

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

COMPANY

SHAKESPEARE OIL COMPANY

WELL

TEETER #1-11

FIELD

WILDCAT

PROVINCE/COUNTY

LOGAN

COUNTRY/STATE

UNITED STATES / KANSAS

LOCATION

2305' FSL & 630' FEL
SE/4

SEC

TWP
11
13SRGE
32WOther Services
MAI/MFE
MML
MSS

API Number

15-109-21168

Permit Number

Permanent Datum G.L., Elevation 3130 feet

Log Measured From KB

Drilling Measured From K.B. @ 10 FEET

Date

26-JUN-2013

Run Number

ONE

Service Order

3537768

Depth Driller

4700.00 feet

Depth Logger

4700.00 feet

First Reading

4668.00 feet

Last Reading

3700.00 feet

Casing Driller

222.00 feet

Casing Logger

223.00 feet

Bit Size

7.880

inches

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.30 lb/USg

54.00 CP

PH / Fluid Loss

10.00

9.60 ml/30Min

Sample Source

MUDPIT

Rm @ Measured Temp

1.17 @ 85.0 ohm-m

Rmf @ Measured Temp

0.94 @ 85.0 ohm-m

Rmc @ Measured Temp

1.40 @ 85.0 ohm-m

Source Rmf / Rmc

CALC

CALC

Rm @ BHT

0.84 @118.0 ohm-m

Time Since Circulation

4 HOURS

Max Recorded Temp

118.00

deg F

Equipment / Base

13096

LIB

Recorded By

W. STAMBAUGH

Witnessed By

TIM PRIEST

JOB#

LB13-185

Elevations:
KB 3004.00 feet
DF 3003.00
GL 2994.00**BOREHOLE RECORD**

Last Edited: 26-JUN-2013 04:45

Bit Size
inches

7.875

Depth From
feet

223.00

Depth To
feet

4700.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

0.00

Shoe Depth
feet

223.00

Weight
pounds/ft

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: 1900 CU. FT.

- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO SURFACE CASING: 1170 CU. FT.

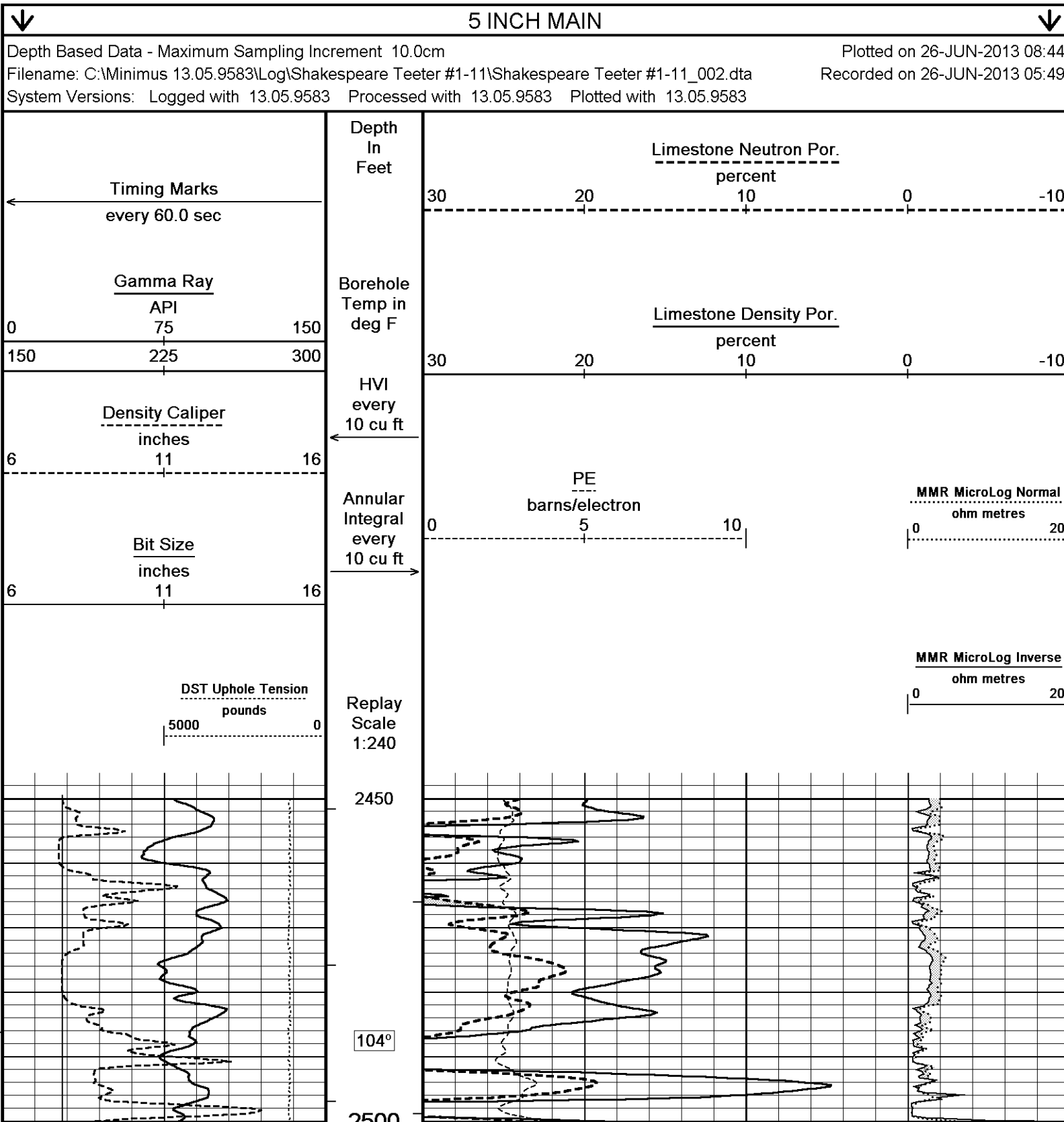
- SERVICE ORDER # 3537768.

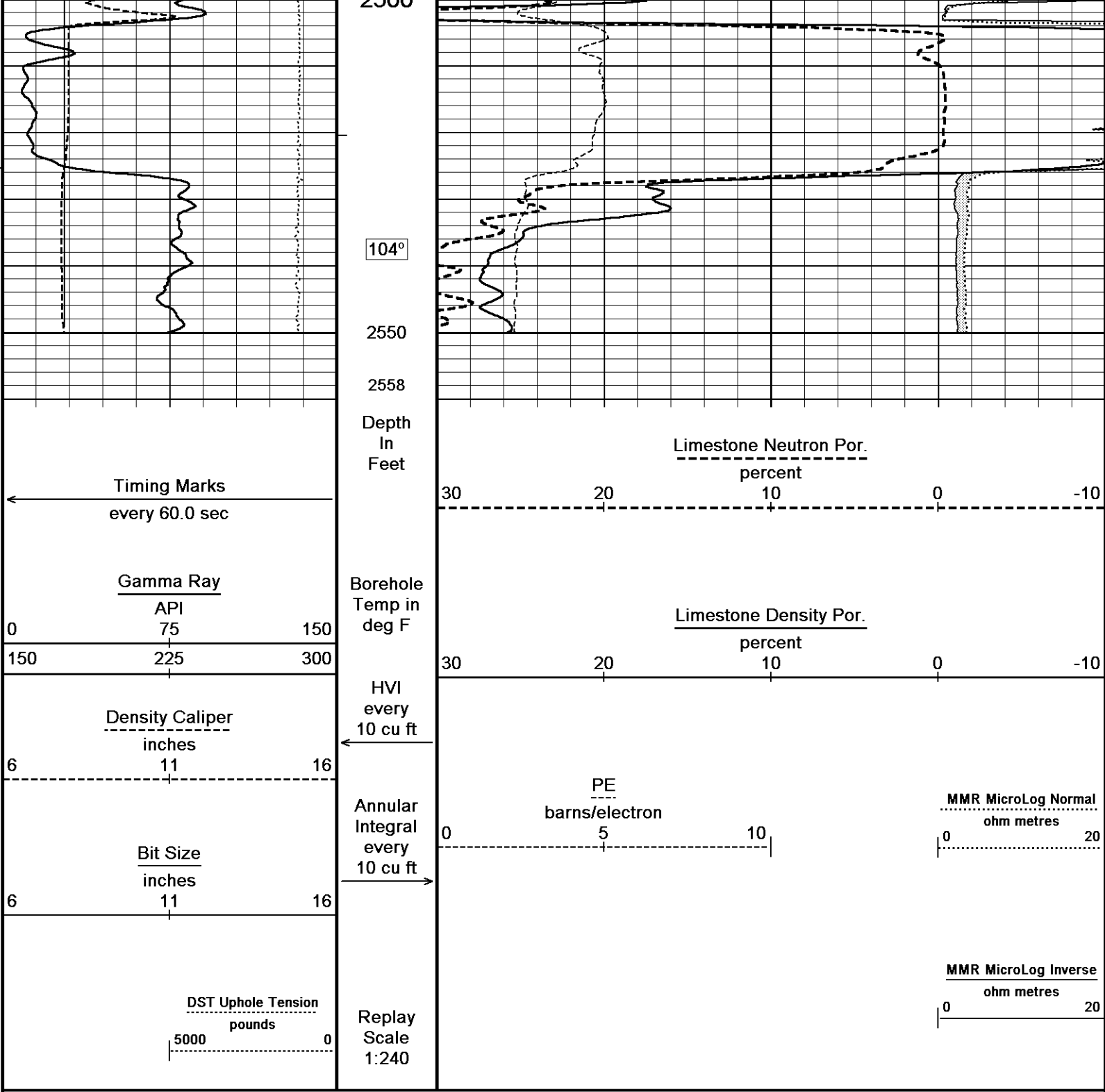
- RIG: HD DRILLING #2.

- ENGINEER: WILLIAM STAMBAUGH

- OPERATOR(S): K. RINEHART, 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.

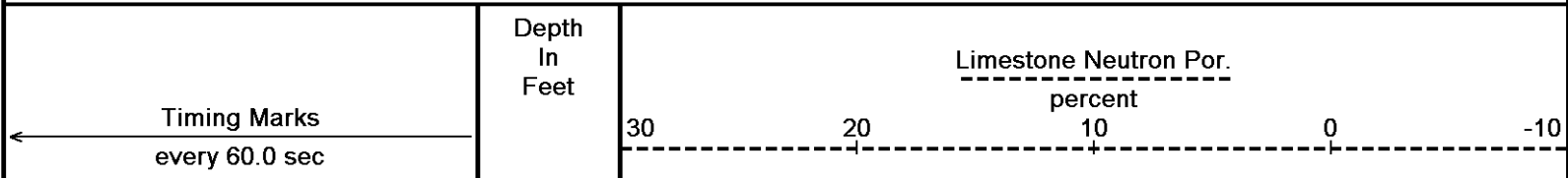


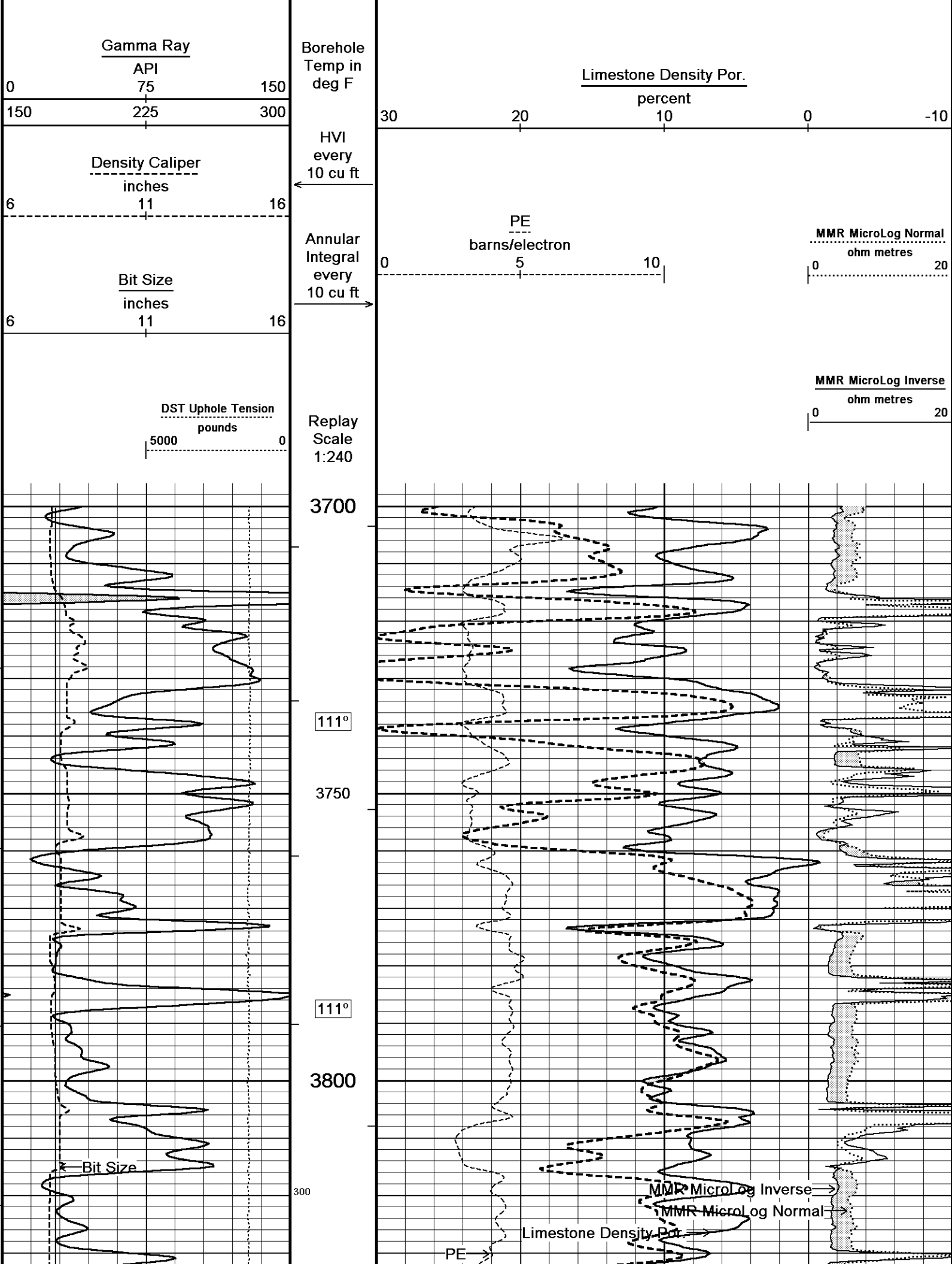


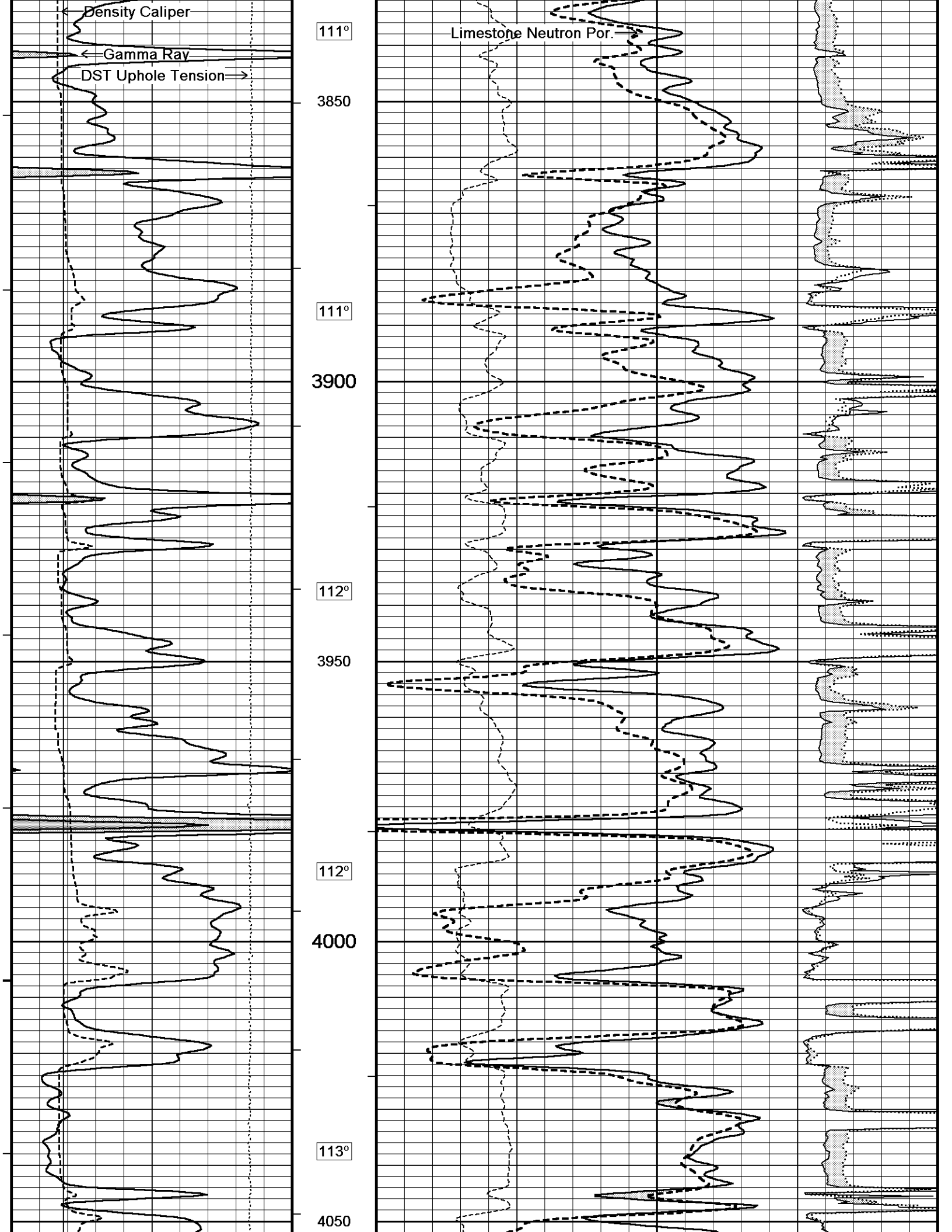
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_002.dta
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

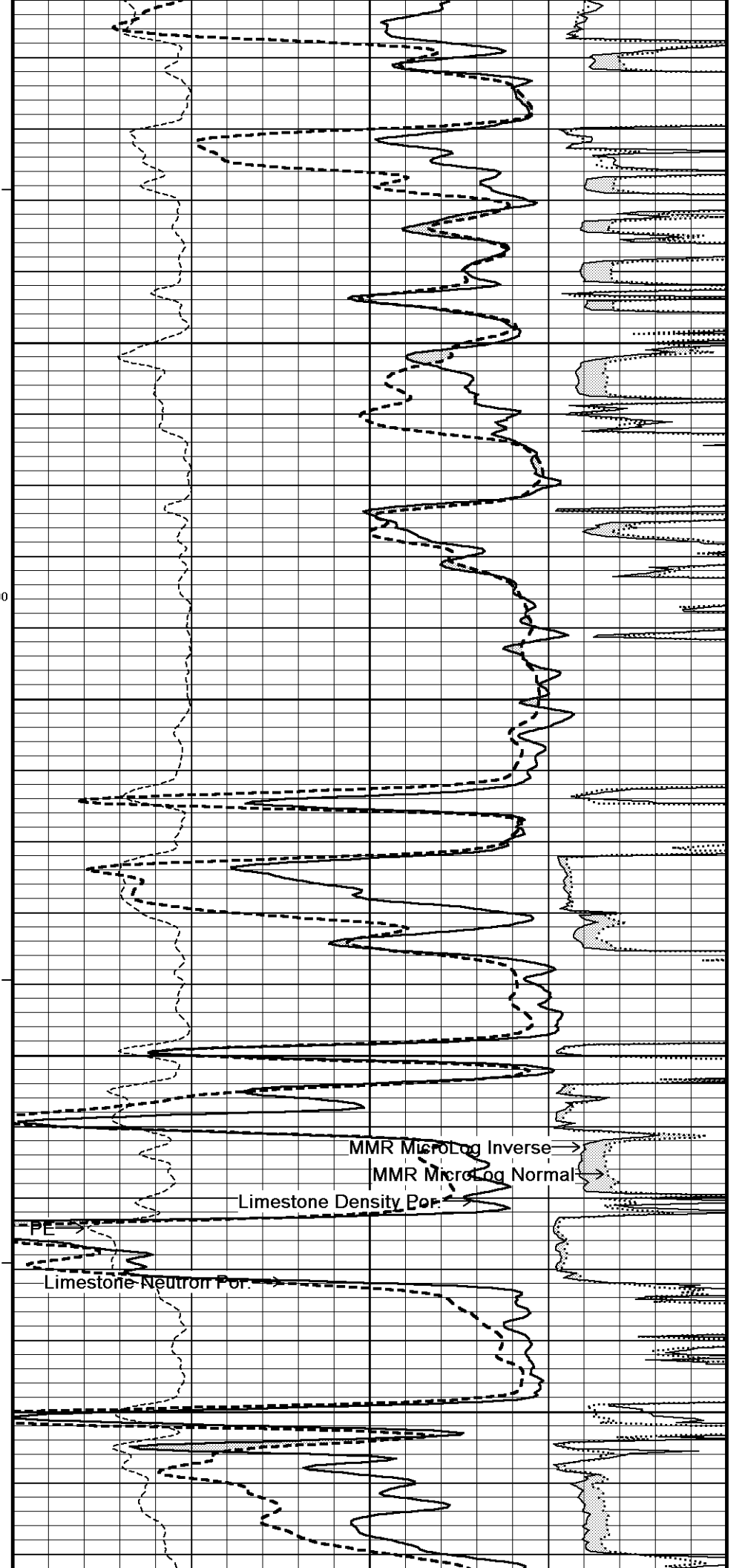
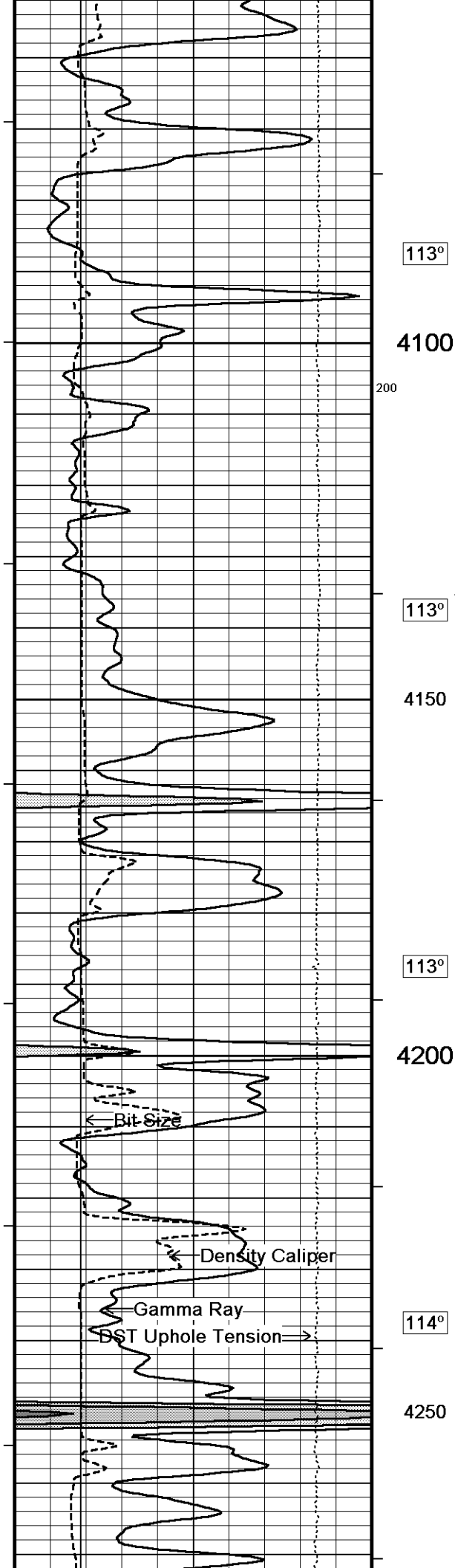
5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_002.dta
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583



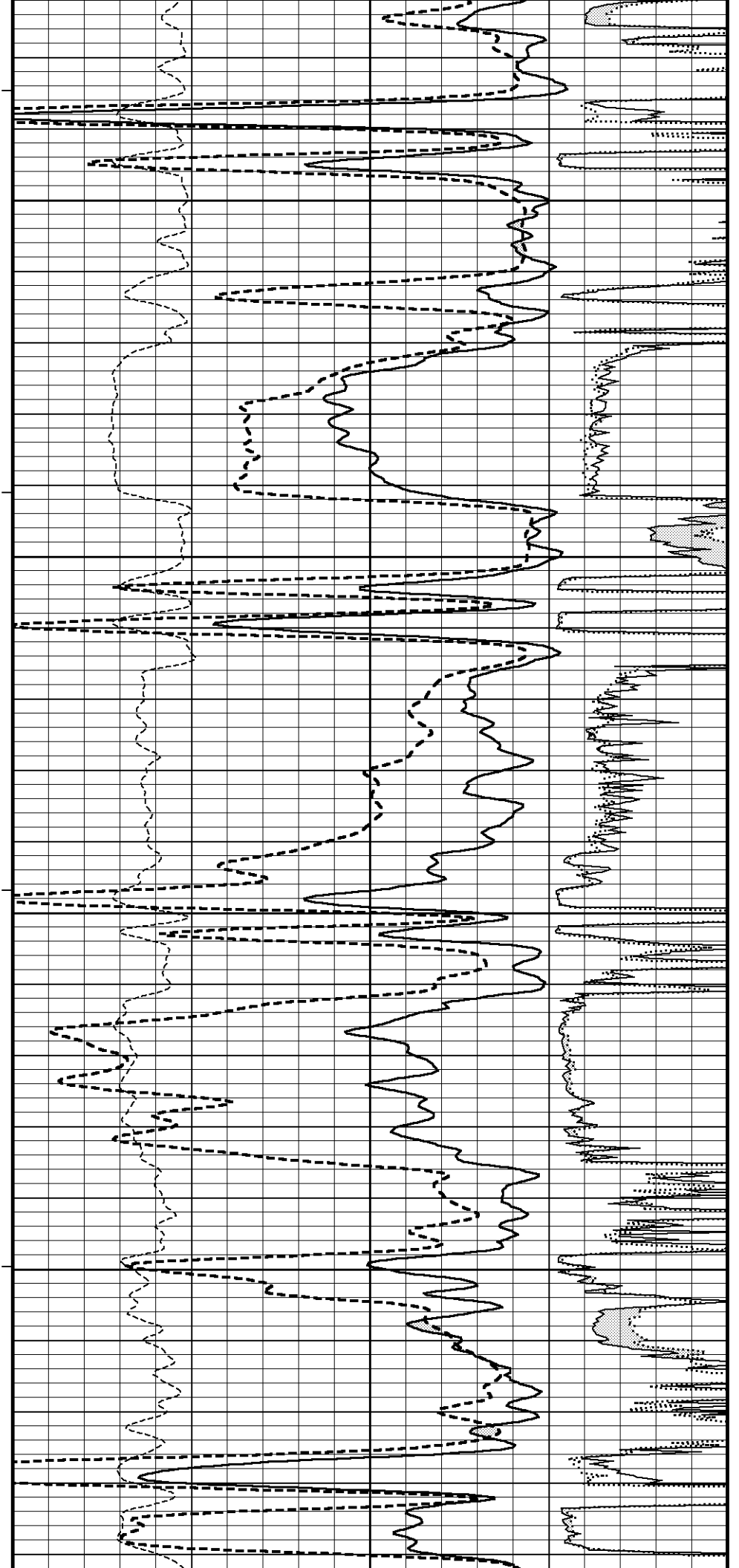


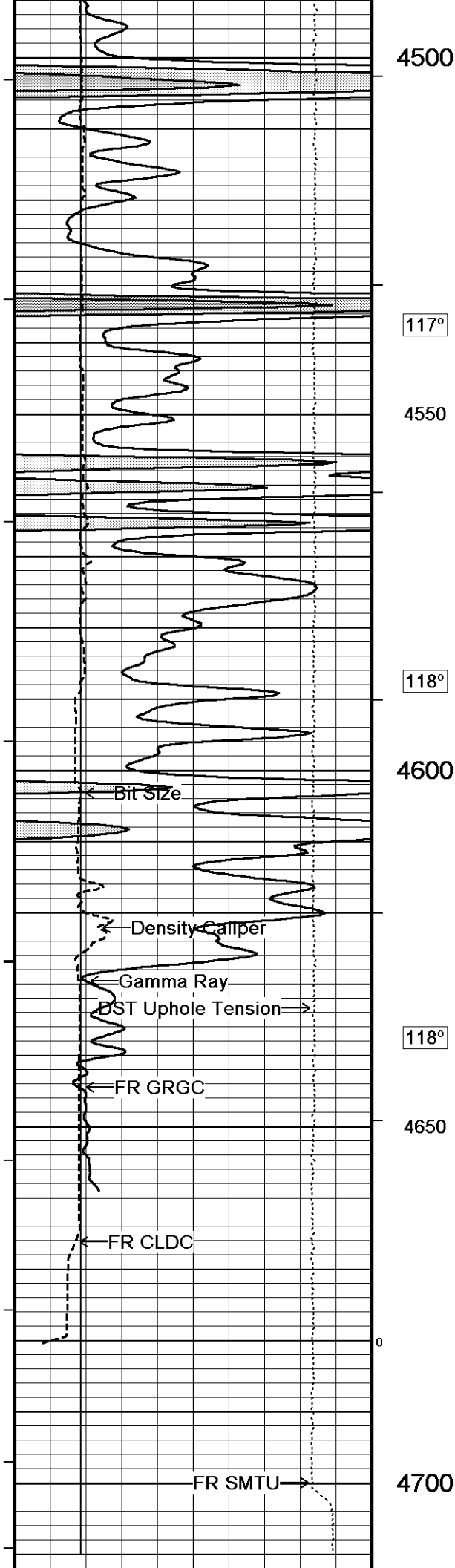






115°
4300
115°
4350
100 115°
4400
116°
4450
116°





4500

117°

4550

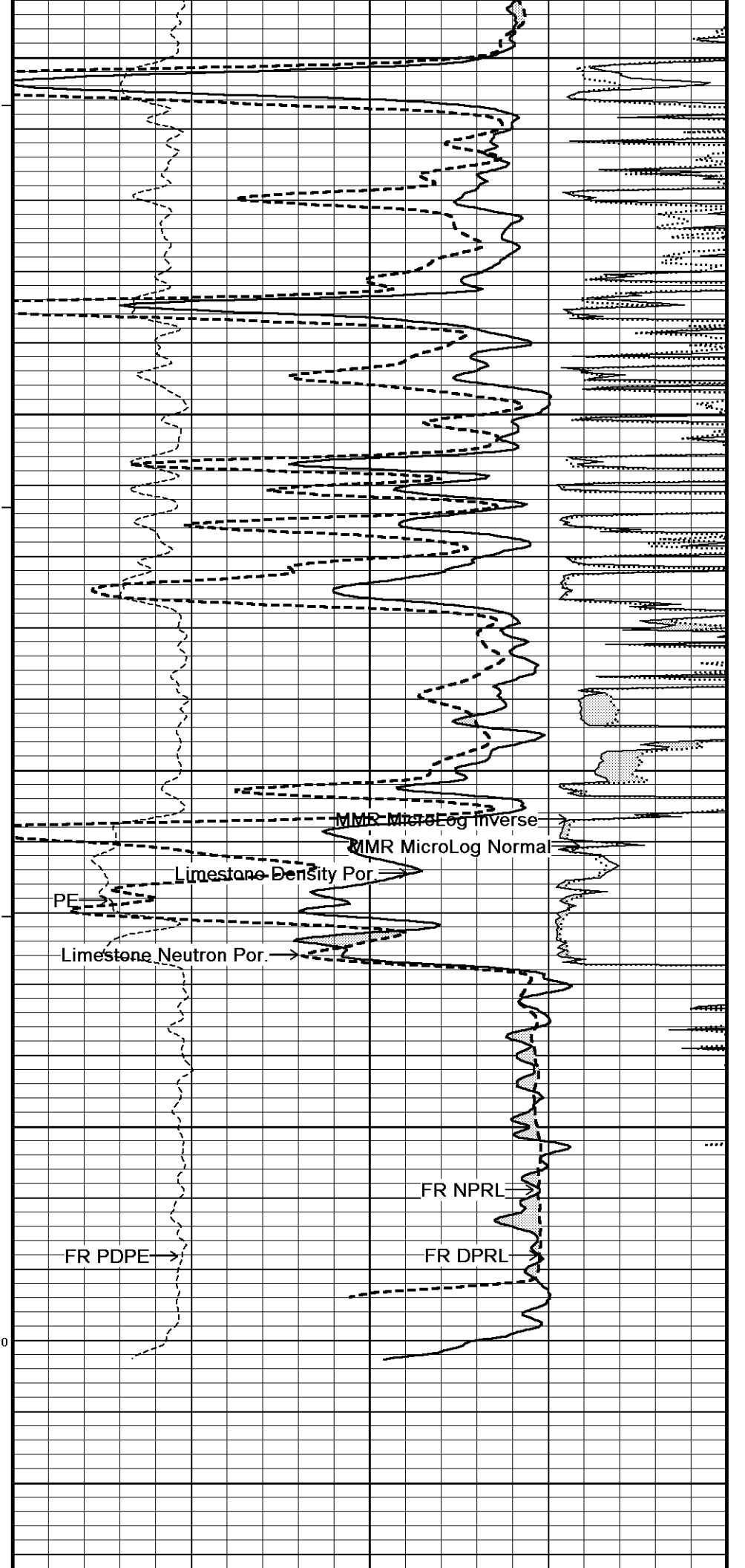
118°

4600

118°

4650

4700



MMR MicroLog Inverse

MMR MicroLog Normal

Limestone Density Por.

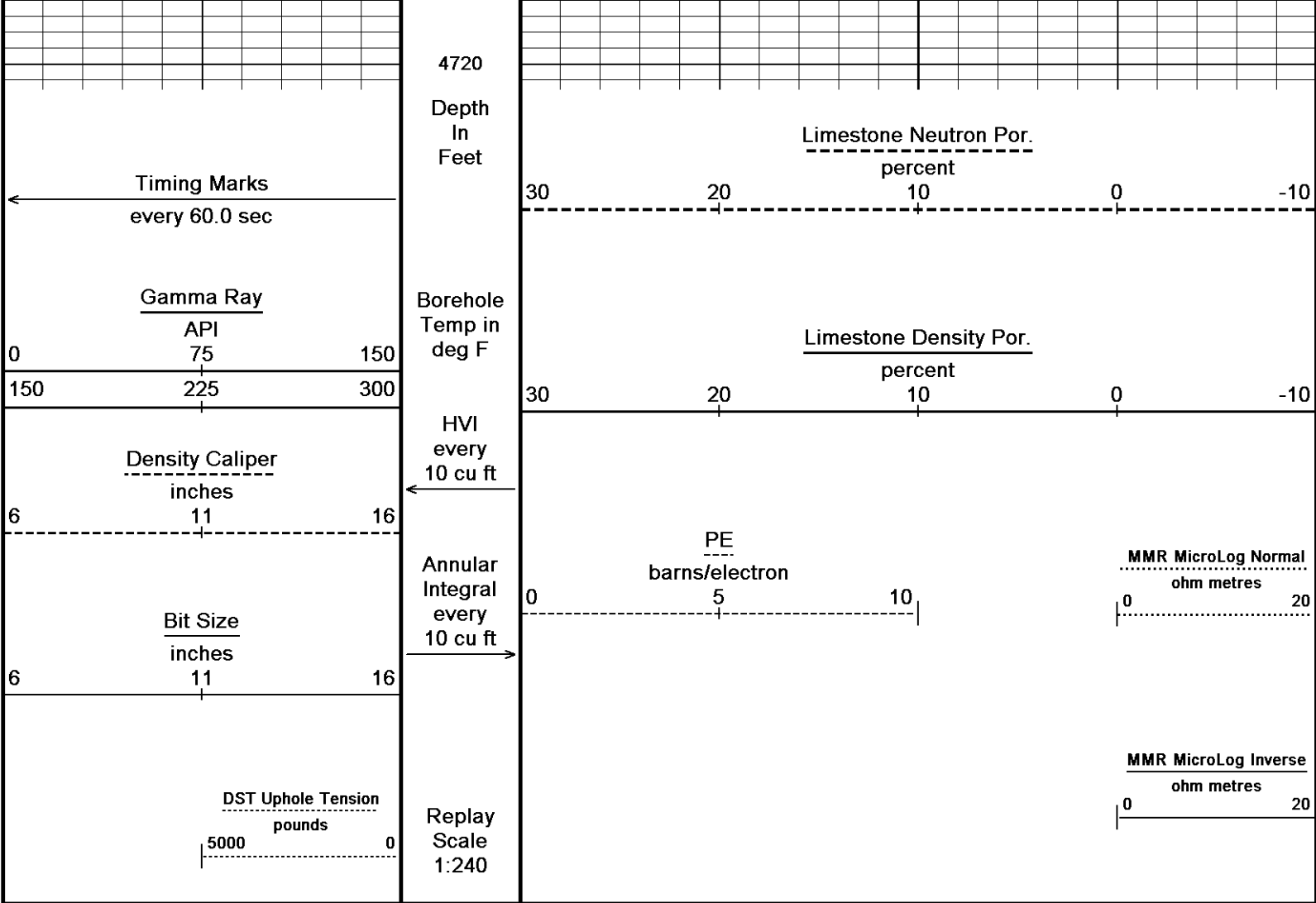
PE

Limestone Neutron Por.

FR NPRL

FR PDPE

FR DPRL



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 26-JUN-2013 08:44

Filename: C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_002.dta

Recorded on 26-JUN-2013 05:49

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

↑

5 INCH MAIN

↑

↓

REPEAT SECTION

↓

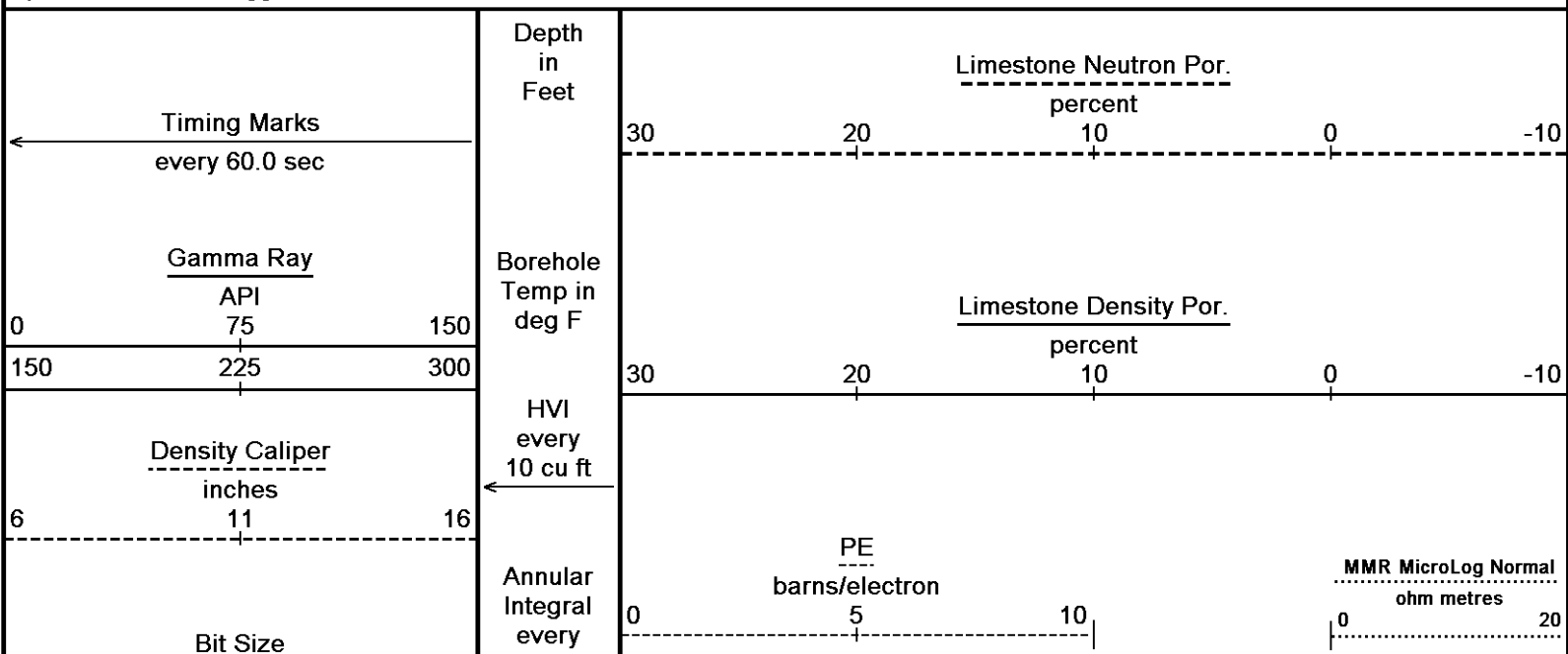
Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 26-JUN-2013 08:44

Filename: C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_001.dta

Recorded on 26-JUN-2013 05:32

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



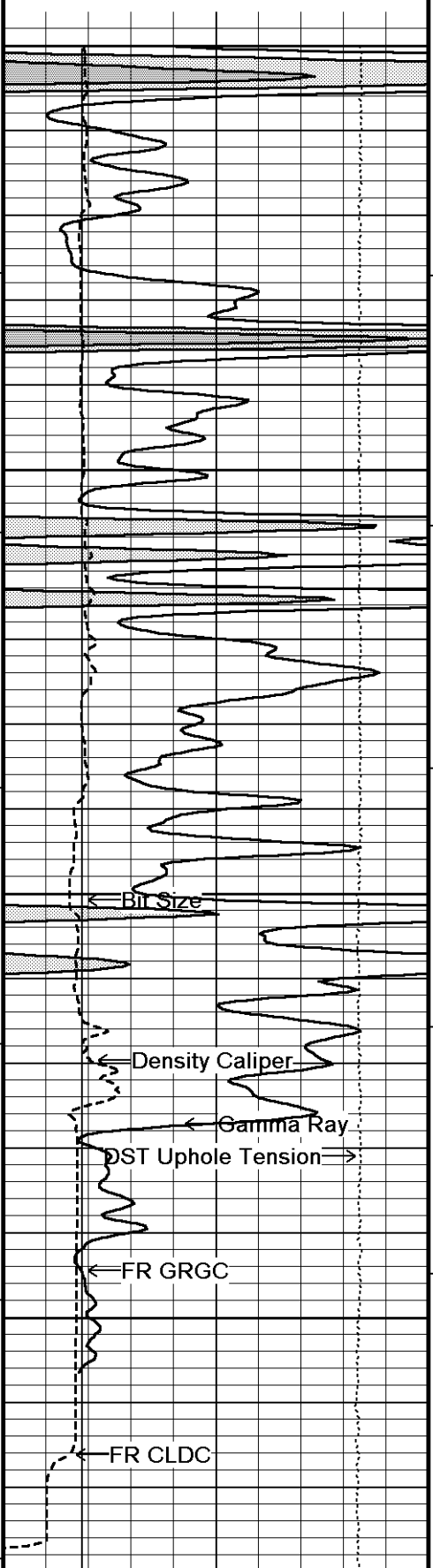
6 inches 11 16

10 cu ft

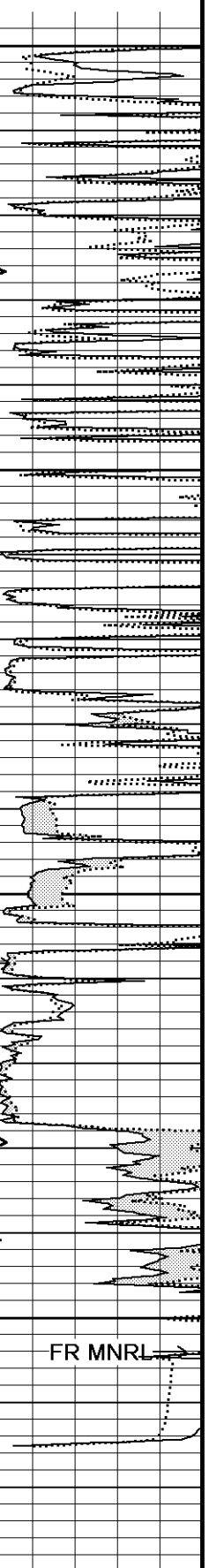
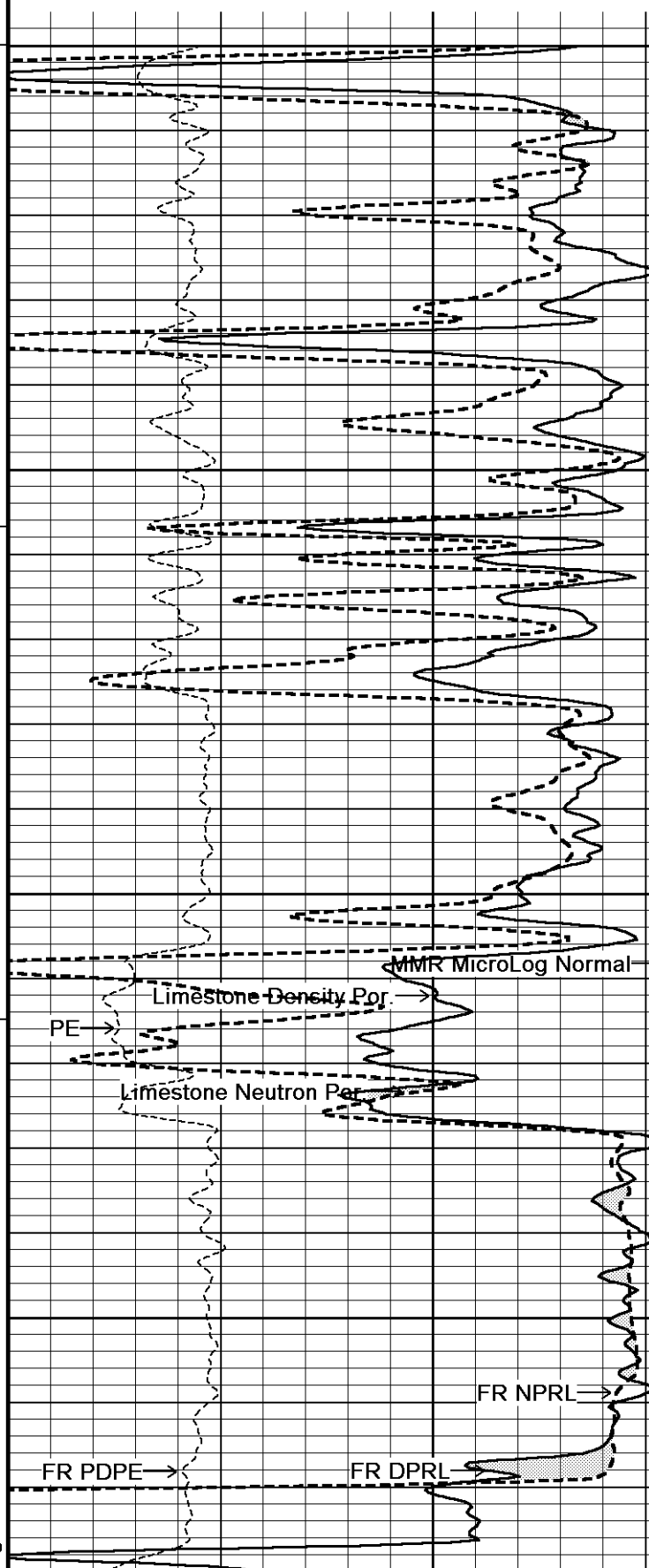
DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

MMR MicroLog Inverse
ohm metres
0 20



4500
116°
4550
117°
4600
116°
4650
0



FR SMTU

4700

4724
Depth
in
FeetTiming Marks
every 60.0 sec

Gamma Ray

API

75

0

150

150 225 300

Density Caliper
inches

11

6

16

Bit Size
inches

11

6

16

DST Uphole Tension
pounds

5000

0

Borehole
Temp in
deg FHVI
every
10 cu ftAnnular
Integral
every
10 cu ftReplay
Scale
1:240Limestone Neutron Por.
percent

30

20

10

0

-10

Limestone Density Por.
percent

30

20

10

0

-10

PE
barns/electron

0

5

10

MMR MicroLog Normal
ohm metres

0

20

MMR MicroLog Inverse
ohm metres

0

20

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 26-JUN-2013 08:44

Filename: C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_001.dta

Recorded on 26-JUN-2013 05:32

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



REPEAT SECTION



5 INCH MAIN



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 26-JUN-2013 08:44

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Recorded on 26-JUN-2013 05:49

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

Timing Marks
every 60.0 sec

Gamma Ray

API

75

0

150

Depth
In
FeetBorehole
Temp in
deg FCompensated Density
grams/cc

2

2.25

2.50

2.75

3

150 225 300

Density Caliper
inches

6 11 16

Bit Size
inches

6 11 16

DST Uphole Tension
pounds

5000 0

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Replay
Scale
1:240

3700

111°

3750

111°

3800

300

Bit Size

Density Caliper

Gamma Ray

DST Uphole Tension

Limestone Density Por.

percent

30 20 10 0 -10

PE

barns/electron

Density Correction

grams/cc

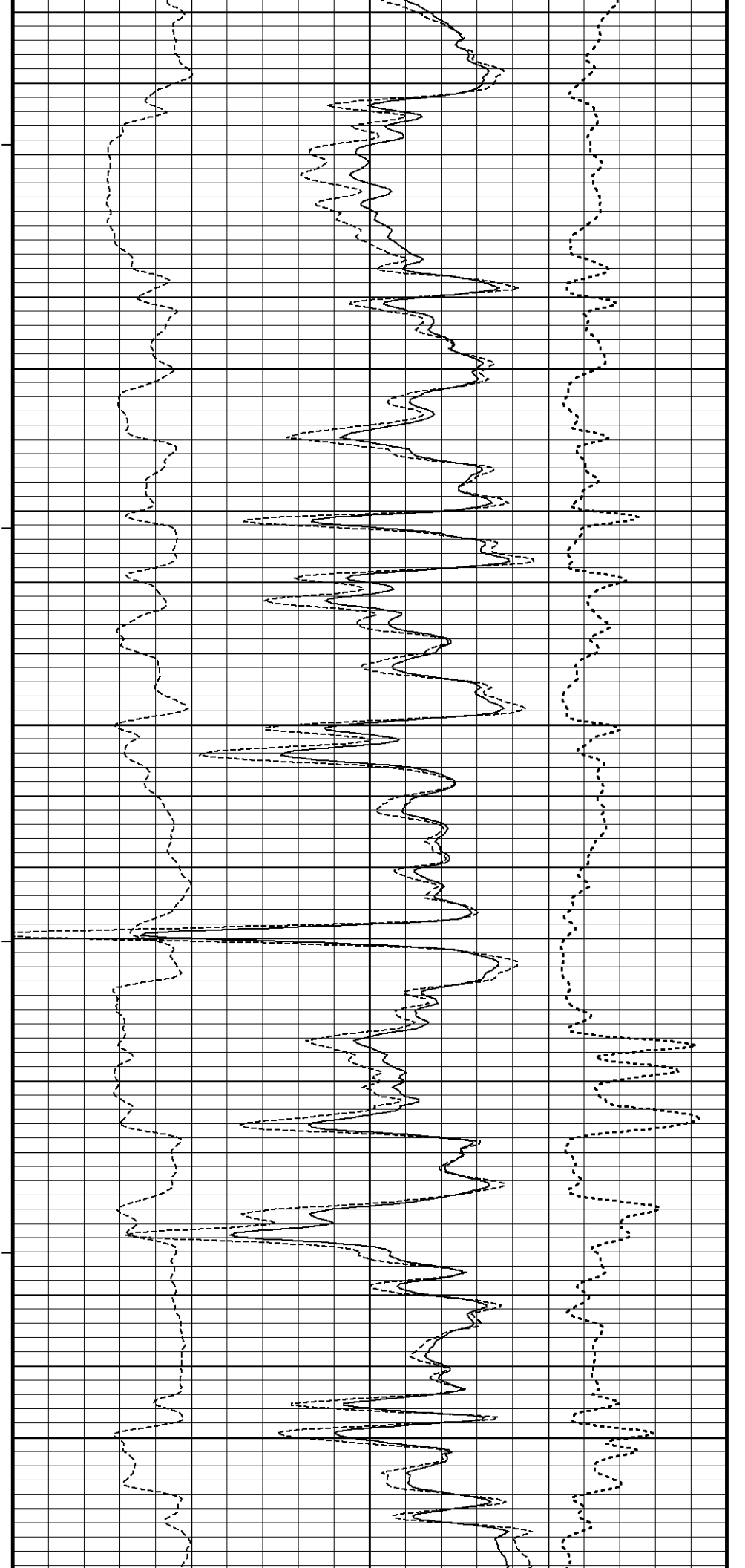
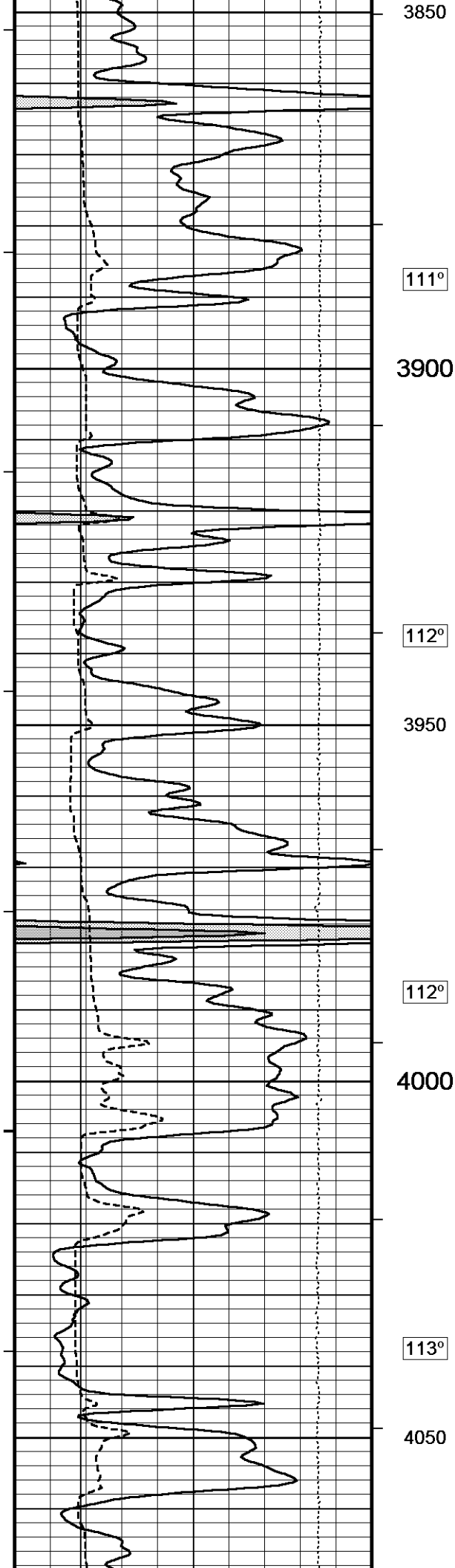
0 5 10 -0.50 0 0.50

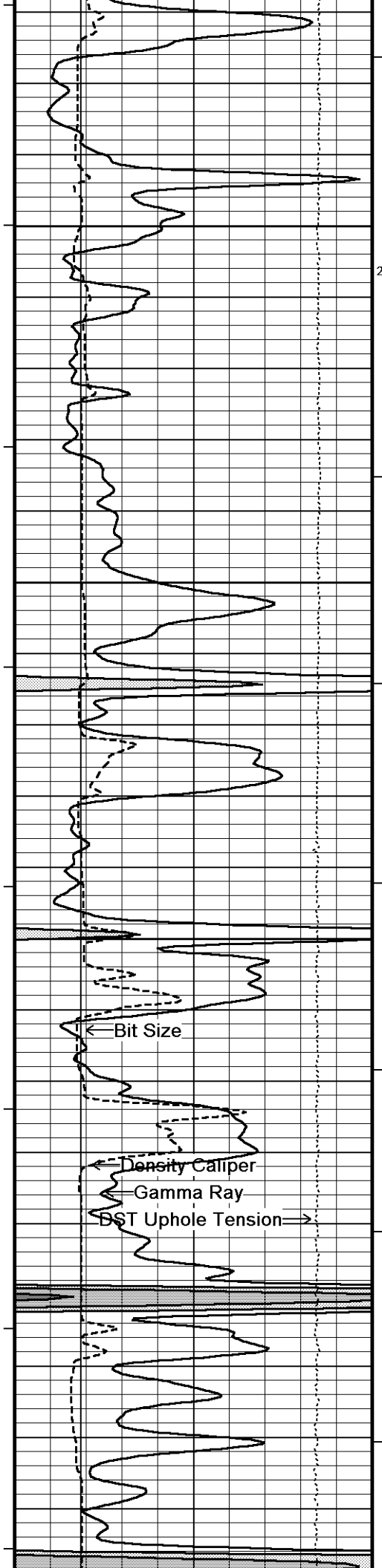
PE

Limestone Density Por.

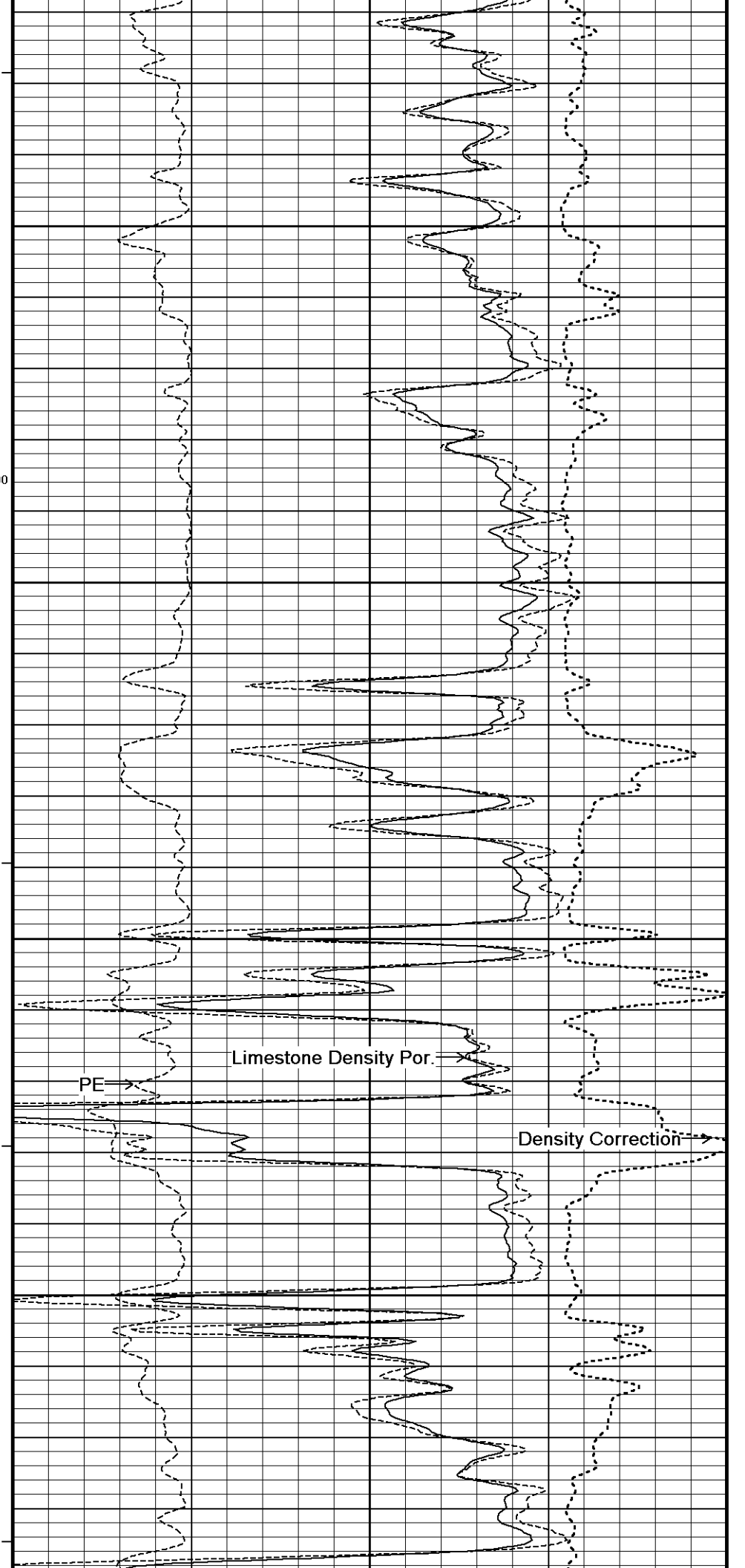
Compensated Density

Density Correction

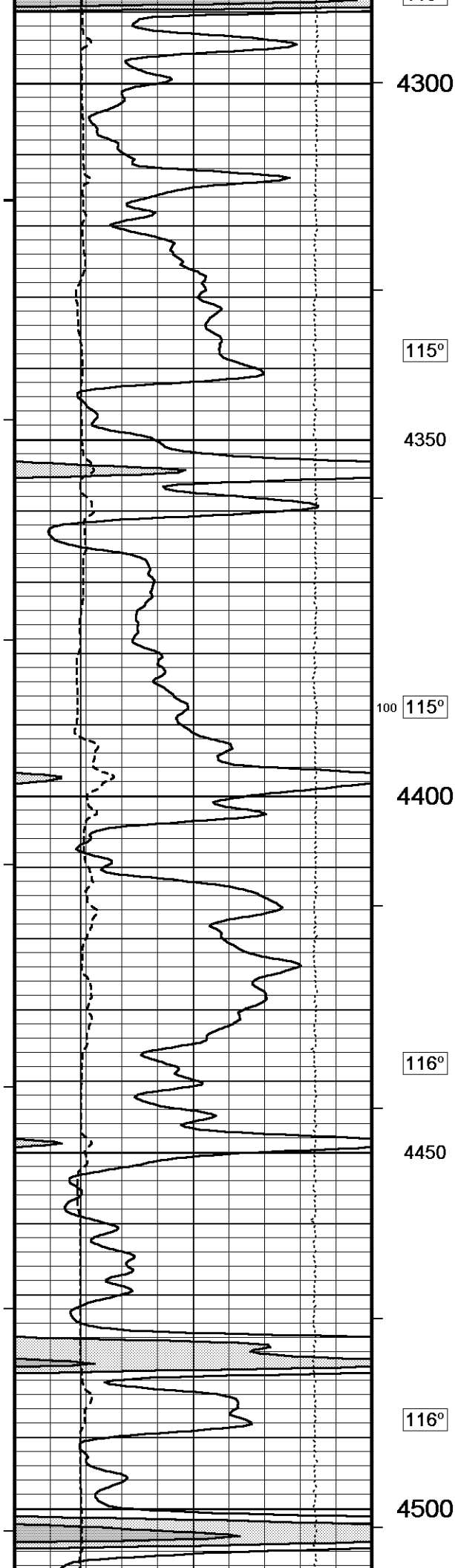




113°
4100
200
113° 100
4150
113°
4200
114°
4250
115°



PE →
Limestone Density Por. →
Density Correction →



4300

115°

4350

100 115°

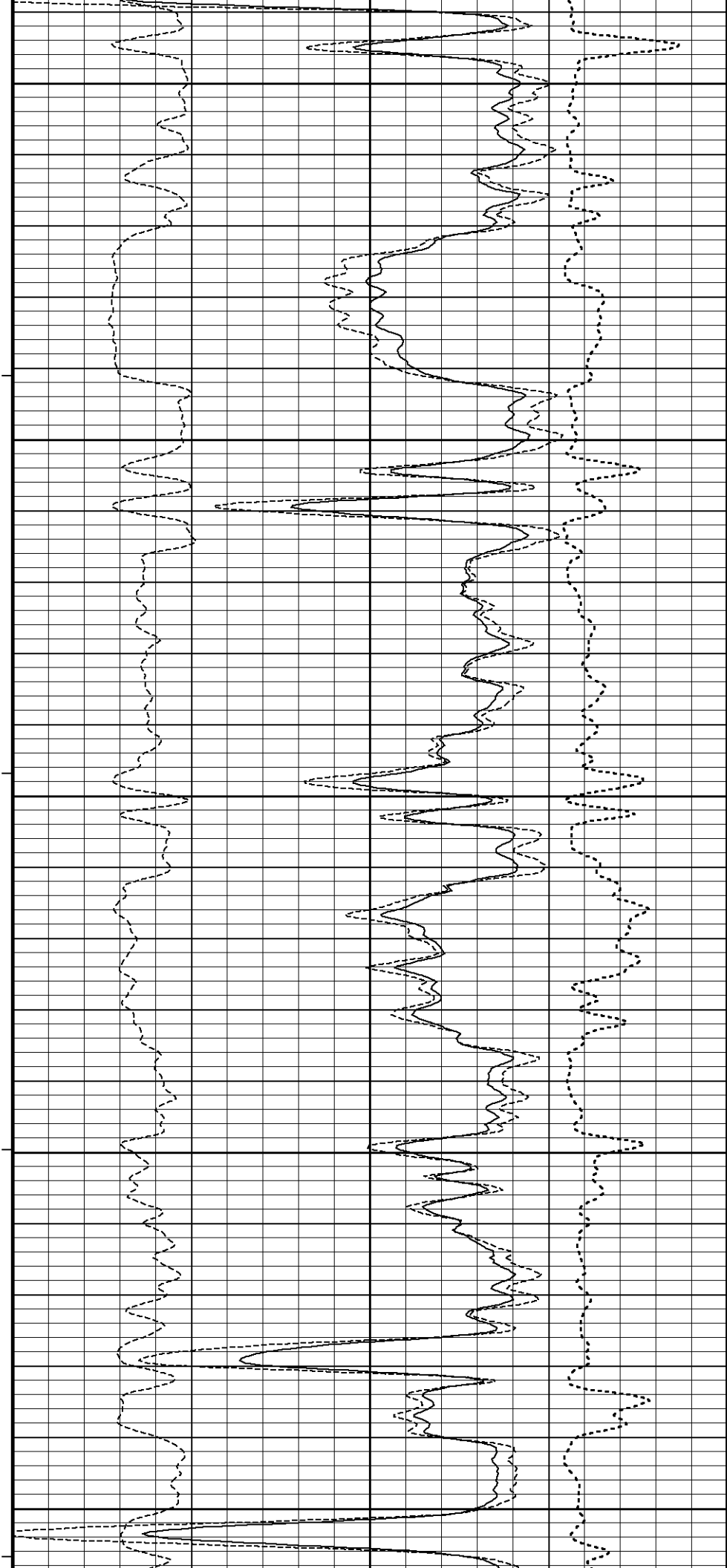
4400

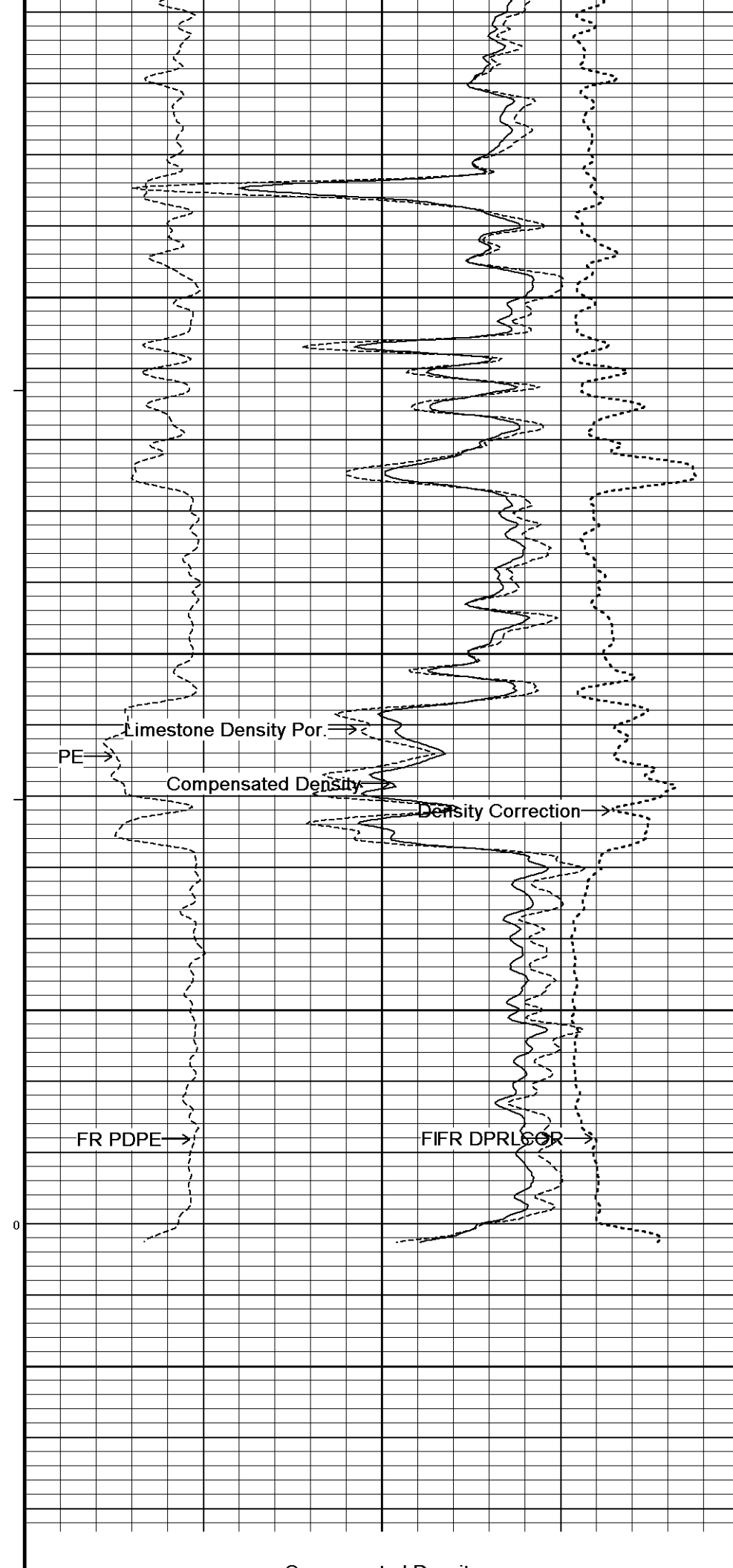
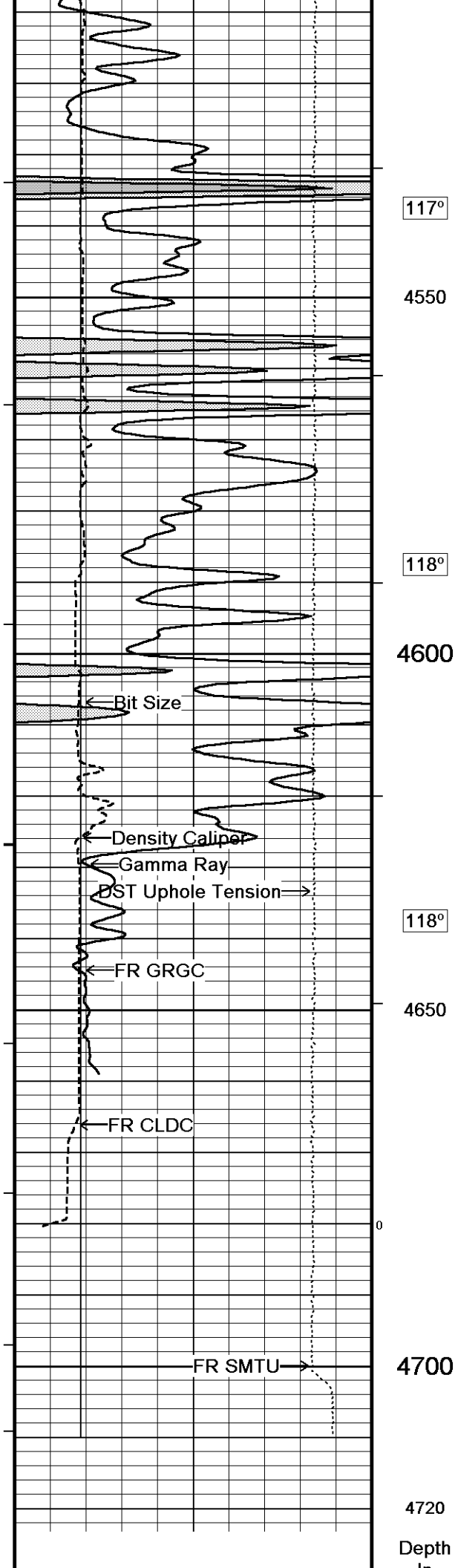
116°

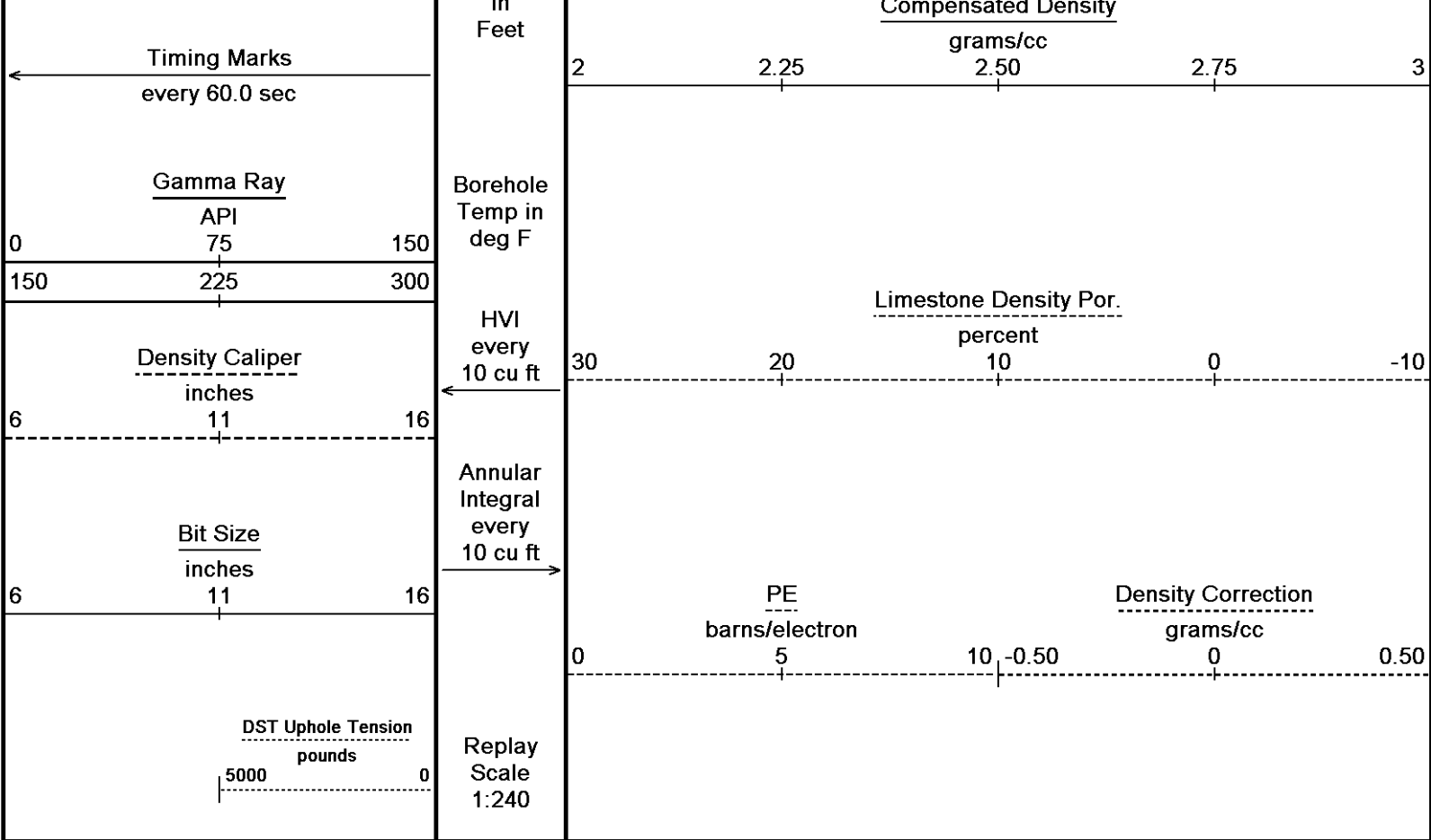
4450

116°

4500







Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 26-JUN-2013 08:44

Filename: C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_002.dta

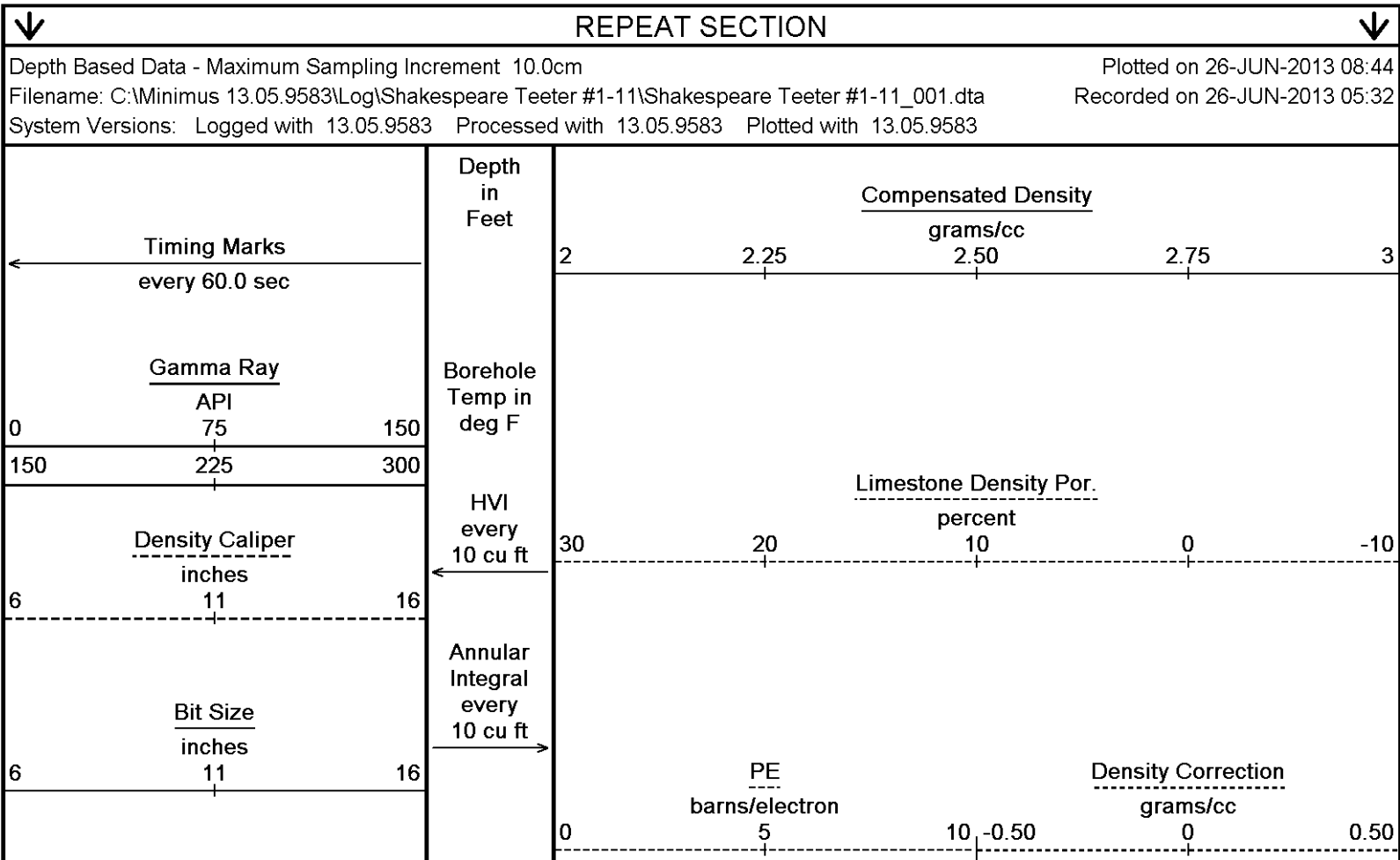
Recorded on 26-JUN-2013 05:49

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

↑

5 INCH MAIN

↑



DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

4500

116°

4550

117°

4600

← Bit Size

← Density Caliper

← Gamma Ray

DST Uphole Tension →

← FR GRGC

← FR CLDC

0

Limestone Density Por. →

PE →

Compensated Density →

Density Correction →

116°

4650

FR PDPE →

FRFR DEN →

FR DCOR →

0

FR SMTU →

4700

4724

Depth
in
FeetTiming Marks
every 60.0 sec

Gamma Ray

API
75

0 150

150 225 300

Density Caliper
inches

6 11 16

Bit Size
inches

6 11 16

DST Uphole Tension
pounds

5000 0

Borehole
Temp in
deg FHVI
every
10 cu ftAnnular
Integral
every
10 cu ftReplay
Scale
1:240

Compensated Density

grams/cc

2 2.25 2.50 2.75 3

Limestone Density Por.

percent

30 20 10 0 -10

PE
barns/electron

0 5 10 -0.50

Density Correction
grams/cc

-0.50 0 0.50

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 26-JUN-2013 08:44

Filename: C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_001.dta

Recorded on 26-JUN-2013 05:32

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\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_002.dta

General Constants All 000

Last Edited on 26-JUN-2013,04:46

General Parameters

Mud Resistivity	1.120	ohm-metres
Mud Resistivity Temperature	89.000	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	0.610		
RWA Constant M	2.150		
SW/APOR Tool Source	0.000		
Down-hole Tension Calibration SMS 0			
			Field Calibration on 26-JUN-2013 04:24
Reading No	Measured	Calibrated (lbs)	
1	13930.99	0.00	
2	15329.61	471.80	
Gamma Calibration MCG-D.K 469			
			Field Calibration on 21-JUN-2013 10:11
	Measured	Calibrated (API)	
Background	66	44	
Calibrator (Gross)	1145	769	
Calibrator (Net)	1079	725	
Gamma Constants MCG-D.K 469			
			Last Edited on 26-JUN-2013,01:00
Gamma Calibrator Number	GRC38		
Mud Density	1.11	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 28-MAY-2013,04:01
	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 28-MAY-2013,04:01
Pre-filter Length	11		
SP Calibration MCG-D.K 469			
			Field Calibration on 28-MAY-2013,04:01
	Measured	Calibrated (mV)	
Reference 1	105.8	100.0	
Reference 2	-94.3	-100.0	
Caliper Calibration MML-A 3			
			Base Calibration on 05-JUN-2013 15:43 Field Calibration on 21-JUN-2013 10:00
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)	
	6.12	5.98	
Micro Normal and Micro Inverse Calibration MML-A 3			
			Base Calibration on 05-JUN-2013 15:36 Field Check on 21-JUN-2013 09:57
Base Calibration			
	Measured	Calibrated (ohm-m)	
Channel	Resistor 1 Resistor 2	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 21-JUN-2013,09:54
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159		
Micro Normal K Factor	1.0000		
Micro Inverse K Factor	1.0000		

Micro Inverse K Factor	1.0000	
Standoff Offset	N/A	inches
Neutron Calibration MDN-A.B 66		Base Calibration on 22-MAY-2013 15:00 Field Check on 21-JUN-2013 10:22
Base Calibration		
	Measured	Calibrated (cps)
	Near Far	Near Far
	3145 98	3714 110
Ratio	32.215	33.764
Field Calibrator at Base		
		Calibrated (cps)
		1654 2365
Ratio		0.699
Field Check		
		Calibrated (cps)
		1643 2364
Ratio		0.695

Neutron Constants MDN-A.B 66		Last Edited on 21-JUN-2013,10:12
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	None	
Formation Pressure	N/A	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 353		Base Calibration on 22-MAY-2013 08:22 Field Check on 21-JUN-2013 10:30
Base Calibration		
	Measured	Calibrated (ohm-m)
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 21-JUN-2013,10:29
Running Mode	No Sleeve	
MFE K Factor	0.1268	
Caliper Source for FE correction	Bit Size	
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-C.K 368		Last Edited on 19-JUN-2013,16:37
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	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	0.00	micro-sec
MY3ET	1500.00	micro-sec

Array Temperature	79.1	Deg F
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Induction Model		RtAP-WBM	
Caliper for Borehole Corr.		Bit Size	
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 28-MAY-2013,04:23

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

High Resolution Temperature Constants MAI-A.A 167

Last Edited on 28-MAY-2013,04:23

Pre-filter Length	11
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Caliper Calibration MPD-B 64

Base Calibration on 21-MAY-2013 17:34

Field Calibration on 21-JUN-2013 09:49

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	14464	3.99
2	23406	5.98
3	32206	7.97
4	40368	9.86
5	50018	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	6.00	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 21-MAY-2013 17:55

Field Check on 21-JUN-2013 09:53

Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	60105	33685	59556	30836
Reference 2	25286	2917	24941	2541

Field Check at Base

1165.8 1353.6

Field Check

1166.1 1344.8

PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	210	1037		
Reference 1	22619	59903	0.381	0.371
Reference 2	6846	25146	0.275	0.272

Field Check at Base

210.2 1037.2

Field Check

212.0 1039.0

Density Constants MPD-B 64

Last Edited on 26-JUN-2013,01:00

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	1.11	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	
0.00	0.00	

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Log\Shakespeare Teeter #1-11\Shakespeare Teeter #1-11_002.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

Compact Micro-log

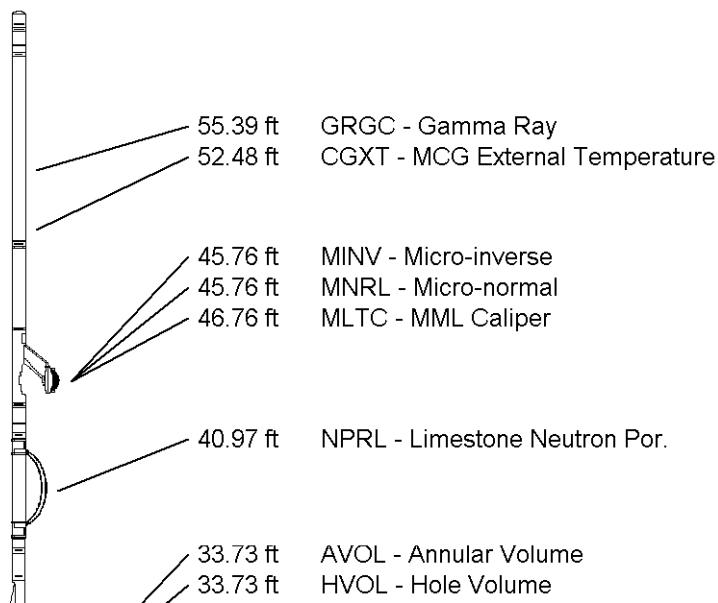
MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

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

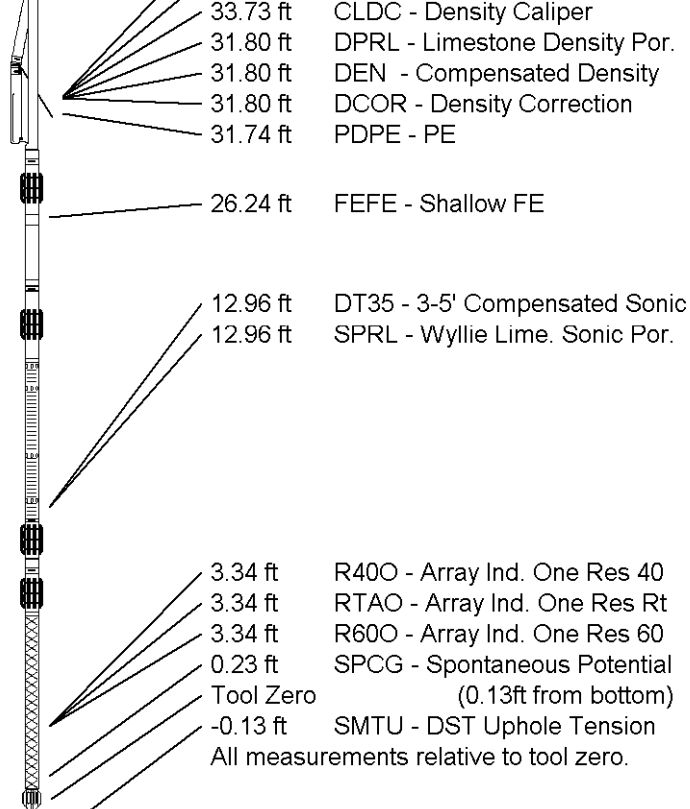


Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-C.K 368 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 COMPANY
WELL	TEETER #1-11
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	UNITED STATES / KANSAS

Elevation Kelly Bushing	3004.00	feet	First Reading	4668.00	feet
Elevation Drill Floor	3003.00	feet	Depth Driller	4700.00	feet
Elevation Ground Level	2994.00	feet	Depth Logger	4700.00	feet



Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG