



Weatherford[®]

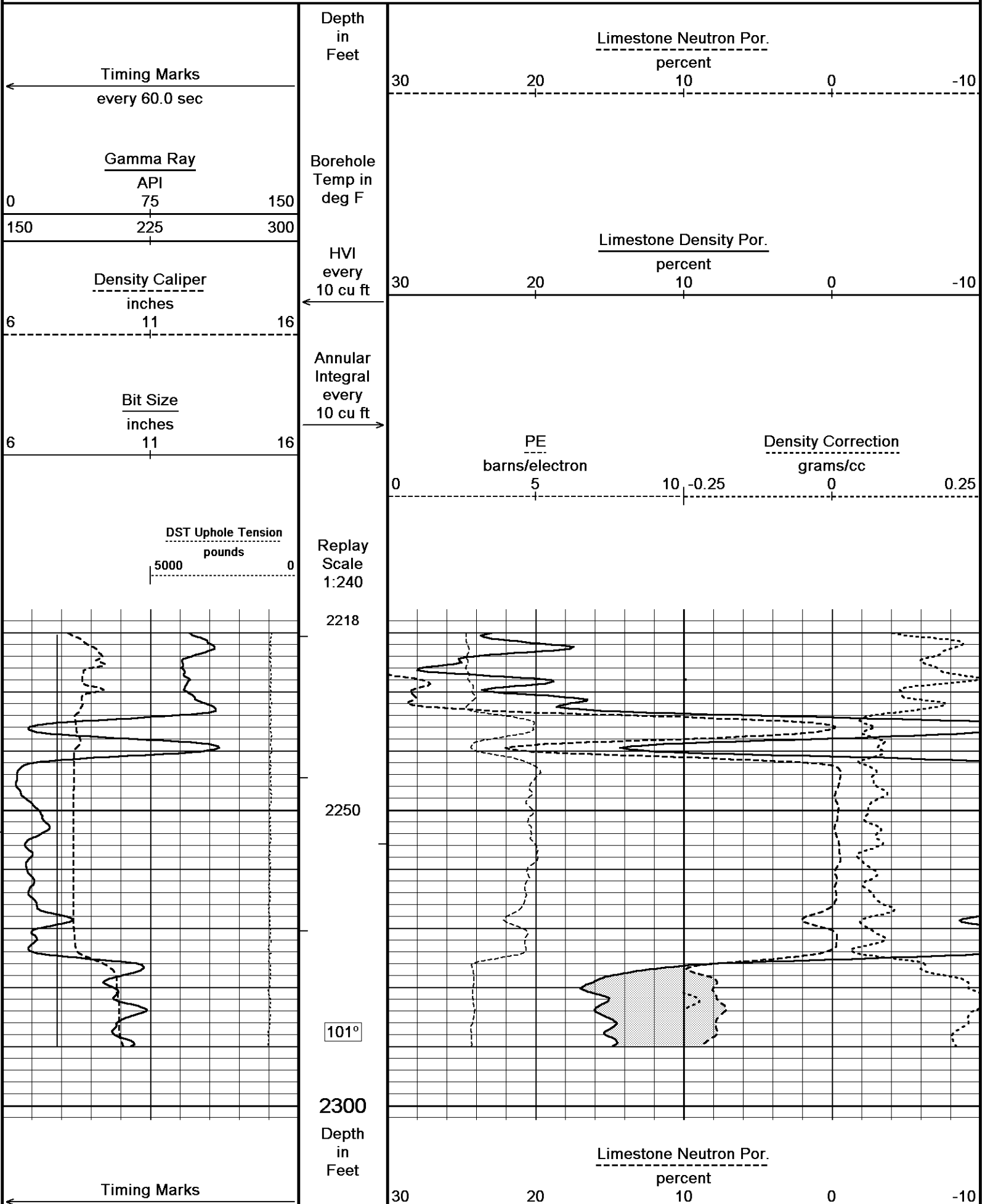
**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY		GRAND MESA OPERATING COMPANY	
WELL		Q-R #1-17	
FIELD		Q-B	
PROVINCE/COUNTY		GOVE	
COUNTRY/STATE		U.S.A. / KANSAS	
LOCATION		2598' FNL & 2087' FEL SE SW SW NE	
SEC	TWP	RGE	Other Services
17	11S	26W	MML
API Number		15-063-22048	MAI/MFE
Permit Number			
Permanent Datum G.L., Elevation 2647 feet			
Log Measured From KB			
Drilling Measured From K.B.			
Date	17-OCT-2012	Elevations: KB 2652.00 DF 2651.00 GL 2647.00	
Run Number	ONE		
Depth Driller	4669.00	feet	
Depth Logger	4669.00	feet	
First Reading	4649.00	feet	
Last Reading	3600.00	feet	
Casing Driller	262.00	feet	
Casing Logger	263.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.30 lb/USg	68.00 CP	
PH / Fluid Loss	10.50	7.80 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.98 @ 92.0	ohm-m	
Rmf @ Measured Temp	0.82 @ 92.0	ohm-m	
Rmc @ Measured Temp	1.22 @ 92.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.79 @ 115.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	115.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	13096	LIB	
Recorded By	L. SCOTT		
Witnessed By	BOB SCHREIBER		
S.O. / JOB#	3537893	LB12-278	

BOREHOLE RECORD				Last Edited: 17-OCT-2012 12:08
Bit Size inches		Depth From feet		Depth To feet
7.875		263.00		4669.00
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	263.00	24.00

REMARKS
Tools Ran: MCG, MML, MDN, MPD, MFE, MAI RAN IN COMBINATION. 2.71 G/CC Limestone Density porosity 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= 1928 cubic feet Annular hole volume with 5.5 Inch casing from TD to 3600ft.= 213 cubic feet Service order: 3537893 Rig: Murfin #8 Engineer: L. Scott Operator(s): J. LaPoint, N. Adame

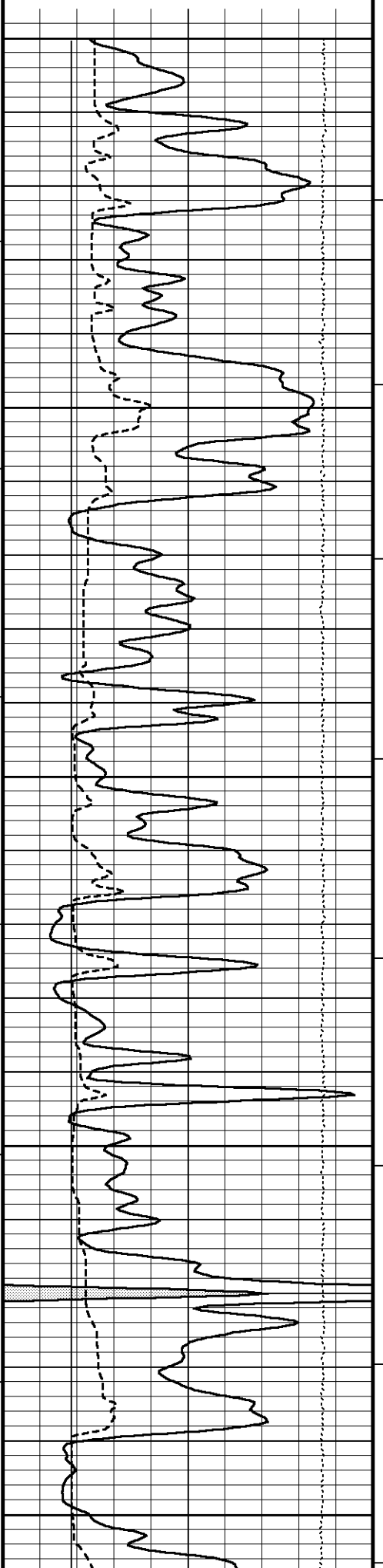
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, 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.



5000 0

Scale
1:240

0 20



3600

107°

3650

200

108°

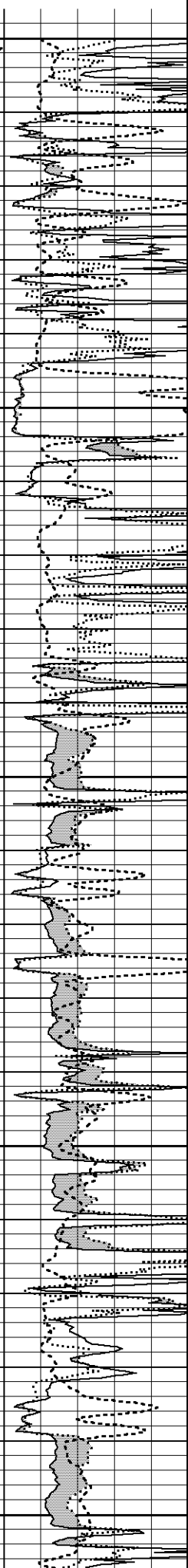
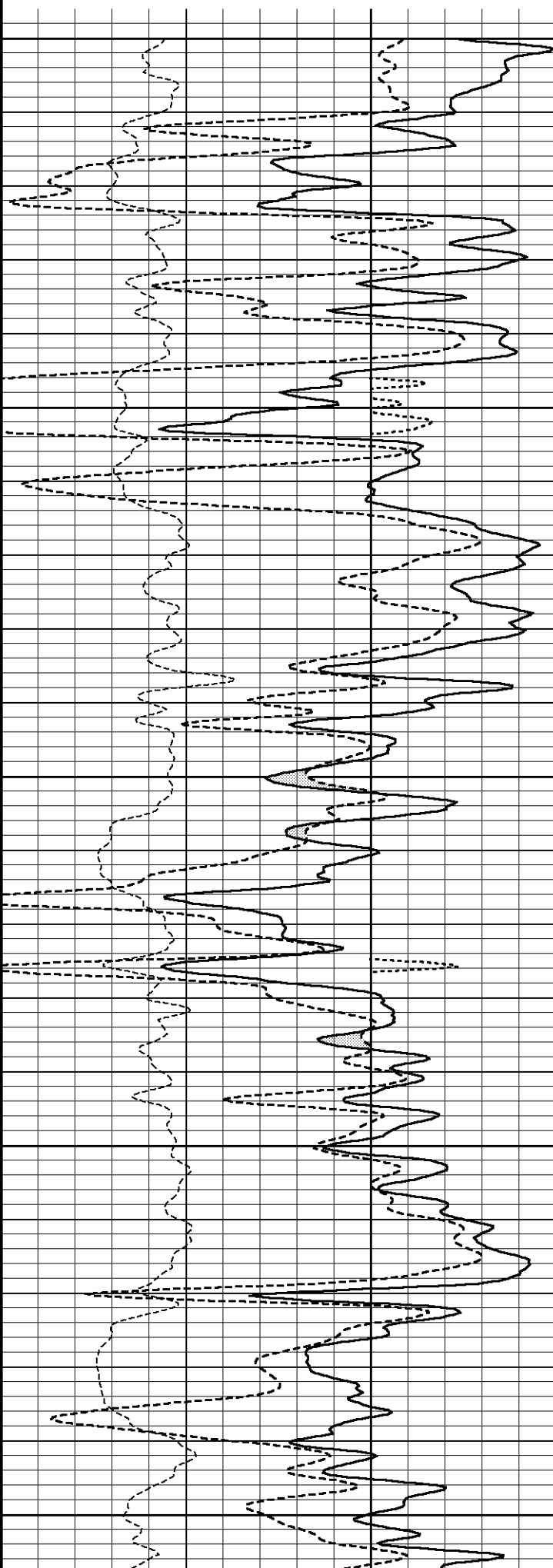
3700

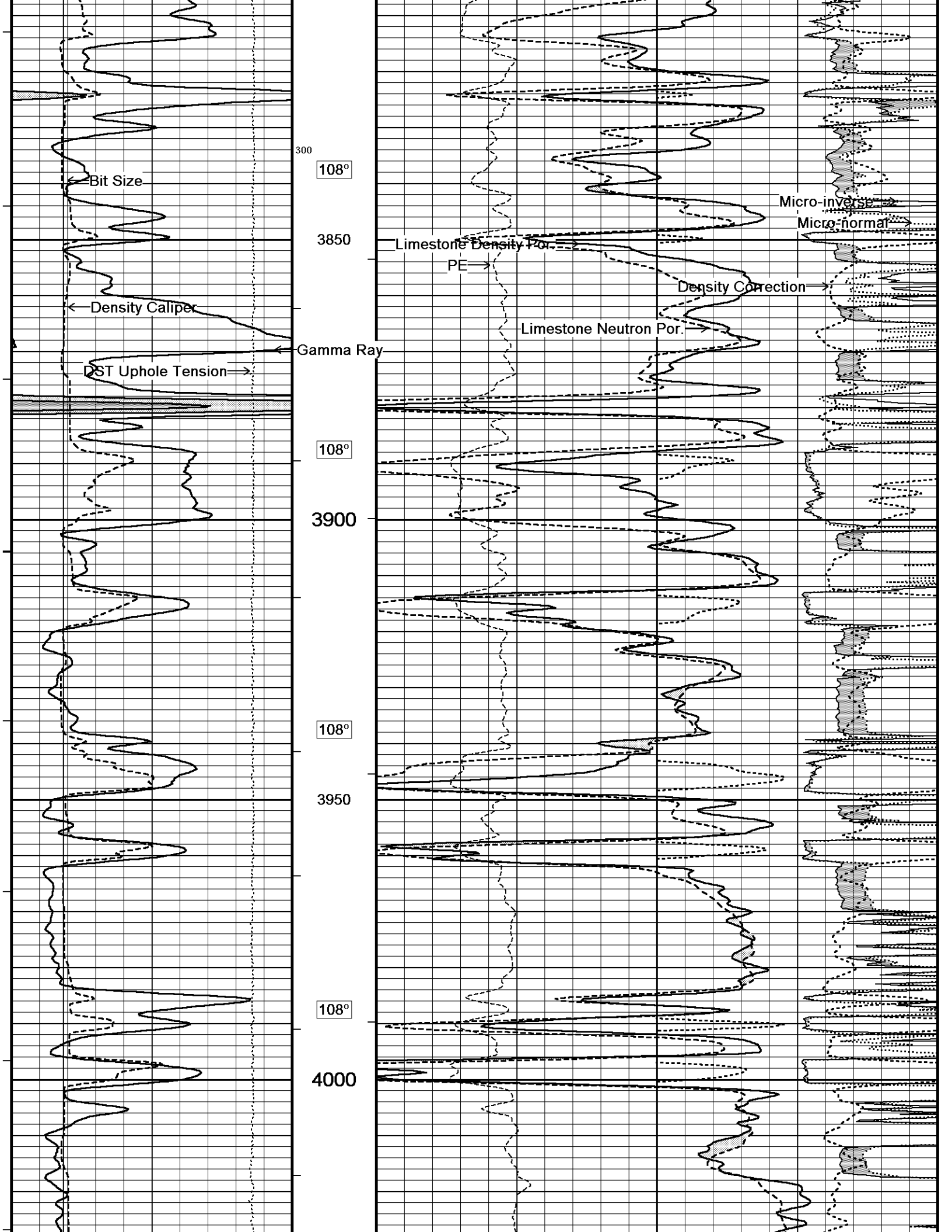
108°

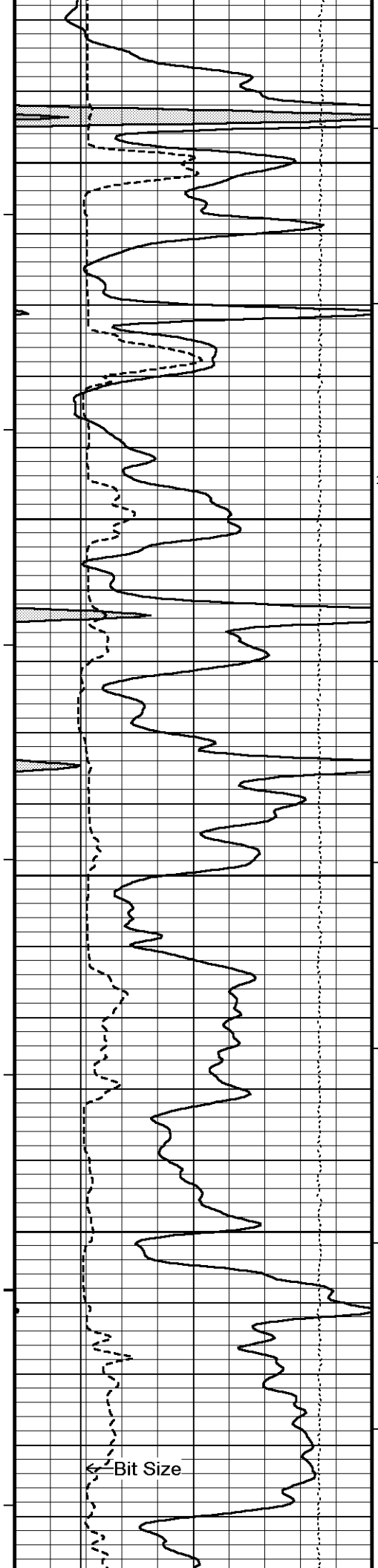
3750

108°

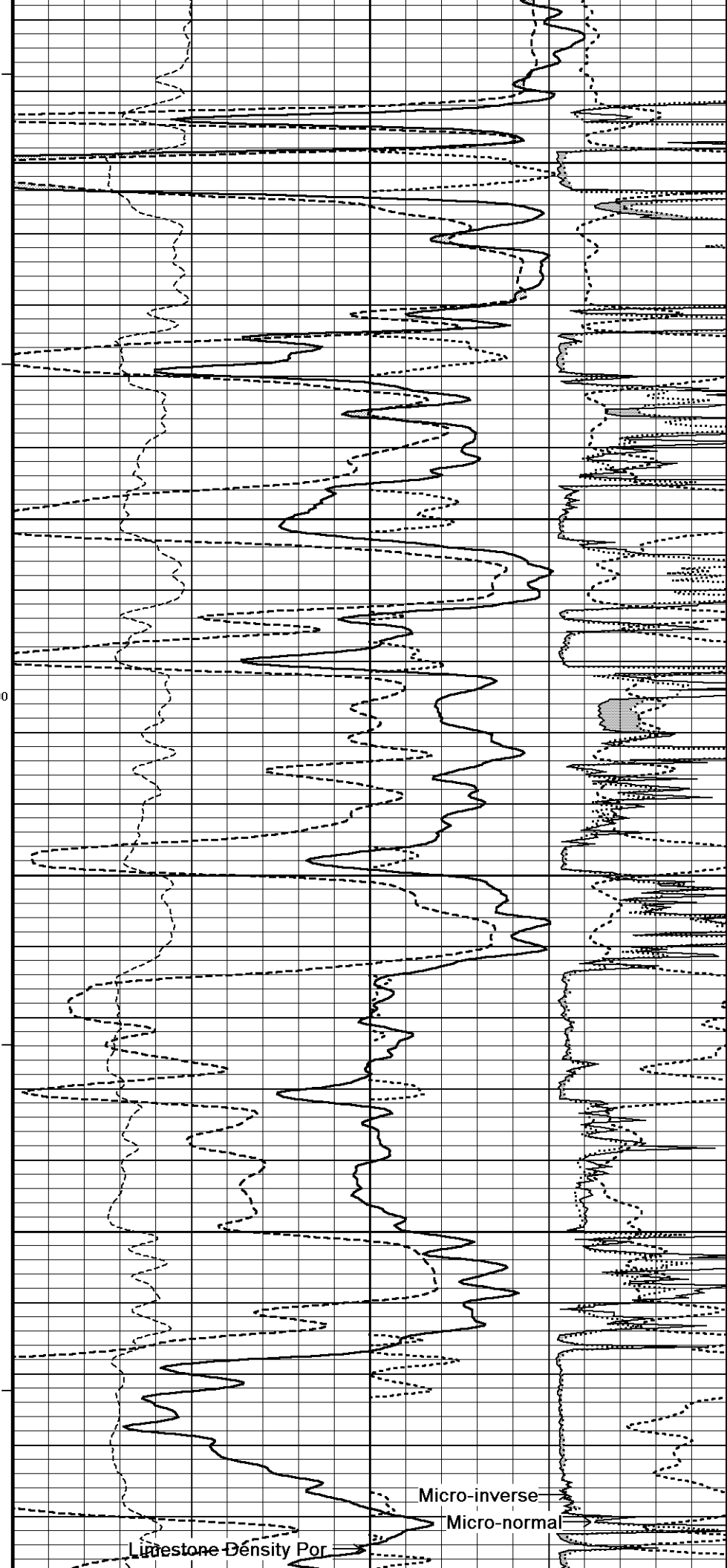
3800







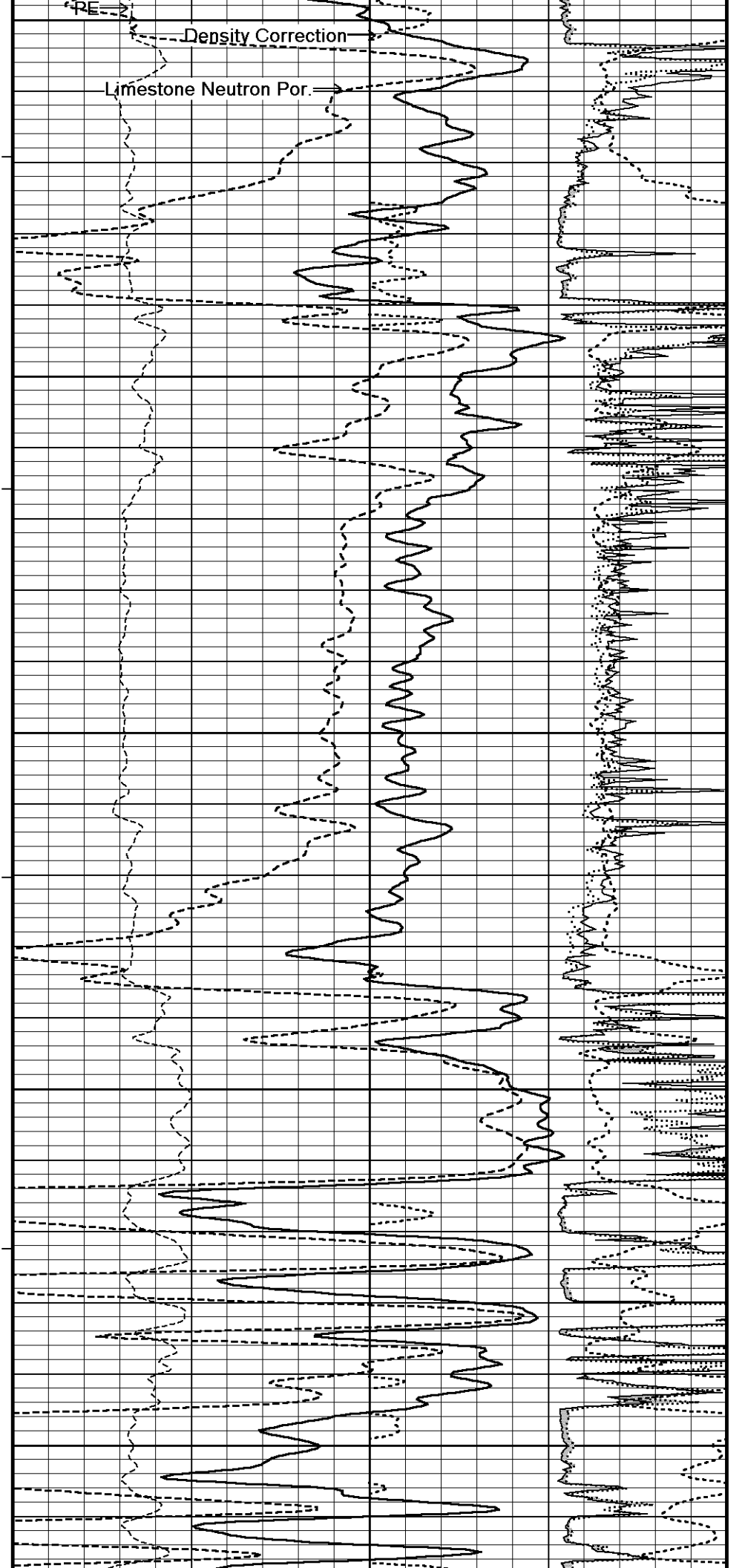
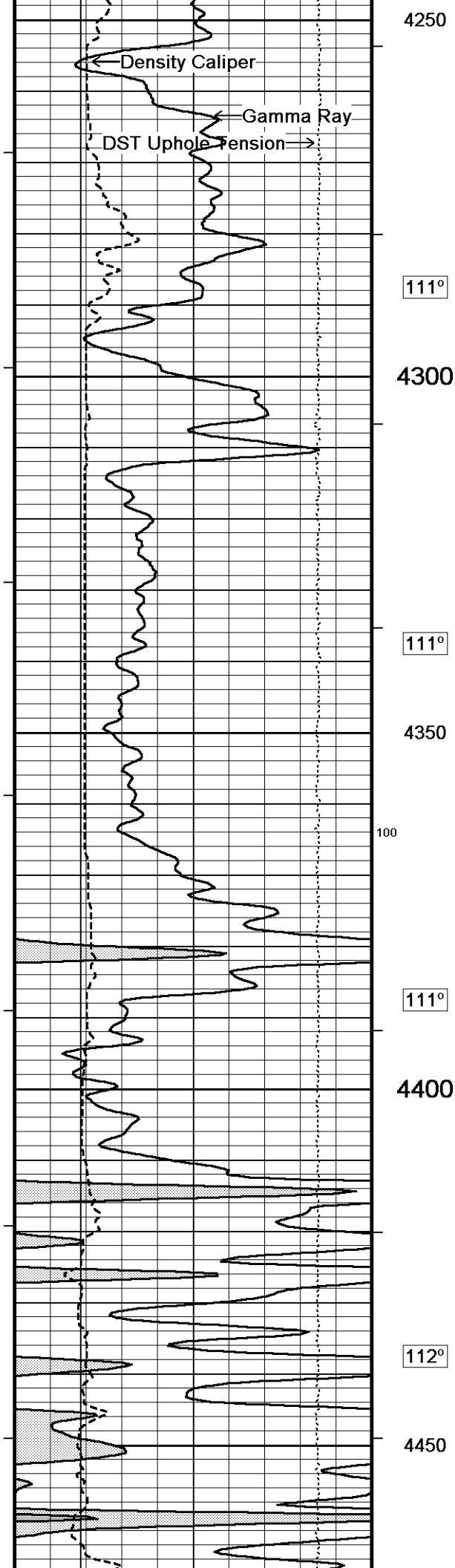
109°
4050
109°
200
4100
100
110°
4150
110°
4200
111°



Limestone Density Por

Micro-inverse

Micro-normal



4250

111°

4300

111°

4350

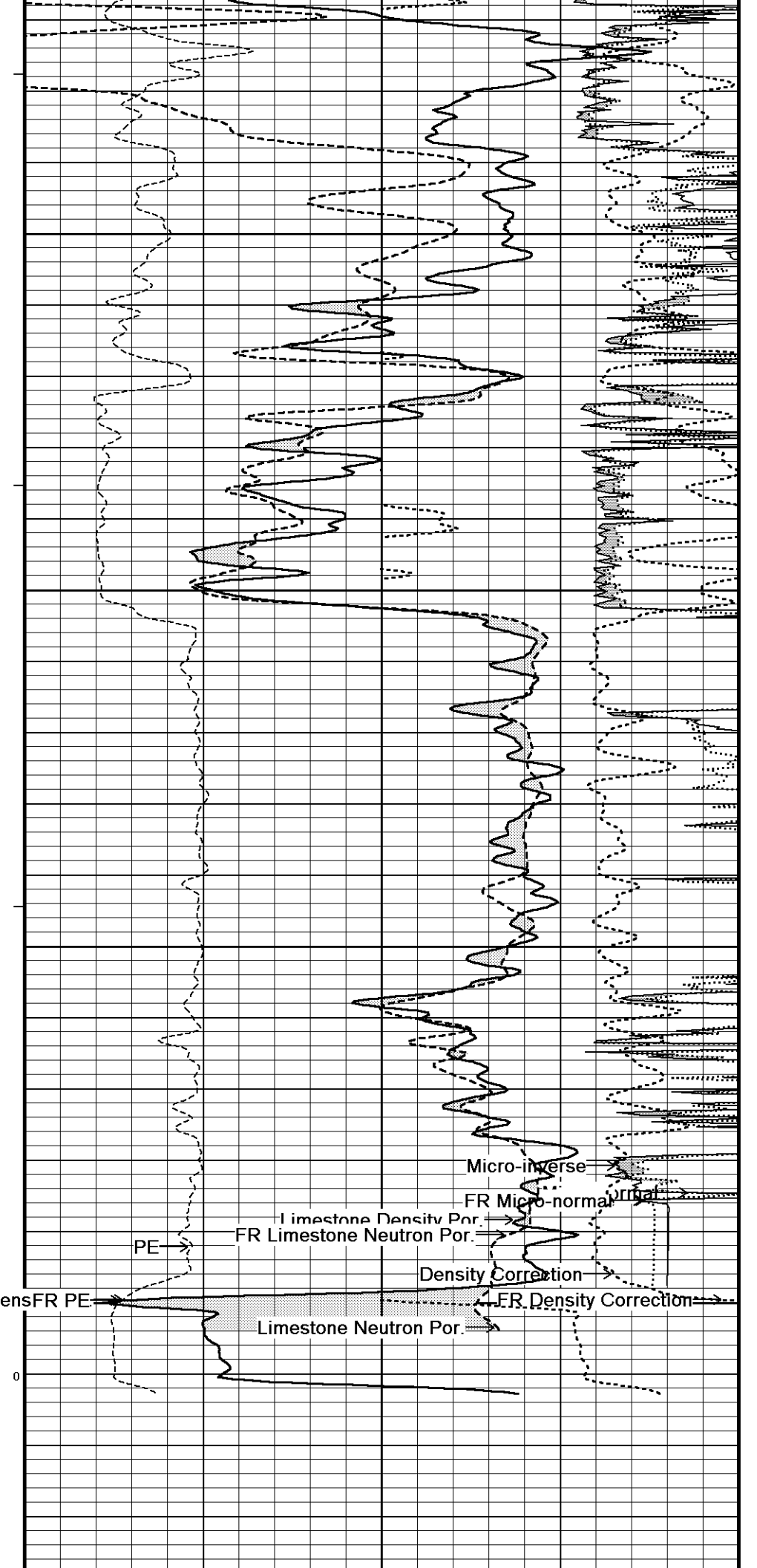
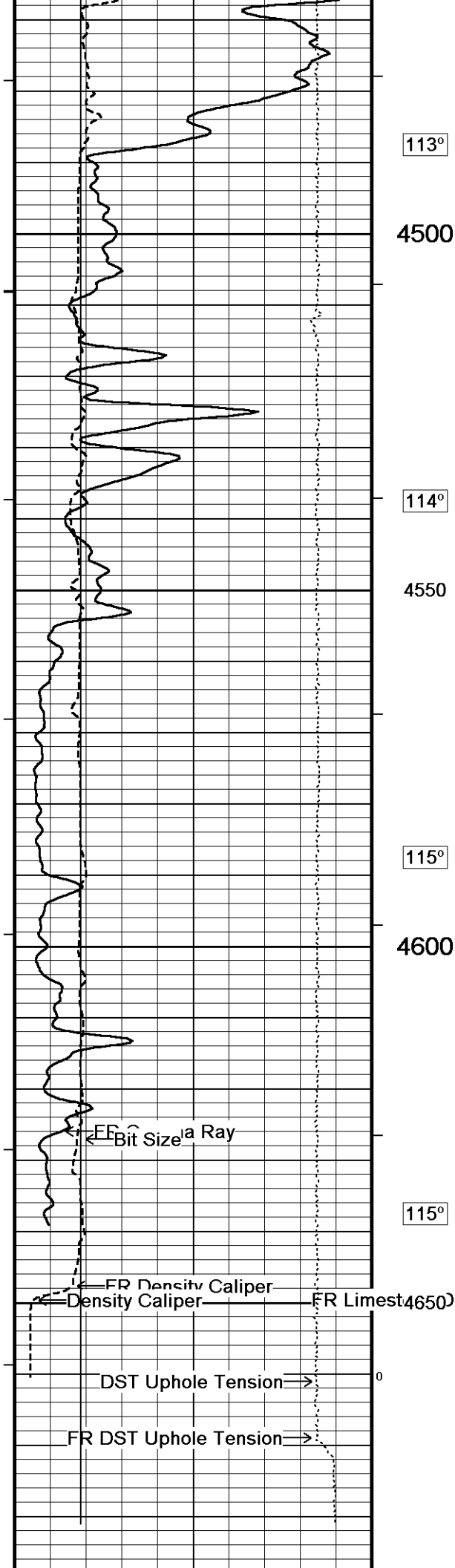
100

111°

4400

112°

4450



Bit Size
inches

6 11 16

DST Uphole Tension
pounds

5000 0

every
10 cu ft

Replay
Scale
1:240

Micro-normal
ohm metres

0 20

Micro-inverse
ohm metres

0 20

4350

100

110°

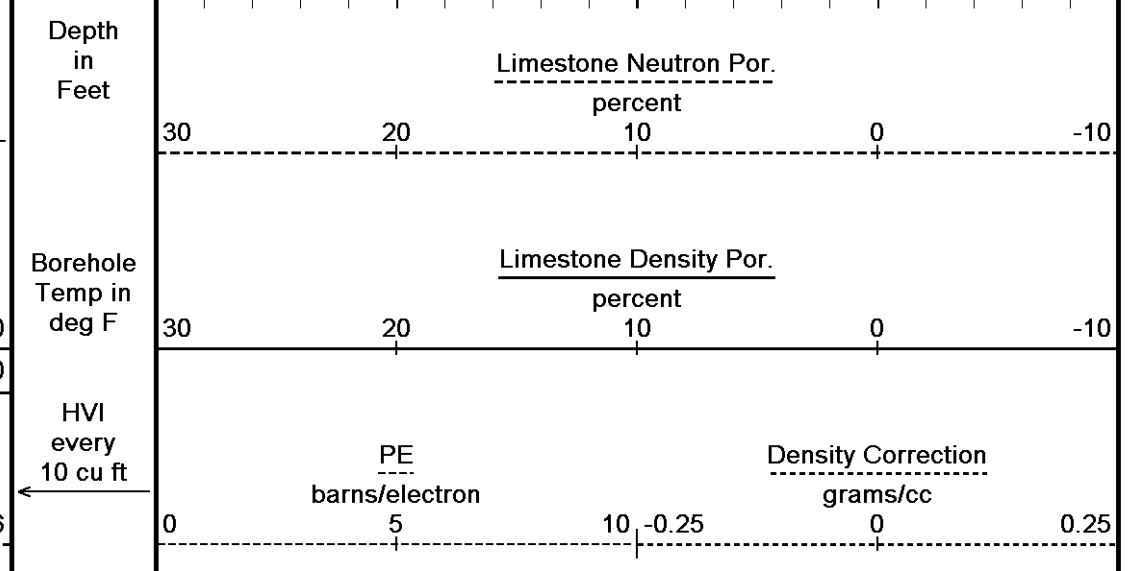
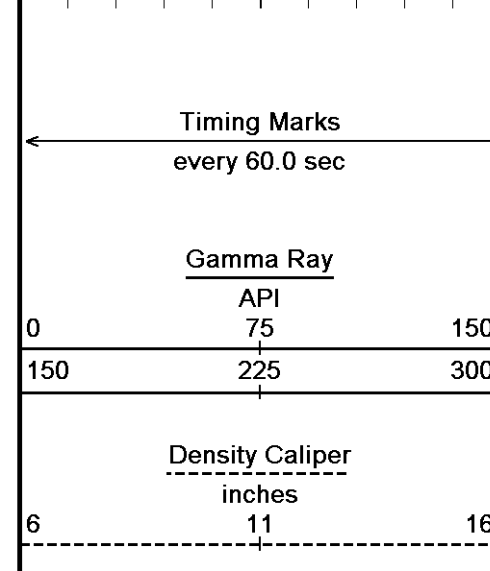
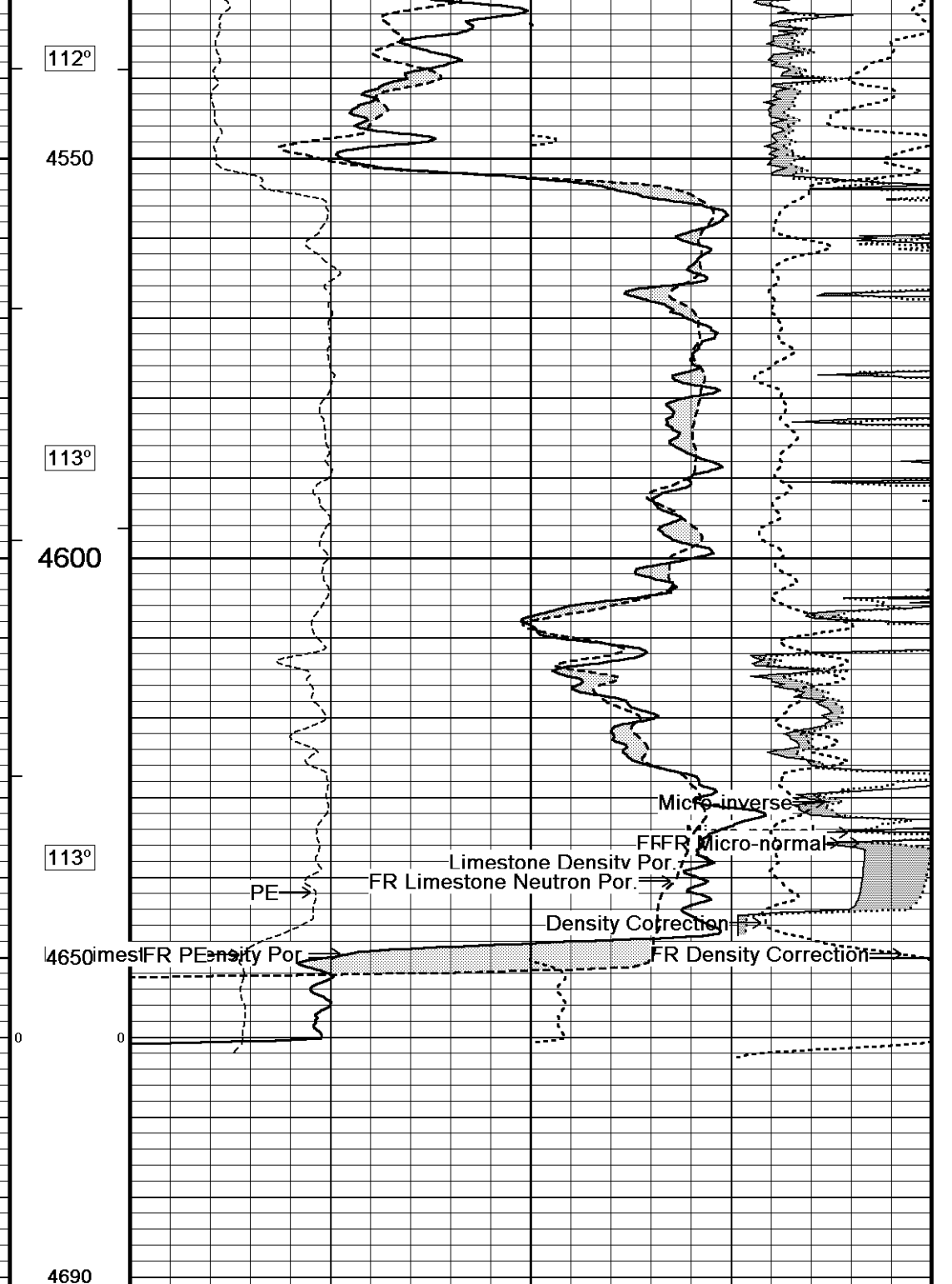
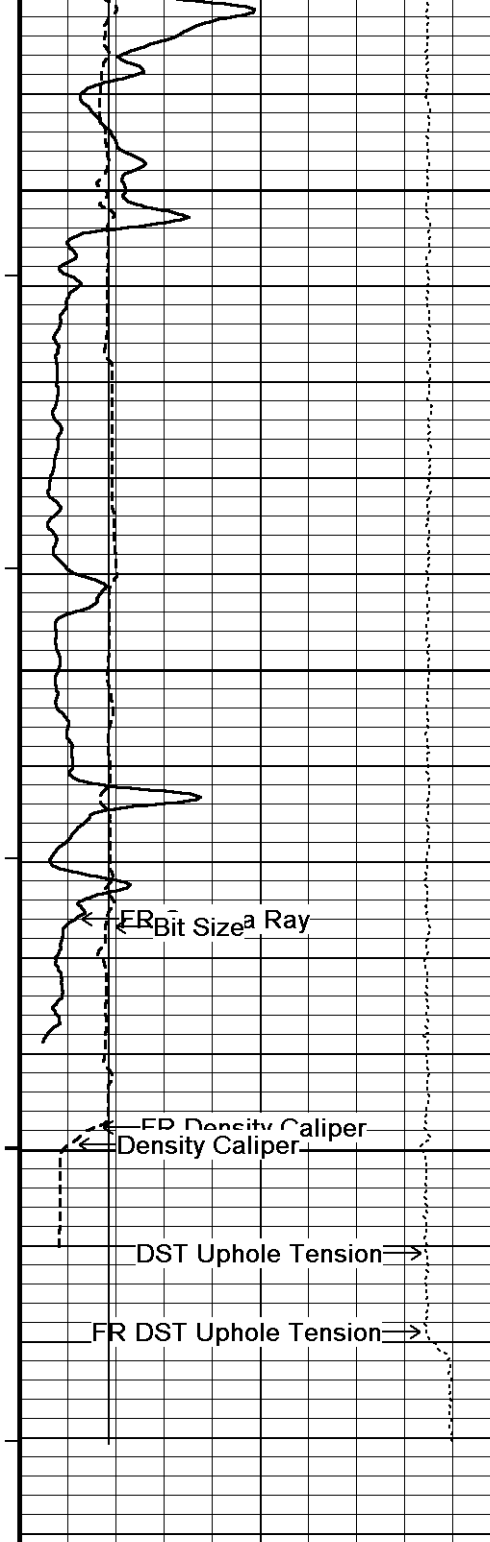
4400

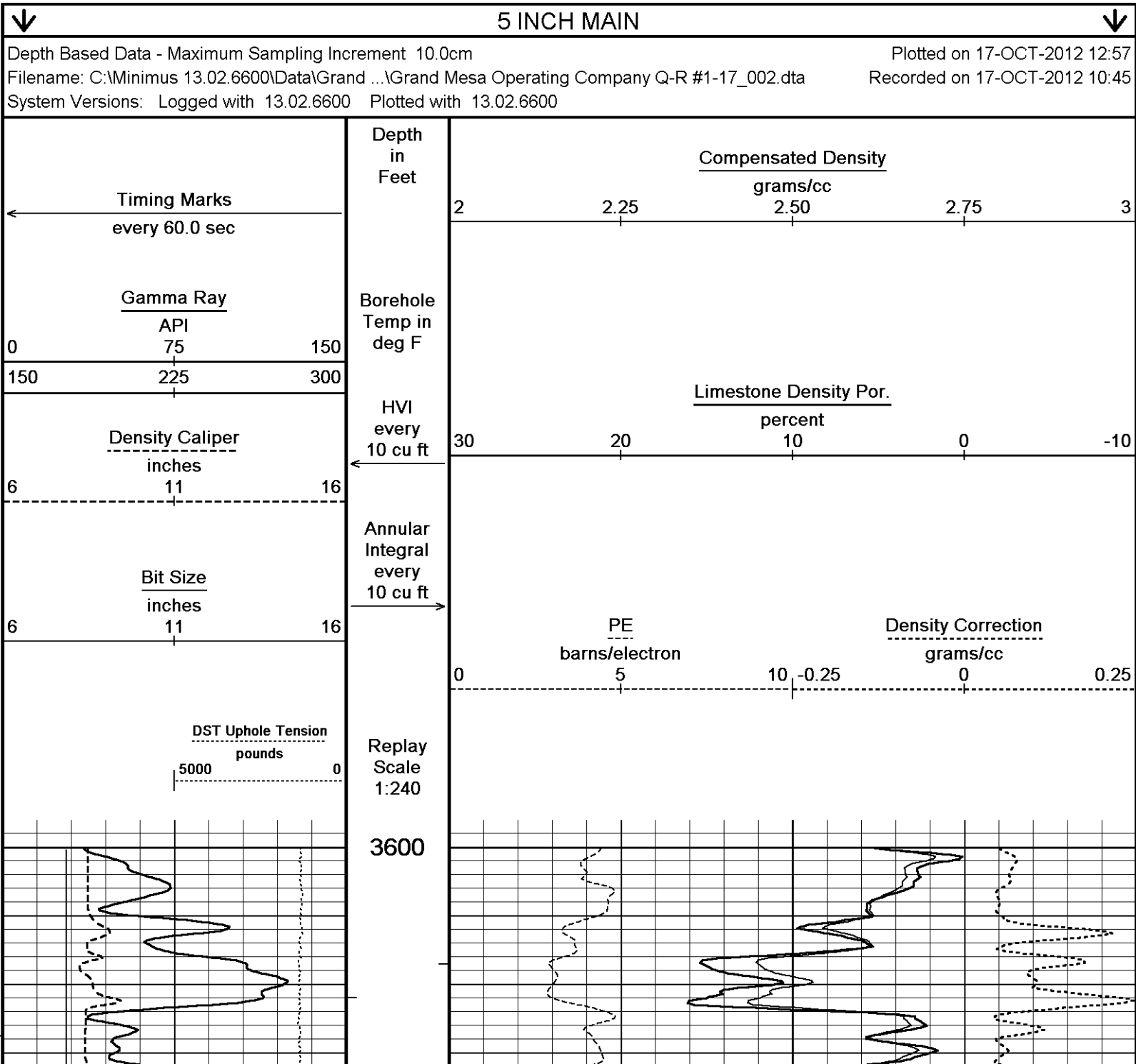
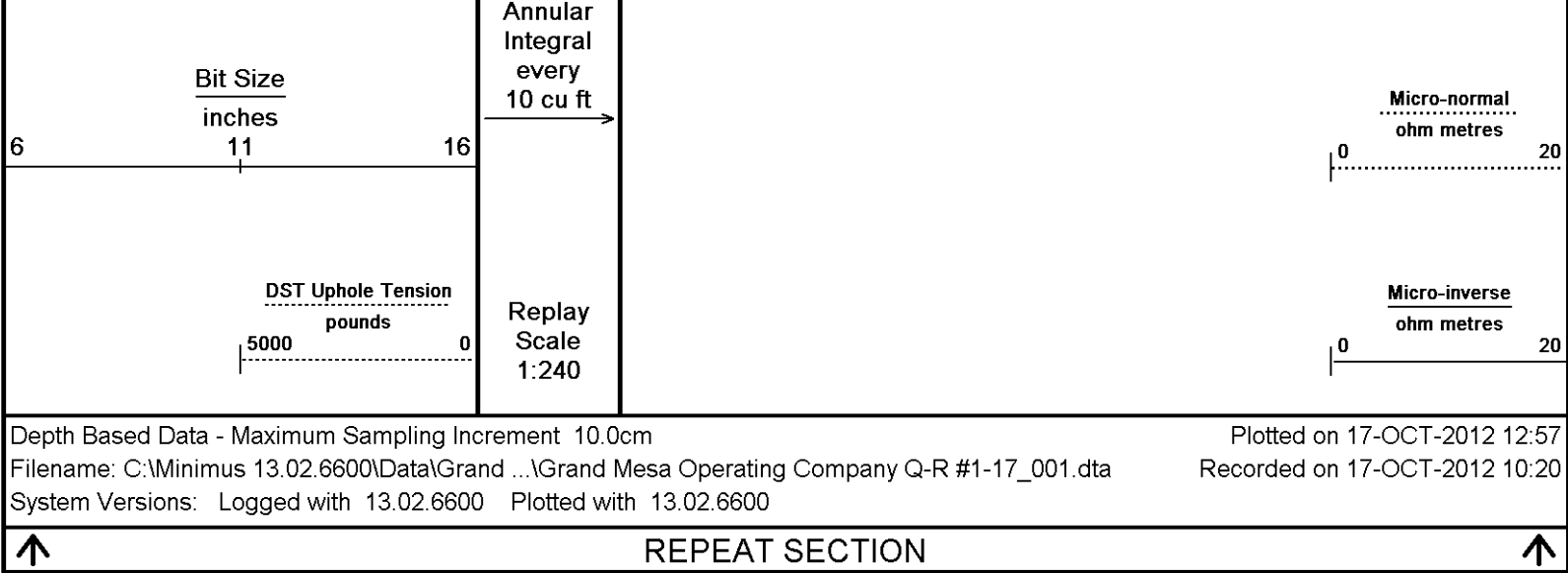
111°

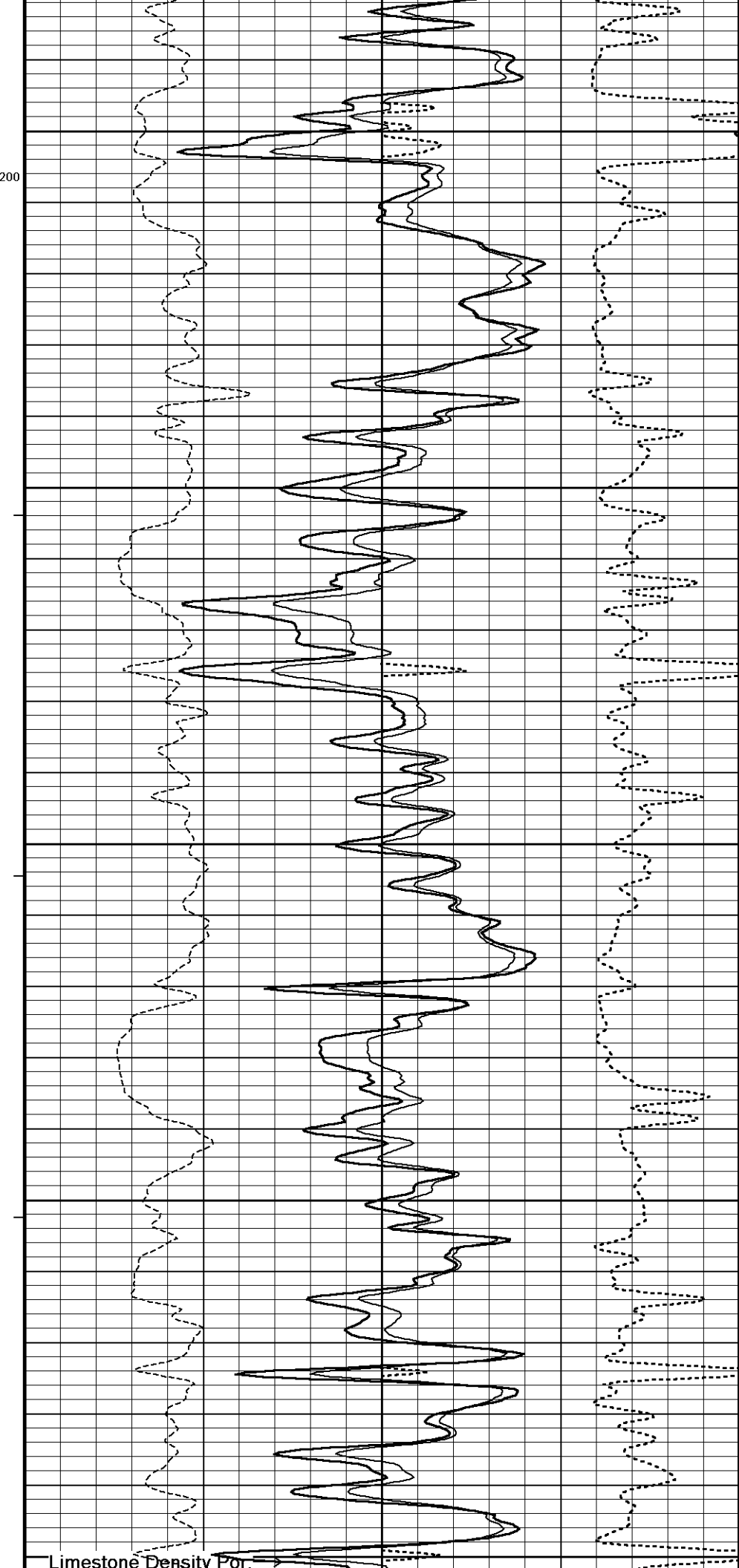
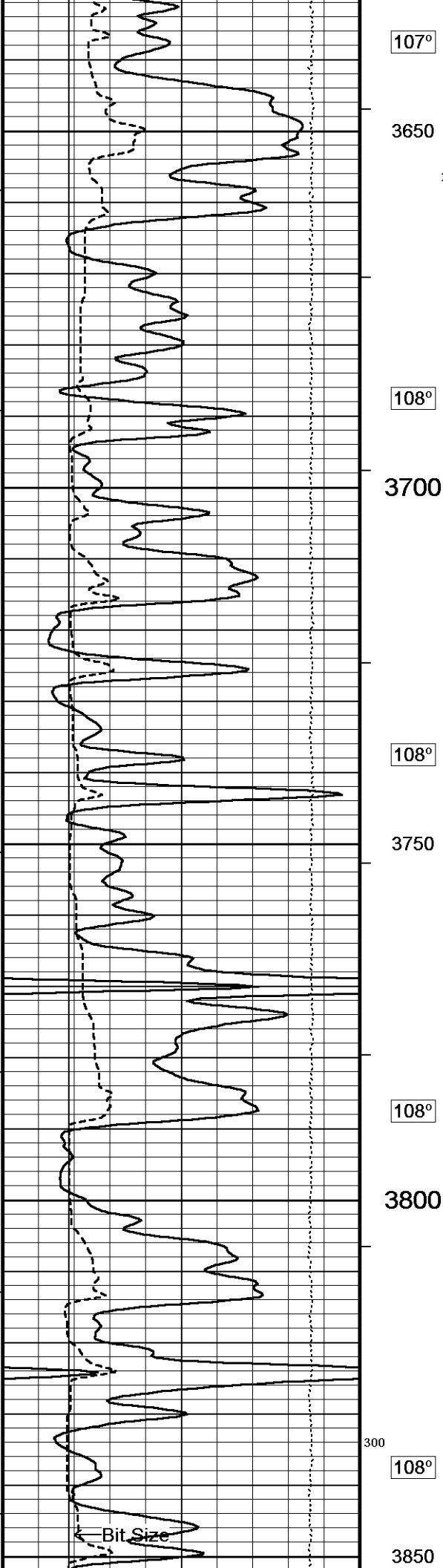
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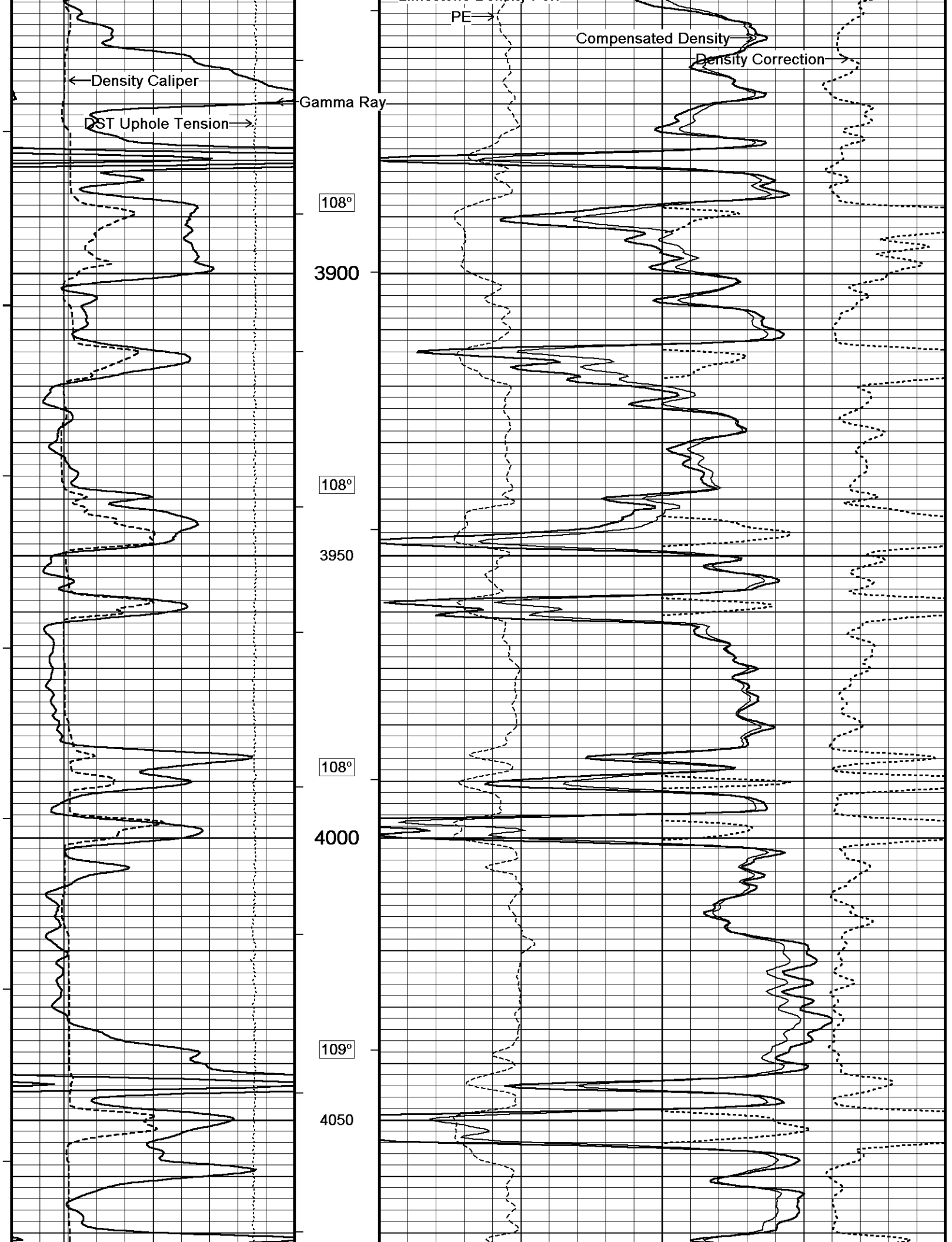
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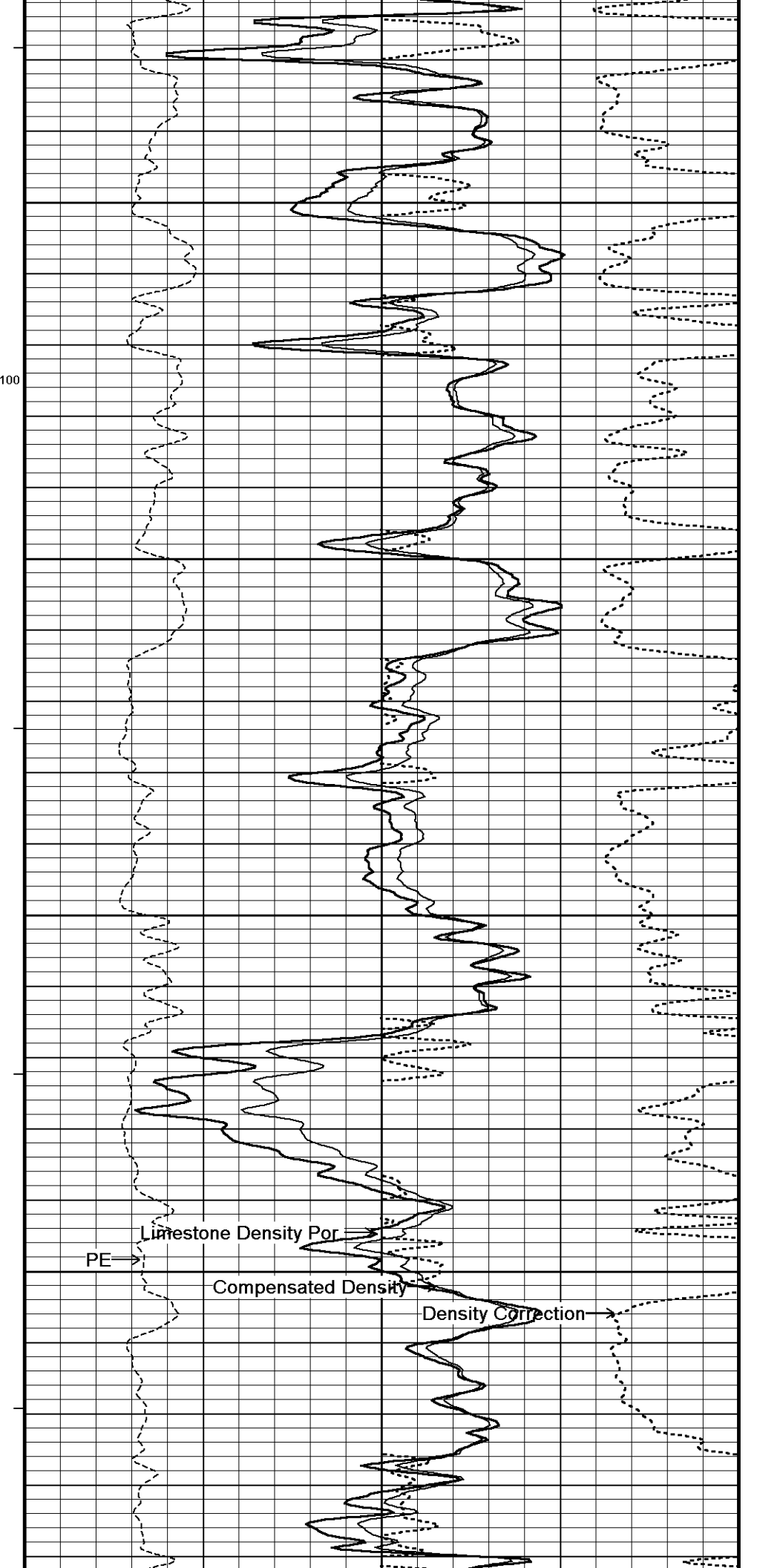
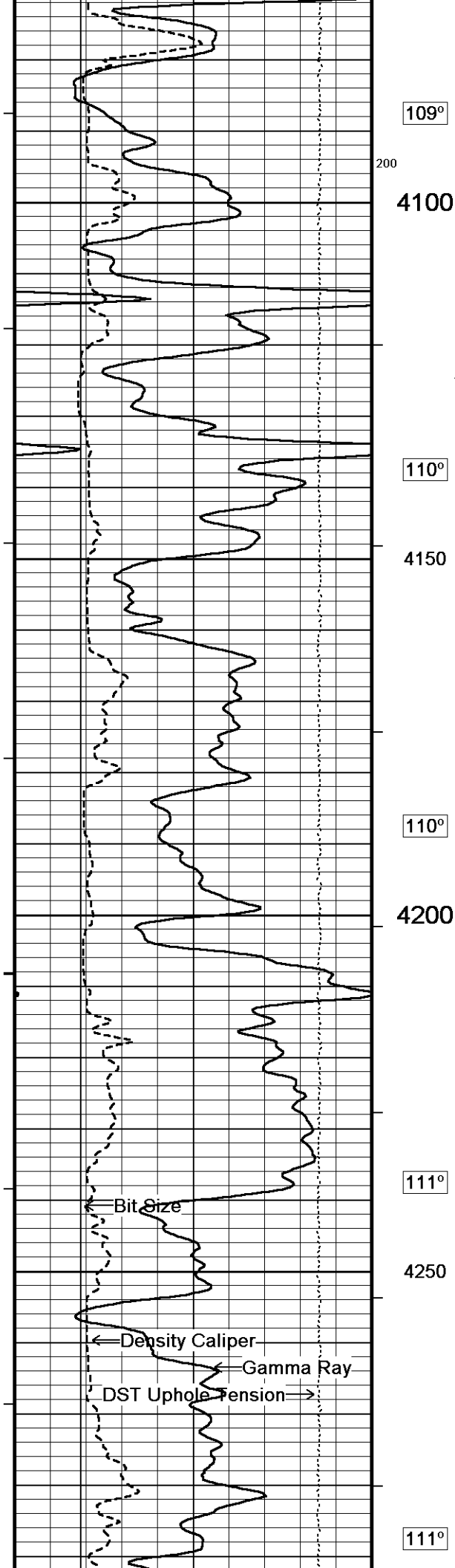
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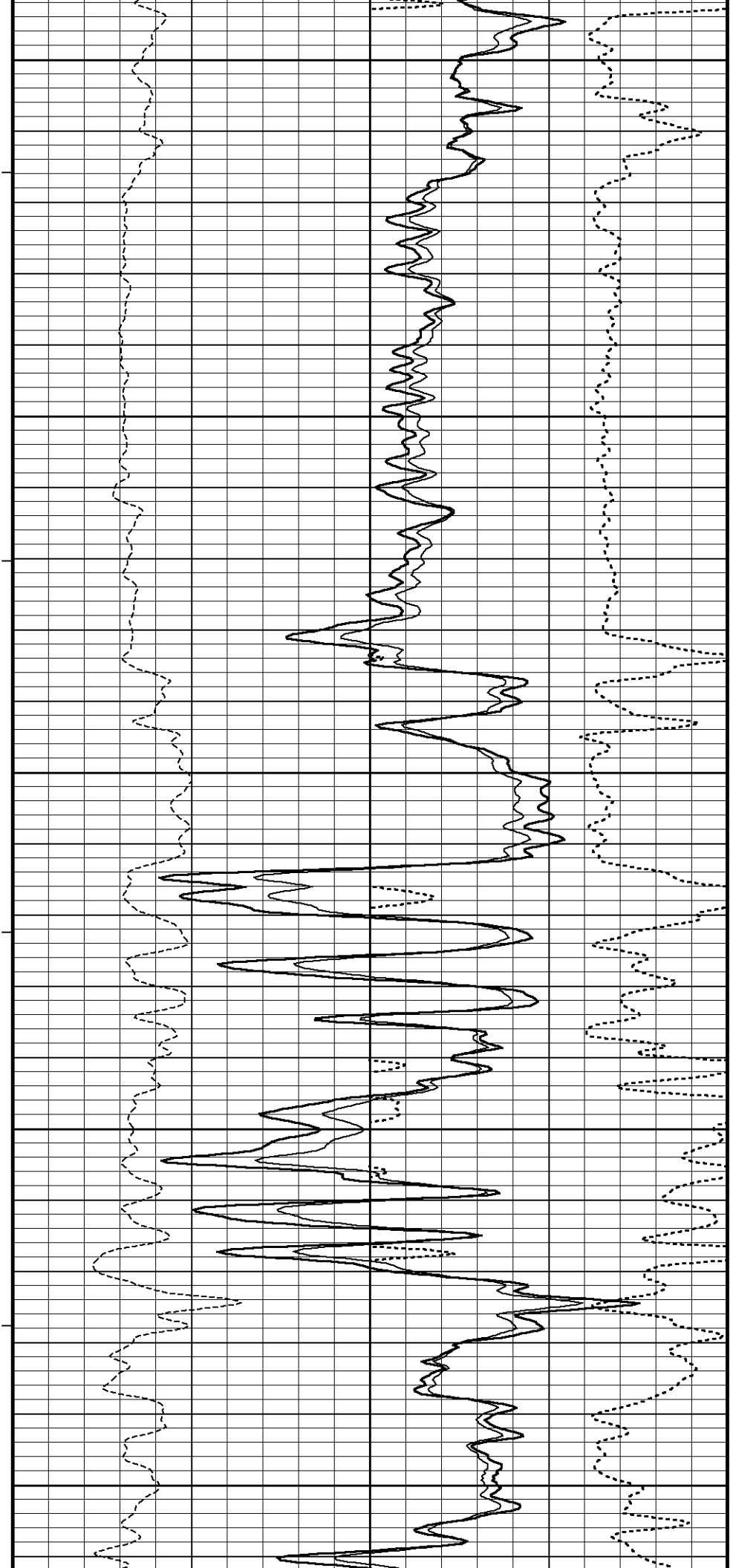
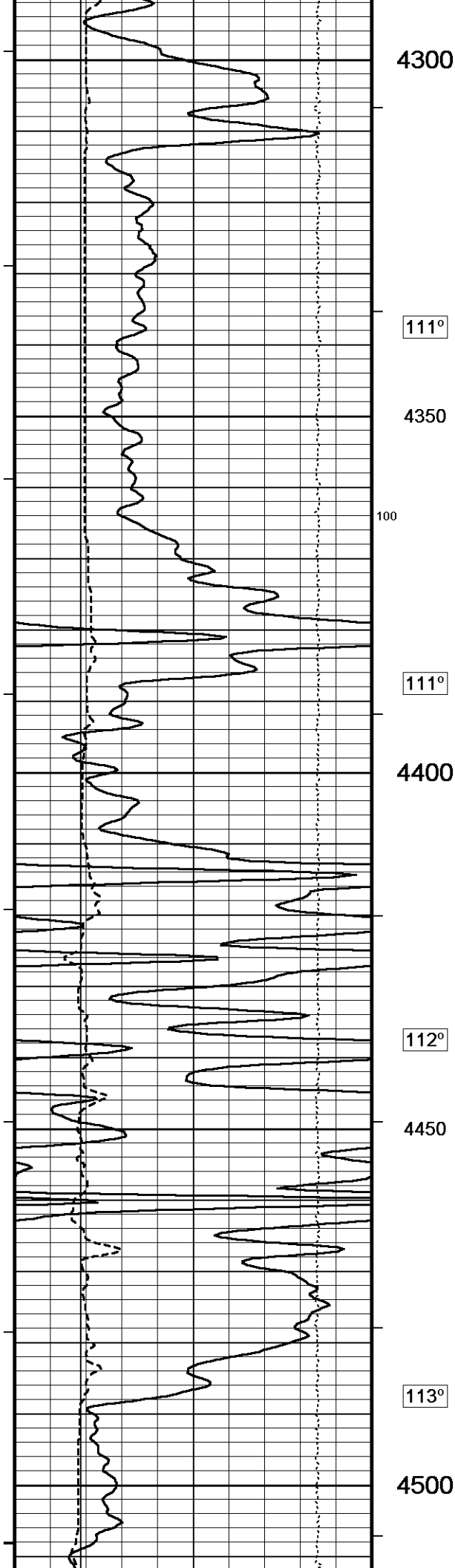


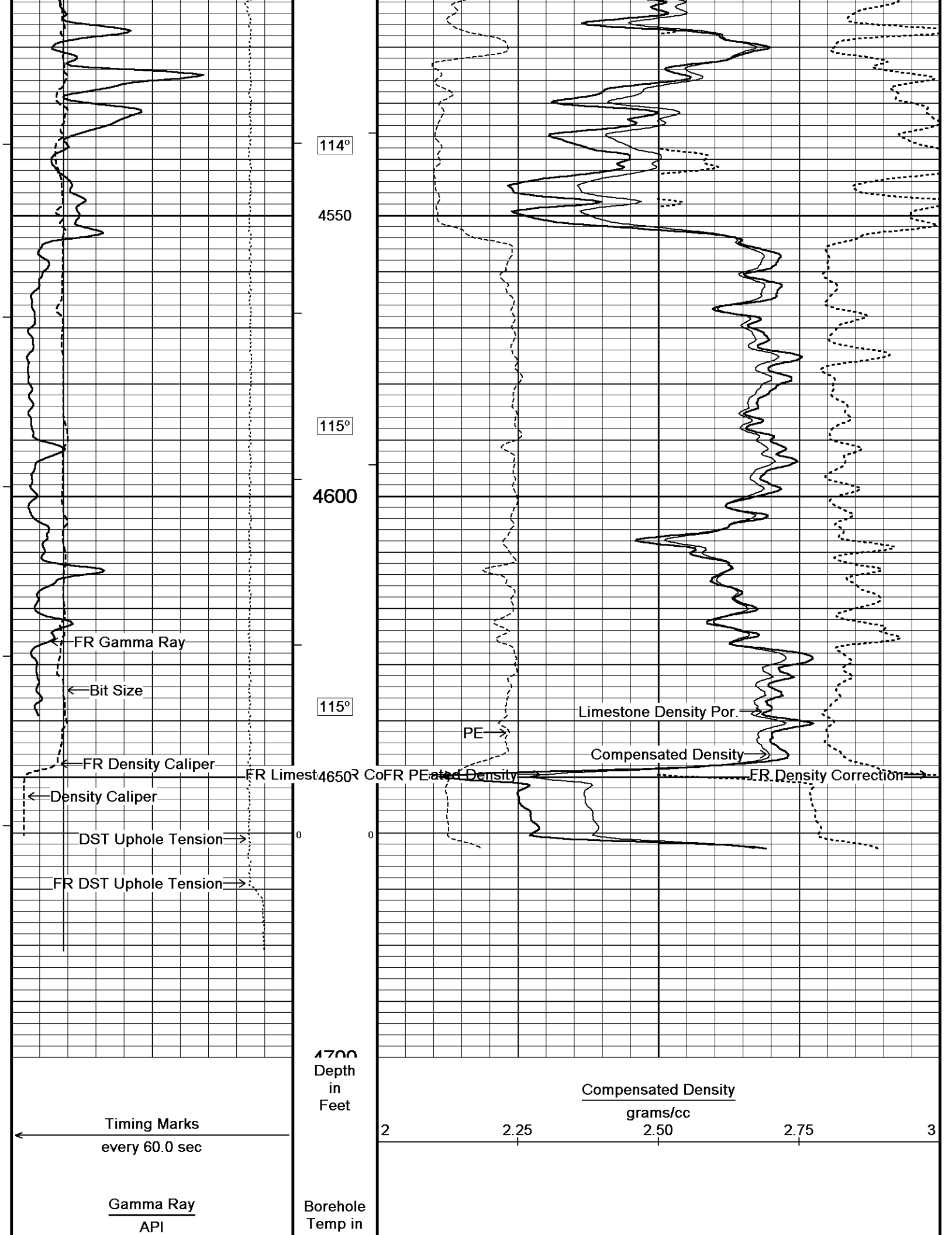


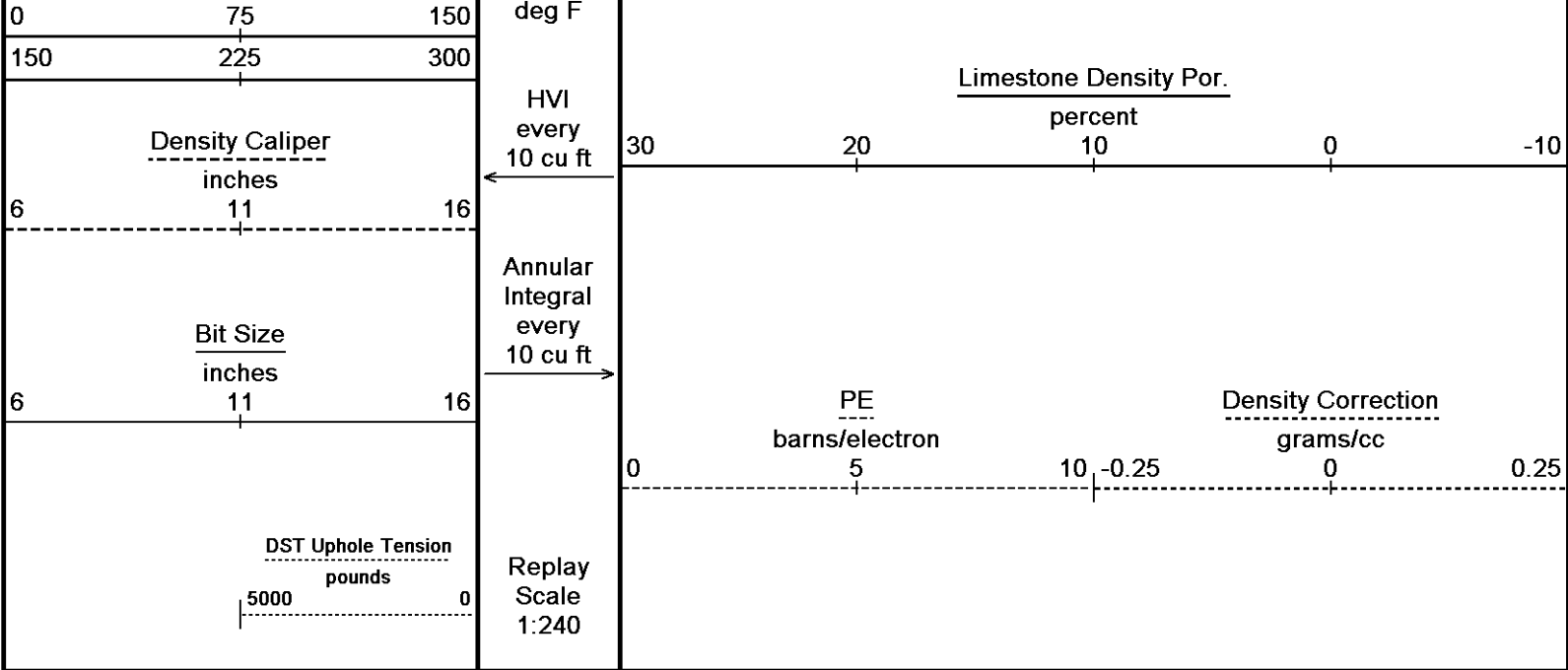










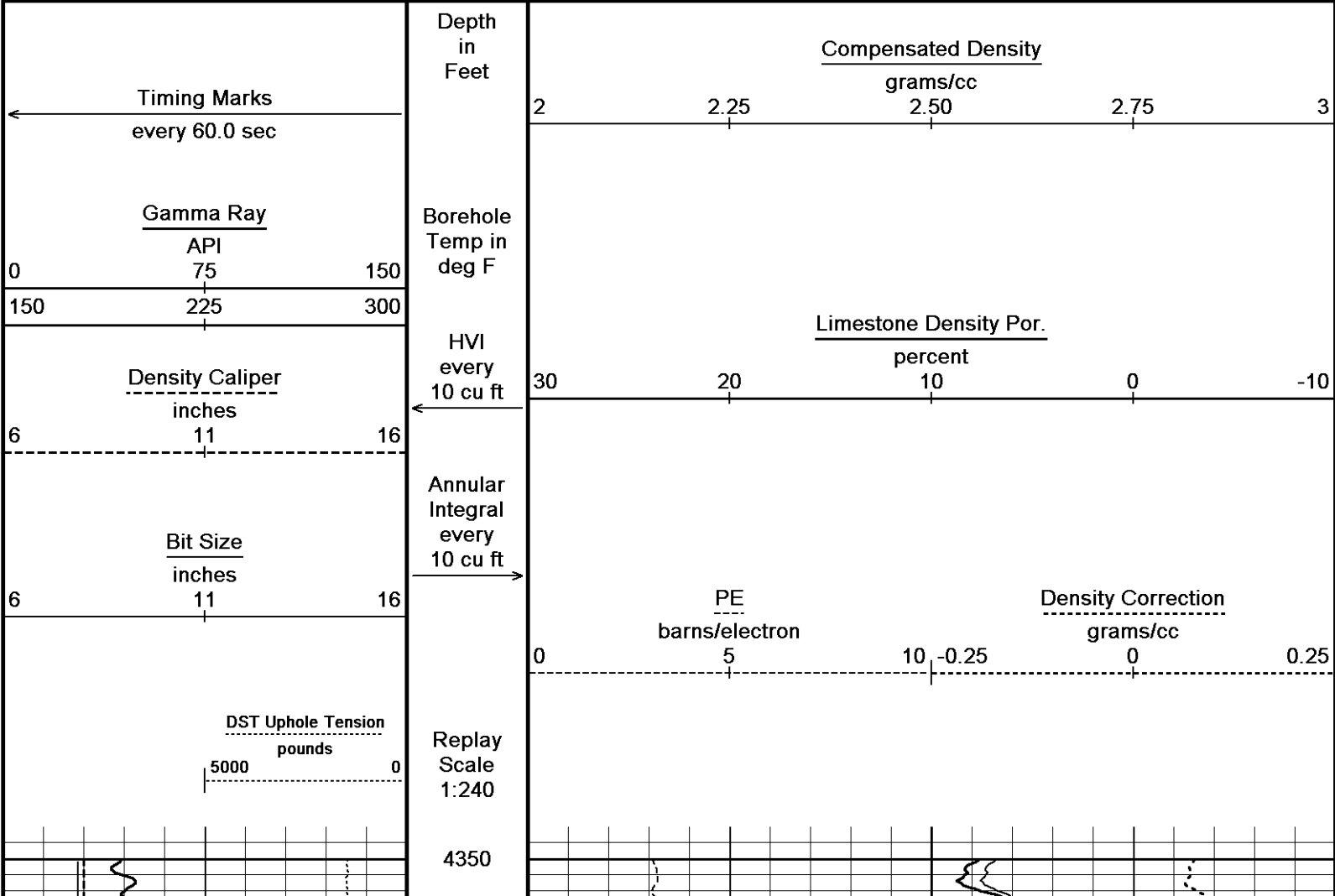


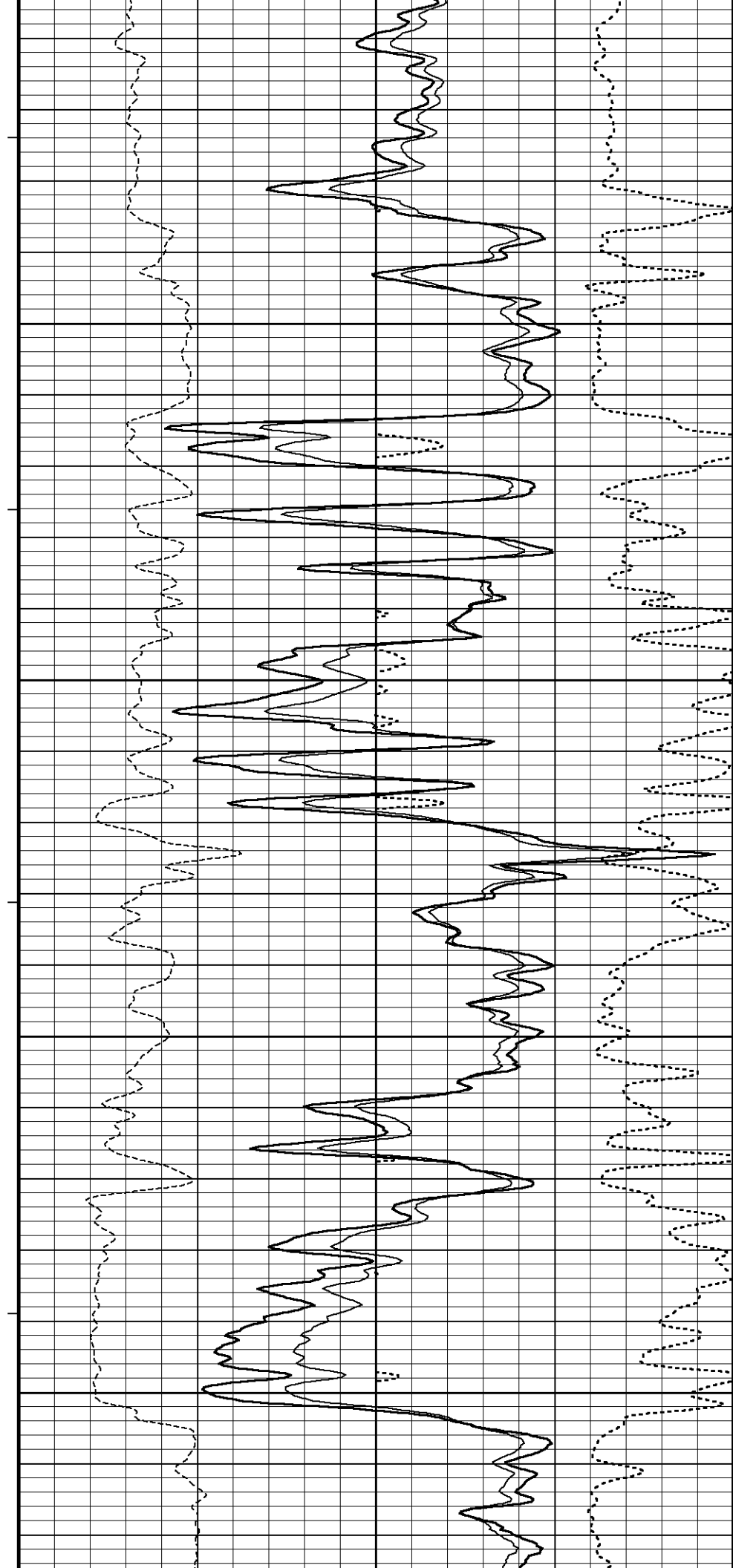
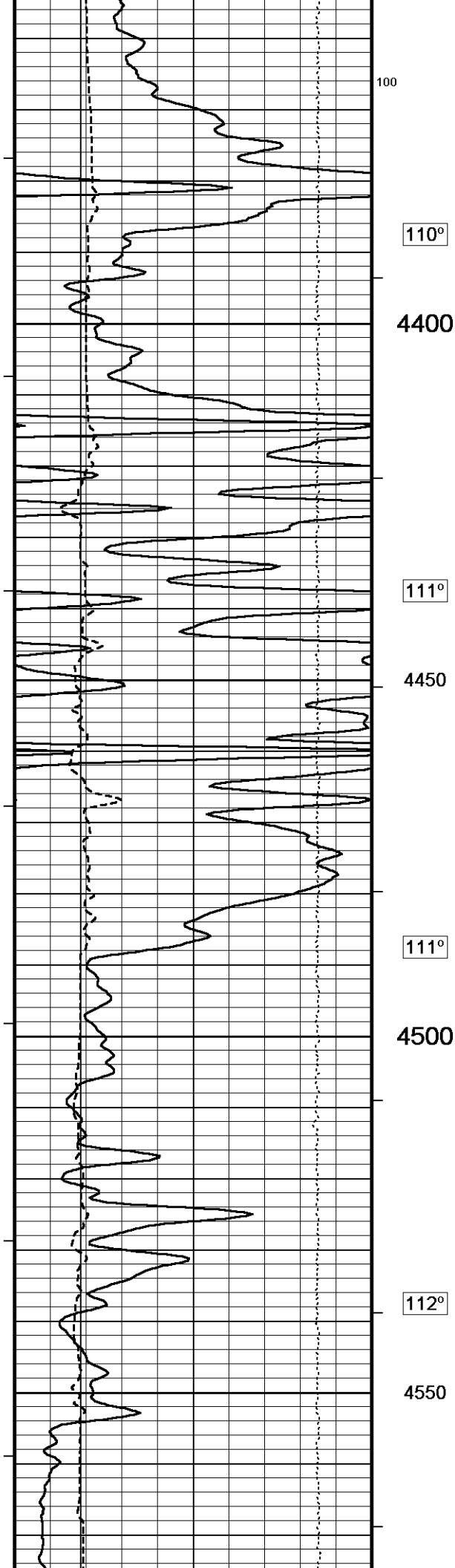
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.02.6600\Data\Grand ...Grand Mesa Operating Company Q-R #1-17_002.dta
System Versions: Logged with 13.02.6600 Plotted with 13.02.6600

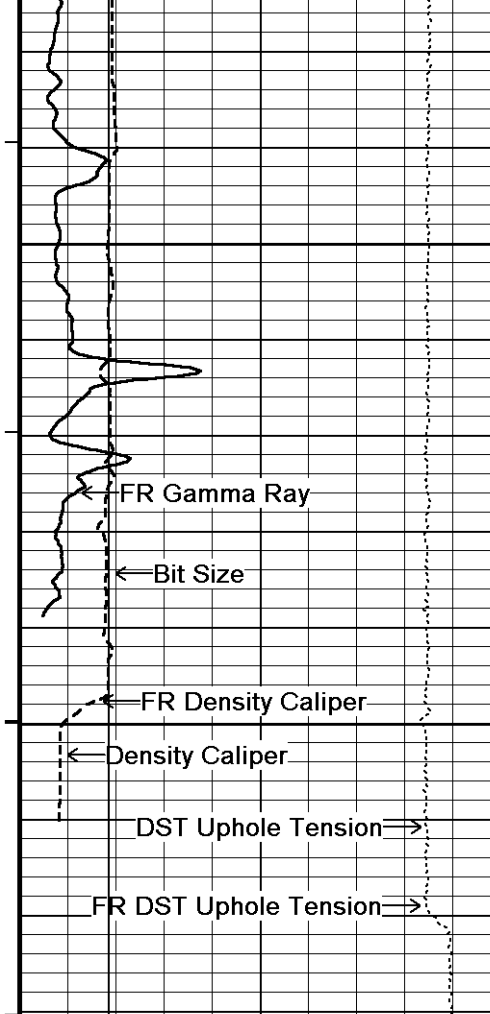
5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.02.6600\Data\Grand ...Grand Mesa Operating Company Q-R #1-17_001.dta
System Versions: Logged with 13.02.6600 Plotted with 13.02.6600







113°

4600

113°

4650

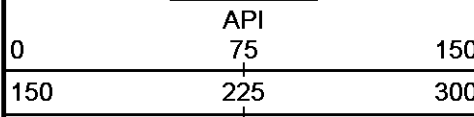
0

4690

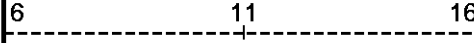
Depth
in
Feet

Timing Marks
every 60.0 sec

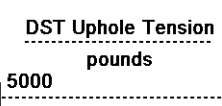
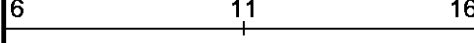
Gamma Ray



Density Caliper
inches



Bit Size
inches

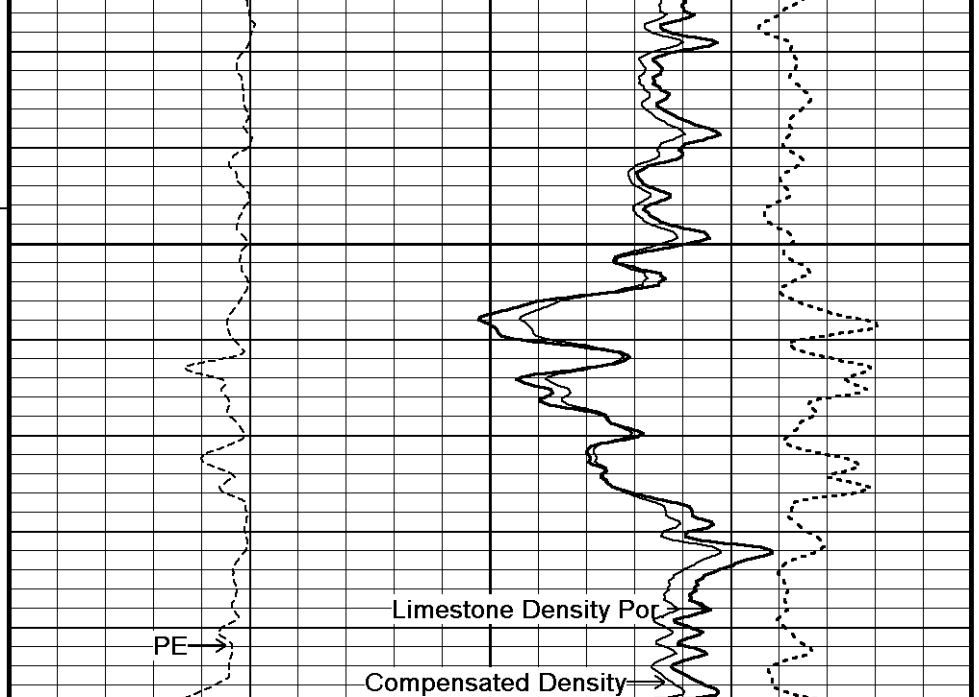


Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

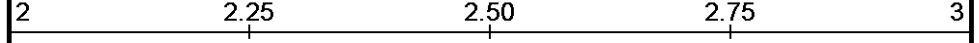
Replay
Scale
1:240



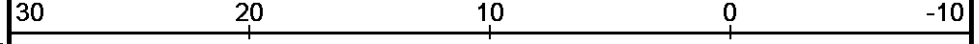
FR PE Compensated Density

0

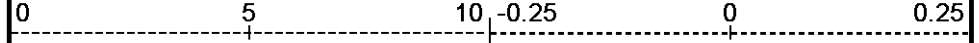
Compensated Density
grams/cc



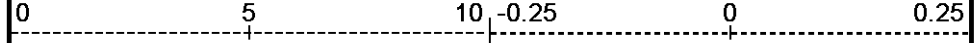
Limestone Density Por.
percent



PE
barns/electron



Density Correction
grams/cc





REPEAT SECTION



BEFORE SURVEY CALIBRATION

C:\Minimus 13.02.6600\Data\Grand Mesa Operating Q-R #17\Grand Mesa Operating Company Q-R #1-17_001.dta

General Constants All 000

Last Edited on 17-OCT-2012,08:05

General Parameters

Mud Resistivity	0.980	ohm-metres
Mud Resistivity Temperature	92.000	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	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

Down-hole Tension Calibration SMS 0

Field Calibration on 10-SEP-2012 04:28

Reading No	Measured	Calibrated (lbs)
1	15456.86	0.00
2	16071.78	384.00

Gamma Calibration MCG-D.K 442

Field Calibration on 14-OCT-2012 02:07

	Measured	Calibrated (API)
Background	69	46
Calibrator (Gross)	1152	771
Calibrator (Net)	1083	725

Gamma Constants MCG-D.K 442

Last Edited on 14-OCT-2012,08:31

Gamma Calibrator Number	GRC38	
Mud Density	1.12	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG-D.K 442

Field Calibration on 17-JUL-2012 16:34

	Measured	Calibrated (mV)
Reference 1	100.2	100.0
Reference 2	-99.9	-100.0

High Resolution Temperature Calibration MCG-D.K 442

Field Calibration on 17-JUL-2012,16:35

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

High Resolution Temperature Constants MCG-D.K 442

Last Edited on

Pre-filter Length	11
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Caliper Calibration MML-A 16

Base Calibration on 30-SEP-2012 19:38

Field Calibration on 14-OCT-2012 02:01

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13888	5.98

2	16946	7.97
3	20169	9.86
4	23996	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.03	5.98

Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 30-SEP-2012 19:42
Field Check on 14-OCT-2012 02:02

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.2	5.0	25.0
Micro Inverse	15.6	78.4	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	62.9	62.9
Micro Inverse	48.2	48.2

Micro Normal and Micro Inverse Constants MML-A 16

Last Edited on 17-OCT-2012,08:04

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 10-OCT-2012 14:12
Field Check on 14-OCT-2012 02:13

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
Ratio	3058	95	3714	110
	32.033		33.764	

Field Calibrator at Base

	Calibrated (cps)
Ratio	1673 2395
	0.698

Field Check

	Calibrated (cps)
Ratio	1678 2400
	0.699

Neutron Constants MDN-A.B 66

Last Edited on 17-OCT-2012,08:04

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 01-OCT-2012 09:16
Field Check on 14-OCT-2012 01:52

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	965.2	126.8

Base Check				280.7	
Field Check				280.9	
FE Constants MFE-B.J 353					Last Edited on 17-OCT-2012,08:03
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 17-JUL-2012,13:53
	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 17-JUL-2012,13:49
Pre-filter Length	11				
Induction Calibration MAI-A.A 167					Base Calibration on 17-JUL-2012,13:55 Field Check on 14-OCT-2012 01:51
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	12.3	3841.0	
2	0.0	0.0	29.3	3478.5	
3	0.0	0.0	28.9	3054.3	
4	0.0	0.0	19.7	2082.6	
Deep	0.0	0.0	18.5	2049.7	
Medium	0.0	0.0	42.1	3992.9	
Shallow	0.0	0.0	42.5	5056.6	
Array Temperature	0.0		64.3	Deg F	
Induction Constants MAI-A.A 167					Last Edited on 17-OCT-2012,08:03
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 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 64

Base Calibration on 10-OCT-2012 12:35
Field Calibration on 14-OCT-2012 01:53

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	12128	3.99
2	20753	5.98
3	29254	7.97
4	37705	9.86
5	46896	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.95	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 10-OCT-2012 12:54
Field Check on 14-OCT-2012 02:00

Density Calibration

Base Calibration

	Near	Measured Far	Calibrated (sdu) Near	Far
Reference 1	58951	32645	59556	30836
Reference 2	24760	2893	24941	2541

Field Check at Base

1181.6 1375.1

Field Check

1187.9 1371.9

PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	215	1053		
Reference 1	22216	58751	0.381	0.371
Reference 2	6718	24623	0.276	0.272

Field Check at Base

215.0 1052.6

Field Check

215.0 1059.8

Density Constants MPD-B 64

Last Edited on 14-OCT-2012,08:30

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	1.12	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

CRCI	0.00
Density Z/A Correction	Hybrid
Matrix Density (gm/cc)	Depth (ft)
2.87	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 13.02.6600\Data\Grand Mesa Operating Q-R #17\Grand Mesa Operating Company Q-R #1-17_001.dta

Compact Comms Gamma
MCG-D.K 442 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

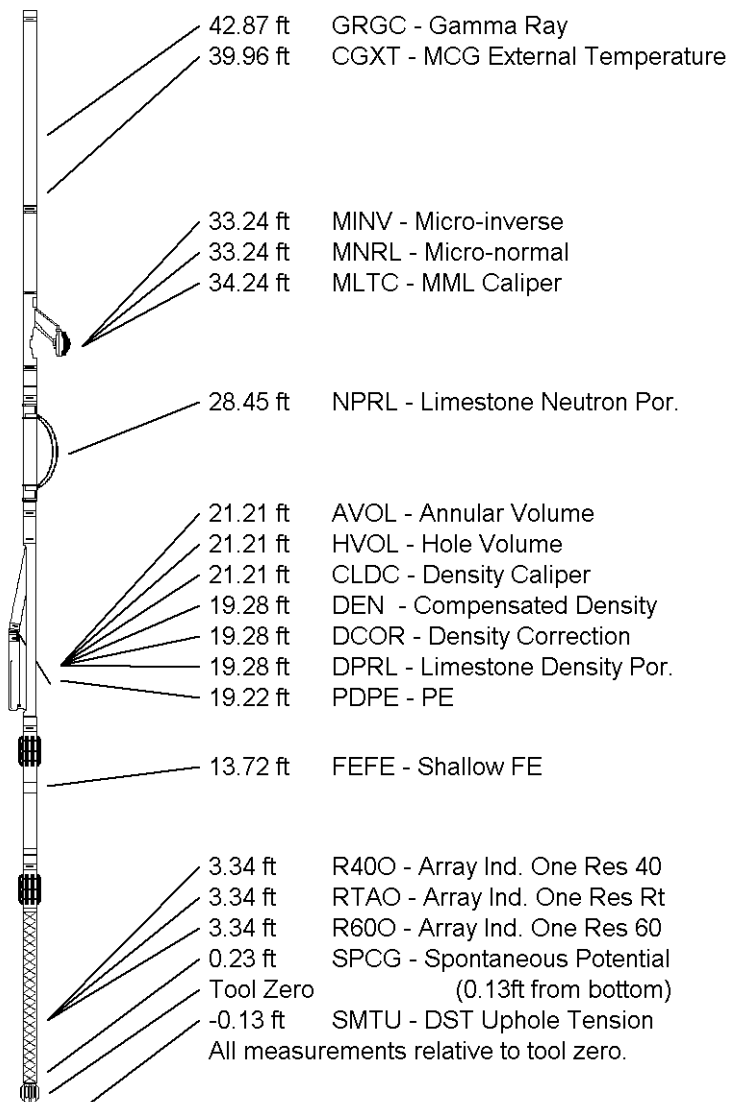
Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

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

Total Length: 48.16 ft Weight: 383.6 lb



COMPANY	GRAND MESA OPERATING COMPANY
WELL	Q-R #1-17
FIELD	Q-B
PROVINCE/COUNTY	GOVE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2652.00	feet	First Reading	4649.00	feet
Elevation Drill Floor	2651.00	feet	Depth Driller	4669.00	feet
Elevation Ground Level	2647.00	feet	Depth Logger	4669.00	feet



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COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG