



Weatherford

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY

M&M EXPLORATION, INC.

WELL

Z-BAR #9-5

FIELD

AETNA GAS AREA

PROVINCE/COUNTY

BARBER

COUNTRY/STATE

UNITED STATES / KANSAS

LOCATION

**1900' FNL & 350' FWL
NW/4**

SEC

TWP

RGE

Other Services

9

34S

14W

API Number

15-007-24068

Permit Number

Permanent Datum G.L., Elevation 1656 feet

Log Measured From KB

Drilling Measured From K.B. @ 10 FEET

Elevations:
KB 1666.00
DF 1664.00
GL 1656.00

Date

13-OCT-2013

Run Number

ONE

Service Order

3541096

Depth Driller

5200.00 feet

Depth Logger

5201.00 feet

First Reading

5181.00 feet

Last Reading

3920.00 feet

Casing Driller

316.00 feet

Casing Logger

314.00 feet

Bit Size

7.880

inches

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.10 lb/USg

49.00 CP

PH / Fluid Loss

10.40

8.00 ml/30Min

Sample Source

MUDPIT

Rm @ Measured Temp

1.39 @ 75.0 ohm-m

Rmf @ Measured Temp

1.11 @ 75.0 ohm-m

Rmc @ Measured Temp

1.67 @ 75.0 ohm-m

Source Rmf / Rmc

CALC

CALC

Rm @ BHT

0.90 @ 116.0

ohm-m

Time Since Circulation

5 HOURS

Max Recorded Temp

116.00

deg F

Equipment / Base

13096

LIB

Recorded By

W STAMBAUGH

Witnessed By

BILL BUSCH

IOB#

LB13-289

BOREHOLE RECORD

Last Edited: 14-OCT-2013 04:08

Bit Size
inches

7.880

Depth From
feet

316.00

Depth To
feet

5201.00

CASING RECORD

Type

Size
inches

13.375

Depth From
feet

0.00

Shoe Depth
feet

314.00

Weight
pounds/ft

48.00

REMARKS

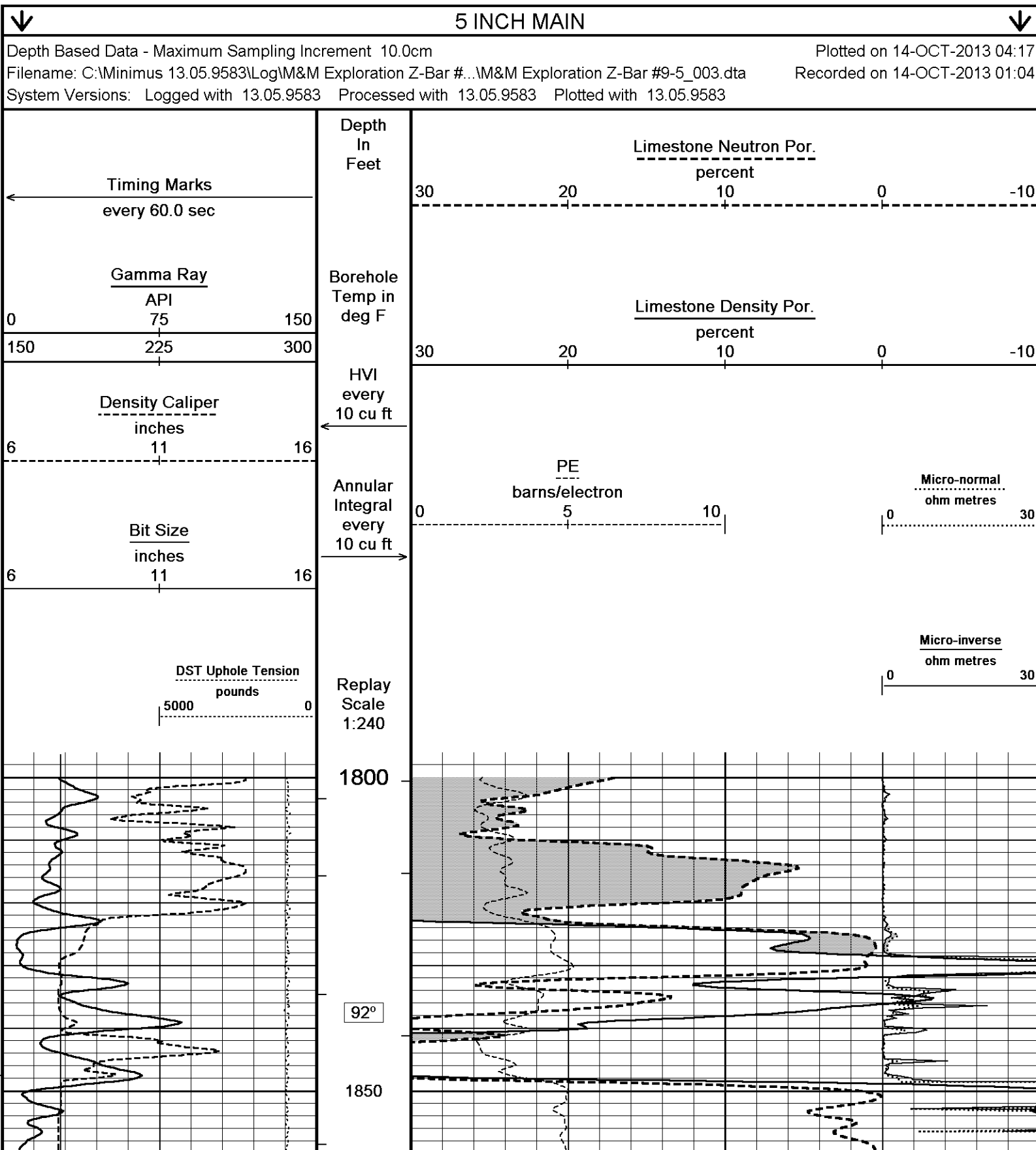
- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, SGS, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION.
 - HARDWARE: DUAL BOWSPRING USED ON MDN.
 - 0.5 INCH STANDOFF USED ON MFE.
 - 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING AT 316 FEET: 1880 CU. FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH CASING FROM TD TO SURFACE CASING AT 316 FEET: 1340 CU. FT.

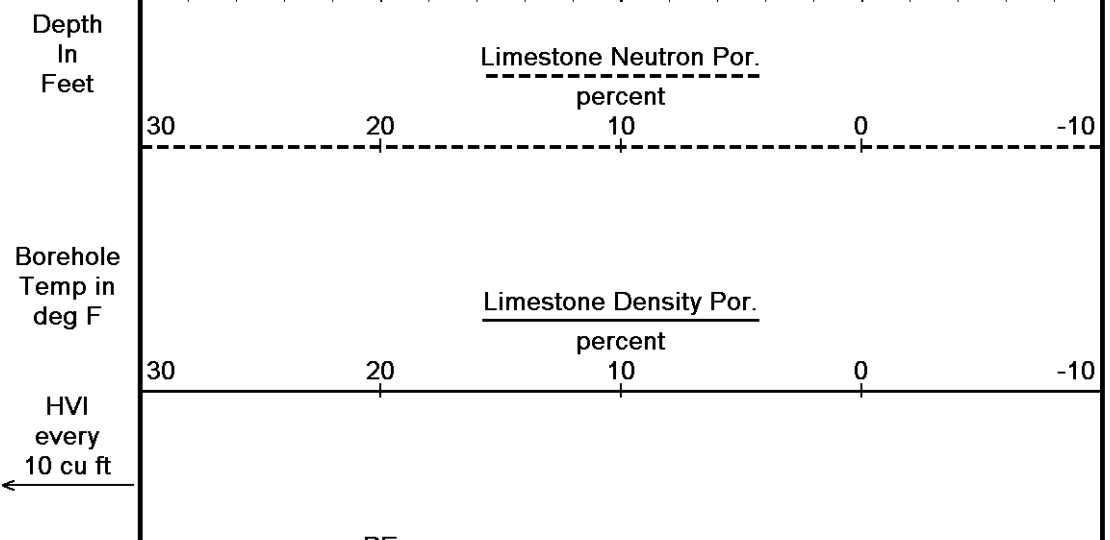
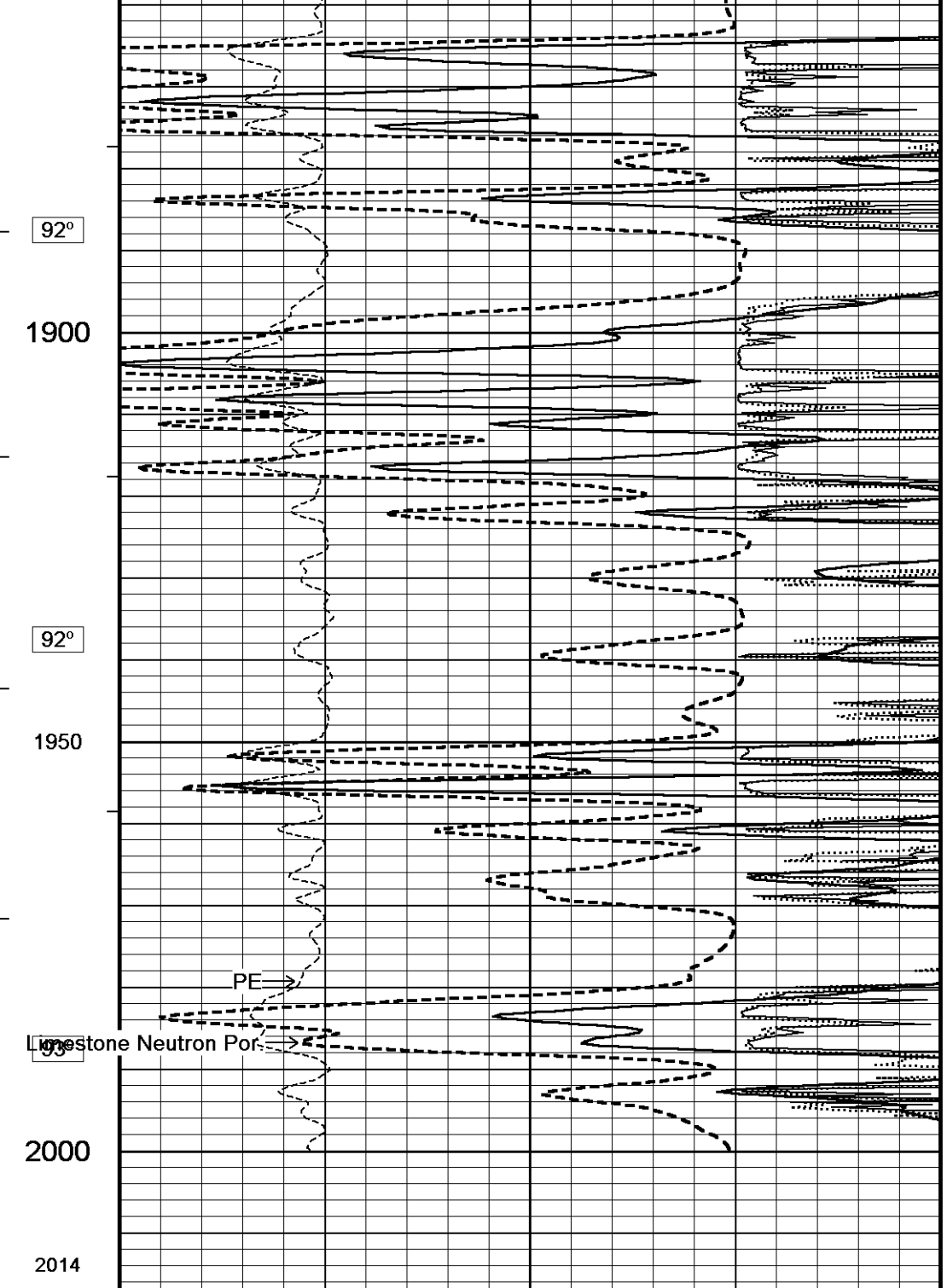
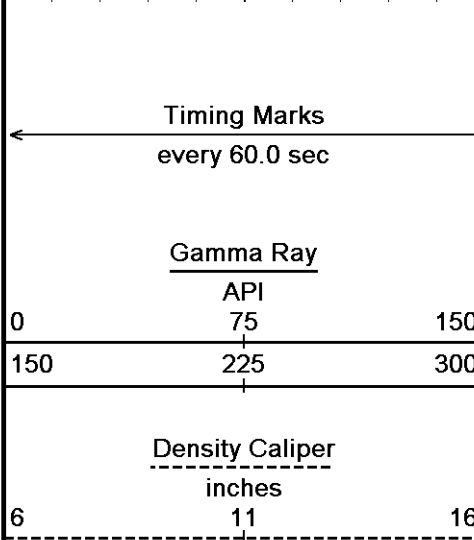
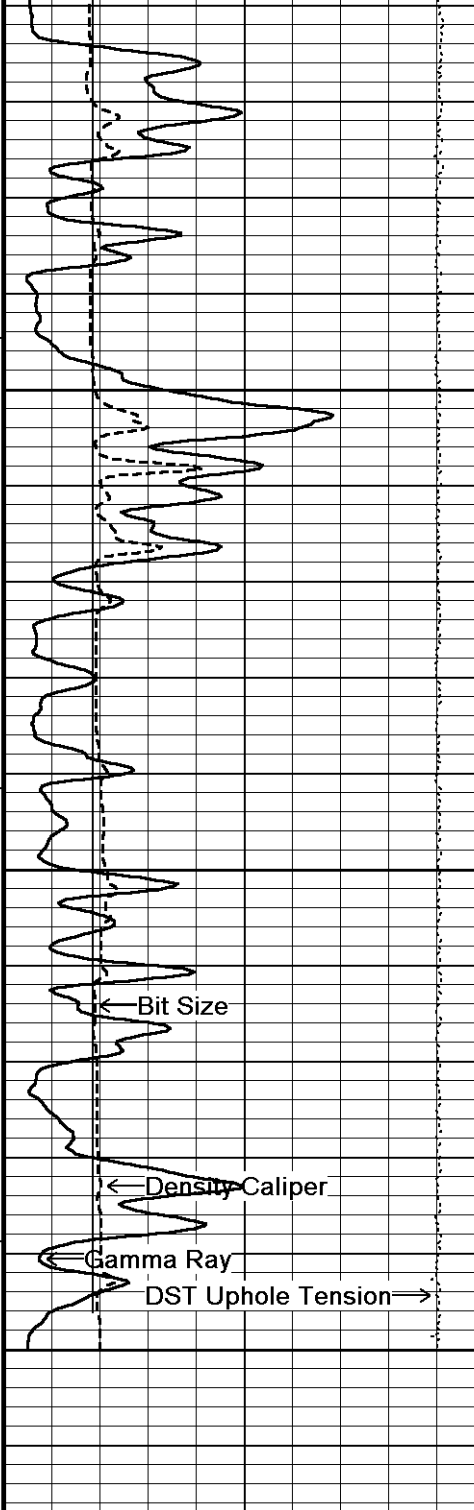
DRILLING RIG: HARDT DRILLING #1

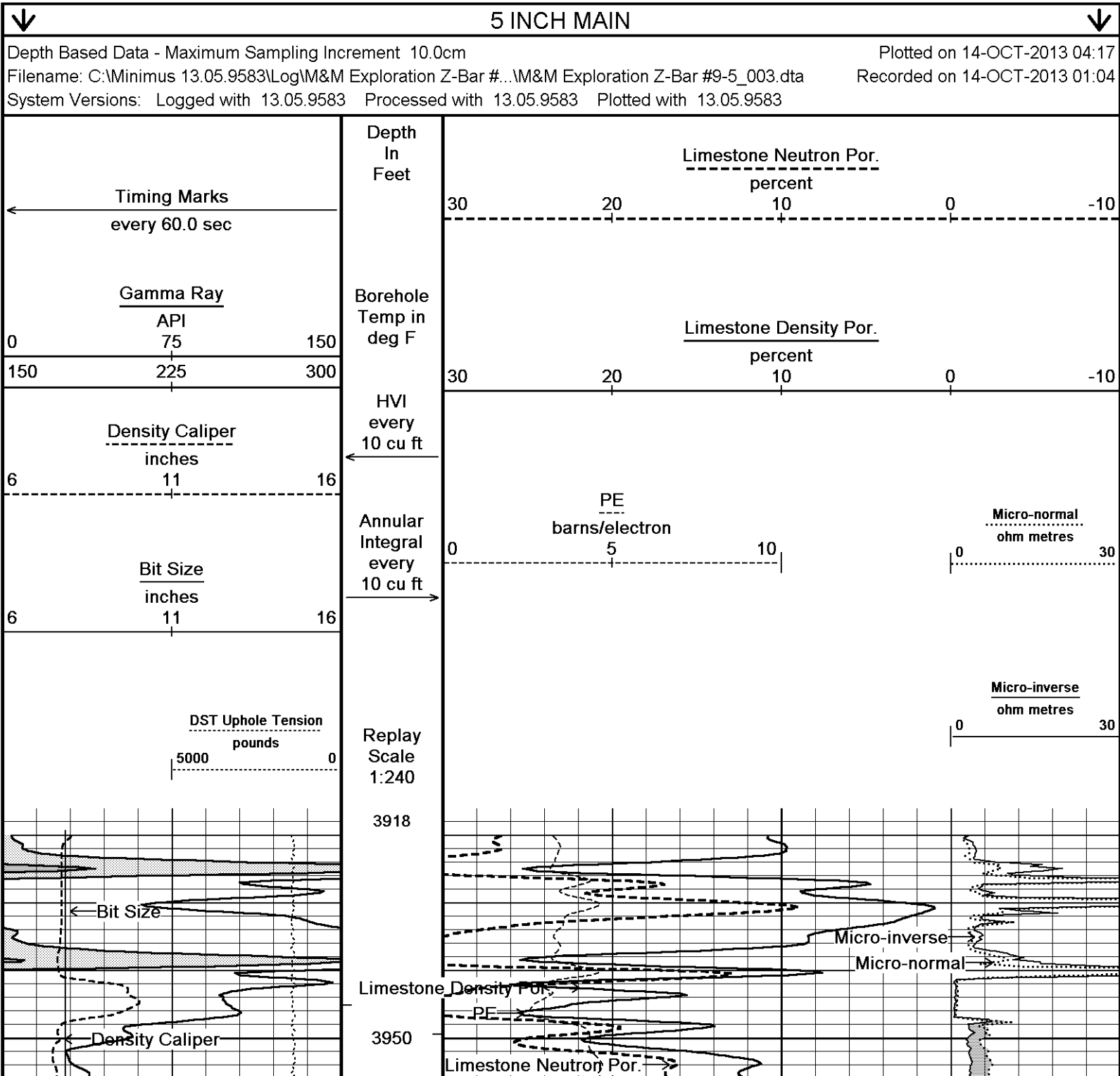
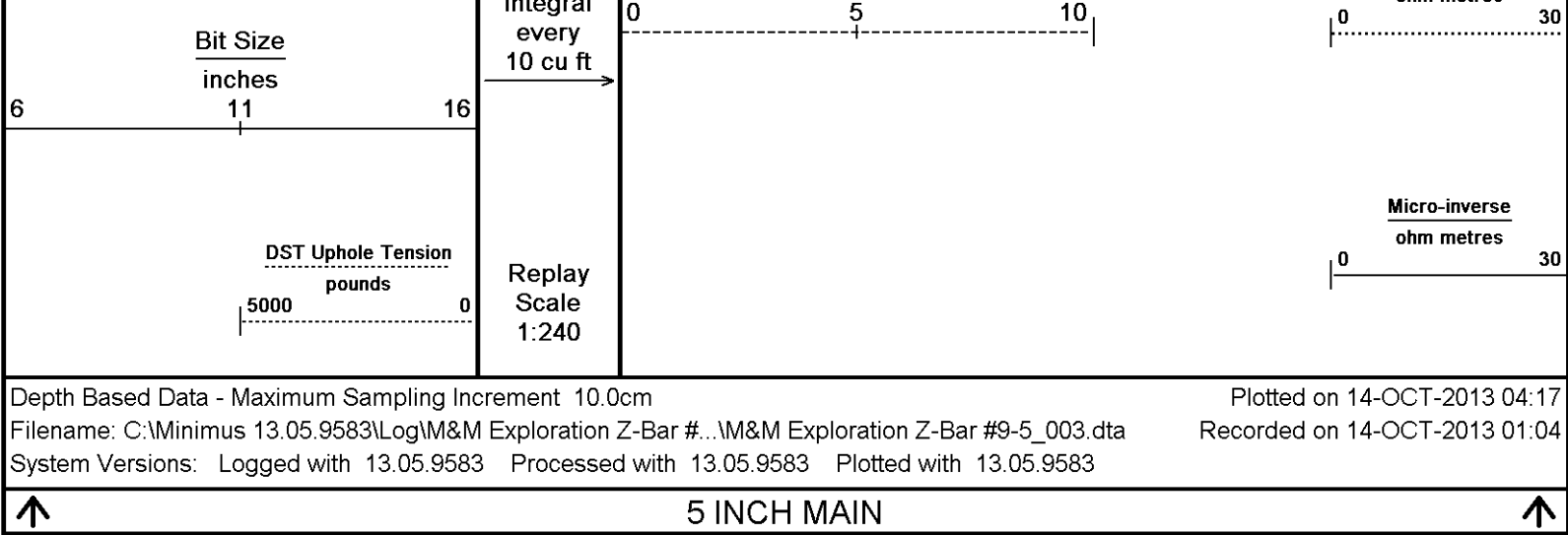
- ENGINEER: W. STAMBAUGH

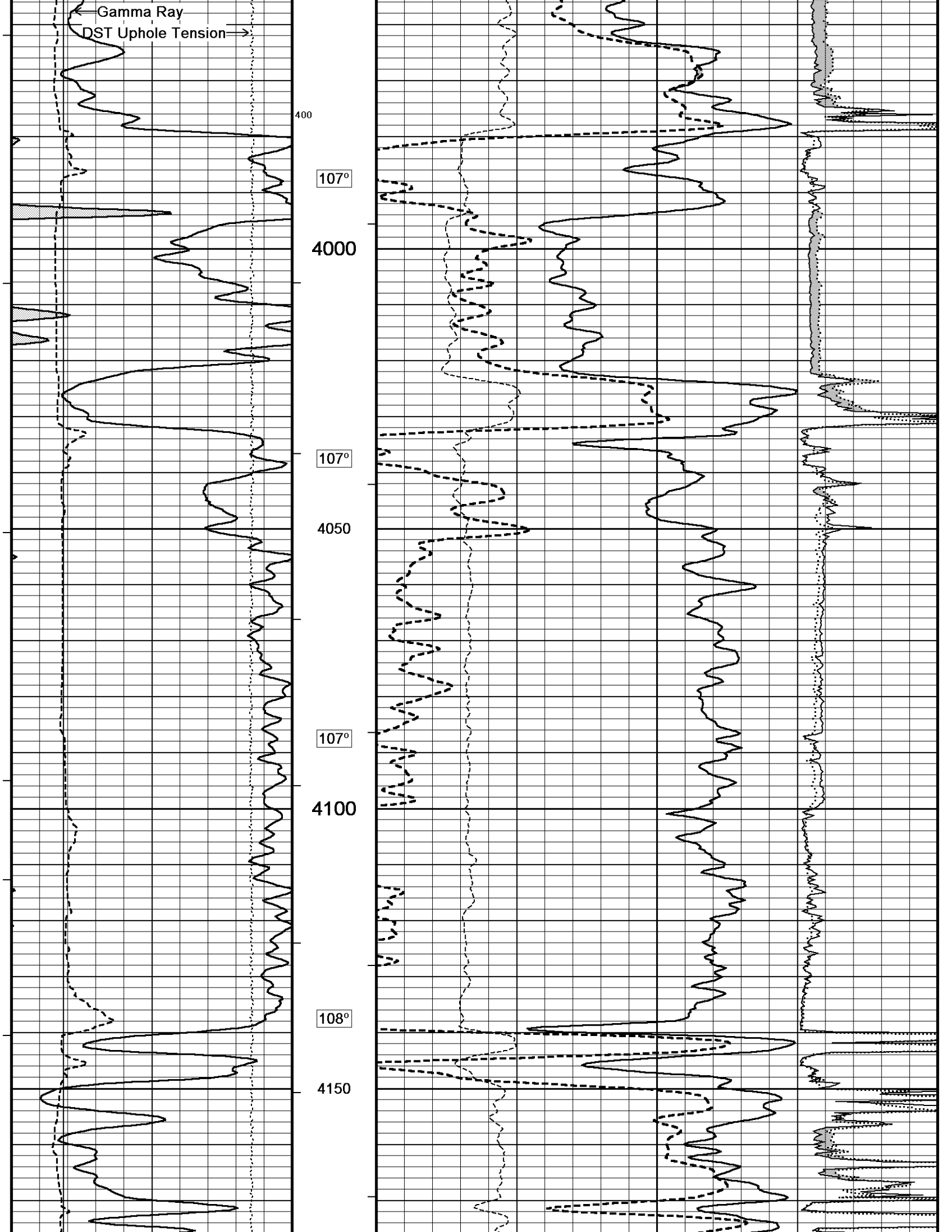
- OPERATOR(S): D. CANADAY

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.









108°

4200

108°

4250

200

300

109°

4300

110°

4350

110°

Bit Size

Density Caliper

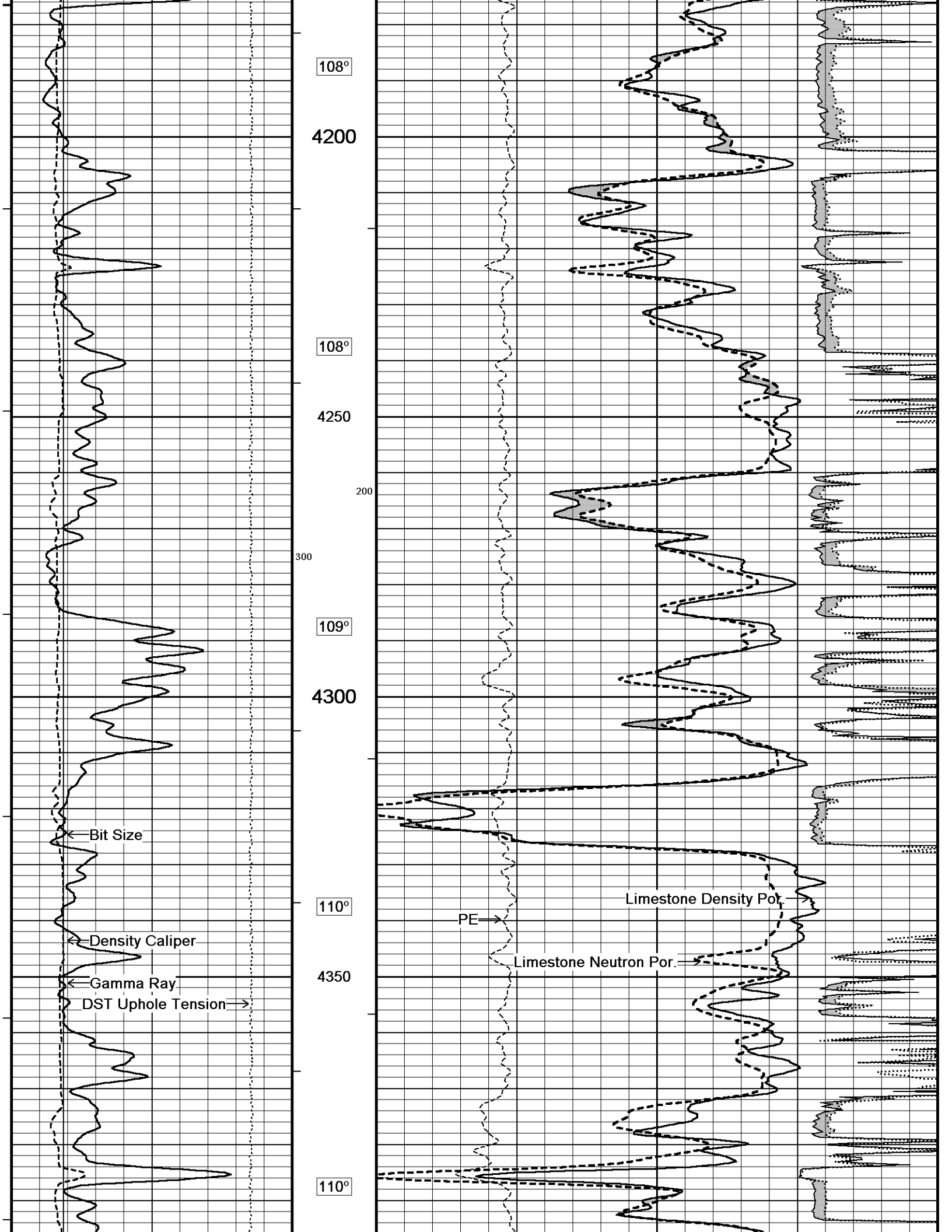
Gamma Ray

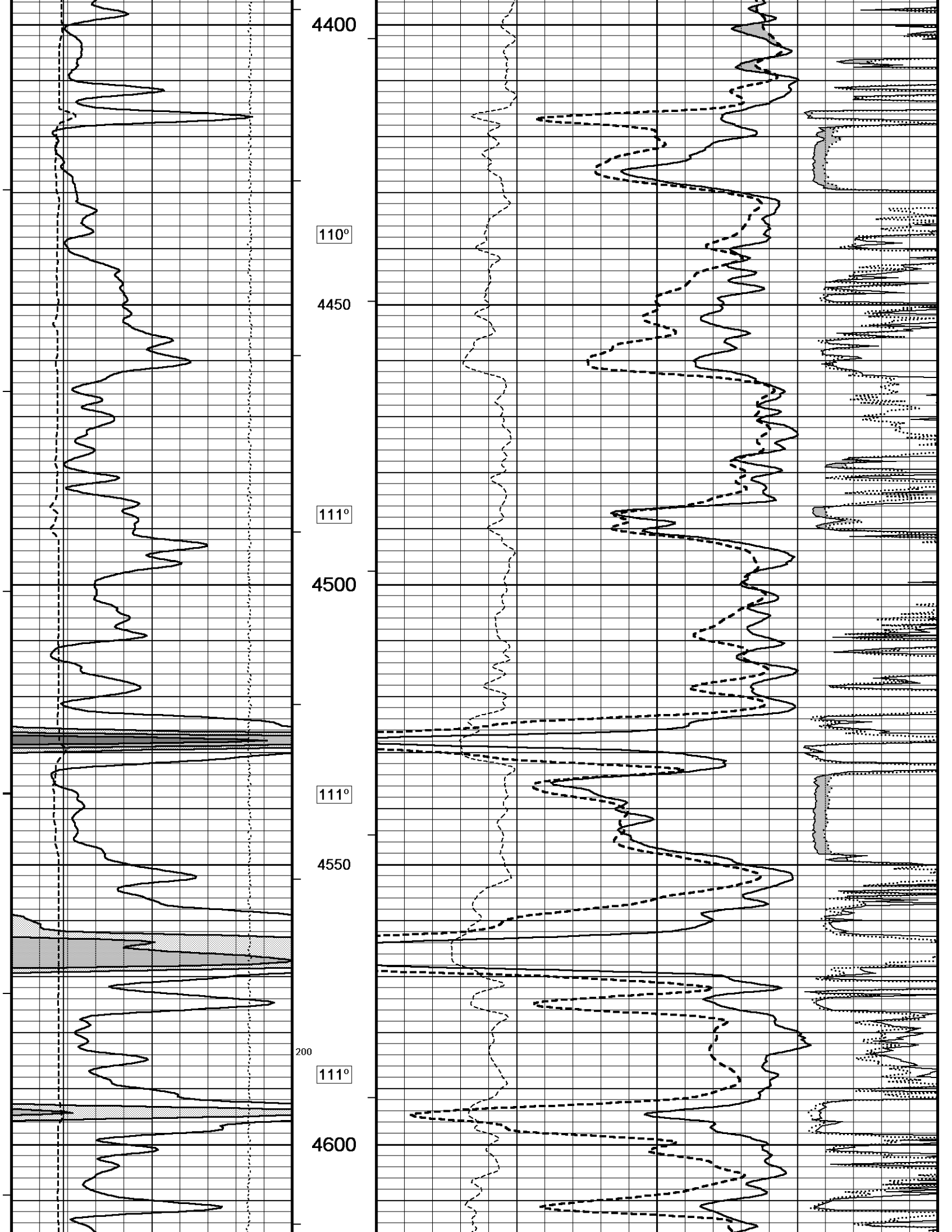
DST Uphole Tension

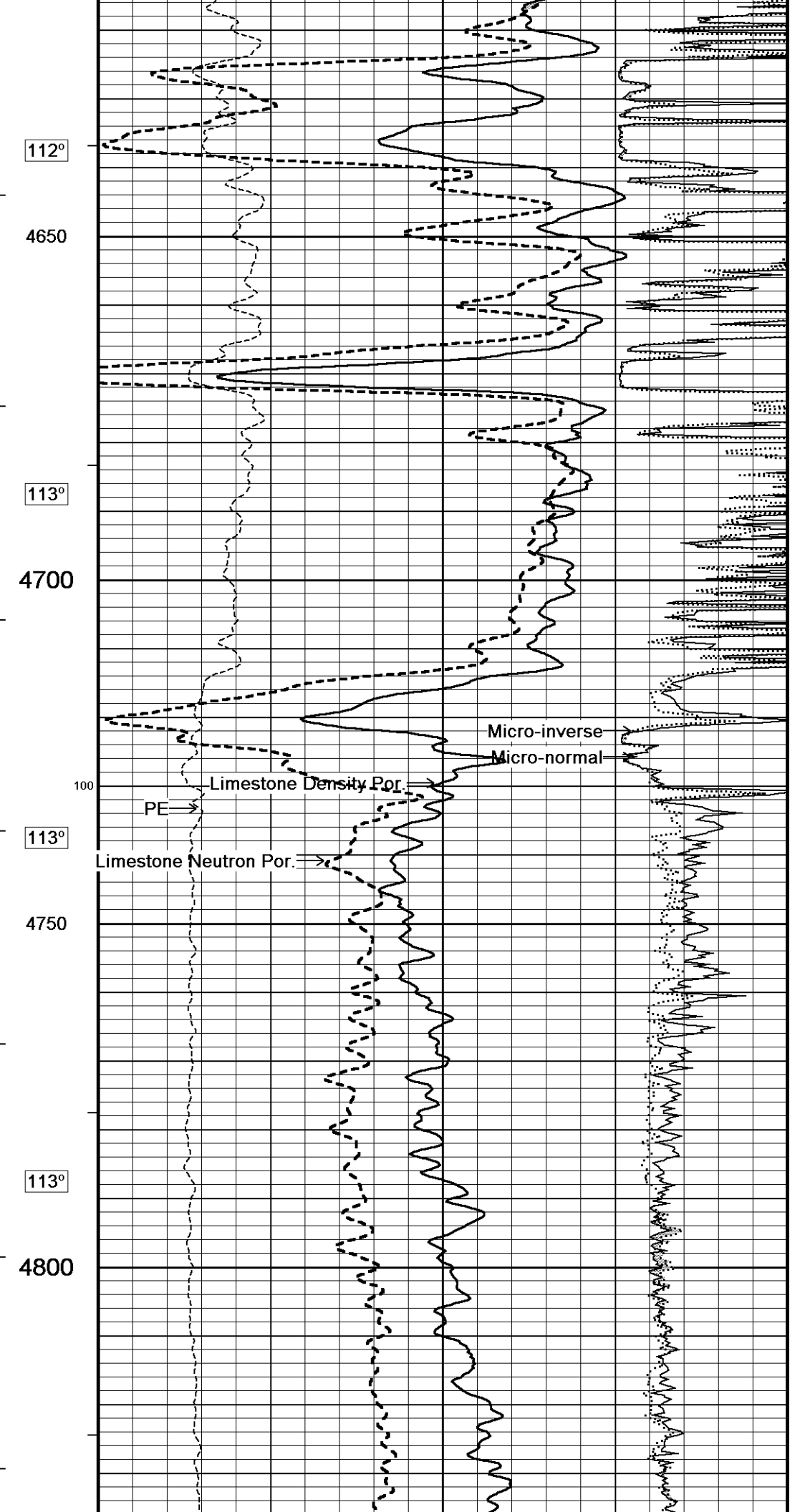
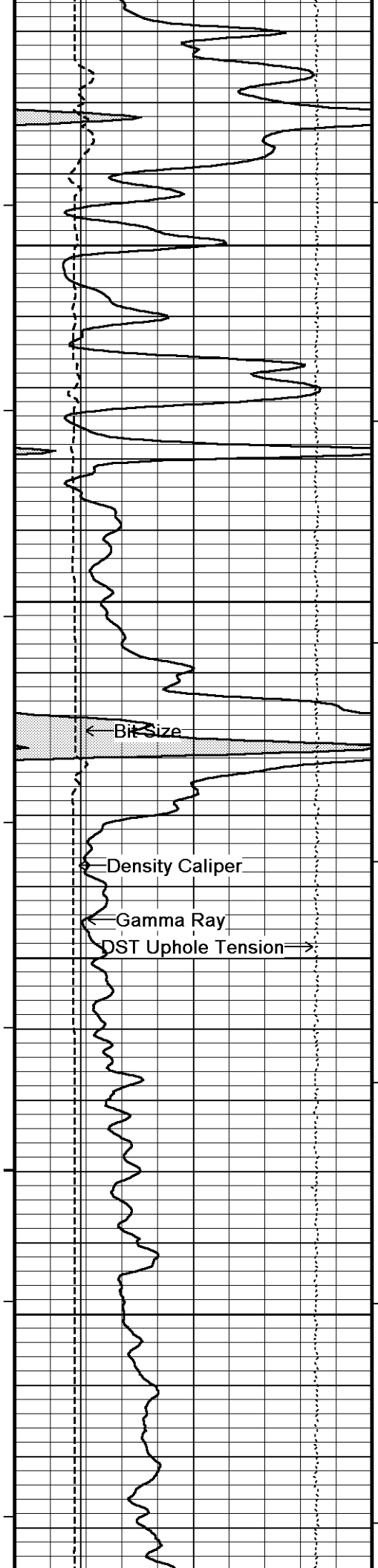
PE

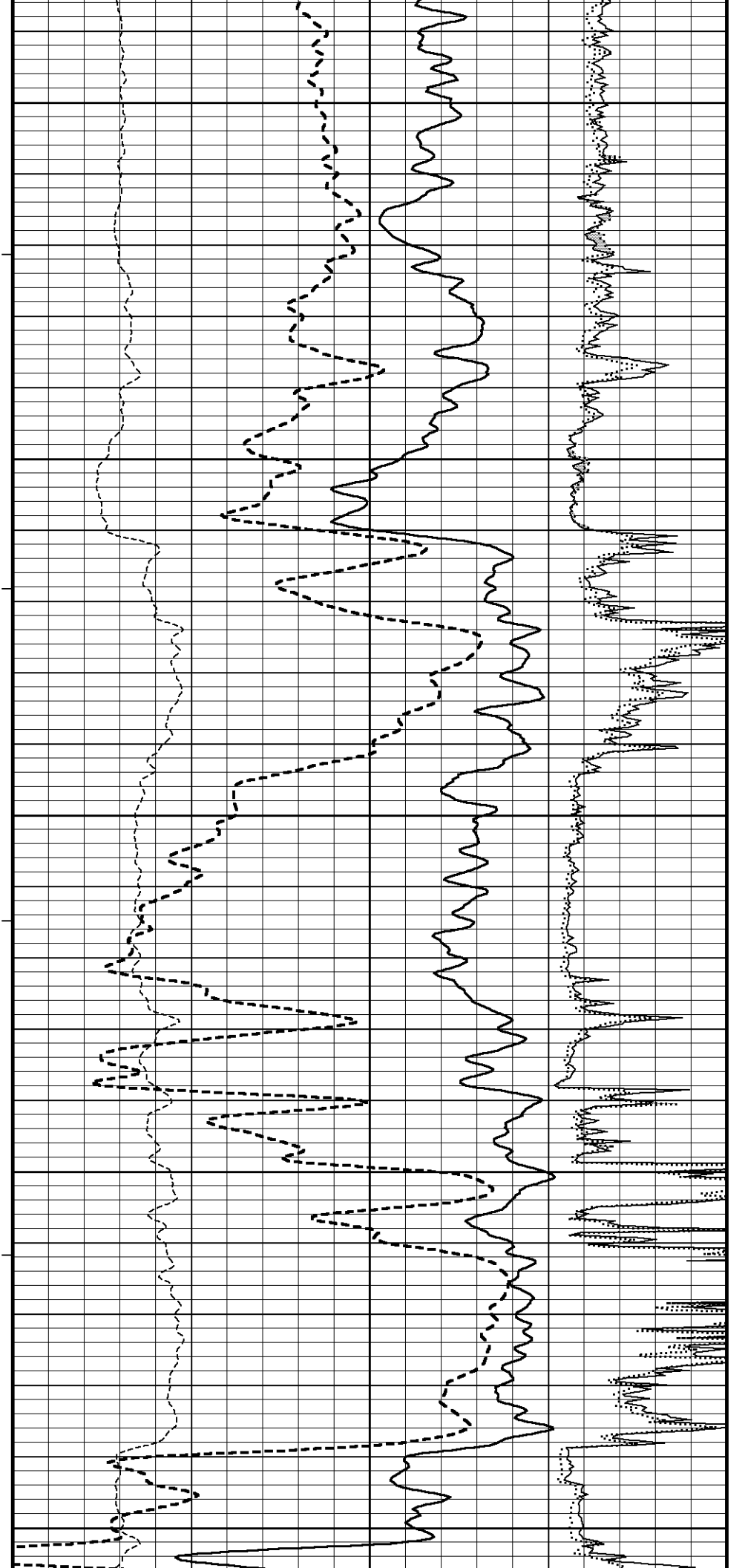
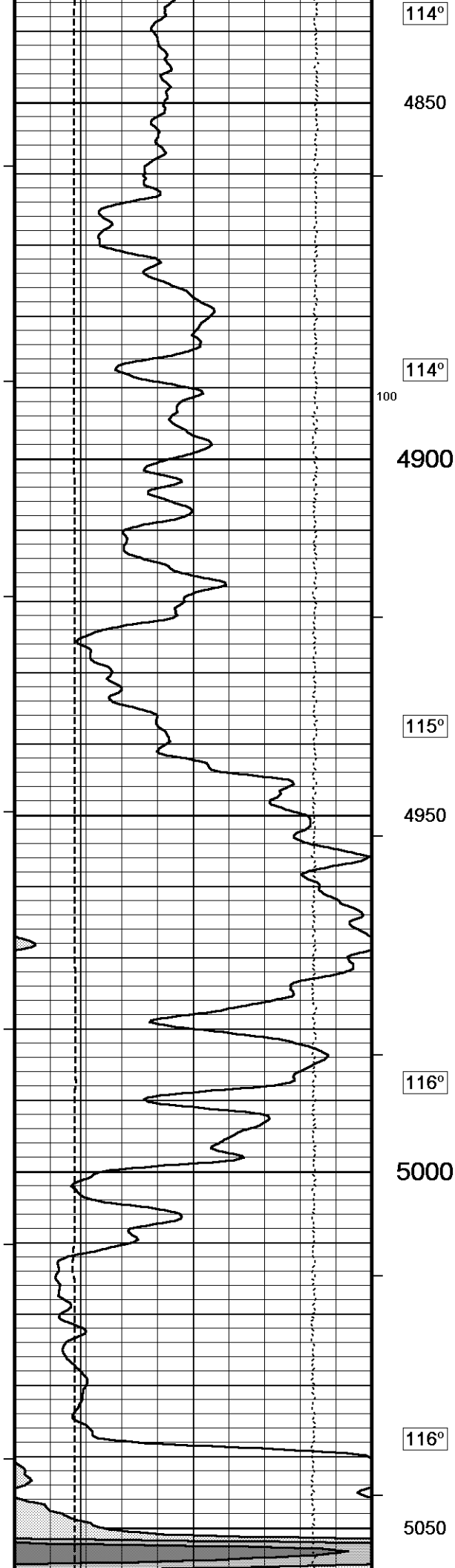
Limestone Density Por.

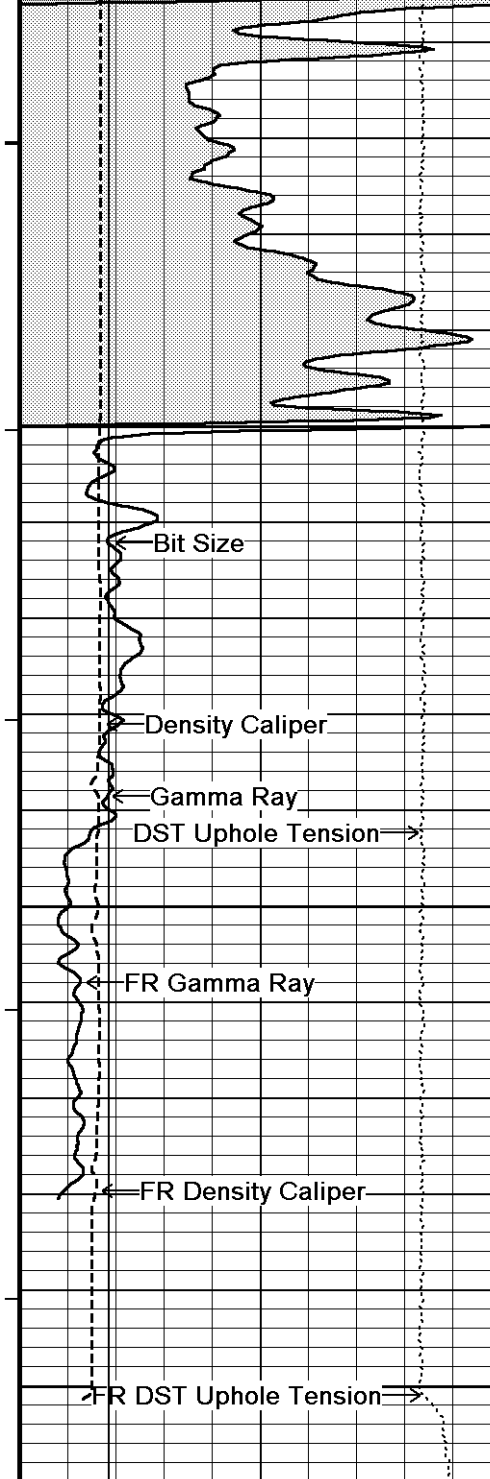
Limestone Neutron Por.











117°

5100

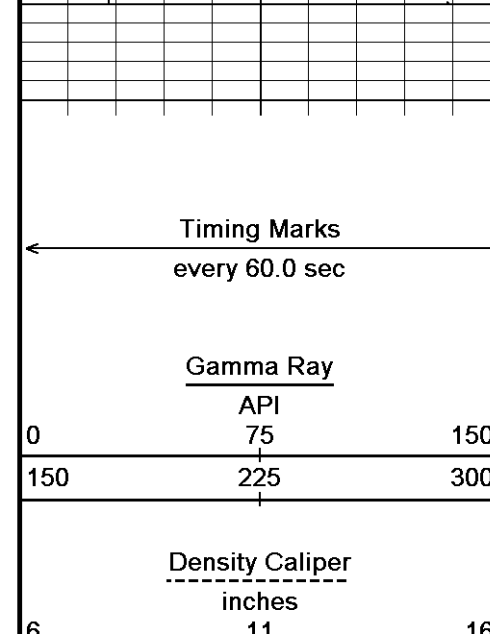
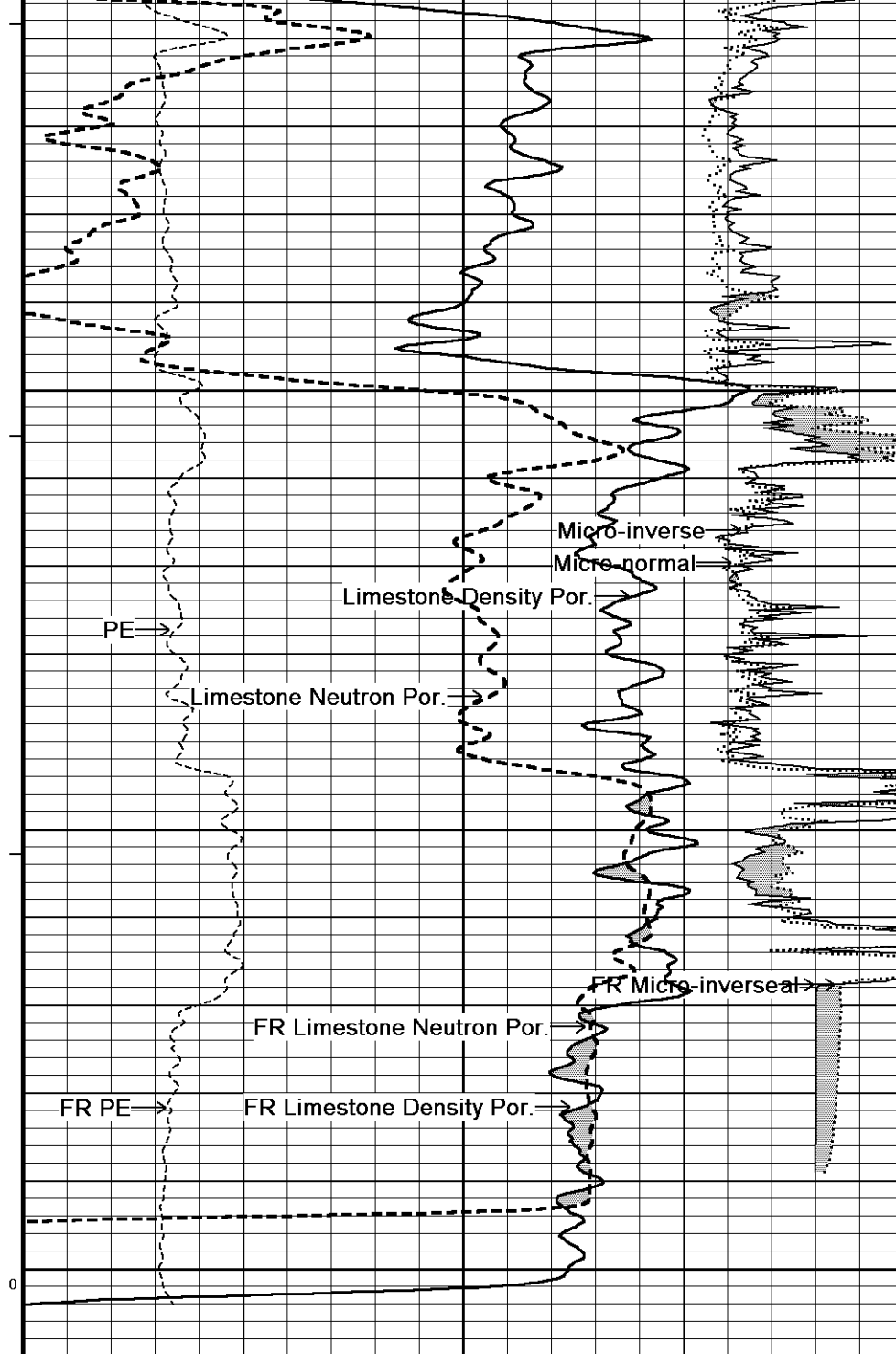
117°

5150

5200

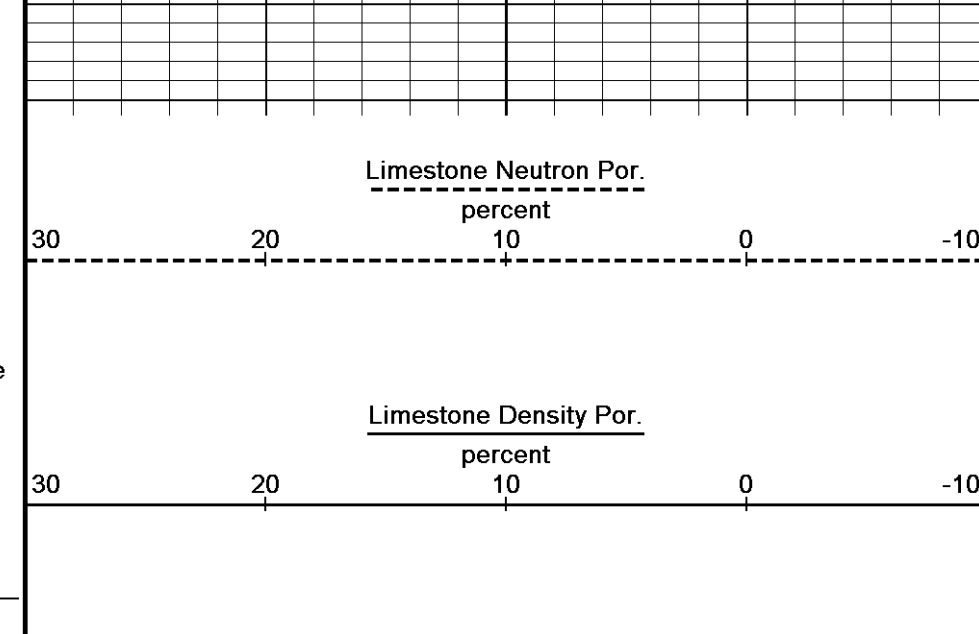
5220

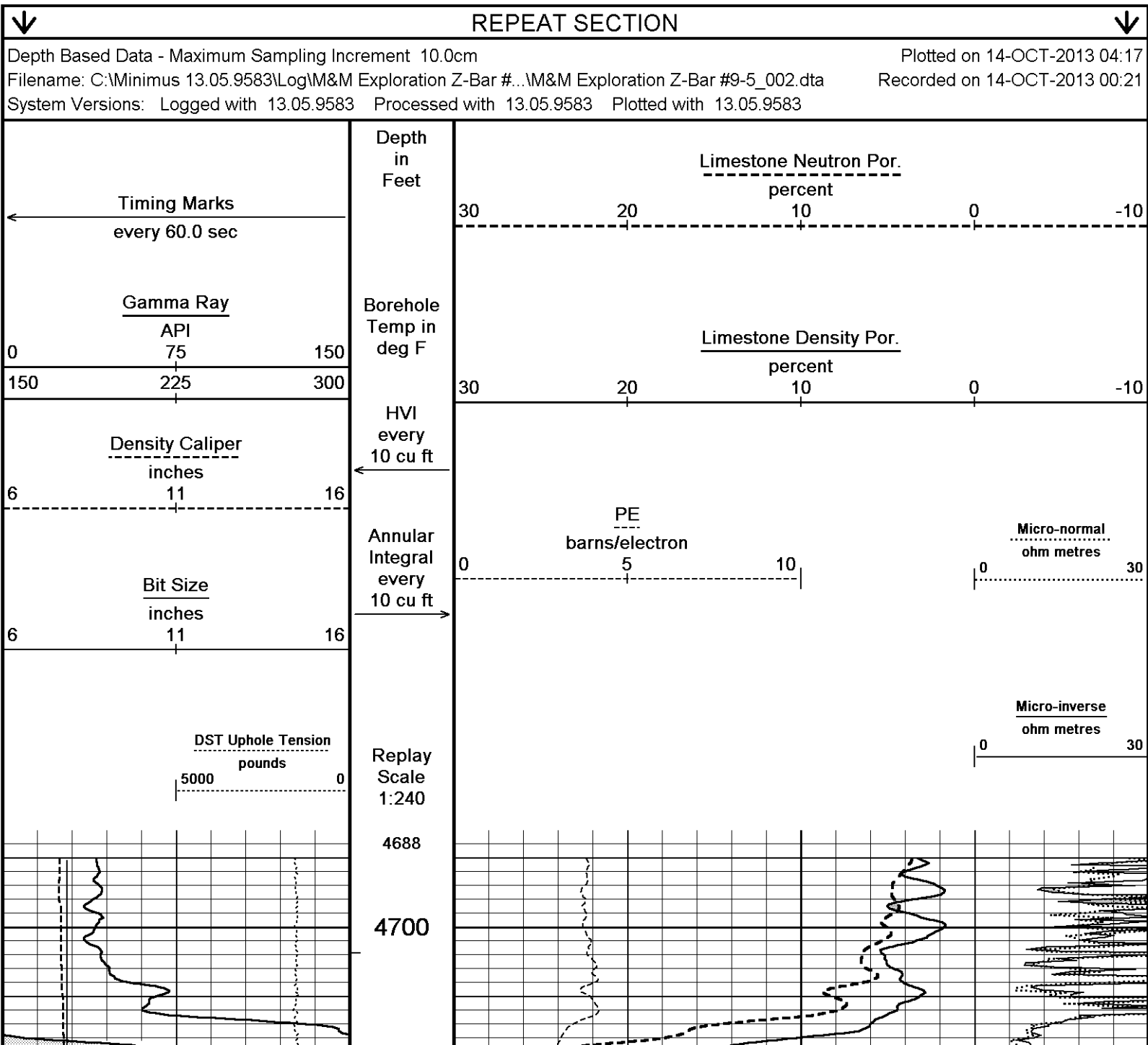
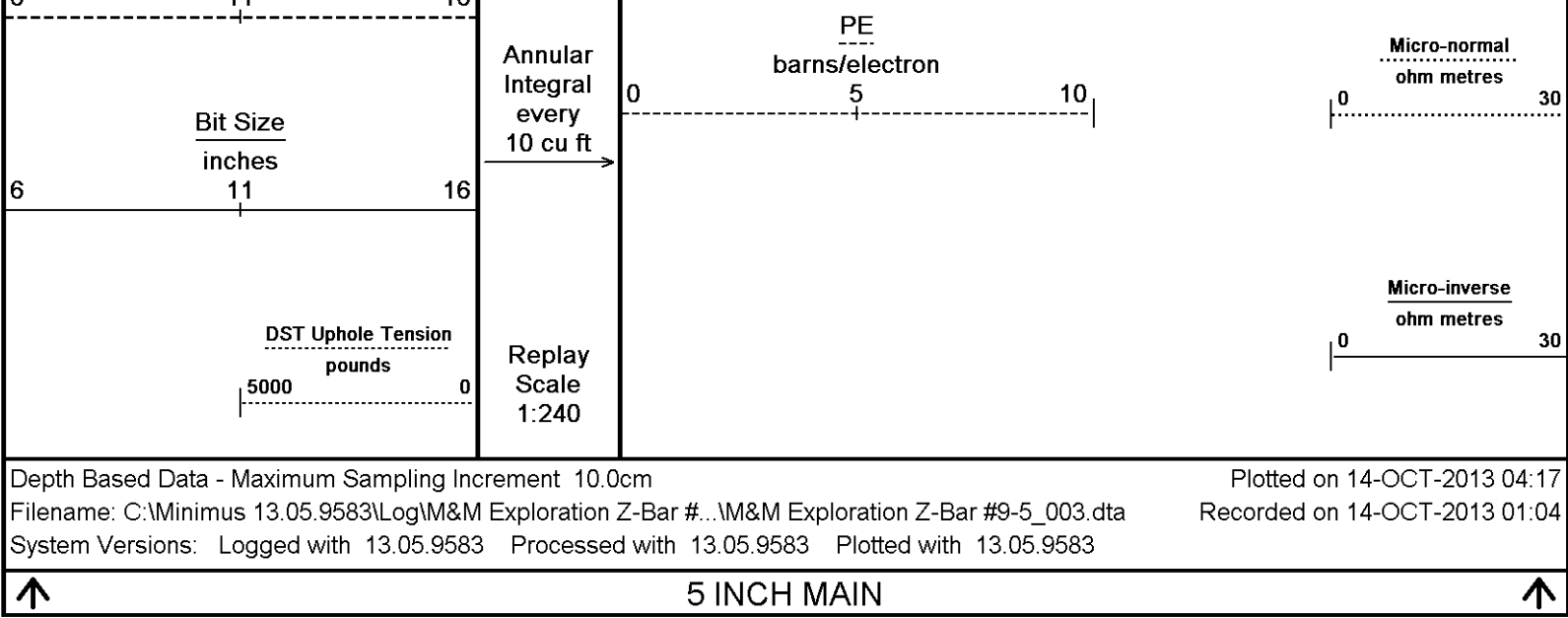
Depth In Feet

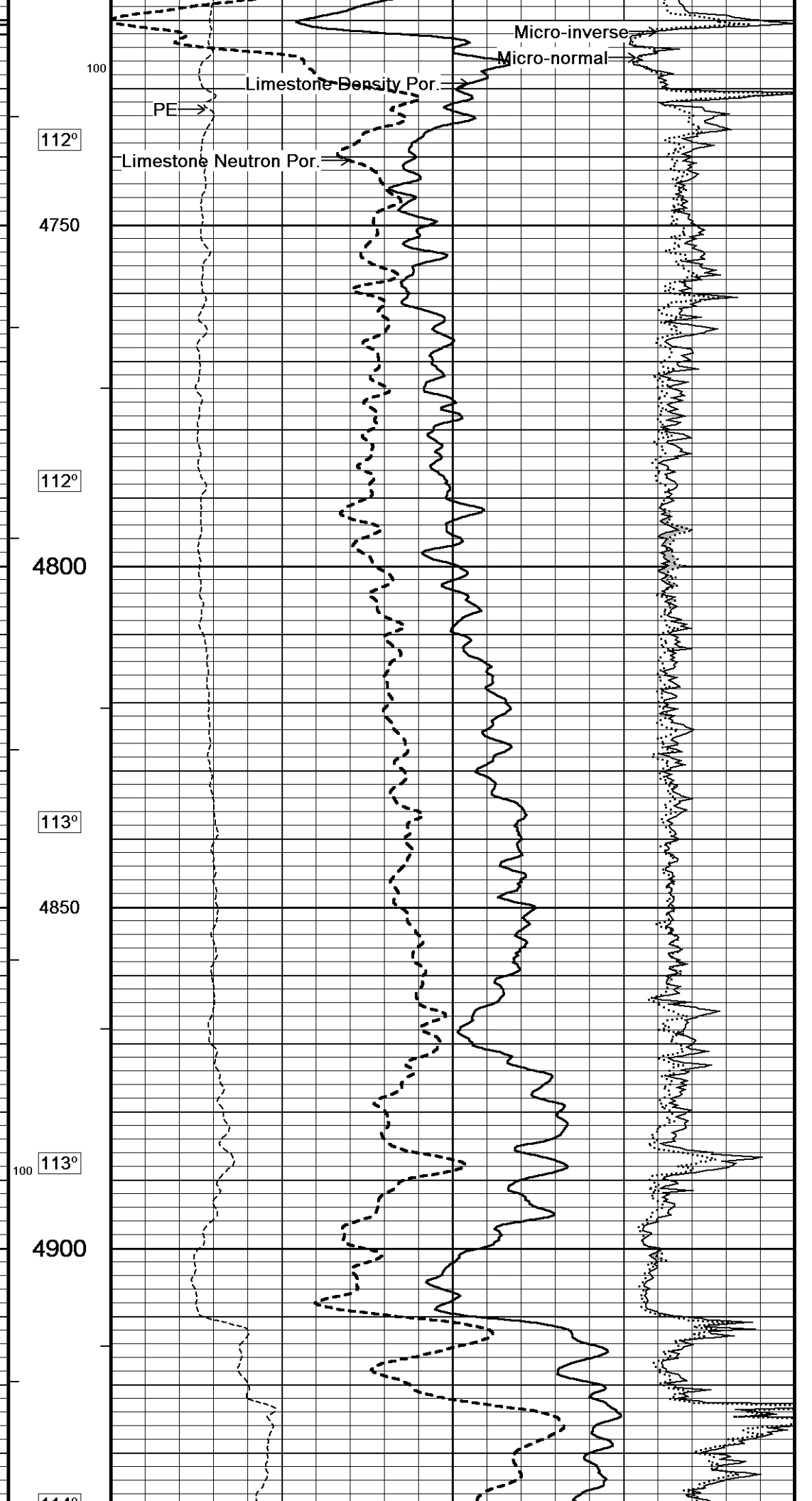
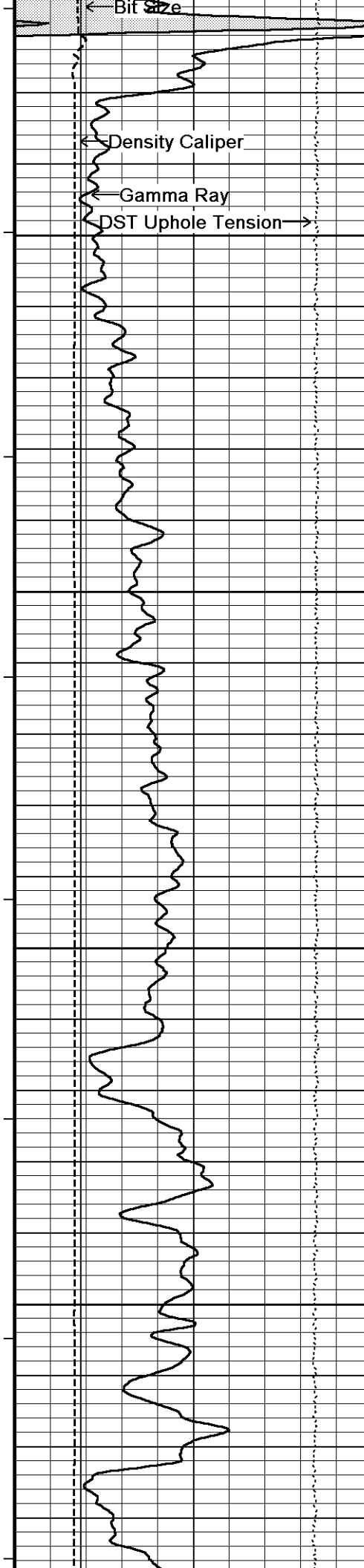


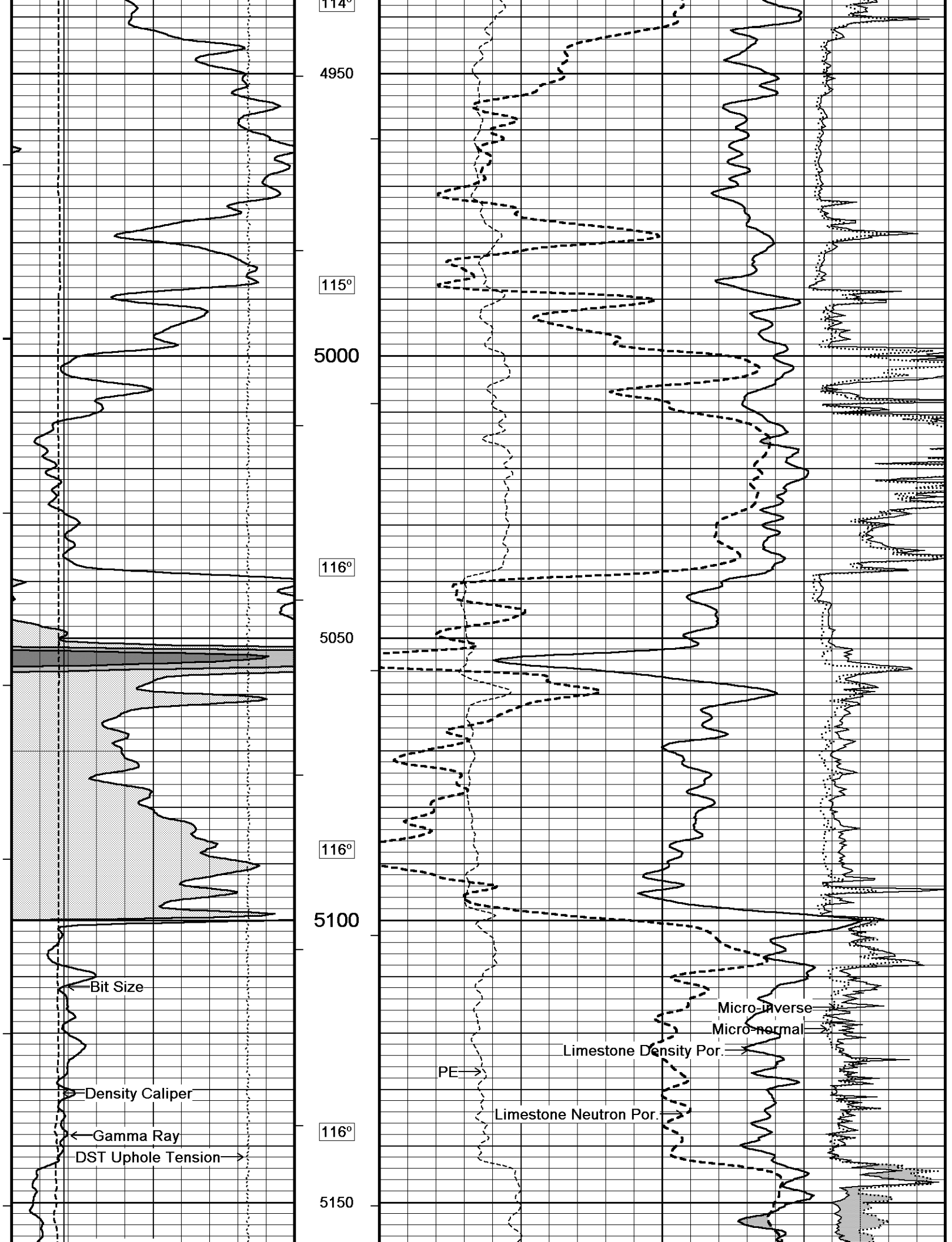
Borehole Temp in deg F

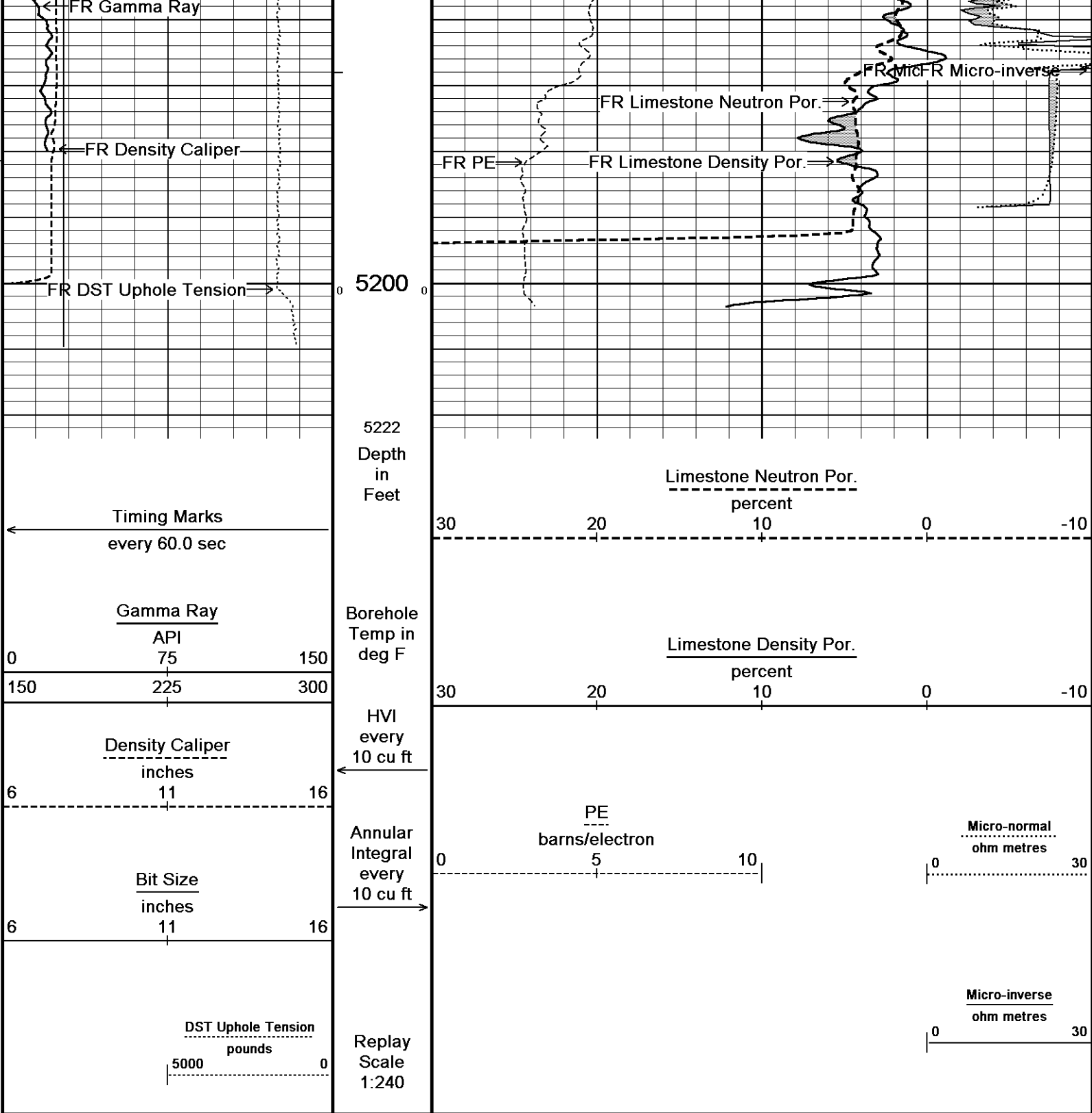
HVI every 10 cu ft











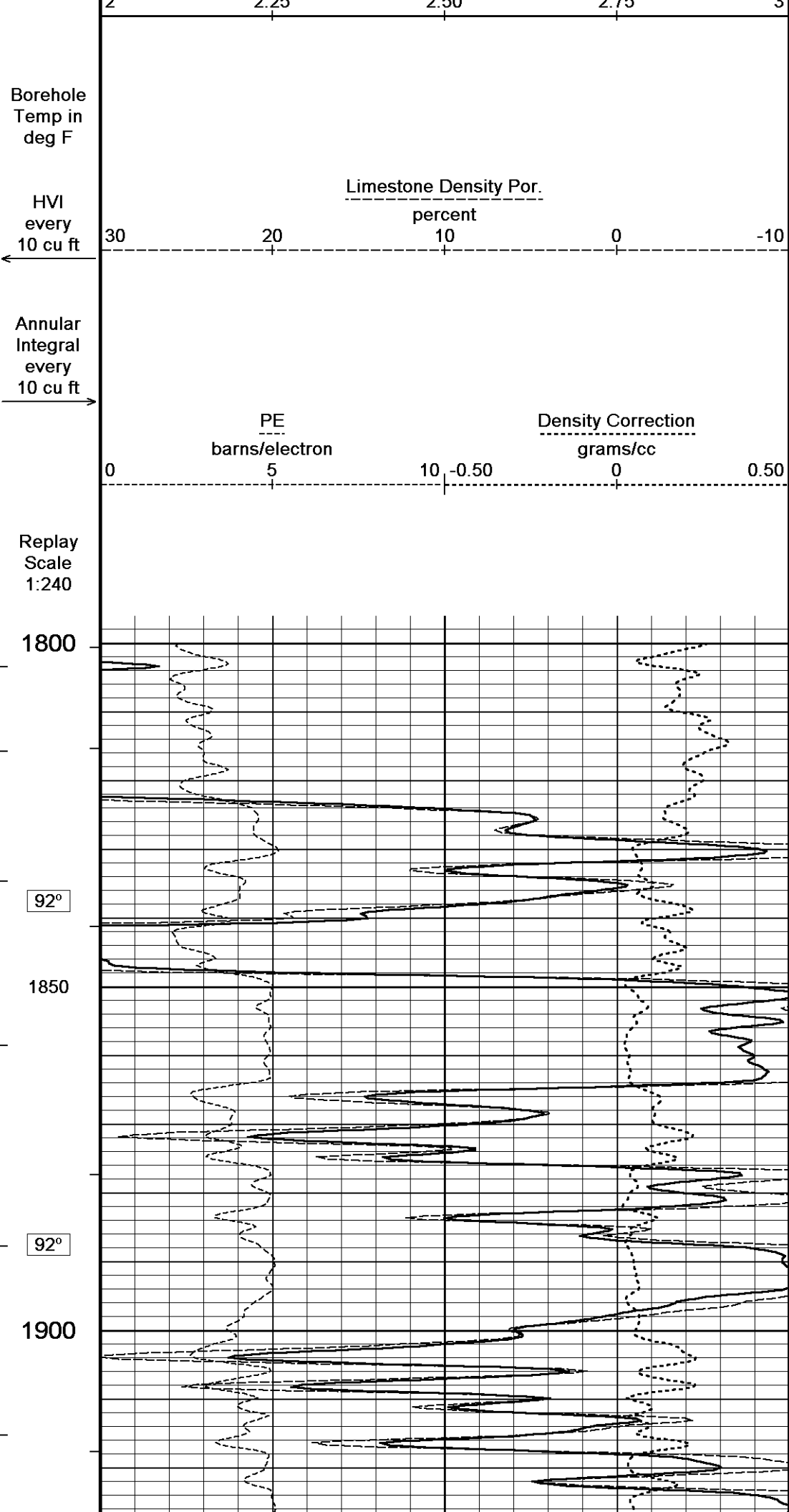
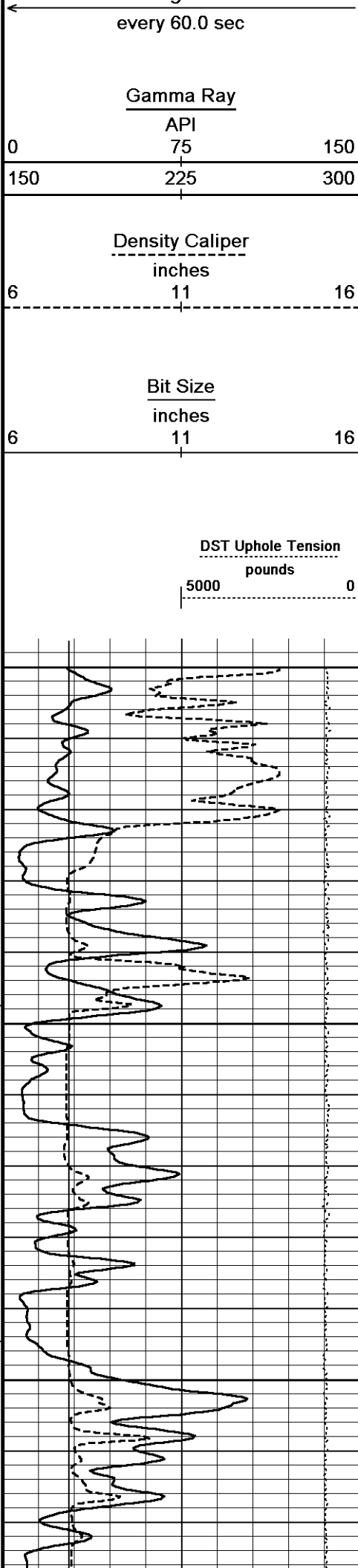
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.05.9583\Log\M&M Exploration Z-Bar #...M&M Exploration Z-Bar #9-5_002.dta
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583
Plotted on 14-OCT-2013 04:17
Recorded on 14-OCT-2013 00:21

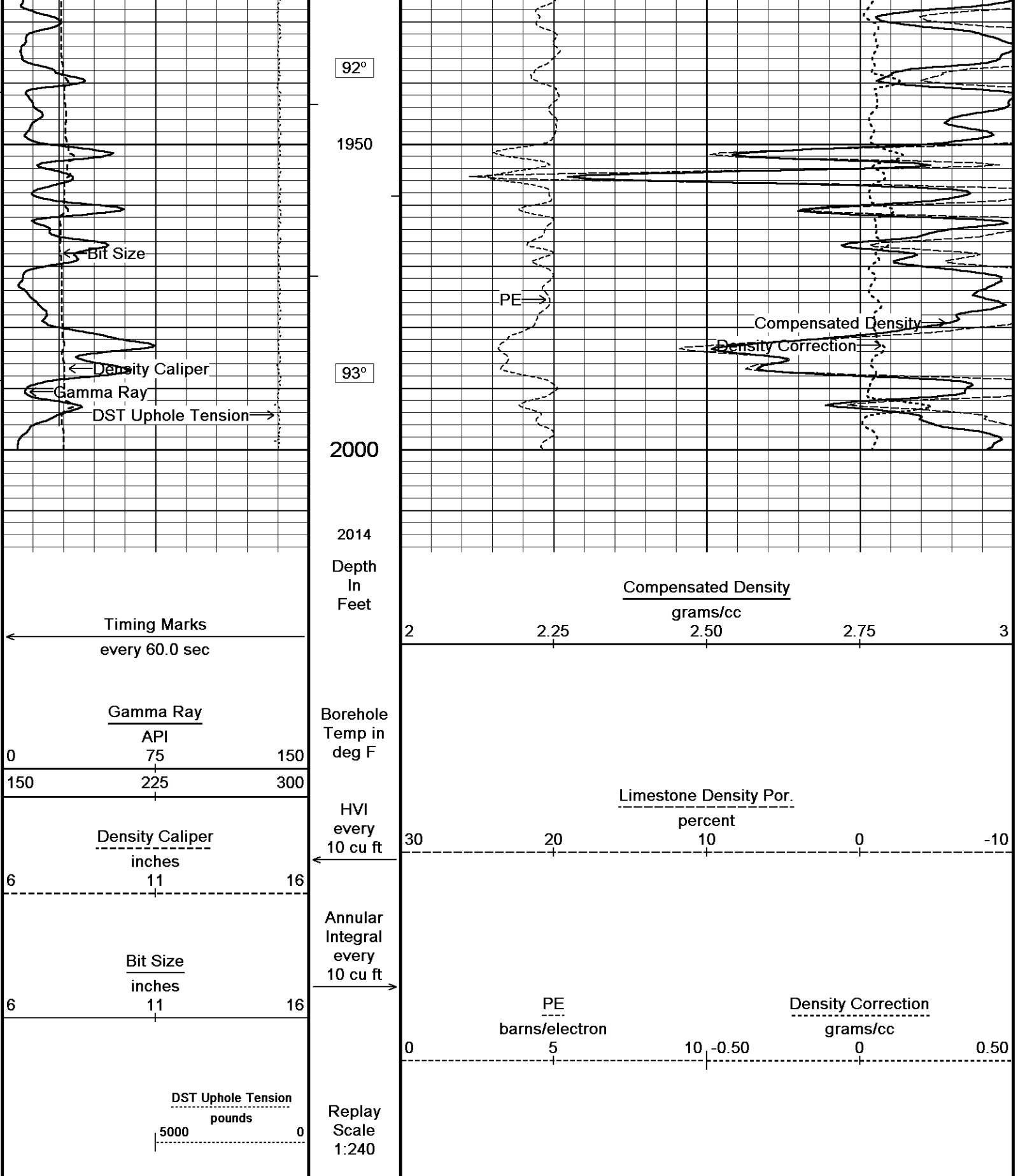
↑ REPEAT SECTION ↑

↓ 5 INCH MAIN ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.05.9583\Log\M&M Exploration Z-Bar #...M&M Exploration Z-Bar #9-5_003.dta
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583
Plotted on 14-OCT-2013 04:17
Recorded on 14-OCT-2013 01:04

Timing Marks		Depth In Feet	Compensated Density grams/cc			
			2	2.25	2.50	2.75





Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 14-OCT-2013 04:17

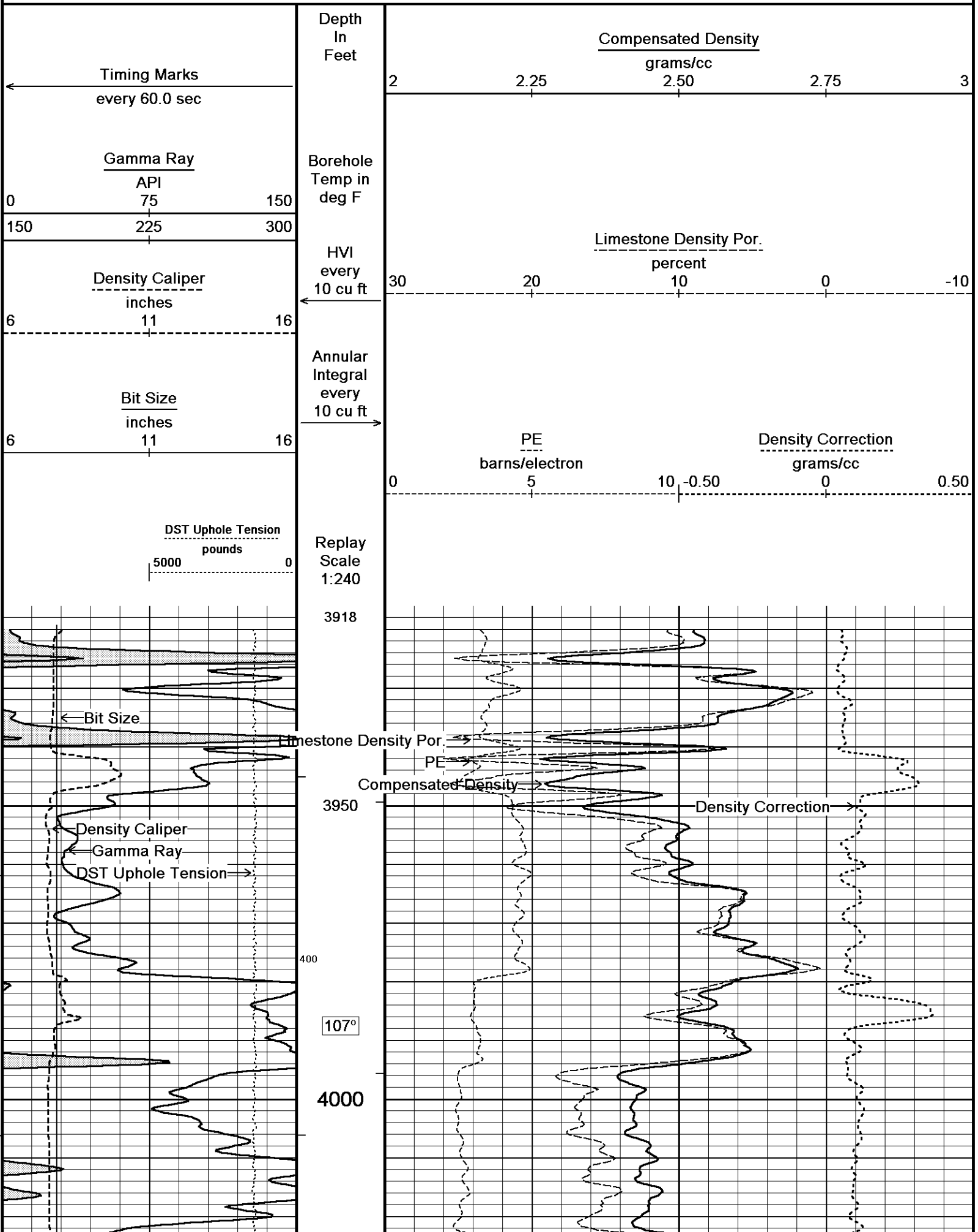
Filename: C:\Minimus 13.05.9583\Log\M&M Exploration Z-Bar #...M&M Exploration Z-Bar #9-5_003.dta

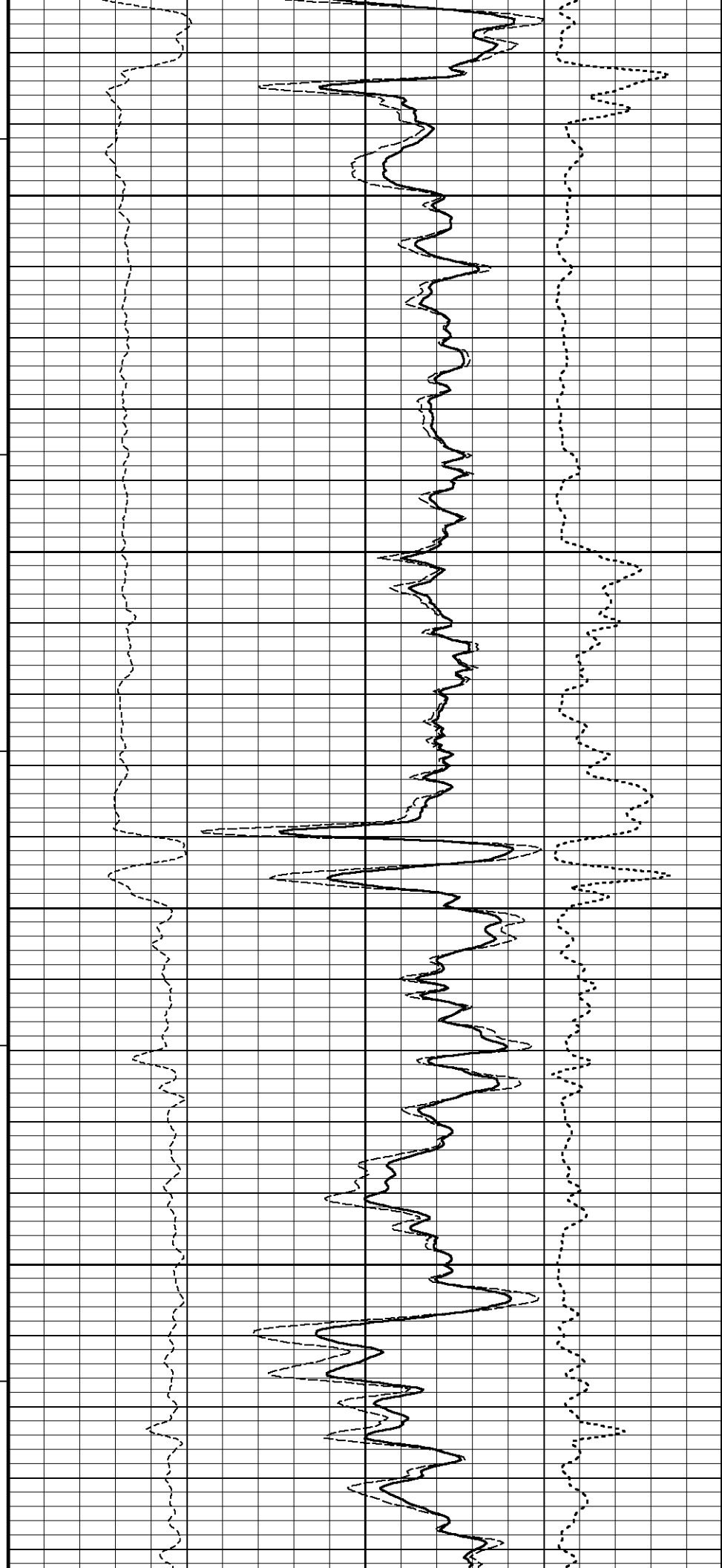
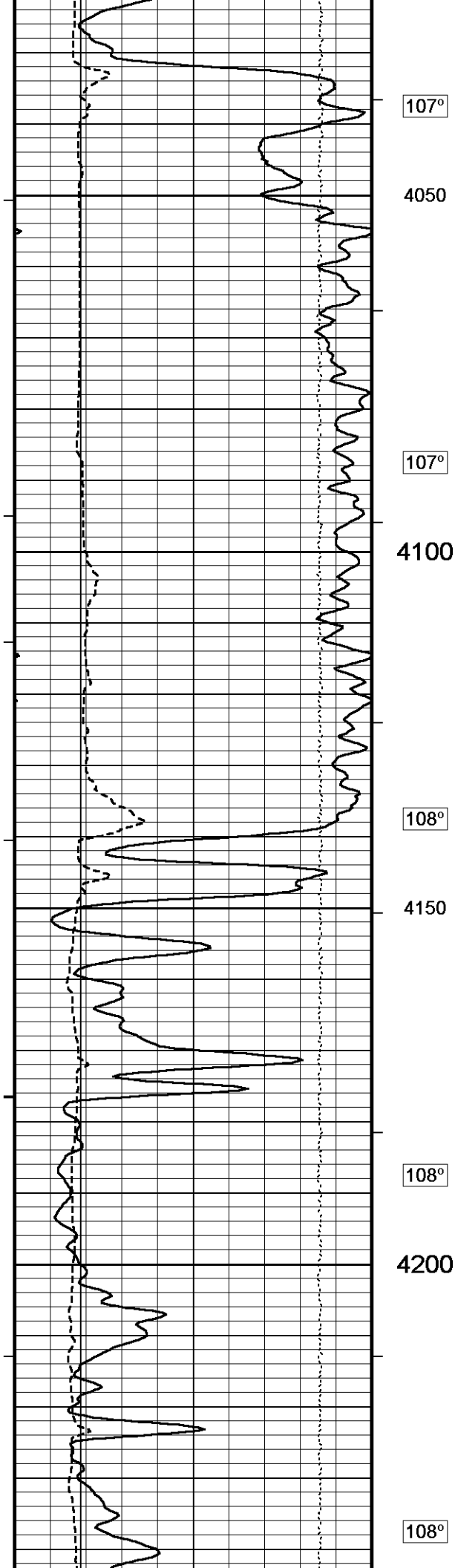
Recorded on 14-OCT-2013 01:04

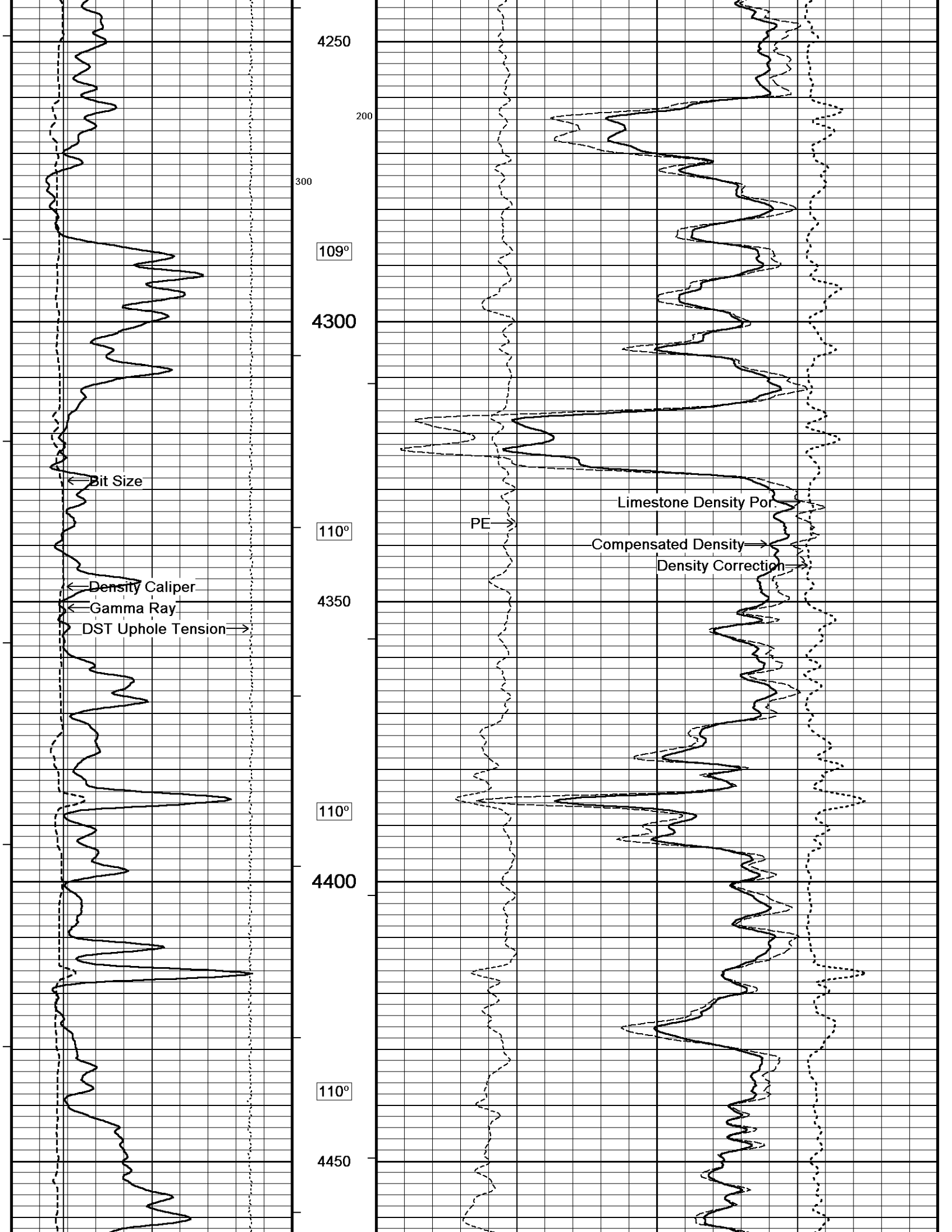
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

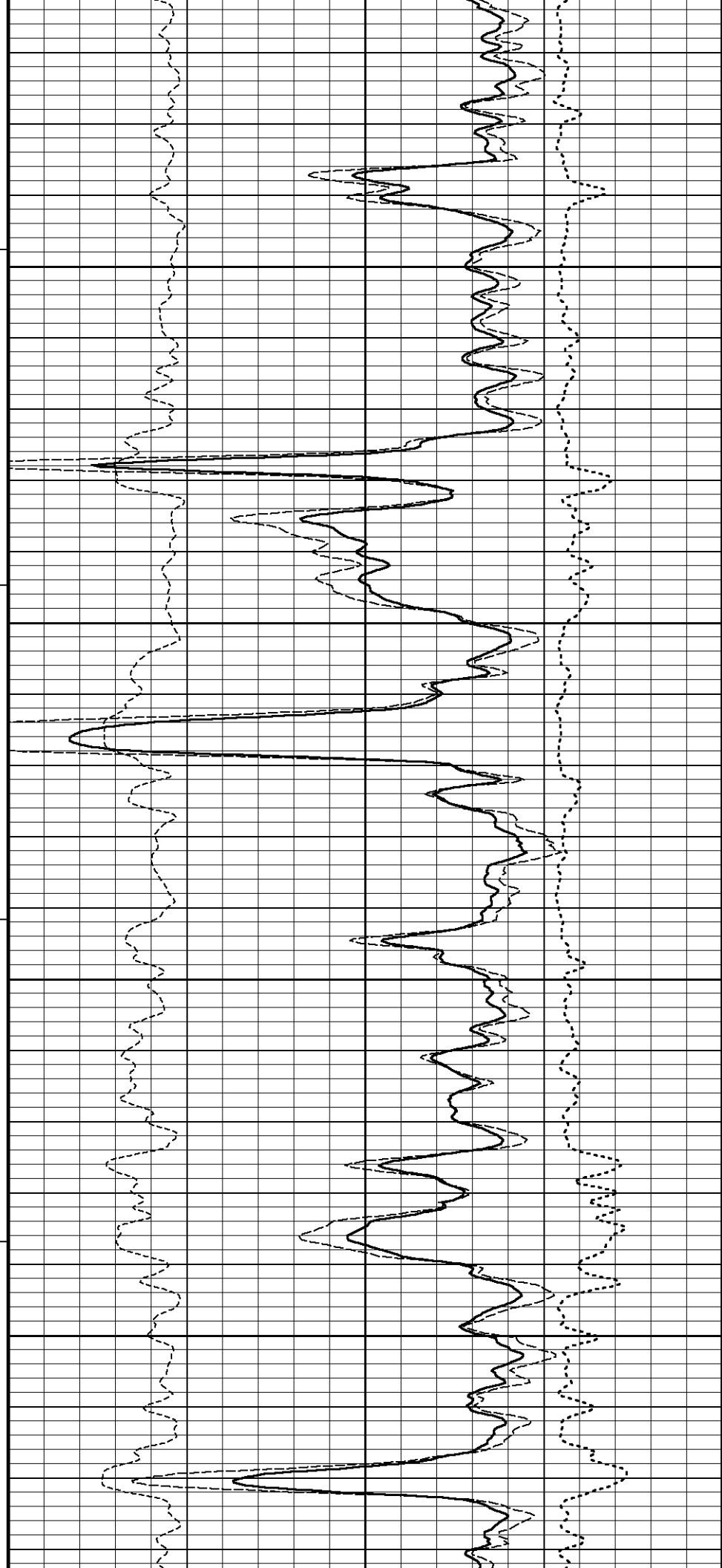
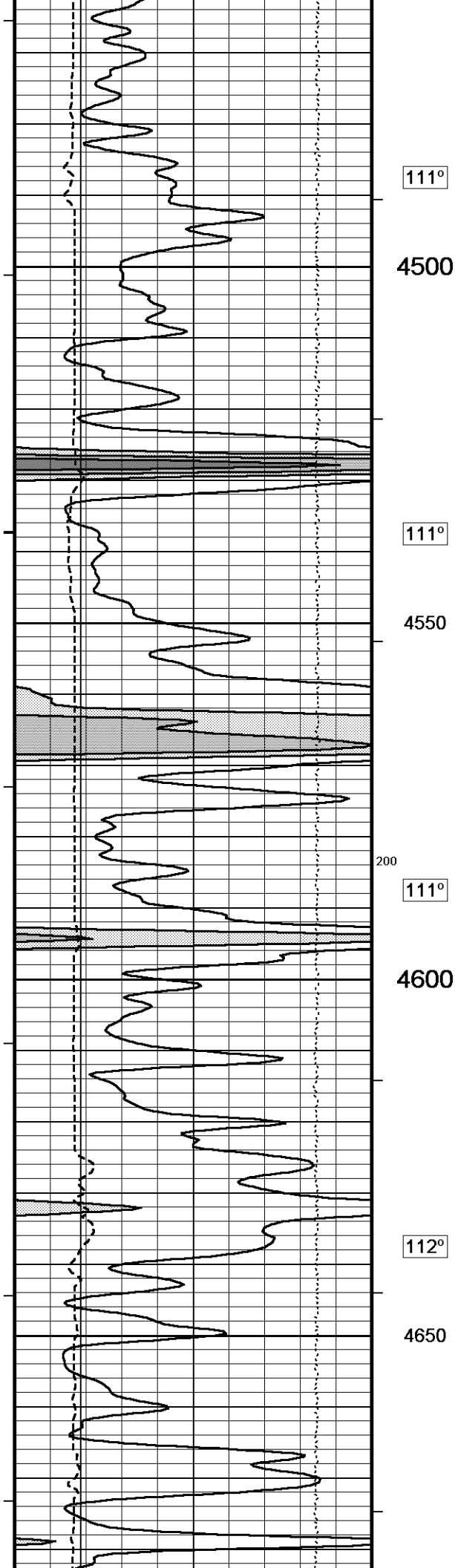
↑ 5 INCH MAIN ↑

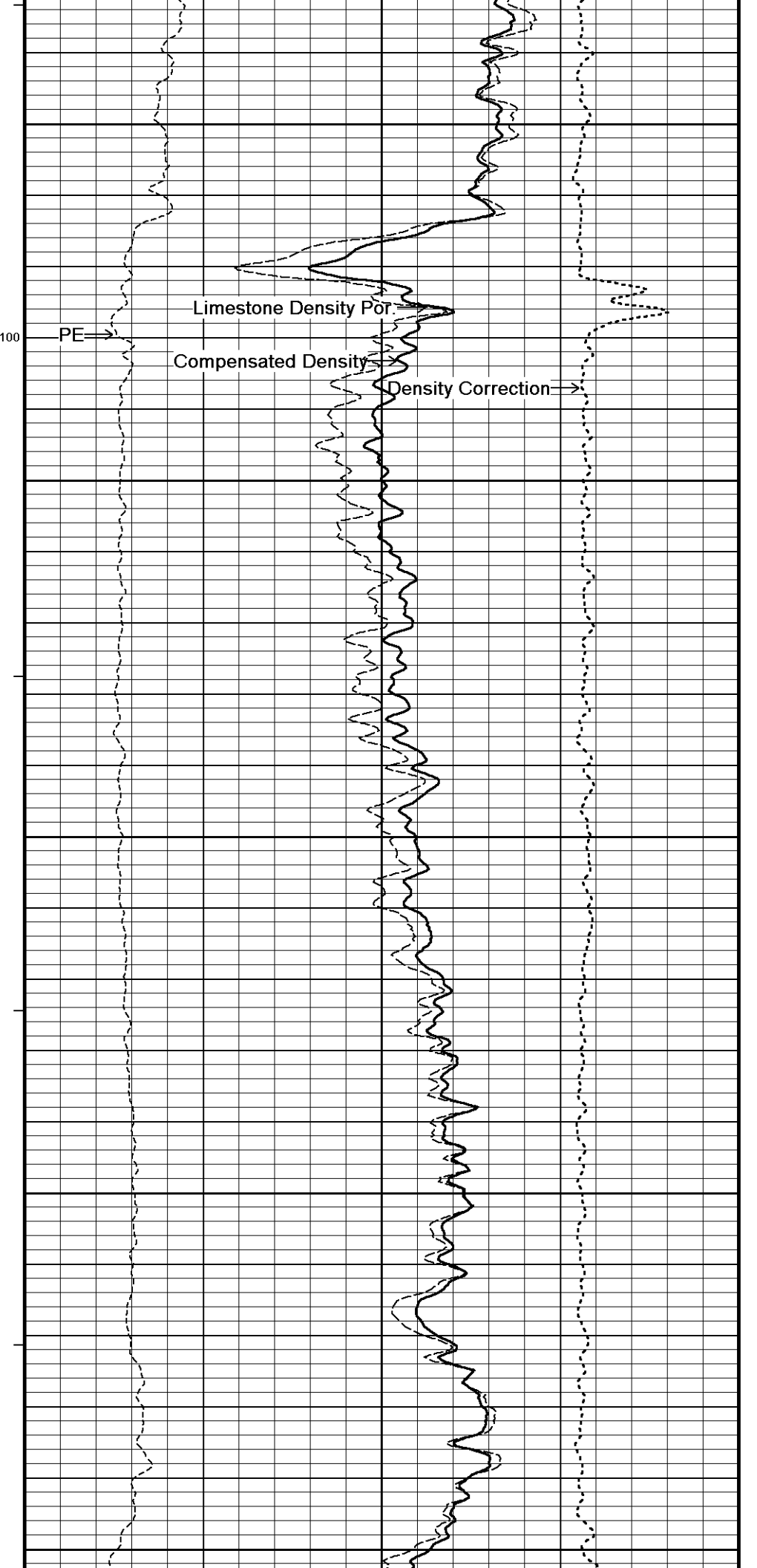
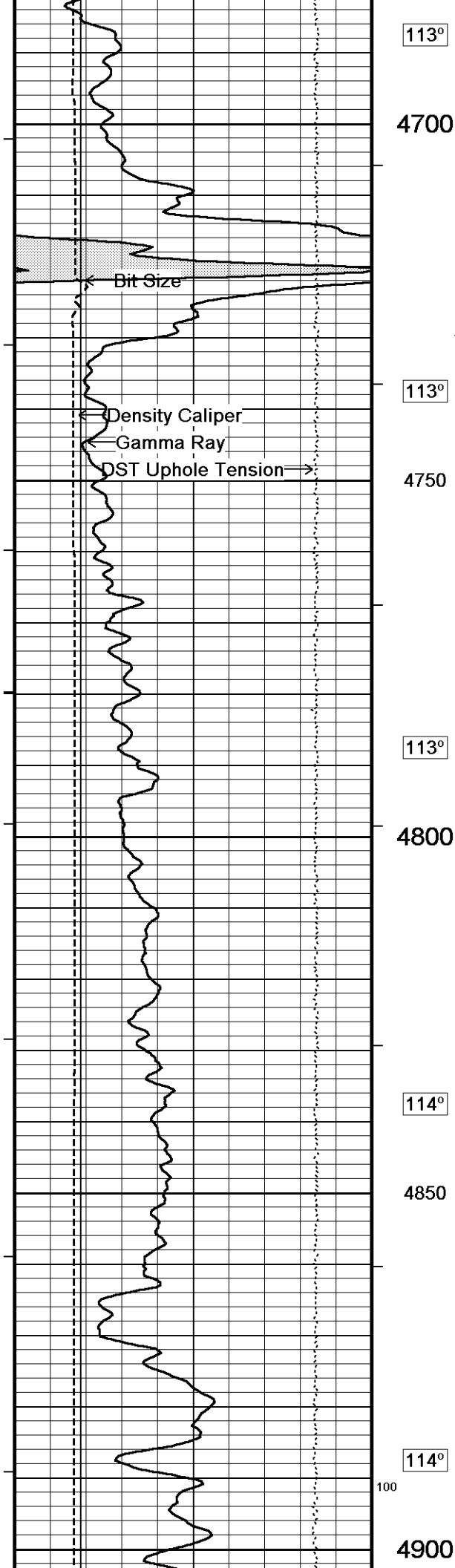
↓ 5 INCH MAIN ↓

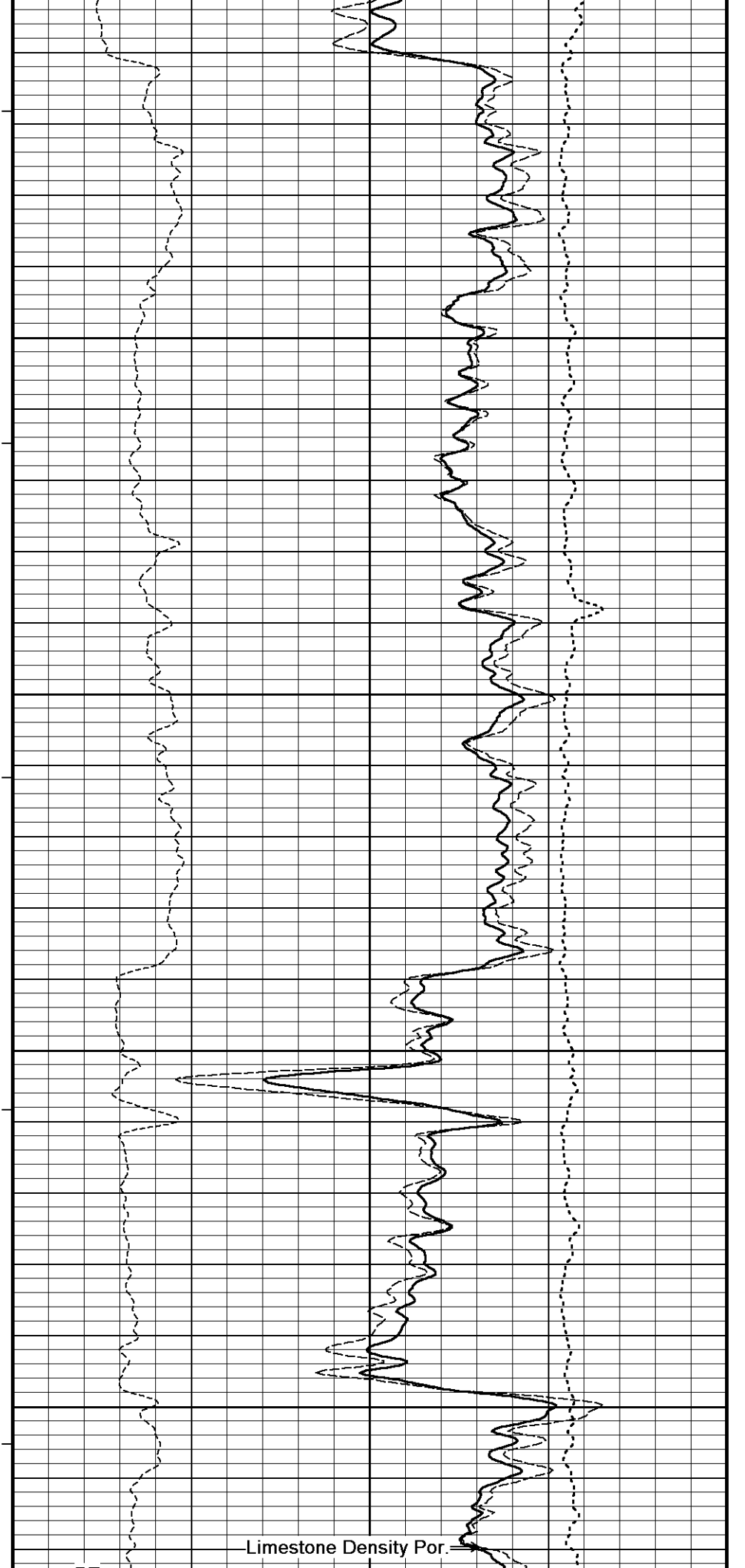
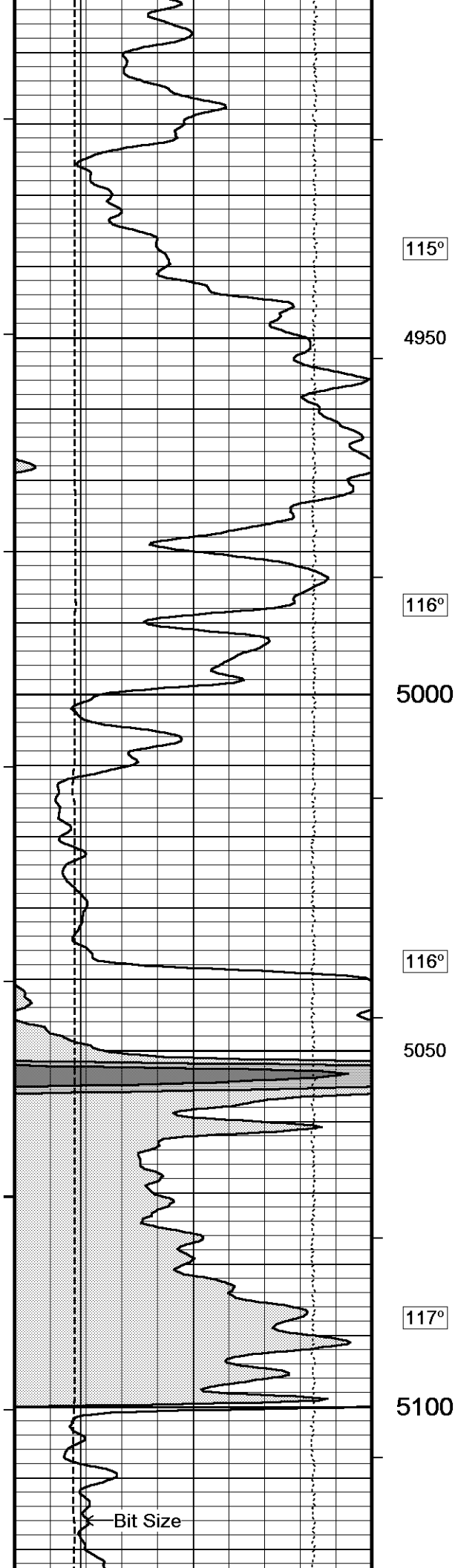


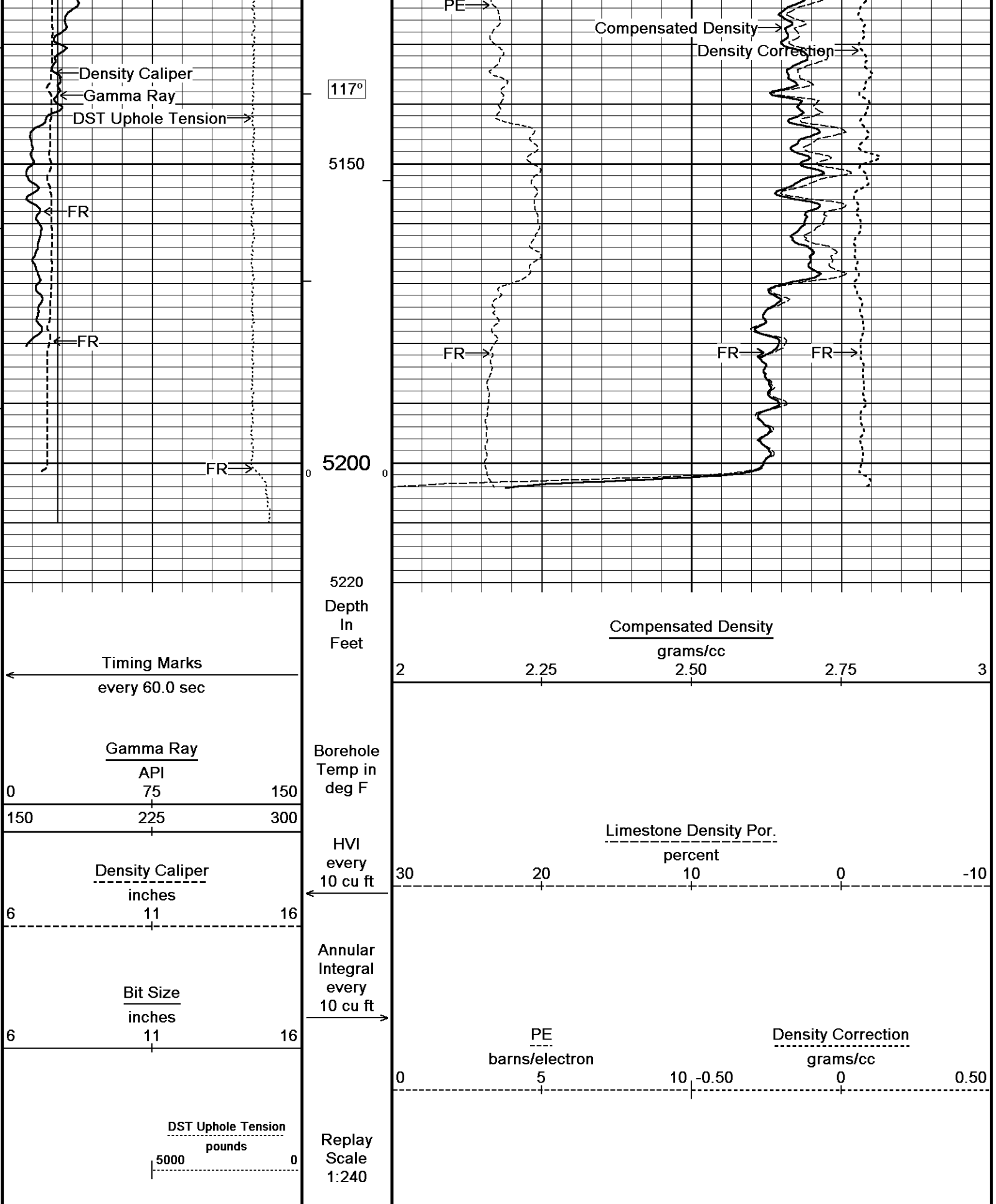














REPEAT SECTION



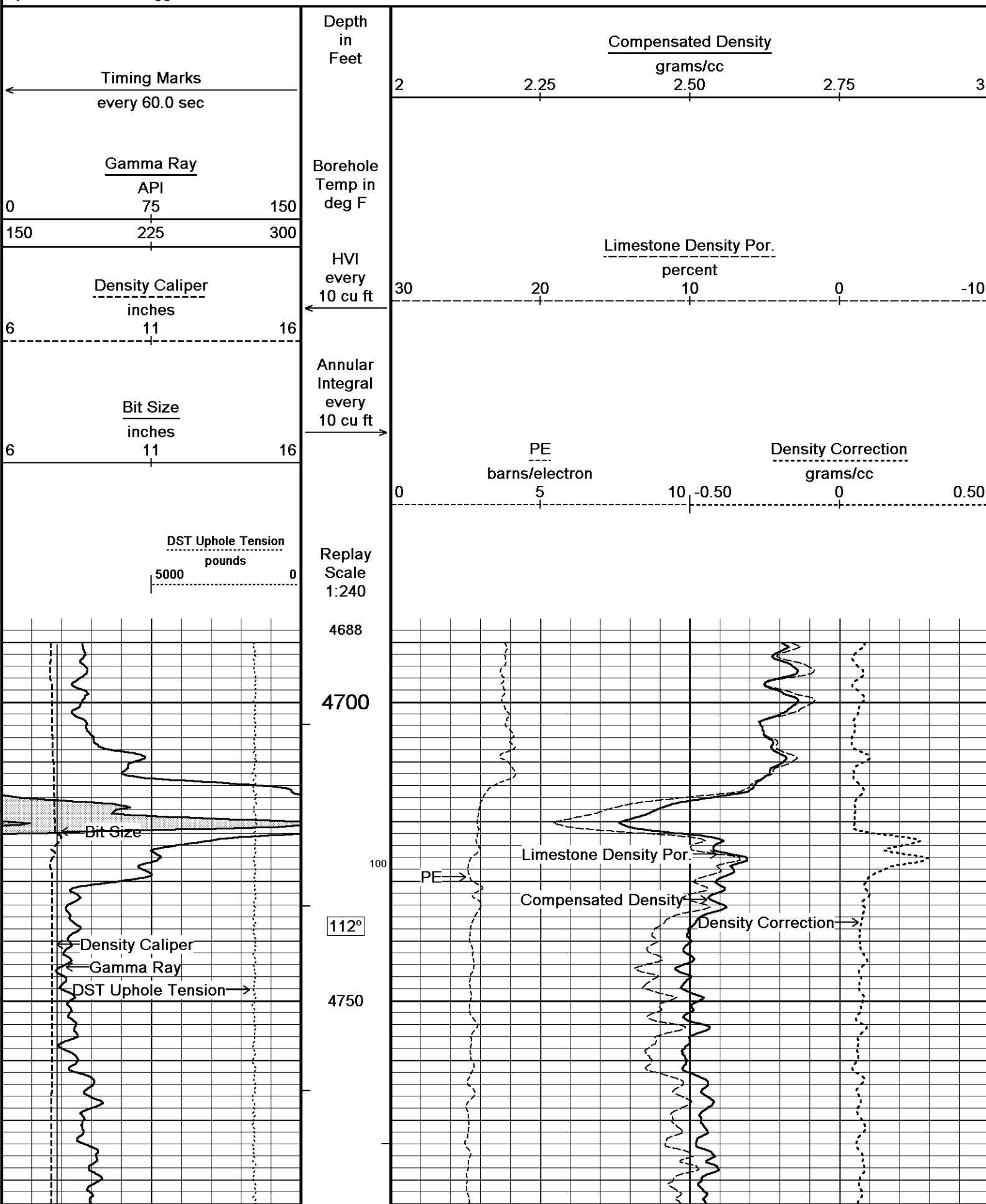
Depth Based Data - Maximum Sampling Increment 10.0cm

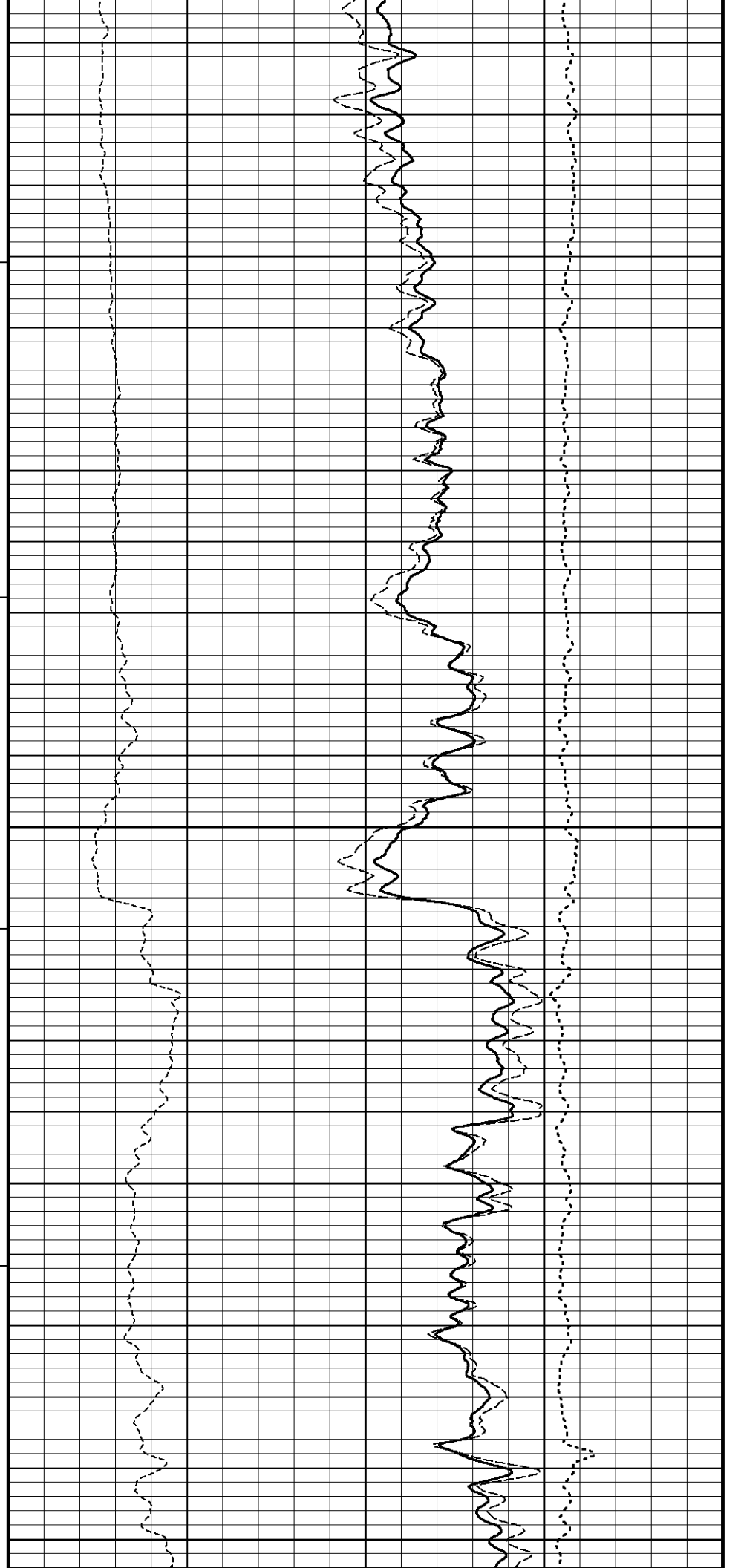
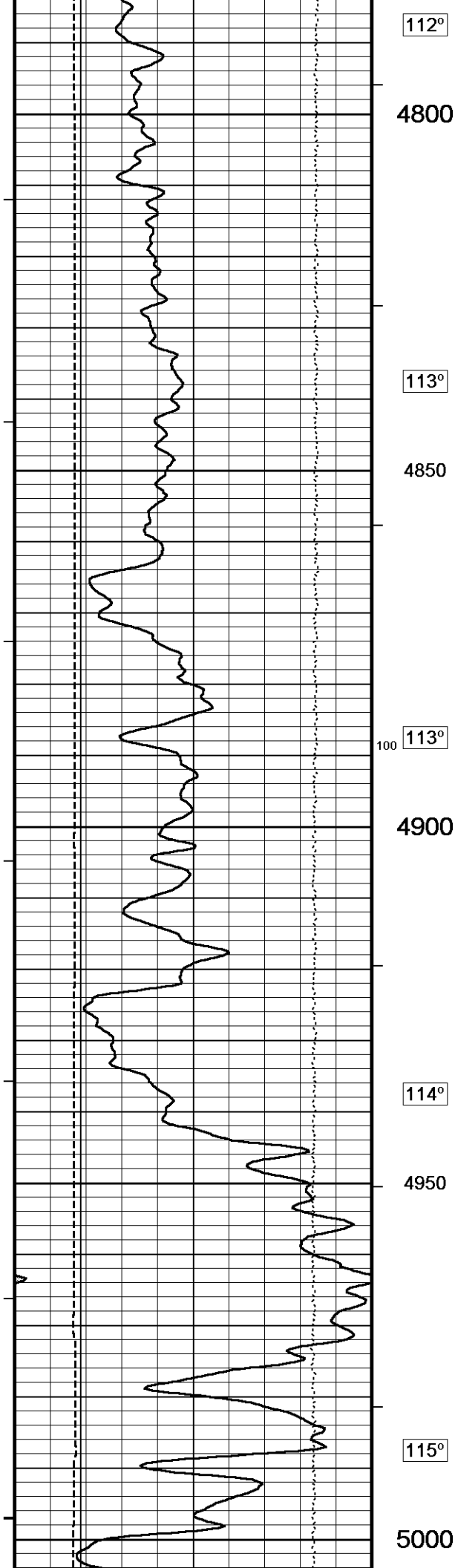
Plotted on 14-OCT-2013 04:17

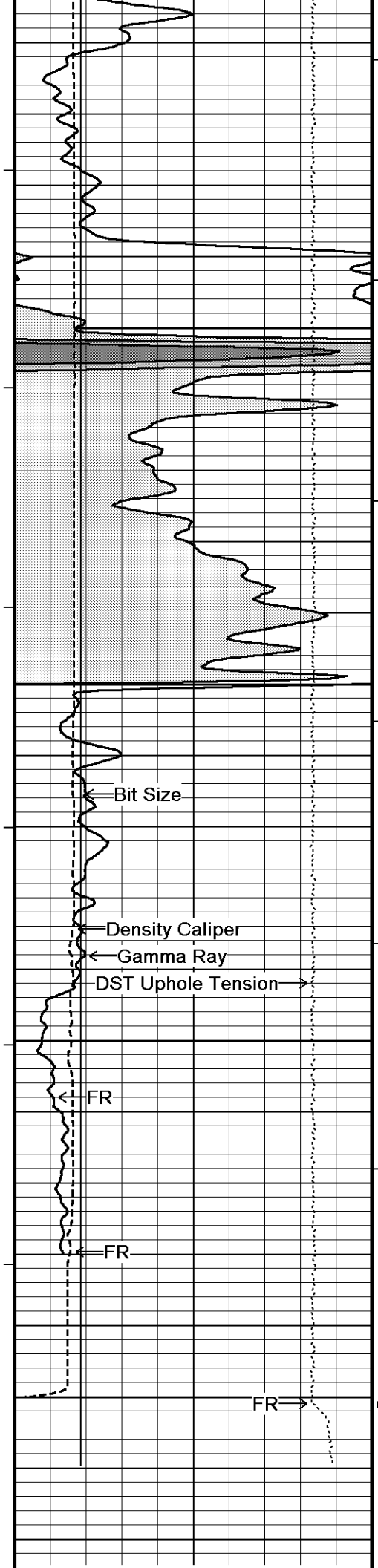
Filename: C:\Minimus 13.05.9583\Log\M&M Exploration Z-Bar #...M&M Exploration Z-Bar #9-5_002.dta

Recorded on 14-OCT-2013 00:21

System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583







116°

5050

116°

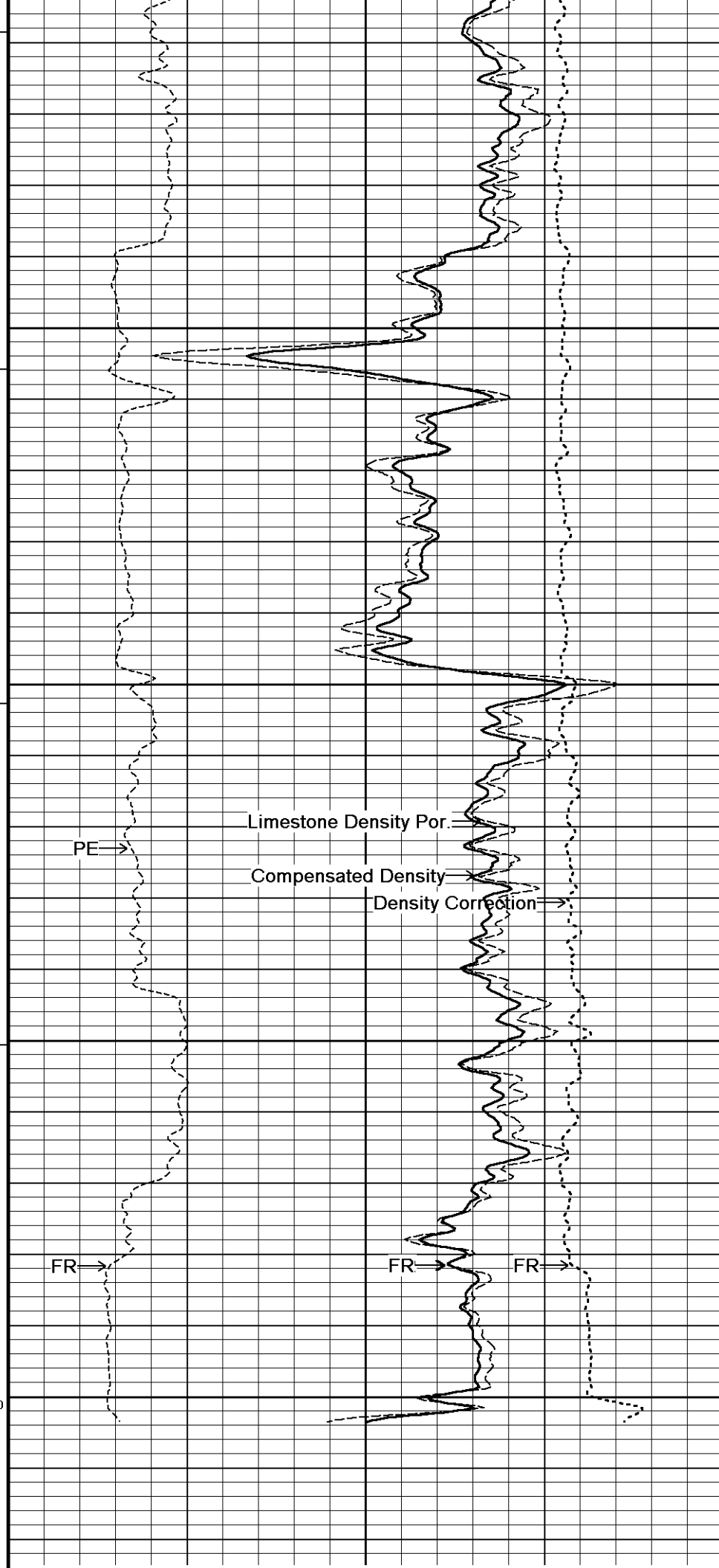
5100

116°

5150

5200

5222



PE

Limestone Density Por.

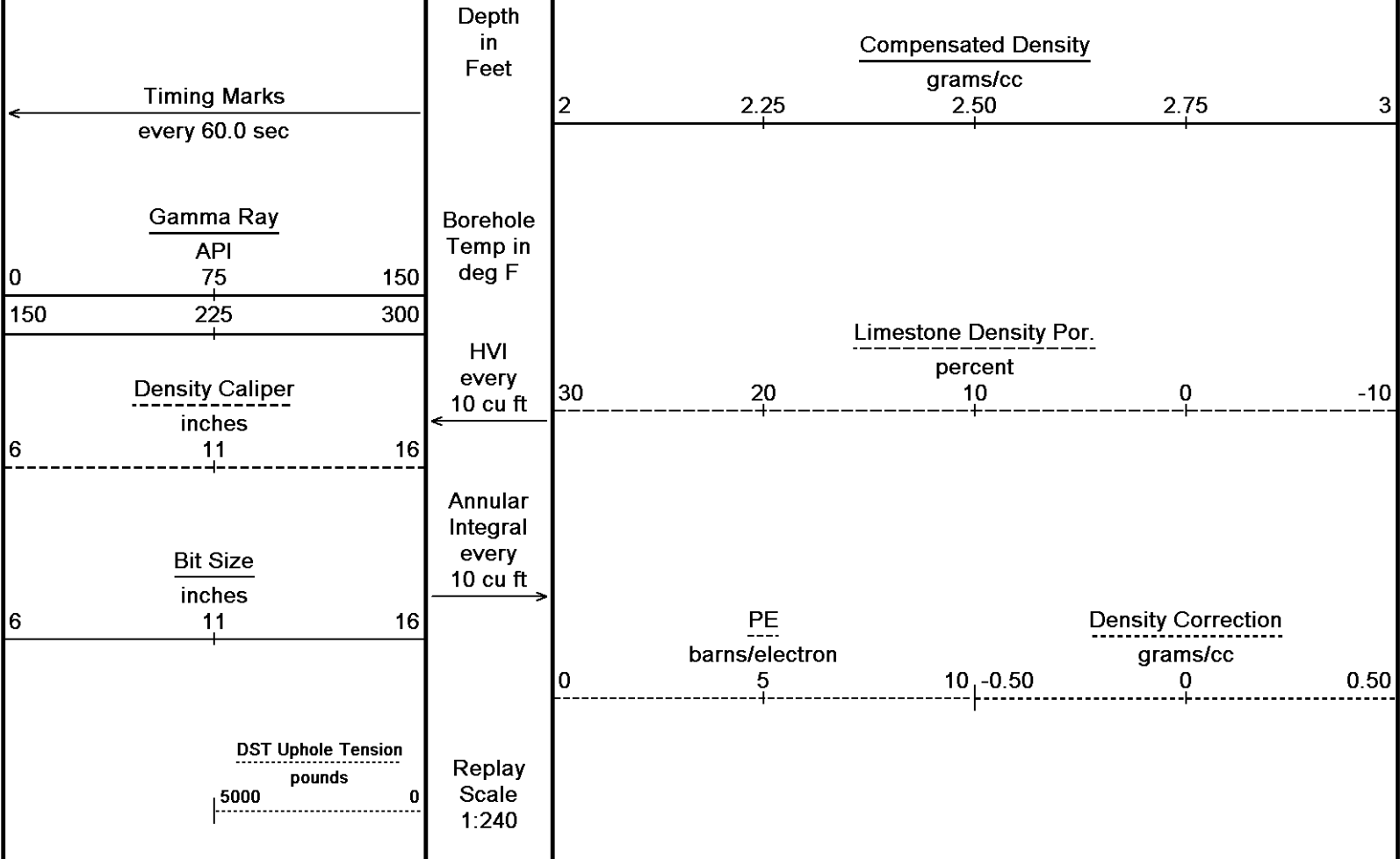
Compensated Density

Density Correction

FR

FR

FR



Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 14-OCT-2013 04:17
 Filename: C:\Minimus 13.05.9583\Log\M&M Exploration Z-Bar #9-5\M&M Exploration Z-Bar #9-5_002.dta Recorded on 14-OCT-2013 00:21
 System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION		
C:\Minimus 13.05.9583\Log\M&M Exploration Z-Bar #9-5\M&M Exploration Z-Bar #9-5_003.dta		
General Constants All 000		Last Edited on 13-OCT-2013,23:15
General Parameters		
Mud Resistivity	1.350	ohm-metres
Mud Resistivity Temperature	75.000	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	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Six Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

Gamma Calibration MCG-D.K 469		Field Calibration on 10-OCT-2013 10:26
	Measured	Calibrated (API)
Background	70	48
Calibrator (Gross)	1122	773
Calibrator (Net)	1052	725

Gamma Constants MCG-D.K 469			Last Edited on 13-OCT-2013,22:25
Gamma Calibrator Number	GRC38		
Mud Density	1.09	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl		kppm	
K Mud Type	Chloride		
K Mud Concentration	0.00	%	

High Resolution Temperature Calibration MCG-D.K 469			Field Calibration on 18-AUG-2013,02:35
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	100.00	100.00	

High Resolution Temperature Constants MCG-D.K 469			Last Edited on 18-AUG-2013,02:35
Pre-filter Length	11		

Caliper Calibration MPD-B 64			Base Calibration on 02-OCT-2013 15:52 Field Calibration on 10-OCT-2013 10:11
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	16381	3.99	
2	25151	5.98	
3	33629	7.97	
4	41918	9.86	
5	51268	11.92	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.12	5.98	

Photo Density Calibration MPD-B 64			Base Calibration on 02-OCT-2013 16:14 Field Check on 10-OCT-2013 10:08
Density Calibration			
Base Calibration			
	Measured	Calibrated (sdu)	
	Near	Far	Near
Reference 1	60377	33815	59556
Reference 2	25205	2910	24941
Field Check at Base			
	1160.4	1343.0	
Field Check			
	1157.1	1346.0	

PE Calibration			
Base Calibration			
	Measured	Calibrated	
	WS	WH	Ratio
Background	209	1031	
Reference 1	22936	60176	0.384
Reference 2	6851	25064	0.276
Field Check at Base			
	209.0	1030.6	
Field Check			
	208.2	1029.8	

Density Constants MPD-B 64			Last Edited on 13-OCT-2013,22:24
Density Source Id	18235B		
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	1.09	gm/cc	
Mud Density 7/4 Multiplier	1.11		

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 13.05.9583\Log\M&M Exploration Z-Bar #9-5\M&M Exploration Z-Bar #9-5_003.dta		
3/8" Triple Cone Cable Head (MCB C A) MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in		
Compact Comms Gamma MCG-D.K 469 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in	42.87 ft 39.96 ft	GRGC - Gamma Ray CGXT - MCG External Temperature
Compact Micro-log MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in	33.24 ft 33.24 ft 34.24 ft	MINV - Micro-inverse MNRL - Micro-normal MLTC - MML Caliper
Compact Neutron MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in	28.45 ft	NPRL - Limestone Neutron Por.
Compact Density/Caliper MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in	21.21 ft 21.21 ft 21.21 ft 19.28 ft 19.28 ft 19.28 ft 19.22 ft	AVOL - Annular volume HVOL - Hole Volume CLDC - Density Caliper DEN - Compensated Density DCOR - Density Correction DPRL - Limestone Density Por. DNDF - DF
Compact Focussed Electric MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in	13.72 ft	FEFE - Shallow FE
Compact Induction MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in	3.34 ft 3.34 ft 3.34 ft 0.23 ft Tool Zero -0.13 ft	R400 - Array Ind. One Res 40 R1A0 - Array Ind. One Res Rt R600 - Array Ind. One Res 60 SPCG - Spontaneous Potential (0.13ft from bottom) SMTU - DST Uphole Tension
Total Length: 49.73 ft Weight: 399.0 lb		All measurements relative to tool zero.

COMPANY	M&M EXPLORATION, INC.
WELL	Z-BAR #9-5
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	UNITED STATES / KANSAS

Elevation Kelly Bushing			1666.00	feet	First Reading			5181.00	feet
Elevation Drill Floor			1664.00	feet	Depth Driller			5200.00	feet
Elevation Ground Level			1656.00	feet	Depth Logger			5201.00	feet



Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG