

Weatherford

COMPACT PHOTO DENSITY COMPENSATED NEUTRON MICRORESISTIVITY LOG

COMPANY

**M&M EXPLORATION, INC.
Z-BAR #32-6**

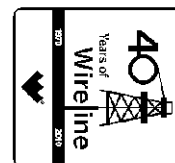
AETNA

BARBER

U.S.A. / KANSAS

2080' FNL & 2420' FWL

NW14



SEC 32	TWP 33S	RGE 14W	Other Services MA/MI/FE
API Number 15-007-23855			
Permit Number			
Permanent Datum G.L., Elevation 1690 feet			Elevations: feet
Log Measured From KB			KB 1702.00
Drilling Measured From KB			DF 1700.00
Drilling Measured From K.B.			GL 1690.00

Date	15-APR-2012			
Run Number	ONE			
Depth Driller	4950.00	feet		
Depth Logger	4956.00	feet		
First Reading	4834.00	feet		
Last Reading	3900.00	feet		
Casing Driller	881.00	feet		
Casing Logger	881.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.20 lb/USg	55.00 CP		
PH / Fluid Loss	10.00	8.40 ml/30Min		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.76 @ 71.0	ohm-m		
Rmf @ Measured Temp	0.61 @ 71.0	ohm-m		
Rmc @ Measured Temp	0.91 @ 71.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.48 @113.0	ohm-m		
Time Since Circulation	4 HOURS			
Max Recorded Temp	113.00	deg F		
Equipment Name	COMPACT			
Equipment / Base	13025	LIB		
Recorded By	L. SCOTT			
Witnessed By	BETH BROCK			
S O # / JOB#	3534636			LB12-094

BOREHOLE RECORD

Last Edited: 16-APR-2012 01:19

Bit Size inches	Depth From feet	Depth To feet
7.875	881.00	4956.00

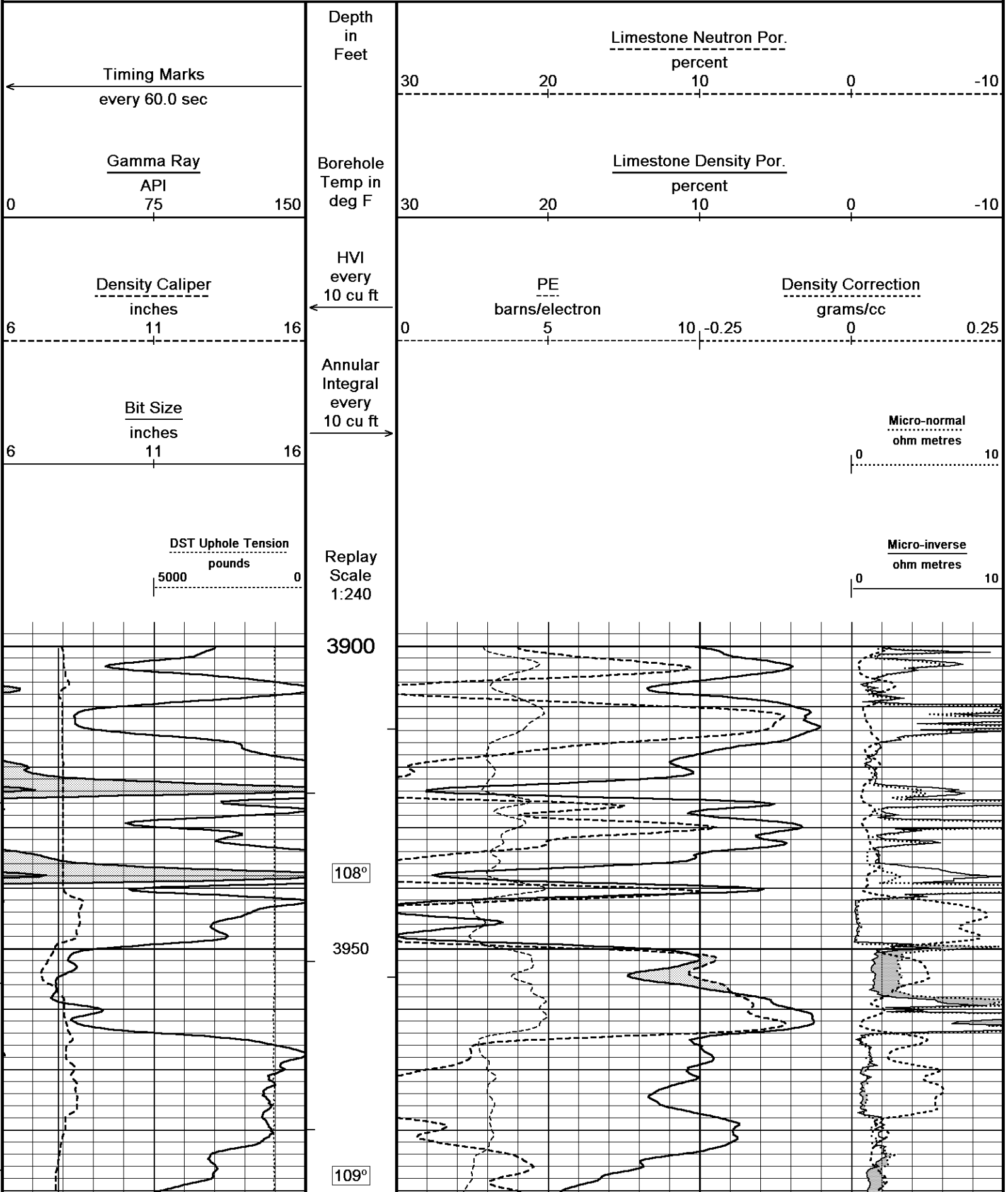
CASING RECORD

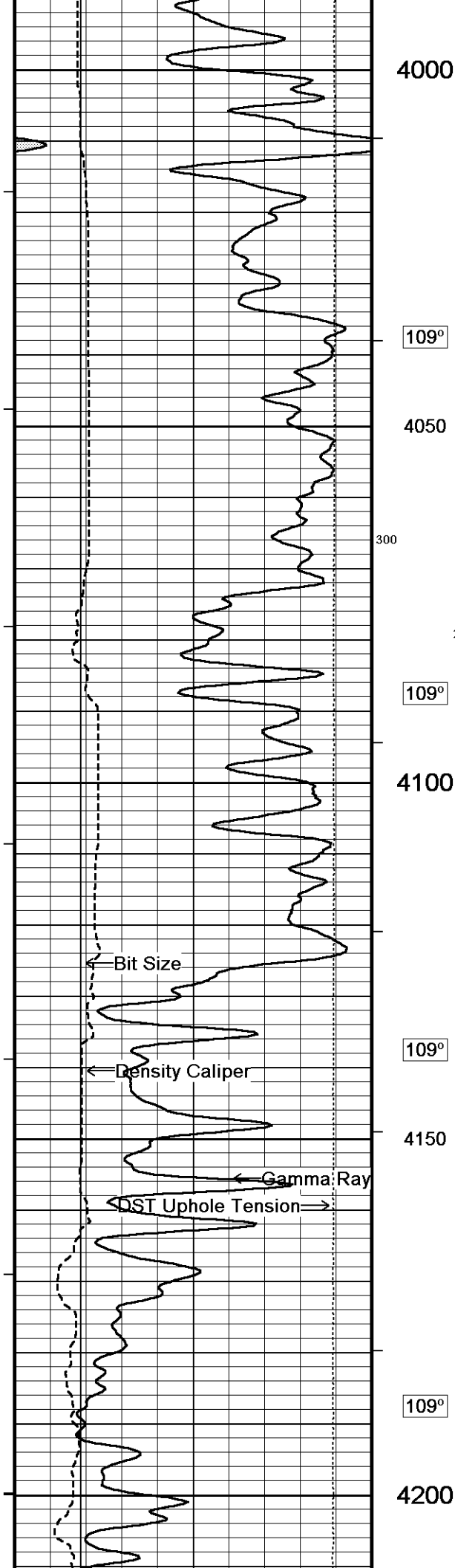
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	13.375	0.00	295.00	48.00
SURFACE	8.625	0.00	881.00	24.00

REMARKS

Tools Run: MAI, MPD, MCG, MDN, MFE, MML, SKJ
Hardware: MPD: 8 inch profile plate used. MAI and MFE: 0.5 inch standoffs used. MDN: Dual Eccentralizer used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Borhole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Annular volume with 4.5 inch production casing= 219 cu. ft.
Total hole volume from TD to Surface casing= 1857 cu. ft.
Service order #3534636
Rig: Southwind #70
Engineer: L. Scott
Operator(s): M. Stegman

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.





4000

109°

4050

300

200

109°

4100

Bit Size

Density Caliper

Gamma Ray

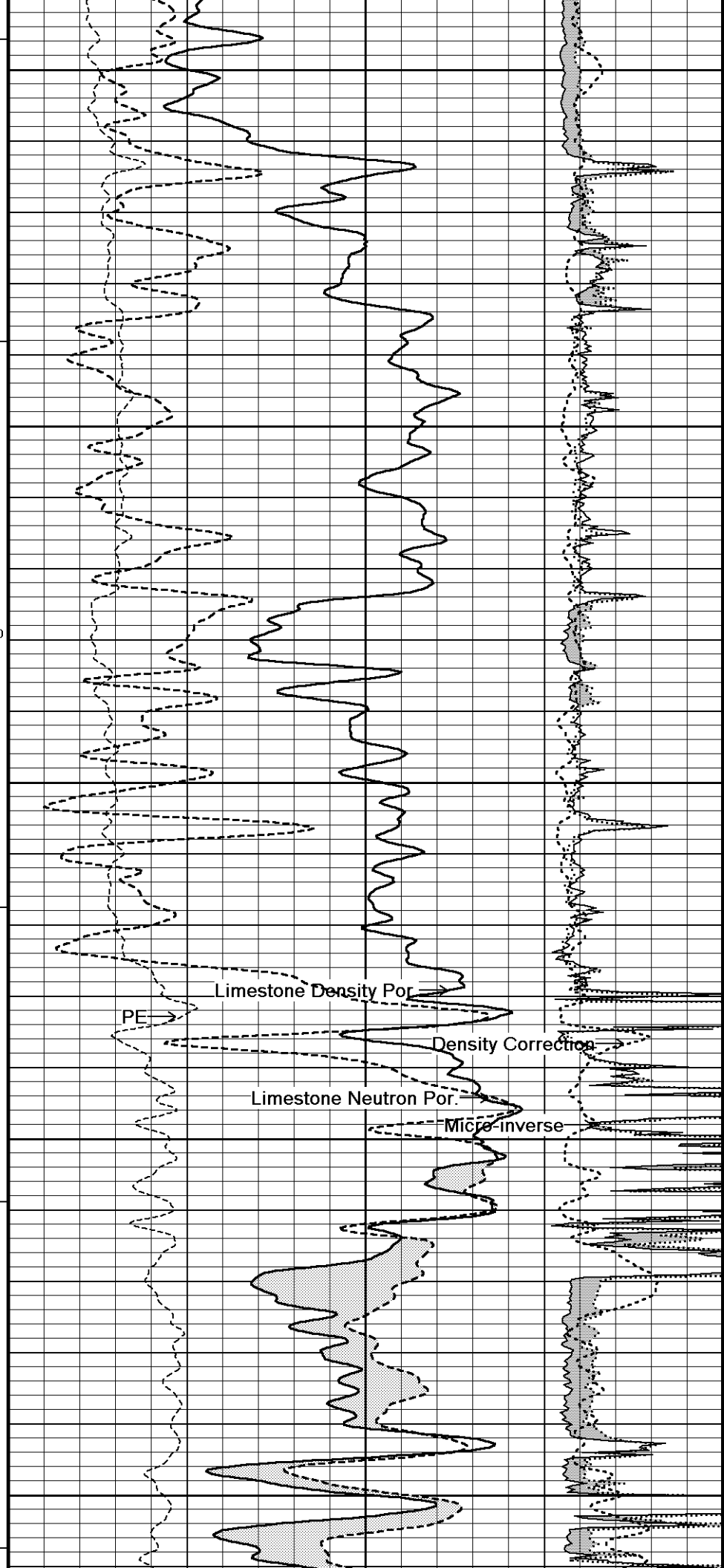
DST Uphole Tension

109°

4150

109°

4200



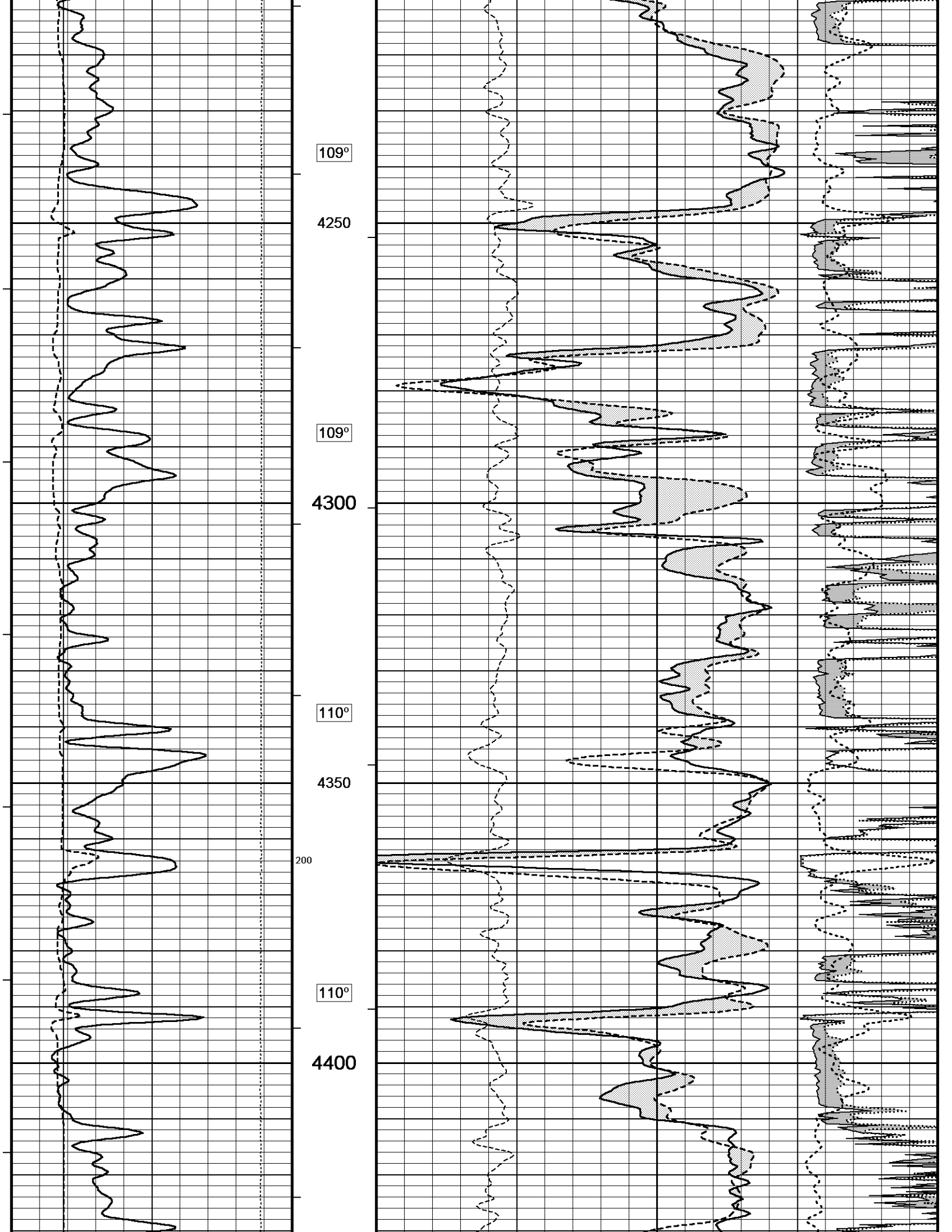
Limestone Density Por.

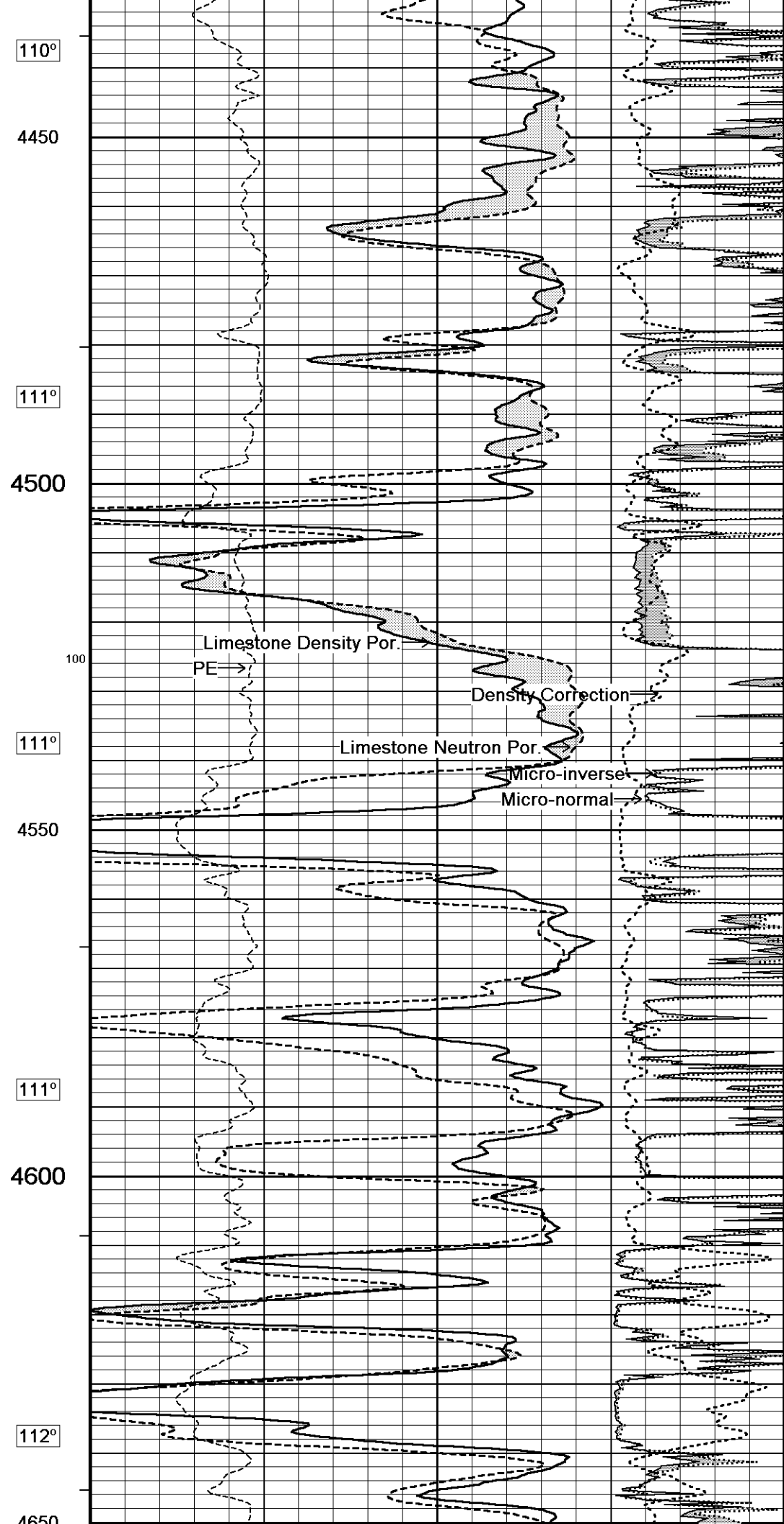
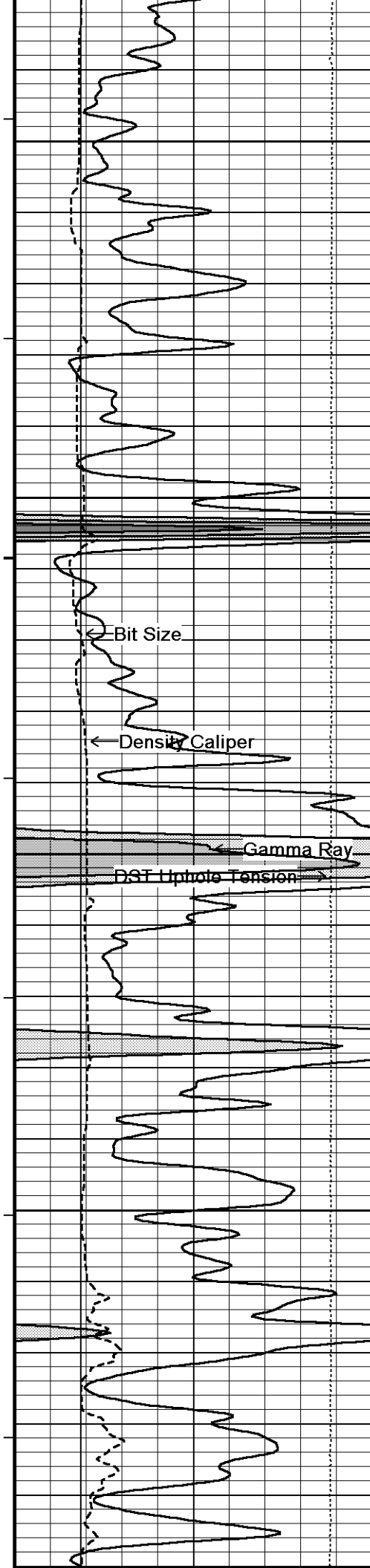
PE

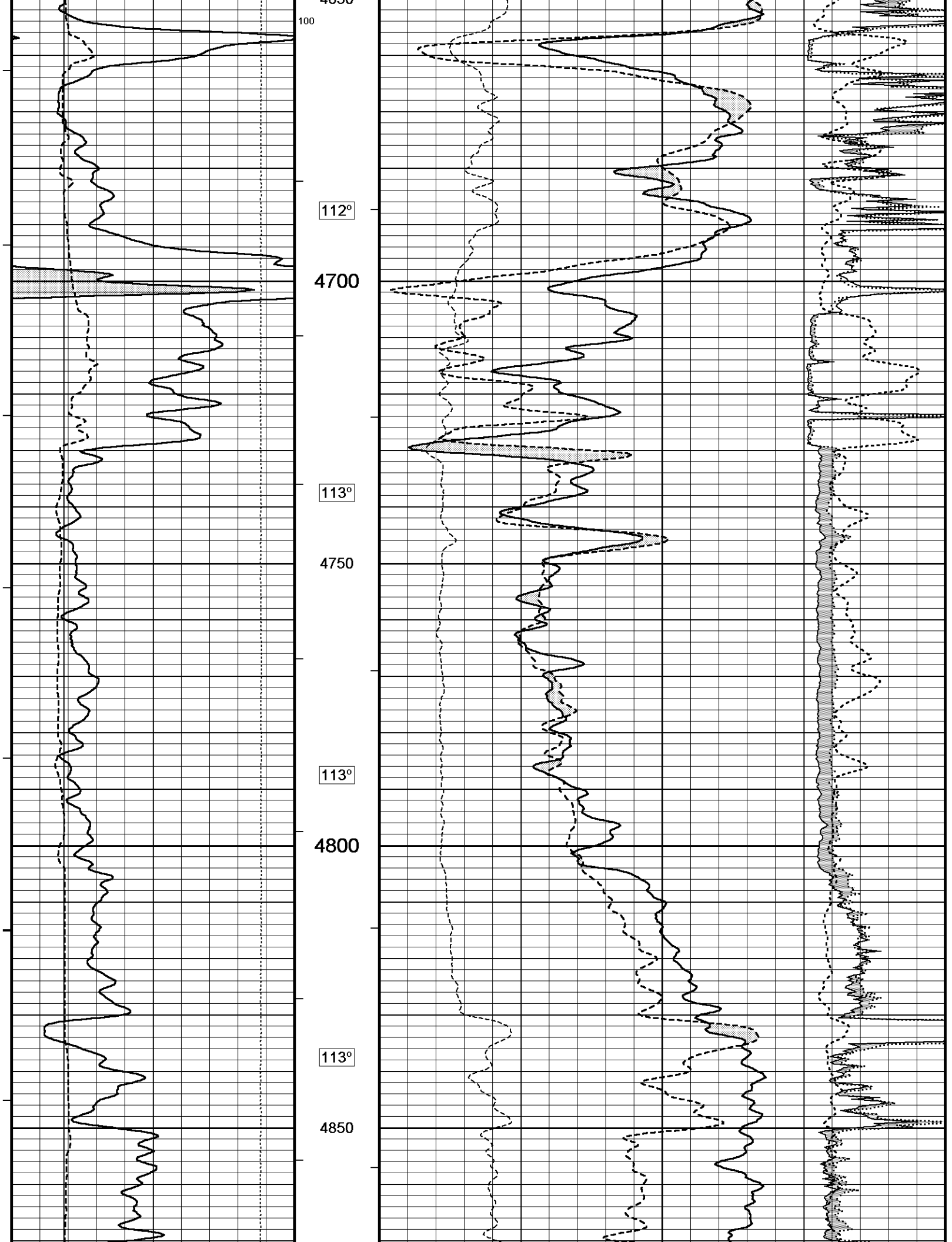
Limestone Neutron Por.

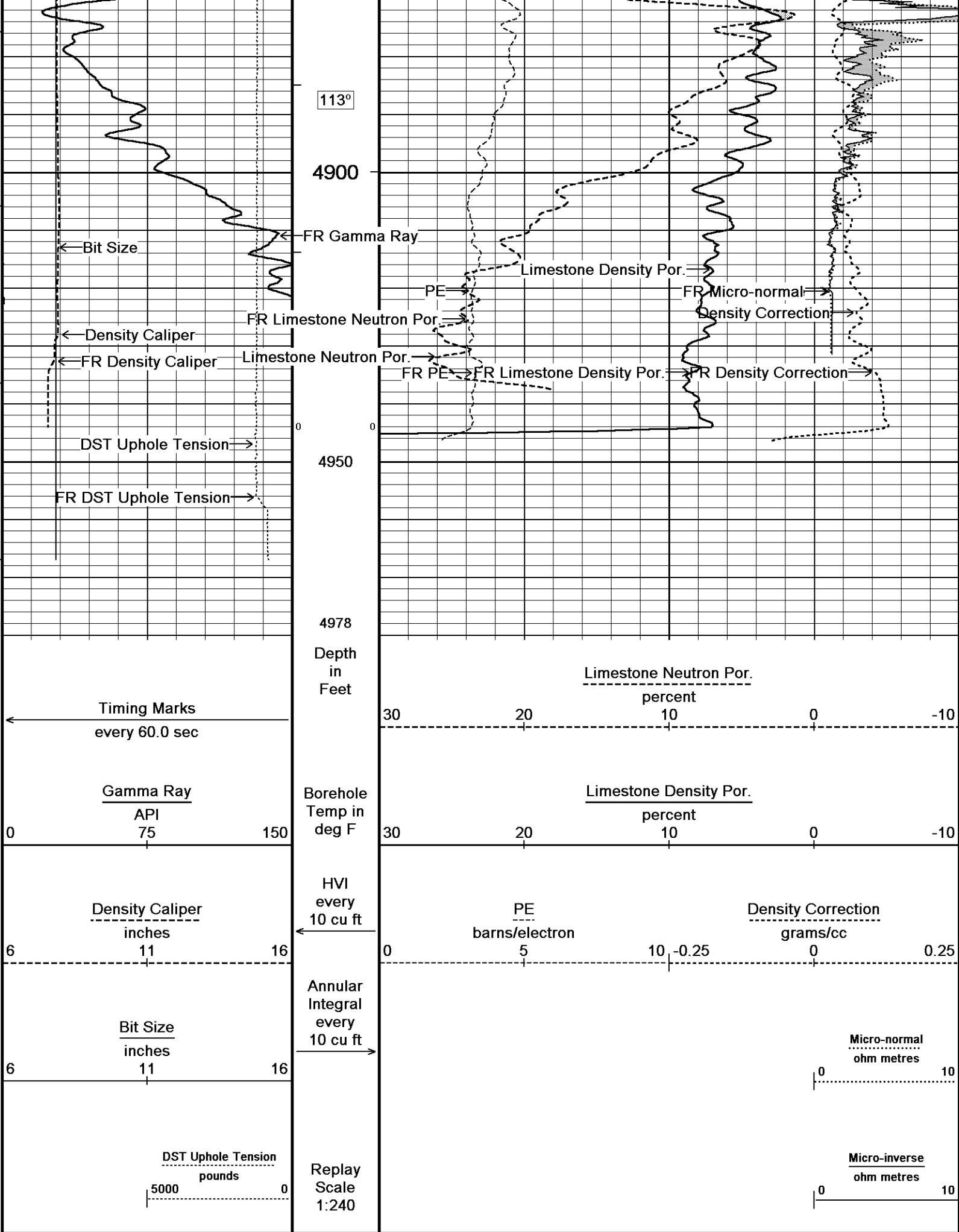
Density Correction

Micro-Inverse



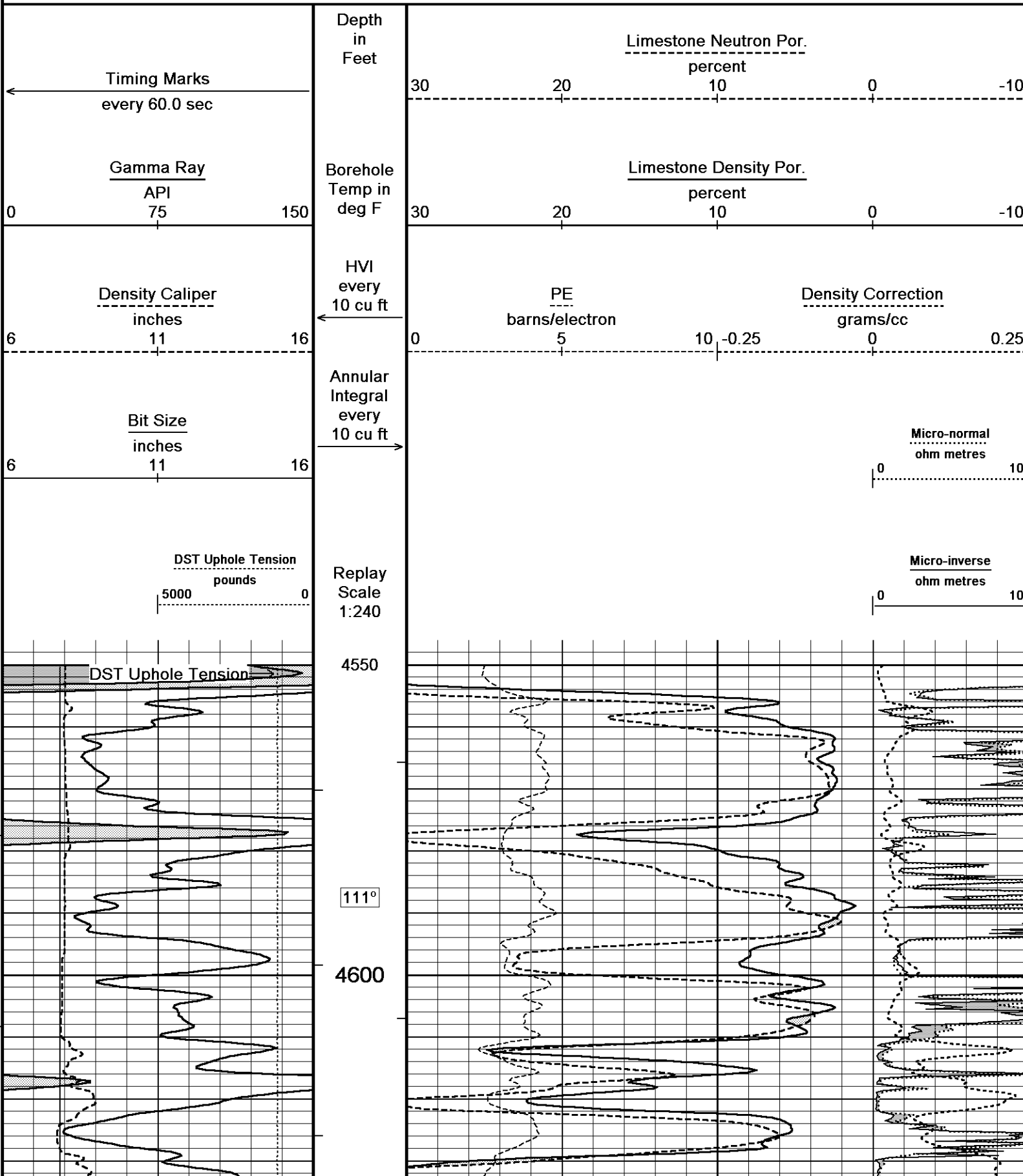


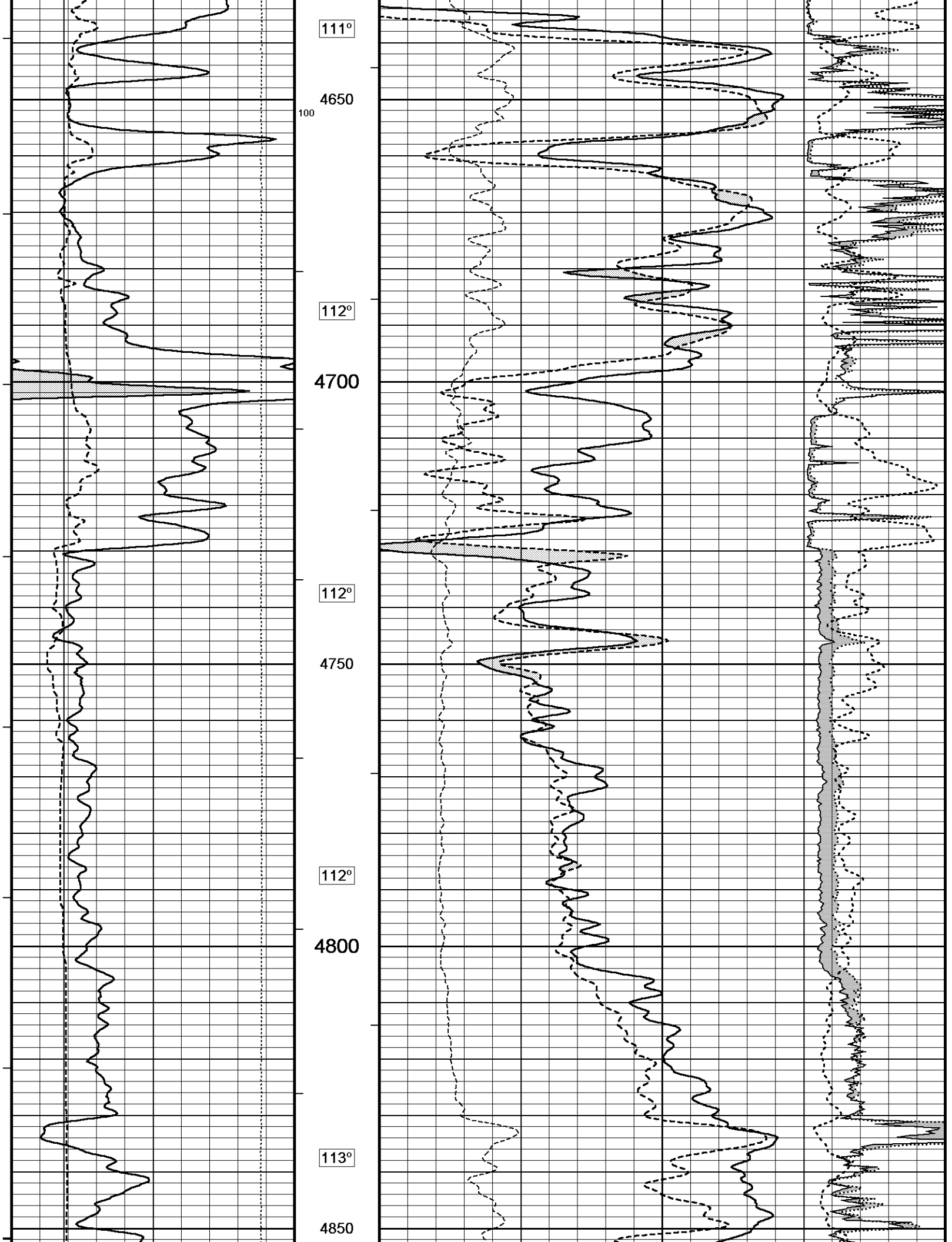


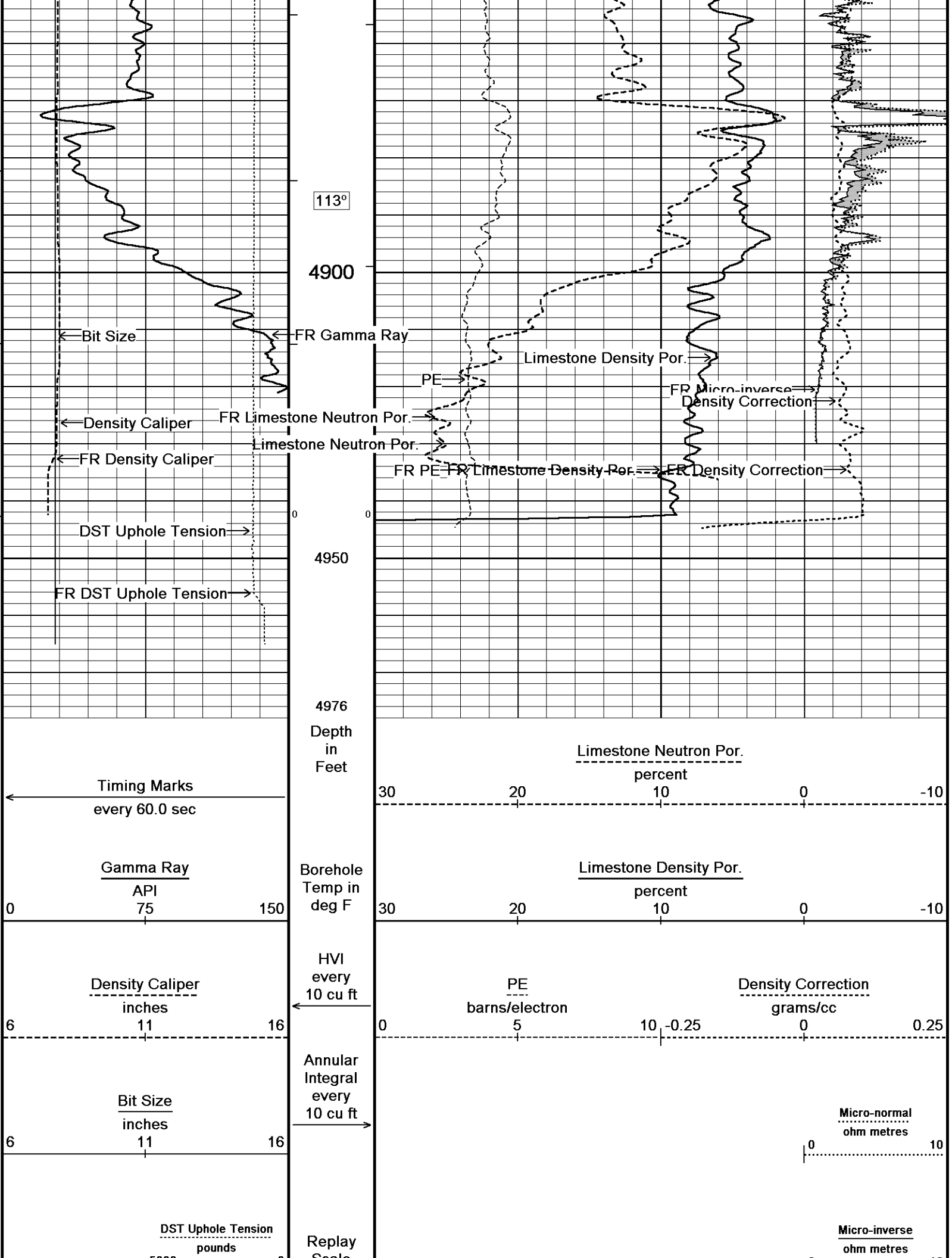


REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 16-APR-2012 02:02
 Filename: C:\Minimus 11.03.4044\Data\M&M Z-Bar 32-6\M&M Z-Bar 32-6_001.dta
 Recorded on 15-APR-2012 23:28
 System Versions: Logged with 11.03.4044 Plotted with 11.03.4044







5000 0
Scale
1:240

0 10

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11.03.4044\Data\M&M Z-Bar 32-6\M&M Z-Bar 32-6_001.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

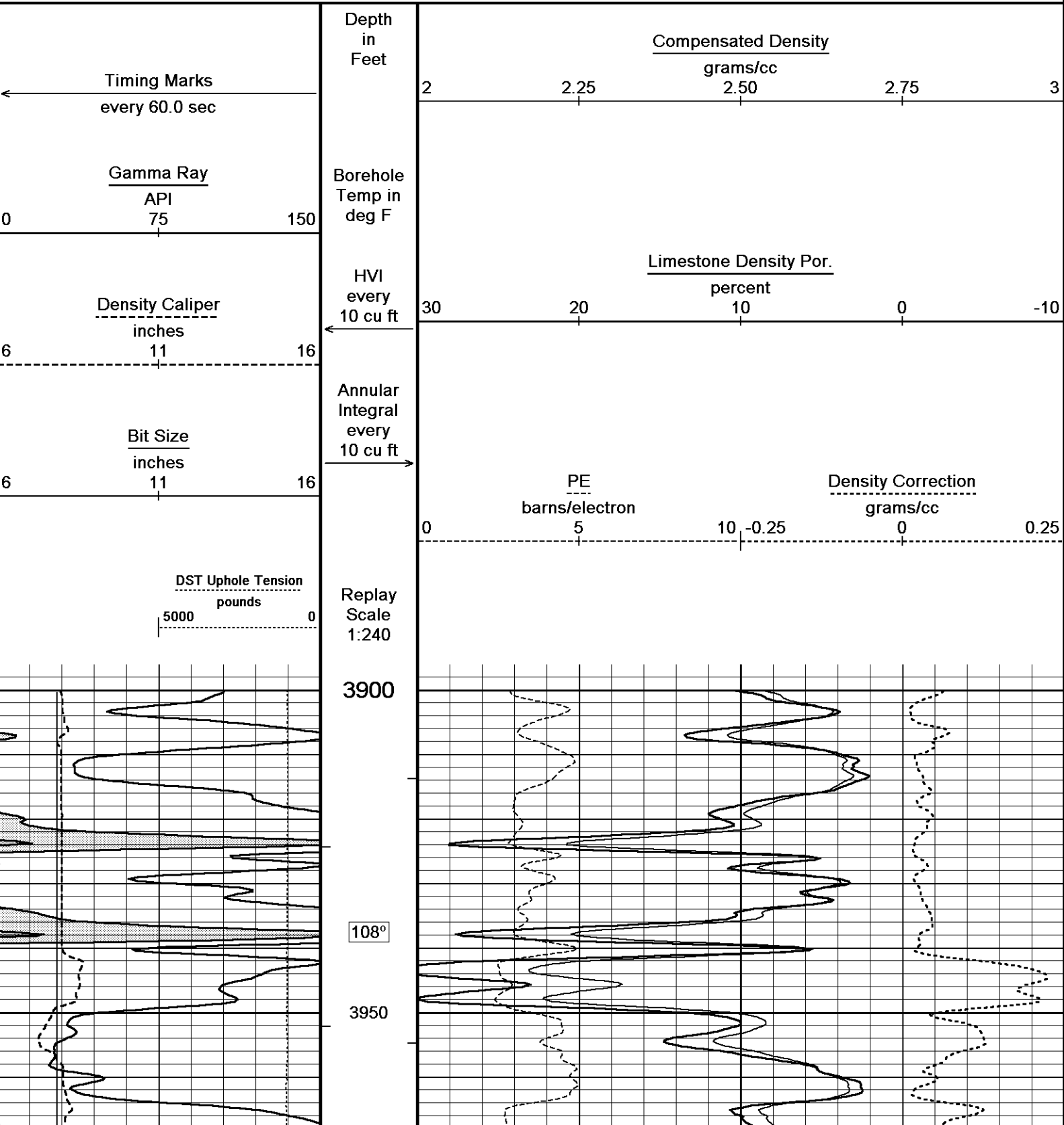
Plotted on 16-APR-2012 02:02
Recorded on 15-APR-2012 23:28

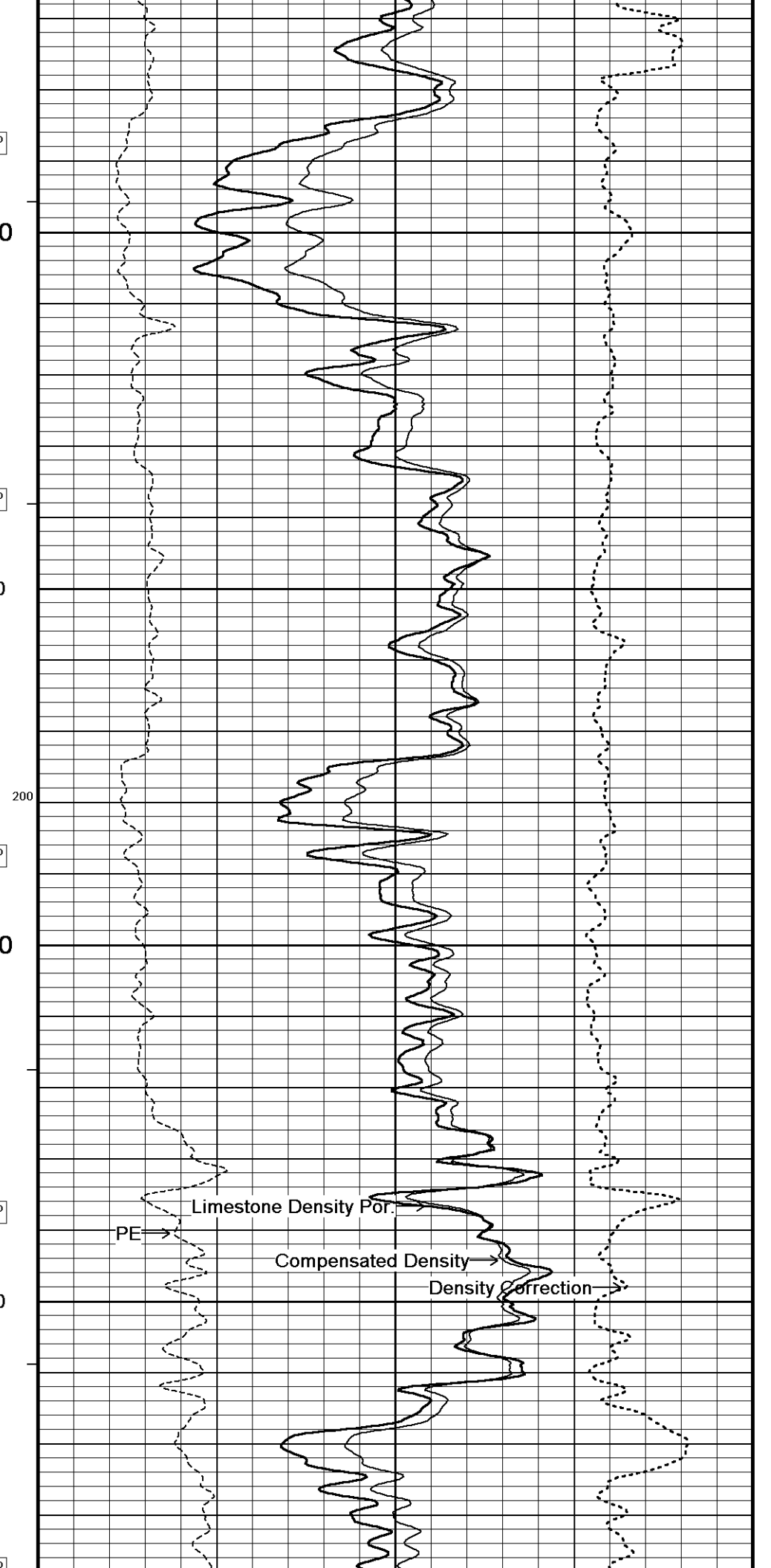
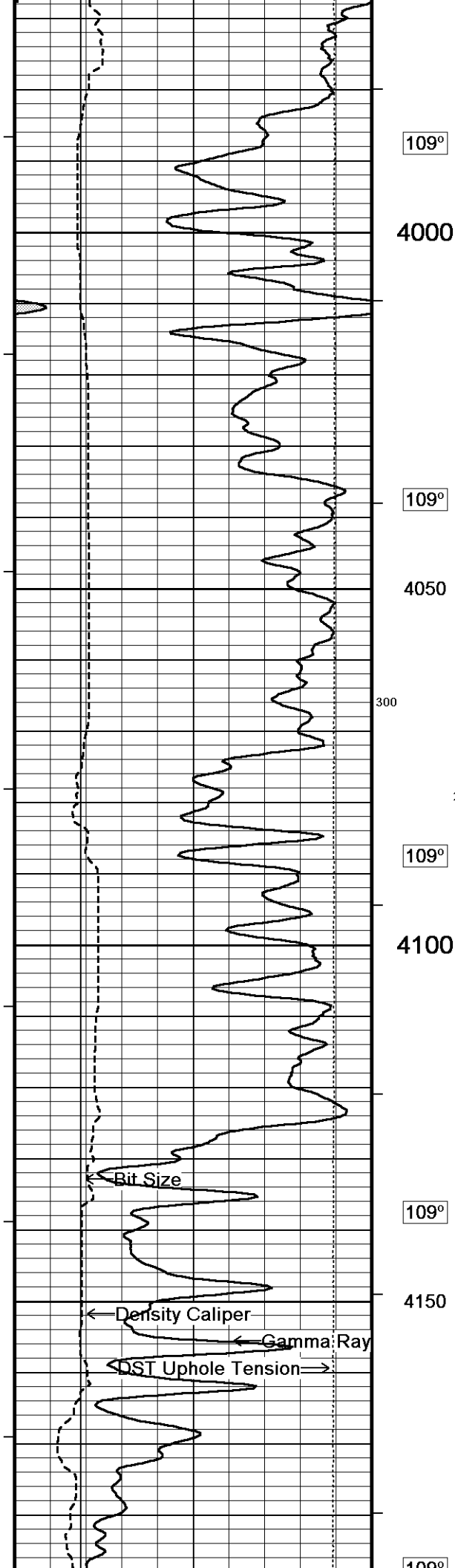
↑ REPEAT SECTION ↑

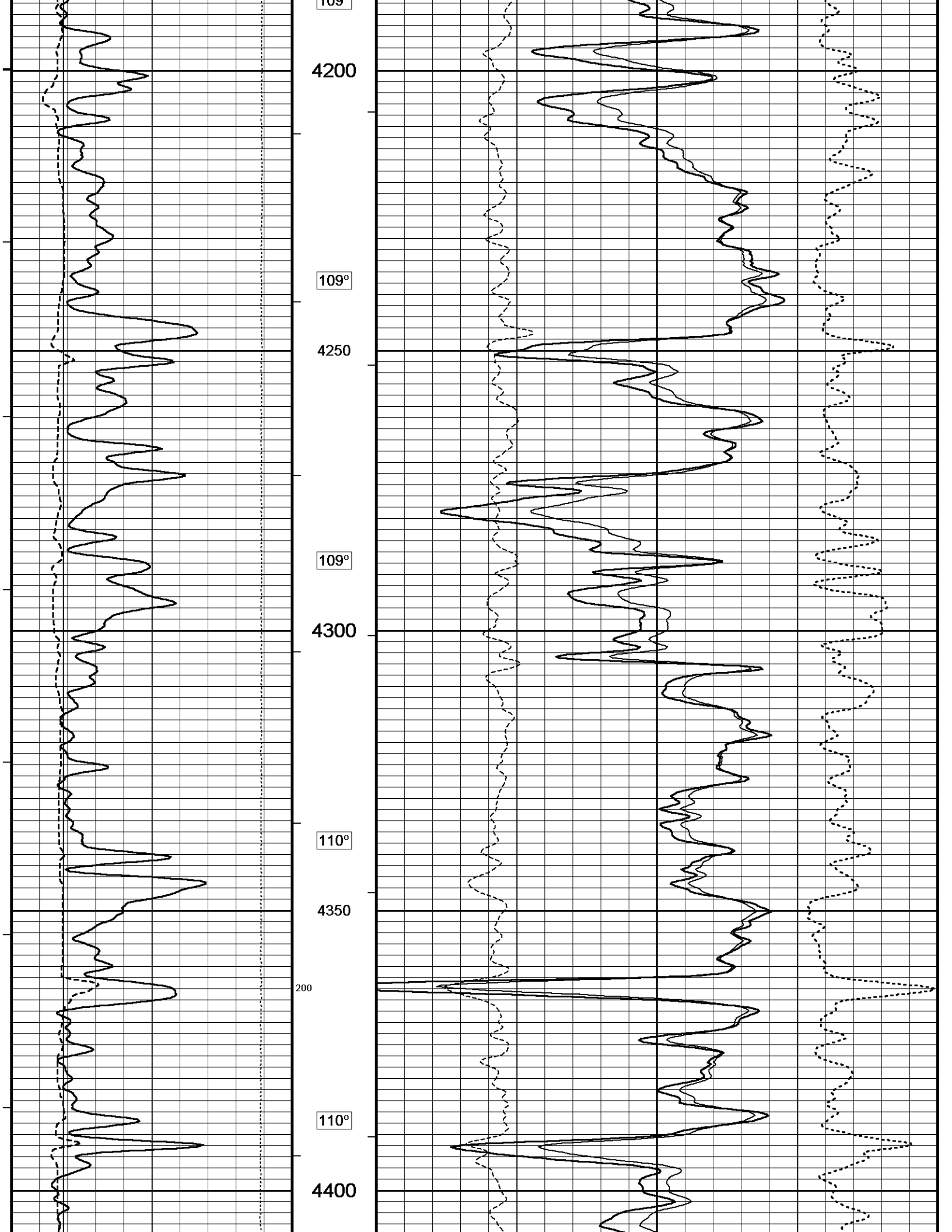
↓ 5 INCH MAIN ↓

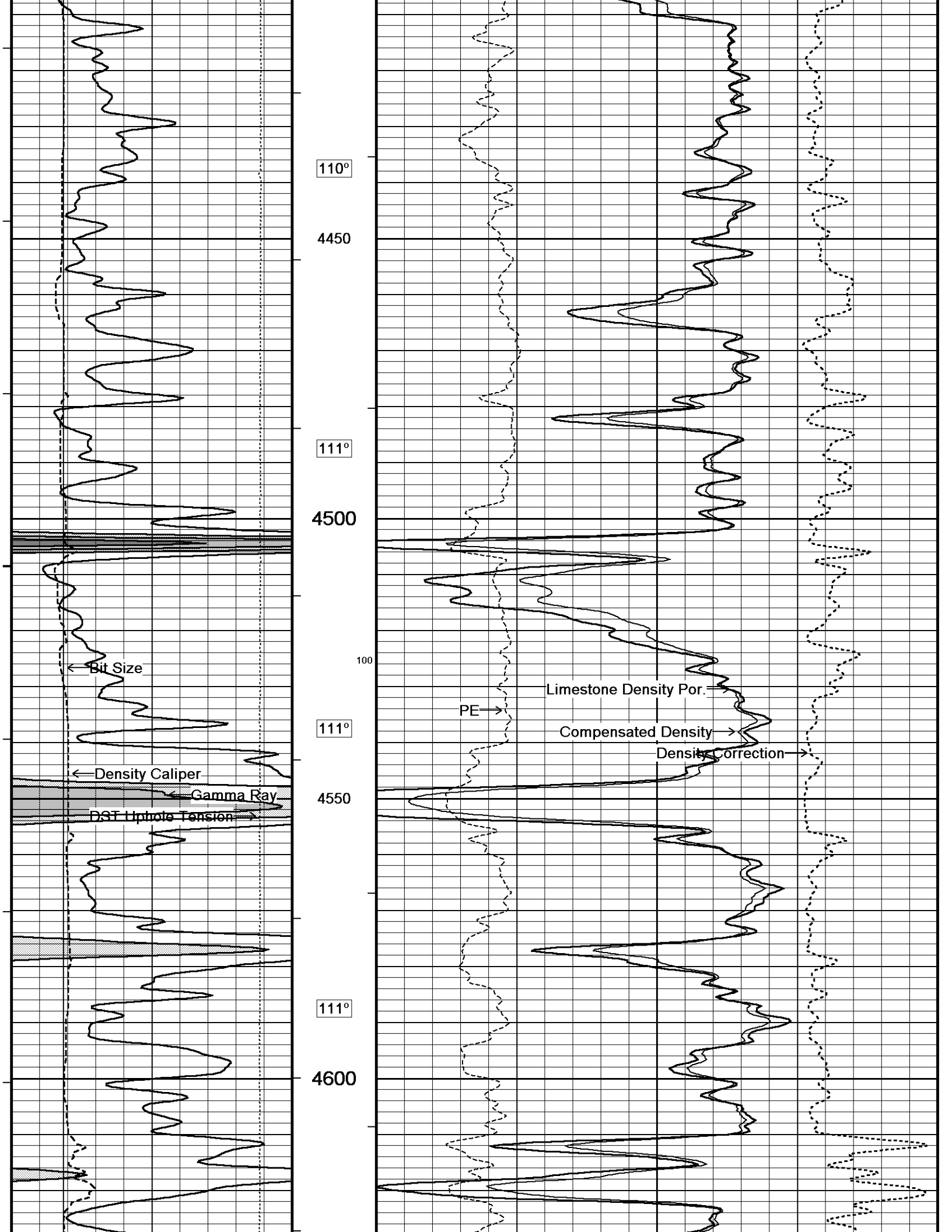
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System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

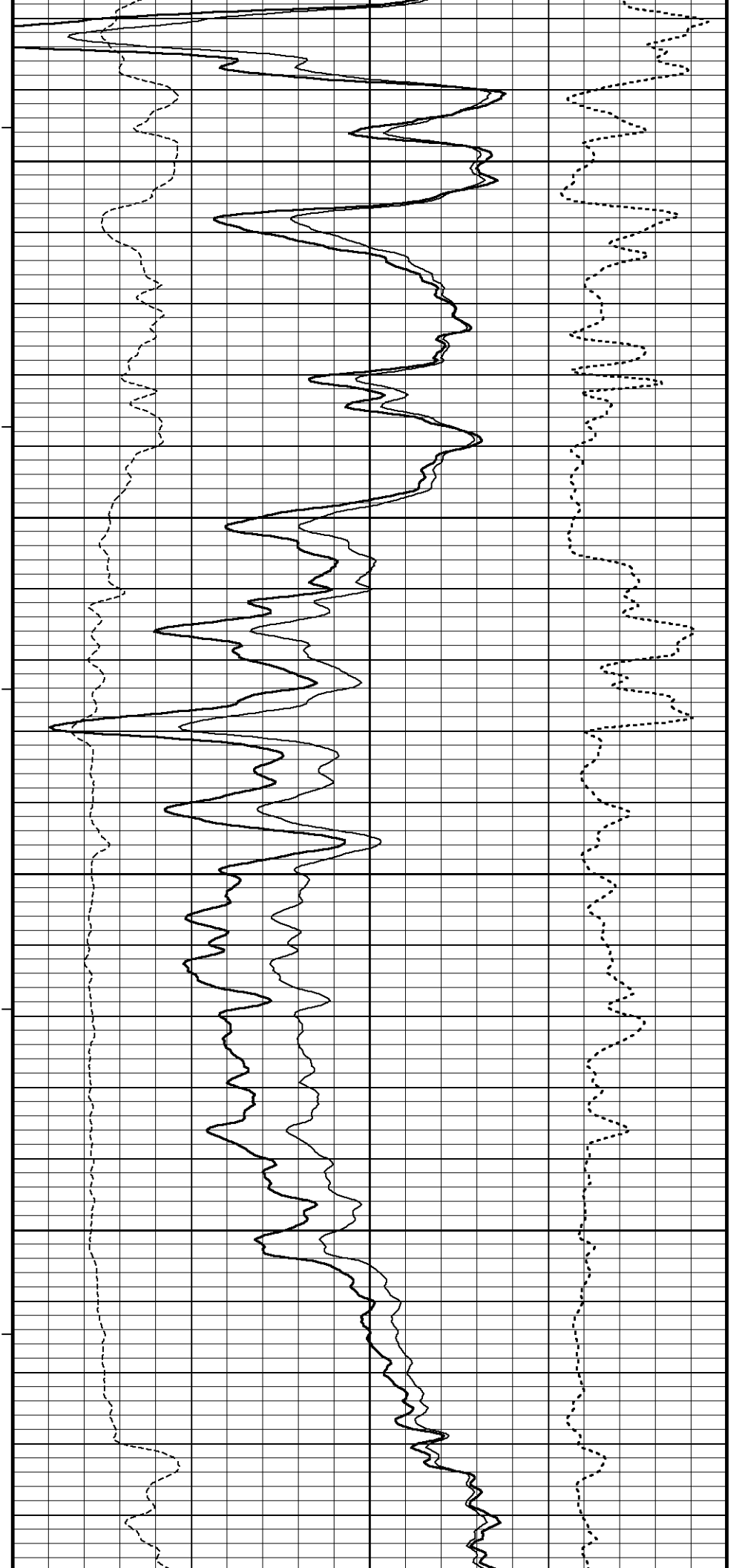
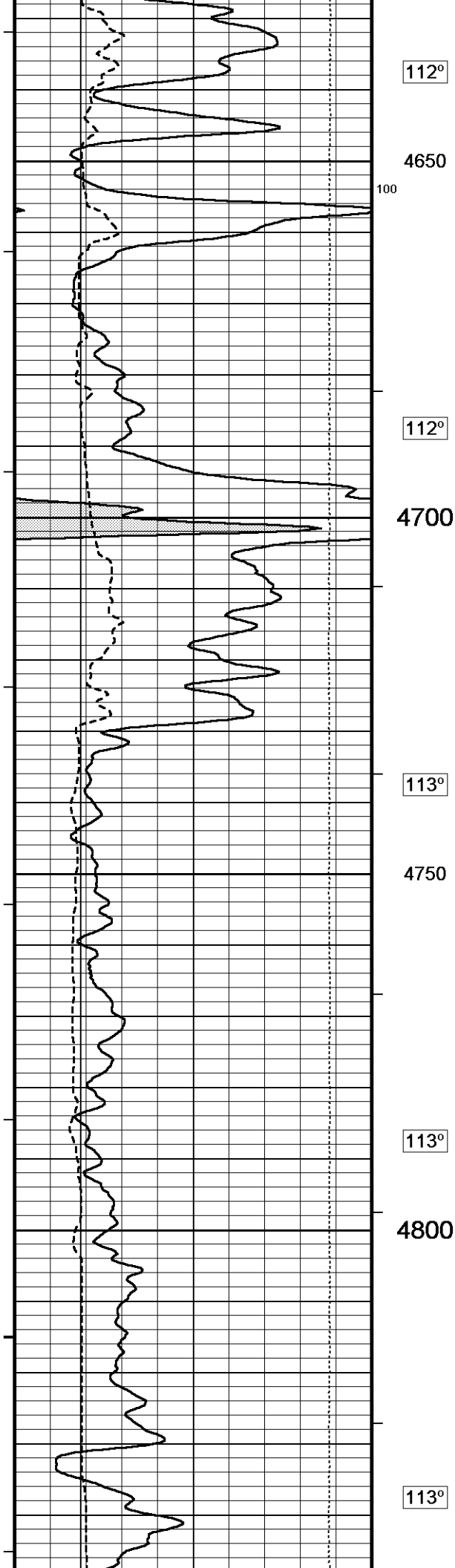
Plotted on 16-APR-2012 02:02
Recorded on 15-APR-2012 23:51

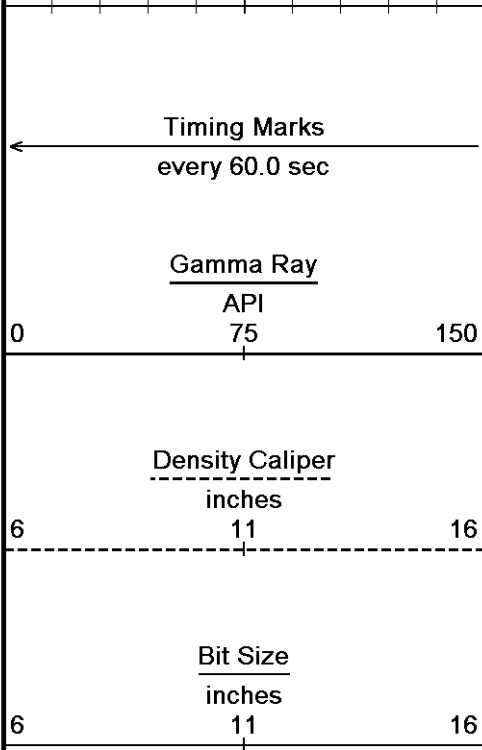
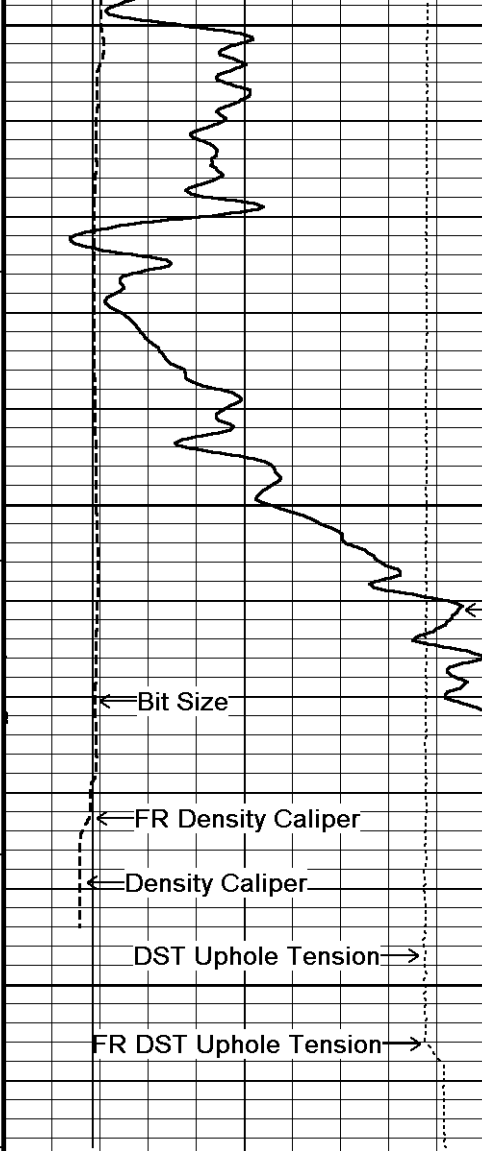












4850

113°

4900

4950

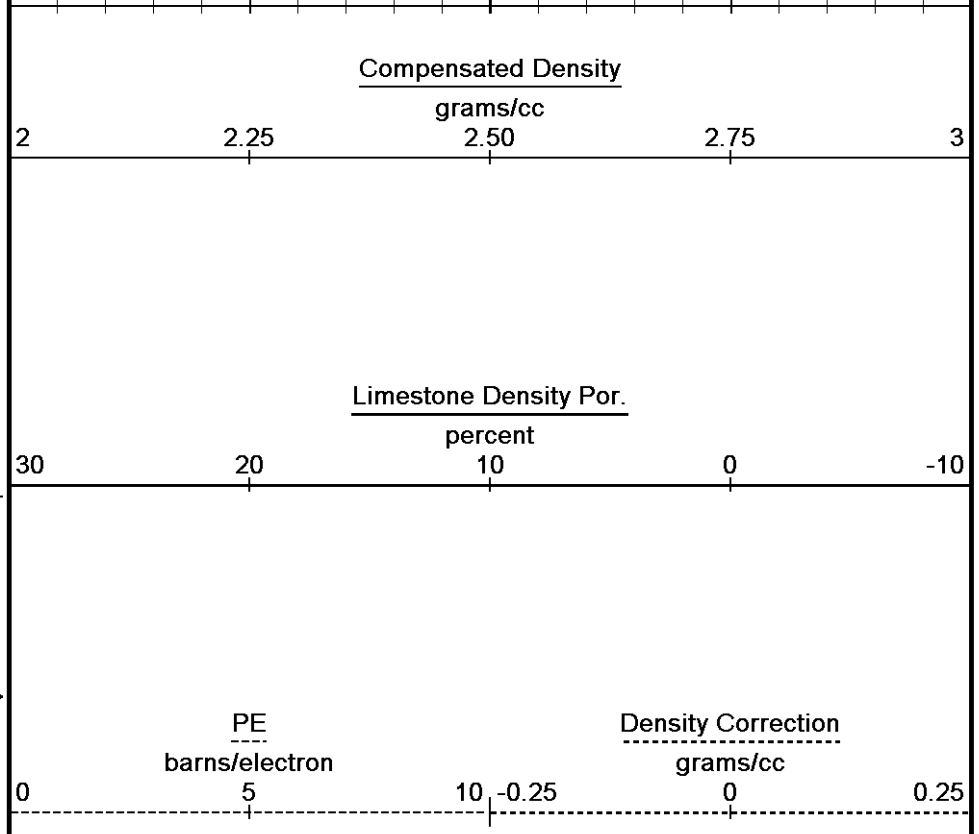
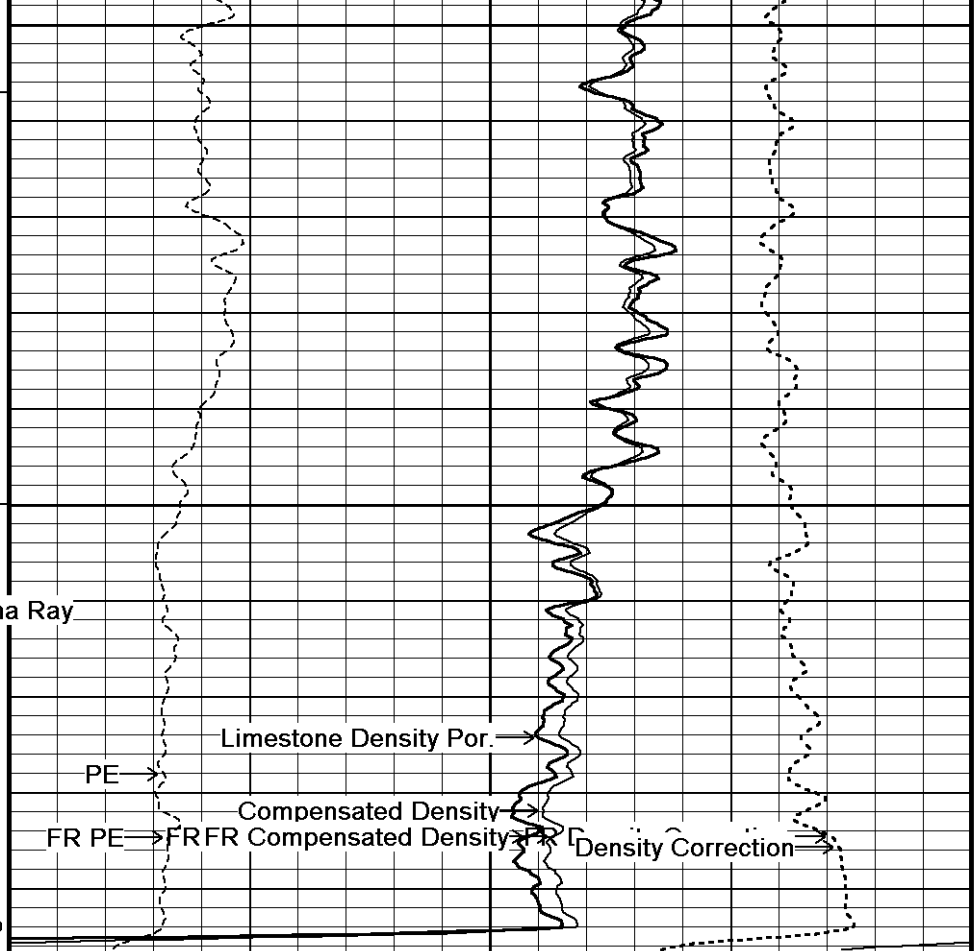
4978

Depth
in
Feet

Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft



DST Uphole Tension
pounds

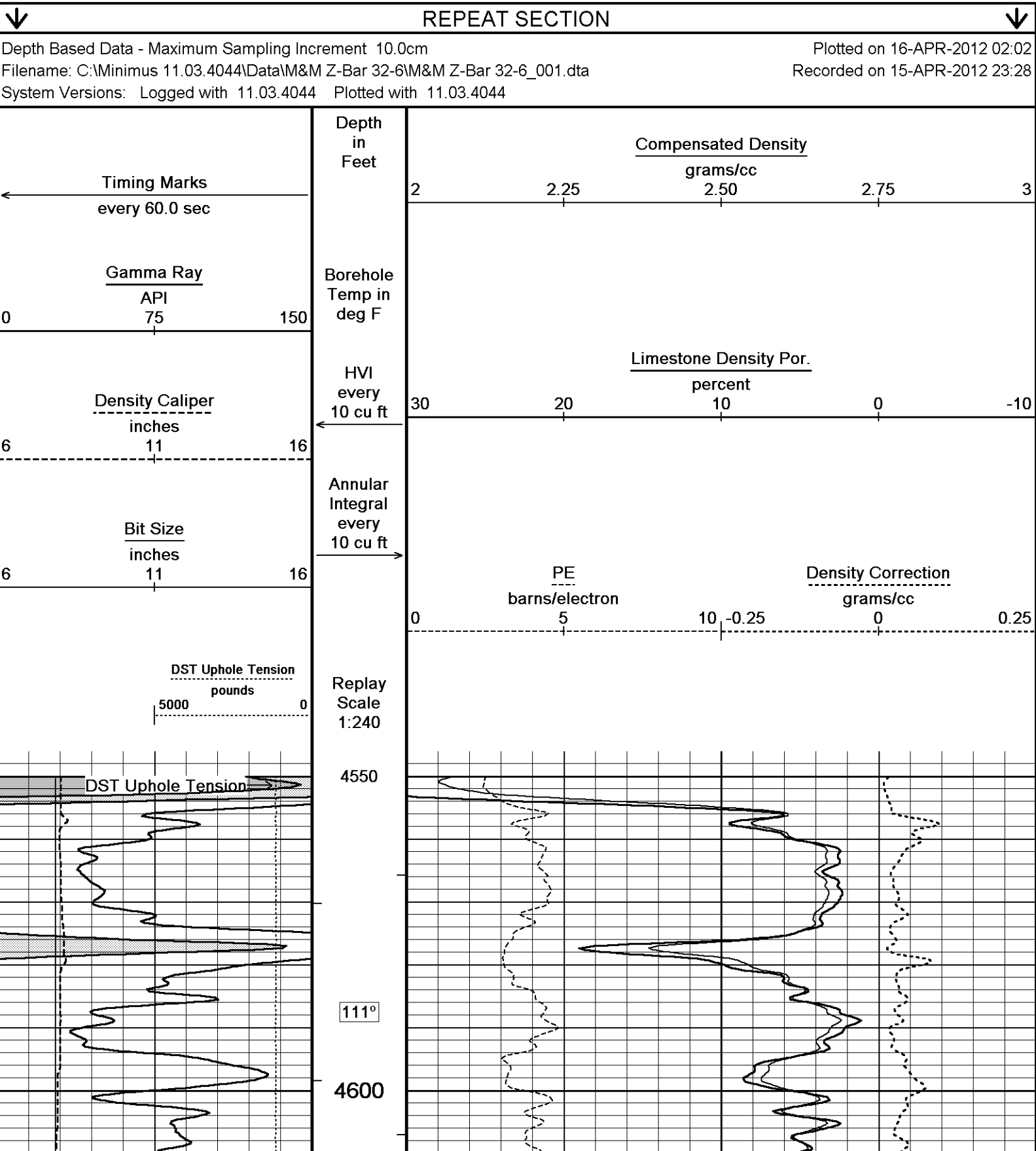
50000

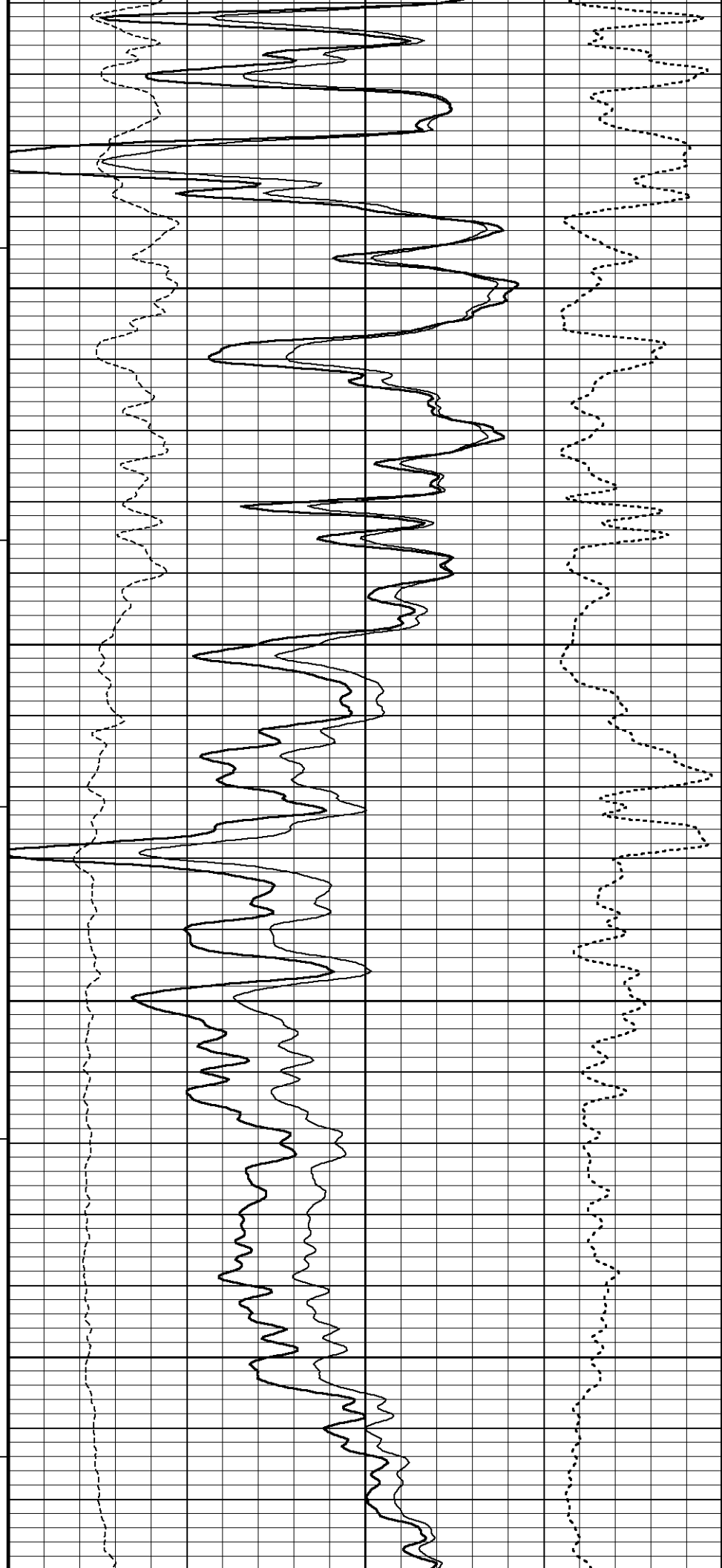
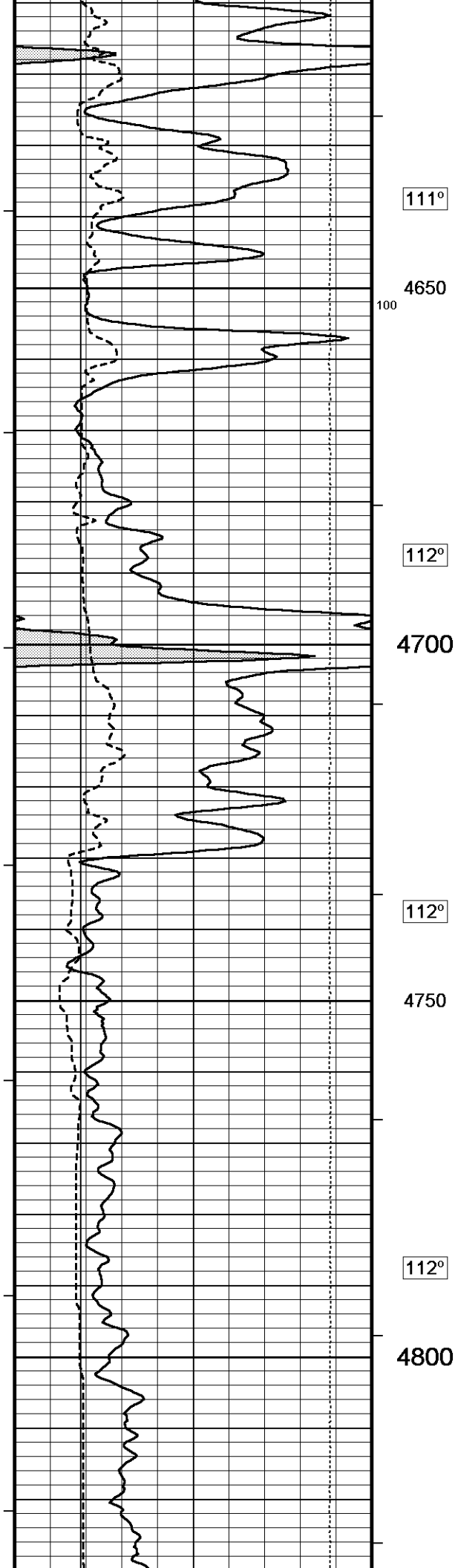
Replay
Scale
1:240

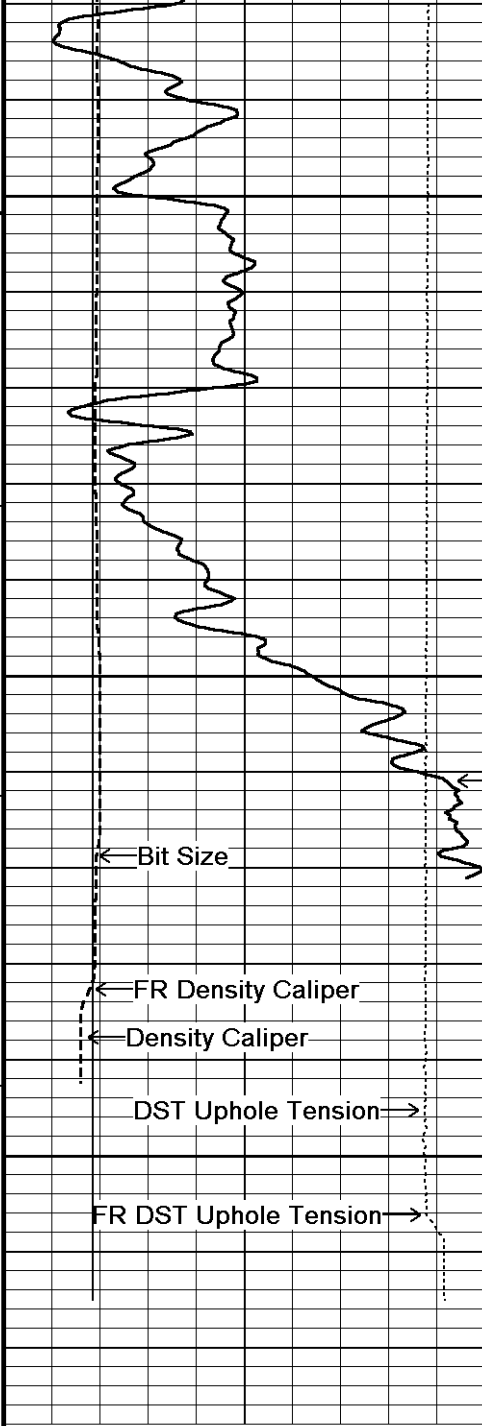
Depth Based Data - Maximum Sampling Increment 10.0cm
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System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 16-APR-2012 02:02
Recorded on 15-APR-2012 23:51

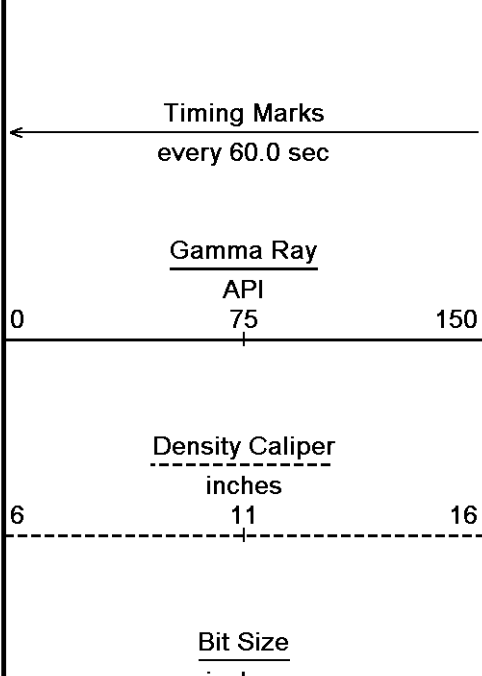
5 INCH MAIN



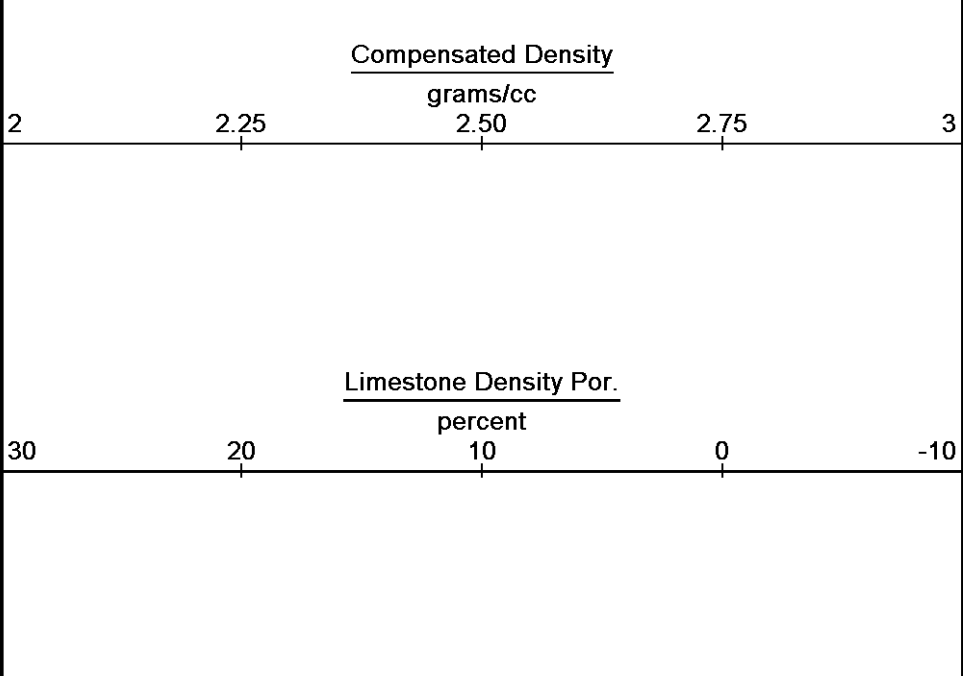
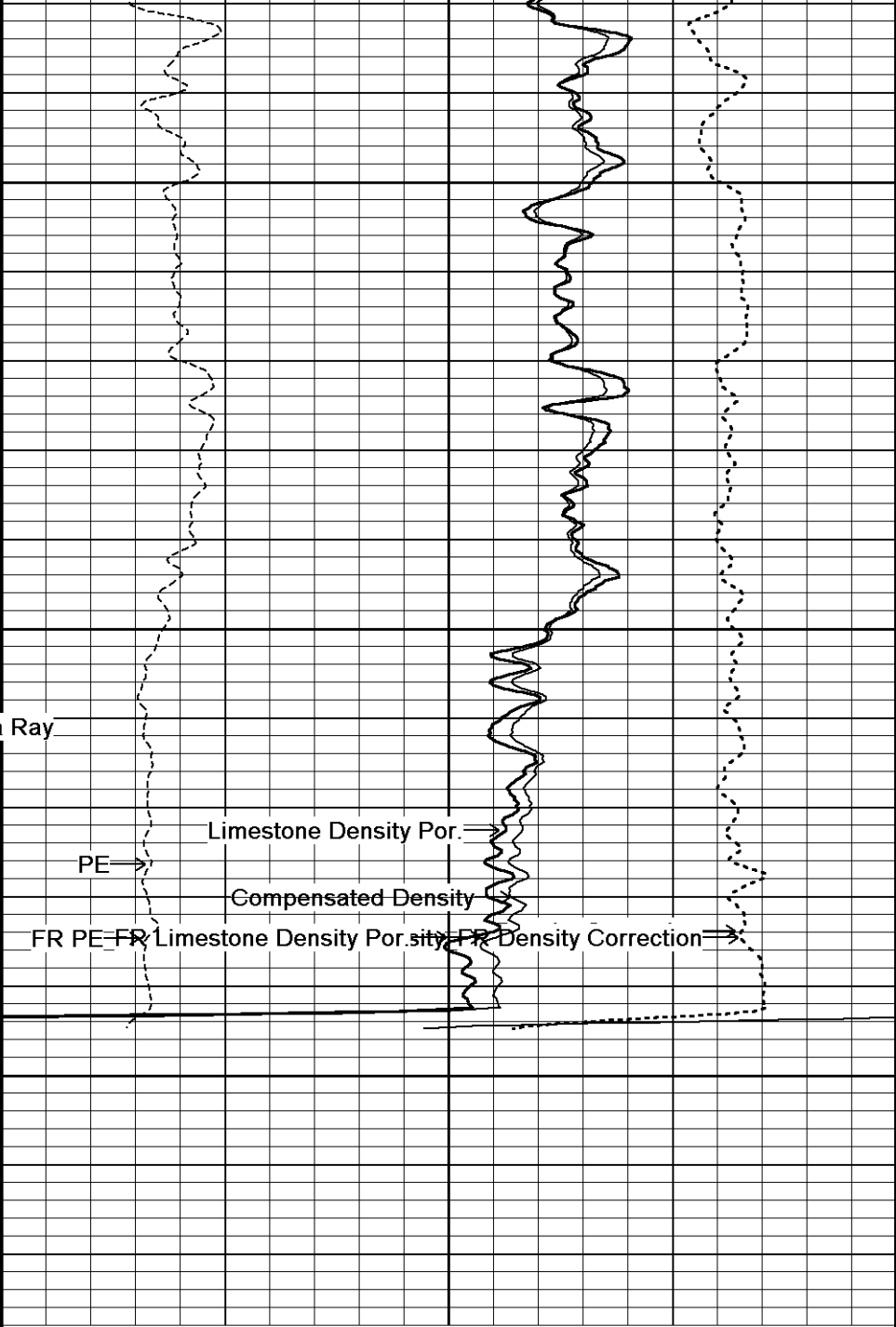




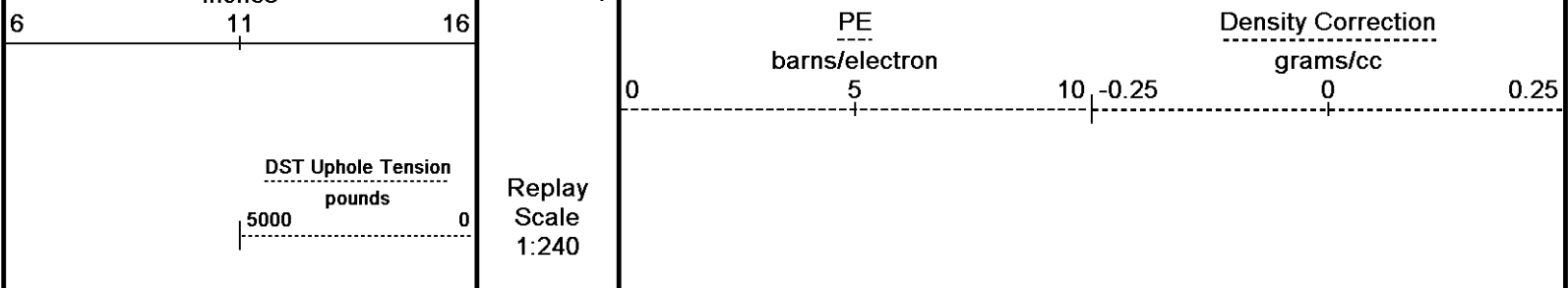
113°
4850
113°
4900
FR Gamma Ray
Bit Size
FR Density Caliper
Density Caliper
DST Uphole Tension
FR DST Uphole Tension
0
4950
4976
Depth
in
Feet



Timing Marks
every 60.0 sec
Gamma Ray
API
0 75 150
Density Caliper
inches
6 11 16
Bit Size
inches
6 11 16
Borehole
Temp in
deg F
HVI
every
10 cu ft
Annular
Integral
every
10 cu ft



Compensated Density
grams/cc
2 2.25 2.50 2.75 3
Limestone Density Por.
percent
30 20 10 0 -10



Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: C:\Minimus 11.03.4044\Data\M&M Z-Bar 32-6\M&M Z-Bar 32-6_001.dta
 System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 16-APR-2012 02:02
 Recorded on 15-APR-2012 23:28

↑
REPEAT SECTION
↑

BEFORE SURVEY CALIBRATION
 C:\Minimus 11.03.4044\Data\M&M Z-Bar 32-6\M&M Z-Bar 32-6.dta

Down-hole Tension Calibration All 000			Field Calibration on 30-JUN-2010
Reading No	Measured	Calibrated (lbs)	
1	14112.01	10.00	
2	15164.79	427.00	

General Constants All 000			Last Edited on 15-APR-2012,22:02
General Parameters			
Mud Resistivity	0.760	ohm-metres	
Mud Resistivity Temperature	71.000	degrees F	
Water Level	0.000	feet	
Density/Neutron 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	Limestone Density Por.		
Resistivity used	Array Ind. One Res Rt		
RWA Constant A	1.000		
RWA Constant M	2.000		

Down-hole Tension Calibration SMS 0			Field Calibration on 29-MAR-2012 11:07
Reading No	Measured	Calibrated (lbs)	
1	-2133.10	0.00	
2	-2135.89	100.00	

High Resolution Temperature Calibration MCG-C 208			Field Calibration on 18-OCT-2011,14:32
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MCG-C 208		Last Edited on
Pre-filter Length	11	

SP Calibration MCG-C 208			Field Calibration on 24-FEB-2012 11:08
	Measured	Calibrated (mV)	
Reference 1	98.6	100.0	
Reference 2	-101.8	-100.0	

Gamma Calibration MCG-C 208			Field Calibration on 13-APR-2012 11:22
	Measured	Calibrated (API)	
Background	66	47	

Background	85	772
Calibrator (Gross)	1085	725
Calibrator (Net)	1020	
Gamma Constants MCG-C 208		Last Edited on 15-APR-2012,11:13
Gamma Calibrator Number	gcr38	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm
Caliper Calibration MML-A 16		Base Calibration on 12-MAR-2012 08:42 Field Calibration on 13-APR-2012 11:17
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	14446	5.98
2	17749	7.97
3	20974	9.86
4	24969	11.92
5	0	0.00
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	6.00	5.98
Micro Normal and Micro Inverse Calibration MML-A 16		Base Calibration on 12-MAR-2012 08:50 Field Check on 13-APR-2012 11:06
Base Calibration		
Channel	Resistor 1	Measured Resistor 2
Micro Normal	12.2	60.2
Micro Inverse	15.6	78.3
Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	32.1	32.1
Micro Inverse	16.3	16.3
Micro Normal and Micro Inverse Constants MML-A 16		Last Edited on 15-APR-2012,11:14
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	0.5110	
Micro Inverse K Factor	0.3380	
Standoff Offset	N/A	inches
Neutron Calibration MDN-A.B 66		Base Calibration on 12-MAR-2012 14:21 Field Check on 13-APR-2012 11:27
Base Calibration		
	Measured	Calibrated (cps)
	Near Far	Near Far
	3048 95	3714 110
Ratio	32.068	33.764
Field Calibrator at Base		Calibrated (cps)
		1659 2400
Ratio		0.691
Field Check		Calibrated (cps)
		1680 2432
Ratio		0.691
Neutron Constants MDN-A.B 66		Last Edited on 15-APR-2012,11:13
Neutron Source Id	P58125B	
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 Process Source	None	

Formation Pressure Source	N/A	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-C.A 353		Base Calibration on 12-MAR-2012 09:09 Field Check on 13-APR-2012 11:05	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	964.2	126.8	
Base Check		281.2	
Field Check		281.1	

FE Constants MFE-C.A 353		Last Edited on 15-APR-2012,22:03	
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	

High Resolution Temperature Calibration MAI-A.A 167		Field Calibration on 12-MAR-2012,10:57	
	Measured	Calibrated(Deg F)	
Lower	1.00	33.80	
Upper	11.00	51.80	

High Resolution Temperature Constants MAI-A.A 167		Last Edited on
Pre-filter Length	11	

Induction Calibration MAI-A.A 167				Base Calibration on 11-MAR-2011,09:58	
				Field Check on 13-APR-2012 11:04	
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	17.3	474.2	9.3	966.2	
2	6.3	388.4	7.6	821.4	
3	3.3	259.4	5.2	566.0	
4	1.9	133.0	2.6	279.2	
Array Temperature		76.8	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	12.8	3840.0	
2	0.0	0.0	29.5	3477.6	
3	0.0	0.0	29.1	3053.4	
4	0.0	0.0	19.7	2081.9	
Deep	0.0	0.0	18.5	2049.0	
Medium	0.0	0.0	42.2	3991.8	
Shallow	0.0	0.0	42.9	5055.4	
Array Temperature		0.0	69.1	Deg F	

Induction Constants MAI-A.A 167		Last Edited on 15-APR-2012,22:03	
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 Angle	40.00	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	

Caliper Calibration MPD-B 31

Base Calibration on 12-MAR-2012 10:12
Field Calibration on 13-APR-2012 11:14

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	16948	3.99
2	25696	5.98
3	34353	7.97
4	42688	9.86
5	52032	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.93	5.98

Photo Density Calibration MPD-B 31

Base Calibration on 12-MAR-2012 10:38
Field Check on 13-APR-2012 11:11

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	57640	28373	59556	30836
Reference 2	22775	2147	24941	2541

Field Check at Base

697.8	863.6
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Field Check

694.4	860.3
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PE Calibration

Base Calibration	WS	Measured		Calibrated Ratio
		WH	Ratio	
Background	128	611		
Reference 1	22671	57483	0.396	0.371
Reference 2	6663	22677	0.296	0.272

Field Check at Base

127.9	611.2
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Field Check

128.5	600.2
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Density Source Id	P50557B	
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 (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

DOWNHOLE EQUIPMENT

C:\Minimus 11.03.4044\Data\M&M Z-Bar 32-6\M&M Z-Bar 32-6.dta

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

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

Compact Micro-log
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Micro-log
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

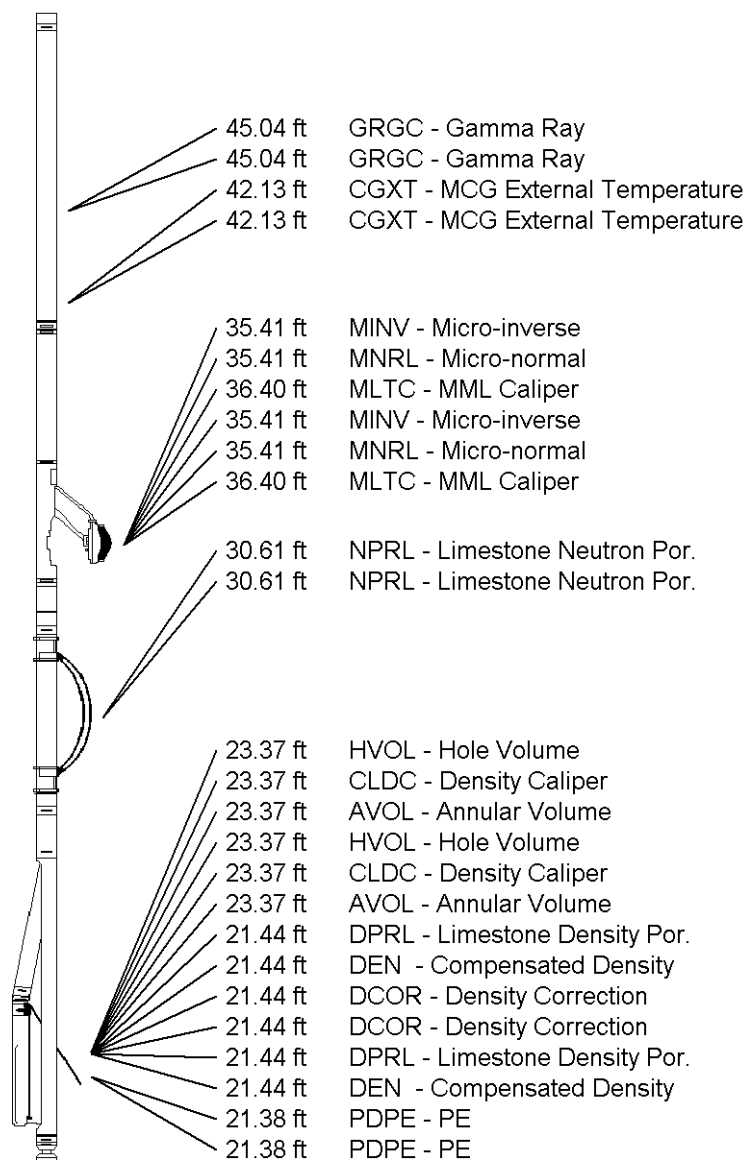
Compact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

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

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focused Electric
MFE-C.A 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in



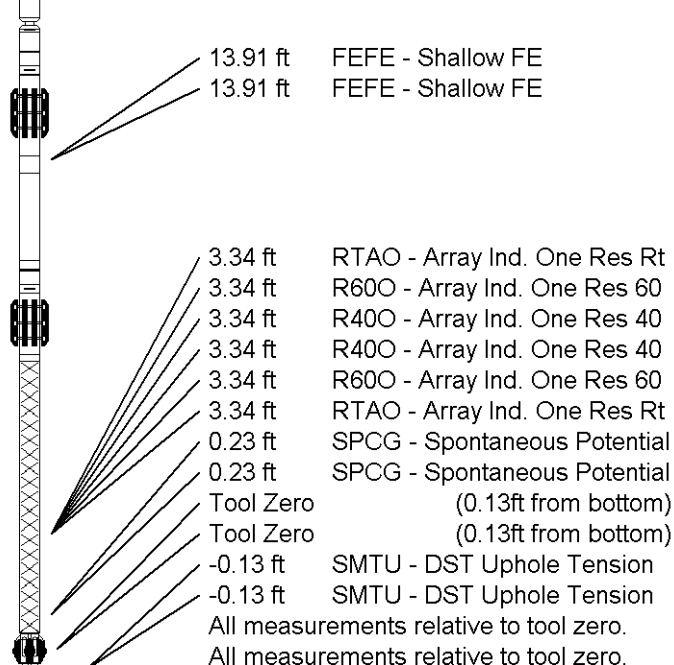
Compact Focussed Electric
MFE-C.A 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 50.32 ft Weight: 407.9 lb

Total Length: 50.32 ft Weight: 407.9 lb



COMPANY	M&M EXPLORATION, INC.
WELL	Z-BAR #32-6
FIELD	AETNA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1702.00	feet	First Reading	4934.00	feet
Elevation Drill Floor	1700.00	feet	Depth Driller	4950.00	feet
Elevation Ground Level	1690.00	feet	Depth Logger	4956.00	feet



Weatherford®

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

