



**Weatherford**

**COMPENSATED SONIC  
WITH INTEGRATED TRANSIT TIME**

COMPANY **MCCELVAIN ENERGY, INC.**  
 WELL **PRICE 14-5**  
 FIELD **LIANOS SE**  
 PROVINCE/COUNTY **SHERMAN**  
 COUNTRY/STATE **U.S.A. / KANSAS**  
 LOCATION **1717' FNL & 388' FWL  
SE NW SW NW**

SEC	TWP	RGE	Other Services	SGS
14	6S	37W	MPD/MDN	
API Number	15-181-20597		MA/MFE	
Permit Number			MML	

Permanent Datum GL, Elevation 3441 feet  
 Log Measured From KB  
 Drilling Measured From KB @ 11 FEET

Date	23-NOV-2013	Elevations:	KB 3452.00 DF 3450.00 GL 3441.00
Run Number	ONE		
Service Order	3547622		
Depth Driller	5082.00	feet	
Depth Logger	5078.00	feet	
First Reading	5065.00	feet	
Last Reading	331.00	feet	
Casing Driller	352.00	feet	
Casing Logger	351.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.30 lb/USg	50.00 CP	
PH / Fluid Loss	10.50	8.00 ml/30Min	
Sample Source	FLOW LINE		
Rm @ Measured Temp	1.60 @ 49.0	ohm-m	
Rmf @ Measured Temp	1.28 @ 49.0	ohm-m	
Rmc @ Measured Temp	1.92 @ 49.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.60 @ 130.0	ohm-m	
Time Since Circulation	3 HRS		
Max Recorded Temp	130.00	deg F	
Equipment / Base	13057	LIB	
Recorded By	J. LAPPOINT		R. HOFFMAN
Witnessed By	L. NICHOLSON		
JOB #	LB 13-331		

BOREHOLE RECORD			Last Edited: 24-NOV-2013 07:12
Bit Size inches	Depth From feet	Depth To feet	
7.875	351.00	5078.00	

CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	351.00	24.00

**REMARKS**

- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, SGS, 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: 1847 CU. FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 1071 CU. FT.

- RIG: H2 DRILLING

- ENGINEER: J. LAPOINT AND R. HOFFMAN

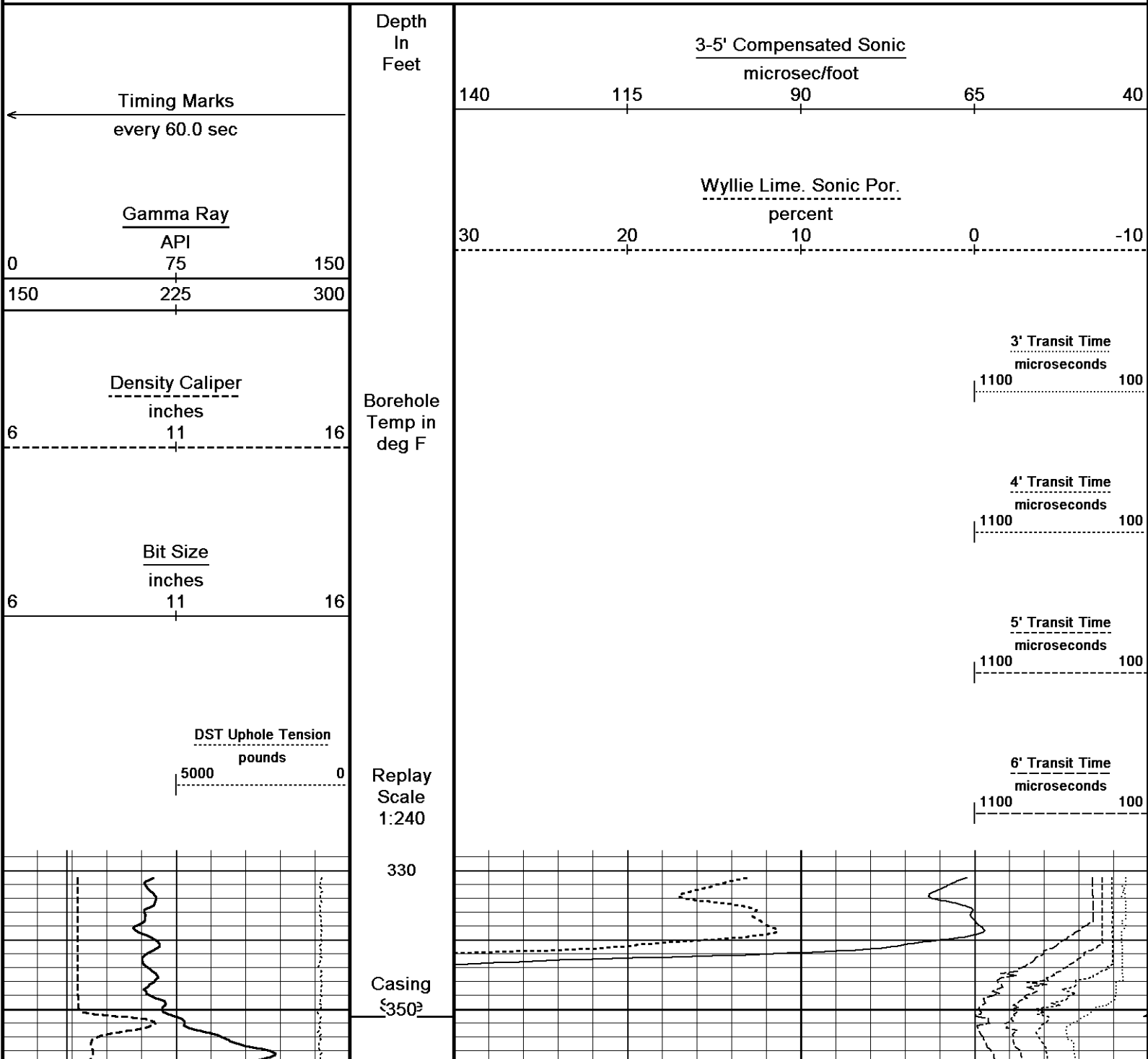
- OPERATOR(S): K. RINEHART AND C. RAMIREZ

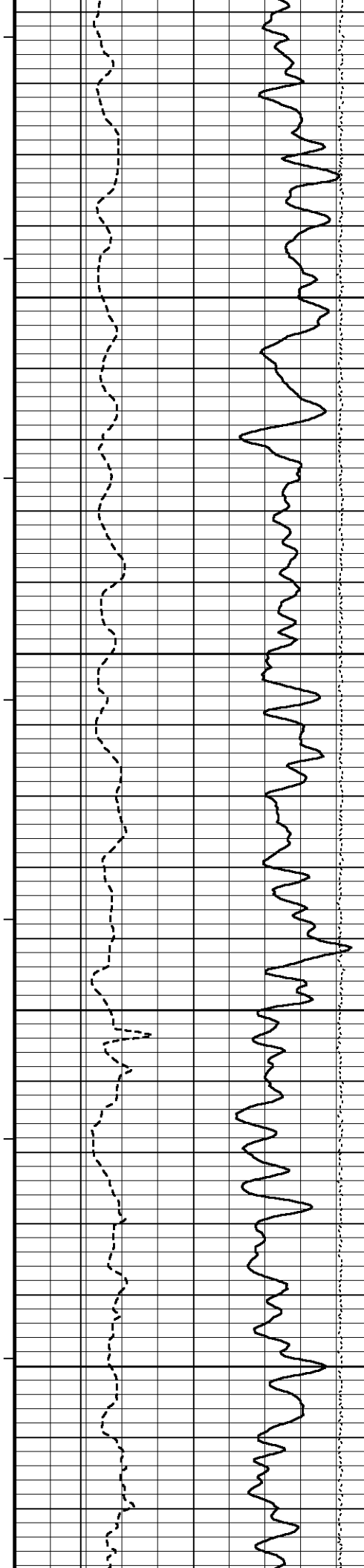
- LCM: 8 LBS/PBL

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.

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm  
Plotted on 24-NOV-2013 08:36  
Filename: C:\Minimus 13.05.9583\Logs\McElvain Price 14-5\McElvain Price 14-5 Main.dta  
Recorded on 24-NOV-2013 02:52  
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583





79°

400

79°

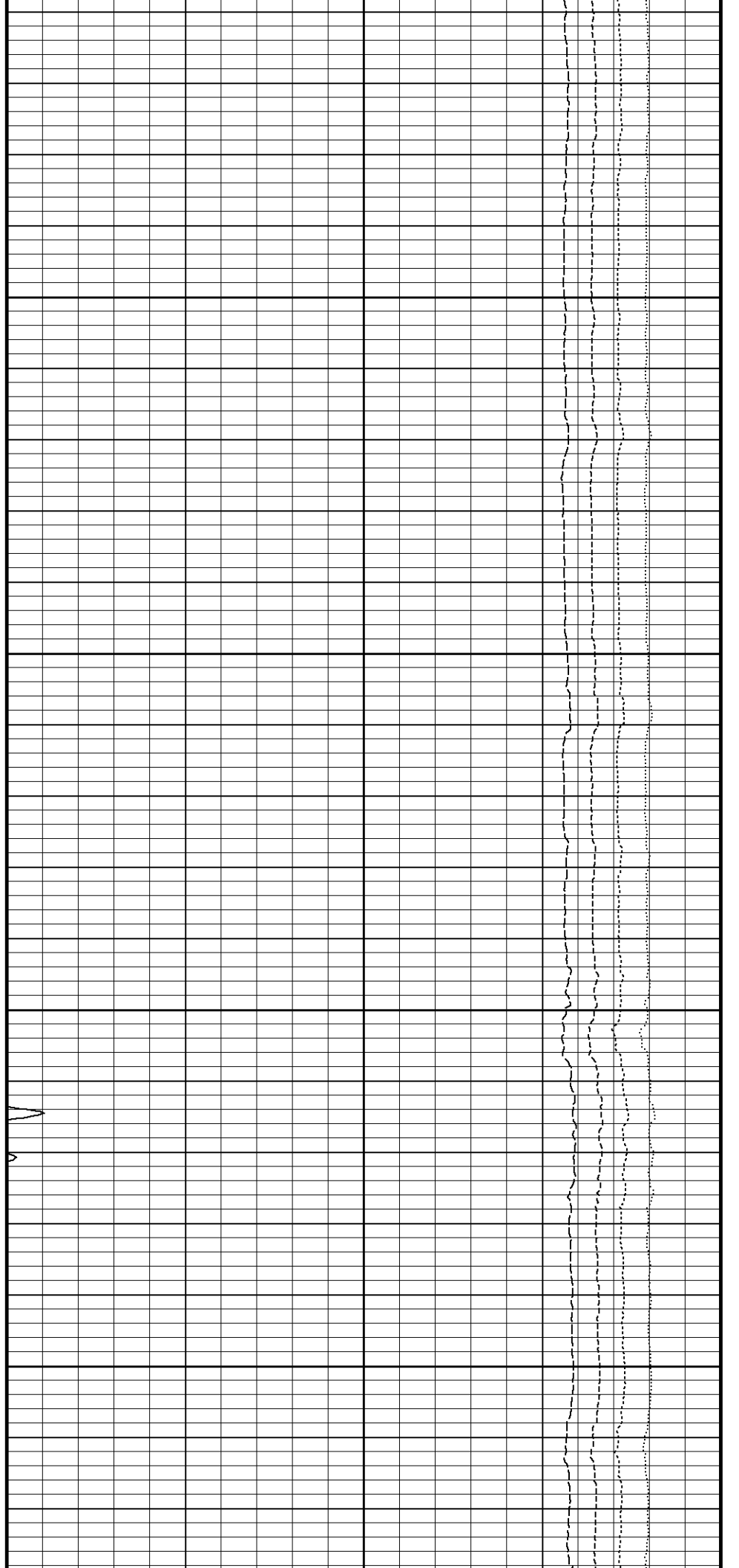
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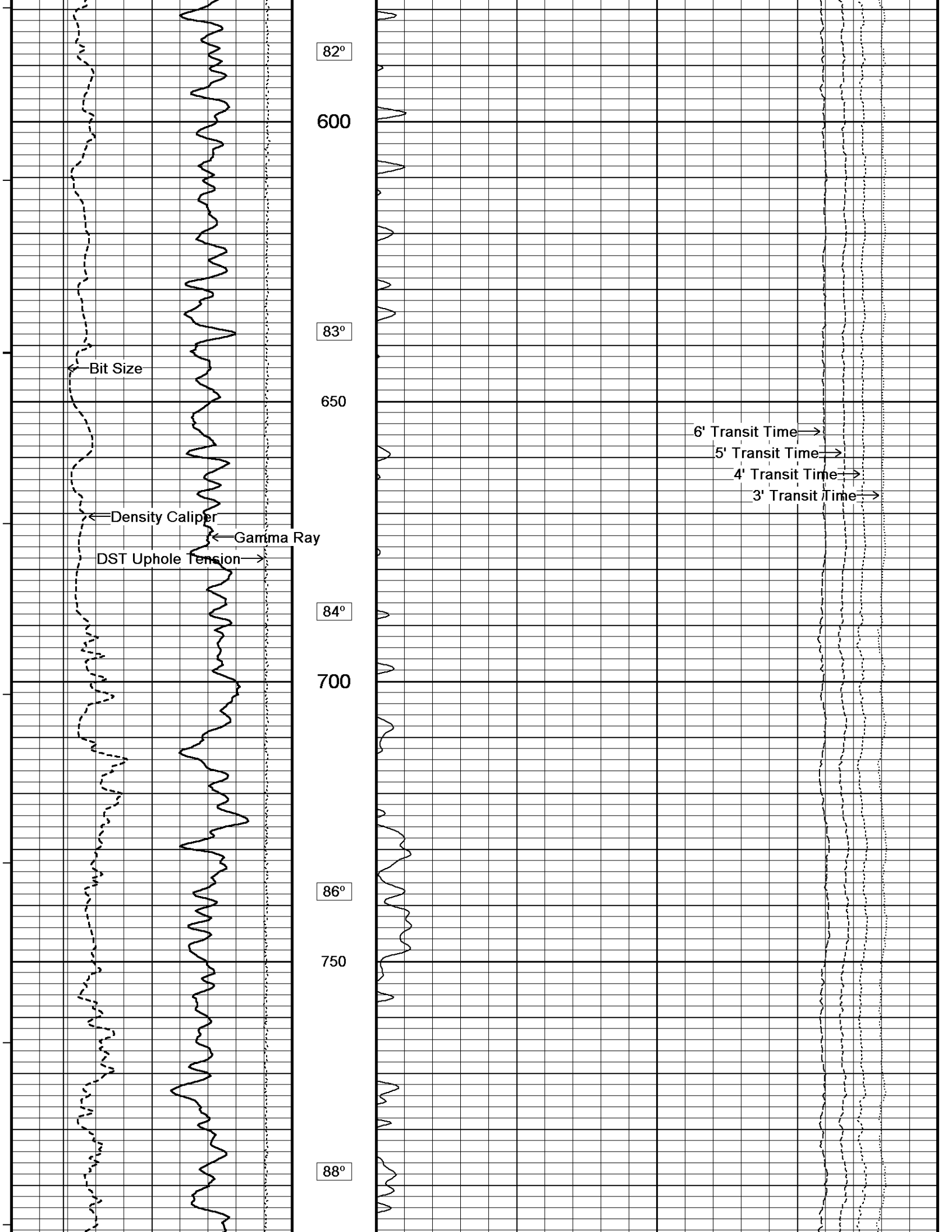
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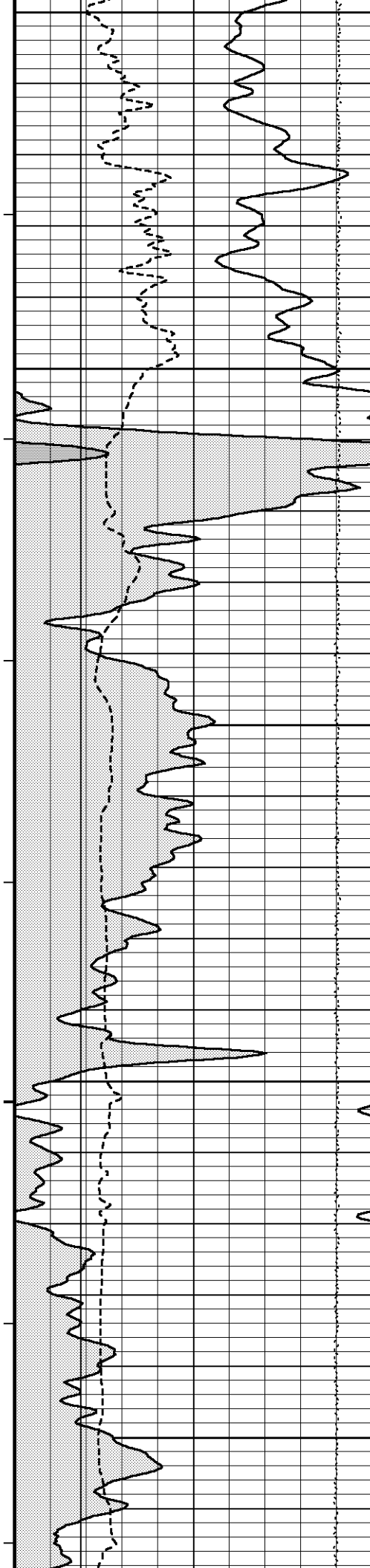
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81°

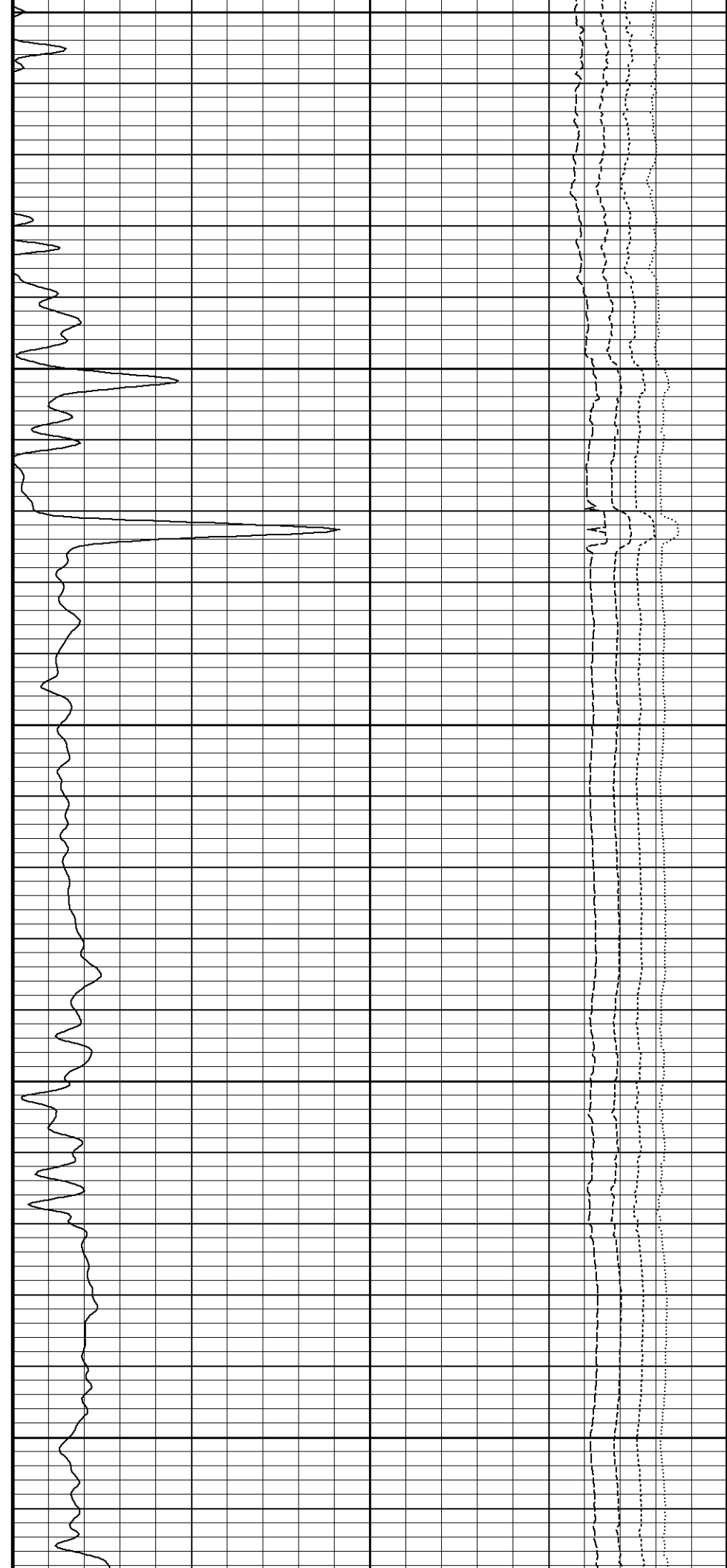
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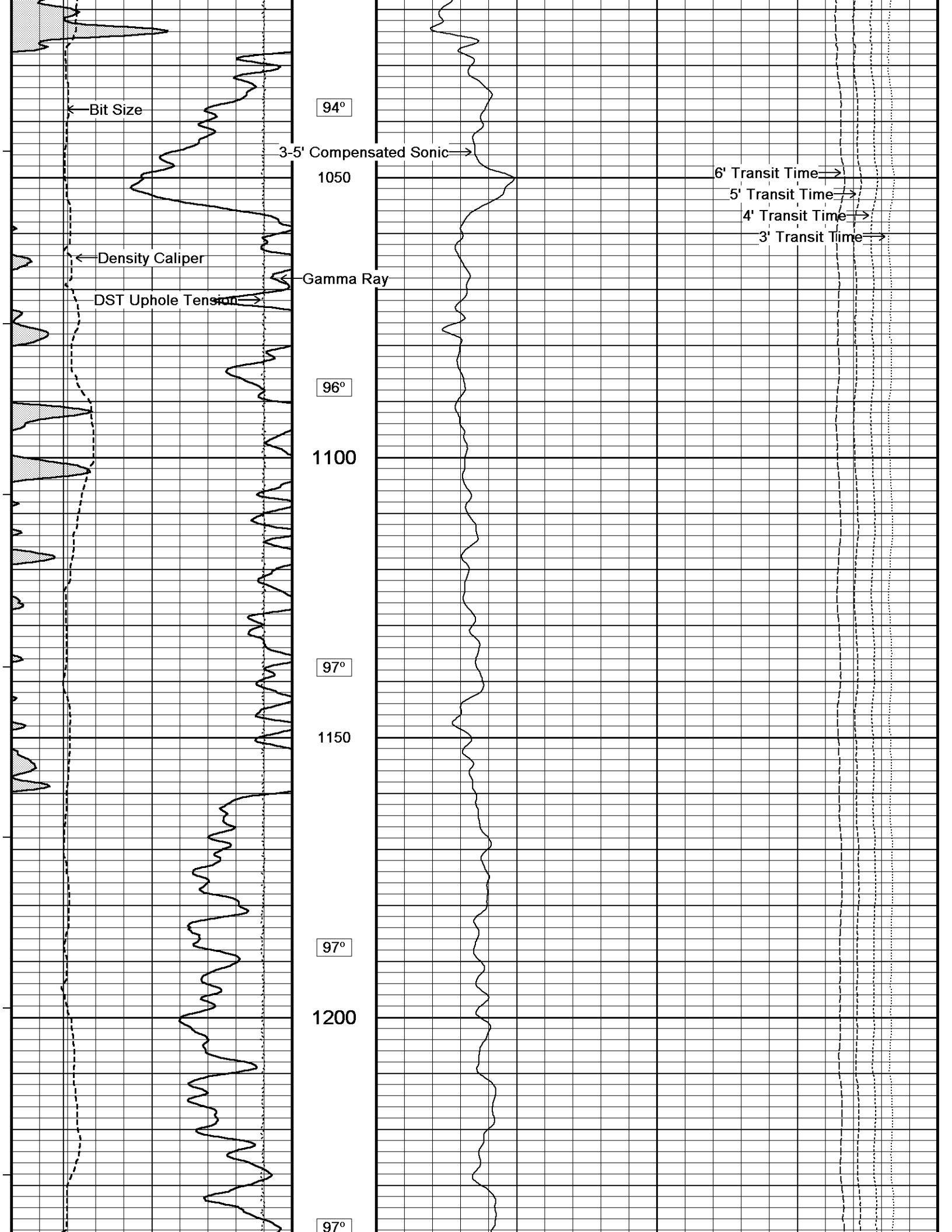






800  
90°  
850  
92°  
900  
93°  
950  
94°  
1000





← Bit Size

94°

3-5' Compensated Sonic →

1050

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →

← Density Caliper

Gamma Ray

DST Uphole Tension →

96°

1100

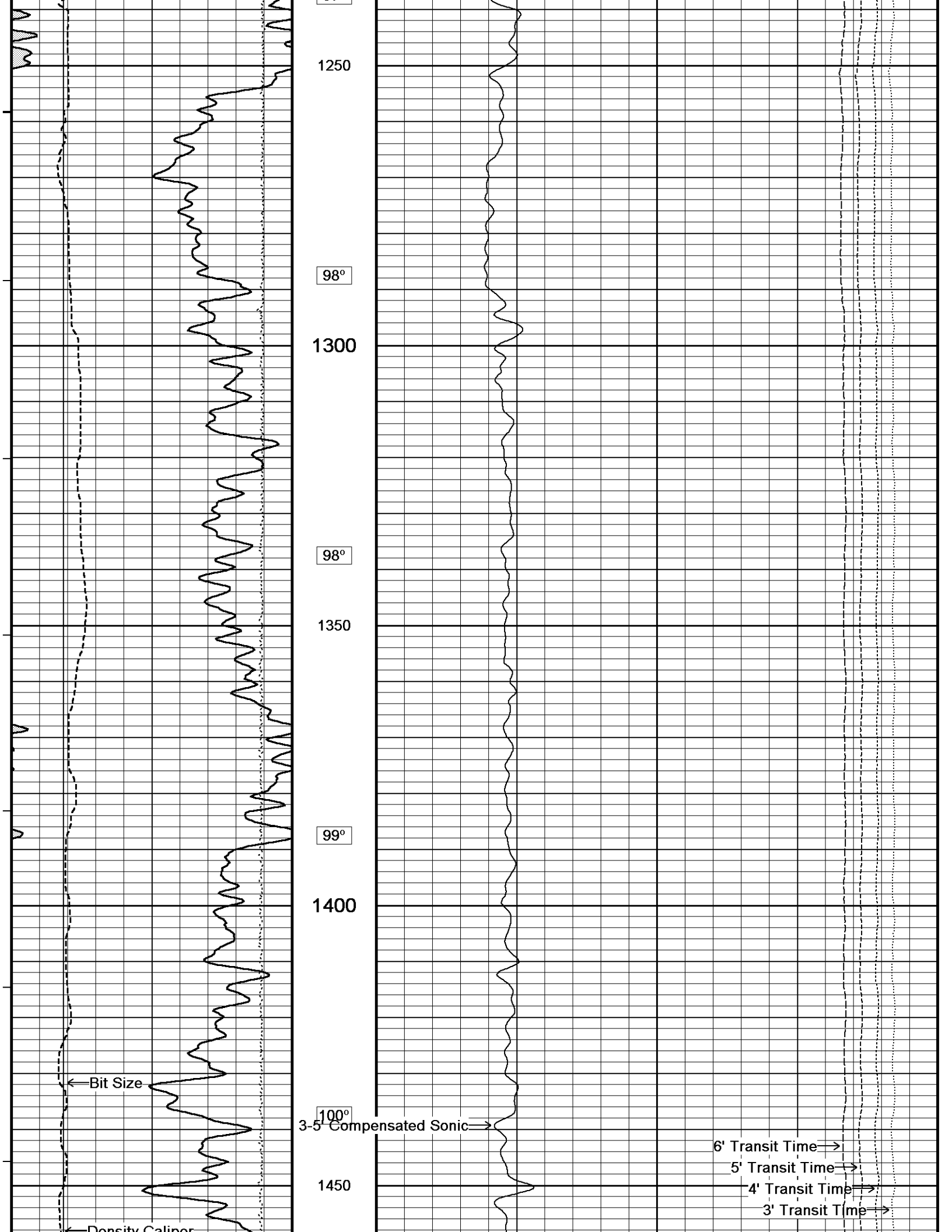
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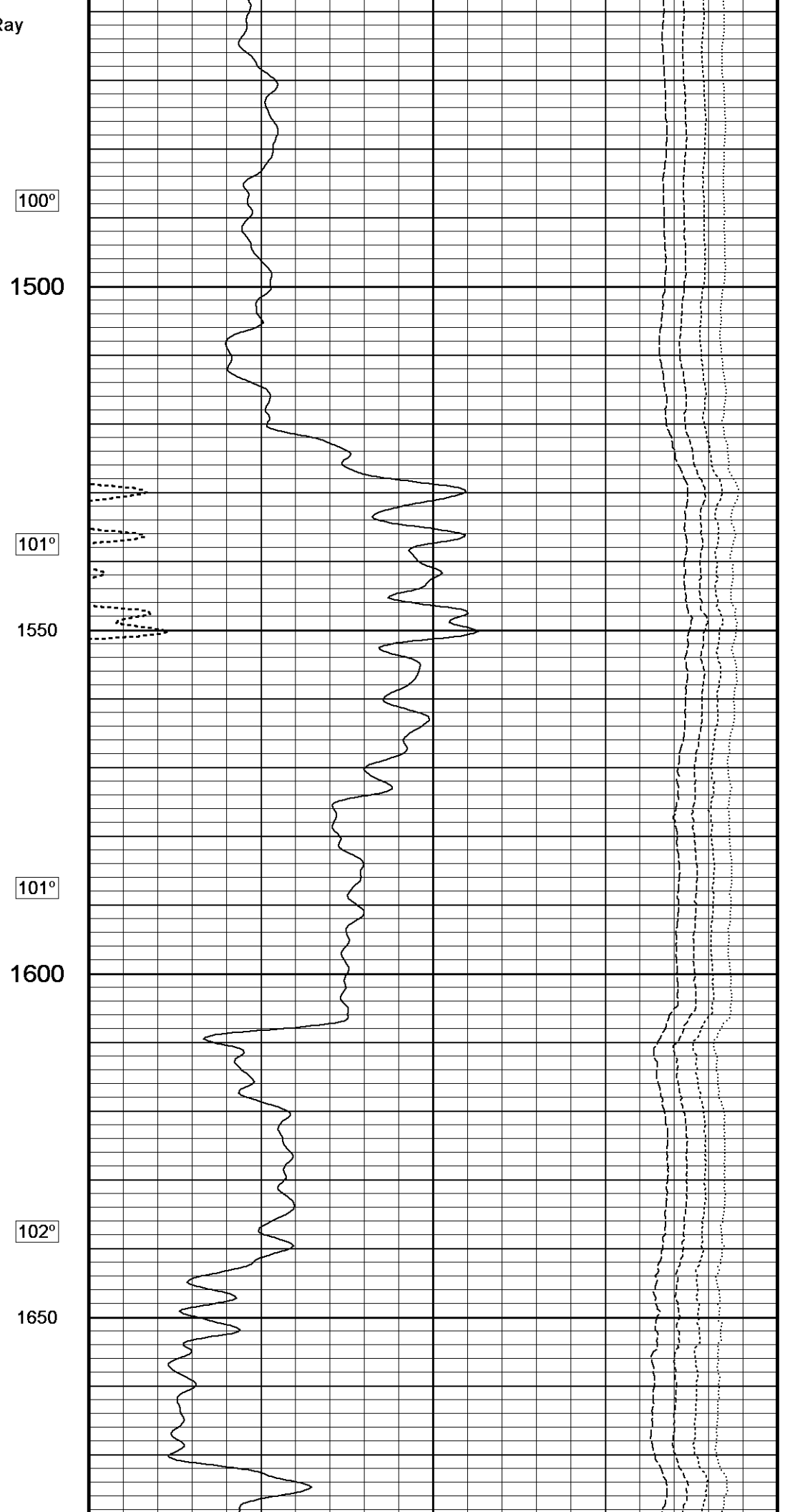
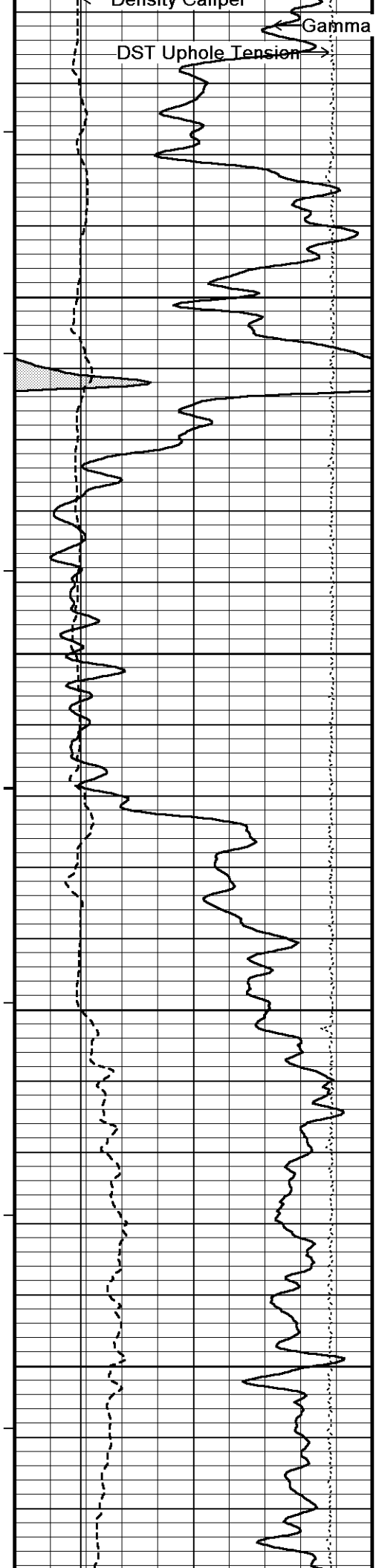
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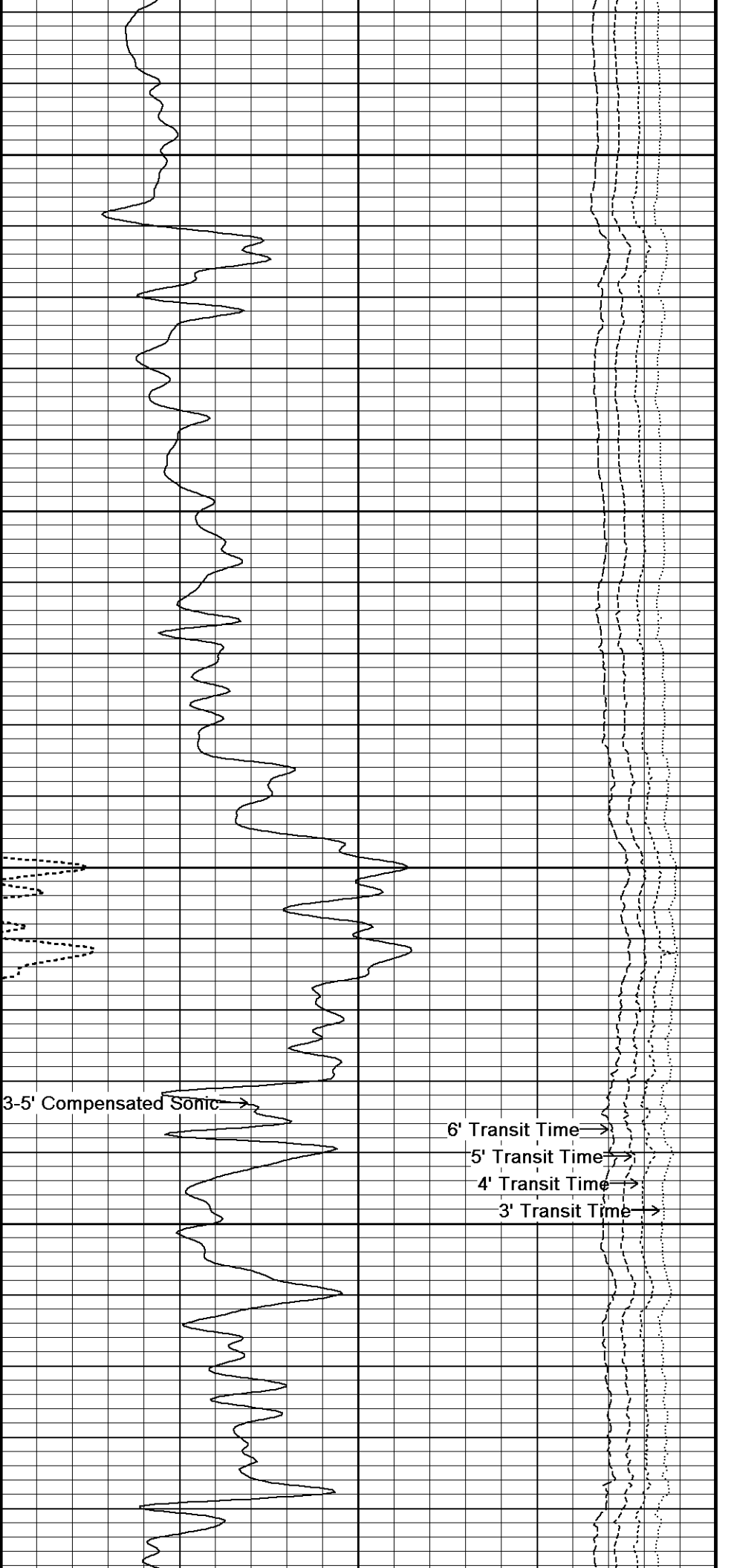
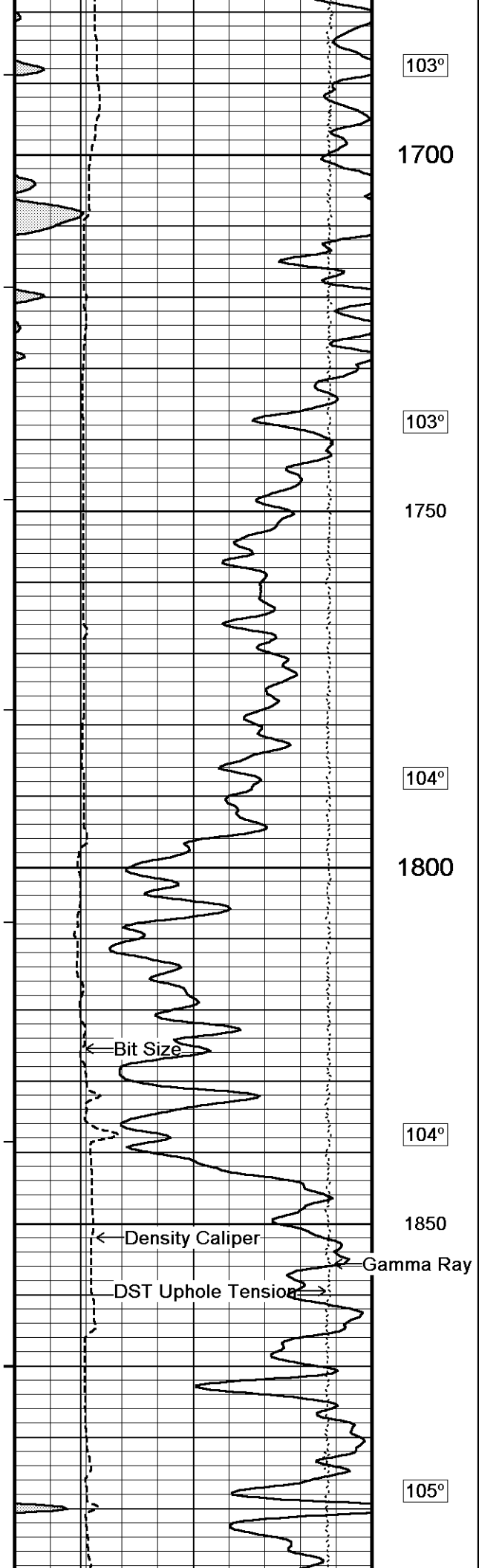
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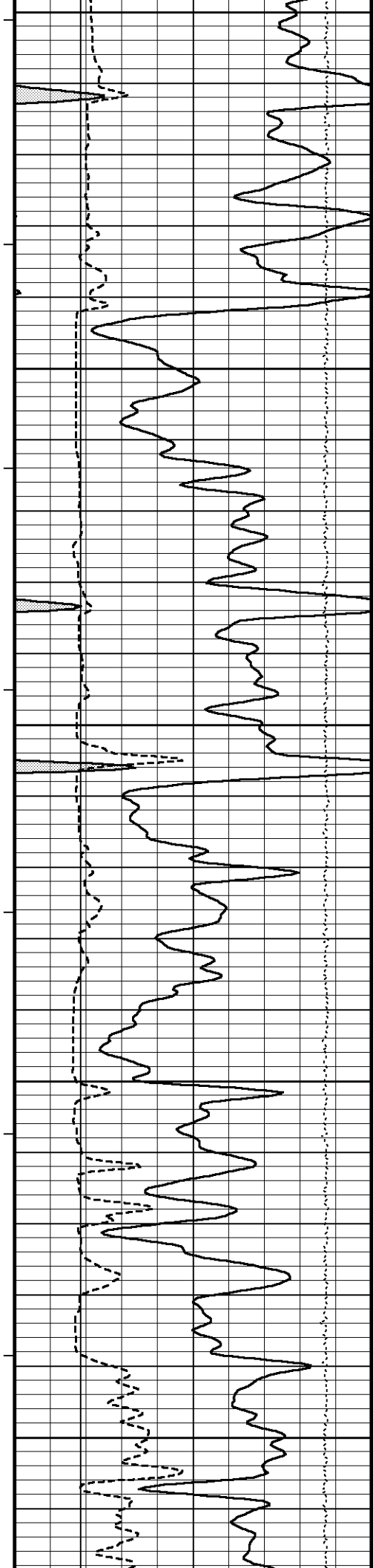
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97°

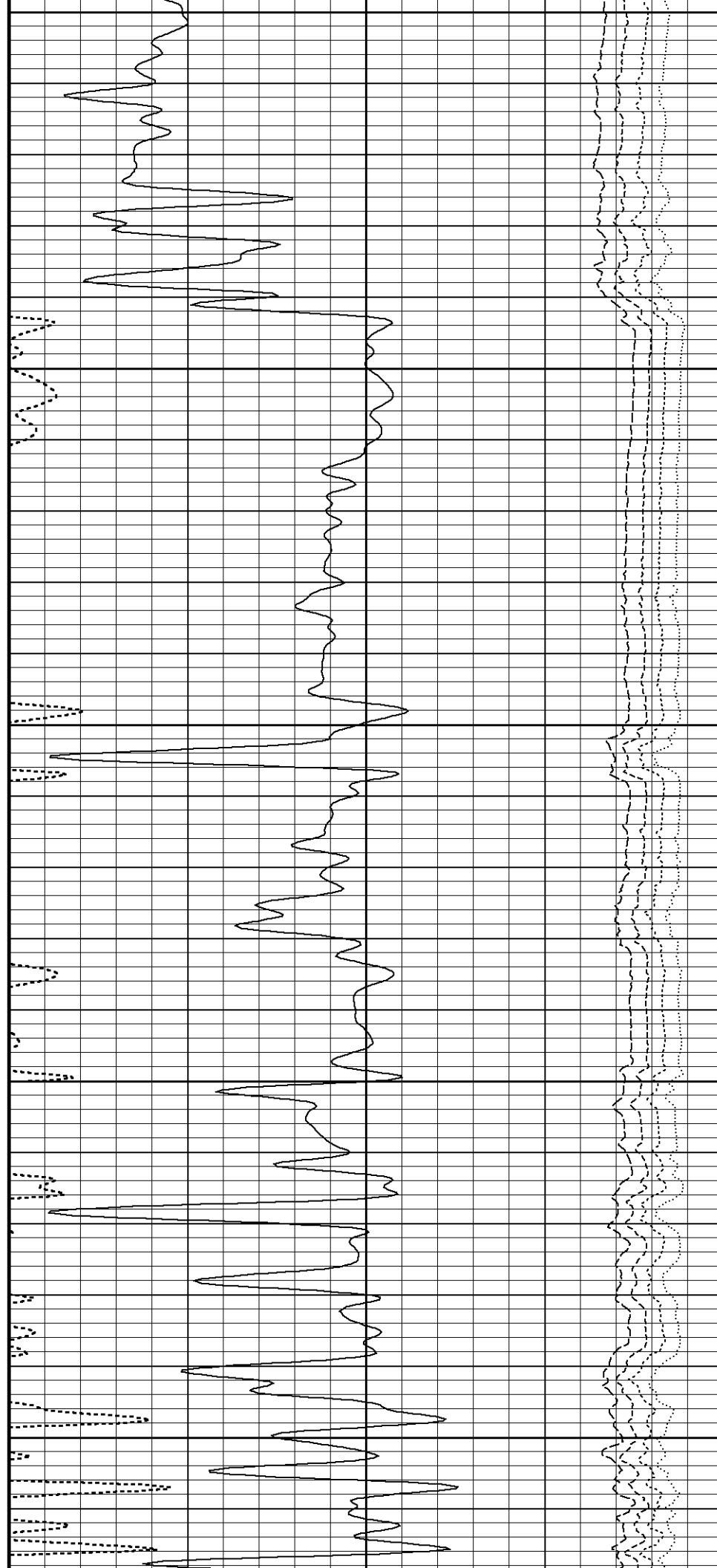


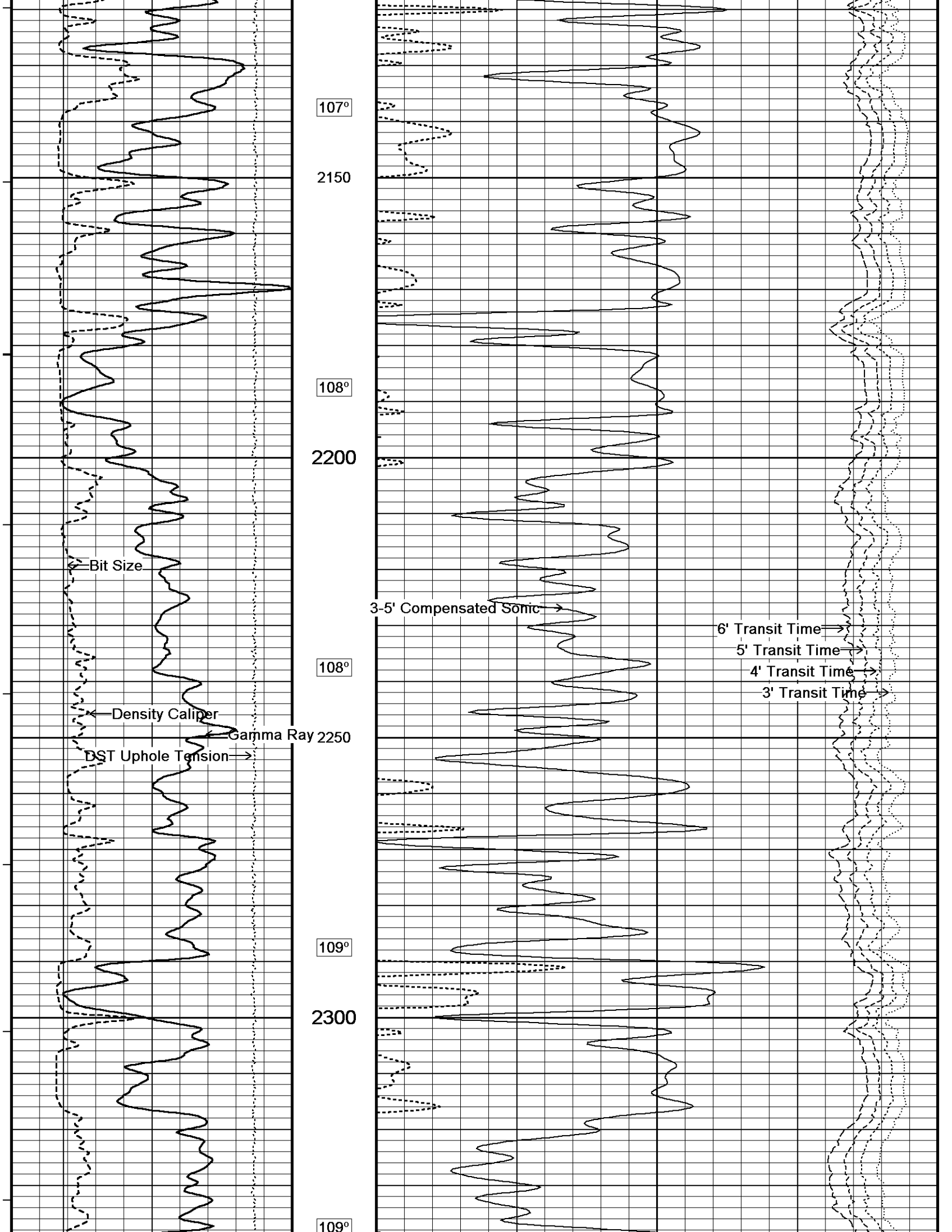


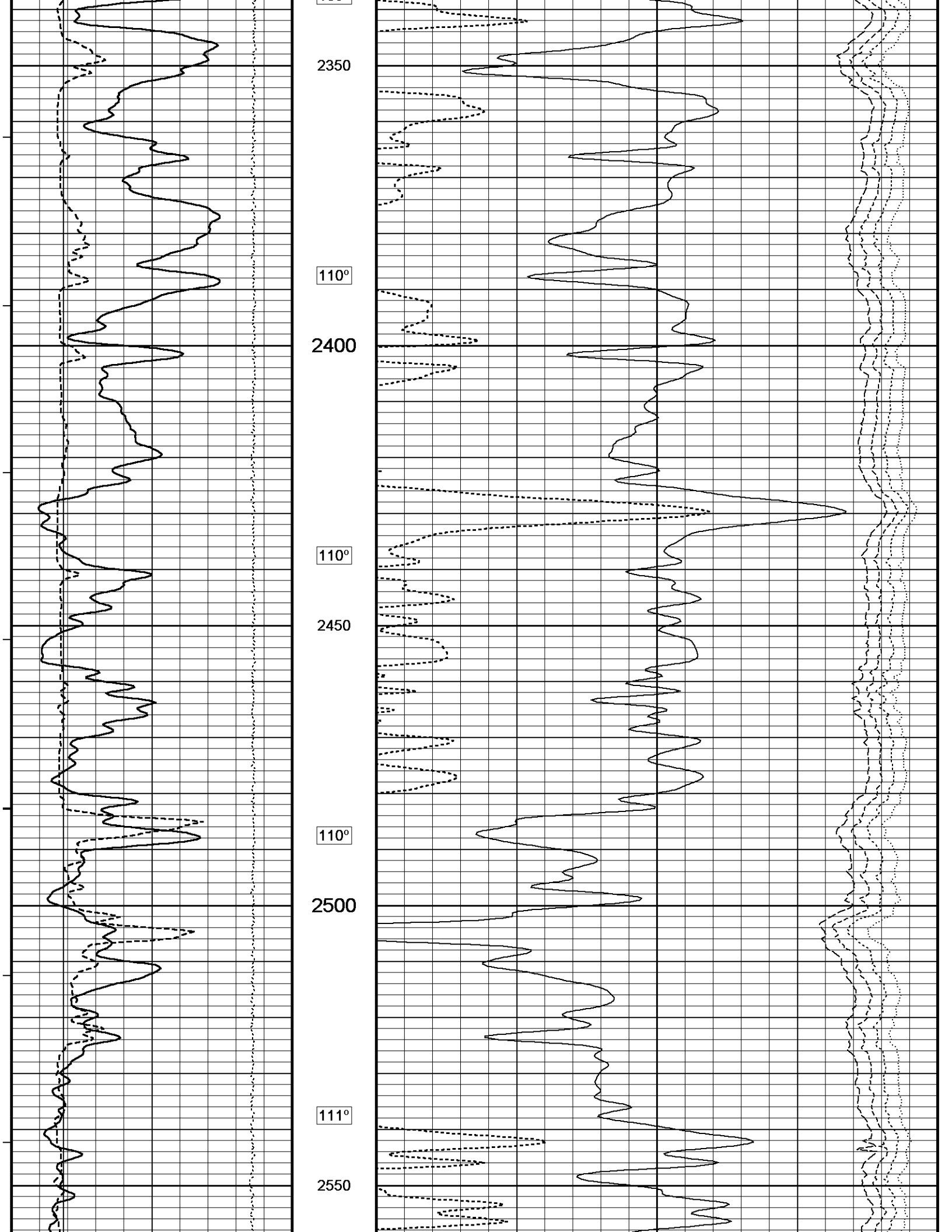


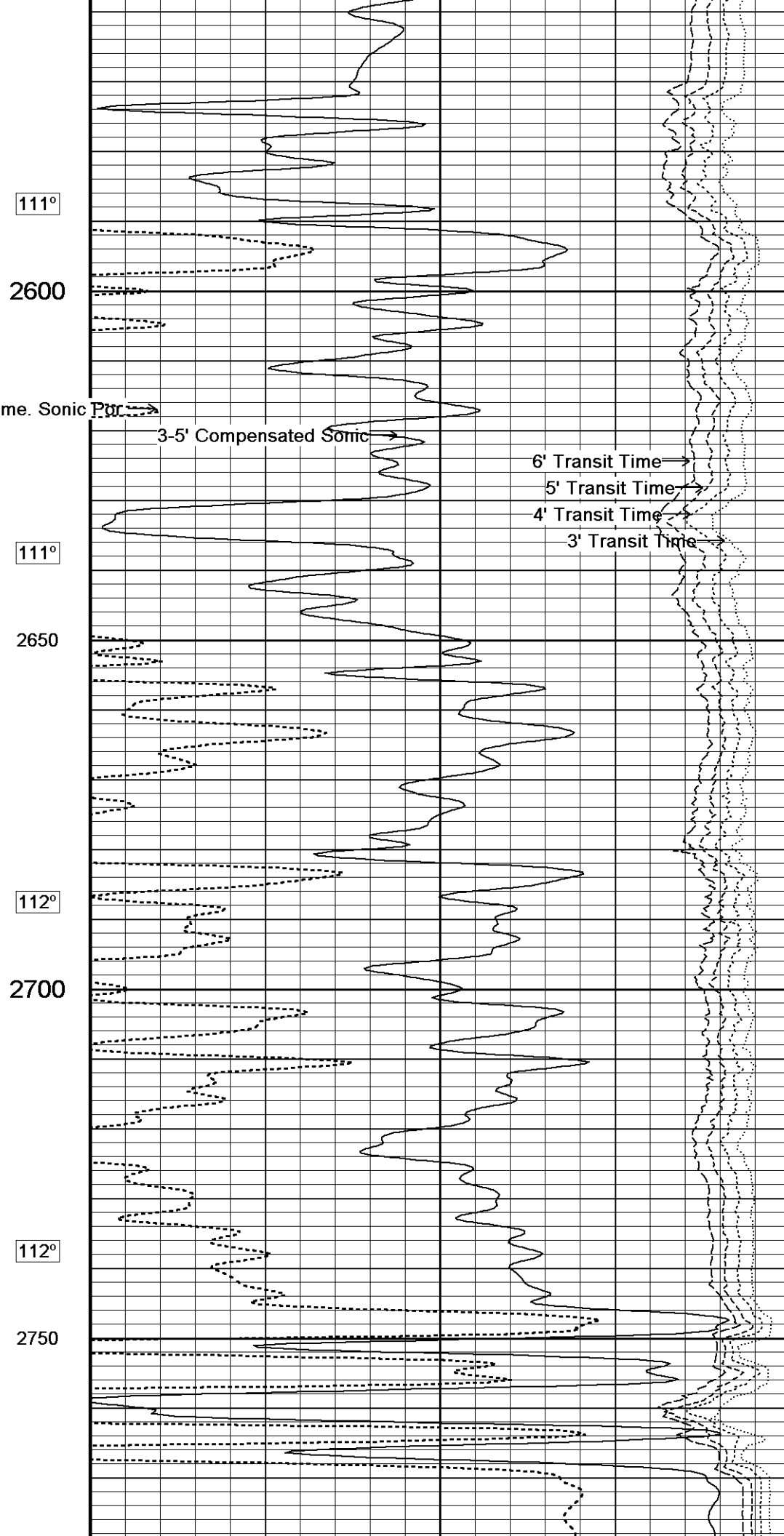
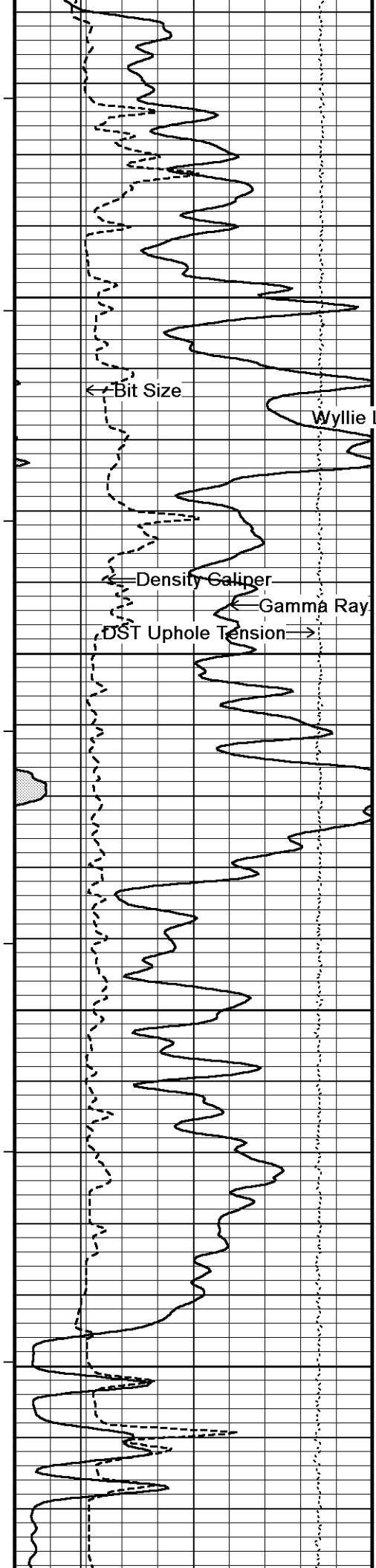


1900  
106°  
1950  
106°  
2000  
106°  
2050  
107°  
2100









111°

2600

111°

2650

112°

2700

112°

2750

← Bit Size

Wyllie Lime. Sonic Por. →

3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

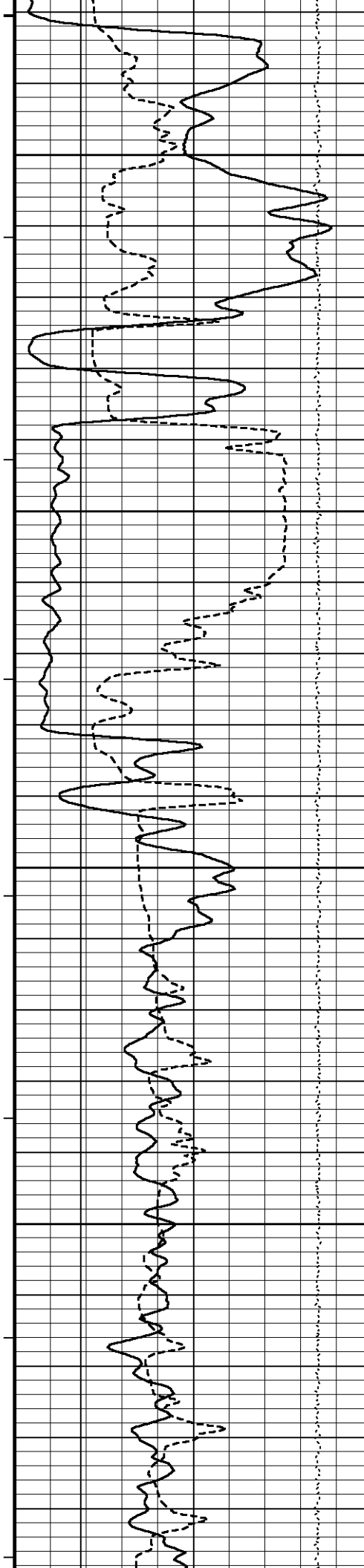
4' Transit Time →

3' Transit Time →

← Density Caliper

← Gamma Ray

→ DST Uphole Tension



112°

2800

113°

2850

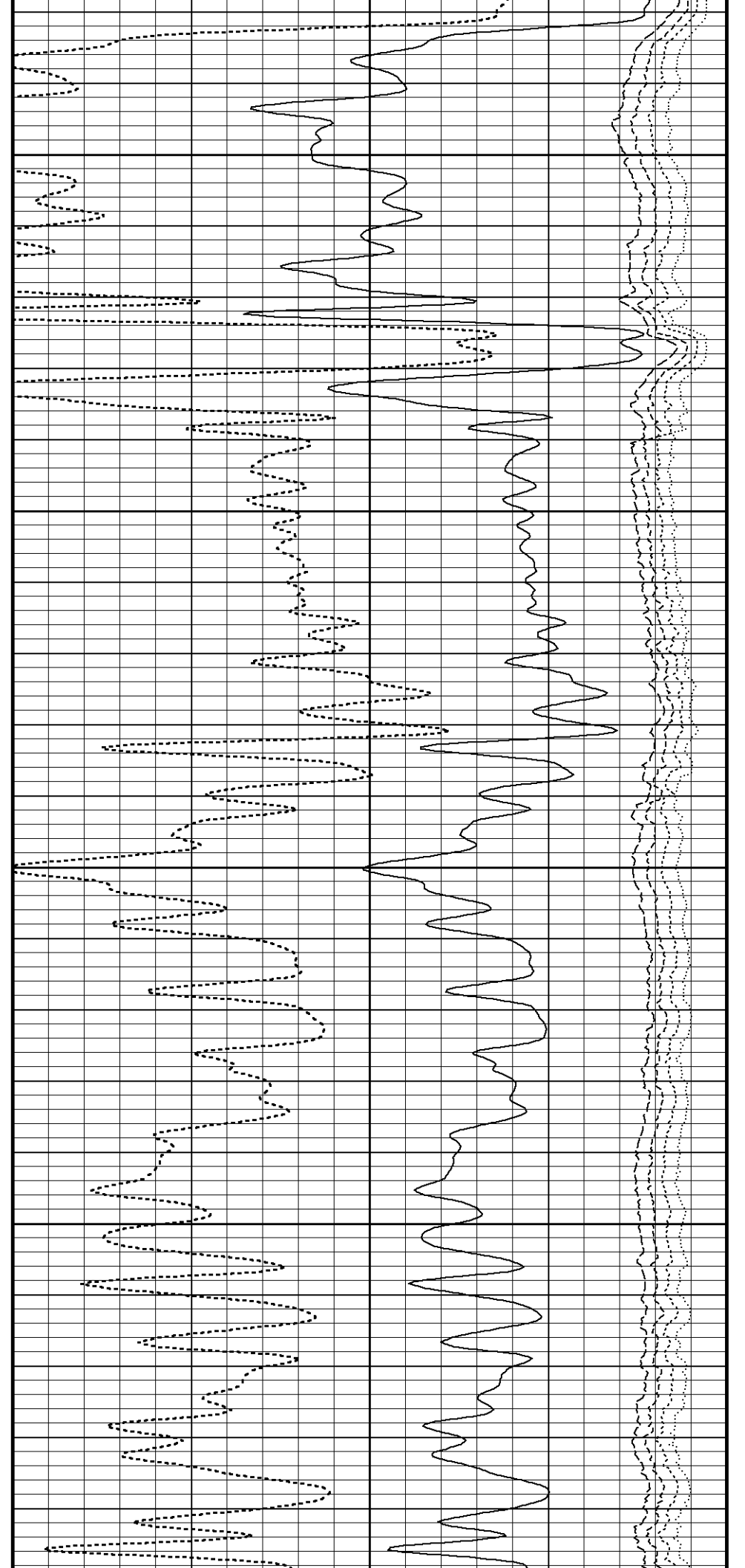
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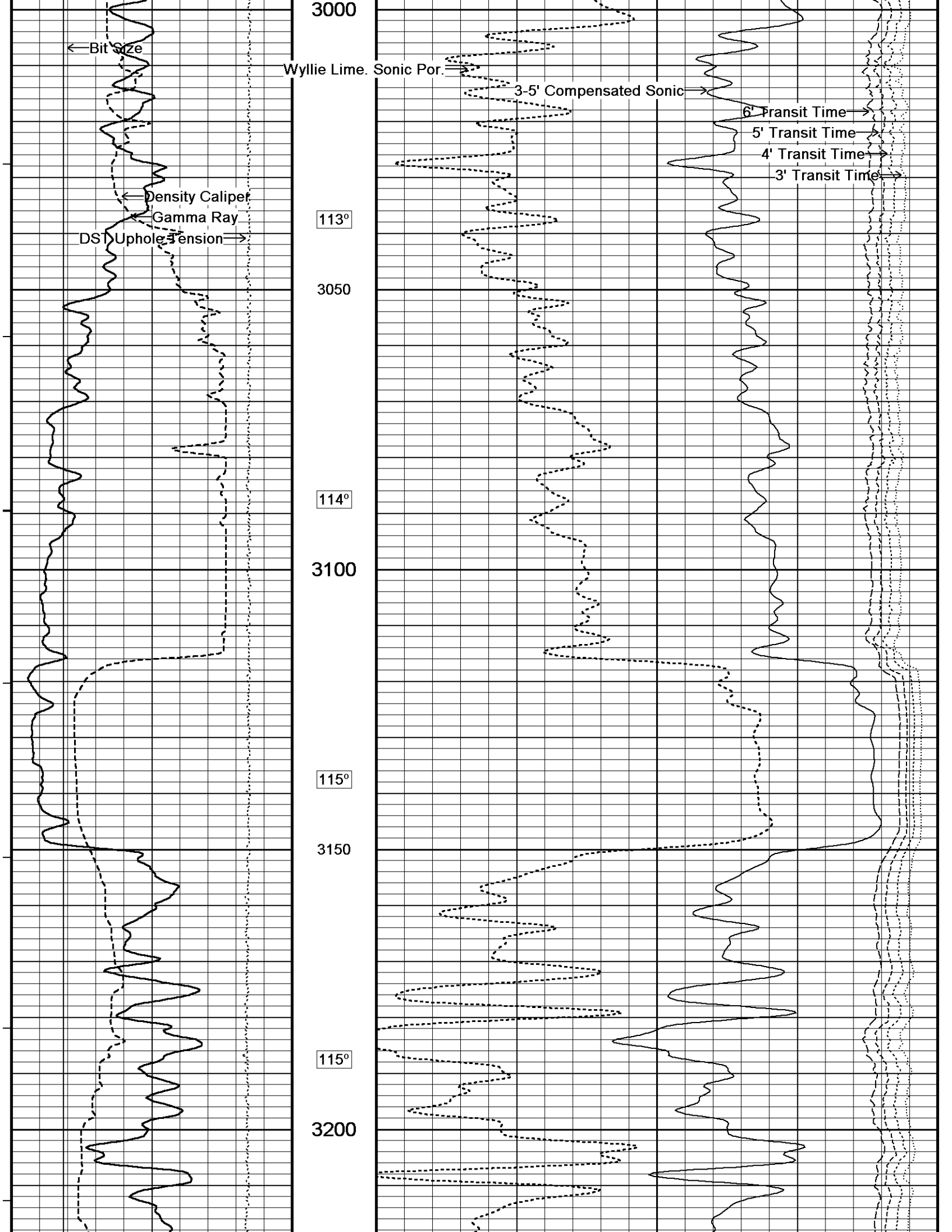
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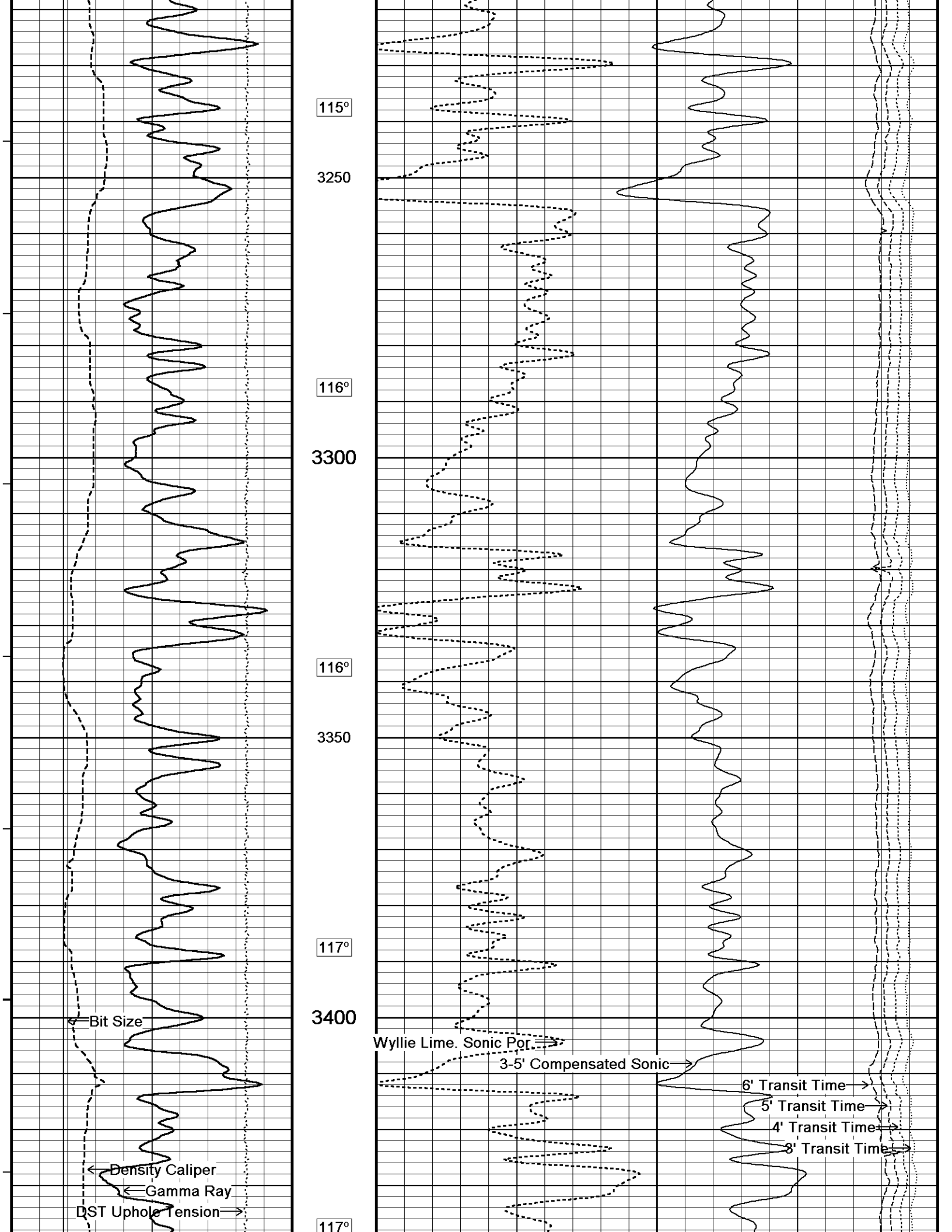
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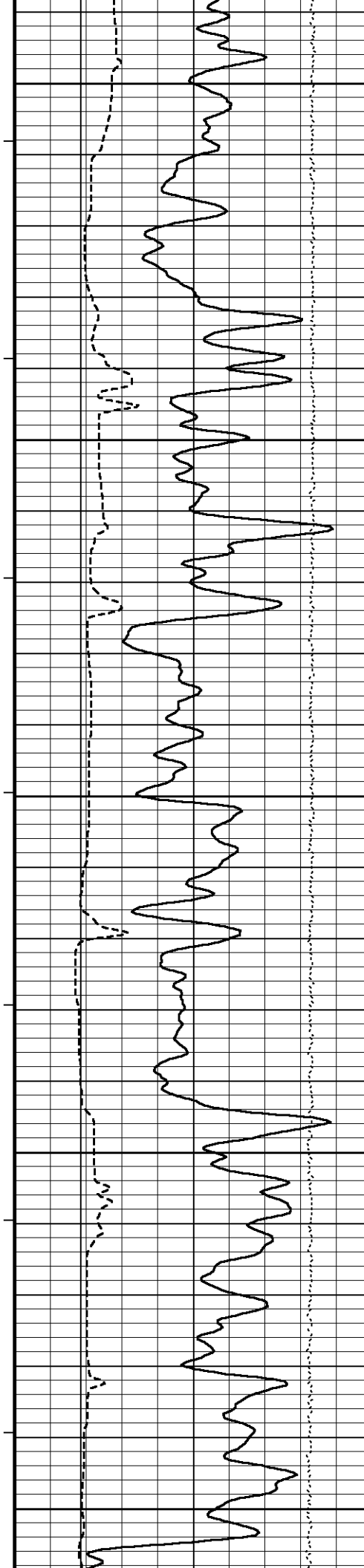
2950

113°









3450

118°

3500

118°

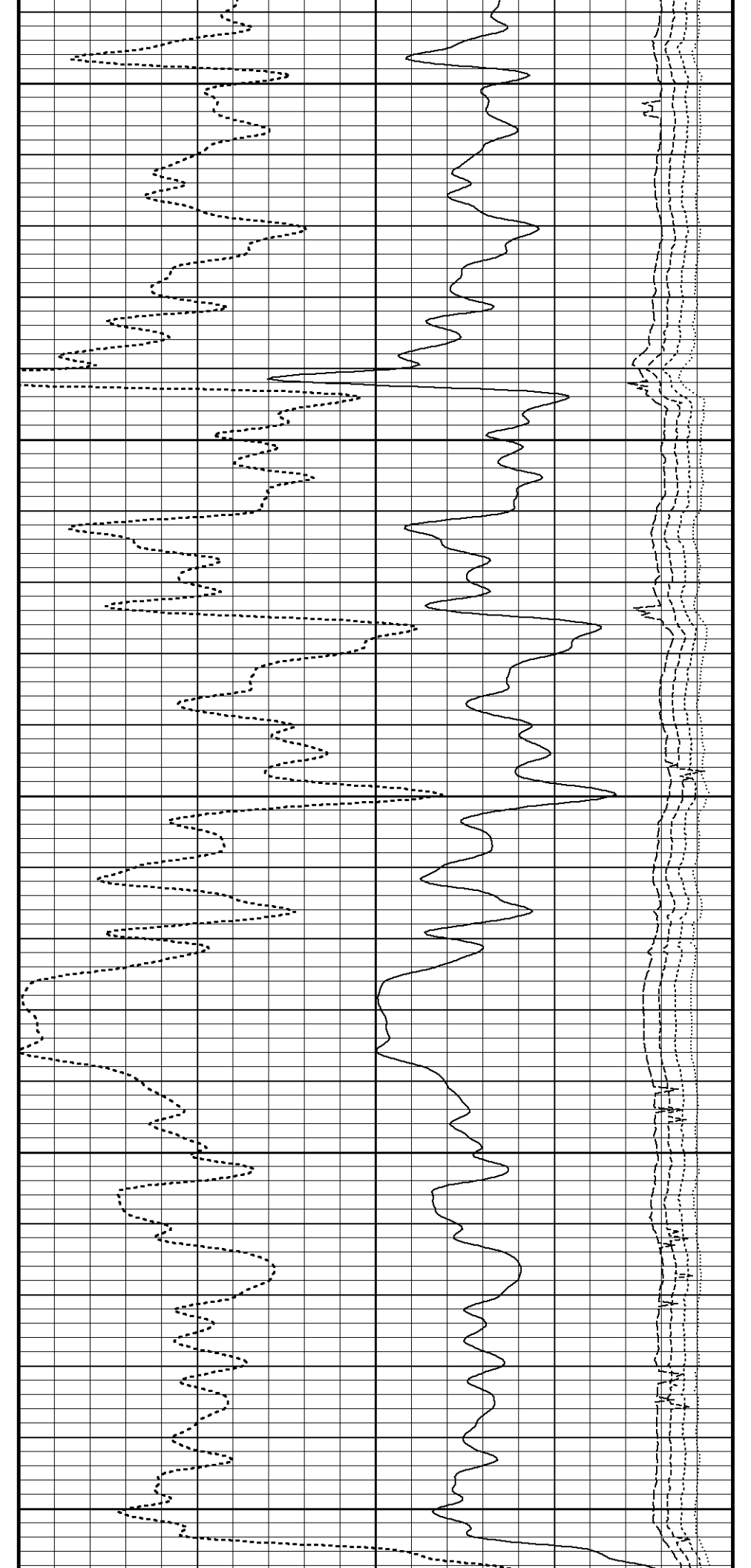
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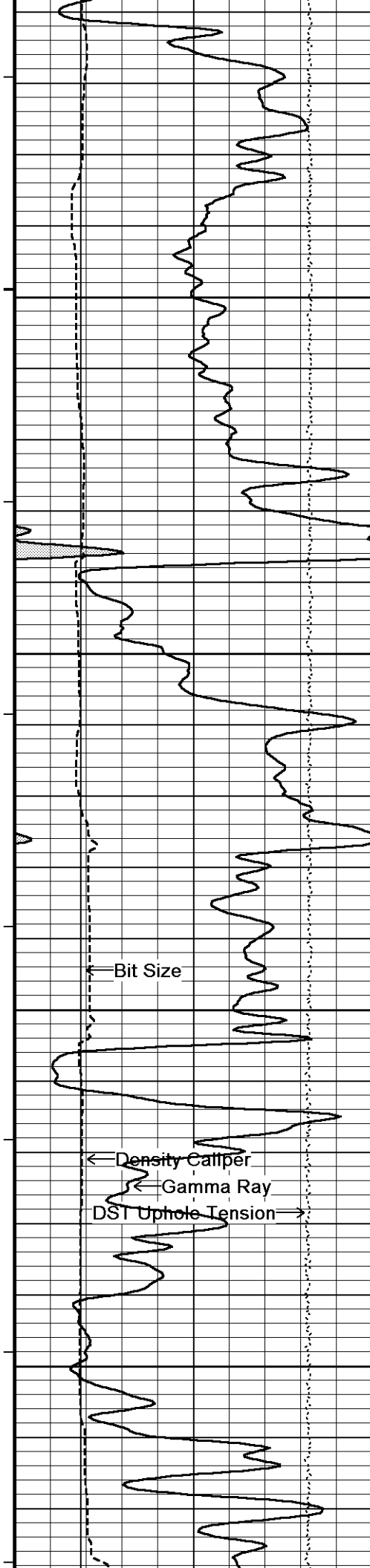
118°

3600

118°

3650





119°

3700

119°

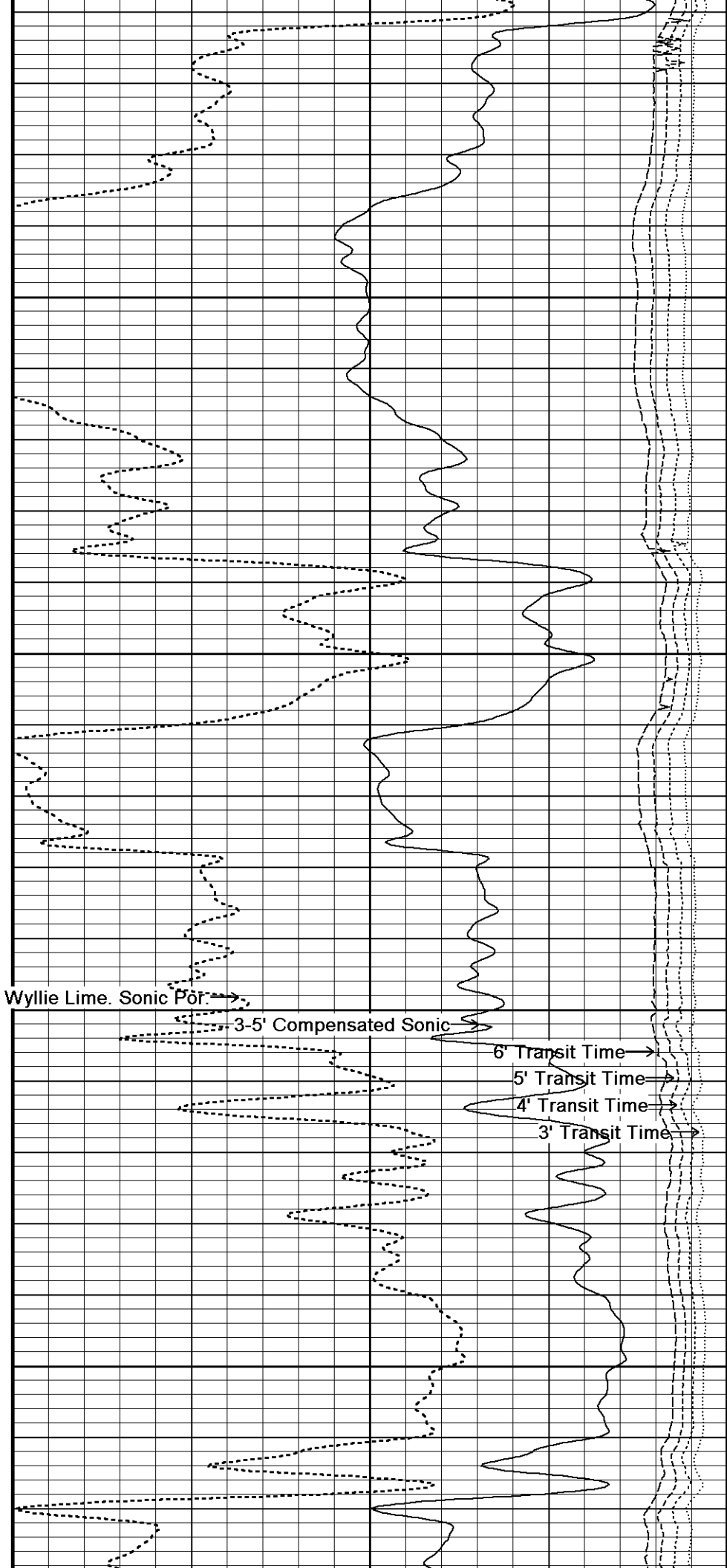
3750

119°

3800

120°

3850



Wyllie Lime. Sonic Por. →

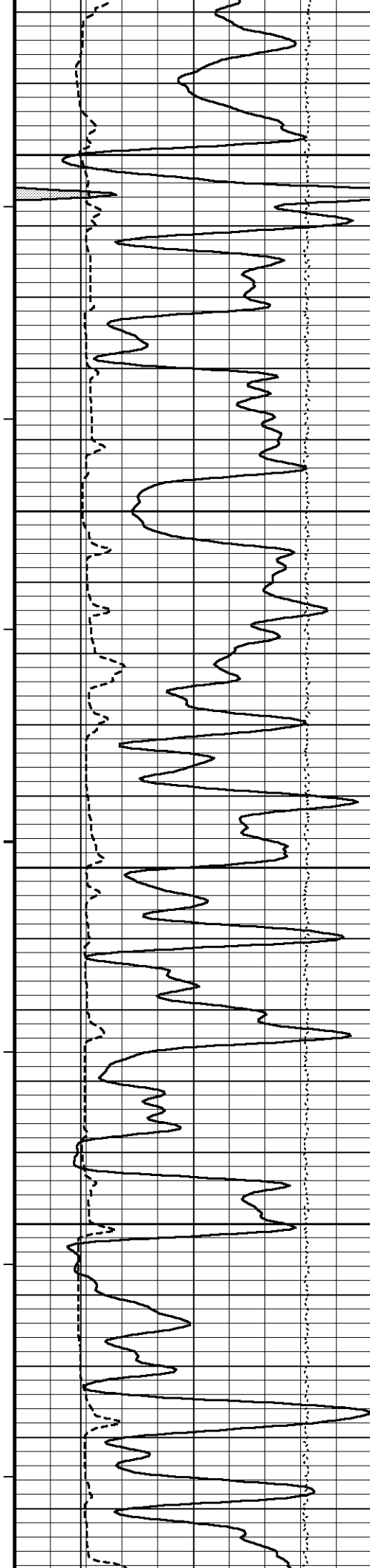
3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →



120°

3900

120°

3950

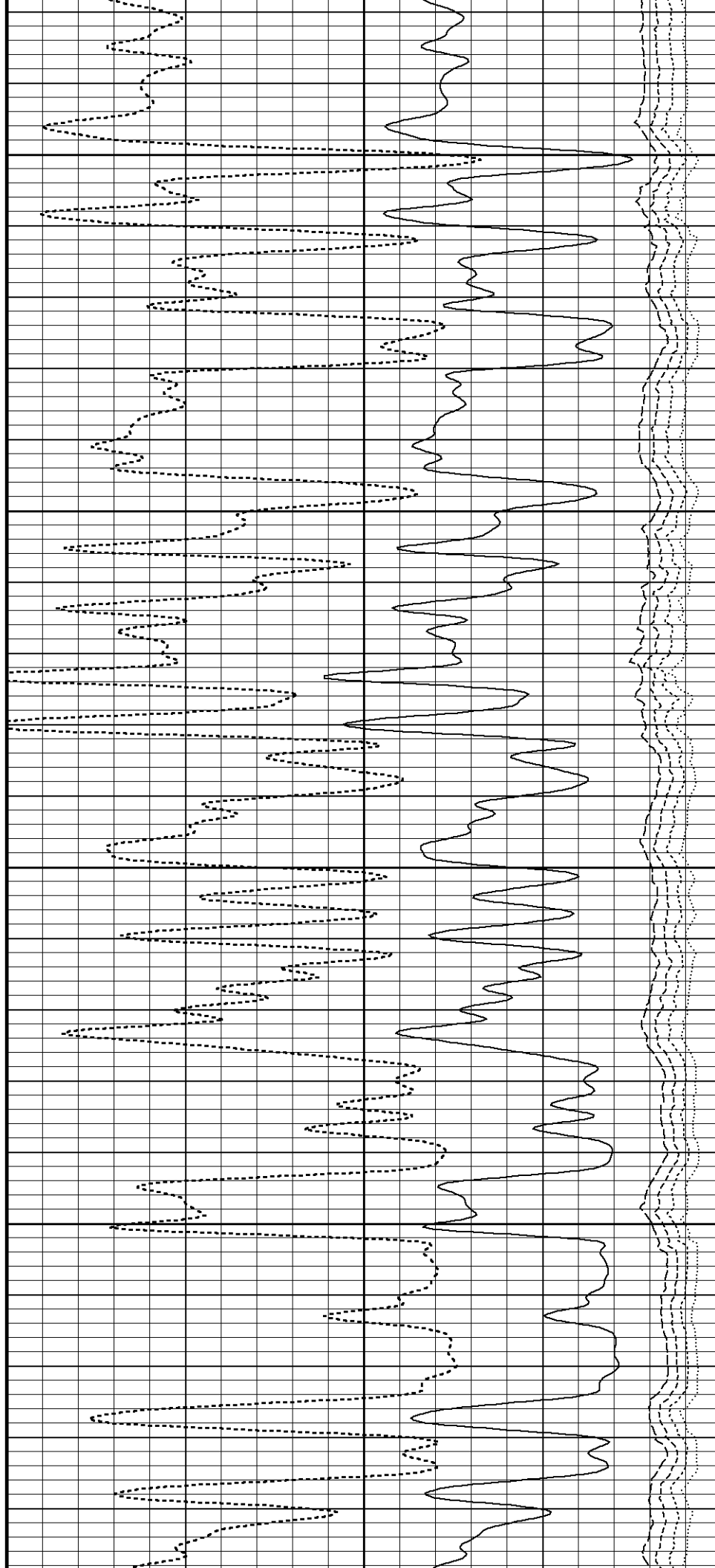
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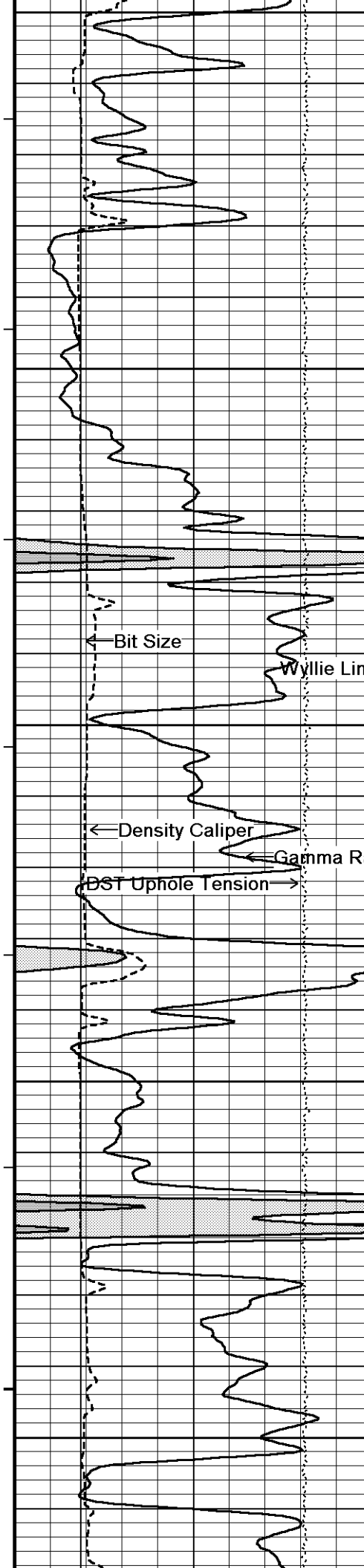
4000

121°

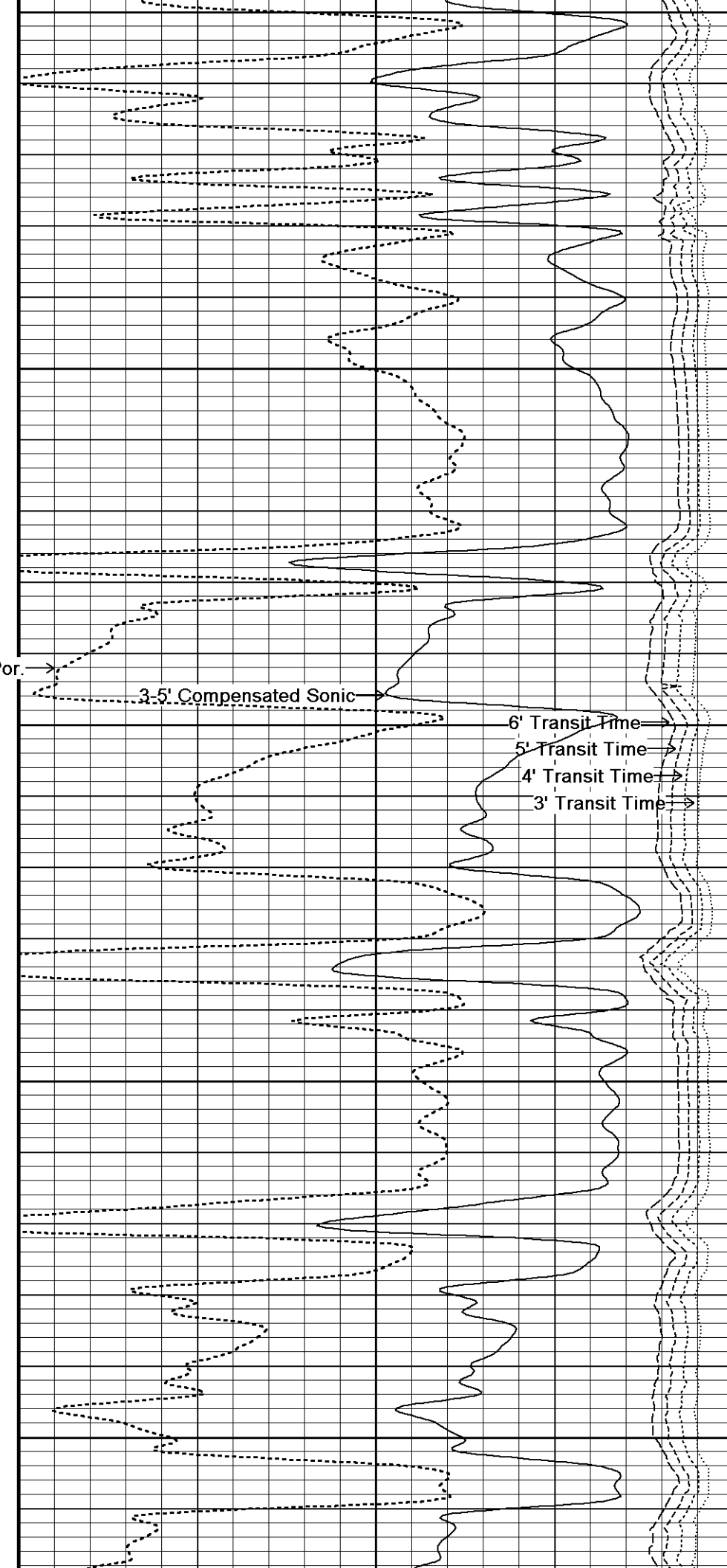
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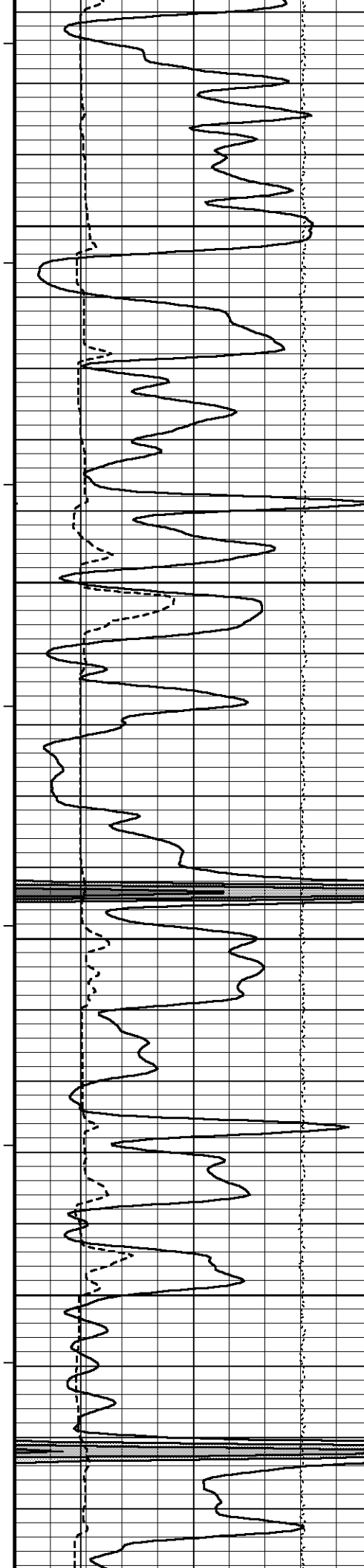
122°





4100  
122°  
4150  
122°  
4200  
123°  
4250  
123°  
4300





124°

4350

124°

4400

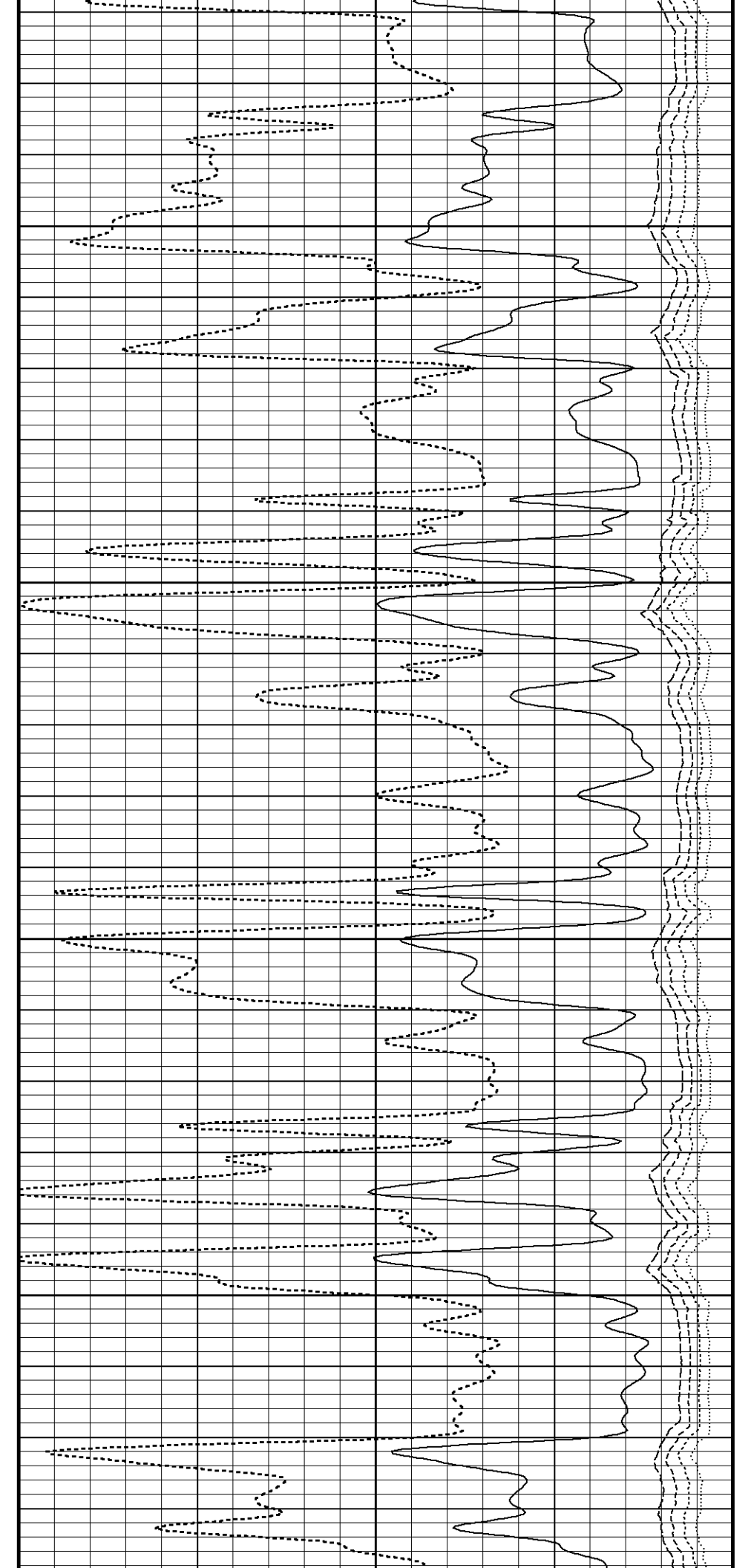
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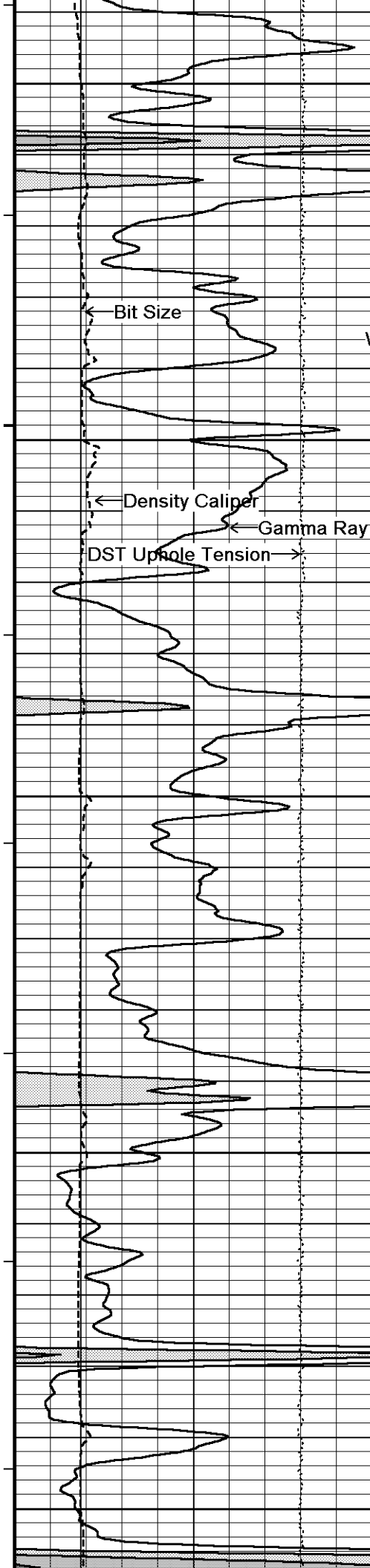
4450

126°

4500

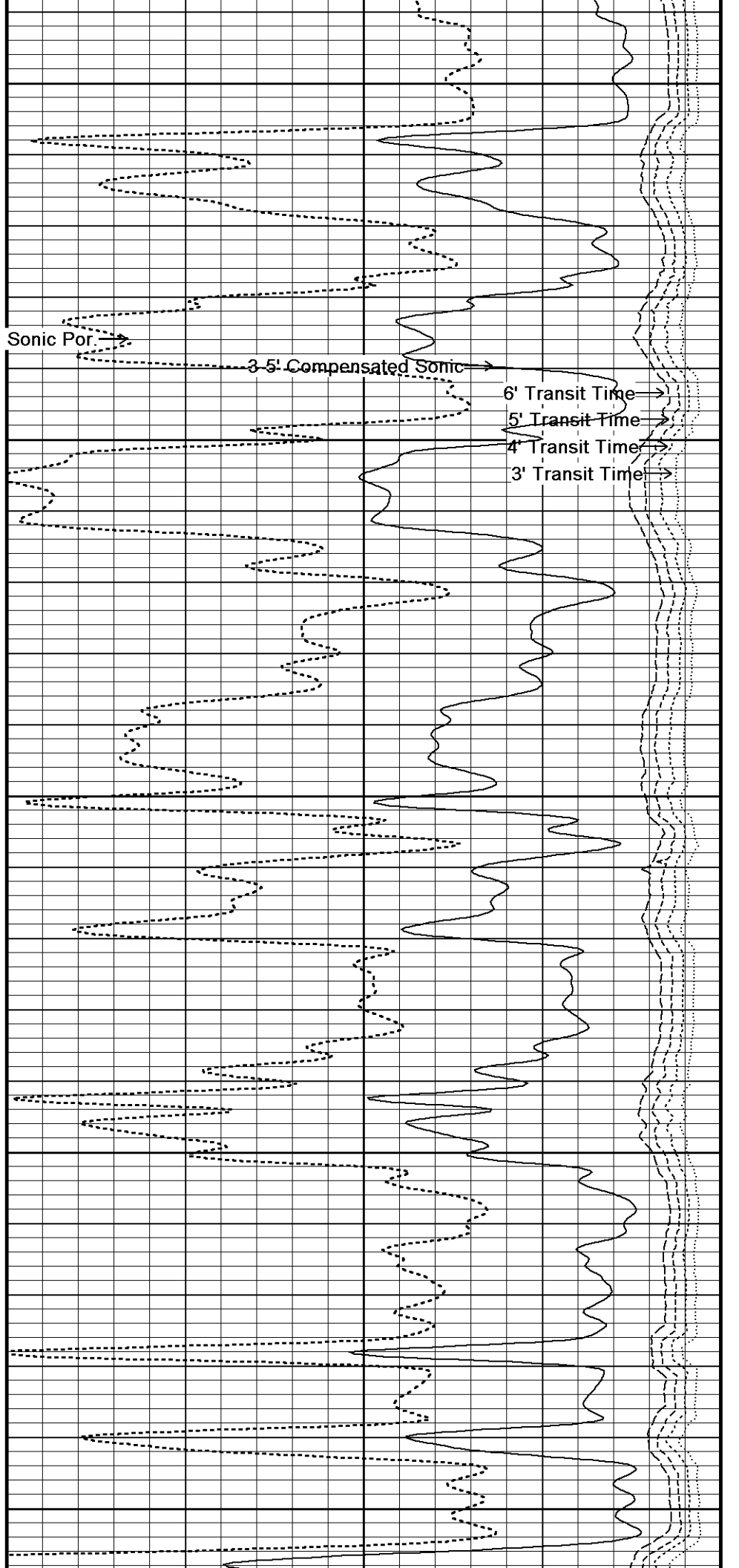
127°





4550  
127°  
4600  
128°  
4650  
128°  
4700  
130°  
4750

Wyllie Line. Sonic Por. →





130°

4800

131°

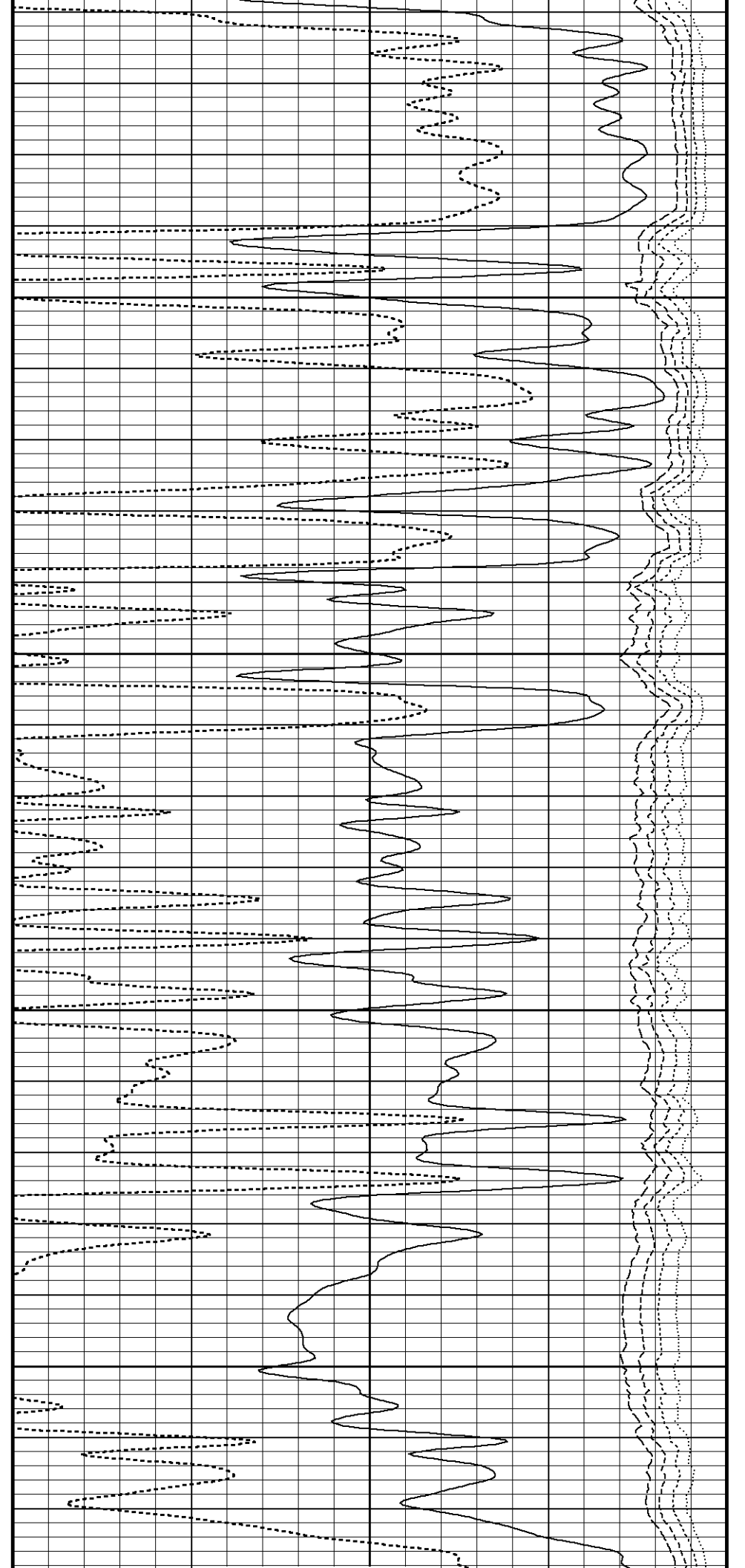
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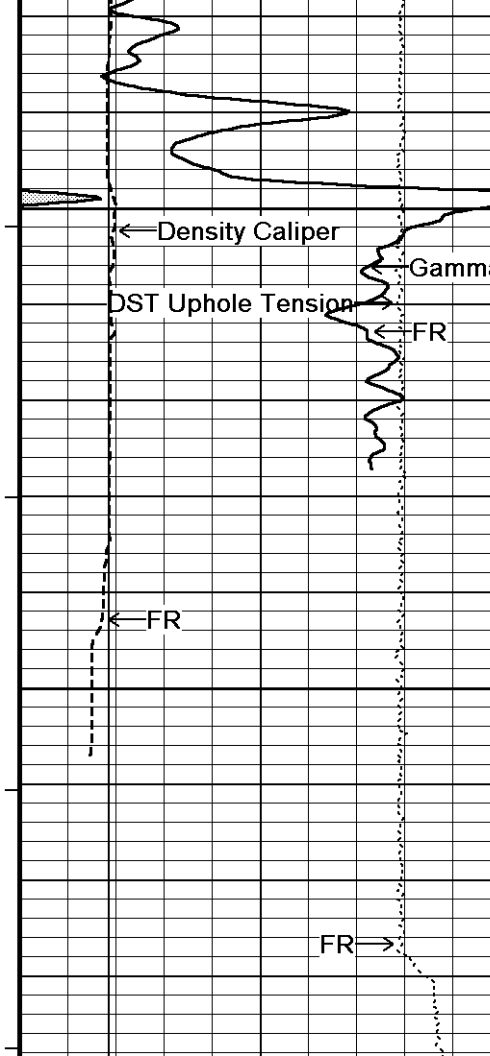
132°

4900

132°

4950





133°

5000

5050

TD

5100

Depth  
In  
Feet

Timing Marks  
every 60.0 sec

Gamma Ray

0	API	150
	75	
150	225	300

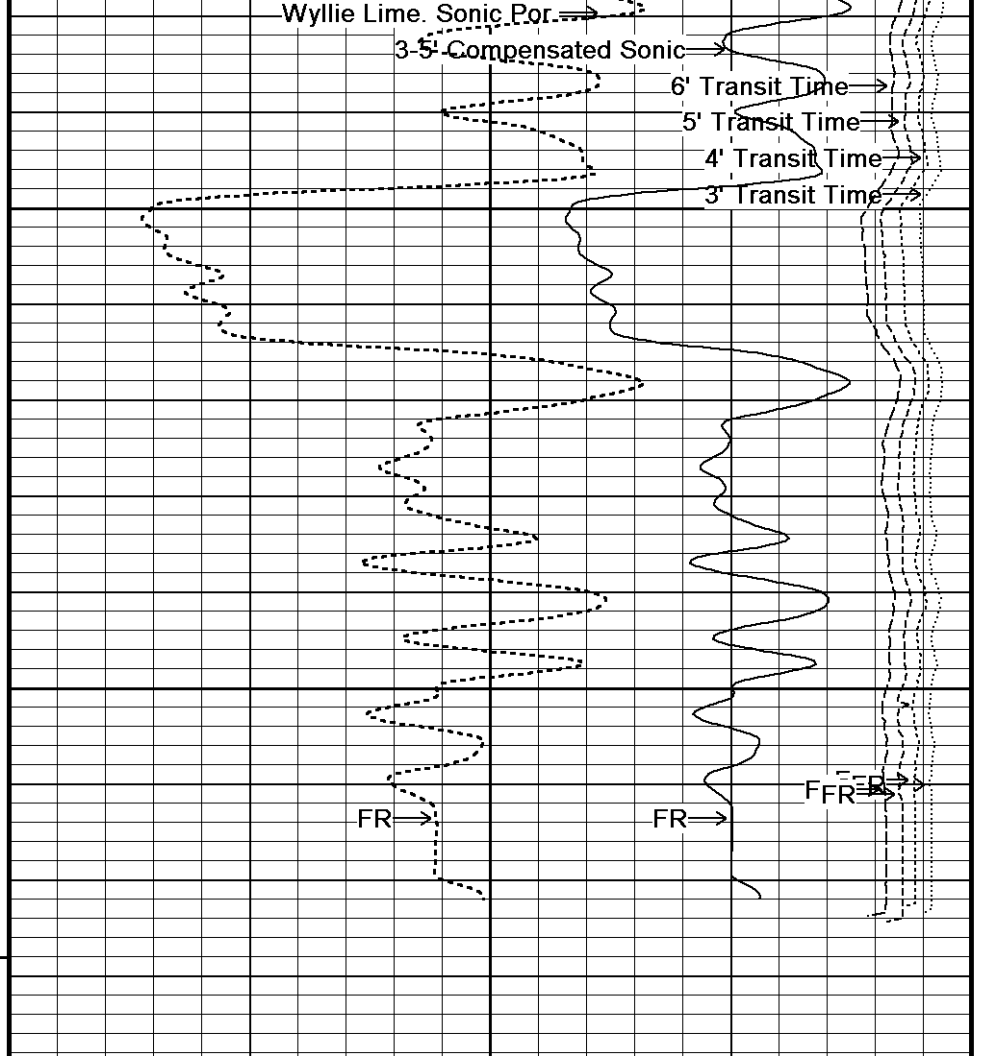
Density Caliper  
inches

6	11	16
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Bit Size  
inches

6	11	16
---	----	----

Borehole  
Temp in  
deg F



3-5' Compensated Sonic  
microsec/foot

140	115	90	65	40
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Wyllie Lime. Sonic Por.  
percent

30	20	10	0	-10
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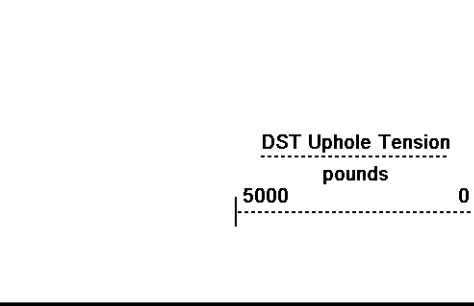
3' Transit Time  
microseconds

1100	100
------	-----

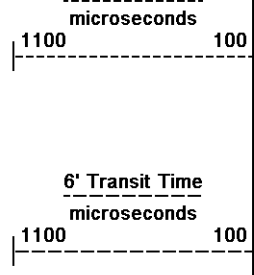
4' Transit Time  
microseconds

1100	100
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5' Transit Time



Replay  
Scale  
1:240

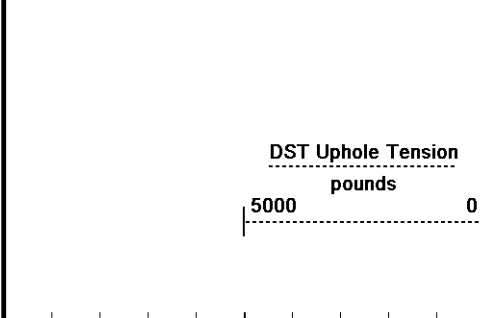
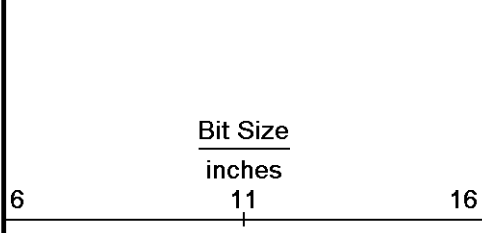
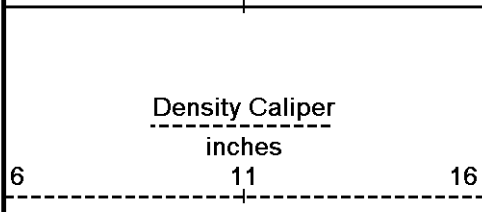
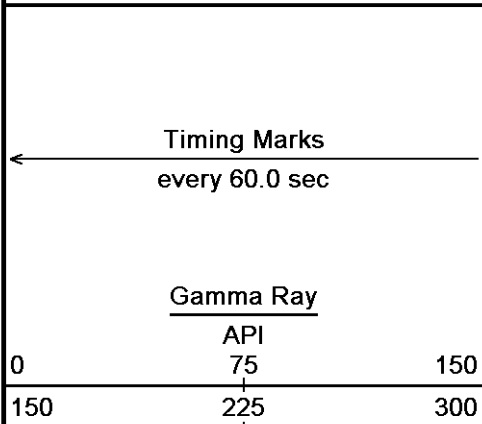


Depth Based Data - Maximum Sampling Increment 10.0cm  
 Plotted on 24-NOV-2013 08:36  
 Filename: C:\Minimus 13.05.9583\Logs\McElvain Price 14-5\McElvain Price 14-5 Main.dta  
 Recorded on 24-NOV-2013 02:52  
 System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

↑ 5 INCH MAIN ↑

↓ HI-RES ↓

Depth Based Data - Maximum Sampling Increment 2.5cm  
 Plotted on 24-NOV-2013 08:36  
 Filename: C:\Minimus 13.05.9583\Logs\McElvain Price 14-5\McElvain Price 14-5 High Res.dta  
 Recorded on 24-NOV-2013 01:03  
 System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

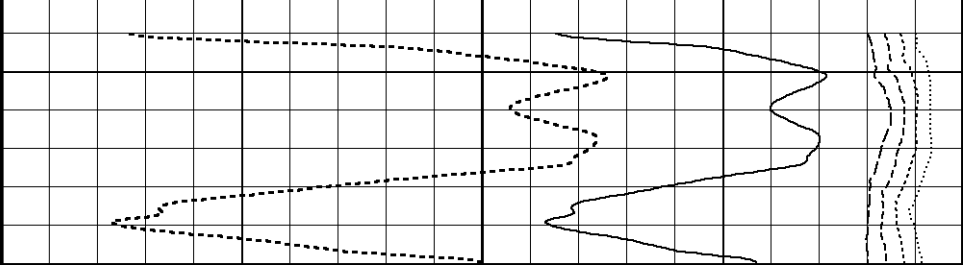
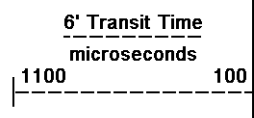
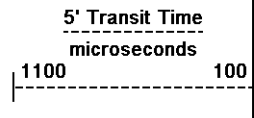
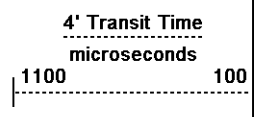
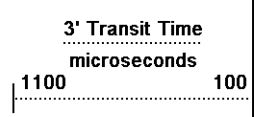
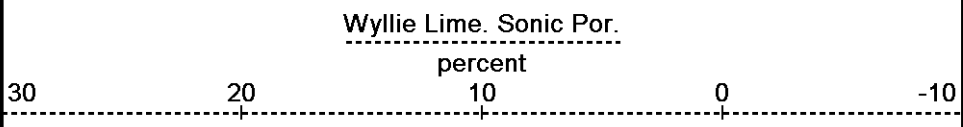
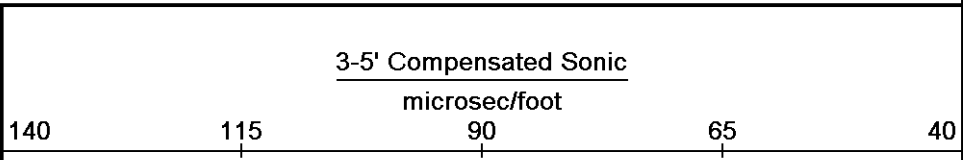


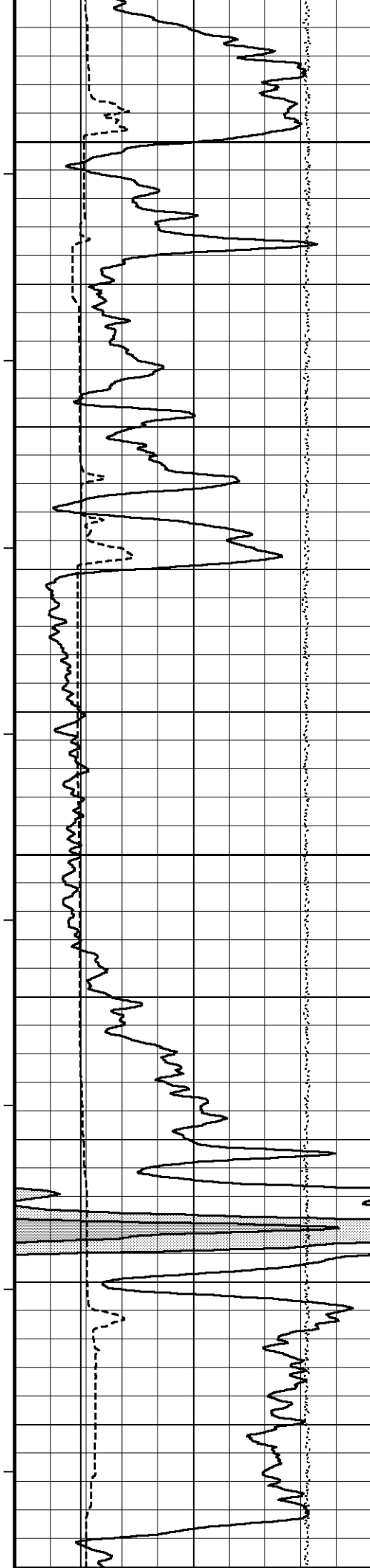
Depth  
in  
Feet

Borehole  
Temp in  
deg F

Replay  
Scale  
1:120

4078





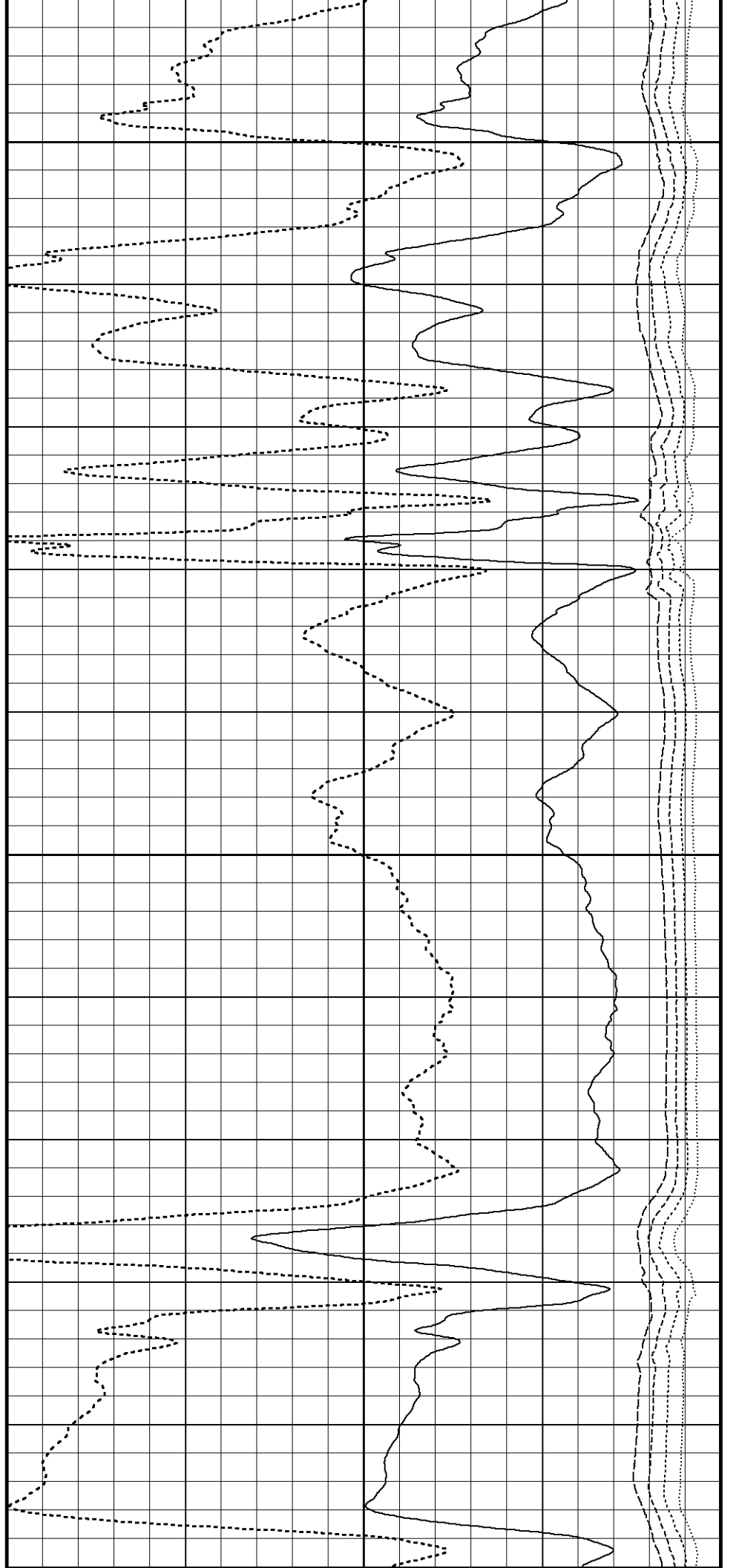
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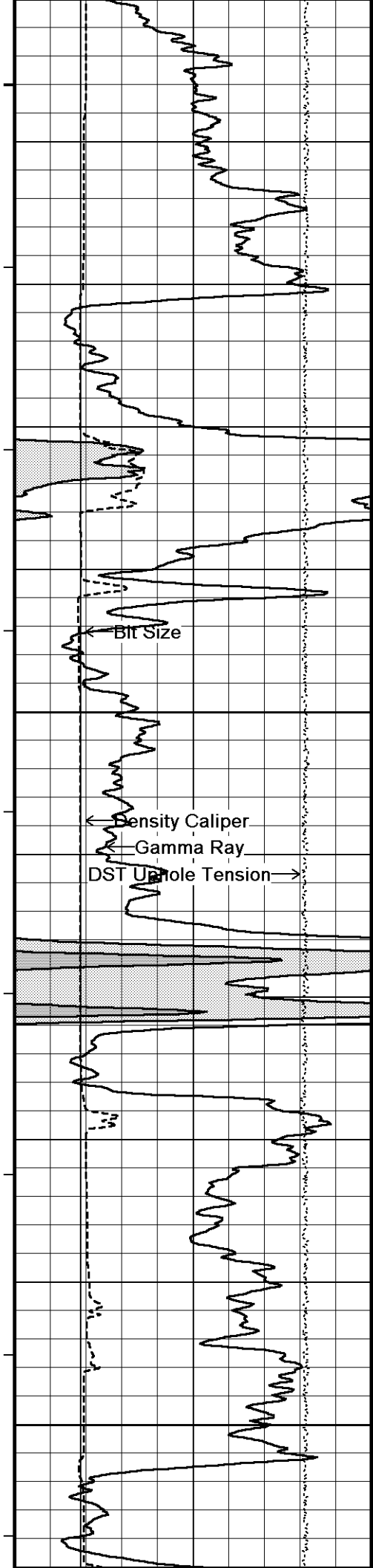
121°

4150

122°

4200





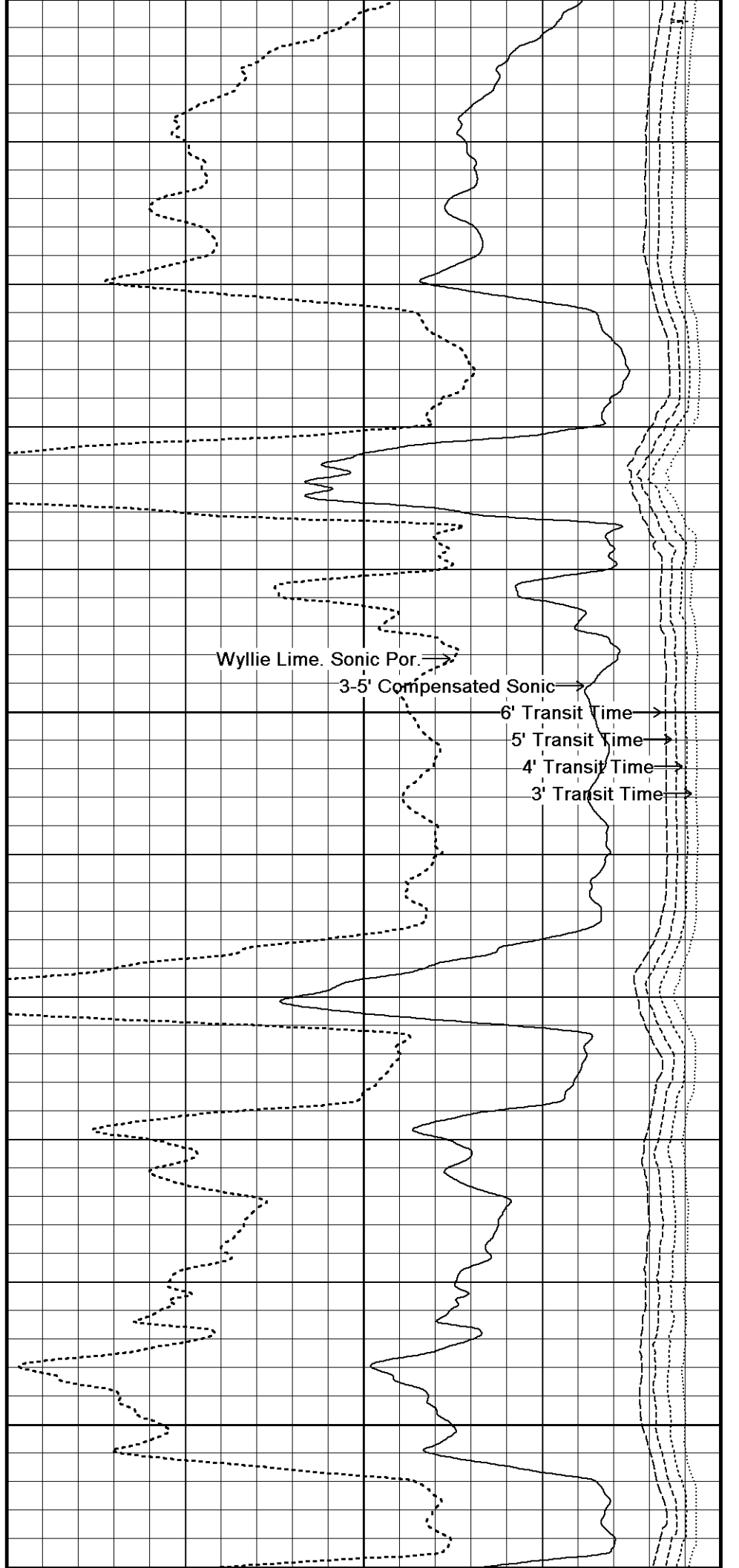
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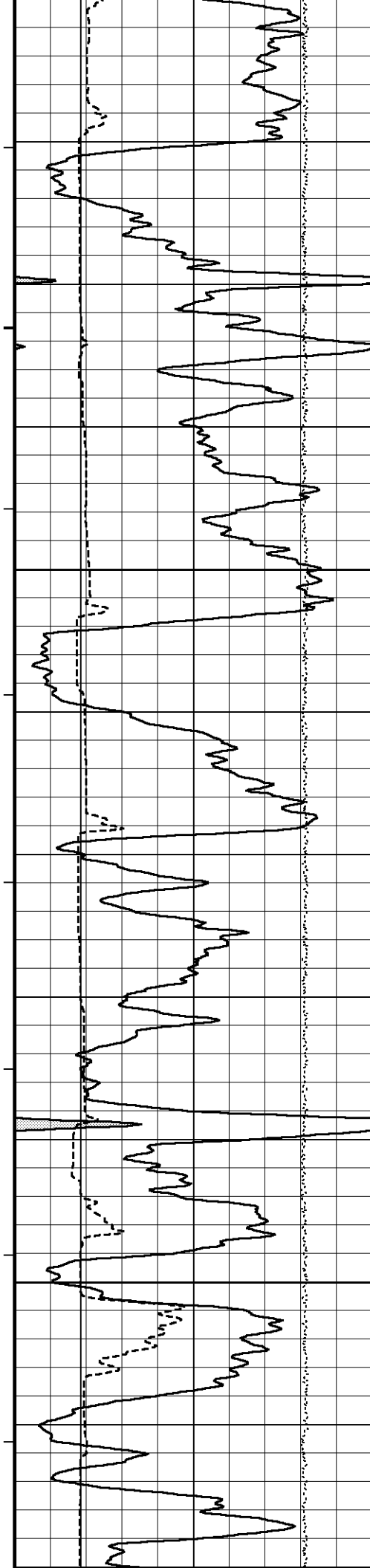
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4250

122°

4300



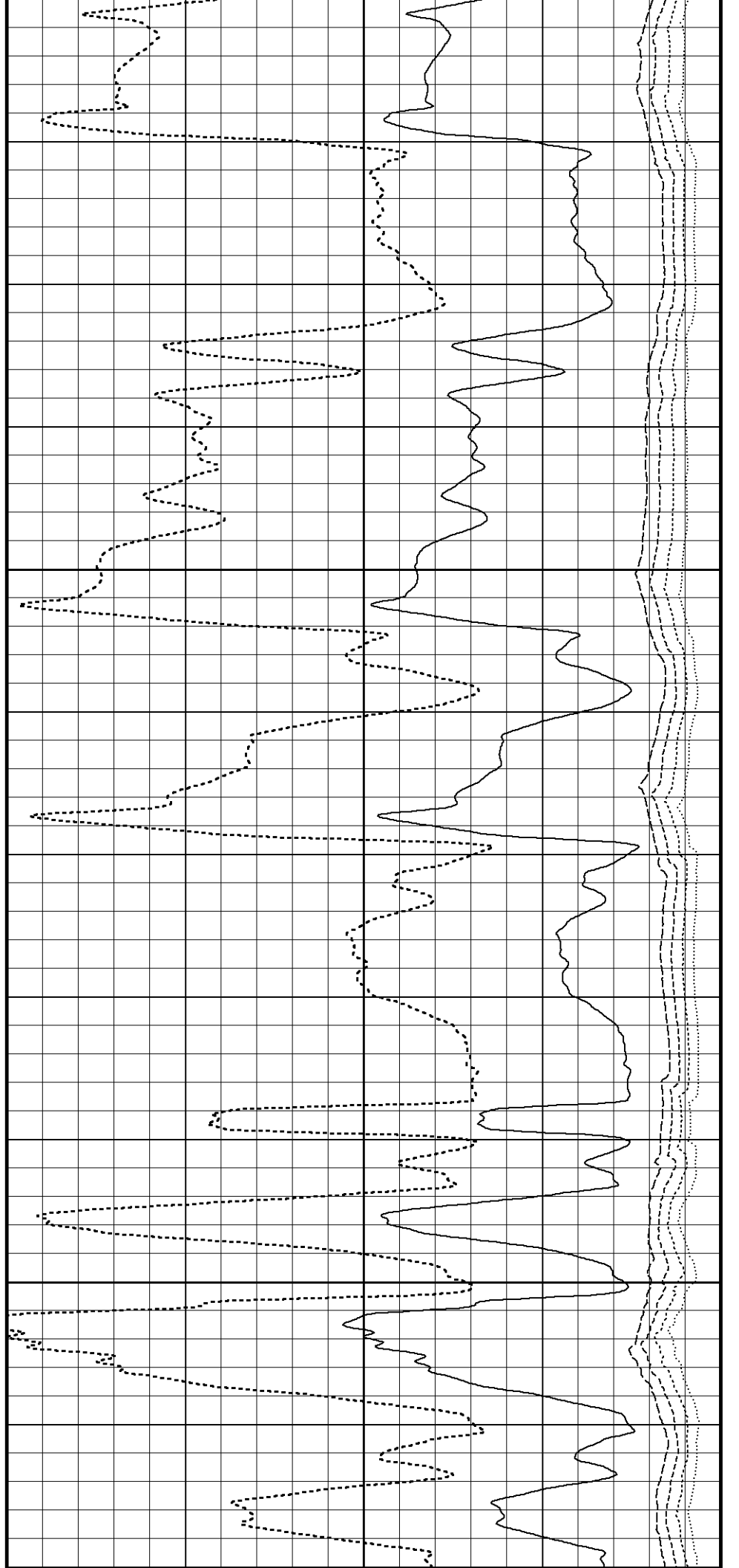


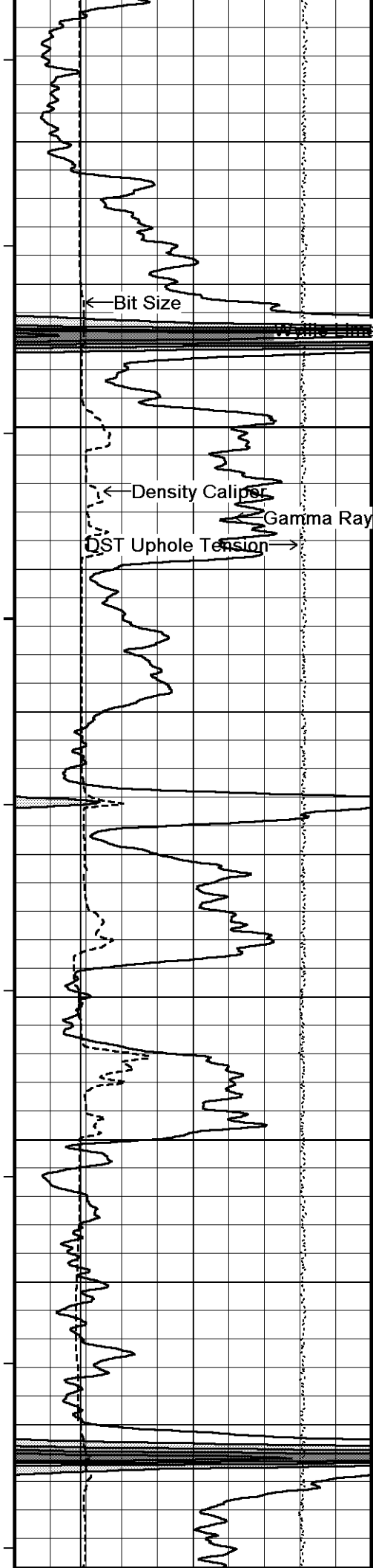
123°

4350

123°

4400





123°

4450

124°

4500

Sonic Porosity →

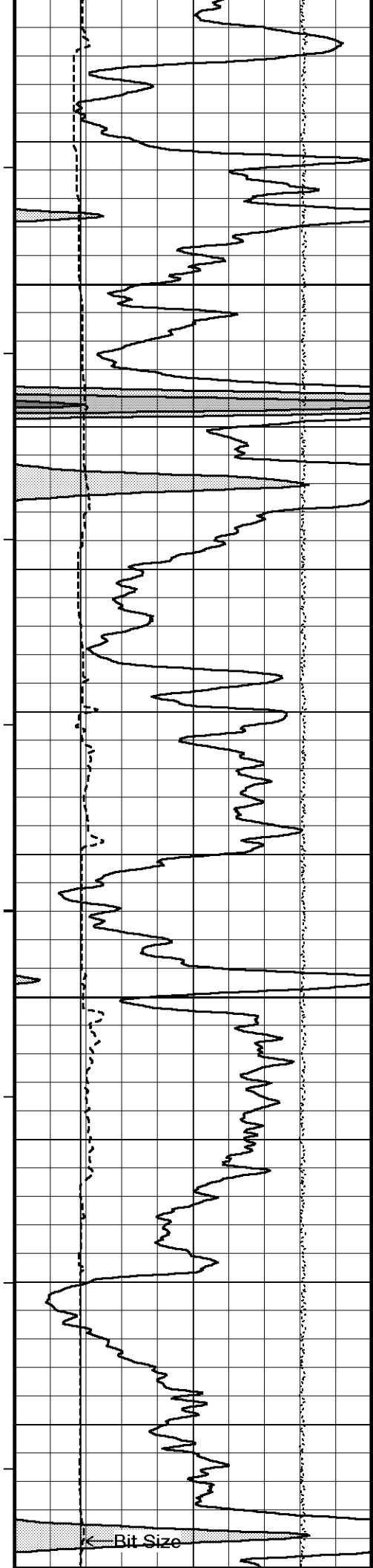
3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →



125°

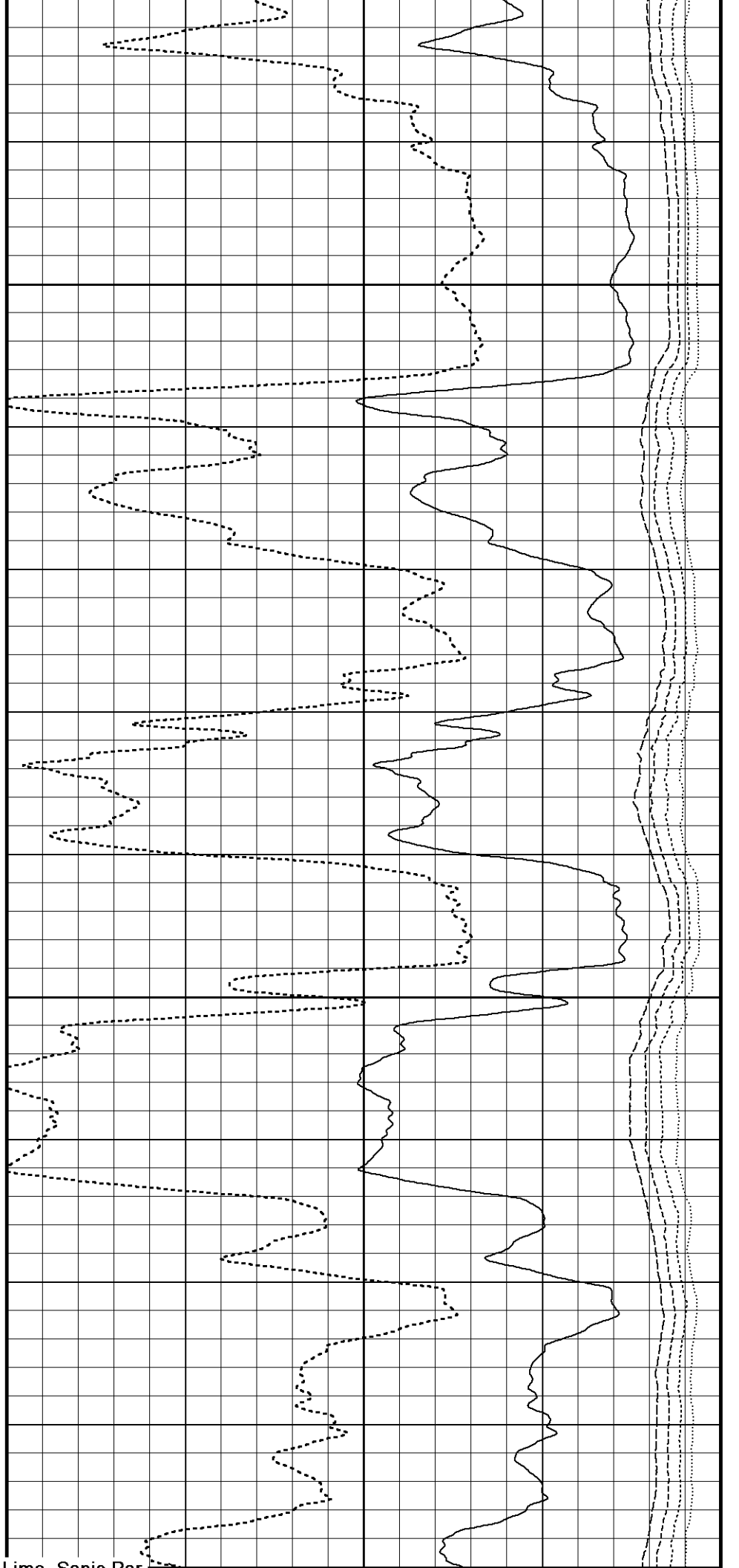
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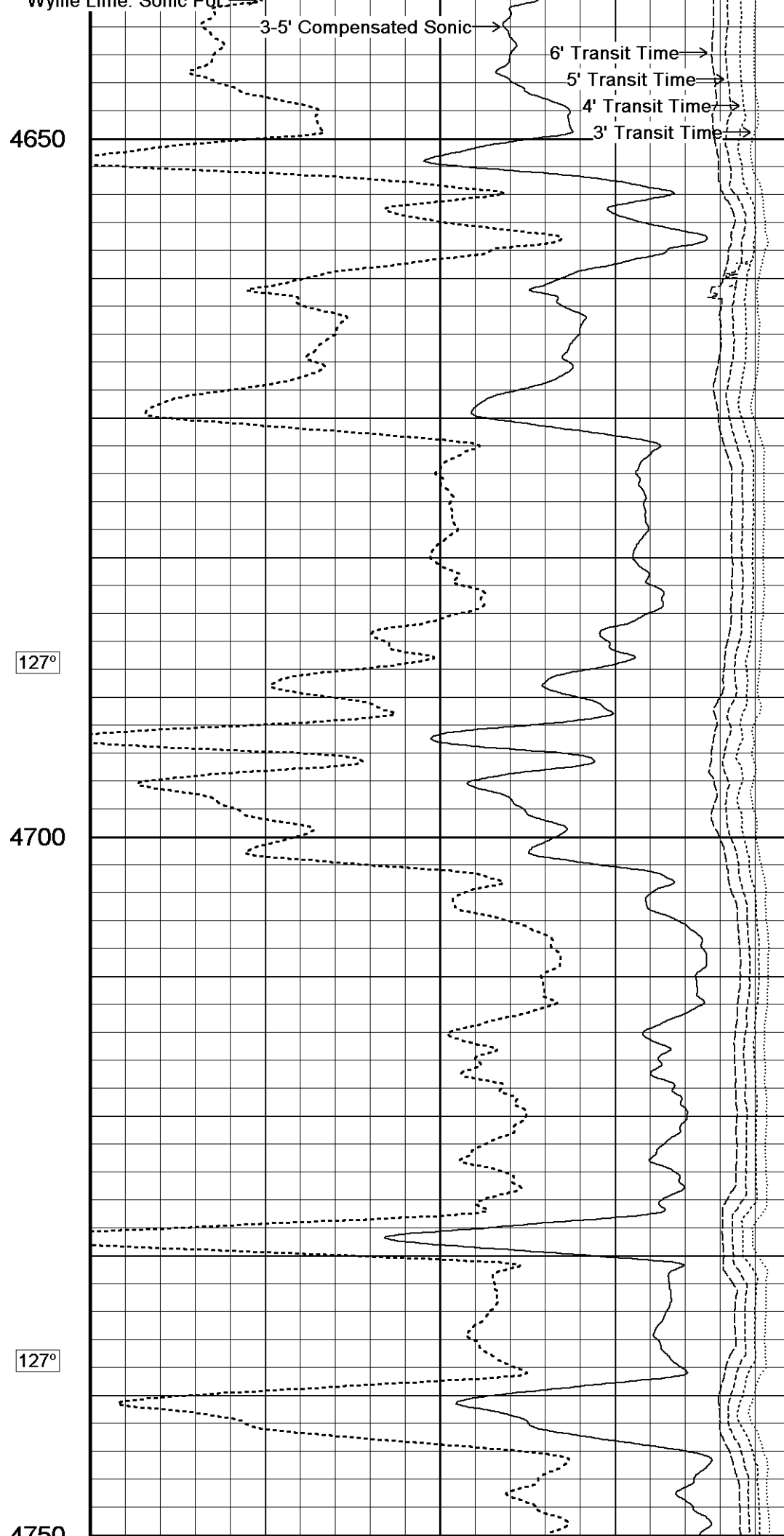
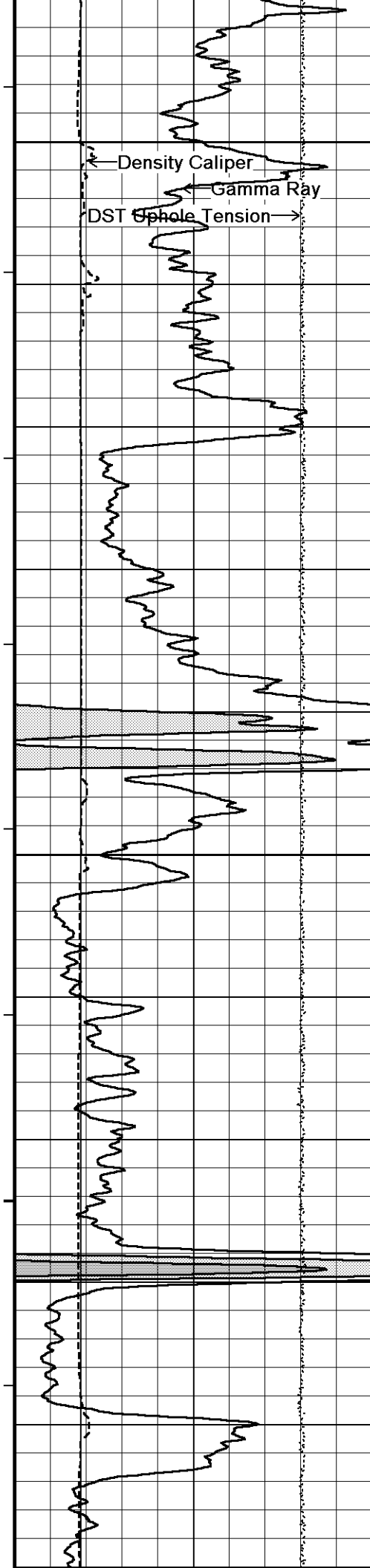
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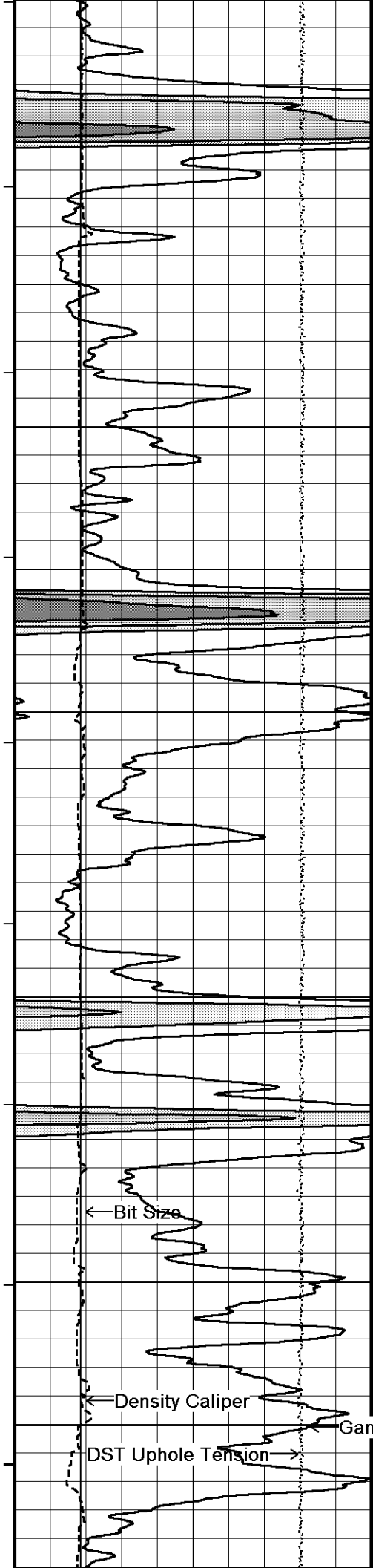
4600

126°

Wylie Lims. Senio Bar







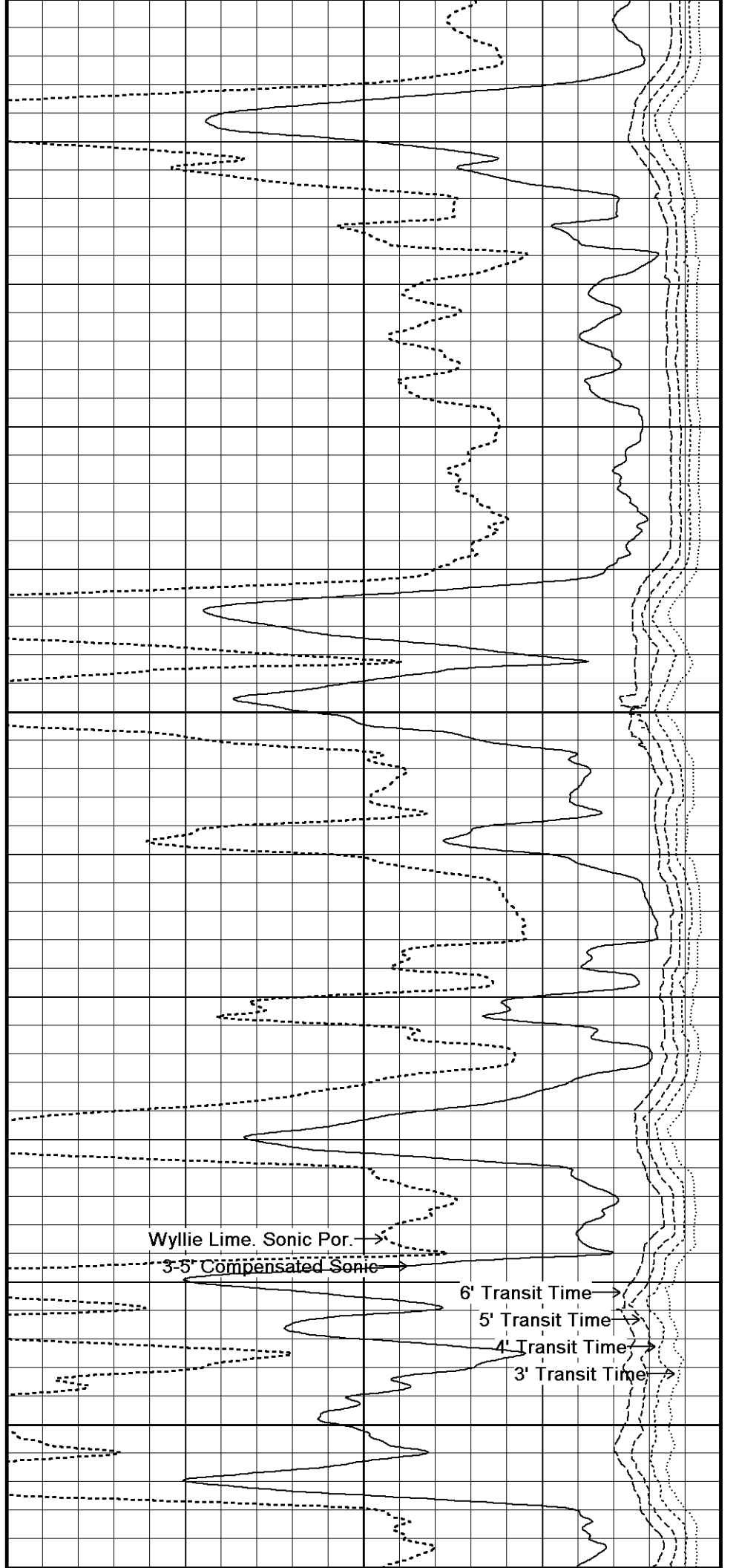
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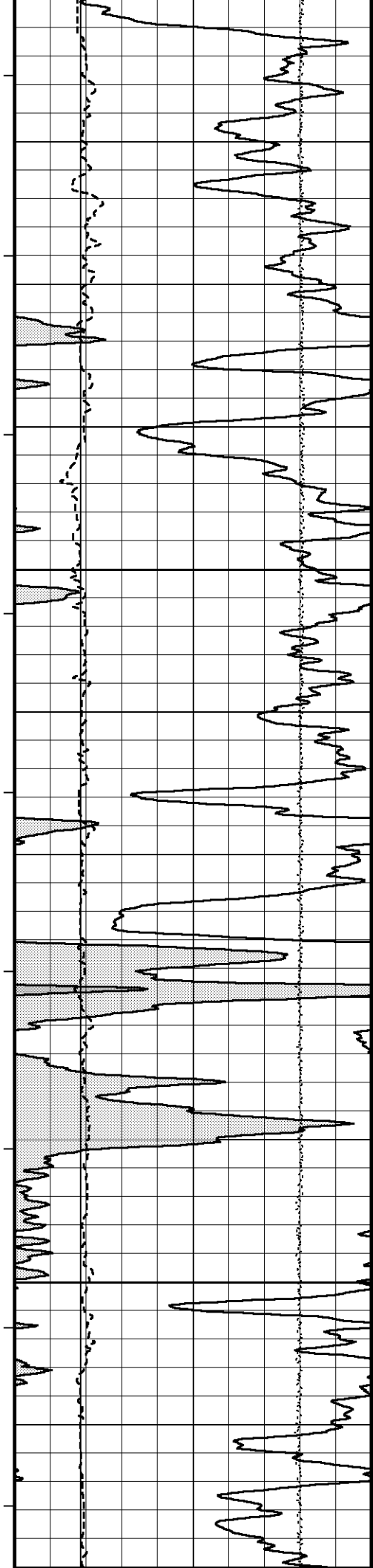
127°

4800

129°

Gamm4850



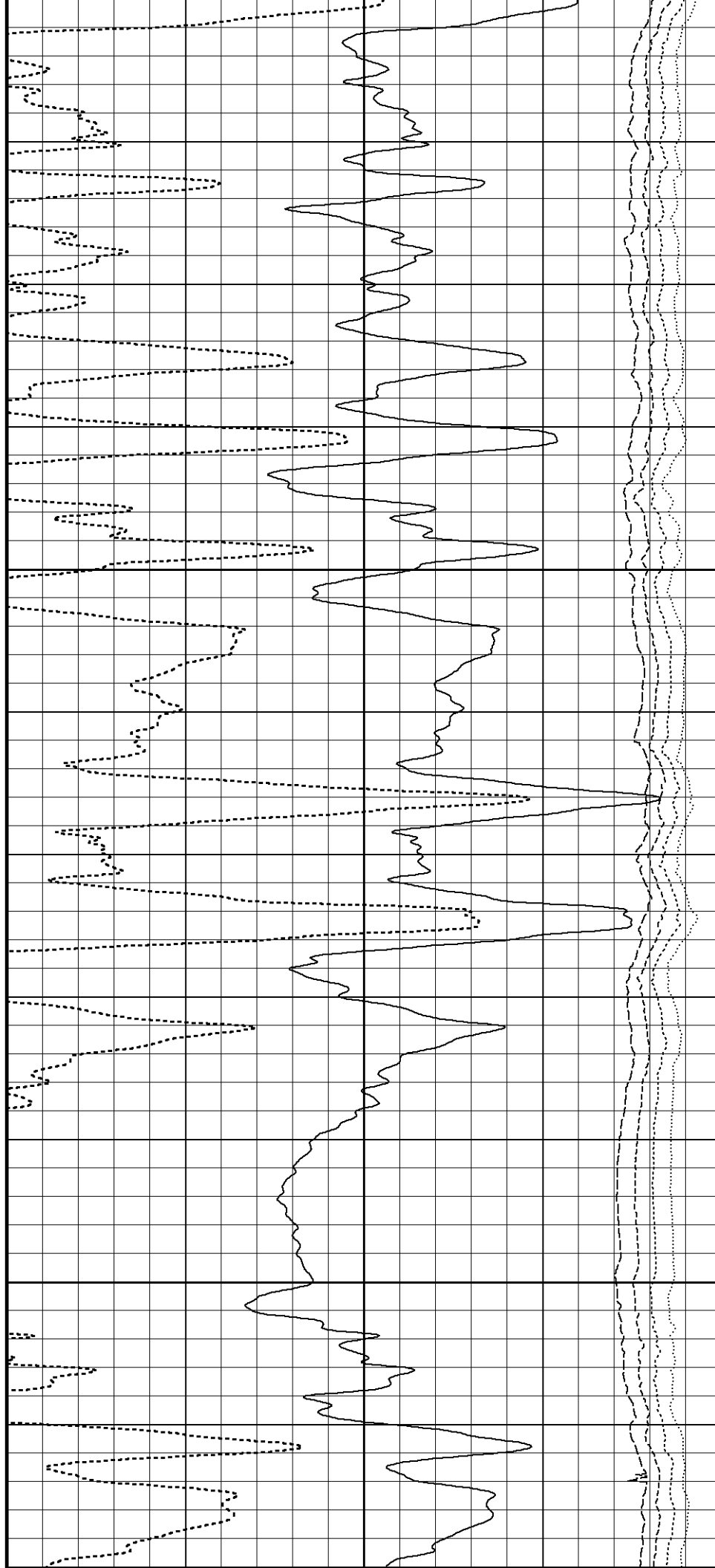


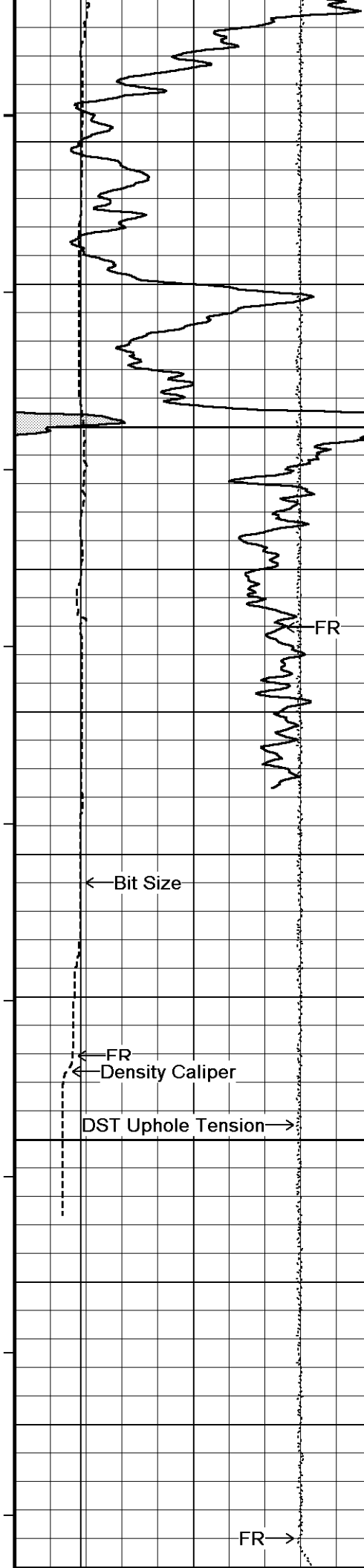
129°

4900

129°

4950



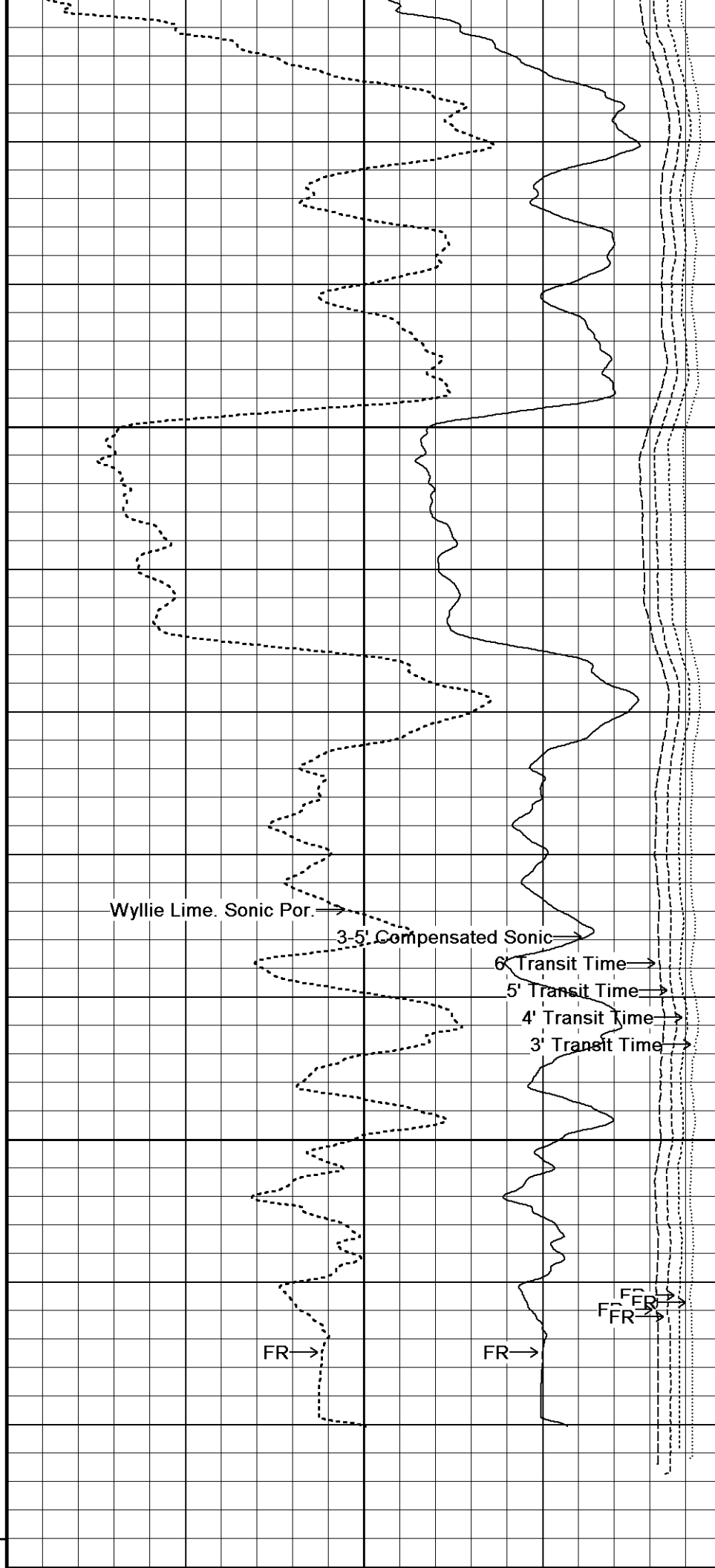


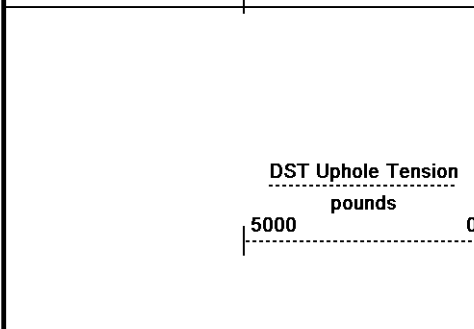
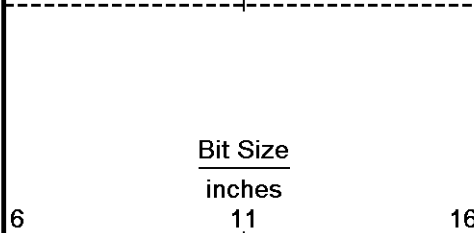
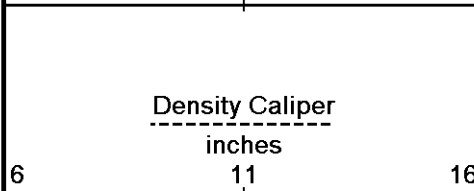
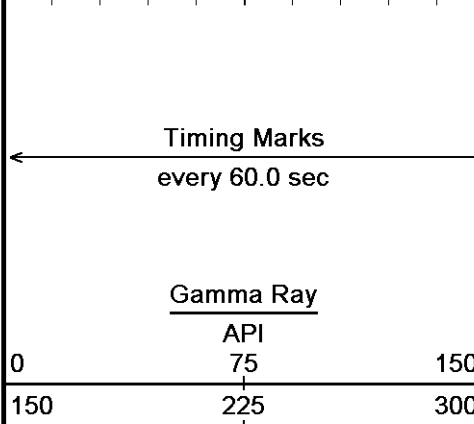
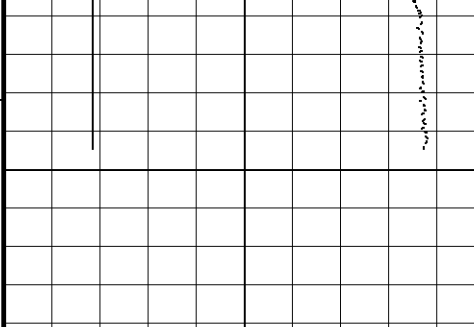
130°

5000

5050

TD

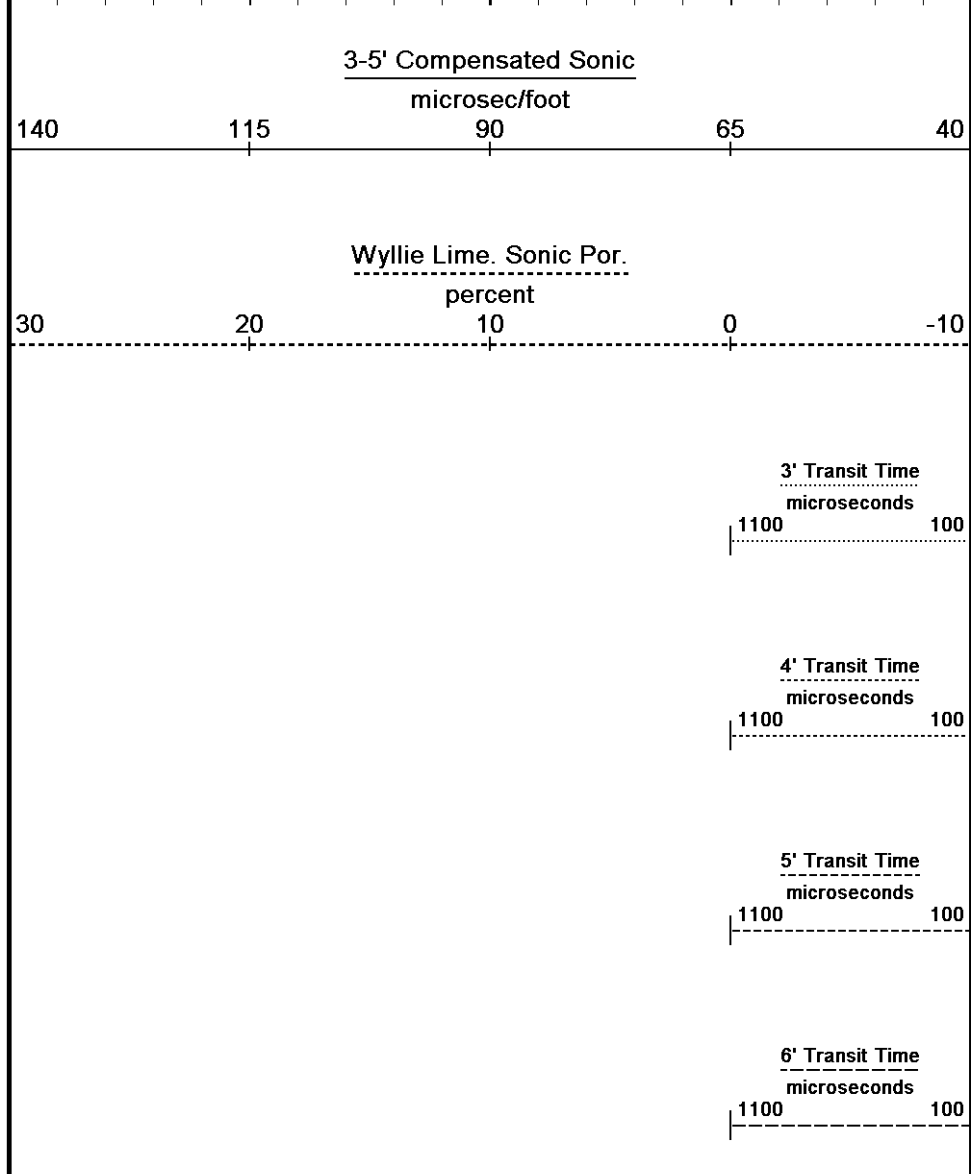




Depth in Feet

Borehole Temp in deg F

Replay Scale 1:120

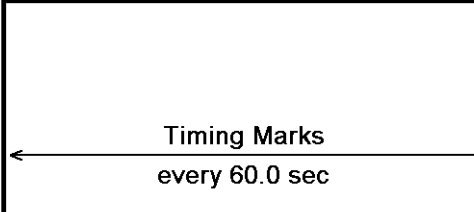


Depth Based Data - Maximum Sampling Increment 2.5cm Plotted on 24-NOV-2013 08:36  
 Filename: C:\Minimus 13.05.9583\Logs\McElvain Price 14-5\McElvain Price 14-5 High Res.dta Recorded on 24-NOV-2013 01:03  
 System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

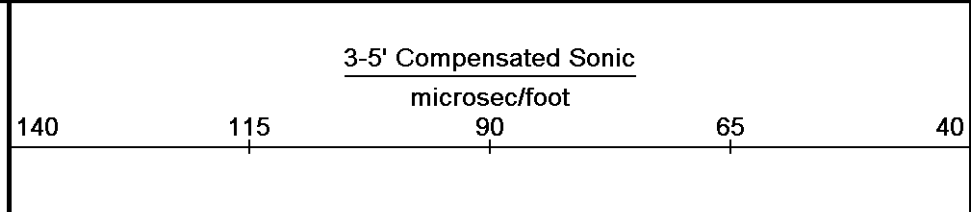
↑ HI-RES ↑

↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 24-NOV-2013 08:36  
 Filename: C:\Minimus 13.05.9583\Logs\McElvain Price 14-5\McElvain Price 14-5 Repeat.dta Recorded on 24-NOV-2013 01:03  
 System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583



Depth in Feet

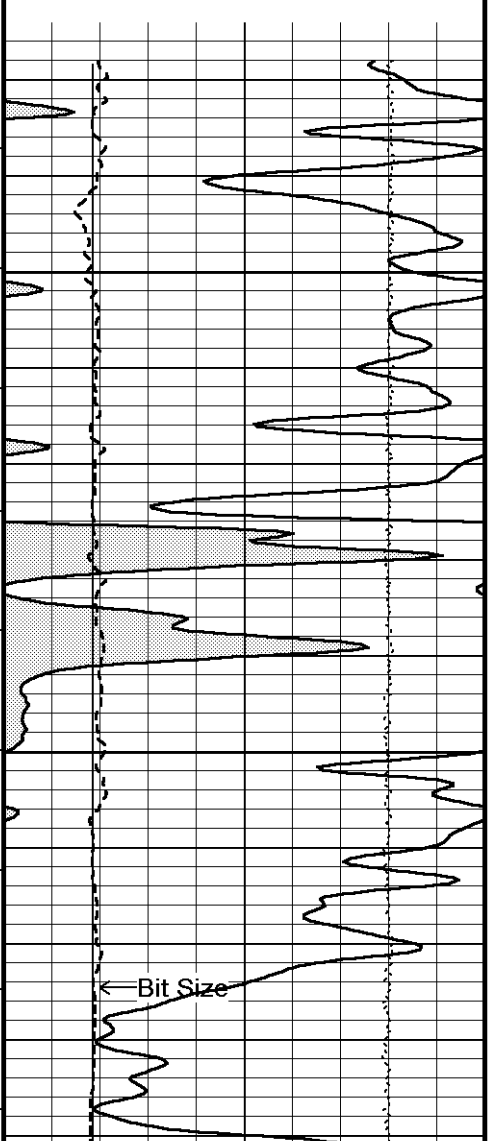


Gamma Ray		
API		
0	75	150
150	225	300

Density Caliper		
inches		
6	11	16

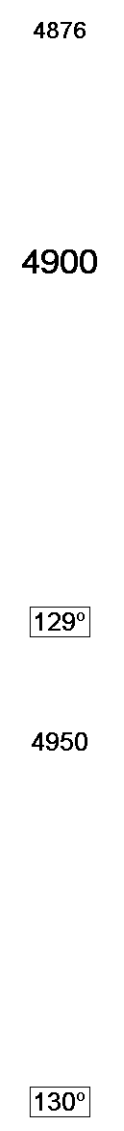
Bit Size		
inches		
6	11	16

DST Uphole Tension		
pounds		
5000		0

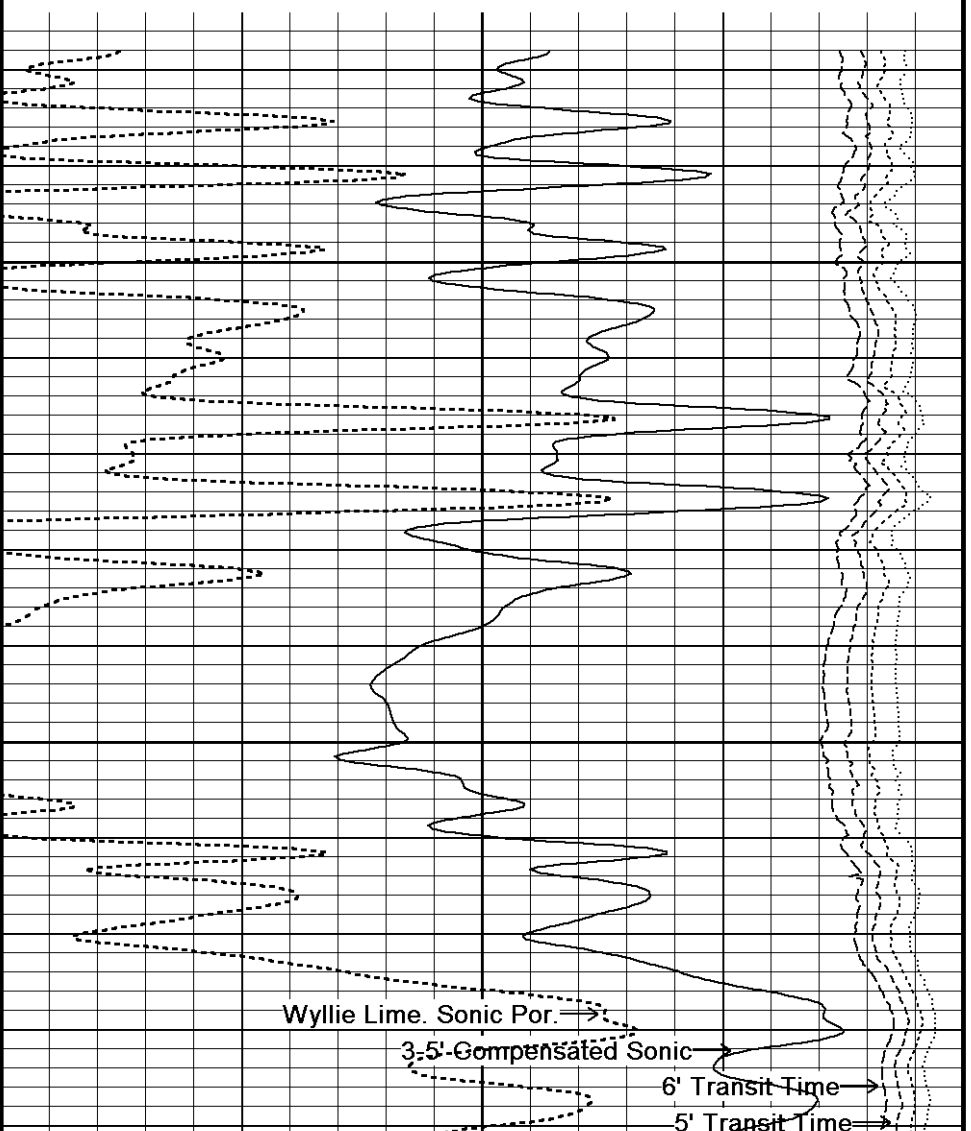


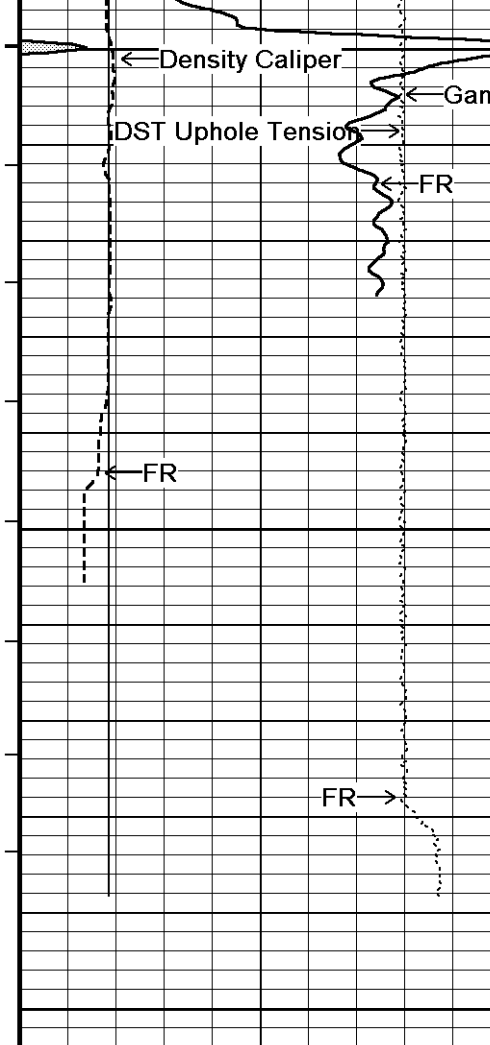
Borehole  
Temp in  
deg F

Replay  
Scale  
1:240

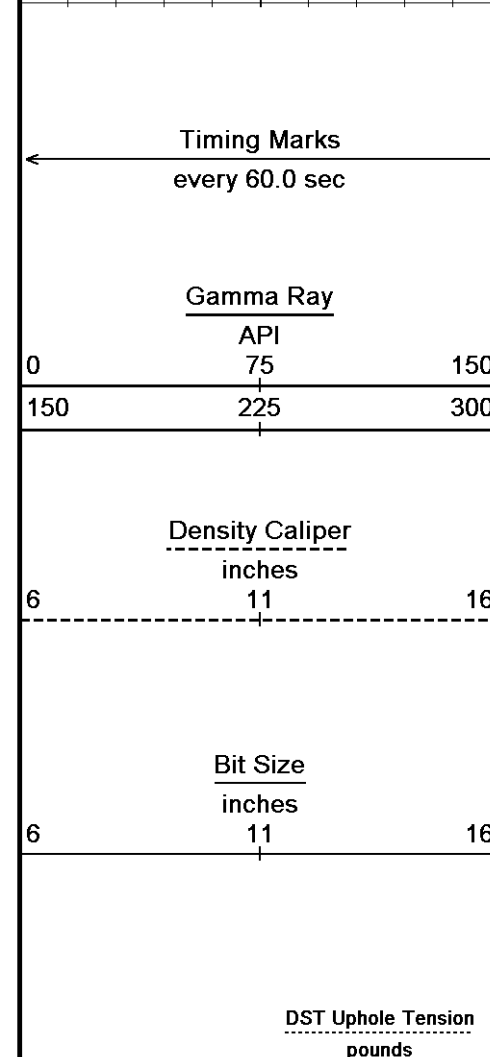
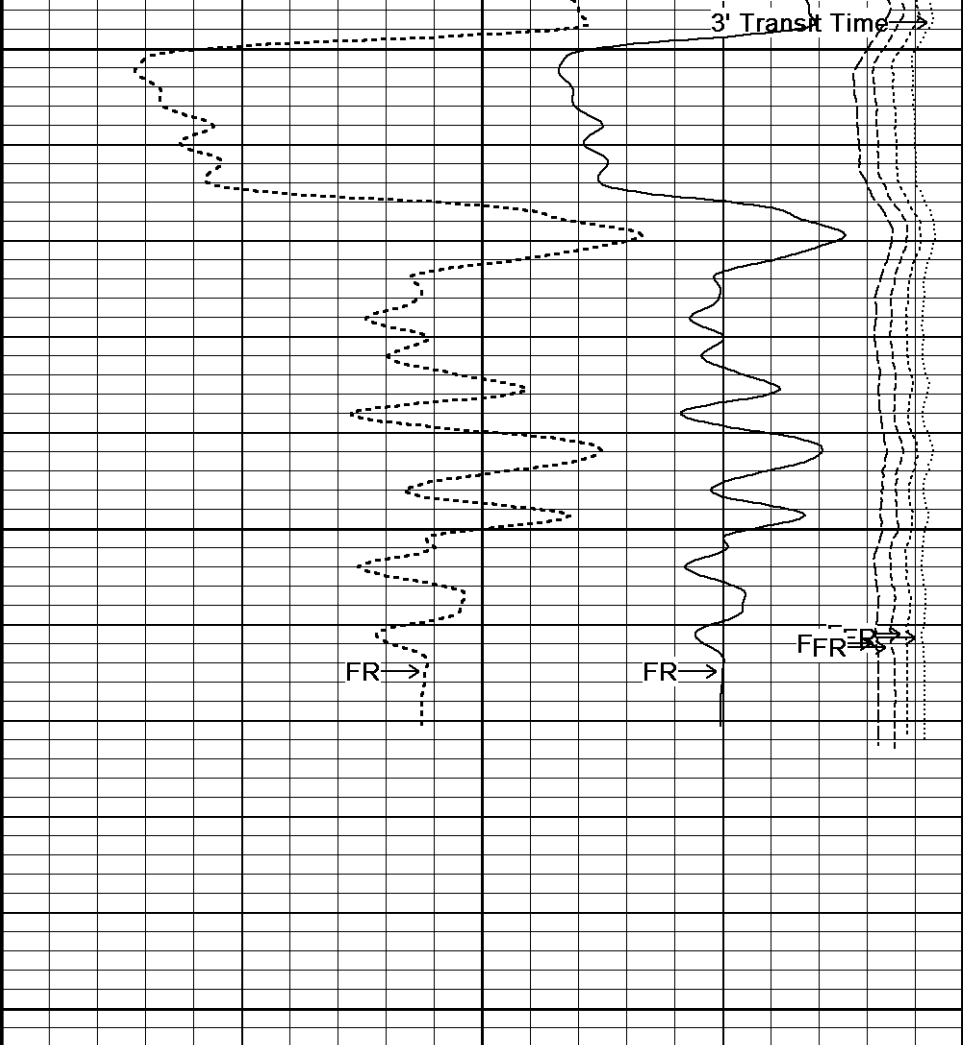


Wyllie Lime. Sonic Por.			
percent			
30	20	10	0
			-10

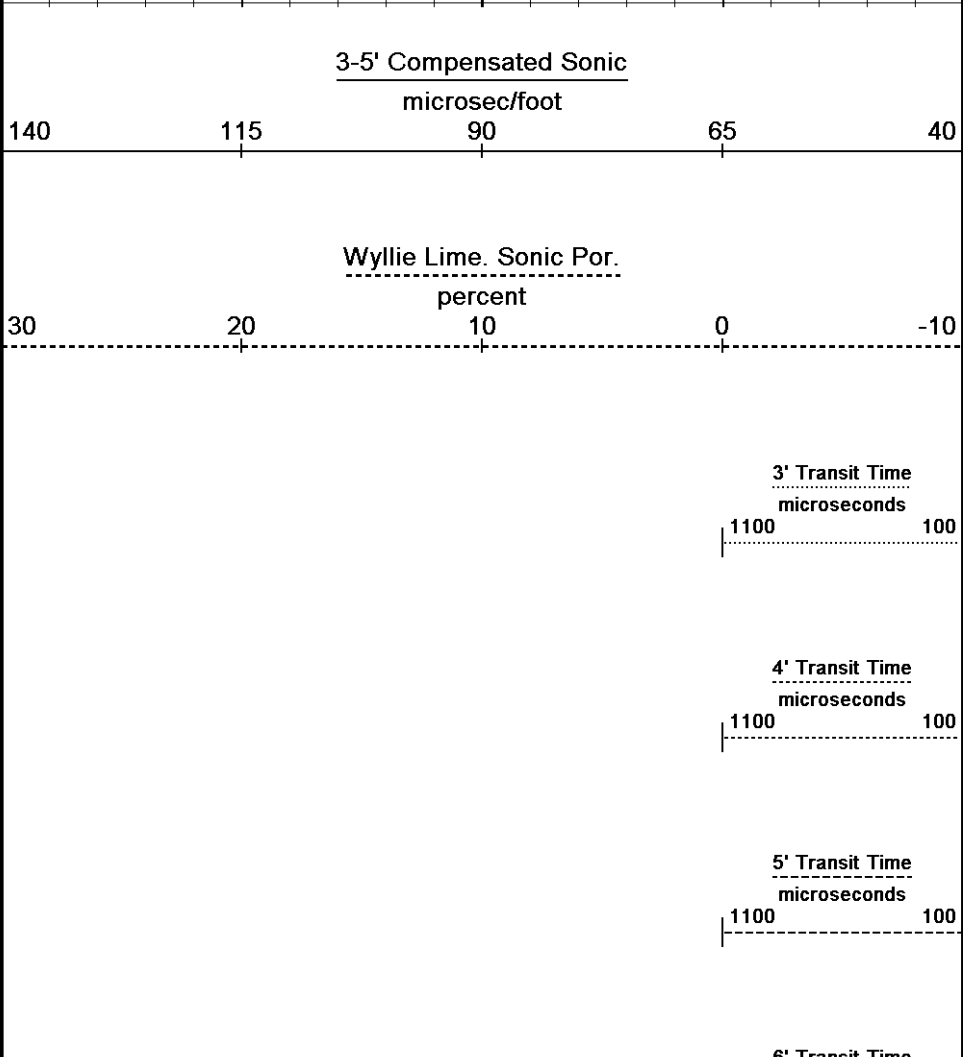




5000  
5050  
TD  
5100



Depth in Feet  
Borehole Temp in deg F



5000 0

Replay

Scale

1:240

microseconds 1100 100

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 24-NOV-2013 08:36

Filename: C:\Minimus 13.05.9583\Logs\McElvain Price 14-5\McElvain Price 14-5 Repeat.dta

Recorded on 24-NOV-2013 01:03

System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION

C:\Minimus 13.05.9583\Logs\McElvain Price 14-5\McElvain Price 14-5 Repeat.dta

General Constants All 000 Last Edited on 23-NOV-2013,18:00

General Parameters

Mud Resistivity	1.600	ohm-metres
Mud Resistivity Temperature	49.000	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	MMR Caliper	

Rwa Parameters

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

High Resolution Temperature Calibration MCG-D.K 442 Field Calibration on 29-OCT-2013,14:34

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MCG-D.K 442 Last Edited on 29-OCT-2013,14:34

Pre-filter Length 11

Gamma Calibration MCG-D.K 442 Field Calibration on 21-NOV-2013 09:45

	Measured	Calibrated (API)
Background	72	48
Calibrator (Gross)	1151	773
Calibrator (Net)	1079	725

Gamma Constants MCG-D.K 442 Last Edited on 23-NOV-2013,18:00

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	%

Sonic Constants MSS-A.A 55 Last Edited on 23-NOV-2013,18:01

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	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 20-NOV-2013 10:19  
Field Calibration on 20-NOV-2013 10:21

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	18720	3.99
2	27472	5.98
3	36127	7.97
4	44368	9.86
5	53568	11.92
6	N/A	N/A

Field Calibration	Measured Caliper (in)	Actual Caliper (in)
	7.90	7.97

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Logs\McElvain Price 14-5\McElvain Price 14-5 Repeat.dta

CBH-CA 170 LG: 2.40 ft WT: 24.3 lb OD: 2.24 in

Compact Comms Gamma  
MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Spectral Gamma Ray Sub  
SGS-E.J 150 LG: 7.78 ft WT: 105.8 lb OD: 3.54 in

Compact Micro-Resistivity  
MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.88 in

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

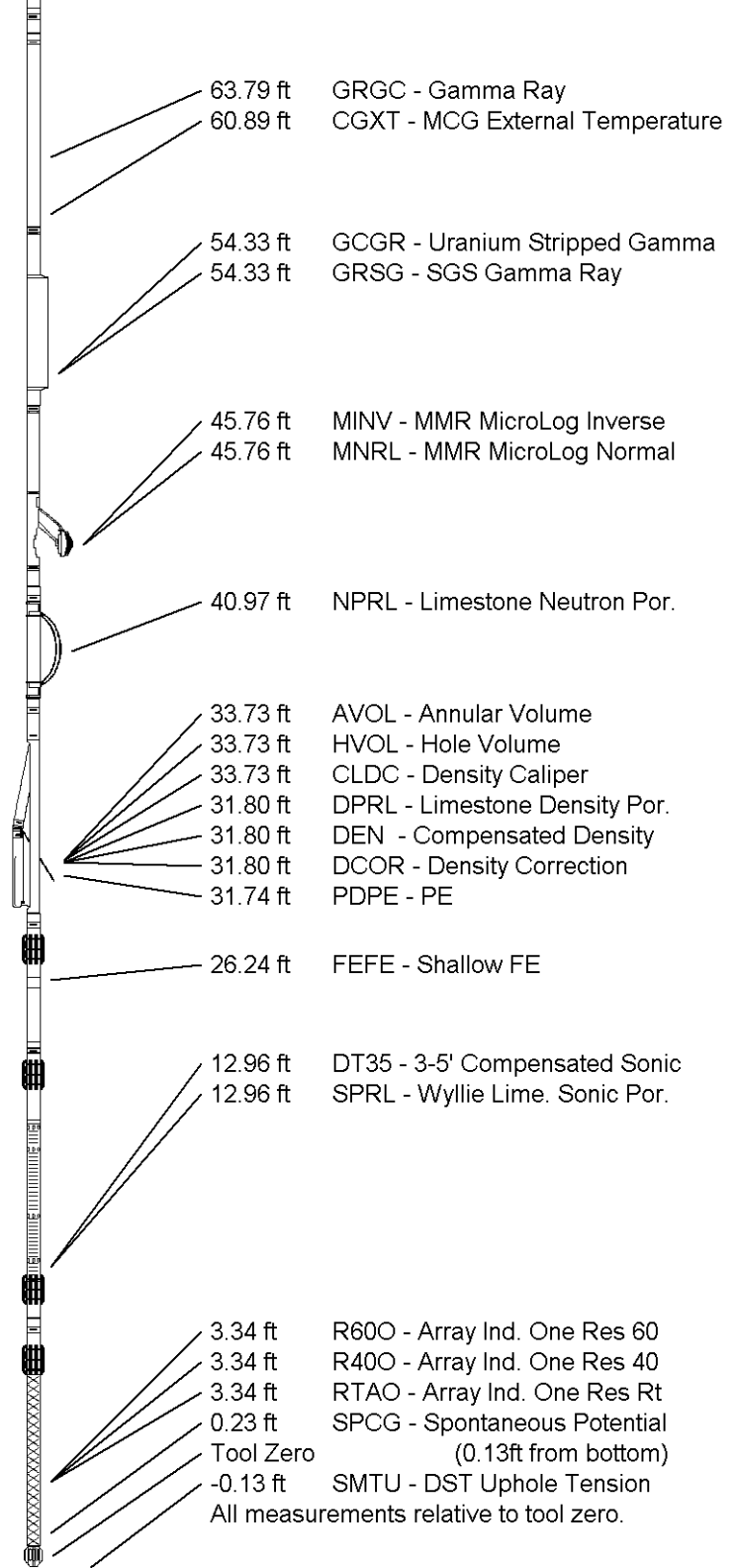
Compact Density/Caliper  
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

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

Compact Sonic  
MSS-A.A 55 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: 71.47 ft Weight: 586.4 lb



COMPANY MCELVAIN ENERGY, INC.  
 WELL PRICE 14-5  
 FIELD LIANOS SE  
 PROVINCE/COUNTY SHERMAN  
 COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	3452.00	feet	First Reading	5065.00	feet
Elevation Drill Floor	3450.00	feet	Depth Driller	5082.00	feet
Elevation Ground Level	3441.00	feet	Depth Logger	5078.00	feet



**Weatherford**<sup>®</sup>

COMPENSATED SONIC  
WITH INTEGRATED TRANSIT TIME