



Weatherford

**COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

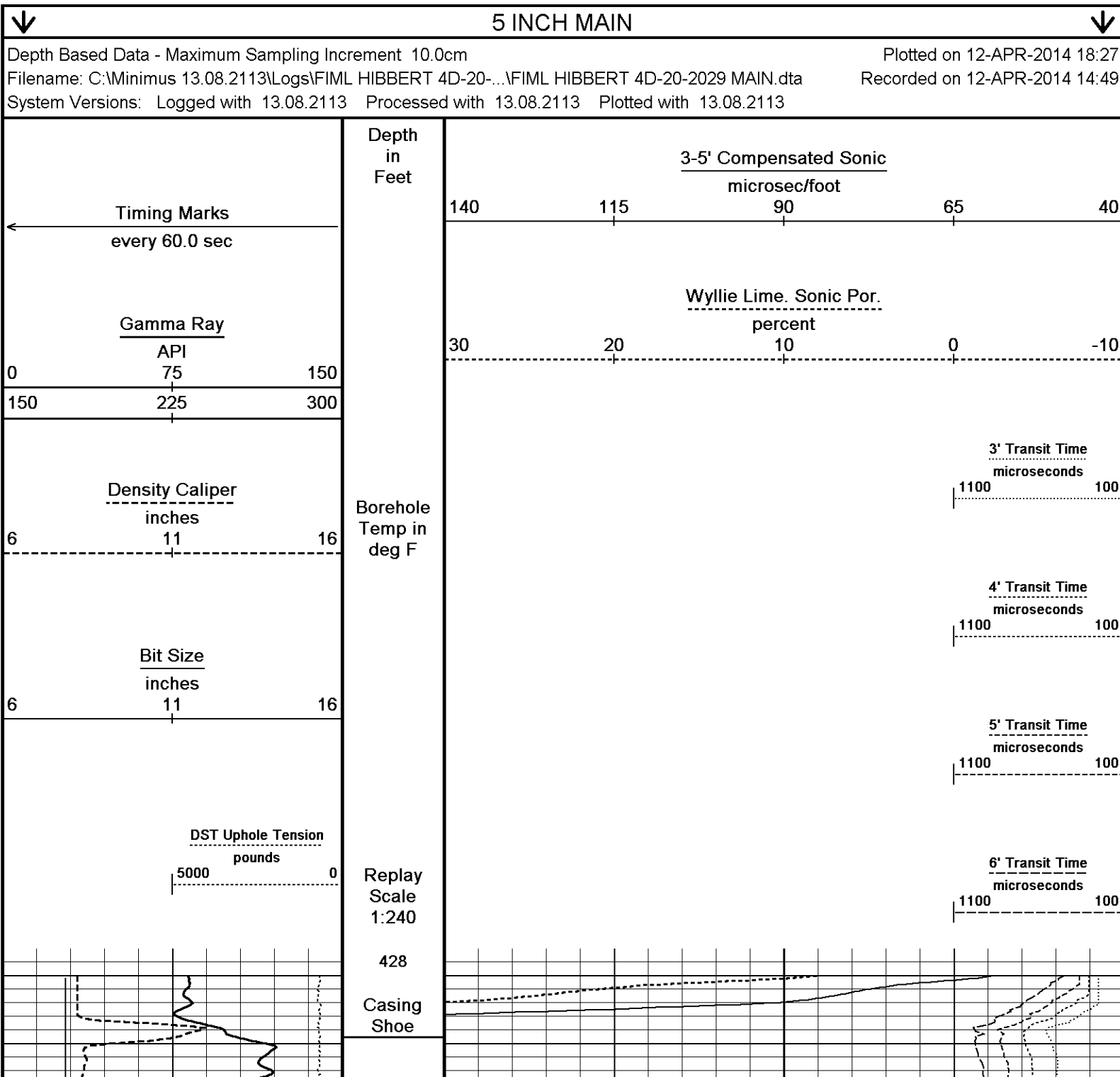
COMPANY		FIML NATURAL RESOURCES, LLC.			
WELL		HIBBERT 4D-20-2029			
FIELD		WILDCAT			
PROVINCE/COUNTY LANE		U.S.A. / KANSAS			
COUNTRY/STATE		1235' FNL & 1000' FNL			
LOCATION					
SEC 20	TWP 20S	RGE 29W	Other Services		MML
Latitude			MPD/MDN		
Longitude			MAI/MFE		
API Number	15-101-22502		MSS		
Permanent Datum GL, Elevation 2882 feet					
Log Measured From KB					
Drilling Measured From KB @ 10 FEET					
Date	12-APR-2014				
Run Number	ONE				
Service Order	5872-84492996				
Depth Driller	4900.00		feet		
Depth Logger	4902.00		feet		
First Reading	4889.00		feet		
Last Reading	439.00		feet		
Casing Driller	437.00		feet		
Casing Logger	439.00		feet		
Bit Size	7.875		inches		
Hole Fluid Type	CHEM				
Density / Viscosity	9.30	lb/USg	55.00	CP	
PH / Fluid Loss	10.50		7.00	ml/30Min	
Sample Source	PIT				
Rm @ Measured Temp	0.80 @ 96.0		ohm-m		
Rmf @ Measured Temp	0.64 @ 96.0		ohm-m		
Rmc @ Measured Temp	0.96 @ 96.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.65 @ 117.0		ohm-m		
Time Since Circulation	4 HRS				
Max Recorded Temp	117.00		deg F		
Equipment / Base	13057		LIB		
Recorded By	D. COLE				
Witnessed By	G. DOKE		K. TALBOT		
JOB #	LB 14-111				

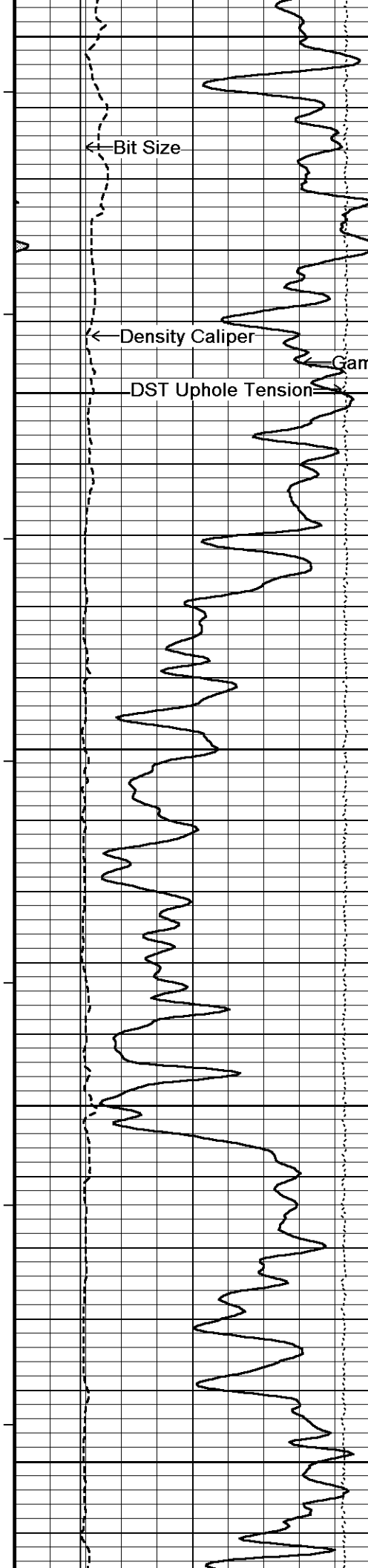
BOREHOLE RECORD			Last Edited: 12-APR-2014 11:38	
Bit Size inches	Depth From feet		Depth To feet	
7.875	437.00		4900.00	
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
CASING	8.625	0.00	437.00	24.00

REMARKS
- SOFTWARE ISSUE: WLS 13.08.211.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS AND 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: 1760 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 1025 CU.FT.

- OPERATOR: J. DUNLAP.

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.





450

94°

Gamma Ray

500

94°

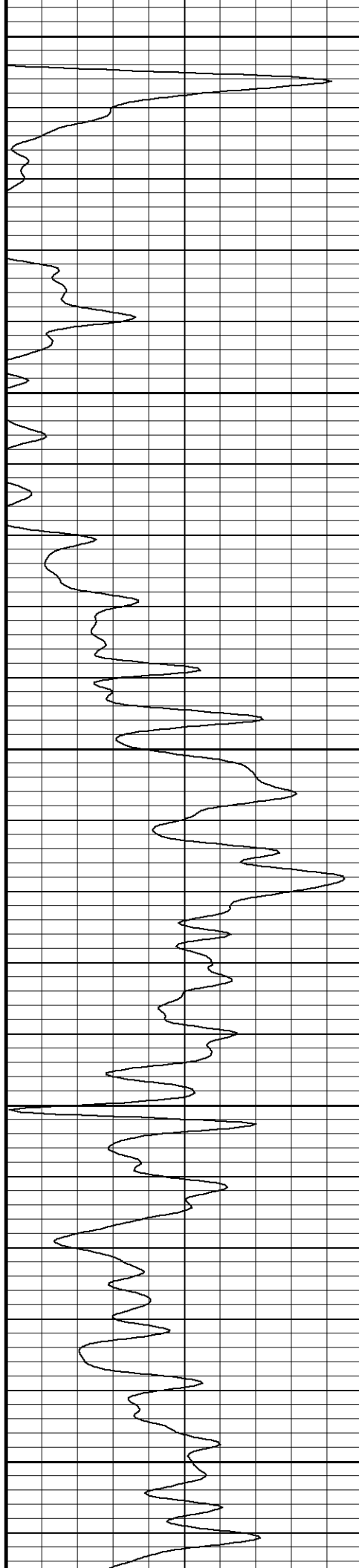
550

95°

600

95°

650

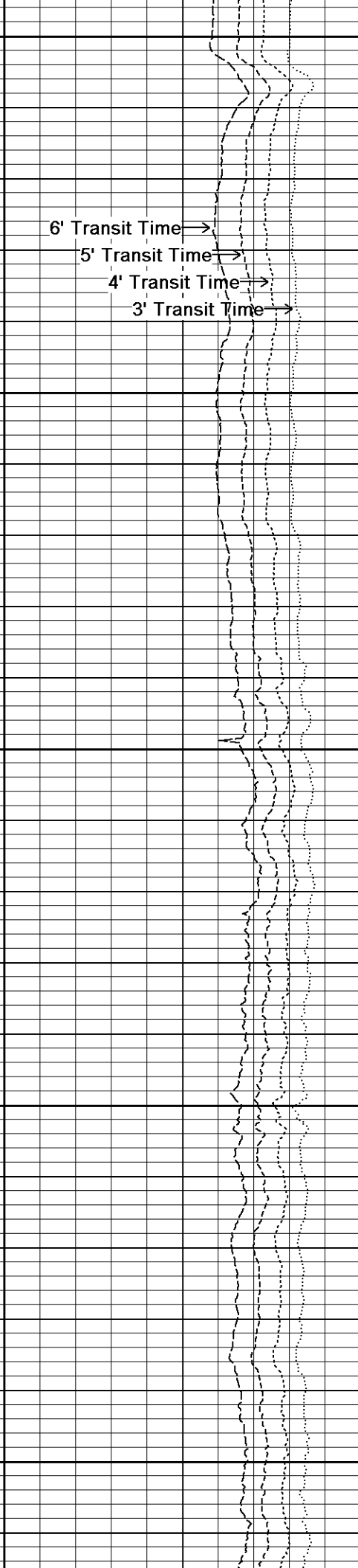


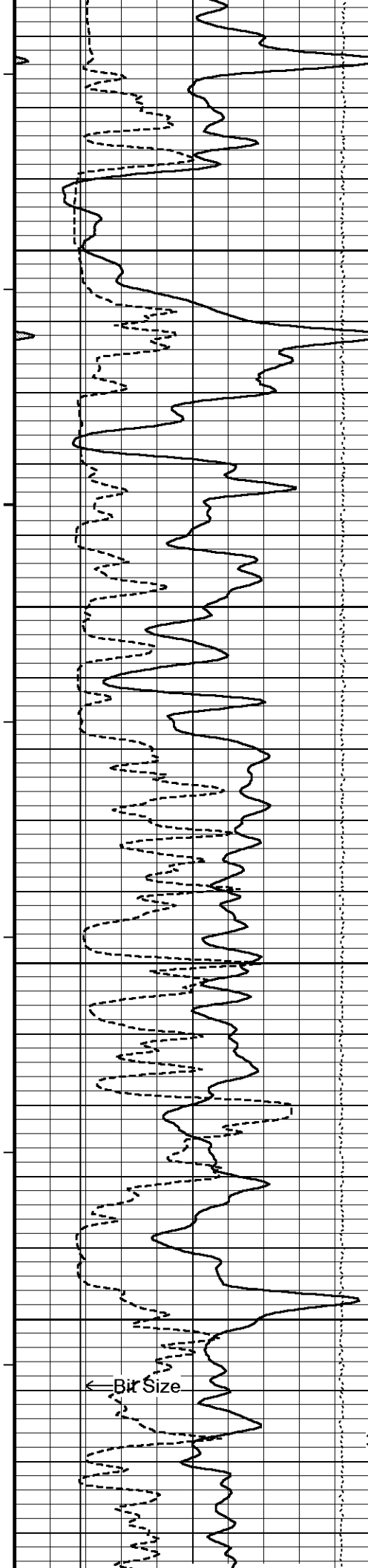
6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time





95°

700

96°

750

97°

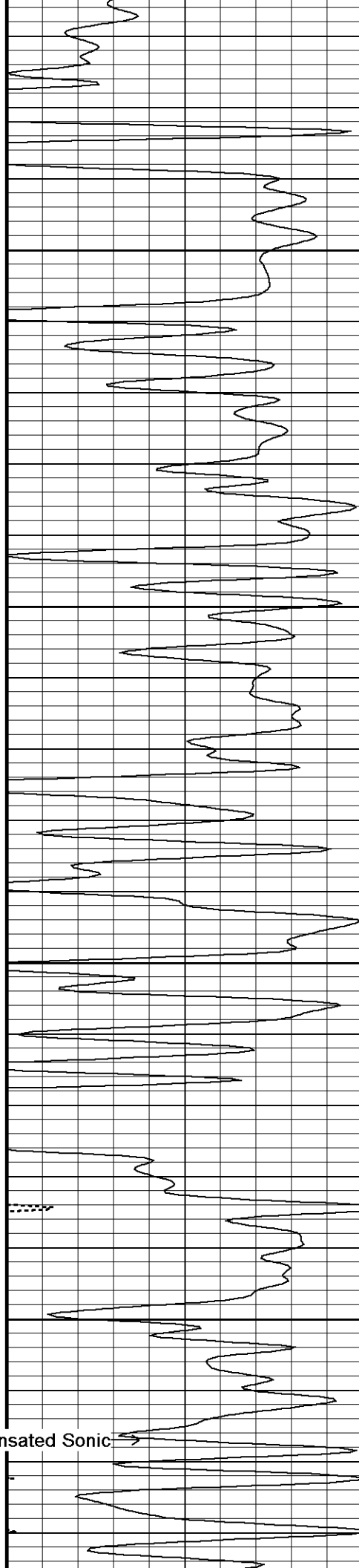
800

97°

850

Bit Size

3-5' Compensated Sonic

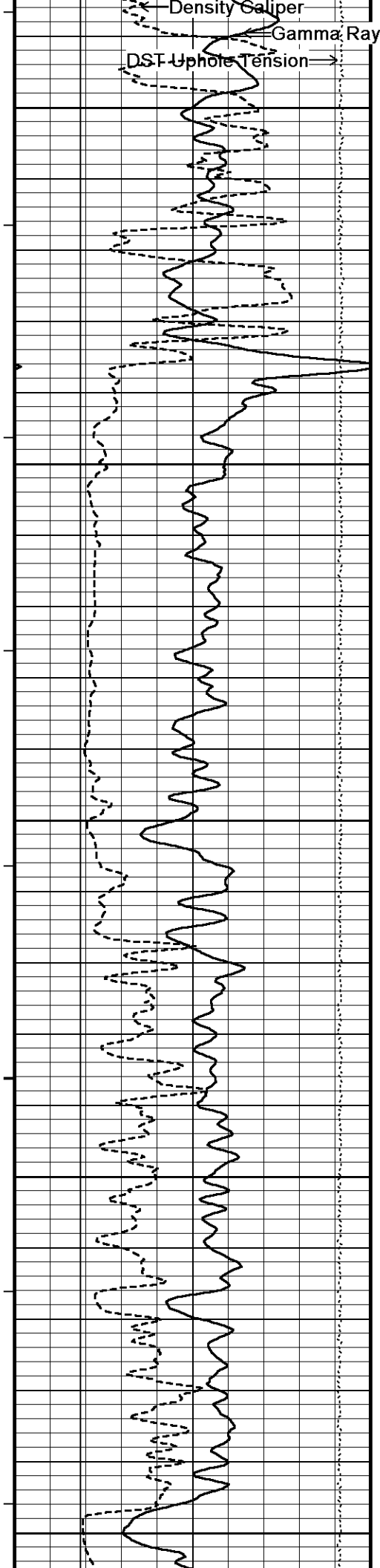


6' Transit Time

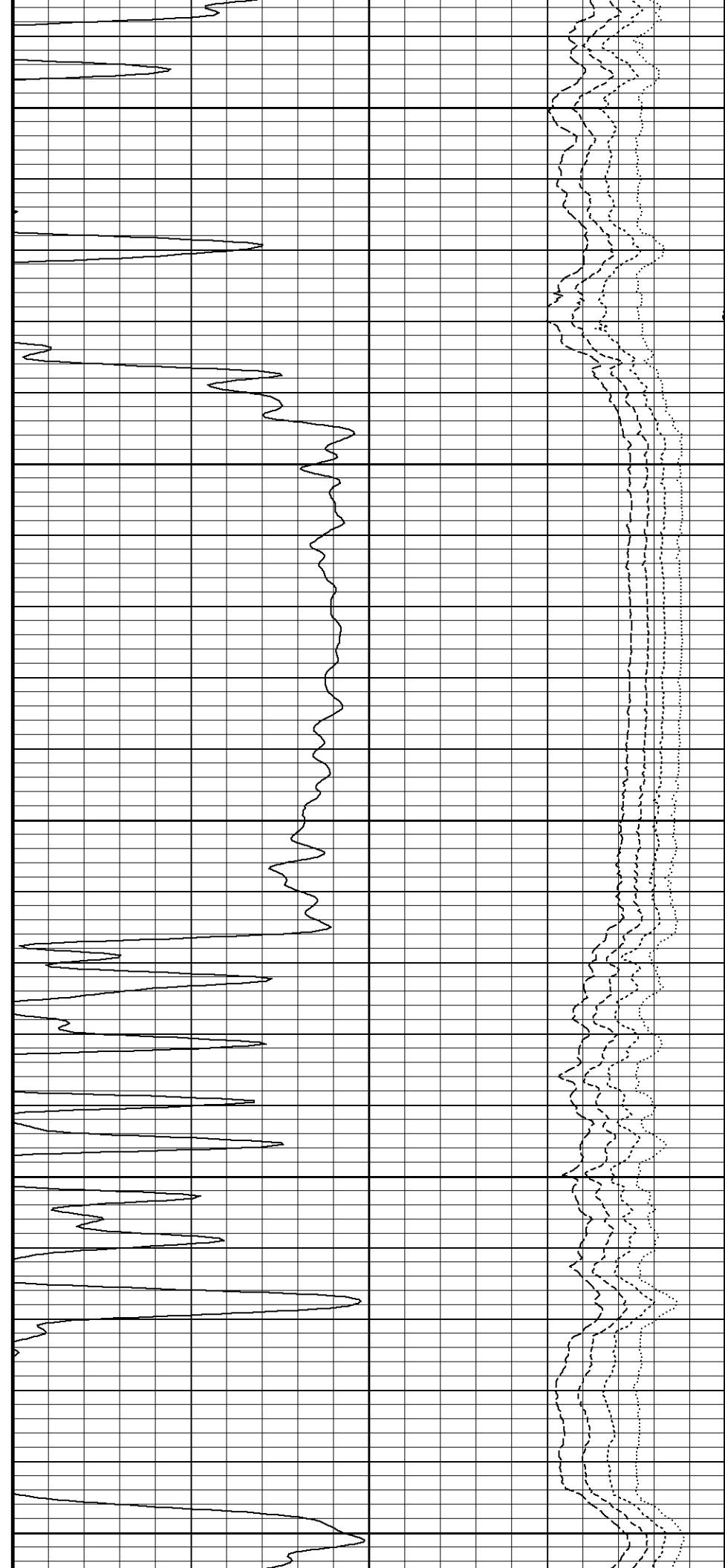
5' Transit Time

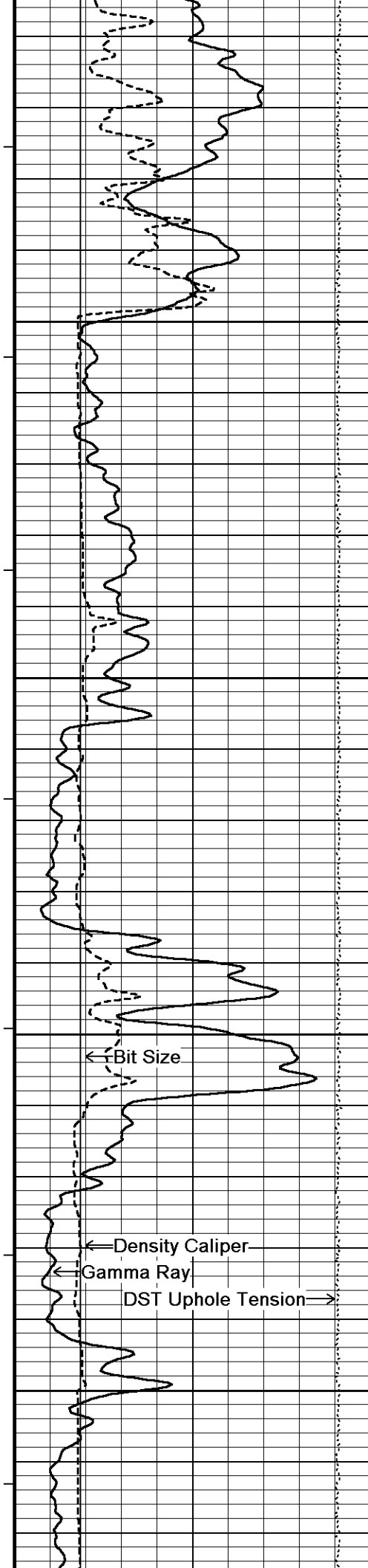
4' Transit Time

3' Transit Time



97°
900
96°
950
97°
1000
97°
1050
97°
1100





97°

1150

97°

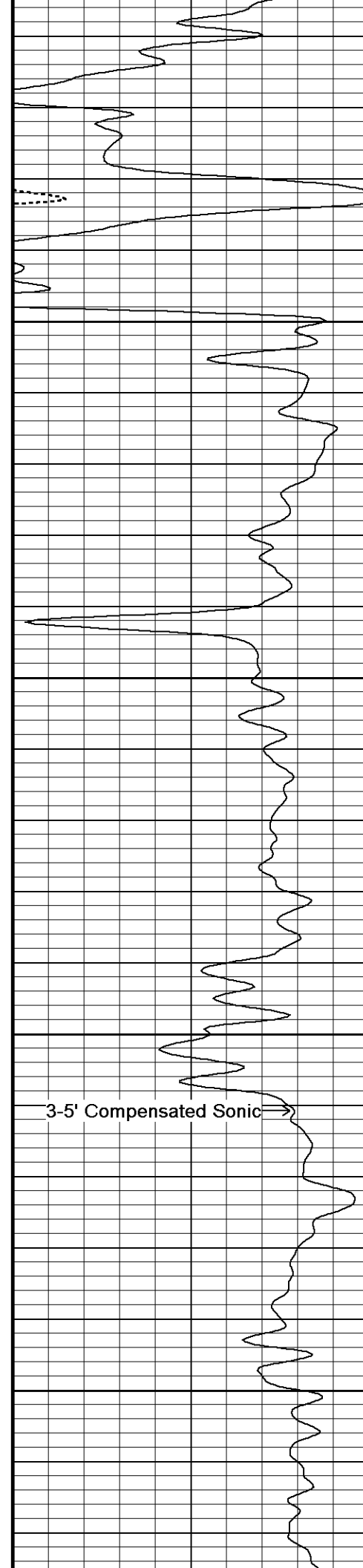
1200

97°

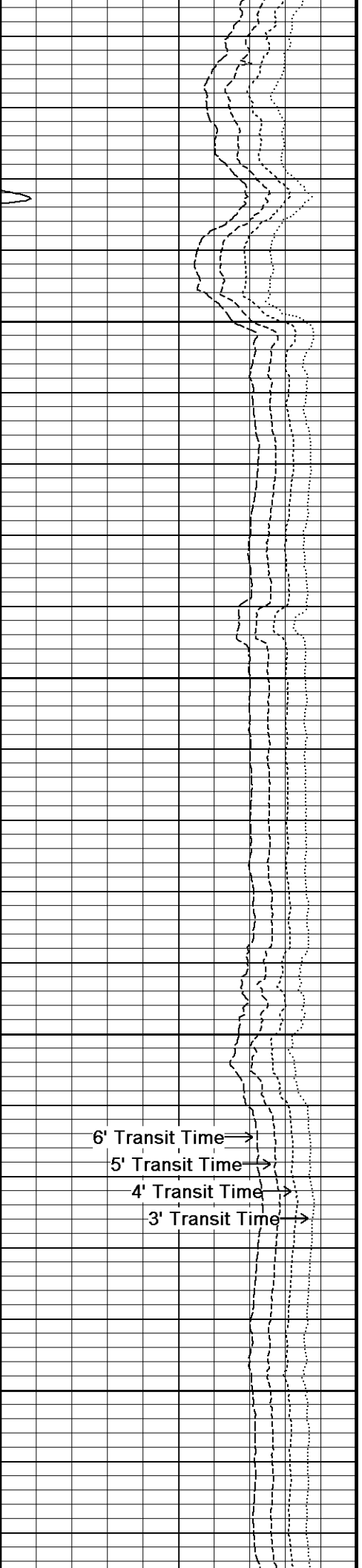
1250

97°

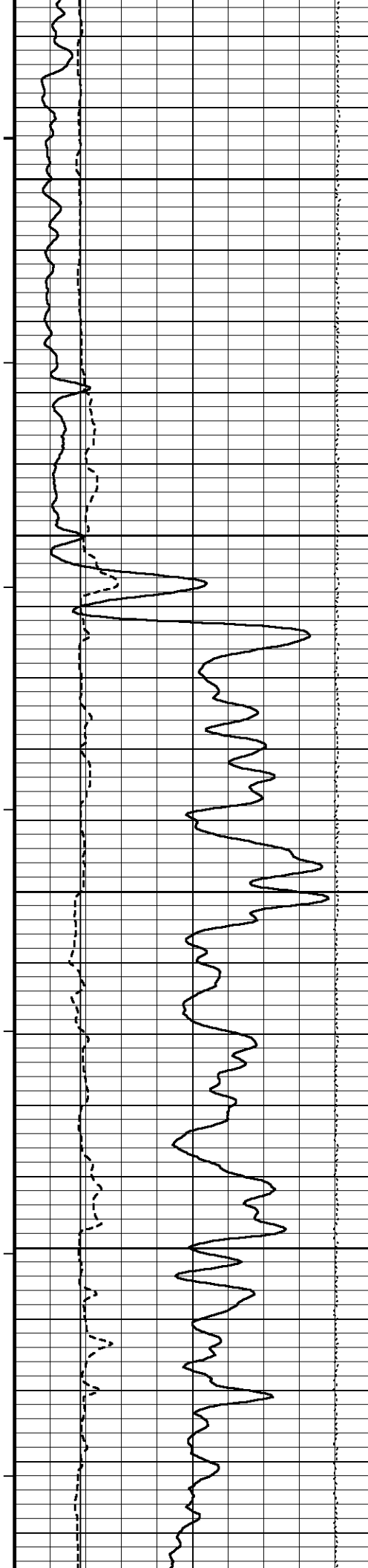
1300



3-5' Compensated Sonic



6' Transit Time
5' Transit Time
4' Transit Time
3' Transit Time



98°

1350

99°

1400

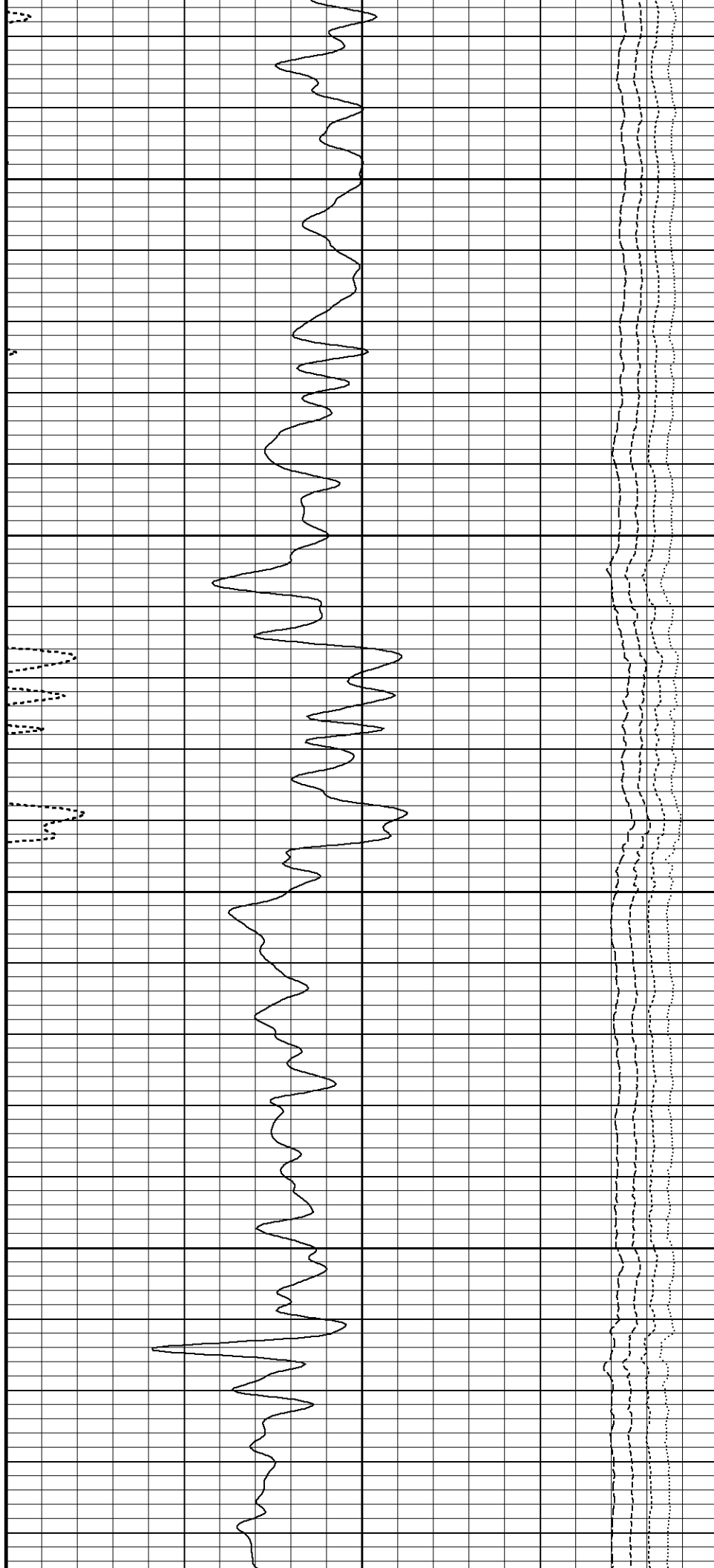
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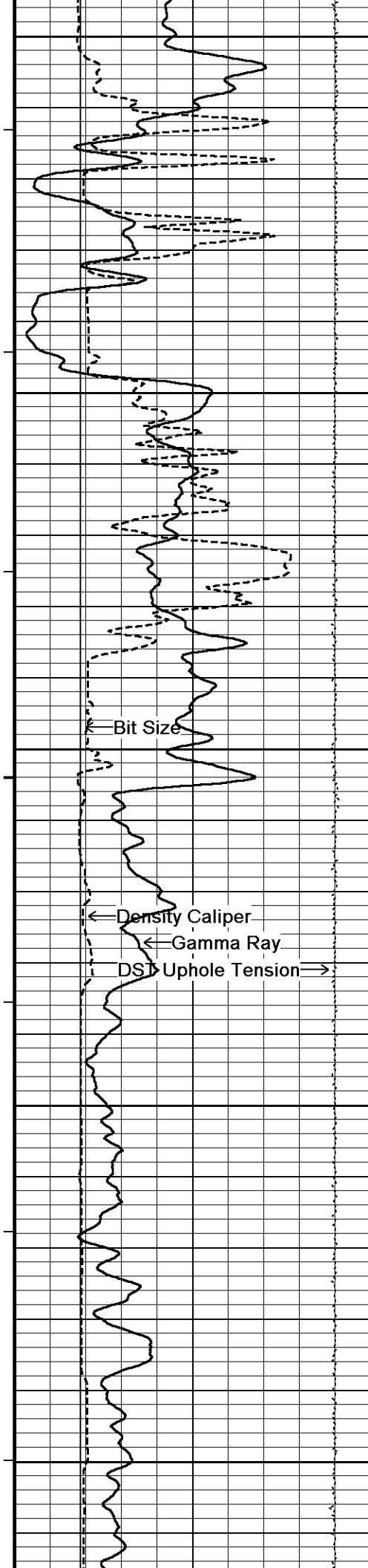
1450

99°

1500

100°





1550

99°

1600

99°

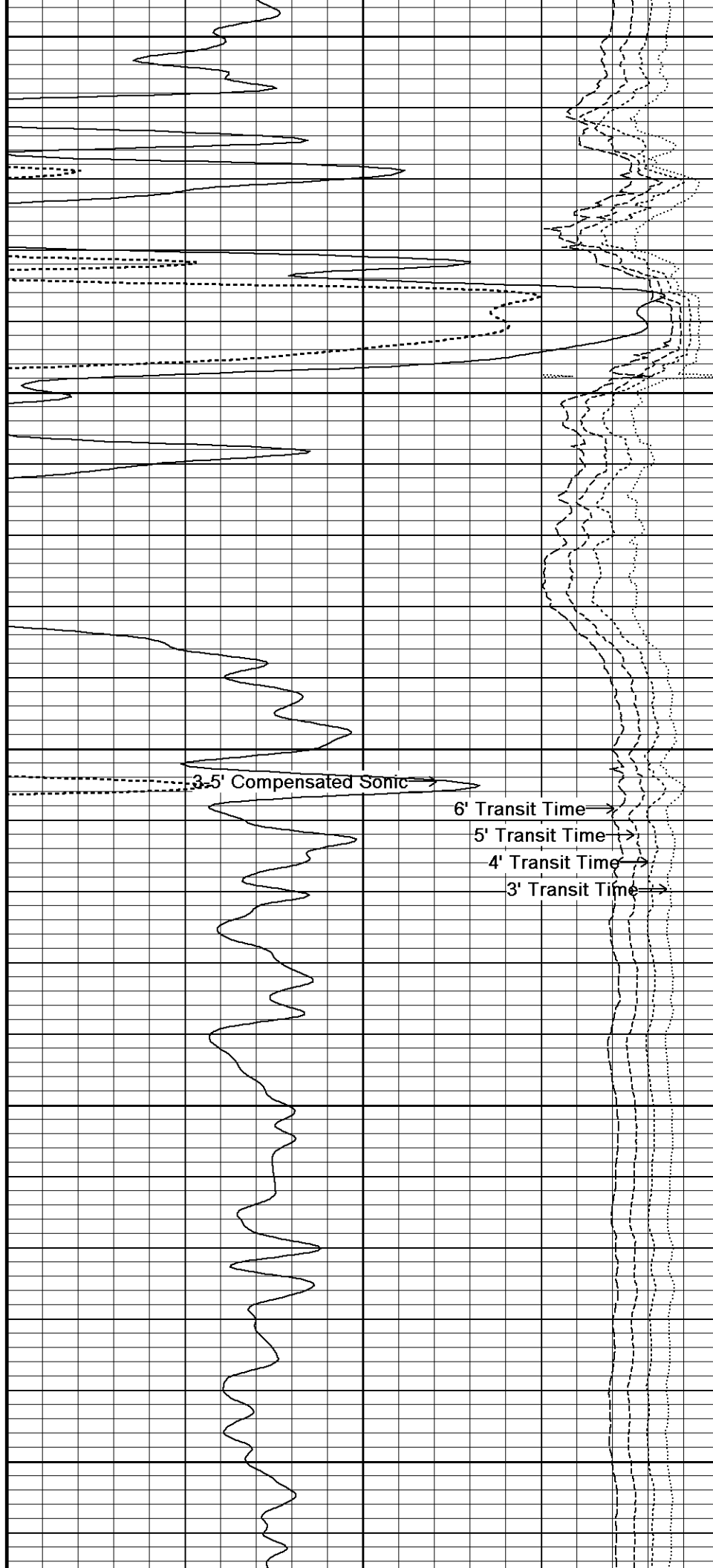
1650

99°

1700

100°

1750



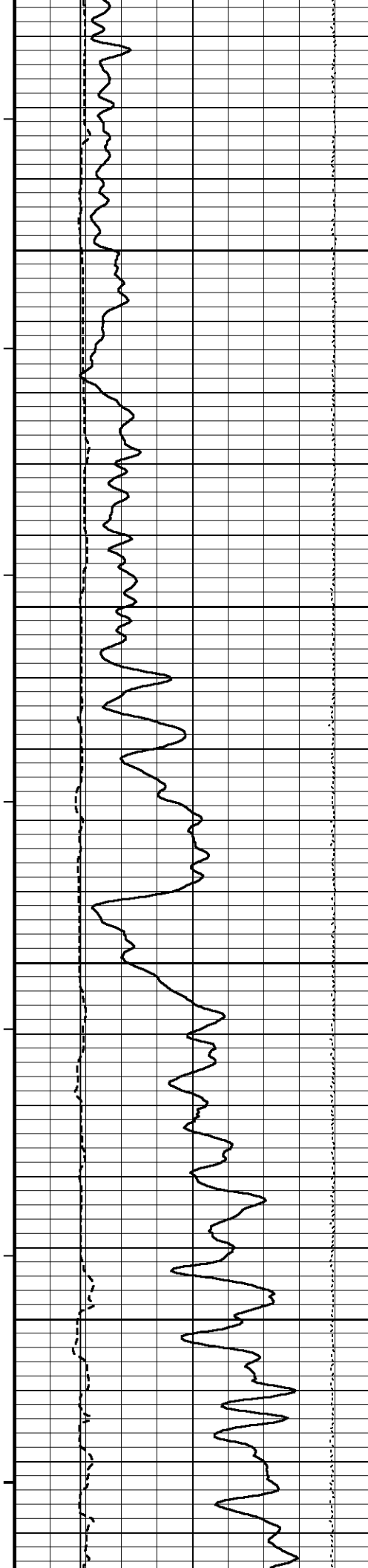
3.5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



100°

1800

100°

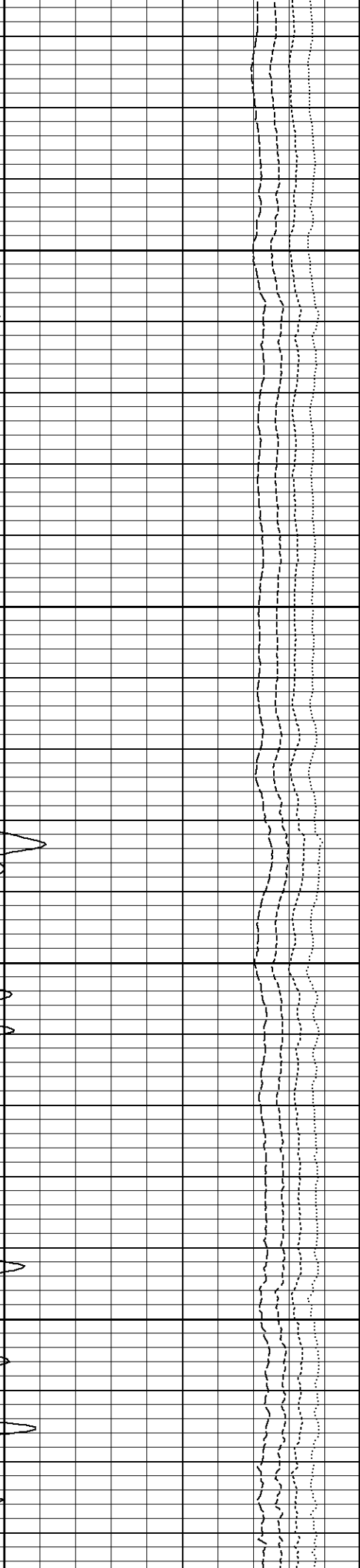
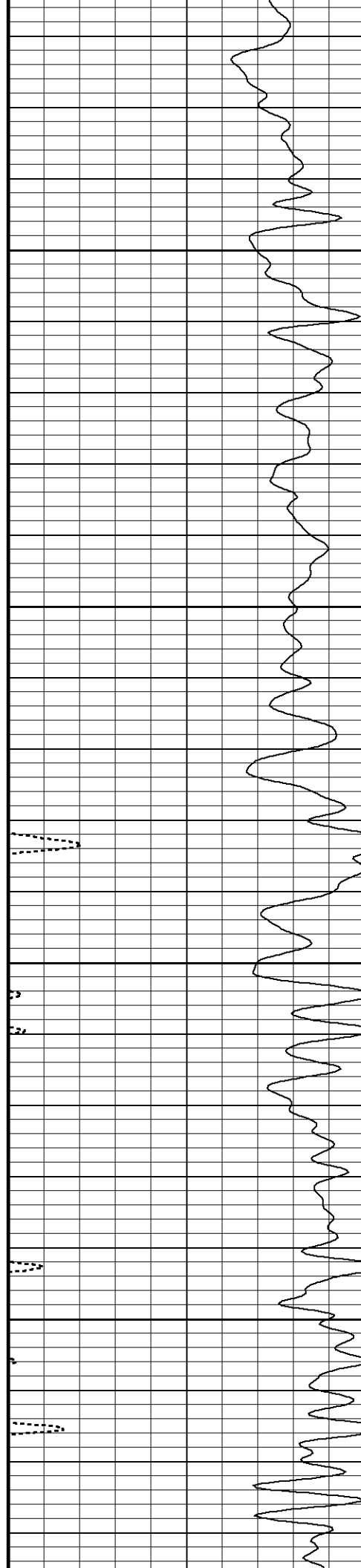
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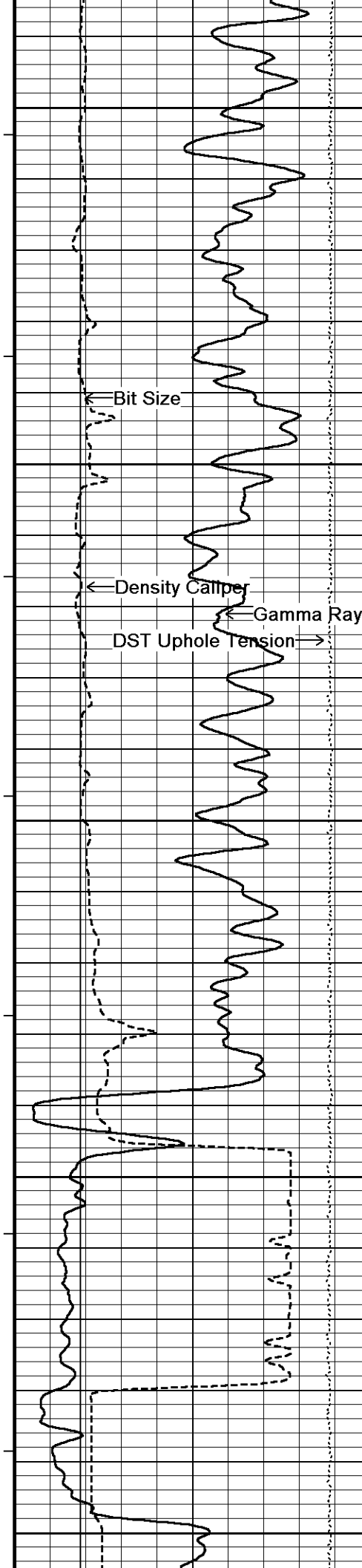
101°

1900

101°

1950





101°

2000

102°

2050

102°

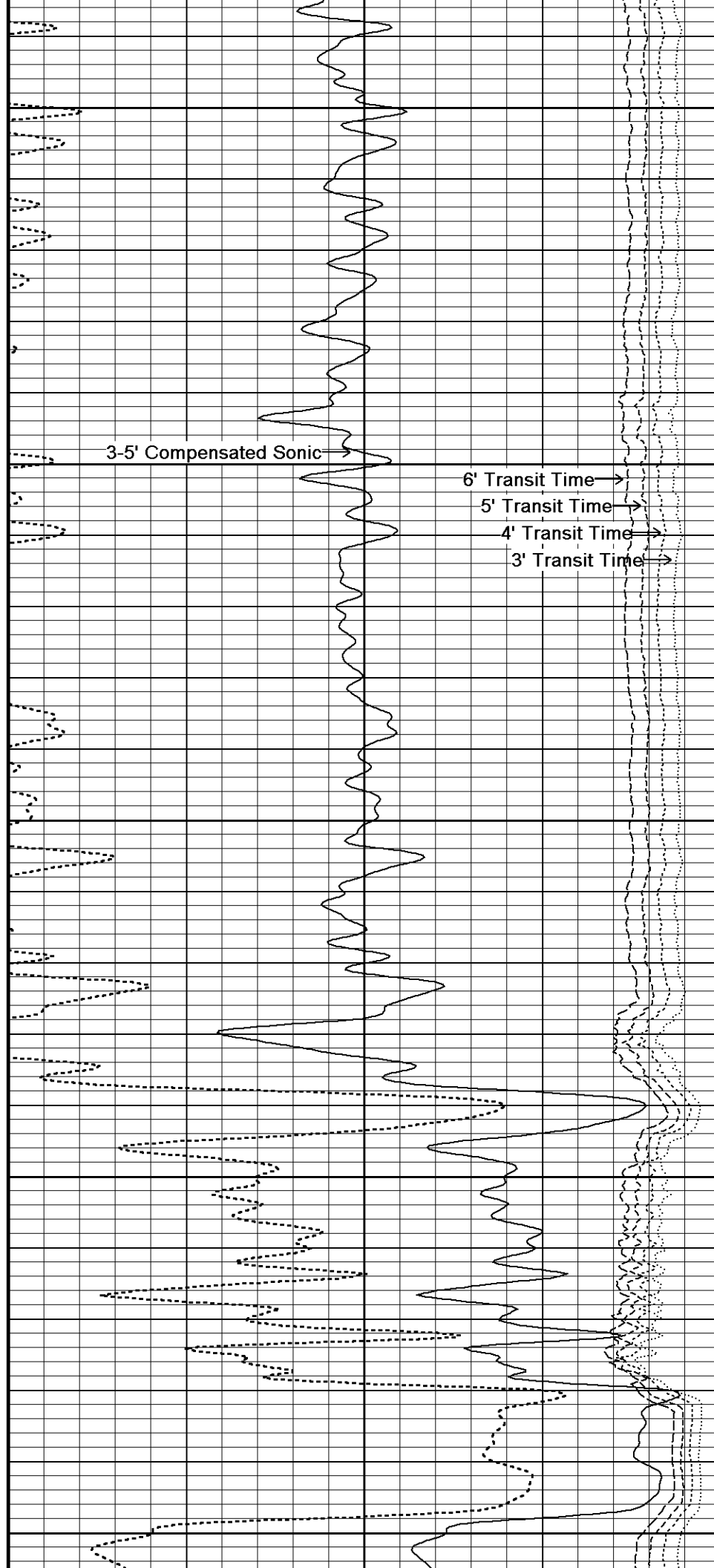
2100

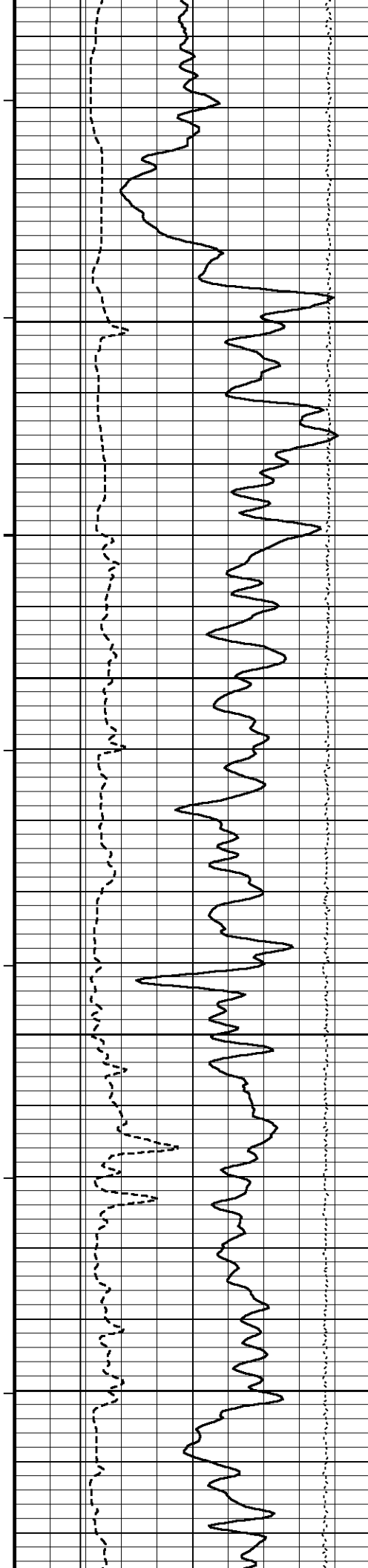
102°

2150

102°

2200





103°

2250

103°

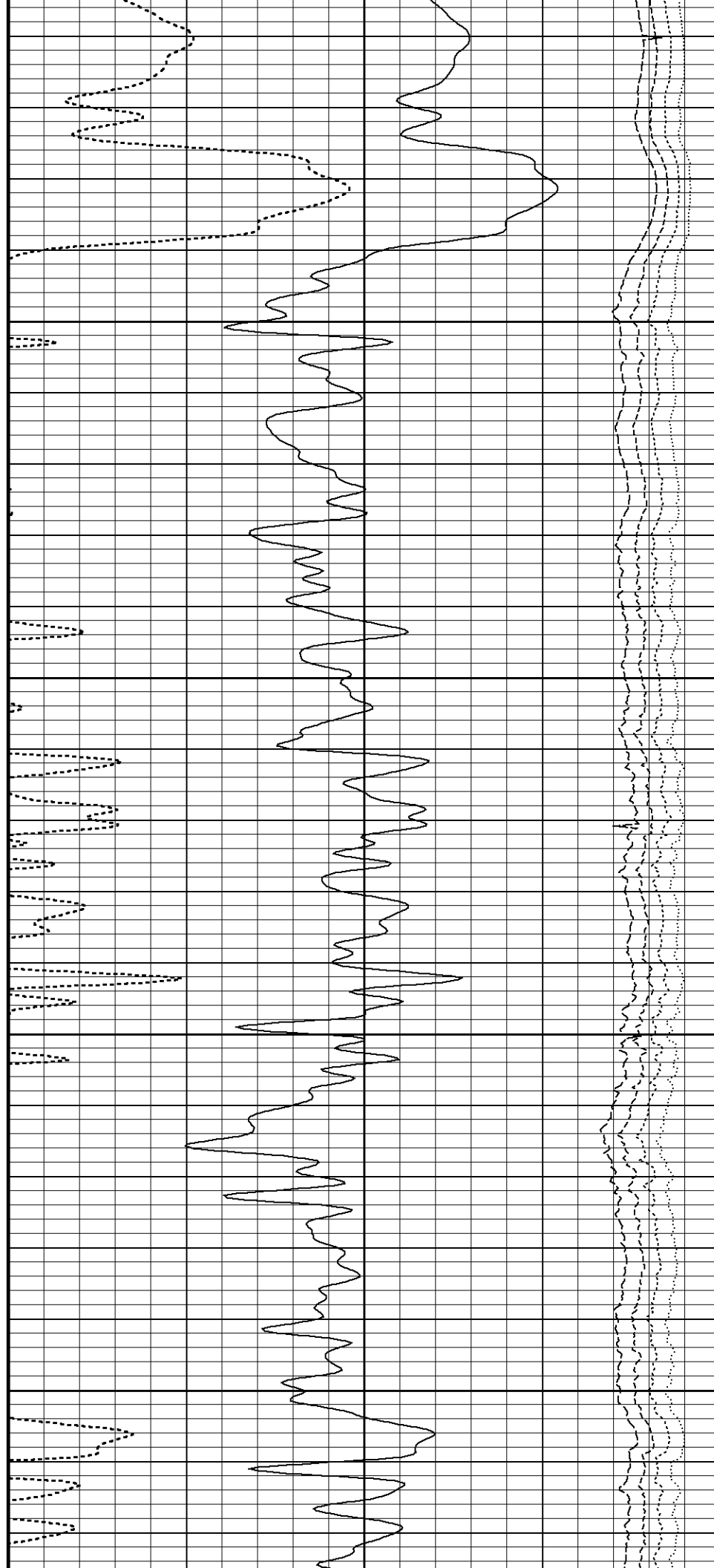
2300

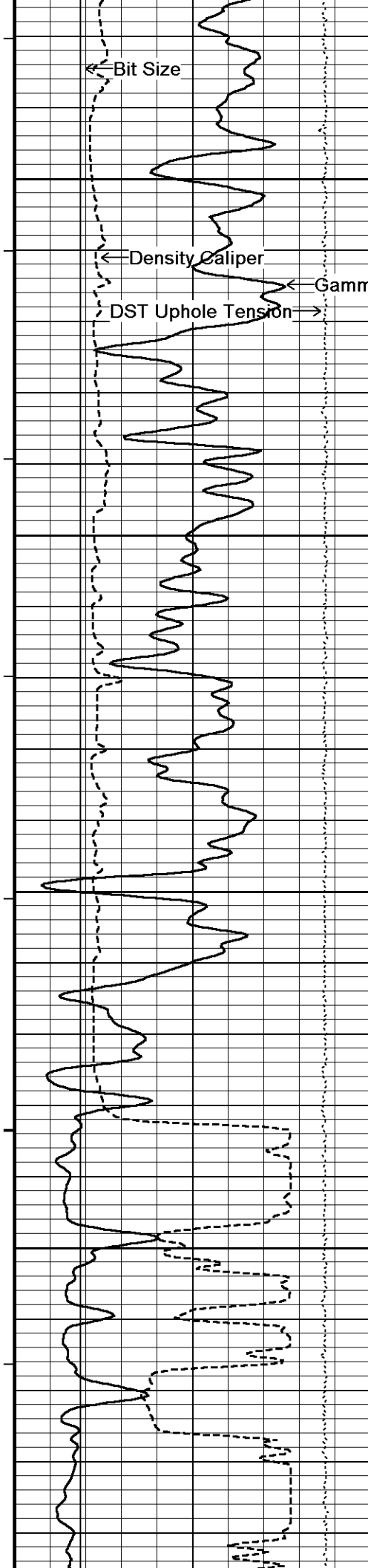
103°

2350

104°

2400





104°

2450

105°

2500

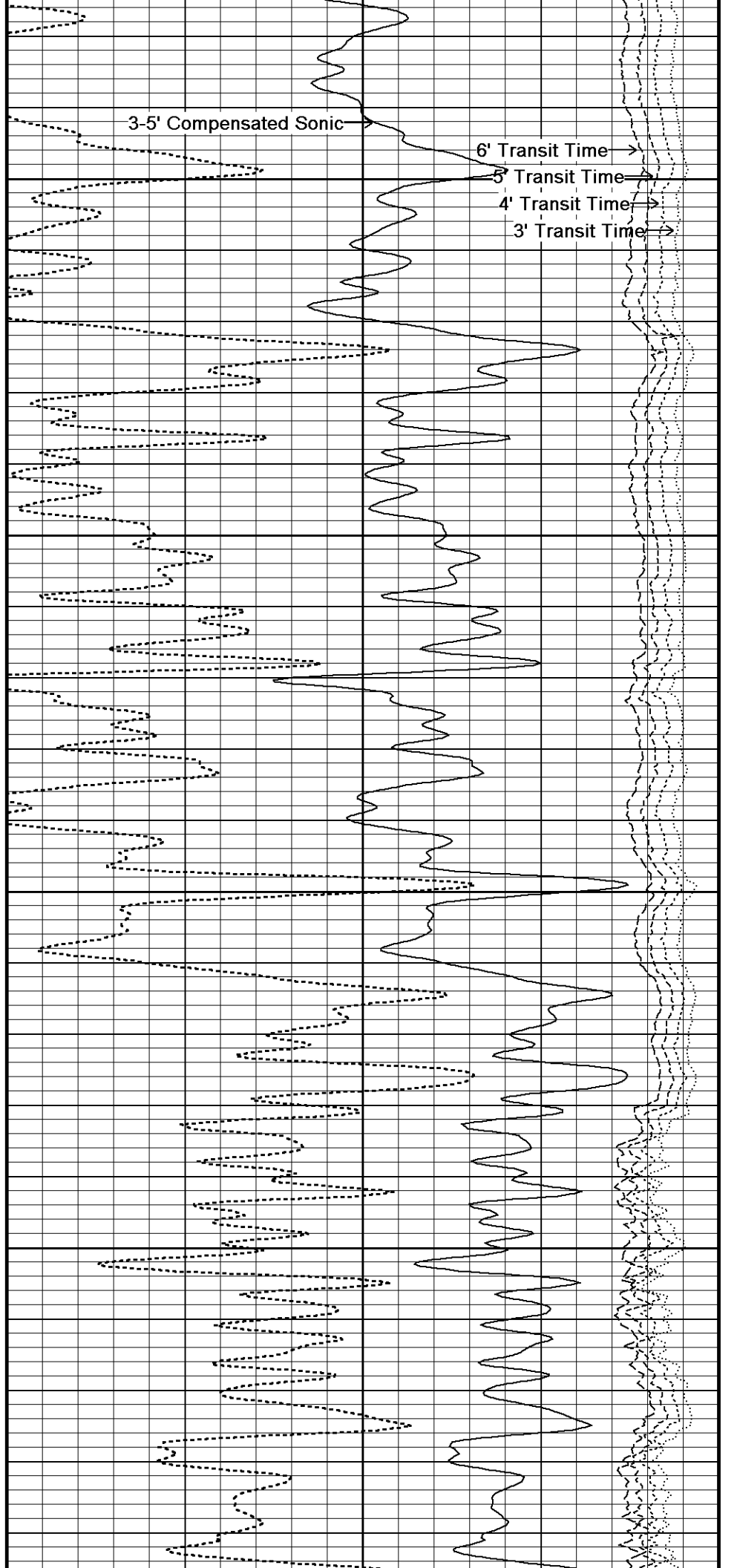
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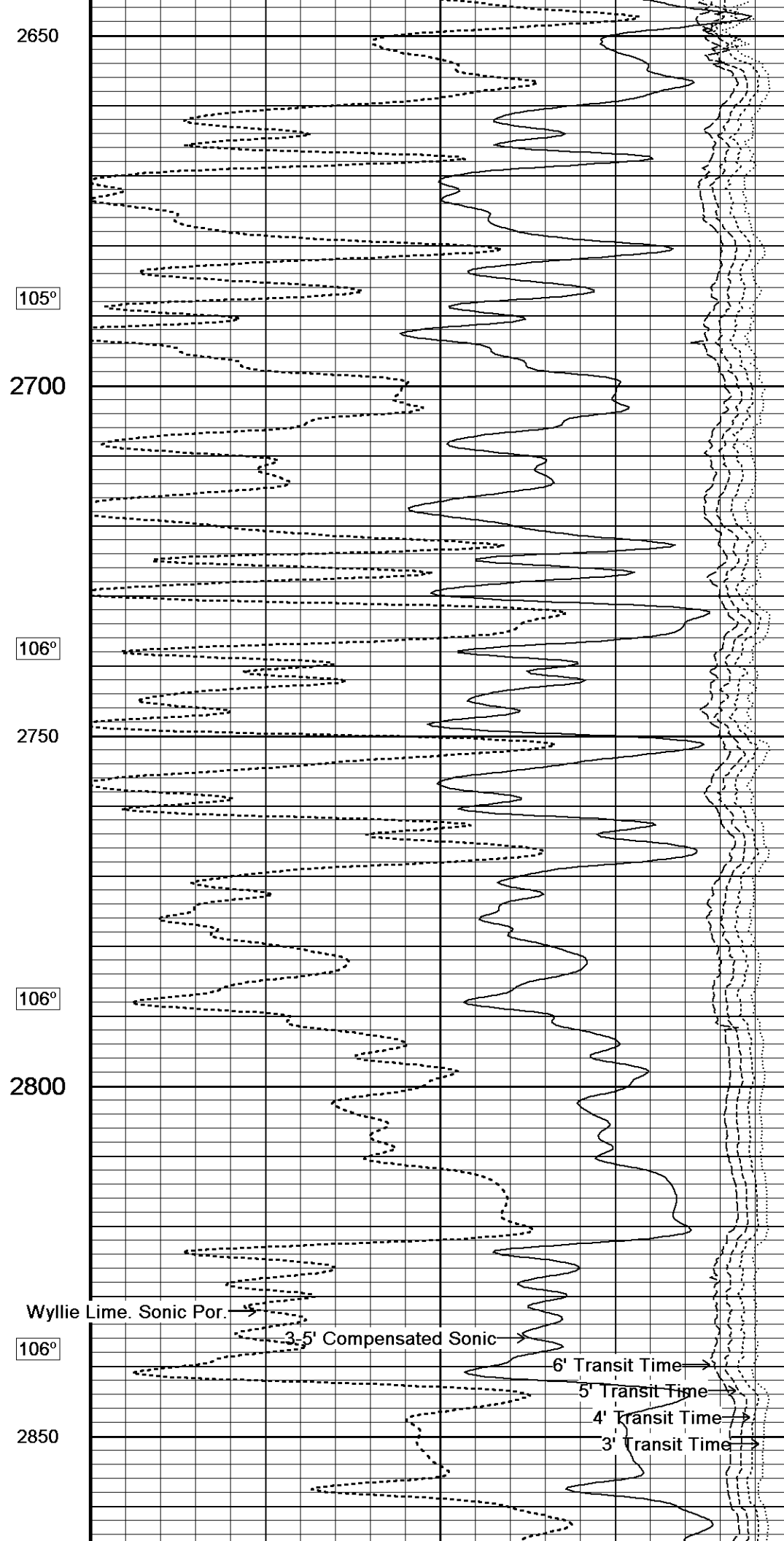
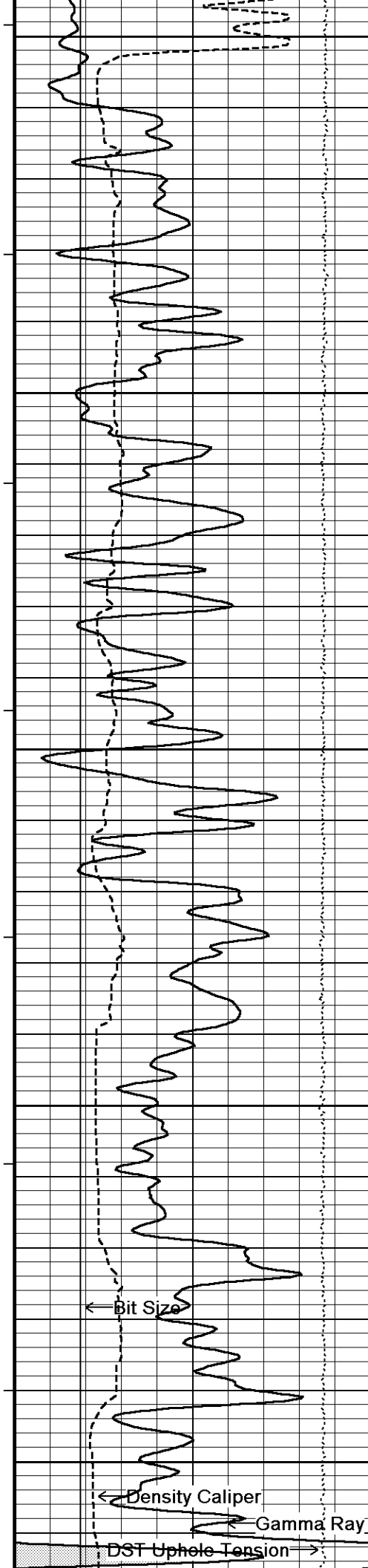
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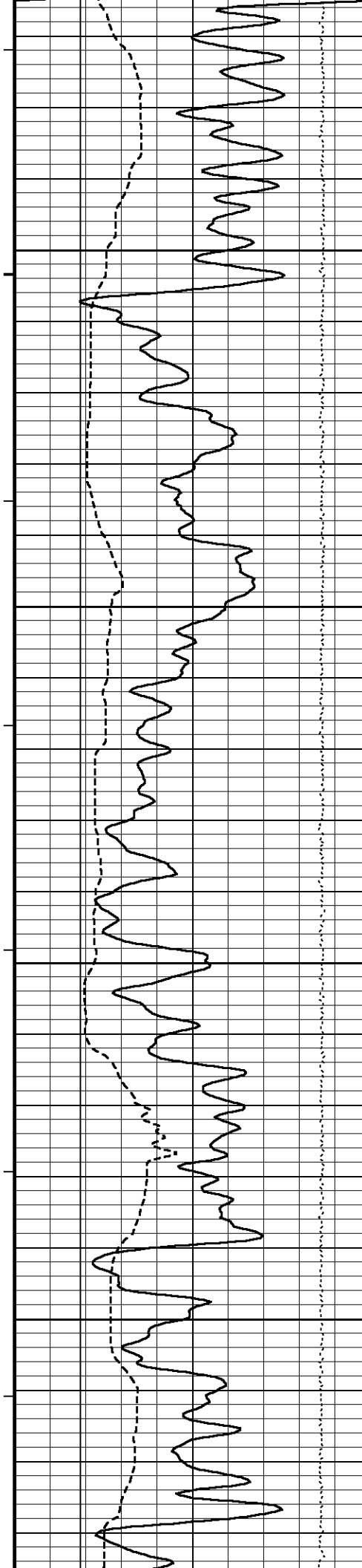
105°

2600

105°







106°

2900

107°

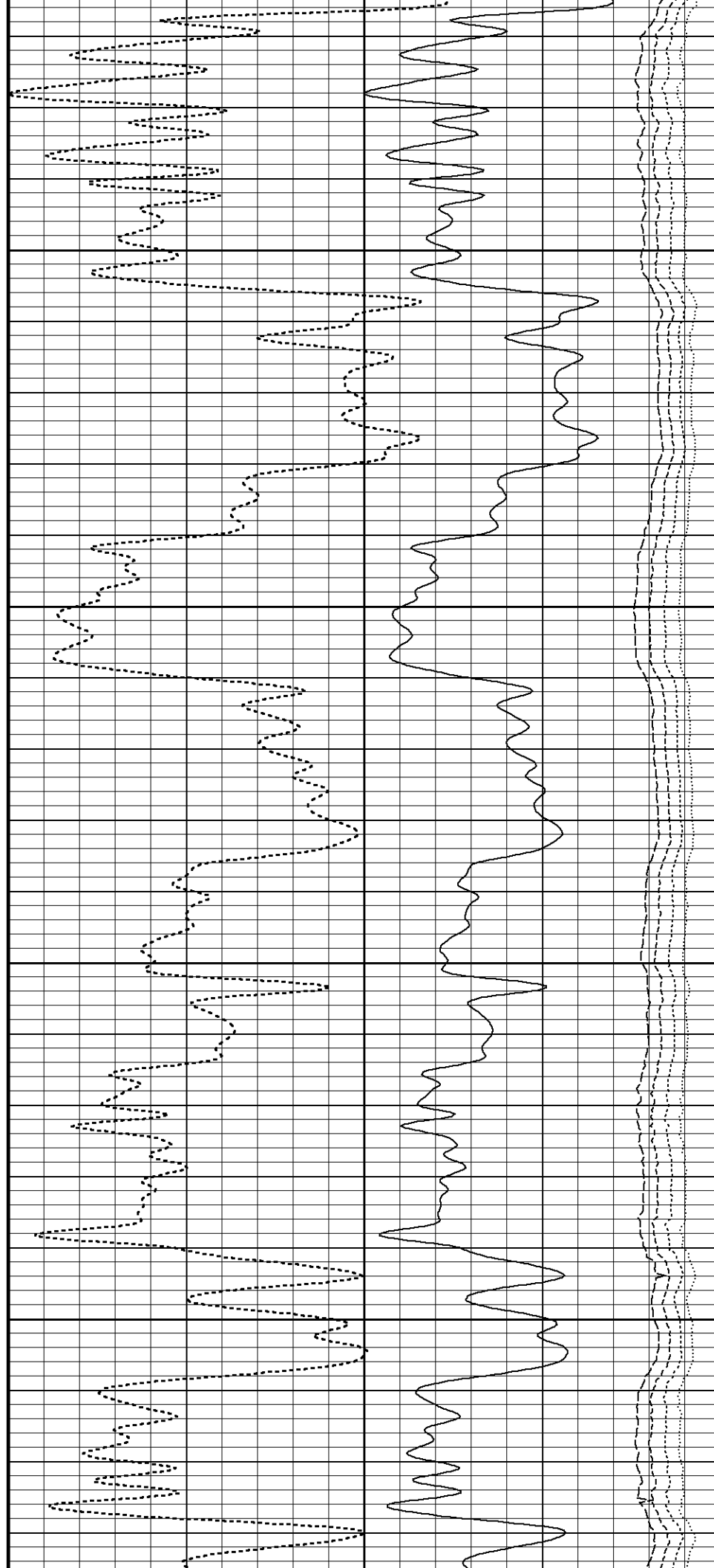
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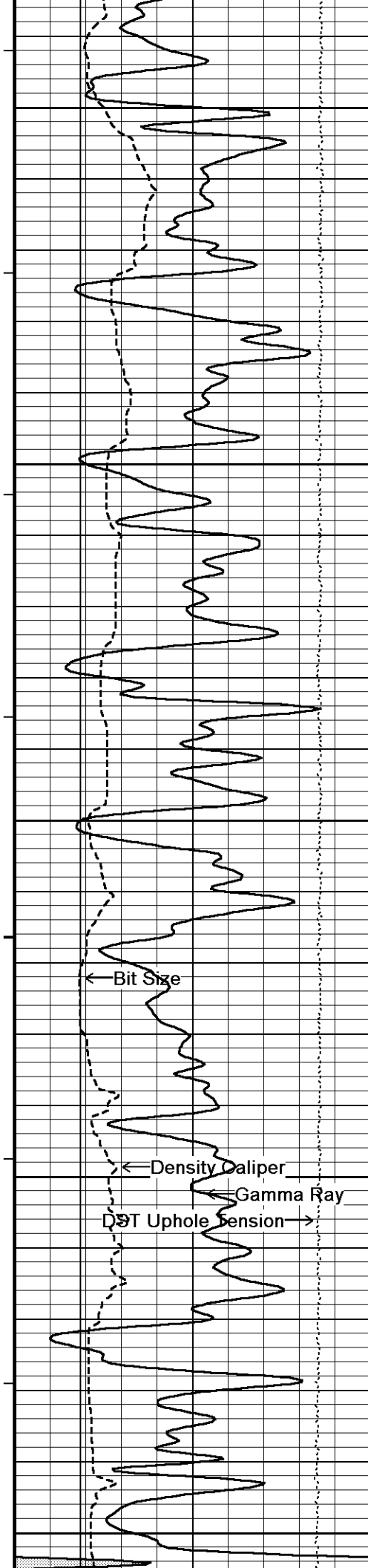
107°

3000

107°

3050





108°

3100

108°

3150

108°

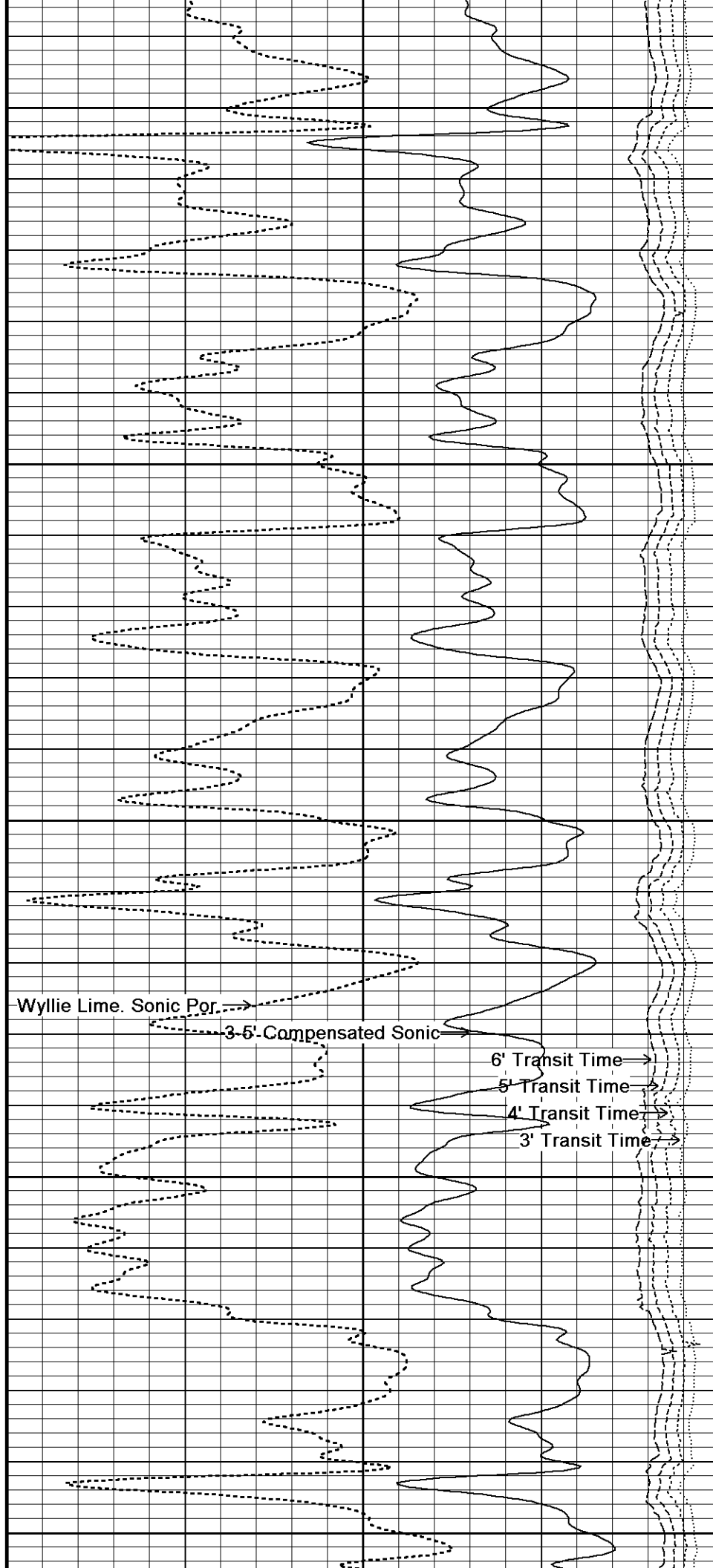
3200

108°

3250

109°

3300



Wyllie Lime. Sonic Por.

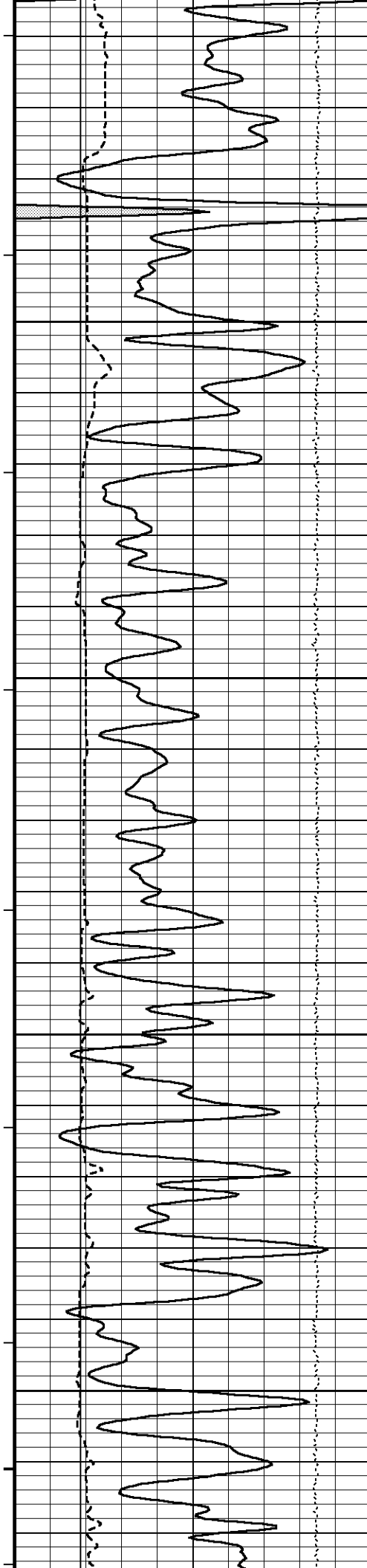
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



109°

3350

109°

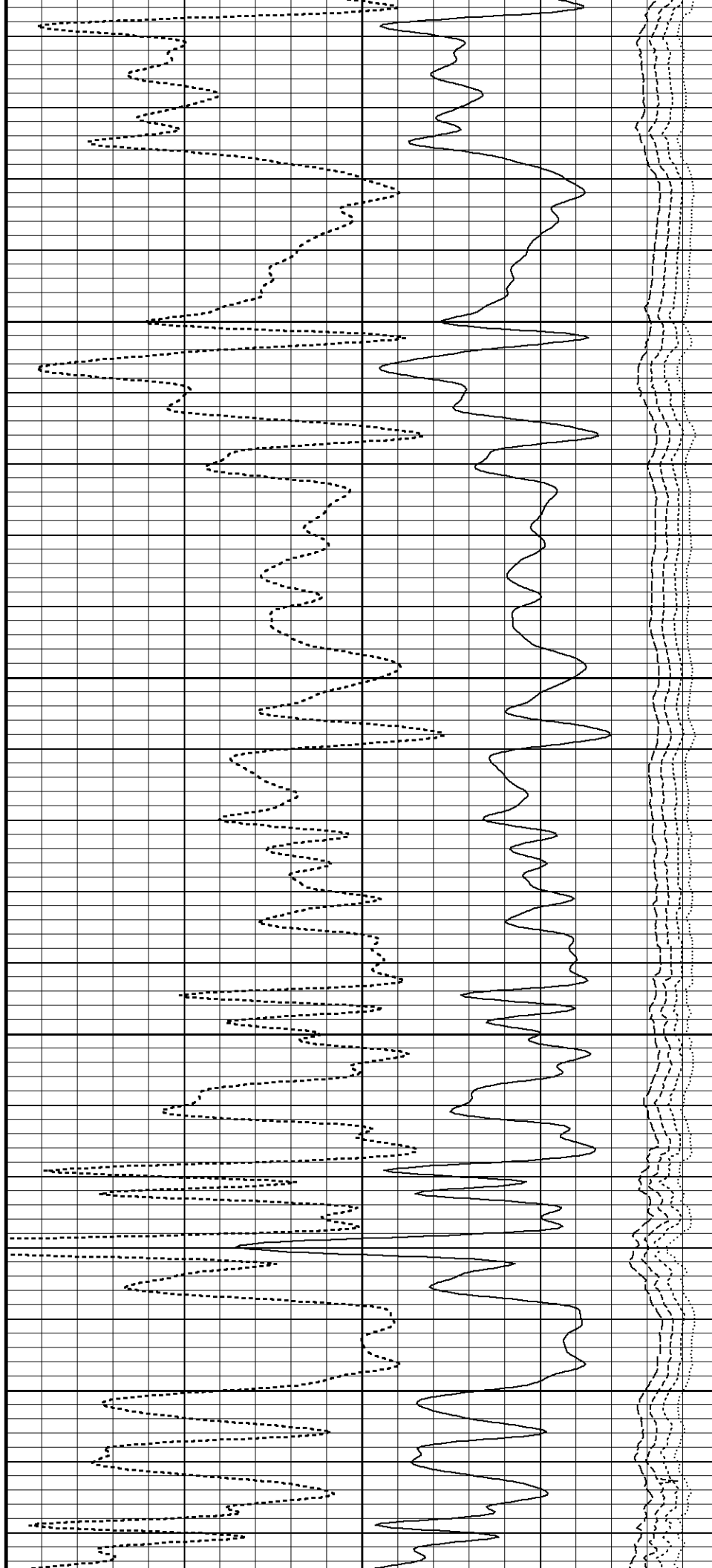
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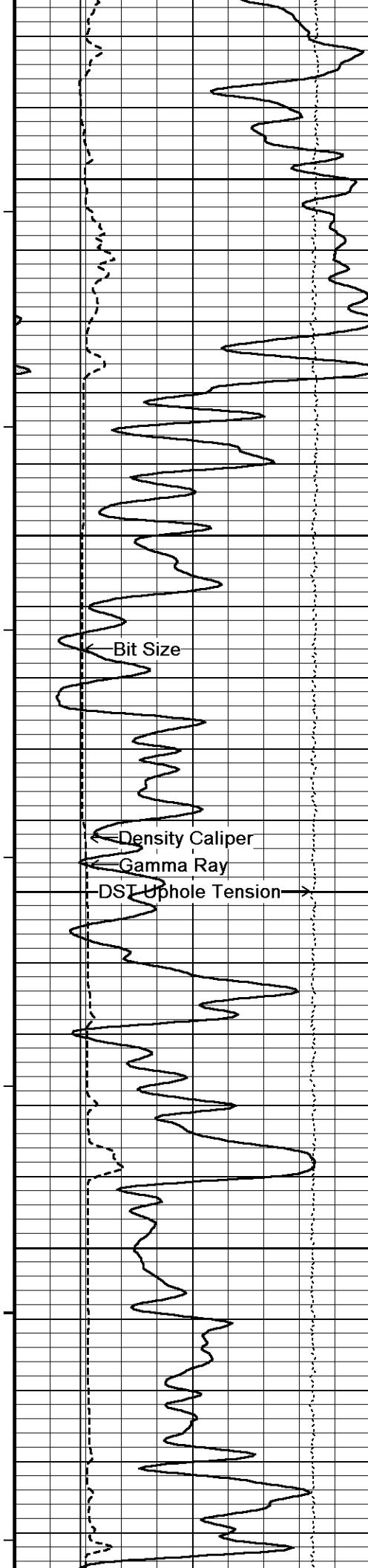
110°

3450

110°

3500





110°

3550

111°

3600

111°

3650

111°

3700

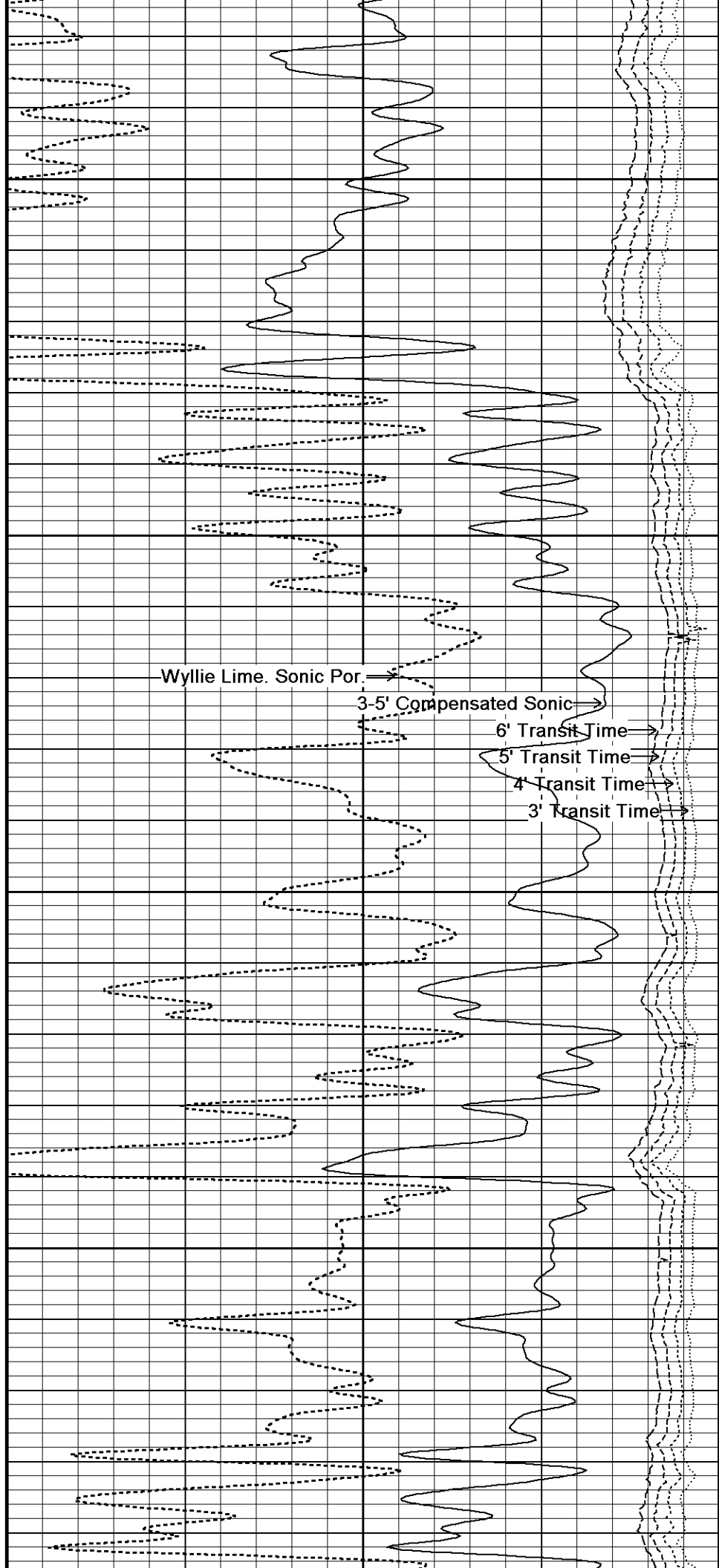
112°

Bit Size

Density Caliper

Gamma Ray

DST Uphole Tension



Wyllie Lime. Sonic Por.

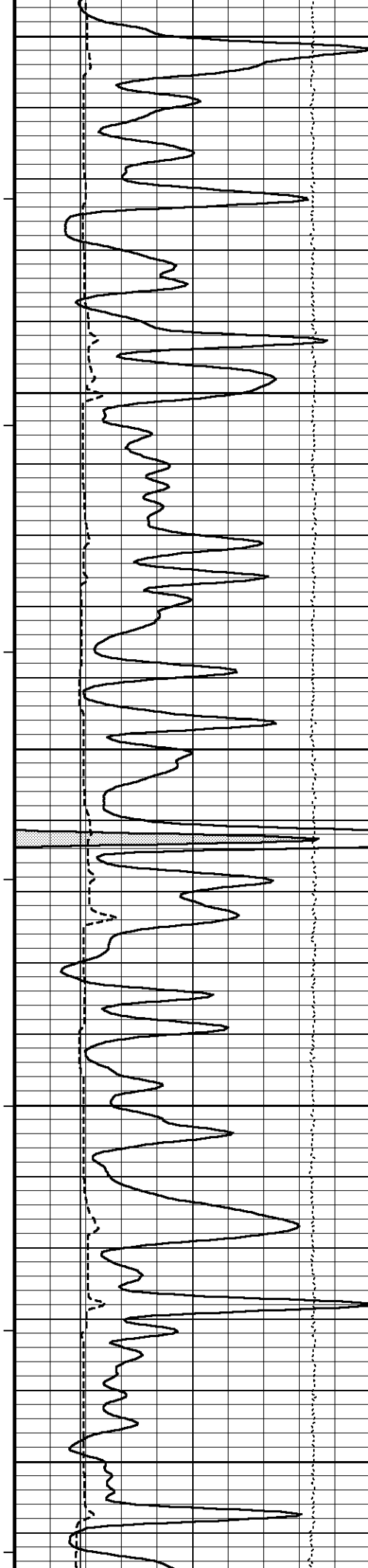
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



3750

112°

3800

112°

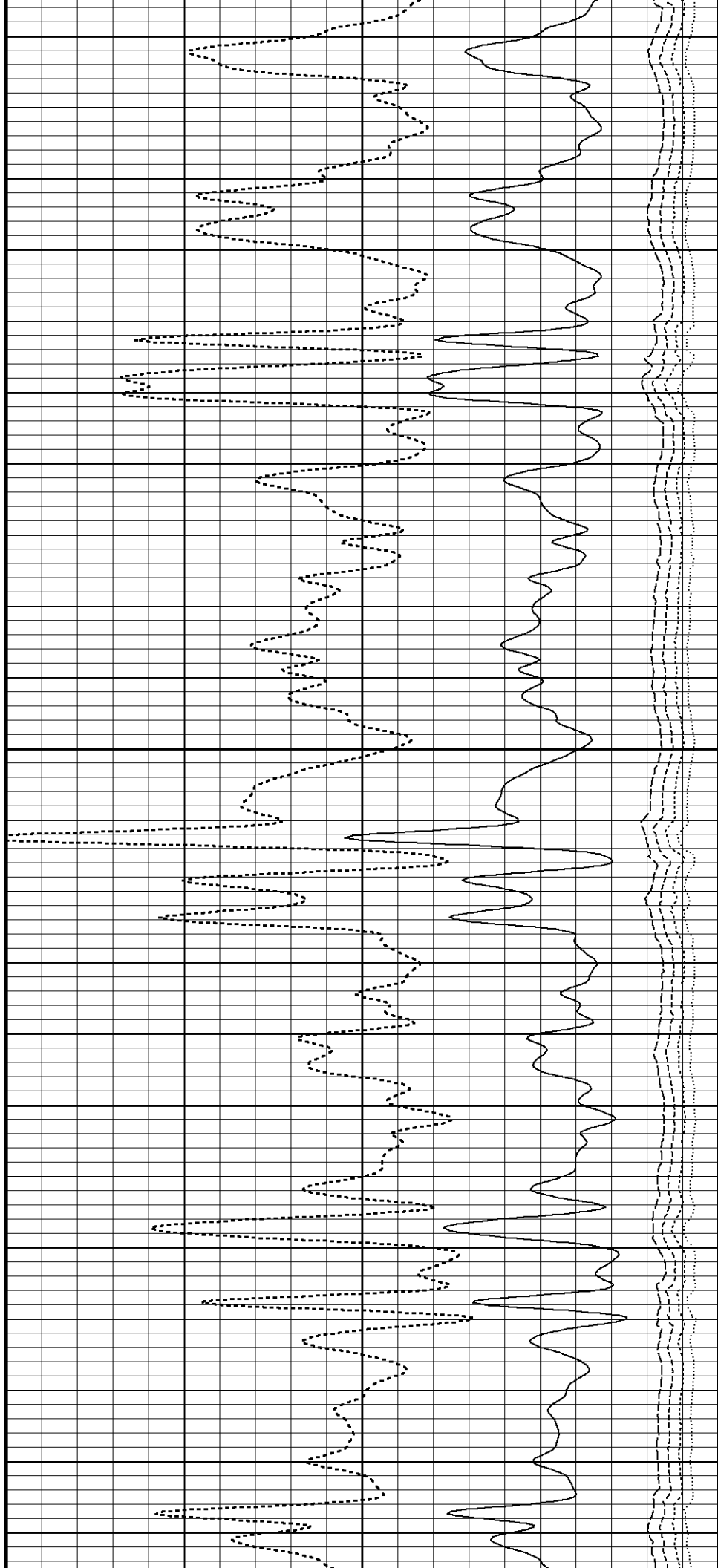
3850

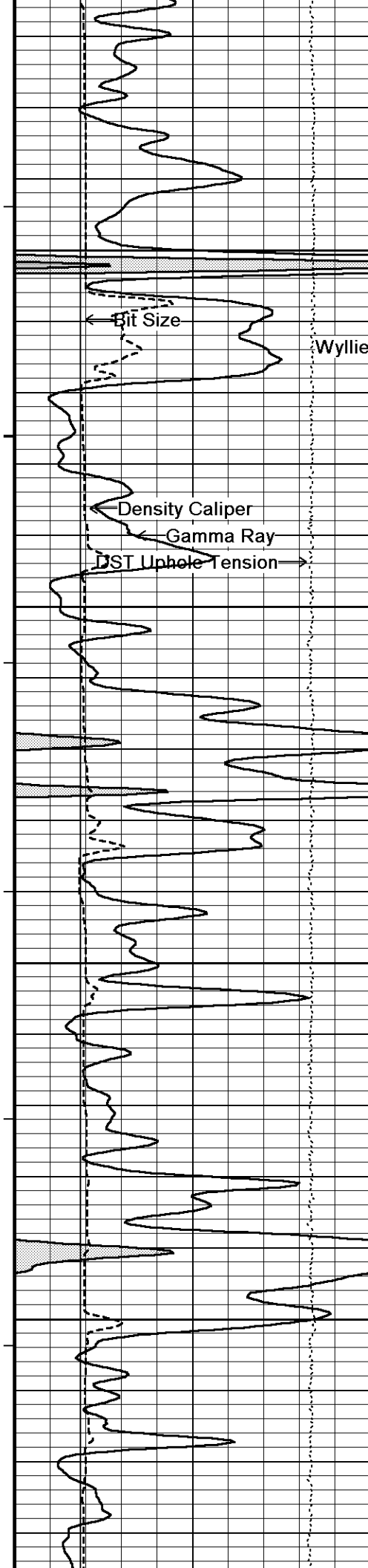
113°

3900

113°

3950





113°

4000

Wyllie Lime. Sonic Por. →

113°

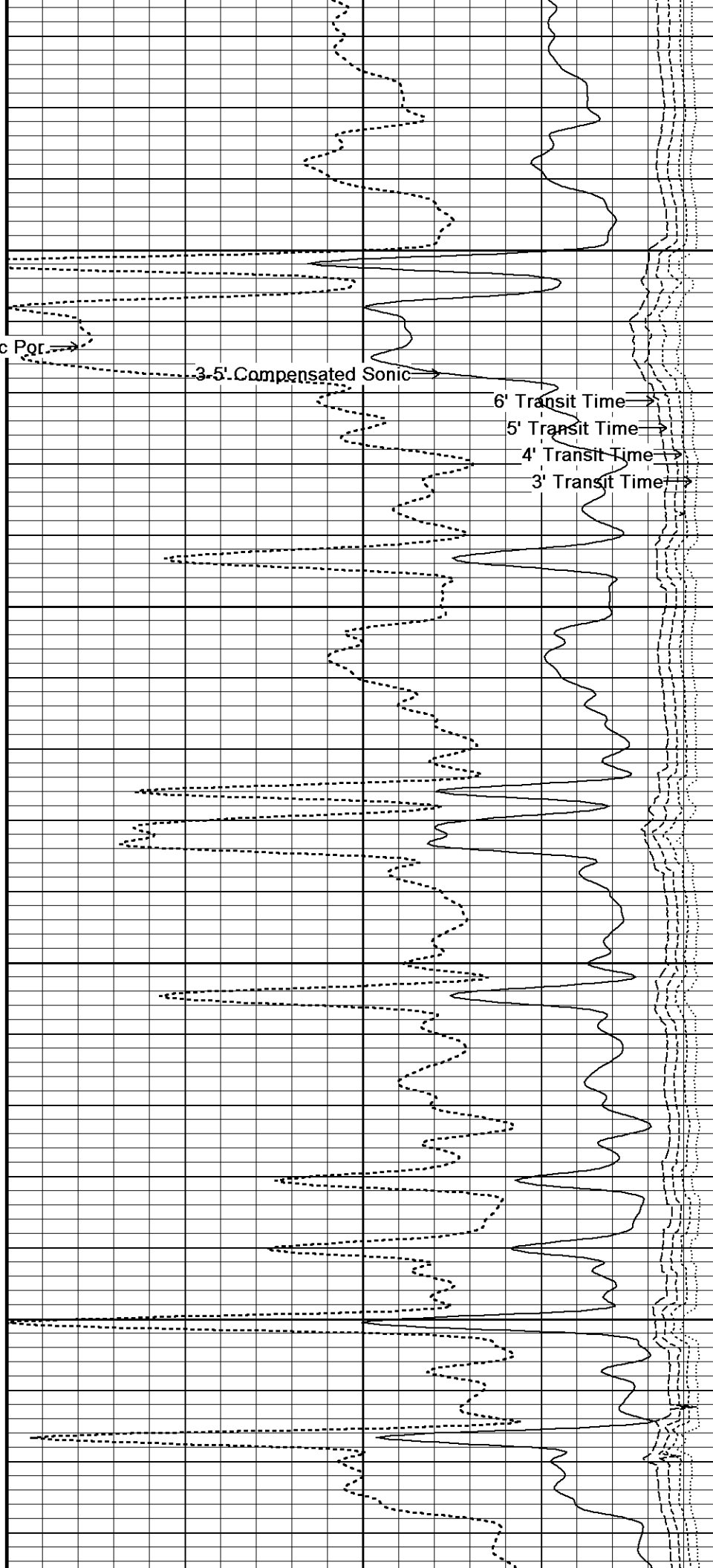
4050

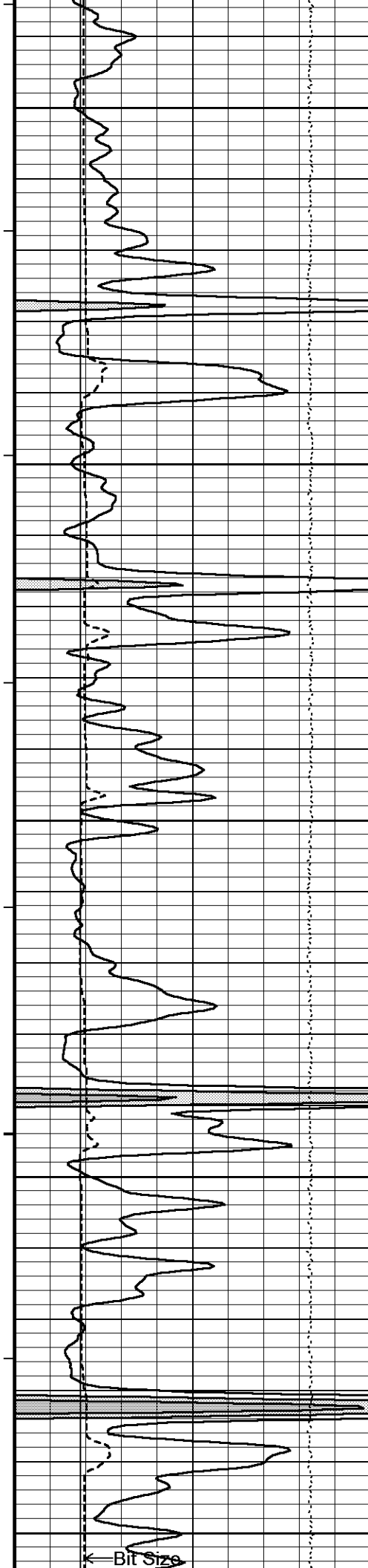
114°

4100

114°

4150





114°

4200

114°

4250

115°

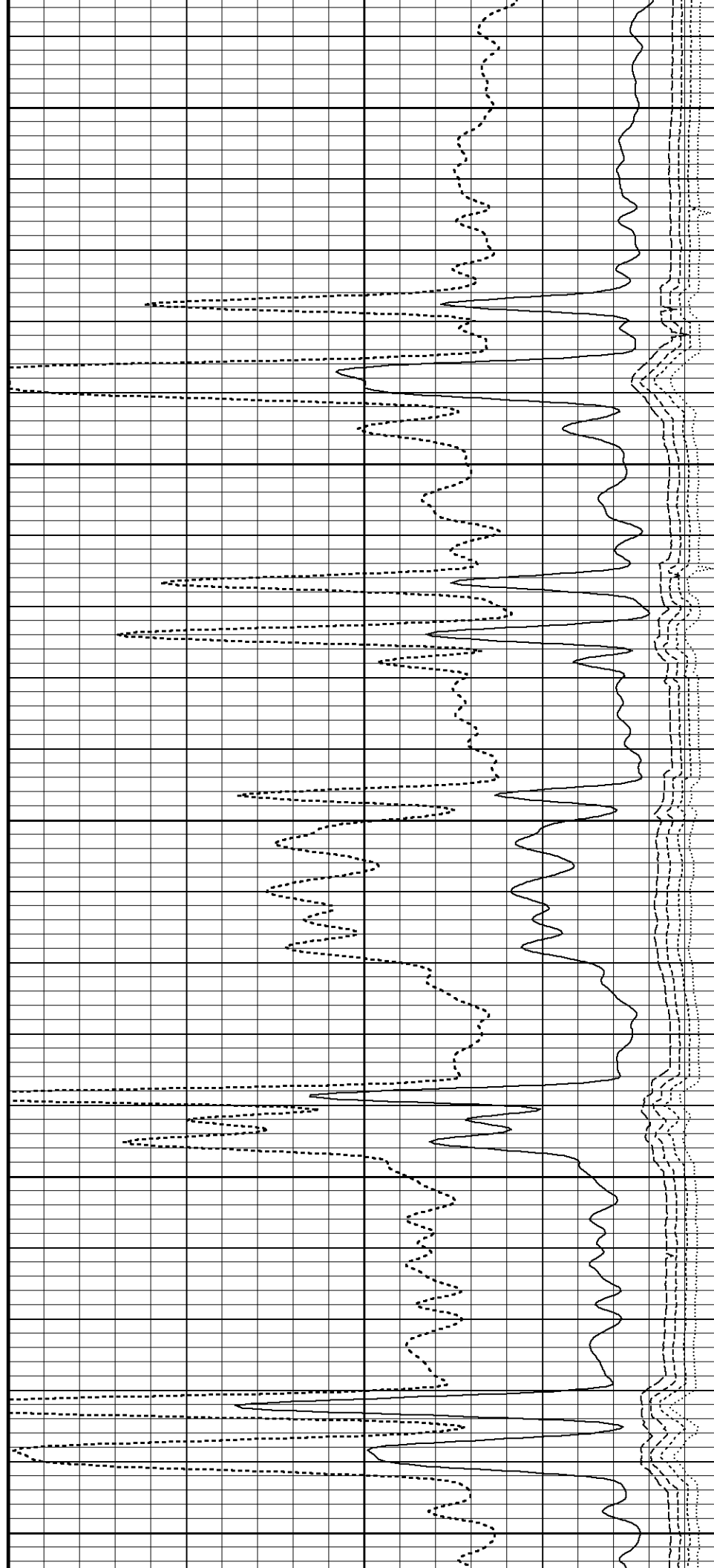
4300

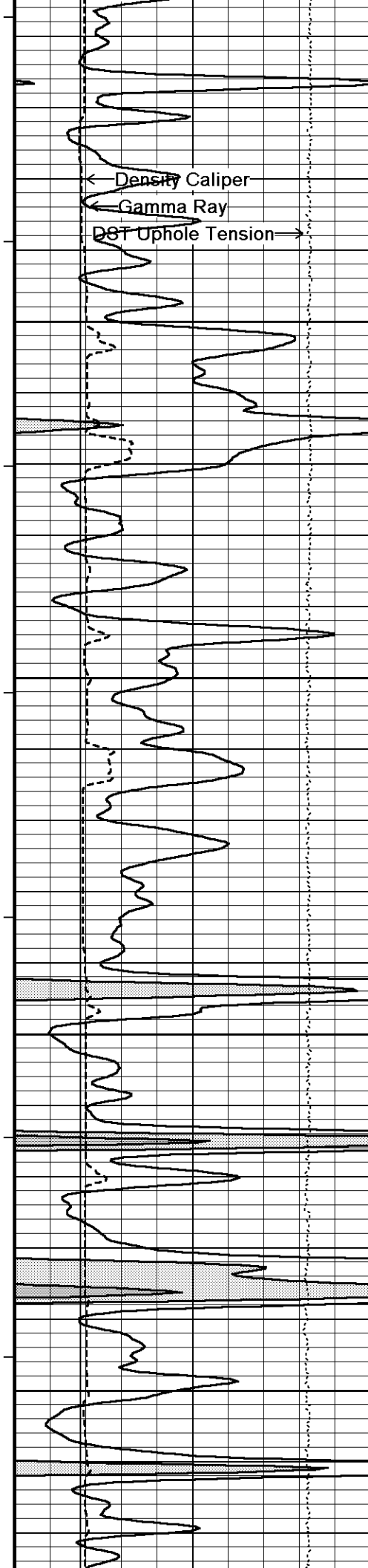
115°

4350

115°

4400





116°

4450

116°

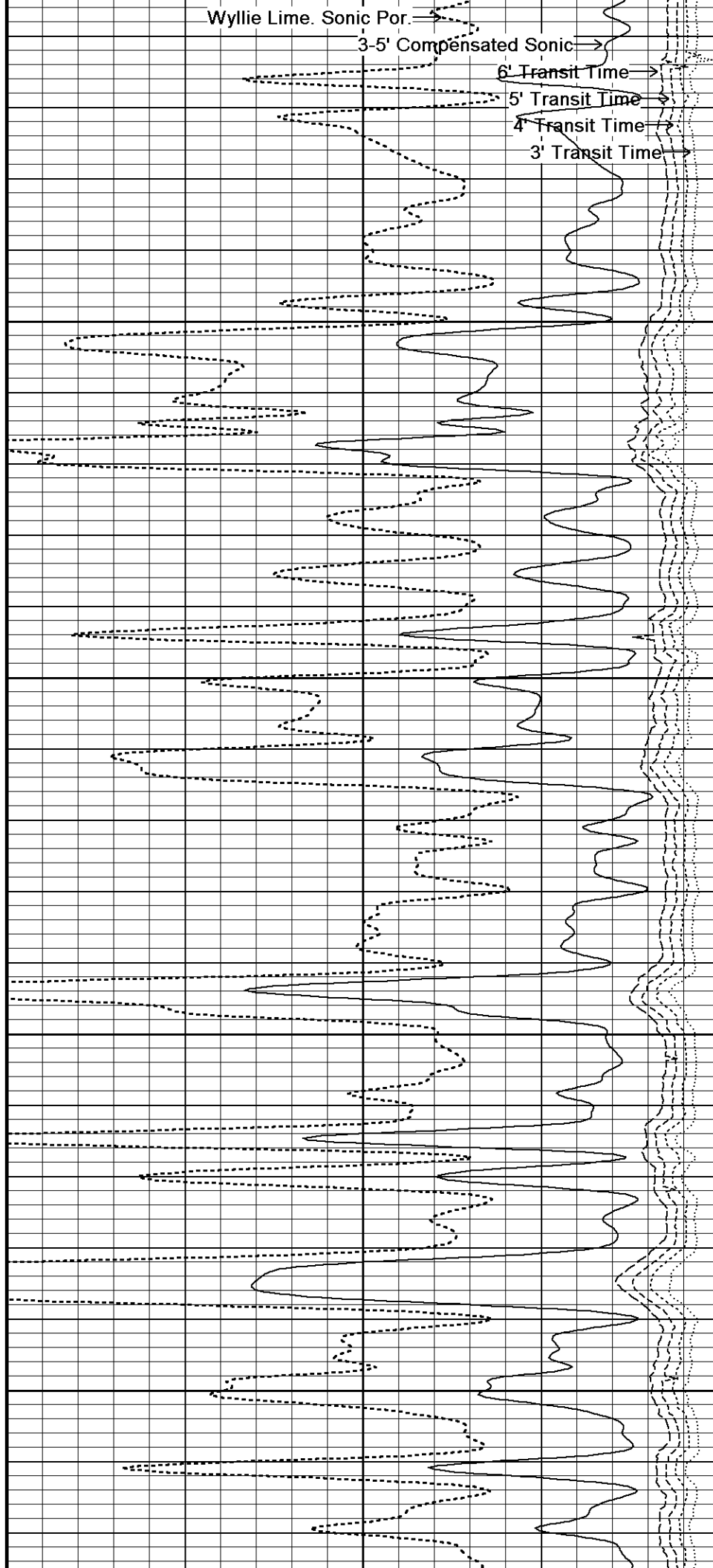
4500

117°

4550

117°

4600



Wyllie Lime. Sonic Por.

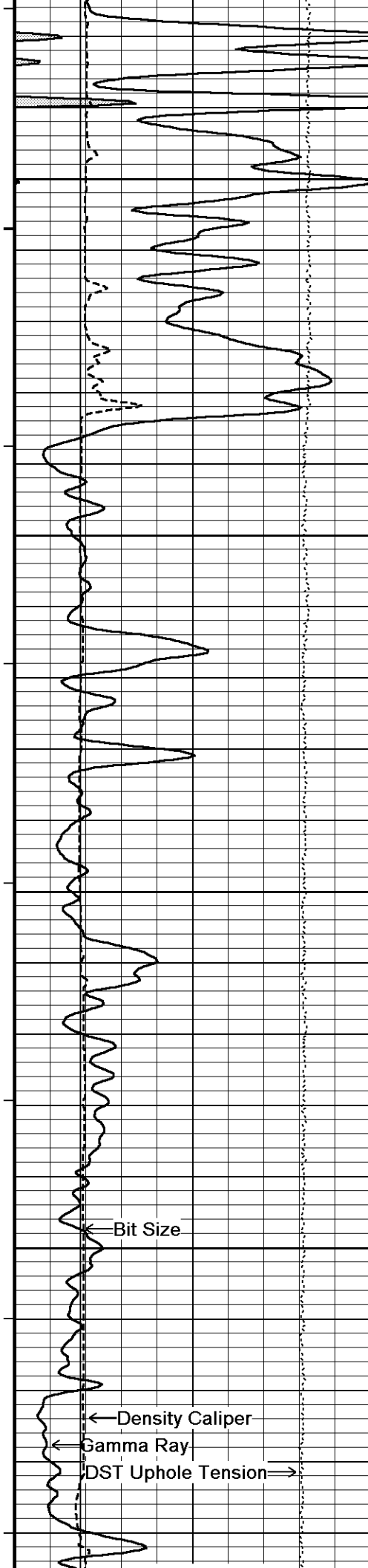
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



117°

4650

118°

4700

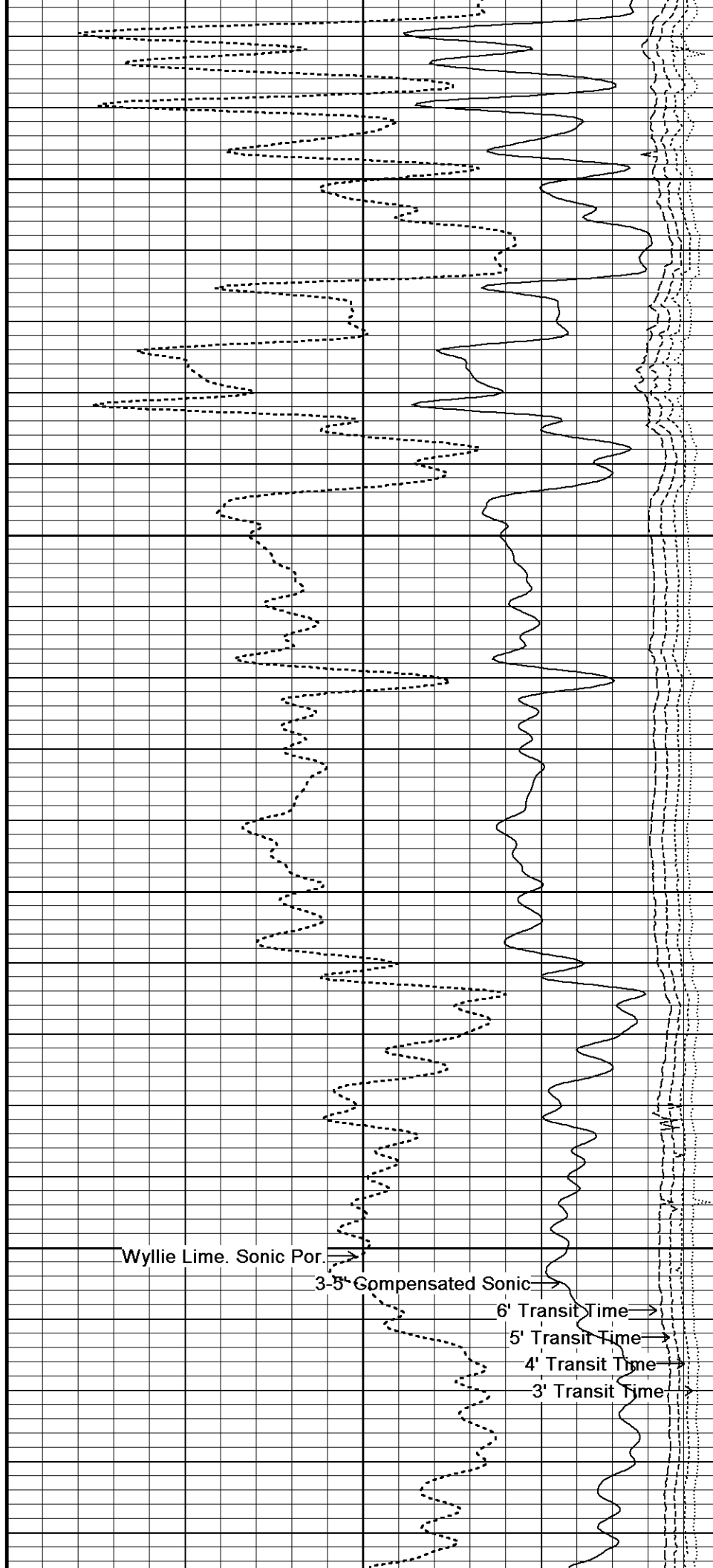
119°

4750

119°

4800

118°



Wyllie Lime. Sonic Por.

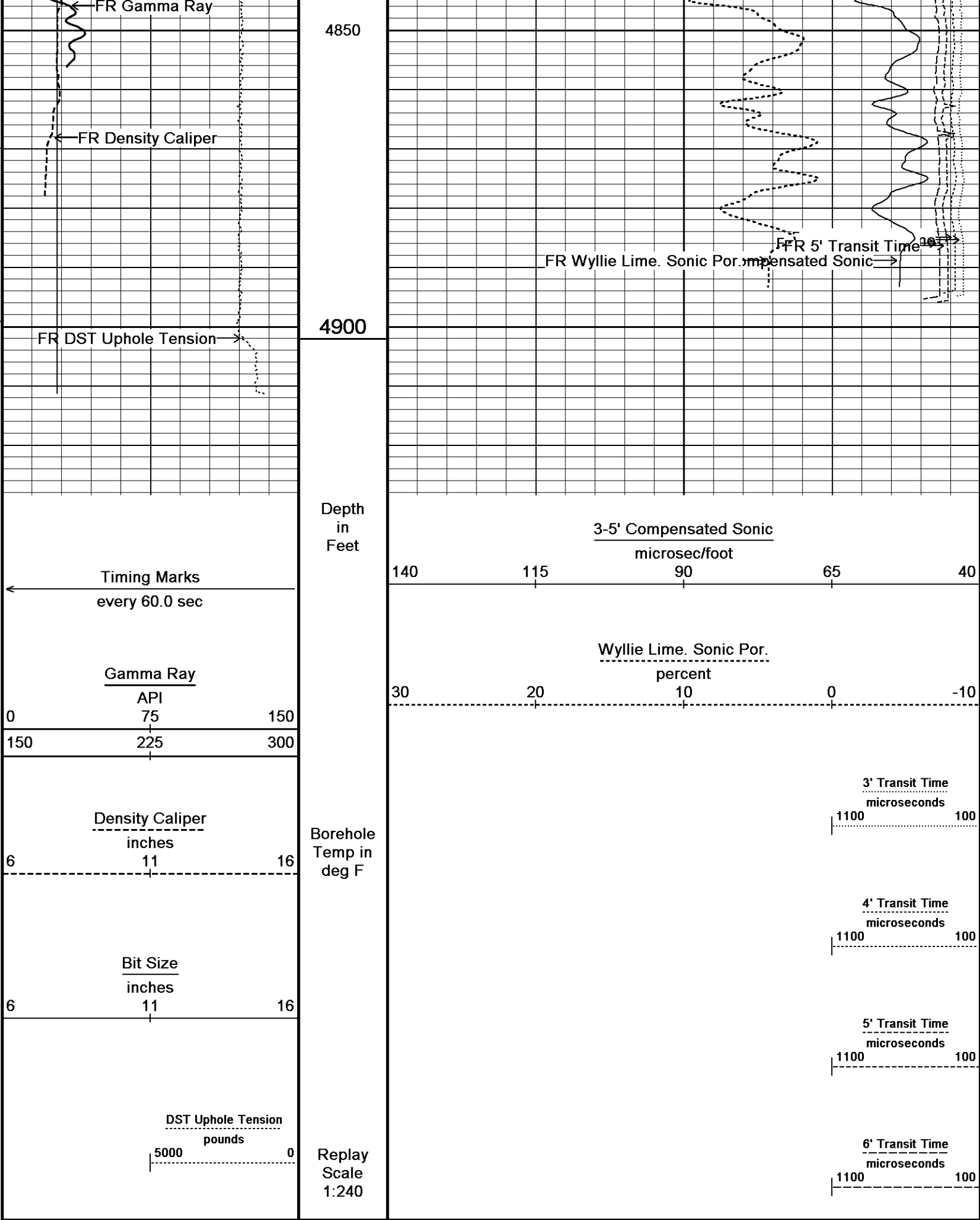
3-5" Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time





REPEAT SECTION



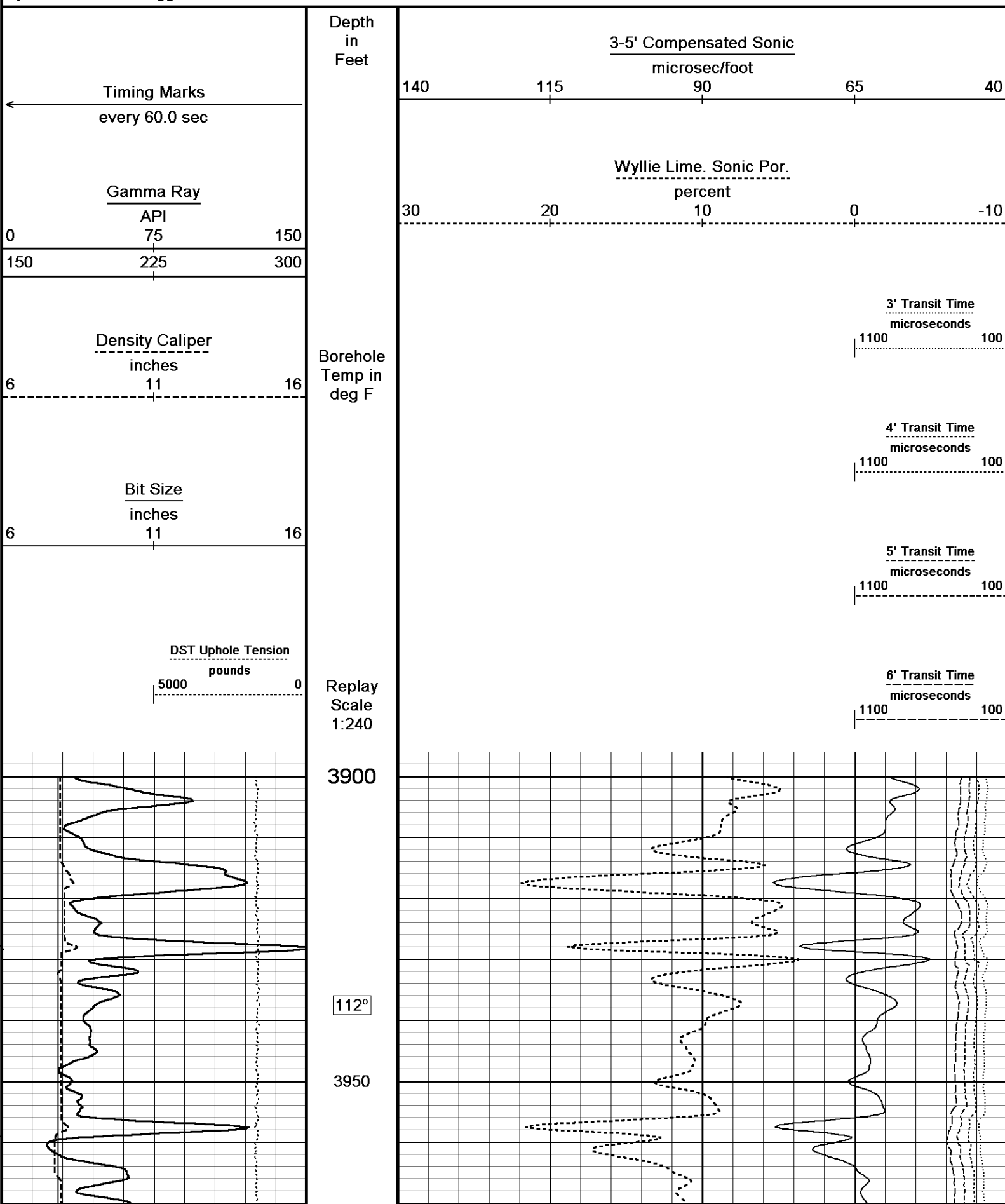
Depth Based Data - Maximum Sampling Increment 10.0cm

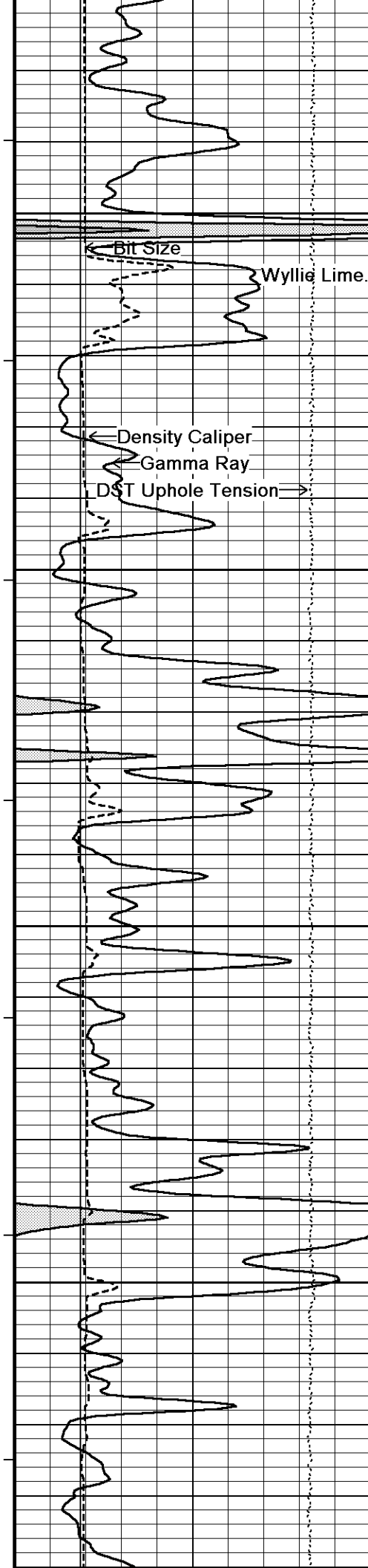
Plotted on 12-APR-2014 18:27

Filename: C:\Minimus 13.08.2113\Logs\FIML HIBBERT 4D-...\FIML HIBBERT 4D-20-2029 REPEAT.dta

Recorded on 12-APR-2014 14:03

System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113





113°

4000

Bit Size

Wyllie Lime. Sonic Por.

113°

4050

Density Caliper

Gamma Ray

DST Uphole Tension

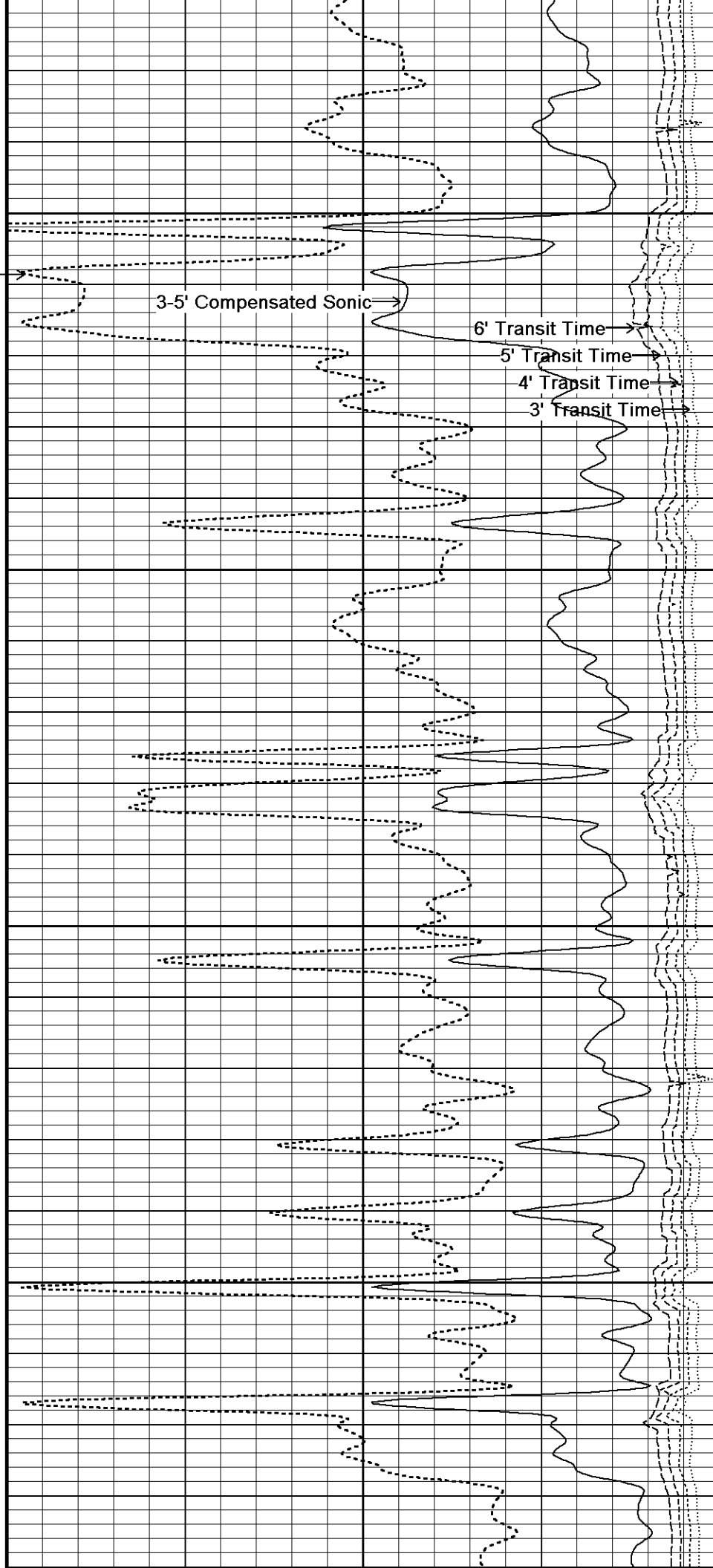
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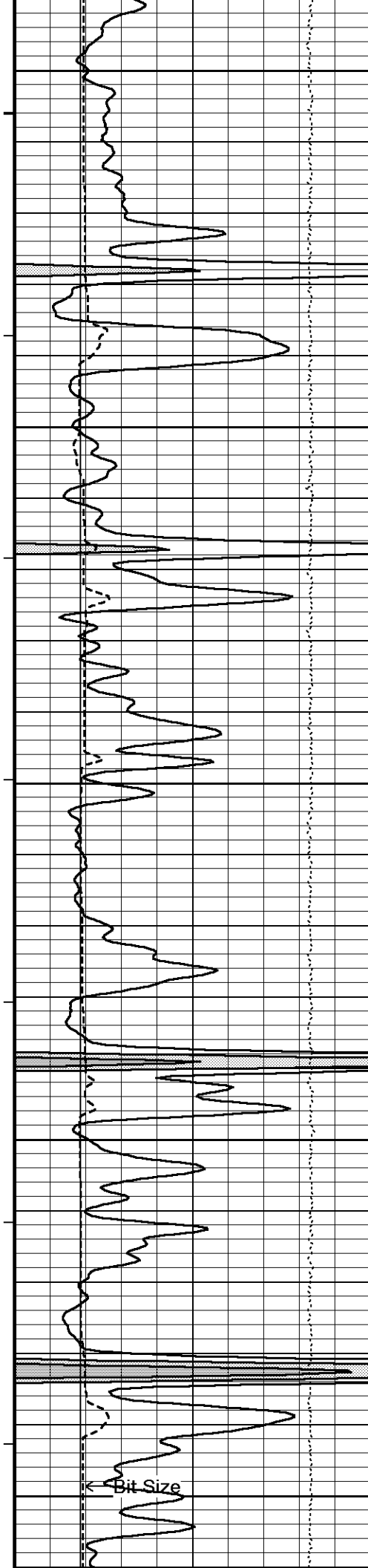
4100

113°

4150

114°





4200

114°

4250

114°

4300

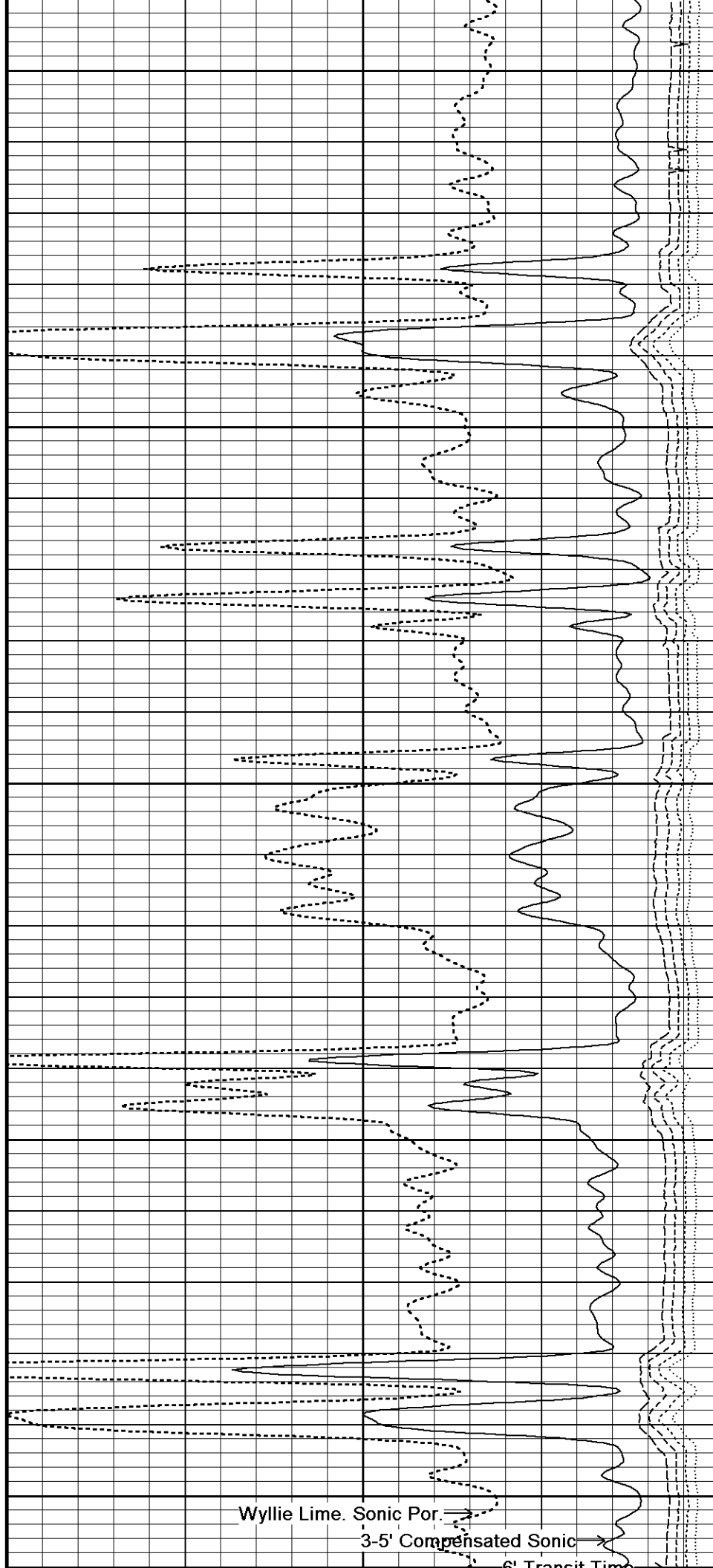
114°

4350

115°

4400

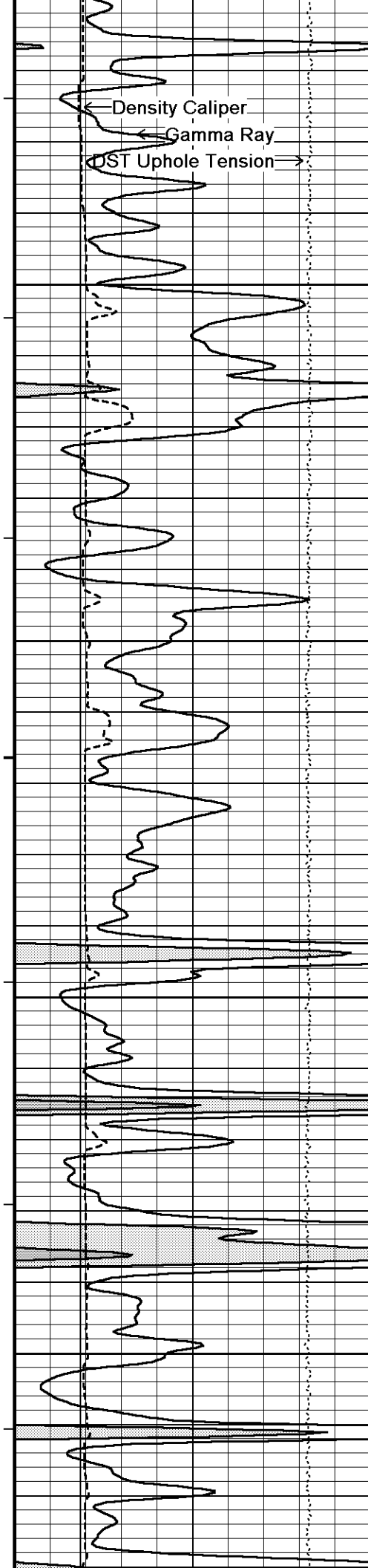
Bit Size



Wyllie Lime. Sonic Por. →

3-5' Compensated Sonic →

6' Transit Time →



115°

4450

115°

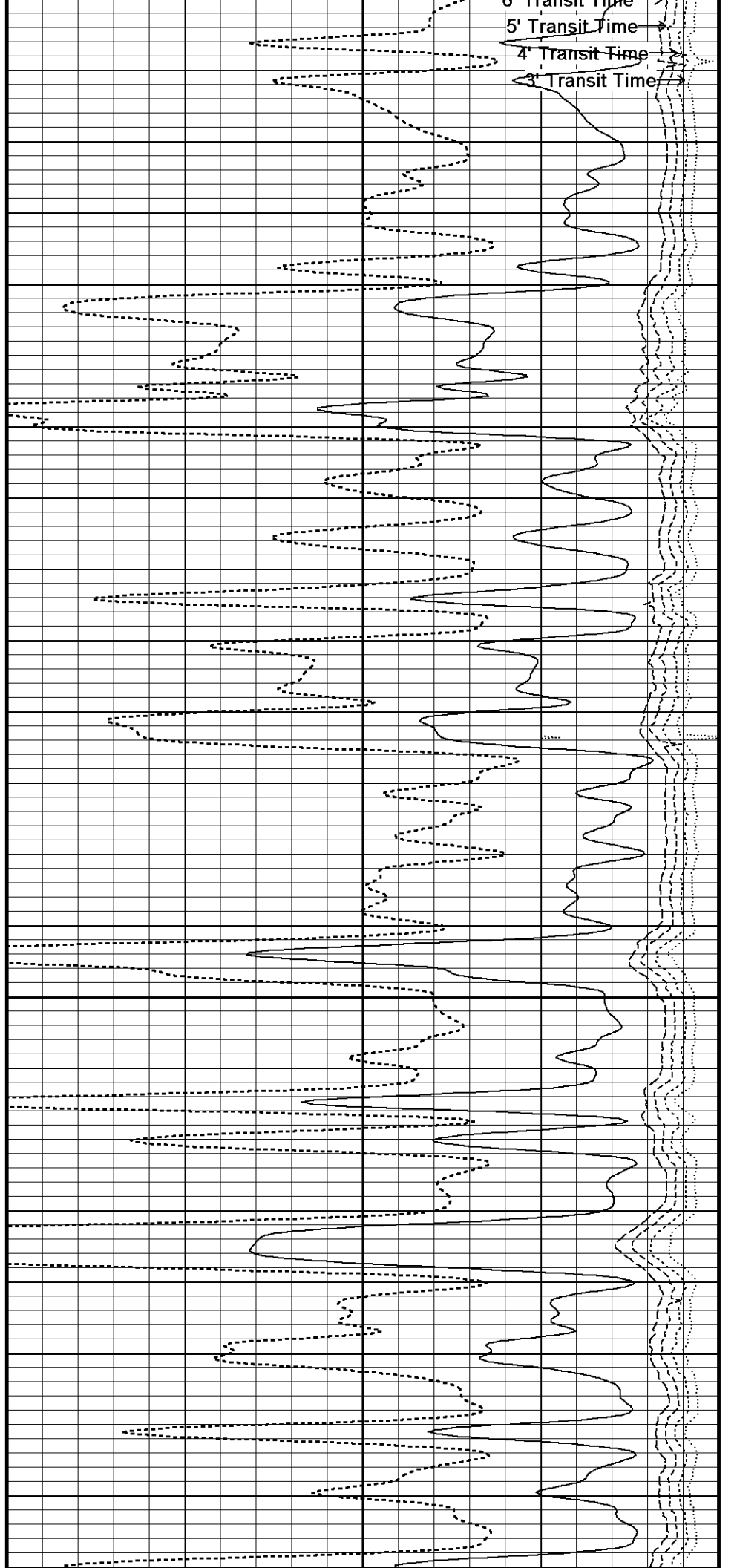
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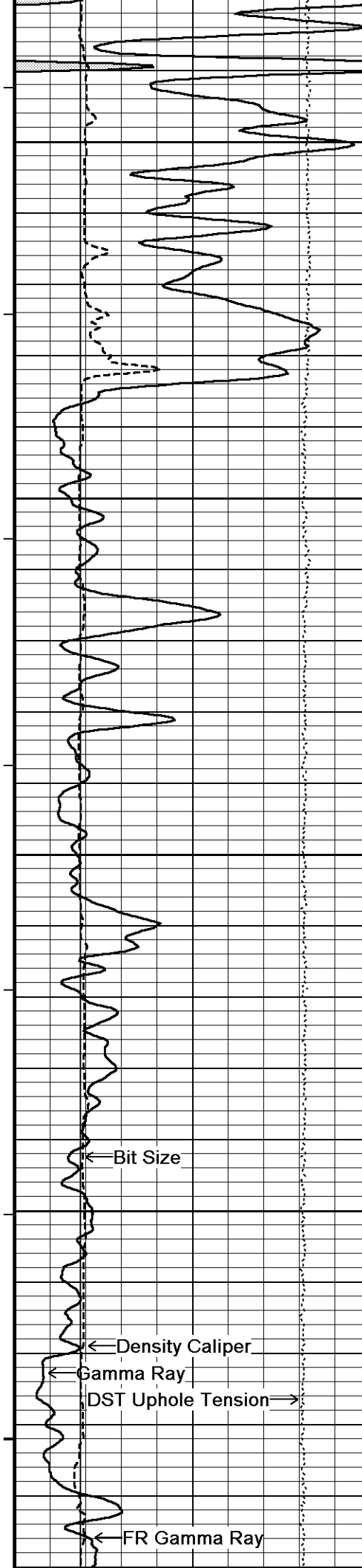
116°

4550

116°

4600





116°

4650

117°

4700

117°

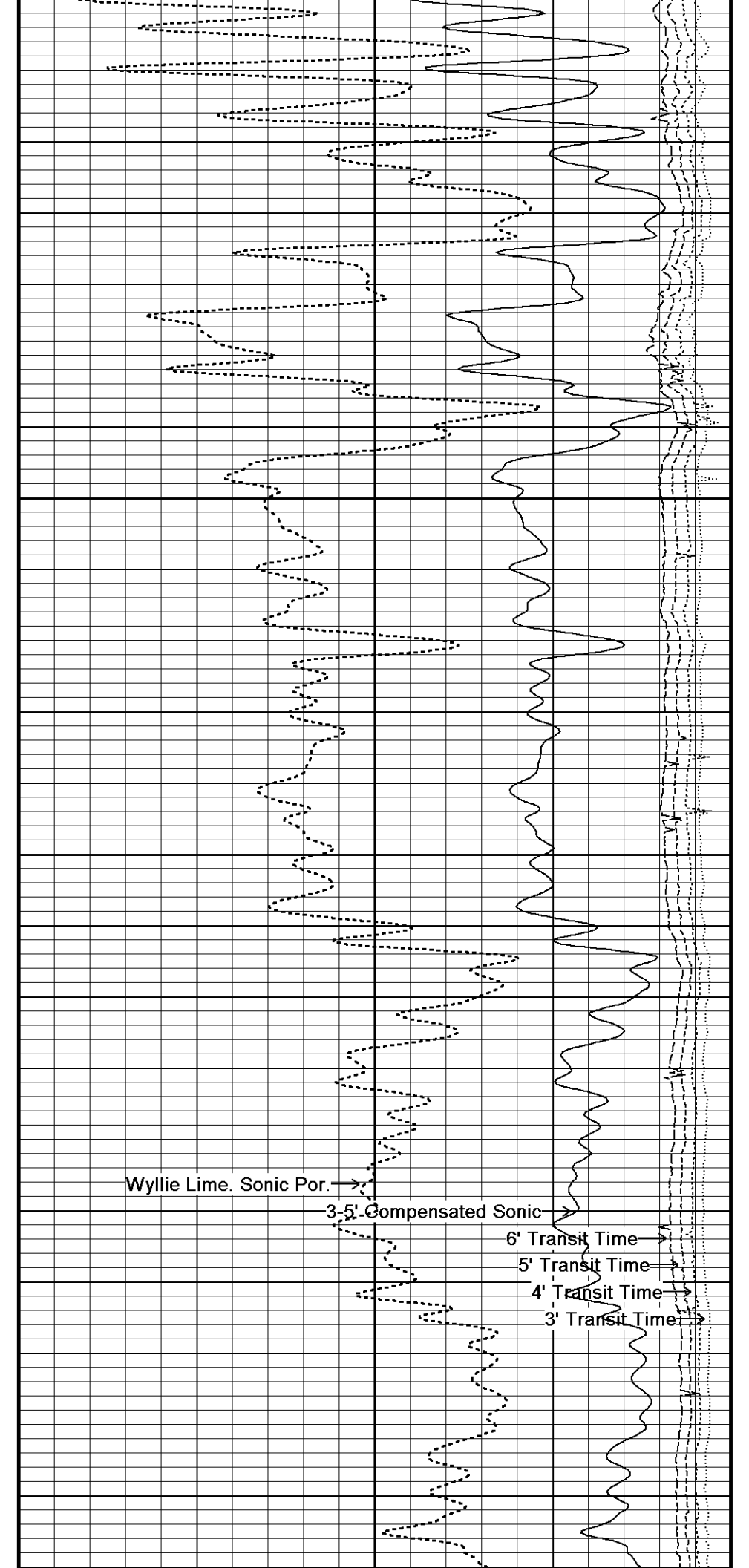
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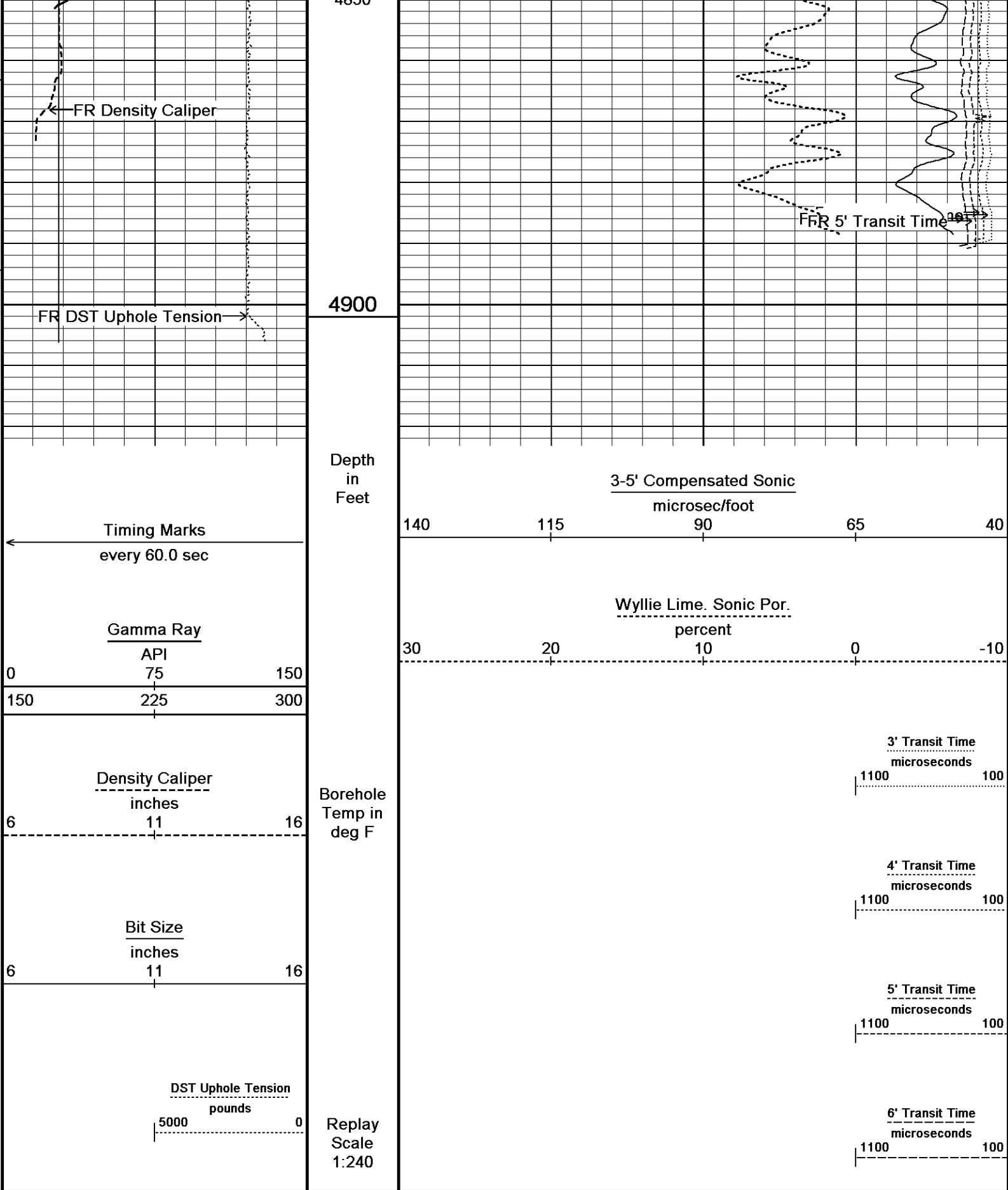
117°

4800

117°

4850





General Constants All 000

Last Edited on 12-APR-2014,13:35

General Parameters

Mud Resistivity	0.800	ohm-metres
Mud Resistivity Temperature	96.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Water Level Switch	

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	MMR Caliper	

Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Array Ind. Four Res Rt
RWA Constant A	0.610
RWA Constant M	2.150
SW/APOR Tool Source	0.000

Gamma Calibration MCG-D.K 443

Field Calibration on 10-APR-2014 11:55

	Measured	Calibrated (API)
Background	75	49
Calibrator (Gross)	1183	774
Calibrator (Net)	1108	725

Gamma Constants MCG-D.K 443

Last Edited on 12-APR-2014,13:35

Gamma Calibrator Number	GRC38	
Mud Density	1.11	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

Field Calibration on 05-MAR-2014,20:50

	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 05-MAR-2014,20:50

Pre-filter Length	11
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Sonic Constants MSS-A.A 126

Last Edited on 19-MAR-2014,17:48

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 Sonic	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	N/A	micro-sec
MX3FT	N/A	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft

Sonde Mode	Compensated
Hole Type	Open Hole

Sonde Parameters

	Measured	Calibrated
Offset	N/A	0.0000
...	N/A	N/A

Free Pipe	N/A	N/A	N/A	N/A	N/A
Peak Amplitude Source	N/A				
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)	N/A		
N/A	N/A	N/A			
N/A	N/A	N/A	N/A		
N/A	N/A	N/A	N/A		
N/A	N/A	N/A	N/A		
N/A	N/A	N/A	N/A		

Full Waveform Parameters

Use 3' Waveform to derive TR	N/A	
Use 4' Waveform to derive TR	N/A	
Use 5' Waveform to derive TR	N/A	
Use 6' Waveform to derive TR	N/A	
3' Waveform Discriminator Level	N/A	mV
4' Waveform Discriminator Level	N/A	mV
5' Waveform Discriminator Level	N/A	mV
6' Waveform Discriminator Level	N/A	mV
3' Waveform Filter	N/A	
4' Waveform Filter	N/A	
5' Waveform Filter	N/A	
6' Waveform Filter	N/A	
Semblance Level	N/A	
Semblance Window Width	N/A	micro-sec
Sonic 1 Despiker	N/A	N/A
Sonic 2 Despiker	N/A	N/A

Caliper Calibration MPD-B 31

Base Calibration on 02-APR-2014 10:39
Field Calibration on 10-APR-2014 11:42

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	18192	3.99
2	27035	5.98
3	35696	7.97
4	44016	9.86
5	53216	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.91	7.97

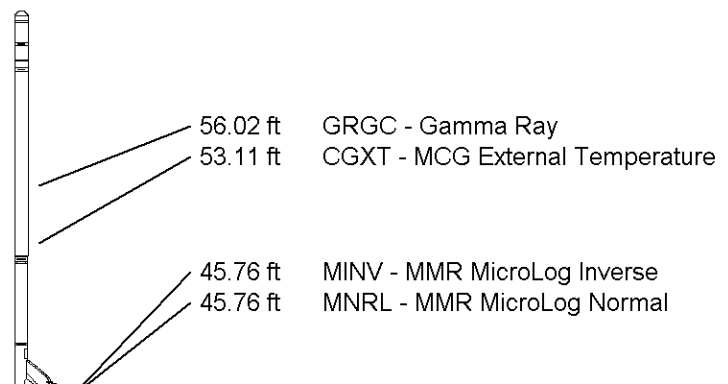
DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Logs\FIML HIBBERT 4D-20-2029\FIML HIBBERT 4D-20-2029 REPEAT.dta

MCB-A 11B Tension Cablehead
MCB-A 170 LG: 2.18 ft WT: 19.8 lb OD: 2.240 in

Compact Comms Gamma
MCG-D.K 443 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in



Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

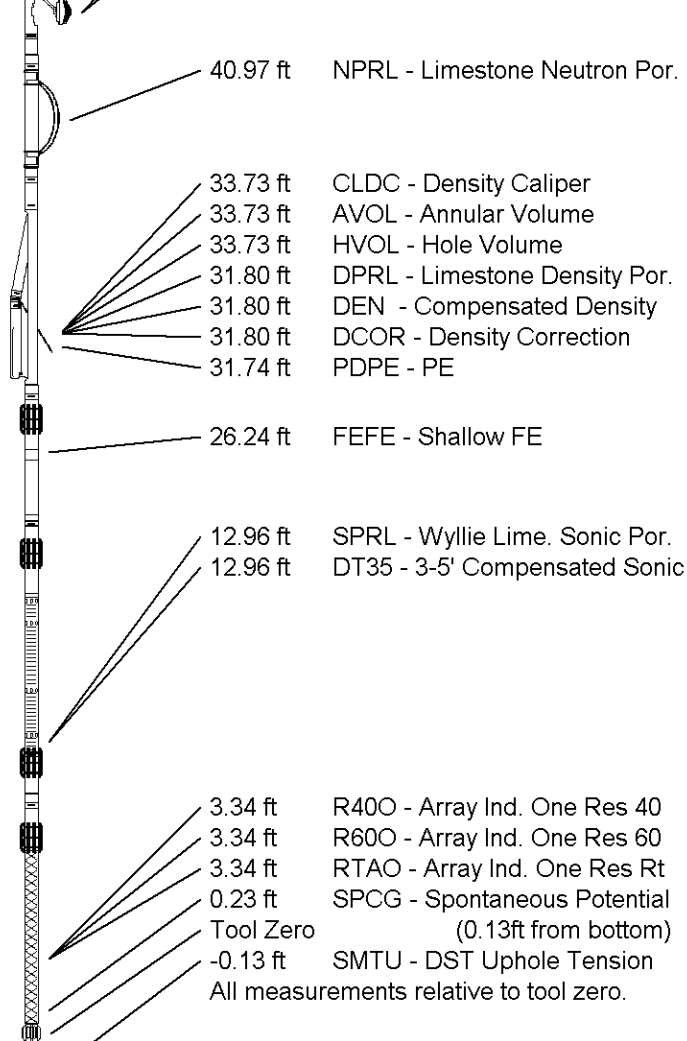
Compact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focused Electric
MFE-B.J 352 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 158 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.48 ft Weight: 476.2 lb



COMPANY	FIML NATURAL RESOURCES, LLC.
WELL	HIBBERT 4D-20-2029
FIELD	WILDCAT
PROVINCE/COUNTY	LANE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2892.00	feet	First Reading	4889.00	feet
Elevation Drill Floor	2890.00	feet	Depth Driller	4900.00	feet
Elevation Ground Level	2882.00	feet	Depth Logger	4902.00	feet



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COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME