

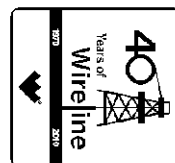


Weatherford

COMPENSATED SONIC

WITH INTEGRATED TRANSIT TIME

LOG



COMPANY	GRAND MESA		
WELL	ELLIS 1-23		
FIELD	WILDCAT		
PROVINCE/COUNTY	LOGAN		
COUNTRY/STATE	U.S.A./KANSAS		
LOCATION	1711' FSL & 2310' FWL		
SEC	TWP	RGE	Other Services
23	14S	32W	MPD/MDN
API Number	15-109-21001		MAI/MFE
Permit Number	MML		
Permanent Datum G.L., Elevation 2780 feet			Elevations:
Log Measured From K.B. @ 5 FEET above Permanent Datum			KB
Drilling Measured From K.B.			DF
Date	26-APR-2011		GL
Run Number	ONE		
Depth Driller	4570.00	feet	
Depth Logger	4572.00	feet	
First Reading	4559.00	feet	
Last Reading	212.00	feet	
Casing Driller	214.00	feet	
Casing Logger	212.00	feet	
Bit Size	7.880	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.50 lb/USg	59.00 CP	
PH / Fluid Loss	9.00	10.40 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.70 @ 81.0	ohm-m	
Rmf @ Measured Temp	0.56 @ 81.0	ohm-m	
Rmc @ Measured Temp	0.84 @ 81.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.50 @114.0	ohm-m	
Time Since Circulation	3 HOURS		
Max Recorded Temp	114.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	13025	LB	
Recorded By	SHAWN NUTT		
Witnessed By	WES HANSEN		
S.O.#/JOB#	3529182	LB11-091	

BOREHOLE RECORD

Last Edited: 26-APR-2011 17:21

Bit Size inches	Depth From feet	Depth To feet
7.880	212.00	4572.00

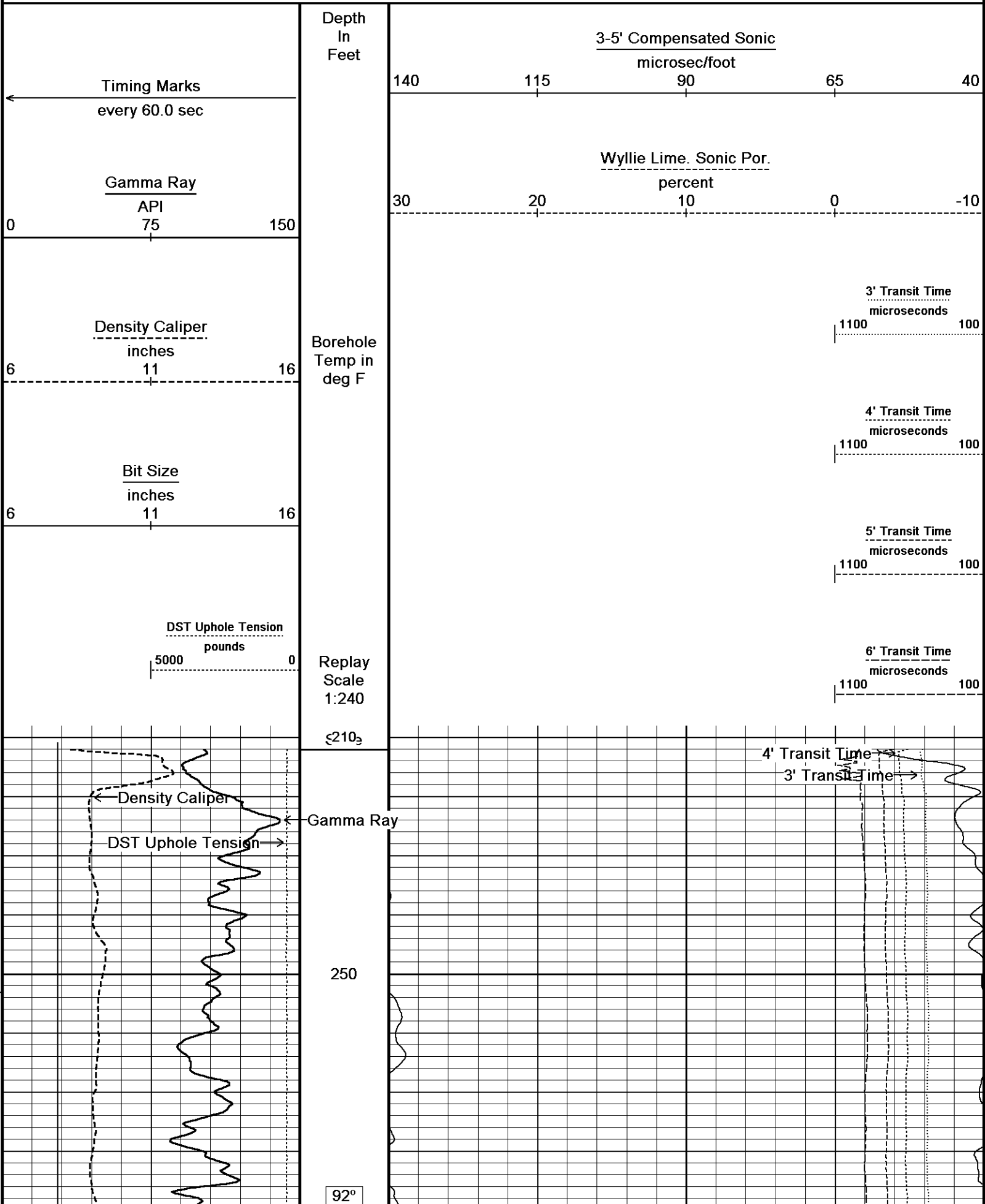
CASING RECORD

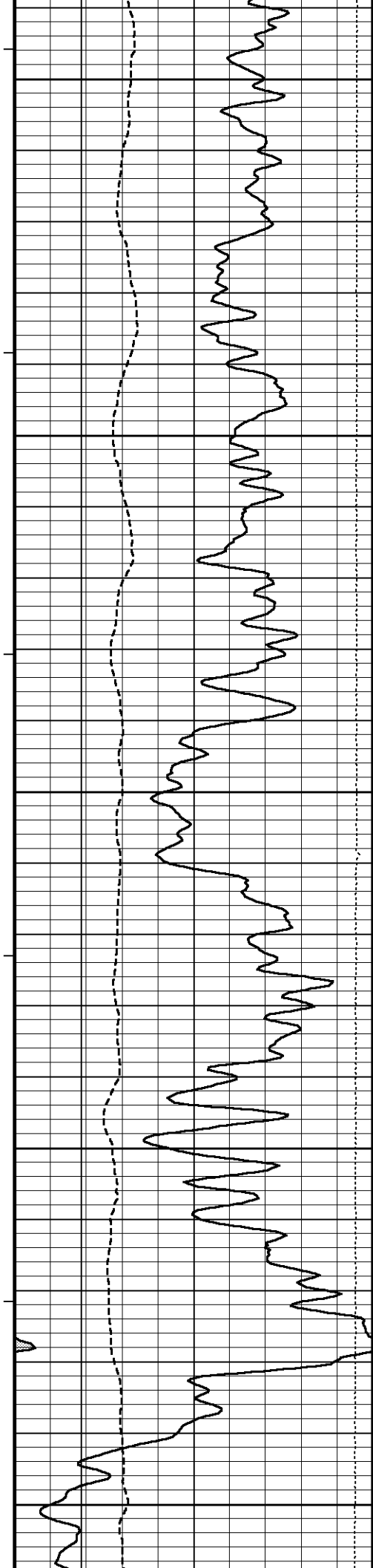
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	212.00	24.00

REMARKS

Tools Used: MPD, MCG, MDN, MFE, MAI, MML, MSS
Hardware: MPD: 8 inch profile plate used. MAI, MSS AND MFE: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Borehole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing = cu. ft
Service order #3529182
Rig: Murfin #8
Engineer: Shawn Nutt
Operator(s): Ken Rinehart, Nick Adame

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.





300

92°

350

93°

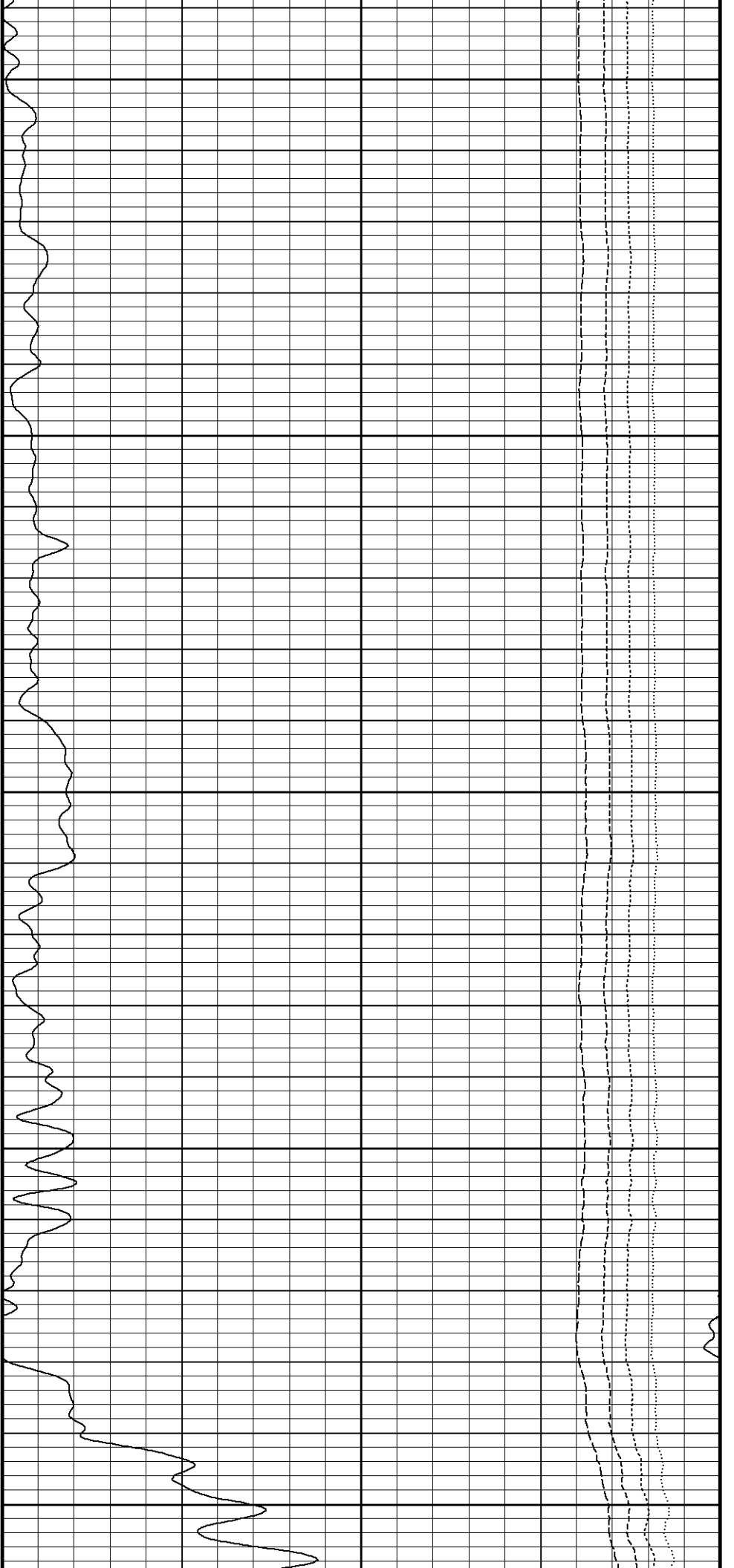
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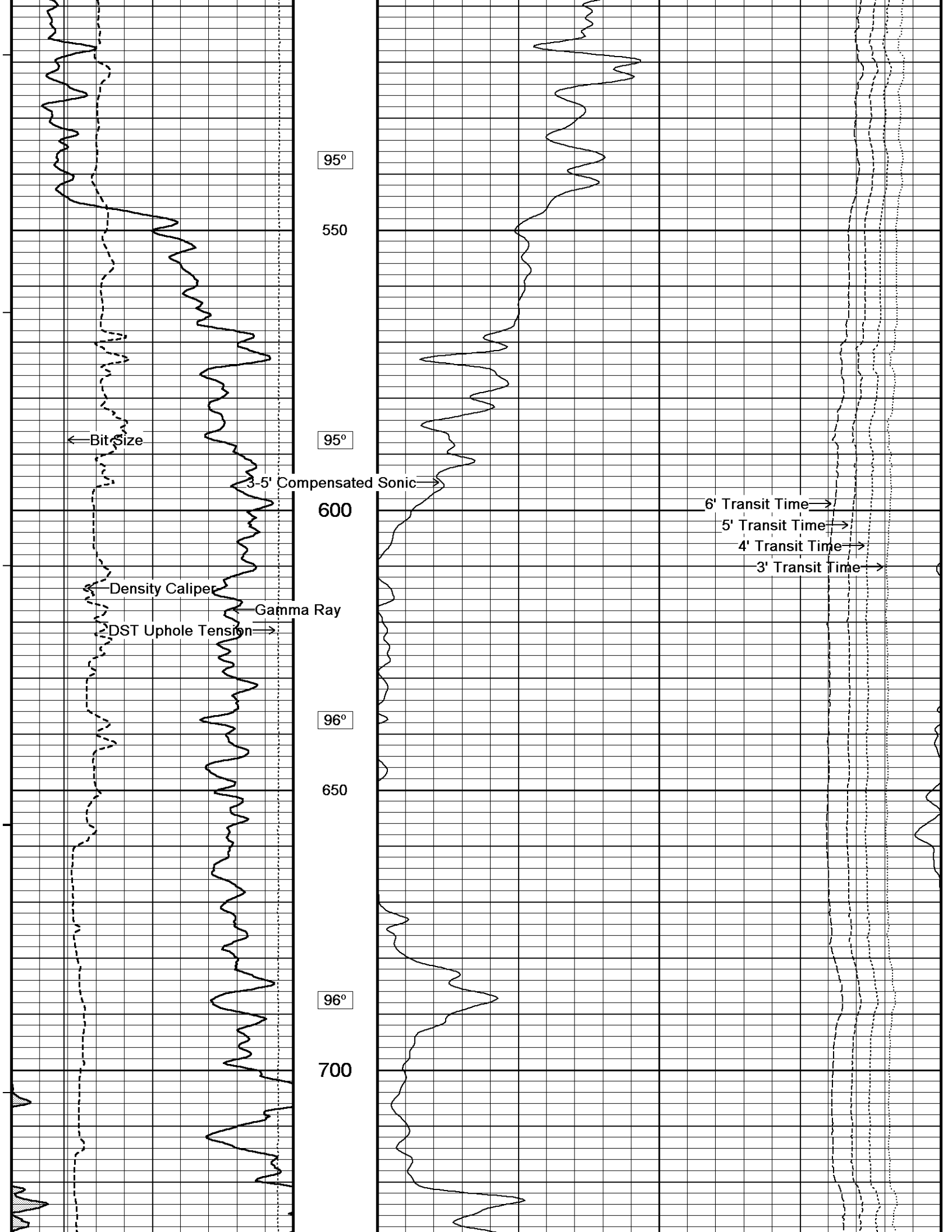
94°

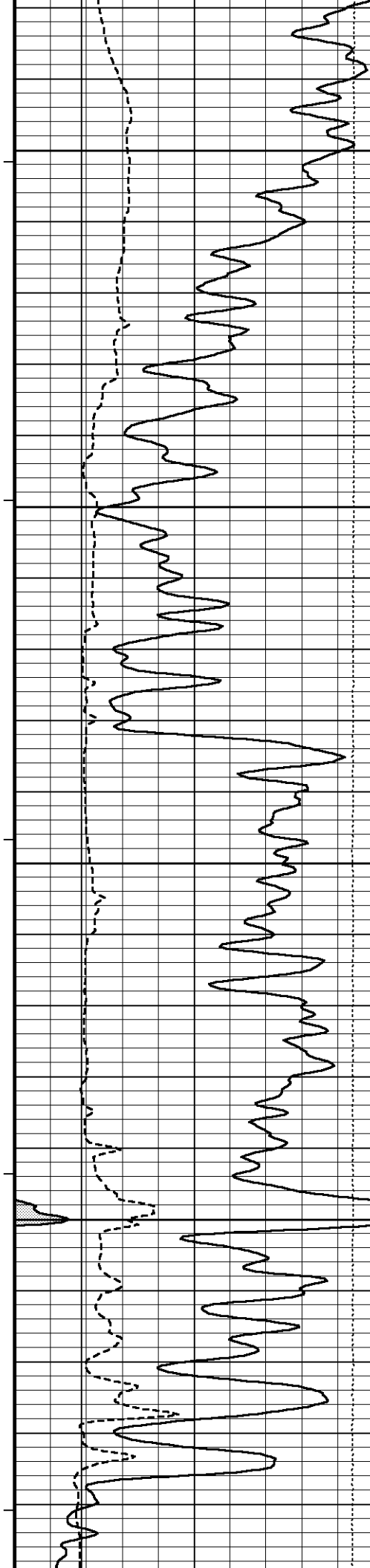
450

94°

500







96°

750

97°

800

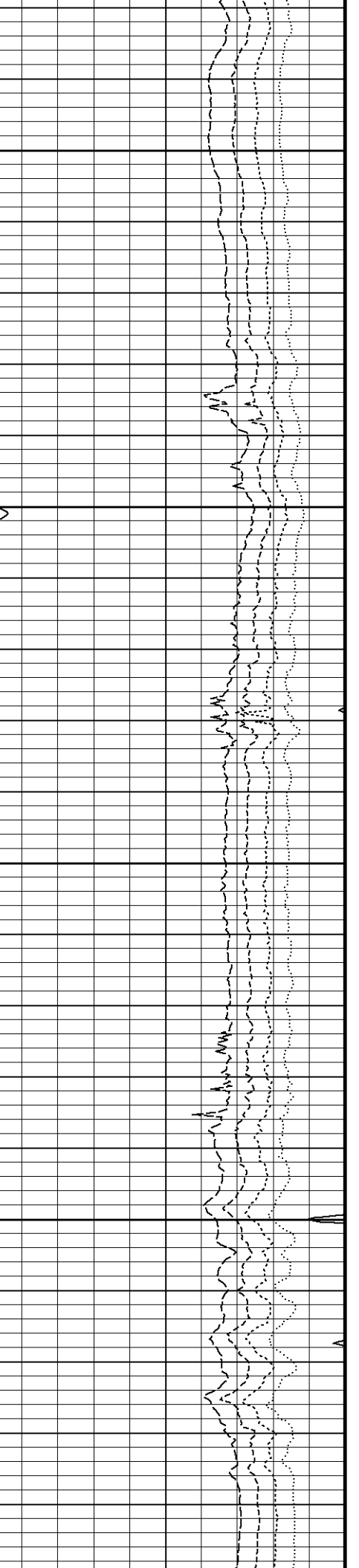
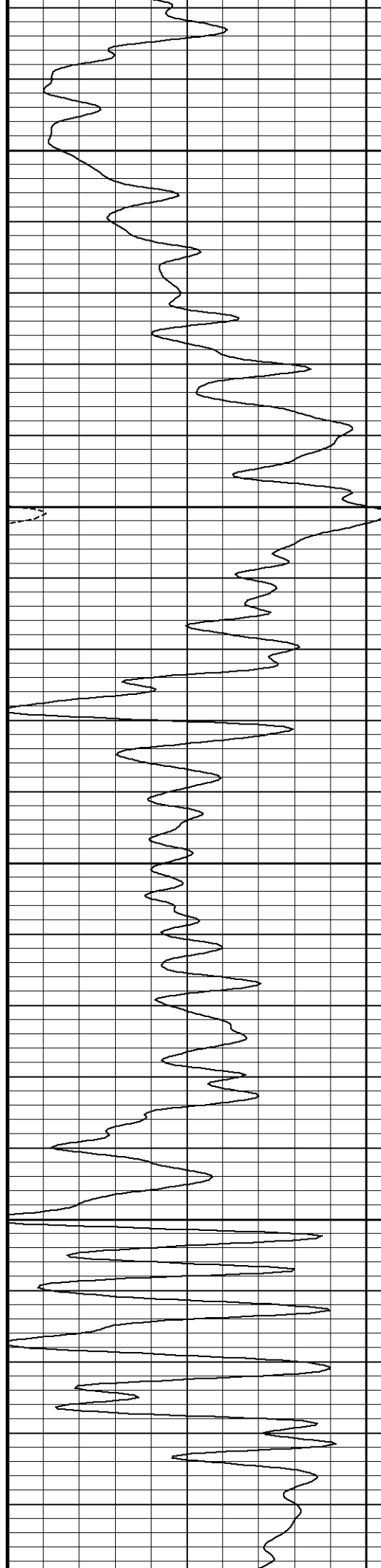
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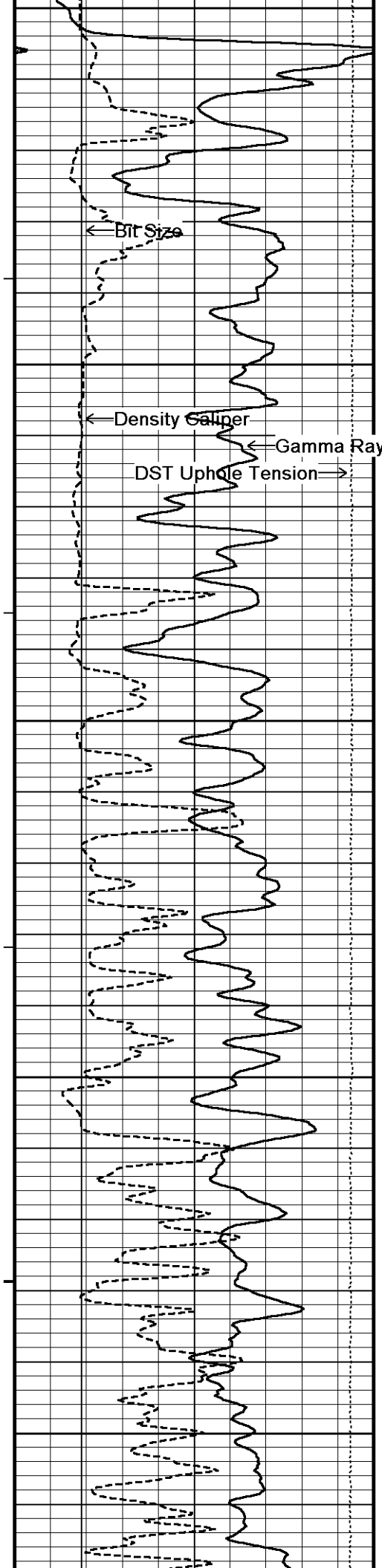
850

98°

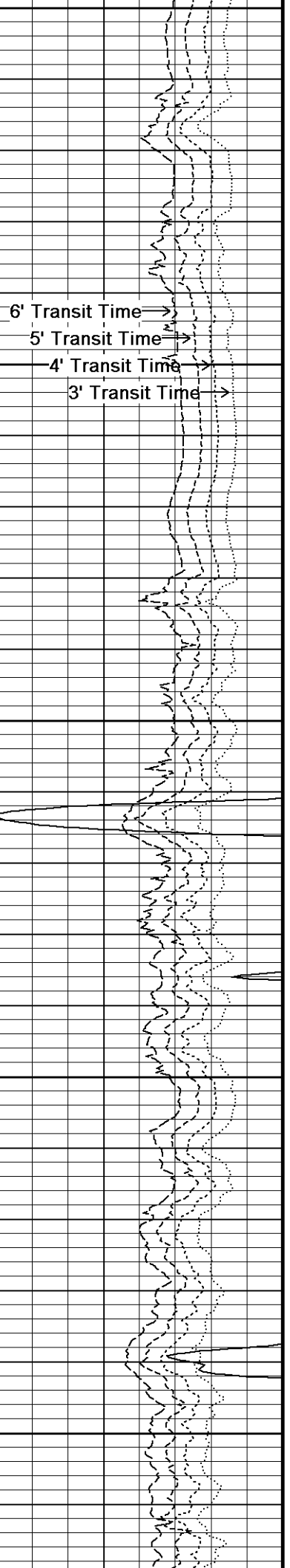
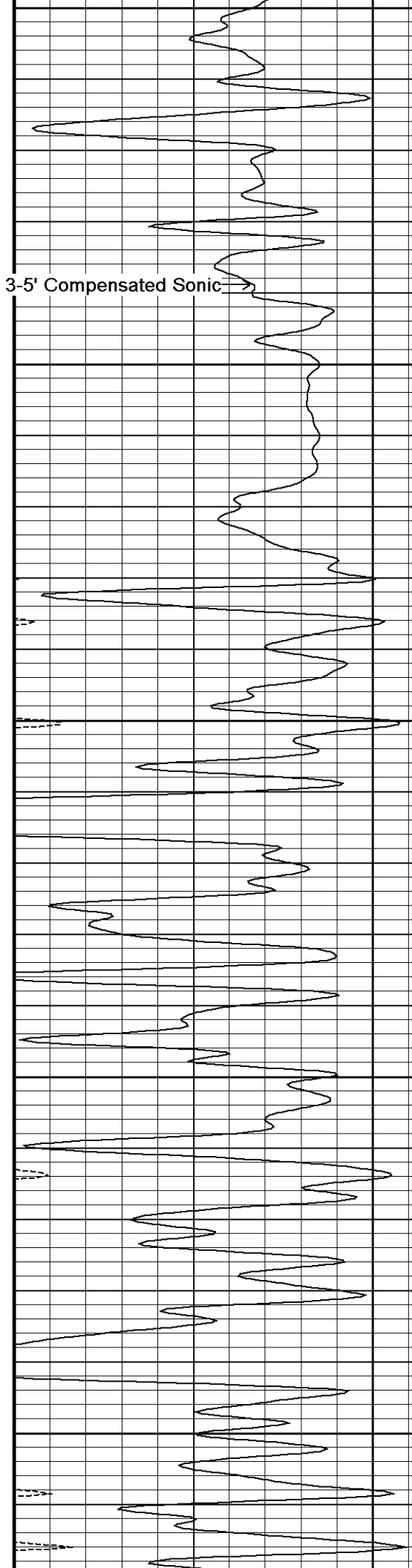
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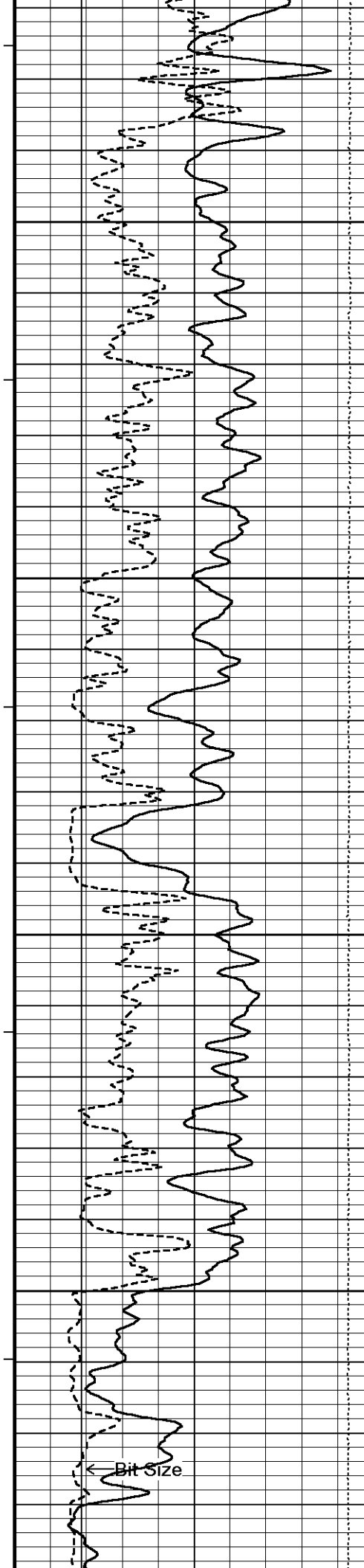
98°



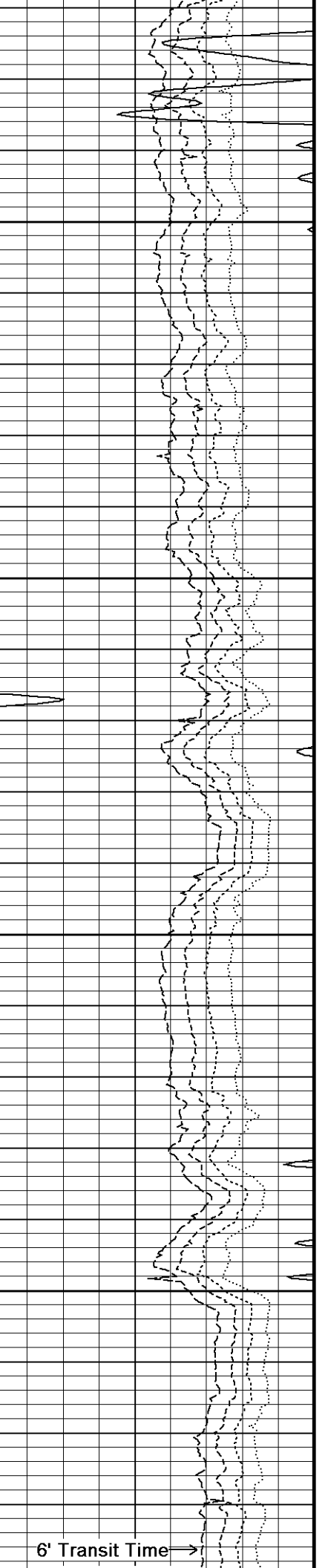
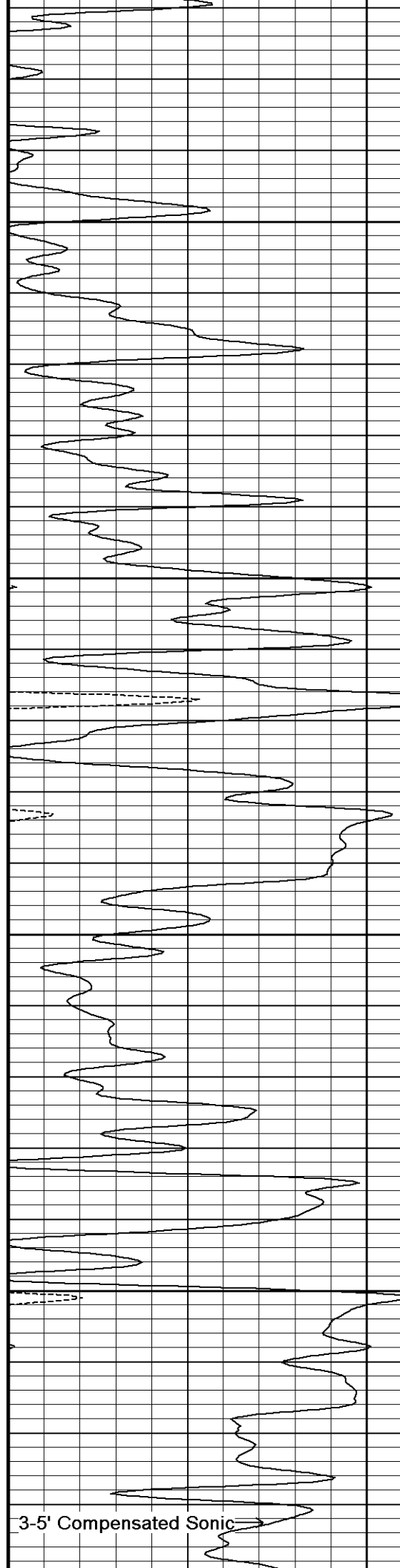


