



Weatherford

**COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

COMPANY	O'BRIEN RESOURCES, LLC.		
WELL	JECCHA 4 #2		
FIELD	WILDCAT		
PROVINCE/COUNTY	RUSH		
COUNTRY/STATE	U.S.A. / KANSAS		
LOCATION	1302' FNL & 2137' FWL		
SEC 4	TWP 19S	RGE 17W	Other Services
Latitude			MDN/MPD
Longitude			MML
API Number	15-165-22137		MAI/MFE
Permanent Datum GL, Elevation	2070 feet		Elevations:
Log Measured From KB			KB 2083.00
Drilling Measured From KB @ 13 FEET			DF 2081.00
			GL 2070.00
Date	04-OCT-2016		
Run Number	ONE		
Service Order	4558-162772378		
Depth Driller	3907.00	feet	
Depth Logger	3908.00	feet	
First Reading	3895.00	feet	
Last Reading	267.00	feet	
Casing Driller	265.00	feet	
Casing Logger	267.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.35 lb/USg	53.00 CP	
PH / Fluid Loss	9.50	13.60 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.46 @ 75.0	ohm-m	
Rmf @ Measured Temp	0.37 @ 75.0	ohm-m	
Rmc @ Measured Temp	0.55 @ 75.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.33 @103.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	103.00	deg F	
Equipment / Base	13096	OKC	
Recorded By	ADAM SILL		
Witnessed By	JIM MUSGROVE		

BOREHOLE RECORD			Last Edited: 04-OCT-2016 13:29
Bit Size inches	Depth From feet	Depth To feet	
7.875	265.00	3907.00	

CASING RECORD			
Type	Size inches	Depth From feet	Shoe Depth feet
SURFACE	8.625	0.00	265.00
			Weight pounds/ft
			24.00

REMARKS

- SOFTWARE ISSUE: WLS 15.03.5939.

- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION.
 - HARDWARE: DUAL BOWSPRING USED ON MDN.
 0.5 INCH STANDOFF USED ON MFE.
 TWO 0.5 INCH STANDOFFS USED ON MSS.
 0.5 INCH STANDOFF USED ON MAI.

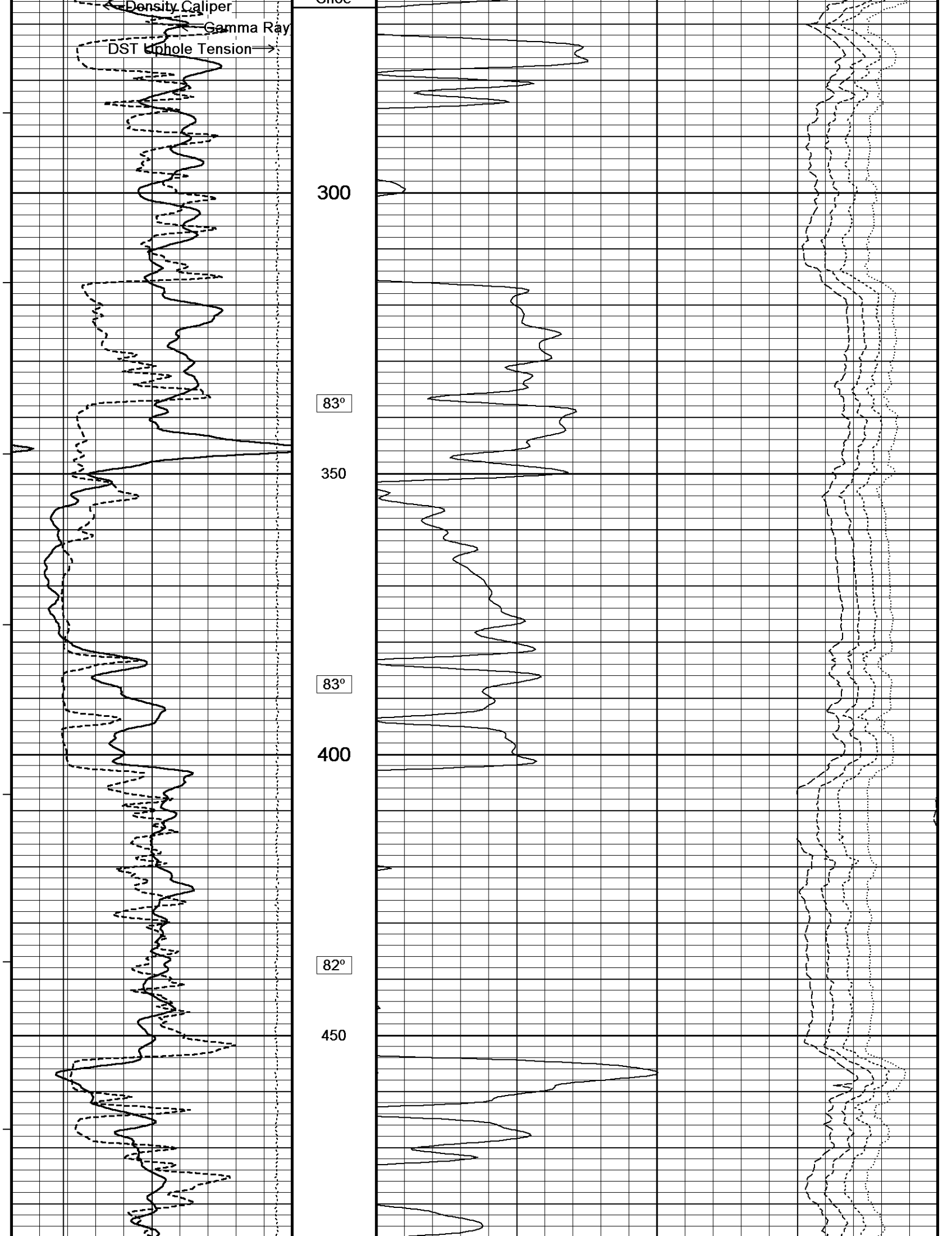
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.

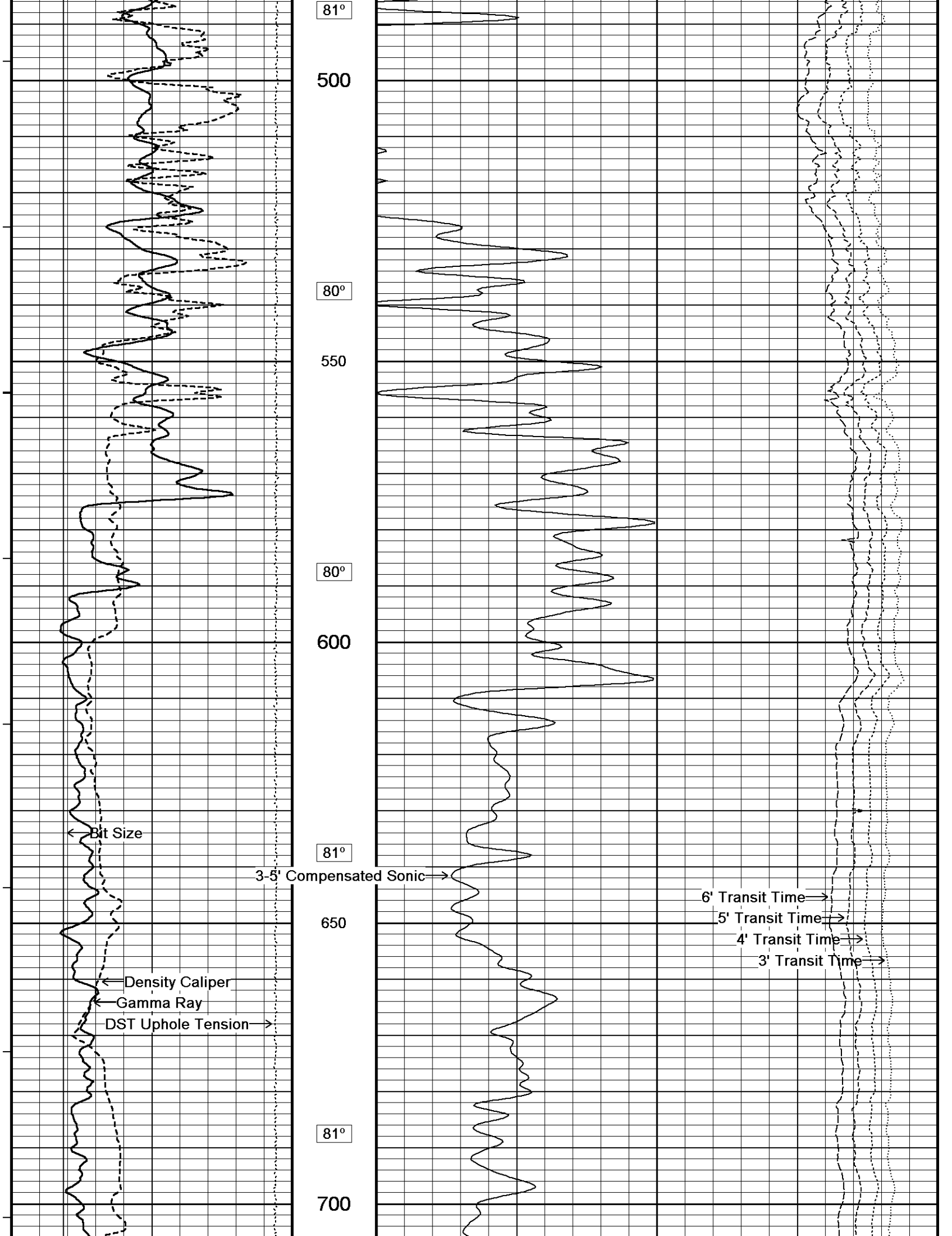
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.

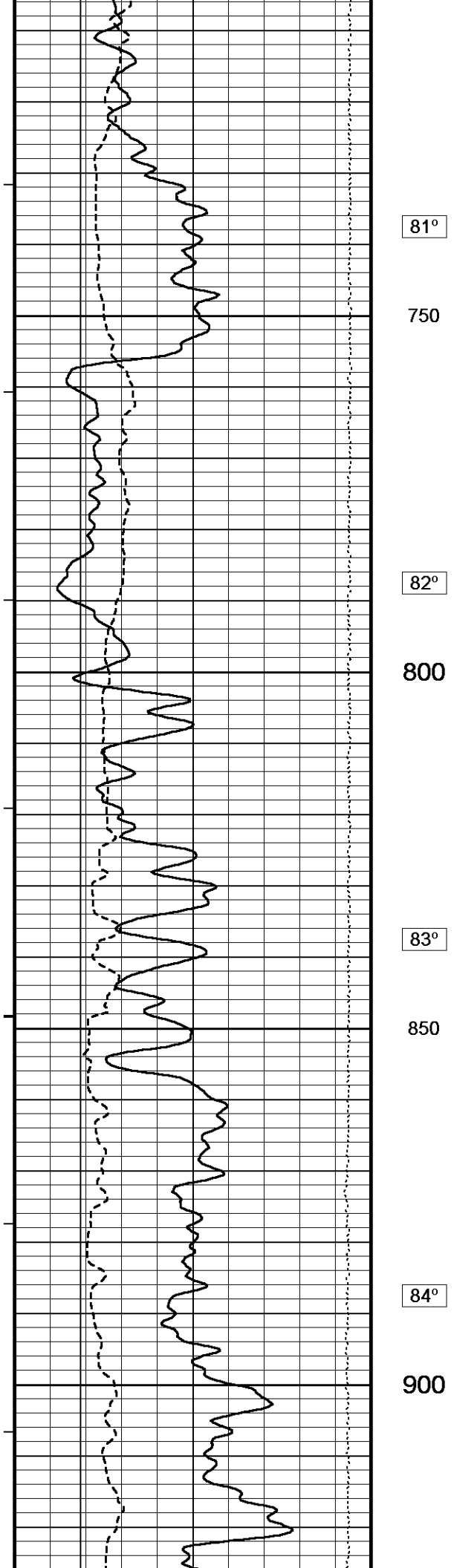
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 1742 CU.FT.

- ANNULAR HOLE VOLUME WITH 4.5 INCH PRODUCTION CASING FROM TD TO 2300: 466 CU.FT.







81°

750

82°

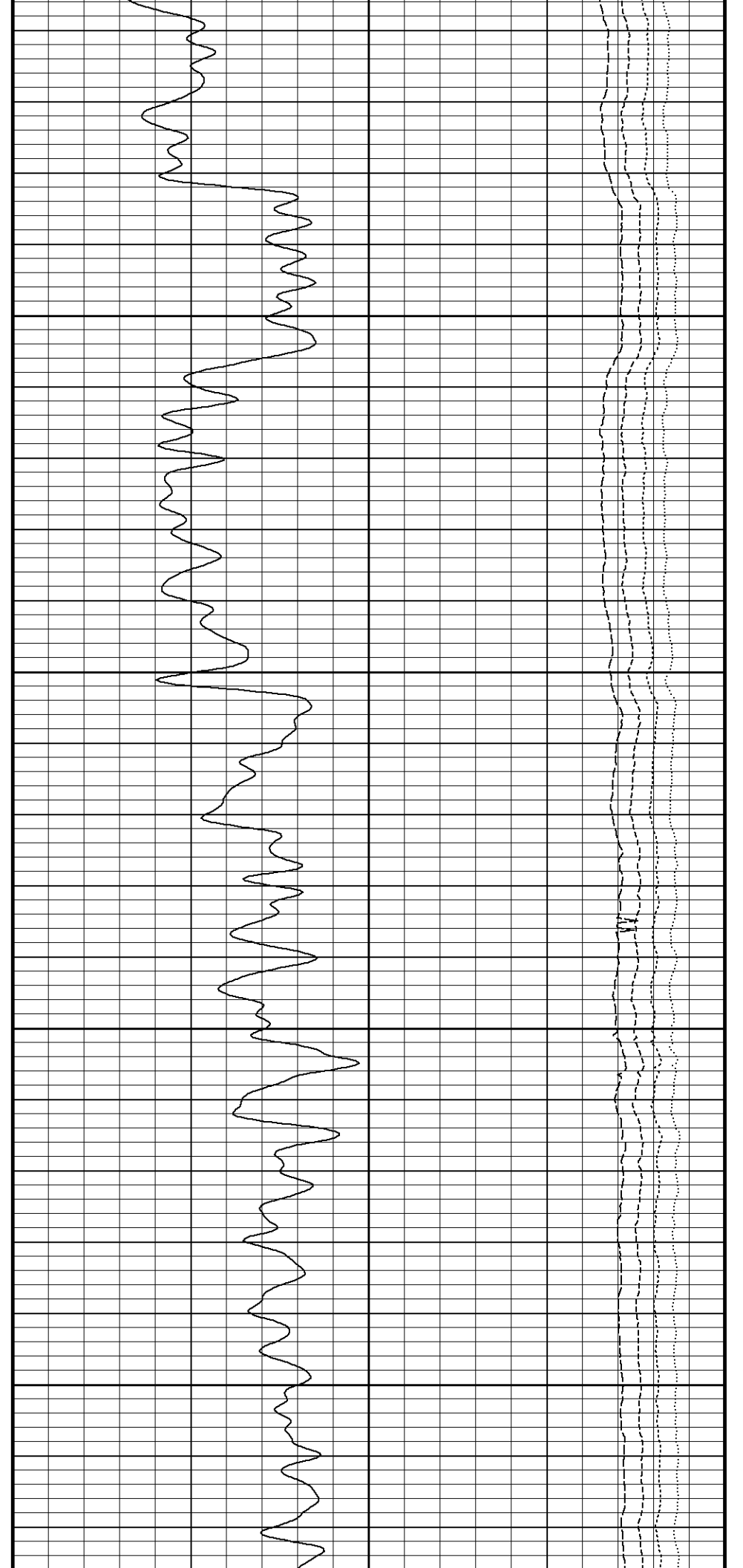
800

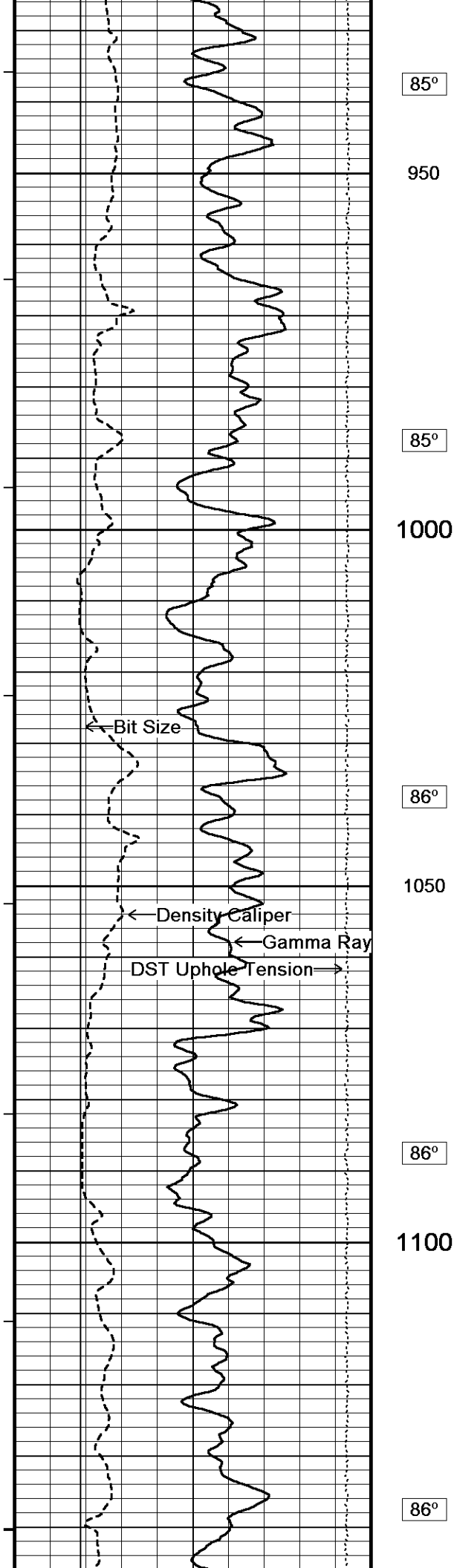
83°

850

84°

900





85°

950

85°

1000

← Bit Size

86°

1050

← Density Caliper

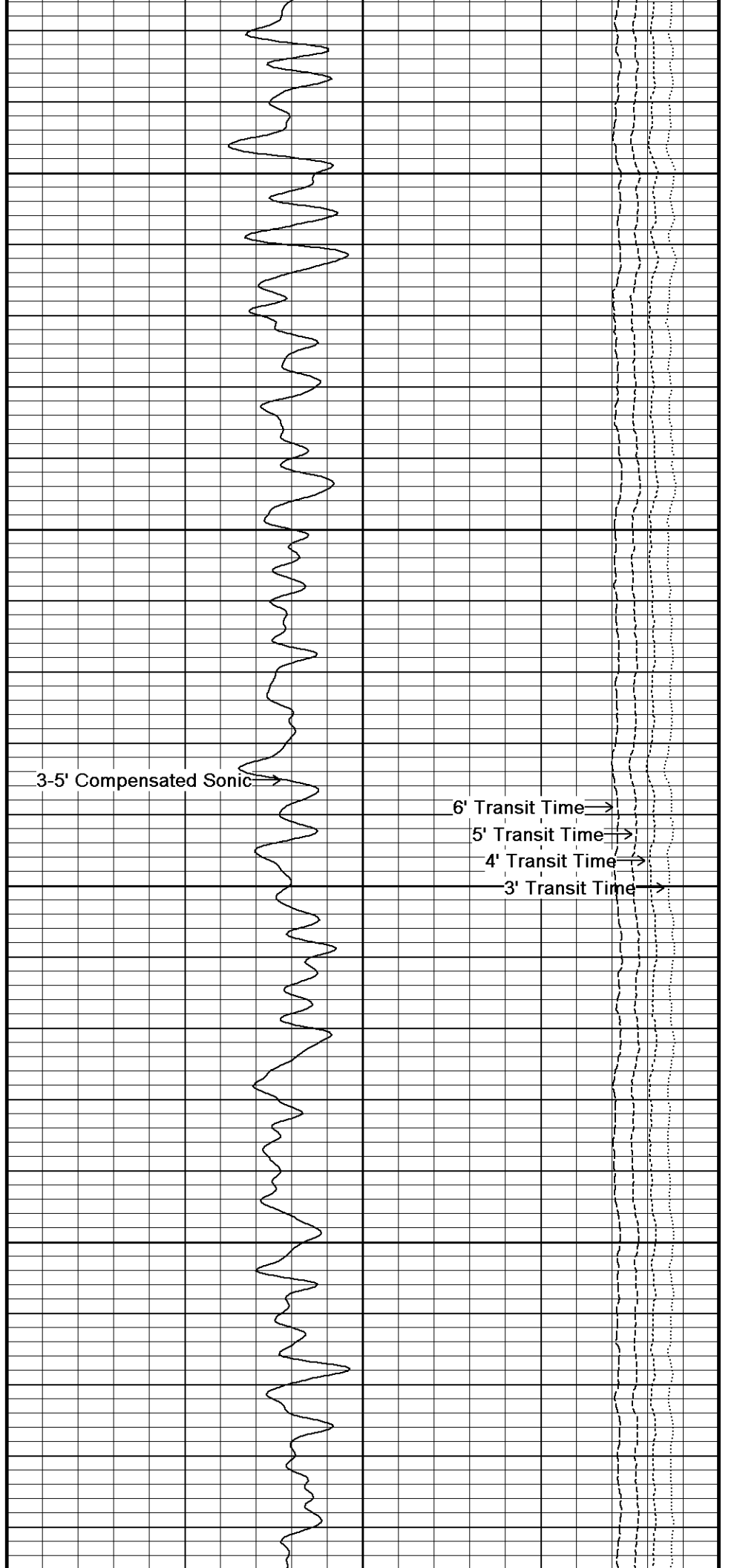
← Gamma Ray

DST Uphole Tension →

86°

1100

86°



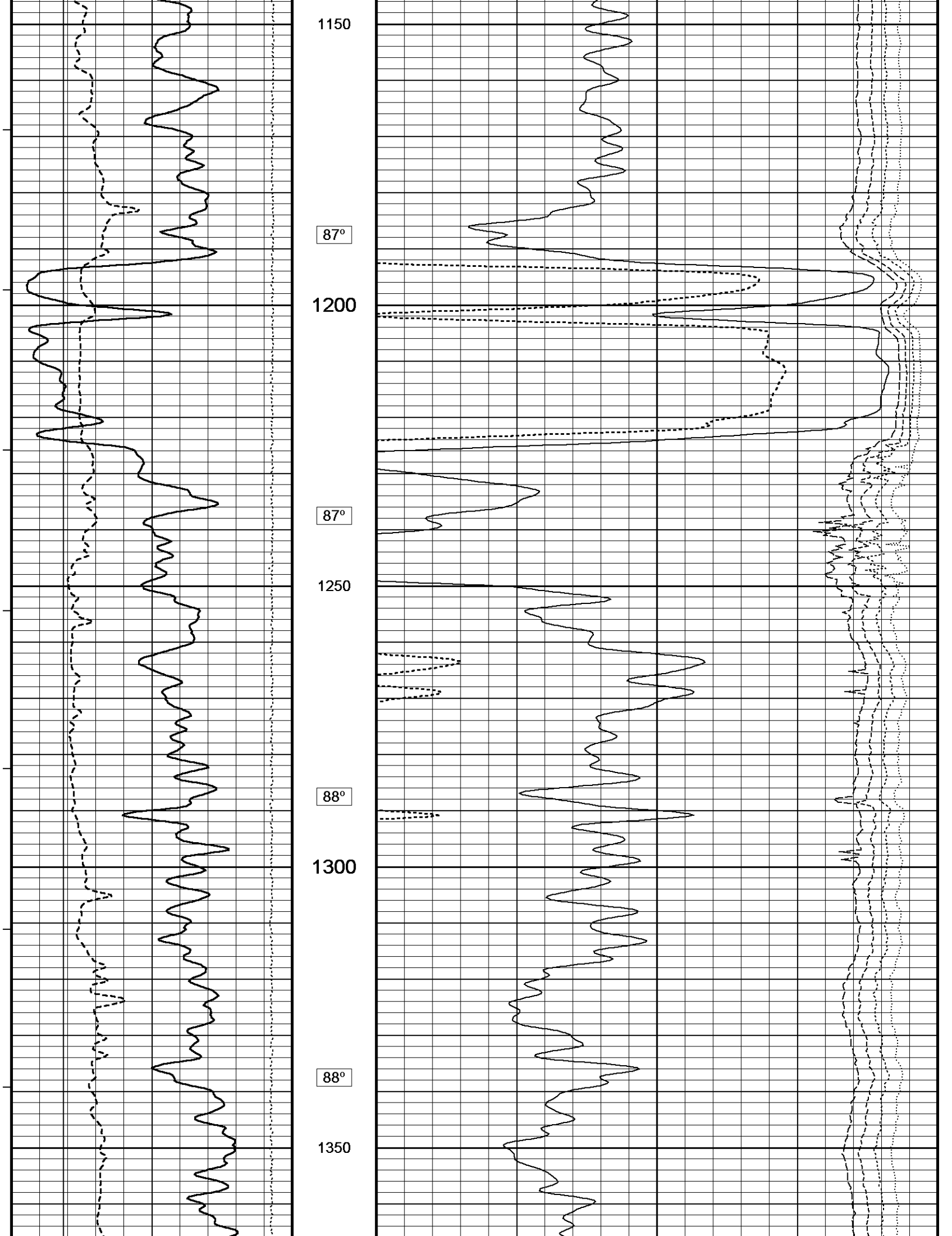
3-5' Compensated Sonic →

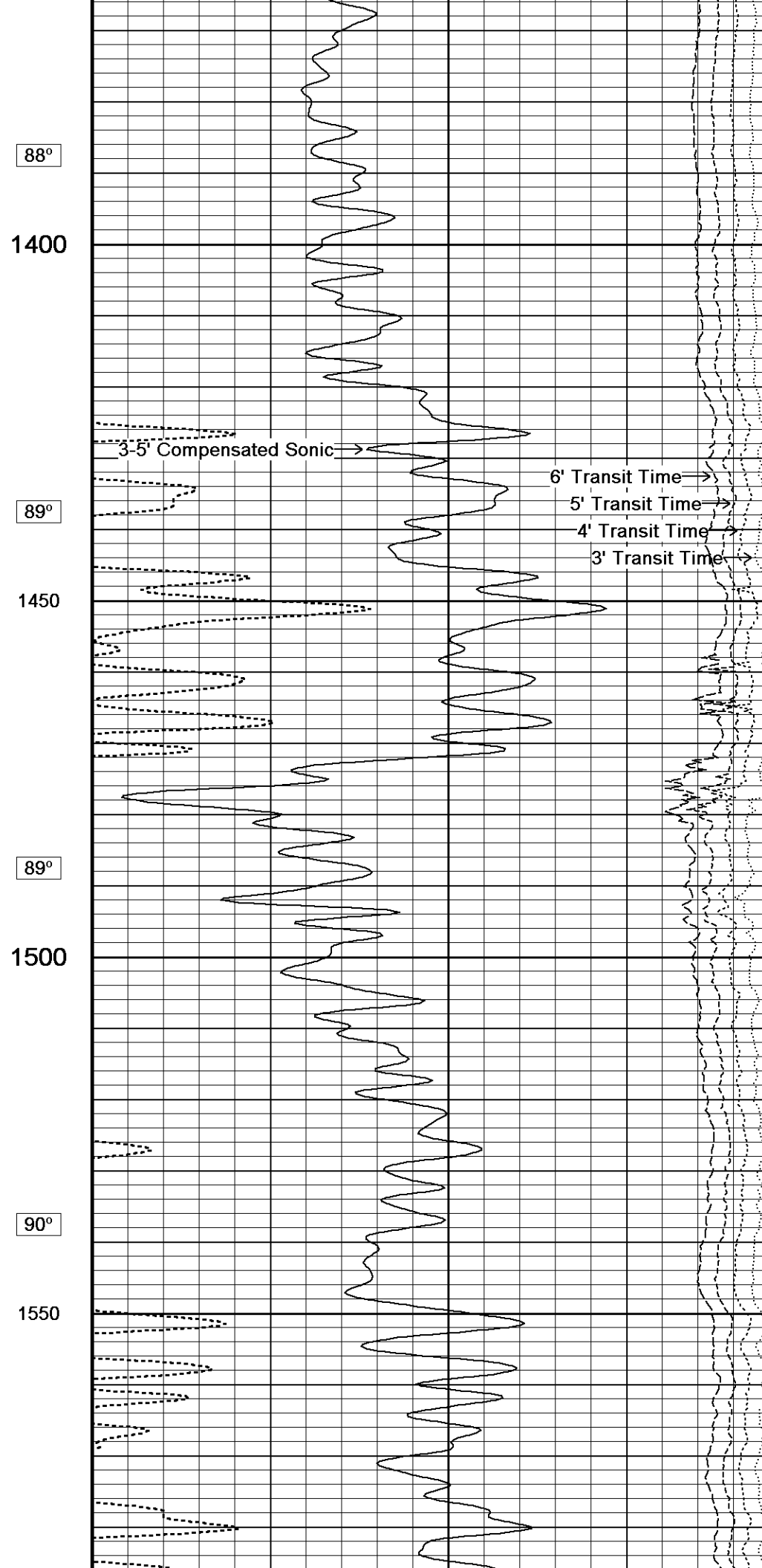
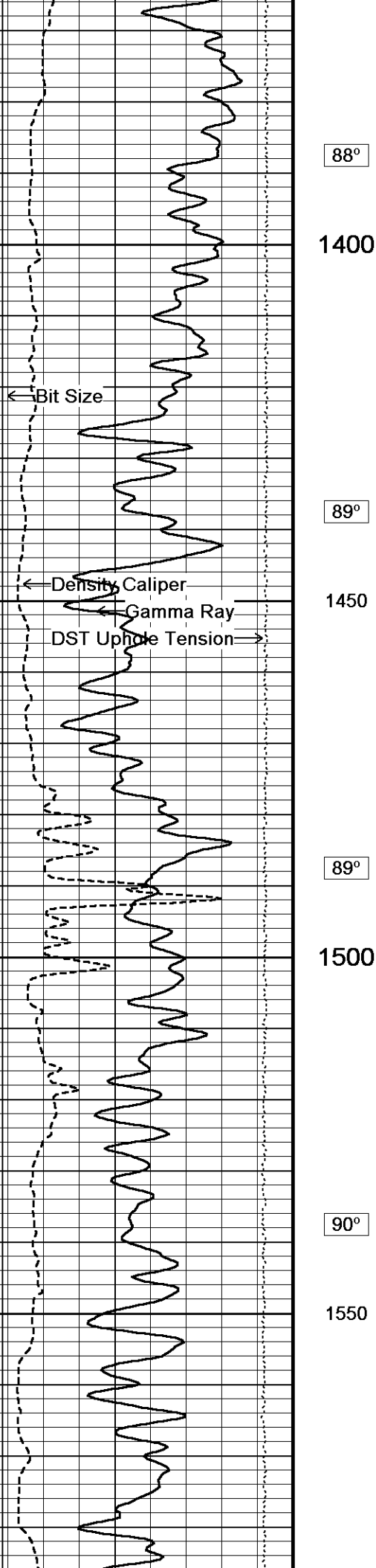
6' Transit Time →

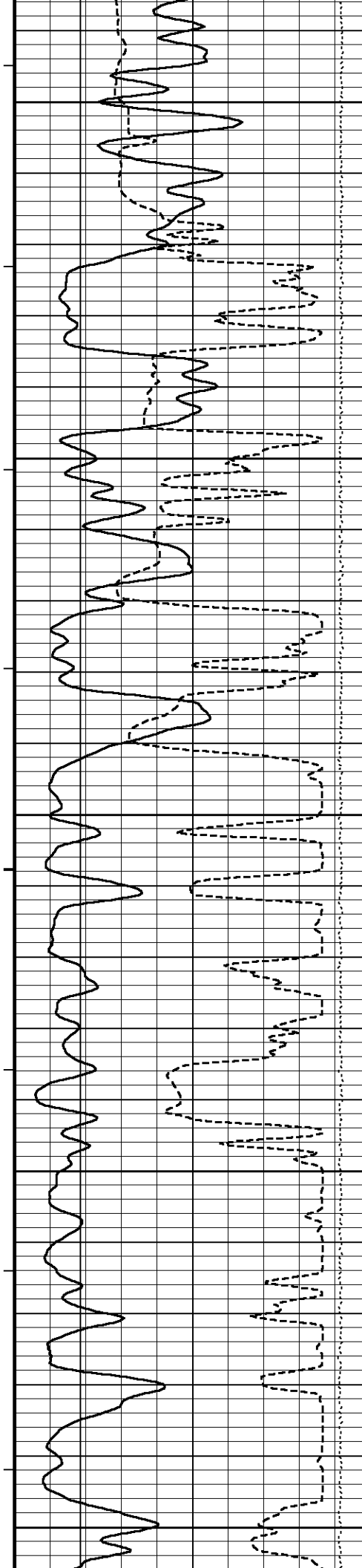
5' Transit Time →

4' Transit Time →

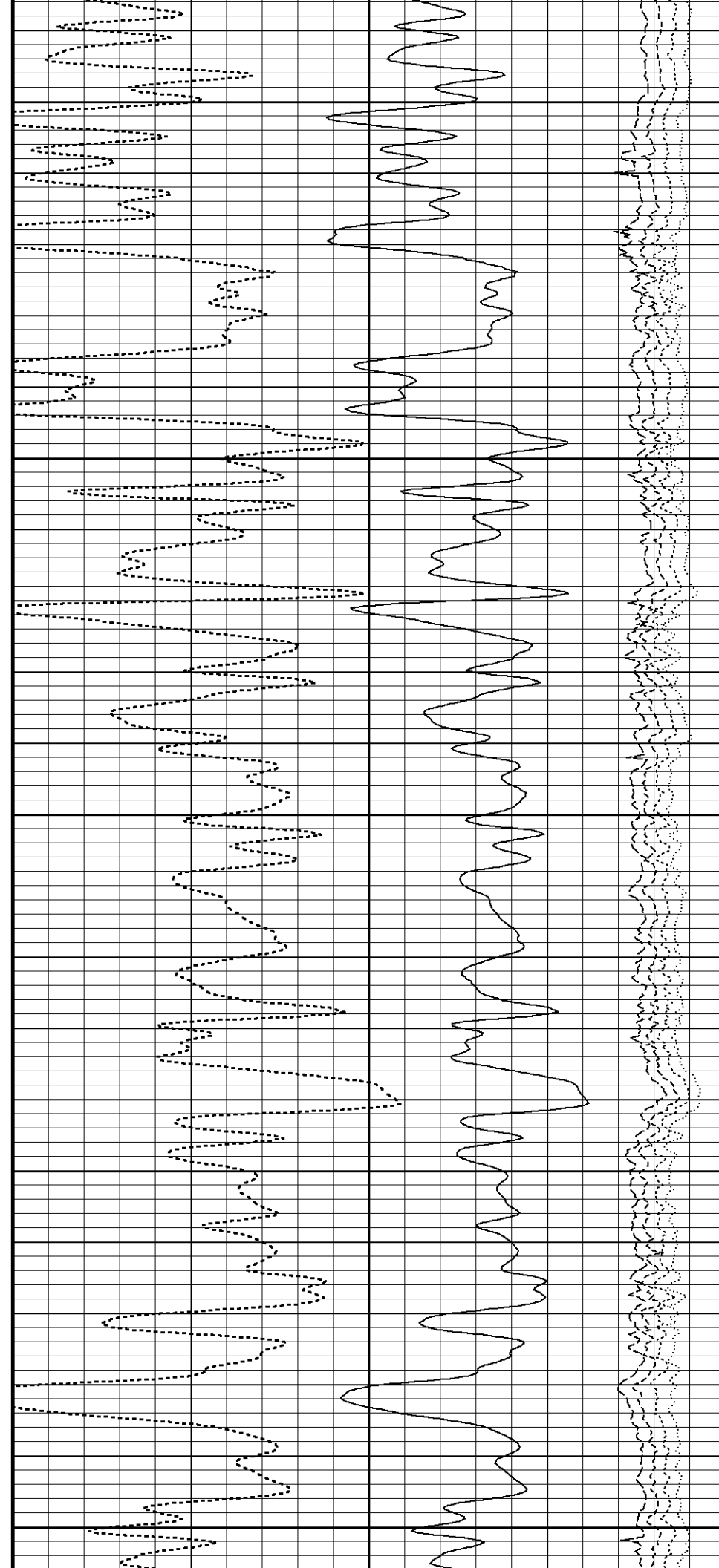
3' Transit Time →

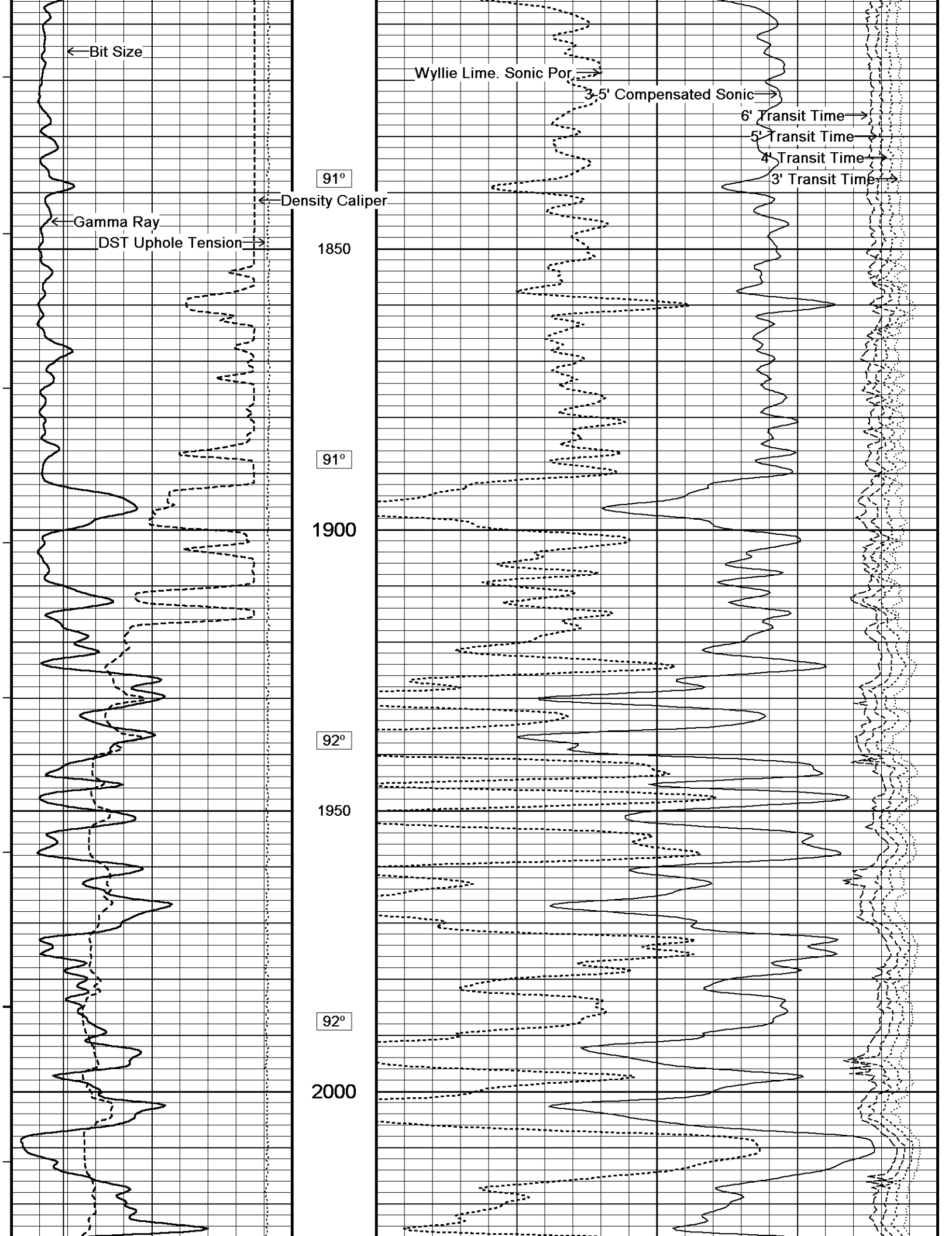


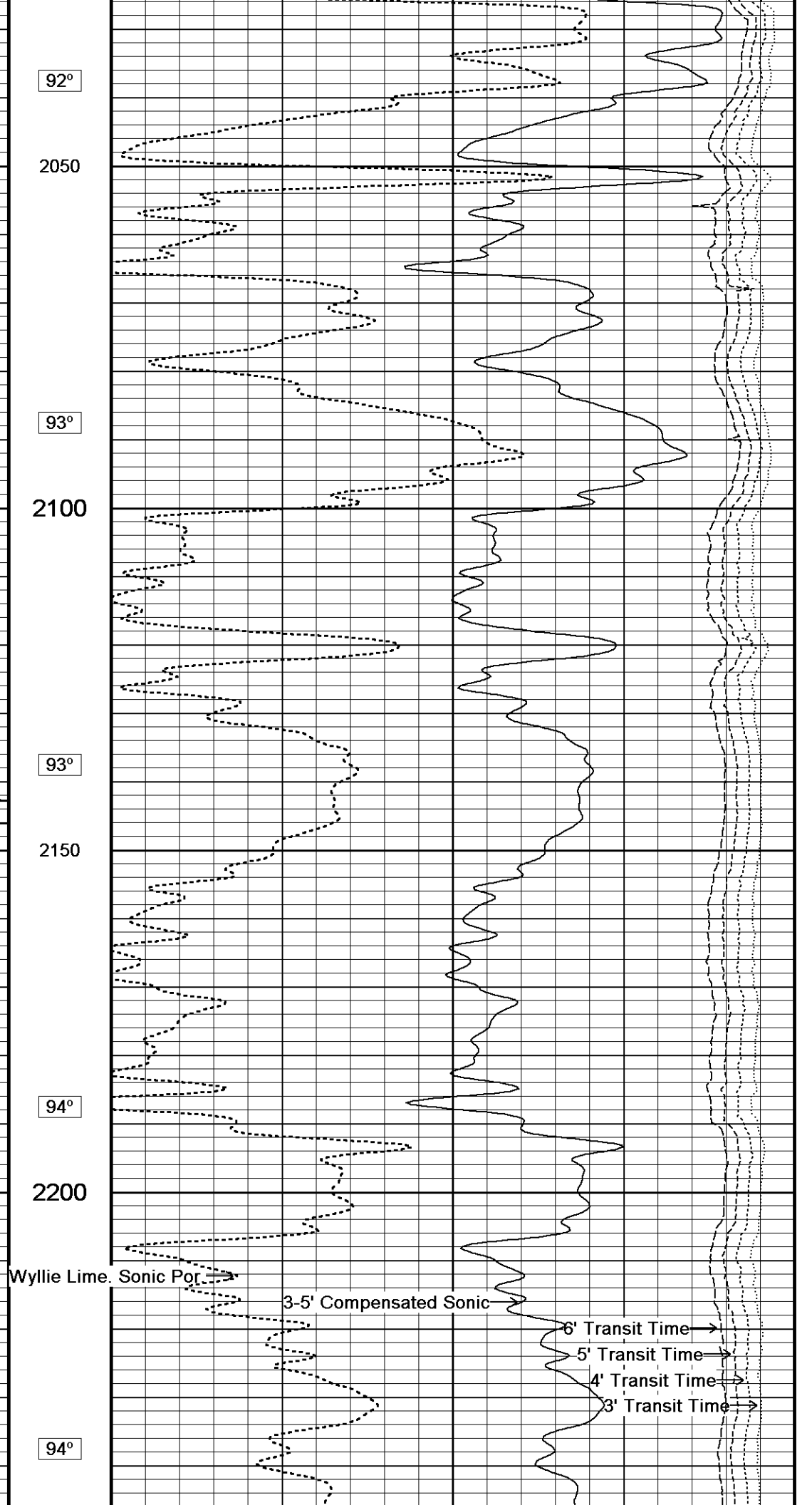
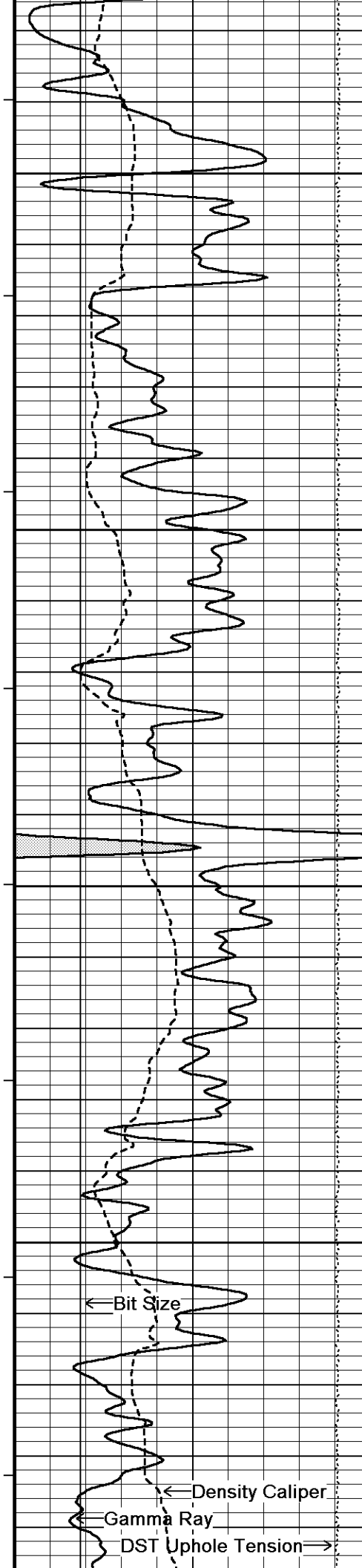


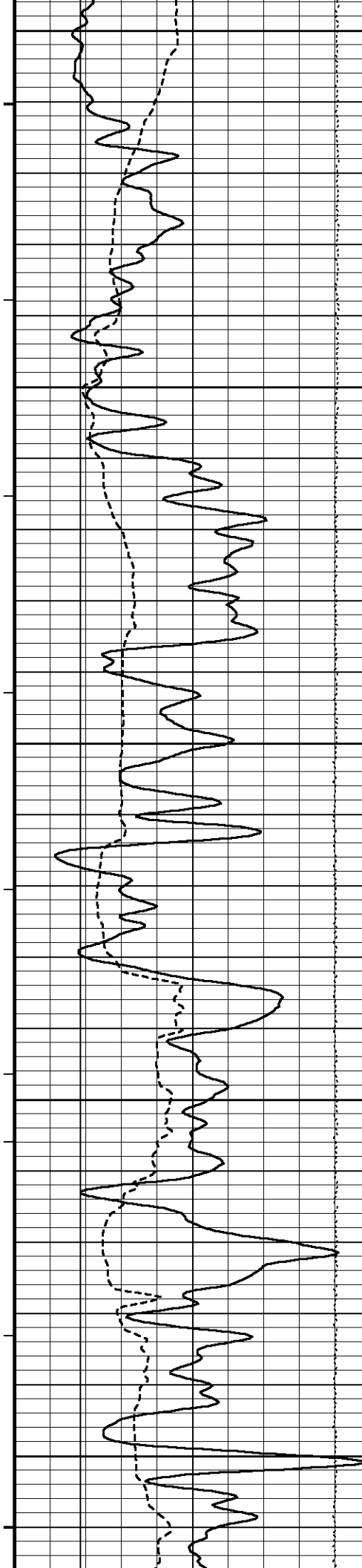


90°
1600
90°
1650
91°
1700
91°
1750
91°
1800









2250

94°

2300

94°

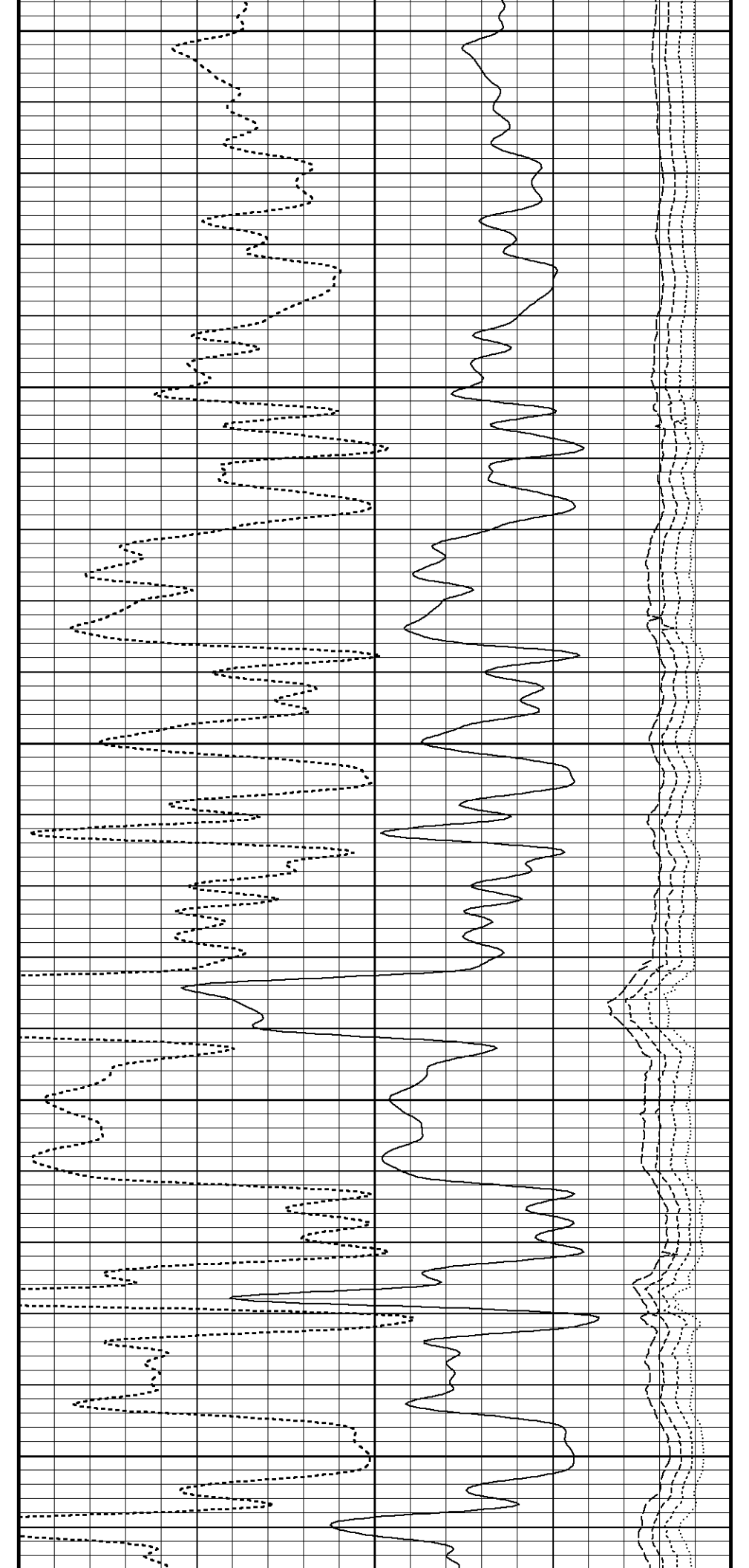
2350

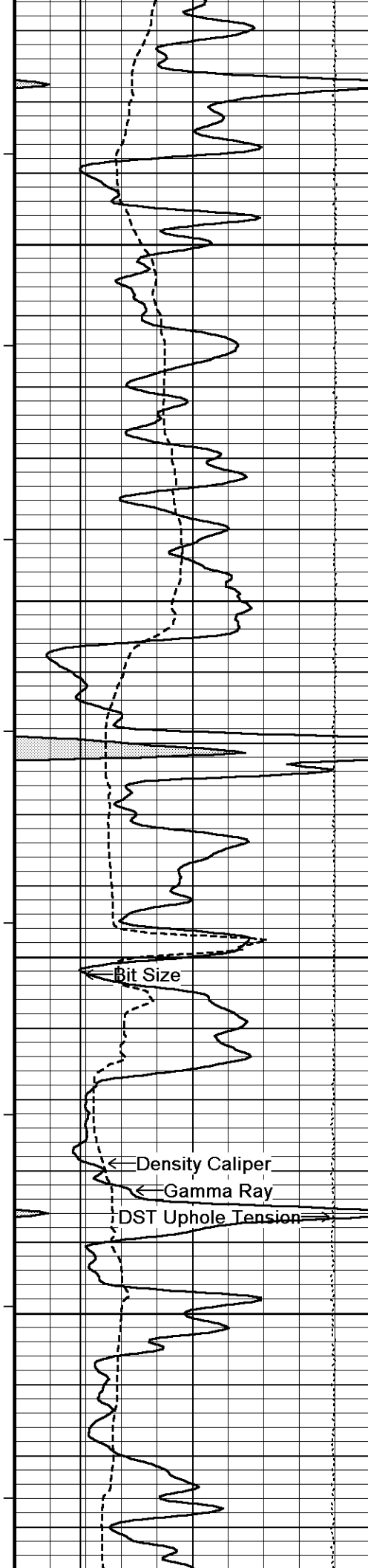
95°

2400

95°

2450





95°

2500

96°

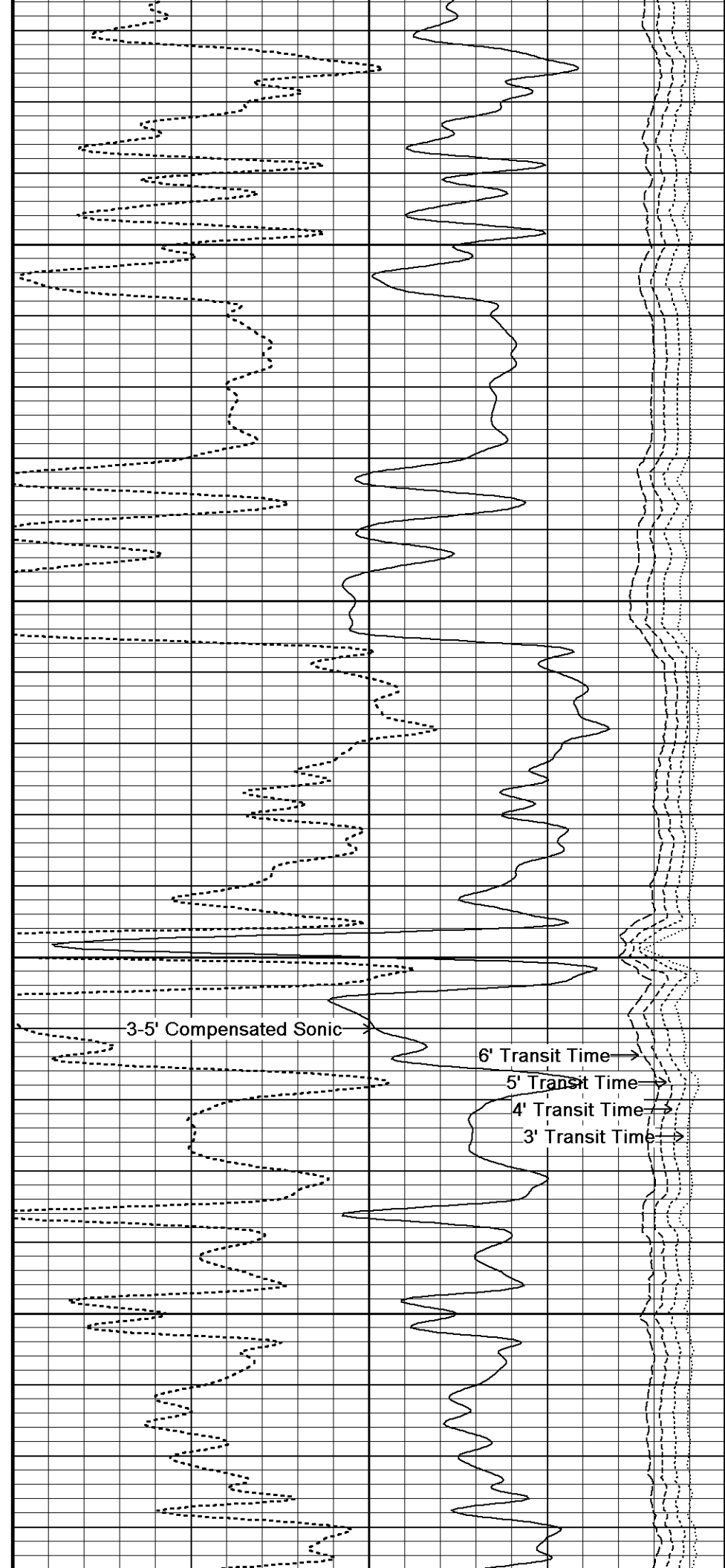
2550

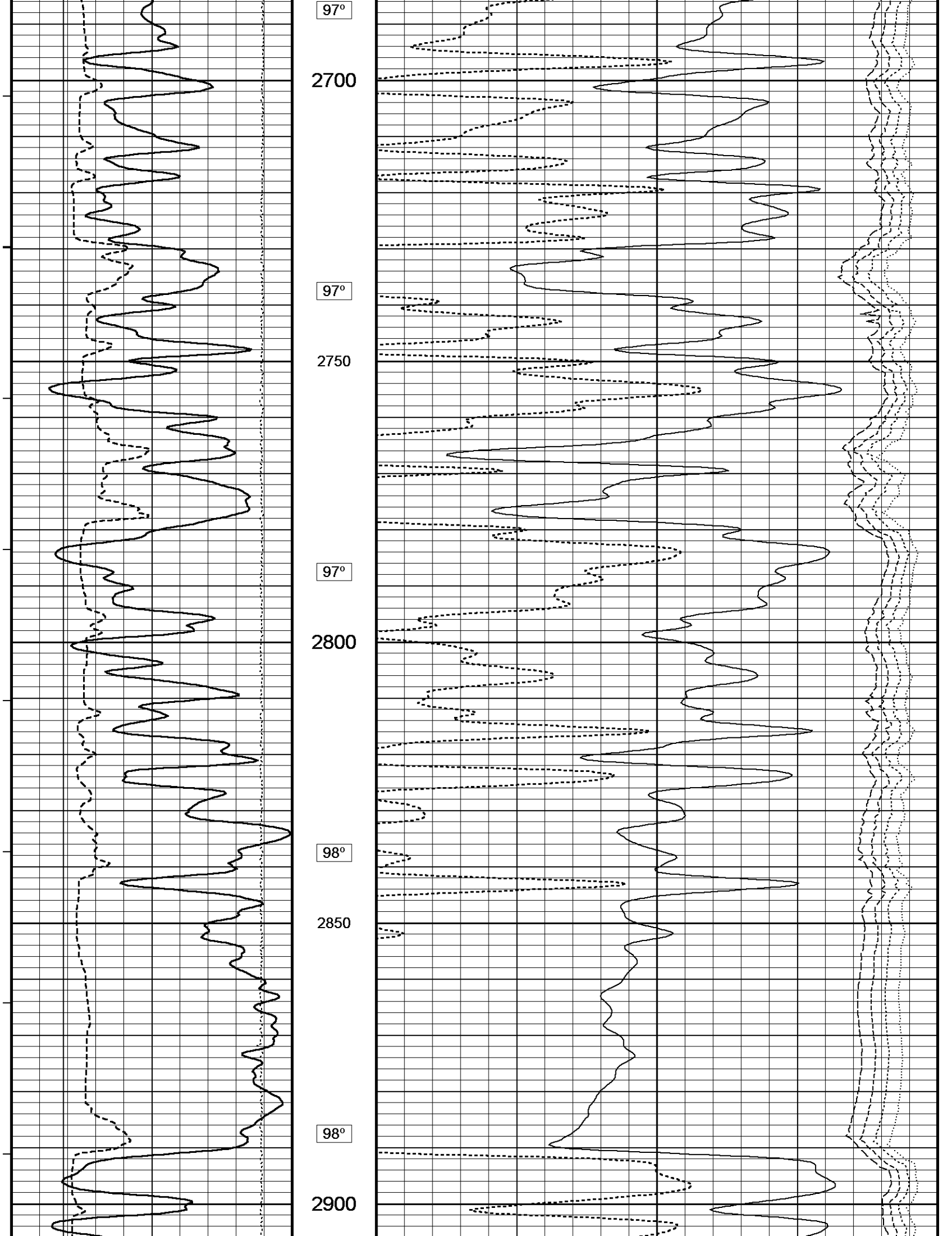
96°

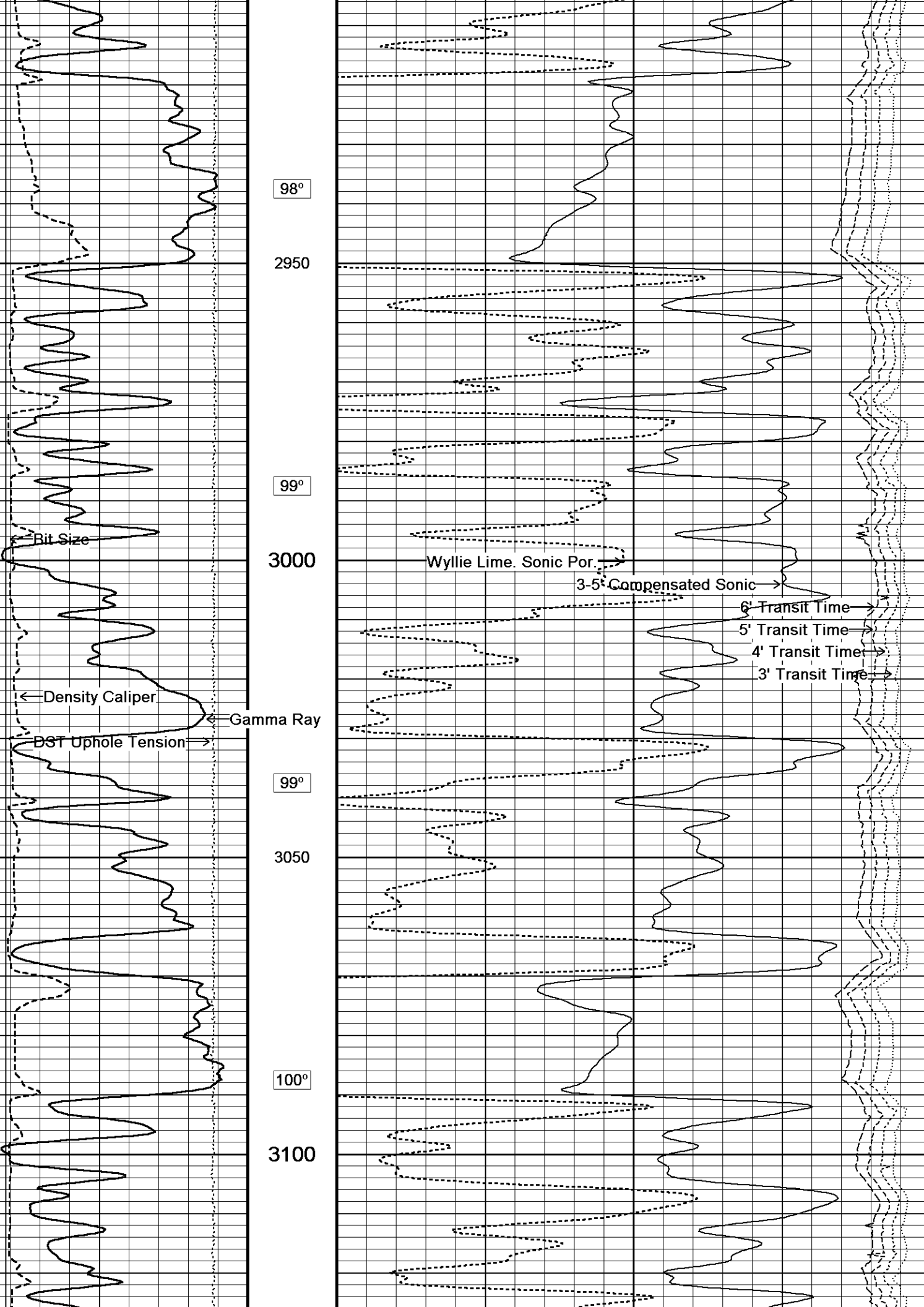
2600

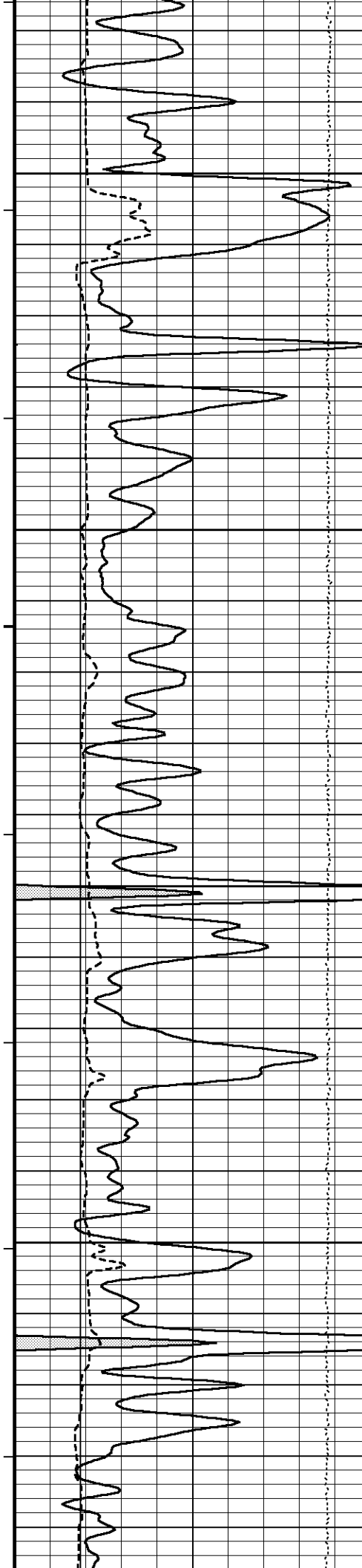
96°

2650

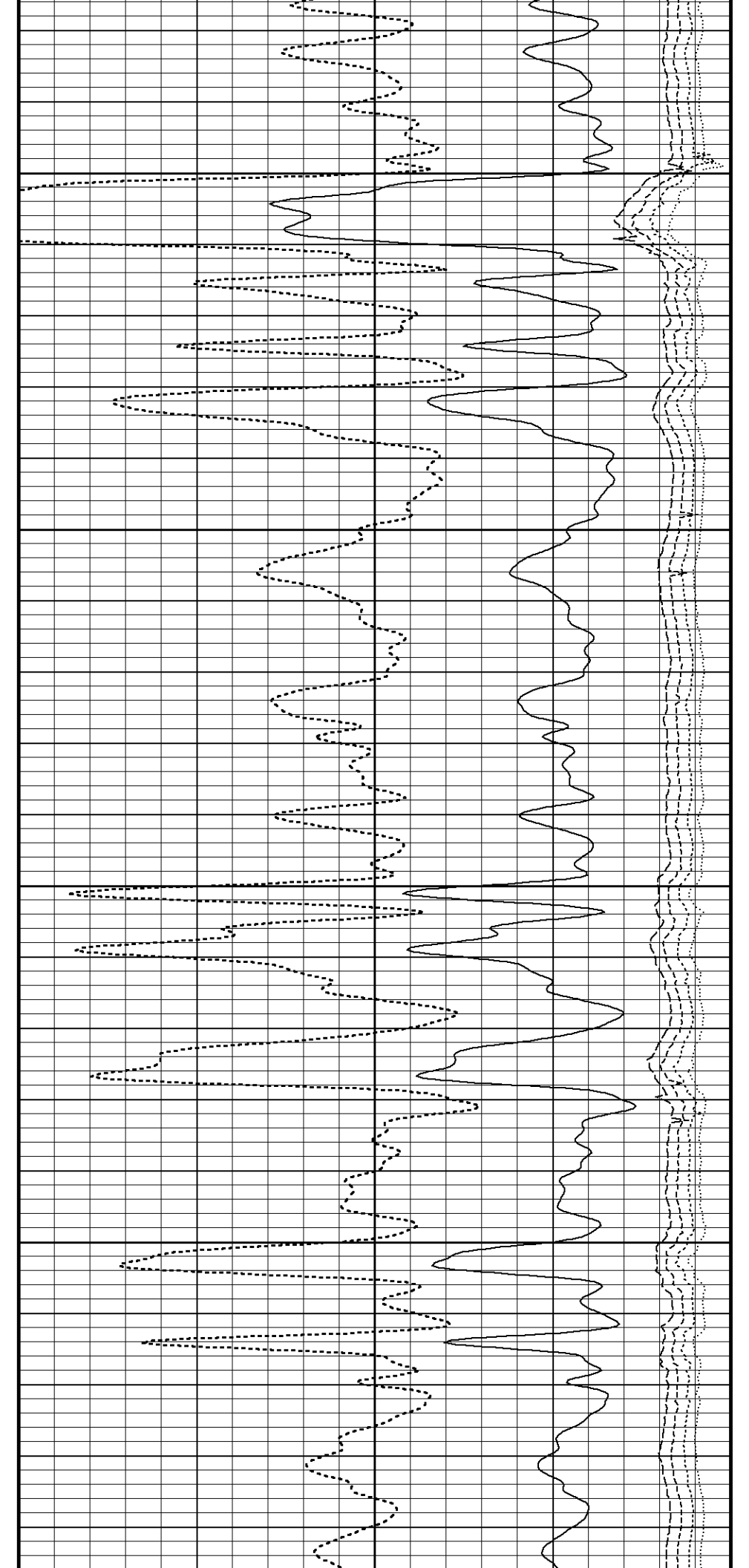


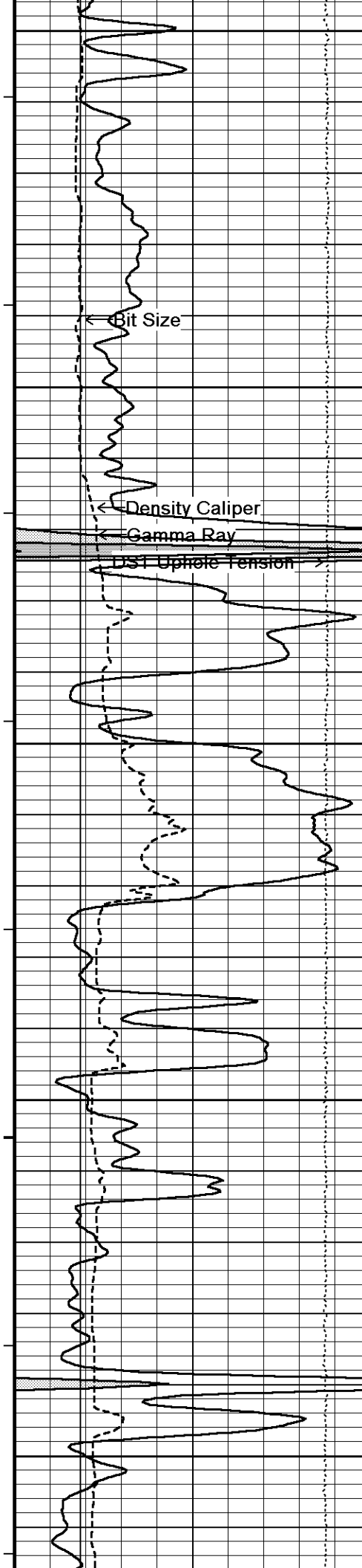




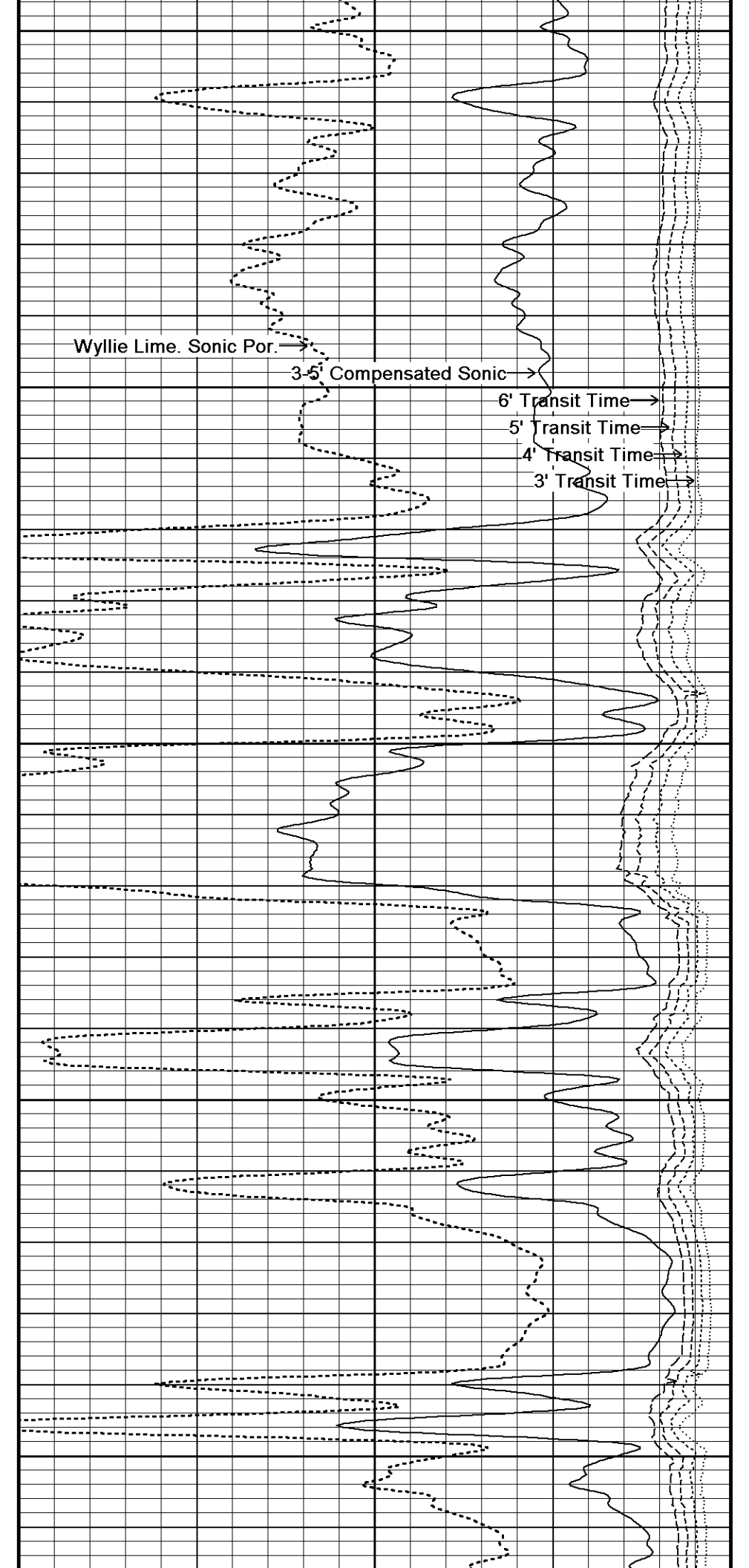


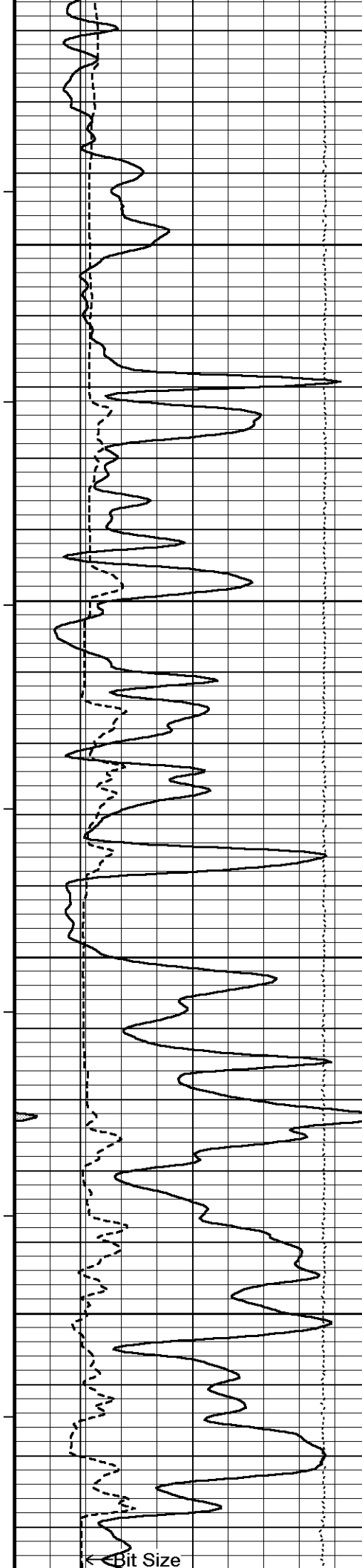
100°
3150
100°
3200
100°
3250
101°
3300
101°





3350
101°
3400
102°
3450
102°
3500
102°
3550





102°

3600

102°

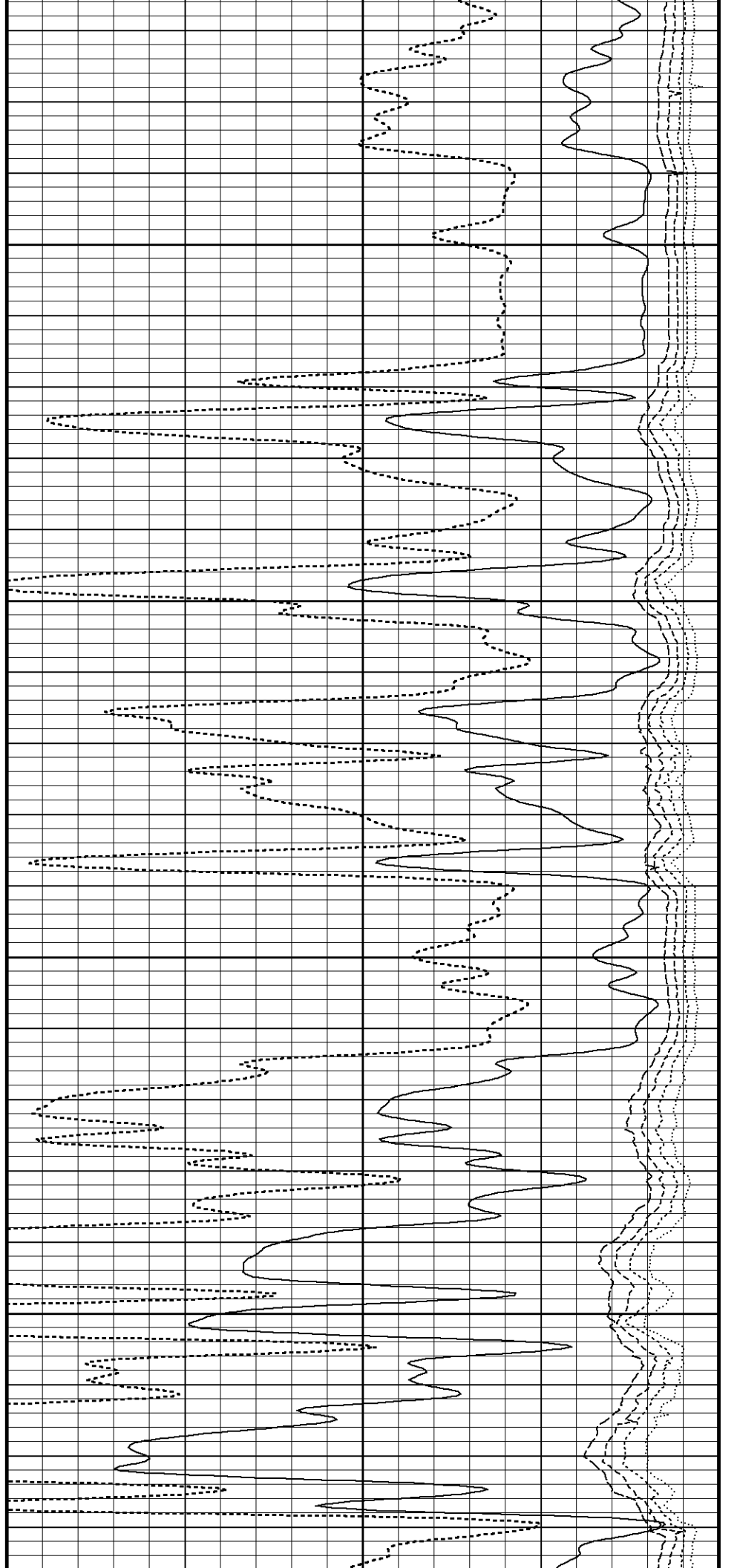
3650

103°

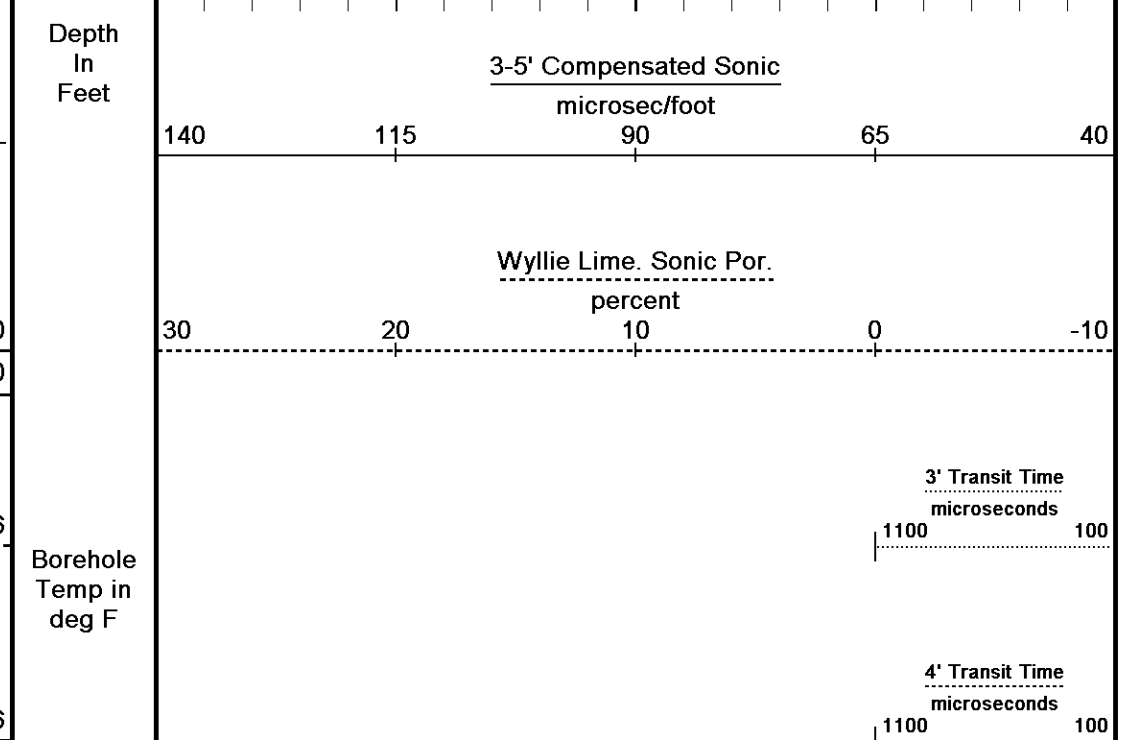
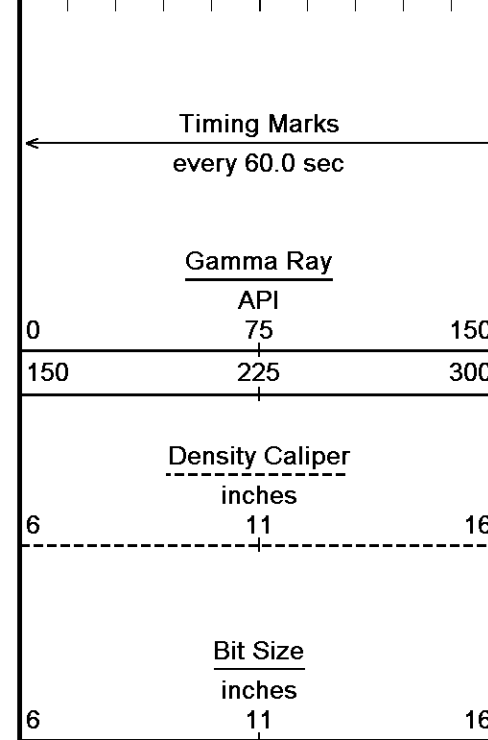
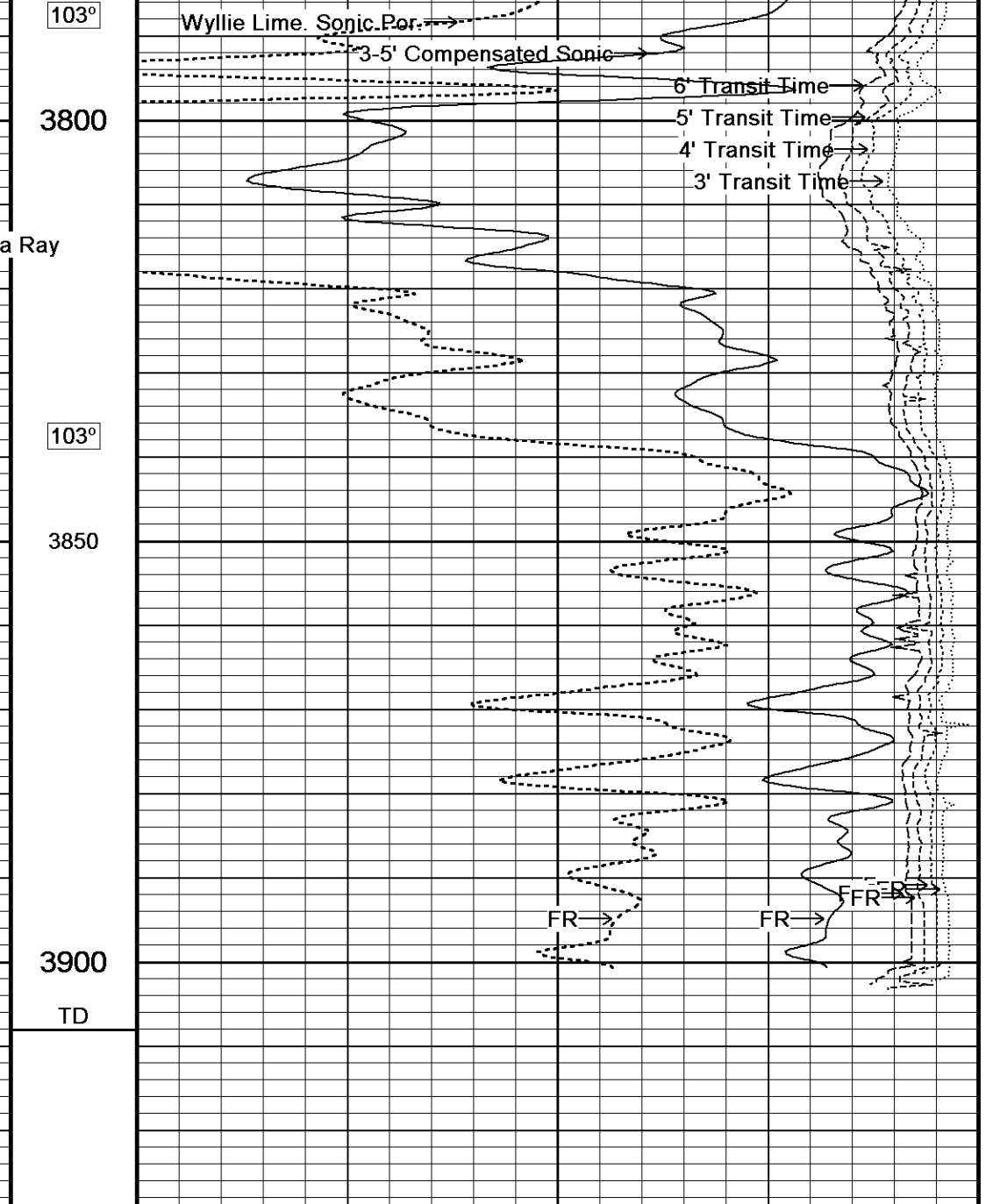
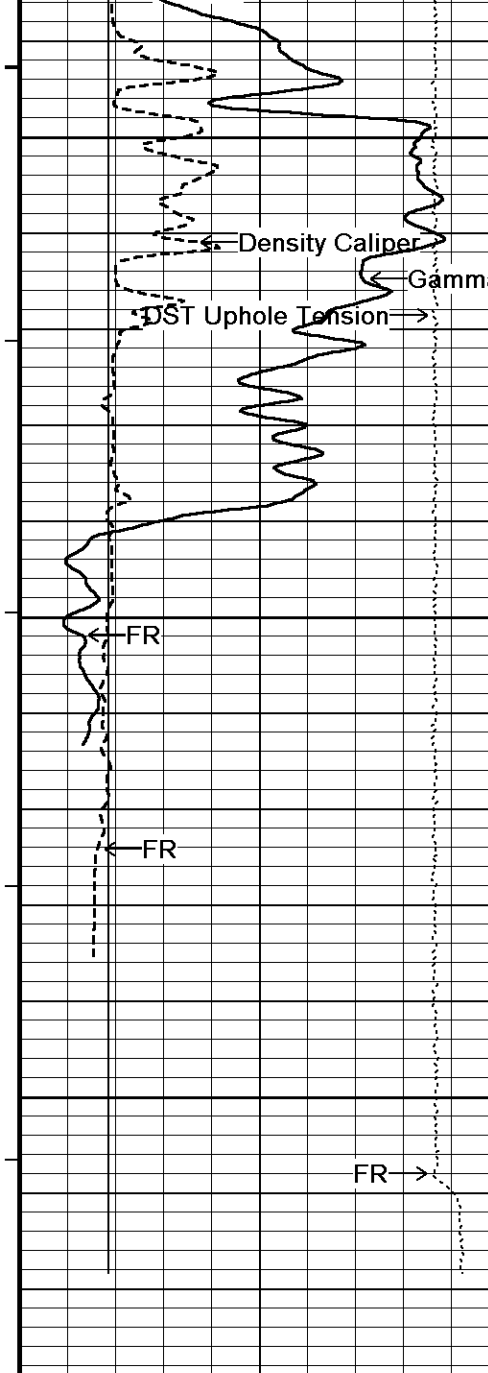
3700

103°

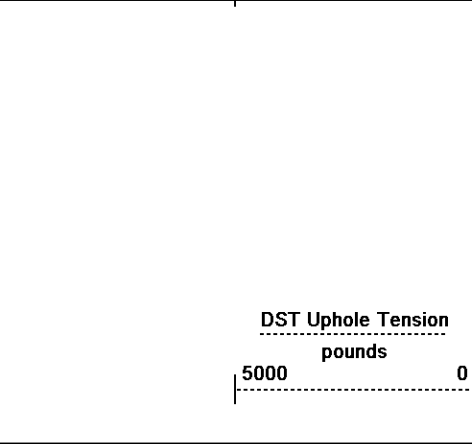
3750



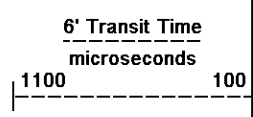
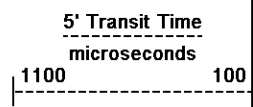
Bit Size



Depth In Feet
 TD
 Borehole Temp in deg F



Replay
Scale
1:240

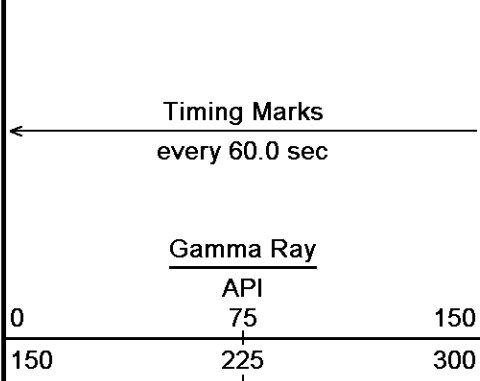


Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 04-OCT-2016 19:00
 Filename: C:\Minimus 15.03.5939\Logs\O'Brien (LA) Jecha 4 #2\O'Brien (LA) Jecha 4 #2_002.dta
 Recorded on 04-OCT-2016 16:29
 System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

↑ 5 INCH MAIN ↑

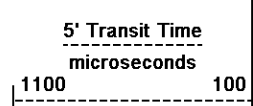
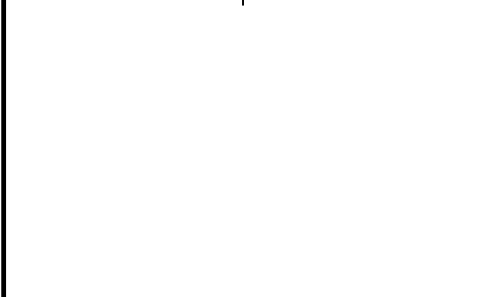
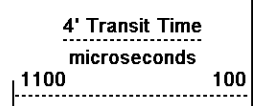
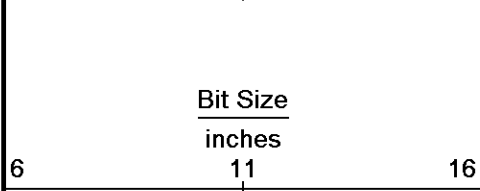
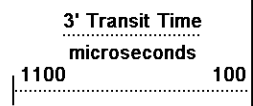
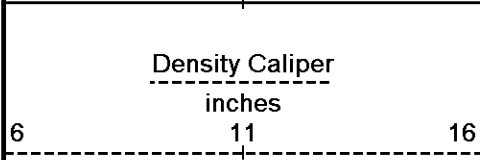
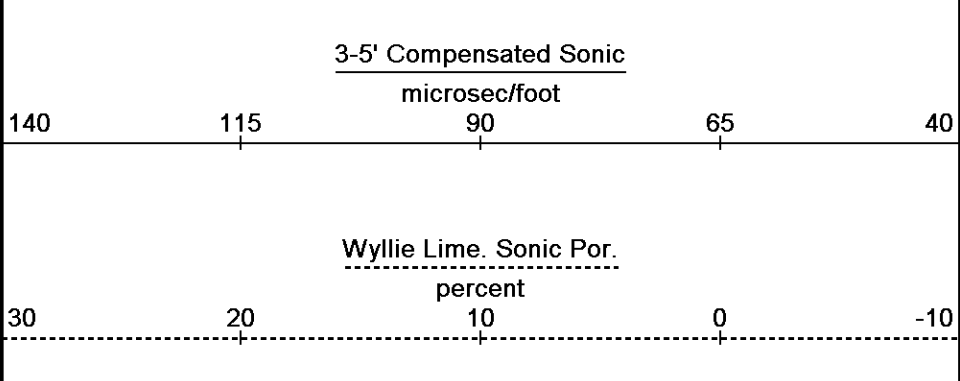
↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 04-OCT-2016 19:00
 Filename: C:\Minimus 15.03.5939\Logs\O'Brien (LA) Jecha 4 #2\O'Brien (LA) Jecha 4 #2_001.dta
 Recorded on 04-OCT-2016 16:05
 System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

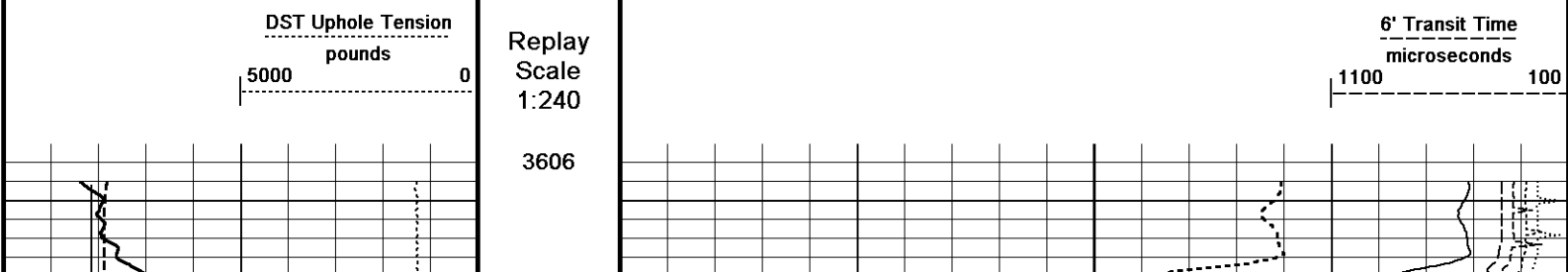
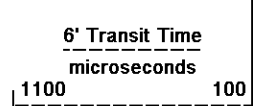


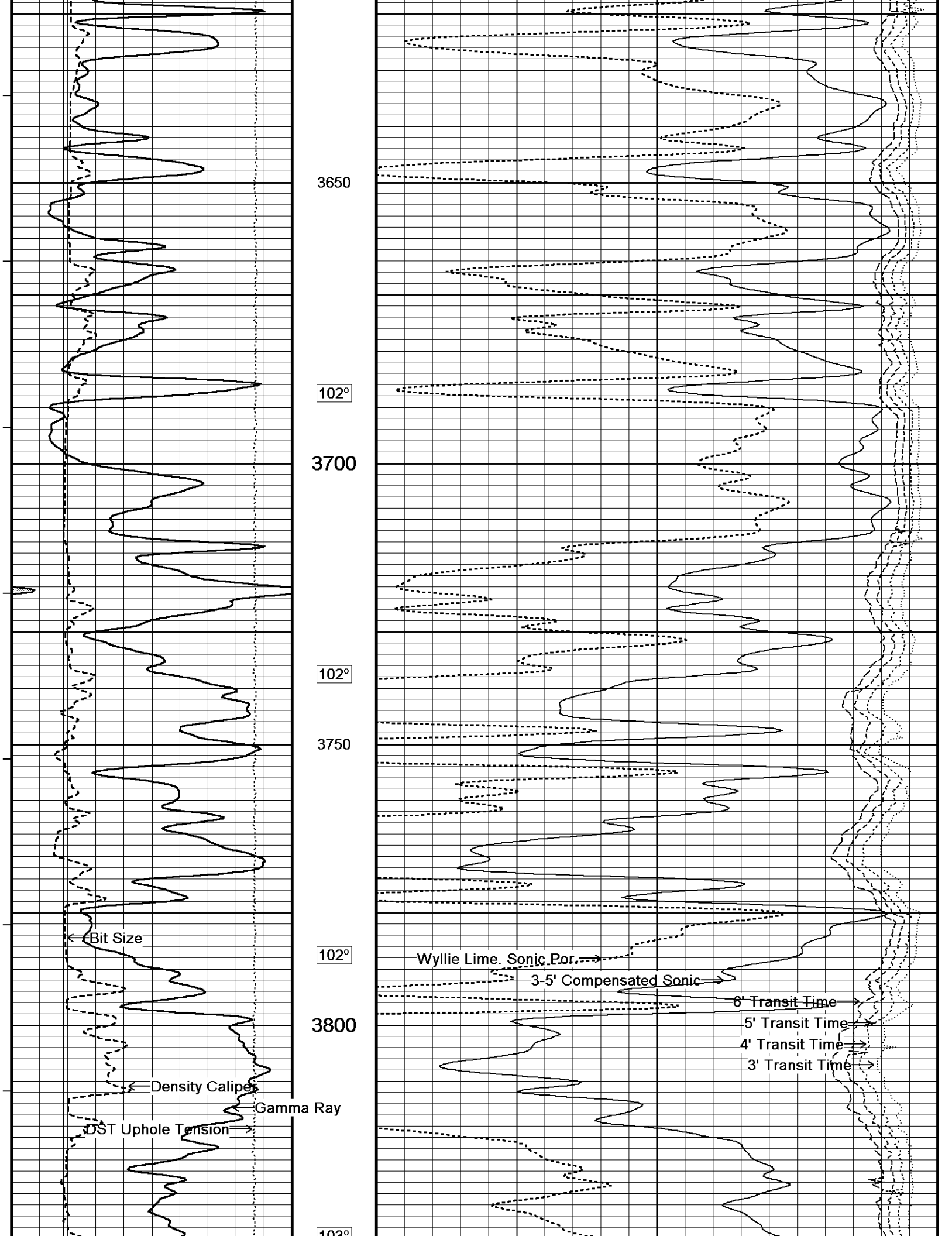
Depth
in
Feet

Borehole
Temp in
deg F



Replay
Scale
1:240





3650

102°

3700

102°

3750

102°

3800

102°

Bit Size

Density Caliper

Gamma Ray

DST Uphole Tension

Wyllie Lime. Sonic Por.

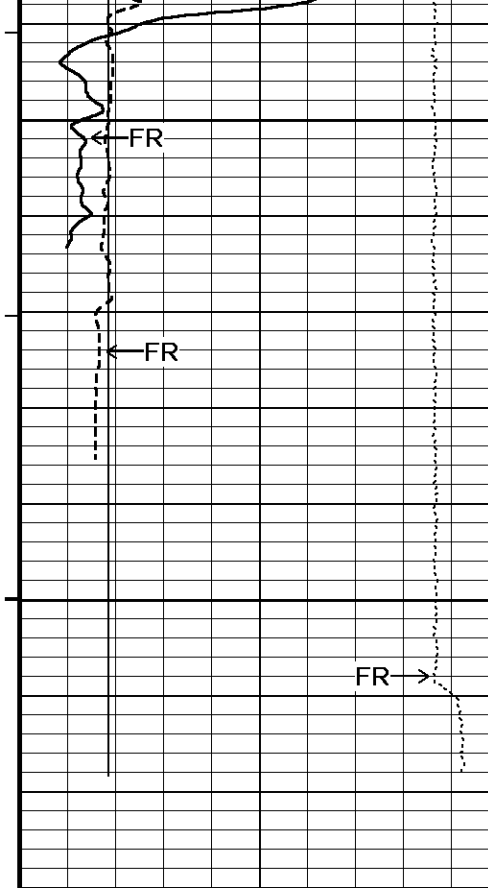
3-5' Compensated Sonic

6' Transit Time

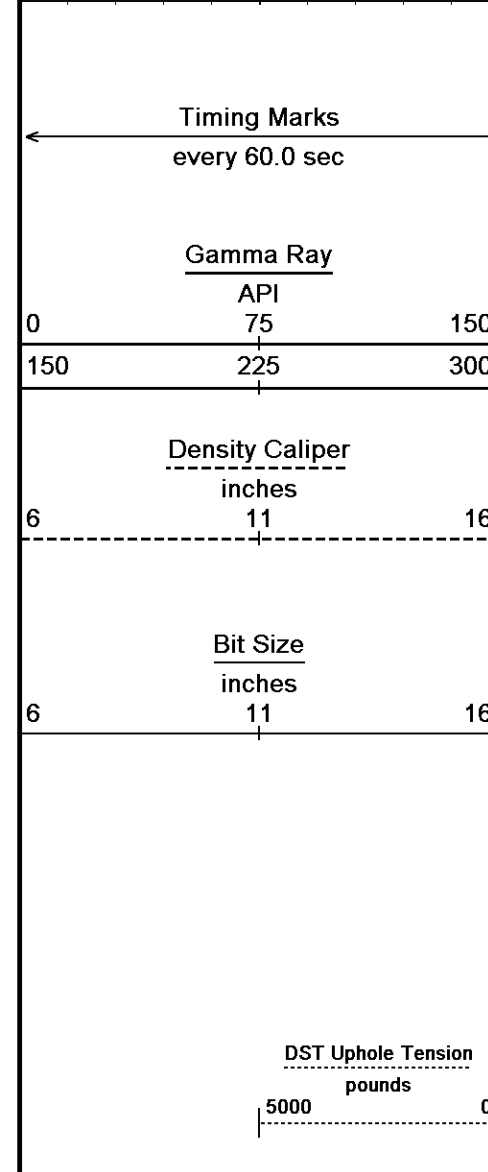
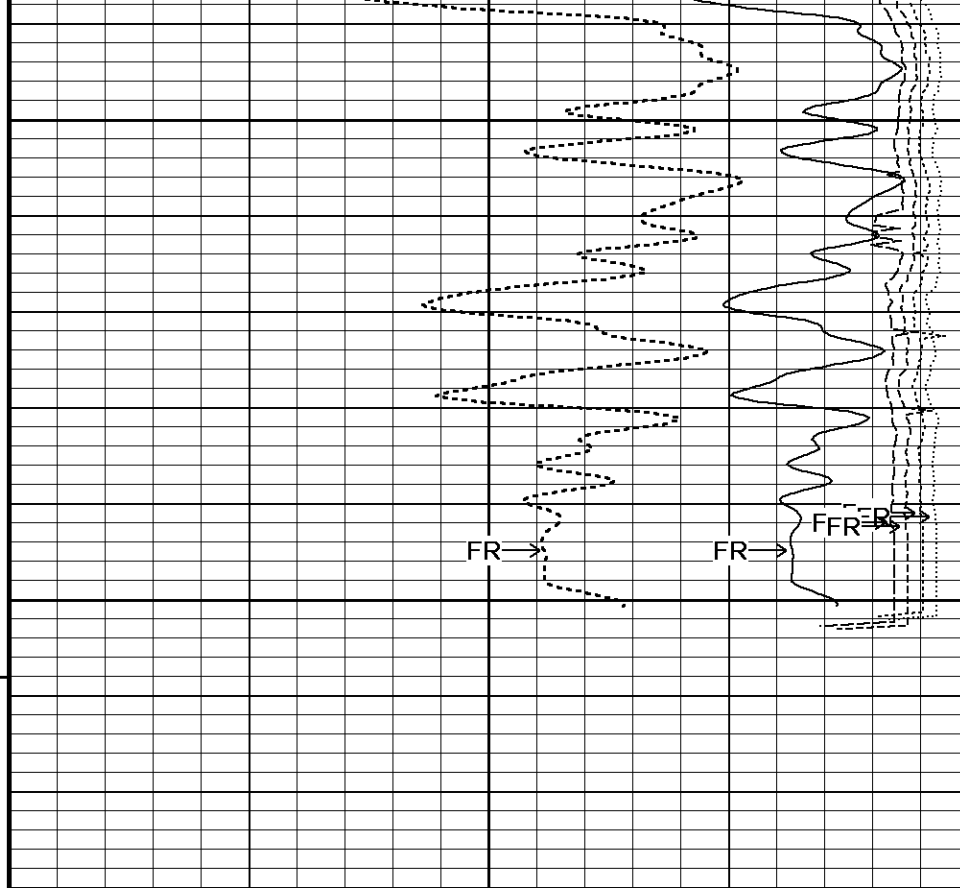
5' Transit Time

4' Transit Time

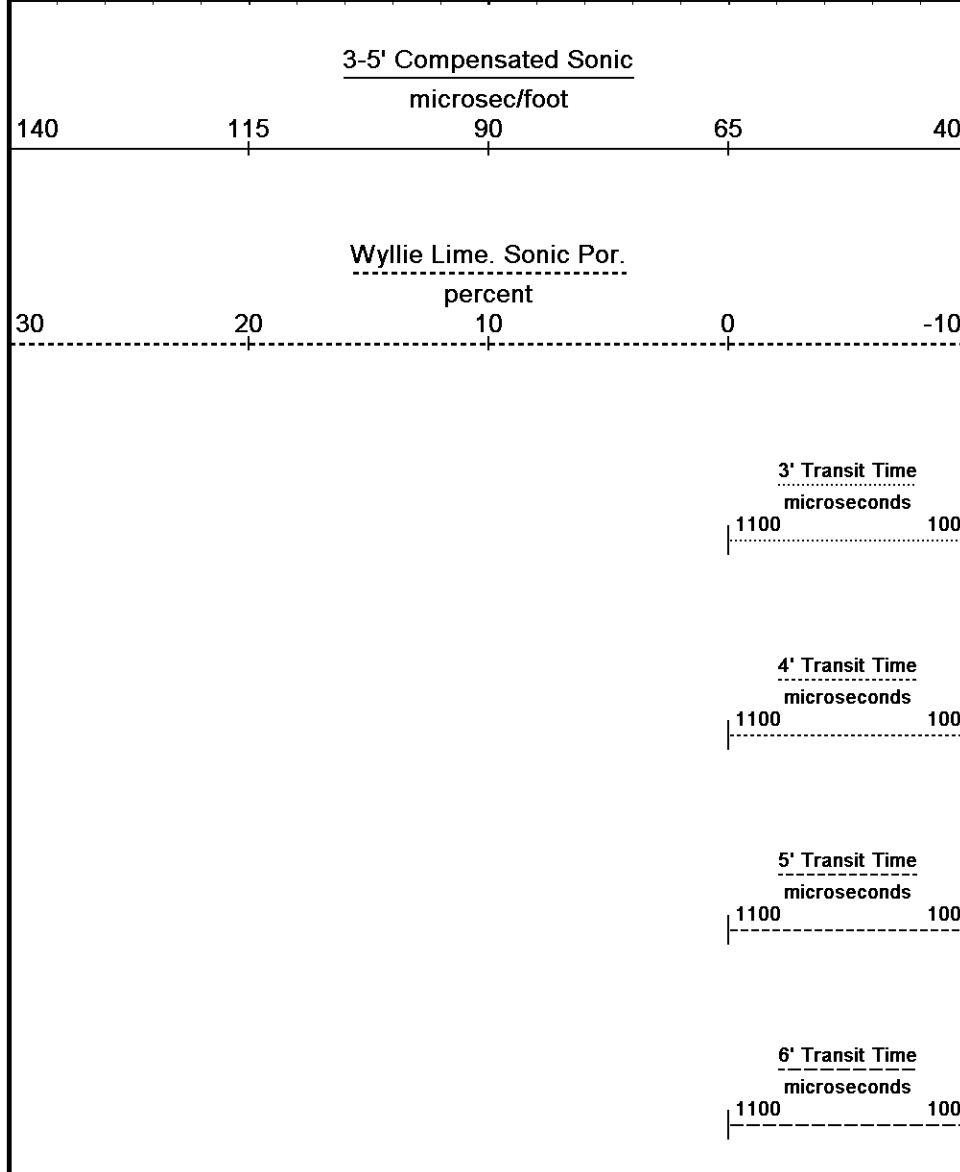
3' Transit Time



103
3850
3900
TD



Depth in Feet
Borehole Temp in deg F
Replay Scale 1:240



REPEAT SECTION

BEFORE SURVEY CALIBRATION
 C:\Minimus 15.03.5939\Log\O'Brien (LA) Jecha 4 #2\O'Brien (LA) Jecha 4 #2_001.dta

General Constants All 000 Last Edited on 04-OCT-2016,15:43

General Parameters		
Mud Resistivity	0.460	ohm-metres
Mud Resistivity Temperature	75.000	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	4.500	inches
Caliper for Differential Caliper	None	
Rwa Parameters		
Porosity used	Limestone Density Por.	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

Down-hole Tension Calibration SMS 0 Field Calibration on 24-JUL-2016 15:20

Reading No	Measured	Calibrated (lbs)
1	15235.81	0.00
2	16026.61	481.00

Gamma Calibration MCG-C 123 Field Calibration on 04-OCT-2016 08:13

	Measured	Calibrated (API)
Background	143	100
Calibrator (Gross)	795	556
Calibrator (Net)	652	456



Gamma Constants MCG-C 123 Last Edited on 04-OCT-2016,13:32

Gamma Calibrator Number	MCGGRCC141	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.12	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

High Resolution Temperature Calibration MCG-C 123 Field Calibration on 31-OCT-2015,17:05

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-C 123 Last Edited on 22-SEP-2015,11:43

Pre-filter Length	11
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SP Calibration MCG-C 123 Field Calibration on 14-JUL-2016 12:06

	Measured	Calibrated (mV)
Reference 1	101.2	100.6

Micro Normal and Micro Inverse Calibration MMR-C.A 247

Base Calibration on 28-AUG-2016 19:13

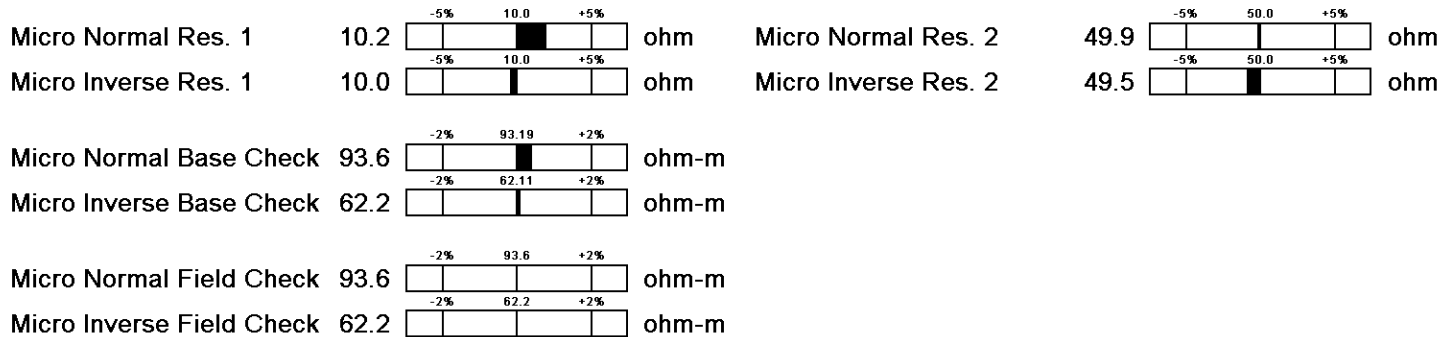
Field Check on 04-OCT-2016 15:26

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.2	49.9	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	93.6	93.6
Micro Inverse	62.2	62.2

Micro Normal & Micro Inverse Calibration Tolerance MMR-C.A 247



Micro Normal and Micro Inverse Constants MMR-C.A 247

Last Edited on 26-JUN-2016,15:44

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	

Caliper Calibration MMR-C.A 247

Base Calibration on 28-AUG-2016 19:08

Field Calibration on 04-OCT-2016 15:24

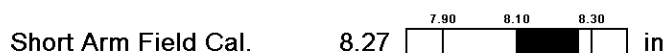
Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14869	5.98
2	18207	7.97
3	21411	9.86
4	25389	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
8.27	8.10

Caliper Calibration Tolerances MMR-C.A 247



Micro-Resistivity Caliper Constants MMR-C.A 247

Last Edited on

Sonde Configuration	Resistivity Mode

Neutron Calibration MDN-A.B 66

Base Calibration on 22-MAY-2016,18:15

Field Check on 04-OCT-2016 08:22

Base Calibration

Ratio	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3116	97	3714	110
	32.277		33.764	

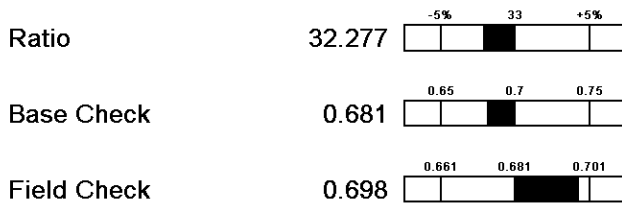
Field Calibrator at Base

Ratio	Calibrated (cps)
	2061 3028
	0.681

Field Check

Ratio	Calibrated (cps)
	2167 3105
	0.698

Neutron Calibration Tolerances MDN-A.B 66



Neutron Constants MDN-A.B 66

Last Edited on 04-OCT-2016,13:32

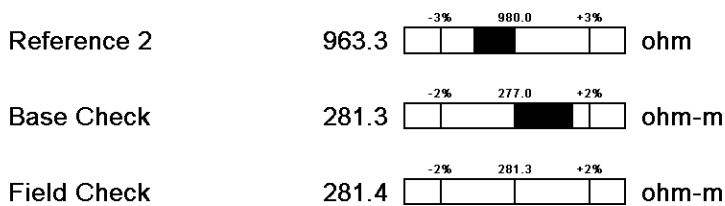
Neutron Source Id	P0204NN	
Neutron Jig Number	NJ5736	
Air Hole Processing	Legacy	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 352

Base Calibration on 28-AUG-2016 18:58
Field Check on 04-OCT-2016 15:05

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	963.3	126.8
Base Check		281.3
Field Check		281.4

FE Calibration Tolerances MFE-B.J 352



FE Constants MFE-B.J 352

Last Edited on 04-OCT-2016,15:04

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-A.A 55

Last Edited on 04-OCT-2016,13:31

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	

Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	N/A	micro-sec
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

Induction Calibration MAI-A.A 111

Base Calibration on 05-AUG-2014,09:34
Field Check on 04-OCT-2016 15:23

Base Calibration

Test Loop Calibration Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	17.6	473.6	9.3	966.2
2	6.4	385.9	7.6	821.4
3	3.2	264.0	5.2	566.0
4	2.1	135.5	2.6	279.2

Array Temperature 23.0 Deg F

Test Loop Calibration Verified 22-MAY-2016,17:59

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	12.1	3873.0	15.9	3871.4
2	29.8	3528.1	32.3	3525.6
3	29.1	3021.3	31.1	3019.0
4	19.1	2058.5	20.5	2056.8

Deep	17.7	1962.1	19.1	1960.6
Medium	43.1	3976.4	45.6	3973.2
Shallow	44.4	5232.7	48.1	5229.1

Array Temperature 65.8 86.7 Deg F

Induction Calibration Tolerances MAI-A.A 111

Low Conductivity 1	17.6		mmho/m	High Conductivity 1	473.6		mmho/m
Low Conductivity 2	6.4		mmho/m	High Conductivity 2	385.9		mmho/m
Low Conductivity 3	3.2		mmho/m	High Conductivity 3	264.0		mmho/m
Low Conductivity 4	2.1		mmho/m	High Conductivity 4	135.5		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-A.A 111

Last Edited on 04-OCT-2016,15:21

Induction Model	RtAP-WBM		
Borehole Correction Constants			
Tool Centred	No		
Hole Size Source	Density Caliper		
Hole Size Constant Value	N/A inches		
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		
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			
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		

High Resolution Temperature Calibration MAI-A.A 111

Field Calibration on 24-NOV-2014,10:23

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

High Resolution Temperature Constants MAI-A.A 111

Last Edited on 26-JUN-2014,15:06

Pre-filter Length 11

Photo Density Calibration MPD-B 104

Base Calibration on 28-AUG-2016 20:24
Field Check on 04-OCT-2016 15:09

Density Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Base Calibration				
Background	1145	1339		
Reference 1	49665	24007	59556	30836
Reference 2	20032	2442	24941	2541

Field Check at Base
1144.9 1338.6

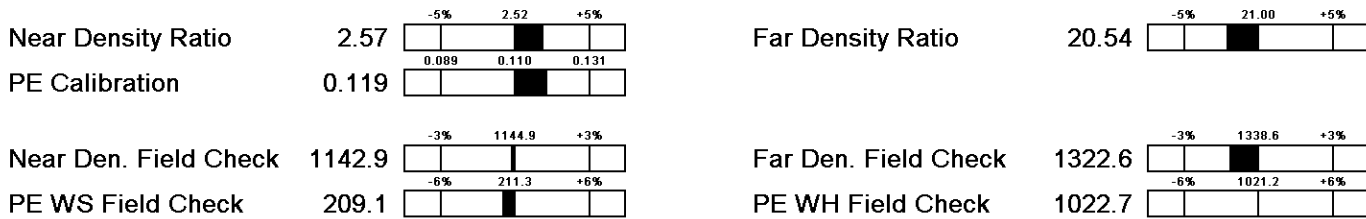
Field Check
1142.9 1322.6

PE Calibration	Measured			Calibrated
	WS	WH	Ratio	Ratio
Base Calibration				
Background	211	1021		
Reference 1	20773	49486	0.424	0.371
Reference 2	5807	19899	0.296	0.272

Field Check at Base
211.3 1021.2

Field Check
209.1 1022.7

Photo Density Calibration Tolerances MPD-B 104



Density Constants MPD-B 104

Last Edited on 04-OCT-2016,15:09

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	1.12	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	
0.00	0.00	

Caliper Calibration MPD-B 104

Base Calibration on 28-AUG-2016 19:51

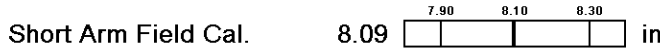
Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13646	3.99
2	22688	5.98
3	31297	7.97
4	39521	9.86
5	48608	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
8.09	8.10

Caliper Calibration Tolerances MPD-B 104



DOWNHOLE EQUIPMENT

C:\Minimus 15.03.5939\Logs\O'Brien (LA) Jecha 4 #2\O'Brien (LA) Jecha 4 #2_001.dta

Cablehead, 11 pin
CBH-CA 176 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Comms Gamma
MCG-C 123 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-C.A 247 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

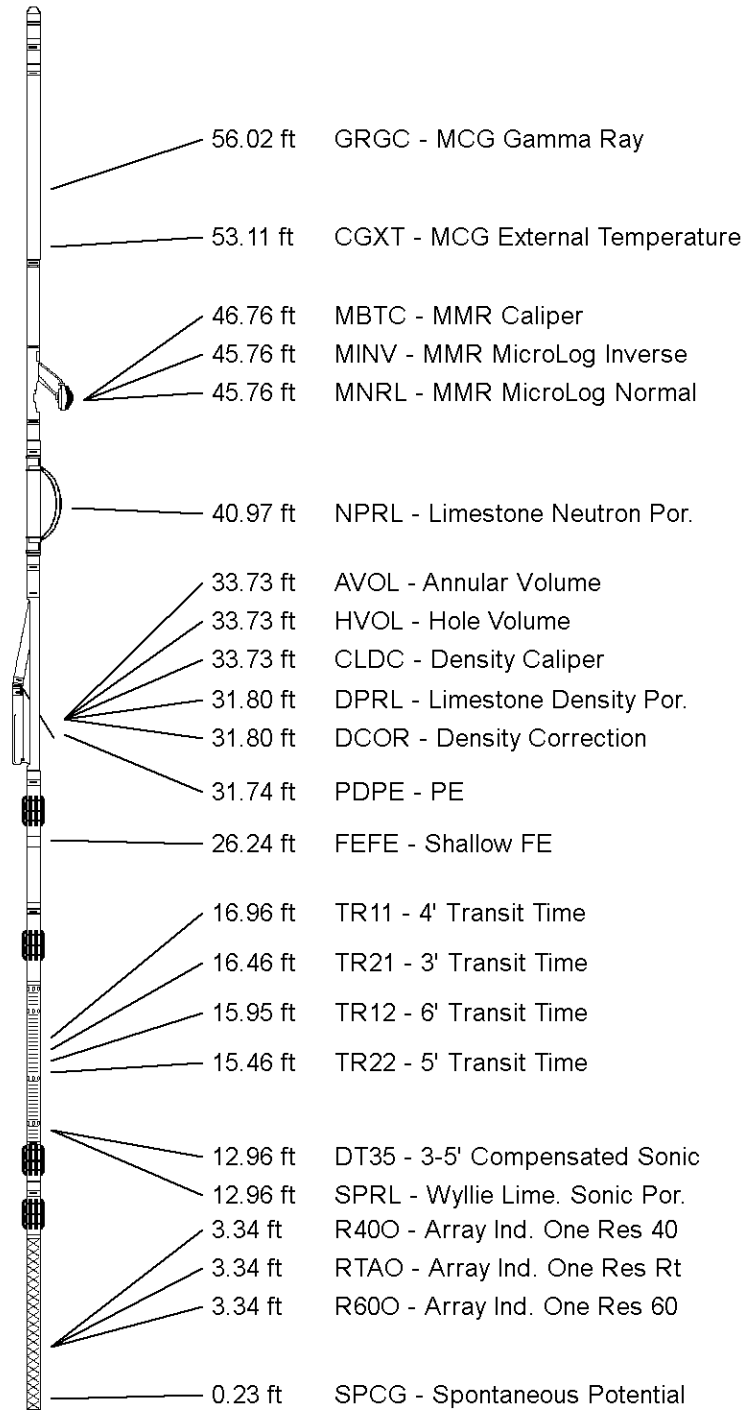
Compact Density/Caliper
MPD-B 104 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-A.A 55 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction
MAI-A.A 111 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.70 ft Weight: 480.6 lb





Tool Zero

(0.13ft from bottom)

-0.13 ft

SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY O'BRIEN RESOURCES, LLC.
 WELL JECHA 4 #2
 FIELD WILDCAT
 PROVINCE/COUNTY RUSH
 COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2083.00	feet	First Reading	3895.00	feet
Elevation Drill Floor	2081.00	feet	Depth Driller	3907.00	feet
Elevation Ground Level	2070.00	feet	Depth Logger	3908.00	feet



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WITH INTEGRATED TRANSIT TIME