

HALLIBURTON

BORE HOLE COMPENSATED SONIC ARRAY LOG

COMPANY	OXY USA INC
WELL	ELIZABETH A COX #5
FIELD	LEMON NW
COUNTY	HASKELL
STATE	KANSAS
COMPANY	OXY USA INC
WELL	ELIZABETH A COX #5
FIELD	LEMON NW
COUNTY	HASKELL
STATE	KANSAS
API No.	15-081-21942
Location	1459 FSL & 330 th FEL
Other Services:	SDLT/DSENT MICRO ACRT
Sect. 8	Twsp. 30S
Rge. 33W	
Elev. 2969.0 ft	
Elev. K.B. 2980.0 ft	
D.F. 2978.0 ft	
G.L. 2969.0 ft	

Permanent Datum	GL		
Log measured from	KB		11.0 ft above perm. Datum
Drilling measured from	KB		G.L.
Date	09-Jun-11		
Run No.	ONE		
Depth - Driller	5660.00 ft		
Depth - Logger	5545.0 ft		
Bottom - Logged Interval	5518.0 ft		
Top - Logged Interval	1839.0 ft		
Casing - Driller	9.625 in @ 1840.0 ft		@
Casing - Logger	1839.0 ft		@
Bit Size	8.750 in		@
Type Fluid in Hole	WATER BASED MUD		
Density	9.1 ppq	41.00 s/qt	
PH	8.90 pH	6.6 cp/m	
Source of Sample	FLOW LINE		
Rm @ Meas. Temperature	0.909 ohmm @ 85.00 degF		@
Rmf @ Meas. Temperature	0.80 ohmm @ 81.00 degF		@
Rmc @ Meas. Temperature	1.050 ohmm @ 81.00 degF		@
Source Rmf	MEASURED	MEASURED	
Rm @ BHT	0.61 ohmm @ 130.0 degF		@
Time Since Circulation	7.0 hr		
Time on Bottom	09-Jun-11 23:31		
Max. Rec. Temperature	120.0 degF @ 5545.0 ft		@
Equipment	10549592	LIBERAL	
Recorded By	C.PARKER		
Witnessed By	M.ATWOOD		

Fold here

Service Ticket No.: 8233459		API Serial No.: 15-081-21942		PGM Version: WL INSITE R3.2.5 (Build 2)			
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE				RESISTIVITY SCALE CHANGES			
Date	Sample No.			Type Log	Depth	Scale Up Hole	Scale Down Hole
Depth-Driller							
Type Fluid in Hole							
Density	Viscosity						
Ph	Fluid Loss						
Source of Sample				RESISTIVITY EQUIPMENT DATA			
Rm @ Meas. Temp	@	@		Run No.	Tool Type & No.	Pad Type	Tool Pos.
Rmf @ Meas. Temp.	@	@					
Rmc @ Meas. Temp.	@	@					
Source Rmf	Rmc						
Rm @ BHT	@	@					
Rmf @ BHT	@	@					
Rmc @ BHT	@	@					
EQUIPMENT DATA							
GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.		Run No.	
Serial No.	10811258	Serial No.	10747683	Serial No.		Serial No.	
Model No.	GTET	Model No.	BSAT	Model No.		Model No.	
Diameter	3.625	No. of Cent.	2	Diameter		Diameter	
Detector Model No.	T-102	Spacing	0.5	Log Type		Log Type	
Type	SCINT			Source Type		Source Type	
Length	8"	LSA [Y/N]	YES	Serial No.		Serial No.	
Distance to Source	10'	FWDA [Y/N]	YES	Strength		Strength	
LOGGING DATA							
GENERAL		GAMMA		ACOUSTIC		DENSITY	

Run No.	Depth		Speed ft/min	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
	From	To		L	R	L	R		L	R		L	R	
ONE	TD	CSG	REC	0	150	30%	-10%	47.6						

DIRECTIONAL INFORMATION

Maximum Deviation @ KOP @

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 7 INCH CASING

CHLORIDES 1500 MG/L; LCM 4 #/BBL

GPS COORDINATES: 37° 19' N, 100° 54' W

TODAY'S CREW: P. COBLE, A. VAQUERA

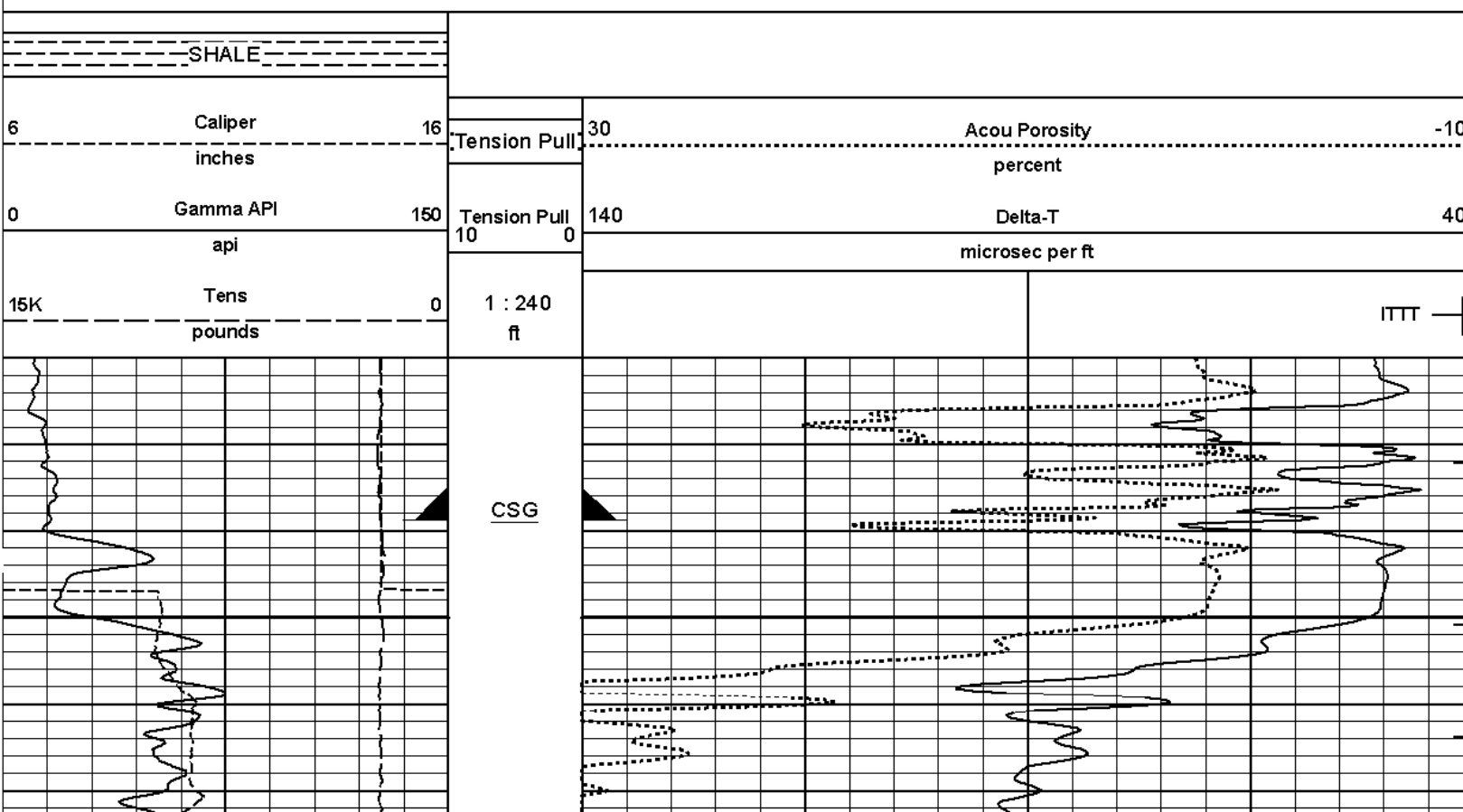
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KANSAS 620 624 8123

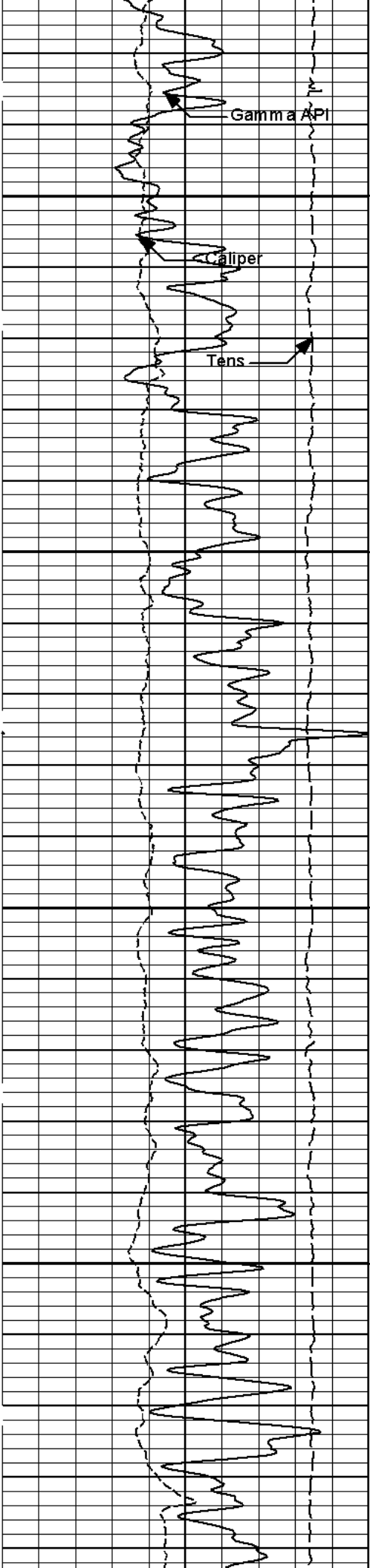
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR 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.

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HALLIBURTON Plot Time: 10-Jun-11 01:06:17
 Plot Range: 1820 ft to 5548.42 ft
 Data: ELIZABETH_A_COX\Well Based\DAQ-0001-0041
 Plot File: \\BSAT\BSAT_5_MAIN_LIB

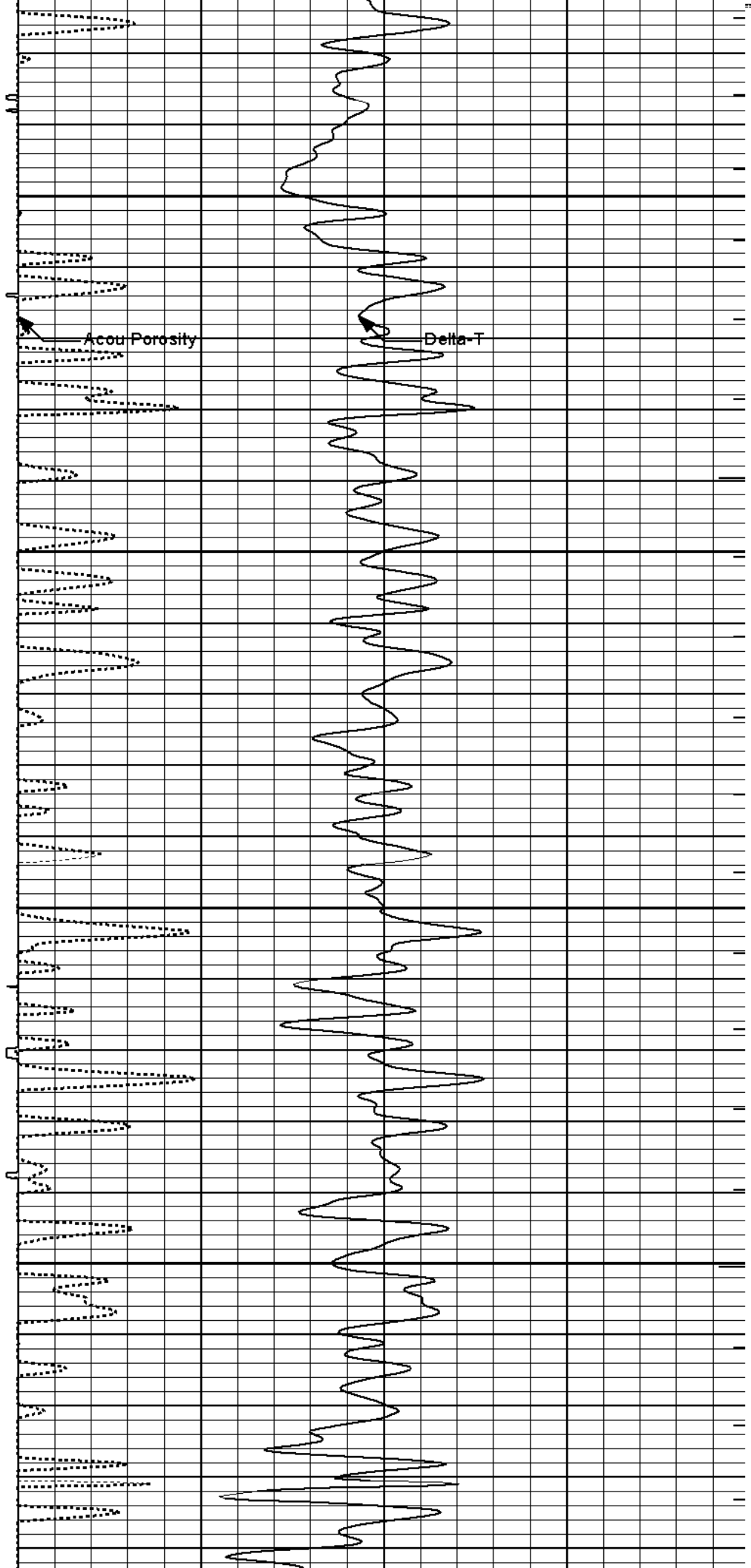
5 INCH MAIN LOG

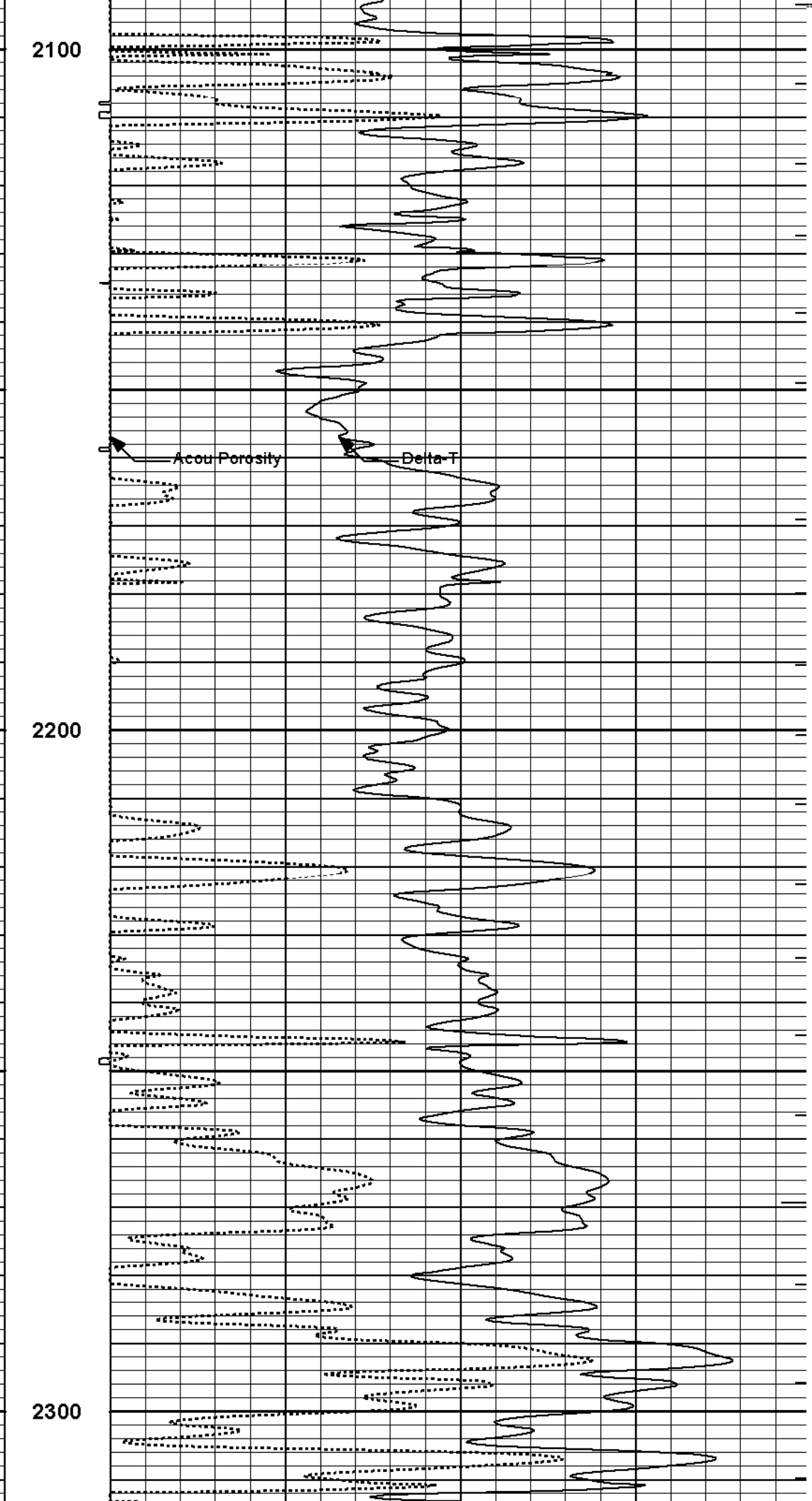
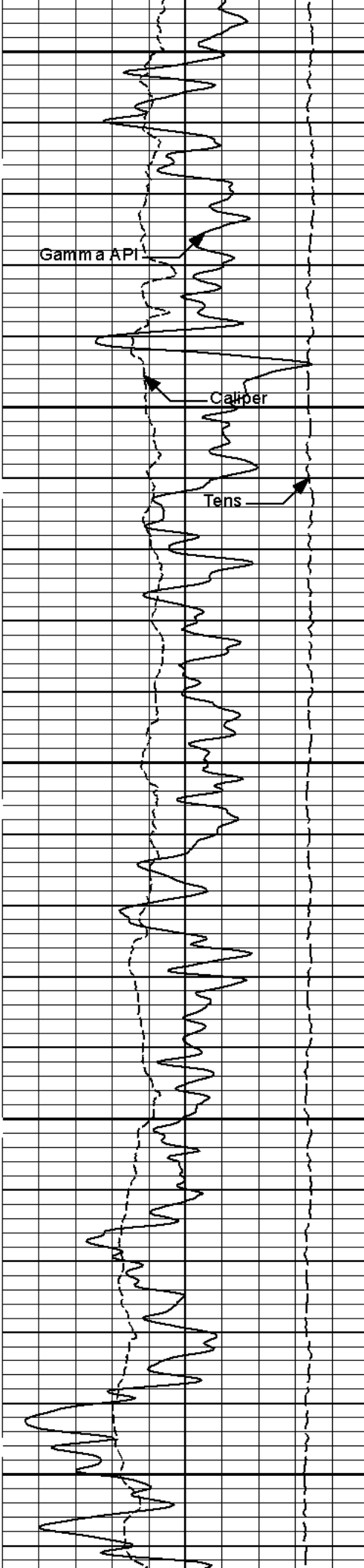


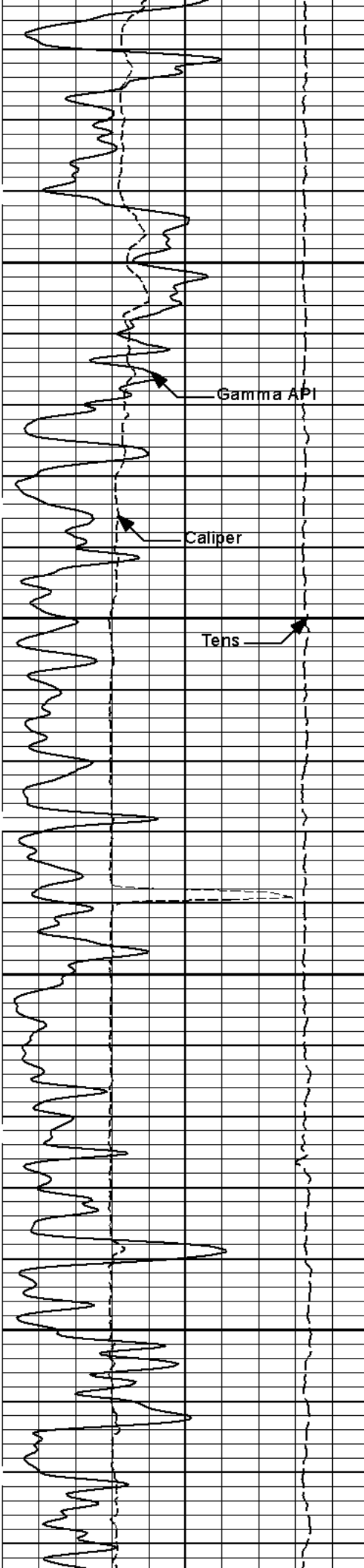


1900

2000

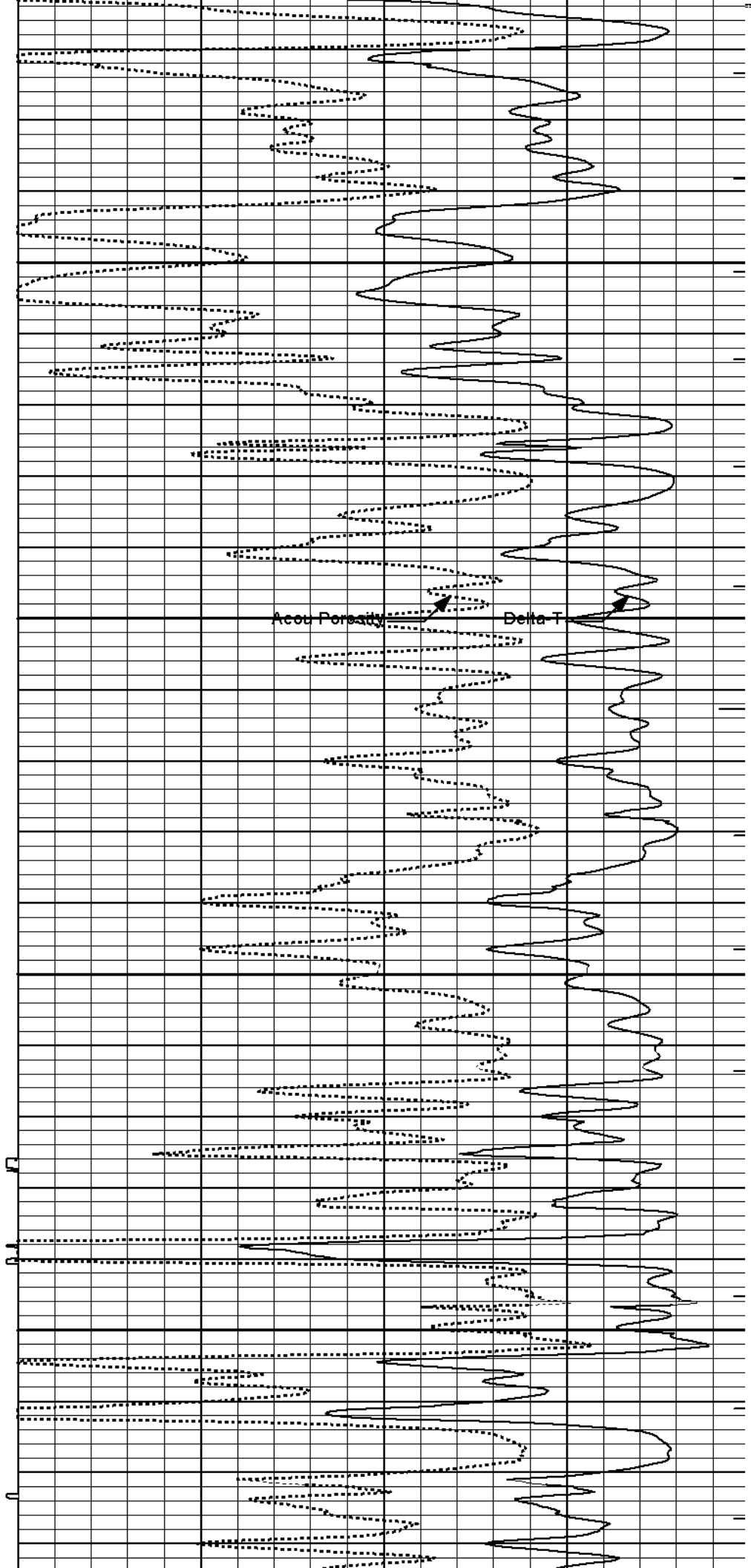




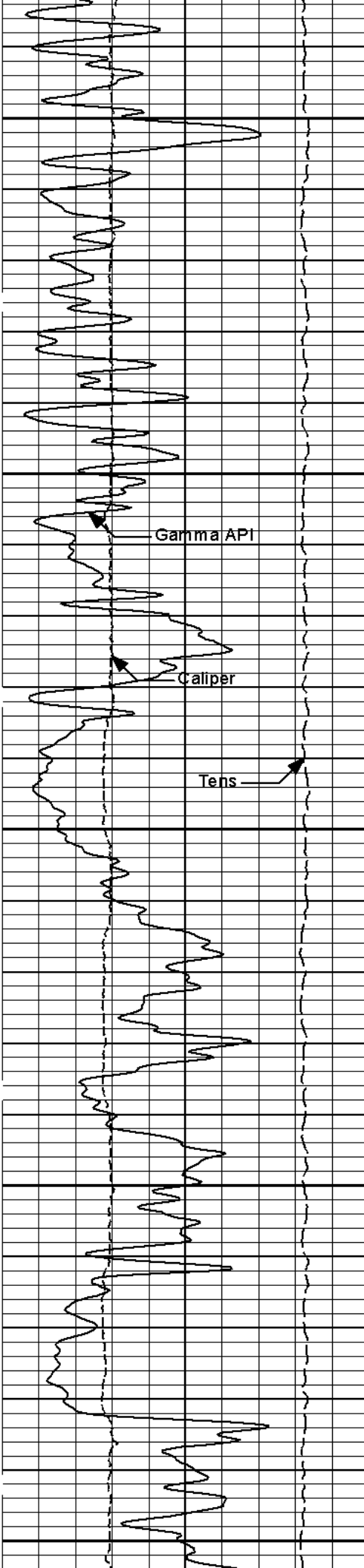


Gamma API
Caliper
Tens
2400

2500

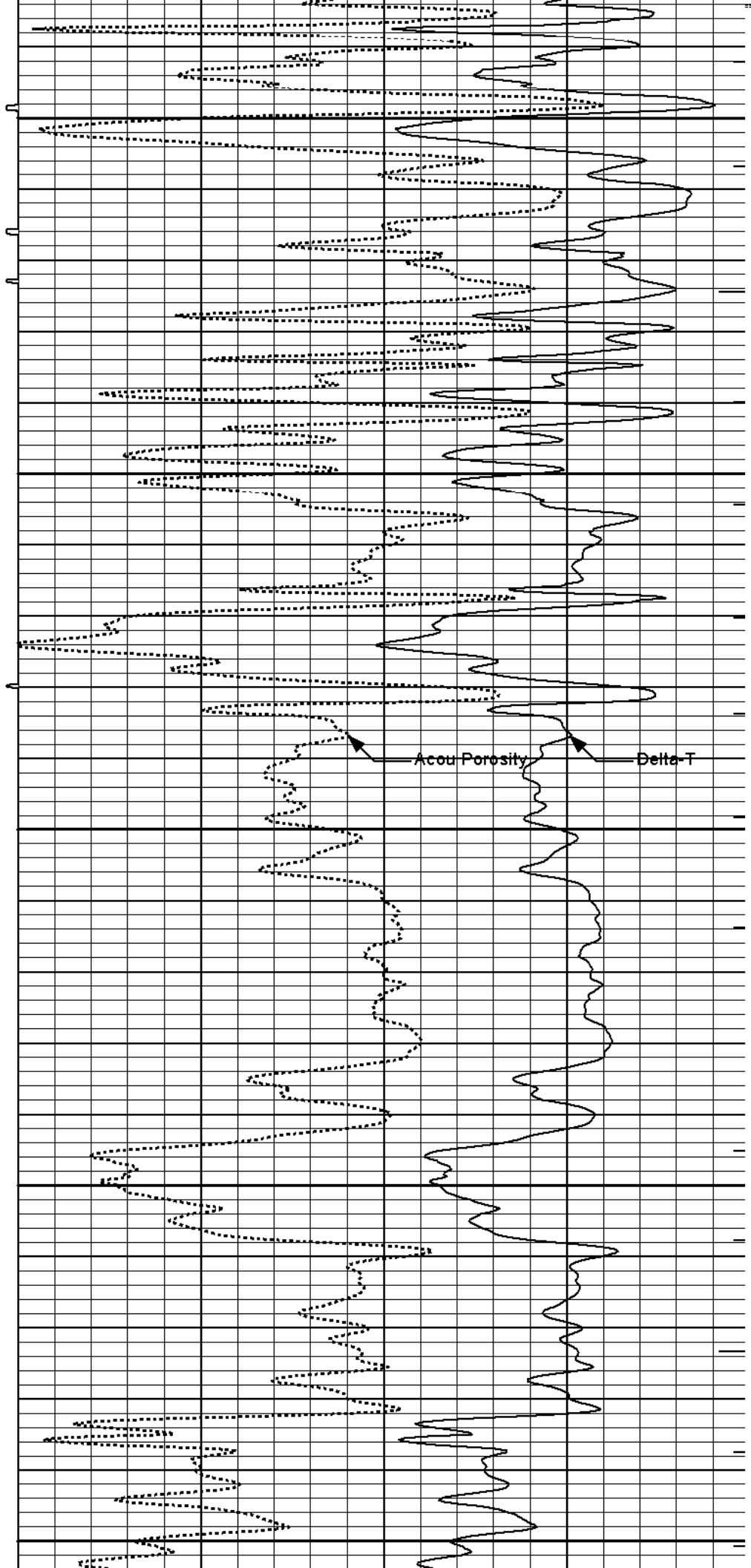


Acou Porosity
Delta T



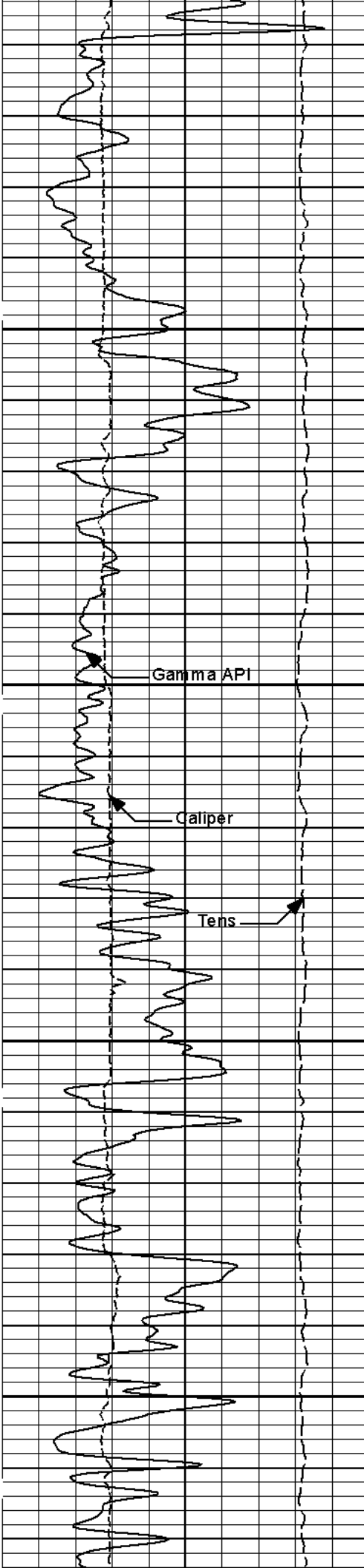
2600

2700



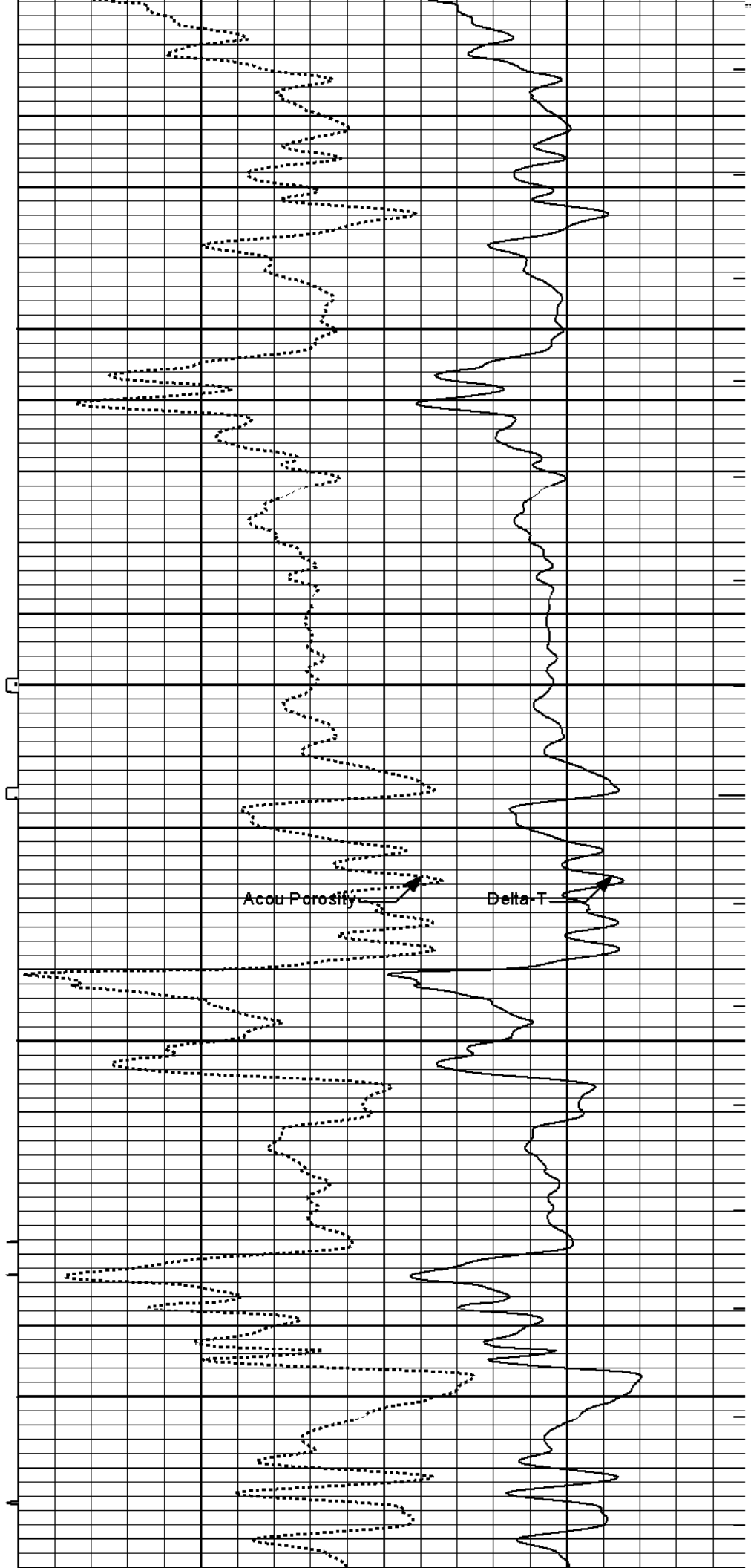
Acou Porosity

Delta-T



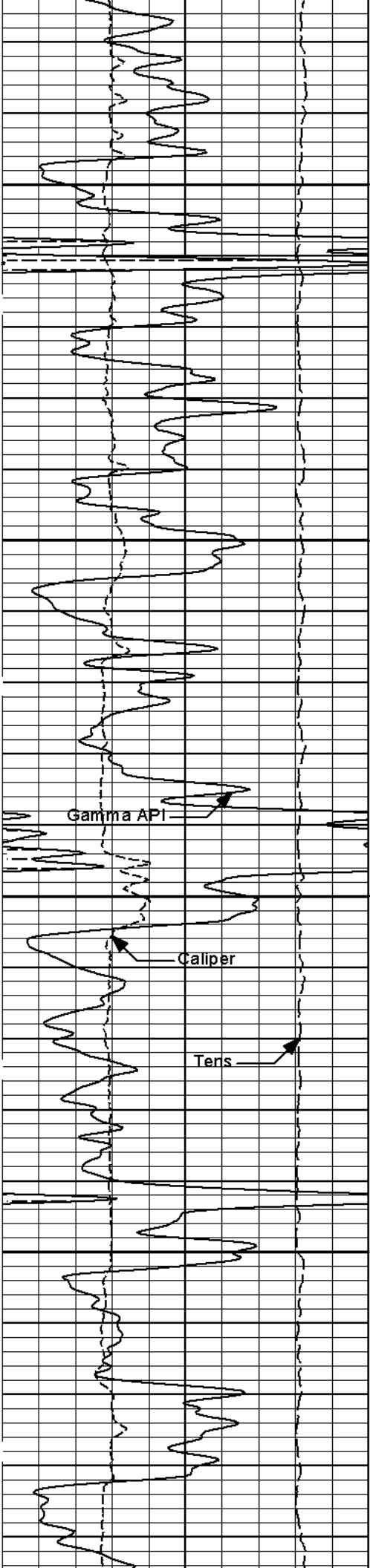
2800

2900



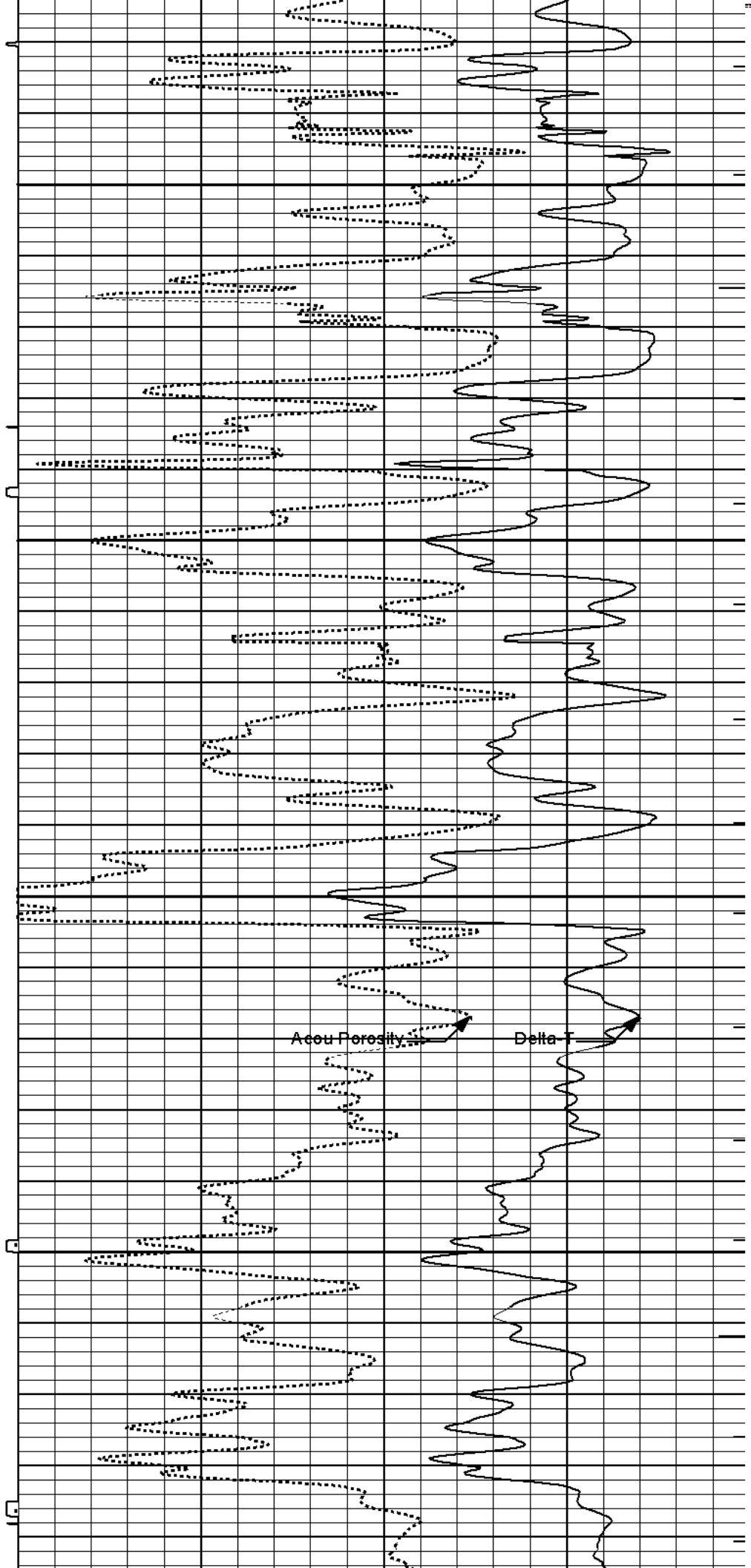
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Delta T



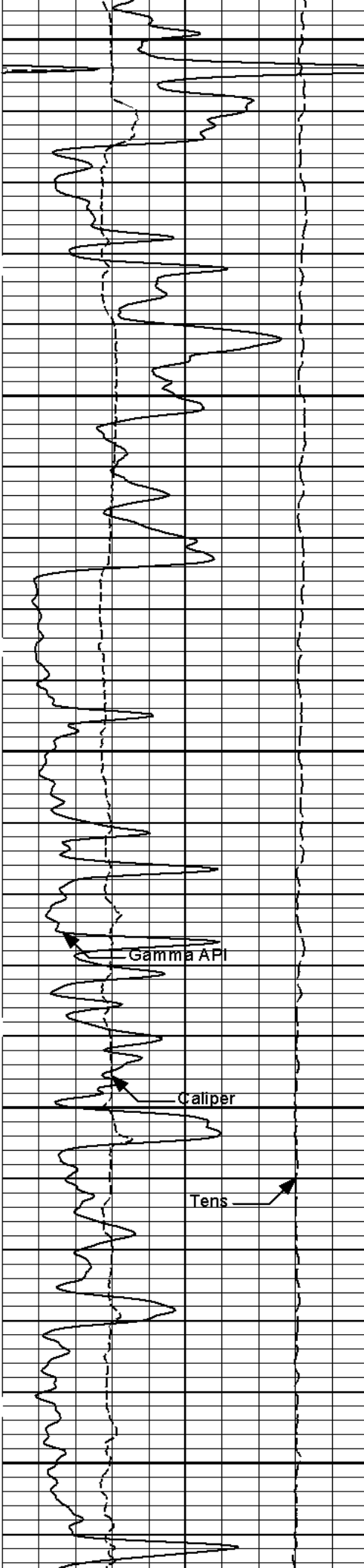
3000

3100



Acou Porosity

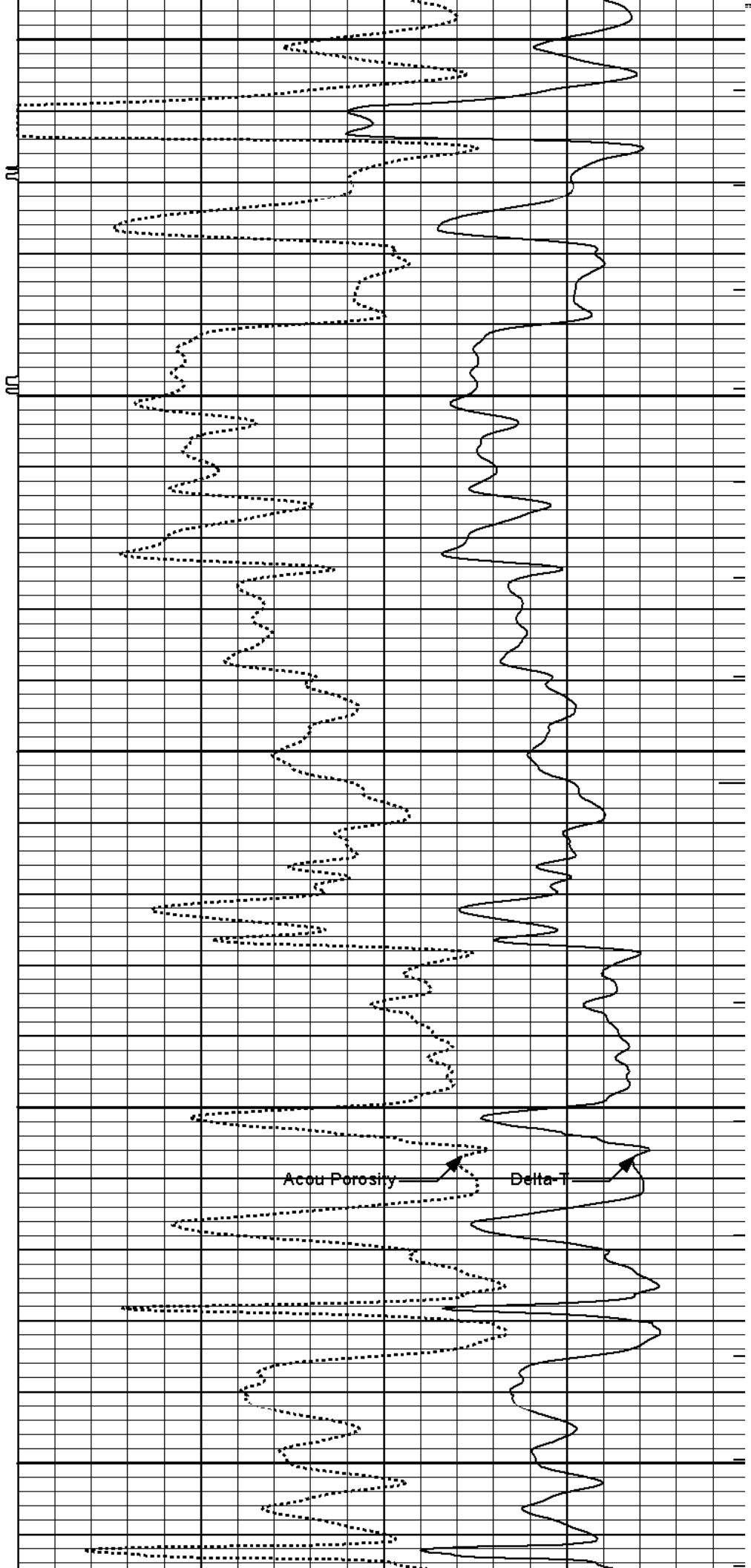
Delta T



3200

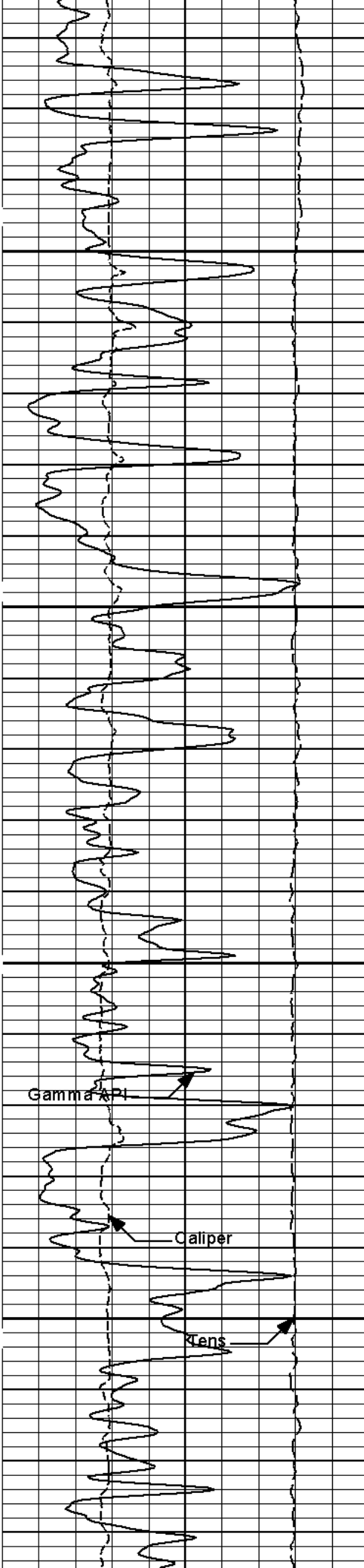
3300

3400



Acou Porosity

Delta-T



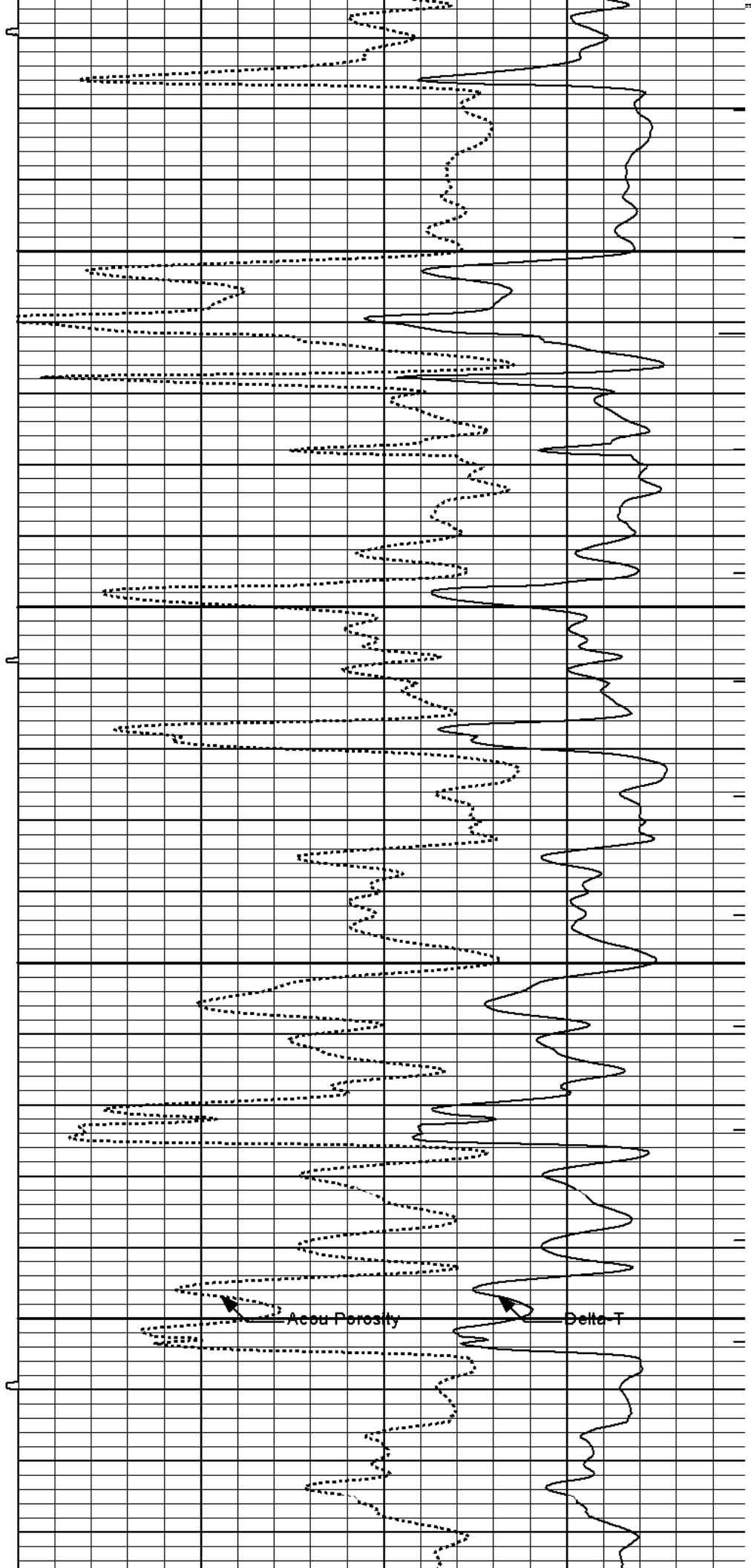
3500

3600

Gamma Ray

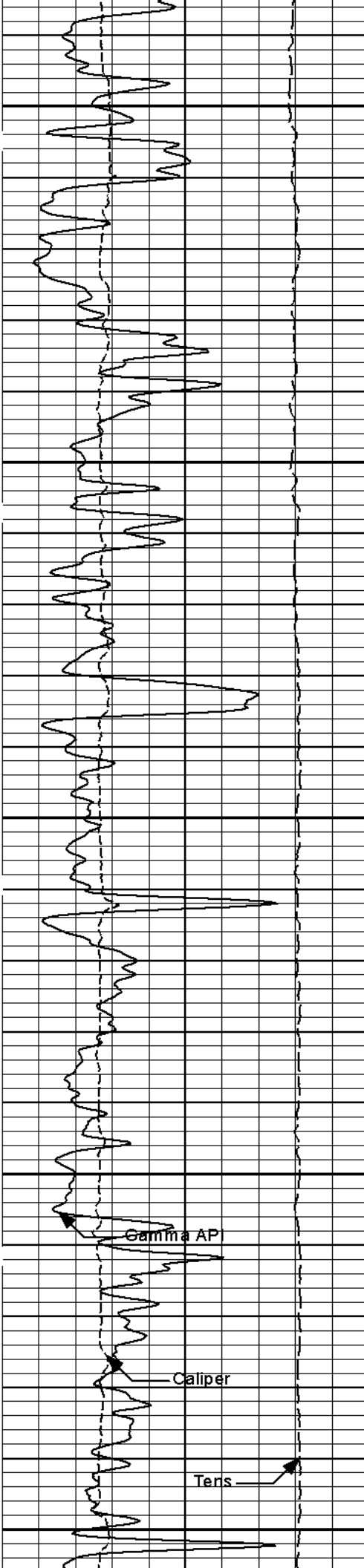
Caliper

Lens



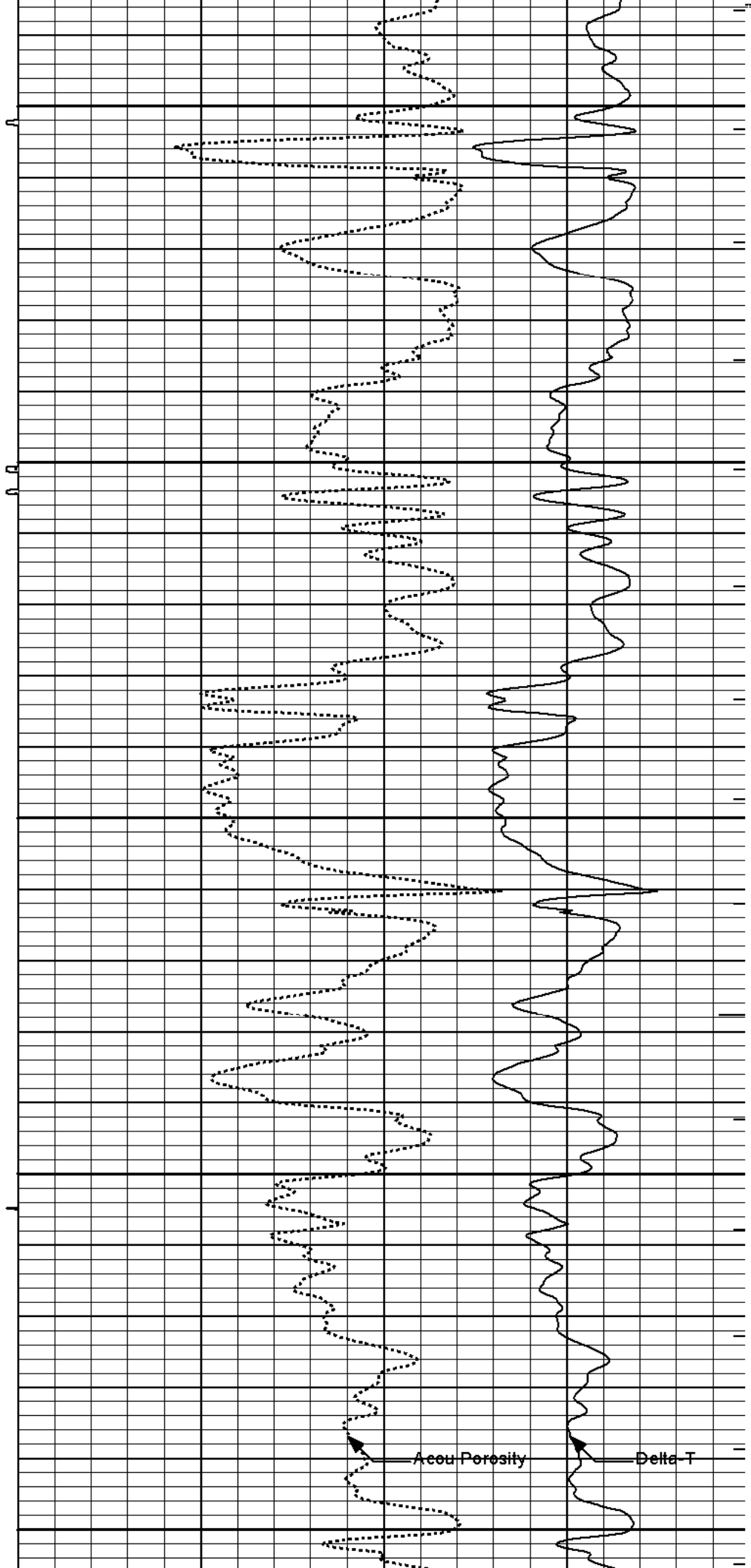
Acoustic Porosity

Delta T



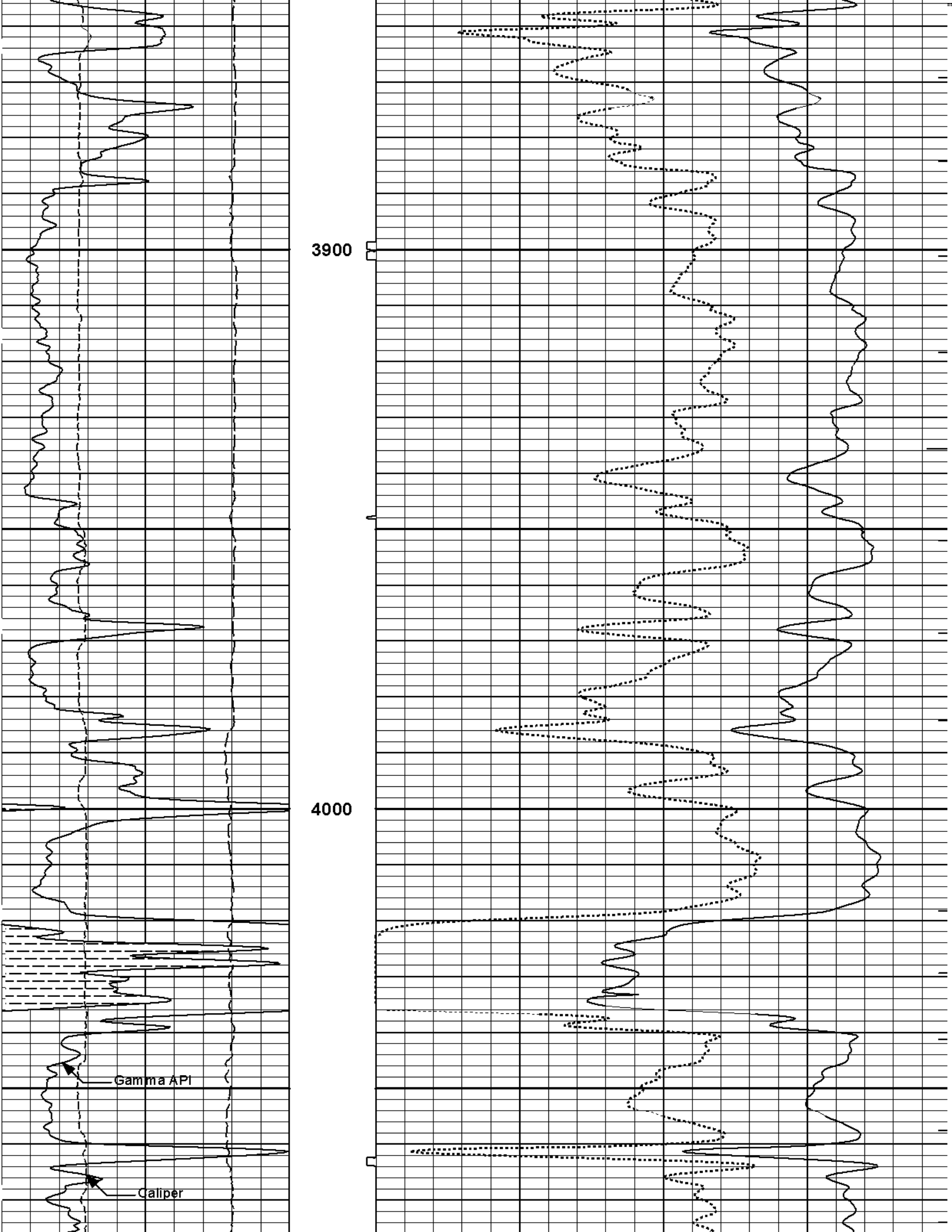
3700

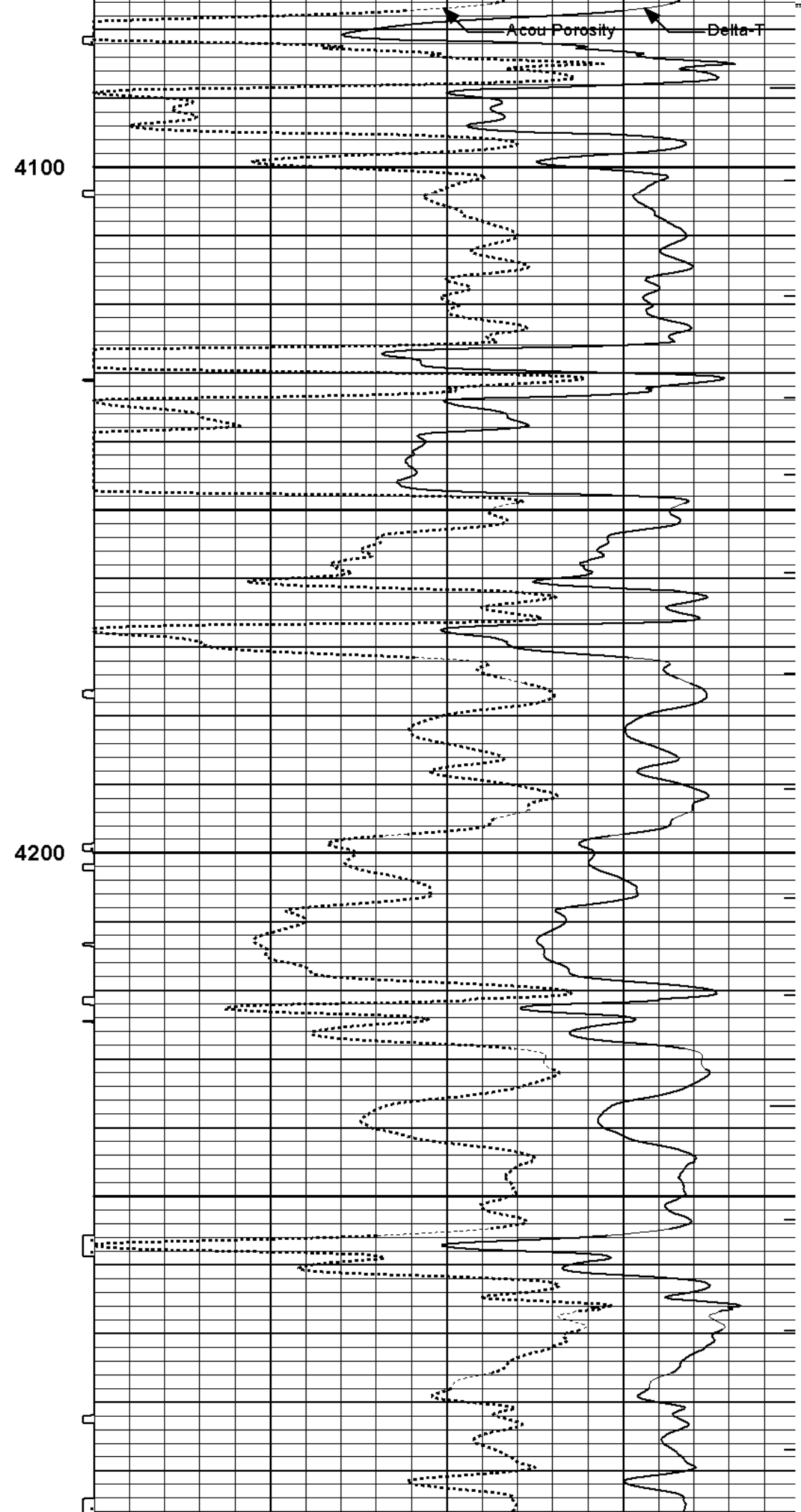
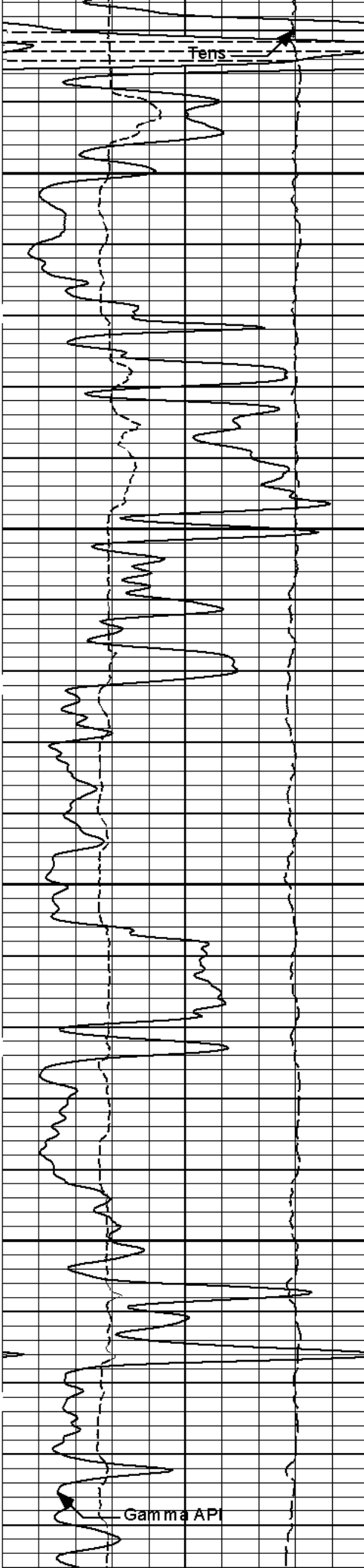
3800



Acou Porosity

Delta-T

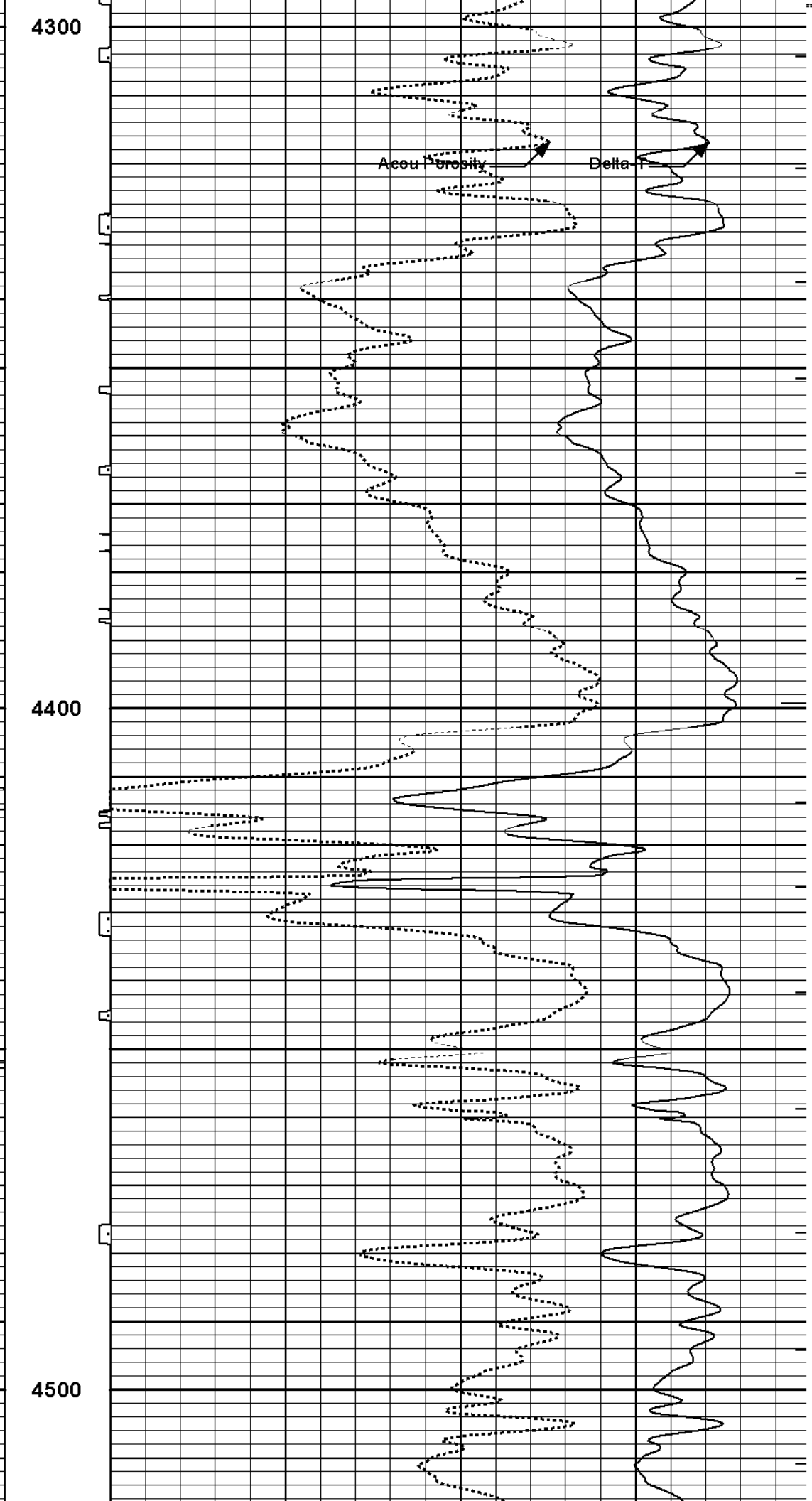
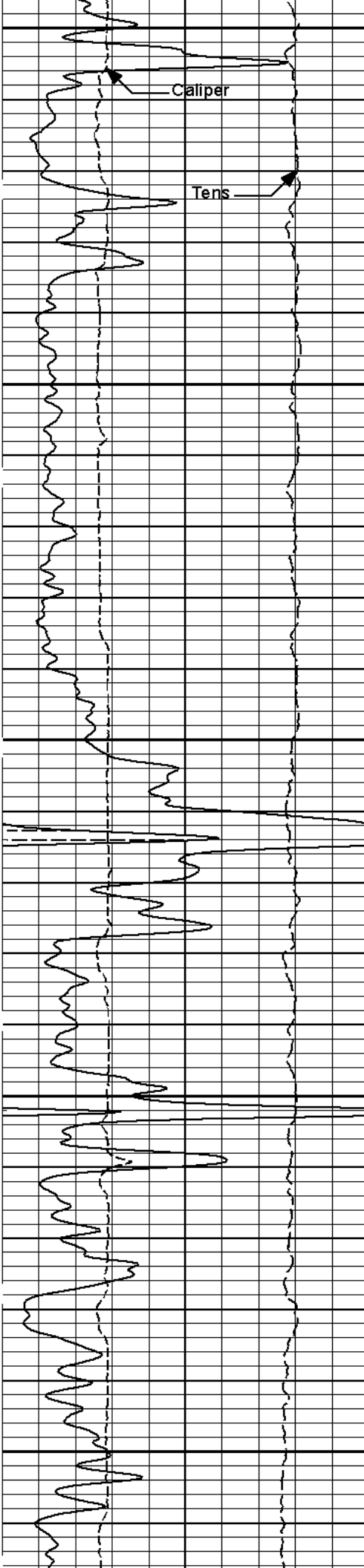


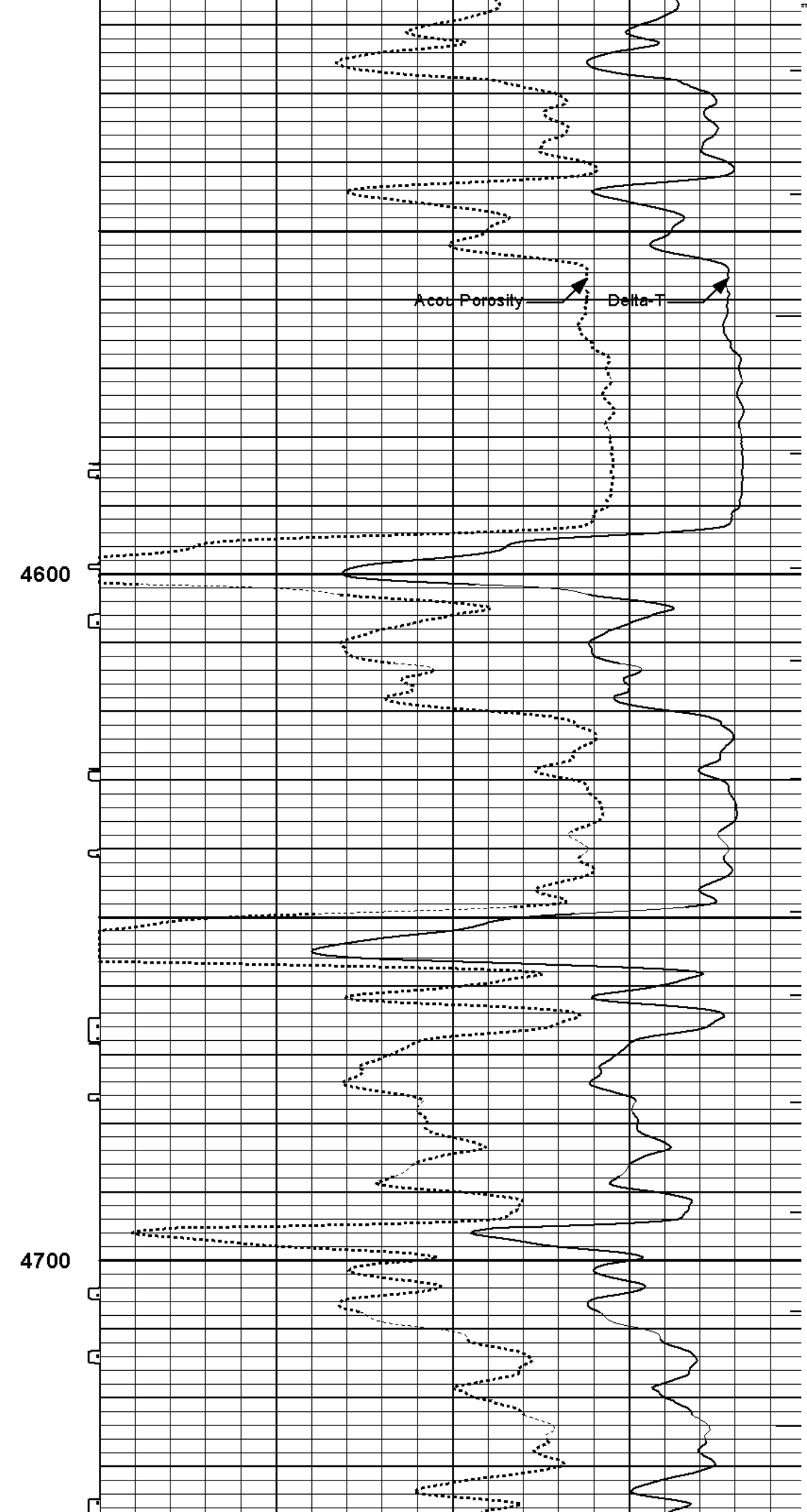
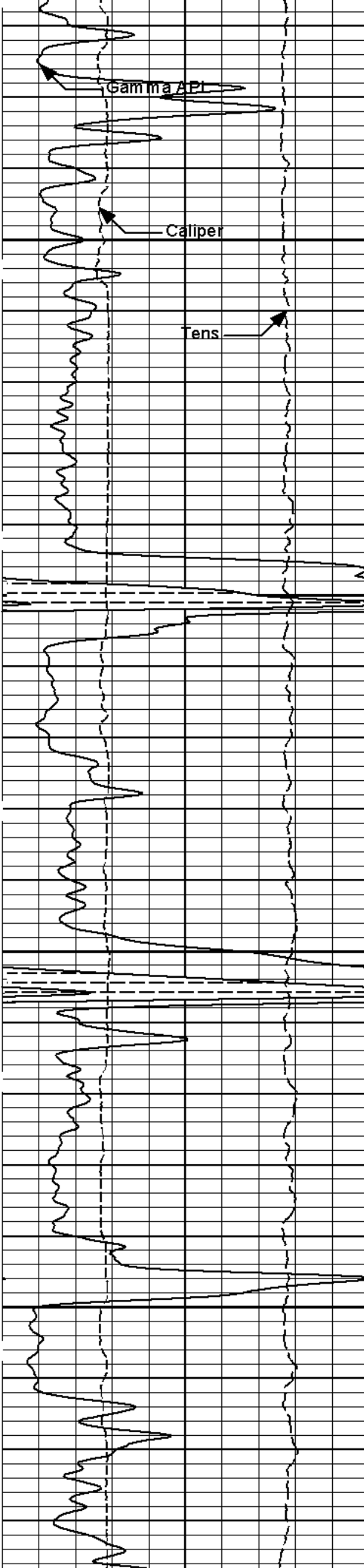


4100

4200

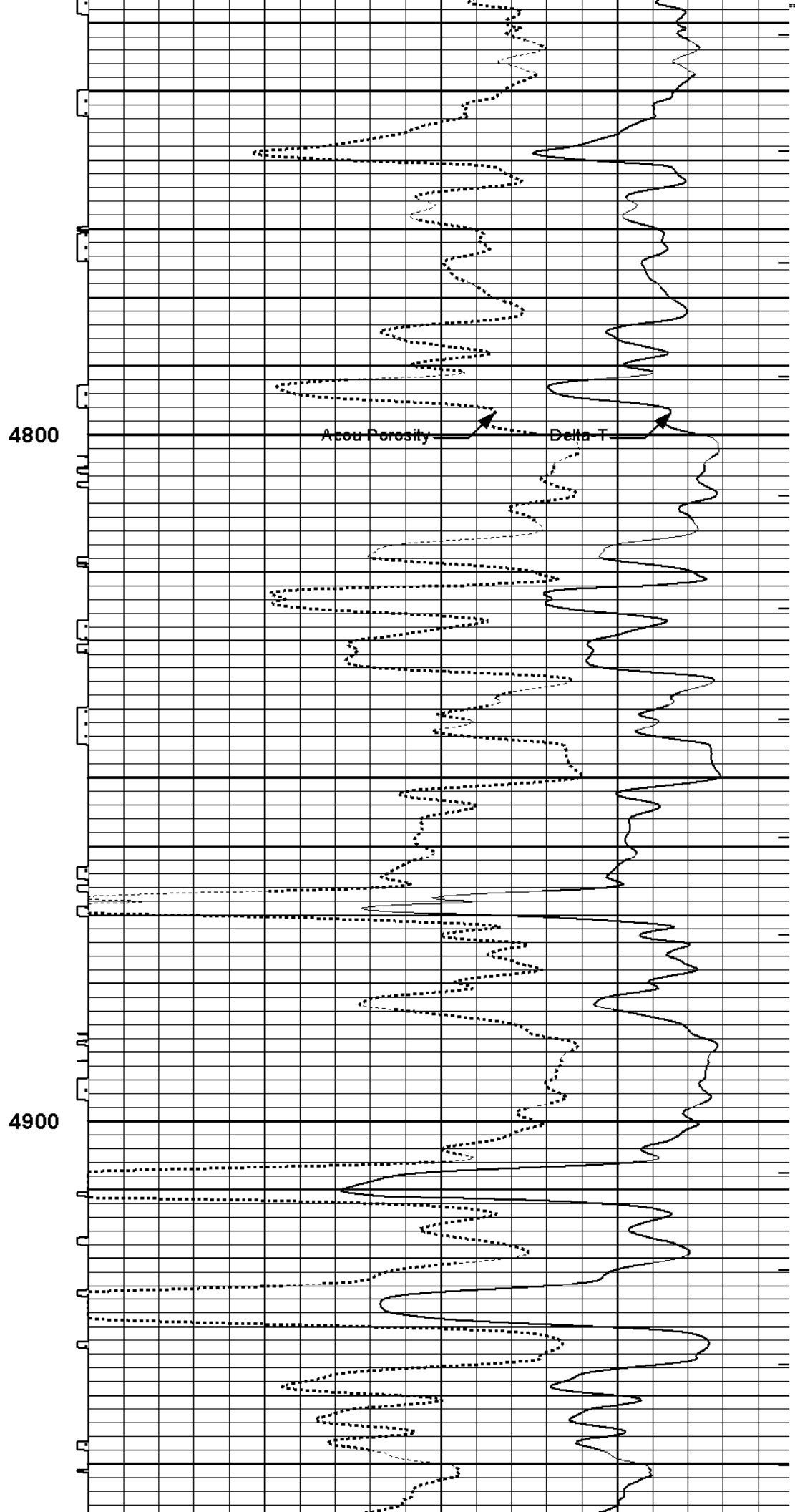
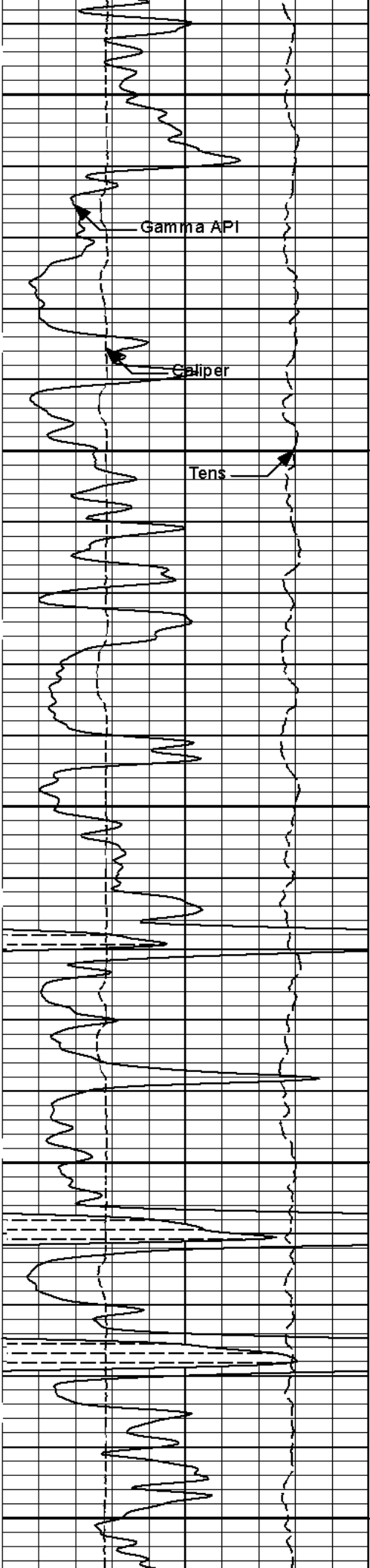
Gamma API

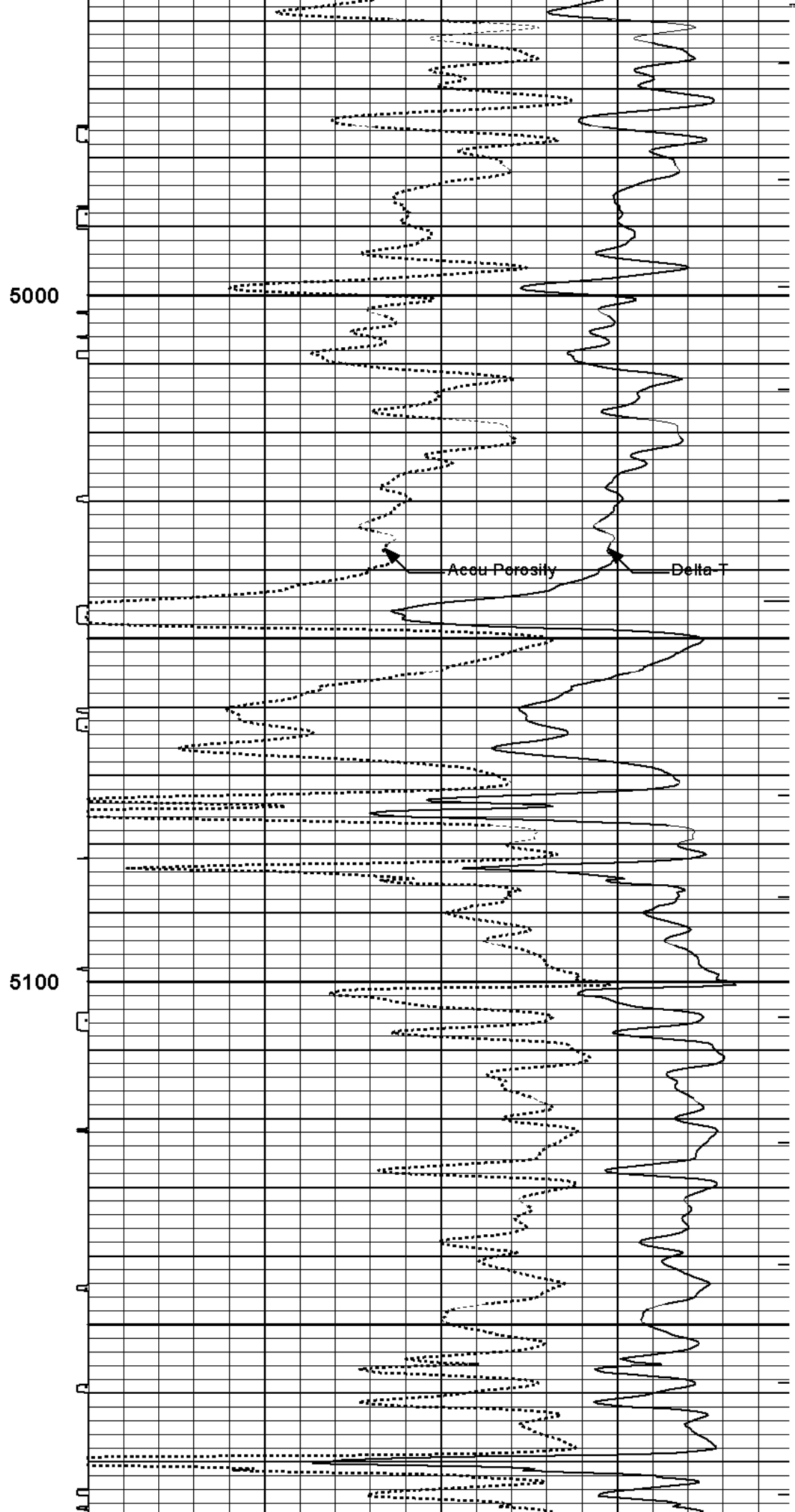
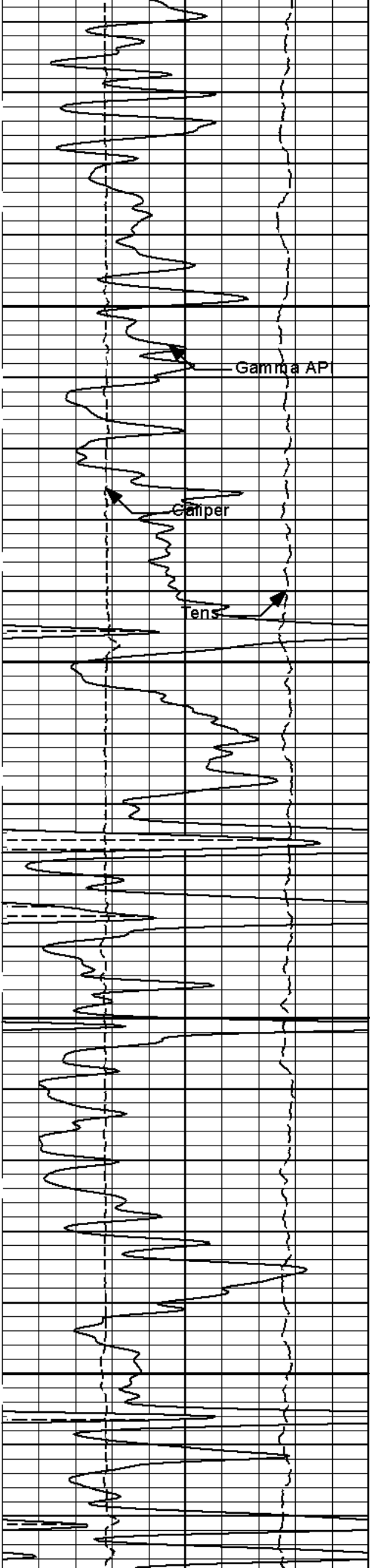




4600

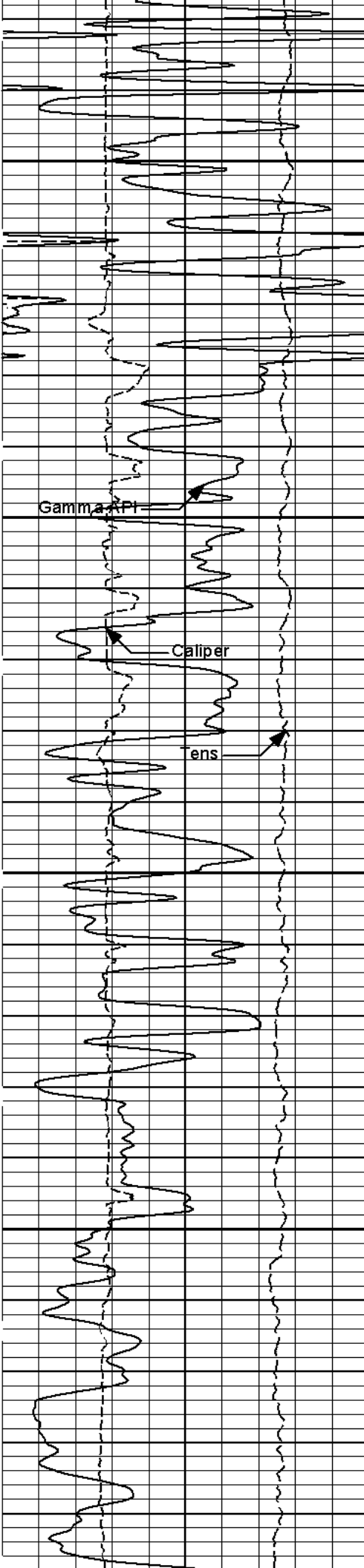
4700





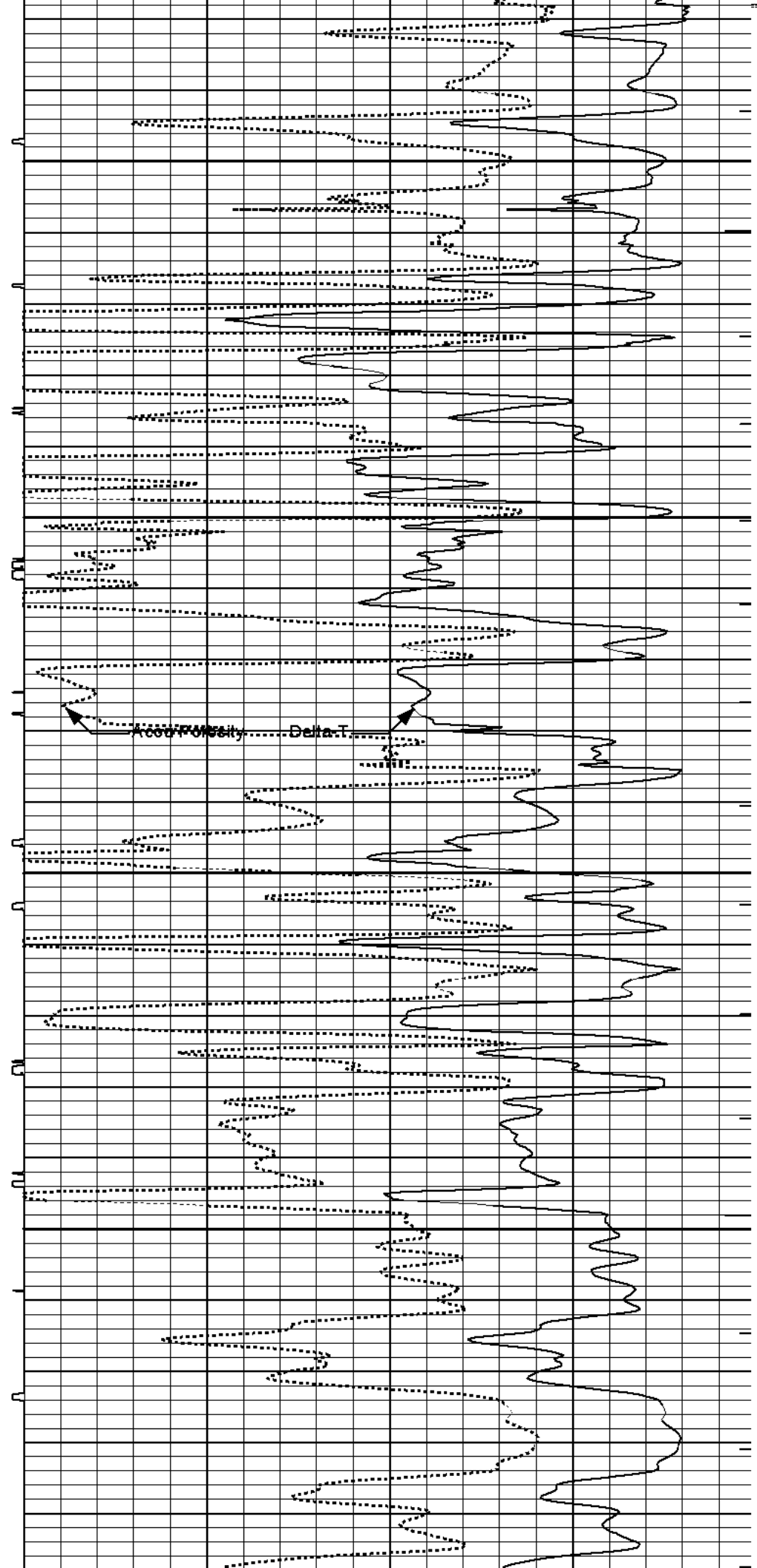
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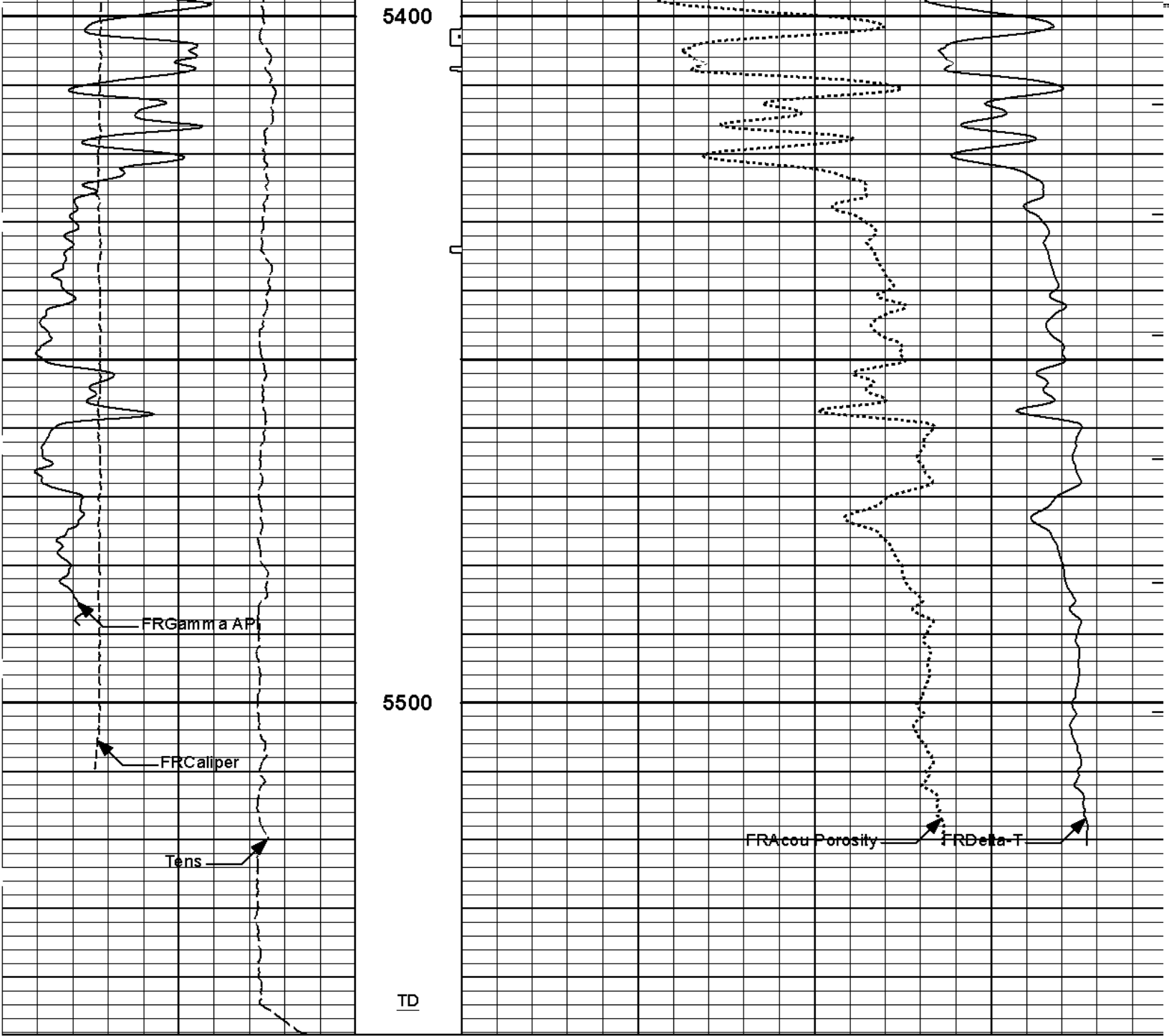
5100



5200

5300





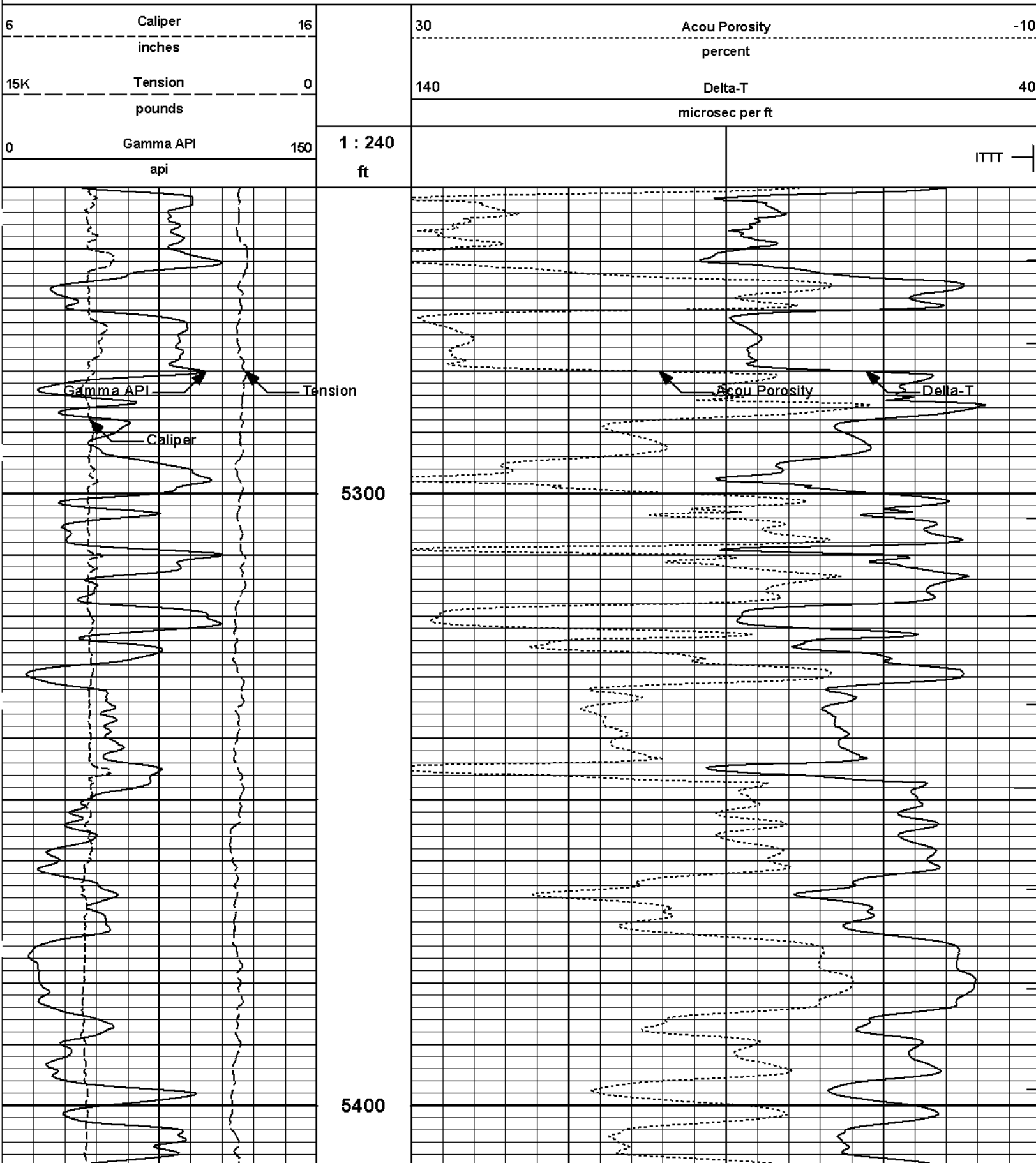
15K	Tens	0	1 : 240			ITTT
	pounds		ft			
0	Gamma API	150	Tension Pull	140	Delta-T	40
	api		10		microsec per ft	
6	Caliper	16	Tension Pull	30	Acou Porosity	-10
	inches				percent	
SHALE						

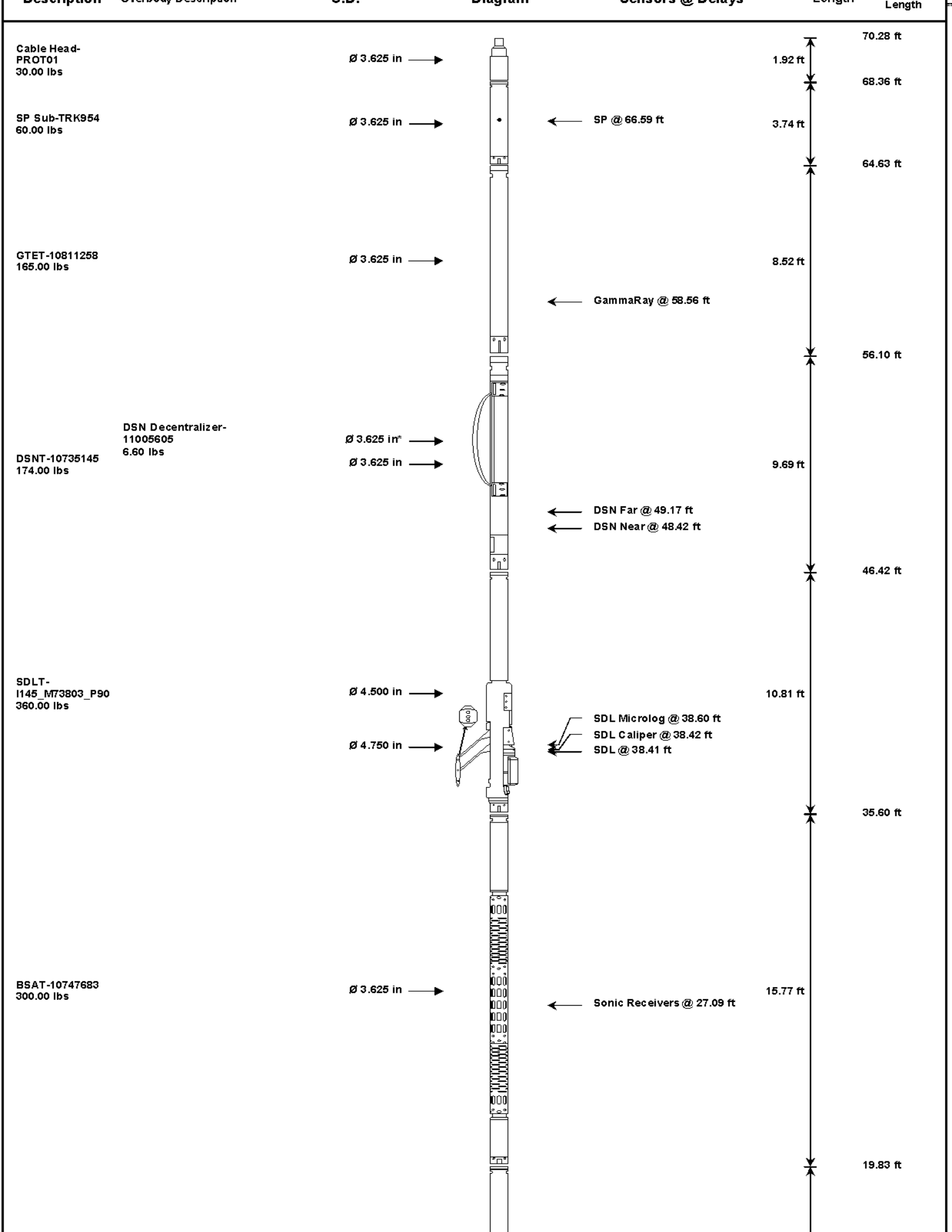
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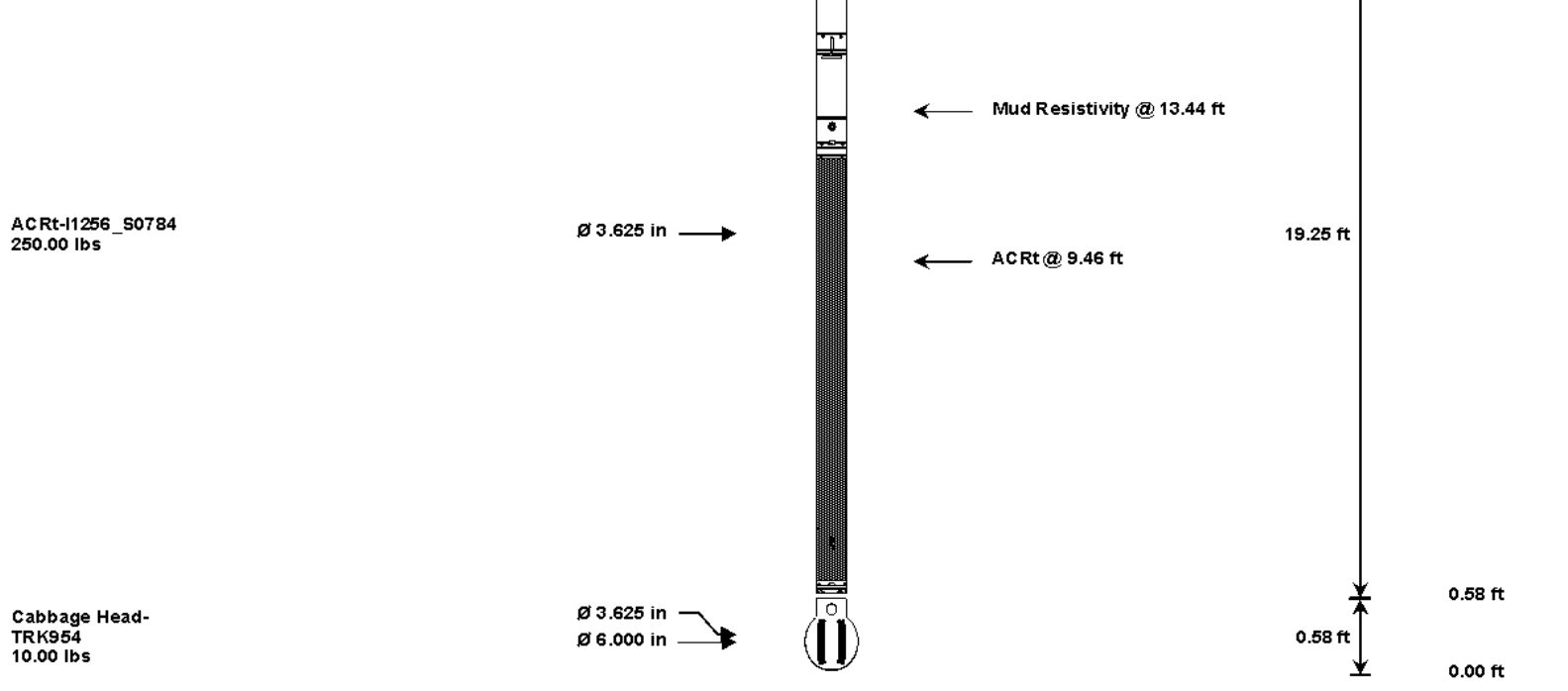
Plot Time: 10-Jun-11 01:06:21
 Plot Range: 1820 ft to 5548.42 ft
 Data: ELIZABETH_A_COX\Well Based\DAQ-0001-0041
 Plot File: \\BSAT\BSAT_5_MAIN_LIB

5 INCH MAIN LOG

REPEAT SECTION







Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max. Log. Speed (fpm)
CH	Standard OH Cable Head	PROT01	30.00	1.92	68.36	300.00
SP	SP Sub	TRK954	60.00	3.74	64.63	300.00
GTET	Gamma Telemetry Tool	10811258	165.00	8.52	56.10	60.00
DSNT	Dual Spaced Neutron	10735145	174.00	9.69	46.42	60.00
DCNT	DSN Decentralizer	11005605	6.60	5.13 *	49.75	300.00
SDLT	Spectral Density Tool	I145_M73803_P90	360.00	10.81	35.60	60.00
BSAT	Borehole Sonic Array Tool	10747683	300.00	15.77	19.83	60.00
ACRt	Array Compensated True Resistivity	I1256_S0784	250.00	19.25	0.58	300.00
CBHD	Cabbage Head	TRK954	10.00	0.58	0.00	300.00
Total			1,355.60	70.28		

* Not included in Total Length and Length Accumulation.

Data: ELIZABETH_A_COX0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIDLE Date: 09-Jun-11 22:26:51

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PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	DSNT	DNOK	Process DSN?	No	
	SDLT	DNOK	Process Density?	No	
	SDLT	MLOK	Process MicroLog Outputs?	No	
3740.00					
	SHARED	BS	Bit Size	8.750	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	9.100	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	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	0.909	ohm m
	SHARED	TRM	Temperature of Mud	75.0	degF

SHARED	CSD	Logging Interval is Cased?	No	
SHARED	ICOD	AHV Casing OD	7.000	in
SHARED	ST	Surface Temperature	75.0	degF
SHARED	TD	Total Well Depth	5560.00	ft
SHARED	BHT	Bottom Hole Temperature	130.0	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	
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	Centered	
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	DNOK	Process Density?	Yes	
SDLT	DNOK	Process Density EVR?	No	
SDLT	CB	Logging Calibration Blocks?	No	
SDLT	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT	DTWN	Disable temperature warning	No	
SDLT	DMA	Formation Density Matrix	2.710	g/cc
SDLT	DFL	Formation Density Fluid	1.000	g/cc
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT	MLOK	Process MicroLog Outputs?	Yes	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	User define	
BSAT	DTMA	Delta -T Matrix	47.60	uspf
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wyllie	
ACRT	RTOK	Process ACRT?	Yes	
ACRT	MNSO	Minimum Tool Standoff	1.50	in
ACRT	TCS1	Temperature Correction Source	FP Lwr & FP Up	
ACRT	TPOS	Tool Position	Free Hanging	
ACRT	RMOP	Rmud Source	Mud Cell	
ACRT	RMIN	Minimum Resistivity for MAP	0.20	ohm m
ACRT	RMIN	Maximum Resistivity for MAP	200.00	ohm m
ACRT	THQY	Threshold Quality	0.50	

BOTTOM

Data: ELIZABETH_A_COX10001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIDLE

Date: 09-Jun-11 23:12:00

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INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay	Filter Type	Filter Length
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Membrane	Input Description	Depth Panel	(ft)	Filter Type	(ft)
TENS	Tension		0.00	NO	
SP Sub					
PLTC	Plot Control Mask		66.58	NO	
SP	Spontaneous Potential		66.58	BLK	1.250
SPR	Raw Spontaneous Potential		66.58	NO	
SPO	Spontaneous Potential Offset		66.58	NO	
GTET					
TPUL	Tension Pull		58.56	NO	
GR	Natural Gamma Ray API		58.56	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API		58.56	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution		58.56	W	1.416 , 0.750
ACCZ	Accelerometer Z		0.00	BLK	0.083
DEVI	Inclination		0.00	NO	
DSNT					
TPUL	Tension Pull		48.32	NO	
RNDS	Near Detector Telemetry Counts		48.42	BLK	1.417
RFDS	Far Detector Telemetry Counts		49.17	TRI	0.583
DNTT	DSN Tool Temperature		48.42	NO	
DSNS	DSN Tool Status		48.32	NO	
ERND	Near Detector Telemetry Counts EVR		48.42	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR		49.17	BLK	0.000
ENTM	DSN Tool Temperature EVR		48.42	NO	
SDLT					
TPUL	Tension Pull		38.41	NO	
NAB	Near Above		38.24	BLK	0.920
NHI	Near Cesium High		38.24	BLK	0.920
NLO	Near Cesium Low		38.24	BLK	0.920
NVA	Near Valley		38.24	BLK	0.920
NBA	Near Barite		38.24	BLK	0.920
NDE	Near Density		38.24	BLK	0.920
NPK	Near Peak		38.24	BLK	0.920
NLI	Near Lithology		38.24	BLK	0.920
NBAU	Near Barite Unfiltered		38.24	BLK	0.250
NLIU	Near Lithology Unfiltered		38.24	BLK	0.250
FAB	Far Above		38.58	BLK	0.250
FHI	Far Cesium High		38.58	BLK	0.250
FLO	Far Cesium Low		38.58	BLK	0.250
FVA	Far Valley		38.58	BLK	0.250
FBA	Far Barite		38.58	BLK	0.250
FDE	Far Density		38.58	BLK	0.250
FPK	Far Peak		38.58	BLK	0.250
FLI	Far Lithology		38.58	BLK	0.250
PTMP	Pad Temperature		38.42	BLK	0.920
NHV	Near Detector High Voltage		35.60	NO	
FHV	Far Detector High Voltage		35.60	NO	
ITMP	Instrument Temperature		35.60	NO	
DDHV	Detector High Voltage		35.60	NO	
TPUL	Tension Pull		38.42	NO	
PCAL	Pad Caliper		38.42	TRI	0.250
ACAL	Arm Caliper		38.42	TRI	0.250
TPUL	Tension Pull		38.42	NO	

TPUL	Tension Pull	38.60	NO	
MINV	Microlog Lateral	38.60	BLK	0.750
MNOR	Microlog Normal	38.60	BLK	0.750

BSAT

TPUL	Tension Pull	27.09	NO	
STAT	Status	27.09	NO	
DLYT	Delay Time	27.09	NO	
SI	Sample Interval	27.09	NO	
TXRX	Raw Telemetry 10 Receivers	27.09	NO	
FRMC	Tool Frame Count	27.09	NO	

ACRT

TPUL	Tension Pull	2.97	NO	
F1R1	ACRT 12KHz - 80in R value	9.22	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	9.22	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.72	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.72	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	5.22	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	5.22	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	4.22	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	4.22	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.72	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.72	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.47	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.47	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	9.22	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	9.22	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.72	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.72	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	5.22	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	5.22	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	4.22	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	4.22	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.72	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.72	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.47	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.47	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	9.22	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	9.22	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.72	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.72	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	5.22	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	5.22	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	4.22	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	4.22	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.72	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.72	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.47	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.47	BLK	0.000
RMUD	Mud Resistivity	12.76	BLK	0.000
F1RT	Transmitter Reference 12 KHz Real Signal	2.97	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.97	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.97	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.97	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.97	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.97	BLK	0.000

FSX I	Transmitter Reference 72 KHZ Imaginary Signal	2.97	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.97	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.97	BLK	0.000
ITMP	Instrument Temperature	2.97	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.97	NO	
TIDV	Instrument Temperature Derivative	2.97	NO	
TUDV	Upper Temperature Derivative	2.97	NO	
TLDV	Lower Temperature Derivative	2.97	NO	
TRBD	Receiver Board Temperature	2.97	NO	

Data: ELIZABETH_A_COX10001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIDLE Date: 09-Jun-11 23:11:21

COMPANY	OXY USA INC		
WELL	ELIZABETH A COX #5		
FIELD	LEMON NW		
COUNTY	HASKELL	STATE	KANSAS
HALLIBURTON		BORE HOLE COMPENSATED SONIC ARRAY LOG	