

COMPANYWINDY HILL GAS STORAGE

WELLWINDY HILL #7-17S

FIELDUNNAMED

COUNTYMORGANSTATECOLORADO

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WELLWINDY HILL #7-17S

FIELDUNNAMED

COUNTYMORGANSTATECOLORADO

API No.05087081460000

LocationNE/SW1748' FNL2622' FWL

Other ServicesRWCH/GRHRI/SD/DSNCSNG

Sect17

Twp3N

Rge55W

Permanent DatumG.L. _____ Elev.4499.0

Log measured fromK.B. _____, 16.5 ft. above perm. datum

Drilling measured fromK.B. _____

Elev.:K.B.4515.5
D.F. _____
G.L.4499.0

Date02-19-2007

04-05-2007

Run No. ONE

TWO

Depth - Driller490'

5520'

Depth - Logger490'

5517'

Bottom - Logged Interval483'

5510'

Top - Logged Interval60'

478'

Casing - Driller30" @ 60.5'

20" @ 465'

Casing - Logger60'

478'

Bit Size26"

12.25"

Type Fluid in HoleWATER BASED

WATER BASED

Dens. | Visc.9.1 | 55

9.2 | 50

Ph | Fluid Loss9.0 | N/A

9.0 | 7.0

Source of SampleFLOWLINE

FLOWLINE

Rm @ Meas. Temp.1.90 @ 61 F

0.60 @ 61 F

Rmf @ Meas. Temp.1.36 @ 75 F

0.40 @ 75 F

Rmc @ Meas. Temp.1.38 @ 75 F

0.49 @ 75 F

Source Rmf | RmcCHART | CHART

CHART | CHART

Rm @ BHT1.331 @ 90 F

0.293 @ 132 F

Time Since Circ.02-18 2345

04-04 1500

Time on Bottom02-19 0630

04-05 0140

Max. Rec. Temp.90 F @ TD

132 F @ TD

Equip. | Location9597 | CASPER

9597 | CASPER

Recorded ByC. HEARN

E. KOON

Witnessed ByJ. KYLE

J. BROWNING

Fold Here

Service Ticket No.: 4957392		API Serial No.: 05087081460000		PGM Version: XL v5.6				
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLES				RESISTIVITY SCALE CHANGES				
Date Sample No.				Type Log	Depth	Scale Up Hole	Scale Down Hole	
Depth – Driller								
Type Fluid								
in Hole								
Dens. Visc.								
Ph Fluid Loss								
Source of Sample				RESISTIVITY EQUIPMENT DATA				
Rm @ Meas. Temp.	@	@		Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
Rmf @ Meas. Temp.	@	@		ONE	HRIDE #AB287	N/A	1.5" SO	N/A
Rmc @ Meas. Temp.	@	@		TWO	HRIDE #AB287	N/A	1.5" SO	N/A
Source Rmf Rmc								
Rm @ BHT	@	@						
Rmf @ BHT	@	@						
Rmc @ BHT	@	@						
EQUIPMENT DATA								
GAMMA		ACOUSTIC		DENSITY		NEUTRON		
Run No.	TWO	Run No.	TWO	Run No.	TWO	Run No.	TWO	
Serial No.	108646	Serial No.	350	Serial No.	A046	Serial No.	108722	
Model No.	NGRT	Model No.	BCSD	Model No.	SDL-DC	Model No.	DSN II	
Diameter	3.625"	No. of Cent.	2	Diameter	4.500"	Diameter	3.625"	
Detector Model No.	102A	Spacing	2’	Log Type	GAM-GAM	Log Type	NEU-NEU	
Type	SCINT			Source Type	Cs 137	Source Type	Am241 Be	
Length	4.000"	ISA / Y / NI	NO	Serial No	2370 GW	Serial No	DSN-83	

Distance to Source	N/A		FWDA [Y / N]		NO		Strength		1.5 Ci		Strength		18.5 Ci	
LOGGING DATA														
GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale			Scale			Scale		
No.	From	To	Ft / Min	L	R	L	R	Matrix	L	R	Matrix	L	R	Matrix
ONE	490'	60'	REC	0	150	.60	0	55.5	.60	0	2.65	.60	0	SAND
TWO	5517	478'	REC	0	150	.60	0	55.5	.60	0	2.65	.60	0	SAND
DIRECTIONAL INFORMATION														
Maximum Deviation			deg. @			KOP								
Remarks:														
PRESENTATION AS PER CUSTOMER REQUEST.														
AHV USES 8 5/8" PRODUCTION CASING.														
LARGE HOLE SIZE AND HOLE RUGOSITY AFFECTS TOOL RESPONSE.														
RWCH/NGRT/CSNG/BCS RUN IN COMBINATION.														
CHLORIDES: 9000 PPM.														
LATITUDE: 40.217 DEGREES NORTH.														
LONGITUDE: 103.550 DEGREES WEST.														
YOUR EXCELL 2000 CREW: B. SHORT, G. BREED, AND A. HENNEMAN										RIG: UNIT #134				
THANK YOU FOR USING HALLIBURTON. CASPER, WY (307-473-8200)														
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.														
HALLIBURTON														

Current EXCELL-2000 Parameter Values

Depth: 67.167

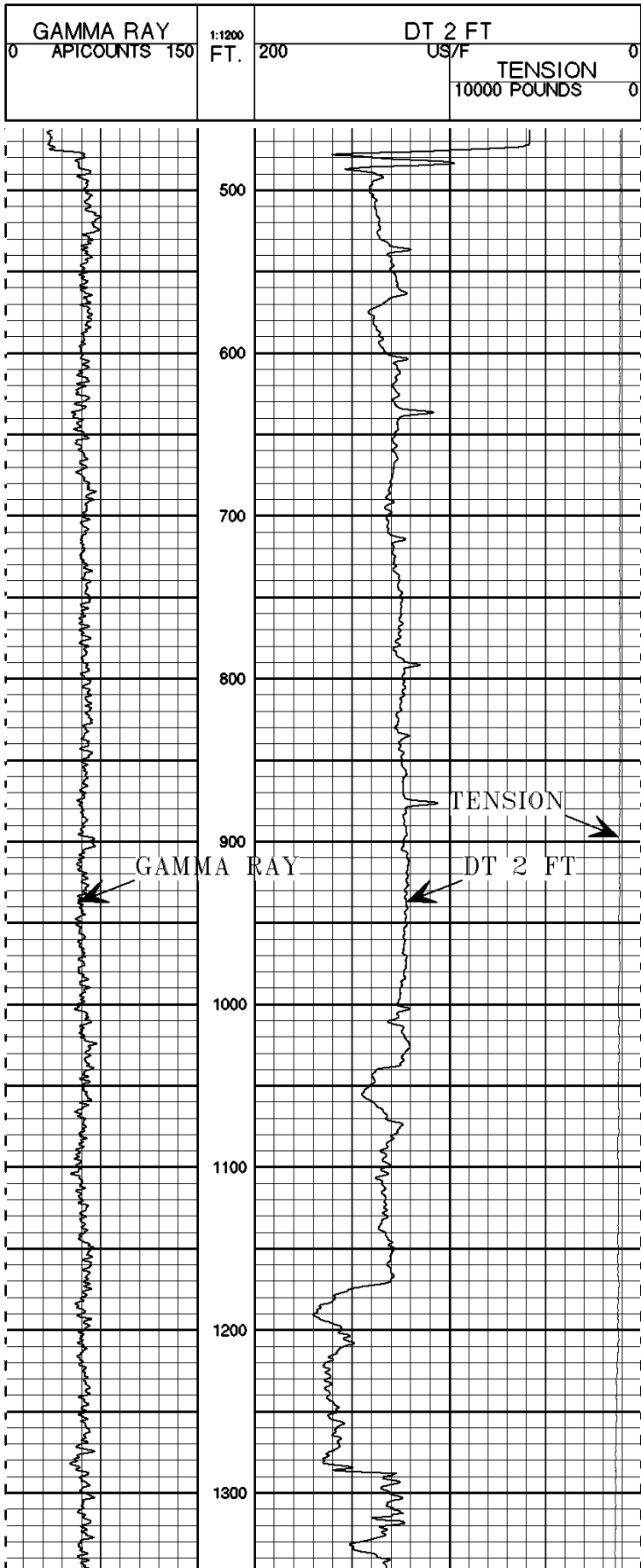
Date: 05-Apr-2007 07:45:

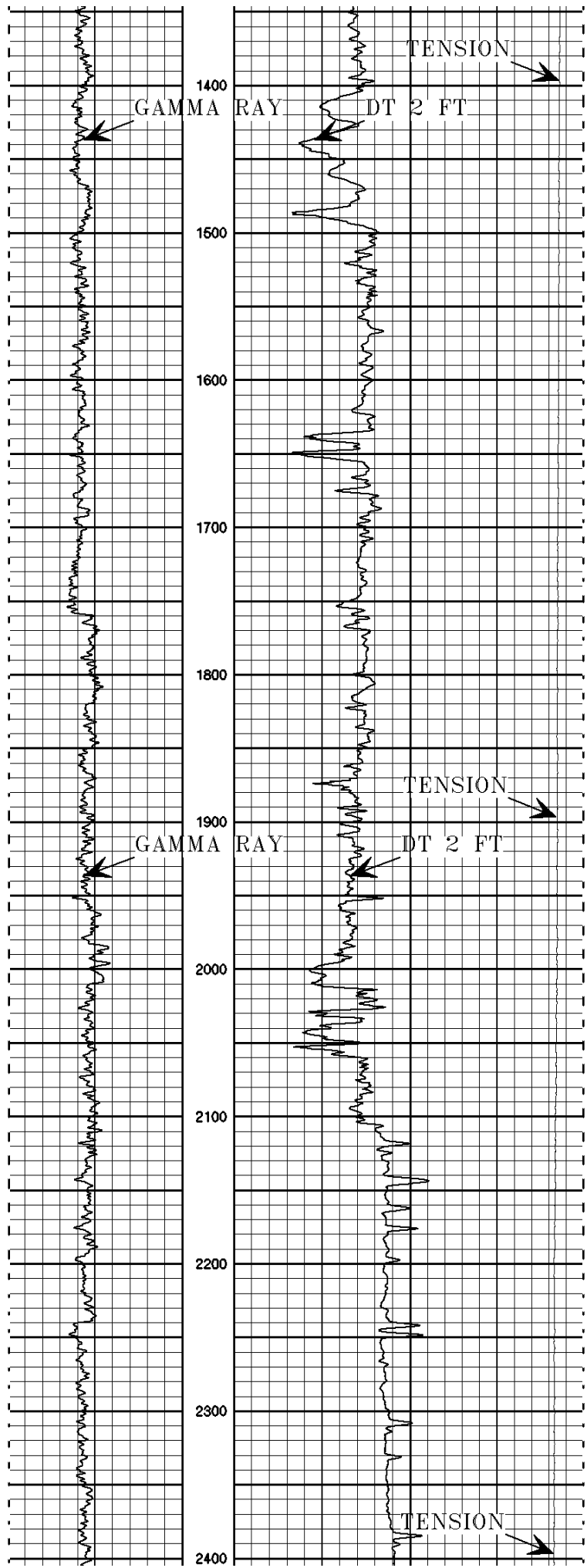
Service Number: 2100

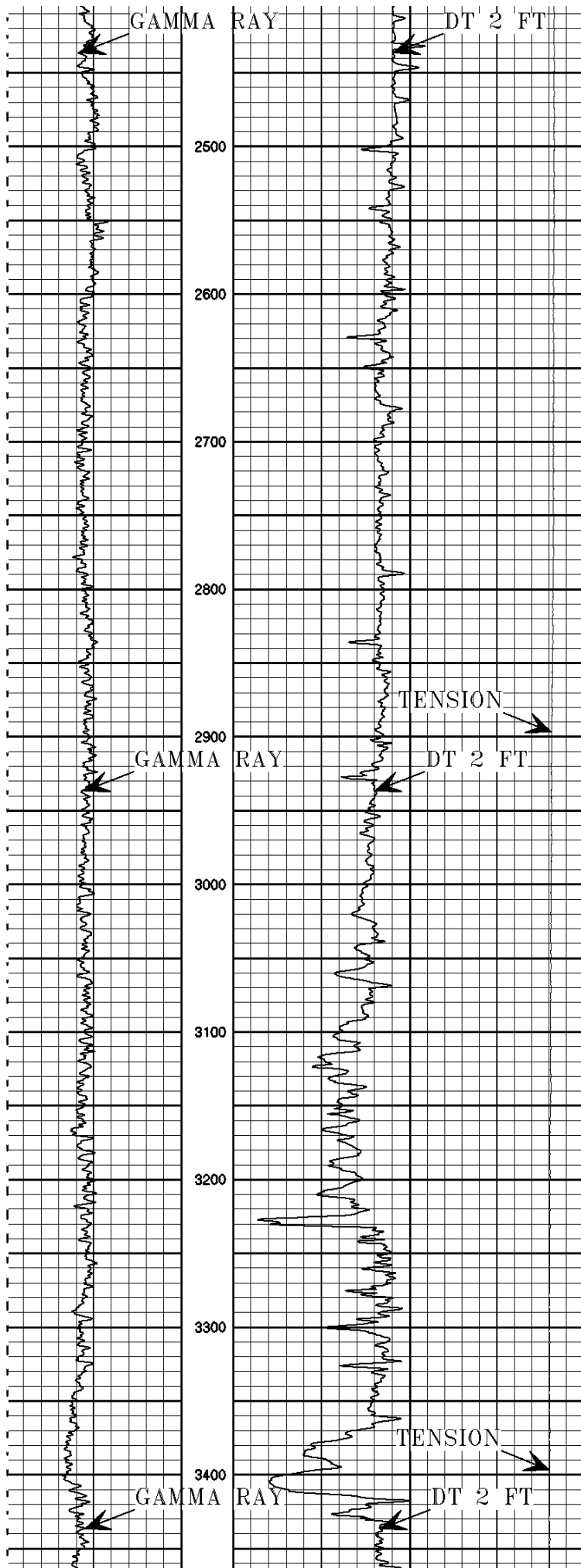
Software Version: 5.6

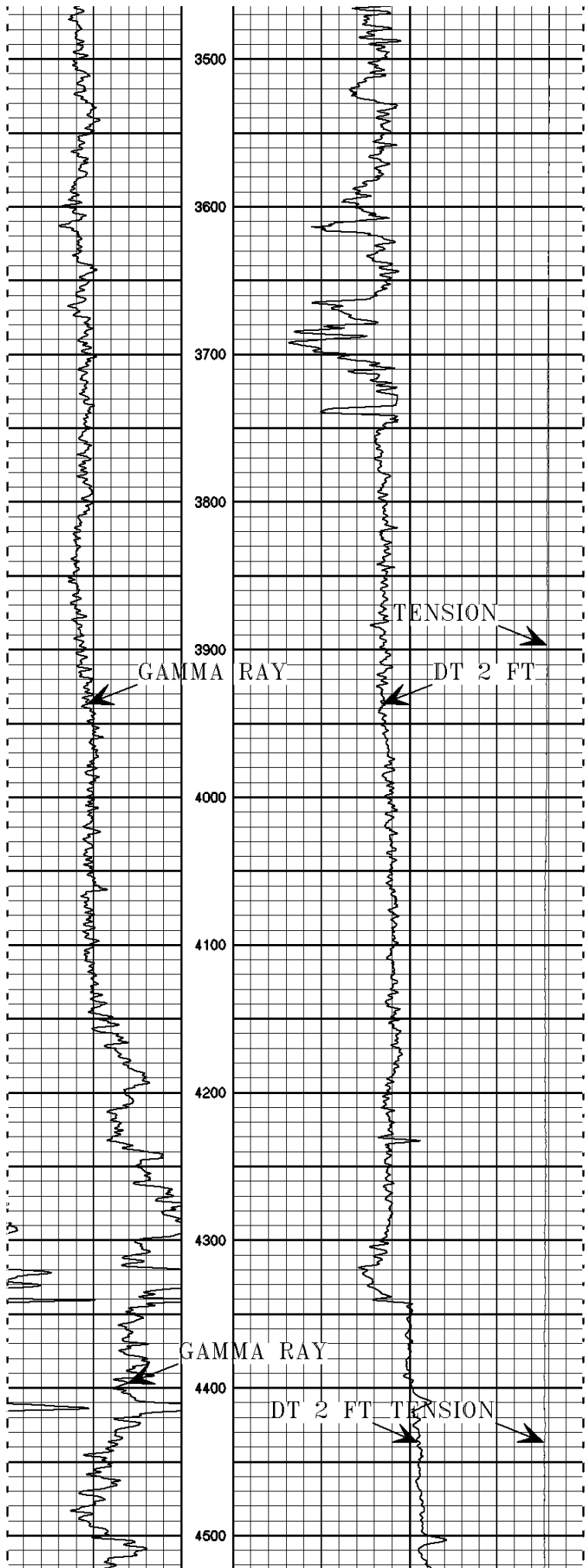
Mnemonic	Tool	Parameter Description	Value	Units
PERF	DITSHD	PERFORATED INTERVAL	NO	
TD	DITSHD	TOTAL DEPTH	5517.	FT
CS_ANT	DITSHD	CASING DEPTH (FOR ANNOTATION)	478.	FT
D4IN	D4TS	USE D4TG FOR INCLINATION?	NO	
GR_OK	GAMMA	DO GAMMA CALCULATIONS?	YES	
CASED	SHARED	CASED HOLE?	NO	
CASEOD	SHARED	CASING DIAMETER (OD)	8.625	Inches
MUDWT	SHARED	BOREHOLE FLUID WEIGHT	9.2	Pounds/Gal.
GRSO	GAMMA	GAMMA RAY STANDOFF	0.	Inches
BS	SHARED	BIT SIZE	17.5	Inches
FWSTOK	BCS	DO FWST CALCULATIONS?	YES	
WYLIE	BCS	ACOUSTIC POROSITY EQUATION	WYLE	
DTSHA	BCS	DELTA T SHALE	100.	uSec/Ft.
DTMAT	BCS	DELTA T MATRIX	55.5	uSec/Ft.
DTFLU	BCS	DELTA T FLUID?	189.	uSec/Ft.
RHOMAT	BCS	MATRIX DENSITY	2.65	Grams/CC
RHOFLU	BCS	FLUID DENSITY	1.	Grams/CC
DTFT	BCS	USE 1 OR 2 FT DT FOR POROSITY	2	Feet
ARCHA	BCS	ARCHIE A	0.62	
ARCHM	BCS	ARCHIE M	2.15	
FSEL	BCS	POROSITY SELECTION FOR F	ACOU	
USEFIX	BCS	USE MINIMUM FIXED THRESHOLD.	NO	
USENOI	BCS	USE NOISE THRESHOLD FOR PICK.	NO	
TDU_OK	TDUF	USE TDU DISPLAY CONTROLS?	YES	
CSNGOK	CSNGDT	DO CSNG CALCULATIONS?	YES	
EPOXYC	CSNGDT	CSNG EPOXY CASE	NO	
MUDKCL	CSNGDT	MUD PERCENT KCL (EX: 5.3%)	0.	%

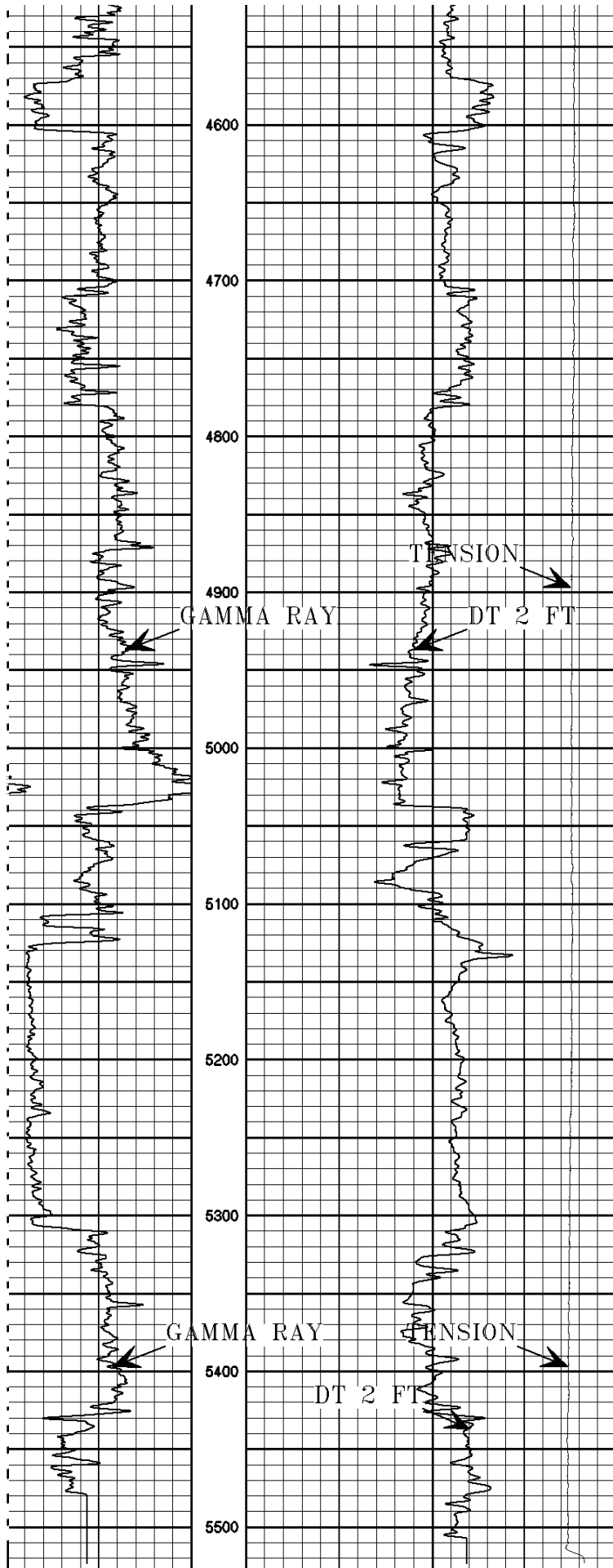
MAIN PASS 1"=100'











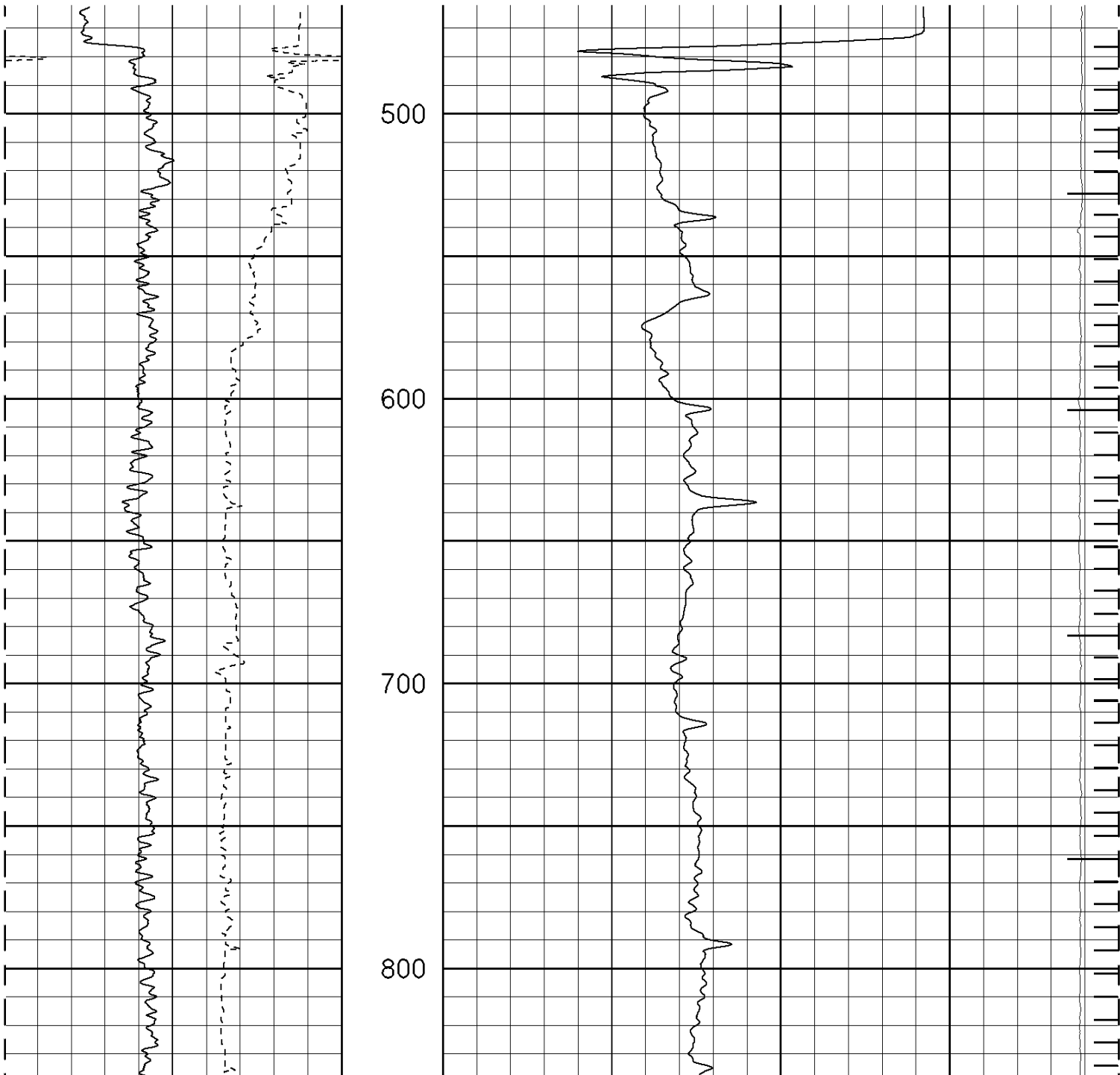
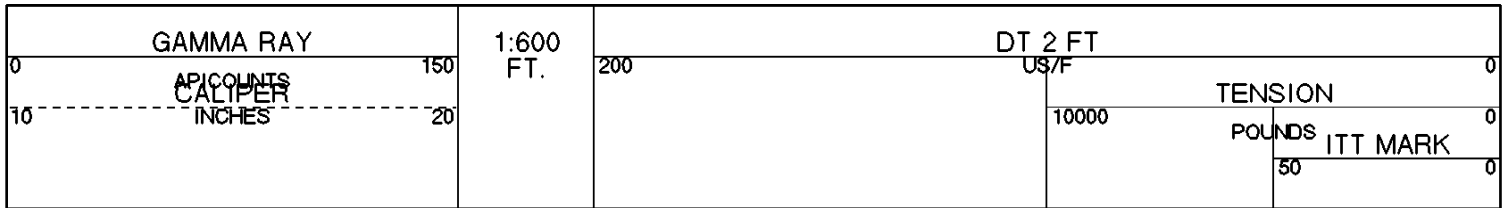
GAMMA RAY	1:1200	DT 2 FT	TENSION 10000 POUNDS 0
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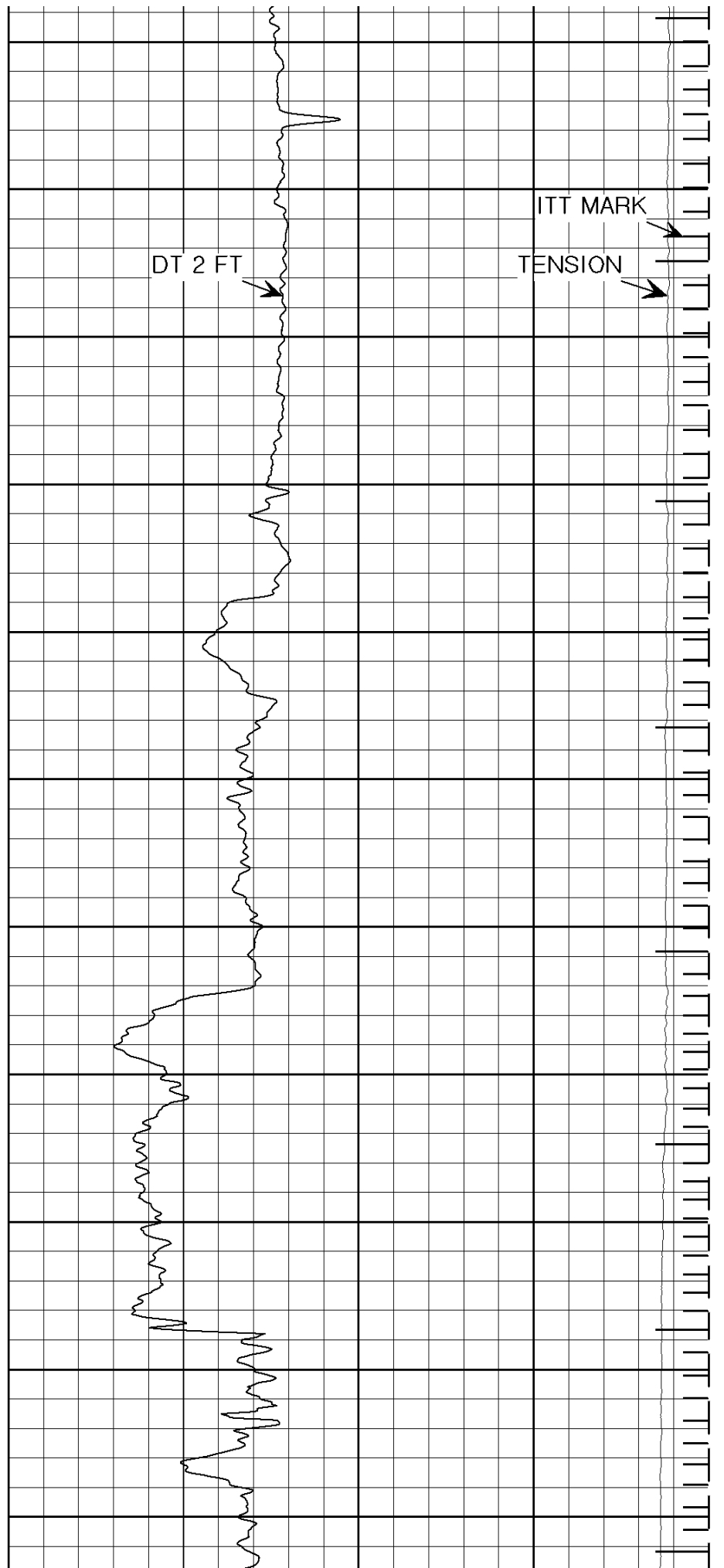
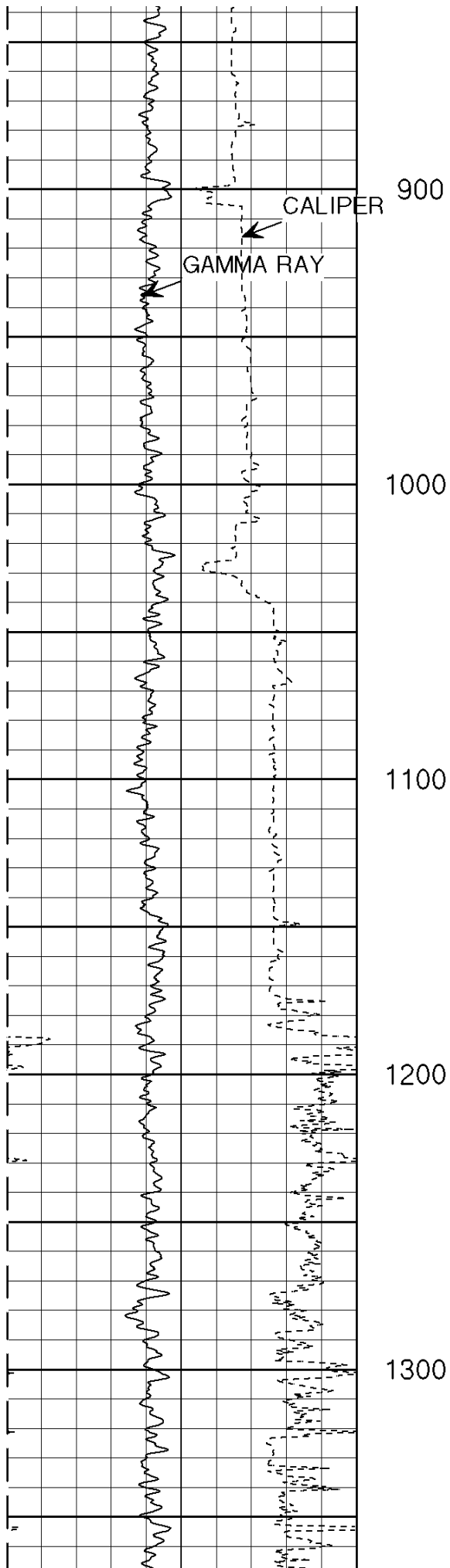
MAIN PASS 2"=100'

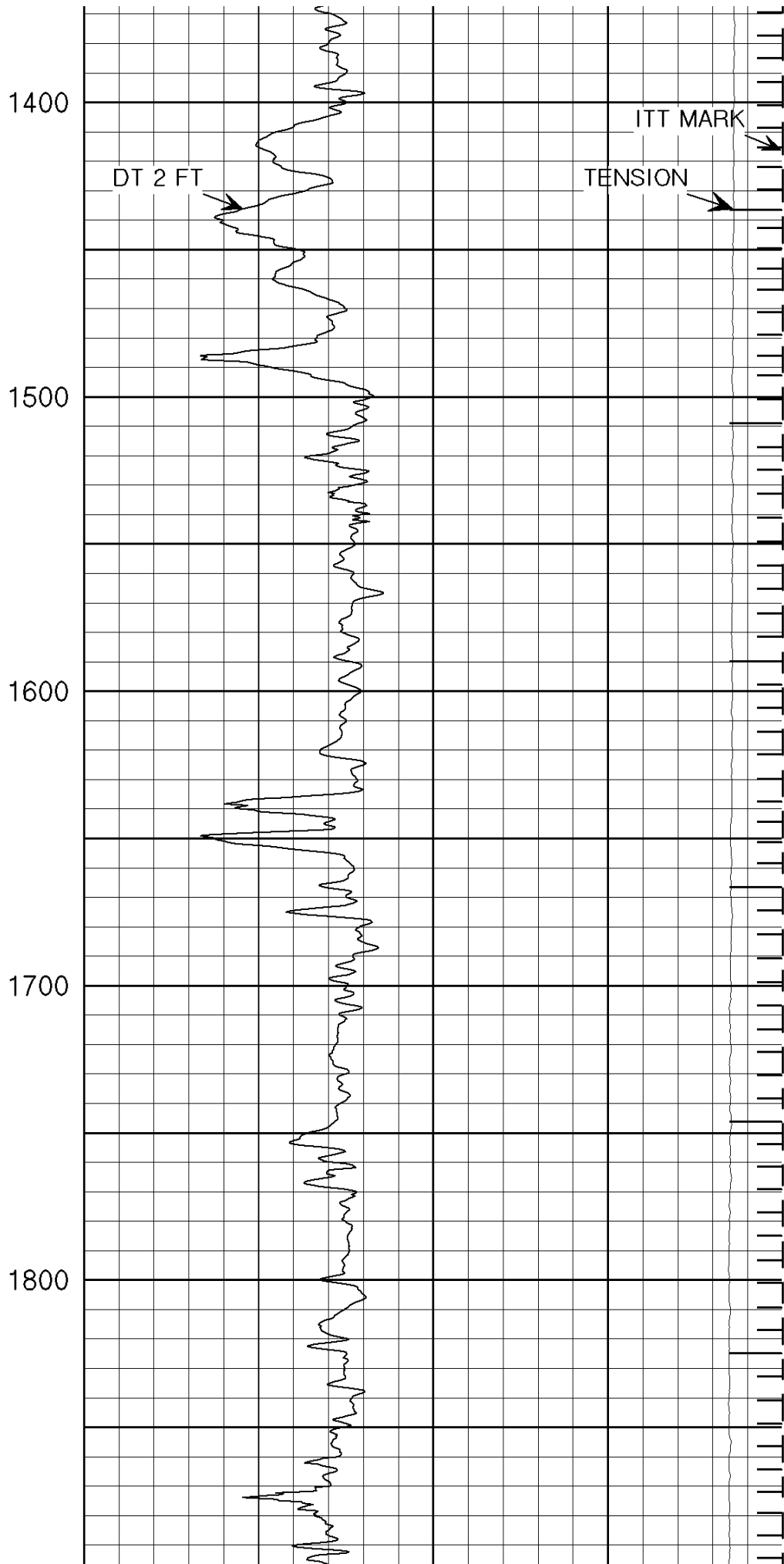
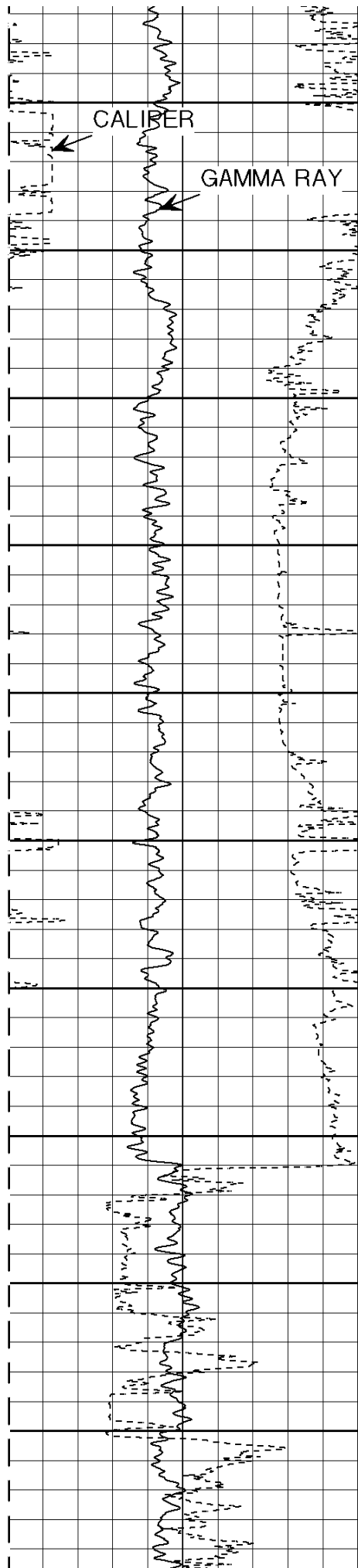
HALLIBURTON

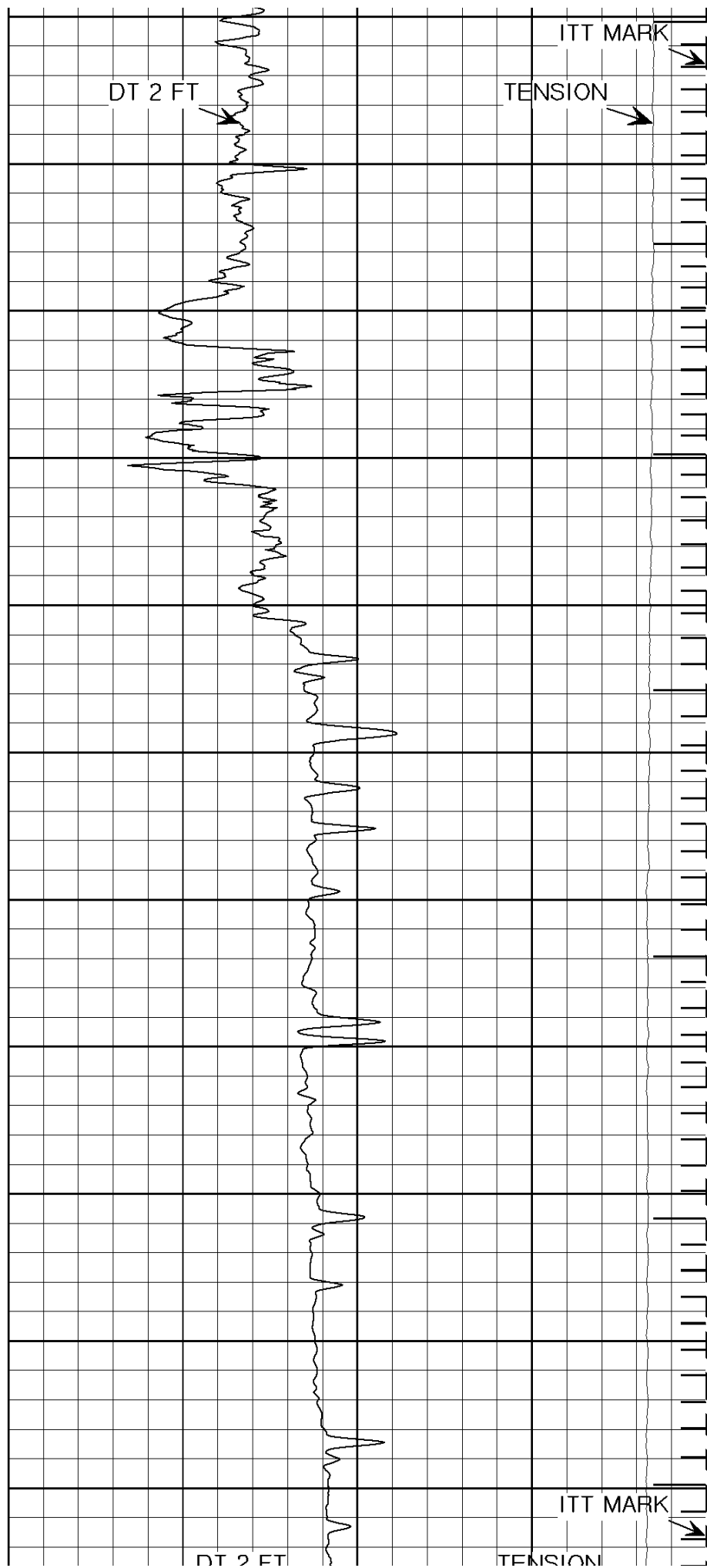
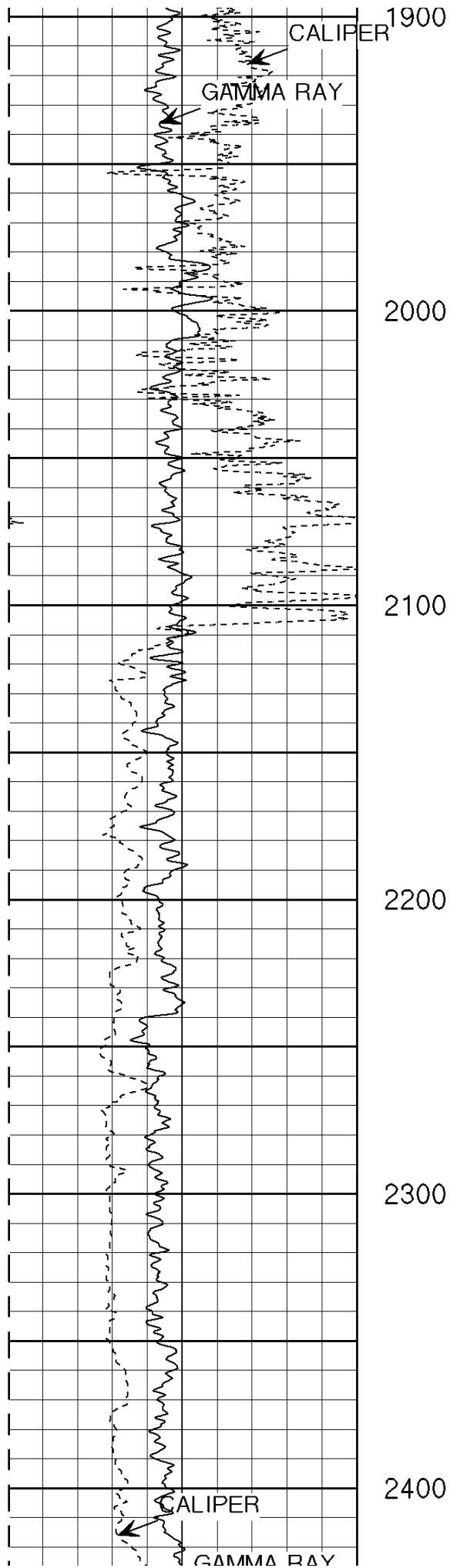
Version No: 5.6 ; hc:3.0
Data File: awind_7_17_run2.2.cls
Format File: 2IN_SONIC.spc
Plot Time: 2007-04-05 07:51:19
Log Time: 2007-04-05 01:39:16

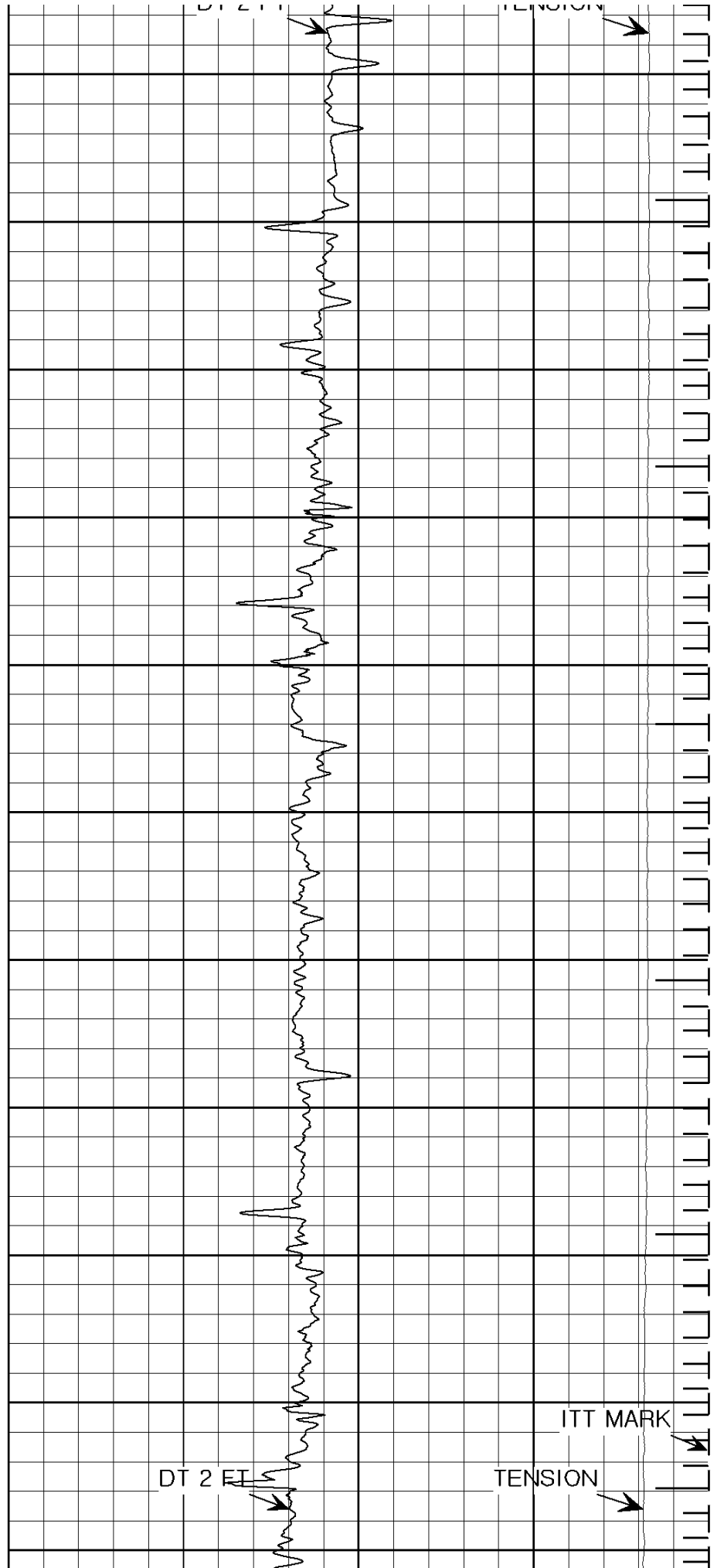
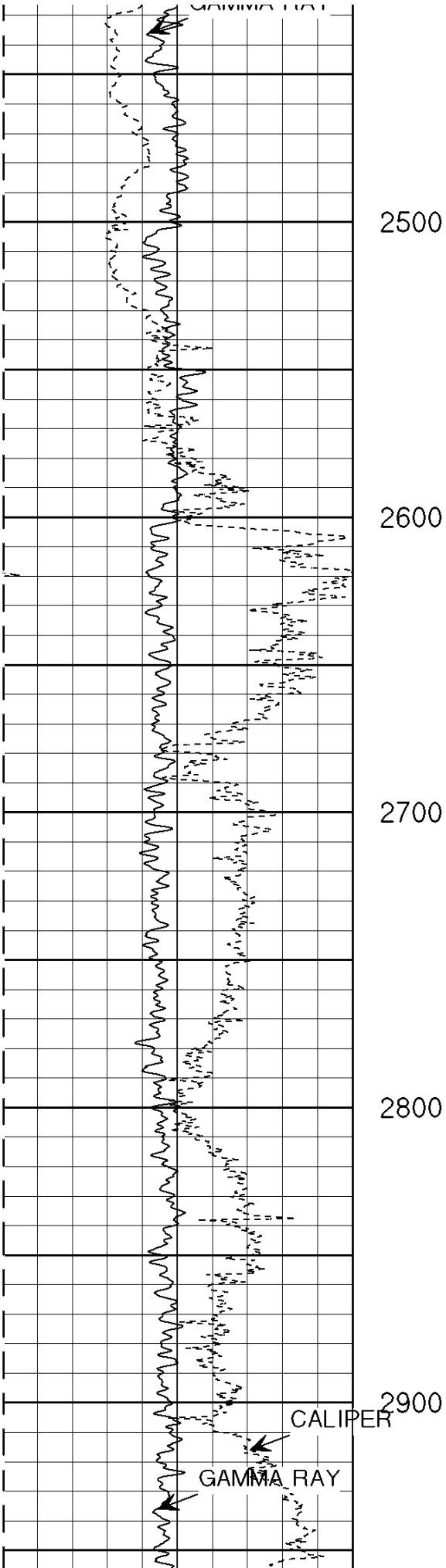
Top Depth: 461.00
Bottom Depth: 5527.00

