

**Weatherford****COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY

GRAND MESA OPERATING COMPANY

WELL

DBY #5-16

FIELD

WILDCAT

PROVINCE/COUNTY

SCOTT

COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

1556' FNL & 2119' FEL

NE NW SW NE

SEC

TWP

RGE

Other Services
MAI/MFE

16

16S

33W

API Number

15-171-20924

Permit Number

Permanent Datum G.L., Elevation 2969 feet

Log Measured From KB

Drilling Measured From K.B.

Date

21-JAN-2013

Run Number

ONE

Service Order

3537849

Depth Driller

4740.00 feet

Depth Logger

4740.00 feet

First Reading

4720.00 feet

Last Reading

3700.00 feet

Casing Driller

221.00 feet

Casing Logger

221.00 inches

Bit Size

7.875

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.20 lb/USg 49.00 CP

PH / Fluid Loss

10.00 10.00

Sample Source

FLOWLINE

Rm @ Measured Temp

0.58 @ 93.0 ohm-m

Rmf @ Measured Temp

0.46 @ 93.0 ohm-m

Rmc @ Measured Temp

0.70 @ 93.0 ohm-m

Source Rmf / Rmc

CALC

Rm @ BHT

0.49 @ 112.0 ohm-m

Time Since Circulation

4 HOURS

Max Recorded Temp

112.00 deg F

Equipment / Base

13057 LIB

Recorded By

LYNN SCOTT

Witnessed By

KENT MATSON

IOB#

LB13-019

Elevations:
KB 2974.00
DF 2973.00
GL 2969.00**BOREHOLE RECORD**

Last Edited: 21-JAN-2013 18:46

Bit Size
inches

7.875

Depth From
feet

221.00

Depth To
feet

4740.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

0.00

Shoe Depth
feet

221.00

Weight
pounds/ft

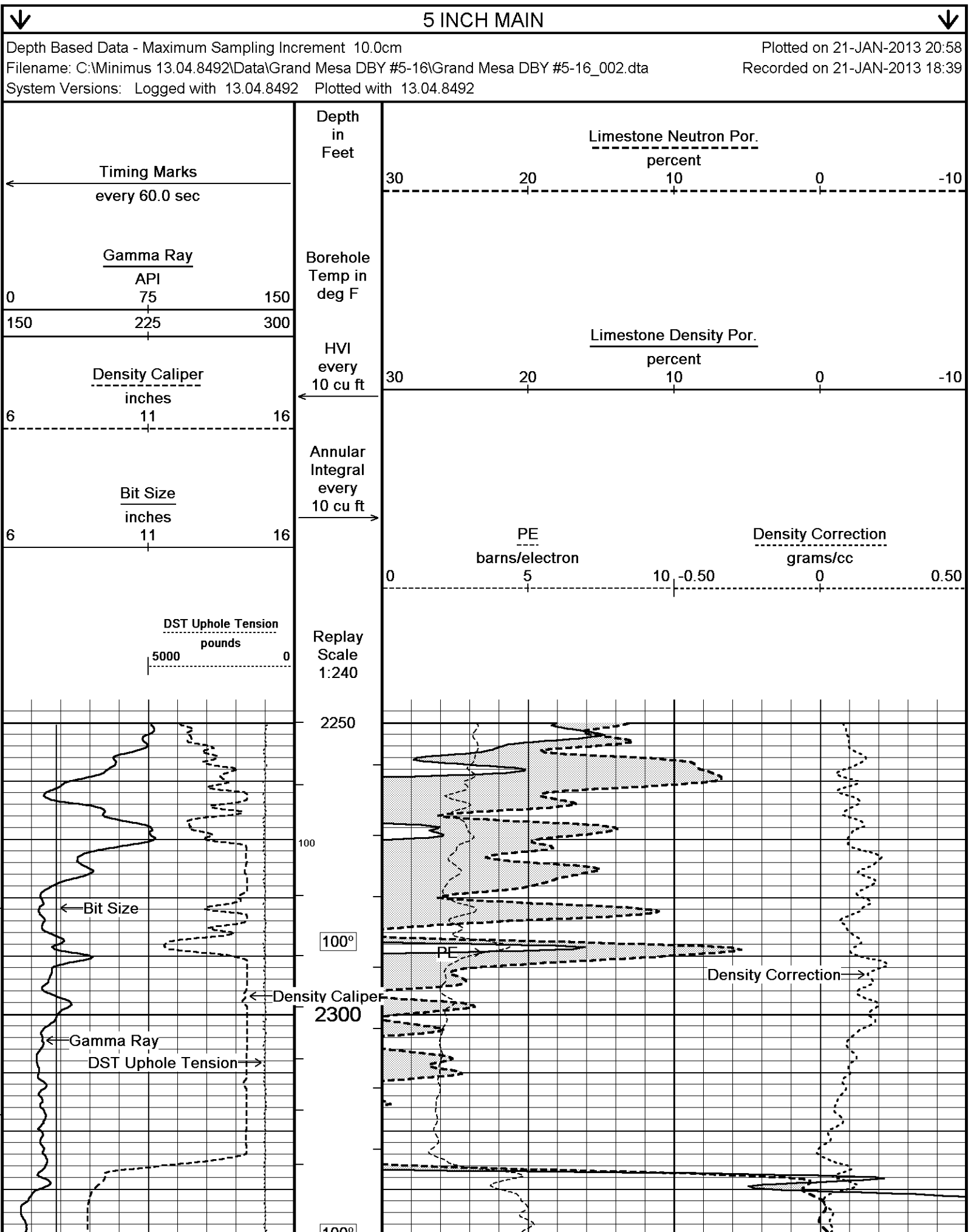
24.00

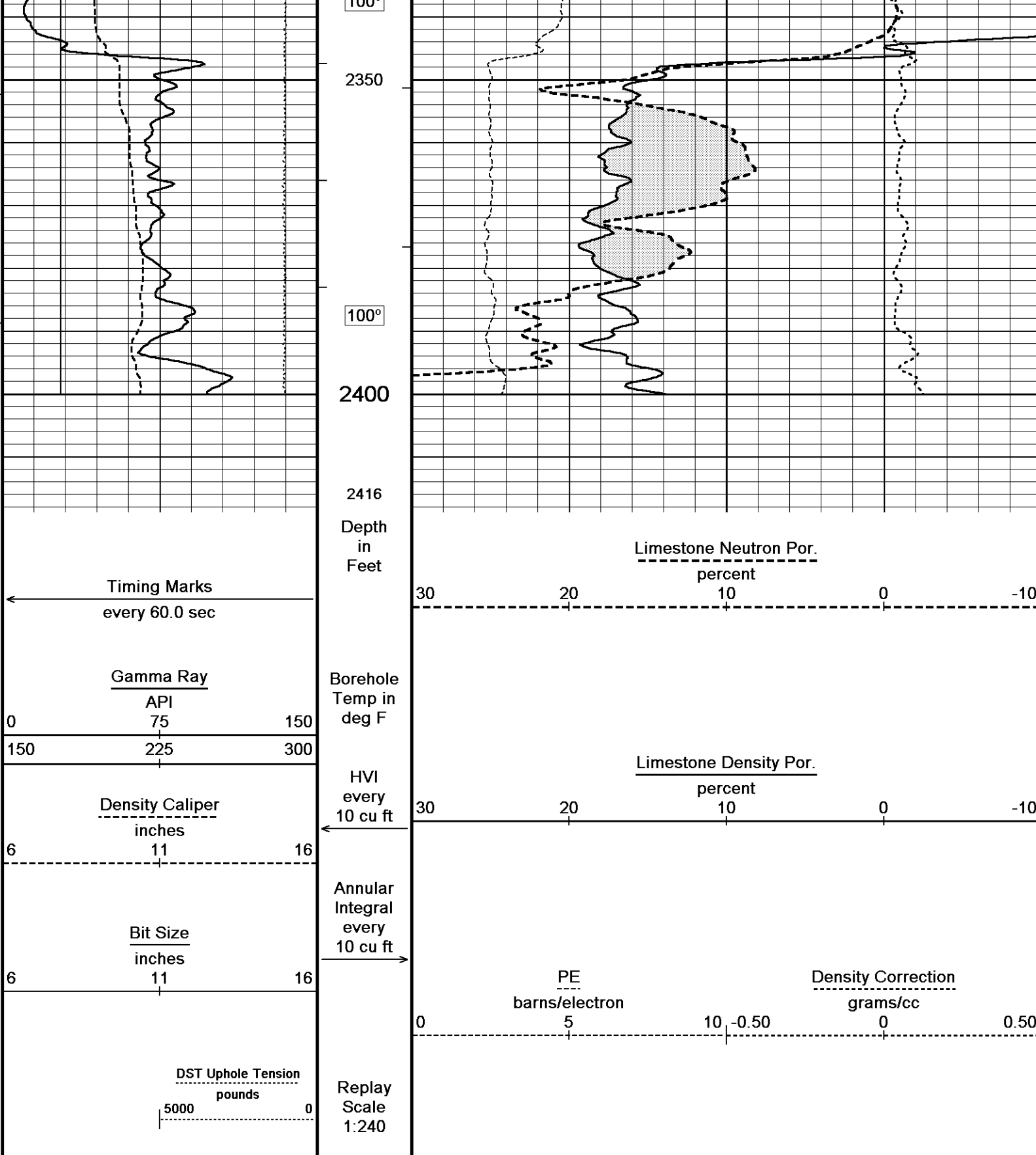
REMARKS

Tools Ran: MCG, MML, MDN, MPD, MFE, MAI ran in combination.
Hardware Used: MDN Dual bowspring used. MPD 8 inch profile plate used. MAI and MFE 0.5 Inch standoffs used.
2.71 g/cc Limestone Density Matrix used to calculate porosity.
All intervals logged and scaled per customer's request.
Tight pulls, washouts and borehole rugosity will affect data quality.
Total hole volume from TD to Surface Casing= 2354 cu. ft.
Annular volume with 5.5 inch production casing from TD to 3700 ft.= 258 cu. ft.
Service order: #3537849
Rig: Murfin #24
Engineer: L. Scott
Operator(s): B. Reeves

Software duplicates the pH value onto the fluid loss. The fluid loss is 8.0

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





Depth Based Data - Maximum Sampling Increment 10.0cm

Filename: C:\Minimus 13.04.8492\Data\Grand Mesa DBY #5-16\Grand Mesa DBY #5-16_002.dta

System Versions: Logged with 13.04.8492 Plotted with 13.04.8492

Plotted on 21-JAN-2013 20:58

Recorded on 21-JAN-2013 18:39

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm

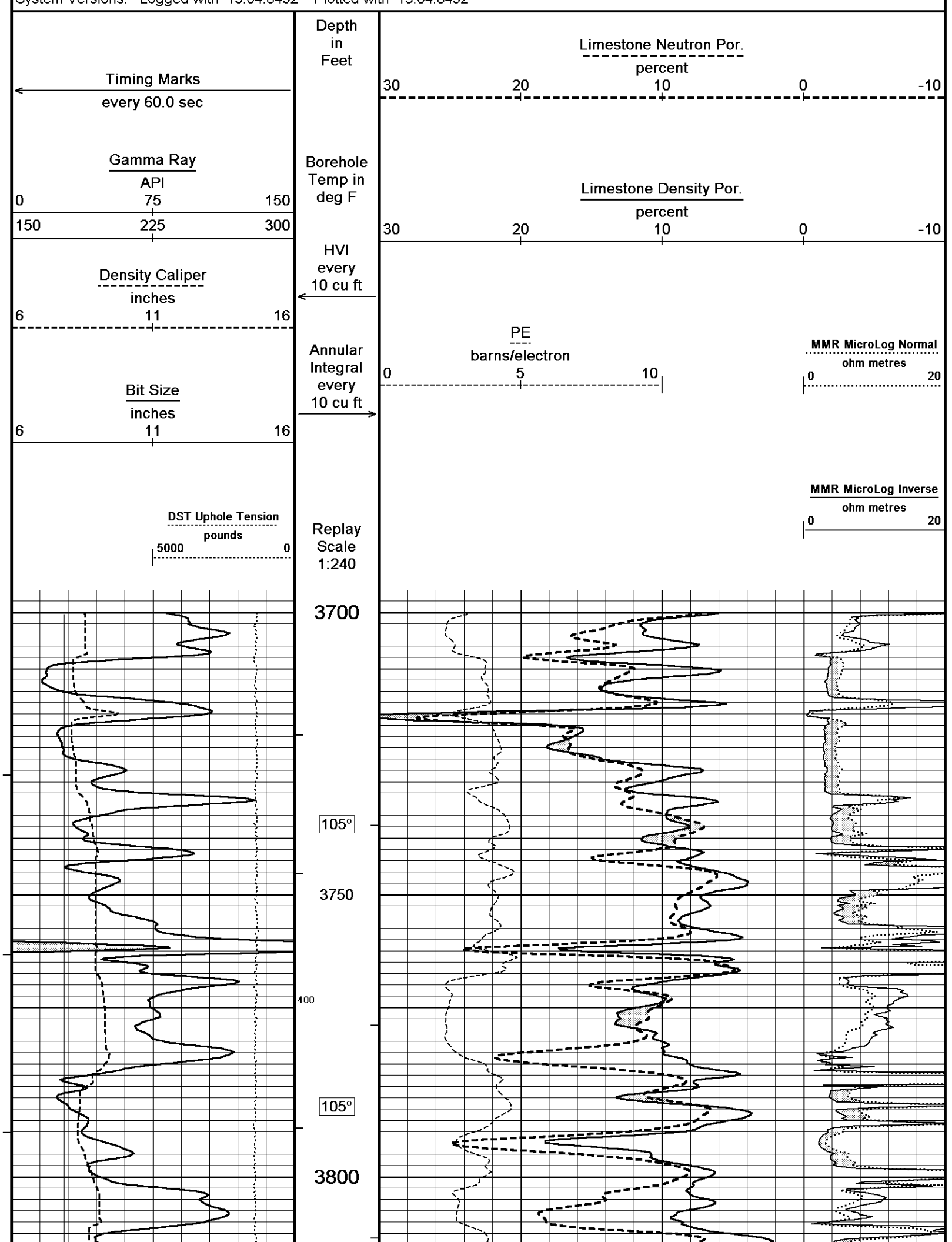
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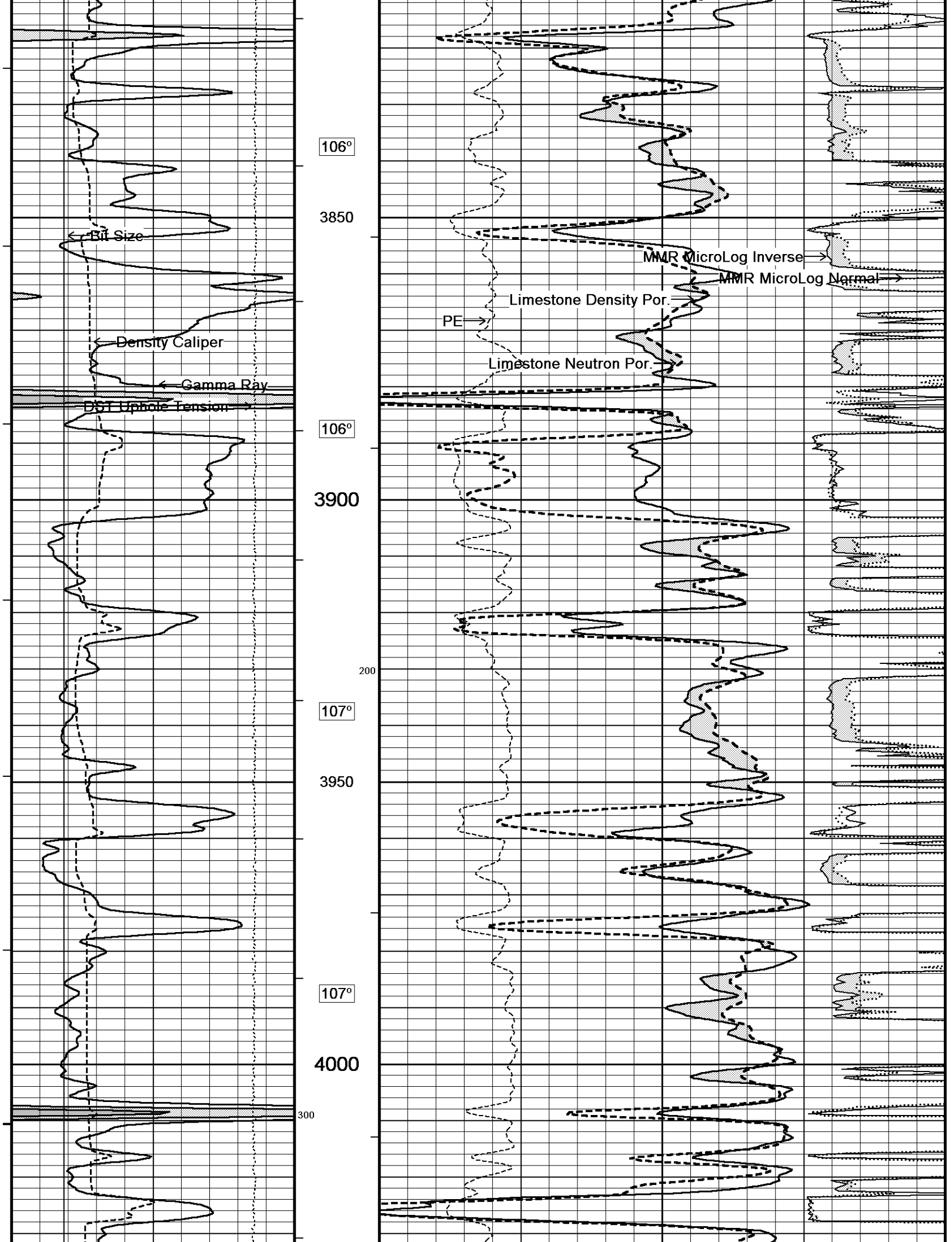
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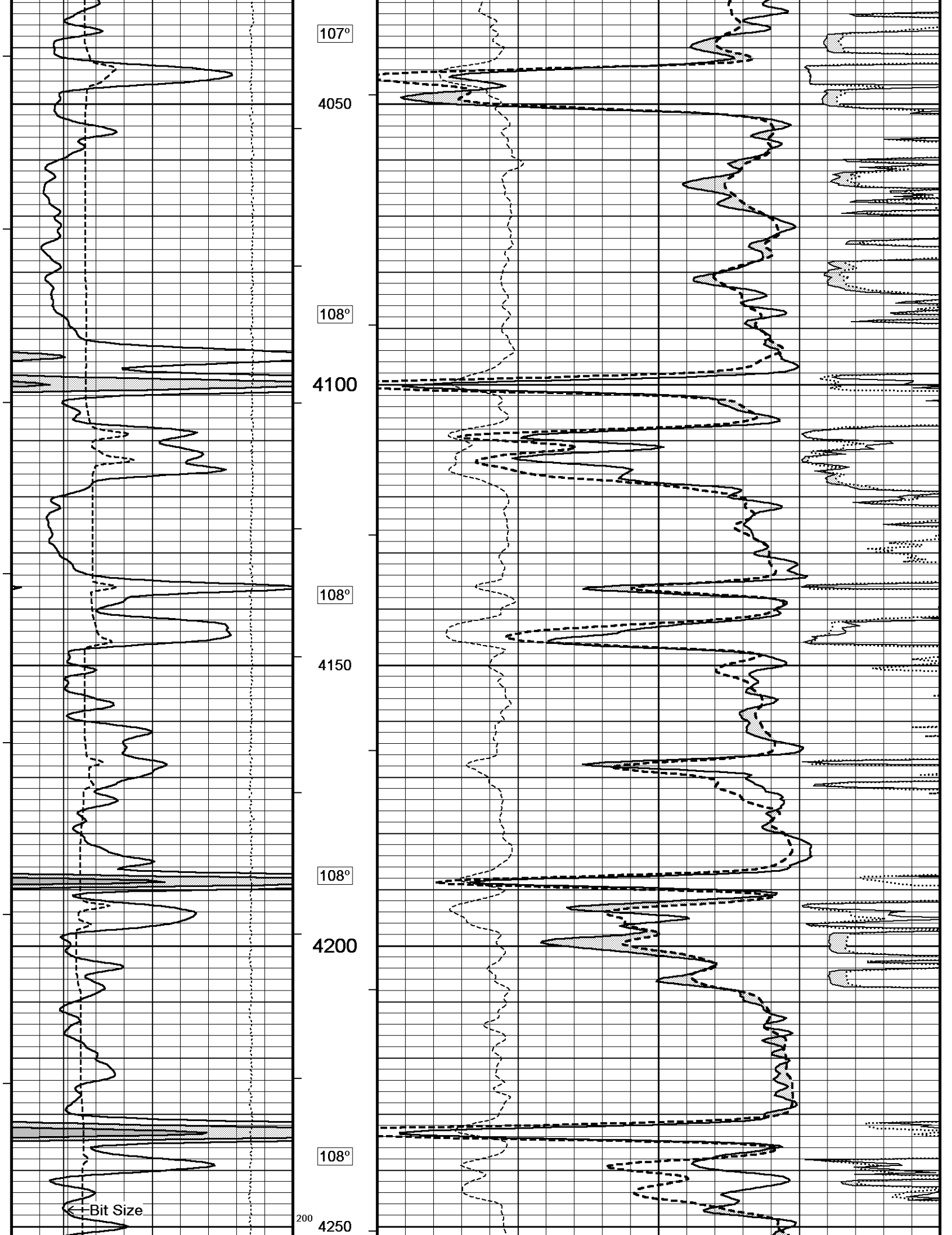
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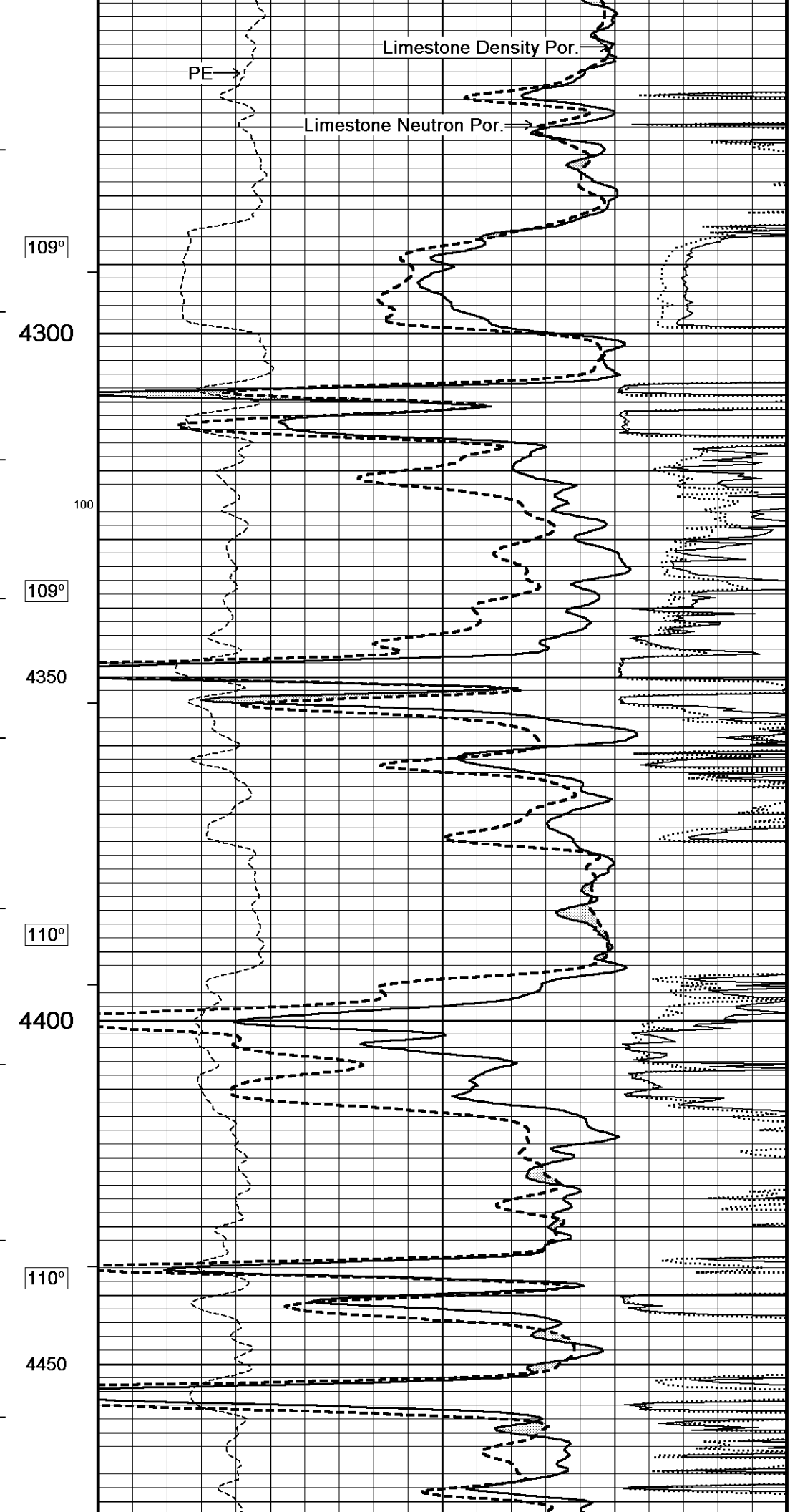
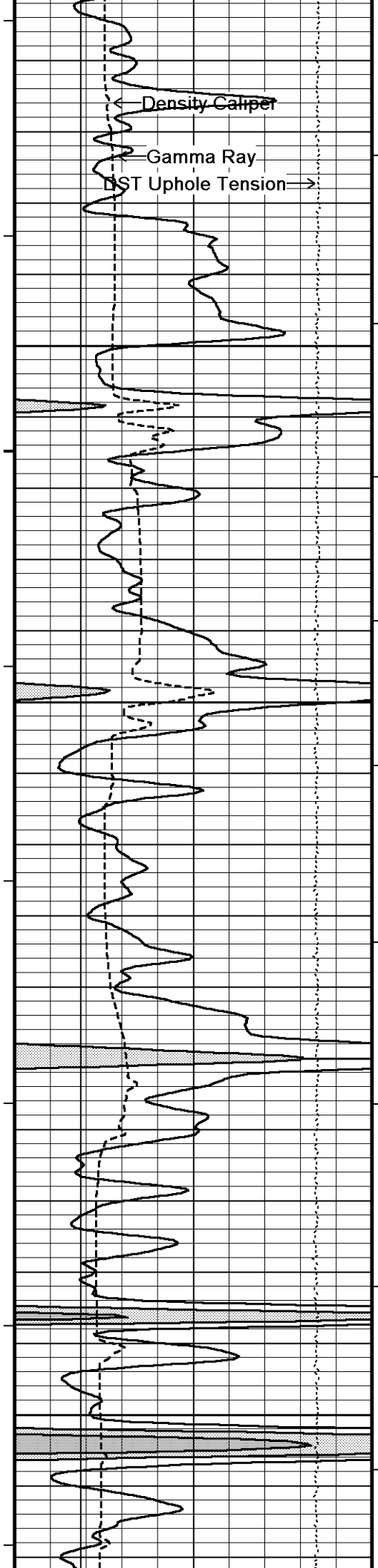
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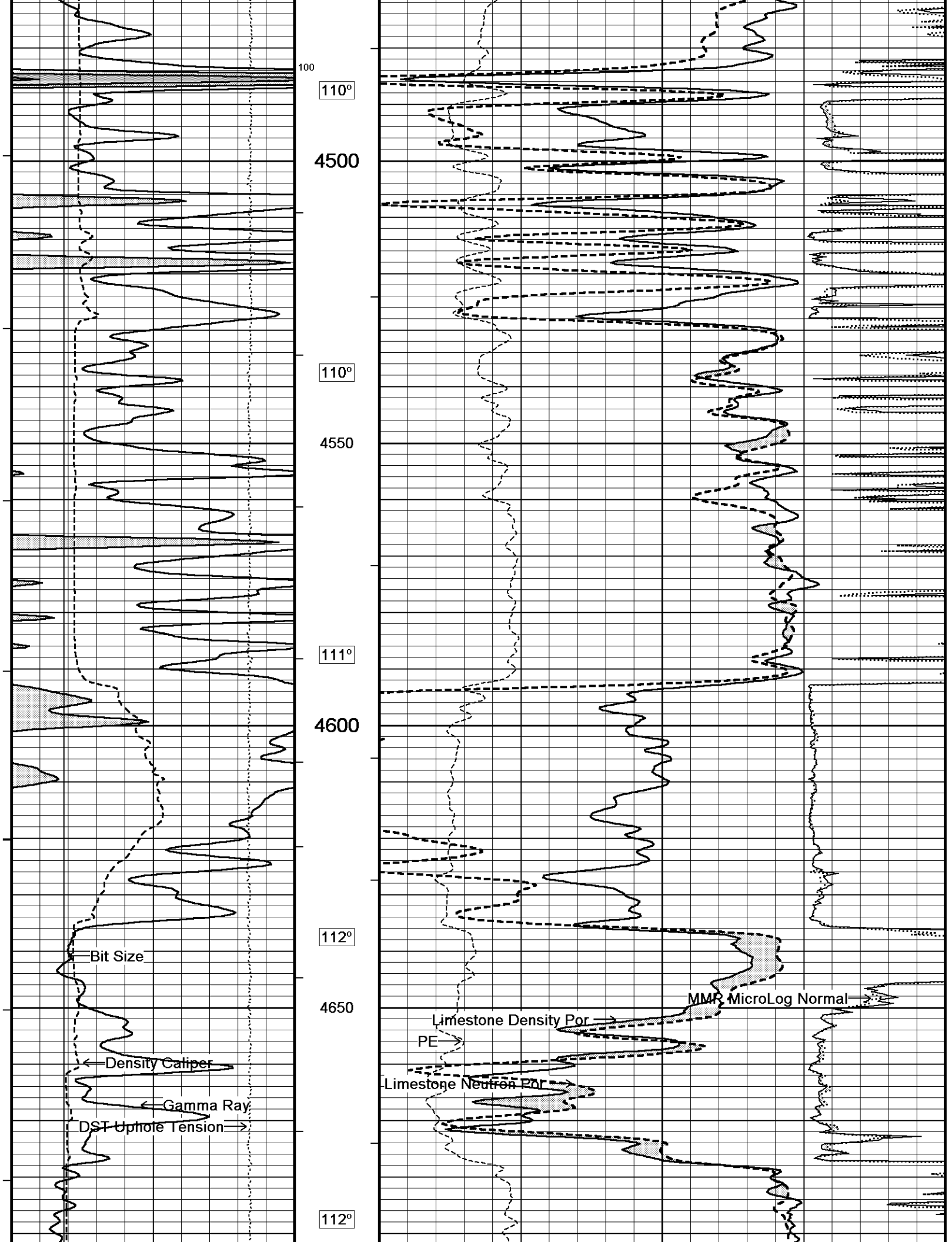
5 INCH MAIN

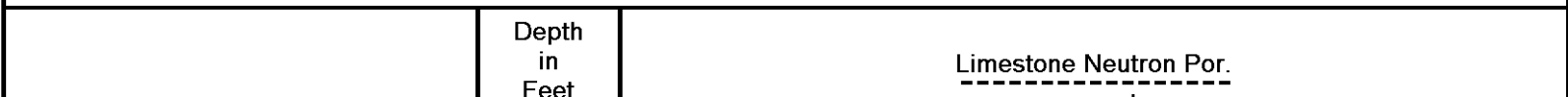
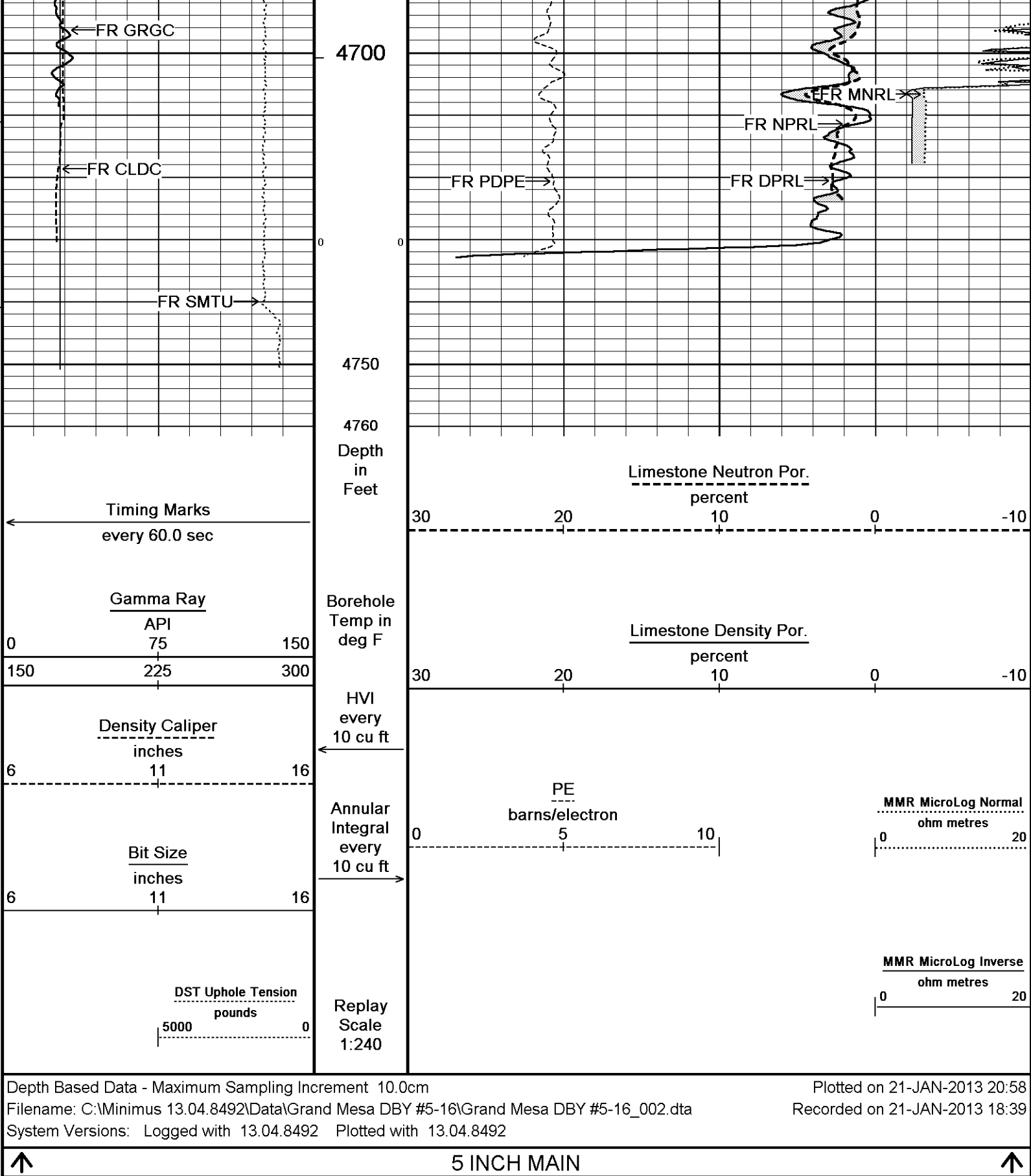


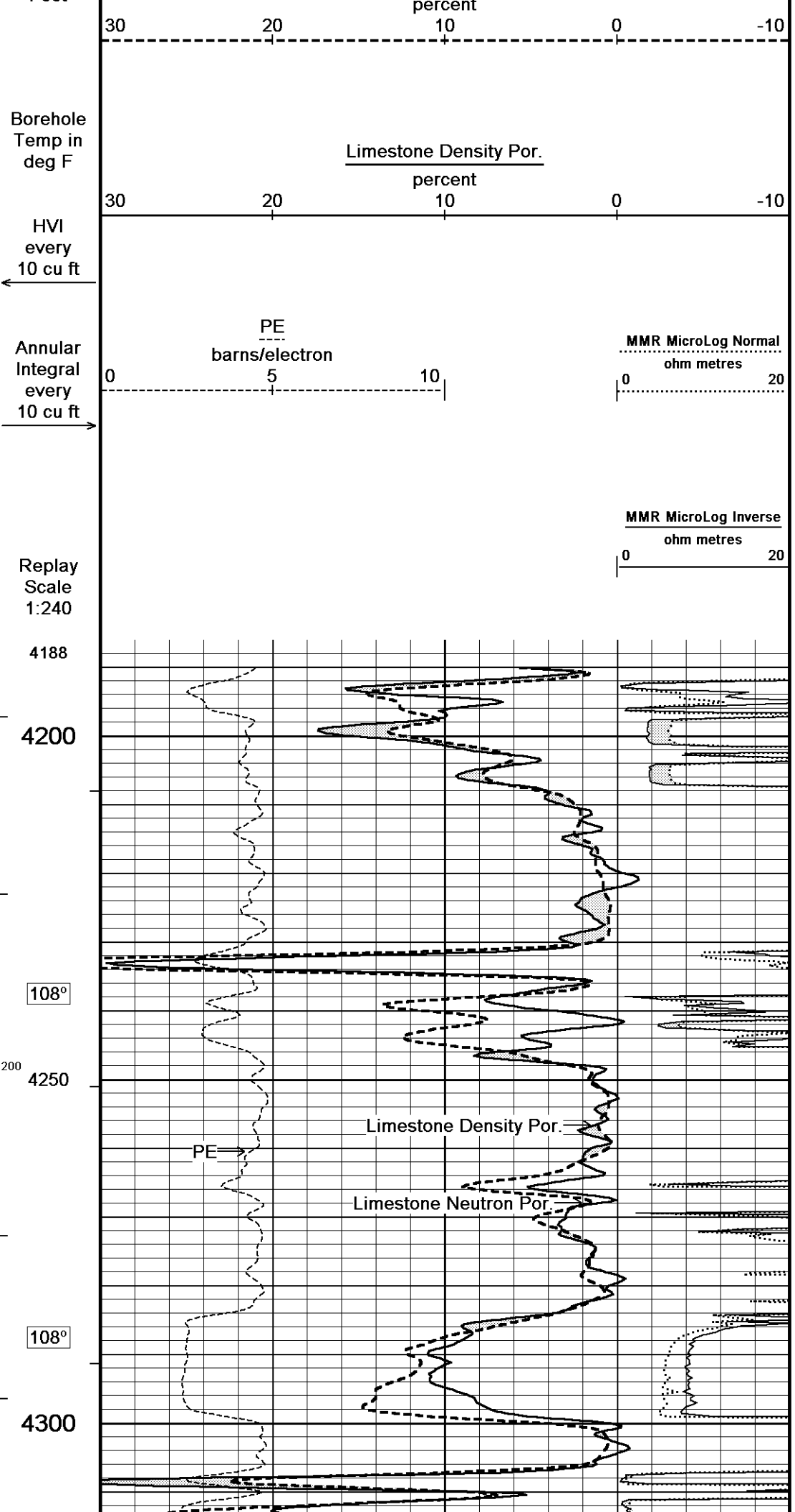
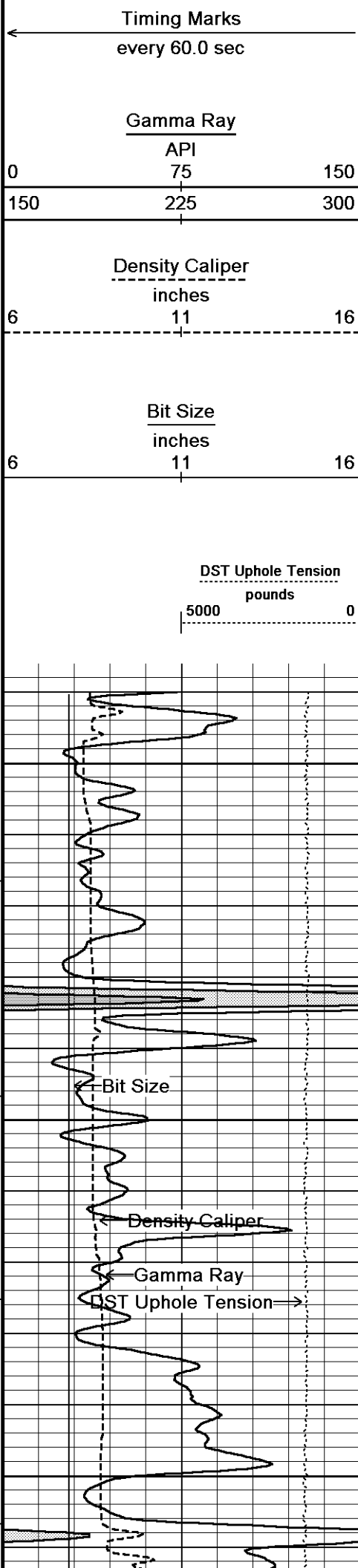


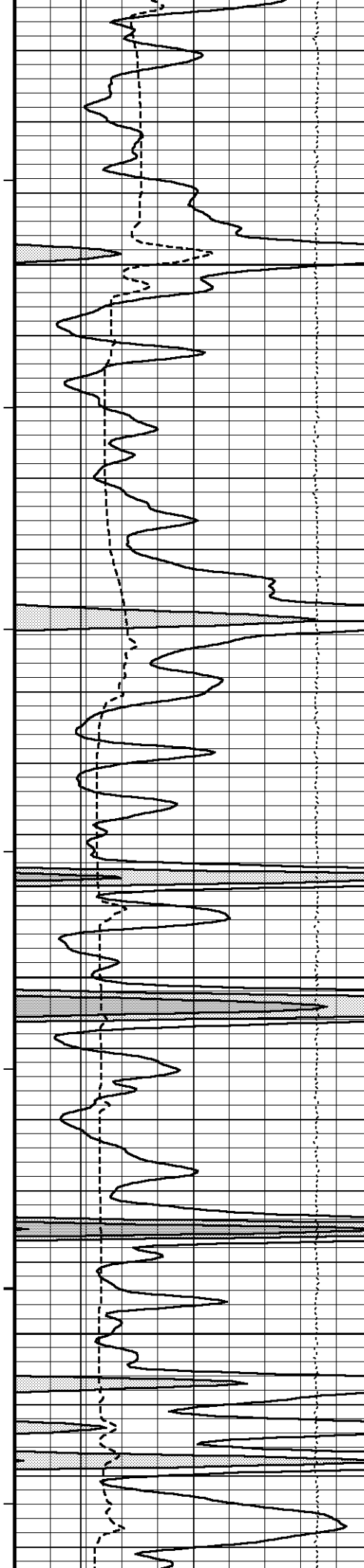




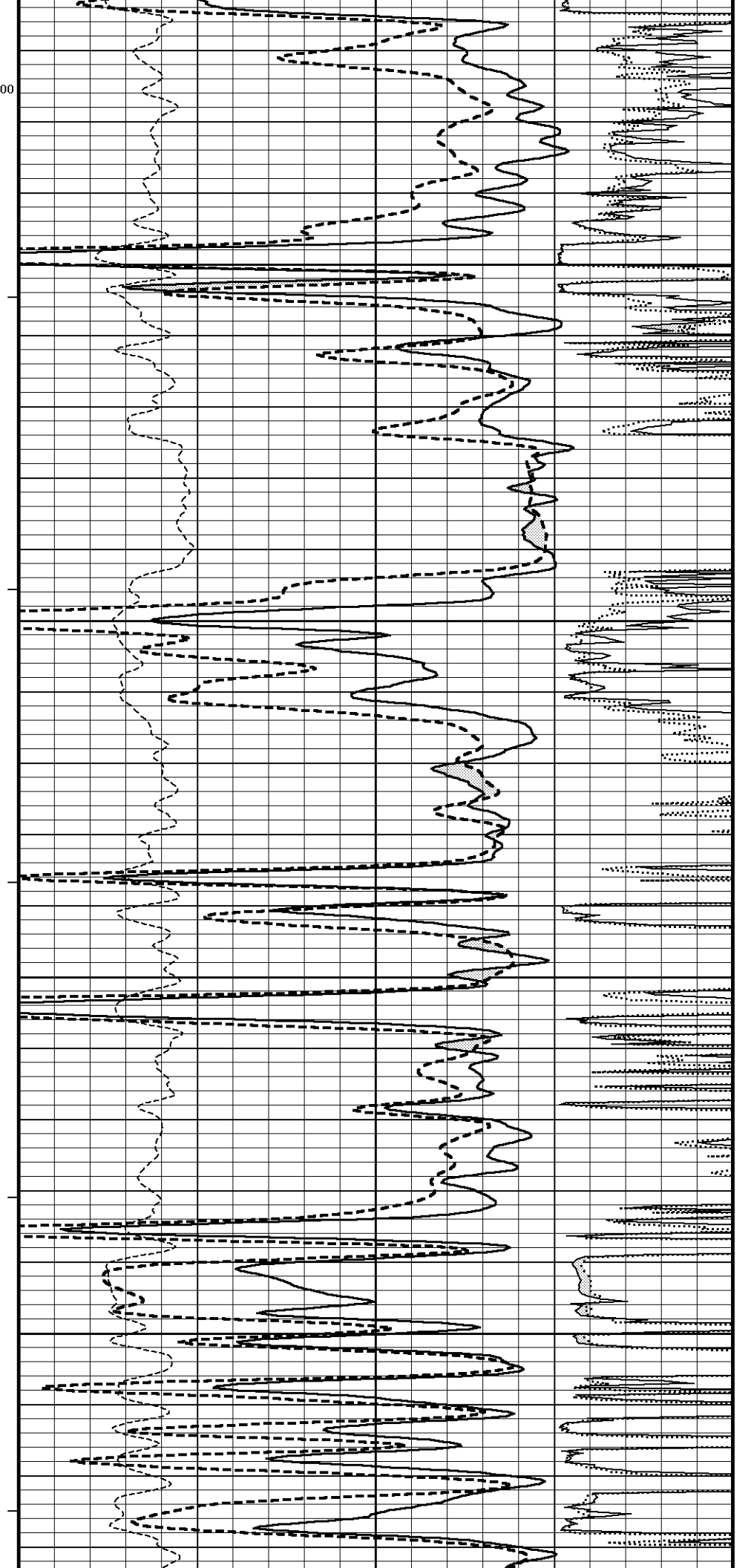


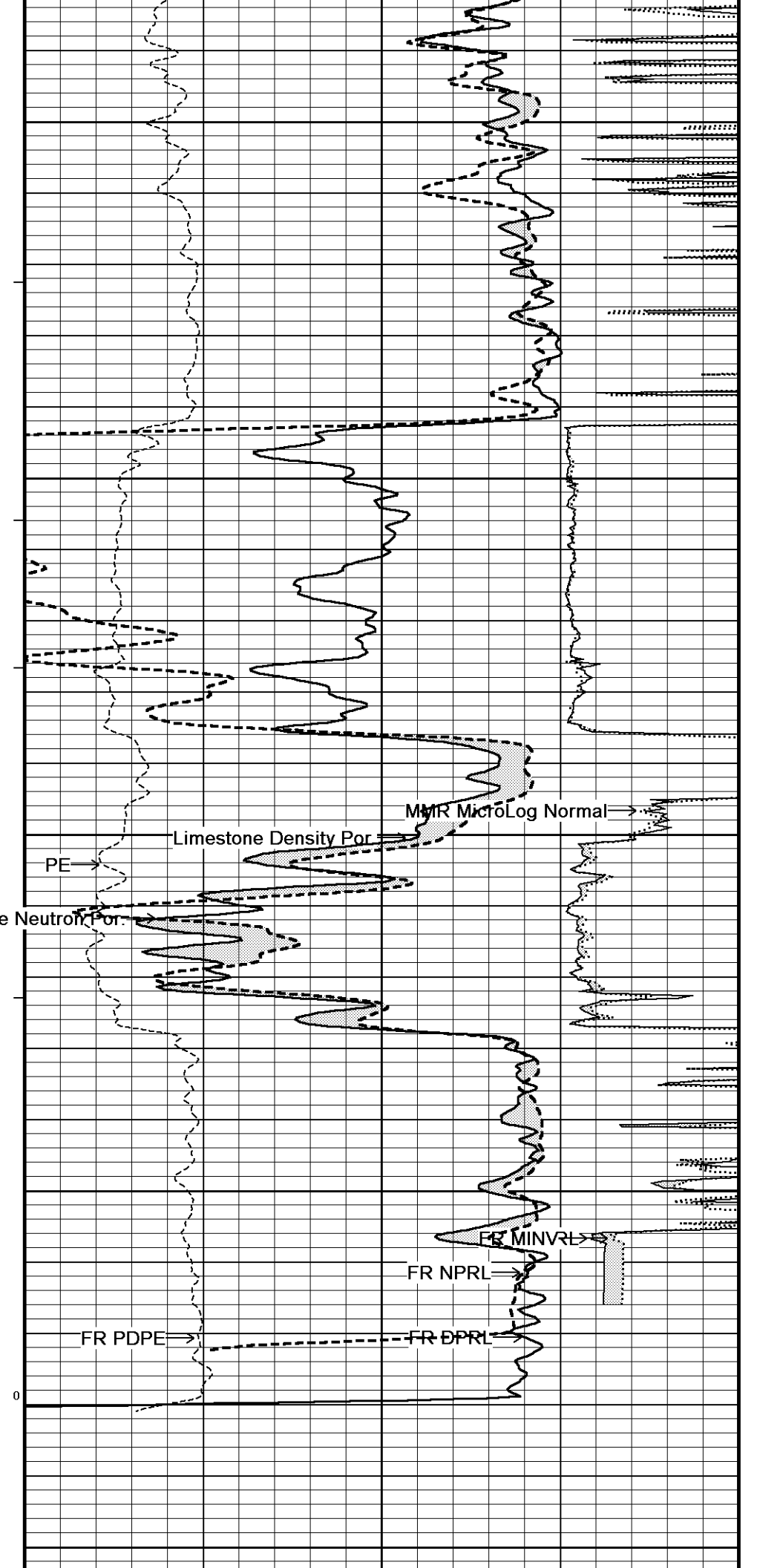
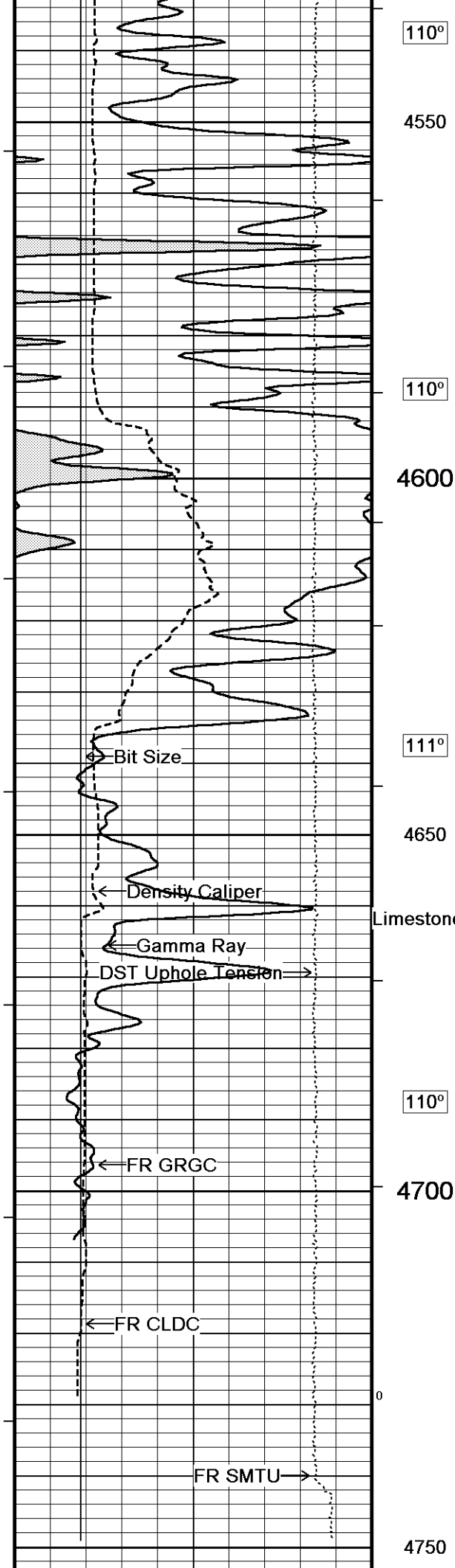


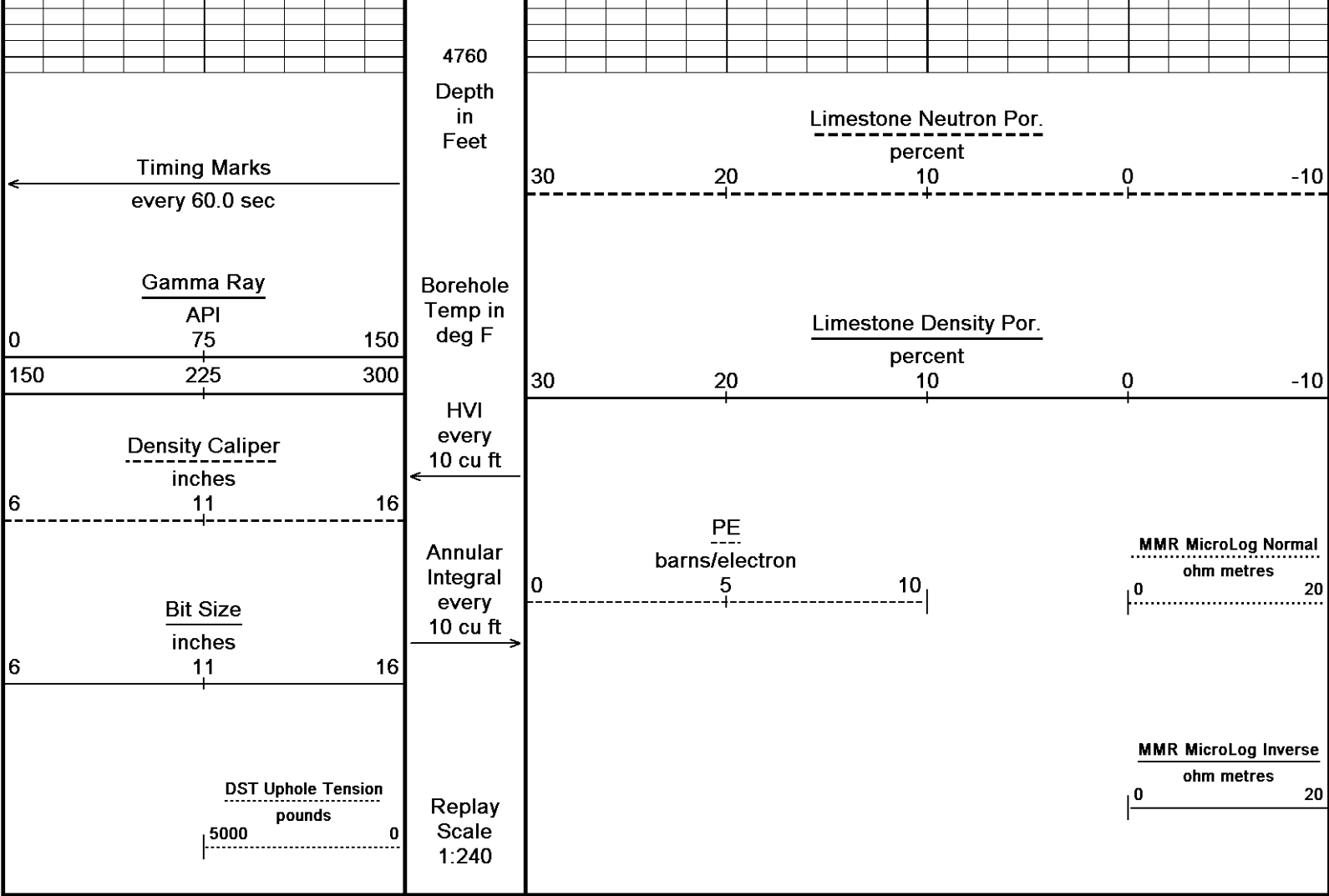




108°
4350
108°
4400
108°
4450
109°
4500







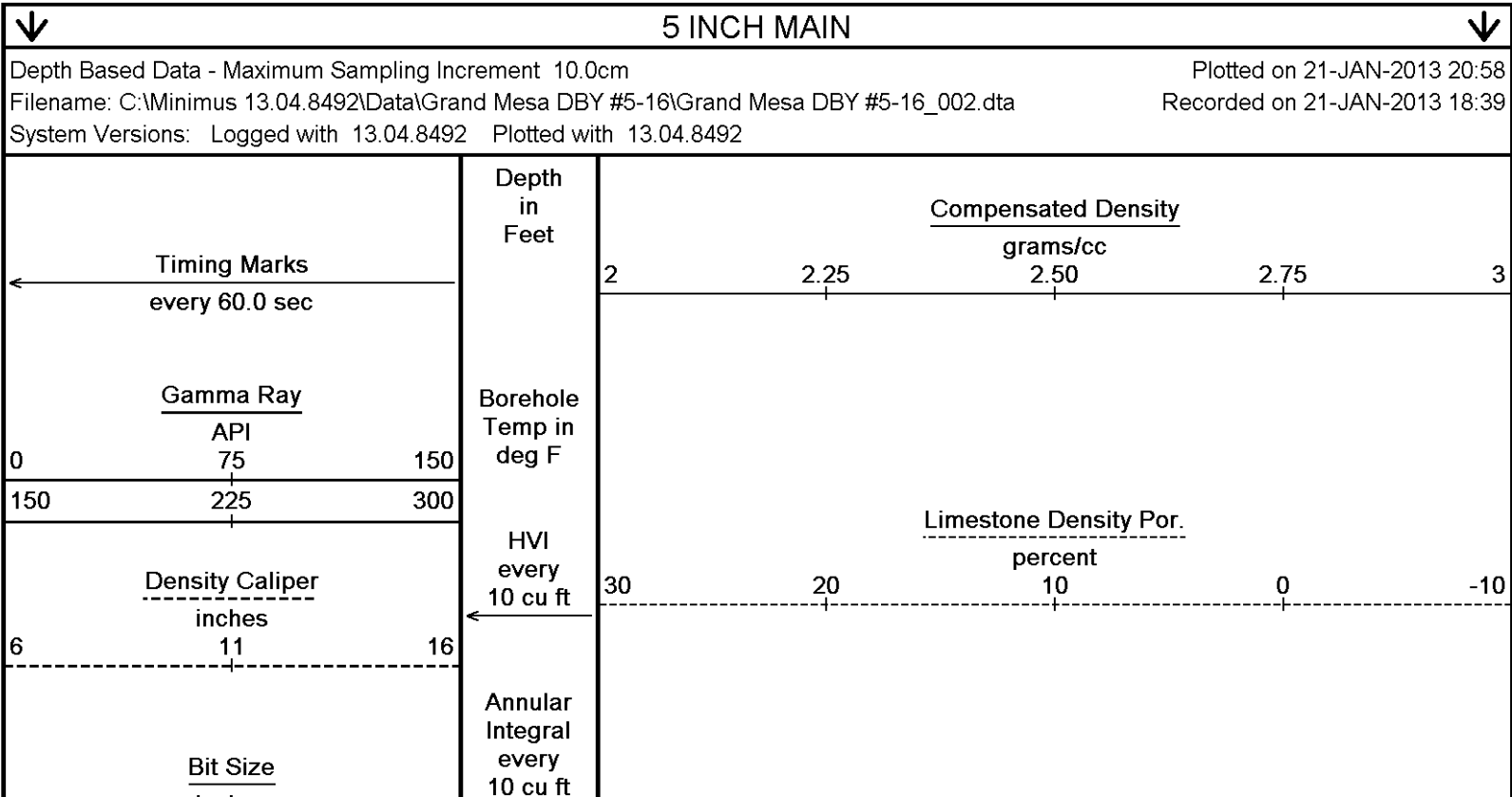
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.04.8492\Data\Grand Mesa DBY #5-16\Grand Mesa DBY #5-16_001.dta
System Versions: Logged with 13.04.8492 Plotted with 13.04.8492

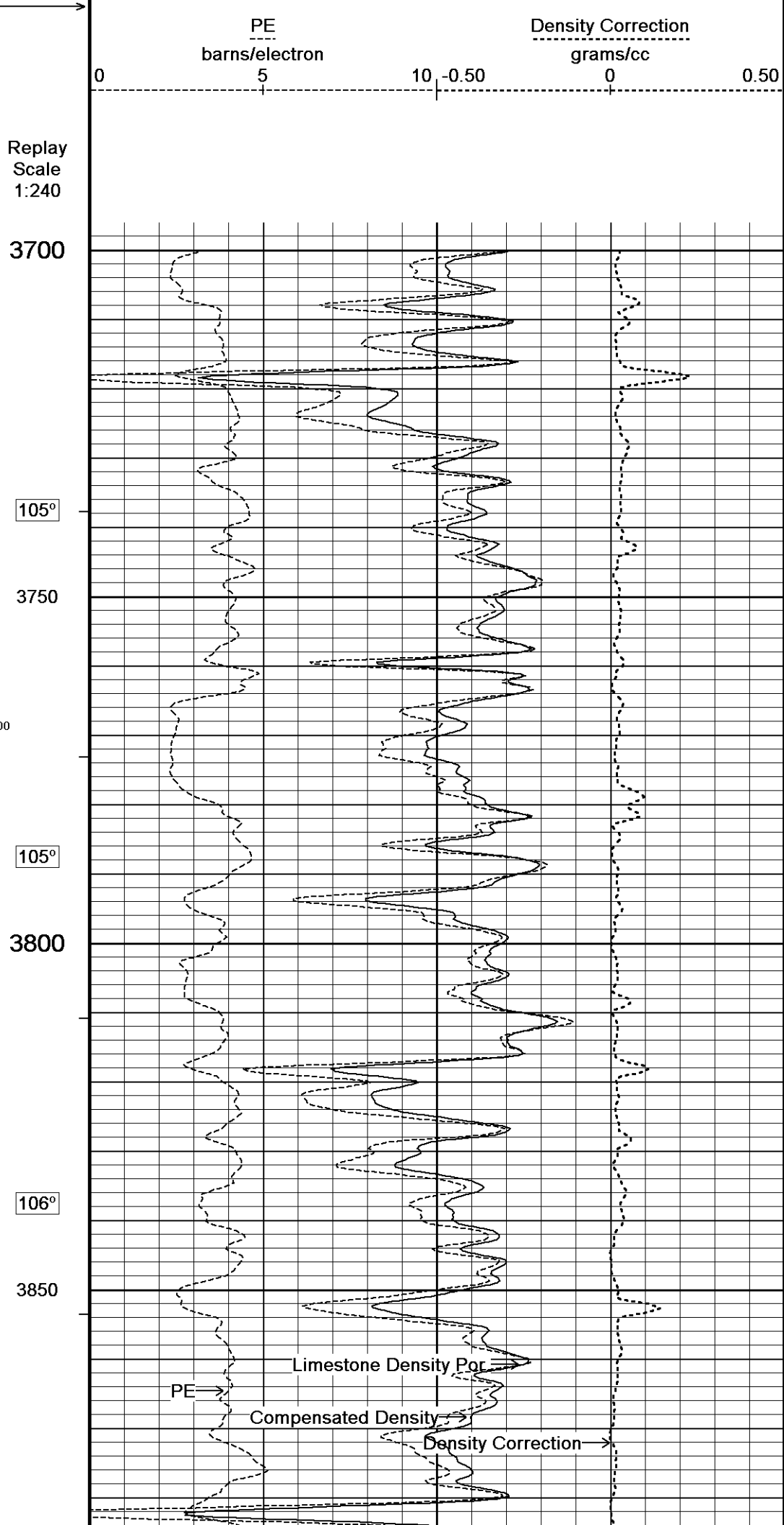
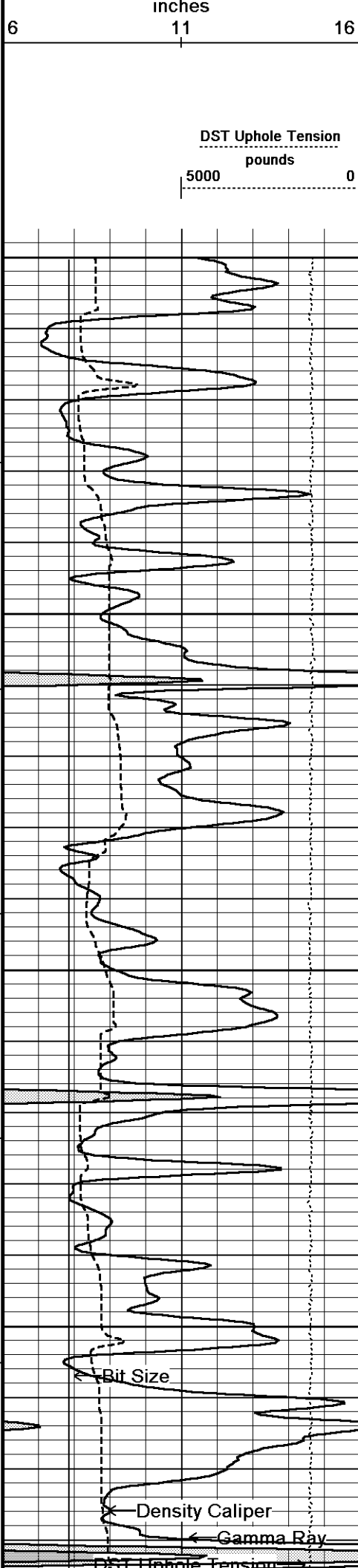
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Recorded on 21-JAN-2013 18:11

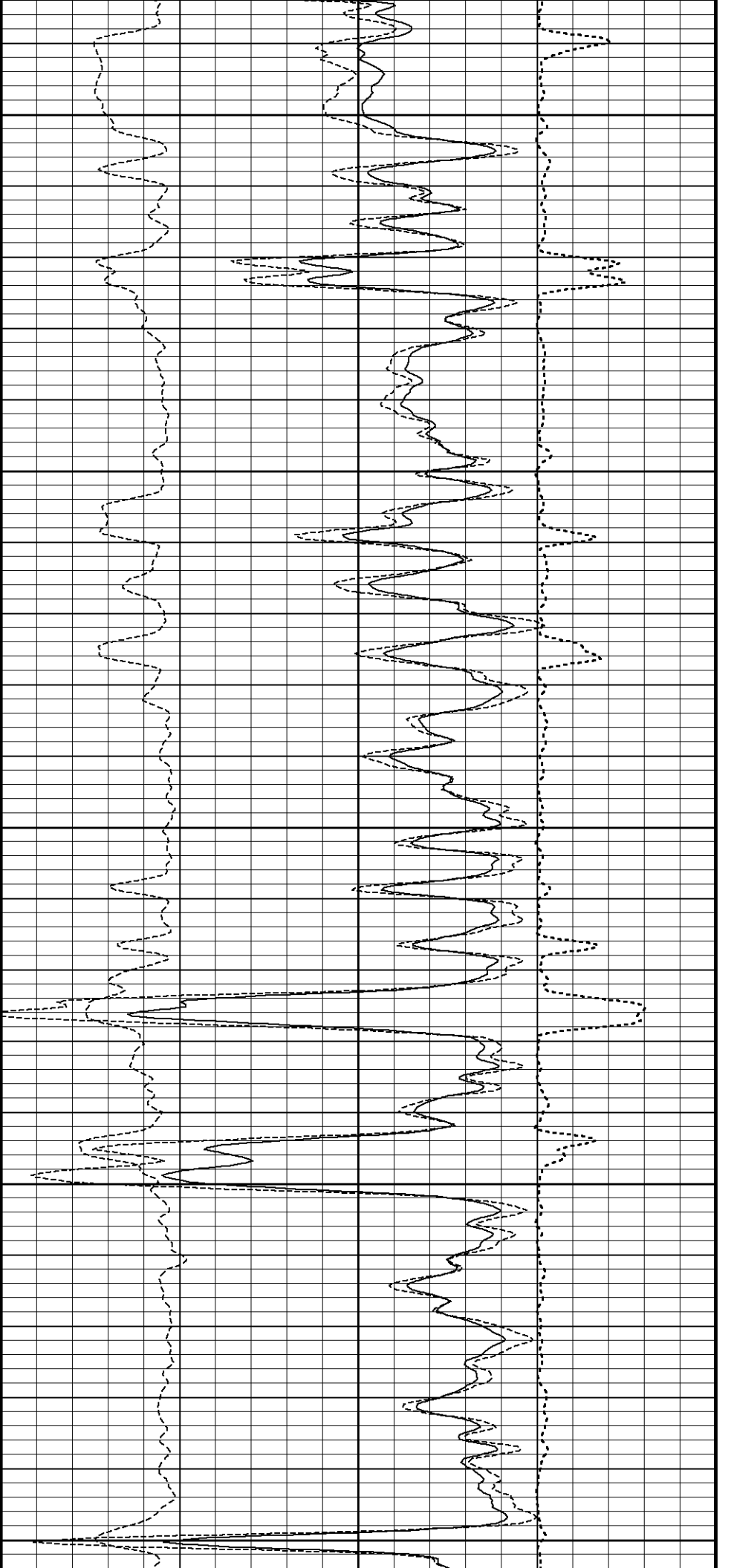
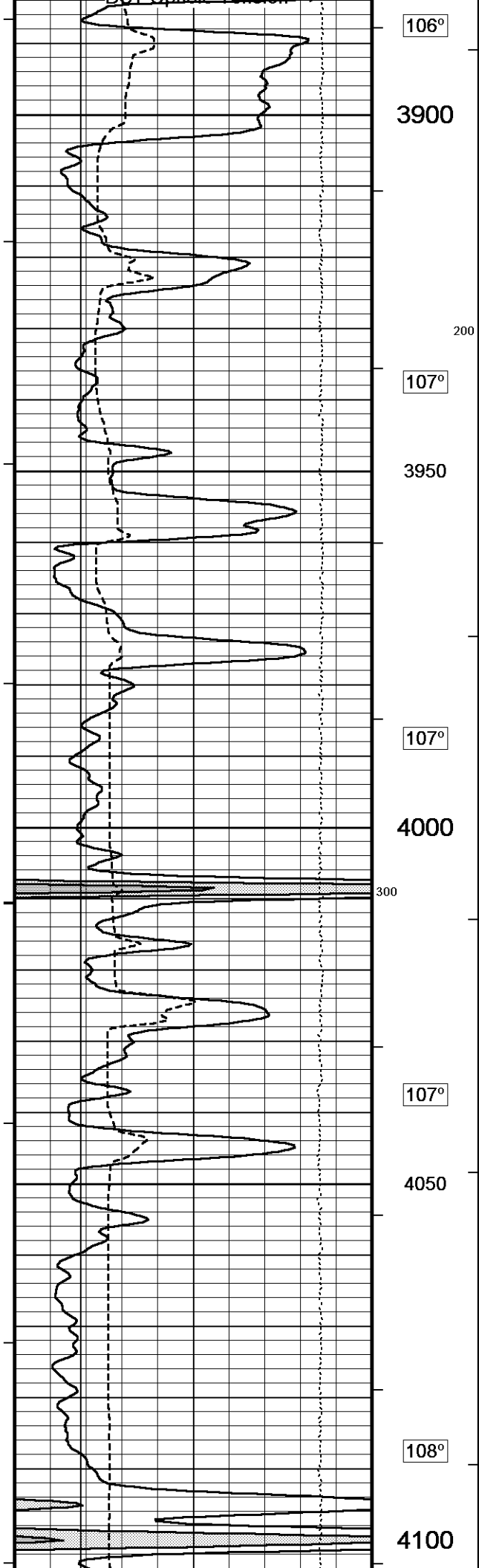
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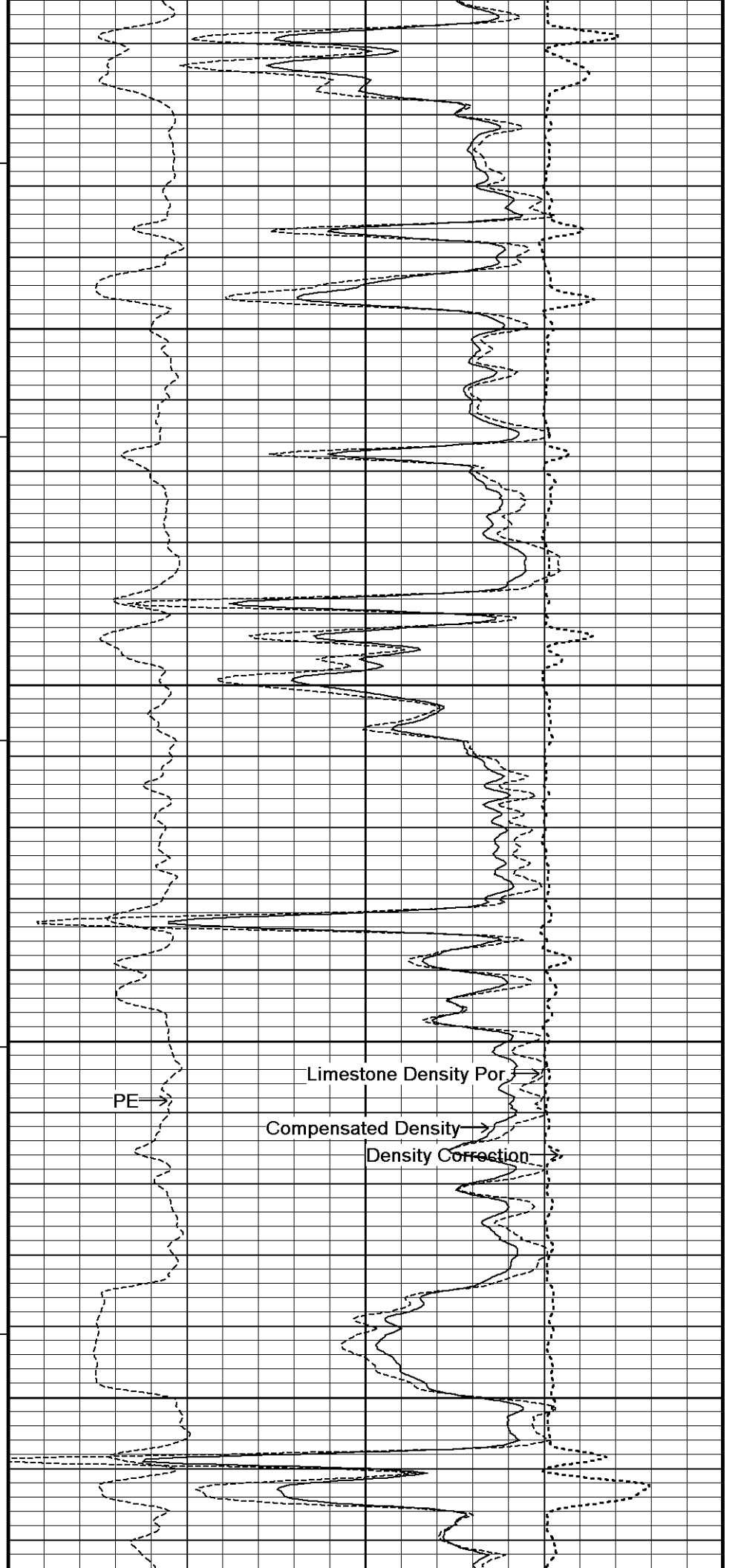
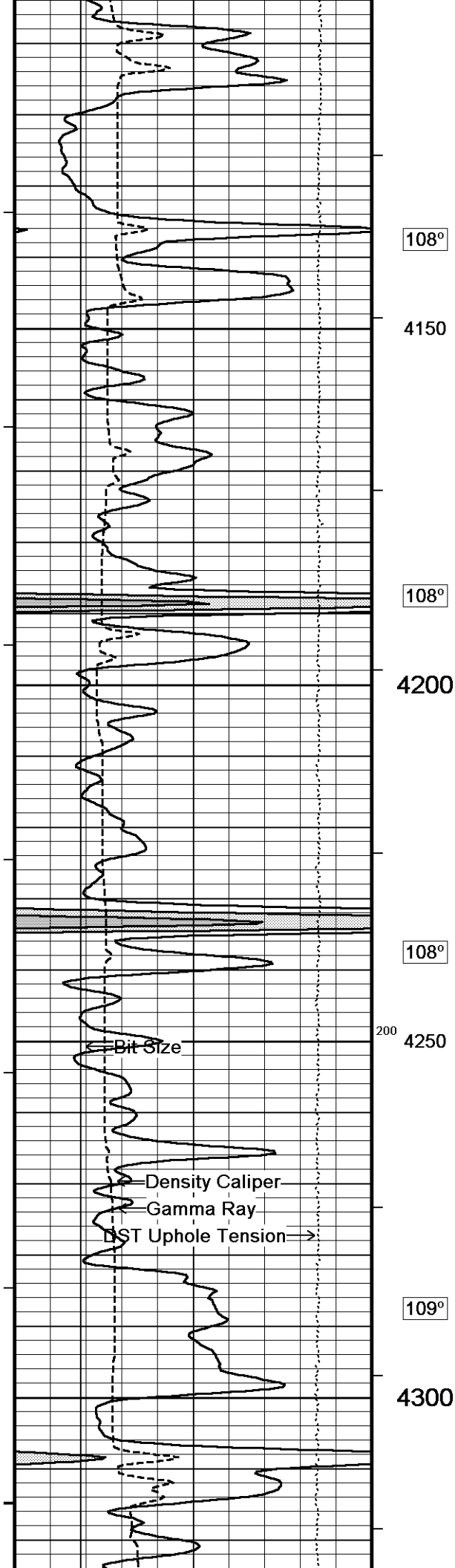
REPEAT SECTION

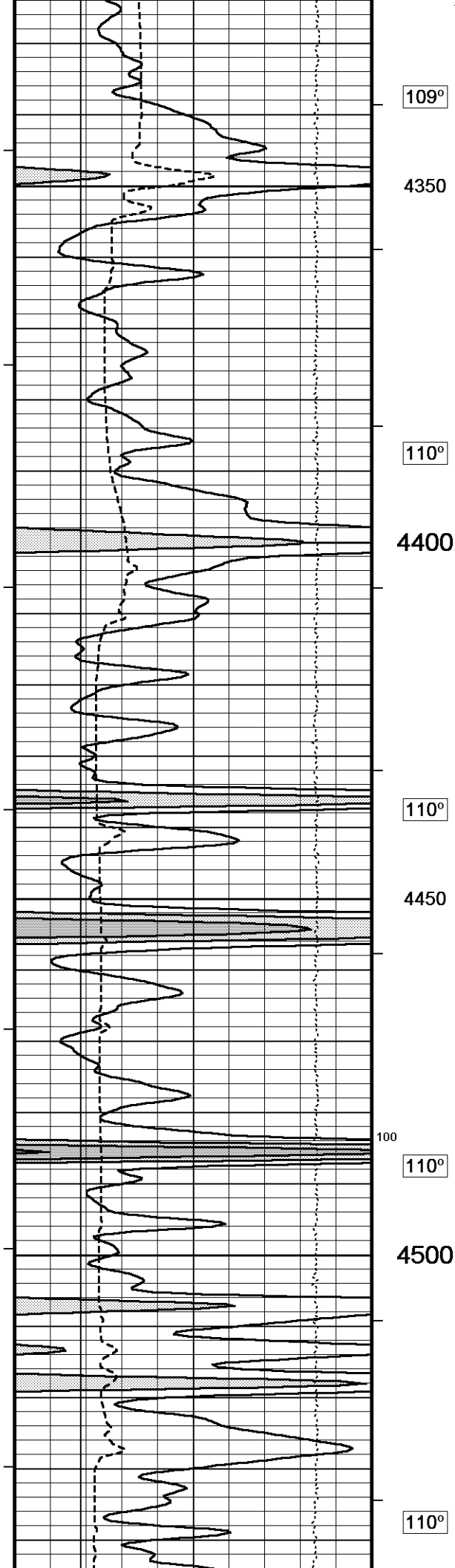
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109°

4350

110°

4400

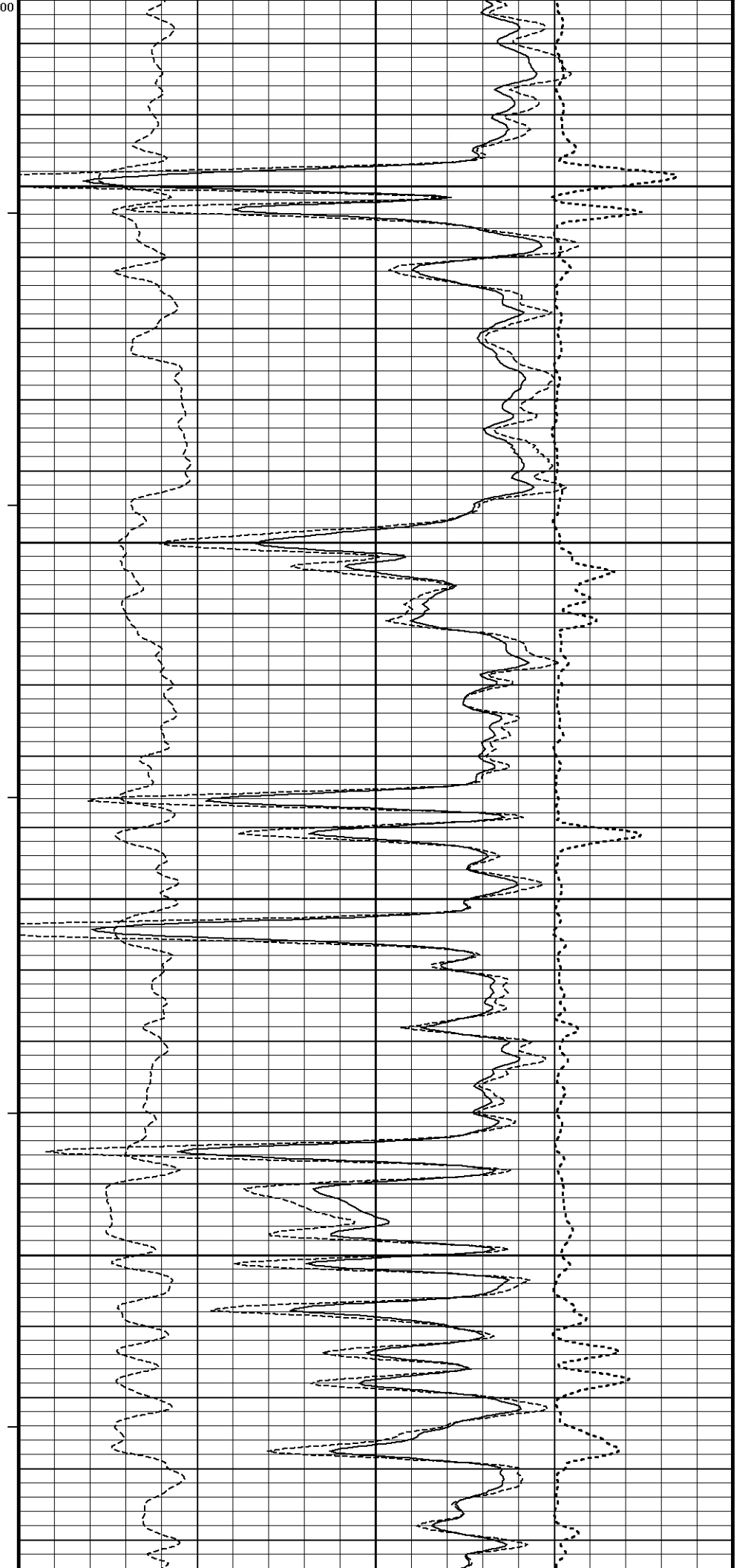
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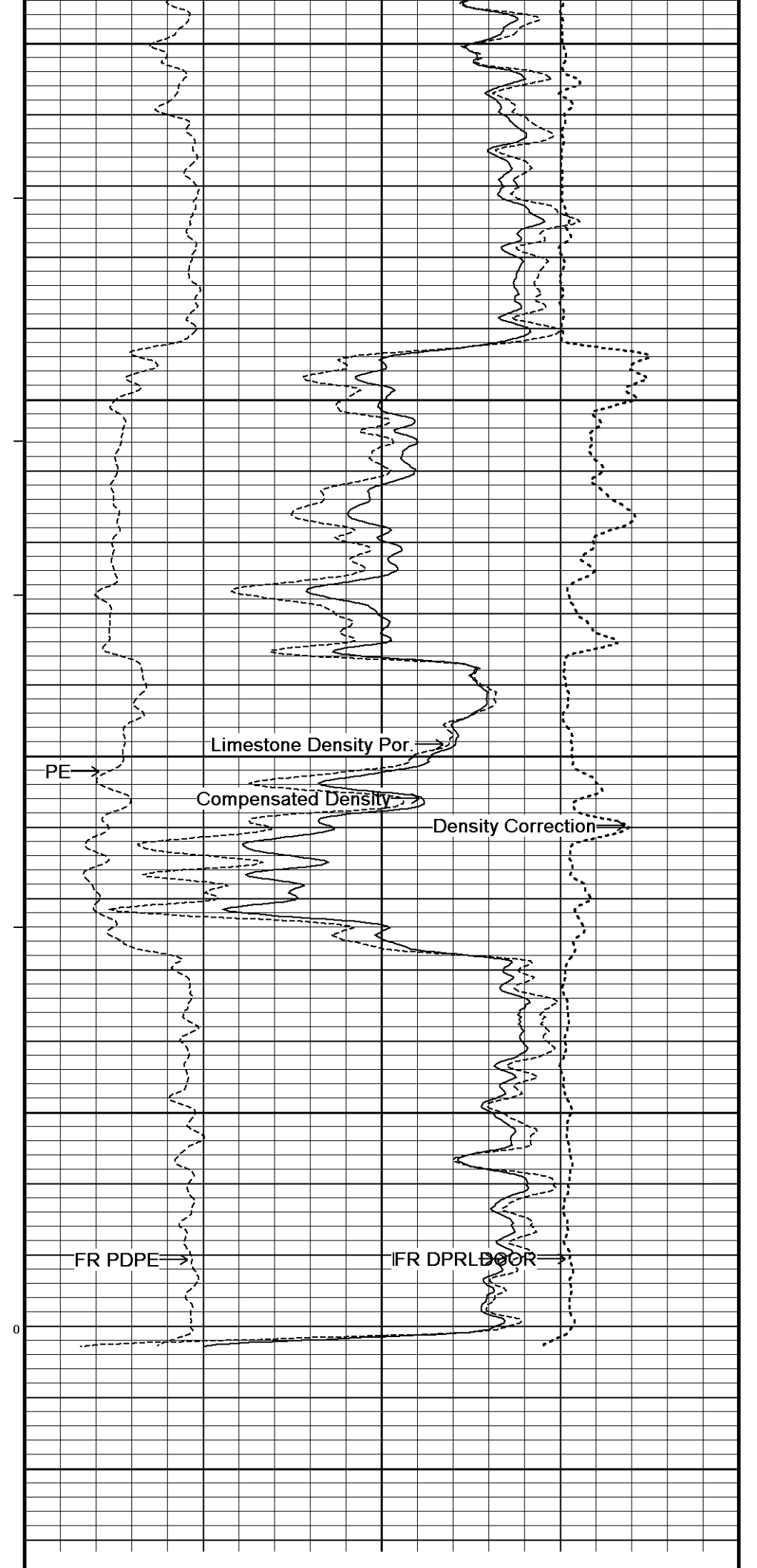
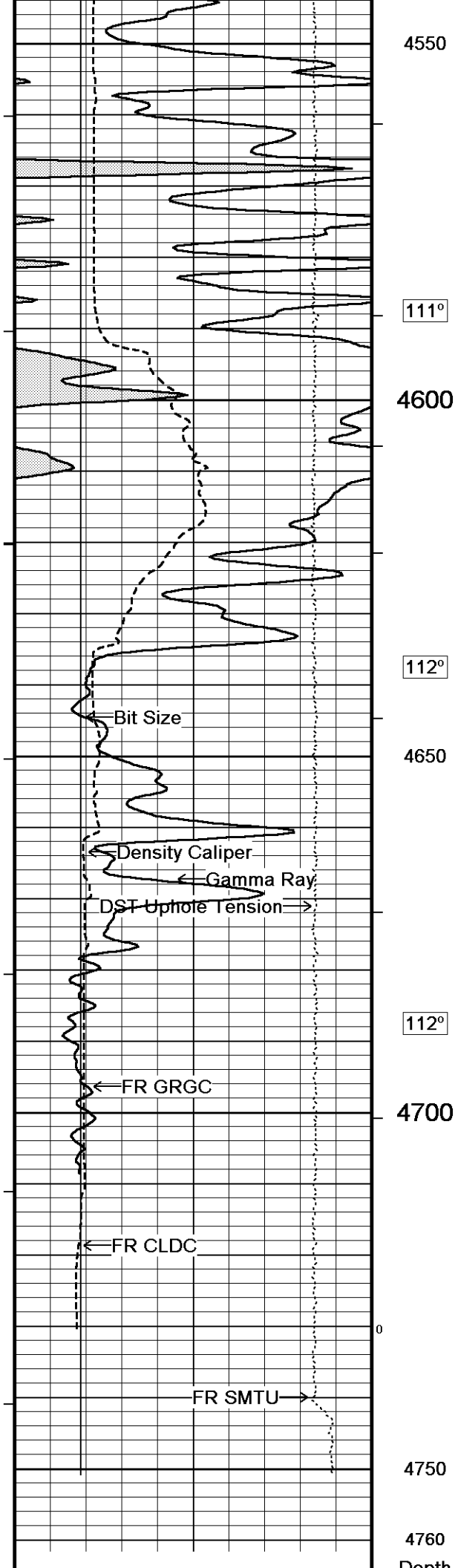
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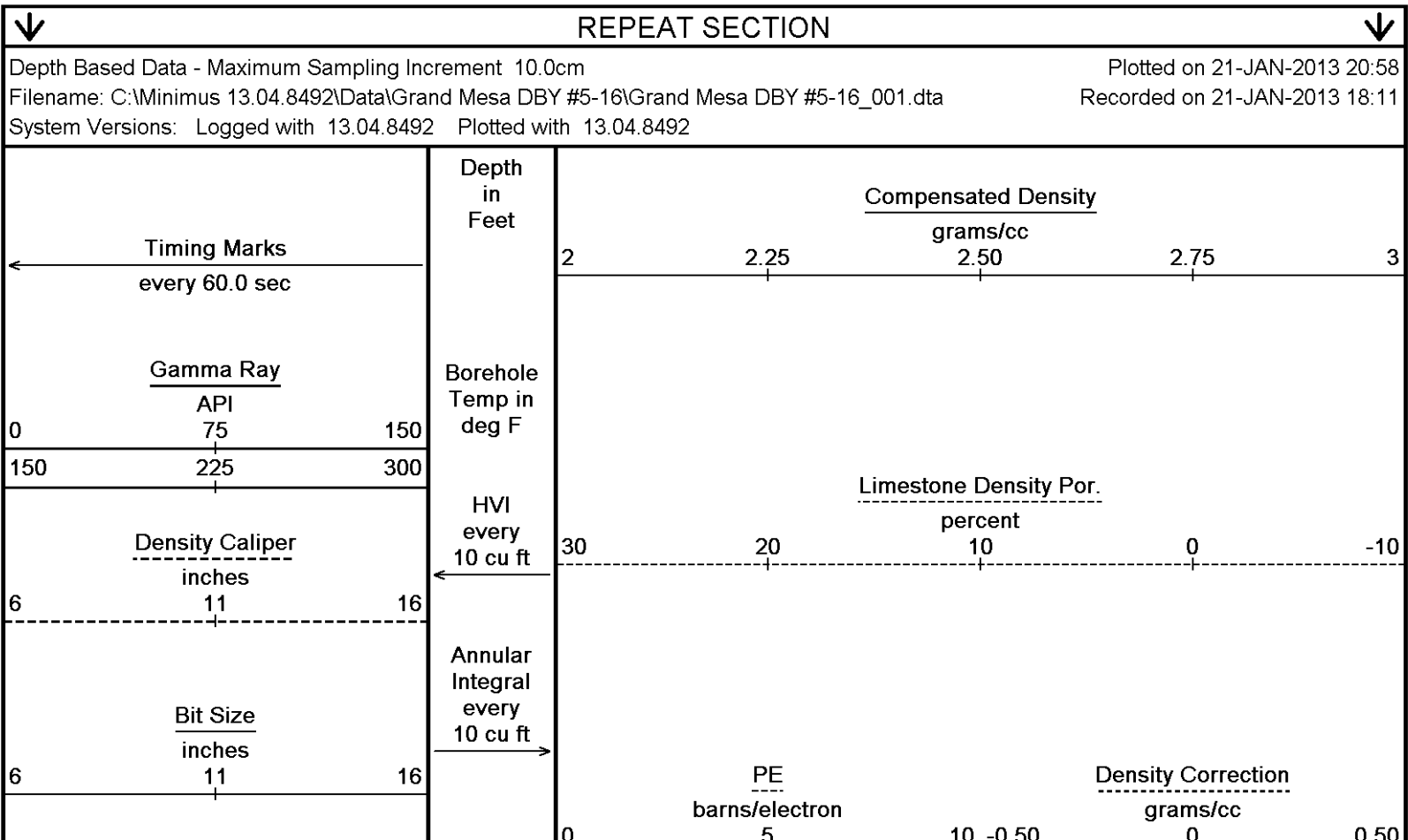
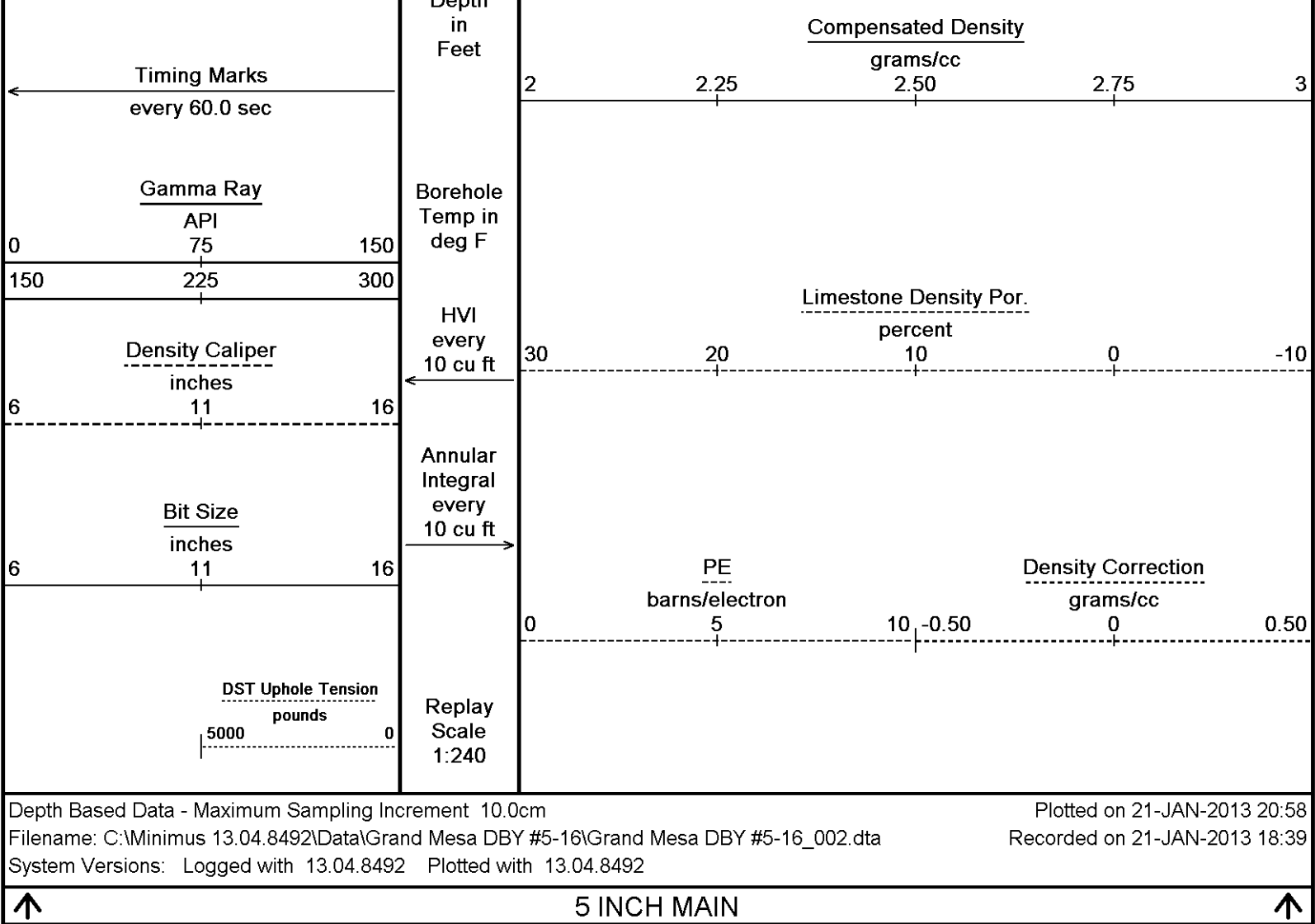
110°

4500

110°







DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

4188

4200

108°

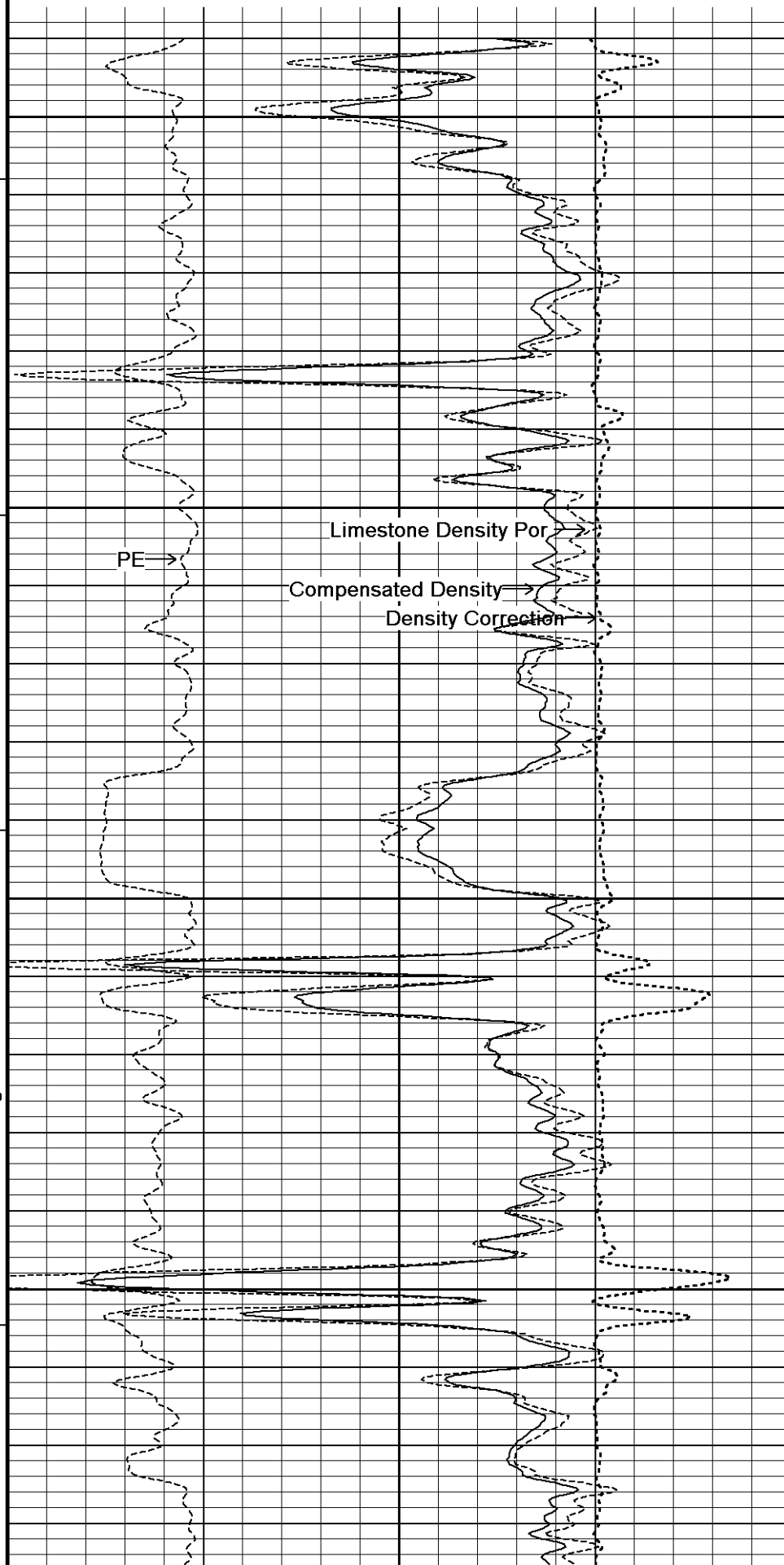
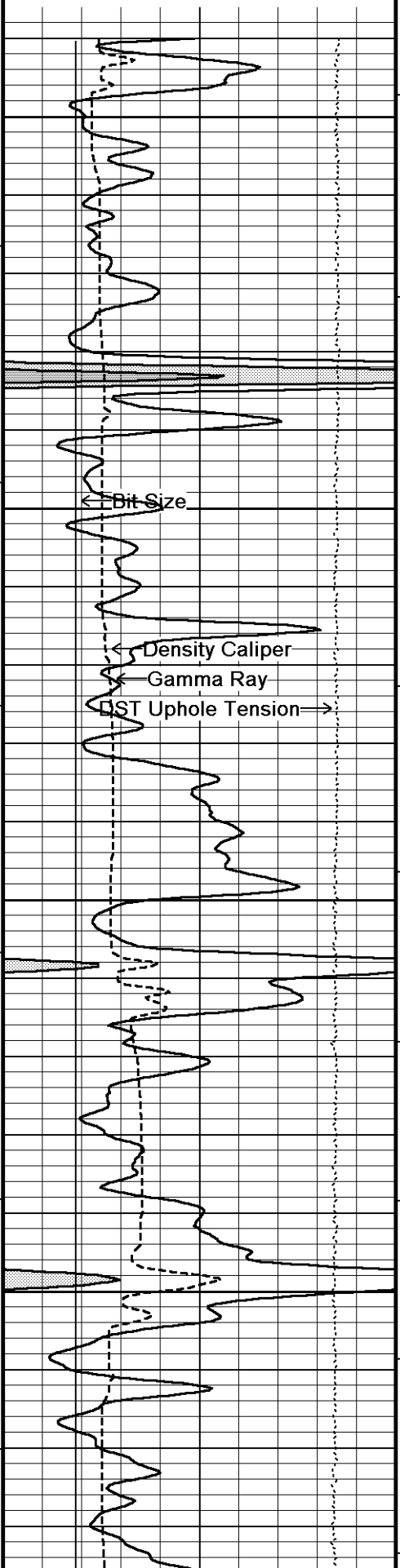
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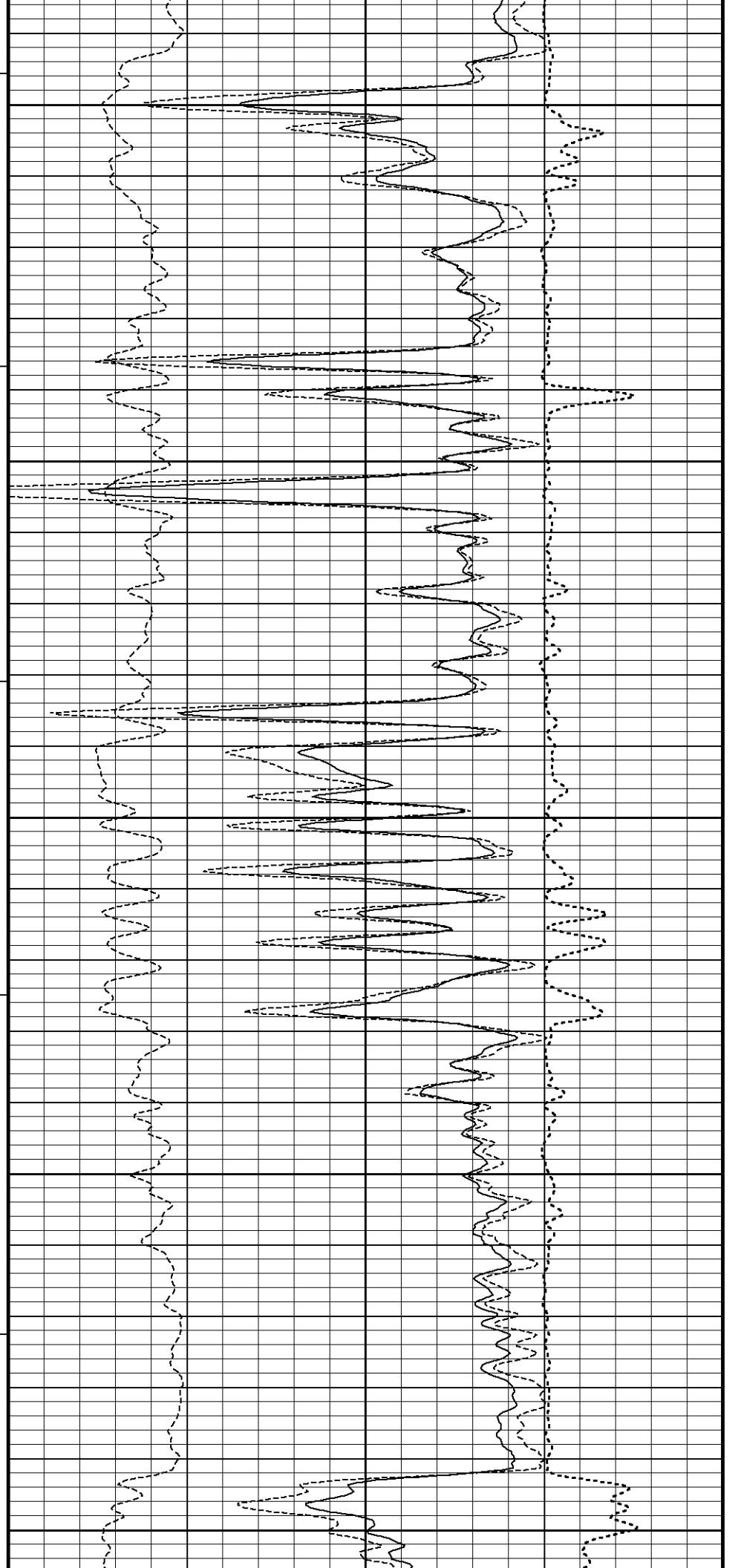
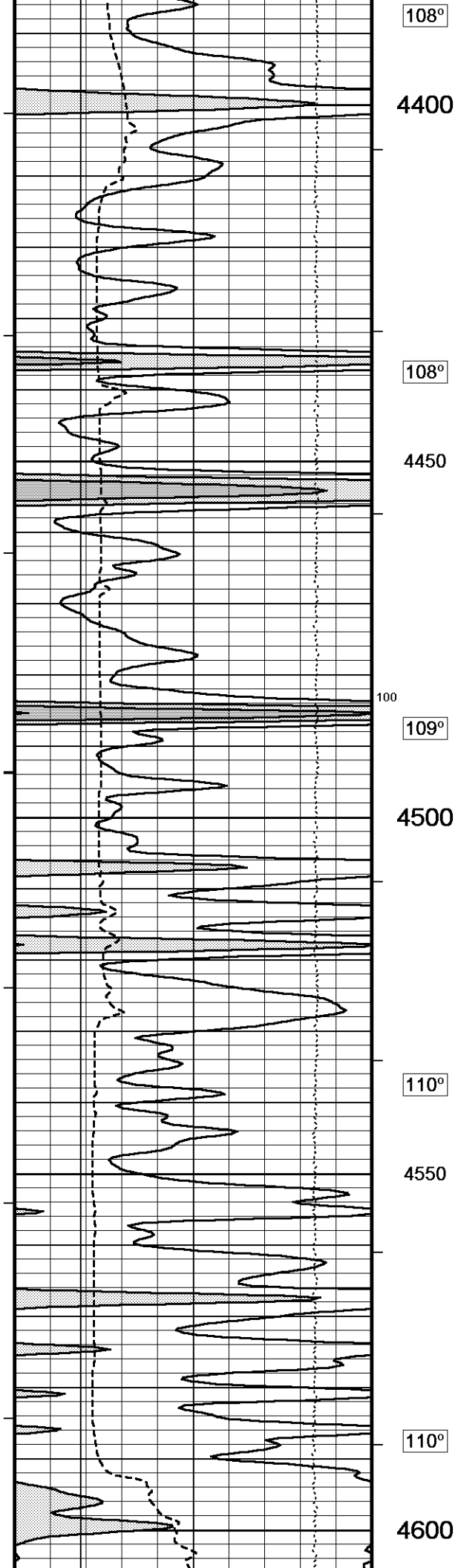
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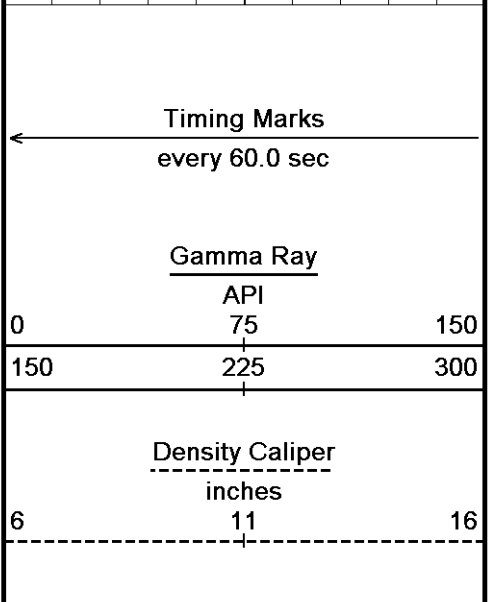
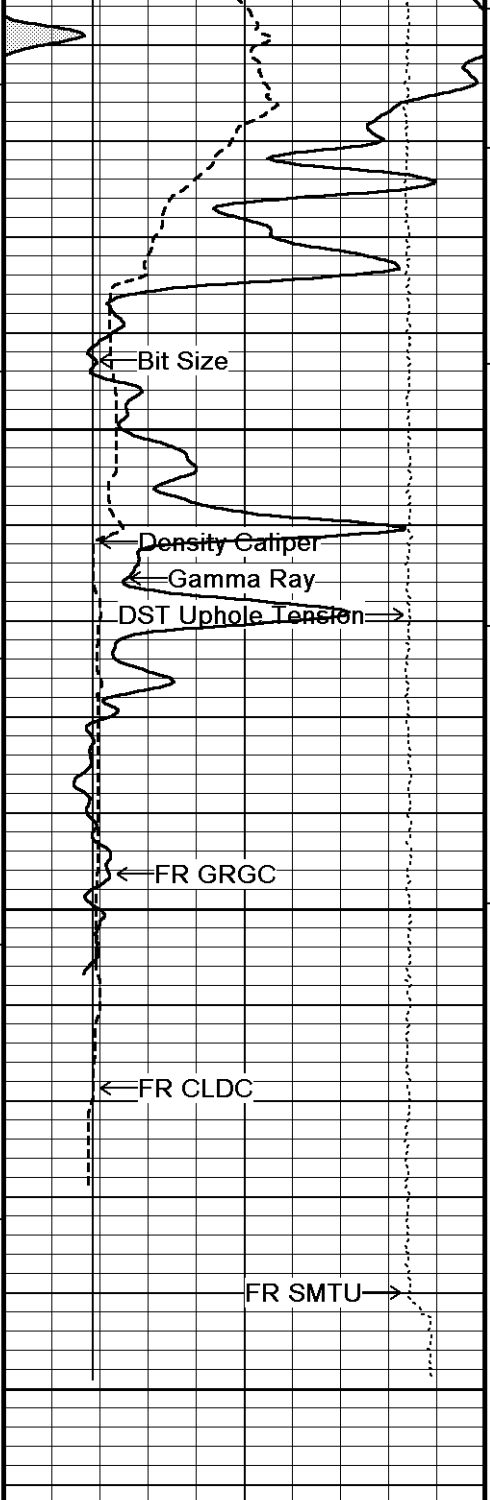
4300

108°

4350







111°

4650

110°

4700

0

4750

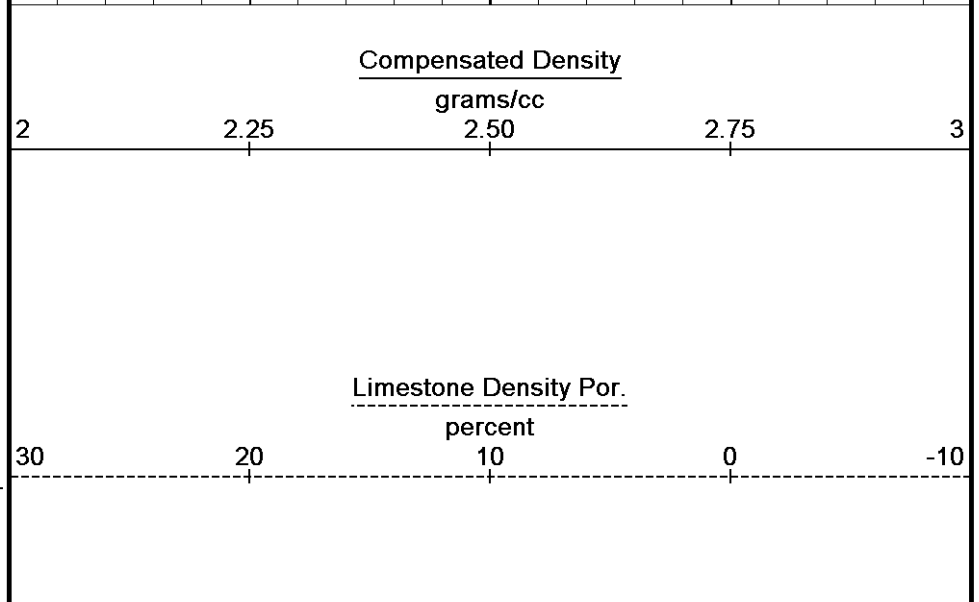
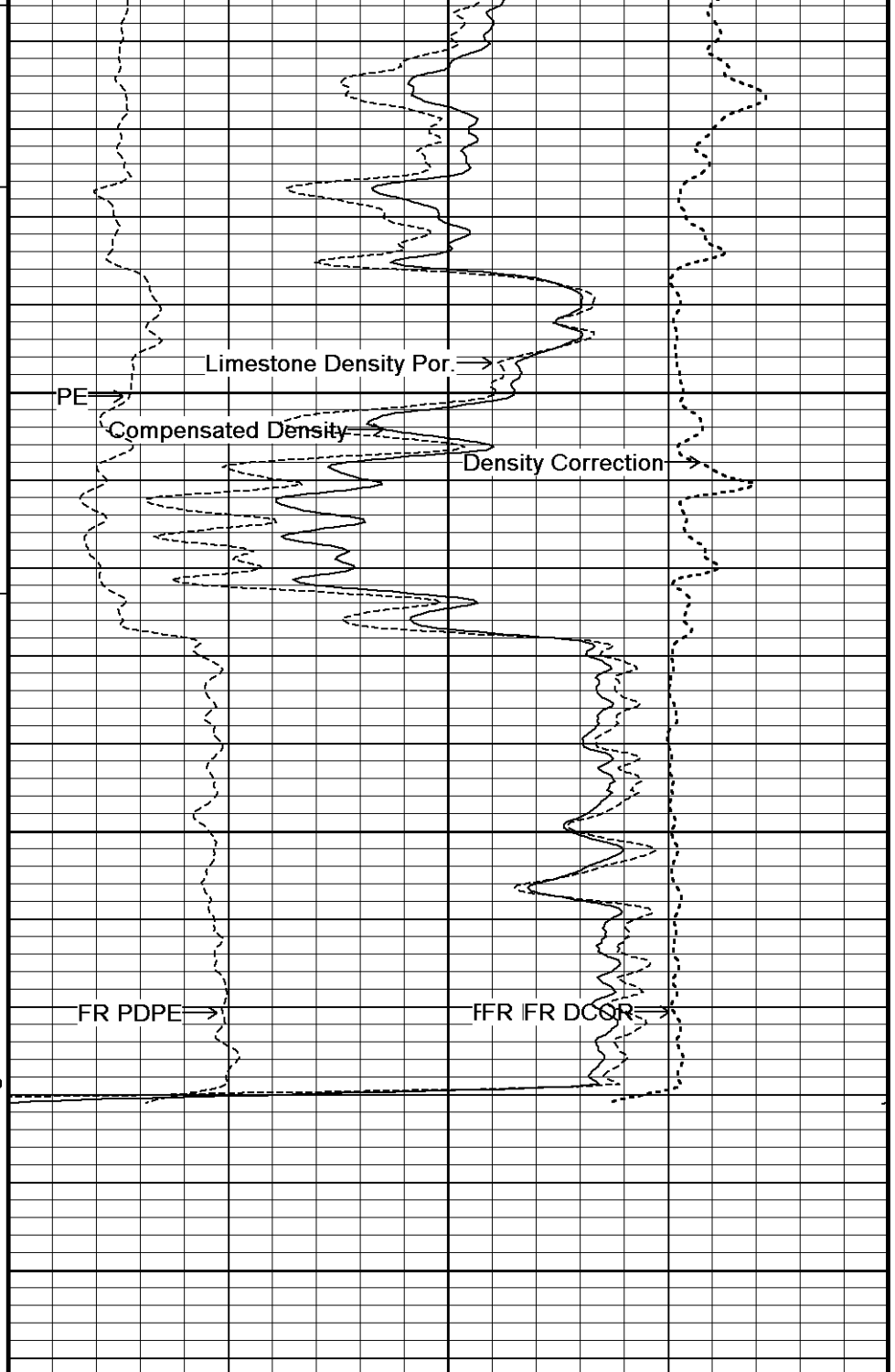
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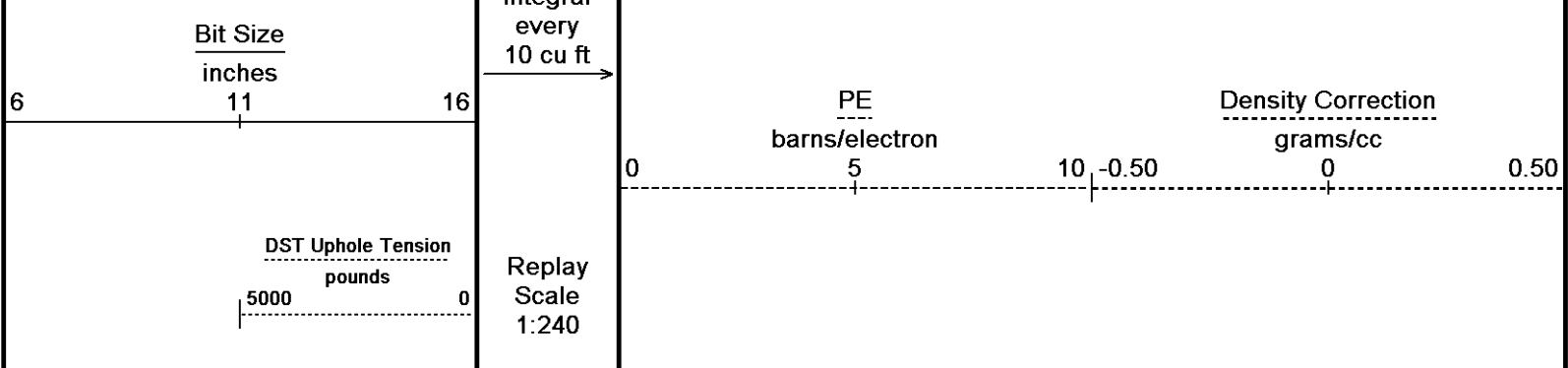
Depth in Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral





Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 21-JAN-2013 20:58
Filename: C:\Minimus 13.04.8492\Data\Grand Mesa DBY #5-16\Grand Mesa DBY #5-16_001.dta	Recorded on 21-JAN-2013 18:11
System Versions: Logged with 13.04.8492 Plotted with 13.04.8492	

↑
REPEAT SECTION
↑

BEFORE SURVEY CALIBRATION

C:\Minimus 13.04.8492\Data\Grand Mesa DBY #5-16\Grand Mesa DBY #5-16_001.dta

General Constants All 000		Last Edited on 21-JAN-2013,15:01
General Parameters Mud Resistivity 0.580 ohm-metres Mud Resistivity Temperature 93.000 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 5.500 inches Caliper for Differential Caliper Density Caliper Rwa Parameters Porosity used Base Density Porosity Resistivity used Array Ind. Four Res Rt RWA Constant A 1.000 RWA Constant M 2.000		

Down-hole Tension Calibration SMS 0			Field Calibration on 18-JAN-2013 01:57
Reading No	Measured	Calibrated (lbs)	
1	15220.96	0.00	
2	15827.69	390.00	

SP Calibration MCG-C 208			Field Calibration on 27-DEC-2012 10:06
	Measured	Calibrated (mV)	
Reference 1	100.9	100.0	
Reference 2	-100.6	-100.0	

High Resolution Temperature Calibration MCG-C 208			Field Calibration on 05-NOV-2012,14:26
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MCG-C 208		Last Edited on 05-NOV-2012,14:25
Pre-filter Length	11	

Gamma Calibration MCG-C 208			Field Calibration on 20-JAN-2013 14:04
	Measured	Calibrated (API)	
Background	71	50	
Calibrator (Gross)	1115	775	
Calibrator (Net)	1044	725	

Gamma Calibrator Number	GR38	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Micro Laterolog Calibration MMR-A 11

Base Calibration on 31-DEC-1999 00:00

Field Check on 31-DEC-1999 00:00

Base Calibration

	Measured		Calibrated (ohm-m)	
	Ref 1	Ref 2	Ref 1	Ref 2
	0.0	0.0	0.0	0.0
	Base Check (ohm-m)		Field Check (ohm-m)	
	0.0		0.0	

Micro Laterolog Constants MMR-A 11

Last Edited on 12-NOV-2012,01:59

Pad Type	6 in Solid Nylon B23059	
Micro Laterolog K Factor	0.0128	
Standoff Offset	0.0000	inches

Mudcake Thickness Correction Constants

Mud Cake Source	Constant Value	
Mud Cake Thickness	0.4000	inches
Mud Cake Thickness Caliper	N/A	
Mud Cake Resistivity	0.1500	ohm-m
Mud Cake Resistivity Temp.	68.00	Deg F
Mud Cake Resistivity Source	Constant Value	
Temp. Source Rmc Correc.	N/A	

Caliper Calibration MMR-A 11

Base Calibration on 16-JAN-2013 10:32

Field Calibration on 20-JAN-2013 13:49

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13881	5.98
2	17138	7.97
3	20398	9.86
4	24351	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

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

Micro Normal and Micro Inverse Calibration MMR-A 11

Base Calibration on 16-JAN-2013 10:36

Field Check on 20-JAN-2013 13:50

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.3	59.9	5.0	25.0
Micro Inverse	15.5	77.5	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	76.3	76.3
Micro Inverse	58.7	58.7

Micro Normal and Micro Inverse Constants MMR-A 11

Last Edited on 05-NOV-2012,13:54

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	1.0000	
Micro Inverse K Factor	1.0000	
Standoff Offset	0.0000	inches

Neutron Calibration MDN-A.B 65

Base Calibration on 13-DEC-2012 16:03

Field Check on 20-JAN-2013 14:00

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2945	91	3714	110

Ratio	32.377	33.764
Field Calibrator at Base	Calibrated (cps)	
	1743	2519
Ratio	0.692	
Field Check	Calibrated (cps)	
	1729	2508
Ratio	0.691	

Neutron Constants MDN-A.B 65			Last Edited on 21-JAN-2013,15:01		
Neutron Source Id	PN-521				
Neutron Jig Number	5824NE				
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	Constant Value				
Formation Pressure	0.00	kpsi			
Temperature Source	Constant Value				
Temperature	68.00	degrees F			
Mud Salinity	0.00	kppm			
Salinity Correction	Not Applied				
Formation Fluid Salinity Source	Constant Value				
Formation Fluid Salinity	0.00	kppm			
Barite Mud Correction	Not Applied				

FE Calibration MFE-B.J 352		Base Calibration on 16-JAN-2013 10:20 Field Check on 20-JAN-2013 13:39	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	964.3	126.8	
Base Check		281.2	
Field Check		281.4	

FE Constants MFE-B.J 352				Last Edited on 21-JAN-2013,15:01	
Running Mode		No Sleeve			
MFE K Factor		0.1268			
Caliper Source for FE correction		Density Caliper			
Caliper Value for FE correction		N/A		inches	
Rm Source for FE correction		Temperature Corr			
Temp. for Rm Corr.		MCG External Temperature			
Stand-off		0.5		inches	

Induction Calibration MAI-A.A 45				Base Calibration on 26-JUL-2012,09:22	
				Field Check on 20-JAN-2013 13:34	
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	14.4	472.6	9.3	966.2	
2	5.7	374.0	7.6	821.4	
3	3.4	261.2	5.2	566.0	
4	2.5	133.9	2.6	279.2	
Array Temperature		78.4	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1			18.5	3849.8	
2			31.7	3628.2	
3			28.6	3048.8	
4			18.3	2079.0	
Deep			16.1	1911.2	
Medium			42.5	4059.5	

Medium

Shallow

42.5

4055.5

49.5

5480.8

Array Temperature

61.2

Deg F

Induction Constants MAI-A.A 45

Last Edited on 21-JAN-2013,15:01

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	8.0000		
Stand-off Fin Angle	45.00	degrees	
Stand-off Fin Width	0.5000	inches	
Borehole Corr. Rm Source	Temperature Corr		
Temp. for Rm Corr.	MCG External Temperature		
Squasher Start	0.0020	mhos/metre	
Squasher Offset	N/A	mhos/metre	

Borehole Normalisation

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

Calibration Site Corrections

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

Apparent Porosity and Water Saturation Constants

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

High Resolution Temperature Calibration MAI-A.A 45

Field Calibration on 13-DEC-2012,10:54

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

High Resolution Temperature Constants MAI-A.A 45

Last Edited on 13-DEC-2012,10:53

Pre-filter Length 11

Caliper Calibration MPD-B 31

Base Calibration on 13-DEC-2012 14:11

Field Calibration on 20-JAN-2013 13:40

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	15472	3.99
2	24160	5.98
3	32703	7.97
4	41008	9.86
5	50231	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.97	5.98

Photo Density Calibration MPD-B 31

Base Calibration on 13-DEC-2012 14:32

Field Check on 20-JAN-2013 13:48

Density Calibration

Base Calibration	Measured	Calibrated (sdu)
	Near	Far
Reference 1	46489	23675
Reference 2	18873	1941
	59556	30836
	24941	2541

Field Check at Base

683.9 844.6

Field Check

684.3 844.8

PE Calibration

Base Calibration	Measured	Calibrated
	WS	WH
	Ratio	Ratio
Background	126	608
Reference 1	18821	46368
Reference 2	5566	18789
	0.409	0.371
	0.299	0.272

Field Check at Base

125.8 608.0

Field Check

126.2 608.8

Density Constants MPD-B 31

Last Edited on 20-JAN-2013,16:54

Density Source Id	254	
Nylon Calibrator Number	DNCE695	
Aluminium Calibrator Number	DACD698	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.10	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:\Minimus 13.04.8492\Data\Grand Mesa DBY #5-16\Grand Mesa DBY #5-16_001.dta

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

43.50 ft
40.59 ft

GRGC - Gamma Ray
CGXT - MCG External Temperature

Compact Micro-Resistivity
MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.88 in

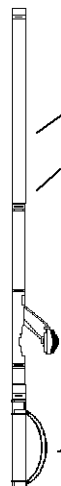
33.24 ft
33.24 ft
33.24 ft

MBTC - MMR Caliper
MINV - MMR MicroLog Inverse
MNRL - MMR MicroLog Normal

Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

28.45 ft

NPRL - Limestone Neutron Por.

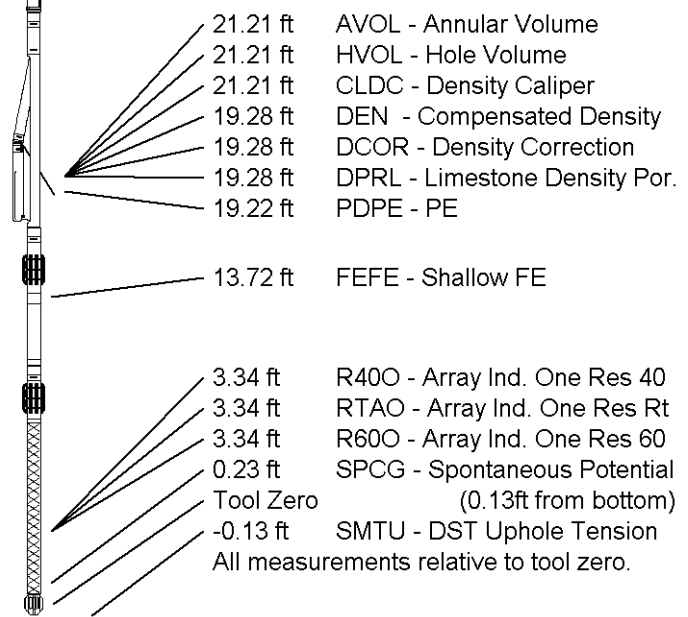


Compact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 48.78 ft Weight: 383.6 lb



COMPANY	GRAND MESA OPERATING COMPANY
WELL	DBY #5-16
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2974.00	feet	First Reading	4720.00	feet
Elevation Drill Floor	2973.00	feet	Depth Driller	4740.00	feet
Elevation Ground Level	2969.00	feet	Depth Logger	4740.00	feet



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COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG