Weatherford®

CML MESSENGER SHUTTLE
COMPACT PHOTO DENSITY
COMPENSATED NEUTRON LOG

COMPANY	SANDRIDGE ENERGY
WELL	LEROY 3119 1-5H
FIELD	SIX MOONS
PROVINCE/COUNTY	COMANCHE
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	200' FSL & 660' FWL

SEC	TWP	RGE	Other Services
5	31S	19W	MAI

API Number 15-033-21623
Permit Number

Permanent Datum G.L., Elevation 2114 feet
Log Measured From KB
Drilling Measured From K.B. @ 18.5 FEET

Elevations:	feet
KB	2132.50
DF	2132.50
GL	2114.00

Date	09-JAN-2013	
Run Number	ONE	
Service Order	3539527	
Depth Driller	9509.00 feet	
Depth Logger	9509.00 feet	
First Reading	9460.00 feet	
Last Reading	5000.00 feet	
Casing Driller	5495.00 feet	
Casing Logger	5495.00 inches	
Bit Size	6.125	
Hole Fluid Type	WBM lb/USg	
Density / Viscosity	8.70 lb/USg	29.00 CP
PH / Fluid Loss	9.50	9.50
Sample Source	FLOWLINE	
Rm @ Measured Temp	0.89 @ 72.0	ohm-m
Rmf @ Measured Temp	0.72 @ 72.0	ohm-m
Rmc @ Measured Temp	1.07 @ 72.0	ohm-m
Source Rmf / Rmc	CALC	CALC
Rm @ BHT	0.50 @128.0	ohm-m
Time Since Circulation	1 HOUR	
Max Recorded Temp	128.00	deg F
Equipment / Base	18077	OKC
Recorded By	STEVEN TOTTEY	
Witnessed By	KATHY GENTRY	

BOREHOLE RECORD

Last Edited: 09-JAN-2013 21:43

Bit Size inches	Depth From feet	Depth To feet
8.750	0.00	5495.00
6.125	5495.00	9505.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	7.000	0.00	5495.00	32.00

REMARKS

LOGGED WITH WLS VER 13.04.8492 SOFTWARE

WELL LOGGED USING MESSENGER METHOD OF DEPLOYMENT, AND MEMORY LOGGING SYSTEM

HARDWARE: MAI: ISA STANDOFF BELOW
MPD: 4"PROFILE PLATE, MIS-A SINGLE SPRING DECENTRALIZER BELOW
MDN: MISD DOUBLE SPRING DECENTRALIZER RAN ABOVE

2.71 G/CC DENSITY MATRIX USED TOCALCULATE POROSITY
ALL INTERVALS LOGGED AND SCALED PER CUSTOMER REQUEST

DRILL PIPE DEPTH DURING DEPLOYMENT - 9413
LOGGING TOOL DEPTH AFTER DEPLOYMENT: 9496

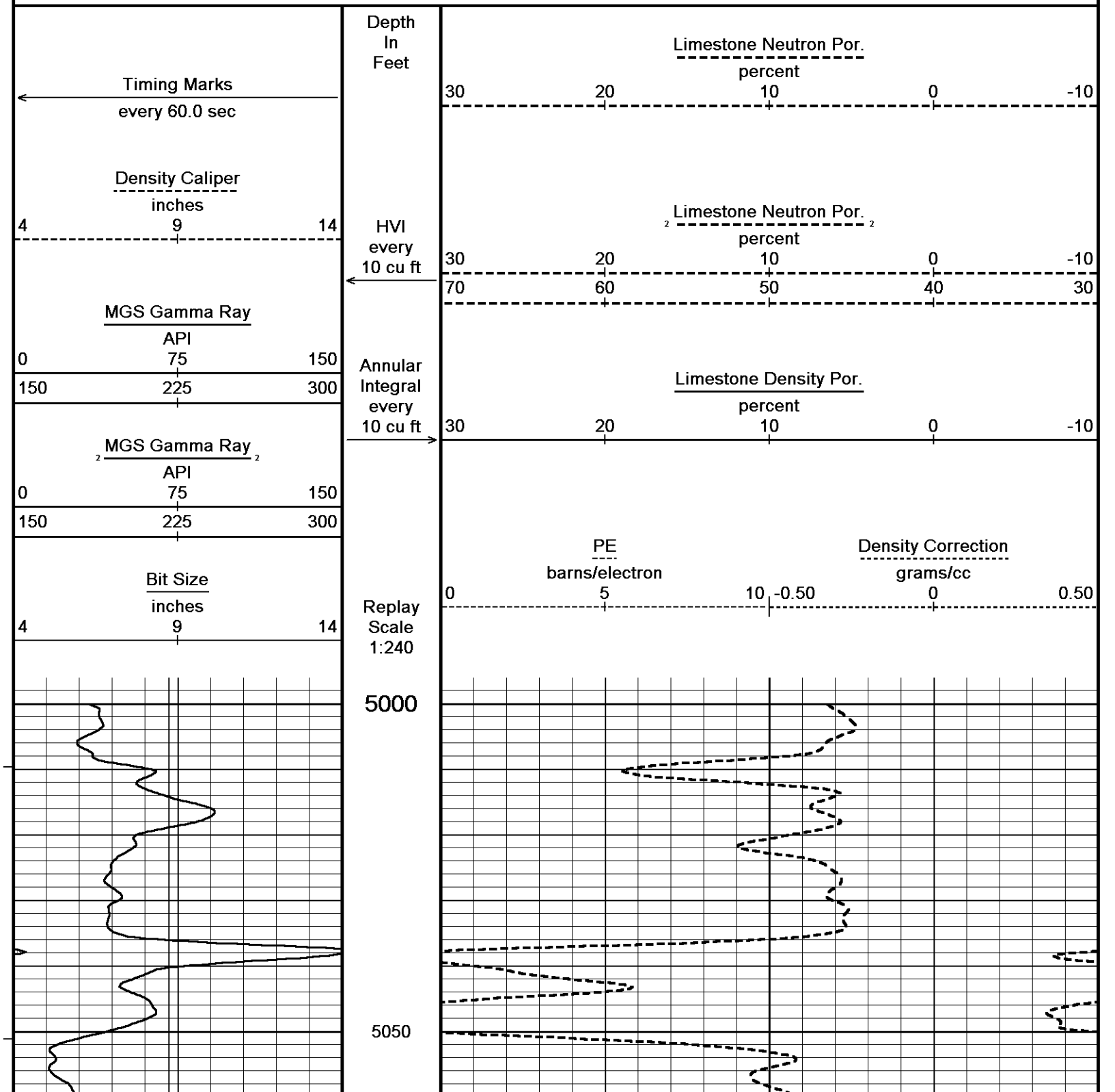
4.5" CASING USED TO CALCULATE AHV

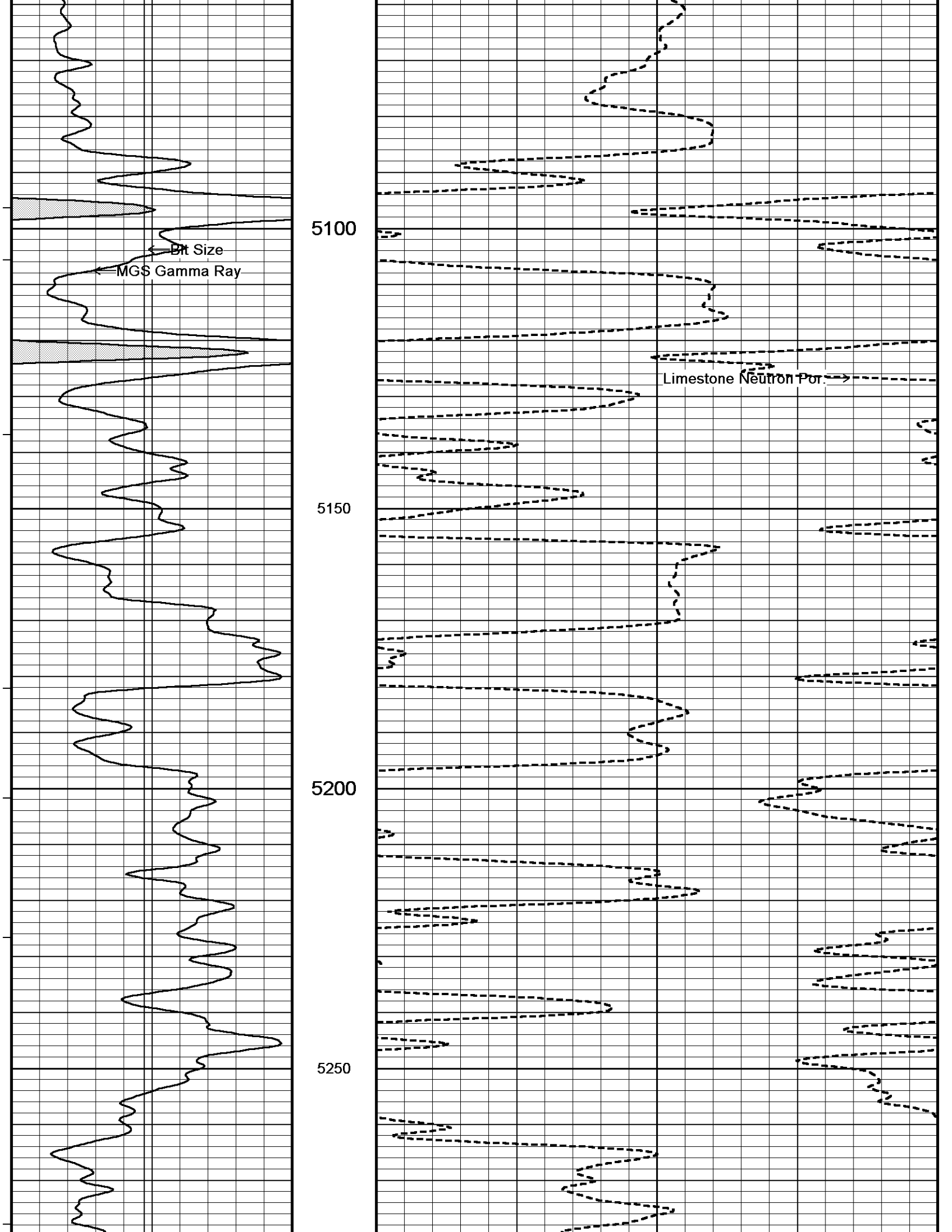
SERVICE ORDER # 3539527
RIG: LARIAT 38

OPERATORS: K. CHAFFIN AND D. TURNER

5 INCH MAIN PASS

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 10-JAN-2013 12:20
Filename: C:\DATA_13_04_8492\SANDRIDGE LEROY 319 1-5H\LEROY RTAP DEPTH.dta
Recorded on 10-JAN-2013 11:20
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

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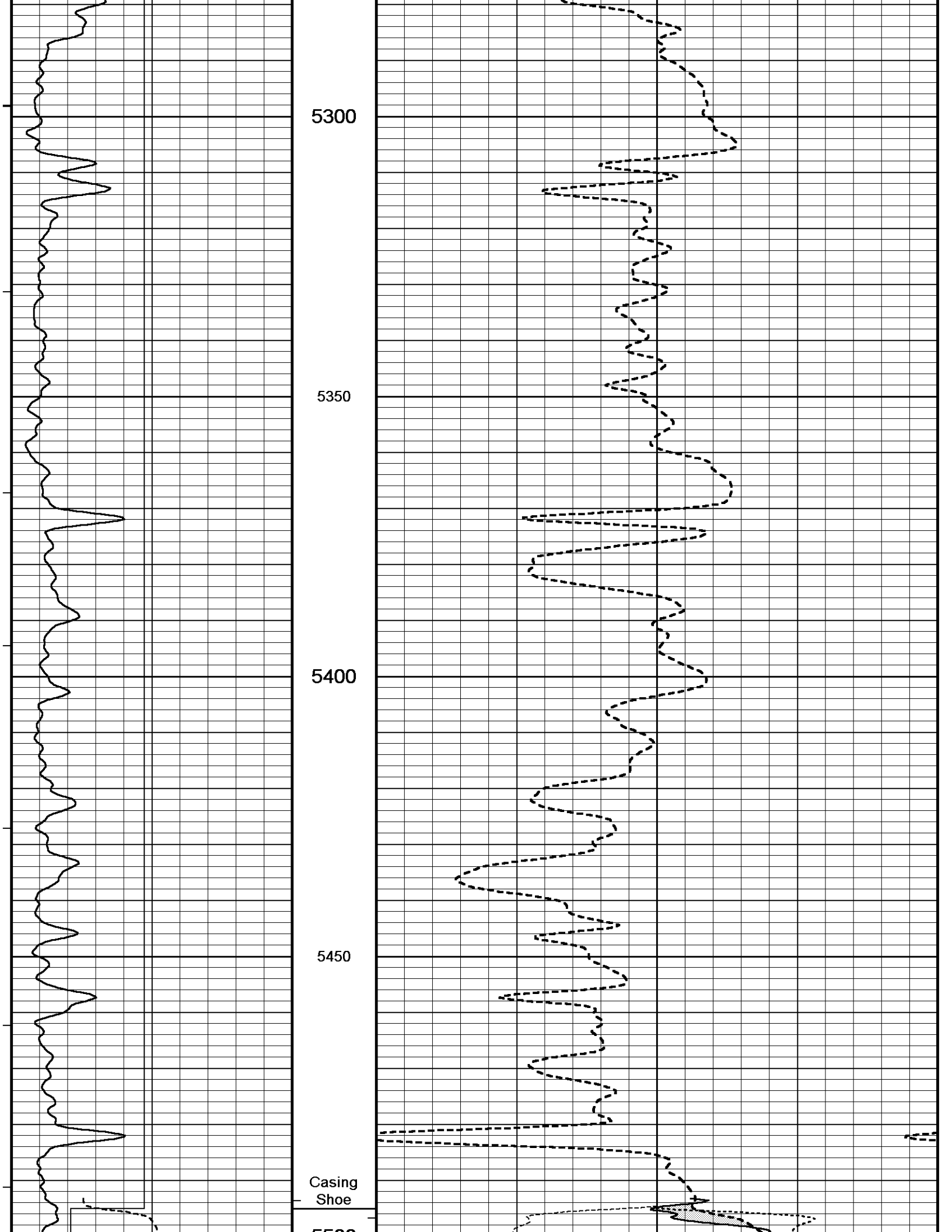
MGS Gamma Ray
Limestone Neutron Por
5100
5150
5200
5250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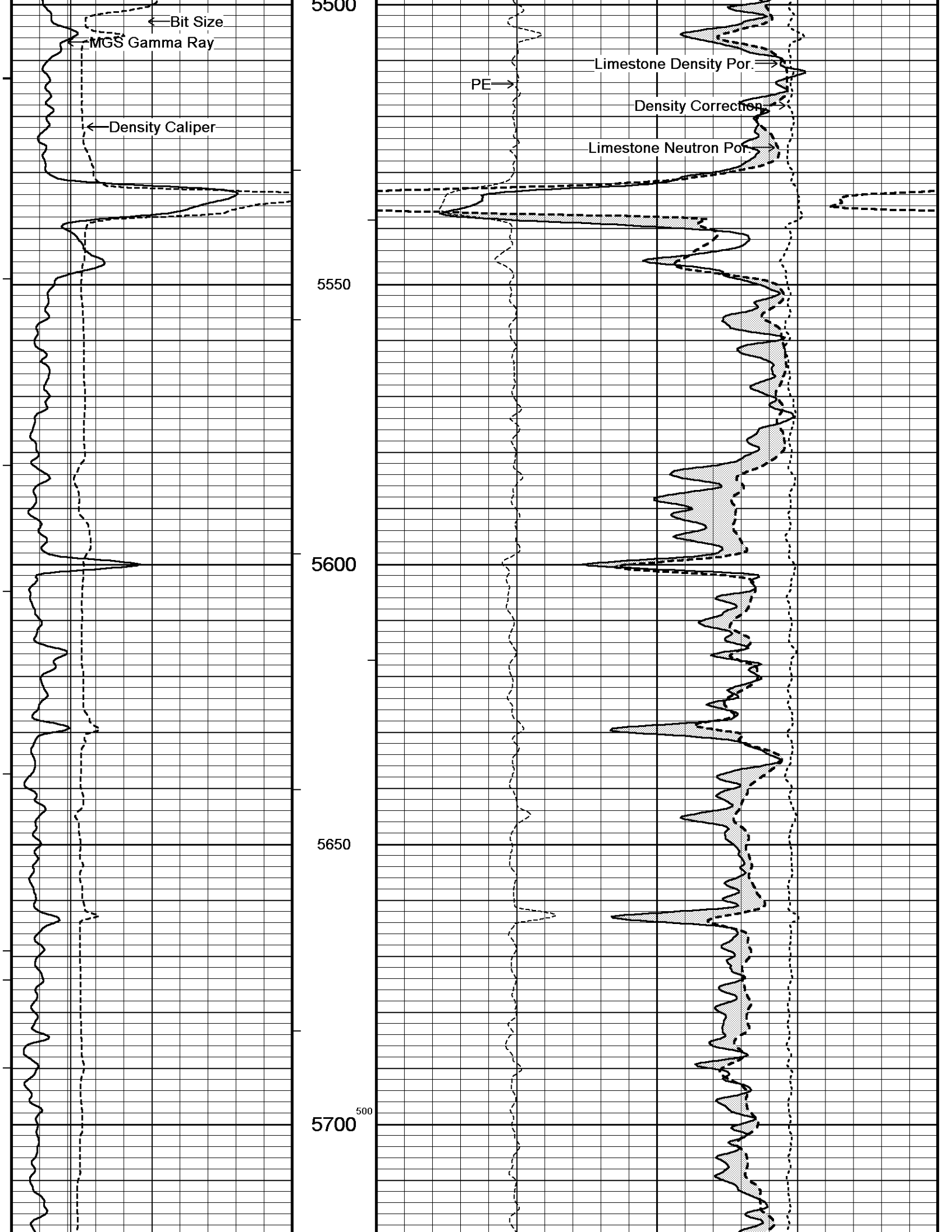
5350
5400
5450
Casing
Shoe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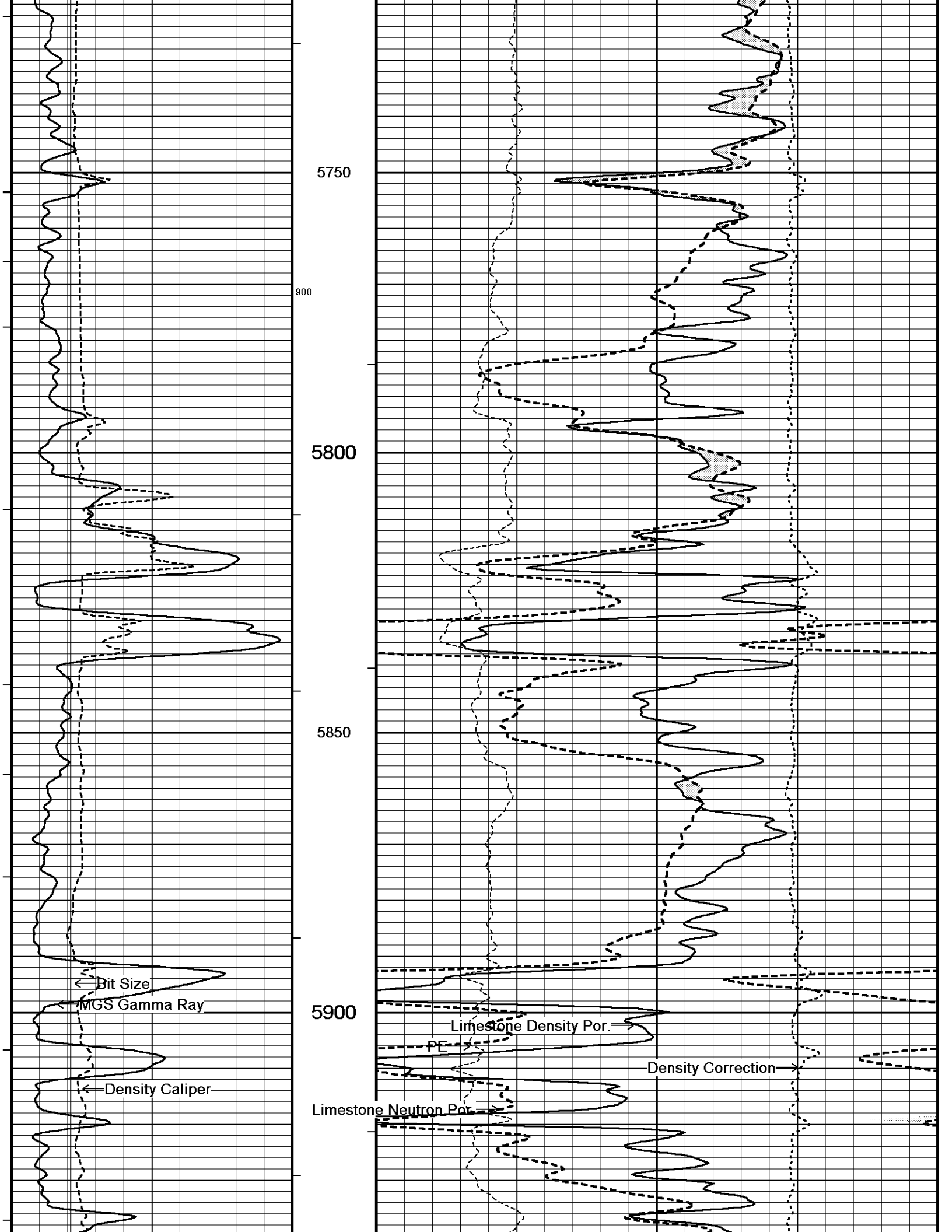
Density Caliper
5500
PE
Limestone Density Por.
Density Correction
Limestone Neutron Por.
5550
5600
5650
5700
500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900
5800
5850
5900
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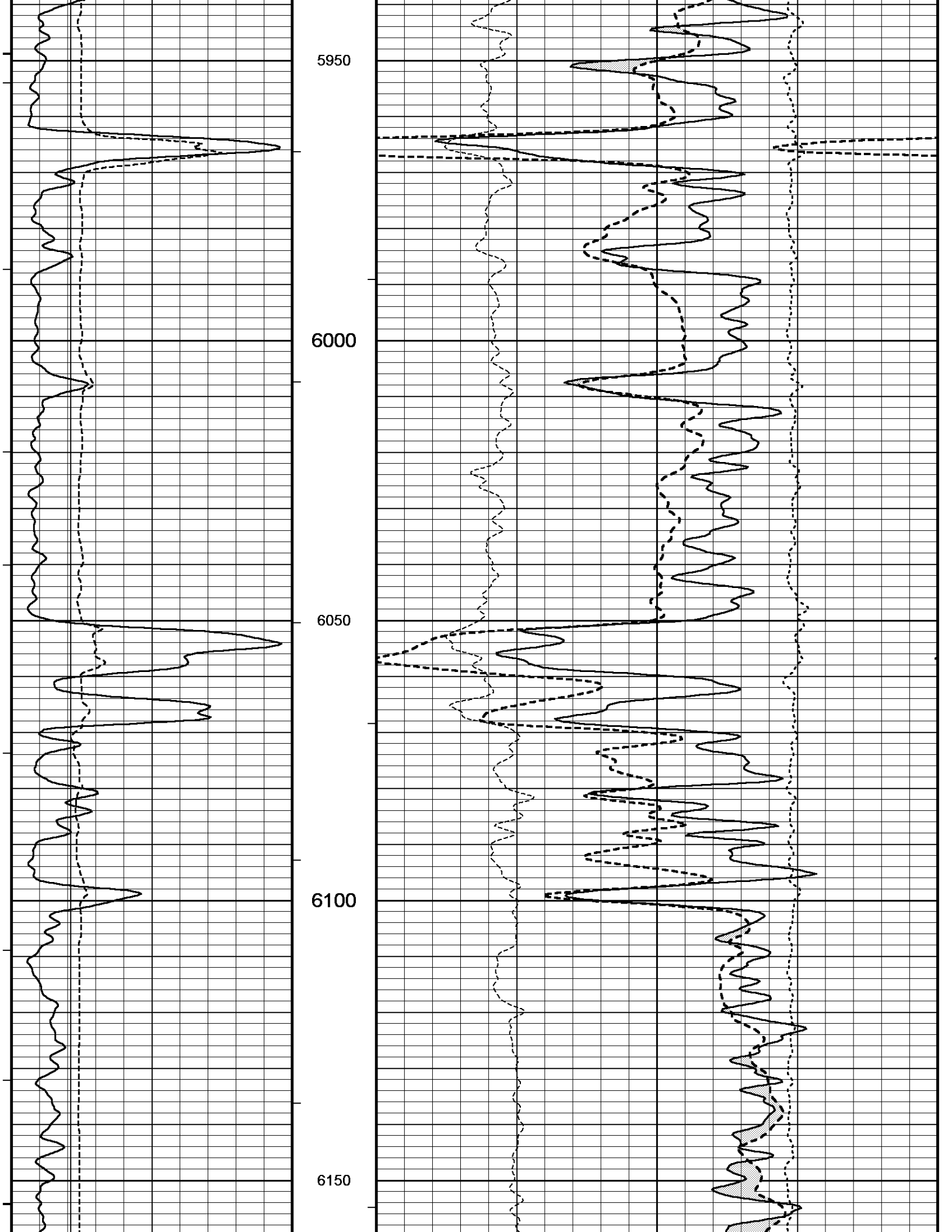
MGS Gamma Ray
Density Caliper
Limestone Density Por.
PE
Density Correction
Limestone Neutron Por.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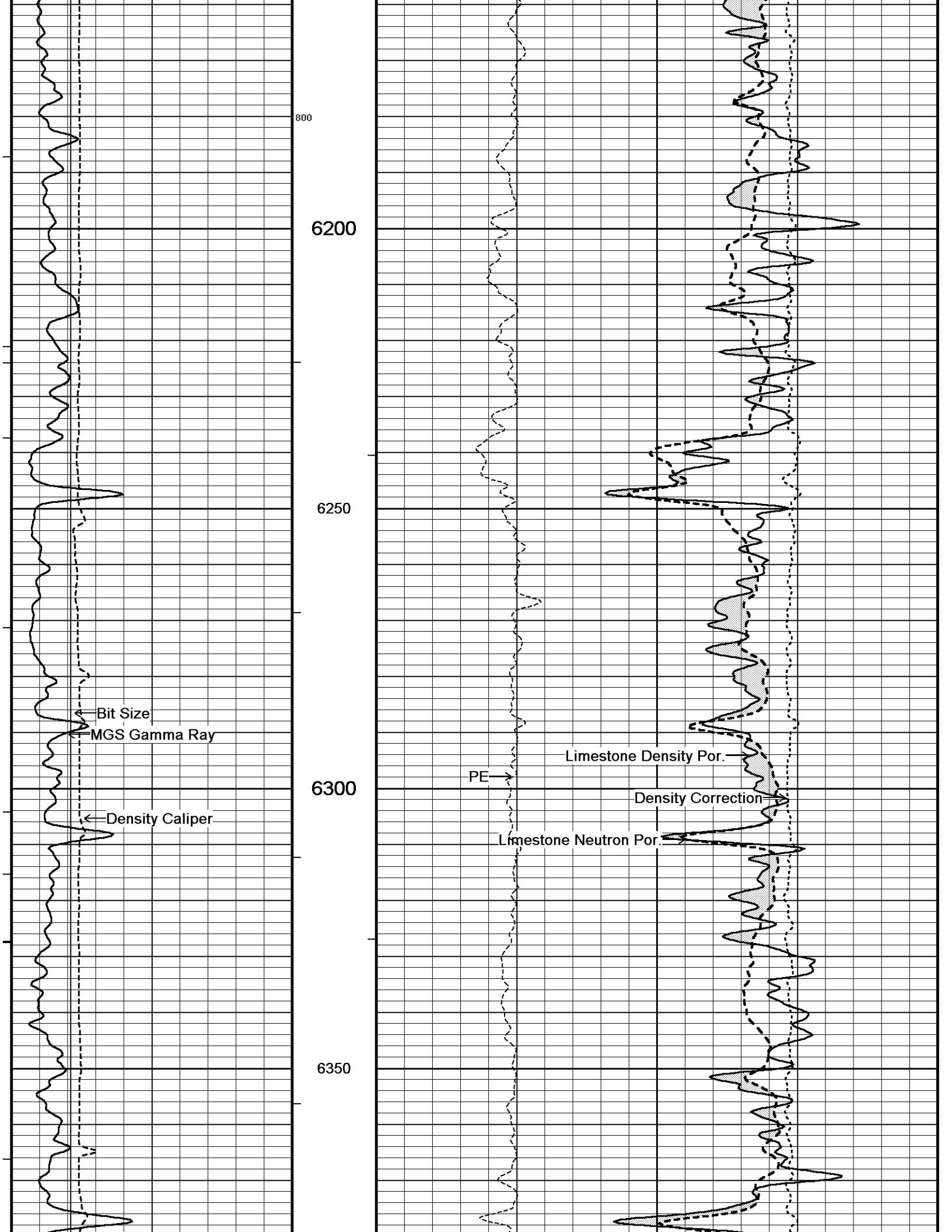
6000
6050
6100
6150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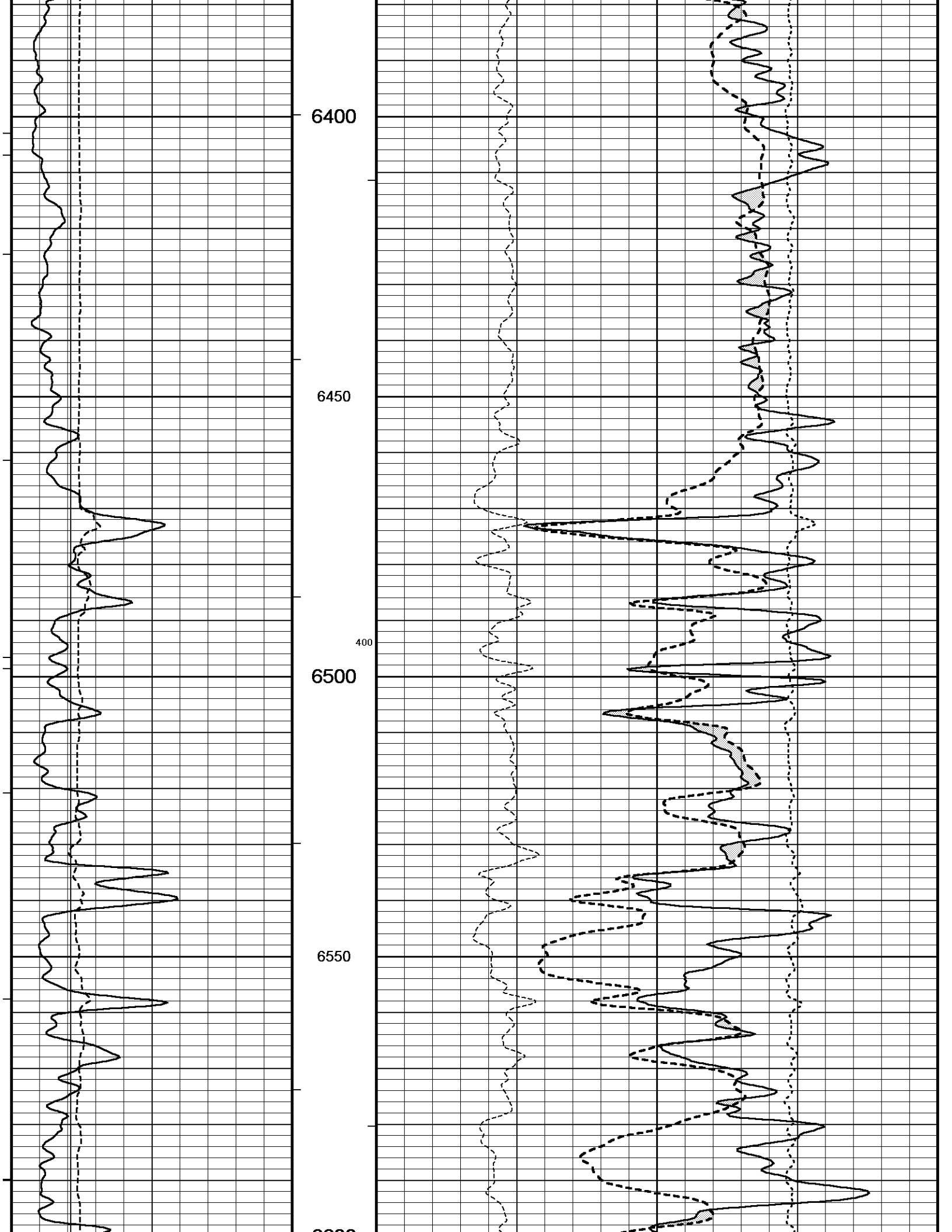
6200
6250
6300
6350
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Density Correction
Limestone Neutron Por.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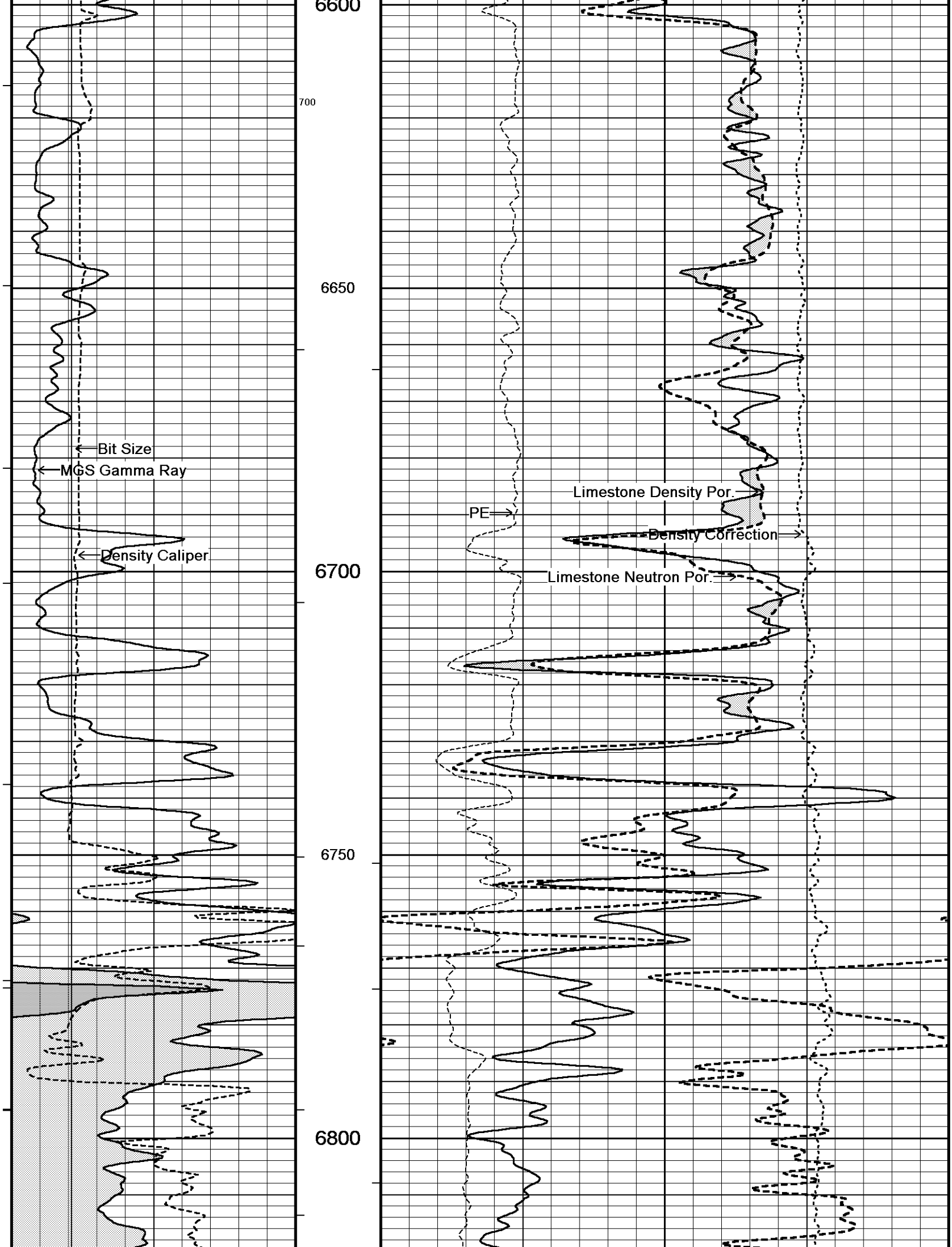
6450
400
6500
6550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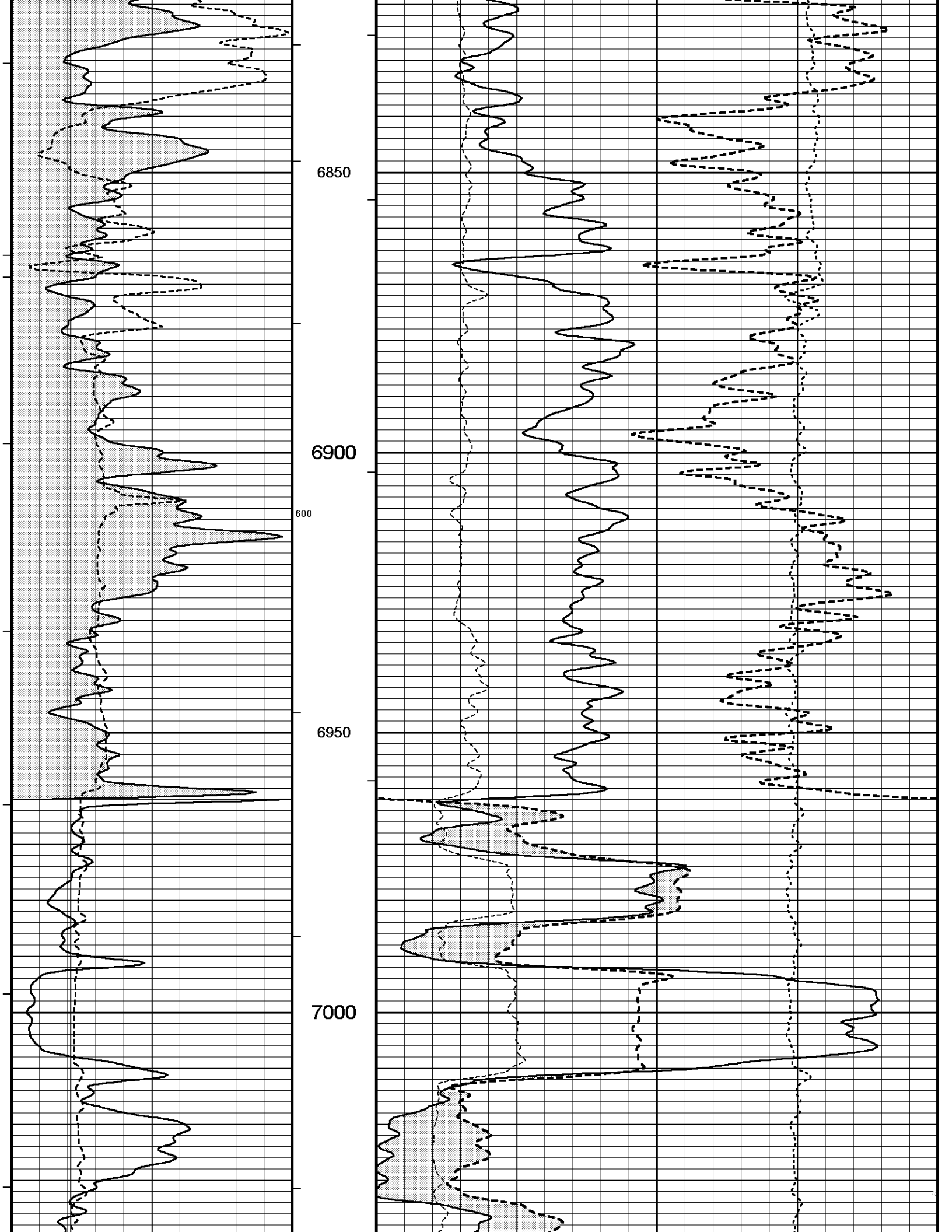
700
6650
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Density Correction
6700
Limestone Neutron Por.
6750
6800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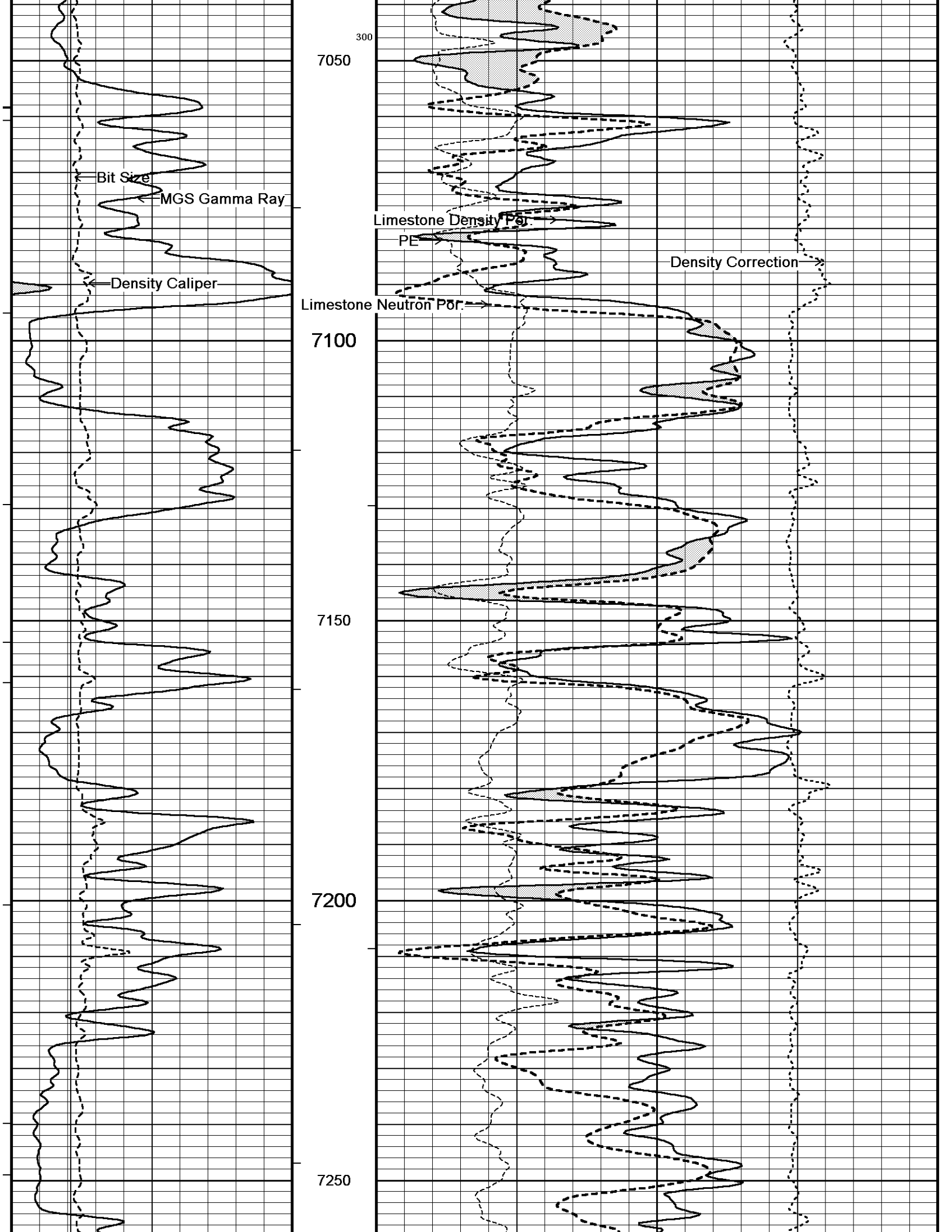
6900
600
6950
7000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7050
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Limestone Density Por.
PE
Density Correction
Density Caliper
Limestone Neutron Por.
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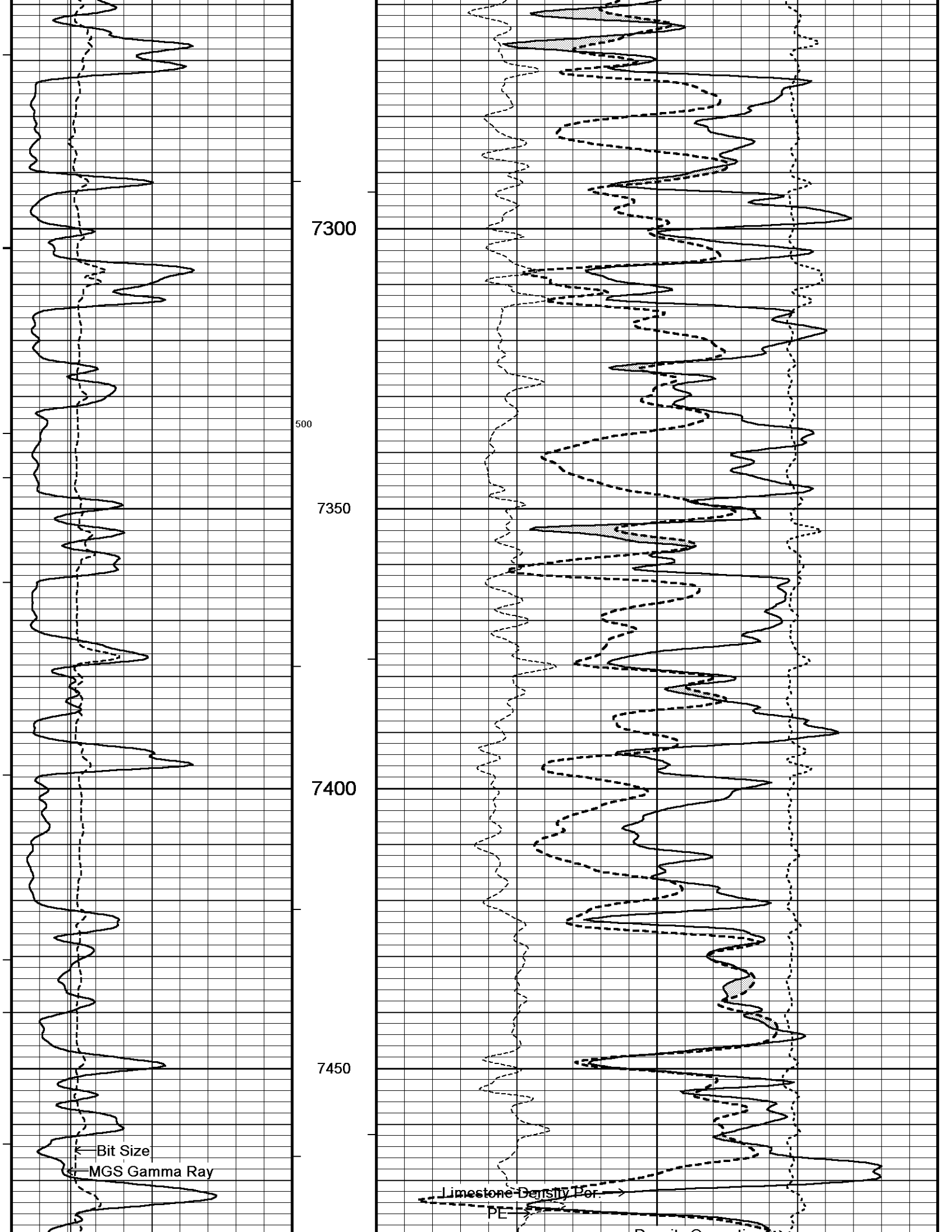
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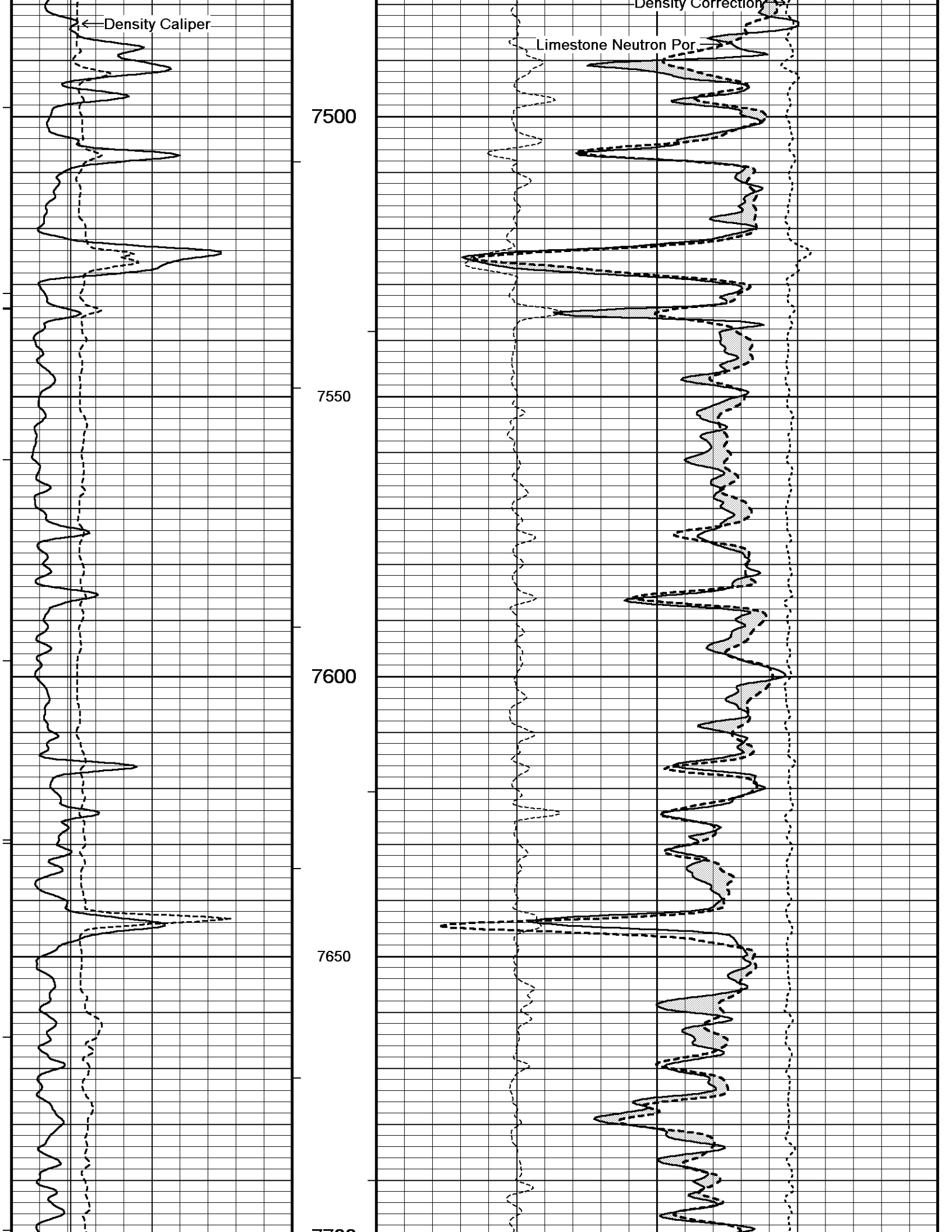
500
7350
7400
7450
Bit Size
MGS Gamma Ray
Limestone Density Por.
PE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Density Correction
Limestone Neutron Por
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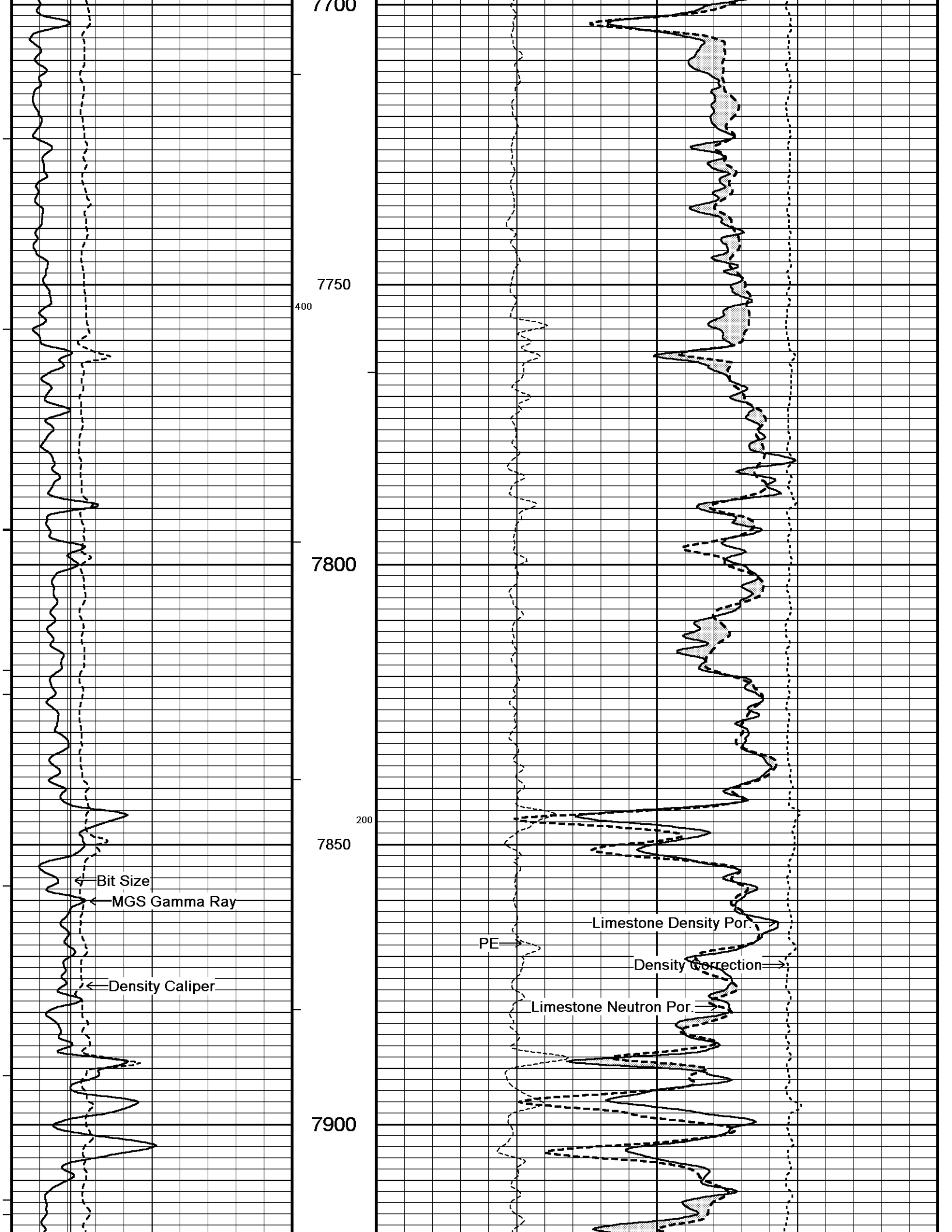
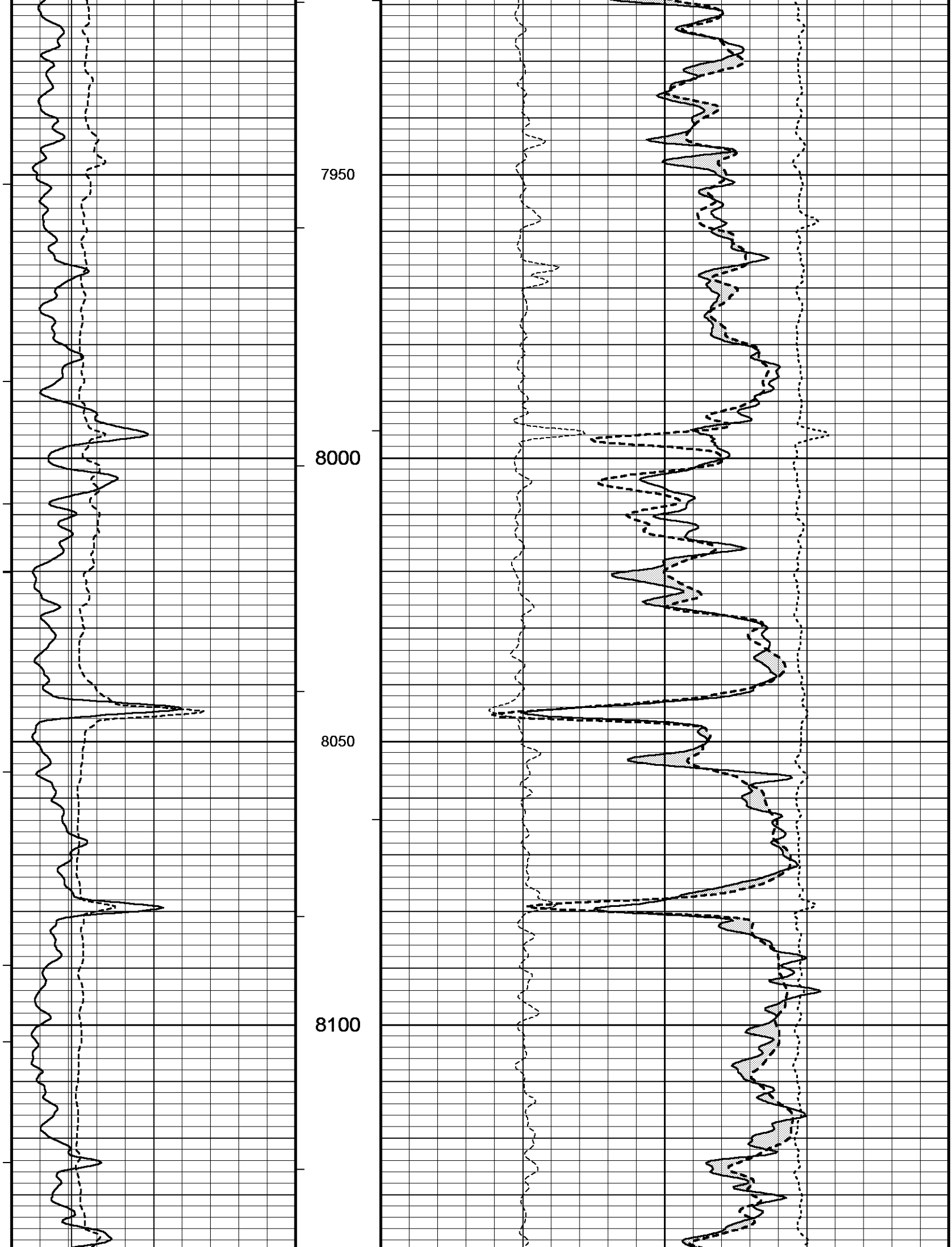
7550
7600
7650


7700
7750
400
7800
200
7850
7900
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Density Correction
Limestone Neutron Por.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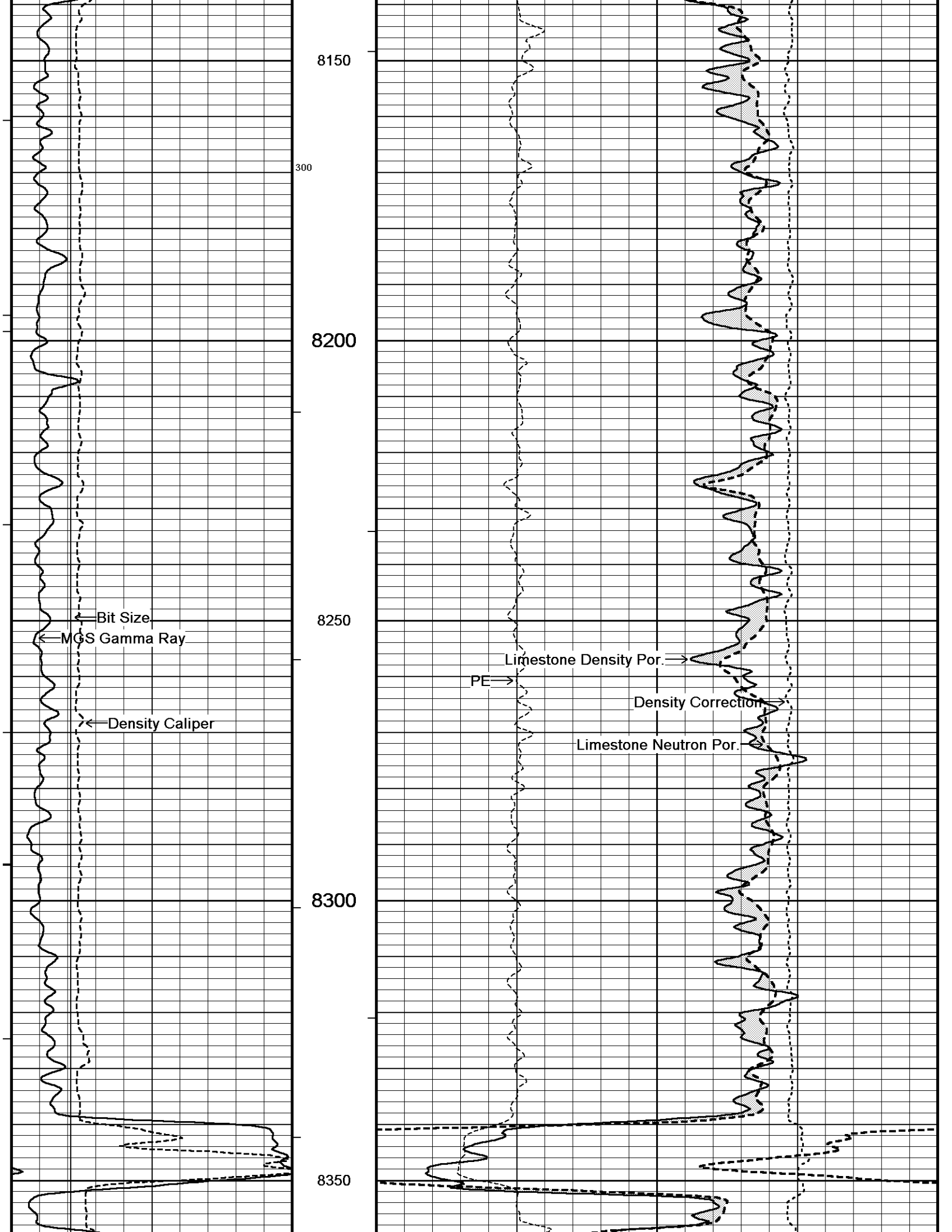
8000
8050
8100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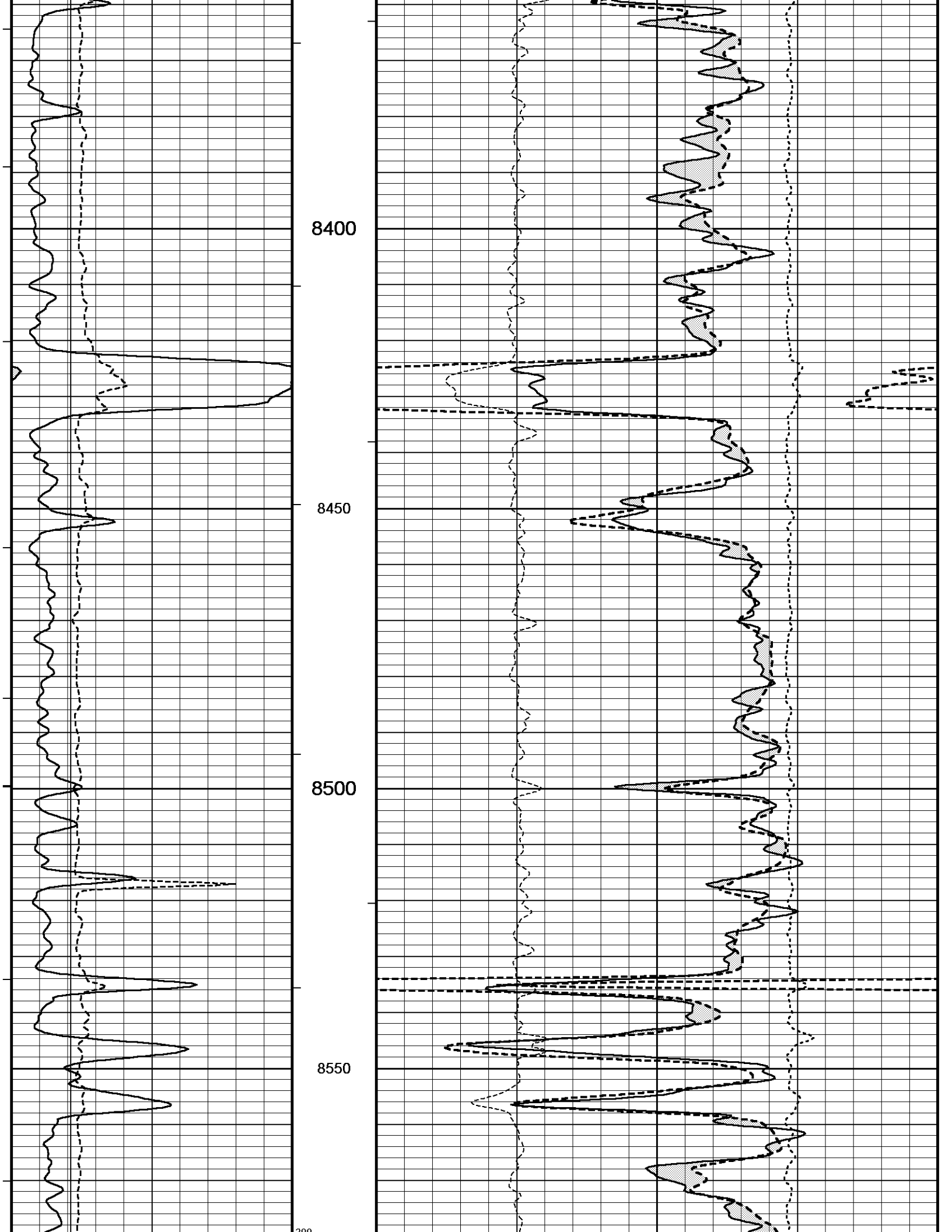
300
8200
8250
8300
8350
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por.
PE
Density Correction
Limestone Neutron Por.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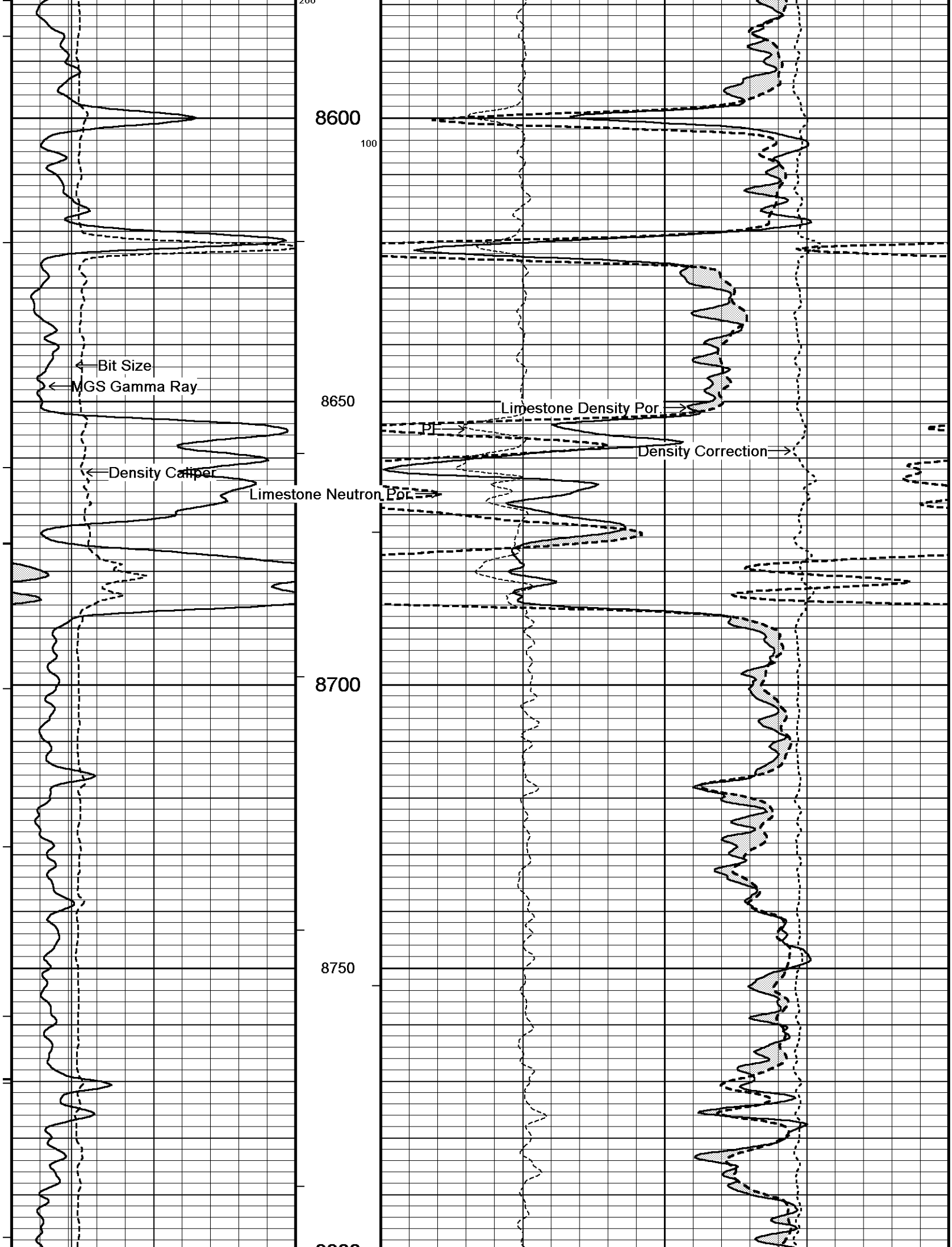
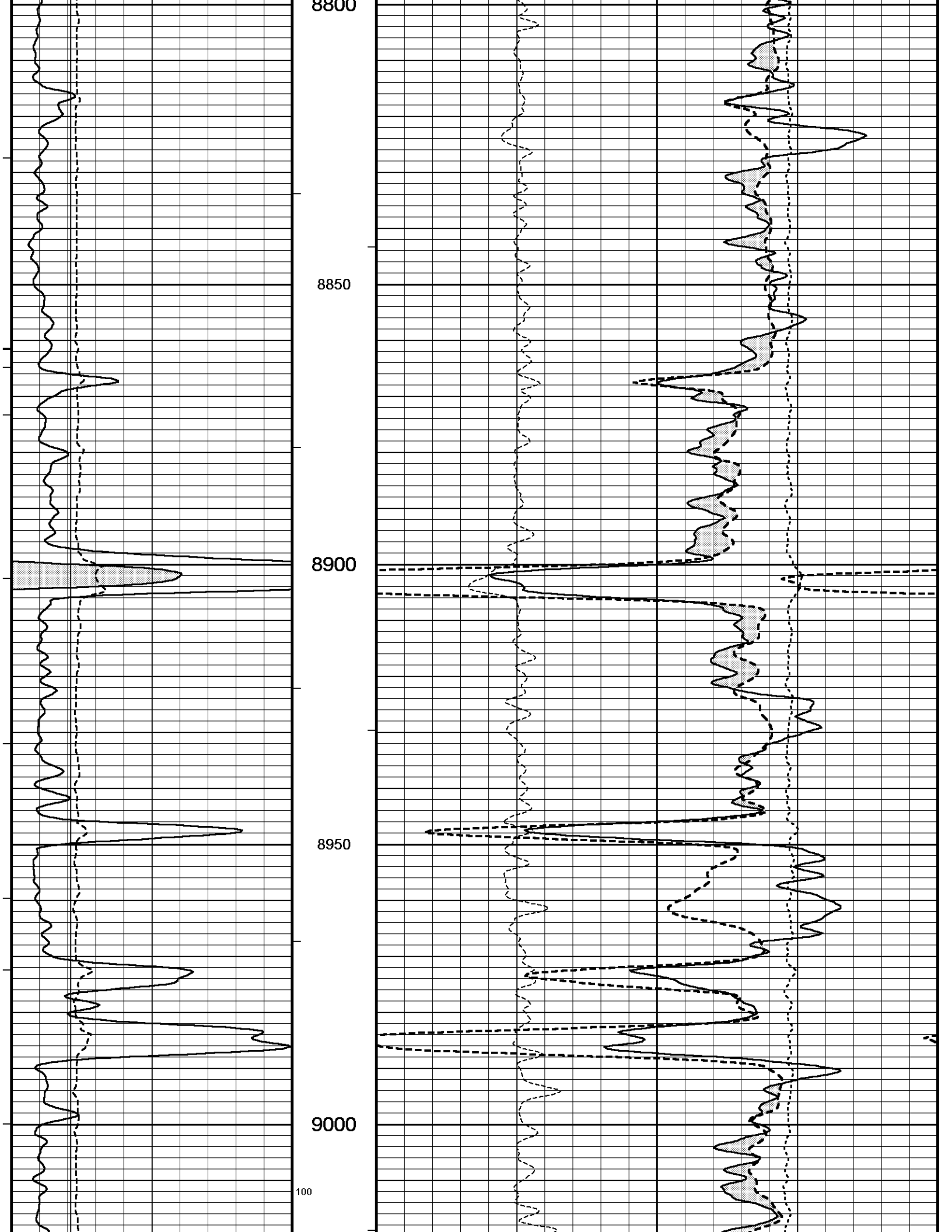

8600
100
8650
8700
8750
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Neutron Por.
Limestone Density Por.
PI
Density Correction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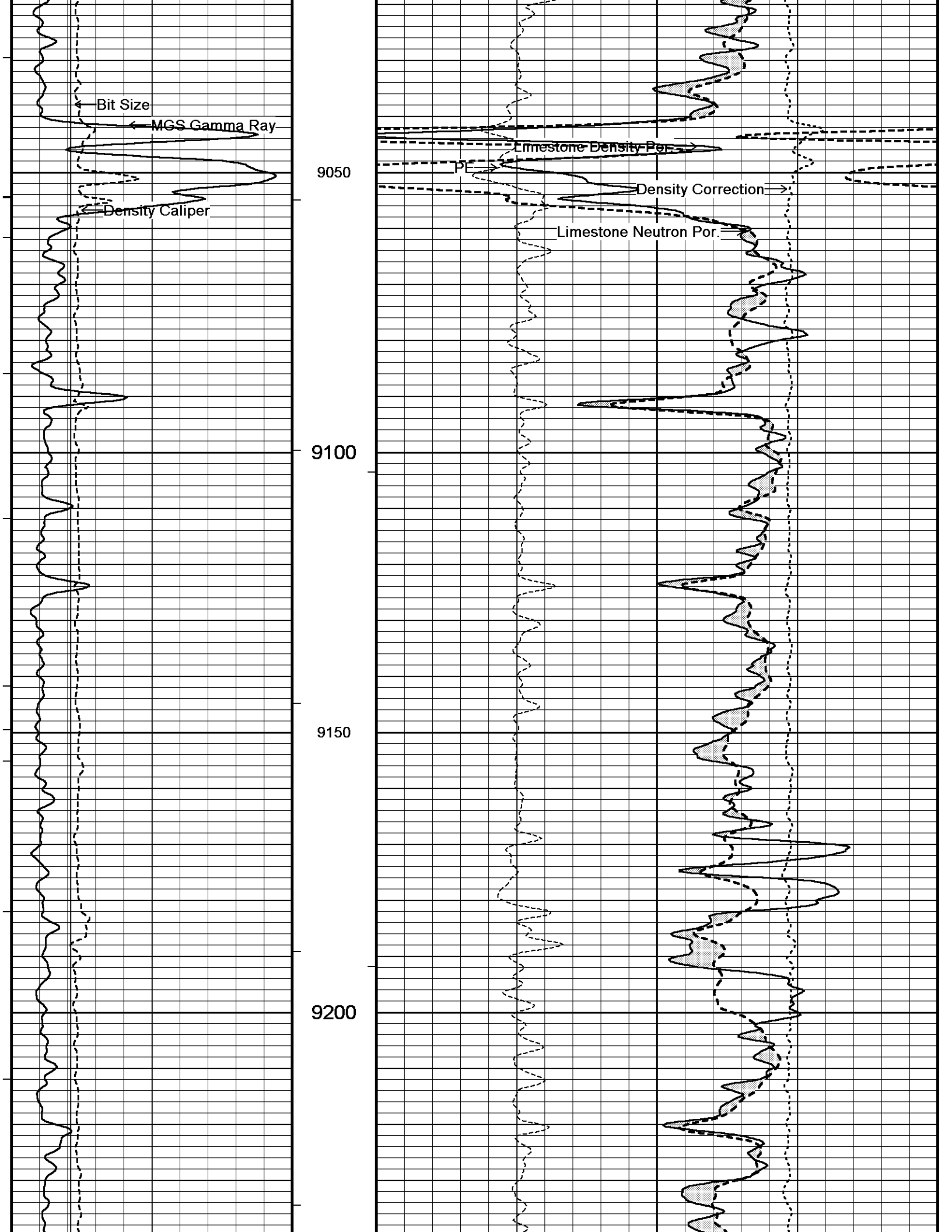
8850
8900
8950
9000
100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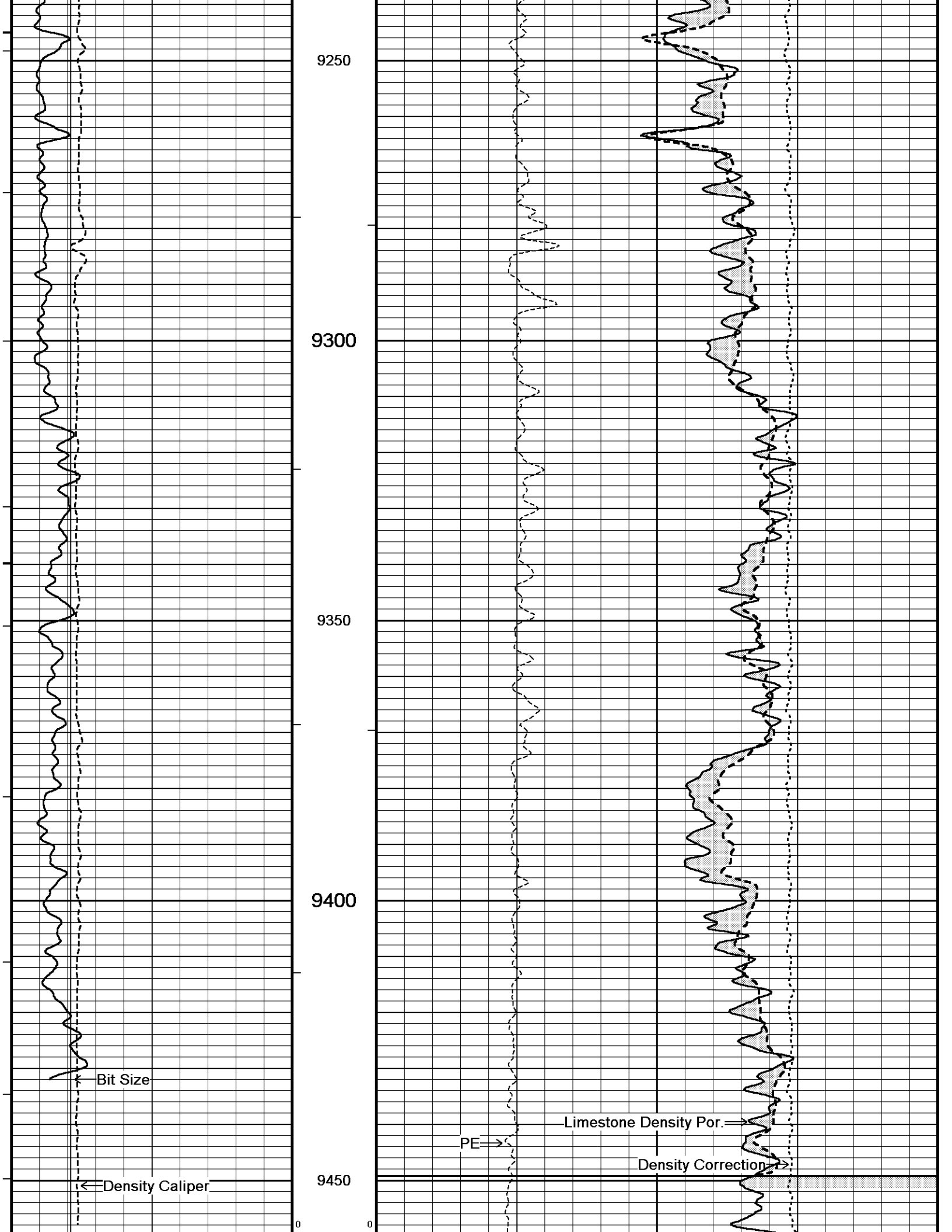
Density Caliper
Limestone Density Por.
PE
Density Correction
Limestone Neutron Por.
9050
9100
9150
9200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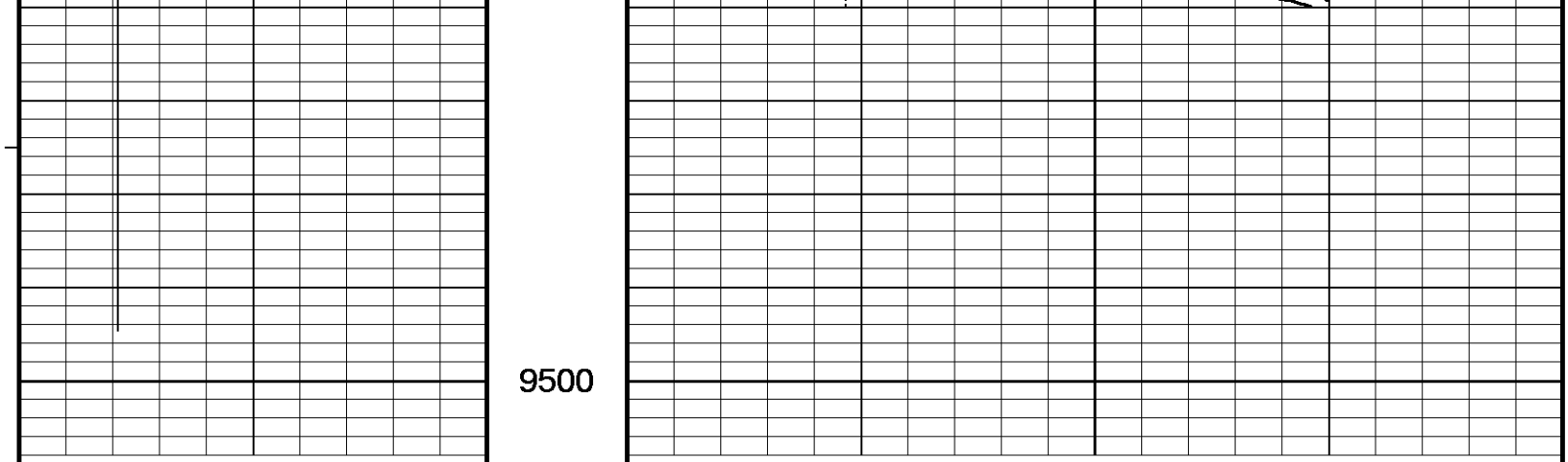
9300
9350
9400
9450
Bit Size
Density Caliper
PE
Limestone Density Por.
Density Correction
0
0



Depth In Feet

Timing Marks
every 60.0 sec

Density Caliper
inches
4 9 14

MGS Gamma Ray
API
0 75 150
150 225 300

MGS Gamma Ray
API
0 75 150
150 225 300

Bit Size
inches
4 9 14

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

Limestone Neutron Por.
percent
30 20 10 0 -10

Limestone Neutron Por.
percent
30 20 10 0 -10
70 60 50 40 30

Limestone Density Por.
percent
30 20 10 0 -10

PE
barns/electron
0 5 10

Density Correction
grams/cc
-0.50 0 0.50

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\DATA_13_04_8492\SANDRIDGE LEROY 319 1-5H\LEROY RTAP DEPTH.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Plotted on 10-JAN-2013 12:20
Recorded on 10-JAN-2013 11:20

5 INCH MAIN PASS

5 INCH BULK DENSITY

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\DATA_13_04_8492\SANDRIDGE LEROY 319 1-5H\LEROY RTAP DEPTH.dta
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Plotted on 10-JAN-2013 12:20
Recorded on 10-JAN-2013 11:20

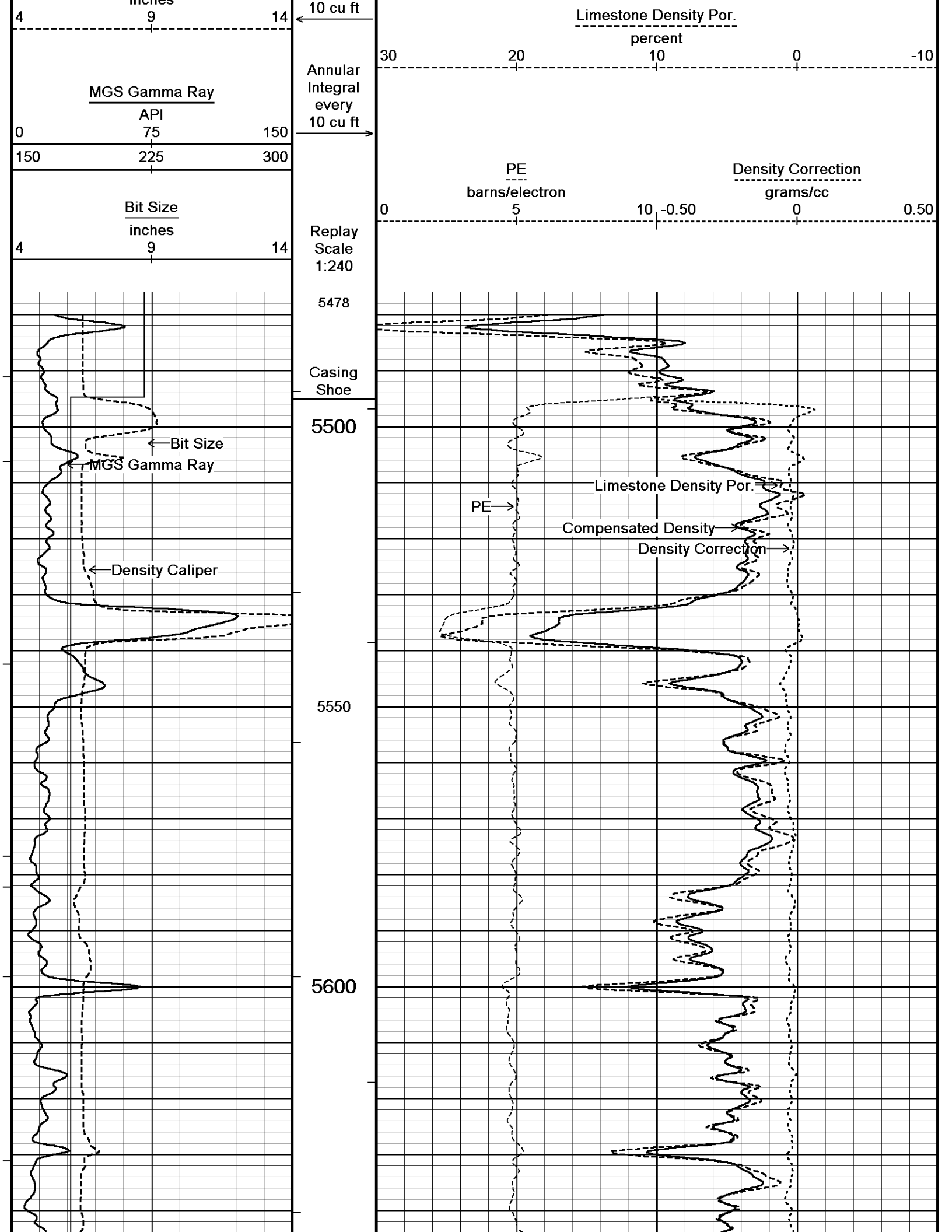
Depth In Feet

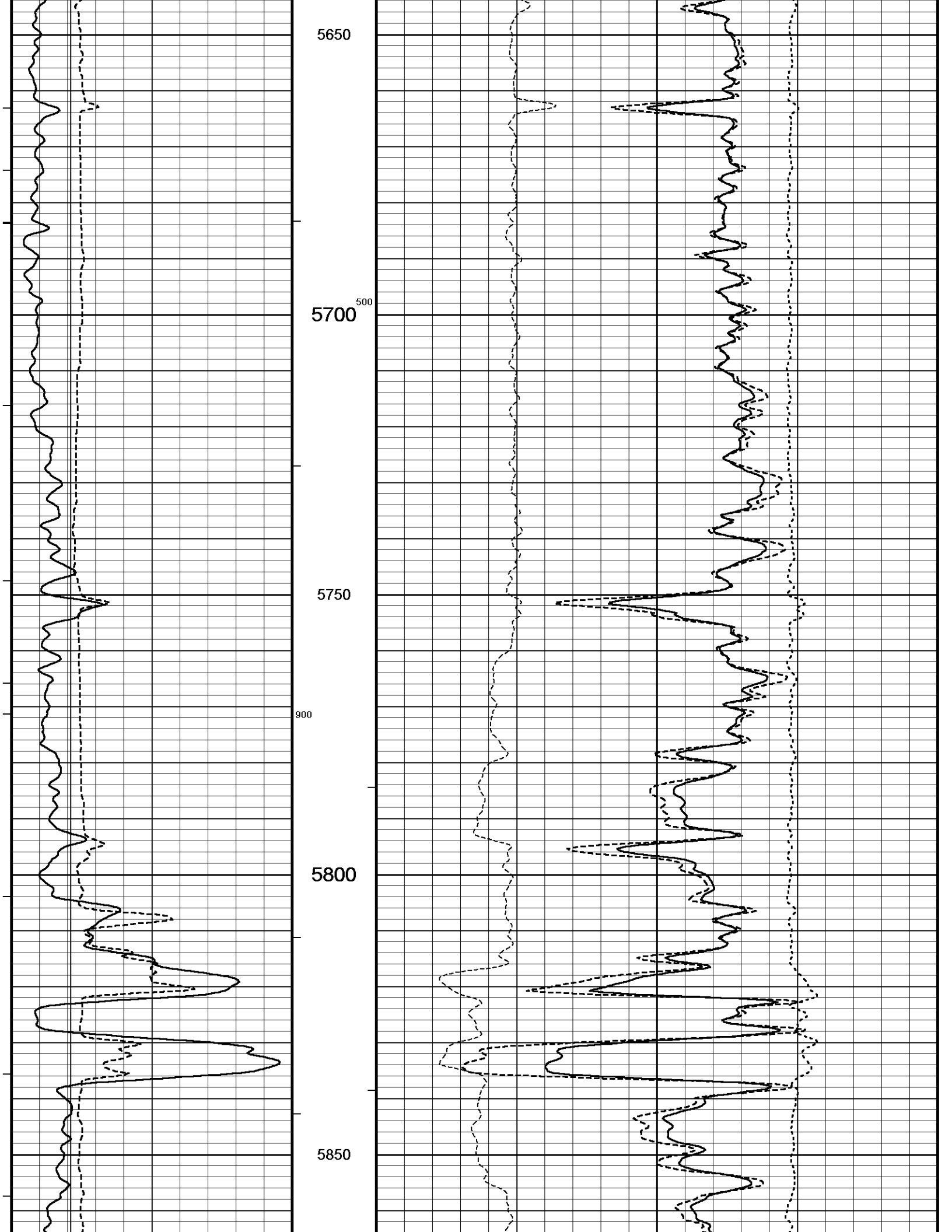
Timing Marks
every 60.0 sec

Density Caliper
inches

HVI every

Compensated Density
grams/cc
2 2.25 2.50 2.75 3


4 9 14
10 cu ft
Limestone Density Por.
percent
30 20 10 0 -10
Annular Integral every 10 cu ft
MGS Gamma Ray
API
0 75 150
150 225 300
PE
barns/electron
0 5 10
Density Correction
grams/cc
-0.50 0 0.50
Bit Size
inches
4 9 14
Replay Scale 1:240
5478
Casing Shoe
5500
5550
5600
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por.
PE
Compensated Density
Density Correction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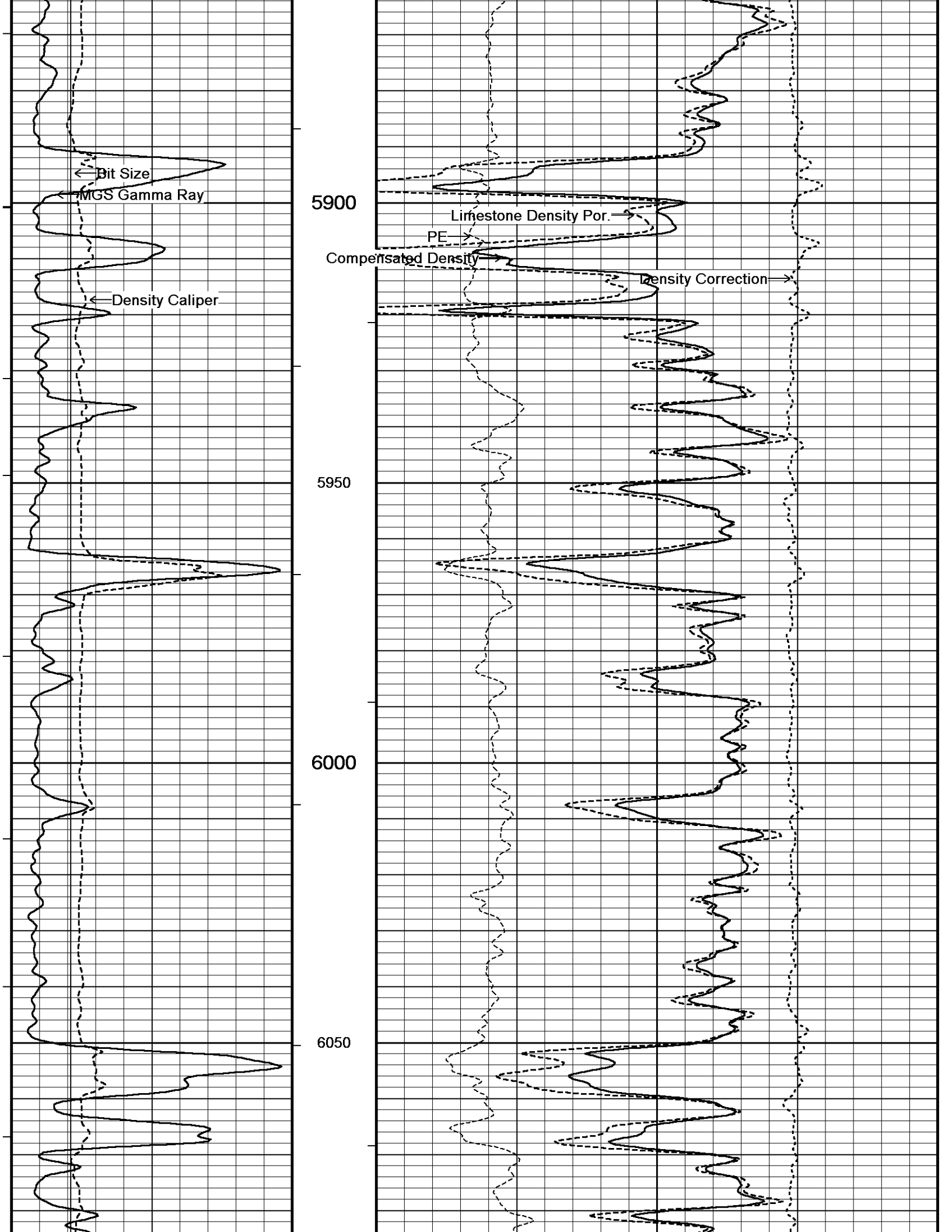
500
5750
900
5800
5850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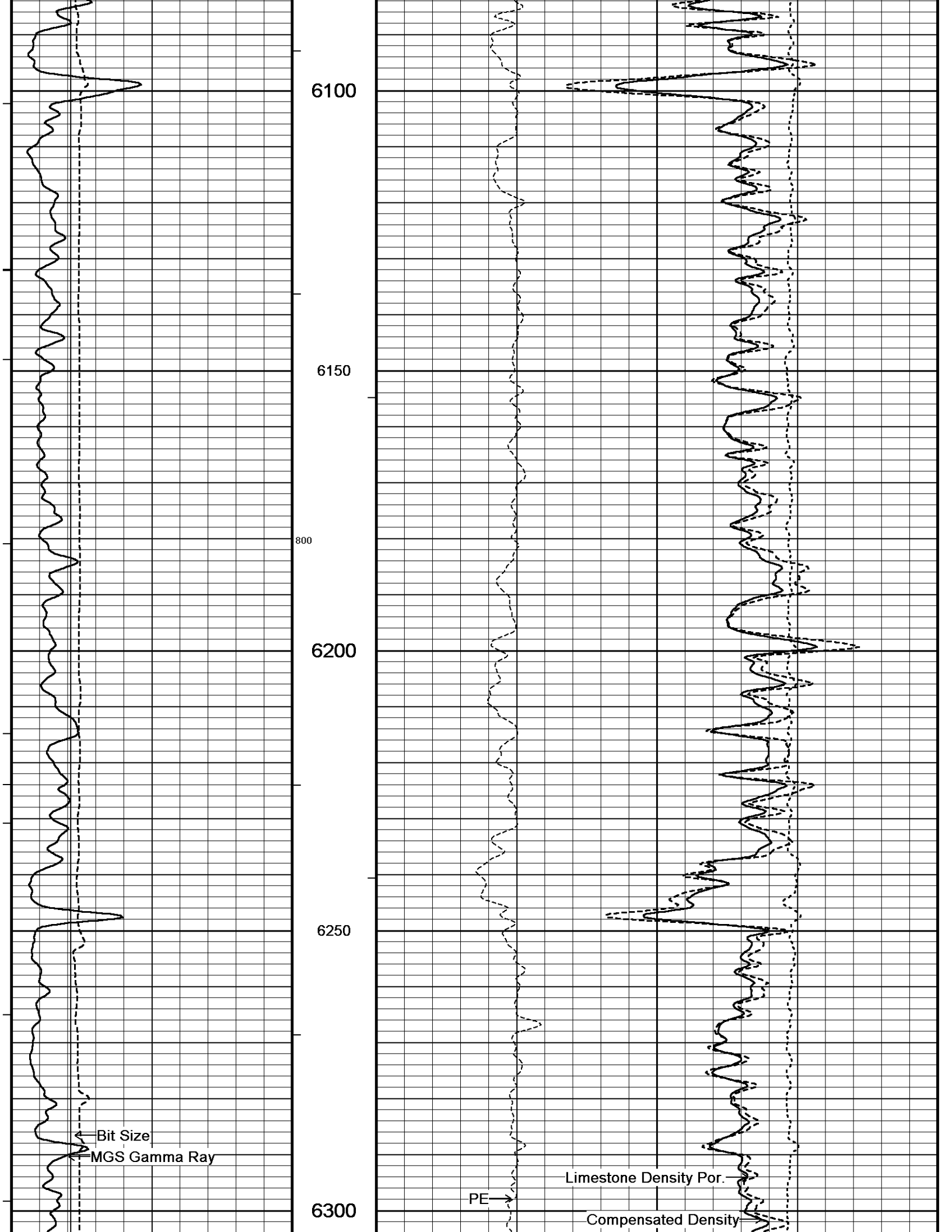
Density Caliper
5900
Limestone Density Por.
PE
Compensated Density
Density Correction
5950
6000
6050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6150
800
6200
6250
6300
Bit Size
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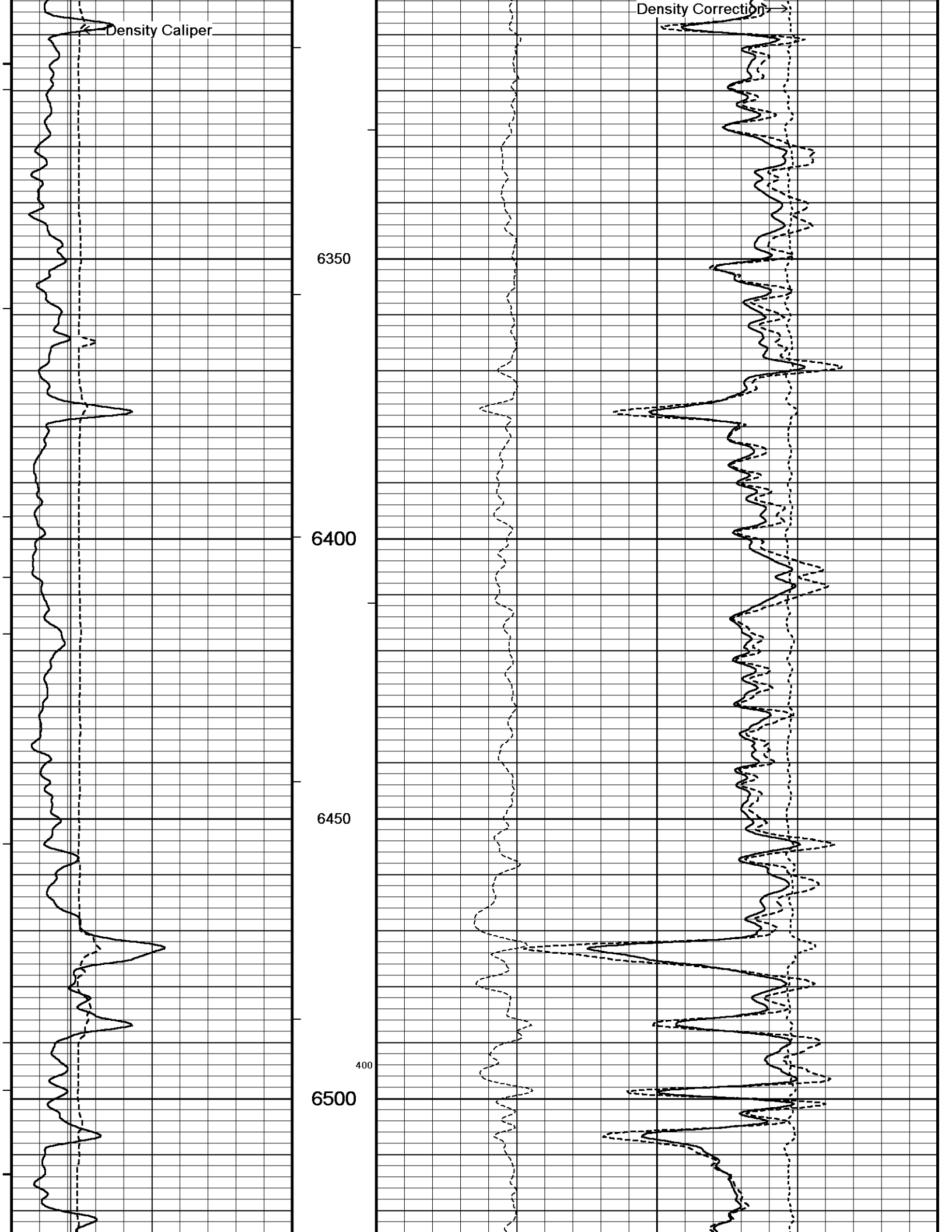
Limestone Density Por.
Compensated Density


Density Caliper
Density Correction
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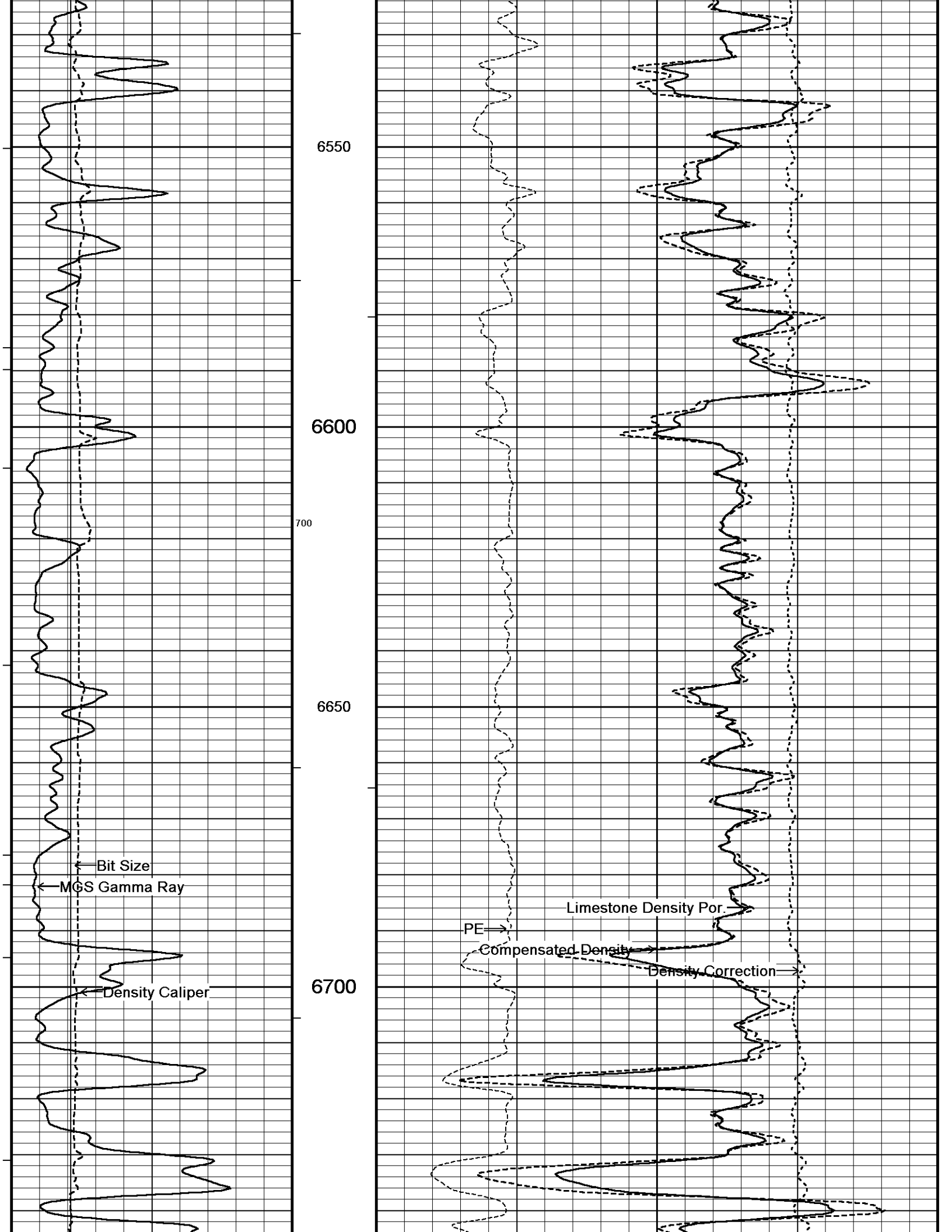
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6650
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Bit Size
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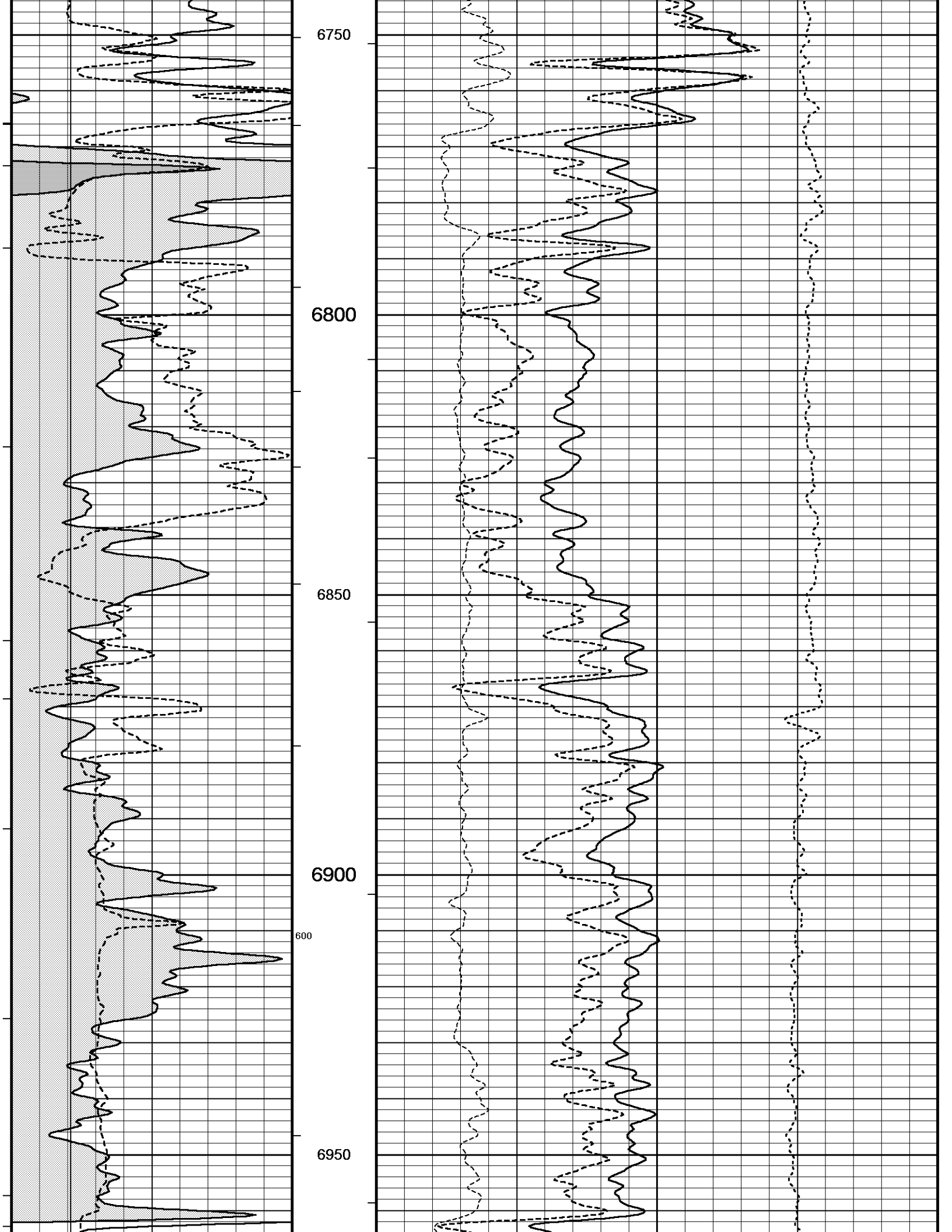
Compensated Density
Density Correction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6900
600
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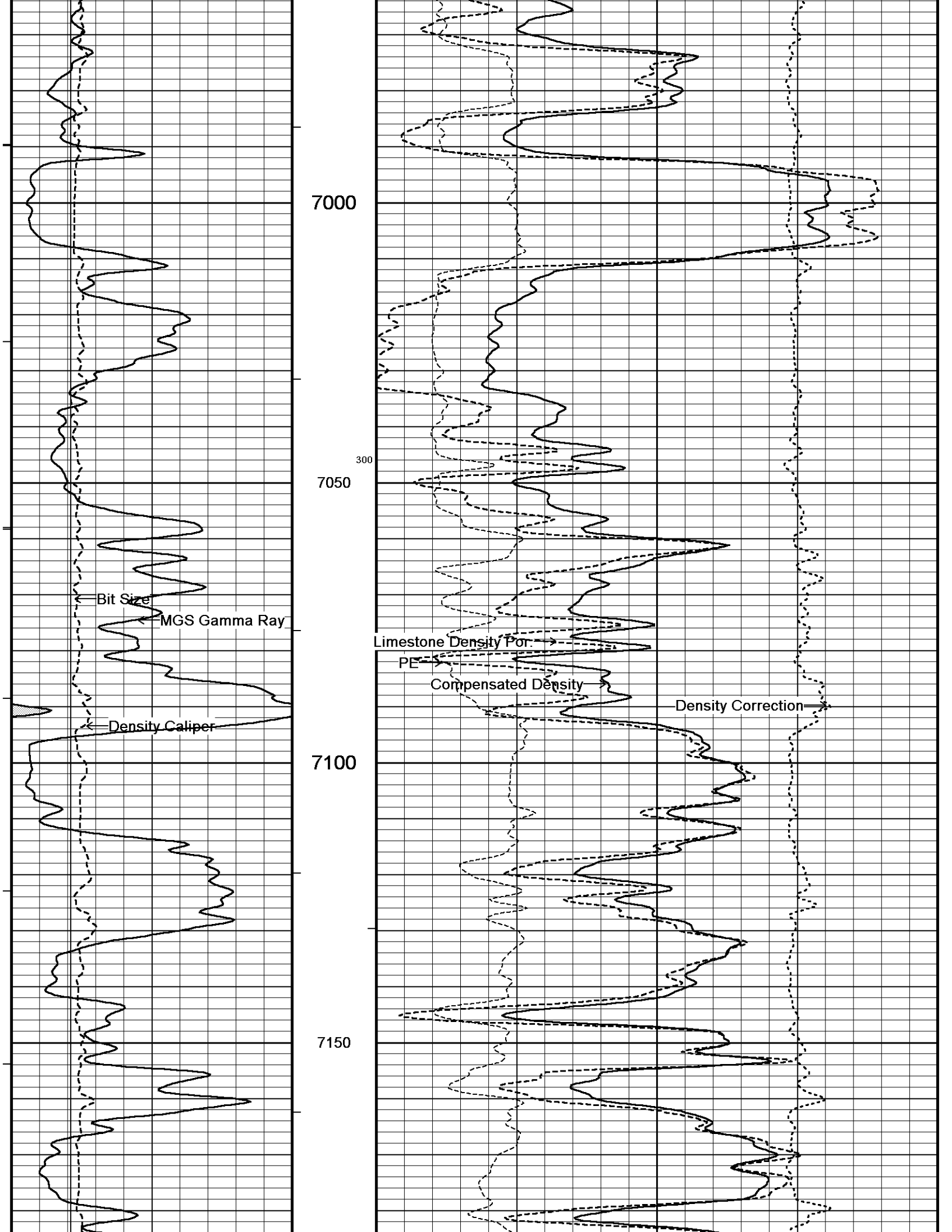
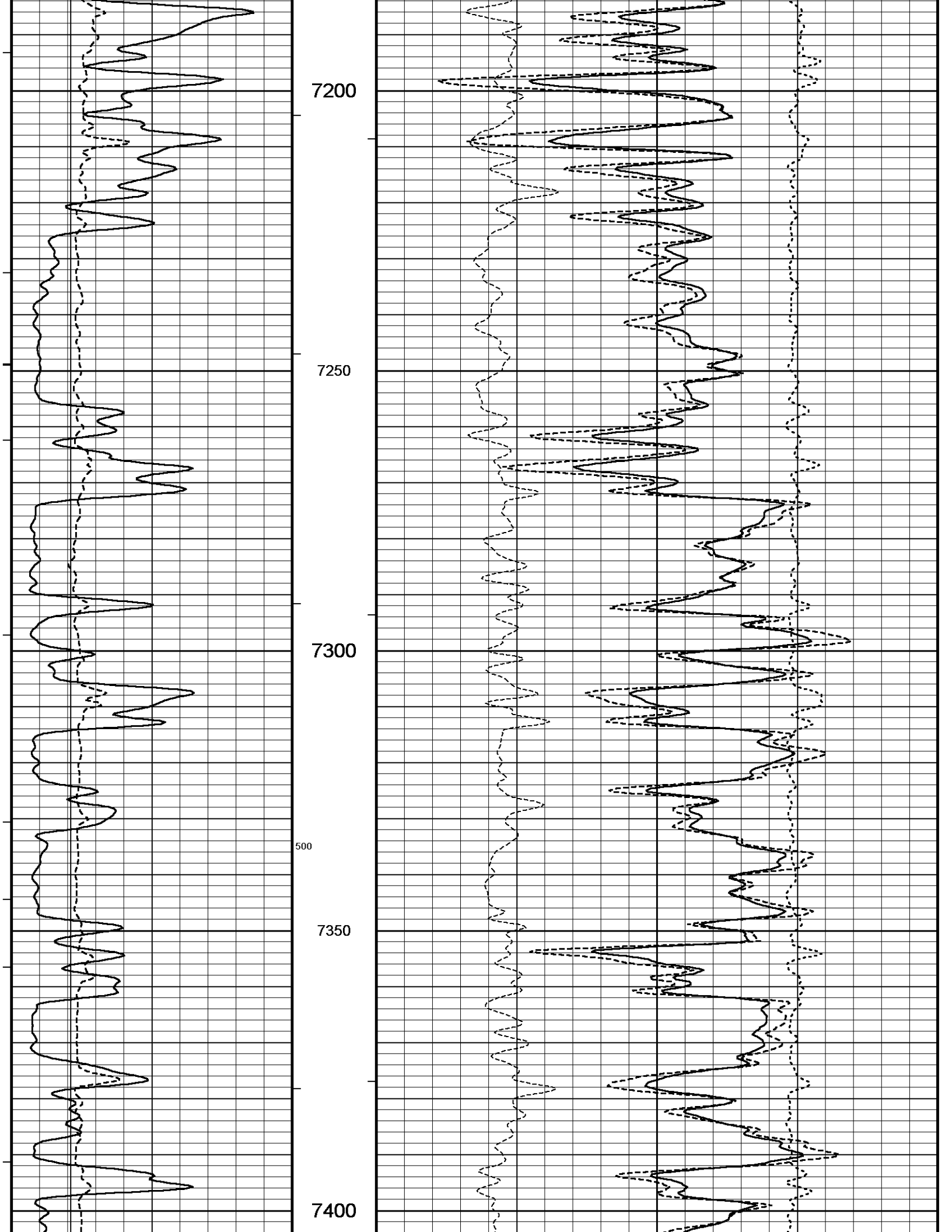

7000
300
7050
Bit Size
MGS Gamma Ray
Limestone Density Por
PE
Compensated Density
Density Correction
Density Caliper
7100
7150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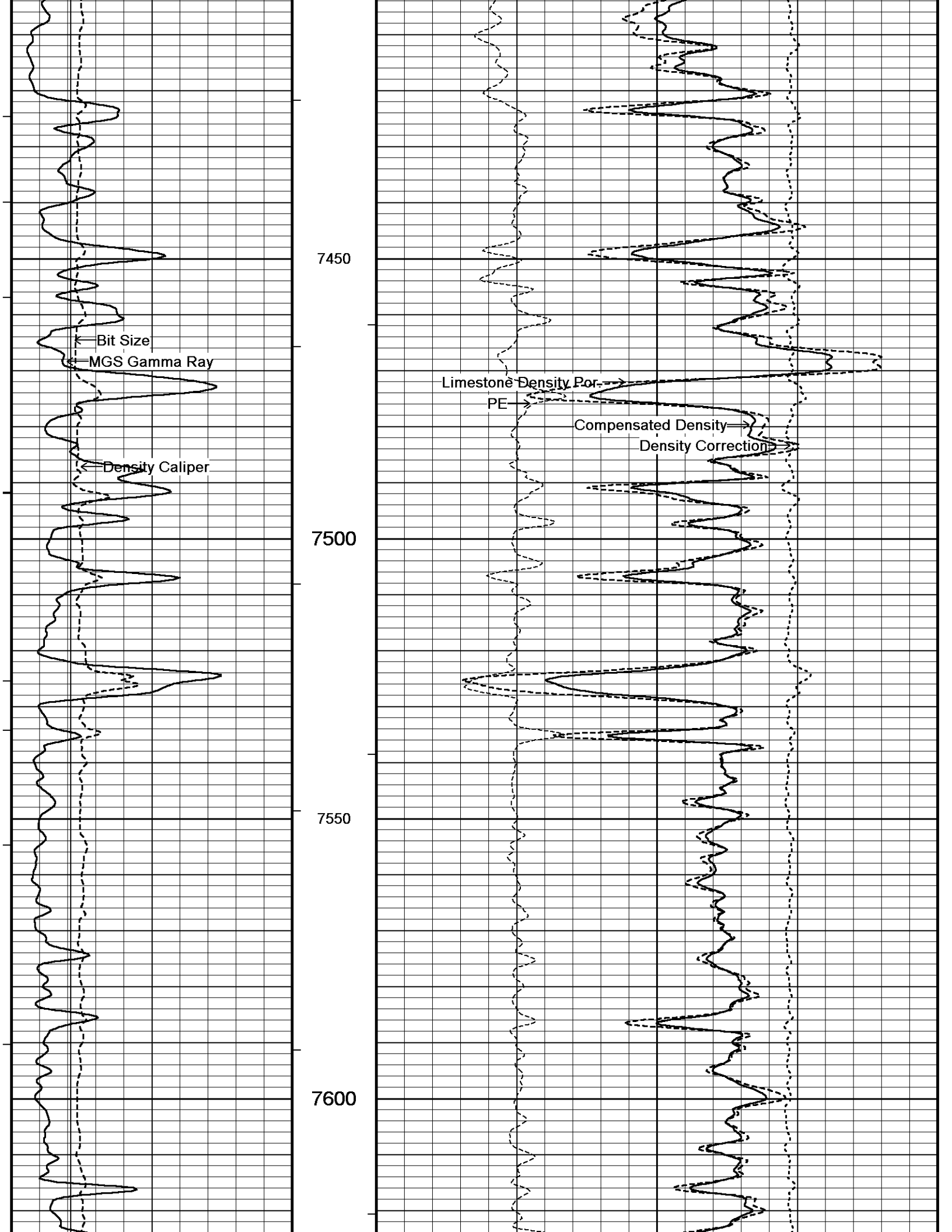
7250
7300
500
7350
7400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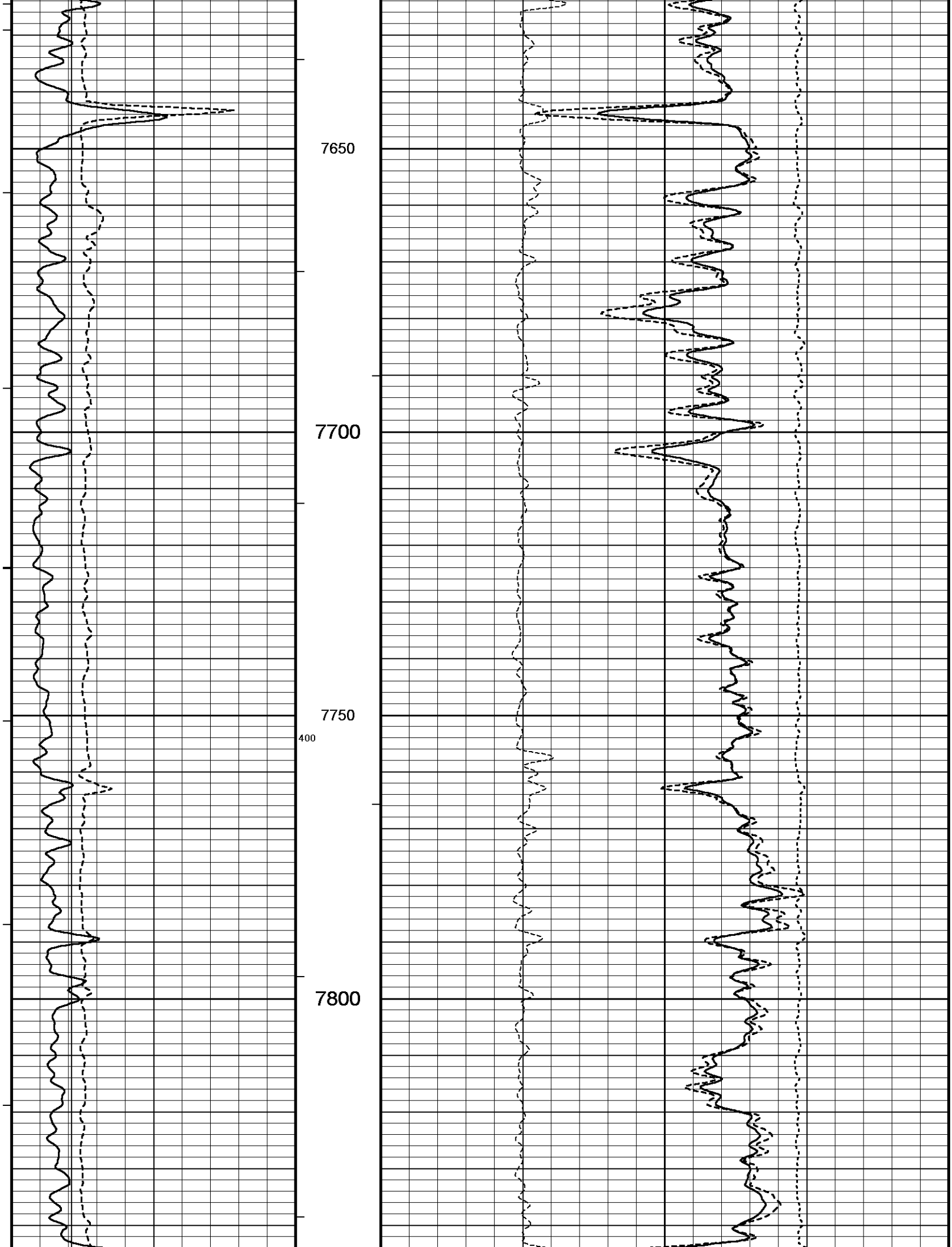
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por
PE
Compensated Density
Density Correction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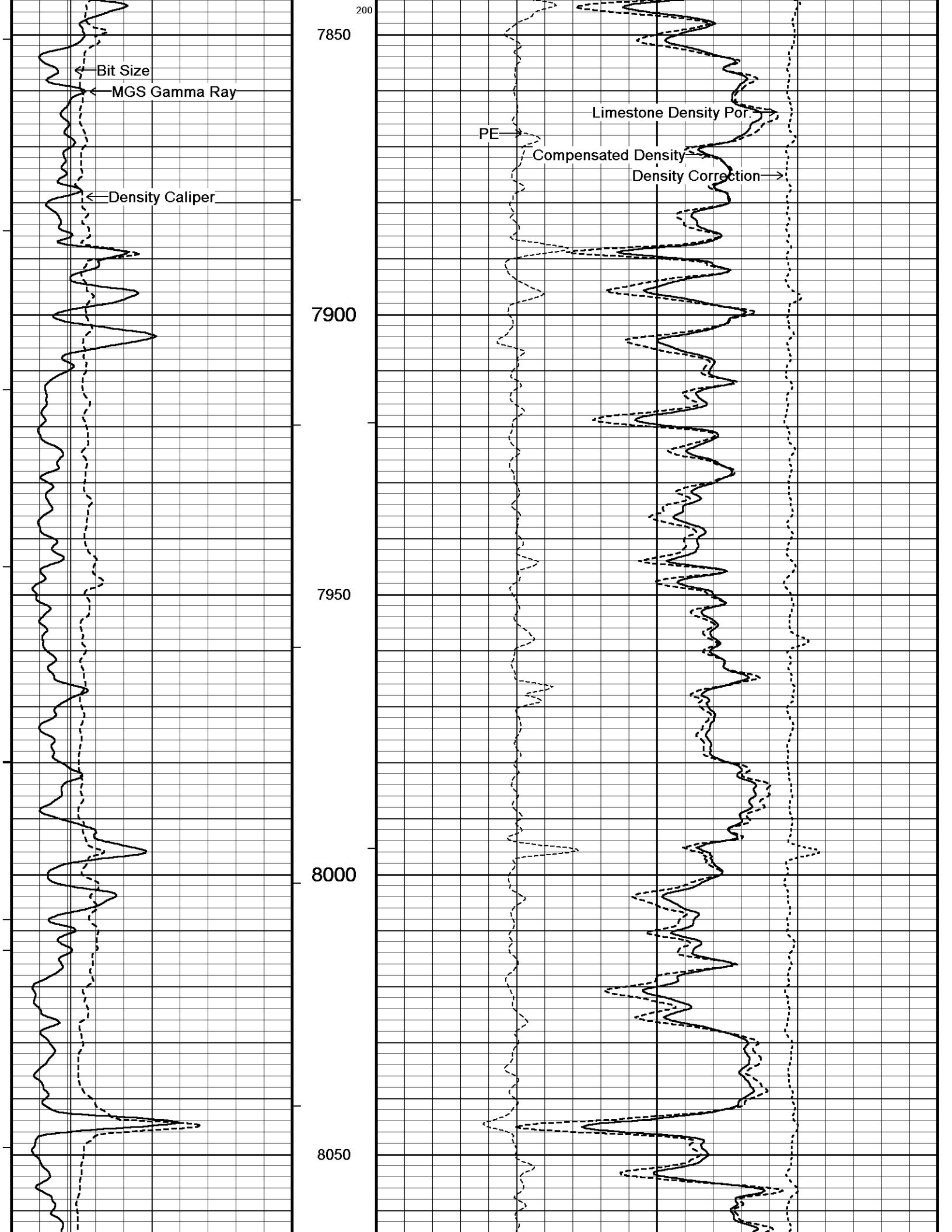
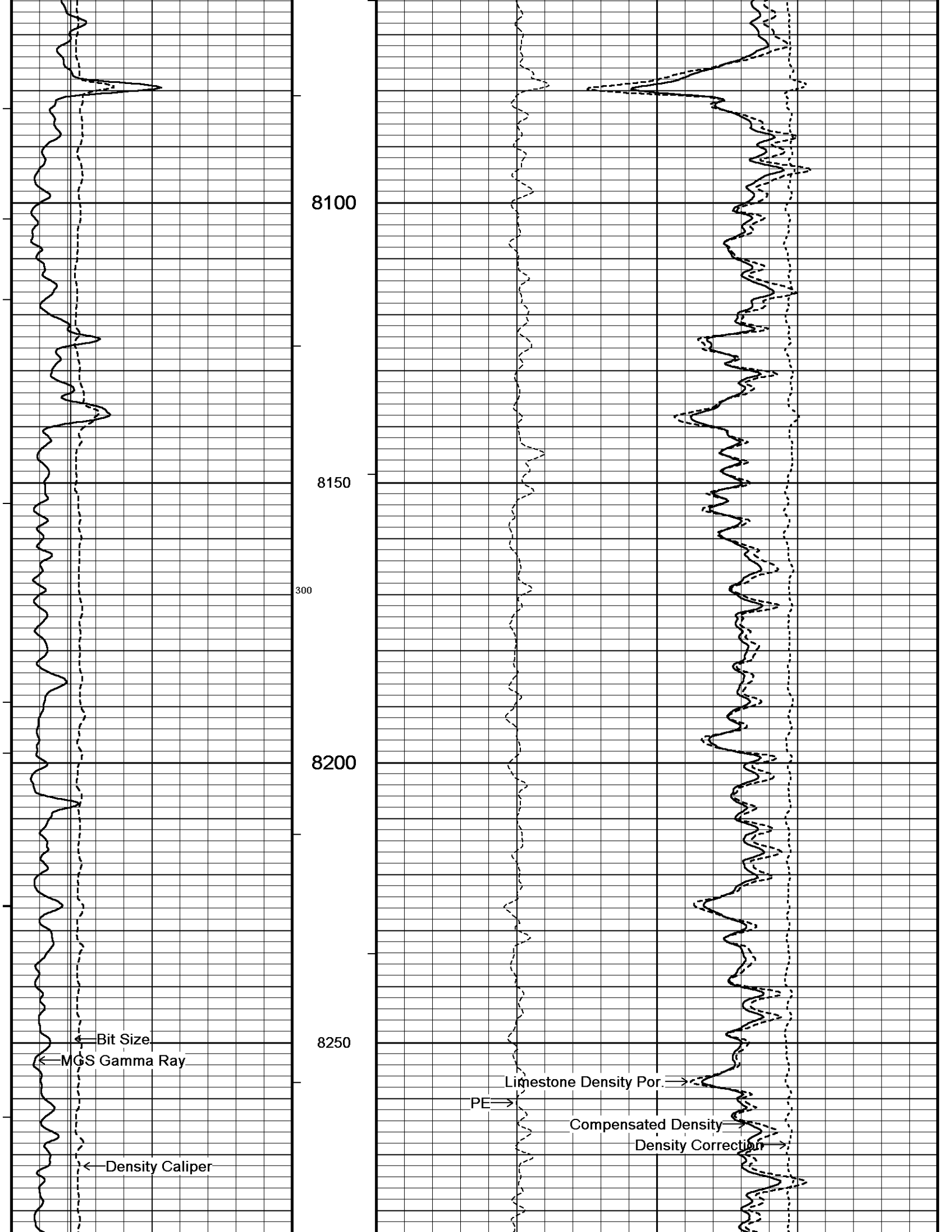

200
7850
7900
7950
8000
8050
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por.
PE
Compensated Density
Density Correction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8200
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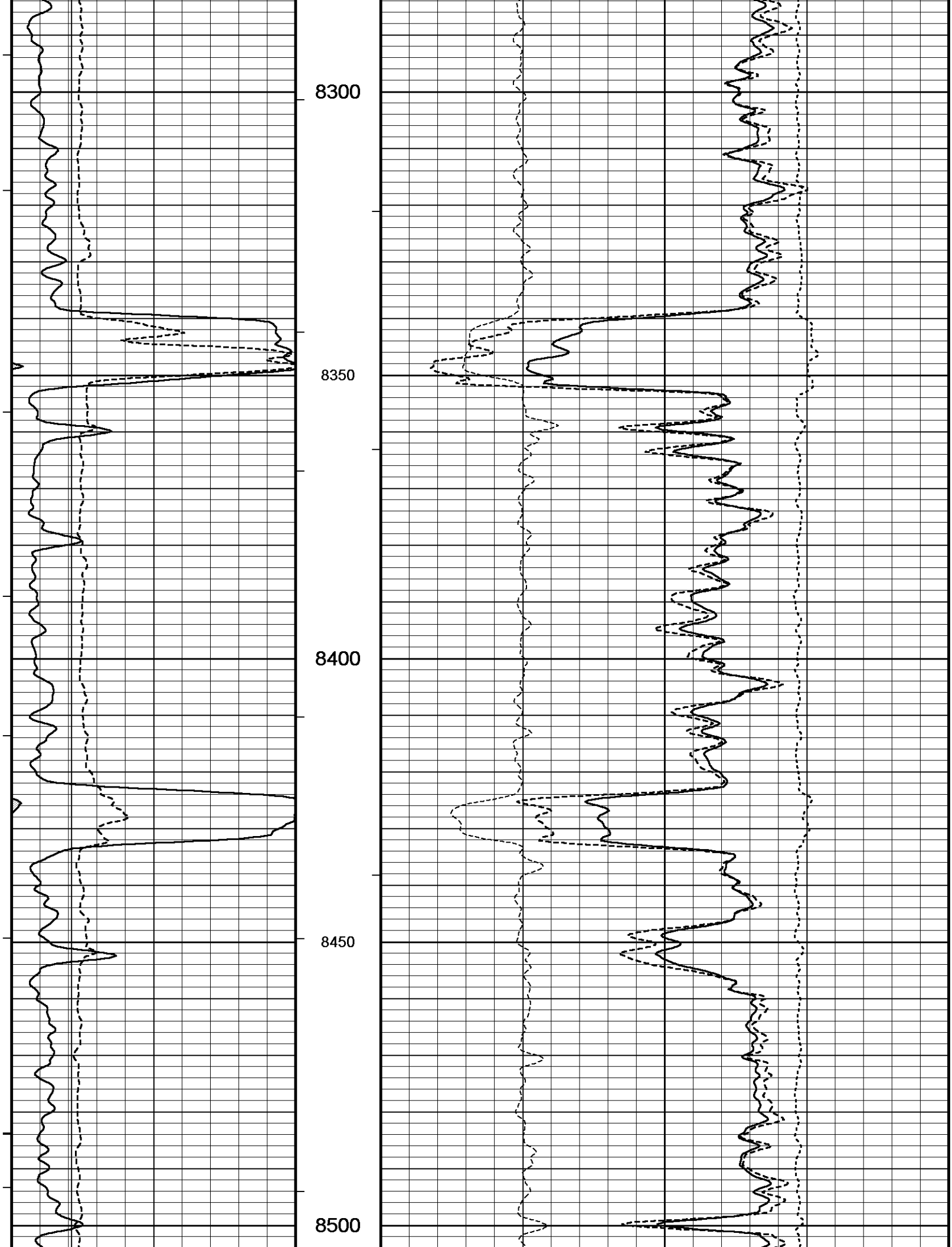
Density Caliper
Limestone Density Por.
PE
Compensated Density
Density Correction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8450
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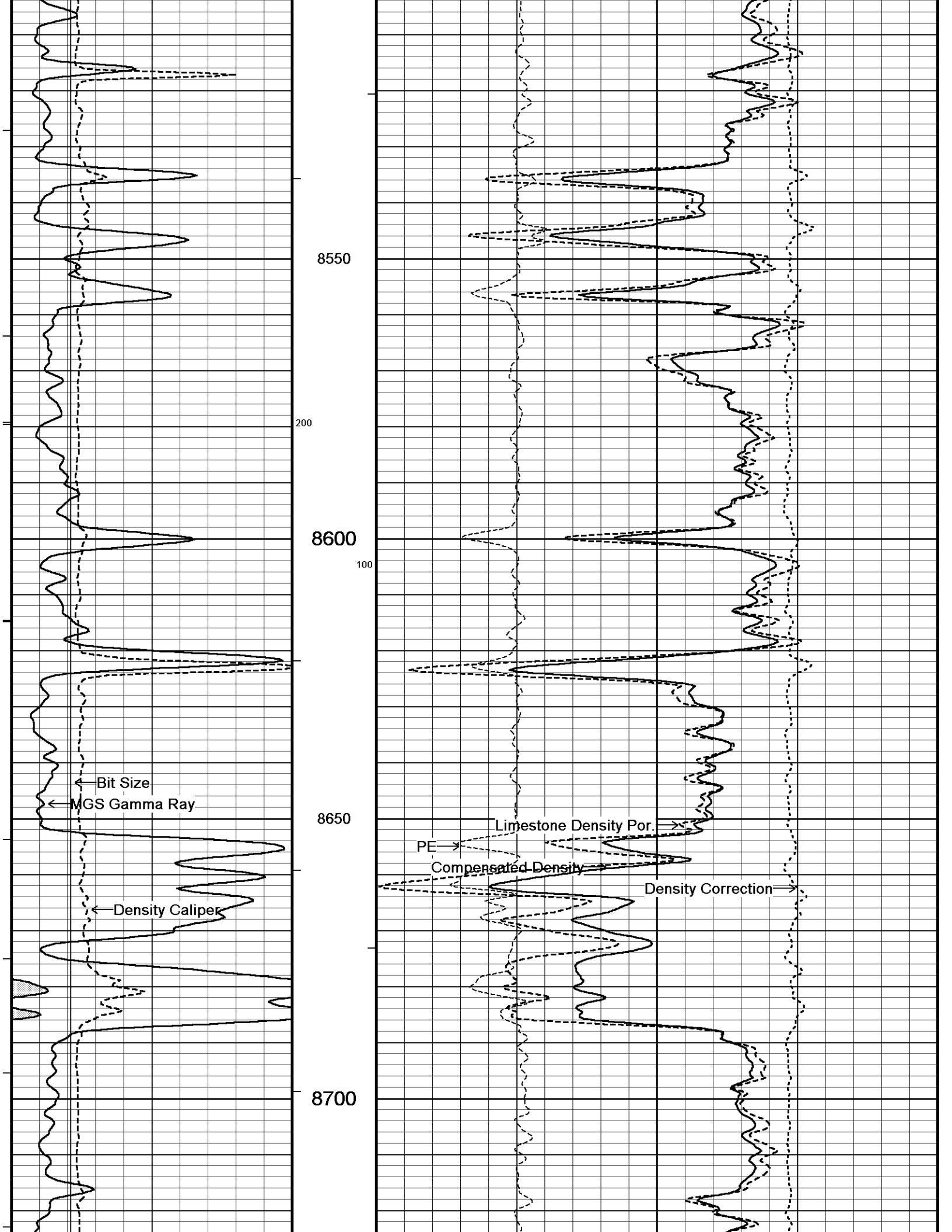
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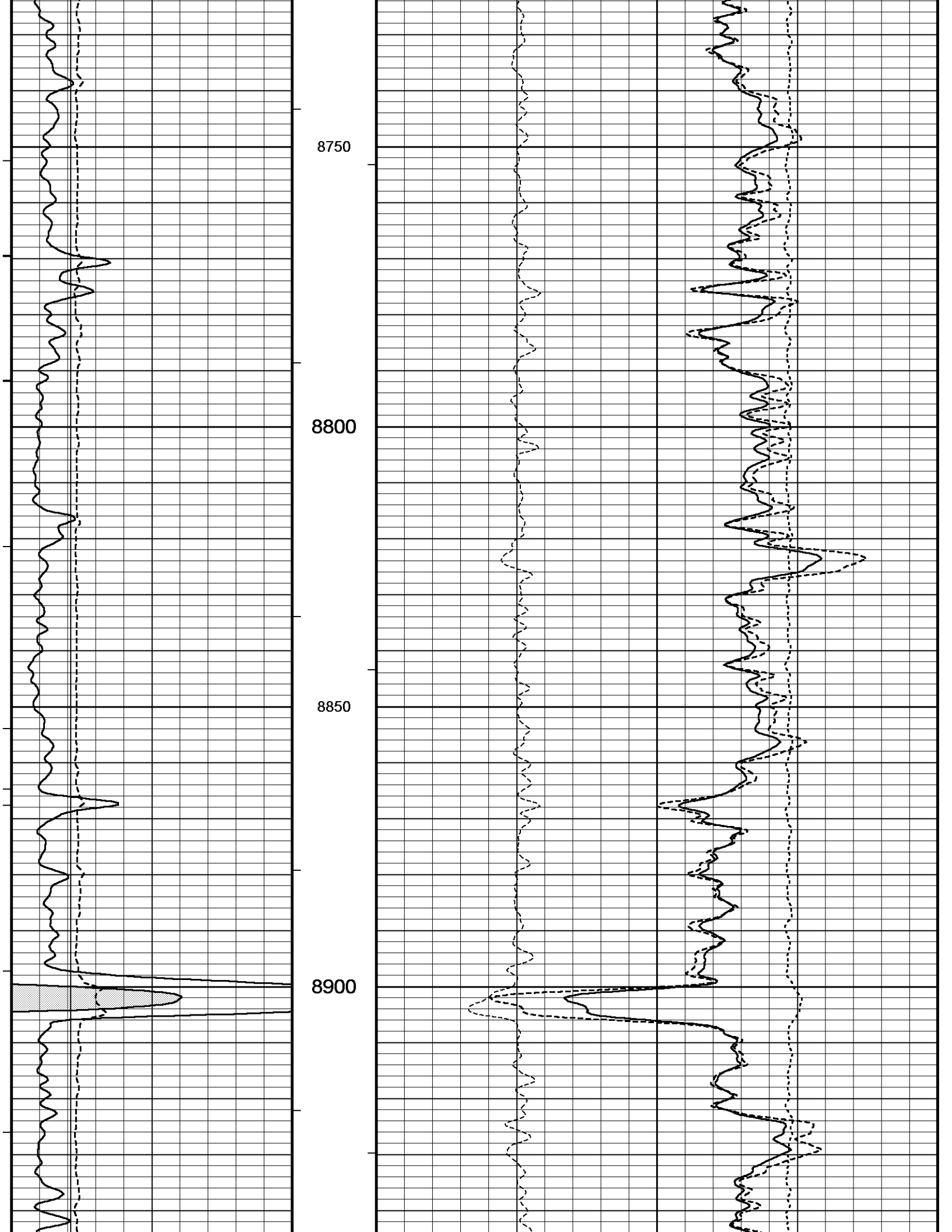
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por.
PE
Compensated Density
Density Correction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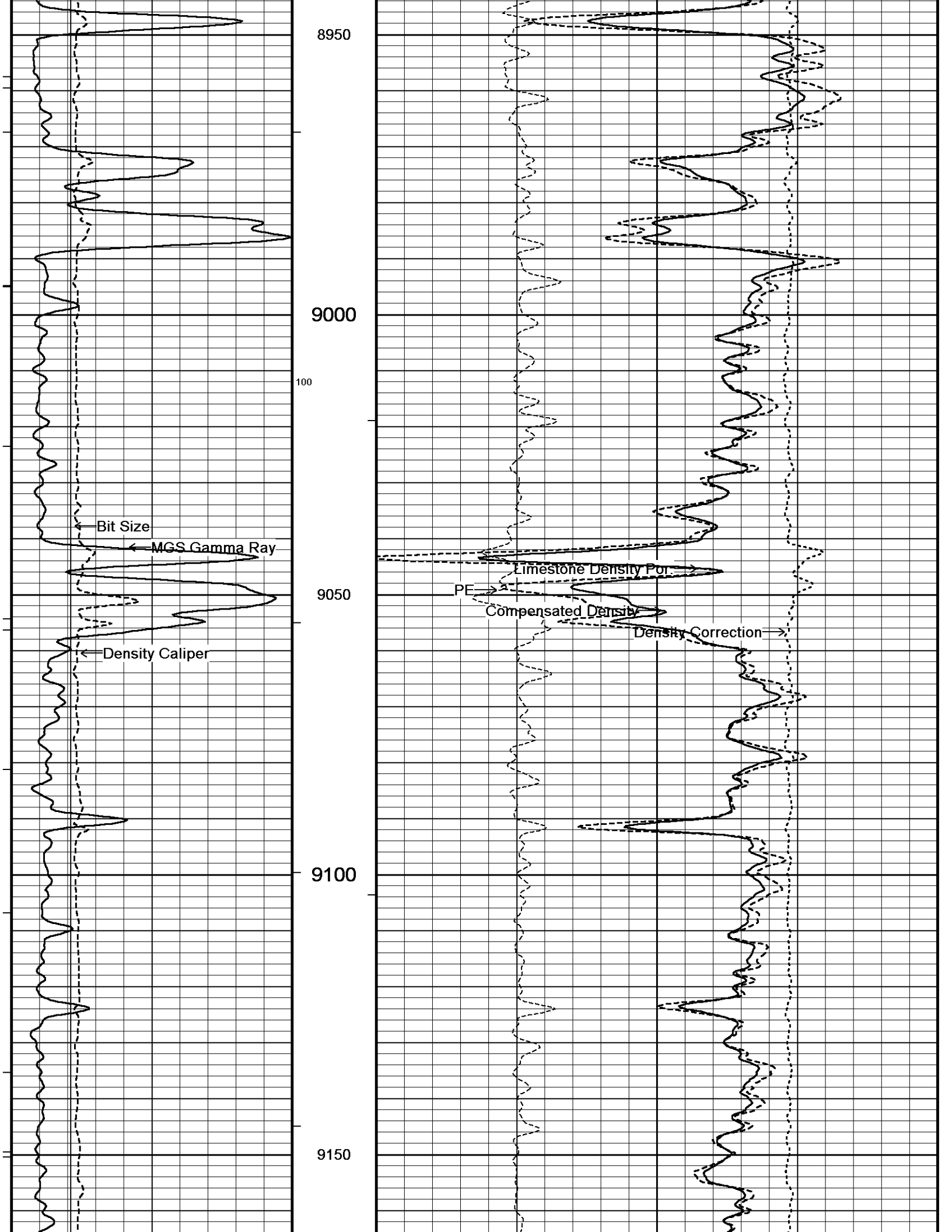
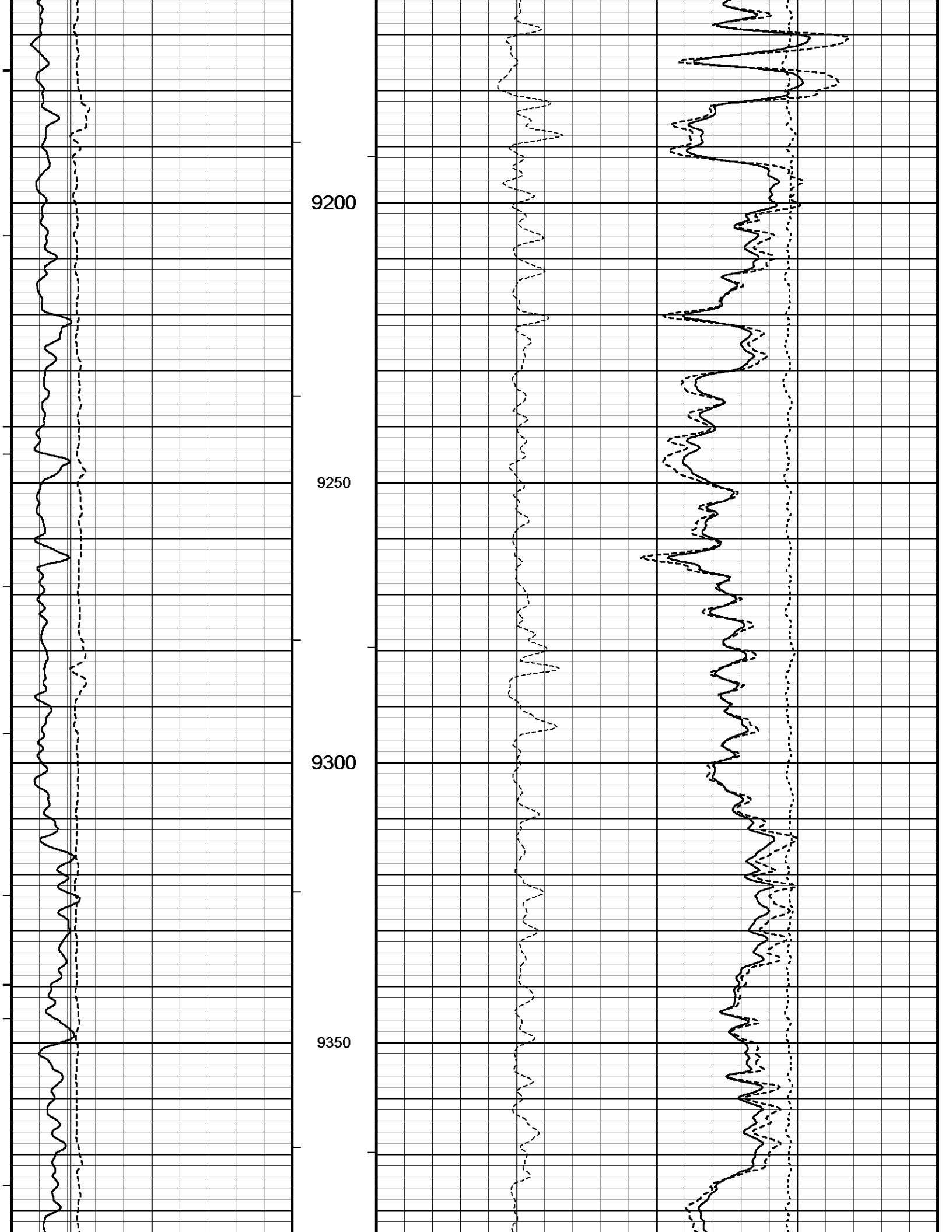
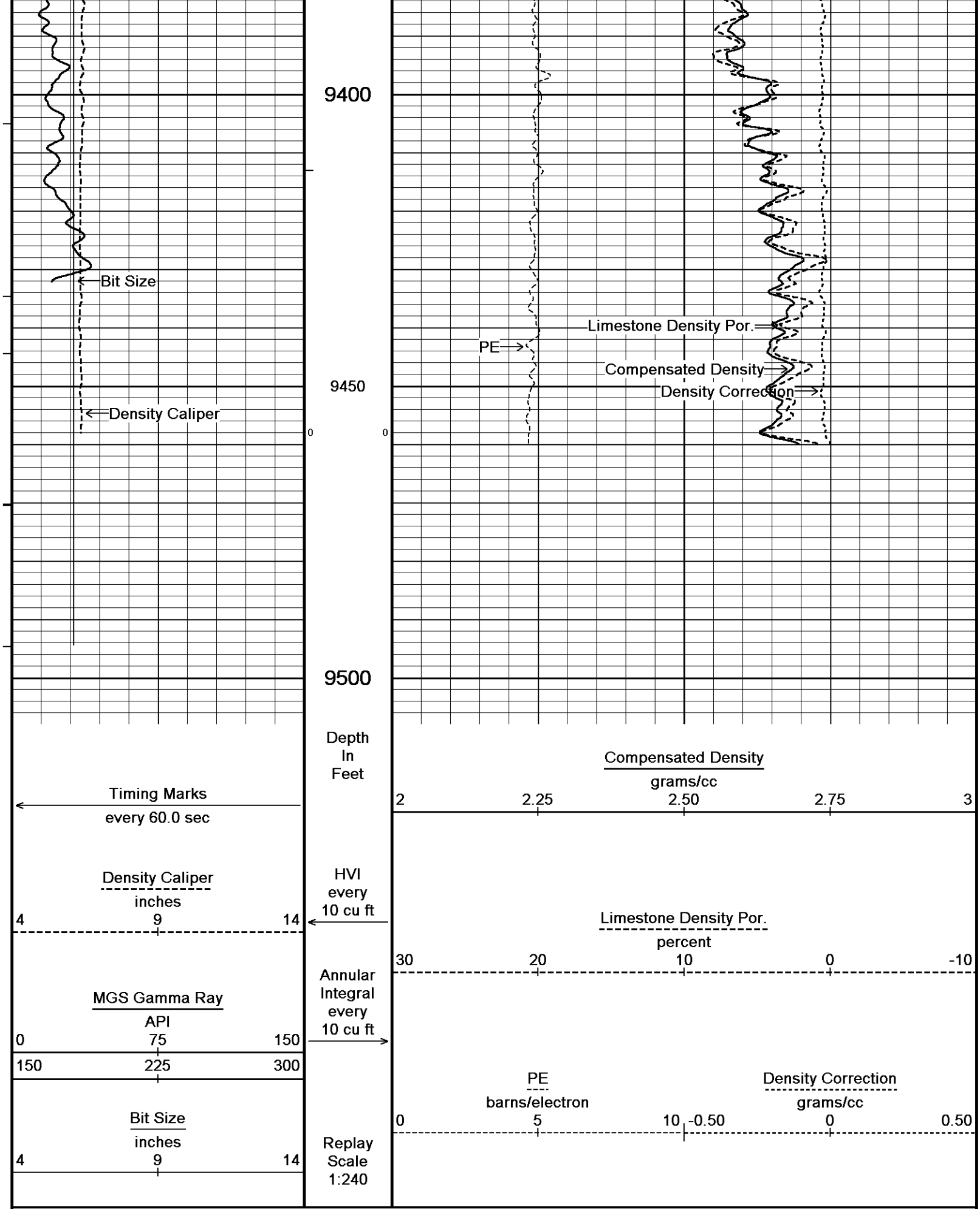
8800
8850
8900


8950
9000
100
9050
9100
9150
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por
PE
Compensated Density
Density Correction


9200
9250
9300
9350



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 10-JAN-2013 12:20
Filename: C:\DATA_13_04_8492\SANDRIDGE LEROY 319 1-5H\LEROY RTAP DEPTH.dta
Recorded on 10-JAN-2013 11:20
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

BEFORE SURVEY CALIBRATION

C:\DATA_13_04_8492\SANDRIDGE LEROY 319 1-5H\LEROY RTAP DEPTH.dta

General Constants All 000

Last Edited on 10-JAN-2013,11:26

General Parameters		
Mud Resistivity	0.890	ohm-metres
Mud Resistivity Temperature	72.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	None	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Deep Induction	
RWA Constant A	0.610	
RWA Constant M	2.150	

Strain Gauge Constants MMS-E.B 133

Last Edited on 07-DEC-2012,11:16

Atmospheric Pressure	14.70	psi
Serial Number	241946	
Calibration Date	09-JUL-08	
Base Check Date		
Dead Weight Serial Number	0	
Dead Weight Gravitational Correction	1.0	

Temperature	75.0		150.0		250.0		350.0	degrees F
Pressure psia	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.
0.0	0.069	0.073	0.062	0.063	0.042	0.042	0.021	0.021
3000.0	5.240	5.253	5.235	5.245	5.219	5.228	5.199	5.209
6000.0	10.422	10.442	10.421	10.439	10.408	10.425	10.388	10.406
9000.0	15.616	15.637	15.619	15.638	15.609	15.627	15.593	15.610
12000.0	20.827	20.839	20.834	20.843	20.828	20.838	20.815	20.823
15000.0	26.051		26.060		26.056		26.046	

SP Calibration MGS-C.J 142

Field Calibration on 06-JAN-2013,22:08

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

High Resolution Temperature Calibration MGS-C.J 142

Field Calibration on 06-JAN-2013,22:03

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

High Resolution Temperature Constants MGS-C.J 142

Last Edited on 06-JAN-2013,22:08

Pre-filter Length	11

Gamma Calibration MGS-C.J 142

Field Calibration on 09-JAN-2013,14:02

	Measured	Calibrated (API)
Background	62	56
Calibrator (Gross)	1059	953
Calibrator (Net)	997	897

Gamma Constants MGS-C.J 142

Last Edited on 09-JAN-2013,14:02

Gamma Calibrator Number	036	
Mud Density	1.01	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 02-JAN-2013 14:51
Field Check on 09-JAN-2013,14:02

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3090	94	3714	110
Ratio	32.975		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	2305	2968
Ratio	0.777	

Field Check

	Calibrated (cps)	
	2172	3286
Ratio	0.661	

Neutron Constants MDN-B.J 391

Last Edited on 09-JAN-2013,14:02

Neutron Source Id	N1055	
Neutron Jig Number	N639	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.01	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	Constant Value	
Formation Pressure	1.80	kpsi
Temperature Source	MGS External Temperature	
Temperature	N/A	degrees F
Mud Salinity	4.40	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-A.A 134

Base Calibration on 06-JAN-2013,21:47
Field Check on 09-JAN-2013 13:59

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	972.5	126.8
Base Check		279.1
Field Check		276.5

FE Constants MFE-A.A 134

Last Edited on 09-JAN-2013,13:58

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-A.A 170

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

	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 06-JAN-2013,21:47

Pre-filter Length	11

Induction Calibration MAI-A.A 170

Base Calibration on 02-FEB-2012 17:42
Field Check on 09-JAN-2013 14:01

Base Calibration

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

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			10.1	3752.8
2			29.3	3530.1
3			27.1	2998.2
4			18.3	2043.4
Deep			15.3	1906.3
Medium			40.8	3982.5
Shallow			45.5	5291.5

Array Temperature 46.0 Deg F

Induction Constants MAI-A.A 170

Last Edited on 10-JAN-2013,11:26

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	0.0060	mhos/metre
Squasher Offset	N/A	mhos/metre

Borehole Normalisation

DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

Calibration Site Corrections

Channel 1	0.00	mmhos/metre
Channel 2	0.00	mmhos/metre
Channel 3	0.00	mmhos/metre
Channel 4	0.00	mmhos/metre

Apparent Porosity and Water Saturation Constants

Archie Constant (A)	1.00	
Cementation Exponent (M)	2.00	
Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

Caliper Calibration MPD-B 166

Base Calibration on 02-JAN-2013 13:59
Field Calibration on 04-JAN-2013 12:08

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)
5.79	5.96

Photo Density Calibration MPD-B 166

Base Calibration on 02-JAN-2013 13:48
Field Check on 09-JAN-2013 13:58

Density Calibration

Base Calibration	Measured Near	Measured Far	Calibrated (sdu) Near	Calibrated (sdu) Far
Reference 1	49795	21888	59869	31110
Reference 2	20626	2381	24557	2522
Field Check at Base	1172.4	1342.2		
Field Check	1176.3	1345.5		

PE Calibration

Base Calibration	WS	Measured WH	Measured Ratio	Calibrated Ratio
Background	212	1049		
Reference 1	20253	49611	0.413	0.369
Reference 2	5714	20492	0.283	0.271
Field Check at Base	211.9	1049.4		
Field Check	215.1	1055.9		

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
0.00	

DOWNHOLE EQUIPMENT

C:\DATA_13_04_8492\SANDRIDGE LEROY 319 1-5H\LEROY RTAP DEPTH.dta

Shuttle Running Tool 3.5")
SRT-A.A 69 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in

MBS-G.A 200v Compact Battery Sub
MBS-G.A 114 LG: 10.22 ft WT: 66.1 lb OD: 2.24 in

Compact Memory Sub E.B
MMS-E.B 133 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

Compact Tool Isolator sub.
MTI-B.A 76 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in

Compact Short Gamma
MGS-C.J 142 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator
MCL-B.J 63 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 479 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.A Compact Swivel Head Adaptor
SHA-J.A 451 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 608 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
MDN-B.J 391 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 166 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 607 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-J.A Compact Swivel Head Adaptor
SHA-J.A 438 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

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

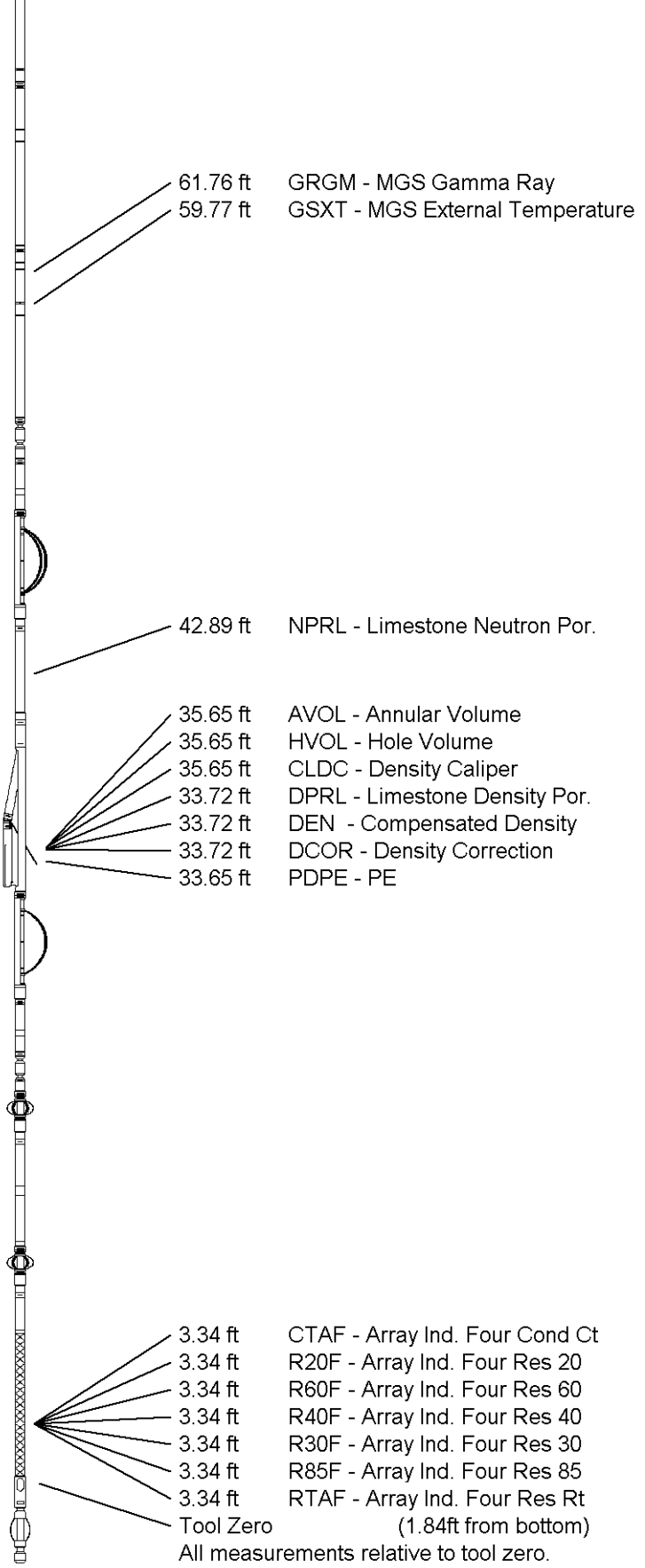
MIS-E.B Compact Inline Standoff sub
MIS-E.B 597 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

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: 87.97 ft Weight: 632.7 lb



COMPANY	SANDRIDGE ENERGY
WELL	LEROY 3119 1-5H
FIELD	SIX MOONS
PROVINCE/COUNTY	COMANCHE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2132.50	feet	First Reading	9460.00	feet
Elevation Drill Floor	2132.50	feet	Depth Driller	9509.00	feet
Elevation Ground Level	2114.00	feet	Depth Logger	9509.00	feet

Weatherford®

CML MESSENGER SHUTTLE
COMPACT PHOTO DENSITY
COMPENSATED NEUTRON LOG