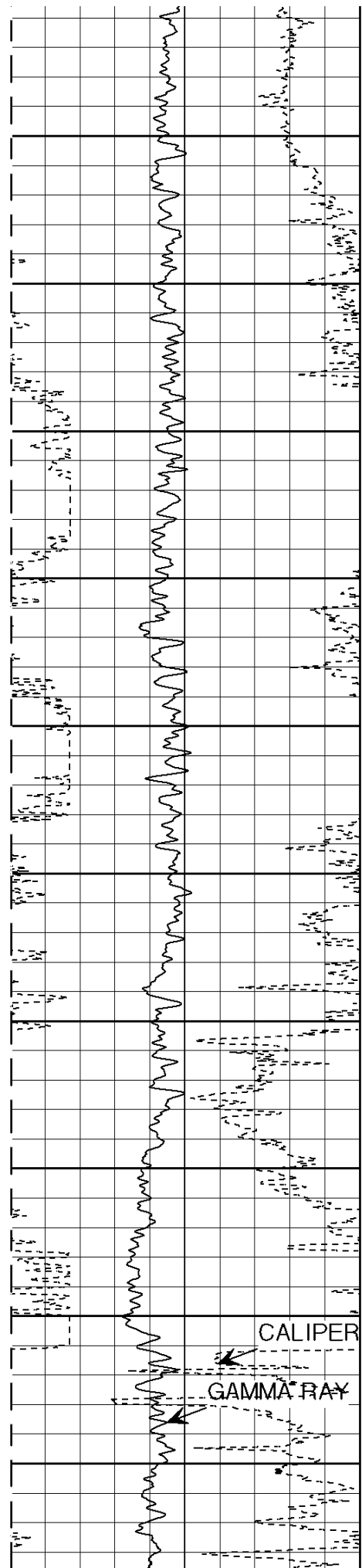












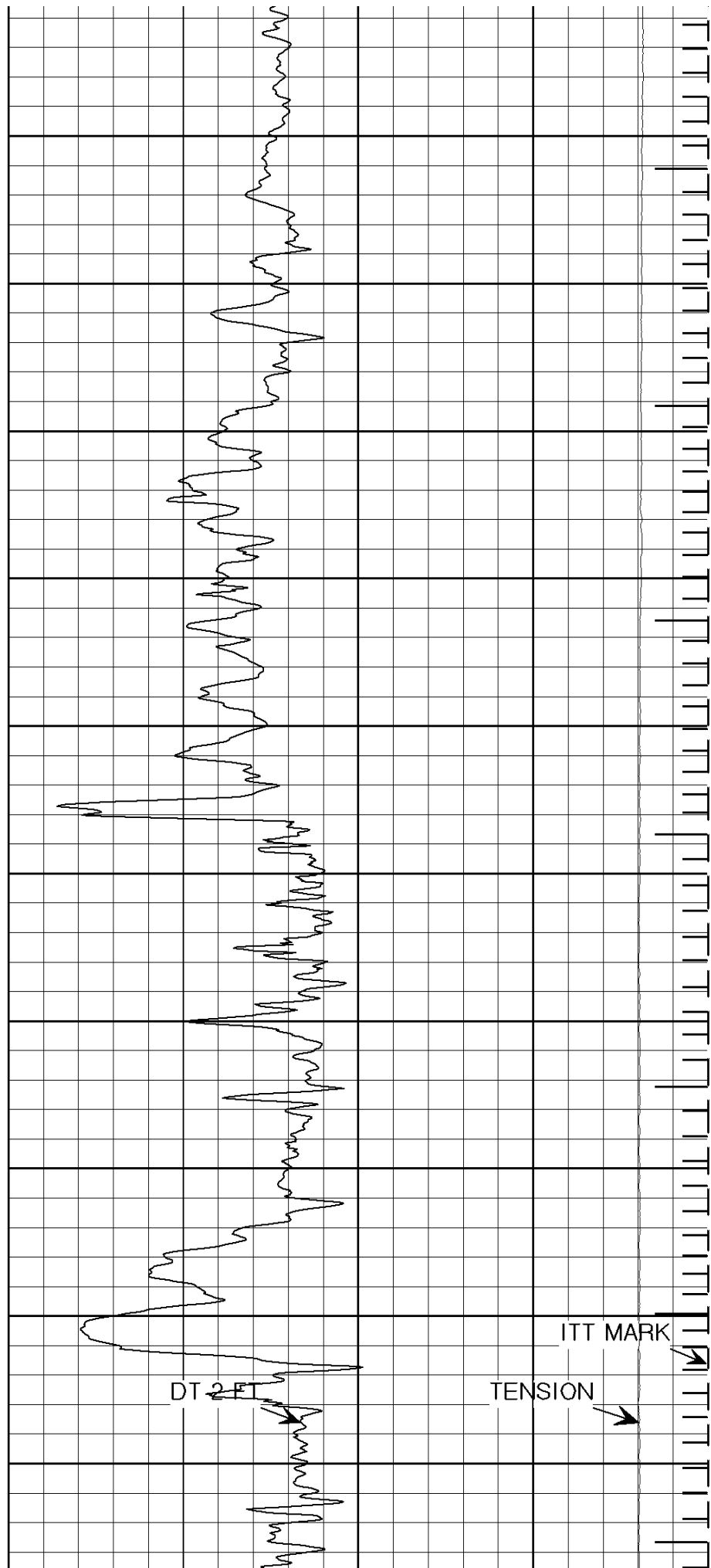
3000

3100

3200

3300

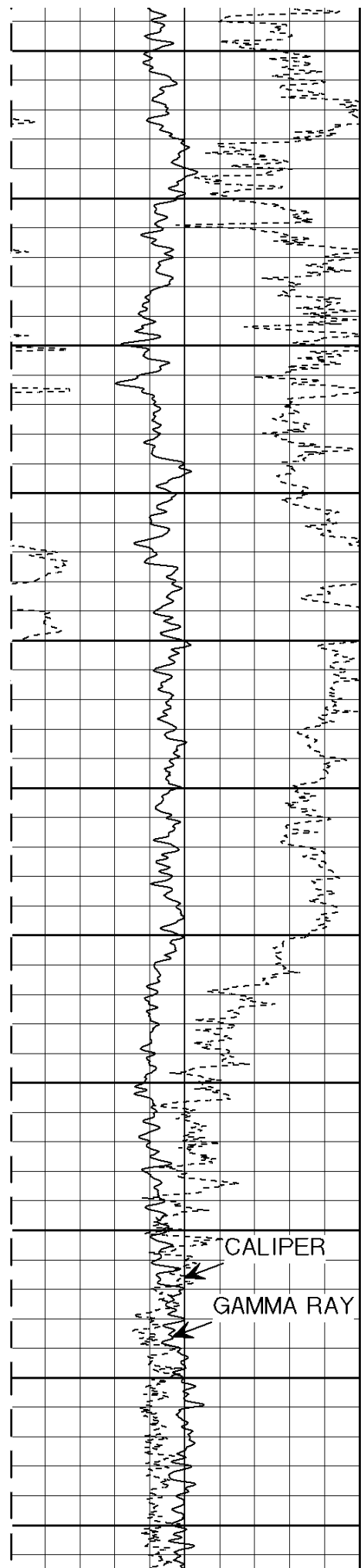
3400



ITT MARK

TENSION

DT 2 FT



3500

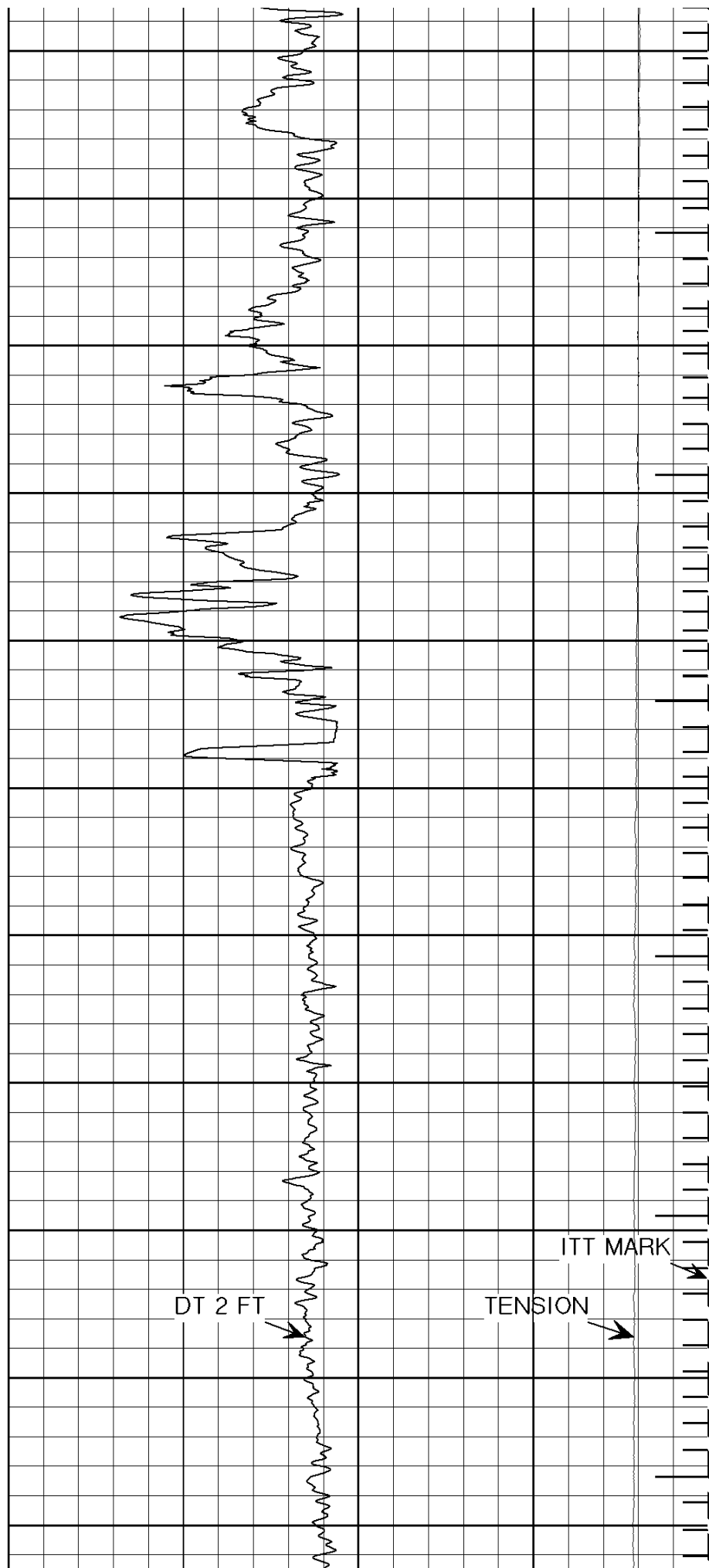
3600

3700

3800

3900

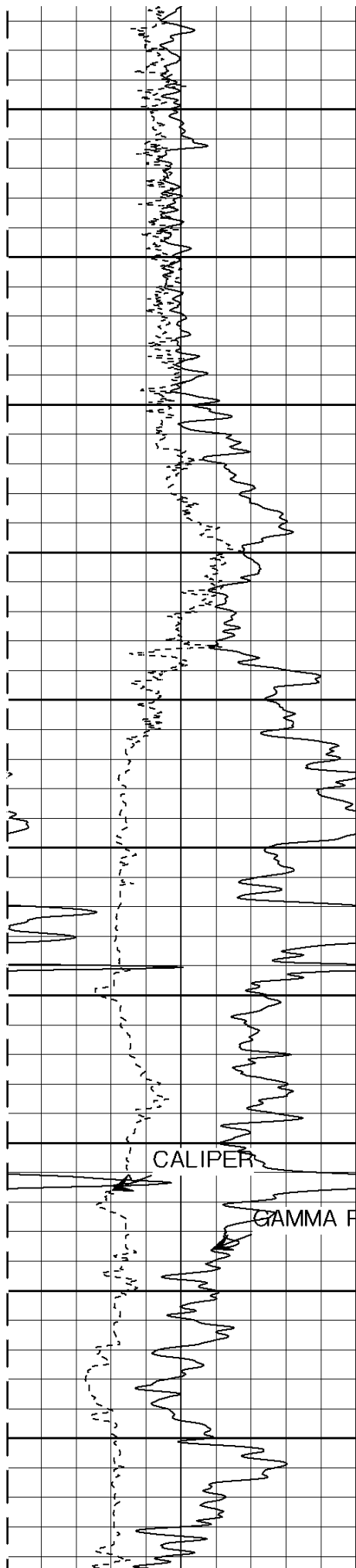
4000



DT 2 FT

TENSION

ITT MARK



4100

4200

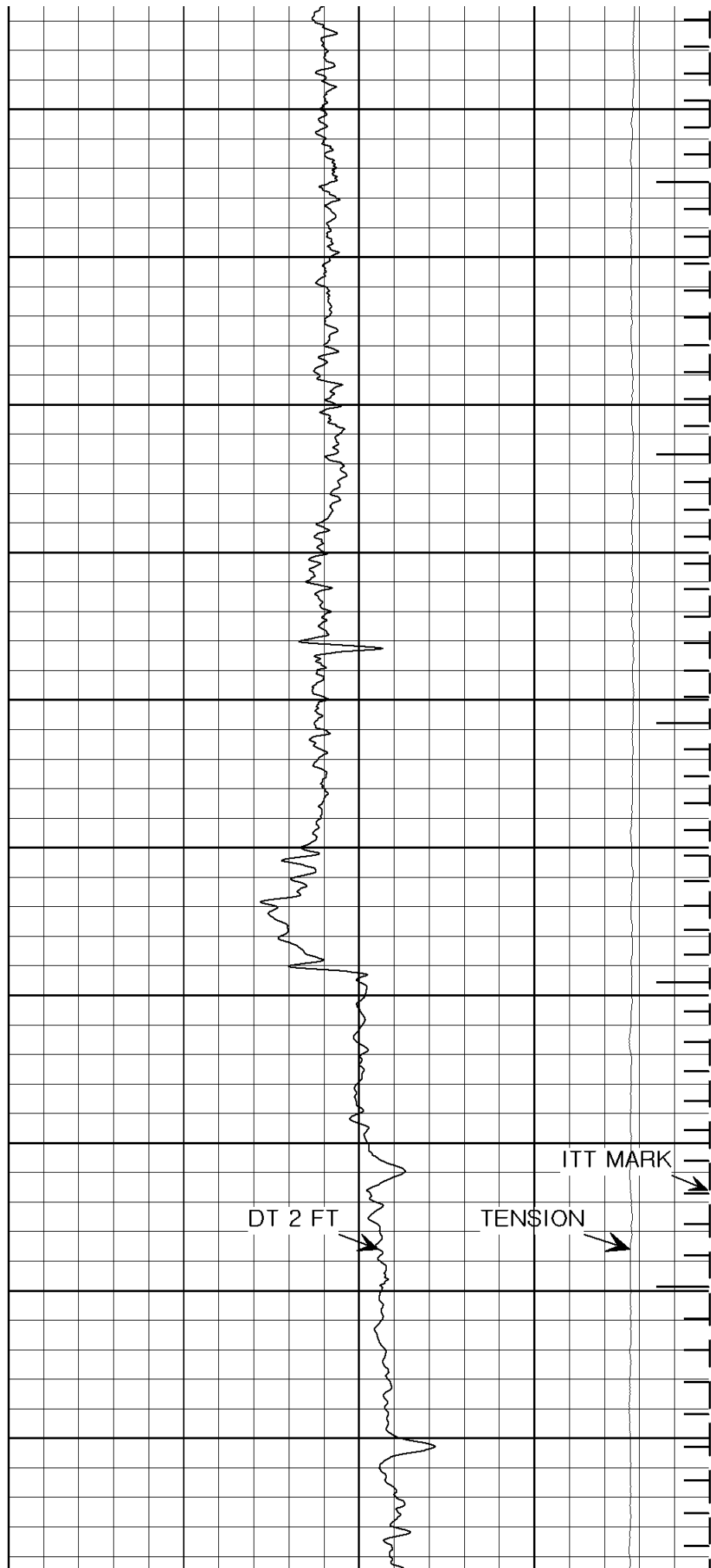
4300

4400

4500

CALIPER

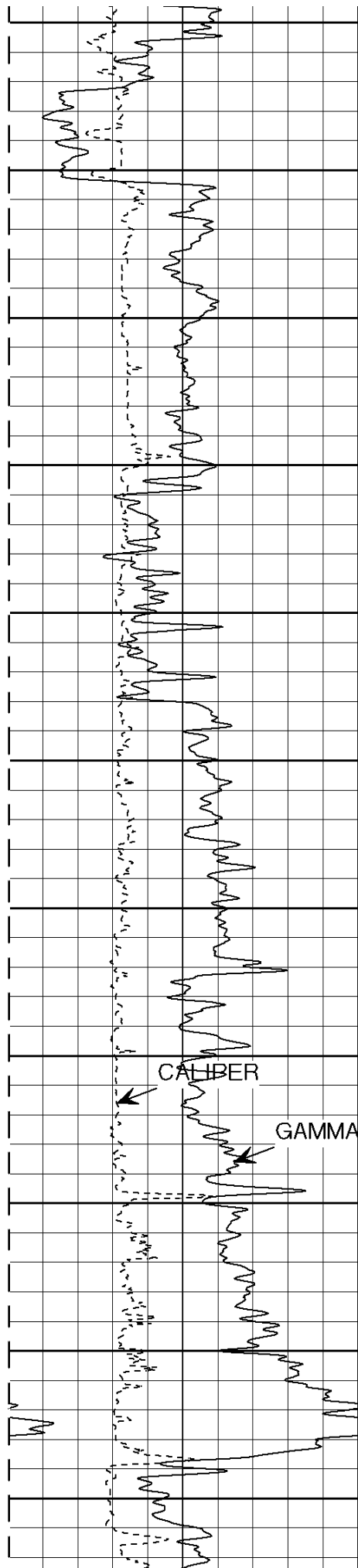
GAMMA RAY



DT 2 FT

TENSION

ITT MARK



4600

4700

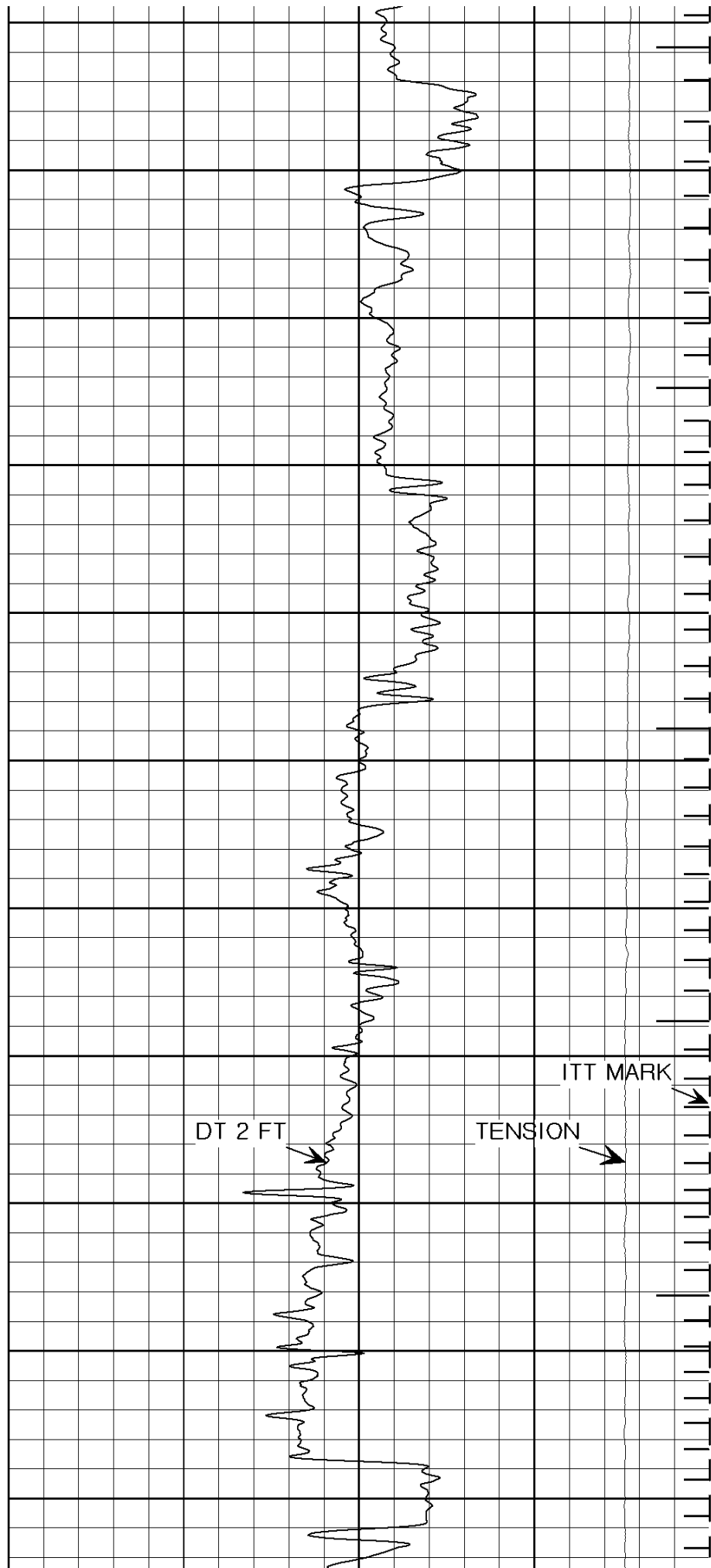
4800

4900

5000

CALIBER

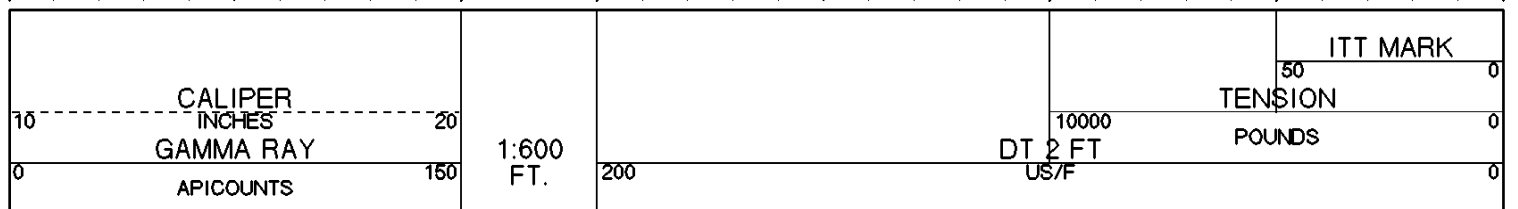
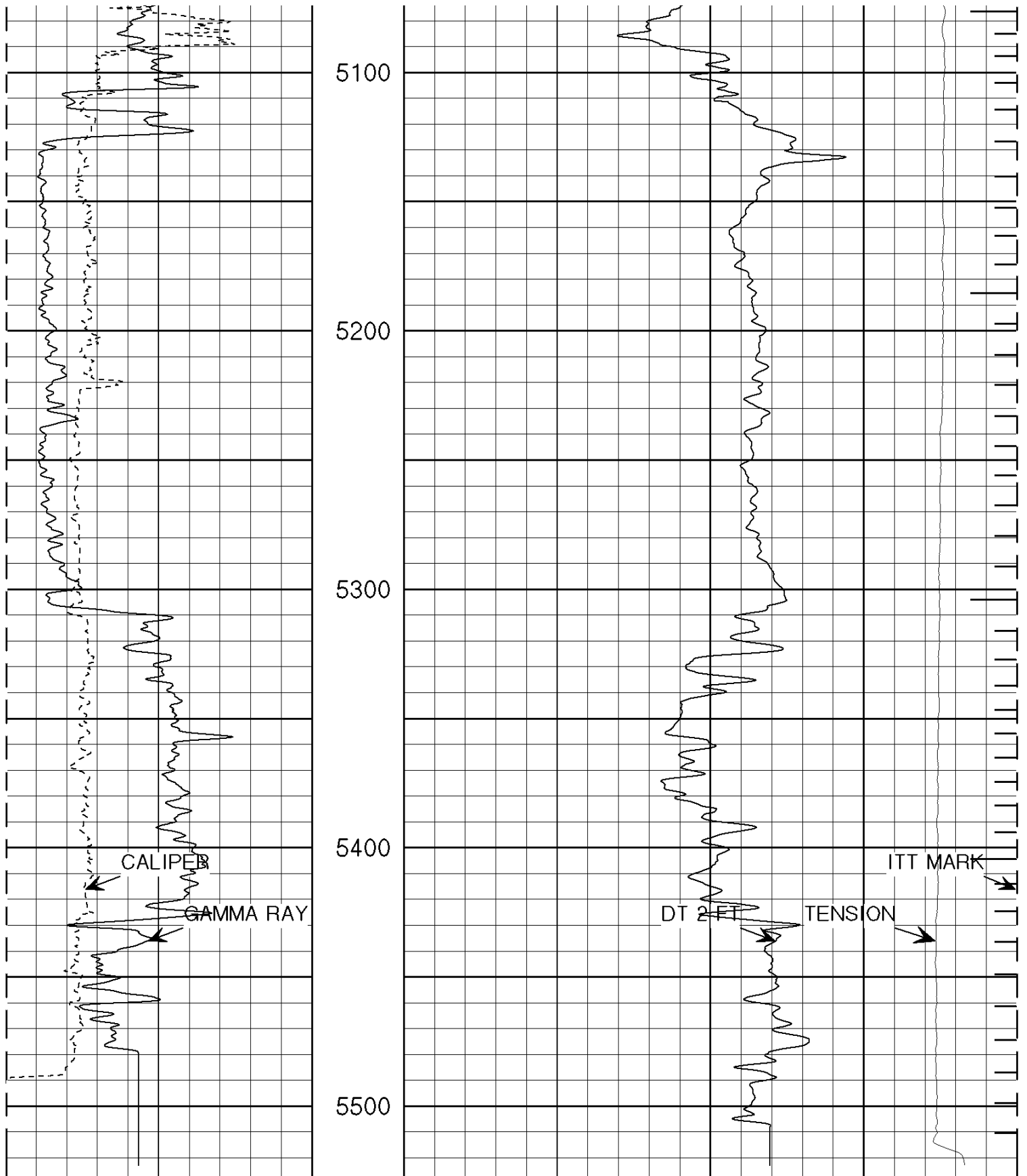
GAMMA RAY



DT 2 FT

TENSION

ITT MARK



HALLIBURTON

Format File: 2IN_SONIC.spc

Plot Time: 2007-04-05 07:51:09

Log Time: 2007-04-05 01:39:16

Top Depth: 461.00

Bottom Depth: 5527.00

MAIN PASS 5"=100'

HALLIBURTON

Version No: 5.6 : hc:3.0

Data File: awind_7_17_run2.2.cls

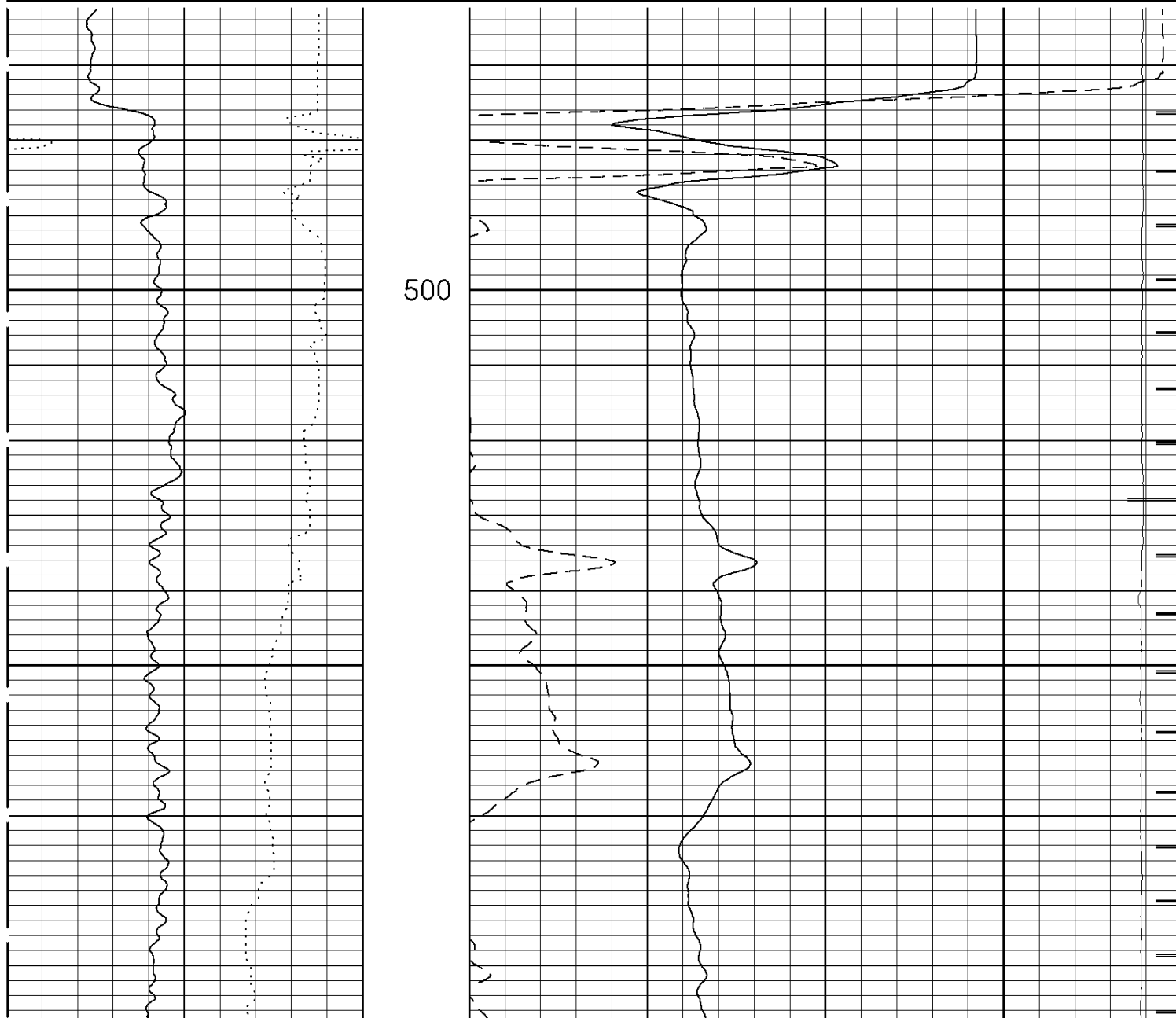
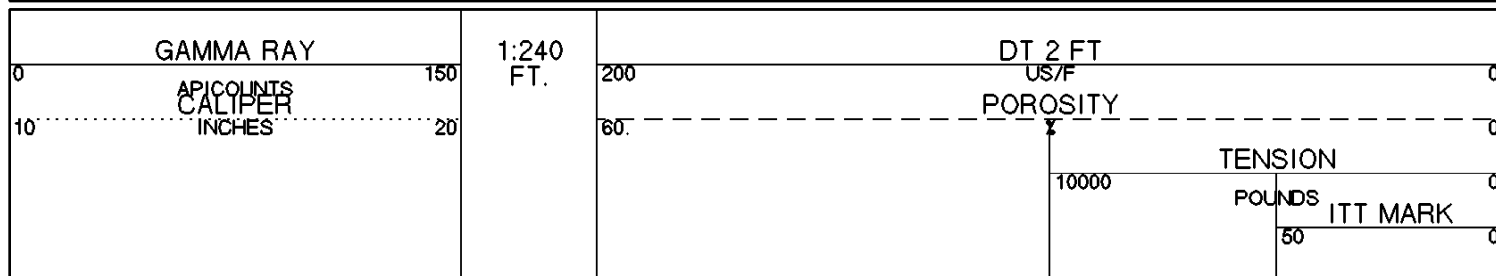
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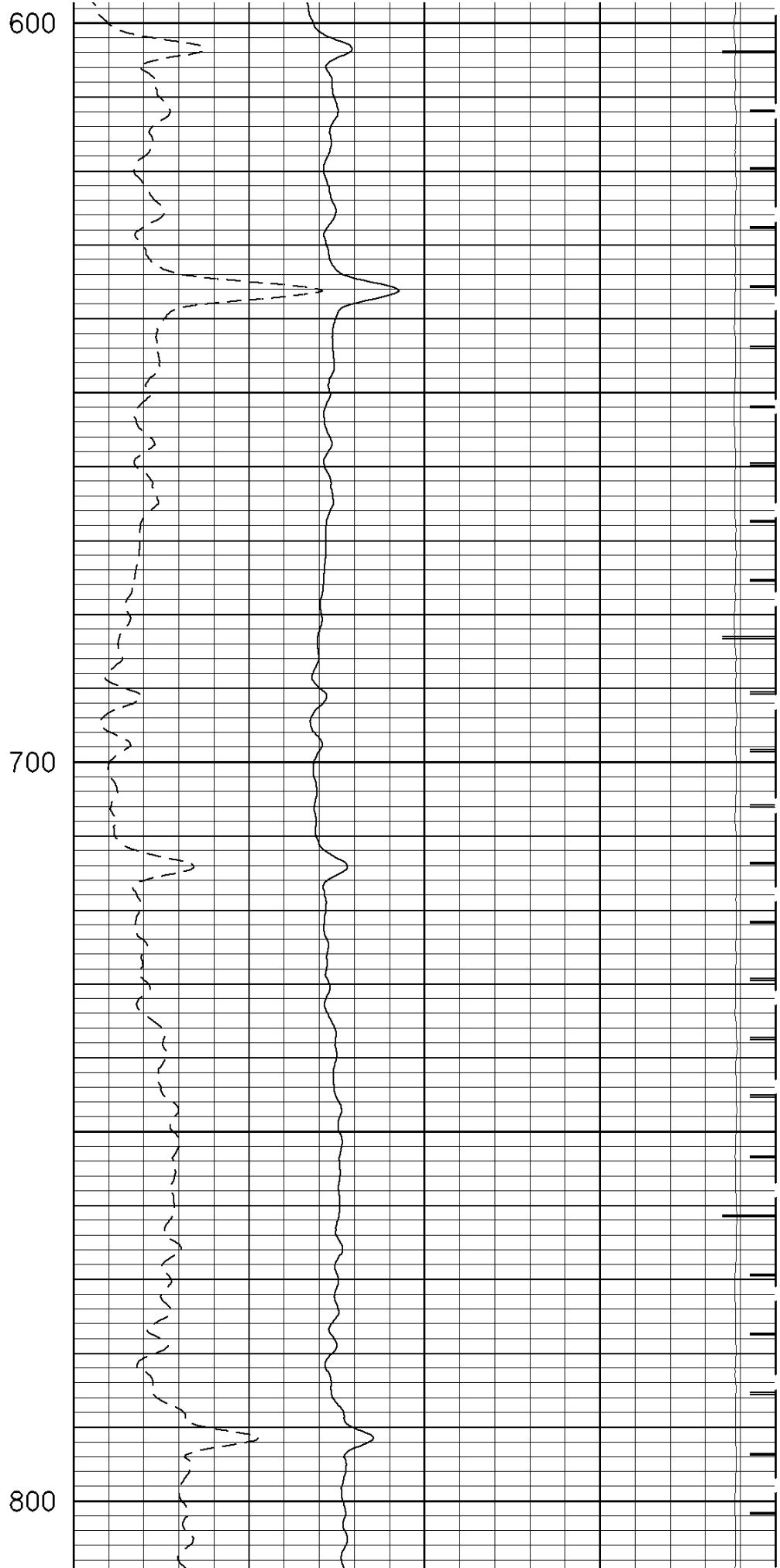
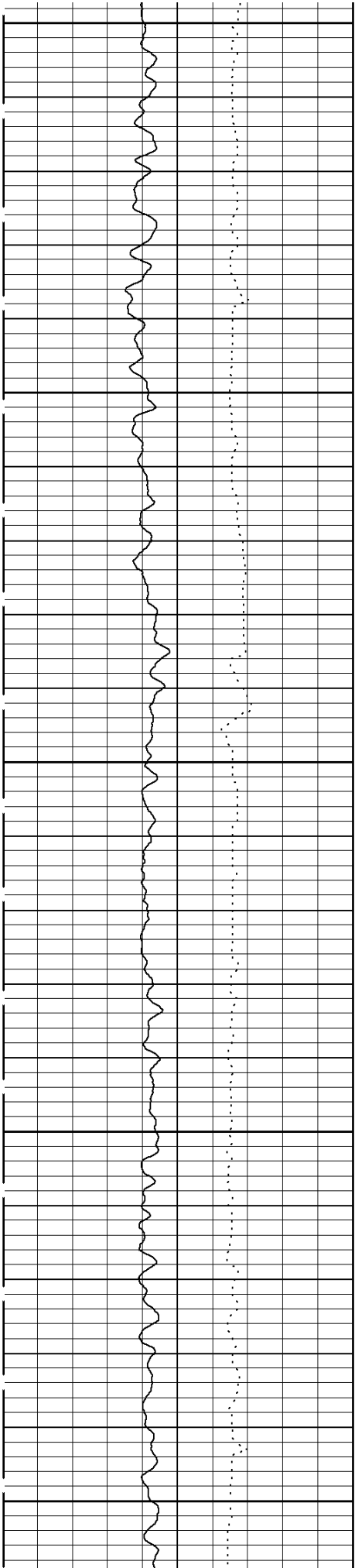
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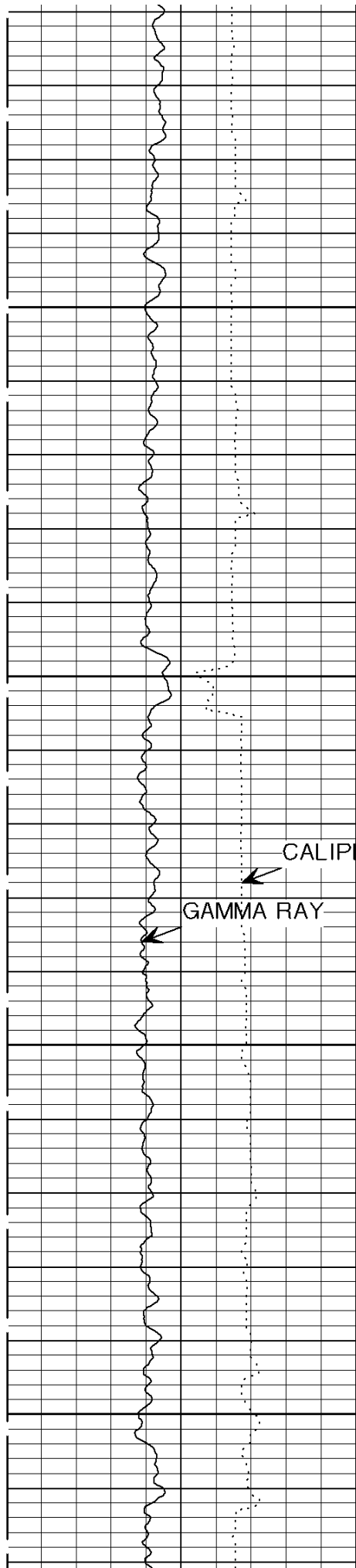
Log Time: 2007-04-05 01:39:16

Top Depth: 462.00

Bottom Depth: 5527.00







900

1000

GAMMA RAY

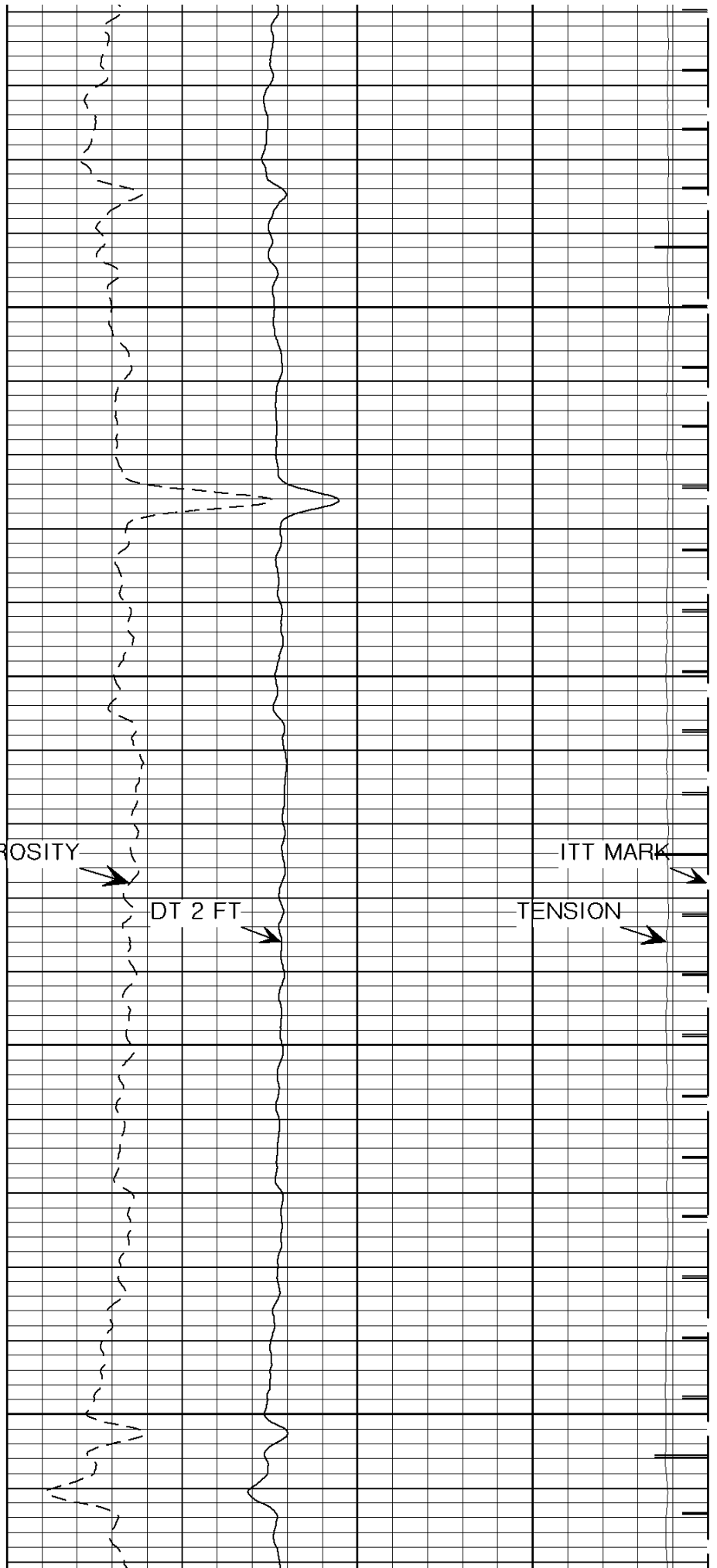
CALIPER

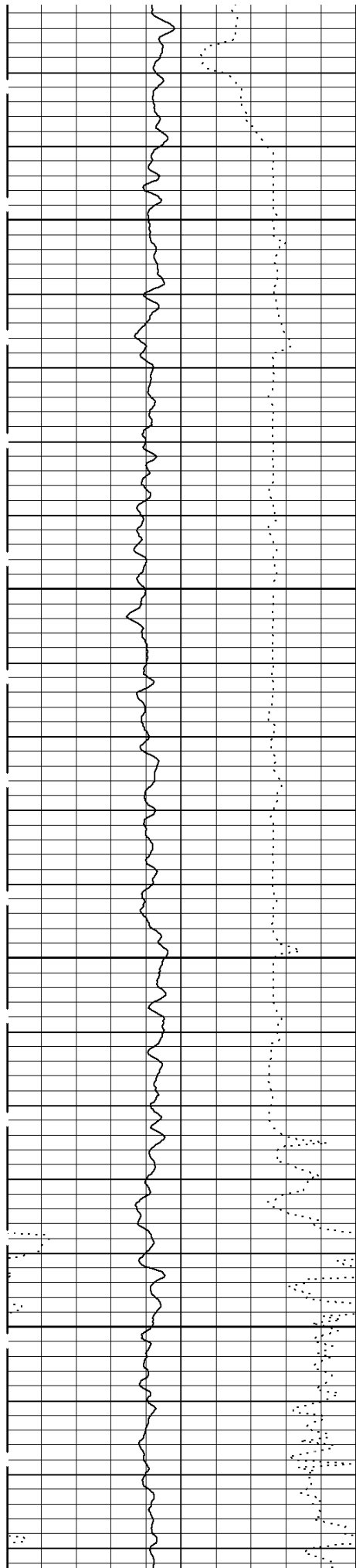
POROSITY

DT 2 FT

TENSION

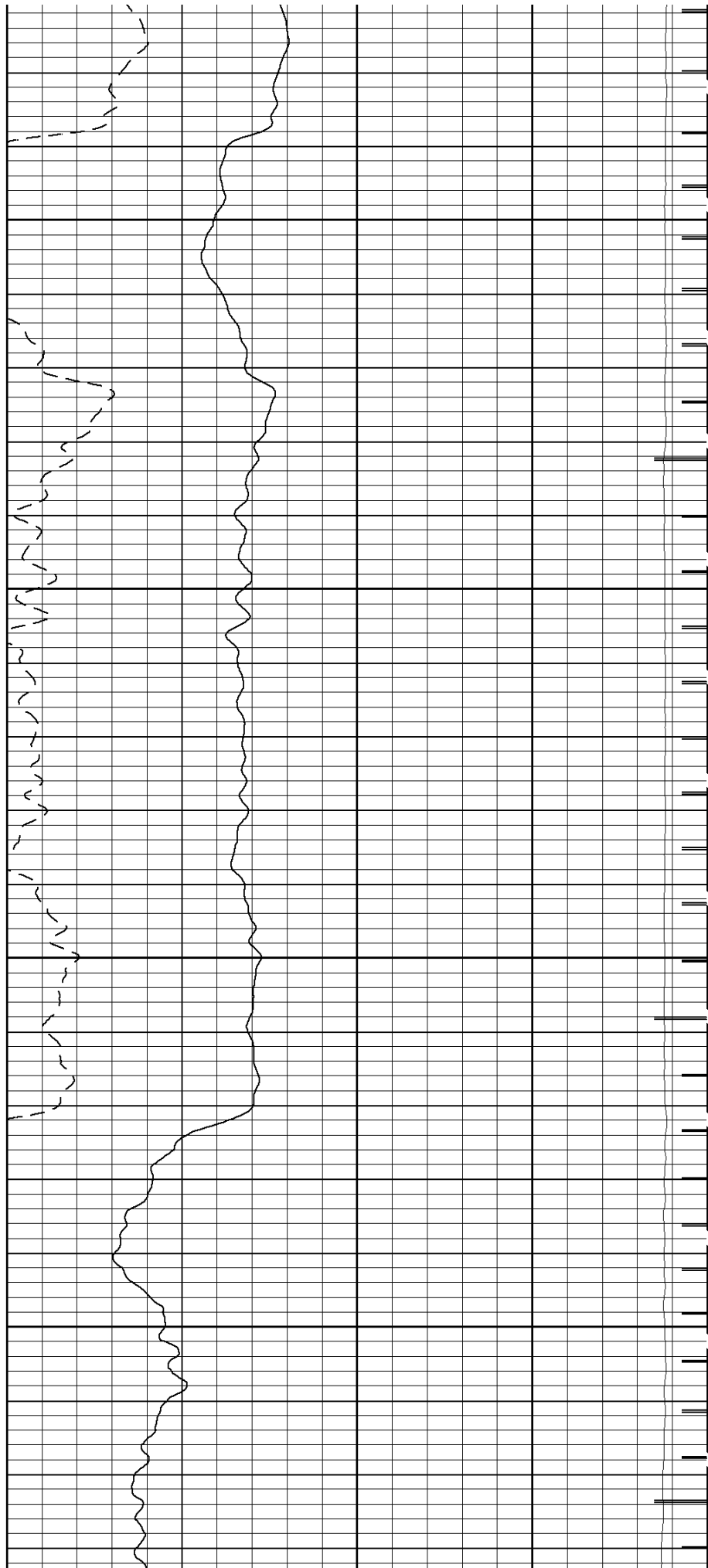
ITT MARK

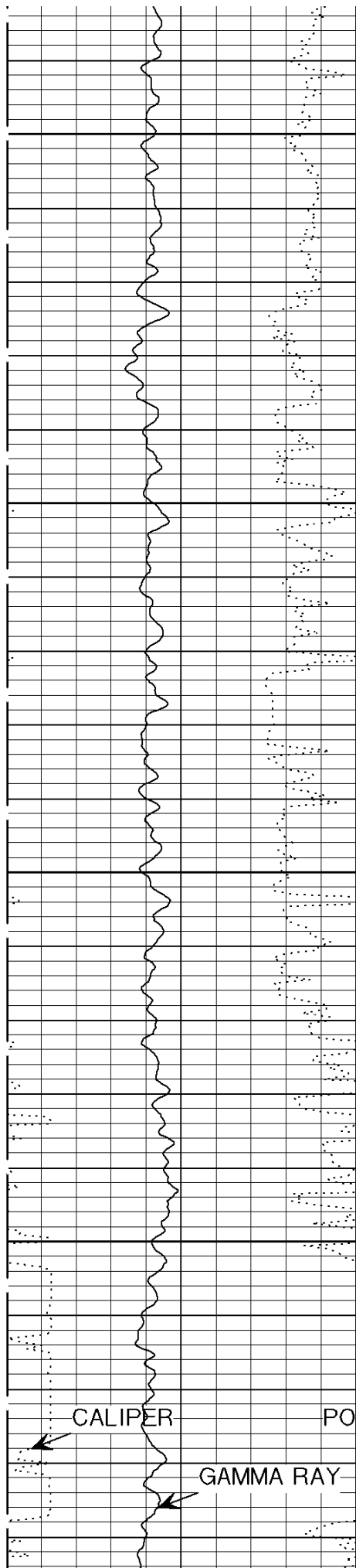




1100

1200





1300

1400

CALIPER

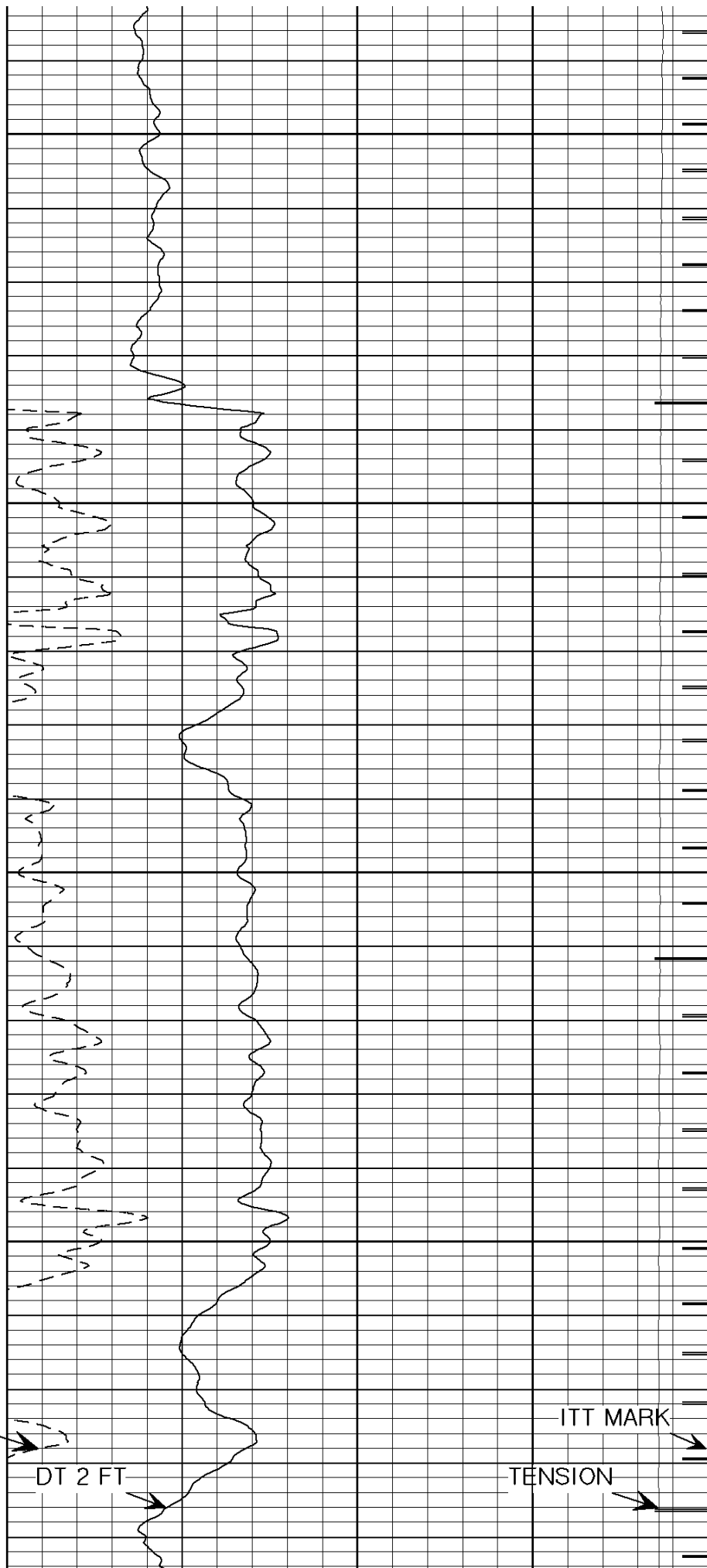
GAMMA RAY

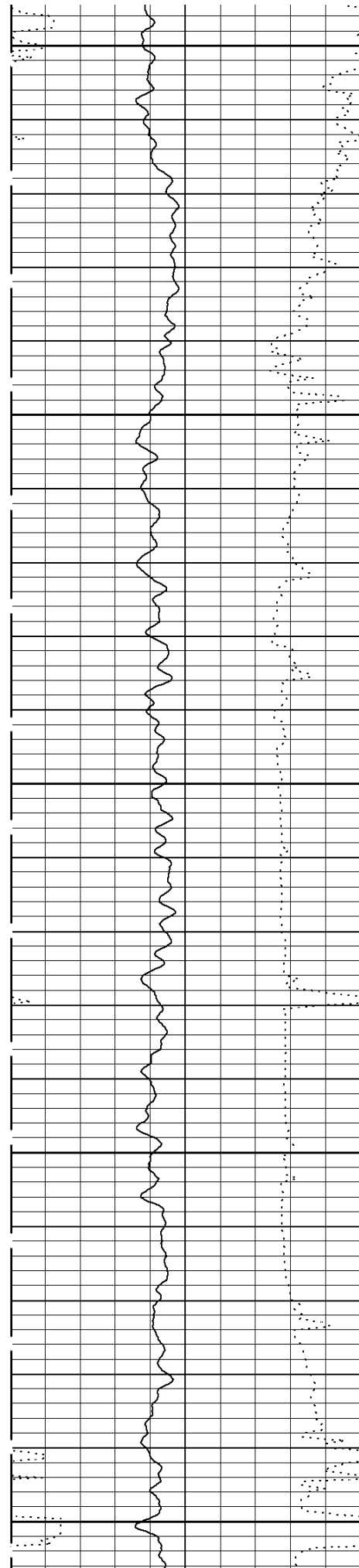
POROSITY

DT 2 FT

ITT MARK

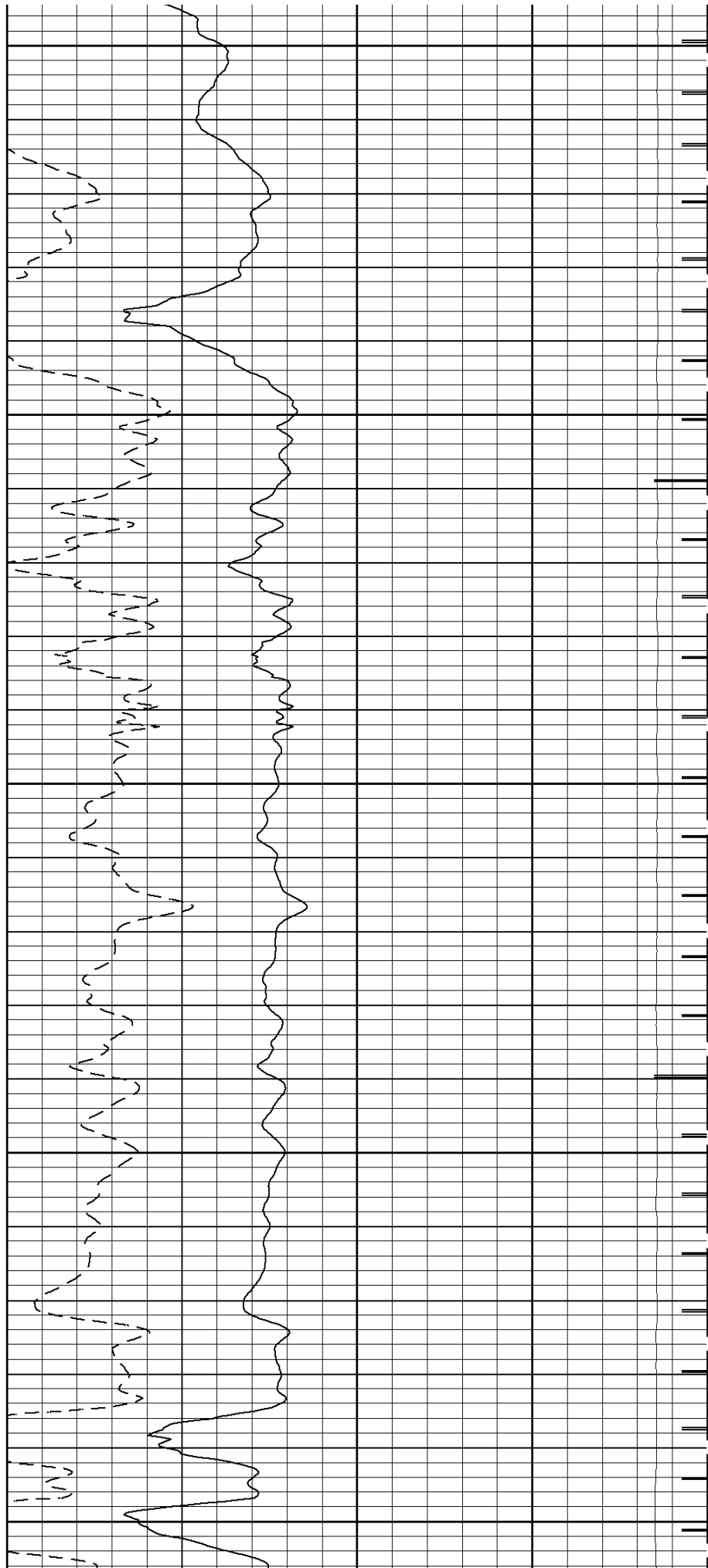
TENSION

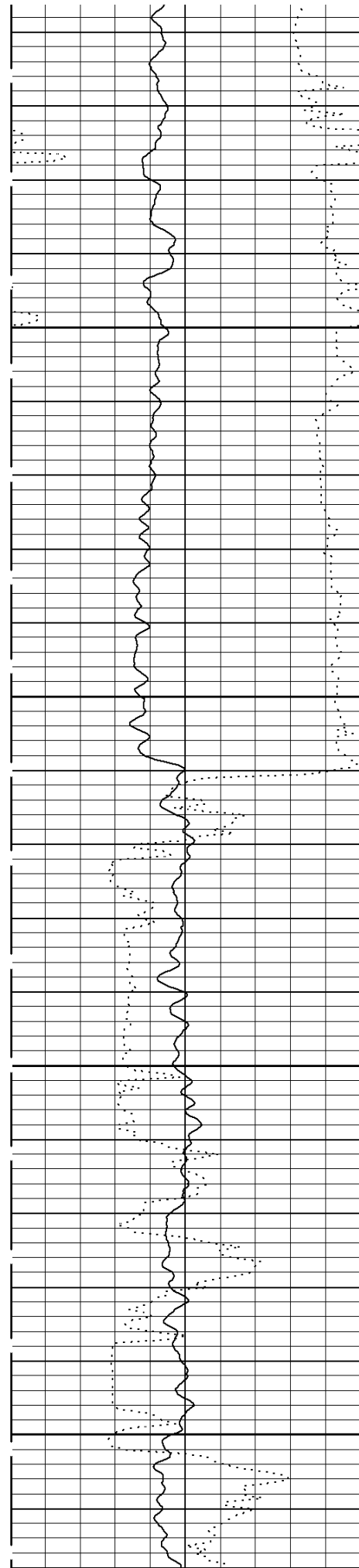




1500

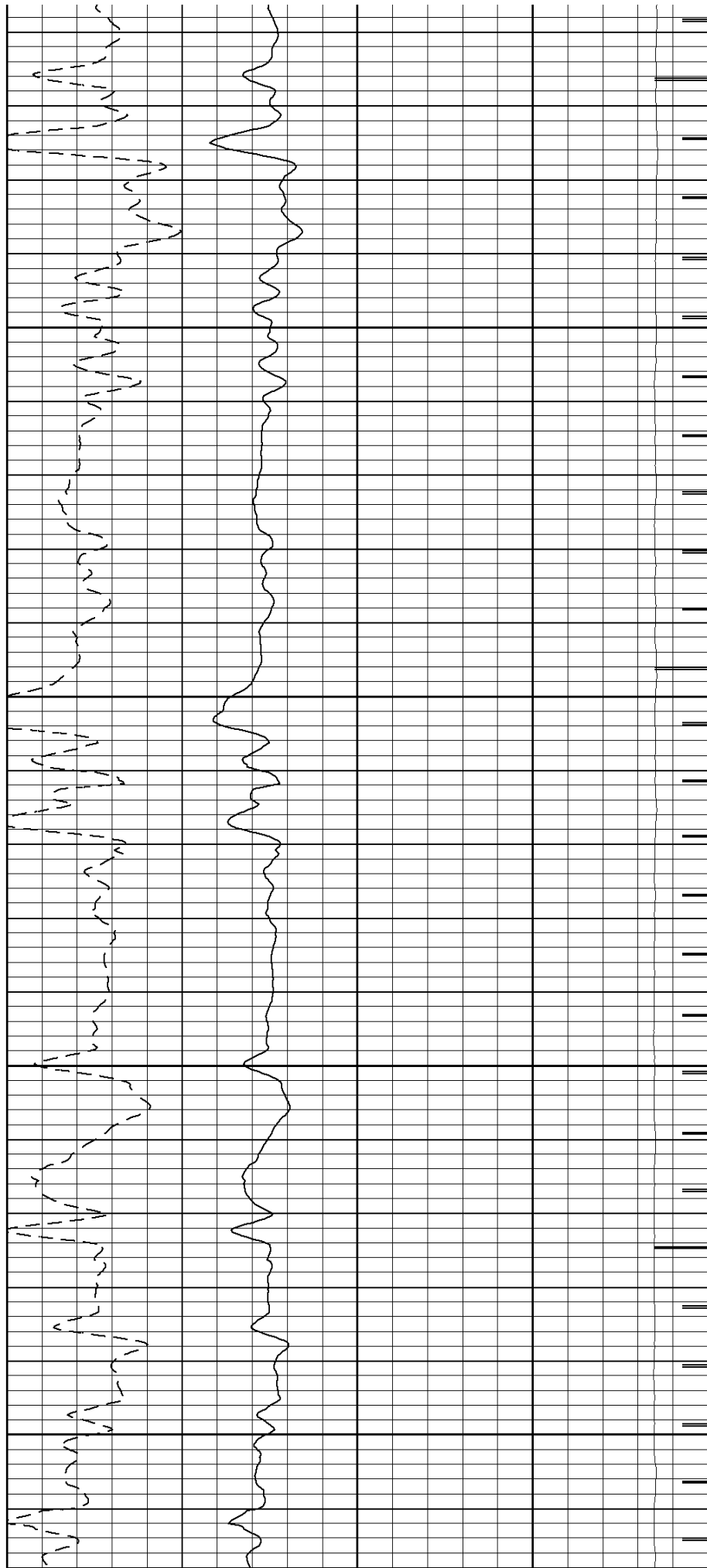
1600

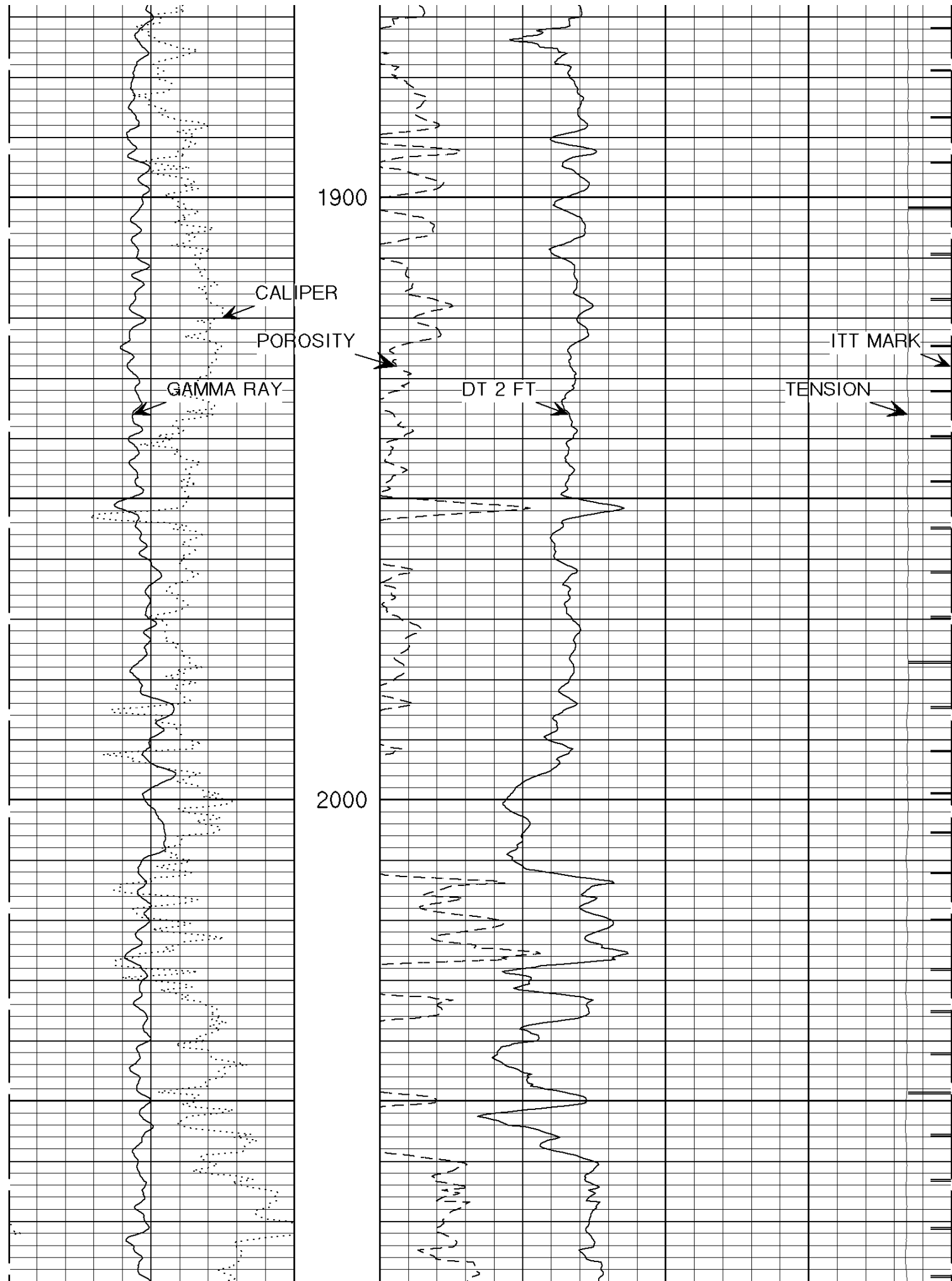


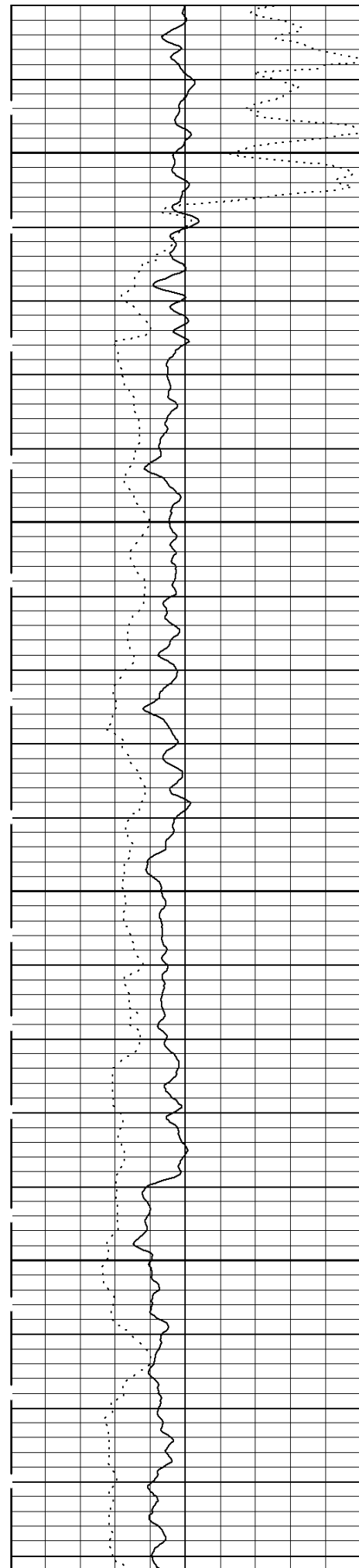


1700

1800

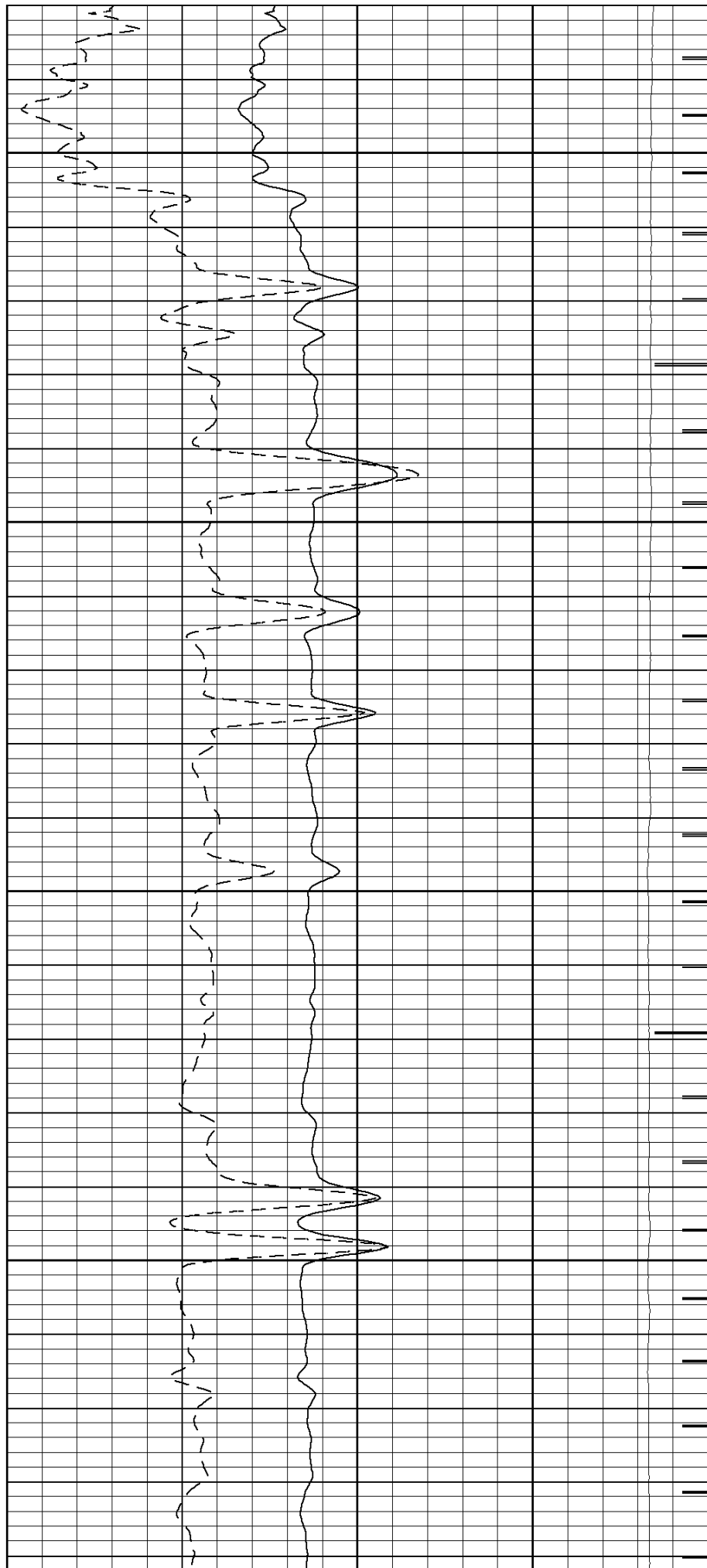


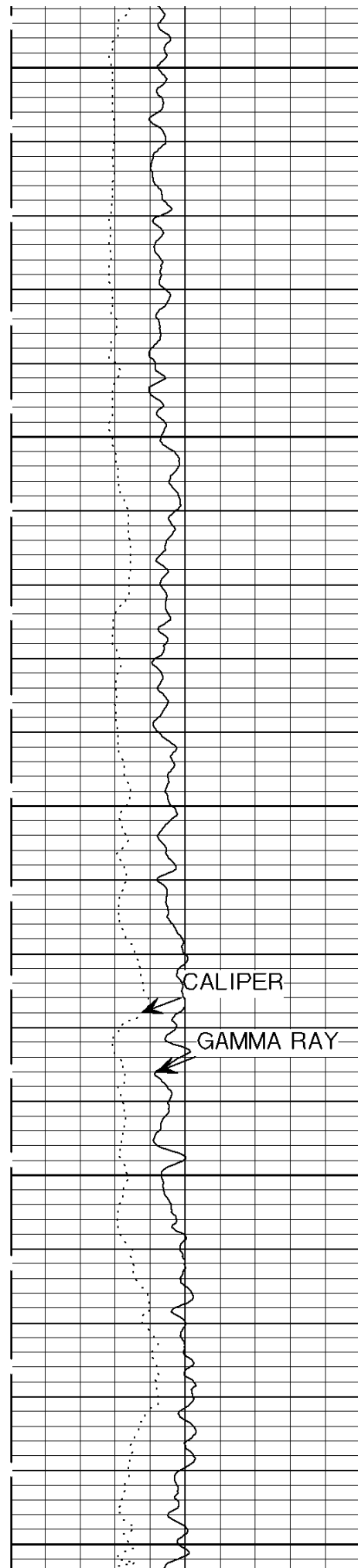




2100

2200





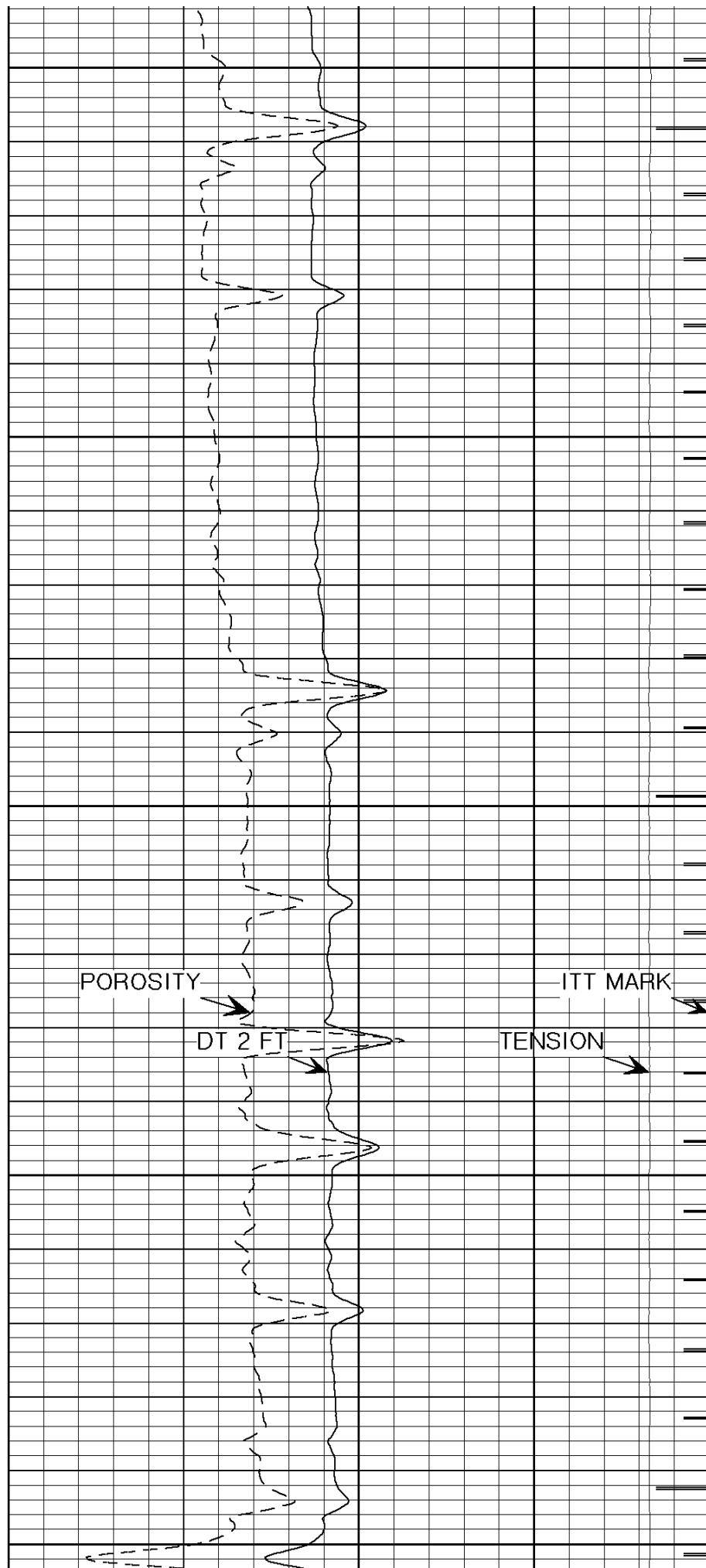
2300

2400

2500

CALIPER

GAMMA RAY

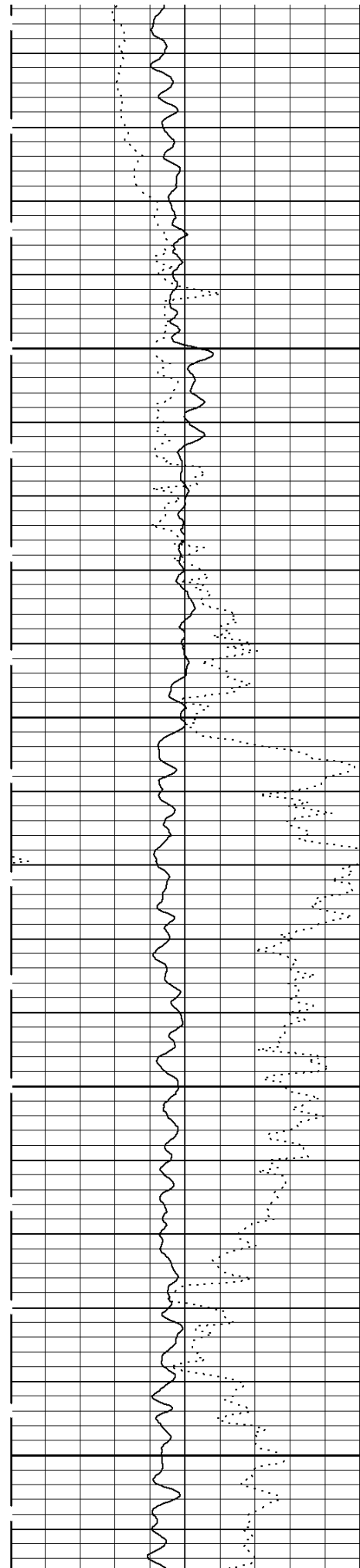


POROSITY

DT 2 FT

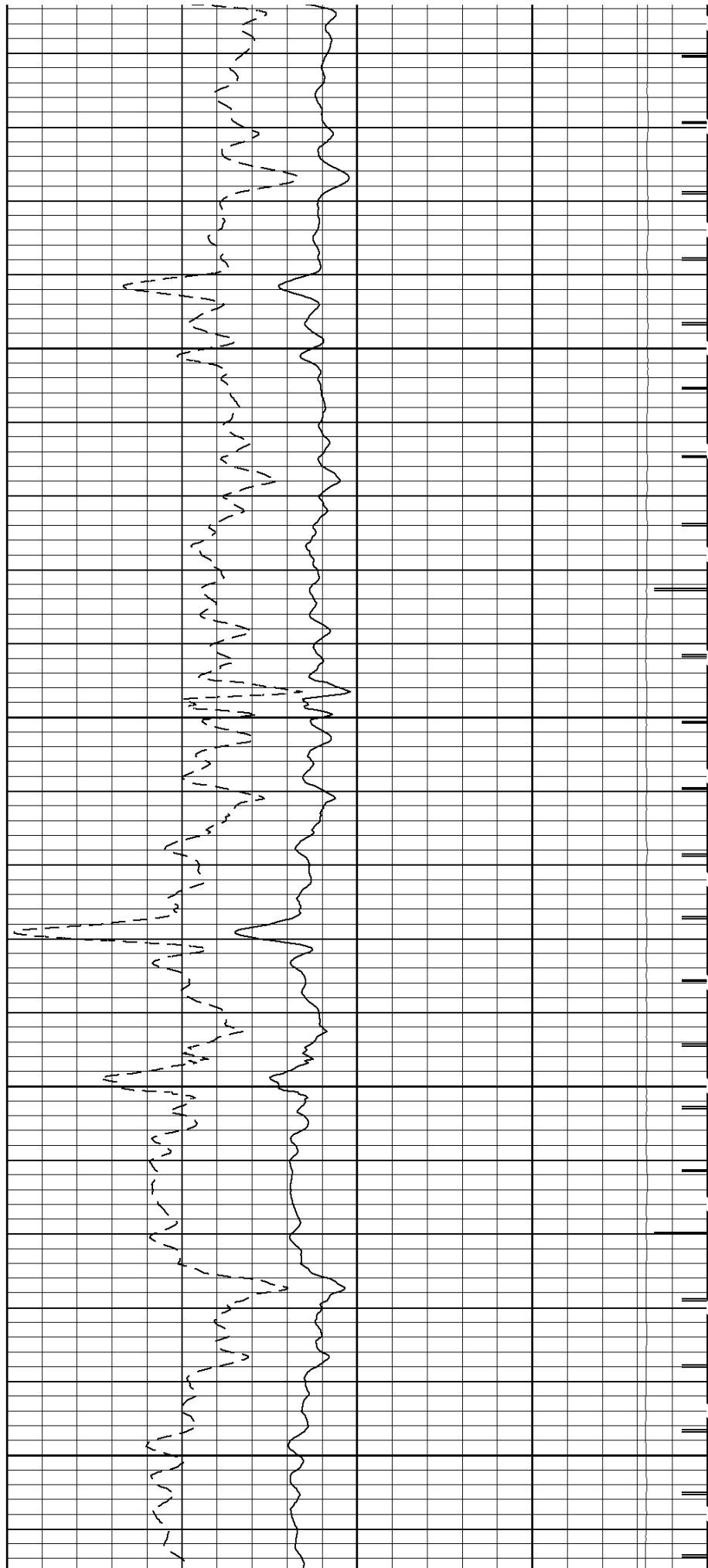
ITT MARK

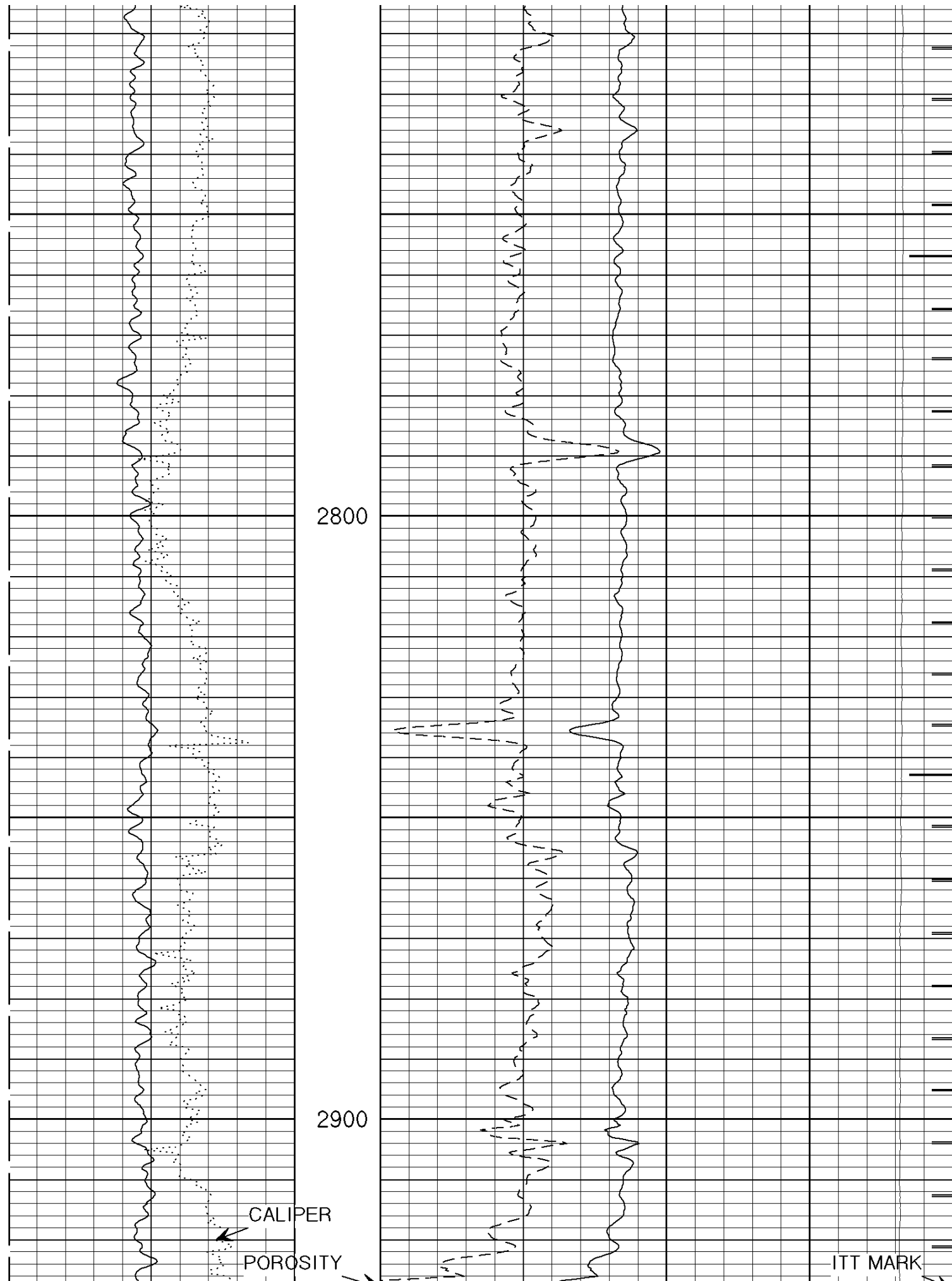
TENSION

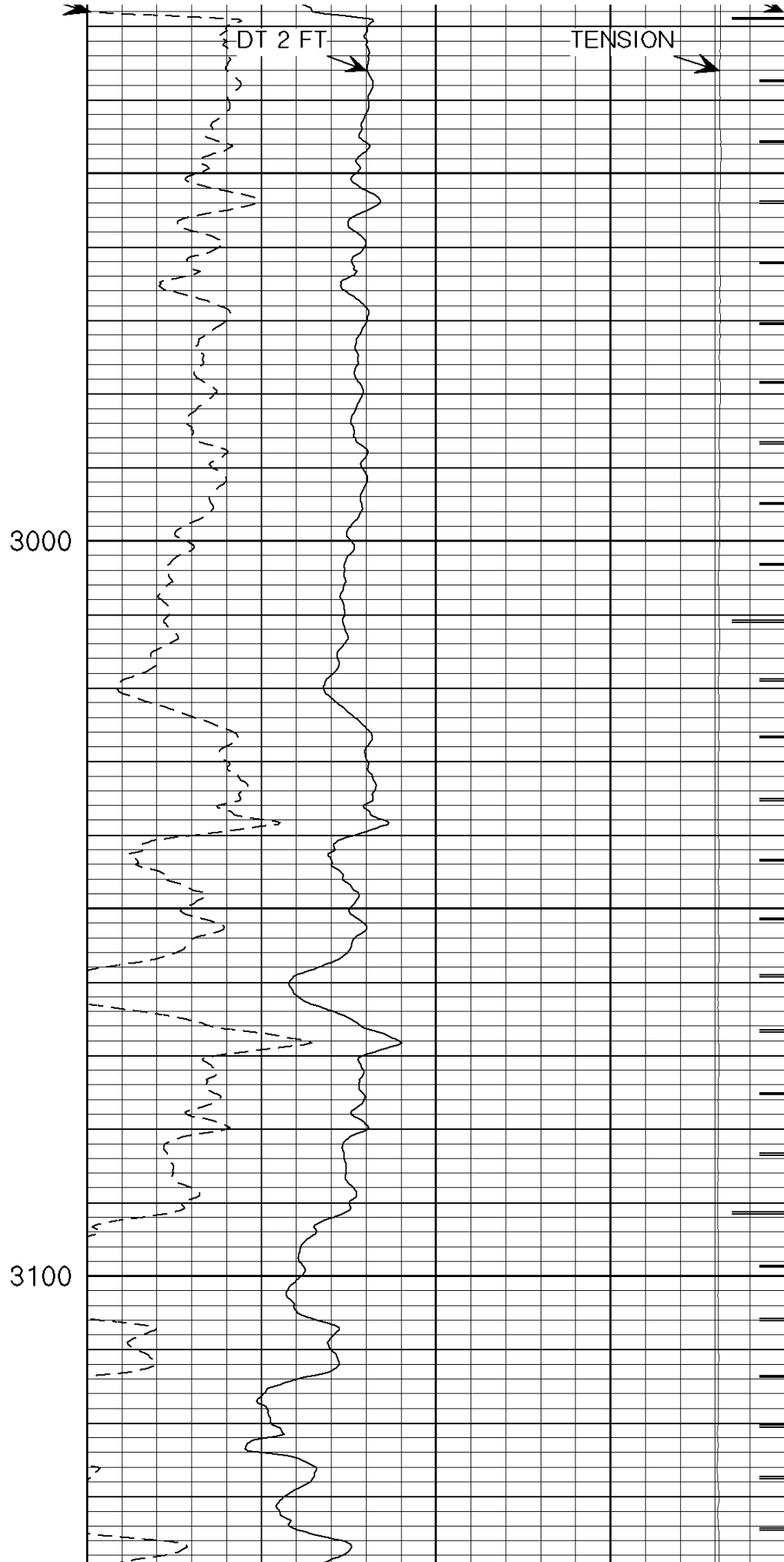
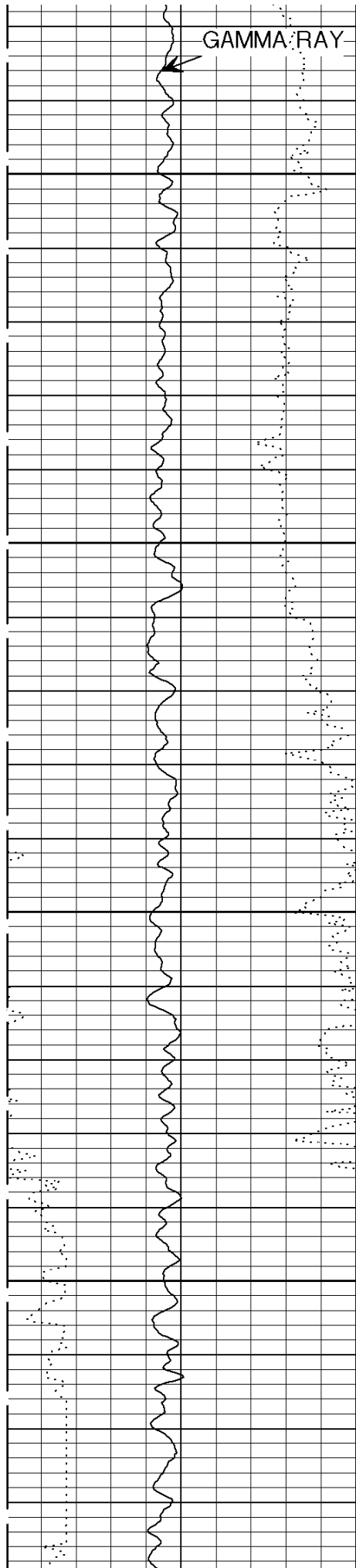


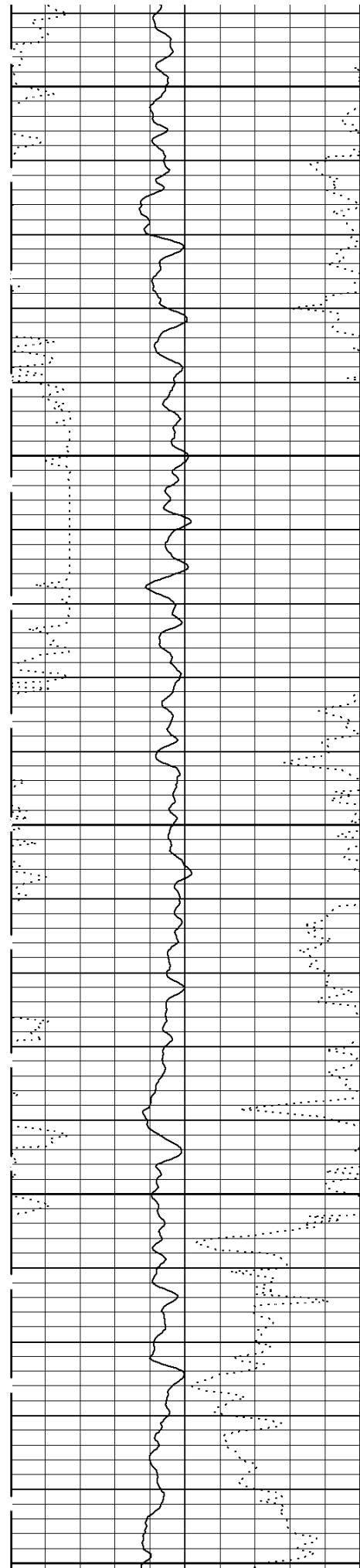
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2700



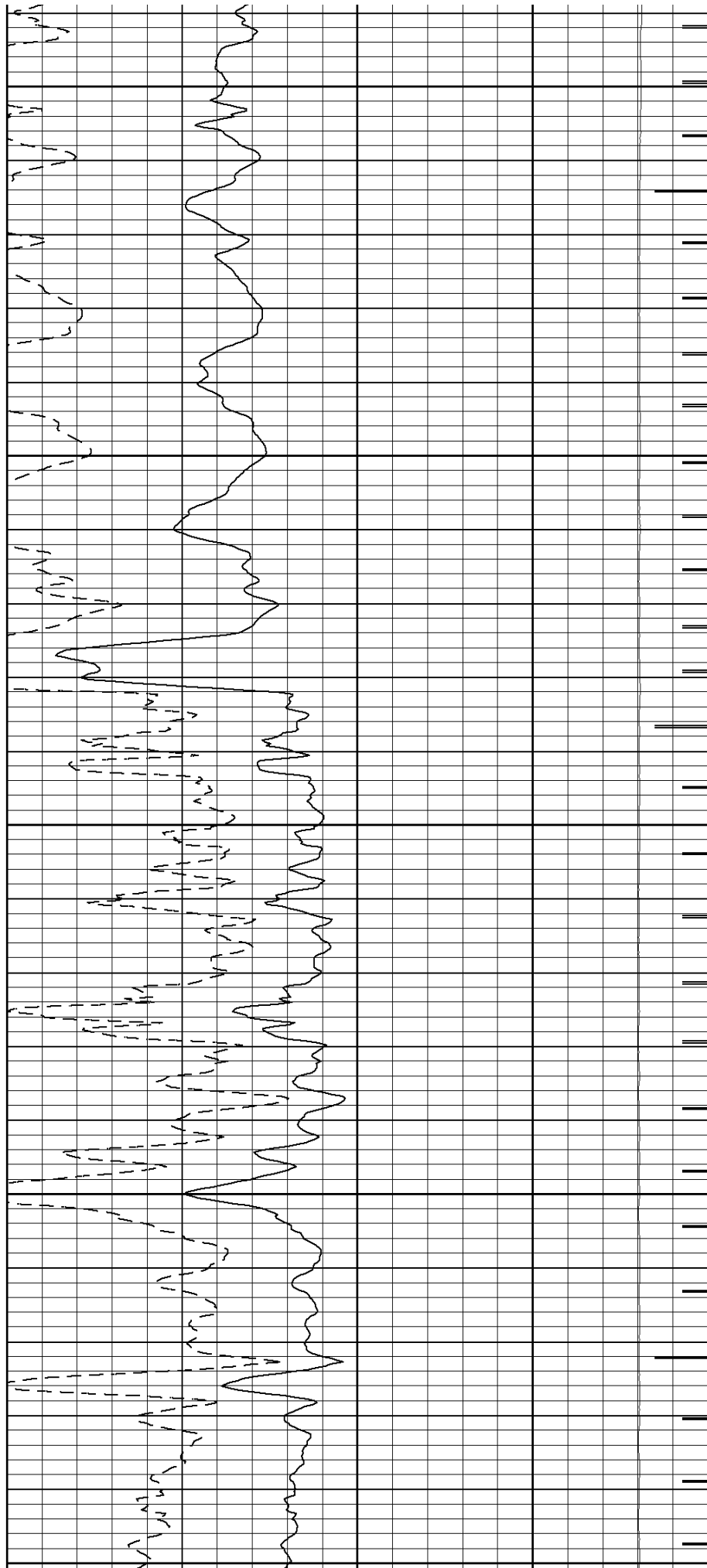


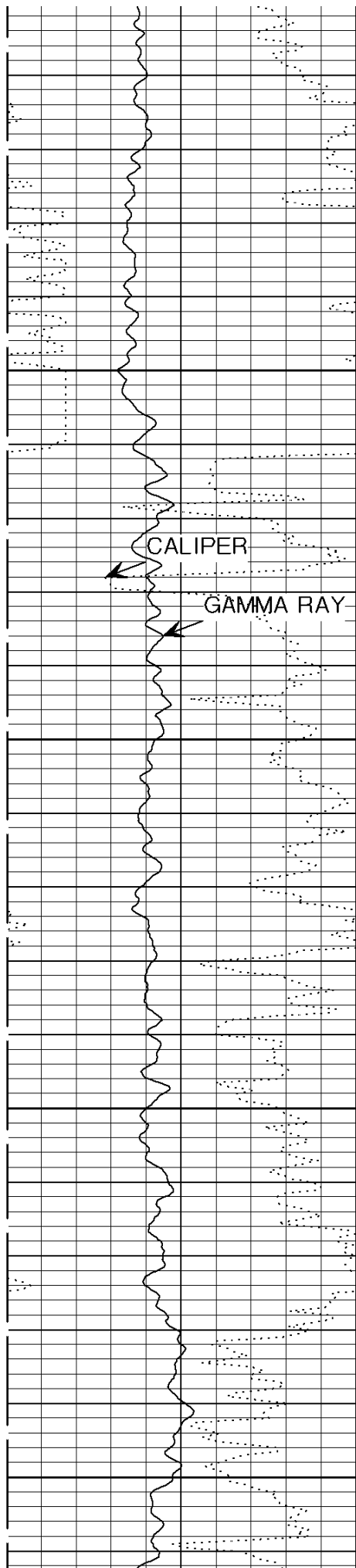




3200

3300





3400

POROSITY

CALIPER

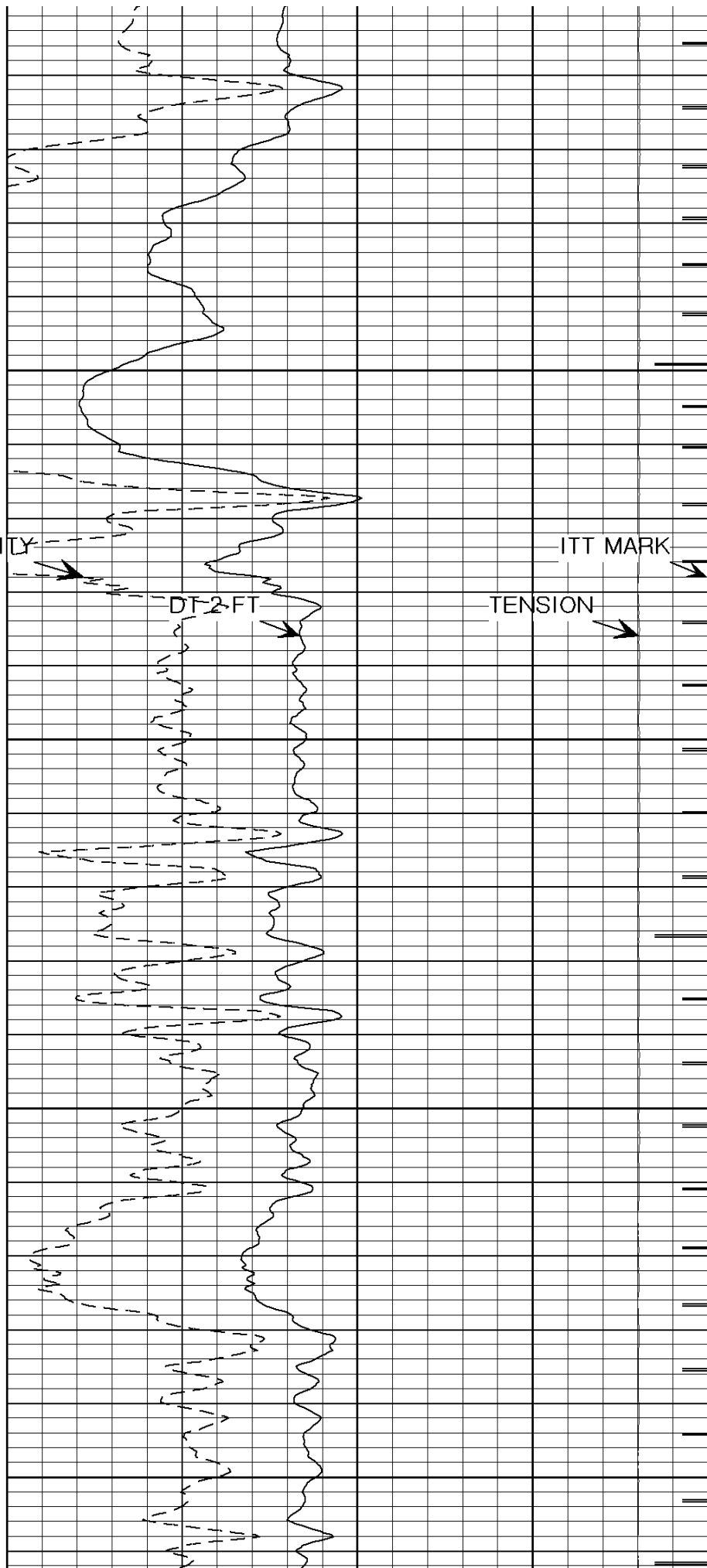
GAMMA RAY

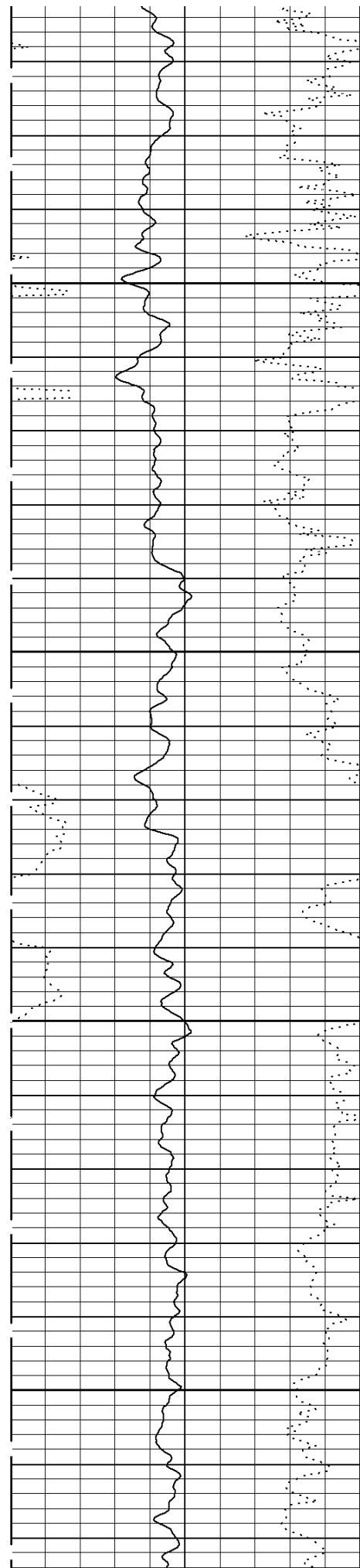
DT-2-FT

ITT MARK

TENSION

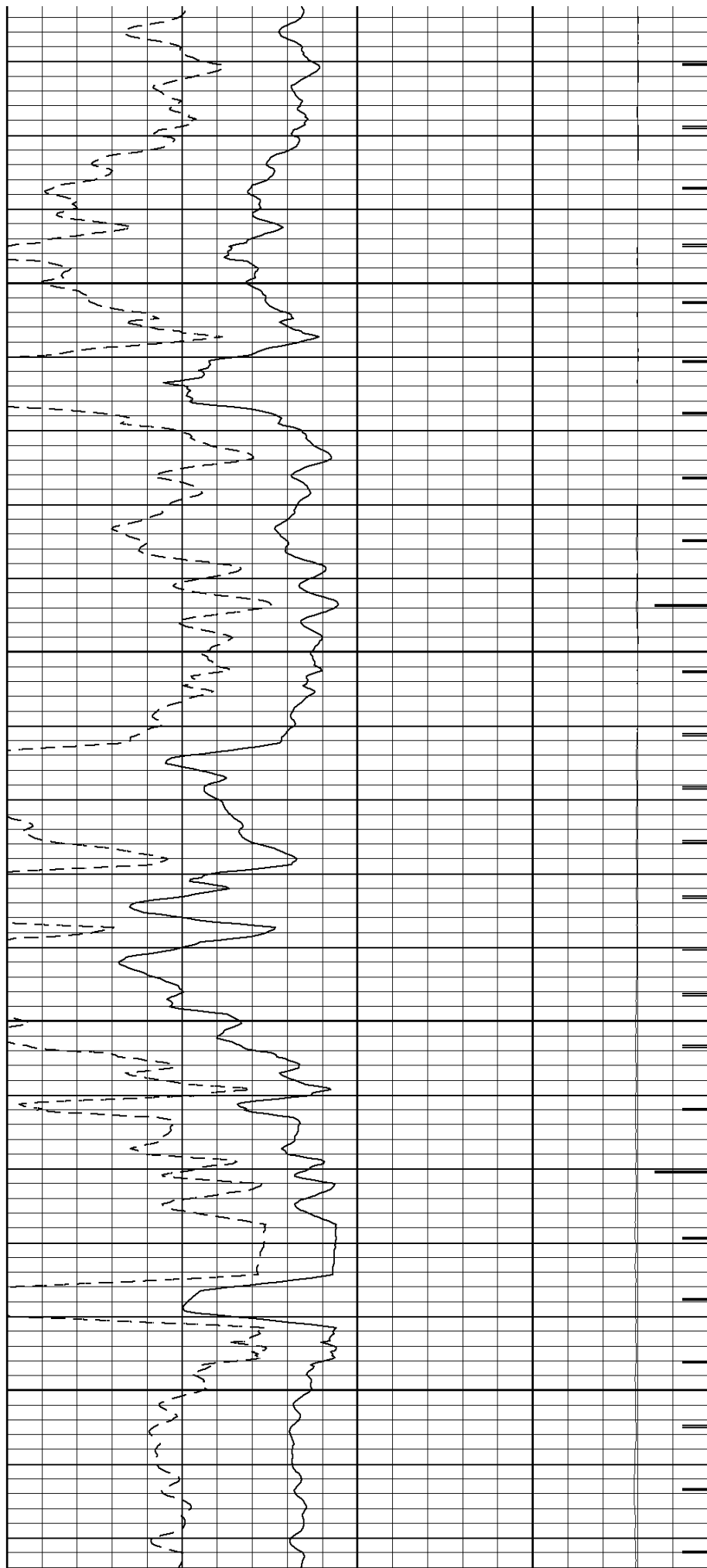
3500

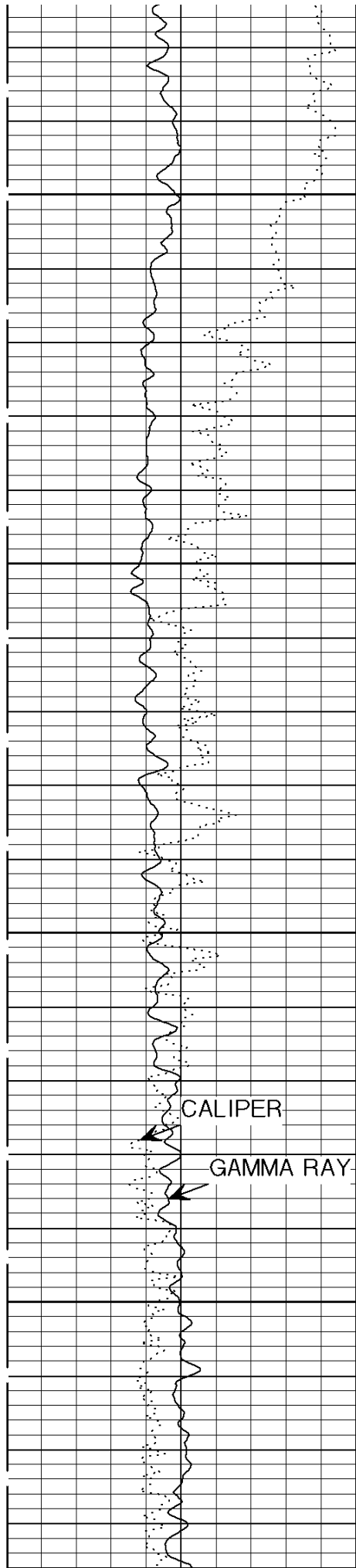




3600

3700



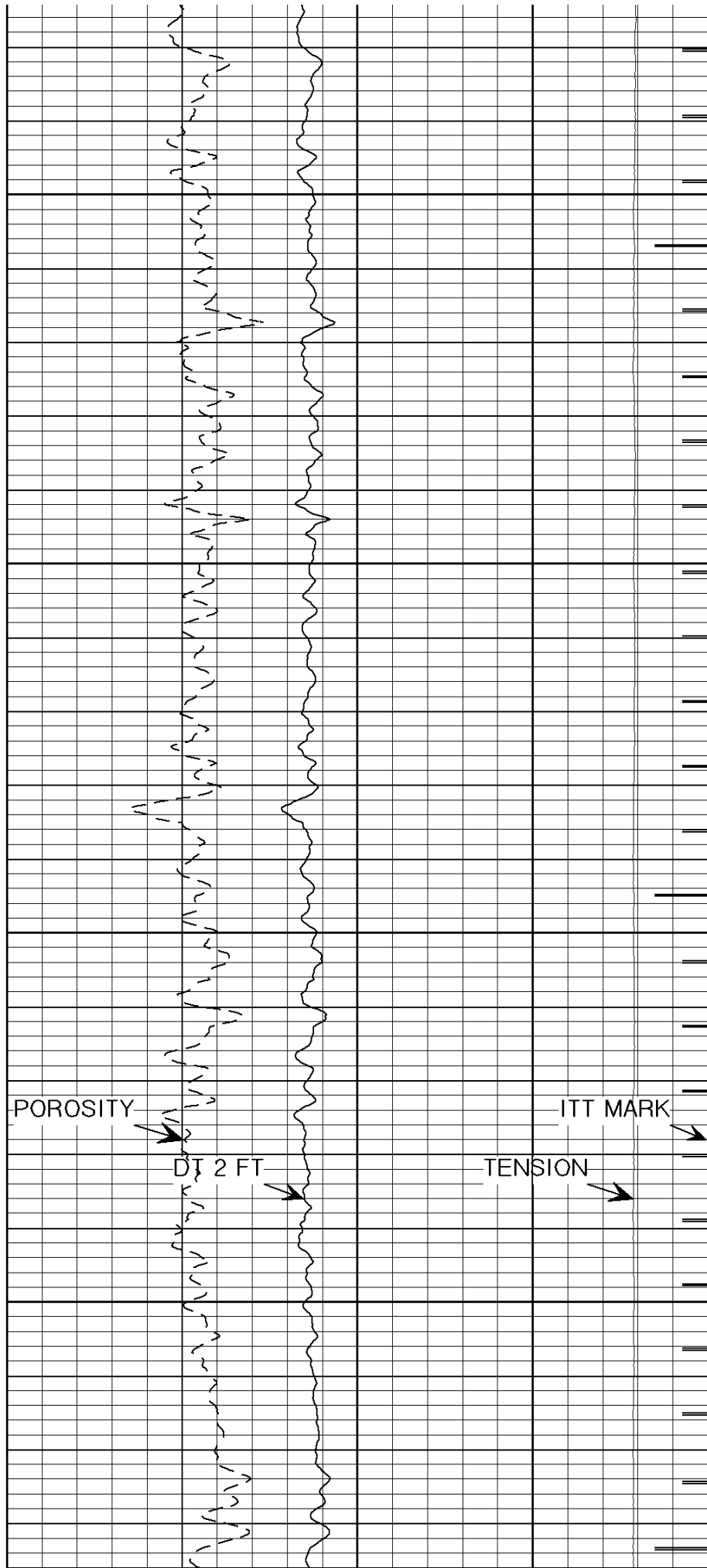


3800

3900

CALIPER

GAMMA RAY

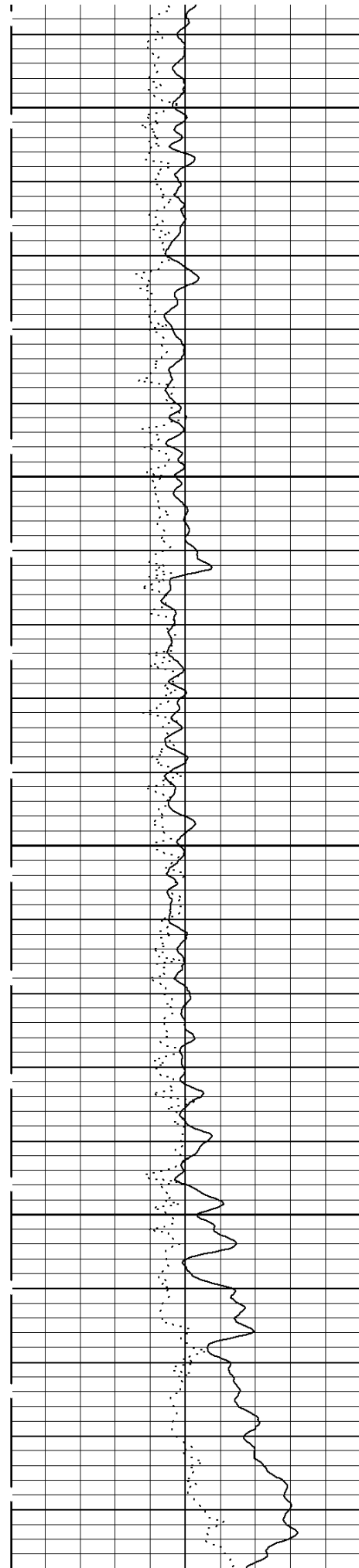


POROSITY

DT 2 FT

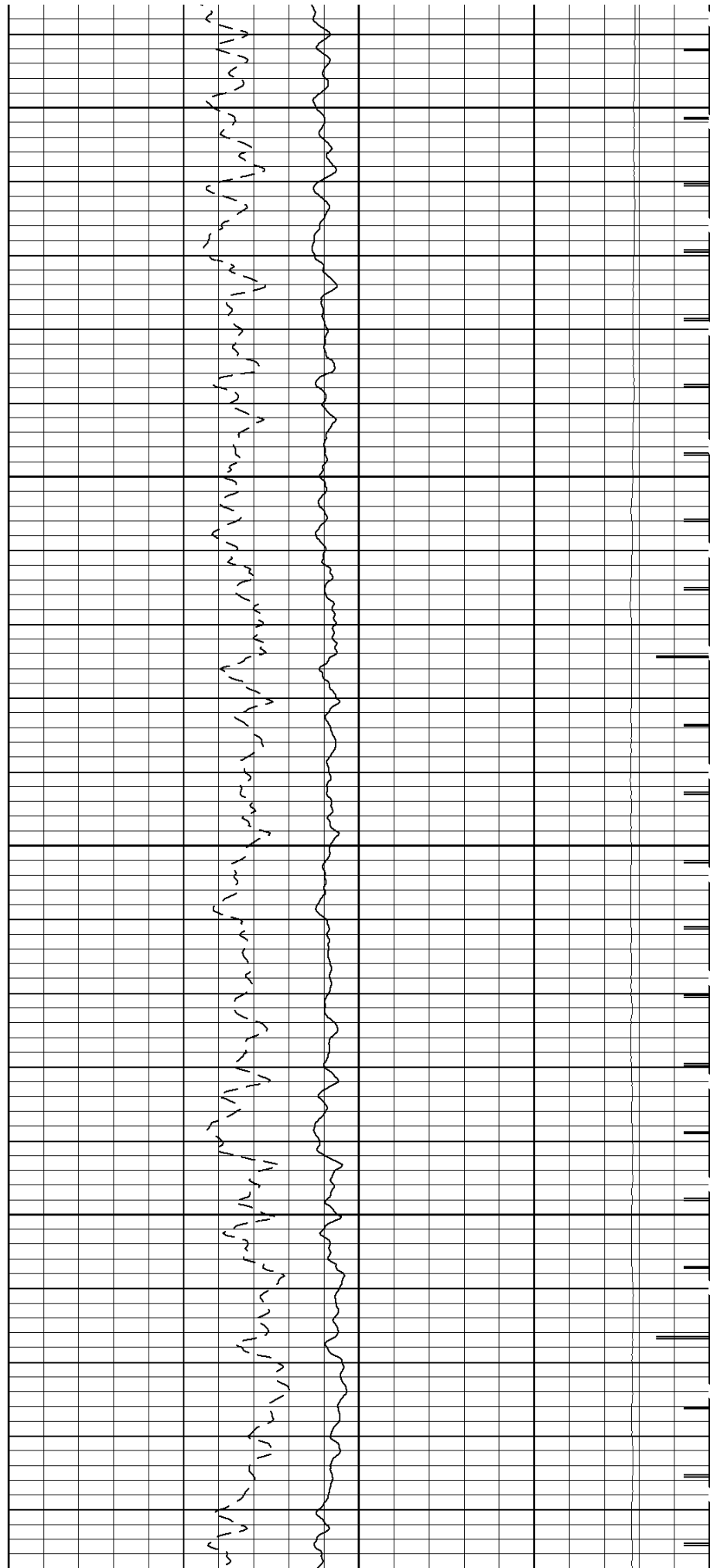
ITT MARK

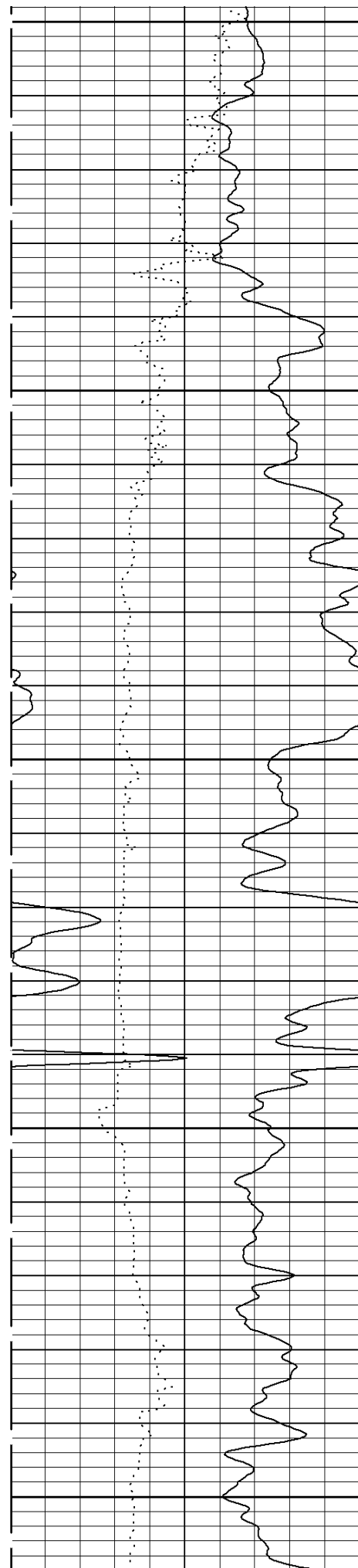
TENSION



4000

4100

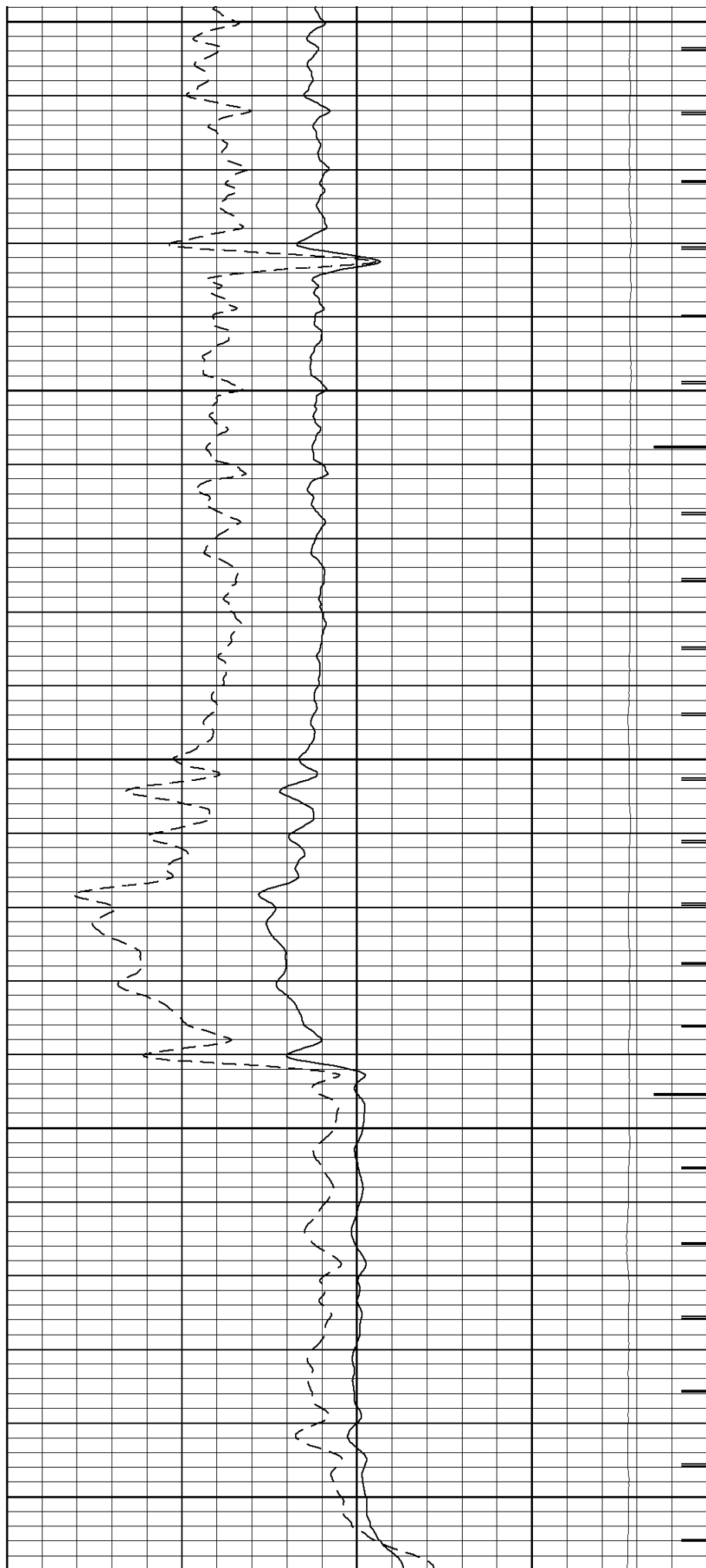


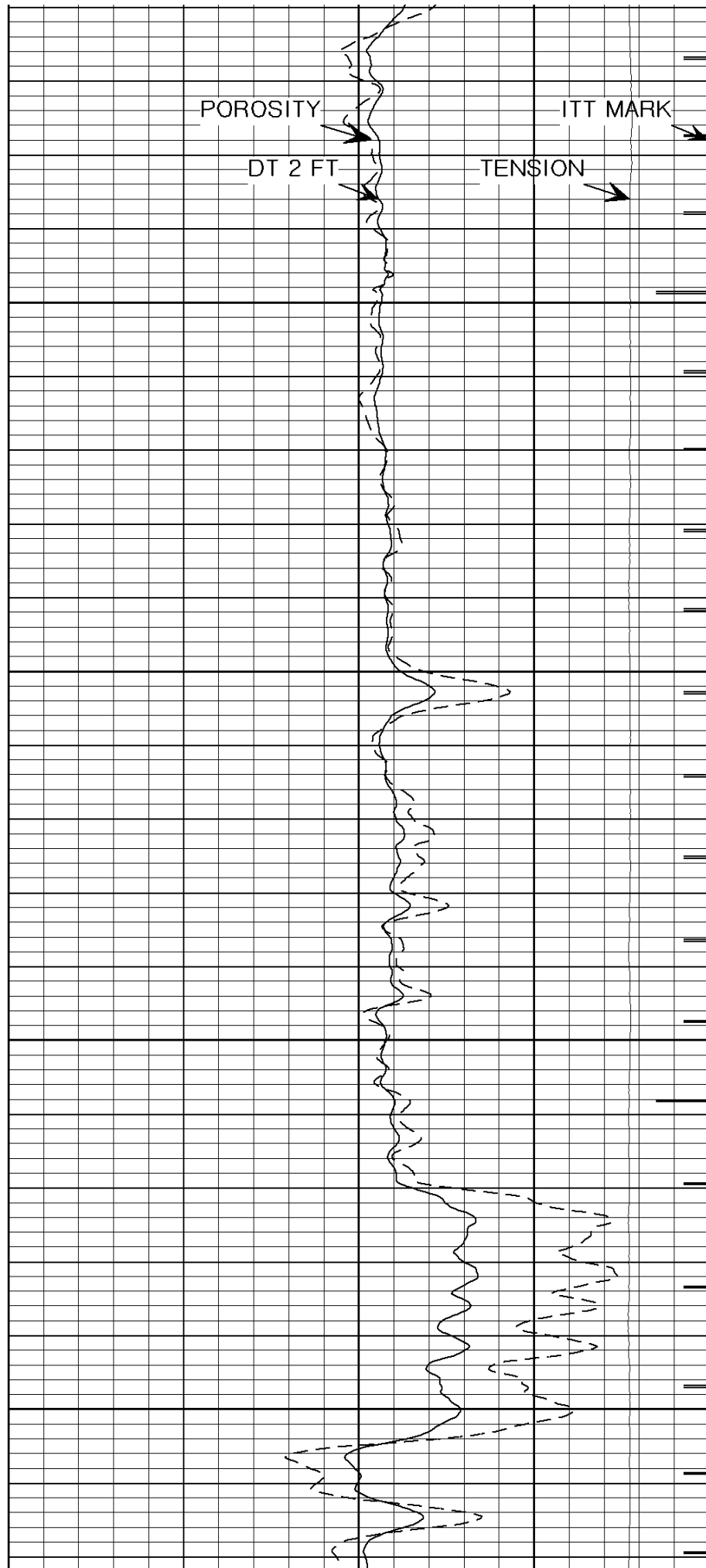
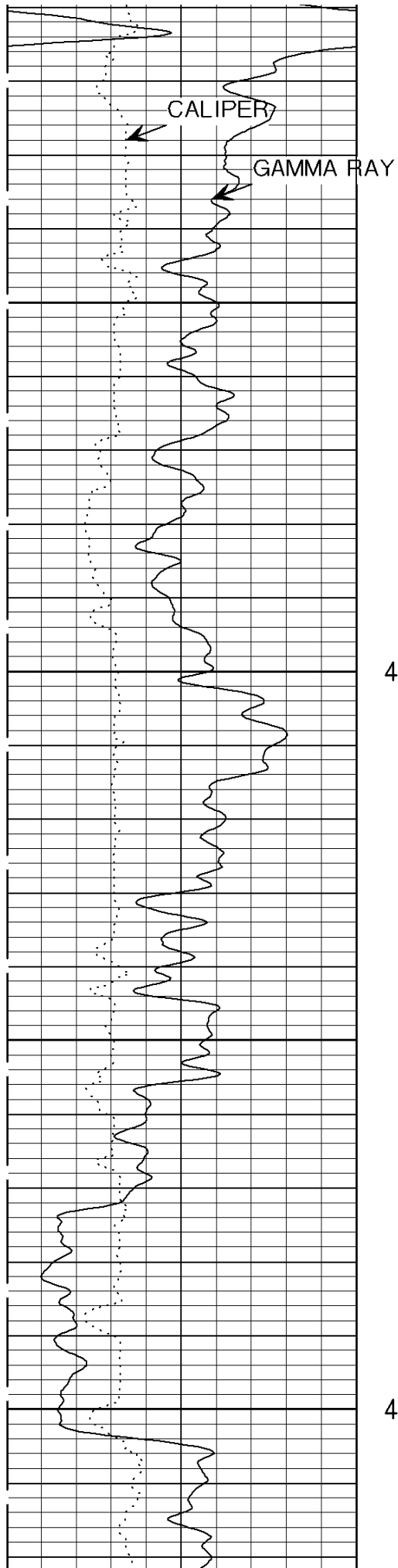


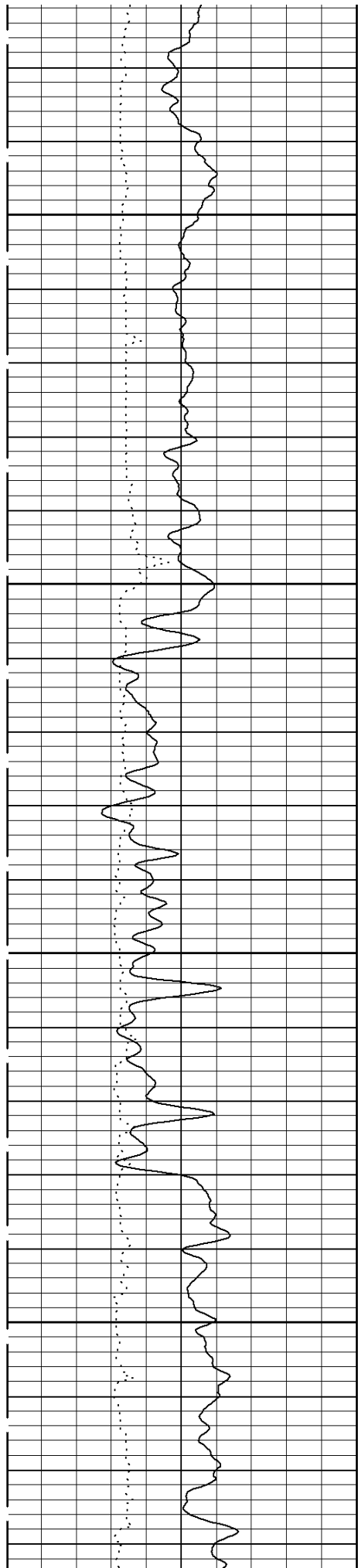
4200

4300

4400

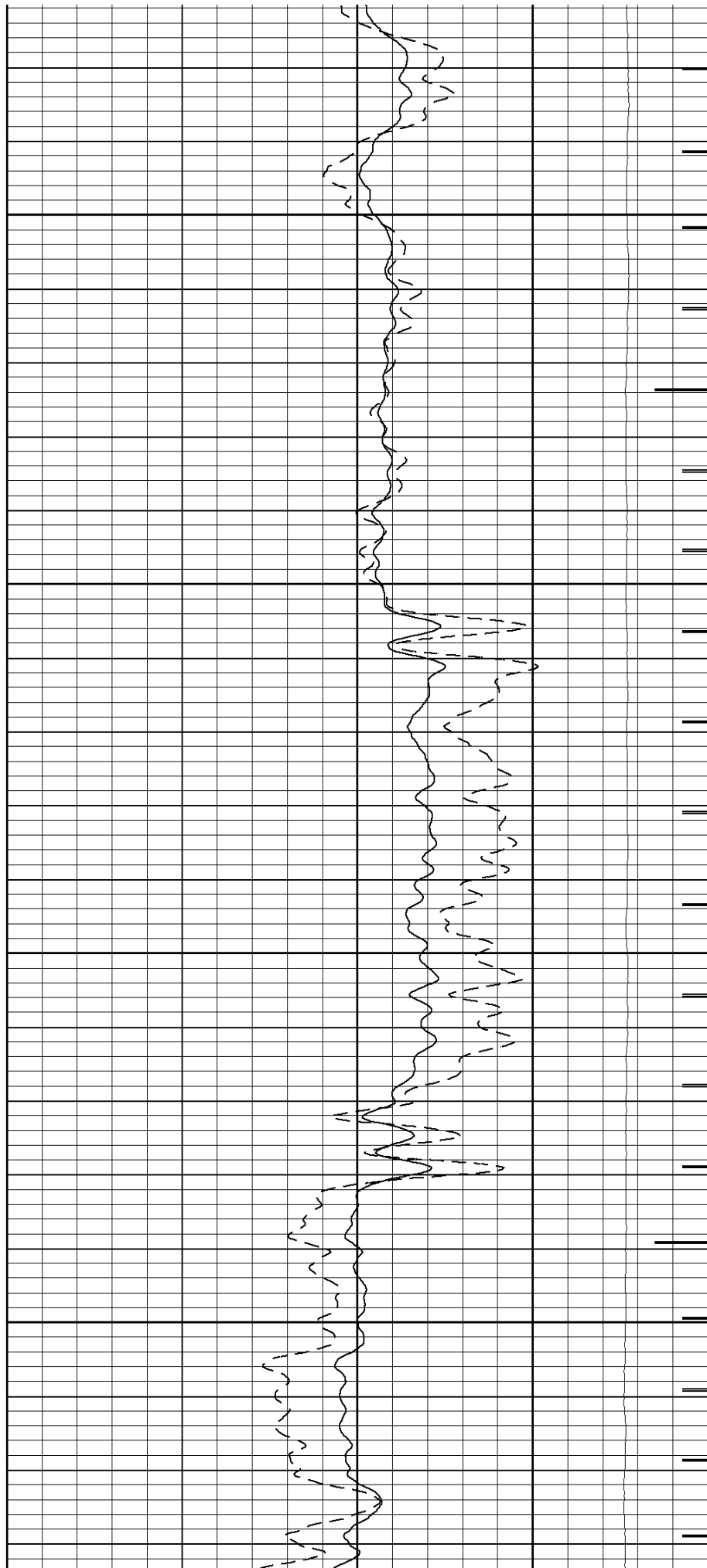


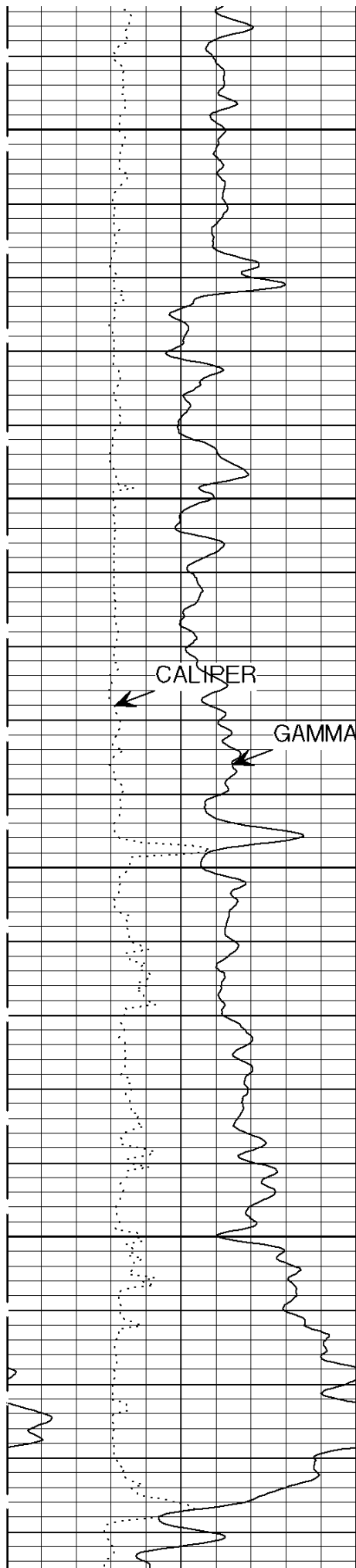




4700

4800



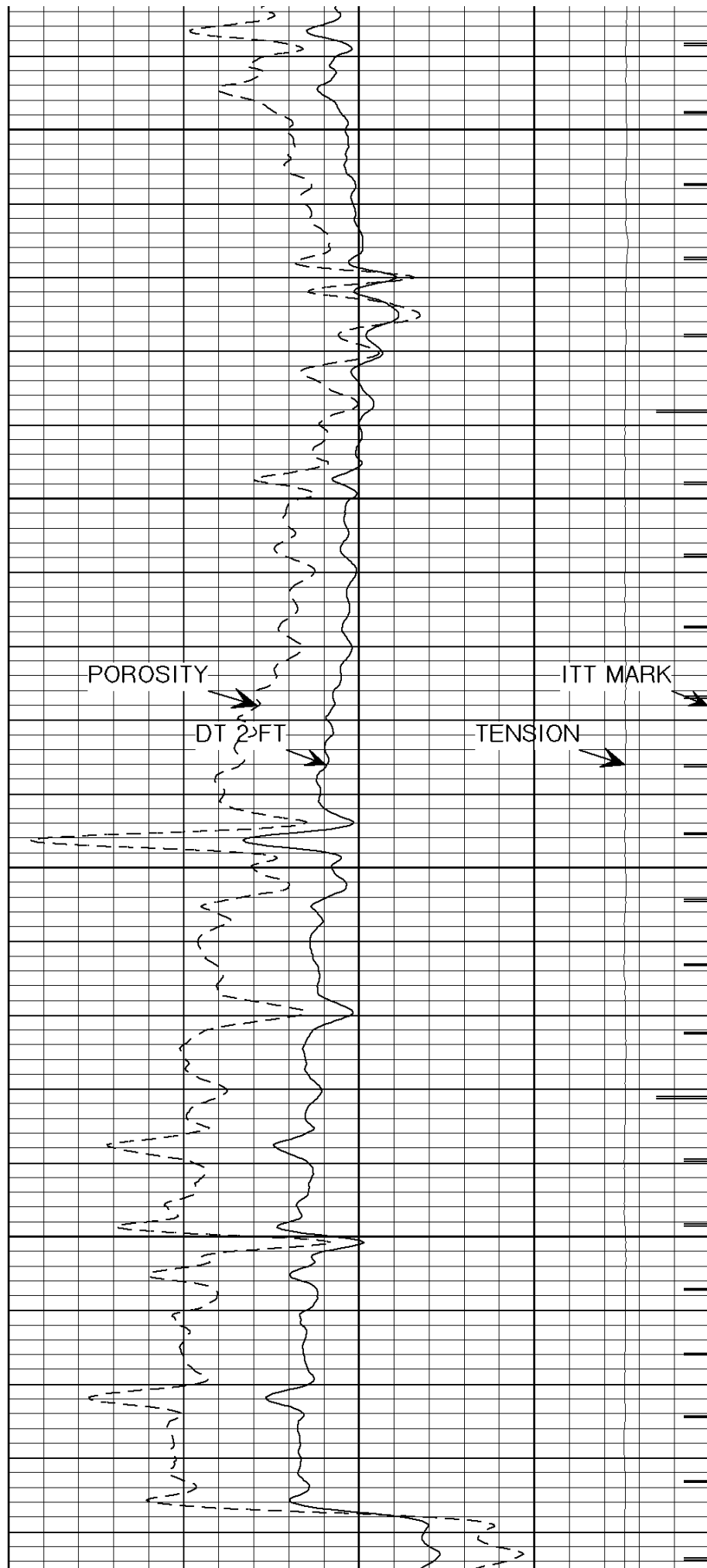


4900

CALIPER

GAMMA RAY

5000

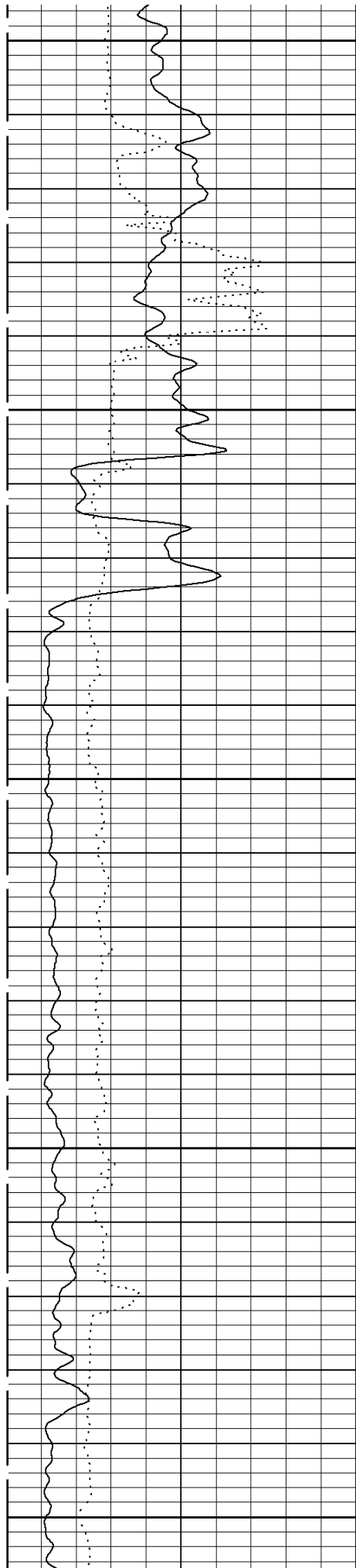


POROSITY

DT 2-FT

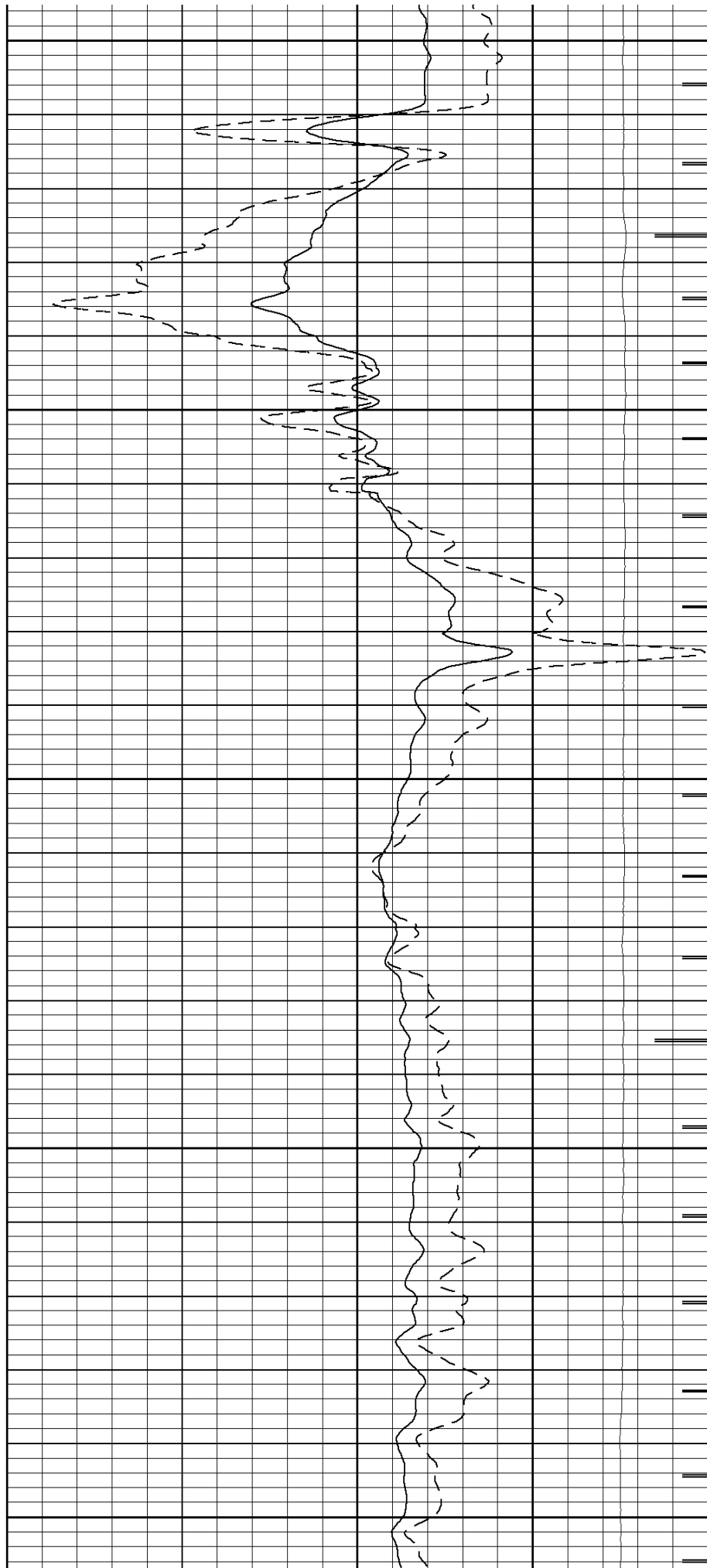
TENSION

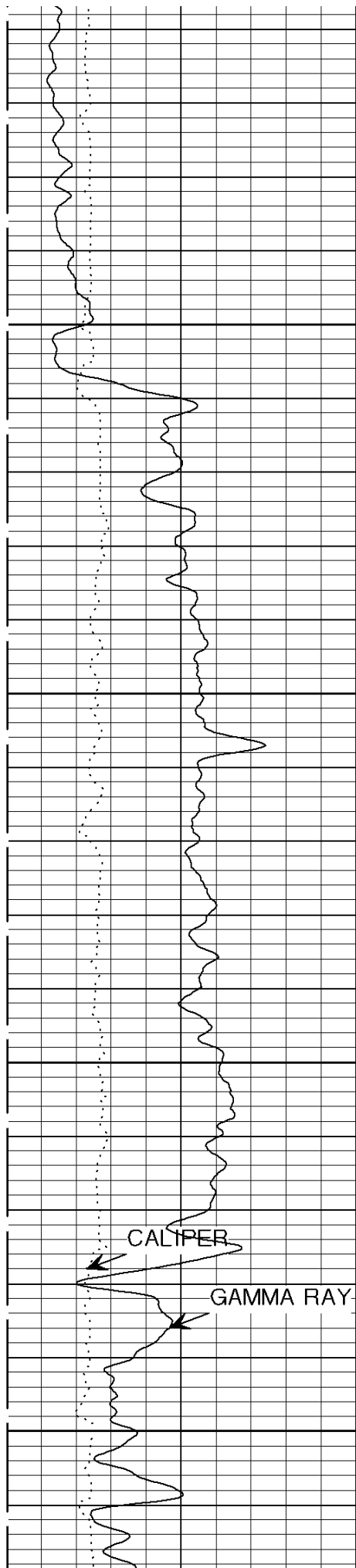
ITT MARK



5100

5200



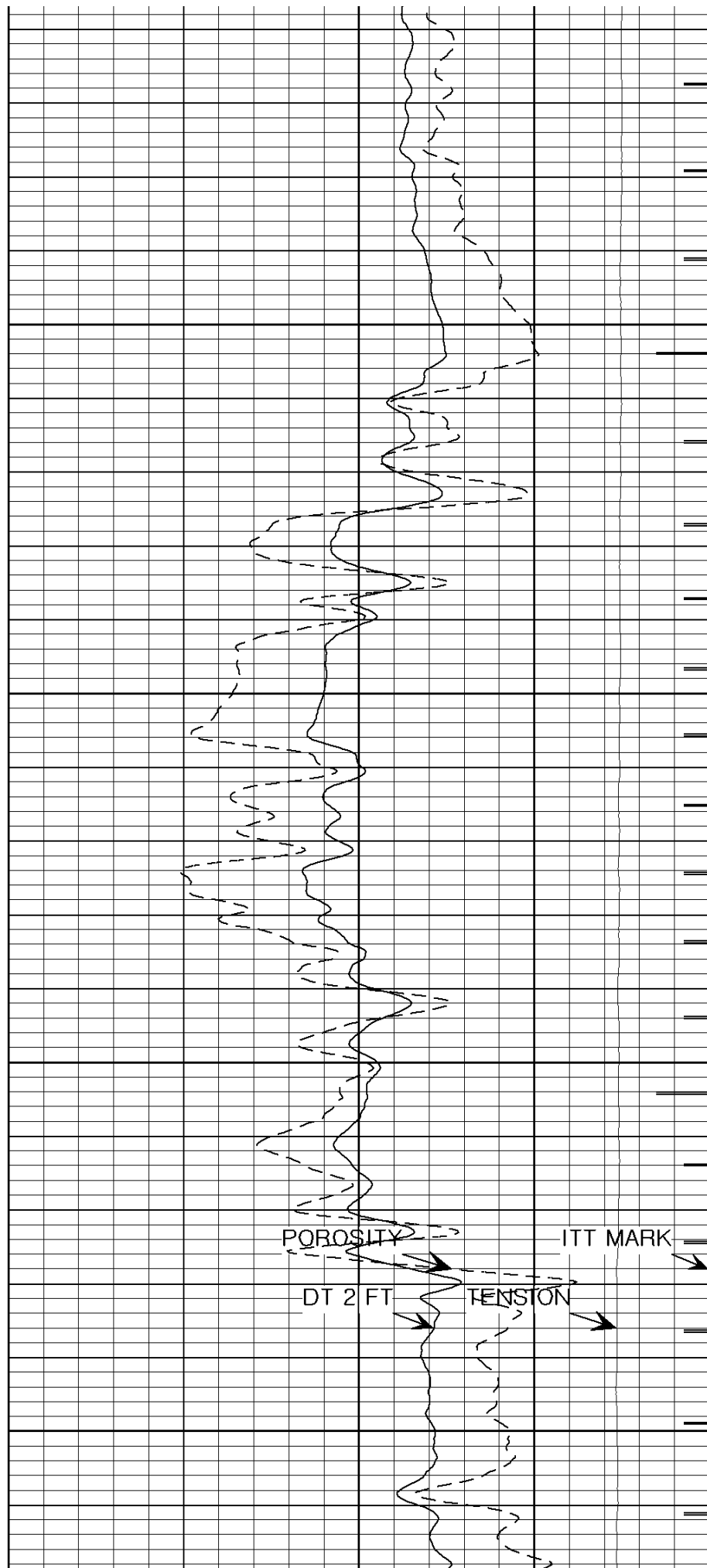


5300

5400

CALIPER

GAMMA RAY

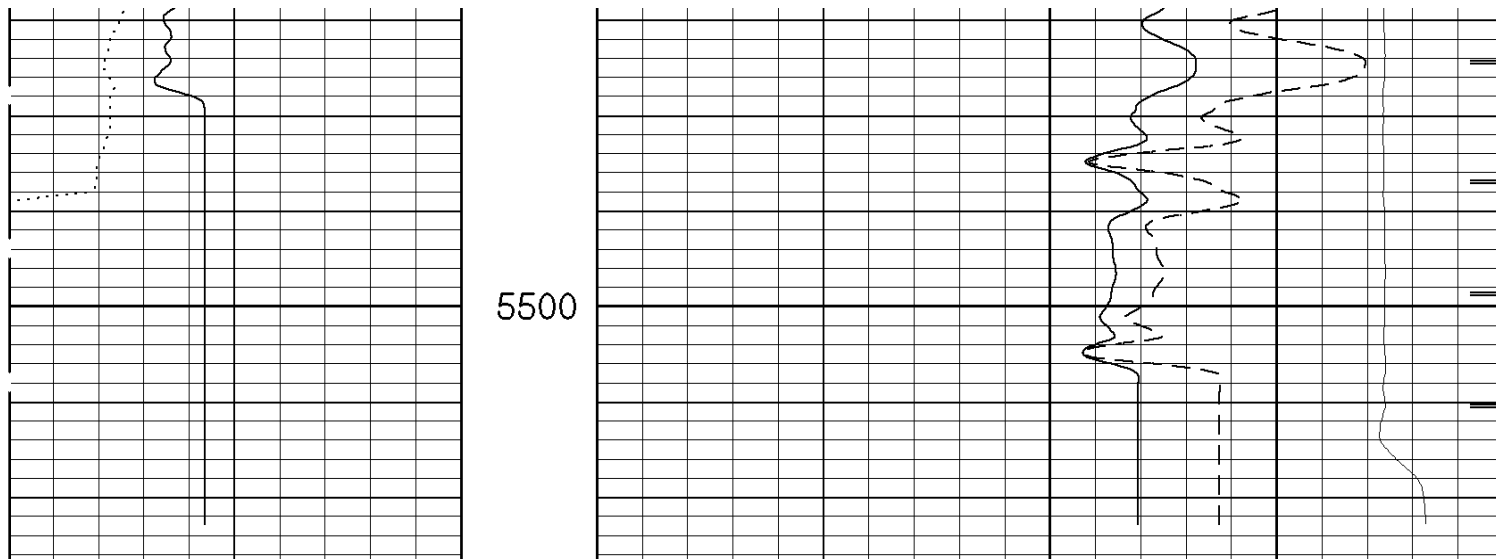


POROSITY

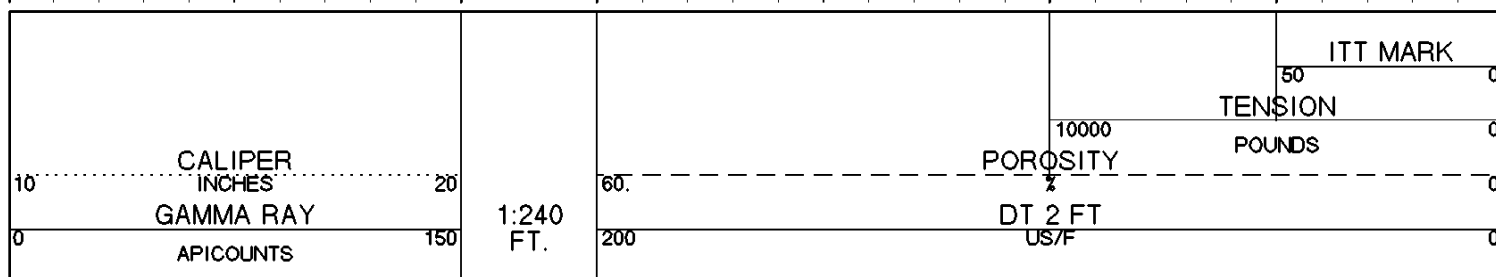
DT 2 FT

TENSTON

ITT MARK



5500



Version No: 5.6 : hc:3.0
 Data File: awind_7_17_run2.2.cls
 Format File: 5IN_SONIC.spc
 Plot Time: 2007-04-05 07:52:03
 Log Time: 2007-04-05 01:39:16

HALLIBURTON

Top Depth: 462.00
 Bottom Depth: 5527.00

EXCELL-2000 Calibration Report

Date: 05-Apr-2007 07:46:

CSNG - DITS - TITANIUM SHOP CALIBRATION SUMMARY

PERFORMED: 28-Mar-2007 17:50 LAST SHOP CALIBRATION: 18-Feb-2007 09:03
 SERIAL NUMBER: I019S925 MODEL: CSNG-T
 CALIBR NUM: 230
 TRUCK UNIT NUMBER: 10549597 PROGRAM VERSION: 5.6
 PERFORMED BY: KOON

TITANIUM CASE	MEASURED	CALIBRATED	UNITS
60KEV PEAK CH#	48	48	CHANNELS
239KEV PEAK CH#	171	171	CHANNELS
583KEV PEAK CH#	49	49	CHANNELS
2614KEV PEAK CH#	202	202	CHANNELS
CALIBRATOR VALUE	229	229	GAPI

CSNG - DITS - TITANIUM BEFORE SURVEY FIELD CHECK SUMMARY

PERFORMED: 05-Apr-2007 00:54 LAST SHOP CALIBRATION: 28-Mar-2007 17:50

	SHOP	FIELD	UNITS
60KEV PEAK CH#	48	48	CHANNELS
239KEV PEAK CH#	171	171	CHANNELS
583KEV PEAK CH#	49	49	CHANNELS
2614KEV PEAK CH#	202	202	CHANNELS
CALIBRATOR VALUE	229	229	GAPI

EXCELL-2000 Calibration Summary Table

Date: 05-Apr-2007 07:46:

Service or Signal	Shop	Before	After	Change	Tolerance
CSNG	229.13	237.05		-7.92	+/-9.0

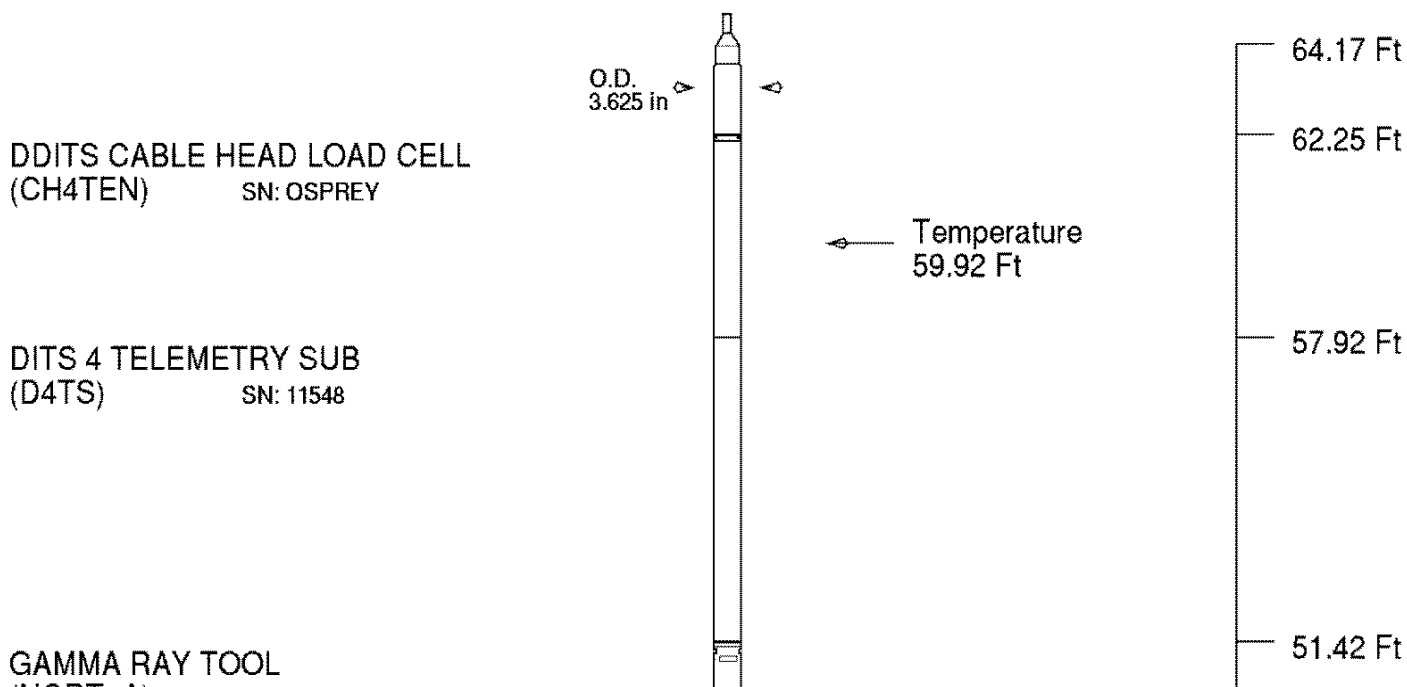
EXCELL-2000 CUSTOMER EVENT LOG

Date: 05-Apr-2007 07:45

Event	Time	Section	Depth	Event Description	Data	Repeat
0001	00:05:33	0	0.00	Engineer is: KOON		
0002	00:30:43	0	60.08	Exiting EXCELL-2000 tool calibrations.	FIELD	
0003	00:56:27	0	98.91	Exiting EXCELL-2000 tool calibrations.	FIELD	
0004	01:11:00	0	576.75	TD PARAM CHANGE 0. -->FP	5517.0000	
0005	01:11:03	0	588.66	CS_ANT PARAM CHANGE 0. -->FP	478.0000	
0006	01:11:03	0	588.66	CASEOD PARAM CHANGE 5.5 -->FP	8.6250	
0007	01:11:03	0	588.66	MUDWT PARAM CHANGE 9.5 -->FP	9.2000	
0008	01:11:03	0	588.66	BS PARAM CHANGE 7.875 -->FP	12.2500	
0009	01:11:21	1	600.50	Begining new Downlog section.	1	
0010	01:37:01	1	5484.83	End logging section	1	
0011	01:39:17	2	5524.00	Begining new Uplog section.	2	
0012	01:56:45	2	5281.50	TTY framing error status a7 data 31	REPEATED: 1	1
0013	06:11:46	2	1741.00	BS PARAM CHANGE 12.2500 -->FP	17.5000	
0014	07:40:28	2	450.33	End logging section	2	

**BOREHOLE COMPENSATED
SONIC / COMPENSATED SPECTRAL
NATURAL GAMMA**

Excell 2000 Tool String Diagram



(NGH I -A)

SN: 108646

CSNG - DITS - TITANIUM
(CSNG-T)

SN: 1019S925

M305B BCS 2XMTR - 2RCVR
(BCSD)

SN: 350

Gamma
44.75 Ft

43.42 Ft

Gamma Ray
30.75 Ft

28.75 Ft

O.D.
3.625 in

O.D.
3.500 in