



**COMPENSATED PHOTO DENSITY  
COMPENSATED DUAL NEUTRON  
LOG**

COMPANY **PIONEER NATURAL RESOURCES**  
 WELL **NORTH FORK RANCH 14 - 1R**  
 FIELD **MAXWELL**  
 PROVINCE/COUNTY **LAS ANIMAS**  
 COUNTRY/STATE **U.S.A./COLORADO**  
 LOCATION **967' FSL & 698' FWL**

SEC 1 TWP 33S RGE 68W Other Services MAI  
 API Number 05-067-08870  
 Permit Number

Permanent Datum G.L., Elevation 7931 feet  
 Log Measured From K.B. @ 4 FEET above Permanent Datum  
 Drilling Measured From K.B.

Elevations:  
 KB 7935.00  
 DF 7934.00  
 GL 7931.00

Date	25-SEP-2009		
Run Number	ONE		
Depth Driller	2015.00	feet	
Depth Logger	2008.00	feet	
First Reading	1992.00	feet	
Last Reading	702.00	feet	
Casing Driller	699.00	feet	
Casing Logger	702.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	AIR		
Density / Viscosity			
PH / Fluid Loss			
Sample Source	FLOWLINE		
Rm @ Measured Temp			
Rmf @ Measured Temp			
Rmc @ Measured Temp			
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT			
Time Since Circulation			
Max Recorded Temp	94.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	13087	FARM	
Recorded By	L.PLAGGE		
Witnessed By	JACKIE LUTHER		

BOREHOLE RECORD			Last Edited: 25-SEP-2009 12:13
Bit Size inches	Depth From feet	Depth To feet	
7.875	698.00	2015.00	
CASING RECORD			
Type	Size inches	Depth From feet	Shoe Depth feet
SURFACE	8.625	0.00	698.00
Weight pounds/ft			
			24.00

**REMARKS**

TOOLS RAN: SHA, MCG, MDN, MPD, SKJ, MFE, AND MAI RAN IN COMBINATION.

HARDWARE: MAI: TWO 0.5 INCH STANDOFFS USED.  
 MDN: DUAL NEUTRON BOWSPRING USED.  
 MPD: 8 INCH PROFILE PLATE USED.

WATER LEVEL AT 1650 FEET. FOAM IN HOLE COULD AFFECT NEUTRON READINGS.

CALIPER CHECK IN CASING PROVIDED, REFERENCE I.D. = 8.097" (8.625", 24.0 LB/FT CASING)

TOTAL HOLE VOLUME FROM TD TO INTERMEDIATE CASING = APPROX. 450 CU. FT.

ANNULAR VOLUME WITH 5.5 INCH PRODUCTION CASING = APPROX. 225 CU. FT.

PRESSURE CONTROL RAN PER CUSTOMER'S REQUEST.

PRESENTATIONS USED PER CUSTOMER'S REQUEST.

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

TIGHT PULLS, BOREHOLE SIZE AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY.

NEUTRON PRESENTED ON A SANDSTONE SCALE.

2.65 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY.

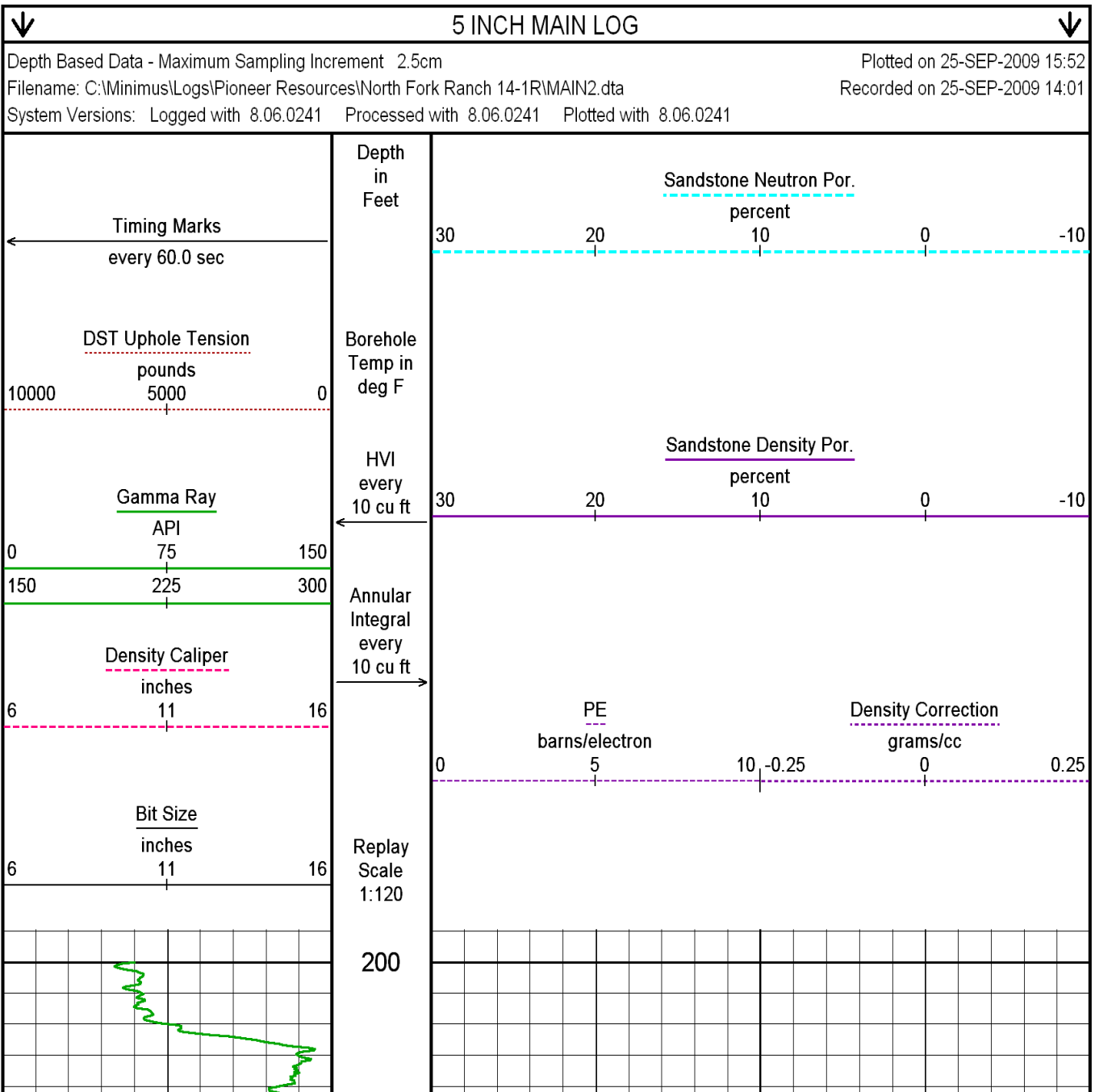
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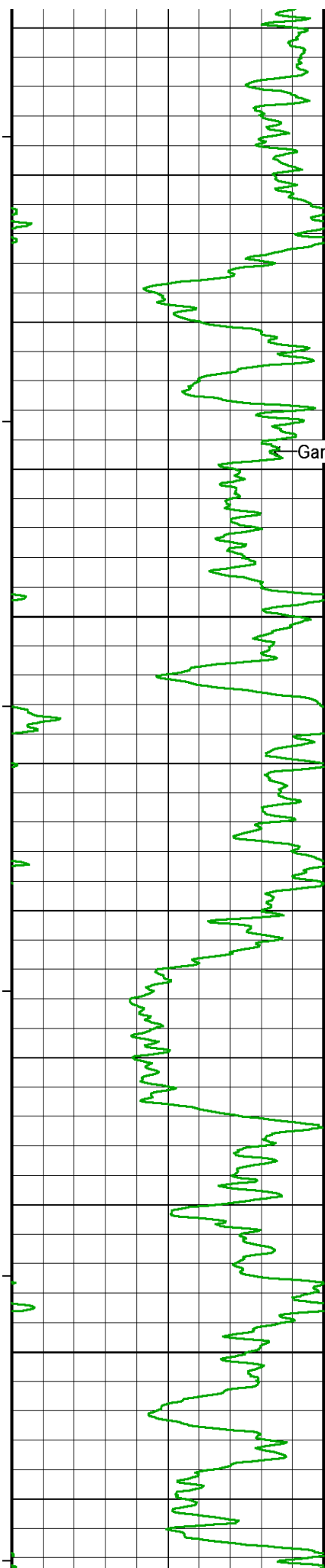
RIG: PIONEER RIG #3

ENGINEER: L. PLAGGE

OPERATOR(S): J. BECKWITH

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.

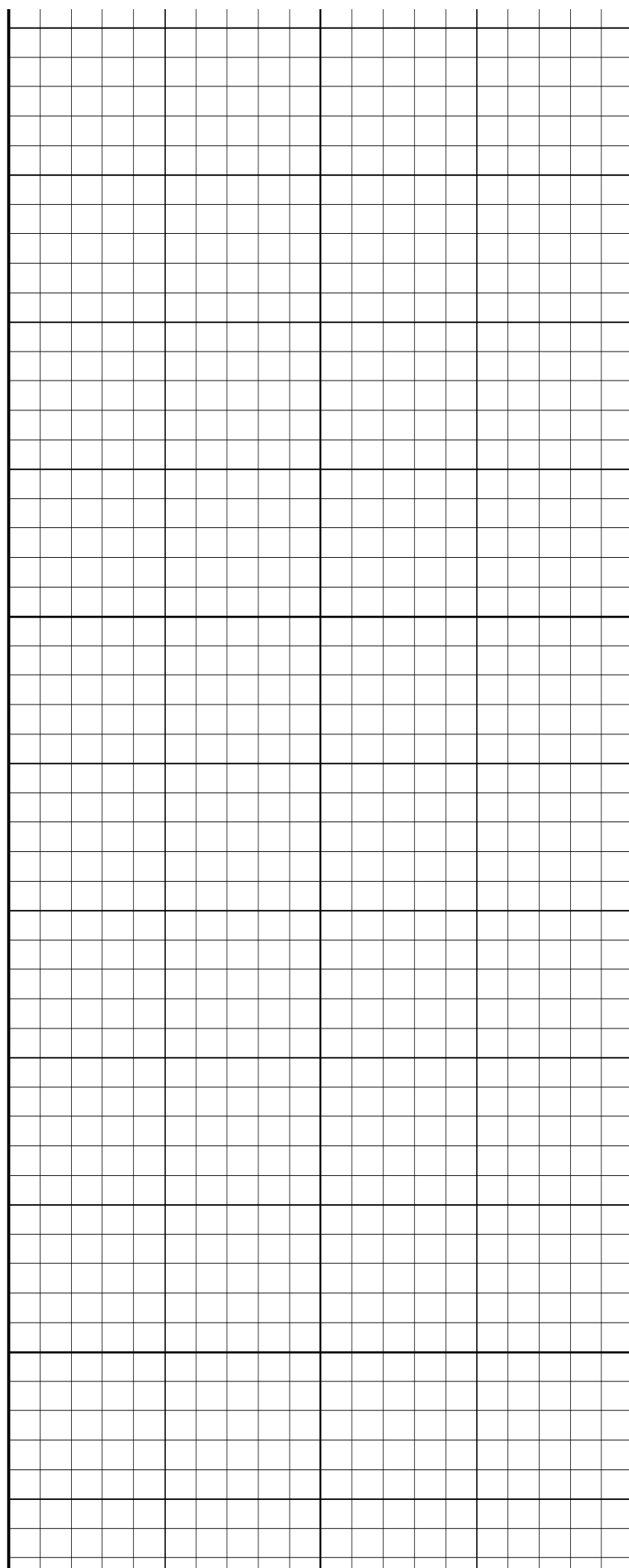


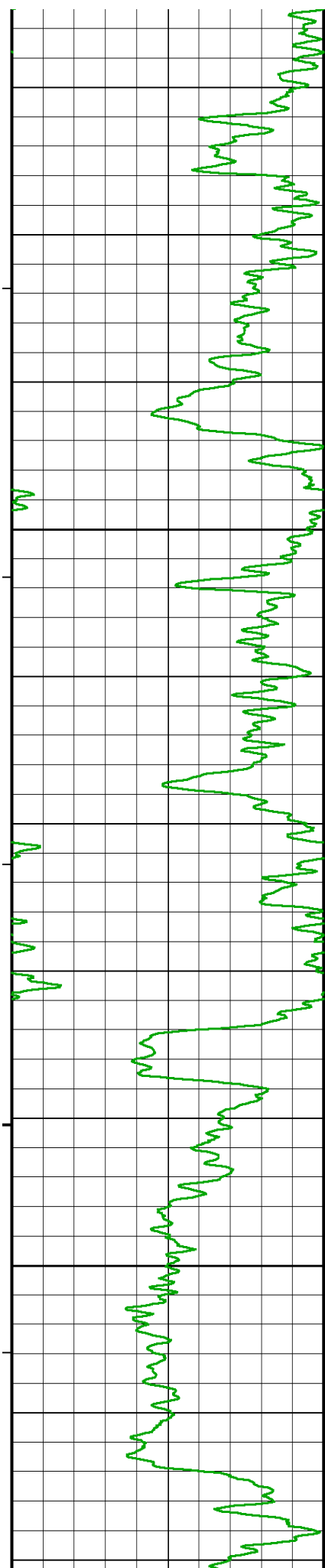


Gamma Ray

250

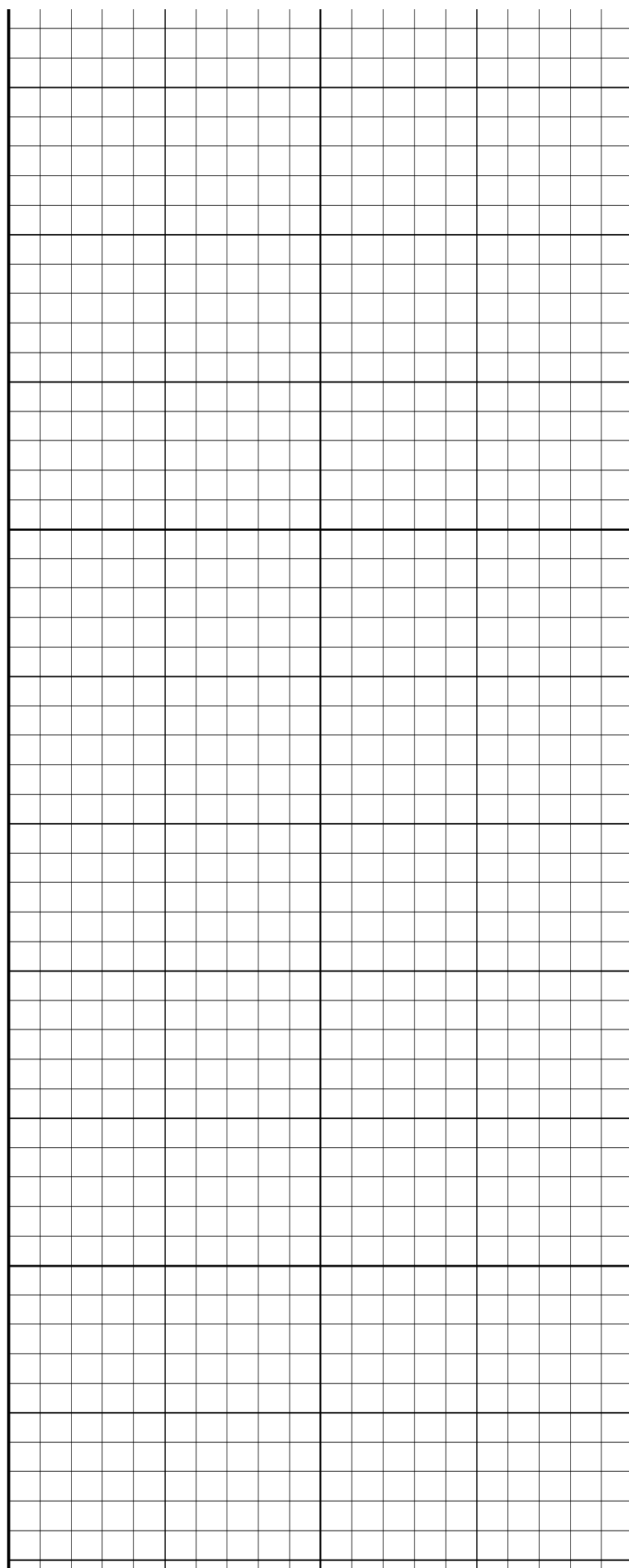
300

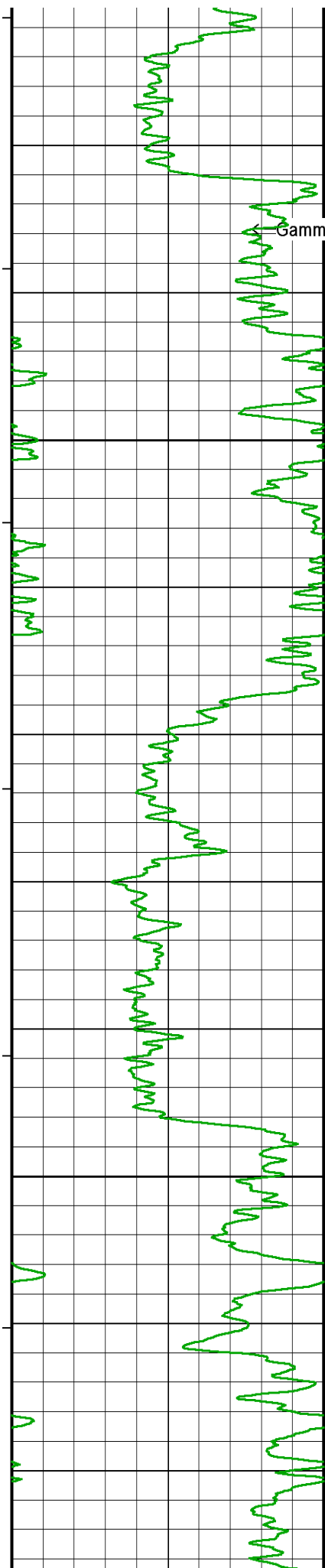




350

400

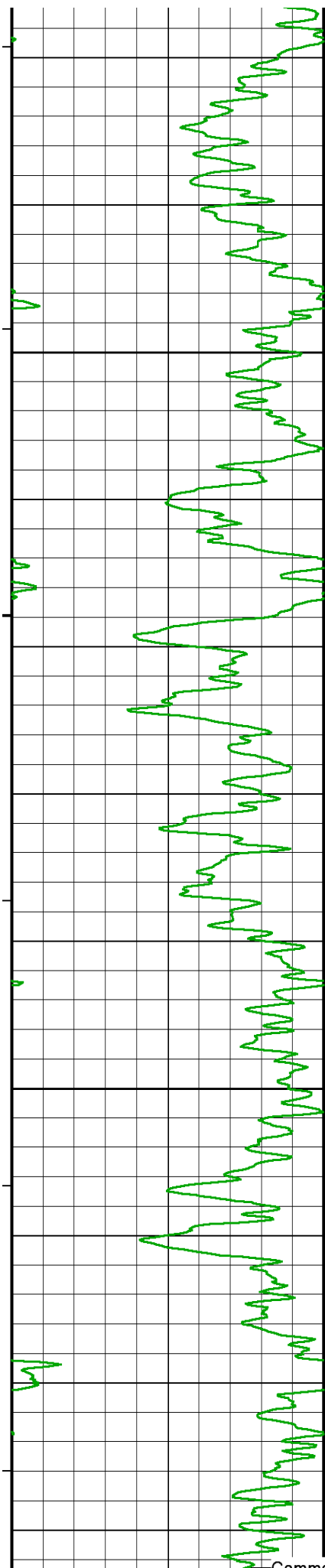




Gamma Ray

450

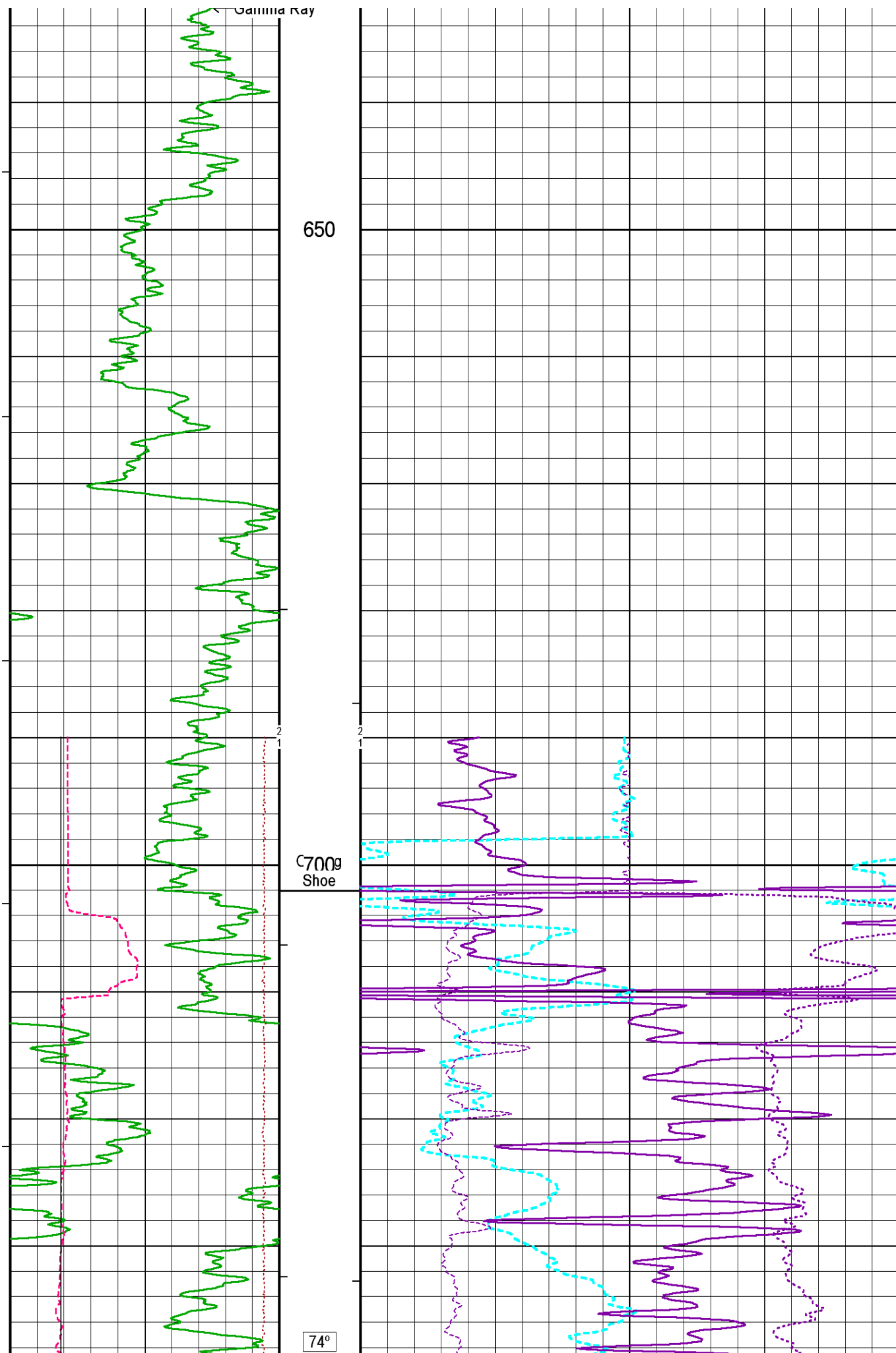
500

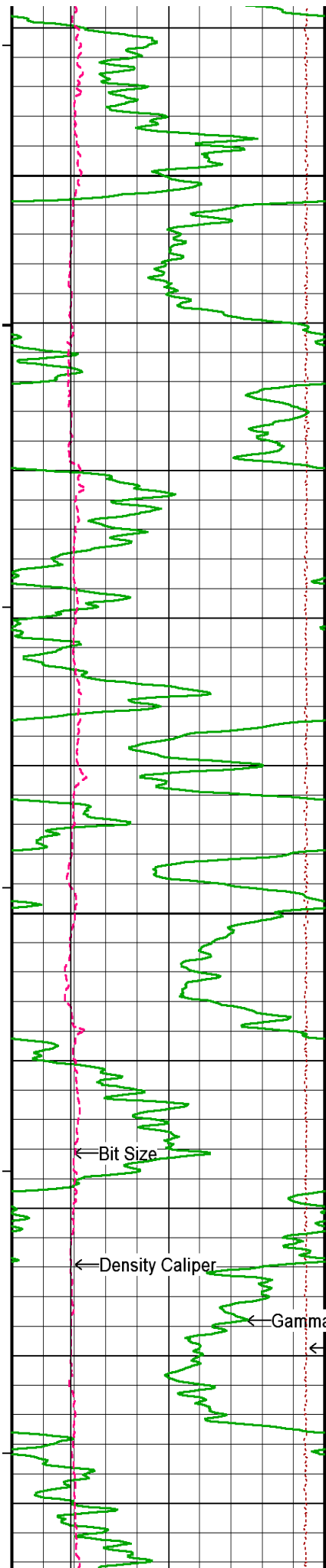


550

600

Comma Dev





750

75°

800

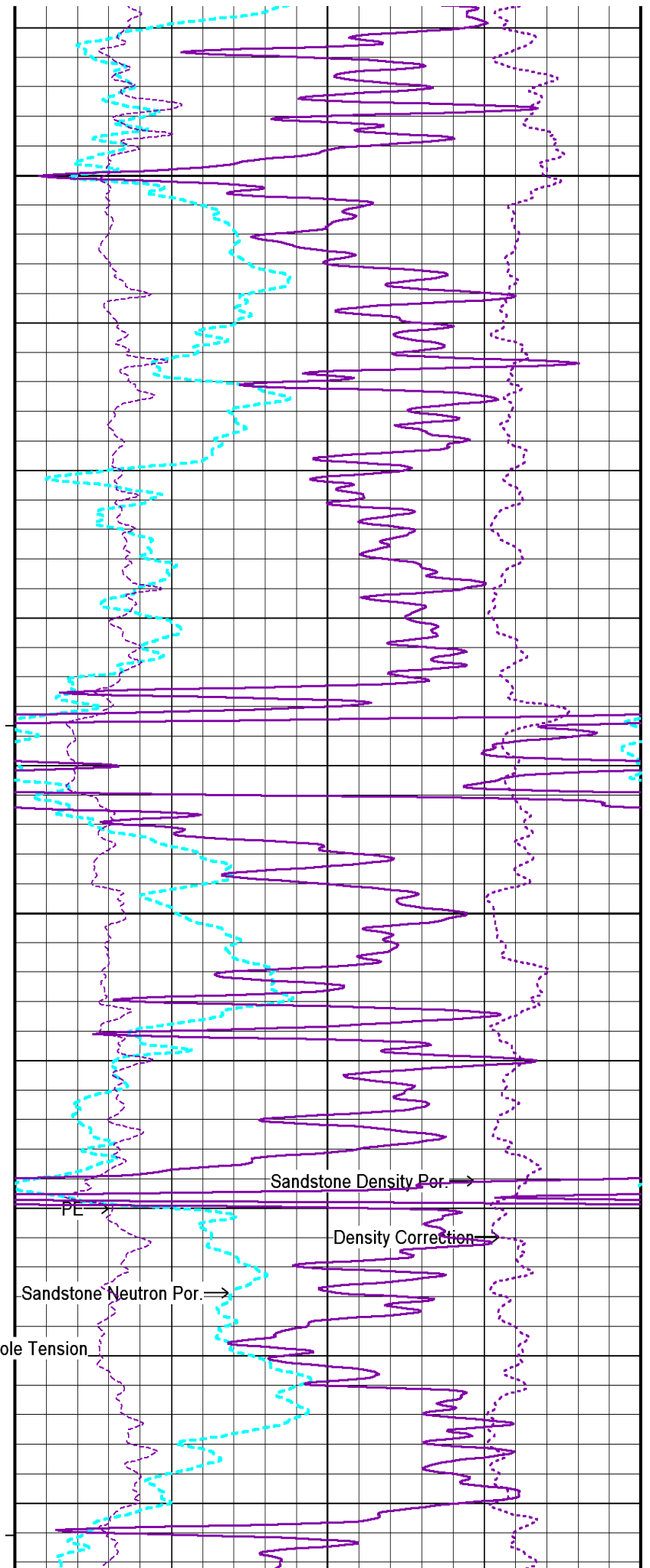
← Bit Size

← Density Caliper

← Gamma Ray

← DST Uphole Tension

76°

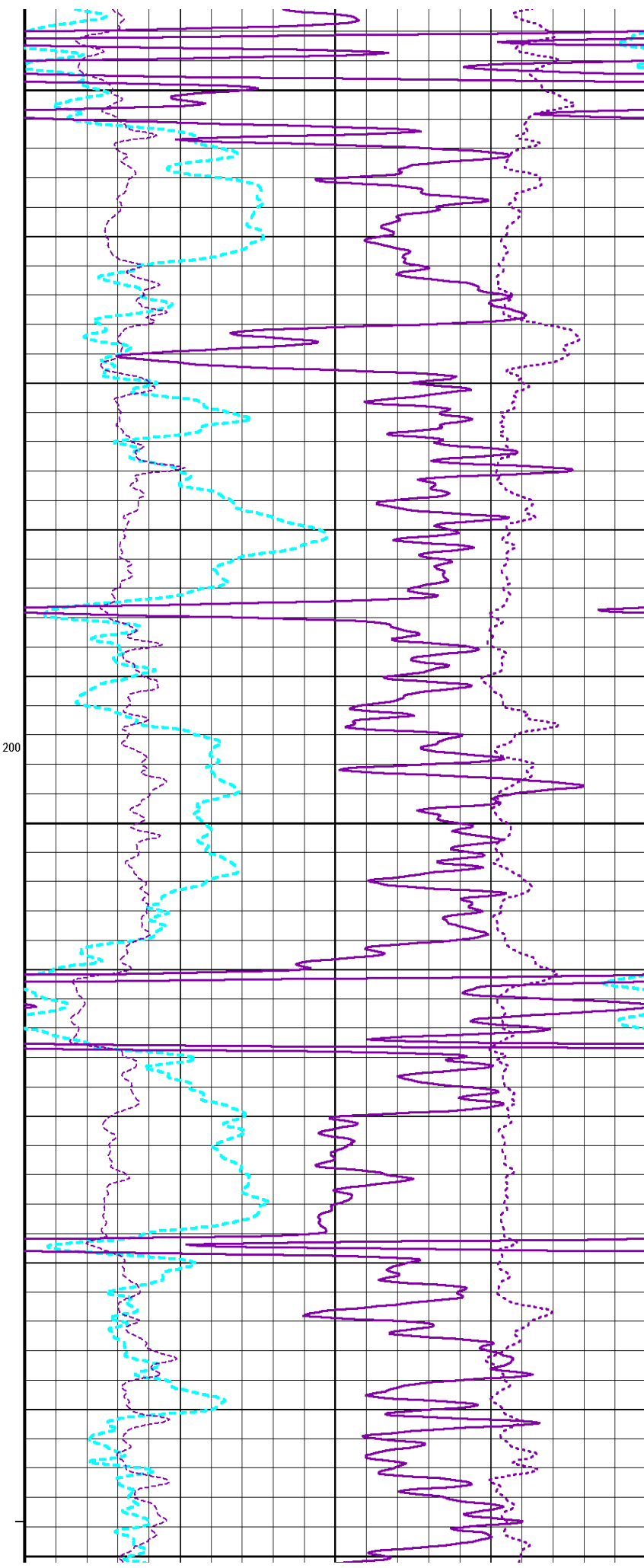
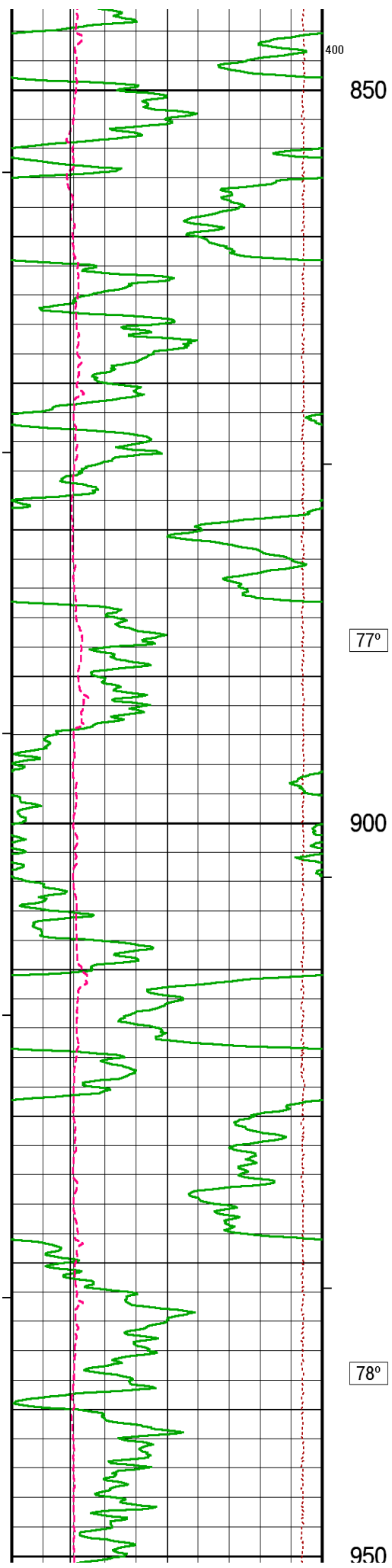


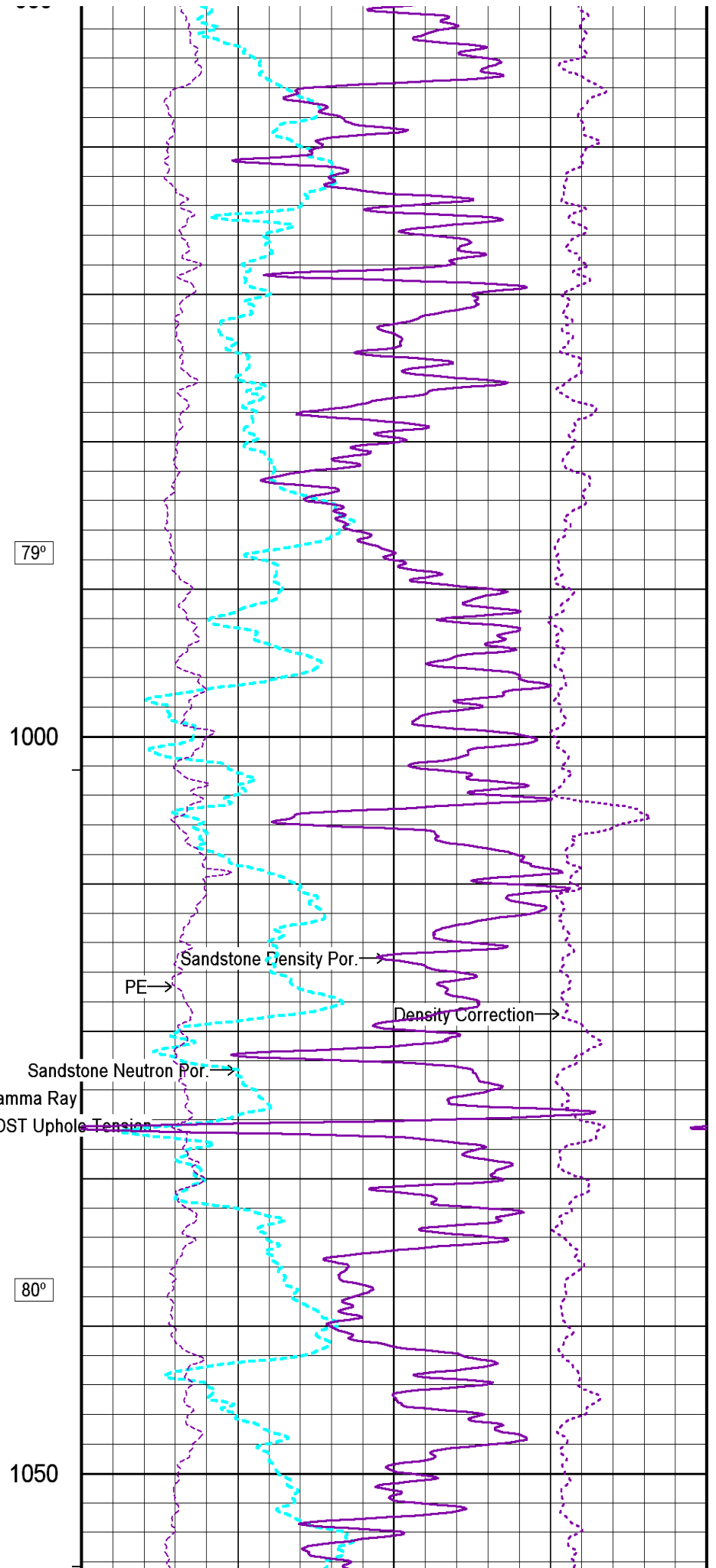
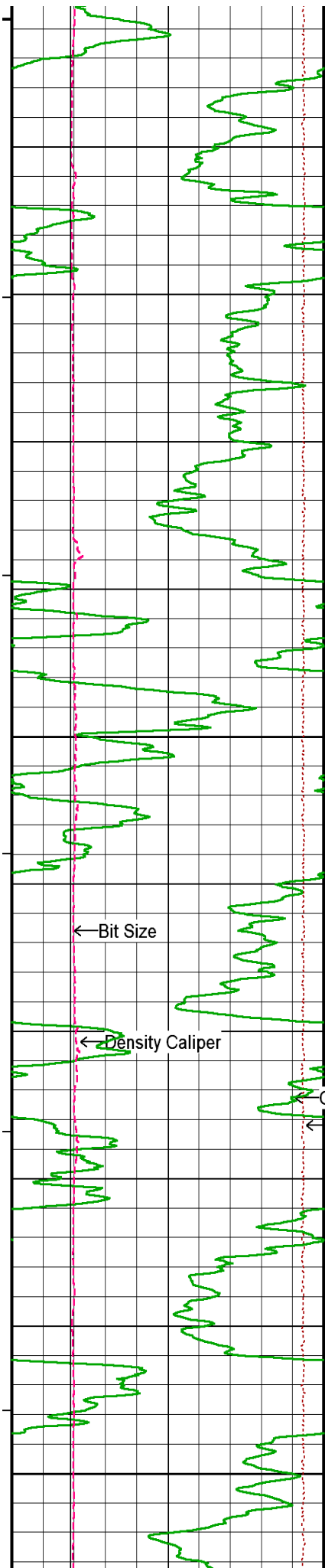
Sandstone Density Por. →

PE →

Density Correction →

Sandstone Neutron Por. →





79°

1000

80°

1050

← Bit Size

← Density Caliper

← Gamma Ray

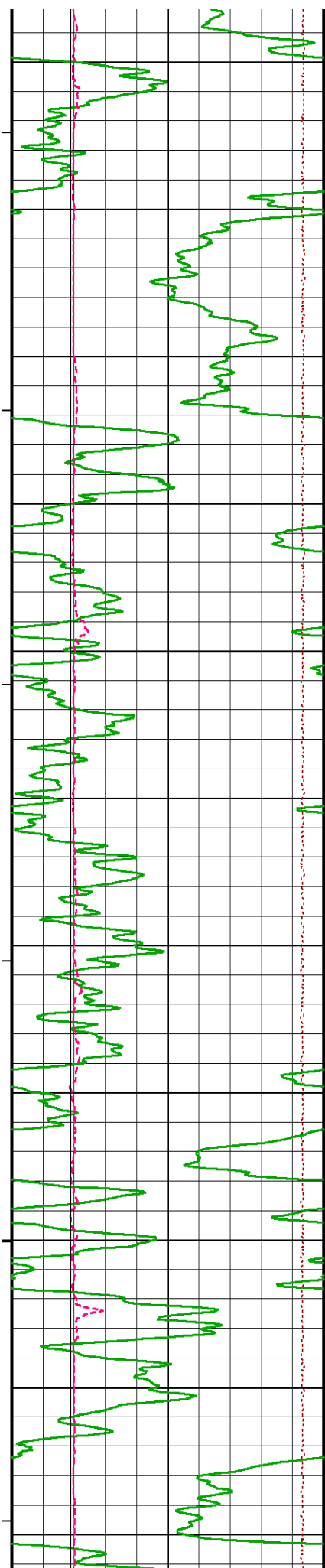
← DST Uphole Tension

PE →

Sandstone Density Por. →

Sandstone Neutron Por. →

Density Correction →



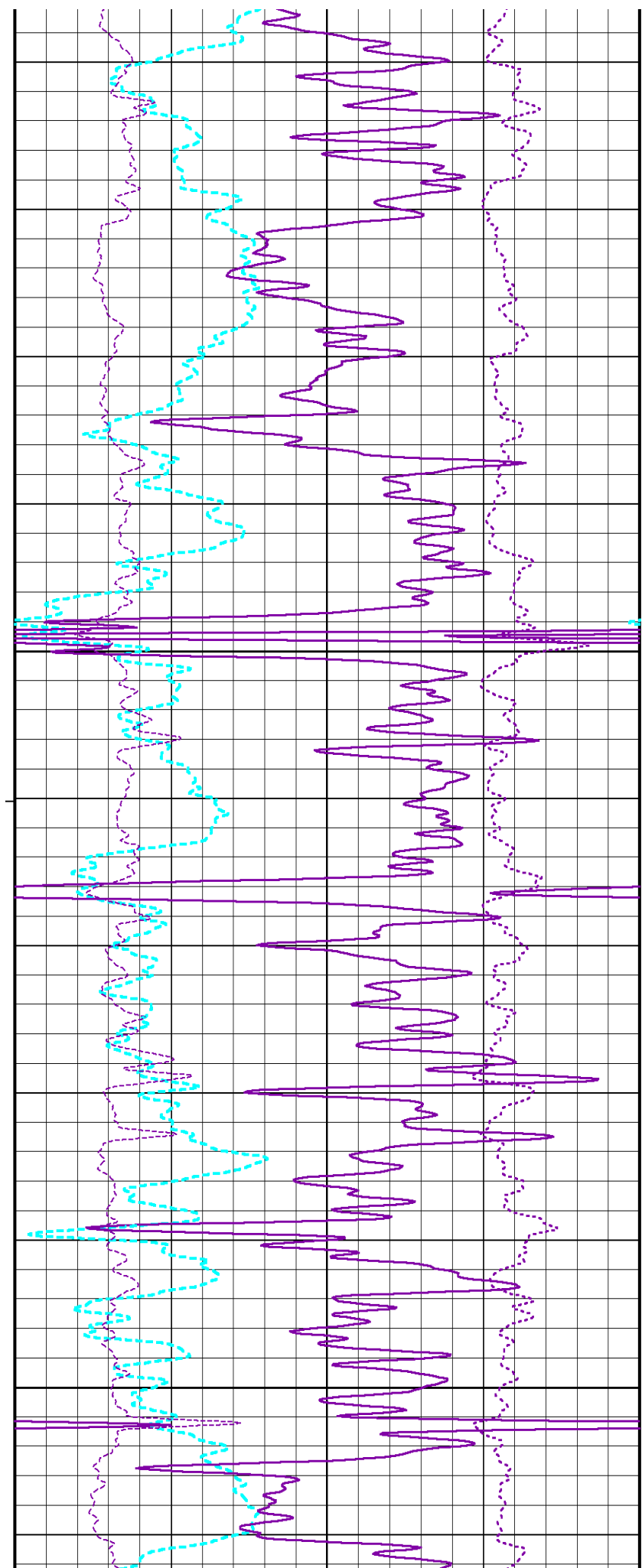
81°

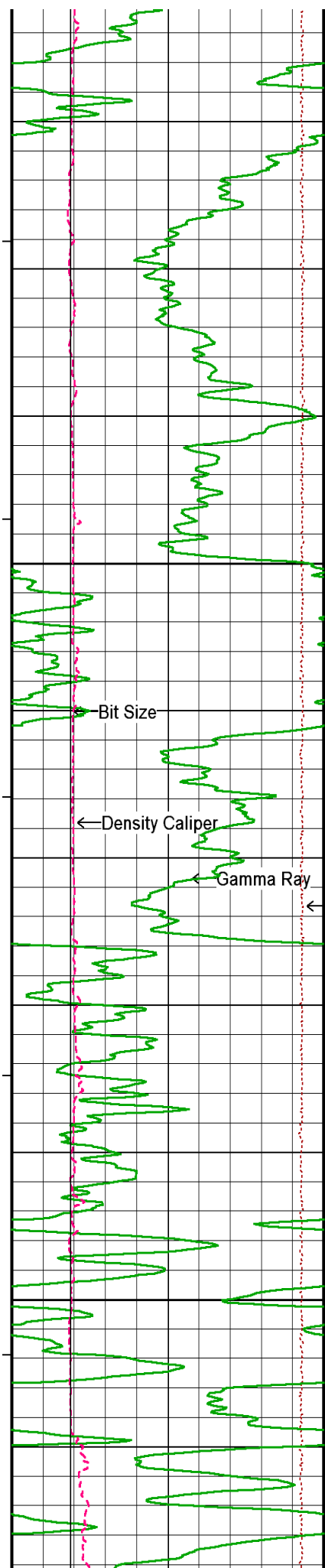
1100

300

81°

1150





82°

1200

Bit Size

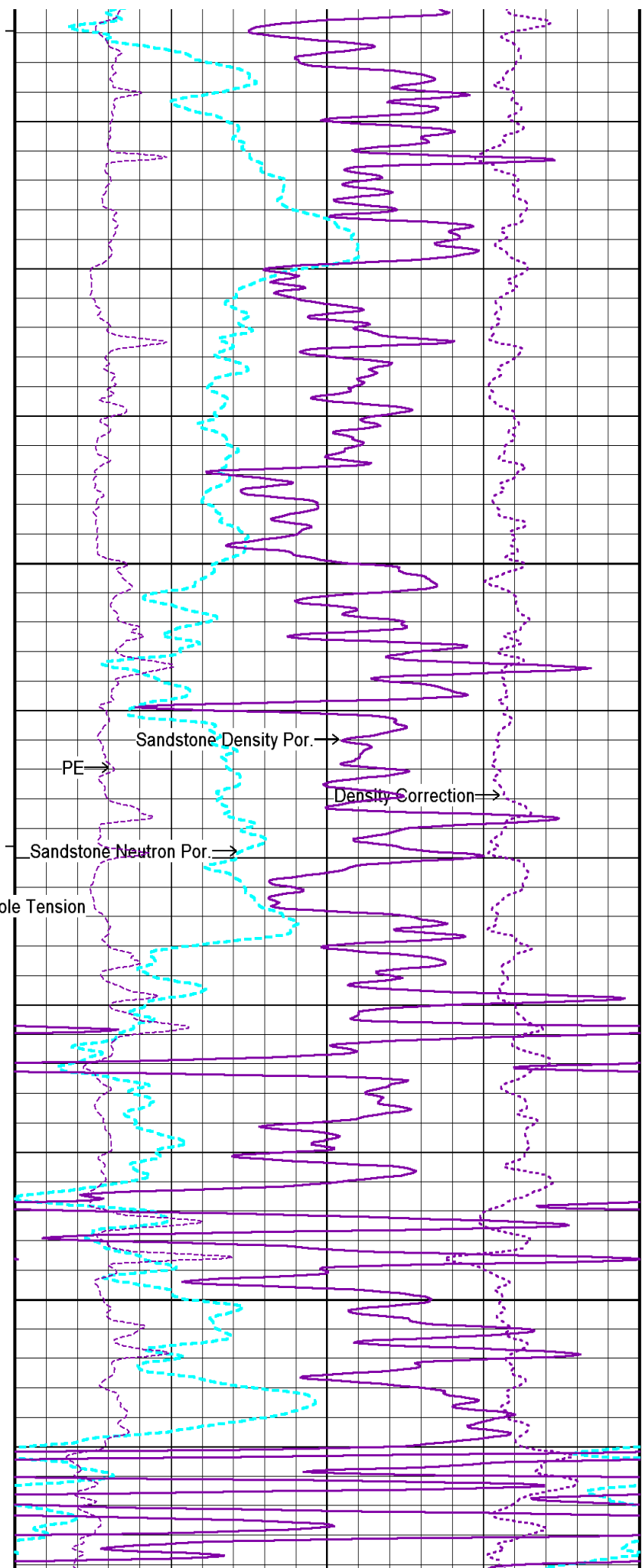
Density Caliper

Gamma Ray

DST Uphole Tension

83°

1250

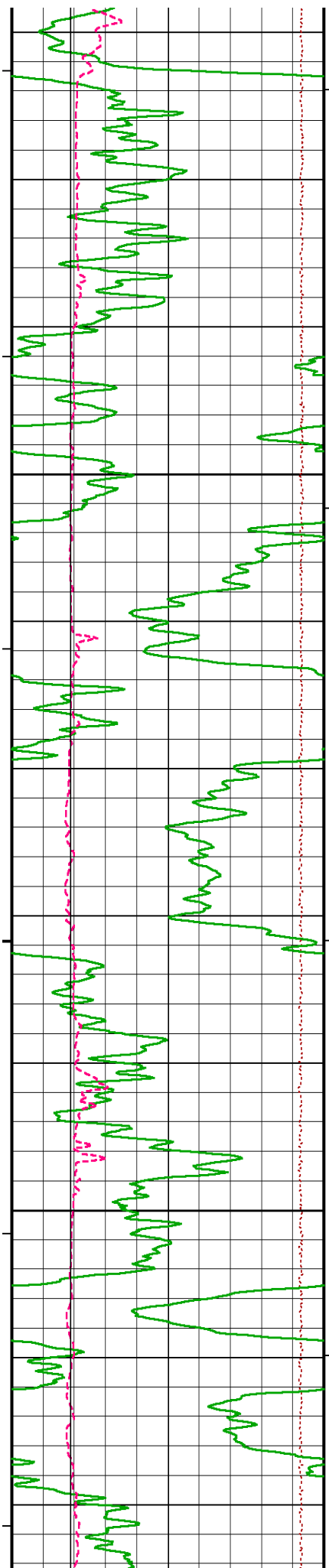


PE

Sandstone Density Por.

Sandstone Neutron Por.

Density Correction

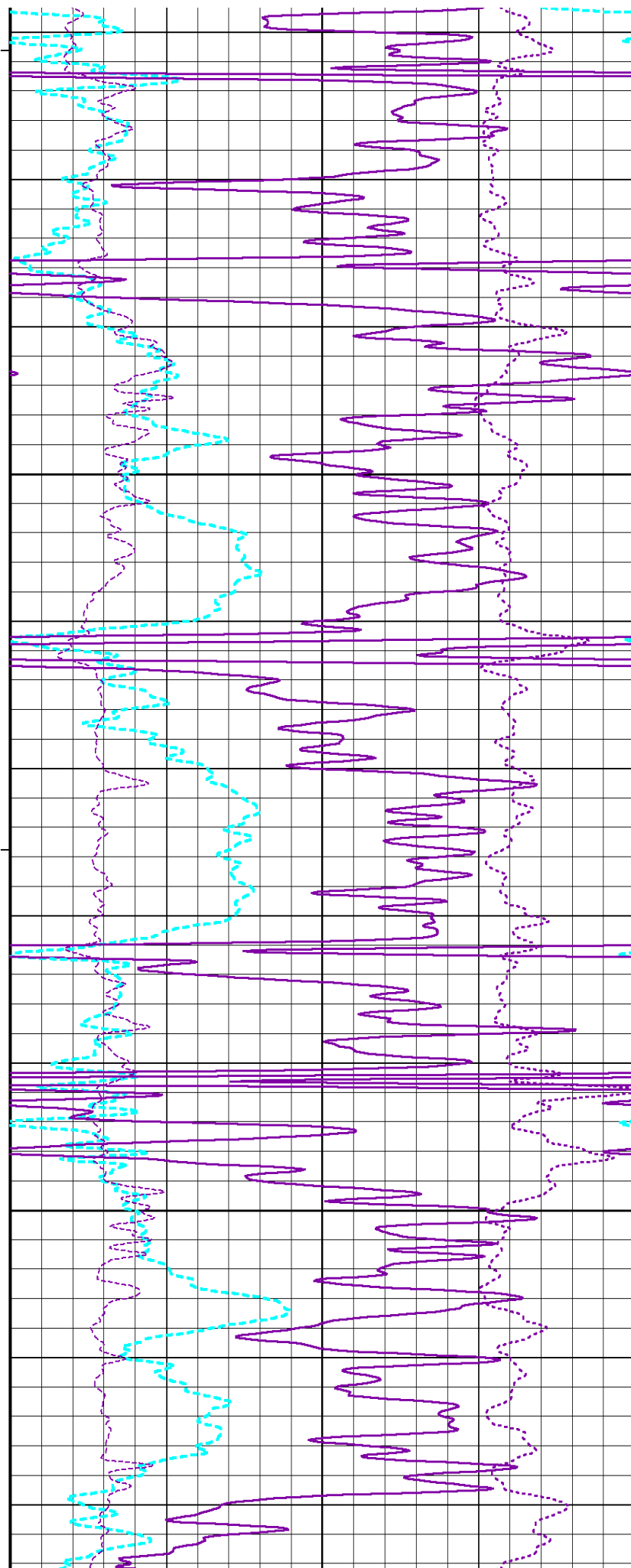


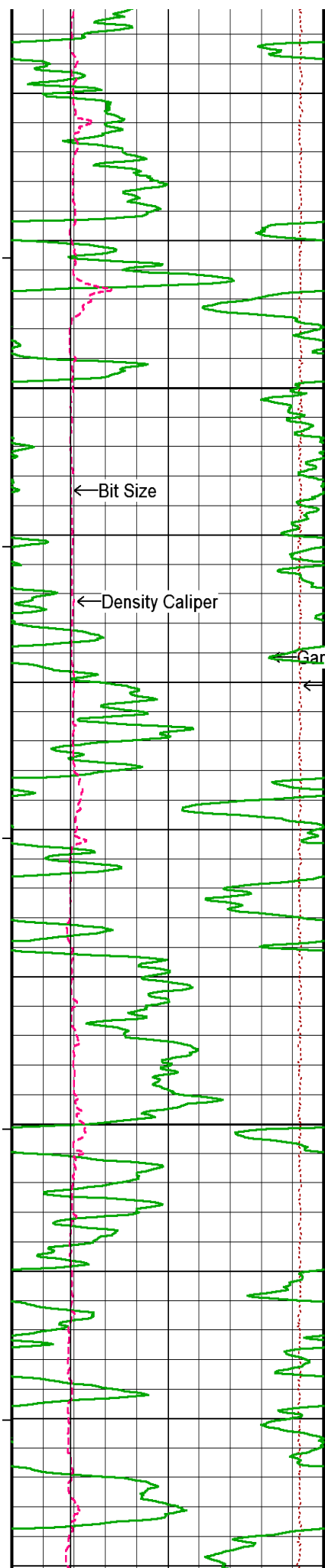
$84^\circ$

1300

$86^\circ$

1350





86°

1400

← Bit Size

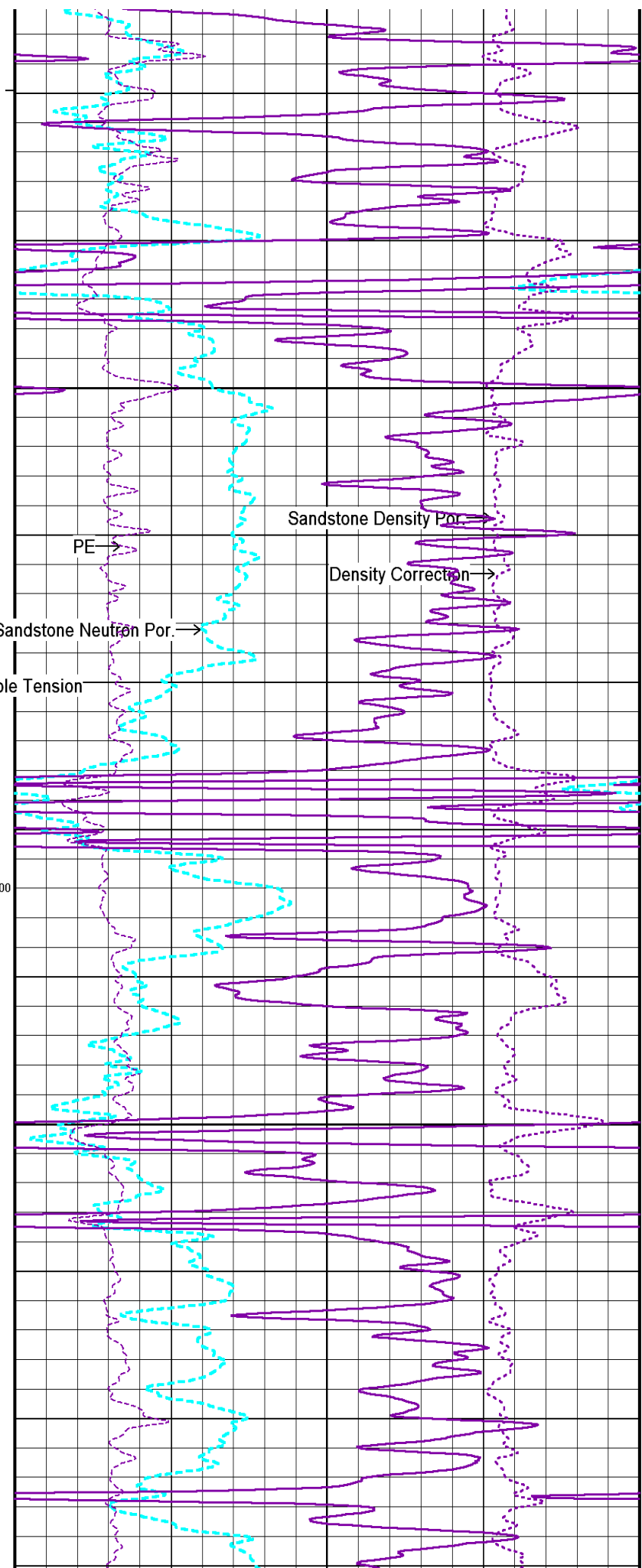
← Density Caliper

← <sup>200</sup>Gamma Ray

← DST Uphole Tension

87°

1450

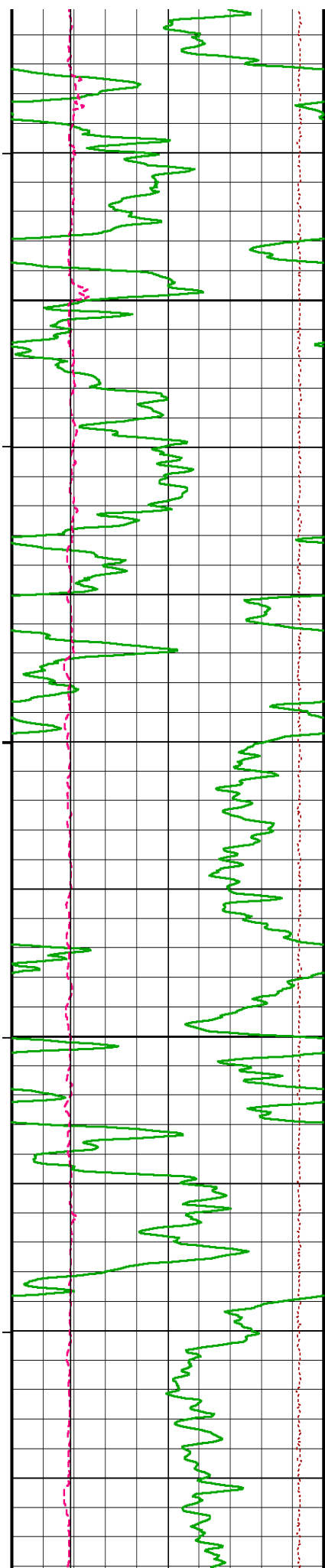


PE →

Sandstone Neutron Por. →

Sandstone Density Por. →

Density Correction →

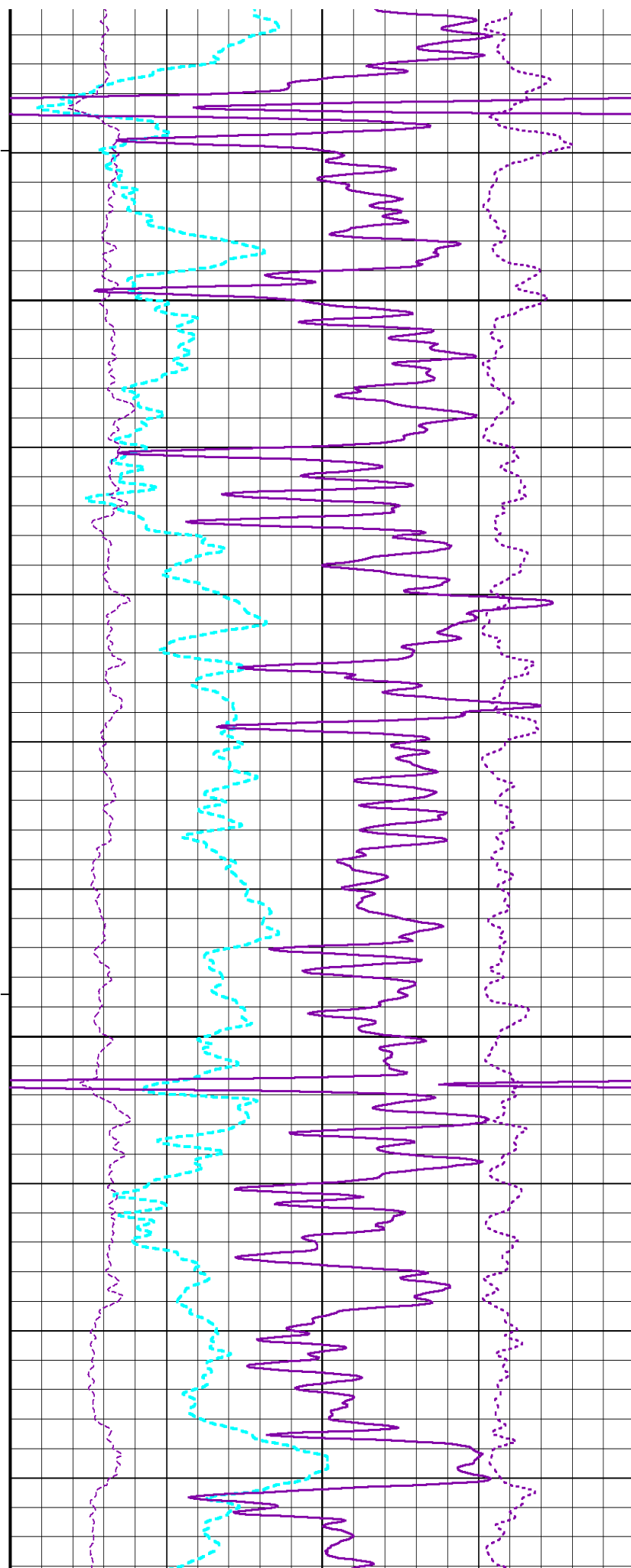


$88^\circ$

1500

$88^\circ$

1550

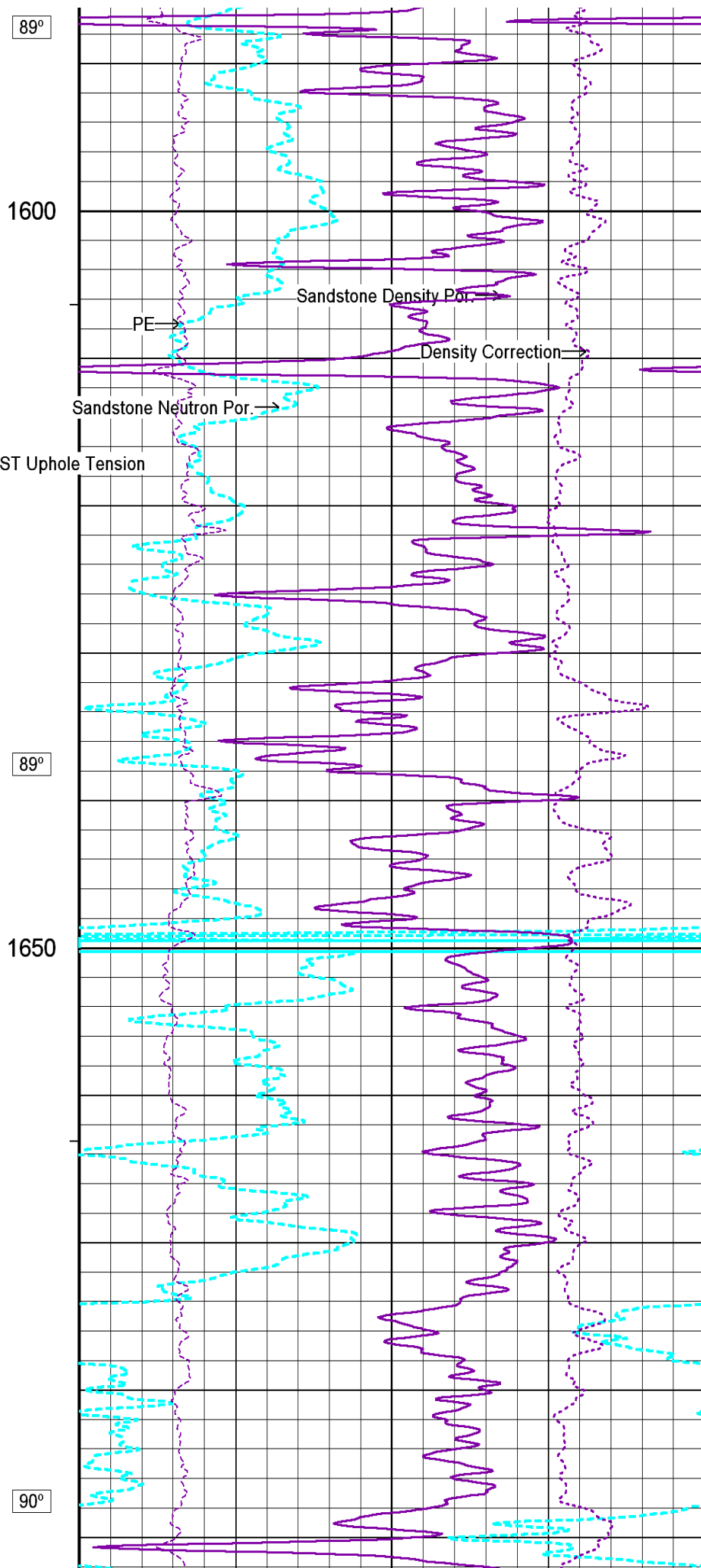
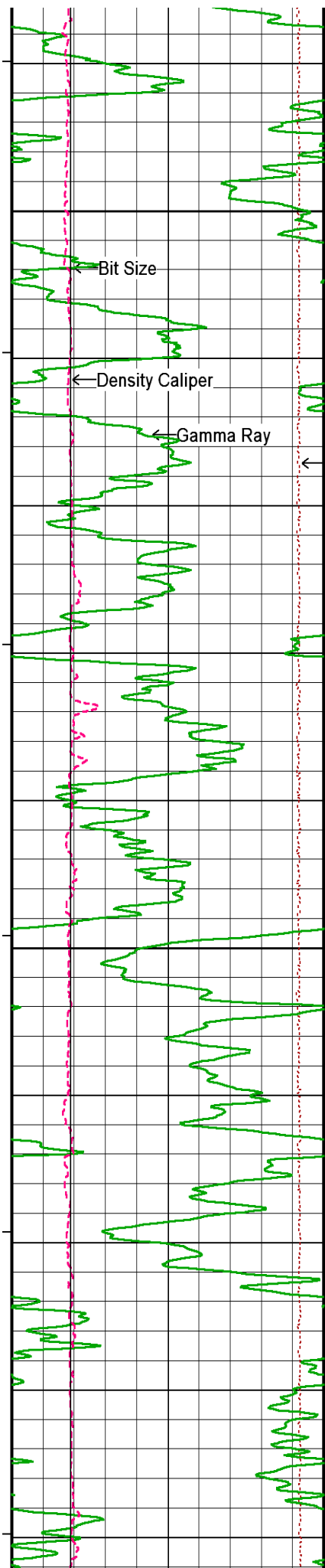


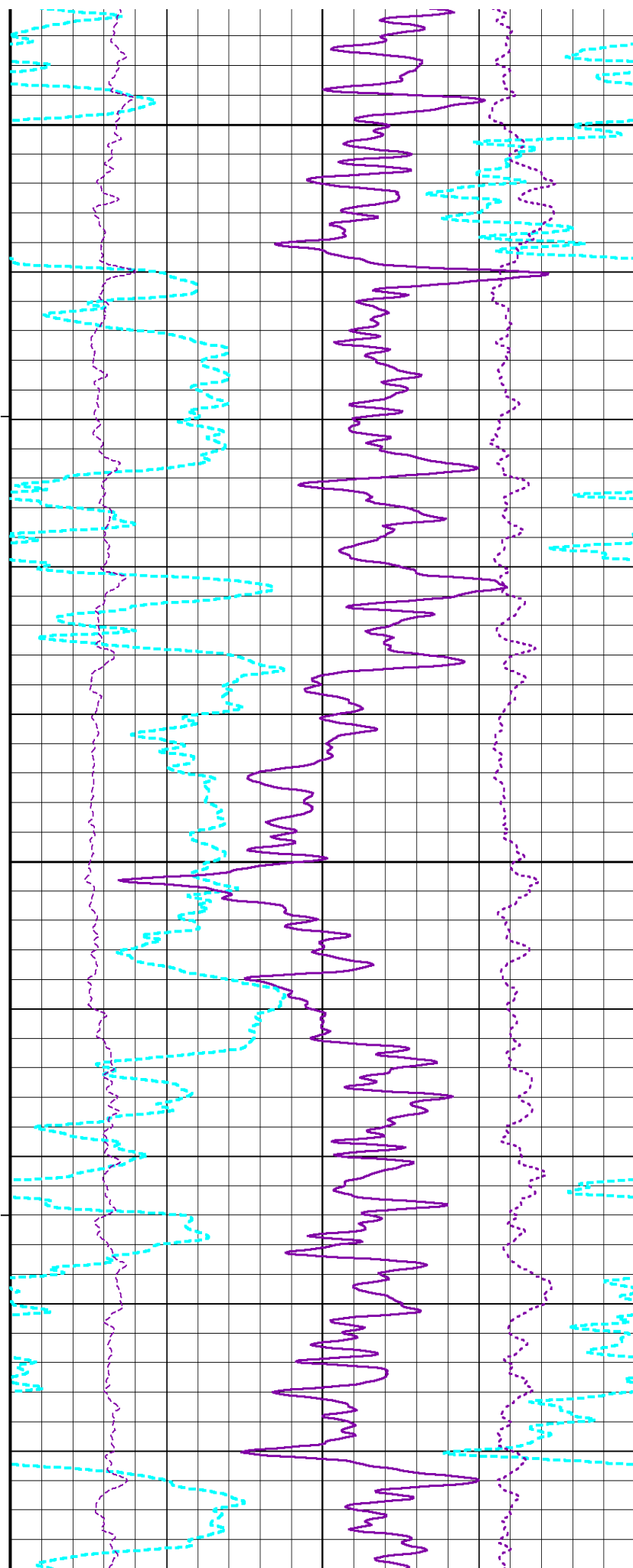
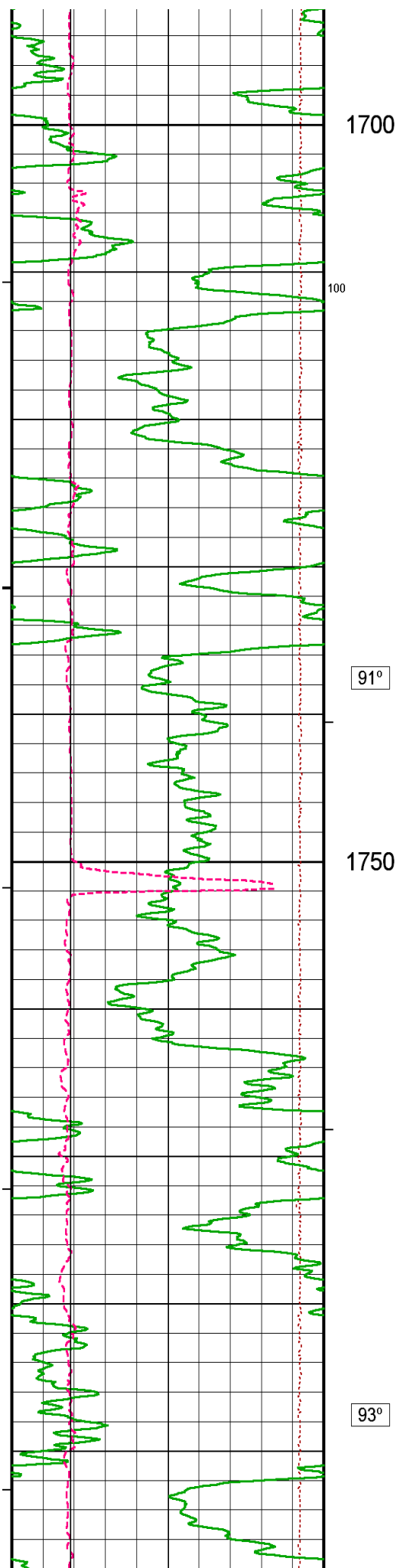
$88^\circ$

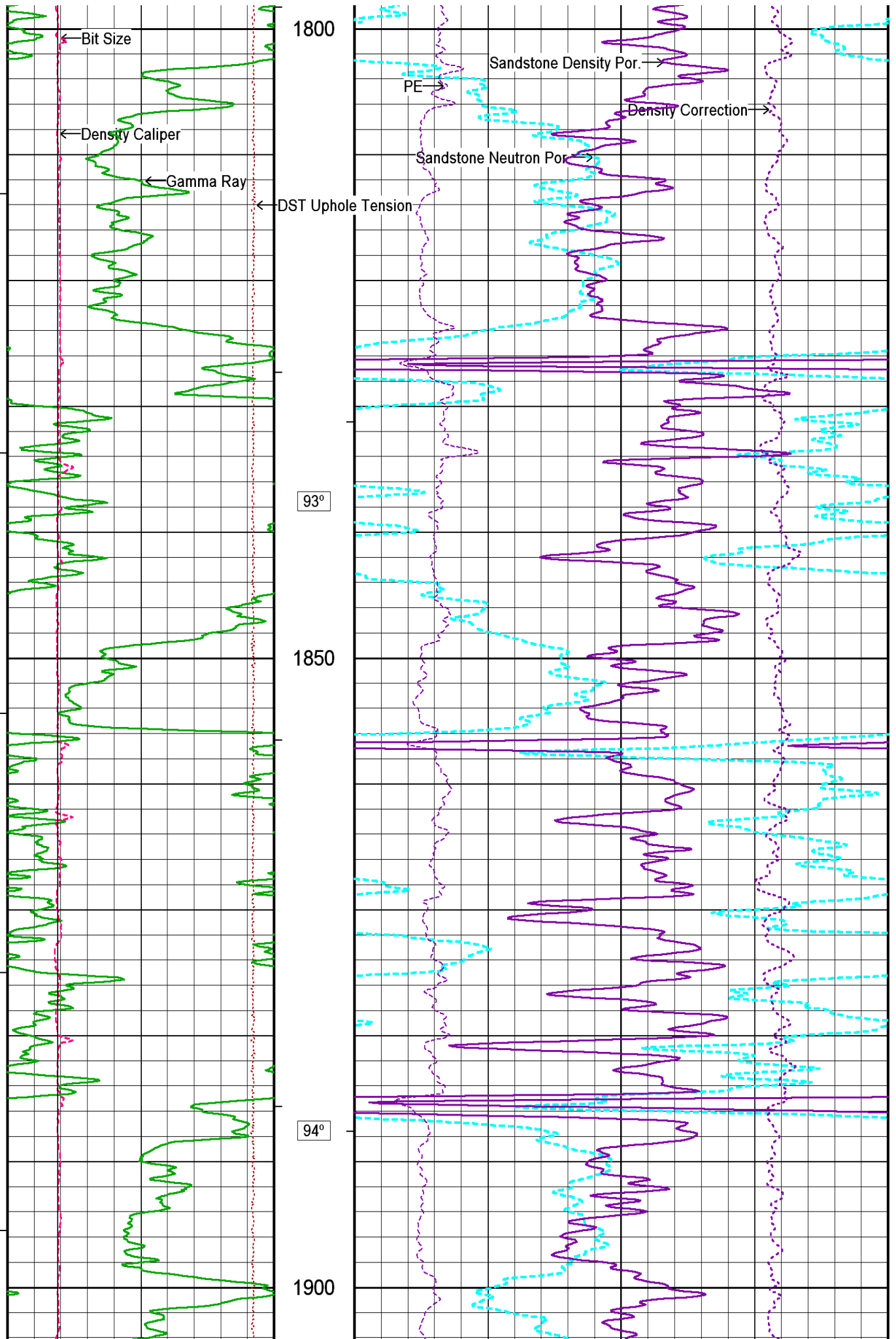
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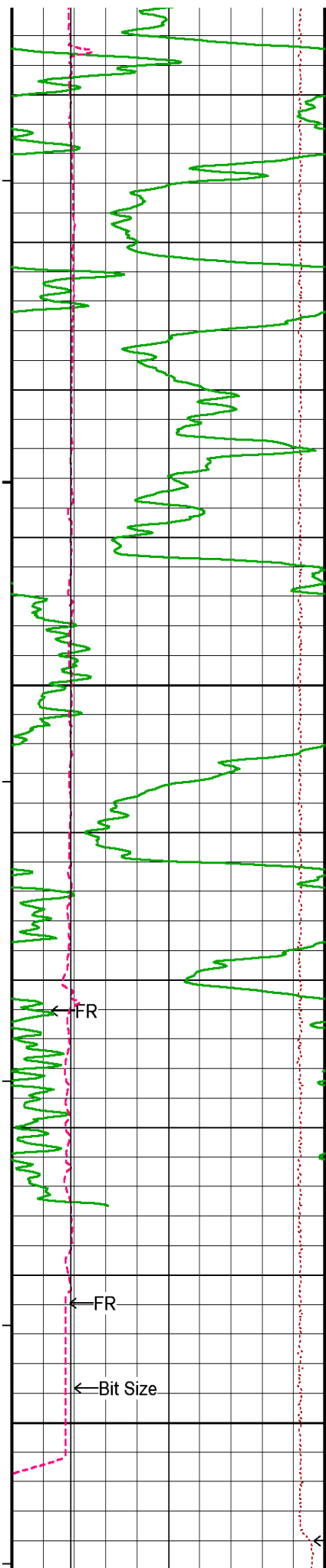
$88^\circ$

1550







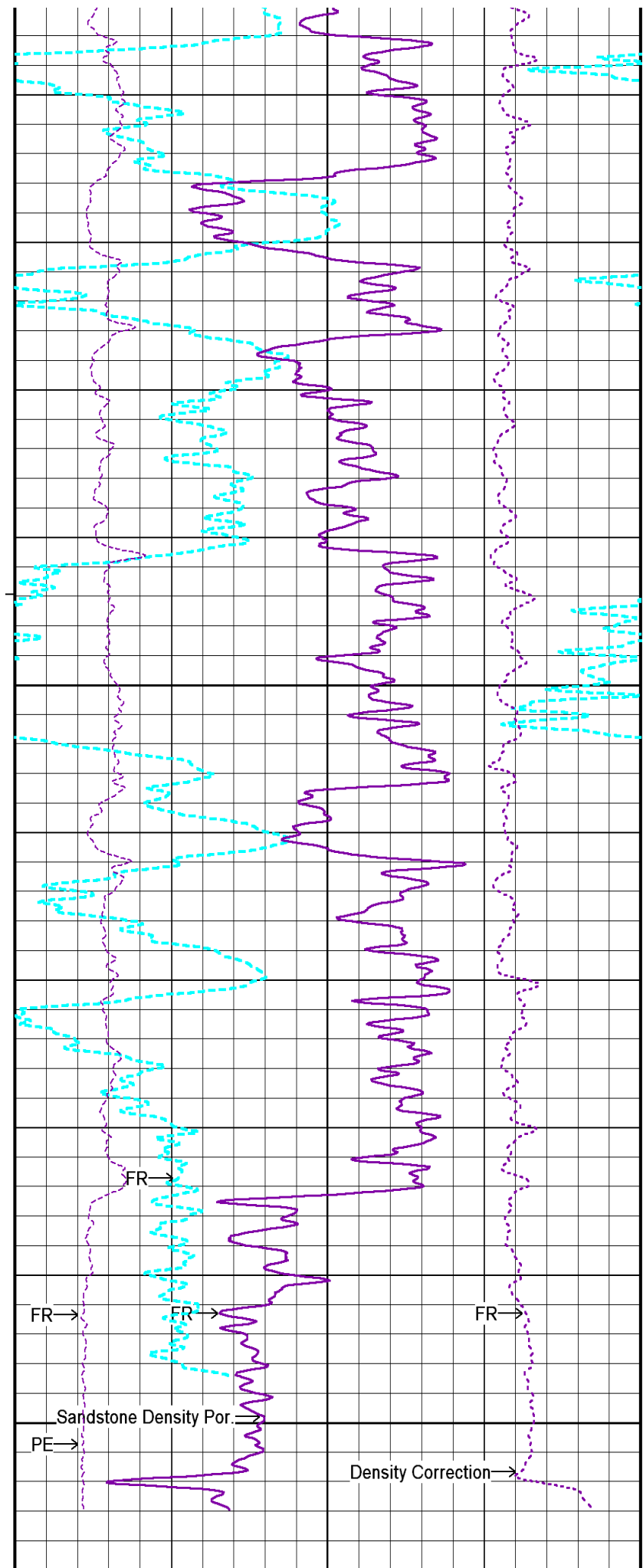


94°

1950

94°

2000



FR →

FR →

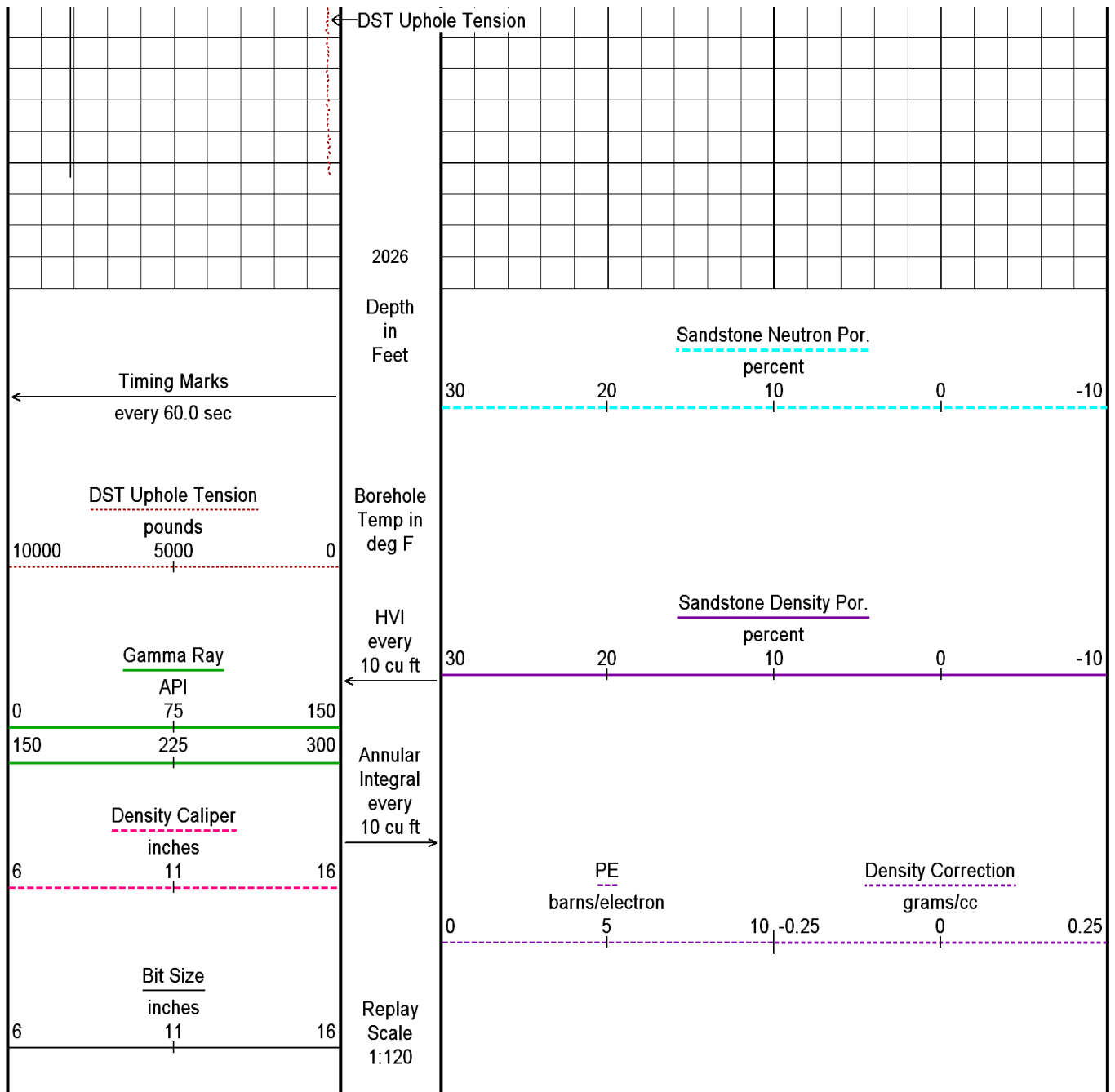
FR →

FR →

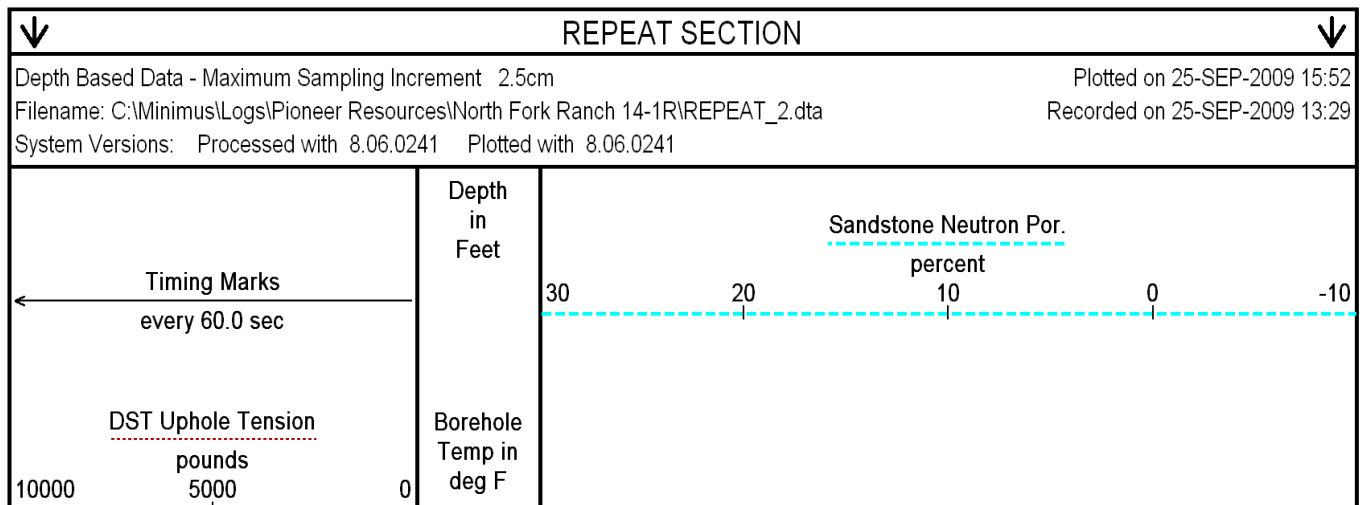
Sandstone Density Por. →

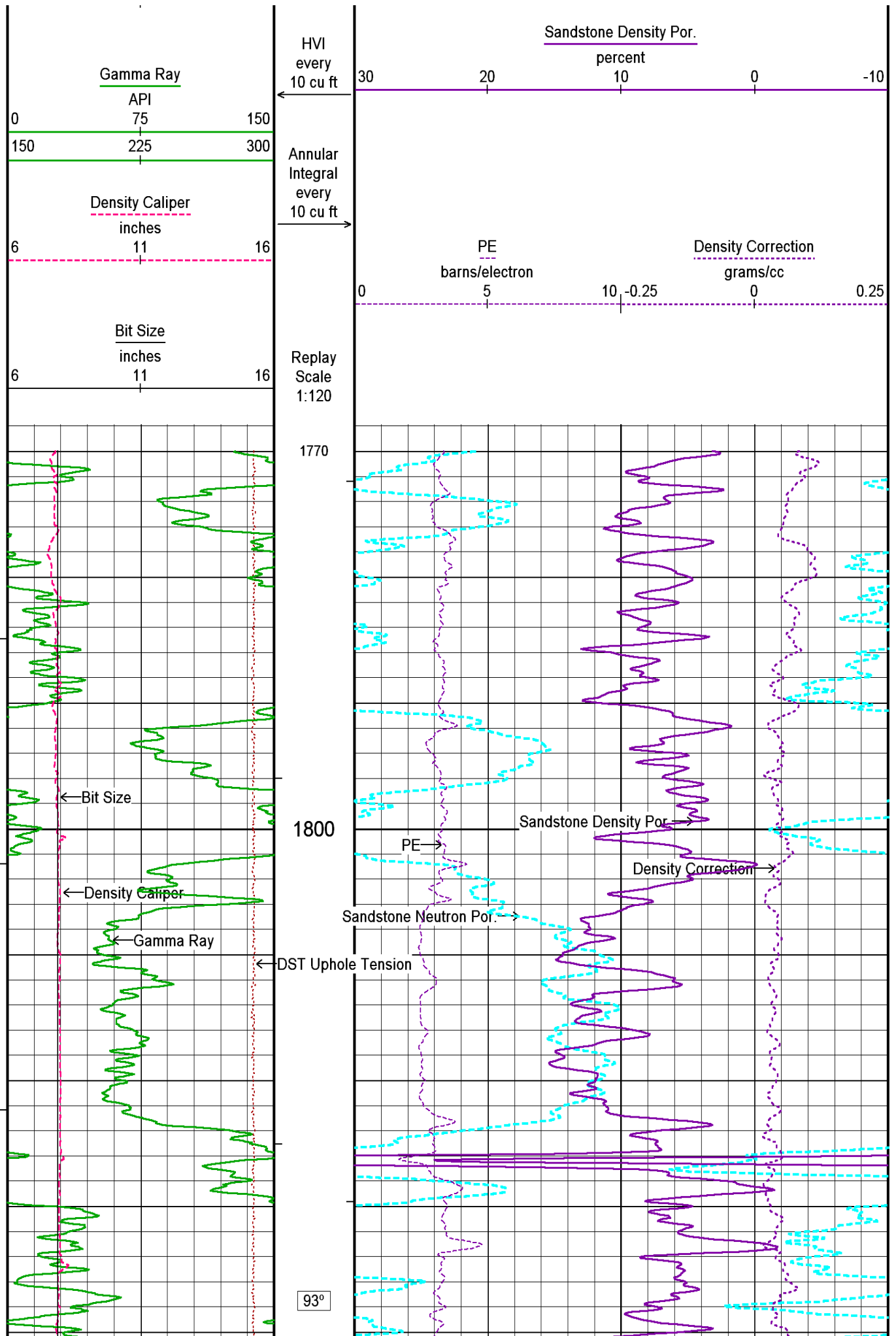
PE →

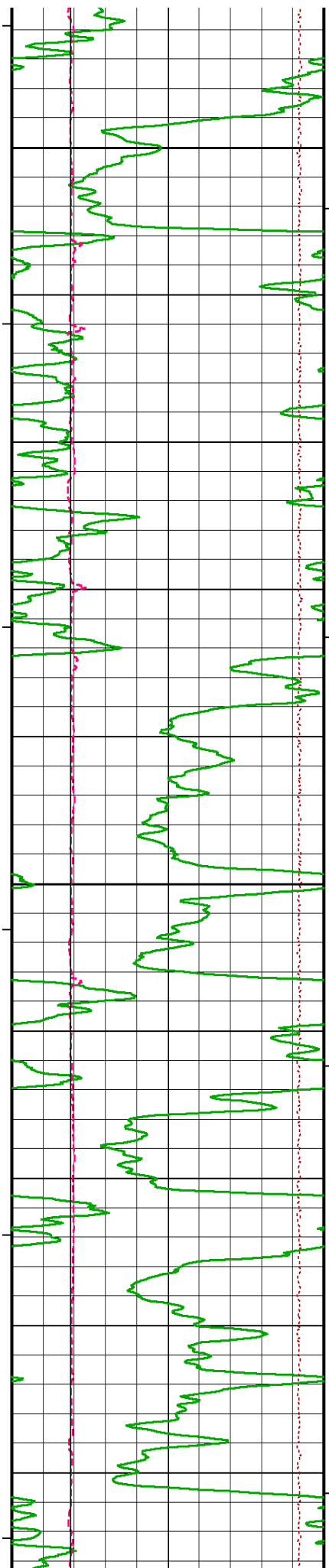
Density Correction →



↑ 5 INCH MAIN LOG ↑





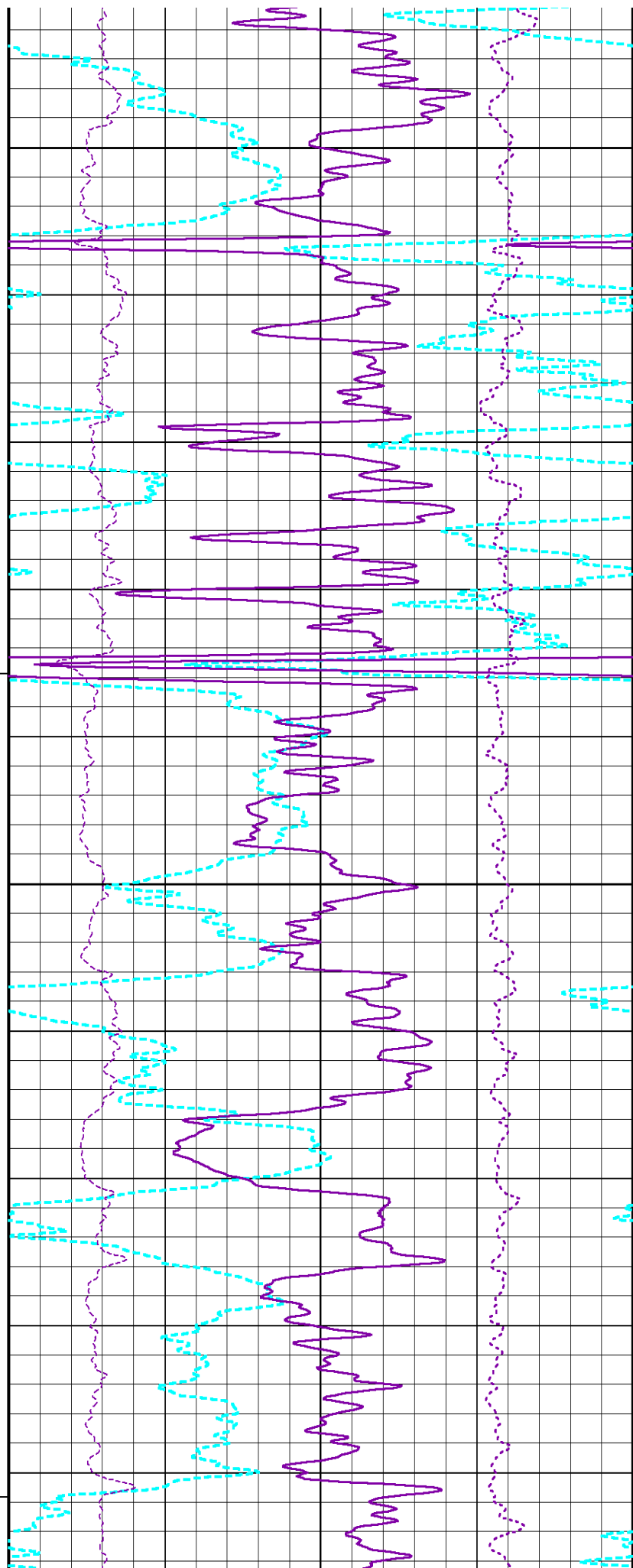


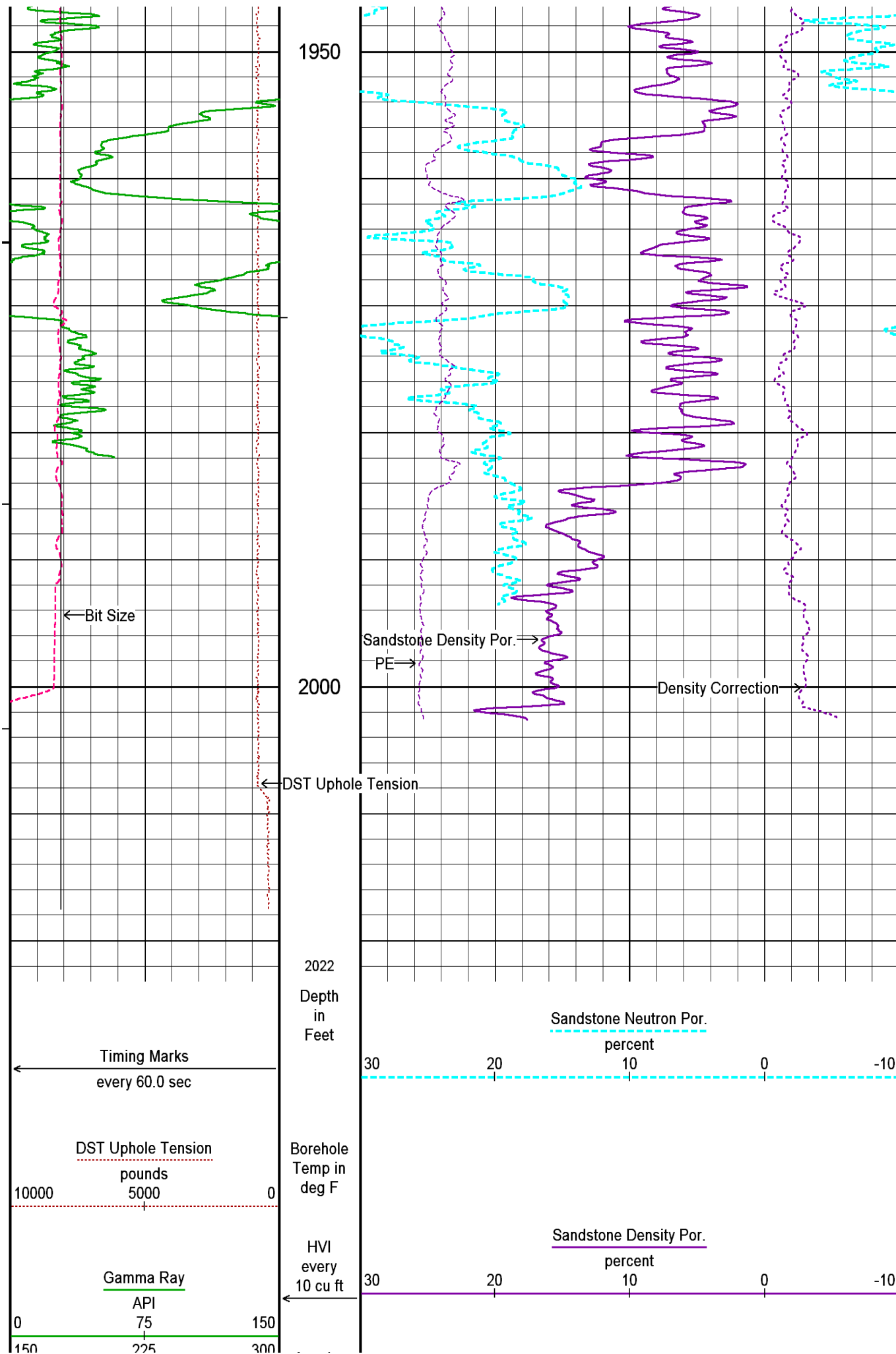
1850

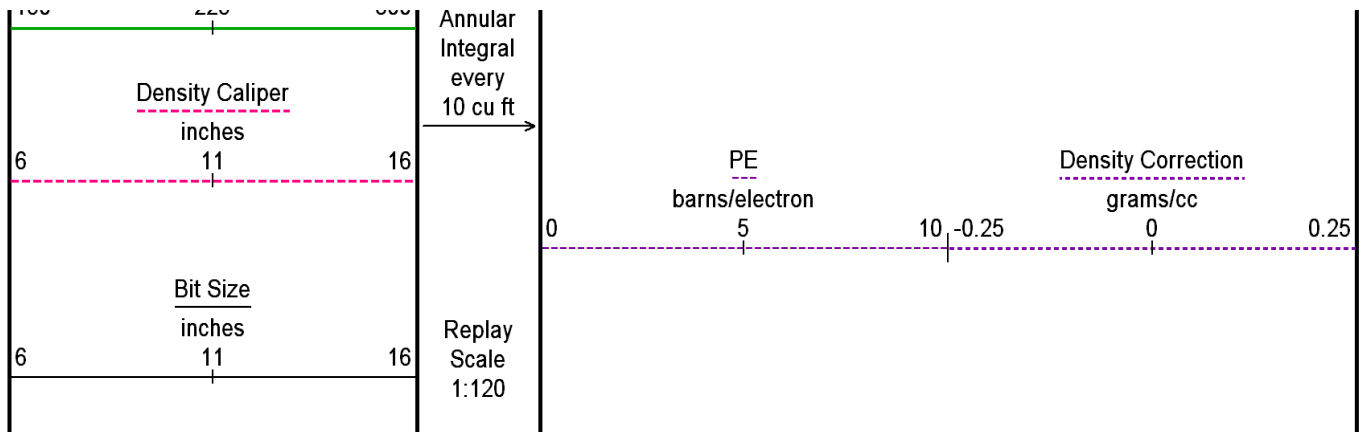
94°

1900

94°





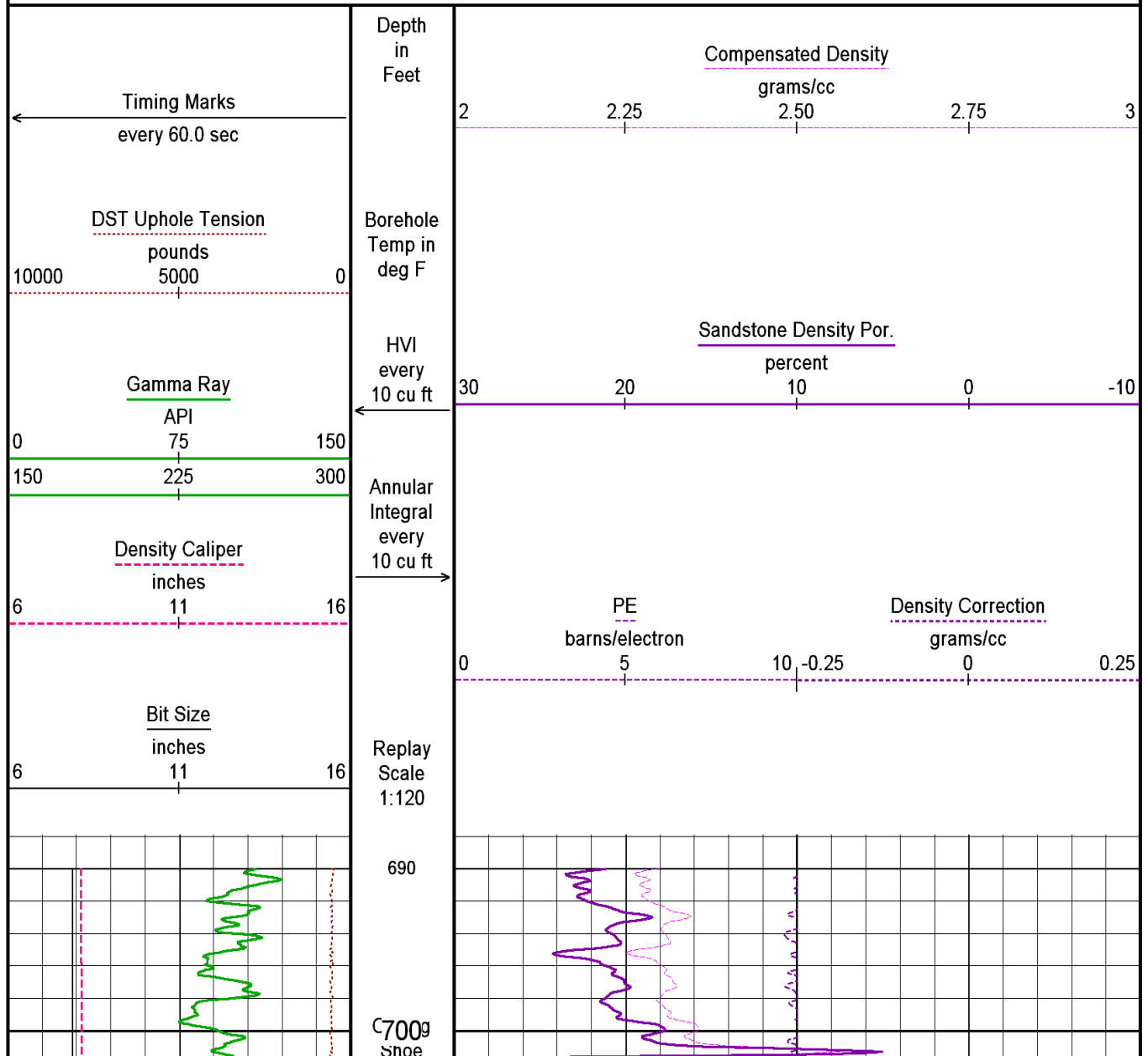


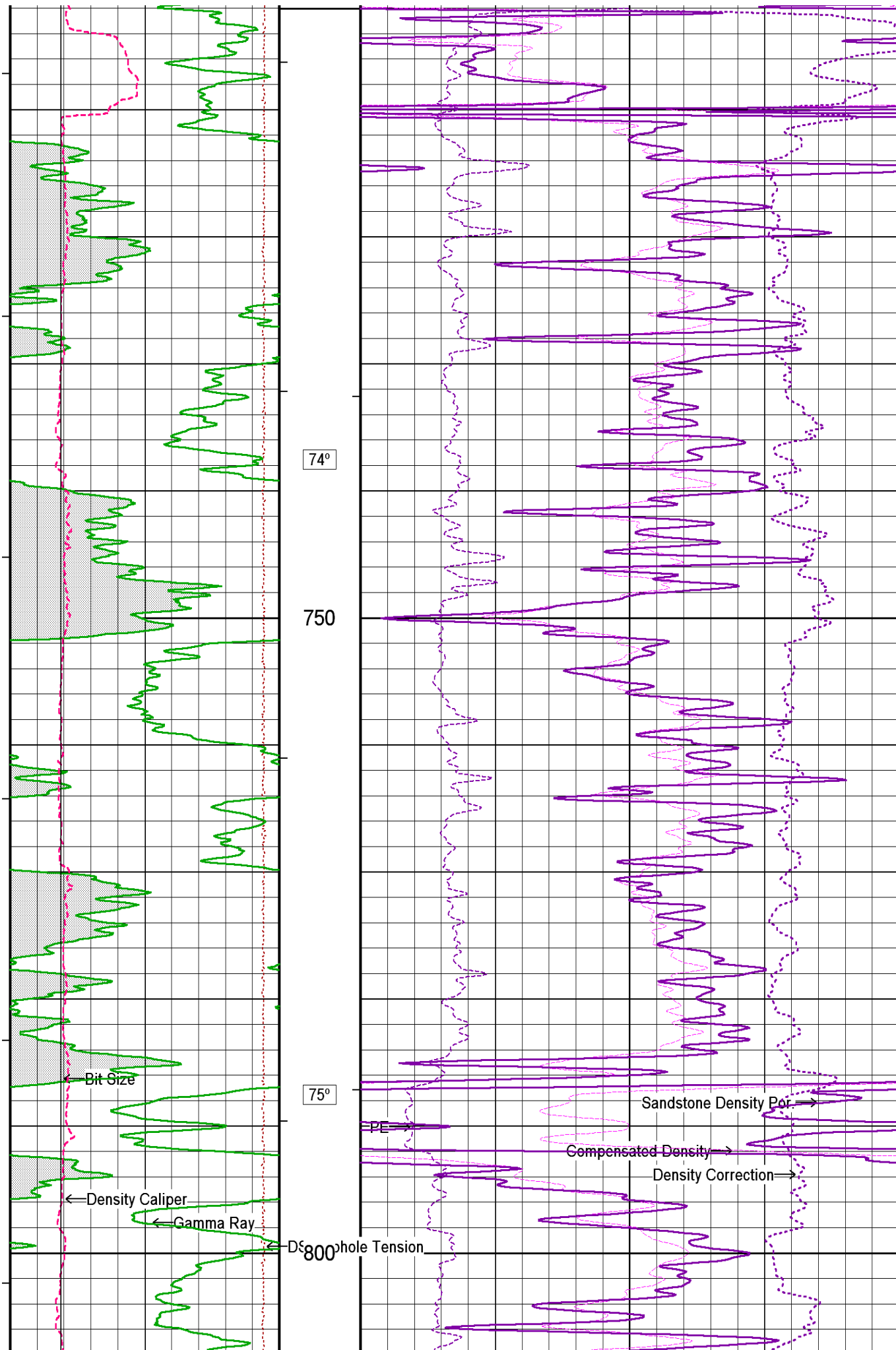
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 Plotted on 25-SEP-2009 15:52  
 Filename: C:\Minimus\Logs\Pioneer Resources\North Fork Ranch 14-1R\REPEAT\_2.dta  
 Recorded on 25-SEP-2009 13:29  
 System Versions: Processed with 8.06.0241 Plotted with 8.06.0241

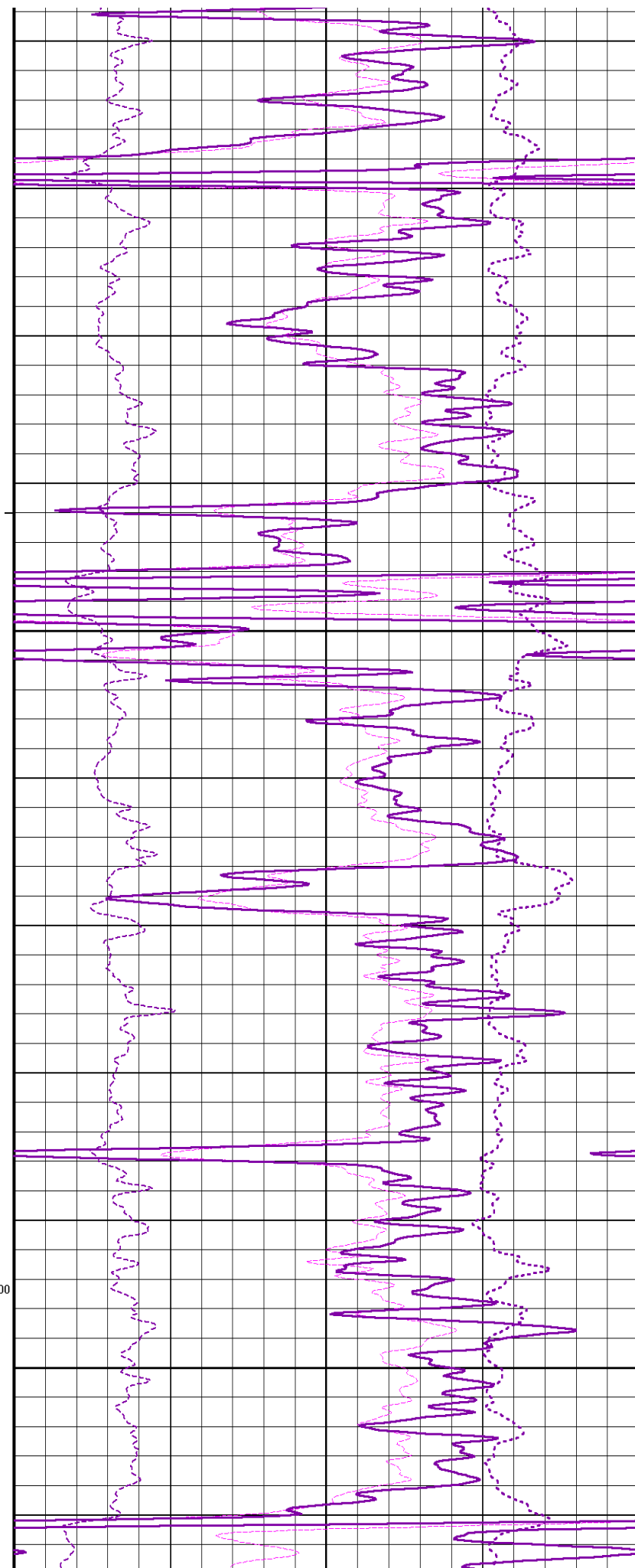
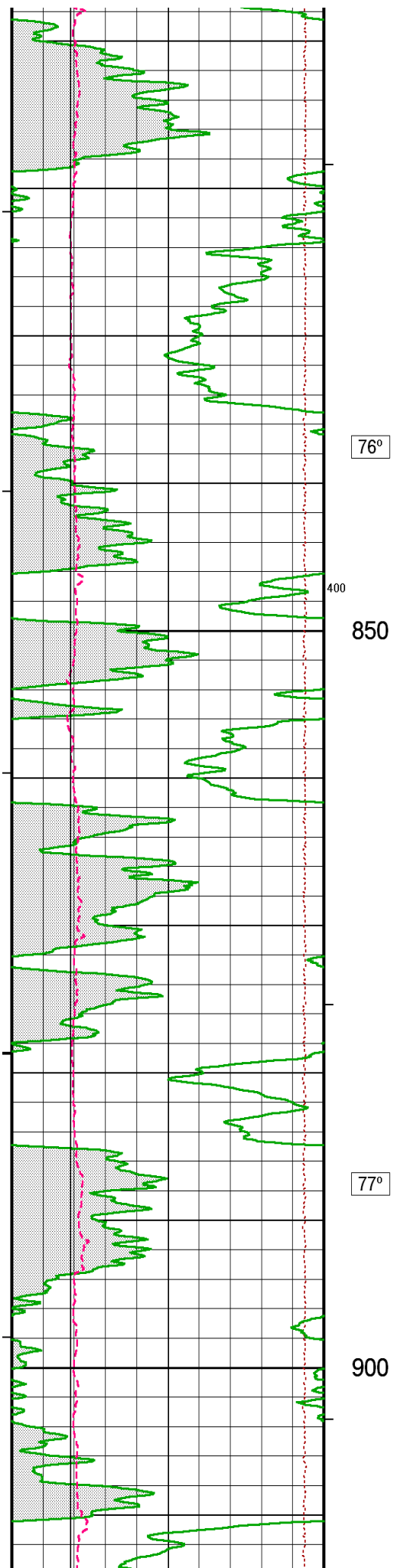
↑ REPEAT SECTION ↑

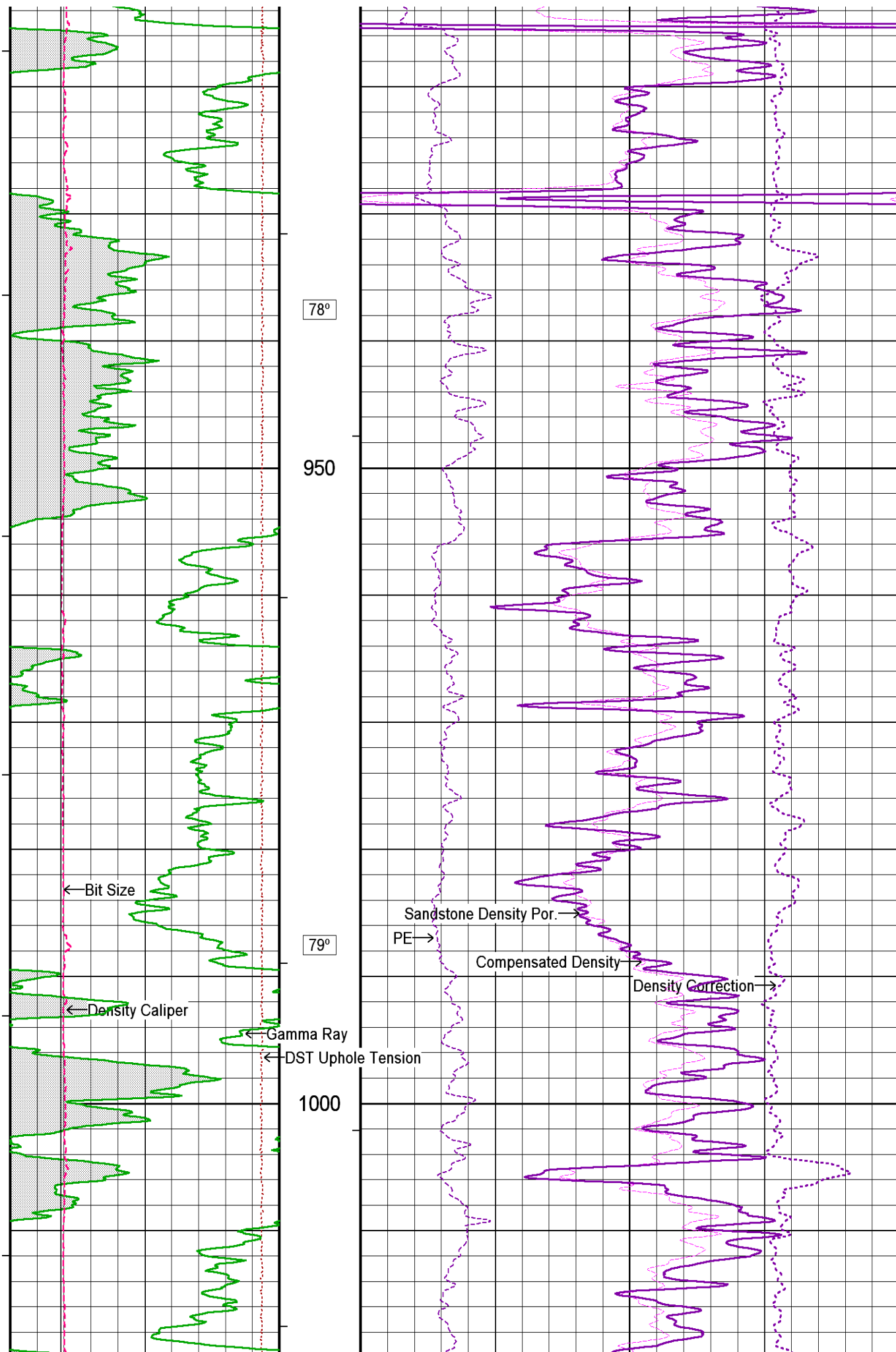
↓ 5 INCH MAIN LOG ↓

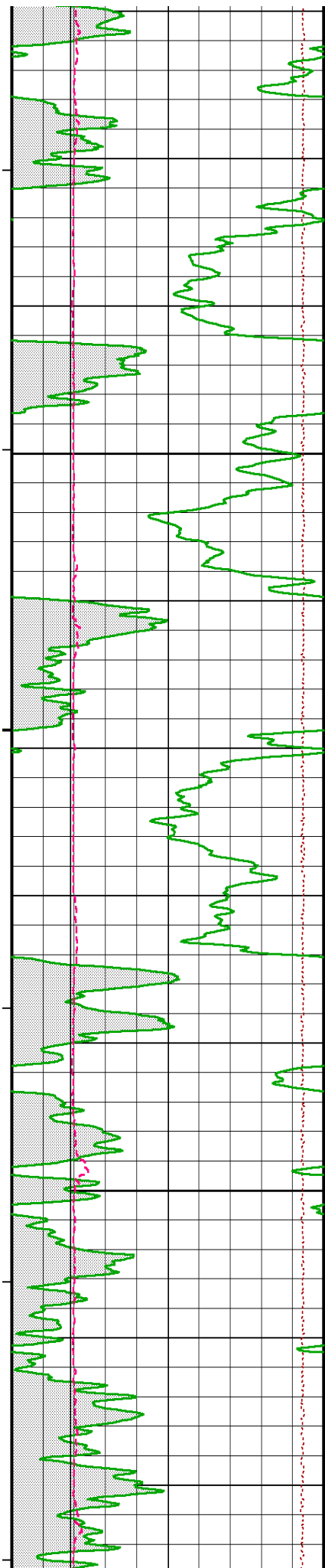
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 System Versions: Logged with 8.06.0241 Processed with 8.06.0241 Plotted with 8.06.0241









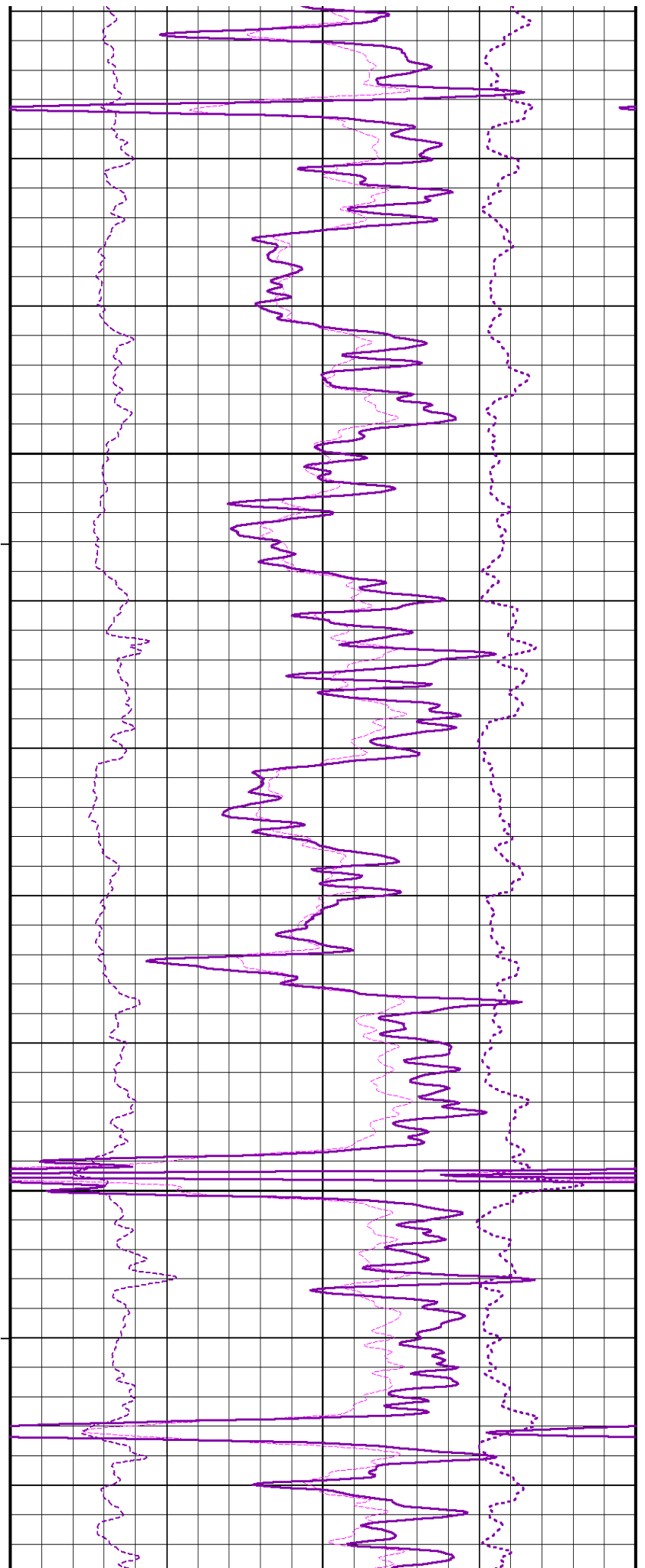


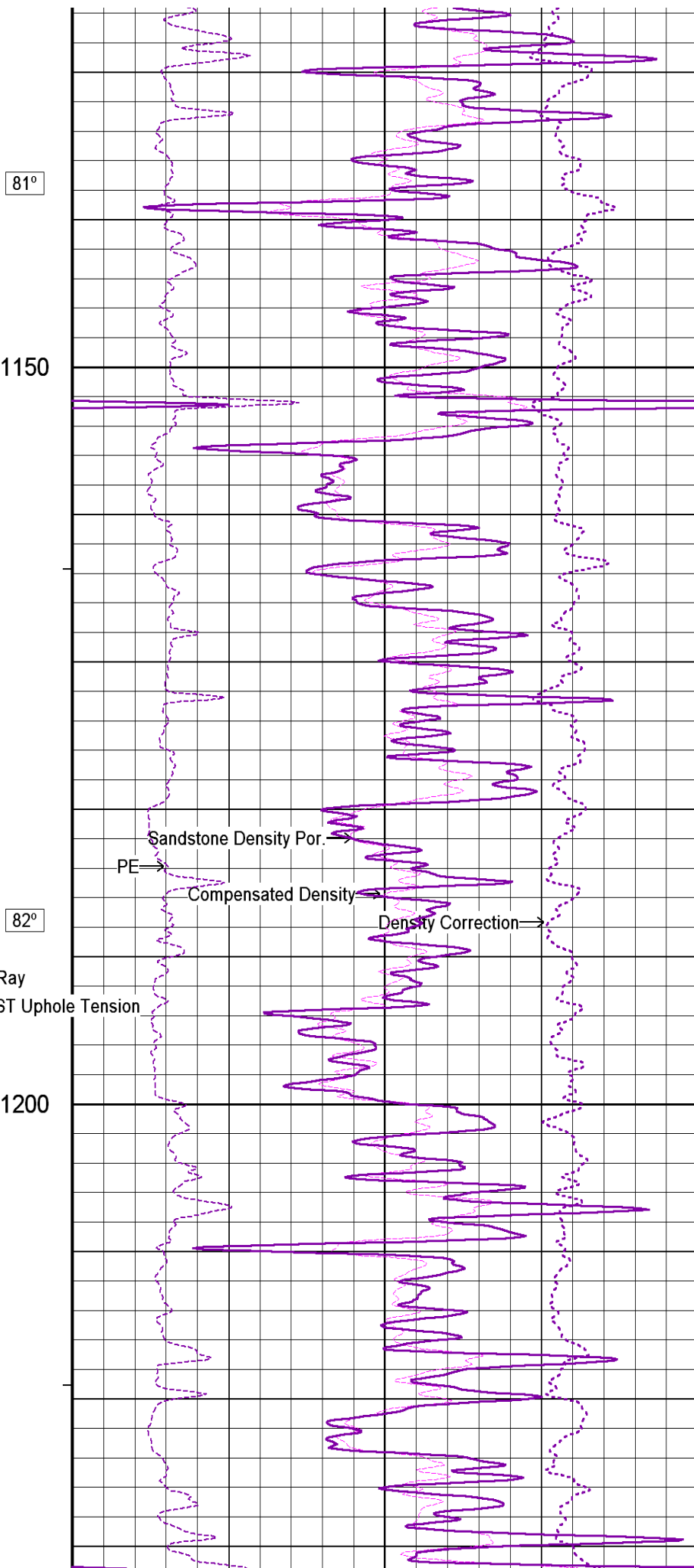
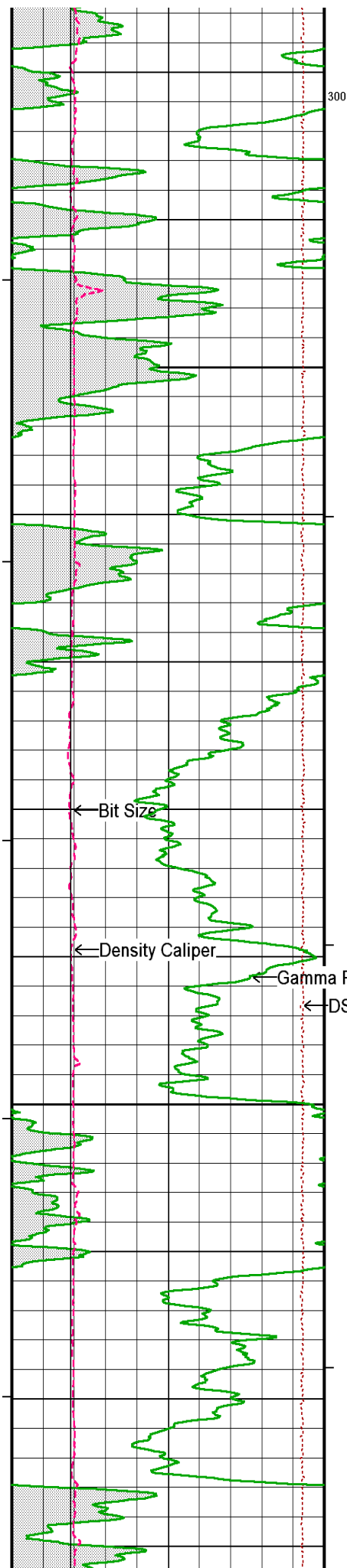
80°

1050

81°

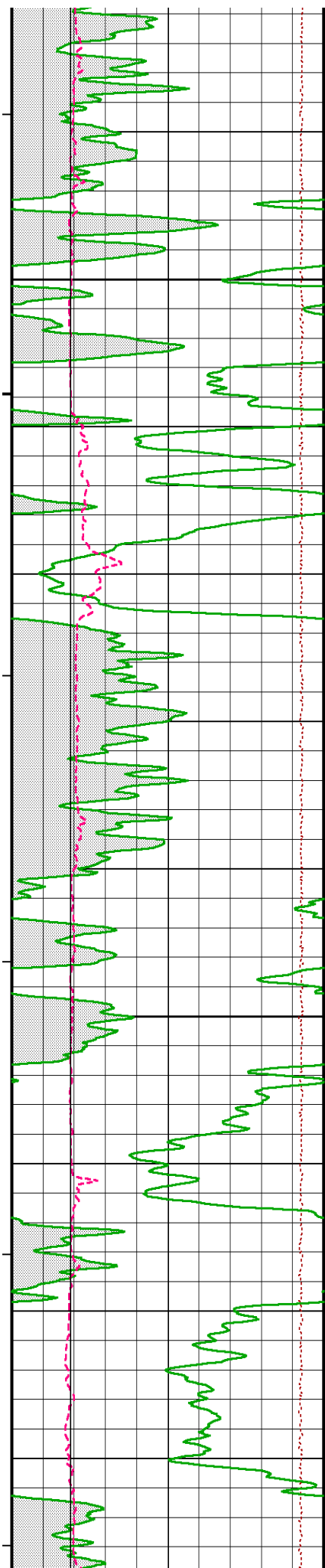
1100





81°

82°



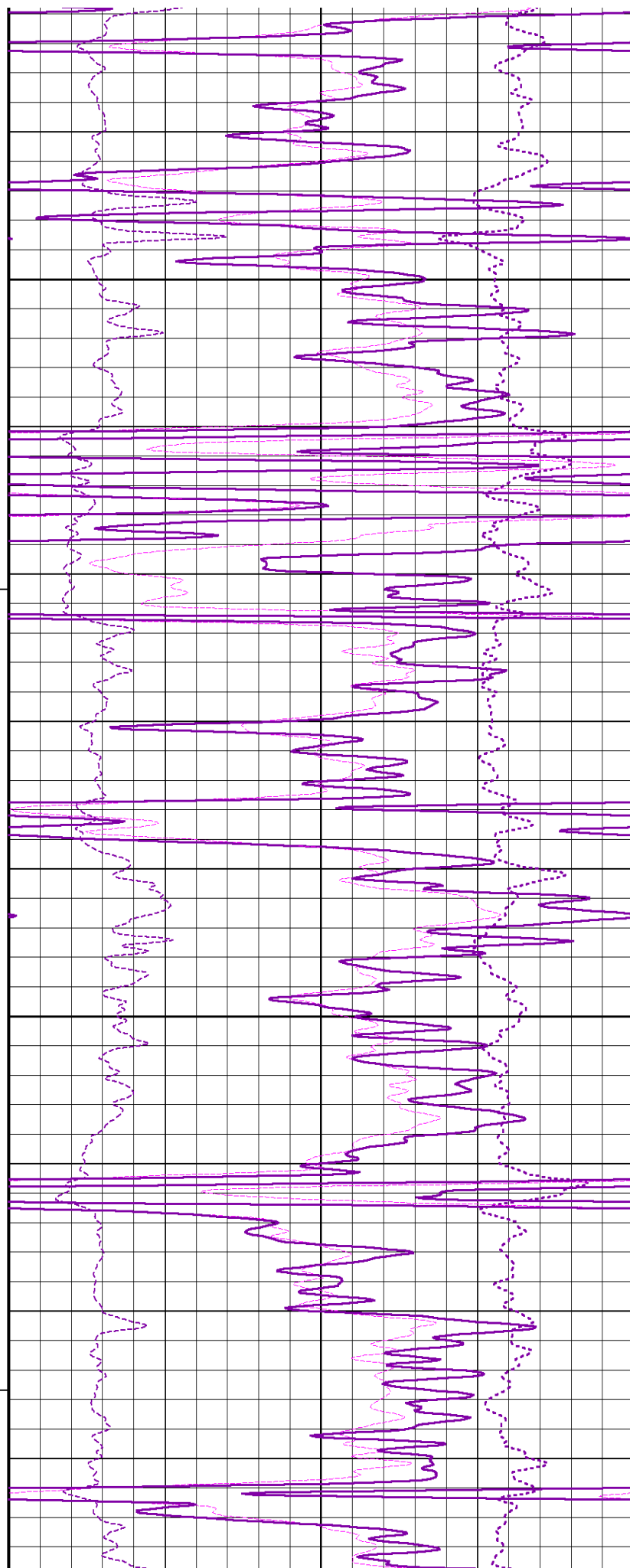
83°

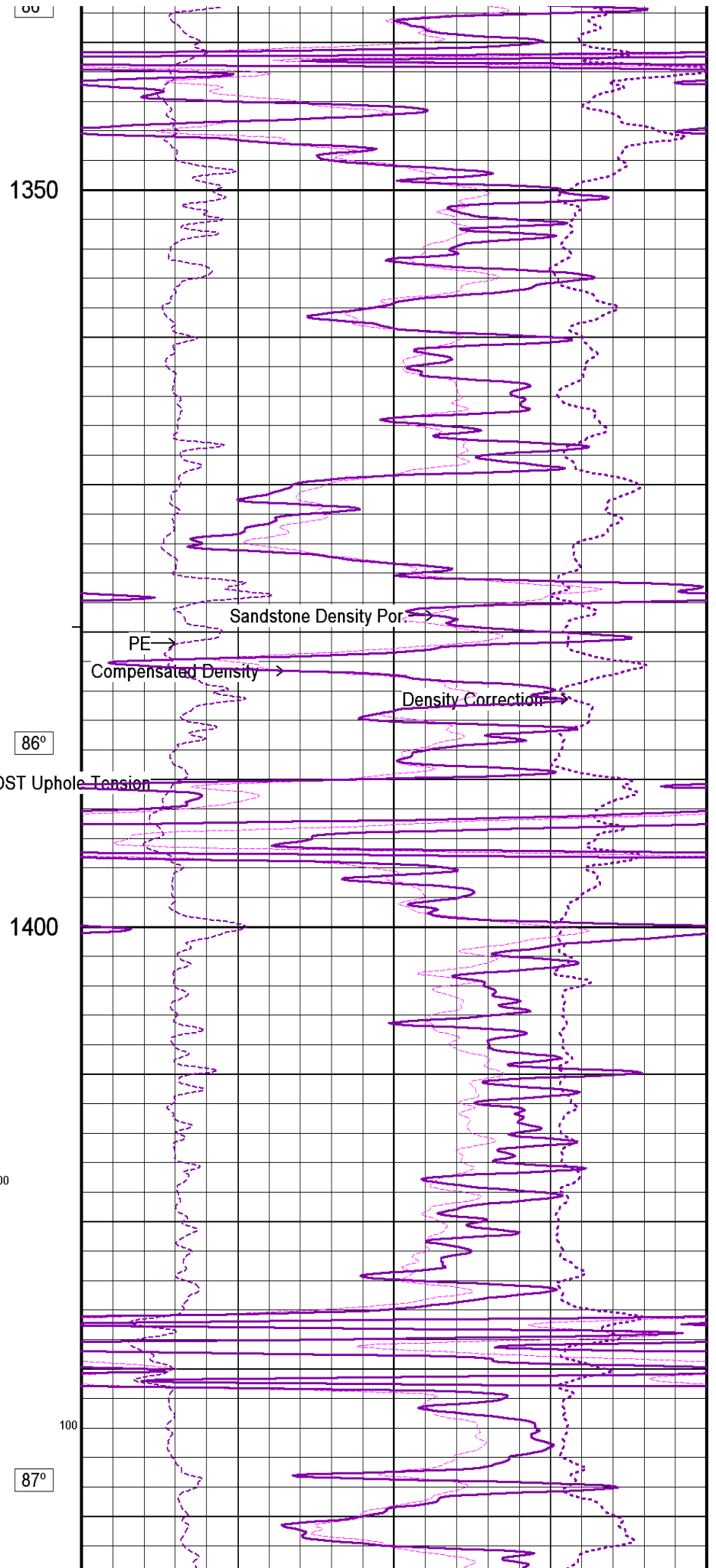
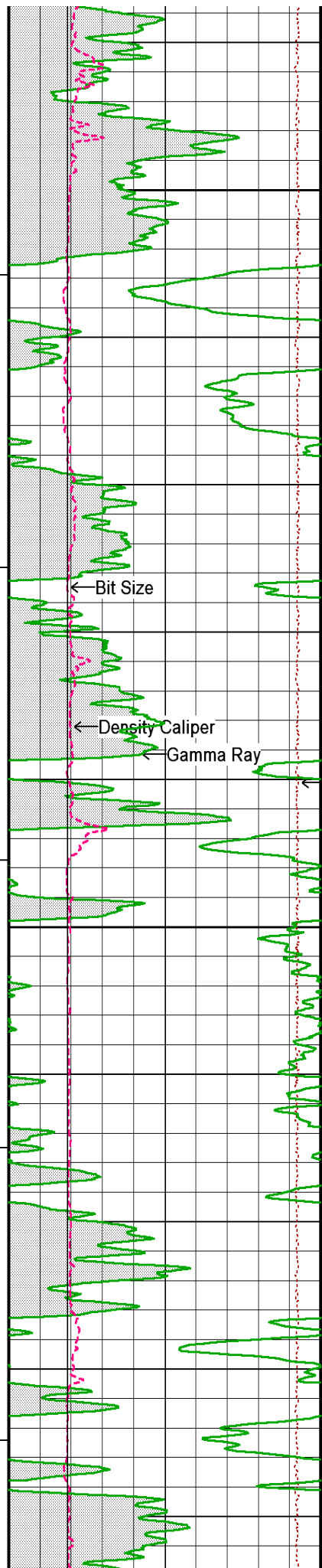
1250

84°

1300

060°





80

1350

86°

1400

200

100

87°

← Bit Size

← Density Caliper

← Gamma Ray

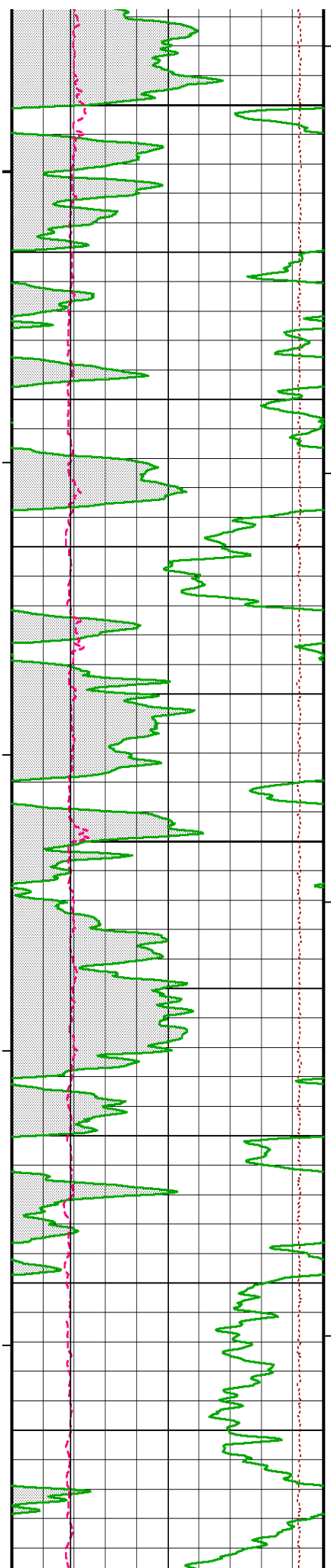
← DST Uphole Tension

PE →

Compensated Density →

Sandstone Density Por. →

Density Correction →

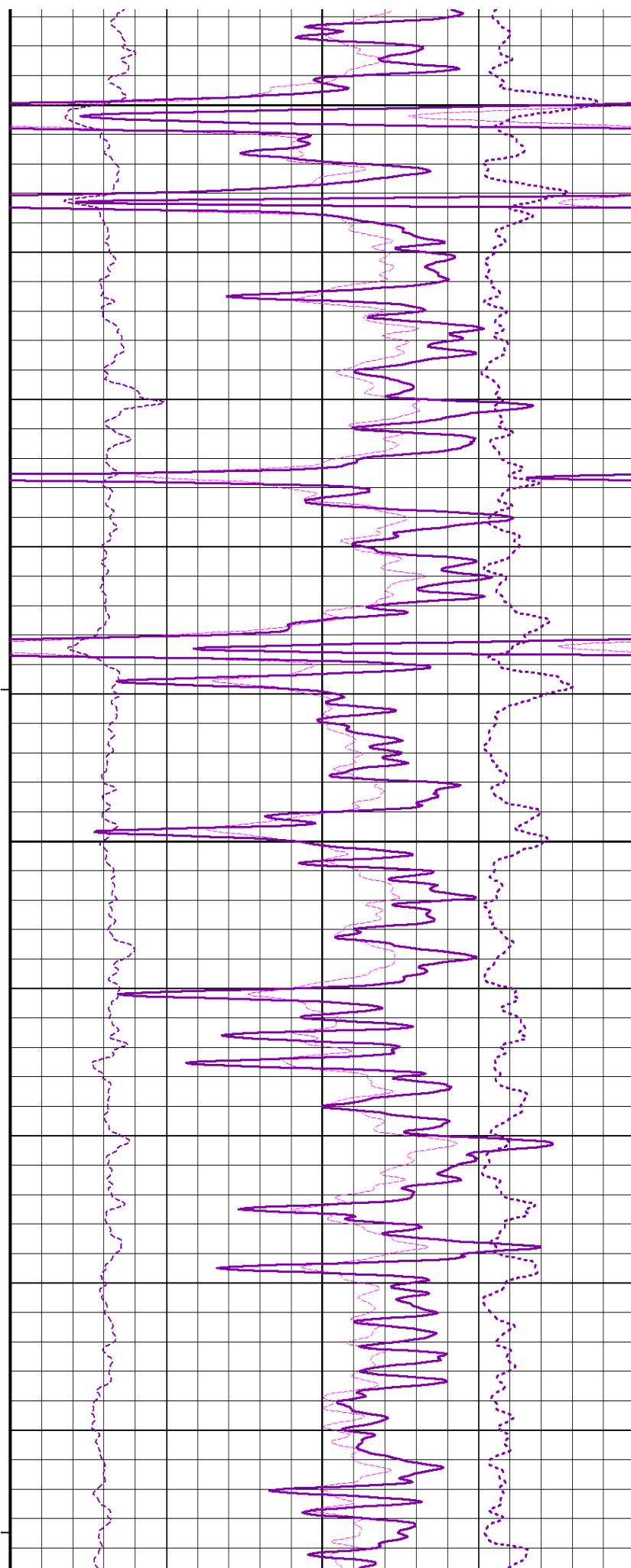


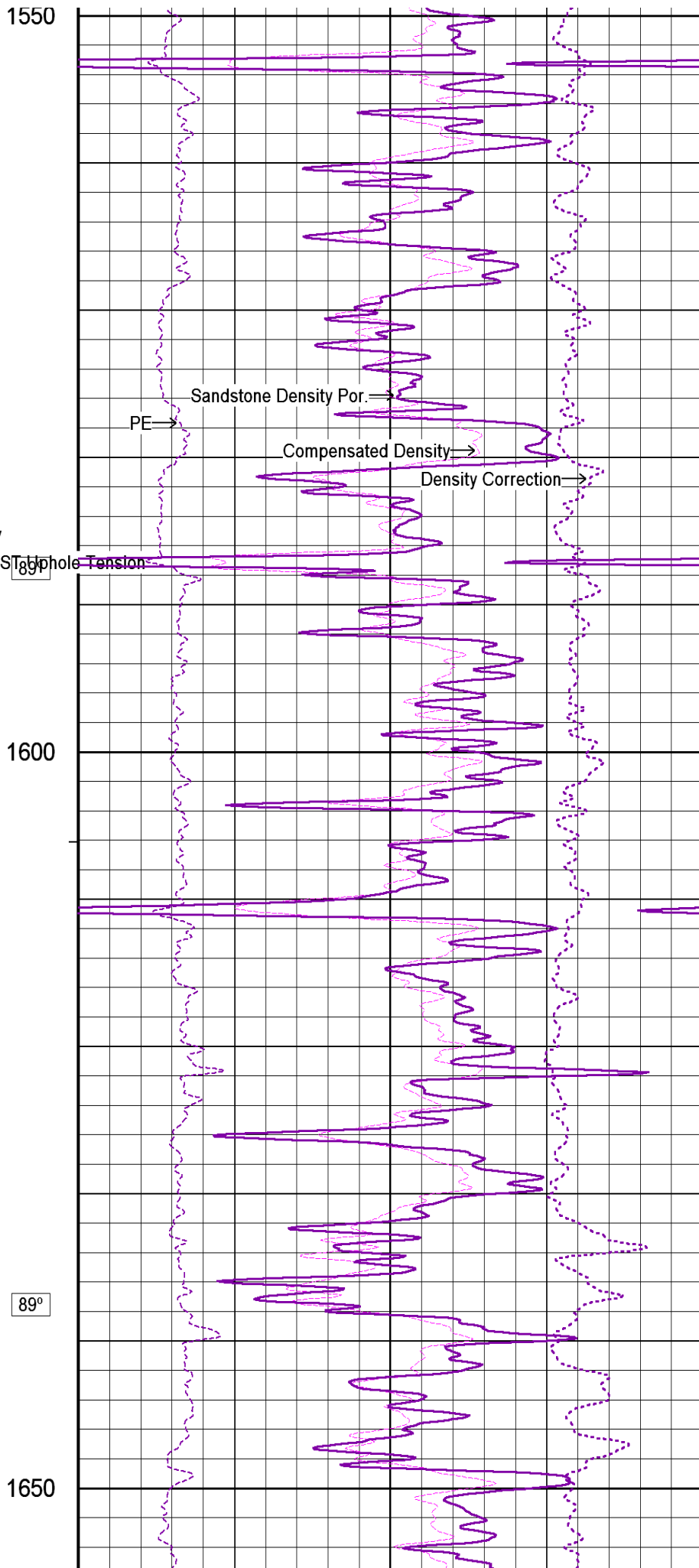
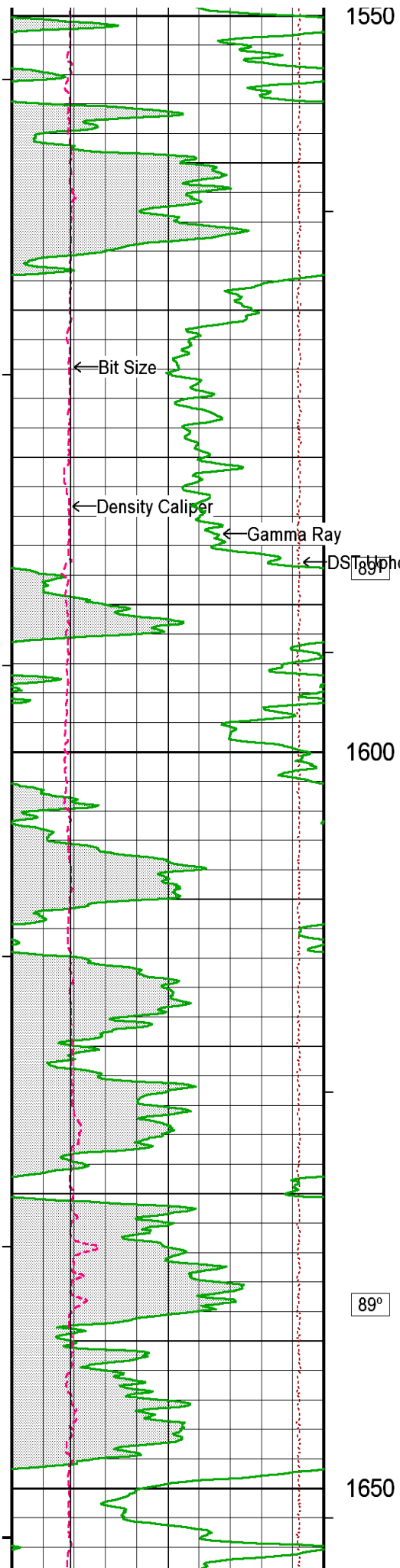
1450

88°

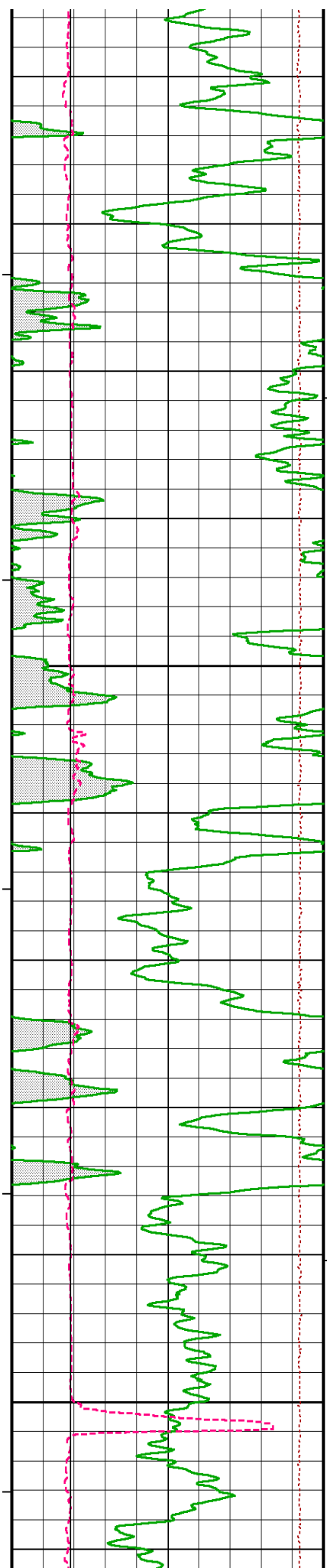
1500

88°





89°



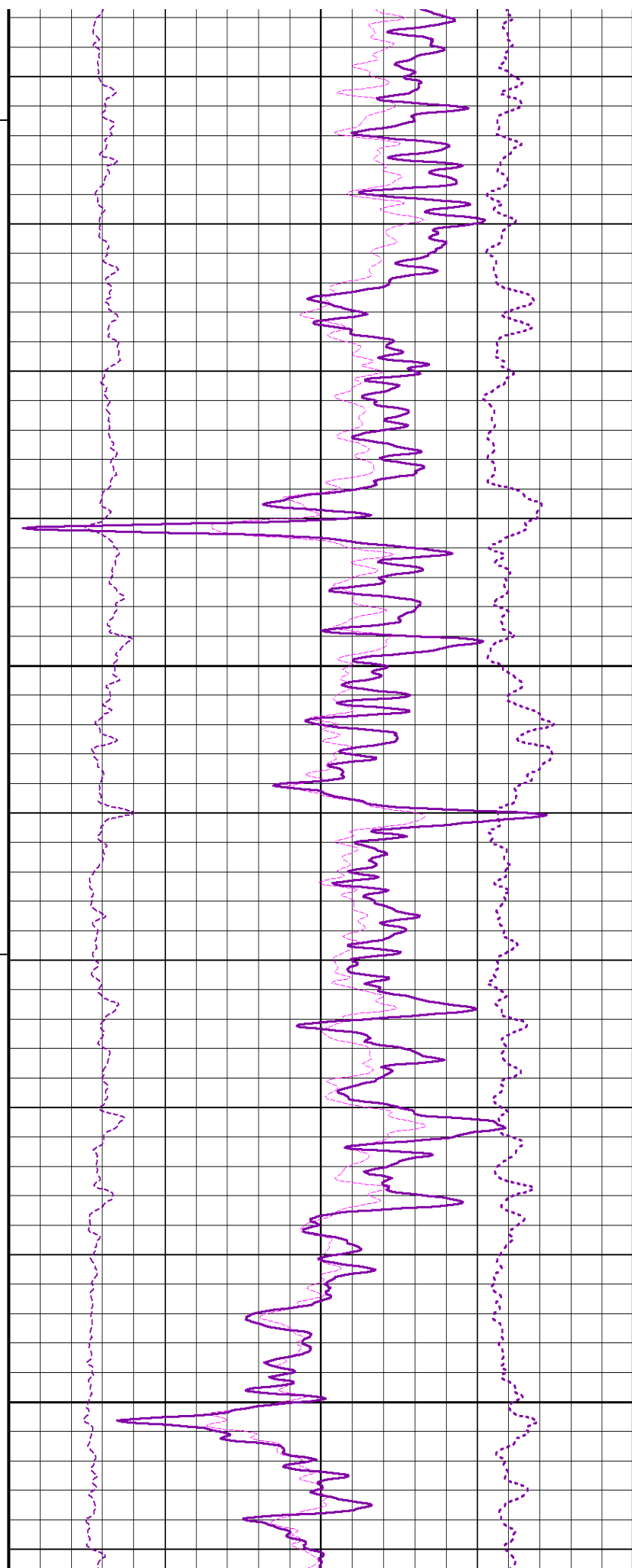
90°

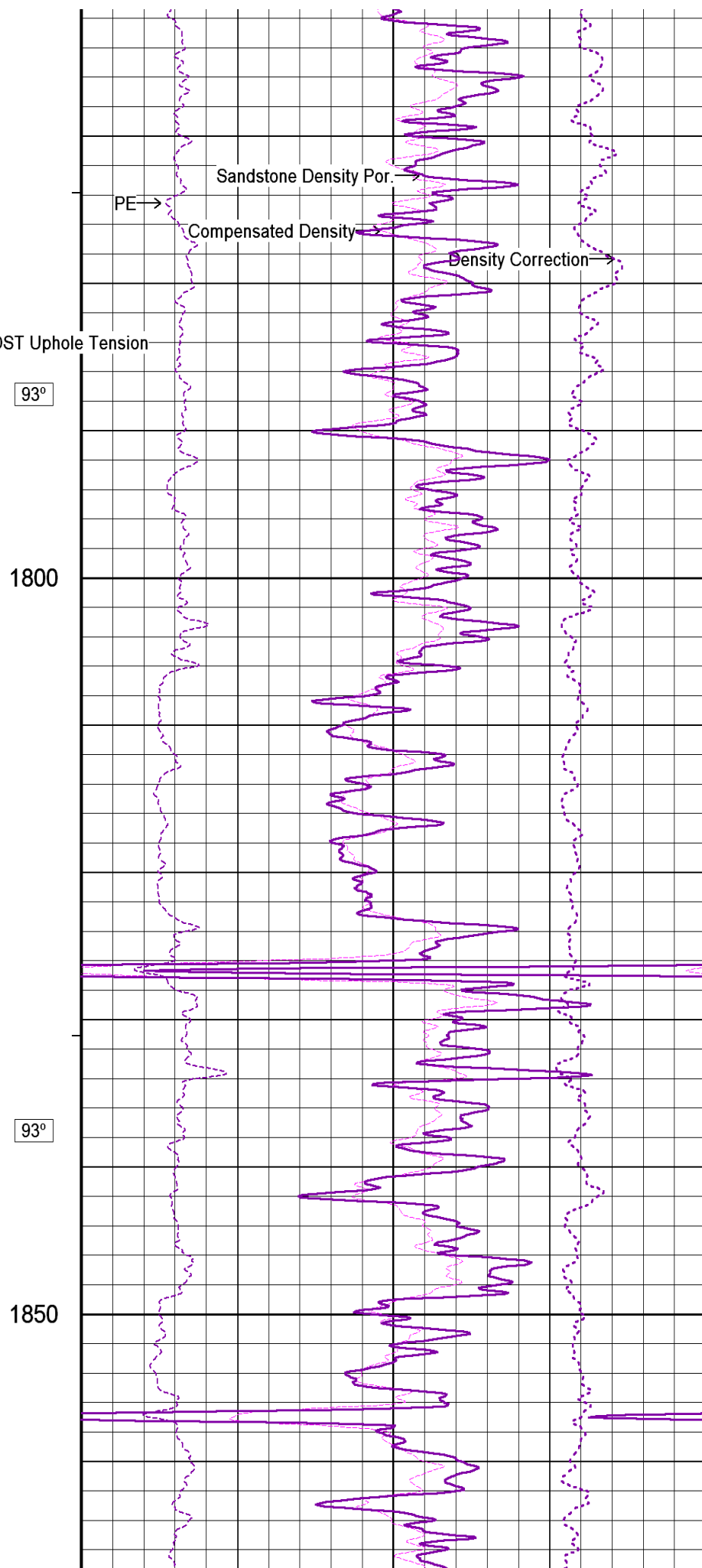
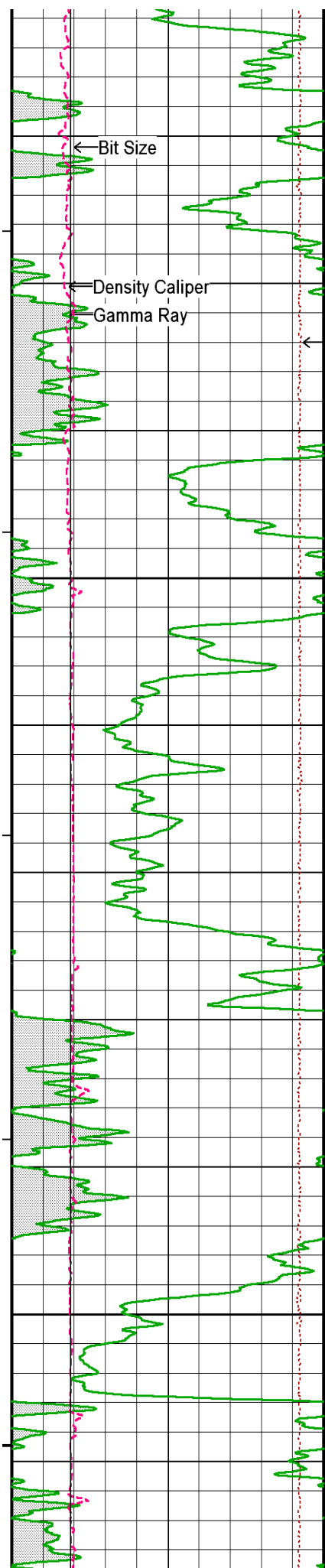
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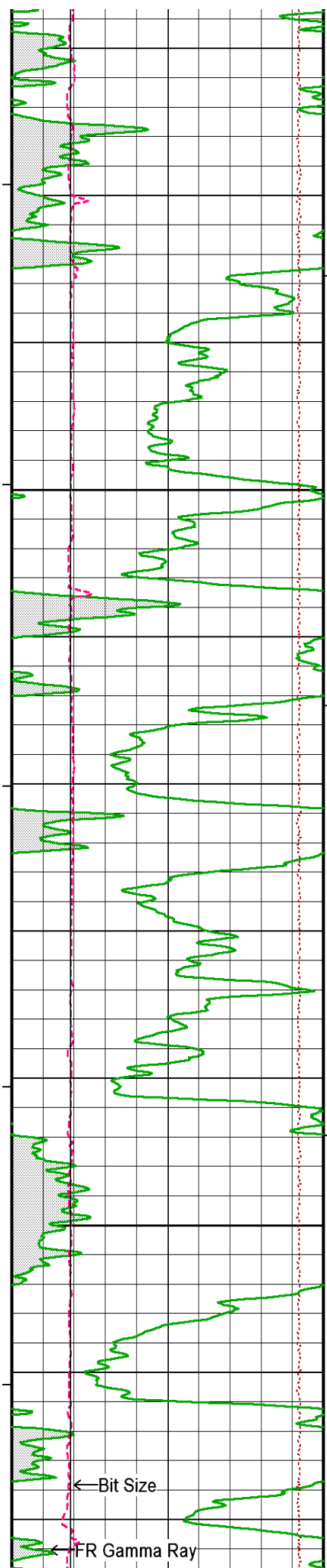
100

91°

1750





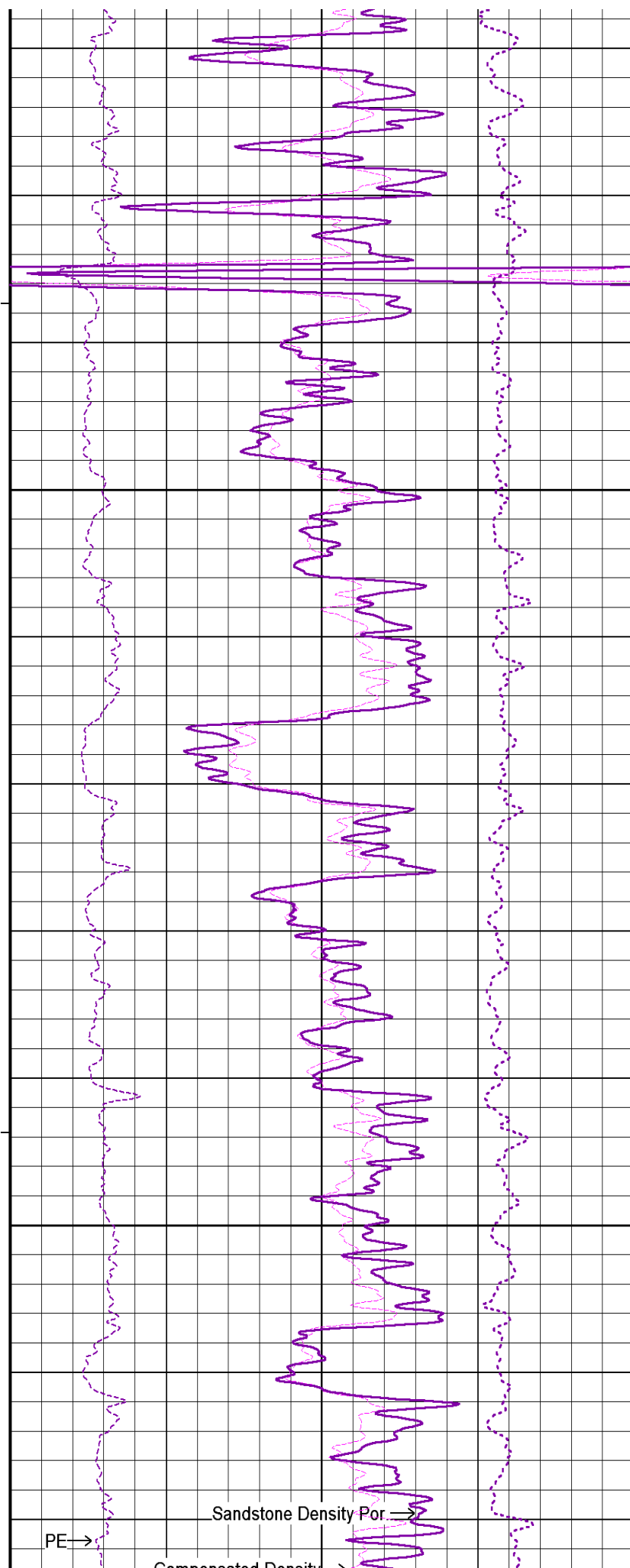


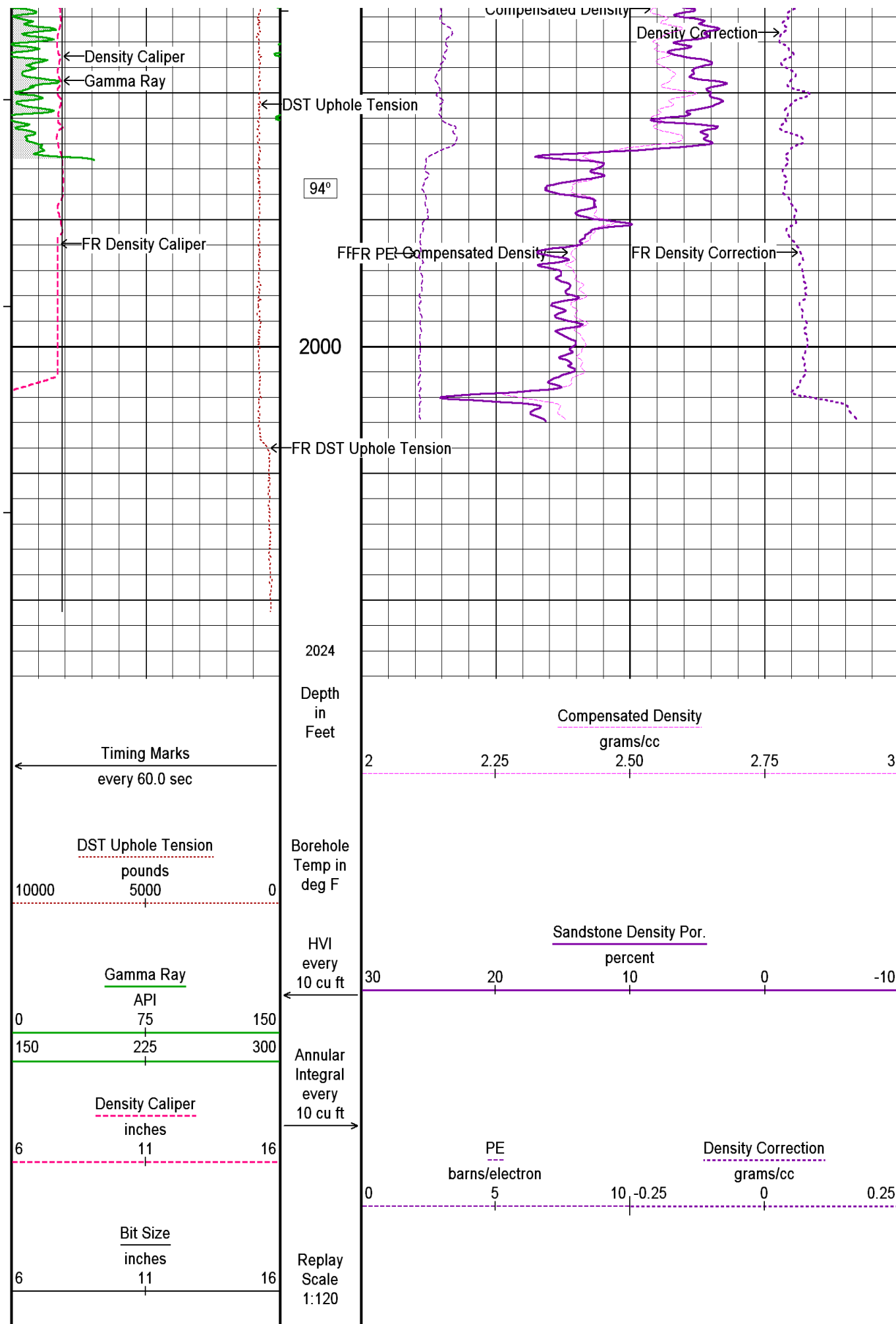
94°

1900

94°

1950

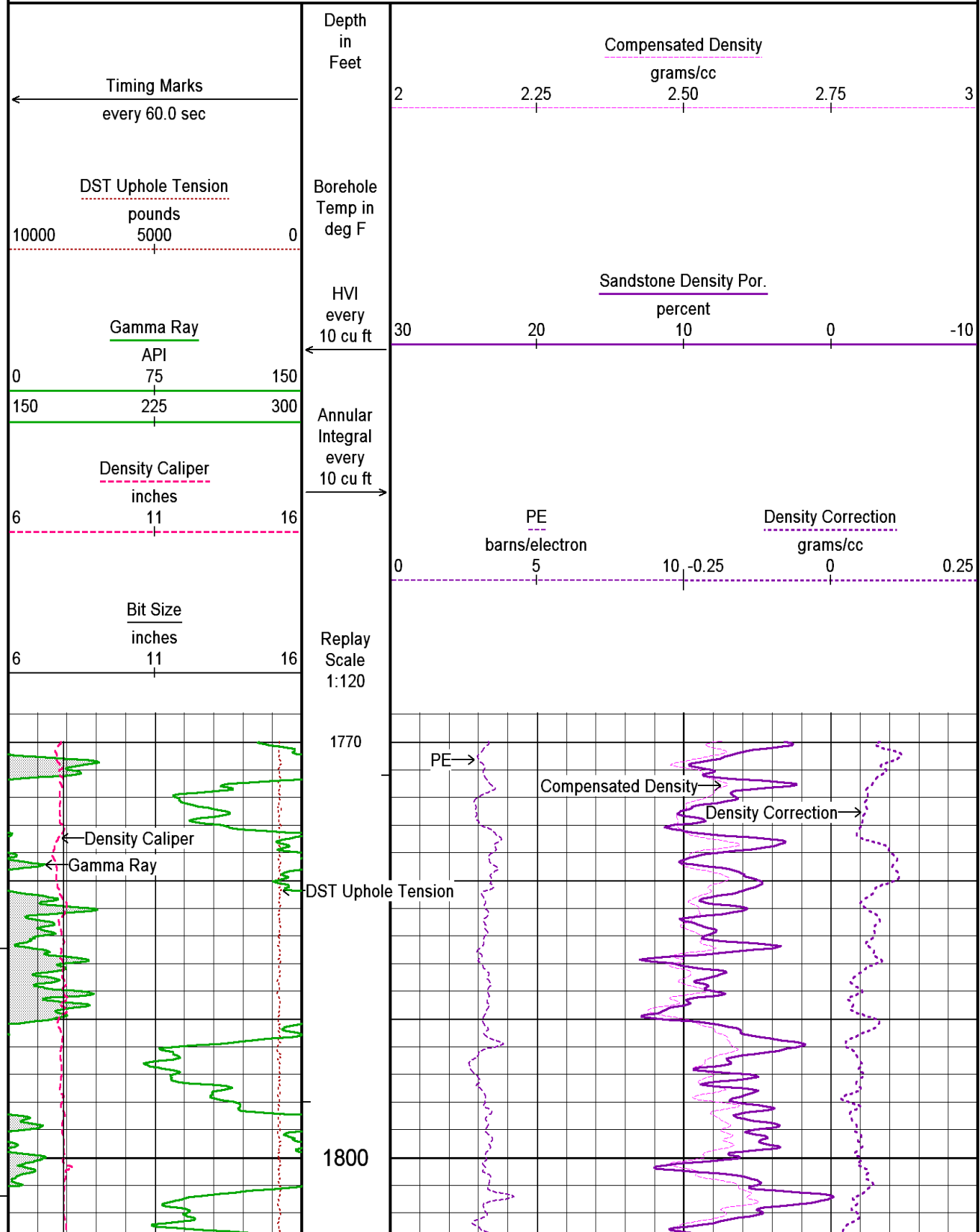


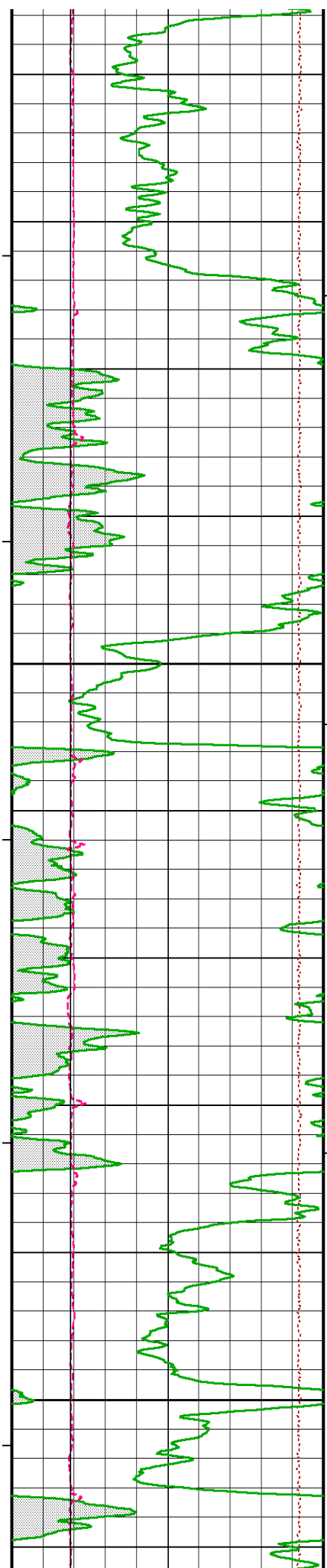


↑ **5 INCH MAIN LOG** ↑

↓ **REPEAT SECTION** ↓

Depth Based Data - Maximum Sampling Increment 2.5cm Plotted on 25-SEP-2009 15:52  
 Filename: C:\Minimus\Logs\Pioneer Resources\North Fork Ranch 14-1R\REPEAT\_2.dta Recorded on 25-SEP-2009 13:29  
 System Versions: Processed with 8.06.0241 Plotted with 8.06.0241



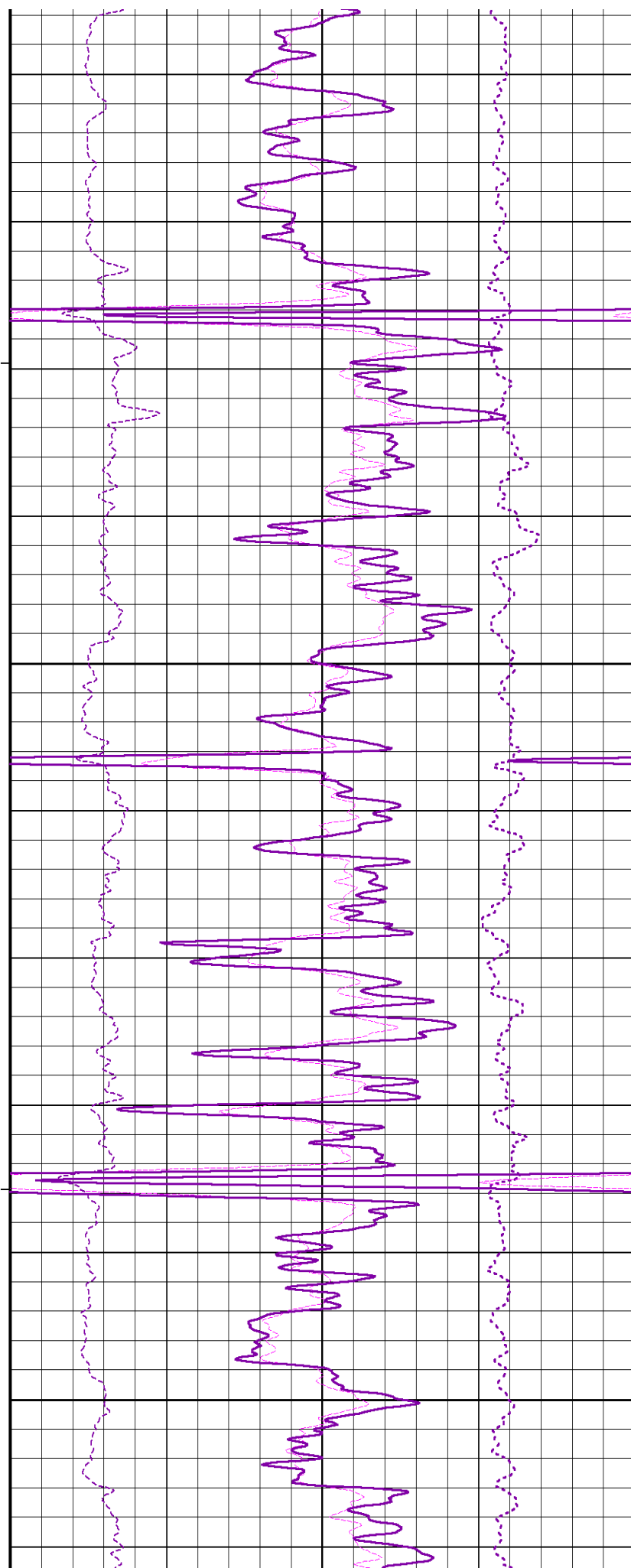


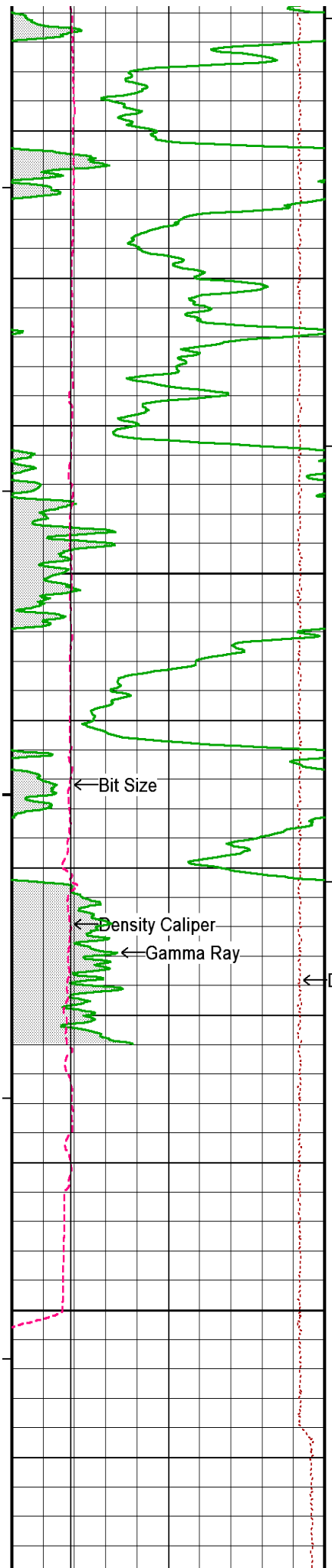
93°

1850

94°

1900





94°

1950

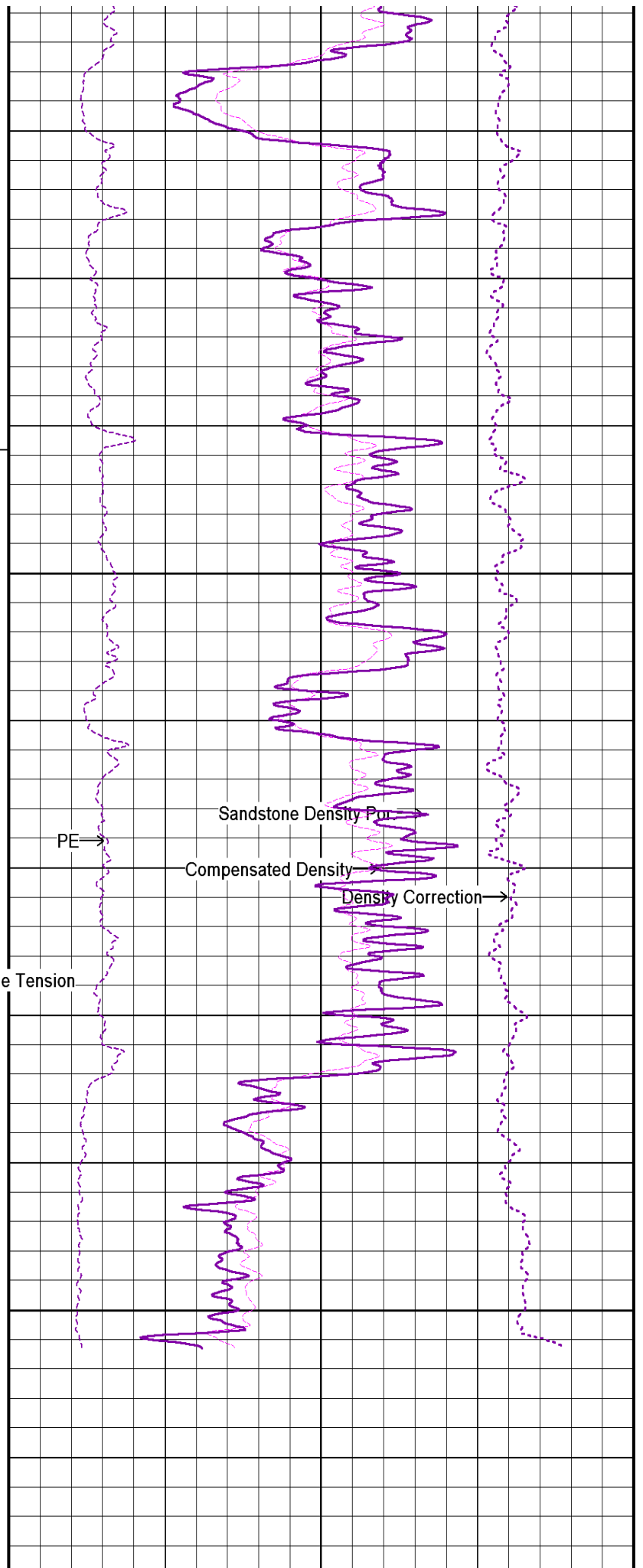
← Bit Size

← Density Caliper

← Gamma Ray

← DST Uphole Tension

2000

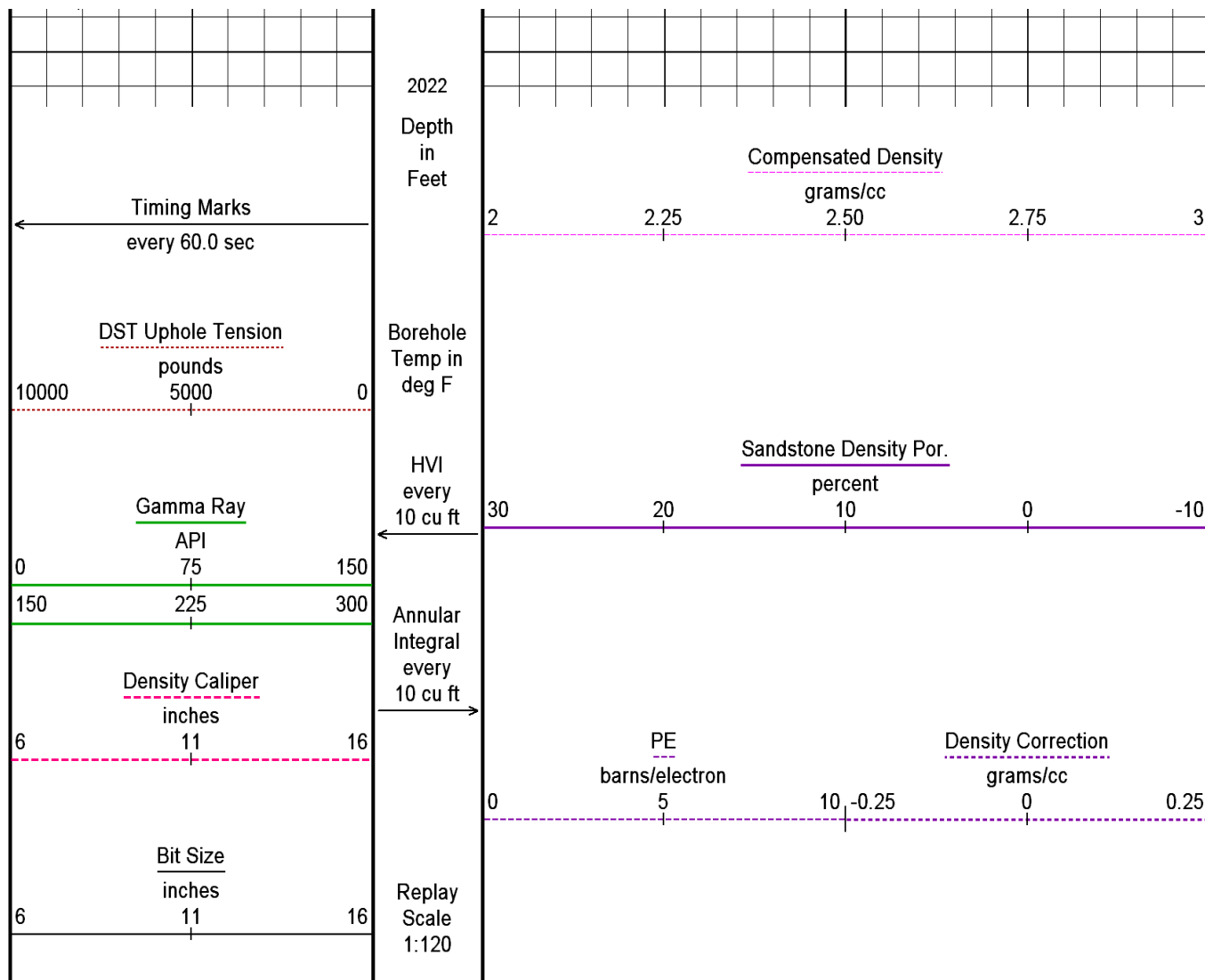


PE →

Sandstone Density Por

Compensated Density →

Density Correction →



Depth Based Data - Maximum Sampling Increment 2.5cm

Plotted on 25-SEP-2009 15:52

Filename: C:\Minimus\Logs\Pioneer Resources\North Fork Ranch 14-1R\REPEAT\_2.dta

Recorded on 25-SEP-2009 13:29

System Versions: Processed with 8.06.0241 Plotted with 8.06.0241



REPEAT SECTION



### BEFORE SURVEY CALIBRATION

C:\Minimus\Logs\Pioneer Resources\North Fork Ranch 14-1R\MAIN.dta

General Constants All 000

Last Edited on 25-SEP-2009,13:23

#### General Parameters

Mud Resistivity	1000.000	ohm-metres
Mud Resistivity Temperature	75.000	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Air Hole	

#### Hole/Annular Volume and Differential Caliper Parameters

HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	None	
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

Down-hole Tension Calibration SMS 000

Downhole Density Calibration MCG 000			Field Calibration on 06-SEP-2009 16:03	
Reading No	Measured	Calibrated (lbs)		
1	14737.51	0.00		
2	15698.25	352.00		
High Resolution Temperature Calibration MCG 247			Field Calibration on 25-SEP-2009,11:25	
	Measured	Calibrated(Deg F)		
Lower	0.00	0.00		
Upper	0.00	0.00		
High Resolution Temperature Constants MCG 247			Last Edited on 6-SEP-2009,12:34	
Pre-filter Length	11			
SP Calibration MCG 247			Field Calibration on 25-SEP-2009,11:24	
	Measured	Calibrated (mV)		
Reference 1	96.1	101.5		
Reference 2	-103.9	-97.7		
Gamma Calibration MCG 247			Field Calibration on 25-SEP-2009 11:29	
	Measured	Calibrated (API)		
Background	132	88		
Calibrator (Gross)	920	613		
Calibrator (Net)	787	525		
Gamma Constants MCG 247			Last Edited on 25-SEP-2009,13:23	
Gamma Calibrator Number	GRC-111			
Mud Density	1.00	gm/cc		
Caliper Source for Processing	Density Caliper			
Tool Position	Eccentred			
Concentration of KCl	0.00	kppm		
Neutron Calibration MDN 216			Base Calibration on 19-AUG-2009 10:59 Field Check on 25-SEP-2009 11:36	
Base Calibration				
	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2957	93	3714	110
Ratio	31.832		33.764	
Field Calibrator at Base				
			Calibrated (cps)	
			2334	3367
Ratio			0.693	
Field Check				
			Calibrated (cps)	
			2394	3390
Ratio			0.706	
Neutron Constants MDN 216			Last Edited on 25-SEP-2009,13:23	
Neutron Source Id	P21131B			
Neutron Jig Number	NJ5236			
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	7.00	cu		
Dolomite Sigma	4.70	cu		
Formation Pressure Source	None			
Formation Pressure	N/A	kpsi		
Temperature Source	None			
Temperature	N/A	degrees F		
Mud Salinity	0.00	kppm		
Formation Fluid Salinity Source	None			
Formation Fluid Salinity	N/A	kppm		
Perite Mud Correction	Not Applied			

Date and Correction

NOT Applied

High Resolution Temperature Calibration MAI 213

Field Calibration on 10-SEP-2009,10:36

	Measured	Calibrated(Deg F)
Lower	10.00	50.00
Upper	100.00	212.00

High Resolution Temperature Constants MAI 213

Pre-filter Length 11

Induction Calibration MAI 213

Base Calibration on 22-JAN-2007,12:35  
Field Check on 25-SEP-2009 11:42

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	16.8	462.4	9.3	966.2
2	6.2	381.7	7.6	821.4
3	3.6	254.8	5.2	566.0
4	2.3	132.3	2.6	279.2

Array Temperature 73.6 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	13.6	3937.6	12.7	3934.0
2	30.1	3541.7	29.8	3538.7
3	28.8	3115.6	28.5	3112.8
4	19.0	2097.7	18.9	2095.7
Deep	17.3	2079.1	17.1	2076.9
Medium	42.5	4090.1	42.3	4086.6
Shallow	45.2	5162.2	44.8	5158.2

Array Temperature 62.4 49.9 Deg F

Induction Constants MAI 213

Last Edited on 25-SEP-2009,13:25

Induction Model	ENHANCED		
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	N/A		
Stand-off Fin Angle	60.00	degrees	
Stand-off Fin Width	0.0000	inches	
Borehole Corr. Rm Source	Temperature Corr		
Temp. for Rm Corr.	MCG External Temperature		
Squasher Start	0.0020	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

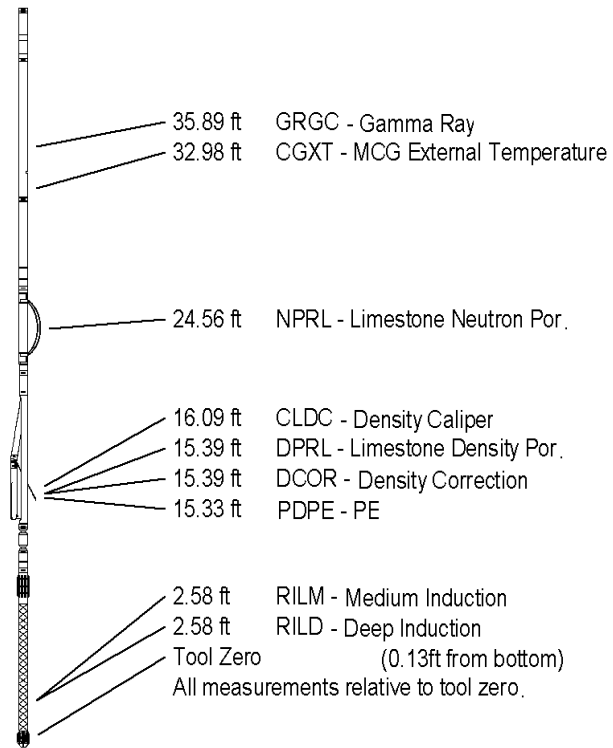
Archie Constant (A)	1.00
Cementation Exponent (M)	2.00
Saturation Exponent (N)	2.00
Saturation of Water for Apor	100.00 percent



### DOWNHOLE EQUIPMENT

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SHA-J.A Compact Swivel Head Adaptor SHA 214	Length: 2.30 ft	Weight: 22.0 lb
Compact Gamma MCG 247	Length: 8.70 ft	Weight: 63.9 lb
Compact Linker MLK 5	Length: 4.87 ft	Weight: 86.0 lb
Compact Neutron MDN 216	Length: 5.04 ft	Weight: 50.7 lb
Compact Density/Caliper MPD 220	Length: 9.59 ft	Weight: 90.4 lb
SKJ-D.A Compact Knuckle Joint SKJ 154	Length: 2.17 ft	Weight: 24.3 lb
Compact Induction MAI 213	Length: 10.81 ft	Weight: 48.5 lb
<b>Total</b>	<b>Length: 43.47 ft</b>	<b>Weight: 385.8 lb</b>



COMPANY	PIONEER NATURAL RESOURCES
WELL	NORTH FORK RANCH 14 - 1R
FIELD	MAXWELL
PROVINCE/COUNTY	LAS ANIMAS
COUNTRY/STATE	U.S.A./COLORADO

Elevation Kelly Bushing	7935.00	feet	First Reading	1992.00	feet
Elevation Drill Floor	7934.00	feet	Depth Driller	2015.00	feet
Elevation Ground Level	7931.00	feet	Depth Logger	2008.00	feet



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