



Weatherford

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY	DAYSTAR PETROLEUM, INC.		
WELL	DEUTSCHER B #1-2		
FIELD	WILDCAT		
PROVINCE/COUNTY	TREGO		
COUNTRY/STATE	U.S.A. / KANSAS		
LOCATION	1330' FSL & 395' FWL		
SEC 2	TWP 15S	RGE 21W	Other Services
Latitude			MAI/MFE
Longitude			MSS
API Number	15-195-23003		
Permanent Datum GL, Elevation	2123 feet		
Log Measured From	KB		
Drilling Measured From	KB @ 8 FEET		
Date	14-MAR-2016		
Run Number	ONE		
Service Order	4558-145149224		
Depth Driller	4040.00	feet	Elevations: KB 2131.00
Depth Logger	4037.00	feet	DF 2129.00
First Reading	4005.00	feet	GL 2123.00
Last Reading	3100.00	feet	
Casing Driller	263.00	feet	
Casing Logger	265.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.10 lb/USg	48.00 CP	
PH / Fluid Loss	9.30	6.40 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.52 @ 75.0	ohm-m	
Rmf @ Measured Temp	0.42 @ 75.0	ohm-m	
Rmc @ Measured Temp	0.62 @ 75.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.38 @104.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	104.00	deg F	
Equipment / Base	13096	OKC	
Recorded By	ADAM SILL		
Witnessed By	BRAD RINE		

BOREHOLE RECORD			Last Edited: 14-MAR-2016 13:16
Bit Size inches	Depth From feet	Depth To feet	
7.875	263.00	4040.00	
CASING RECORD			
Type	Size inches	Depth From feet	Shoe Depth feet
SURFACE	8.625	0.00	263.00
			Weight pounds/ft
			23.00

REMARKS

- SOFTWARE ISSUE: WLS 15.03.5939.
- RUN ONE: 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: 1670 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 3100 FEET: 176 CU.FT.

- RIG: WW DRILLING #12.

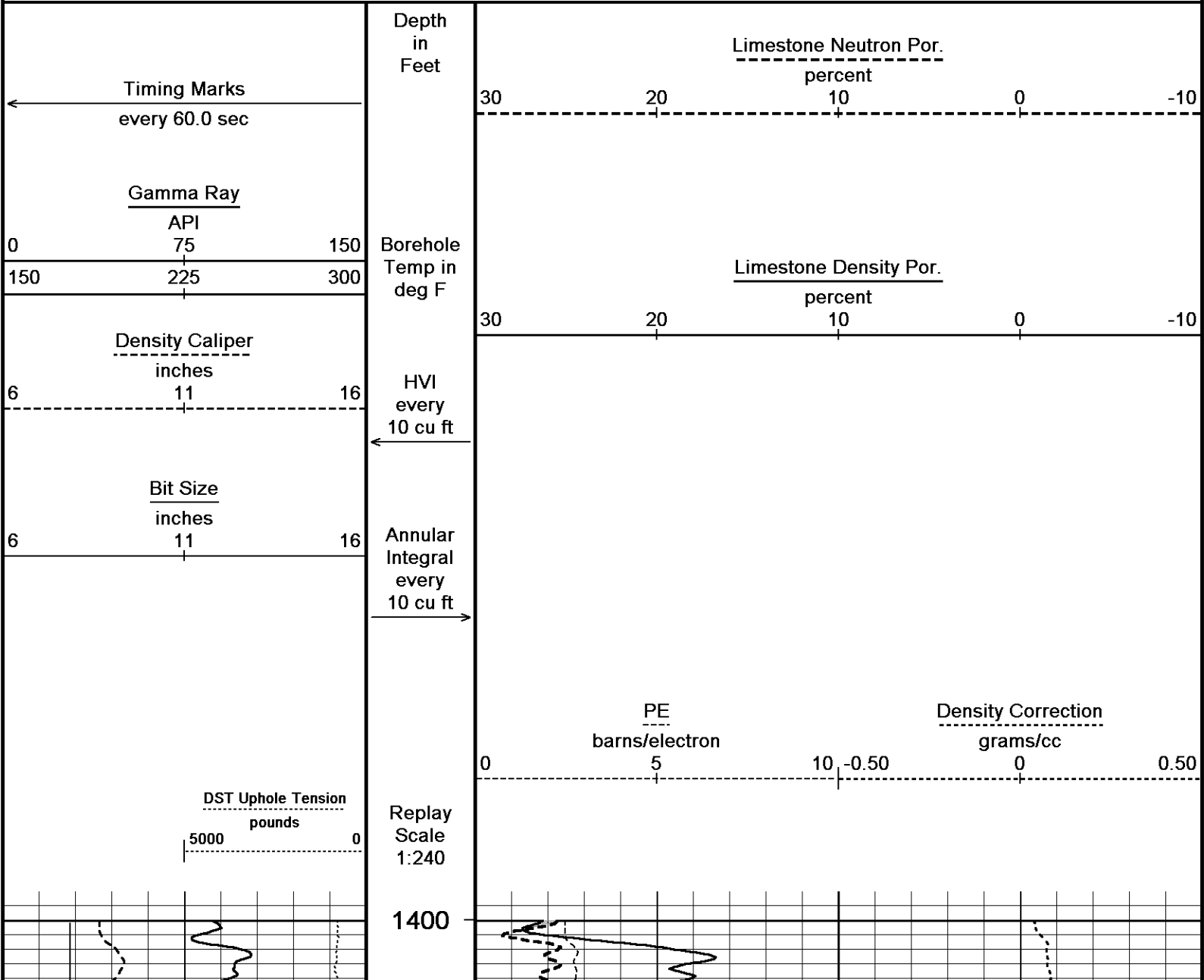
- ENGINEER: A. SILL.

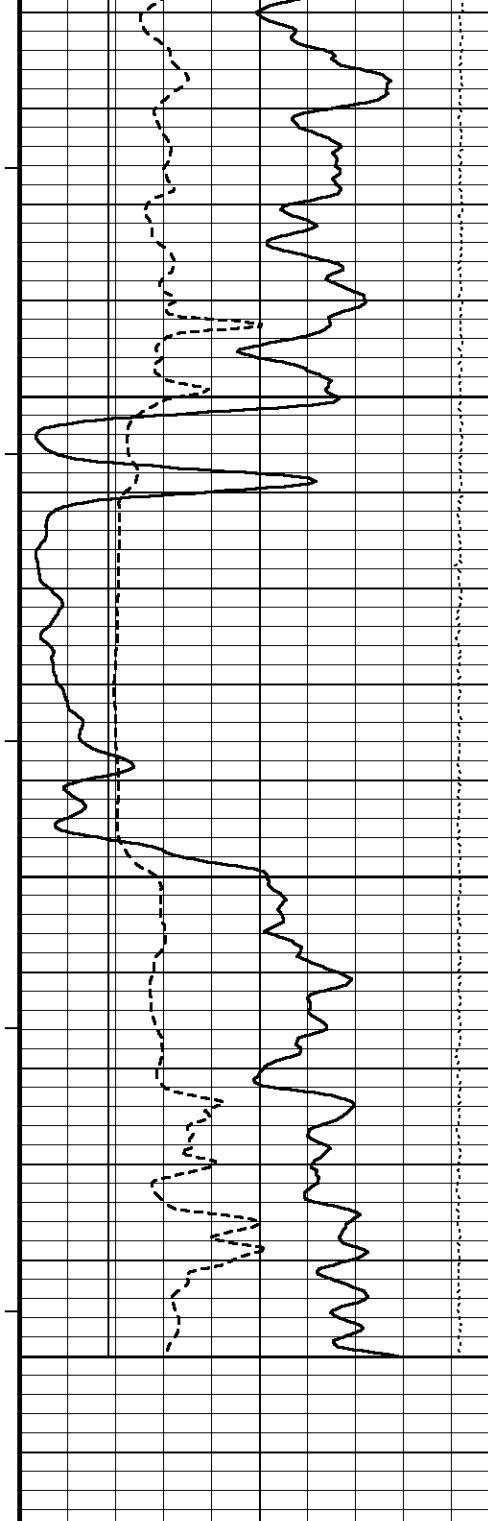
- OPERATOR: J. LaPOINT.

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.

5 INCH LIMESTONE MAIN - ANHYDRITE

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 14-MAR-2016 18:07
 Filename: C:\Minimus 15.03.5939\Logs\Daystar Deutscher B #1-2\Daystar Deutscher B #1-2_002.dta Recorded on 14-MAR-2016 15:01
 System Versions: Logged with 15.03.5939 Plotted with 15.03.5939





87°

1450

88°

1500

89°

1550

Depth
in
Feet

Timing Marks
every 60.0 sec

Gamma Ray
API

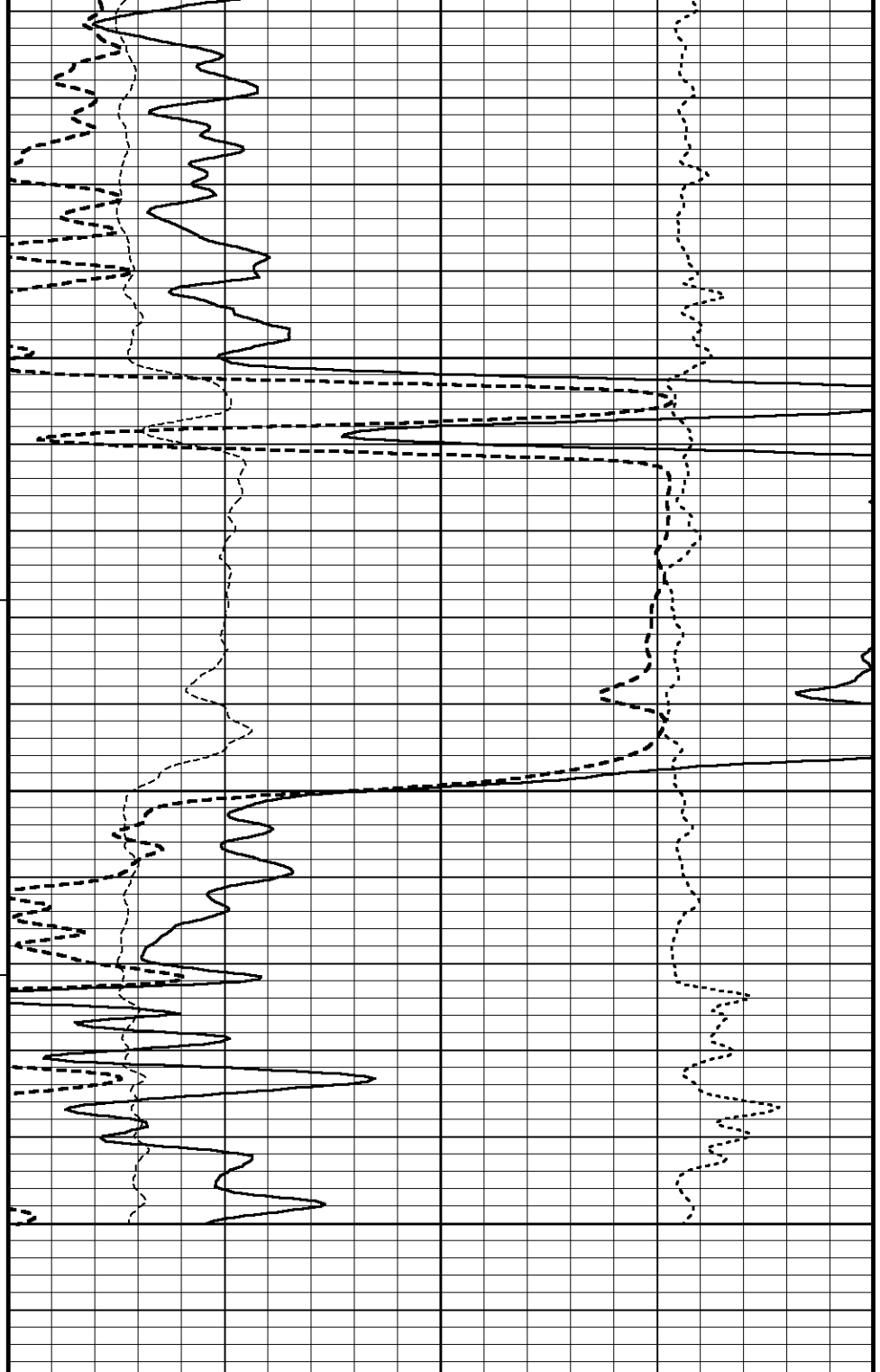
0 75 150
150 225 300

Density Caliper
inches

6 11 16

Borehole
Temp in
deg F

HVI
every
10 cu ft

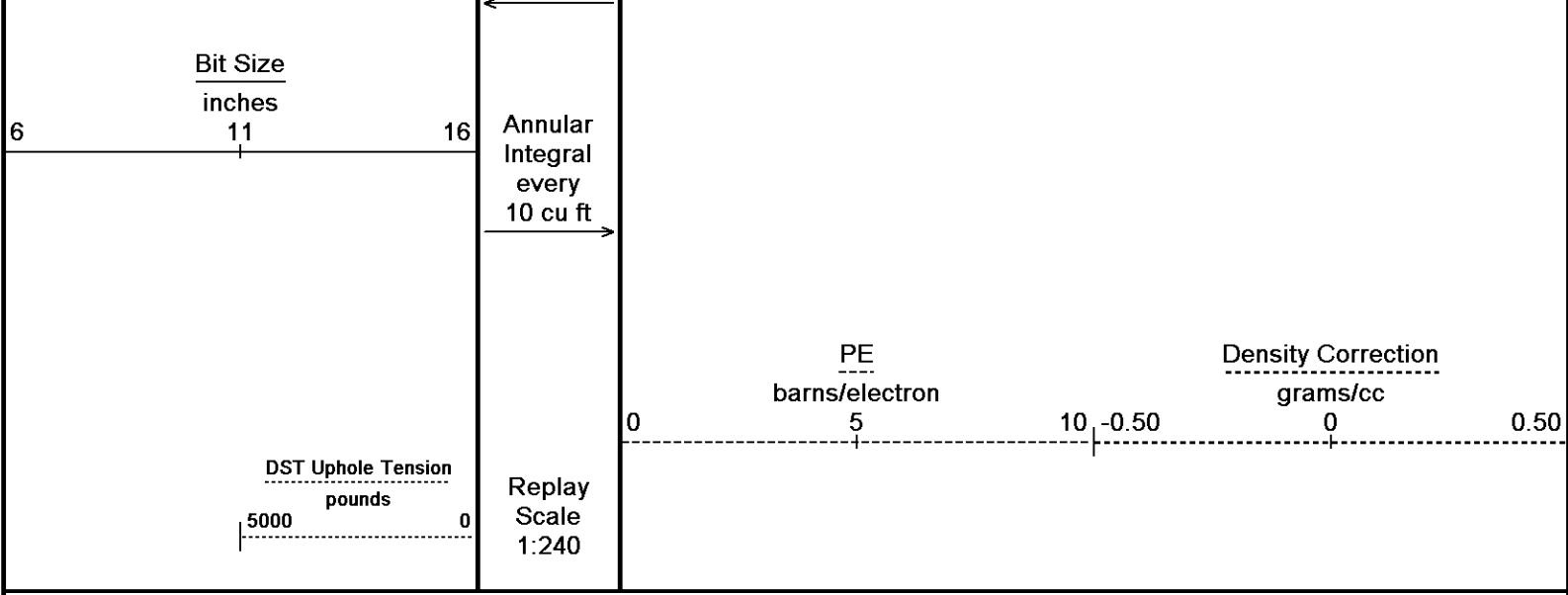


Limestone Neutron Por.
percent

30 20 10 0 -10

Limestone Density Por.
percent

30 20 10 0 -10

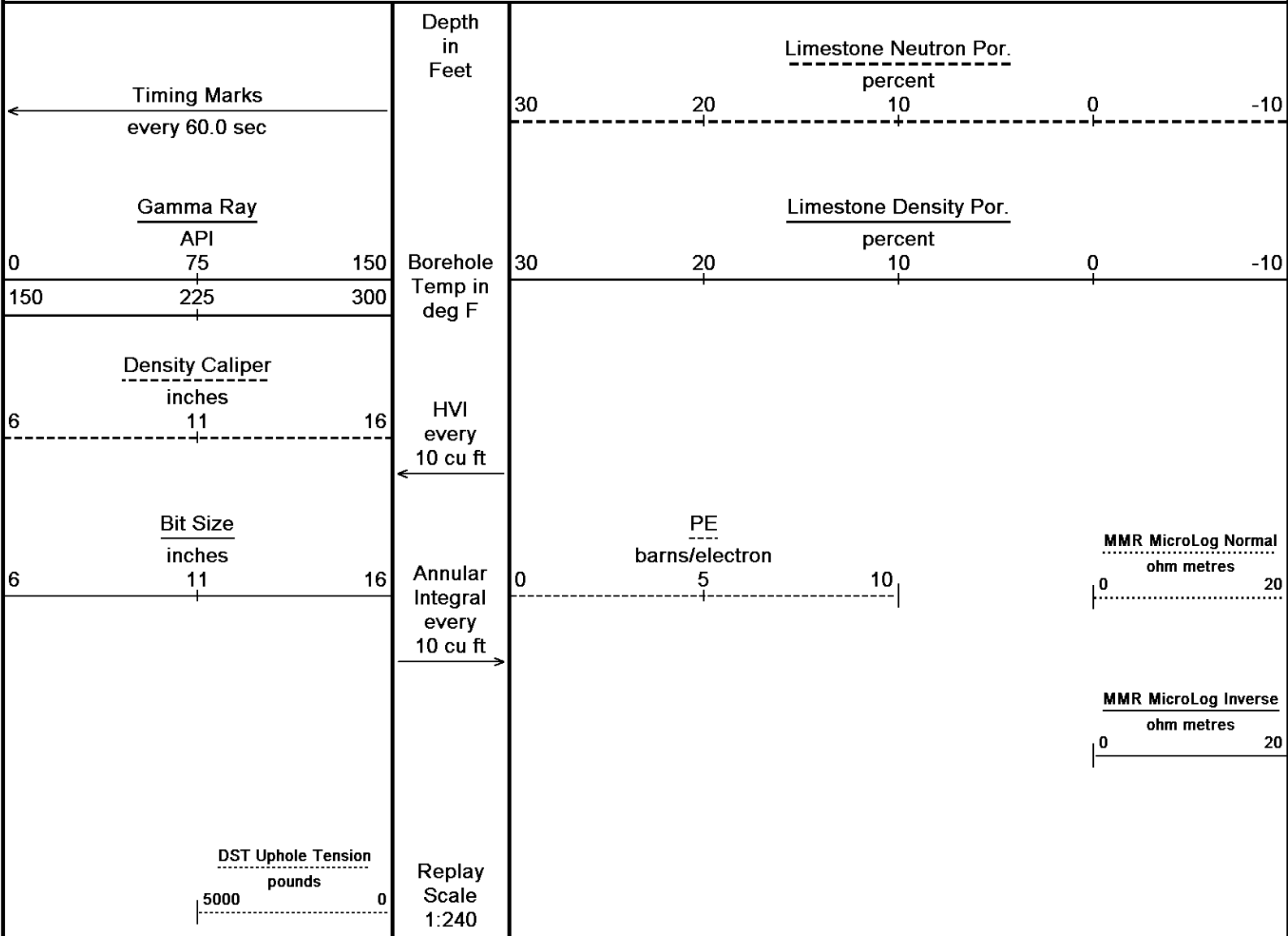


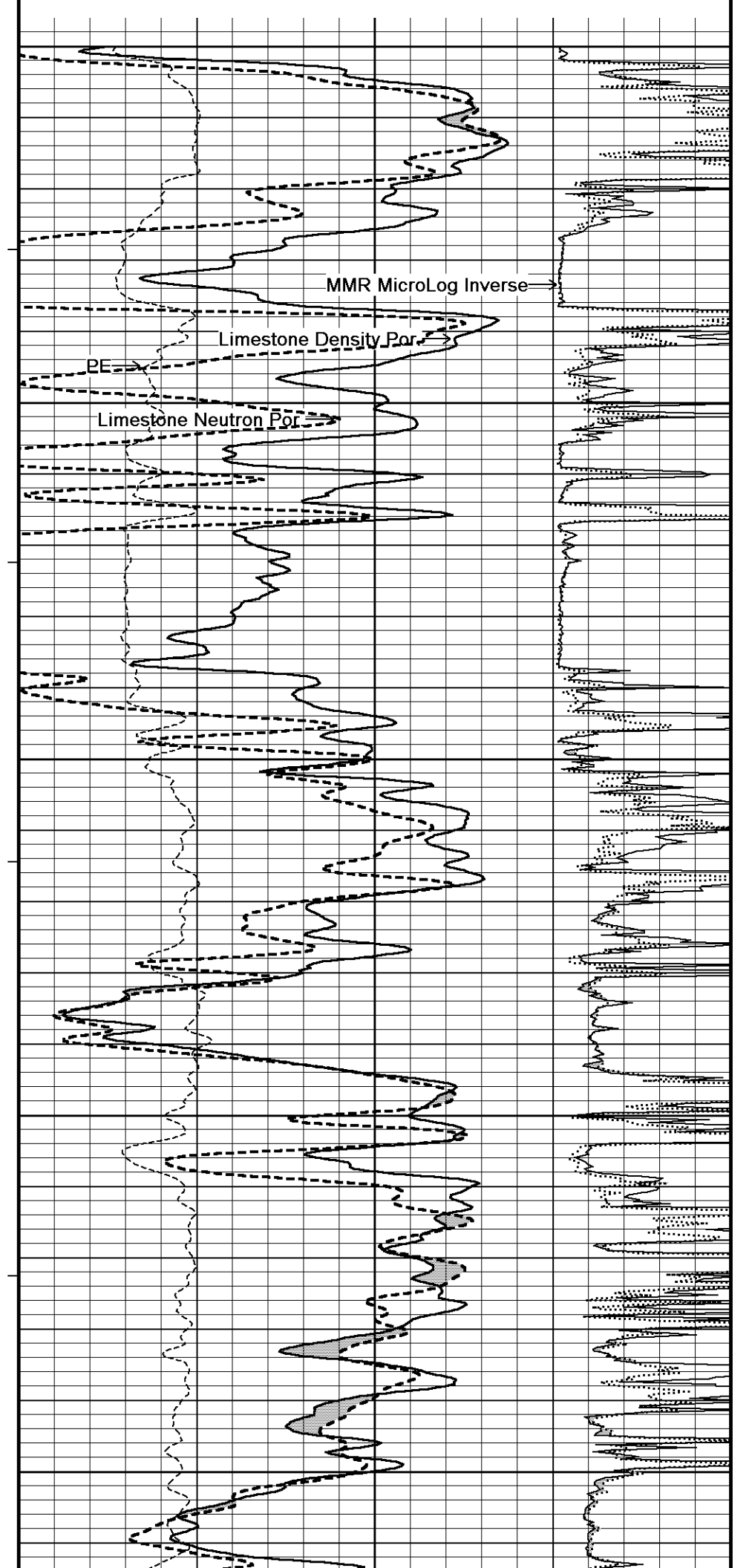
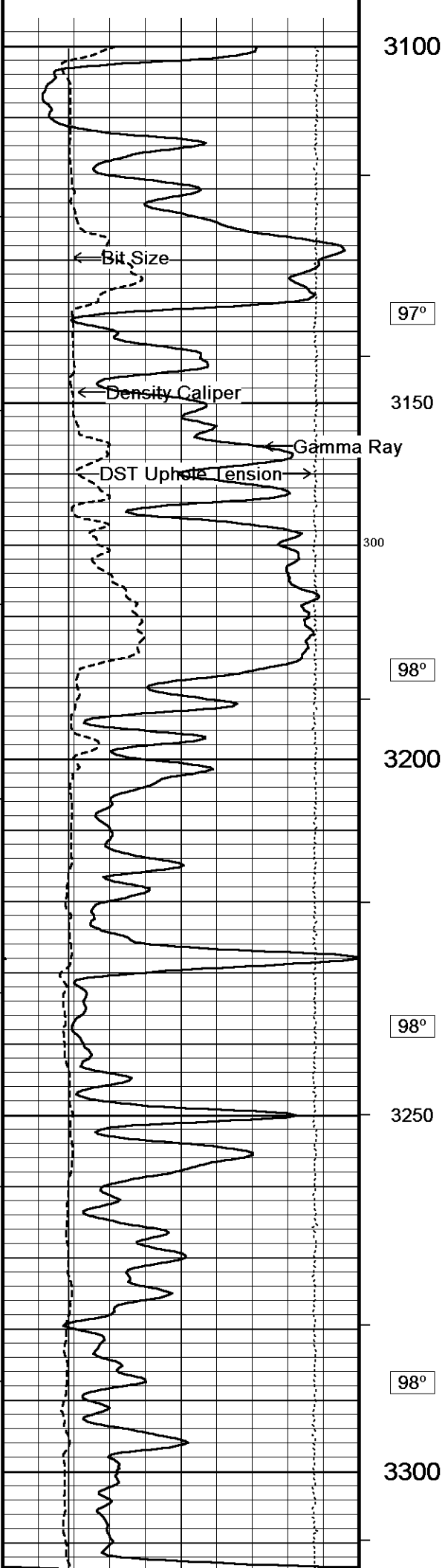
Depth Based Data - Maximum Sampling Increment 10.0cm
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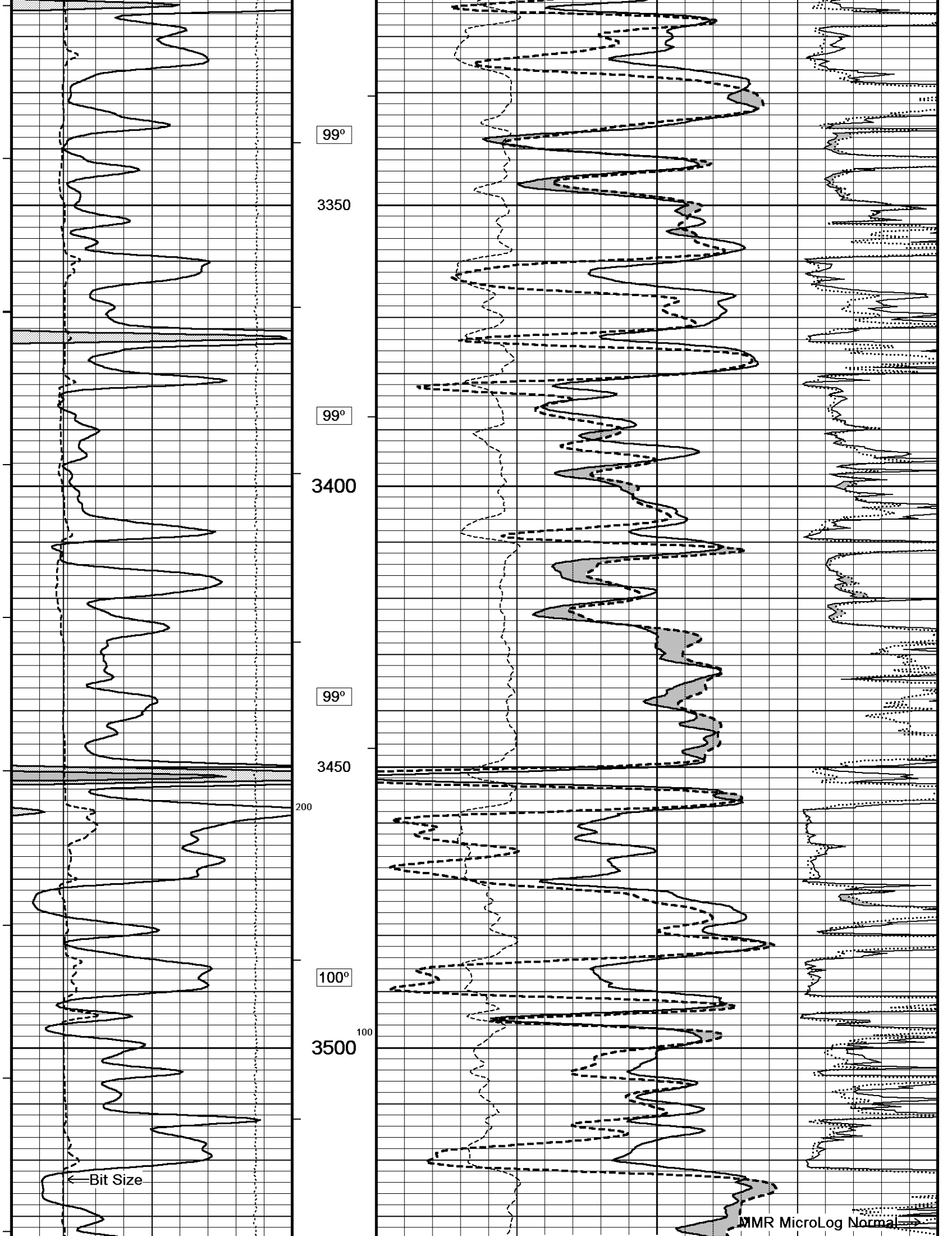
↑ 5 INCH LIMESTONE MAIN - ANHYDRITE ↑

↓ 5 INCH LIMESTONE MAIN ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
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 System Versions: Logged with 15.03.5939 Plotted with 15.03.5939







99°

3350

99°

3400

99°

3450

200

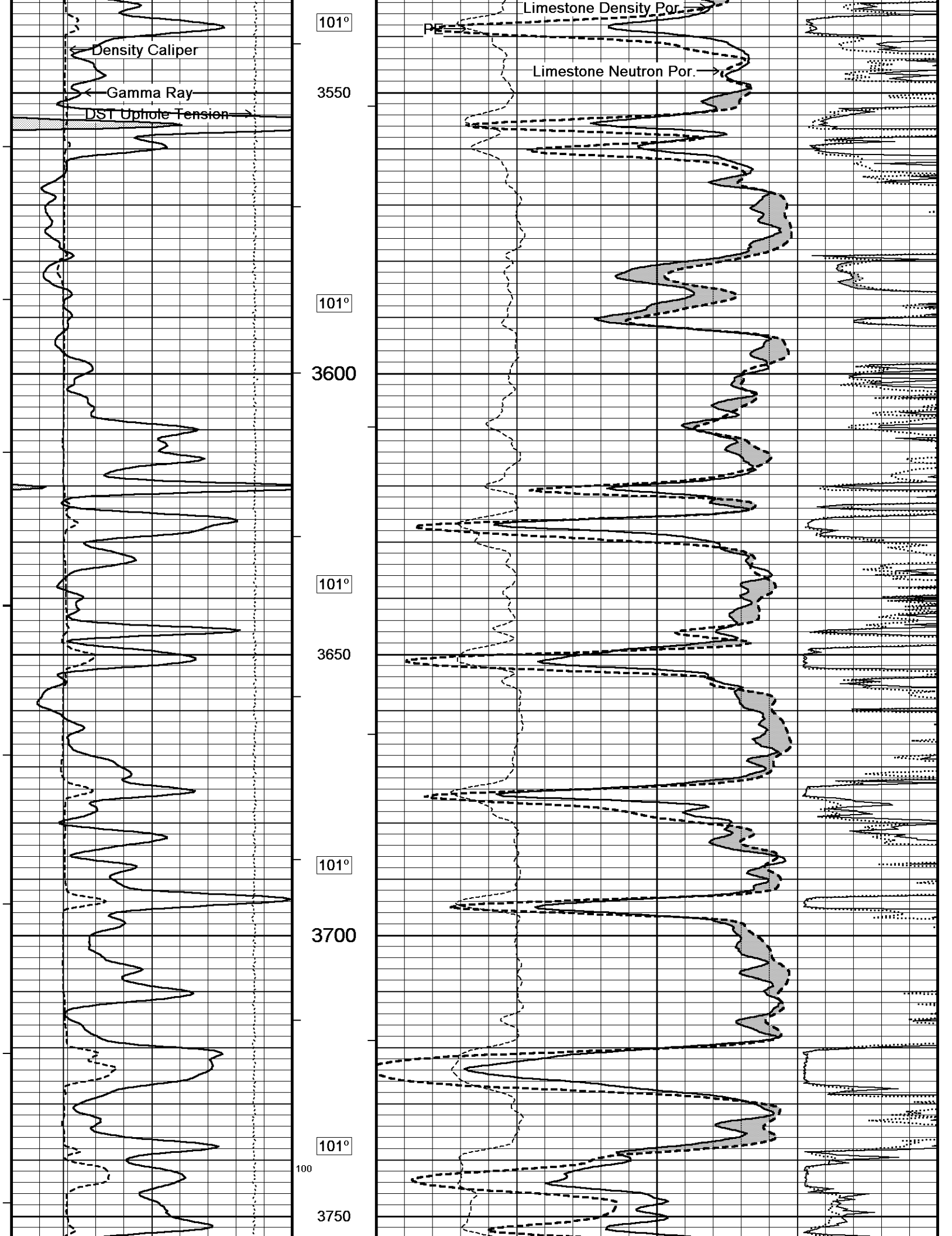
100°

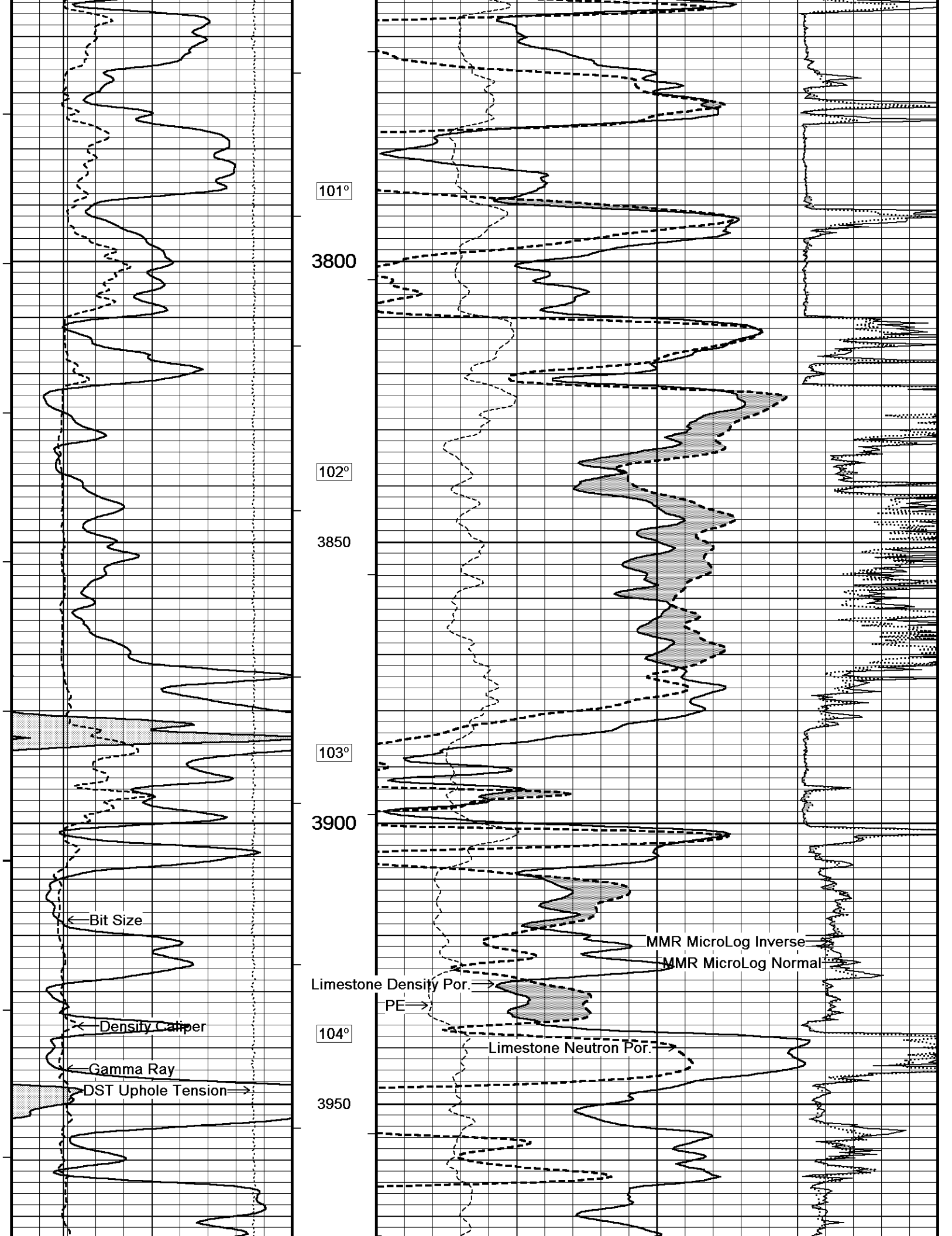
3500

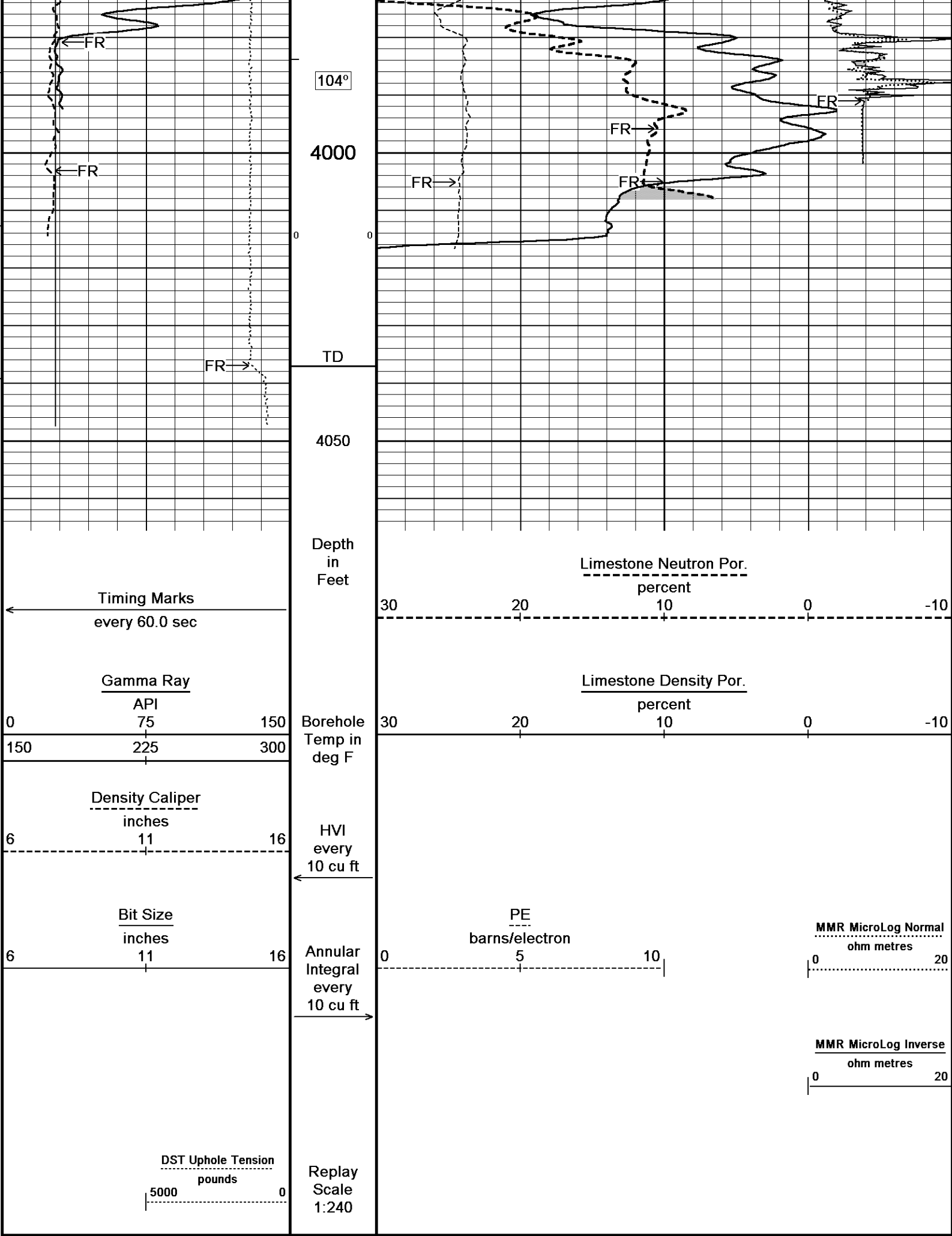
100

← Bit Size

MMR MicroLog Normal →



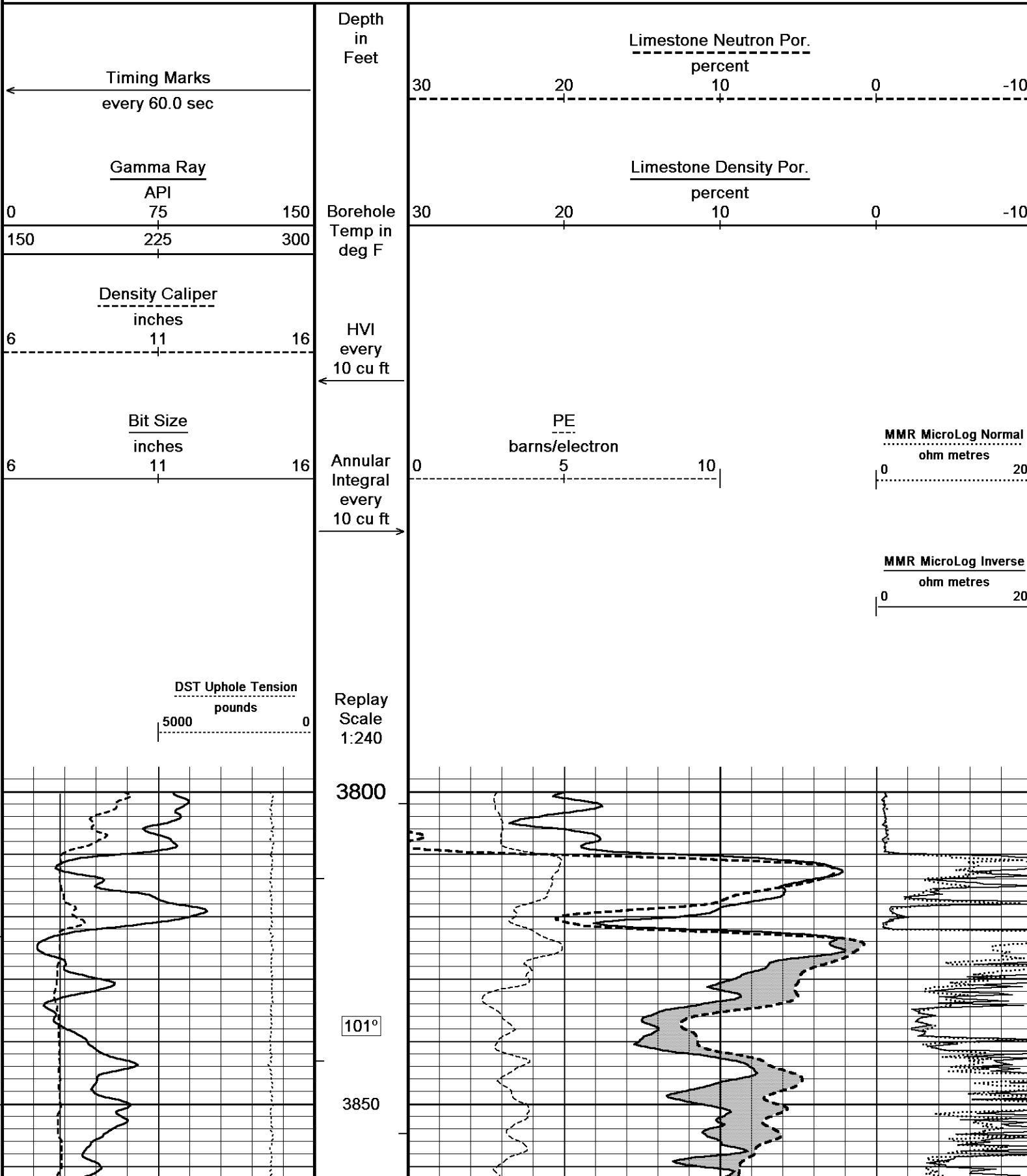


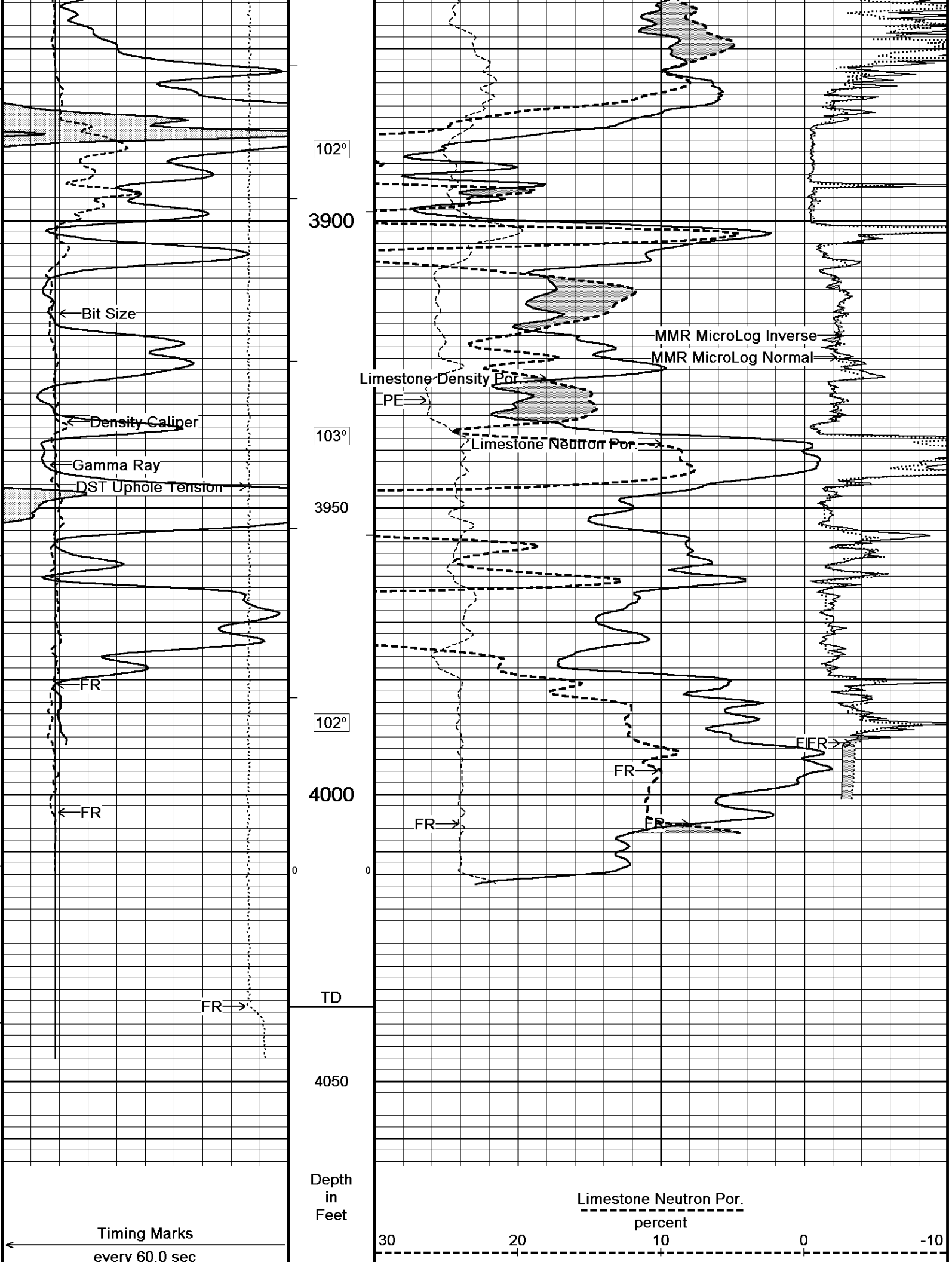


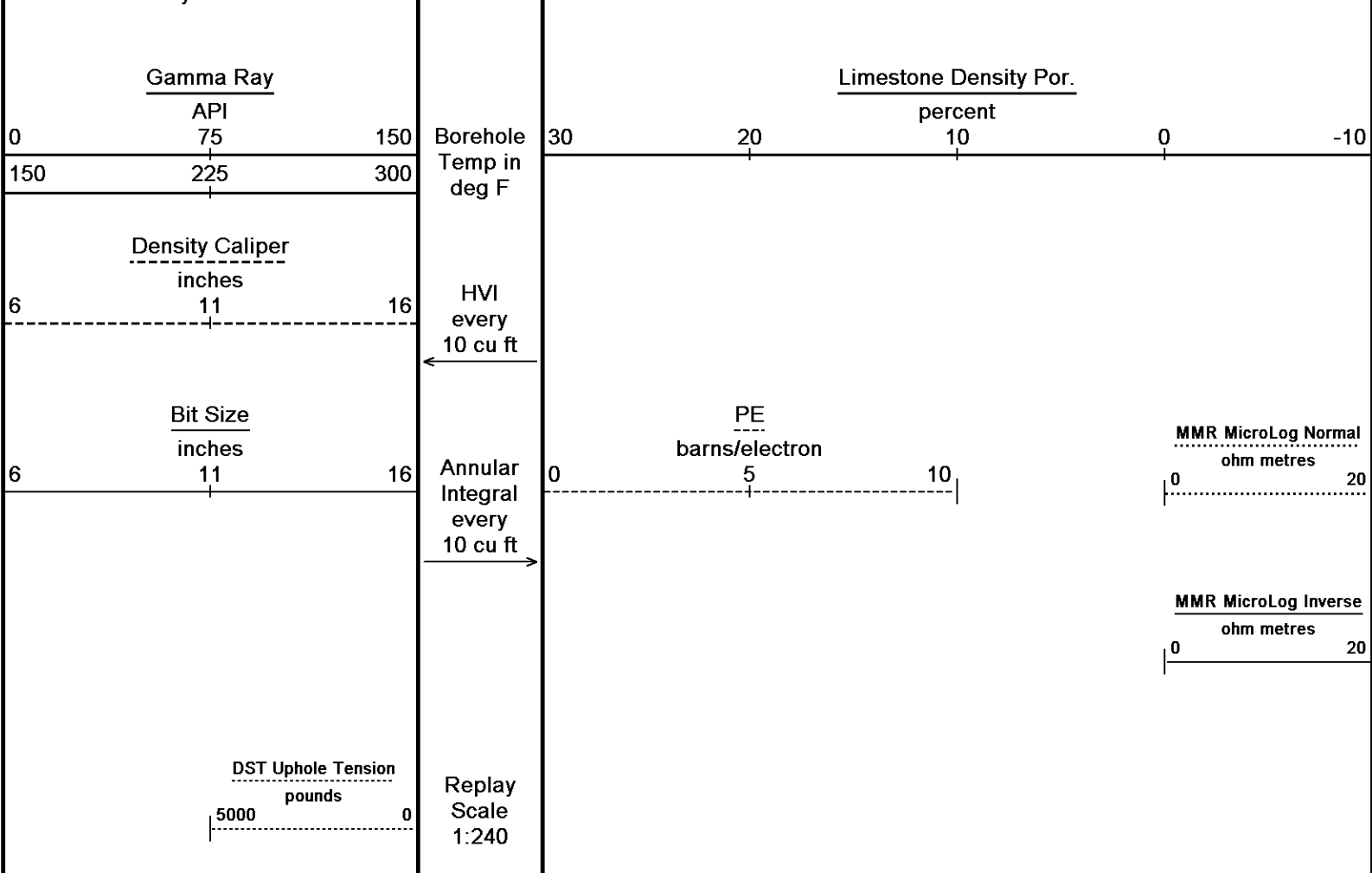
5 INCH LIMESTONE MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 14-MAR-2016 18:07
 Filename: C:\minimus 15.03.5939\Logs\Daystar Deutscher B #1-2\Daystar Deutscher B #1-2_001.dta Recorded on 14-MAR-2016 14:33
 System Versions: Logged with 15.03.5939 Plotted with 15.03.5939





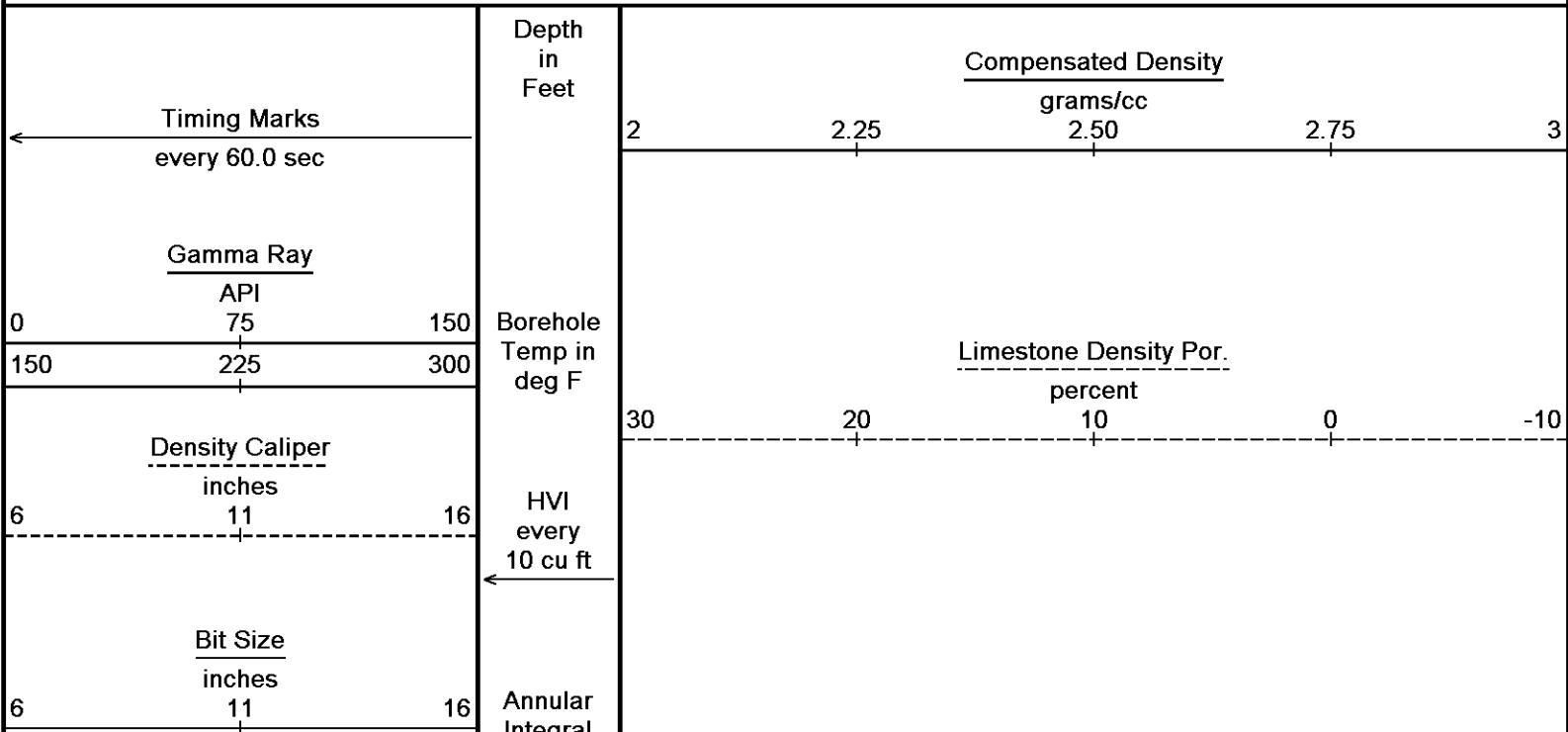


Depth Based Data - Maximum Sampling Increment 10.0cm
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 System Versions: Logged with 15.03.5939 Plotted with 15.03.5939
 Plotted on 14-MAR-2016 18:07
 Recorded on 14-MAR-2016 14:33

↑ REPEAT SECTION ↑

↓ 5 INCH BULK DENSITY MAIN ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: C:\Minimus 15.03.5939\Logs\Daystar Deutscher B #1-2\Daystar Deutscher B #1-2_002.dta
 System Versions: Logged with 15.03.5939 Plotted with 15.03.5939
 Plotted on 14-MAR-2016 18:07
 Recorded on 14-MAR-2016 15:01



Integral
every
10 cu ft
→

PE
barns/electron

Density Correction
grams/cc

0 5 10 -0.50 0 0.50

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

3100

97°

3150

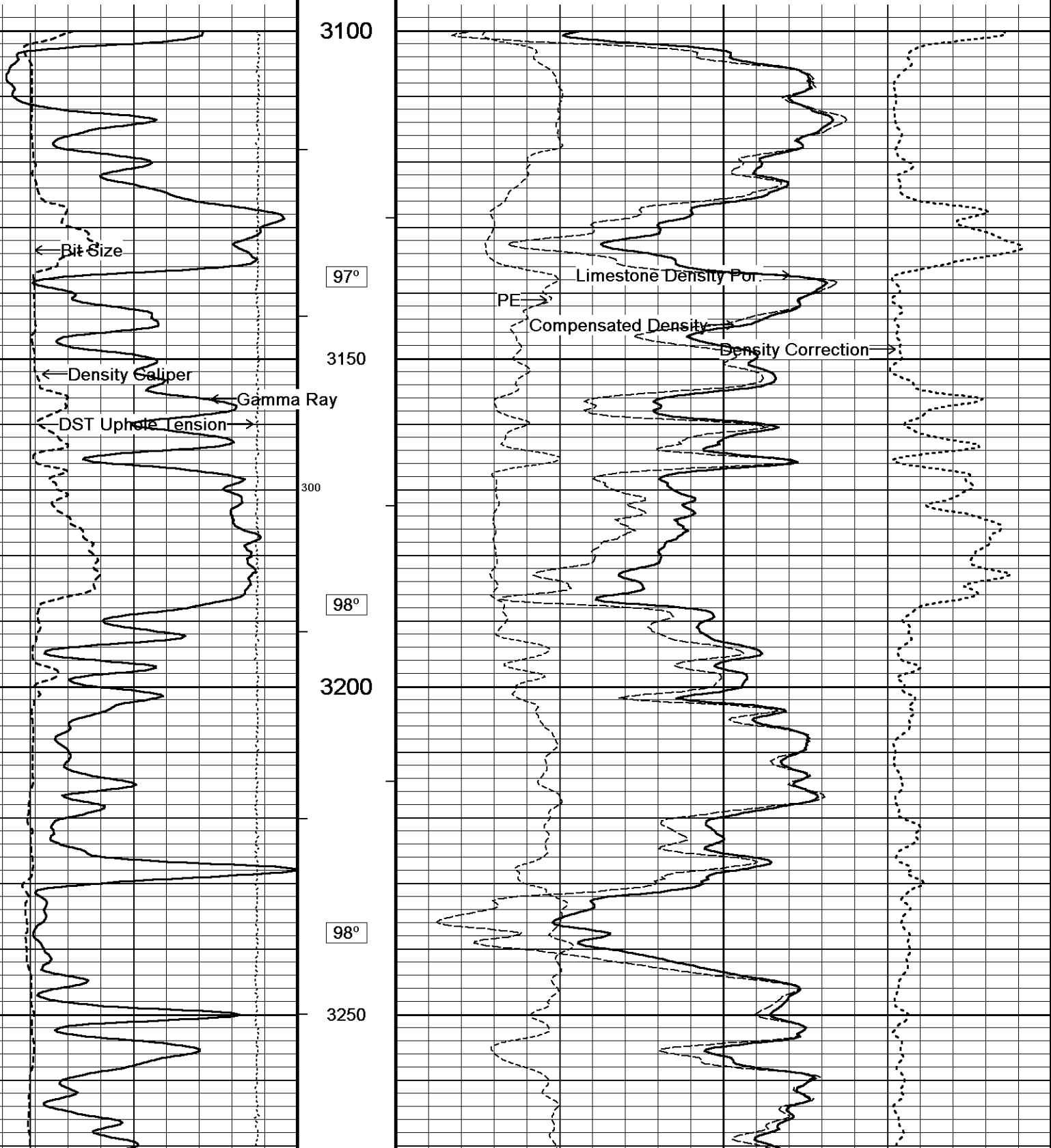
300

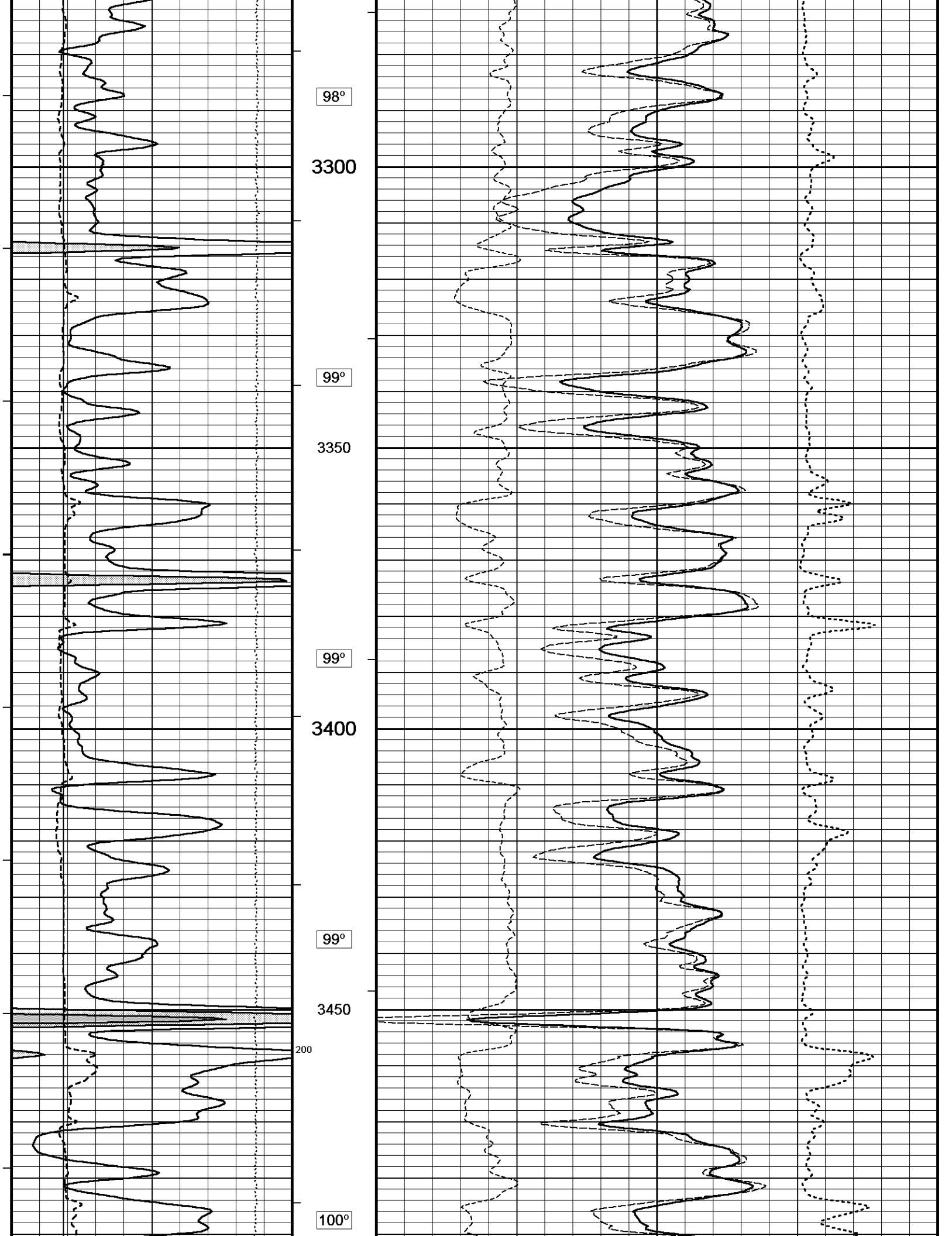
98°

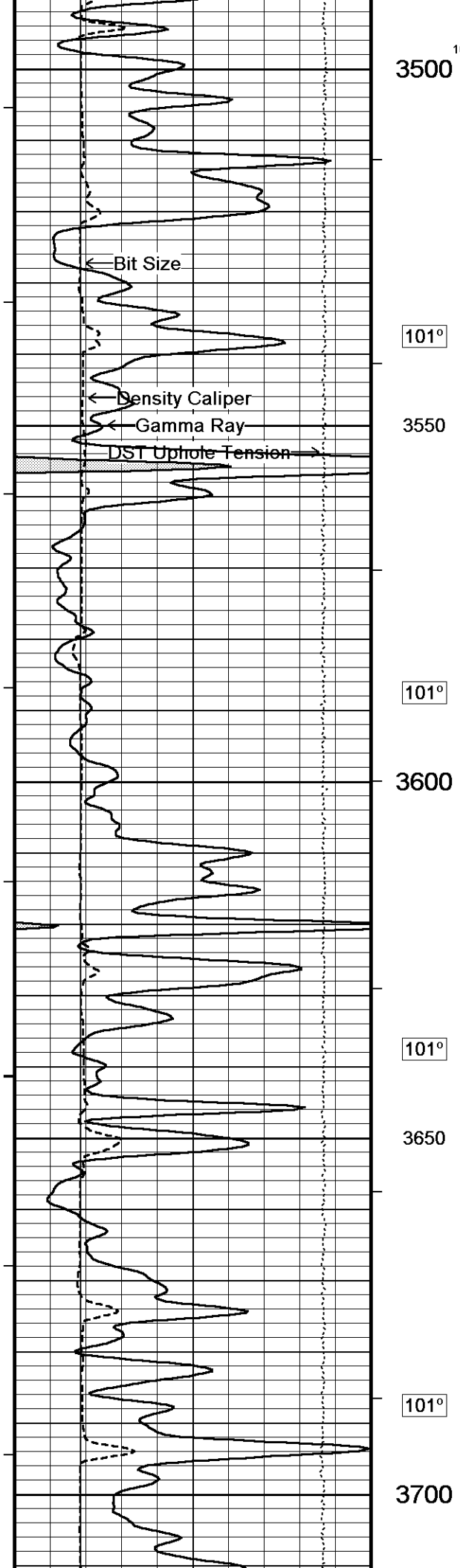
3200

98°

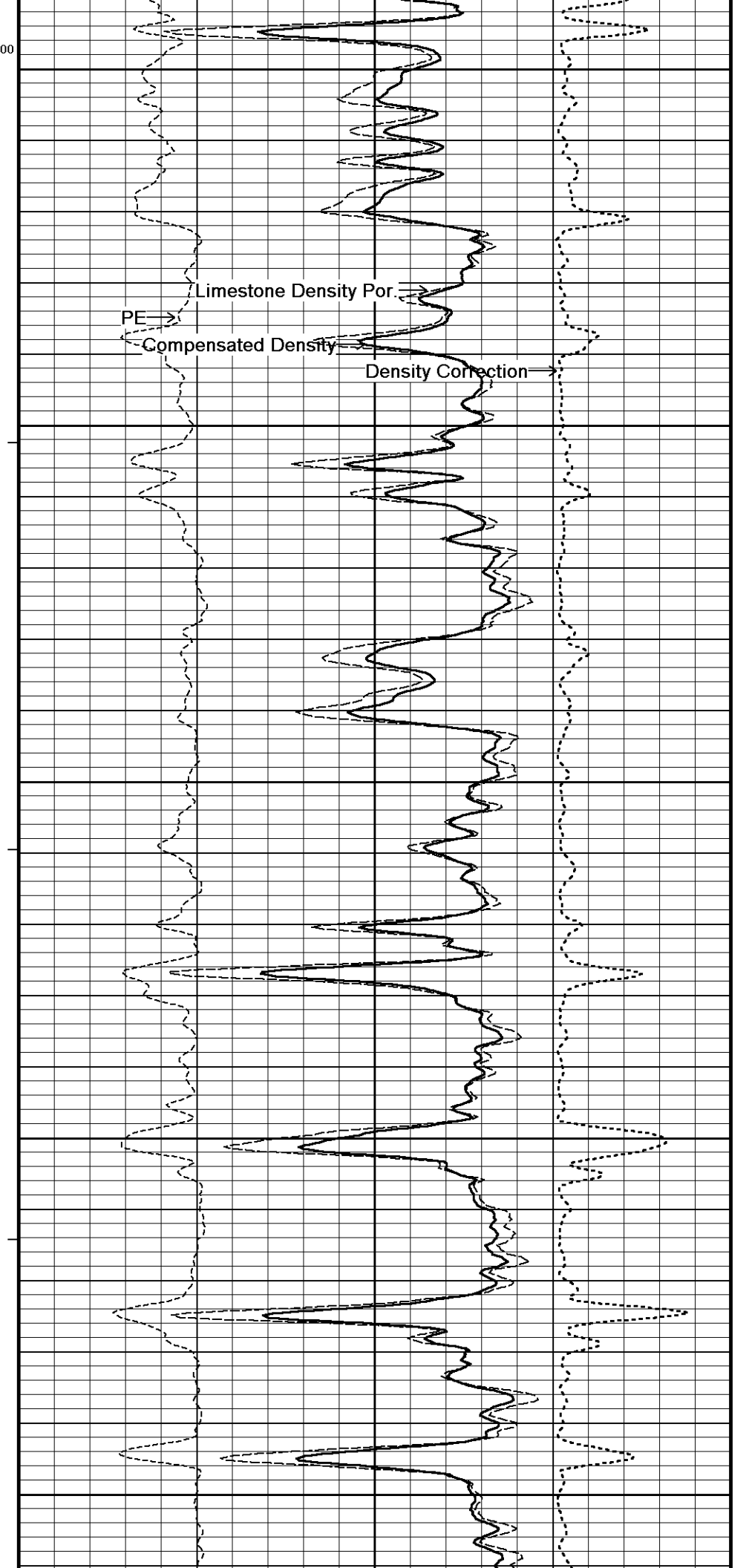
3250



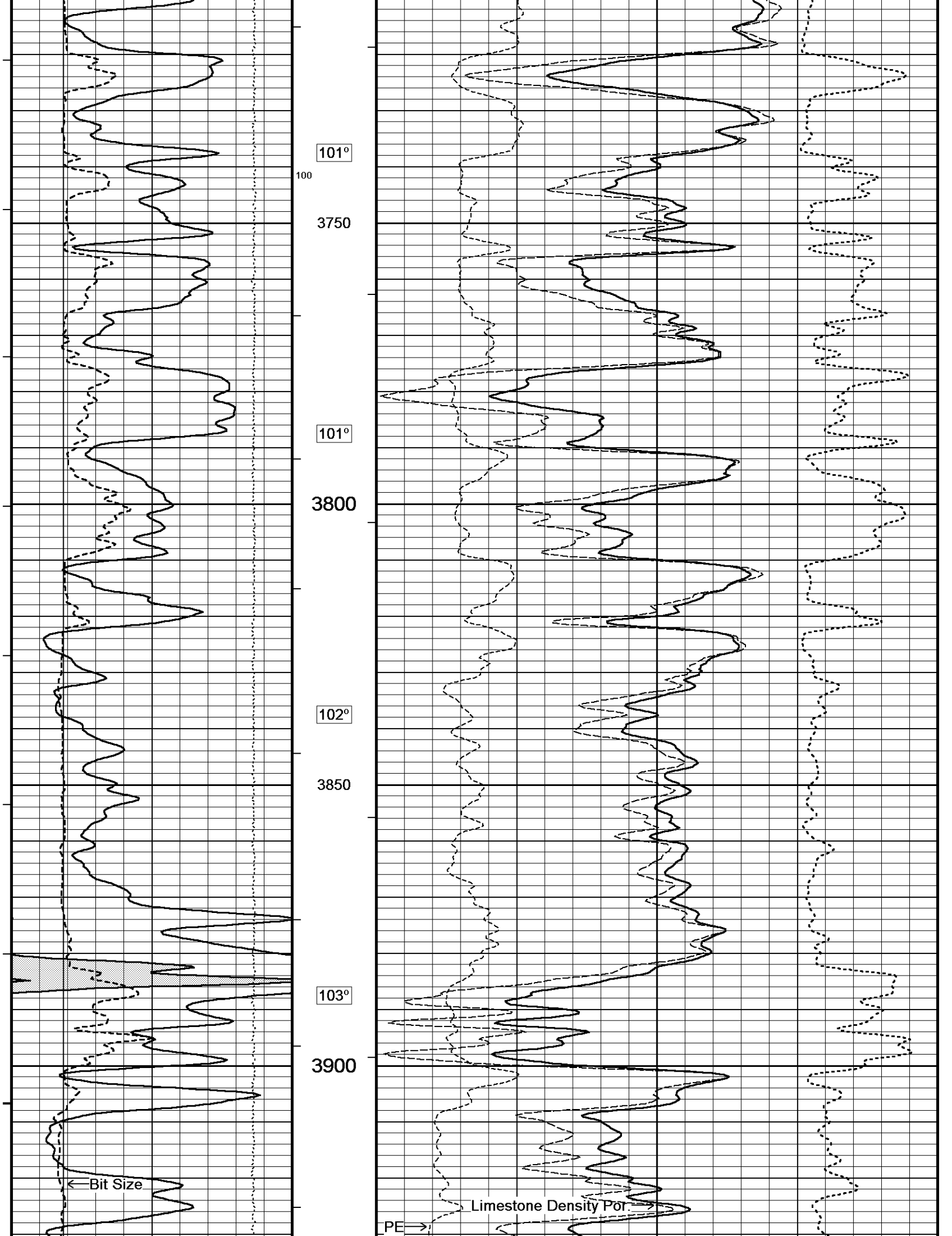


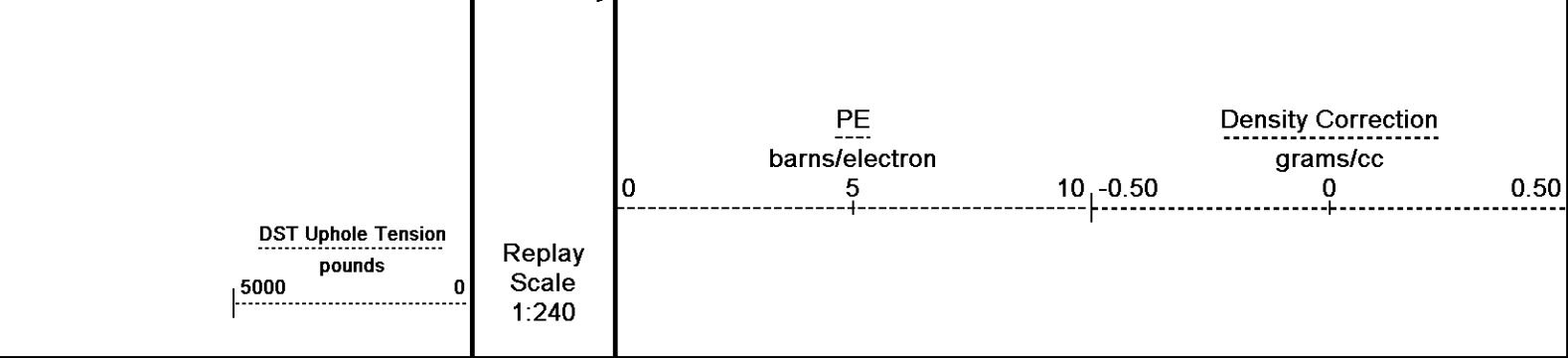


3500
101°
3550
101°
3600
101°
3650
101°
3700



Limestone Density Por.
PE
Compensated Density
Density Correction



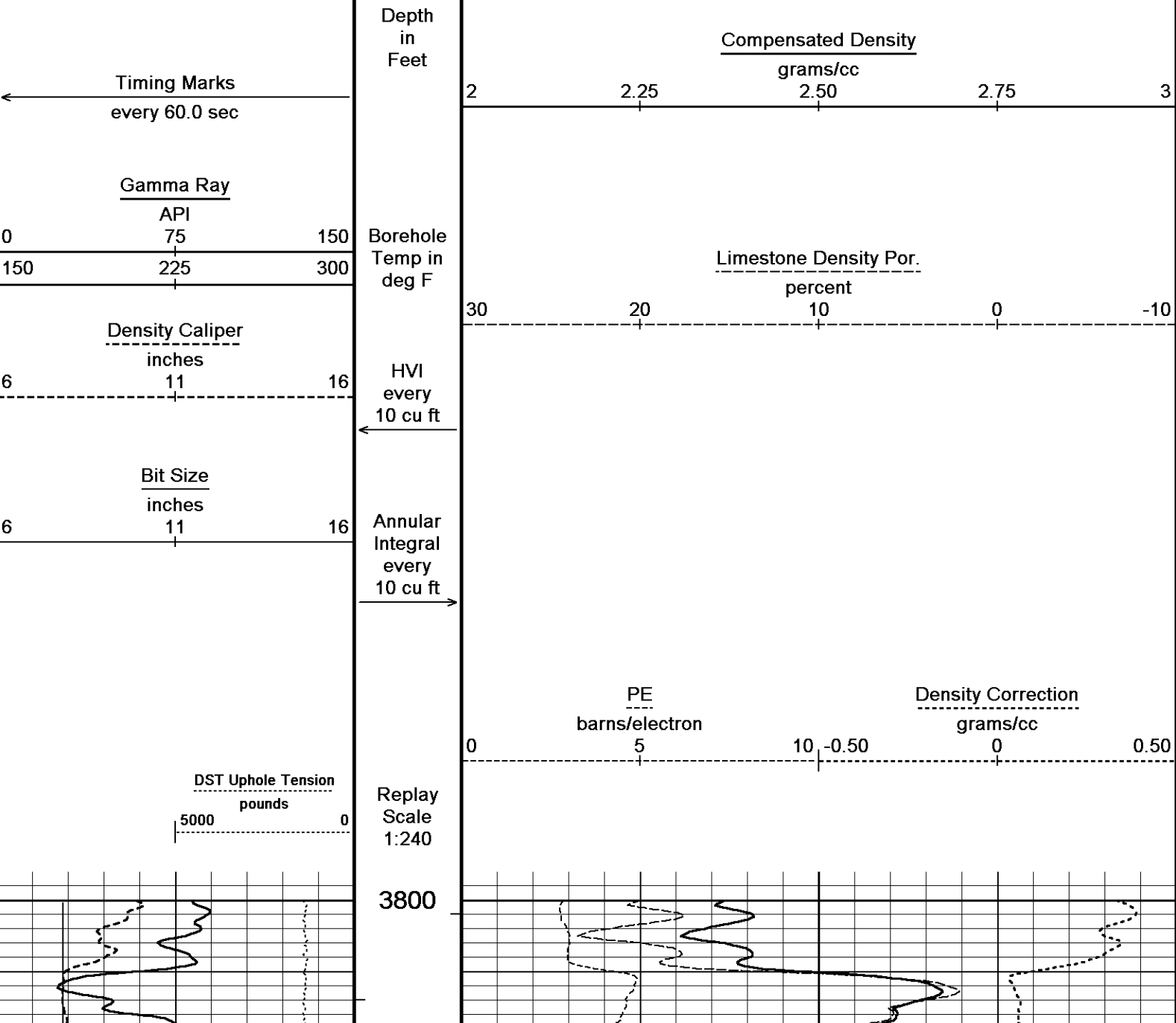


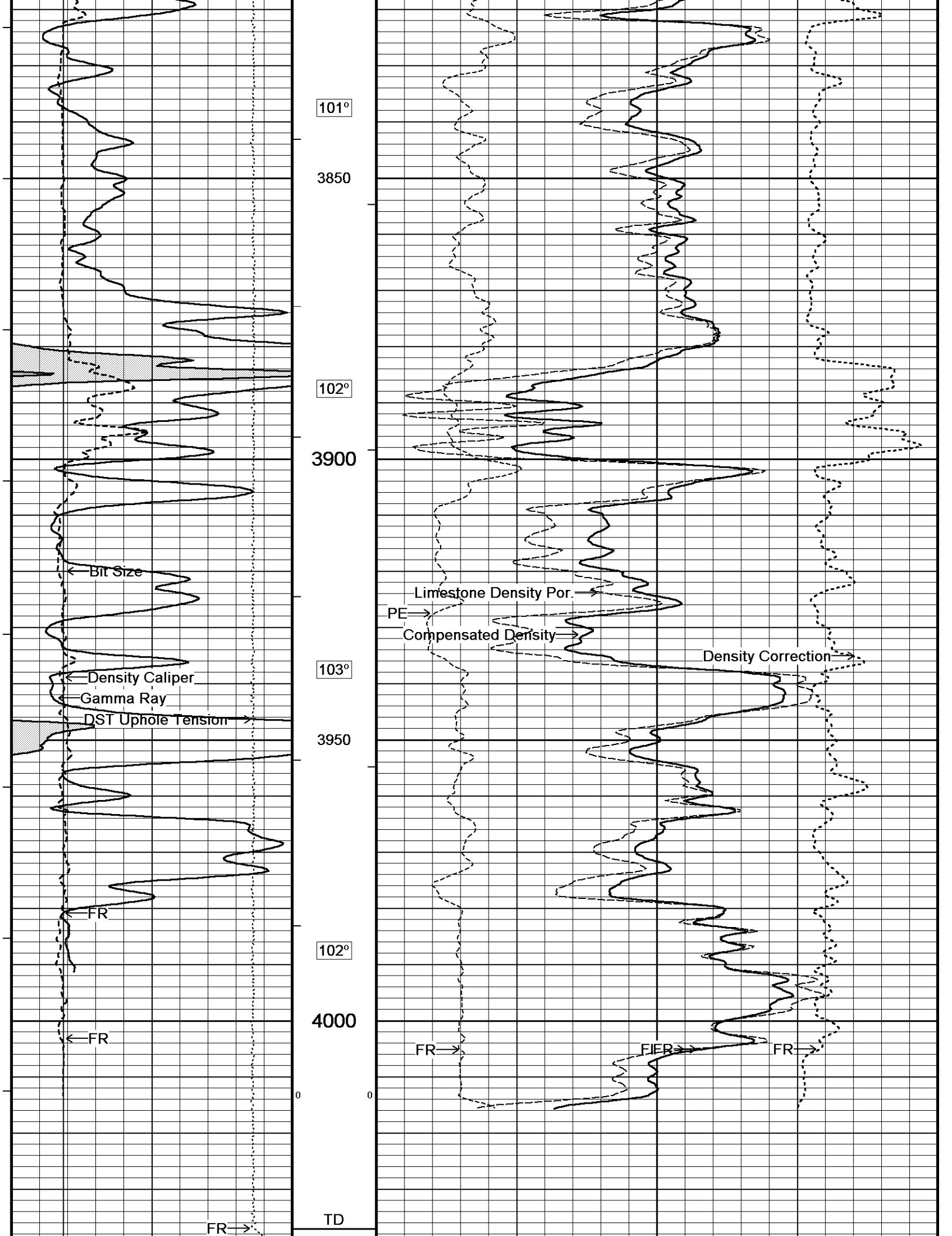
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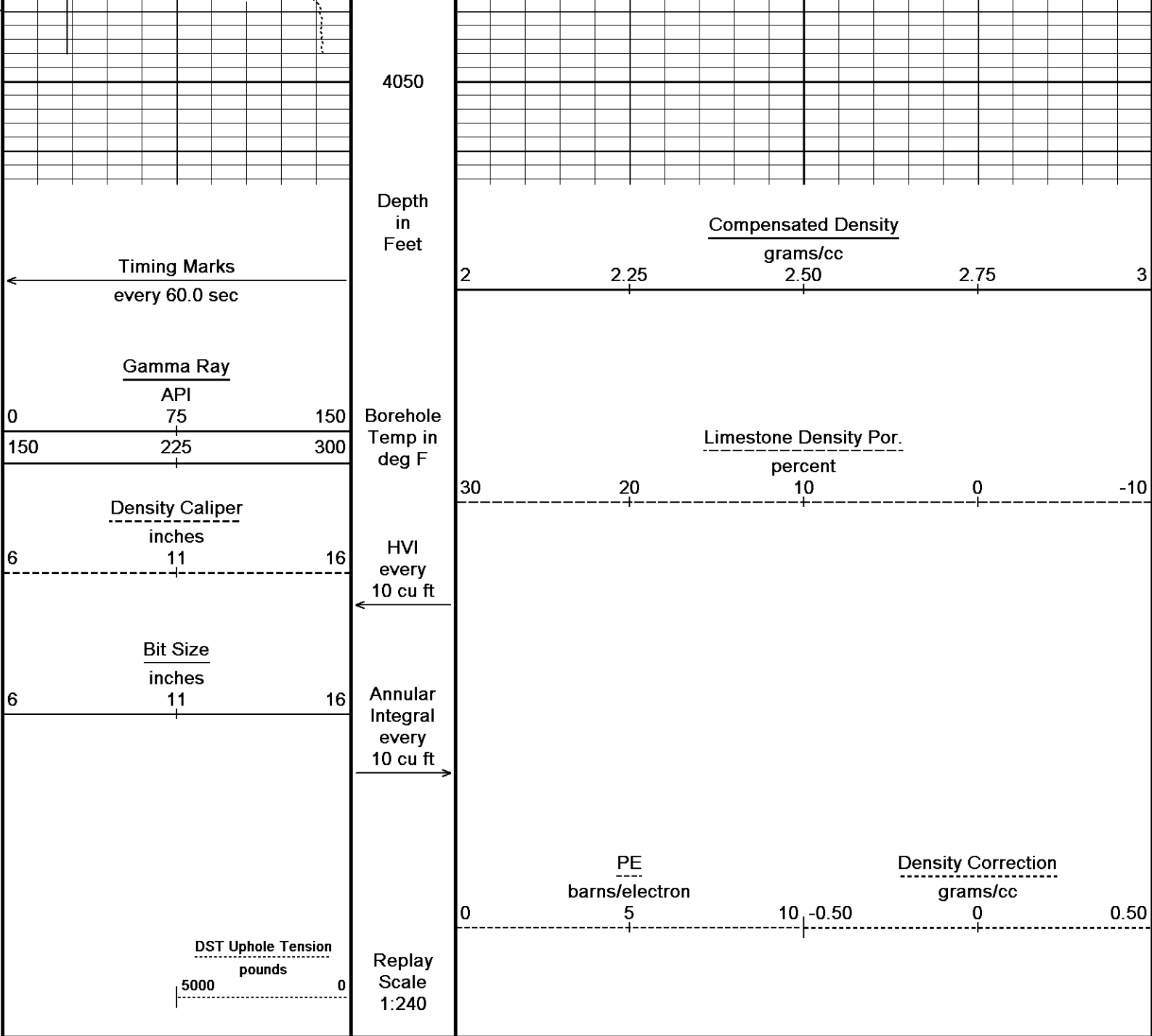
5 INCH BULK DENSITY MAIN

REPEAT SECTION

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↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION
 C:\Minimus 15.03.5939\Logs\Daystar Deutscher B #1-2\Daystar Deutscher B #1-2_001.dta

General Constants All 000 Last Edited on 14-MAR-2016,14:09

General Parameters
 Mud Resistivity 0.520 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 5.500 inches

Annular Volume Diameter 5.500 inches
 Caliper for Differential Caliper None

Rwa Parameters
 Porosity used Base Density Porosity
 Resistivity used Deep Induction
 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 14-MAR-2016 13:45

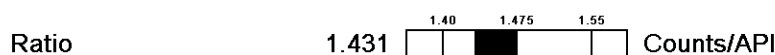
Reading No	Measured	Calibrated (lbs)
1	9937.87	0.00
2	10554.14	500.00

Gamma Calibration MCG-C 123

Field Calibration on 14-MAR-2016 08:52

	Measured	Calibrated (API)
Background	73	51
Calibrator (Gross)	726	507
Calibrator (Net)	653	456

Gamma Calibration Tolerances MCG-C 123



Gamma Constants MCG-C 123

Last Edited on 14-MAR-2016,13:18

Gamma Calibrator Number MCGGRCC141
 GRC-M Calibrator Jig in Use? NO
 Inactive Background Jig in Use? NO
 Mud Density 1.09 gm/cc
 Caliper Source for Processing Density Caliper
 Tool Position Eccentred
 Potassium Equivalence Chloride
 K Mud Concentration 0.00 %

High Resolution Temperature Calibration MCG-C 123

Field Calibration on 31-OCT-2015,17:05

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-C 123

Last Edited on 22-SEP-2015,11:43

Pre-filter Length 11

SP Calibration MCG-C 123

Field Calibration on 02-NOV-2015 16:50

	Measured	Calibrated (mV)
Reference 1	100.3	100.0
Reference 2	-100.1	-99.9

Micro Normal and Micro Inverse Calibration MMR-C.A 247

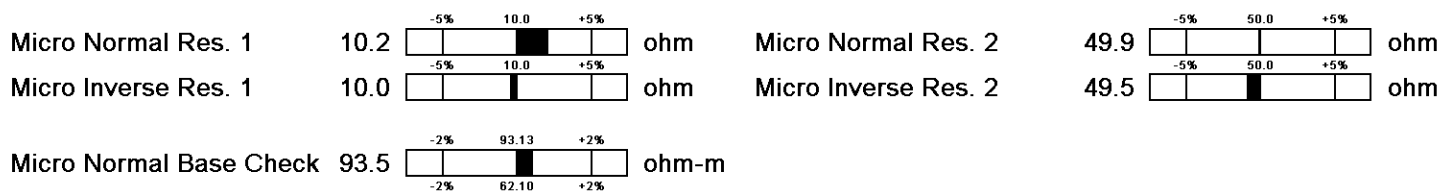
Base Calibration on 28-JAN-2016 15:04
 Field Check on 14-MAR-2016 08:38

Base Calibration

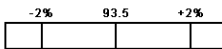
Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.2	49.9	5.1	25.6
Micro Inverse	10.0	49.5	3.4	16.9

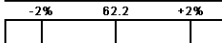
Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	93.5	93.5
Micro Inverse	62.2	62.2

Micro Normal & Micro Inverse Calibration Tolerance MMR-C.A 247



Micro Inverse Base Check 62.2  ohm-m

Micro Normal Field Check 93.5  ohm-m

Micro Inverse Field Check 62.2  ohm-m

Micro Normal and Micro Inverse Constants MMR-C.A 247

Last Edited on 20-OCT-2015,12:33

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 0.0000 inches

Caliper Calibration MMR-C.A 247

Base Calibration on 28-JAN-2016 14:54

Field Calibration on 14-MAR-2016 08:37

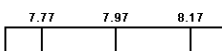
Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14598	5.98
2	17942	7.97
3	21198	9.86
4	25146	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.97	7.97

Caliper Calibration Tolerances MMR-C.A 247

Short Arm Field Cal. 7.97  in

Micro-Resistivity Caliper Constants MMR-C.A 247

Last Edited on

Sonde Configuration Resistivity Mode

Neutron Calibration MDN-A.B 66

Base Calibration on 12-FEB-2016 22:05

Field Check on 14-MAR-2016 08:58

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
Ratio	3097	96	3714	110
	32.423		33.764	


Field Calibrator at Base

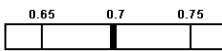
	Calibrated (cps)
Ratio	2076 2984
	0.696

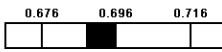
Field Check

	Calibrated (cps)
Ratio	2115 3075
	0.688

Neutron Calibration Tolerances MDN-A.B 66

Ratio 32.423 

Base Check 0.696 

Field Check 0.688 

Neutron Constants MDN-A.B 66

Last Edited on 14-MAR-2016,13:18

Neutron Source Id P0204NN
Neutron Jig Number NJ5736
Air Hole Processing Legacy
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	

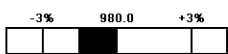
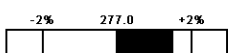
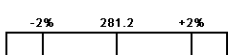
FE Calibration MFE-B.J 352

Base Calibration on 09-NOV-2015 11:10
Field Check on 14-MAR-2016 08:30

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	964.4	126.8
Base Check		281.2
Field Check		281.3

FE Calibration Tolerances MFE-B.J 352

Reference 2	964.4		ohm
Base Check	281.2		ohm-m
Field Check	281.3		ohm-m

FE Constants MFE-B.J 352

Last Edited on 14-MAR-2016,13:17

Running Mode	No Sleeve	
MFE K Factor	0.1268	
Borehole Correction Constants		
Sonde Position	0.5	inches
Hole Size Source	Density Caliper	
Hole Size Constant Value	N/A	inches
Rm Source	Global Value: Temperature Corrected	
Temp. for Rm Corr.	MCG External Temperature	

Sonic Constants MSS-A.A 55

Last Edited on 14-MAR-2016,13:17

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	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	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	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	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 Window Width	N/A micro-sec
Sonic 1 Despiker	N/A N/A
Sonic 2 Despiker	N/A N/A

Induction Calibration MAI-A.A 111

Base Calibration on 05-AUG-2014,09:34
Field Check on 14-MAR-2016 08:29


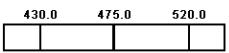
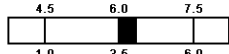
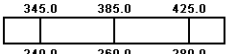
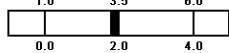
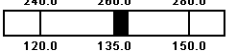
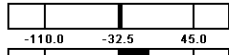
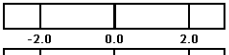
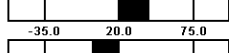
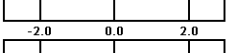
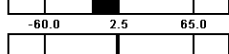
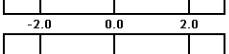
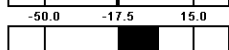
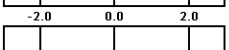
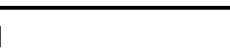
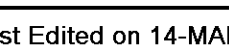
Base Calibration

Test Loop Calibration Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	17.6	473.6	9.3	966.2
2	6.4	385.9	7.6	821.4
3	3.2	264.0	5.2	566.0
4	2.1	135.5	2.6	279.2
Array Temperature	23.0		Deg F	

Test Loop Calibration Verified 09-DEC-2015 11:03

Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	12.1	3873.0	11.8	3871.7	
2	29.8	3528.1	29.8	3527.3	
3	29.1	3021.3	29.1	3020.7	
4	19.1	2058.5	19.2	2058.1	
Deep	17.7	1962.1	17.7	1961.6	
Medium	43.1	3976.4	43.2	3975.7	
Shallow	44.4	5232.7	44.4	5231.5	
Array Temperature	65.8		59.4		Deg F

Induction Calibration Tolerances MAI-A.A 111

Low Conductivity 1	17.6		mmho/m High Conductivity 1	473.6		mmho/m
Low Conductivity 2	6.4		mmho/m High Conductivity 2	385.9		mmho/m
Low Conductivity 3	3.2		mmho/m High Conductivity 3	264.0		mmho/m
Low Conductivity 4	2.1		mmho/m High Conductivity 4	135.5		mmho/m
Background Vx 1	0.0		mmho/m Phase Check Loop 1	0.0		%
Background Vx 2	0.0		mmho/m Phase Check Loop 2	0.0		%
Background Vx 3	0.0		mmho/m Phase Check Loop 3	0.0		%
Background Vx 4	0.0		mmho/m Phase Check Loop 4	0.0		%

Induction Constants MAI-A.A 111

Last Edited on 14-MAR-2016,13:17

Induction Model

RtAP-WBM

Borehole Correction Constants

Tool Centred		No	
Hole Size Source		Density Caliper	
Hole Size Constant Value		N/A	inches
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
Rm Source	Global Value:	Temperature Corrected	
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

Symmetrised Receiver Gains

Receiver 1	1.00
Receiver 2	1.00
Receiver 3	1.00
Receiver 4	1.00

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 111

Field Calibration on 24-NOV-2014,10:23

	Measured	Calibrated(Deg F)
Lower	10.00	10.00
Upper	100.00	100.00

High Resolution Temperature Constants MAI-A.A 111

Last Edited on 26-JUN-2014,15:06

Pre-filter Length	11
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Photo Density Calibration MPD-B 104

Base Calibration on 12-FEB-2016 21:25

Field Check on 14-MAR-2016 08:36

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1155	1342		
Reference 1	49717	23901	59556	30836
Reference 2	20125	2432	24941	2541

Field Check at Base	1154.8	1342.5
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Field Check	1156.1	1341.1
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Cablehead, 11 pin
CBH-CA 155 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Comms Gamma
MCG-C 123 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-C.A 247 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

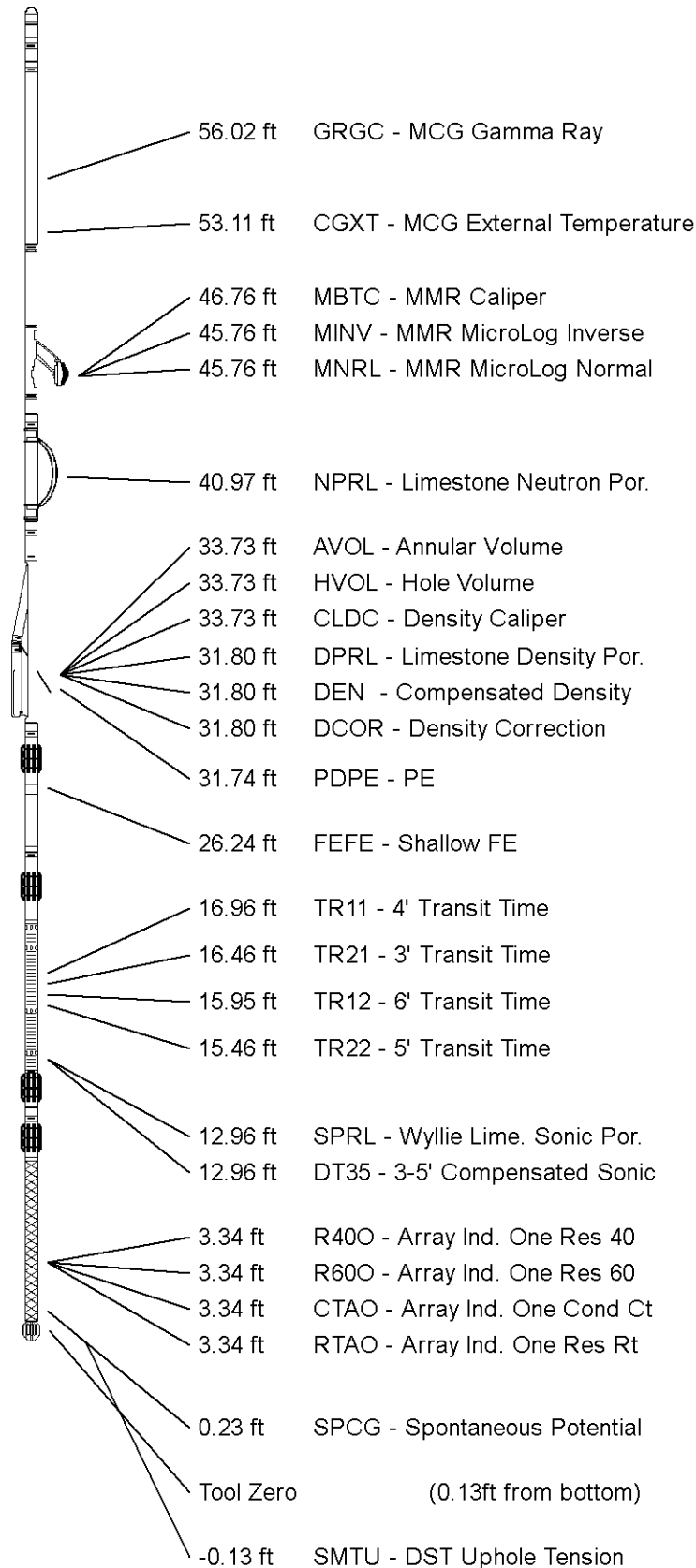
Compact Density/Caliper
MPD-B 104 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-A.A 55 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction
MAI-A.A 111 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.70 ft Weight: 480.6 lb



All measurements relative to tool zero.

COMPANY	DAYSTAR PETROLEUM, INC.
WELL	DEUTSCHER B #1-2
FIELD	WILDCAT
PROVINCE/COUNTY	TREGO
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2131.00	feet
Elevation Drill Floor	2129.00	feet
Elevation Ground Level	2123.00	feet

First Reading	4005.00	feet
Depth Driller	4040.00	feet
Depth Logger	4037.00	feet



Weatherford[®]

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG