

**Weatherford**[®]**COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

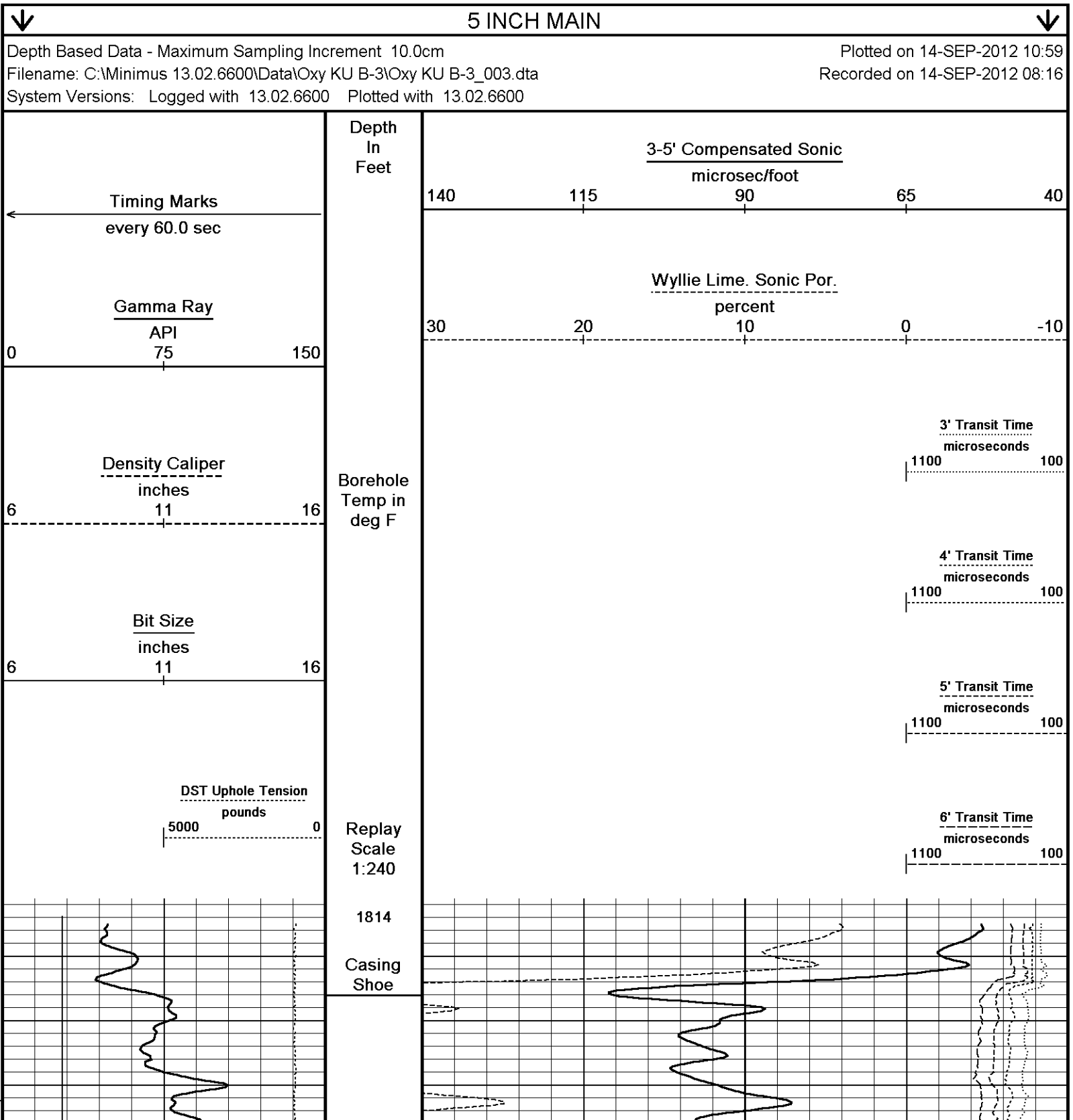
COMPANY		OXY USA, INC.	
WELL		KU B-3	
FIELD		ARROYO	
PROVINCE/COUNTY		STANTON	
COUNTRY/STATE		U.S.A. / KANSAS	
LOCATION		2060' FSL & 2020' FEL	
SEC	TWP	RGE	Other Services
17	29S	41W	MPD/MDN
API Number	15-187-21208		MML
Permit Number			
Permanent Datum GL, Elevation 3411 feet			MAI/MFE
Log Measured From KB			Elevations: KB 3425.00 DF 3423.00 GL 3411.00
Drilling Measured From KB			
Date	13-SEP-2012		
Run Number	ONE		
Depth Driller	5850.00		
Depth Logger	5854.00		
First Reading	5841.00		
Last Reading	1826.00		
Casing Driller	1824.00		
Casing Logger	1826.00		
Bit Size	7.875		
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.20 lb/USg		
PH / Fluid Loss	11.30		
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.81 @ 98.0		
Rmf @ Measured Temp	0.65 @ 98.0		
Rmc @ Measured Temp	0.97 @ 98.0		
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.61 @132.0		
Time Since Circulation	6 HOURS		
Max Recorded Temp	132.00		
Equipment Name	COMPACT		
Equipment / Base	13057		
Recorded By	ADAM SILL		
Witnessed By	EARLY ZION		
S.O. # / JOB #	3538920		

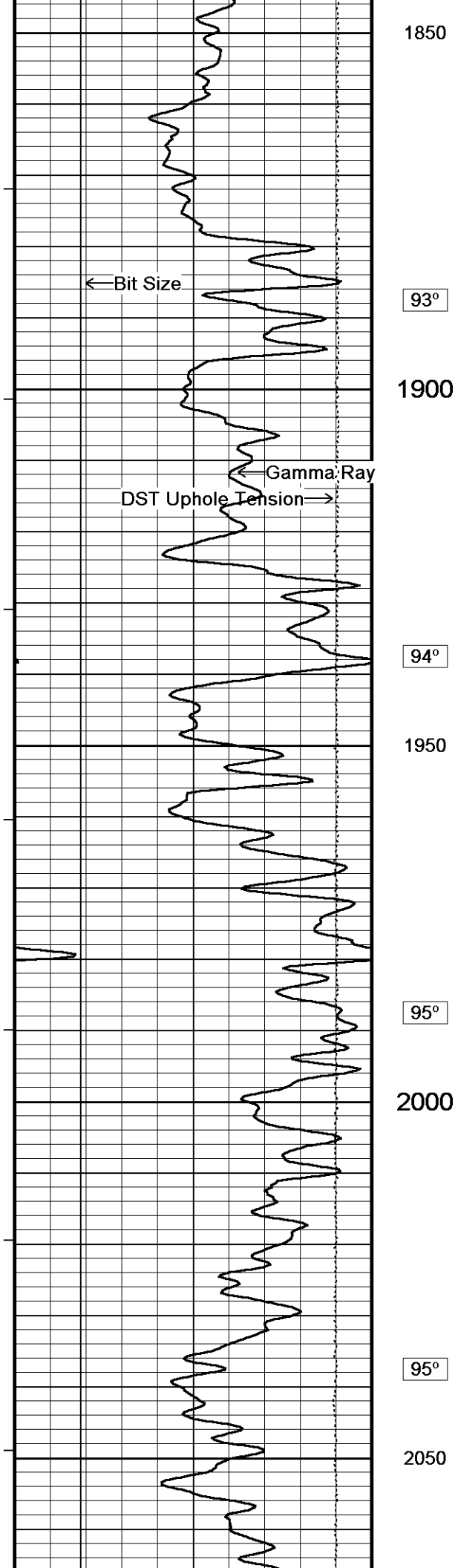
BOREHOLE RECORD					Last Edited: 13-SEP-2012 00:01
Bit Size inches		Depth From feet		Depth To feet	
7.875		1824.00		5850.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	1824.00	24.00	

REMARKS
- SOFTWARE ISSUE: WLS 13.02.6600.
- 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.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 1484 CU. FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 822 CU. FT.

- SERVICE ORDER # 3538920.
- RIG: AZTEC #777.
- ENGINEER: A. SILL.
- OPERATOR(S): B. REEVES.

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.





1850

93°

1900

94°

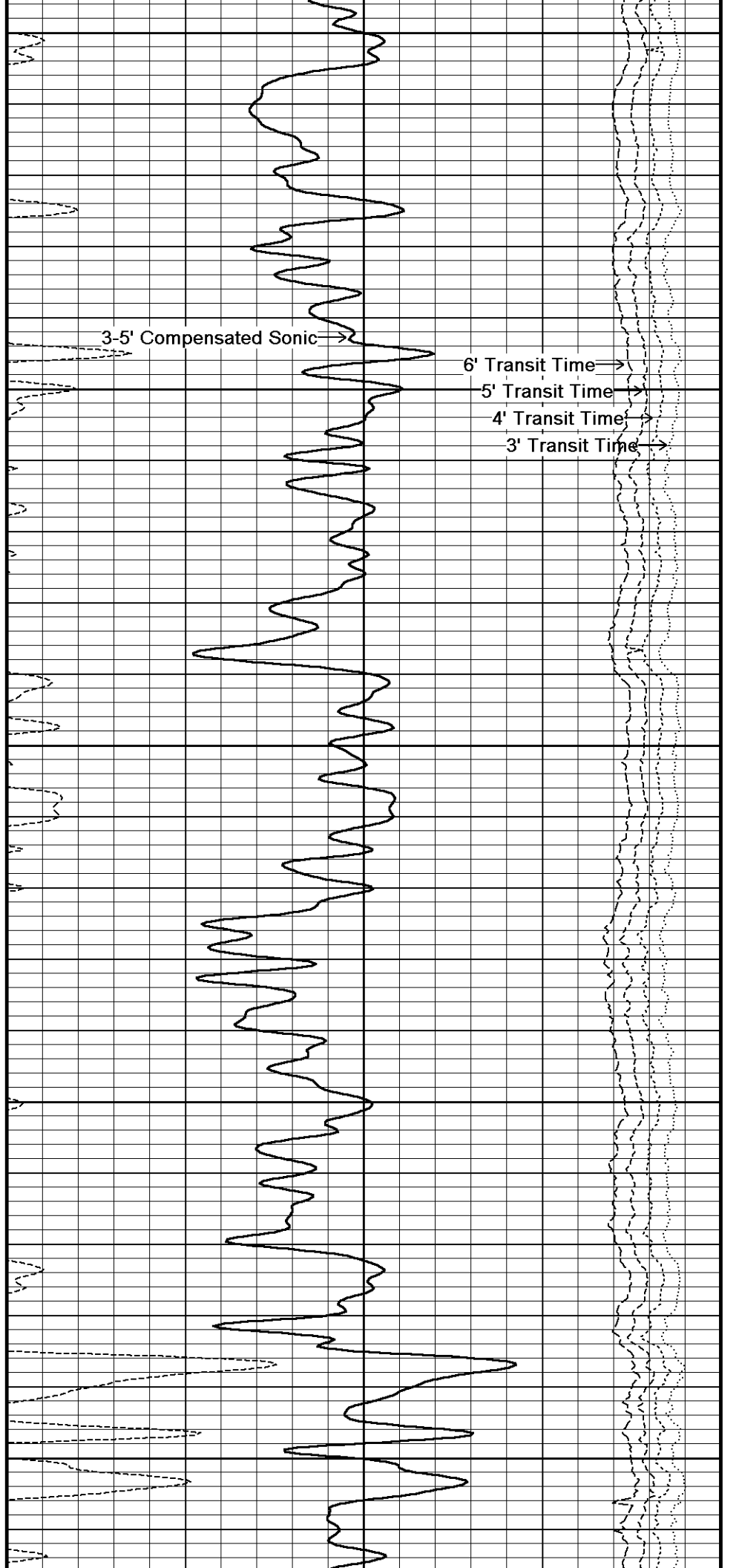
1950

95°

2000

95°

2050



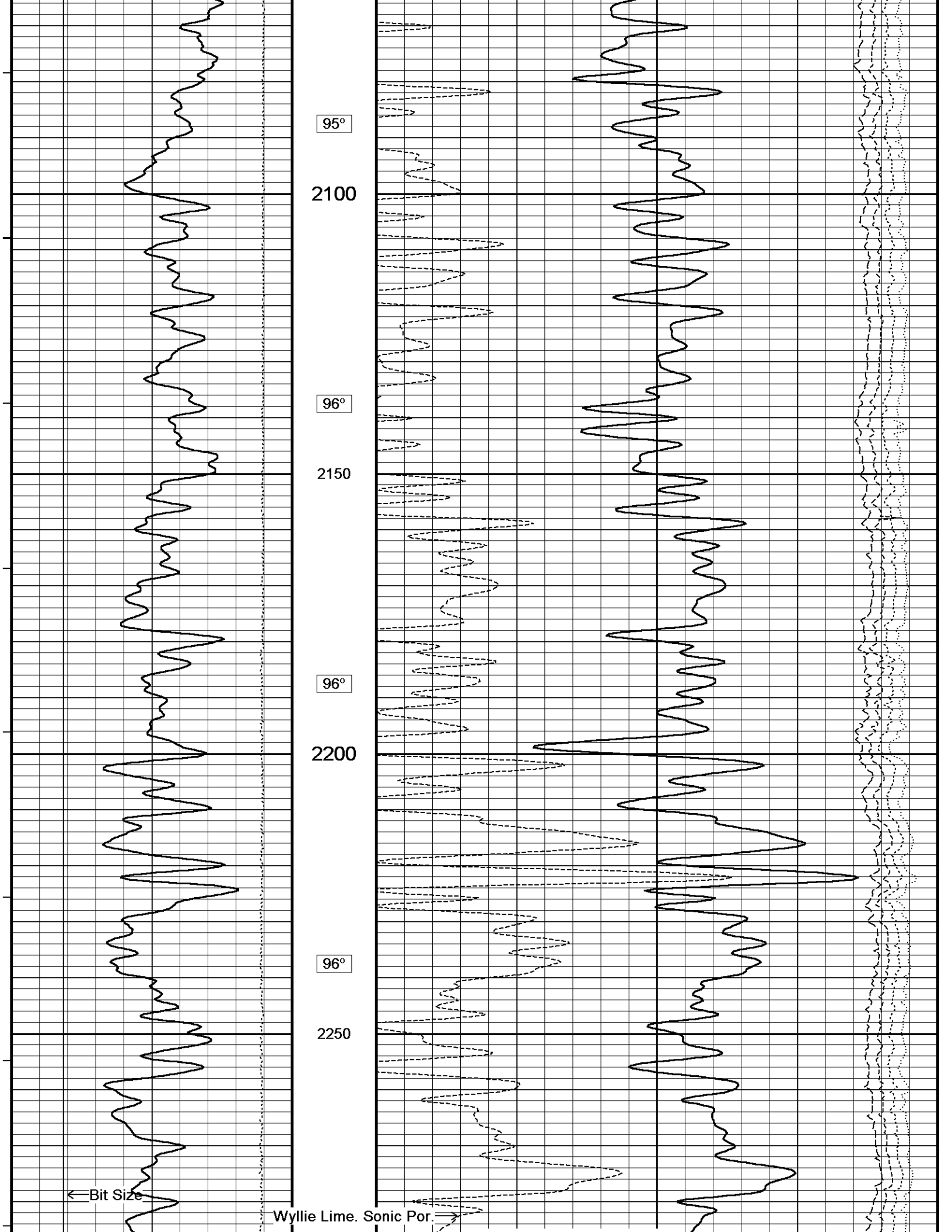
3-5' Compensated Sonic

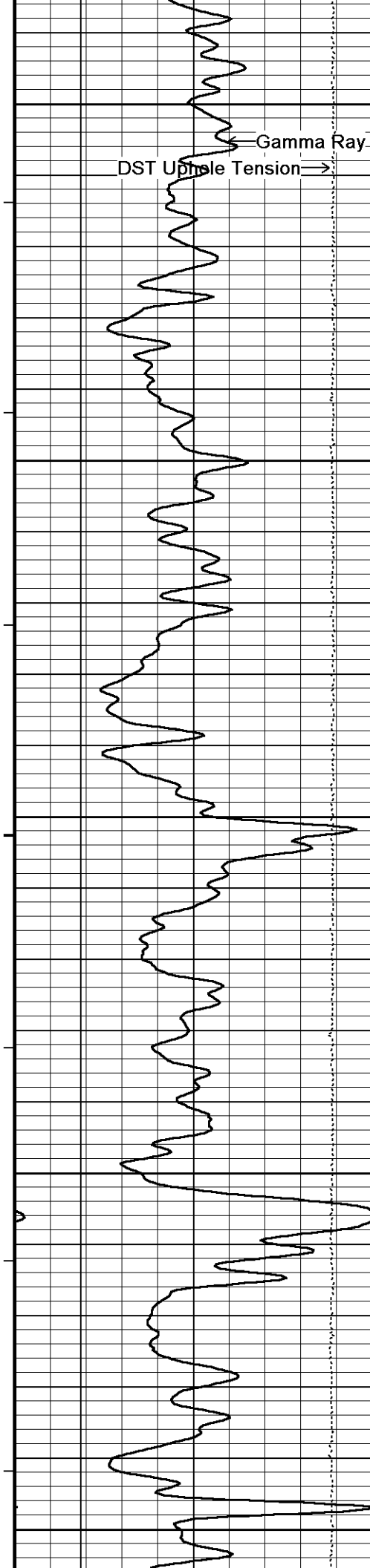
6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time





97°

2300

97°

2350

97°

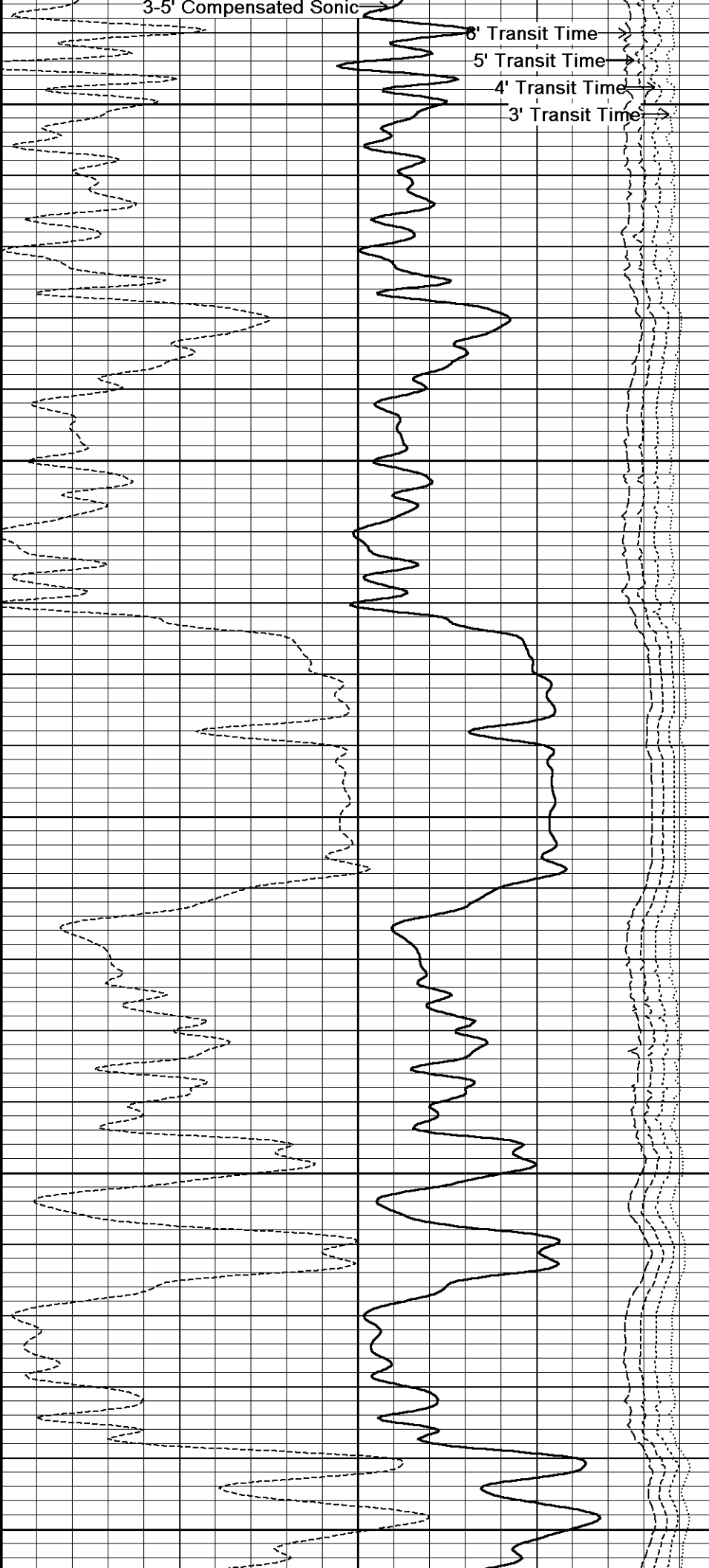
2400

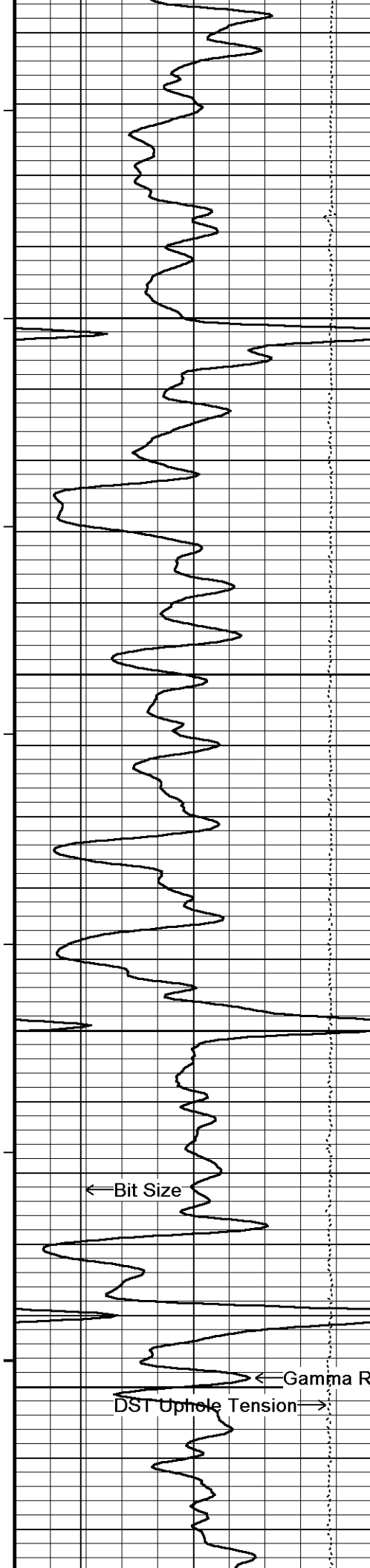
98°

2450

98°

2500





98°

2550

99°

2600

99°

2650

100°

2700

Wyllie Lime. Sonic Por. →

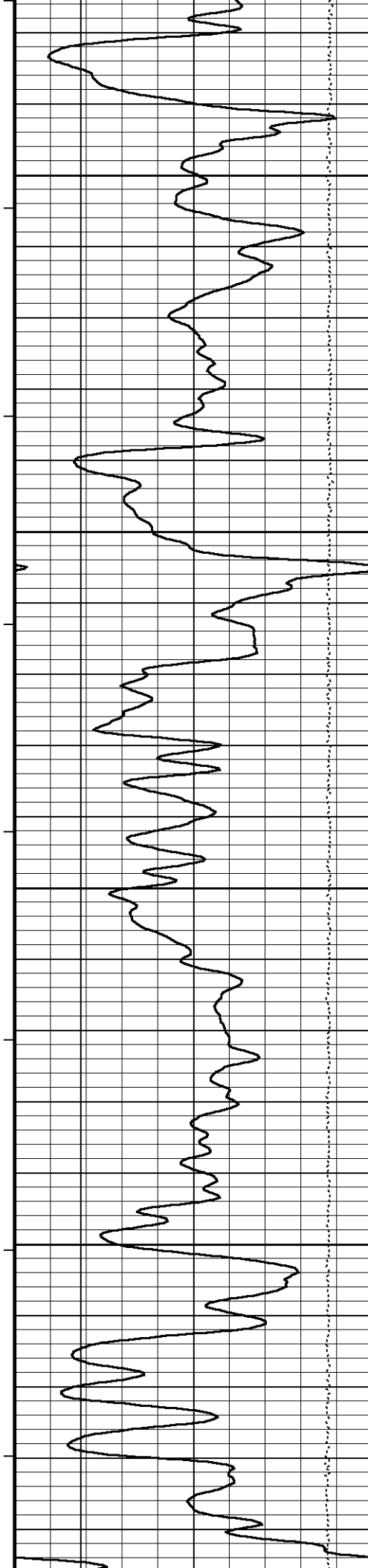
3-5' Compensated Sonic

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →



100°

2750

101°

2800

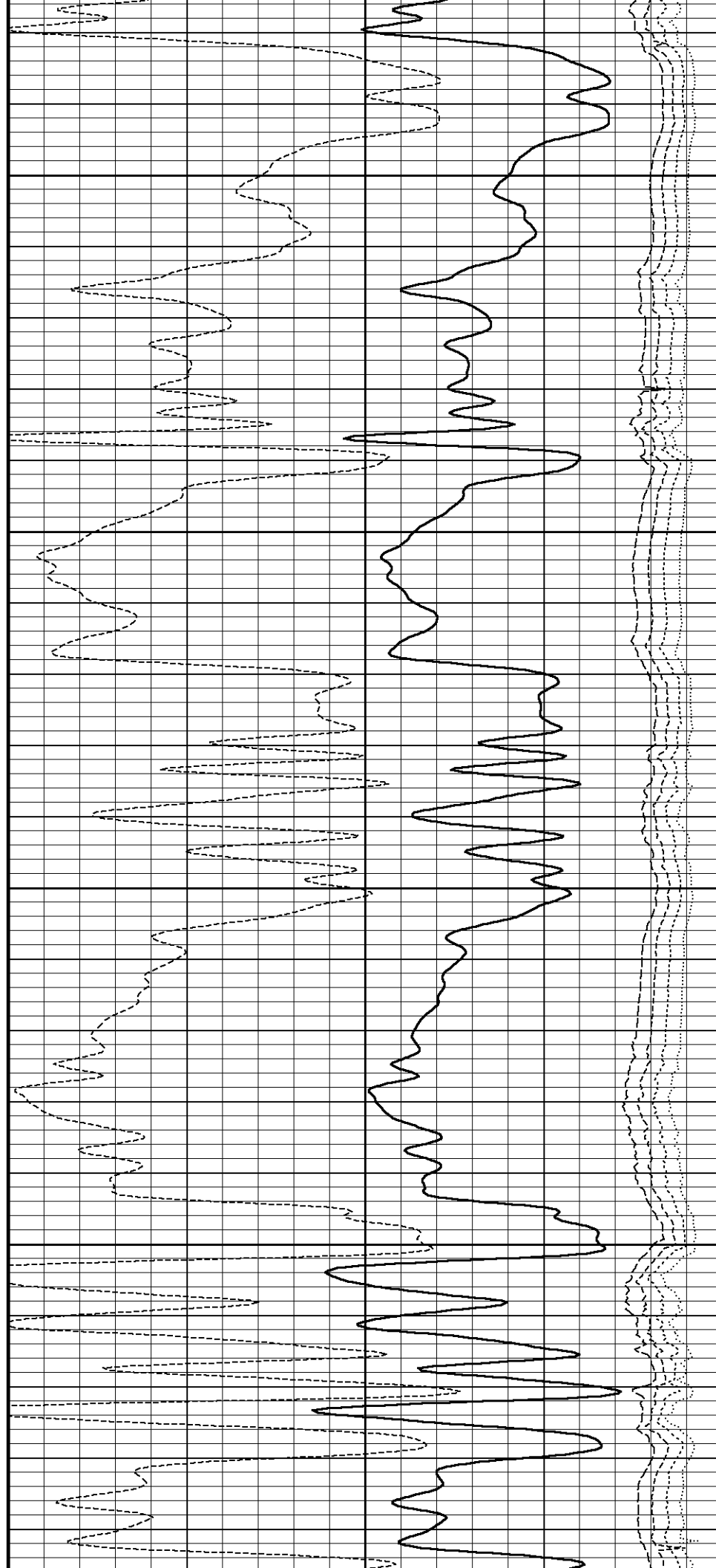
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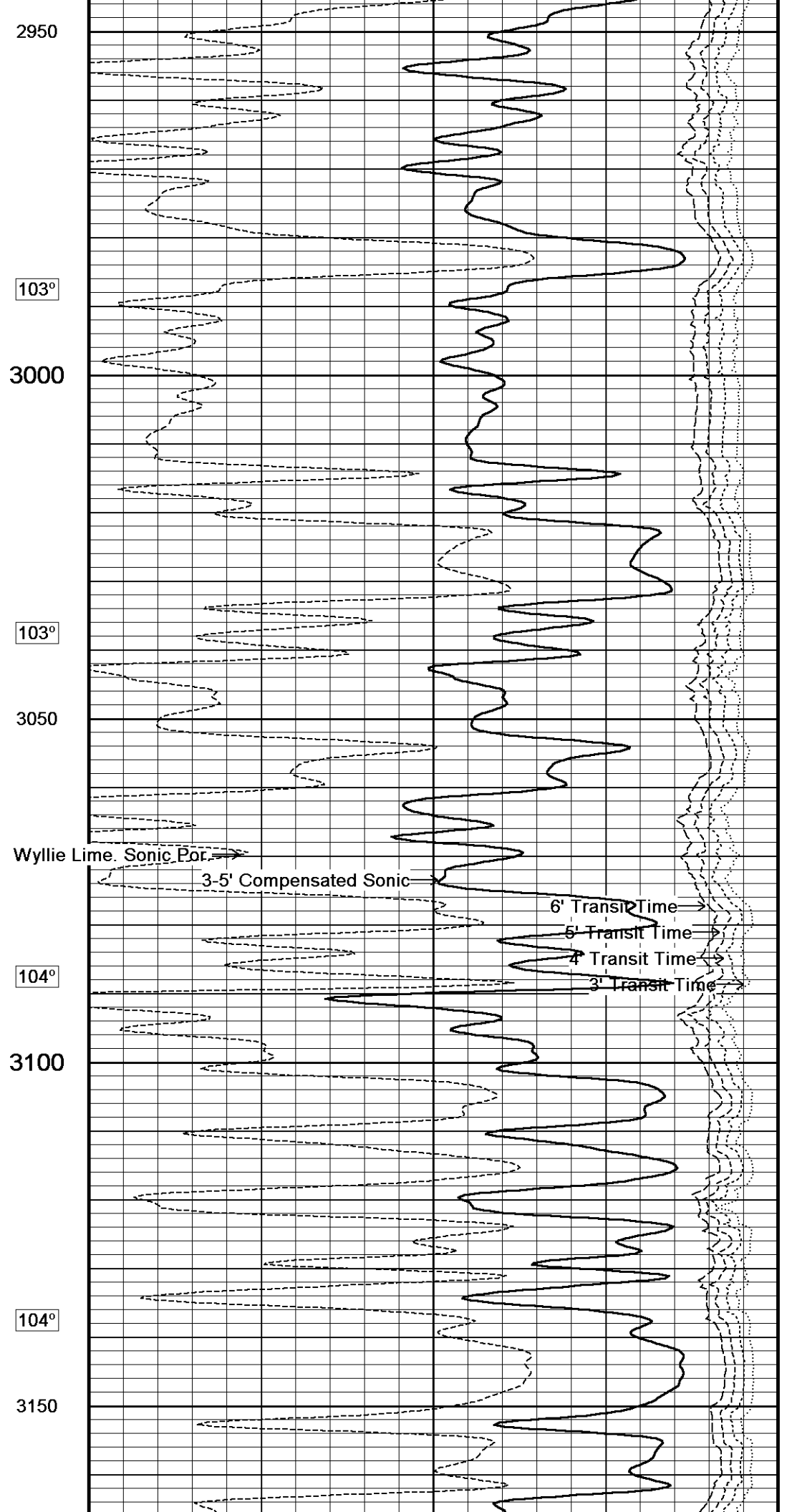
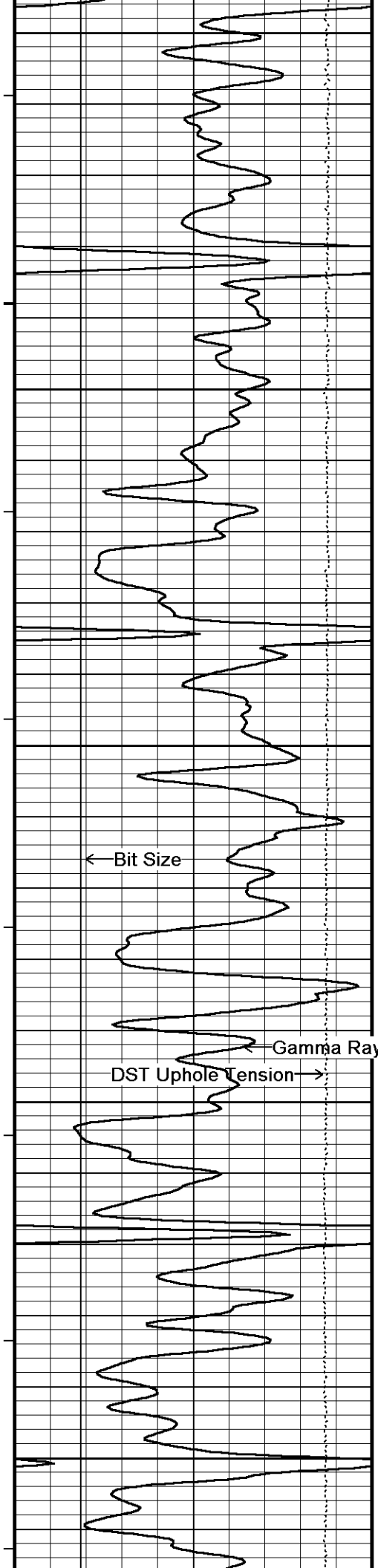
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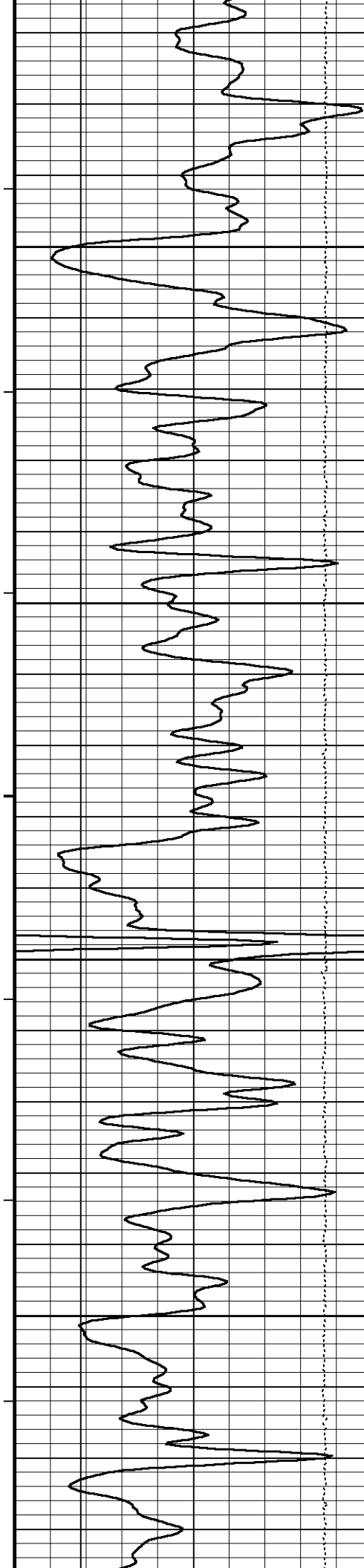
102°

2900

102°







105°

3200

105°

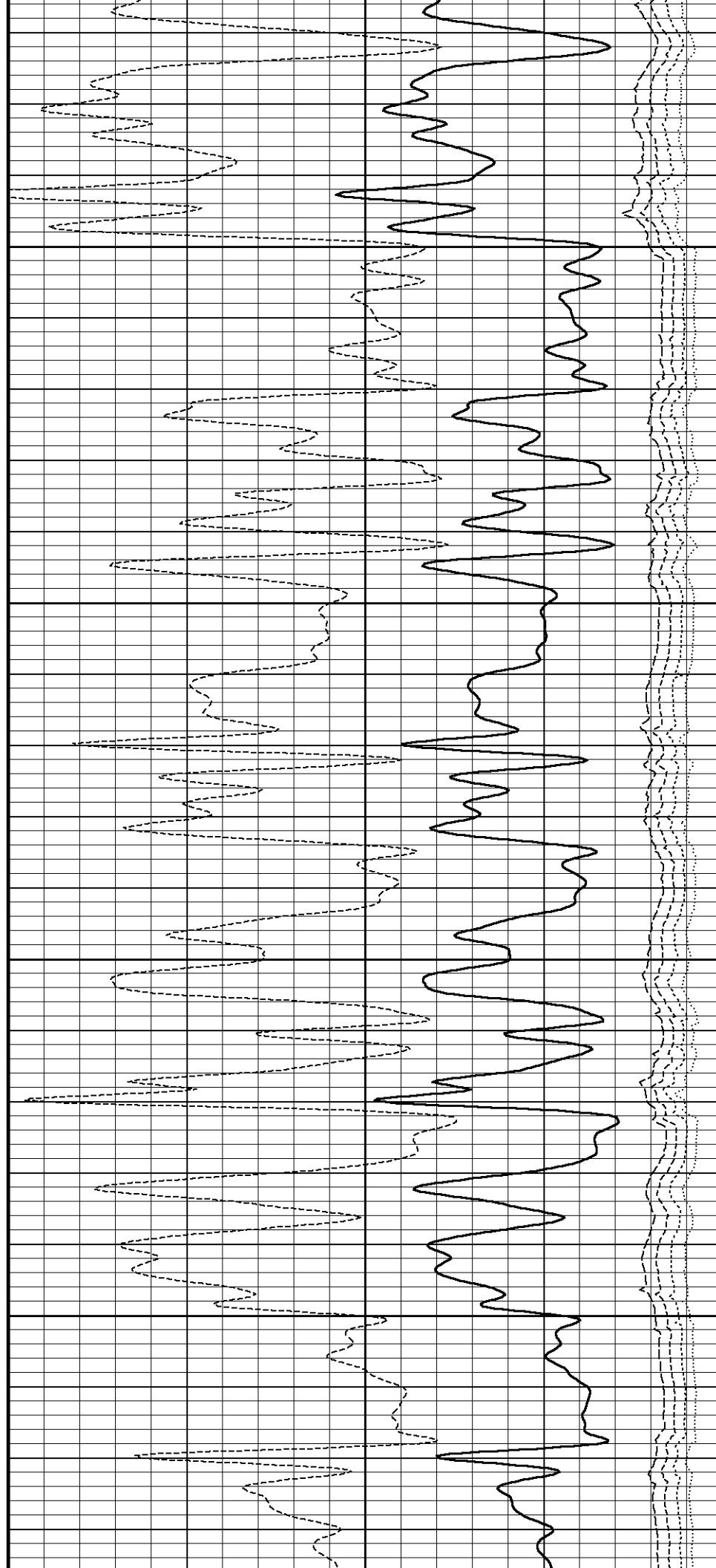
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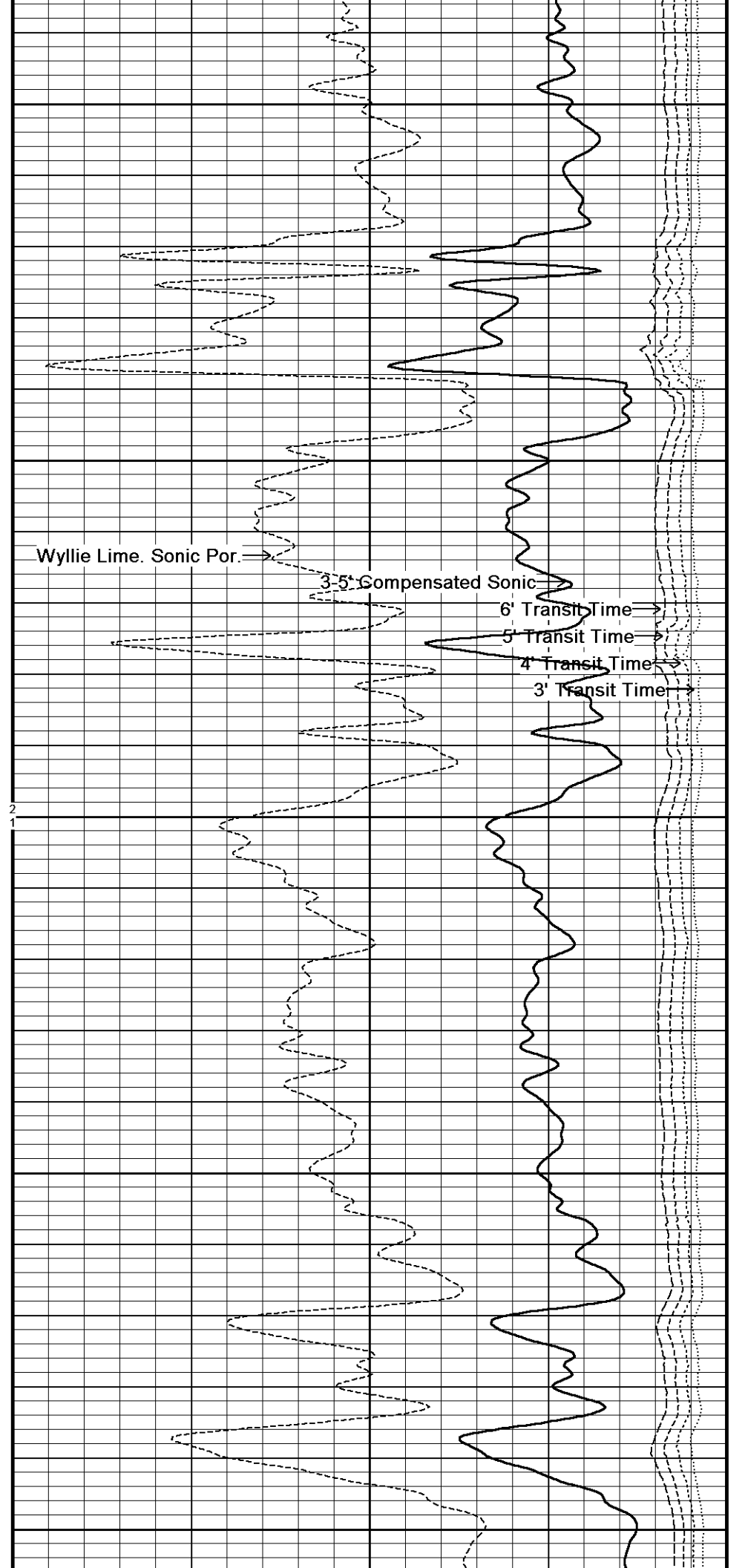
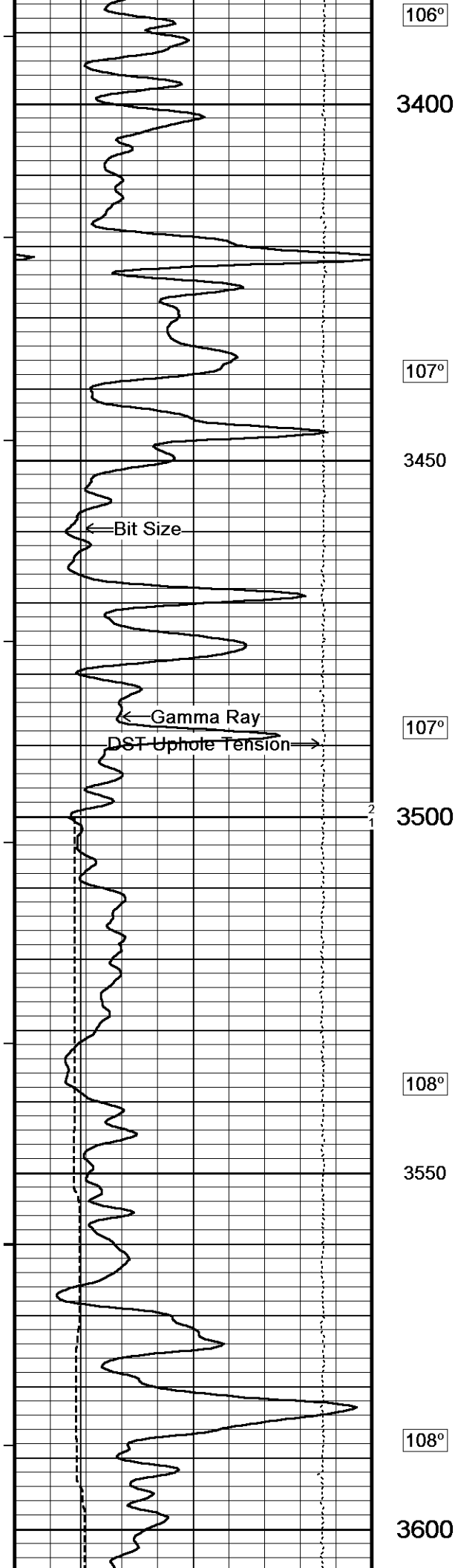
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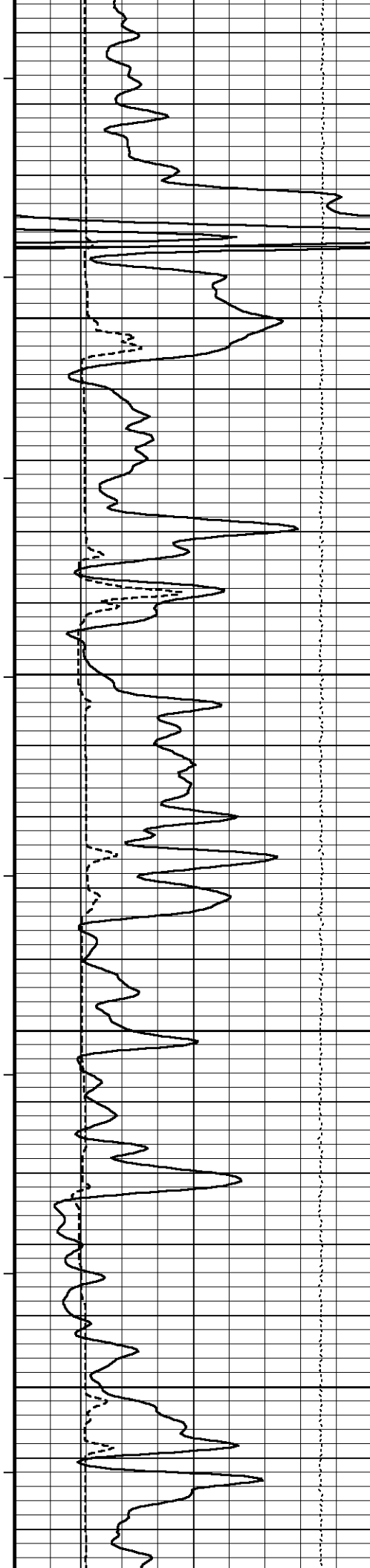
3300

106°

3350







108°

3650

109°

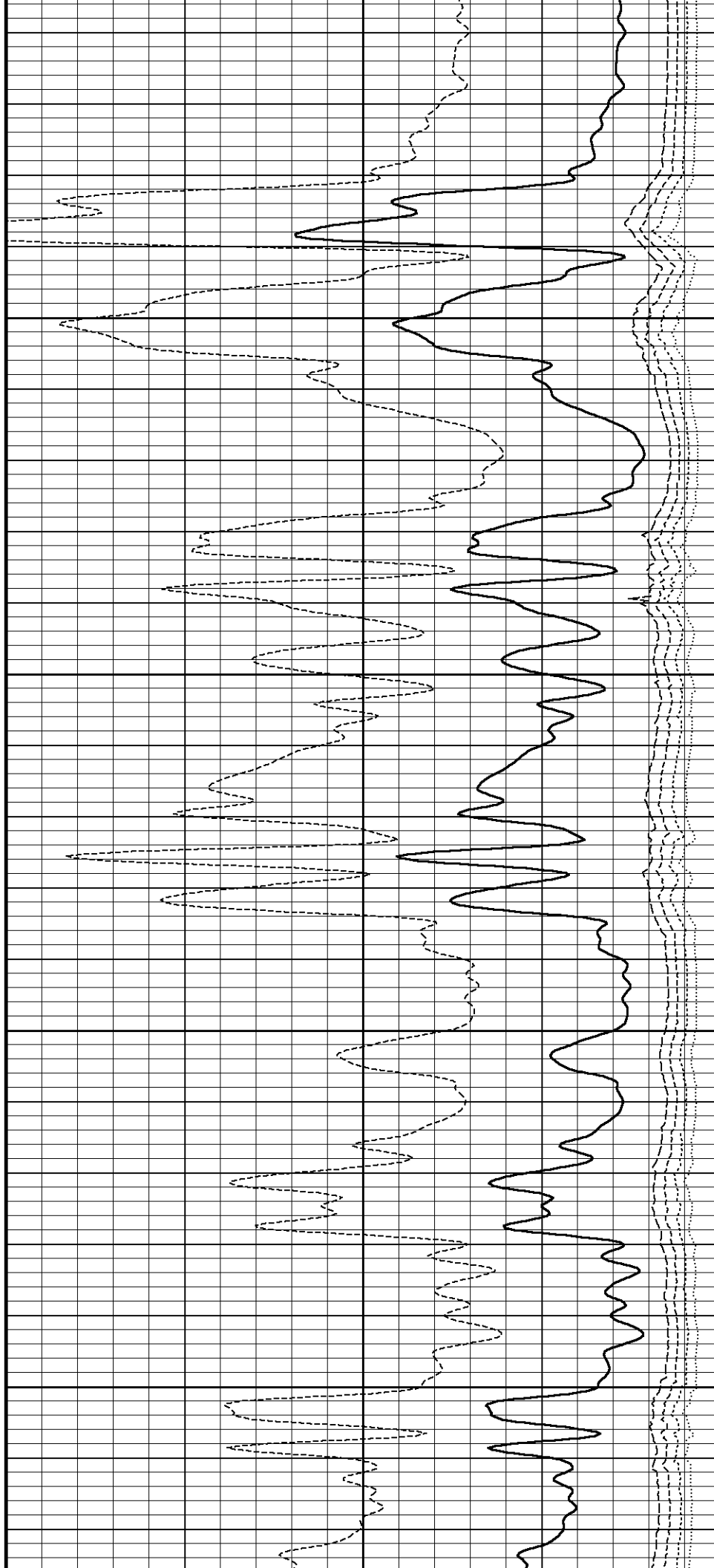
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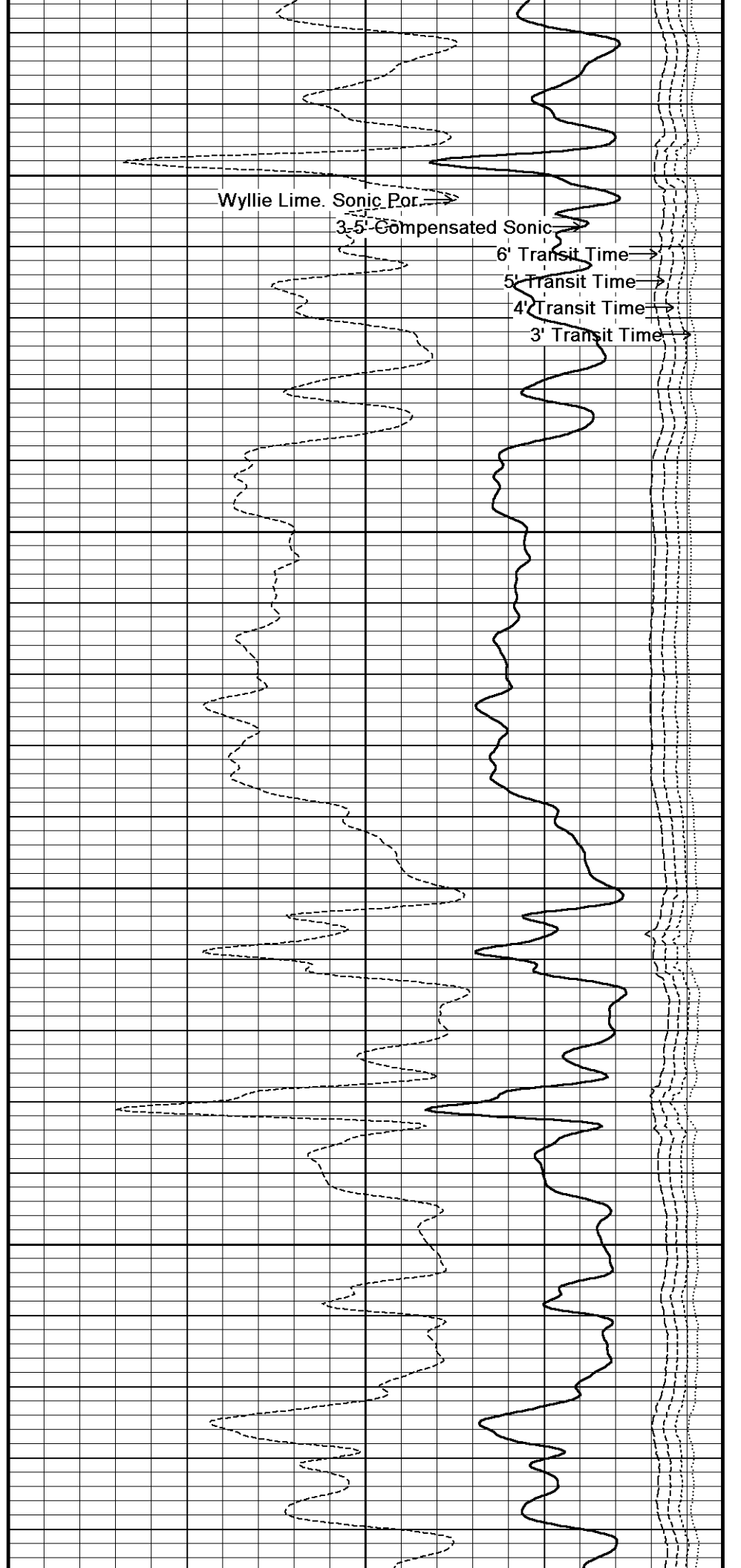
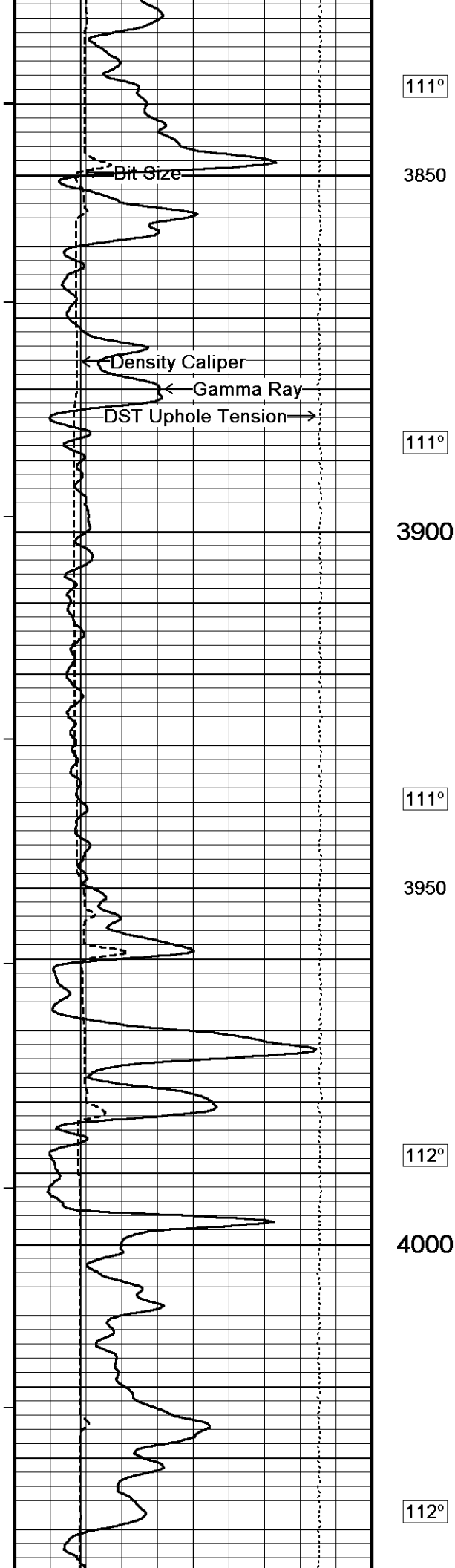
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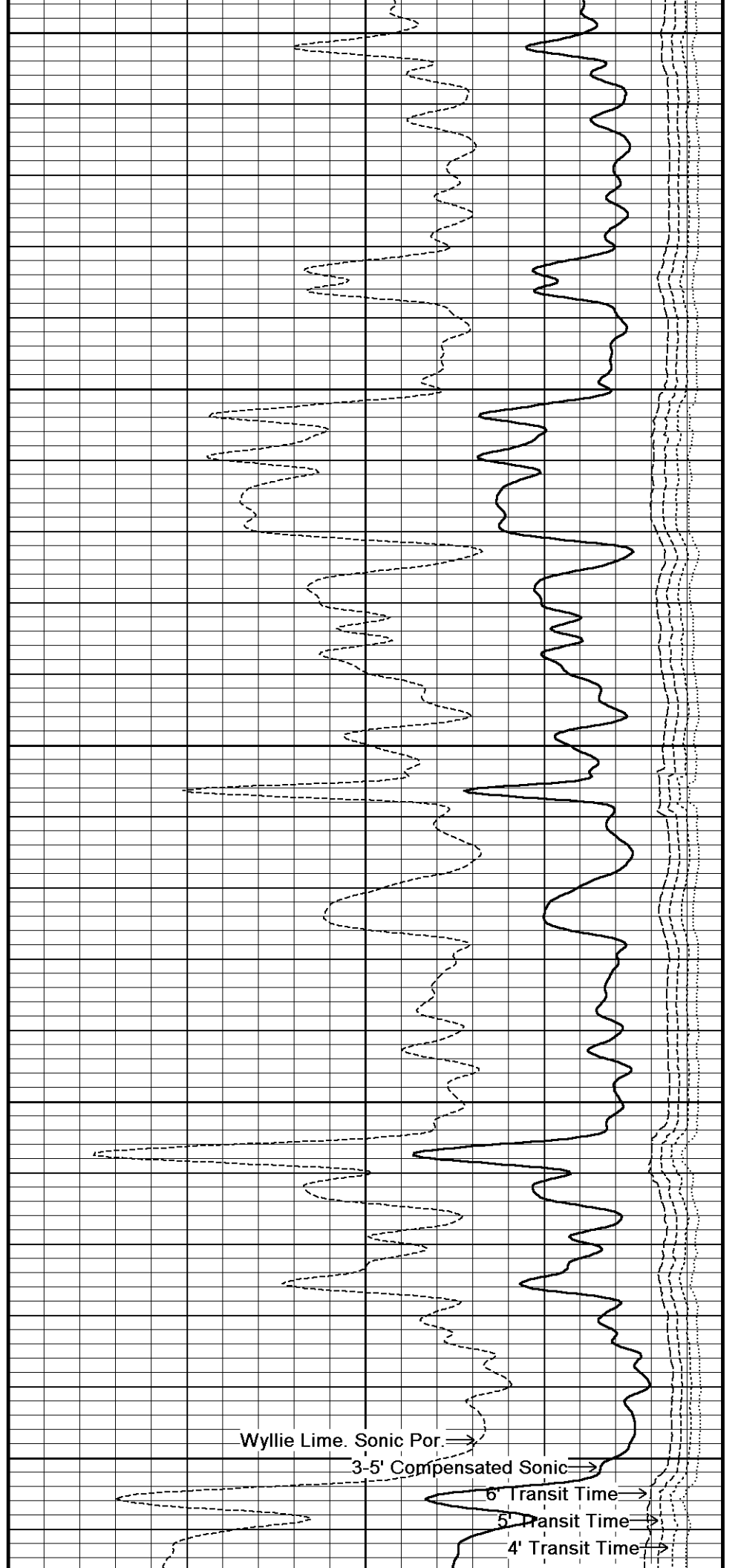
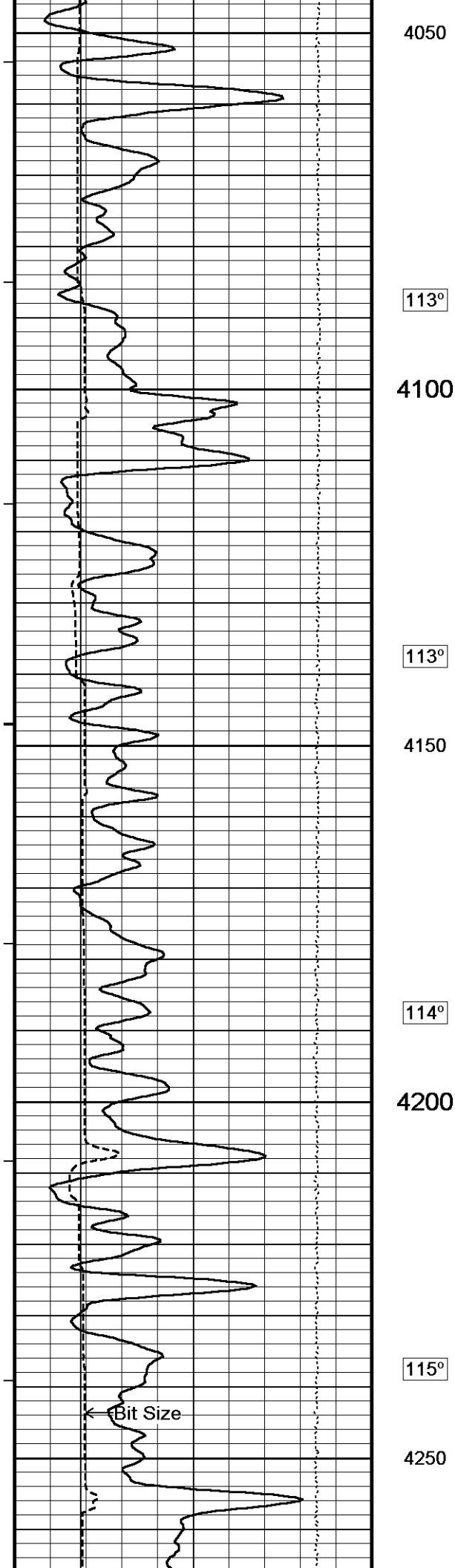
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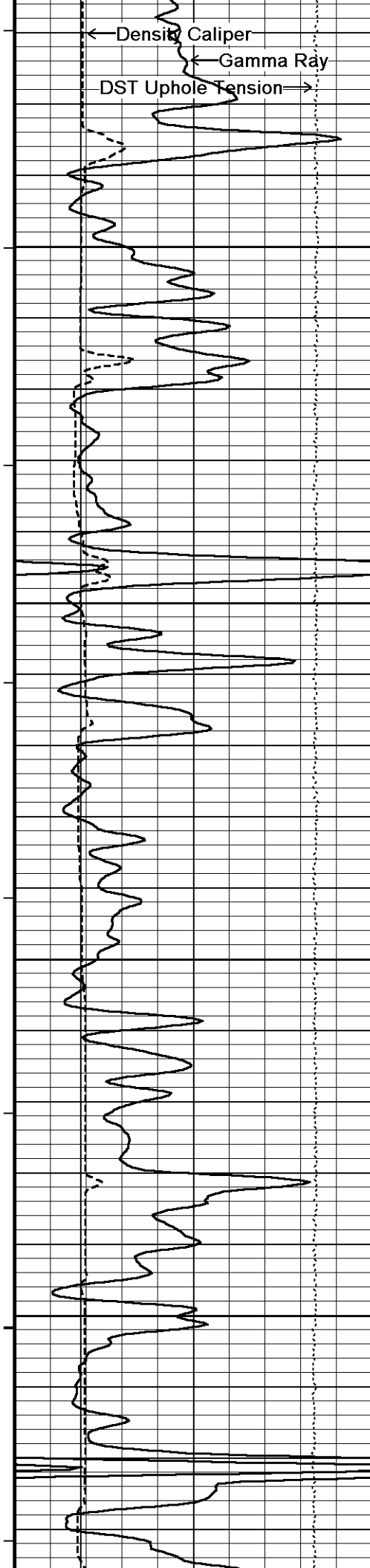
110°

3800









115°

4300

116°

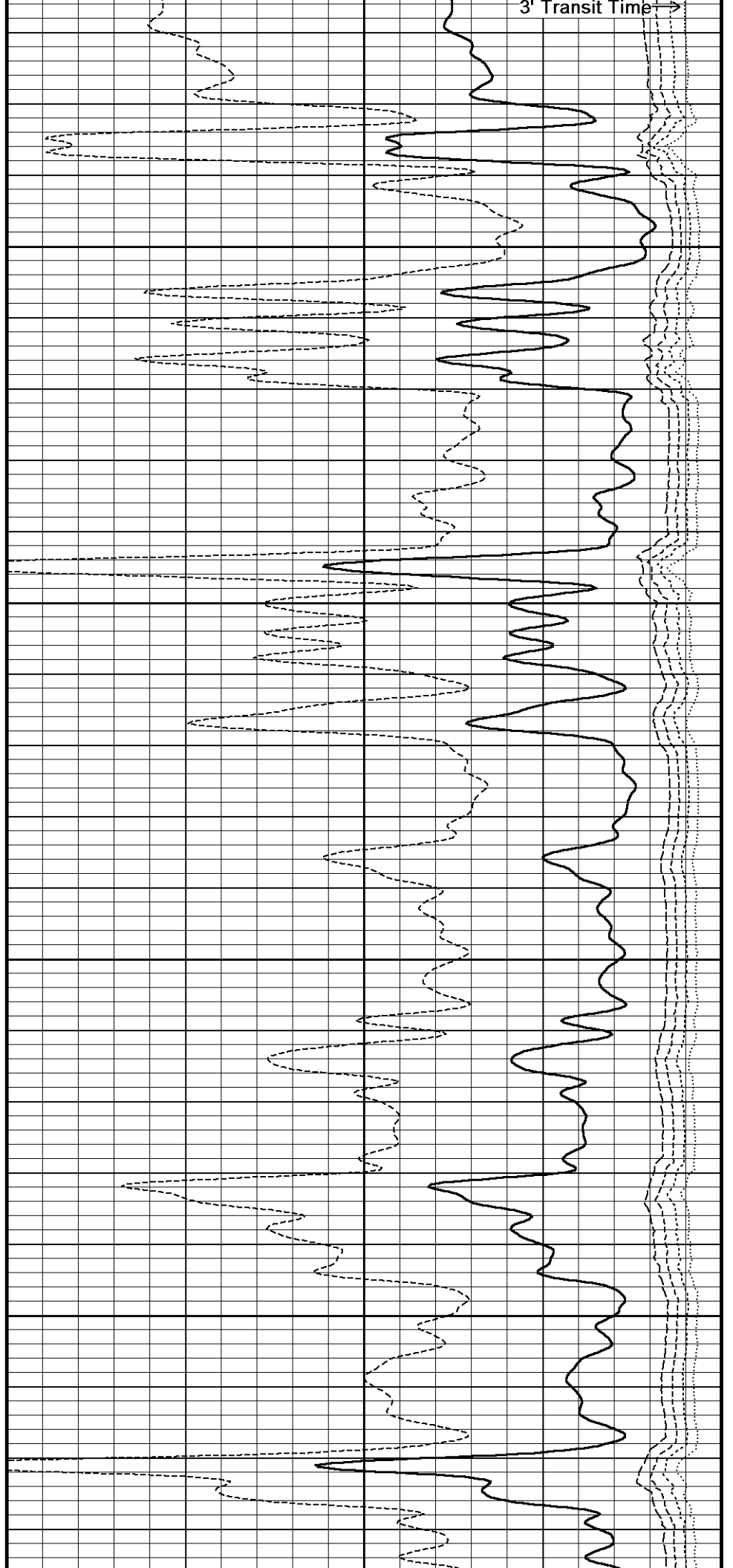
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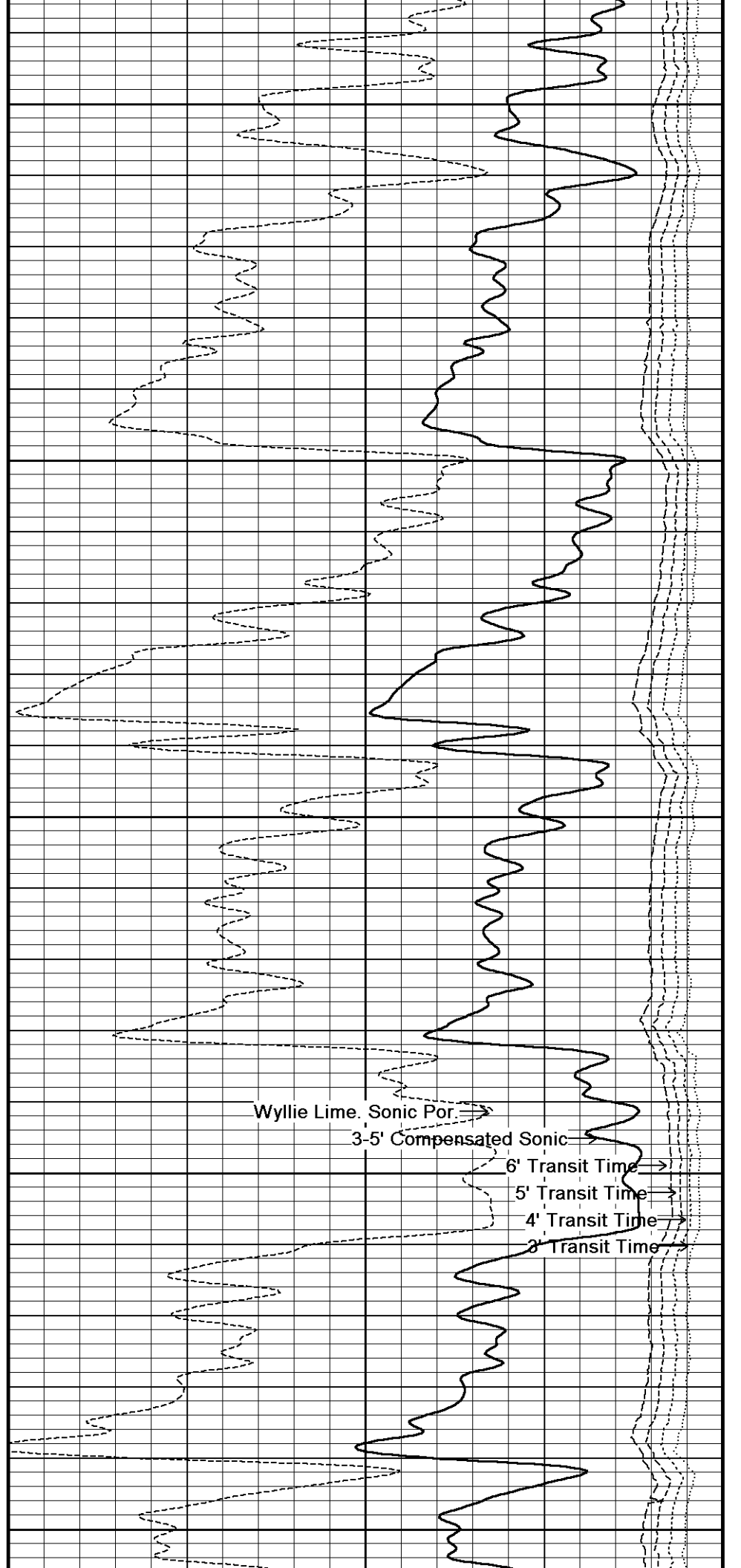
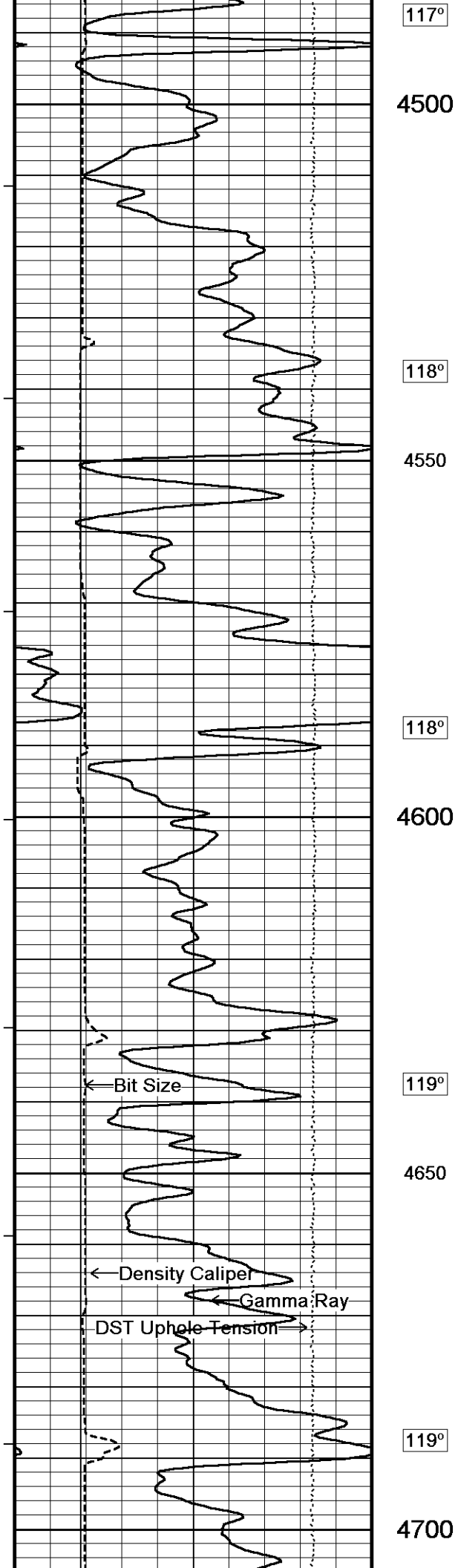
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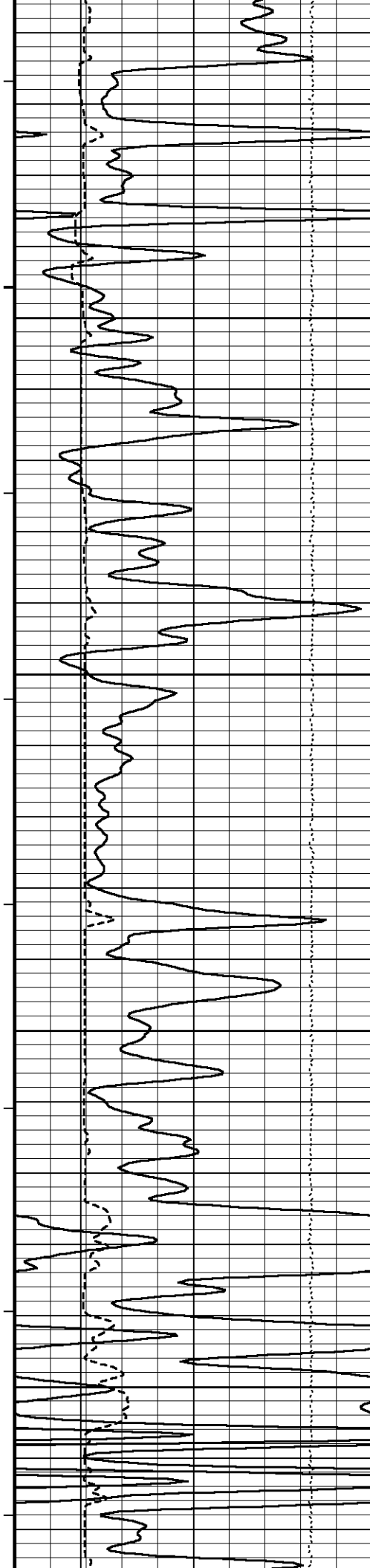
4400

117°

4450







120°

4750

120°

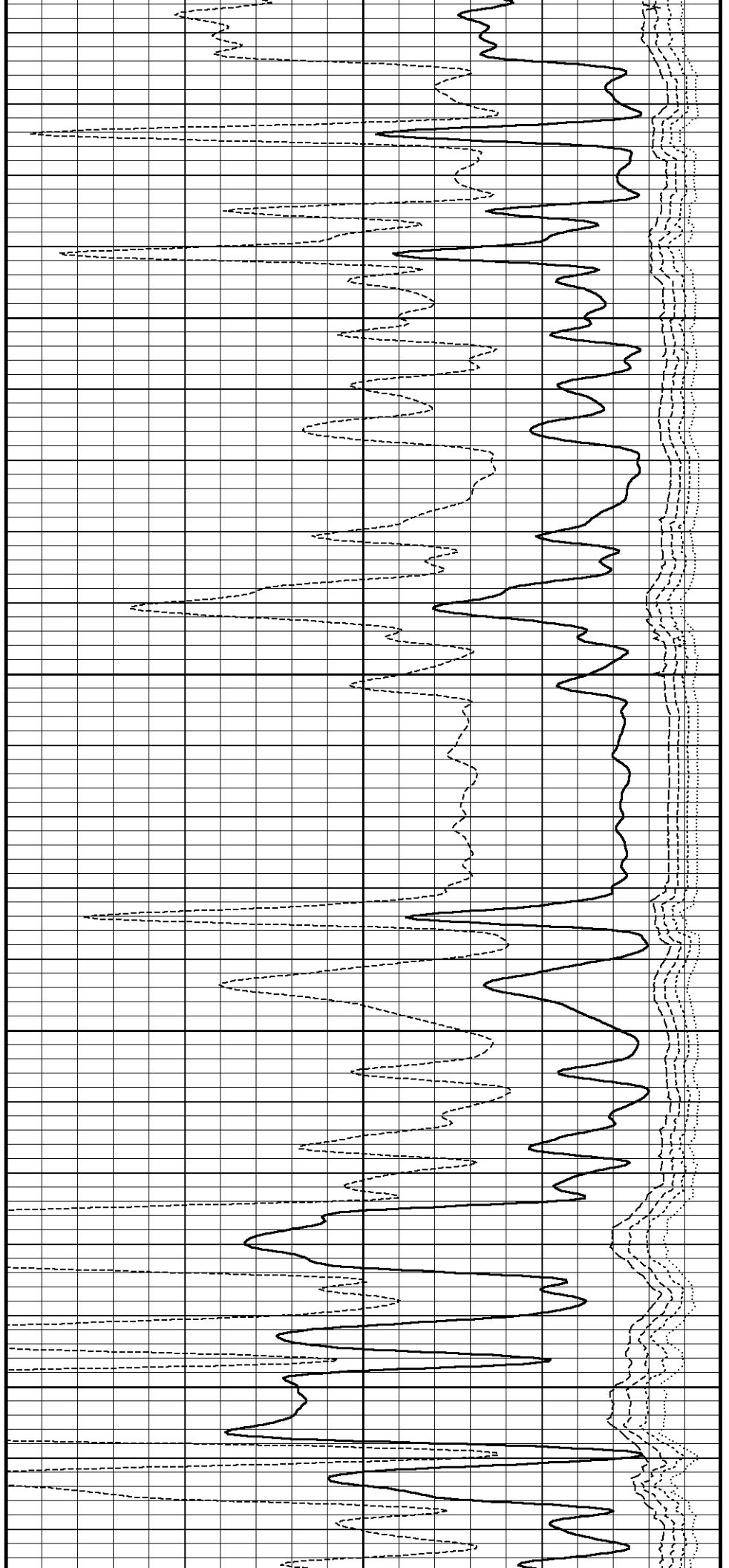
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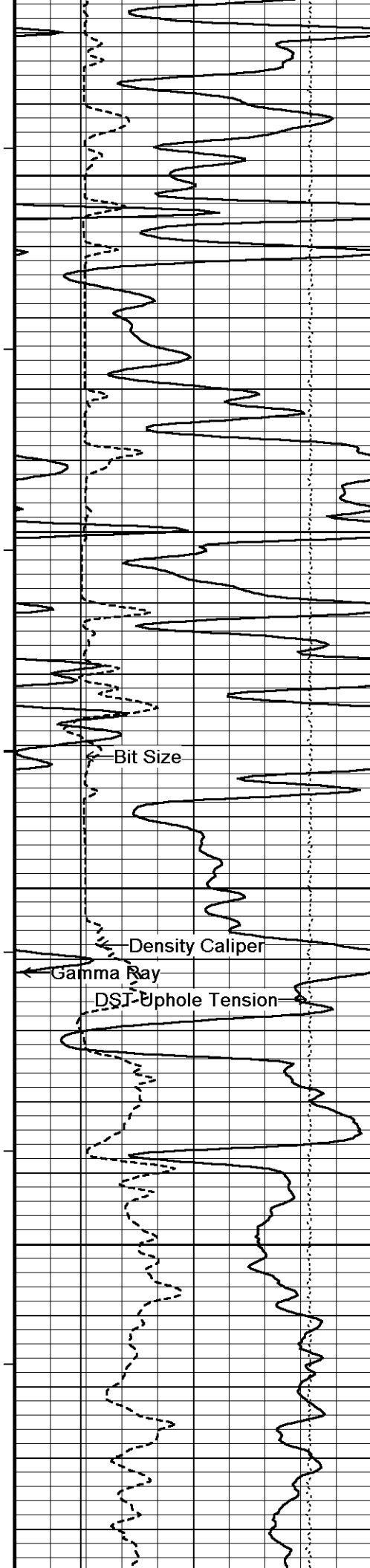
121°

4850

121°

4900





122°

4950

122°

5000

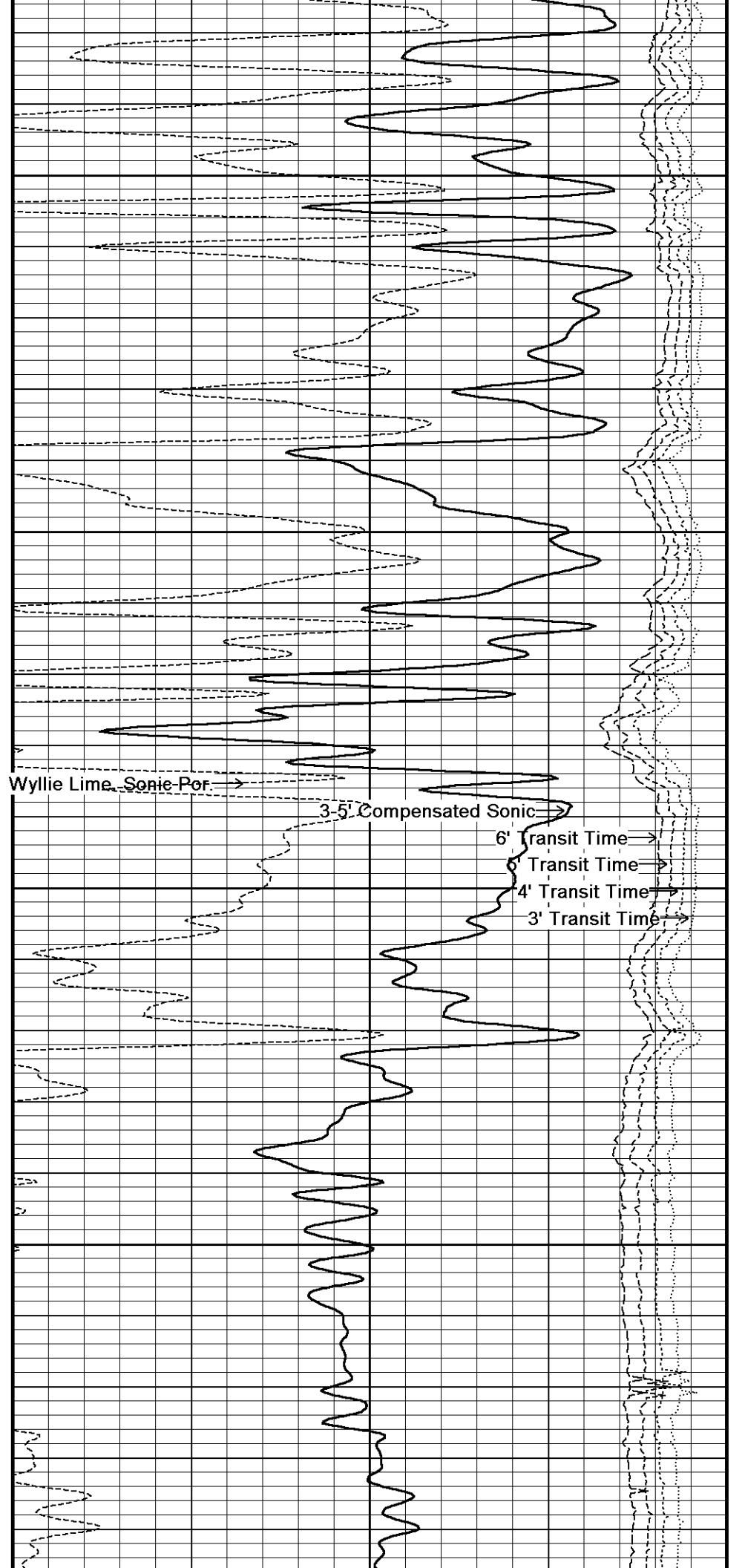
122°

5050

122°

5100

123°



Wyllie Lime Sonic Por.

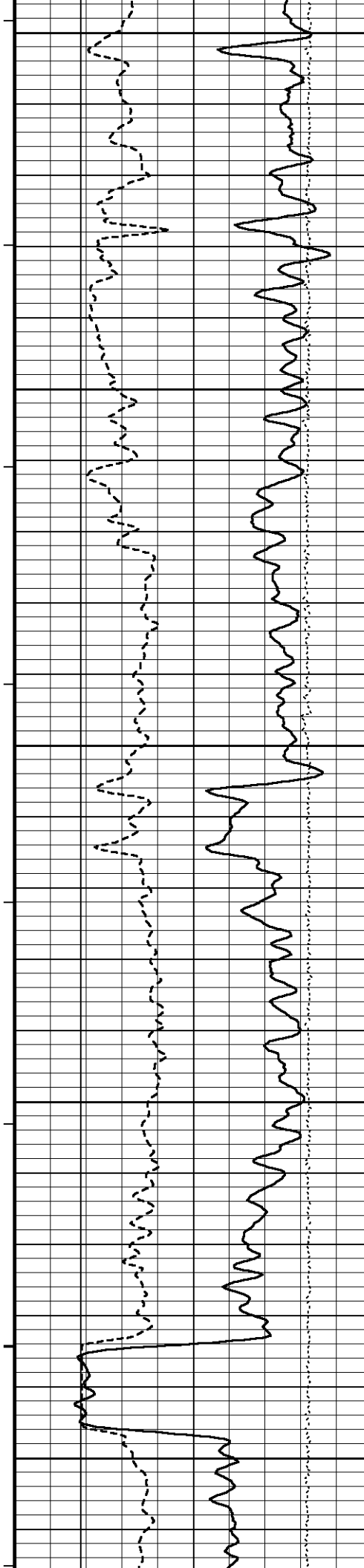
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



5150

124°

5200

124°

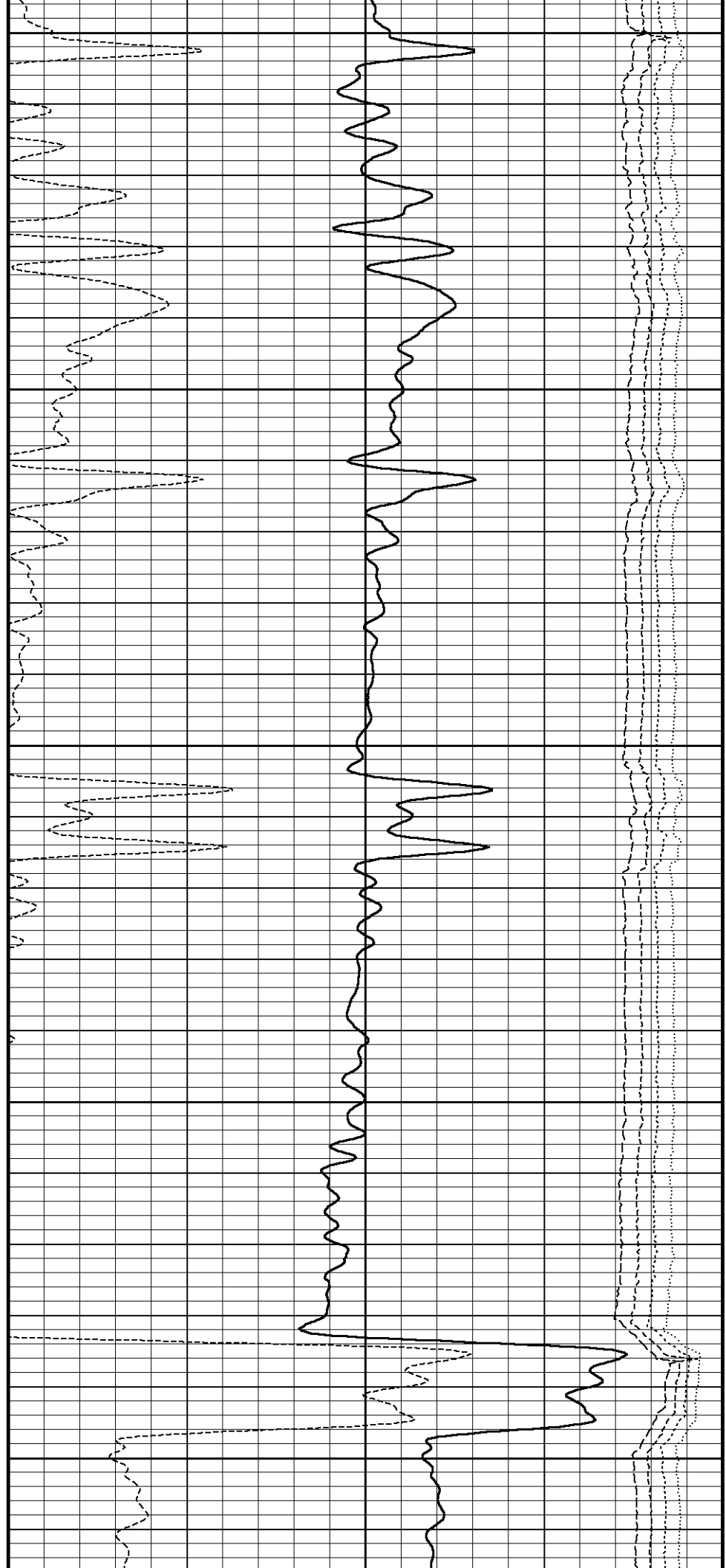
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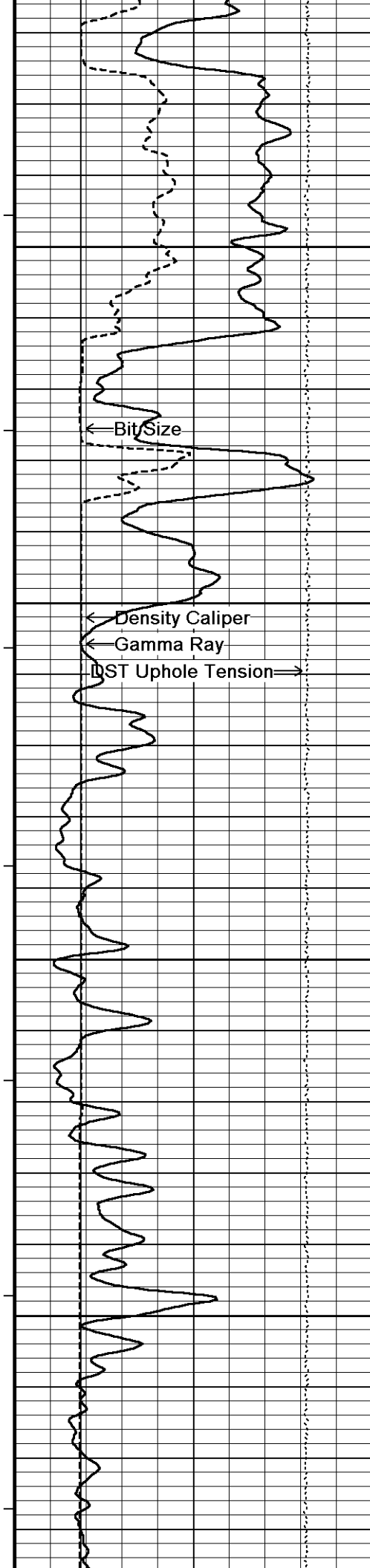
125°

5300

126°

5350





128°

5400

130°

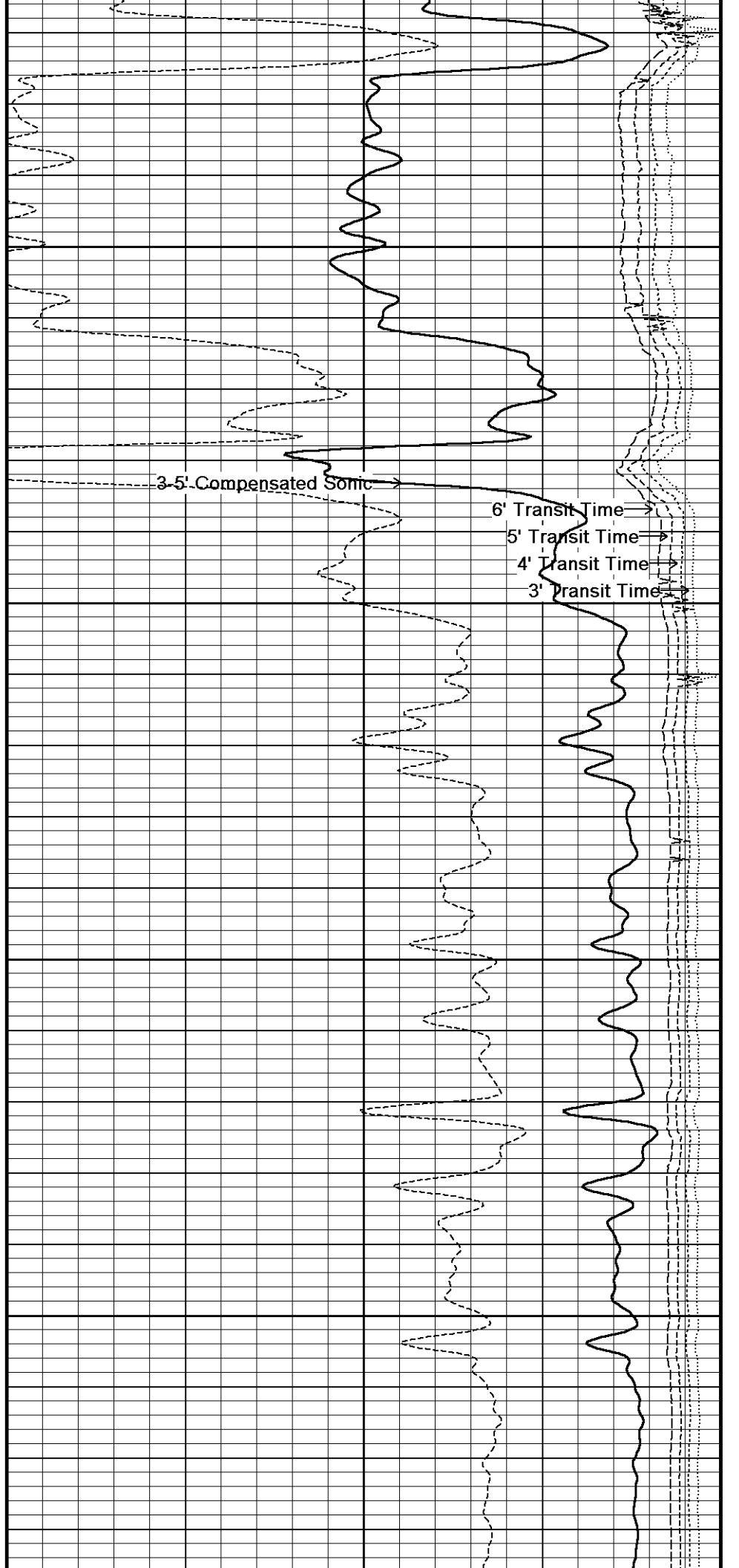
5450

131°

5500

131°

5550



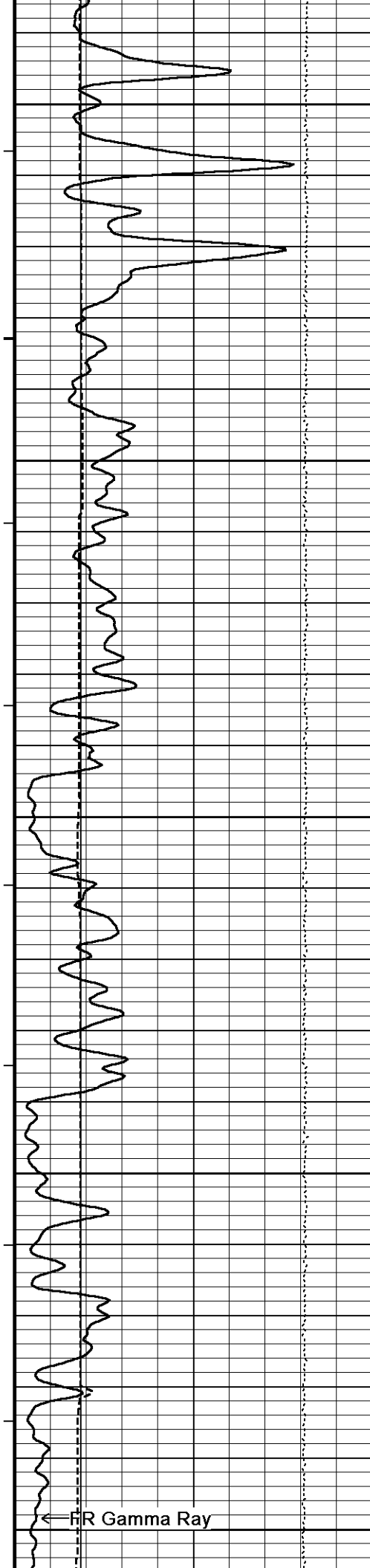
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



131°

5600

131°

5650

132°

5700

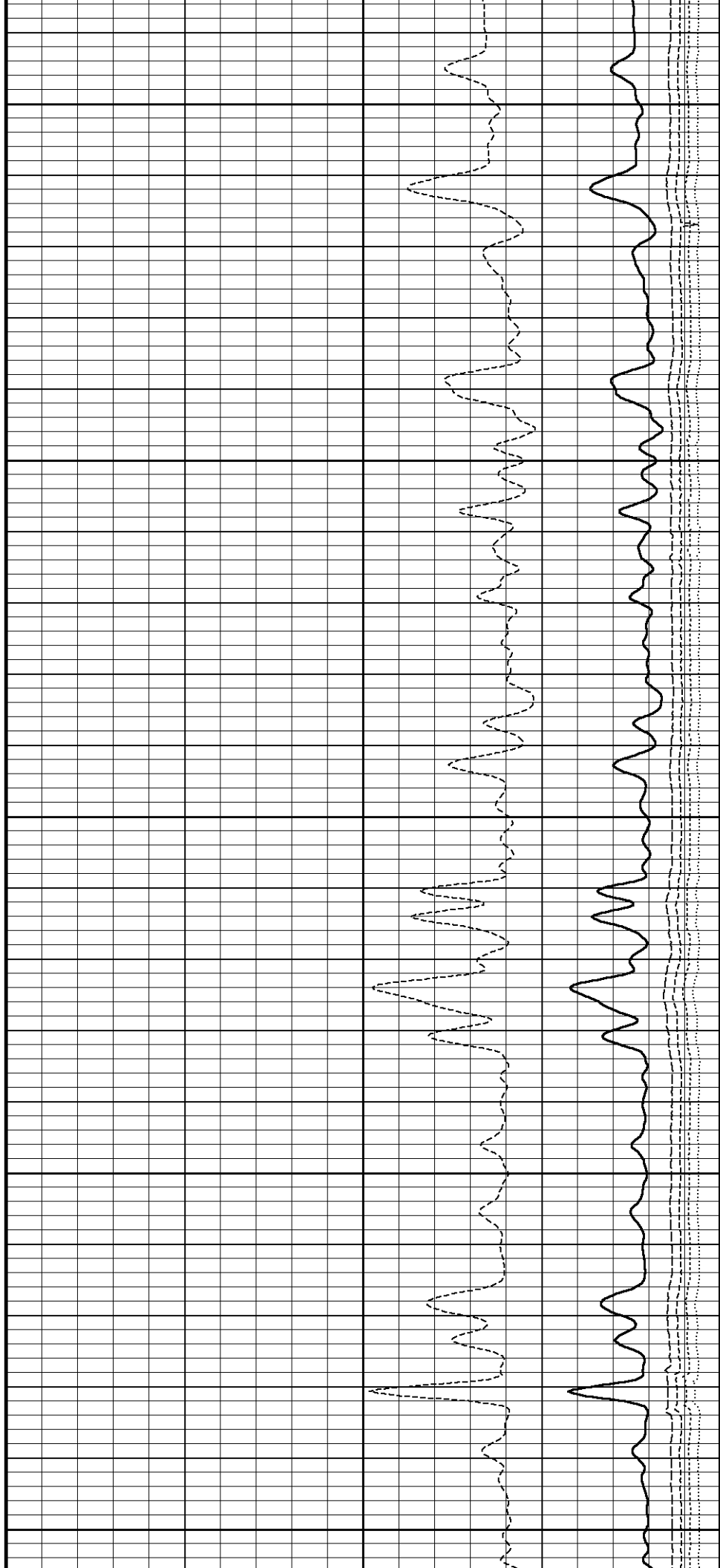
132°

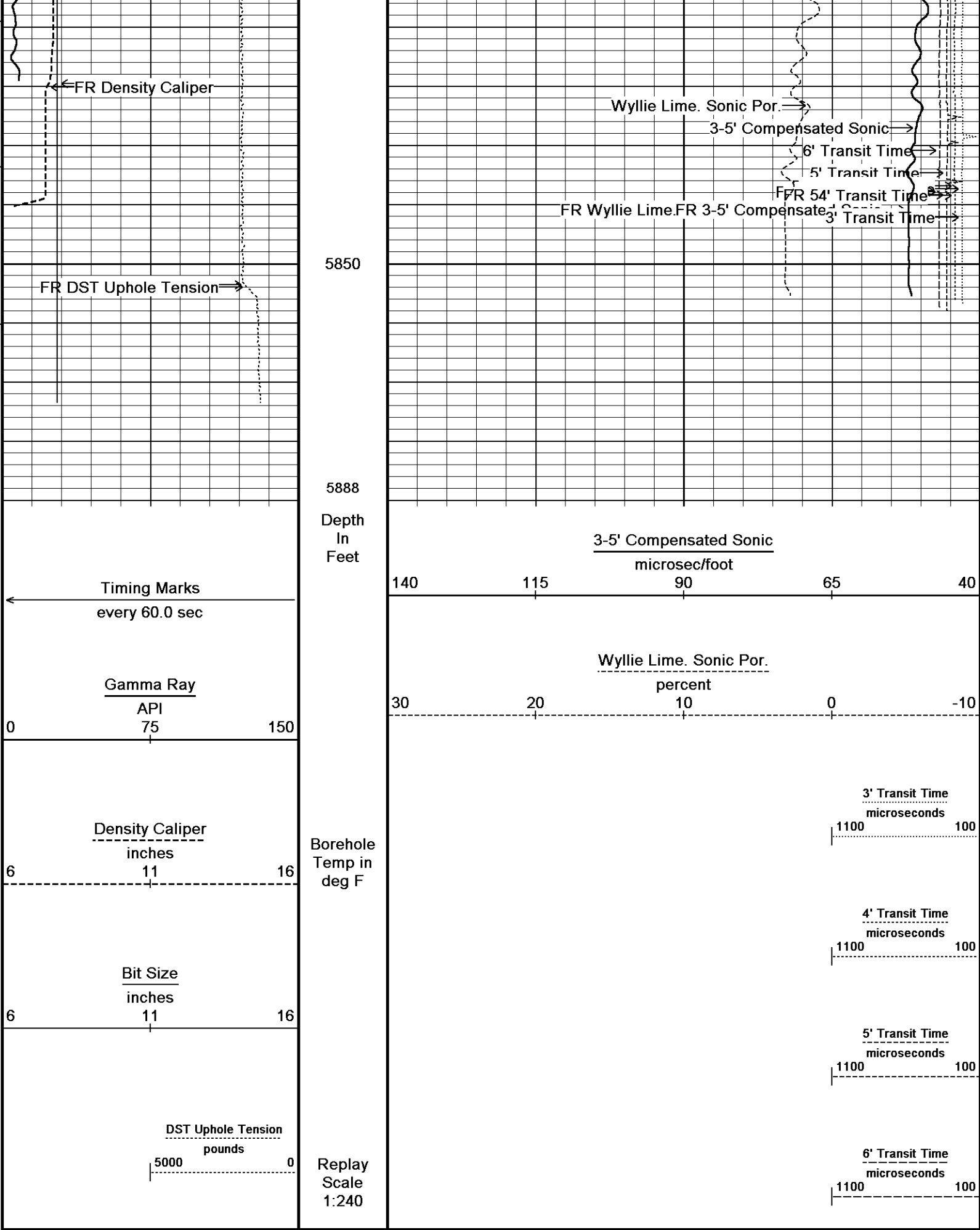
5750

132°

5800

← FR Gamma Ray





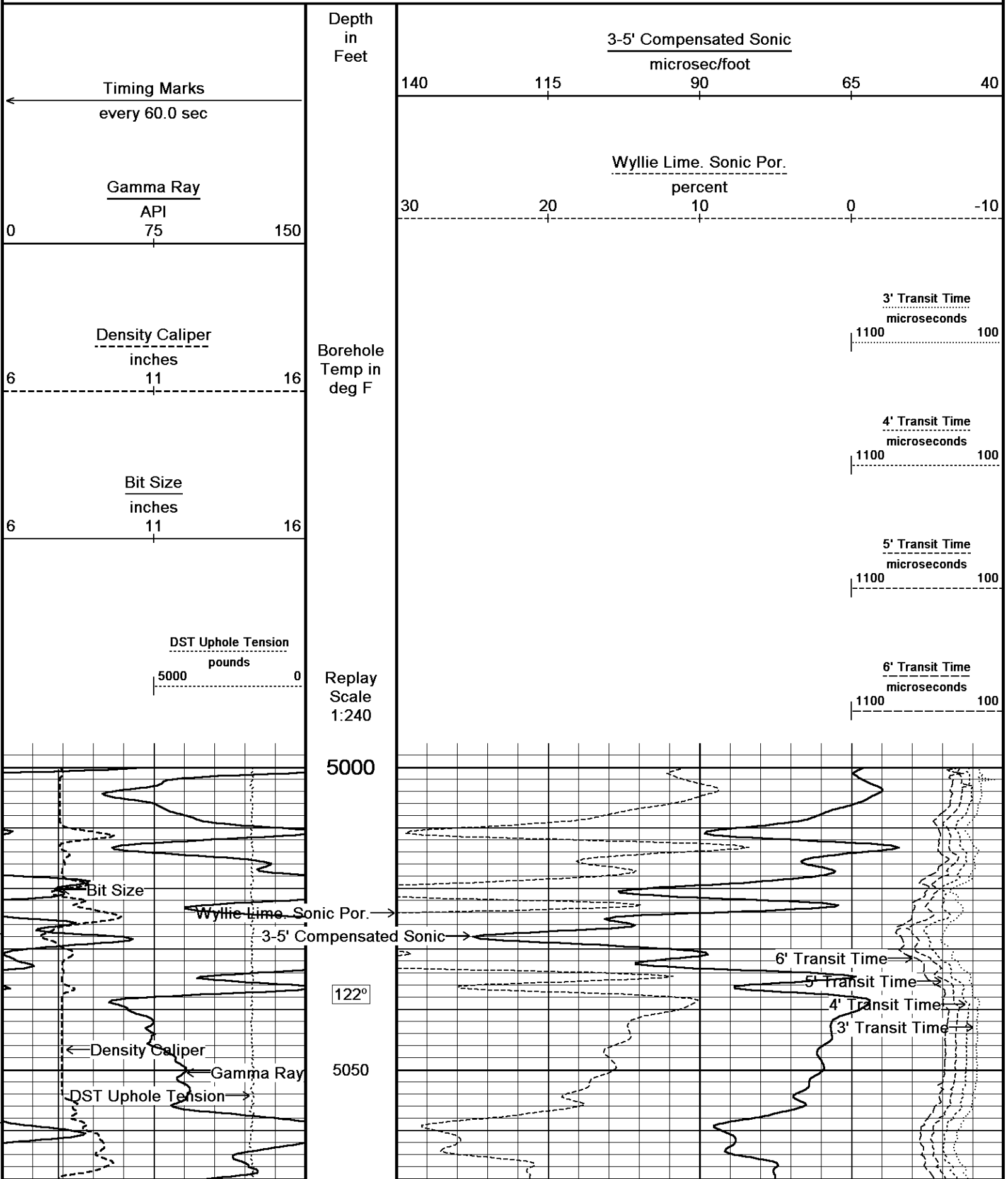
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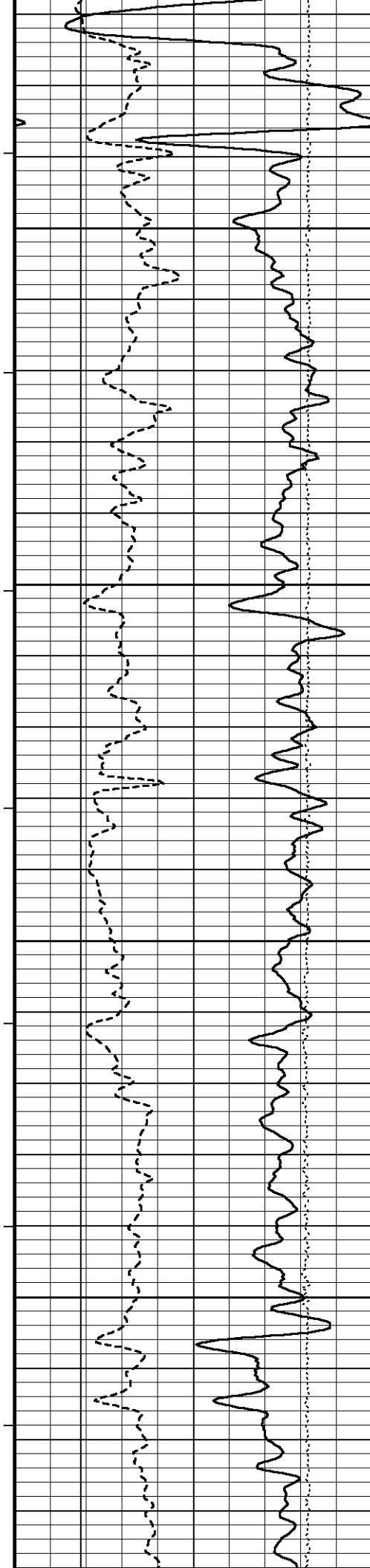
REPEAT SECTION

↓

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.02.6600\Data\Oxy KU B-3\Oxy KU B-3_002.dta
System Versions: Logged with 13.02.6600 Plotted with 13.02.6600

Plotted on 14-SEP-2012 10:59
Recorded on 14-SEP-2012 07:36





122°

5100

122°

5150

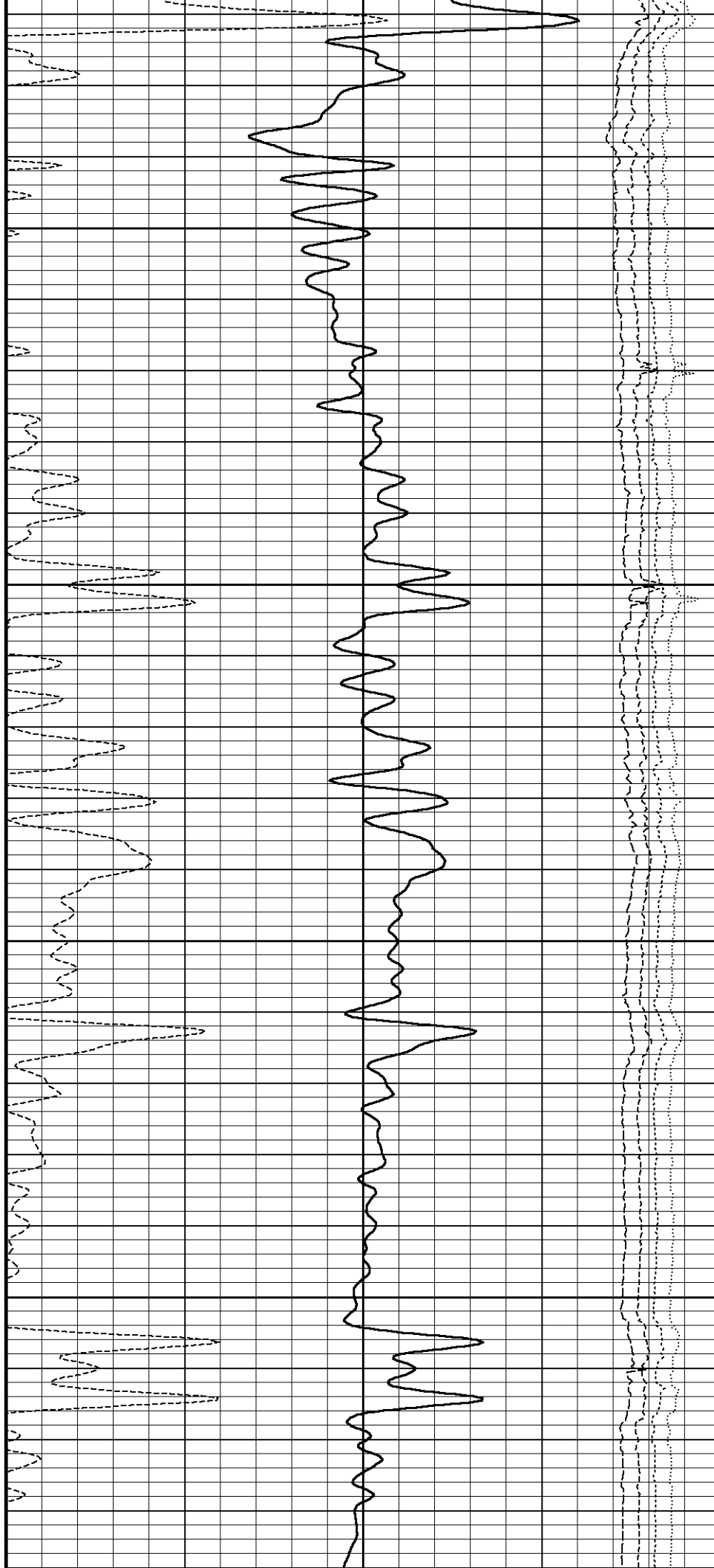
123°

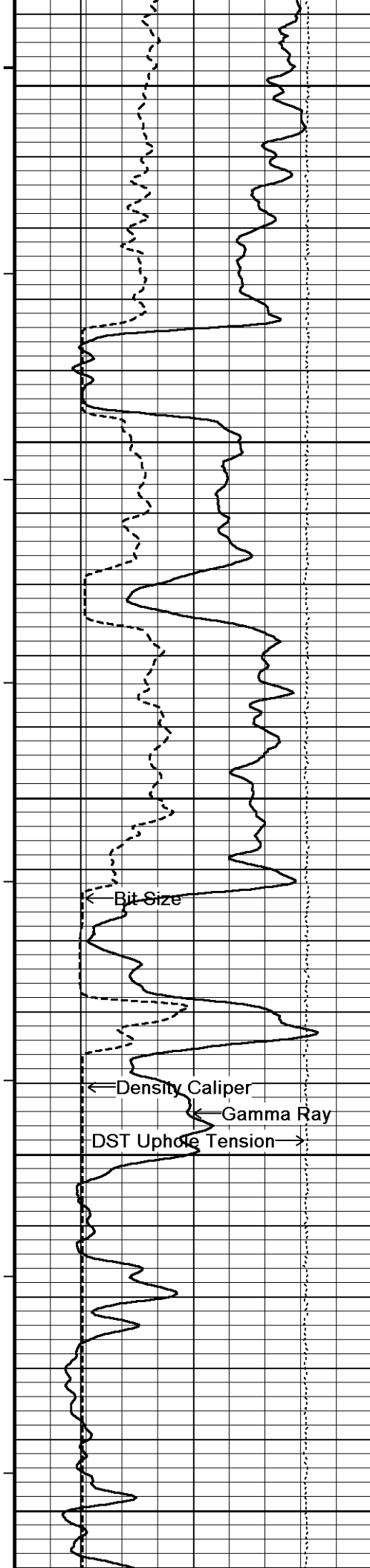
5200

123°

5250

124°





124°
5300

125°

5350

127°

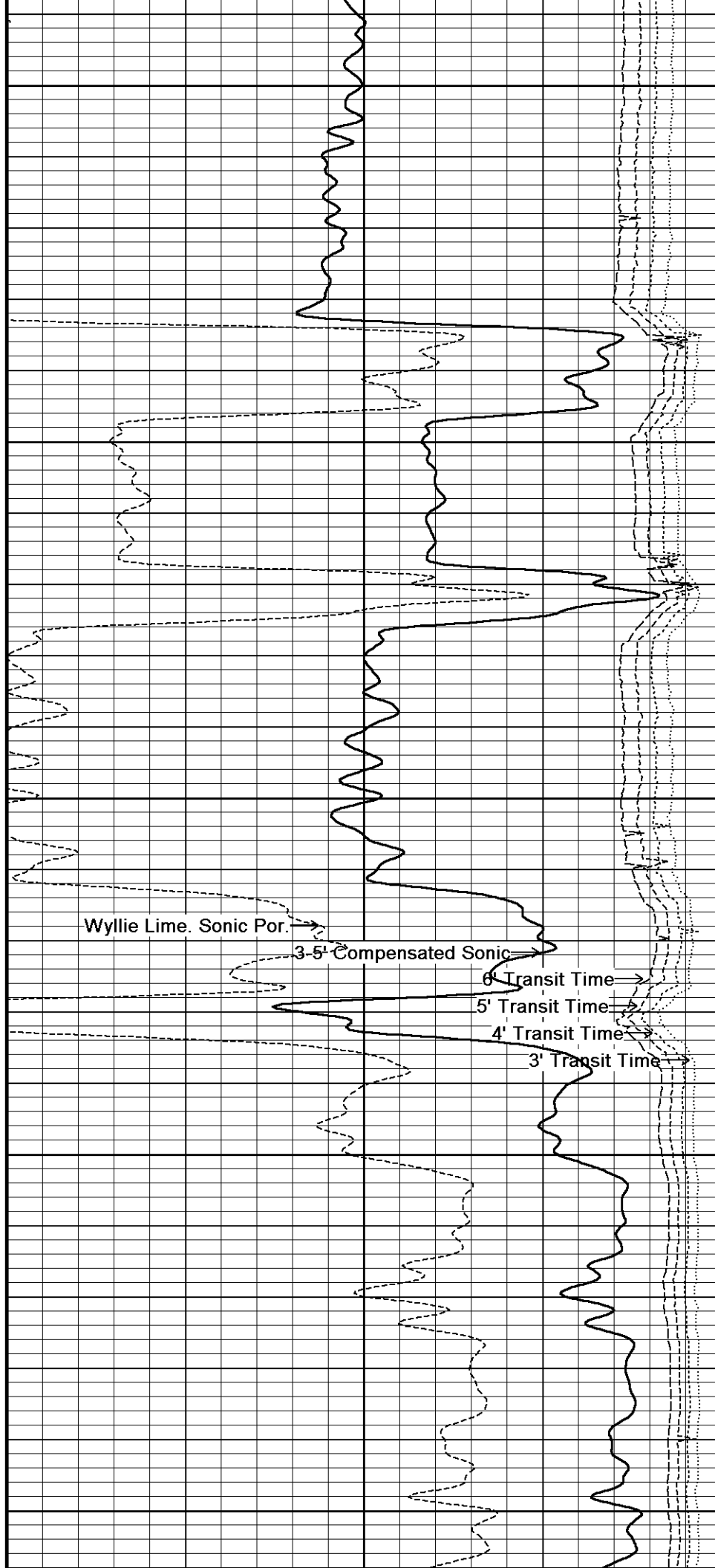
5400

129°

5450

129°

5500



Wyllie Lime. Sonic Por.

3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

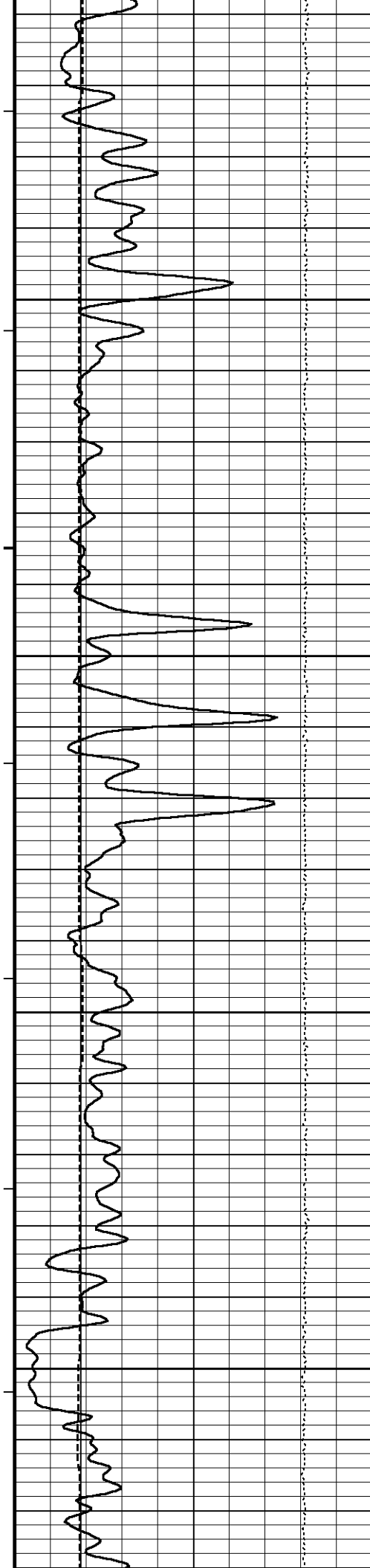
3' Transit Time

Bit Size

Density Caliper

Gamma Ray

DST Uphole Tension



129°

5550

129°

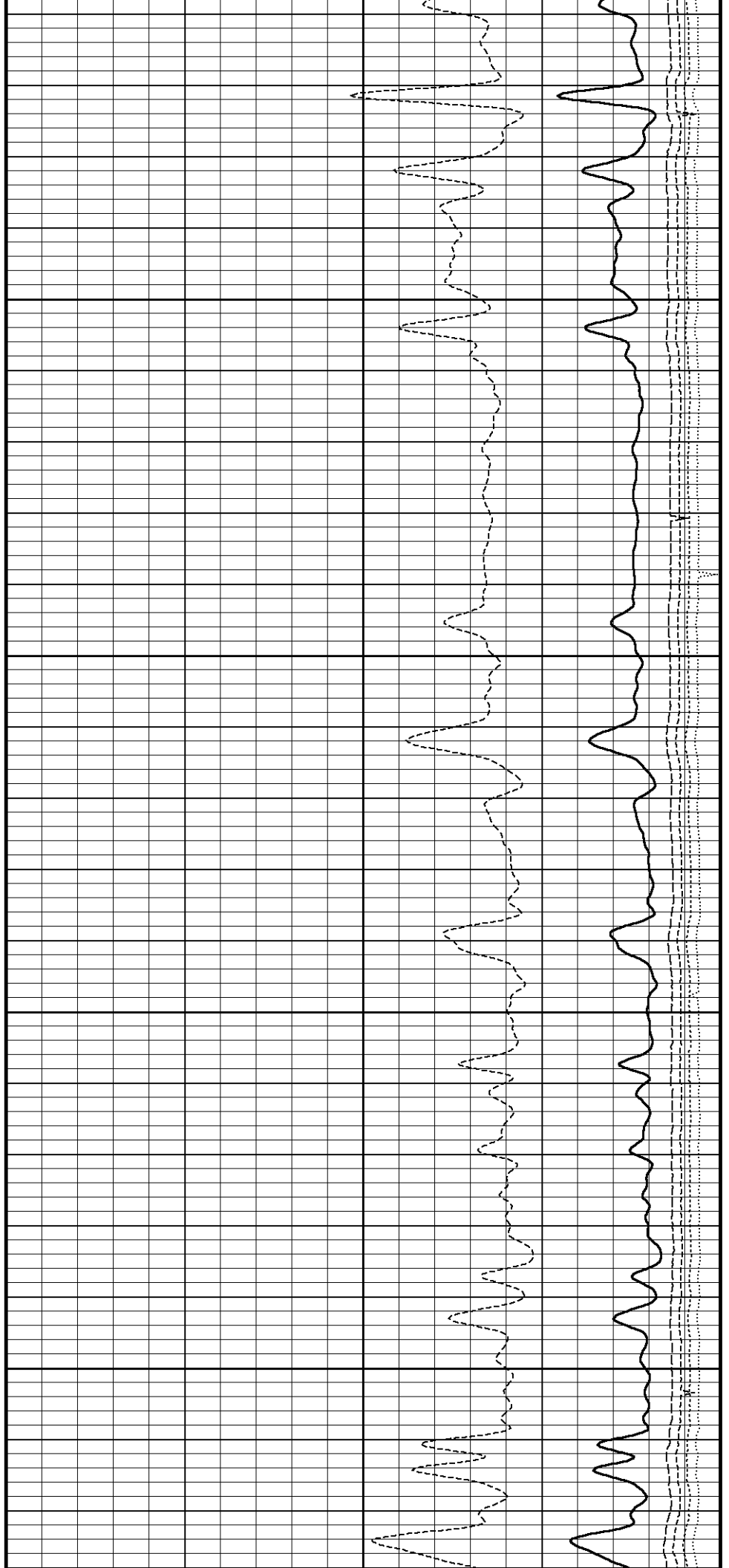
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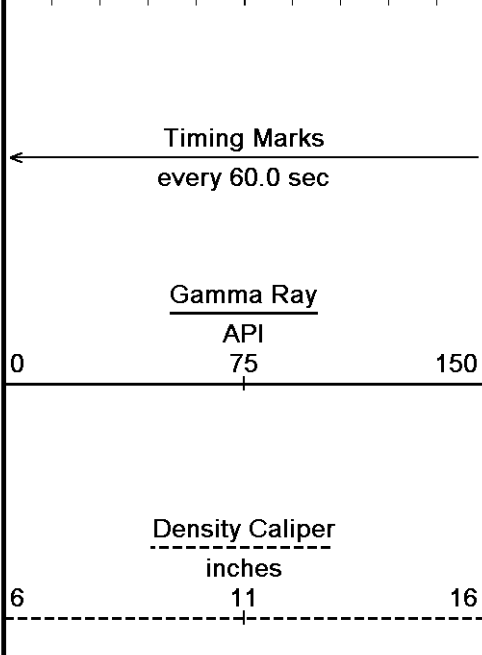
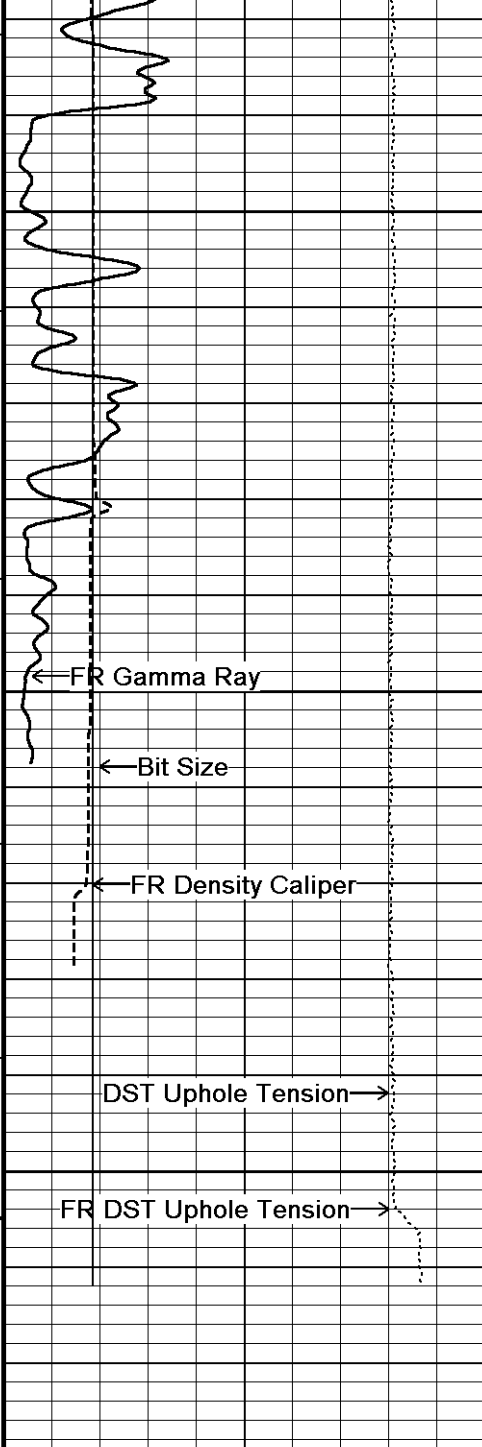
130°

5650

131°

5700





131°

5750

130°

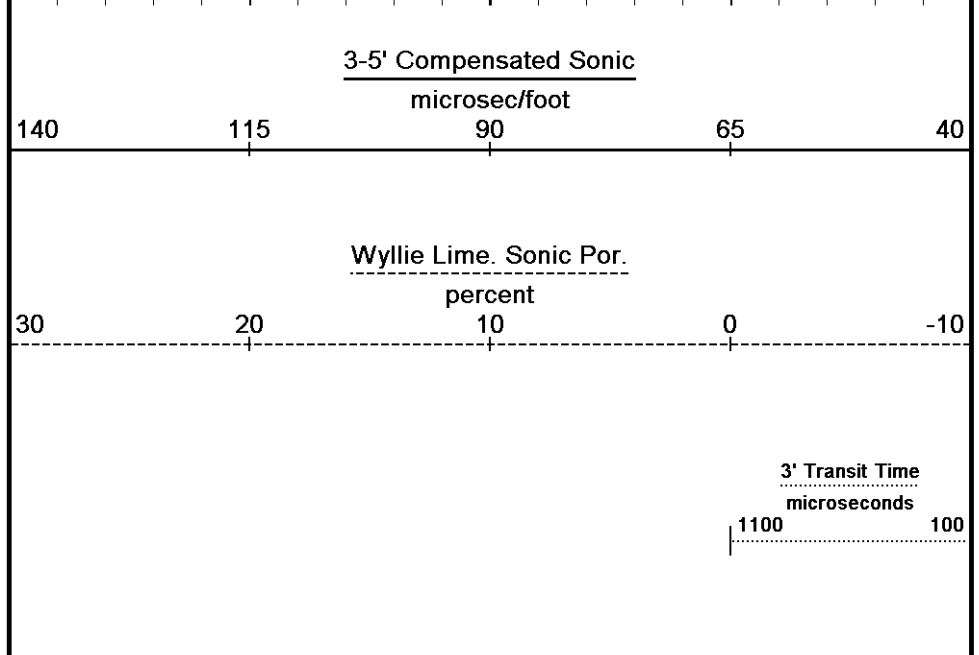
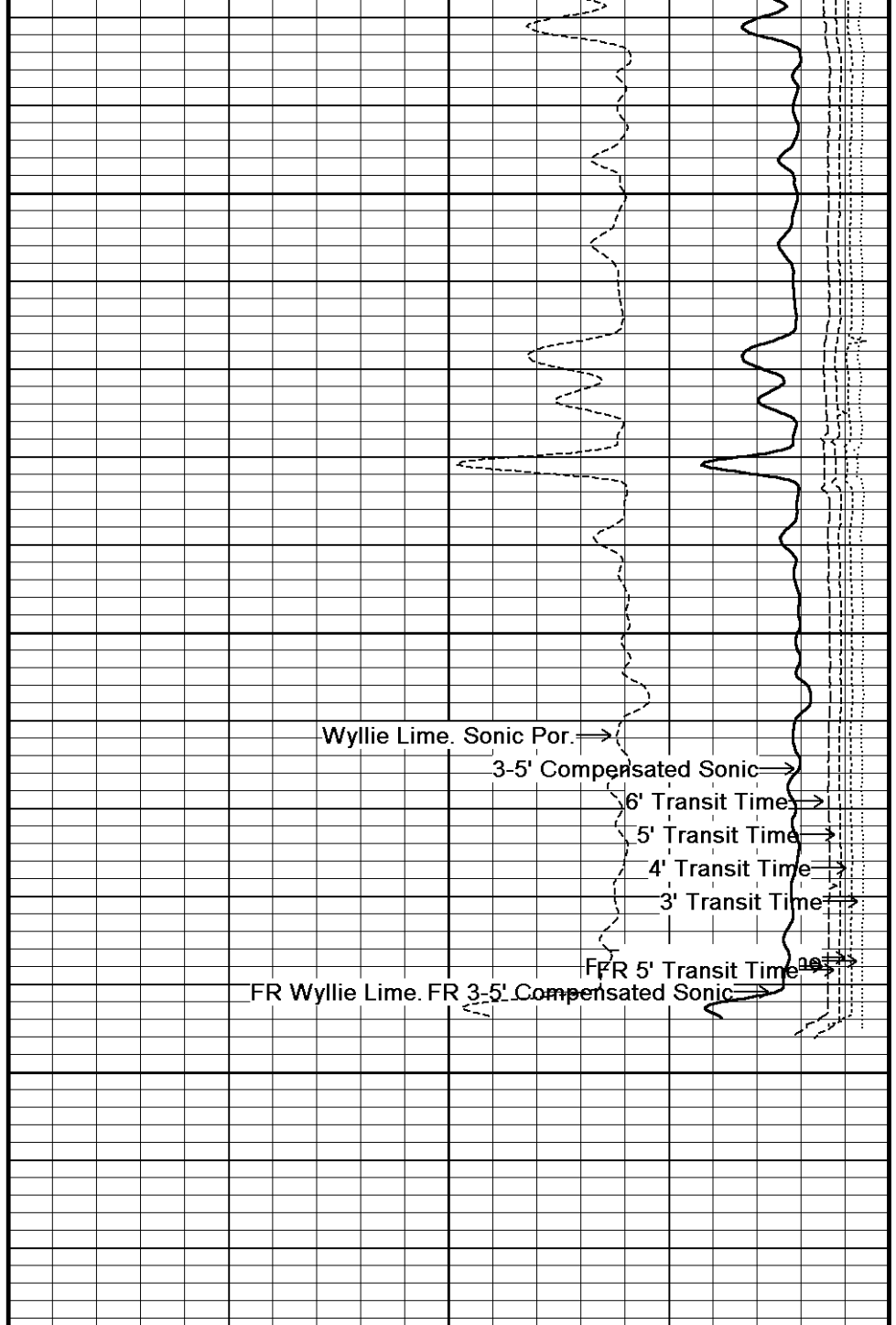
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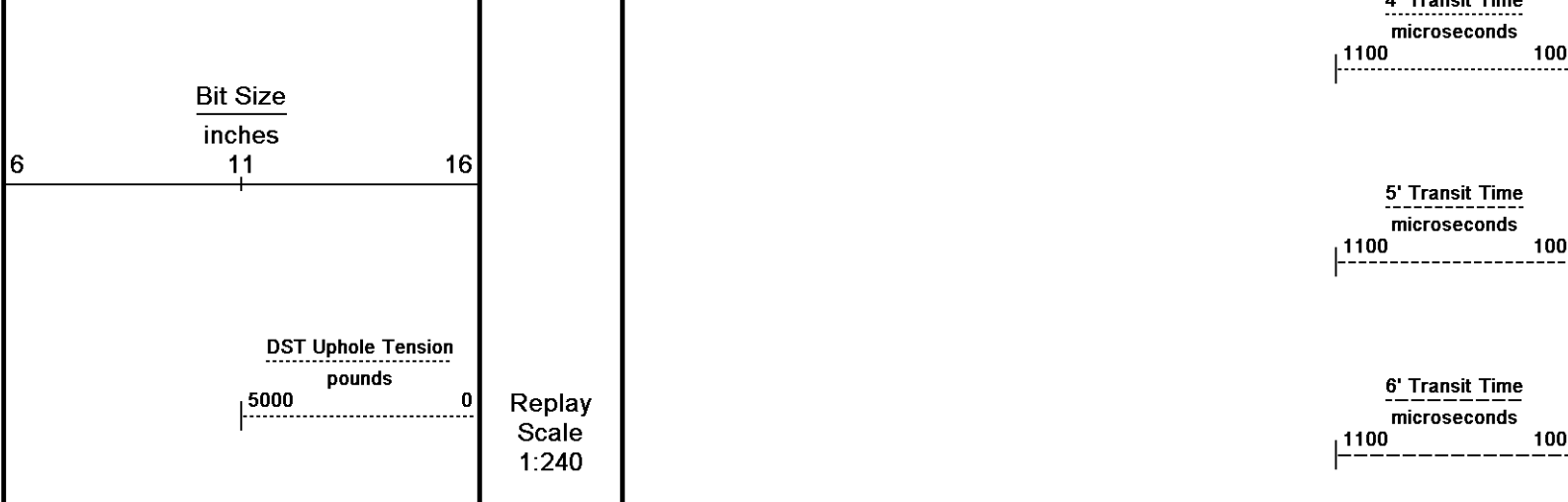
5850

5876

Depth
in
Feet

Borehole
Temp in
deg F





Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: C:\Minimus 13.02.6600\Data\Oxy KU B-3\Oxy KU B-3_002.dta
 System Versions: Logged with 13.02.6600 Plotted with 13.02.6600

Plotted on 14-SEP-2012 10:59
 Recorded on 14-SEP-2012 07:36

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION

C:\Minimus 13.02.6600\Data\Oxy KU B-3\Oxy KU B-3_003.dta

General Constants All 000			Last Edited on 13-SEP-2012,00:04
General Parameters			
Mud Resistivity	0.810	ohm-metres	
Mud Resistivity Temperature	98.000	degrees F	
Water Level	0.000	feet	
Density/Neutron 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	Base Density Porosity		
Resistivity used	Array Ind. One Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		

Down-hole Tension Calibration SMS 0		Field Calibration on 02-SEP-2012 08:42	
Reading No	Measured	Calibrated (lbs)	
1	15850.66	0.00	
2	16330.28	400.00	

Gamma Calibration MCG-C 208		Field Calibration on 11-SEP-2012 09:09	
	Measured	Calibrated (API)	
Background	73	52	
Calibrator (Gross)	1090	777	
Calibrator (Net)	1017	725	

Gamma Constants MCG-C 208		Last Edited on 13-SEP-2012,00:04	
Gamma Calibrator Number	GR38		
Mud Density	1.10	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	

SP Calibration MCG-C 208		Field Calibration on 03-AUG-2012 22:37	
	Measured	Calibrated (mV)	

Reference 1	Measured	Calibrated (mV)
Reference 2	100.2	101.0
	-101.3	-101.0
High Resolution Temperature Calibration MCG-C 208		
	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00
High Resolution Temperature Constants MCG-C 208		
Pre-filter Length	11	
Caliper Calibration MML-A 4		
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	15511	5.98
2	18793	7.97
3	22115	9.86
4	26057	11.92
5	0	0.00
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	6.12	5.98
Micro Normal and Micro Inverse Calibration MML-A 4		
Base Calibration		
Channel	Resistor 1	Resistor 2
Micro Normal	12.2	60.2
Micro Inverse	15.7	78.5
Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	62.9	62.9
Micro Inverse	48.2	48.2
Micro Normal and Micro Inverse Constants MML-A 4		
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	1.0000	
Micro Inverse K Factor	1.0000	
Standoff Offset	N/A	inches
Neutron Calibration MDN-A.B 65		
Base Calibration		
	Measured	Calibrated (cps)
	Near	Far
	3134	97
Ratio	32.240	33.764
Field Calibrator at Base		
	Calibrated (cps)	
	1654	2401
Ratio		0.689
Field Check		
	Calibrated (cps)	
	1639	2369
Ratio		0.692
Neutron Constants MDN-A.B 65		
Neutron Source Id	PN-521	
Neutron Jig Number	5824NE	
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	4.26	cu

Dolomite Sigma	4.70	cu
Formation Pressure Source	Constant Value	
Formation Pressure	0.00	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 352 Base Calibration on 27-AUG-2012 14:50
Field Check on 11-SEP-2012 09:04

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	963.9	126.8
Base Check		281.2
Field Check		281.4

FE Constants MFE-B.J 352 Last Edited on 13-SEP-2012,00:03

Running Mode	No Sleeve	
MFE K Factor	0.1268	
Caliper Source for FE correction	Density Caliper	
Caliper Value for FE correction	N/A	inches
Rm Source for FE correction	Temperature Corr	
Temp. for Rm Corr.	MCG External Temperature	
Stand-off	0.5	inches

Sonic Constants MSS-C.K 330 Last Edited on 13-SEP-2012,00:03

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				
Free Pipe	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

Induction Calibration MAI-A.A 45

Base Calibration on 26-JUL-2012,09:22

Field Check on 11-SEP-2012 09:03

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	14.4	472.6	9.3	966.2
2	5.7	374.0	7.6	821.4
3	3.4	261.2	5.2	566.0
4	2.5	133.9	2.6	279.2

Array Temperature 78.4 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	19.7	3853.2
2	0.0	0.0	32.2	3630.7
3	0.0	0.0	29.0	3050.6
4	0.0	0.0	18.5	2079.8
Deep	0.0	0.0	16.3	1911.9
Medium	0.0	0.0	42.9	4062.2
Shallow	0.0	0.0	50.3	5485.2

Array Temperature 0.0 75.0 Deg F

Induction Constants MAI-A.A 45

Last Edited on 13-SEP-2012,00:03

Induction Model	RtAP-WBM	
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	8.0000	
Stand-off Fin Angle	45.00	degrees
Stand-off Fin Width	0.5000	inches
Borehole Corr. Rm Source	Temperature Corr	
Temp. for Rm Corr.	MCG External Temperature	
Squasher Start	0.0020	mhos/metre
Squasher Offset	N/A	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
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

High Resolution Temperature Calibration MAI-A.A 45			Field Calibration on 26-JUL-2012,09:09
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MAI-A.A 45		Last Edited on
Pre-filter Length	11	

Caliper Calibration MPD-B 31			Base Calibration on 28-AUG-2012 11:03	Field Calibration on 11-SEP-2012 08:56
Base Calibration				
Reading No	Measured	Calibrator Size (in)		
1	18576	3.99		
2	27056	5.98		
3	35613	7.97		
4	44032	9.86		
5	53360	11.92		
6	N/A	N/A		
Field Calibration				
	Measured Caliper (in)	Actual Caliper (in)		
	6.01	5.98		

Photo Density Calibration MPD-B 31			Base Calibration on 28-AUG-2012 11:22	Field Check on 11-SEP-2012 09:01
Density Calibration				
Base Calibration				
	Measured	Calibrated (sdu)		
	Near	Far	Near	Far
Reference 1	46103	23728	59556	30836
Reference 2	19270	1960	24941	2541
Field Check at Base				
	688.3	844.7		
Field Check				
	689.6	853.1		
PE Calibration				
Base Calibration				
	WS	Measured	Calibrated	
		WH	Ratio	Ratio
Background	127	604		
Reference 1	18457	45978	0.404	0.371
Reference 2	5504	19174	0.290	0.272
Field Check at Base				
	127.0	604.2		
Field Check				
	129.2	603.4		

Density Constants MPD-B 31		Last Edited on 13-SEP-2012,00:04
Density Source Id	254	
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 Z/A Multiplier	1.13	
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	

Matrix density (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	0.00

DOWNHOLE EQUIPMENT

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Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 4 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

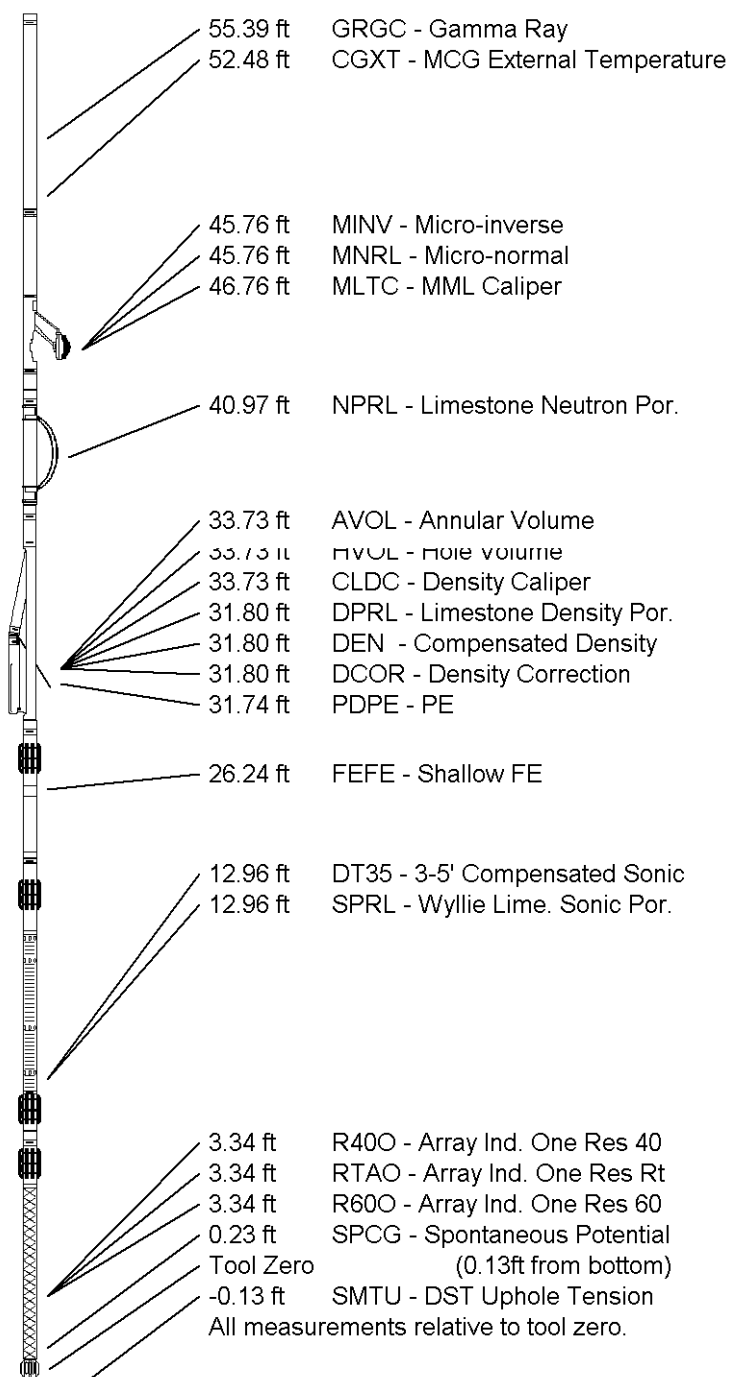
Compact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 60.68 ft Weight: 456.4 lb



COMPANY	OXY USA, INC.				
WELL	KU B-3				
FIELD	ARROYO				
PROVINCE/COUNTY	STANTON				
COUNTRY/STATE	U.S.A. / KANSAS				
Elevation Kelly Bushing	3425.00	feet	First Reading	5841.00	feet
Elevation Drill Floor	3423.00	feet	Depth Driller	5850.00	feet
Elevation Ground Level	3411.00	feet	Depth Logger	5854.00	feet
 Weatherford® COMPENSATED SONIC WITH INTEGRATED TRANSIT TIME					