



Weatherford

**COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

COMPANY	O'BRIEN RESOURCES, LLC.		
WELL	VONDRACEK 4-1		
FIELD	PECHANEC SOUTHWEST		
PROVINCE/COUNTY	RUSH		
COUNTRY/STATE	U.S.A. / KANSAS		
LOCATION	2310' FSL & 452' FEL		
SEC 4	TWP 19S	RGE 17W	Other Services
Latitude			MPD/MDN
Longitude			MML
API Number	15-165-22088		MAI/MFE
Permanent Datum GL, Elevation	2104 feet		Elevations:
Log Measured From	KB		KB 2111.00
Drilling Measured From	KB @ 7 feet		DF 2109.00
			GL 2104.00
Date	28-AUG-2014		
Run Number	ONE		
Service Order	7577-96382198		
Depth Driller	3862.00	feet	
Depth Logger	3864.00	feet	
First Reading	3861.00	feet	
Last Reading	262.00	feet	
Casing Driller	261.00	feet	
Casing Logger	262.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.30 lb/USg	52.00 CP	
PH / Fluid Loss	9.00	11.20 ml/30Min	
Sample Source	MUD PIT		
Rm @ Measured Temp	0.42 @ 81.0	ohm-m	
Rmf @ Measured Temp	0.34 @ 81.0	ohm-m	
Rmc @ Measured Temp	0.50 @ 81.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.31 @ 111.0	ohm-m	
Time Since Circulation	5 HOURS		
Max Recorded Temp	111.00	deg F	
Equipment / Base	13244	LIB	
Recorded By	JEFFREY RANDLE		
Witnessed By	KURT TALBOTT		
JOB #	LB14-254		

BOREHOLE RECORD			Last Edited: 28-AUG-2014 03:00
Bit Size inches	Depth From feet	Depth To feet	
7.875	261.00	3862.00	

CASING RECORD			
Type	Size inches	Depth From feet	Shoe Depth feet
SURFACE	8.625	0.00	261.00
			Weight pounds/ft
			24.00

REMARKS

- SOFTWARE ISSUE: WLS 13.08.2113.

- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION.

- RUN TWO: MCG, MSS RUN IN COMBINATION.

- HARDWARE: DUAL BOWSPRING USED ON MDN.
0.5 INCH STANDOFF USED ON MFE.
2 X 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: 1604 CU.FT.

- ANNUAL HOLE VOLUME WITH 4.5 INCH PRODUCTION CASING FROM TD TO 3300 FEET: 127 CU.FT.

- RIG: MAVERICK DRILLING RIG #102.

- ENGINEER: J. RANDLE.

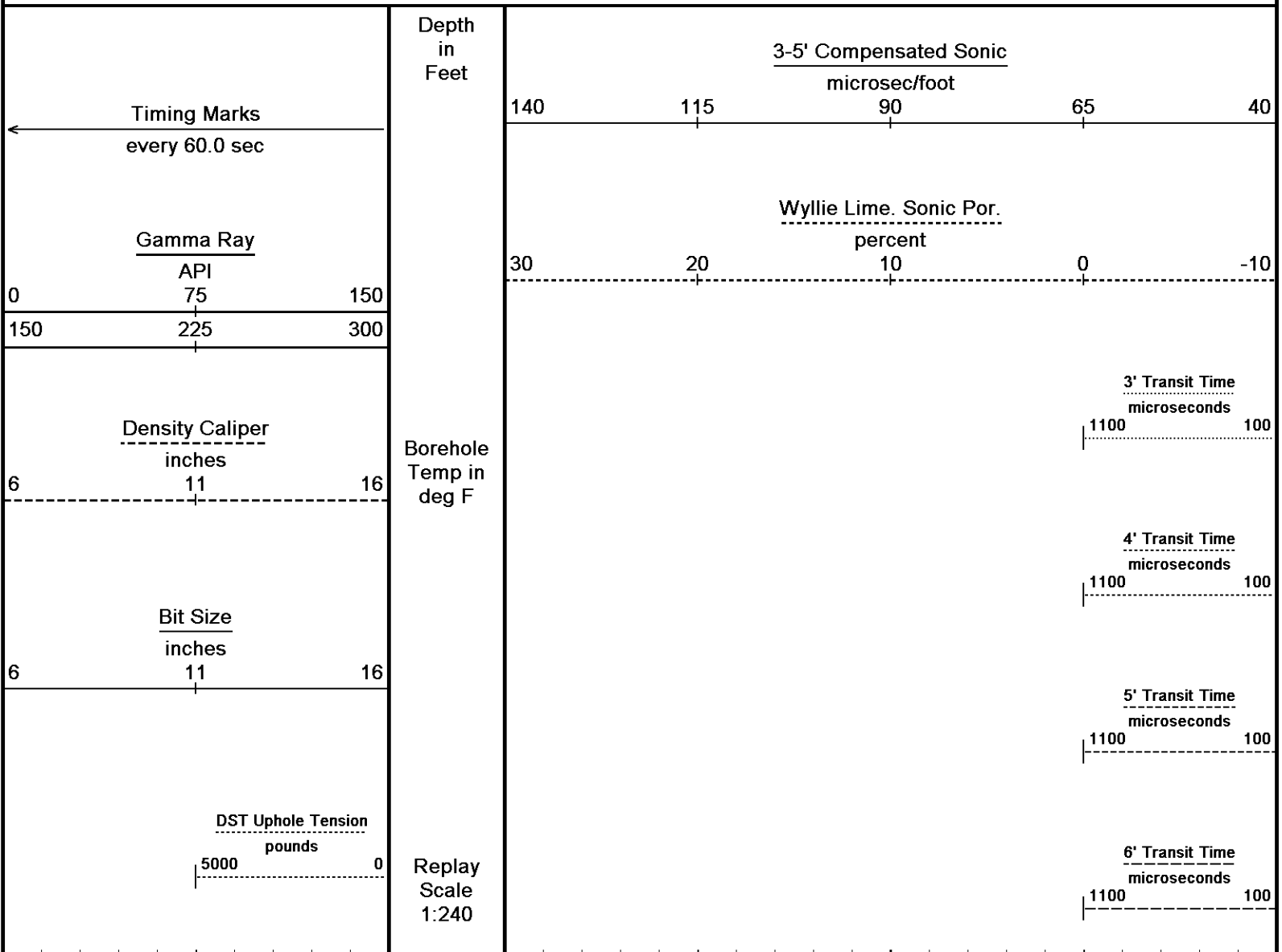
- OPERATOR: J. LaPOINT, S. LARES.

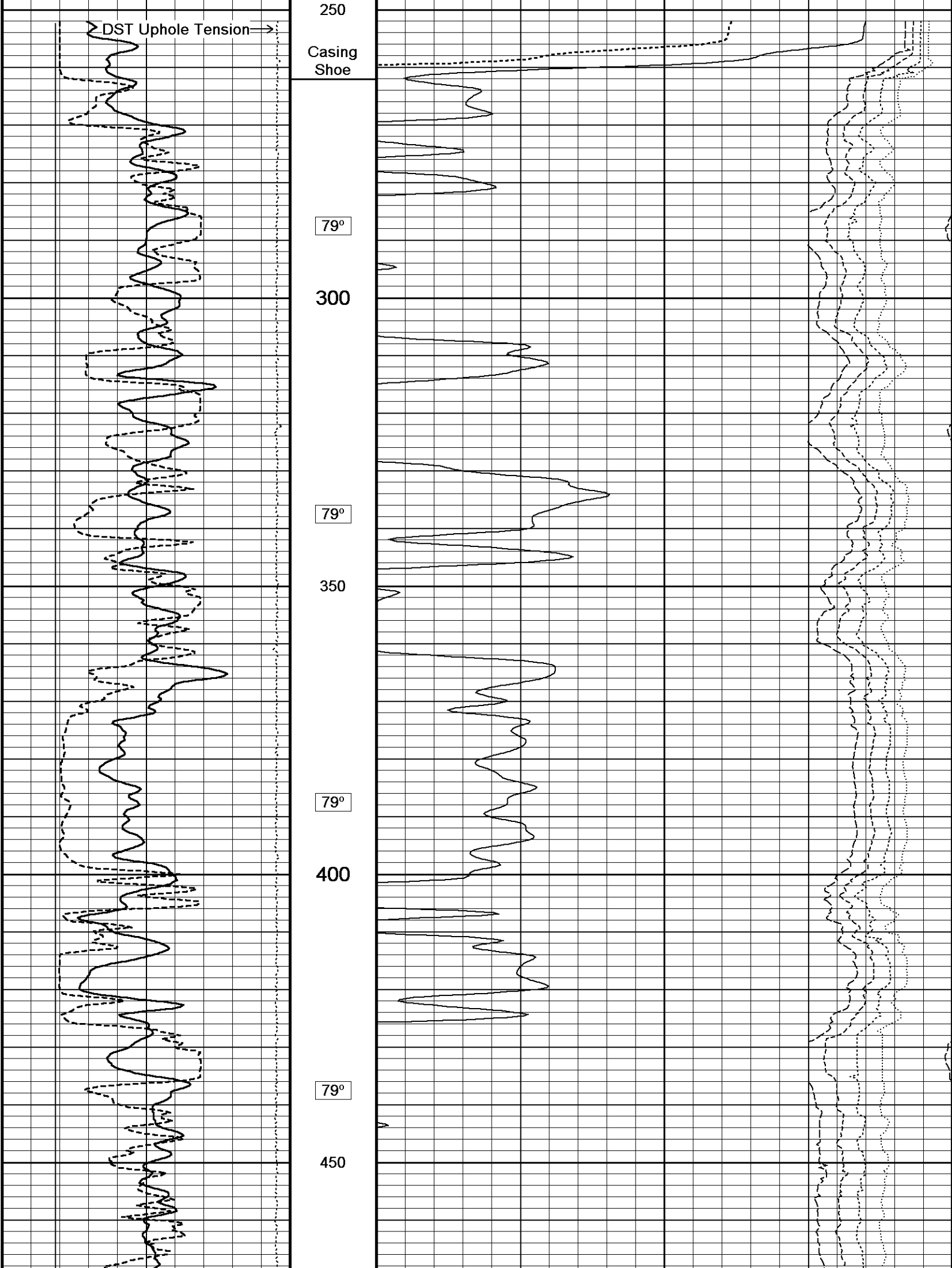
*****RUN TWO SONIC DATA WAS SPLICED INTO RUN ONE DATA TO PROVIDE MORE COMPLETE COVERAGE OF ZONE CLOSEST TO TD PER CUSTOMER REQUEST FOR SONIC DATA ON DETAIL AS CLOSE TO TD AS POSSIBLE.*****

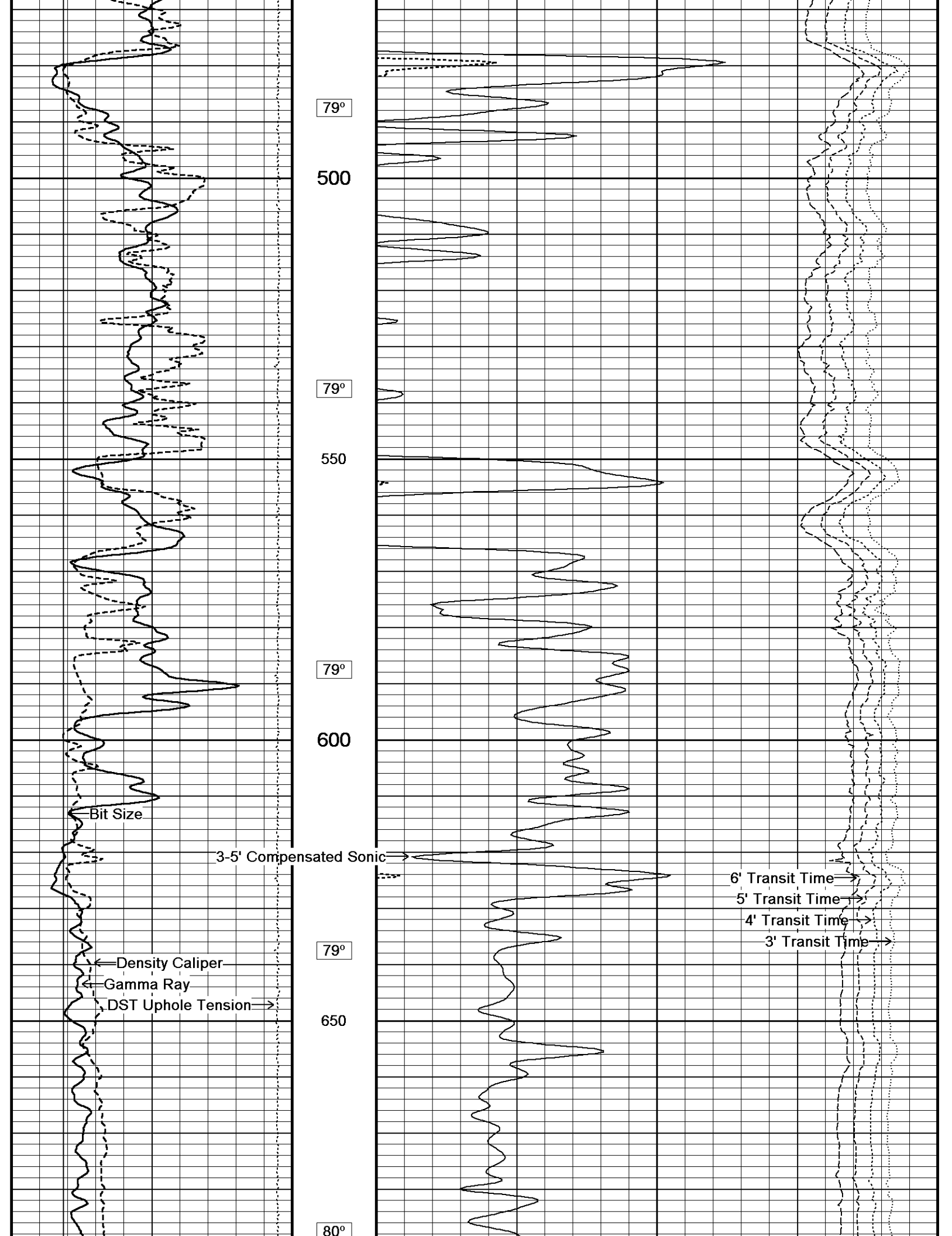
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will 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.

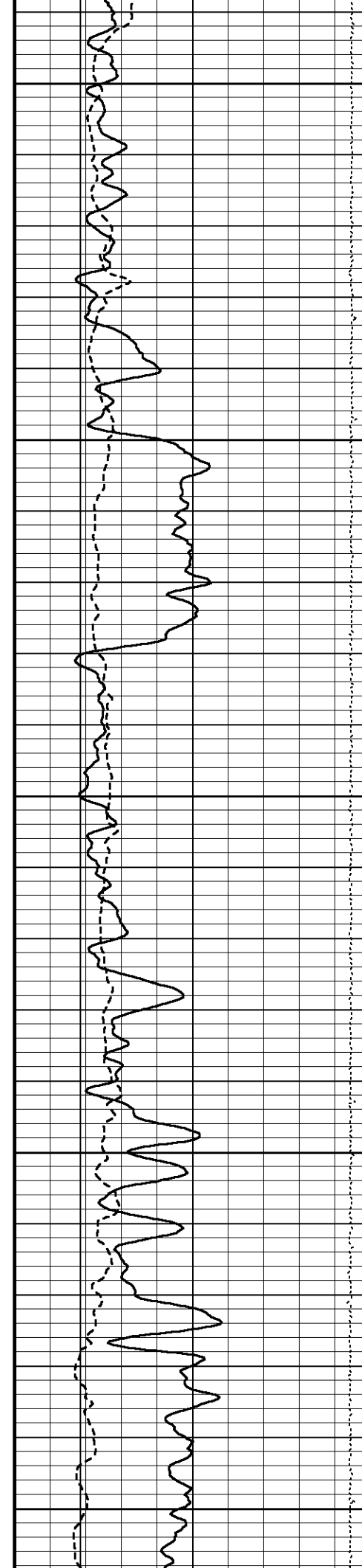
5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 28-AUG-2014 11:13
 Filename: C:\Minimus 13.08.2113\Log\O'Brien Re...\O'Brien Resources Vondracek 4-1 Splice Main.dta Recorded on 28-AUG-2014 10:03
 System Versions: Plotted with 13.08.2113

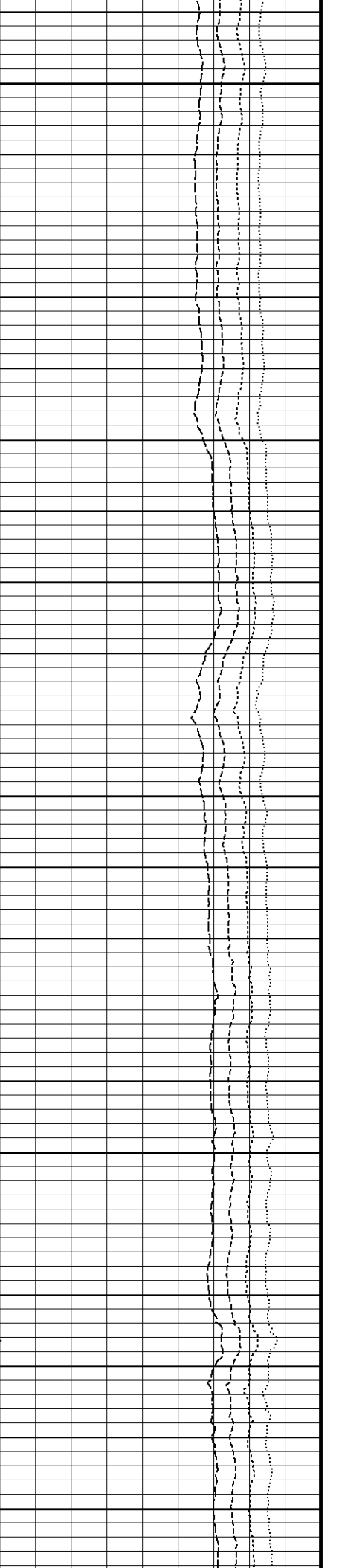
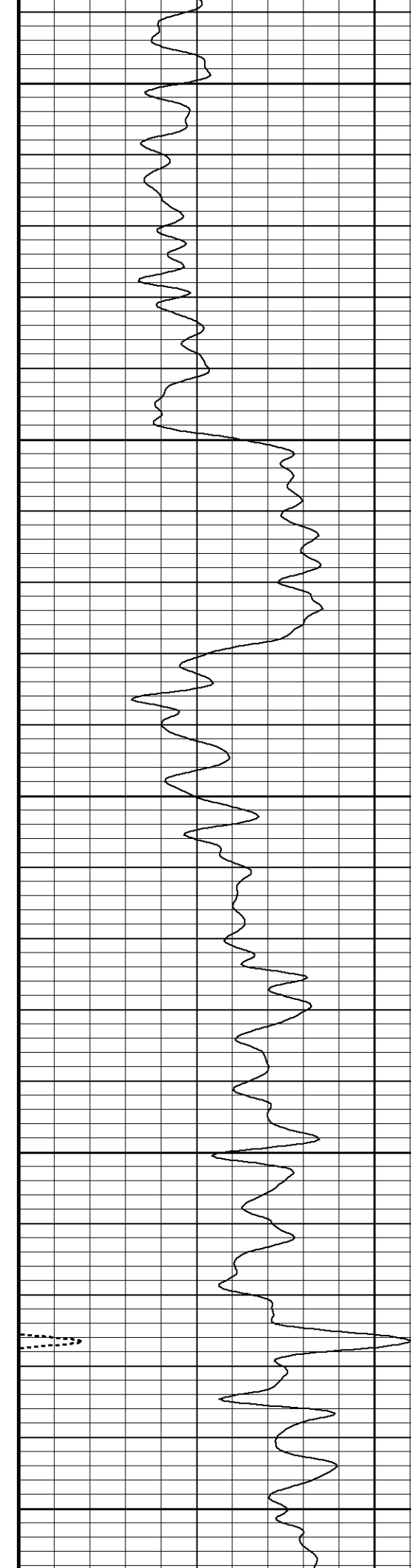


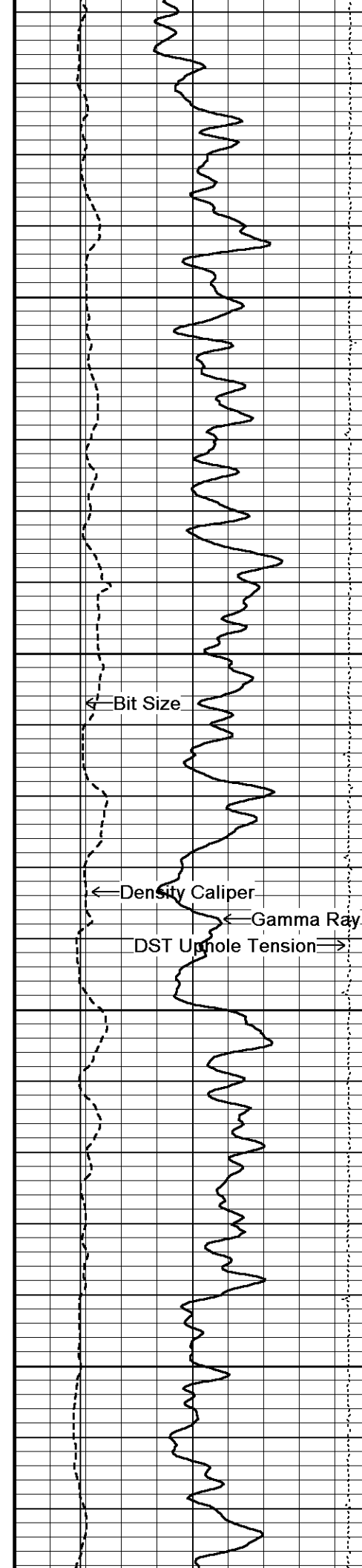






70
80°
750
80°
800
81°
850
82°
900





82°

950

82°

1000

← Bit Size

← Density Caliper

← Gamma Ray

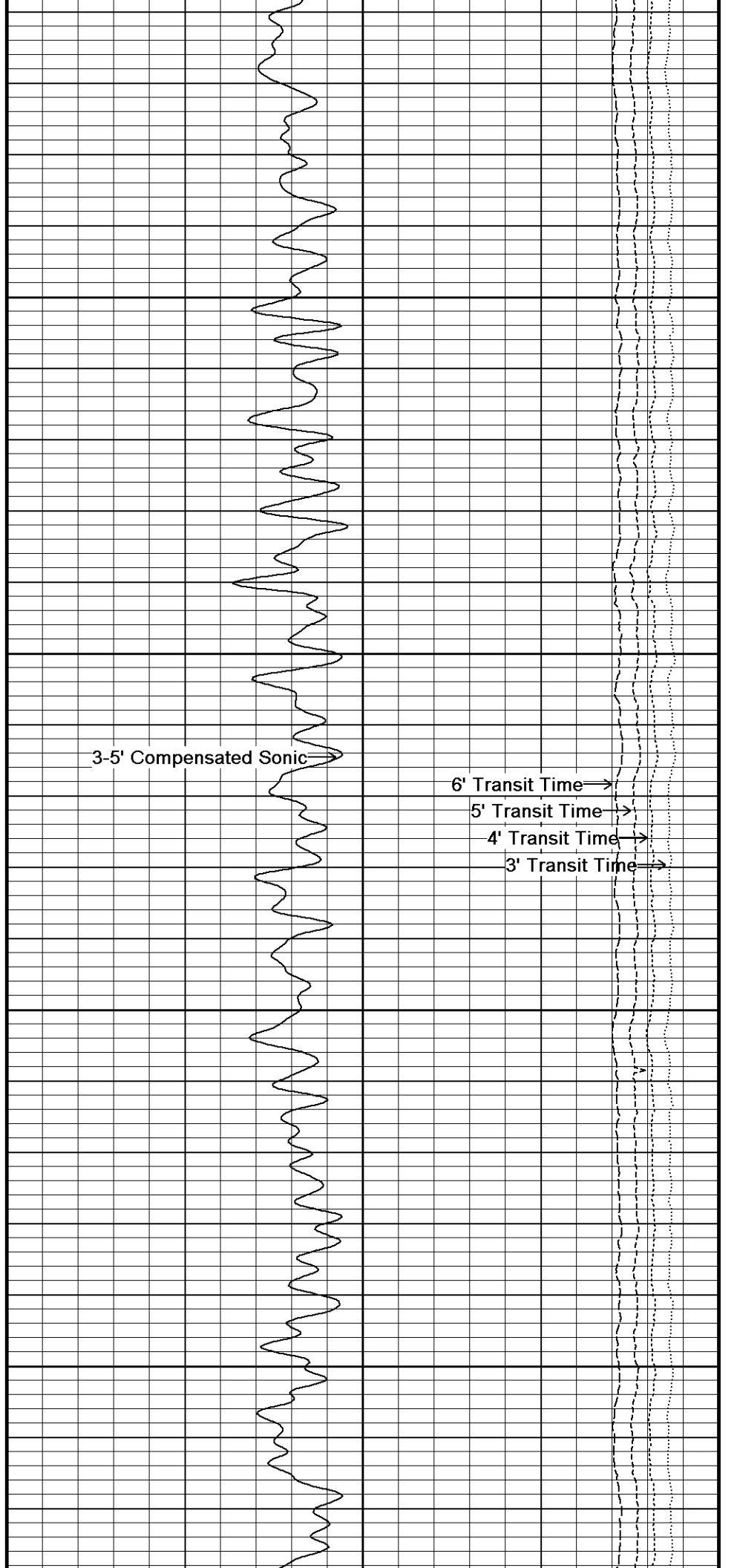
DST Up-hole Tension →

83°

1050

83°

1100



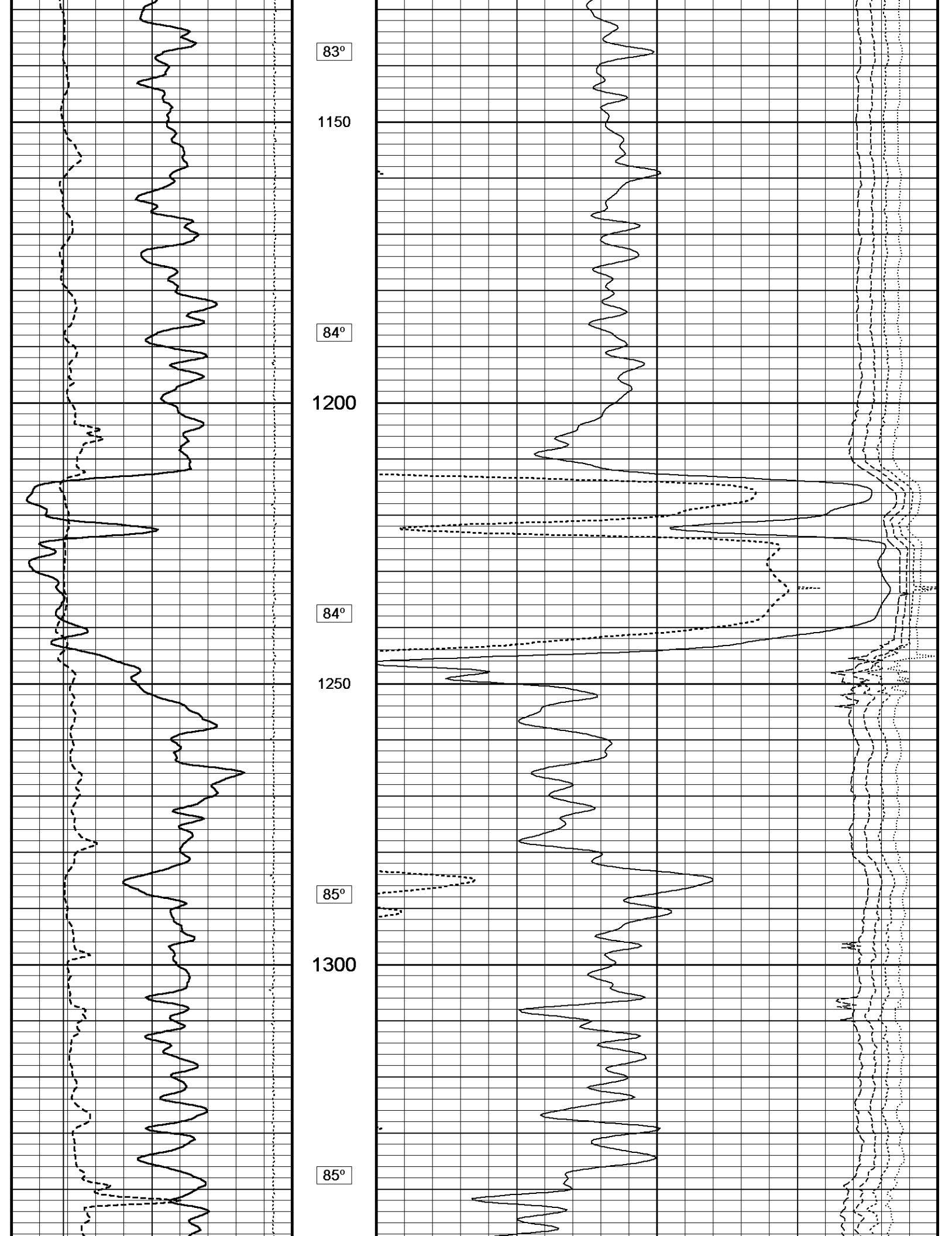
3-5' Compensated Sonic →

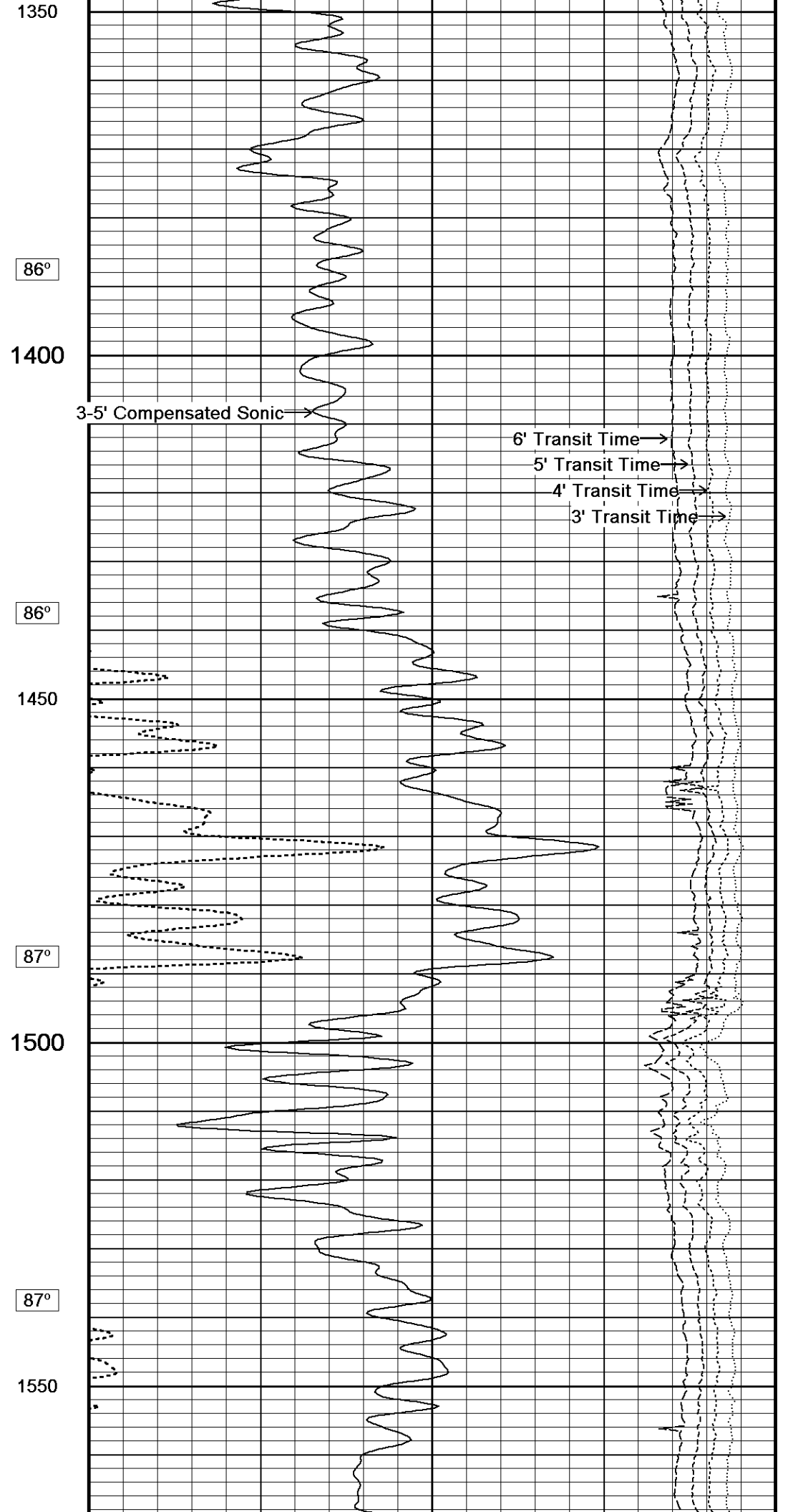
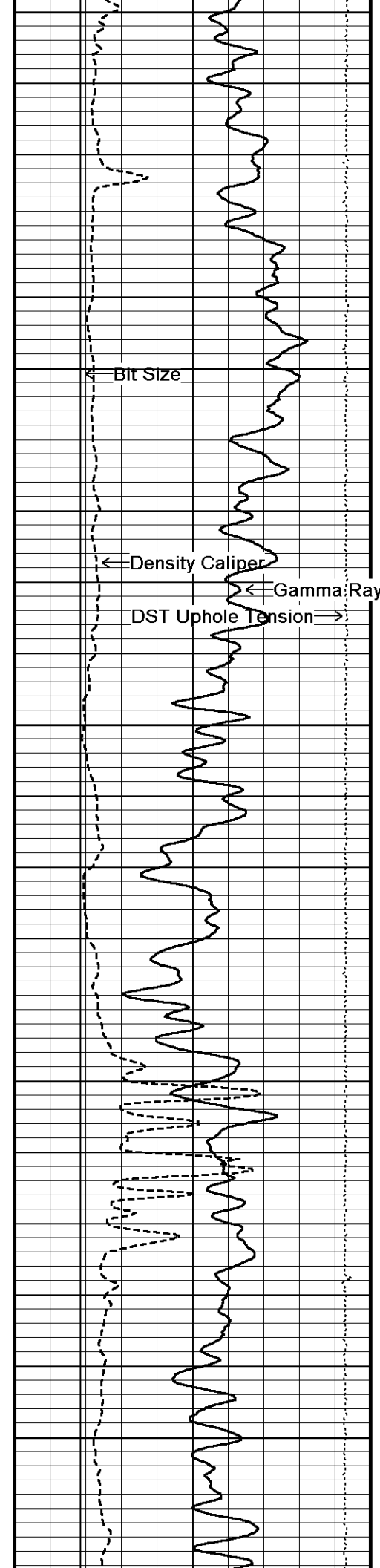
6' Transit Time →

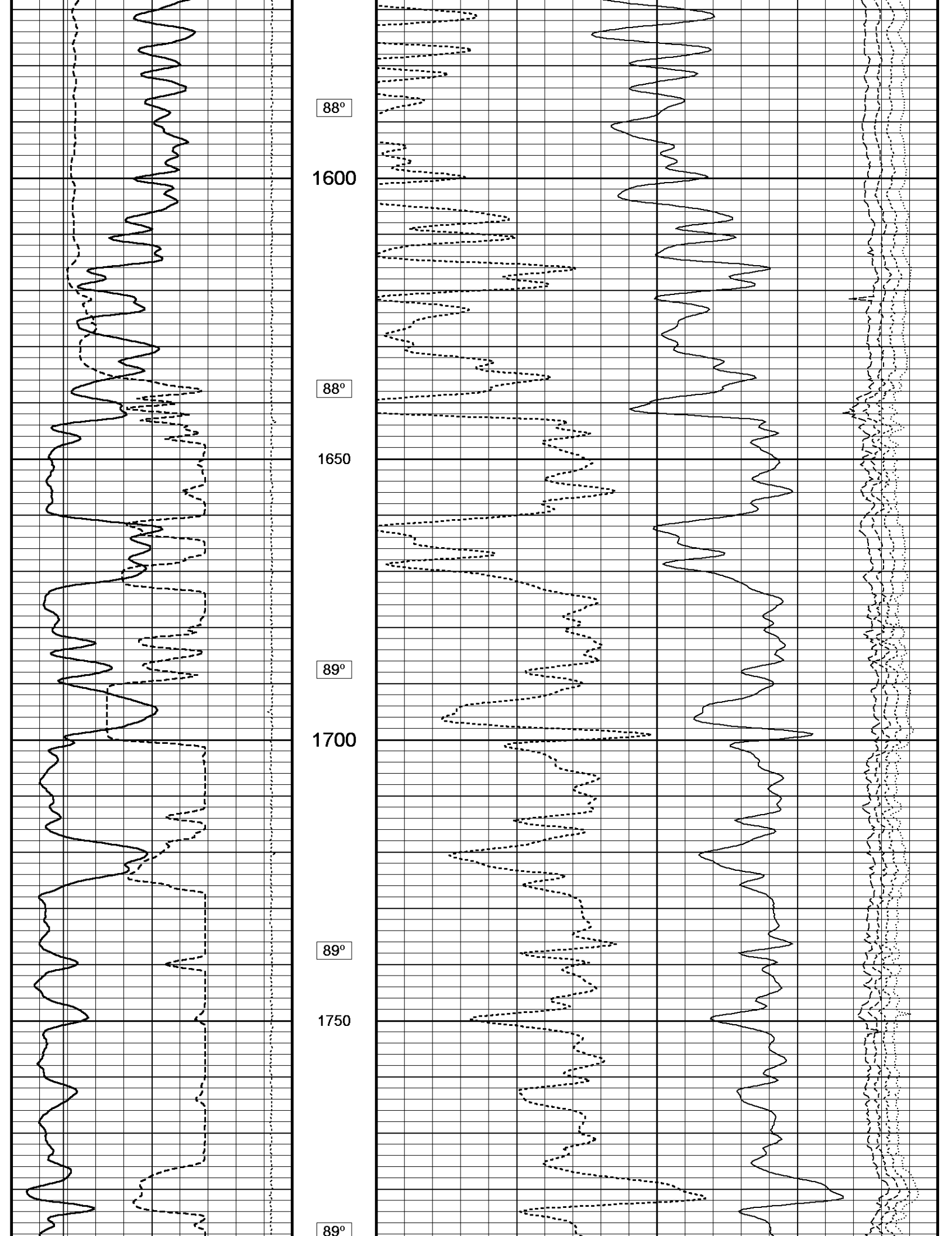
5' Transit Time →

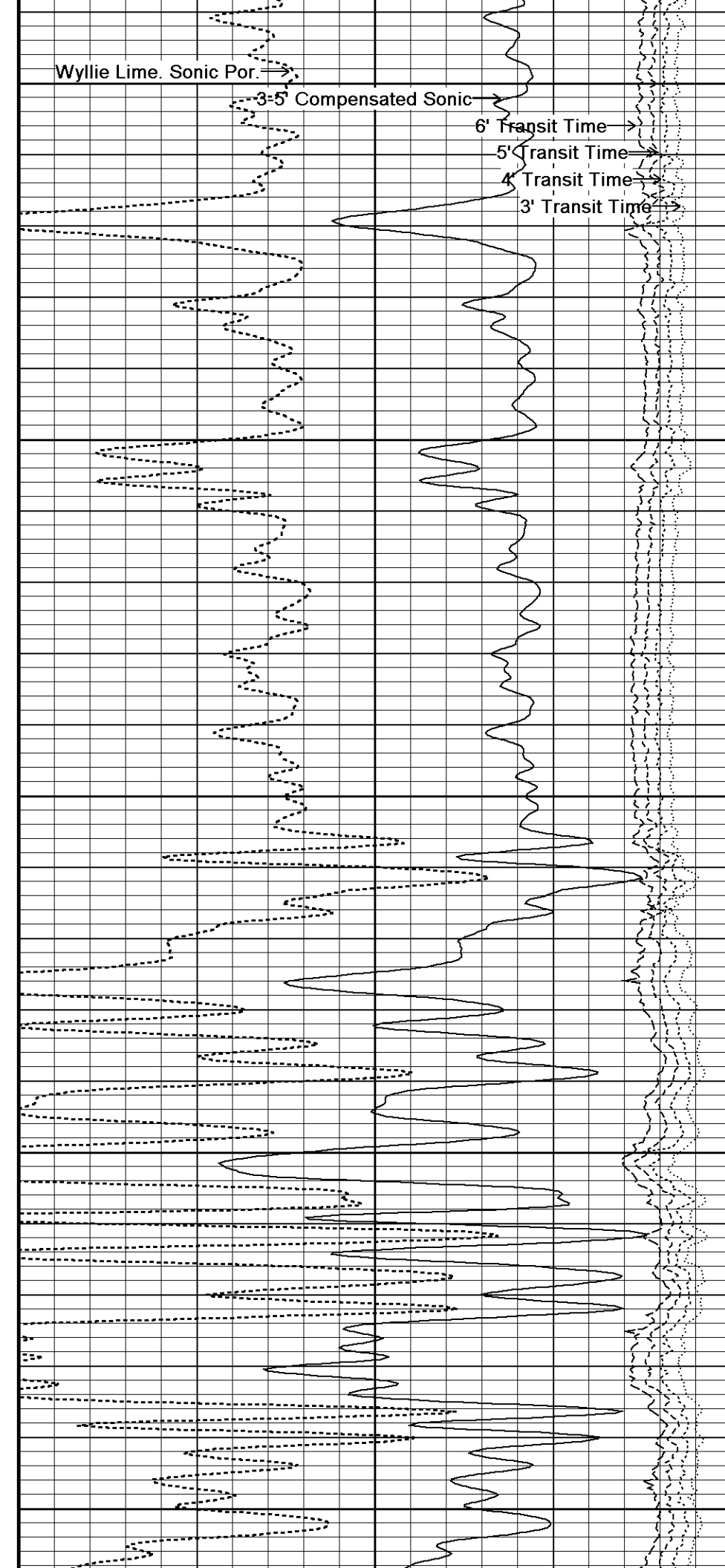
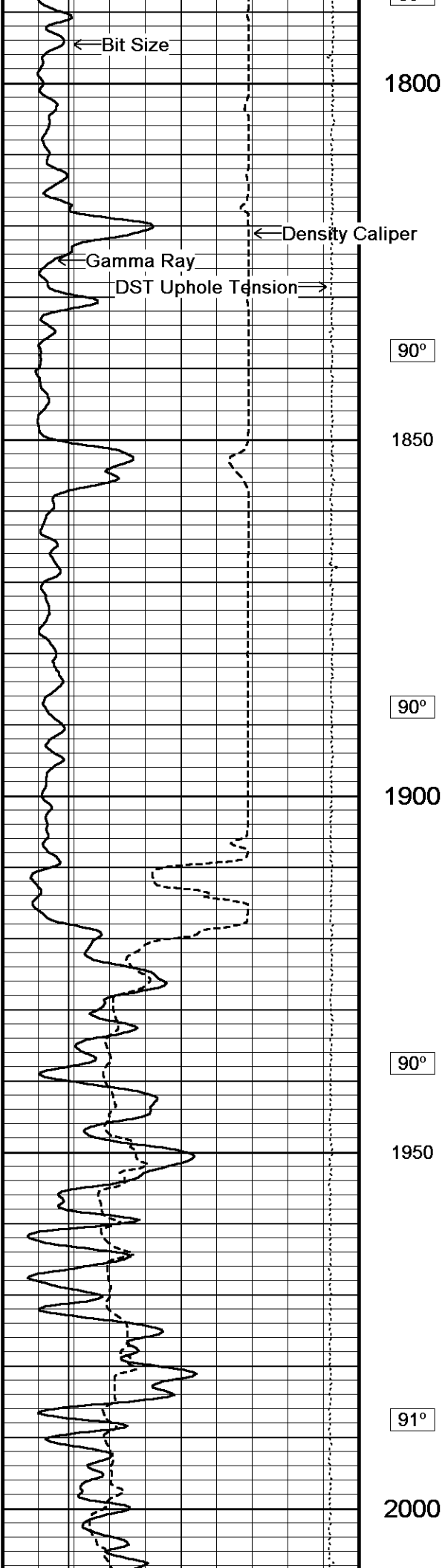
4' Transit Time →

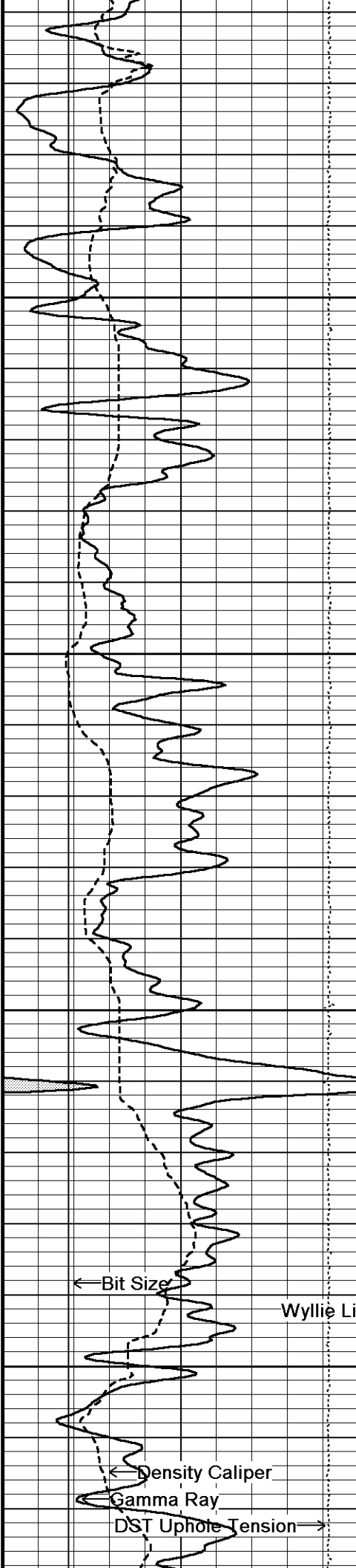
3' Transit Time →











91°

2050

92°

2100

92°

2150

93°

2200

Wyllie Lime. Sonic Por. →

3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →

93°

2250

94°

2300

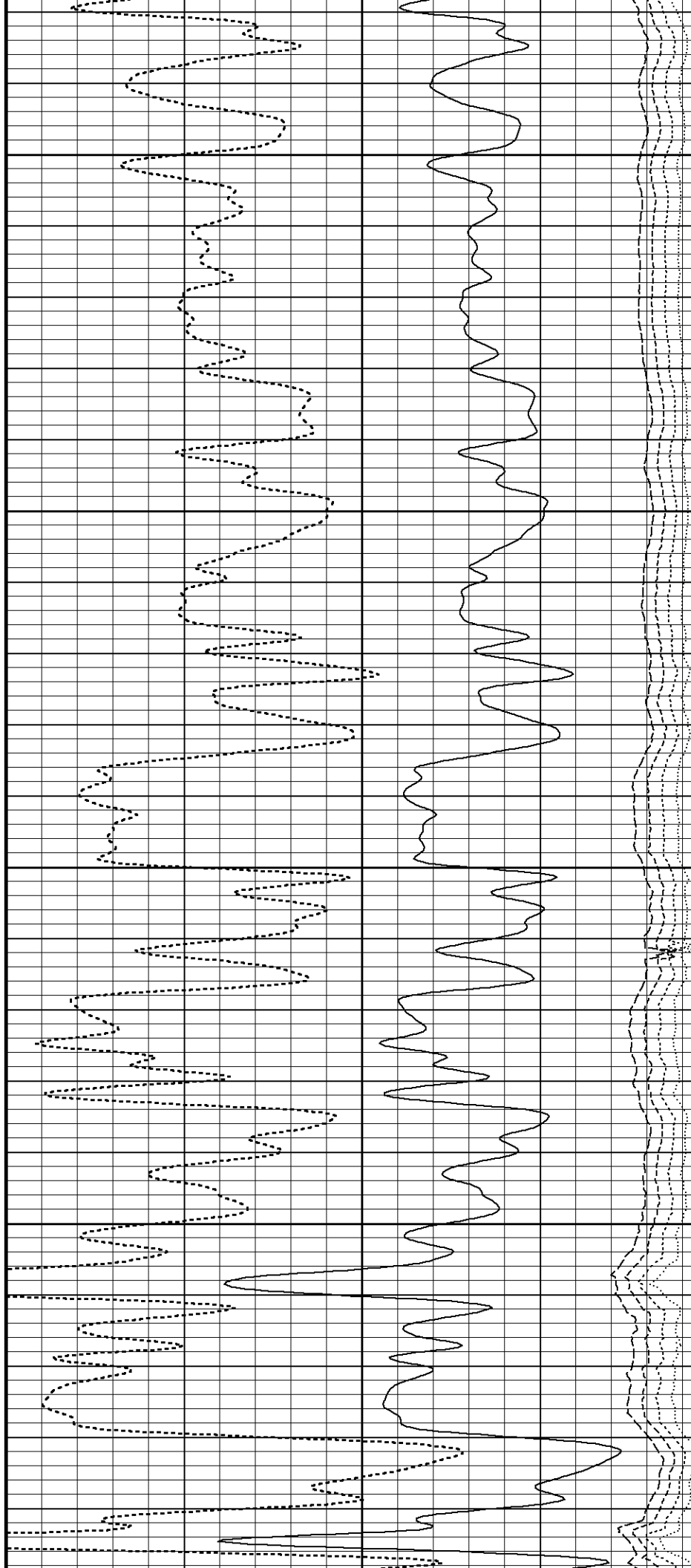
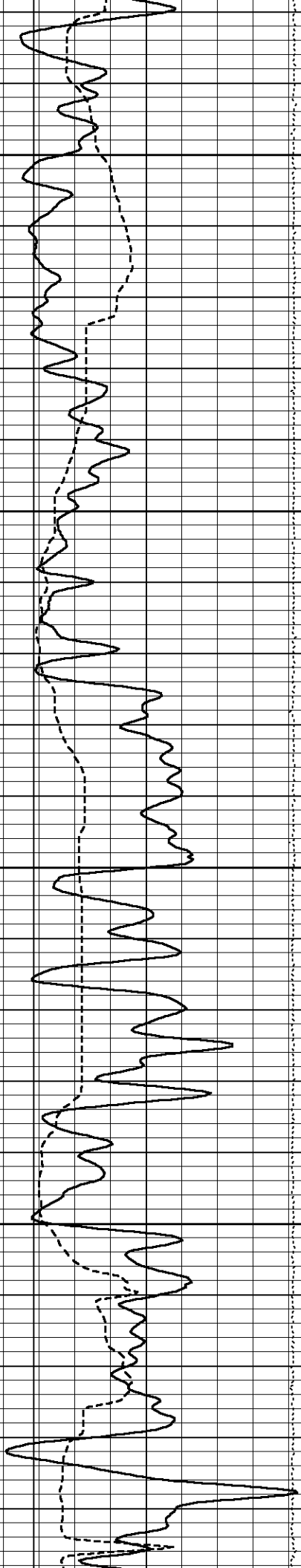
94°

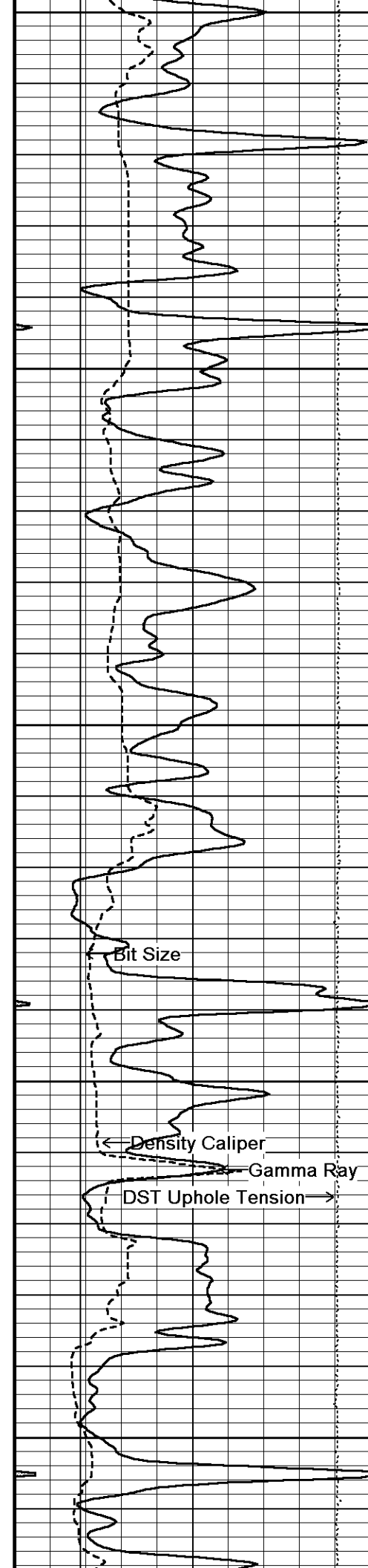
2350

94°

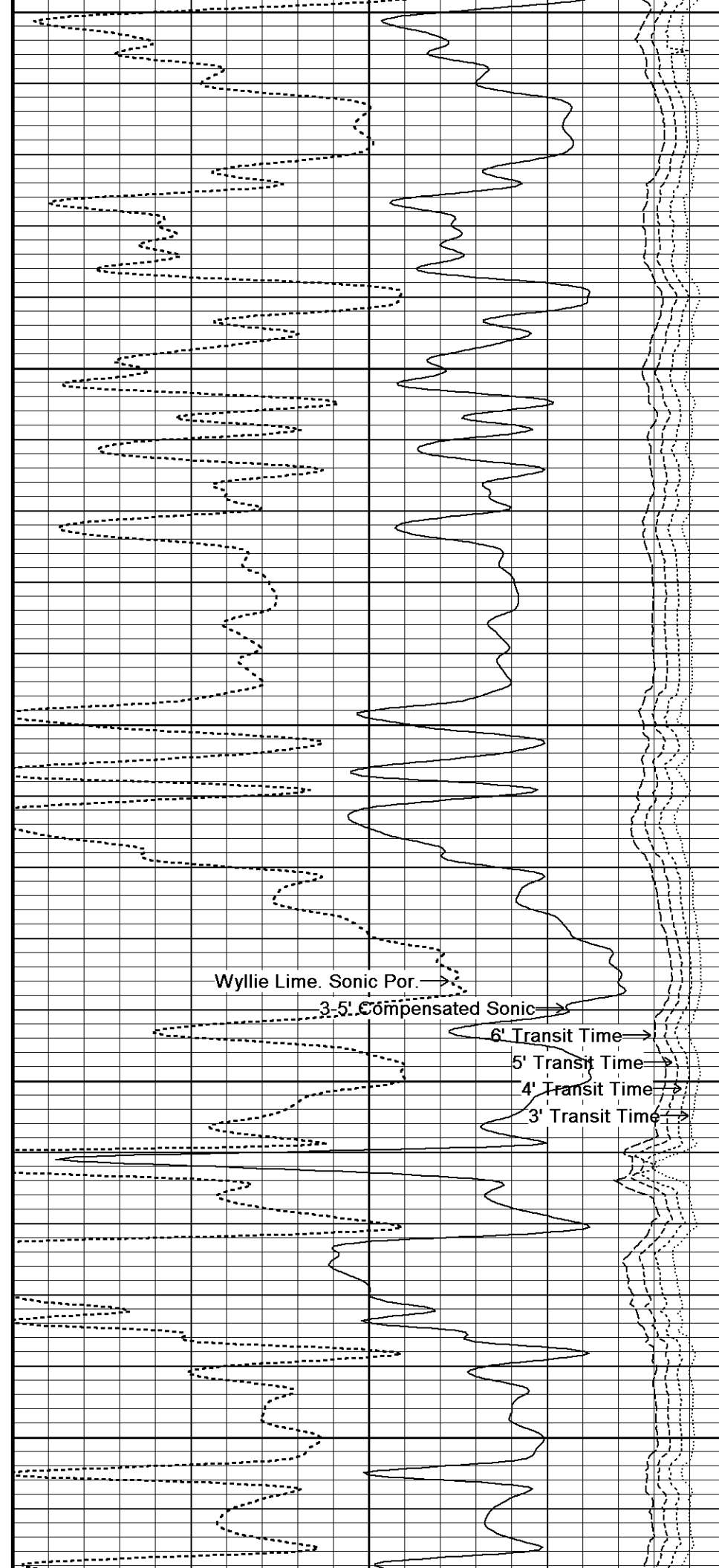
2400

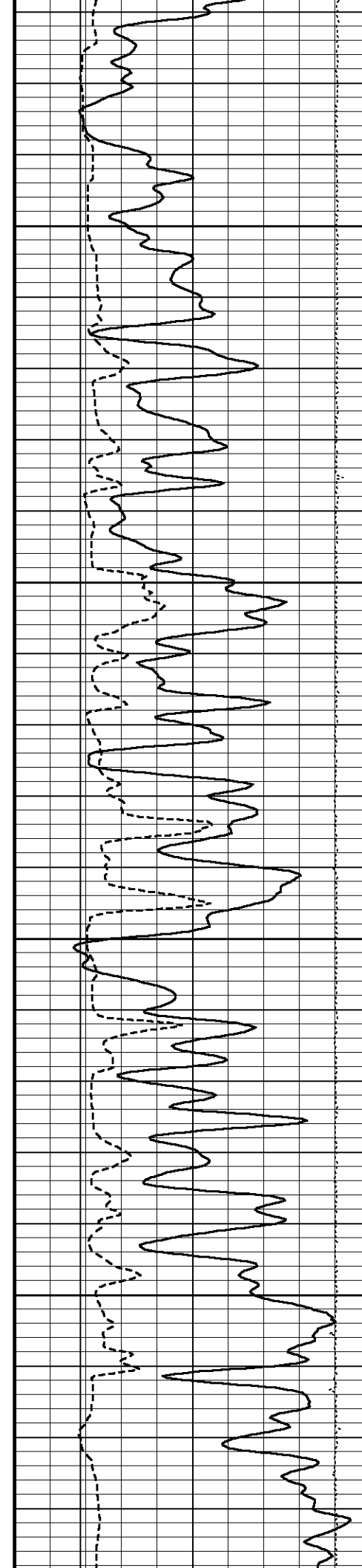
95°





2450
 95°
 2500
 96°
 2550
 96°
 2600
 97°
 2650





97°

2700

98°

2750

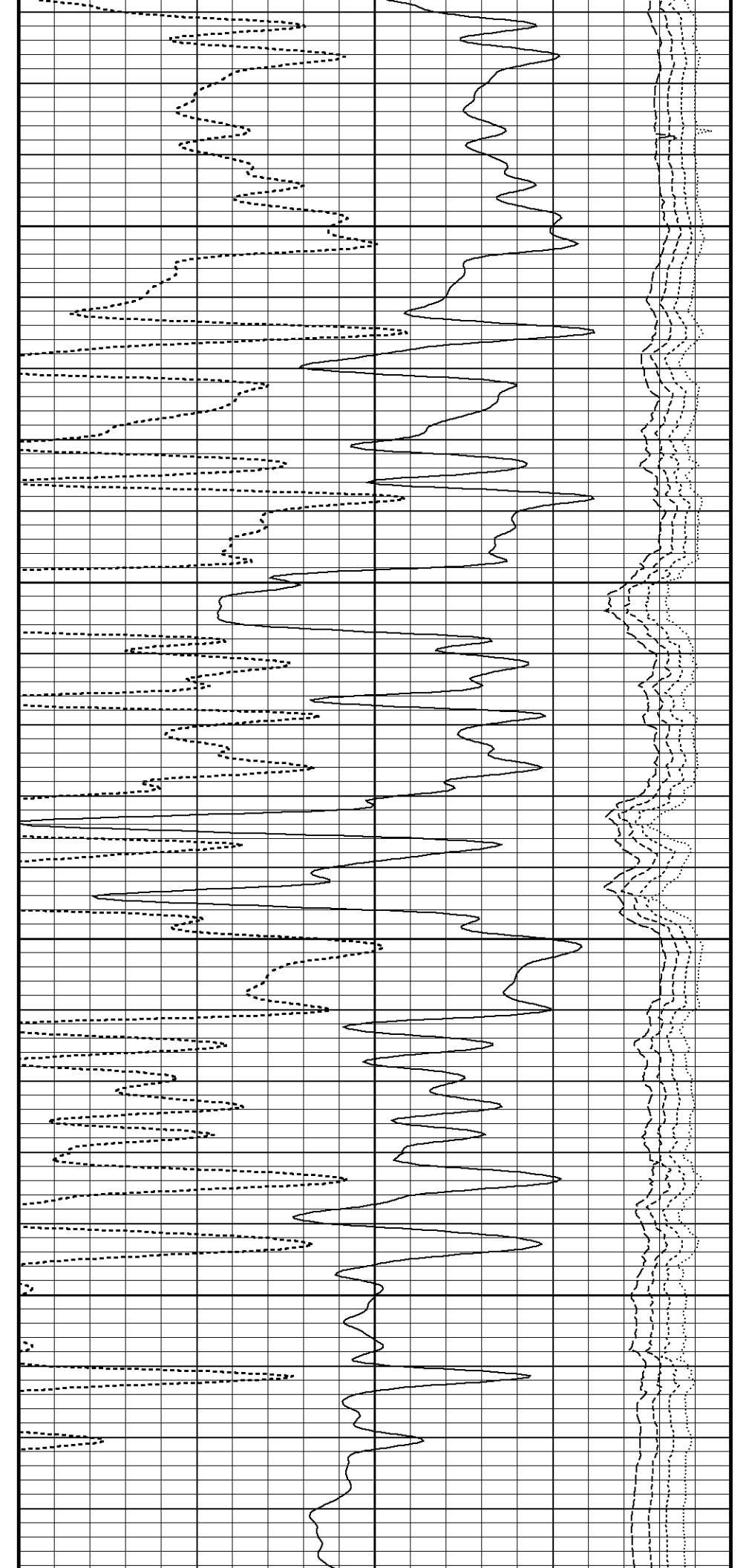
99°

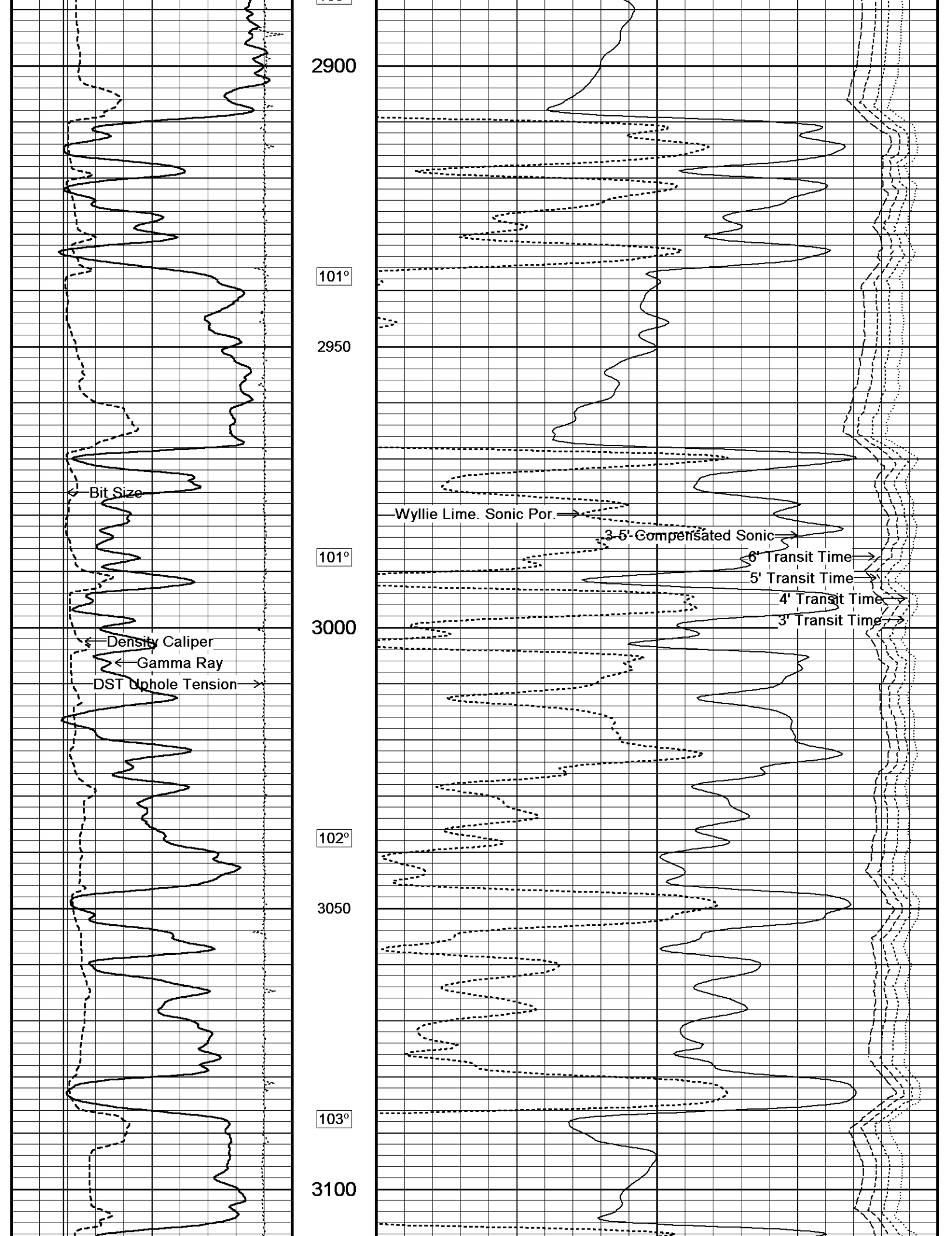
2800

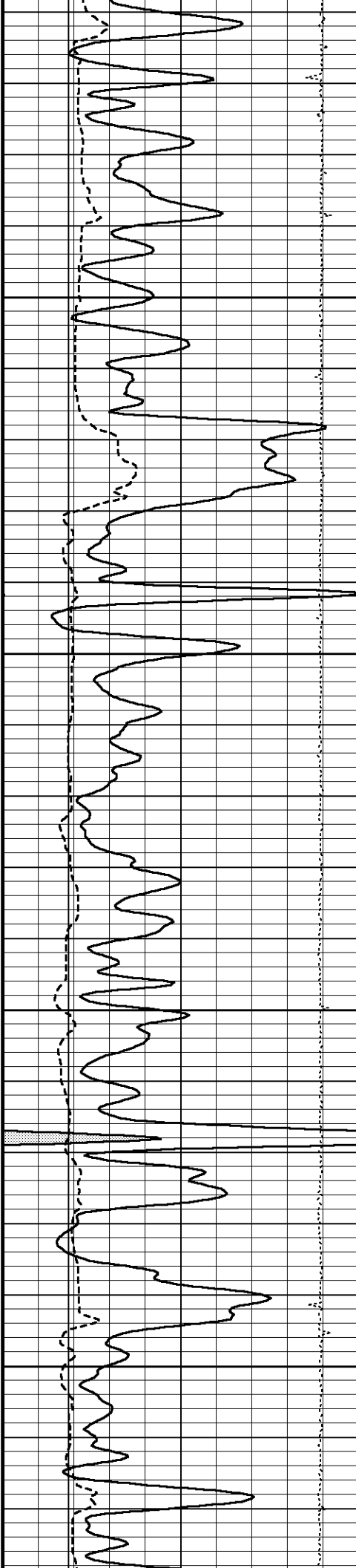
99°

2850

100°







103°

3150

104°

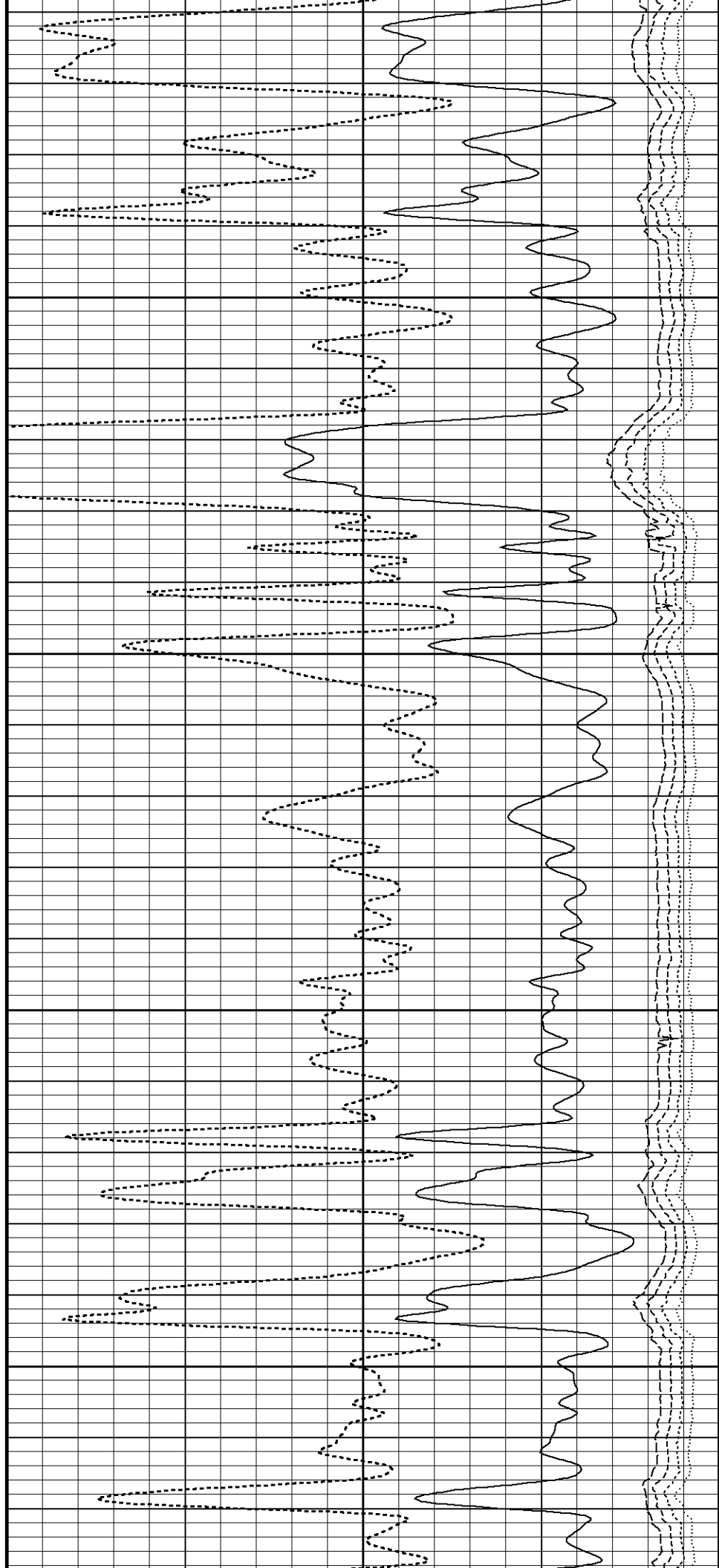
3200

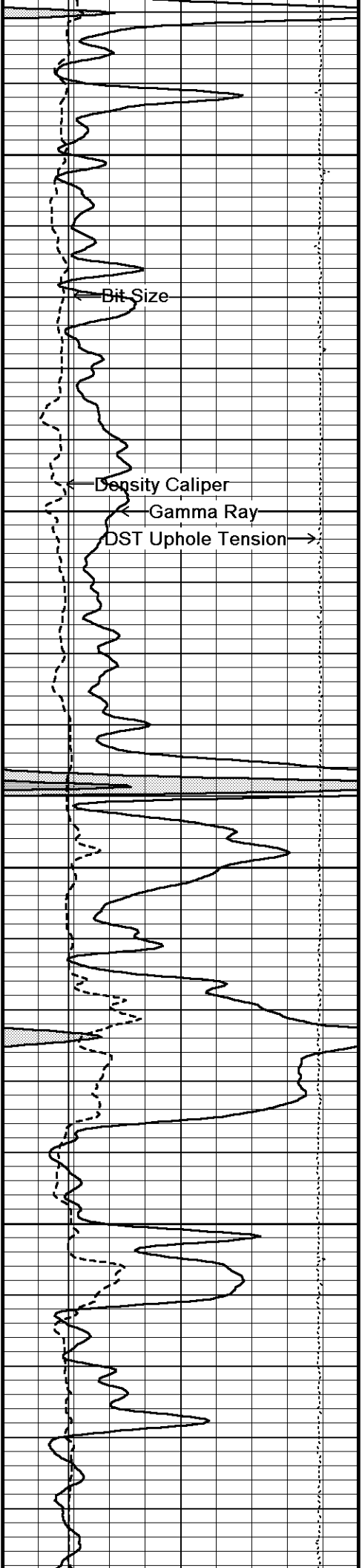
105°

3250

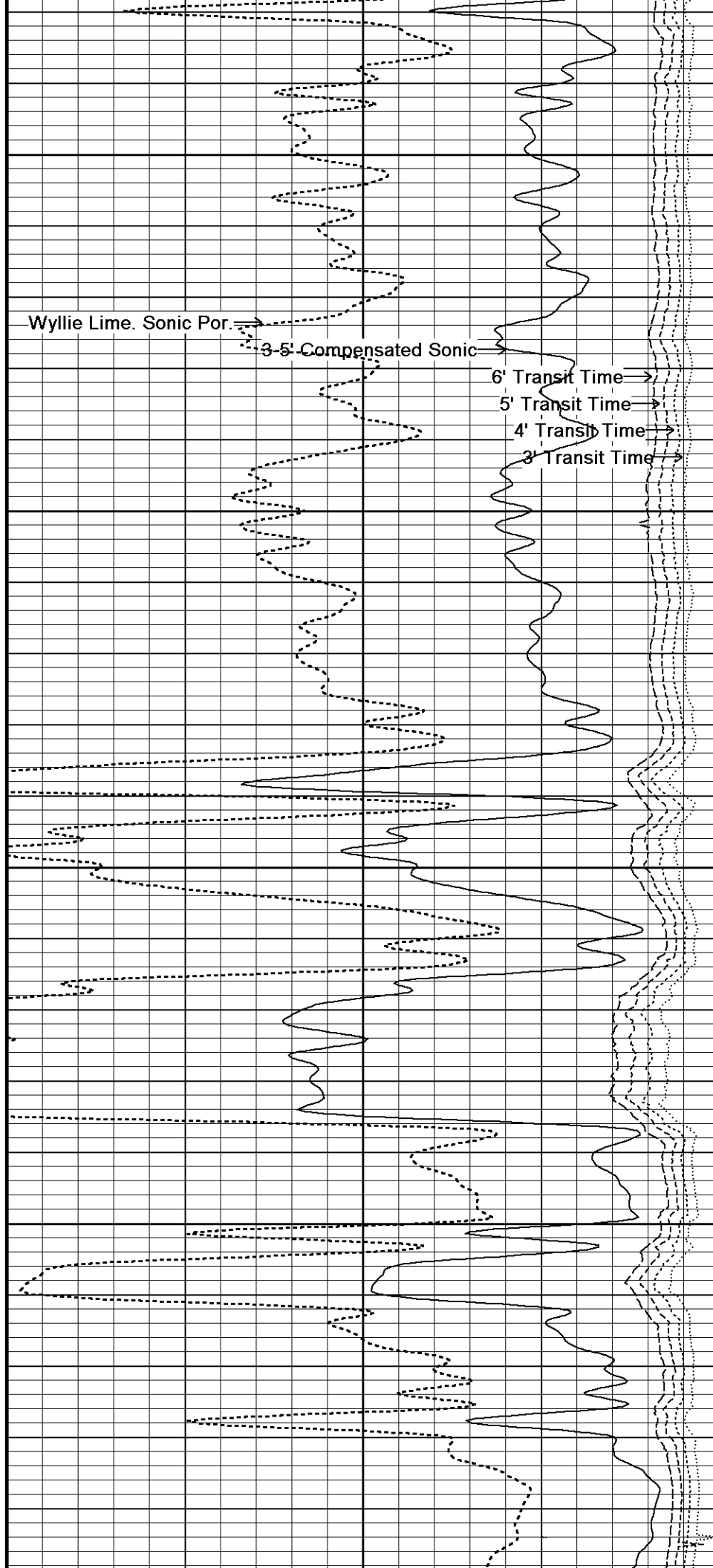
105°

3300

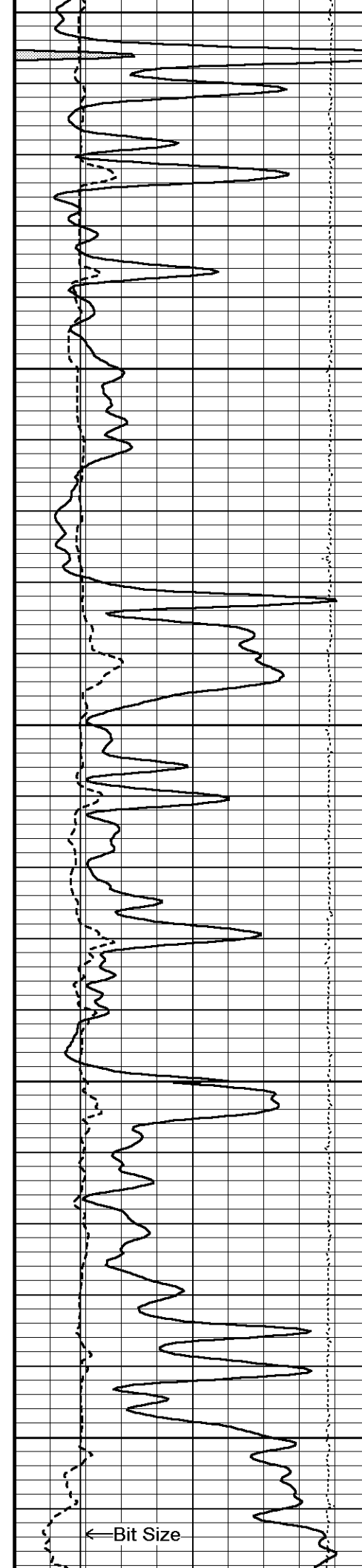




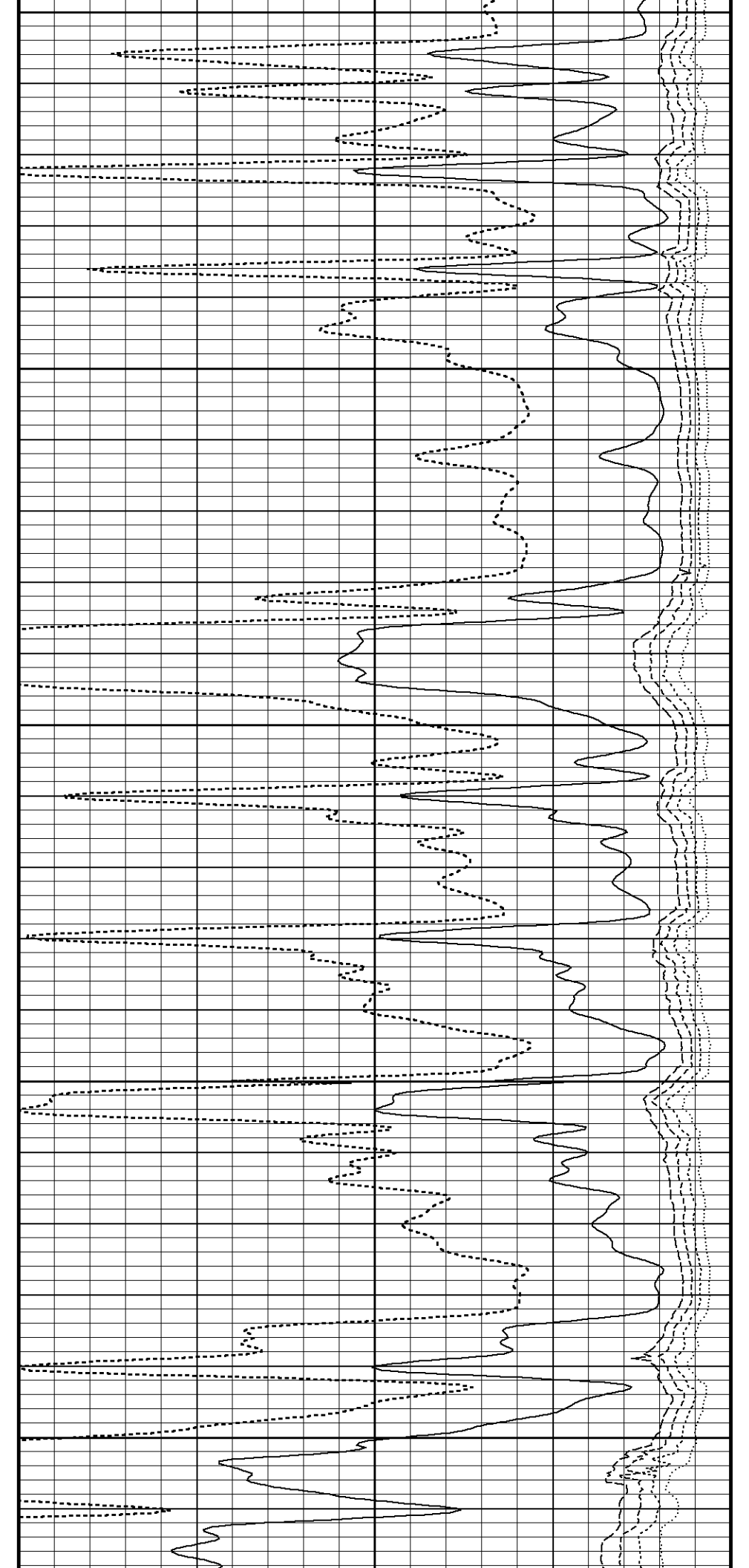
106°
3350
107°
3400
108°
3450
109°
3500
109°

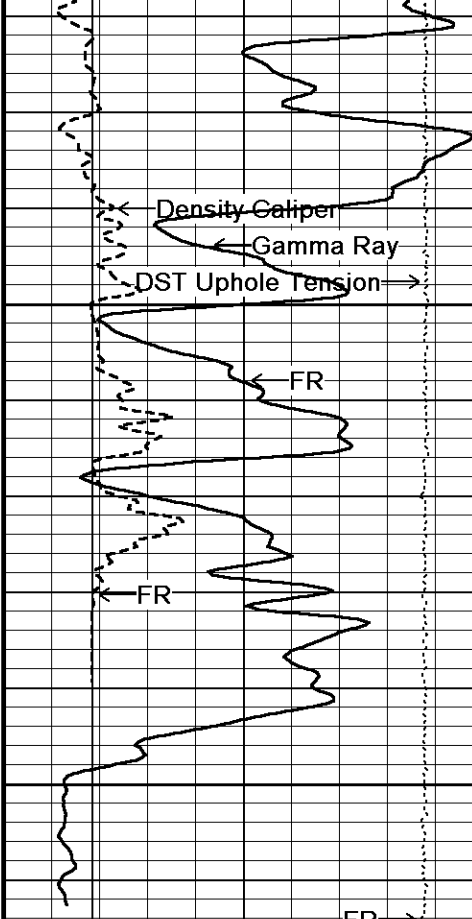


Wyllie Lime. Sonic Por.
3-5-Compensated Sonic
6' Transit Time
5' Transit Time
4' Transit Time
3' Transit Time

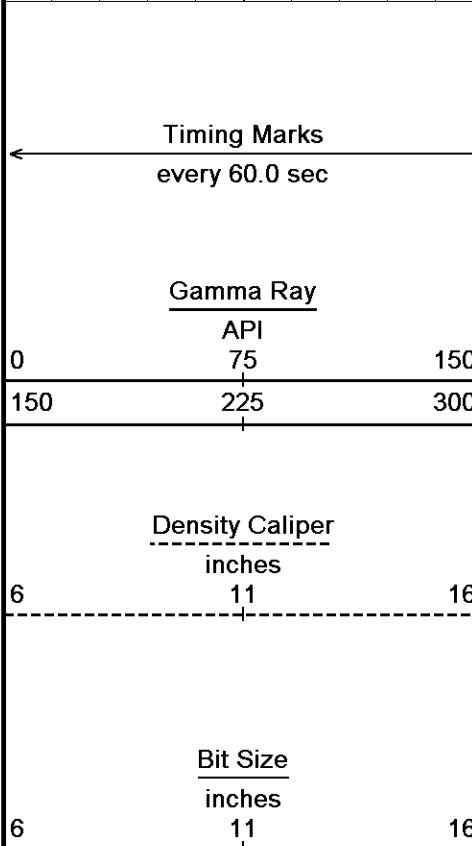
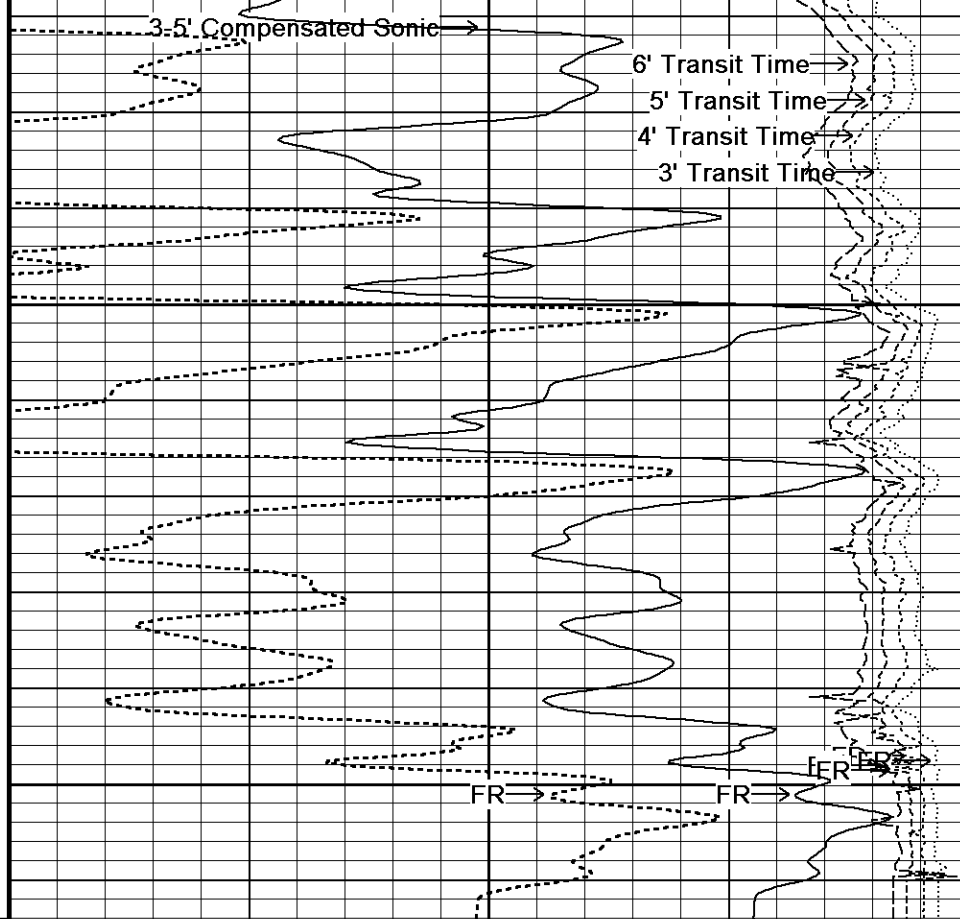


3550
110°
3600
110°
3650
110°
3700
111°
3750

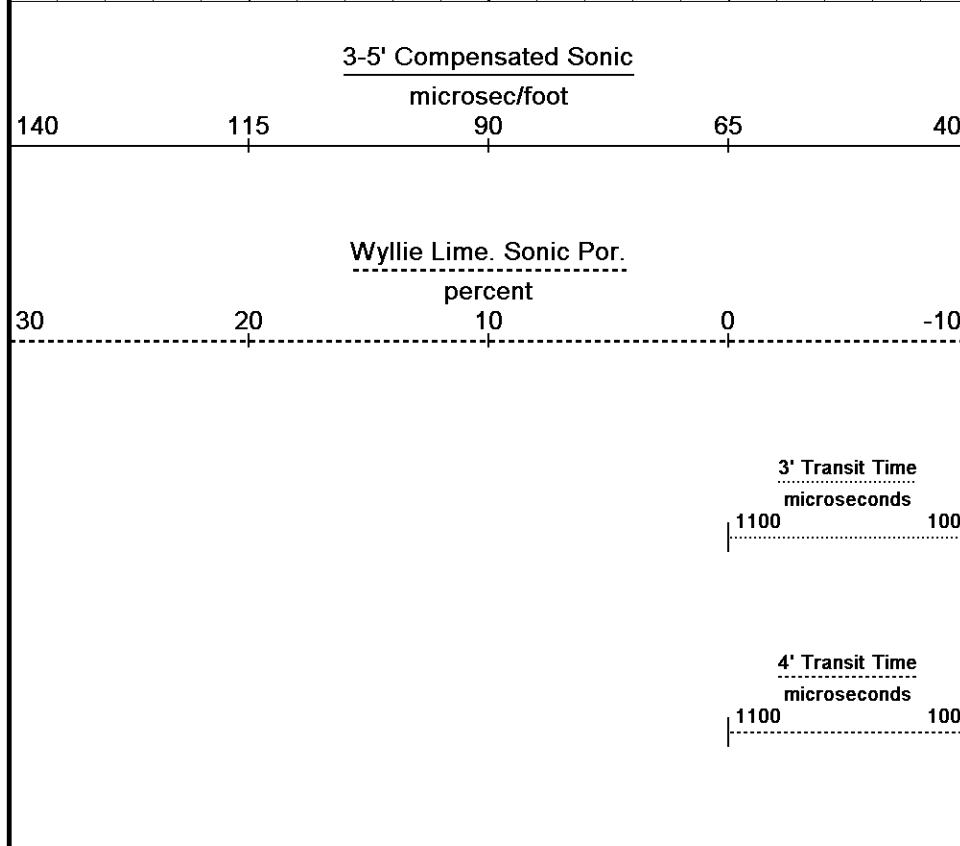




110°
3800
3850
TD



Depth in Feet
Borehole Temp in deg F



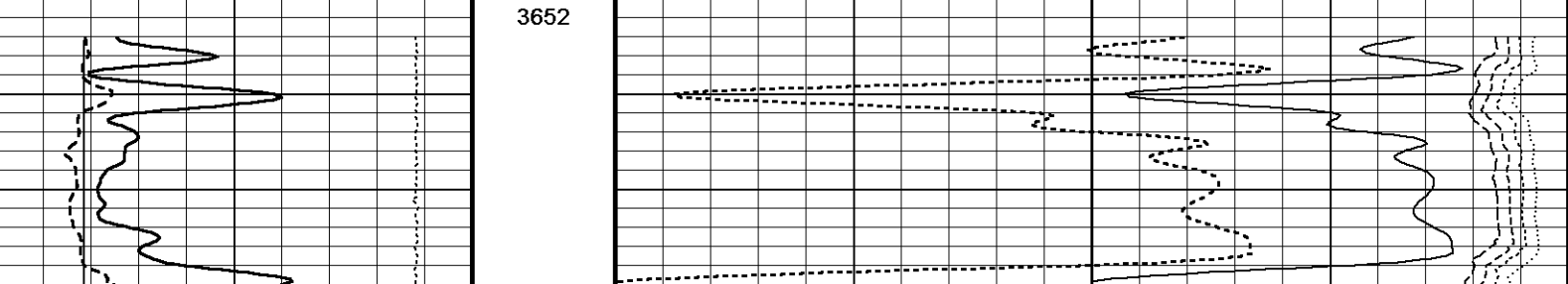
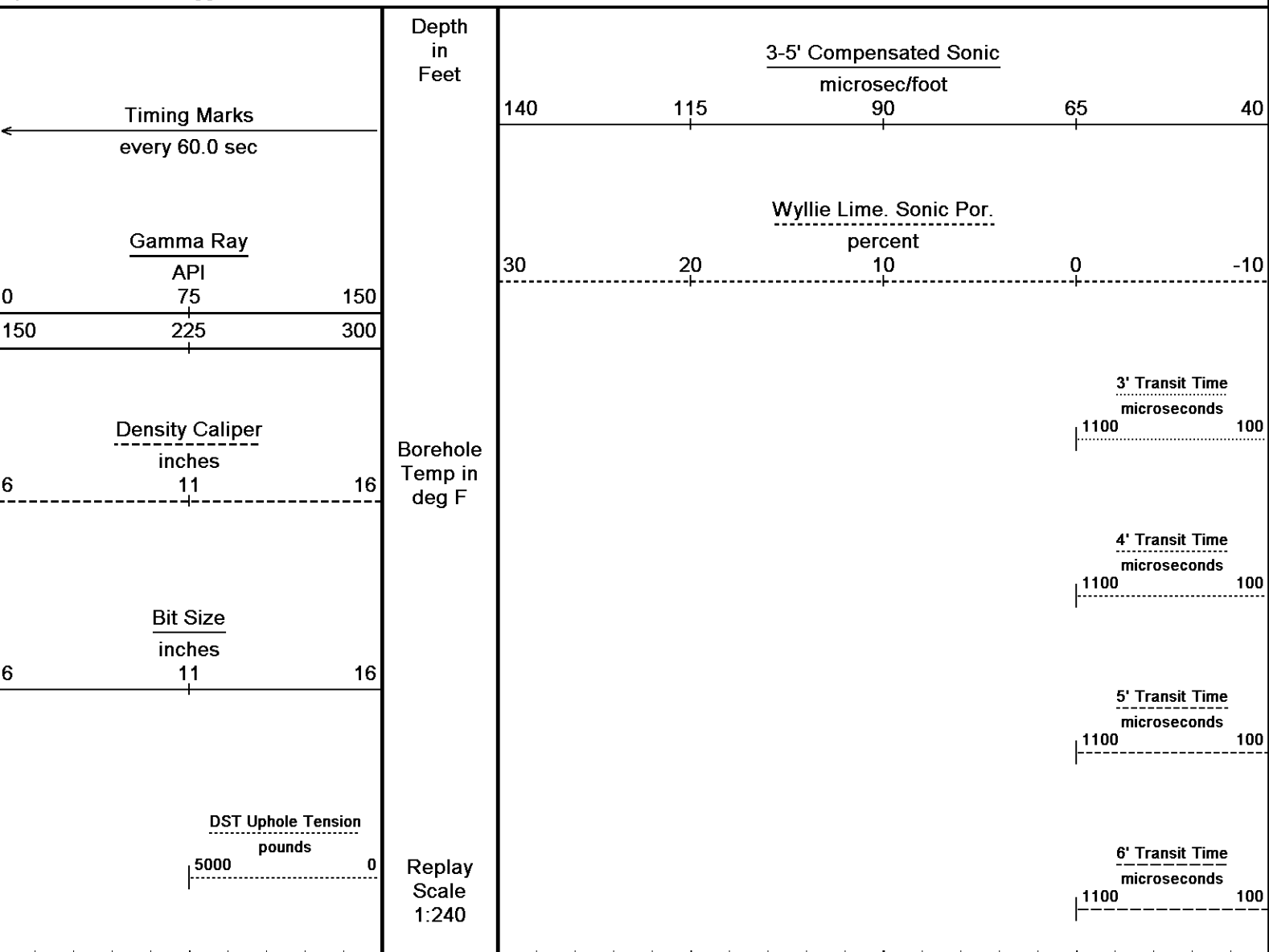


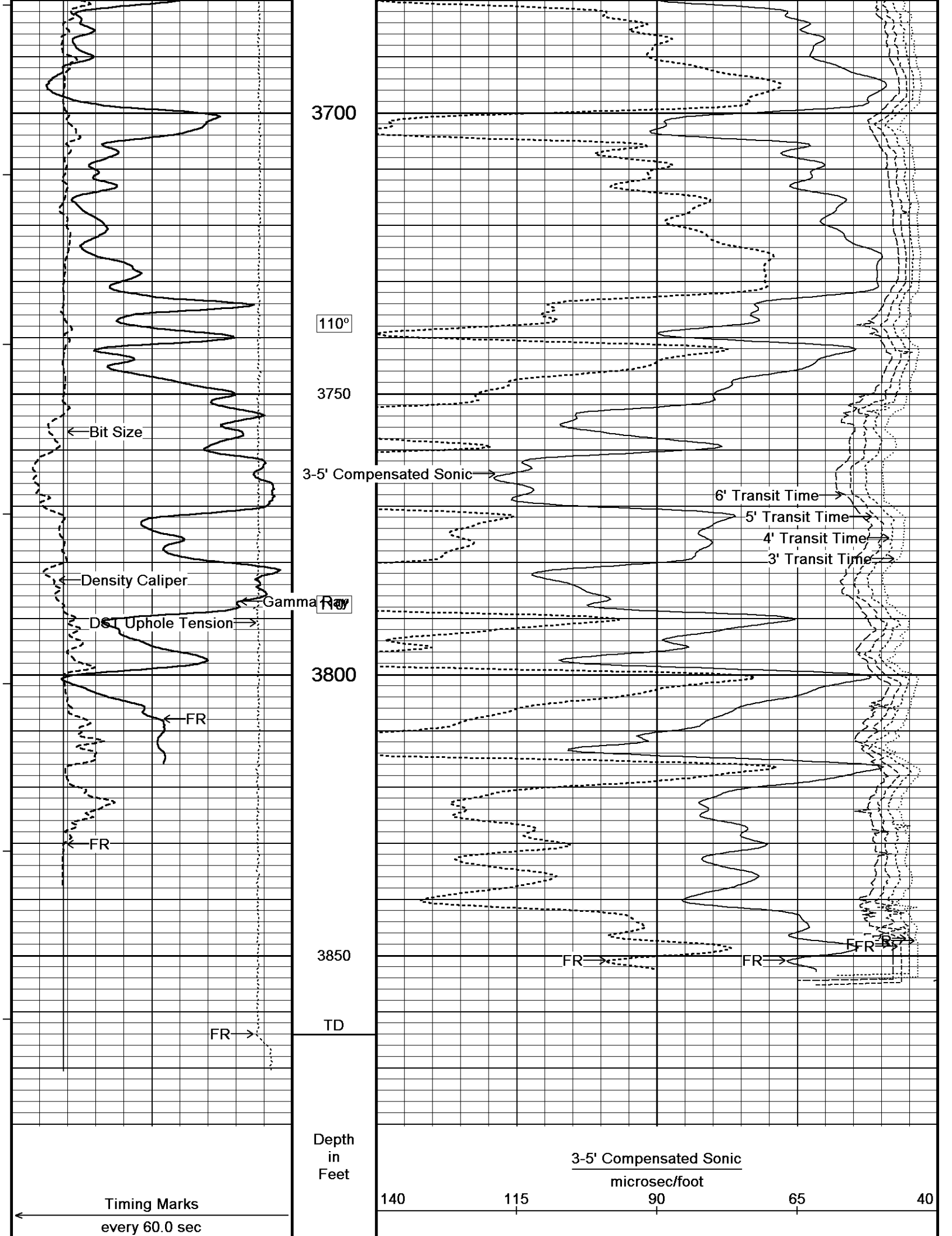
Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 28-AUG-2014 11:13
 Filename: C:\Minimus 13.08.2113\Logs\O'Brien Re...\O'Brien Resources Vondracek 4-1 Splice Main.dta
 Recorded on 28-AUG-2014 10:03
 System Versions: Plotted with 13.08.2113

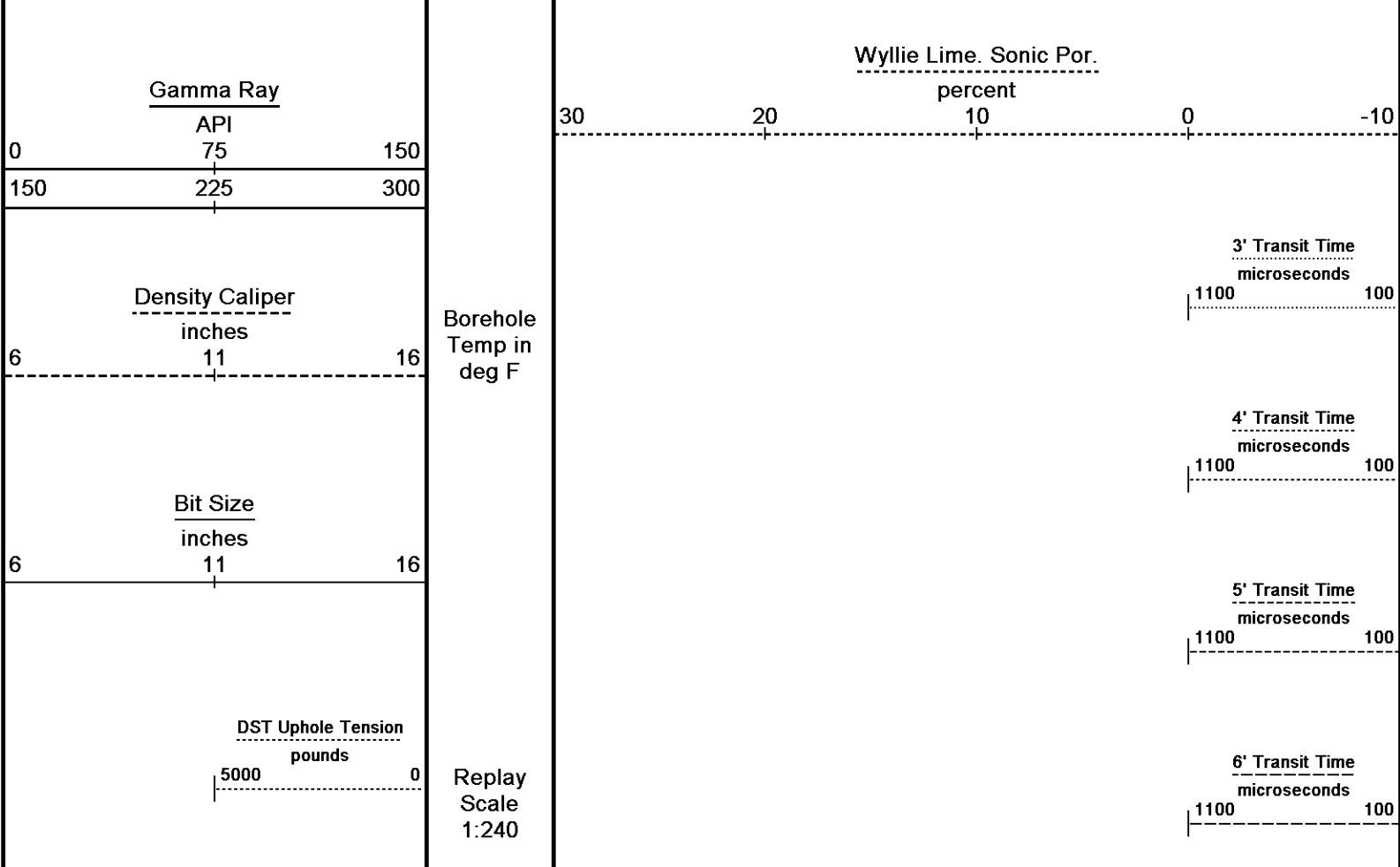
↑ 5 INCH MAIN ↑

↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 28-AUG-2014 11:13
 Filename: C:\Minimus 13.08.2113\Logs\O'Brien ...\O'Brien Resources Vondracek 4-1 Run 1 Repeat.dta
 Recorded on 28-AUG-2014 06:20
 System Versions: Logged with 13.08.2113 Plotted with 13.08.2113







Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 28-AUG-2014 11:13
 Filename: C:\Minimus 13.08.2113\Logs\O'Brien Resources Vondracek 4-1\O'Brien Resources Vondracek 4-1 Run 1 Repeat.dta Recorded on 28-AUG-2014 06:20
 System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION

C:\Minimus 13.08.2113\Logs\O'Brien Resources Vondracek 4-1\O'Brien Resources Vondracek 4-1 Run 1 Repeat.dta

General Constants All 000 Last Edited on 28-AUG-2014,03:35

General Parameters		
Mud Resistivity	0.420	ohm-metres
Mud Resistivity Temperature	81.000	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	Density 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	

Down-hole Tension Calibration SMS 0 Field Calibration on 28-AUG-2014 04:30

Reading No	Measured	Calibrated (lbs)
1	15919.11	0.00
2	16496.06	480.60

SP Calibration MCG-C 208

Field Calibration on 25-AUG-2014 14:59

	Measured	Calibrated (mV)
Reference 1	99.3	98.7
Reference 2	-98.0	-98.9

High Resolution Temperature Calibration MCG-C 208

Field Calibration on 23-JAN-2014,17:11

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

High Resolution Temperature Constants MCG-C 208

Last Edited on 23-JAN-2014,17:11

Pre-filter Length 11

Gamma Calibration MCG-C 208

Field Calibration on 25-AUG-2014 15:11

	Measured	Calibrated (API)
Background	71	48
Calibrator (Gross)	1142	773
Calibrator (Net)	1071	725

Gamma Constants MCG-C 208

Last Edited on 28-AUG-2014,03:18

Gamma Calibrator Number	GRC038	
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	%

Neutron Calibration MDN-B.J 387

Base Calibration on 31-JUL-2014 11:36

Field Check on 25-AUG-2014 15:18

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
Ratio	2985	92	3714	110
	32.470		33.764	

Field Calibrator at Base

	Calibrated (cps)
Ratio	1675 2460
	0.681

Field Check

	Calibrated (cps)
Ratio	1690 2481
	0.689

Neutron Constants MDN-B.J 387

Last Edited on 25-AUG-2014,15:11

Neutron Source Id	P58125B	
Neutron Jig Number	5824NE	
Epithermal Neutron		
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	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	None	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-A.A 55

Base Calibration on 30-JUL-2014 09:41

Field Check on 25-AUG-2014 14:47

Base Calibration

Reference 1	Measured	0.0	Calibrated (ohm-m)	0.0
Reference 2		951.6		126.8
Base Check				281.4
Field Check				281.4

FE Constants MFE-A.A 55

Last Edited on 26-AUG-2014,13:31

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

Sonic Constants MSS-C.K 330

Last Edited on 28-AUG-2014,03:18

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	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	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
3' Waveform Filter	
4' Waveform Filter	
5' Waveform Filter	
6' Waveform Filter	

Semblance Level	0.50	
Semblance Window Width	120.00	micro-sec
Sonic 1 Despiker	100.00	micro-sec/ft
Sonic 2 Despiker	100.00	micro-sec/ft

Induction Calibration MAI-A.A 5

Base Calibration on 21-JAN-2014,09:50

Field Check on 25-AUG-2014 14:46

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	16.3	470.8	9.3	966.2
2	5.6	376.1	7.6	821.4
3	2.6	266.1	5.2	566.0
4	1.6	130.0	2.6	279.2

Array Temperature 71.1 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			16.2	3861.5
2			31.9	3589.0
3			29.9	2970.1
4			20.8	2125.4
Deep			18.6	1911.7
Medium			43.0	3859.2
Shallow			47.5	5369.4

Array Temperature 92.9 Deg F

Induction Constants MAI-A.A 5

Last Edited on 26-AUG-2014,13:31

Induction Model	RtAP-WBM		
Caliper for Borehole Corr.	Density Caliper		
Hole Size for Borehole Correction	N/A	inches	
Tool Centred	No		
Stand-off Type	Fins		
Stand-off	0.50	inches	
Number of Fins on Stand-off	8.0000		
Stand-off Fin Angle	45.00	degrees	
Stand-off Fin Width	0.5000	inches	
Borehole Corr. Rm Source	Temperature Corr		
Temp. for Rm Corr.	MCG External Temperature		
Squasher Start	0.0020	mhos/metre	
Squasher Offset	N/A	mhos/metre	
Borehole Normalisation			
DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

Calibration Site Corrections

Channel 1	0.00	mmhos/metre
Channel 2	0.00	mmhos/metre
Channel 3	0.00	mmhos/metre
Channel 4	0.00	mmhos/metre

Apparent Porosity and Water Saturation Constants

Archie Constant (A)	1.00	
Cementation Exponent (M)	2.00	
Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

High Resolution Temperature Calibration MAI-A.A 5

Field Calibration on 21-JAN-2014,15:43

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

High Resolution Temperature Constants MAI-A.A 5 Last Edited on 27-JUN-2014,14:12

Pre-filter Length 11

Micro Normal and Micro Inverse Calibration MMR-A 29 Base Calibration on 13-AUG-2014 16:50
Field Check on 25-AUG-2014 14:48

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.2	49.8	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	93.7	93.7
Micro Inverse	62.3	62.3

Micro Normal and Micro Inverse Constants MMR-A 29 Last Edited on 13-AUG-2014,16:47

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-A 29 Base Calibration on 13-AUG-2014 17:05
Field Calibration on 25-AUG-2014 14:50

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13833	5.96
2	17084	7.98
3	20261	9.85
4	24276	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.98	7.97

Caliper Calibration MPD-D.A 481 Base Calibration on 23-AUG-2014 13:39
Field Calibration on 25-AUG-2014 14:56

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17257	3.99
2	27352	5.98
3	37398	7.97
4	47224	9.86
5	58327	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.93	7.97

Photo Density Calibration MPD-D.A 481 Base Calibration on 23-AUG-2014 14:06
Field Check on 25-AUG-2014 14:54

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1216	1426		
Reference 1	55706	26385	59556	30836
Reference 2	22306	2607	24941	2541

Field Check at Base	1215.9	1425.6
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Field Check	1212.8	1429.7
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PE Calibration

Base Calibration	WS	WH	Measured Ratio	Calibrated Ratio
Background	232	1087		
Reference 1	24125	55503	0.439	0.371
Reference 2	6847	22166	0.314	0.272
Field Check at Base				
	232.2	1087.0		
Field Check				
	230.5	1085.2		

Density Constants MPD-D.A 481

Last Edited on 28-AUG-2014,03:18

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	1.11	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

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Logs\O'Brien Resources Vondracek 4-1\O'Brien Resources Vondracek 4-1 Run 1 Repeat.dta

CBH-C, Cablehead, 11 pin
CBH-C 265 LG: 2.40 ft WT: 24.3 lb OD: 2.240 in

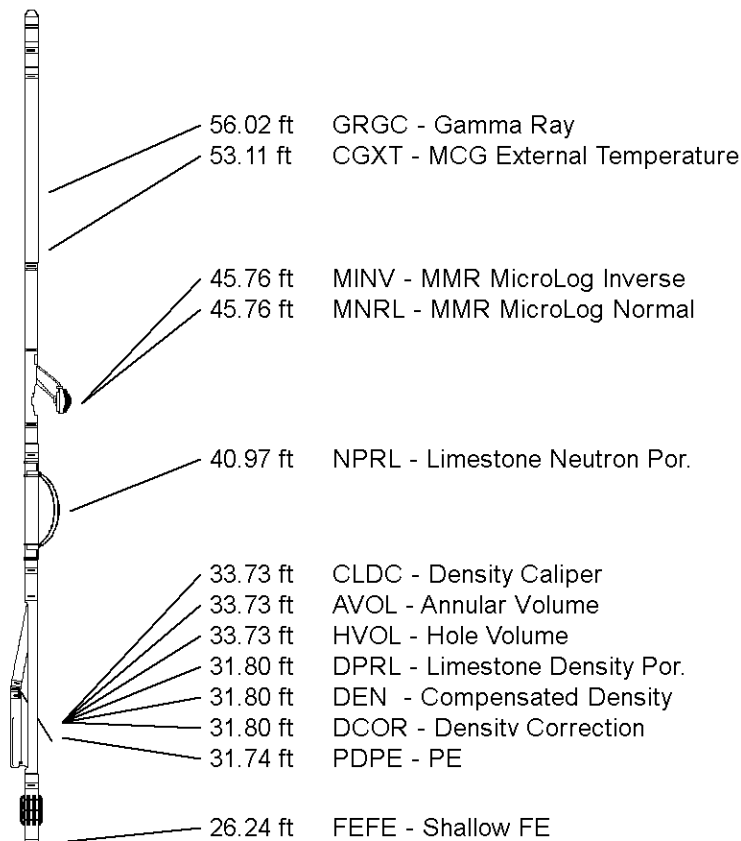
Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.240 in

Compact Micro-Resistivity
MMR-A 29 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-D.A 481 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric



MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.240 in

Compact Induction
MAI-A.A 5 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.70 ft Weight: 480.6 lb



16.96 ft TR11 - 4' Transit Time
 16.46 ft TR21 - 3' Transit Time
 15.95 ft TR12 - 6' Transit Time
 15.46 ft TR22 - 5' Transit Time
 12.96 ft DT35 - 3-5' Compensated Sonic
 12.96 ft SPRL - Wyllie Lime. Sonic Por.

3.34 ft R400 - Array Ind. One Res 40
 3.34 ft R600 - Array Ind. One Res 60
 3.34 ft RTAO - Array Ind. One Res Rt
 3.34 ft CTAO - Array Ind. One Cond Ct
 0.23 ft SPCG - Spontaneous Potential
 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 VONDRACEK 4-1
 FIELD PECHANEC SOUTHWEST
 PROVINCE/COUNTY RUSH
 COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2111.00	feet	First Reading	3861.00	feet
Elevation Drill Floor	2109.00	feet	Depth Driller	3862.00	feet
Elevation Ground Level	2104.00	feet	Depth Logger	3864.00	feet



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COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME