



Weatherford®

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

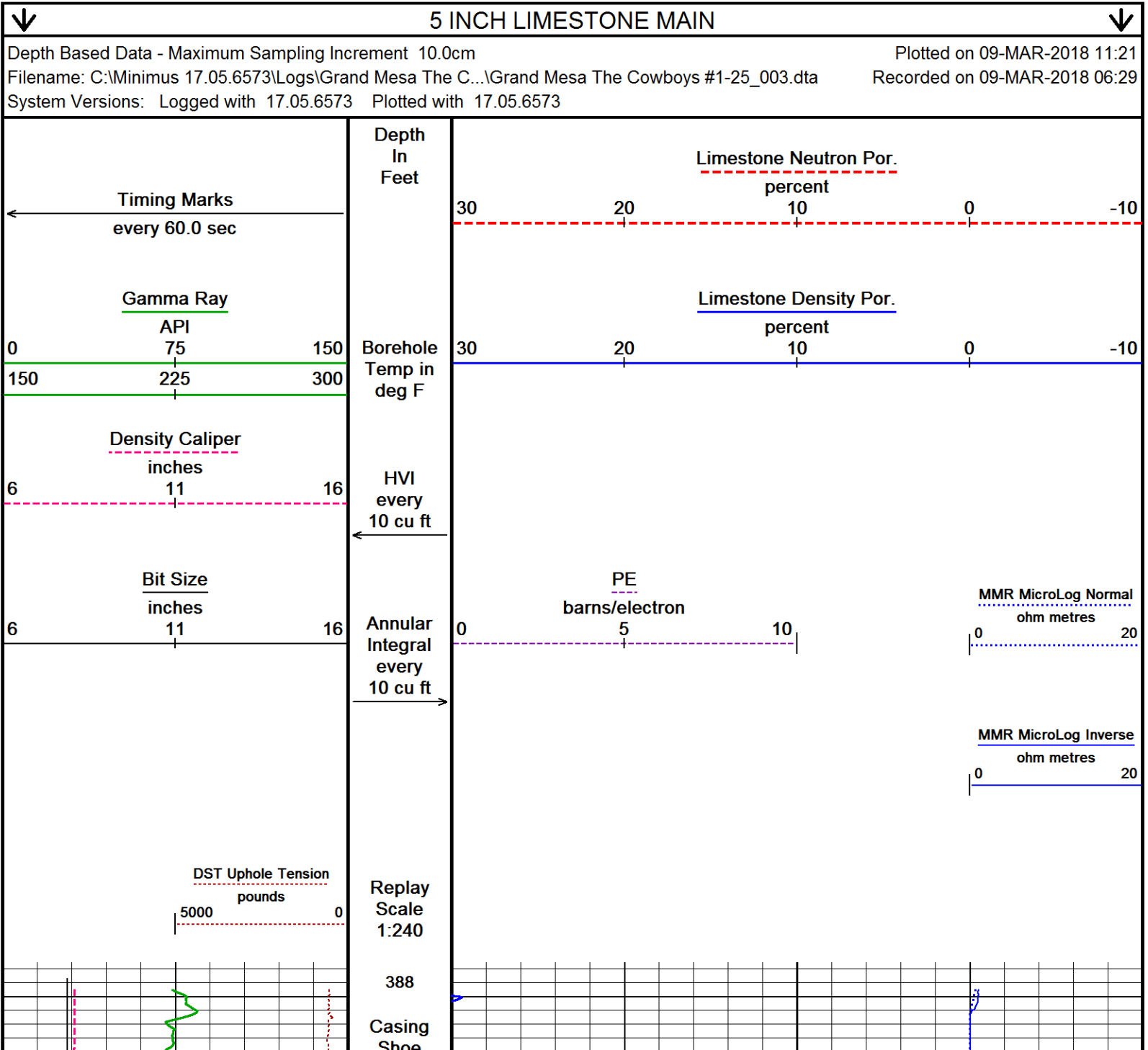
COMPANY				GRAND MESA OPERATING COMPANY			
WELL				THE COWBOYS #1-25			
FIELD				WILDCAT			
PROVINCE/COUNTY				WASHINGTON			
COUNTRY/STATE				U.S.A. / COLORADO			
LOCATION				1328' FNL & 1891' FEL			
SEC 25	TWP 5S	RGE 54W	Other Services		MSS		
Latitude		MAI/MFE					
Longitude							
API Number		05-121-11072					
Permanent Datum GL, Elevation 5150 feet				Elevations: KB 5169.00 DF 5167.00 GL 5150.00			
Log Measured From KB, 19.00 feet above Permanent Datum							
Drilling Measured From KB							
Date	09-MAR-2018						
Run Number	ONE						
Service Order	4558-207732749						
Depth Driller	7545.00			feet			
Depth Logger	7546.00			feet			
First Reading	7512.00			feet			
Last Reading	399.00			feet			
Casing Driller	399.00			feet			
Casing Logger	399.00			feet			
Bit Size	7.875			inches			
Hole Fluid Type	CHEMICAL						
Density / Viscosity	9.20 lb/USg		87.00 CP				
PH / Fluid Loss	10.50		5.60 ml/30Min				
Sample Source	FLOWLINE						
Rm @ Measured Temp	1.09 @ 75.0			ohm-m			
Rmf @ Measured Temp	0.87 @ 75.0			ohm-m			
Rmc @ Measured Temp	1.31 @ 75.0			ohm-m			
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	0.49 @168.0			ohm-m			
Time Since Circulation	5 HOURS						
Max Recorded Temp	168.00			deg F			
Equipment / Base	13244		LIB				
Recorded By	ADAM SILL						
Witnessed By	KENT MATSON						

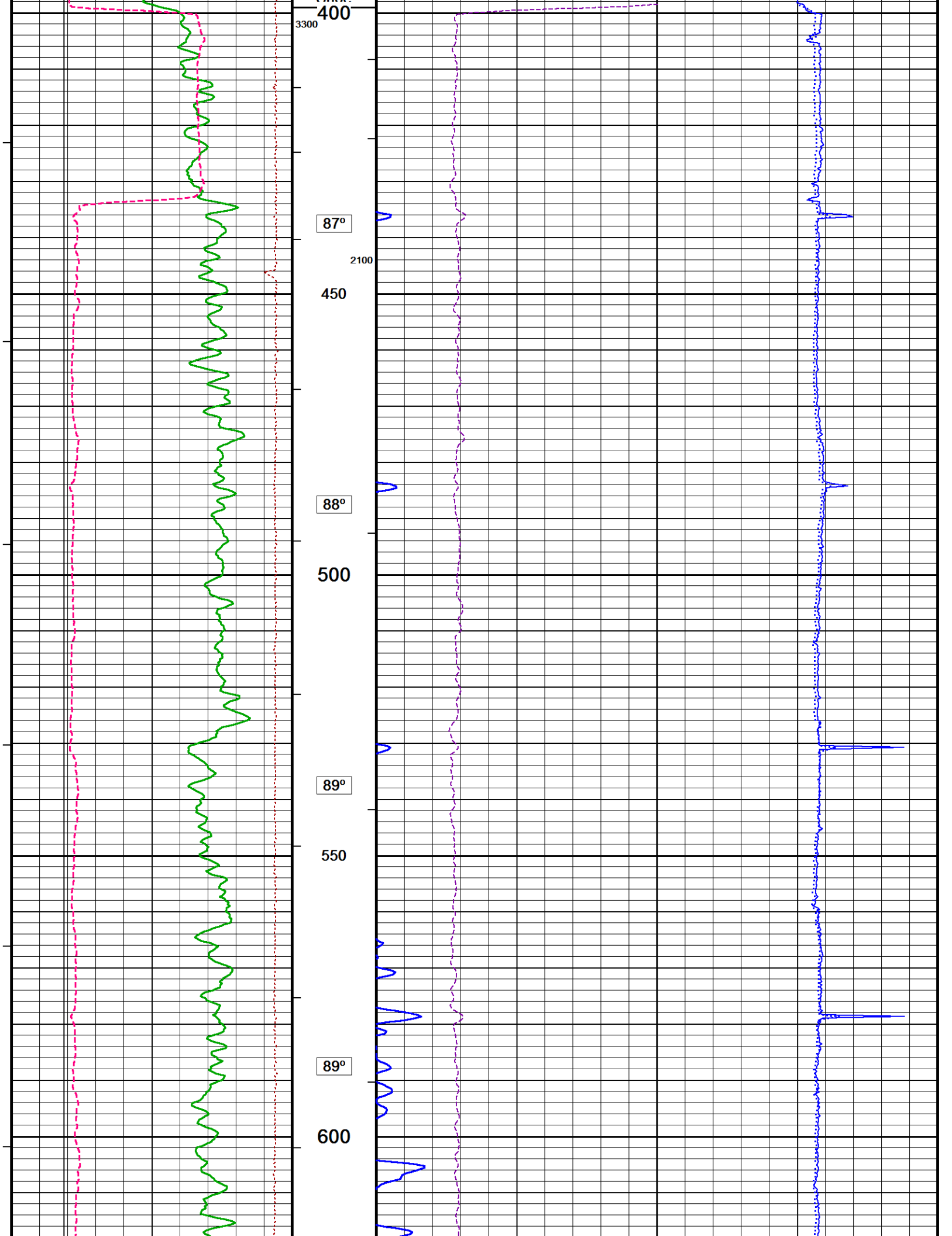
BOREHOLE RECORD					Last Edited: 09-MAR-2018 03:05
Bit Size inches		Depth From feet		Depth To feet	
7.875		399.00		7545.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	399.00	24.00	

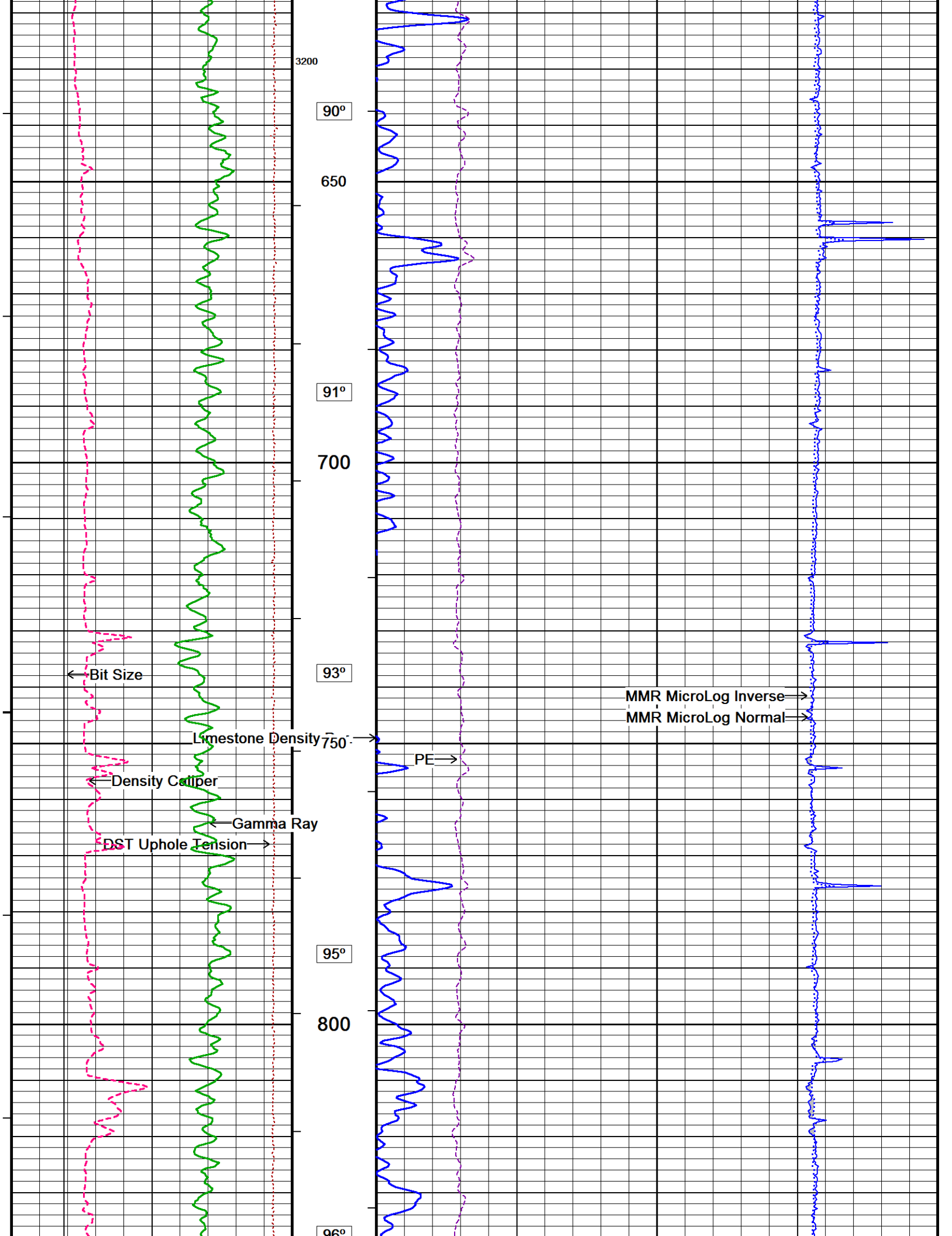
REMARKS
- SOFTWARE ISSUE: WLS 17.05.6573.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- 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: 3301 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 2123 CU.FT.

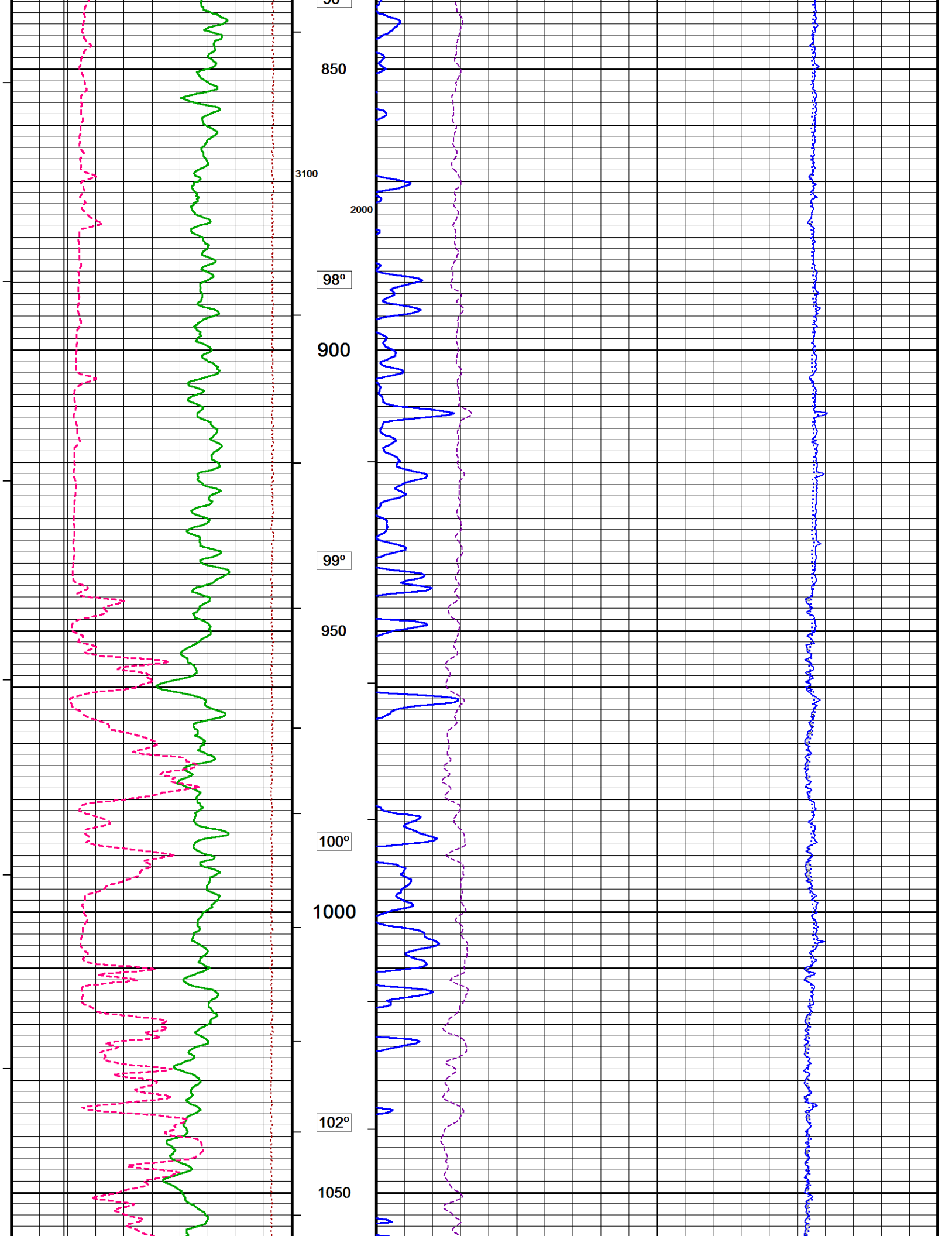
- RIG: WW DRILLING #20.
- ENGINEER: A. SILL.
- OPERATOR: B. TOVAR, C. BAKER.

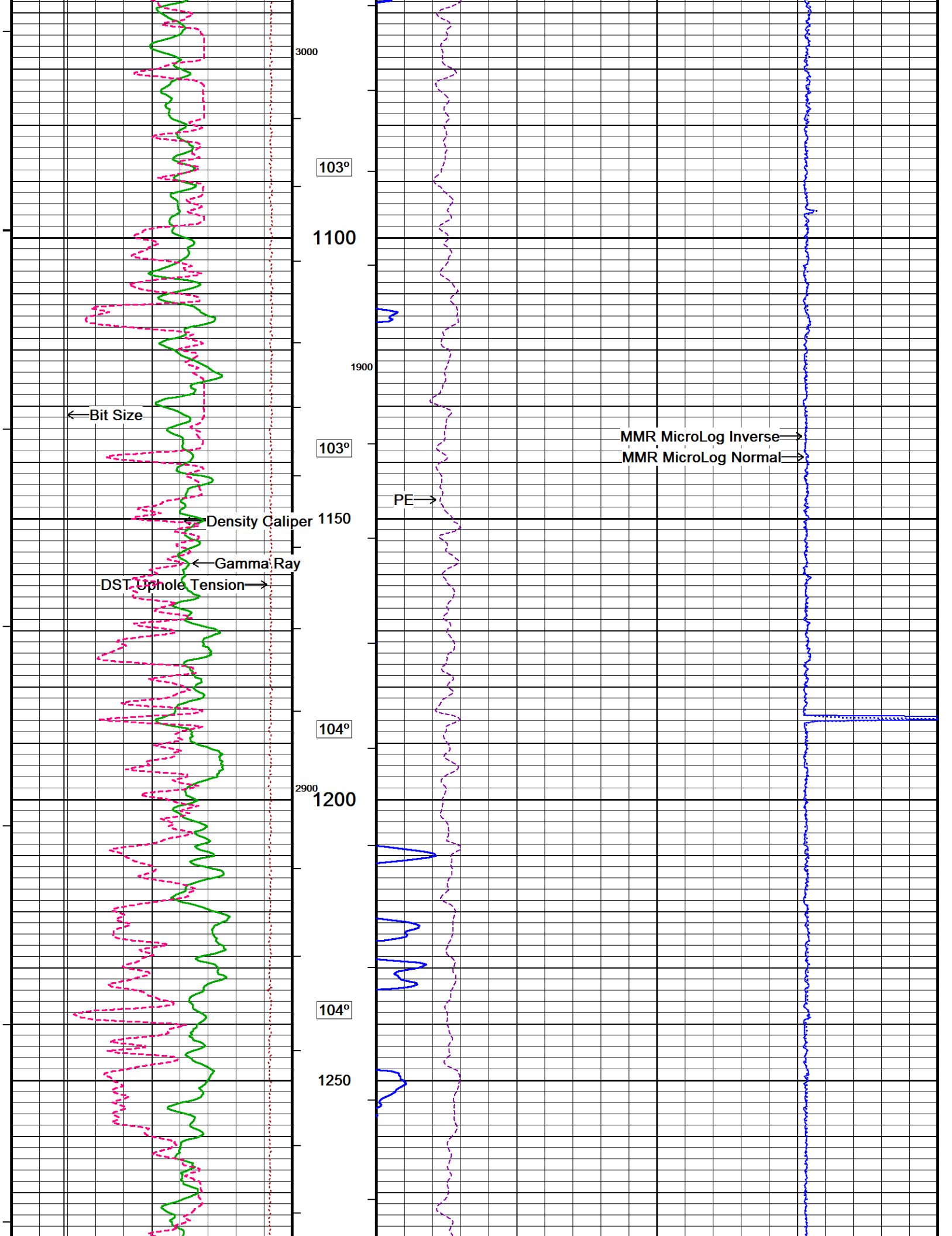
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will 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.

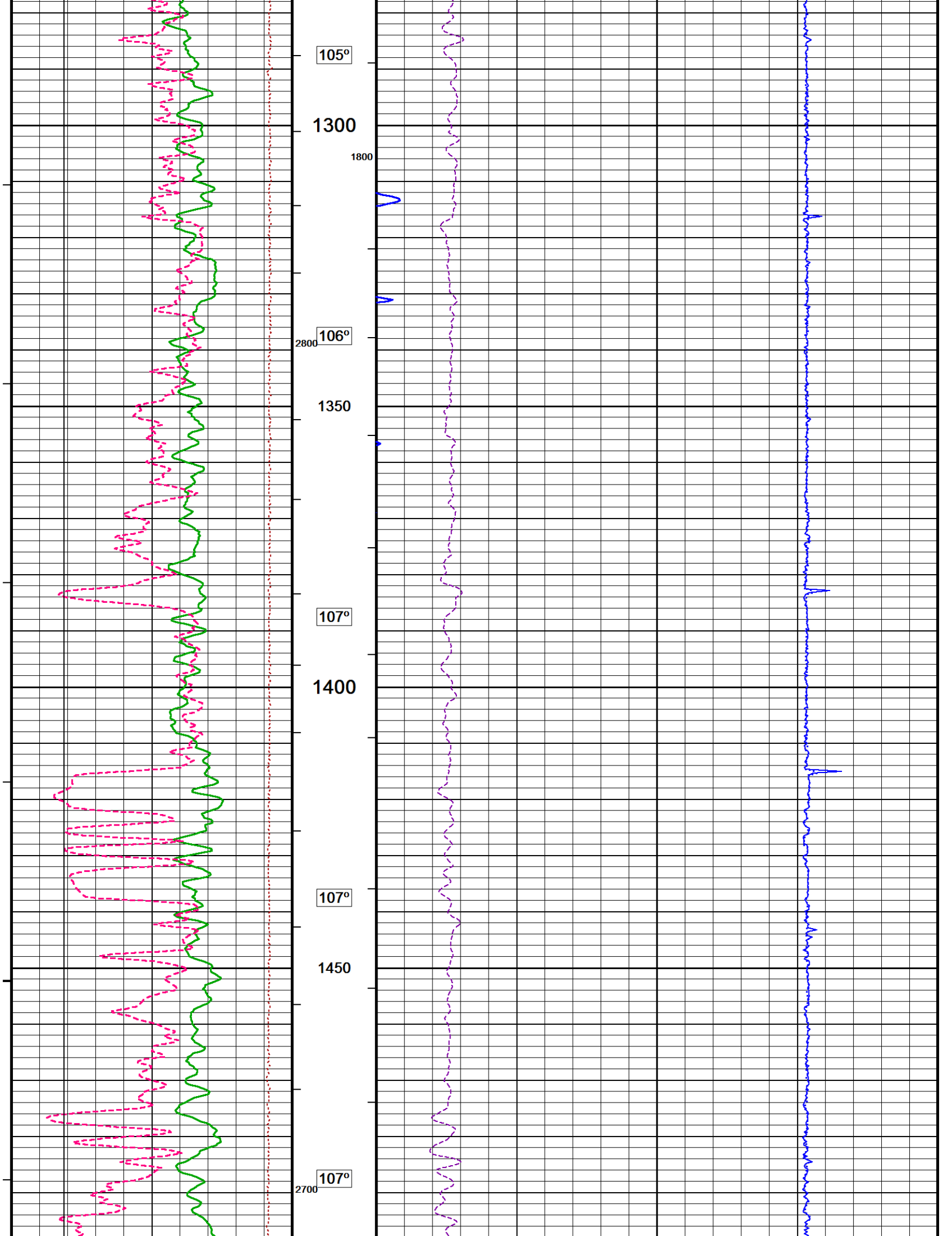


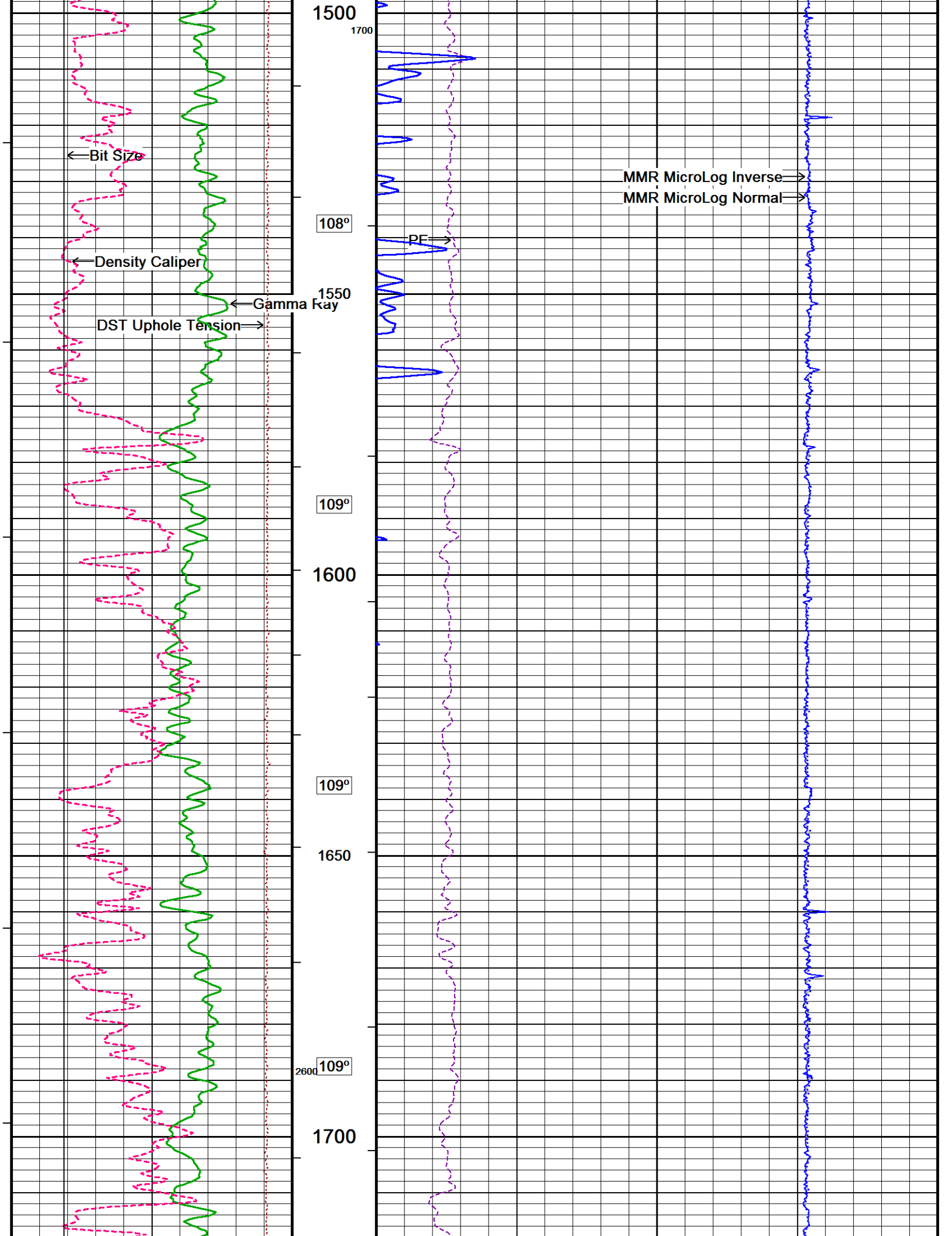


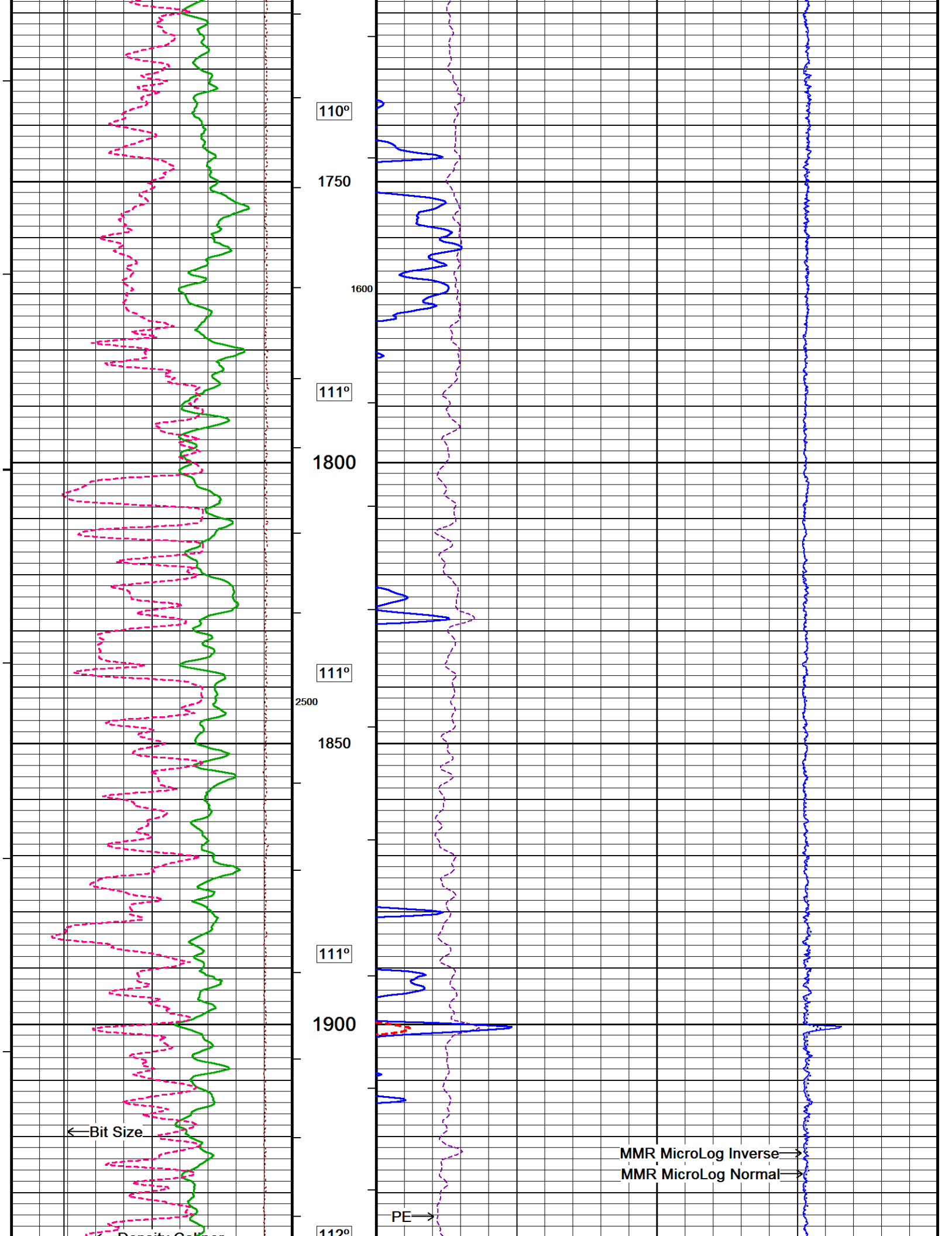


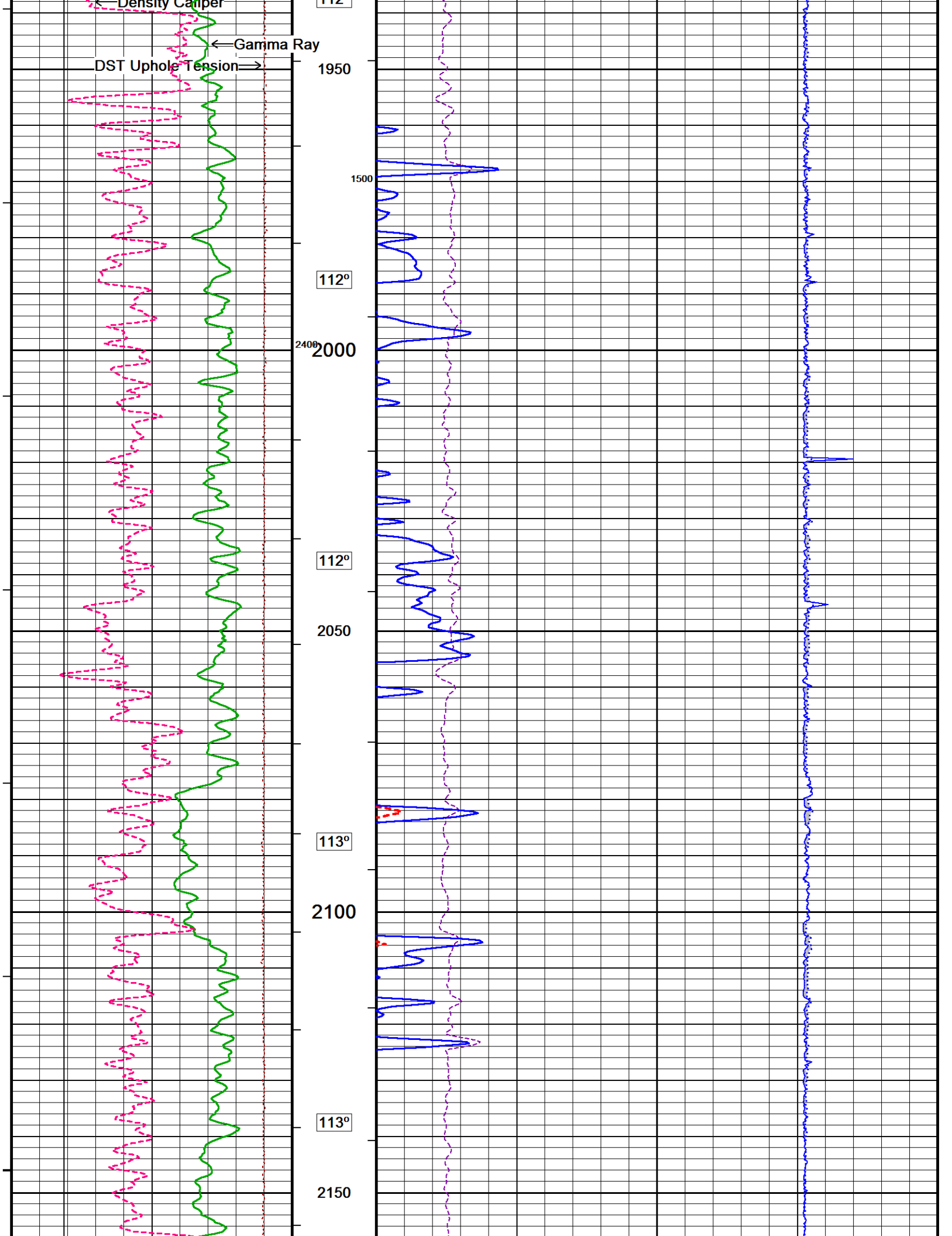


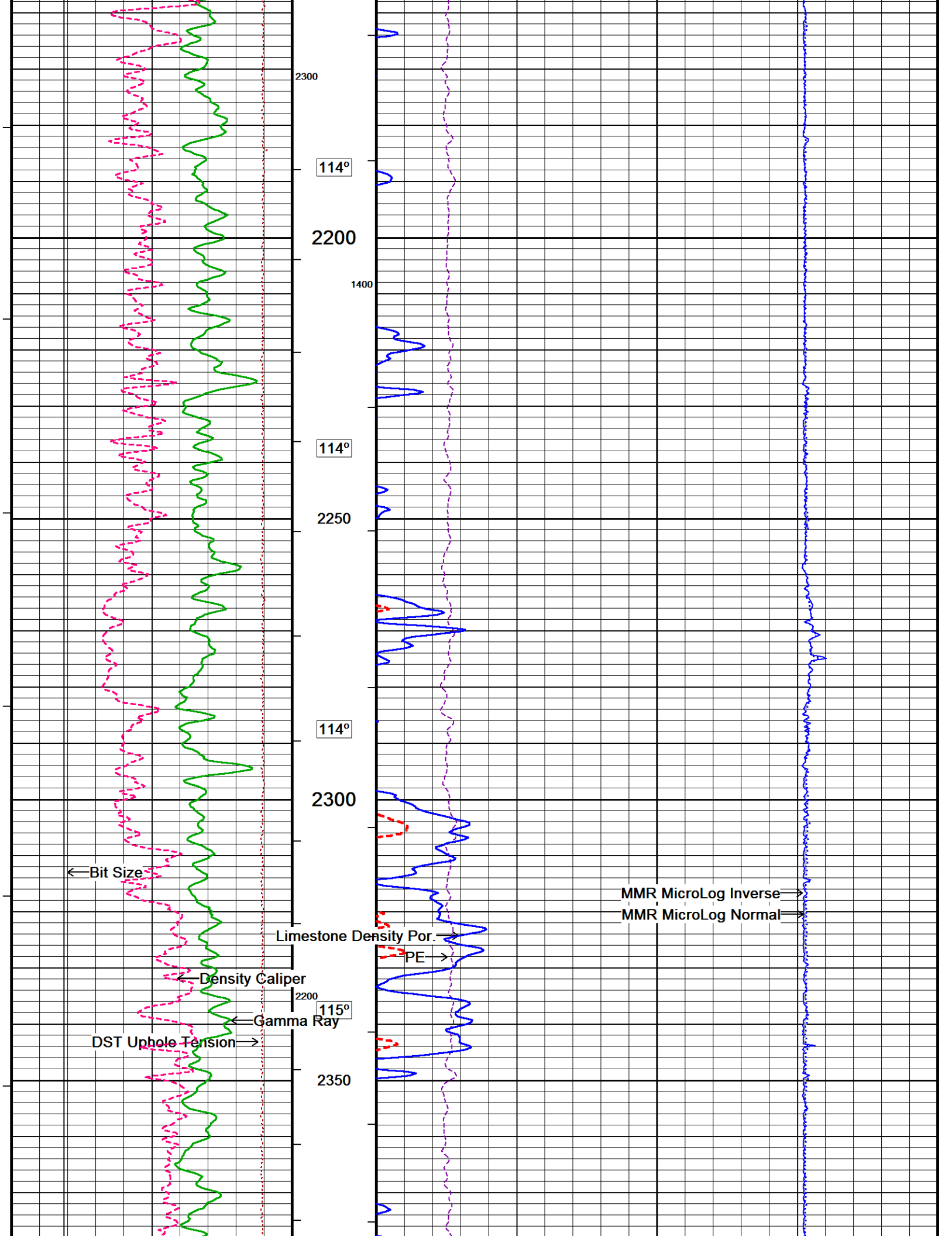


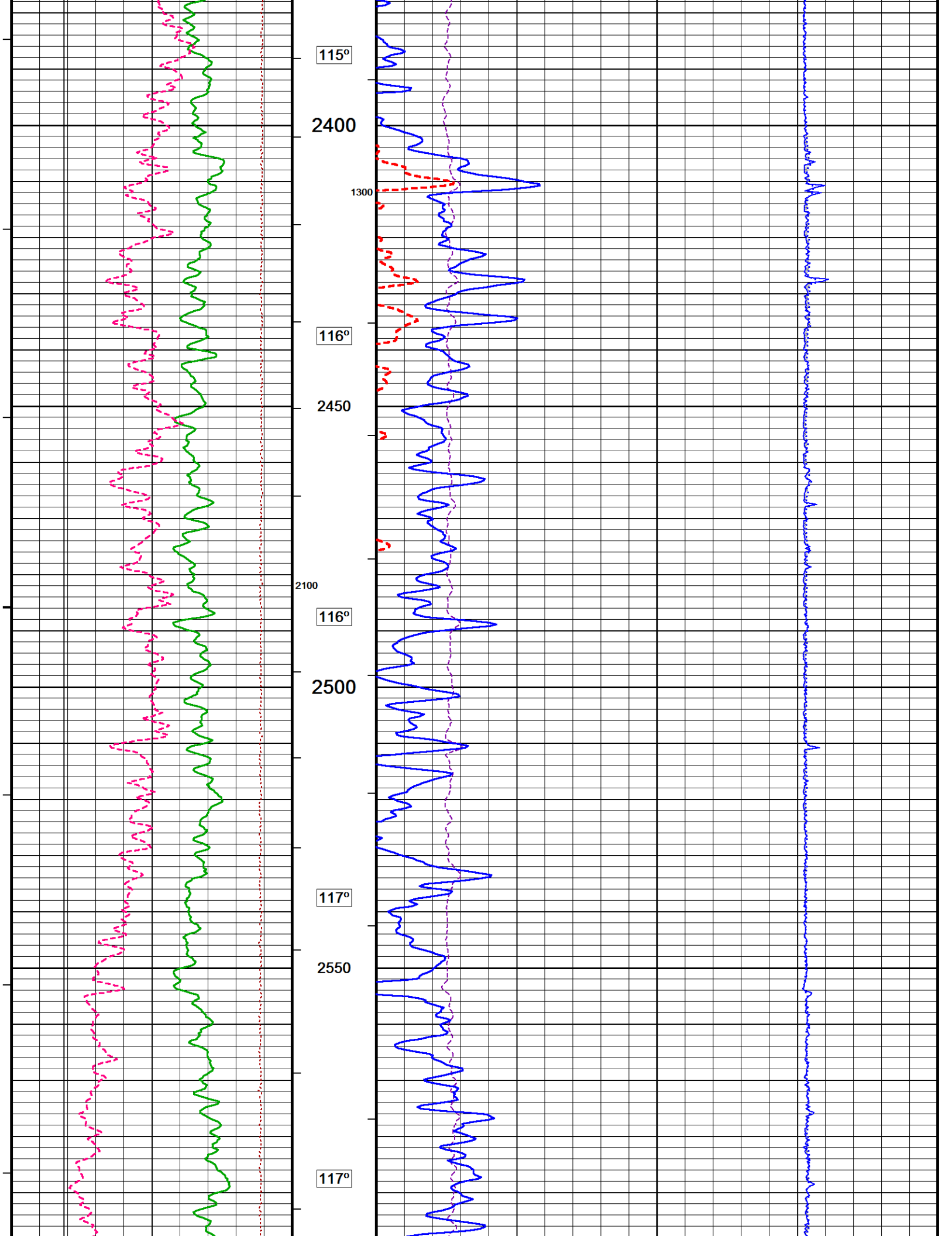


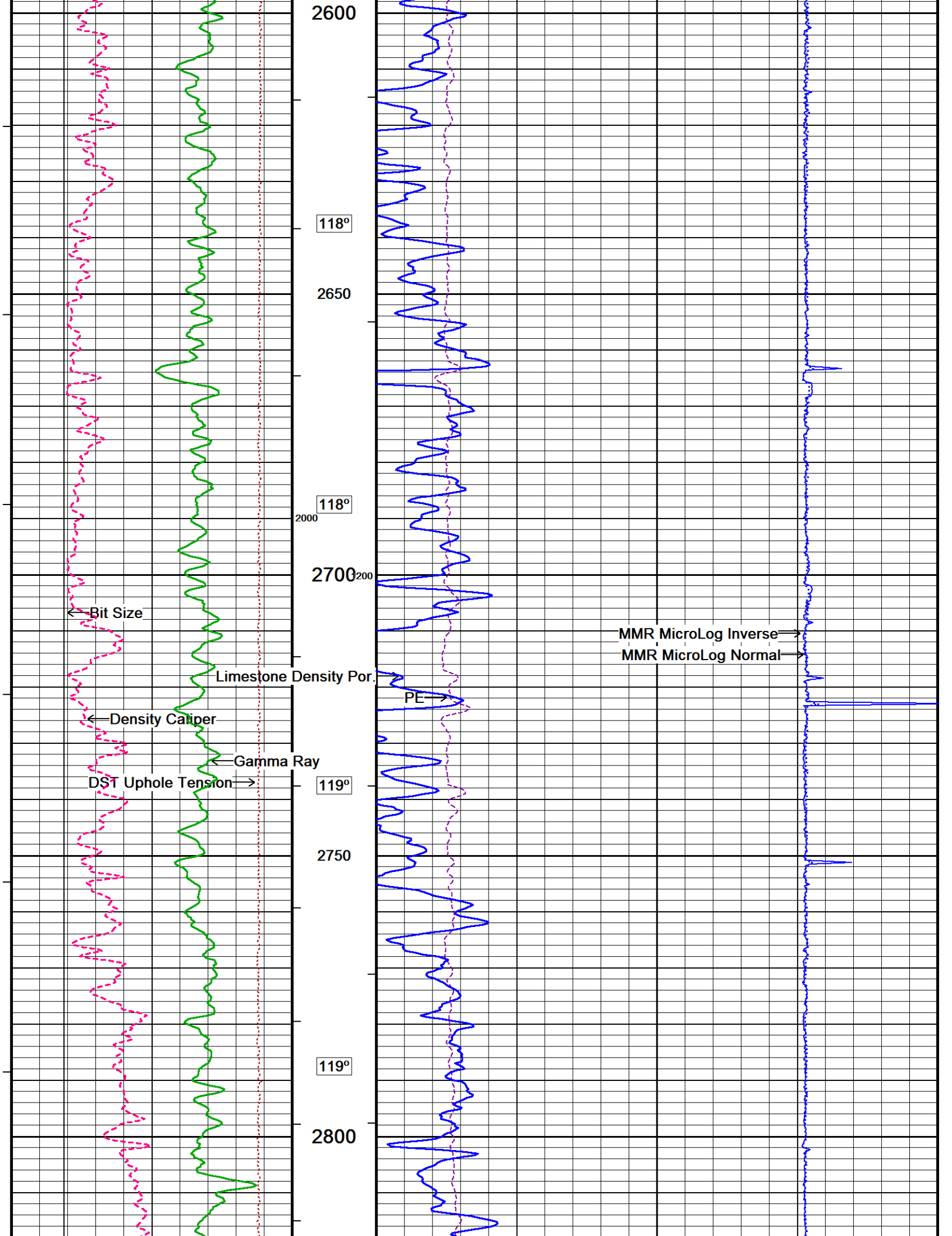


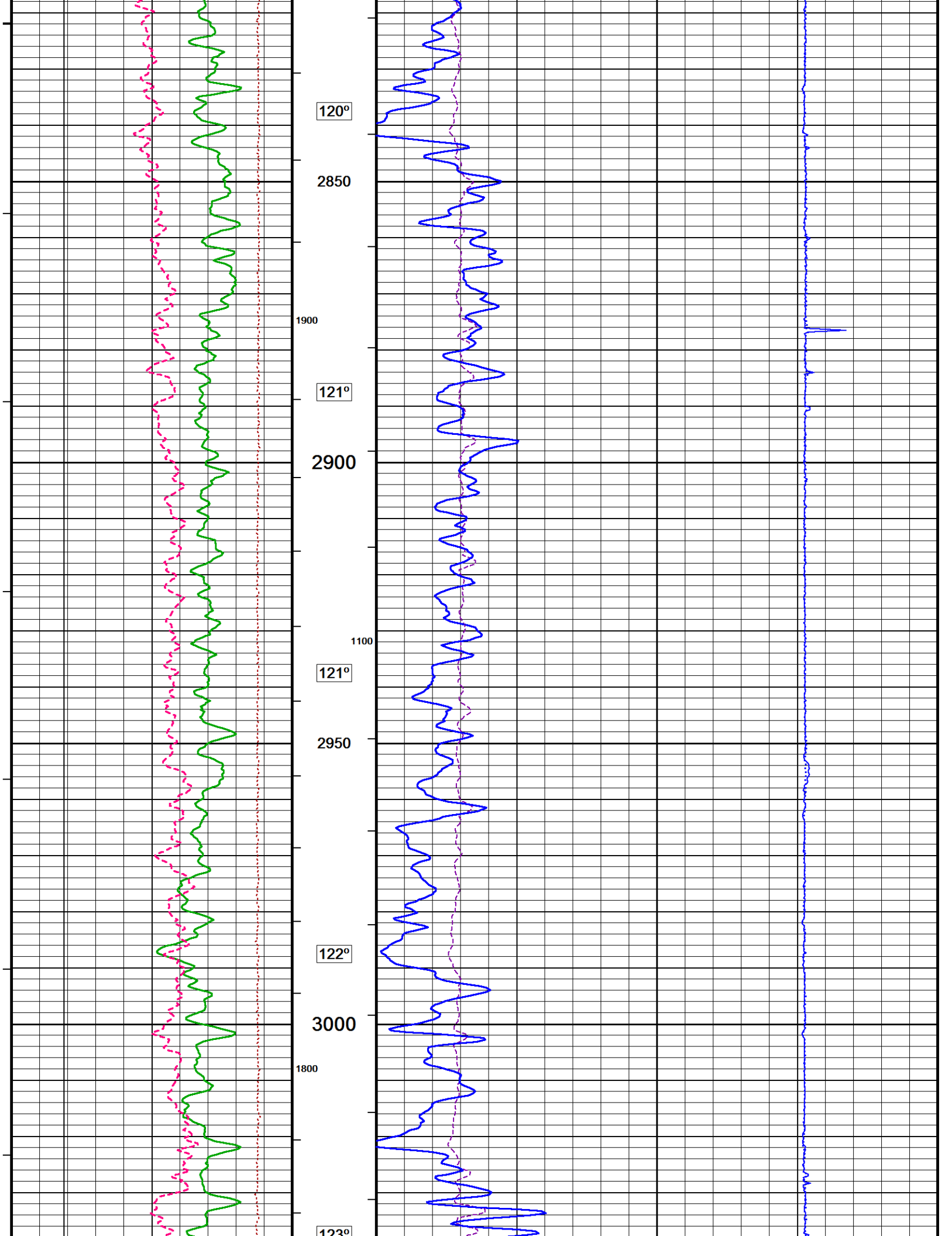


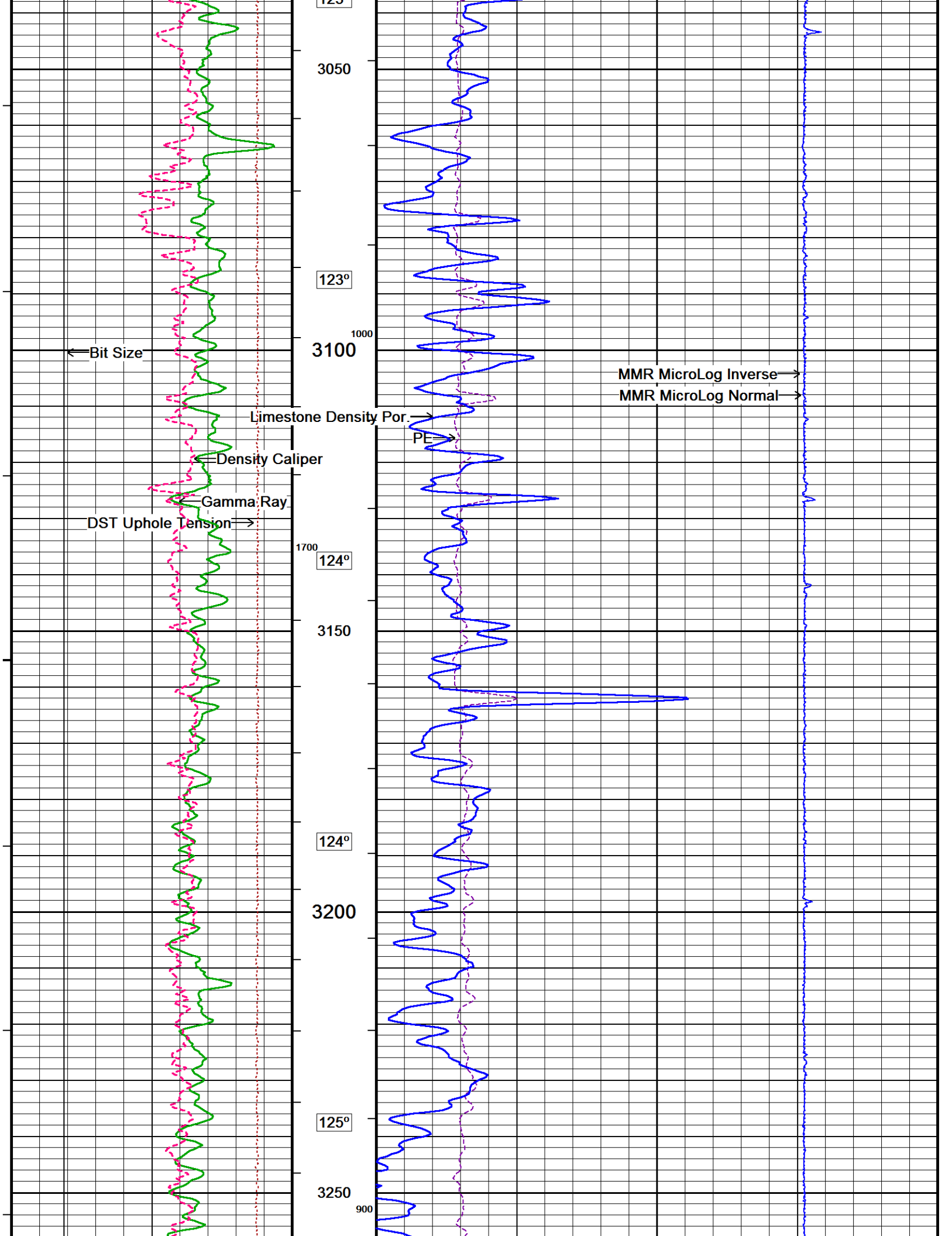


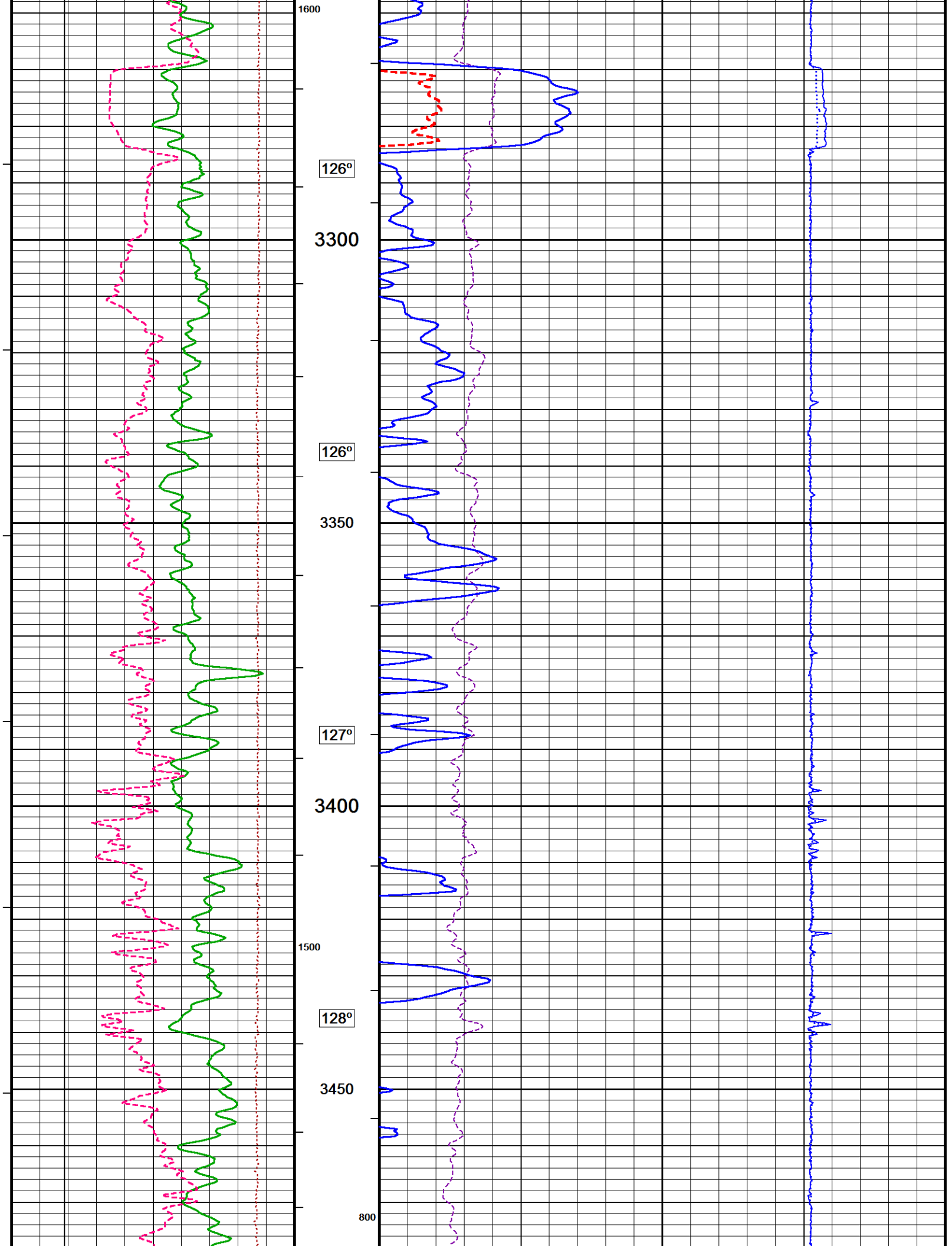


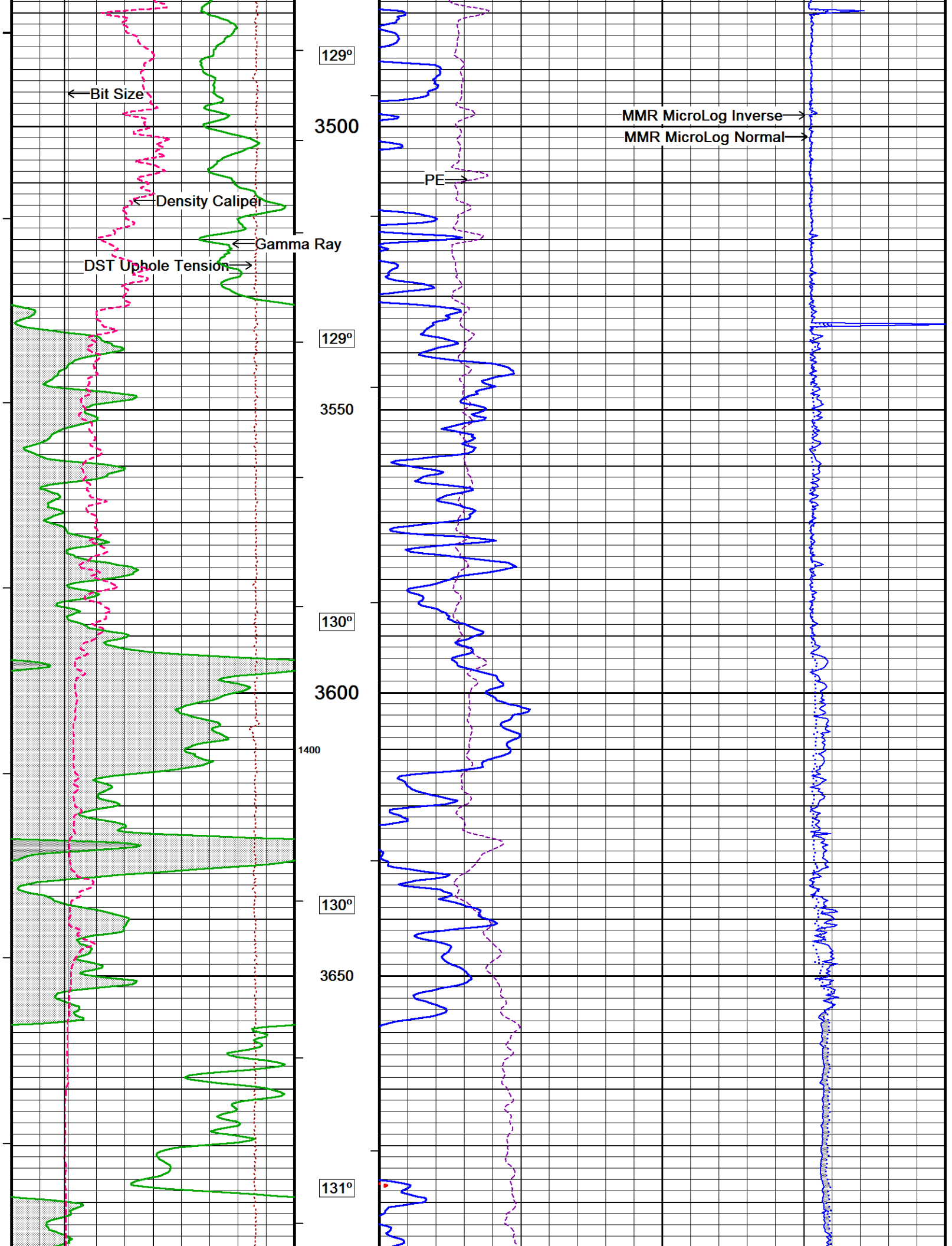


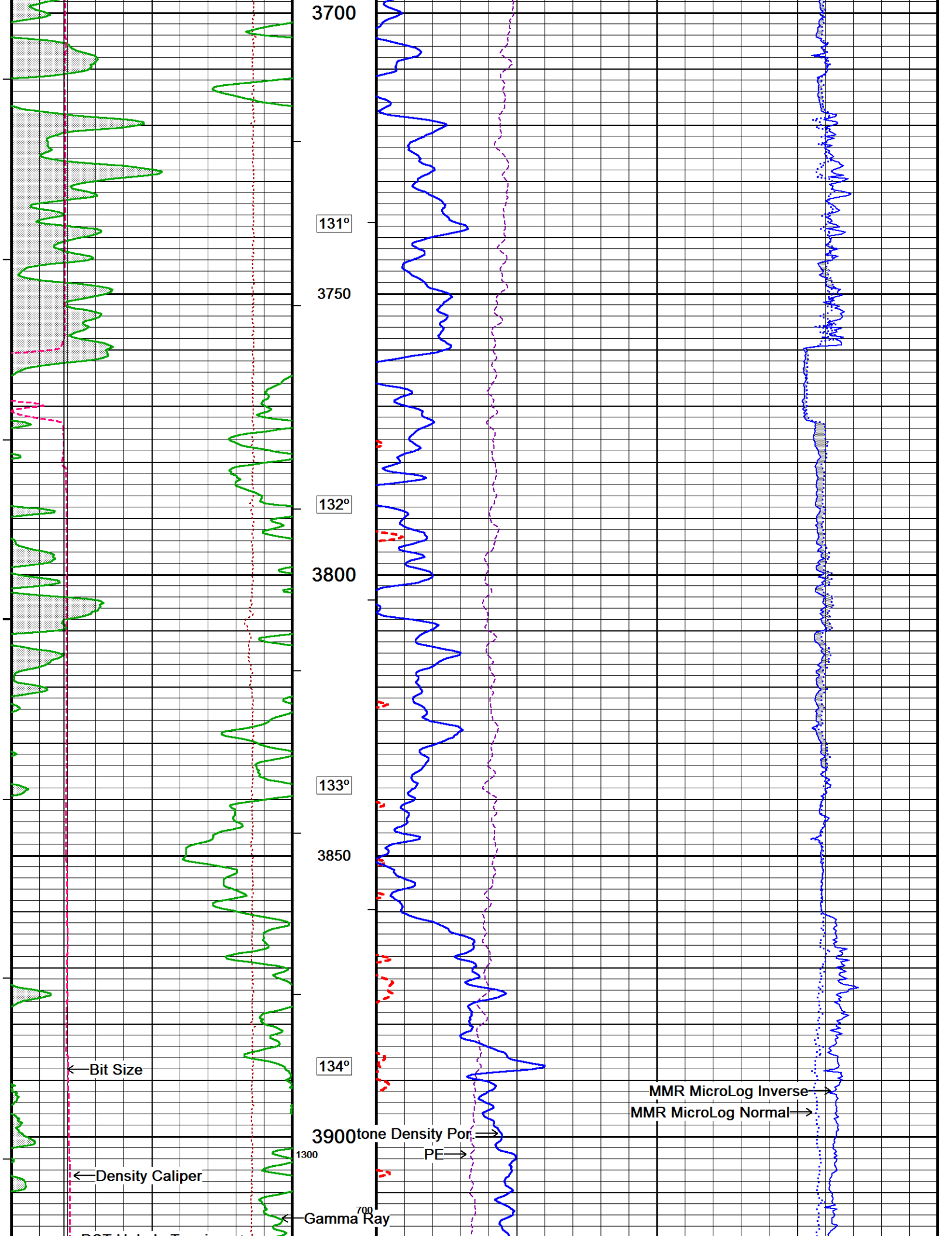


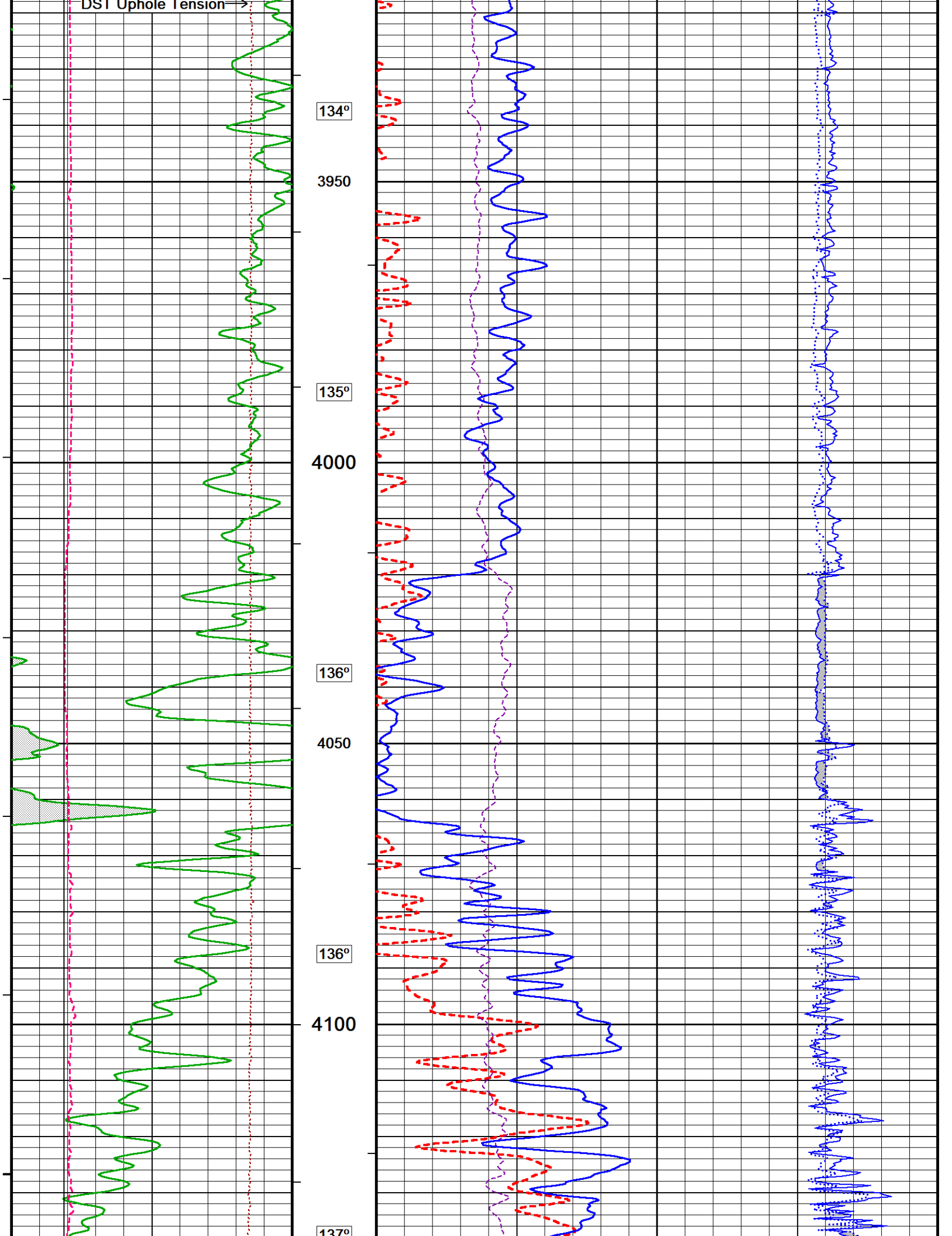


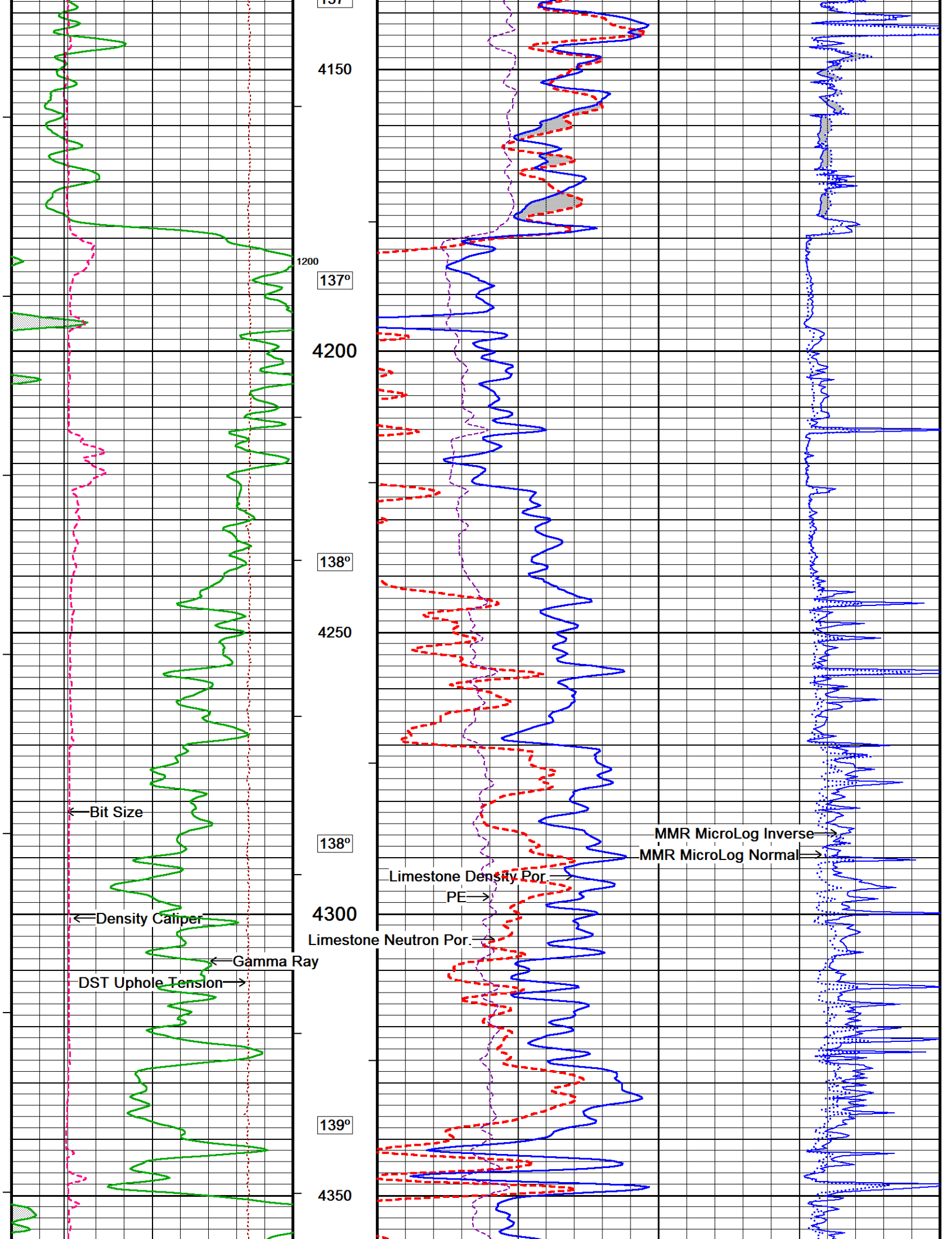


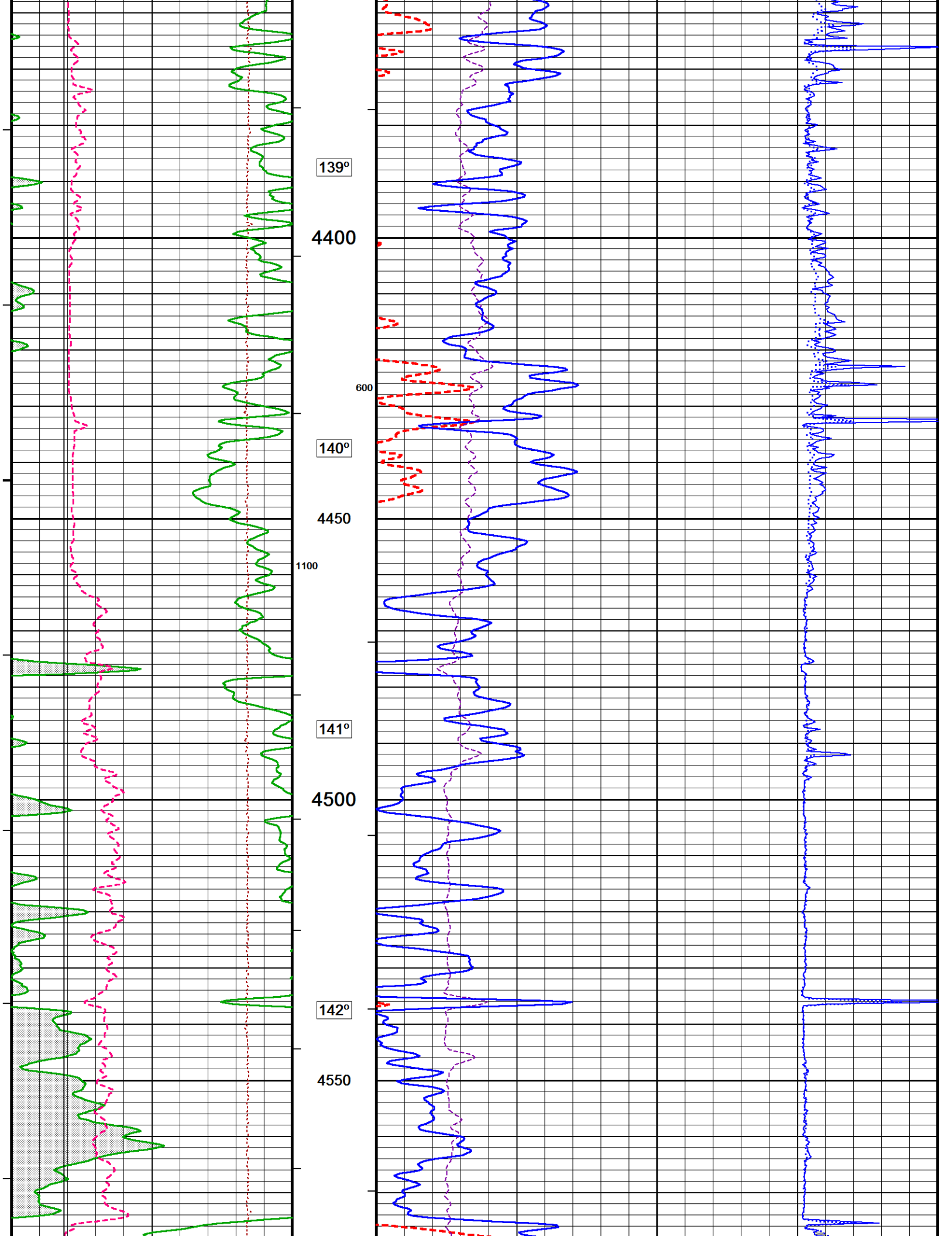


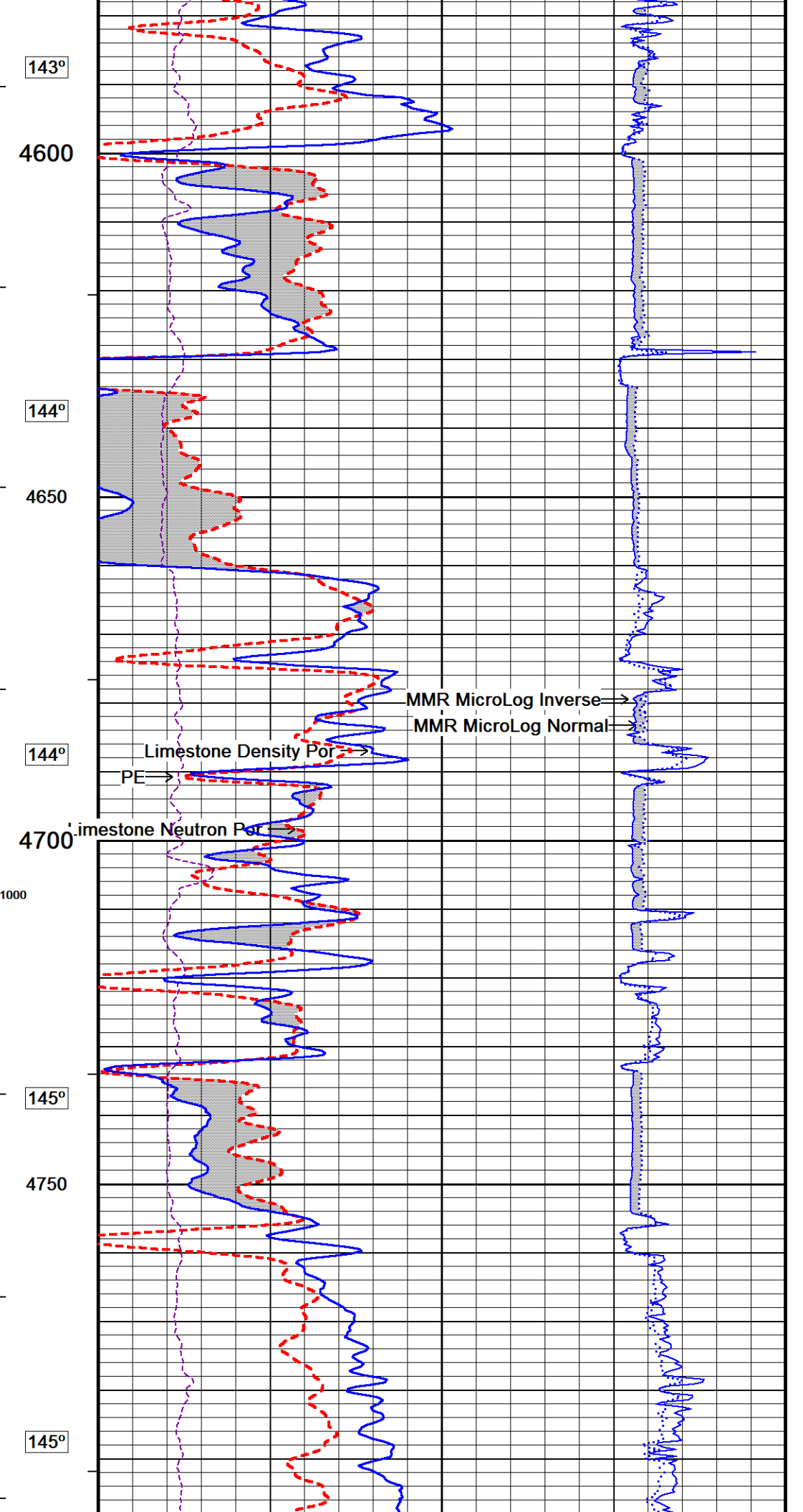
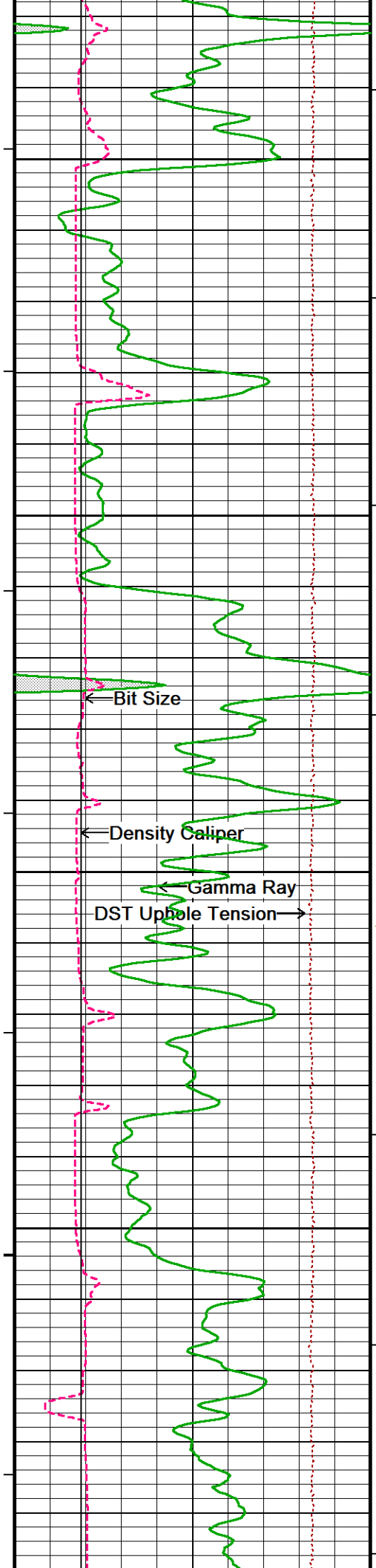


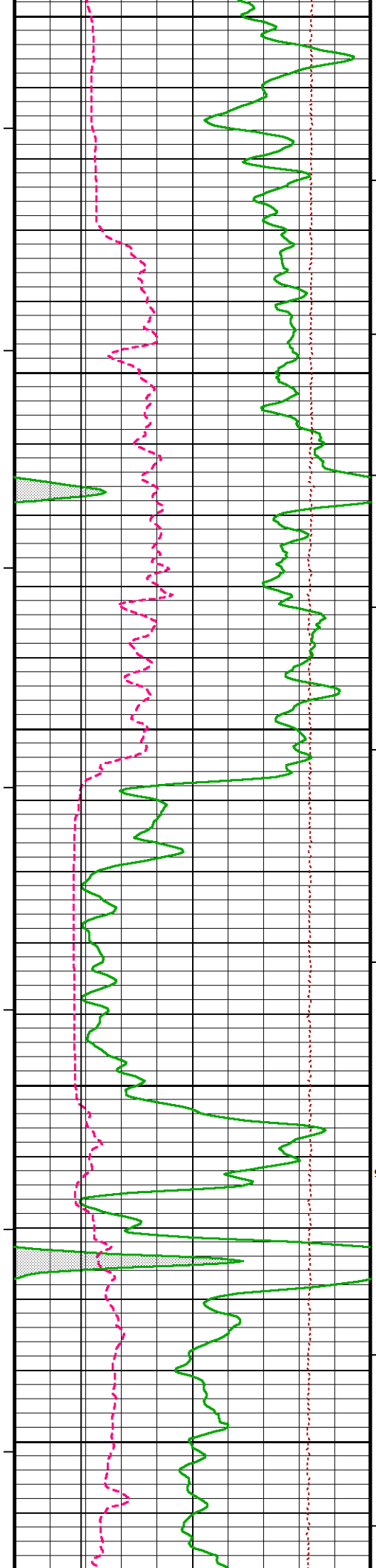




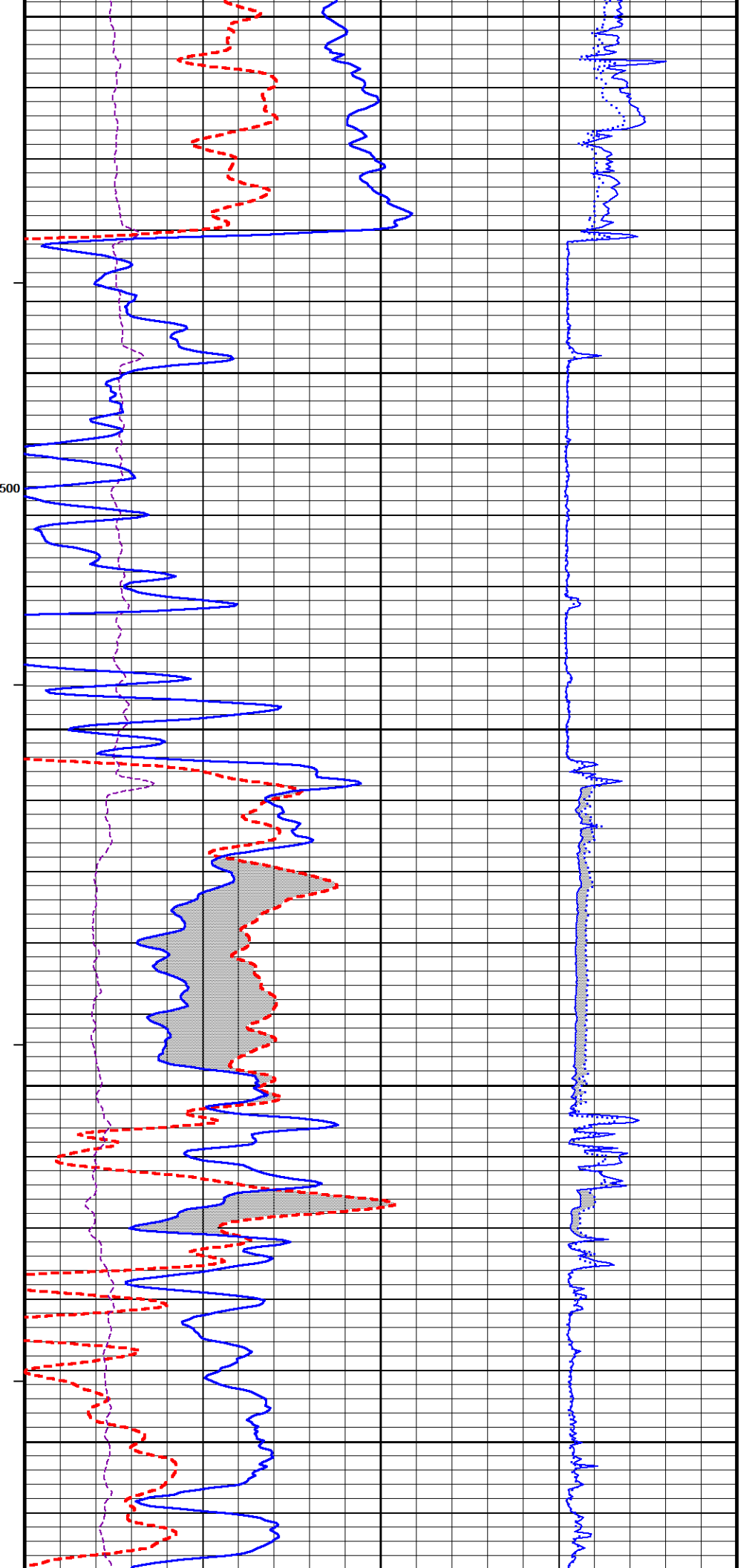


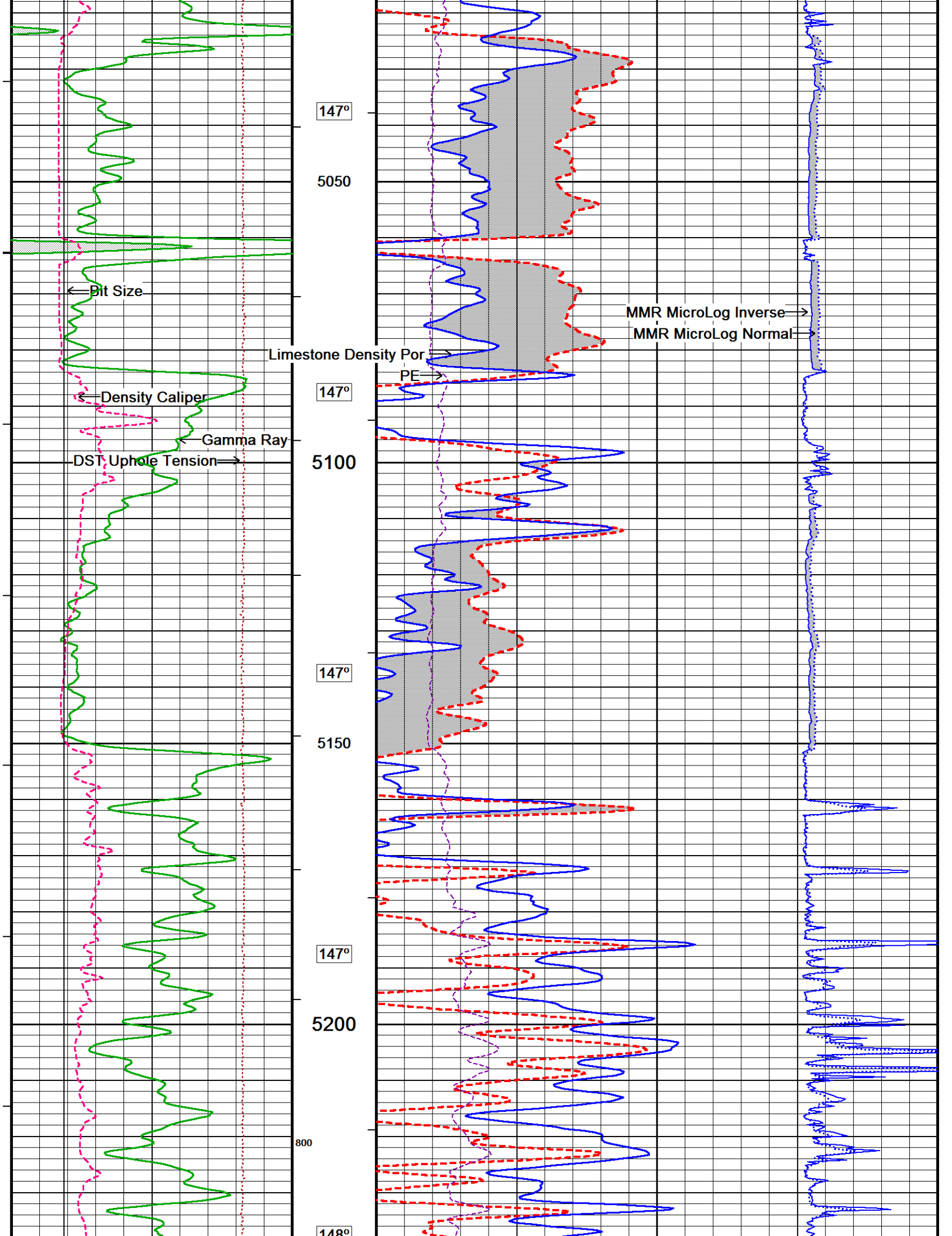


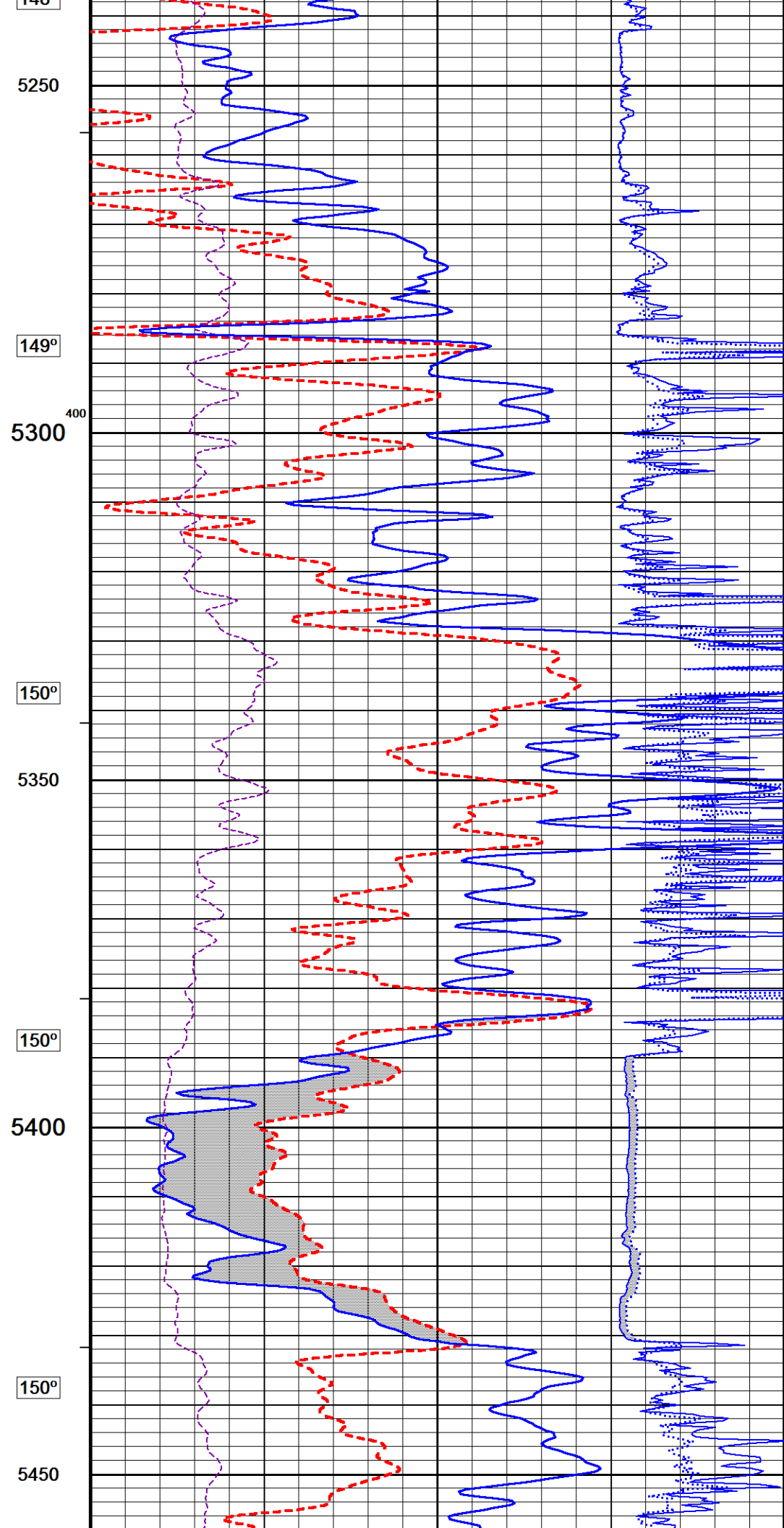
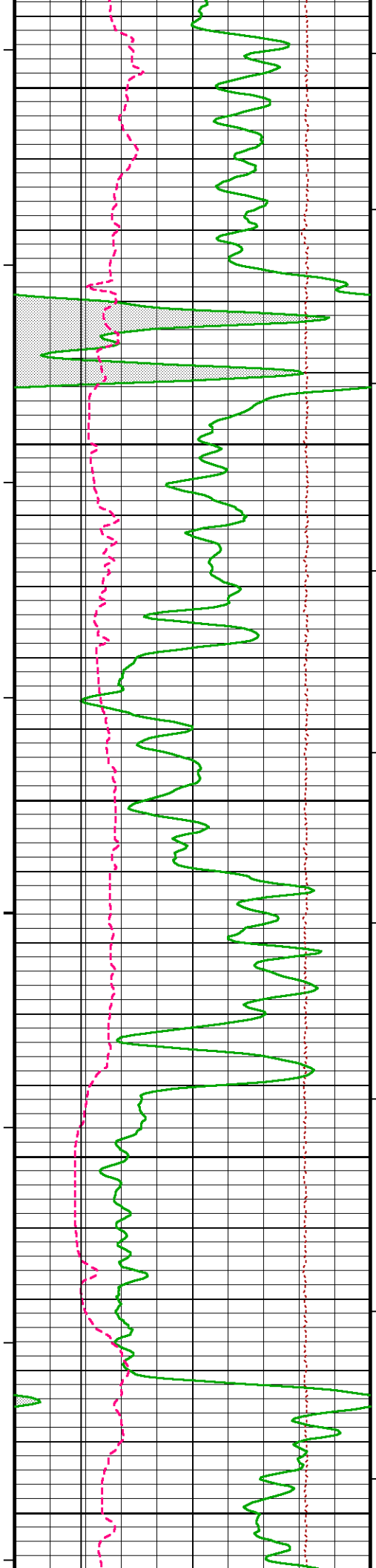


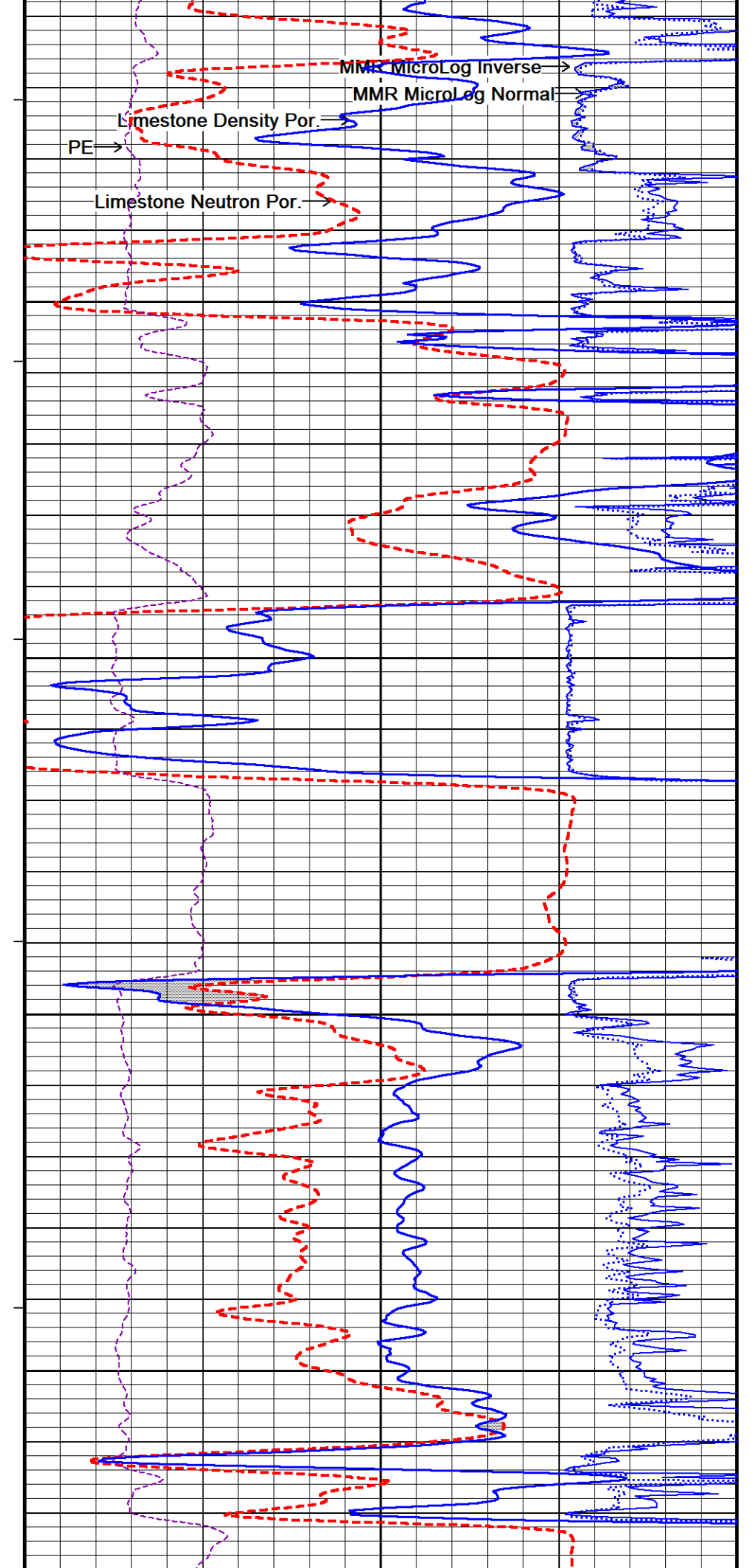
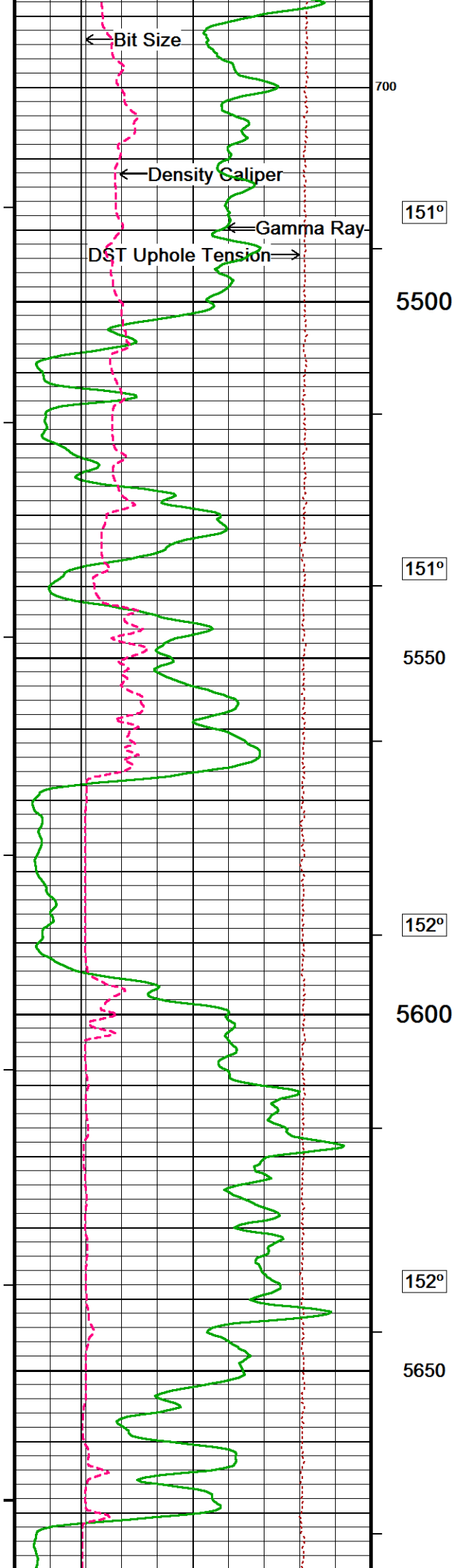


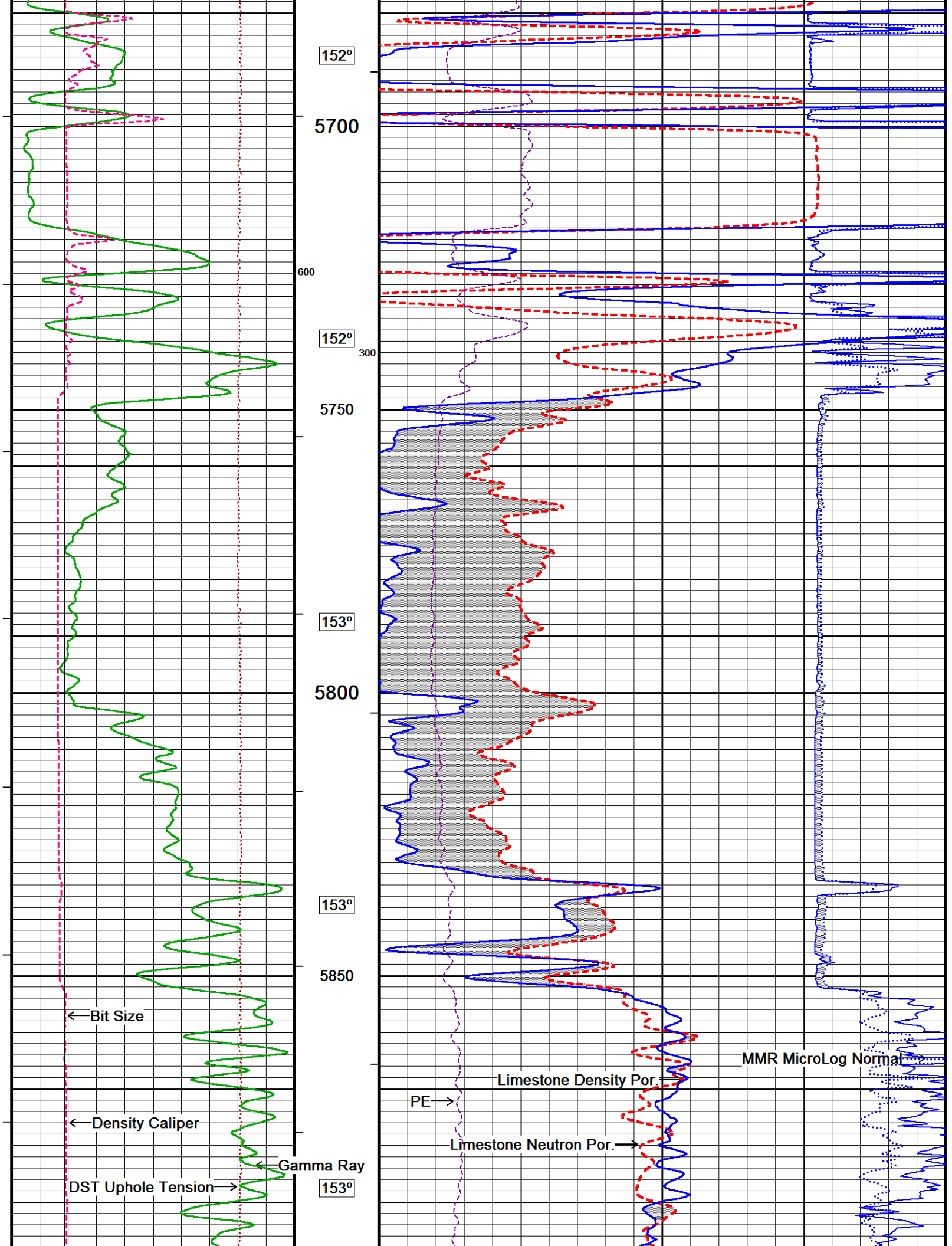
4800
145°
4850
500
146°
4900
147°
4950
900
147°
5000

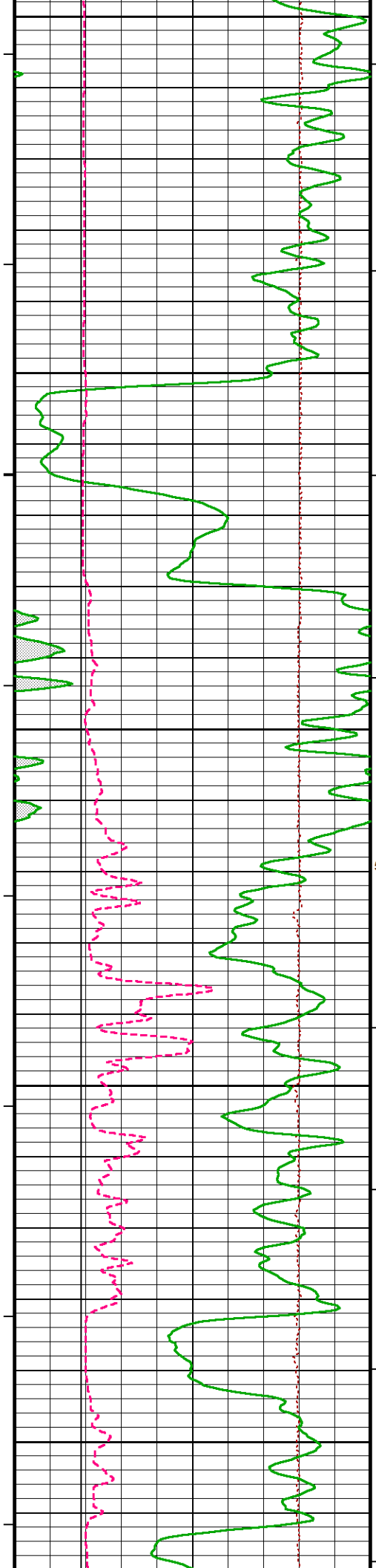




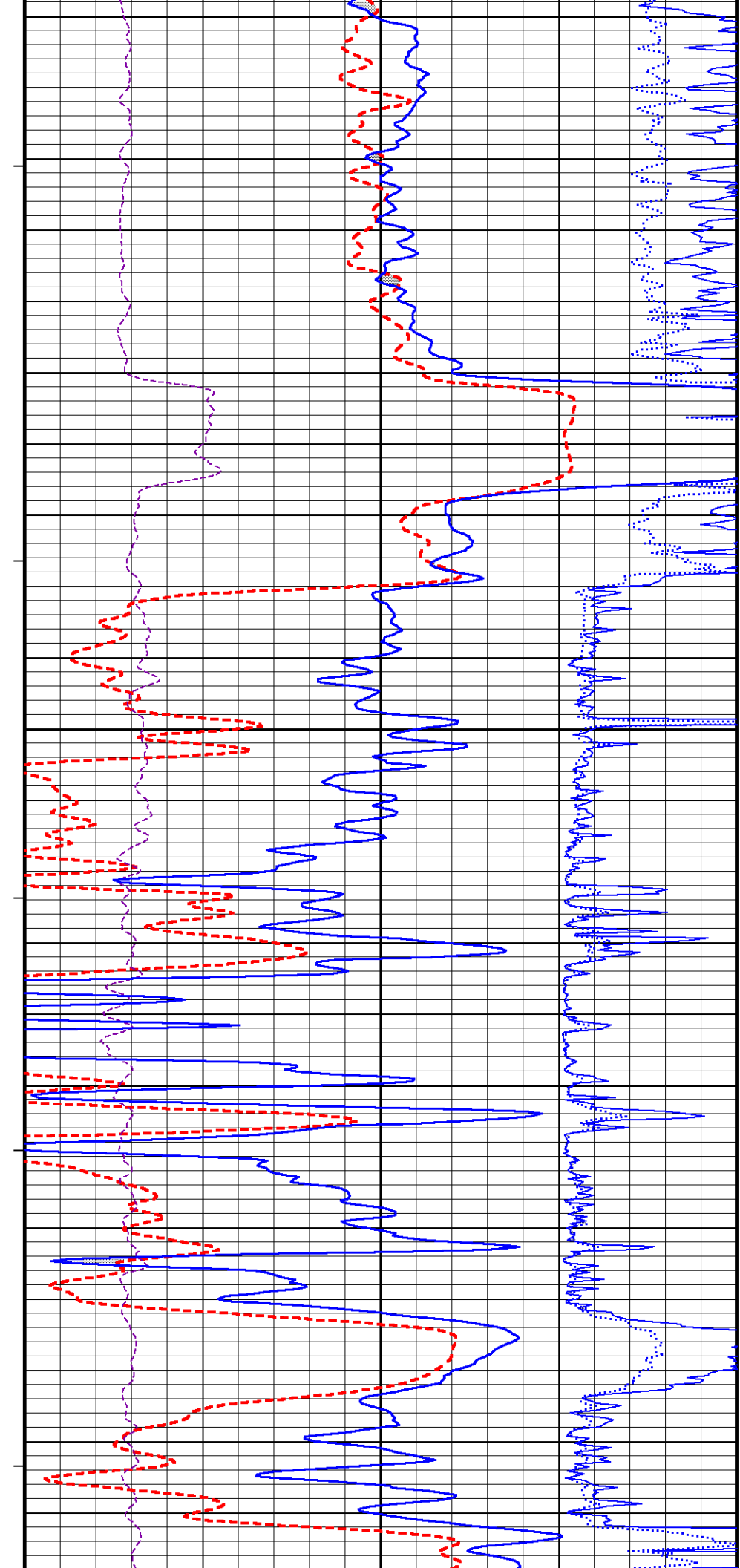


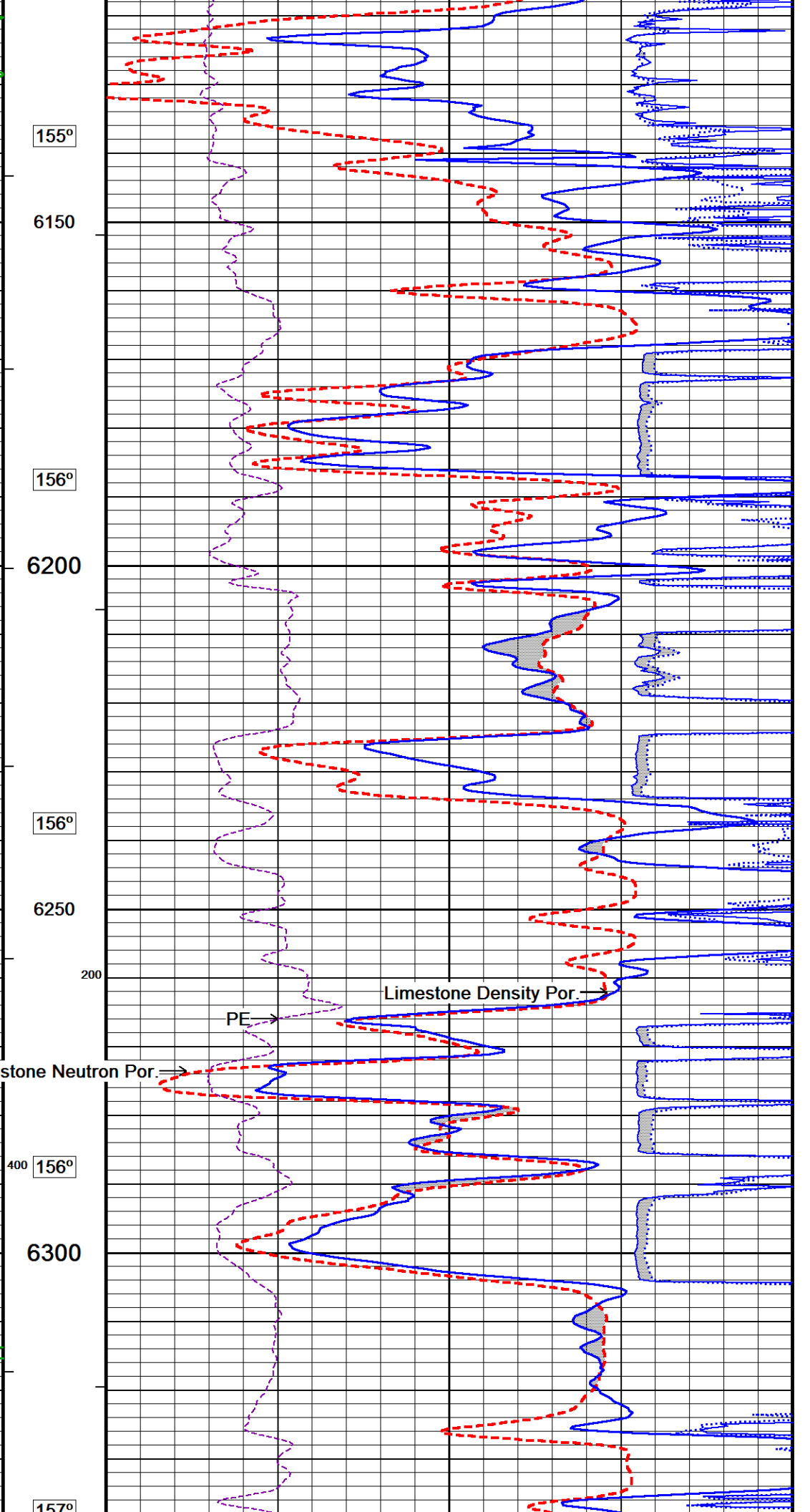
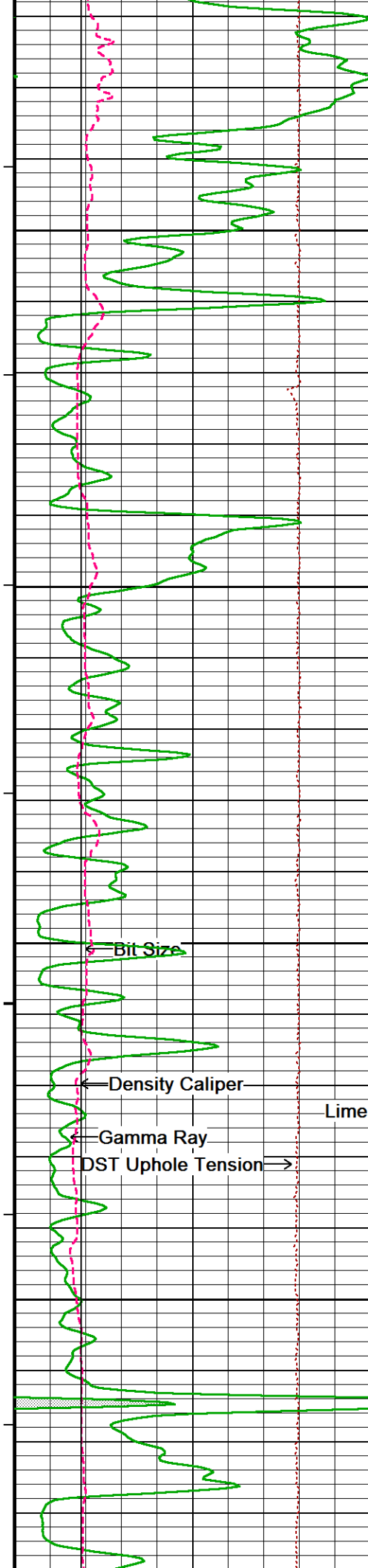


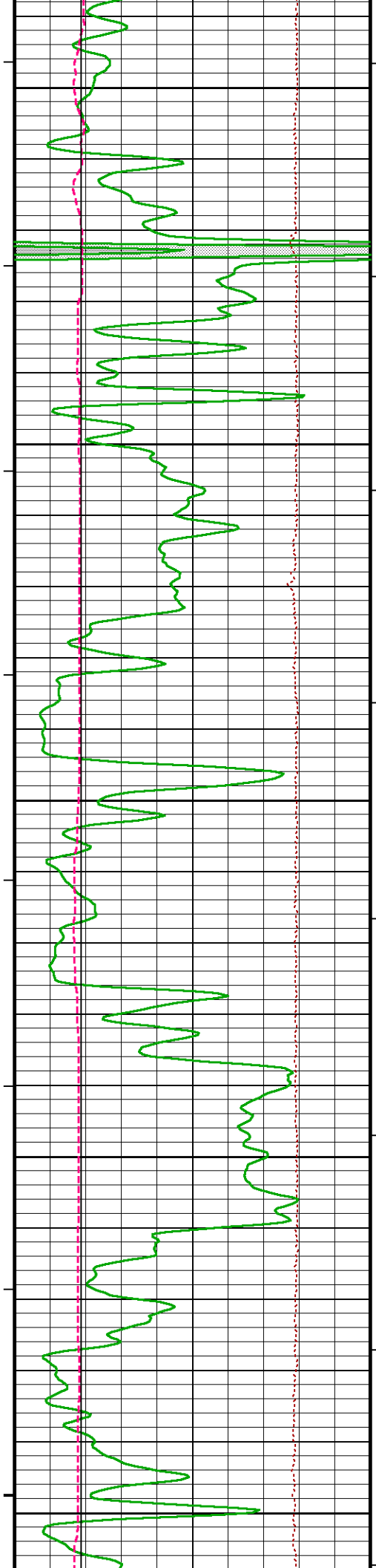




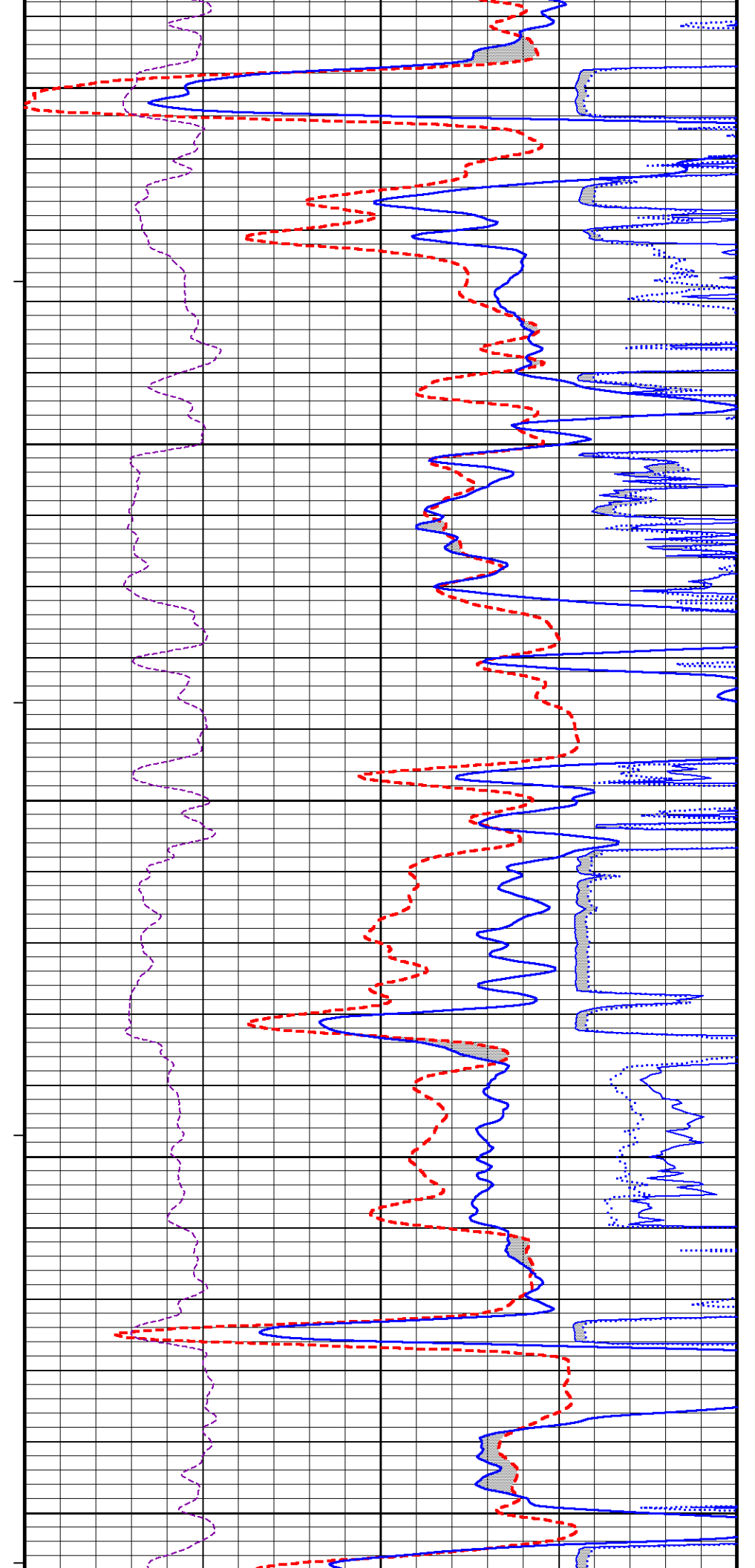
5900
153°
5950
153°
6000
500
153°
6050
155°
6100

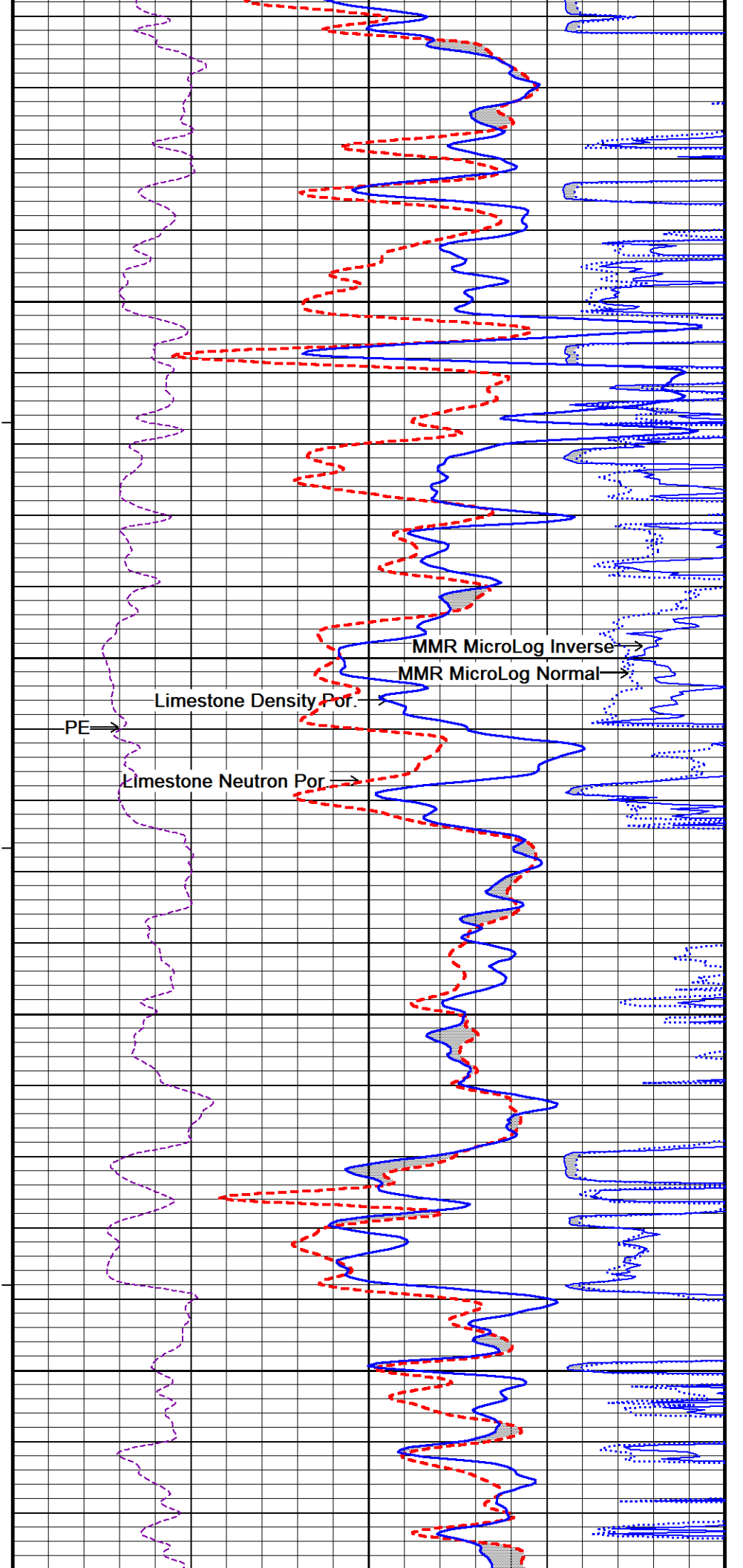
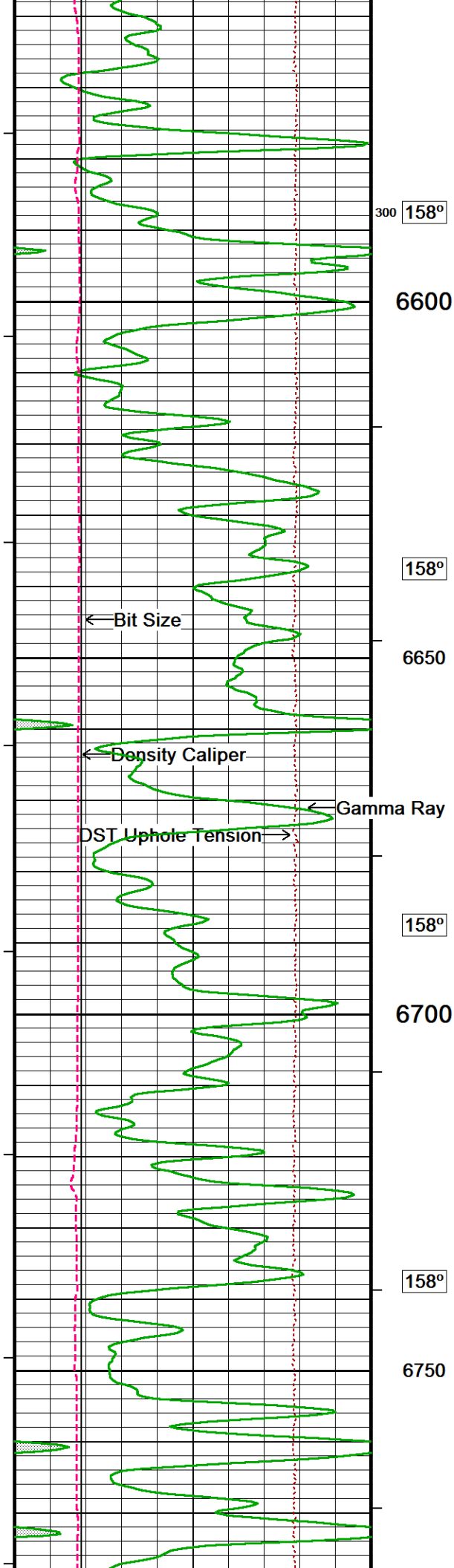


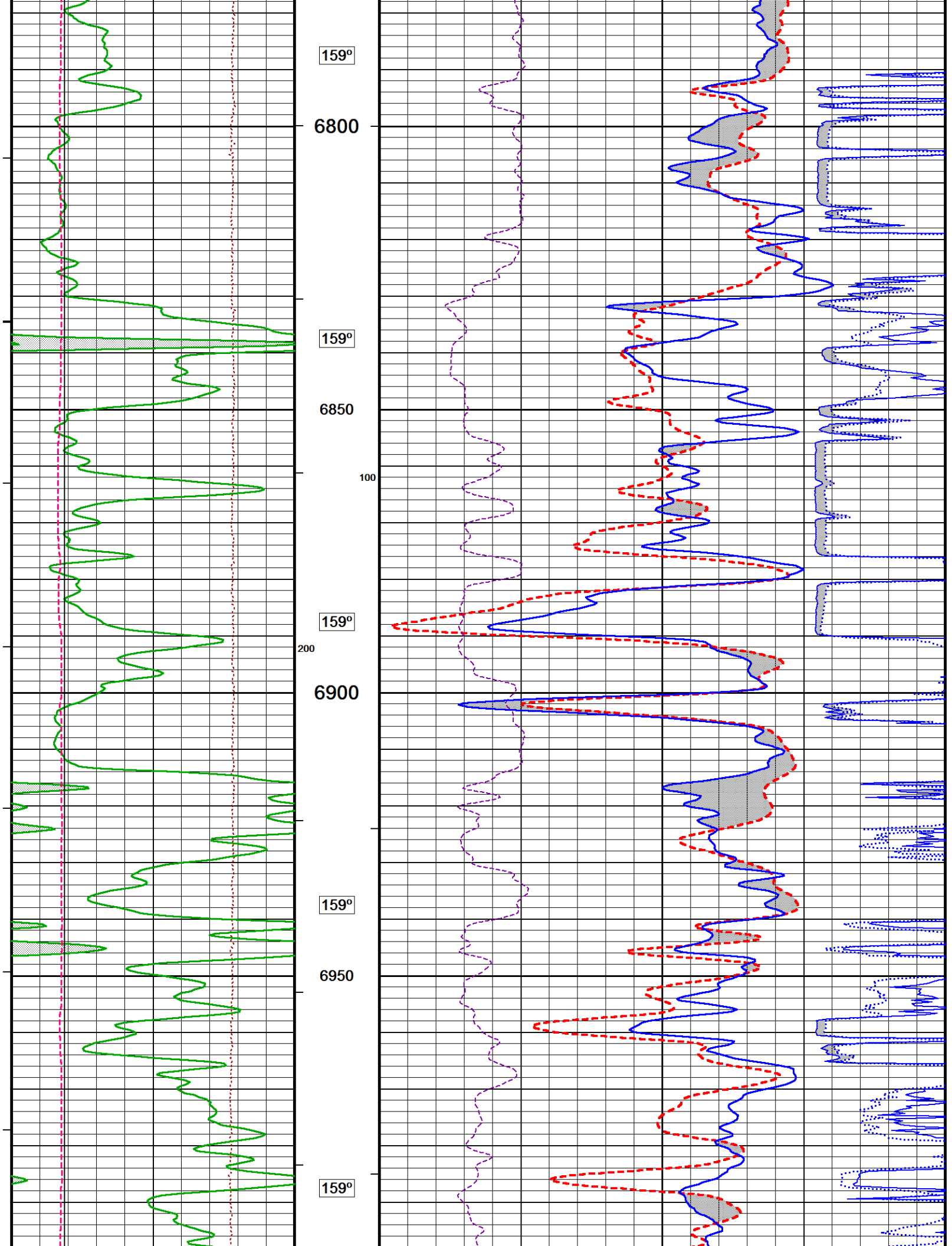


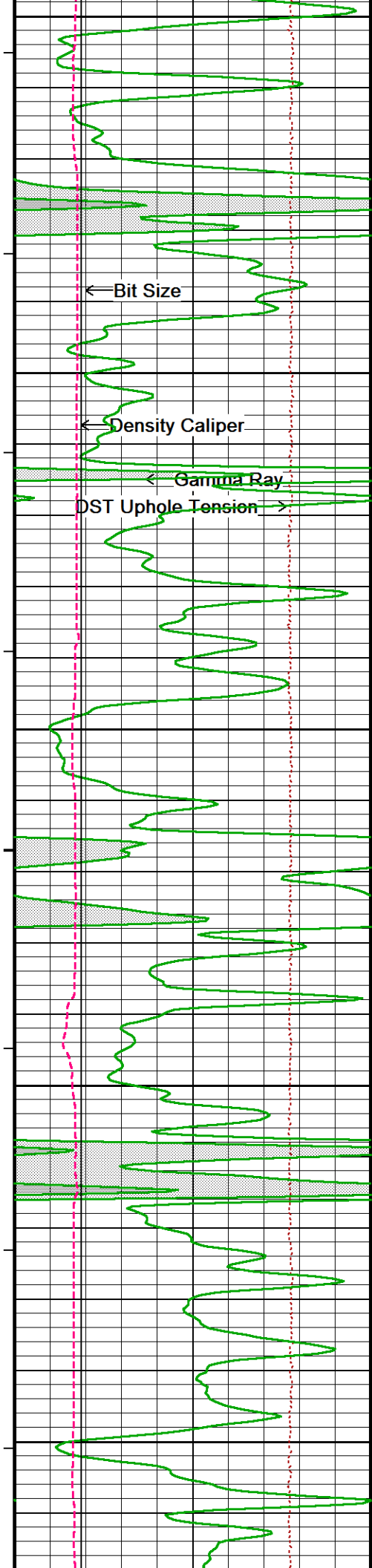


6350
158°
6400
158°
6450
157°
6500
158°
6550

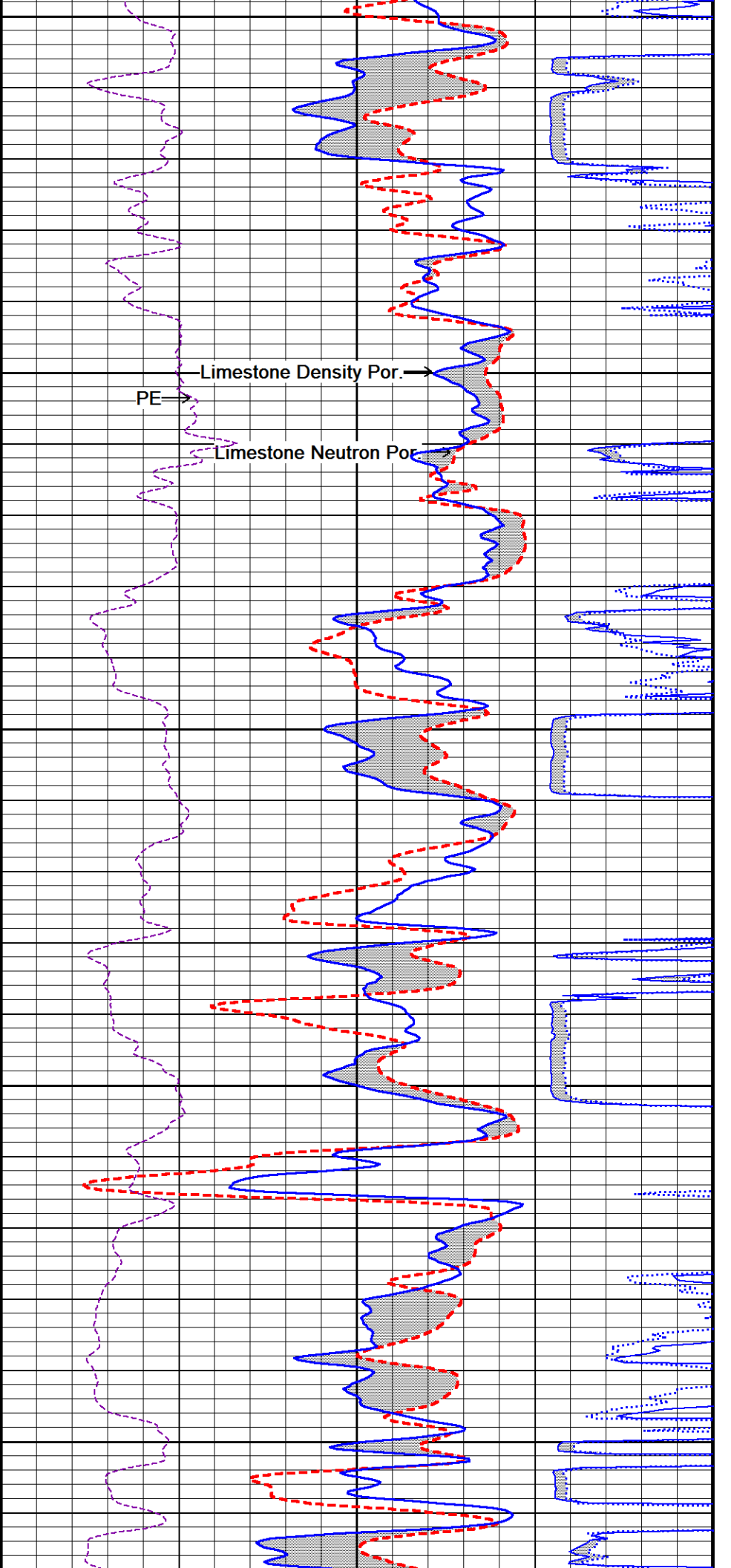


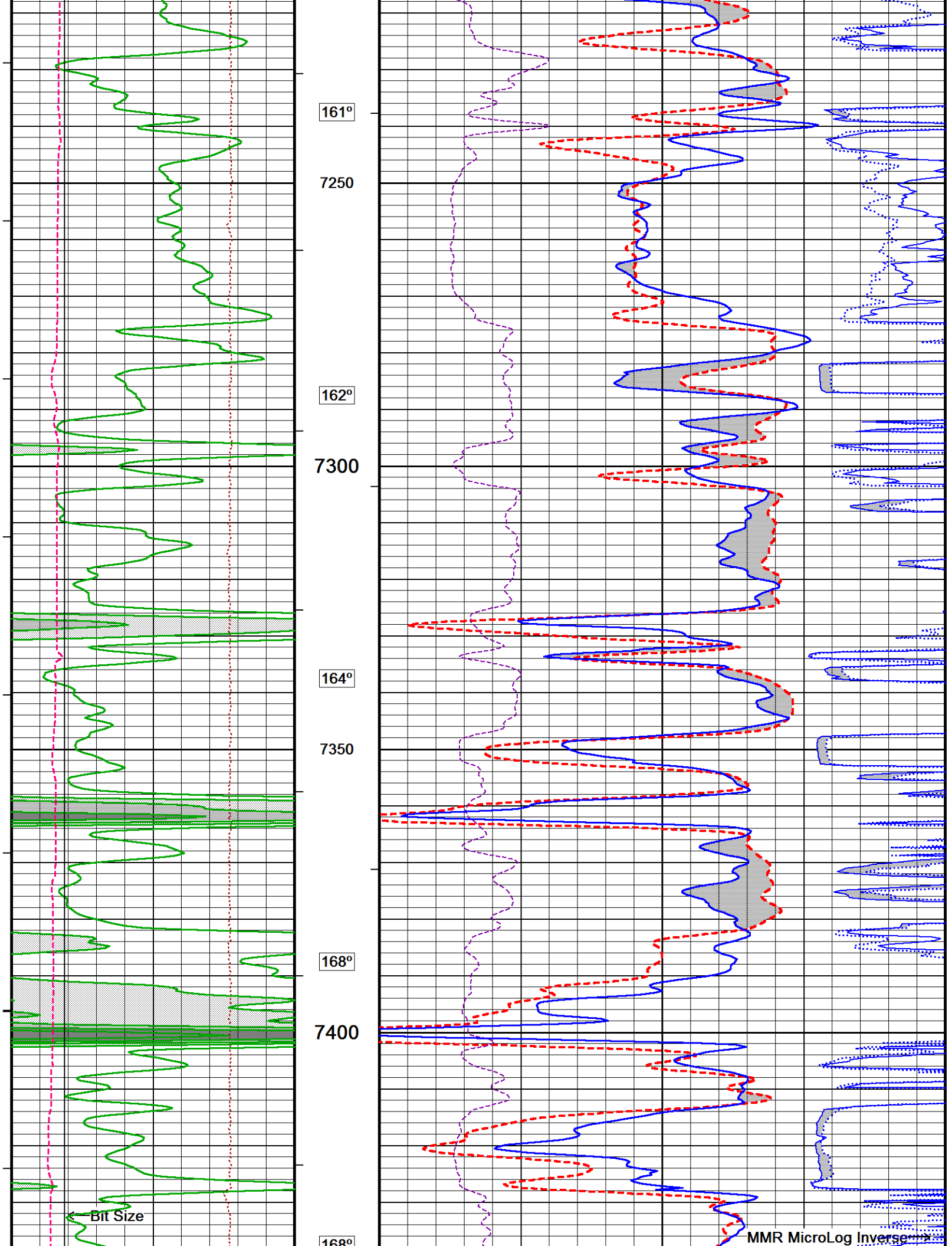


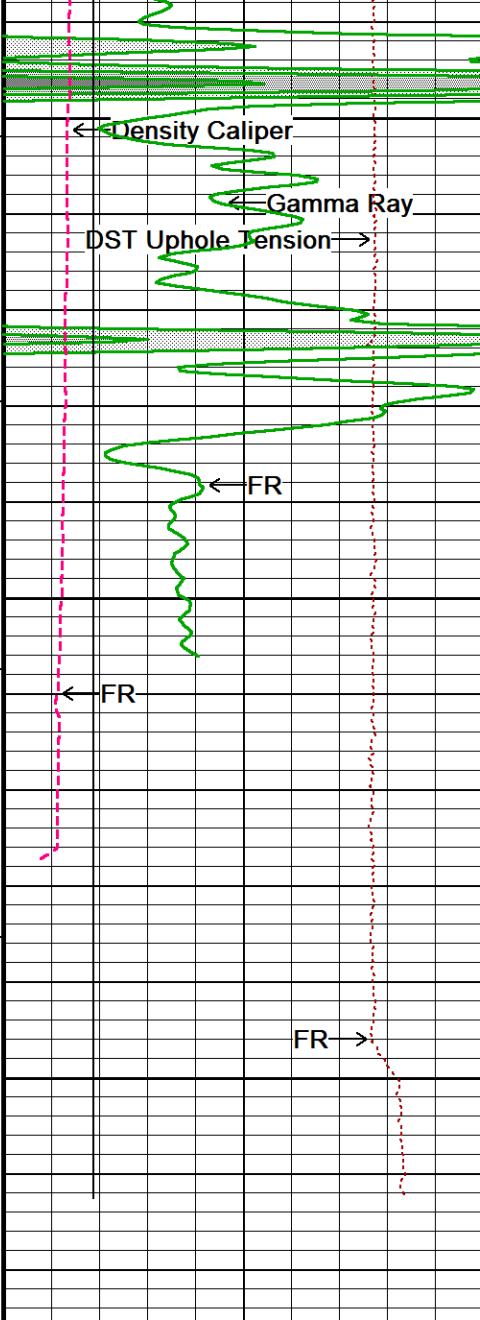




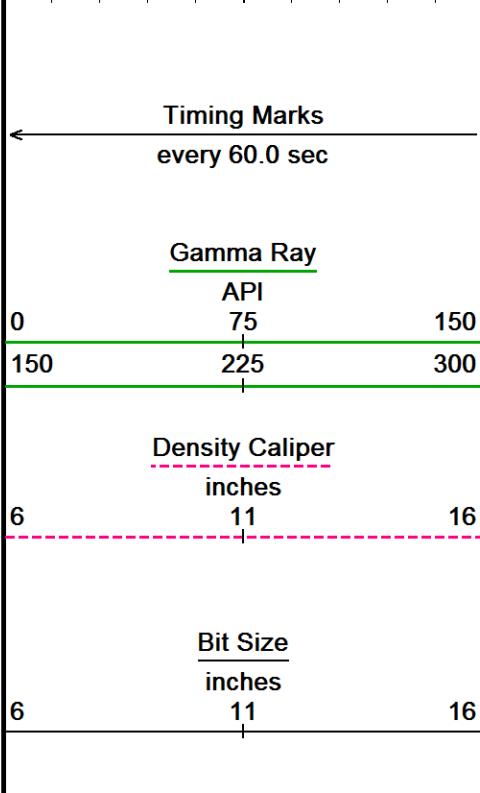
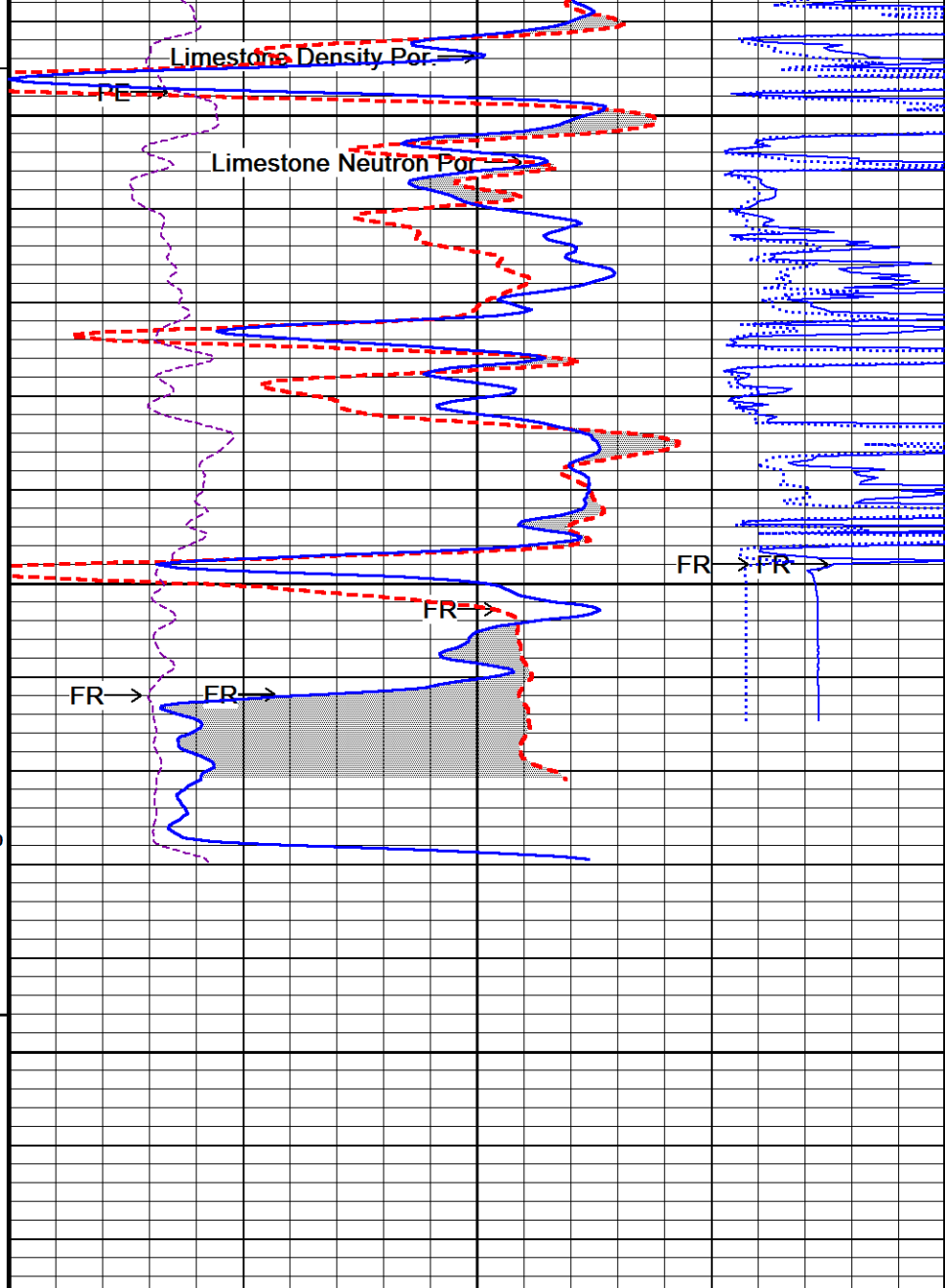
7000
159°
7050
160°
7100
161°
7150
161°
1007200







100
7450
166°
7500
0
TD
7550

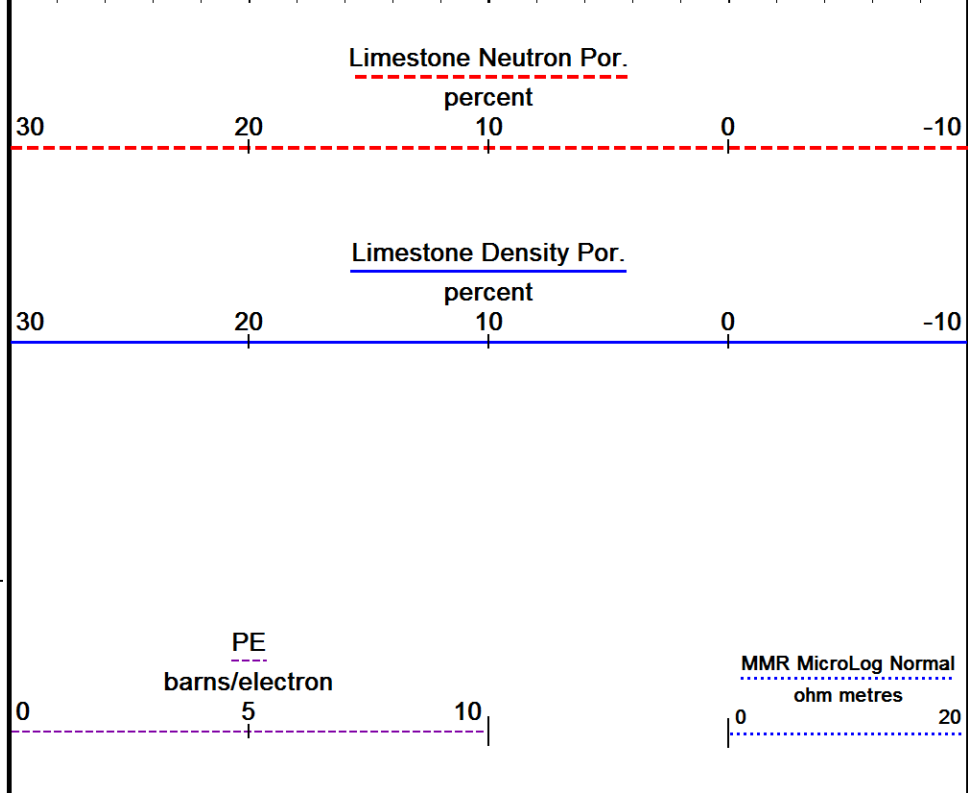


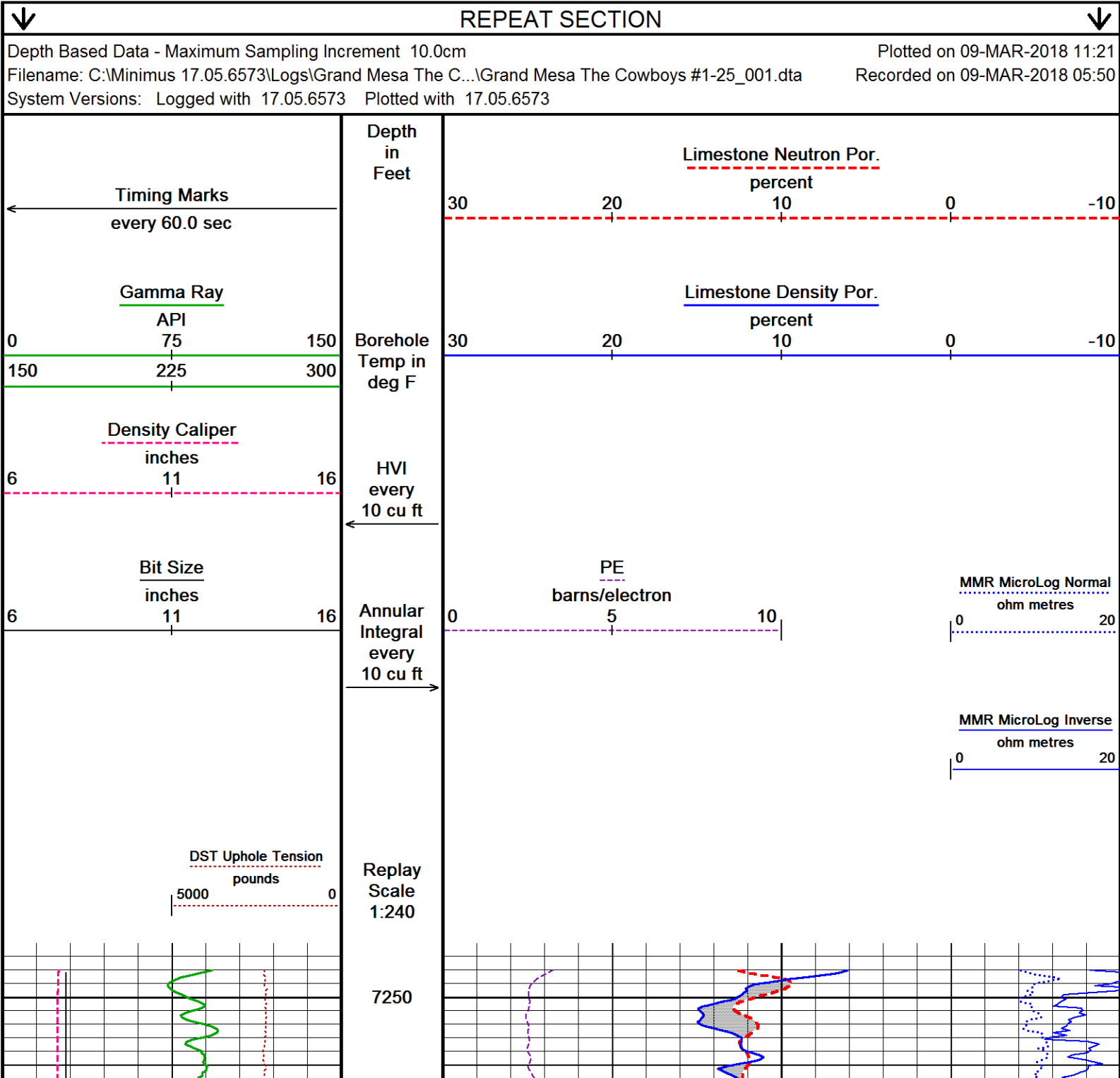
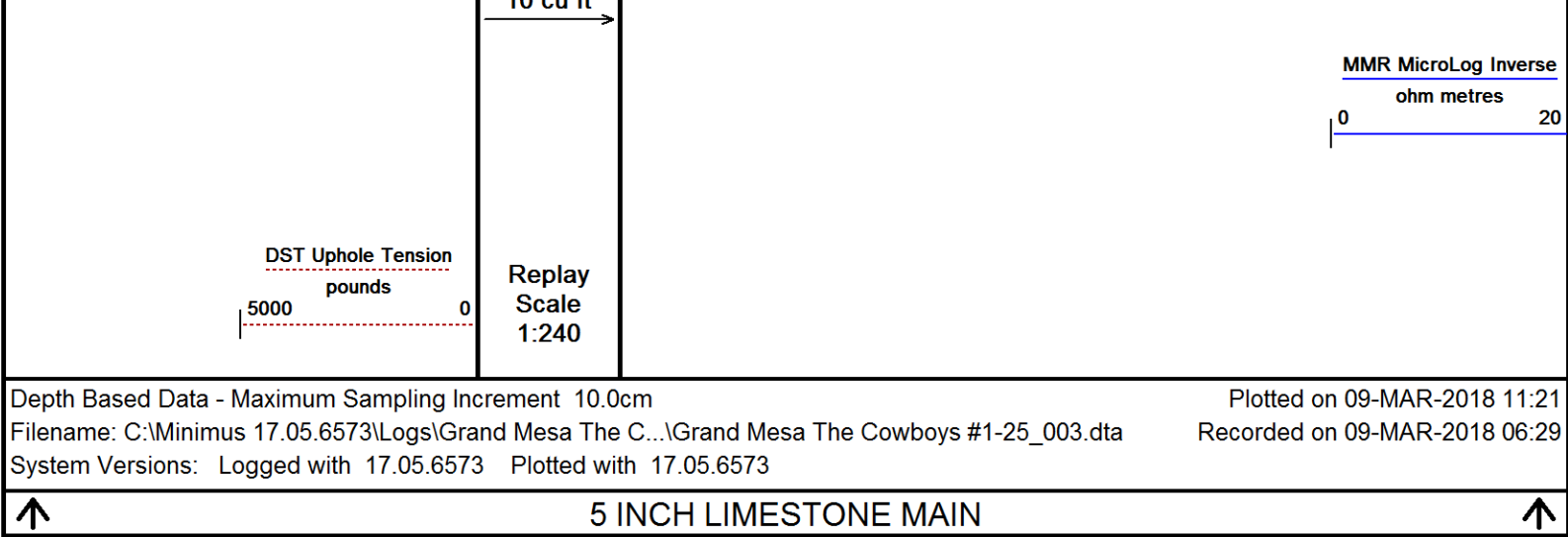
Depth
In
Feet

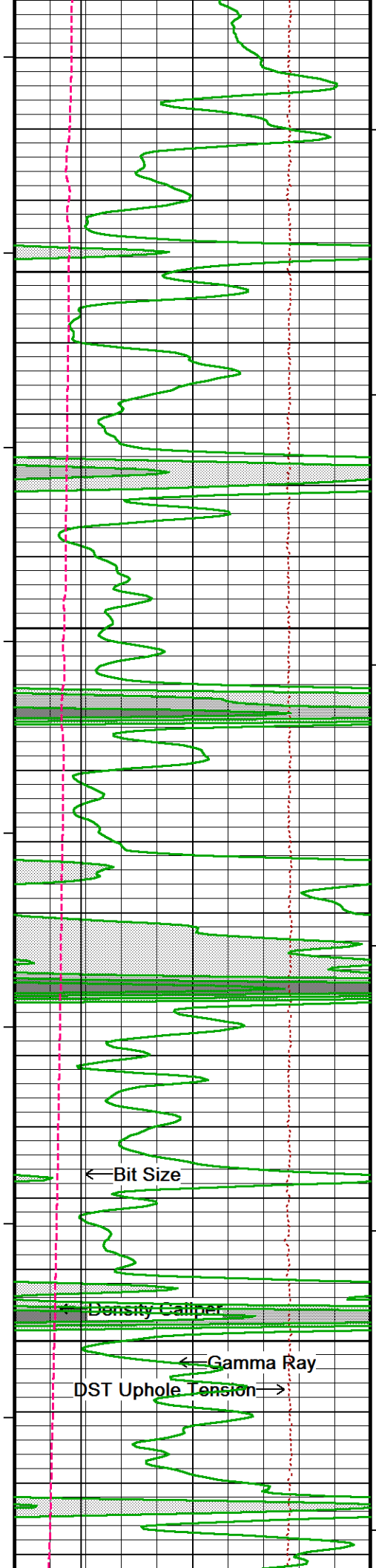
Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft







159°

7300

161°

7350

163°

7400

165°

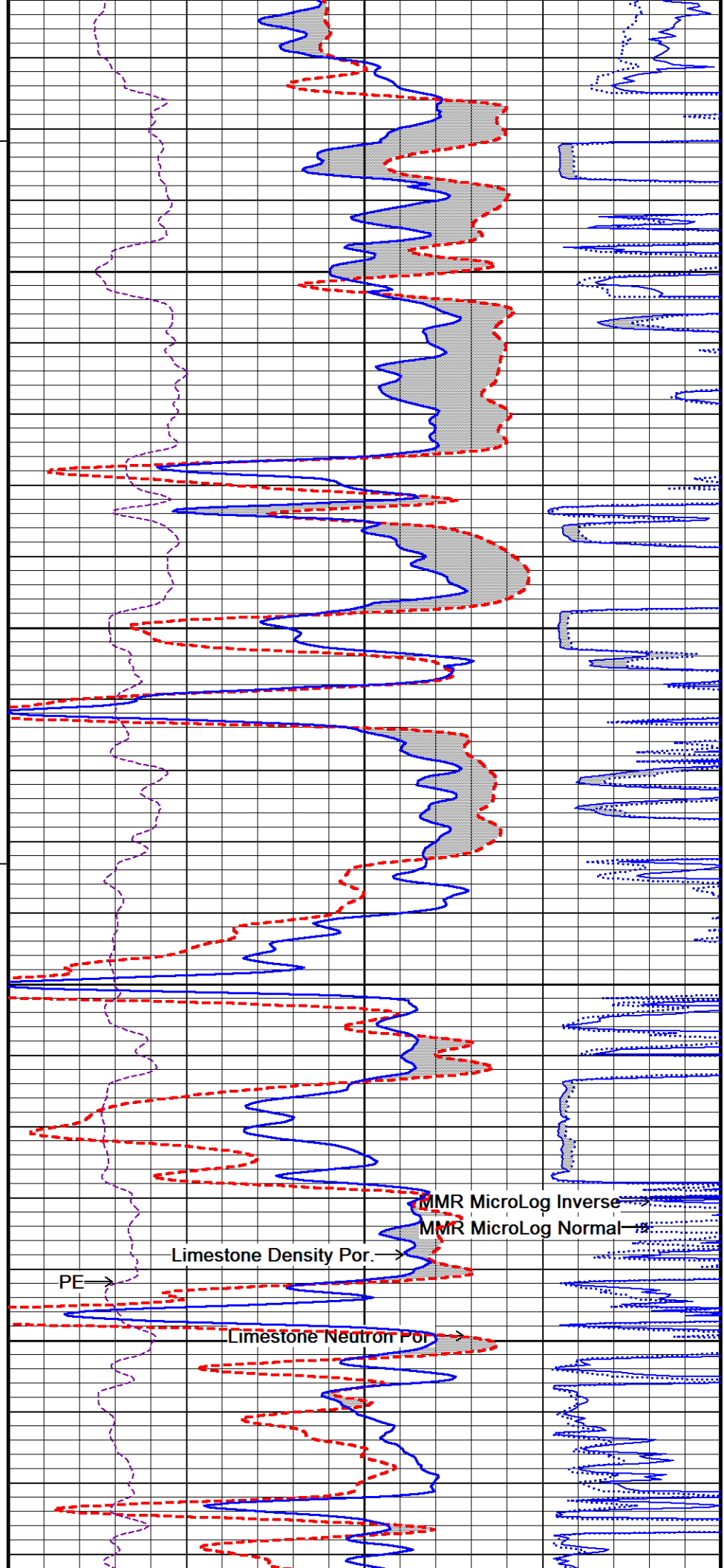
7450

← Bit Size

← Density Caliper

← Gamma Ray

DST Uphole Tension →



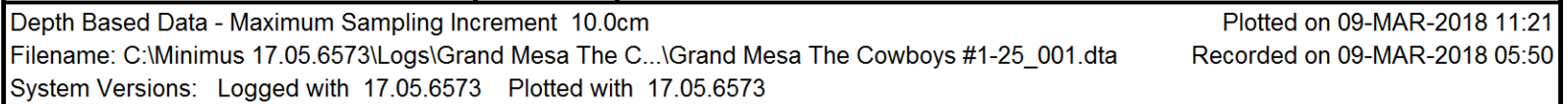
PE →

Limestone Density Por. →

Limestone Neutron Por. →

MMR MicroLog Inverse →

MMR MicroLog Normal →



↓

5 INCH BULK DENSITY MAIN

↓

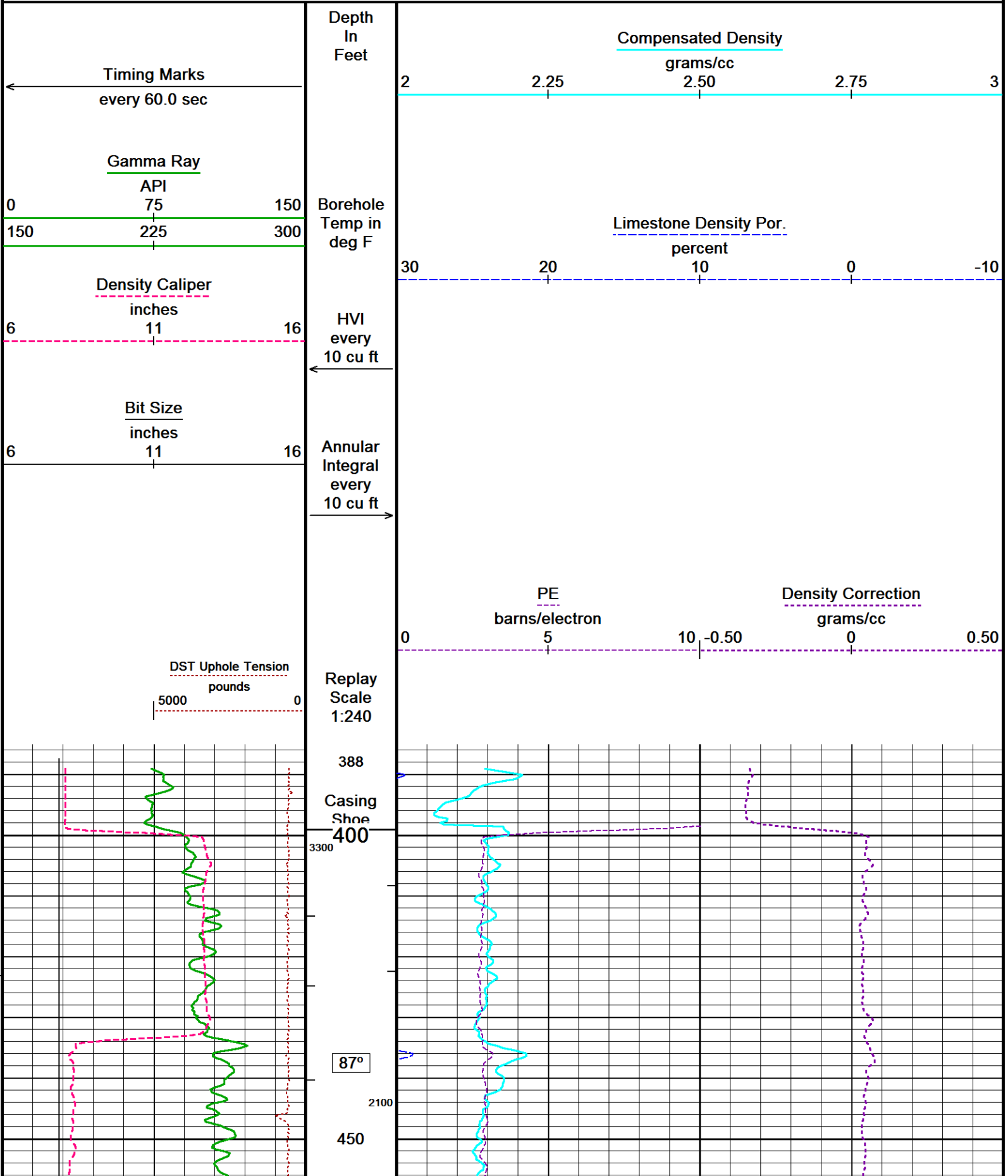
Depth Based Data - Maximum Sampling Increment 10.0cm

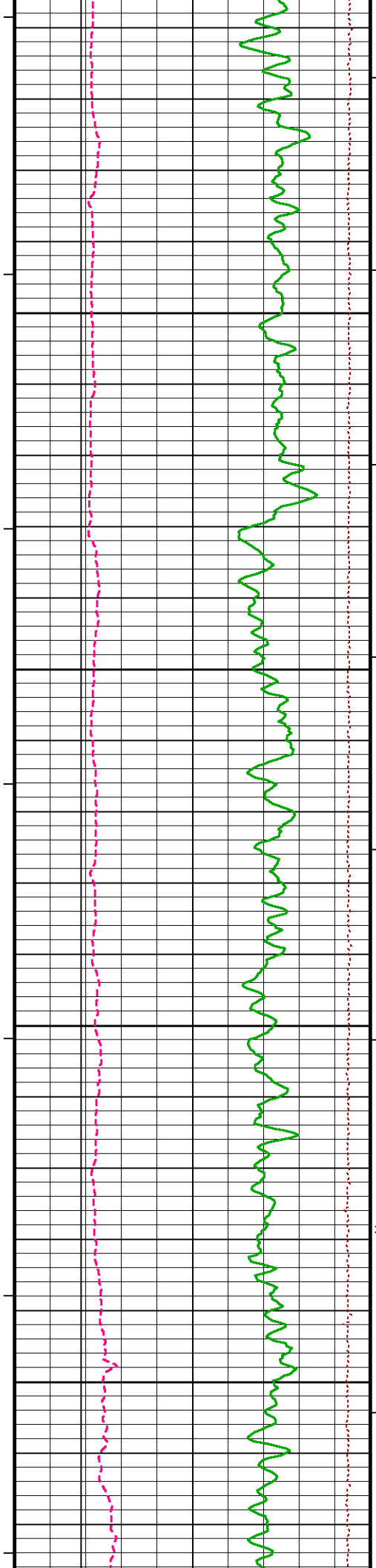
Plotted on 09-MAR-2018 11:21

Filename: C:\Minimus 17.05.6573\Logs\Grand Mesa The C...\Grand Mesa The Cowboys #1-25_003.dta

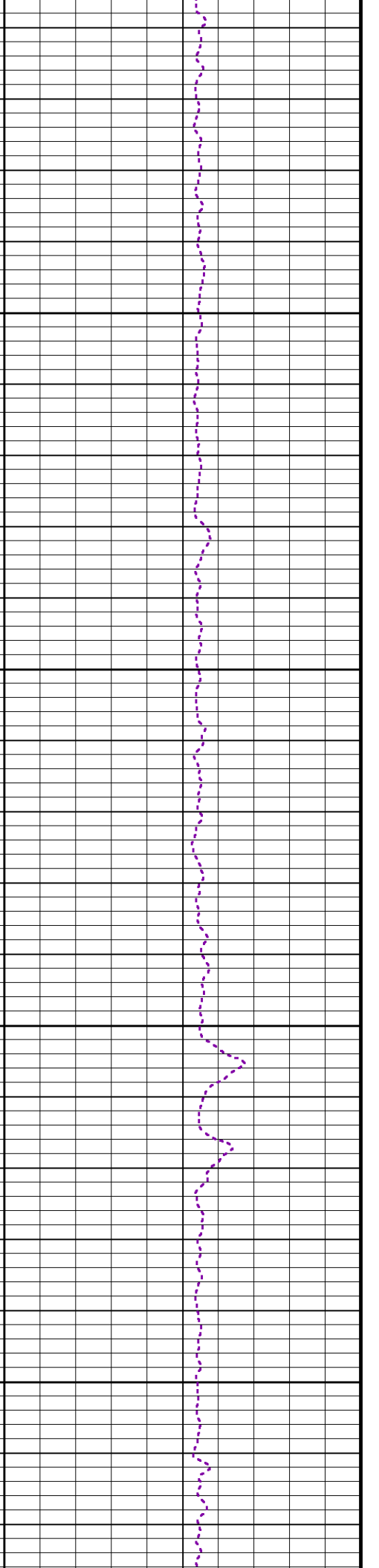
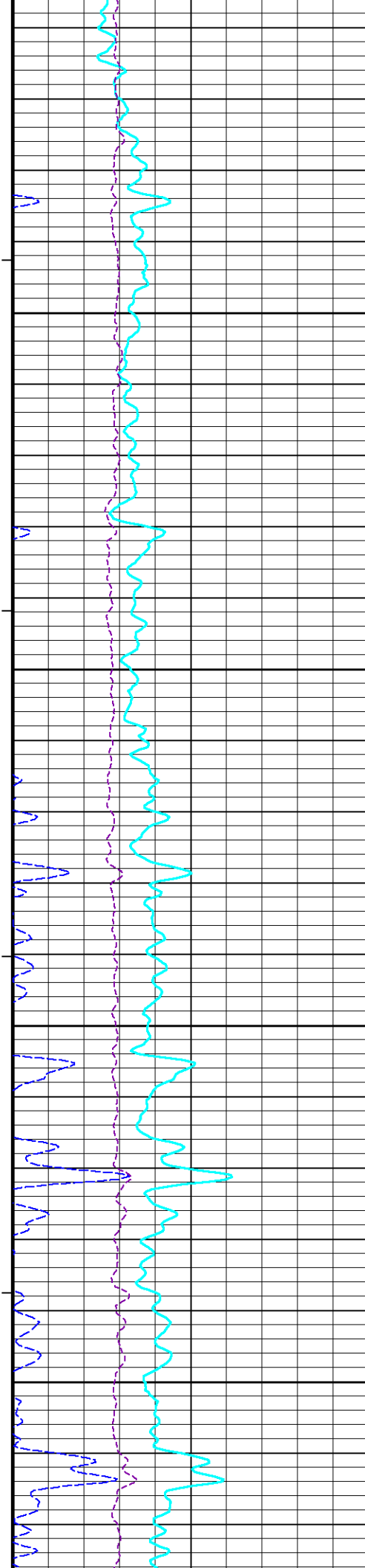
Recorded on 09-MAR-2018 06:29

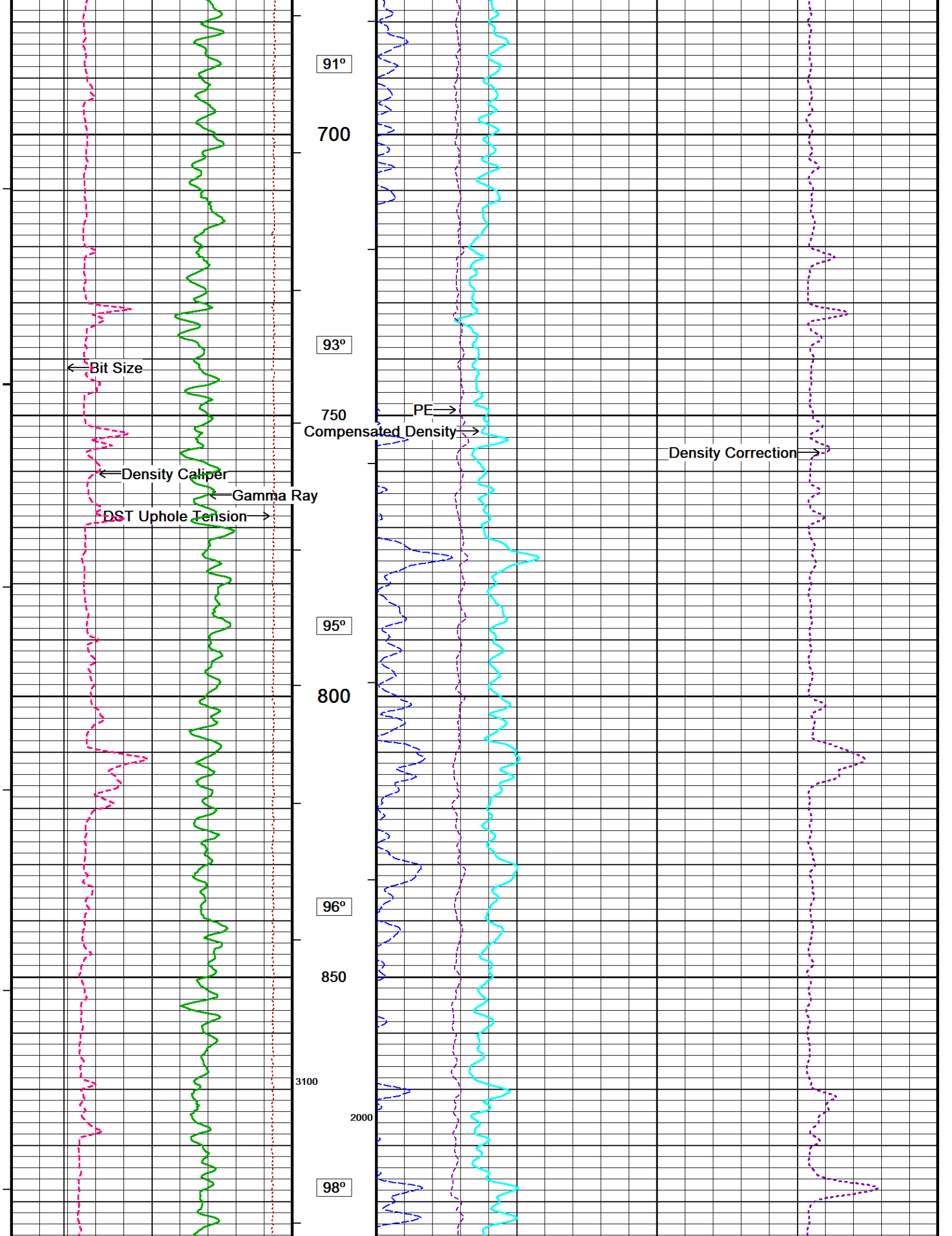
System Versions: Logged with 17.05.6573 Plotted with 17.05.6573

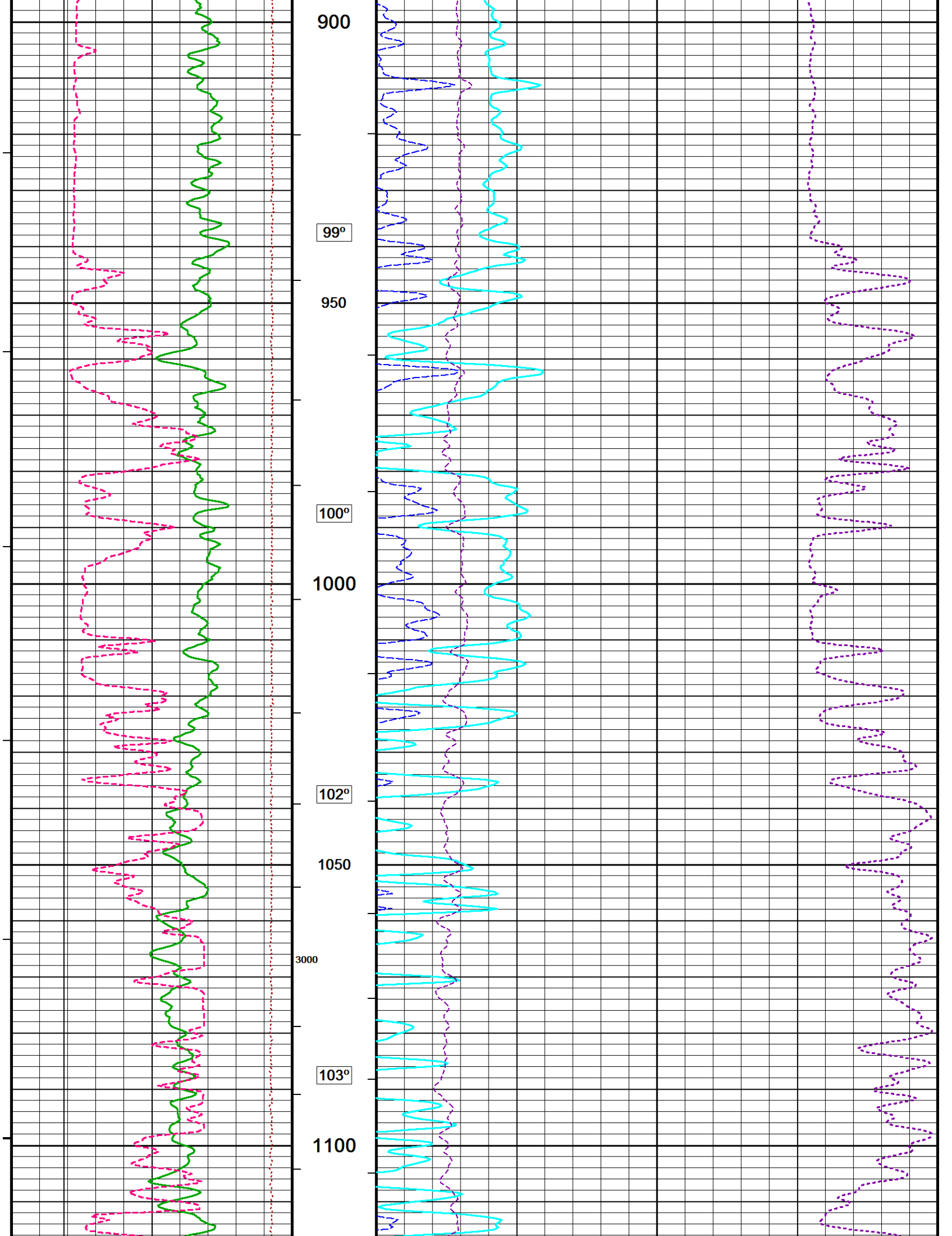


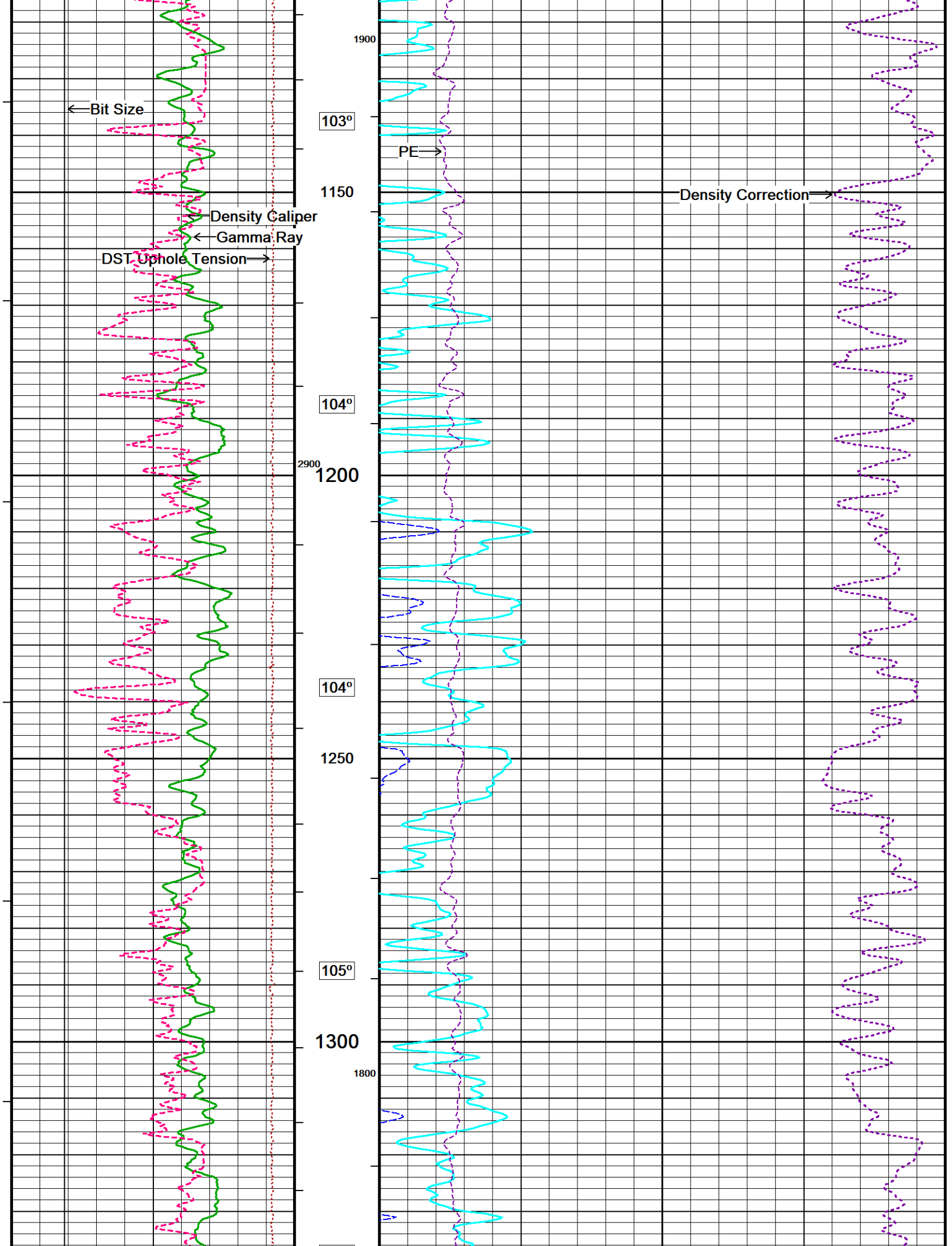


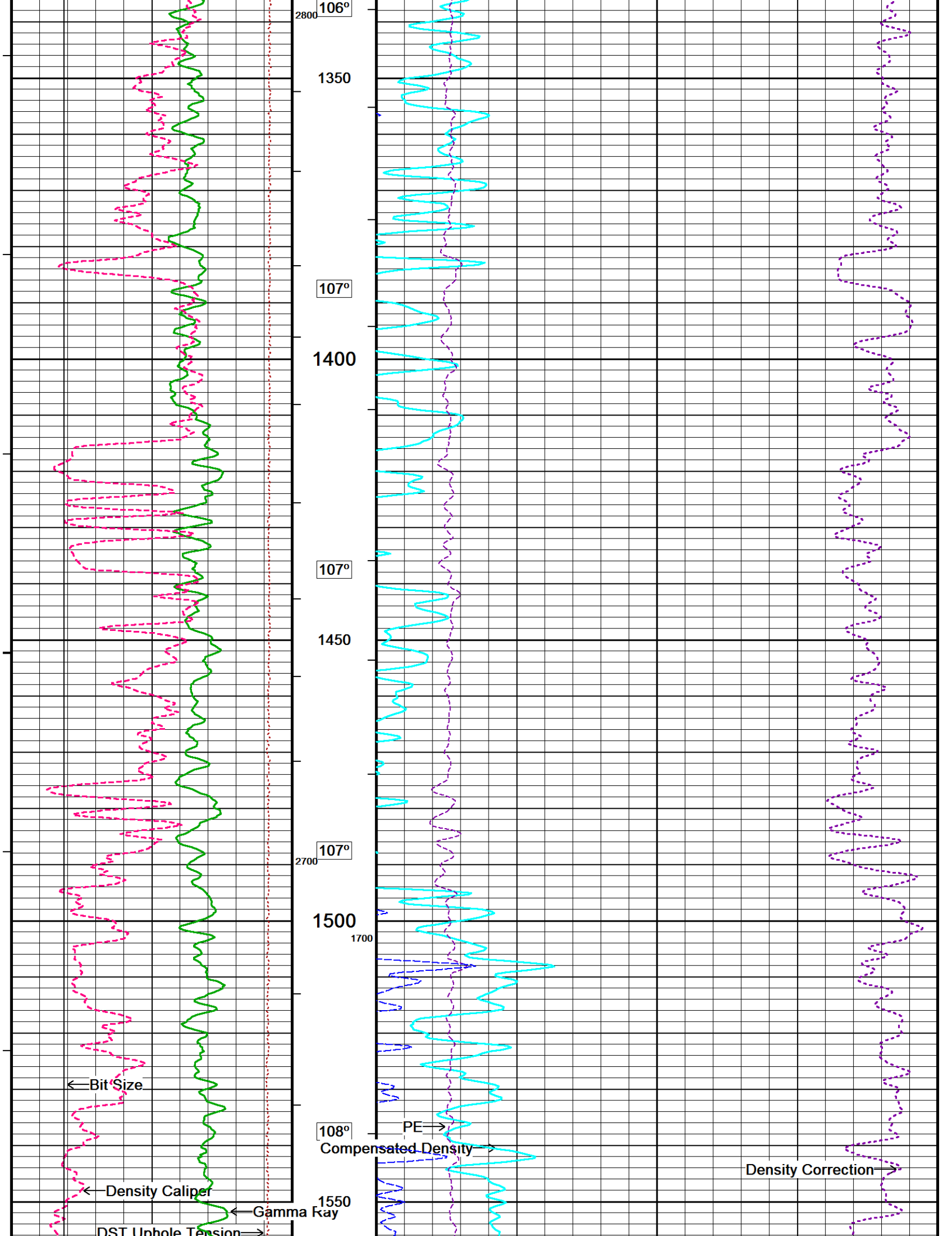
88°
500
89°
550
89°
600
3200
90°
650

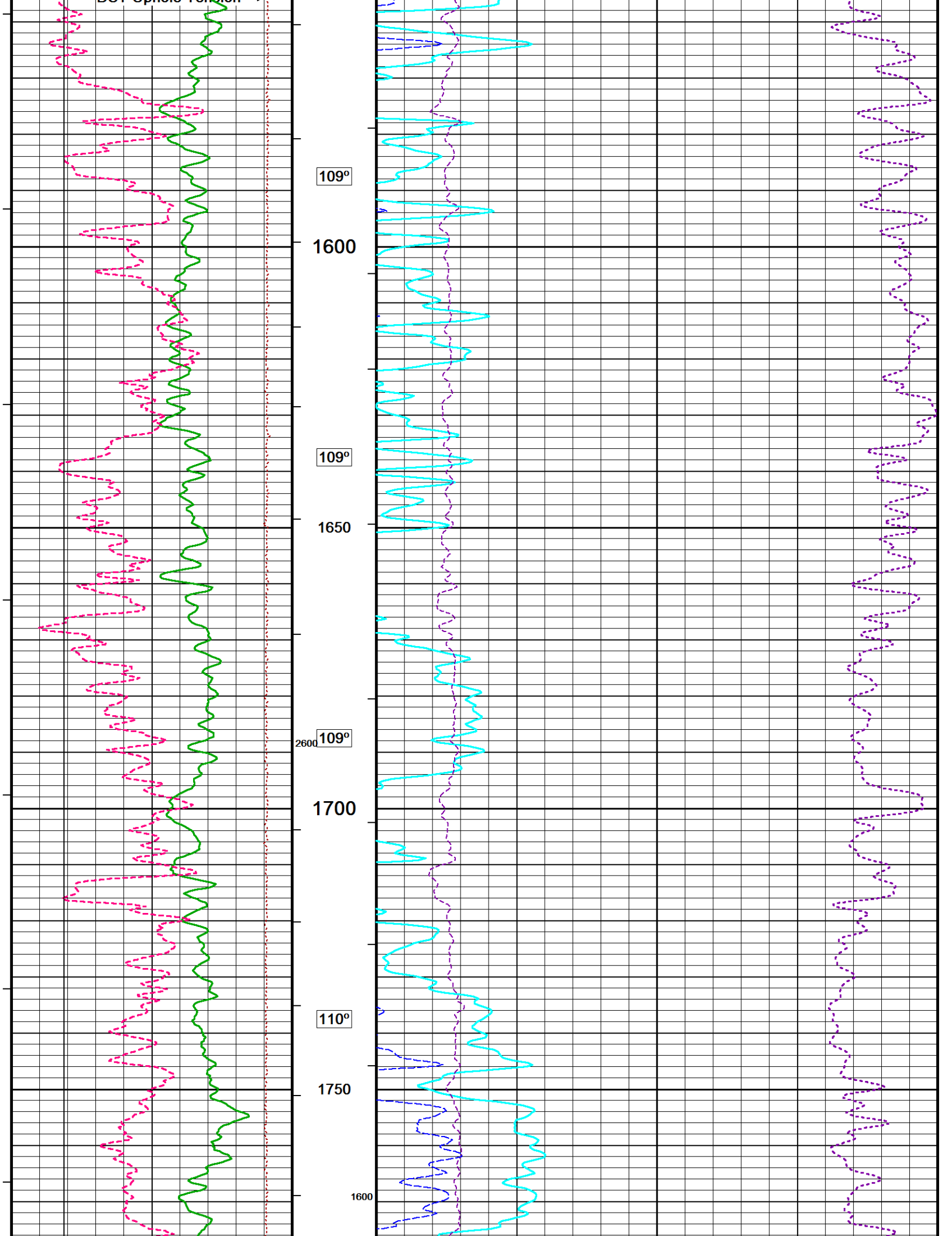


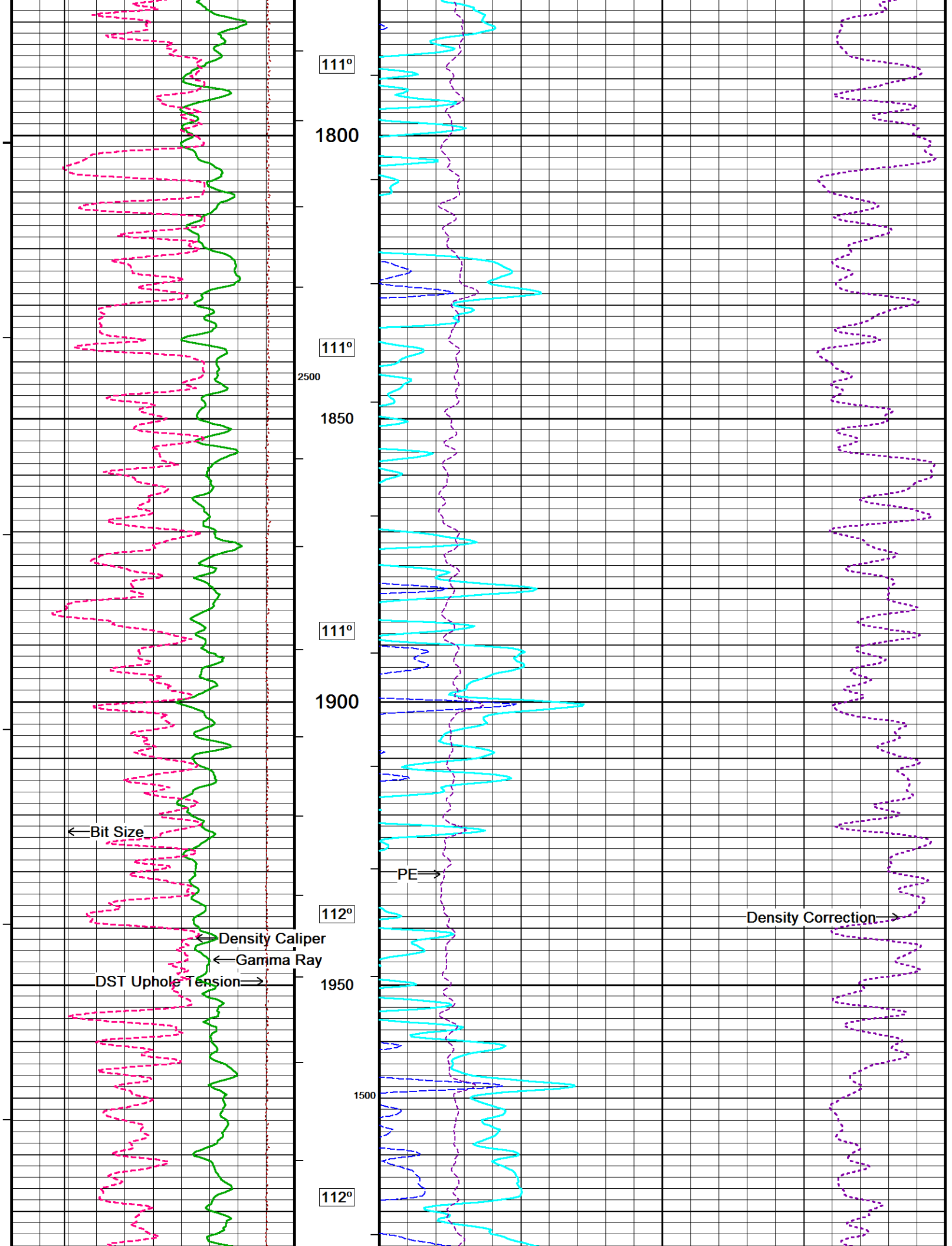


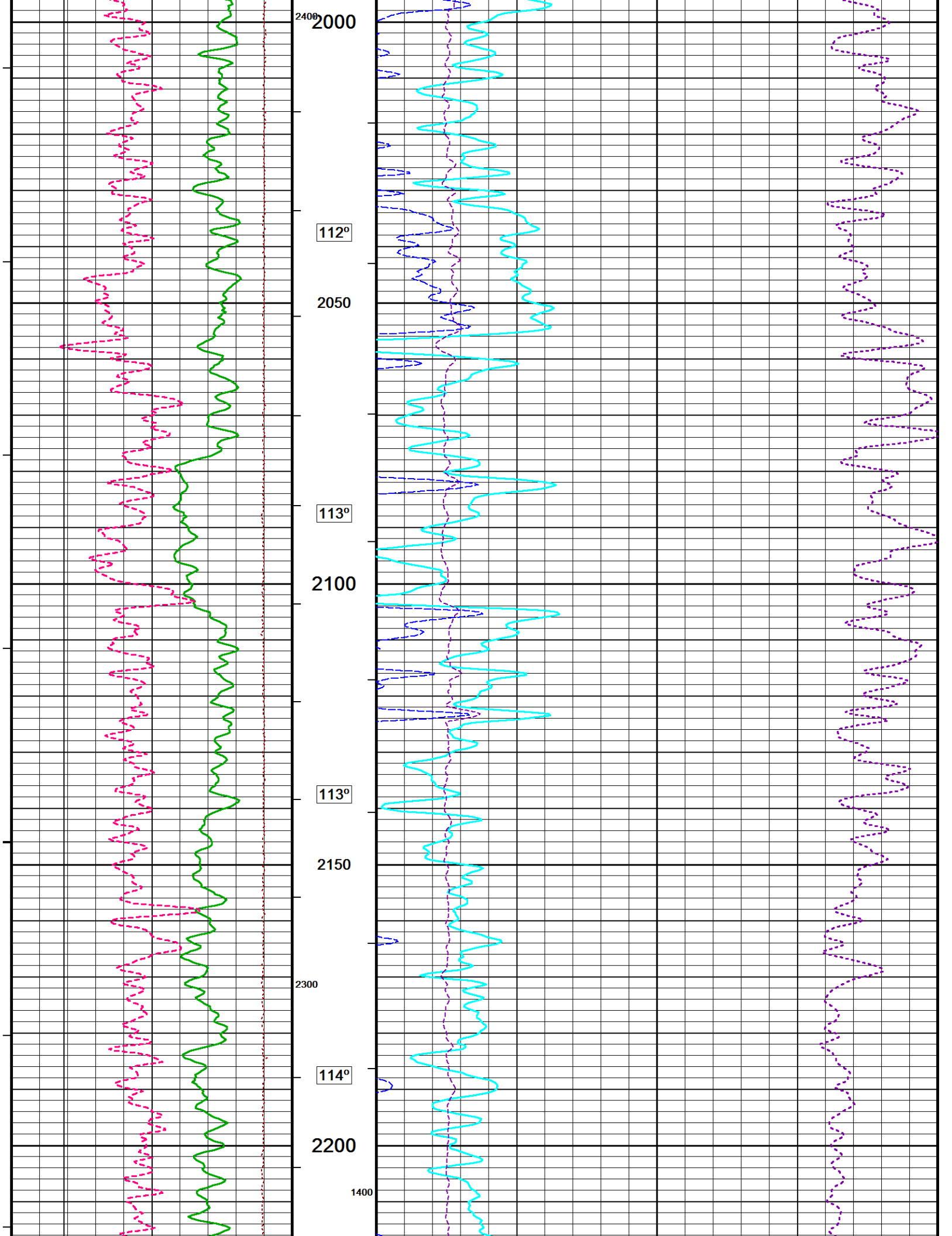


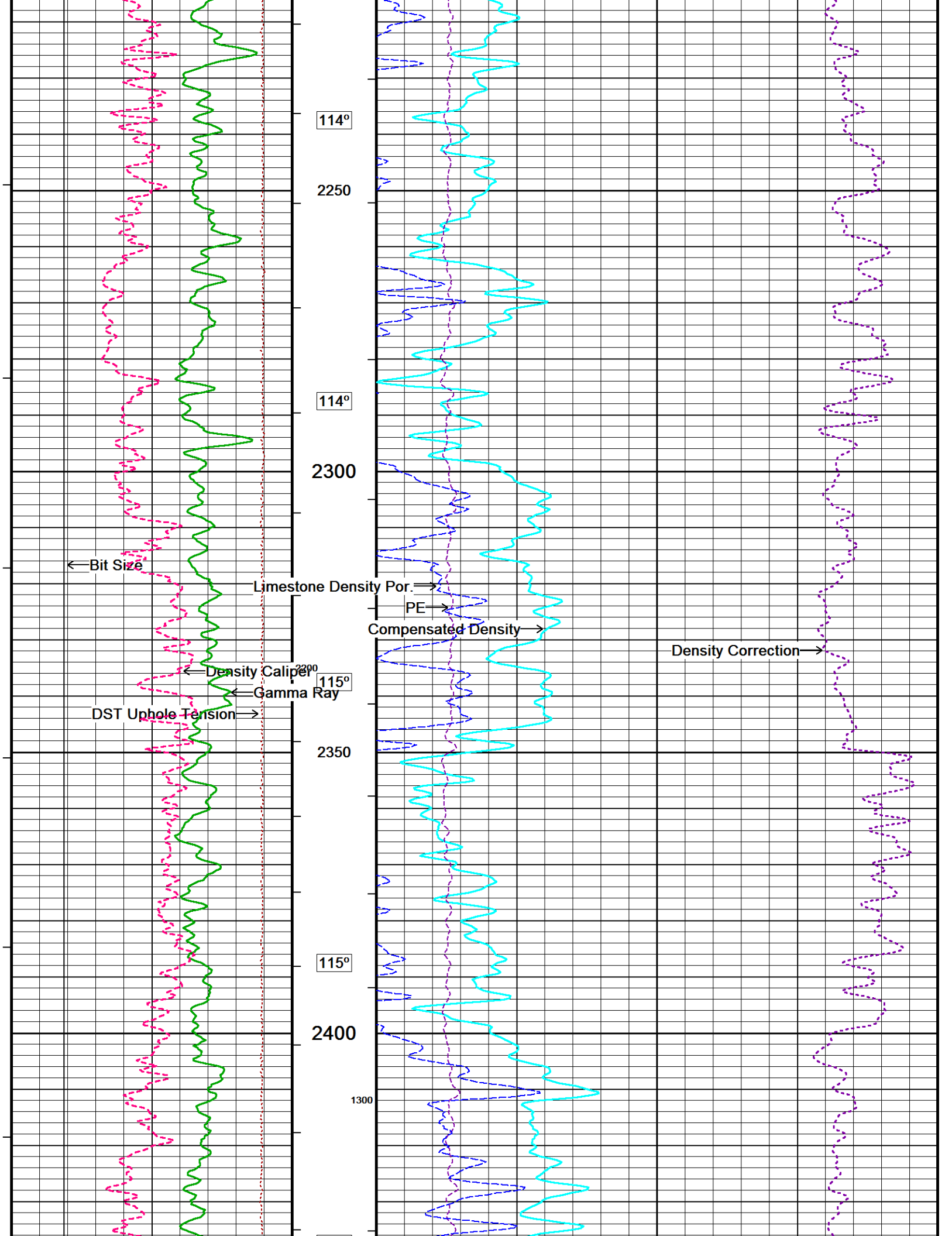


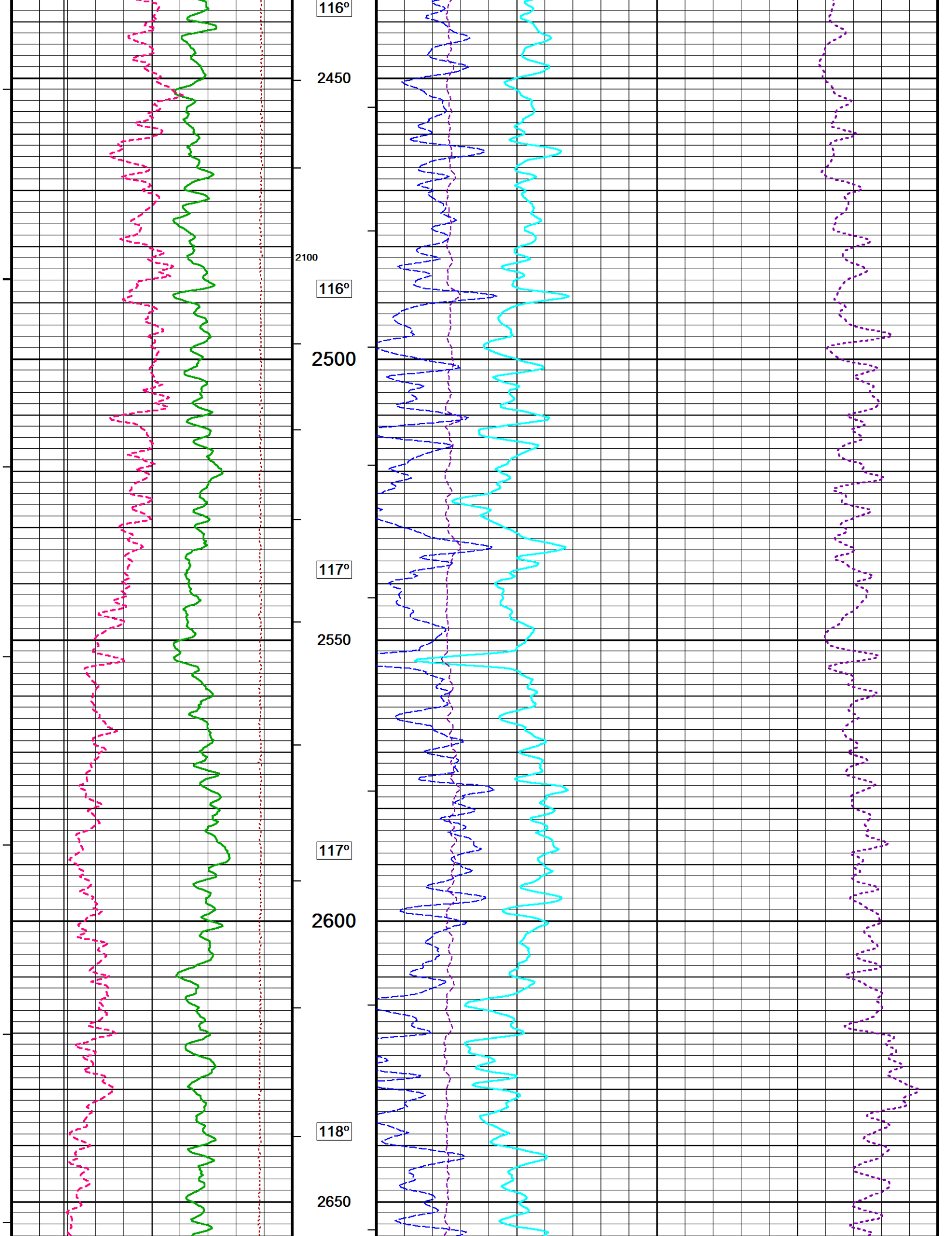


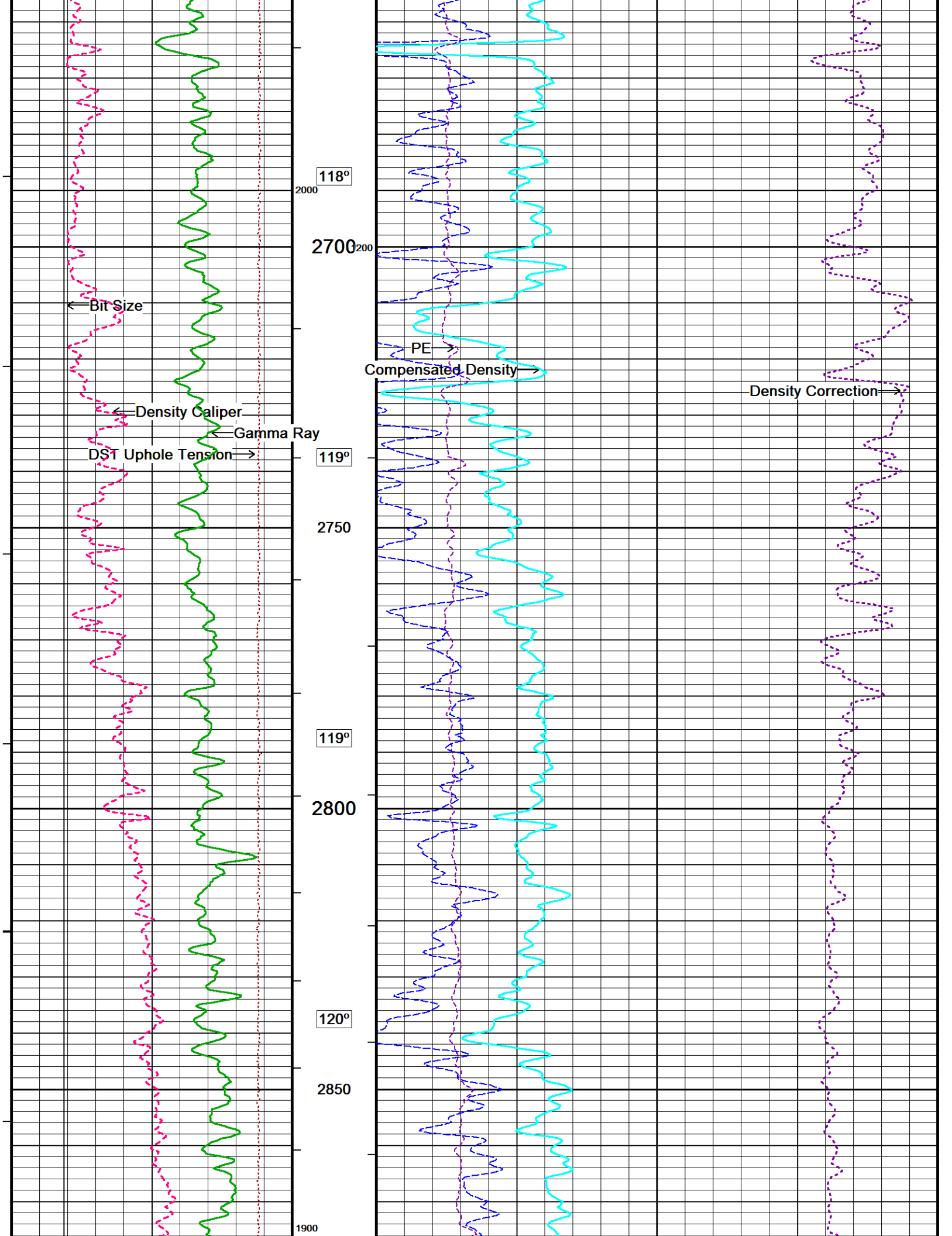


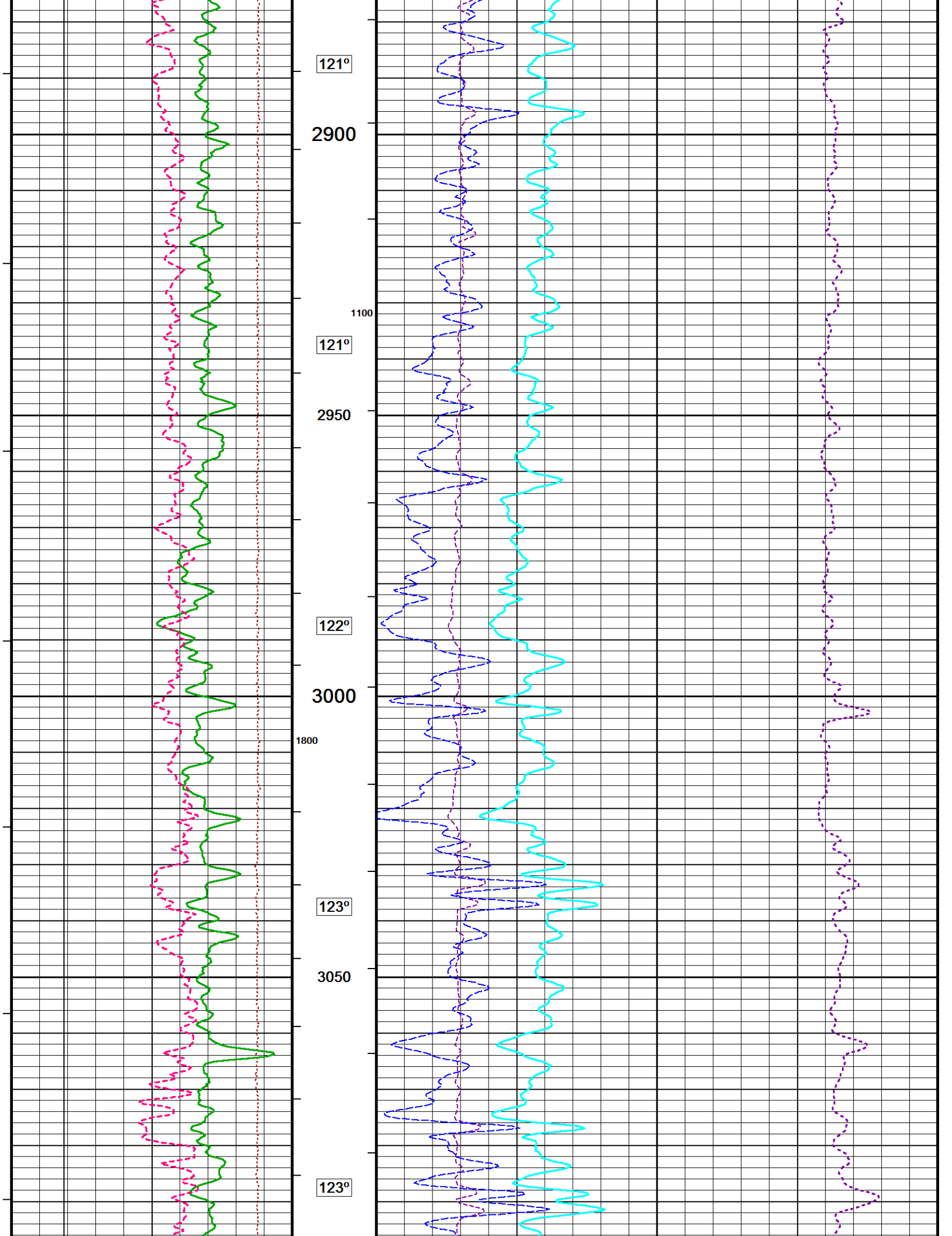


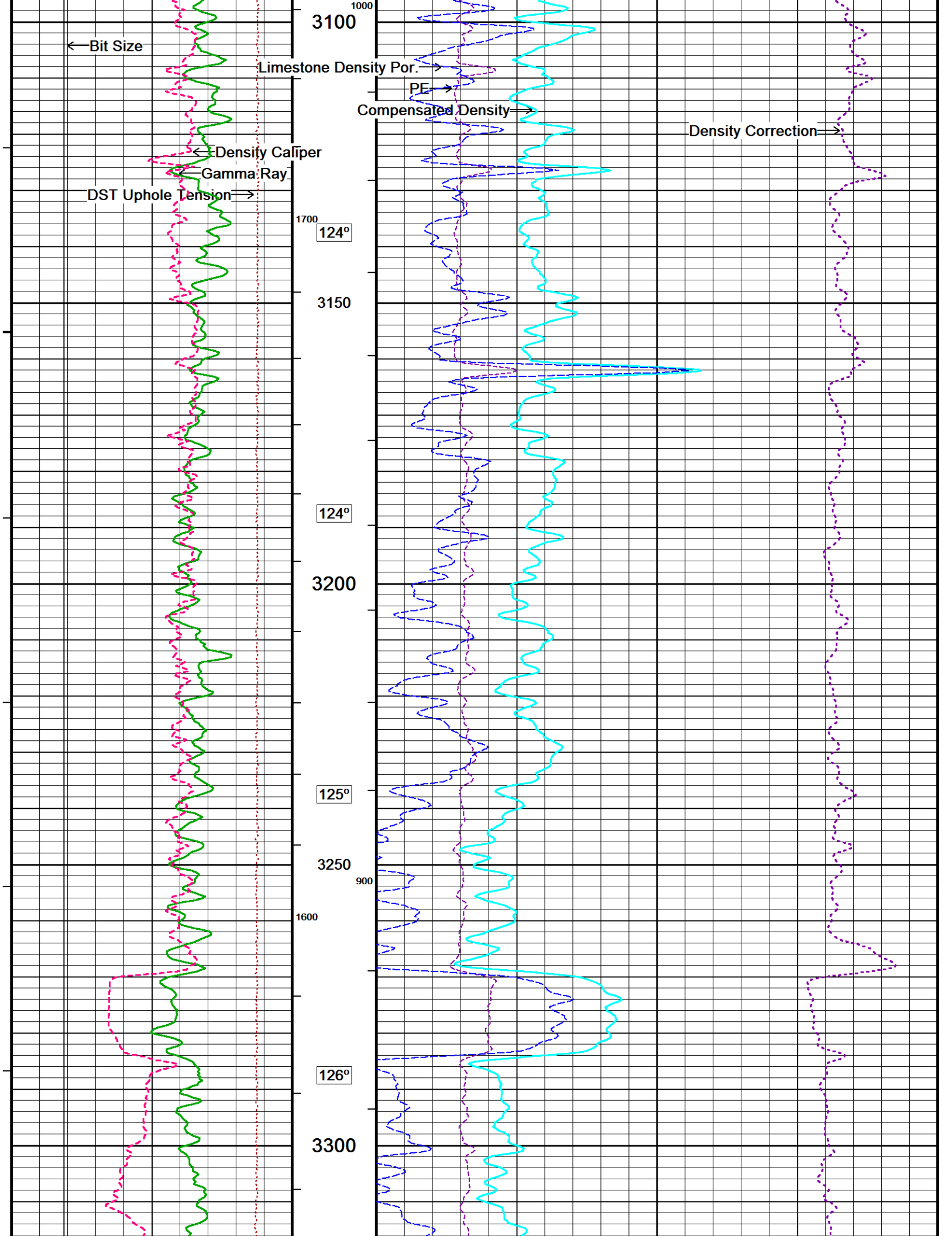


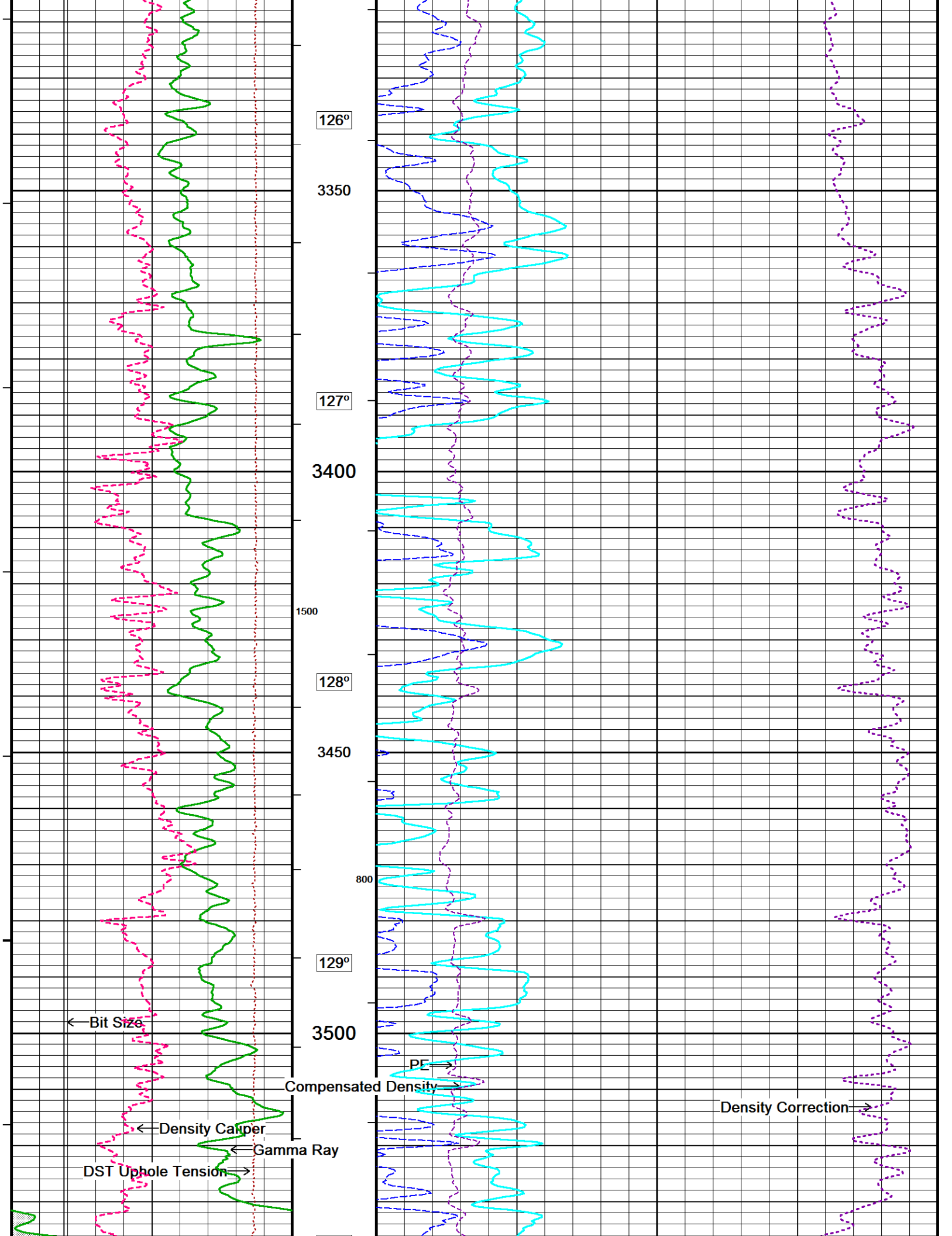


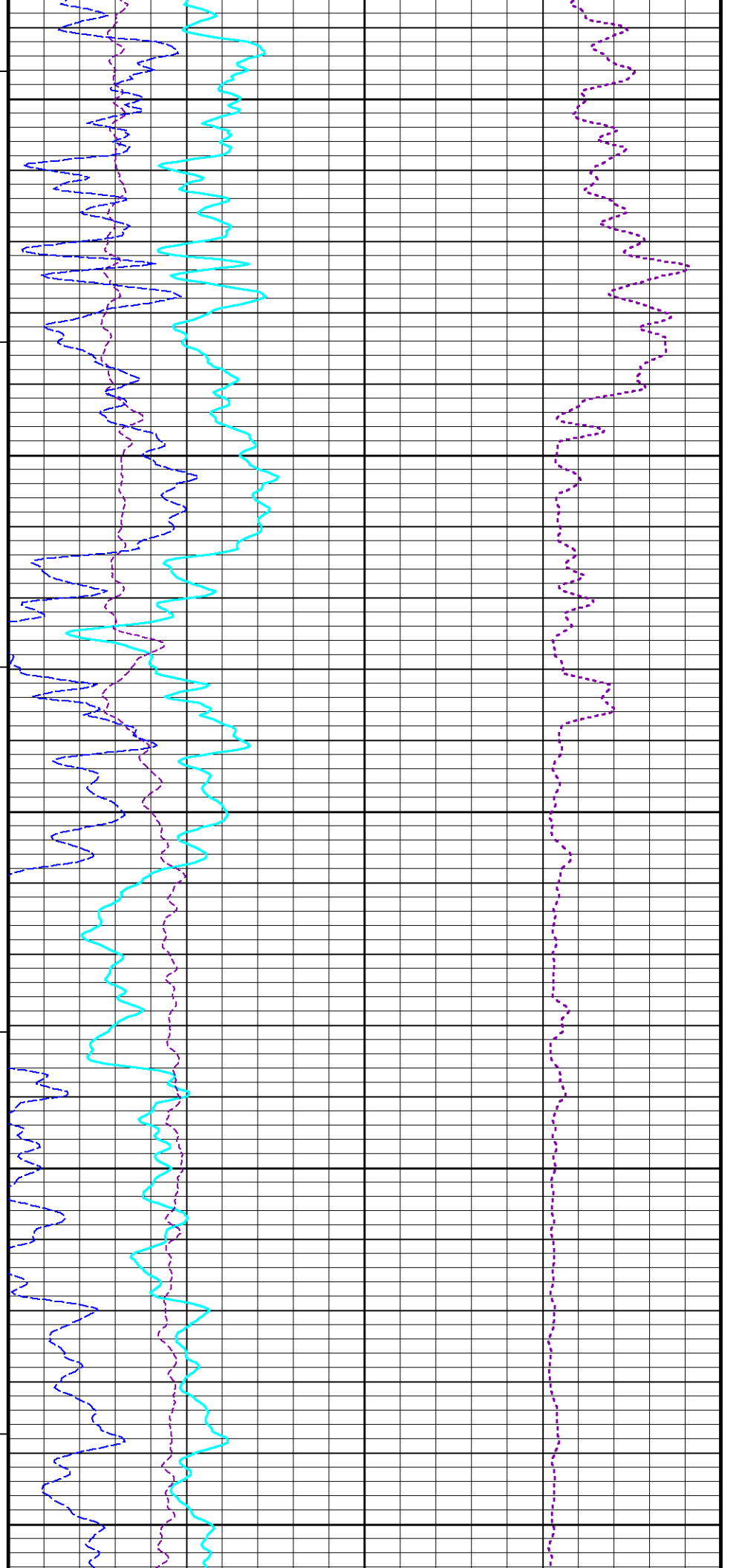
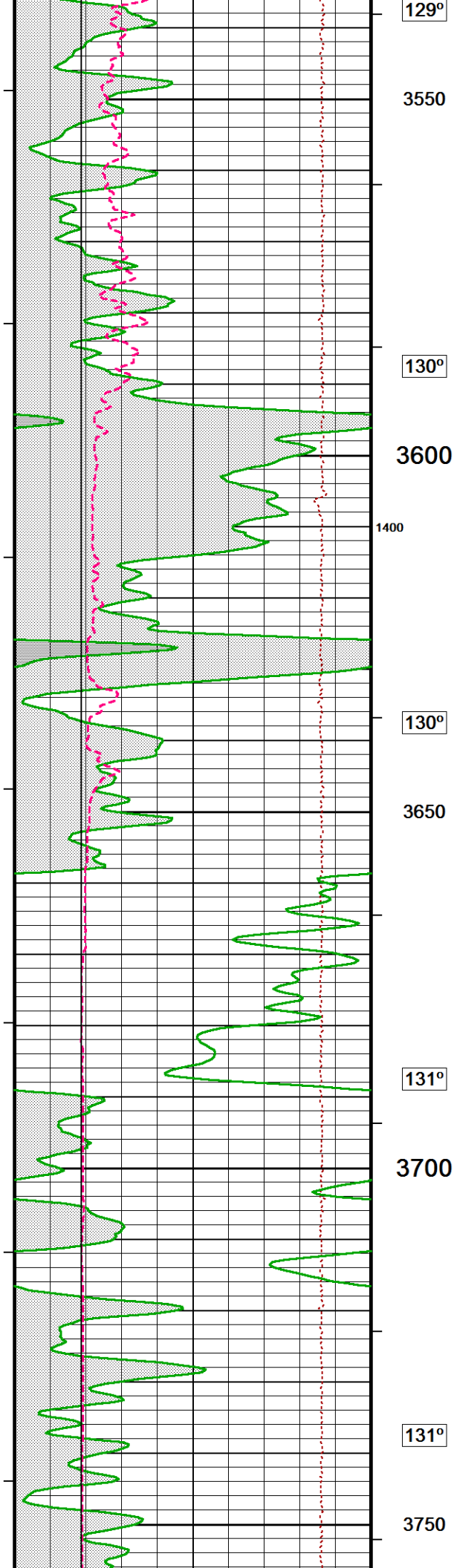


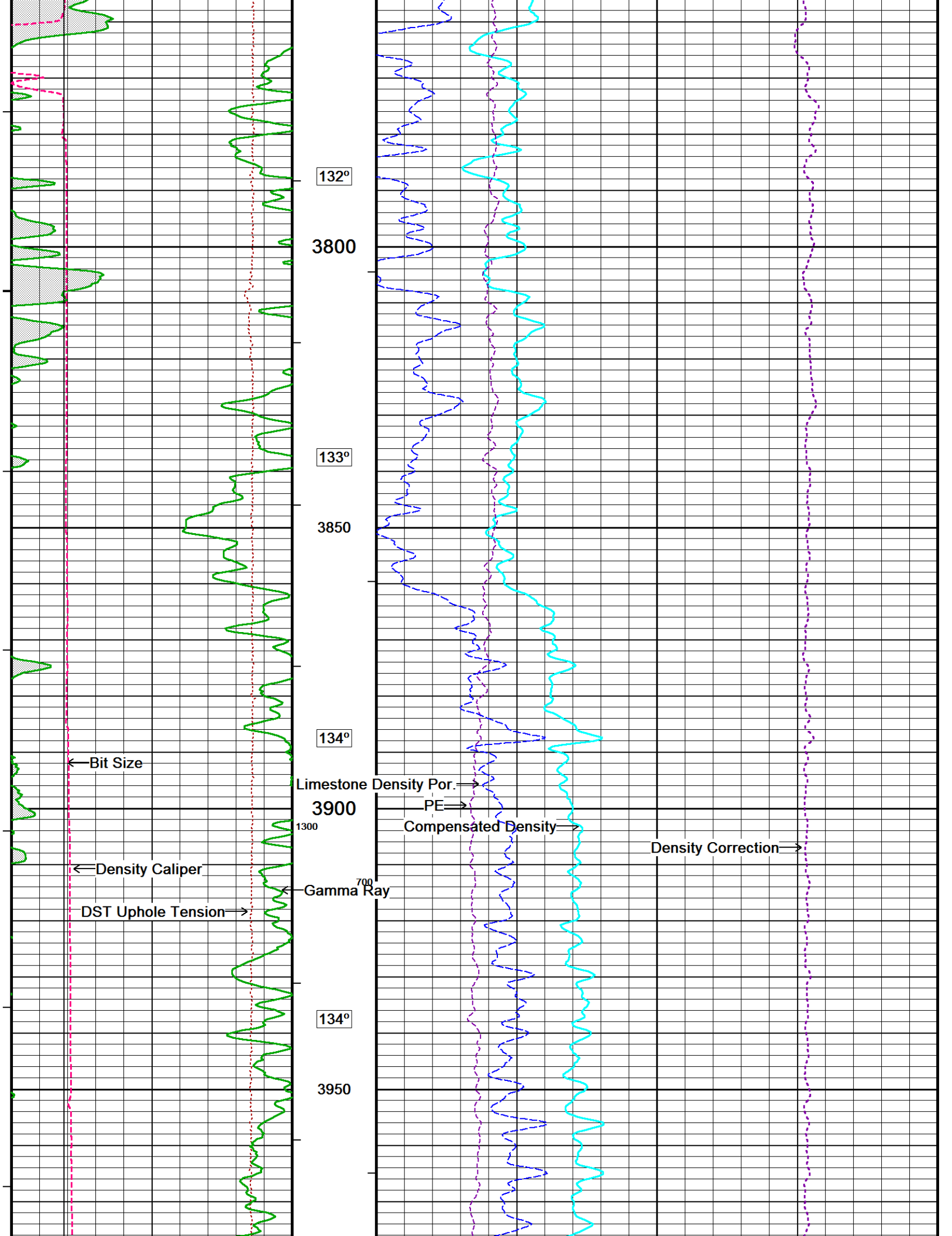


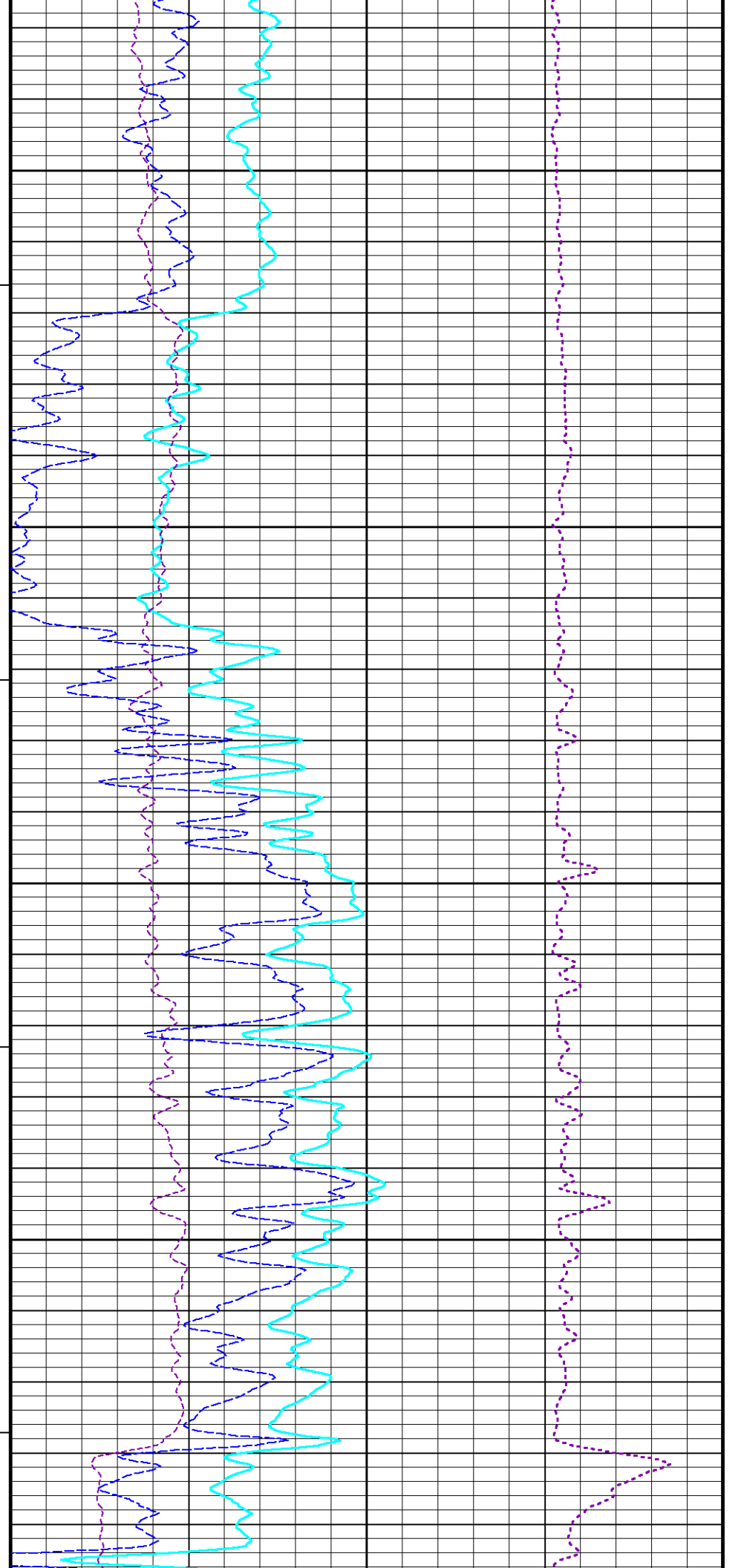
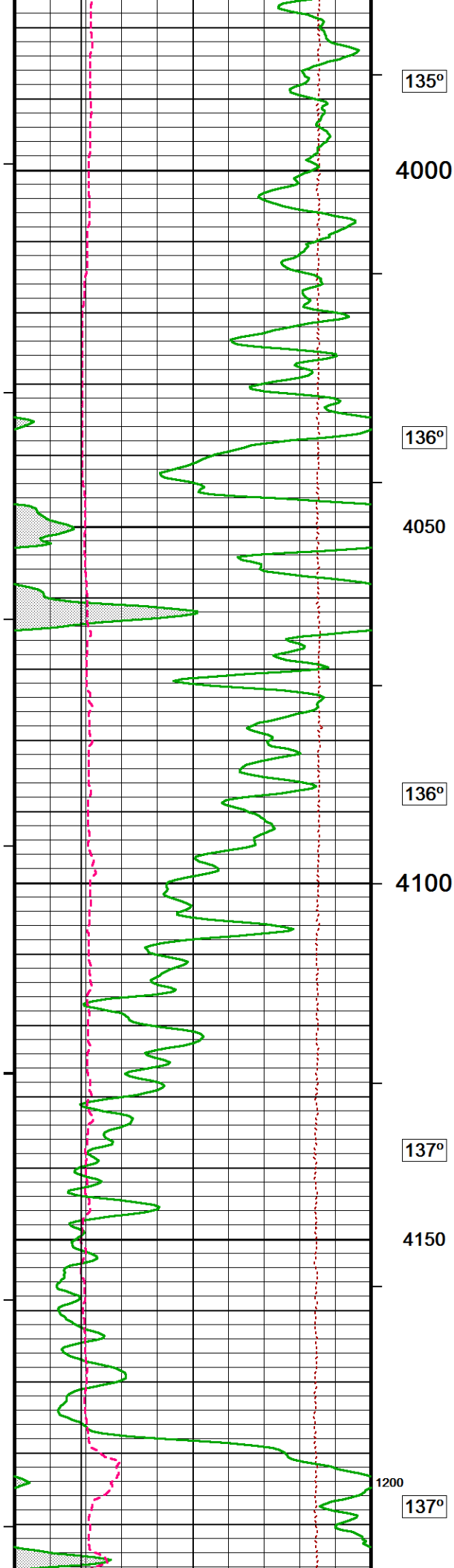


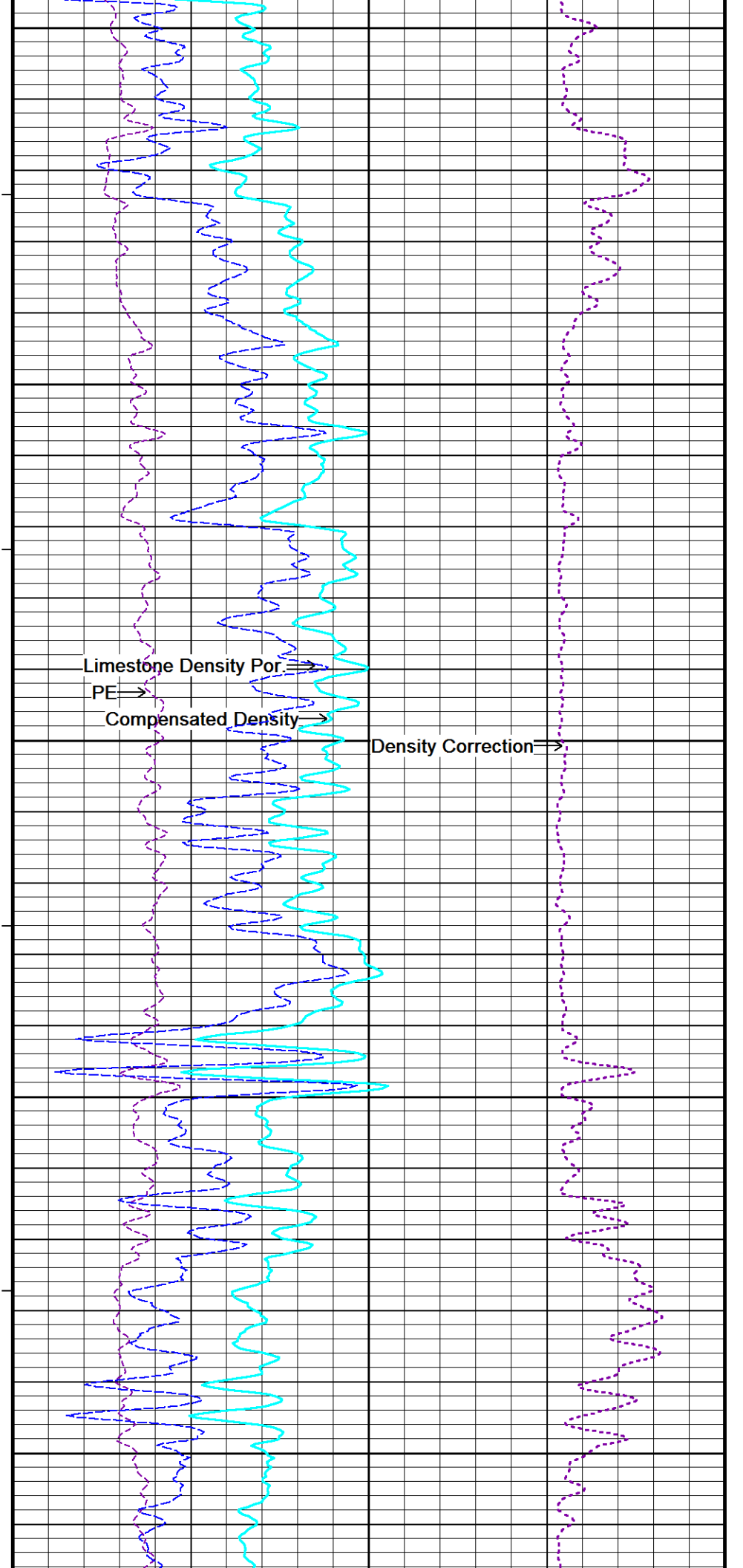
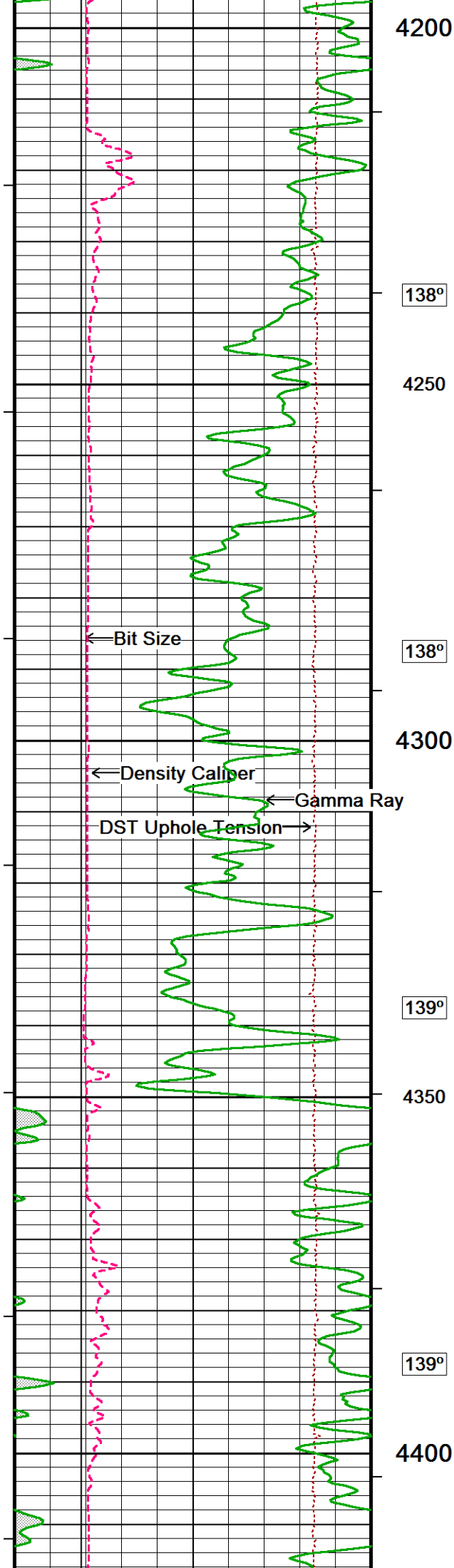


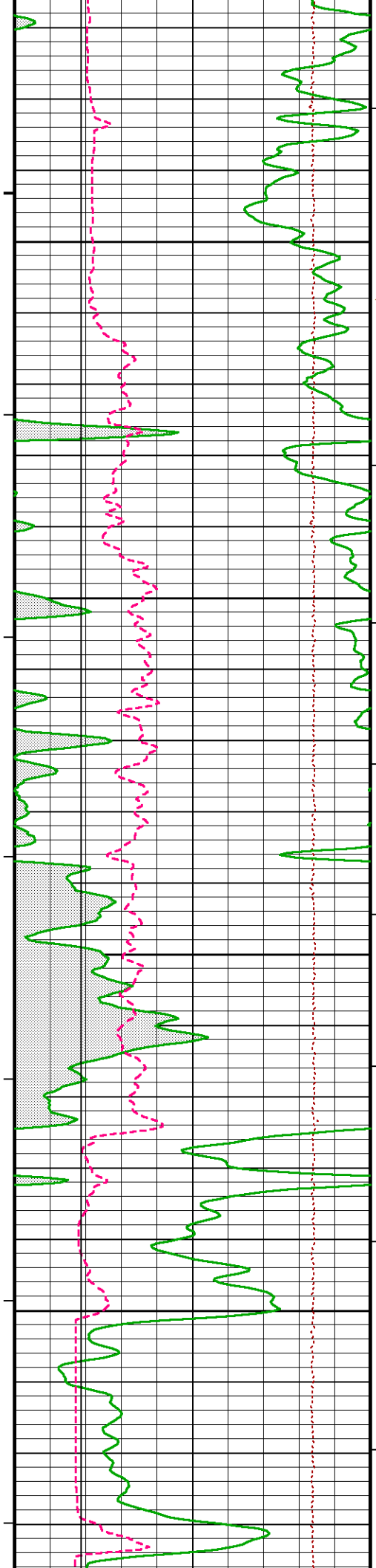




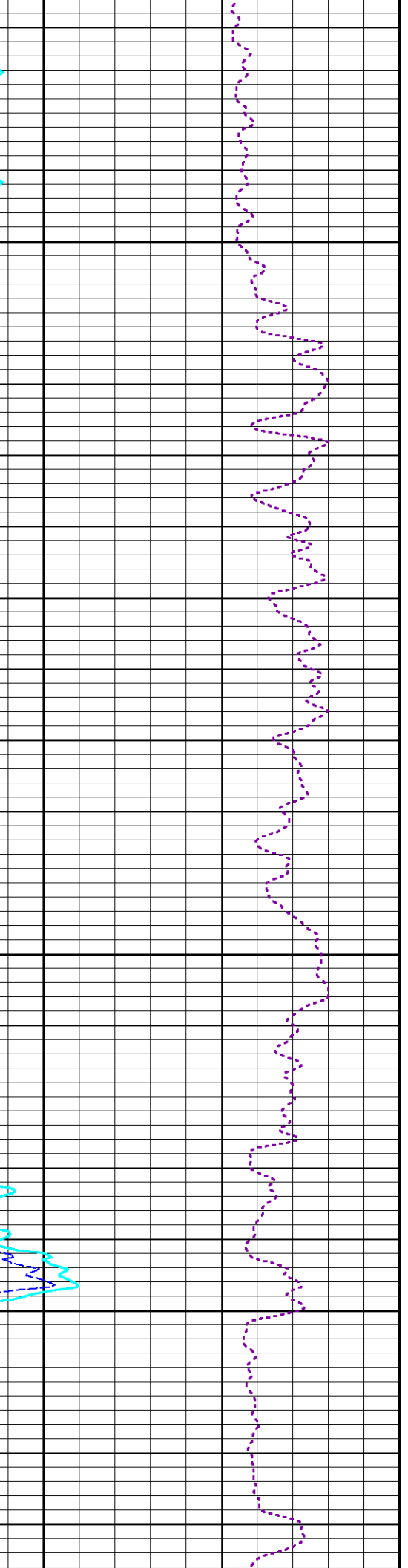
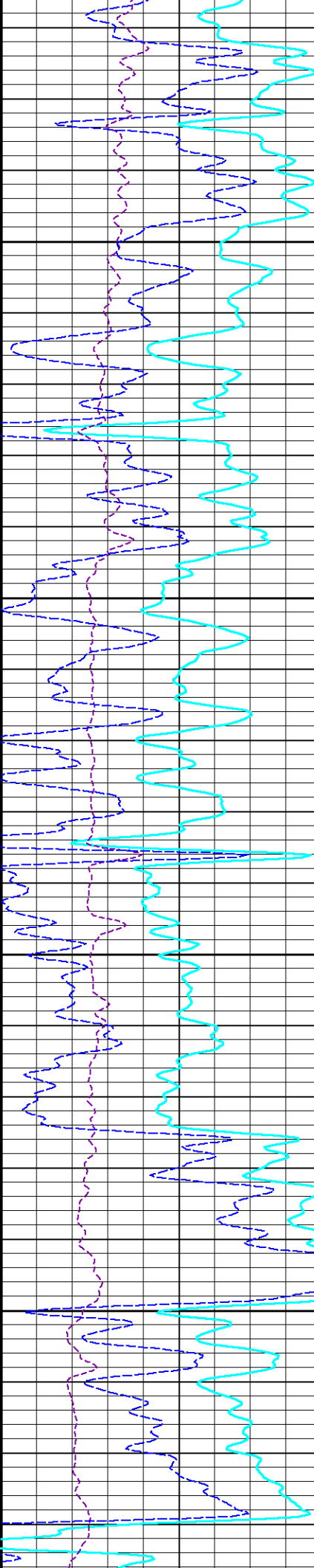


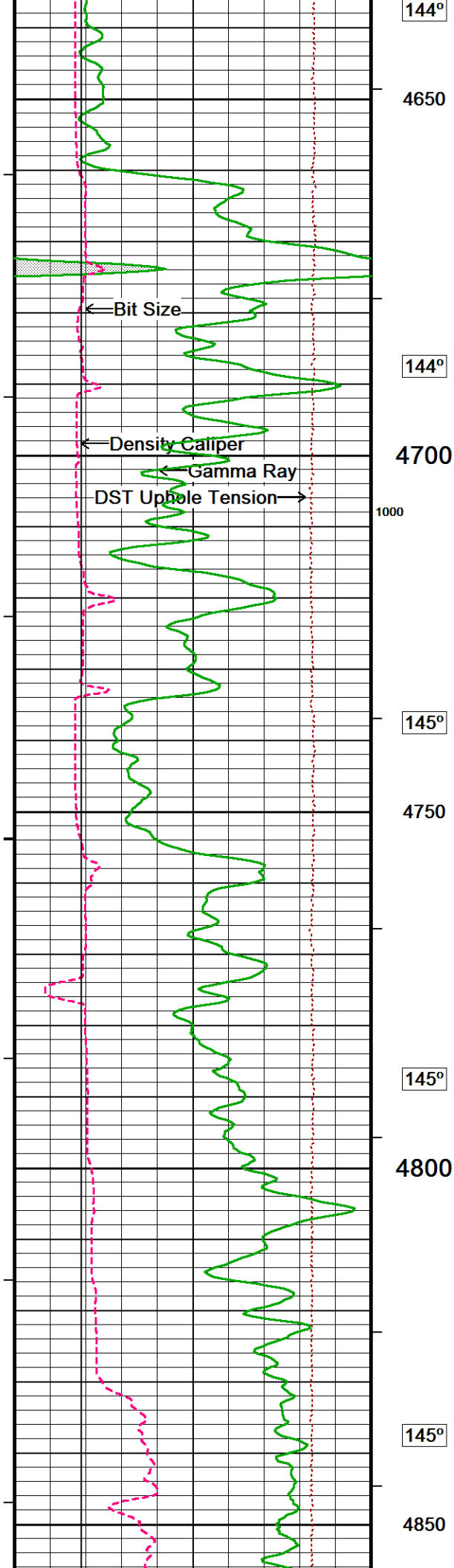






600
140°
4450
1100
141°
4500
142°
4550
143°
4600





144°

4650

144°

4700

1000

145°

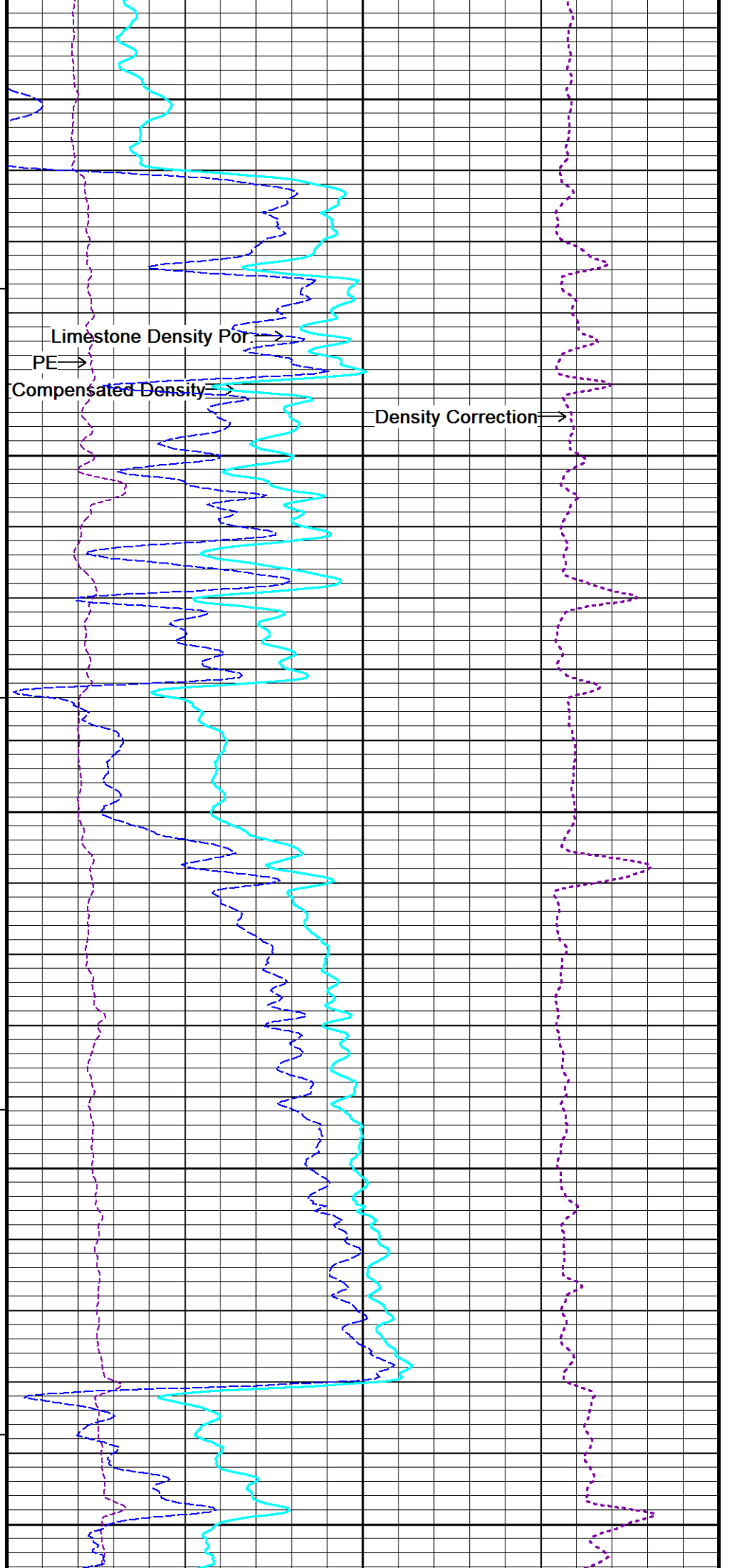
4750

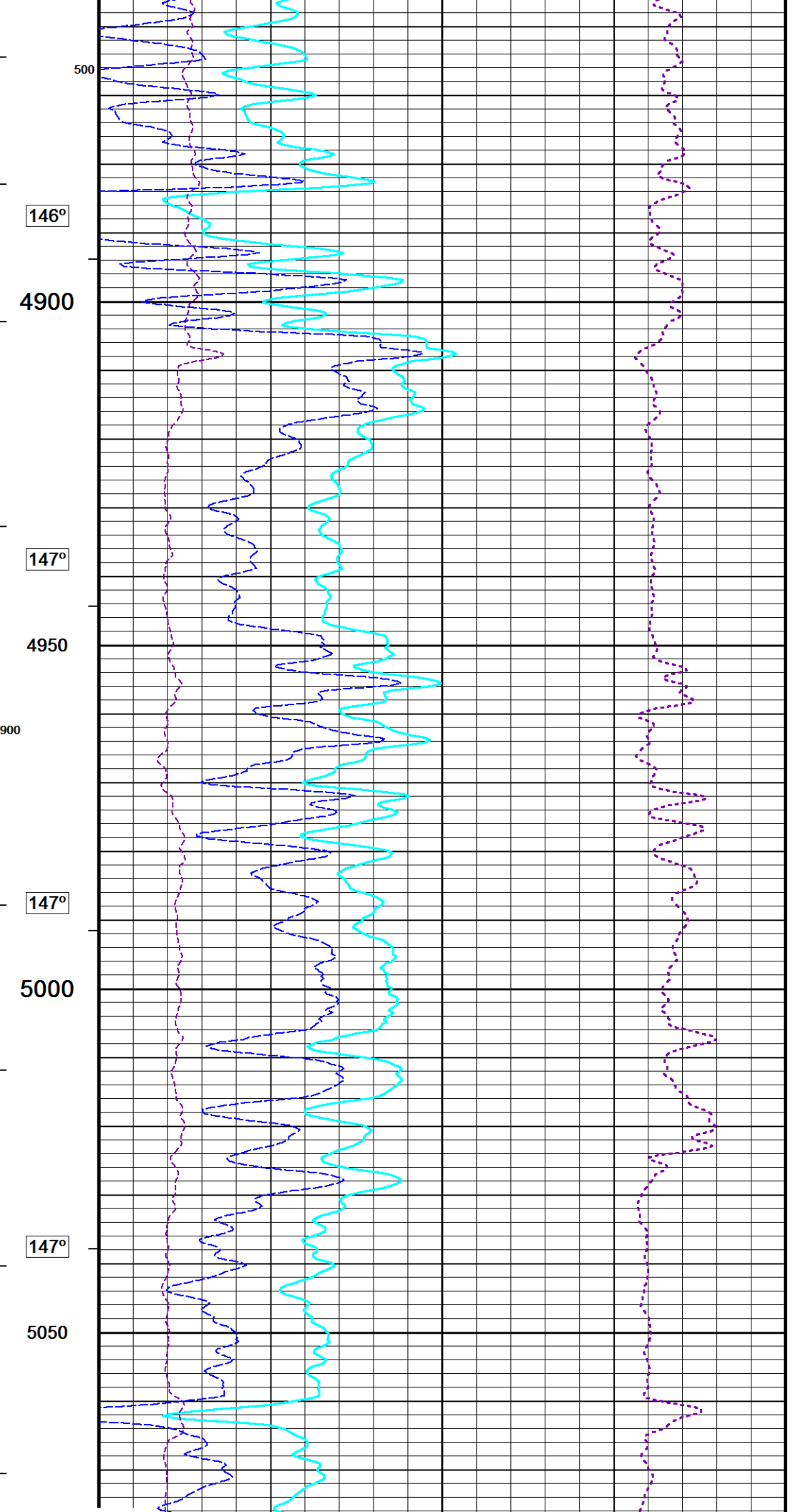
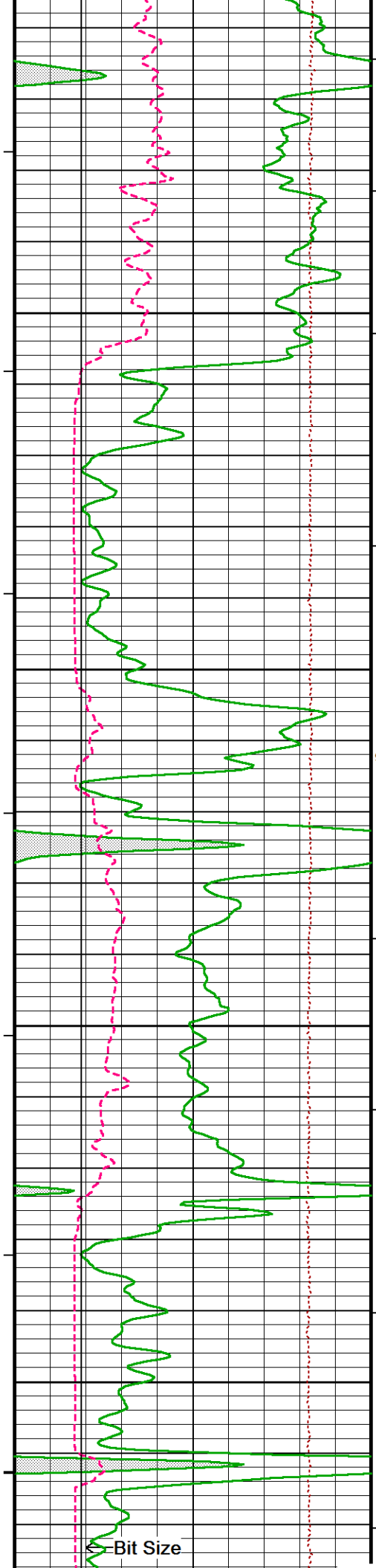
145°

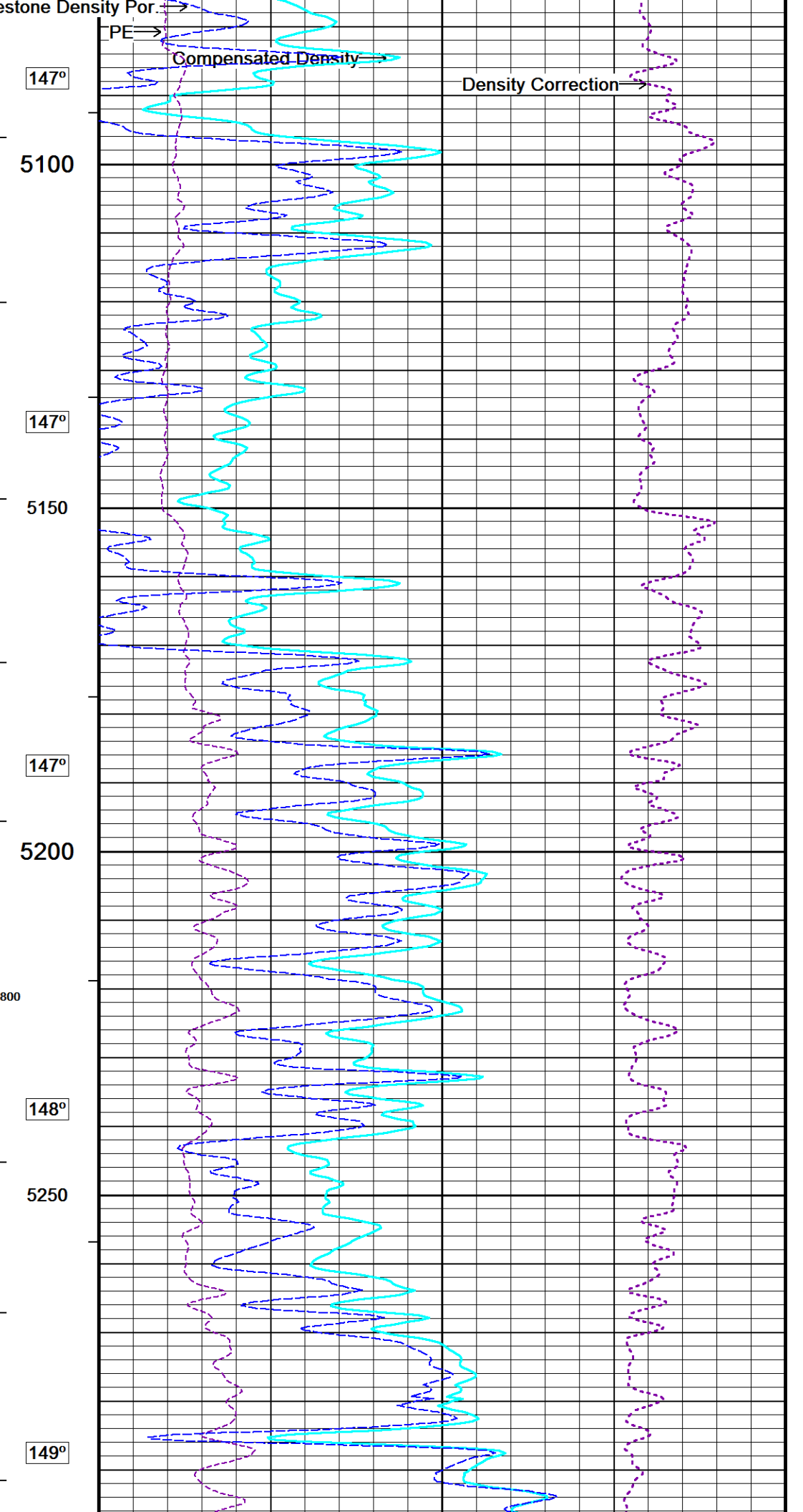
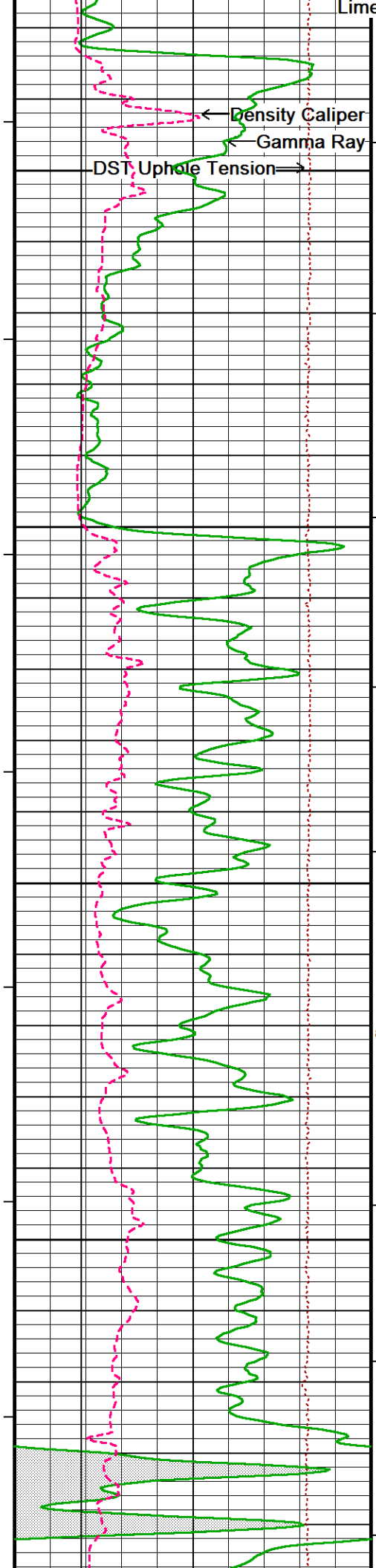
4800

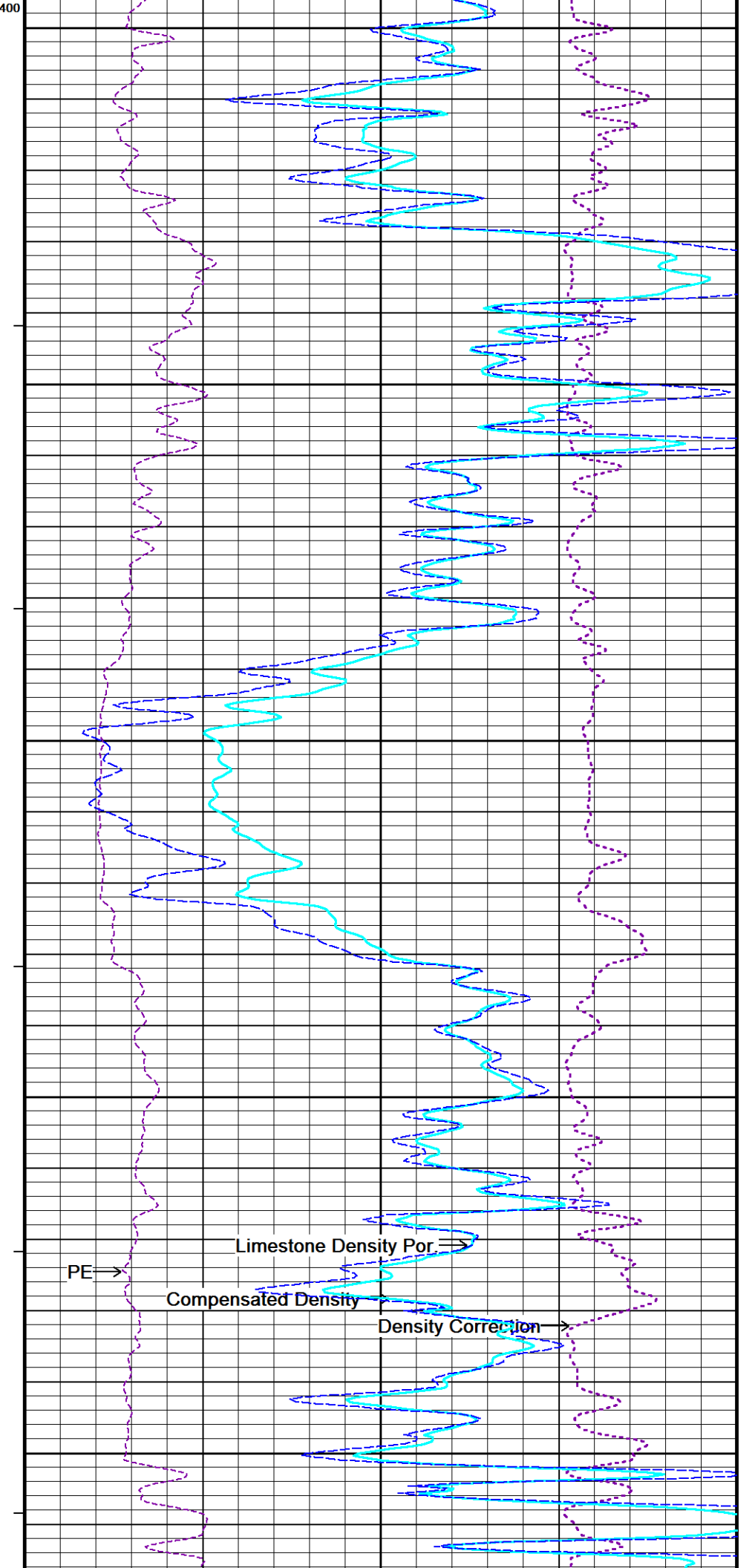
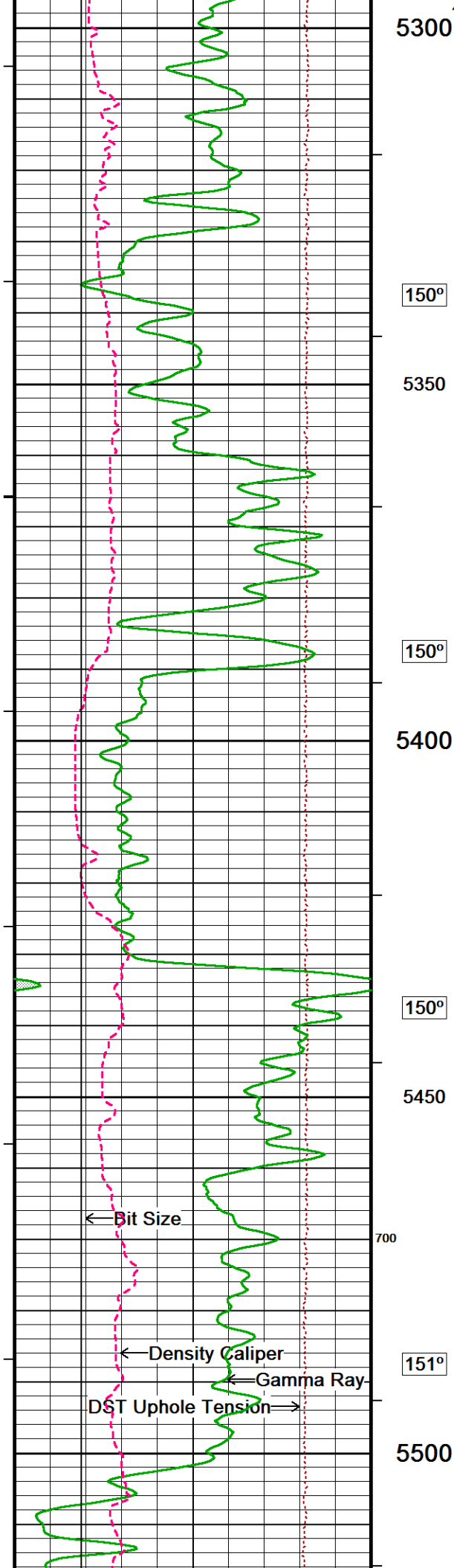
145°

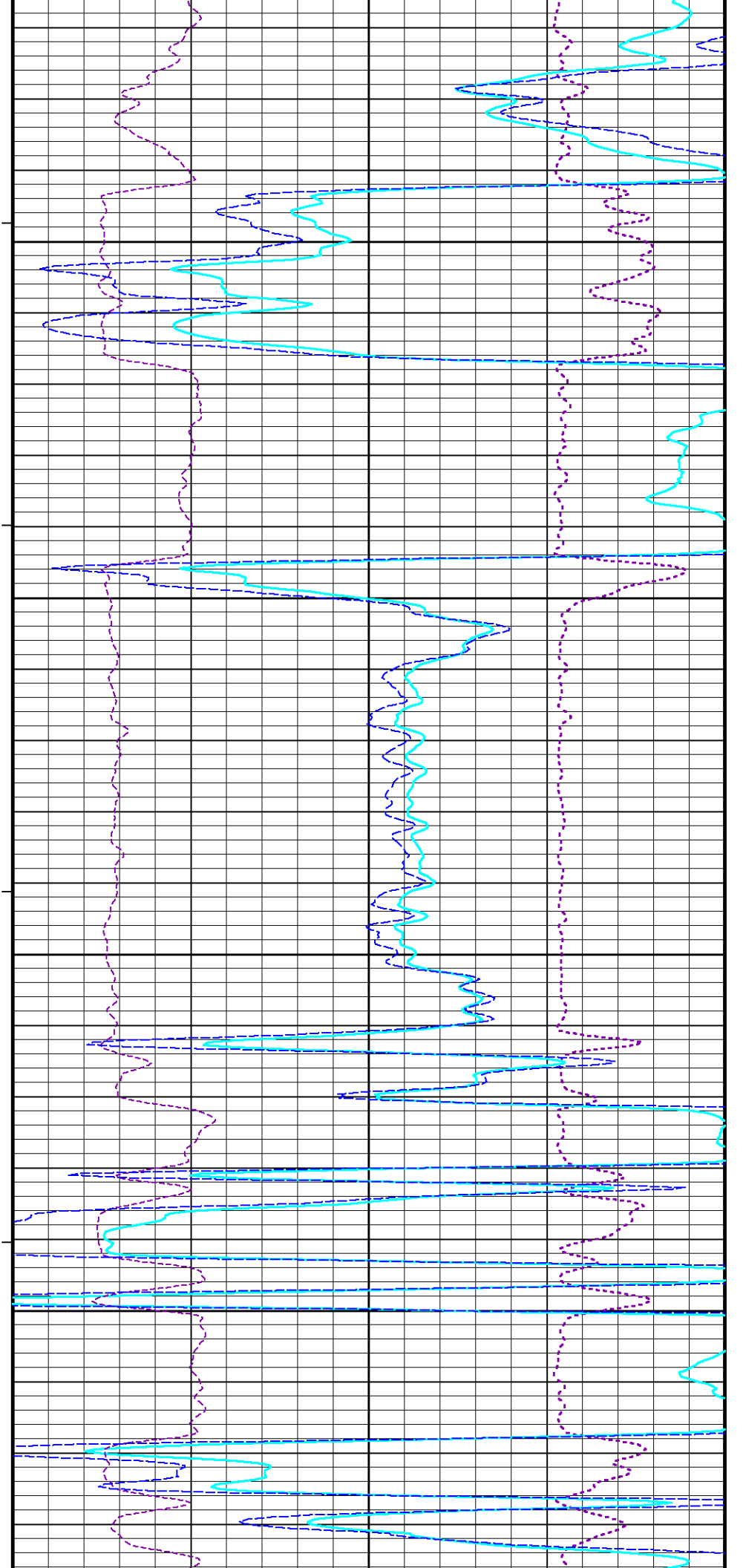
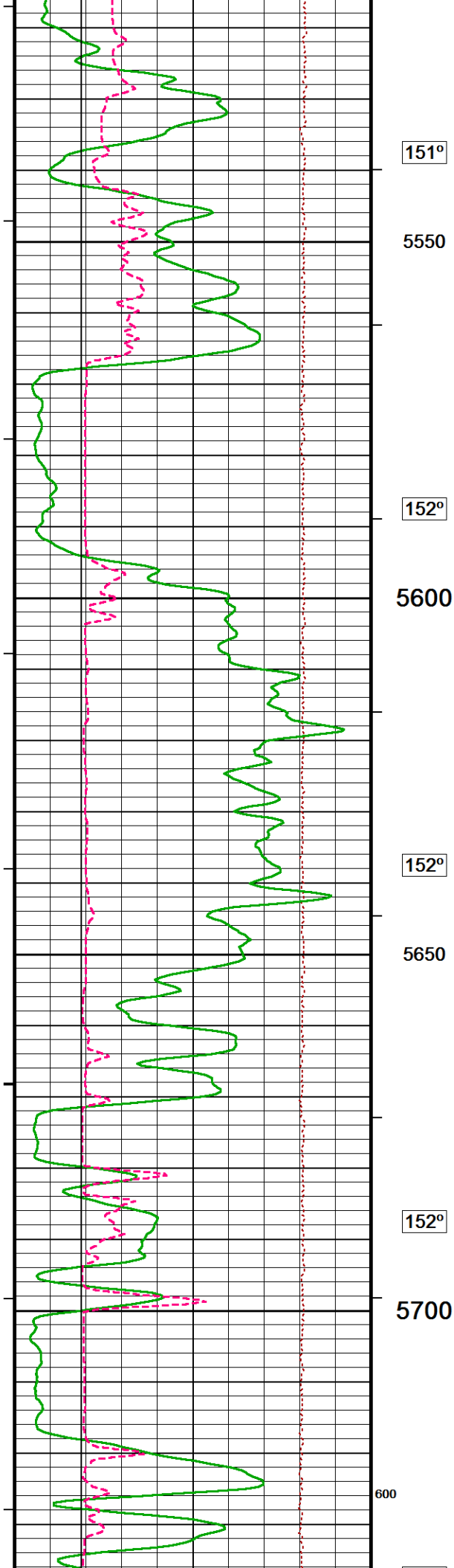
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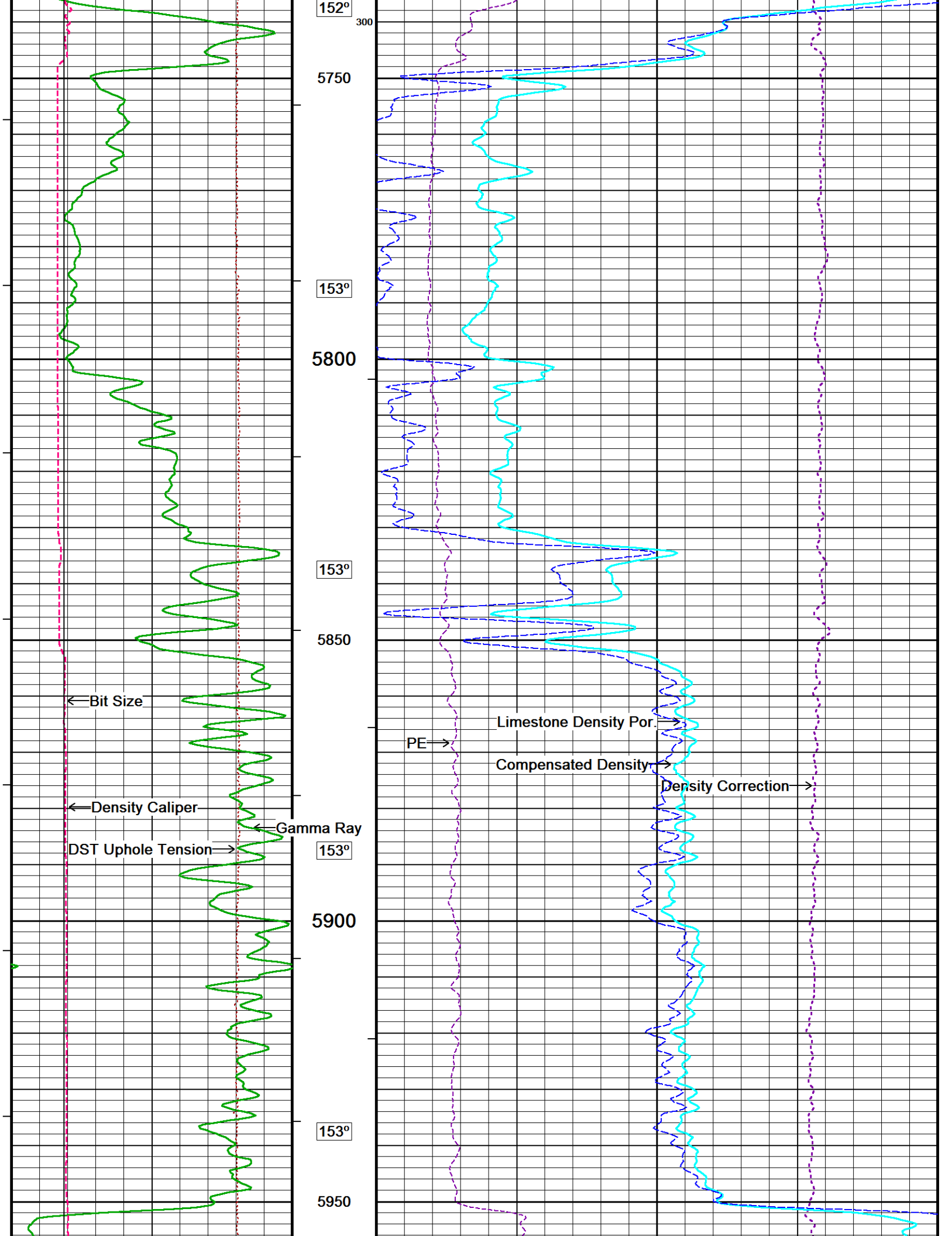


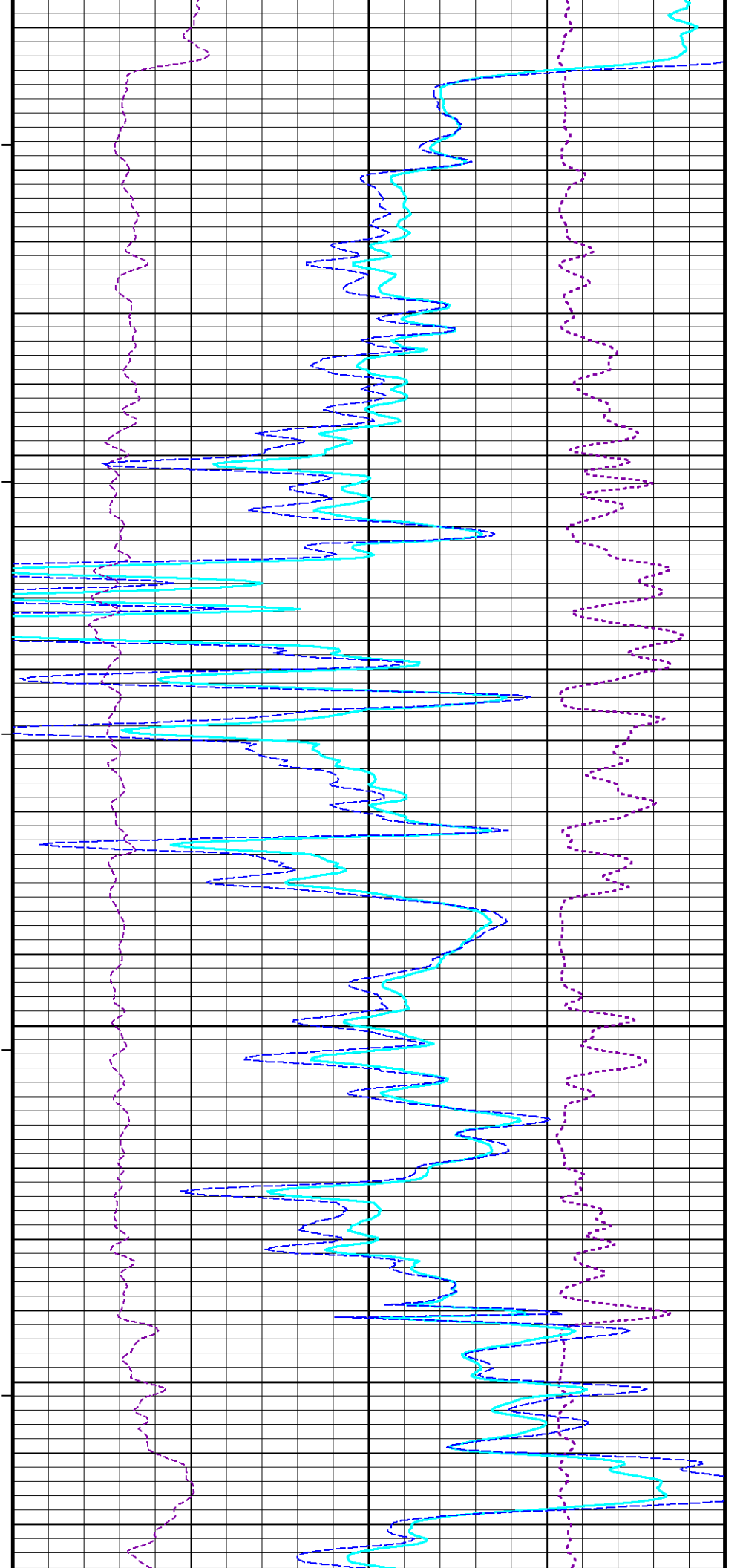
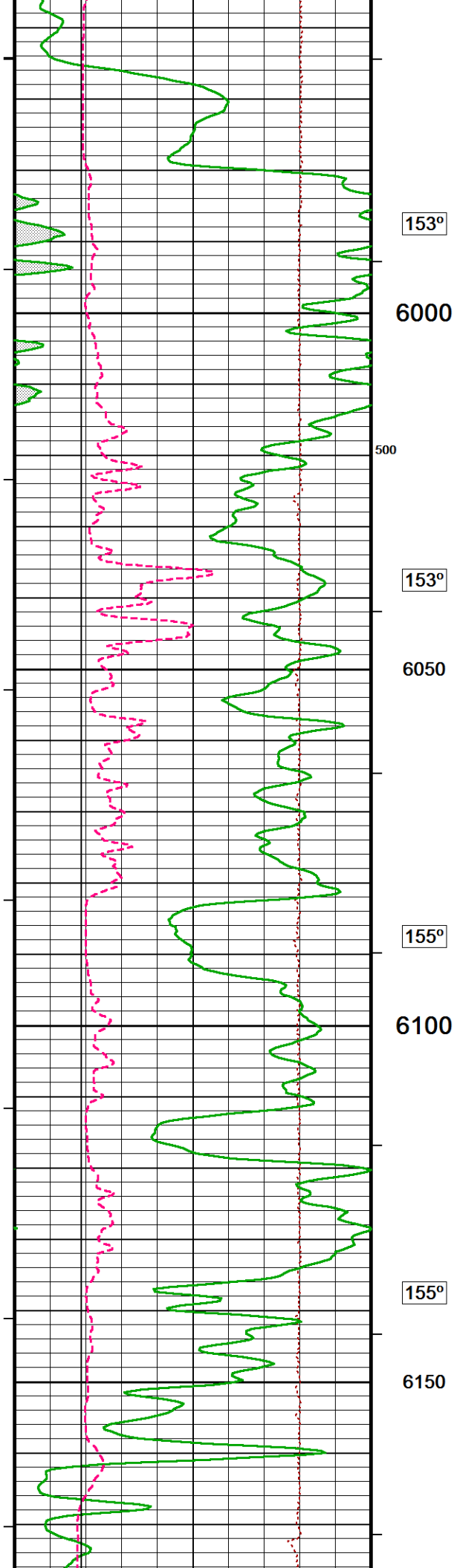


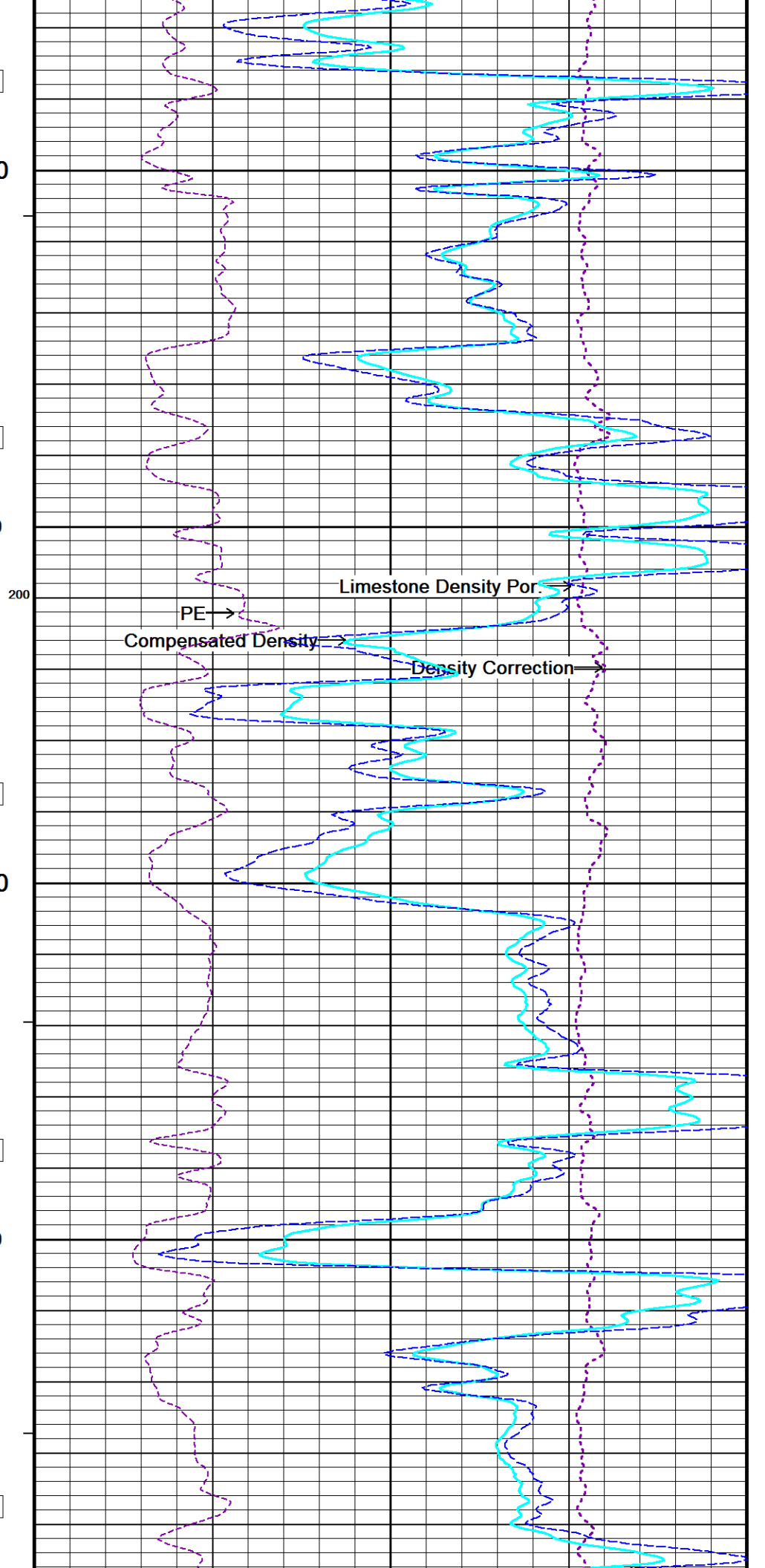
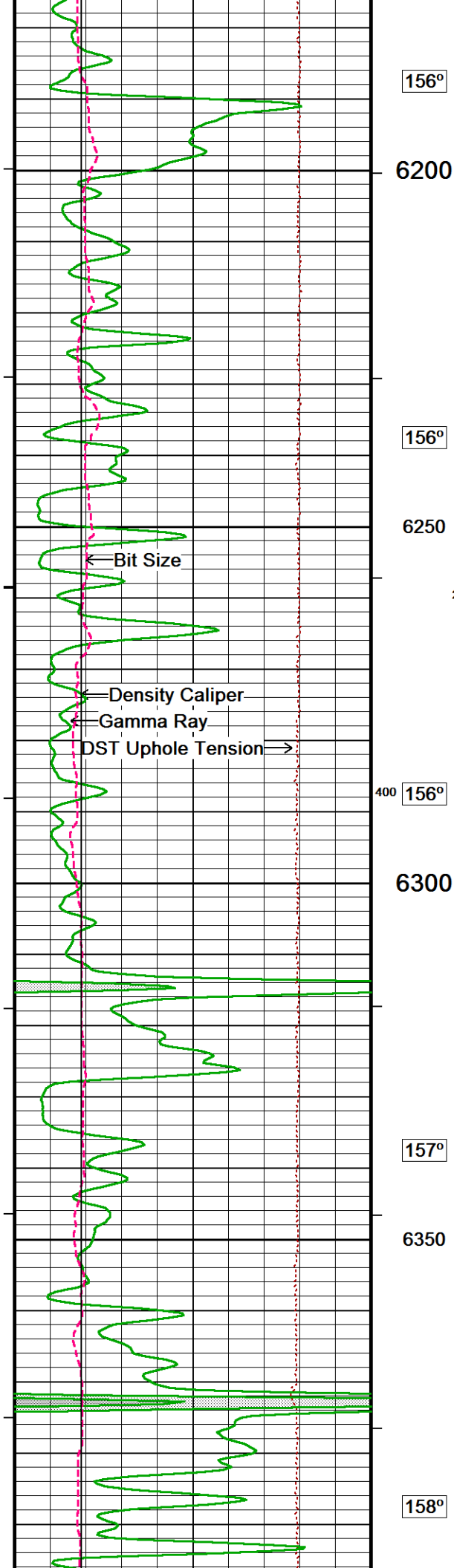


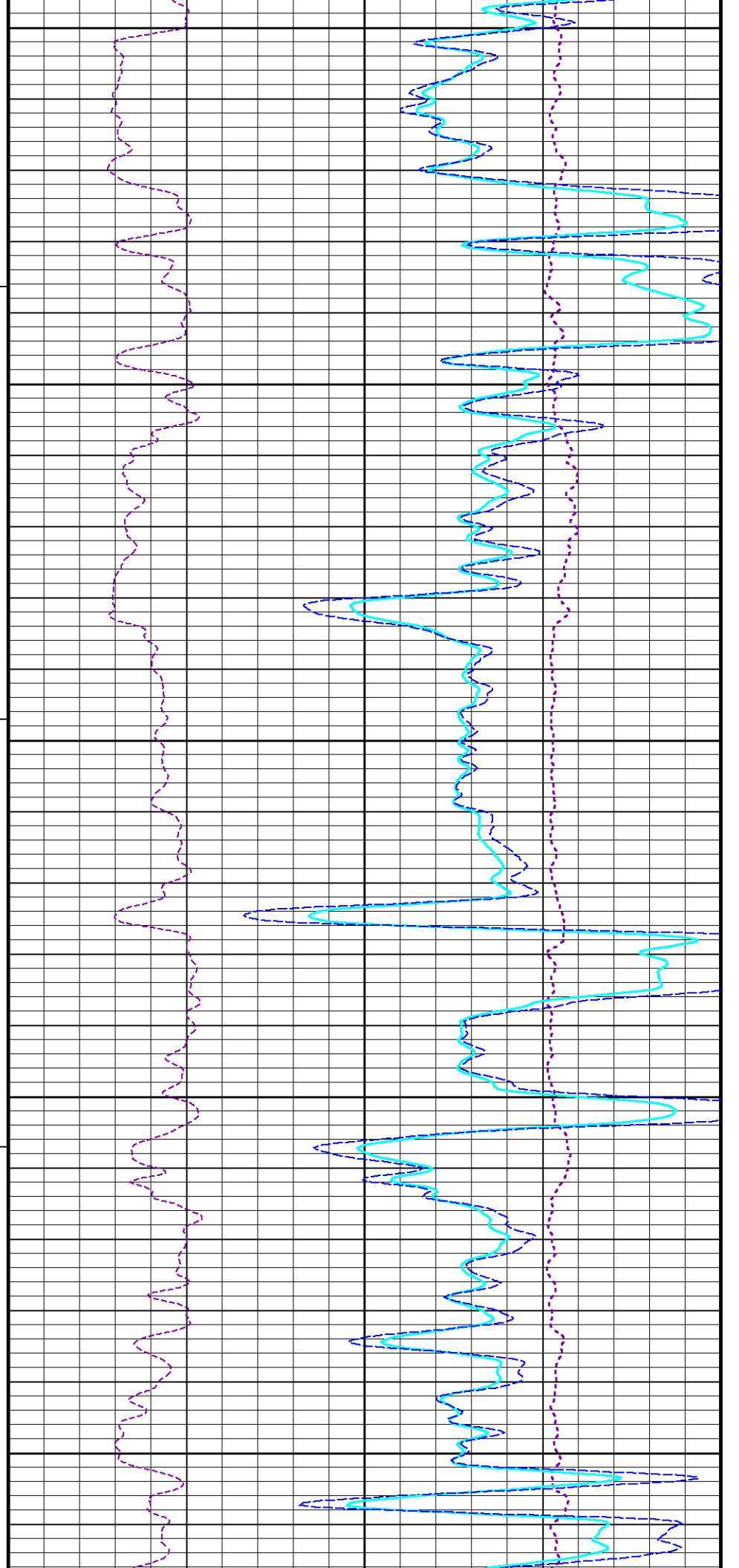
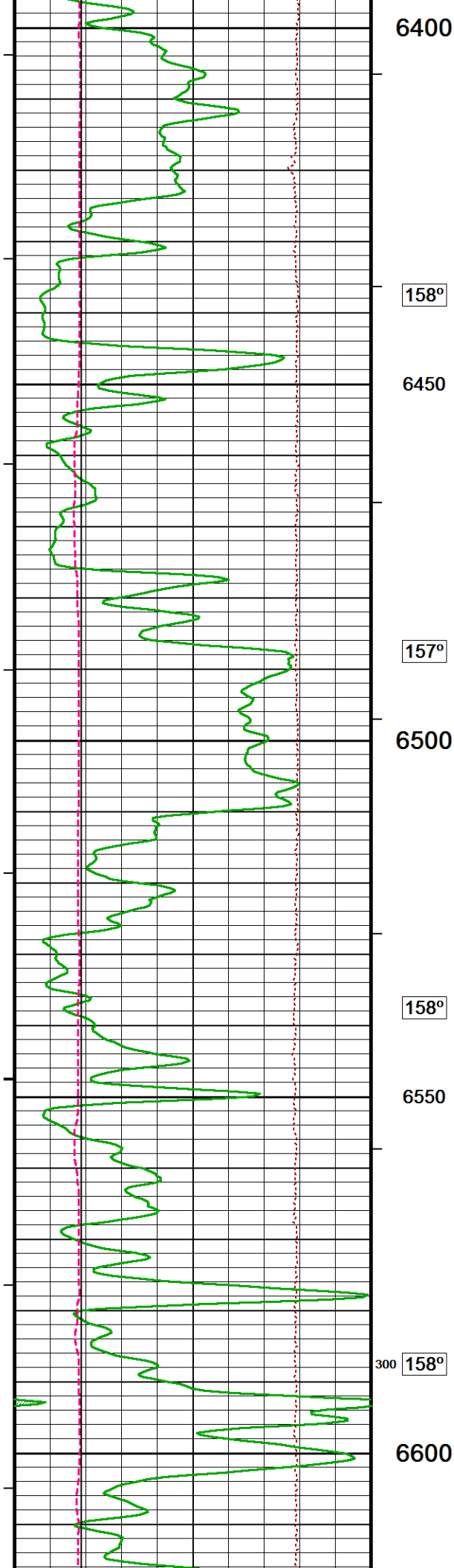


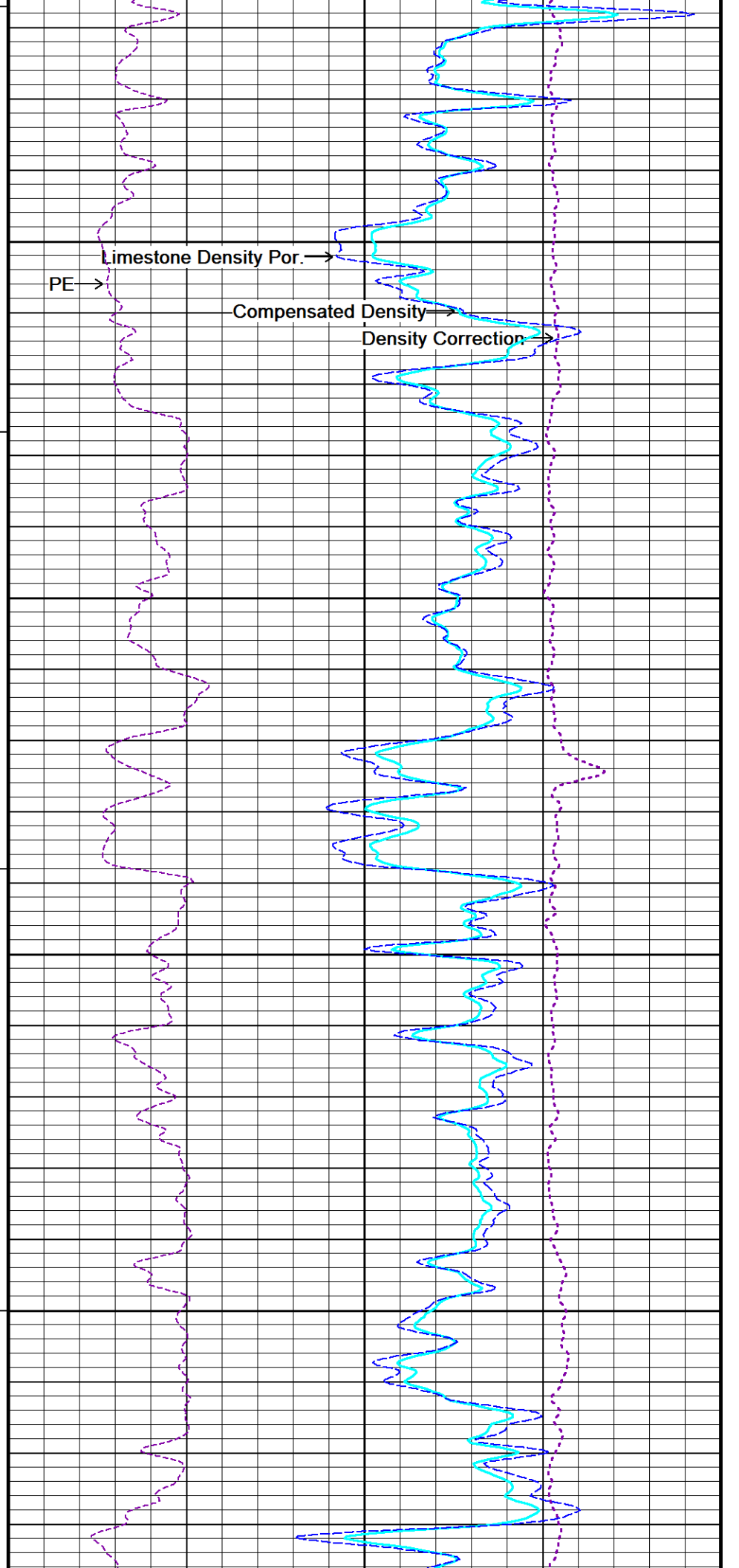
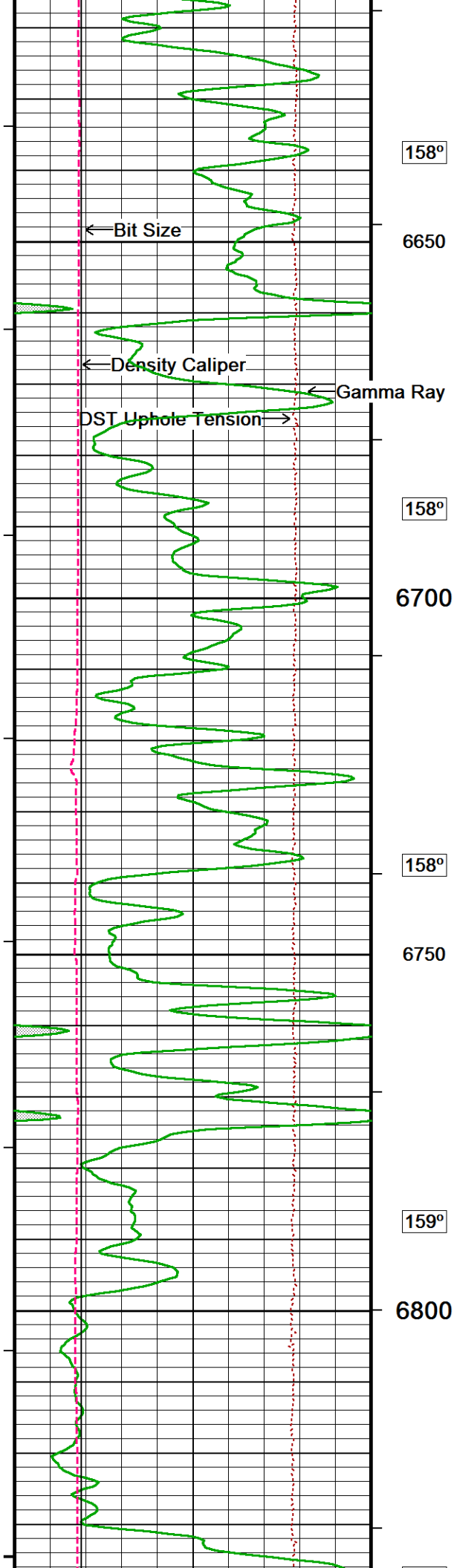


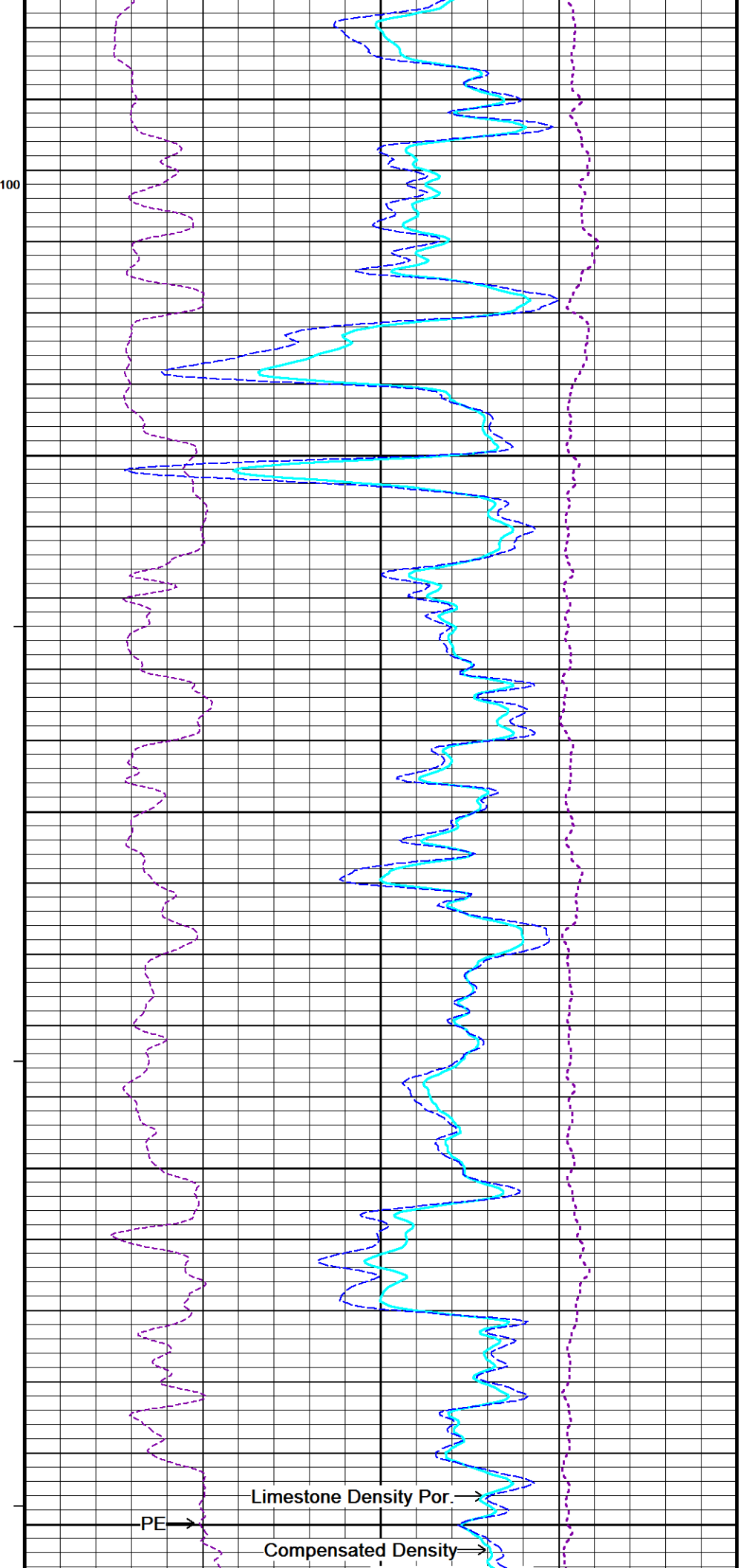
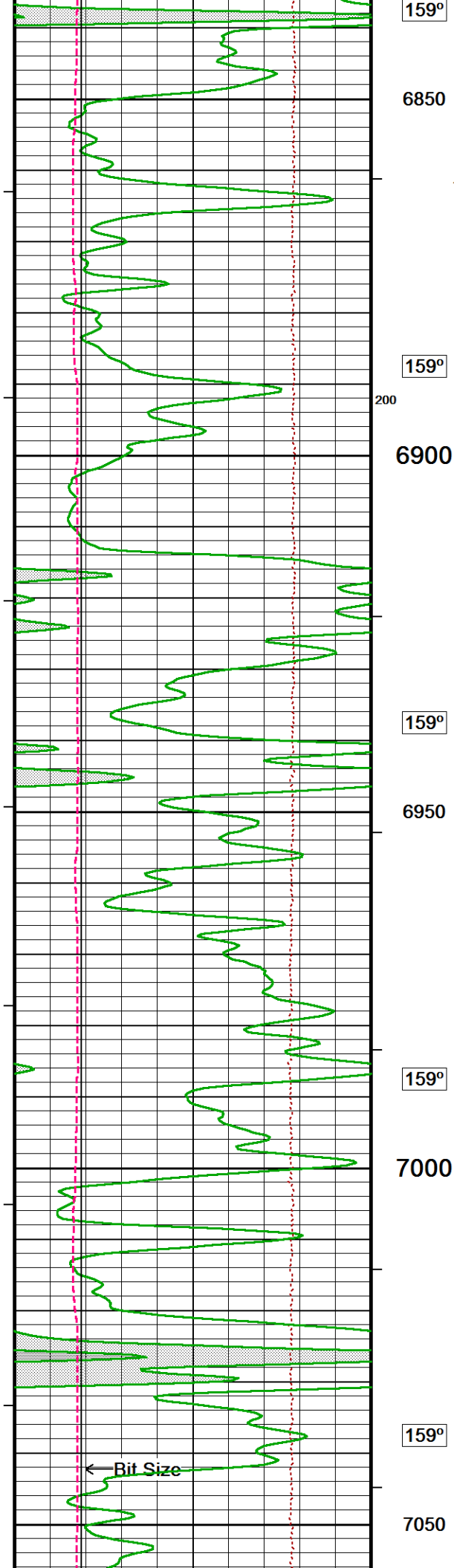


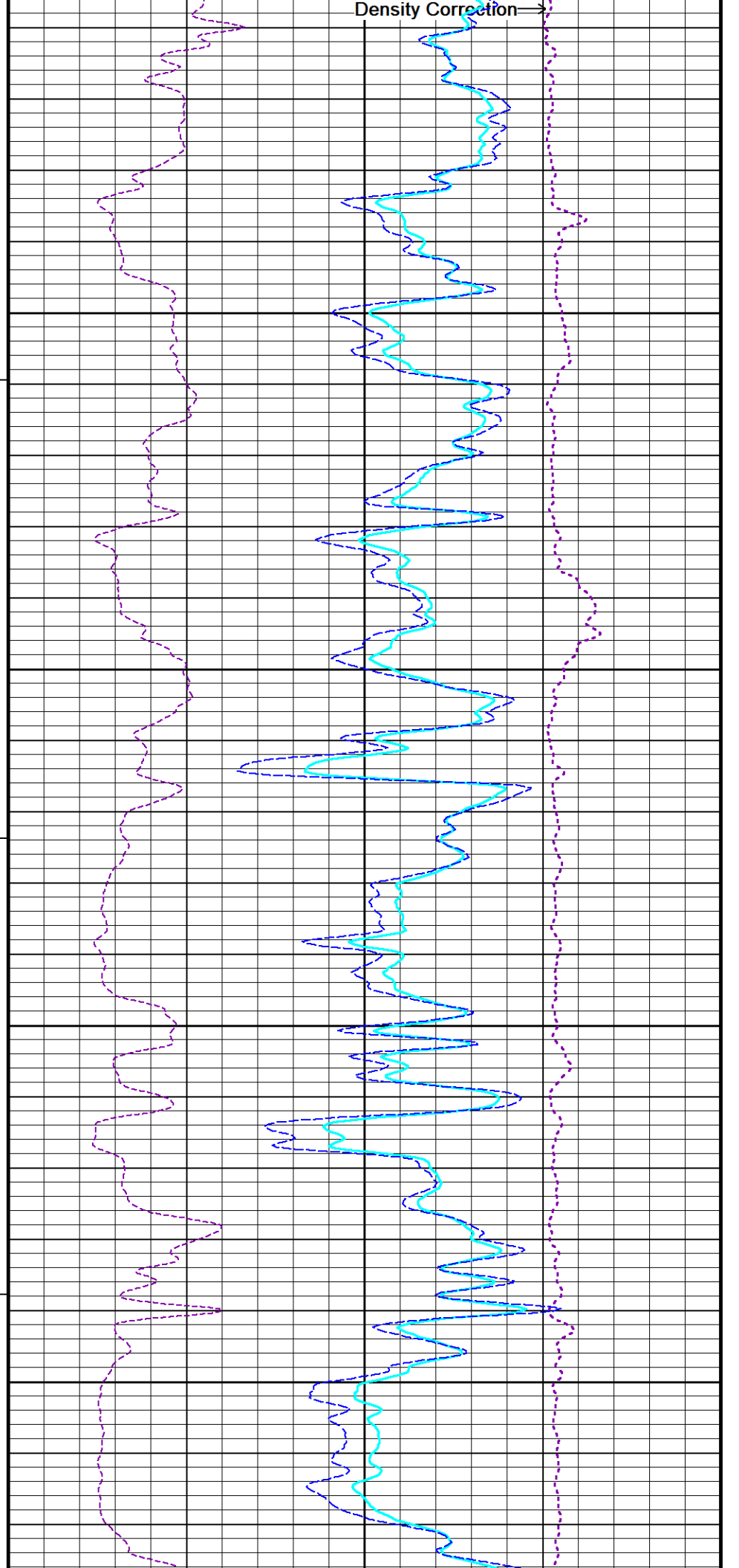
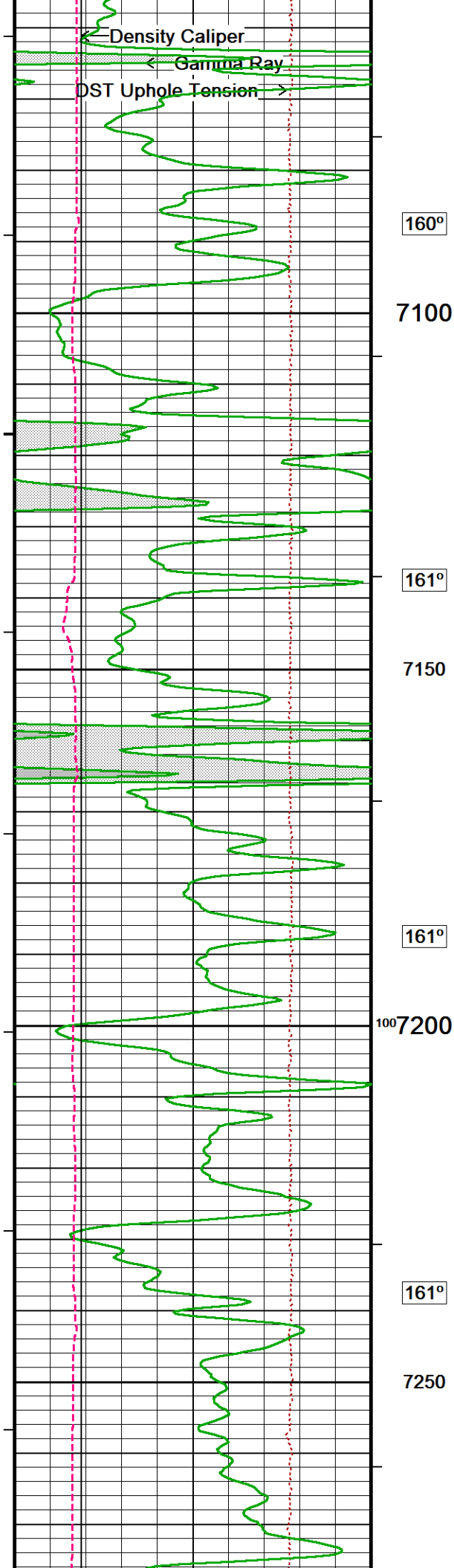


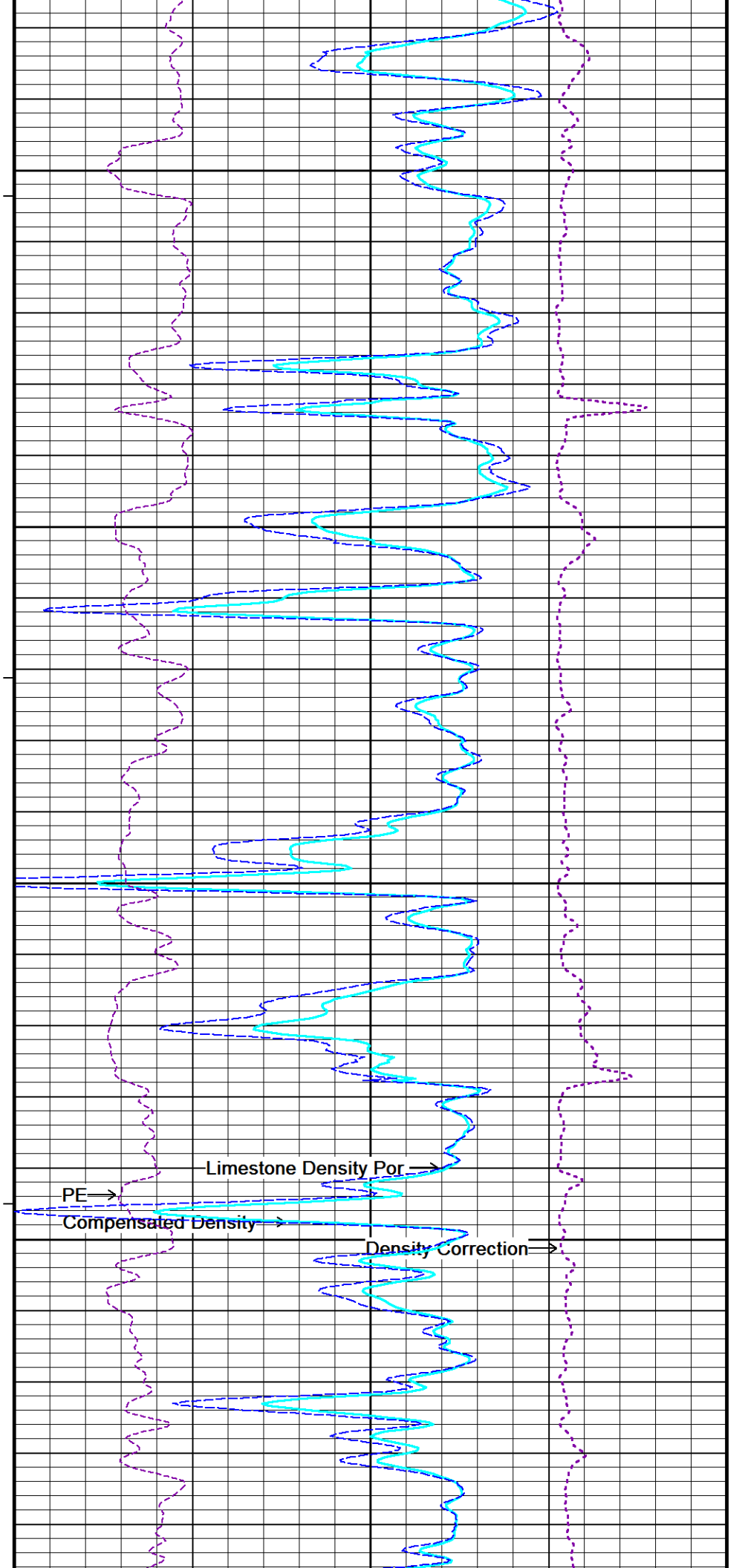
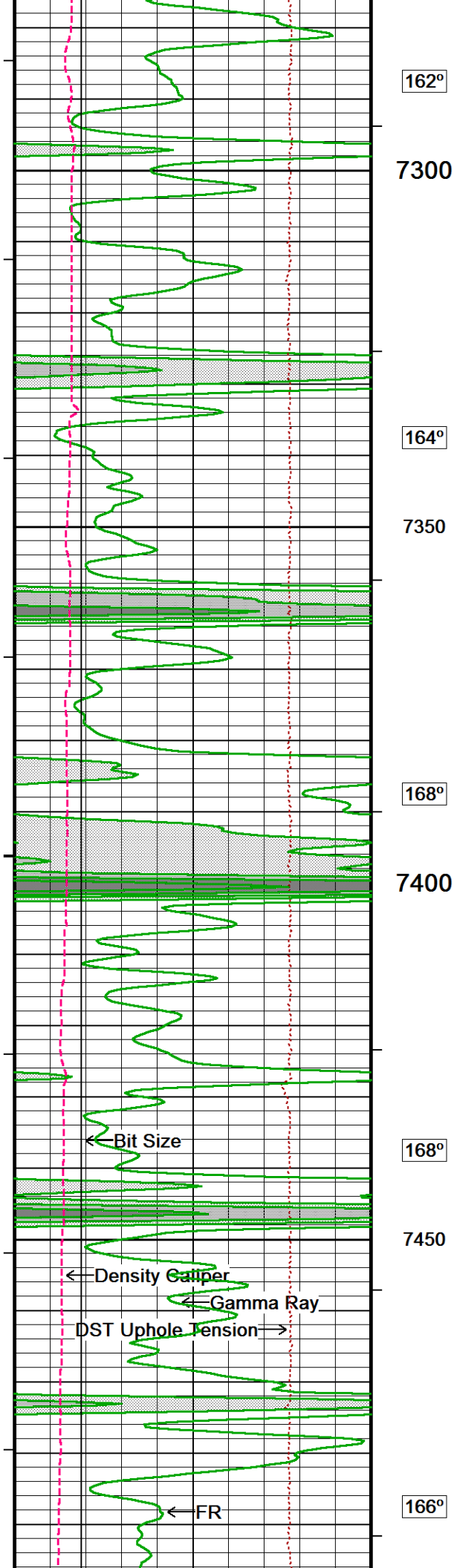


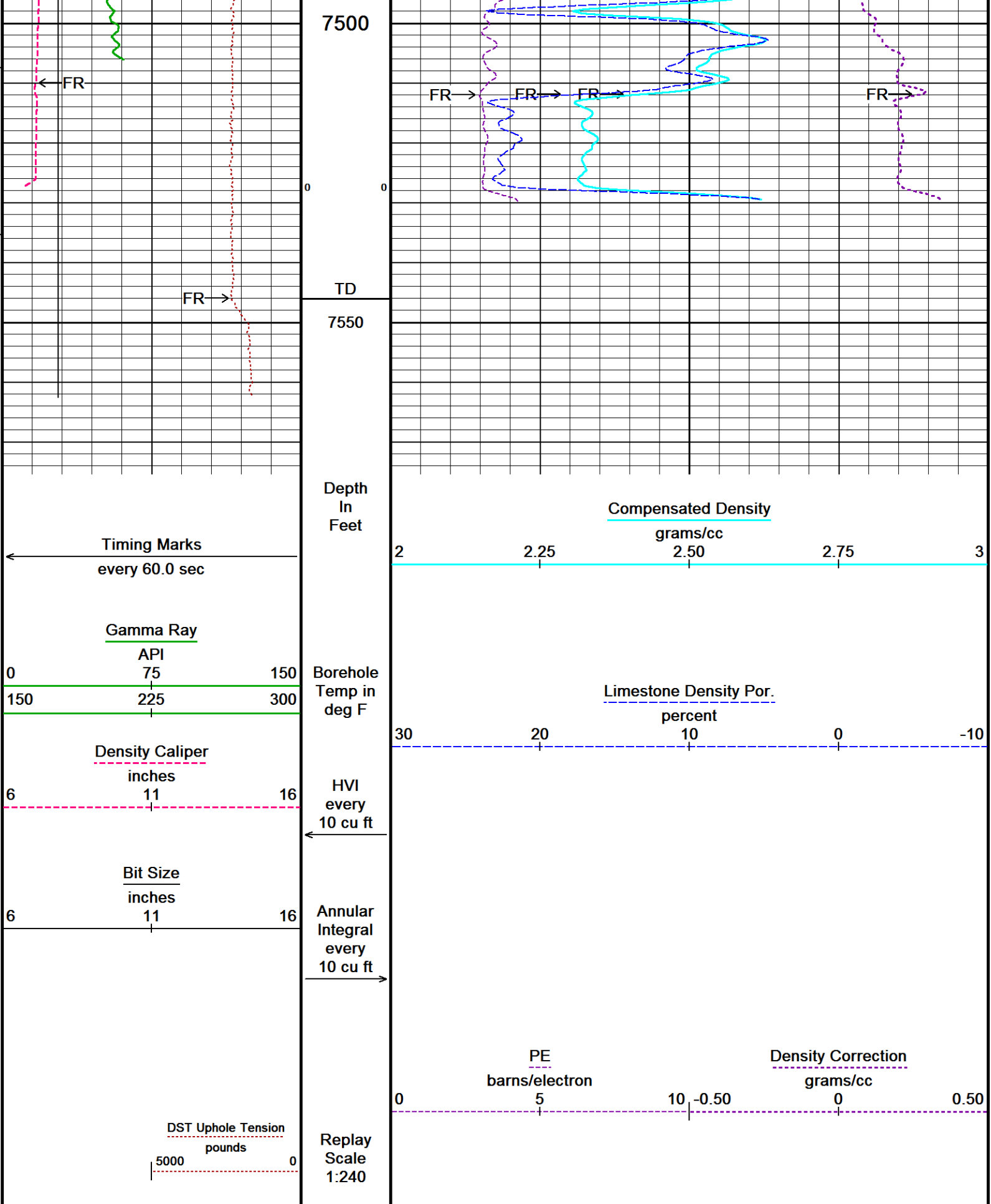










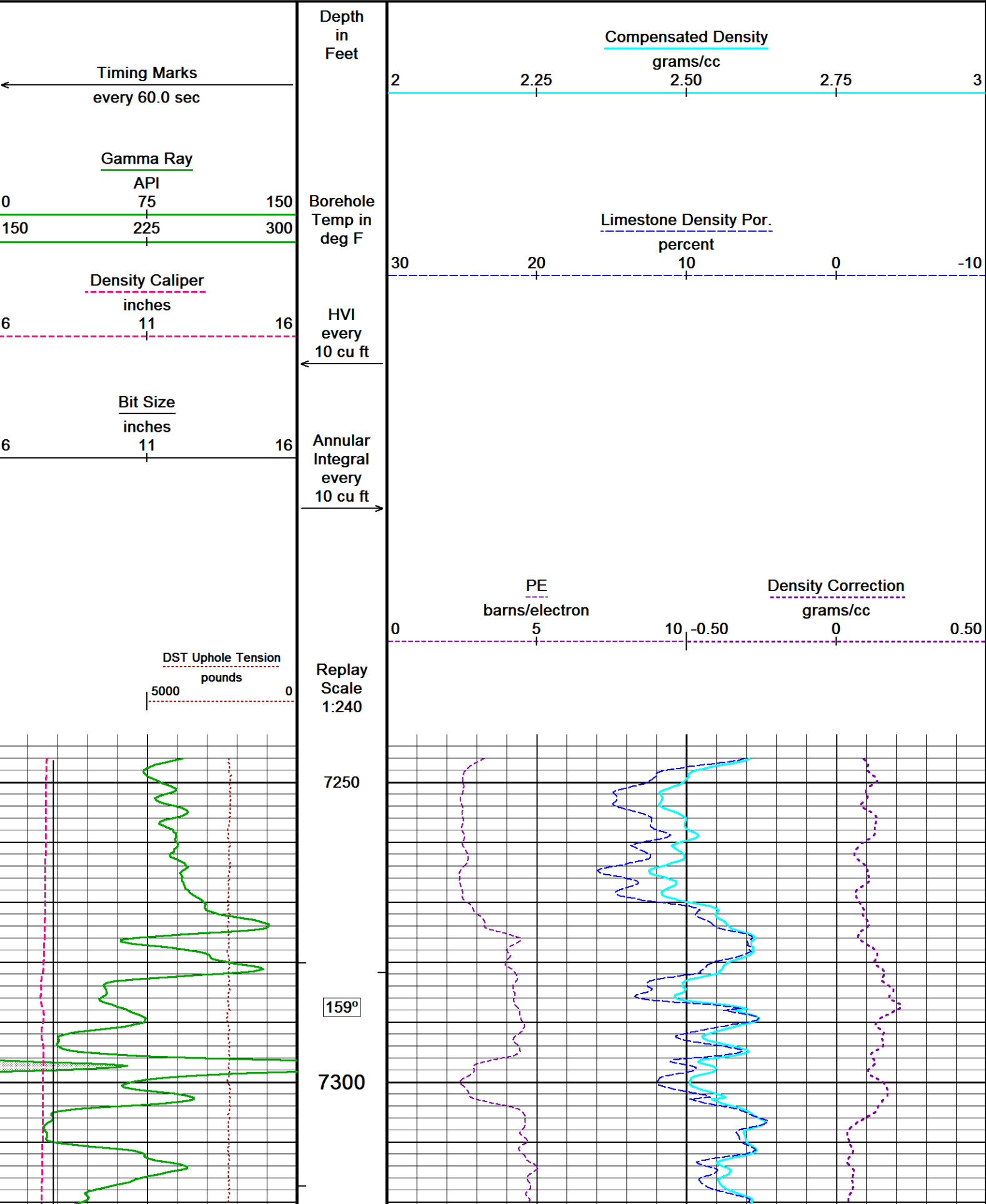


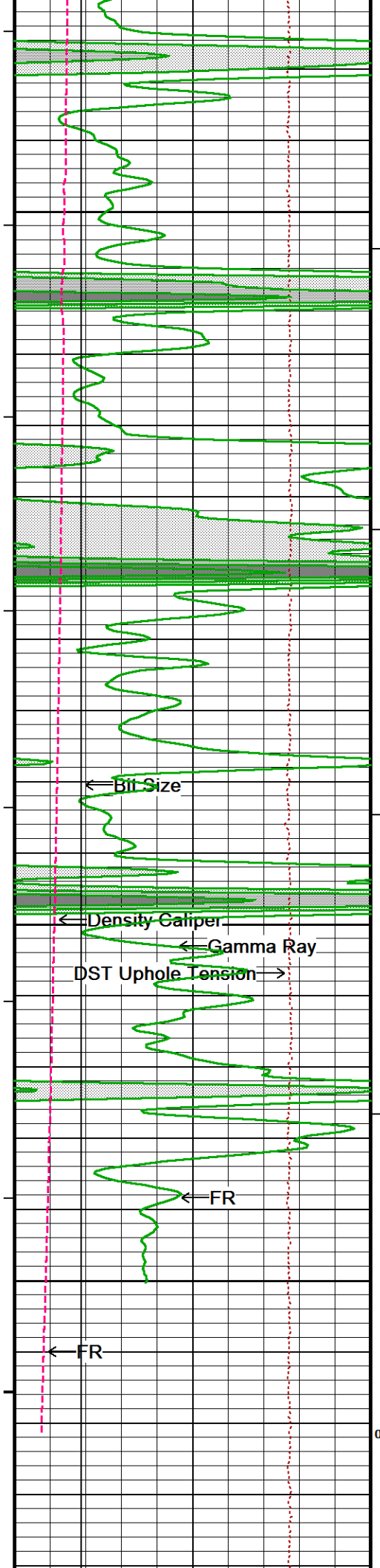


REPEAT SECTION



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 09-MAR-2018 11:21
Filename: C:\Minimus 17.05.6573\Logs\Grand Mesa The C...\Grand Mesa The Cowboys #1-25_001.dta
Recorded on 09-MAR-2018 05:50
System Versions: Logged with 17.05.6573 Plotted with 17.05.6573





161°

7350

163°

7400

165°

7450

165°

7500

0

← Bit Size

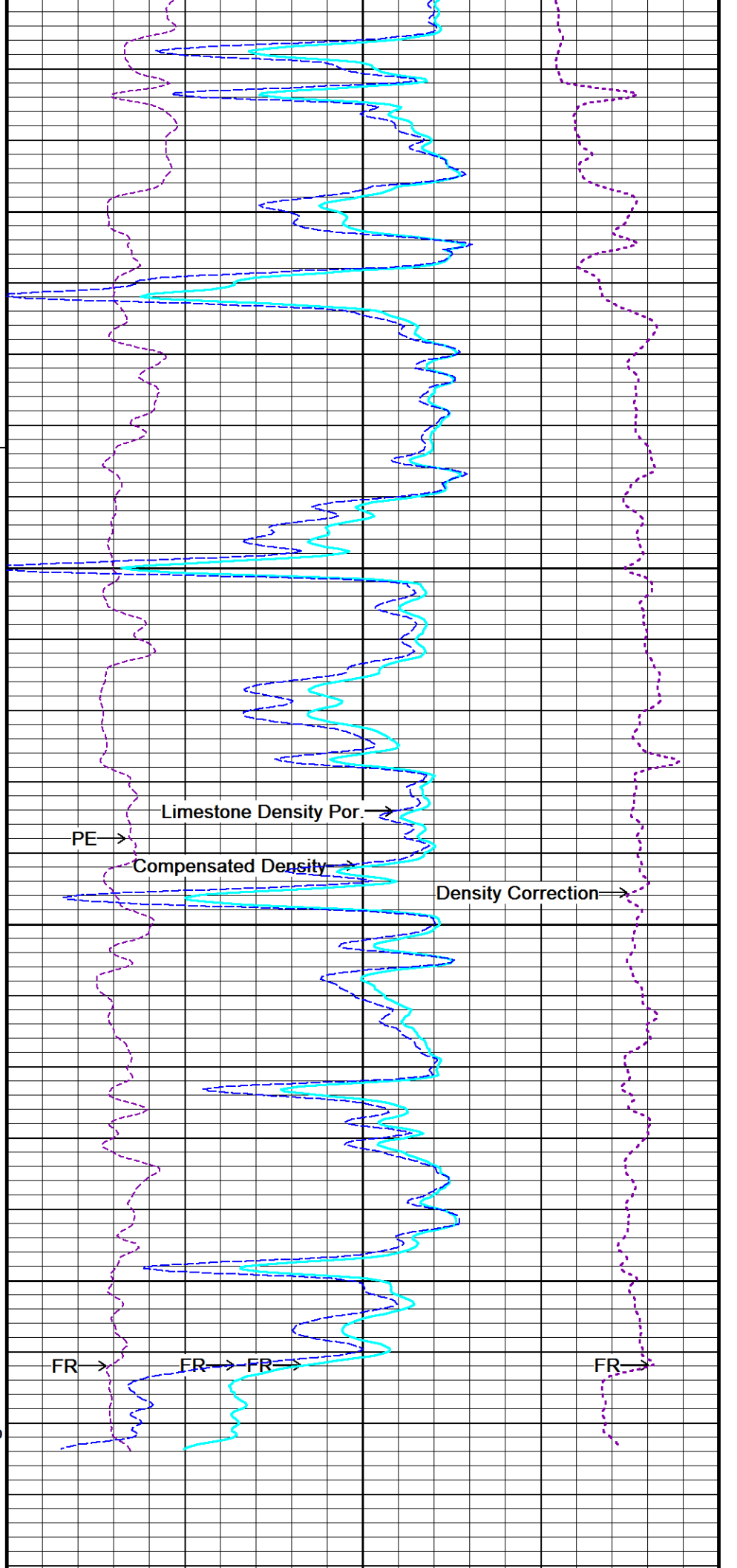
← Density Caliper

← Gamma Ray

DST Uphole Tension →

← FR

← FR



PE →

Limestone Density Por. →

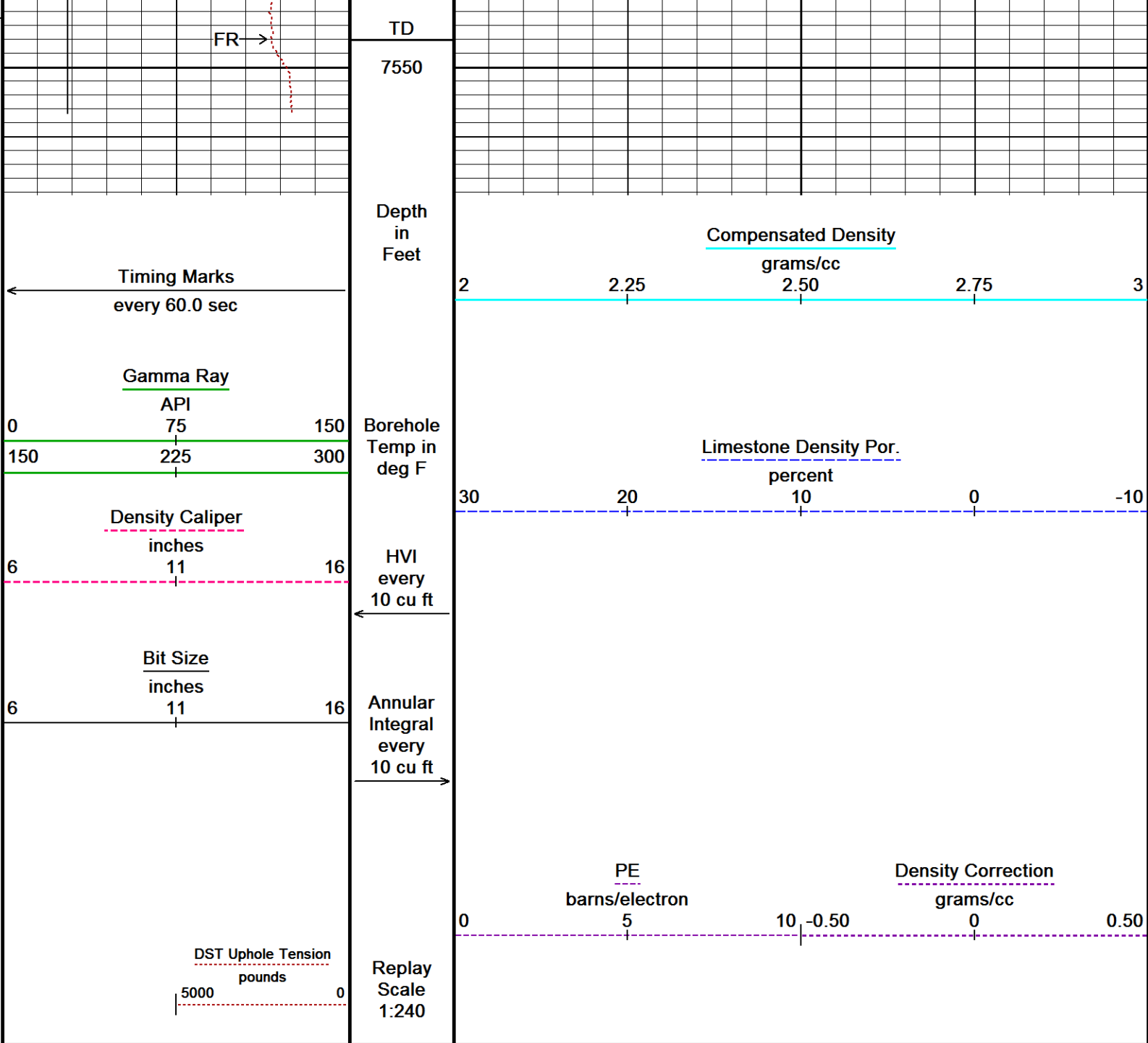
Compensated Density →

Density Correction →

FR →

FR → FR →

FR →



Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 09-MAR-2018 11:21
Filename: C:\Minimus 17.05.6573\Logs\Grand Mesa The C...\Grand Mesa The Cowboys #1-25_001.dta Recorded on 09-MAR-2018 05:50
System Versions: Logged with 17.05.6573 Plotted with 17.05.6573

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION		
C:\Minimus 17.05.6573\Logs\Grand Mesa The Cowboys #1-25\Grand Mesa The Cowboys #1-25_001.dta		
General Constants All 000		Last Edited on 09-MAR-2018,04:45
General Parameters		
Mud Resistivity	1.090	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
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Crossplot Porosity	
Resistivity used	Array Ind. Two Res Rt	
RWA Constant A	0.620	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

Gamma Calibration MCG-C 123			Field Calibration on 08-MAR-2018 14:48
	Measured	Calibrated (API)	
Background	73	52	
Calibrator (Gross)	714	508	
Calibrator (Net)	641	456	

Gamma Calibration Tolerances MCG-C 123		
Ratio	1.406	<div> <div>1.40</div> <div>1.475</div> <div>1.55</div> </div> Counts/API

Gamma Constants MCG-C 123			Last Edited on 09-MAR-2018,03:10
Gamma Calibrator Number	MCGGRCC141		
GRC-M Calibrator Jig in Use?	NO		
Inactive Background Jig in Use?	NO		
Mud Density	1.10	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 23-FEB-2018,11:39
	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		

Caliper Calibration MPD-C.A 271			Base Calibration on 05-MAR-2018 13:46
			Field Calibration on 08-MAR-2018 14:30
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	14064	3.99	
2	24097	5.98	
3	34109	7.97	
4	43728	9.86	
5	54752	11.92	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	7.95	7.97	

Caliper Calibration Tolerances MPD-C.A 271		
Short Arm Field Cal.	7.95	<div> <div>7.77</div> <div>7.97</div> <div>8.17</div> </div> in

Photo Density Calibration MPD-C.A 271			Base Calibration on 05-MAR-2018 14:16
			Field Check on 08-MAR-2018 14:35
Density Calibration			
Base Calibration			
	Near	Far	Calibrated (sdu)
			Near
			Far
Background	1069	1235	
Reference 1	48648	24100	59556 30836
Reference 2	19569	2303	24941 2541
Field Check at Base			
	1069.4	1235.0	

Field Check

1070.6 1235.7

PE Calibration

Base Calibration

Measured

Calibrated

	WS	WH	Ratio
Background	197	965	
Reference 1	18389	48489	0.383
Reference 2	5306	19454	0.276

Ratio

0.371

0.272

Field Check at Base

196.8 965.5

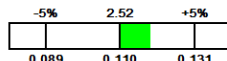
Field Check

195.6 965.2

Photo Density Calibration Tolerances MPD-C.A 271

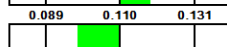
Near Density Ratio

2.57



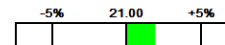
PE Calibration

0.098



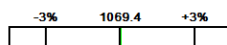
Far Density Ratio

21.41



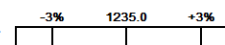
Near Den. Field Check

1070.6



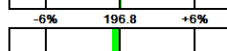
Far Den. Field Check

1235.7



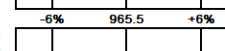
PE WS Field Check

195.6



PE WH Field Check

965.2



Density Constants MPD-C.A 271

Last Edited on 09-MAR-2018,03:10

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 Type		
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	
Precision Enhanced Density Processing	Applied	

Matrixdensity(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

DOWNHOLE EQUIPMENT

C:\Minimus 17.05.6573\Logs\Grand Mesa The Cowboys #1-25\Grand Mesa The Cowboys #1-25_001.dta

Cablehead, 11 pin

CBH-C 0 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Swivel Head Adaptor

SHA-F 48 LG: 2.74 ft WT: 26.5 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-log

MML-A 2 LG: 7.97 ft WT: 81.6 lb OD: 2.244 in



57.56 ft GRGC - MCG Gamma Ray

54.65 ft CGXT - MCG External Temperature

48.92 ft MLTC - MML Caliper

Compact Neutron
MDN-A.B 114 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.A 271 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

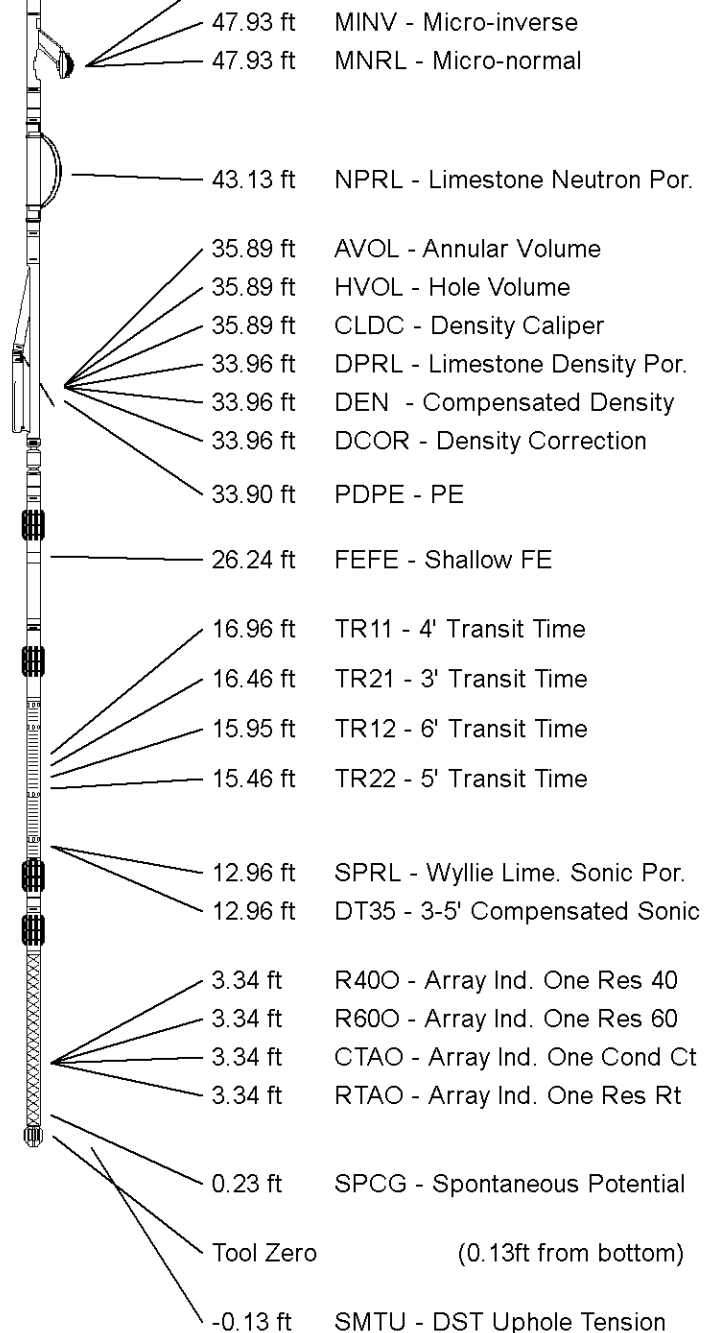
Compact Knuckle Joint
SKJ-E.B 732 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Focussed Electric
MFE-A.A 135 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-A.A 126 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: 67.98 ft Weight: 531.3 lb



All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING COMPANY
WELL	THE COWBOYS #1-25
FIELD	WILDCAT
PROVINCE/COUNTY	WASHINGTON
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	5169	feet	First Reading	7512.00	feet
Elevation Drill Floor	5167	feet	Depth Driller	7545.00	feet
Elevation Ground Level	5150	feet	Depth Logger	7546.00	feet



Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG

