

HALLIBURTON

BOREHOLE COMPENSATED
SONIC ARRAY
LOG

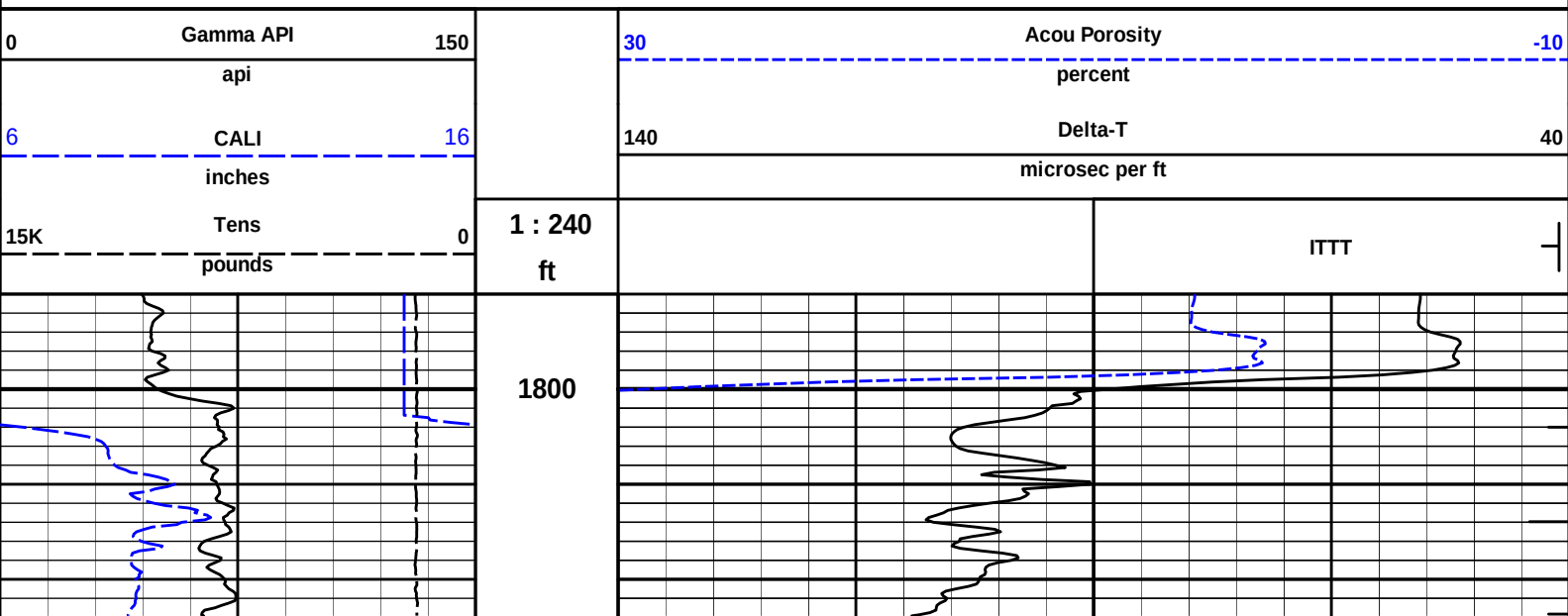
HALLBURTON										BOREHOLE COMPENSATED SONIC ARRAY LOG																			
COMPANY					OXY USA, INC.					COMPANY					OXY USA, INC.														
WELL					BCU #409					WELL					BCU #409														
FIELD					HASKELL					FIELD					HASKELL														
COUNTY					HASKELL					COUNTY					HASKELL														
STATE					ARKANSAS					STATE					ARKANSAS														
Permanent Datum					GL					Sect. 31					Twp. 27S					Rge. 33W					Elev. 3003.4 ft				
Log measured from					KB					Location (SHL) 1575' FNL & 1525' FEL					Other Services: ACRT SDL/DSN MICROLOG BSAT					D.F. 3012.4 ft									
Drilling measured from					KB															G.L. 3003.4 ft									
Date					07-Nov-12																								
Run No.					ONE																								
Depth - Driller					5758.00 ft																								
Depth - Logger					5746.0 ft																								
Bottom - Logged Interval					5693																								
Top - Logged Interval					1803																								
Casing - Driller					8.625 in @ 1803.0 ft																								
Casing - Logger					1803.0 ft																								
Bit Size					7.875 in																								
Type Fluid in Hole					WBM																								
Density					9.3 ppg					38.00 s/qt																			
PH					9.80 pH					8.4 cpm																			
Source of Sample					FLOWLINE																								
Rm @ Meas. Temperature					0.850 ohmm @ 68.00 degF																								
Rmf @ Meas. Temperature					0.64 ohmm @ 66.00 degF																								
Rmc @ Meas. Temperature					1.275 ohmm @ 66.00 degF																								
Source Rmf					CALC																								
Rm @ BHT					0.42 ohmm @ 143.0 degF																								
Time Since Circulation					8.0 hr																								
Time on Bottom					07-Nov-12 05:10																								
Max. Rec. Temperature					143.0 degF @ 5746.0 ft																								
Equipment					786					FTSM																			
Recorded By					BOWMAR																								
Witnessed By					R. WEBSTER																								

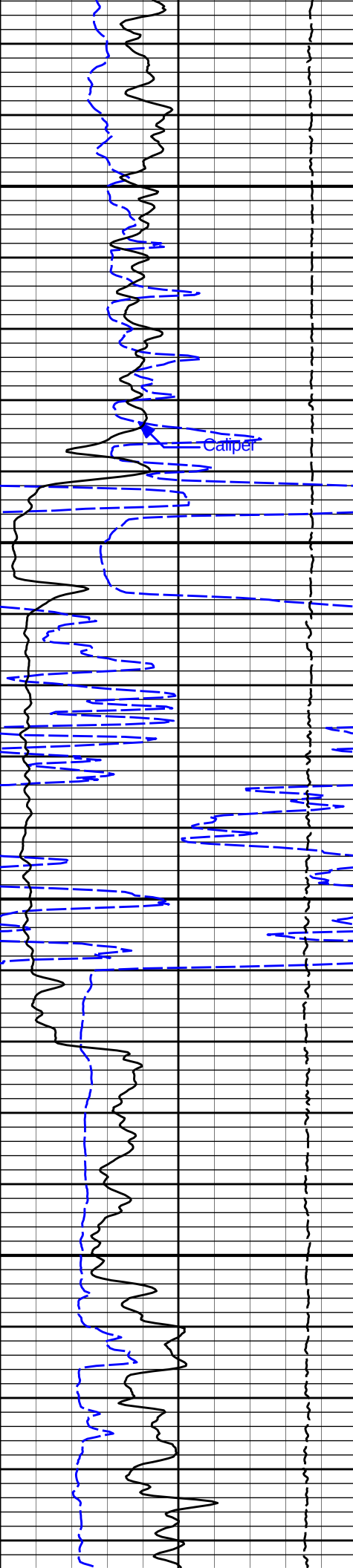
[illegible]**HALLIBURTON**

Plot Time: 07-Nov-12 09:52:22
Plot Range: 1790 ft to 5751.67 ft
Data: OXY_BCU_409\Well Based\DAQ-0001-004\
Plot File: \\BSAT\BSAT_5inch

5 INCH MAIN LOG

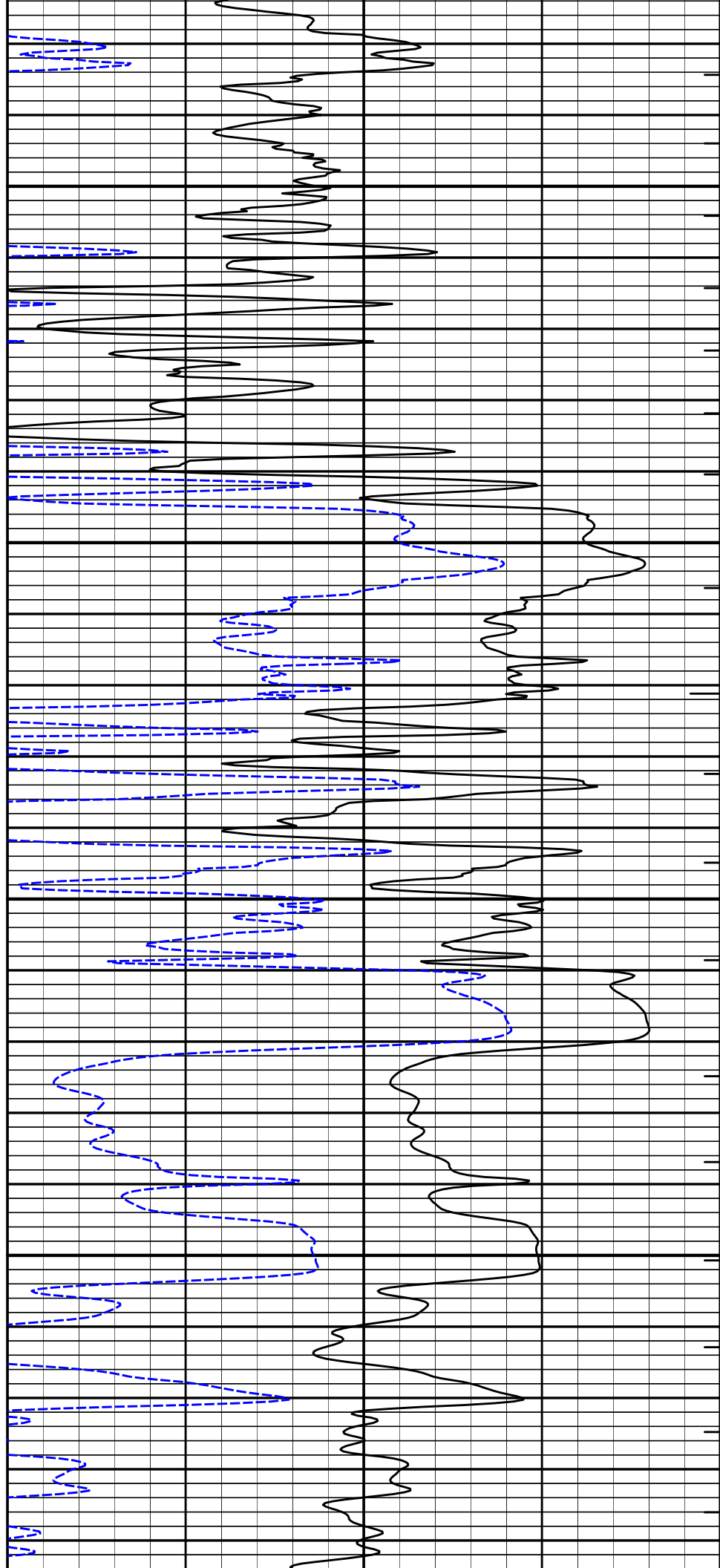
5 INCH MAIN LOG

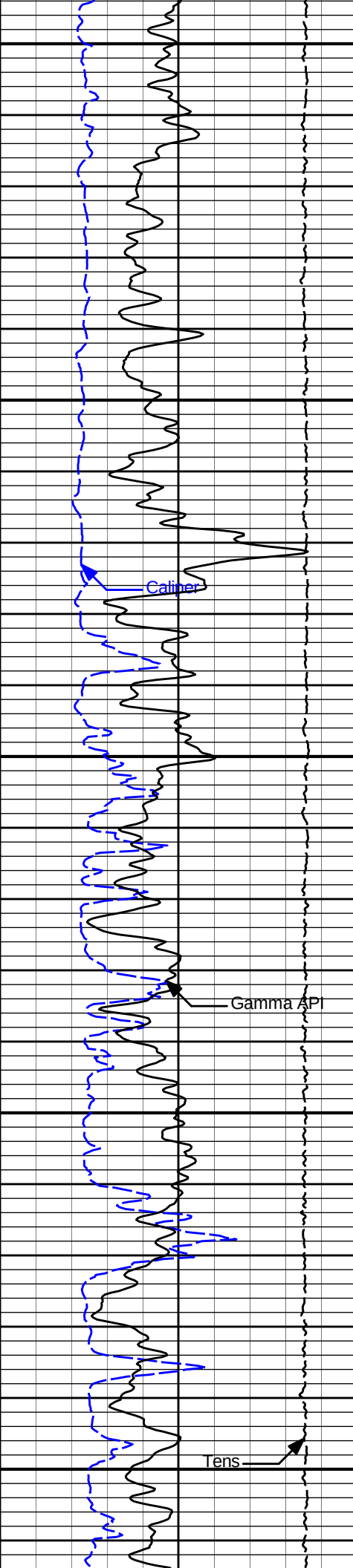




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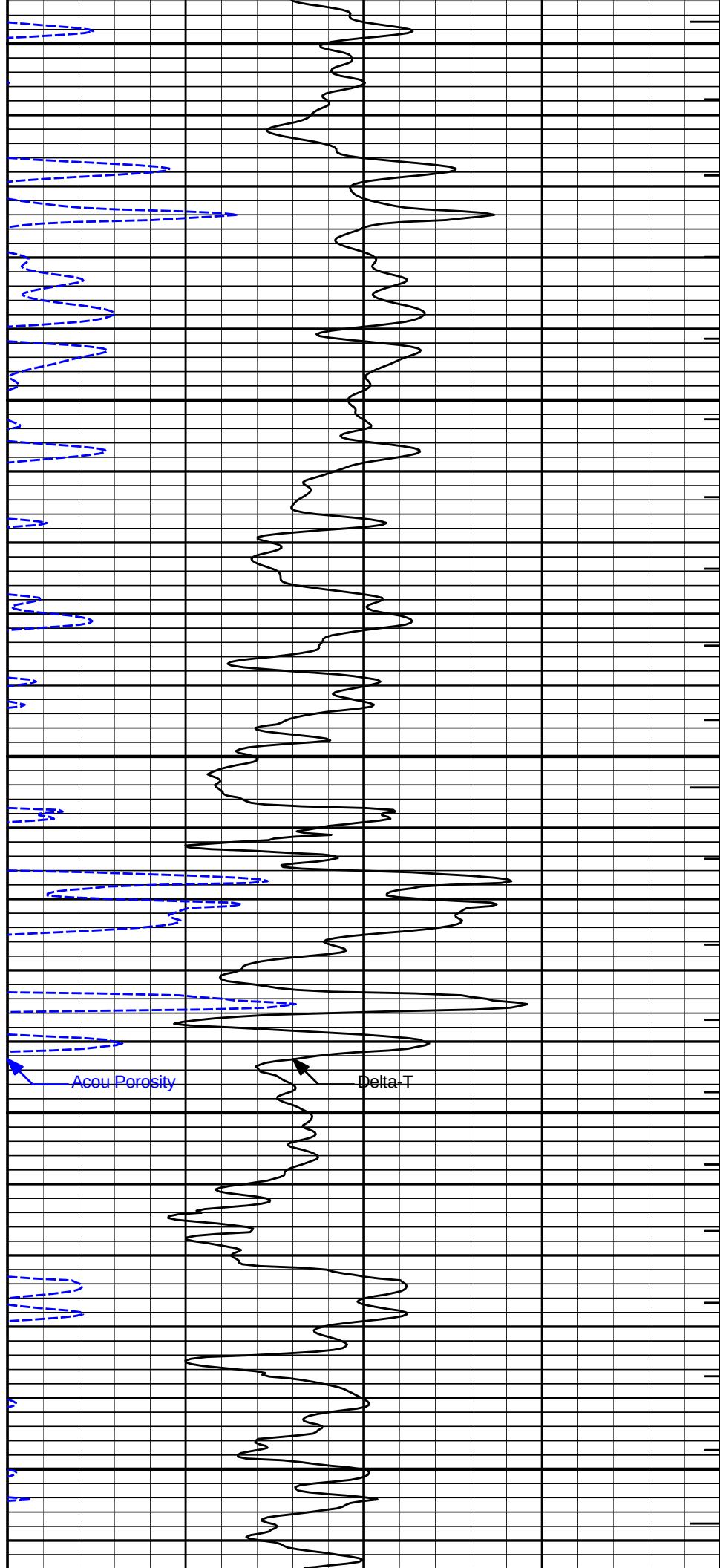
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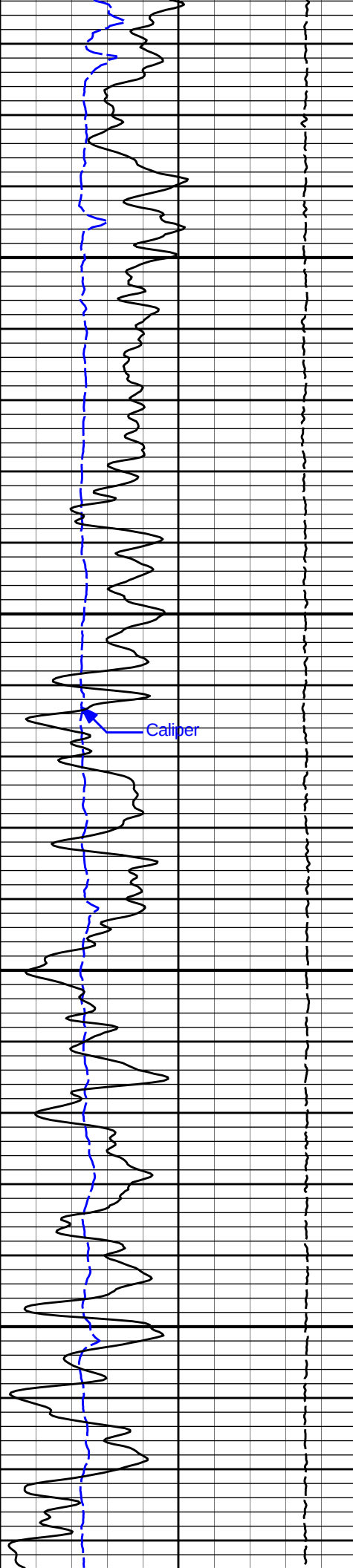




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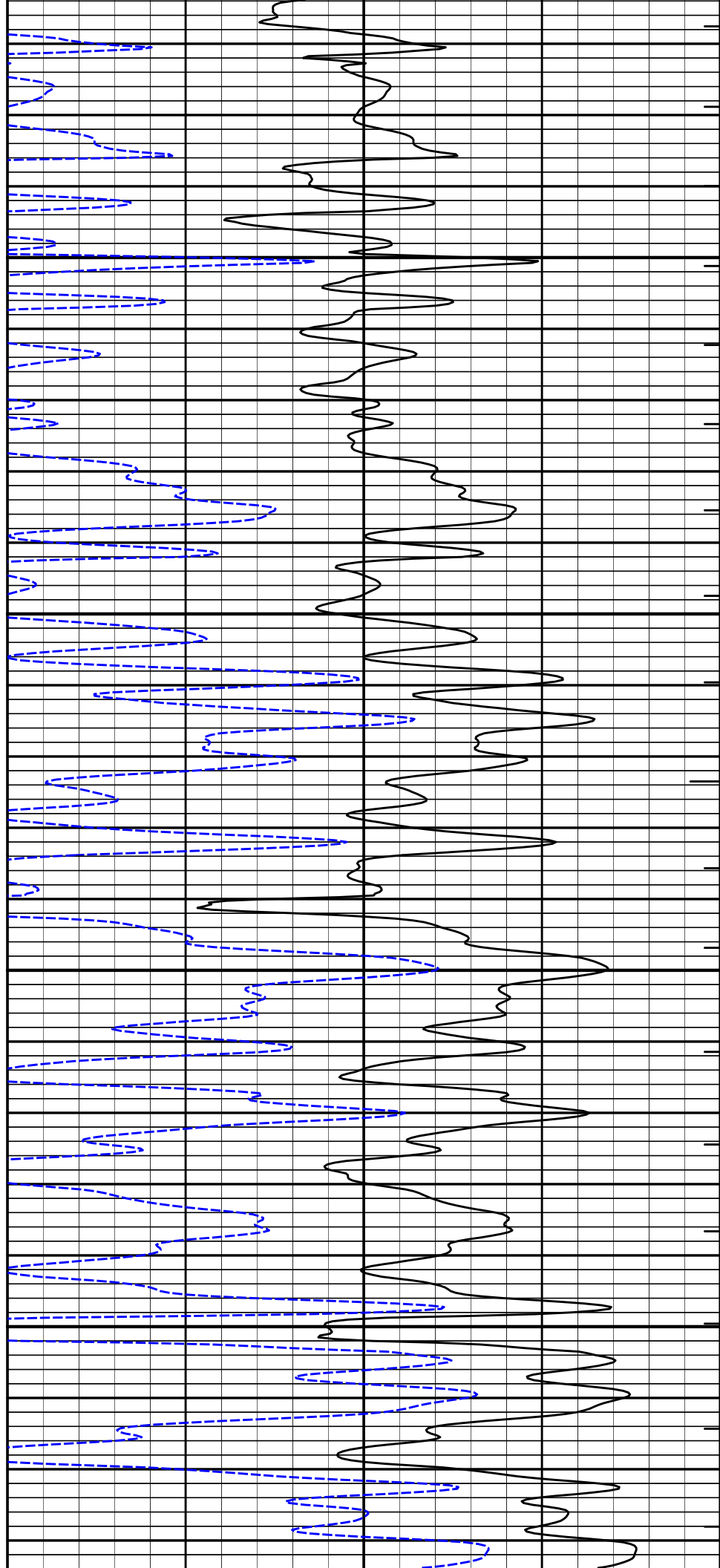
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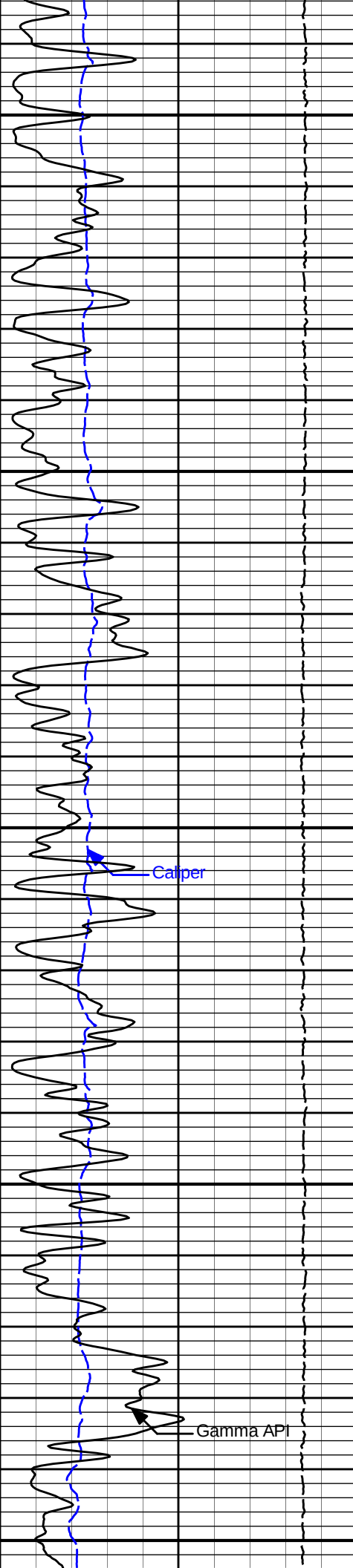




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2400

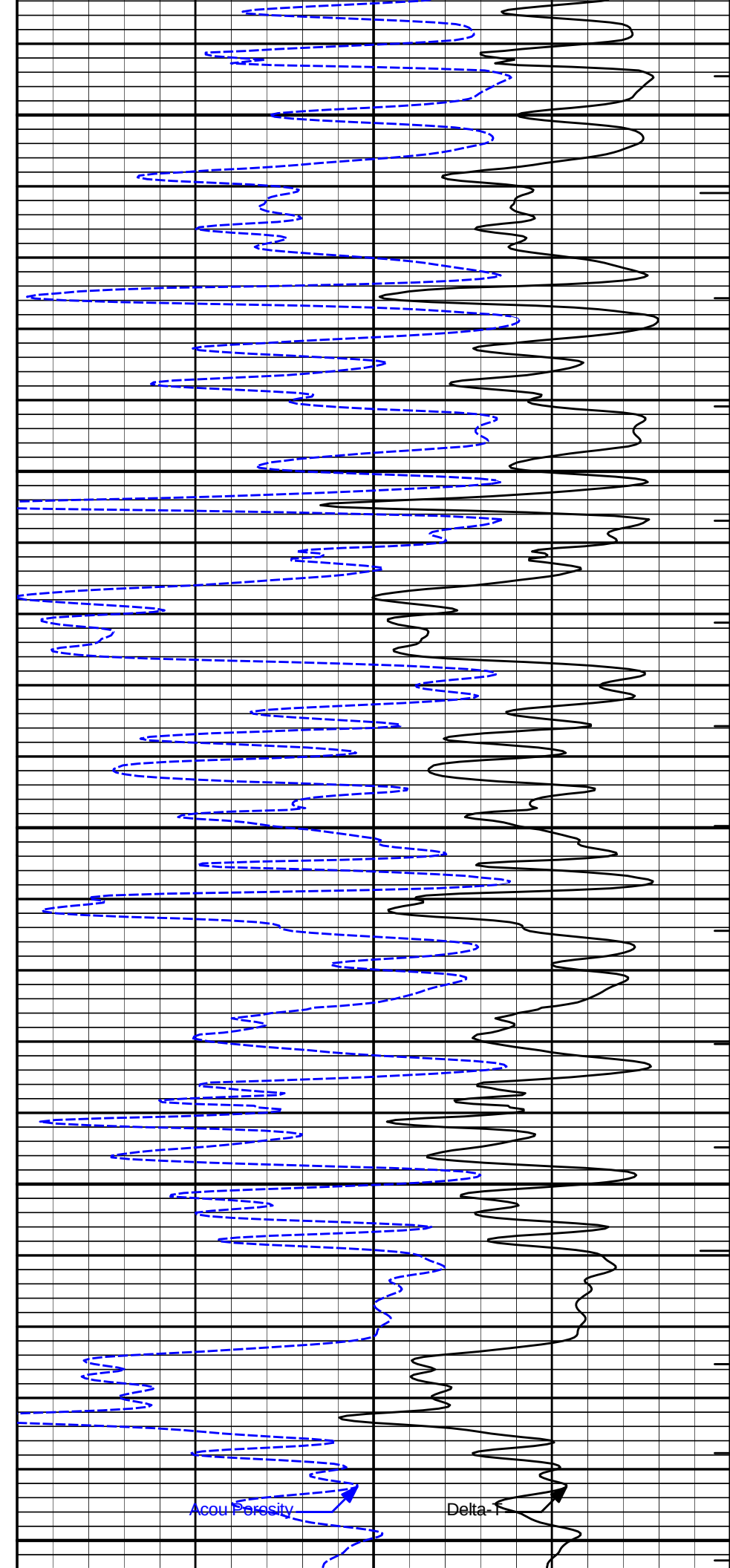


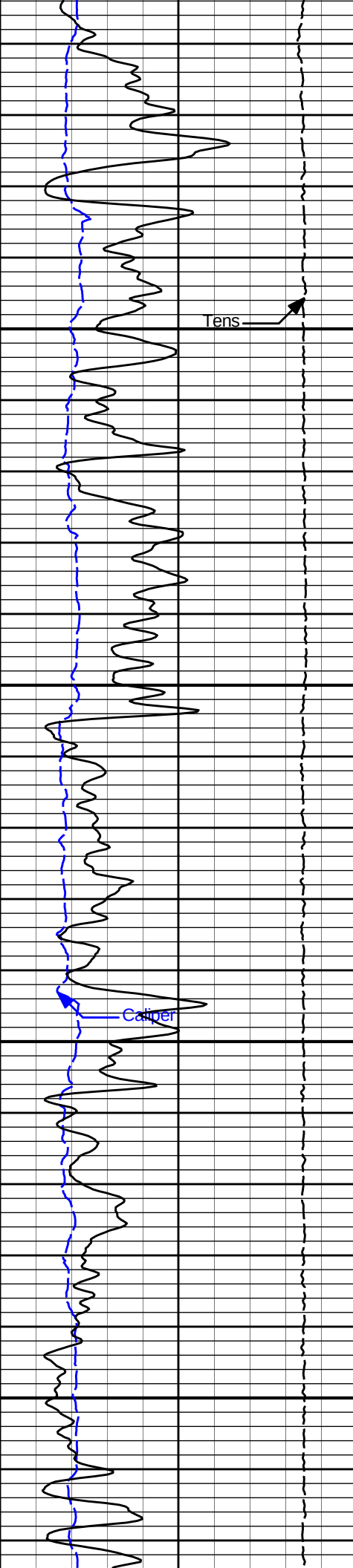


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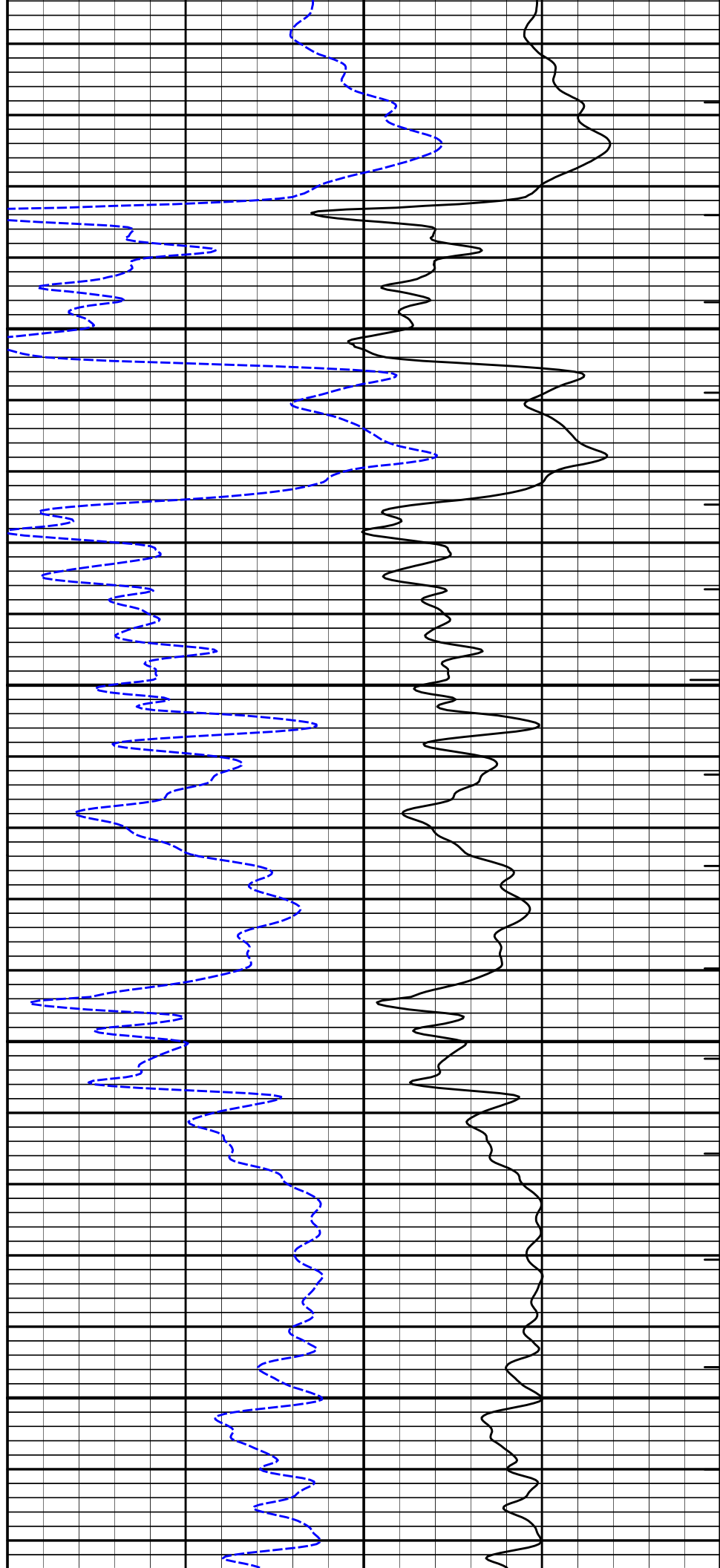
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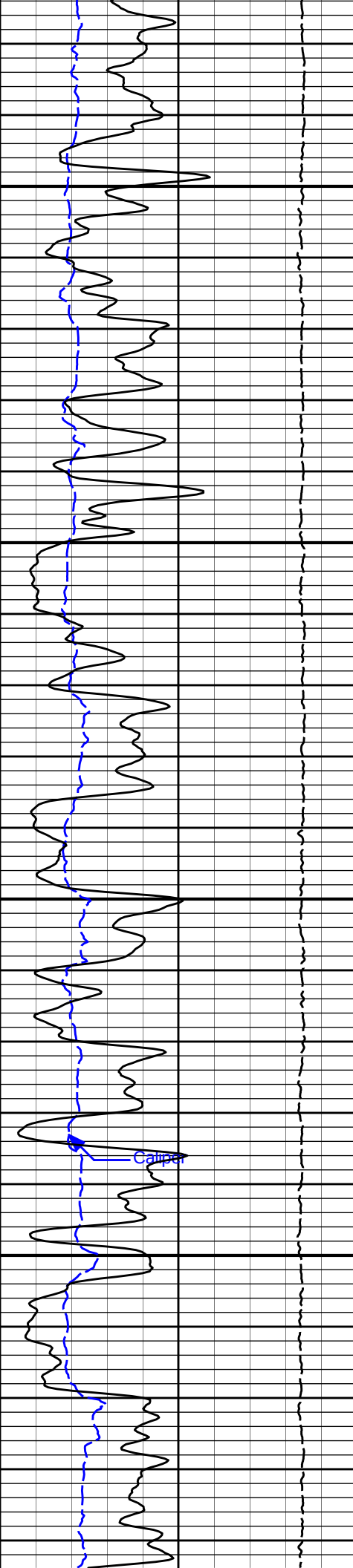




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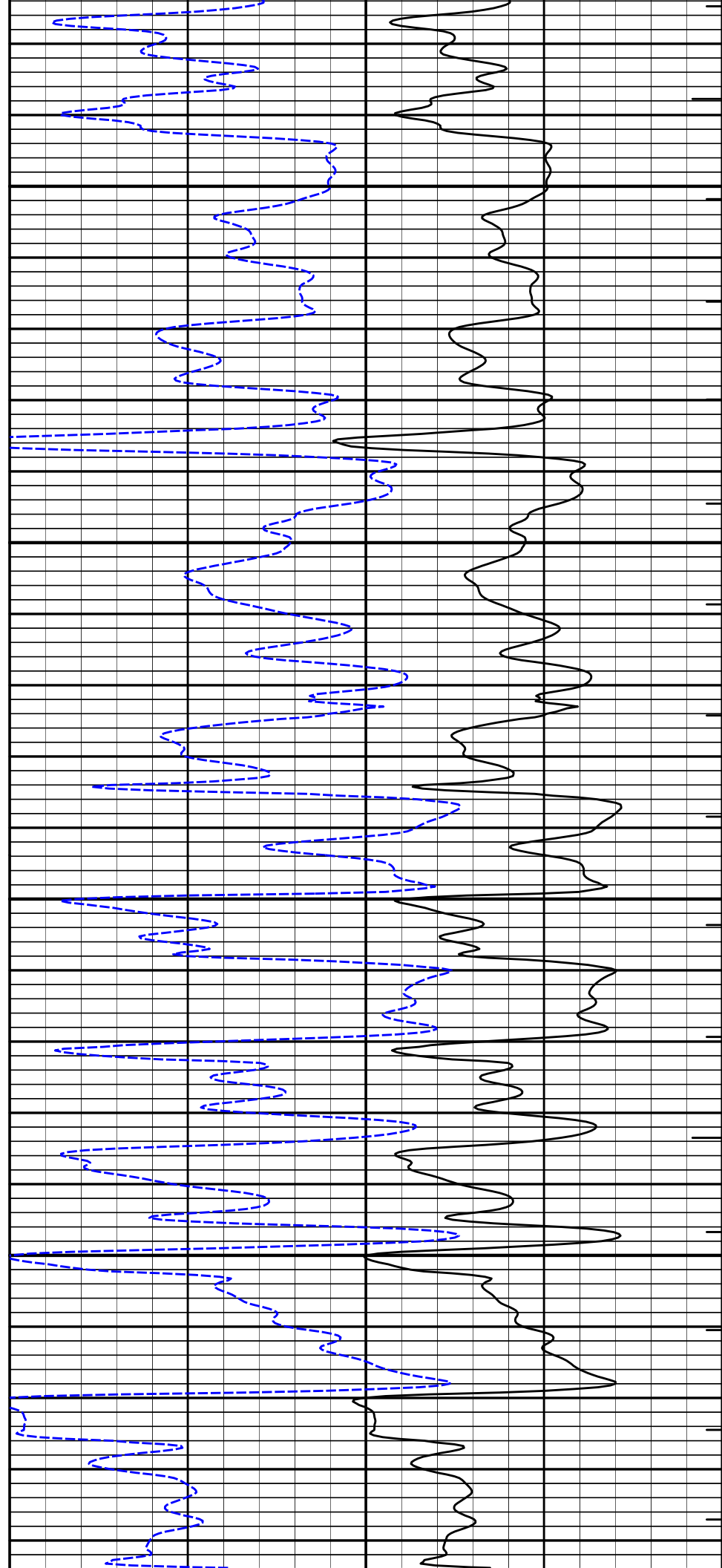
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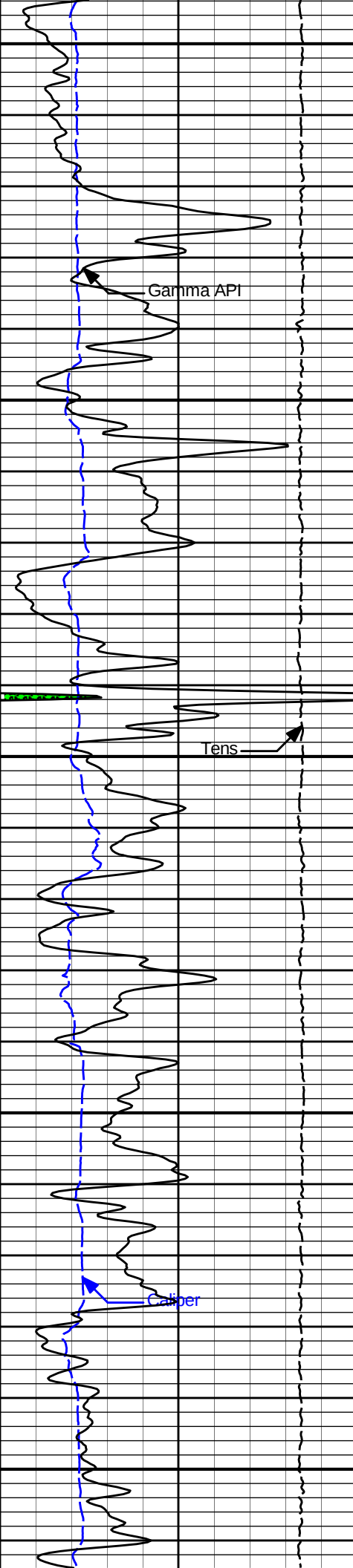




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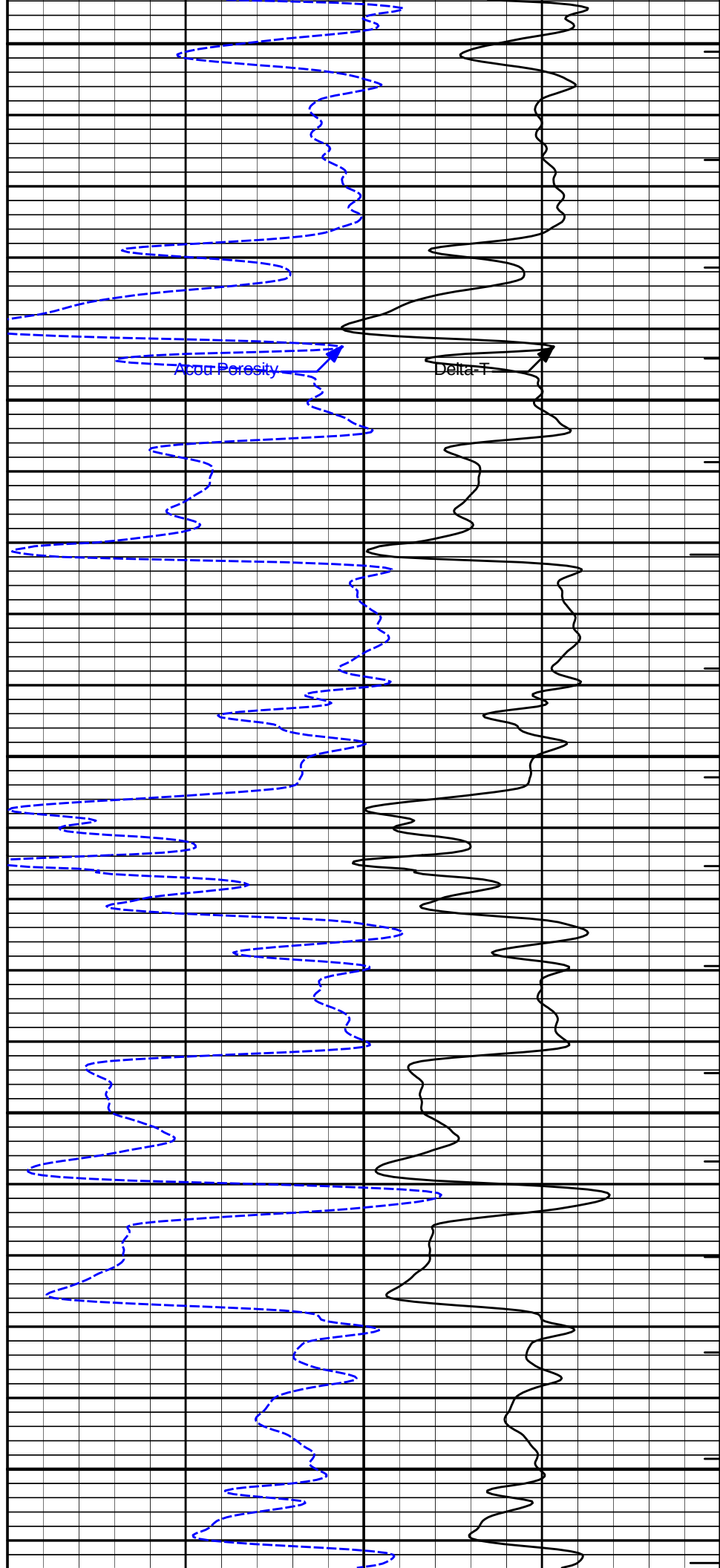
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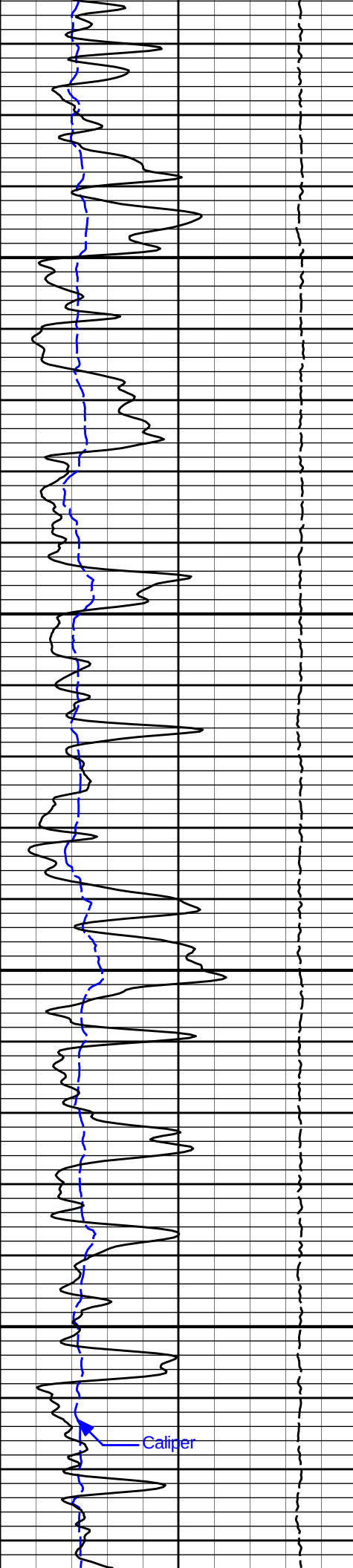




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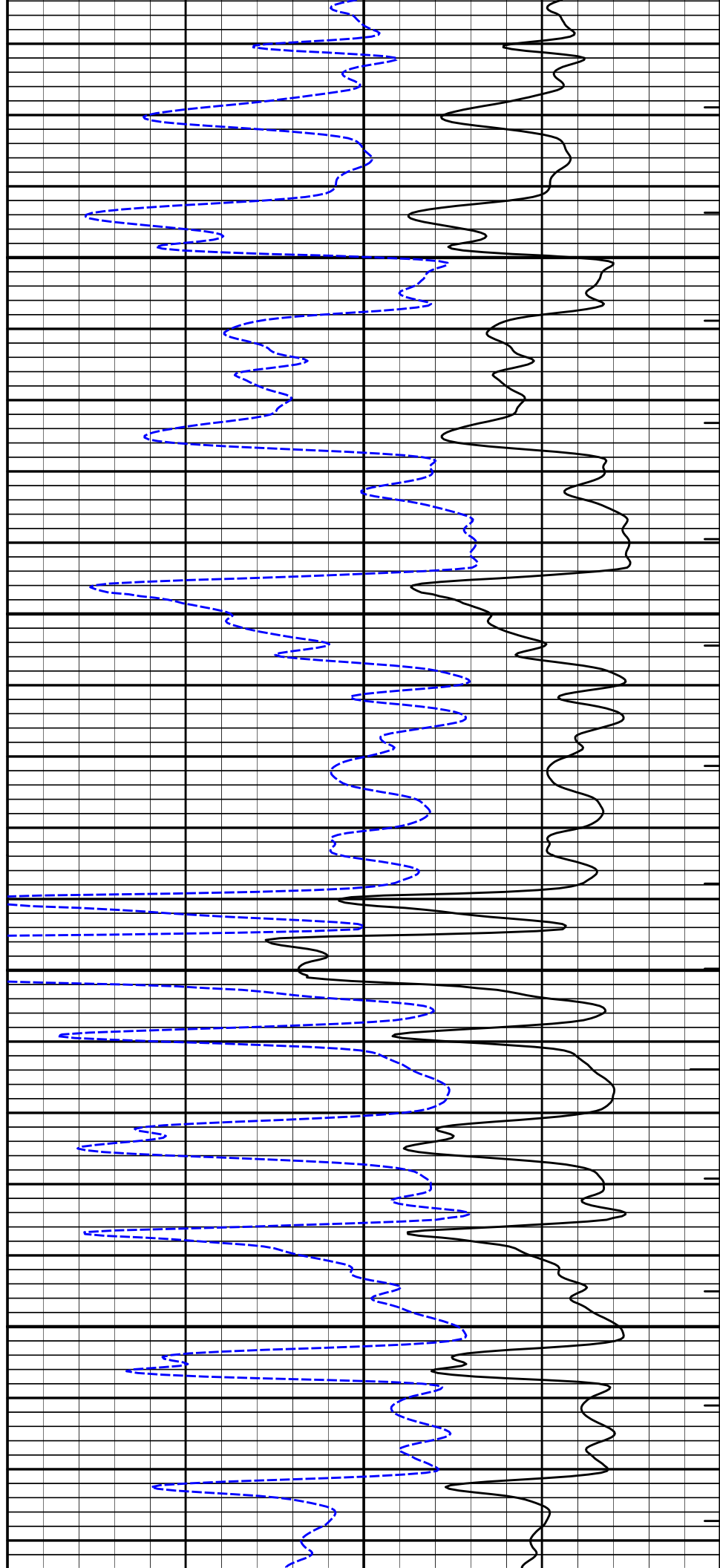
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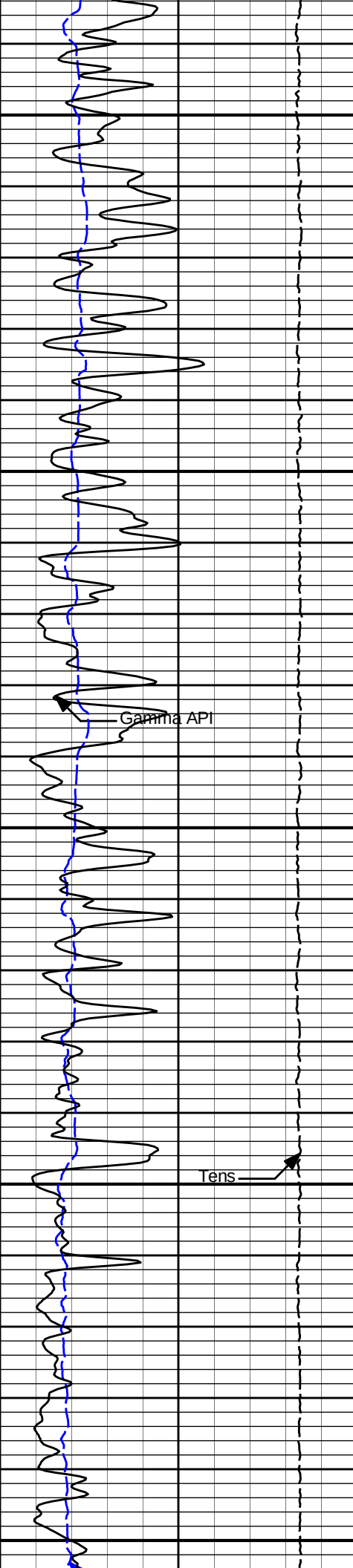


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3500



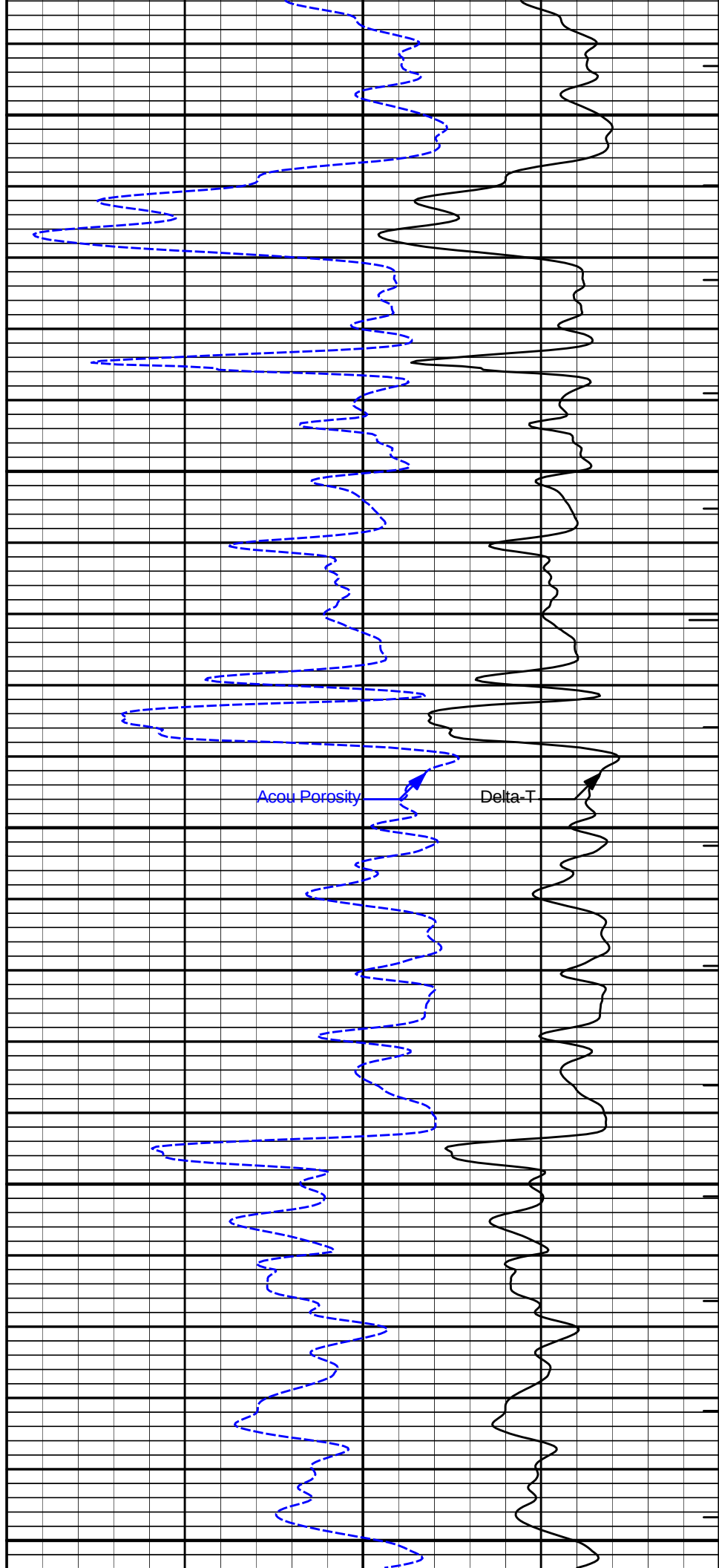
Caliper

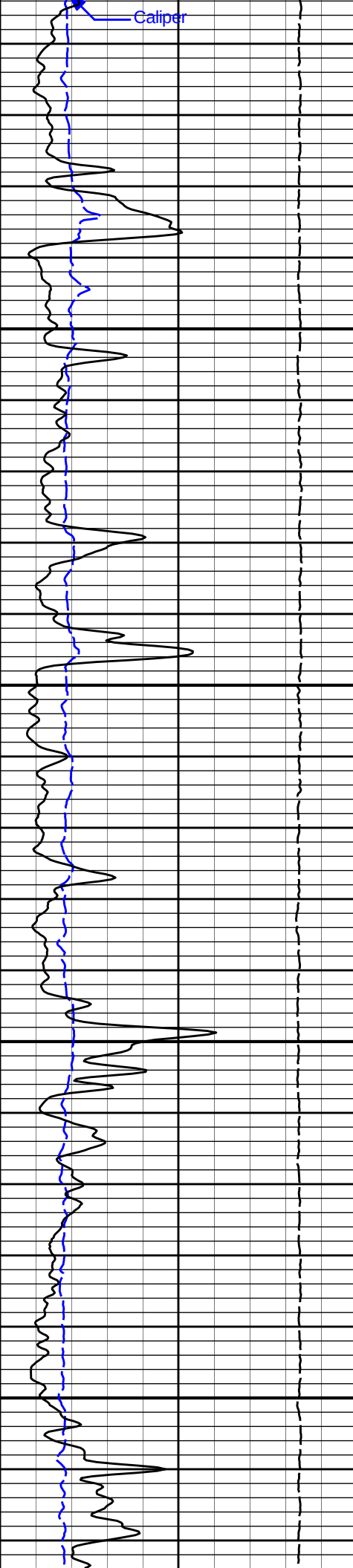


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3700

3800

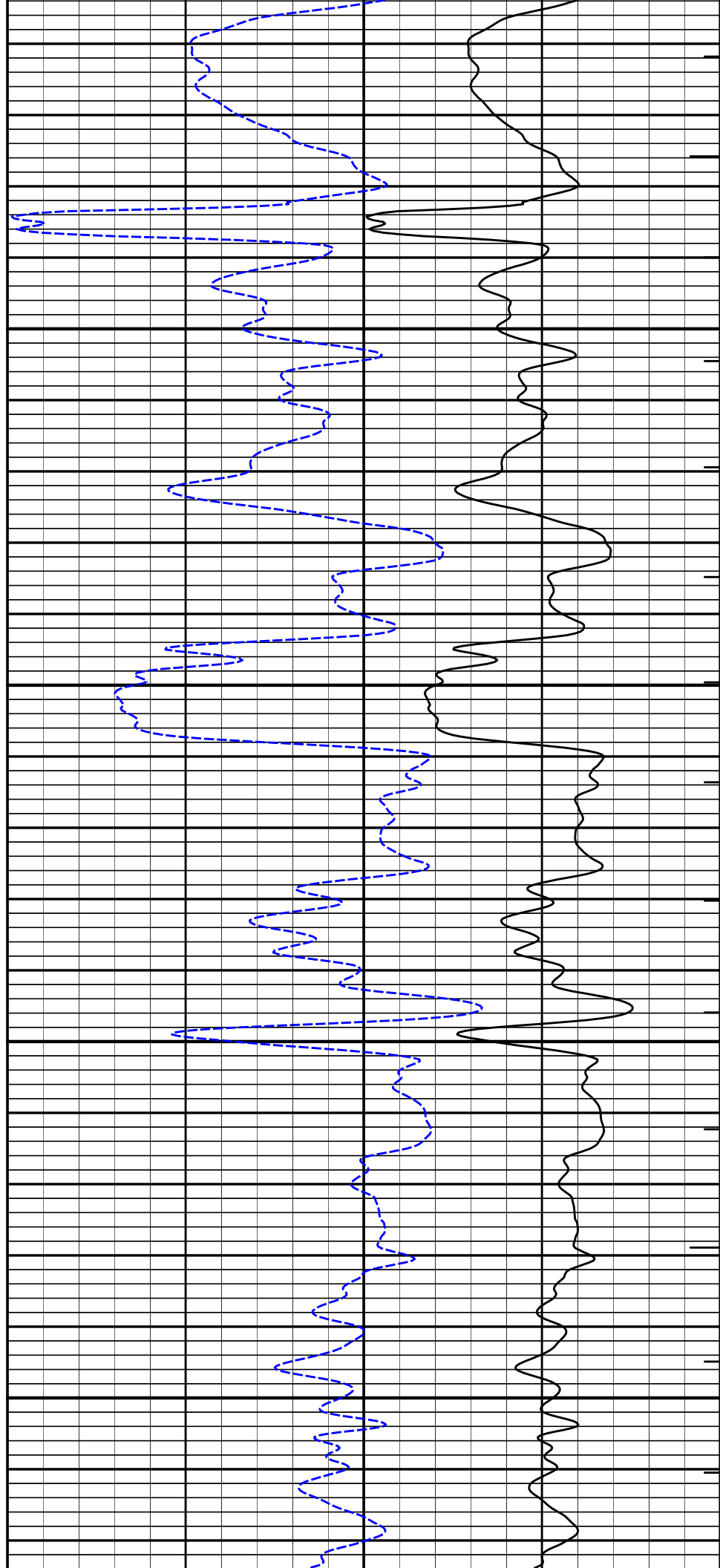


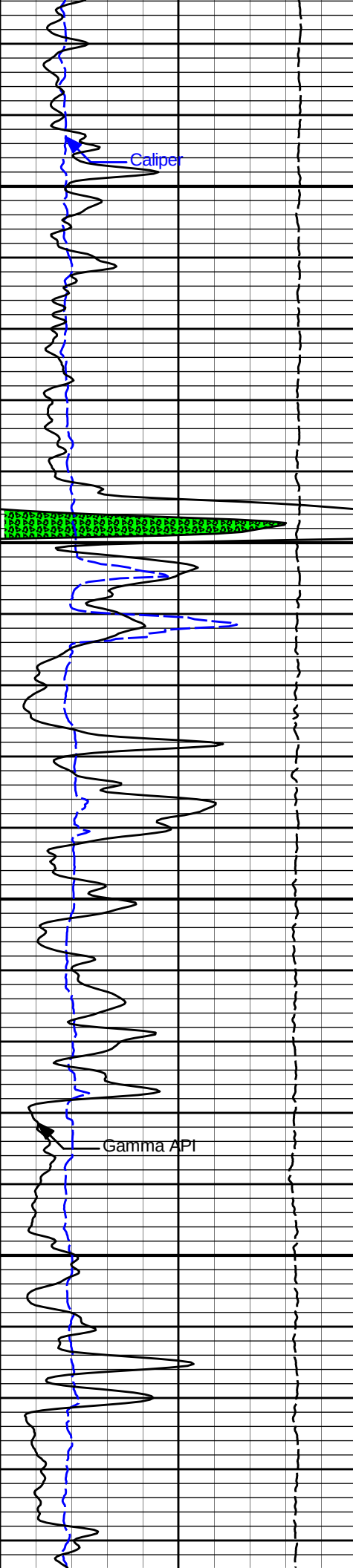


Caliper

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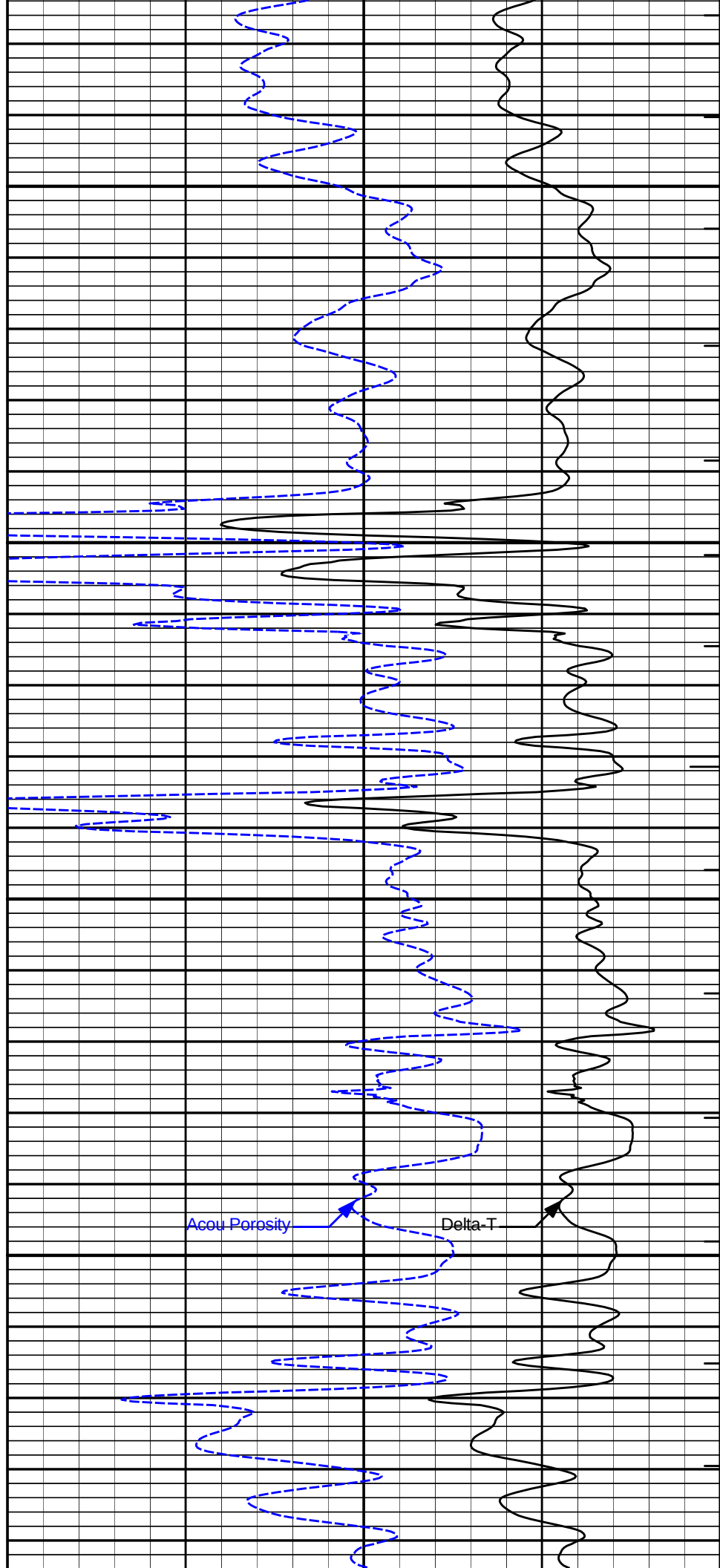
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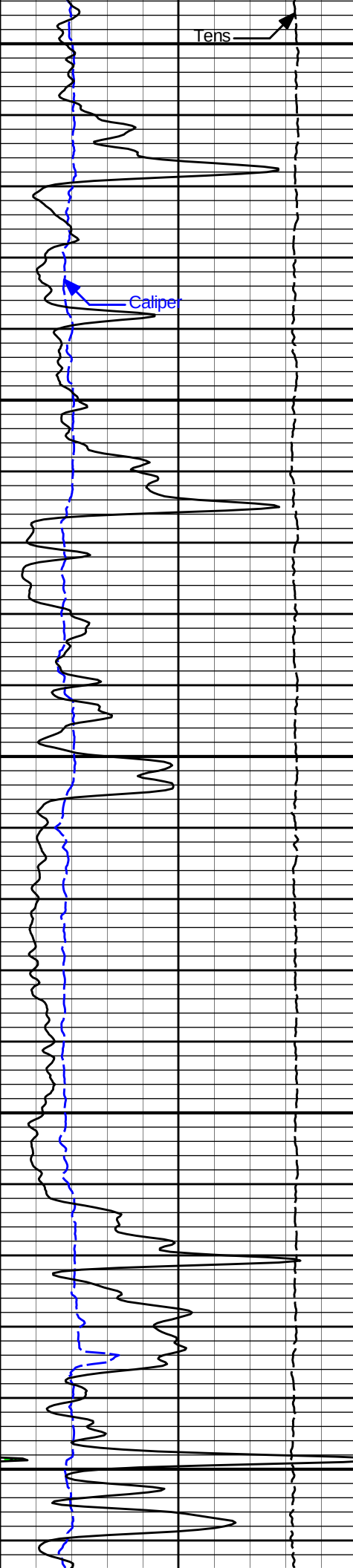




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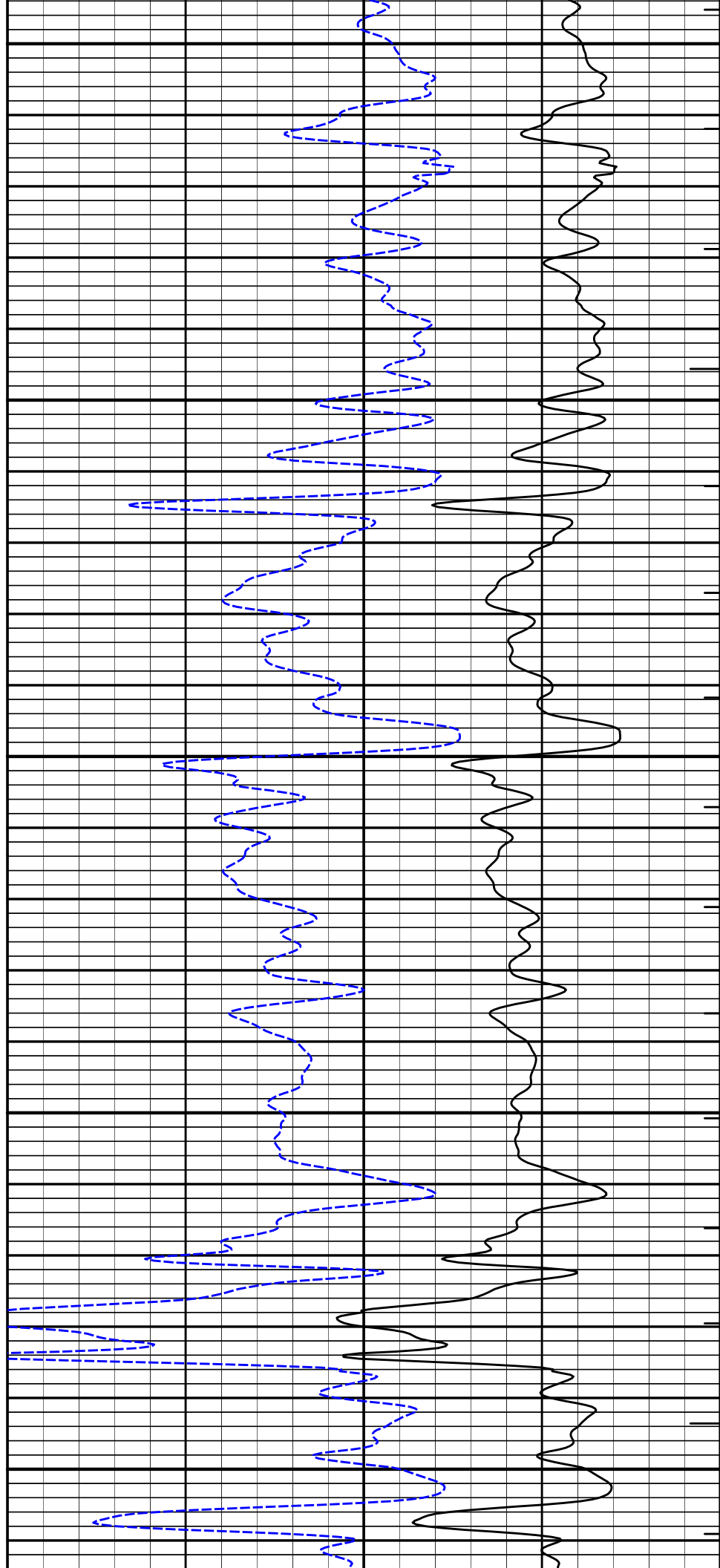
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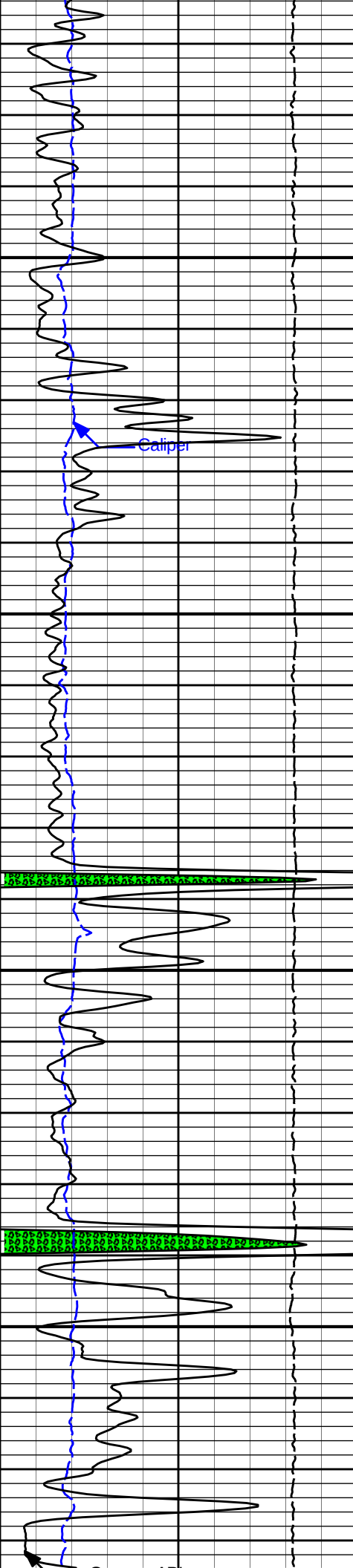




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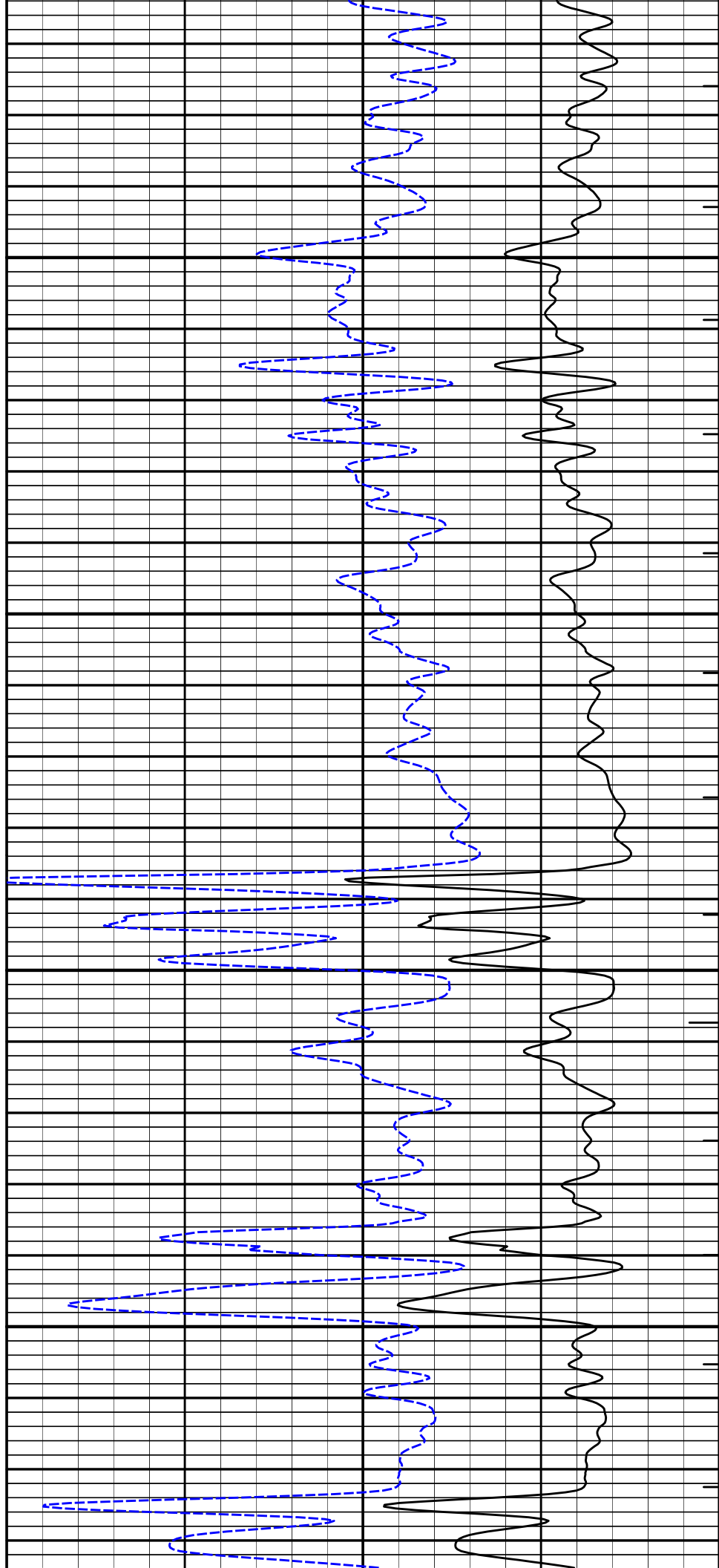
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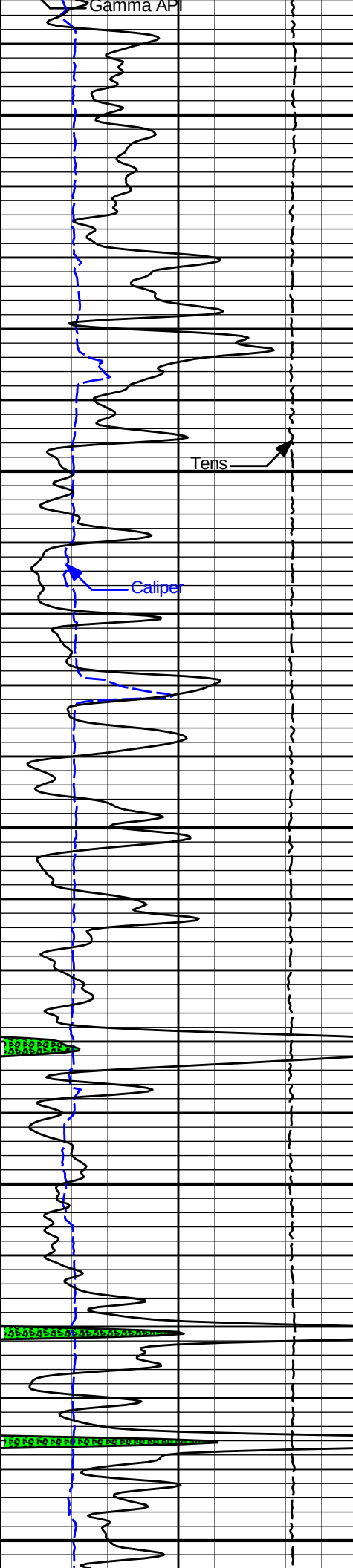




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4600

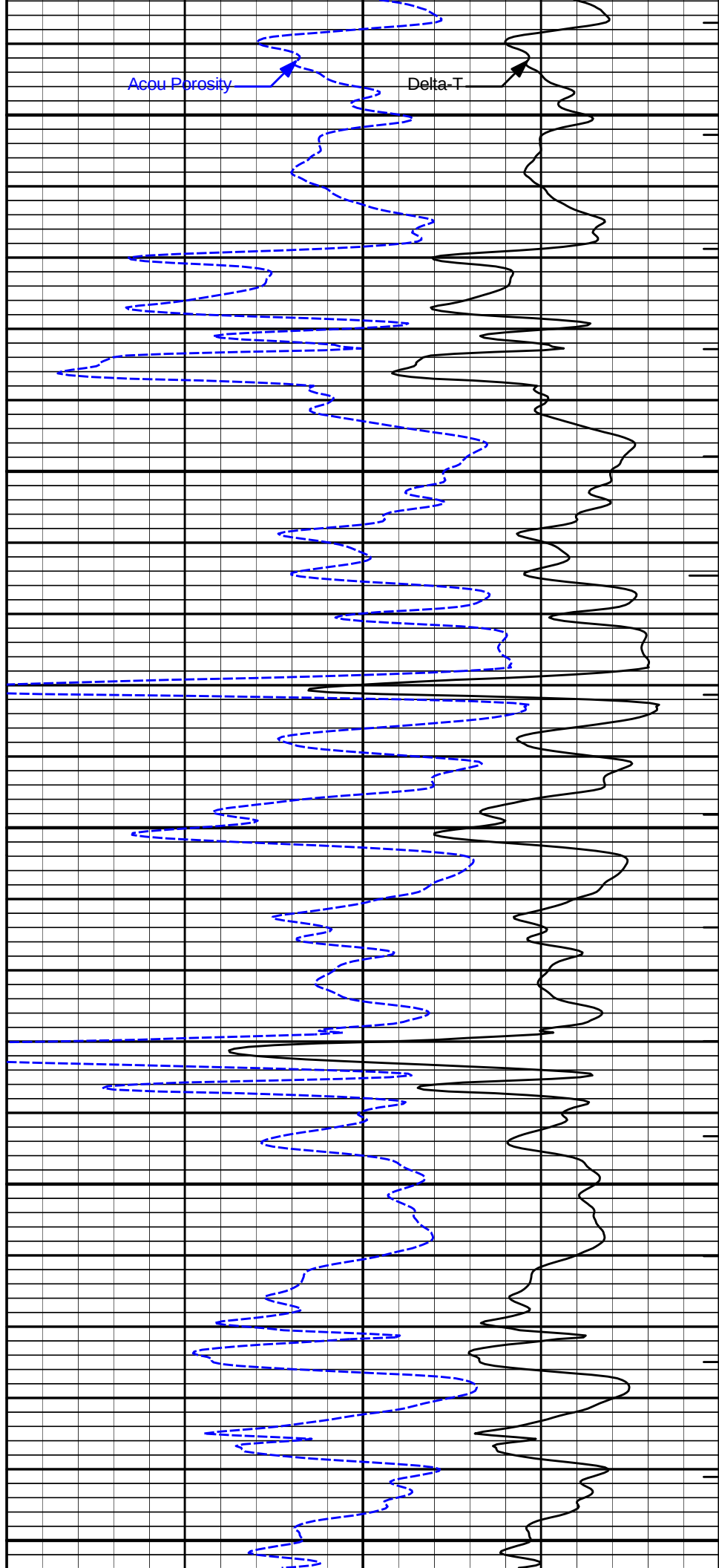


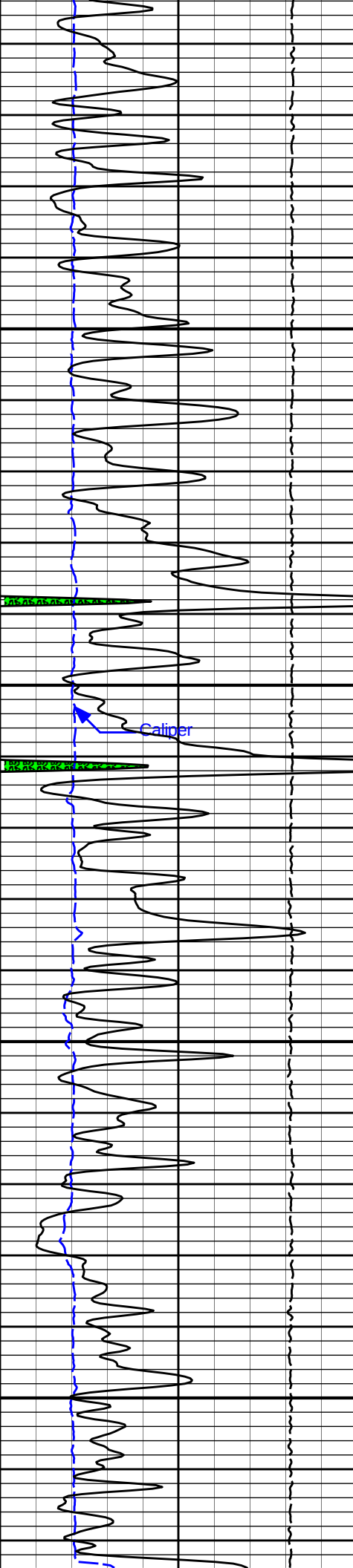


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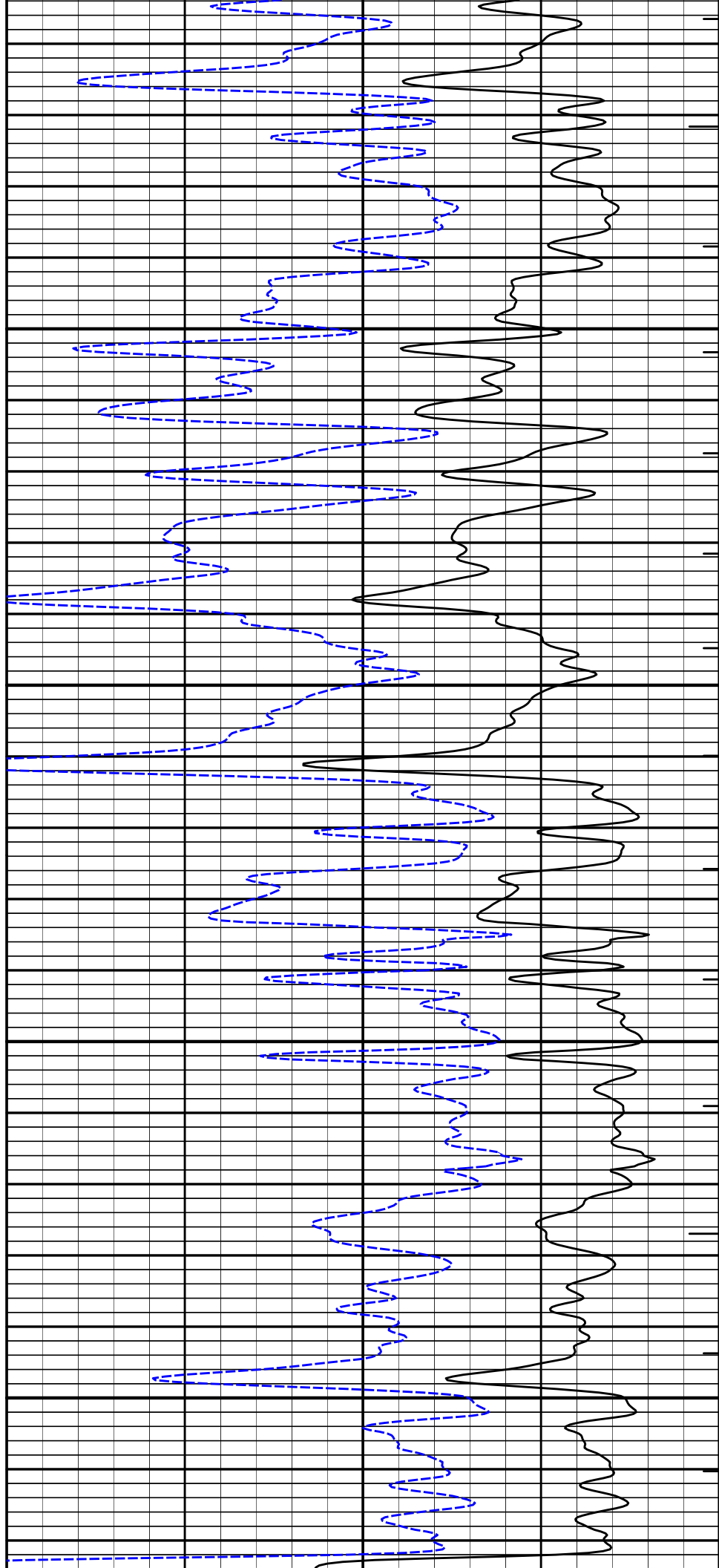
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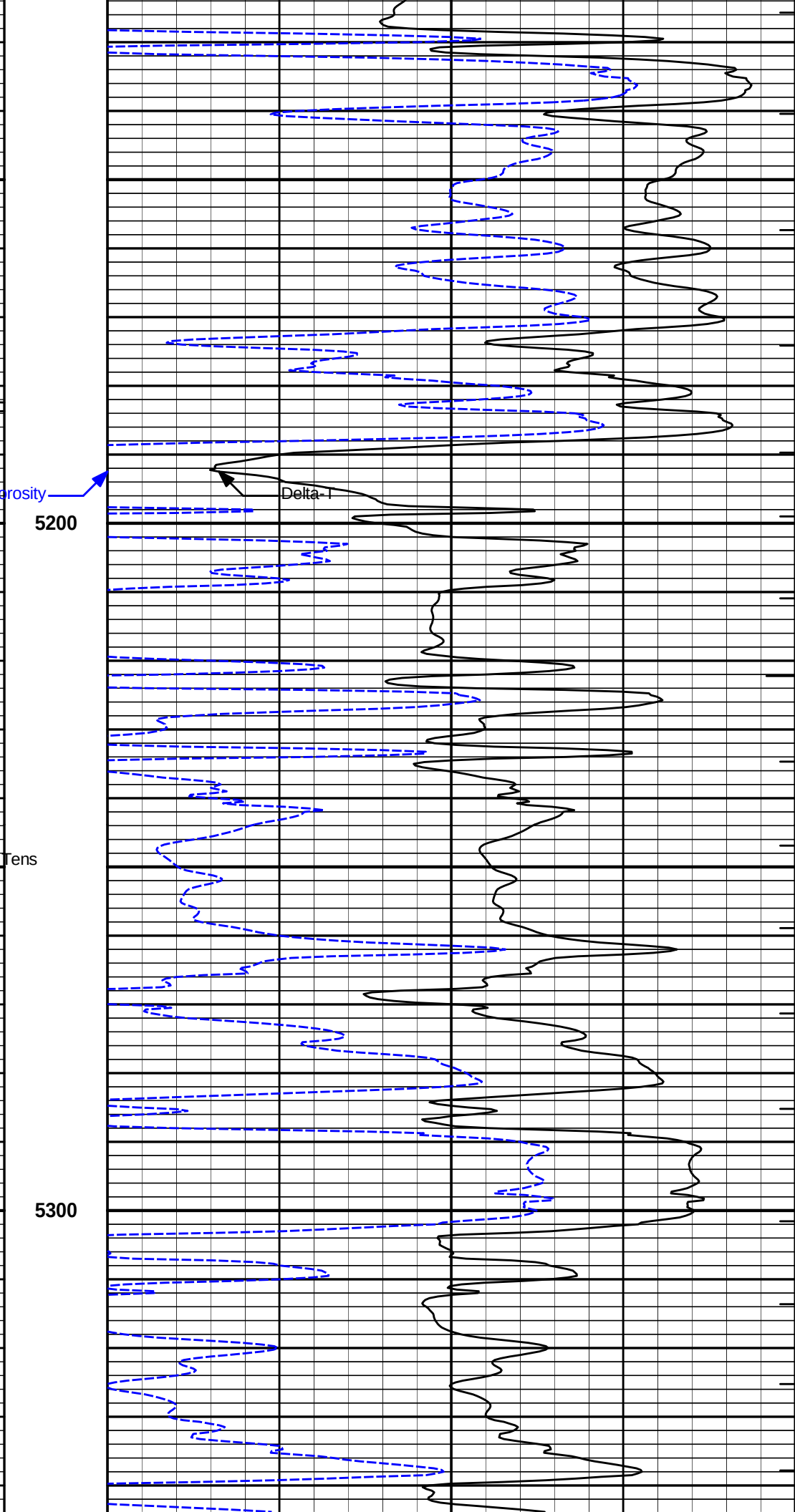
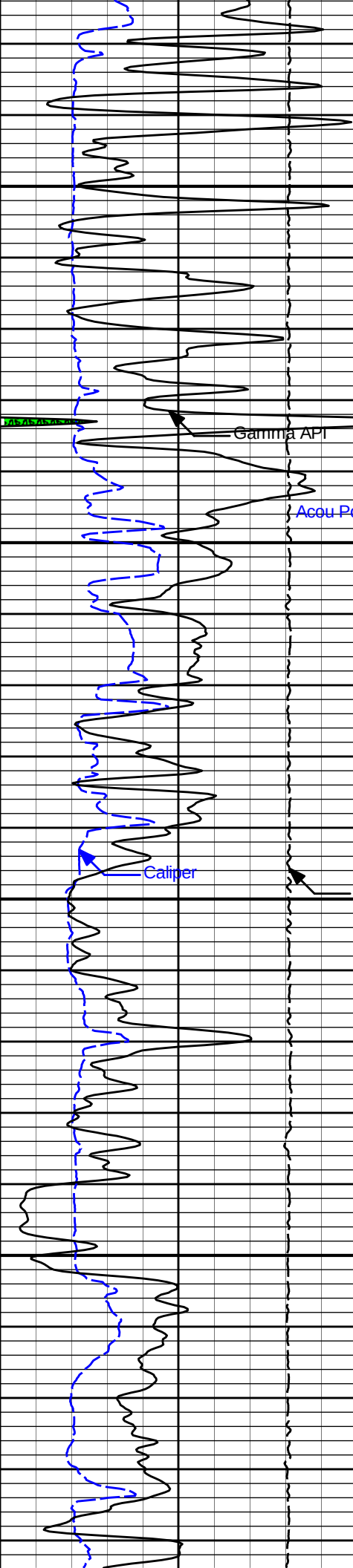




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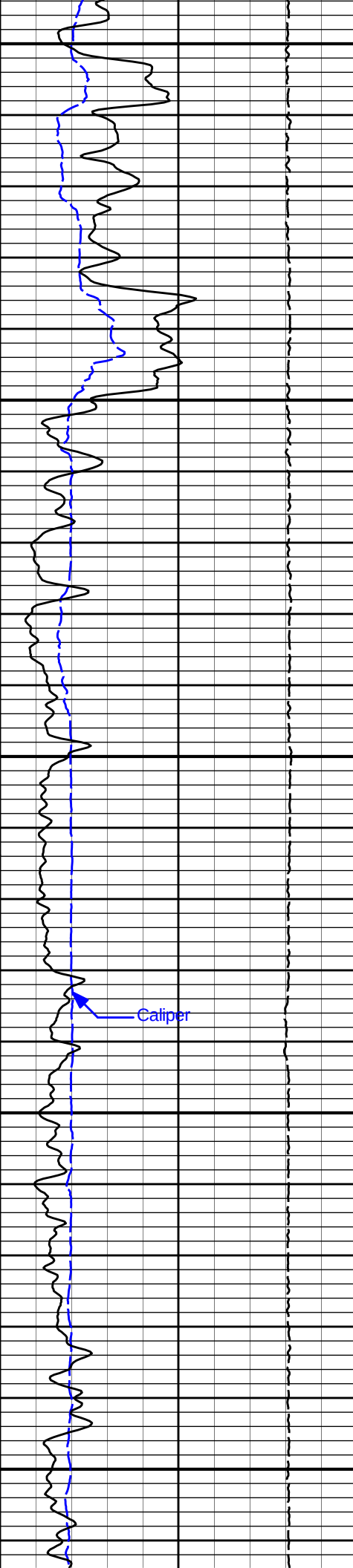
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5200

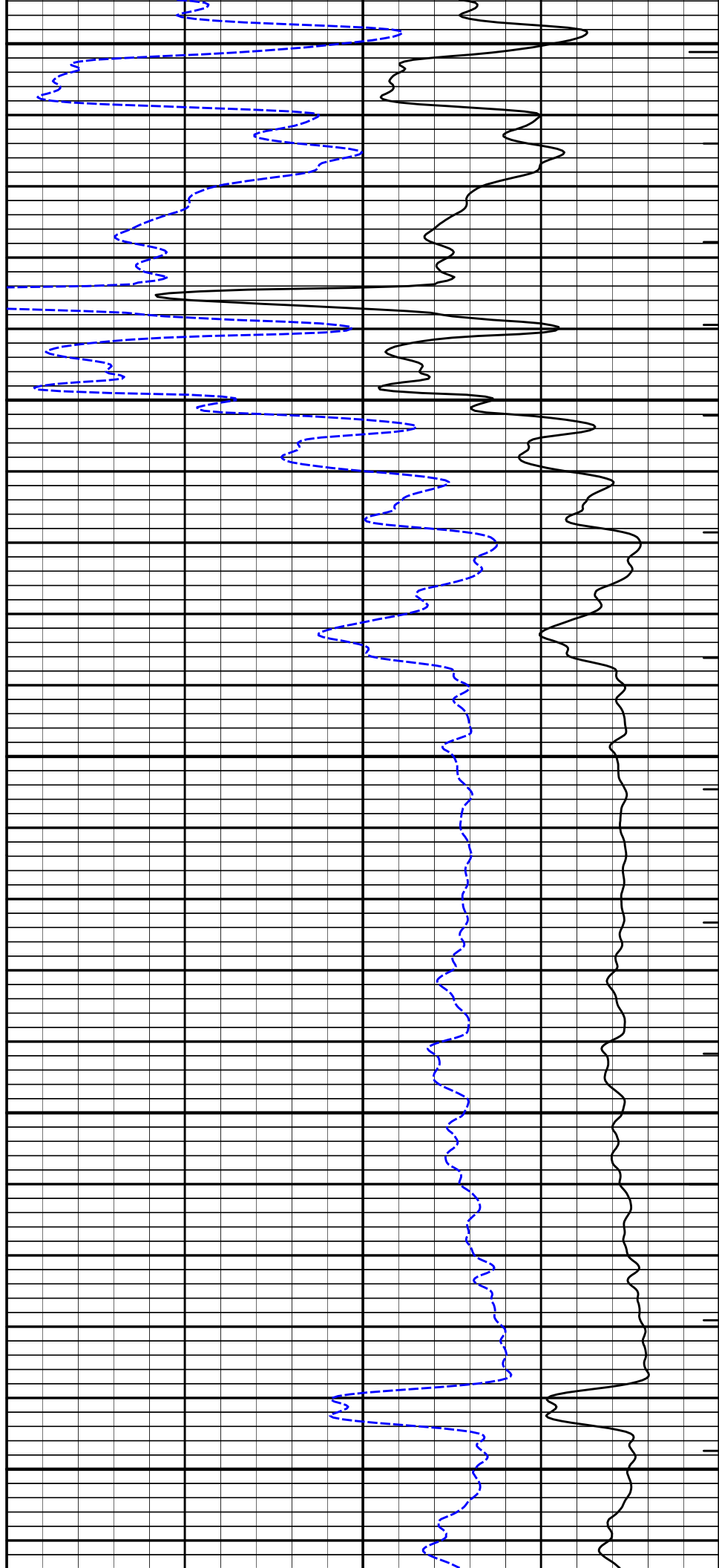
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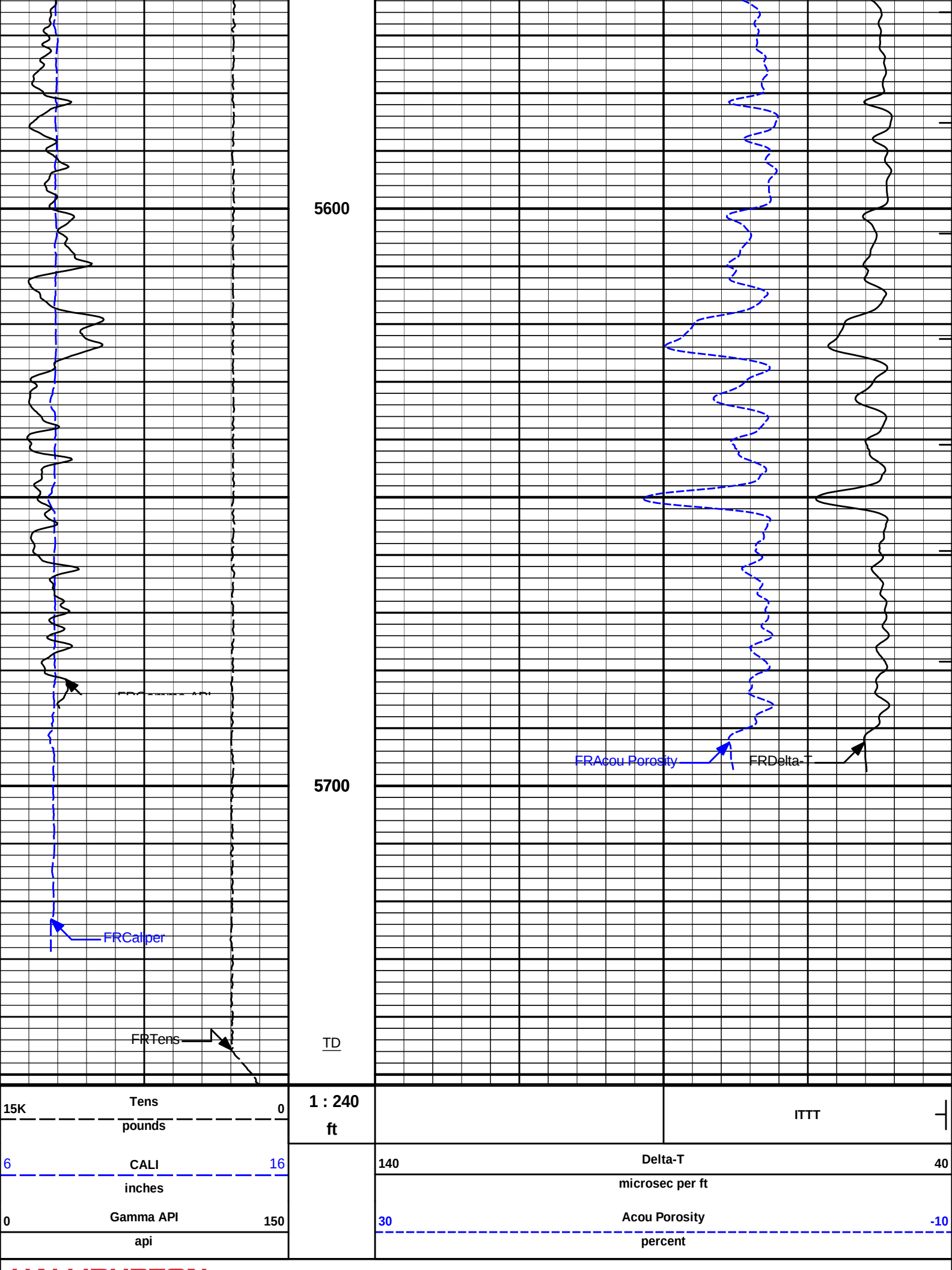


5400

5500

Caliper





15K	Tens	0
	pounds	
6	CALI	16
	inches	
0	Gamma API	150
	api	

1 : 240
ft

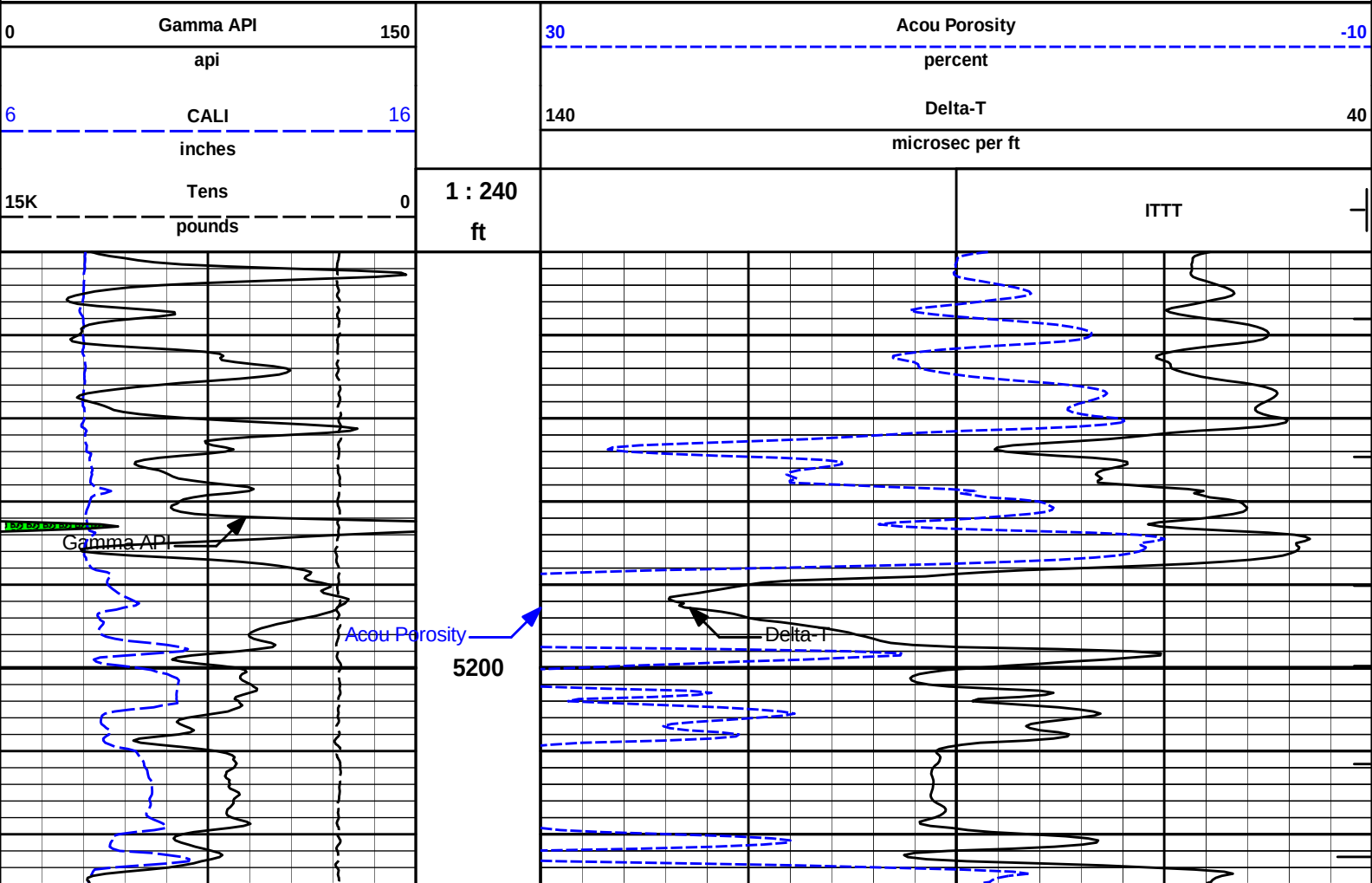
	ITTT	
140	Delta-T	40
	microsec per ft	
30	Acou Porosity	-10
	percent	

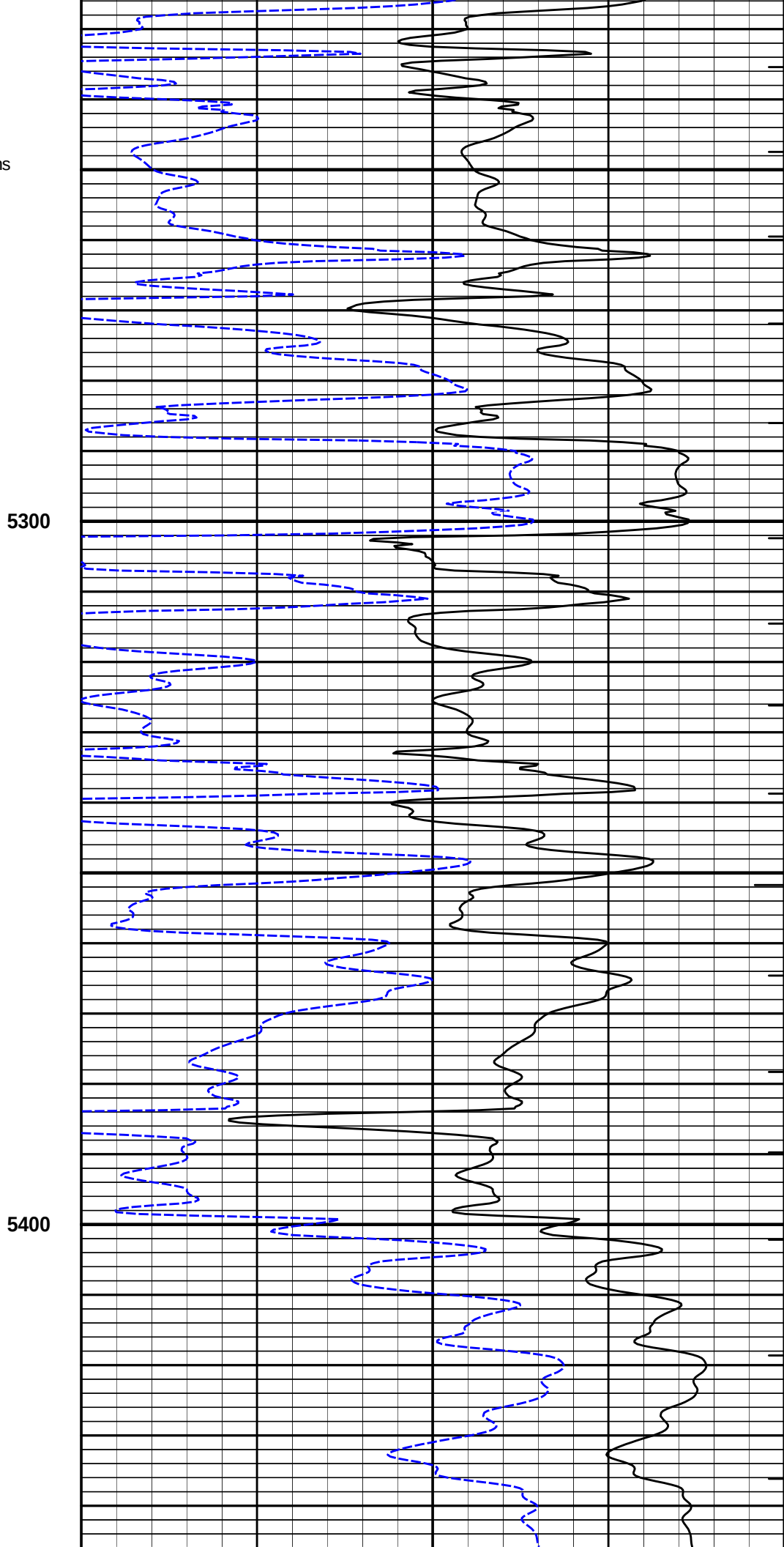
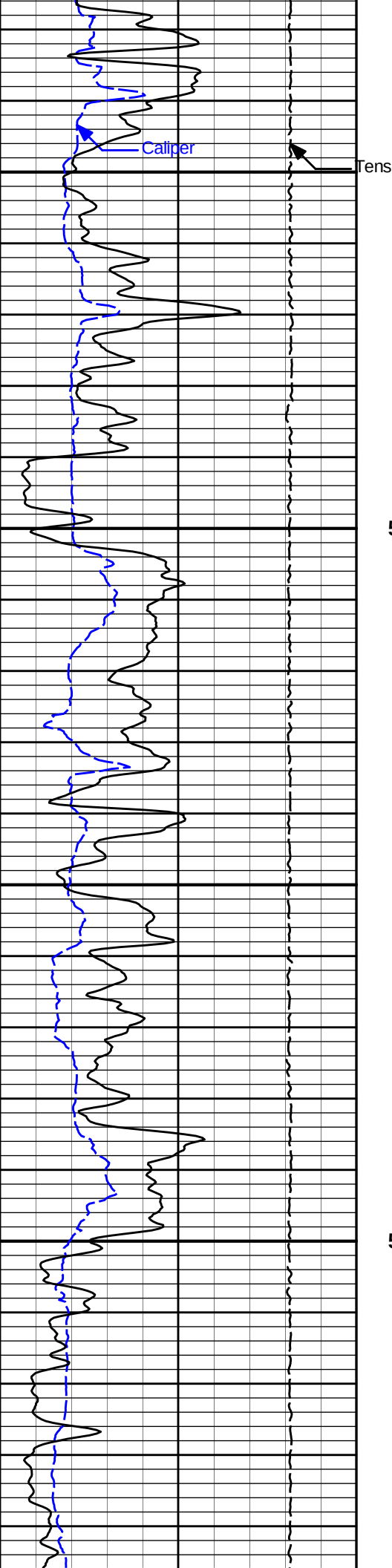
5 INCH MAIN LOG

5 INCH MAIN LOG

REPEAT SECTION

REPEAT SECTION



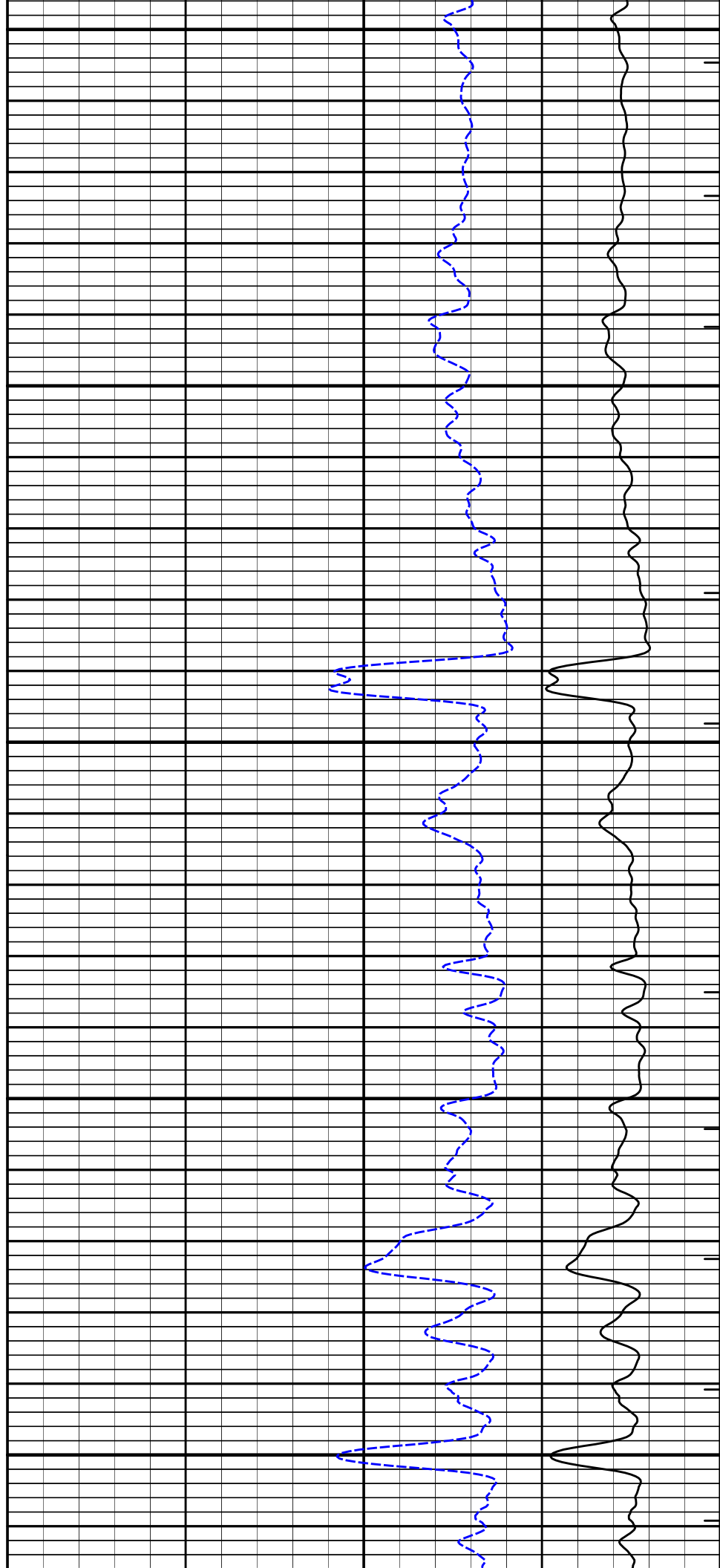


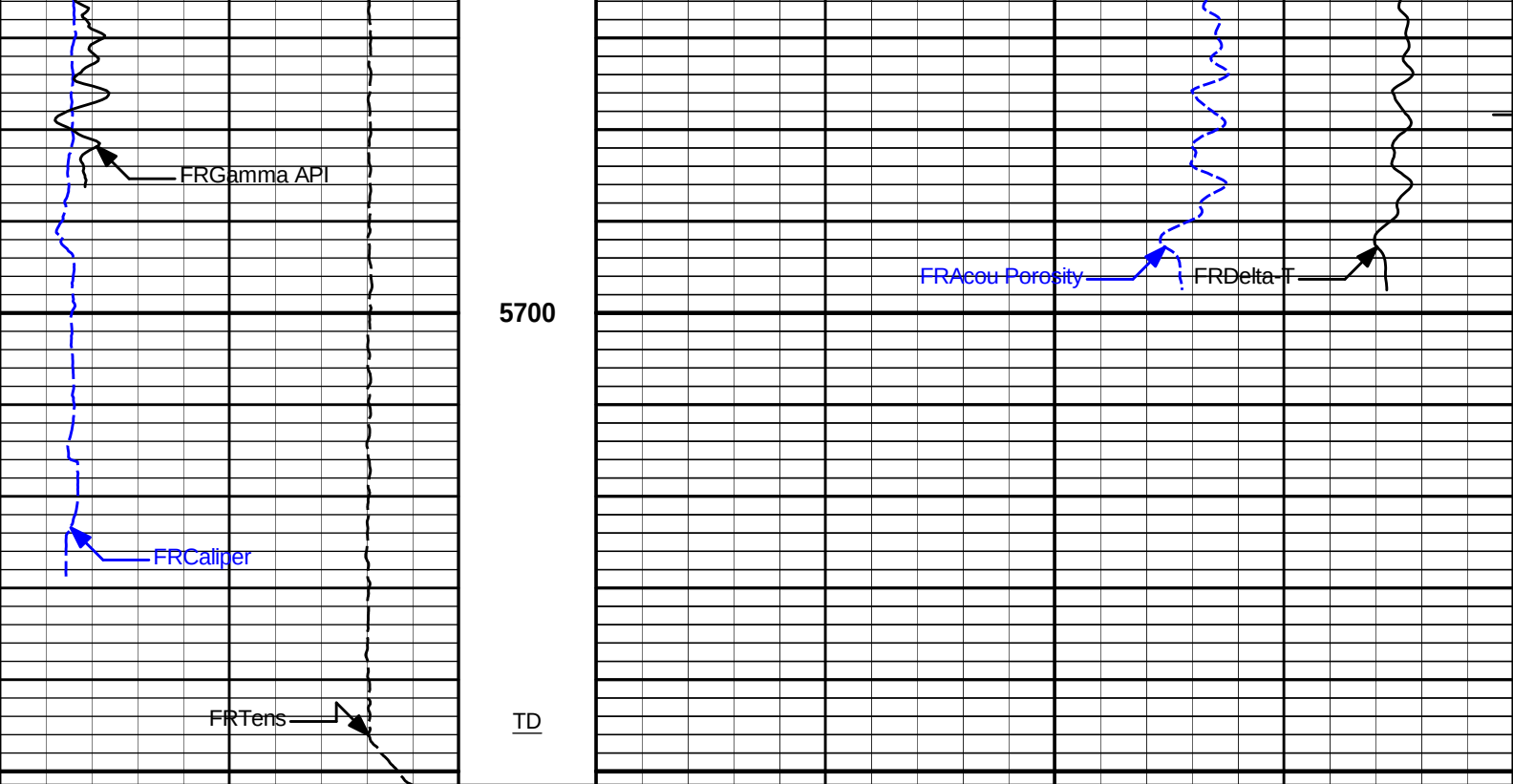


Caliper

5500

5600





15K	Tens	0	1 : 240		ITTT
	pounds		ft		
6	CALI	16		140	Delta-T
	inches				microsec per ft
0	Gamma API	150		30	Acou Porosity
	api				percent

HALLIBURTON

Plot Time: 07-Nov-12 09:52:55
Plot Range: 5150 ft to 5751.5 ft
Data: OXY_BCU_409\Well Based\DAQ-0001-002\
Plot File: \BSAT\BSAT_5inch

REPEAT SECTION

REPEAT SECTION

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	9.300	ppg

SHARED	WAGT	Weighting Agent	Barite	
SHARED	BSAL	Borehole salinity	0.00	ppm
SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
SHARED	RMUD	Mud Resistivity	2.000	ohmm
SHARED	TRM	Temperature of Mud	75.0	degF
SHARED	CSD	Logging Interval is Cased?	No	
SHARED	ICOD	AHV Casing OD	5.500	in
SHARED	ST	Surface Temperature	45.0	degF
SHARED	TD	Total Well Depth	5758.00	ft
SHARED	BHT	Bottom Hole Temperature	150.0	degF
SHARED	SVTM	Navigation and Survey Master Tool	NONE	
SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
SHARED	TEMM	Temperature Master Tool	NONE	
SHARED	BHSM	Borehole Size Master Tool	NONE	
Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Centered	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	15000	Hz
BSAT	DTFL	Delta -T Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	Limestone 47.5	
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wyllie	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTP	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc

Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Up	
ACRt Sonde	TPOS	Tool Position	Free Hanging	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm

BOTTOM

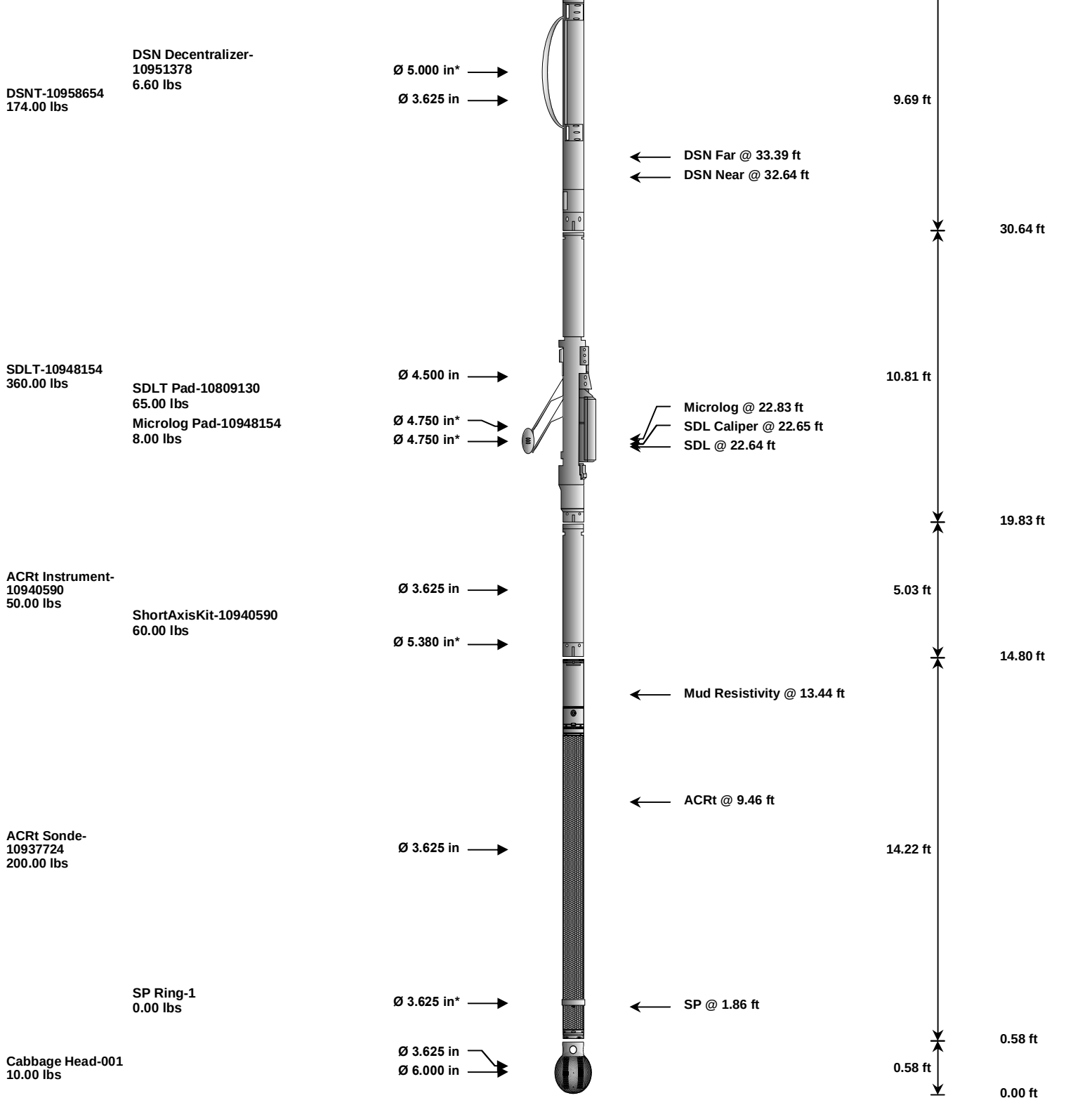
Data: OXY_BCU_409\0001 GTET-BSAT-FLEX-DSNT-SDLT-ACRT\004 MAIN

Date: 07-Nov-12 06:40:23

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS_I 37.50 lbs		Ø 2.750 in →		← Temperature @ 72.30 ft	3.25 ft	73.55 ft
GTET-10957072 165.00 lbs		Ø 3.625 in →		← GammaRay @ 64.23 ft	8.52 ft	70.30 ft
BSAT-10747686 300.00 lbs		Ø 3.625 in →		← Sonic Receivers @ 53.26 ft	15.77 ft	61.78 ft
						46.00 ft
IQ Flex-1 140.00 lbs		Ø 3.625 in →			5.67 ft	40.33 ft



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
CH_HOS		Hostile Cable Head with Load Cell	CH_HOS_I	37.50	3.25	70.30	300.00
GTET		Gamma Telemetry Tool	10957072	165.00	8.52	61.78	60.00
BSAT		Borehole Sonic Array Tool	10747686	300.00	15.77	46.00	60.00
IQF		IQ Flex tool	1	140.00	5.67	40.33	300.00
DSNT		Dual Spaced Neutron	10958654	174.00	9.69	30.64	60.00
DCNT		DSN Decentralizer	10951378	6.60	5.13	33.97	300.00
SDLT		Spectral Density Tool	10948154	360.00	10.81	19.83	60.00
MICP		Microlog Pad	10948154	8.00	1.00	22.33	60.00
SDLP		Density Insite Pad	10809130	65.00	2.55	22.04	60.00
ACRt		Array Compensated True Resistivity Instrument Section	10940590	50.00	5.03	14.80	300.00
SAK		Short Axis Kit for logging short axis of a borehole.	10940590	60.00	1.02	14.80	300.00
ACRt		Array Compensated True Resistivity Sonde Section	10937724	200.00	14.22	0.58	300.00
SP		SP Ring	1	0.00	0.25	1.86	300.00
CBHD		Cabbage Head	001	10.00	0.58	0.00	300.00

Total	1,576.10	73.55
* Not included in Total Length and Length Accumulation.		
Data: OXY_BCU_409\0001 GTET-BSAT-FLEX-DSNT-SDLT-ACRT\004 MAIN	Date: 07-Nov-12 06:41:10	