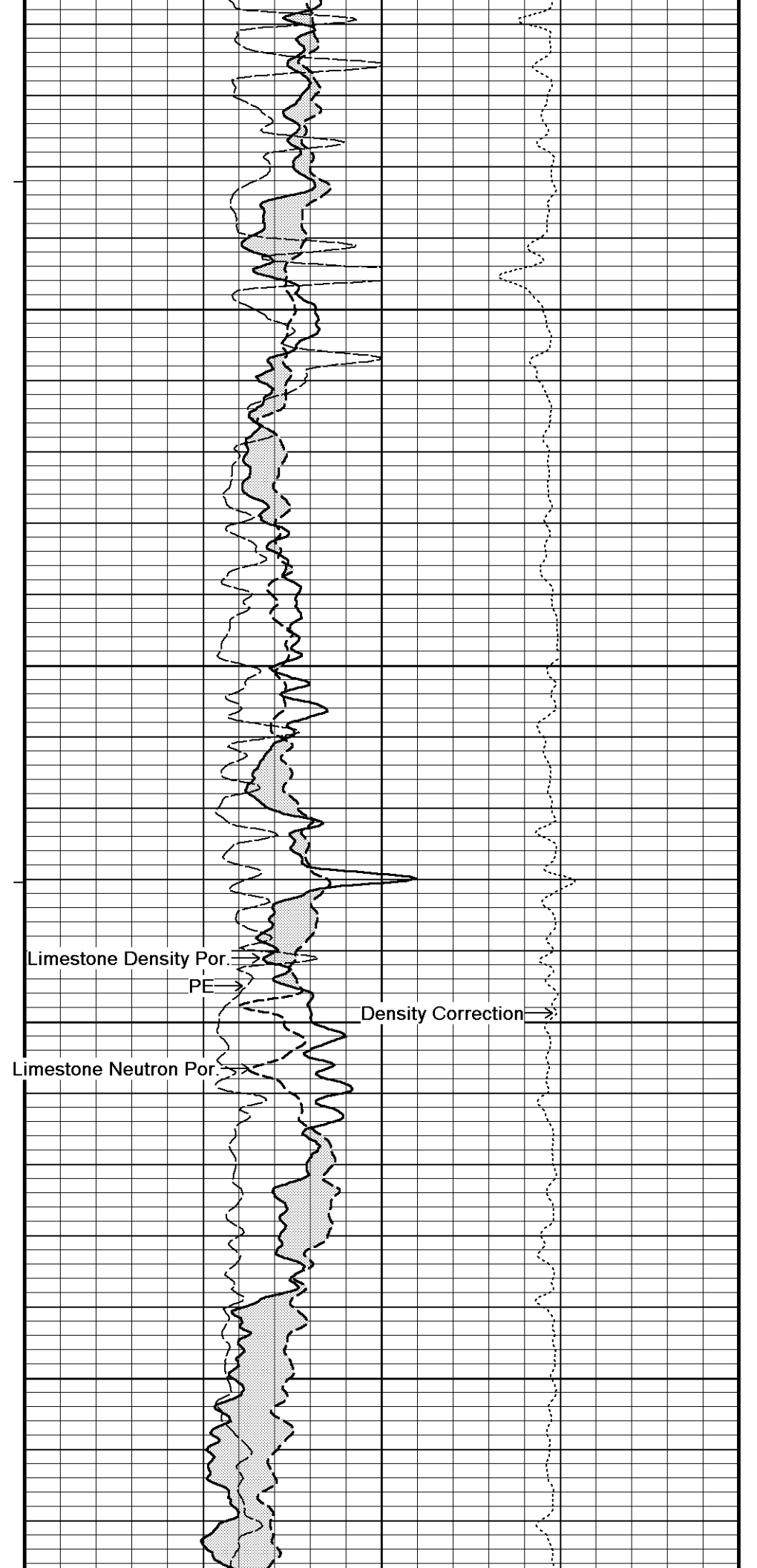
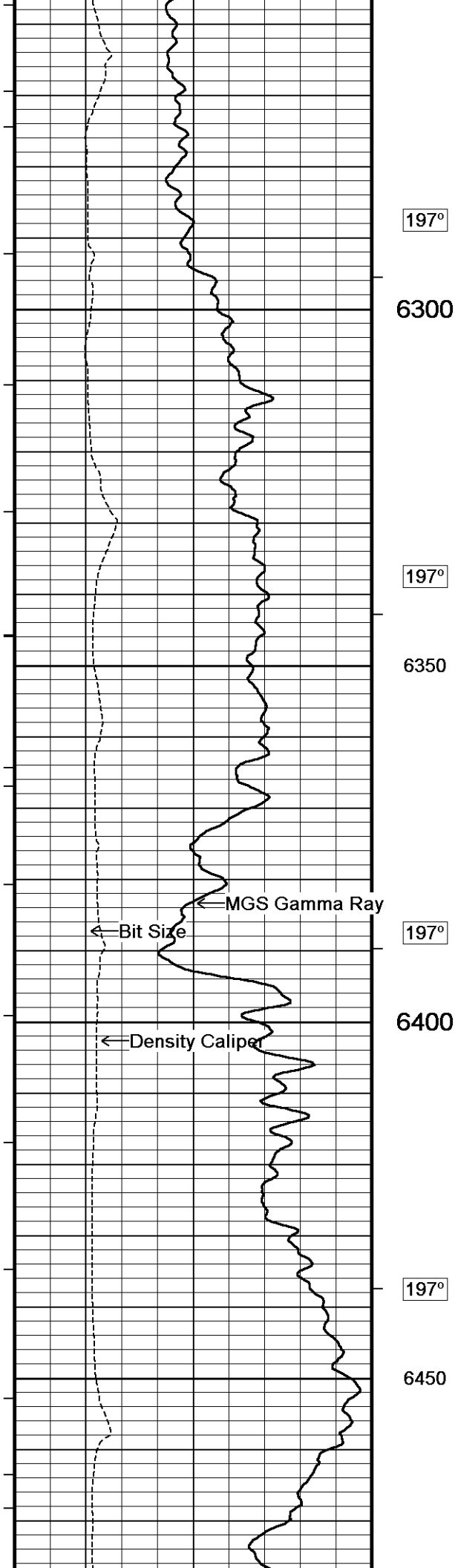
DRILL PIPE DEPTH DURING DEPLOYMENT: 12590
LOGGING TOOL DEPTH AFTER DEPLOYMENT: 12692

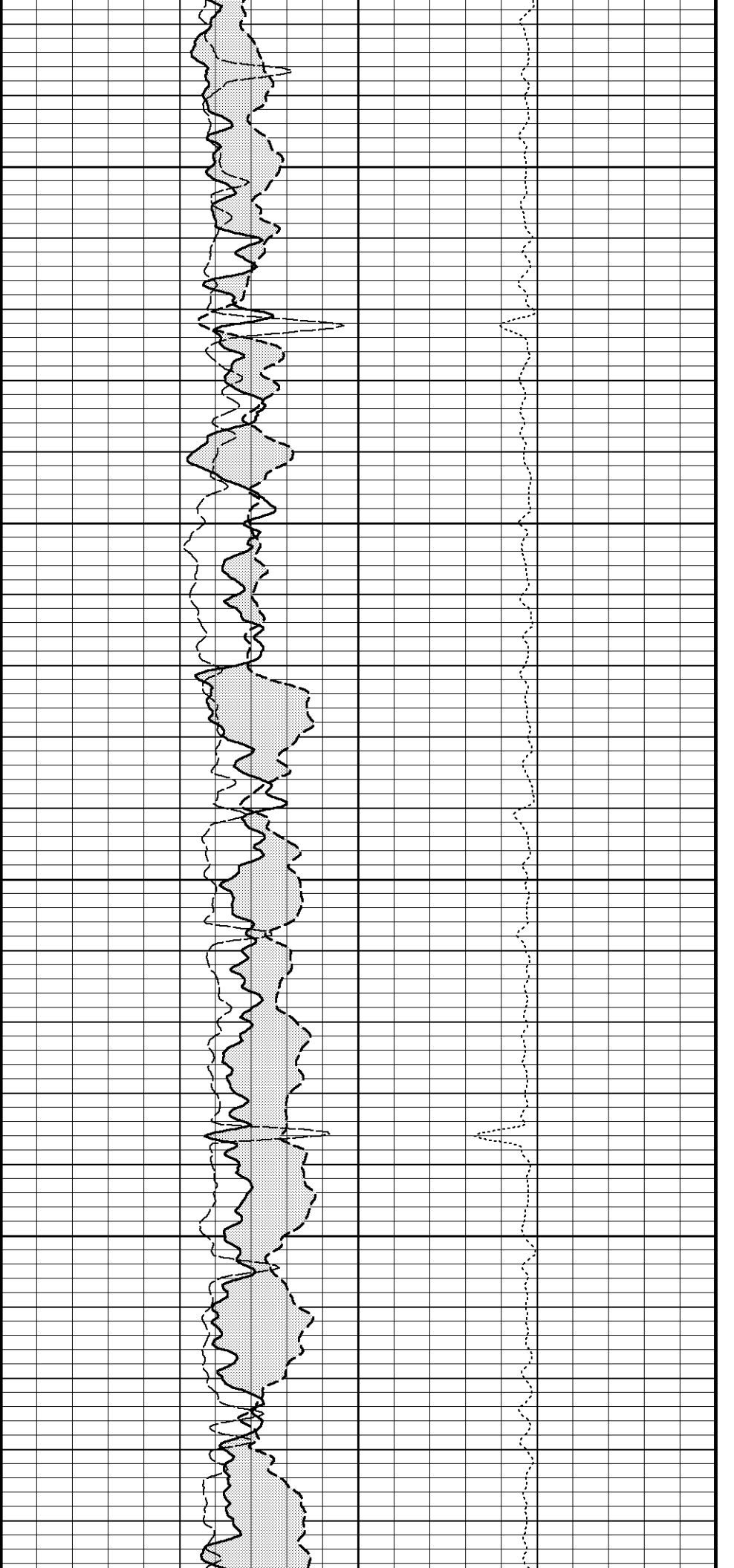
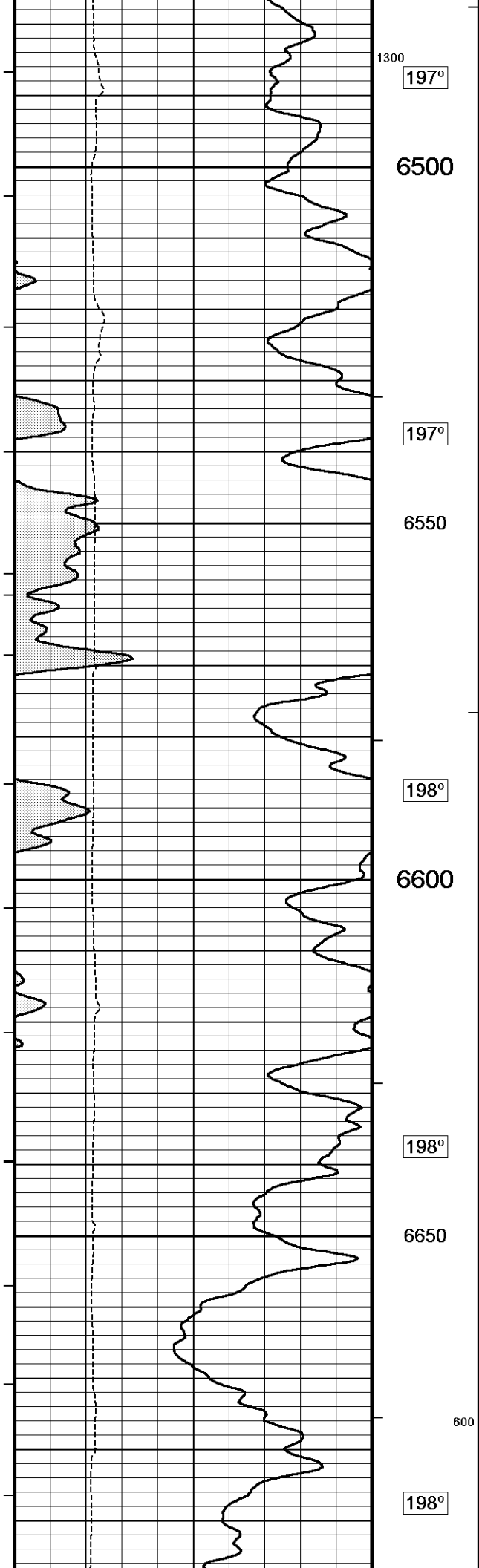
OPERATORS: W. WILLIAMS, T. WILLIAMS

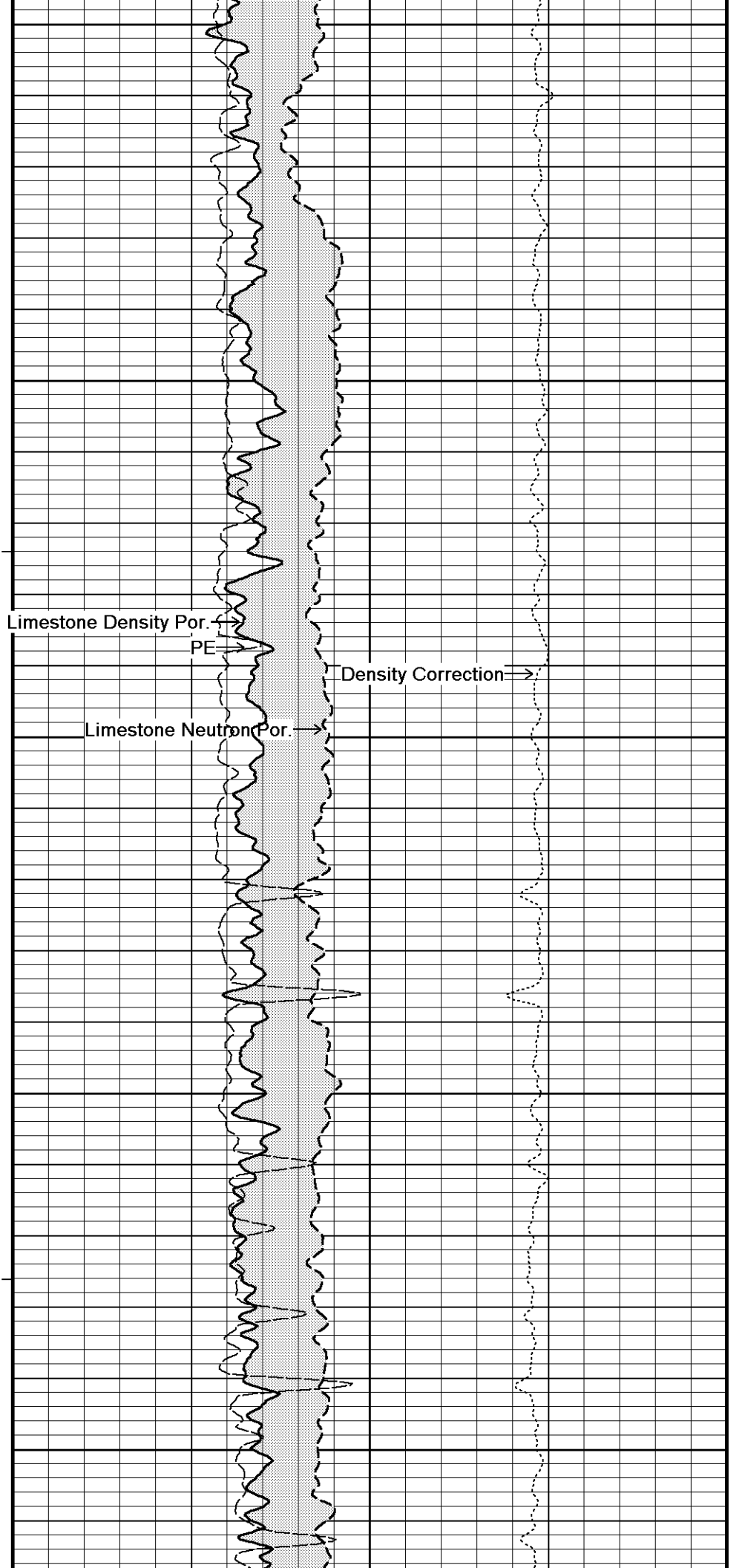
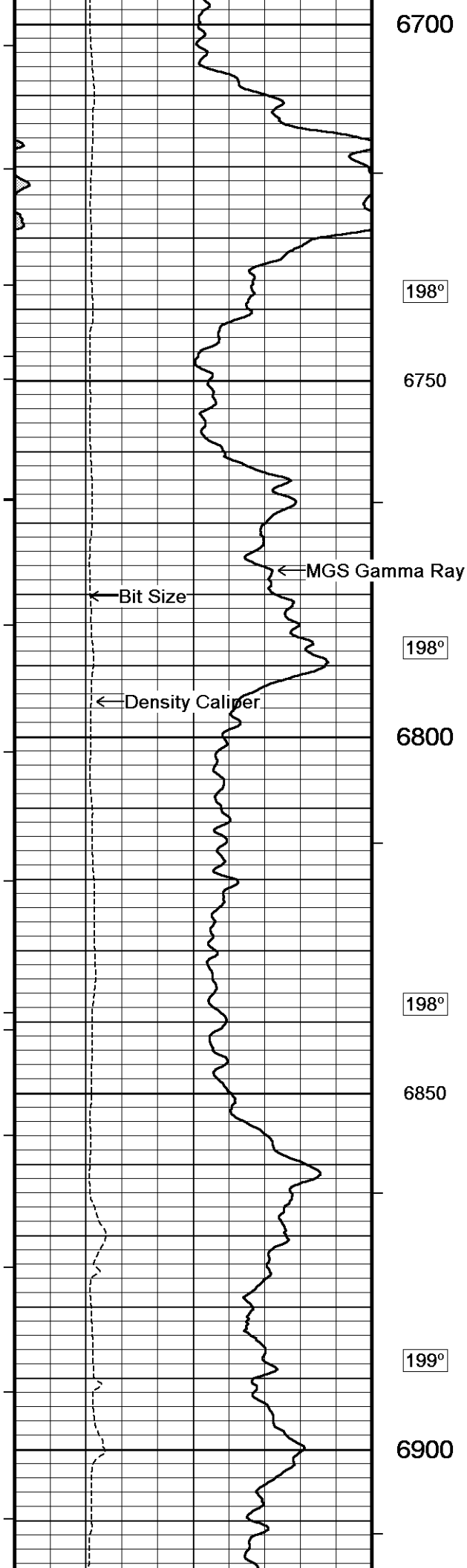
RIG: CADE DRILLING 21

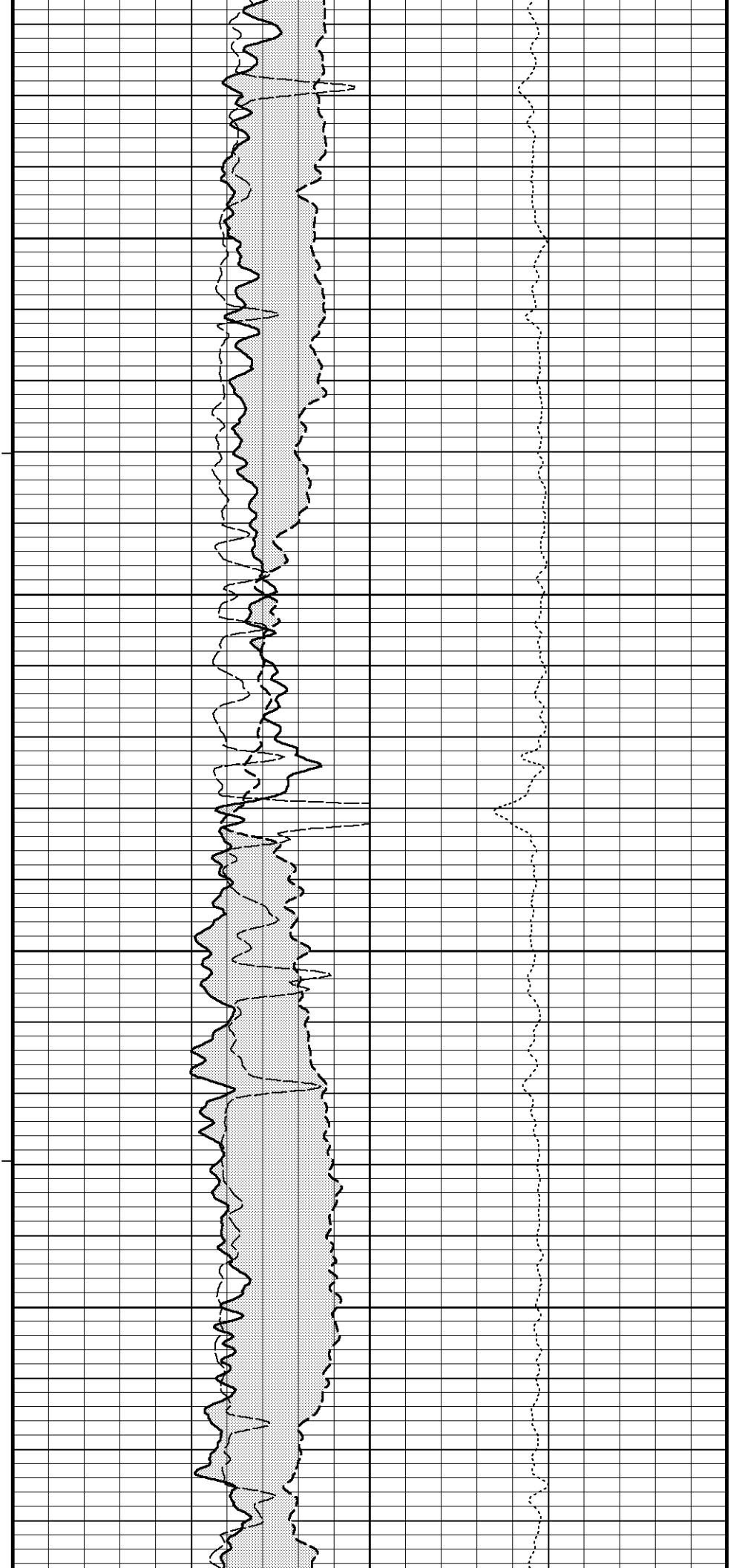
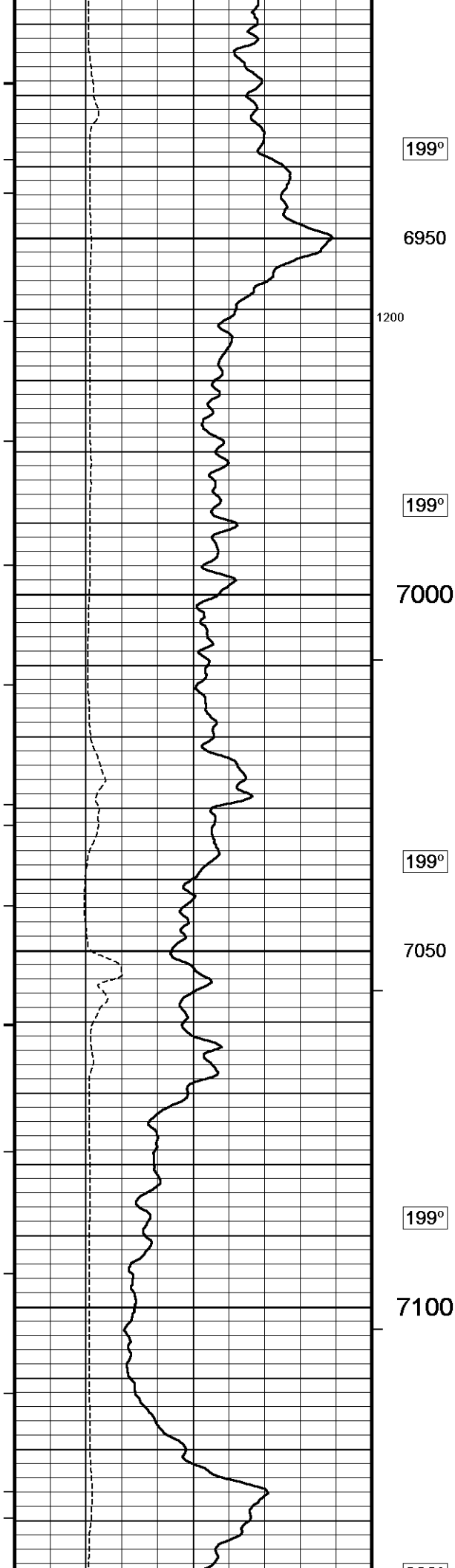
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

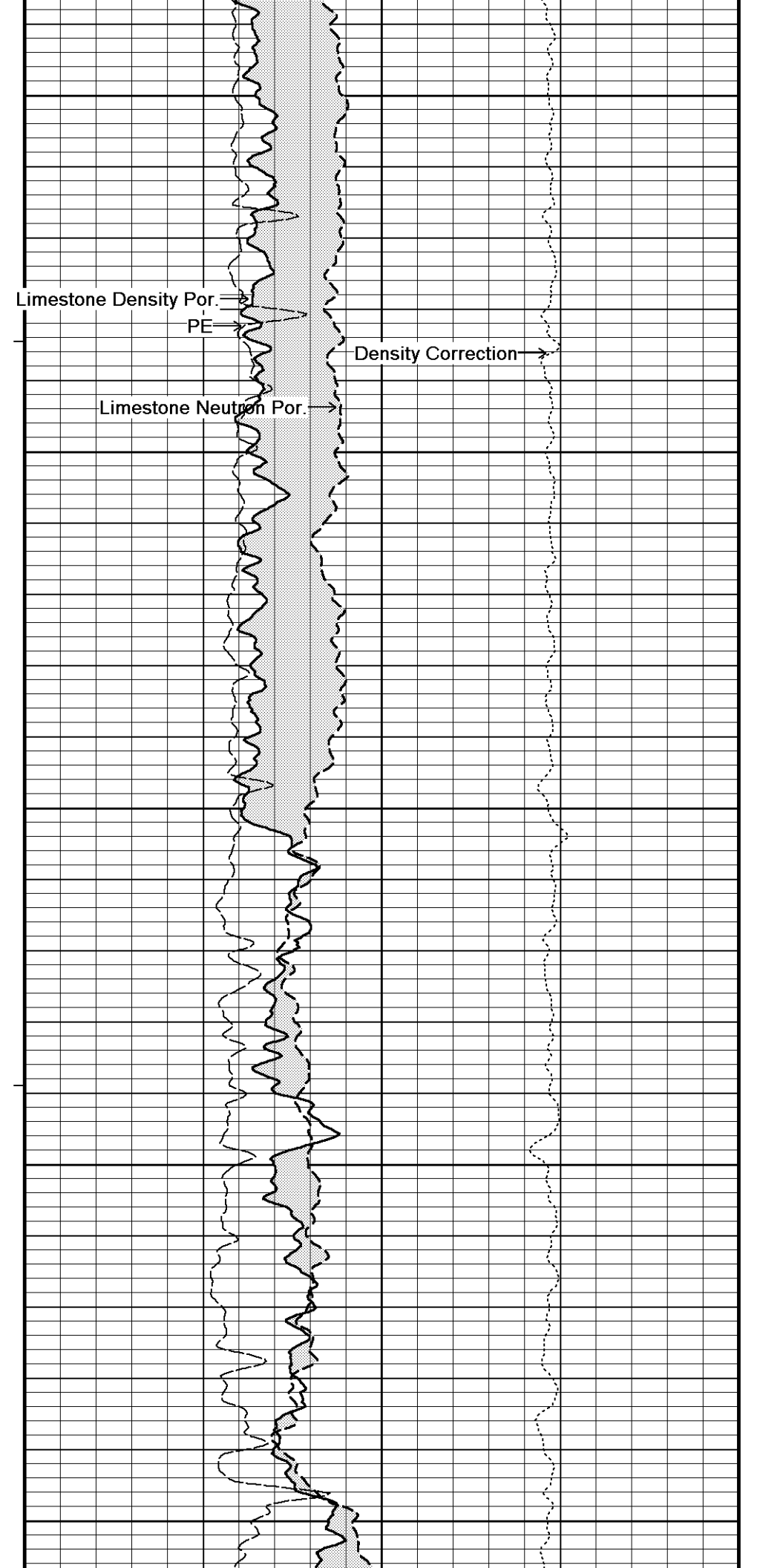
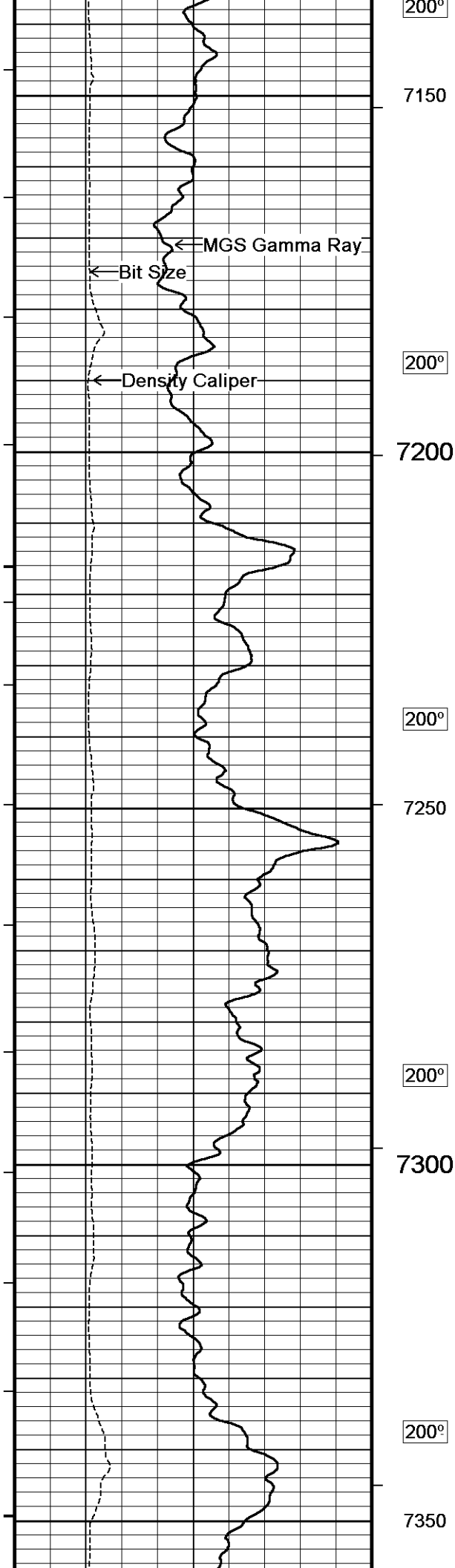


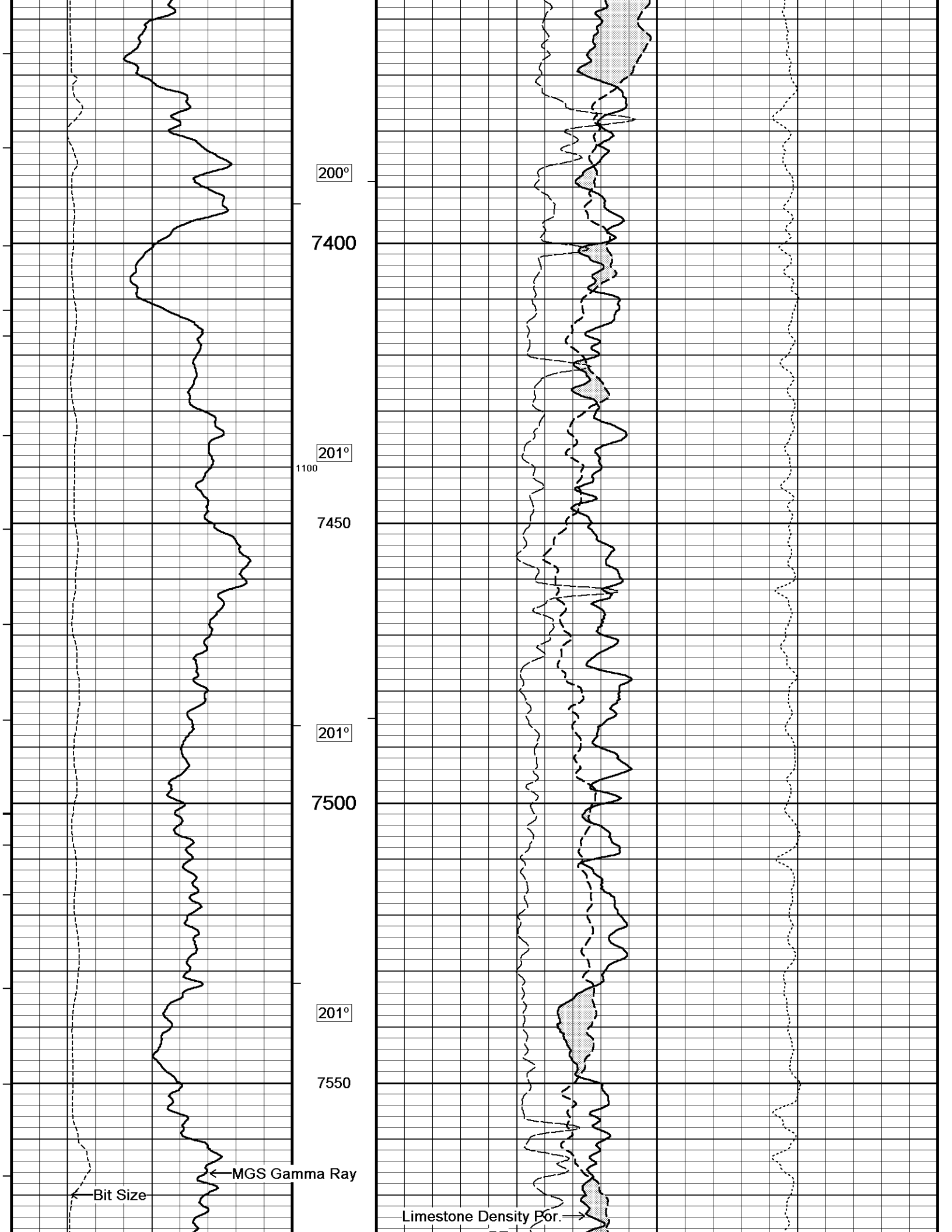


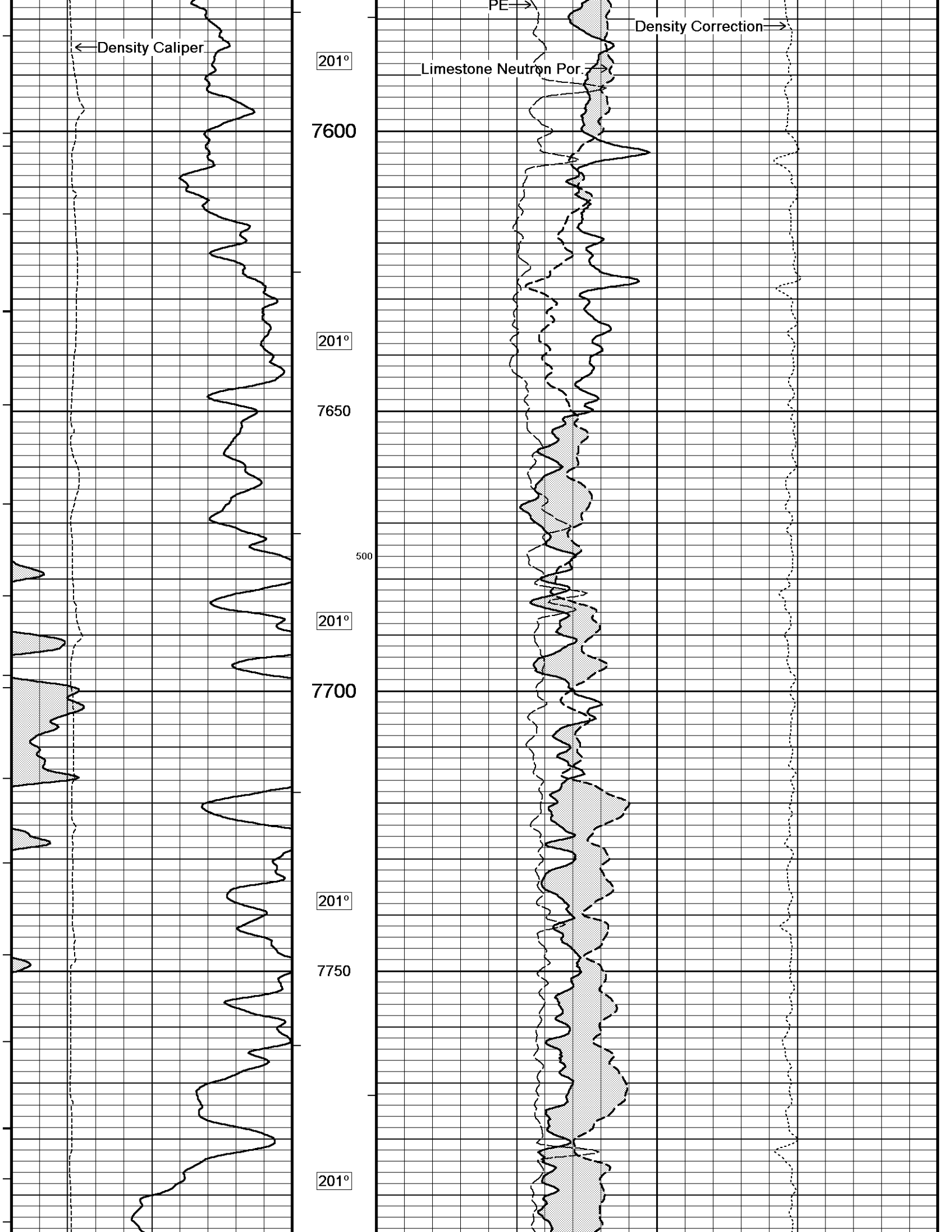


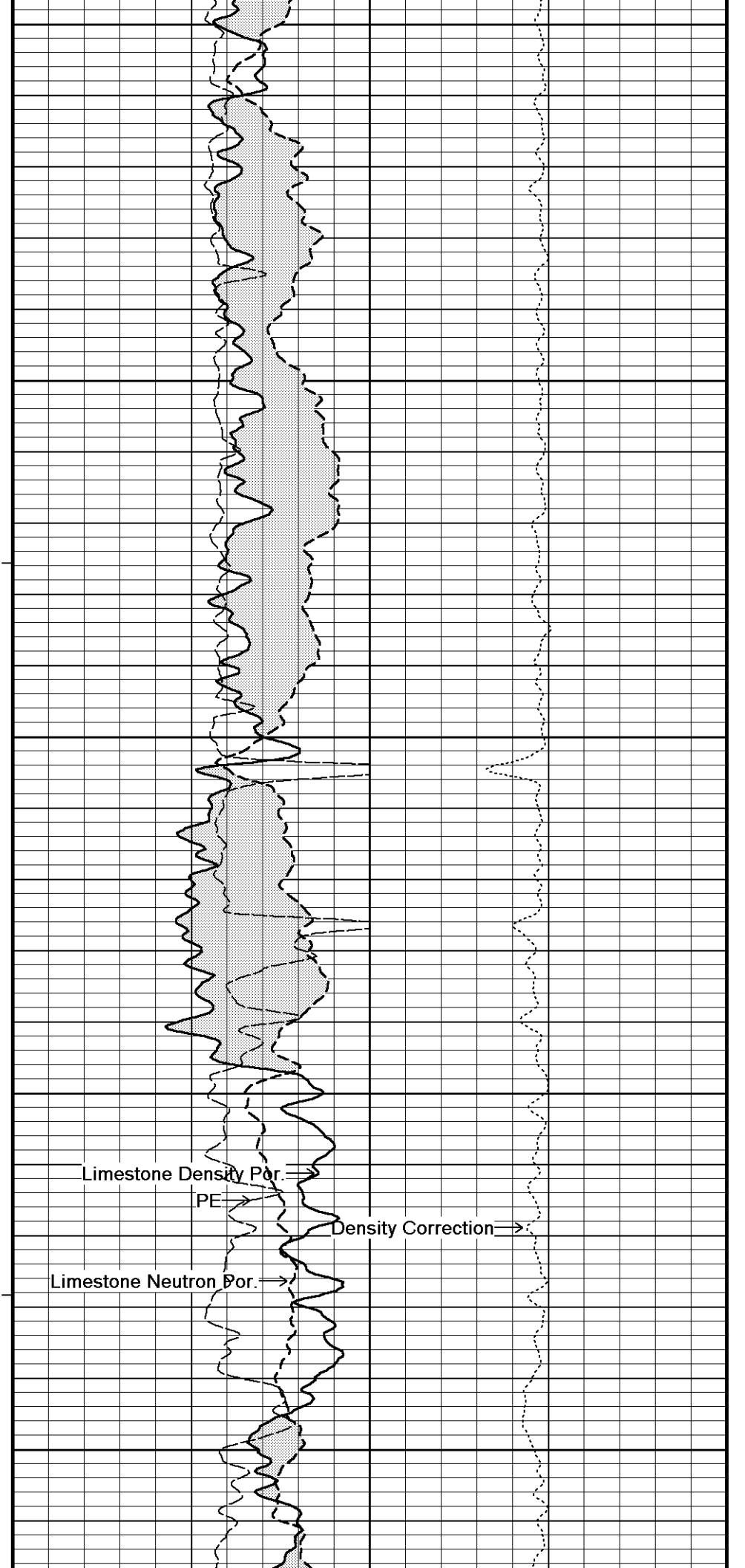
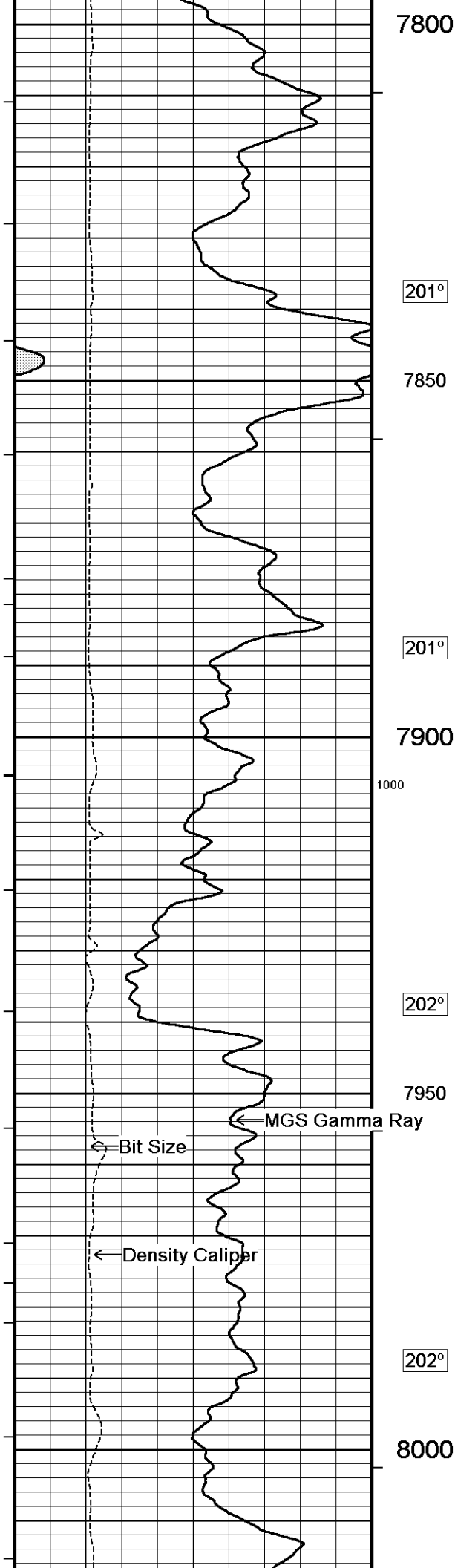


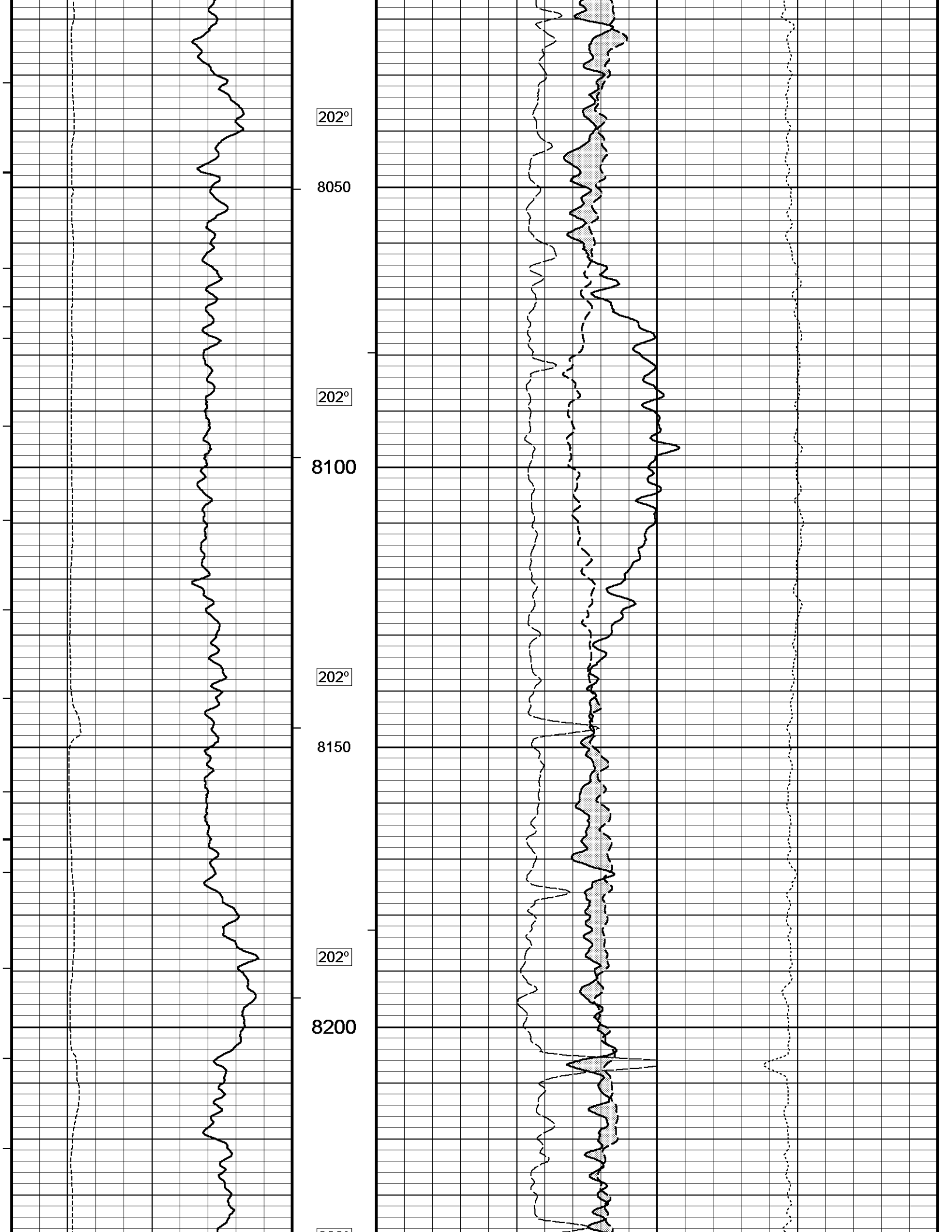


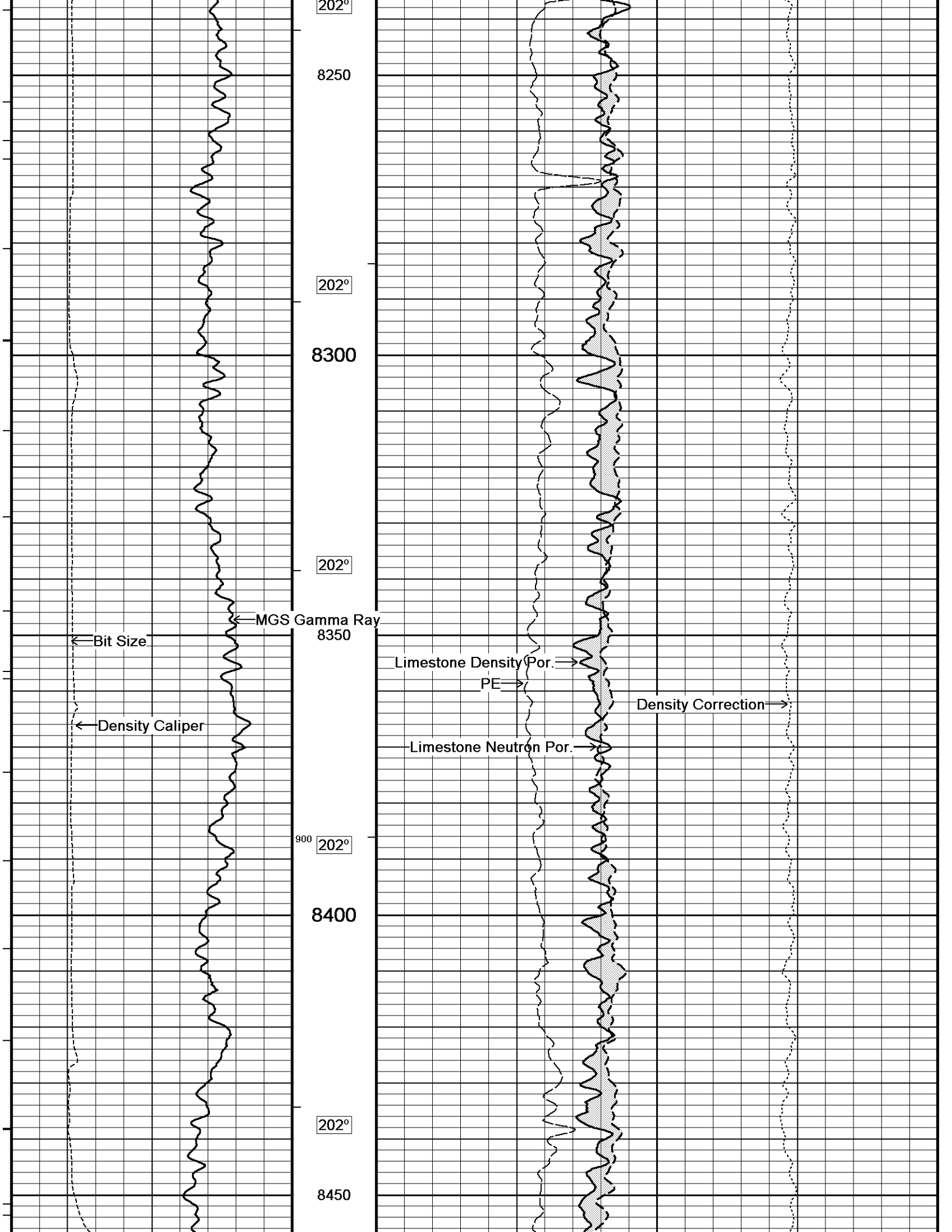


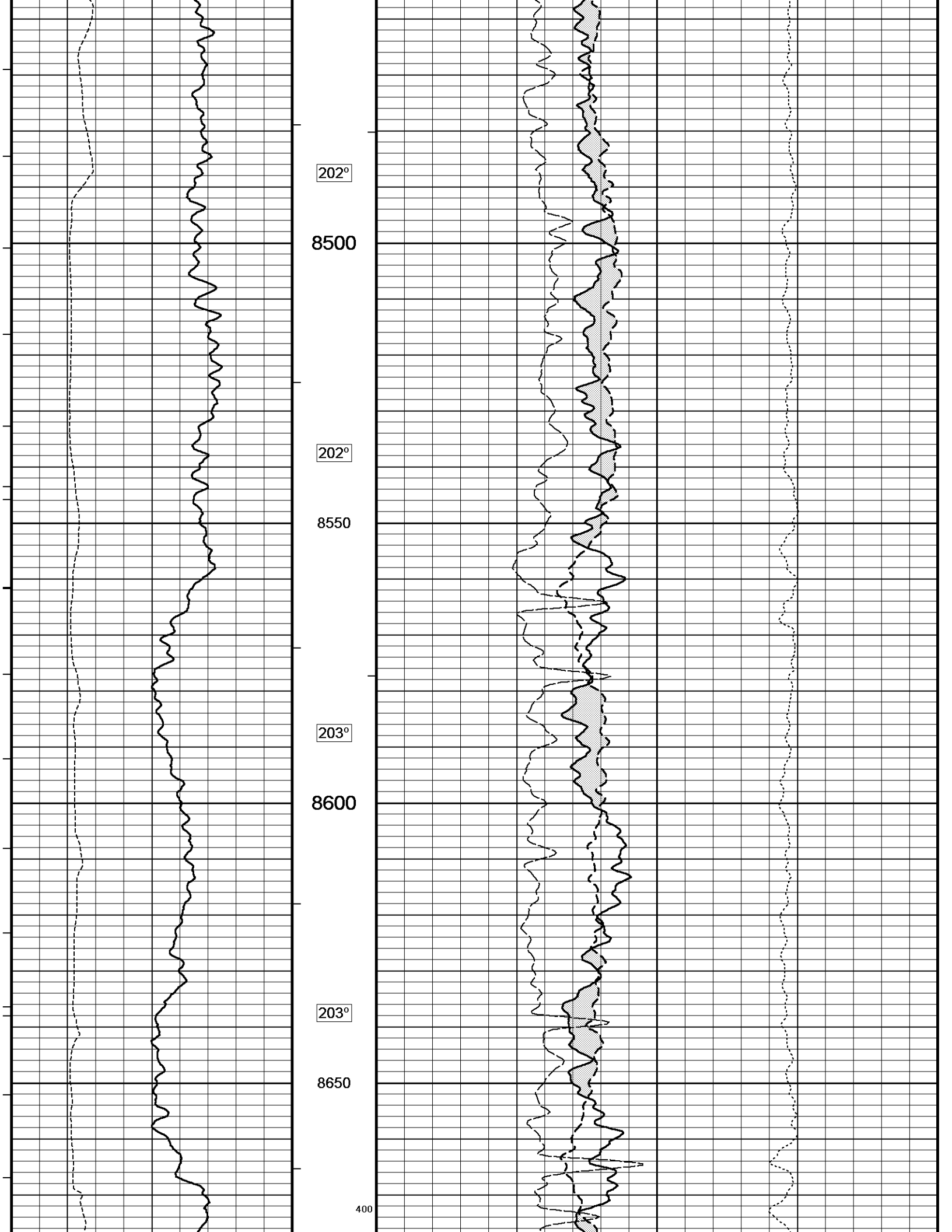


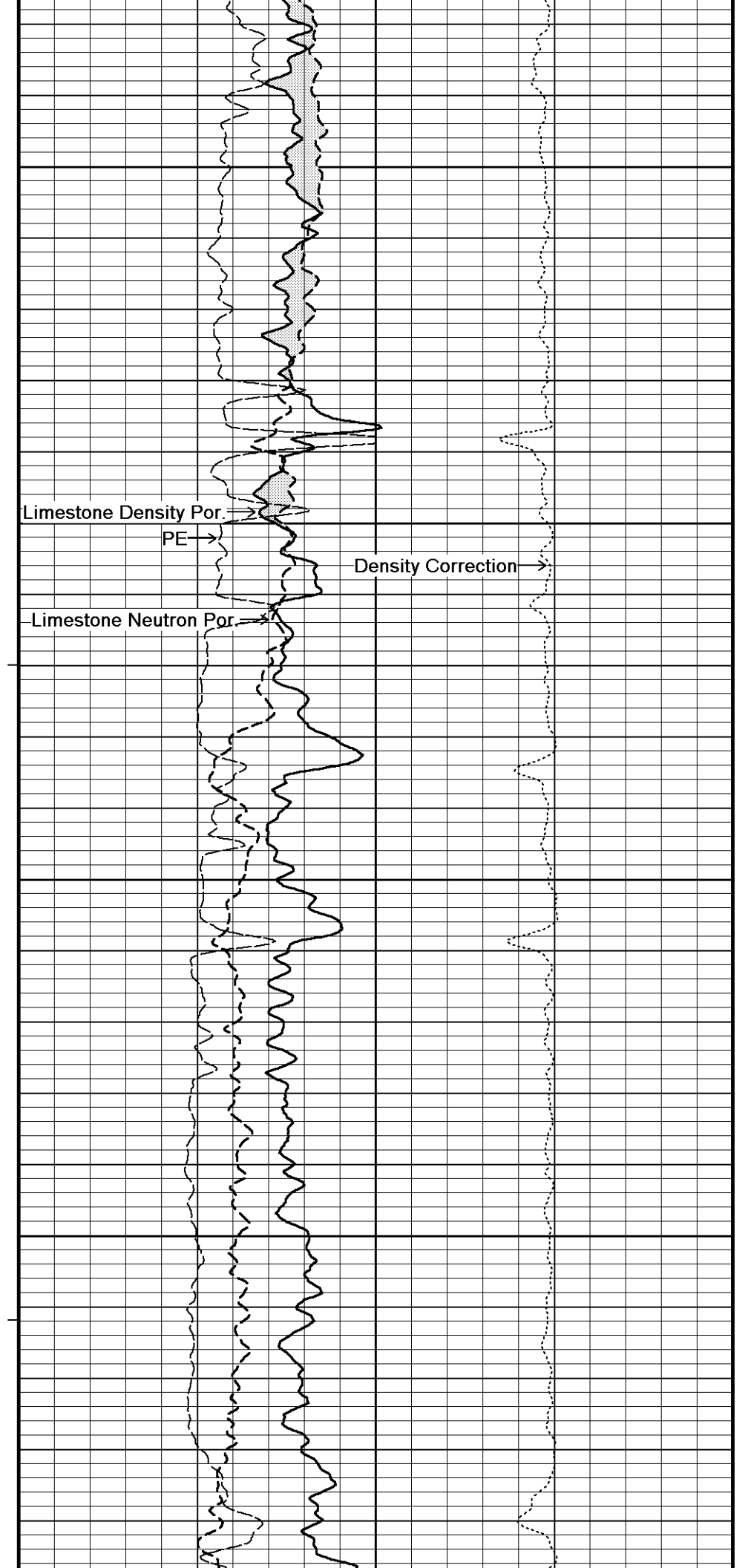
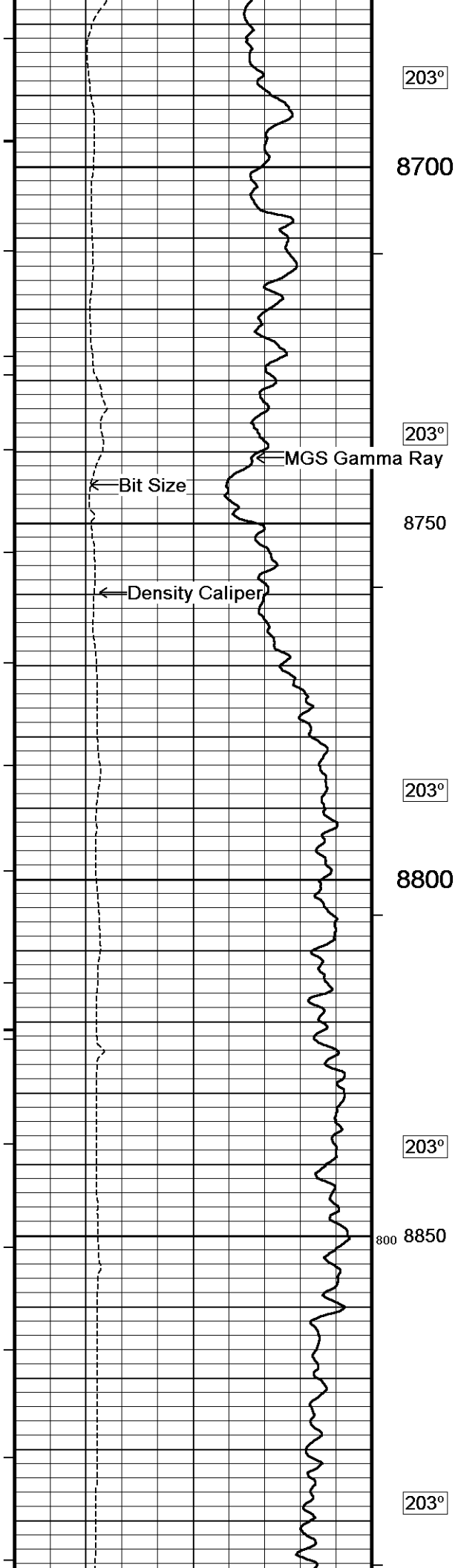


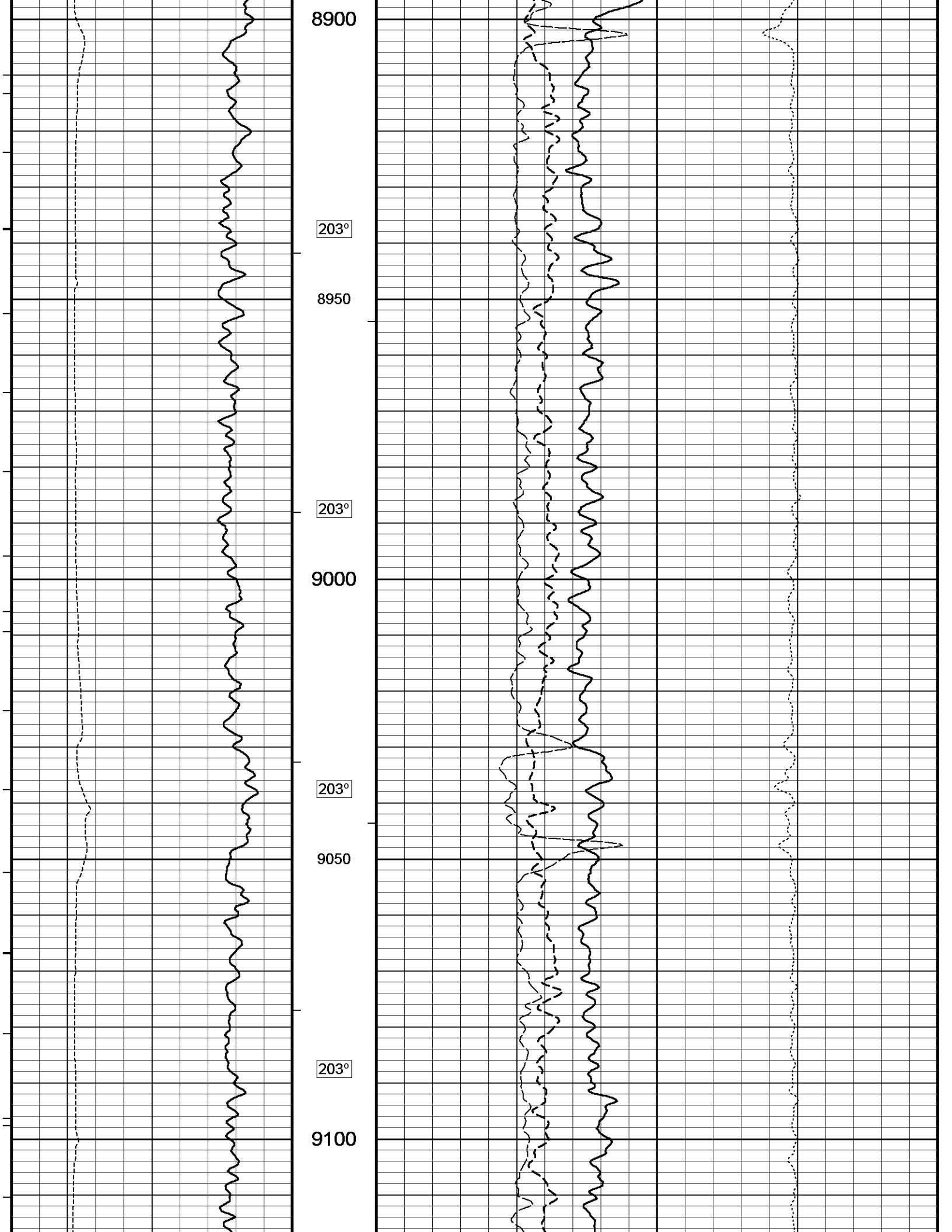


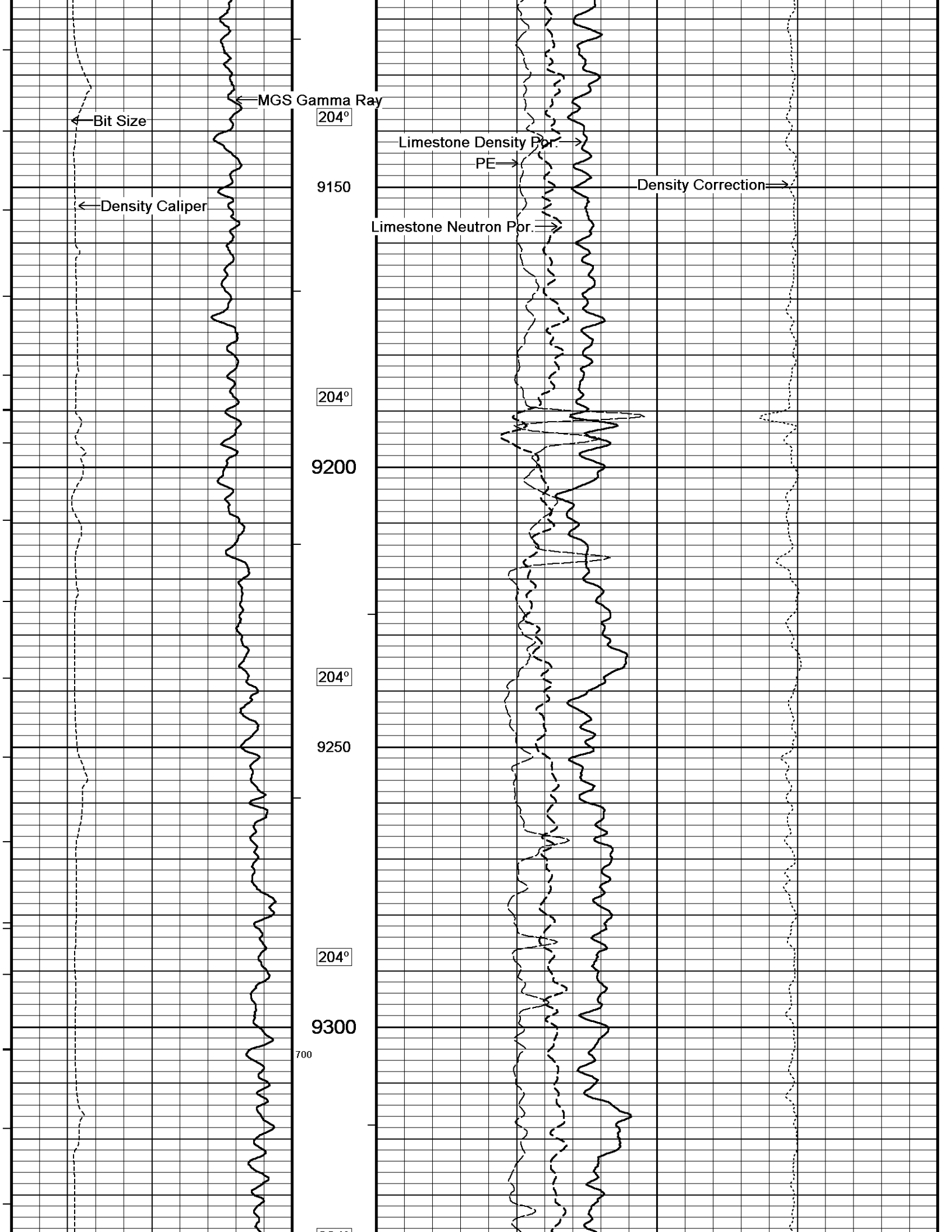


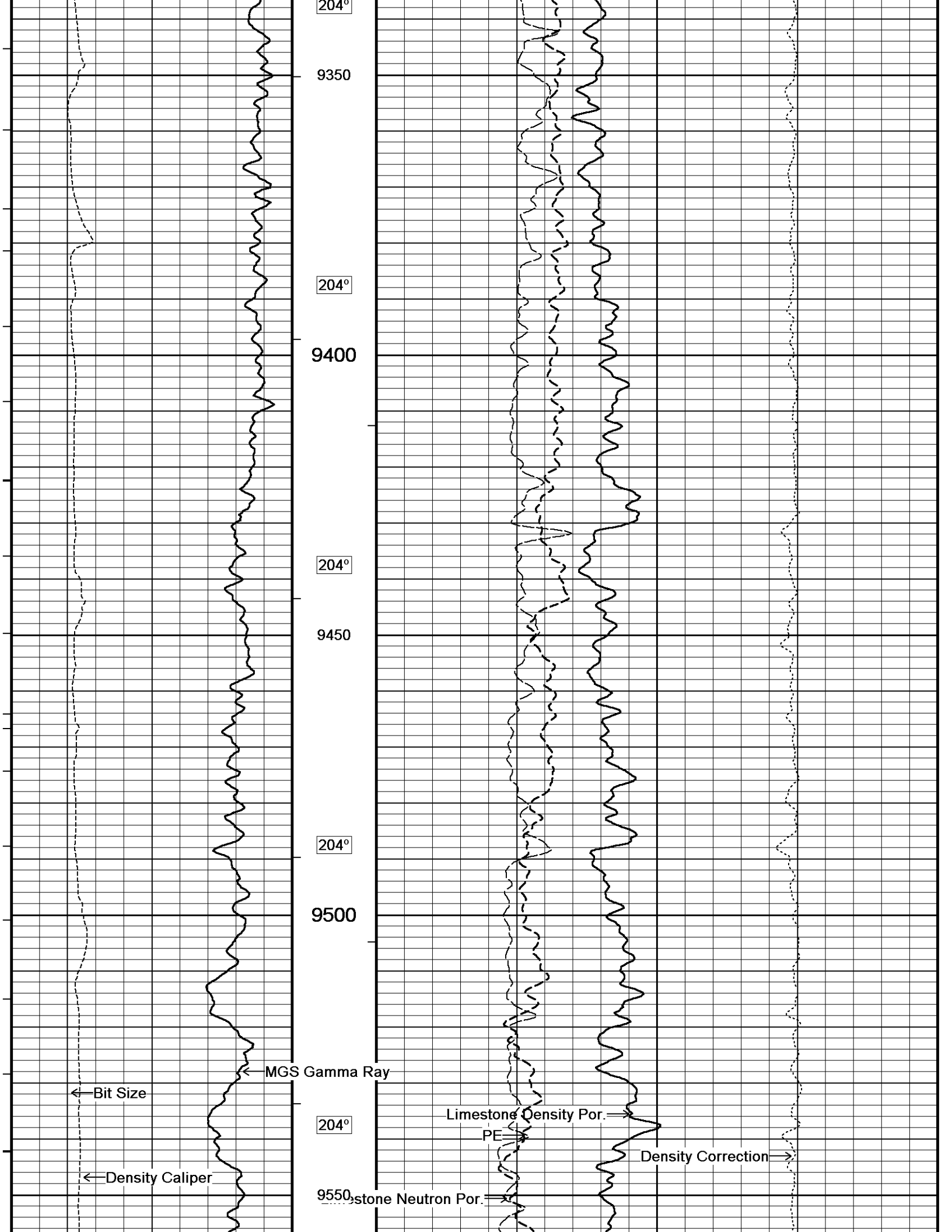


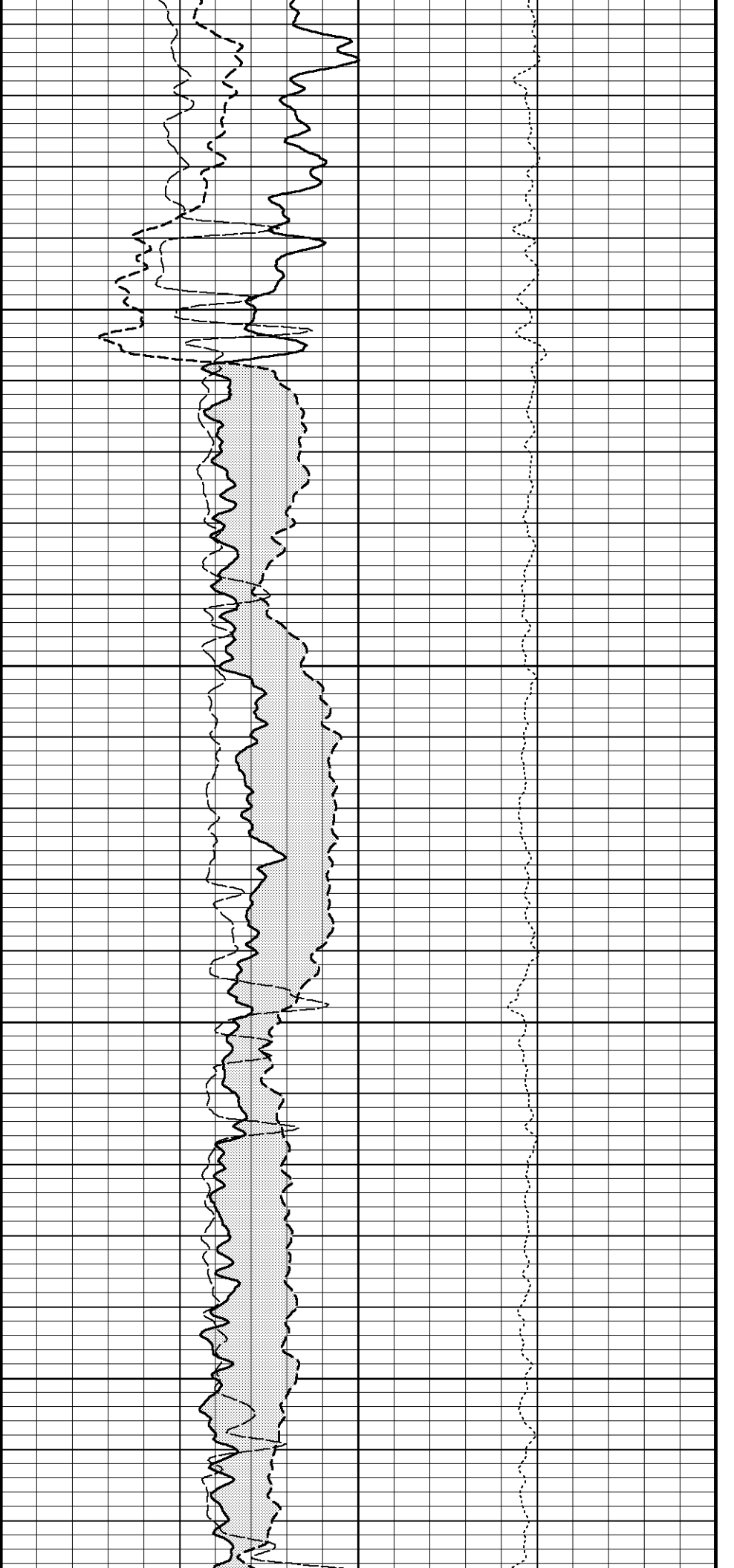
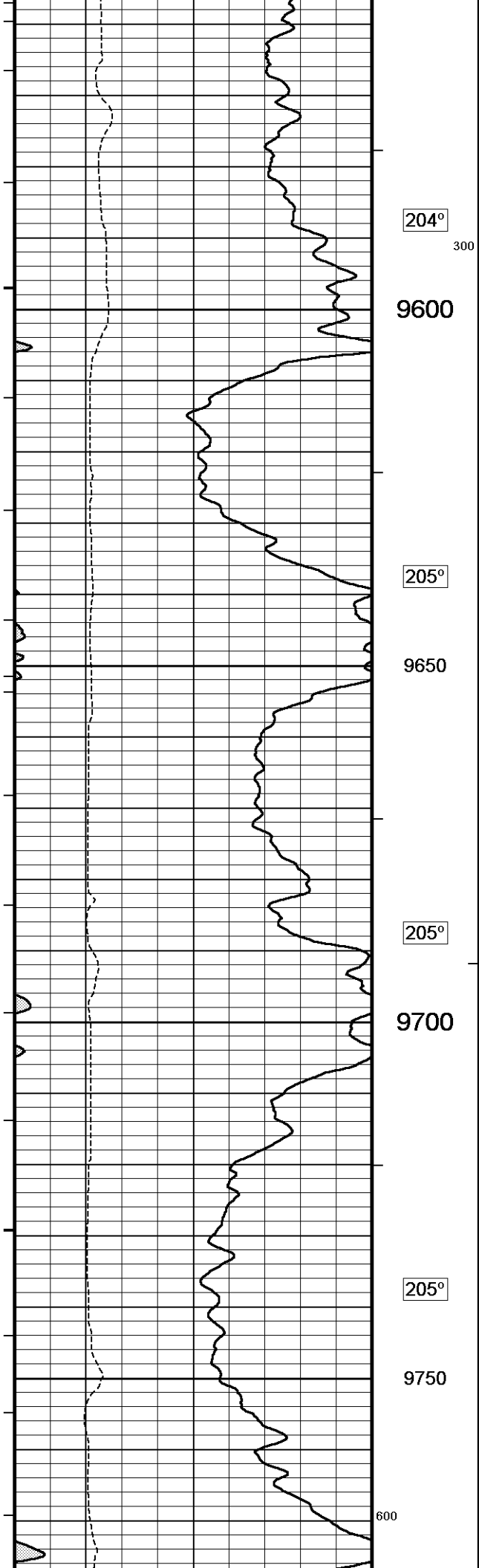


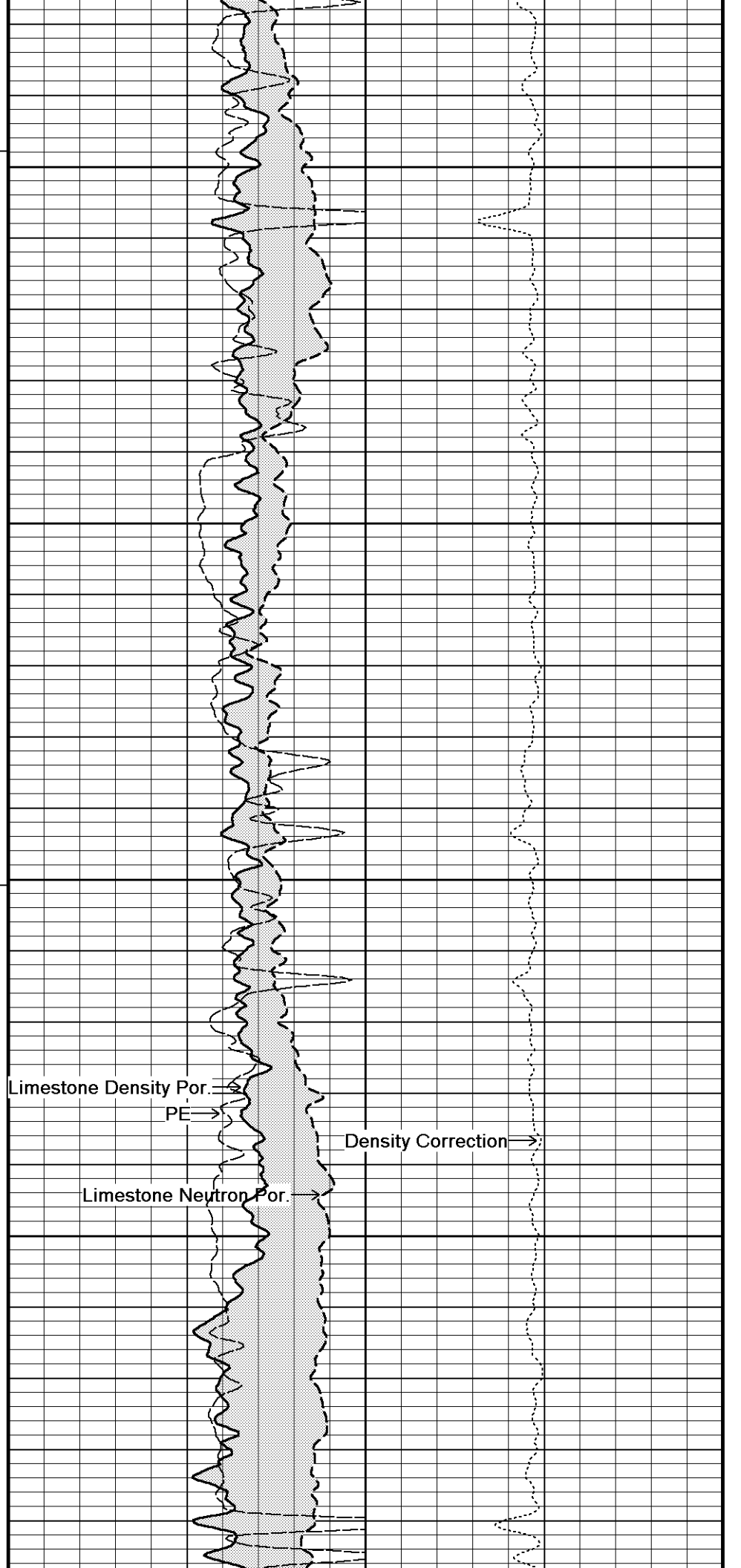
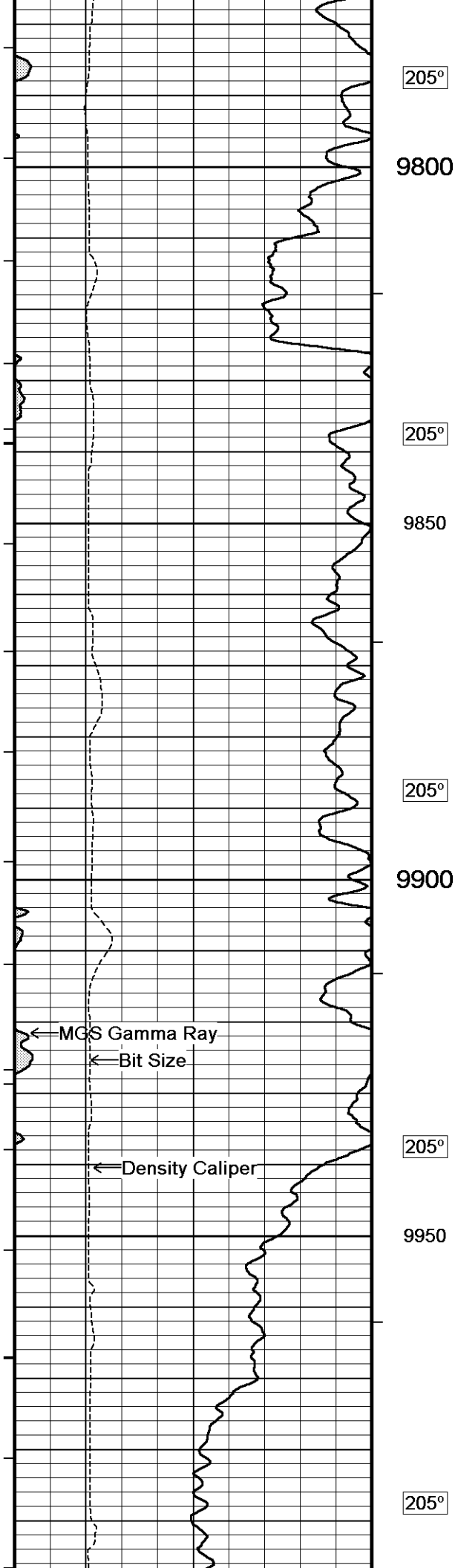


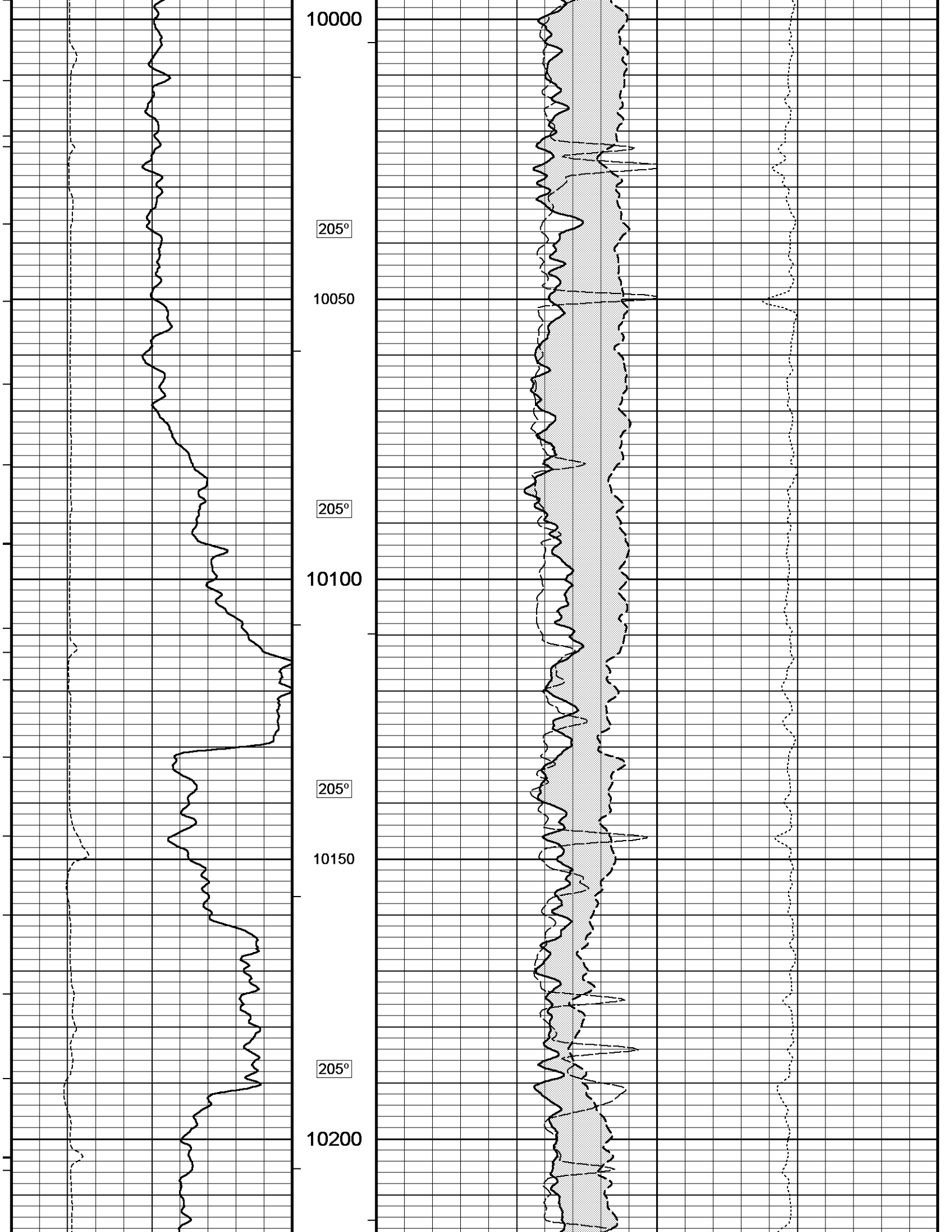


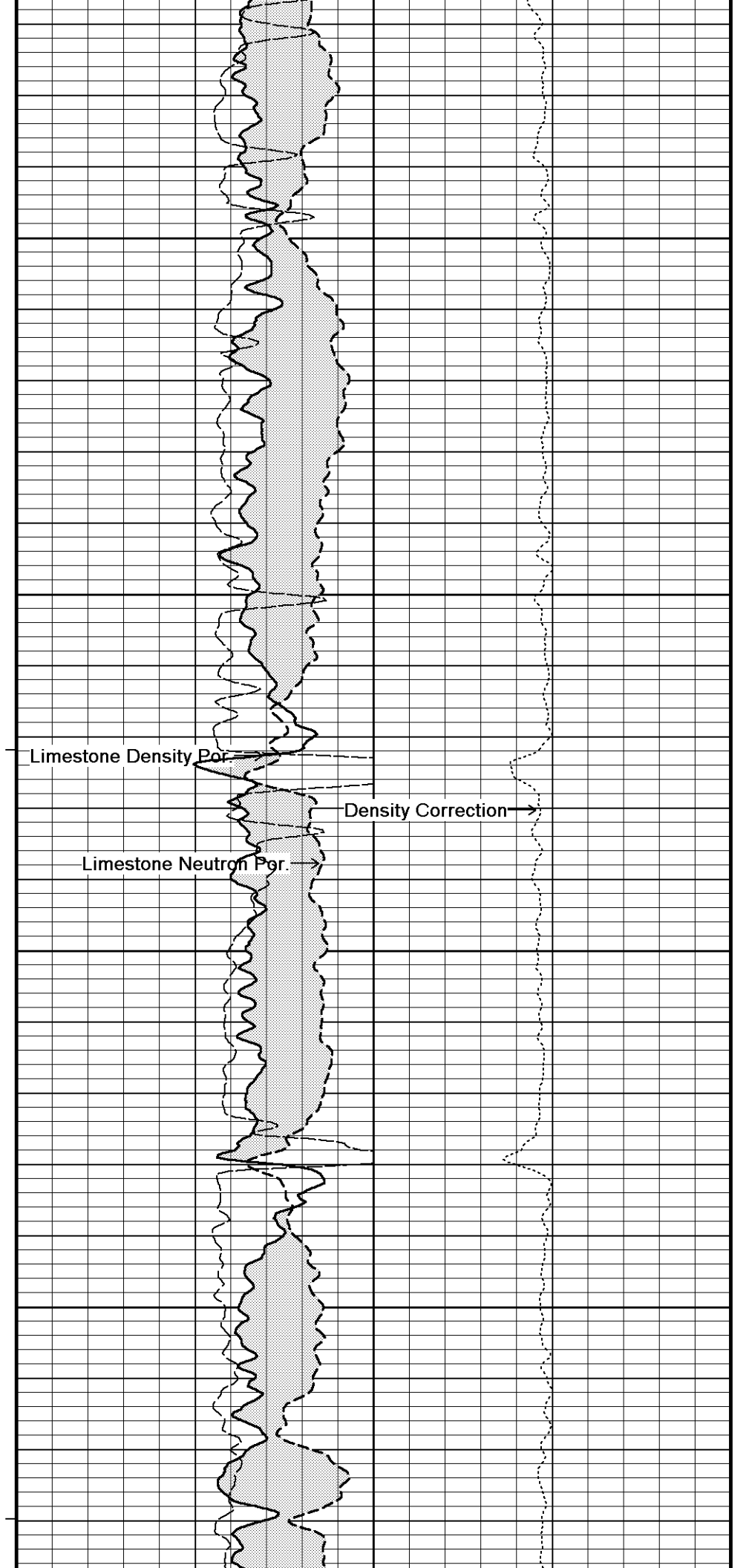
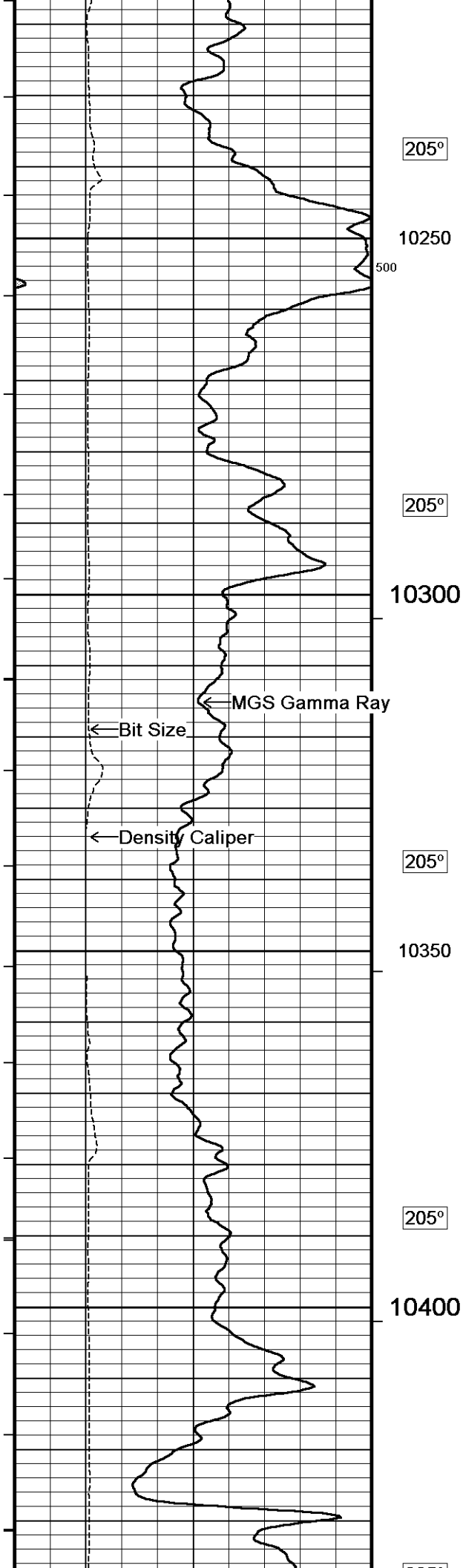


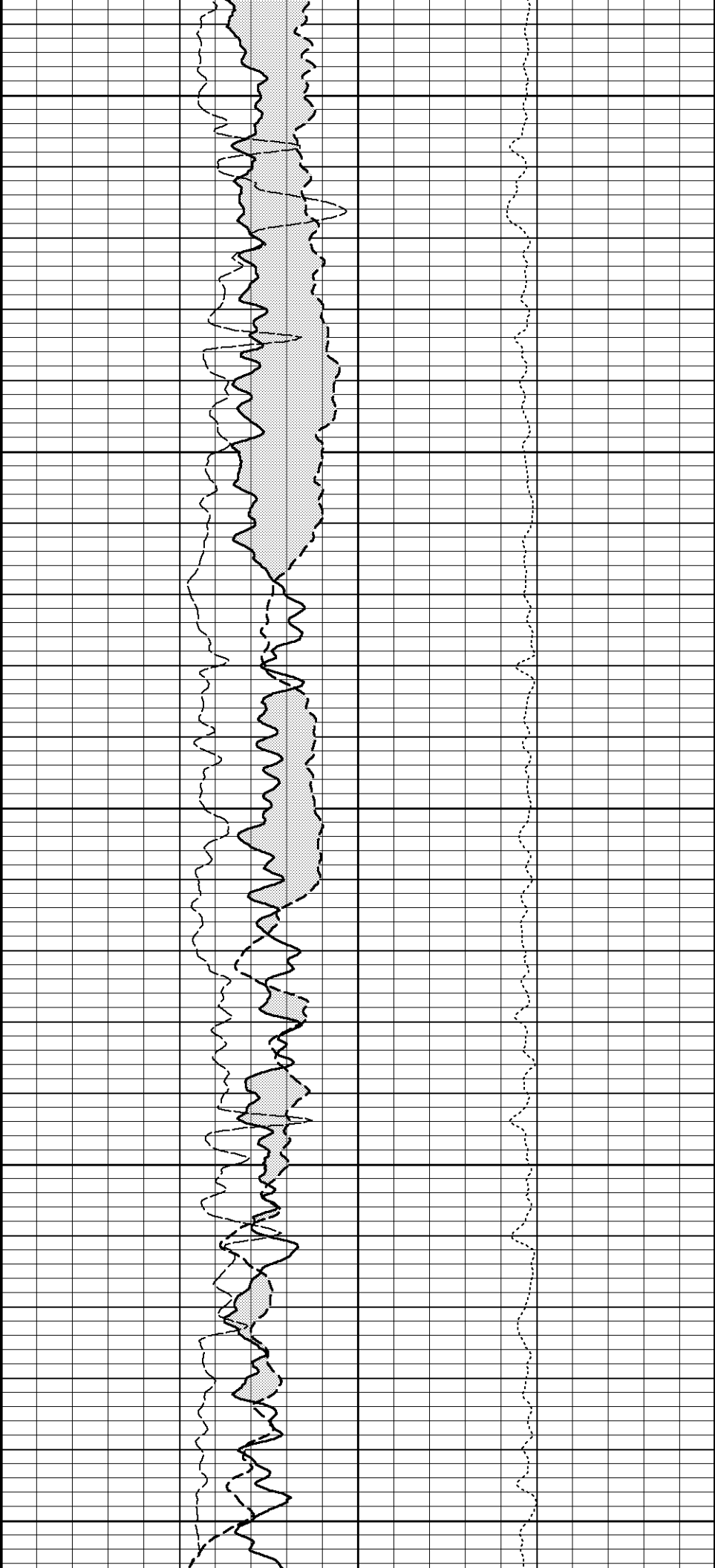
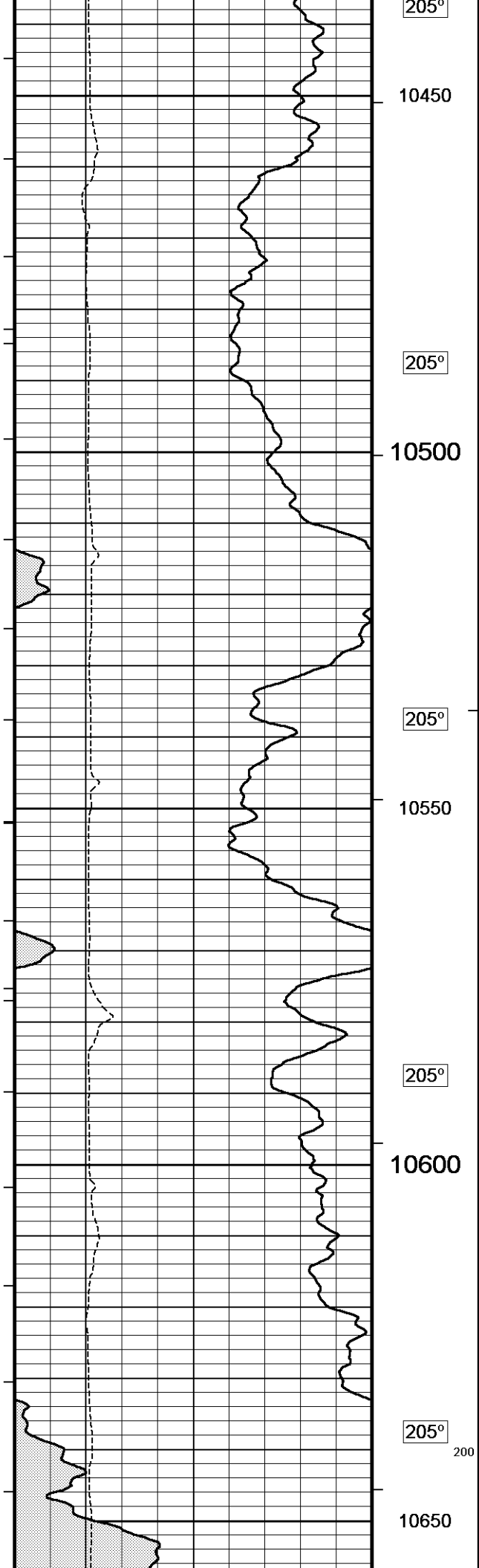


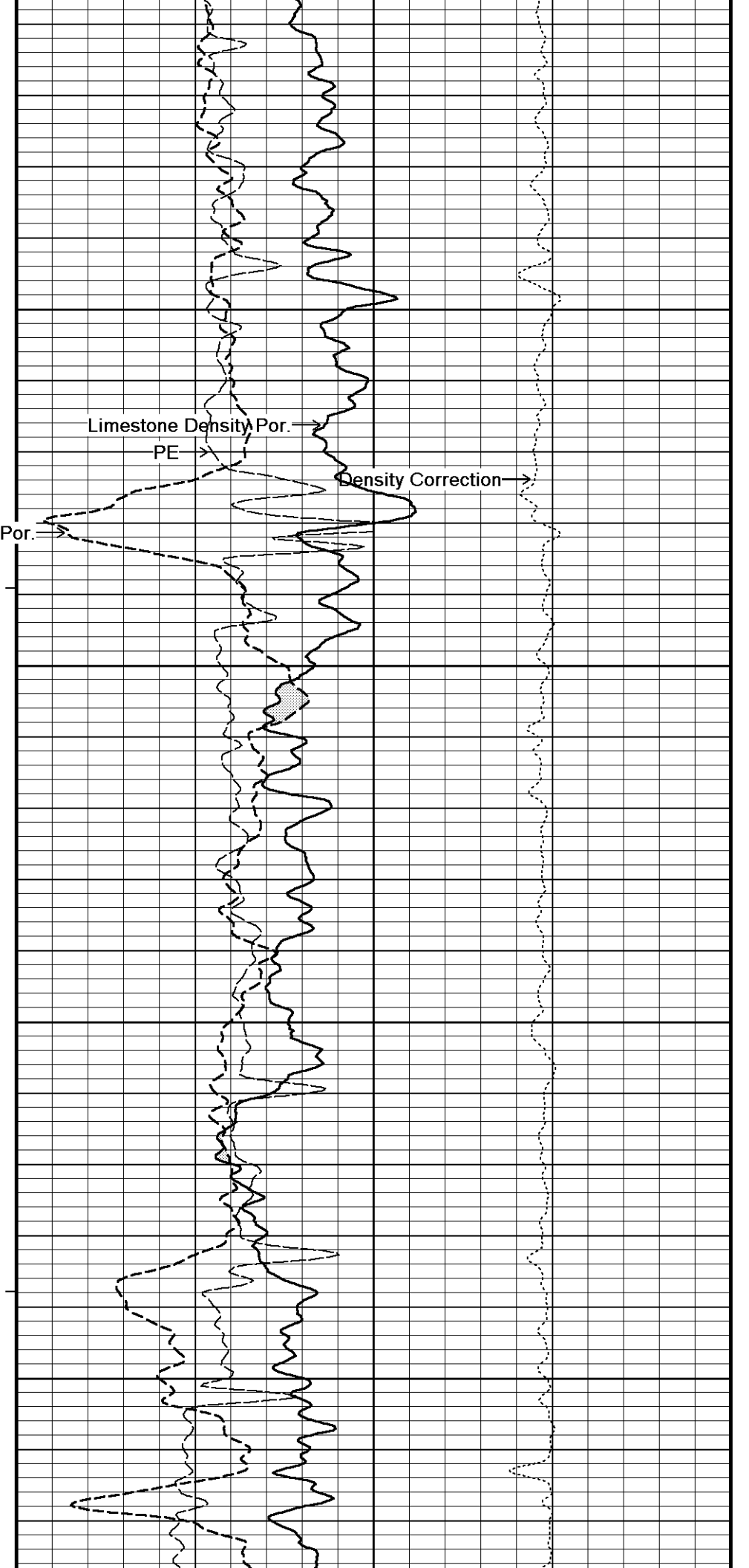
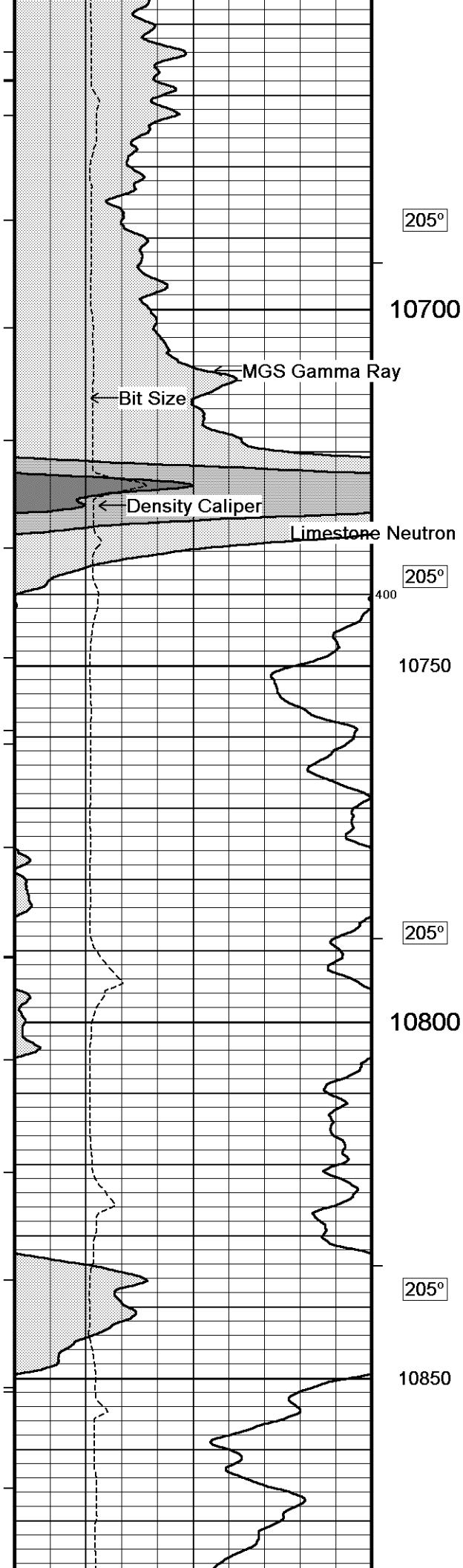


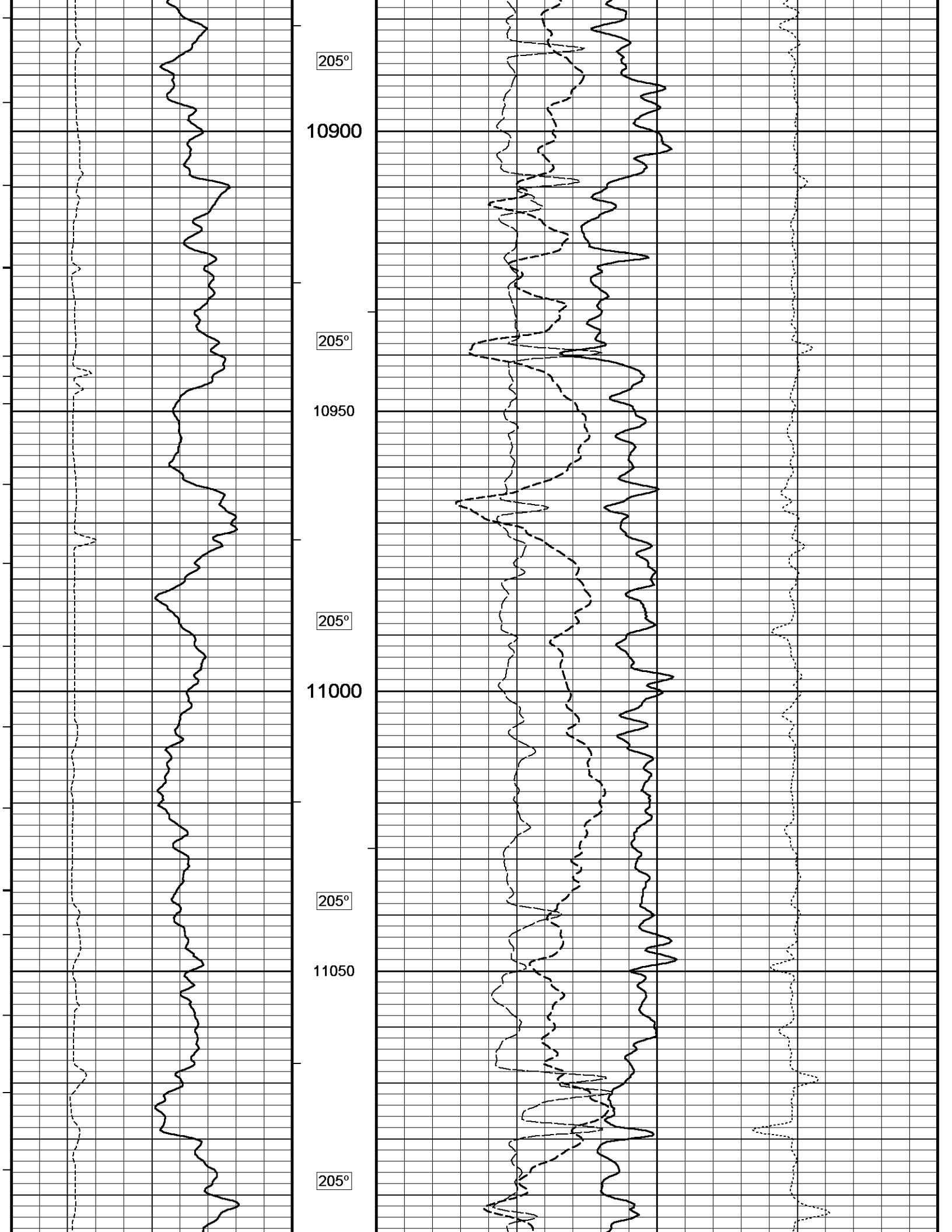


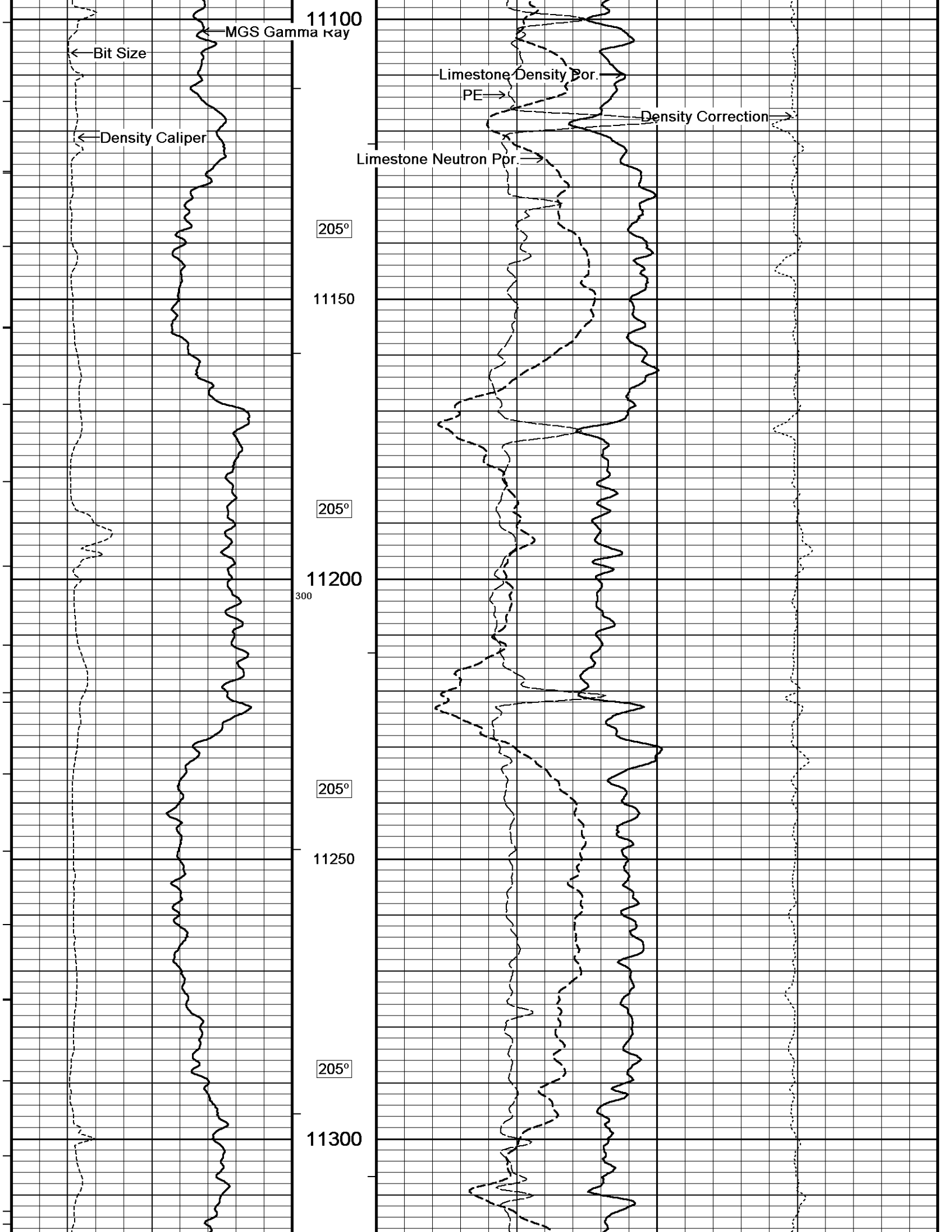


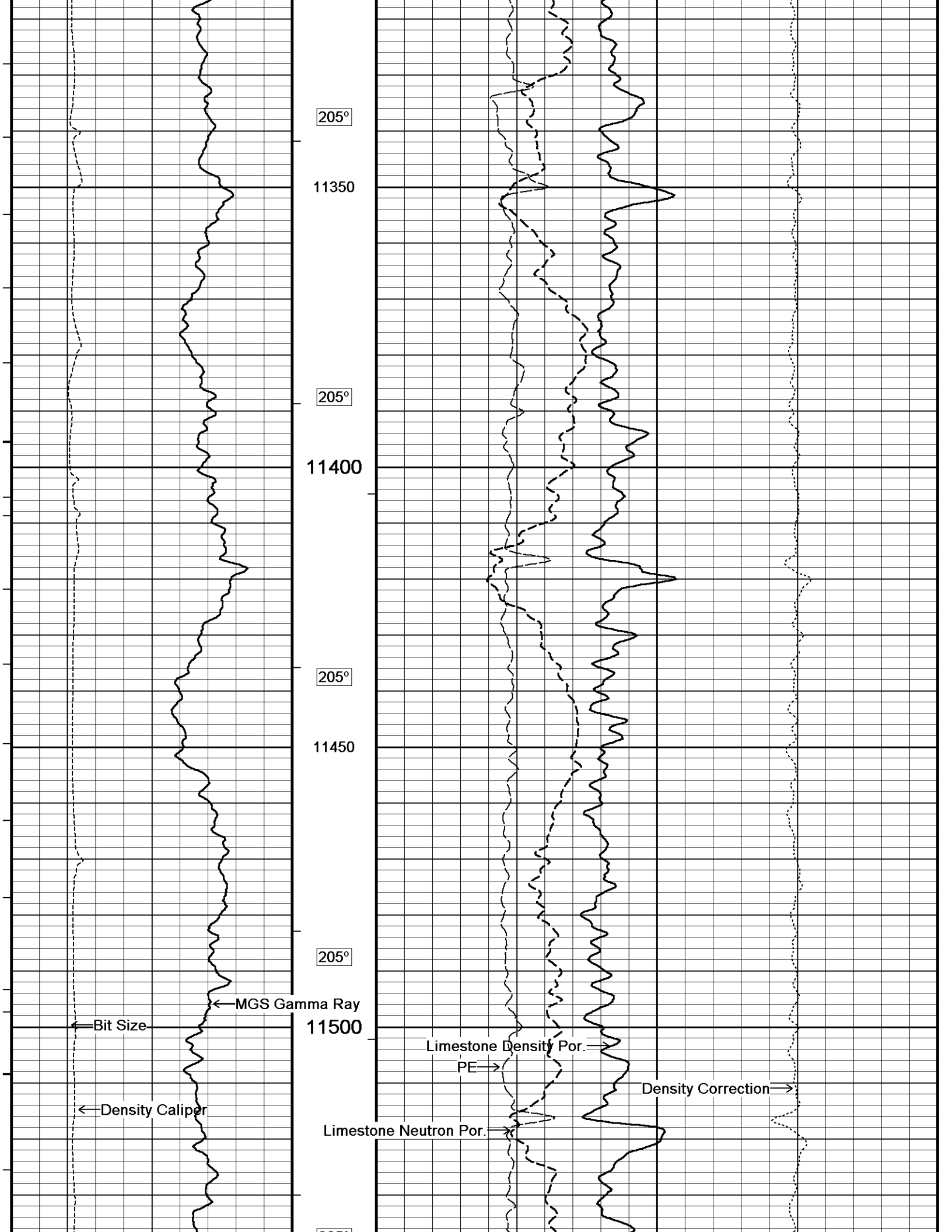


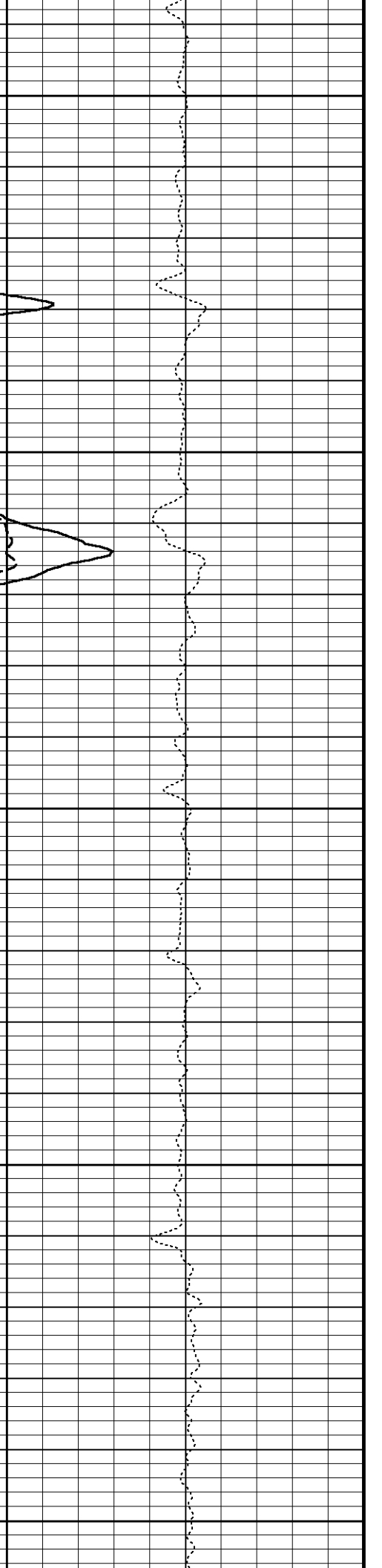
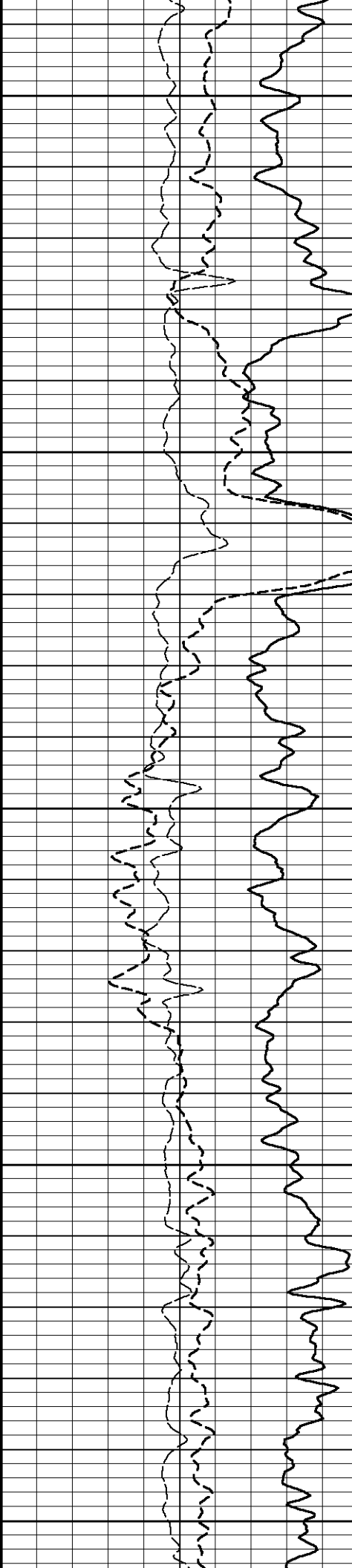
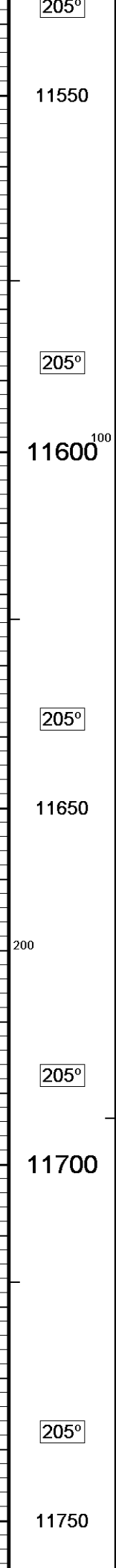
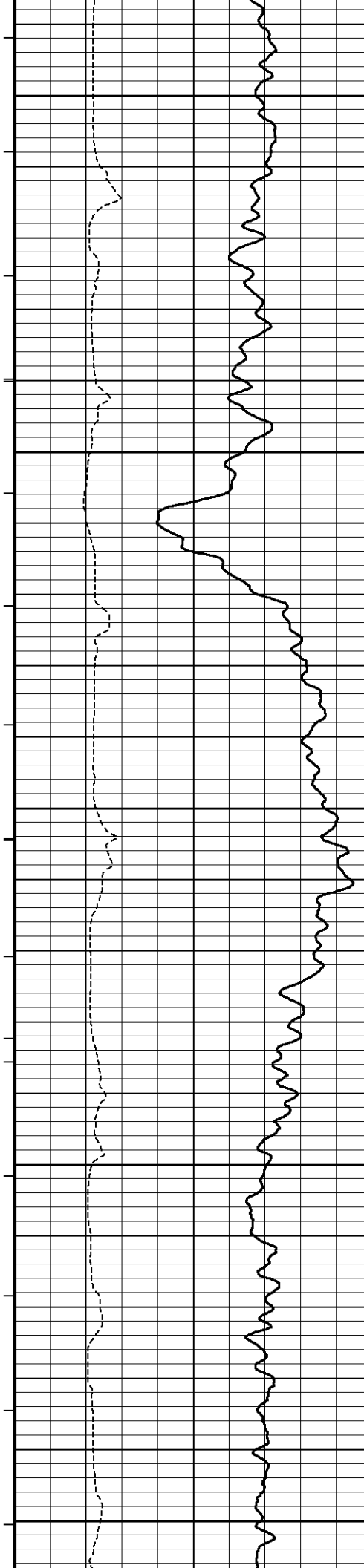


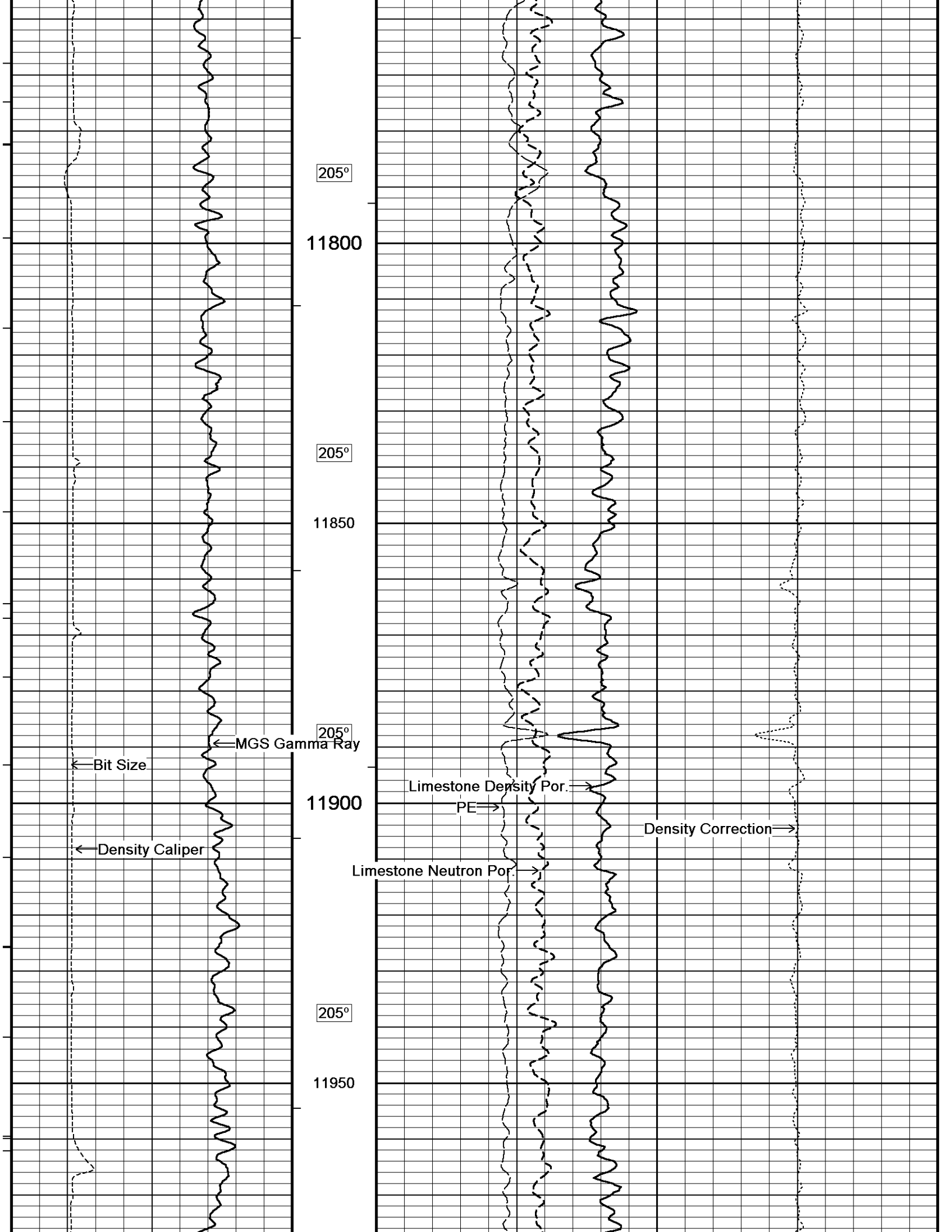


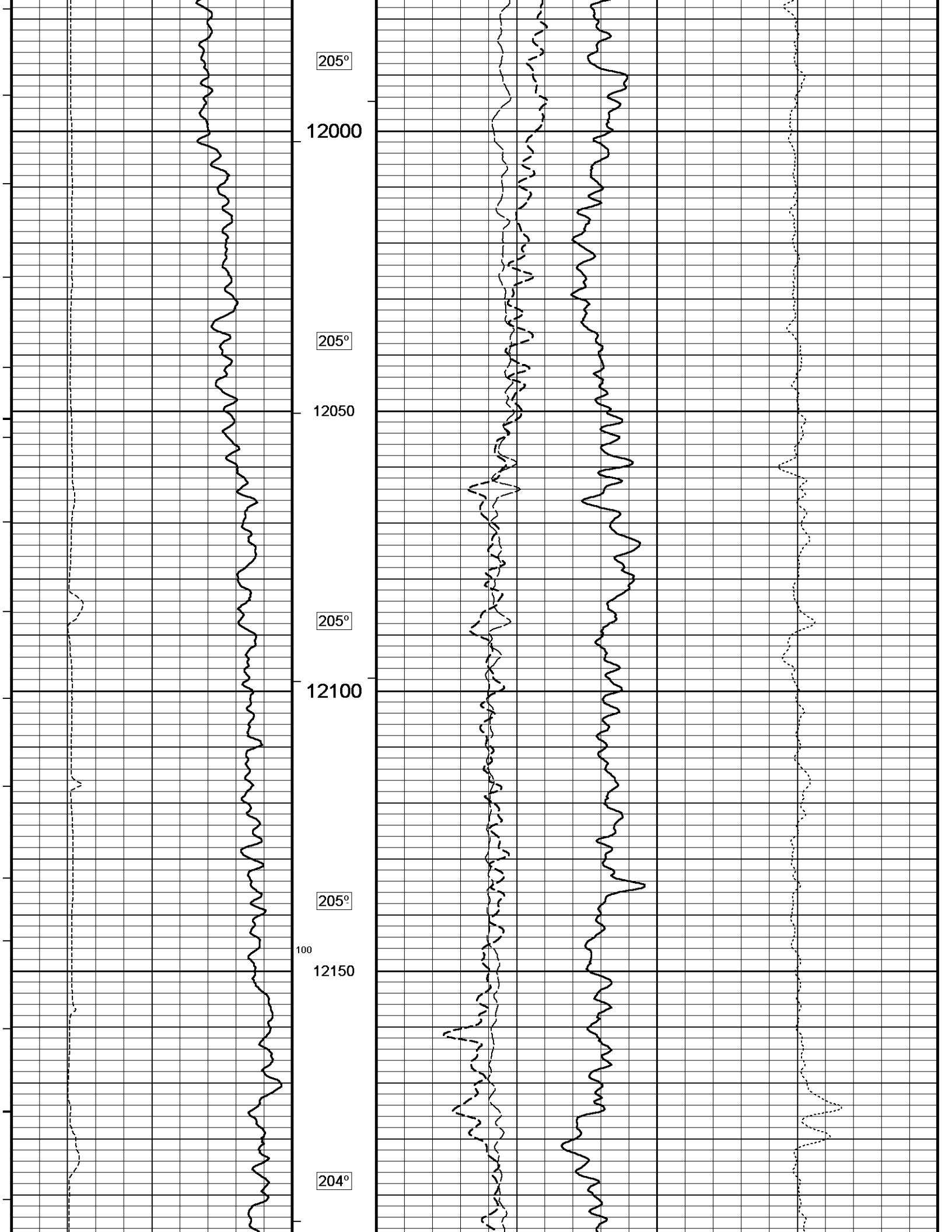


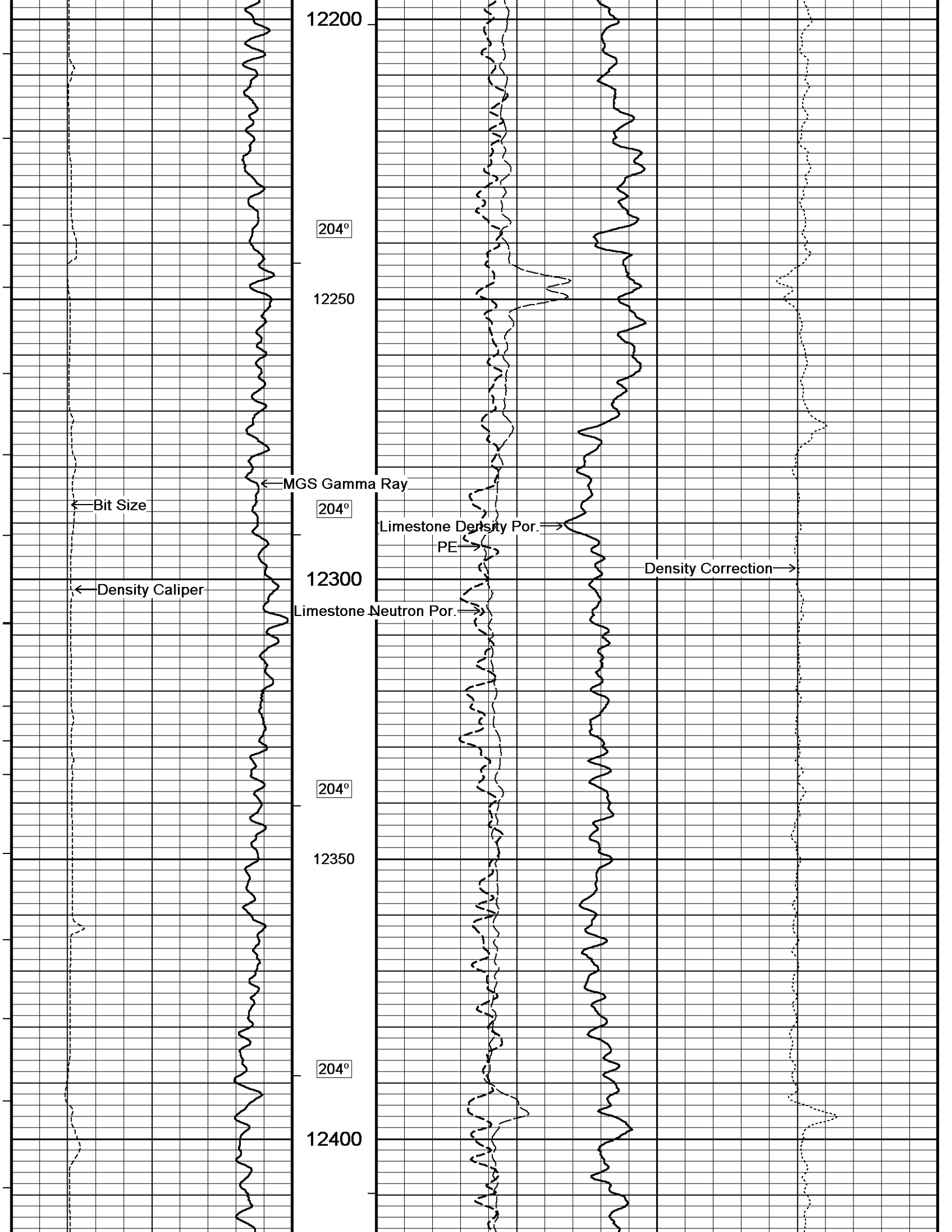


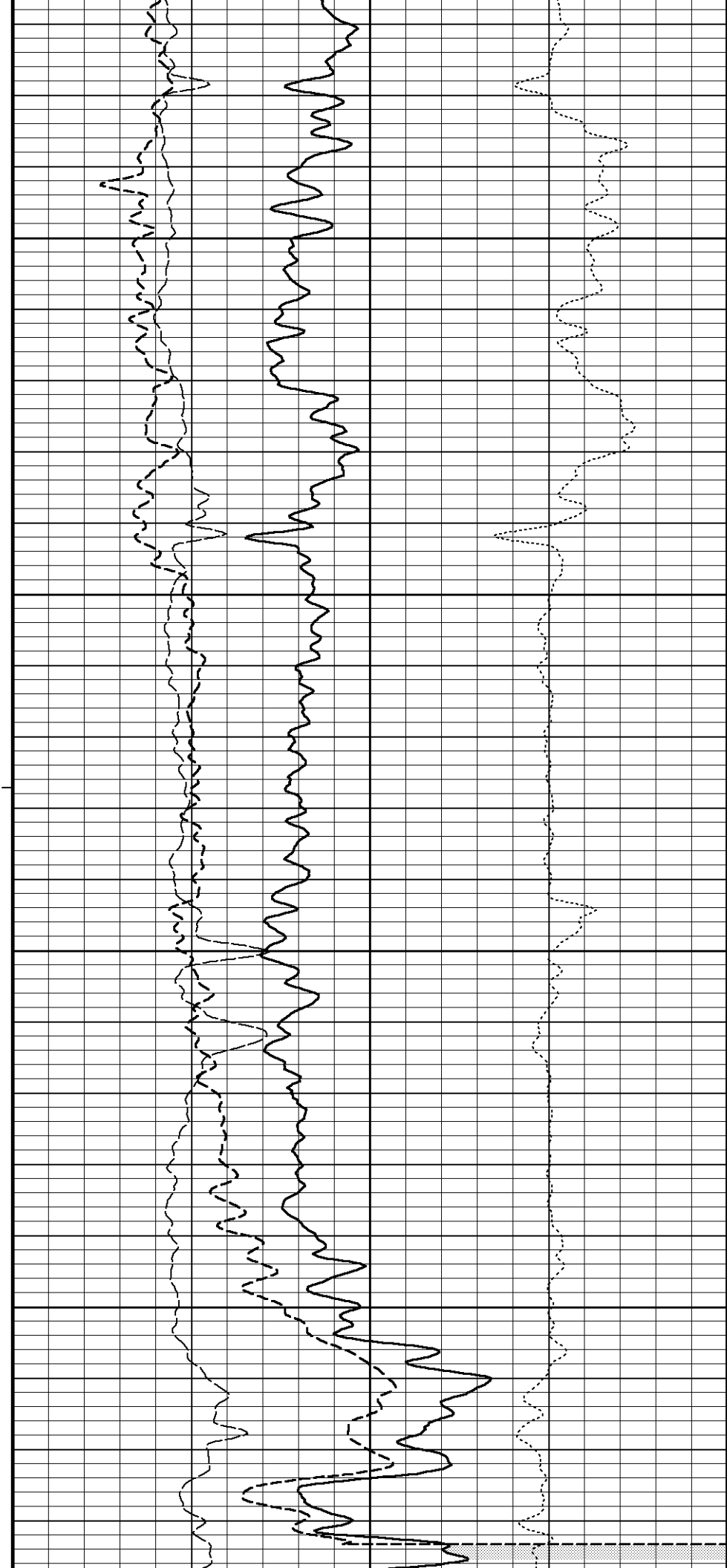
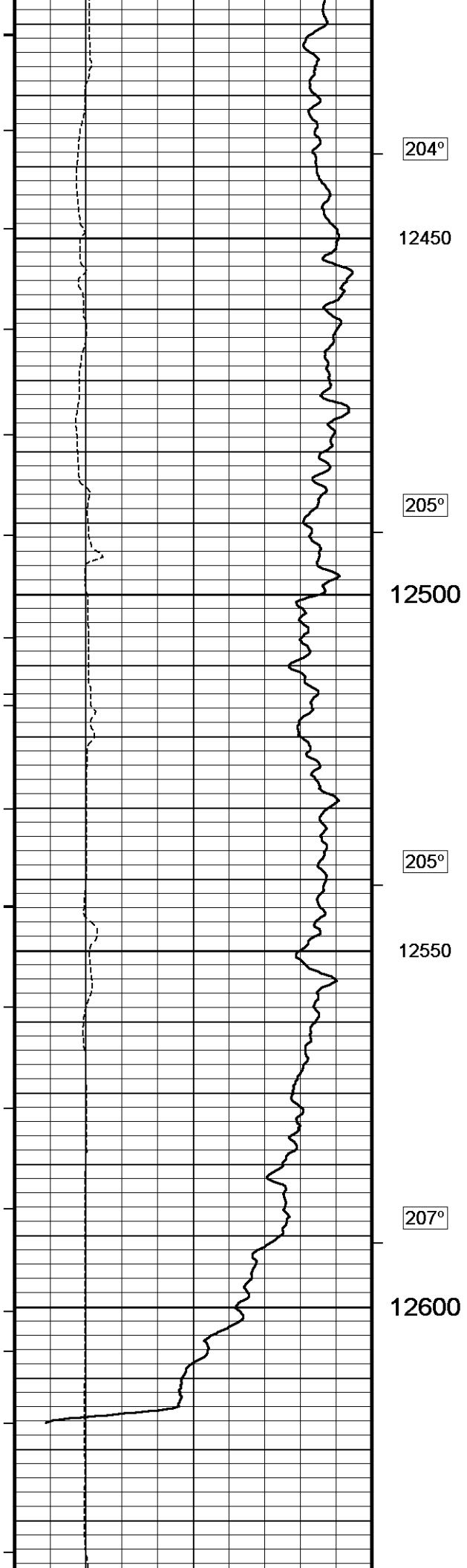


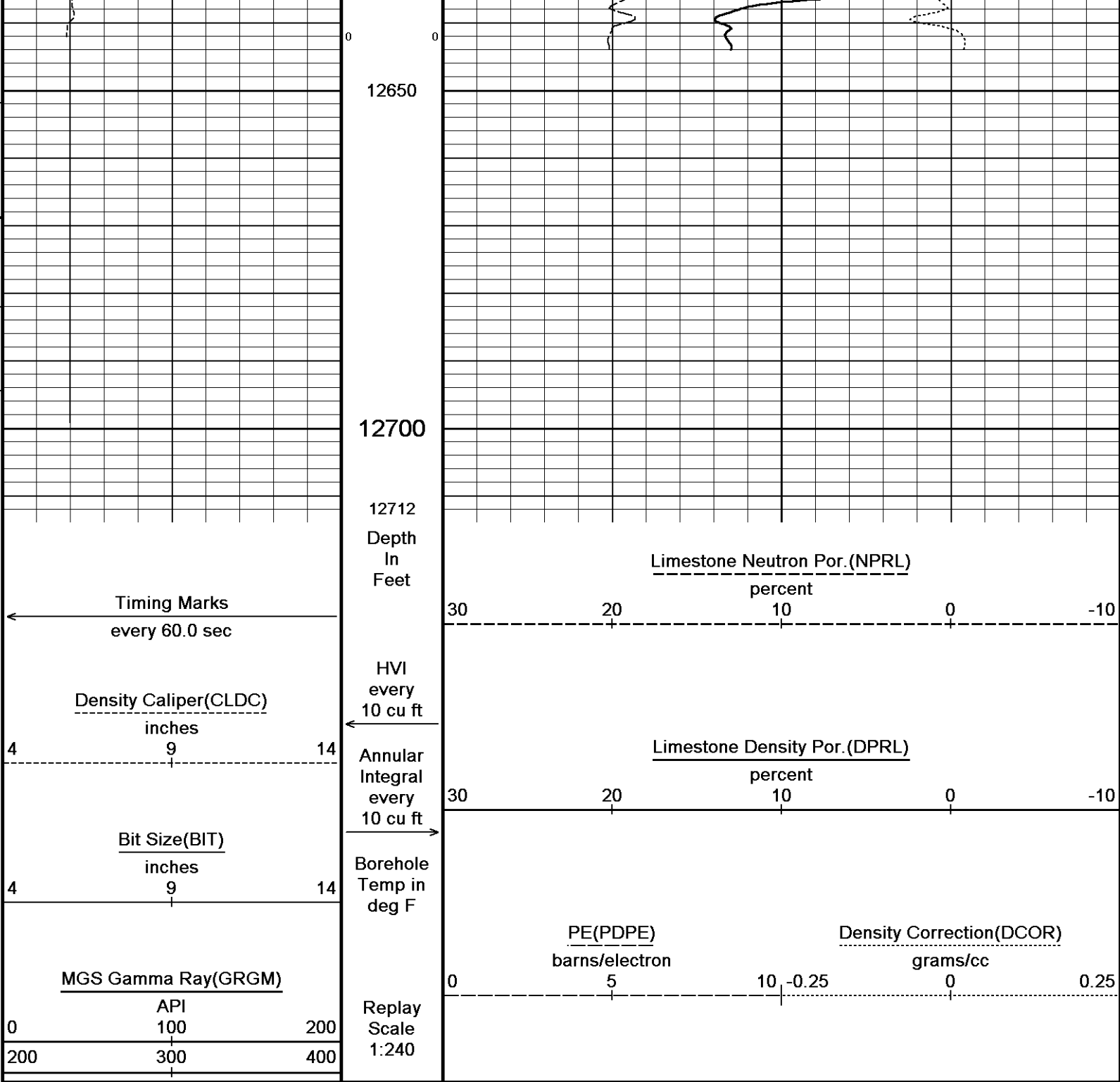












Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Data\Whiting Oil and Gas Corp_Razor 21A-2814B\Razor 21A-2814B.dta
System Versions: Processed with 13.06.9804 Plotted with 13.06.9804

Plotted on 22-SEP-2013 10:41
Recorded on 20-SEP-2013 23:31

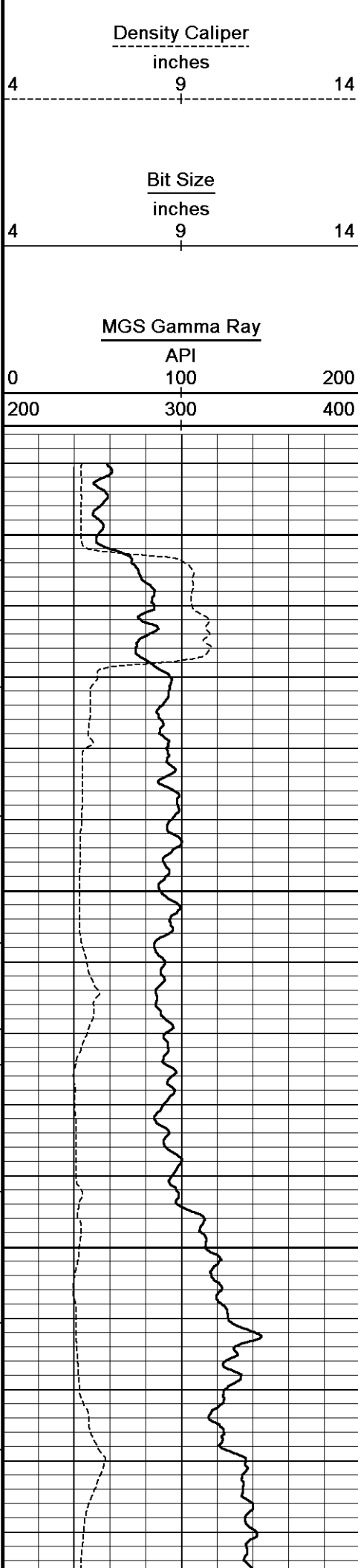
5 INCH MAIN LOG

5 INCH MAIN LOG

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Data\Whiting Oil and Gas Corp_Razor 21A-2814B\Razor 21A-2814B.dta
System Versions: Processed with 13.06.9804 Plotted with 13.06.9804

Plotted on 22-SEP-2013 10:41
Recorded on 20-SEP-2013 23:31

Timing Marks every 60.0 sec	Depth In Feet	Compensated Density			
		grams/cc			
		2	2.25	2.50	2.75
		1	1.25	1.50	1.75



11V1
every
10 cu ft

Annular
Integral
every
10 cu ft

Borehole
Temp in
deg F

Replay
Scale
1:240

6188

6200

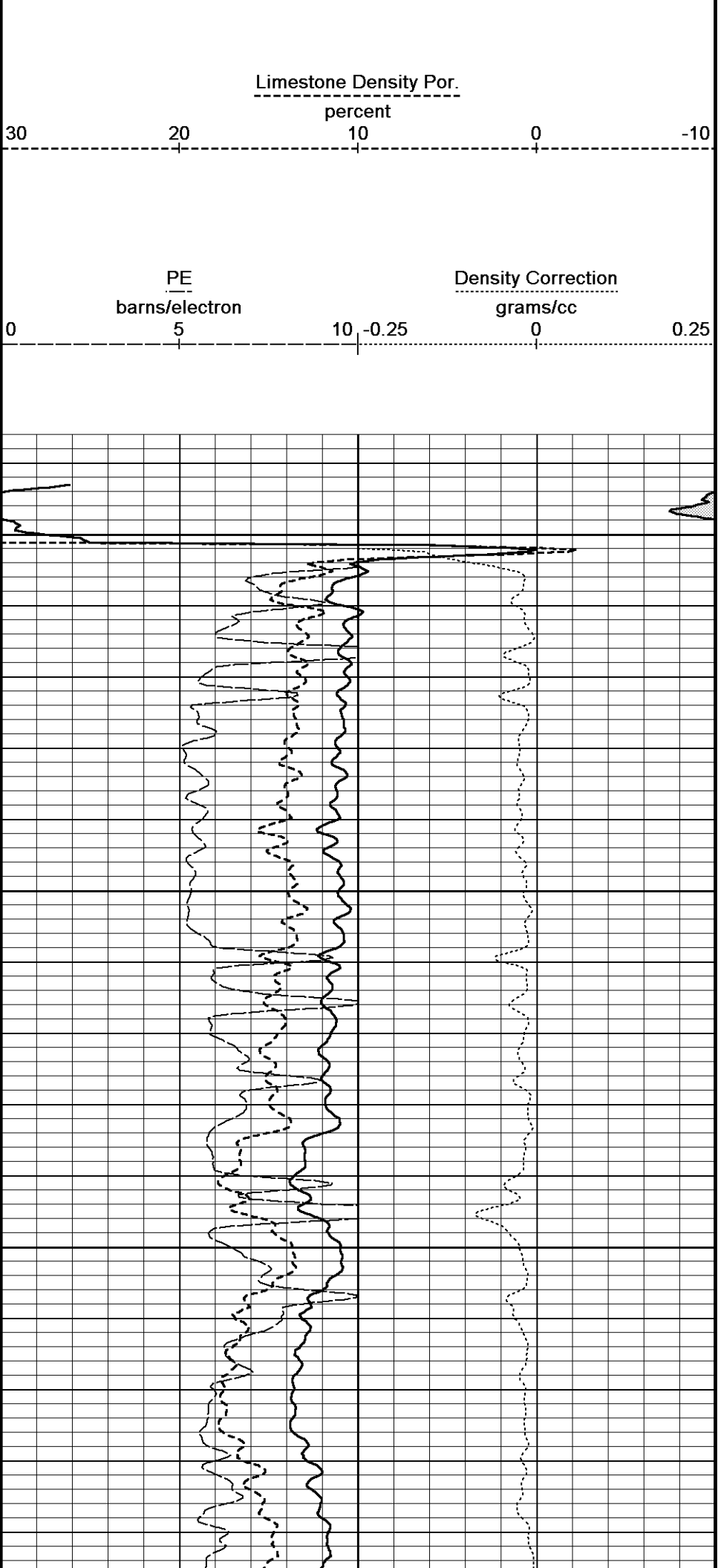
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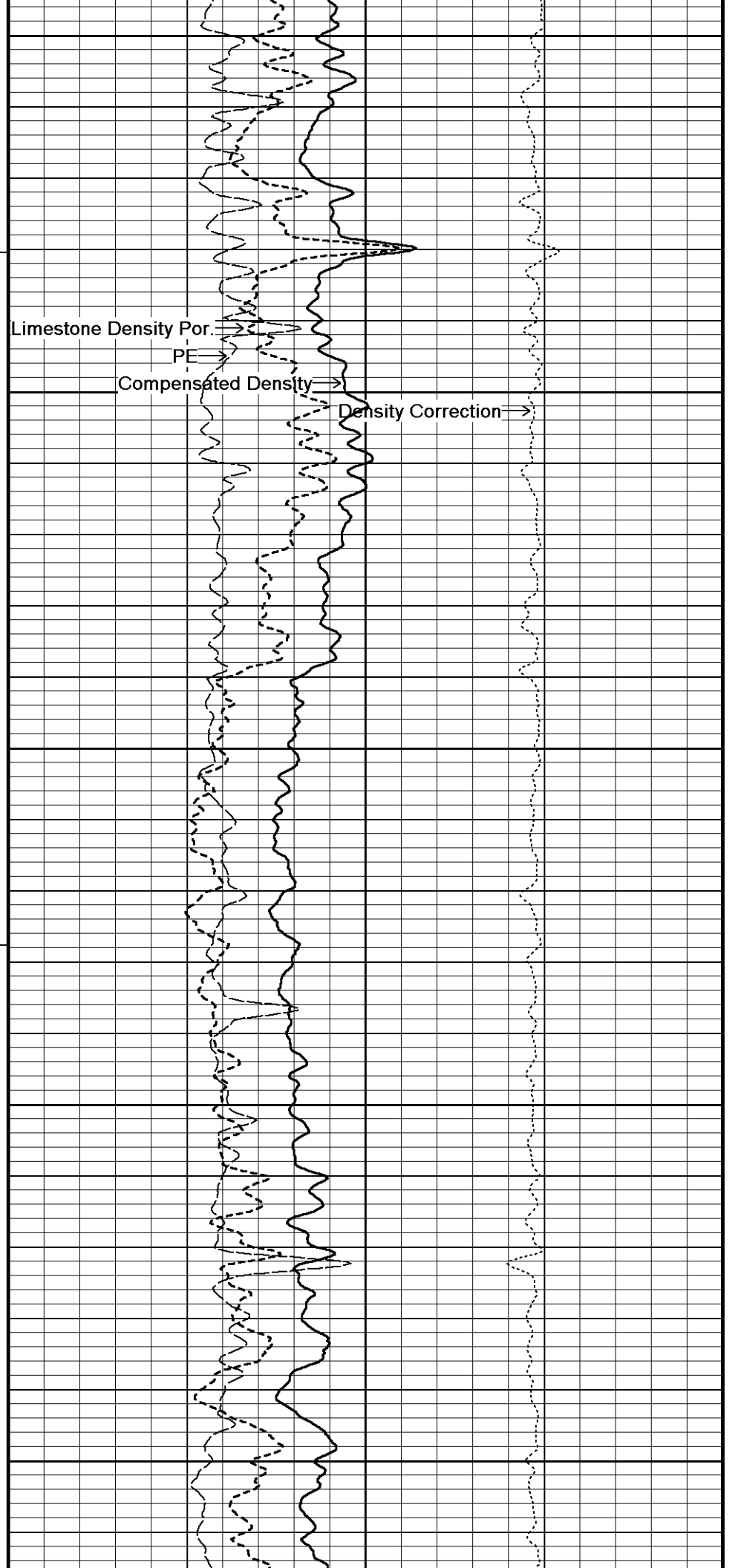
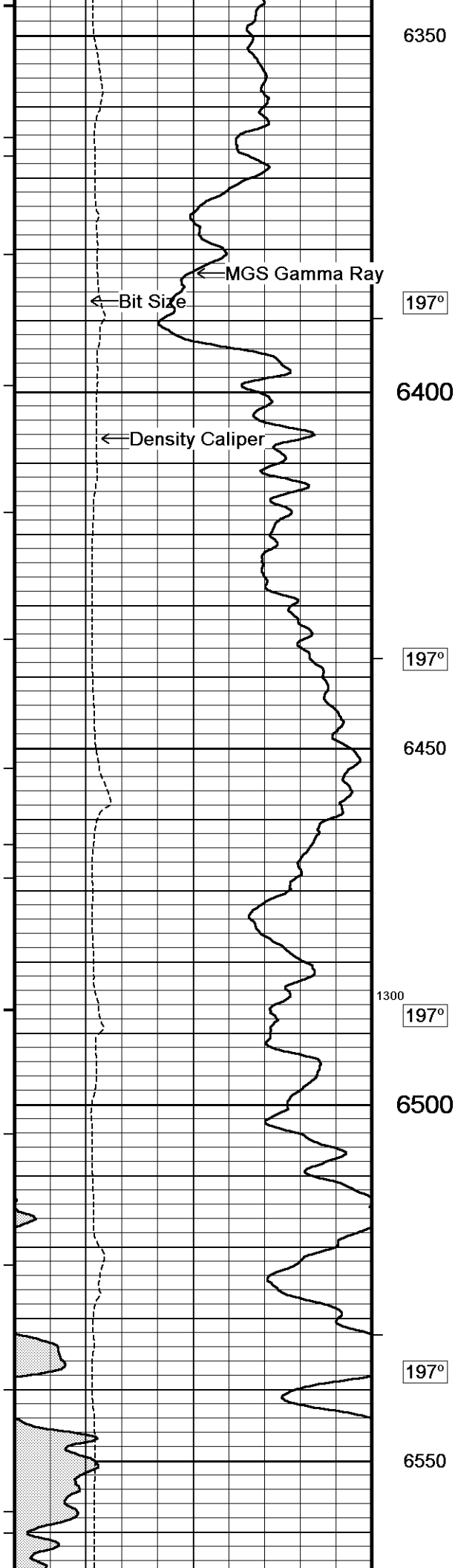
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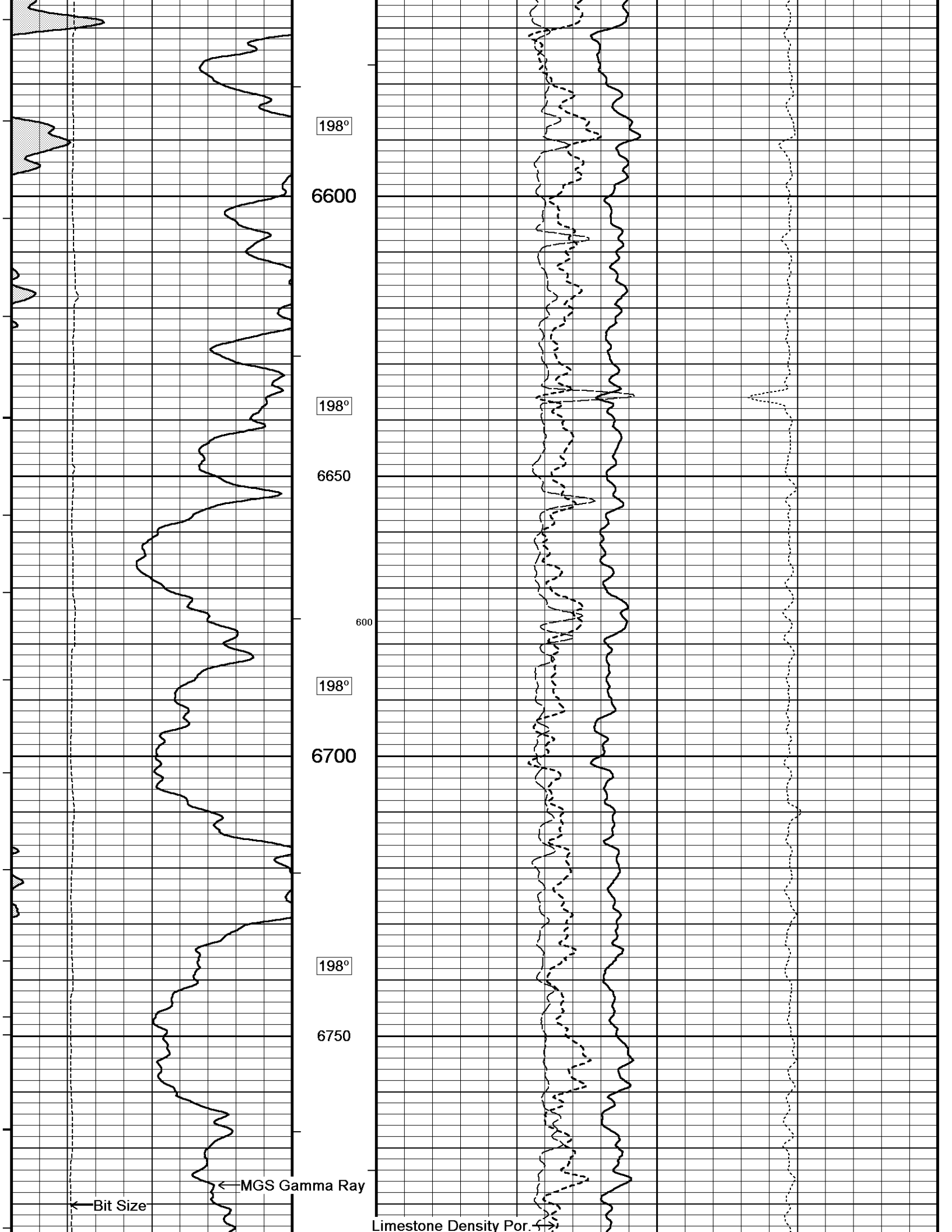
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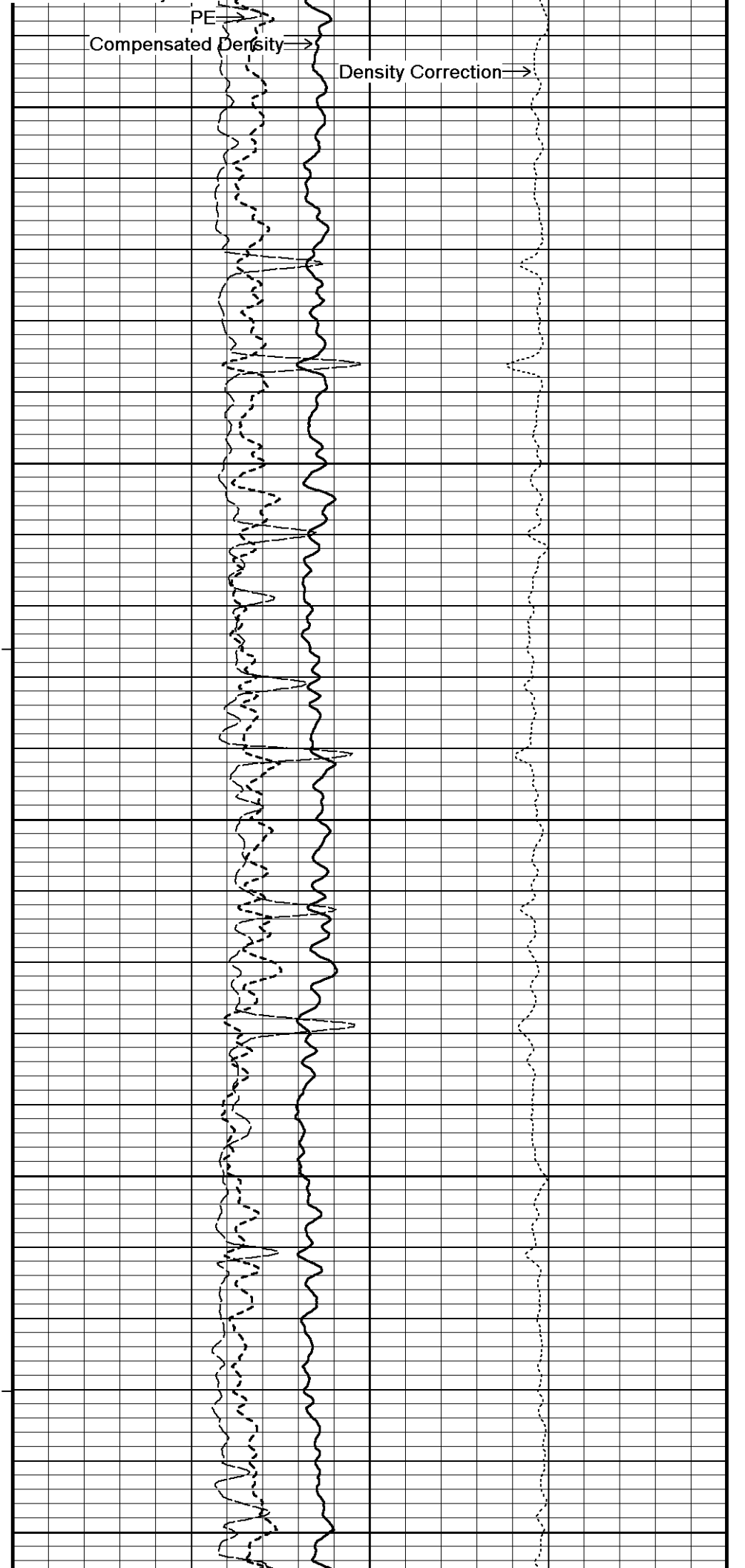
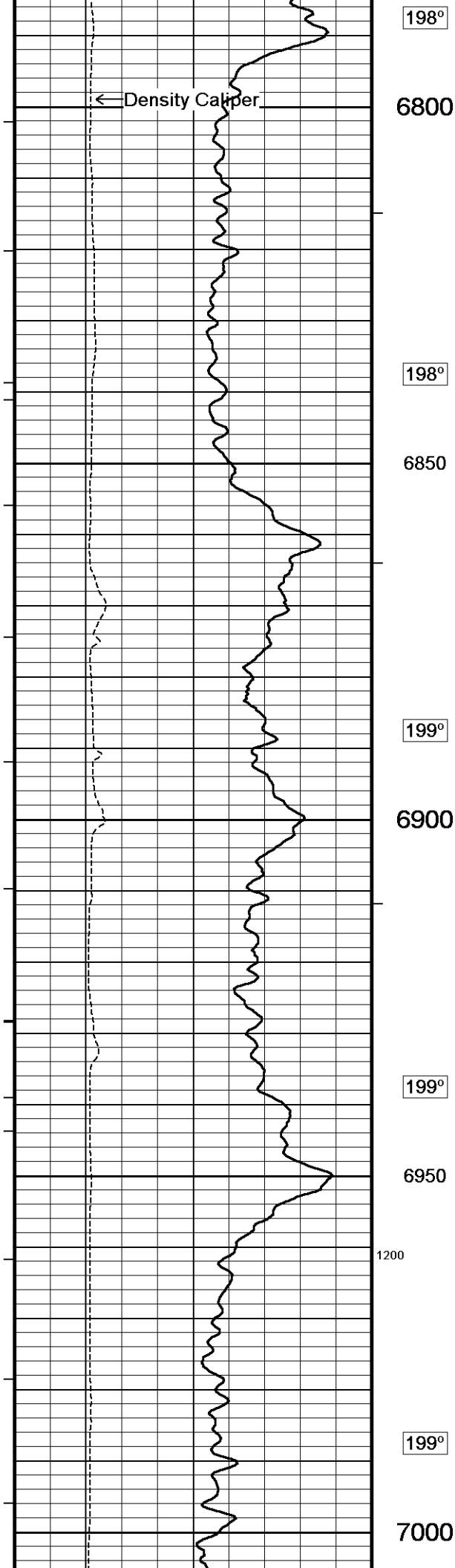
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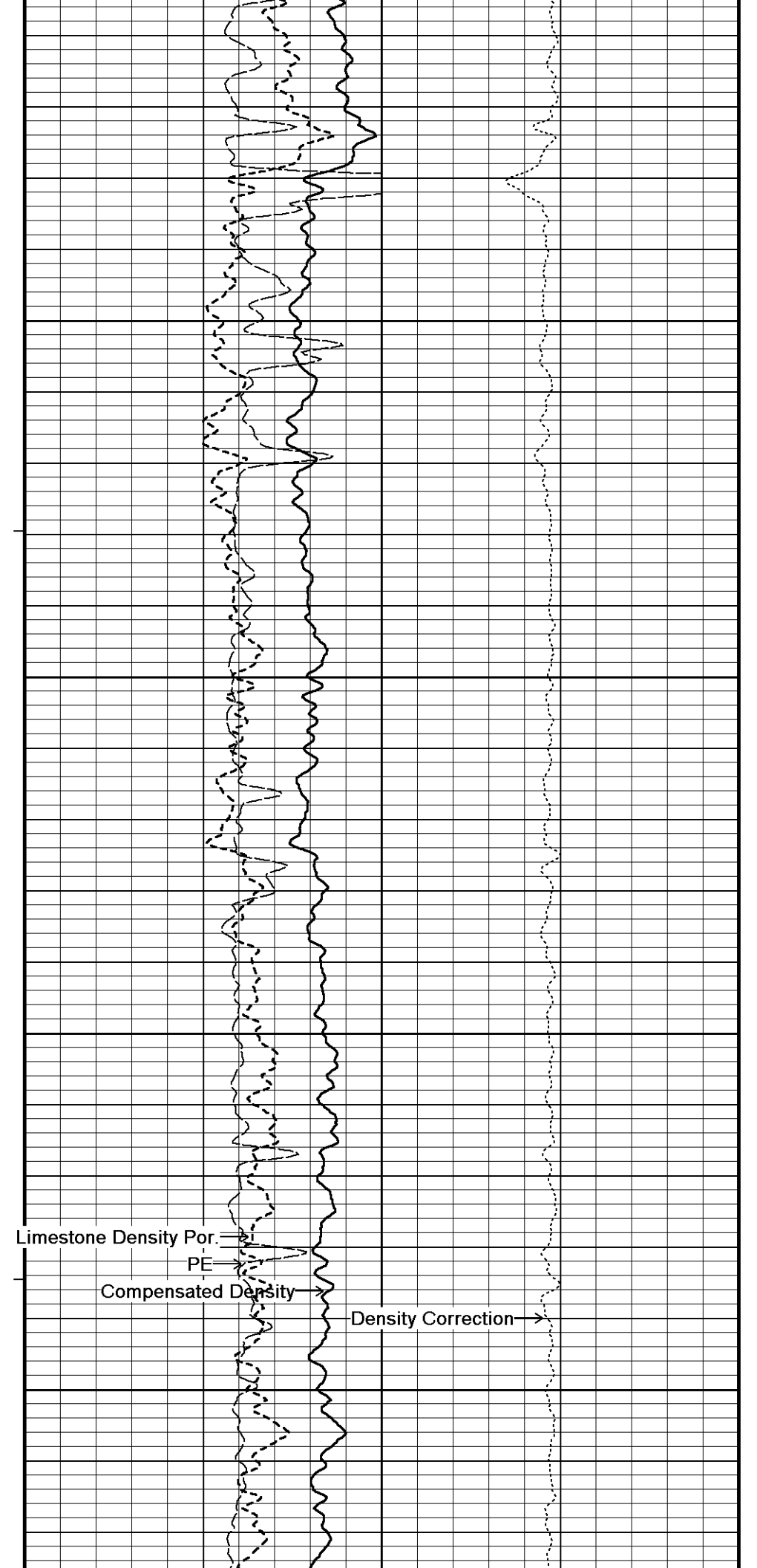
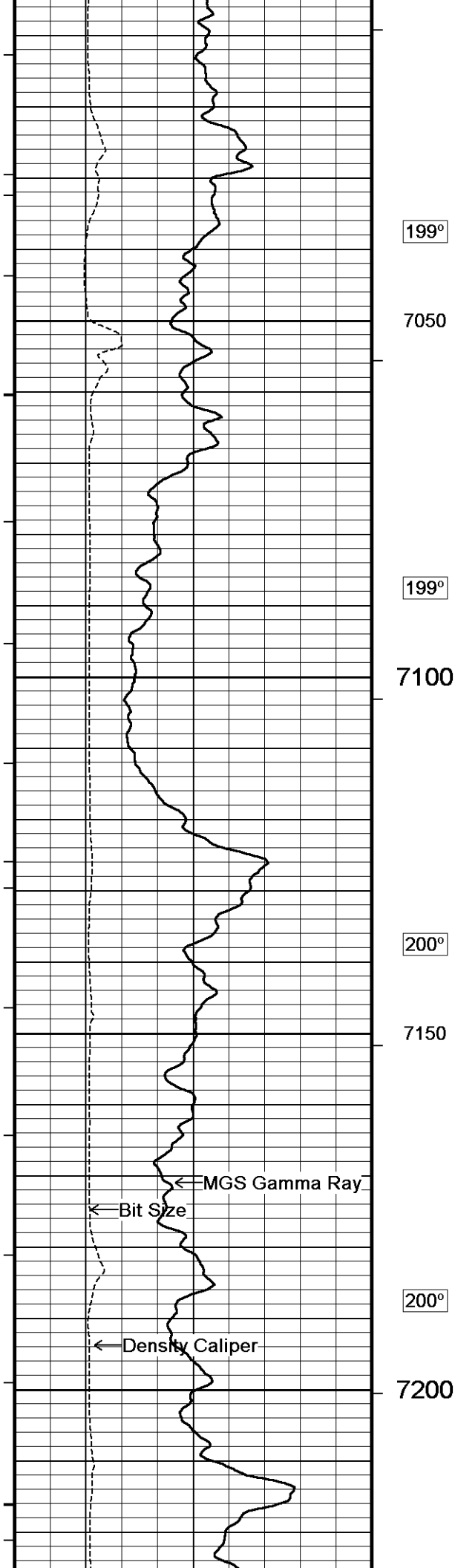
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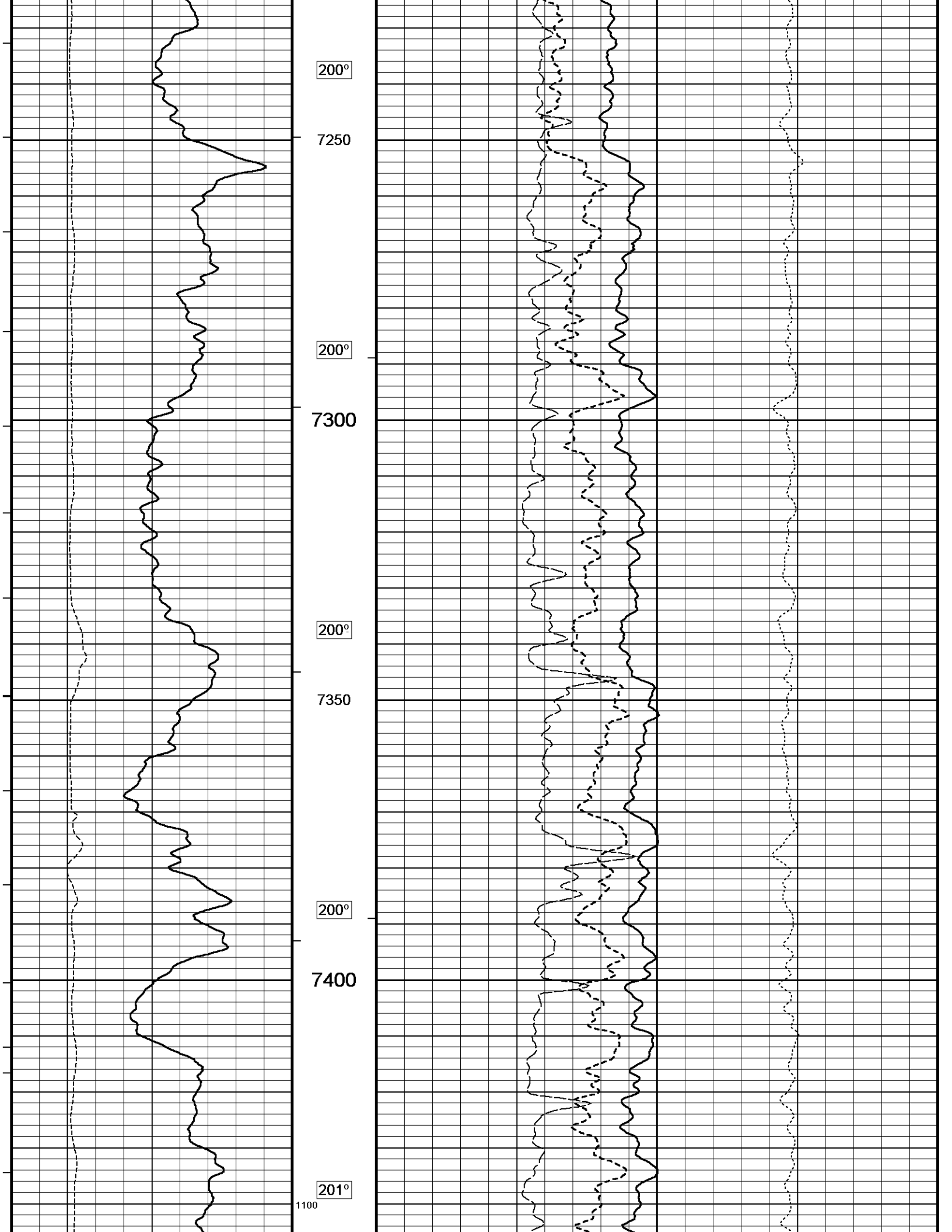


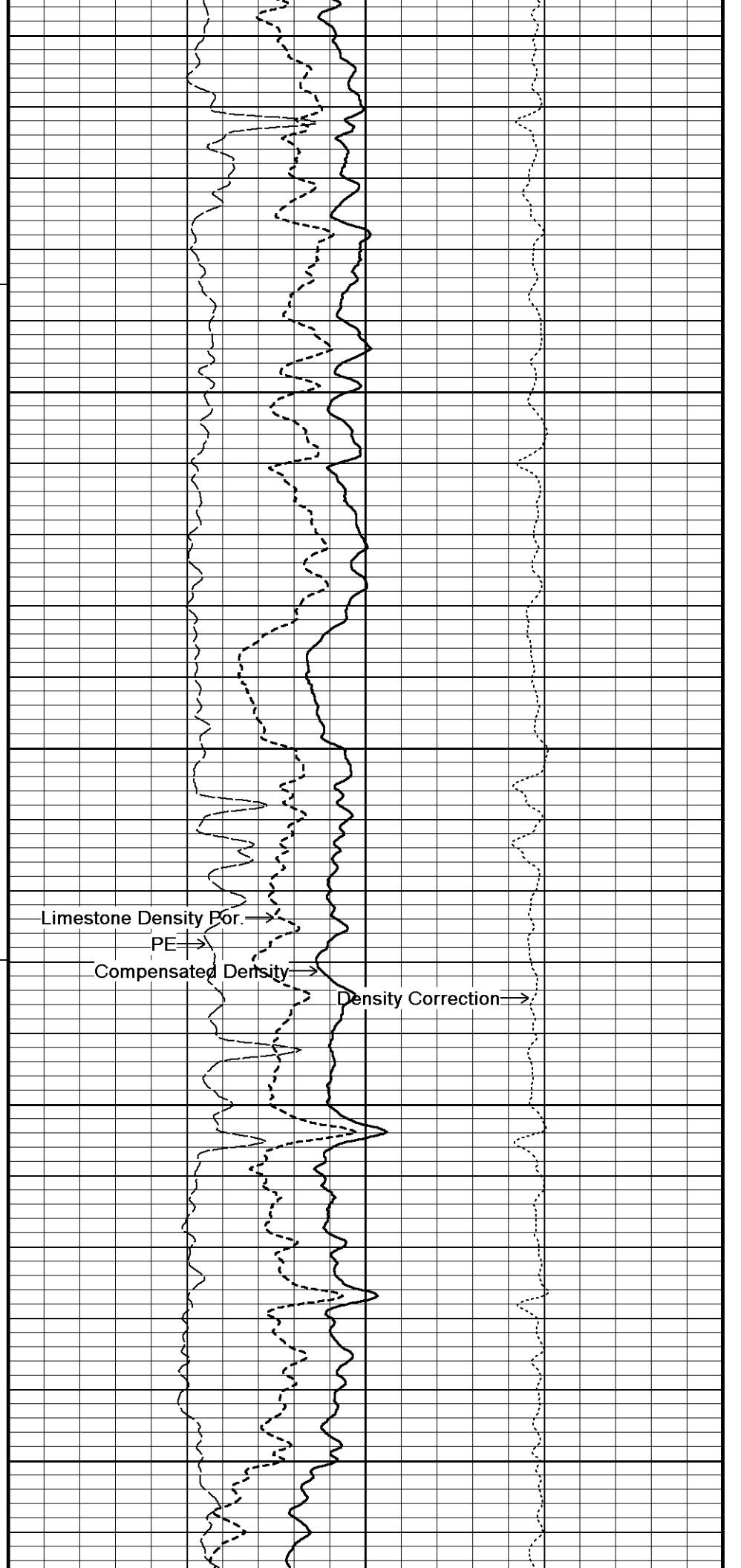
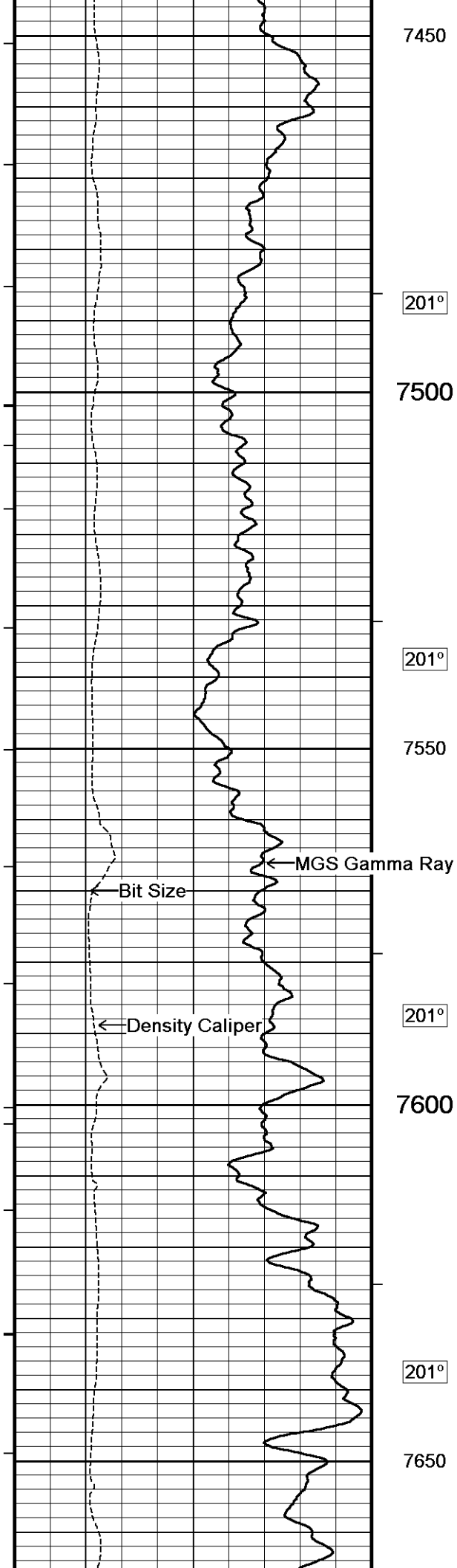


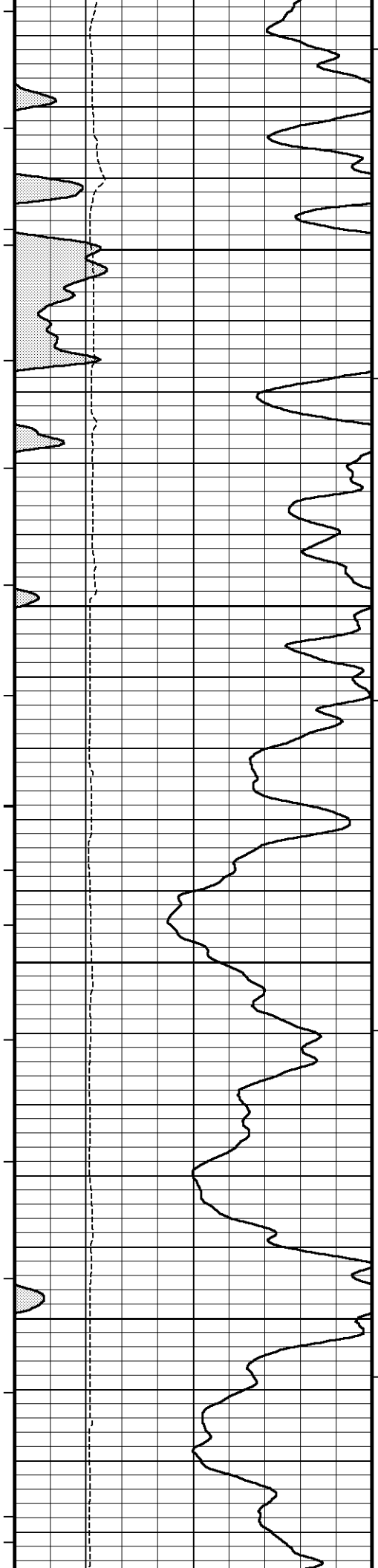




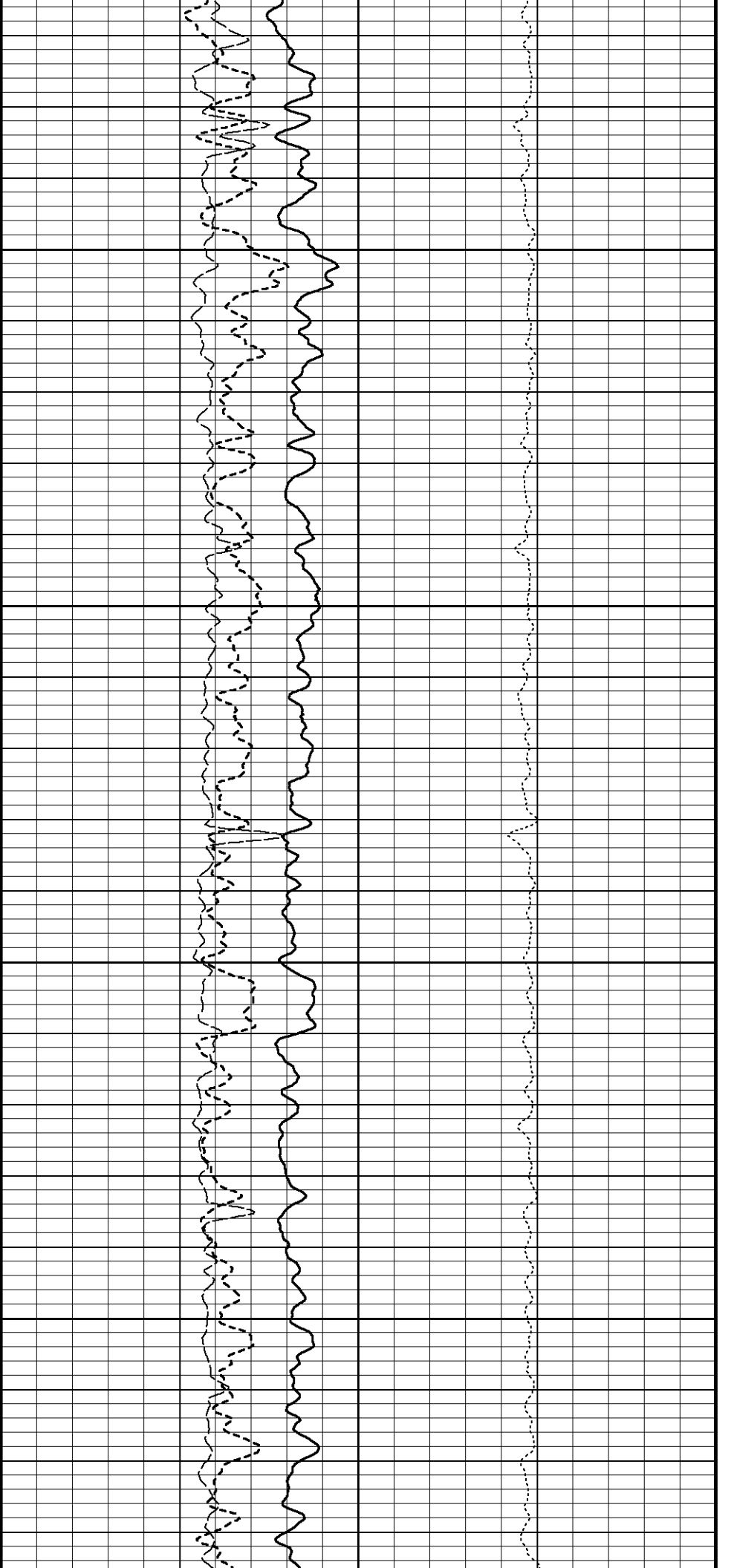


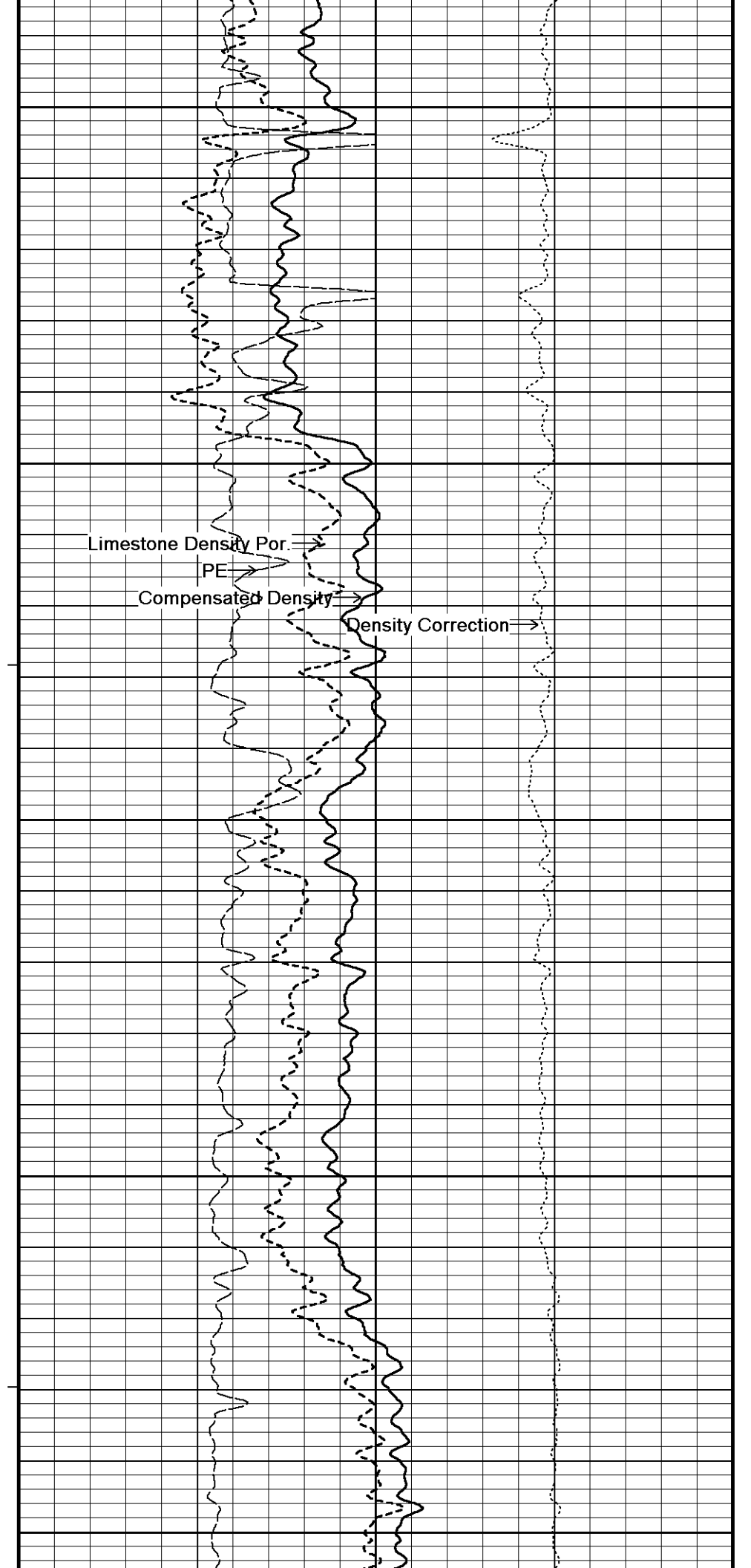
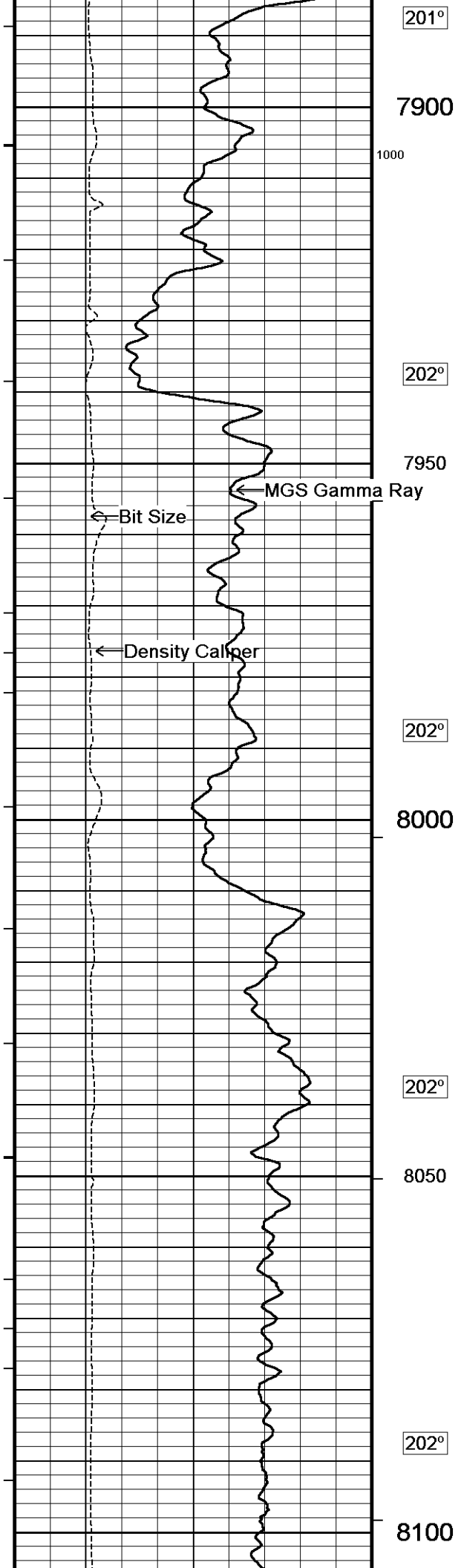


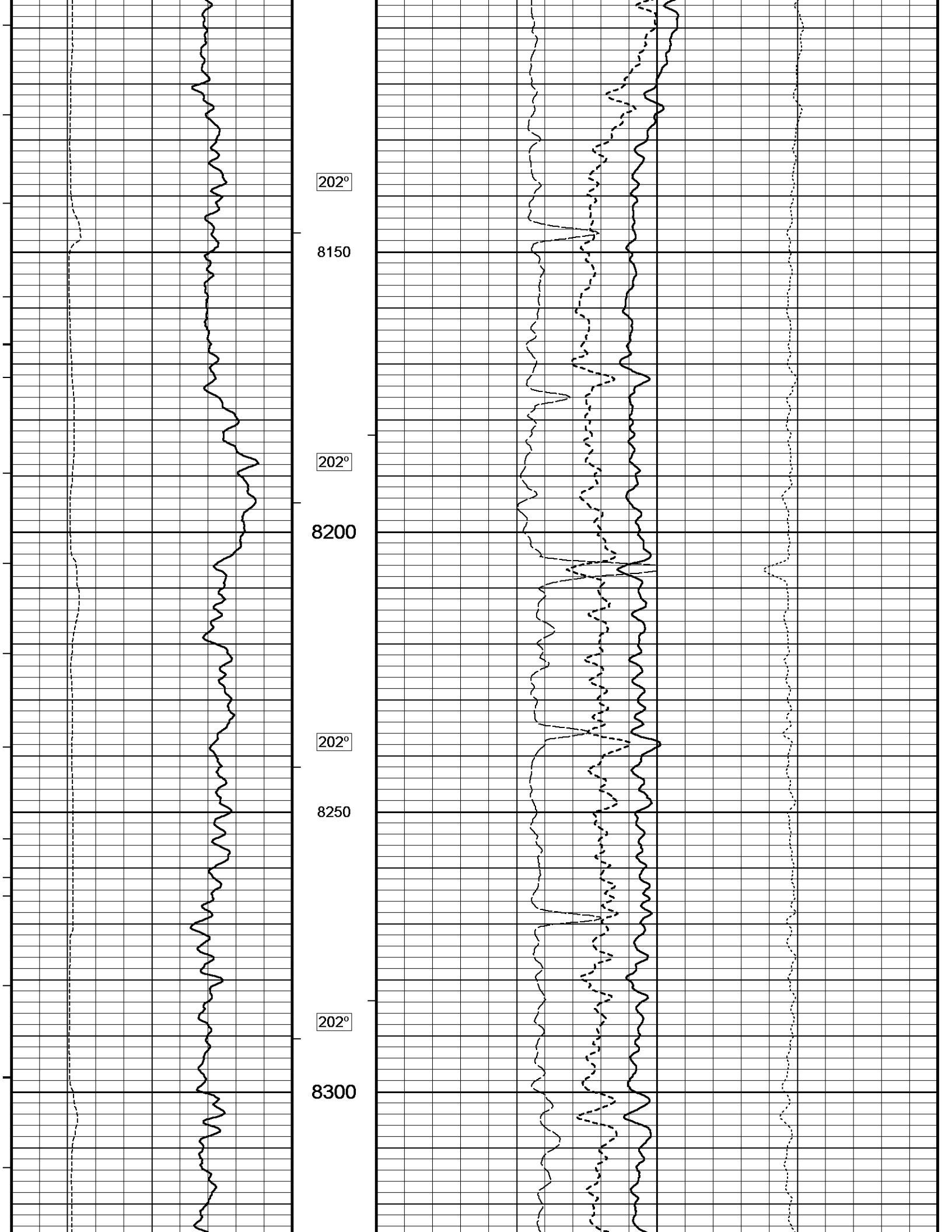


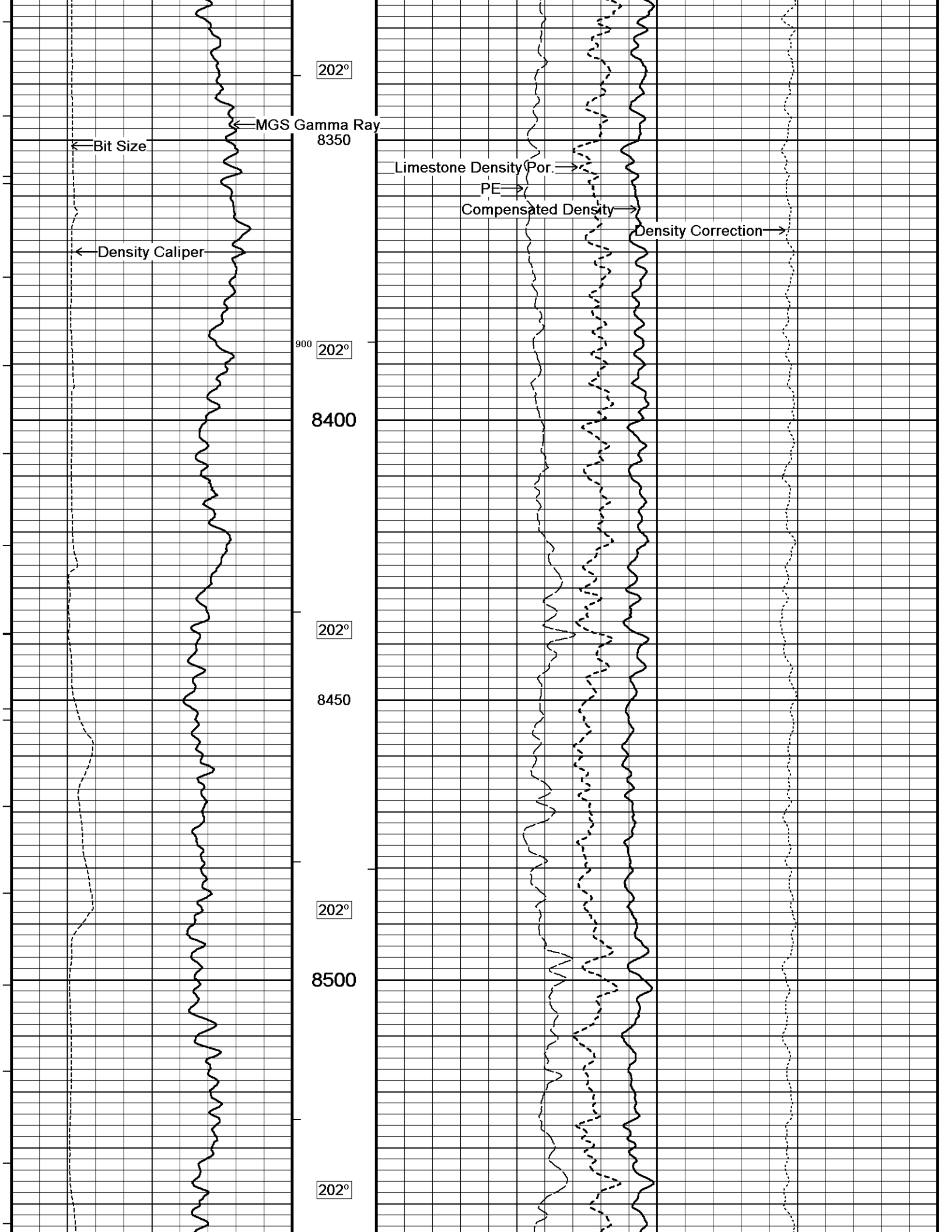


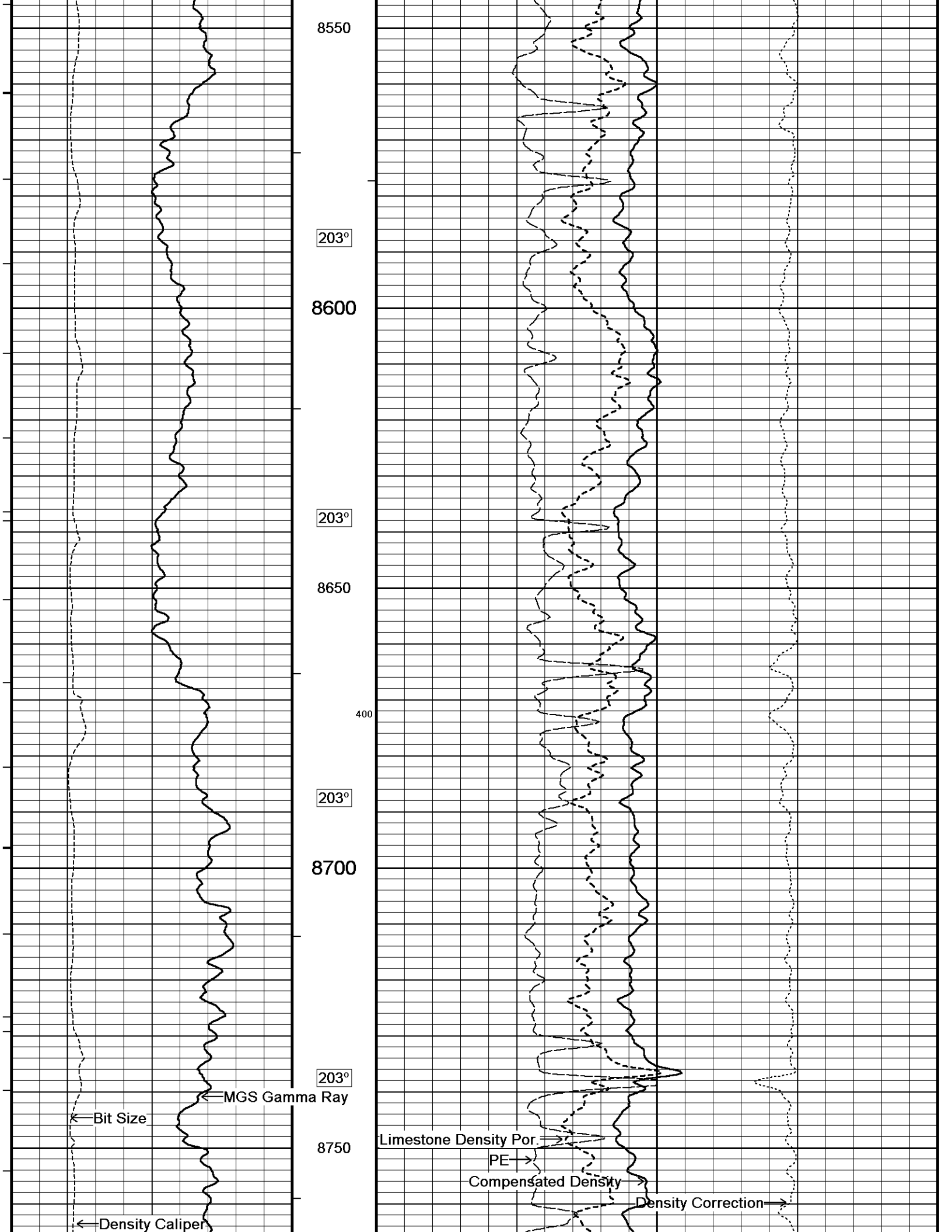
500
201°
7700
201°
7750
201°
7800
201°
7850

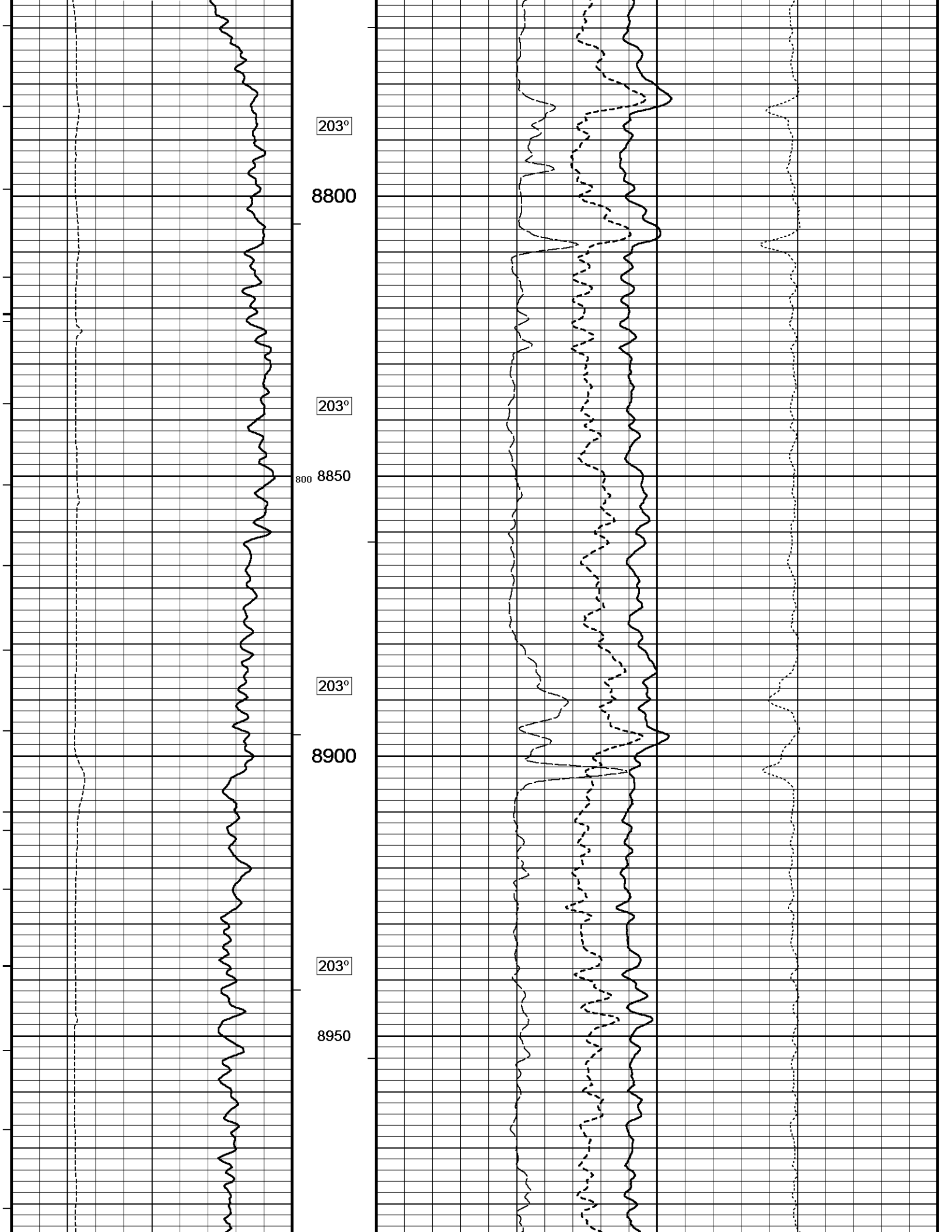


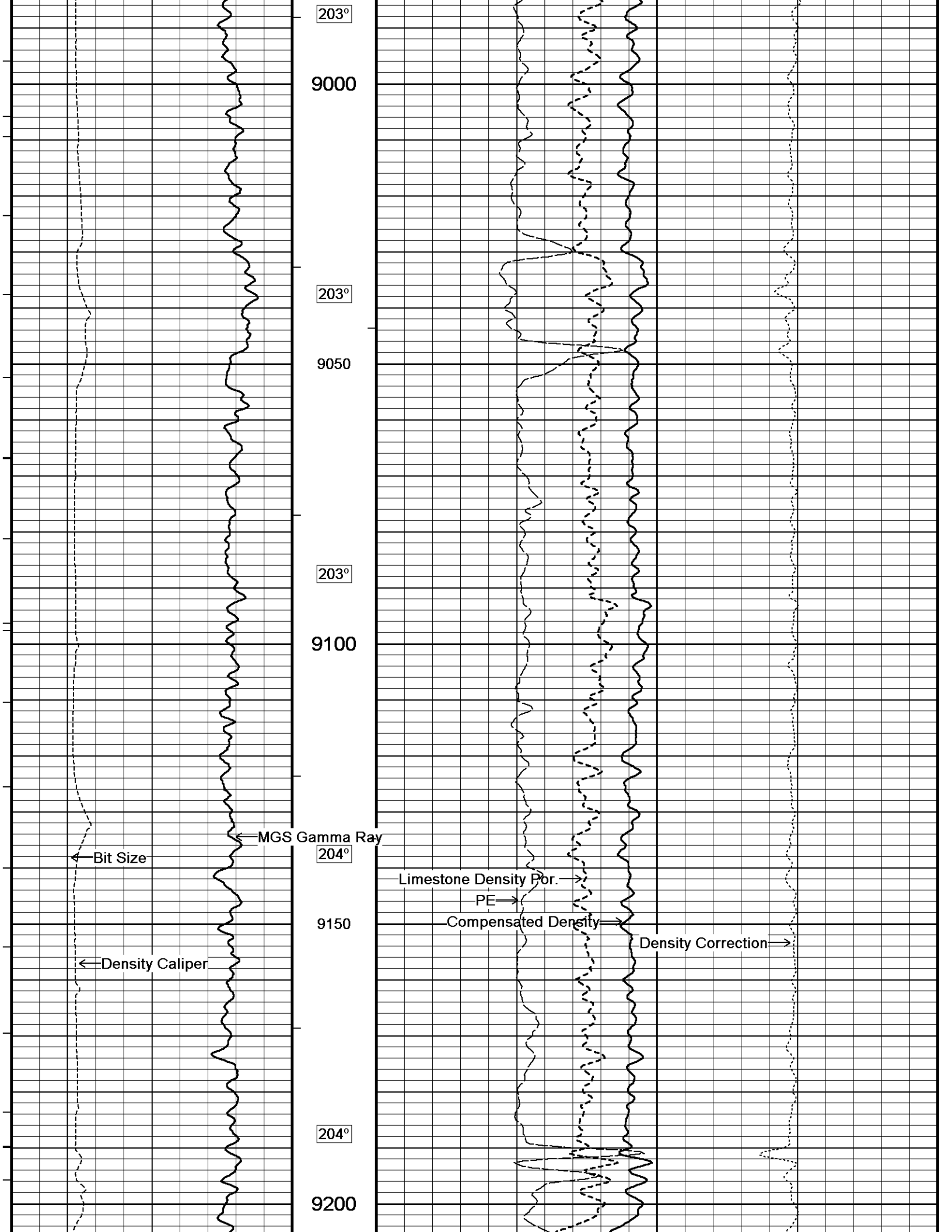


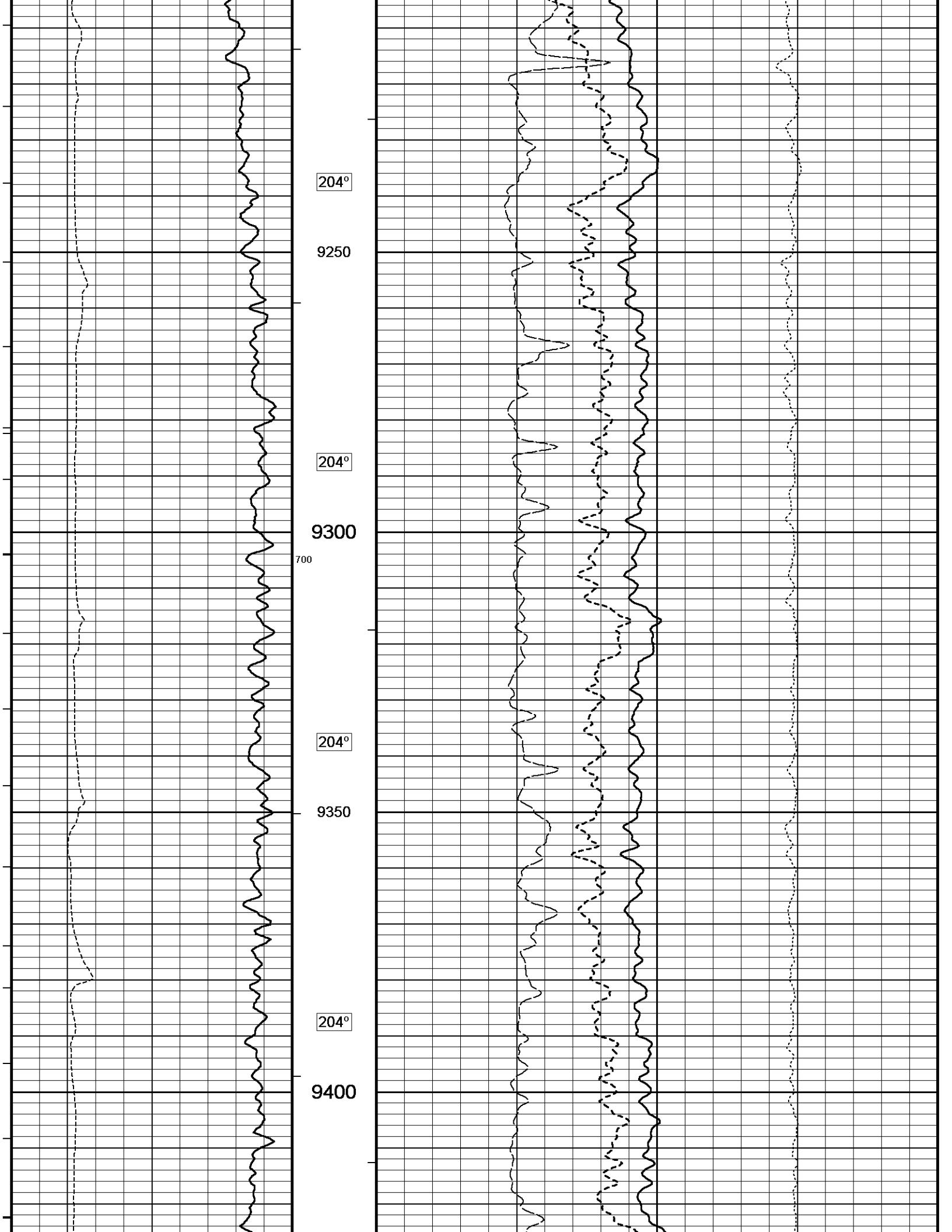


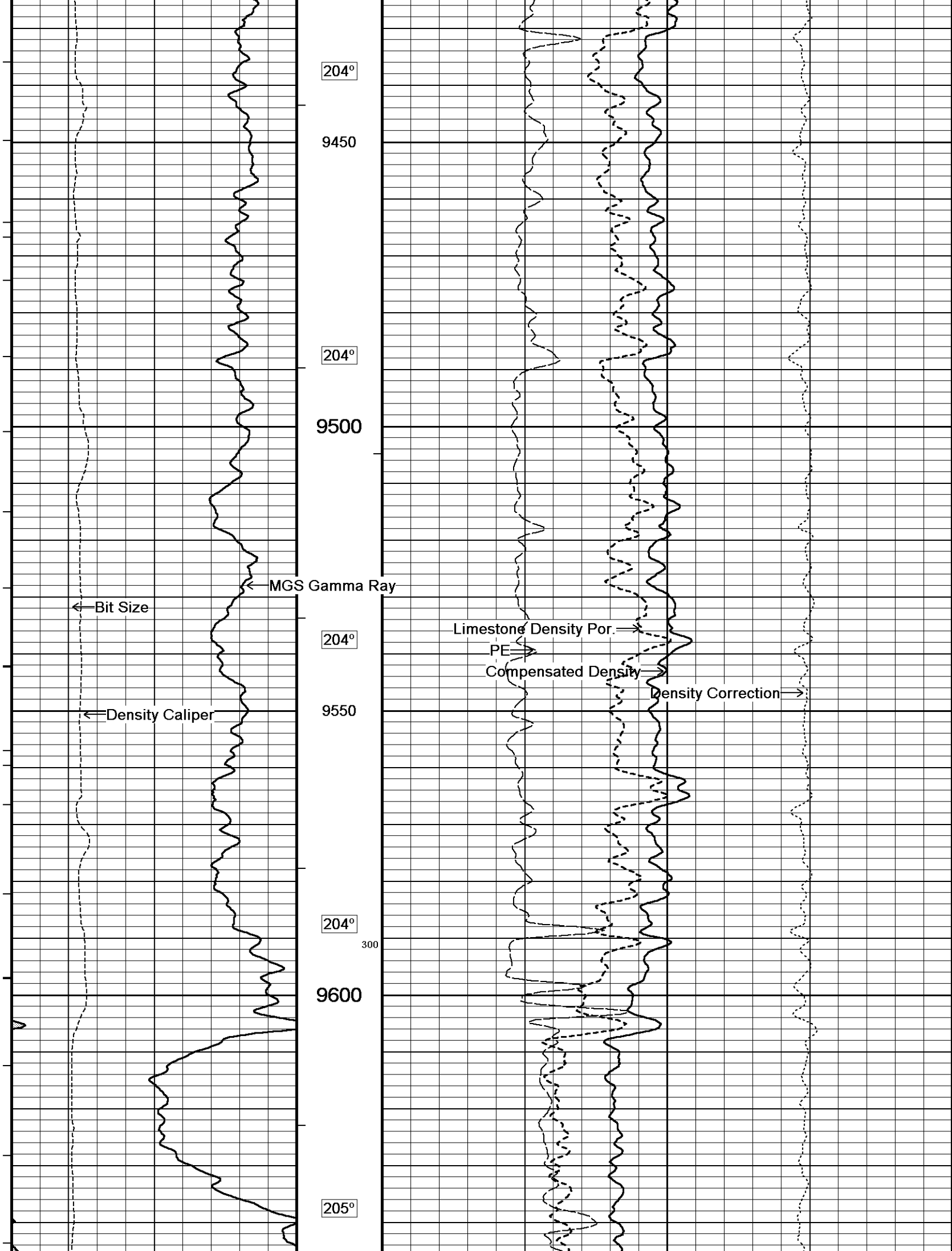


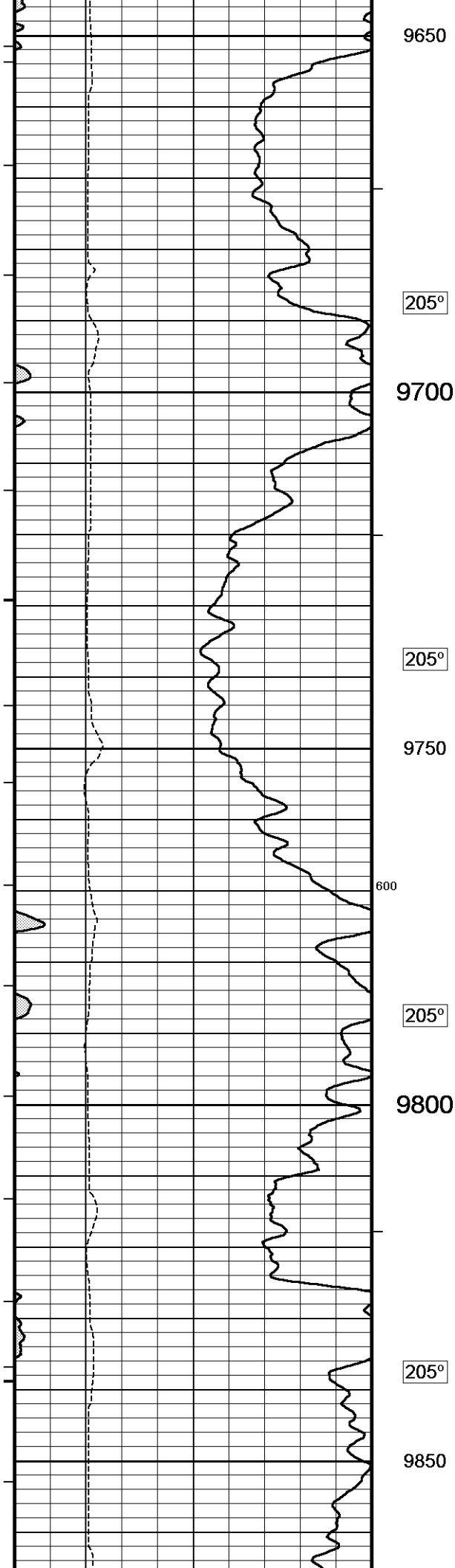
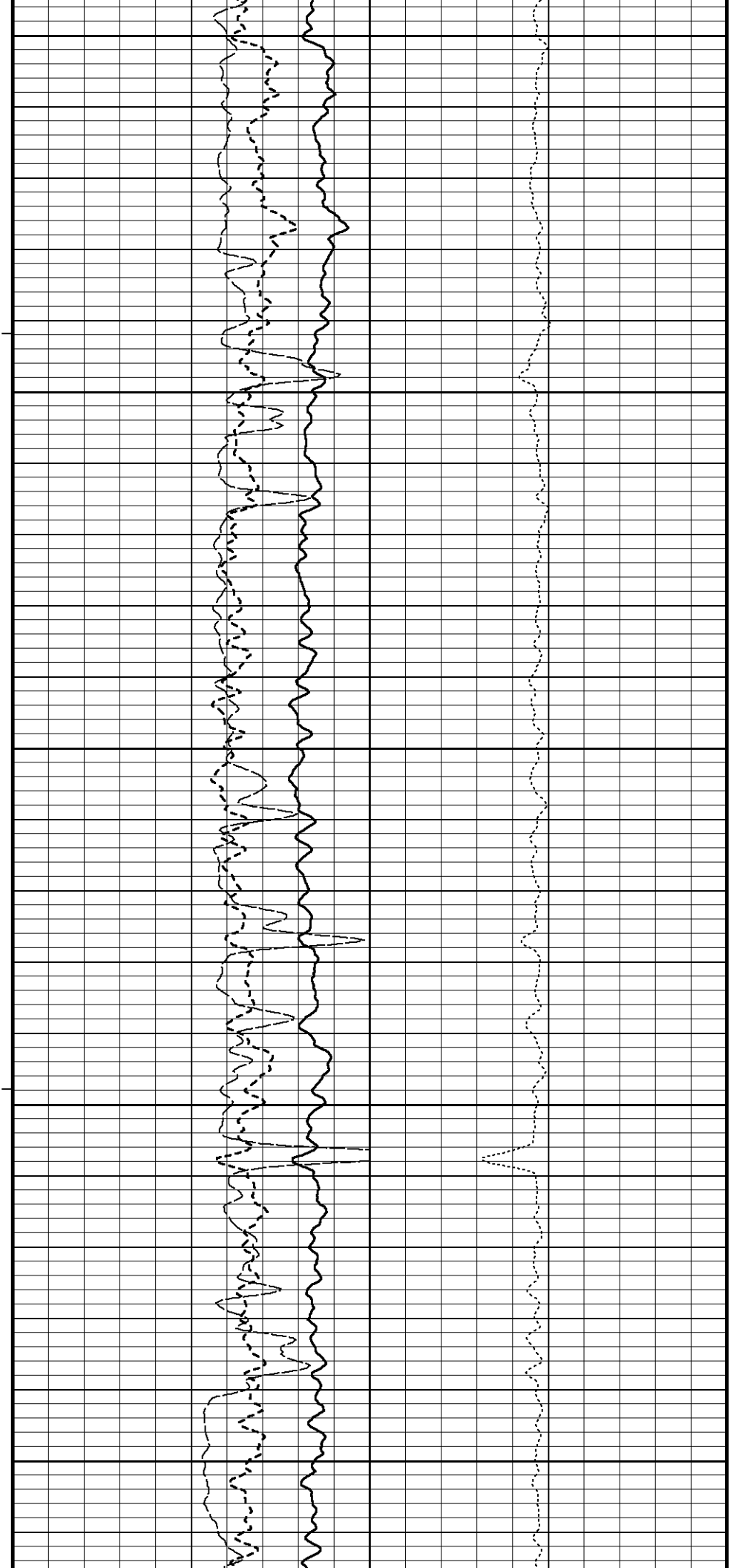
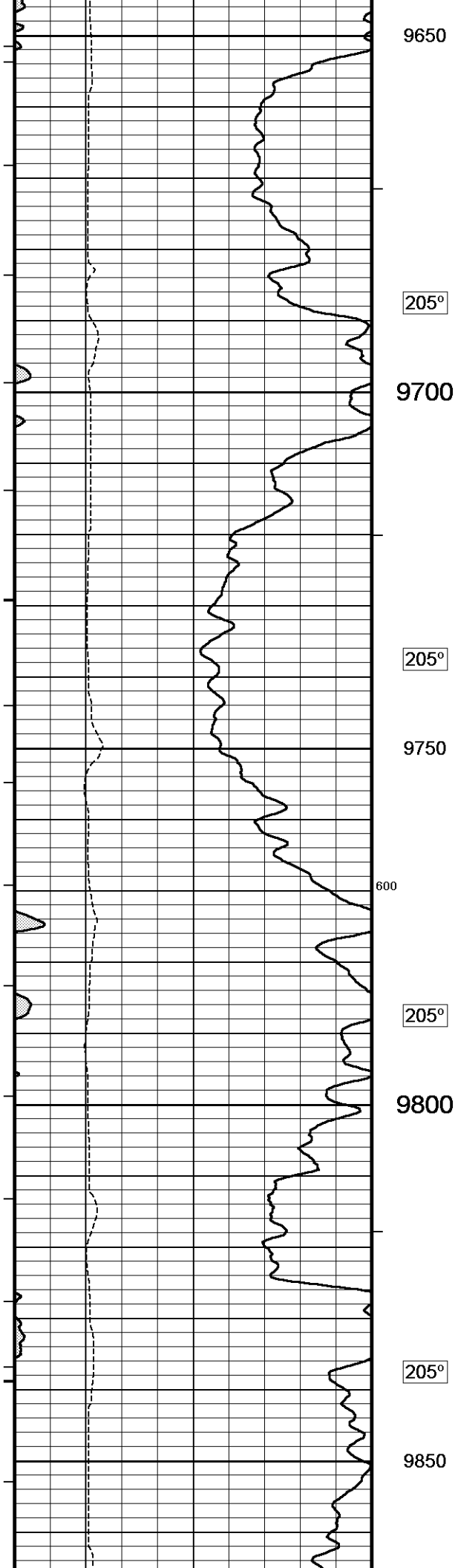


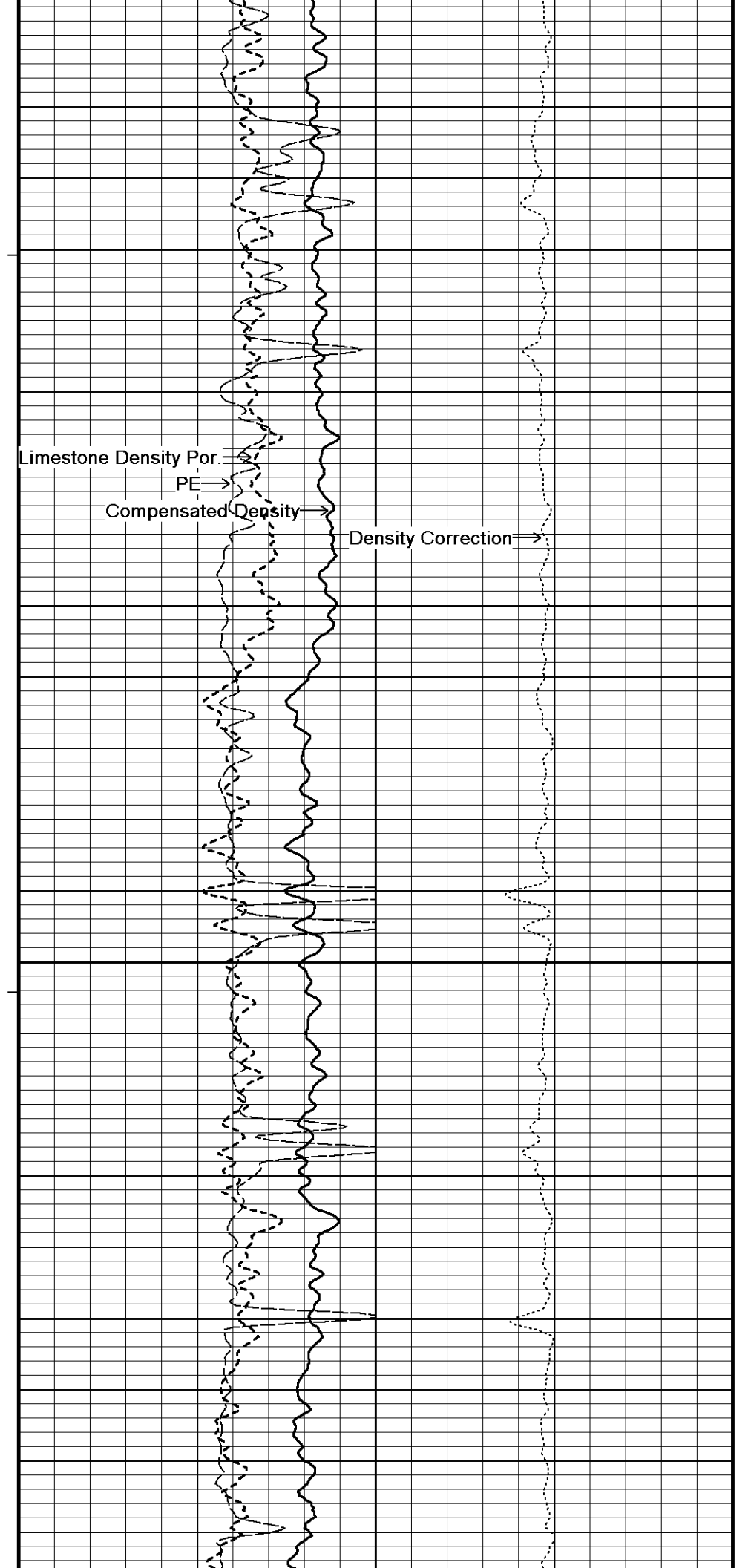
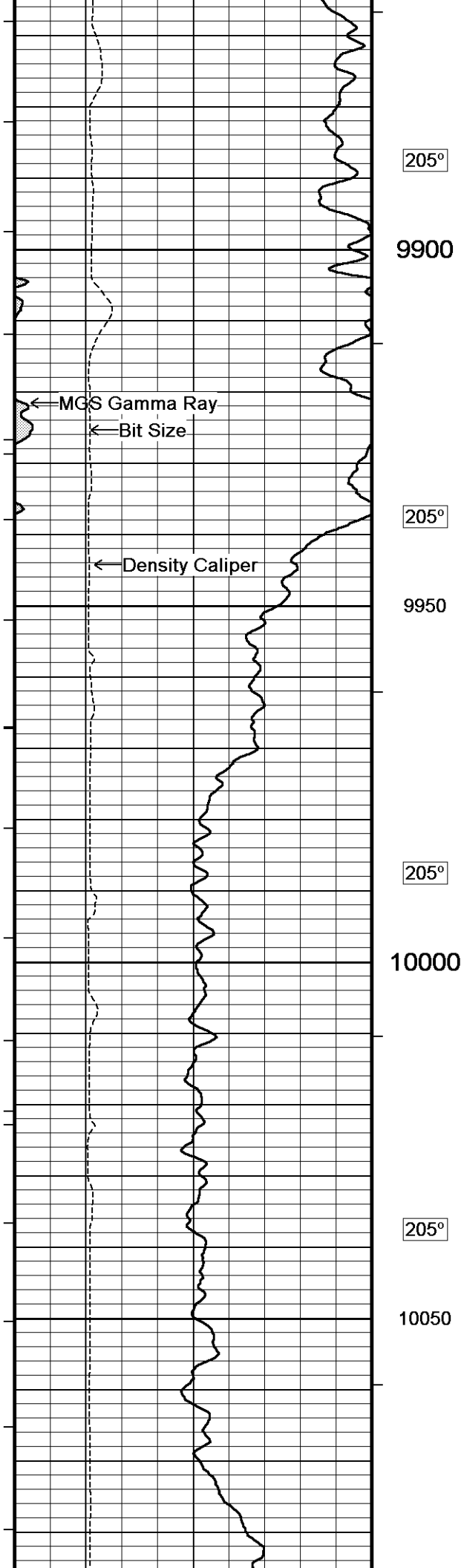


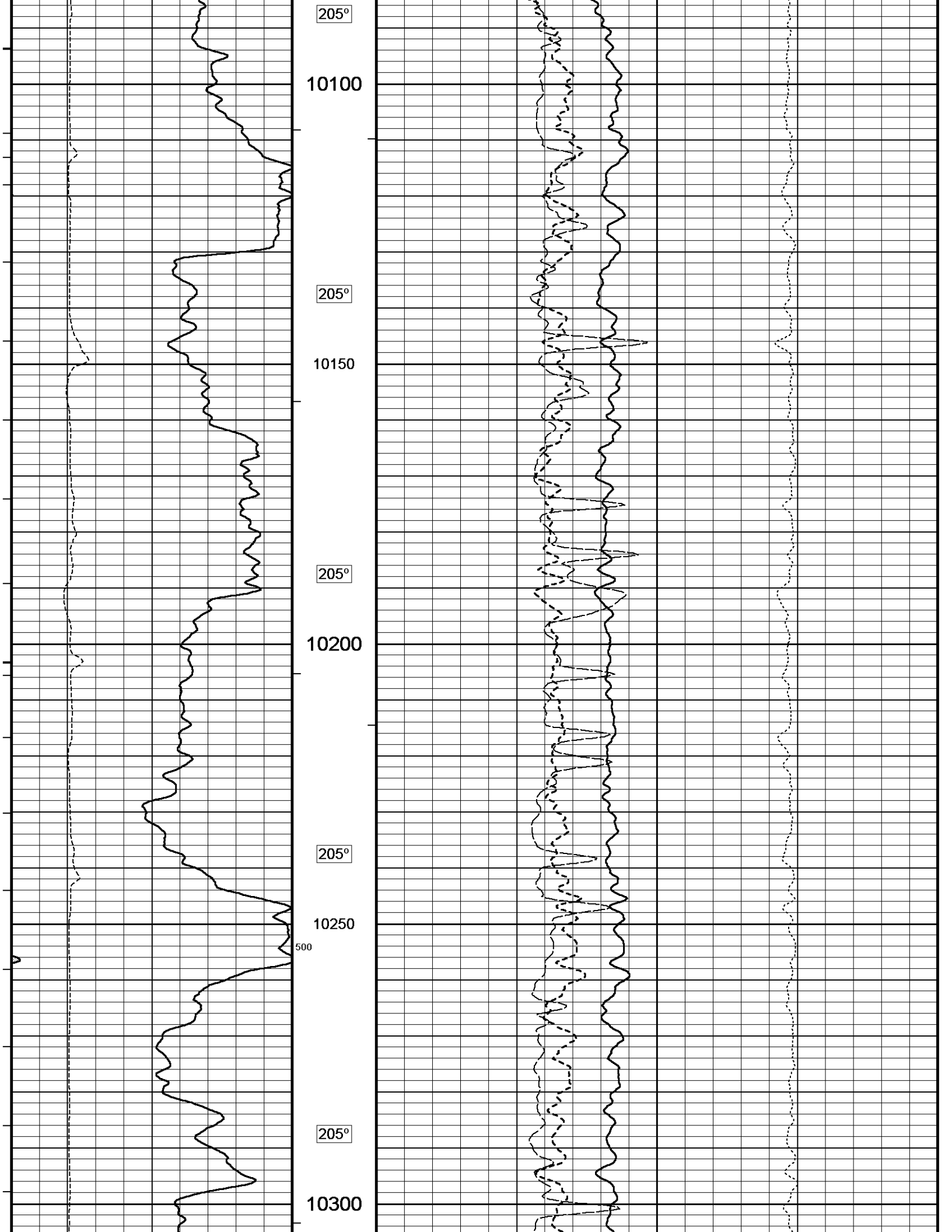


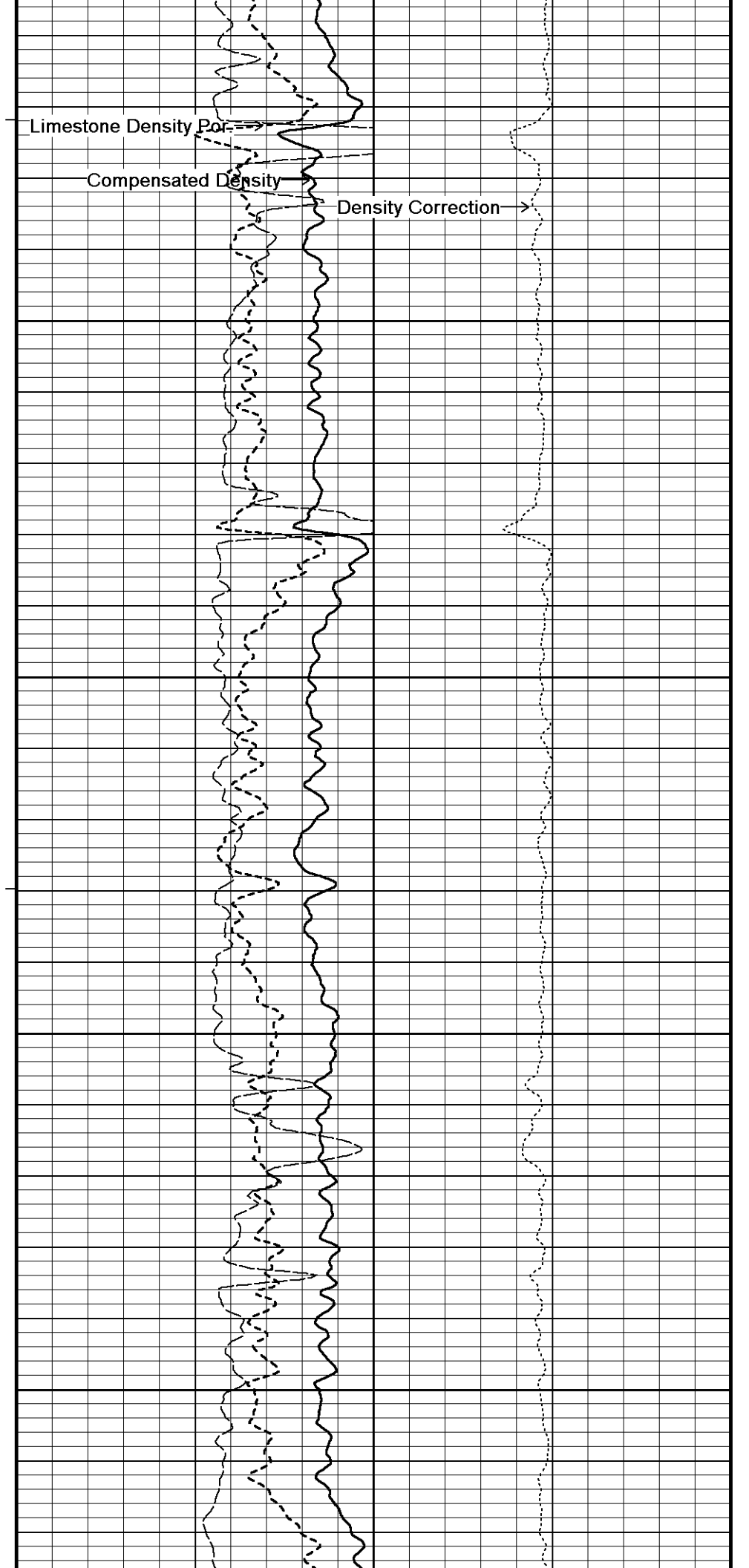
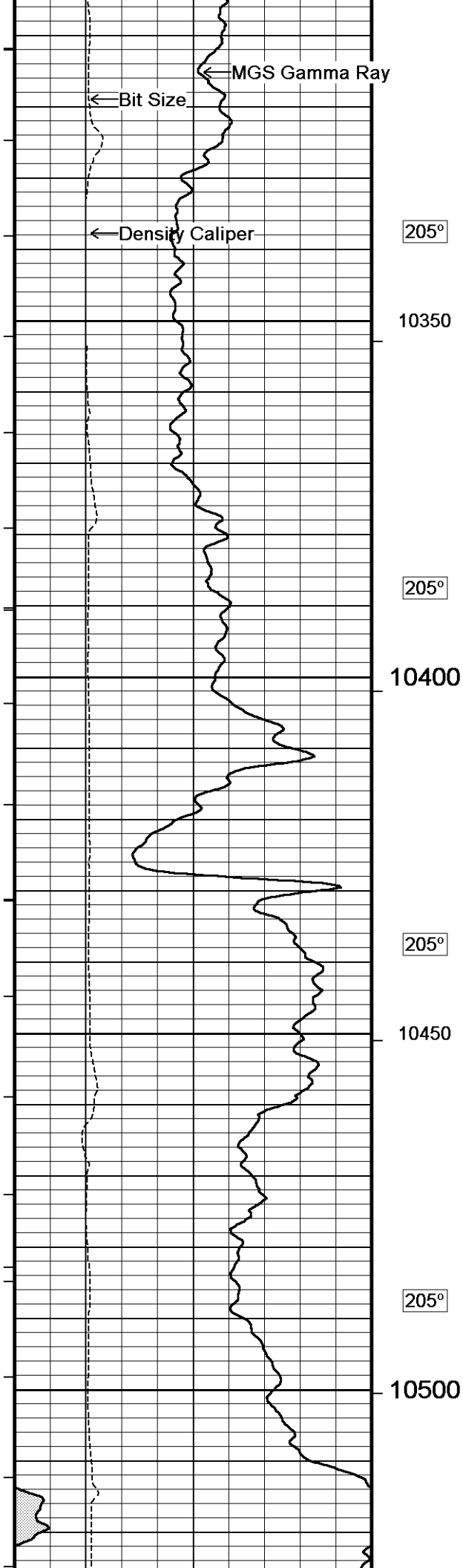


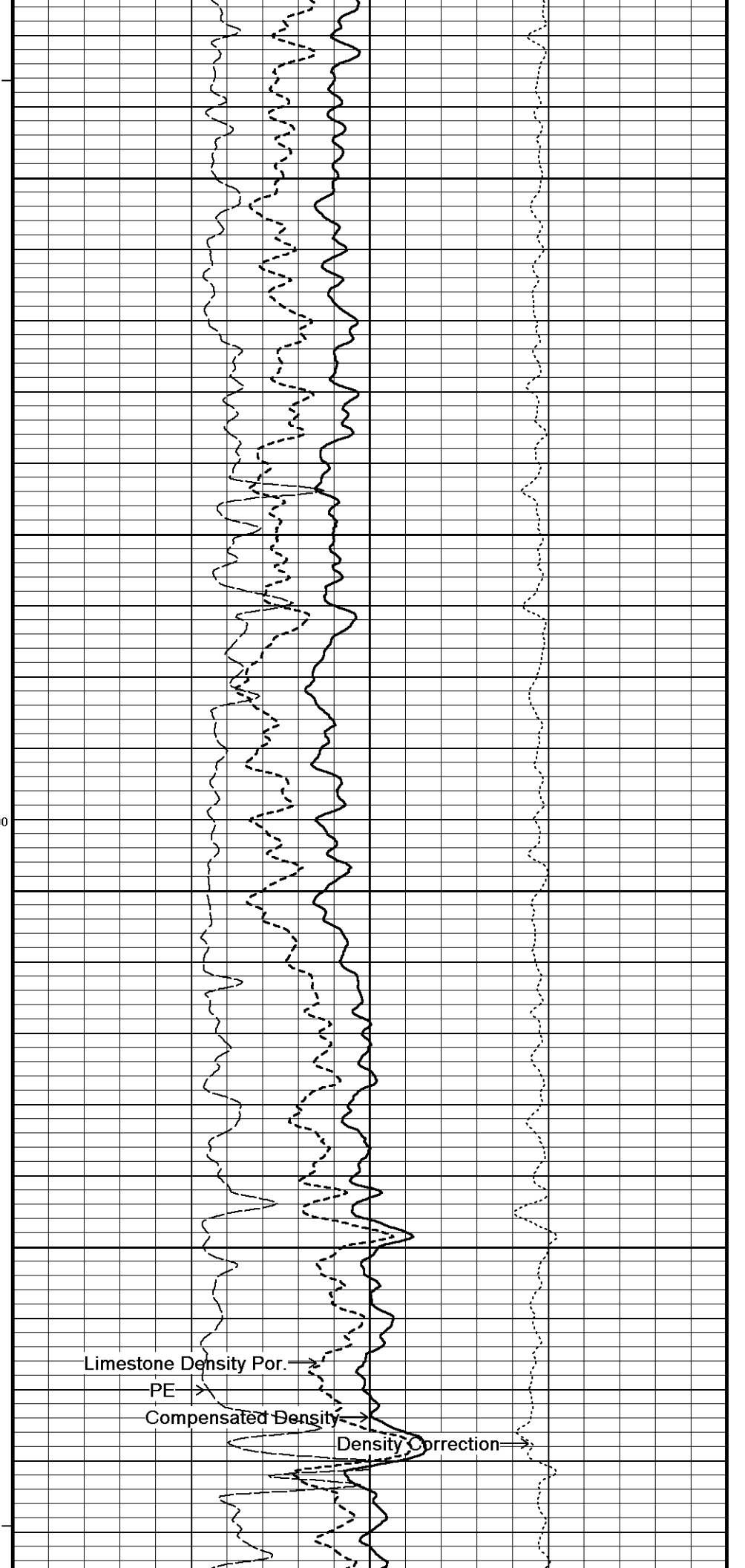
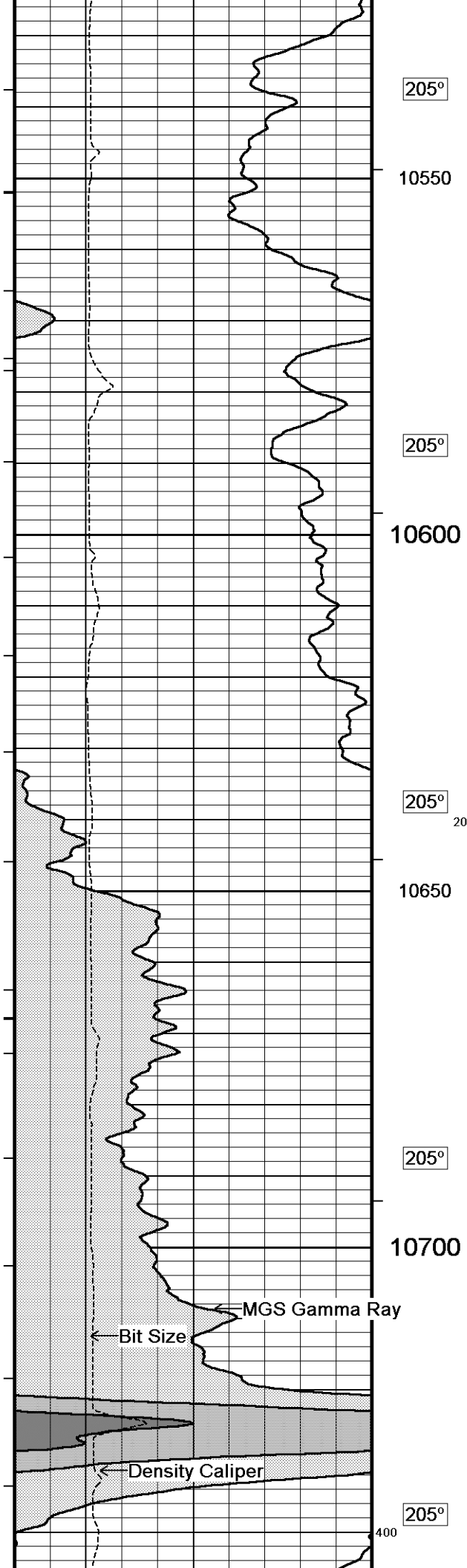


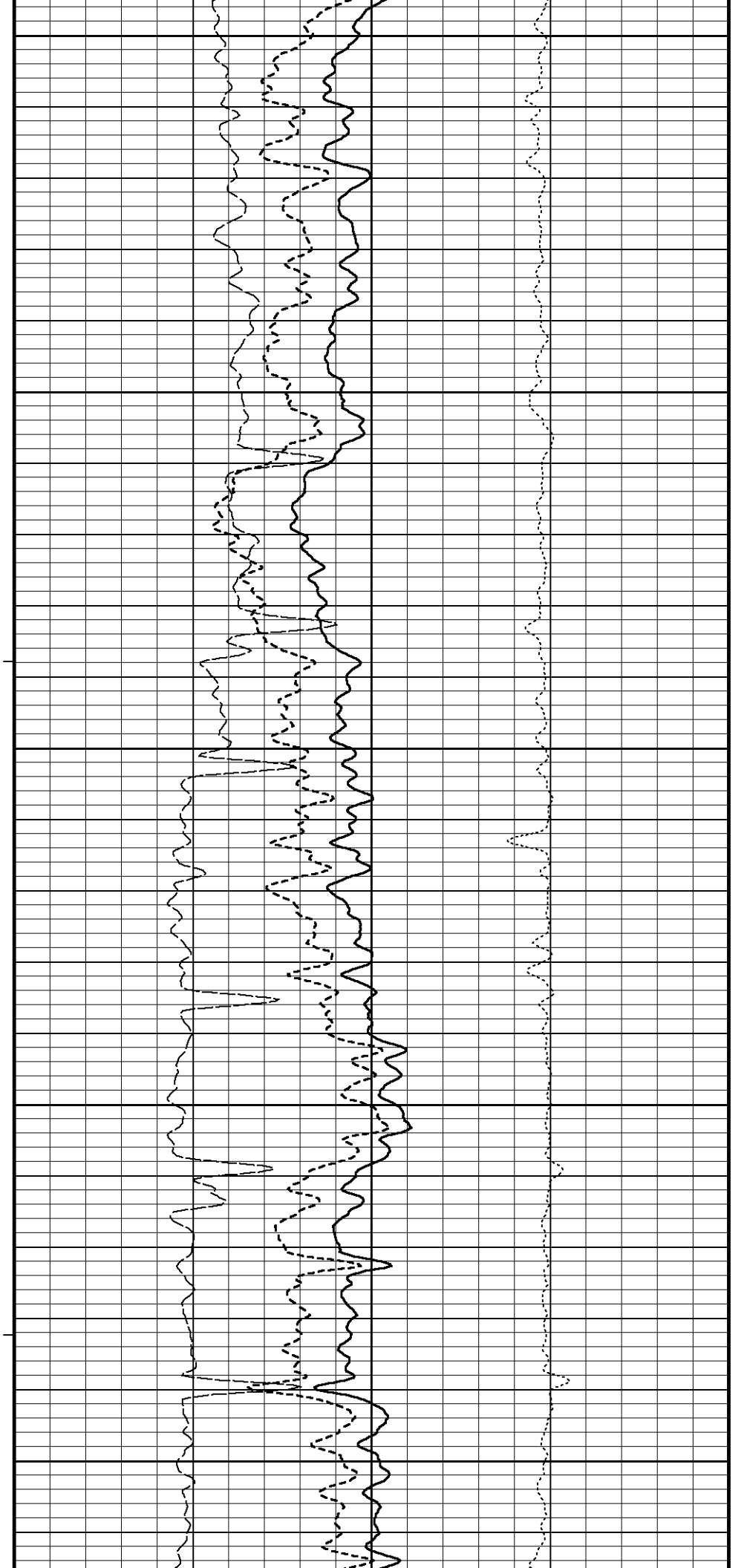
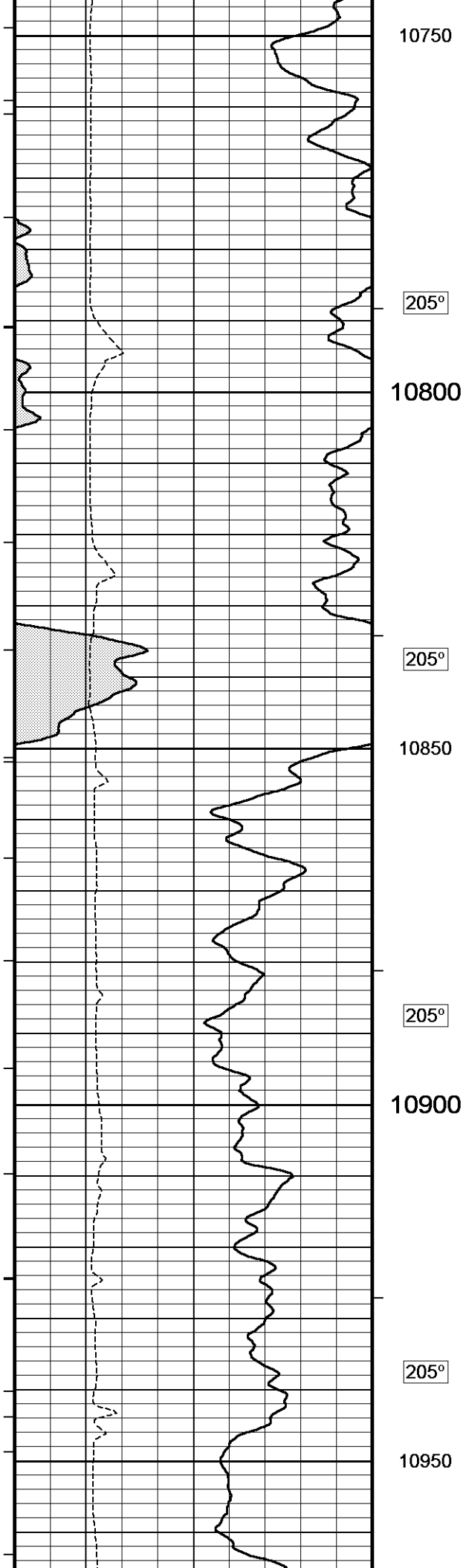


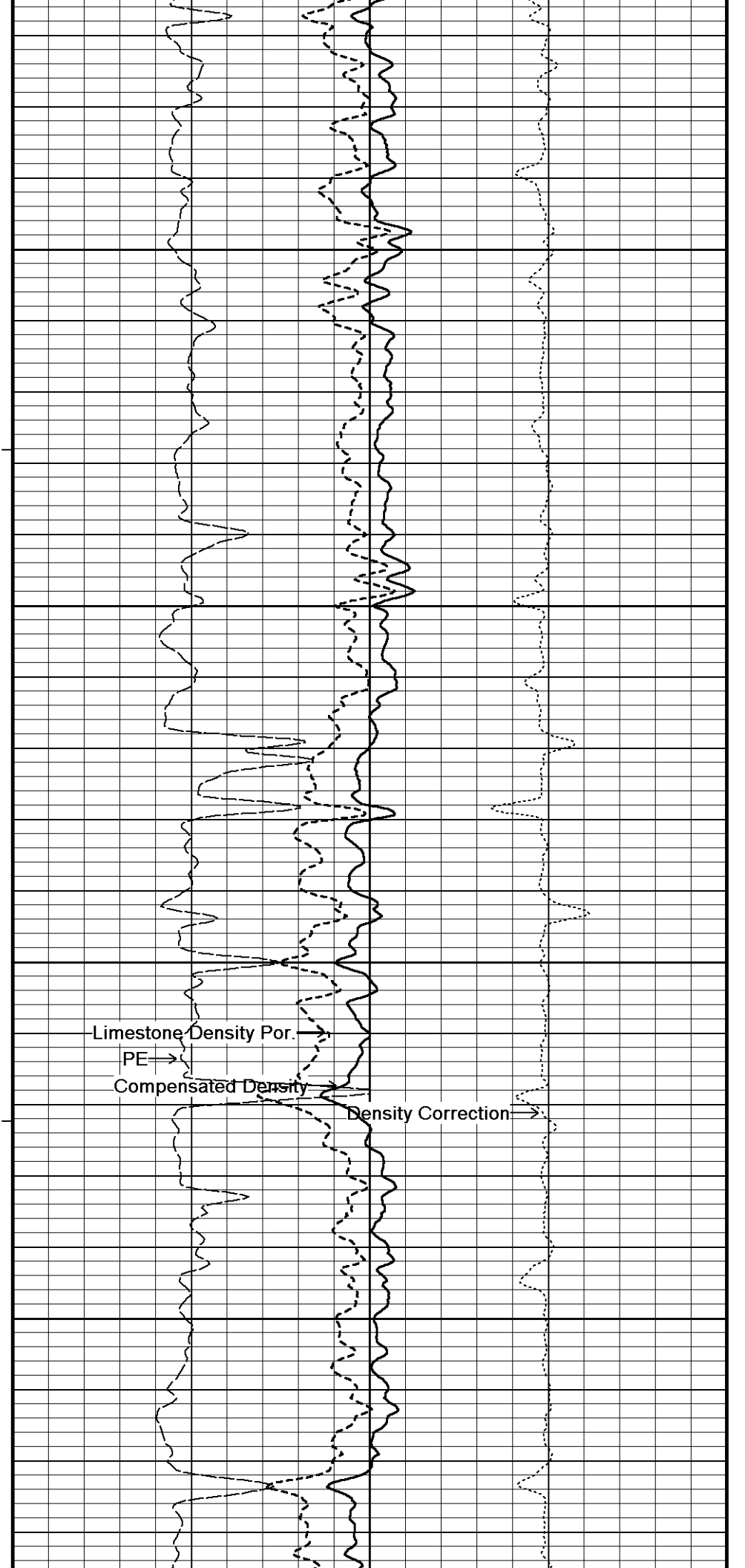
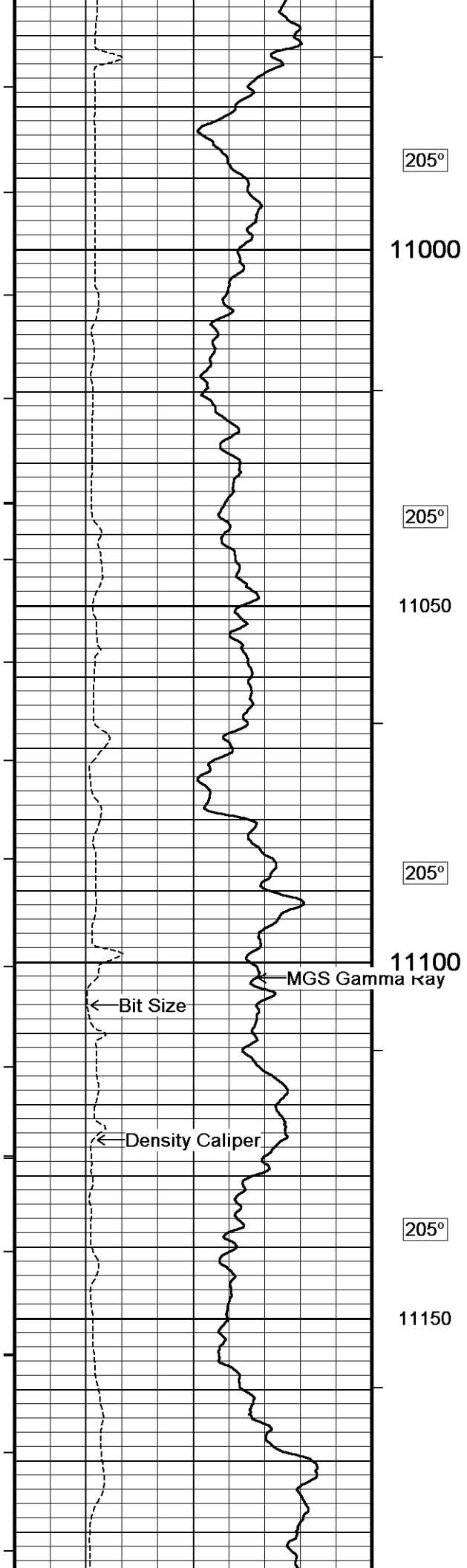


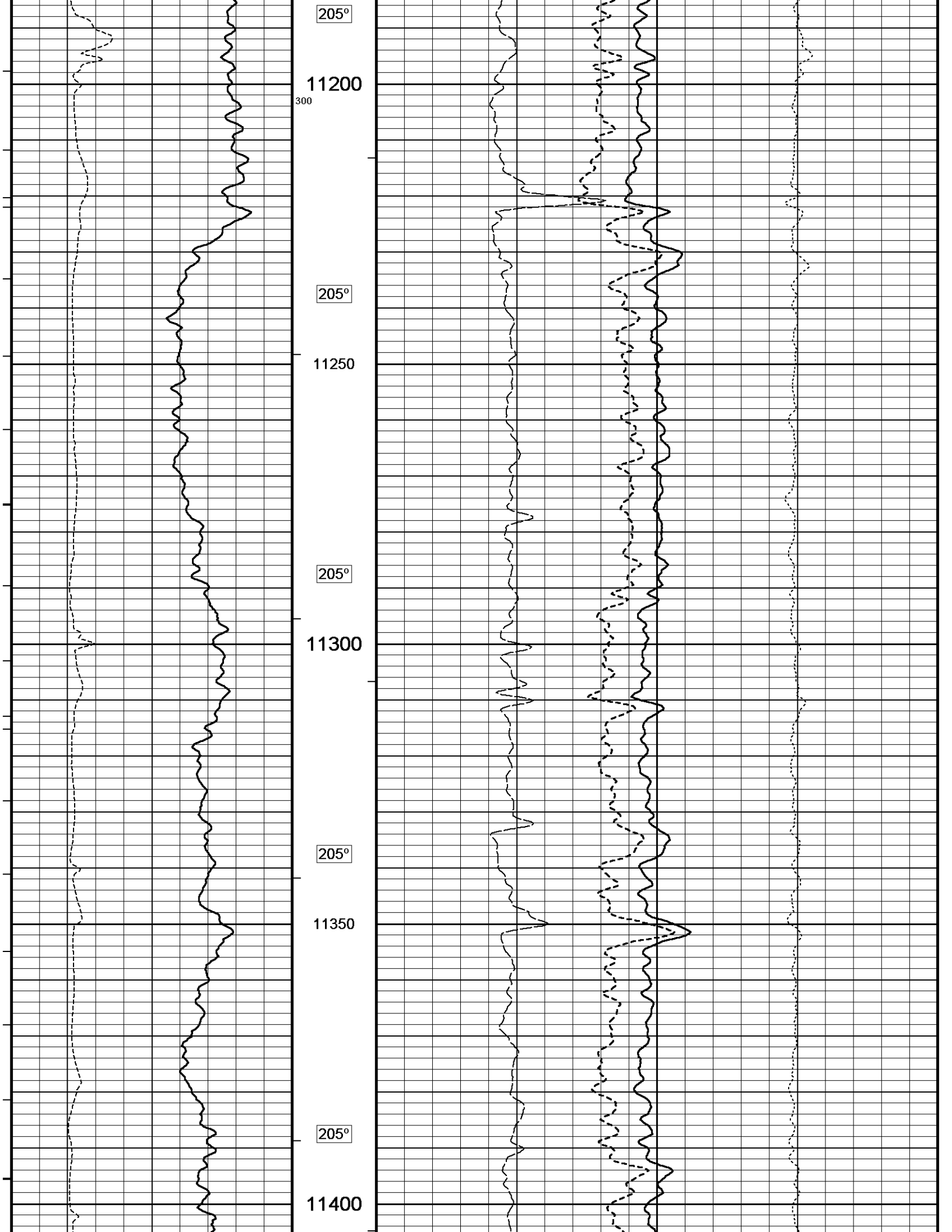


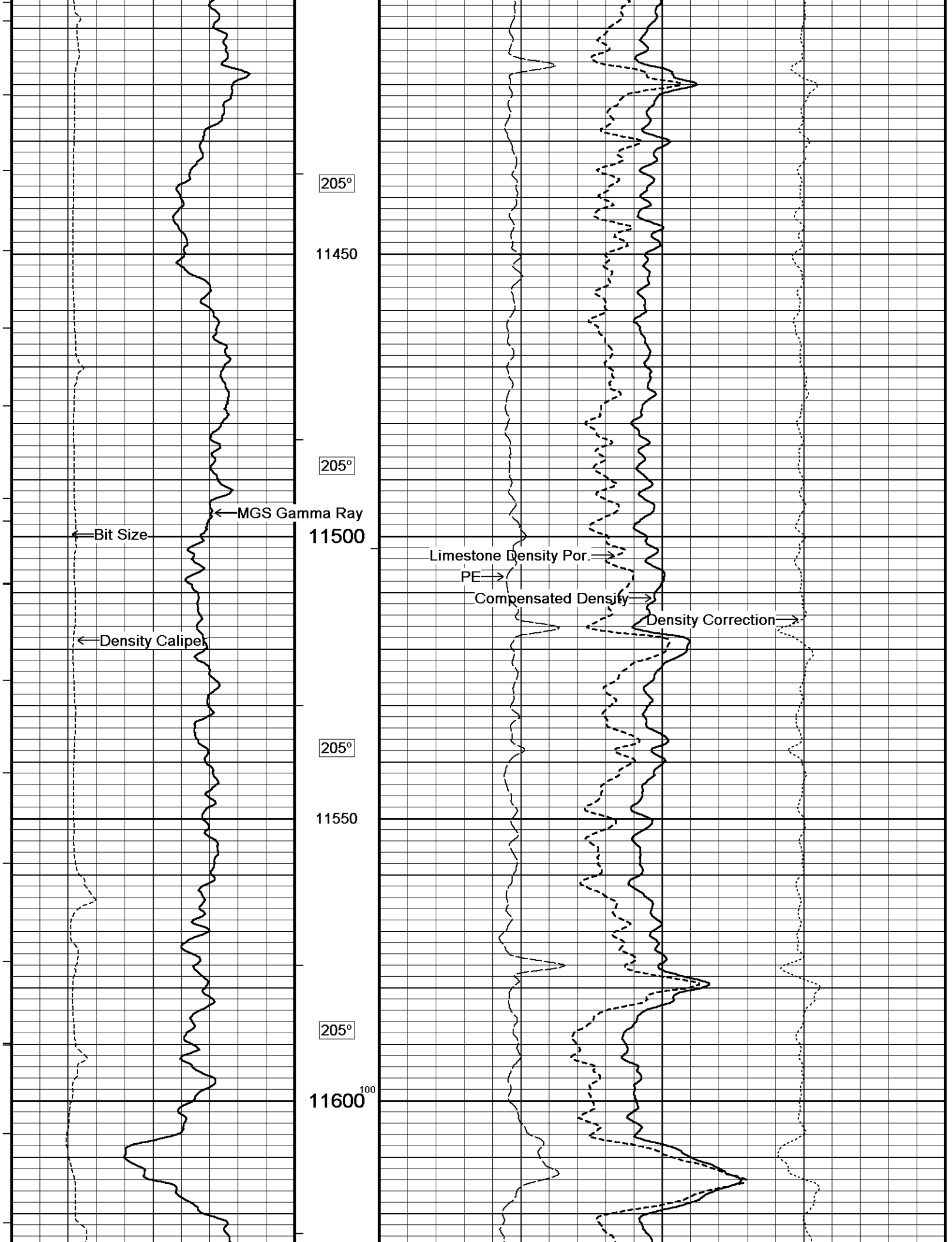


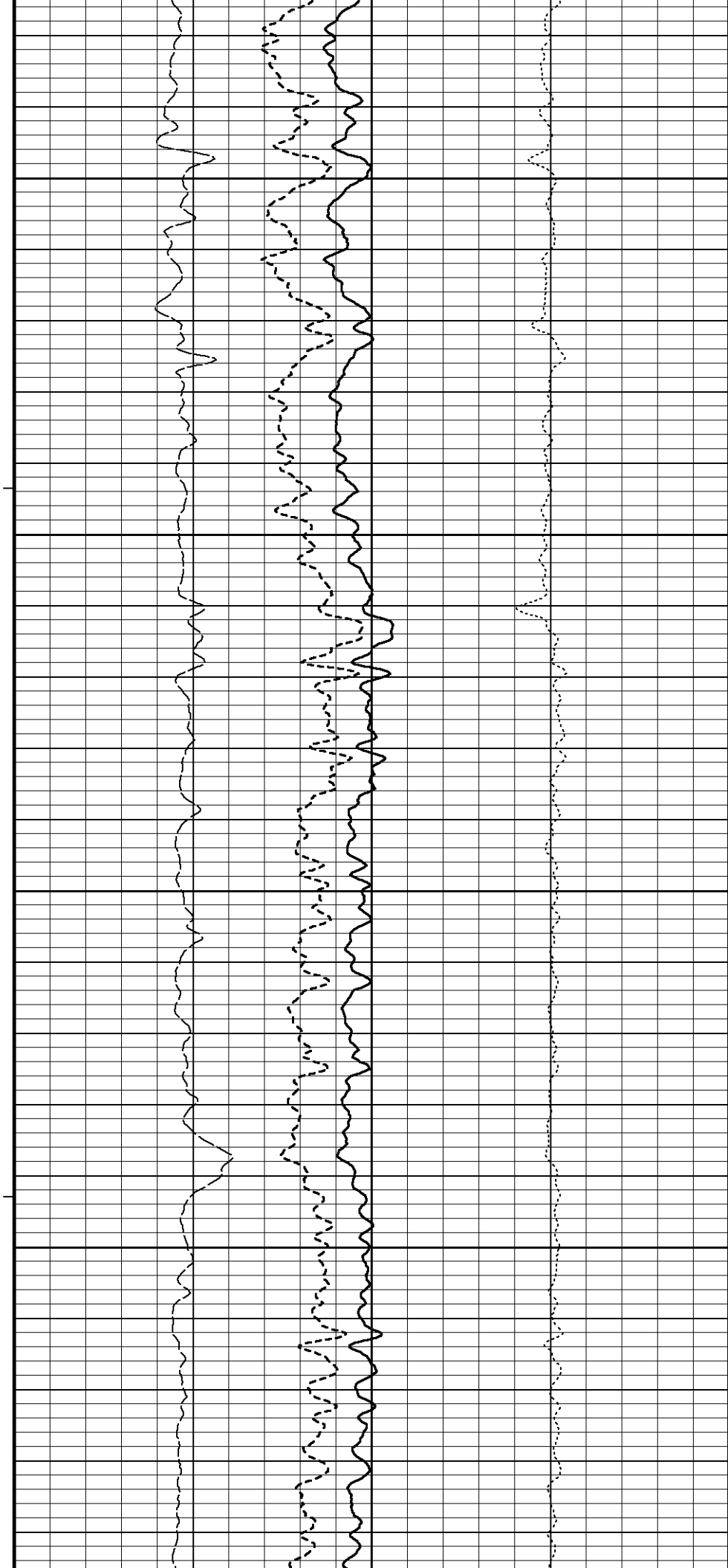
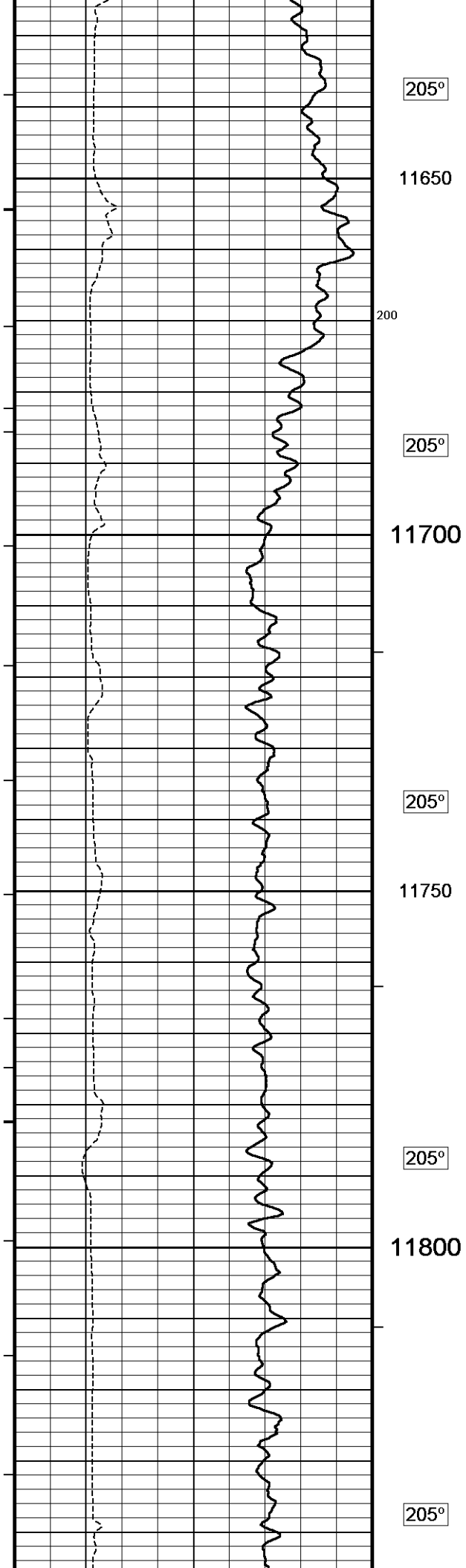


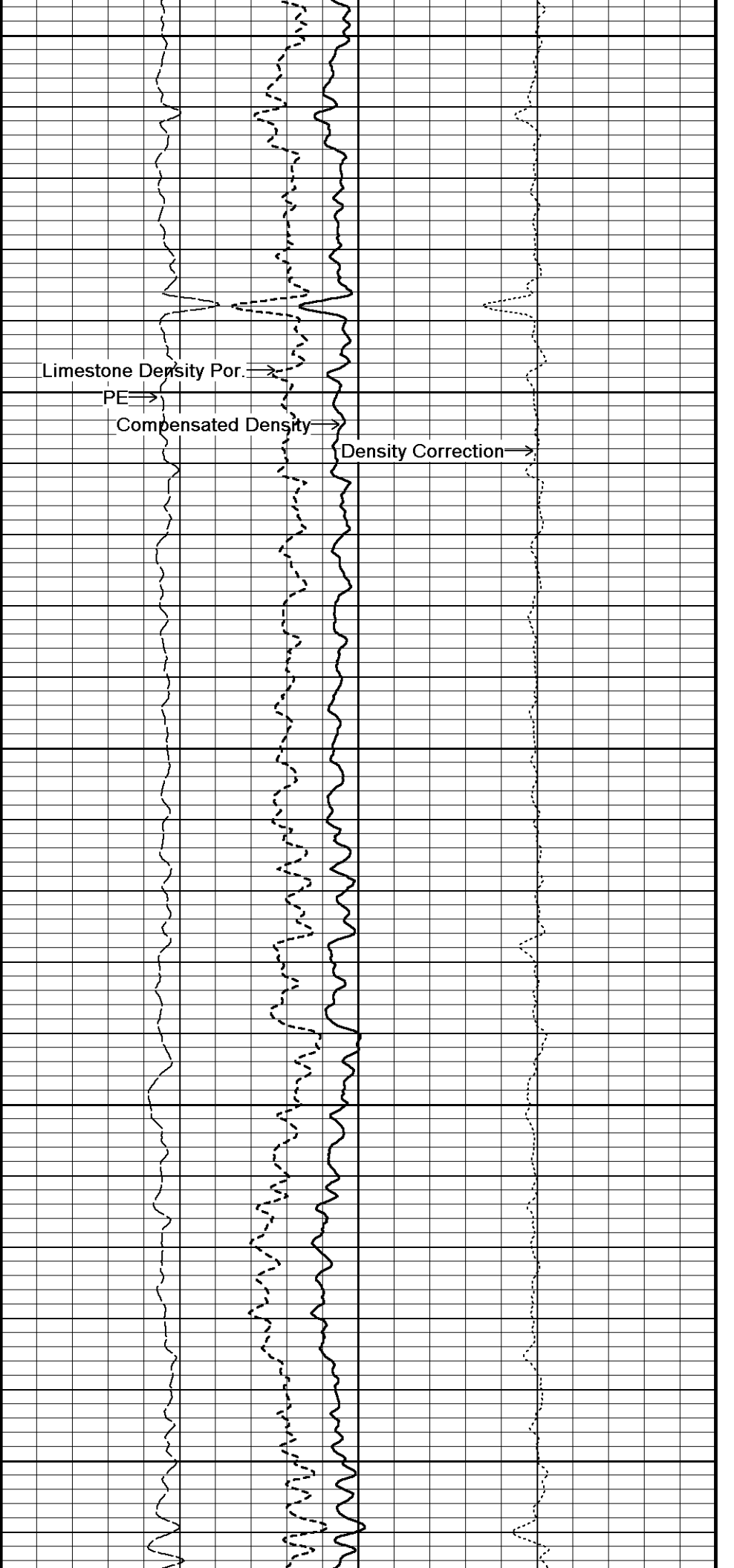
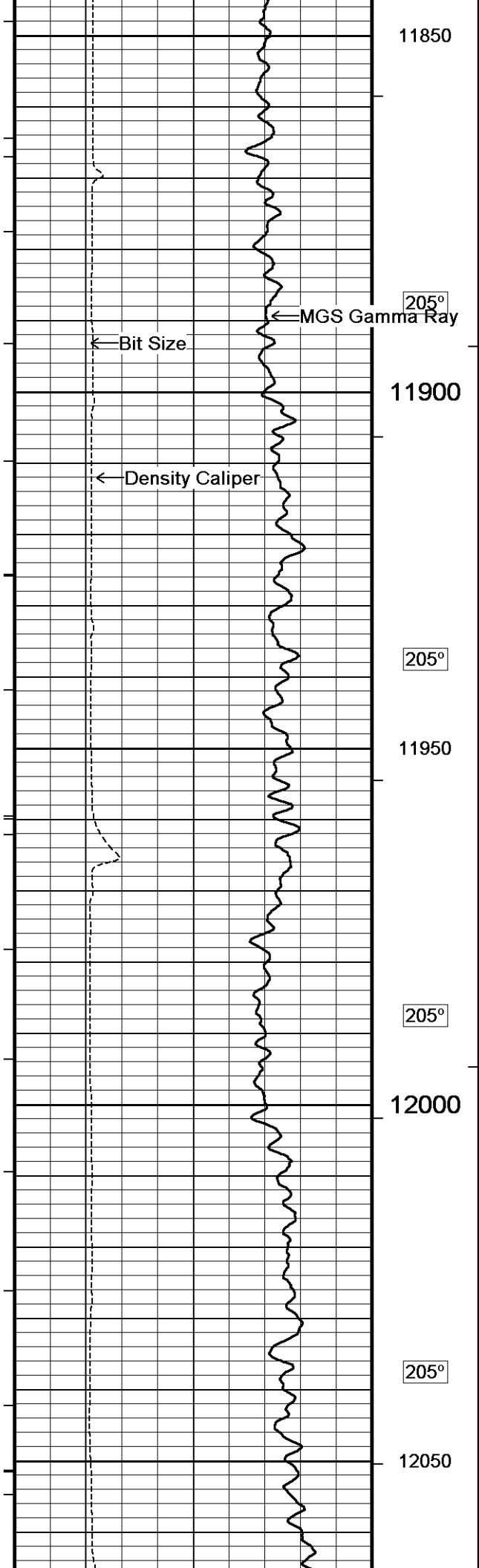


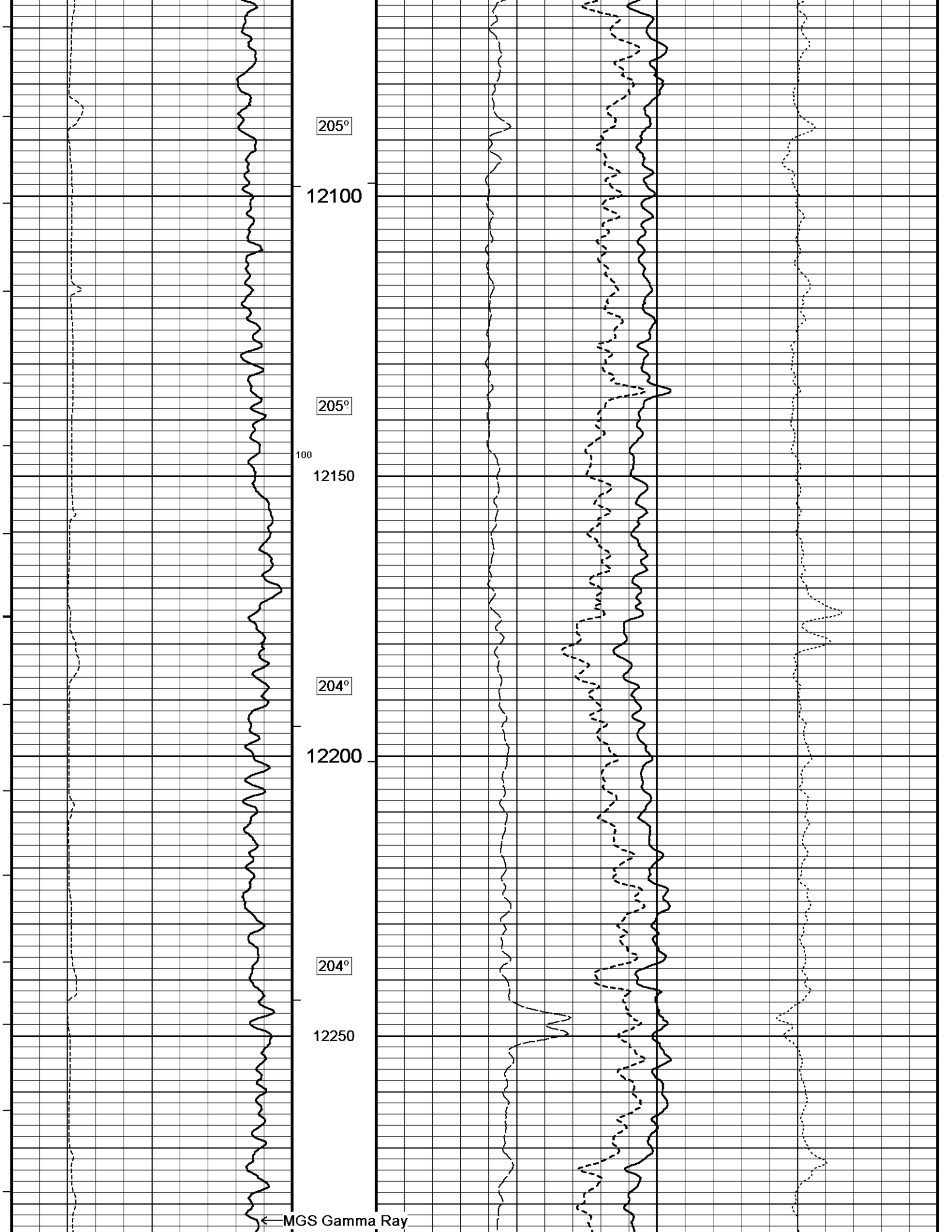


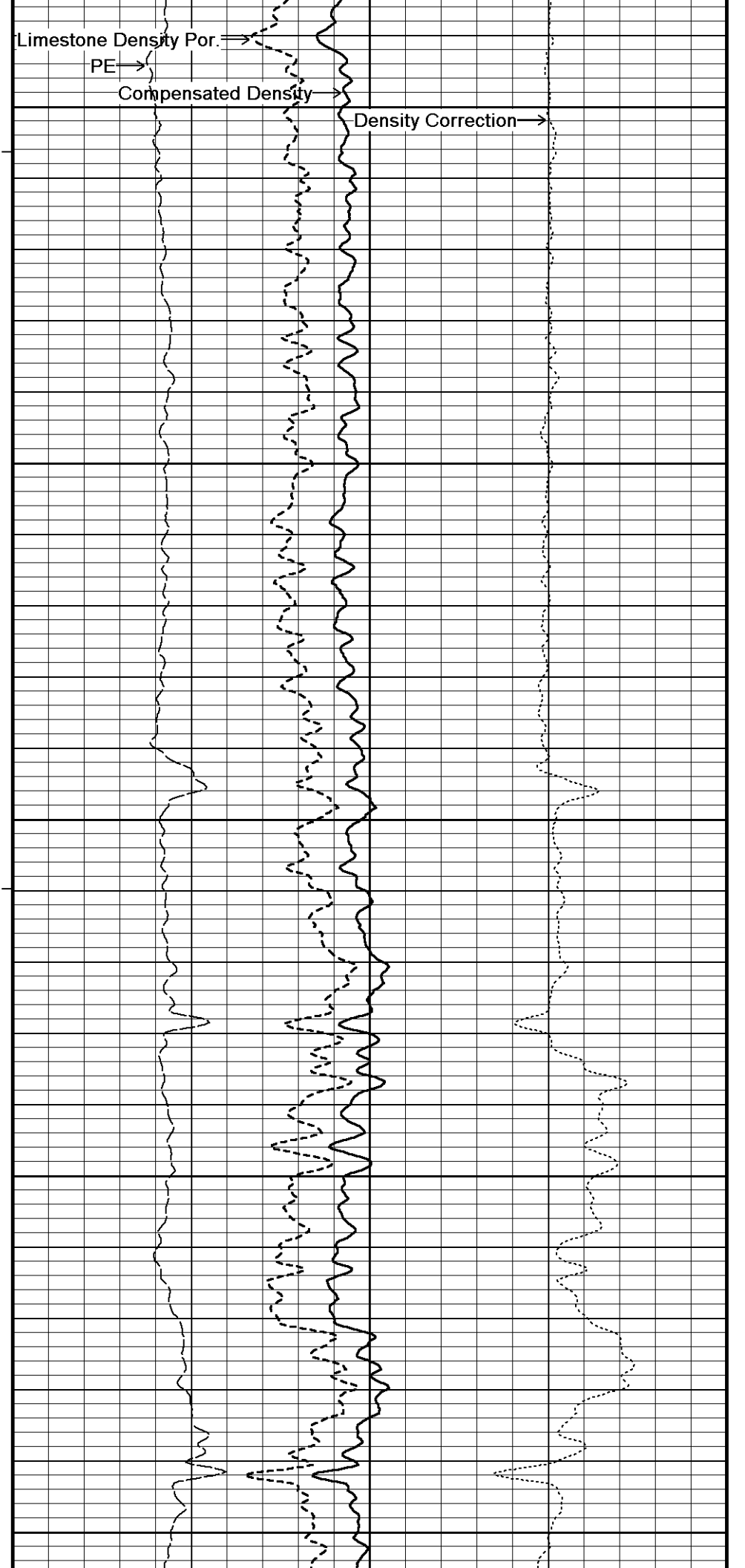
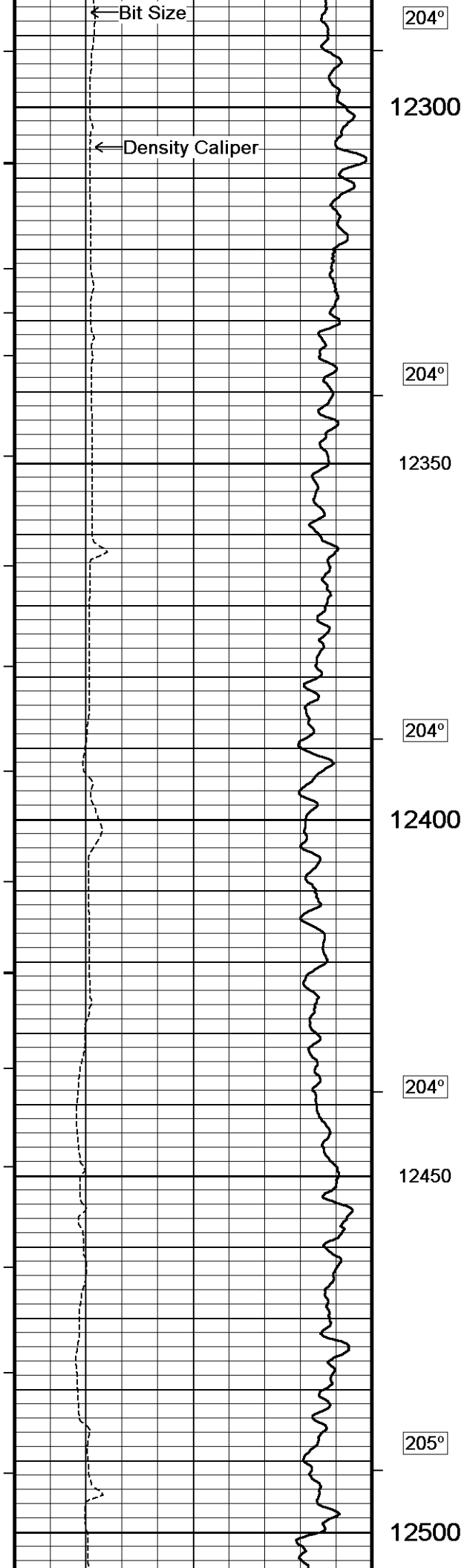


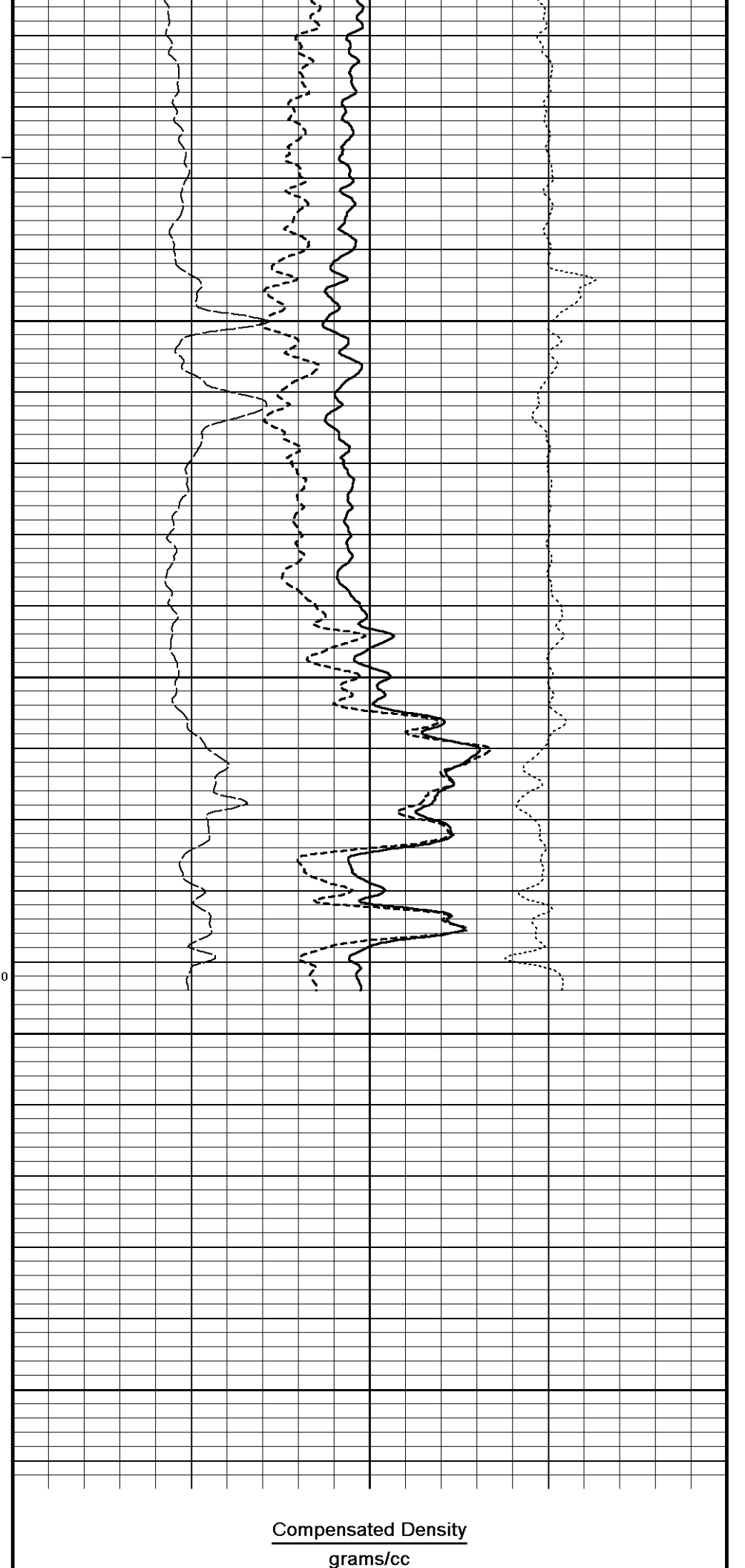
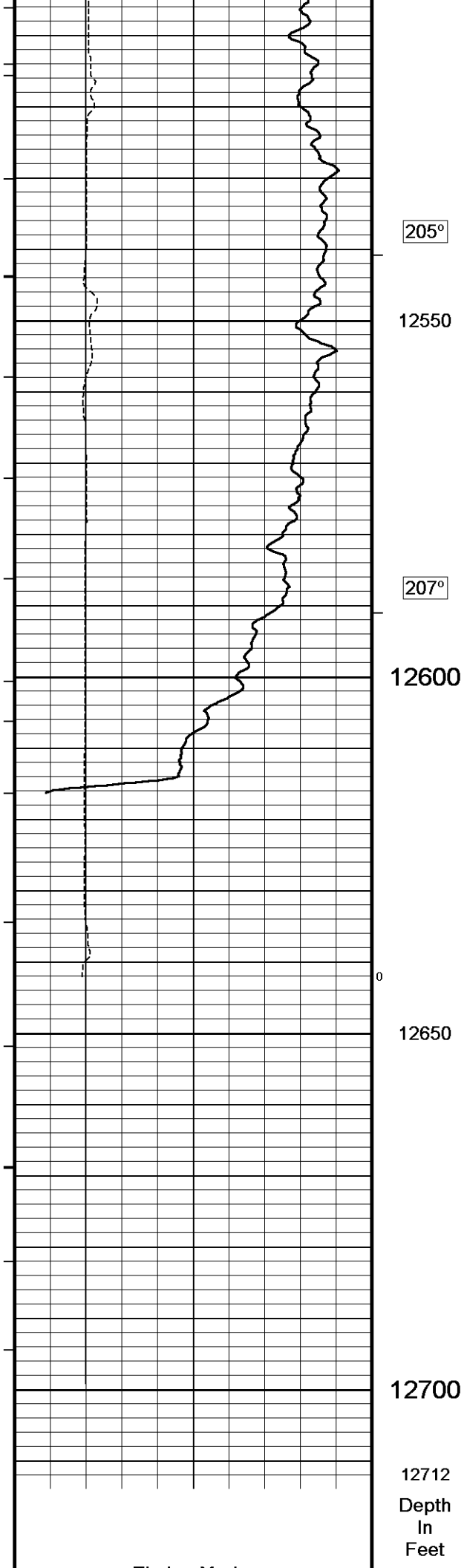


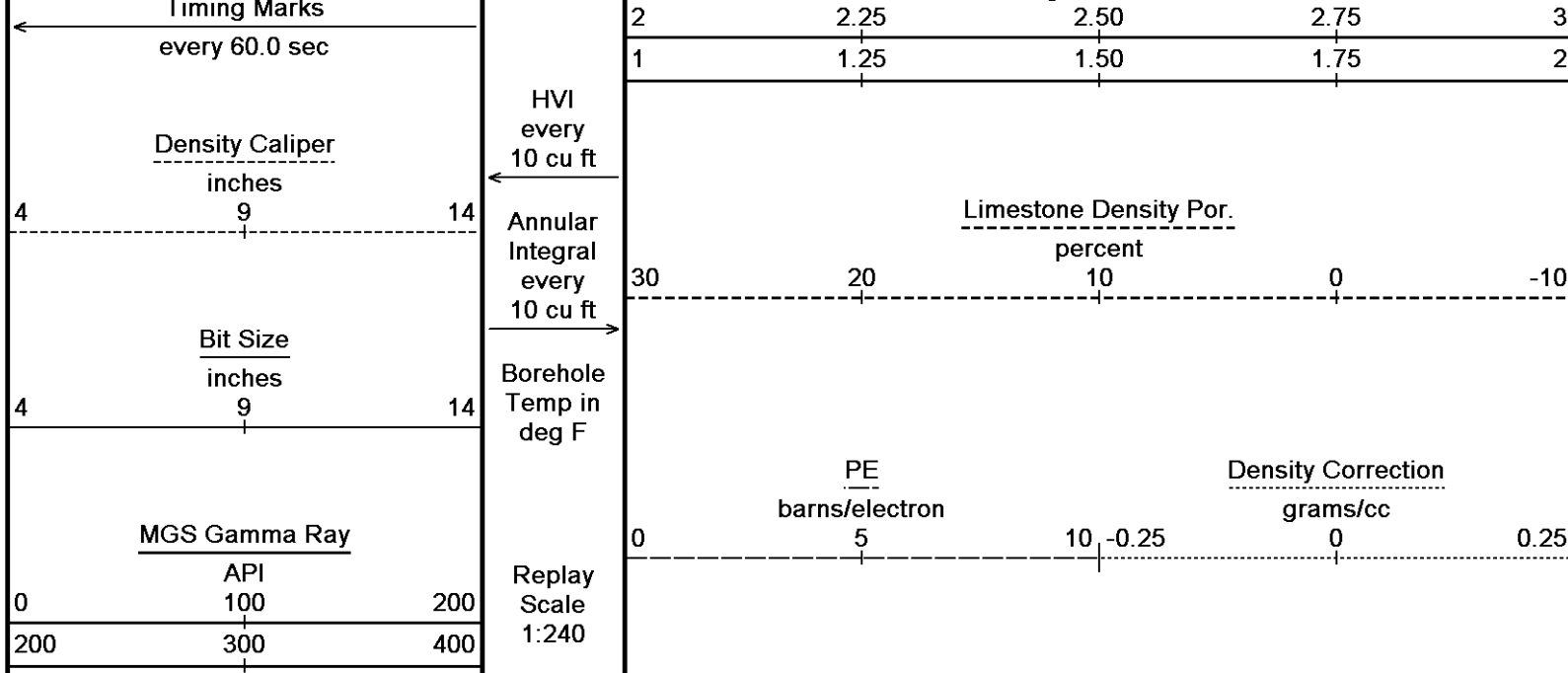












↑ 5 INCH MAIN LOG ↑

General Constants All 000 Last Edited on 20-SEP-2013,23:44

Strain Gauge Constants MMS-E.B 174 Last Edited on 12-AUG-2013,15:53

10000.0 0.000 0.000 0.000 0.000

MMS Parameters MMS-E.B 174

Last Edited on 19-SEP-2013 19:05

Logging Parameters

Firmware Version	2v52	
Caliper Open On	MAI	
Caliper Open Delay		minutes
Caliper Closed On	Unknown	
Caliper Closed Delay	N/A	minutes
Sample Rate	1.00	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	8.0	

Release Parameters

Pulse Duration Base Level	10.0	seconds
Pulse Duration Transition Time	25.0	seconds
Pulse Duration Status Pulse From	20.0	seconds
Pulse Duration Caliper Close From	75.0	seconds
Pulse Duration Caliper Open From	80.0	seconds
Pulse Duration Release Pulse From	120.0	seconds
Pulse Duration Release Pulse To	280.0	seconds
Pulse Release Duration	240.0	seconds
Pulse Discriminator Pressure Band	485.0	seconds
Pulse Pressure Discriminator	1106.0	seconds
Use Negative Pulsing	No	
Good Status Reply Open Hole	65535.0	seconds
Good Status Reply Cased Hole	20.0	seconds
Bad Status Reply	60.0	seconds
Status Pulse To	45.0	seconds
Caliper Close To		seconds
Caliper Open To	105.0	seconds

Configuration

MMS,MGS,MDN,MPD,MPD,MIM,MIE,MAI

Gamma Calibration MGS-C.J 170

Field Calibration on 19-SEP-2013,16:27

	Measured	Calibrated (API)
Background	103	68
Calibrator (Gross)	1336	885
Calibrator (Net)	1234	817

Gamma Constants MGS-C.J 170

Last Edited on 20-SEP-2013,23:45

Gamma Calibrator Number	GRC-070	
Mud Density	1.11	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 MGS-C.J 170

Field Calibration on 13-SEP-2013,12:51

	Measured	Calibrated (mV)
Reference 1	-99.0	-100.1
Reference 2	101.0	99.9

High Resolution Temperature Calibration MGS-C.J 170

Field Calibration on 13-SEP-2013,12:51

	Measured	Calibrated(Deg F)
Lower	60.00	61.00
Upper	101.00	99.00

Pre-filter Length 11

Neutron Calibration MDN-B.A 214

Base Calibration on 13-SEP-2013 13:33

Field Check on 19-SEP-2013 16:23

Base Calibration

	Measured	Calibrated (cps)
	Near Far	Near Far
	2997 91	3714 110
Ratio	32.756	33.764

Field Calibrator at Base

Calibrated (cps)
2128 3147
Ratio 0.676

Field Check

Calibrated (cps)
2135 3138
Ratio 0.680

Neutron Constants MDN-B.A 214

Last Edited on 20-SEP-2013,23:47

Neutron Source Id	P31129B	
Neutron Jig Number	NJ5244	
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	7.00	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	

Navigation Constants MIE-B.A 263

Last Edited on

Magnetic Declination 0.00 degrees East

Accelerometer Parameters MIE-B.A 263

Date Of Last Accelerometer Calibration	17-SEP-2012,14:43		
	X Accelerometer	Y Accelerometer	Z Accelerometer
Slope	-1.109010	-1.107099	-1.100526
Offset	0.007052	0.003811	0.001104

Accelerometer Constants MIE-B.A 263

Last Edited on 12-AUG-2013,21:33

Accelerometer Calibrator Number 000

Accelerometer Temperature Characterisation

X Accelerometer

Serial Number	1173			
Calibration Date	18-Jun-2012			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	1.14172e-005	-2.31925e-008	2.14144e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.73528e-004	2.42371e-007	1.16163e-009

Y Accelerometer

Serial Number	1182			
Calibration Date	16-Jun-2012			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	2.81141e-005	2.27423e-008	-2.19073e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.61892e-004	3.10100e-007	4.78517e-010

Z Accelerometer					
Serial Number	1118				
Calibration Date	12-Jul-2011				
	B0	B1	B2	B3	
Bias(g)	0.00000e+000	2.80348e-005	6.99344e-009	-8.31315e-011	
	SF0	SF1	SF2	SF3	
Scale Factor(mA/g)	3.00000e+000	2.95053e-004	3.90273e-007	3.96648e-010	
Imager Pad Check MIE-B.A 263				Field Check on 12-AUG-2013 21:46	
Pad 1	20/20 Buttons Verified	Pad 5	20/20 Buttons Verified		
Pad 2	24/24 Buttons Verified	Pad 6	24/24 Buttons Verified		
Pad 3	20/20 Buttons Verified	Pad 7	20/20 Buttons Verified		
Pad 4	24/24 Buttons Verified	Pad 8	24/24 Buttons Verified		
Compact Micro Imager Constants MIE-B.A 263				Last Edited on 12-AUG-2013,21:34	
Sonde Configuration	Imager Mode				
Arm-Pad Kit	Normal Pads (12.25 in)				
Arm-Pad Kit Serial Number	N/A				
Centre Pad 1 Rotational Offset	0.00	degrees			
Image/Borehole Ovality Reference	Azimuth of Pad 1				
Non Active Buttons	Omit				
Search Angle	0.00	degrees			
Correlation Interval	3.28	feet			
Correlation Step	1.64	feet			
Current Offset	0.0000	mAmp			
Squasher Start	0.0500	mAmp			
Image Processing	Enabled				
Caliper Calibration MIE-B.A 263				Base Calibration on 12-AUG-2013 22:19 Field Calibration on 12-AUG-2013 22:22	
Base Calibration					
Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)		
1	26896	26795	5.96		
2	37624	37221	7.98		
3	47165	46851	9.86		
4	59017	58438	11.92		
5	0	0	0.00		
Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	24886	25132	24774	25107	5.96
2	33932	33696	33644	34118	7.98
3	42150	41949	42030	42331	9.86
4	51988	51934	51898	52510	11.92
5	0	0	0	0	0.00
Field Calibration					
	Measured	Measured	Actual		
	Pads 1-5 Caliper(in)	Pads 3-7 Caliper(in)	Caliper(in)		
	7.96	7.88	7.98		
	Measured	Measured	Measured	Measured	Actual
	Pad 2 Caliper(in)	Pad 4 Caliper(in)	Pad 6 Caliper(in)	Pad 8 Caliper(in)	Caliper(in)
	4.02	4.04	3.95	3.95	7.98
Caliper Constants MIE-B.A 263				Last Edited on 06-JUN-2013,14:46	
Caliper Difference for BRKT	0.120		inches		
Magnetometer Parameters MIE-B.A 263					
Date Of Last Magnetometer Calibration	3-OCT-2012,11:40				
	X Magnetometer	Y Magnetometer	Z Magnetometer		
Slope	-1.000000	-1.002053	-0.995229		
Offset	-0.002504	-0.016318	-0.005385		
Magnetometer Constants MIE-B.A 263				Last Edited on	
Magnetometer Calibrator Number	000				
Induction Calibration MAI-C.A 494				Base Calibration on 13-AUG-2013,14:10 Field Check on 19-SEP-2013 16:09	

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	16.0	455.1	9.3	966.2
2	6.0	369.3	7.6	821.4
3	3.0	251.1	5.2	566.0
4	0.1	128.5	2.6	279.2

Array Temperature 23.3 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			-3.2	2124.9
2			14.1	1952.9
3			15.4	1684.5
4			13.8	1139.6
Deep			12.1	1094.2
Medium			21.0	2226.2
Shallow			17.2	2892.7

Array Temperature 69.5 Deg F

Induction Constants MAI-C.A 494

Last Edited on 20-SEP-2013,23:44

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
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-C.A 494

Field Calibration on 12-FEB-2013,17:19

	Measured	Calibrated(Deg C)
Lower	10.00	10.00
Upper	100.00	100.00

High Resolution Temperature Constants MAI-C.A 494

Last Edited on 12-FEB-2013,17:18

Pre-filter Length 11

Density Calibration

Base Calibration

	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	50399	24481	59814	31141
Reference 2	22249	2672	24943	2546

Field Check at Base

1314.9	1529.7
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Field Check

1314.0	1525.7
--------	--------

PE Calibration

Base Calibration

	WS	Measured		Calibrated
		WH	Ratio	Ratio
Background	248	1174		
Reference 1	21312	50195	0.430	0.368
Reference 2	6894	22098	0.318	0.272

Field Check at Base

248.4	1173.8
-------	--------

Field Check

246.9	1172.3
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Density Constants MPD-D.A 497

Last Edited on 21-SEP-2013,03:31

Density Source Id	P20716B
Nylon Calibrator Number	DNC-E-687
Aluminium Calibrator Number	DACD696
Density Shoe Profile	4 inch
Caliper Source for Processing	Density Caliper
PE Correction to Density	Not Applied
Mud Density	1.00 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

Caliper Calibration MPD-D.A 497

Base Calibration on 21-SEP-2013 03:20

Field Calibration on 21-SEP-2013 03:21

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	16970	3.99
2	26463	5.96
3	36587	7.98
4	46034	9.86
5	56910	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.96	5.96

Shuttle Running Tool 3.5"

SRT-A.A 67 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in

SKJ-E.B Compact Knuckle Joint

SKJ-E.B 578 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Empty 400v Battery

MLK-A 1 LG: 14.23 ft WT: 30.9 lb OD: 2.24 in

200v Standard Life Spacer

MLK-A 2 LG: 16.31 ft WT: 30.9 lb OD: 2.24 in

MBS-G.A 200v Compact Battery Sub

MBS-G.A 136 LG: 17.06 ft WT: 123.5 lb OD: 2.24 in

Compact Memory Sub E.B

MMS-E.B 174 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

Compact Tool Isolator sub.

MTI-B.A 55 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in

Compact Short Gamma

MGS-C.J 170 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator

MCL-B.J 64 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

SKJ-E.A Compact Knuckle Joint

SKJ-E.A 348 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor

SHA-J.B 635 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub

MIS-D.B 768 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron

MDN-B.A 214 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper

MPD-D.A 497 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub

MIS-D.B 770 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor

SHA-J.B 579 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint

SKJ-E.B 657 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-A.A Compact Inline Bowspring sub

MIS-A.A 23 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact MMI Memory Section



83.74 ft

GRGM - MGS Gamma Ray

81.75 ft

GSXT - MGS External Temperature

64.87 ft

NPRL - Limestone Neutron Por.

57.63 ft

CLDC - Density Caliper

55.70 ft

DPRL - Limestone Density Por.

55.70 ft

DEN - Compensated Density

55.70 ft

DCOR - Density Correction

55.64 ft

PDPE - PE

MIM-B.A 263 LG: 4.65 ft WT: 26.5 lb OD: 2.24 in

Compact MMI Electrode Section

MIE-B.A 263 LG: 13.96 ft WT: 99.2 lb OD: 4.09 in

MIS-A.A Compact Inline Bowspring sub

MIS-A.A 276 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor

SHA-J.B 634 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

Compact Induction

MAI-C.A 494 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 147.78 ft Weight: 910.5 lb



3.34 ft R40S - Array Ind. Six Res 40
3.34 ft R30S - Array Ind. Six Res 30
3.34 ft CTAS - Array Ind. Six Cond Ct
3.34 ft R60S - Array Ind. Six Res 60
3.34 ft R85S - Array Ind. Six Res 85
3.34 ft RTAS - Array Ind. Six Res Rt
Tool Zero (0.13ft from bottom)
All measurements relative to tool zero.

COMPANY	WHITING OIL AND GAS CORPORATION
WELL	RAZOR 21A-2814B
FIELD	WILDCAT
PROVINCE/COUNTY	WELD
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	4850.30	feet	First Reading	12644.00	feet
Elevation Drill Floor	4849.30	feet	Depth Driller	12721.00	feet
Elevation Ground Level	4833.00	feet	Depth Logger	12721.00	feet



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CML MESSENGER SHUTTLE
COMPACT PHOTO DENSITY
COMPENSATED NEUTRON LOG