



Weatherford

**COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

COMPANY SHAKESPEARE OIL CO., INC.
 WELL ZANOBIA #1-21
 FIELD WILDCAT
 PROVINCE/COUNTY LOGAN
 COUNTRY/STATE U.S.A. / KANSAS
 LOCATION 2285' FSL & 1420' FWL

SEC	TWP	RGE	Other Services
21	15S	33W	MAI/MFE MML
API Number	15-109-21141		
Permit Number	MPPDMDN		
Permanent Datum GL, Elevation	2855 feet		
Log Measured From	KB		
Drilling Measured From	KB		

Date	27-NOV-2012			Elevations:	feet
Run Number	ONE			KB	2867.00
Service Order	3537784			DF	2865.00
Depth Driller				GL	2855.00
Depth Logger	4600.00				
First Reading	4601.00				
Last Reading	4588.00				
Casing Driller	222.00				
Casing Logger	225.00				
Bit Size	222.00				
Hole Fluid Type	7.875				
Density / Viscosity	CHEMICAL	lb/USg			
PH / Fluid Loss	9.10	lb/USg	52.00	CP	
Sample Source	10.50		10.50		
Rm @ Measured Temp	MUDPIT				
Rmf @ Measured Temp	0.72 @ 78.0			ohm-m	
Rmc @ Measured Temp	0.58 @ 78.0			ohm-m	
Source Rmf / Rmc	0.86 @ 78.0			ohm-m	
Rm @ BHT	CALC			CALC	
Time Since Circulation	0.52 @ 110.0			ohm-m	
Max Recorded Temp	4 HOURS				
Equipment / Base	110.00			deg F	
Recorded By	13096			LIB	
Witnessed By	ADAM SILL				
JOB #	TIM PRIEST				
	LB12-311				

BOREHOLE RECORD

Last Edited: 27-NOV-2012 22:17

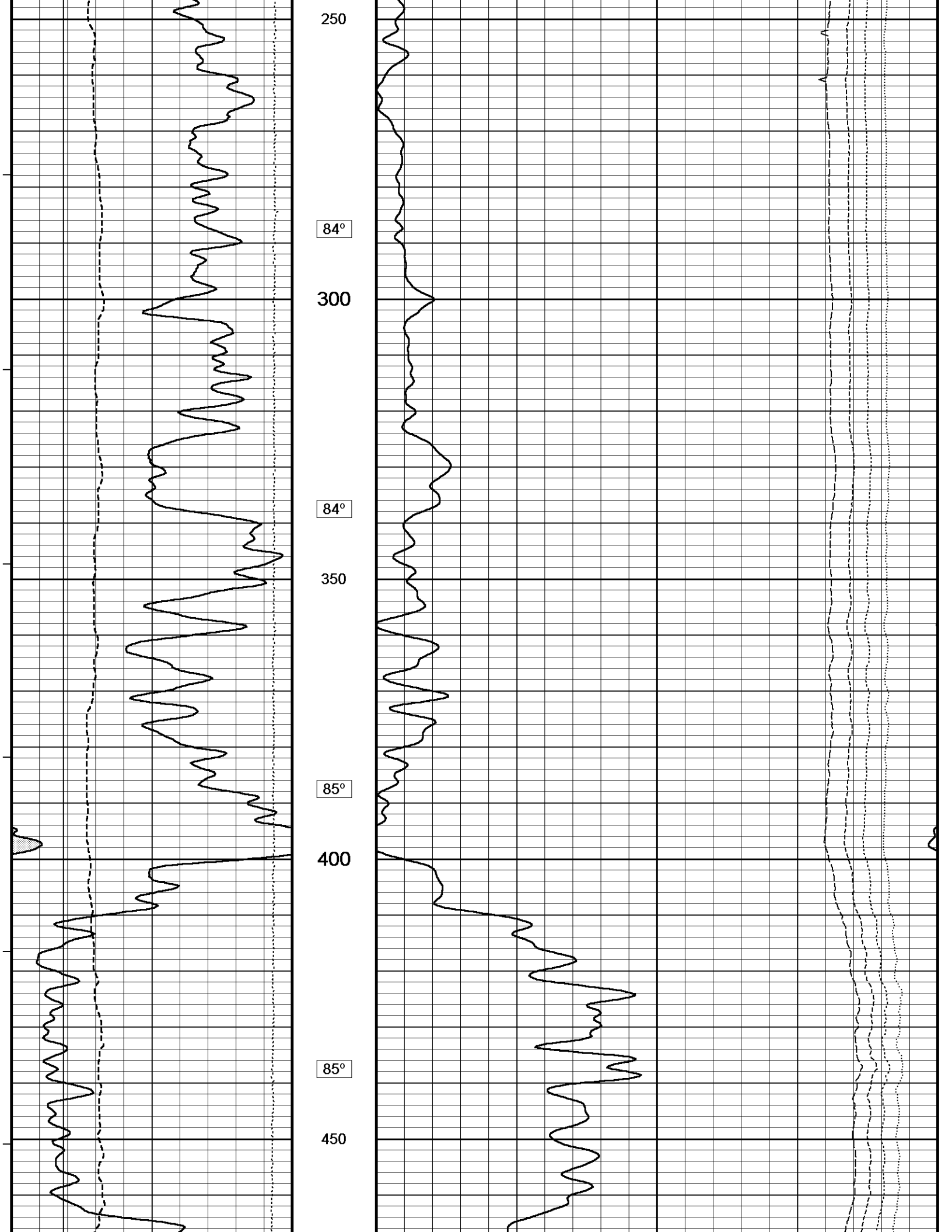
Bit Size inches	Depth From feet	Depth To feet
7.875	225.00	4600.00

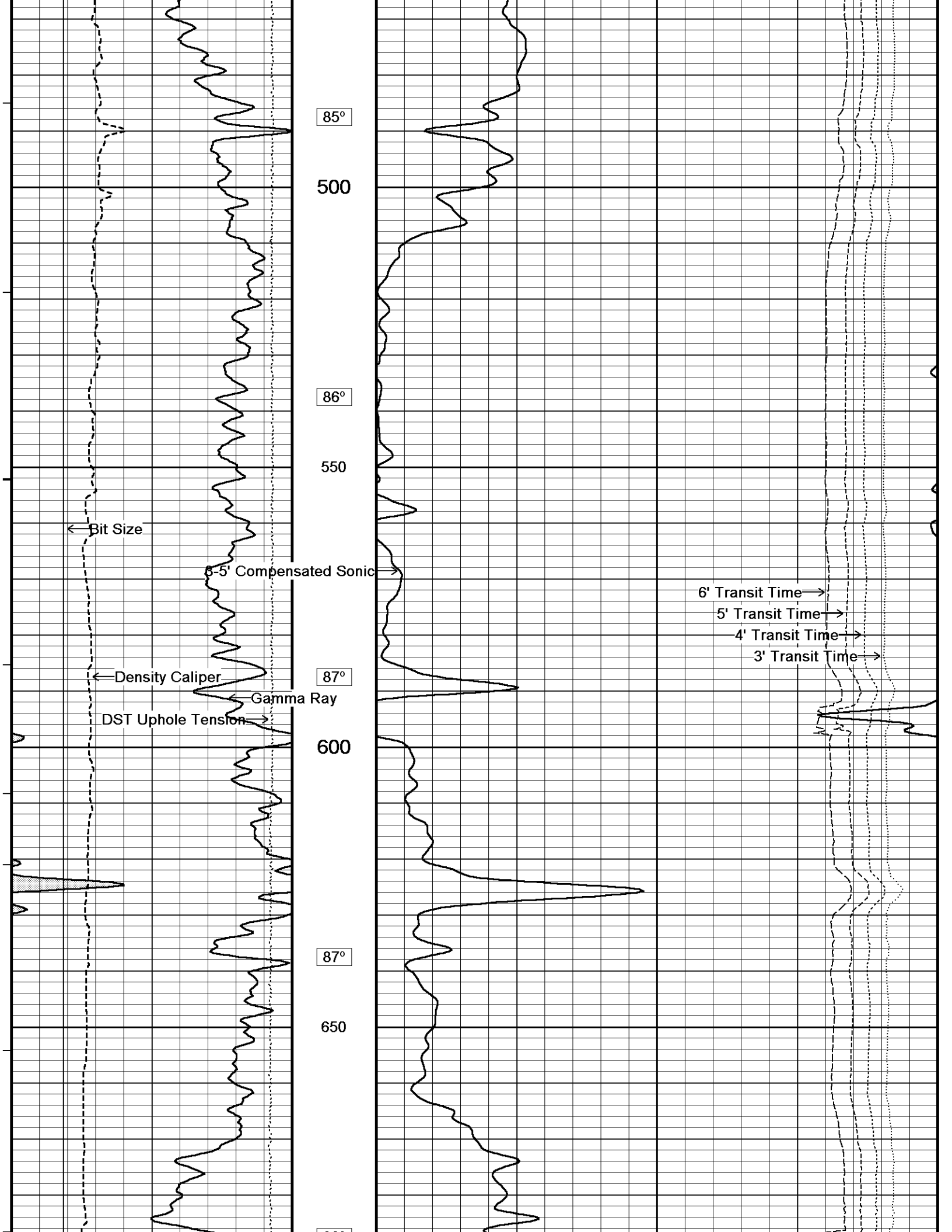
CASING RECORD

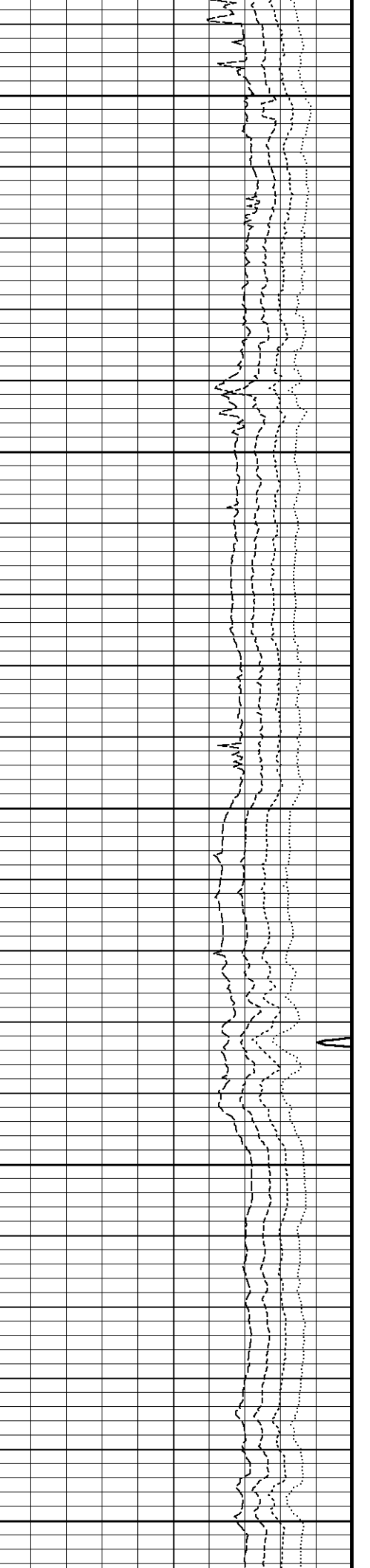
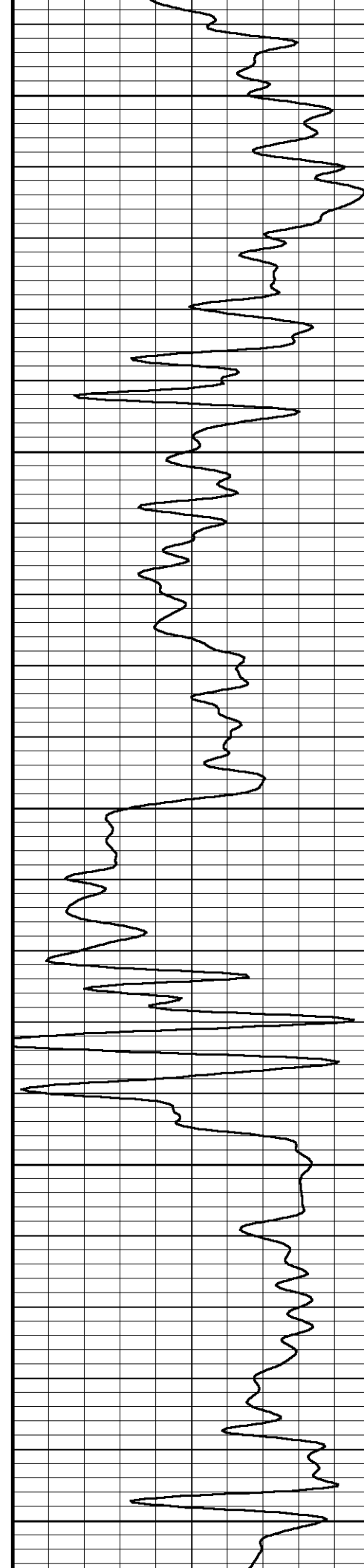
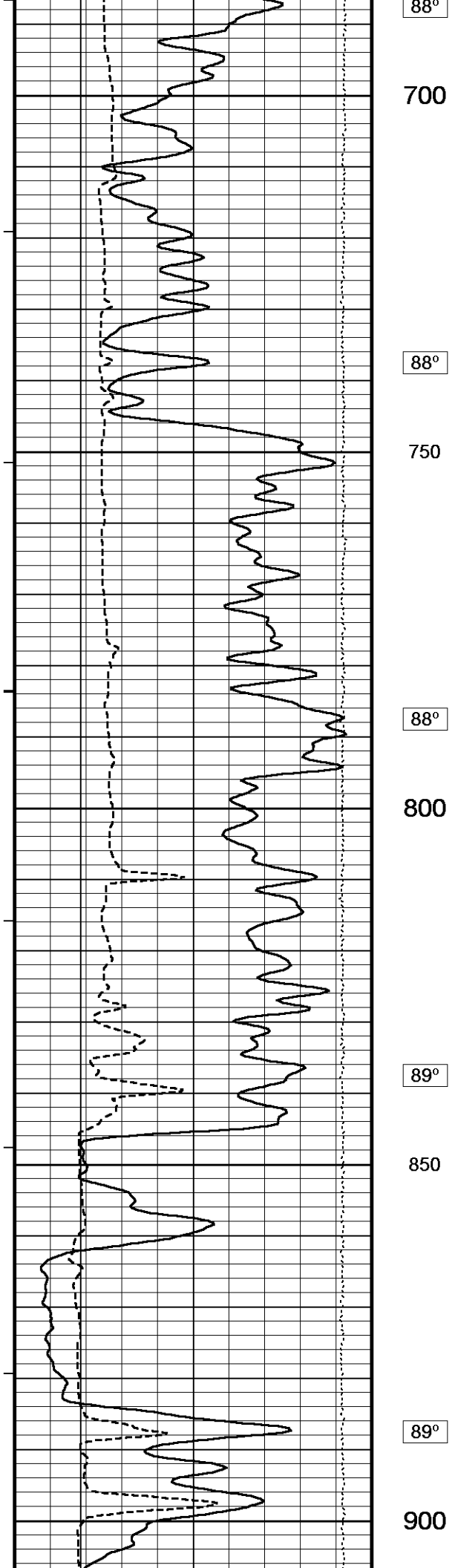
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	225.00	24.00

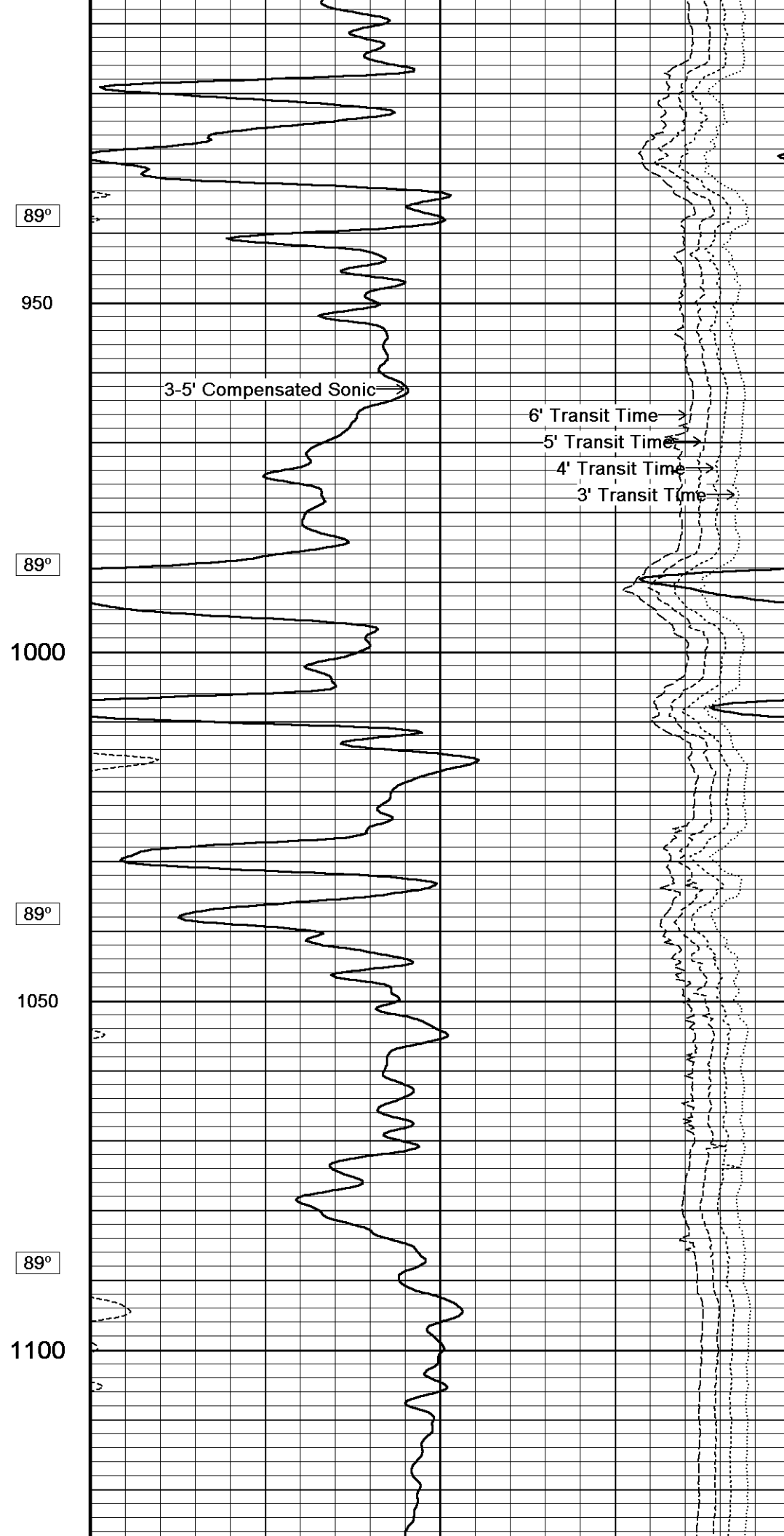
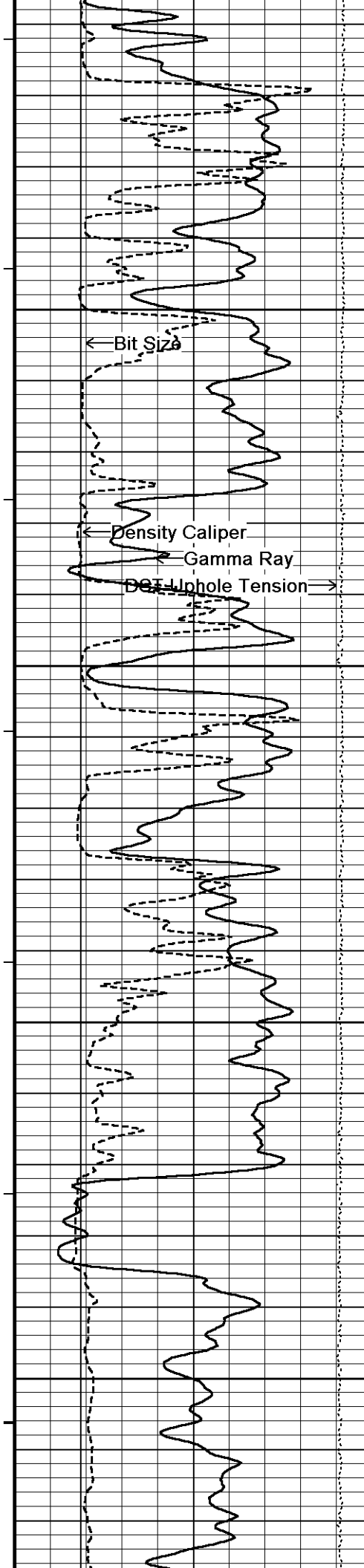
REMARKS

- SOFTWARE ISSUE: WLS 13.04.8492.
- MCG, MML, MDN, MPD, MFE, MSS, MAI RAN 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.
- ANNULAR HOLE VOLUME WITH 4.5 INCH CASING FROM TD TO 3600 FT: 280 CU. FT.
- SERVICE ORDER # 3537784.









89°

950

89°

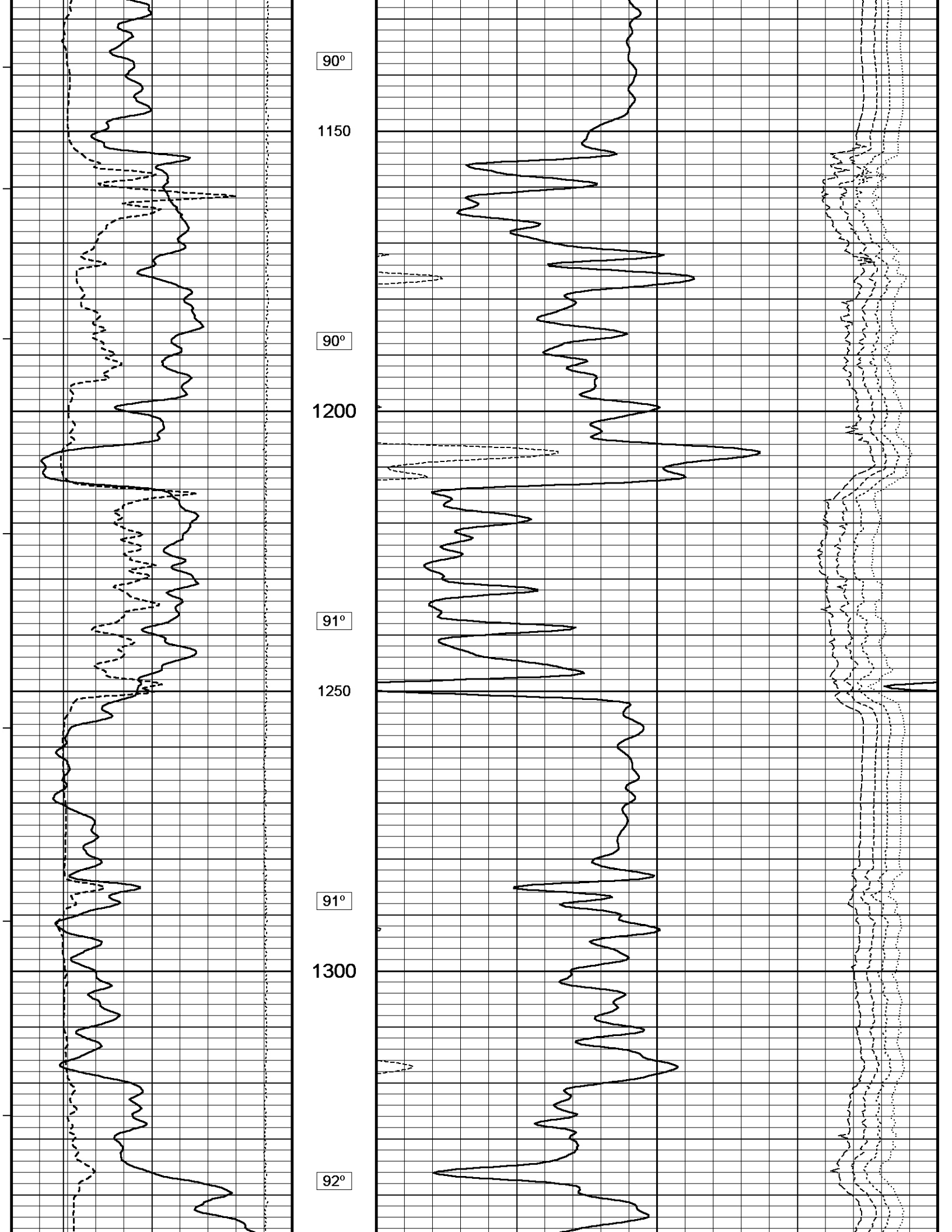
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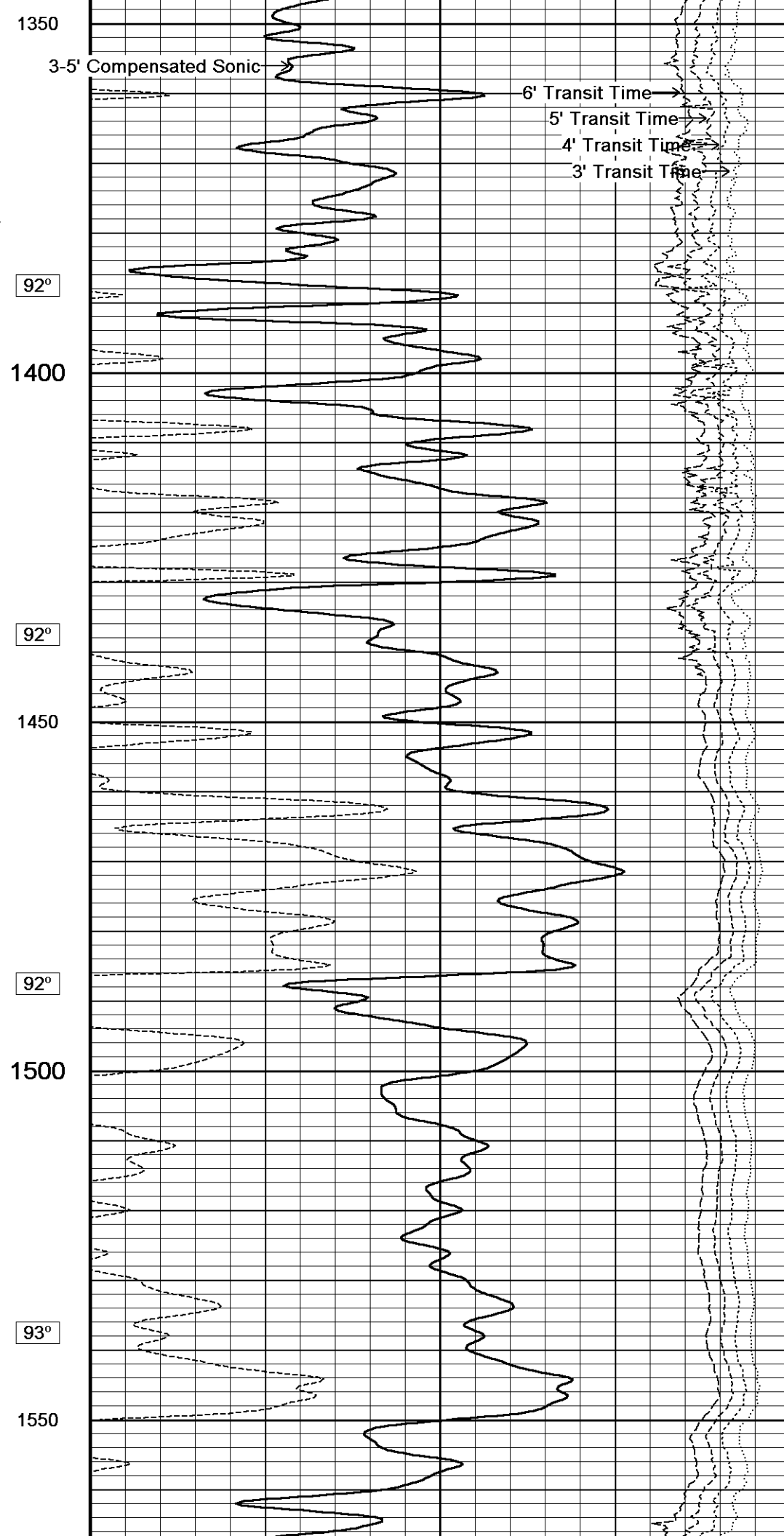
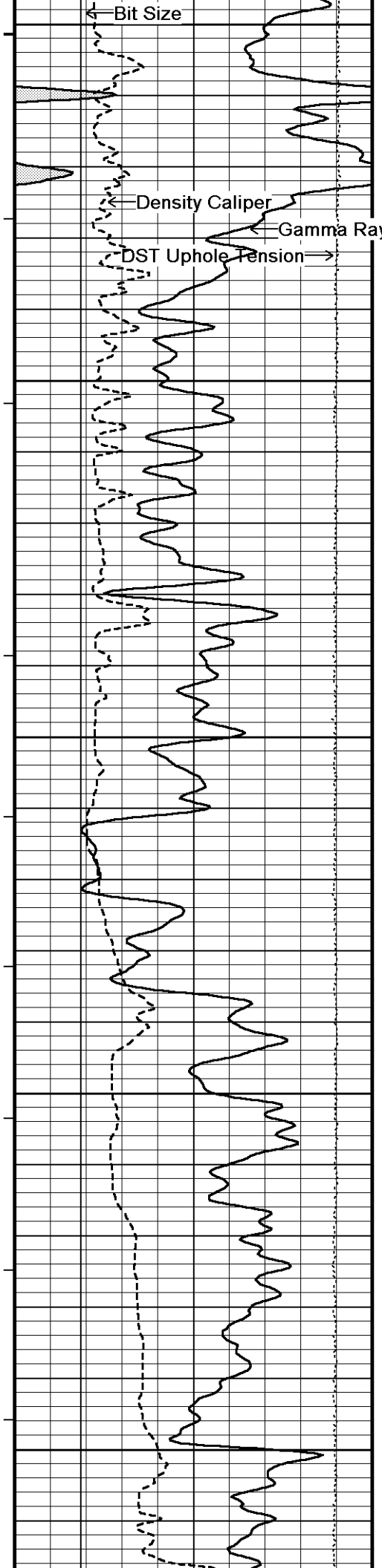
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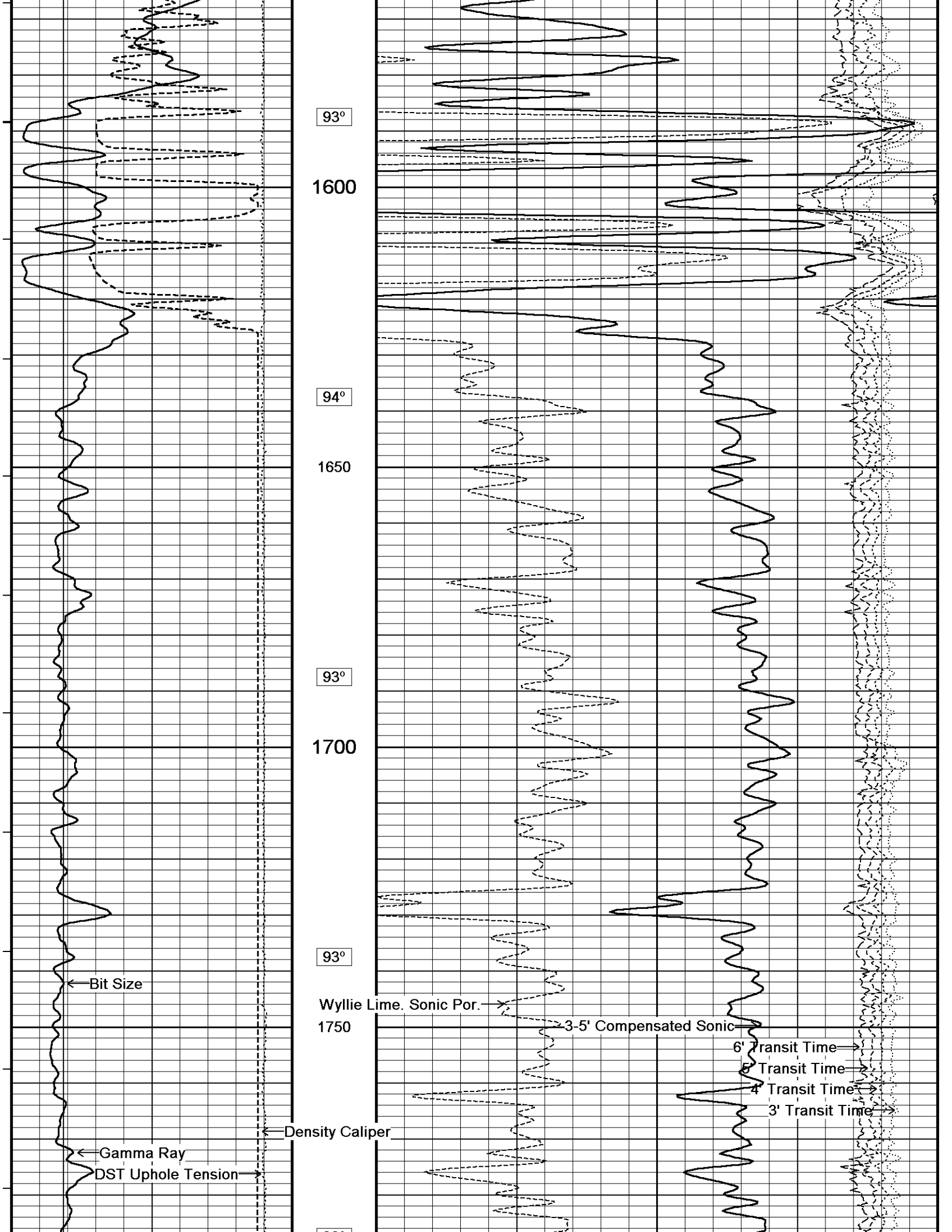
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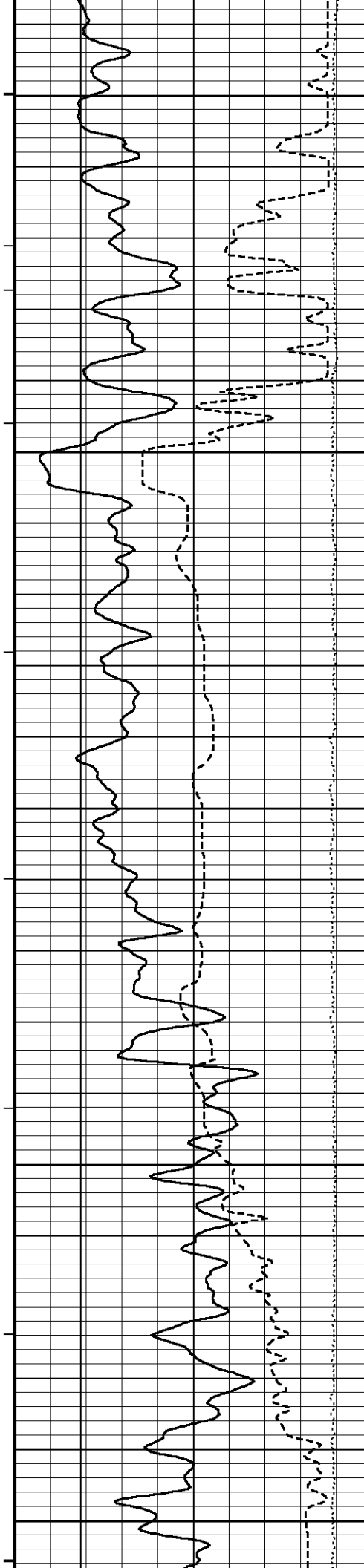
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1100

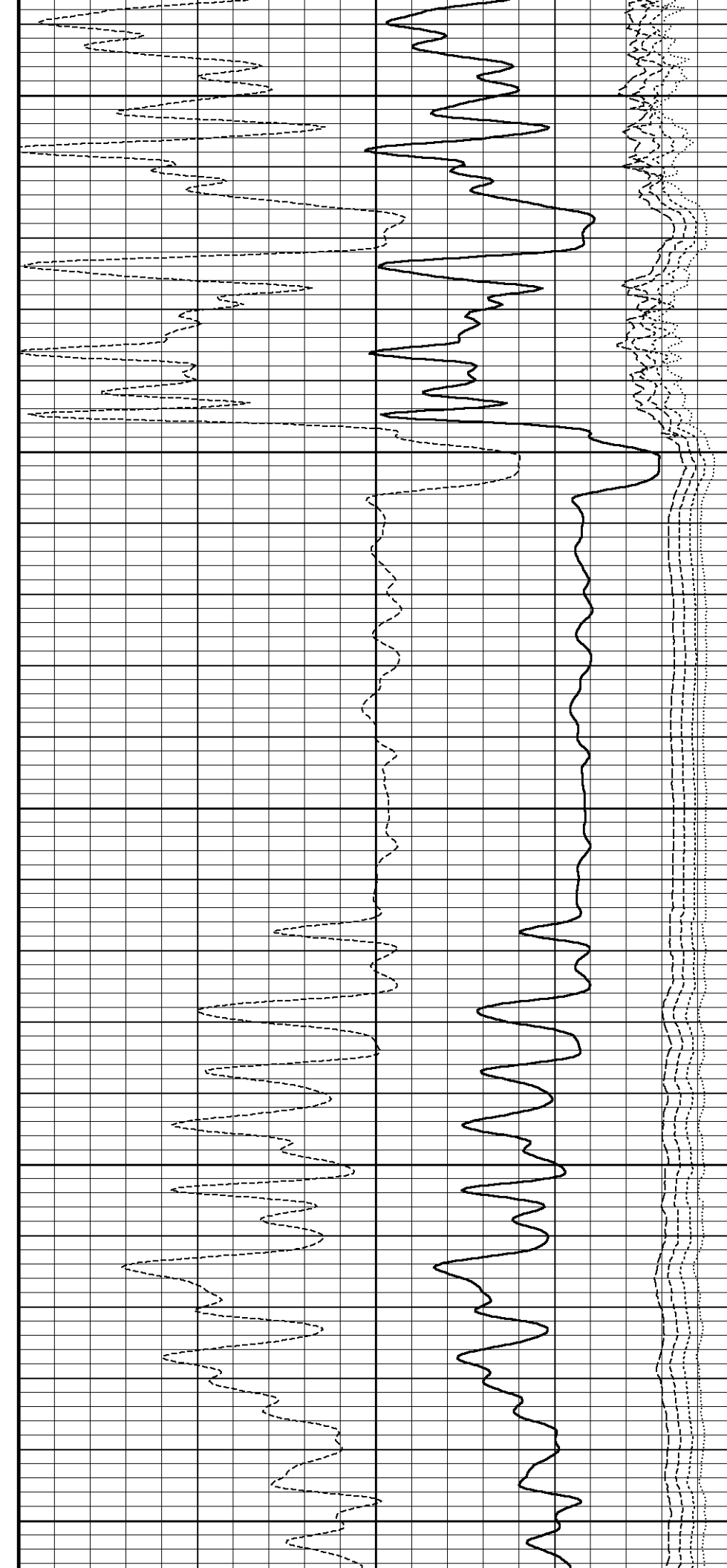


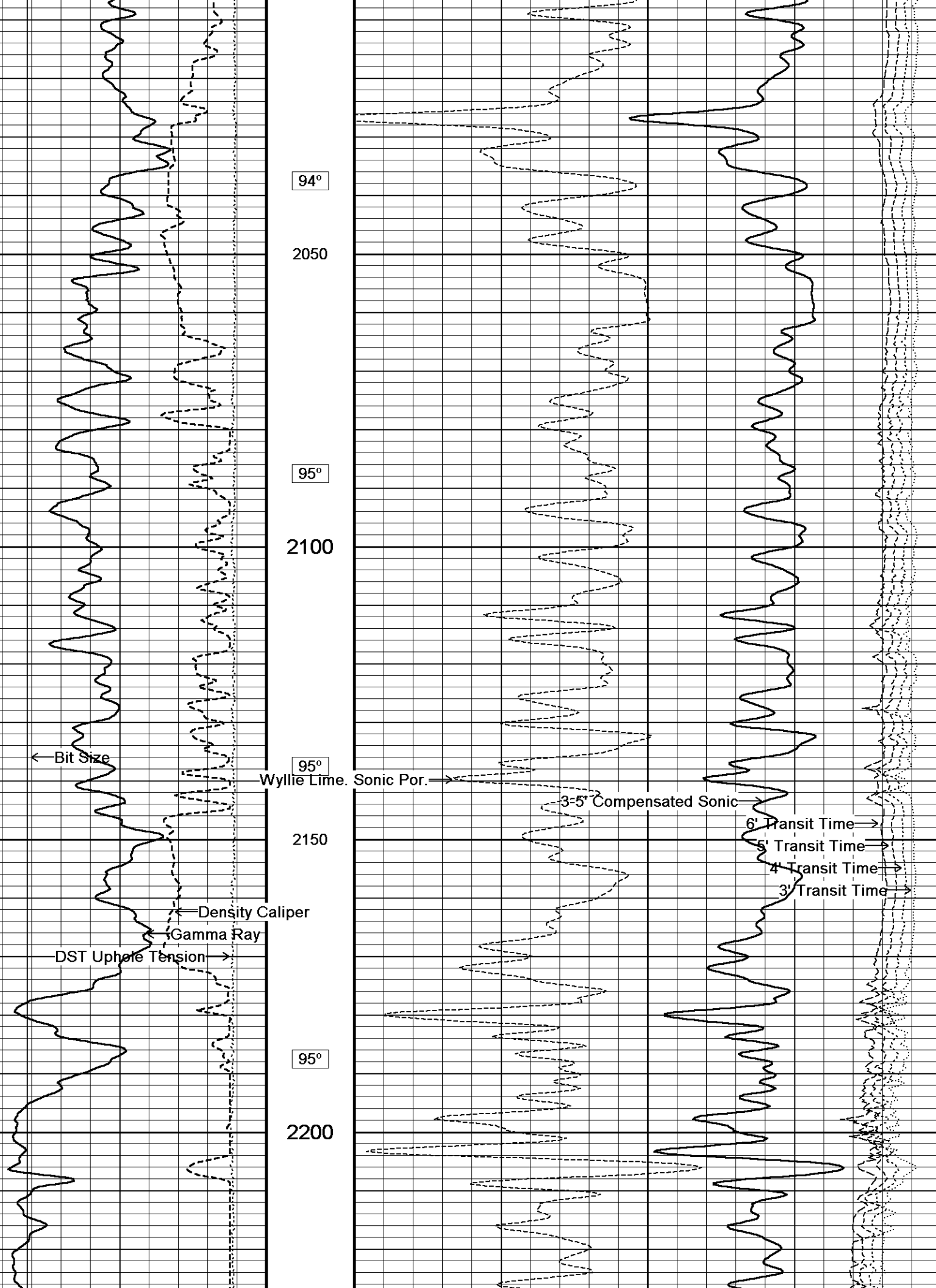


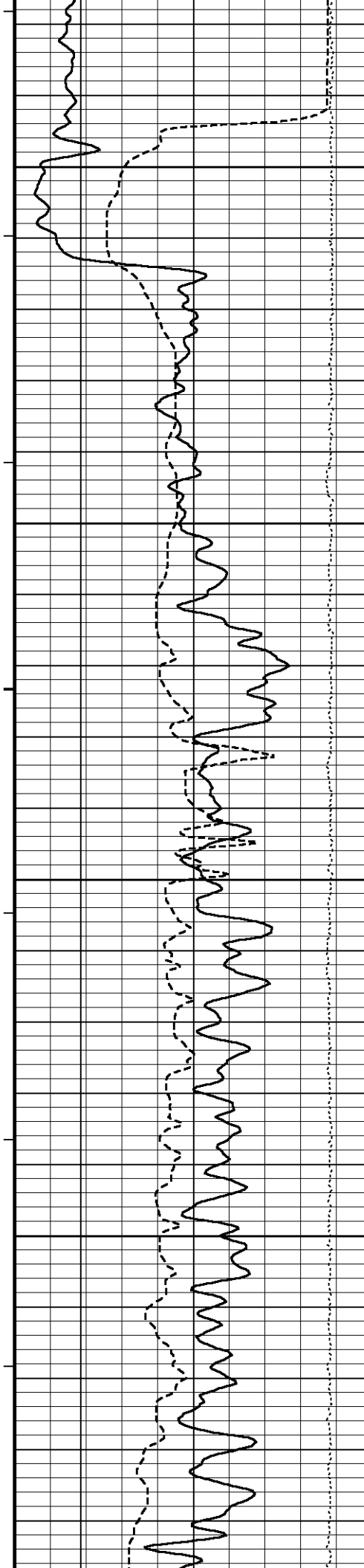




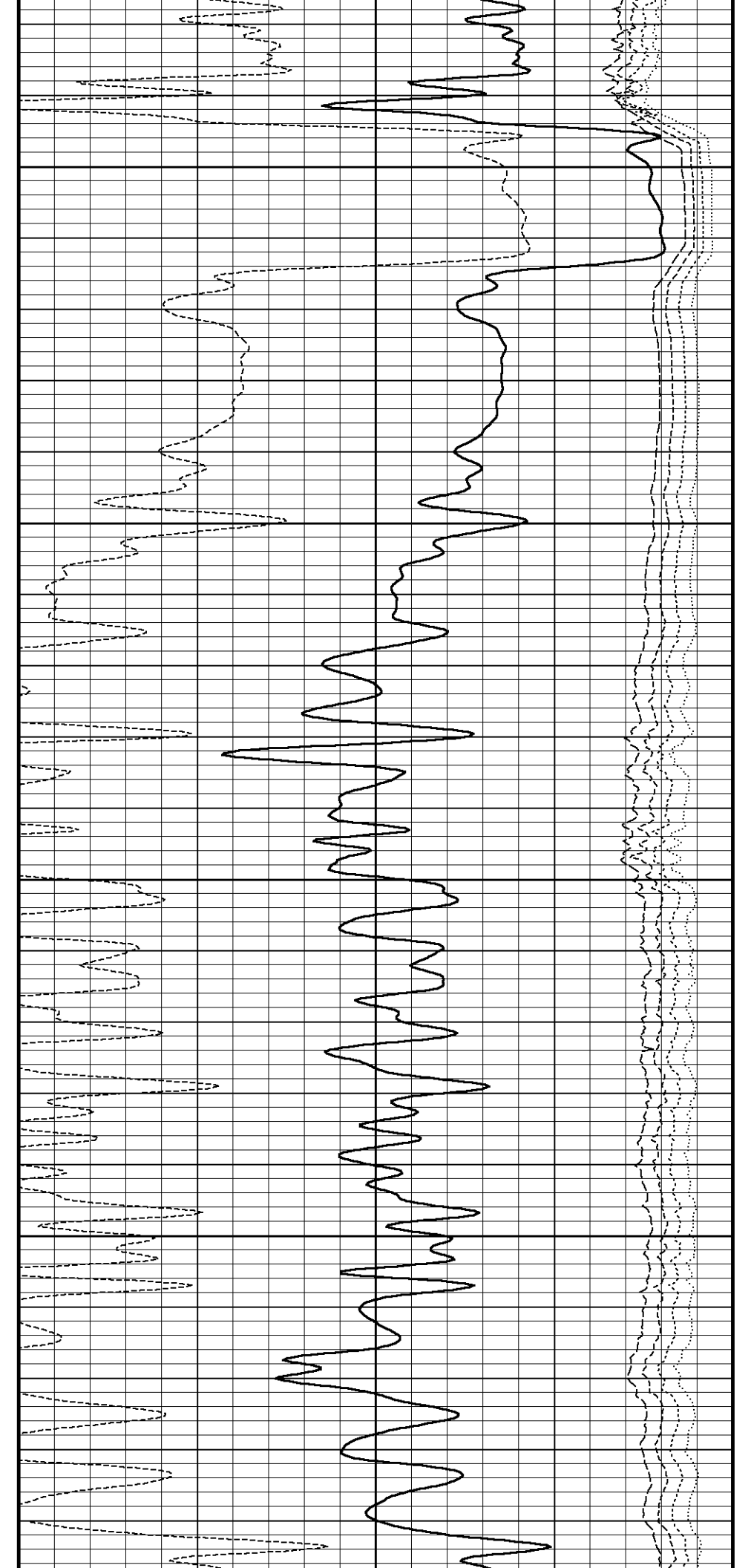
93°
1800
93°
1850
93°
1900
93°
1950
94°
2000

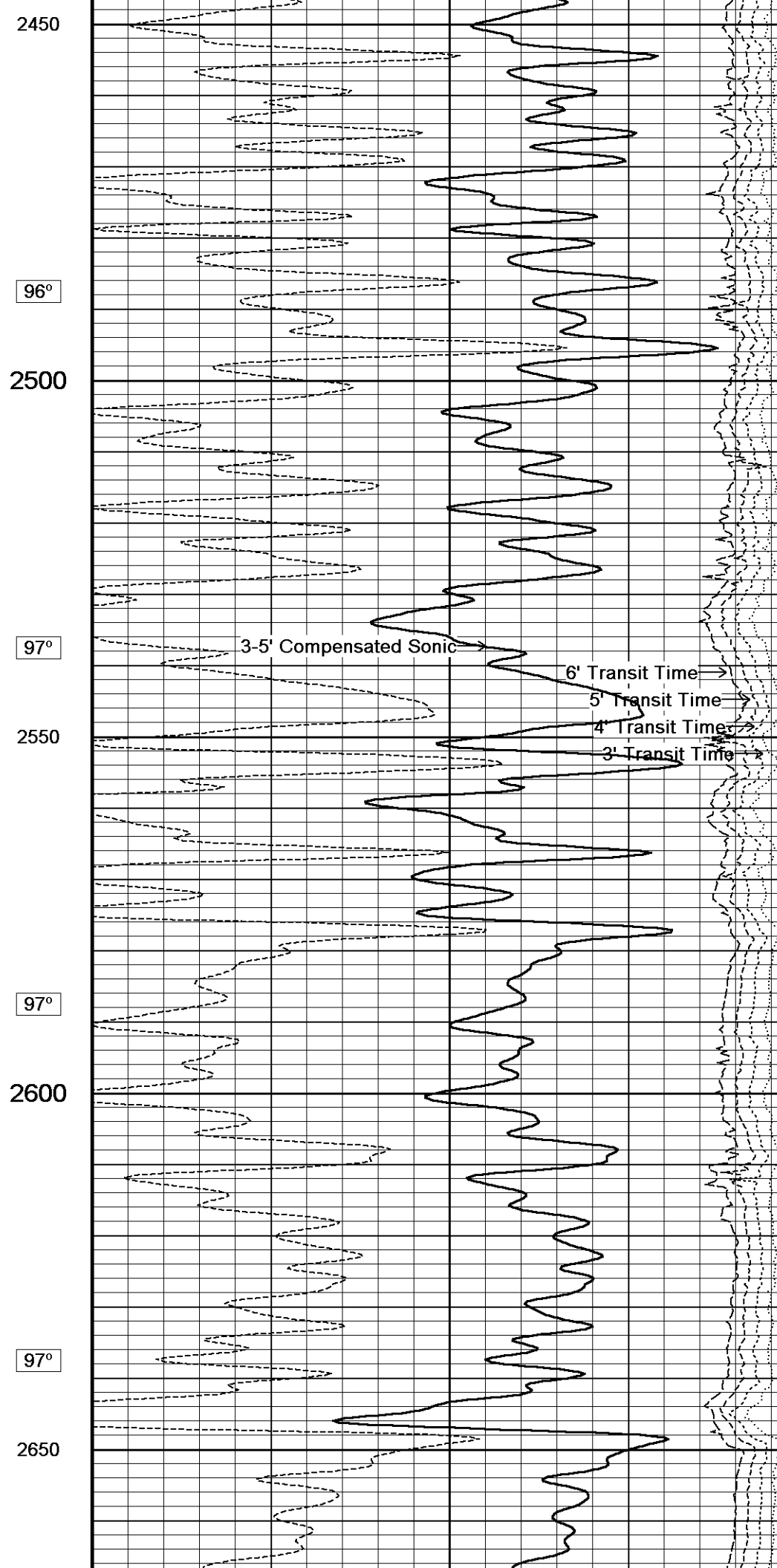
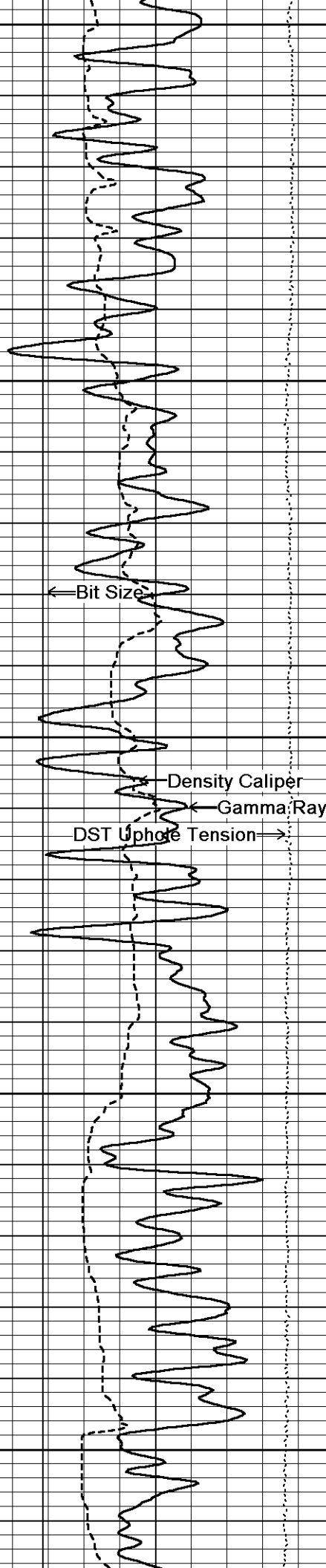






95°
2250
95°
2300
96°
2350
96°
2400
96°





2450

96°

2500

97°

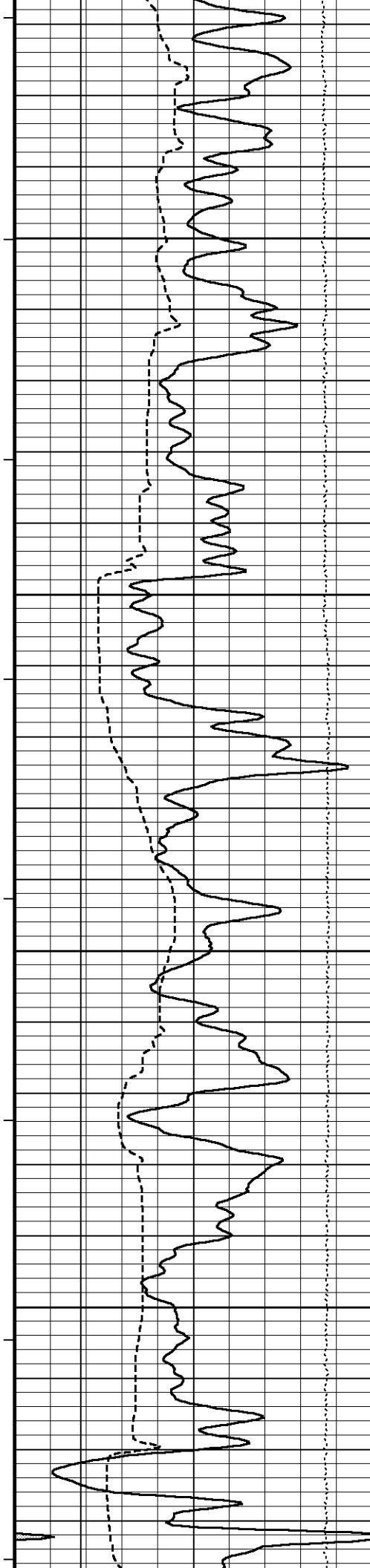
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97°

2600

97°

2650



97°

2700

97°

2750

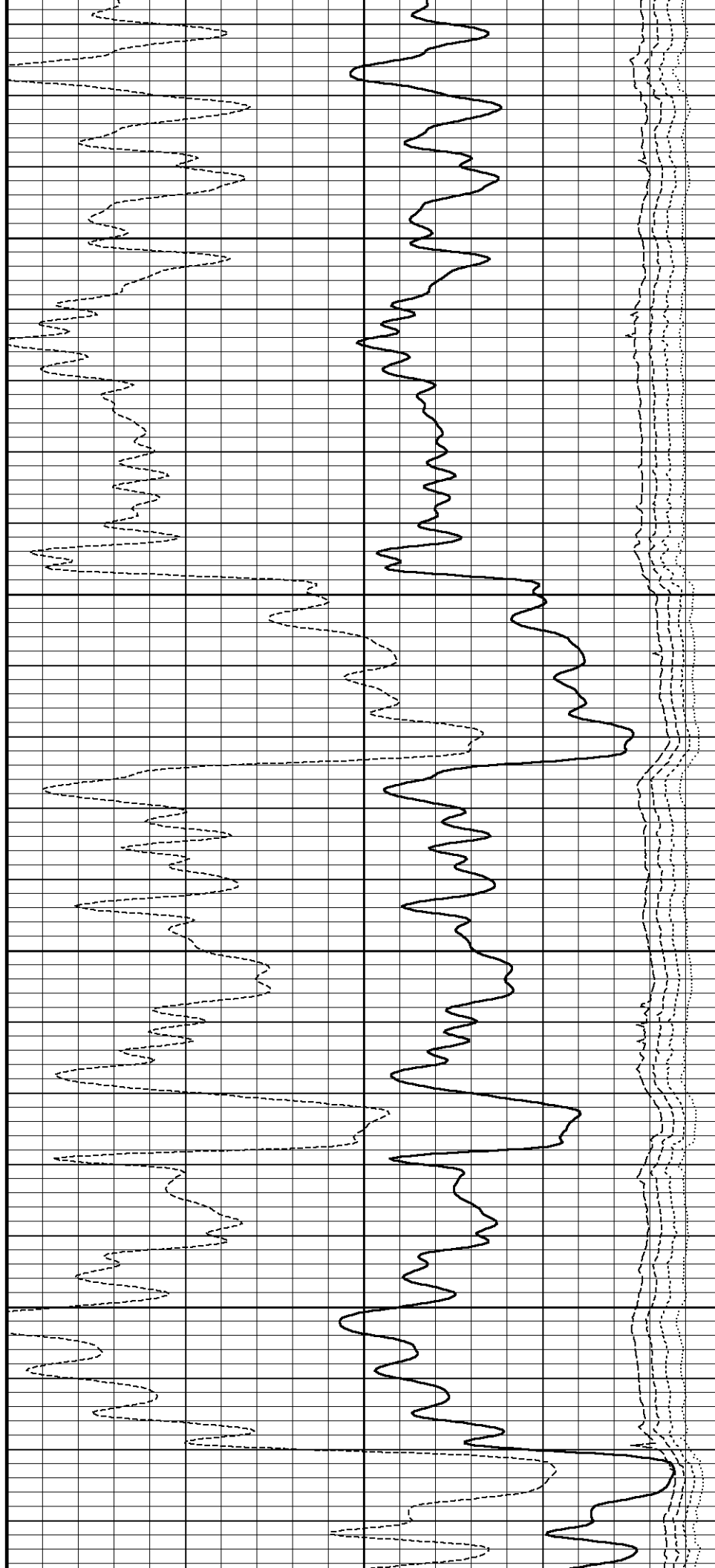
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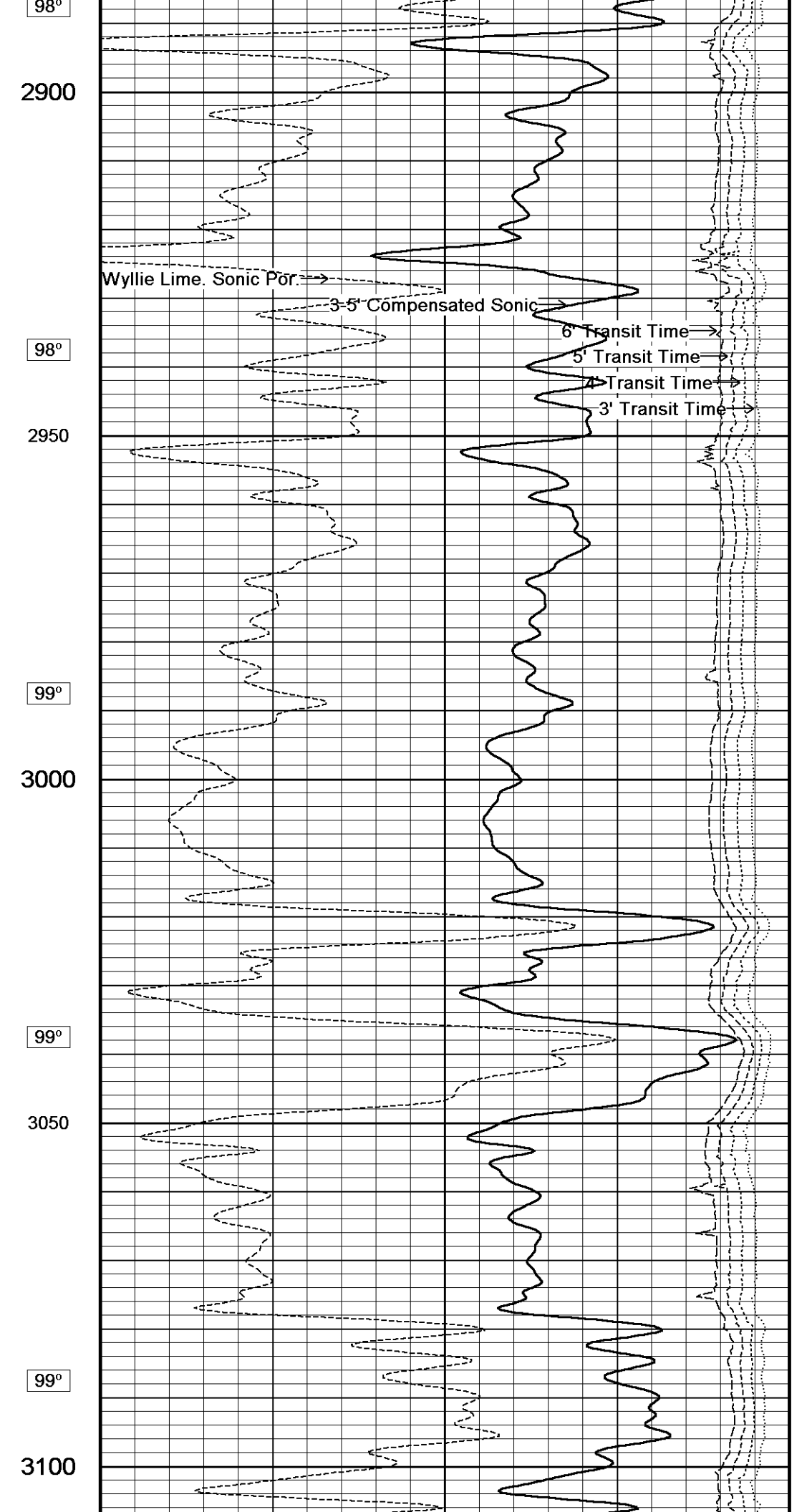
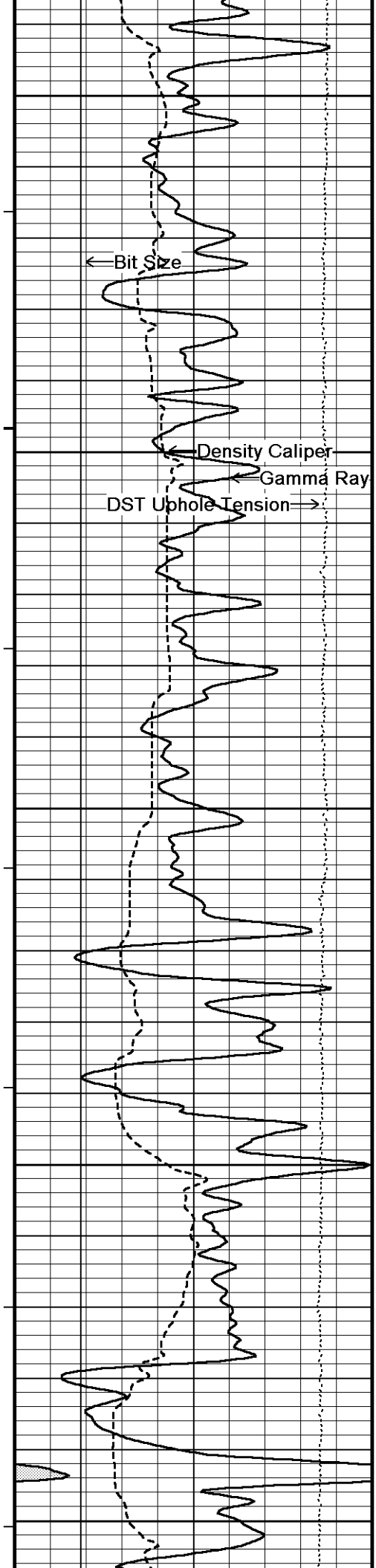
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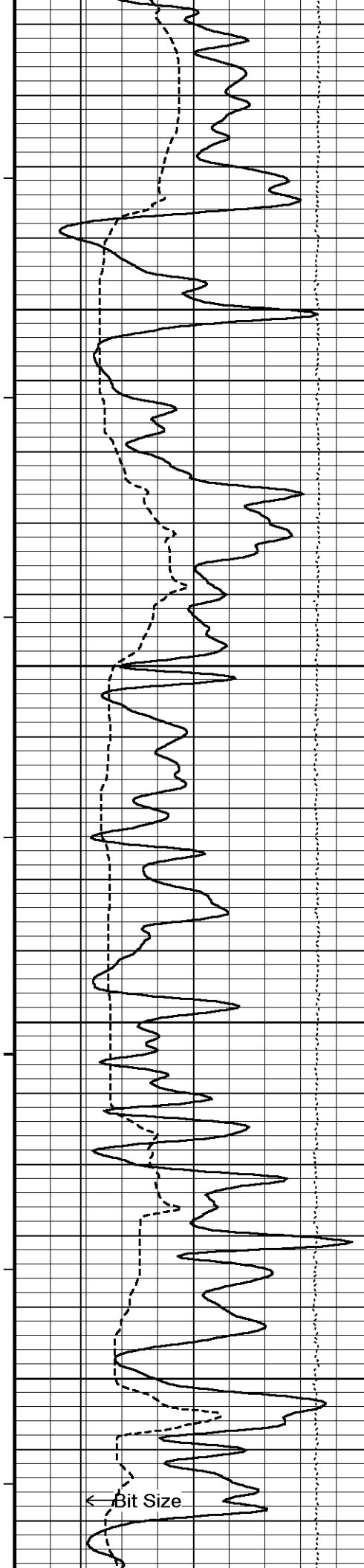
98°

2850

2900







99°

3150

100°

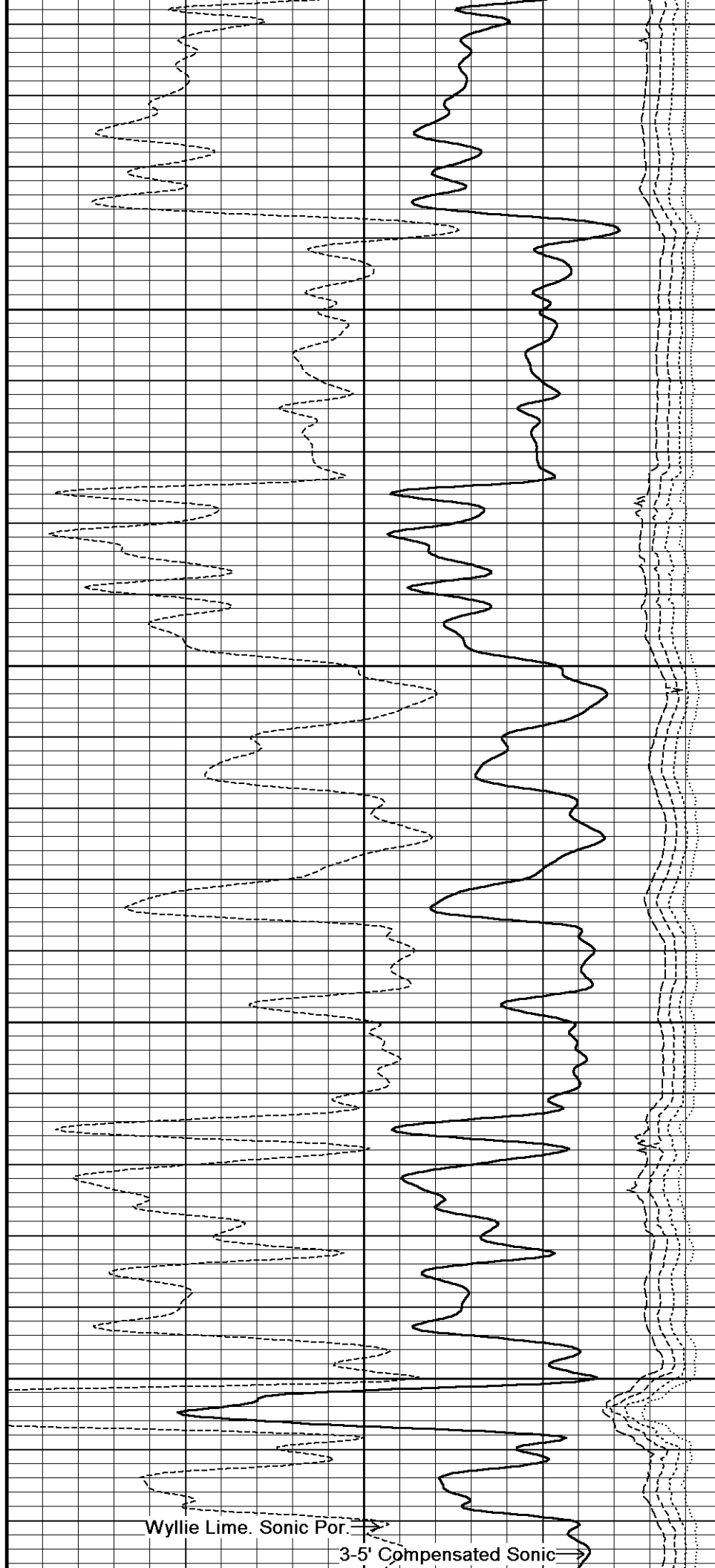
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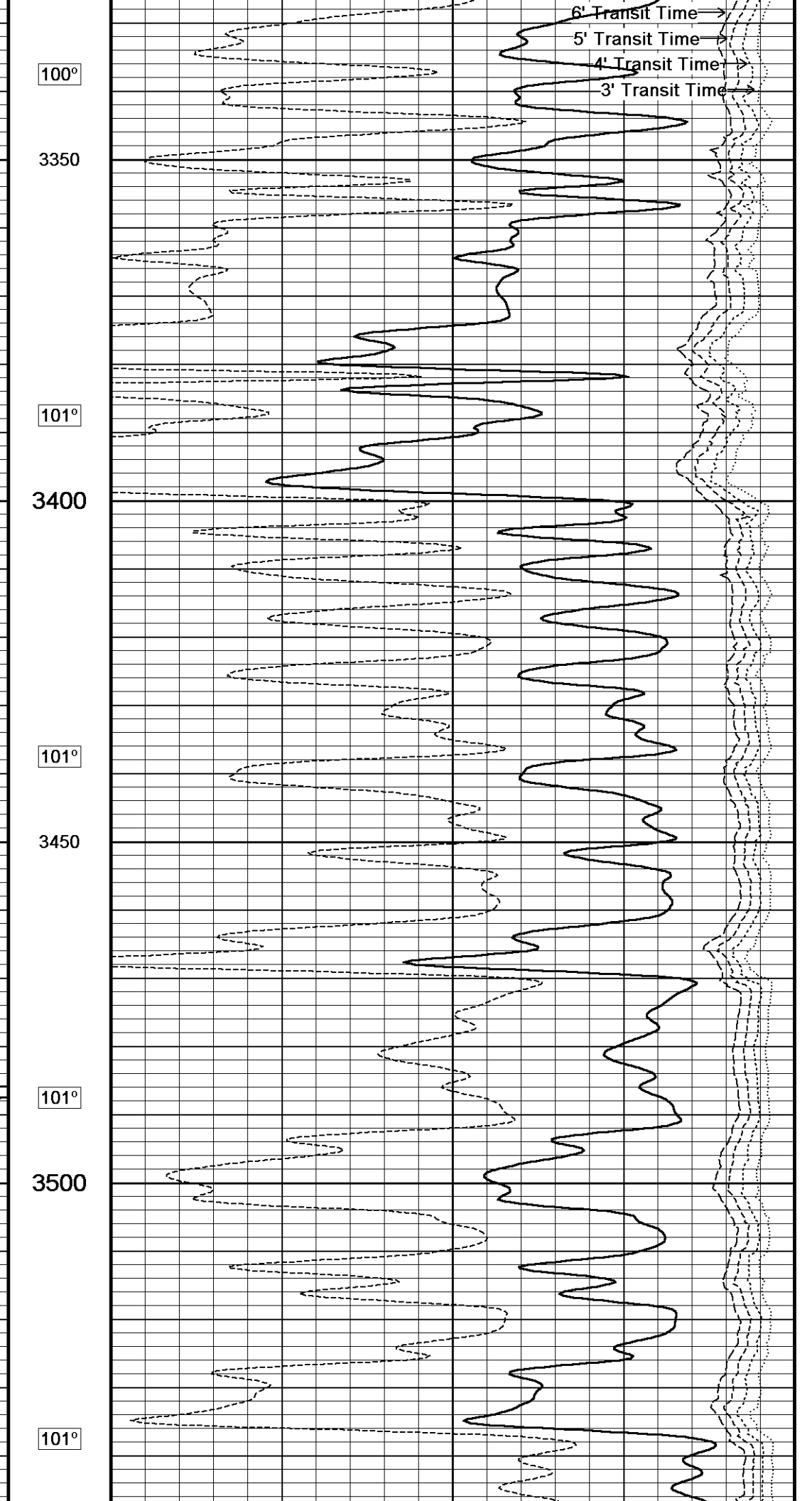
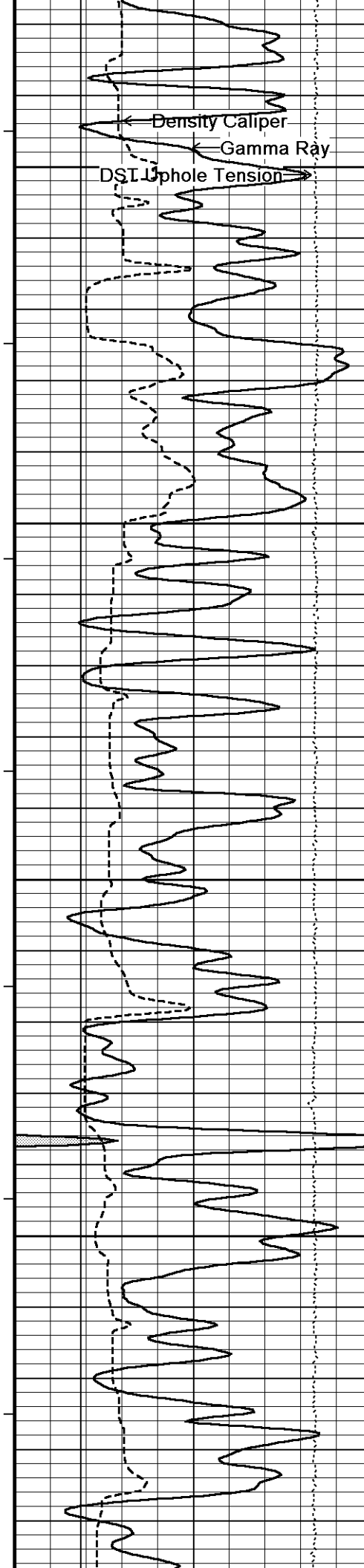
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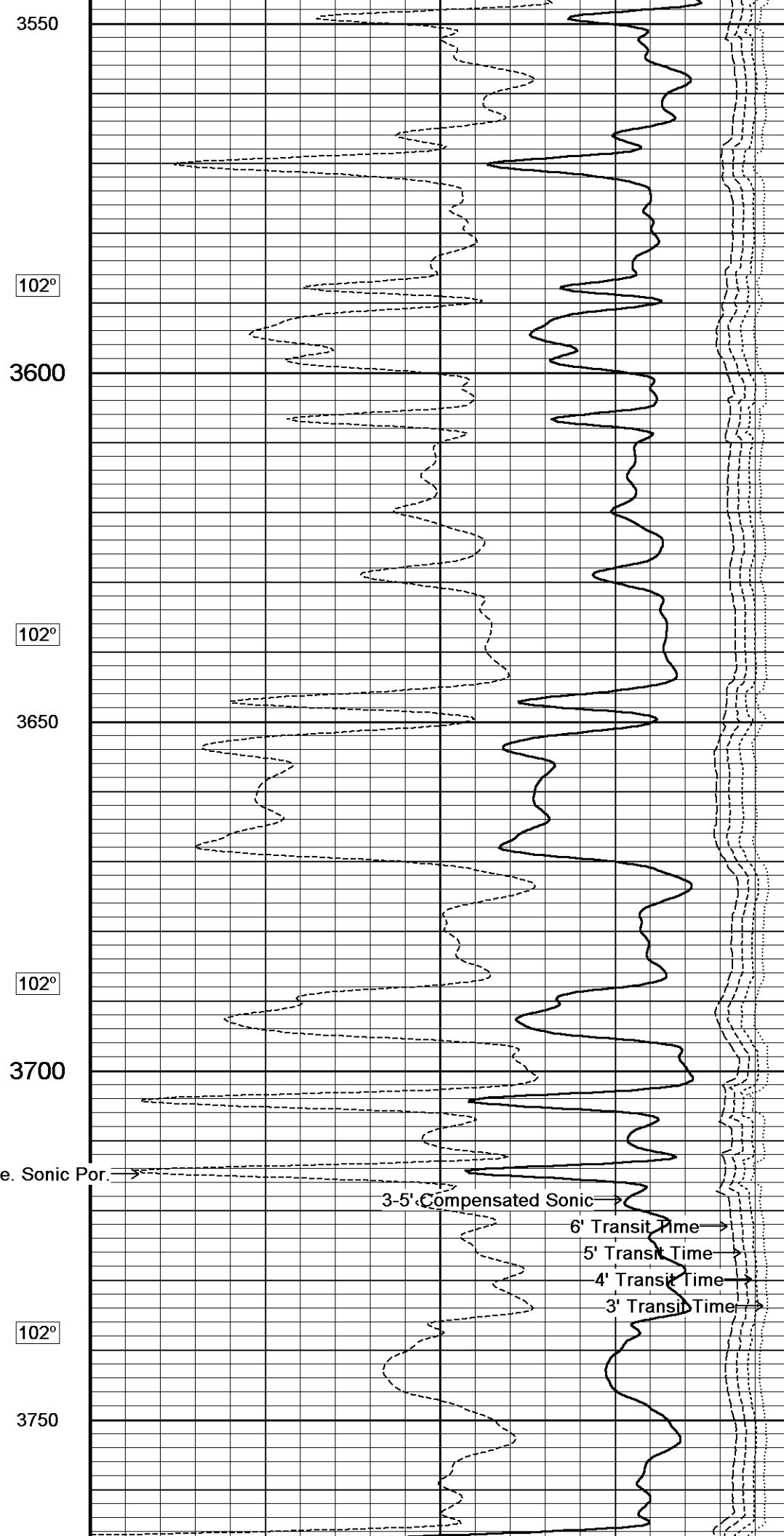
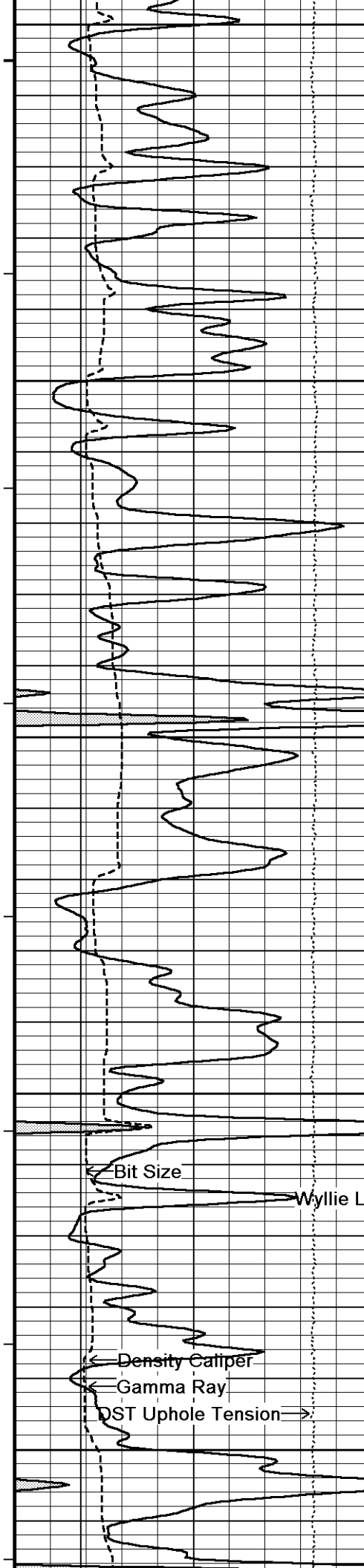
3250

100°

3300







3550

102°

3600

102°

3650

102°

3700

102°

3750

Bit Size

Wyllie Lime. Sonic Por.

3-5' Compensated Sonic

6' Transit Time

5' Transit Time

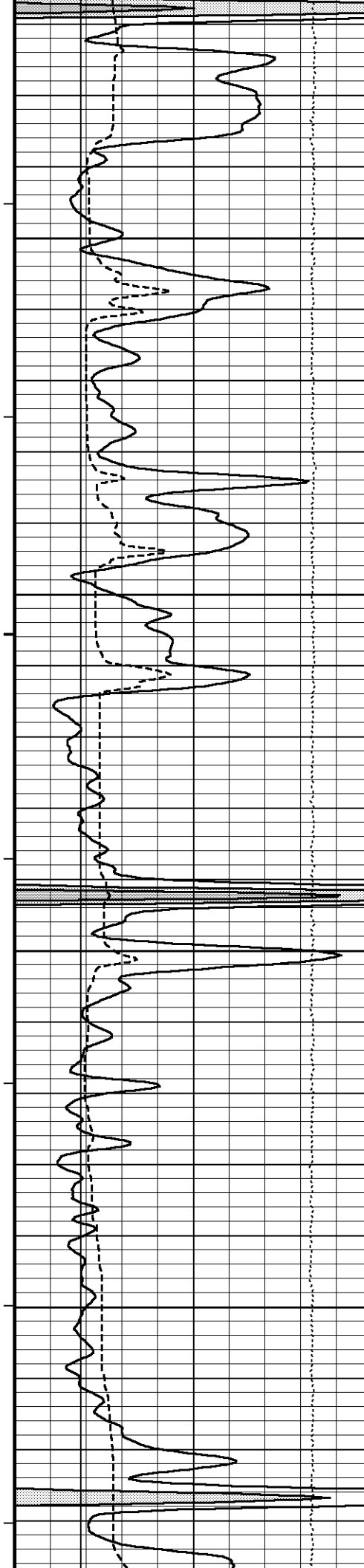
4' Transit Time

3' Transit Time

Density Caliper

Gamma Ray

DST Uphole Tension



103°

3800

103°

3850

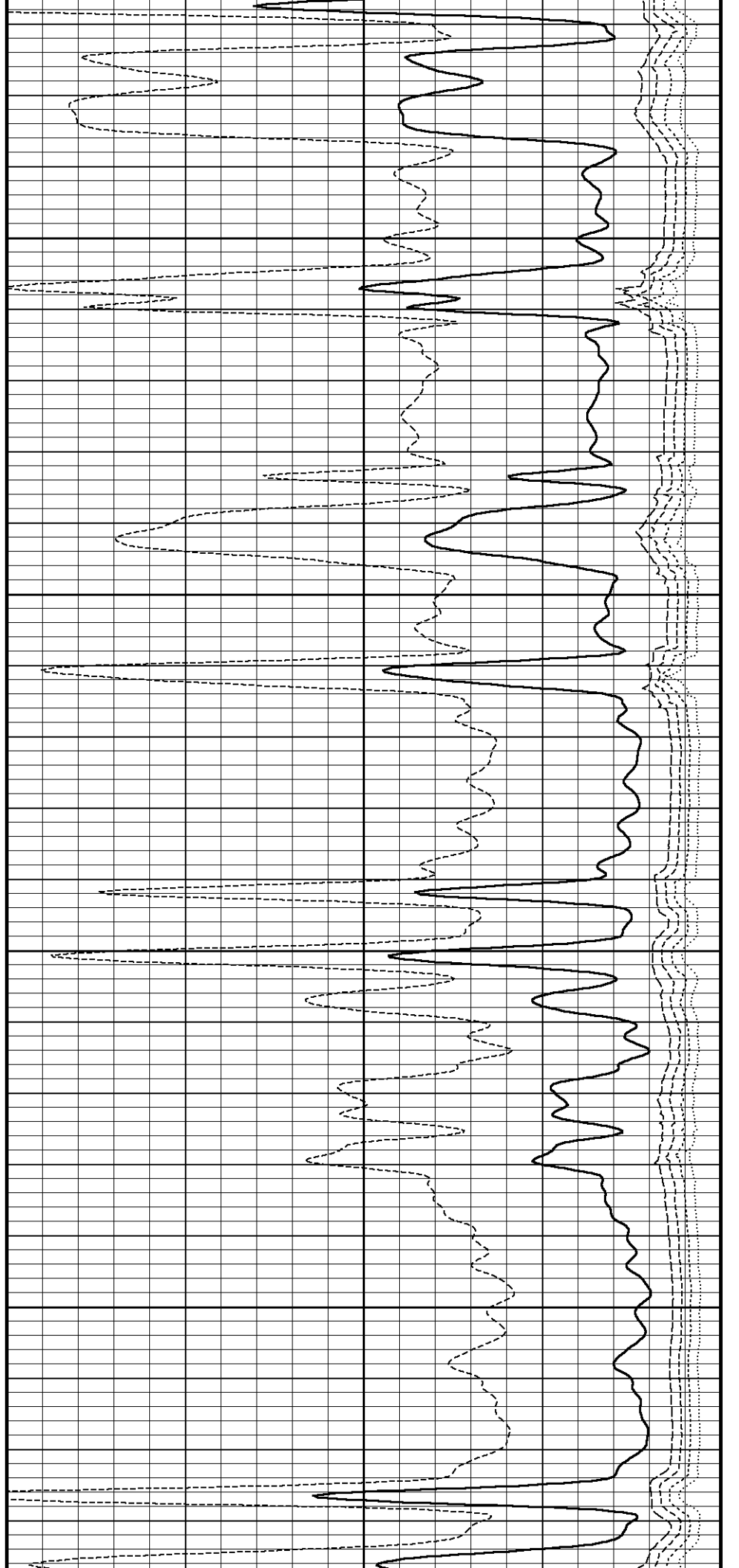
104°

3900

104°

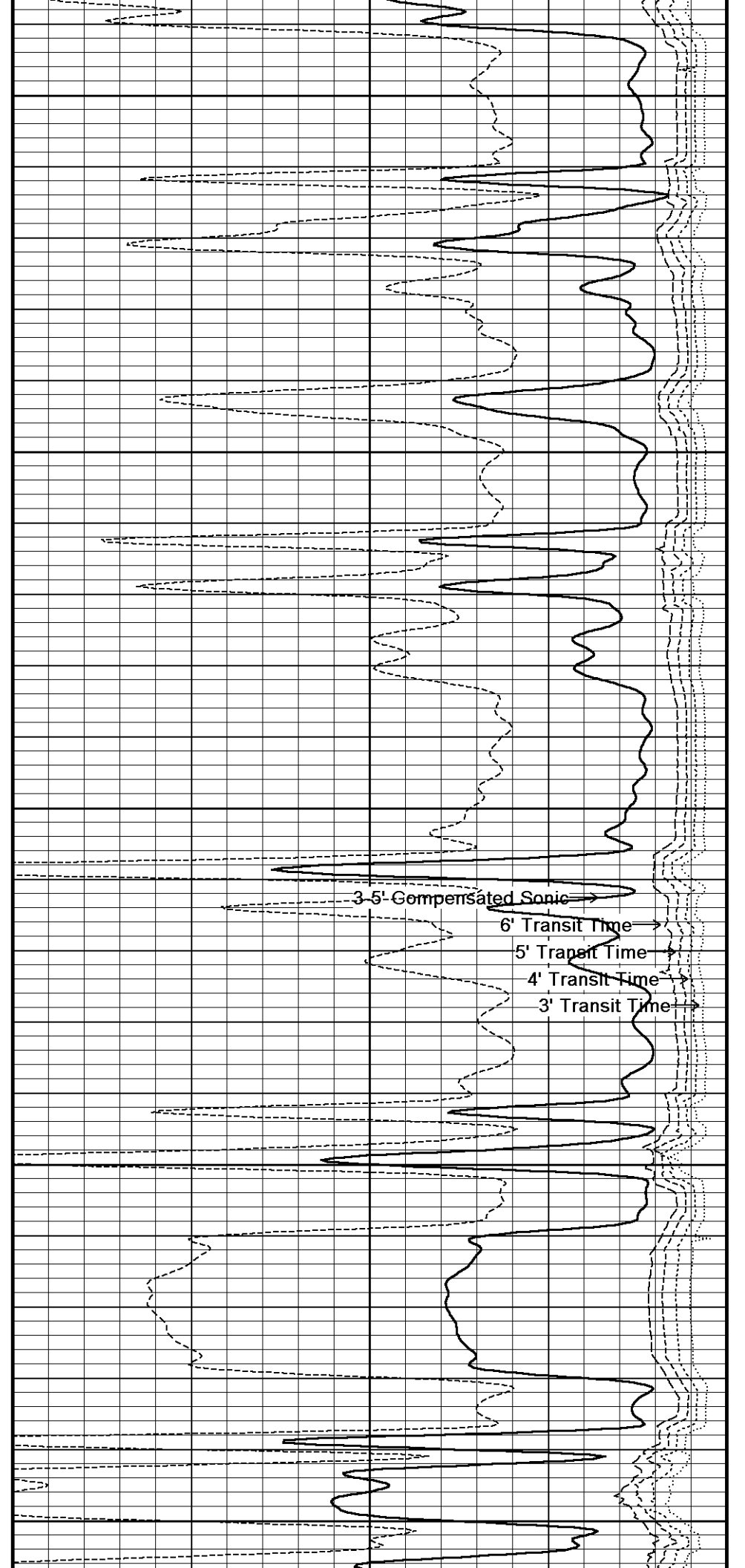
3950

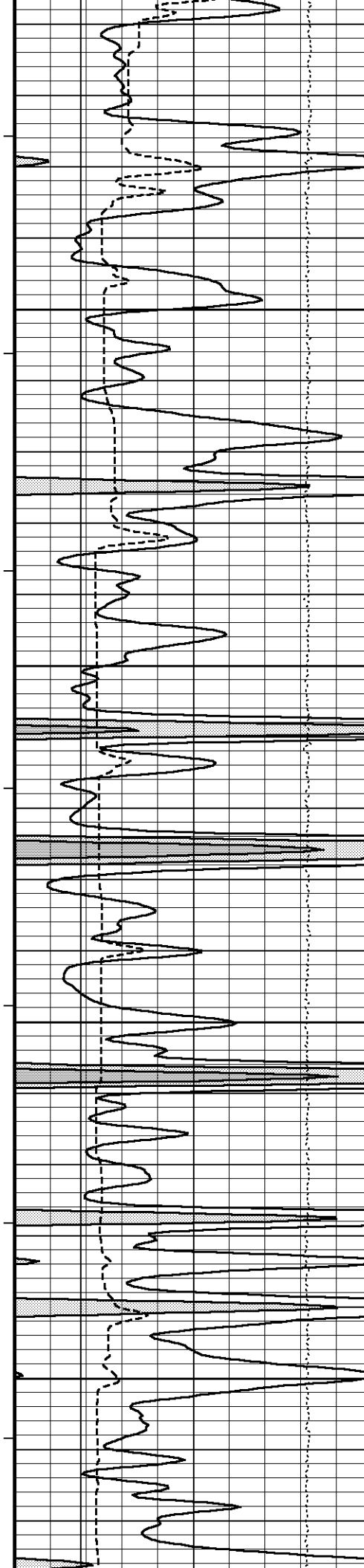
104°





104°
4000
104°
4050
105°
4100
105°
4150
105°
4200





106°

4250

107°

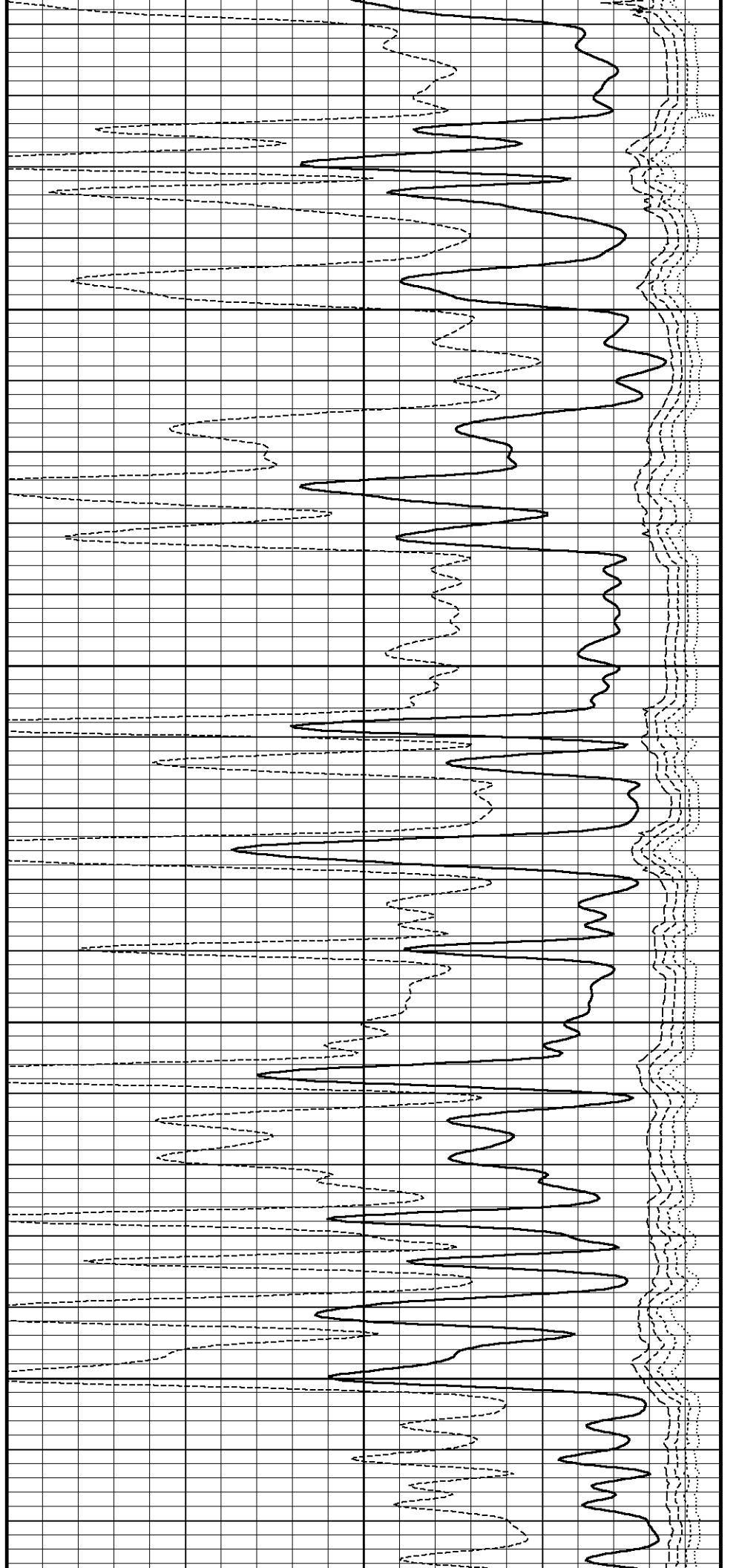
4300

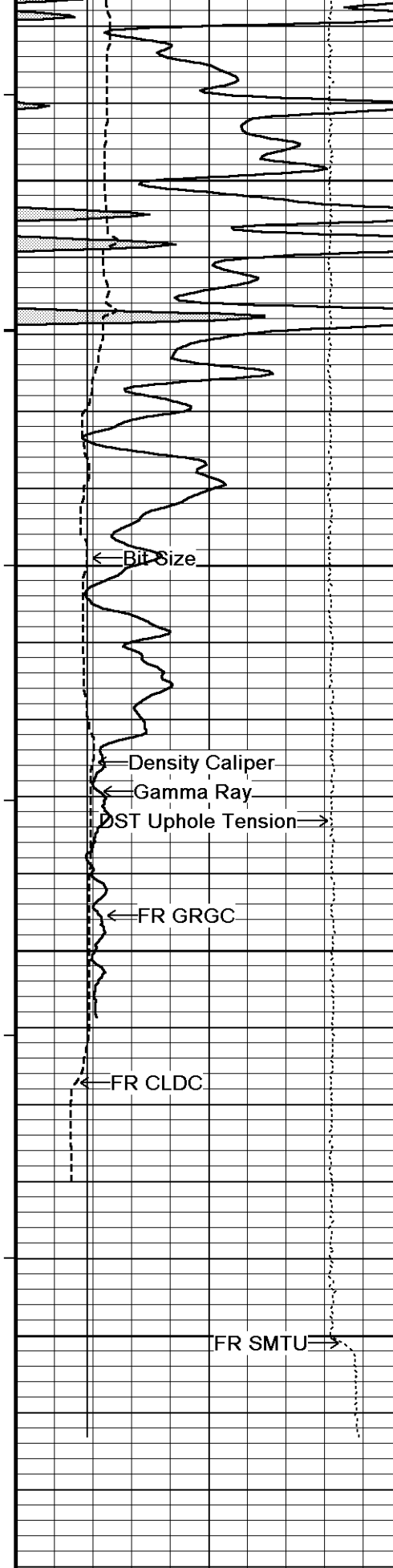
107°

4350

108°

4400





109°

4450

110°

4500

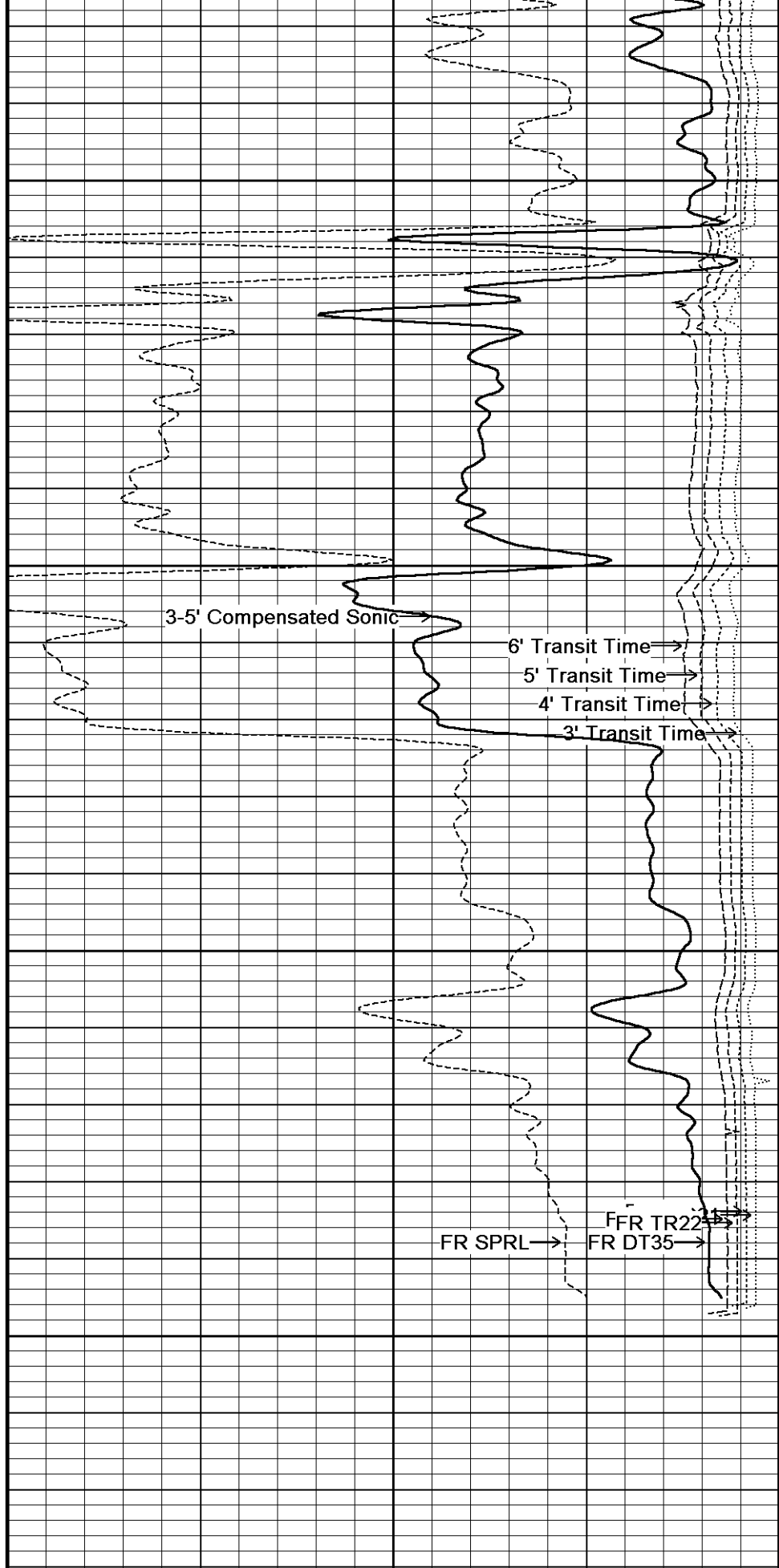
109°

4550

4600

4630

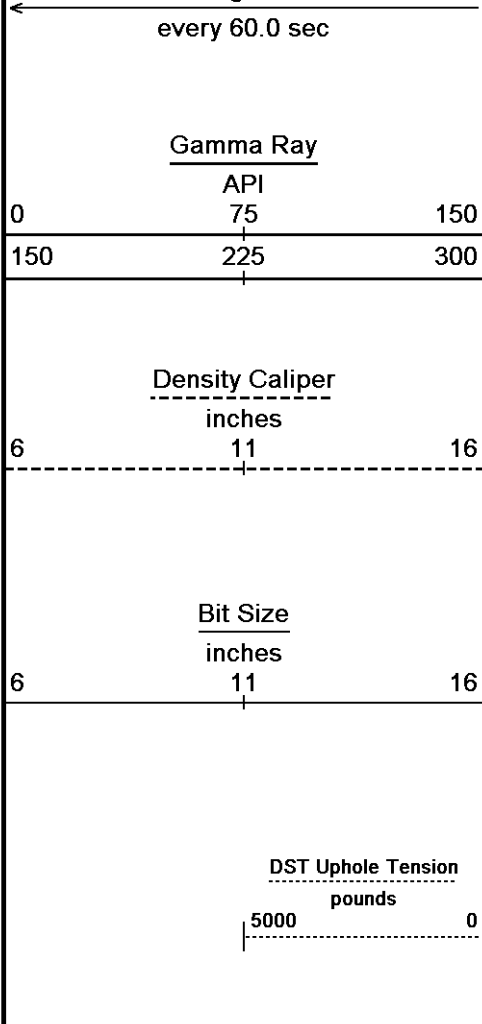
Depth In Feet



Timing Marks

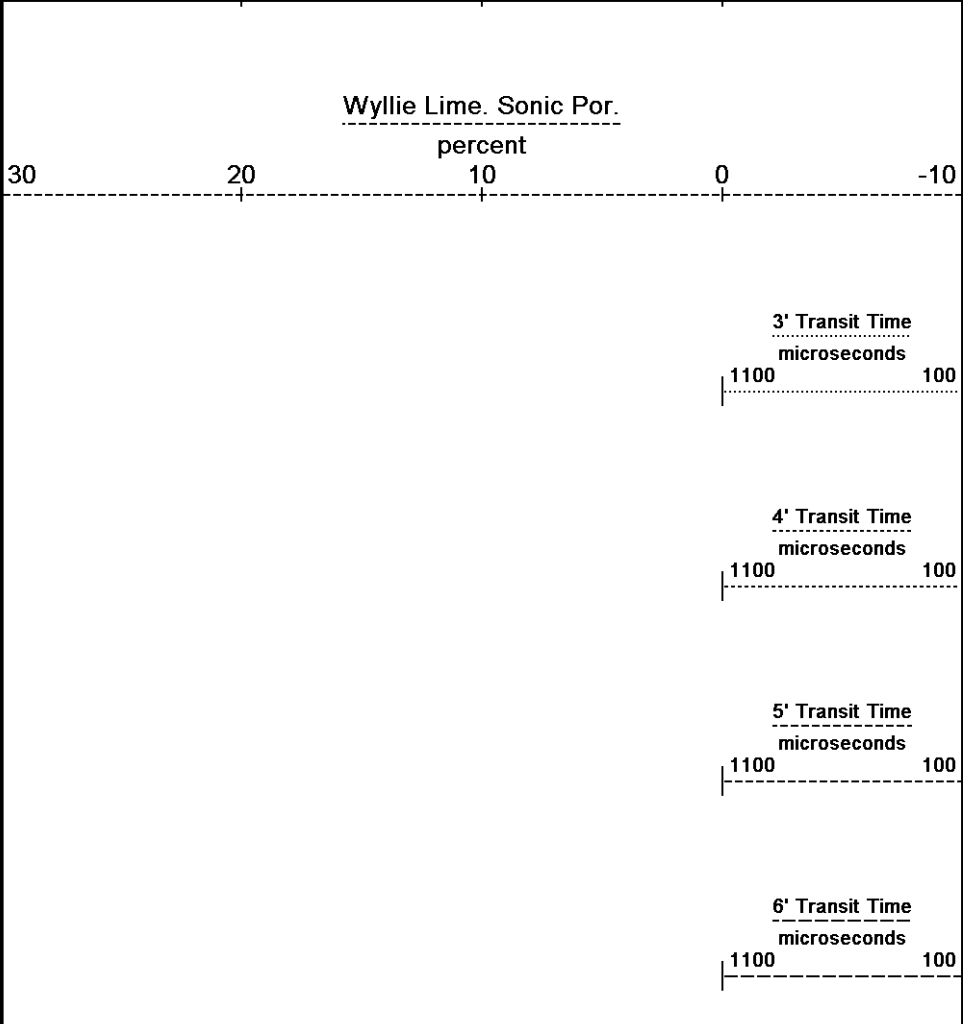
3-5' Compensated Sonic
microsec/foot

140 115 90 65 40



Borehole
Temp in
deg F

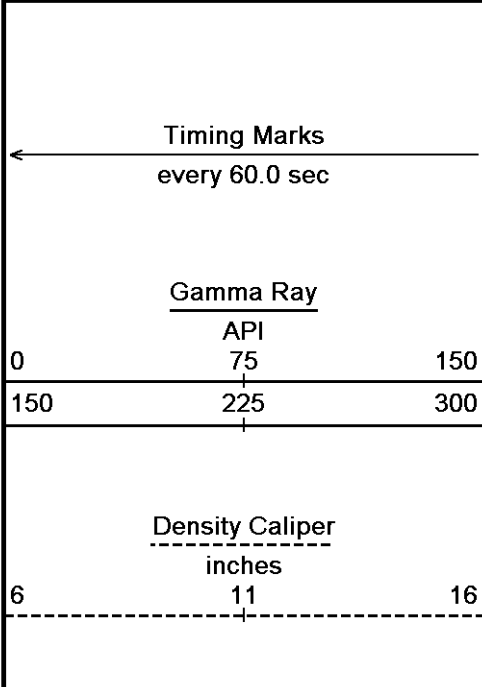
Replay
Scale
1:240



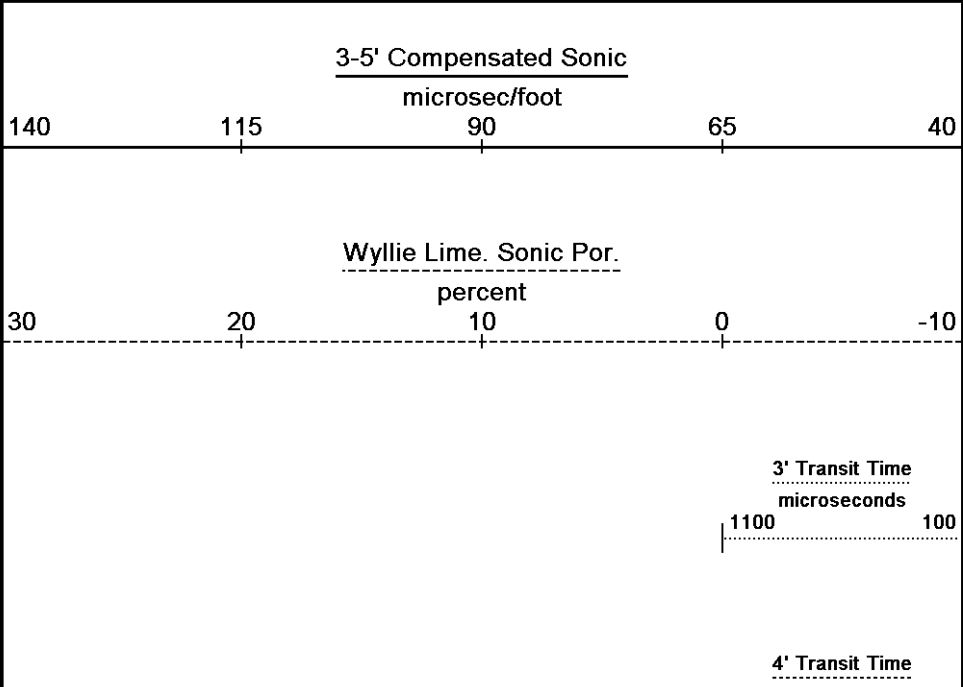
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 28-NOV-2012 05:49
 Filename: C:\Minimus 13.04.8492\Data\Shakespeare O...\Shakespeare Oil Co. Zanobia #1-21_Main.dta Recorded on 28-NOV-2012 02:51
 System Versions: Logged with 13.04.8492 Processed with 13.04.8492 Plotted with 13.04.8492



Depth Based Data - Maximum Sampling Increment 2.5cm Plotted on 28-NOV-2012 05:49
 Filename: C:\Minimus 13.04.8492\Data\Shakespeare Oil...\Shakespeare Oil Co. Zanobia #1-21_001.dta Recorded on 28-NOV-2012 01:41
 System Versions: Logged with 13.04.8492 Plotted with 13.04.8492



Depth
in
Feet



Bit Size
inches

6 11 16

DST Uphole Tension
pounds

5000 0

Replay
Scale
1:120

5' Transit Time
microseconds

1100 100

6' Transit Time
microseconds

1100 100

4100

104°

4150

Wyllie Lime. Sonic Por. →

3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

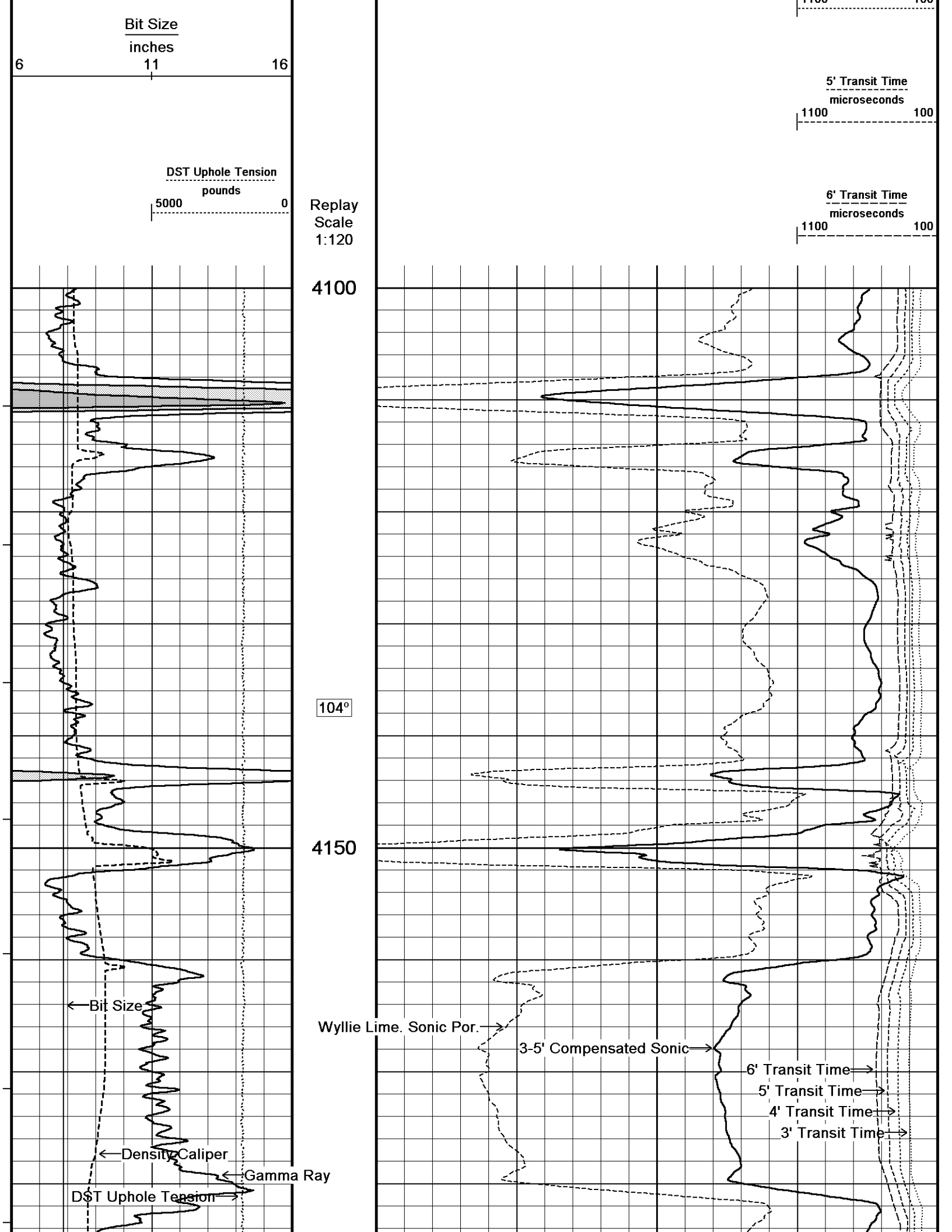
3' Transit Time →

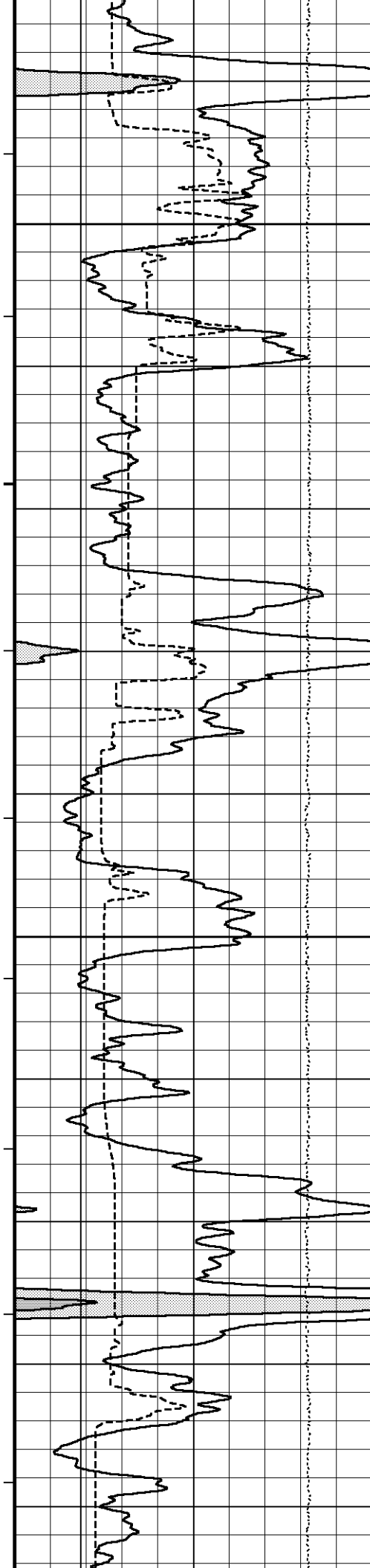
← Bit Size

← Density Caliper

← Gamma Ray

DST Uphole Tension →





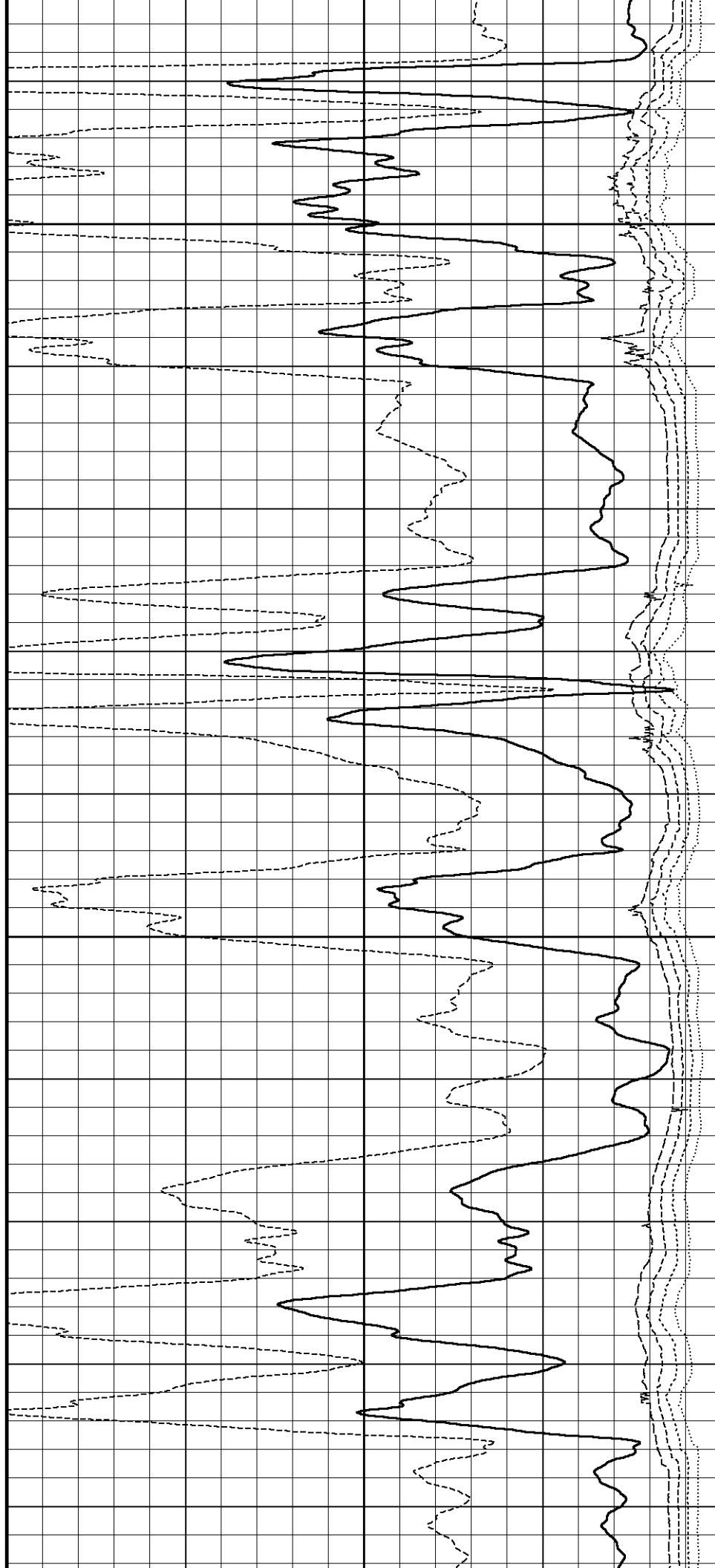
105°

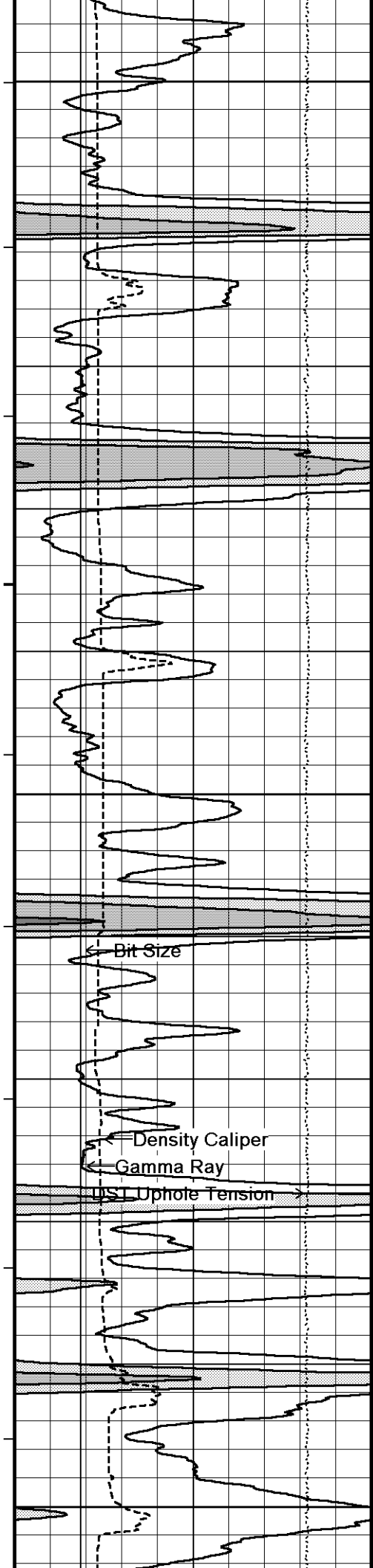
4200

105°

4250

106°





4300

106°

4350

← Bit Size

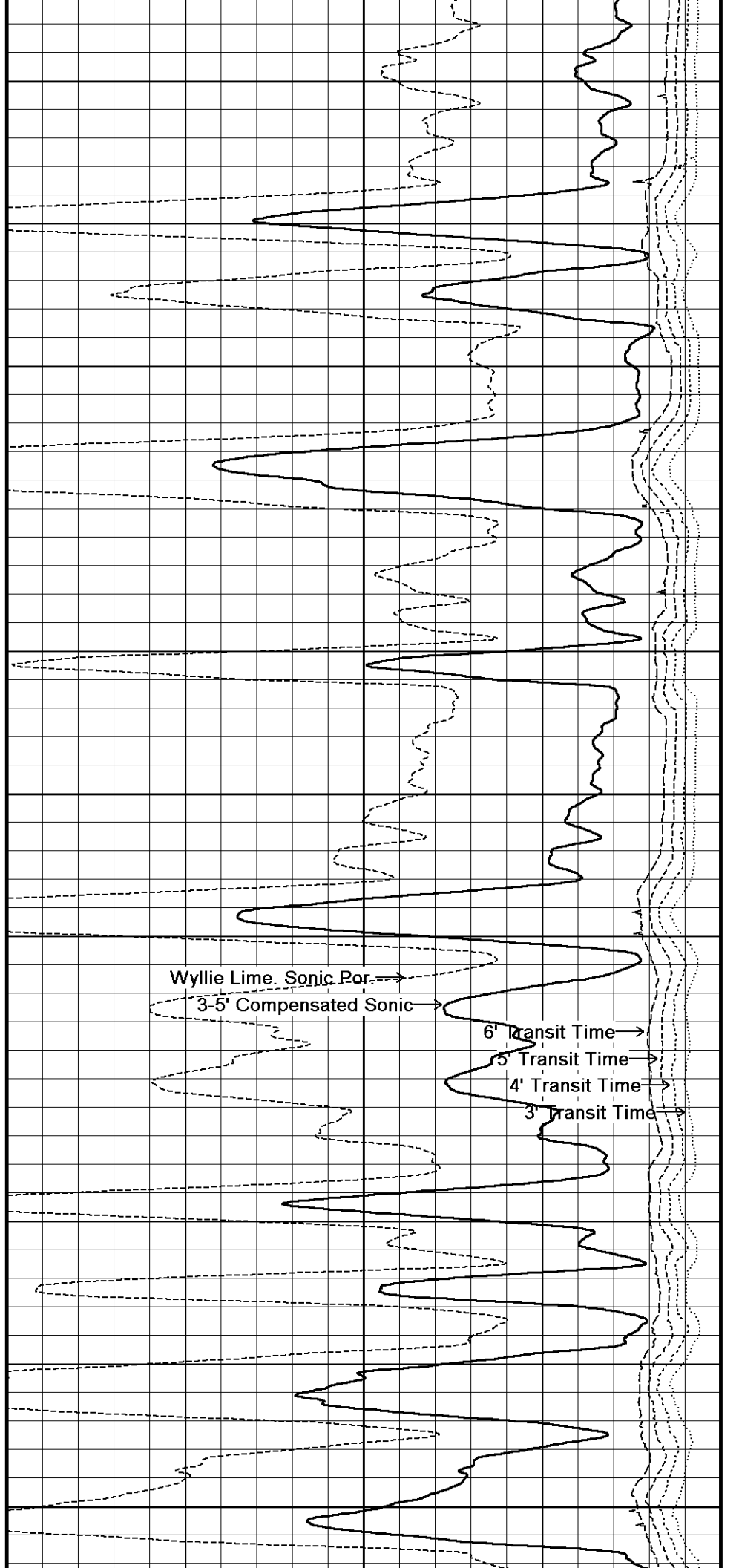
← Density Caliper

← Gamma Ray

← DST Upbore Tension

106°

4400



Wyllie Lime Sonic Por. →

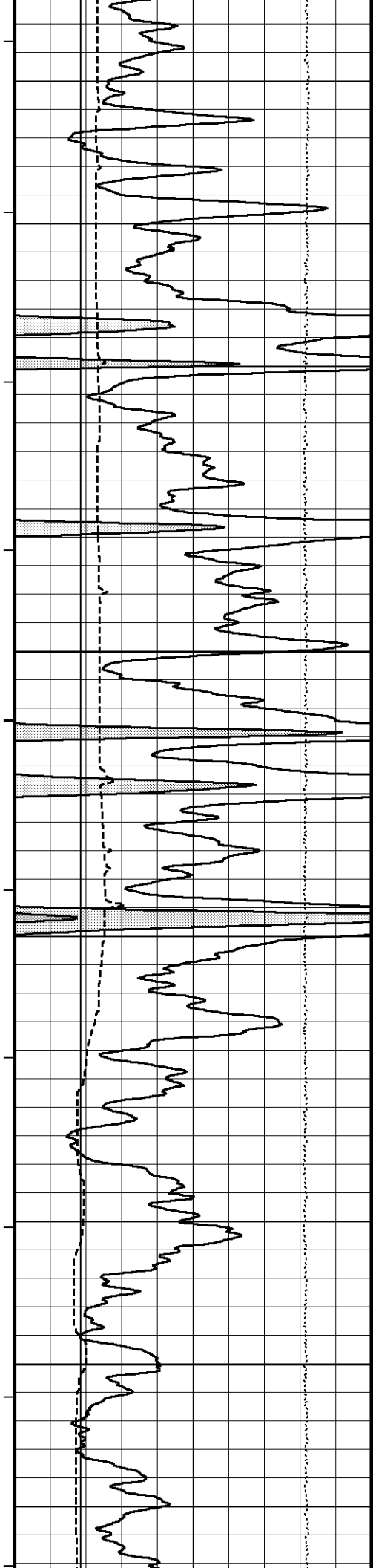
3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →

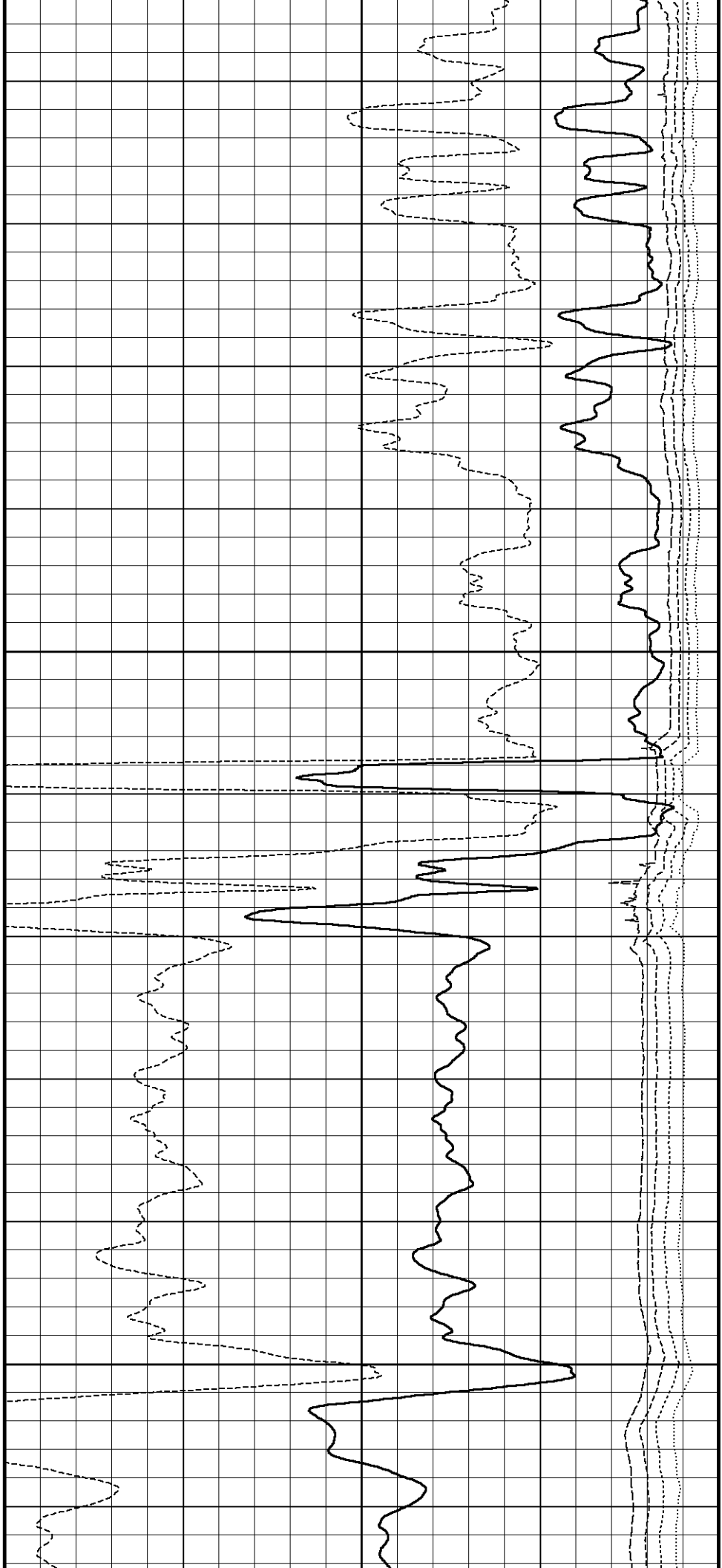


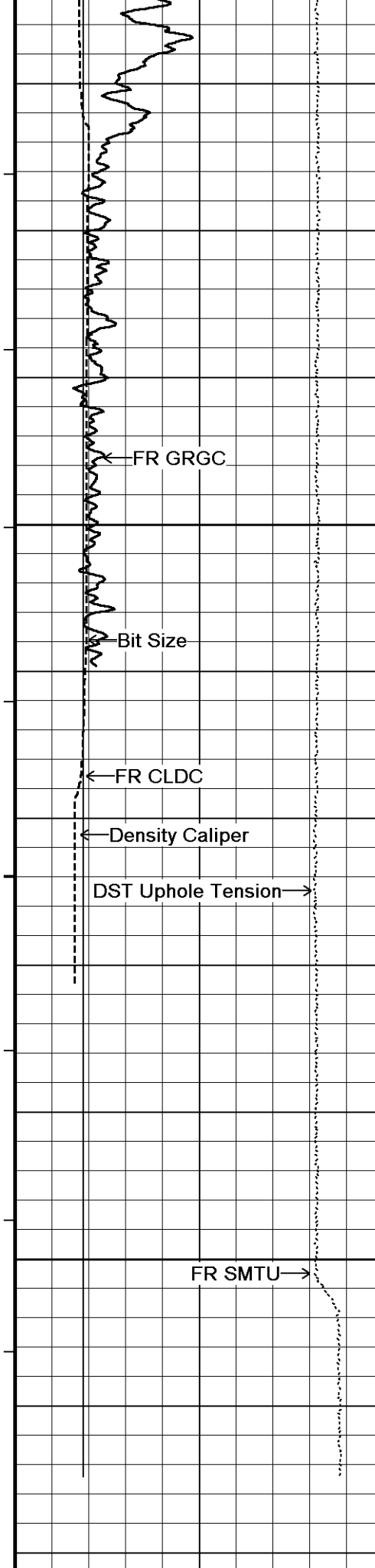
107°

4450

107°

4500





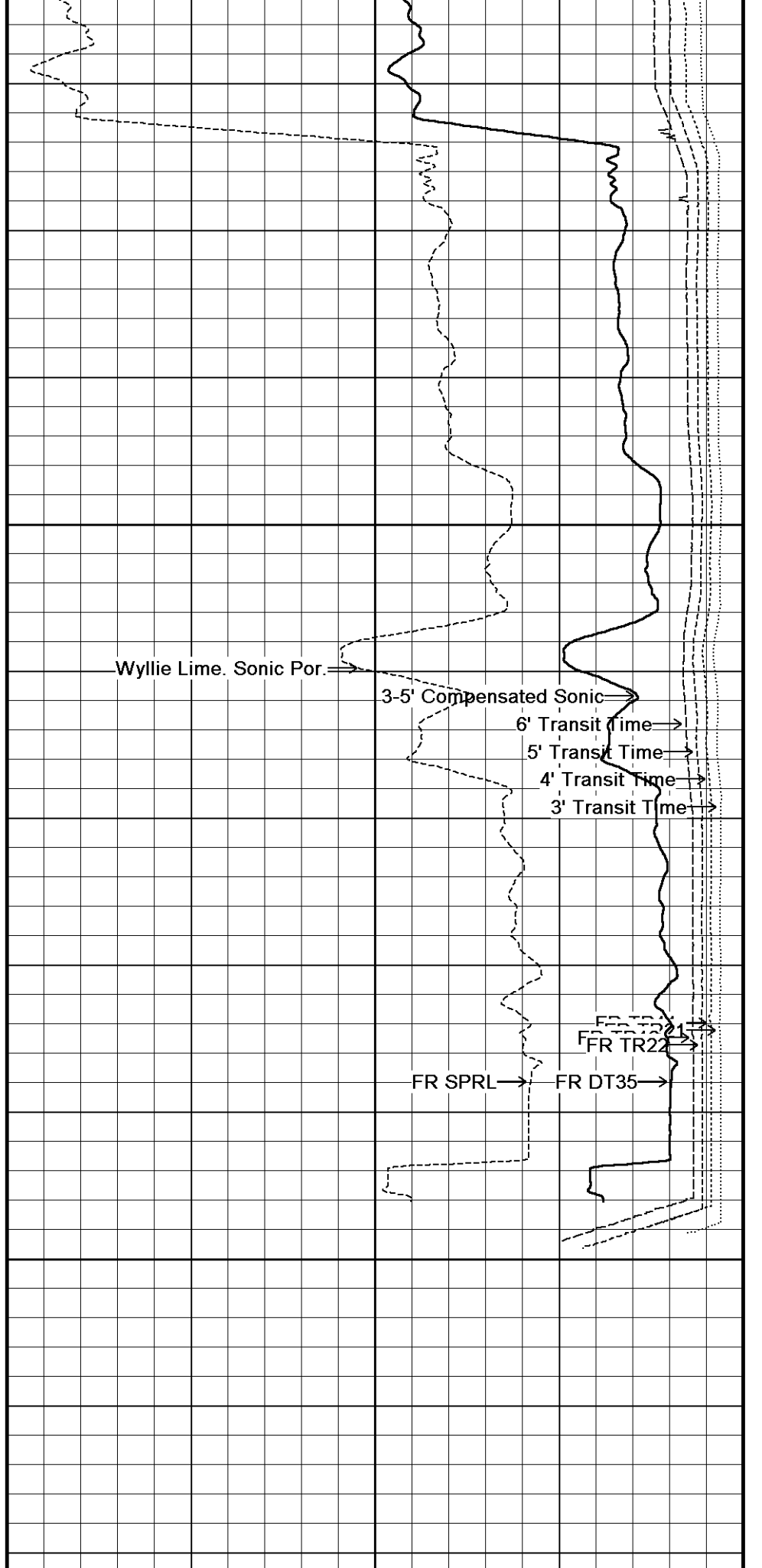
106°

4550

4600

4620

Depth in



Wyllie Lime. Sonic Por.

3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

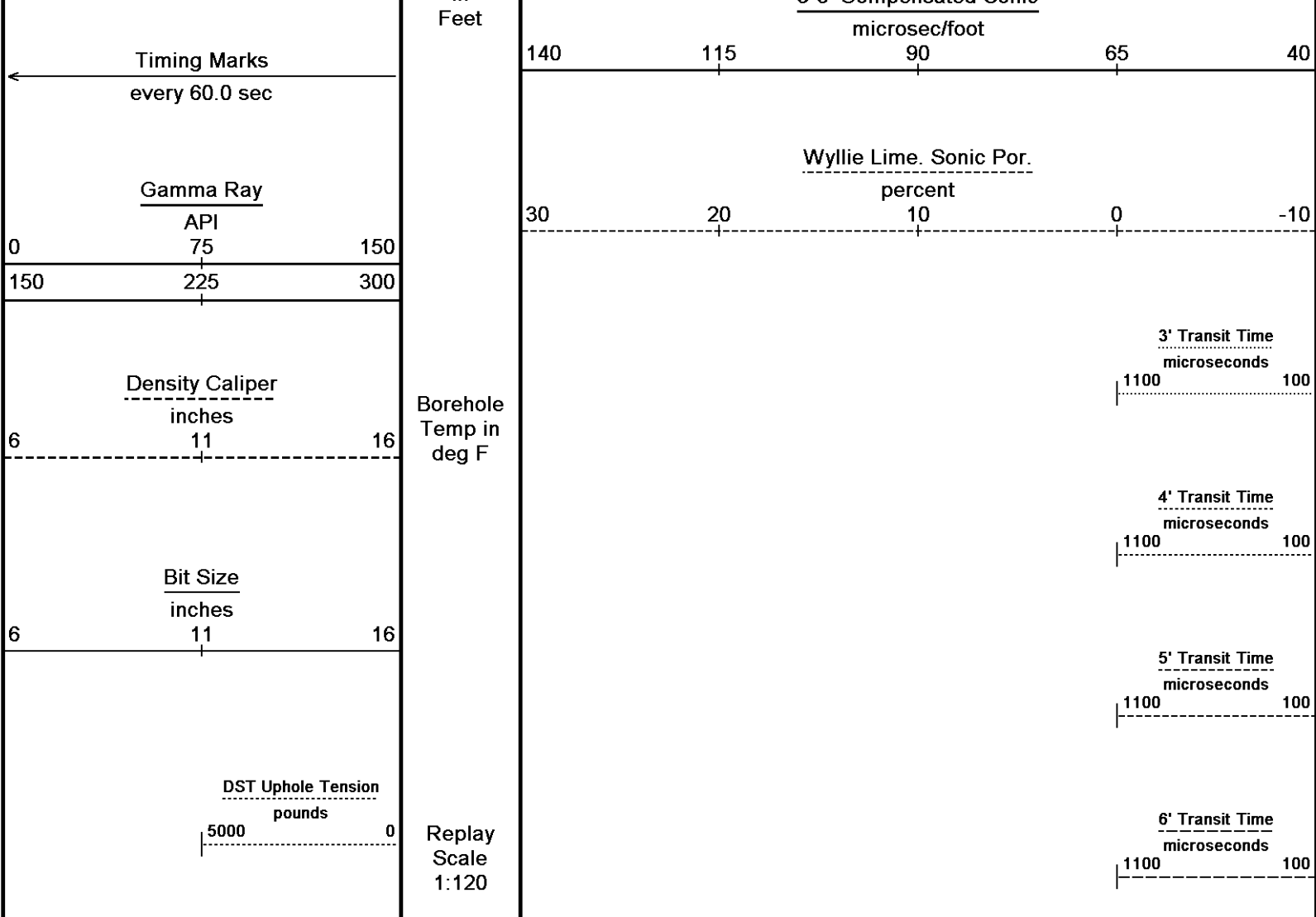
3' Transit Time

FR SPRL

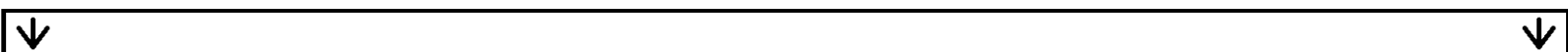
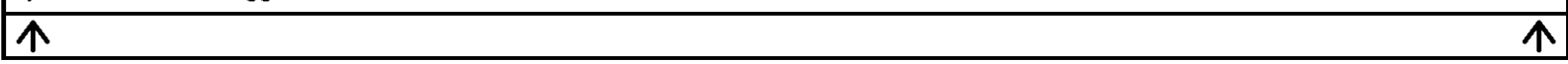
FR DT35

FR TR22

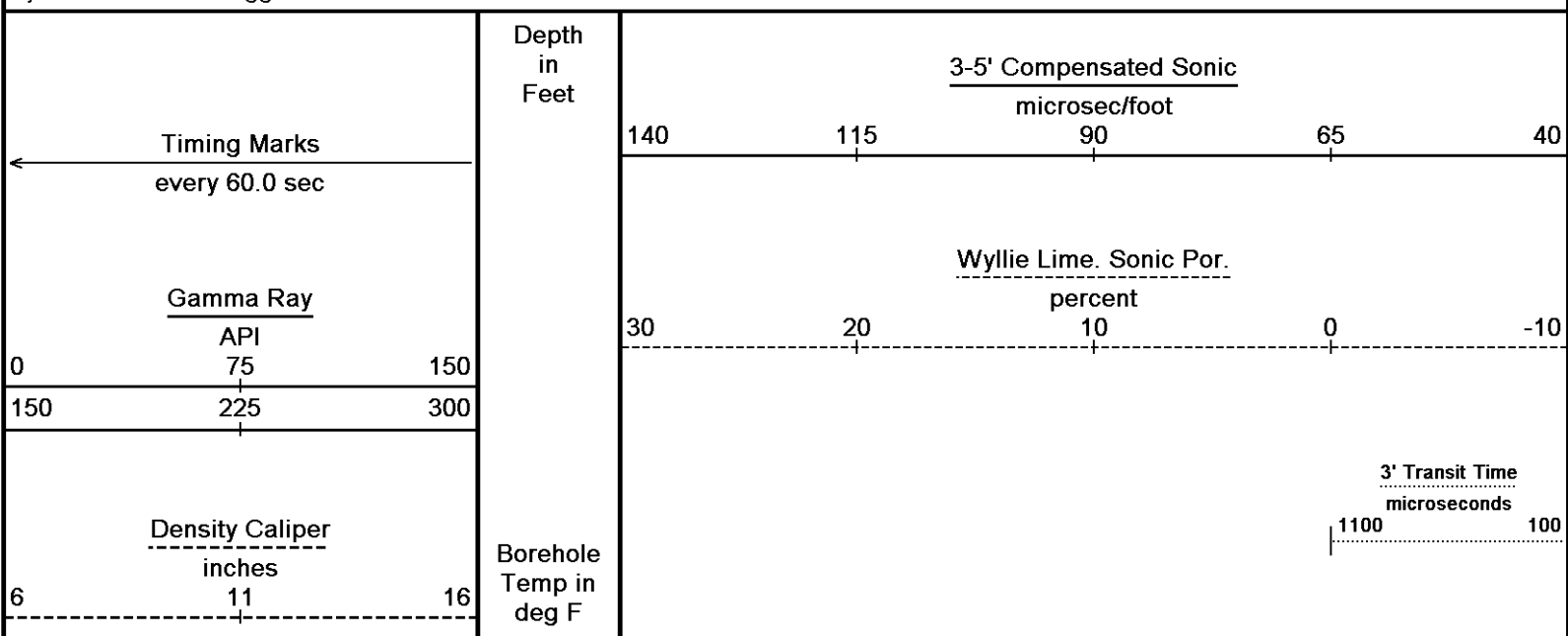
3-5' Compensated Sonic



Depth Based Data - Maximum Sampling Increment 2.5cm Plotted on 28-NOV-2012 05:49
 Filename: C:\Minimus 13.04.8492\Data\Shakespeare Oil...\Shakespeare Oil Co. Zanobia #1-21_001.dta Recorded on 28-NOV-2012 01:41
 System Versions: Logged with 13.04.8492 Plotted with 13.04.8492



Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 28-NOV-2012 05:49
 Filename: C:\Minimus 13.04.8492\Data\Shakespeare Oil...\Shakespeare Oil Co. Zanobia #1-21_002.dta Recorded on 28-NOV-2012 01:41
 System Versions: Logged with 13.04.8492 Processed with 13.04.8492 Plotted with 13.04.8492



Bit Size
inches
6 11 16

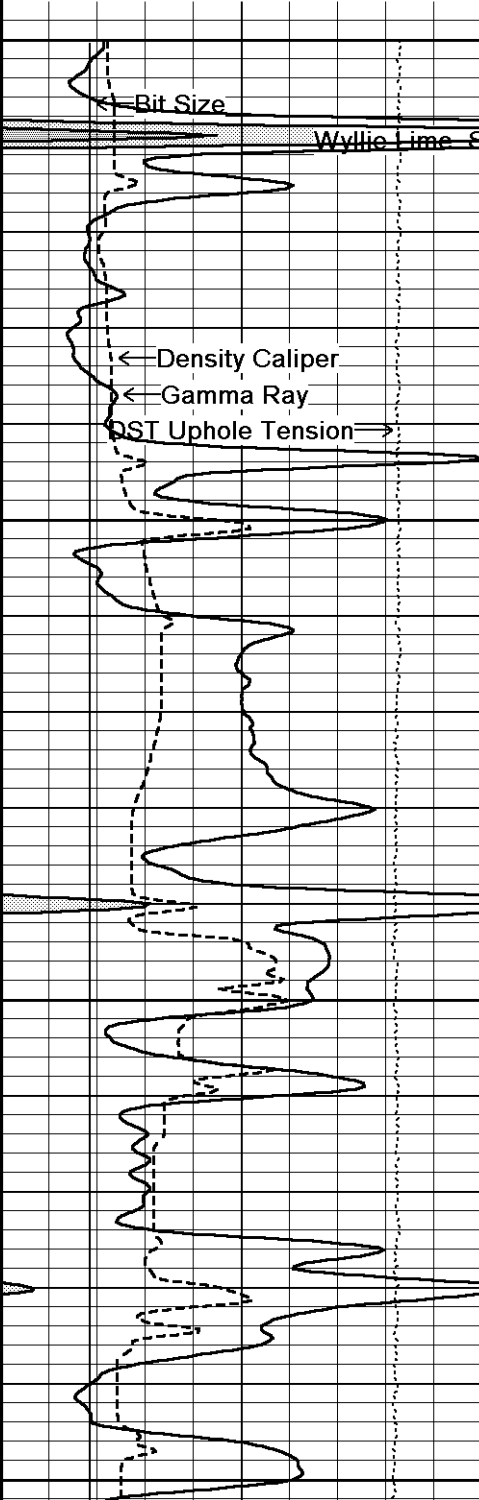
DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

4' Transit Time
microseconds
1100 100

5' Transit Time
microseconds
1100 100

6' Transit Time
microseconds
1100 100



4100

104°

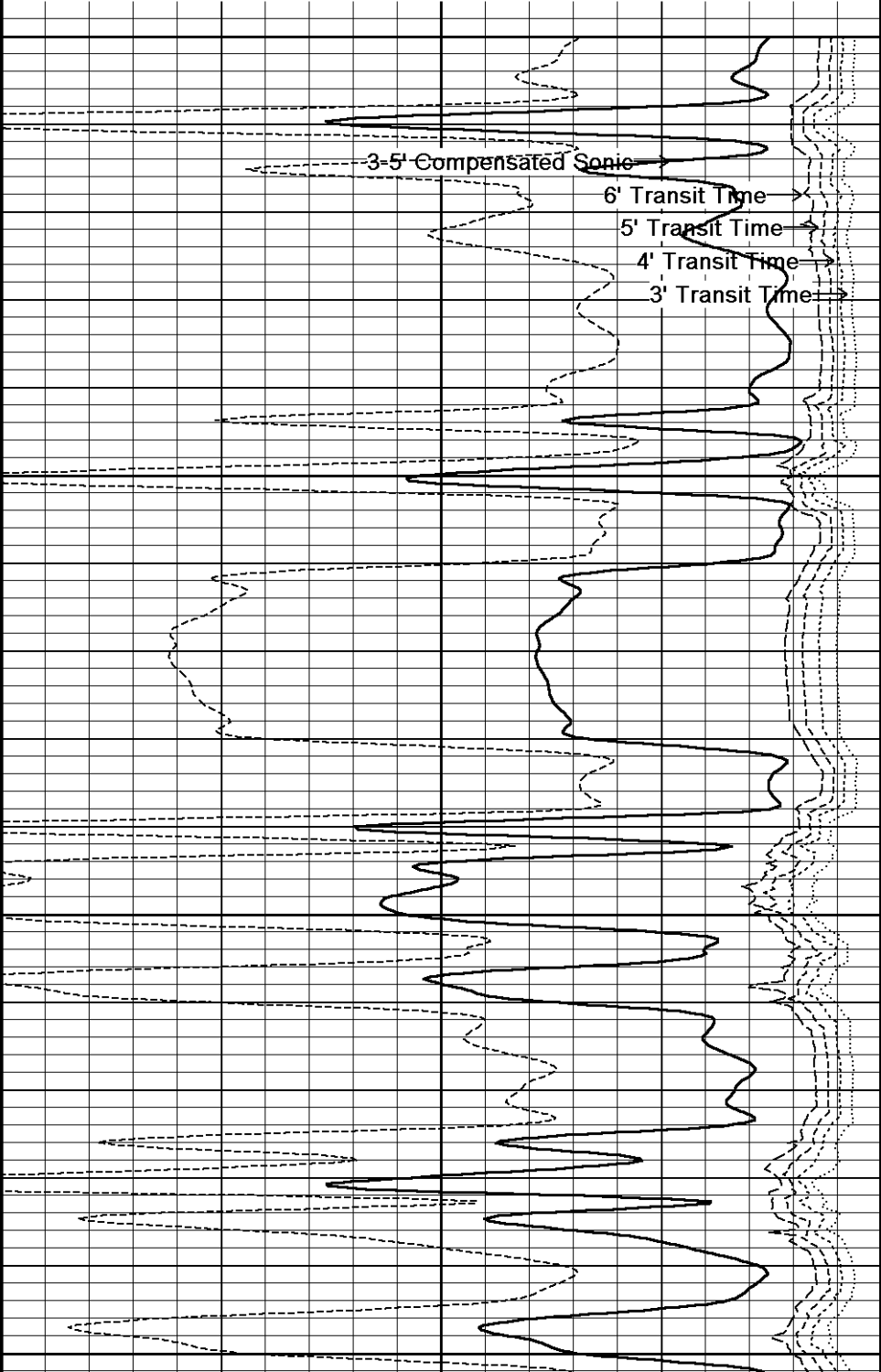
4150

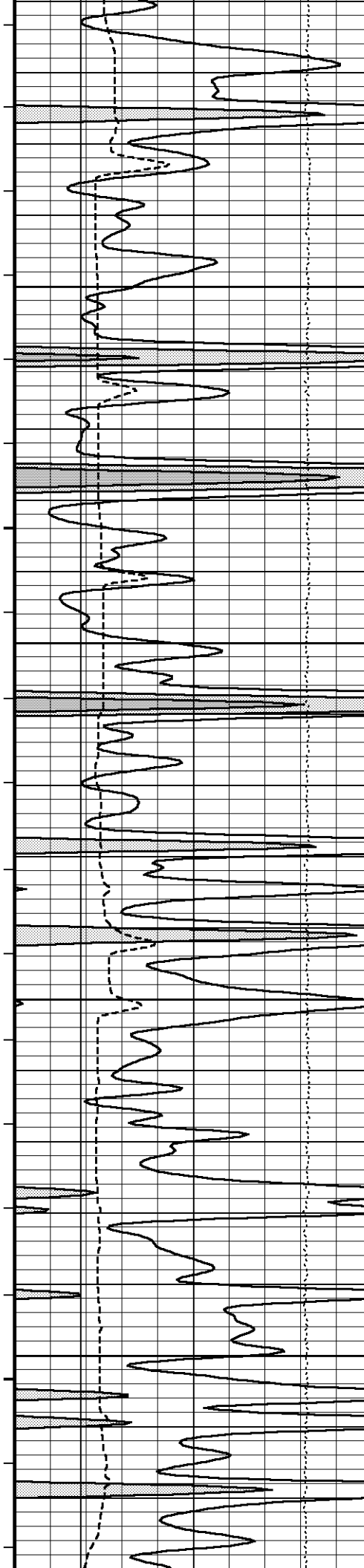
105°

4200

105°

4250





106°

4300

106°

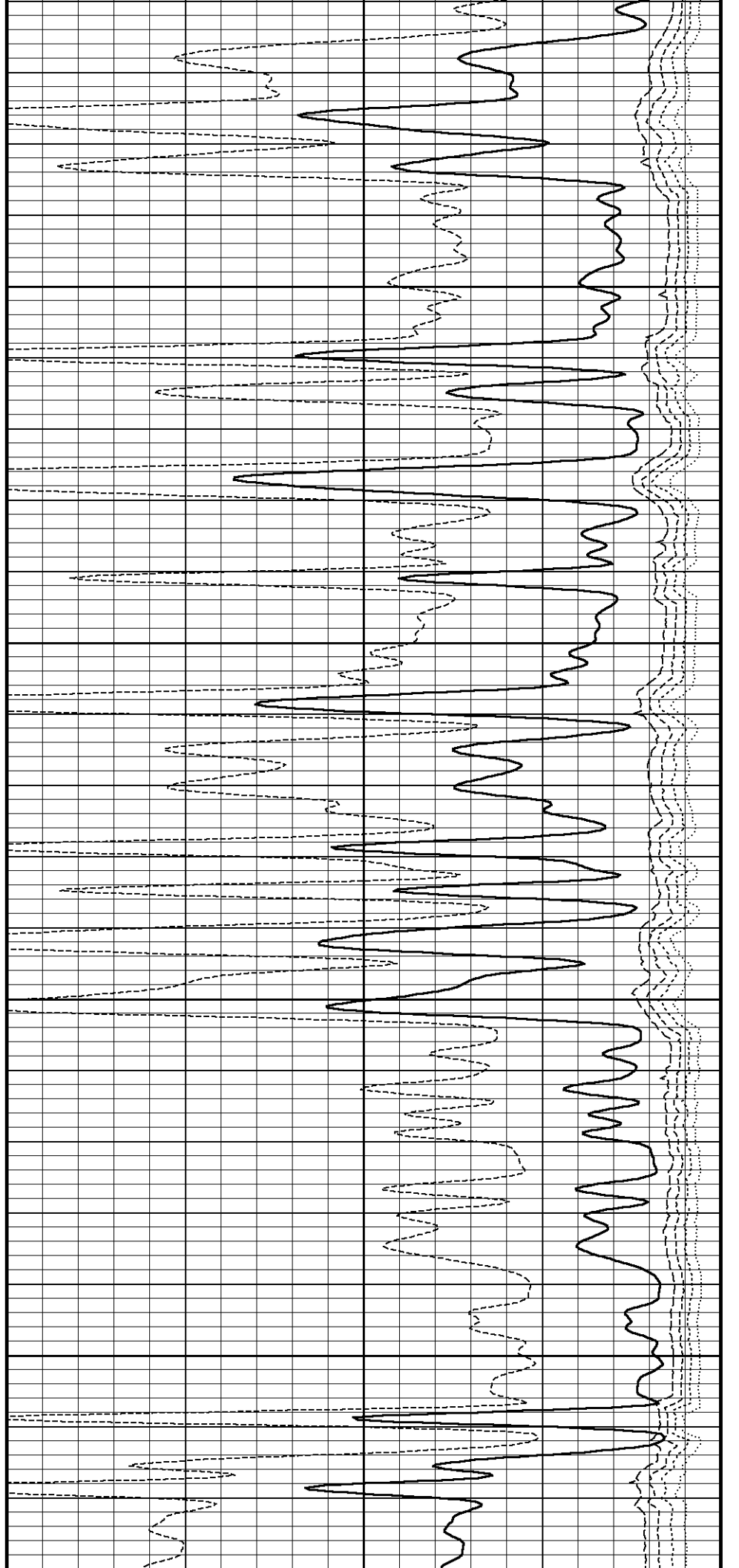
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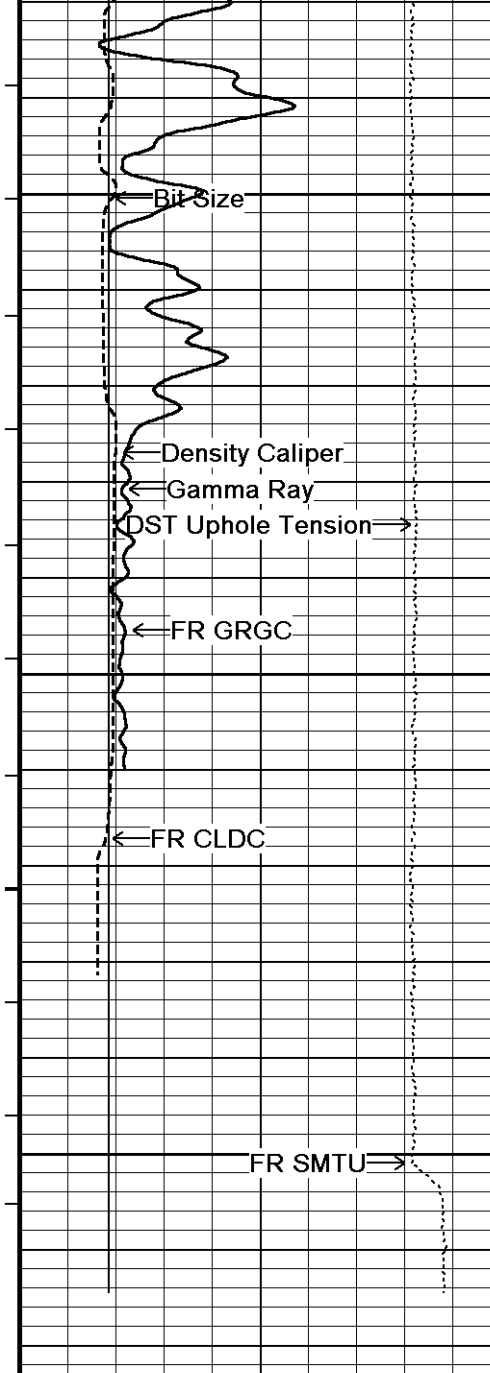
106°

4400

107°

4450





107°

4500

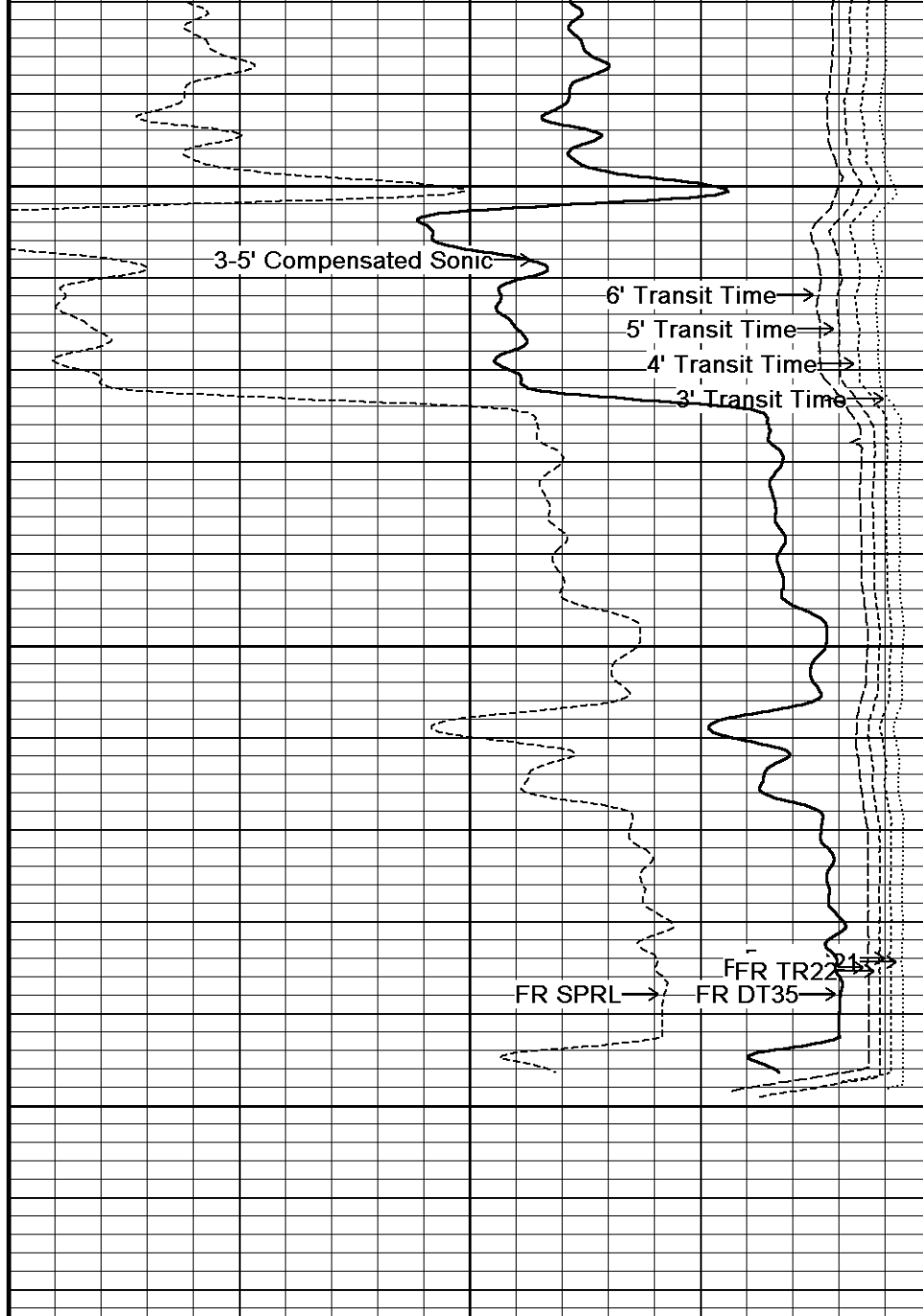
106°

4550

4600

4622

Depth in Feet



Timing Marks every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Density Caliper
inches
6 11 16

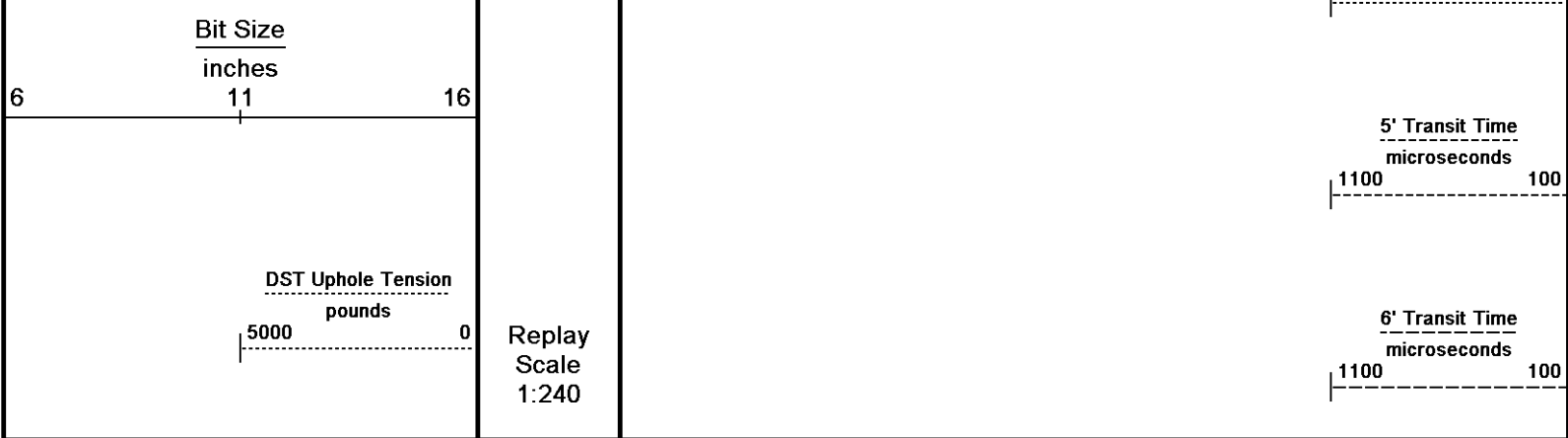
Borehole Temp in deg F

3-5' Compensated Sonic
microsec/foot
140 115 90 65 40

Wyllie Lime. Sonic Por.
percent
30 20 10 0 -10

3' Transit Time
microseconds
1100 100

4' Transit Time
microseconds
1100 100



Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 28-NOV-2012 05:49
 Filename: C:\Minimus 13.04.8492\Data\Shakespeare Oil Co.\Shakespeare Oil Co. Zanobia #1-21_002.dta
 Recorded on 28-NOV-2012 01:41
 System Versions: Logged with 13.04.8492 Processed with 13.04.8492 Plotted with 13.04.8492



BEFORE SURVEY CALIBRATION

C:\Minimus 13.04.8492\Data\Shakespeare Oil Co. Zanobia #1-21\Shakespeare Oil Co. Zanobia #1-21_002.dta

General Constants All 000		Last Edited on 27-NOV-2012,22:25
General Parameters		
Mud Resistivity	0.720	ohm-metres
Mud Resistivity Temperature	78.000	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	4.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Four Res Rt	
RWA Constant A	1.000	
RWA Constant M	2.000	

High Resolution Temperature Calibration MCG-D.K 442		Field Calibration on 08-NOV-2012,09:48
	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 08-NOV-2012,09:48
Pre-filter Length	11	

Gamma Calibration MCG-D.K 442		Field Calibration on 27-NOV-2012 16:06
	Measured	Calibrated (API)
Background	70	47
Calibrator (Gross)	1147	772
Calibrator (Net)	1077	725

Gamma Constants MCG-D.K 442		Last Edited on 27-NOV-2012,22:19
Gamma Calibrator Number	GRC38	
Mud Density	1.09	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Sonic Constants MSS-A.A 126	Last Edited on 27-NOV-2012,22:18
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Maximum Boundary Contrast	100.00	micro-sec/ft
Fluid Transit Time	189.00	micro-sec/ft
Limestone Transit Time	47.50	micro-sec/ft
Sandstone Transit Time	55.50	micro-sec/ft
Dolomite Transit Time	43.50	micro-sec/ft
Sonic used for Porosities	3-5' Compensated	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	0.00	micro-sec
MX3FT	1500.00	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft

Sonde Mode	Compensated
Hole Type	Open Hole

Sonde Parameters

	Measured	Calibrated
Offset	0.0000	0.0000
Free Pipe	0.0000	

Peak Amplitude Source

Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A

Processed Fixed Gate Parameters

Waveform Used For Processing	N/A			
Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	Depth (ft)	
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	0.00	0.00	0.00	

Full Waveform Parameters

Use 3' Waveform to derive TR	No
Use 4' Waveform to derive TR	No
Use 5' Waveform to derive TR	No
Use 6' Waveform to derive TR	No
3' Waveform Discriminator Level	0.30 mV
4' Waveform Discriminator Level	0.30 mV
5' Waveform Discriminator Level	0.15 mV
6' Waveform Discriminator Level	0.15 mV
3' Waveform Filter	
4' Waveform Filter	
5' Waveform Filter	
6' Waveform Filter	

Semblance Level	0.50
Semblance Window Width	120.00 micro-sec
Sonic 1 Despiker	100.00 micro-sec/ft
Sonic 2 Despiker	100.00 micro-sec/ft

Caliper Calibration MPD-B 64

Base Calibration on 14-NOV-2012 10:10
Field Calibration on 27-NOV-2012 15:59

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	12782	3.99
2	21549	5.98
3	30053	7.97
4	38387	9.86
5	47704	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
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DOWNHOLE EQUIPMENT

C:\Minimus 13.04.8492\Data\Shakespeare Oil Co. Zanolbia #1-21\Shakespeare Oil Co. Zanolbia #1-21_002.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

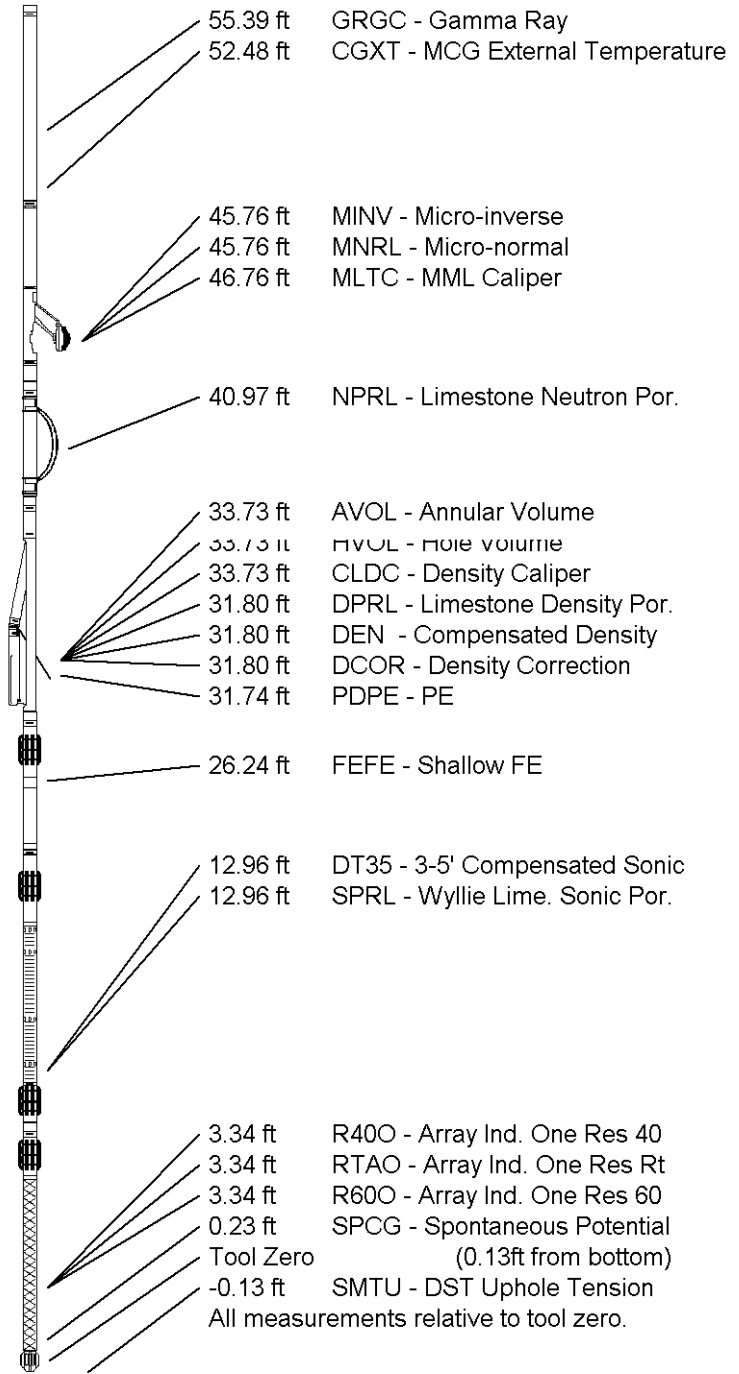
Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-A.A 126 LG: 12.52 ft WT: 72.8 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: 60.68 ft Weight: 456.4 lb



COMPANY	SHAKESPEARE OIL CO., INC.
WELL	ZANOBIA #1-21
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2867.00	feet	First Reading	4588.00	feet
Elevation Drill Floor	2865.00	feet	Depth Driller	4600.00	feet
Elevation Ground Level	2855.00	feet	Depth Logger	4601.00	feet



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WITH INTEGRATED TRANSIT TIME