



**Weatherford®**

**COMPENSATED SONIC  
WITH INTEGRATED TRANSIT TIME**

COMPANY				GRAND MESA OPERATING CO.			
WELL				RIO LOBO 1-30			
FIELD				WILDCAT			
PROVINCE/COUNTY				WASHINGTON			
COUNTRY/STATE				U.S.A. / COLORADO			
LOCATION				SHL: 2474' FNL & 610' FWL			
SEC 30	TWP 5S	RGE 53W	Other Services		ARRAY INDUCTION		
Latitude	39.586820	DUAL SPACED NEUTRON		MICRLOG			
Longitude	-103.366370	PHOTO DENSITY					
API Number	05-121-11065						
Permanent Datum GL, Elevation 5138 feet							
Log Measured From KB, 19.00 feet above Permanent Datum							
Drilling Measured From KB							
Date	04-JUL-2017				Elevations: feet		
Run Number	ONE				KB	5157.00	
Service Order	8367-186414219				DF	5157.00	
Depth Driller	8099.00				GL	5138.00	
Depth Logger	8095.00						
First Reading	8076.00						
Last Reading	376.00						
Casing Driller	386.00						
Casing Logger	386.00						
Bit Size	7.875						
Hole Fluid Type	CHEMICAL						
Density / Viscosity	9.40 lb/USg		76.00 CP				
PH / Fluid Loss	---		---				
Sample Source	FLOWLINE						
Rm @ Measured Temp	1.20 @ 50.0		ohm-m				
Rmf @ Measured Temp	0.96 @ 50.0		ohm-m				
Rmc @ Measured Temp	1.44 @ 50.0		ohm-m				
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	0.347 @183.0		ohm-m				
Time Since Circulation	12 HOURS						
Max Recorded Temp	183.00		deg F				
Equipment / Base	13174		CASPER				
Recorded By	ANDREW EASTAUGHFFE						
Witnessed By	KENT MATSON						

Elevations:	feet
KB	5157.00
DF	5157.00
GL	5138.00

**BOREHOLE RECORD**

Last Edited: 05-JUL-2017 02:23

Bit Size inches	Depth From feet	Depth To feet
7.875	386.00	8099.00

**CASING RECORD**

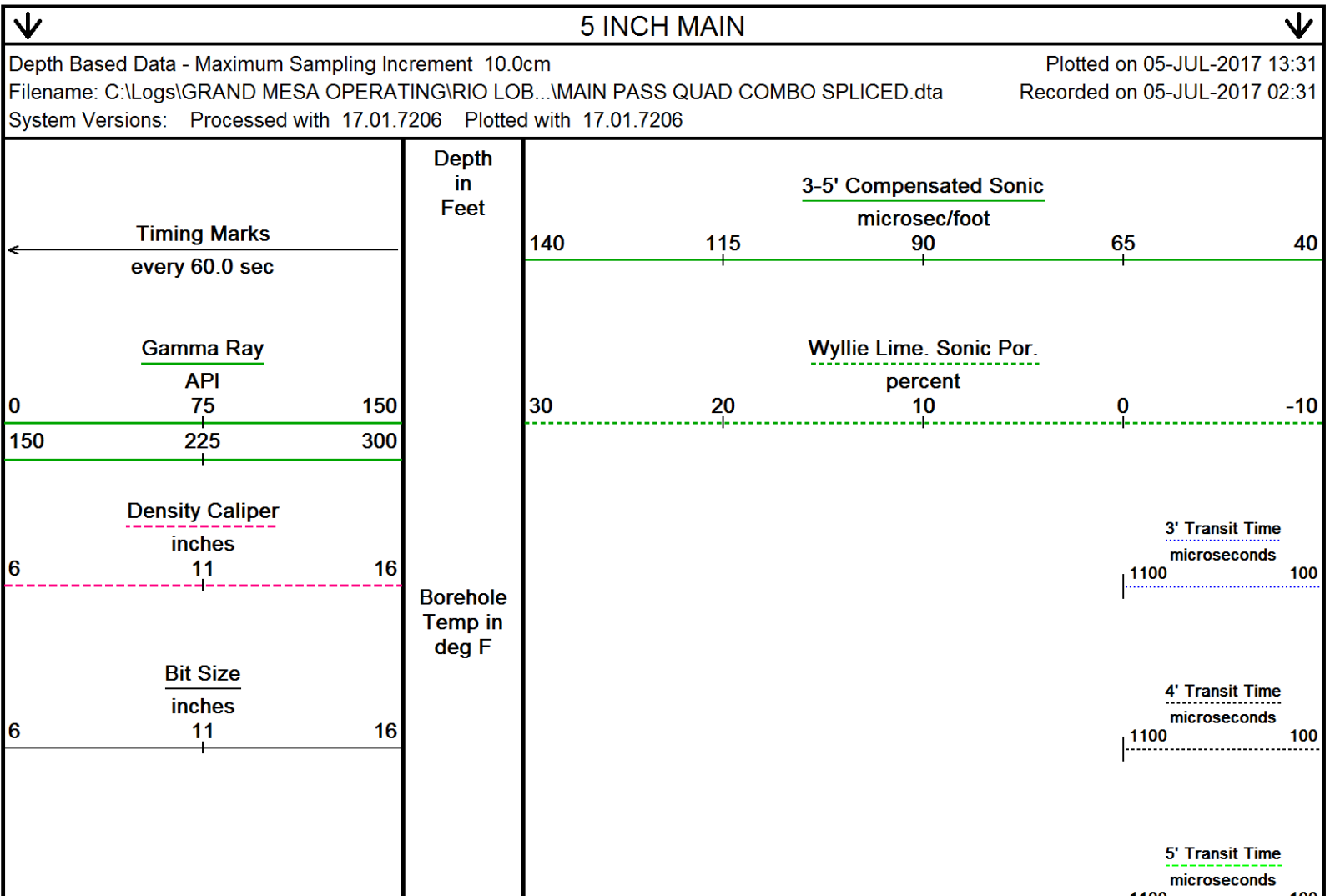
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	386.00	24.00

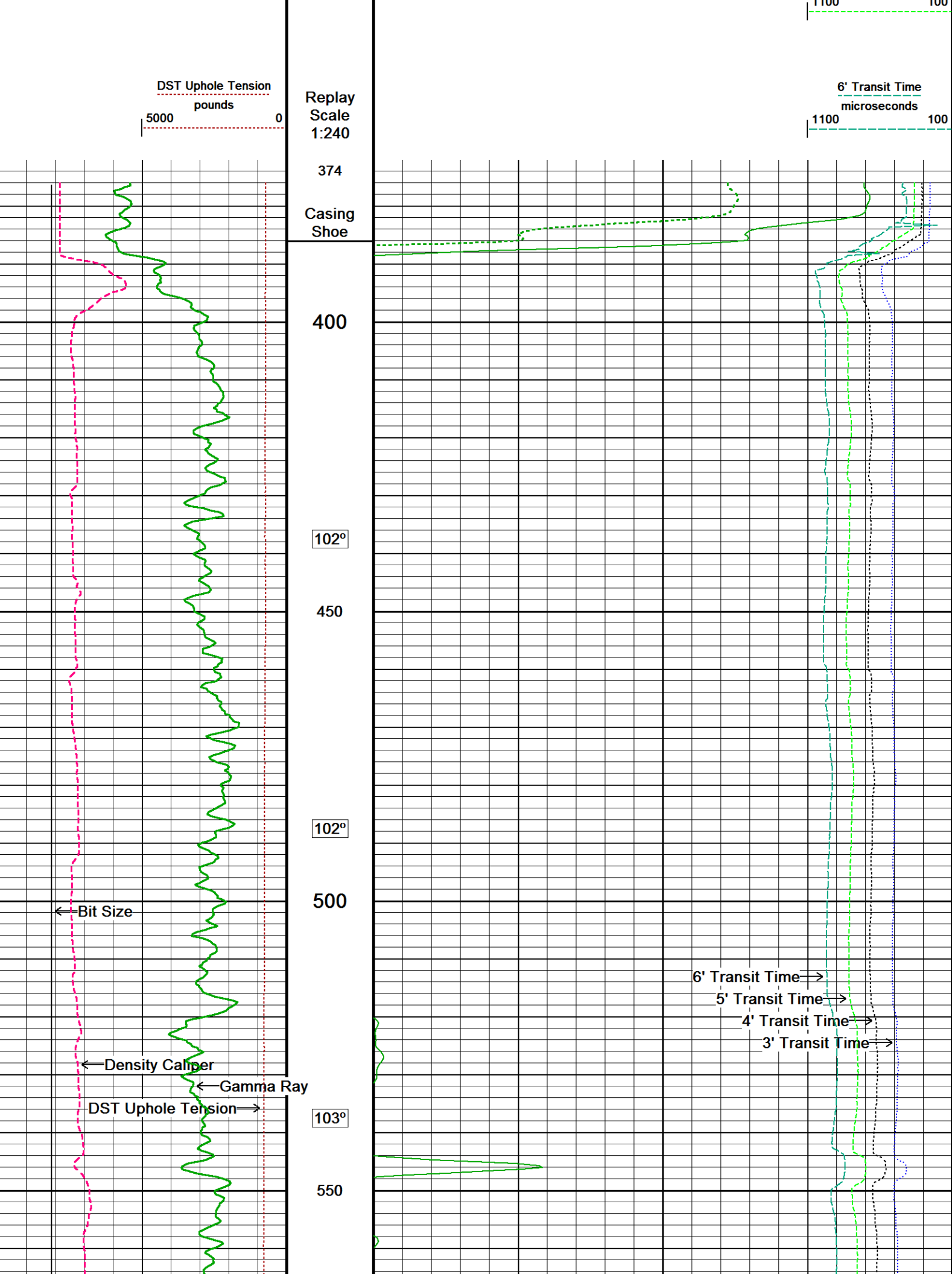
**REMARKS**

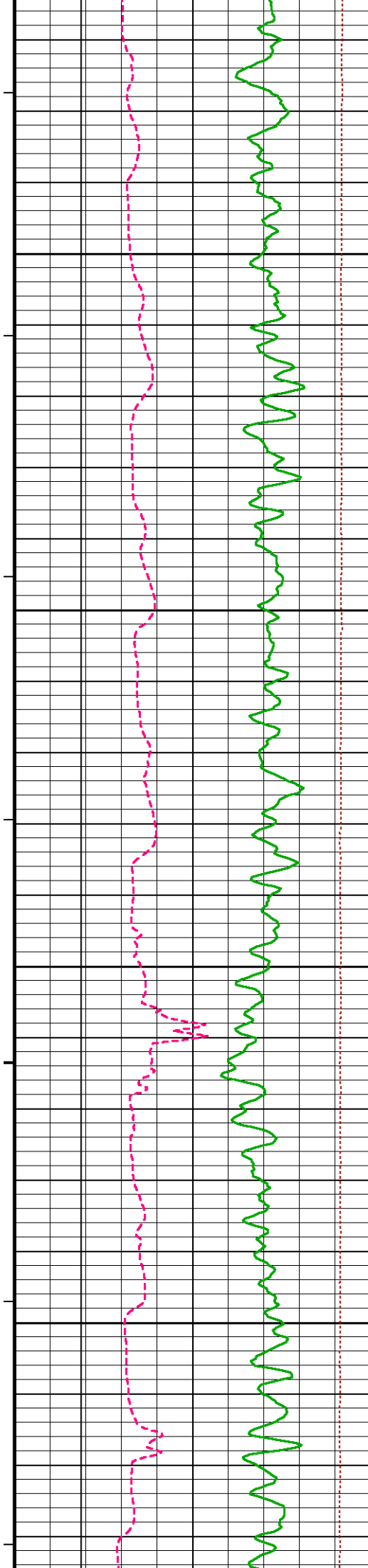
- SOFTWARE: LOGGED WITH WLS 17.01.7206
- RUN ONE: MAI, MFE, MSS, SKJ, MISE, SKJ, MISD, MPD, MDN, MMR(MML), MCG, SHA, MTA, CBH RUN IN COMBINATION.
  - HARDWARE: MDN: DUAL BOWSPRING ECCENTRALIZER
  - MPD: 8 INCH PROFILE PLATE
  - MFE: 1 X 0.5 INCH STANDOFF
  - MSS: 3 X 0.5 INCH STANDOFFS
  - MAI 1 X 0.5 INCH STANDOFF AT TOP, 1 X 0.5 INCH PINEAPPLE STANDOFF AT BOTTOM.
- RUN TWO: HFS, MISD, MIE, MIM, MCG, SHA, MTA, CBH RUN IN COMBINATION.
  - HARDWARE: MIM: OVERBODY CENTRALIZER BASKET
  - MIE: PROTECTIVE STANDOFF AT BASE
- 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: 3440 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 2190 CU.FT.
- LATITUDE: 39.586820
- LONGITUDE: -103.366370
- MAG DEC FROM NOAA WEBSITE: 7.38 DEG EAST
- RIG: WW DRILLING #20.
- ENGINEER: A. A. EASTAUGHFFE
- OPERATOR: P. B. MEYER

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.







104°

600

104°

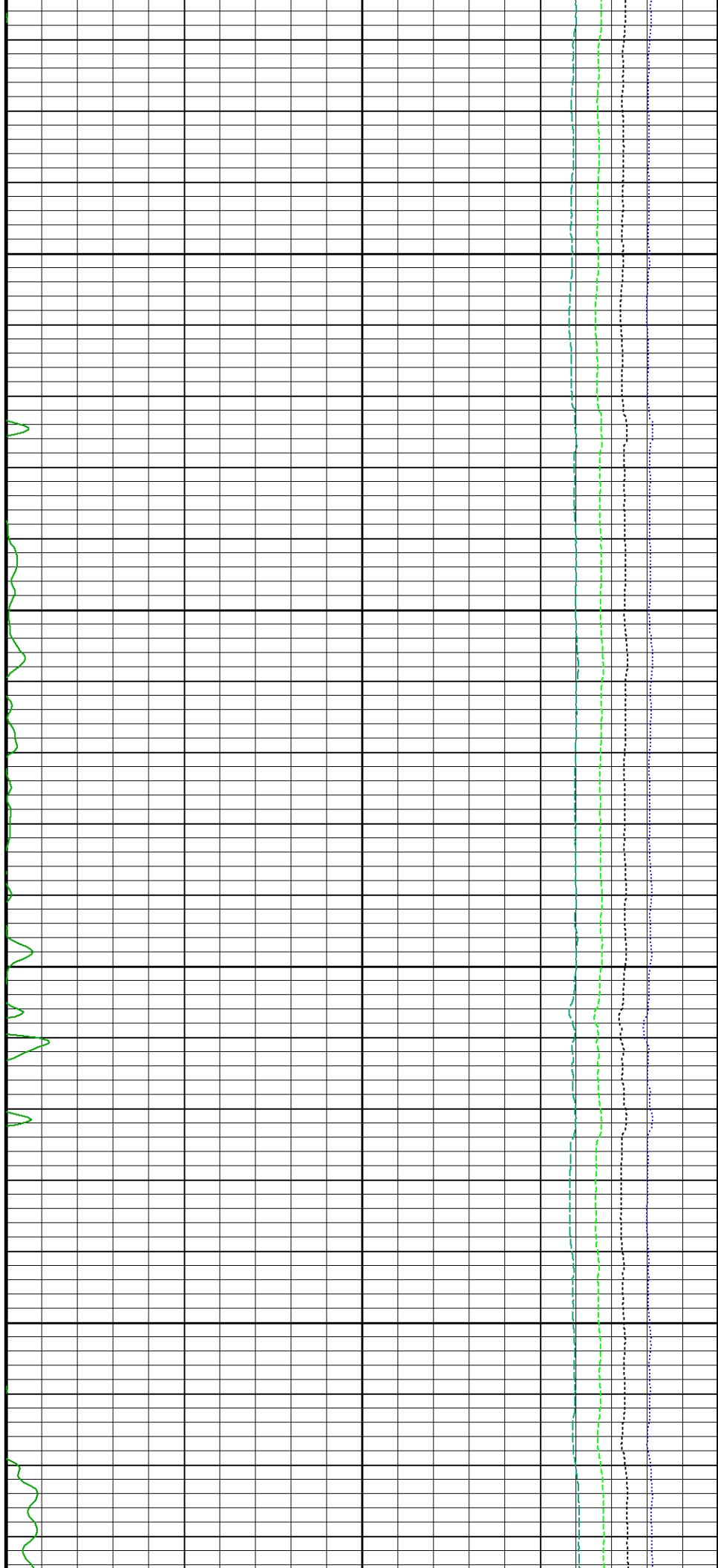
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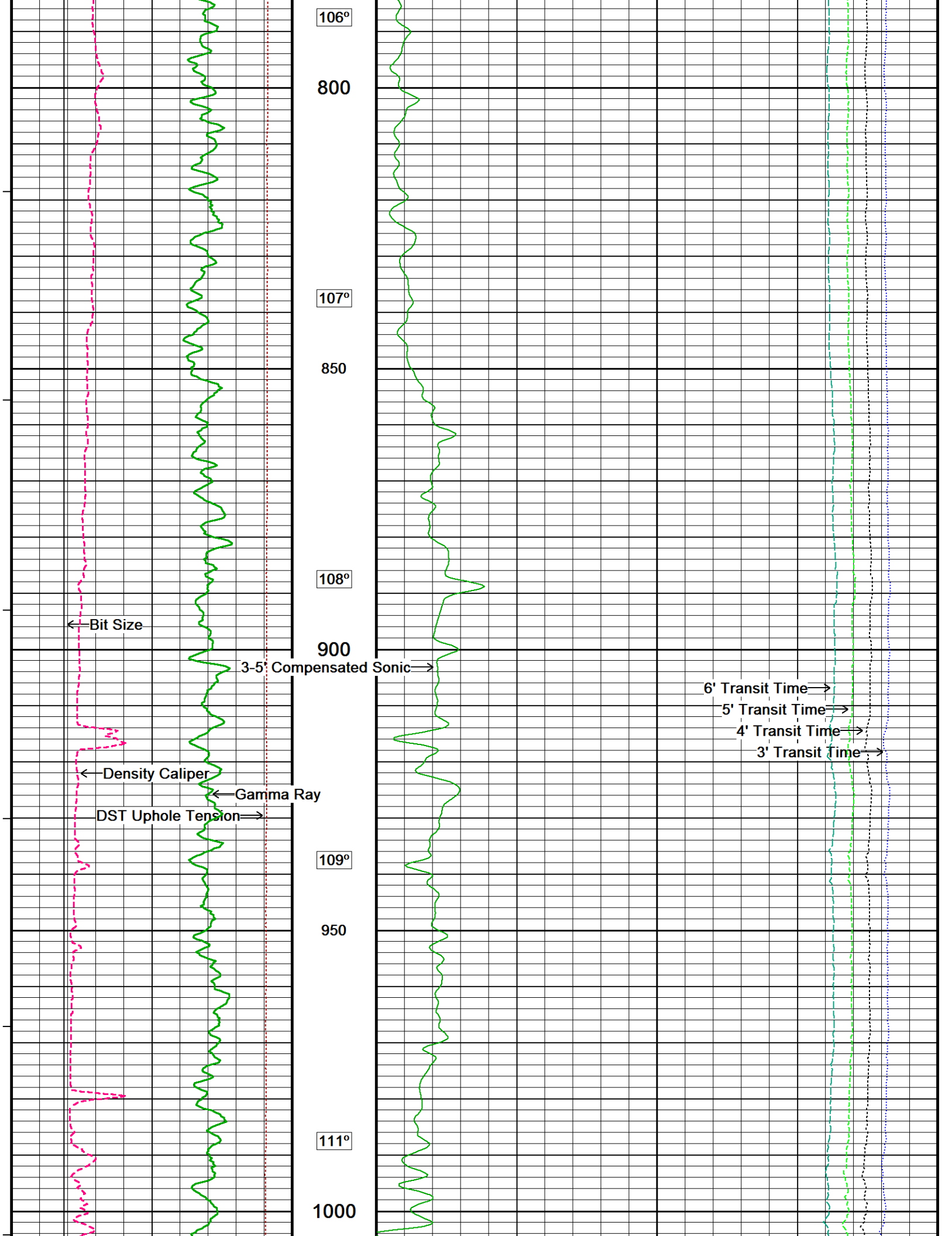
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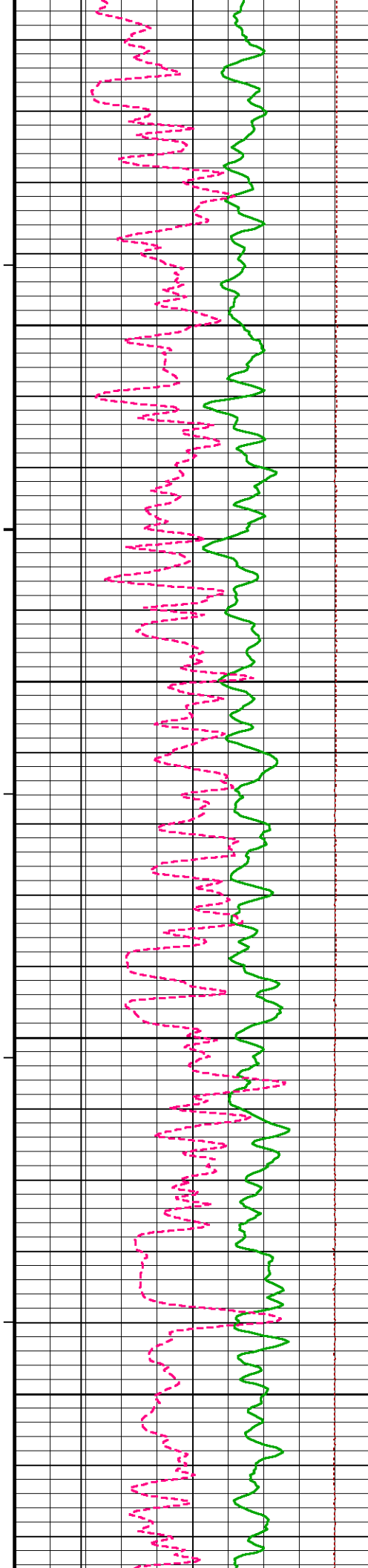
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106°

750







112°

1050

113°

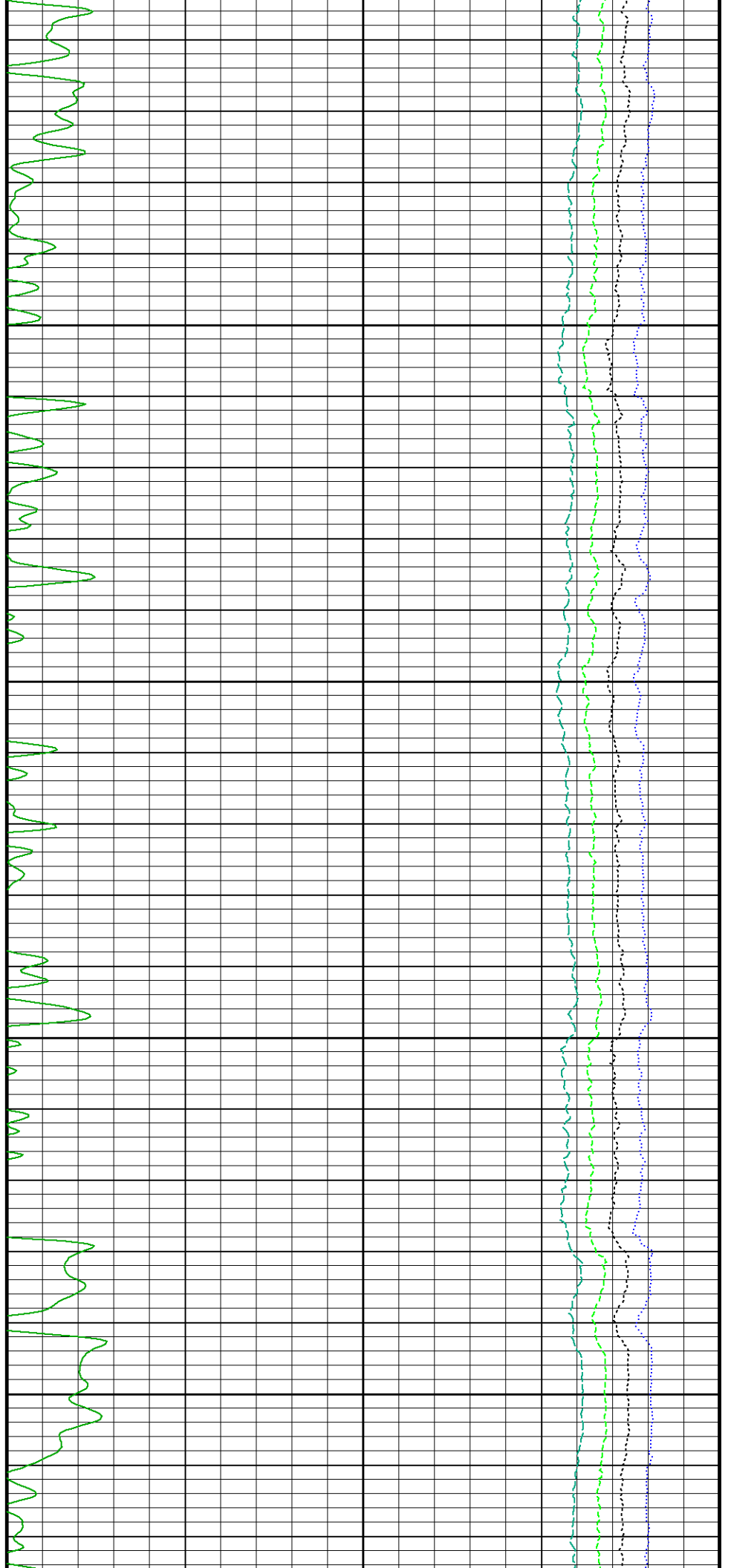
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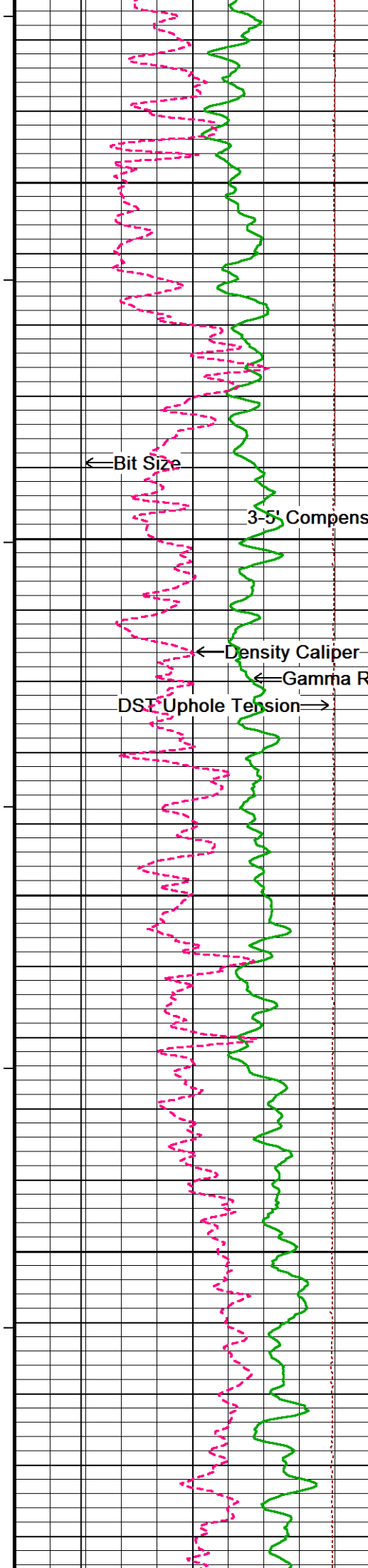
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1150

114°

1200





114°

1250

114°

3-5' Compensated Sonic  
1300

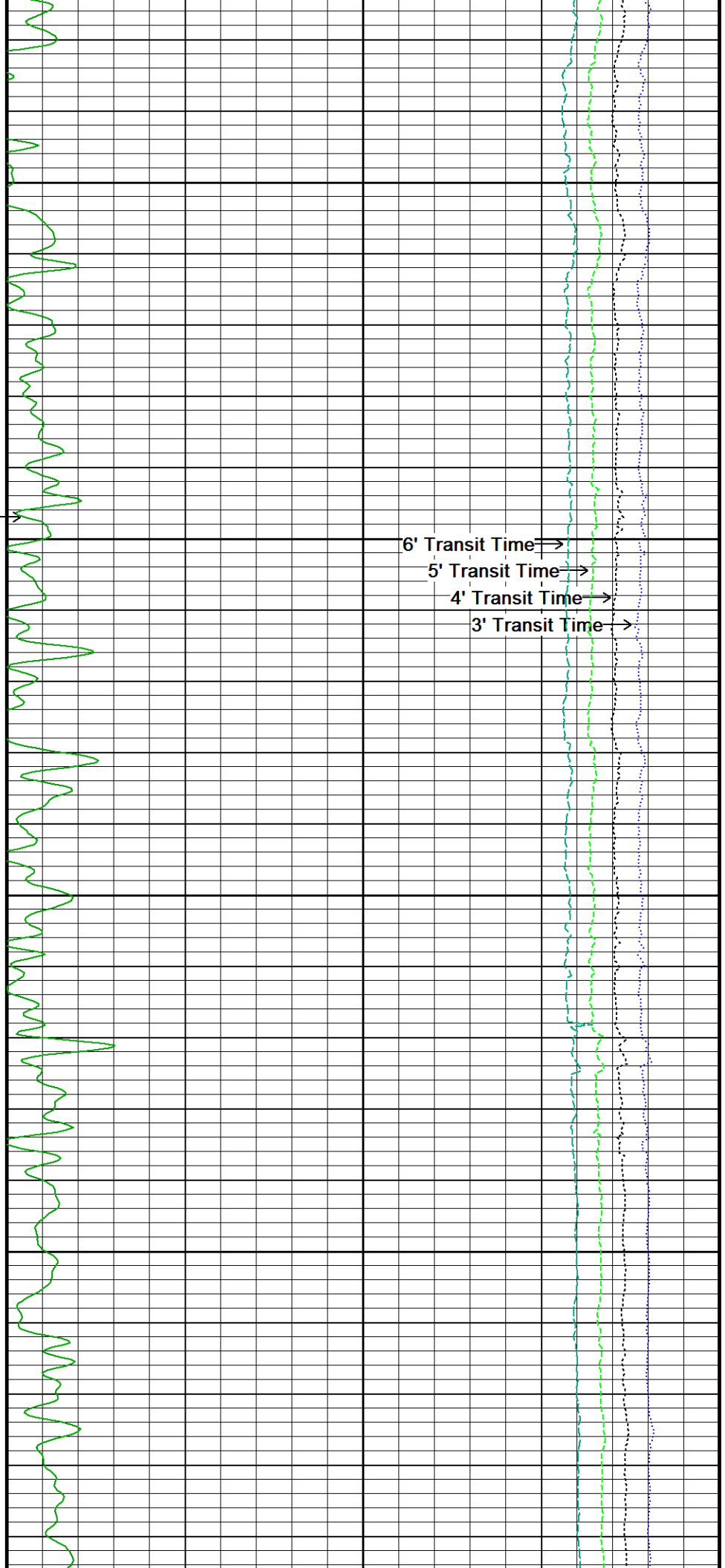
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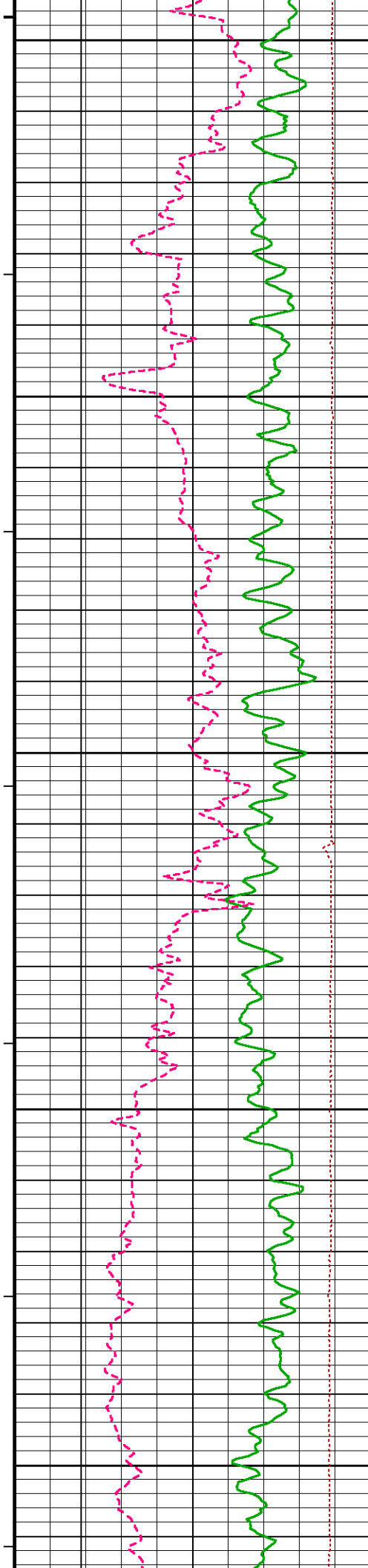
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115°

1400

115°





1450

115°

1500

116°

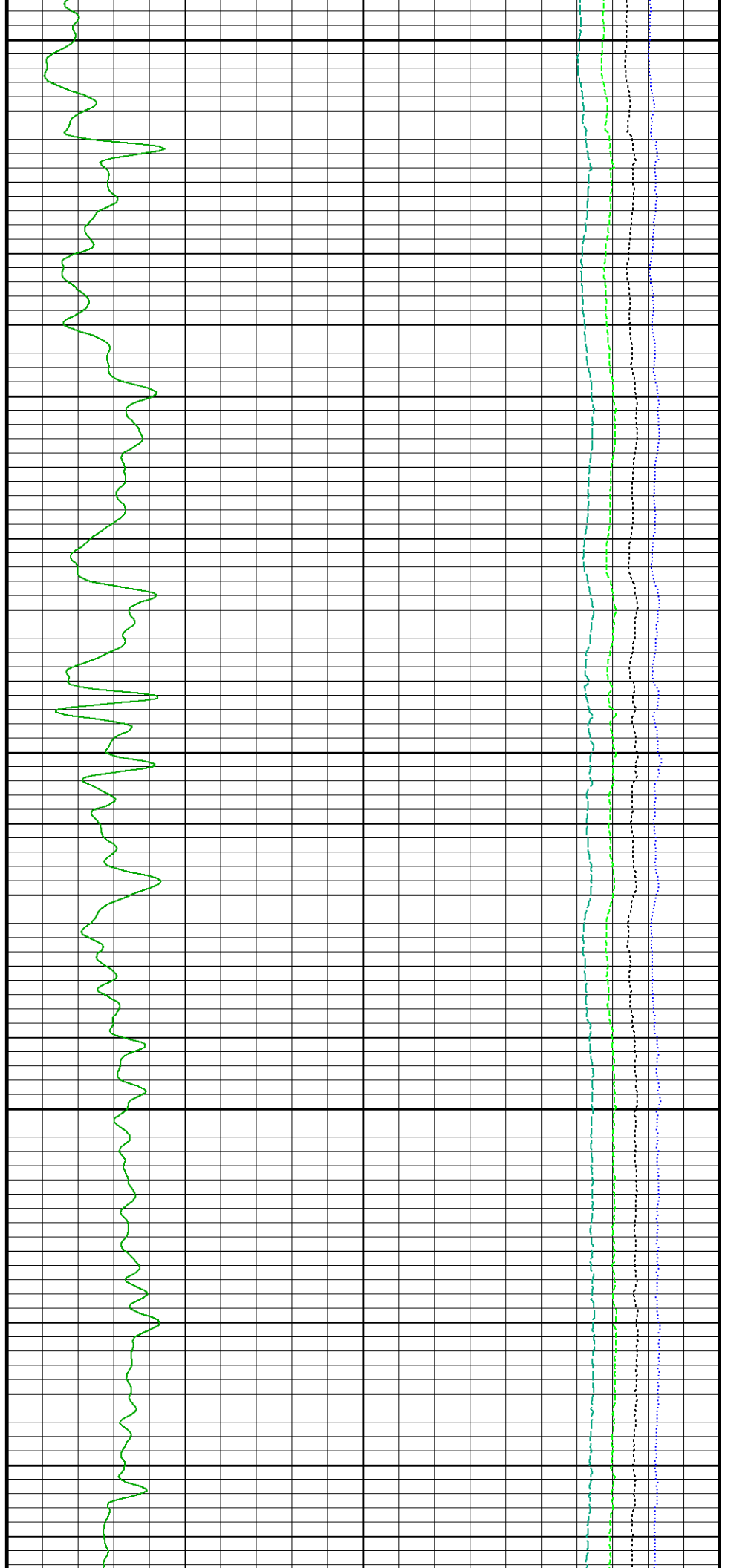
1550

117°

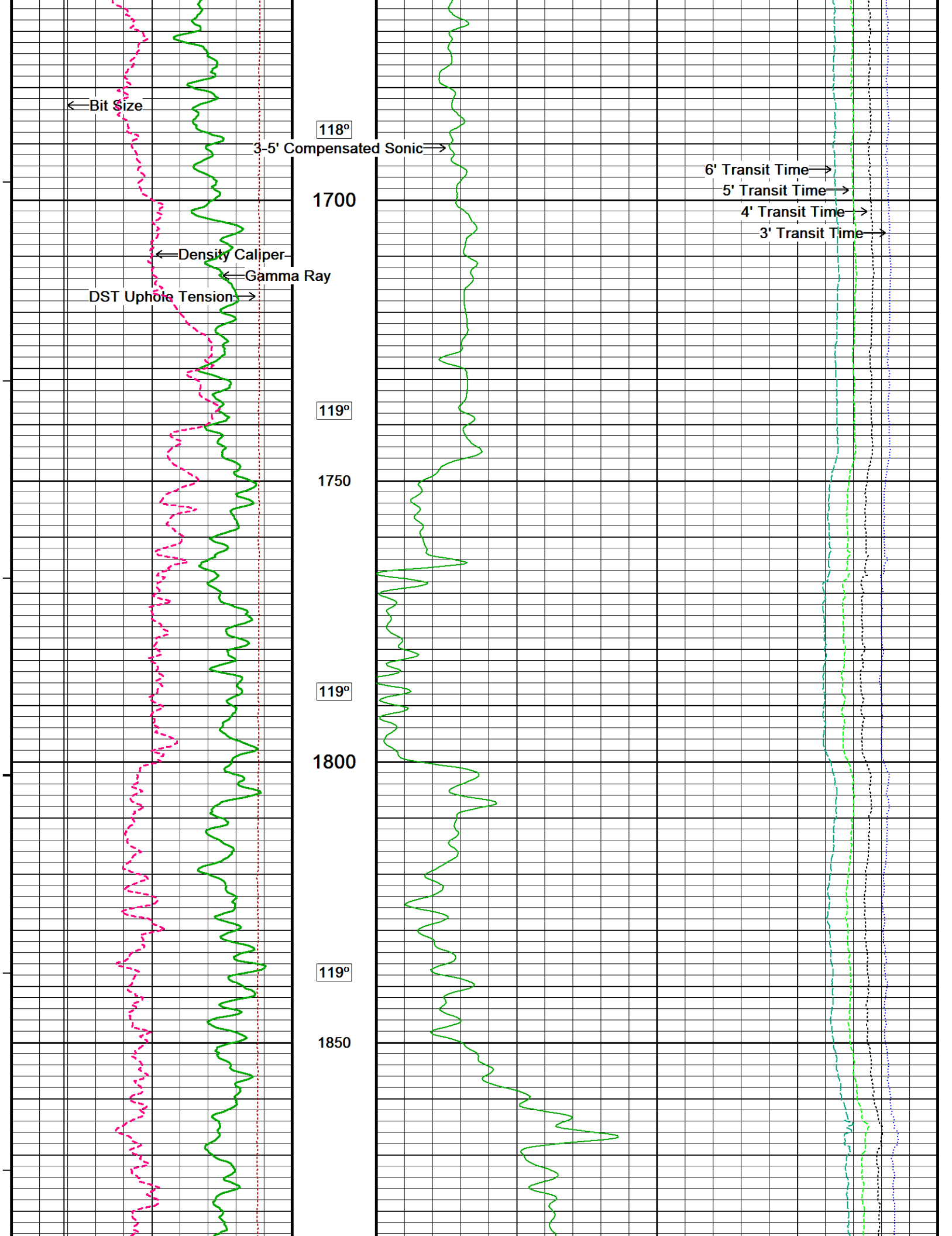
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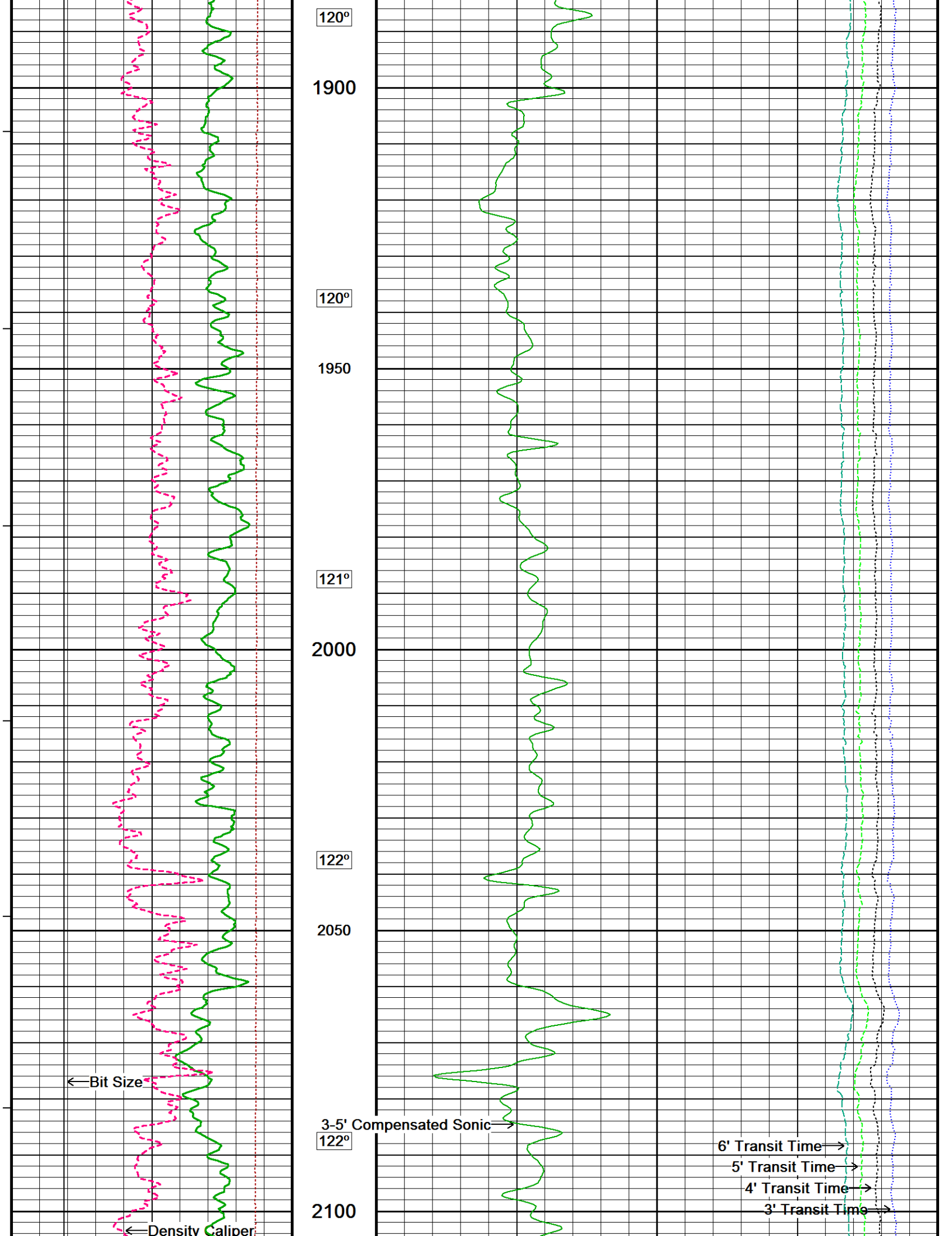
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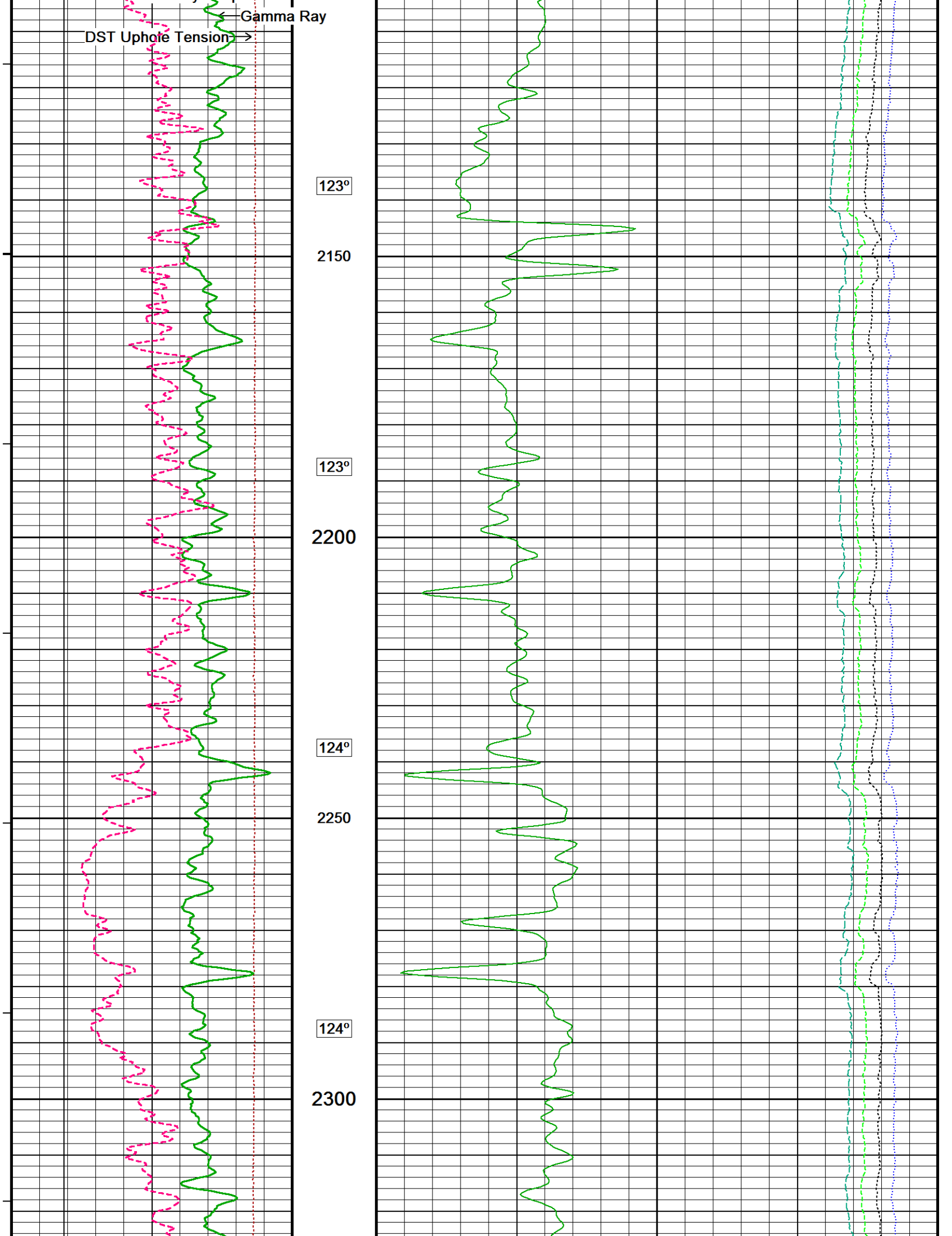
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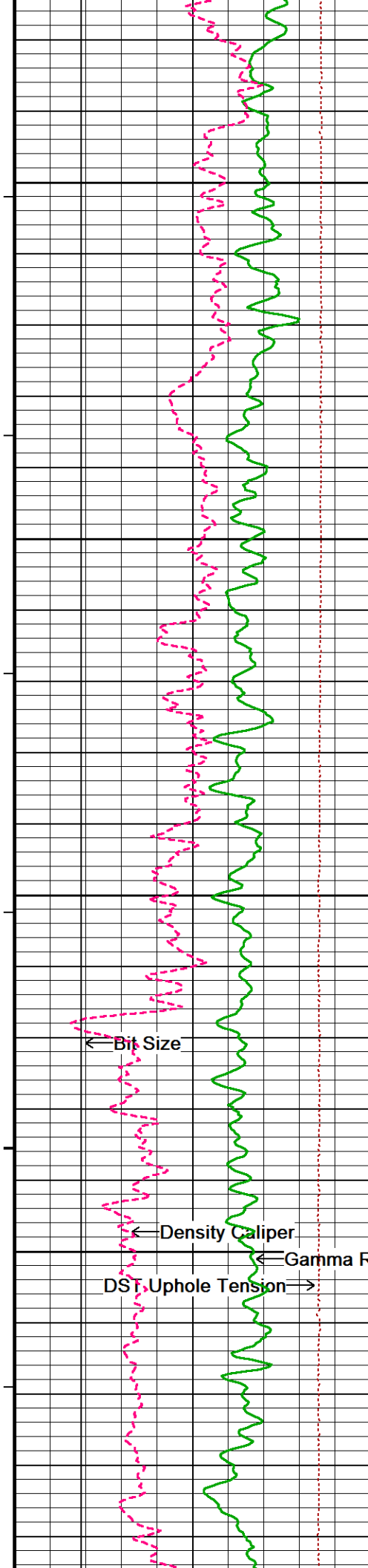












125°

2350

125°

2400

126°

2450

126°

2500

127°

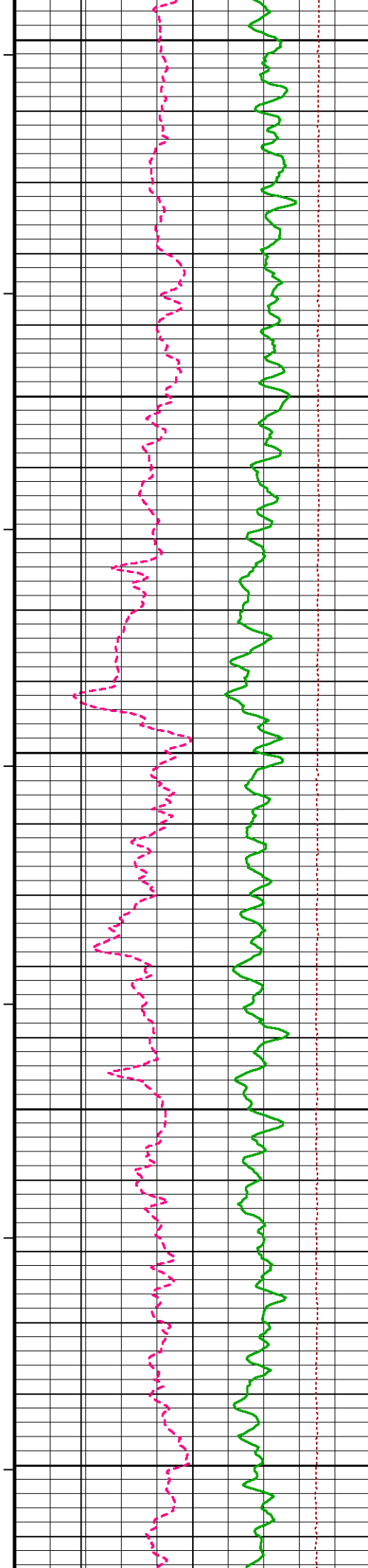
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



2550

127°

2600

128°

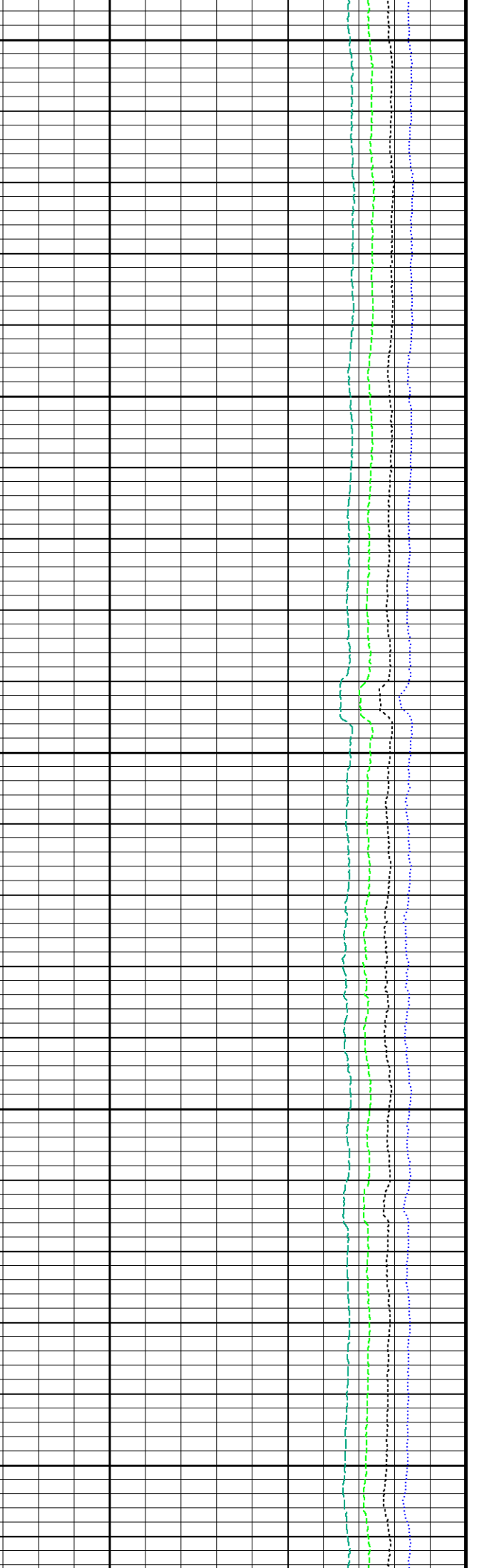
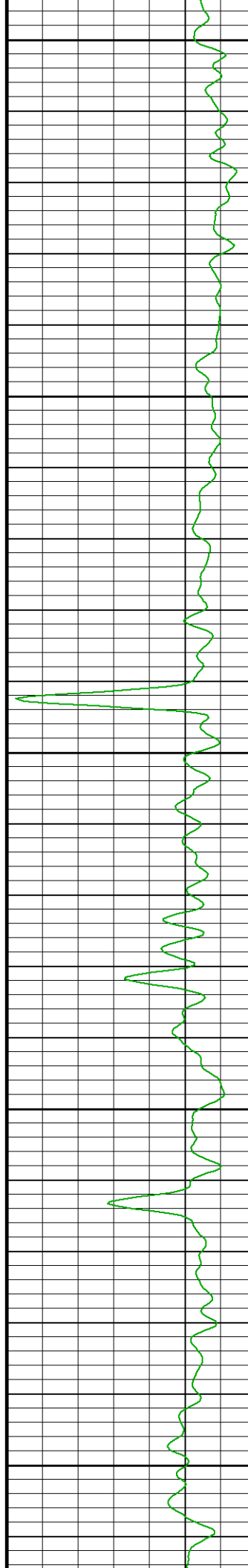
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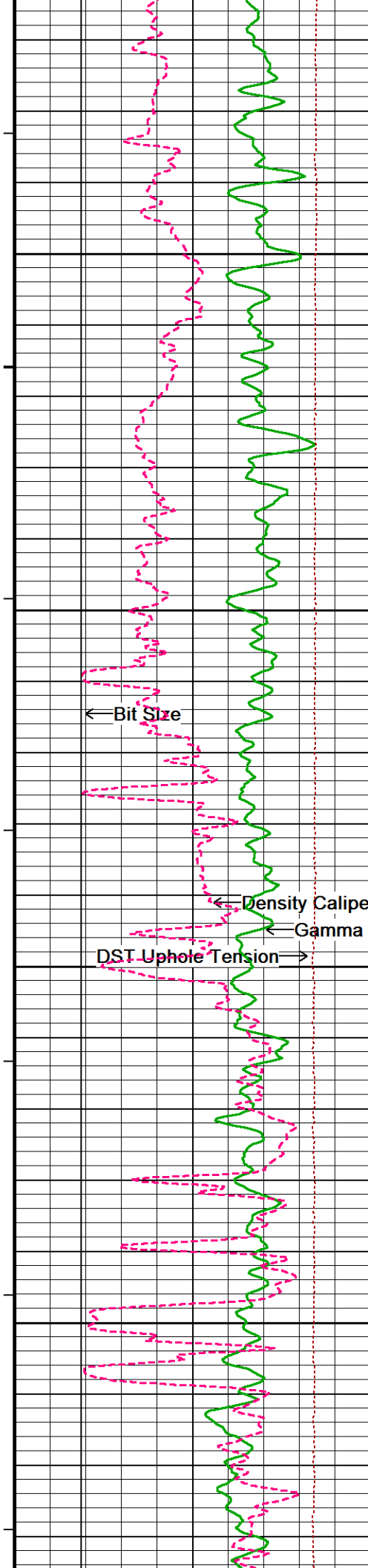
129°

2700

129°

2750





130°

2800

131°

2850

132°

2900

132°

2950

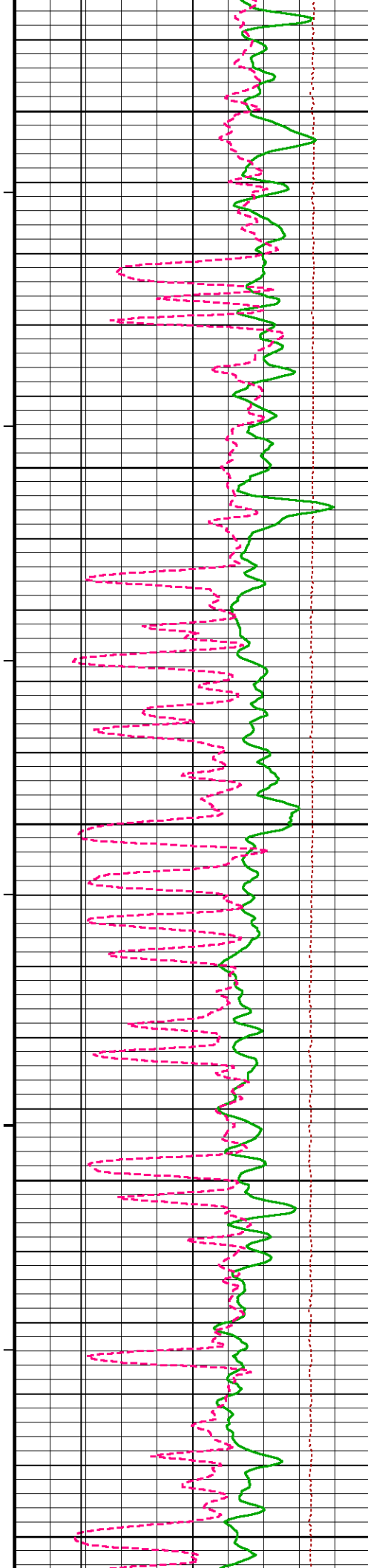
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



133°

3000

134°

3050

135°

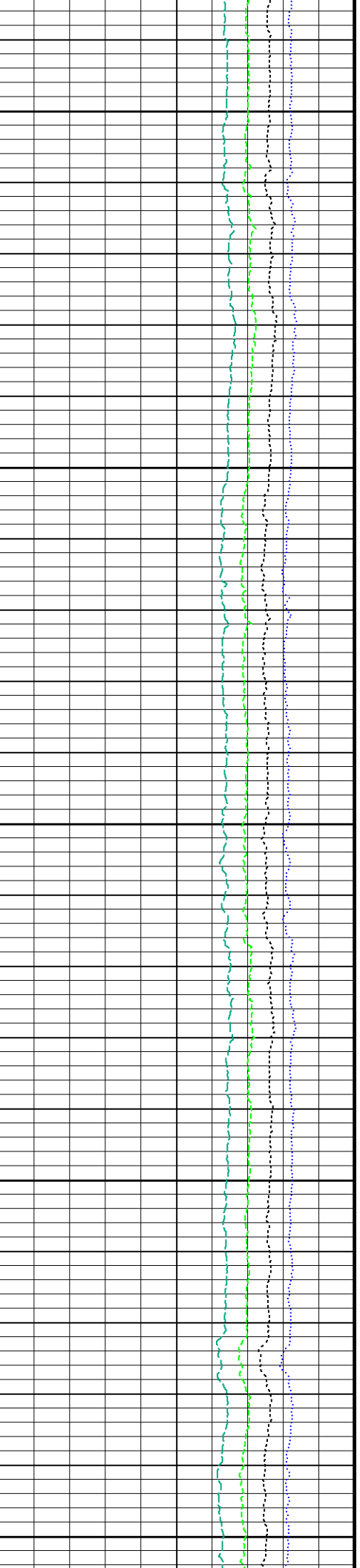
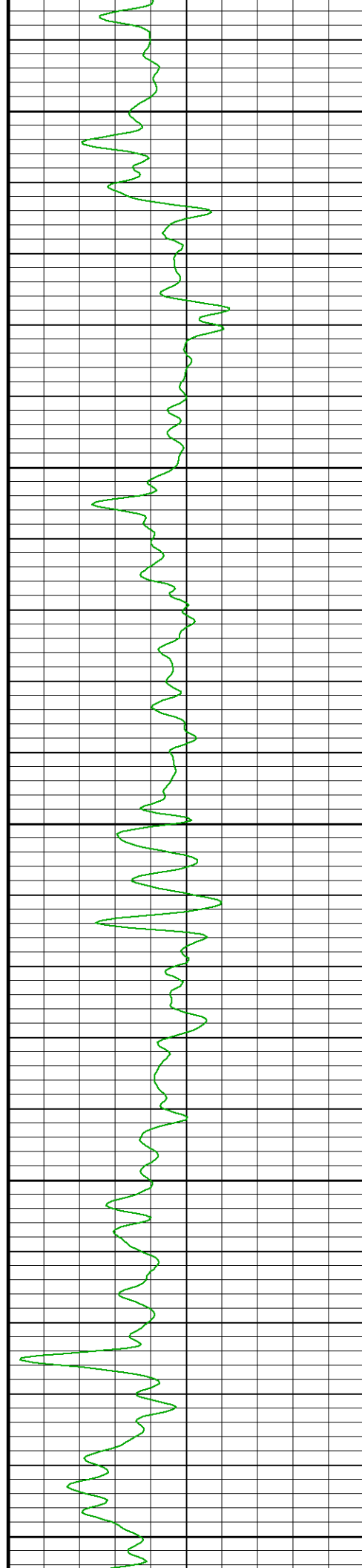
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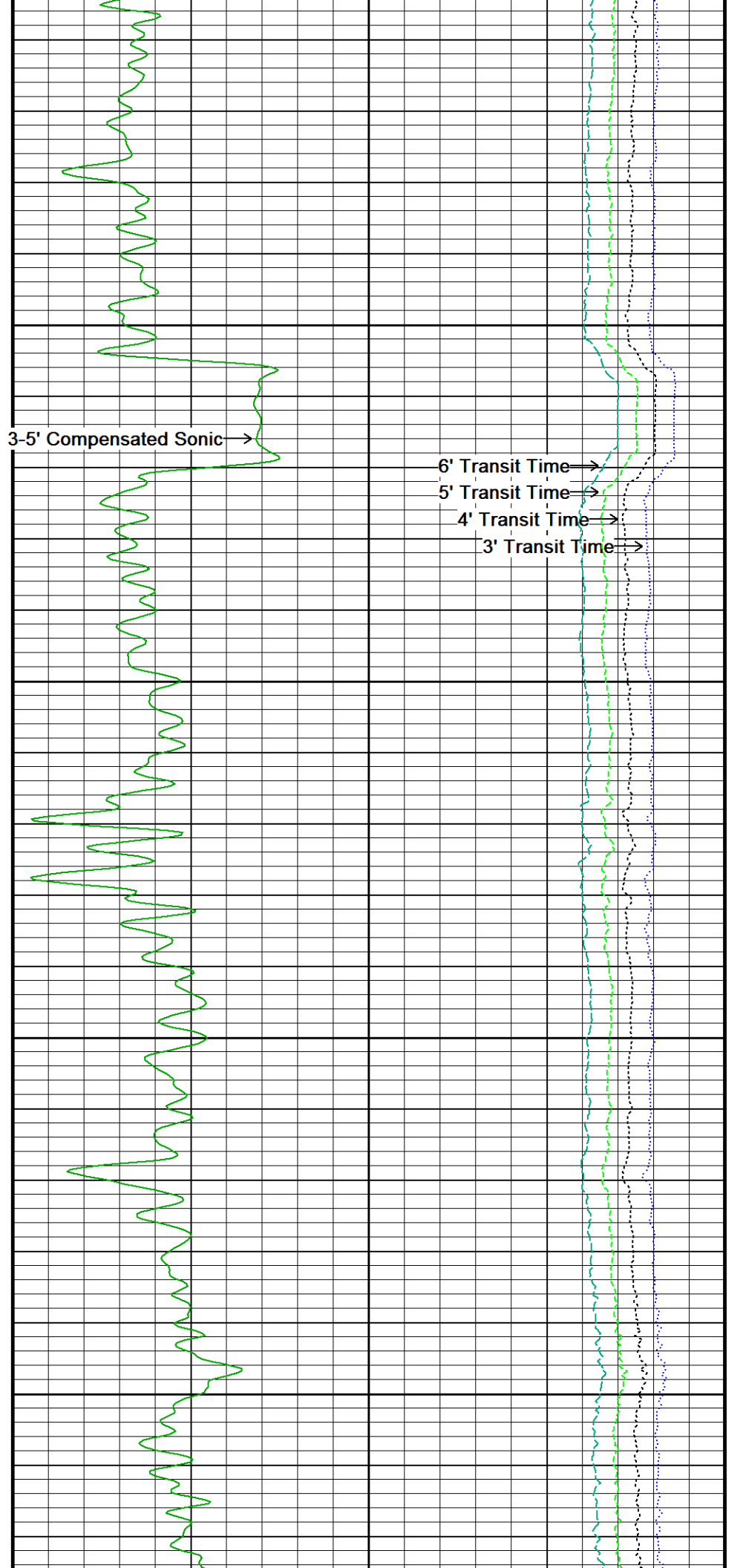
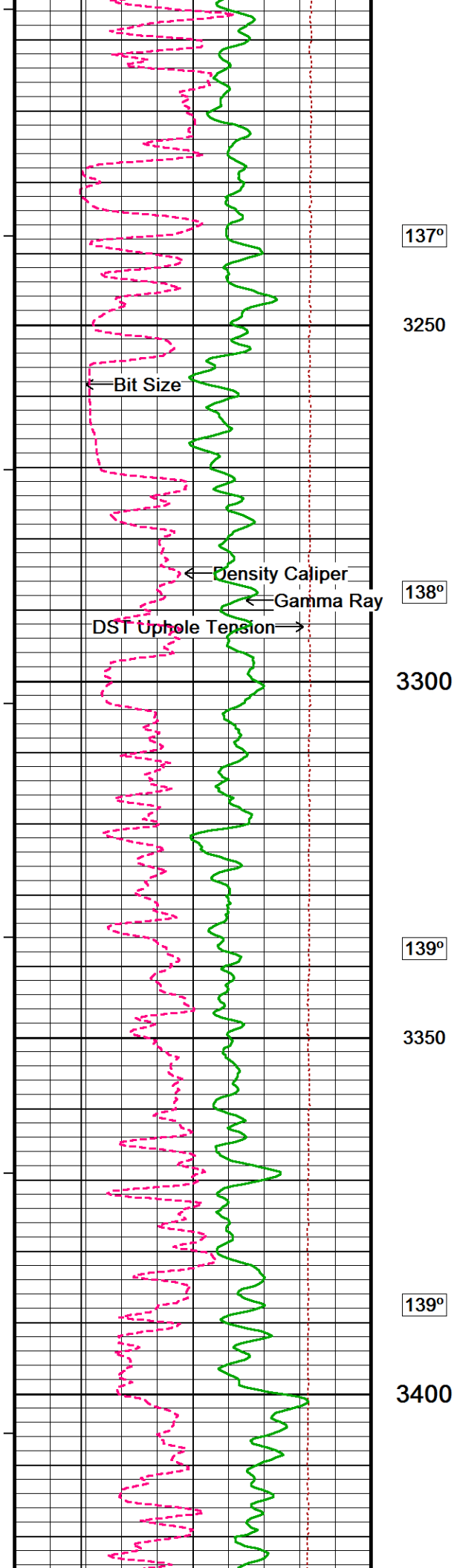
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3150

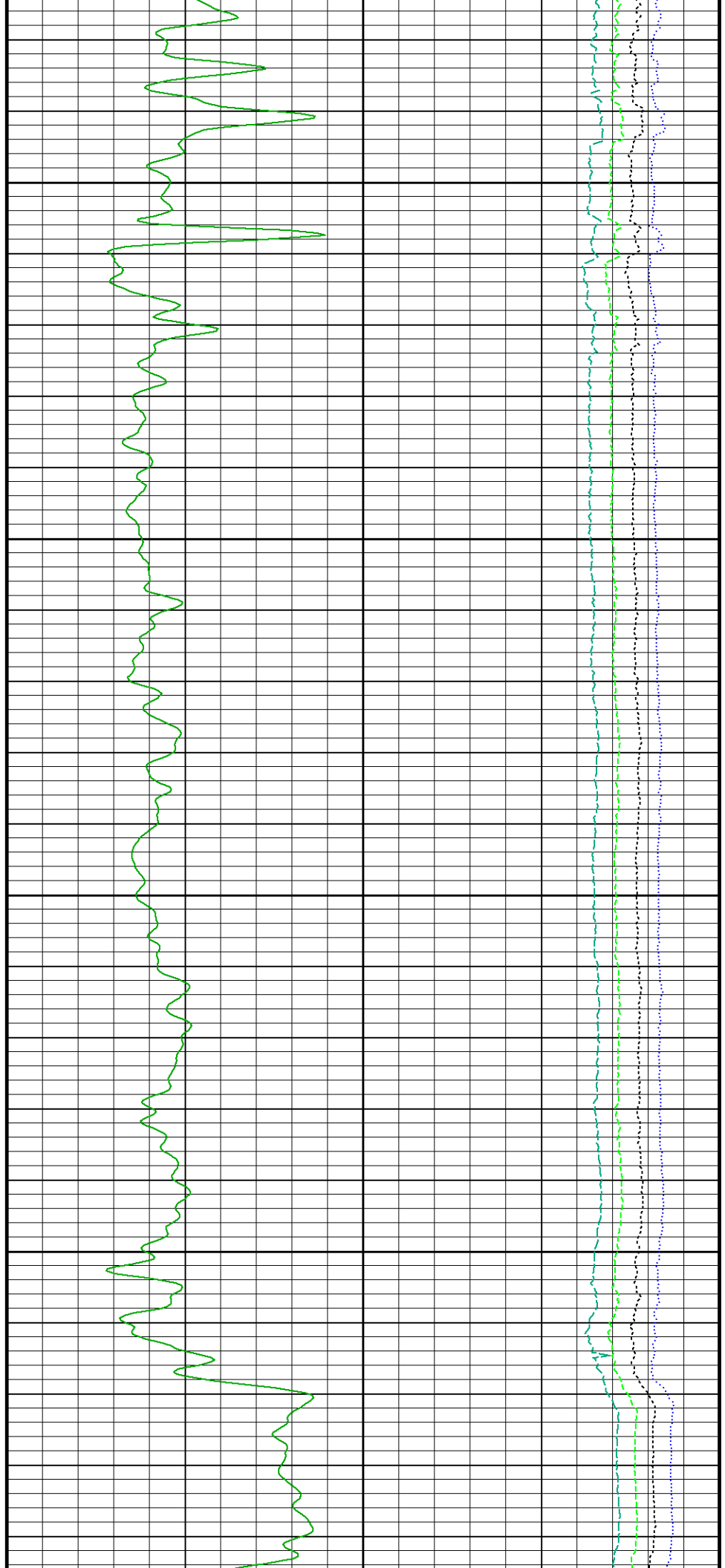
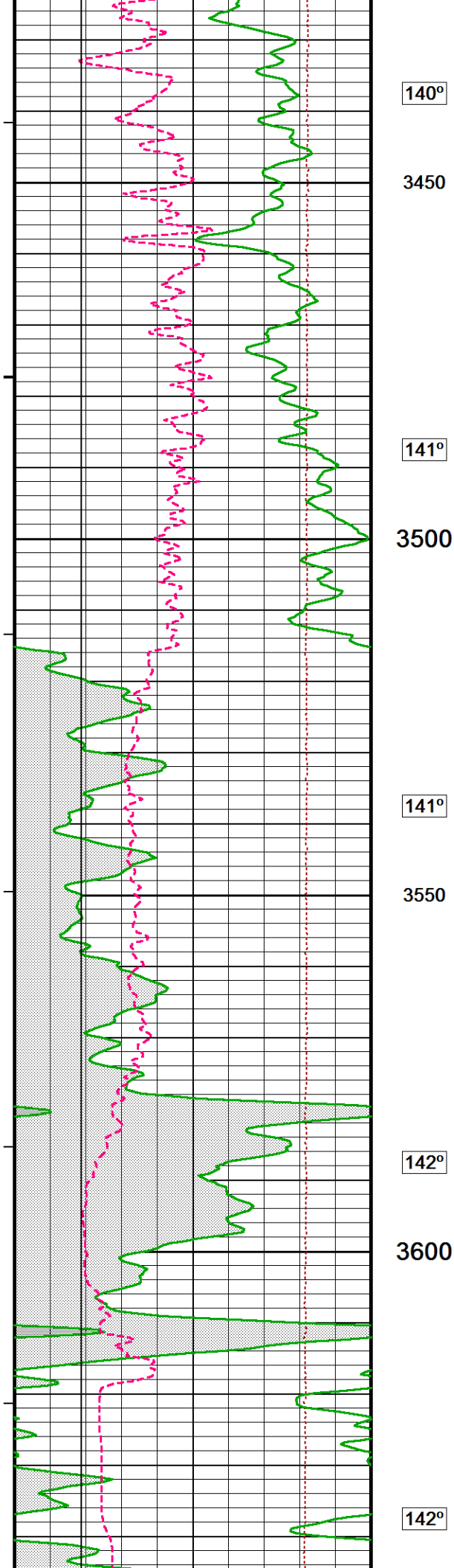
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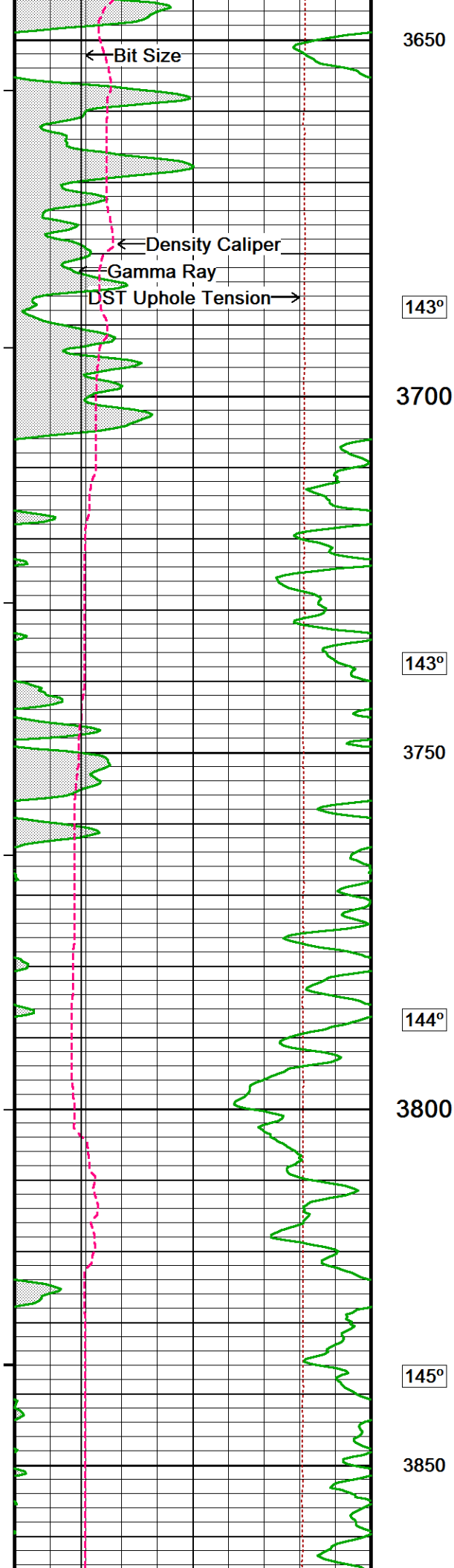
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3650

143°

3700

143°

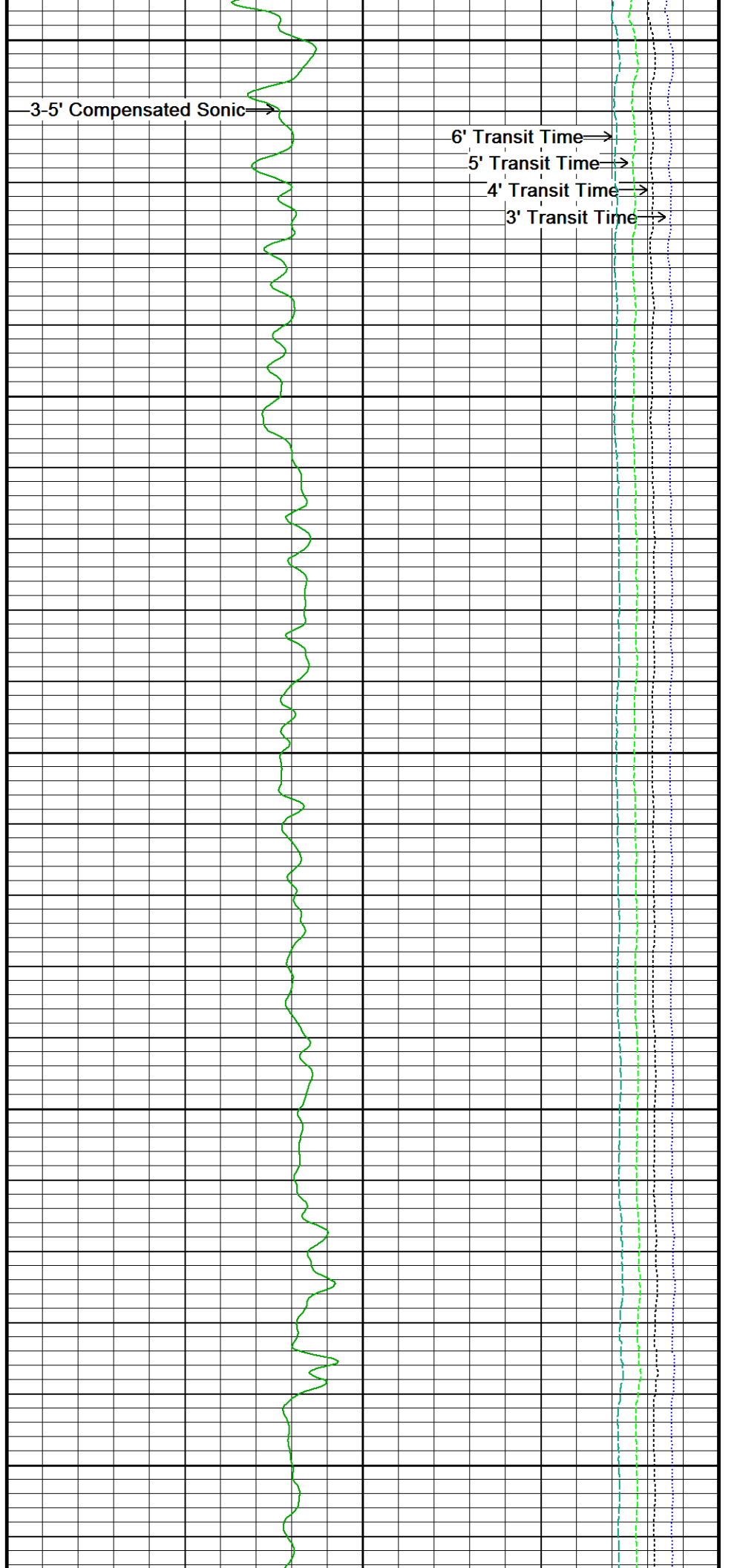
3750

144°

3800

145°

3850



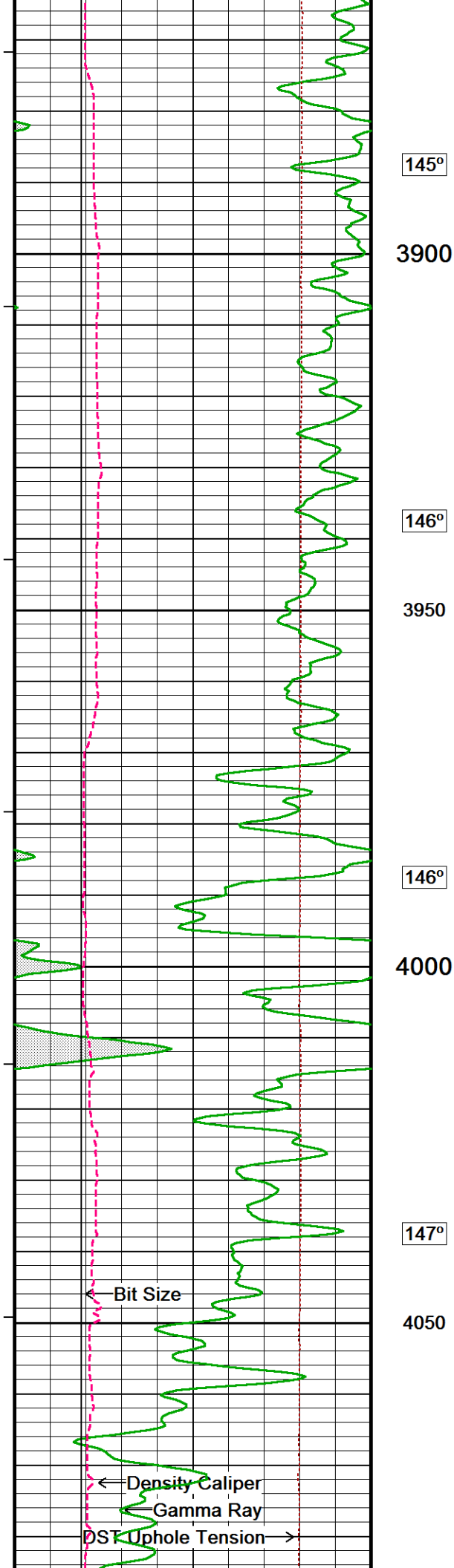
← 3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →



145°

3900

146°

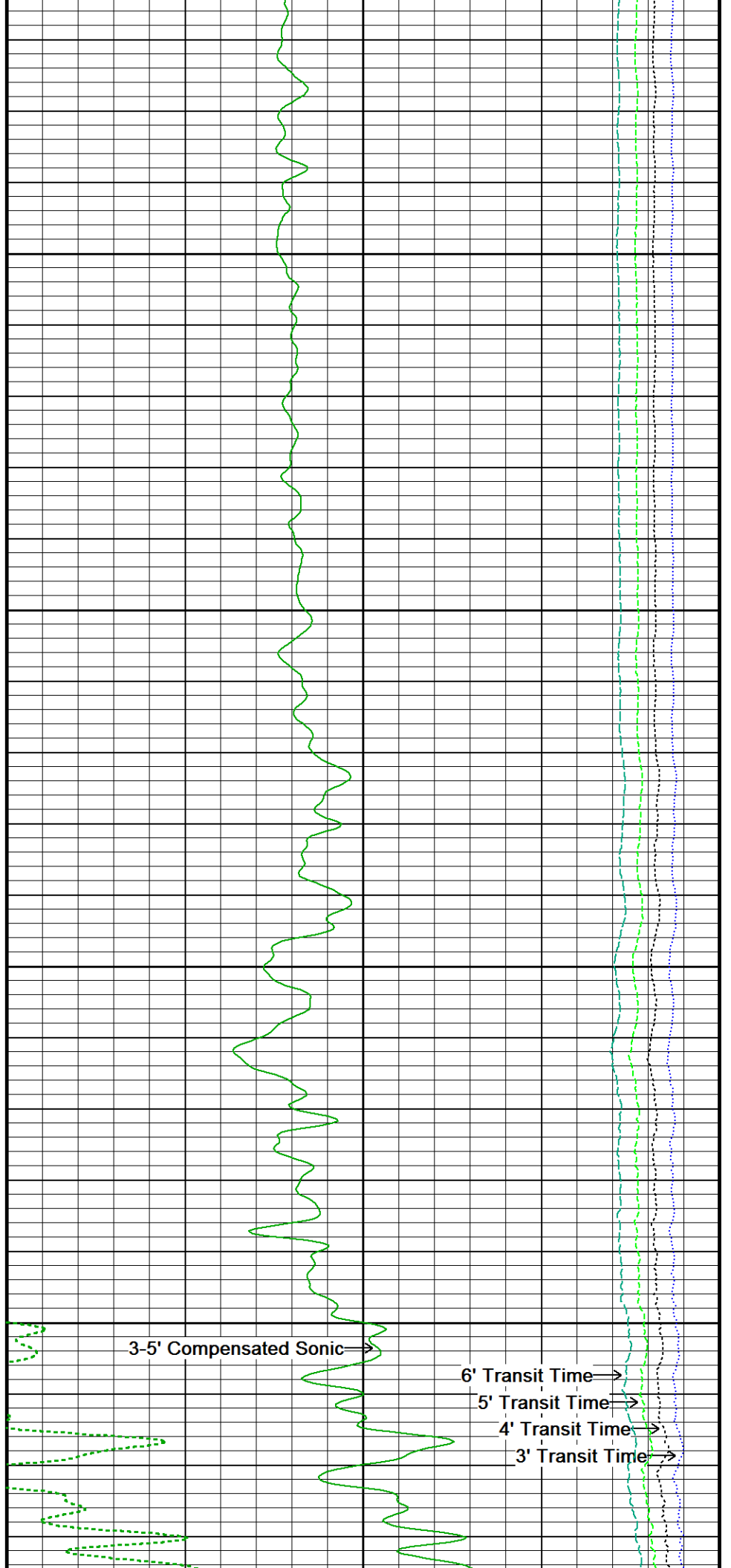
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146°

4000

147°

4050



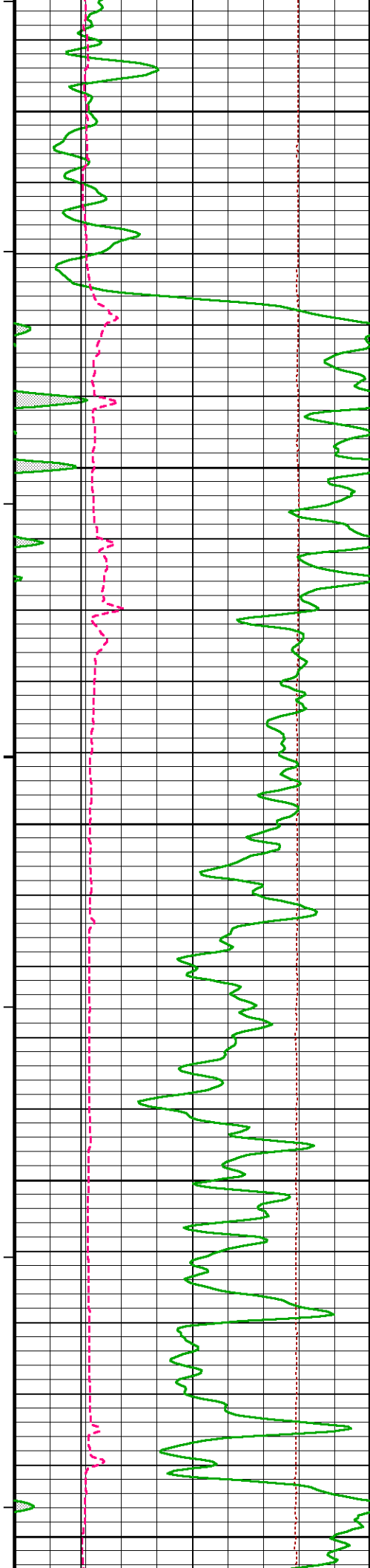
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



148°

4100

148°

4150

149°

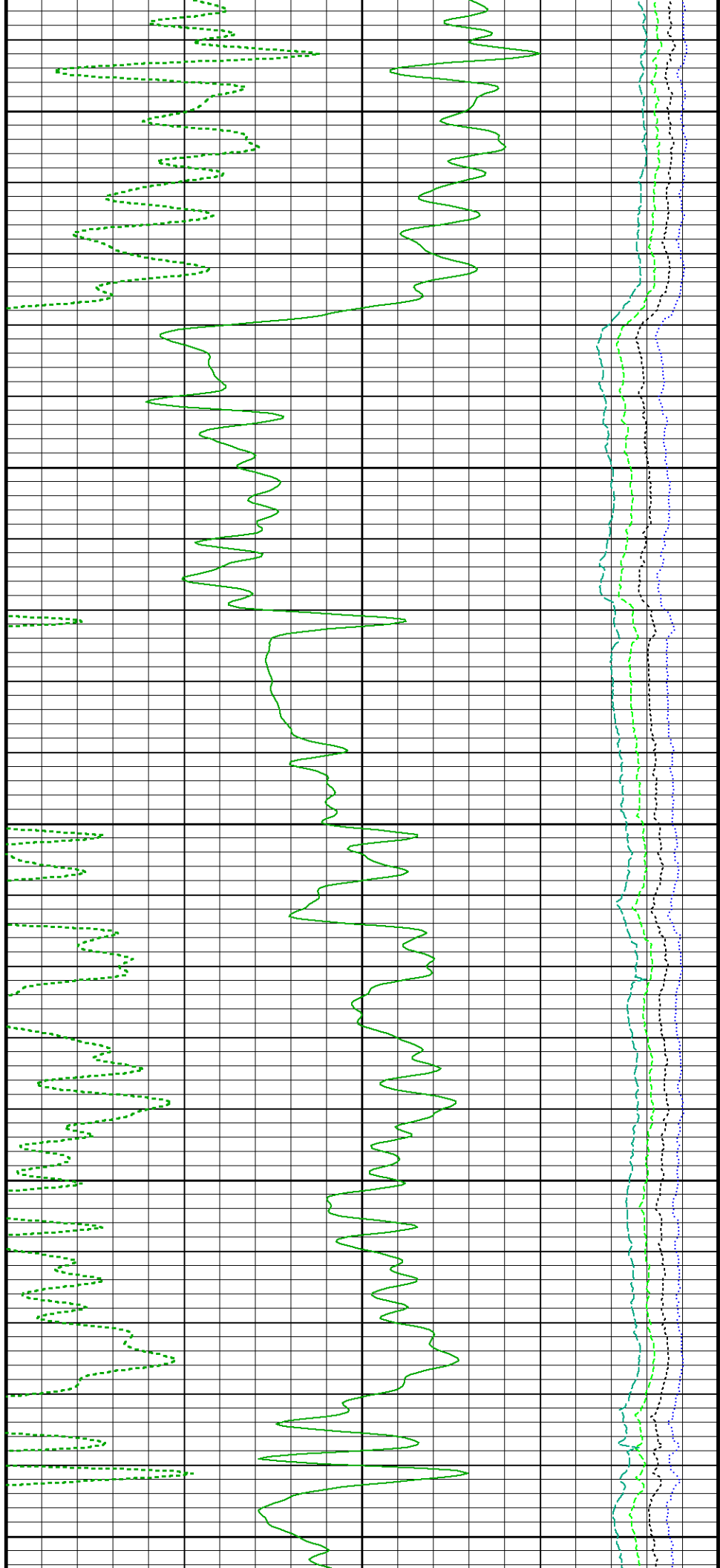
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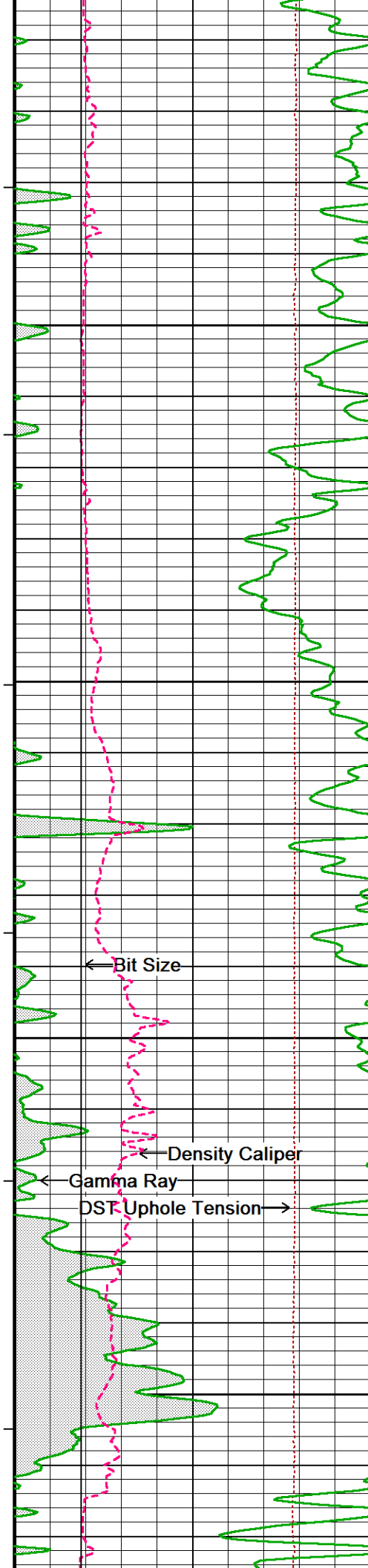
150°

4250

150°

4300





151°

4350

152°

4400

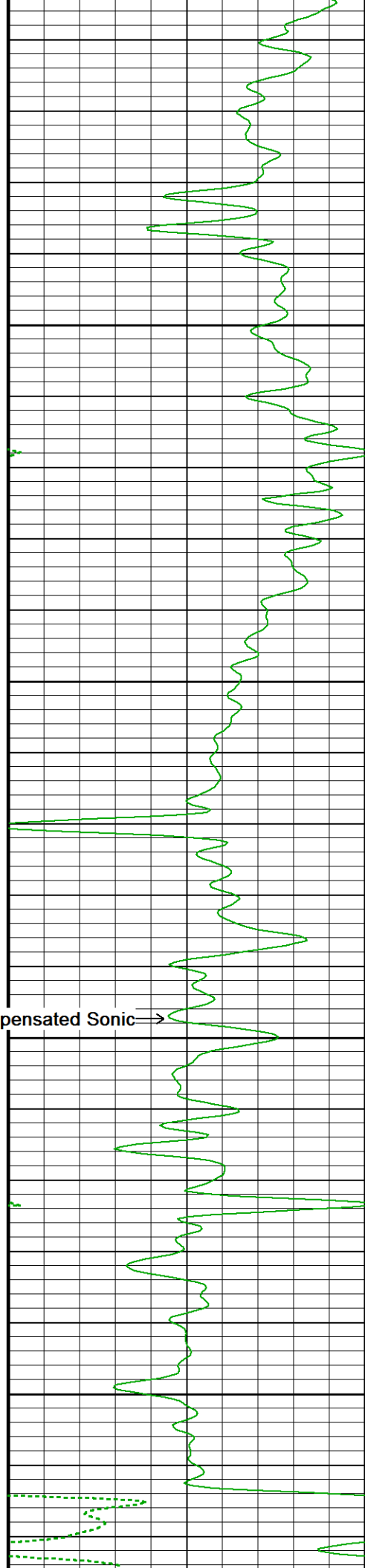
153°

3-5' Compensated Sonic →

4450

153°

4500

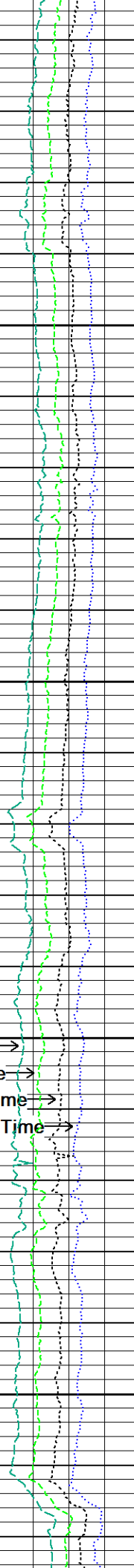


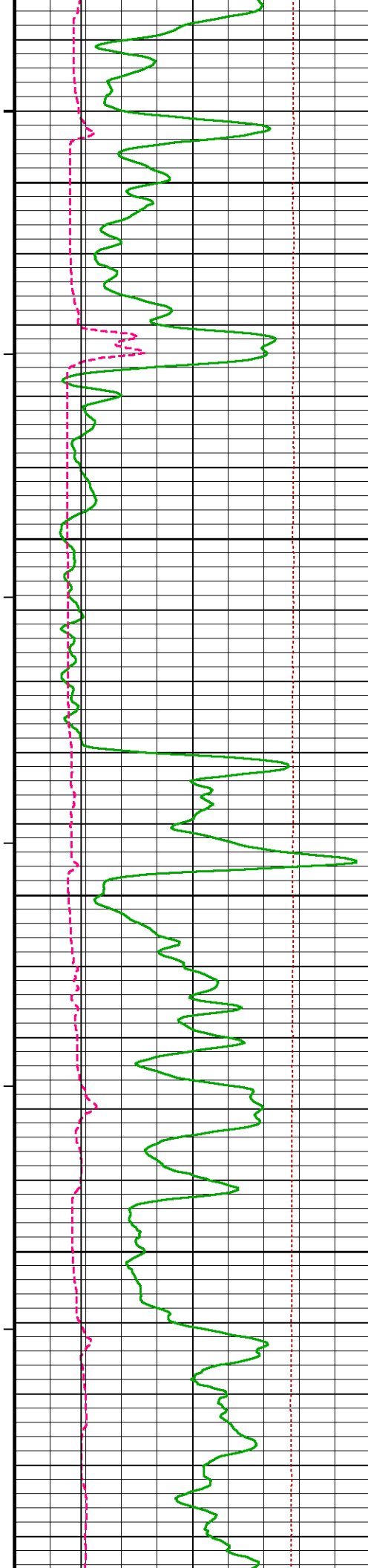
6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →





154°

4550

155°

4600

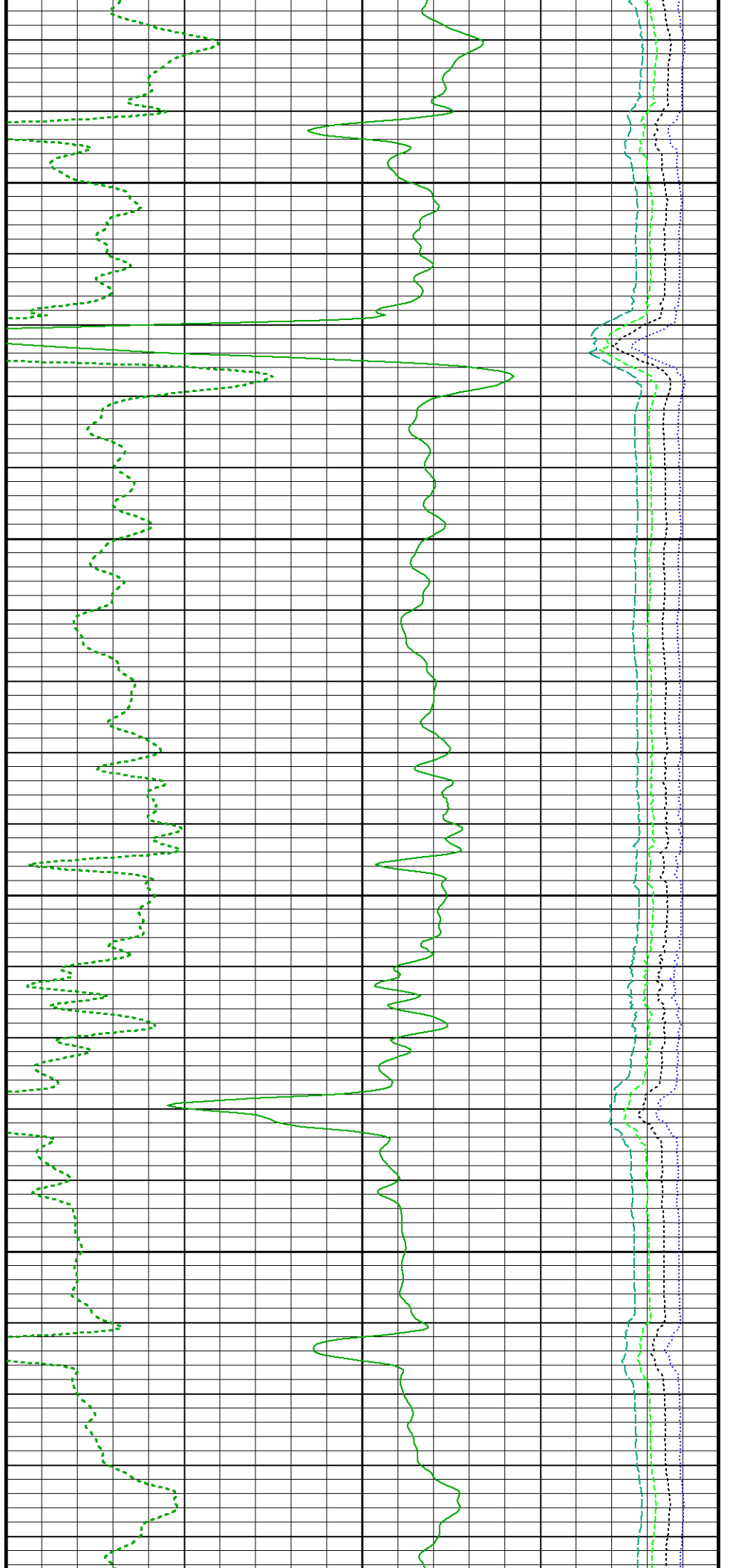
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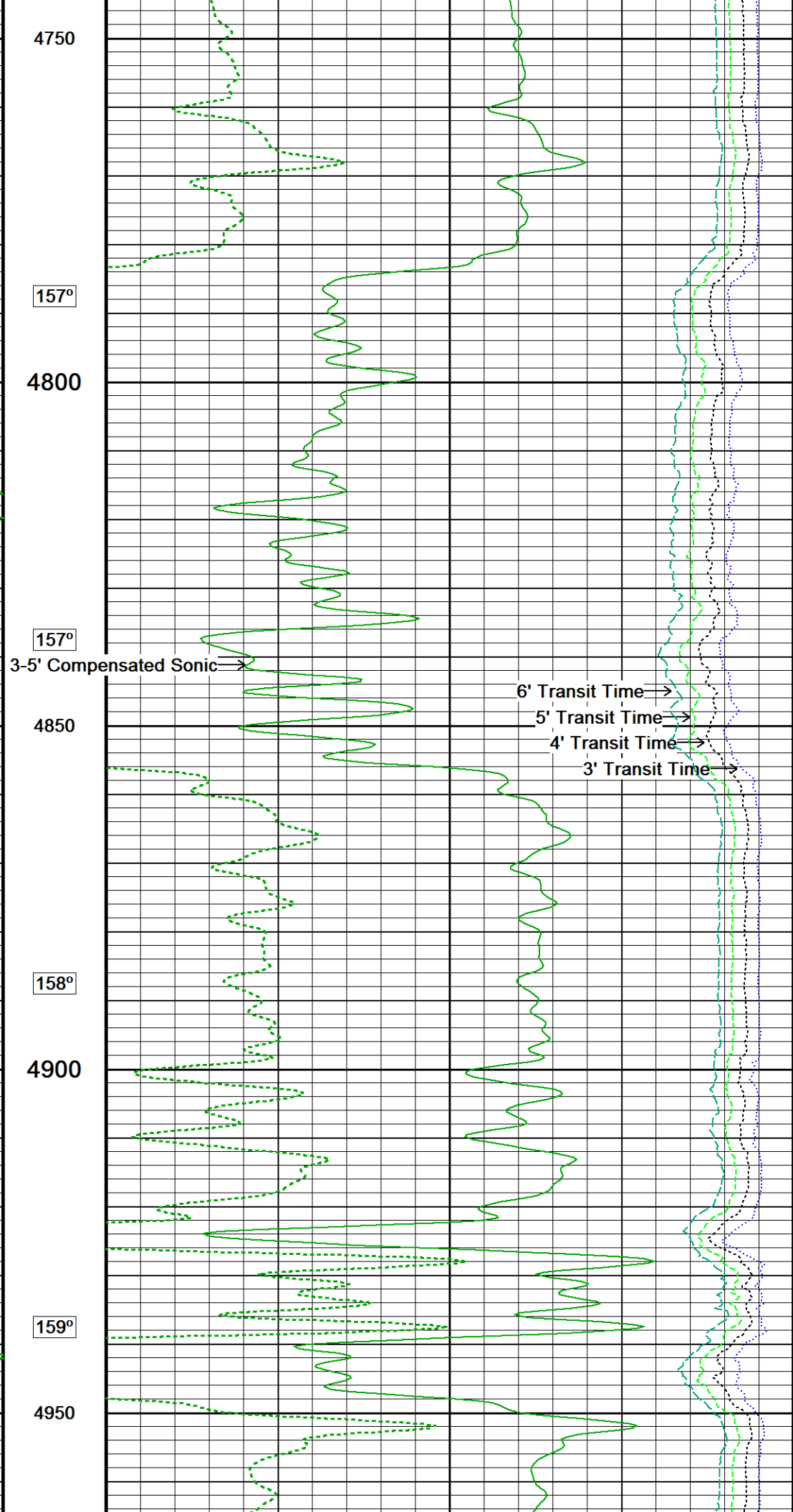
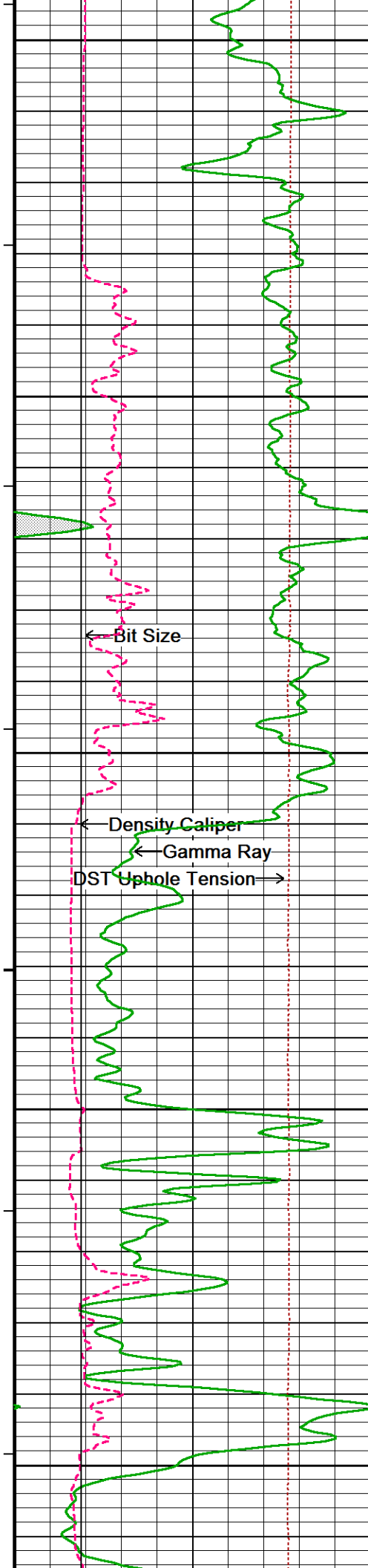
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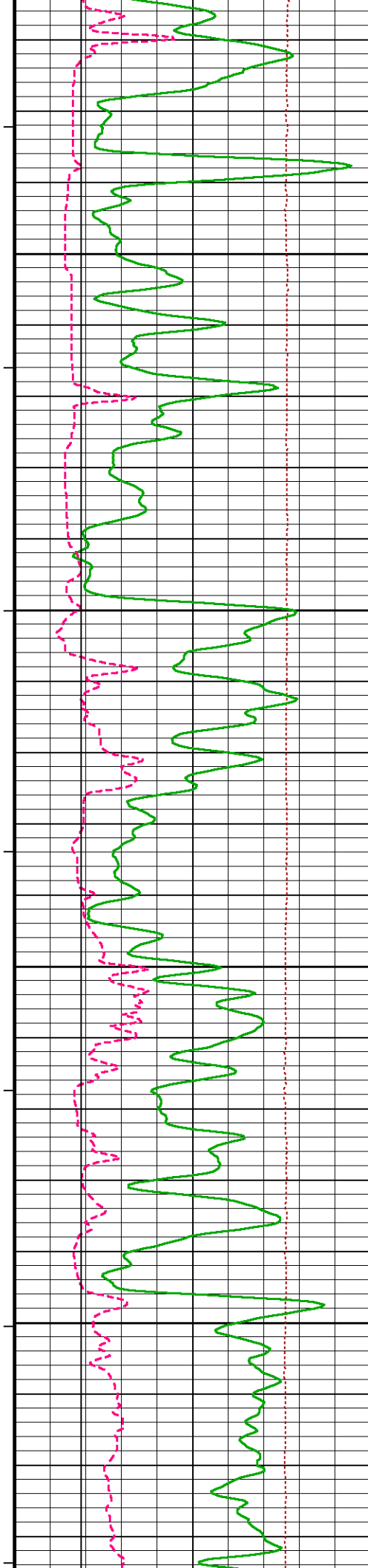
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4700

156°







159°

5000

159°

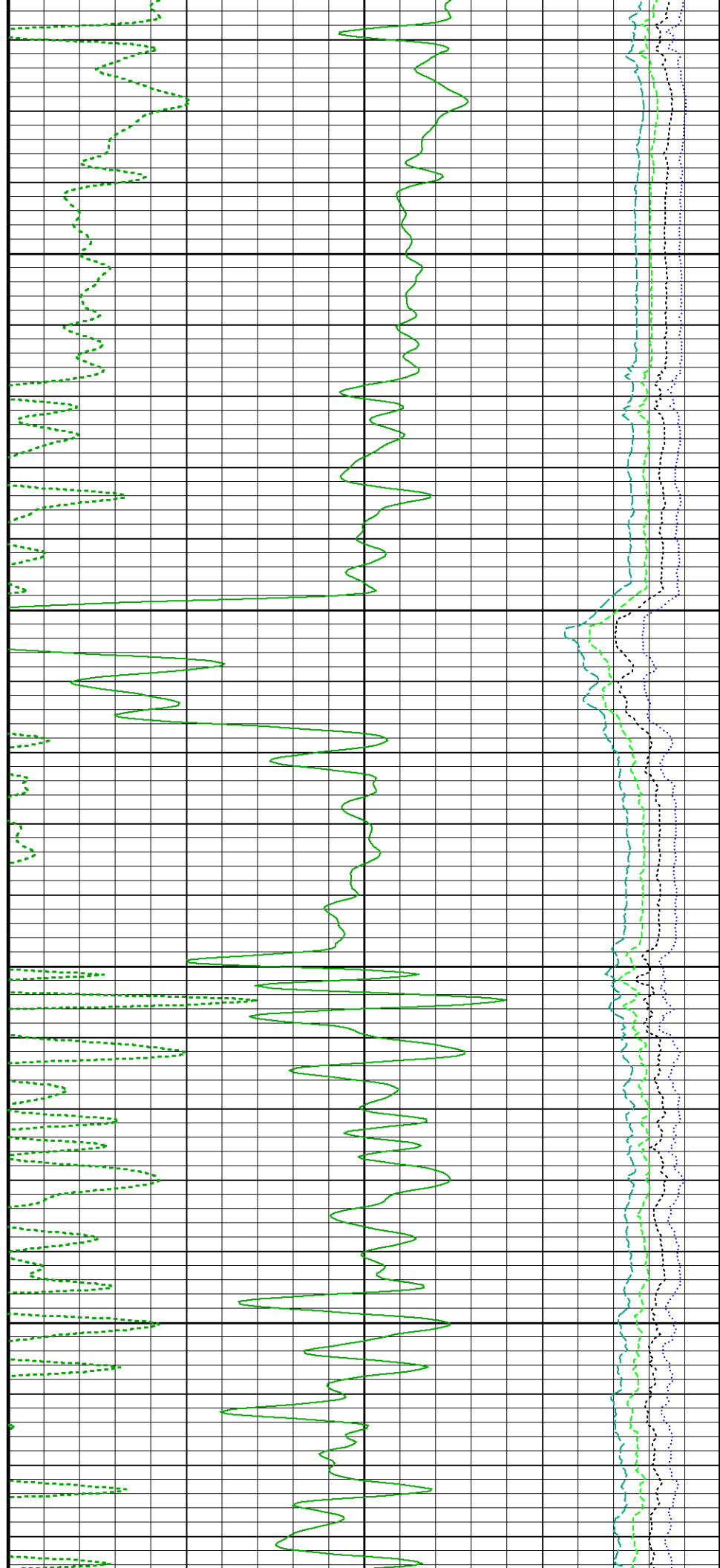
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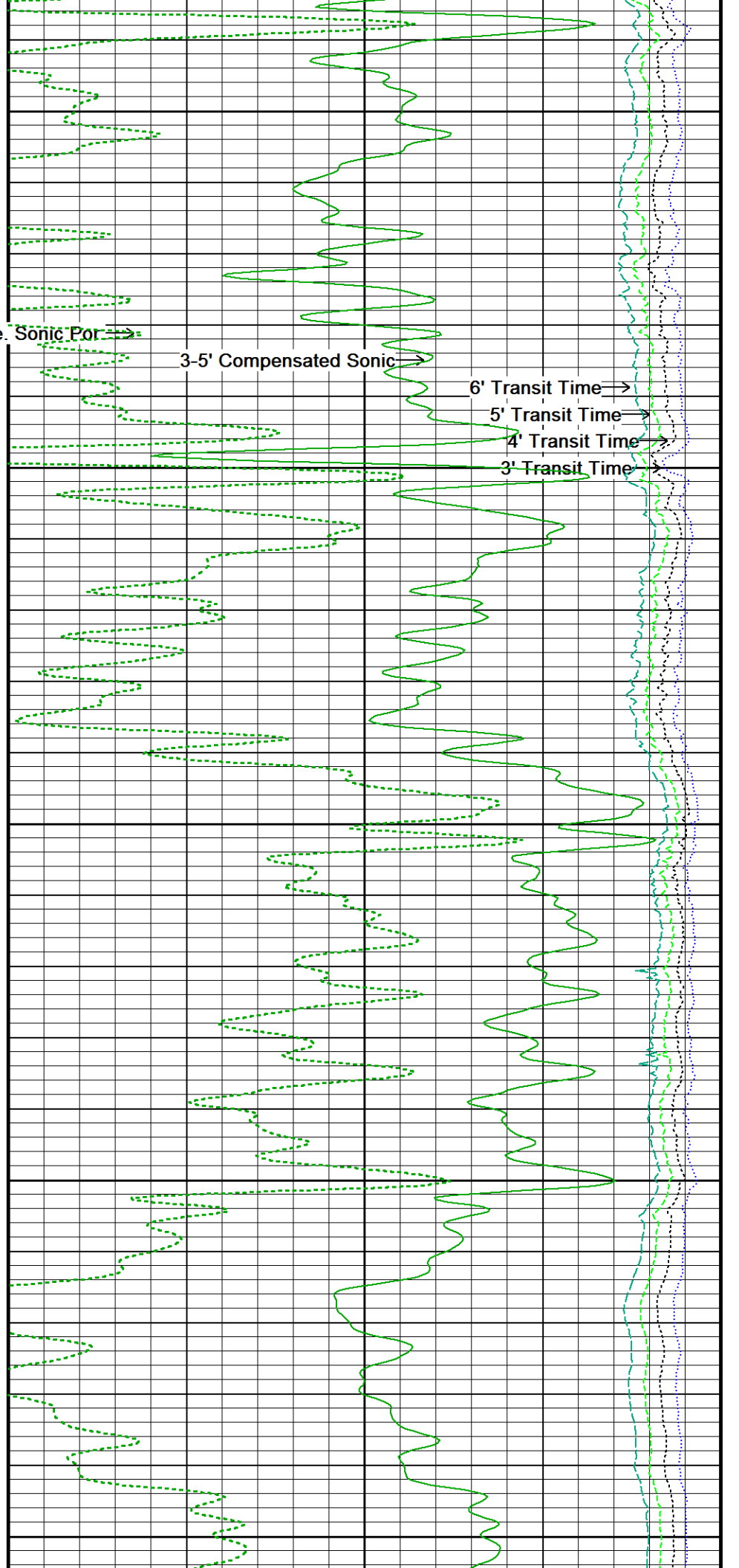
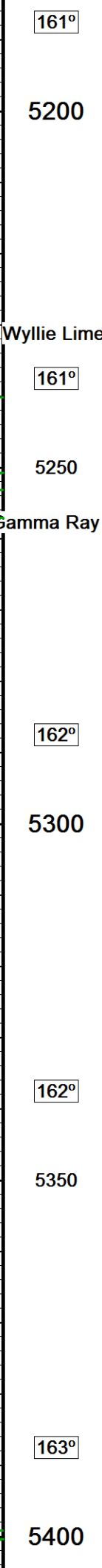
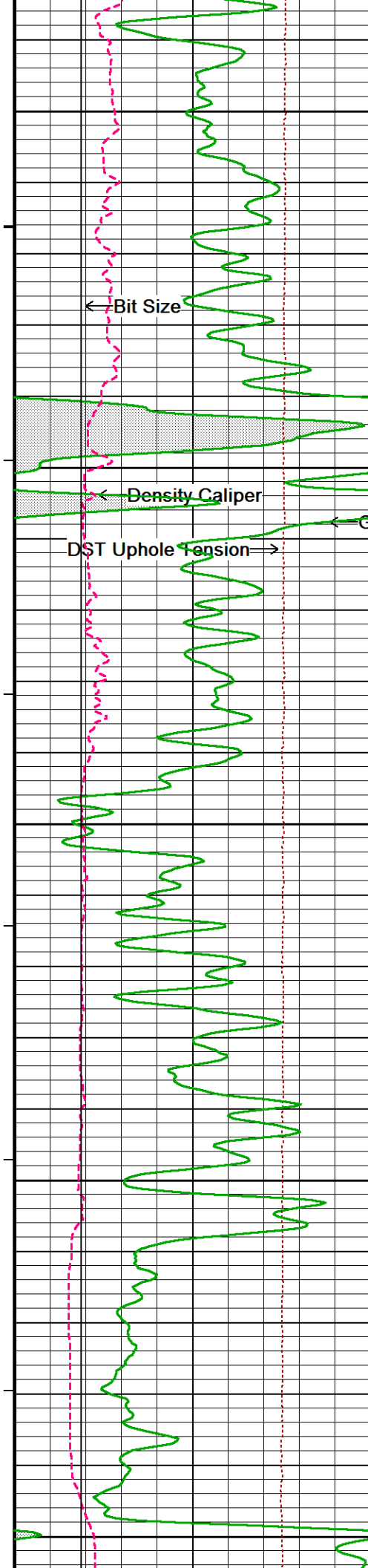
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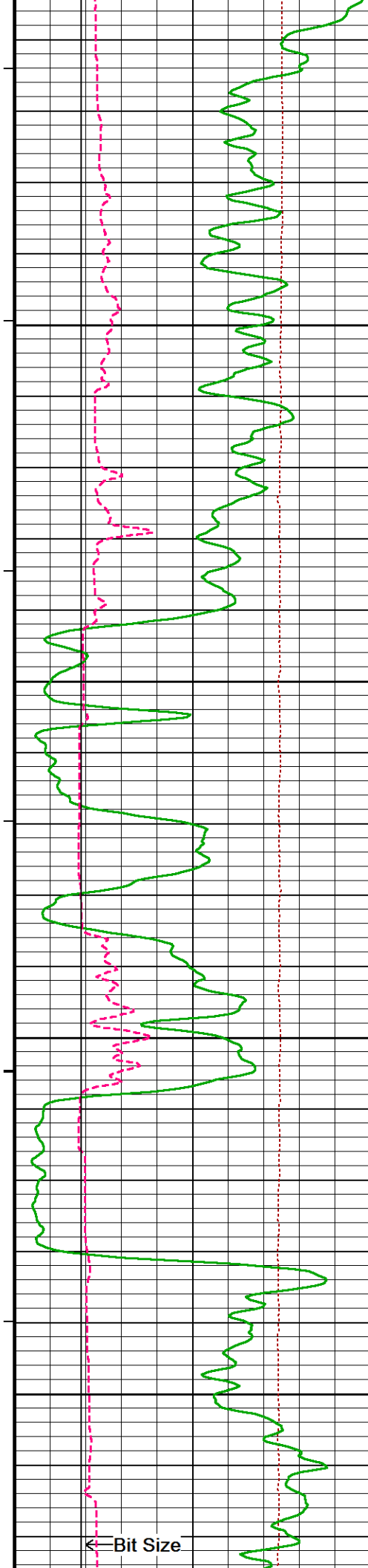
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163°

5450

164°

5500

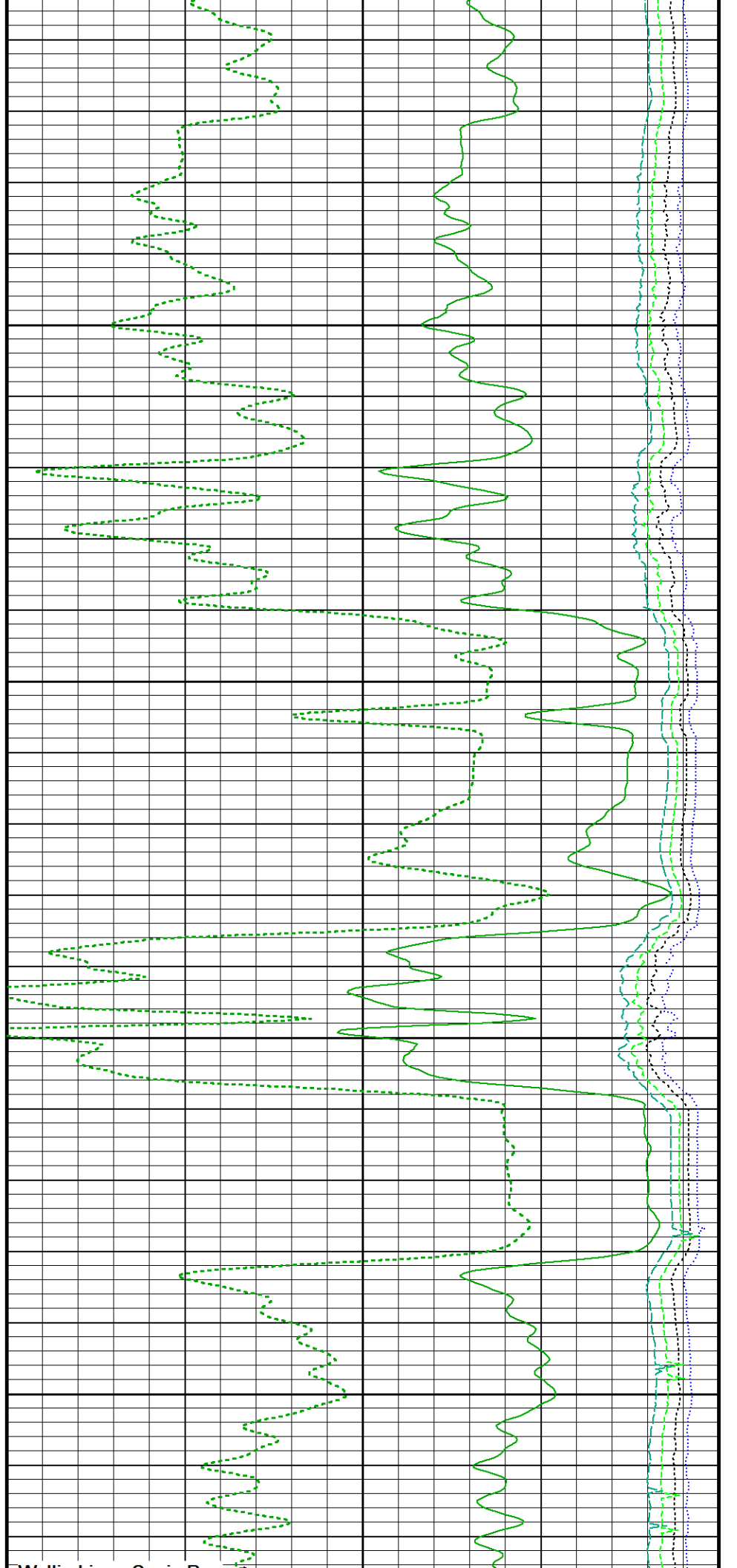
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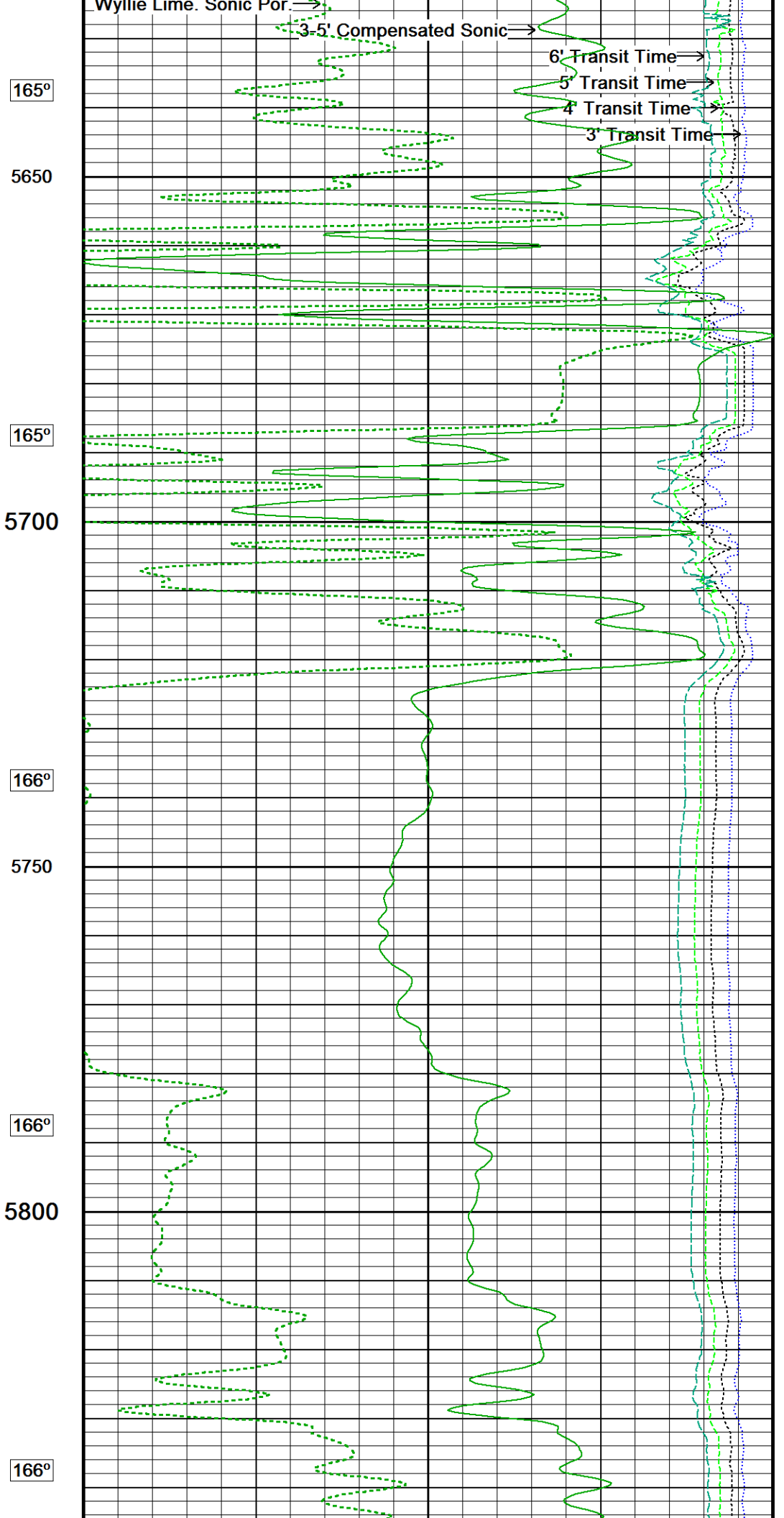
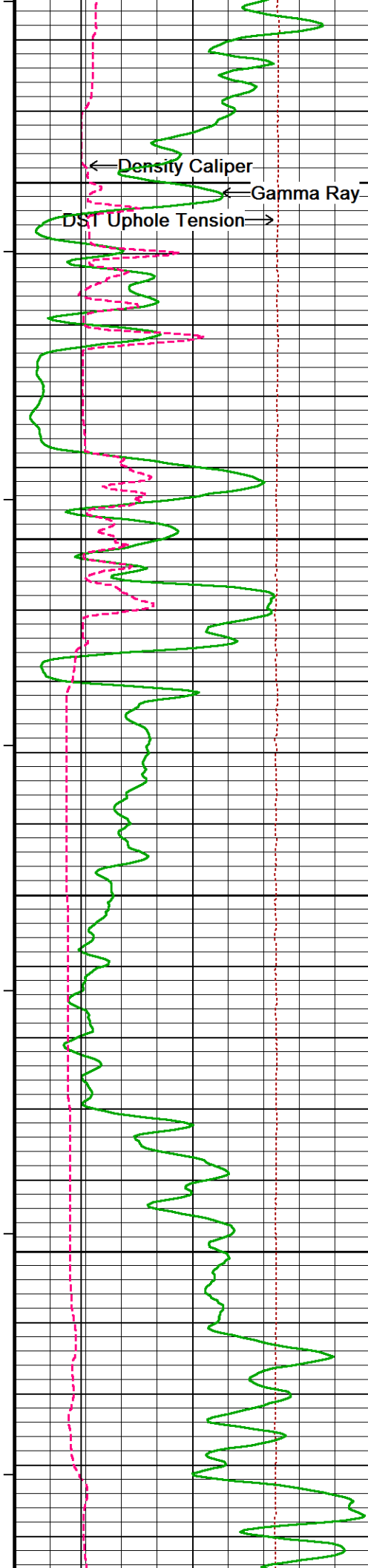
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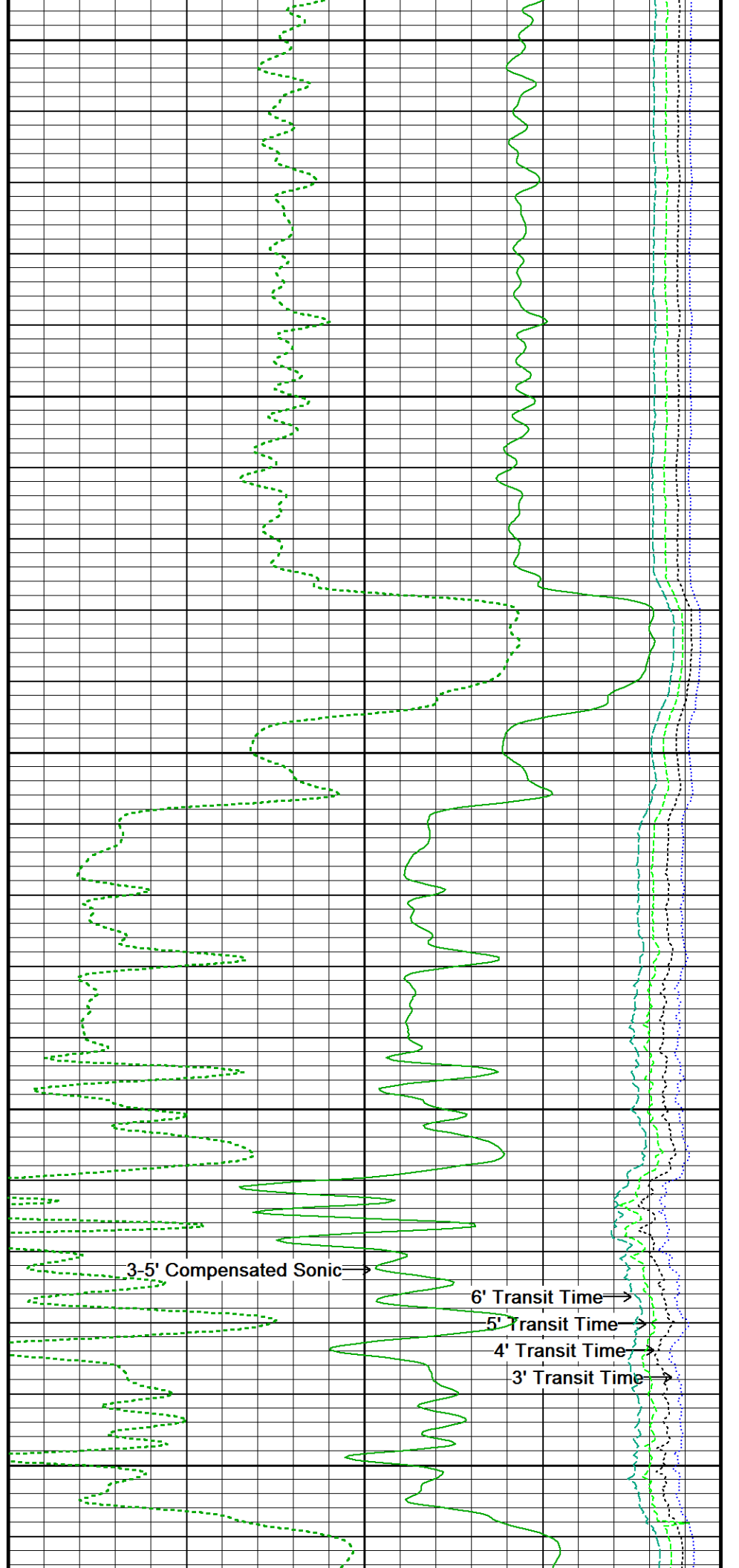
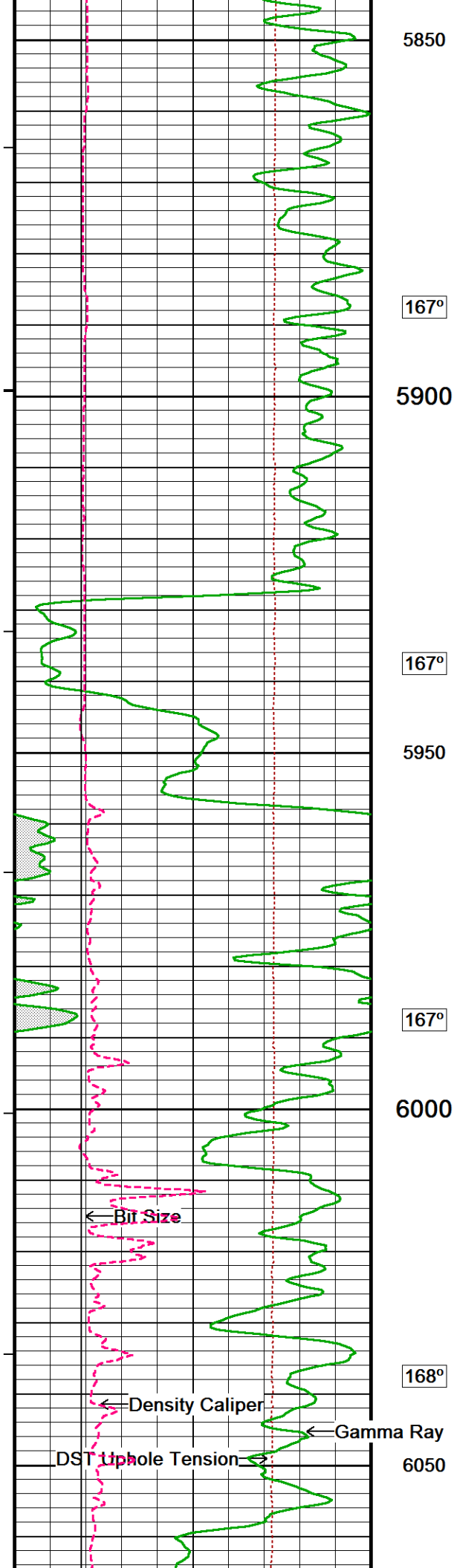
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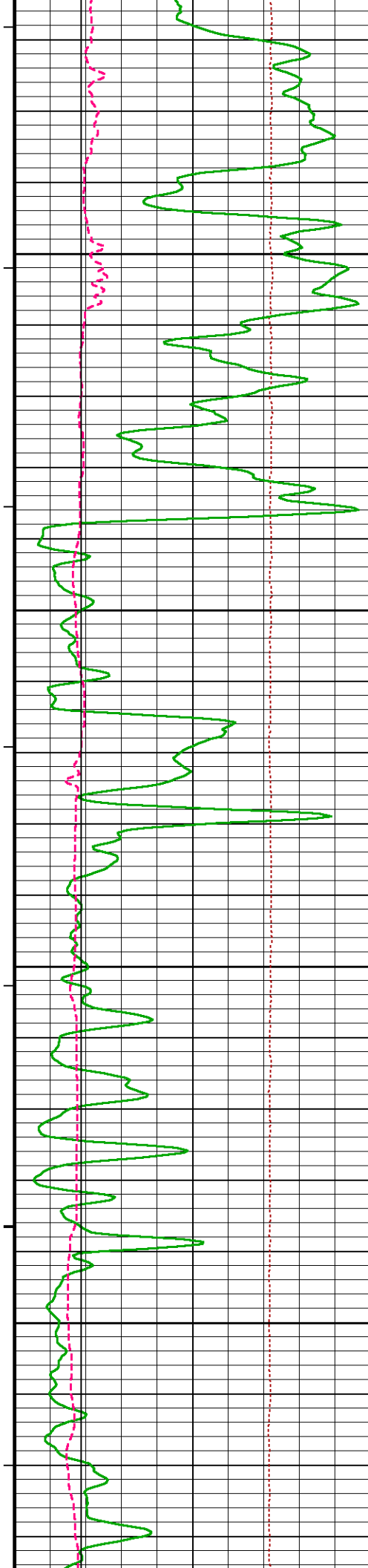
5600

← Bit Size









169°

6100

169°

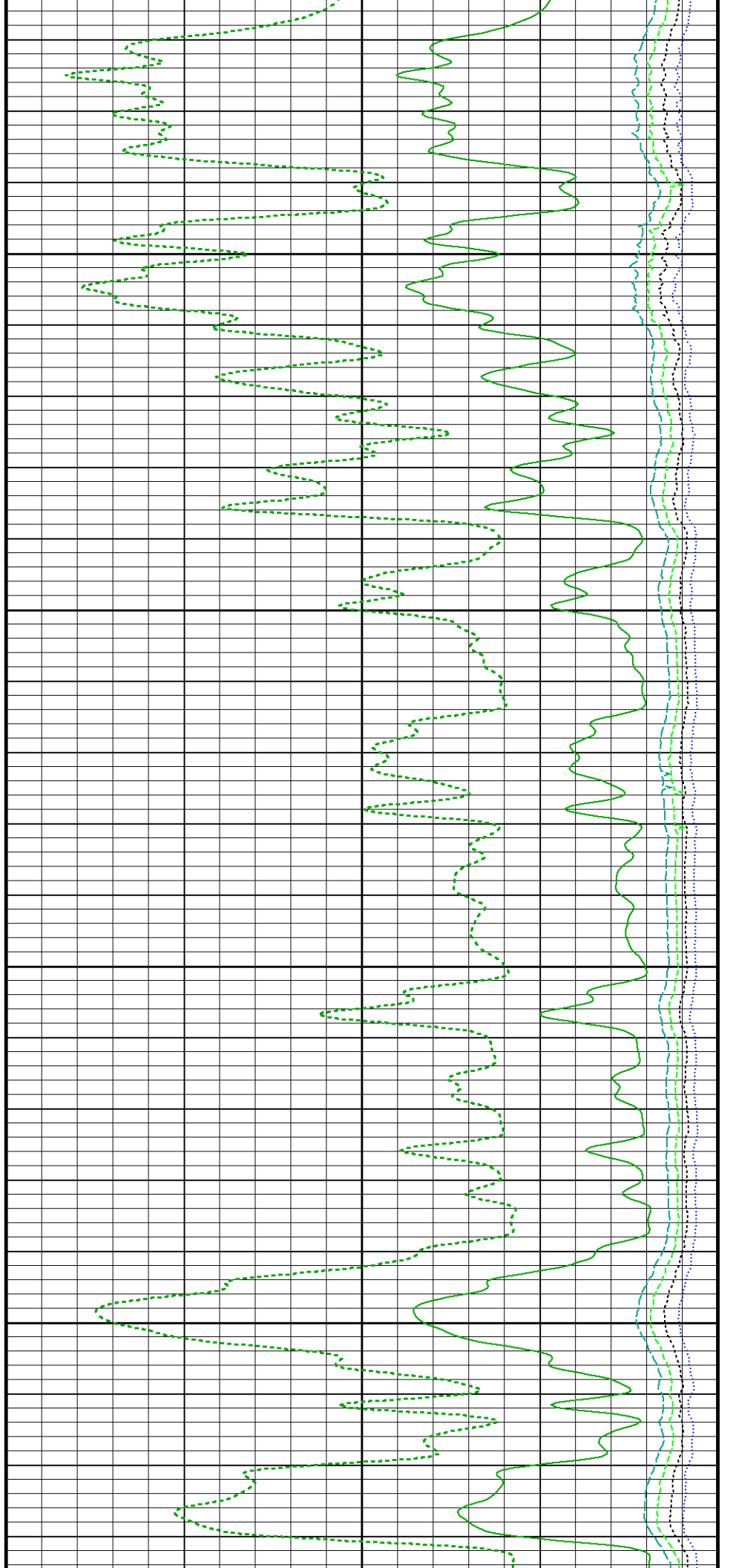
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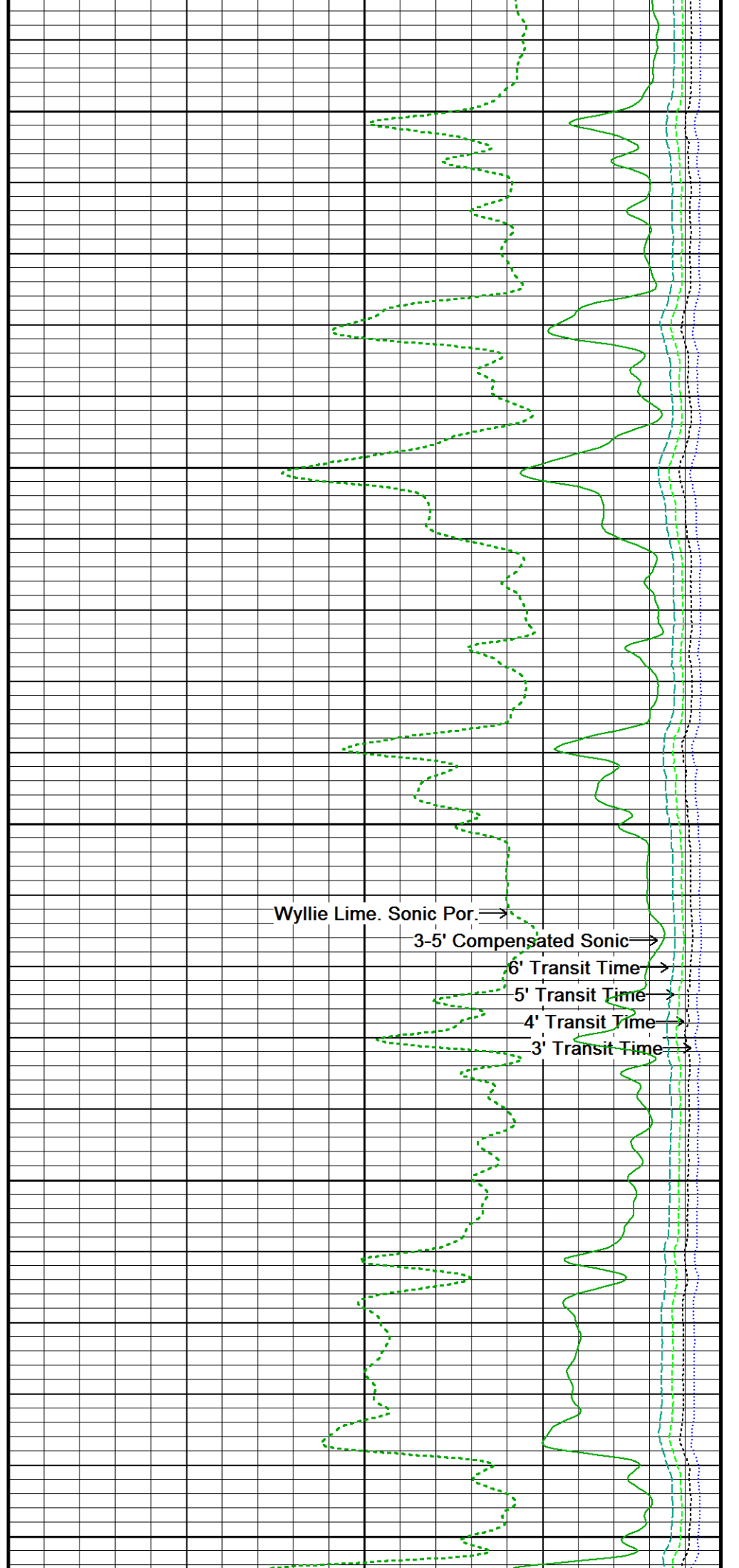
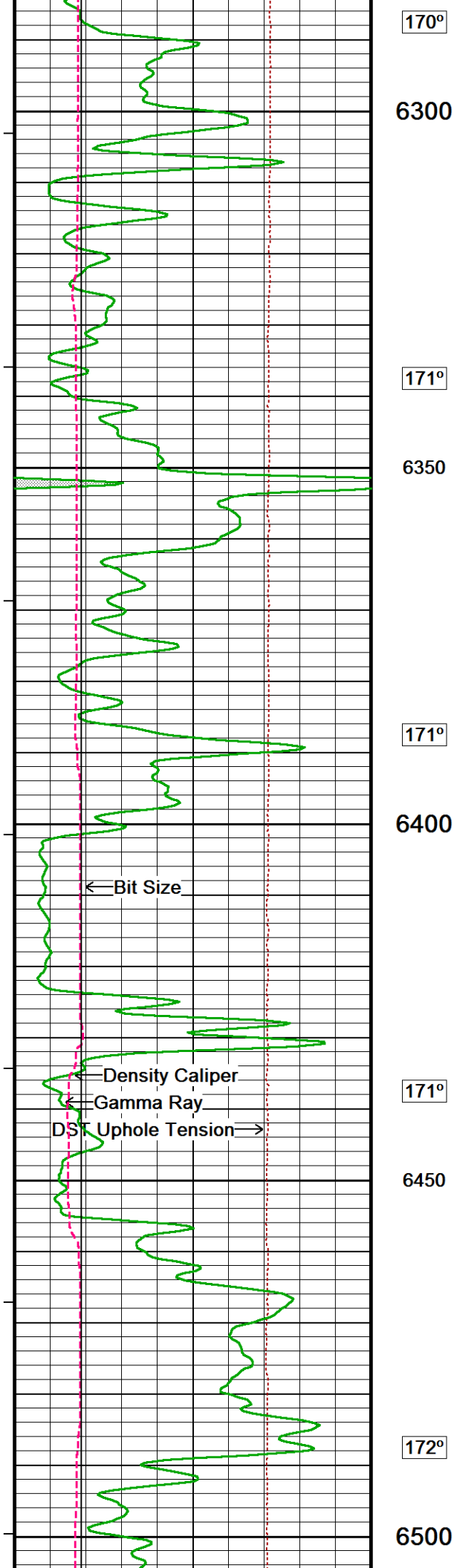
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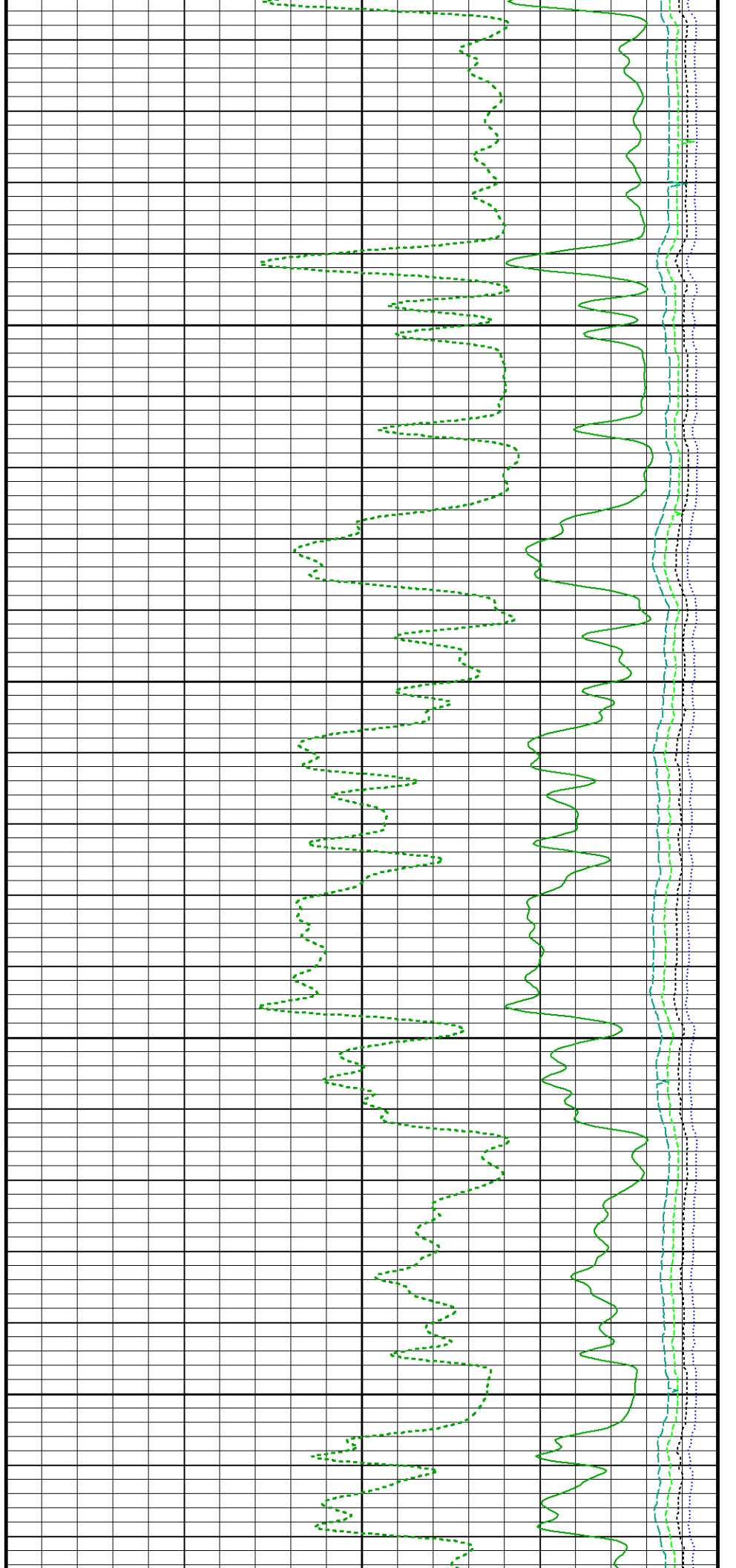
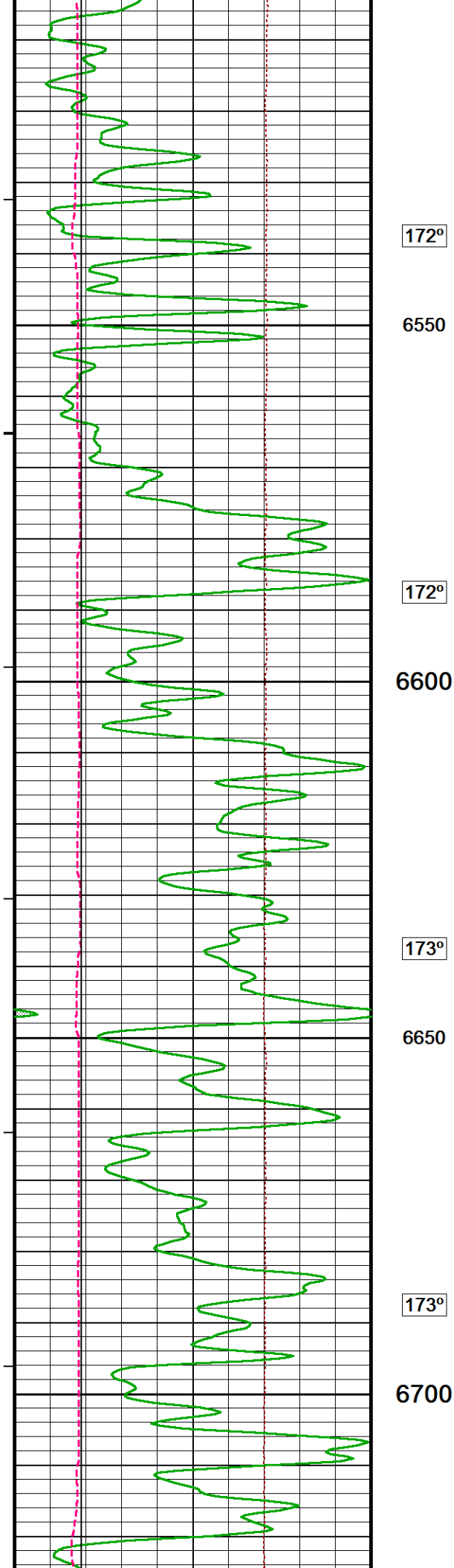
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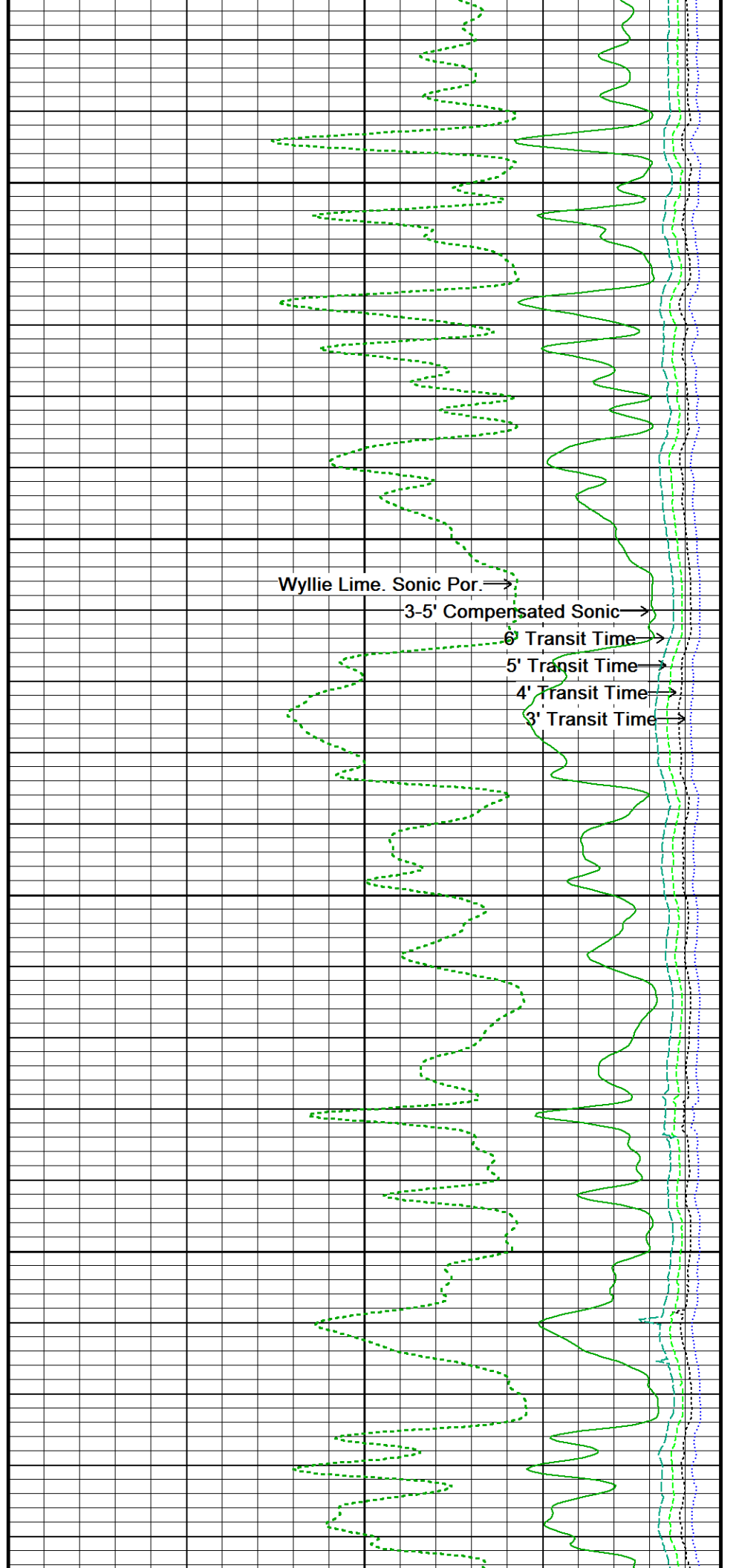
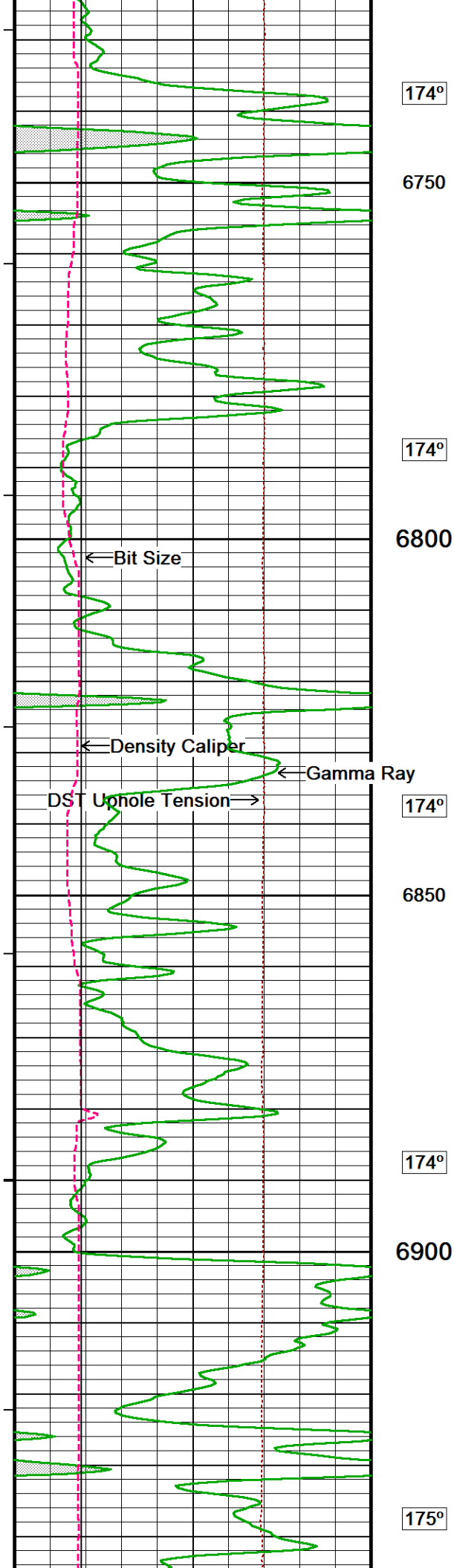
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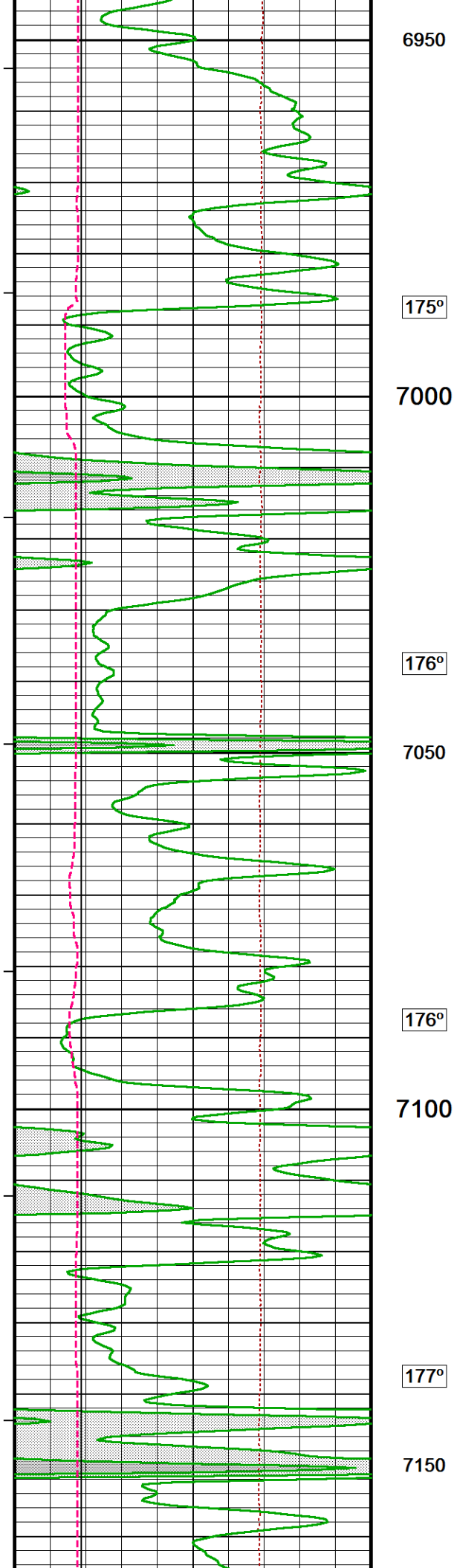












6950

175°

7000

176°

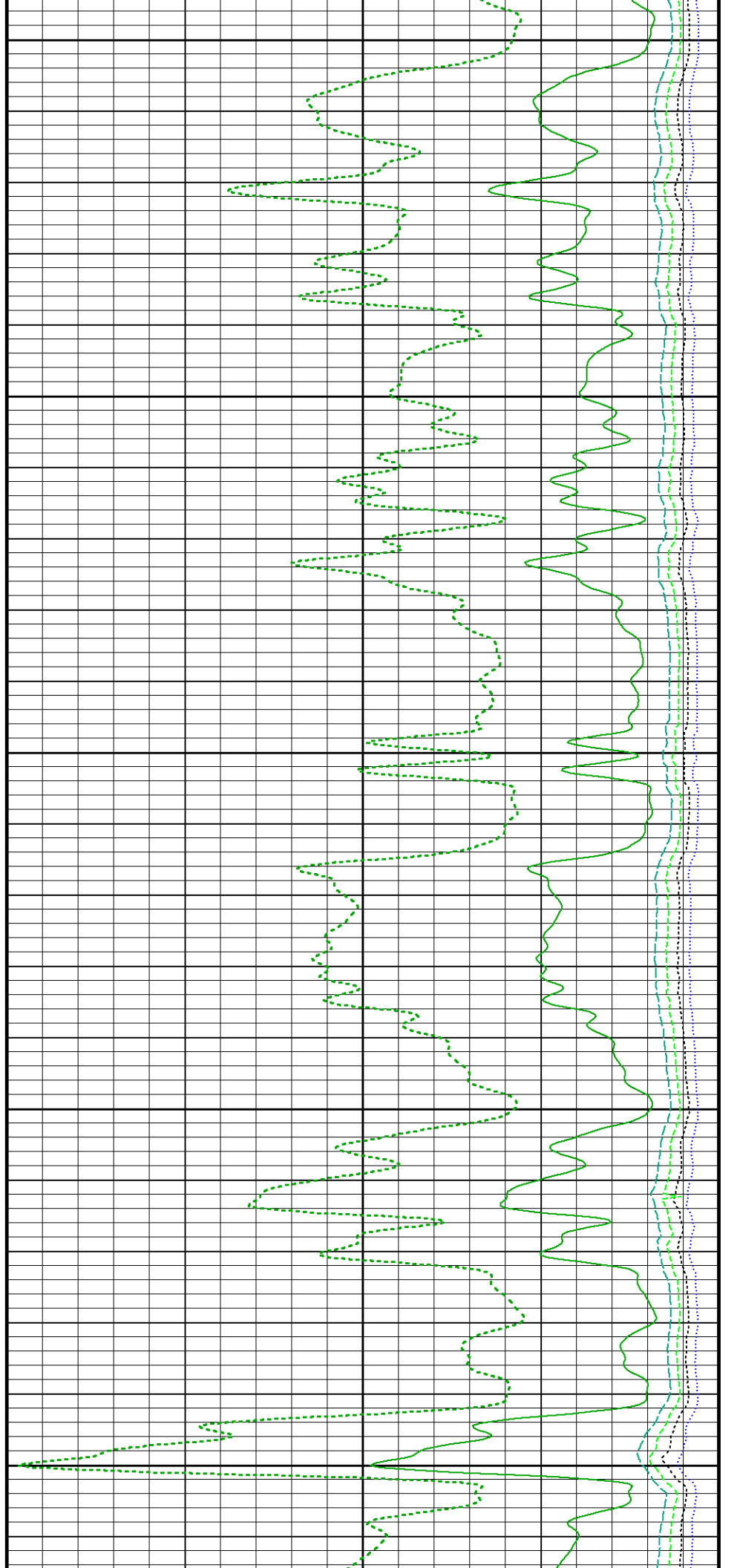
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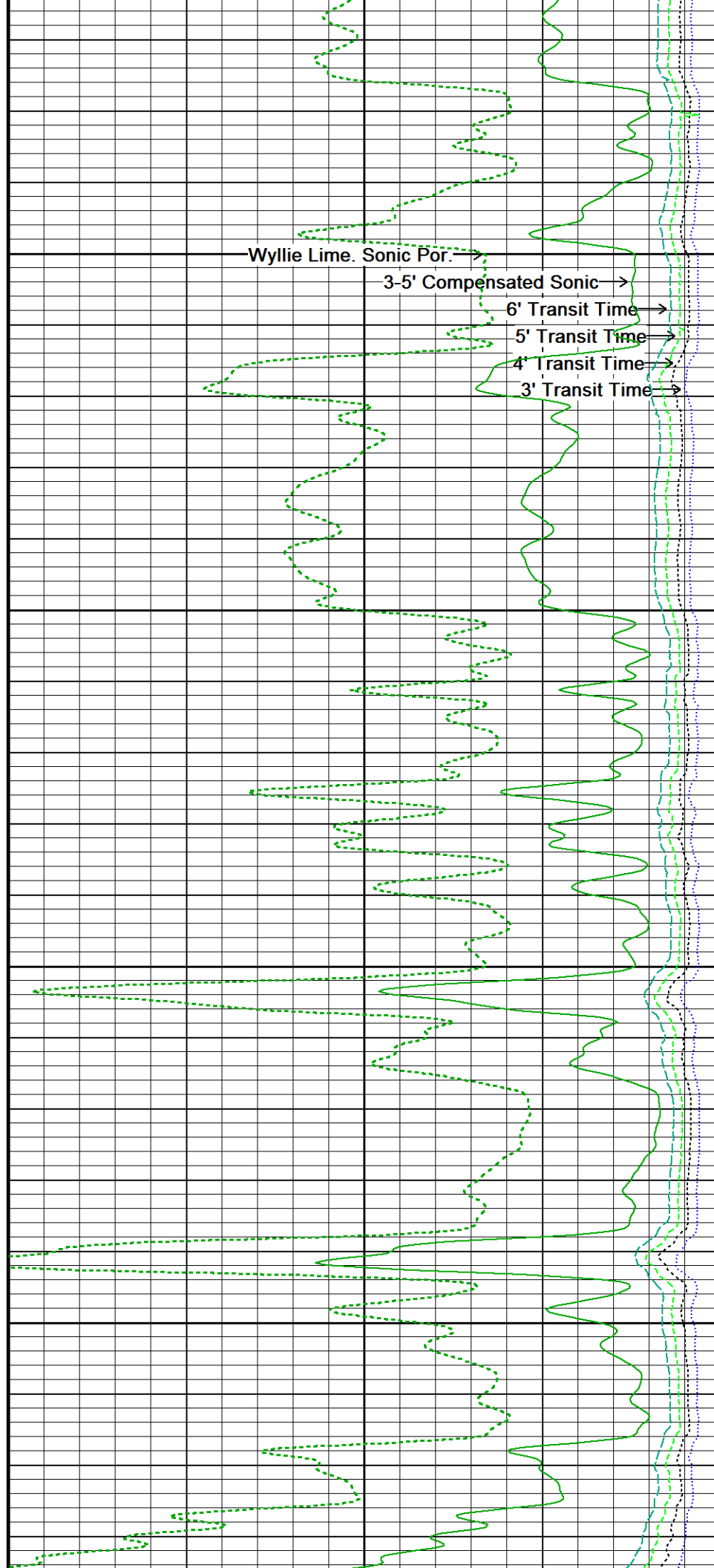
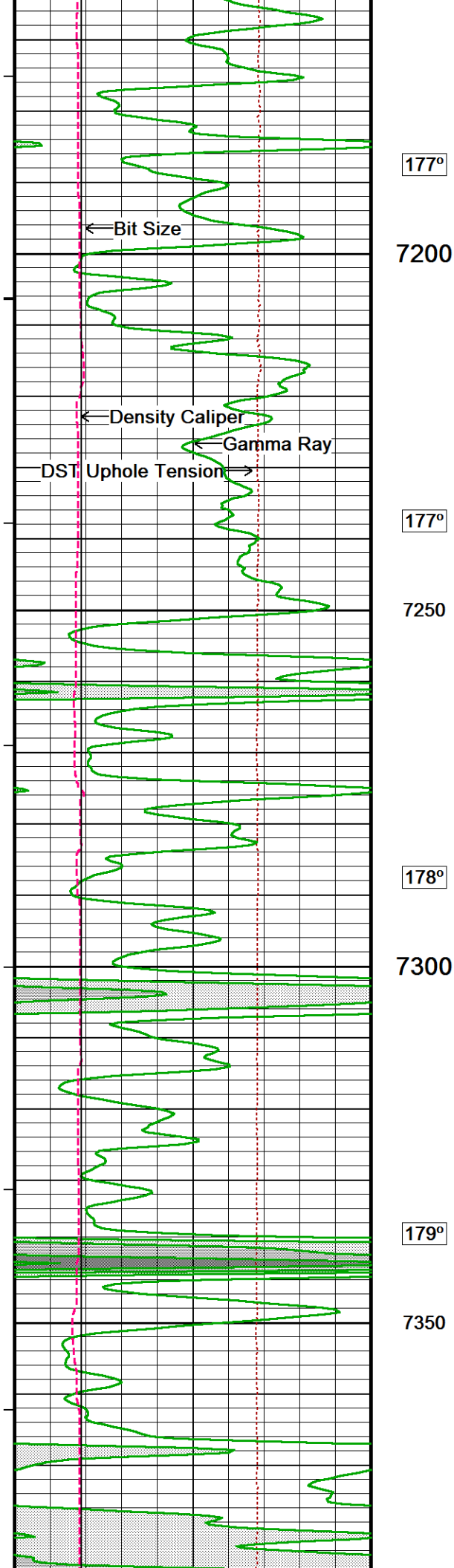
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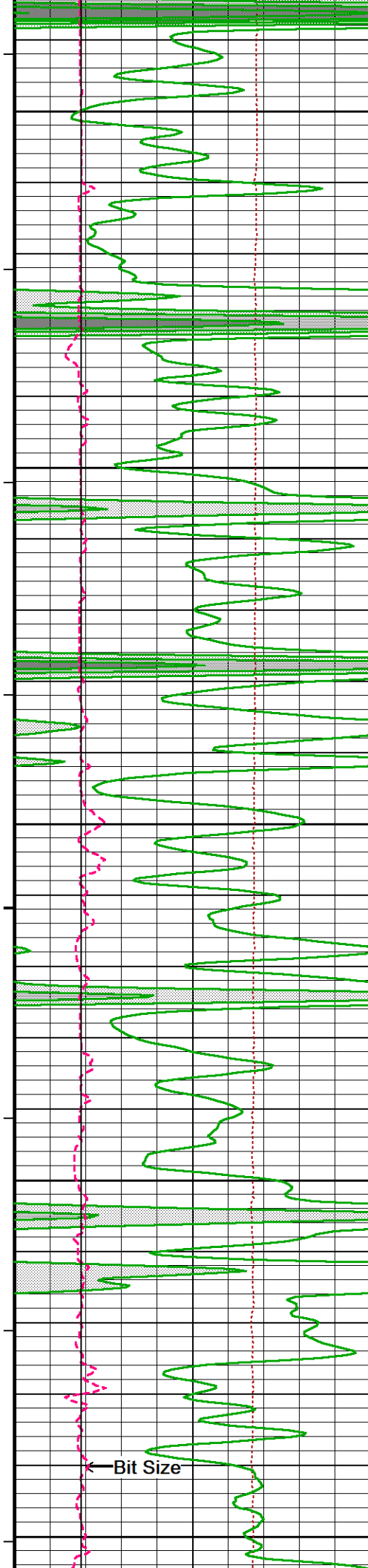
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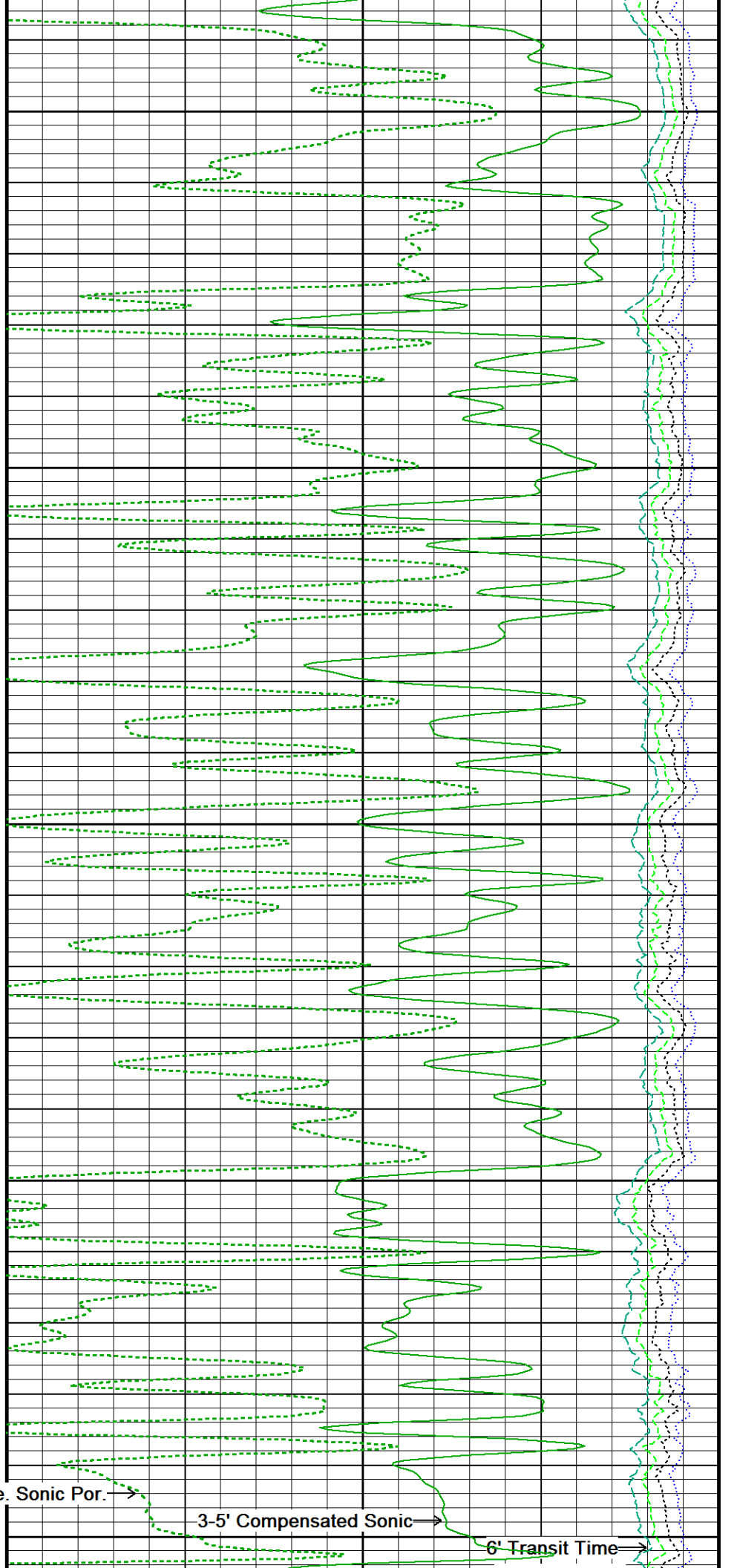
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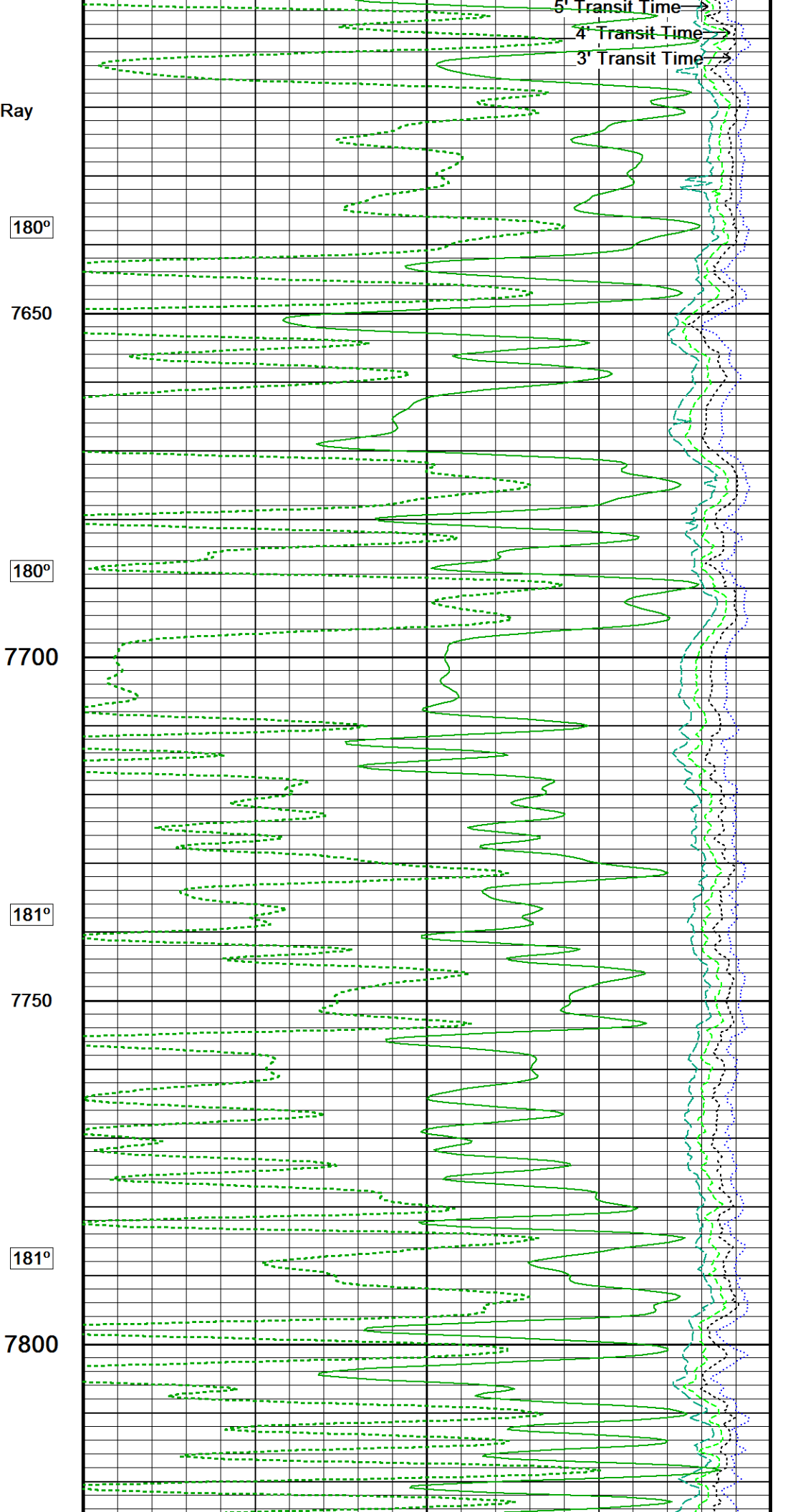
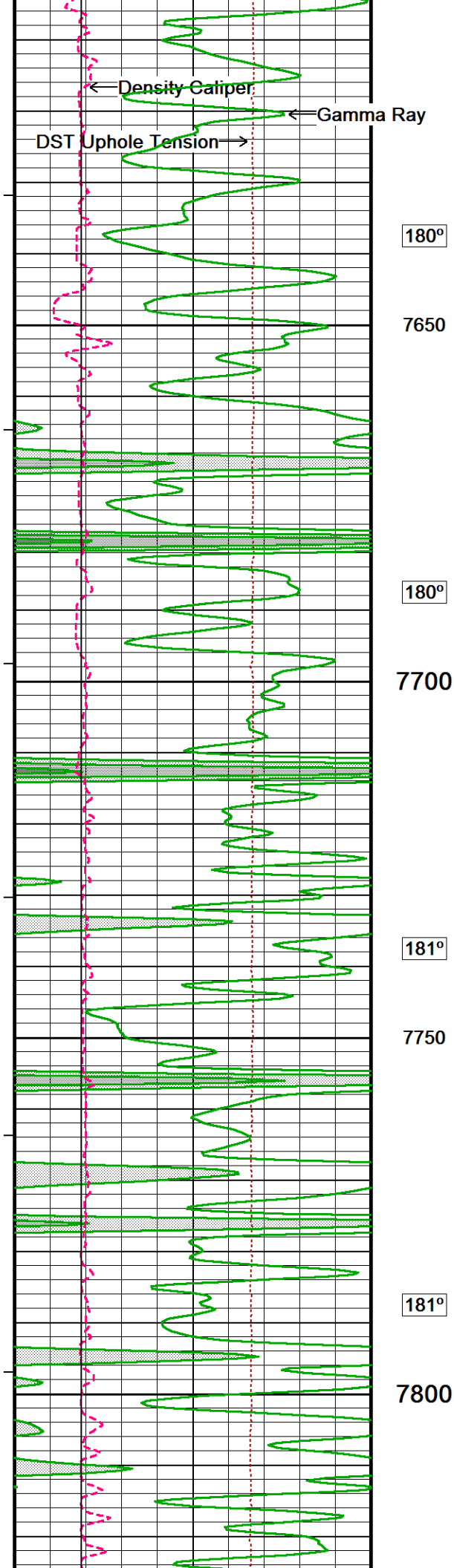


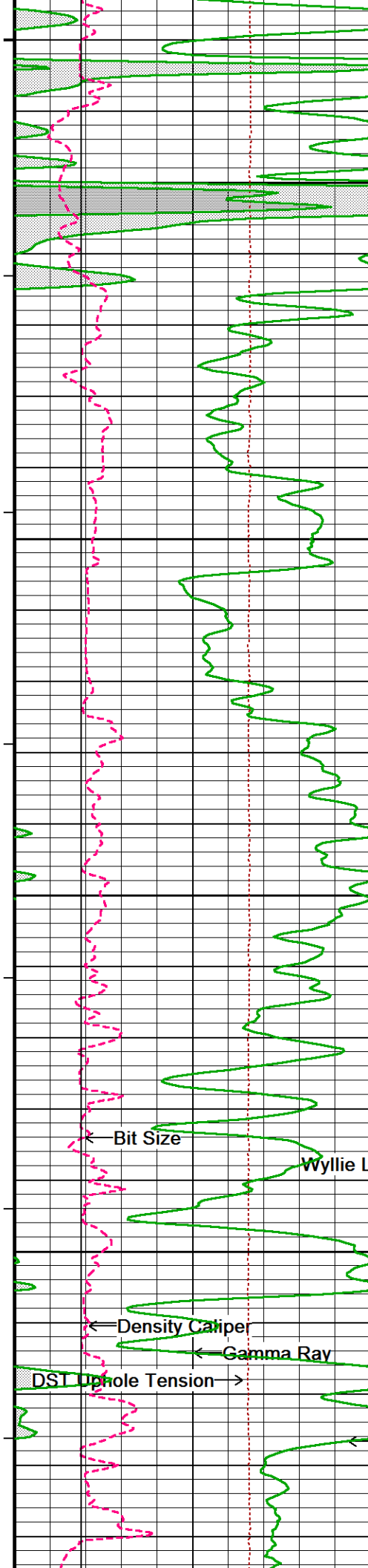




179°  
7400  
179°  
7450  
179°  
7500  
179°  
7550  
179°  
7600







182°

7850

182°

7900

182°

7950

183°

8000

183°

← Bit Size

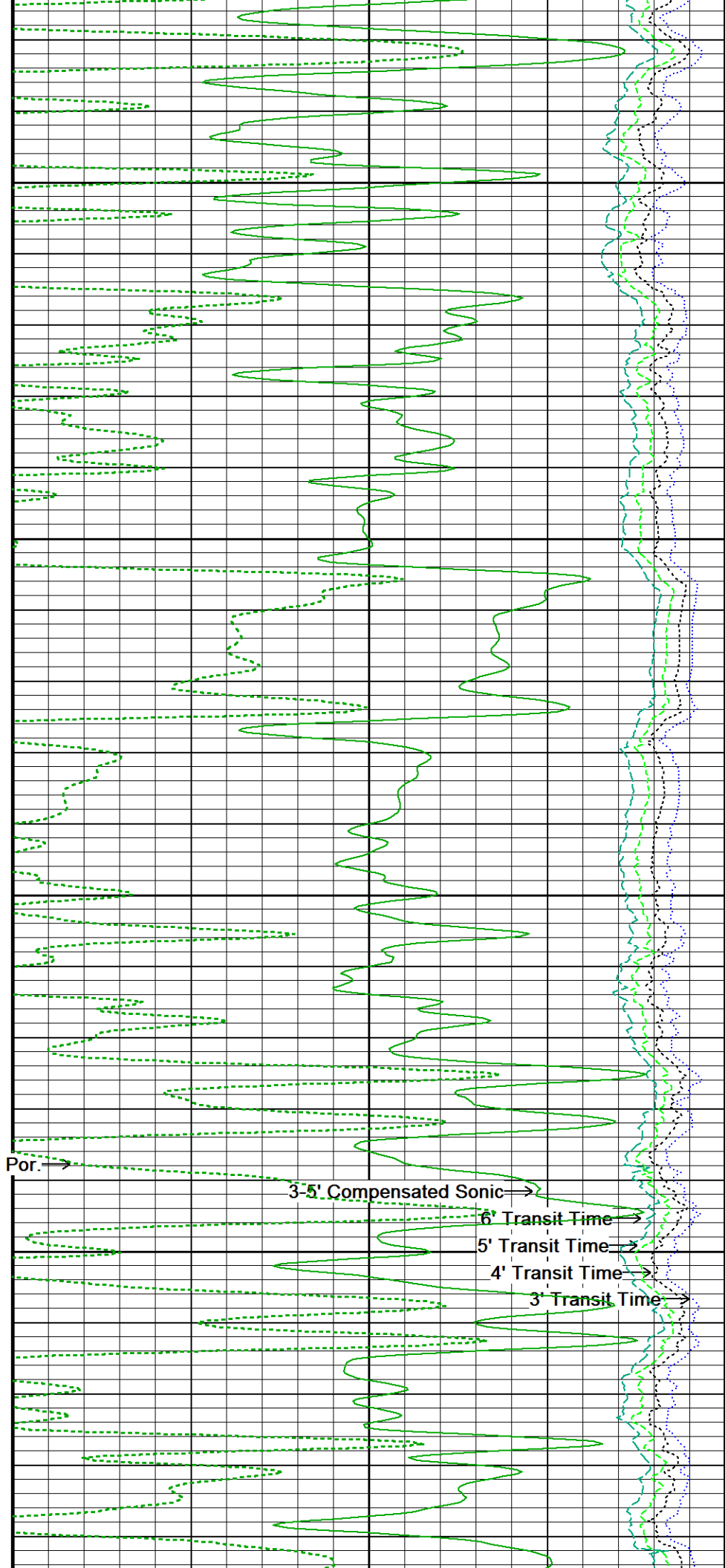
Wyllie Lime Sonic Por. →

← Density Caliper

← Gamma Ray

DST Up-hole Tension →

← FR



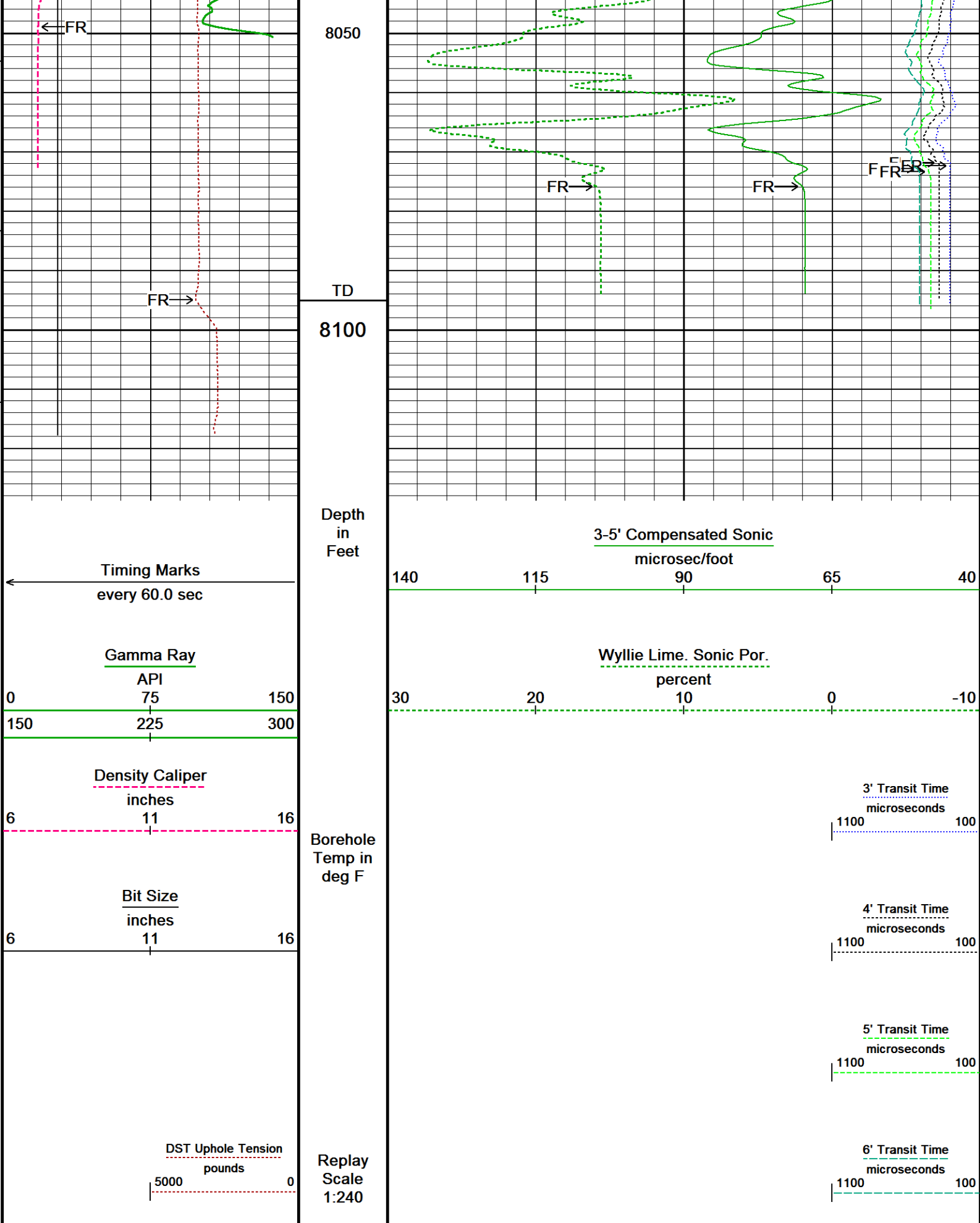
3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →





## REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 05-JUL-2017 13:32

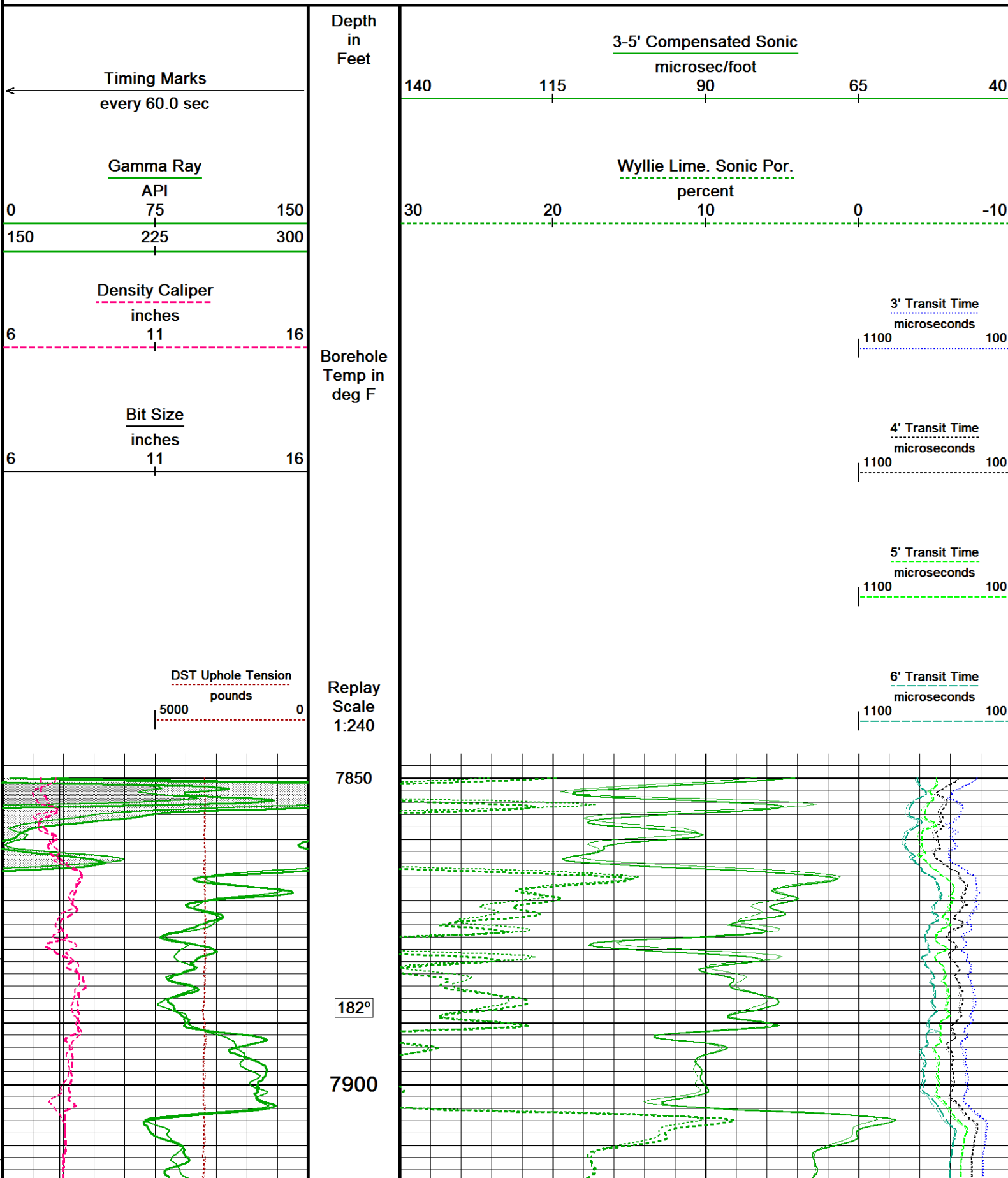
Filename: C:\Logs\GRAND MESA OPERATING\RIO LOB...\MAIN PASS QUAD COMBO SPLICED.dta

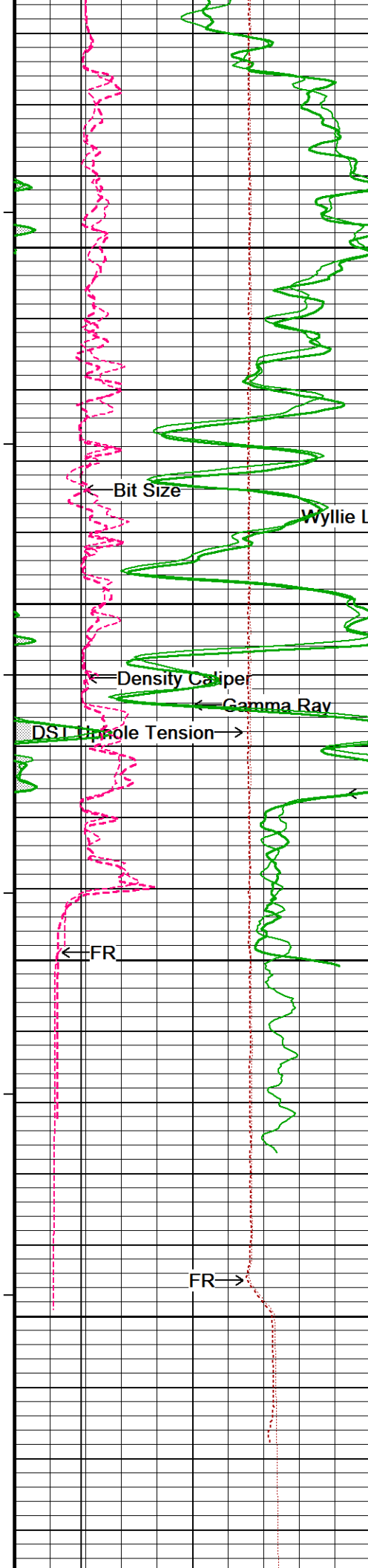
Recorded on 05-JUL-2017 02:31

Filename: C:\Logs\GRAND MESA OPERATING\RIO LOBO 1-30\_QUAD COMBO\_REPEAT PASS.dta

Recorded on 04-JUL-2017 22:36

System Versions: Processed with 17.01.7206 Plotted with 17.01.7206





182°

7950

Wyllie Lime Sonic Por. →

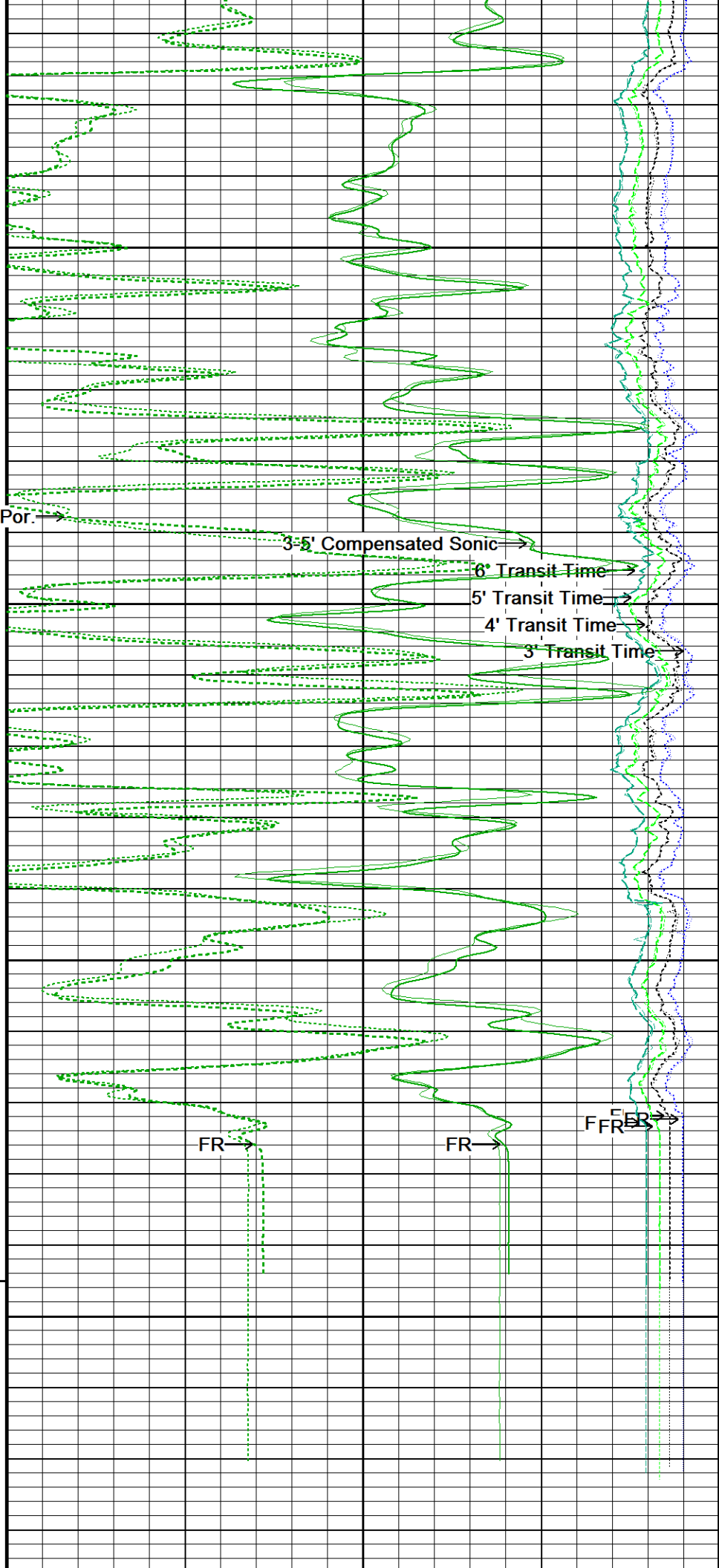
8000

183°

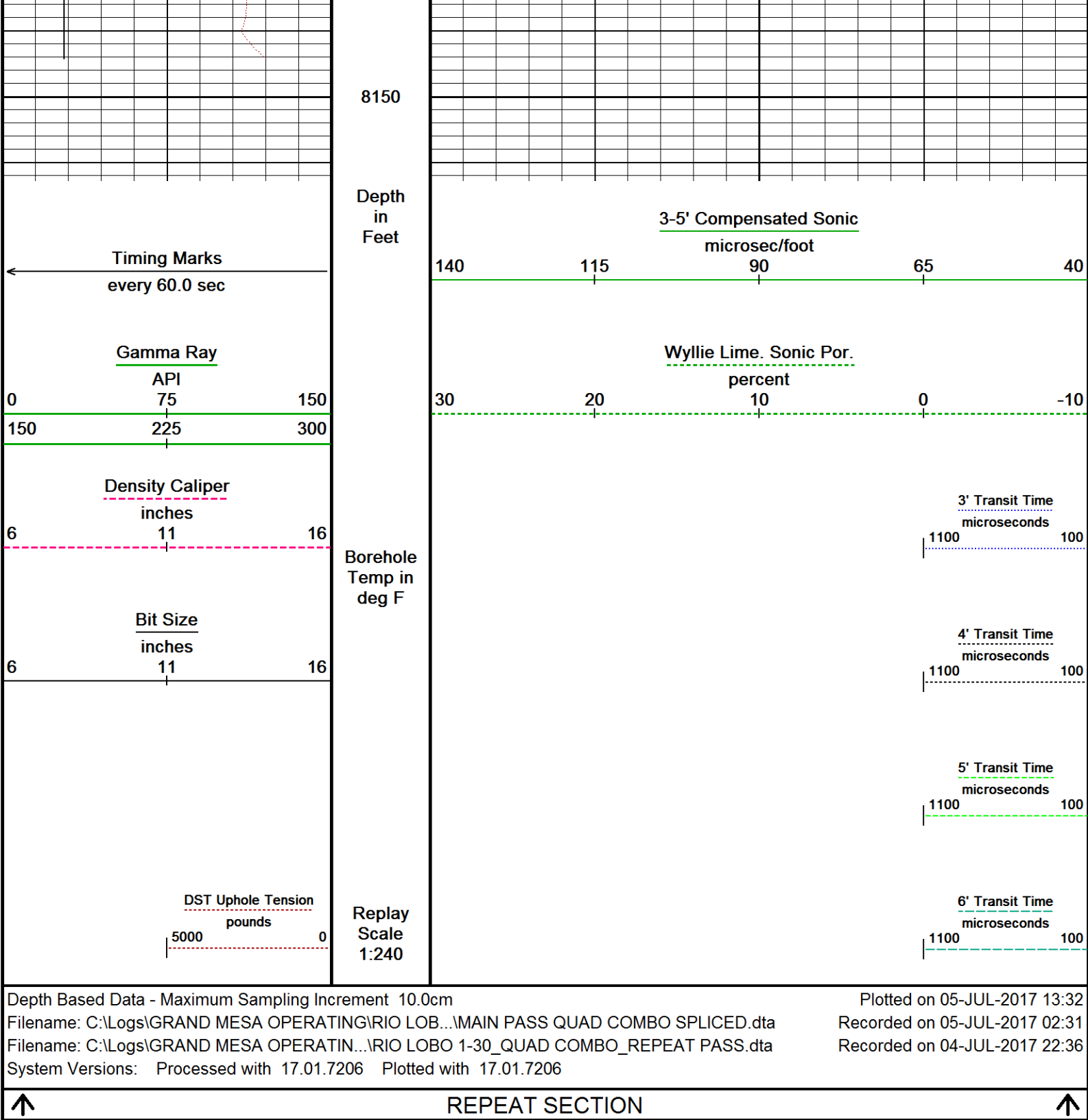
8050

TD

8100







BEFORE SURVEY CALIBRATION		
C:\Logs\GRAND MESA OPERATING\RIO LOBO 1-30\RUN_1\8367-186414219\MAIN PASS QUAD COMBO SPLICED.dta		
Caliper Calibration MPD-C.A 310		Base Calibration on 28-JUN-2017 12:55 Field Calibration on 30-JUN-2017 14:33
Base Calibration Reading No	Measured	Calibrator Size (in)
1	14863	3.99
2	23472	5.96
3	32082	7.96
4	40369	9.85
5	49632	11.88
6	N/A	N/A

Actual Caliper (in)  
7.96

Long Arm Field Cal. 7.93 

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 in

205.3      982.8

[illegible]

# High Resolution Temperature Calibration MAI-B.J 363

Field Calibration on 19-JUN-2017,16:22

Lower	Measured	Calibrated(Deg F)
	10.00	10.00
Upper	100.00	100.00

# High Resolution Temperature Constants MAI-B.J 363

Last Edited on 19-JUN-2017,16:22

Pre-filter Length 11

# Induction Calibration MAI-B.J 363

Base Calibration on 19-JUN-2017,16:57  
Field Check on 30-JUN-2017 14:44

Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	17.8	467.2	9.3	966.2	
2	6.3	374.8	7.6	821.4	
3	3.8	260.7	5.2	566.0	
4	2.0	132.4	2.6	279.2	
Array Temperature		69.4	Deg F		

## Test Loop Calibration Verified

Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	13.2	3898.1	
2	0.0	0.0	30.7	3604.8	
3	0.0	0.0	28.1	3043.1	
4	0.0	0.0	19.6	2093.7	
Deep	0.0	0.0	16.5	1946.5	
Medium	0.0	0.0	41.2	4012.2	
Shallow	0.0	0.0	46.9	5394.3	
Array Temperature		0.0	89.9	Deg F	

# Induction Calibration Tolerances MAI-B.J 363

Low Conductivity 1	17.8		mmho/m	High Conductivity 1	467.2		mmho/m
Low Conductivity 2	6.3		mmho/m	High Conductivity 2	374.8		mmho/m
Low Conductivity 3	3.8		mmho/m	High Conductivity 3	260.7		mmho/m
Low Conductivity 4	2.0		mmho/m	High Conductivity 4	132.4		mmho/m
Background Vx 1	0.0		mmho/m	Phase Check Loop 1	0.0		%
Background Vx 2	0.0		mmho/m	Phase Check Loop 2	0.0		%
Background Vx 3	0.0		mmho/m	Phase Check Loop 3	0.0		%
Background Vx 4	0.0		mmho/m	Phase Check Loop 4	0.0		%

# Induction Constants MAI-B.J 363

Last Edited on 04-JUL-2017,20:42

Induction Model		RtAP-WBM	
Borehole Correction Constants			
Tool Centred		Yes	
Hole Size Source	Density Caliper		
Hole Size Constant Value		N/A	inches
Stand-off Type		N/A	
Stand-off		N/A	inches
Number of Fins on Stand-off		N/A	
Stand-off Fin Angle		N/A	degrees
Stand-off Fin Width		N/A	inches
Rm Source	Global Value: Temperature Corrected		
Temp. for Rm Corr.	MCG External Temperature		
Squasher Start		0.0020	mhos/metre
Squasher Offset		N/A	mhos/metre

## Borehole Normalisation

RFM1 0.0000 RFM2 0.0000

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

#### Symmetrised Receiver Gains

Receiver 1	1.00
Receiver 2	1.00
Receiver 3	1.00
Receiver 4	1.00

#### 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	

#### FE Calibration MFE-C.A 417

Base Calibration on 09-MAY-2017 12:36

Field Check on 10-JUN-2017 03:57

##### Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	962.4	126.8
Base Check		281.5
Field Check		281.6

#### FE Calibration Tolerances MFE-C.A 417

Reference 2	962.4	<div><div></div><div></div><div></div><div></div><div></div></div> <div>-3% 960.0 +3%</div> <div>ohm</div>
Base Check	281.5	<div><div></div><div></div><div></div><div></div><div></div></div> <div>-2% 277.0 +2%</div> <div>ohm-m</div>
Field Check	281.6	<div><div></div><div></div><div></div><div></div><div></div></div> <div>-2% 281.5 +2%</div> <div>ohm-m</div>

#### FE Constants MFE-C.A 417

Last Edited on 04-JUL-2017,20:42

Running Mode	No Sleeve
MFE K Factor	0.1268
Borehole Correction Constants	
Sonde Position	0.5 inches
Hole Size Source	Density Caliper
Hole Size Constant Value	N/A inches
Rm Source	Global Value: Temperature Corrected
Temp. for Rm Corr.	MCG External Temperature

#### Sonic Constants MSS-D.A 387

Last Edited on 16-JUN-2017,09:44

Maximum Boundary Contrast	70.00	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	
MN3ET	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

Waveform Discriminator Filter	Not Applied
Semblance Window Width	150.00 micro-sec
Sonic Despiker	

#### Neutron Calibration MDN-C.A 464

Base Calibration on 28-JUN-2017 15:50  
Field Check on 30-JUN-2017 14:30

##### Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3028	93	3714	110
Ratio	32.626		33.764	

##### Field Calibrator at Base

	Calibrated (cps)
	1393 2071
Ratio	0.673

##### Field Check

	Calibrated (cps)
	1399 2063
Ratio	0.678

#### Neutron Calibration Tolerances MDN-C.A 464

Ratio	32.626	<div><div></div><div></div><div></div><div></div><div></div></div>
Base Check	0.673	<div><div></div><div></div><div></div><div></div><div></div></div>
Field Check	0.678	<div><div></div><div></div><div></div><div></div><div></div></div>

#### Neutron Constants MDN-C.A 464

Last Edited on 30-JUN-2017,16:18

5922NE

Neutron Jig Number		
Air Hole Processing	Modified Ratio	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	7.00	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	

## Micro Normal and Micro Inverse Calibration MMR-C.A 229

Base Calibration on 25-MAY-2017 02:03

Field Check on 04-JUL-2017 18:58

## Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	9.9	49.5	5.1	25.6
Micro Inverse	10.0	49.5	3.4	16.9

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	93.9	93.9
Micro Inverse	62.2	62.2

## Micro Normal &amp; Micro Inverse Calibration Tolerance MMR-C.A 229

Micro Normal Res. 1	9.9	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm	Micro Normal Res. 2	49.5	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm
Micro Inverse Res. 1	10.0	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm	Micro Inverse Res. 2	49.5	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm
Micro Normal Base Check	93.9	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm-m				
Micro Inverse Base Check	62.2	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm-m				
Micro Normal Field Check	93.9	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm-m				
Micro Inverse Field Check	62.2	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm-m				

## Micro Normal and Micro Inverse Constants MMR-C.A 229

Last Edited on 25-MAY-2017,01:53

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159
Micro Normal K Factor	0.5110
Micro Inverse K Factor	0.3380
Standoff Offset	0.0000 inches

## Micro Laterolog Calibration MMR-C.A 229

Base Calibration on 23-MAY-2017,23:57

Field Check on 23-MAY-2017,23:57

## Base Calibration

	Measured		Calibrated (ohm-m)	
	Ref 1	Ref 2	Ref 1	Ref 2
	0.0	9911.7	0.0	128.0
Base Check (ohm-m)	5.2		Field Check (ohm-m)	5.2

## Micro Laterolog Calibration Tolerances MMR-C.A 229

Ref 2	9911.7	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm
Base Check	5.2	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm-m
Field Check	5.2	<div><div></div><div></div><div></div><div></div><div></div></div>	ohm-m

## Micro Laterolog Constants MMR-C.A 229

Last Edited on 24-MAY-2017,12:42

Pad Type	6 in Solid Nylon B23059	
Micro Laterolog K Factor	0.0128	
Standoff Offset	0.0000	inches
Mudcake Thickness Correction Constants		
Mud Cake Source	Constant Value	
Mud Cake Thickness	0.4000	inches
Mud Cake Thickness Caliper	N/A	
Mud Cake Resistivity	0.1500	ohm-m
Mud Cake Resistivity Temp.	68.00	Deg F
Mud Cake Resistivity Source	Constant Value	
Temp. for Rmc Corr.	N/A	
Caliper Calibration MMR-C.A 229		Base Calibration on 04-JUL-2017 18:55 Field Calibration on 04-JUL-2017 18:57
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13741	5.96
2	16951	7.96
3	20207	9.85
4	24130	11.88
5	0	0.00
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	7.98	7.96
Caliper Calibration Tolerances MMR-C.A 229		
Short Arm Field Cal.	7.98	<div> <div>7.76</div> <div>7.96</div> <div>8.16</div> </div> in
Micro-Resistivity Caliper Constants MMR-C.A 229		Last Edited on
Sonde Configuration	Resistivity Mode	
High Resolution Temperature Calibration MCG-D.K 483		Field Calibration on 05-MAY-2017,11:02
	Measured	Calibrated(Deg F)
Lower	66.00	66.00
Upper	209.00	209.00
High Resolution Temperature Constants MCG-D.K 483		Last Edited on 28-APR-2017,13:18
Pre-filter Length	11	
SP Calibration MCG-D.K 483		Field Calibration on 16-MAY-2017 09:09
	Measured	Calibrated (mV)
Reference 1	100.8	100.0
Reference 2	-97.0	-97.0
Gamma Calibration MCG-D.K 483		Field Calibration on 30-JUN-2017 14:25
	Measured	Calibrated (API)
Background	208	142
Calibrator (Gross)	1551	1054
Calibrator (Net)	1343	912
Gamma Calibration Tolerances MCG-D.K 483		
Ratio	1.472	<div> <div>1.40</div> <div>1.475</div> <div>1.55</div> </div> Counts/API
Gamma Constants MCG-D.K 483		Last Edited on 01-JUL-2017,10:32
Gamma Calibrator Number	GRC.C.072	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%



## General Parameters

Mud Resistivity	1.200	ohm-metres
Mud Resistivity Temperature	50.000	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	Density Caliper	

## Rwa Parameters

Porosity used	Crossplot Porosity
Resistivity used	Array Ind. One Res Rt
RWA Constant A	0.620
RWA Constant M	2.150
SW/APOR Tool Source	0.000

## DOWNHOLE EQUIPMENT

C:\Logs\GRAND MESA OPERATING\RIO LOBO 1-30\RUN\_1\8367-186414219\MAIN PASS QUAD COMBO SPLICED.dta

Cablehead, 11 pin

CBH-CA 121 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

11C-11B Compact Tool Adaptor

MTA-K.A 164 LG: 1.53 ft WT: 13.2 lb OD: 2.240 in

Compact Swivel Head Adaptor

SHA-J.B 588 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

Compact Comms Gamma

MCG-D.K 483 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity

MMR-C.A 229 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron

MDN-C.A 464 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper

MPD-C.A 310 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Inline Bowspring sub

MIS-D.B 823 LG: 5.70 ft WT: 33.1 lb OD: 2.244 in

Compact Knuckle Joint

SKJ-E.B 533 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Inline Standoff sub

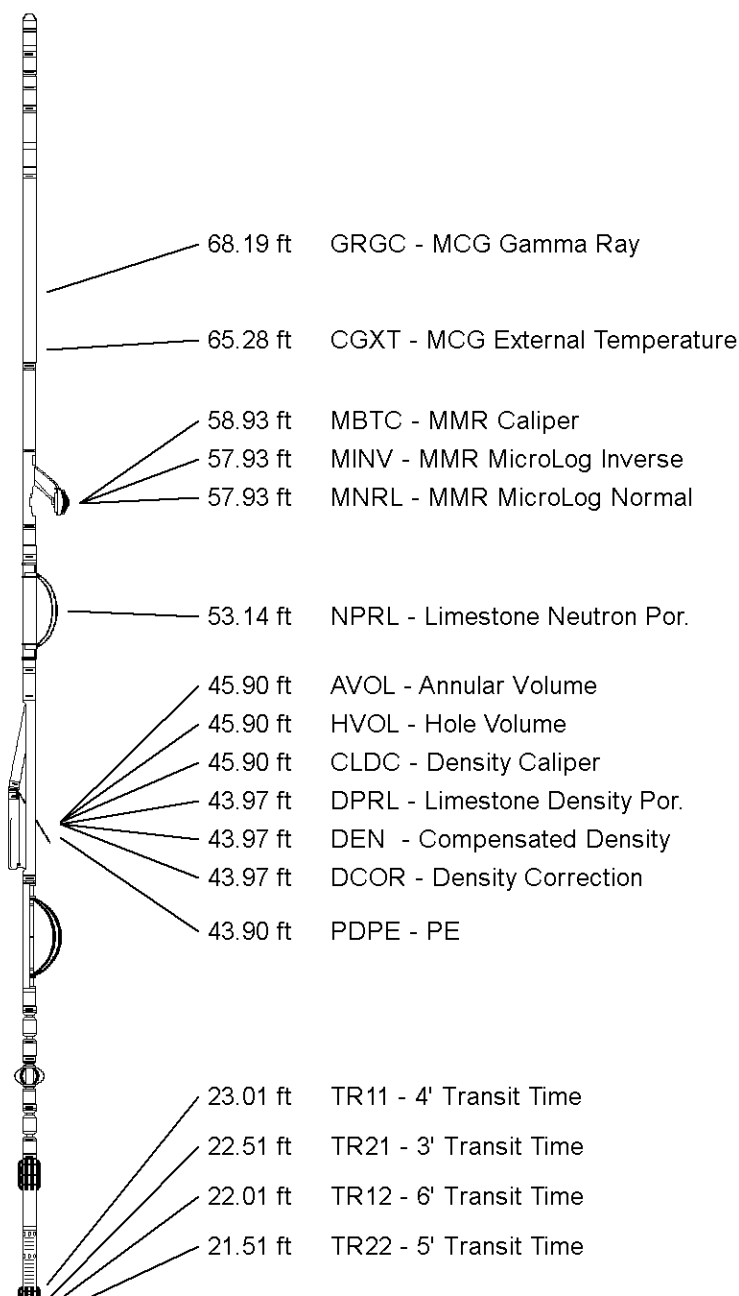
MIS-E.B 784 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

Compact Knuckle Joint

SKJ-E.A 244 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Sonic

MSS-D.A 387 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

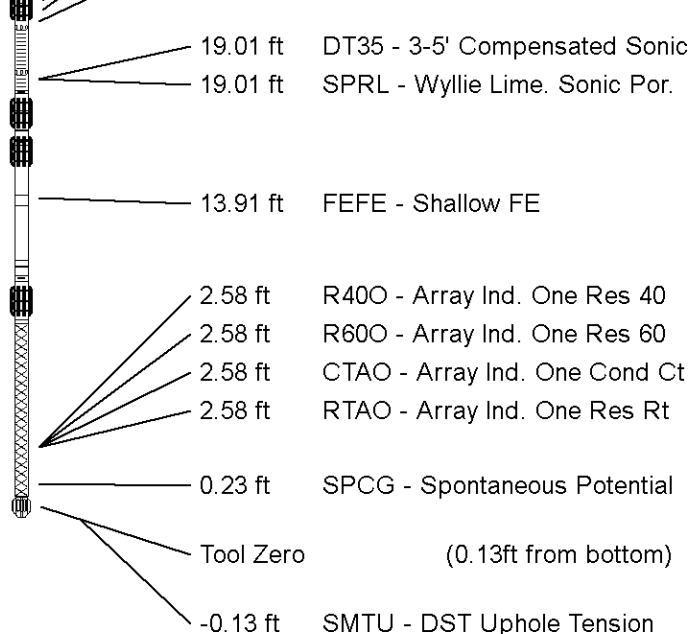




Compact Focussed Electric  
MFE-C.A 417 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Induction  
MAI-B.J 363 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 79.69 ft Weight: 612.9 lb



All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING CO.
WELL	RIO LOBO 1-30
FIELD	WILDCAT
PROVINCE/COUNTY	WASHINGTON
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	5157	feet	First Reading	8076.00	feet
Elevation Drill Floor	5157	feet	Depth Driller	8099.00	feet
Elevation Ground Level	5138	feet	Depth Logger	8095.00	feet



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