950
99°
1000
100°
1050
100°
1100
101°
1150





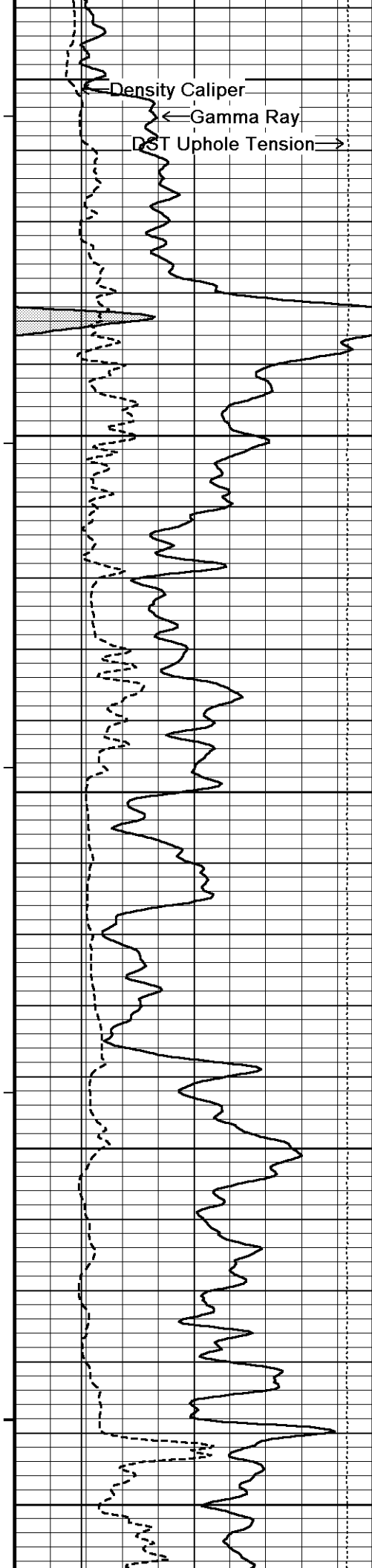
101°
1200
101°
1250
101°
1300
101°
1350
100°



← Bit Size

3-5' Compensated Sonic →

6' Transit Time →



1400

101°

1450

101°

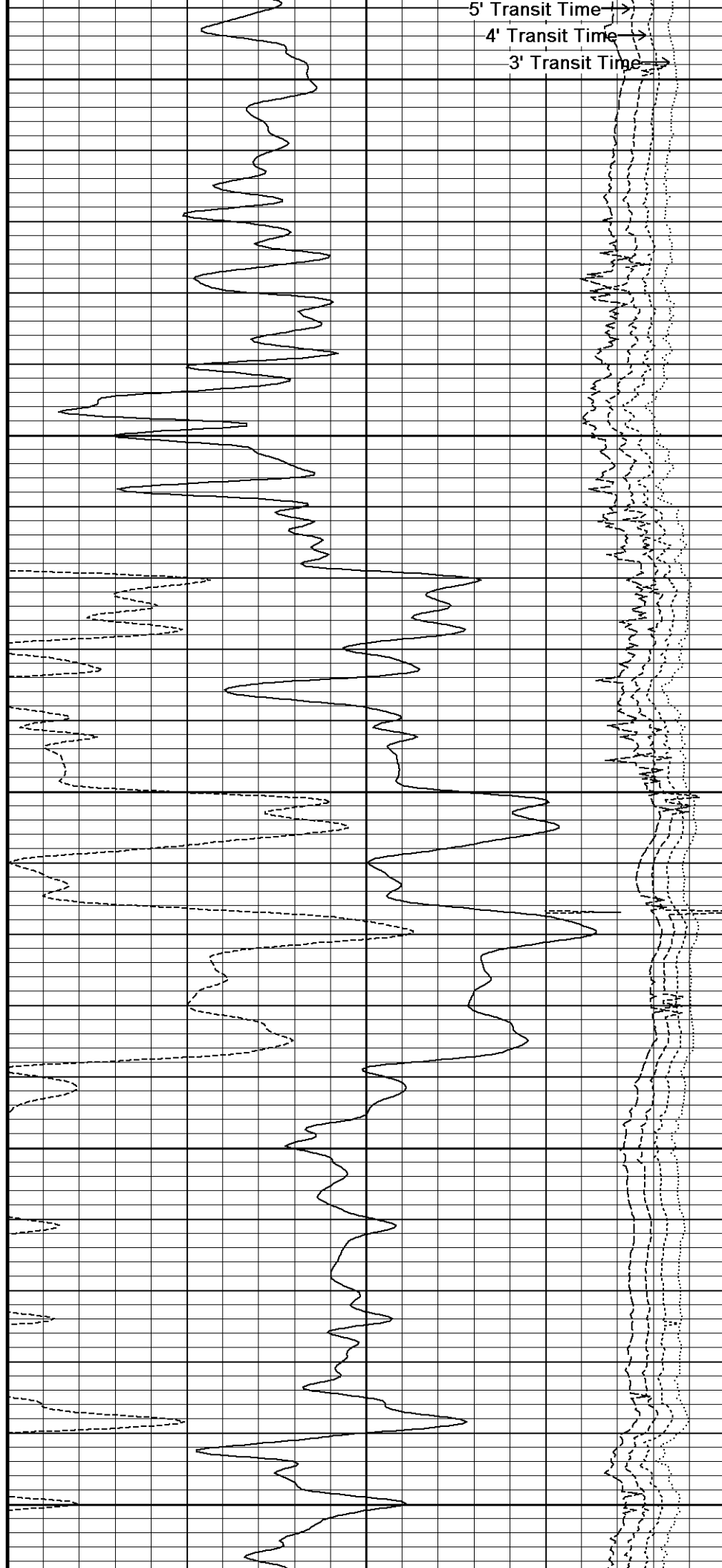
1500

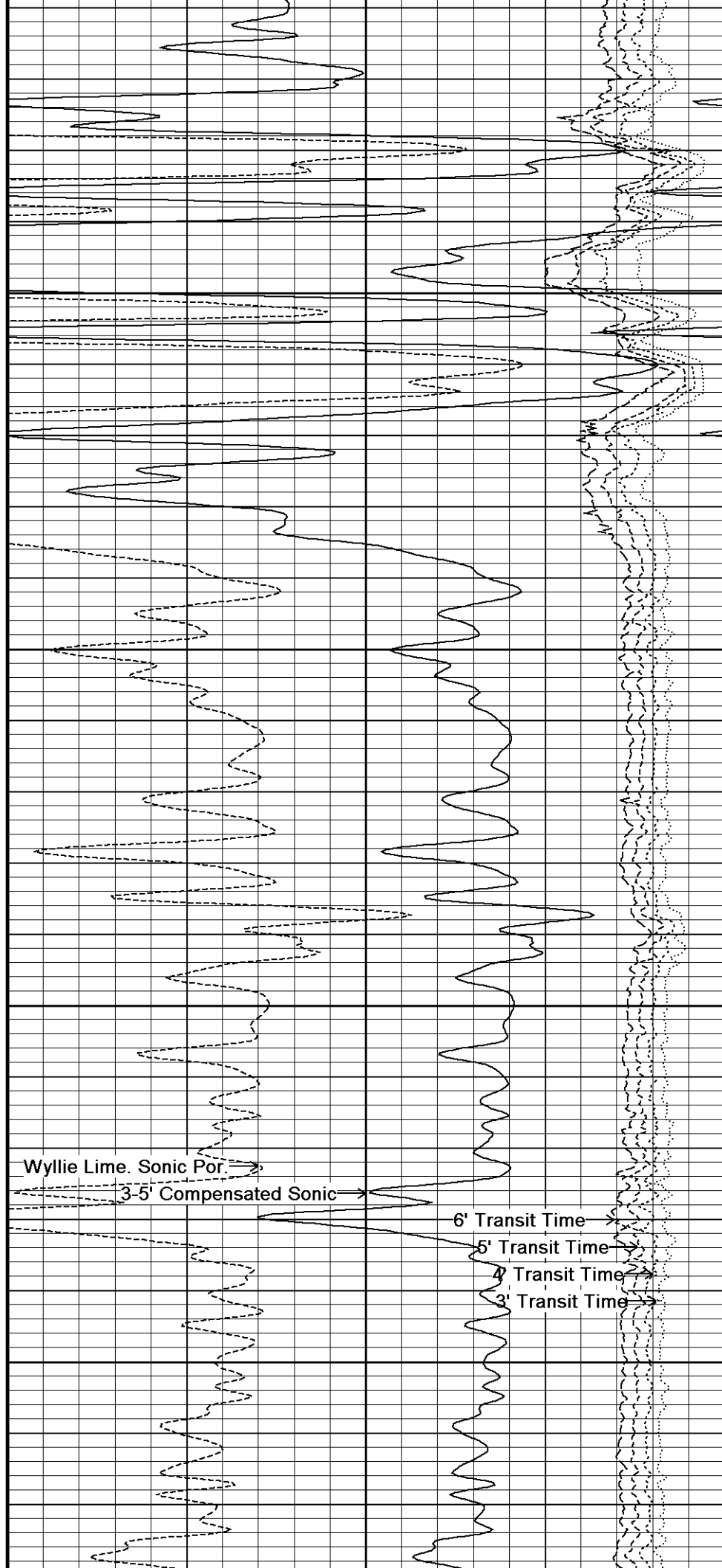
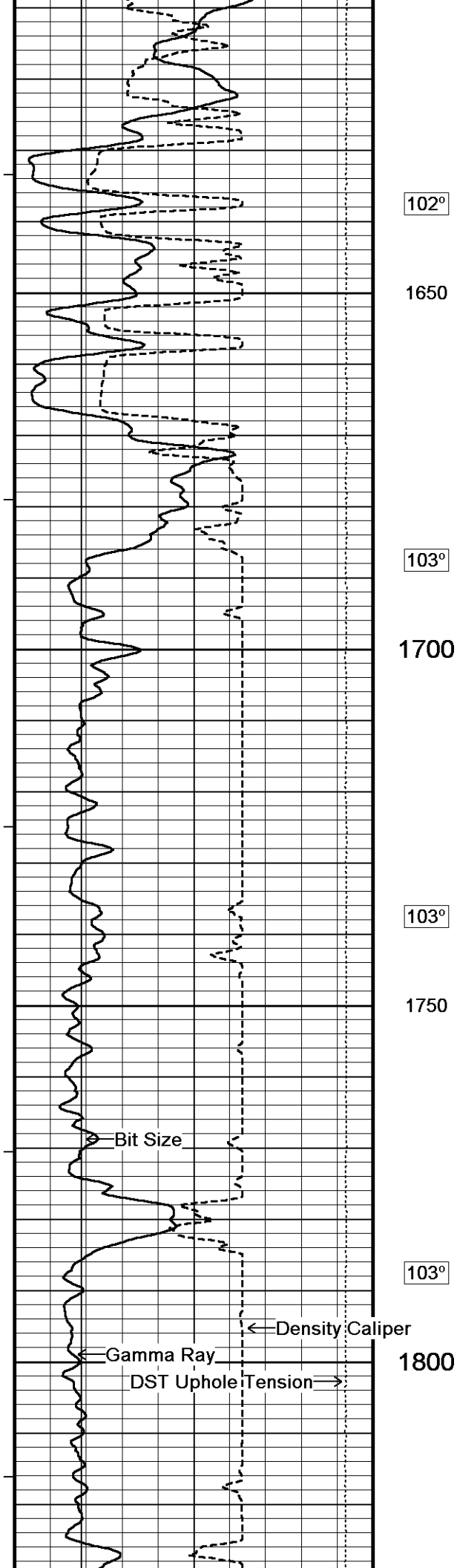
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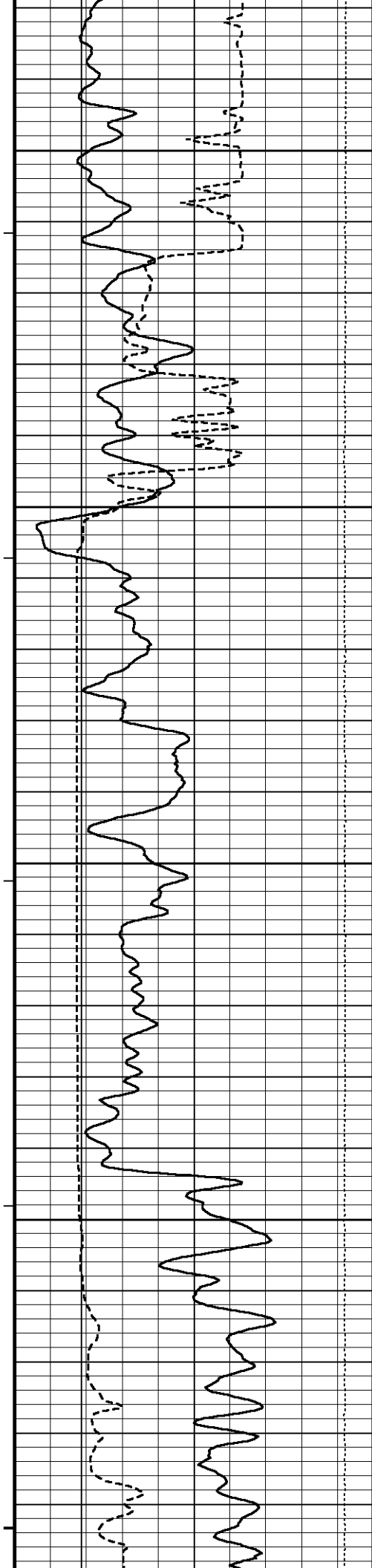
1550

102°

1600







103°

1850

103°

1900

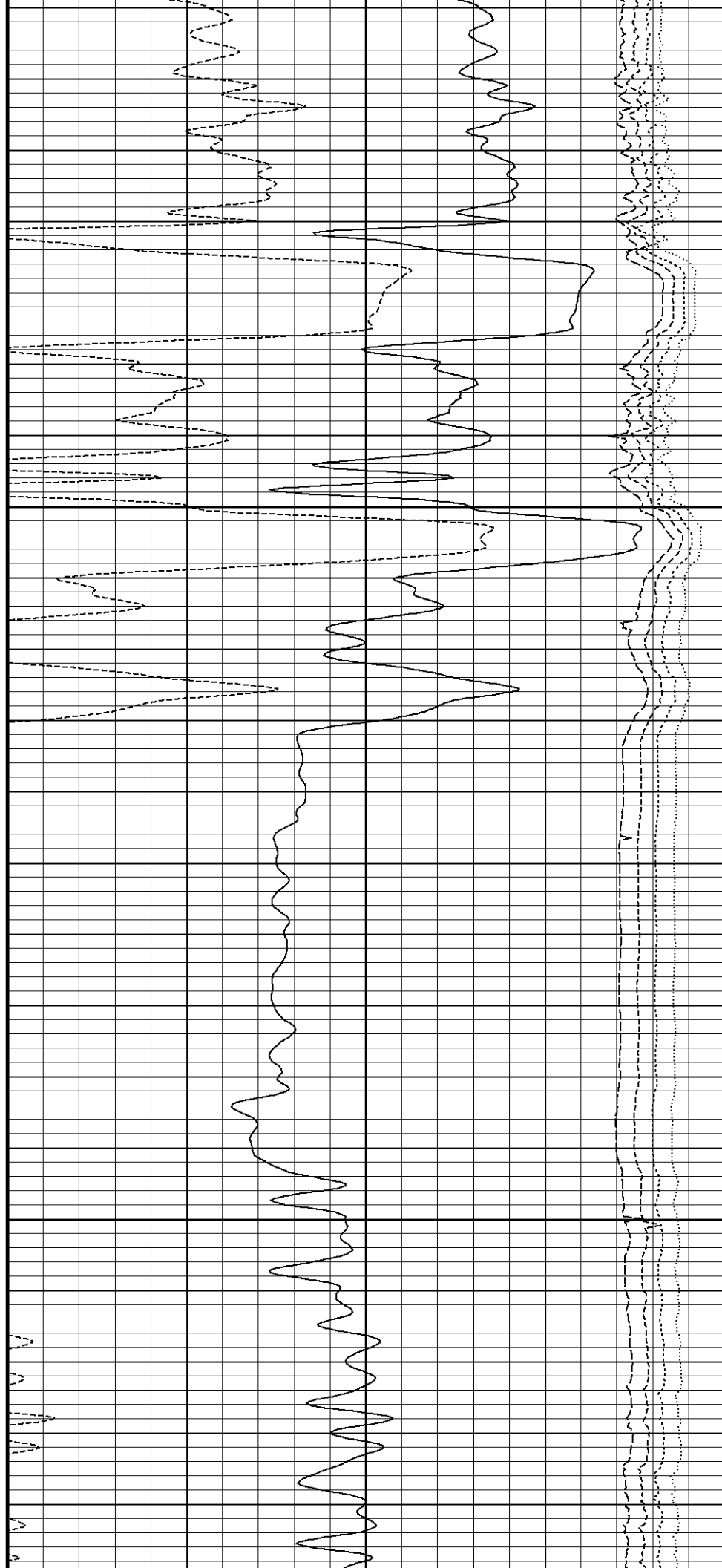
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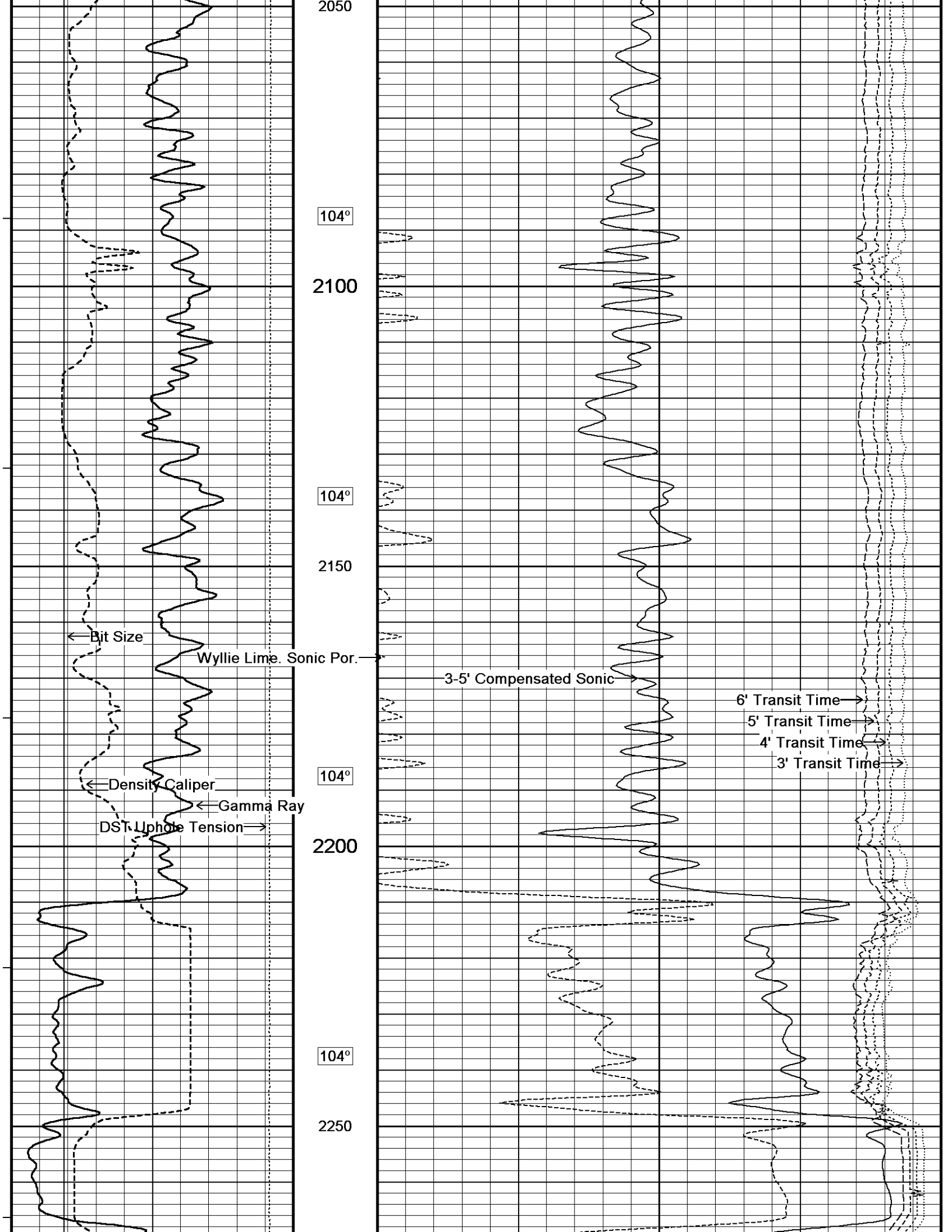
1950

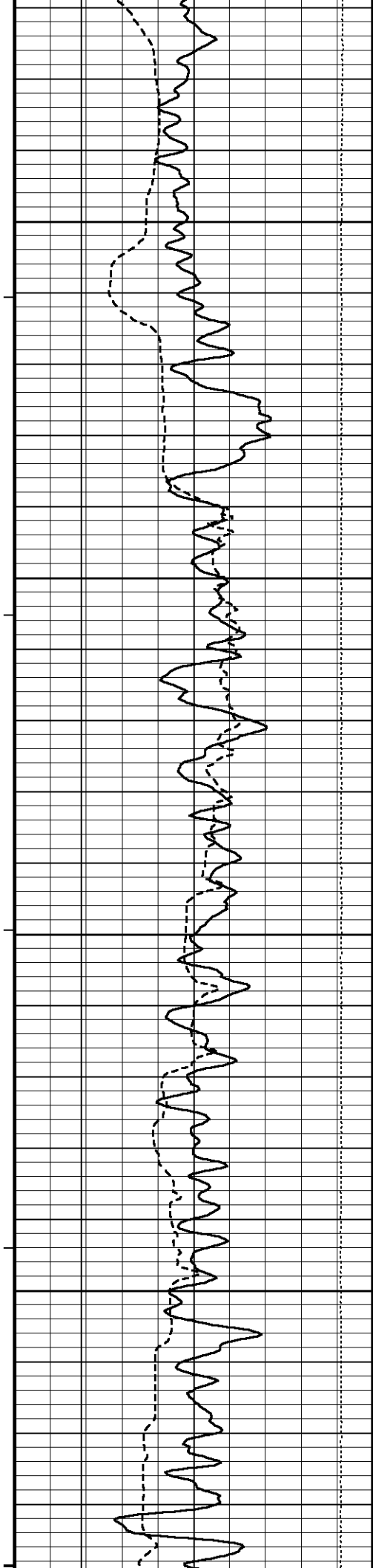
103°

2000

103°







105°

2300

105°

2350

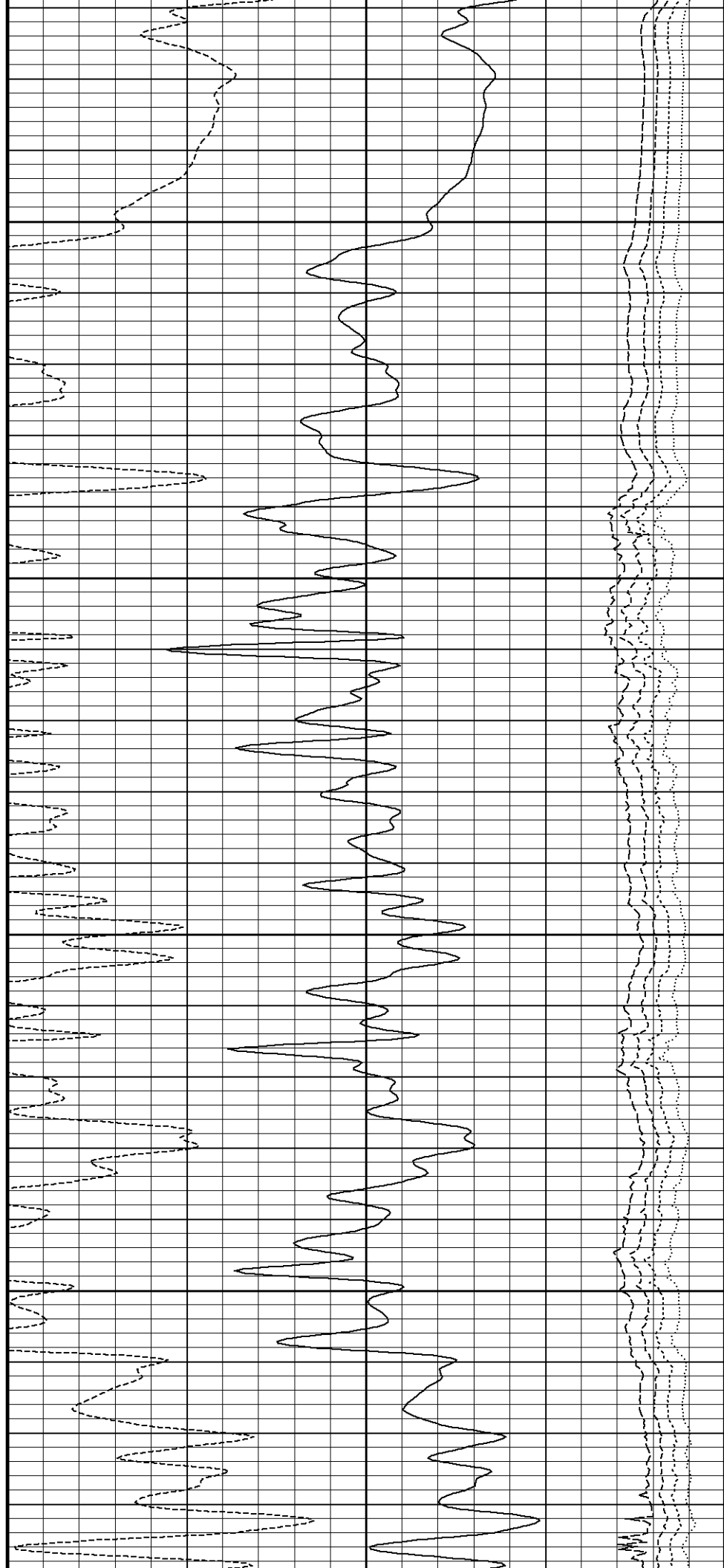
105°

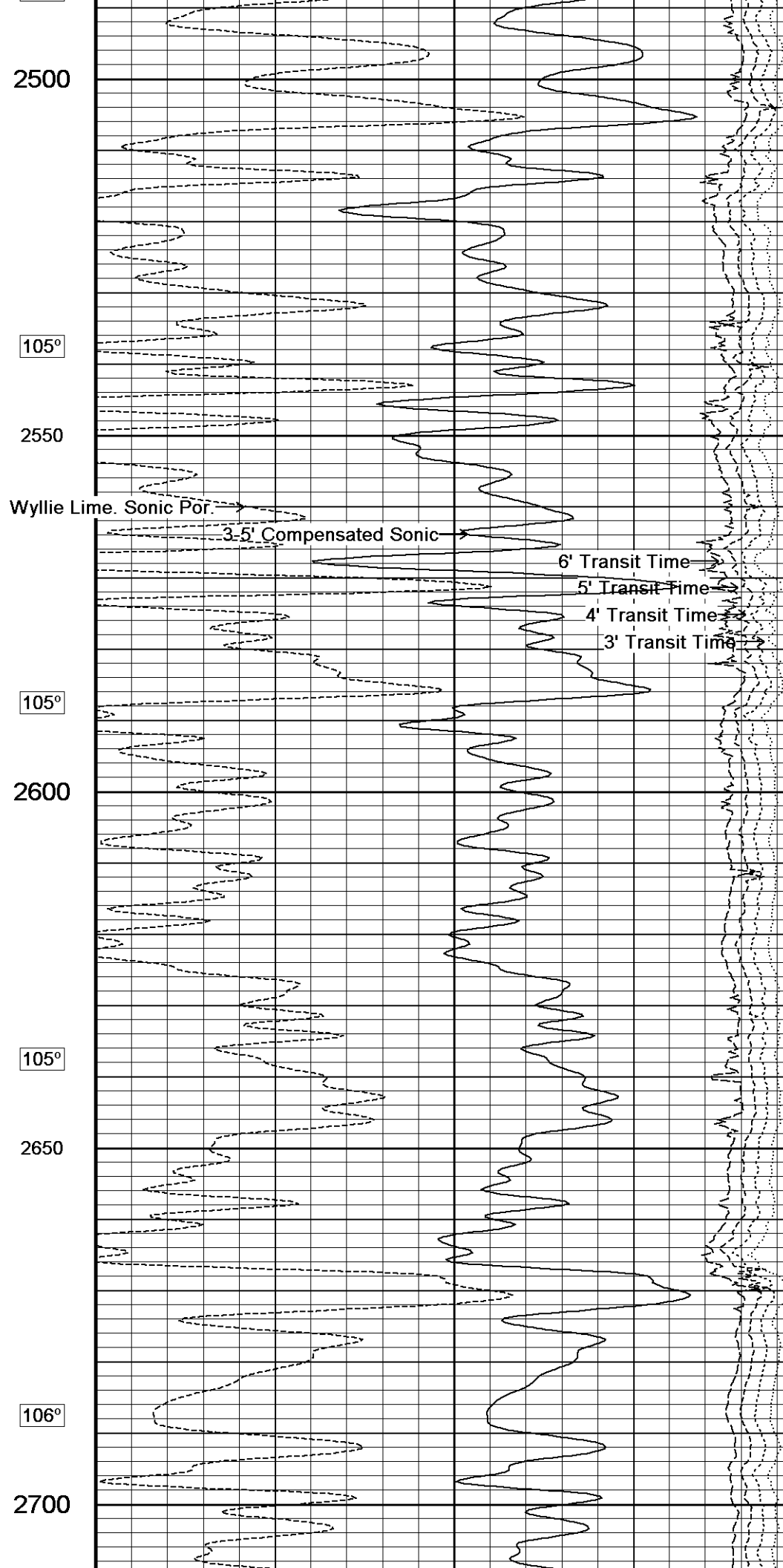
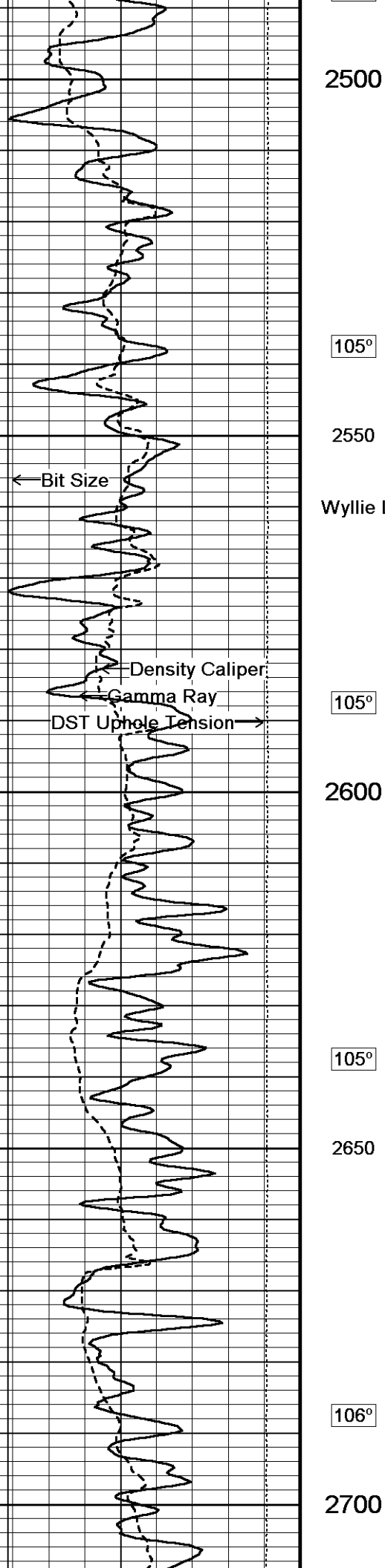
2400

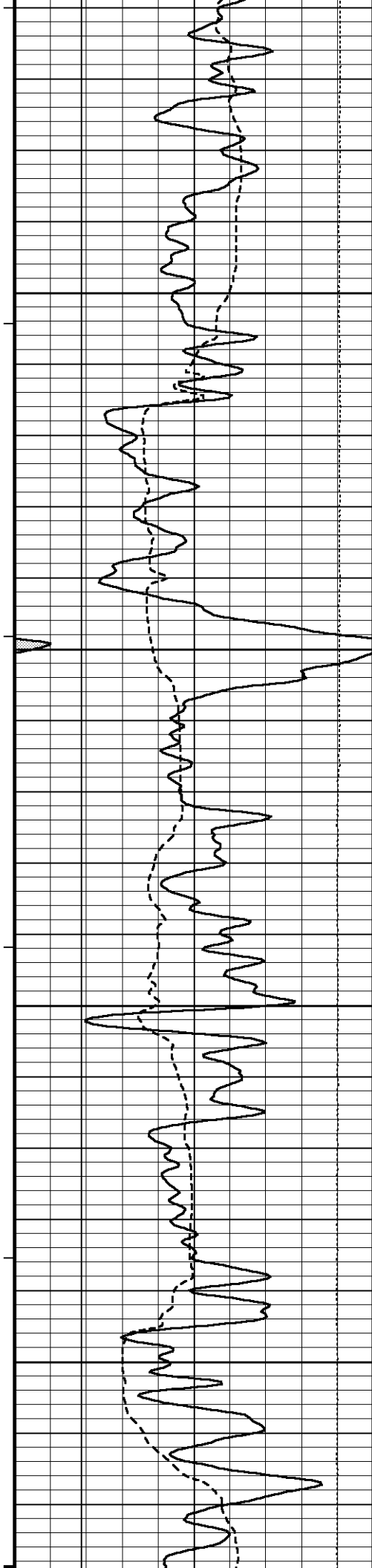
105°

2450

105°







106°

2750

106°

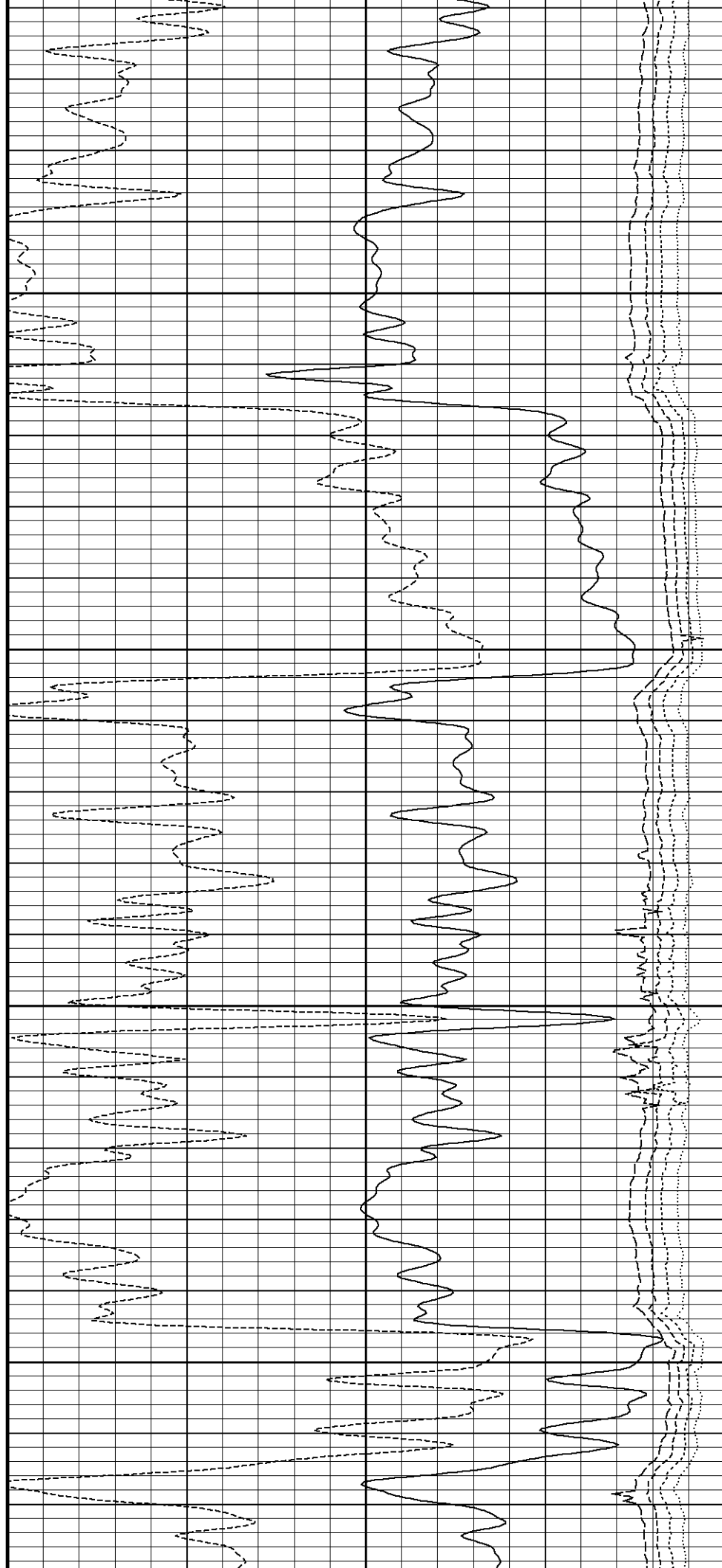
2800

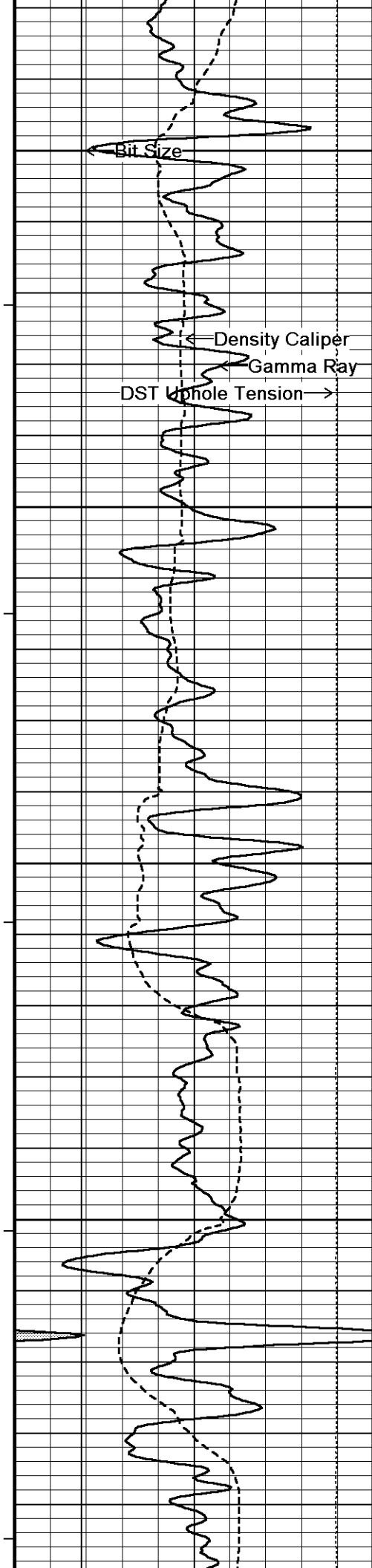
106°

2850

107°

2900





107°

2950

107°

3000

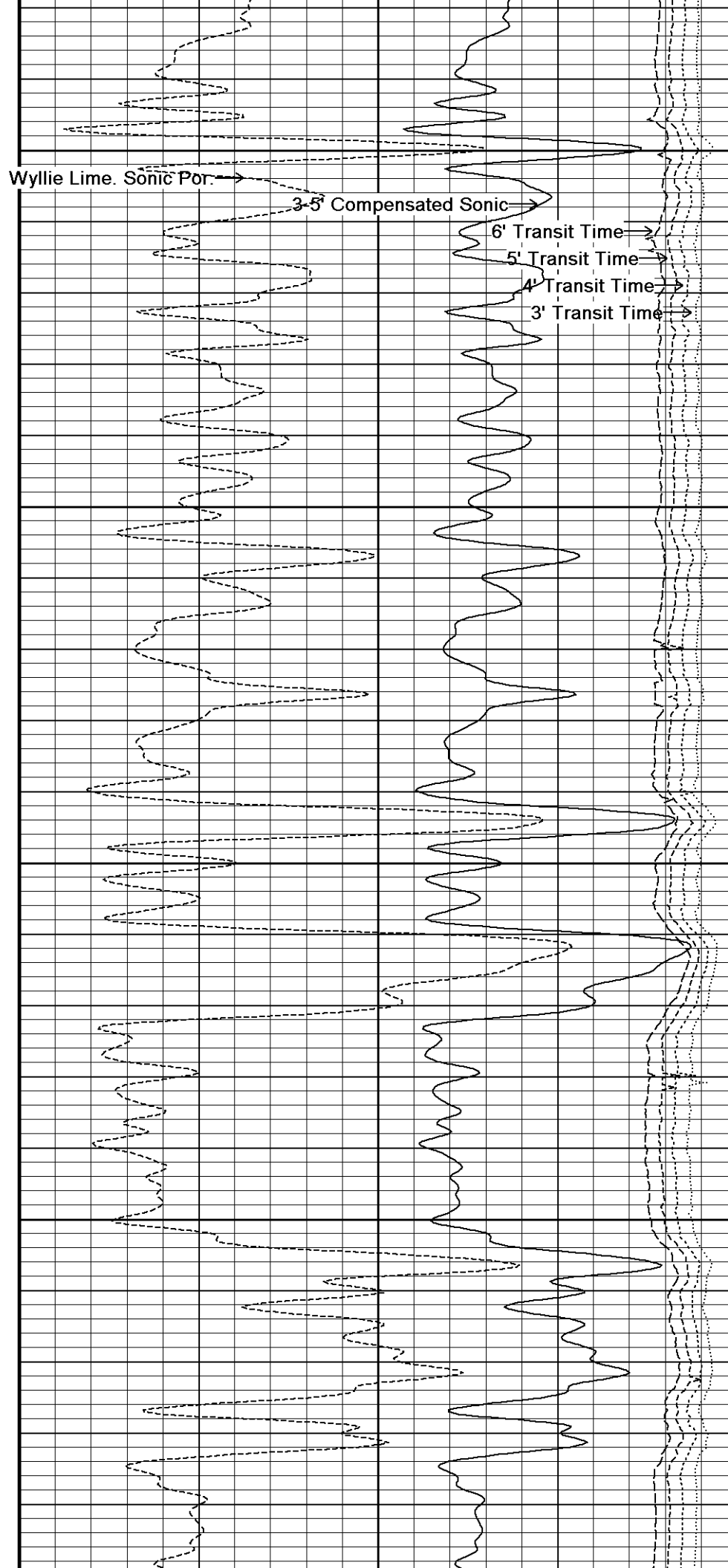
107°

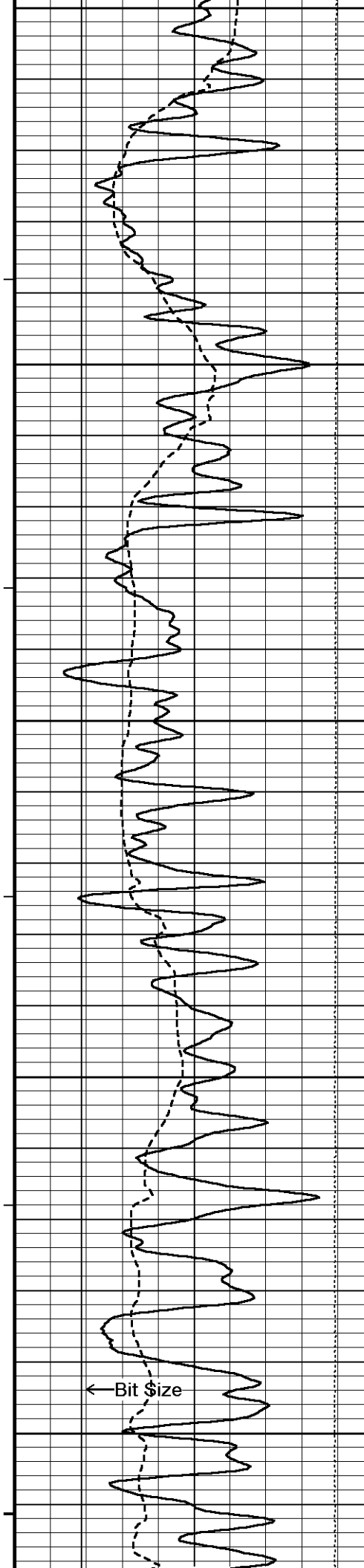
3050

107°

3100

108°





3150

108°

3200

108°

3250

108°

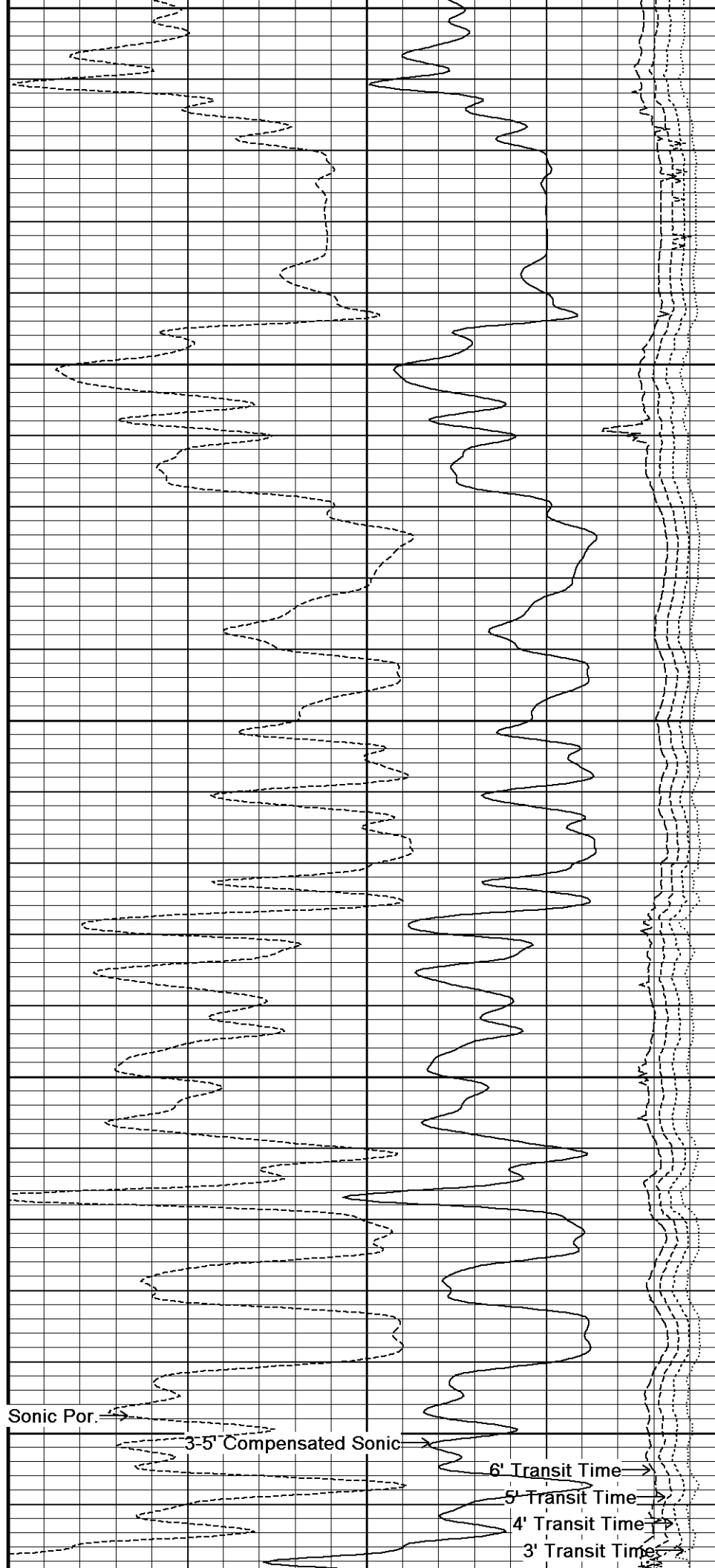
3300

109°

← Bit Size

Wyllie Lime. Sonic Por. →

3350



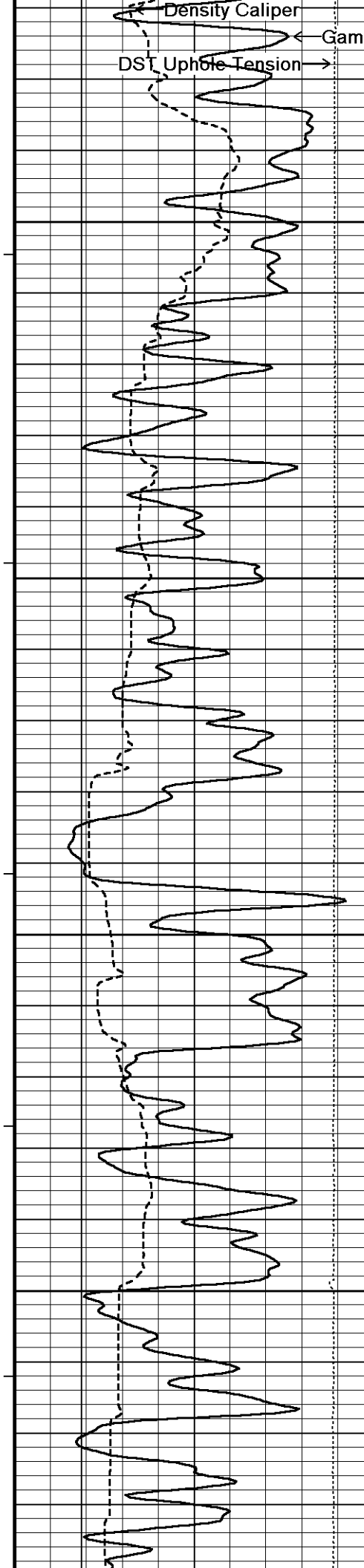
3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →



109°

3400

109°

3450

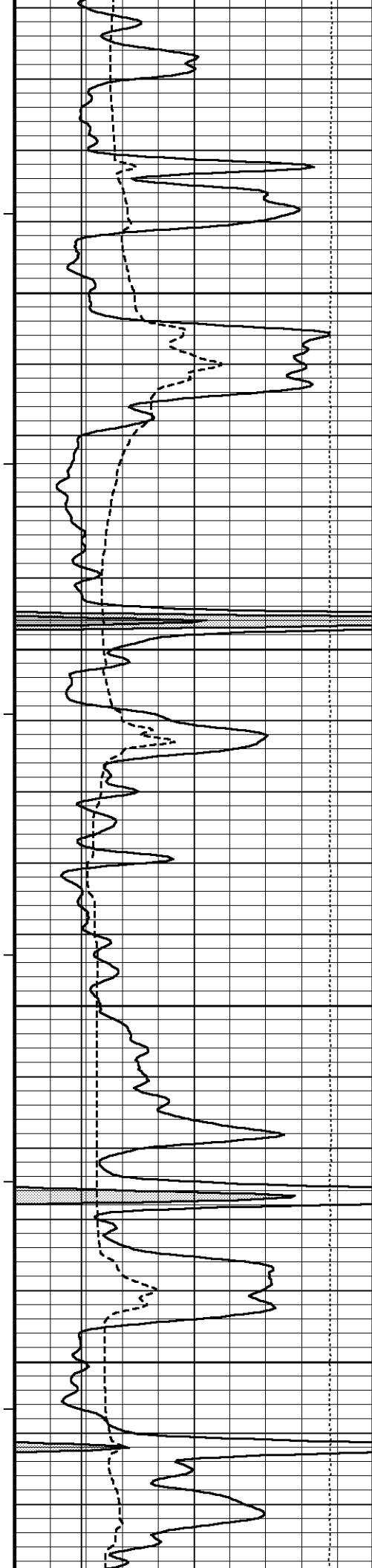
109°

3500

109°

3550

109°



111°

3850

111°

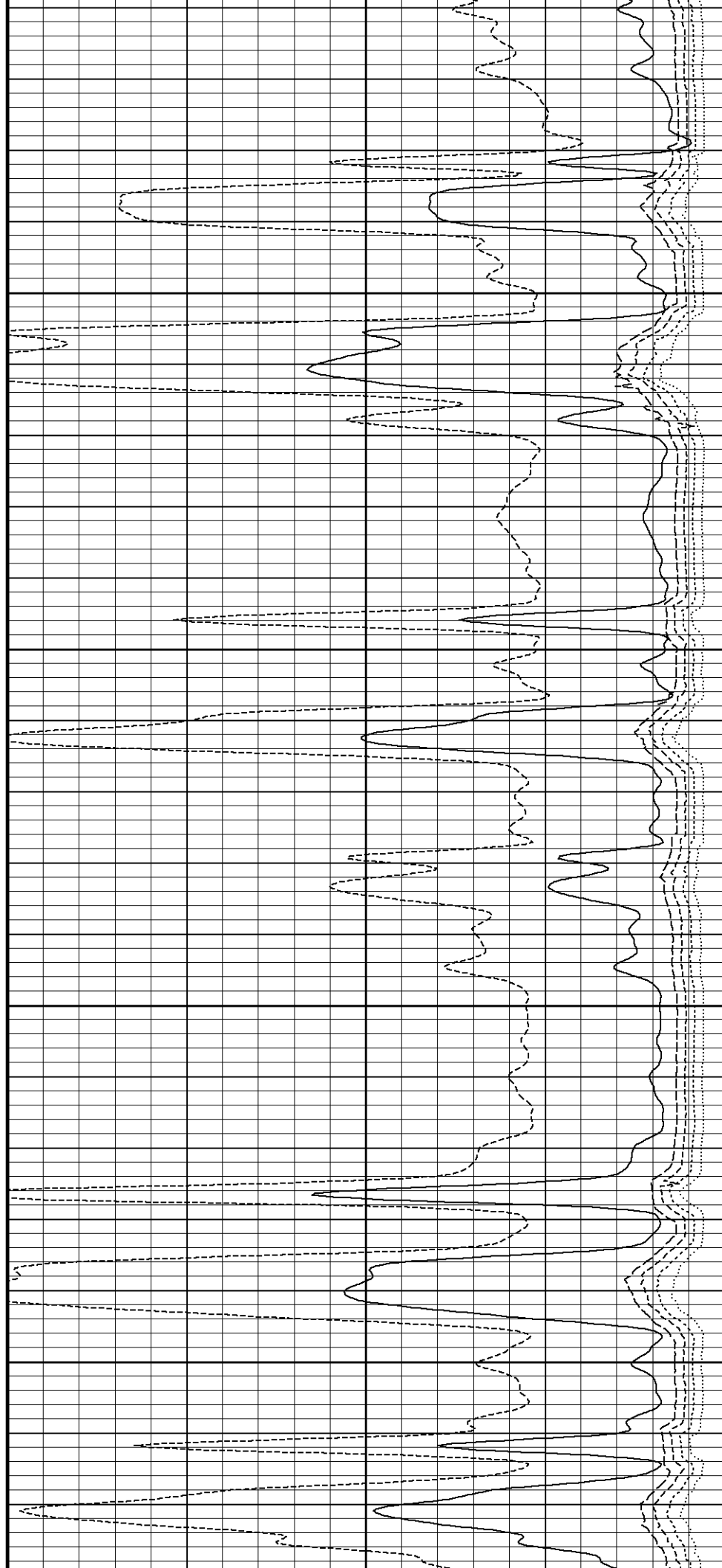
3900

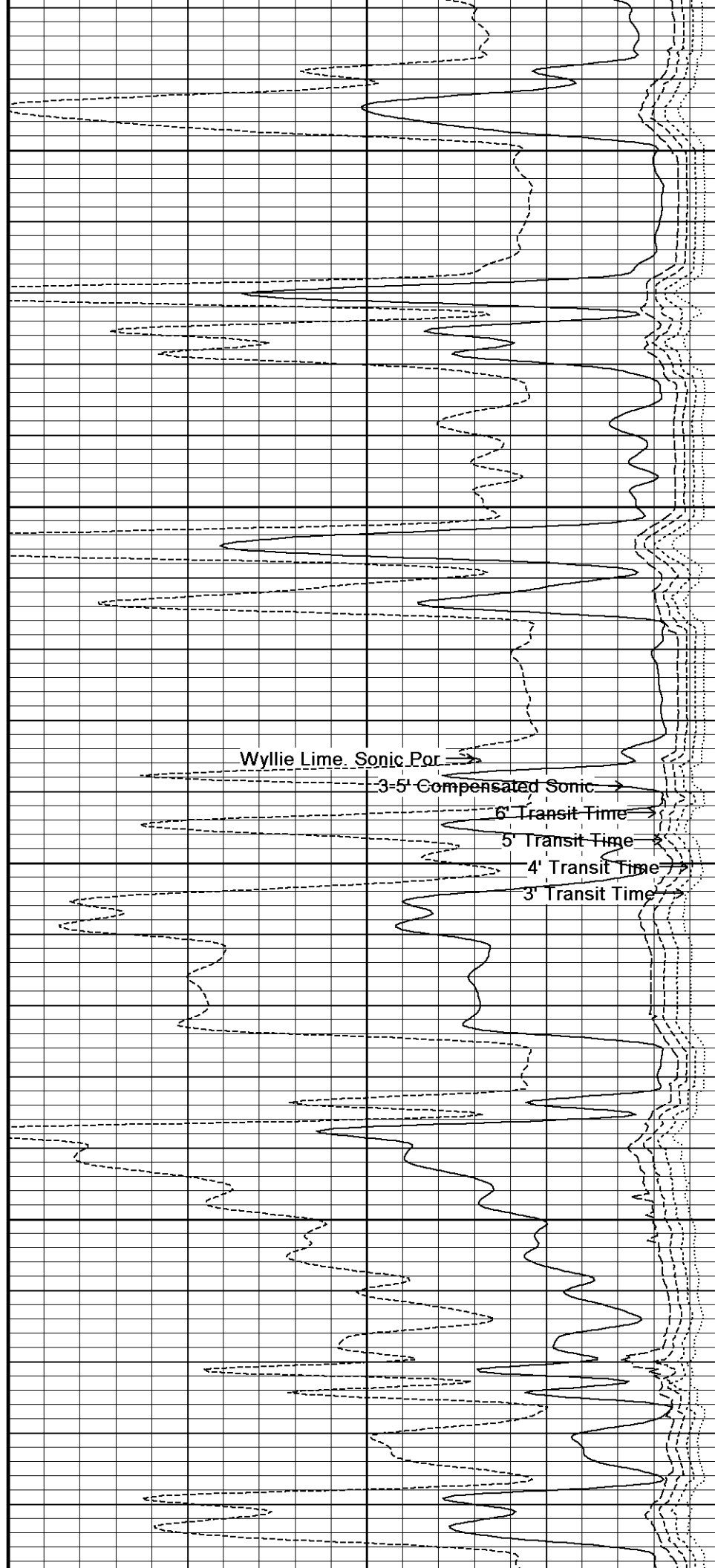
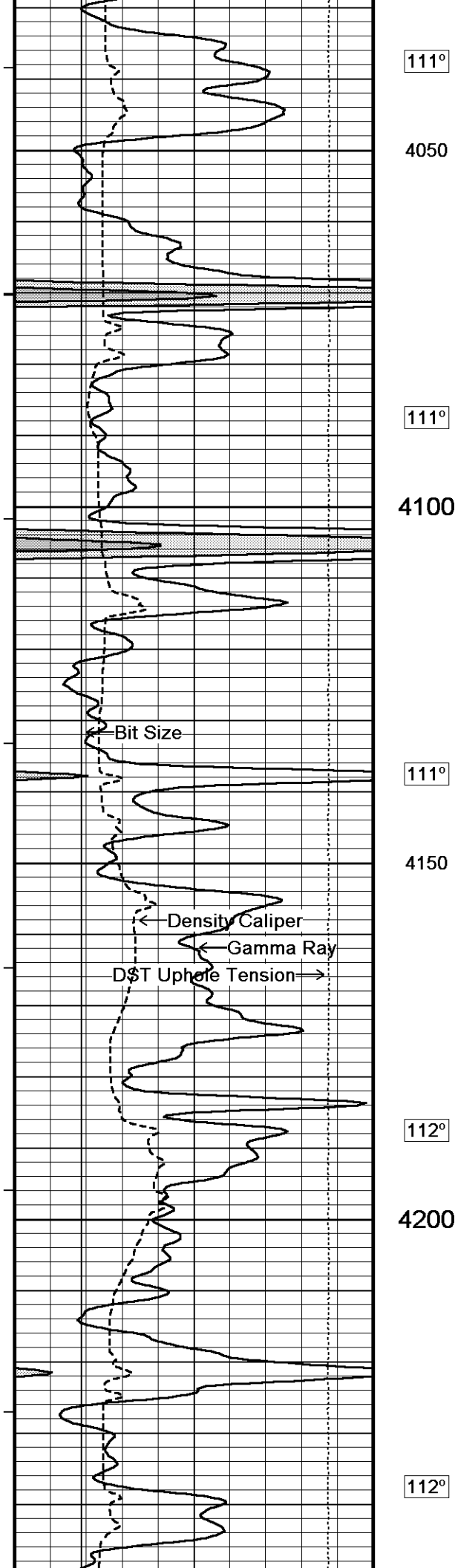
111°

3950

111°

4000







4250

113°

4300

113°

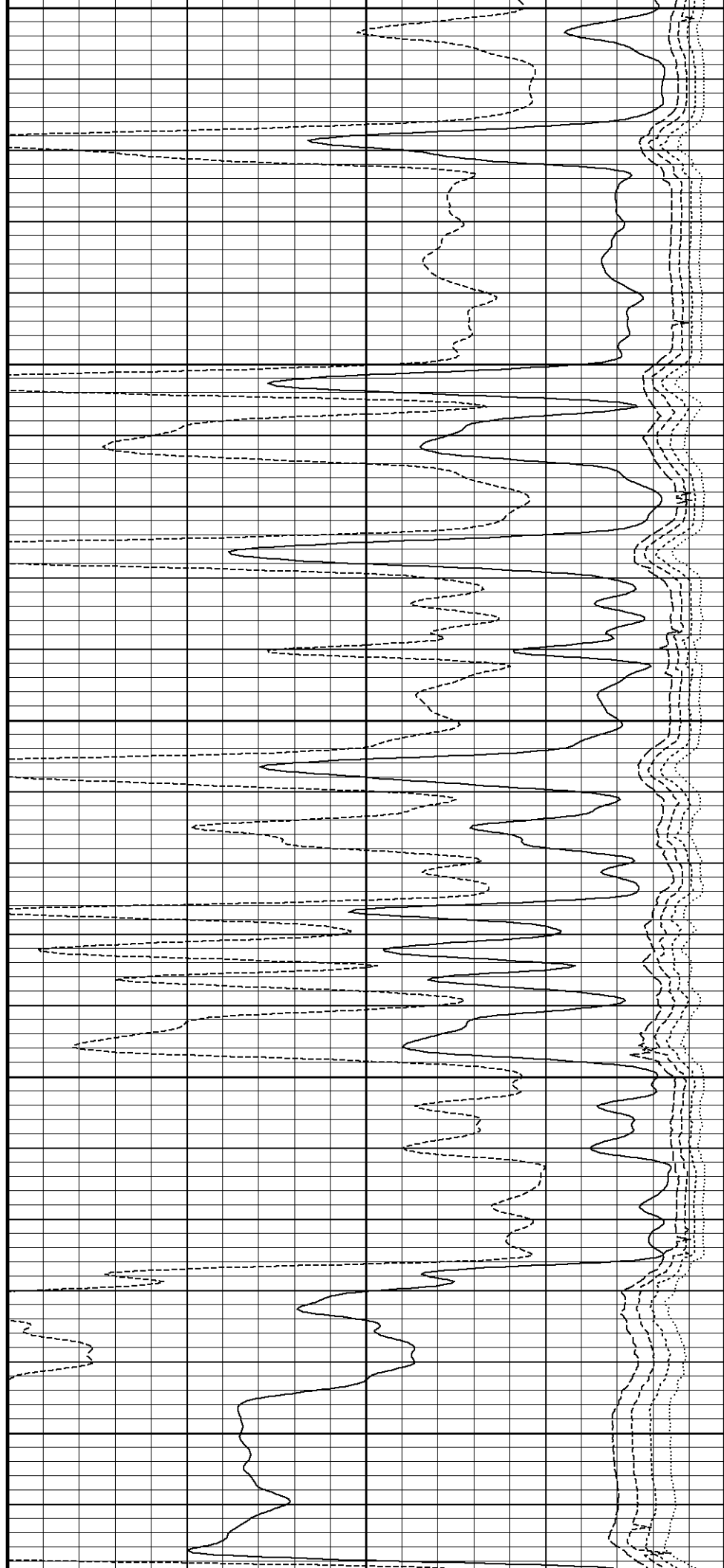
4350

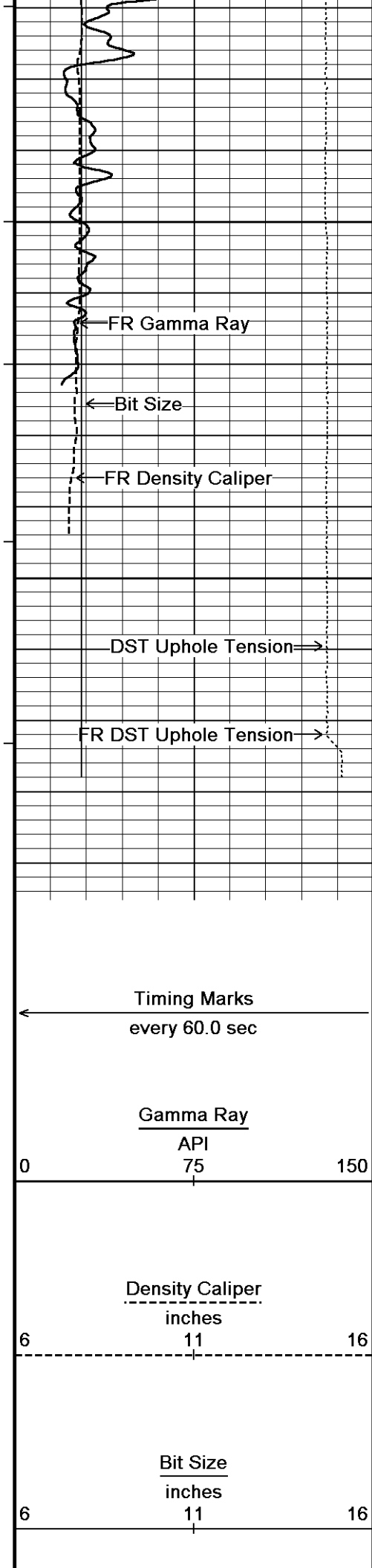
114°

4400

115°

4450





115°

4500

4550

4592

Depth In Feet

Wyllie Lime. Sonic Por.

3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time

FR Wyllie Lime. Sonic Por.

FR 5' Transit Time

3-5' Compensated Sonic

microsec/foot

140

115

90

65

40

Wyllie Lime. Sonic Por.

percent

30

20

10

0

-10

3' Transit Time
microseconds

1100 100

4' Transit Time
microseconds

1100 100

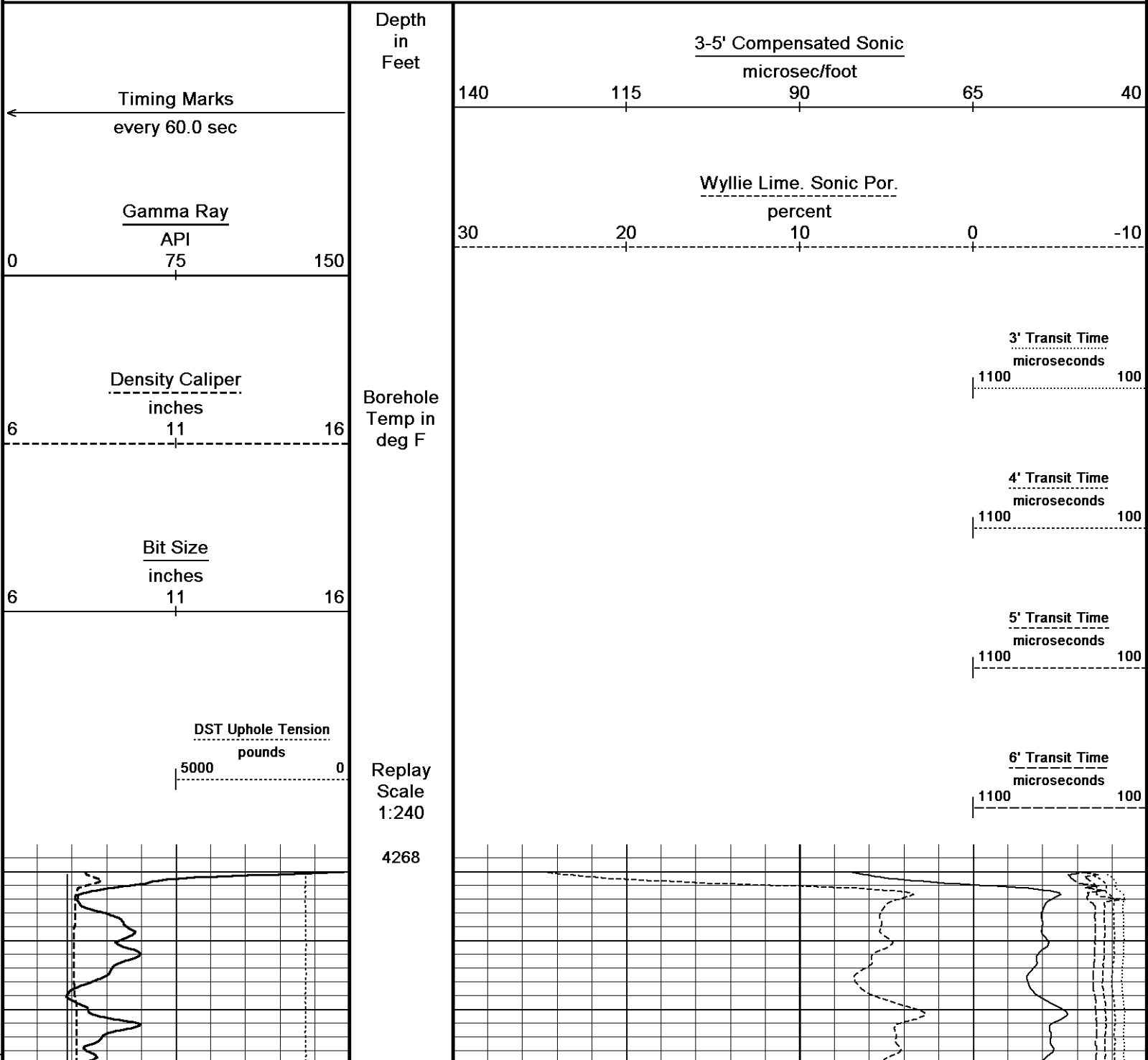
5' Transit Time
microseconds

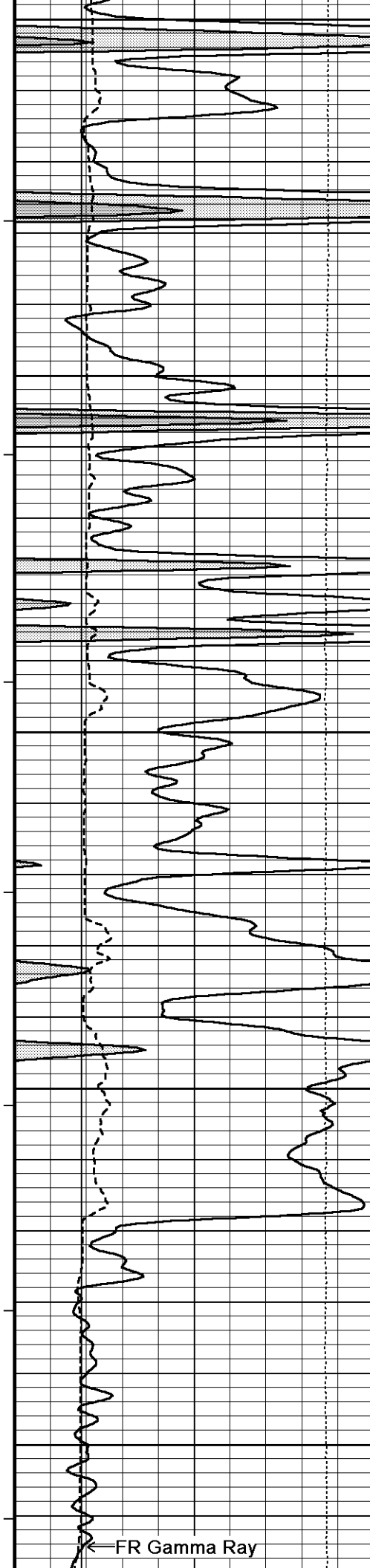


Depth Based Data - Maximum Sampling Increment 10.0cm Filename: C:\Users\SSTRIB~1\AppData\Local\Temp\Weatherford PreView0\Ellis 1-23_002.dta System Versions: Logged with 11.03.2789 Plotted with 11.02.2164	Plotted on 02-MAY-2011 10:30 Recorded on 26-APR-2011 15:33
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Depth Based Data - Maximum Sampling Increment 10.0cm Filename: C:\Users\SSTRIB~1\AppData\Local\Temp\Weatherford PreView0\Ellis 1-23_001.dta System Versions: Logged with 11.03.2789 Plotted with 11.02.2164	Plotted on 02-MAY-2011 10:30 Recorded on 26-APR-2011 15:14
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4300

112°

4350

113°

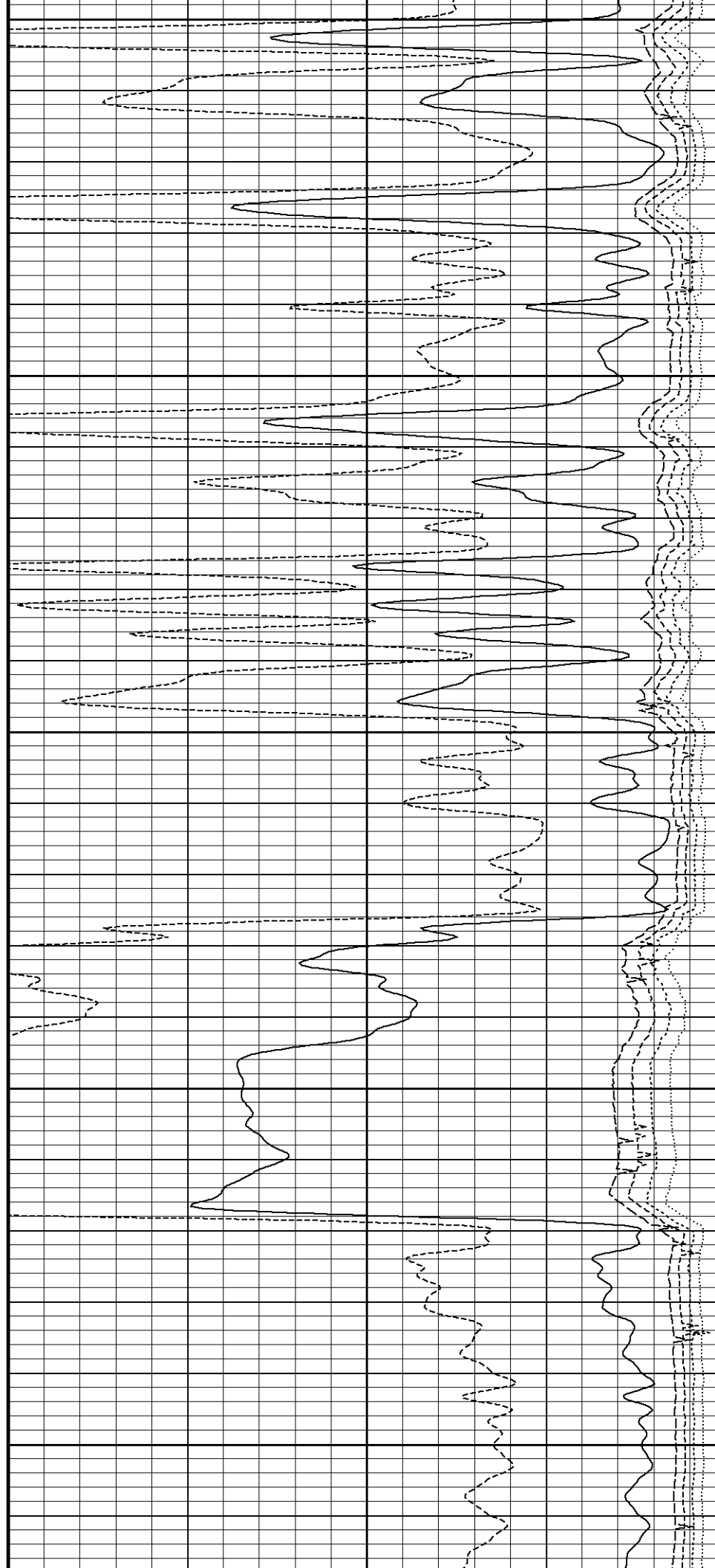
4400

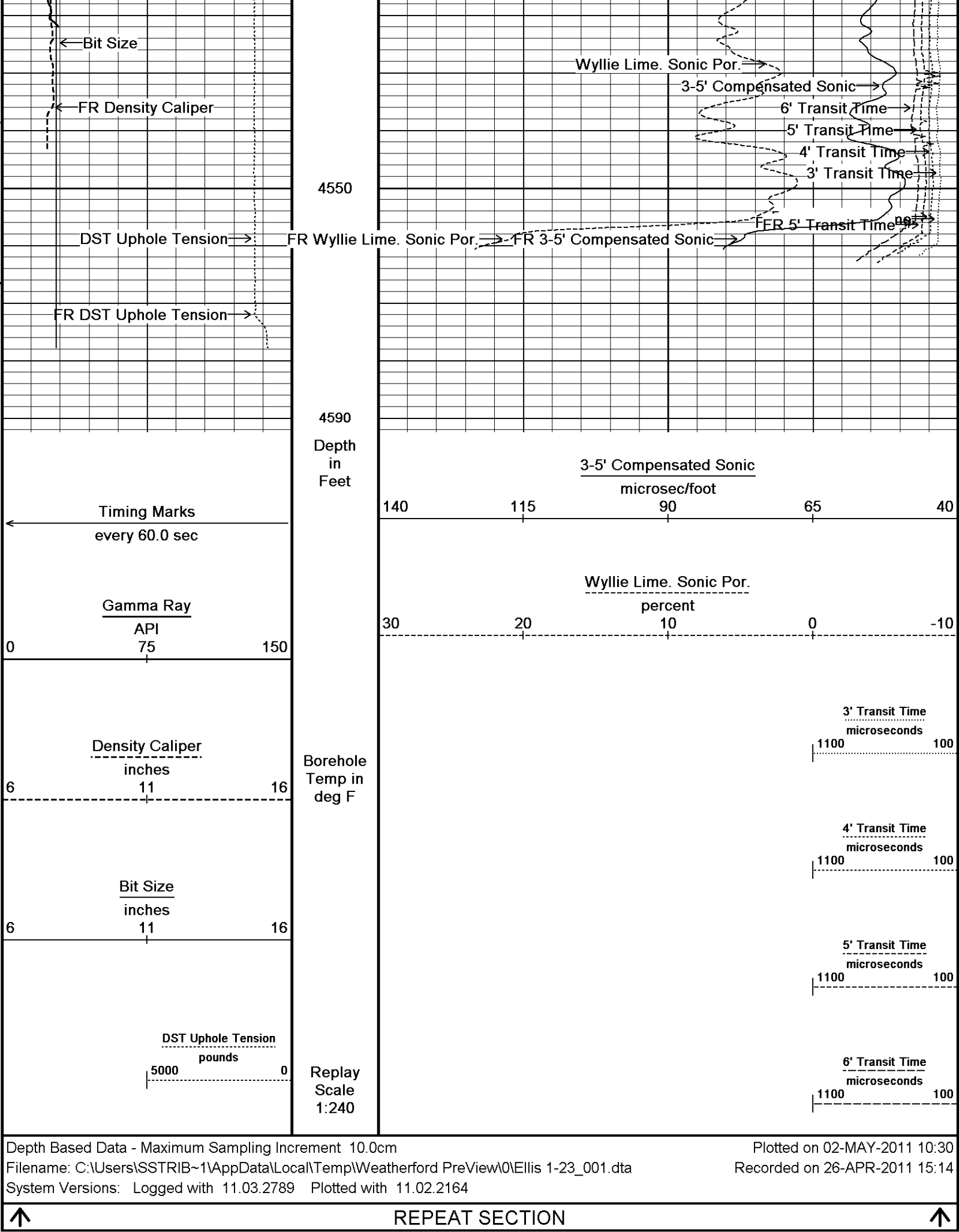
113°

4450

114°

4500





BEFORE SURVEY CALIBRATION

C:\Users\SSTRIB~1\AppData\Local\Temp\Weatherford PreView\0\Ellis 1-23.dta

General Constants All 000

Last Edited on 26-APR-2011,14:20

General Parameters

Mud Resistivity	0.700	ohm-metres
Mud Resistivity Temperature	81.000	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	1.000
RWA Constant M	2.000

Down-hole Tension Calibration All 000

Field Calibration on 30-JUN-2010

Reading No	Measured	Calibrated (lbs)
1	14112.01	10.00
2	15164.79	427.00

Down-hole Tension Calibration SMS 0

Field Calibration on 30-JUN-2010

Reading No	Measured	Calibrated (lbs)
1	14112.01	10.00
2	15164.79	427.00

High Resolution Temperature Calibration MCG-C 139

Field Calibration on 03-SEP-2010,11:23

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

High Resolution Temperature Constants MCG-C 139

Last Edited on

Pre-filter Length	11
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SP Calibration MCG-C 139

Field Calibration on 04-MAR-2011 06:37

	Measured	Calibrated (mV)
Reference 1	103.7	100.0
Reference 2	-96.9	-100.0

Gamma Calibration MCG-C 139

Field Calibration on 25-APR-2011 20:54

	Measured	Calibrated (API)
Background	92	61
Calibrator (Gross)	1187	786
Calibrator (Net)	1095	725

Gamma Constants MCG-C 139

Last Edited on 26-APR-2011,14:21

Gamma Calibrator Number	grc38	
Mud Density	1.14	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 11-MAR-2011 11:10

Field Check on 25-APR-2011 20:38

Base Calibration

		Measured	Calibrated (ohm-m)
Channel	Resistor 1	Resistor 2	Resistor 1 Resistor 2
Micro Normal	12.2	60.2	2.6 12.8
Micro Inverse	15.6	78.3	1.7 8.4

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	32.1	32.1
Micro Inverse	16.3	16.3

Micro Normal and Micro Inverse Constants MML-A 16

Last Edited on 11-APR-2011,09:08

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	N/A	inches

Caliper Calibration MML-A 16

Base Calibration on 11-MAR-2011 11:20

Field Calibration on 25-APR-2011 20:37

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13875	5.98
2	17350	7.97
3	20581	9.86
4	24656	11.92
5	0	0.00
6	N/A	N/A

Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	6.03	5.98

Neutron Calibration MDN-A.B 66

Base Calibration on 11-MAR-2011 13:54

Field Check on 25-APR-2011 20:50

Base Calibration		
	Measured	Calibrated (cps)
	Near Far	Near Far
	3091 97	3714 110
Ratio	31.957	33.764

Field Calibrator at Base		Calibrated (cps)
		1660 2371
Ratio		0.700

Field Check		Calibrated (cps)
		1673 2396
Ratio		0.698

Neutron Constants MDN-A.B 66

Last Edited on 26-APR-2011,14:21

Neutron Source Id	P58125B
Neutron Jig Number	5824NE
Epithermal Neutron	No
Caliper Source for Processing	Density Caliper
Stand-off	0.00 inches
Mud Density	1.14 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
Formation Fluid Salinity Source	Constant Value
Formation Fluid Salinity	0.00 kppm
Barite Mud Correction	Not Applied

FE Calibration MFE-A.A 52

Base Calibration on 11-MAR-2011 10:55

Field Check on 25-APR-2011 20:34

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	965.7	126.8
Base Check		279.9

FE Constants MFE-A.A 52

Last Edited on 26-APR-2011,02:53

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-A.A 126

Last Edited on 11-APR-2011,08:33

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)
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
Discriminator (mV)	Depth (ft)
N/A	0.00
N/A	0.00
N/A	0.00
N/A	0.00

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
Sonic 2 Despiker	N/A

Lower	Measured	Calibrated(Deg F)
	1.00	33.80
Upper	11.00	51.80

High Resolution Temperature Constants MAI-A.A 167

Last Edited on

Pre-filter Length 11

Induction Calibration MAI-A.A 167

Base Calibration on 11-MAR-2011,09:58

Field Check on 25-APR-2011 20:33

Base Calibration

Test Loop Calibration

Measured

Calibrated (mmho/m)

Channel	Low	High	Low	High
1	17.3	474.2	9.3	966.2
2	6.3	388.4	7.6	821.4
3	3.3	259.4	5.2	566.0
4	1.9	133.0	2.6	279.2

Array Temperature 76.8 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	12.0	3842.1
2	0.0	0.0	29.3	3480.2
3	0.0	0.0	28.9	3055.9
4	0.0	0.0	19.7	2083.5
Deep	0.0	0.0	18.4	2050.7
Medium	0.0	0.0	42.1	3995.2
Shallow	0.0	0.0	42.5	5059.1

Array Temperature 0.0 57.8 Deg F

Induction Constants MAI-A.A 167

Last Edited on 24-APR-2011,22:39

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	

Caliper Calibration MPD-B 35

Base Calibration on 11-MAR-2011 11:34

Field Calibration on 25-APR-2011 20:40

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17936	3.99
2	28079	5.98
3	38384	7.97
4	48048	9.86
5	59047	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.02	5.98

Photo Density Calibration MPD-B 35

Base Calibration on 11-MAR-2011 11:54

Field Check on 25-APR-2011 20:44

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	57876	27553	59556	30836
Reference 2	23524	2615	24941	2541

Field Check at Base

1175.2 1398.5

Field Check

1171.2 1390.3

PE Calibration

Base Calibration	Measured		Calibrated
	WS	WH	Ratio
Background	211	1039	
Reference 1	21426	57673	0.375
Reference 2	6234	23377	0.270

Field Check at Base

211.2 1039.0

Field Check

210.1 1035.0

Density Constants MPD-B 35

Last Edited on 26-APR-2011,14:21

Density Source Id	p50557b
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	1.14 gm/cc
Mud Density Z/A Multiplier	1.11
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 (ft)
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

Compact Comms Gamma
MCG-C 139 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 35 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

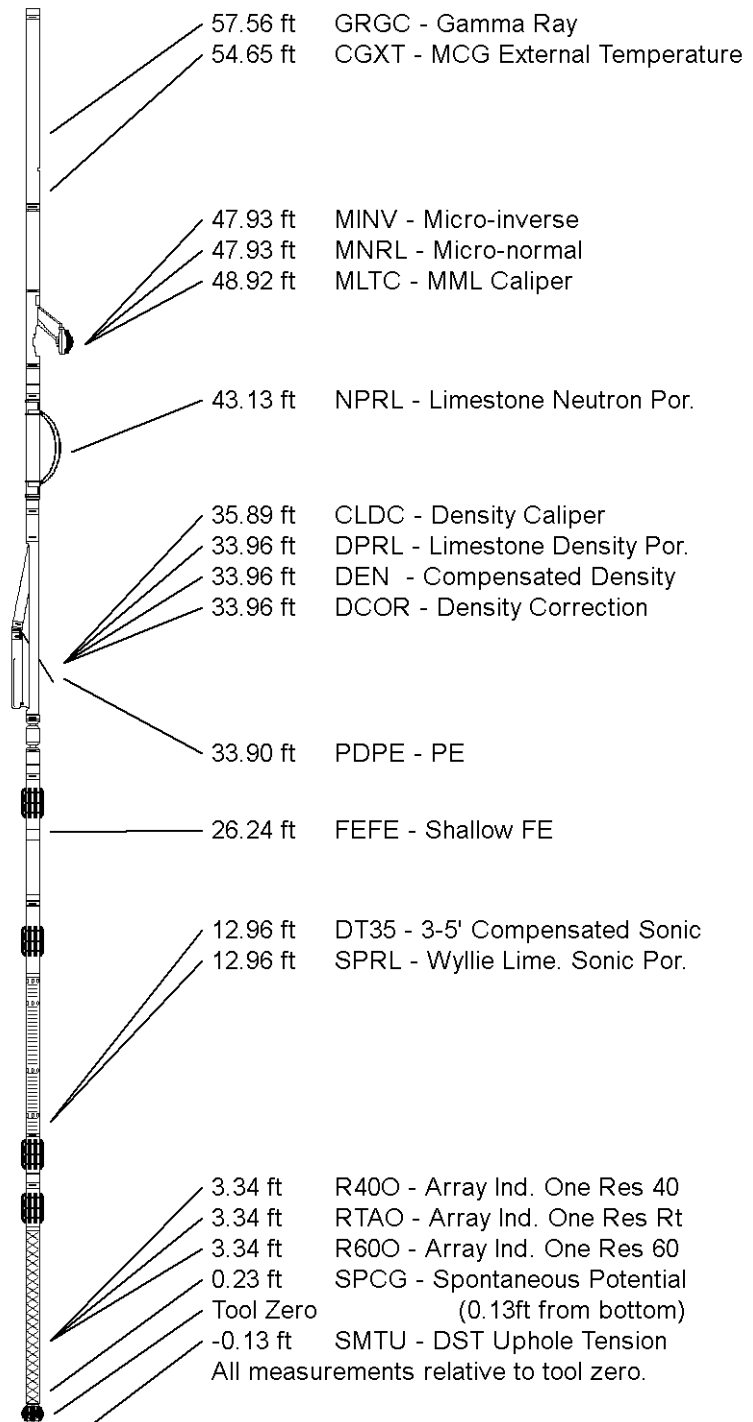
SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 52 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-A.A 126 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 62.84 ft Weight: 480.6 lb



COMPANY	GRAND MESA
WELL	ELLIS 1-23
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A./KANSAS

Elevation Kelly Bushing	2785.00	feet
Elevation Drill Floor	2784.00	feet
Elevation Ground Level	2780.00	feet

First Reading	4559.00	feet
Depth Driller	4570.00	feet
Depth Logger	4572.00	feet



COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME



