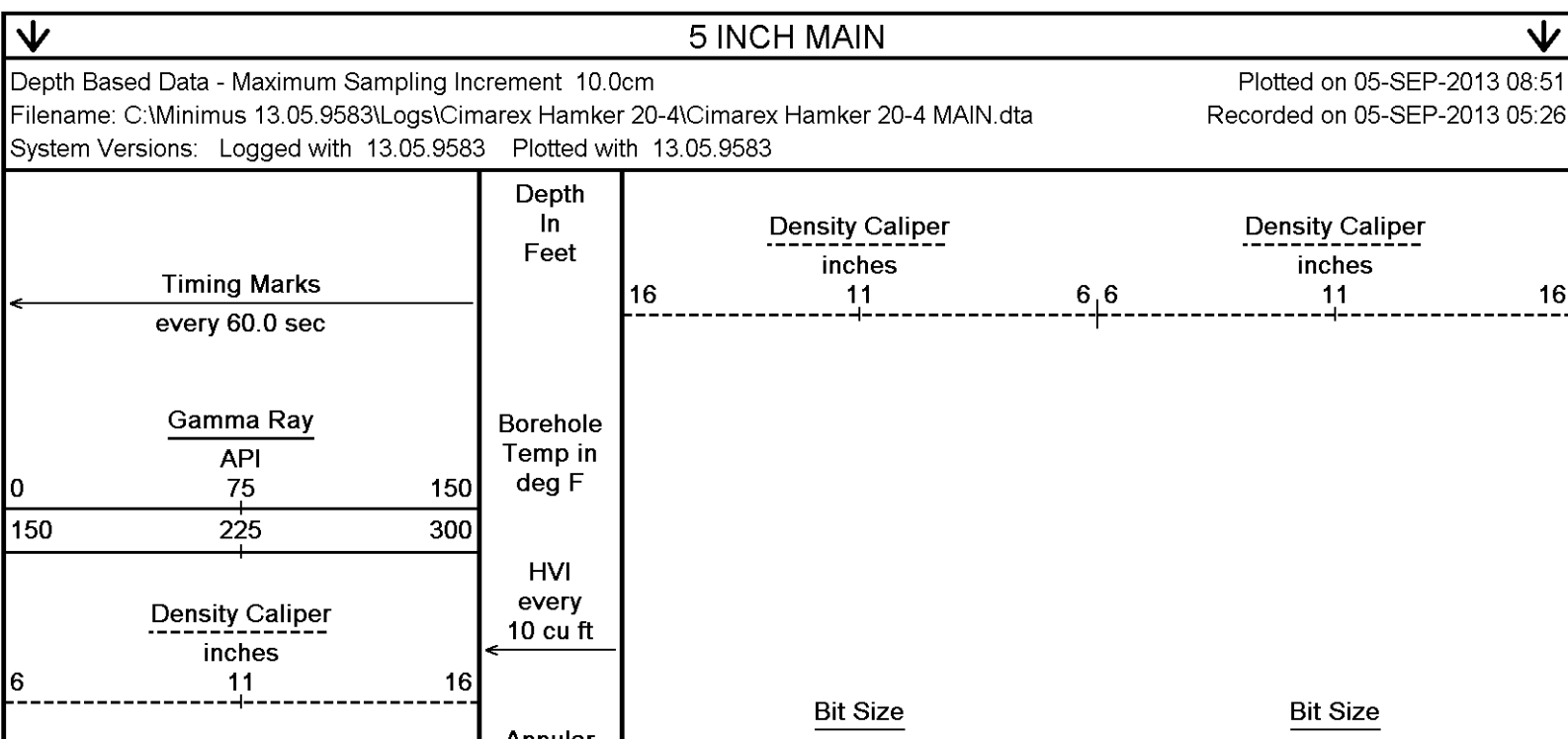


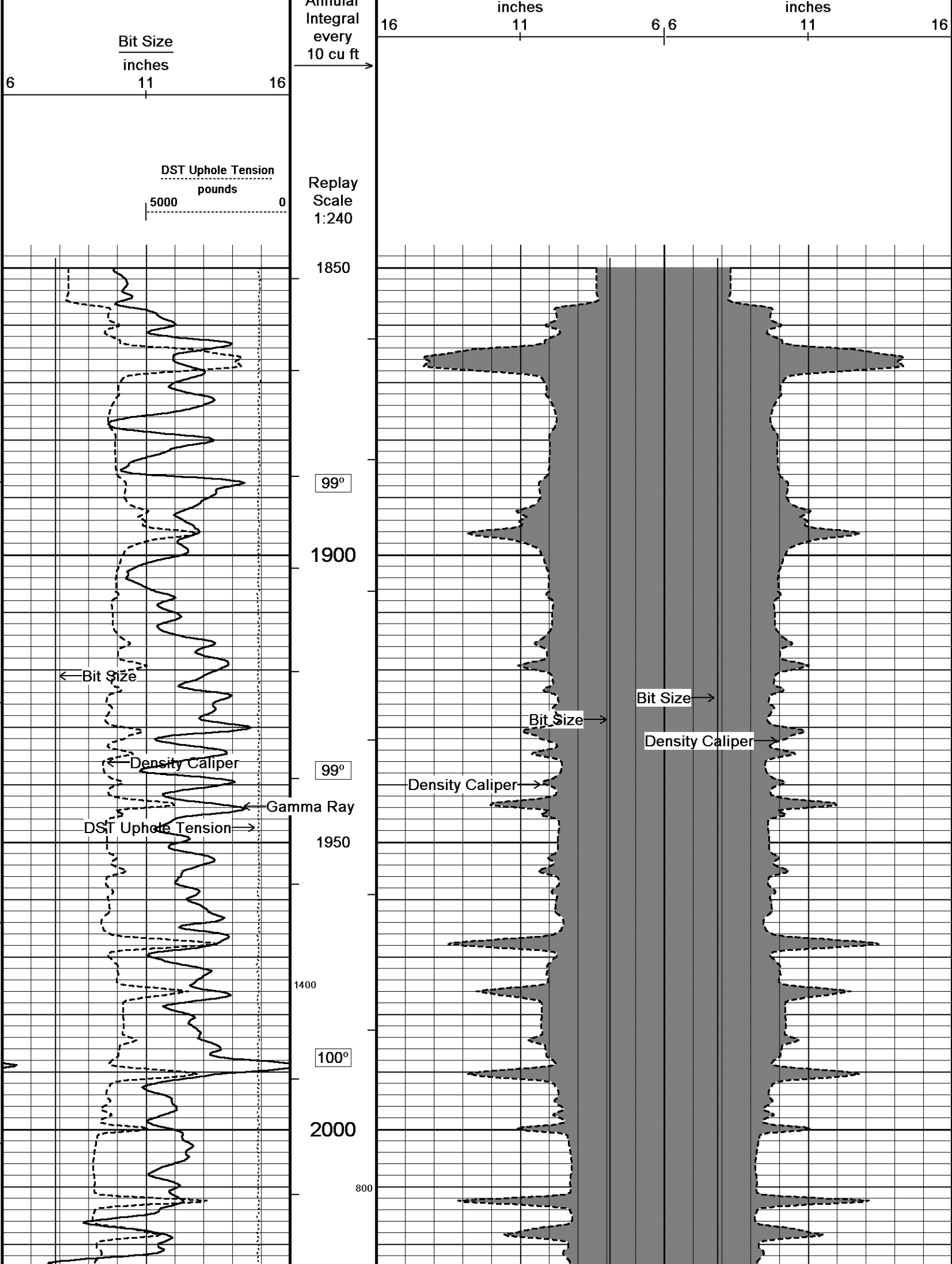
**Weatherford****CALIPER
LOG**

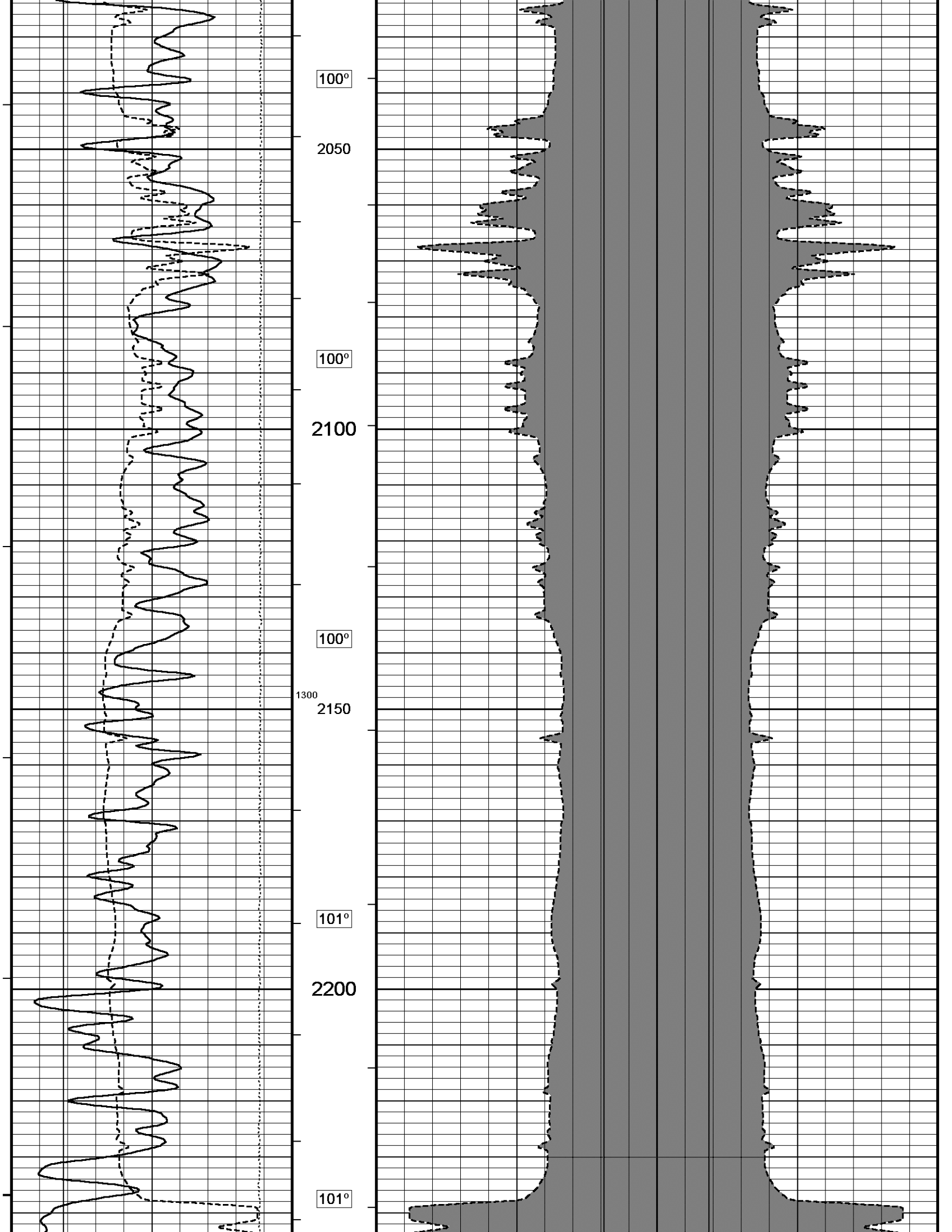
COMPANY **CIMAREX ENERGY CO.**
 WELL **HAMKER 20-4**
 FIELD **WILDCAT**
 PROVINCE/COUNTY **HASKELL**
 COUNTRY/STATE **U.S.A. / KANSAS**
 LOCATION **330' FSL & 1650' FWL
SW SE SW**

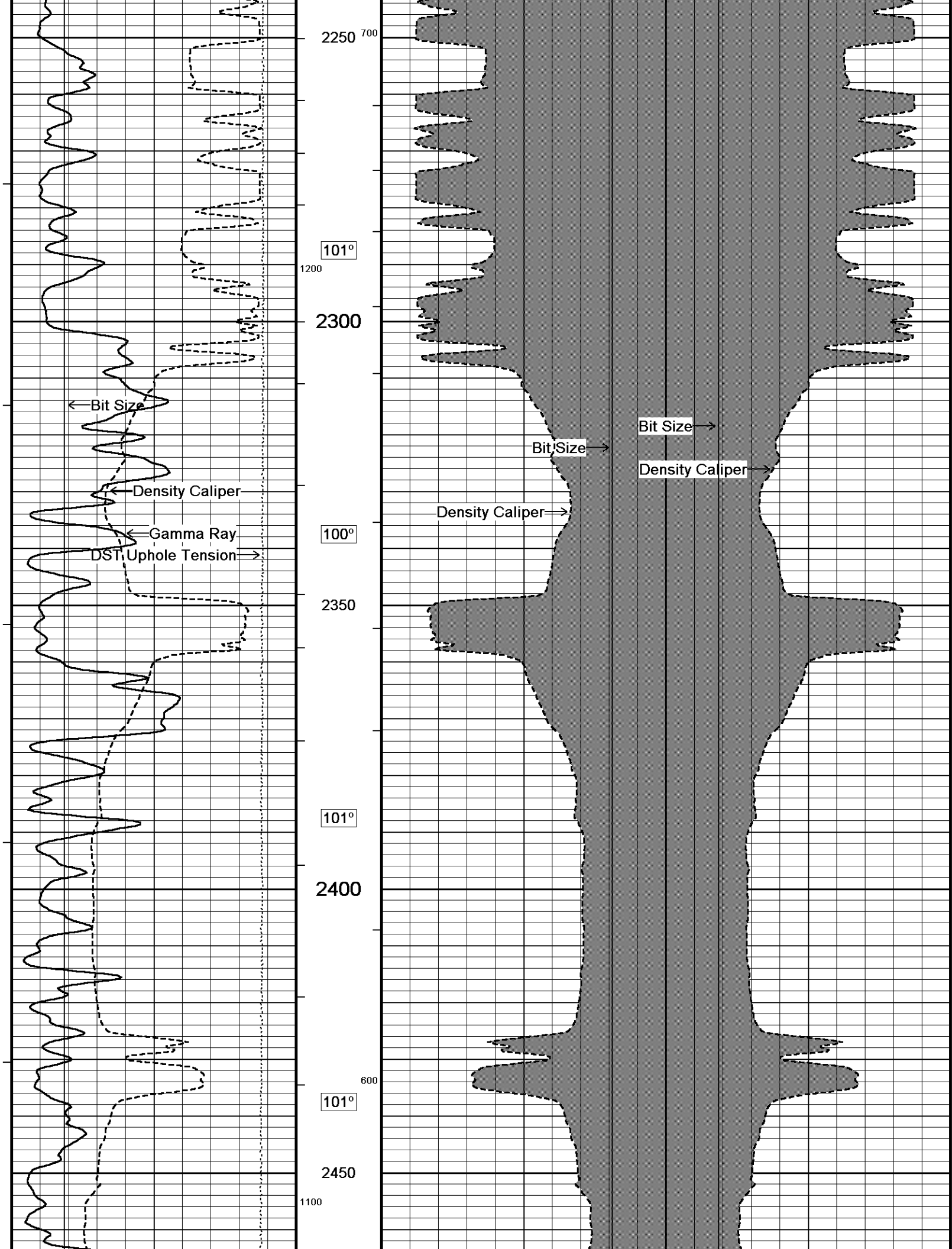
SEC	TWP	RGE	Other Services	MML	
30	30S	31W	MPD/MDN	CMI	
API Number	15-081-22028	MA/ME			
Permit Number					
Permanent Datum GL, Elevation 2849 feet					
Log Measured From KB					Elevations: KB 2857.00 DF 2855.00 GL 2849.00
Drilling Measured From KB @ 8 FEET					
Date	05-SEP-2013				
Run Number	ONE				
Service Order	3541035				
Depth Driller	5559.00				
Depth Logger	5558.00				
First Reading	5516.00				
Last Reading	1857.00				
Casing Driller	1860.00				
Casing Logger	857.00				
Bit Size	7.875				
Hole Fluid Type	GEL				
Density / Viscosity	9.00 lb/USg		65.00 CP		
PH / Fluid Loss	11.80		5.80 ml/30Min		
Sample Source	FLOW LINE				
Rm @ Measured Temp	1.50 @ 60.0		ohm-m		
Rmf @ Measured Temp	1.20 @ 60.0		ohm-m		
Rmc @ Measured Temp	1.80 @ 60.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.70 @ 126.0		ohm-m		
Time Since Circulation	5 HRS				
Max Recorded Temp	126.00		deg F		
Equipment / Base	13244		KANSAS		
Recorded By	D. COLE				
Witnessed By	T. KOLODZIEJ				
IOB #	LB 13-250				K. MARTIN

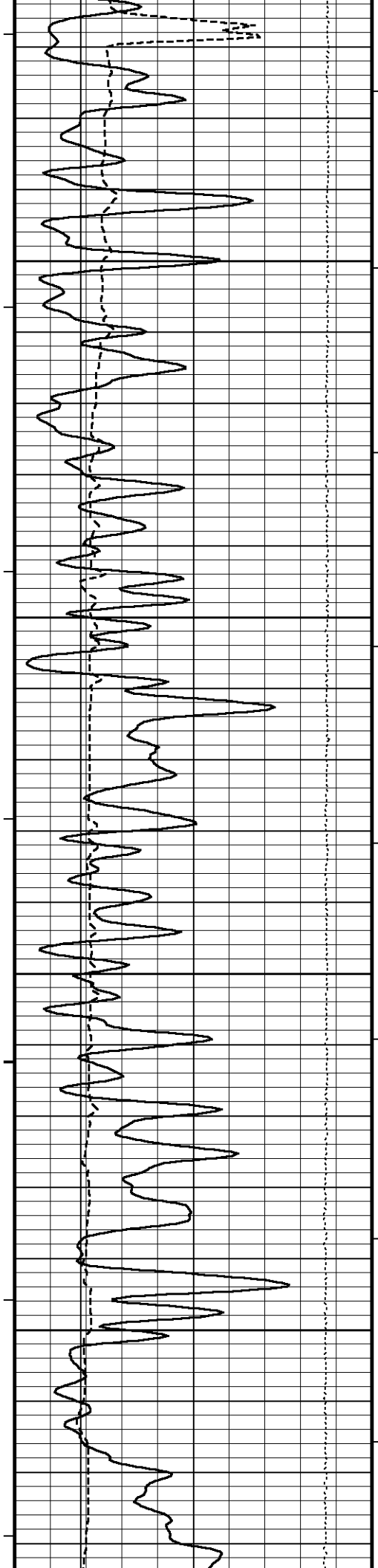
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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











101°

2500

101°

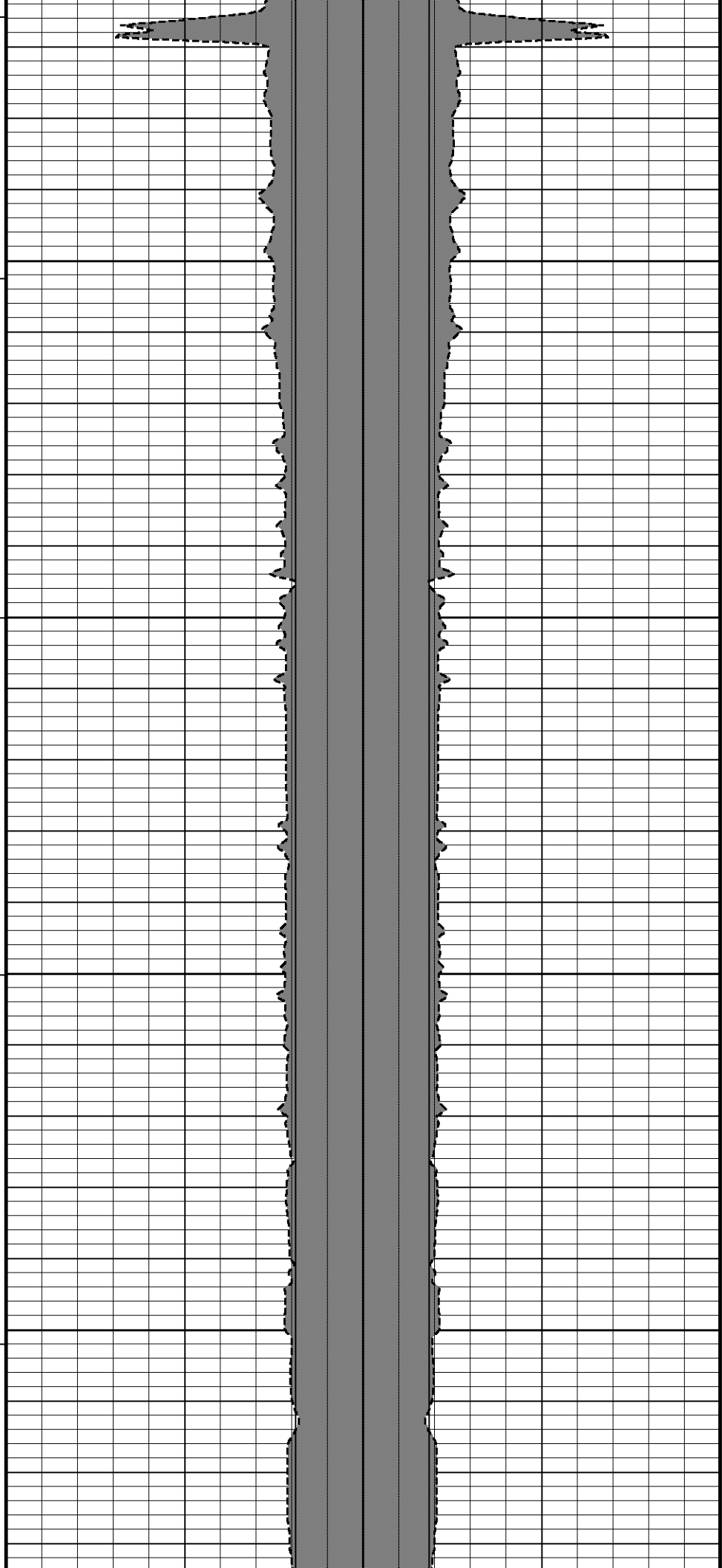
2550

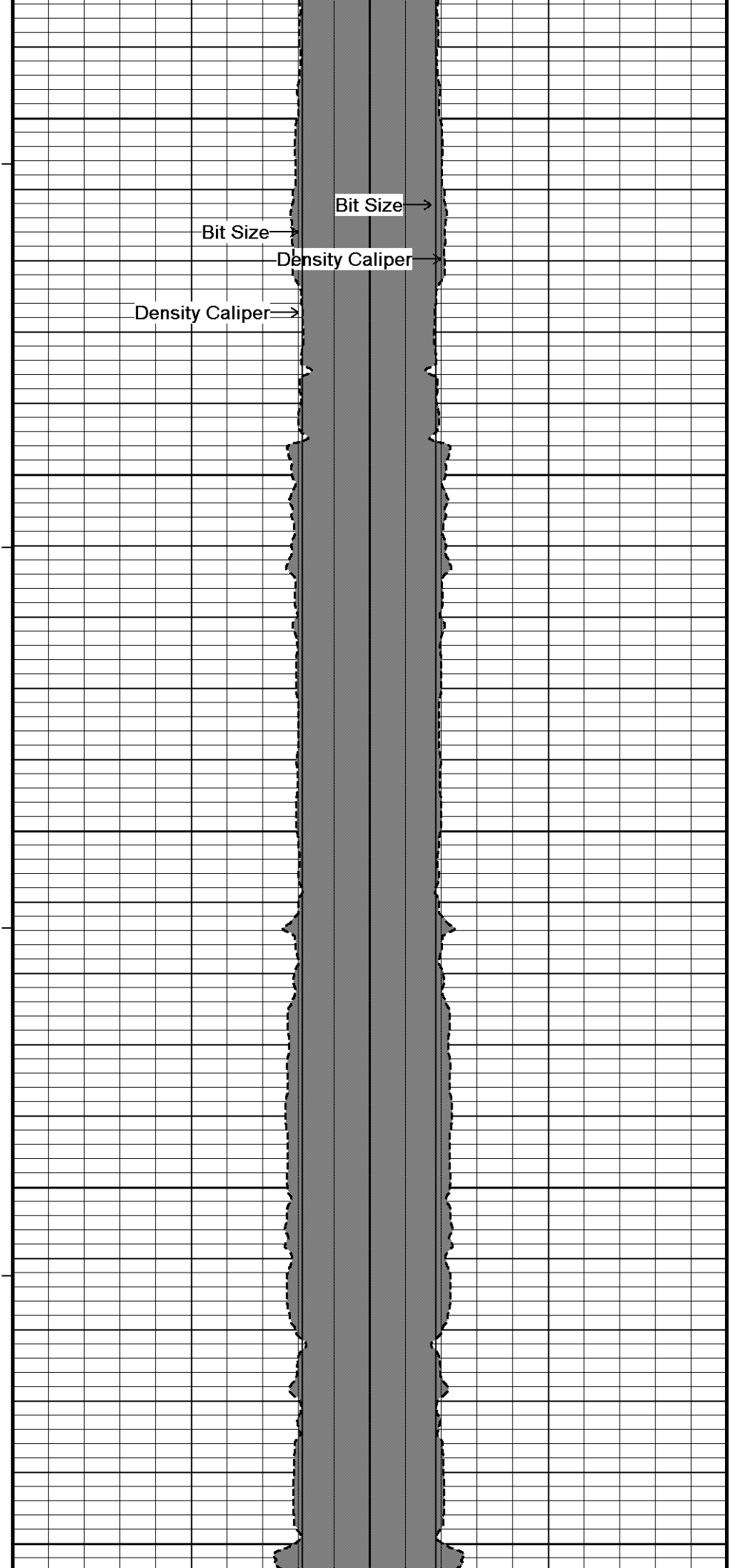
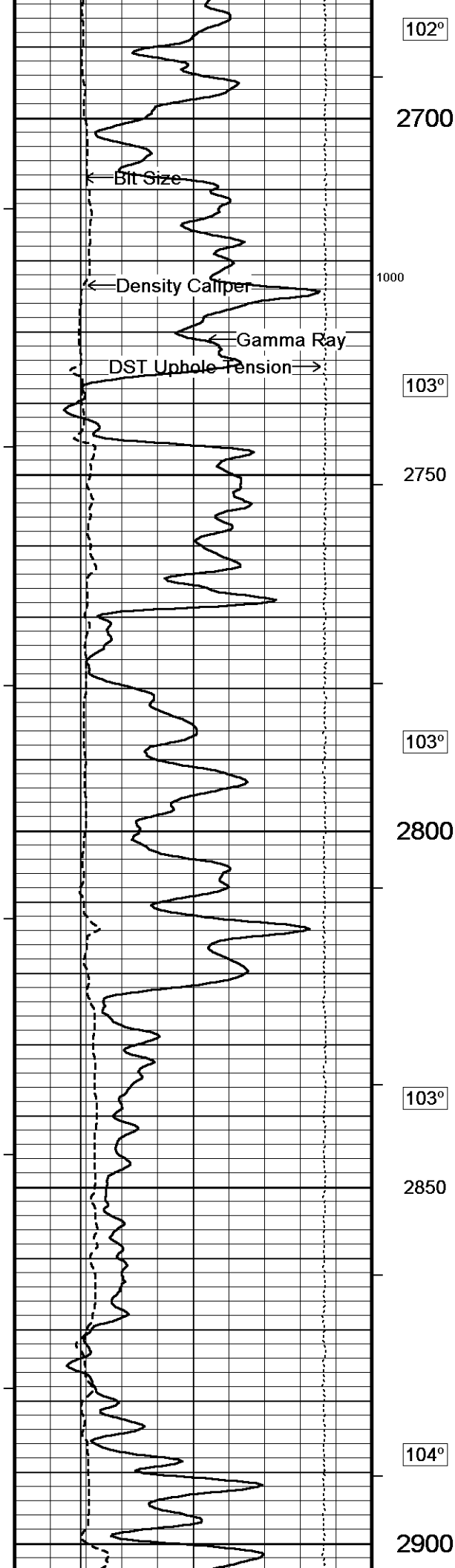
101°

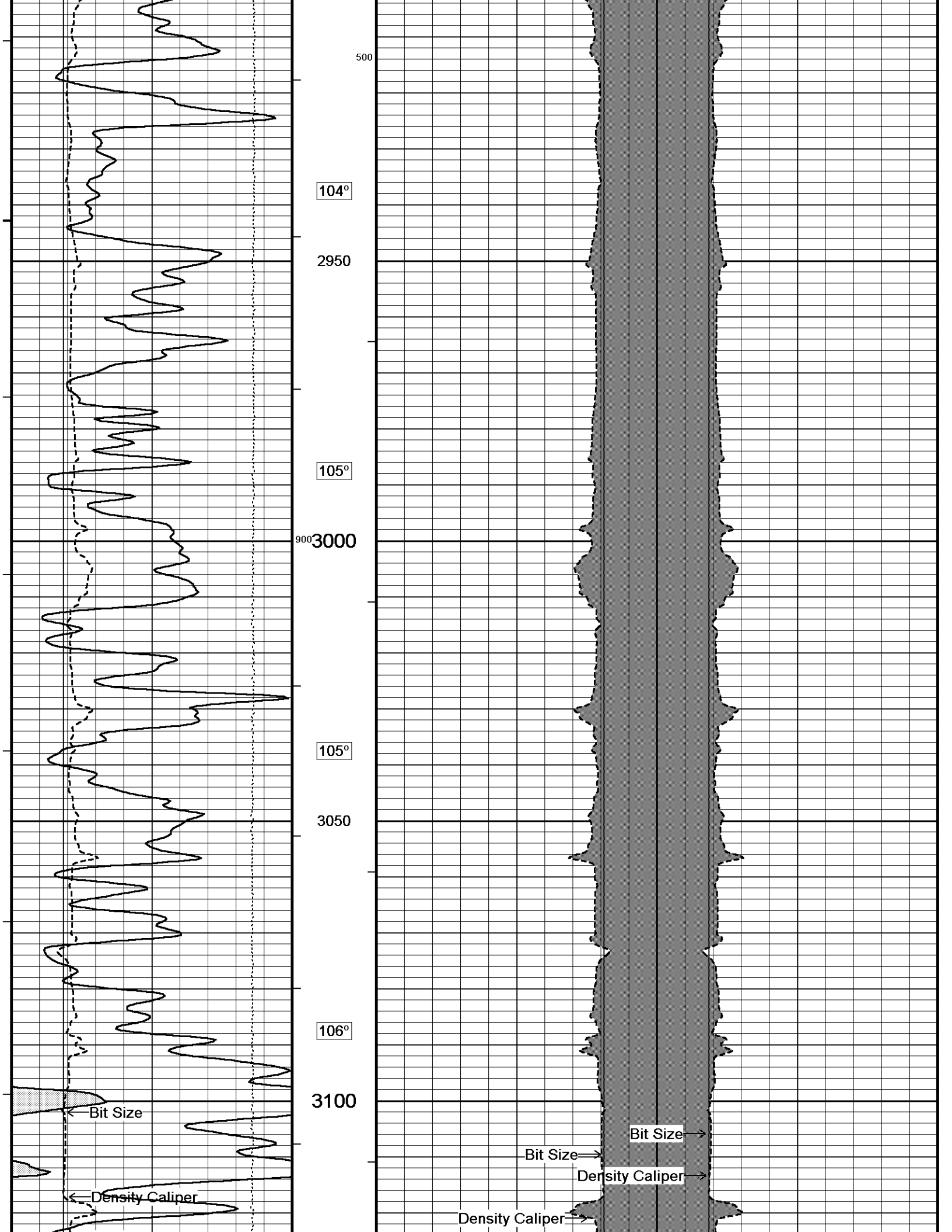
2600

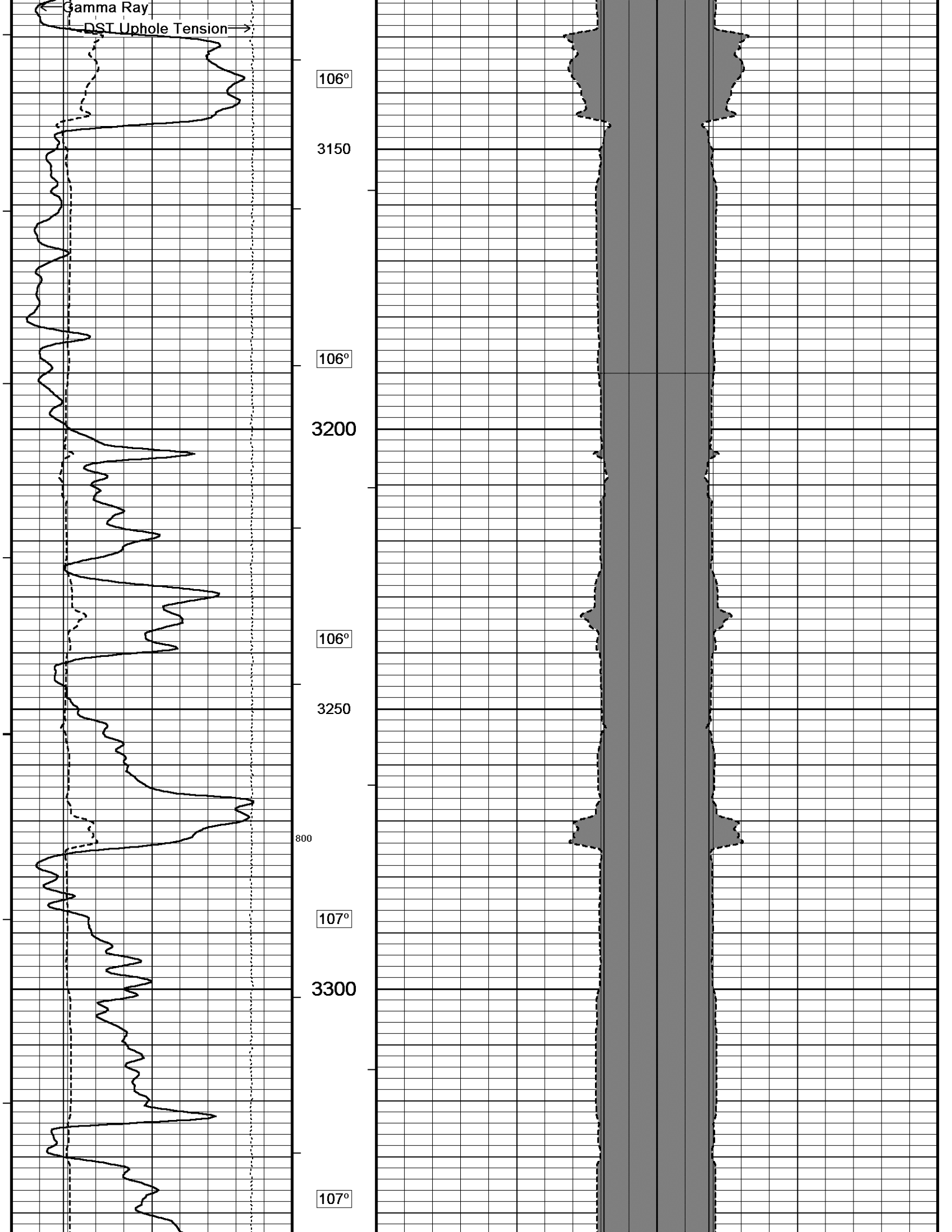
102°

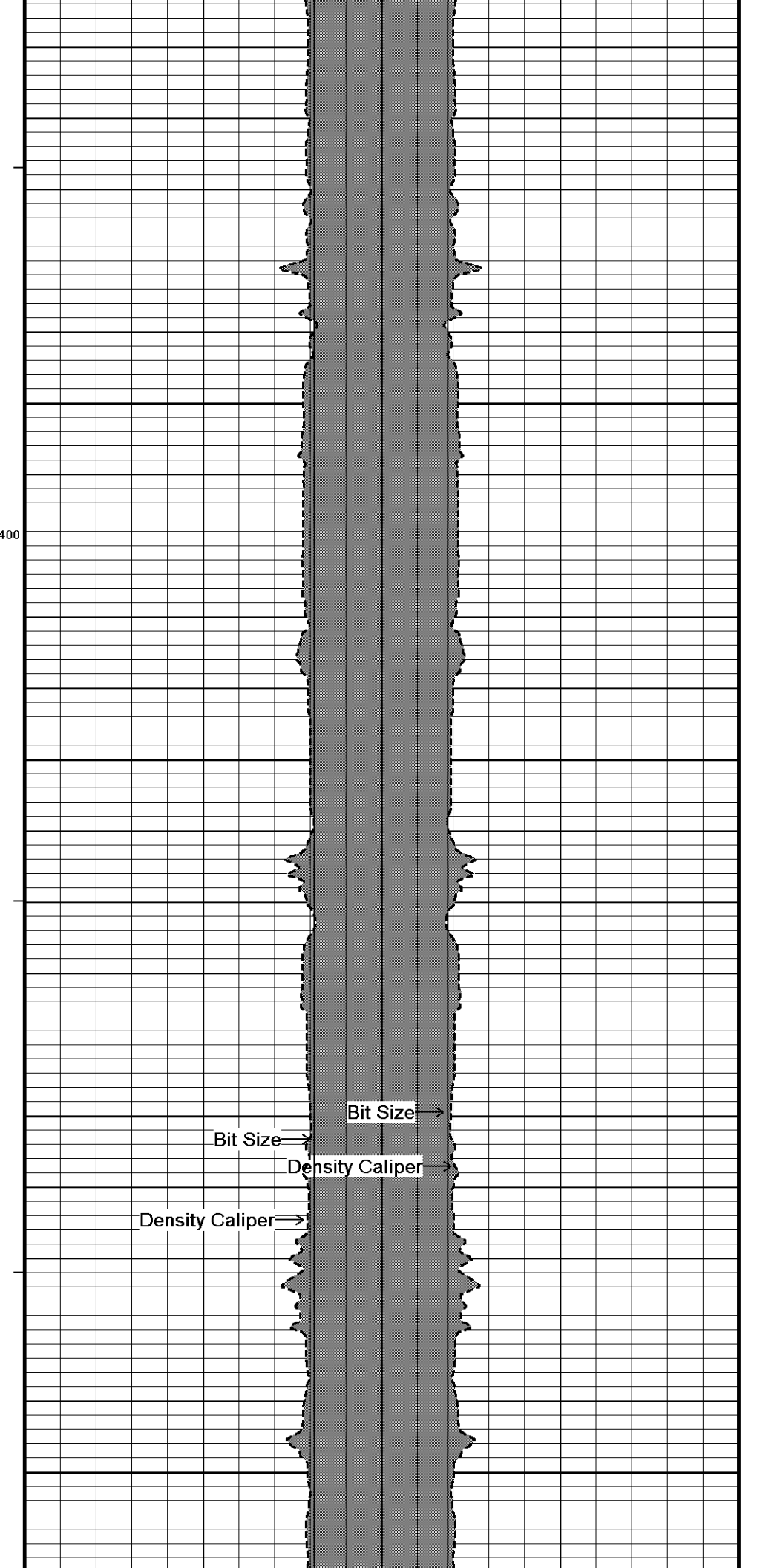
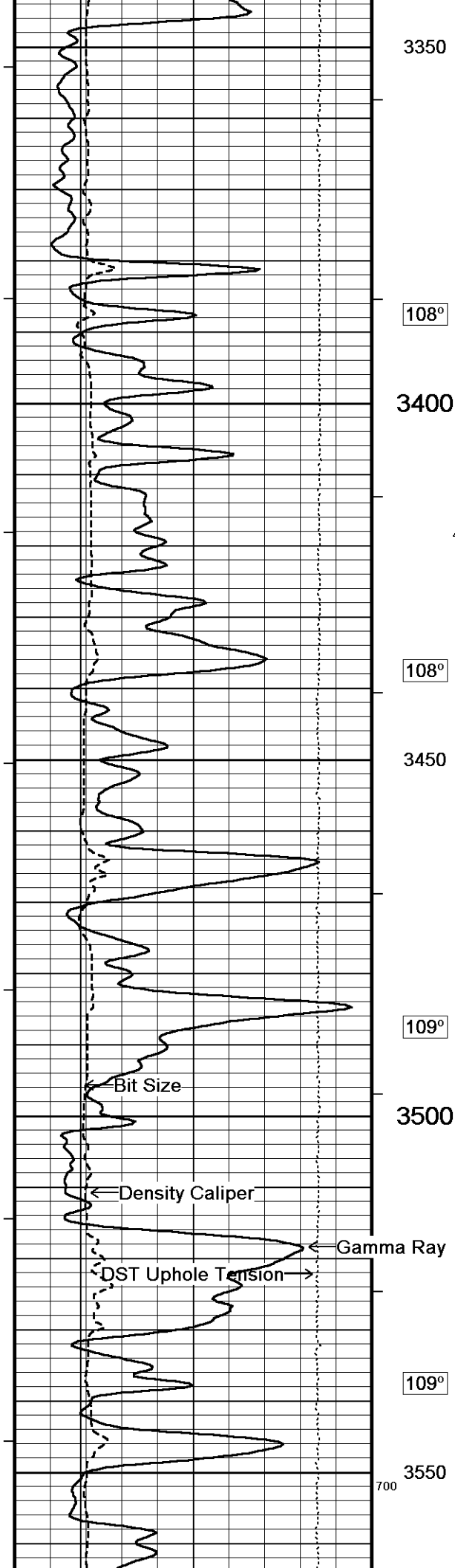
2650

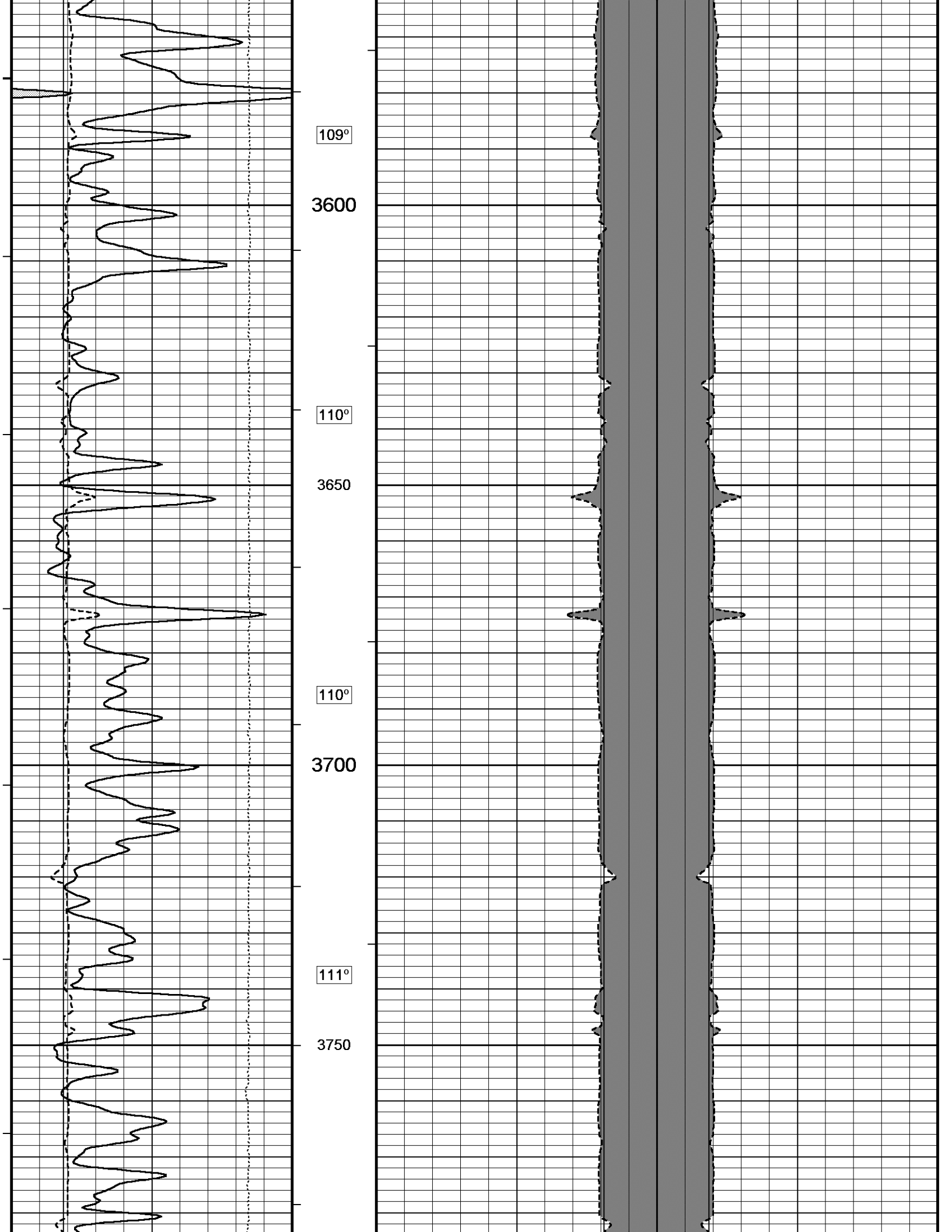


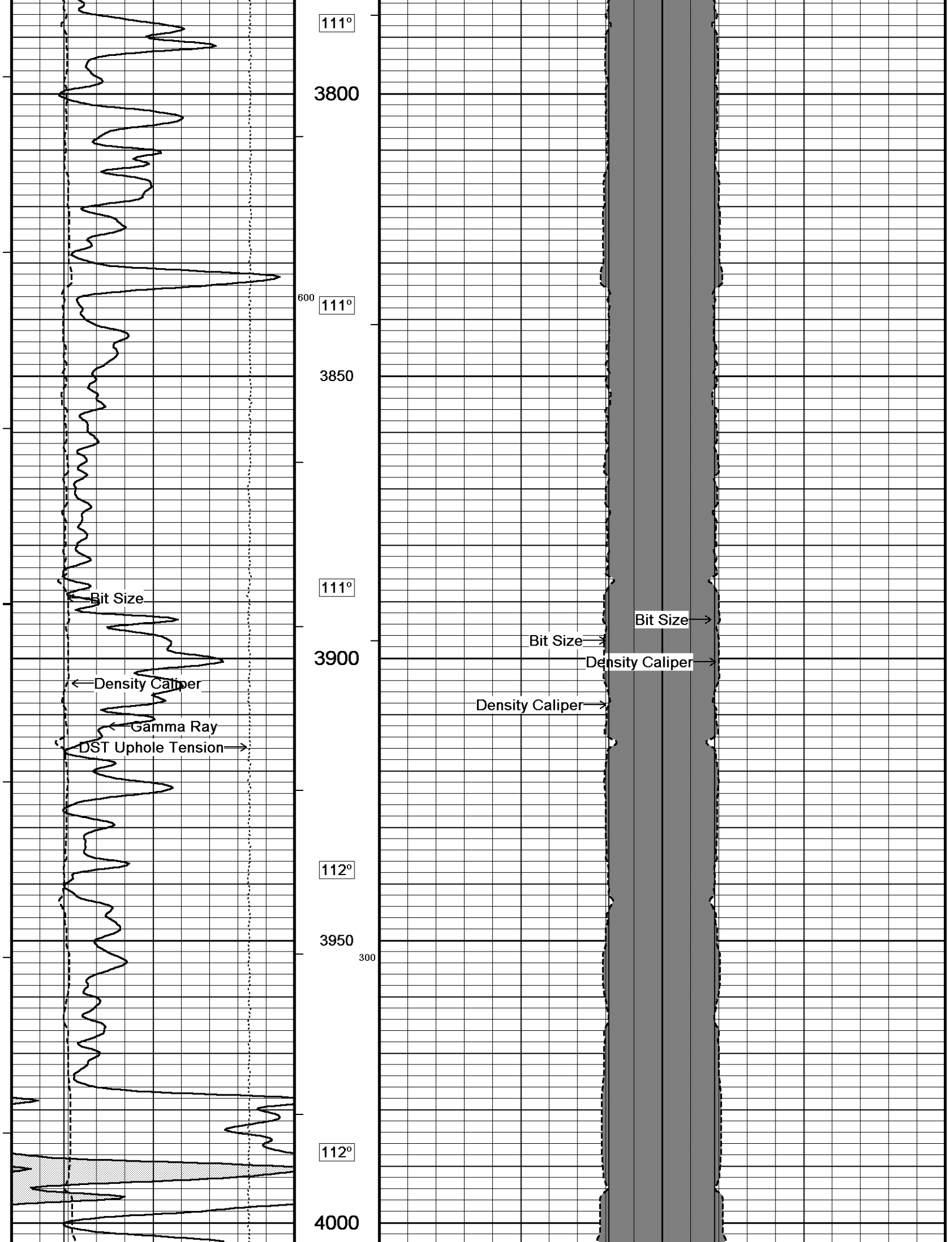


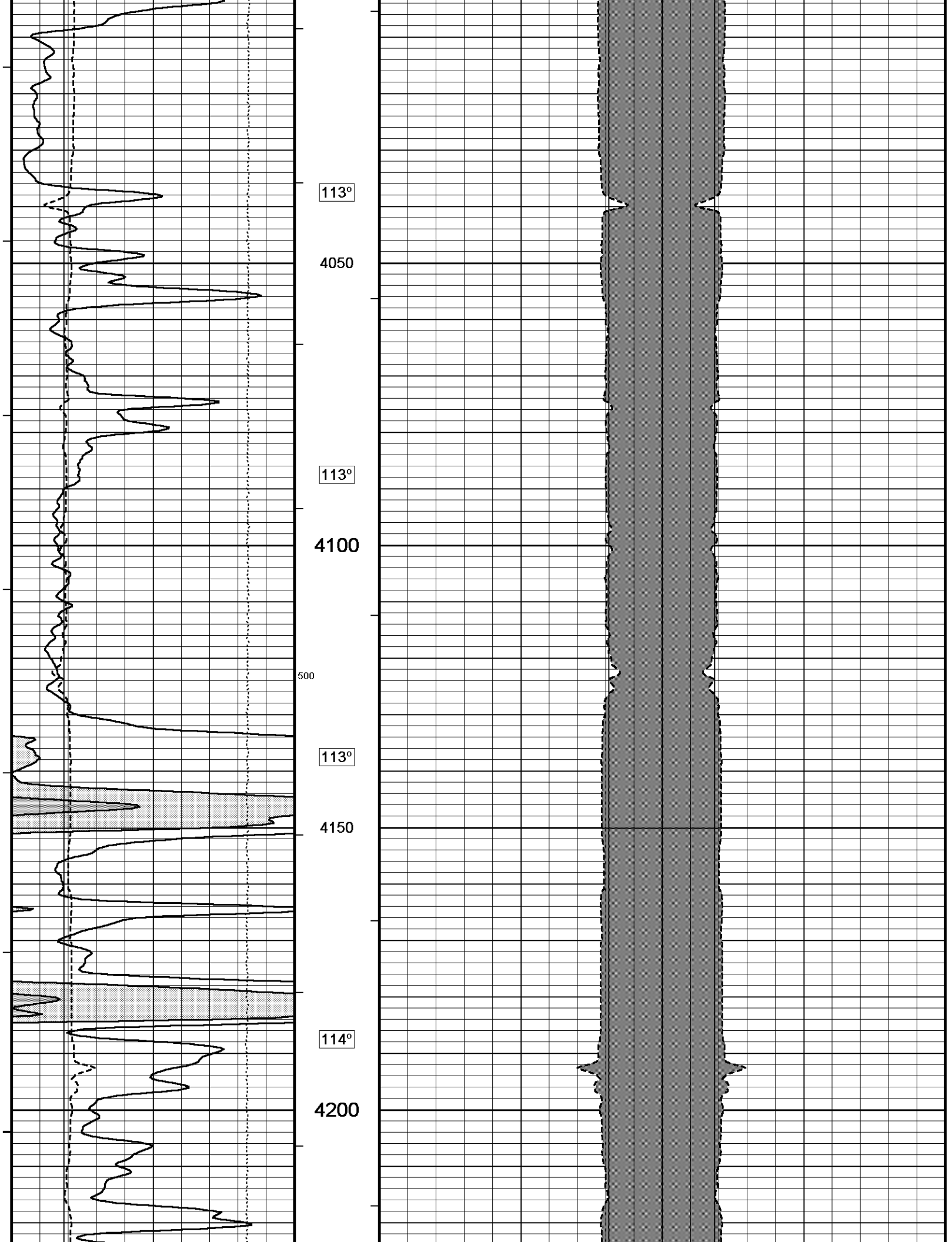


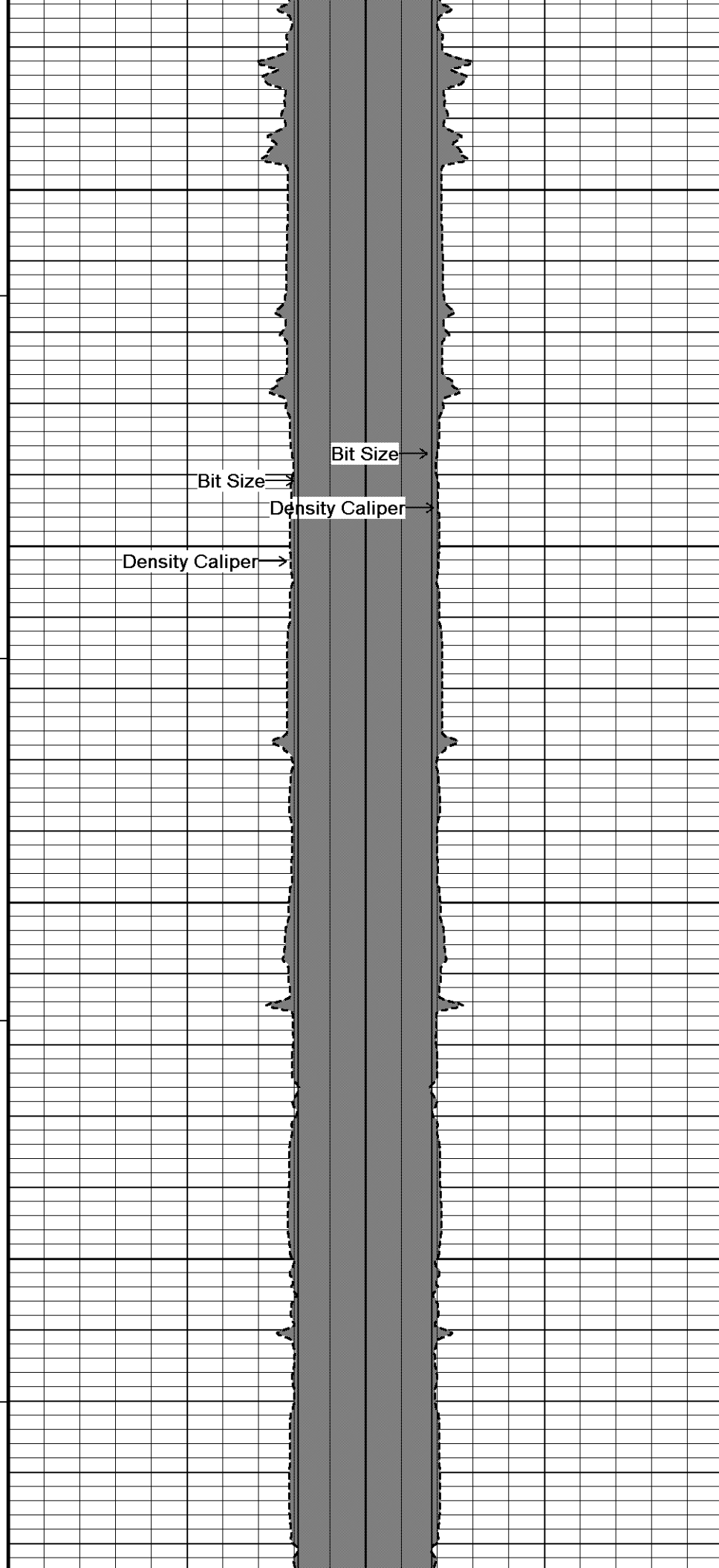
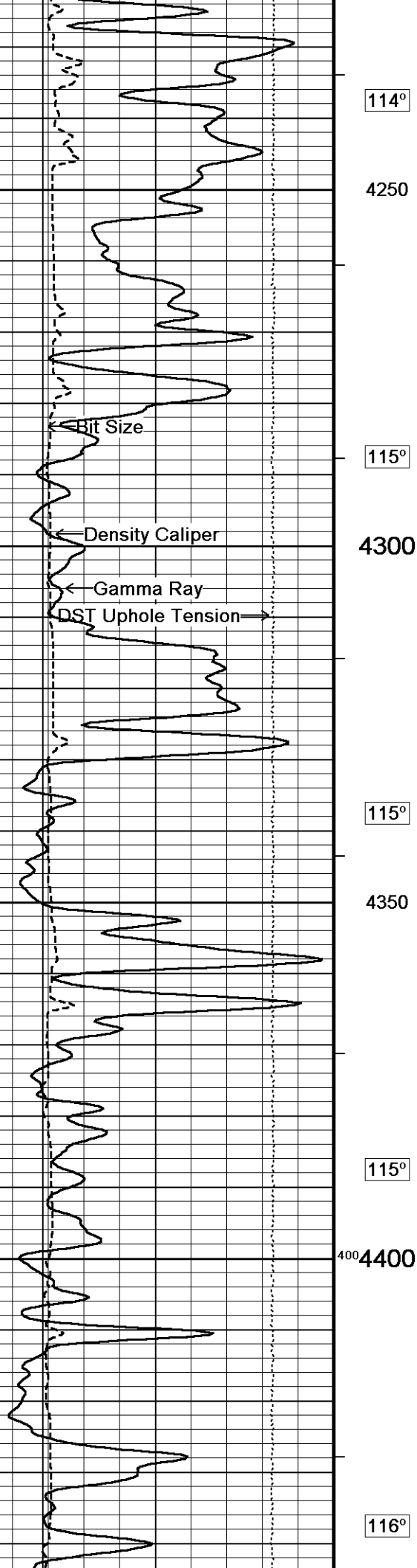


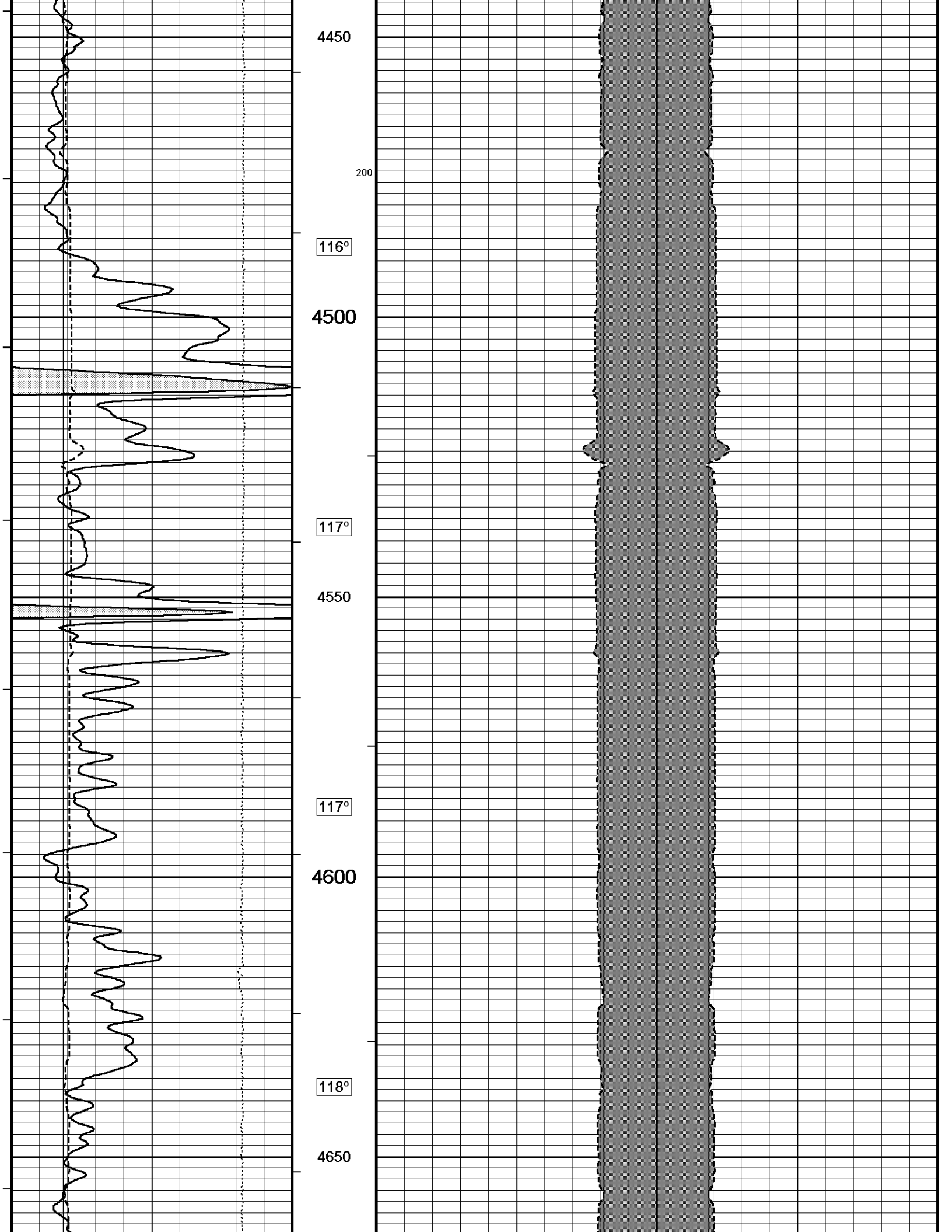


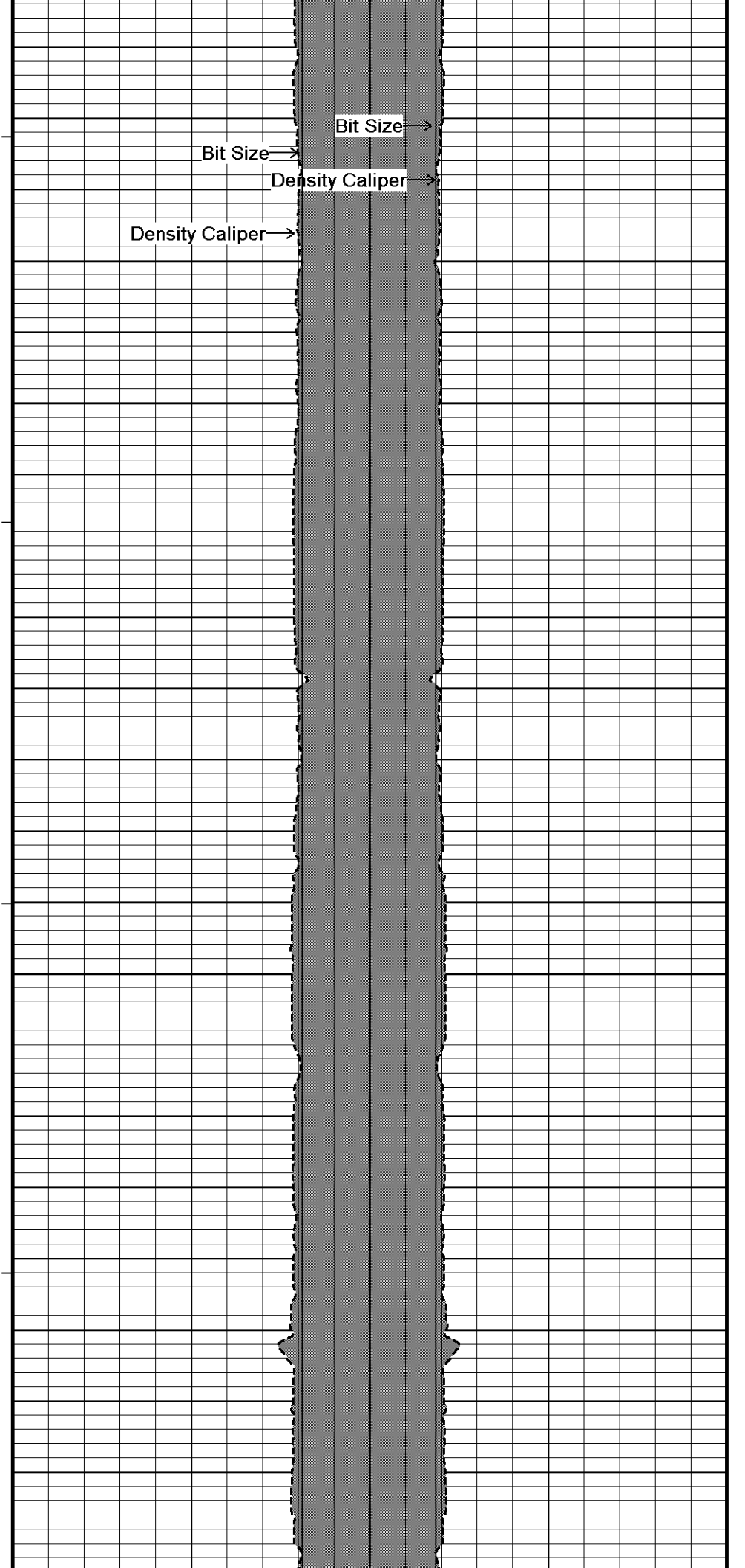
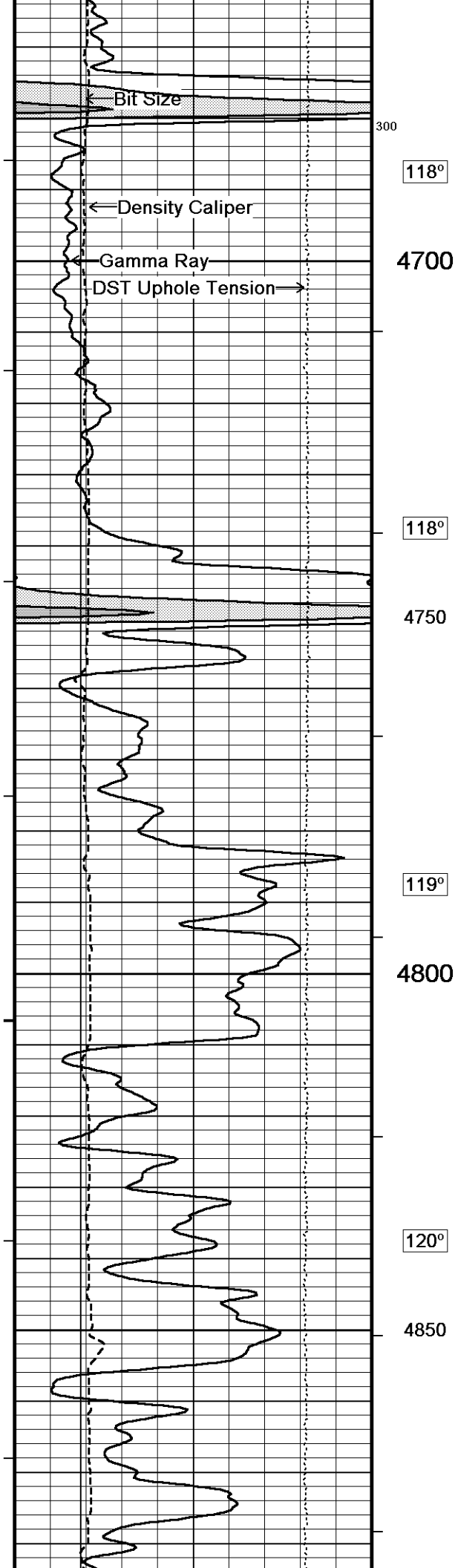


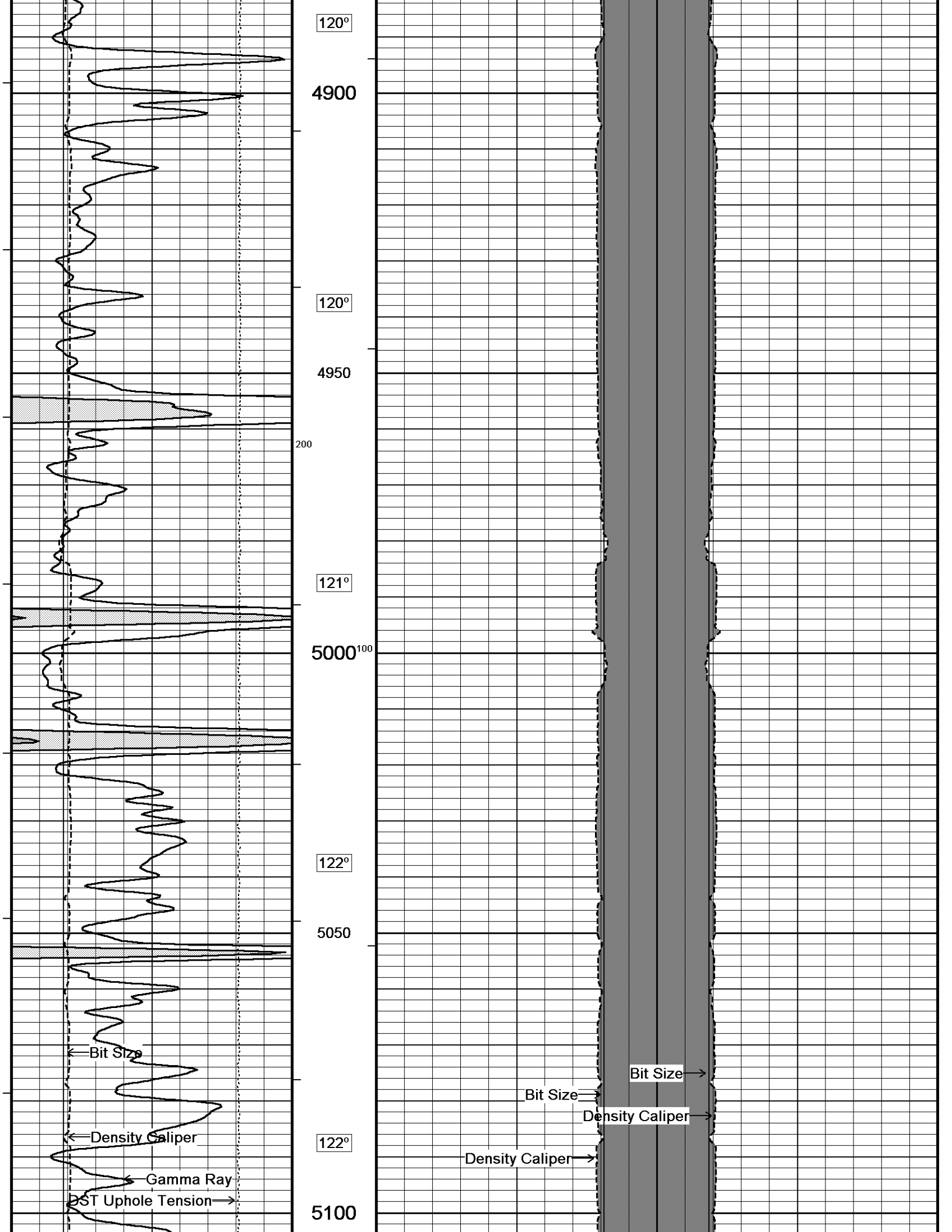


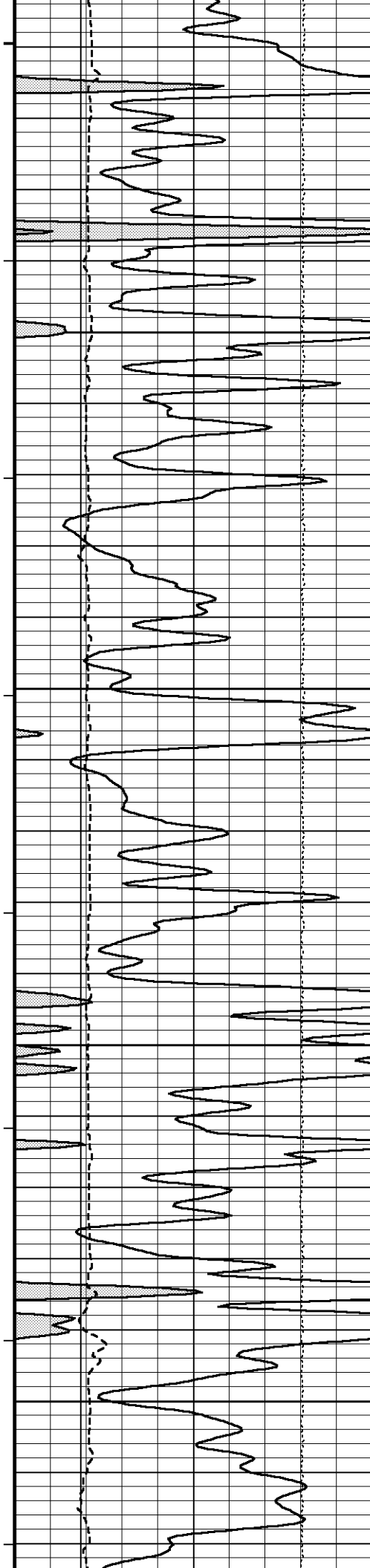












123°

5150

124°

5200

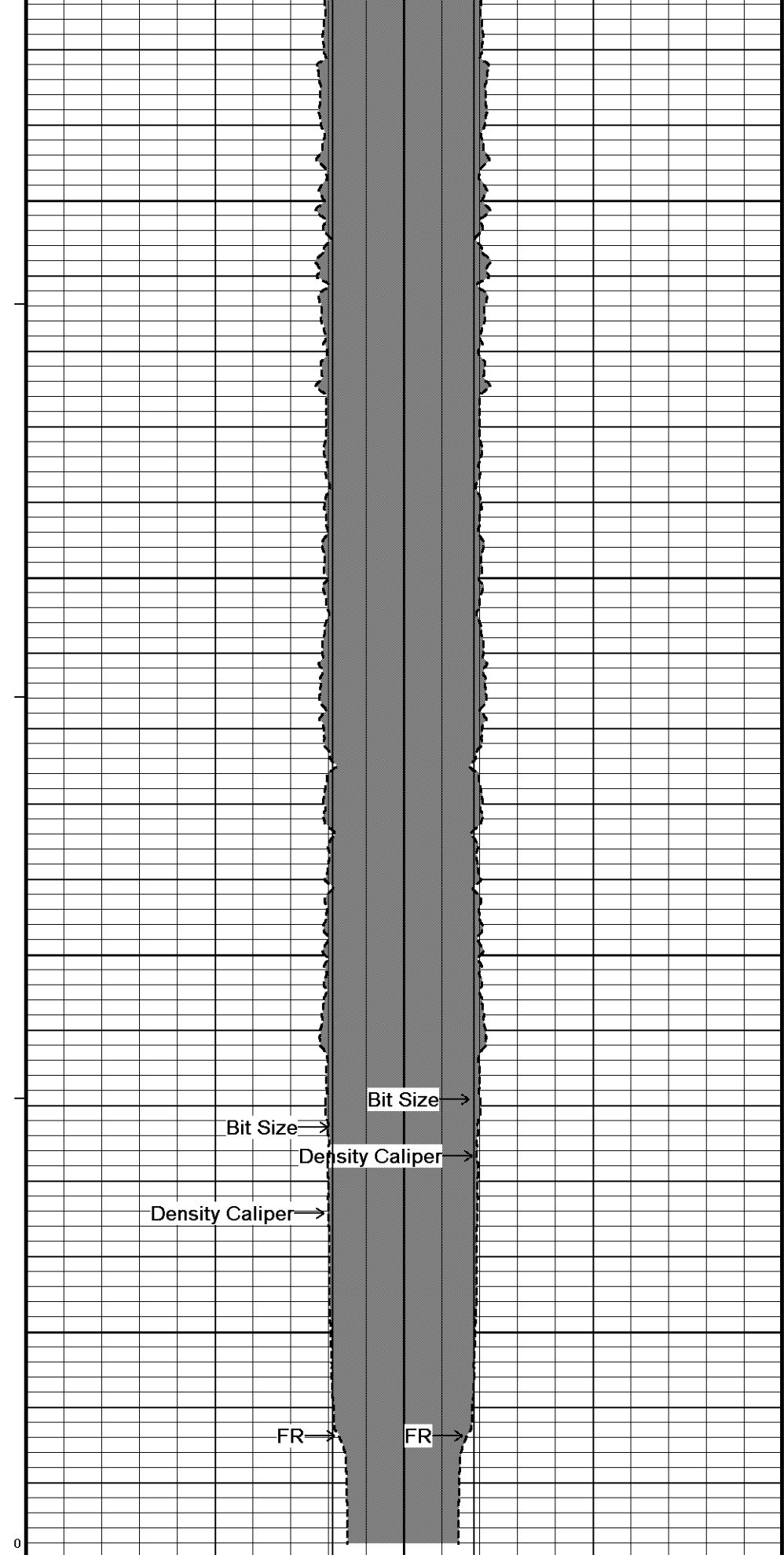
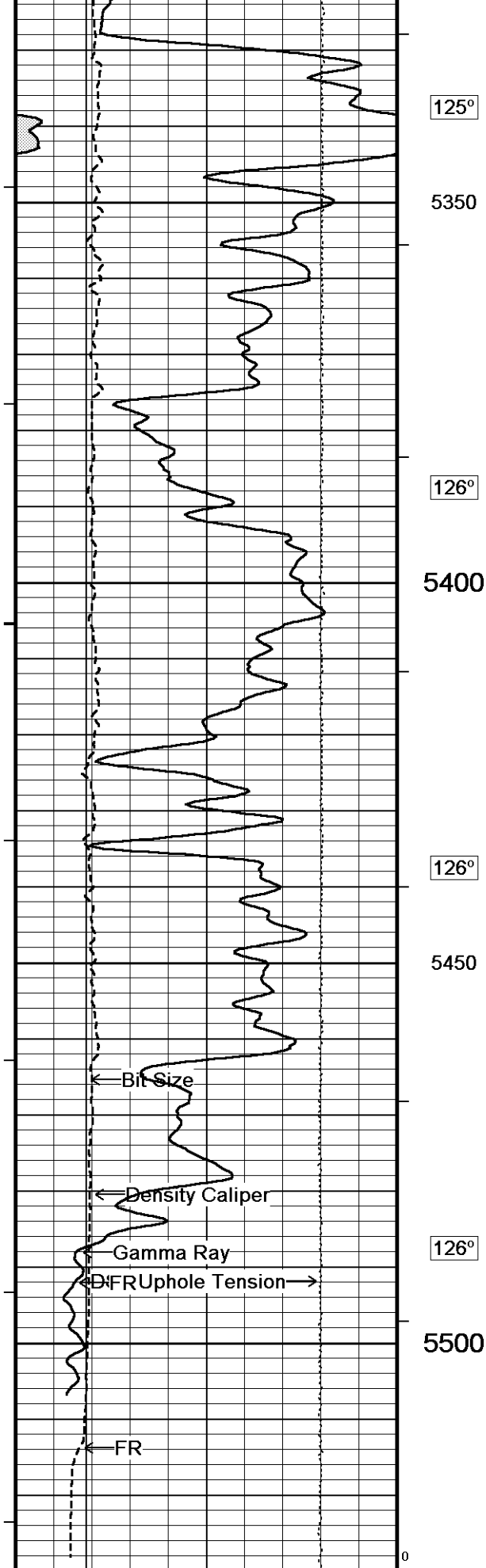
124°

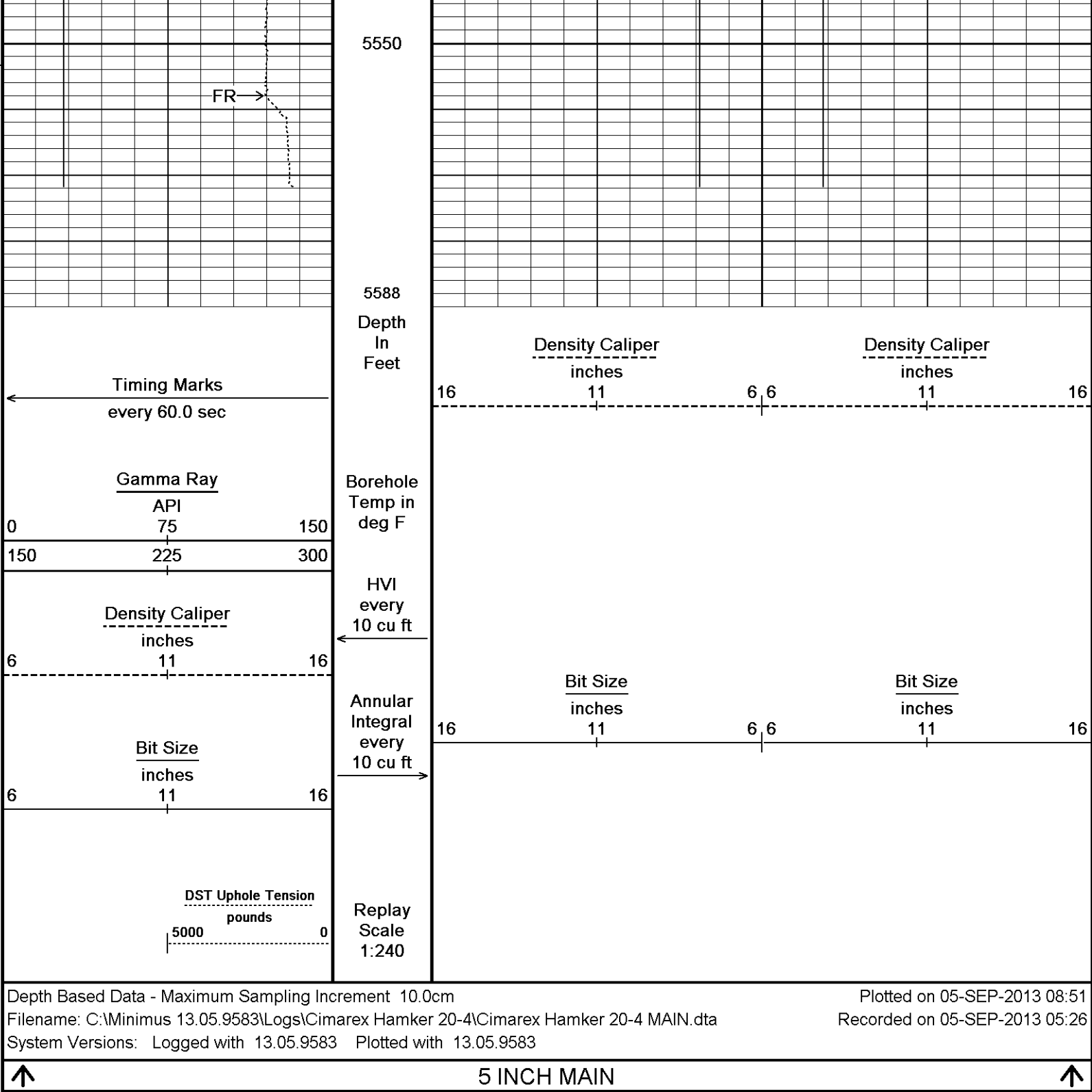
100

5250

125°

5300





BEFORE SURVEY CALIBRATION

C:\Minimus 13.05.9583\Logs\Cimarex Hamker 20-4\Cimarex Hamker 20-4 MAIN.dta

General Constants All 000

Last Edited on 05-SEP-2013,00:24

General Parameters

Mud Resistivity	1.500	ohm-metres
Mud Resistivity Temperature	60.000	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	MIE Caliper X	
Rwa Parameters		
Porosity used	Crossplot Porosity	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	1.000	
RWA Constant M	2.000	
SW/APOR Tool Source	0.000	
Gamma Calibration MCG-D.K 443		
	Measured	Calibrated (API)
Background	53	36
Calibrator (Gross)	1112	761
Calibrator (Net)	1059	725
Gamma Constants MCG-D.K 443		Last Edited on 05-SEP-2013,00:25
Gamma Calibrator Number	GRC38	
Mud Density	1.08	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%
High Resolution Temperature Calibration MCG-D.K 443		
	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00
High Resolution Temperature Constants MCG-D.K 443		Last Edited on 28-AUG-2013,04:08
Pre-filter Length	11	
Accelerometer Parameters MIE-A.A 209		
Date Of Last Accelerometer Calibration	20-FEB-2013,10:48	
	X Accelerometer	Y Accelerometer
Slope	-1.113935	-1.111537
Offset	0.004254	0.005471
		Z Accelerometer
		-1.102344
		0.009082
Accelerometer Constants MIE-A.A 209		Last Edited on 18-JUN-2013,10:20
Accelerometer Calibrator Number	000	
Accelerometer Temperature Characterisation		
X Accelerometer		
Serial Number	826	
Calibration Date	18-Mar-2009	
	B0	B1
Bias(g)	0.00000e+000	2.32377e-005
	SF0	SF1
Scale Factor(mA/g)	3.00000e+000	2.71389e-004
		B2
		-1.87334e-008
		SF2
		4.55326e-007
		B3
		9.07324e-011
		SF3
		4.58364e-010
Y Accelerometer		
Serial Number	617	
Calibration Date	11-May-2008	
	B0	B1
Bias(g)	0.00000e+000	1.76675e-005
	SF0	SF1
Scale Factor(mA/g)	3.00000e+000	2.56882e-004
		B2
		6.93464e-010
		SF2
		5.72598e-007
		B3
		2.98691e-011
		SF3
		2.37496e-010
Z Accelerometer		
Serial Number	844	
Calibration Date	20-Mar-2009	
	B0	B1
Bias(g)	0.00000e+000	-1.21769e-005
	SF0	SF1
Scale Factor(mA/g)	3.00000e+000	2.73539e-004
		B2
		-1.46867e-008
		SF2
		4.65657e-007
		B3
		-6.44015e-011
		SF3
		2.88996e-010
Caliper Calibration MIE-A.A 209		Base Calibration on 18-JUN-2013 10:29

Base Calibration

Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)
1	25996	27327	5.98
2	35112	36609	7.97
3	43537	44699	9.86
4	54458	53758	11.92
5	0	0	0.00

Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	24866	26950	24809	22742	5.98
2	33198	36237	32734	30154	7.97
3	41719	46122	40442	36719	9.86
4	52107	57802	48995	43412	11.92
5	0	0	0	0	0.00

Field Calibration

Measured Pads 1-5 Caliper(in)	Measured Pads 3-7 Caliper(in)	Actual Caliper(in)		
6.26	5.88	5.98		
Measured Pad 2 Caliper(in)	Measured Pad 4 Caliper(in)	Measured Pad 6 Caliper(in)	Measured Pad 8 Caliper(in)	Actual Caliper(in)
3.08	2.85	2.94	3.22	5.98

Caliper Constants MIE-A.A 209

Last Edited on 18-JUN-2013,10:20

Caliper Difference for BRKT 0.120 inches

Magnetometer Parameters MIE-A.A 209

Date Of Last Magnetometer Calibration 20-FEB-2013,13:52

	X Magnetometer	Y Magnetometer	Z Magnetometer
Slope	-1.000000	-1.012493	-1.007780
Offset	0.011941	-0.015960	0.015669

Magnetometer Constants MIE-A.A 209

Last Edited on

Magnetometer Calibrator Number 000

Navigation Constants MIE-A.A 209

Last Edited on 12-AUG-2013,10:56

Magnetic Declination 6.62 degrees East

Compact Micro Imager Constants MIE-A.A 209

Last Edited on

Sonde Configuration	Imager Mode
Arm-Pad Kit	Normal Pads (12.25 in)
Arm-Pad Kit Serial Number	
Centre Pad 1 Rotational Offset	0.00 degrees
Image/Borehole Ovality Reference	Azimuth of Pad 1
Non Active Buttons	Omit
Search Angle	0.00 degrees
Correlation Interval	3.28 feet
Correlation Step	1.64 feet
Current Offset	0.0000 mAmp
Squasher Start	0.0500 mAmp
Image Processing	Enabled

Caliper Calibration MPD-B 59

Base Calibration on 23-AUG-2013 11:17

Field Calibration on 28-AUG-2013 04:05

Base Calibration Reading No	Measured	Calibrator Size (in)
1	16284	3.99
2	23984	5.98
3	31584	7.97
4	39888	9.86
5	49152	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.93	7.97

COMPANY	CIMAREX ENERGY CO.		
WELL	HAMKER 20-4		
FIELD	WILDCAT		
PROVINCE/COUNTY	HASKELL		
COUNTRY/STATE	U.S.A. / KANSAS		

Elevation Kelly Bushing	2857.00	feet	First Reading	5516.00	feet
Elevation Drill Floor	2855.00	feet	Depth Driller	5559.00	feet
Elevation Ground Level	2849.00	feet	Depth Logger	5558.00	feet


Weatherford[®]

CALIPER
LOG