



Weatherford[®]

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

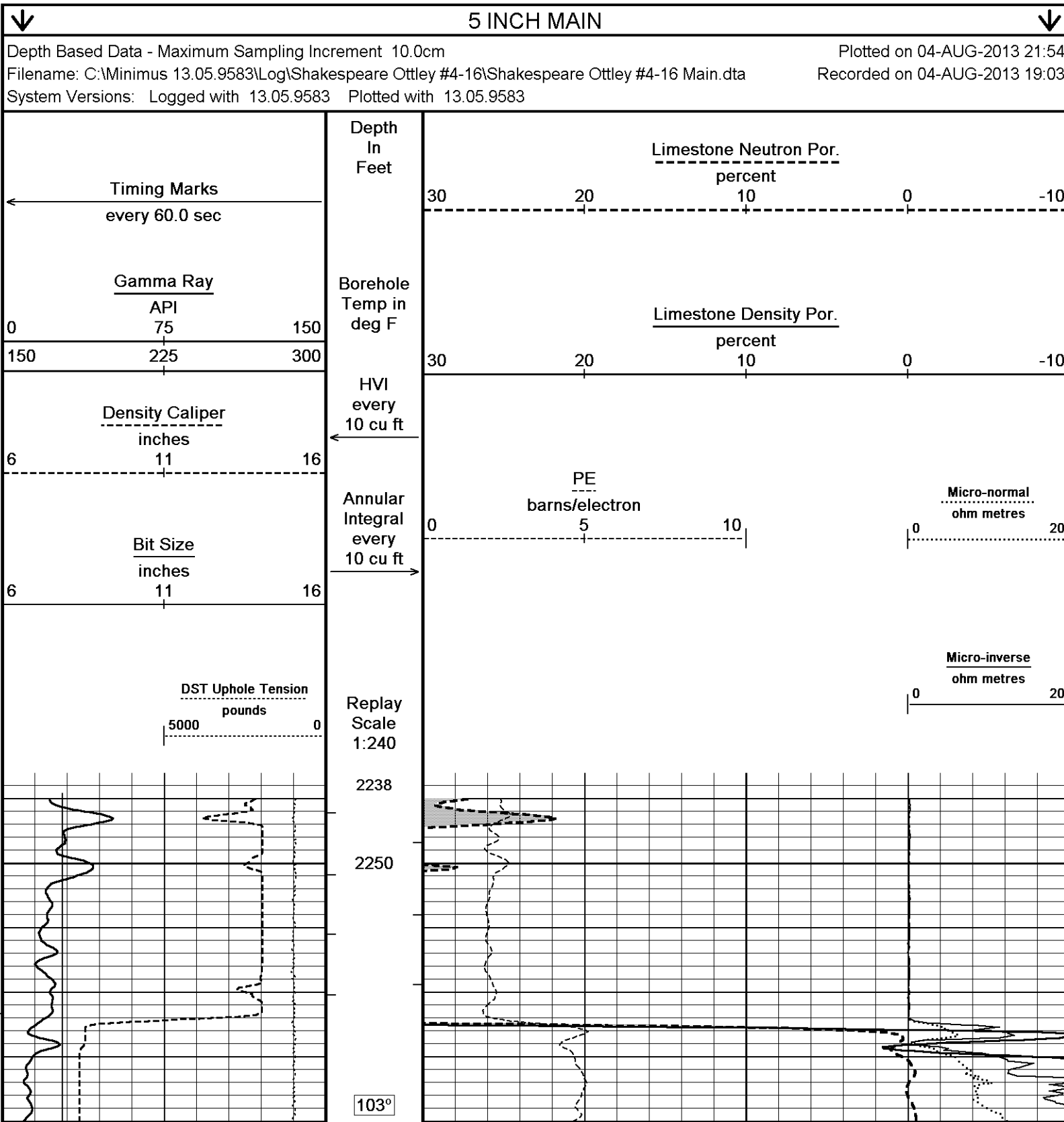
COMPANY				SHAKESPEARE OIL CO., INC.			
WELL				OTTELEY #4-16			
FIELD				WILDCAT			
PROVINCE/COUNTY				LOGAN			
COUNTRY/STATE				U.S.A. / KANSAS			
LOCATION				1599' FNL & 1852' FWL			
SEC	TWP	RGE	Other Services				
16	14S	32W	MAI/MFE				
API Number		15-109-21198		MSS			
Permit Number							
Permanent Datum G.L., Elevation 2808 feet							
Log Measured From KB							
Drilling Measured From K.B. @10 FEET							
Date	04-AUG-2013				Elevations:		
Run Number	ONE				KB	feet	
Service Order	3539955				DF	2818.00	
Depth Driller	4530.00					2816.00	
Depth Logger	4528.00					2808.00	
First Reading	4496.00						
Last Reading	3600.00						
Casing Driller	222.00						
Casing Logger	221.00						
Bit Size	7.875						
Hole Fluid Type	CHEMICAL						
Density / Viscosity	9.10 lb/USg						
PH / Fluid Loss	10.00						
Sample Source	FLOWLINE						
Rm @ Measured Temp	0.51 @ 98.0						
Rmf @ Measured Temp	0.41 @ 98.0						
Rmc @ Measured Temp	0.61 @ 98.0						
Source Rmf / Rmc	CALC						
Rm @ BHT	0.44 @115.0						
Time Since Circulation	3 HOURS						
Max Recorded Temp	115.00						
Equipment / Base	13096						
Recorded By	ROB HOFFMAN						
Witnessed By	TIM PRIEST						
JOB #	LB13-218						

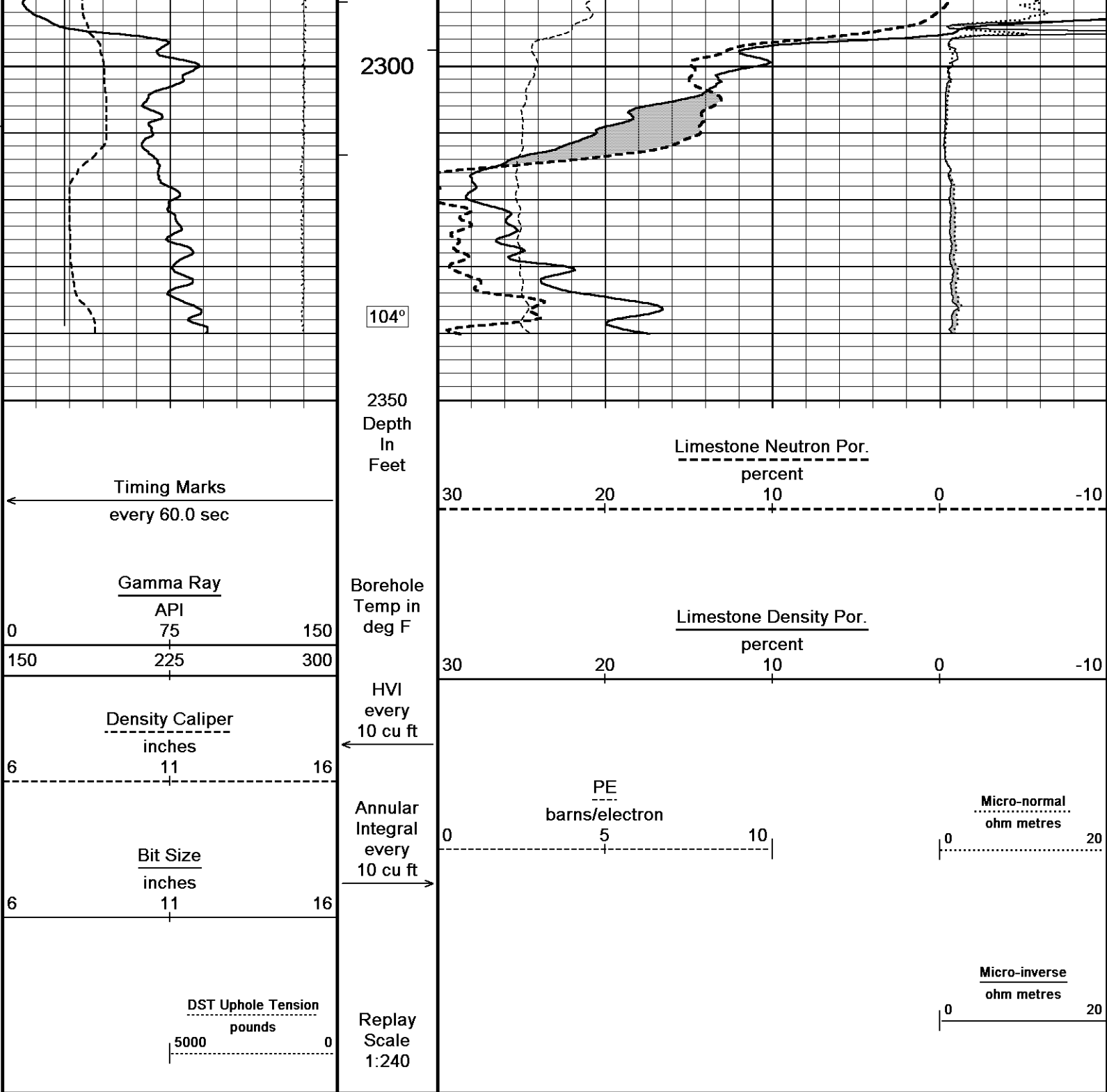
BOREHOLE RECORD				Last Edited: 04-AUG-2013 15:52	
Bit Size inches		Depth From feet		Depth To feet	
7.875		222.00		4530.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	222.00	24.00	

REMARKS
- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 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: 1952 CU. FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO SURFACE CASING: 175 CU. FT.

- SERVICE ORDER # 3539955
- RIG: HD DRILLING #2.
- ENGINEER: ROB HOFFMAN
- OPERATOR(S): NICK ADAME

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.



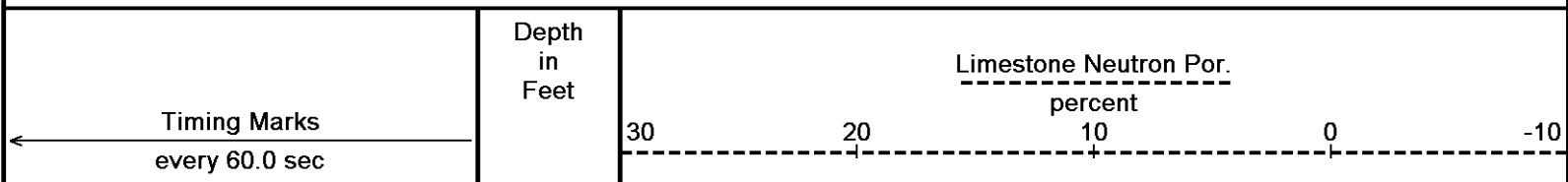


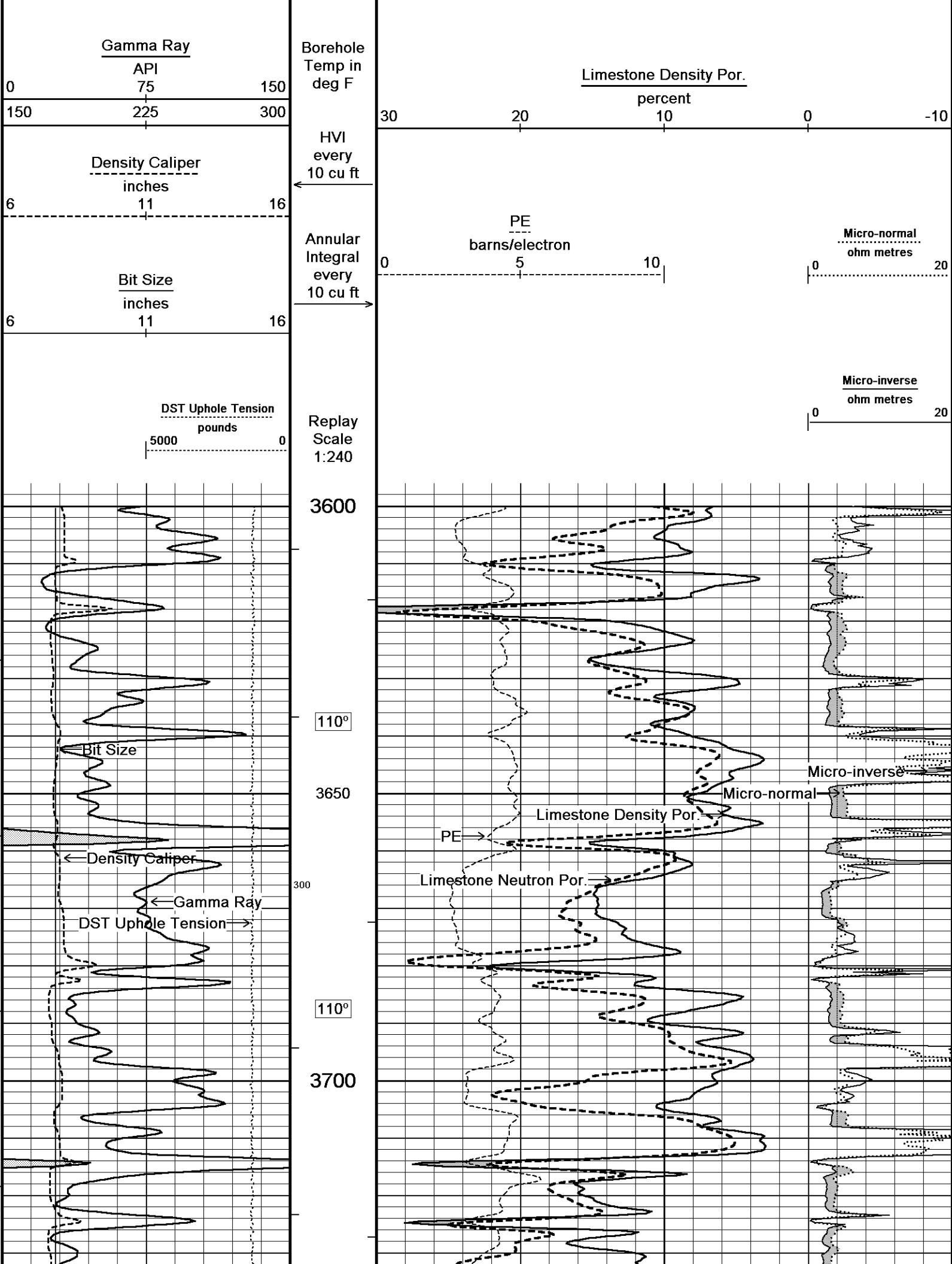
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 04-AUG-2013 21:54
Filename: C:\Minimus 13.05.9583\Log\Shakespeare Ottley #4-16\Shakespeare Ottley #4-16 Main.dta Recorded on 04-AUG-2013 19:03
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

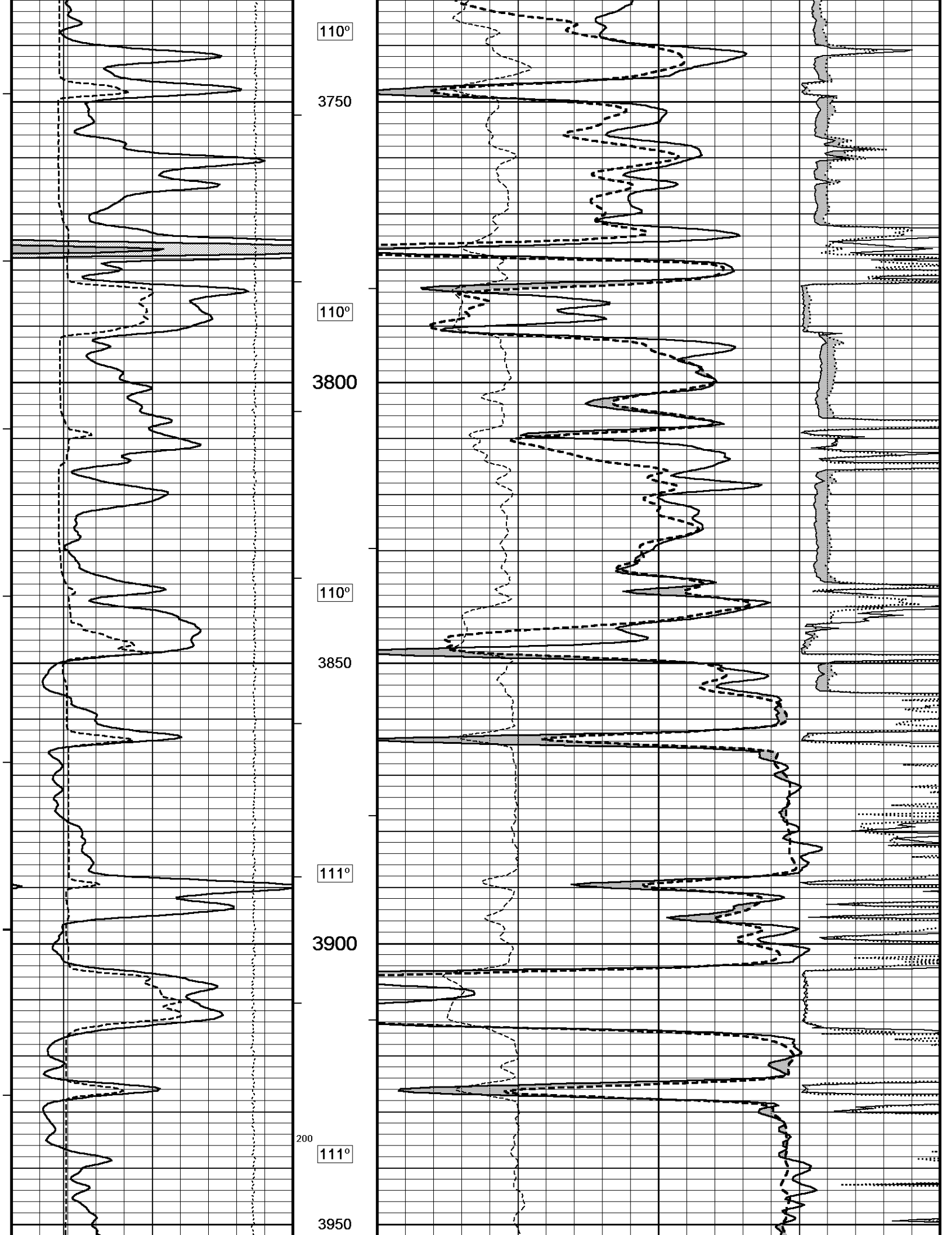
↑ 5 INCH MAIN ↑

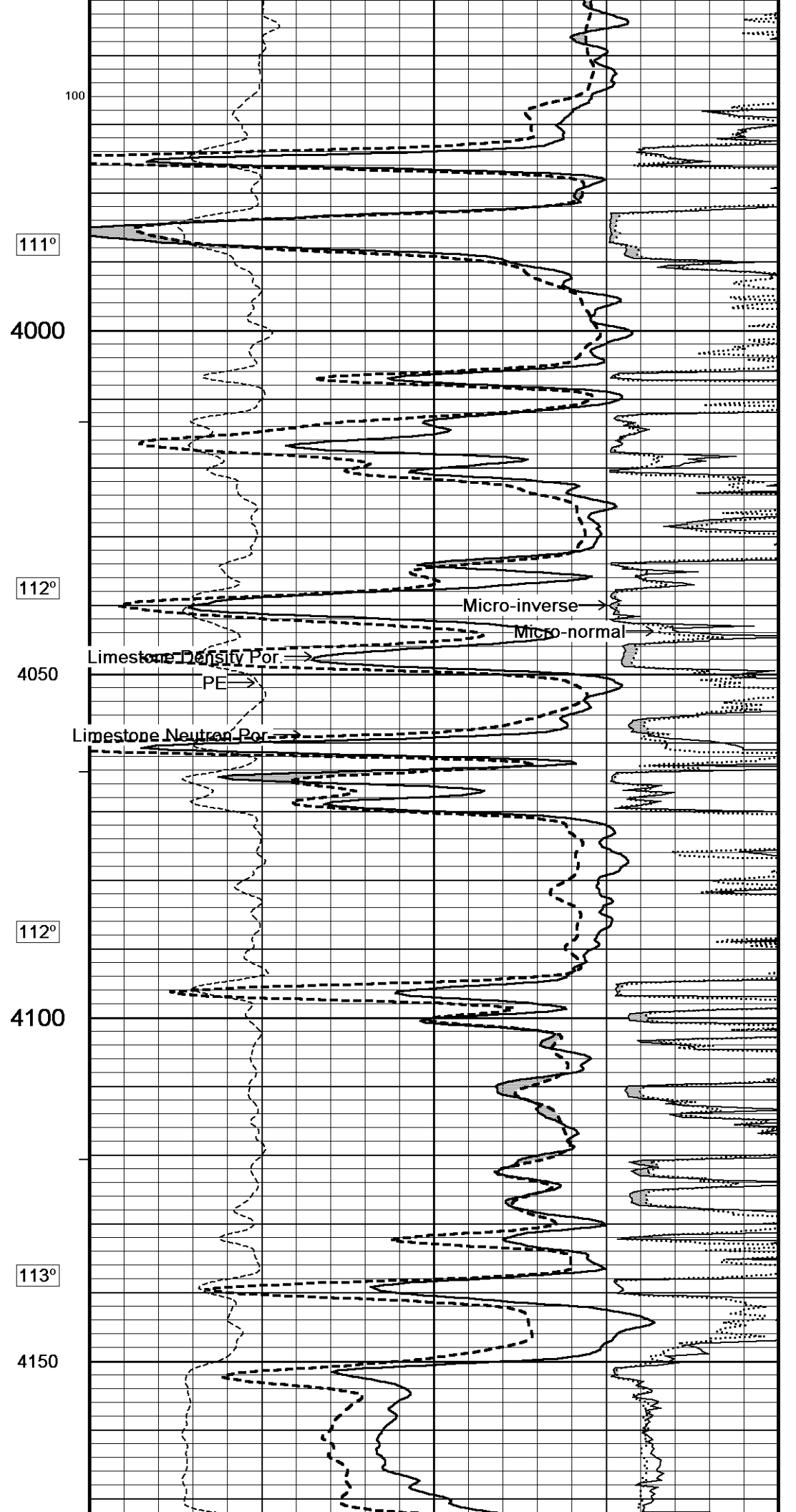
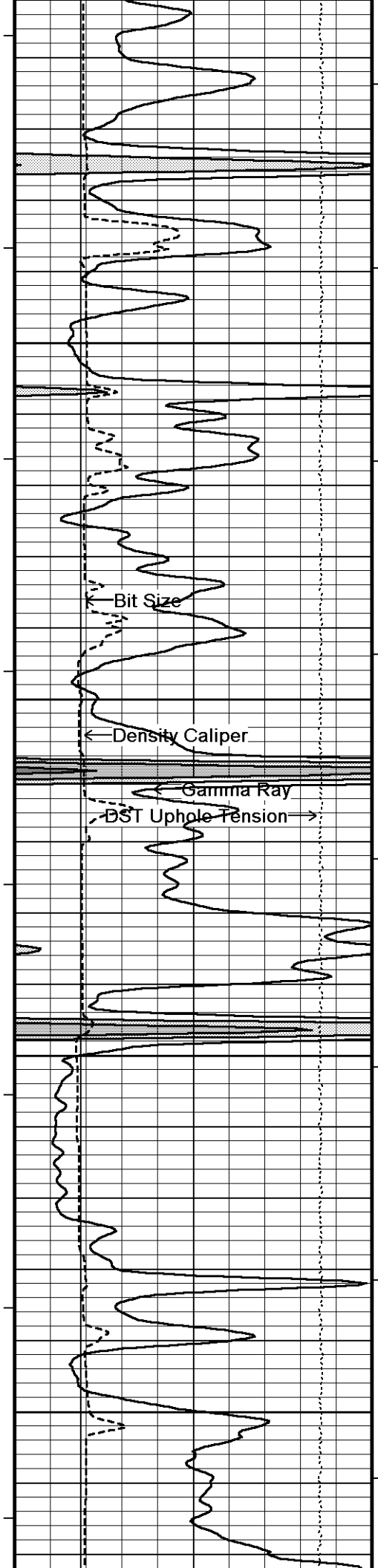
↓ 5 INCH MAIN ↓

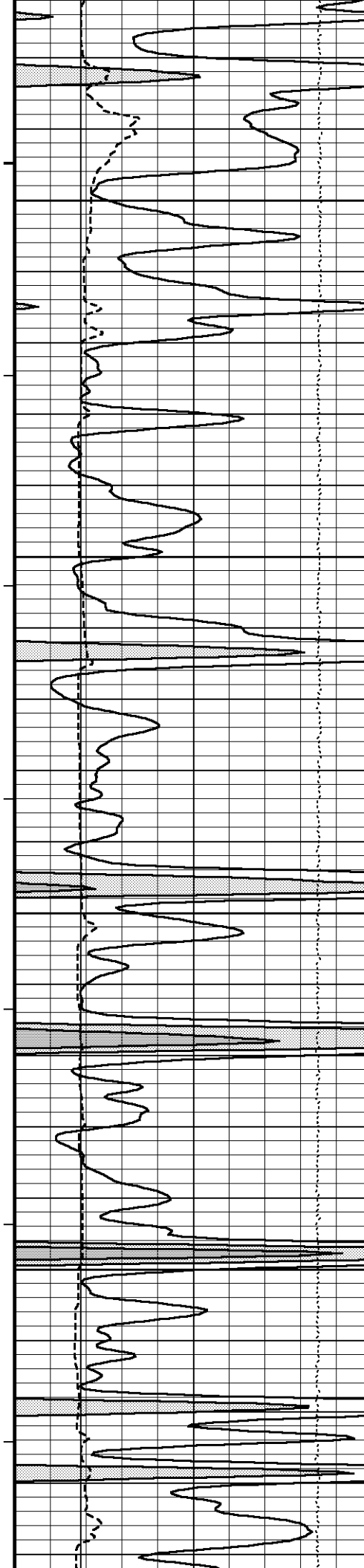
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 04-AUG-2013 21:54
Filename: C:\Minimus 13.05.9583\Log\Shakespeare... \Shakespeare Ottley #4-16 Main spooled section1.dta Recorded on 04-AUG-2013 20:22
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583



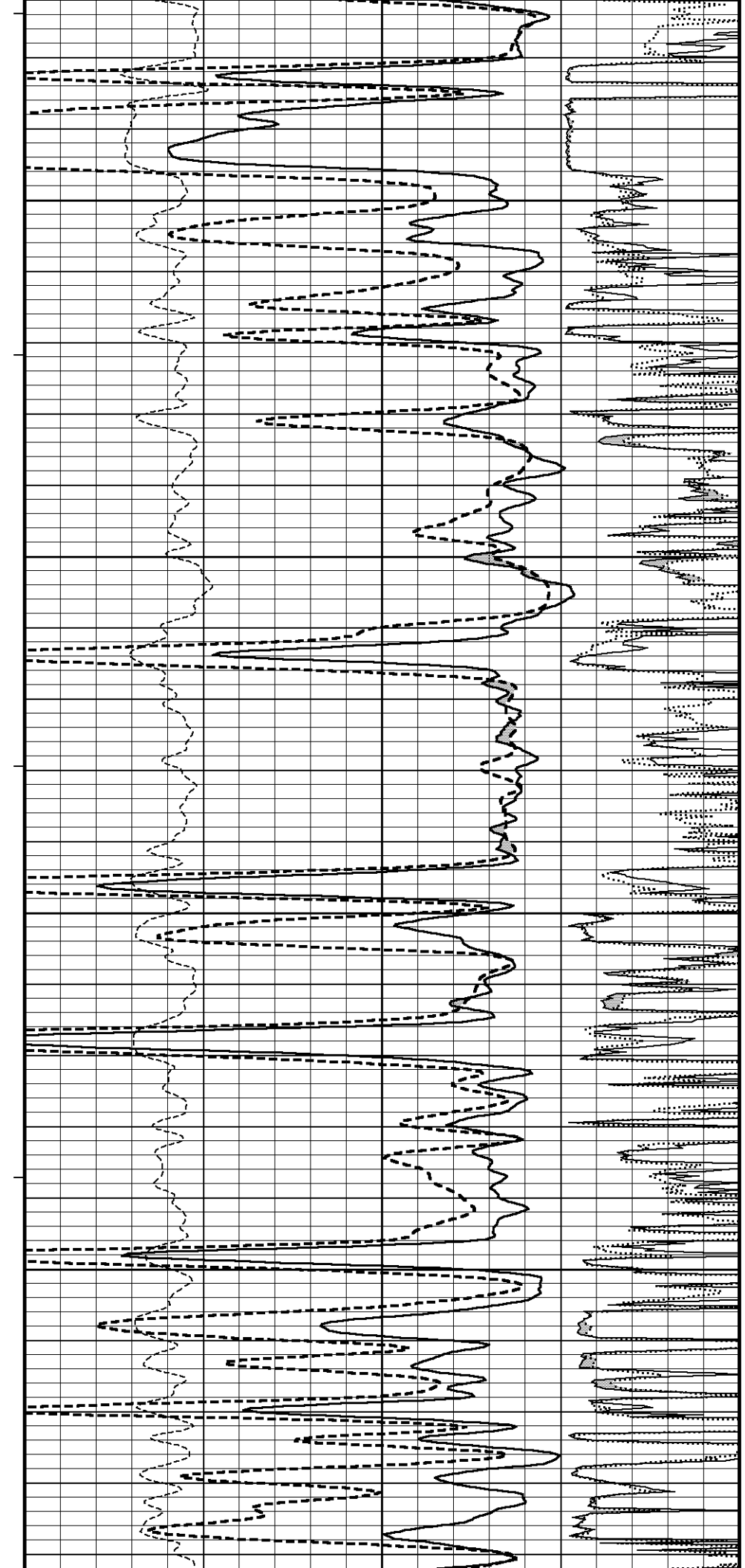


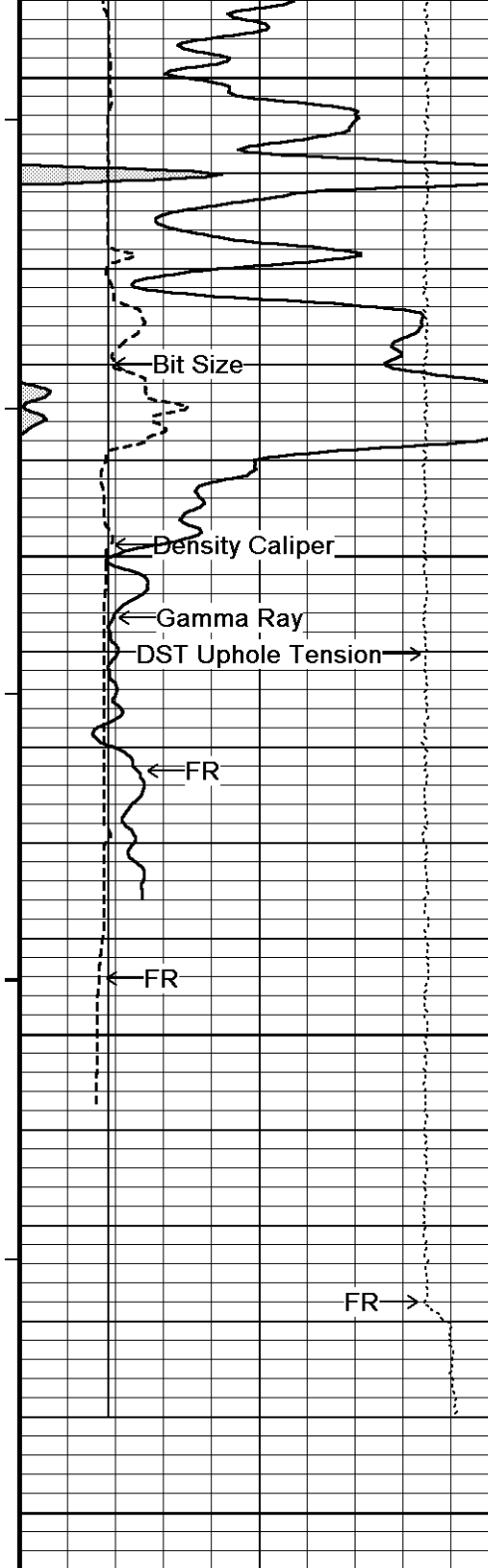




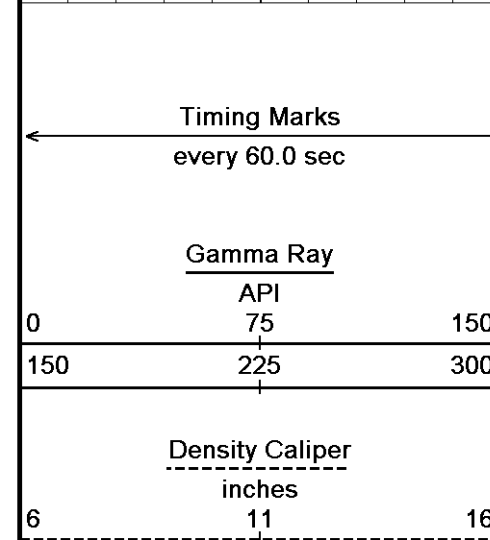
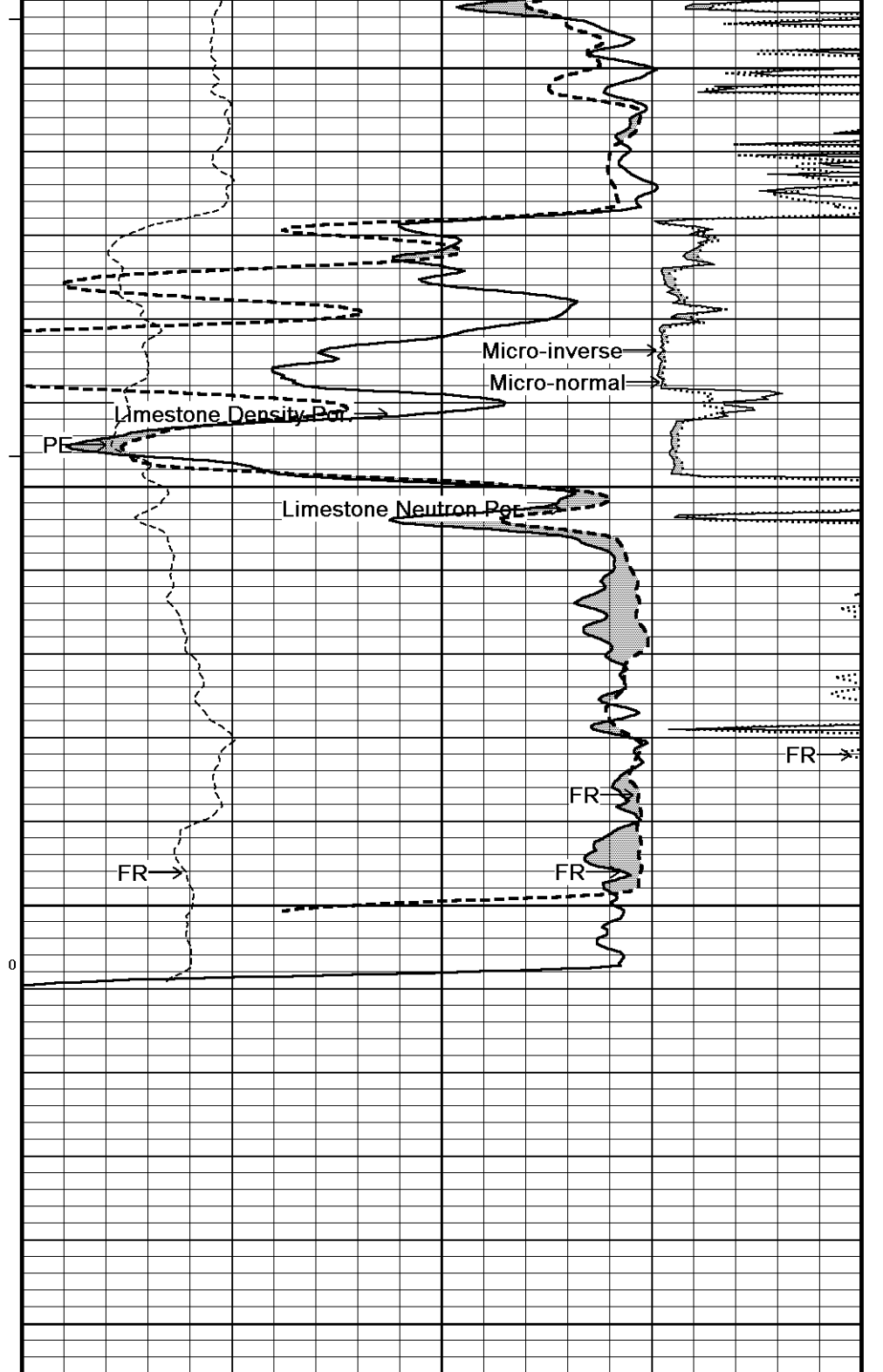


113°
4200
100
114°
4250
114°
4300
114°
4350
115°

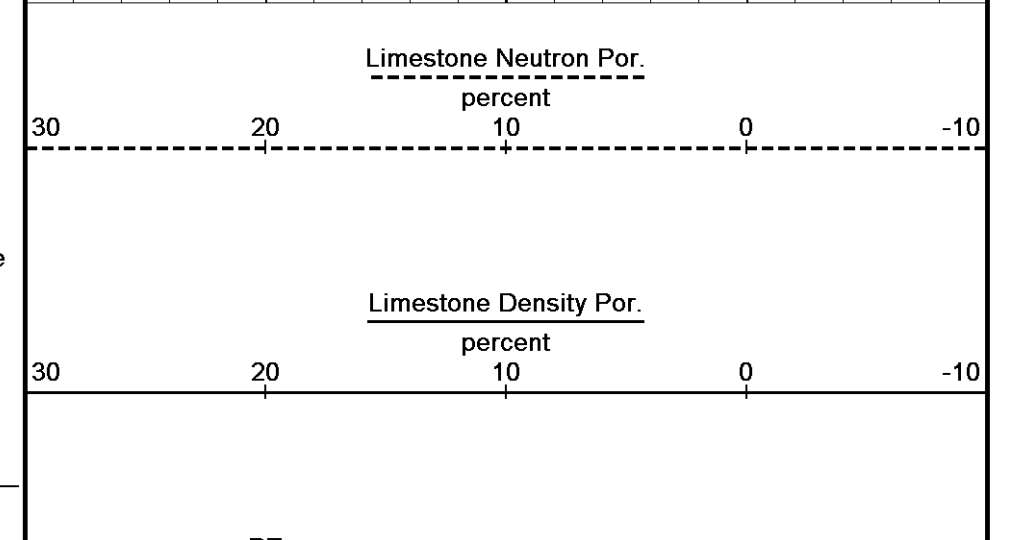


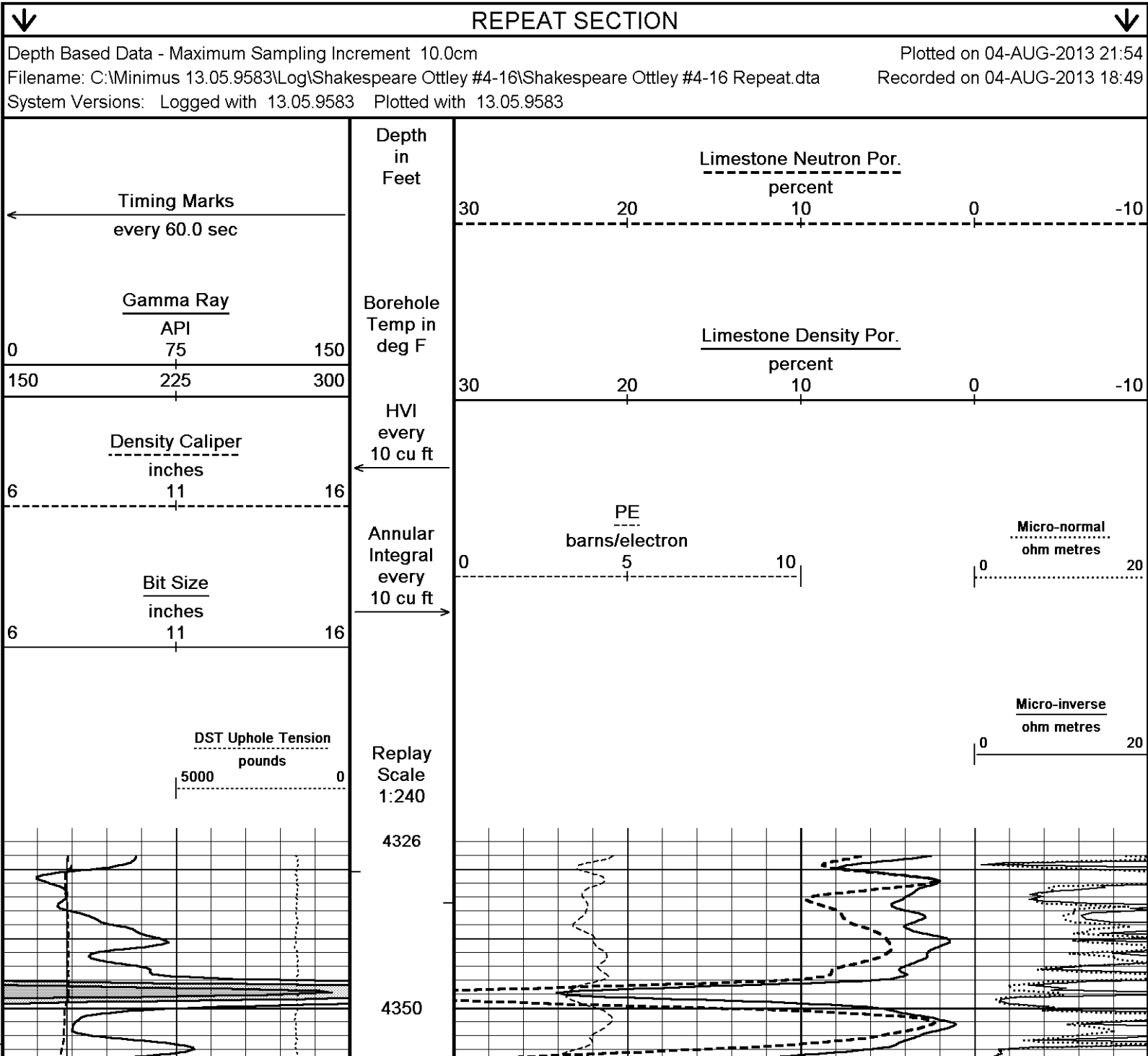
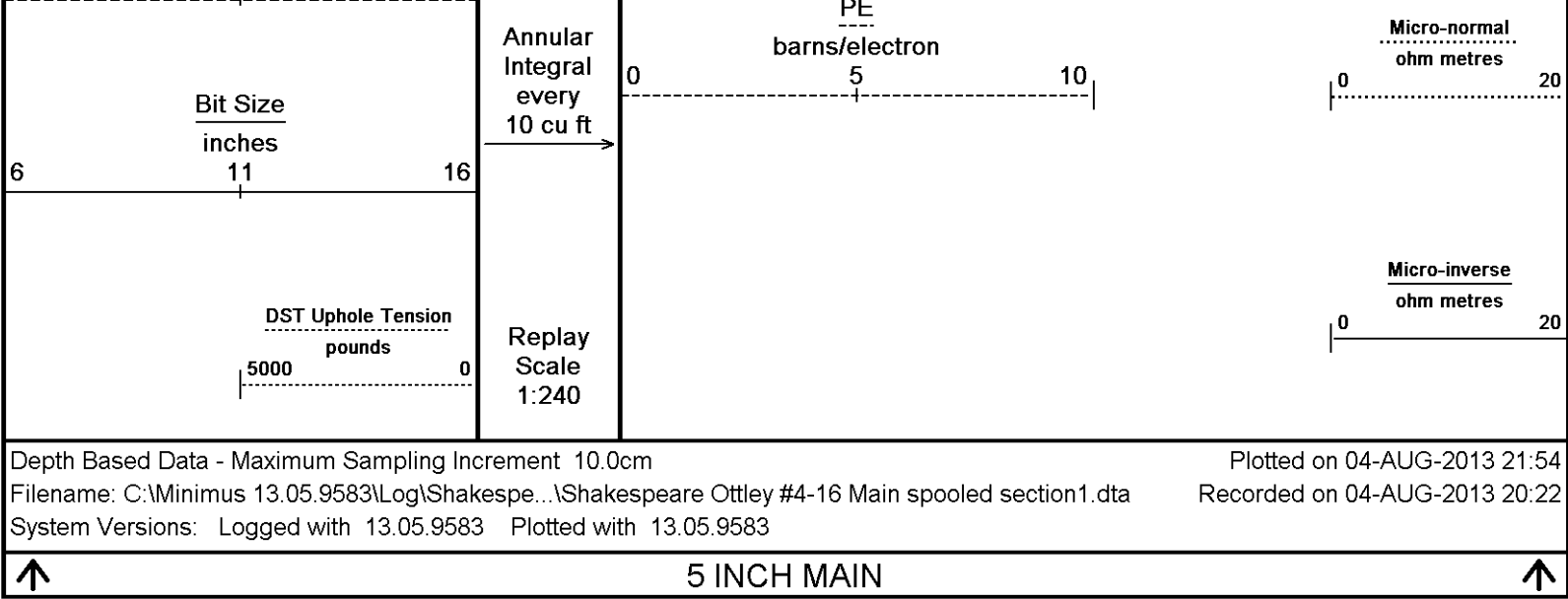


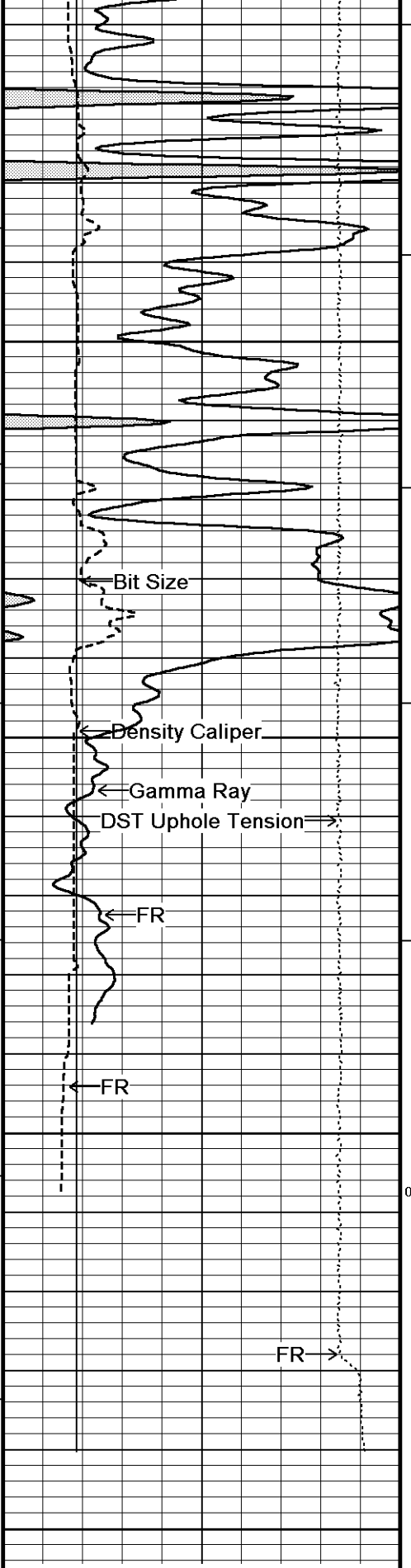
4400
115°
4450
114°
4500
0
4550
Depth in Feet



Borehole Temp in deg F
HVI every 10 cu ft







114°

4400

114°

4450

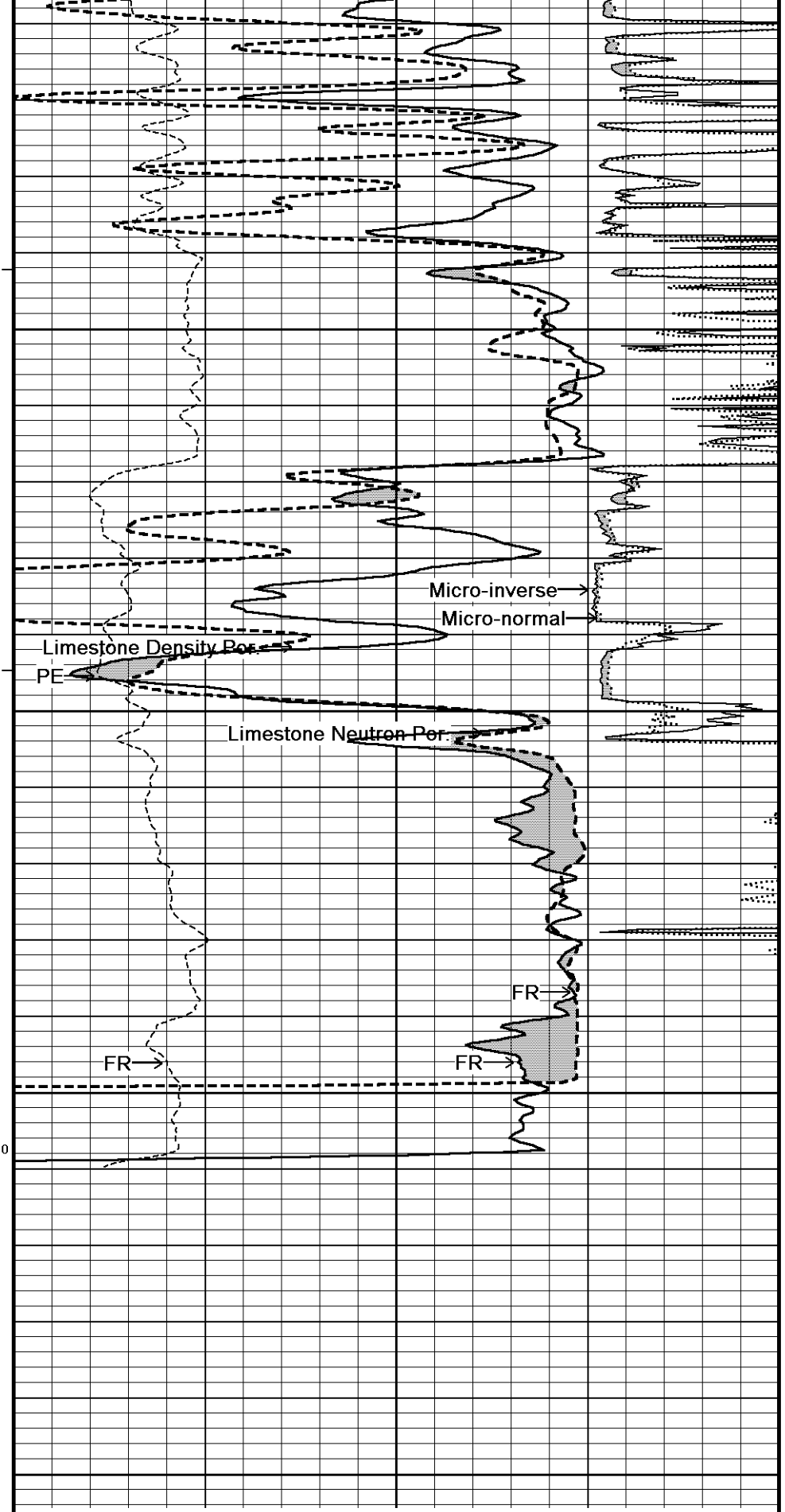
113°

4500

4550

Depth
in
Feet

Timing Marks
every 60.0 sec



Limestone Density Por.
PE

Limestone Neutron Por.

Micro-inverse
Micro-normal

FR

FR

FR

Limestone Neutron Por.
percent

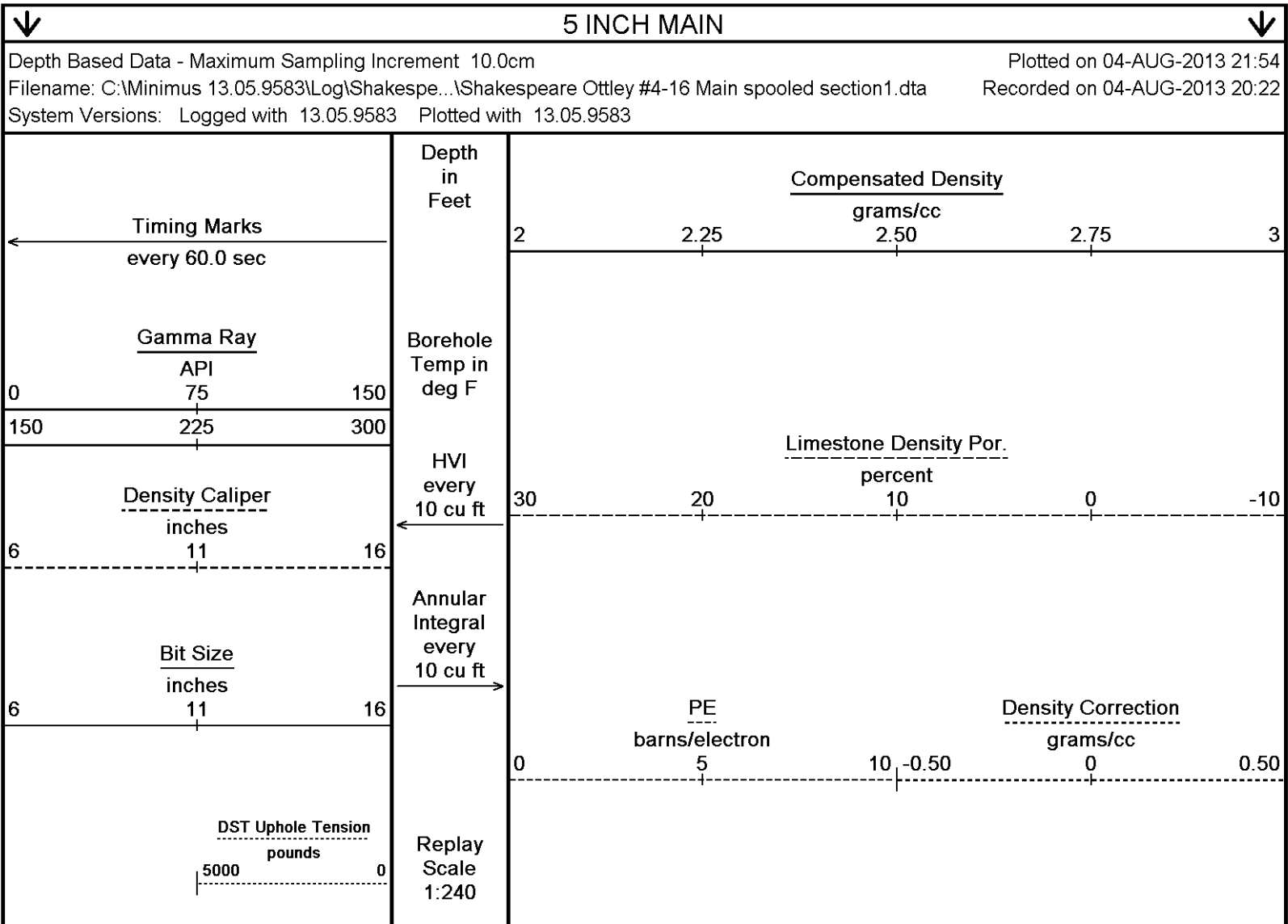
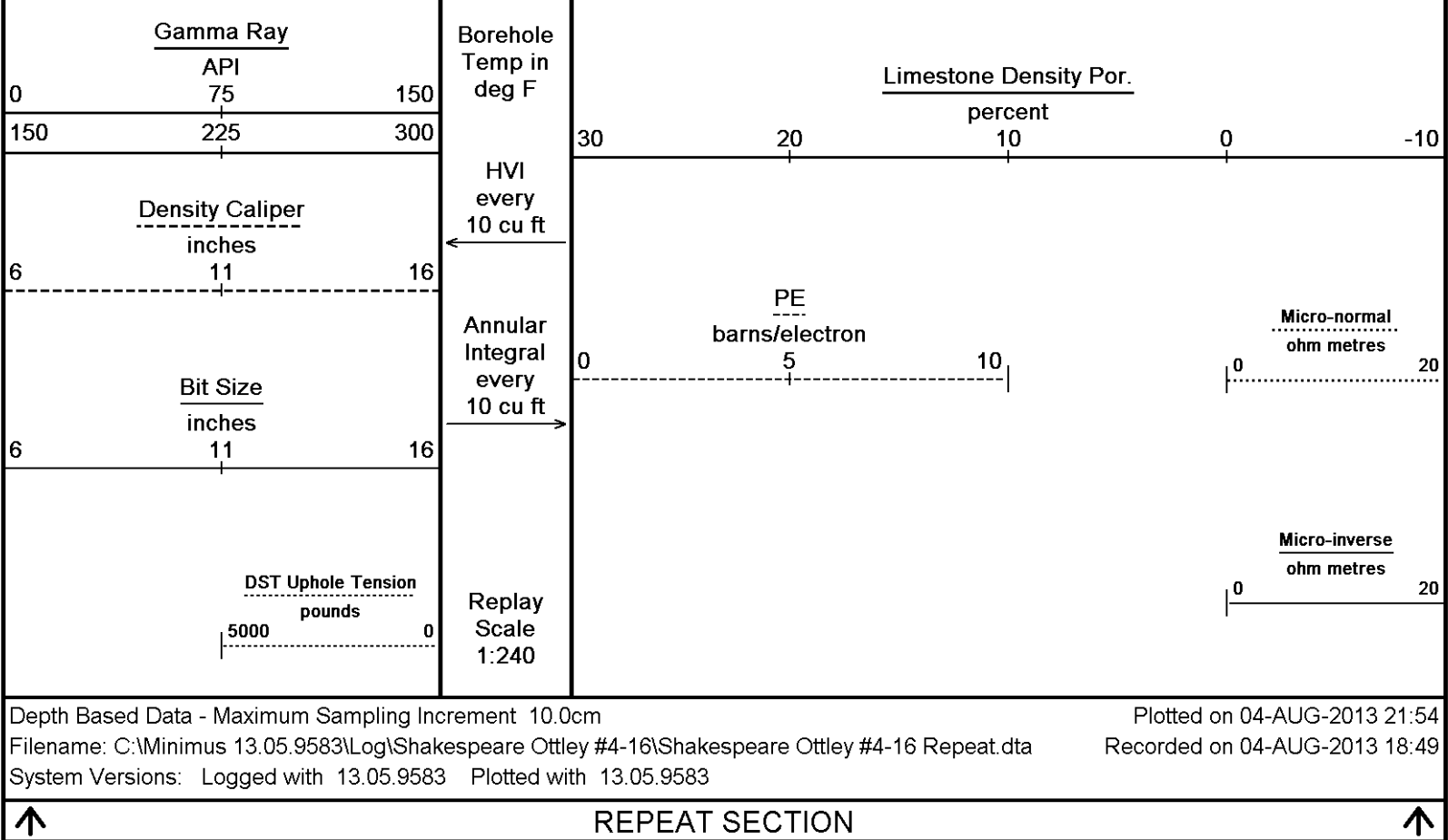
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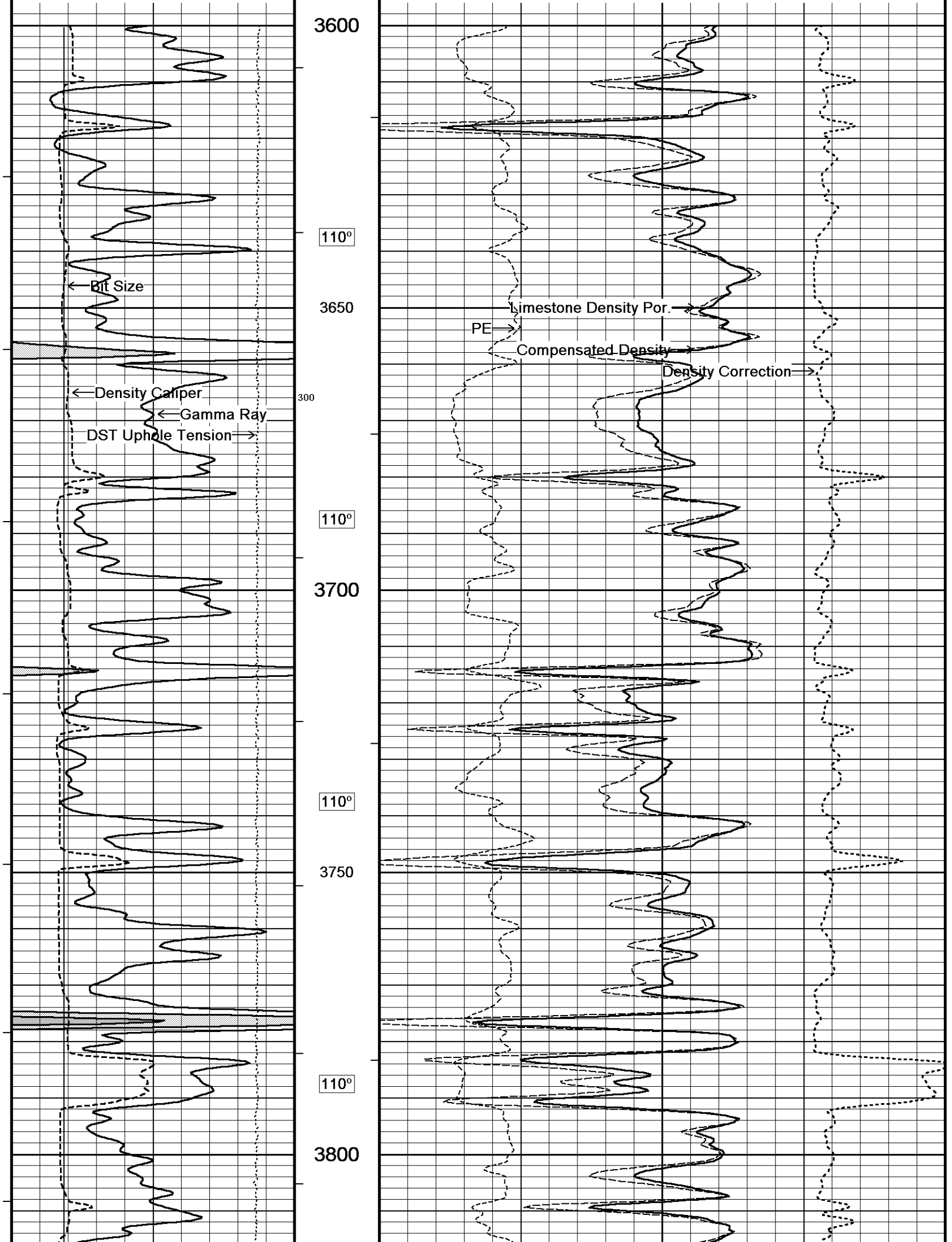
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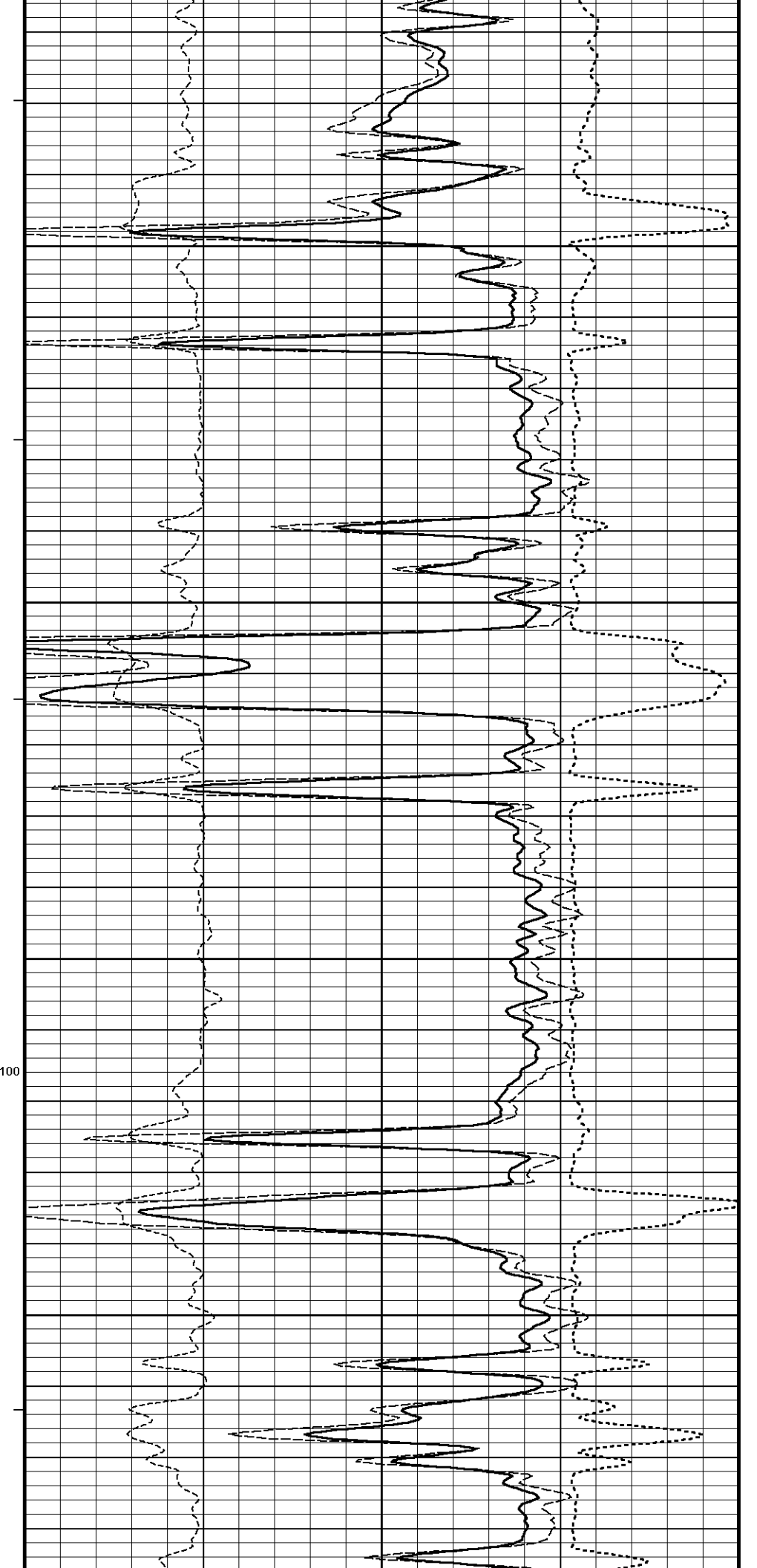
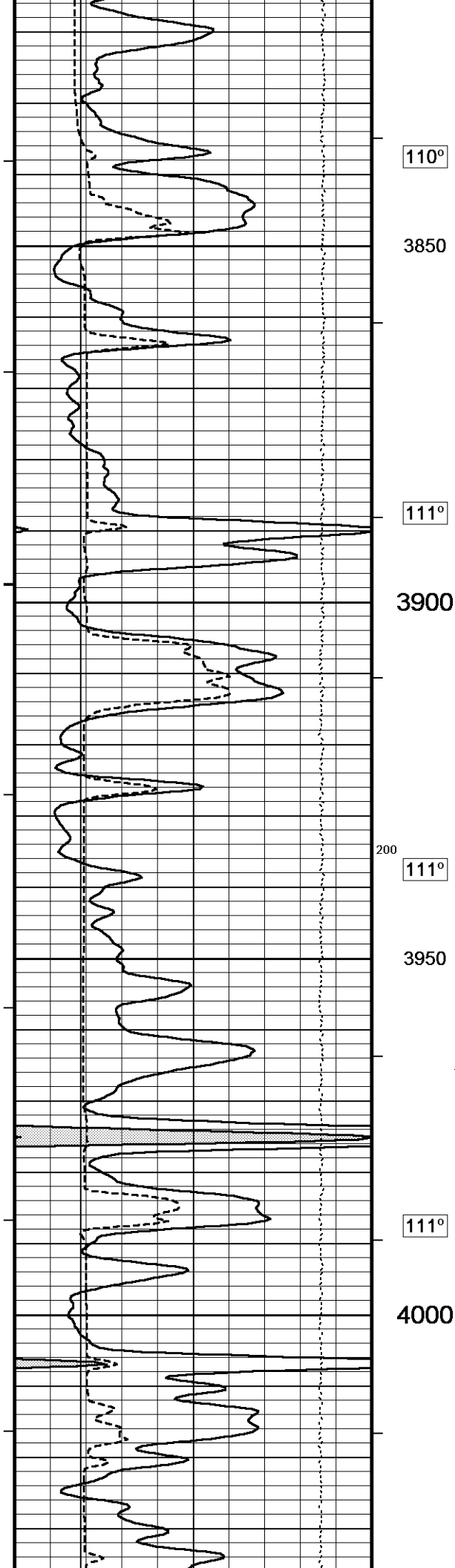
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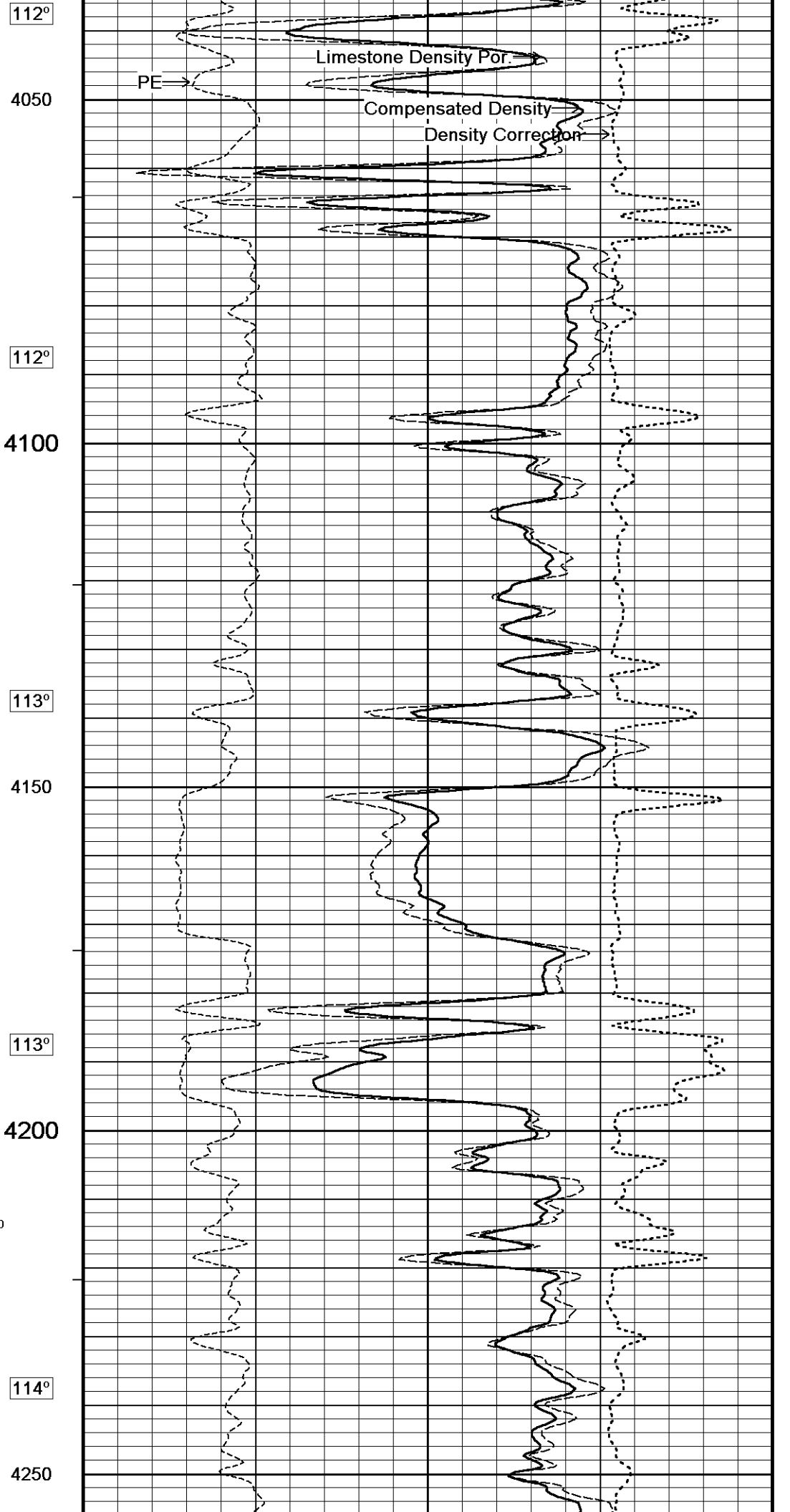
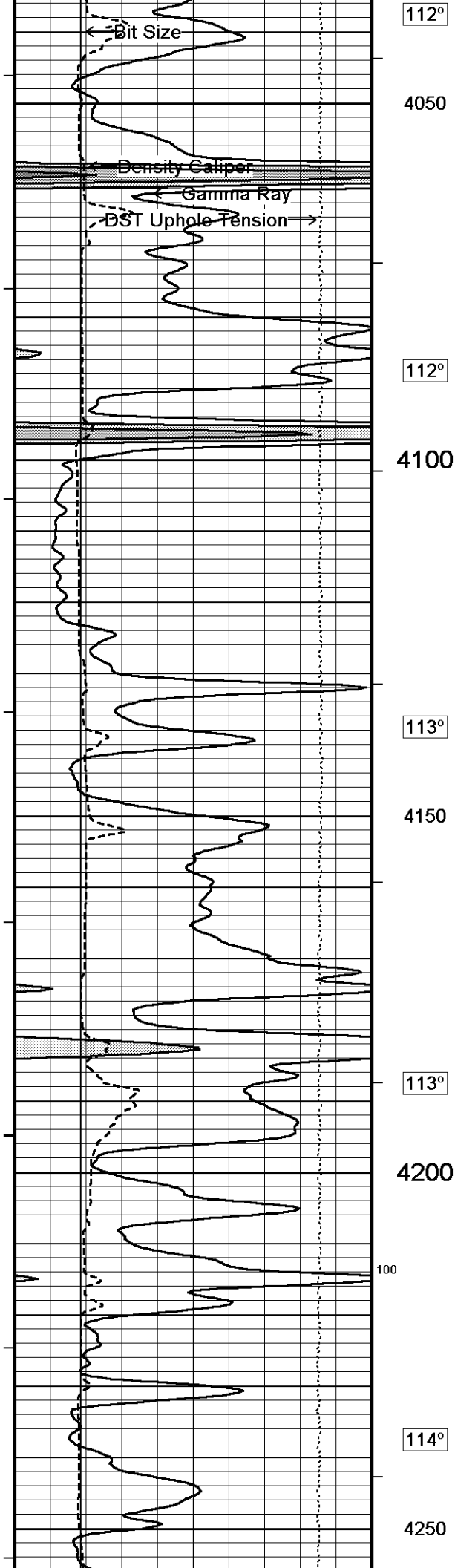
0

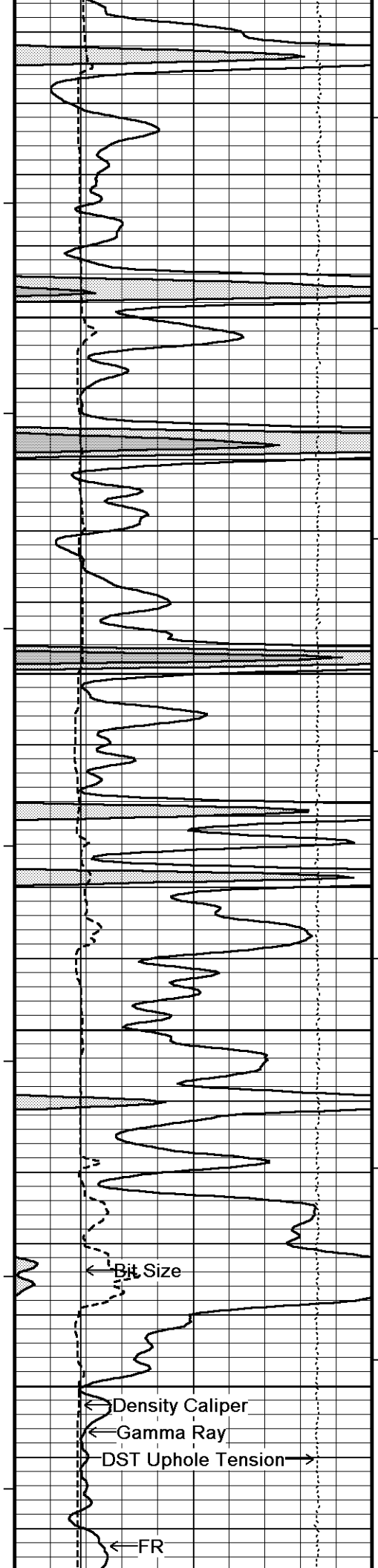
-10











114°

4300

114°

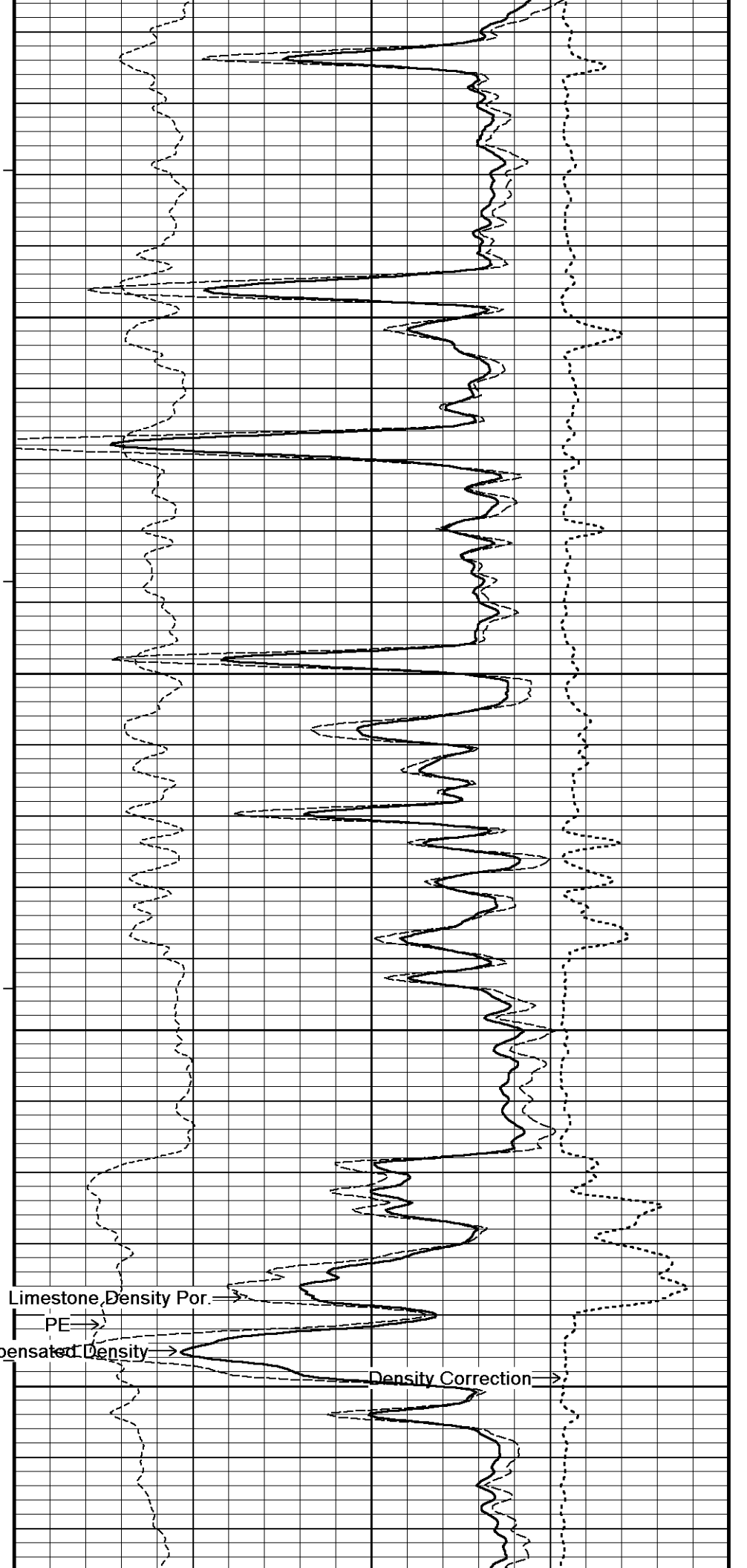
4350

115°

4400

115°

4450



Limestone Density Por. →

PE →

Compensated Density →

Density Correction →

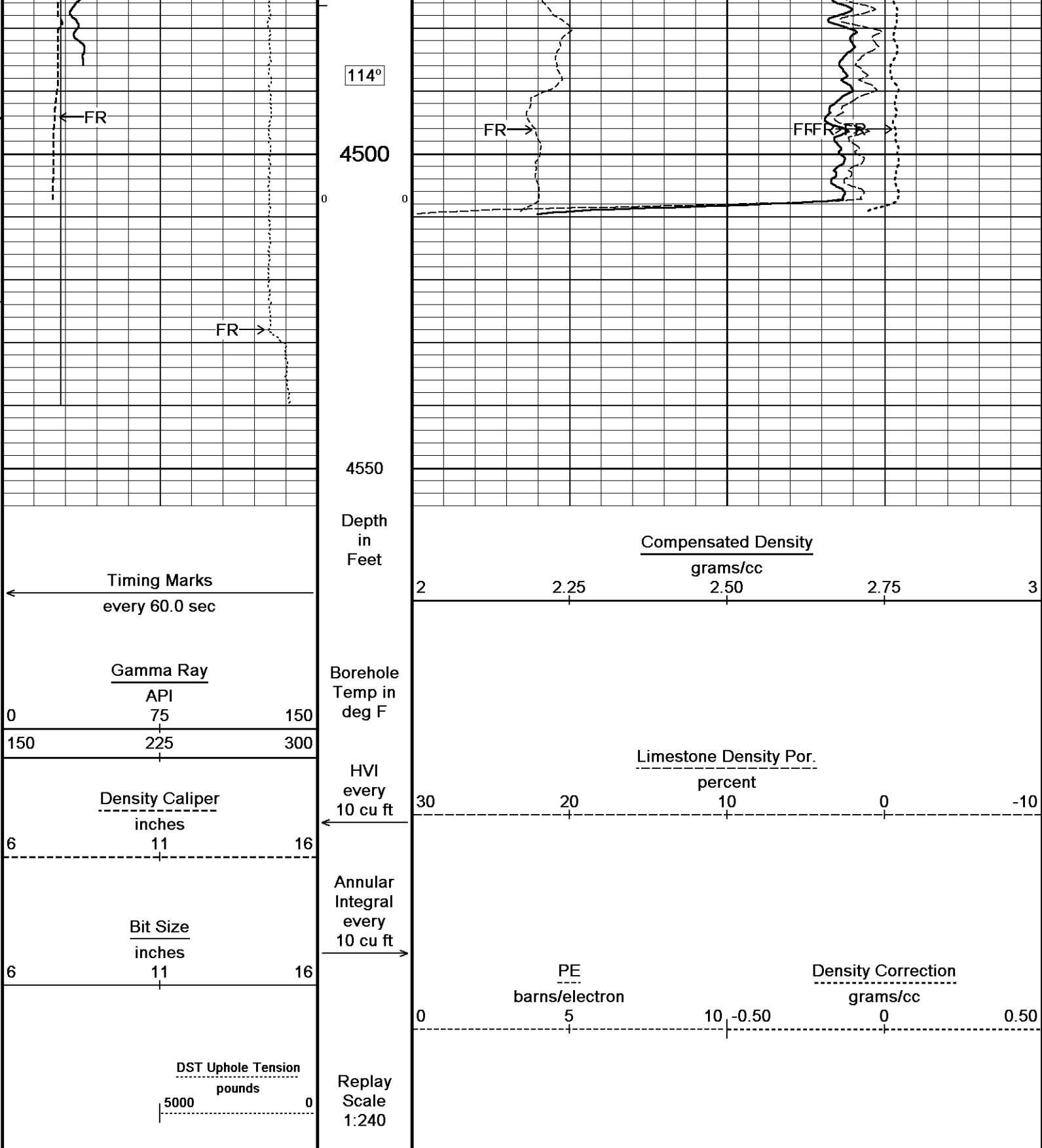
← Bit Size

← Density Caliper

← Gamma Ray

← DST Uphole Tension →

← FR

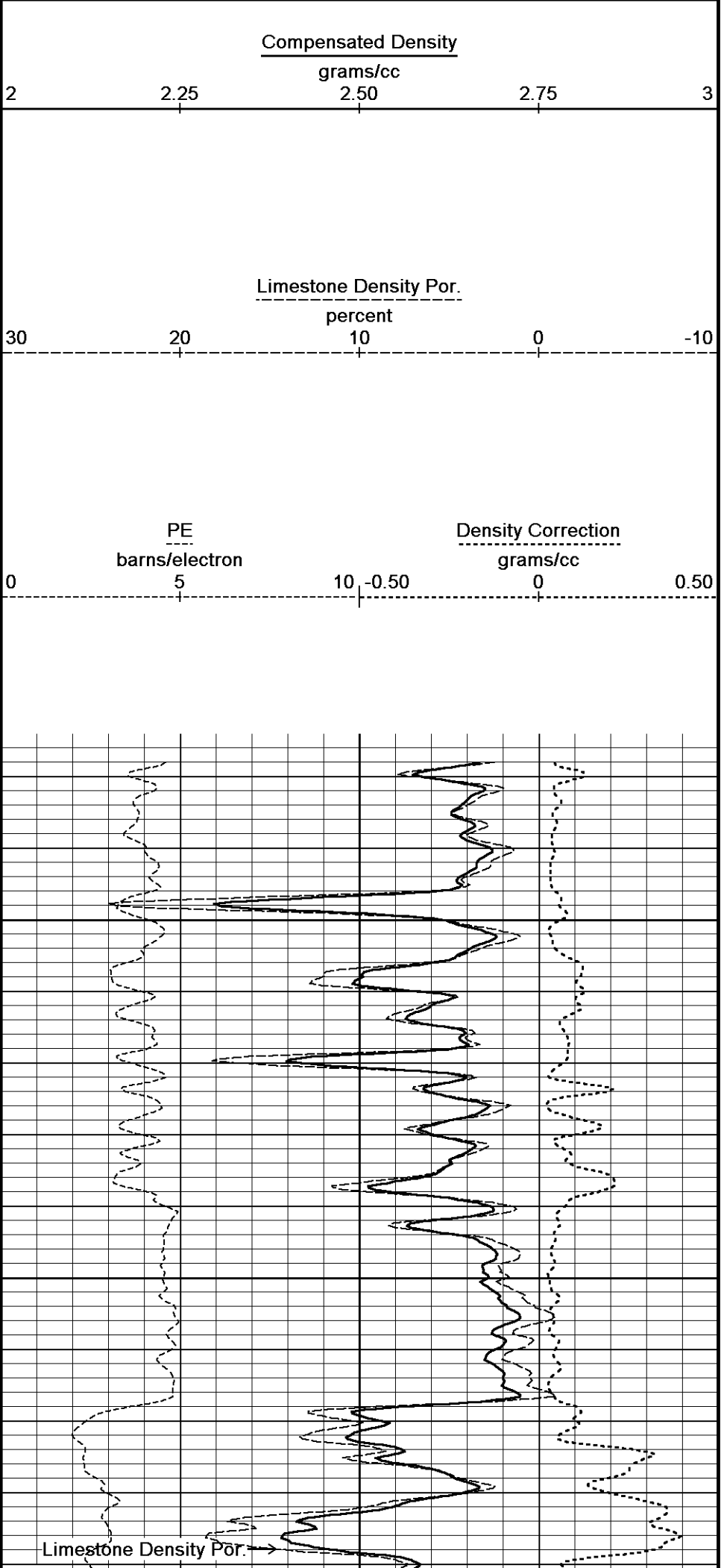
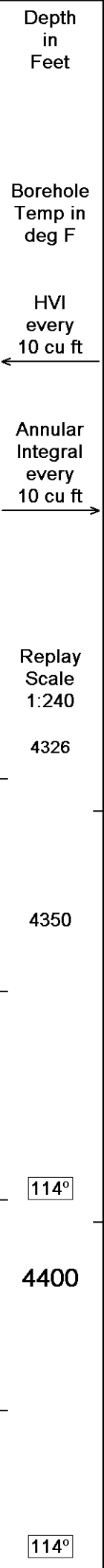
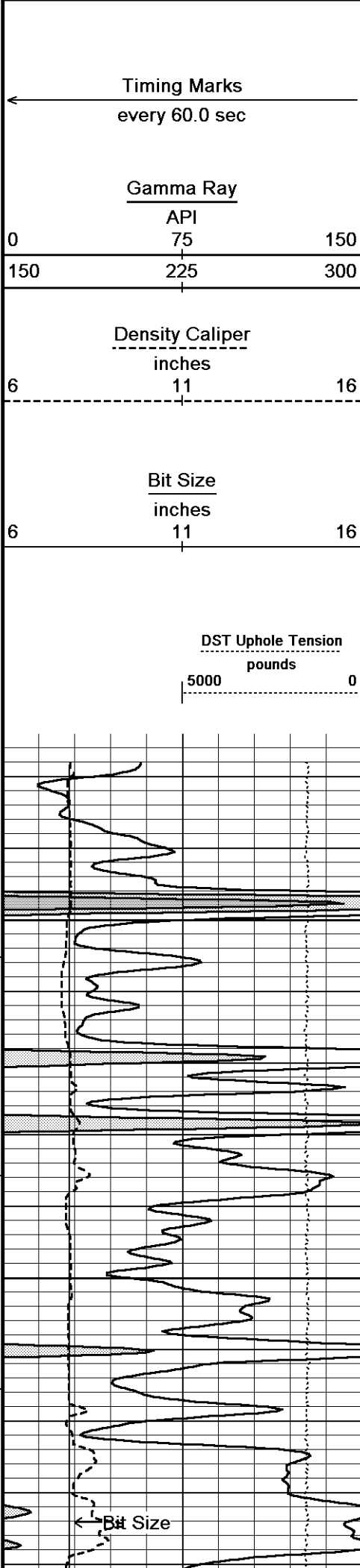


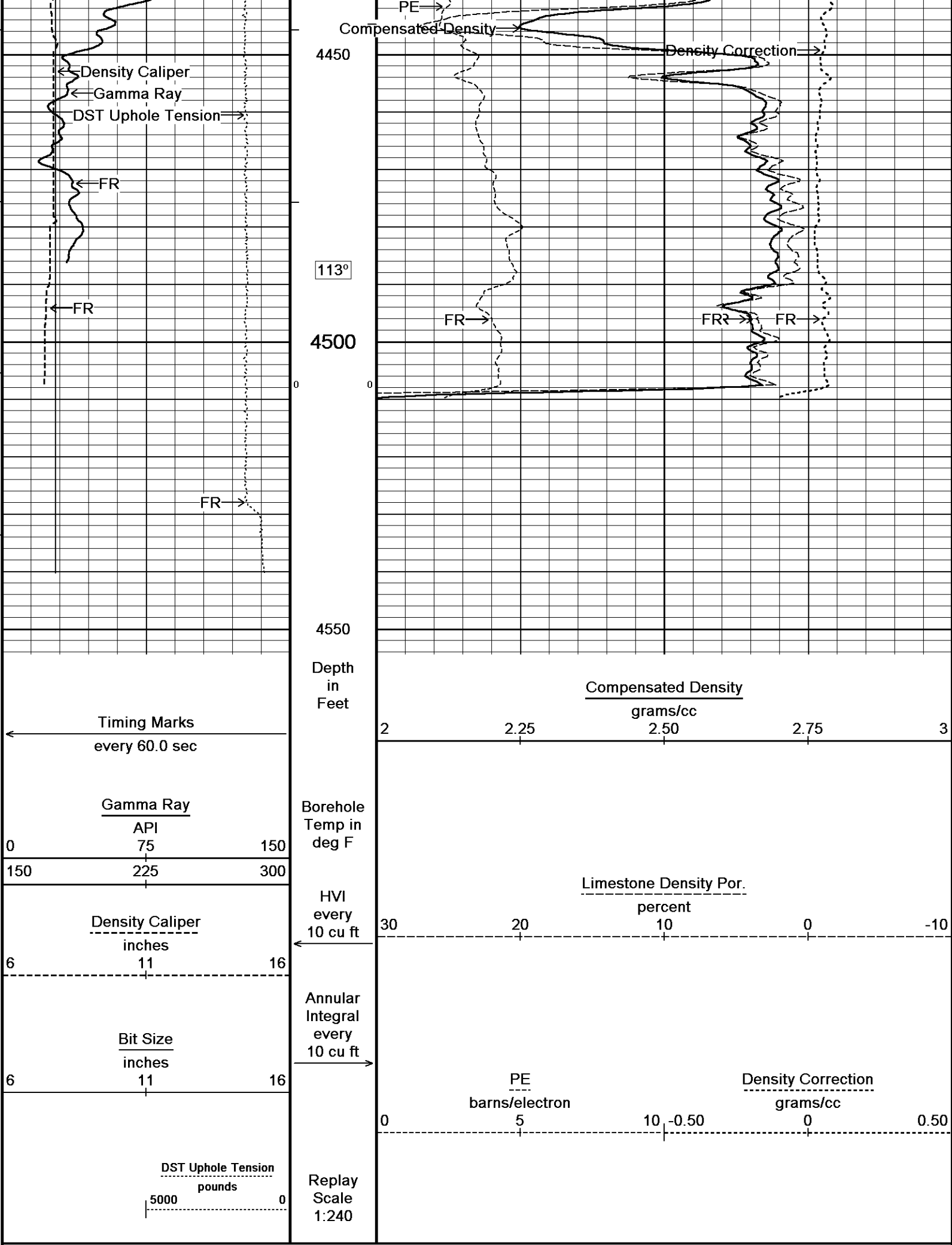
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 04-AUG-2013 21:54
Filename: C:\Minimus 13.05.9583\Log\Shakespeare Otley #4-16 Main spooled section1.dta Recorded on 04-AUG-2013 20:22
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

↑ 5 INCH MAIN ↑

↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 04-AUG-2013 21:54
Filename: C:\Minimus 13.05.9583\Log\Shakespeare Otley #4-16\Shakespeare Otley #4-16 Repeat.dta Recorded on 04-AUG-2013 18:49
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583





↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION

C:\Minimus 13.05.9583\Log\Shakespeare Ottley #4-16\Shakespeare Ottley #4-16 Main spooled section1.dta

General Constants All 000

Last Edited on 04-AUG-2013,16:01

General Parameters

Mud Resistivity	0.510	ohm-metres
Mud Resistivity Temperature	98.000	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. Six Res Rt
RWA Constant A	1.000
RWA Constant M	2.000
SW/APOR Tool Source	0.000

Down-hole Tension Calibration SMS 0

Field Calibration on 04-AUG-2013 18:05

Reading No	Measured	Calibrated (lbs)
1	13735.13	0.00
2	14289.75	471.00

Gamma Calibration MCG-B 39

Field Calibration on 04-AUG-2013 10:53

	Measured	Calibrated (API)
Background	64	43
Calibrator (Gross)	1141	768
Calibrator (Net)	1077	725

Gamma Constants MCG-B 39

Last Edited on 04-AUG-2013,16:01

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	%

SP Calibration MCG-B 39

Field Calibration on 30-JUL-2013,09:41

	Measured	Calibrated (mV)
Reference 1	105.8	100.0
Reference 2	-94.3	-100.0

High Resolution Temperature Calibration MCG-B 39

Field Calibration on 30-JUL-2013,09:41

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

High Resolution Temperature Constants MCG-B 39

Last Edited on 30-JUL-2013,09:41

Pre-filter Length	11
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Caliper Calibration MML-A 3

Base Calibration on 05-JUN-2013 15:43

Field Calibration on 04-AUG-2013 10:46

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14624	5.98
2	17958	7.97
3	21263	9.86
4	25213	11.92
5	0	0.00
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	6.15	5.98

Micro Normal and Micro Inverse Calibration MML-A 3					Base Calibration on 05-JUN-2013 15:36 Field Check on 04-AUG-2013 10:47	
Base Calibration						
Channel	Resistor 1	Measured Resistor 2	Calibrated (ohm-m)	Resistor 1	Resistor 2	
Micro Normal	12.2	60.2	5.0	25.0		
Micro Inverse	15.7	78.3	5.0	25.0		
Channel	Base Check (ohm-m)		Field Check (ohm-m)			
Micro Normal	63.0		63.0			
Micro Inverse	48.2		48.2			

Micro Normal and Micro Inverse Constants MML-A 3					Last Edited on 04-AUG-2013,10:46	
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	N/A inches					

Neutron Calibration MDN-A.B 66					Base Calibration on 31-JUL-2013 10:25 Field Check on 04-AUG-2013 10:58	
Base Calibration						
	Measured		Calibrated (cps)			
	Near	Far	Near	Far		
	3180	99	3714	110		
Ratio	32.180		33.764			
Field Calibrator at Base			Calibrated (cps)			
			1617	2323		
Ratio			0.696			
Field Check			Calibrated (cps)			
			1624	2337		
Ratio			0.697			

Neutron Constants MDN-A.B 66					Last Edited on 04-AUG-2013,10:54	
Neutron Source Id	P0204NN					
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 353					Base Calibration on 22-MAY-2013 08:22 Field Check on 04-AUG-2013 10:23	
Base Calibration						
Reference 1	Measured	Calibrated (ohm-m)				
	0.0	0.0				

Reference 1	0.0	0.0
Reference 2	964.9	126.8
Base Check		280.9
Field Check		280.8

FE Constants MFE-B.J 353		Last Edited on 04-AUG-2013,16:01	
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	

Sonic Constants MSS-A.A 55		Last Edited on 04-AUG-2013,16:01	
Maximum Boundary Contrast	100.00	micro-sec/ft	
Fluid Transit Time	189.00	micro-sec/ft	
Limestone Transit Time	47.50	micro-sec/ft	
Sandstone Transit Time	55.50	micro-sec/ft	
Dolomite Transit Time	43.50	micro-sec/ft	
Sonic used for Porosities	3-5' Compensated Sonic		
Correction for Sonde Skew	Not Applied		
Cycle Stretch Algorithm	Applied		
MN3FT	N/A	micro-sec	
MX3FT	N/A	micro-sec	
Hunt-Raymer Constant	83.13	micro-sec/ft	
Sonde Mode	Compensated		
Hole Type	Open Hole		
Sonde Parameters			
	Measured	Calibrated	
Offset	N/A	0.0000	
Free Pipe	N/A	N/A	
Peak Amplitude Source		N/A	
Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain
3'	N/A	N/A	N/A
4'	N/A	N/A	N/A
5'	N/A	N/A	N/A
6'	N/A	N/A	N/A
Processed Fixed Gate Parameters			
Waveform Used For Processing	N/A		
Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	N/A
N/A	N/A	N/A	
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
Full Waveform Parameters			
Use 3' Waveform to derive TR	N/A		
Use 4' Waveform to derive TR	N/A		
Use 5' Waveform to derive TR	N/A		
Use 6' Waveform to derive TR	N/A		
3' Waveform Discriminator Level	N/A	mV	
4' Waveform Discriminator Level	N/A	mV	
5' Waveform Discriminator Level	N/A	mV	
6' Waveform Discriminator Level	N/A	mV	
3' Waveform Filter	N/A		
4' Waveform Filter	N/A		
5' Waveform Filter	N/A		
6' Waveform Filter	N/A		
Semblance Level	N/A		

Semblance Error:	N/A	micro-sec
Sonic 1 Despiker	N/A	N/A
Sonic 2 Despiker	N/A	N/A

Induction Calibration MAI-A.A 167					Base Calibration on 19-APR-2013,13:41	
					Field Check on 04-AUG-2013 10:21	
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			13.4	3838.7		
2			29.7	3476.3		
3			29.2	3052.4		
4			19.8	2081.3		
Deep			18.7	2048.6		
Medium			42.3	3990.3		
Shallow			43.1	5053.2		
Array Temperature			78.6	Deg F		

Induction Constants MAI-A.A 167			Last Edited on 04-AUG-2013,16:01	
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		60.00	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 167			Field Calibration on 30-JUL-2013,09:41	
		Measured	Calibrated(Deg F)	
Lower		50.00	50.00	

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Log\Shakespeare Ottley #4-16\Shakespeare Ottley #4-16 Main spooled section1.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-B 39 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 3 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

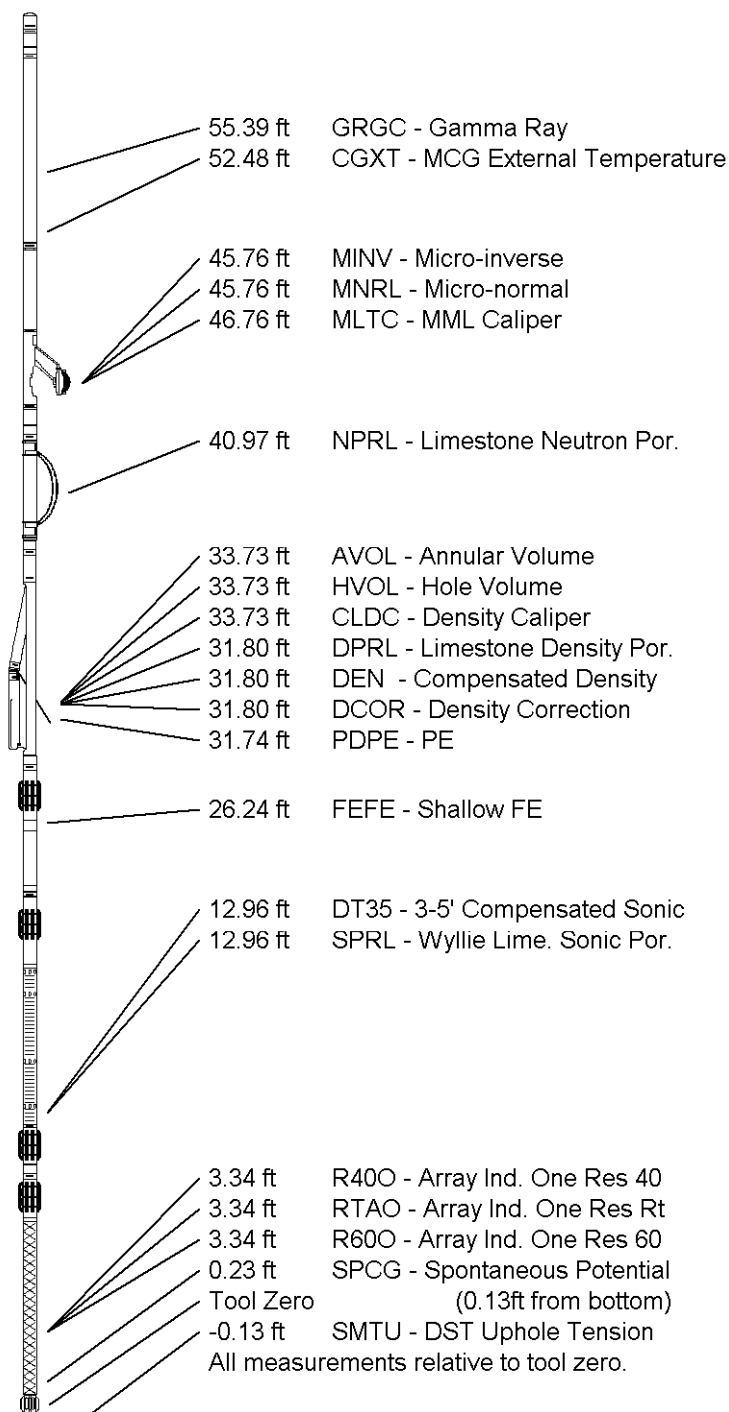
Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

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

Compact Sonic
MSS-A.A 55 LG: 12.52 ft WT: 72.8 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: 62.25 ft Weight: 471.8 lb



COMPANY	SHAKESPEARE OIL CO., INC.
WELL	OTTLEY #4-16
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2818.00	feet	First Reading	4496.00	feet
Elevation Drill Floor	2816.00	feet	Depth Driller	4530.00	feet
Elevation Ground Level	2808.00	feet	Depth Logger	4528.00	feet



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COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG