HALLIBURTON

BOREHOLE COMPENSATED SONIC ARRAY LOG

RAMSEY PROPERTY MANAGEMENT | HOLT #1 | VERDE | BACA | COLORADO

COMPANY / WELL / FIELD/BLOCK / COUNTY / STATE

COMPANY **RAMSEY PROPERTY MANAGEMENT**

WELL **HOLT #1**

FIELD/BLOCK **VERDE**

COUNTY **BACA** STATE **COLORADO**

API No. 05-009-06676

Location (SHL) 215' FSL & 397' FWL

Sect. 31 Twp. 34S Rge. 42W

Other Services:
MICROLOG
DSNT, SDLT
ACRT

Permanent Datum	GL	Elev. 3640.0 ft	Elev.: K.B. 3650.0 ft
Log measured from	KB	10.0 ft above perm. Datum	D.F. 3649.0 ft
Drilling measured from	KB		G.L. 3640.0 ft

Date		16-Sep-13					
Run No.		ONE					
Depth - Driller		4800.00 ft					
Depth - Logger		4792.0 ft					
Bottom - Logged Interval		4765.0 ft					
Top - Logged Interval		1386.0 ft					
Casing - Driller		8.625 in @ 1391.0 ft		@		@	
Casing - Logger		1386.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	9.2 ppg	36.00 s/qt				
PH	Fluid Loss	9.00 pH	8.8 cptm				
Source of Sample		MUD PIT					
Rm @ Meas. Temperature		2.200 ohmm @ 75.00 degF		@		@	
Rmf @ Meas. Temperature		1.50 ohmm @ 75.00 degF		@		@	
Rmc @ Meas. Temperature		3.100 ohmm @ 75.00 degF		@		@	
Source Rmf	Rmc	MEASURED	MEASURED				
Rm @ BHT		1.41 ohmm @ 121.0 degF		@		@	
Time Since Circulation		5.0 hr					
Time on Bottom		16-Sep-13 07:07					
Max. Rec. Temperature		121.0 degF @ 4792.0 ft		@		@	
Equipment	Location	11072142	LIBERAL				
Recorded By		J. BOLLOM					
Witnessed By		C. ANDREWS					

Fold here

Service Ticket No.: 900741439 API Serial No.: 05-009-06676 PGM Version: WL INSITE R3.8.4 (Build 5)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

Date	Sample No.				
Depth-Driller					
Type Fluid in Hole					
Density	Viscosity				
Ph	Fluid Loss				
Source of Sample					
Rm @ Meas. Temp		@	@	@	@
Rmf @ Meas. Temp.		@	@	@	@
Rmc @ Meas. Temp.		@	@	@	@
Source Rmf	Rmc				
Rm @ BHT		@	@	@	@
Rmf @ BHT		@	@	@	@
Rmc @ BHT		@	@	@	@

RESISTIVITY SCALE CHANGES

	Type Log	Depth	Scale Up Hole	Scale Down Hole

RESISTIVITY EQUIPMENT DATA

	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
	@				
	@				
	@				
	@				
	@				
	@				

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.		Run No.	
Serial No.	11048627	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	6"	Log Type		Log Type	
Type	SCINT			Source Type		Source Type	
Length	8'	LSA [Y/N]	NO	Serial No.		Serial No.	
Distance to Source	10'	FWDA [Y/N]	NO	Strength		Strength	

LOGGING DATA

GENERAL			GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	4792	1386	REC	0	150	30	-10	47.6						

DIRECTIONAL INFORMATION

Maximum Deviation @	KOP @

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING

CHLORIDES REPORTED AT 800 MG/L

LCM REPORTED AT 4 LB/BBL

GTET-DSNT-SDLT-BSAT-ACRT RUN IN COMBINATION

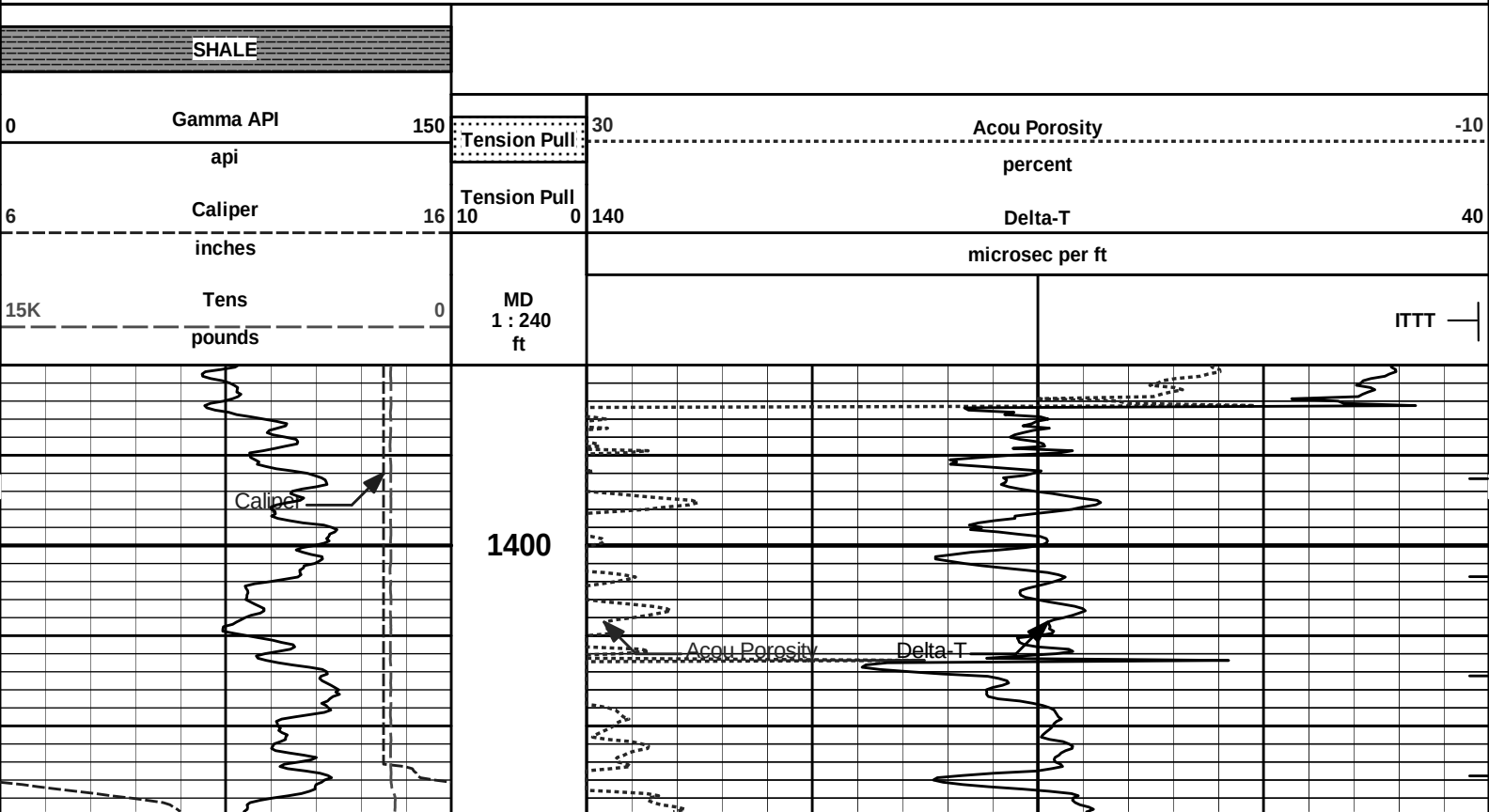
TODAY'S CREW: M. GRAHAM & R. DODD

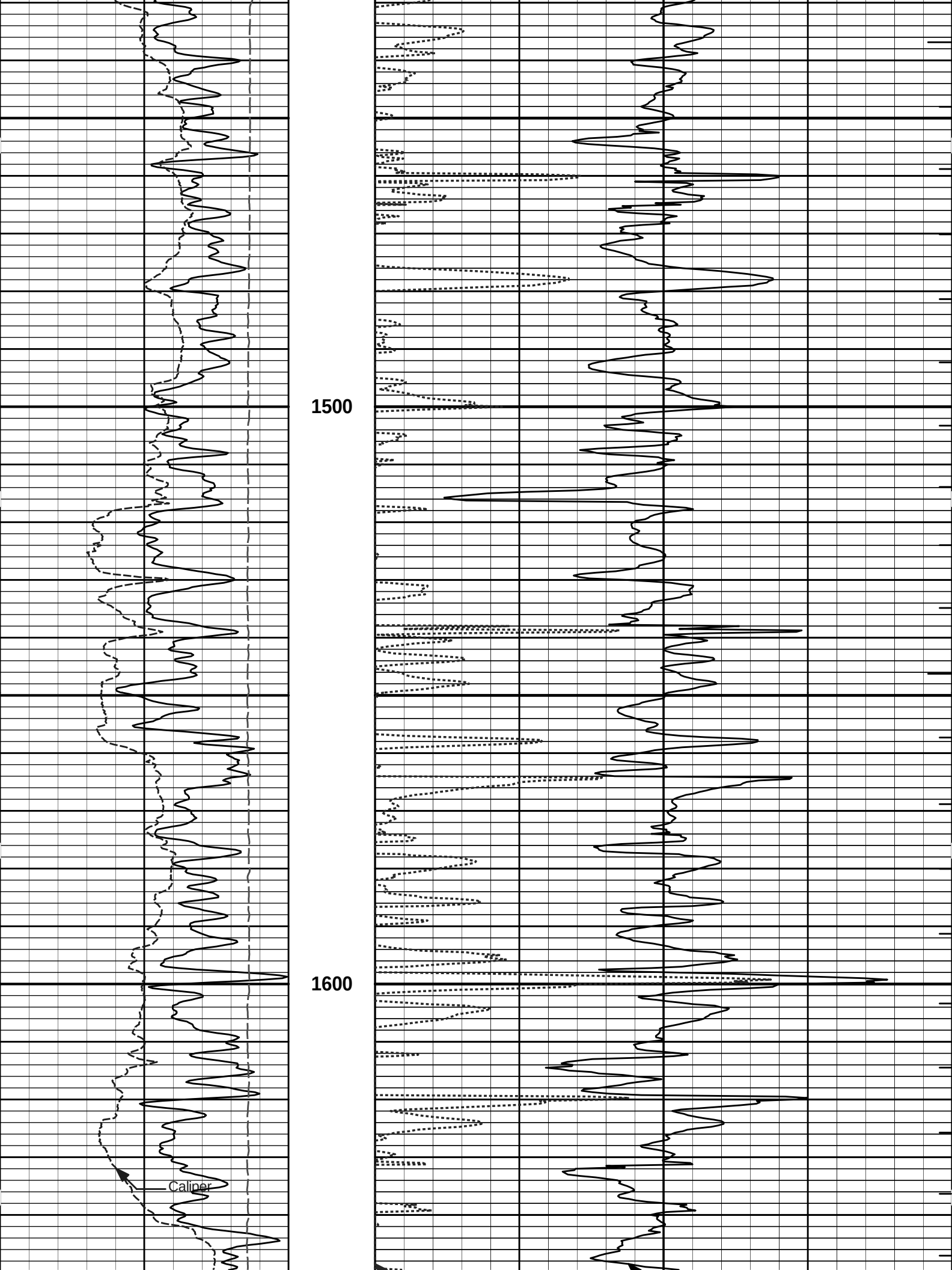
THANK OU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KS. 620-624-8123

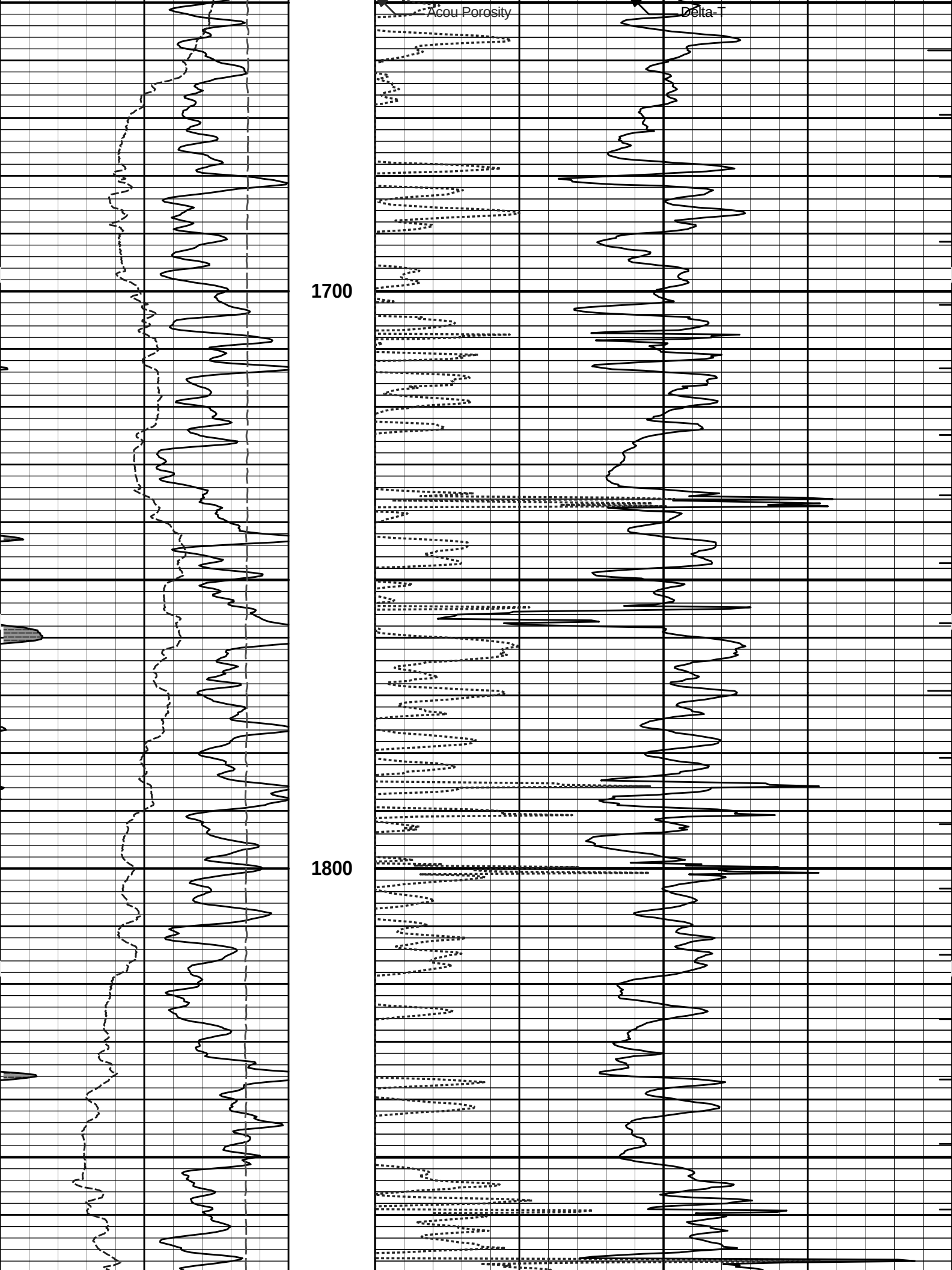
HALLIBURTON

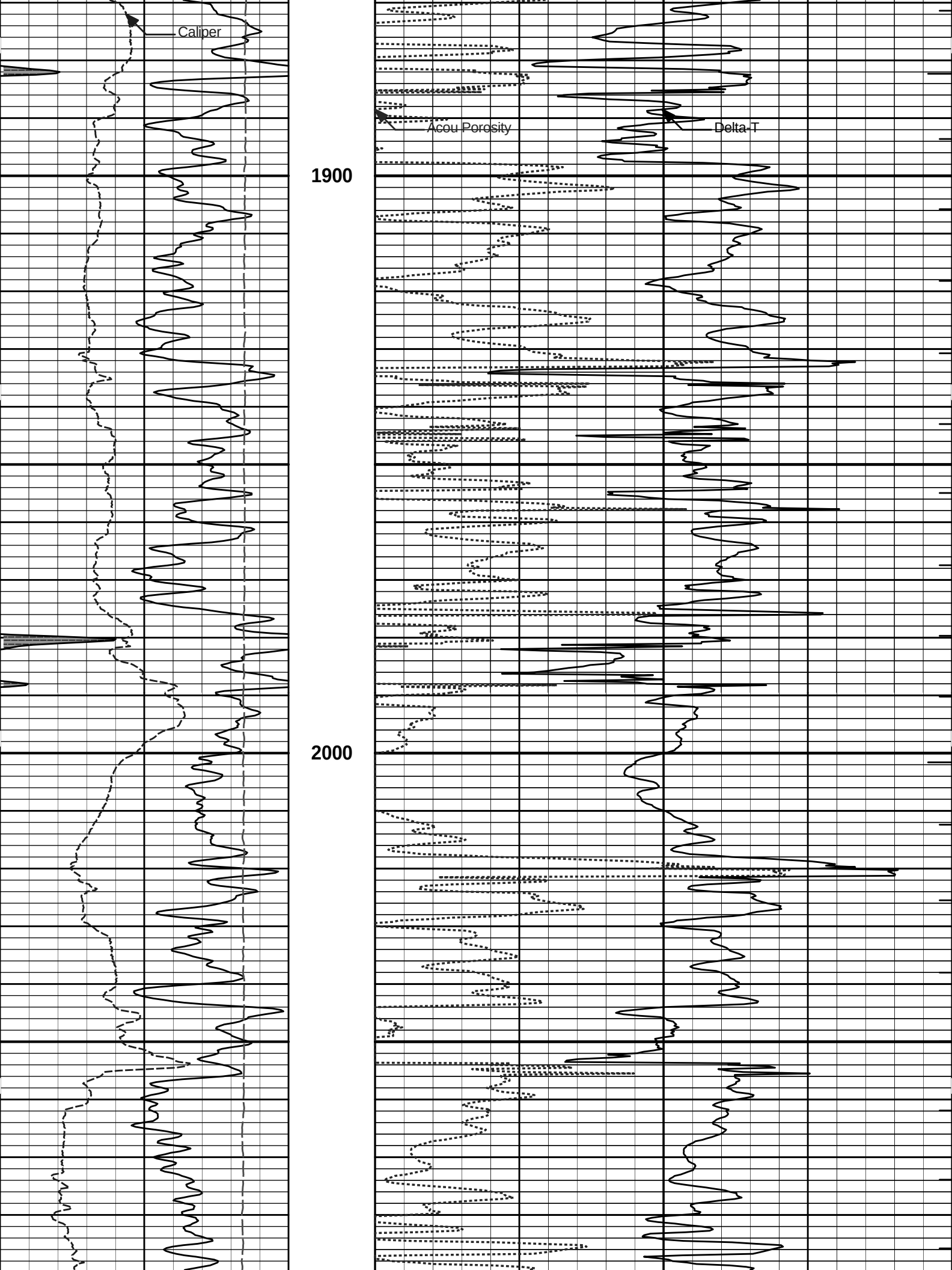
Plot Time: 16-Sep-13 08:04:27
Plot Range: 1380 ft to 4794.75 ft
Data: HOLT_1\Well Based\CASING
Plot File: \\BSAT\BSAT_5_MAIN_LIB

5 INCH MAIN LOG




1500
1600
Caliper


Acou Porosity
Delta-T
1700
1800


Caliper
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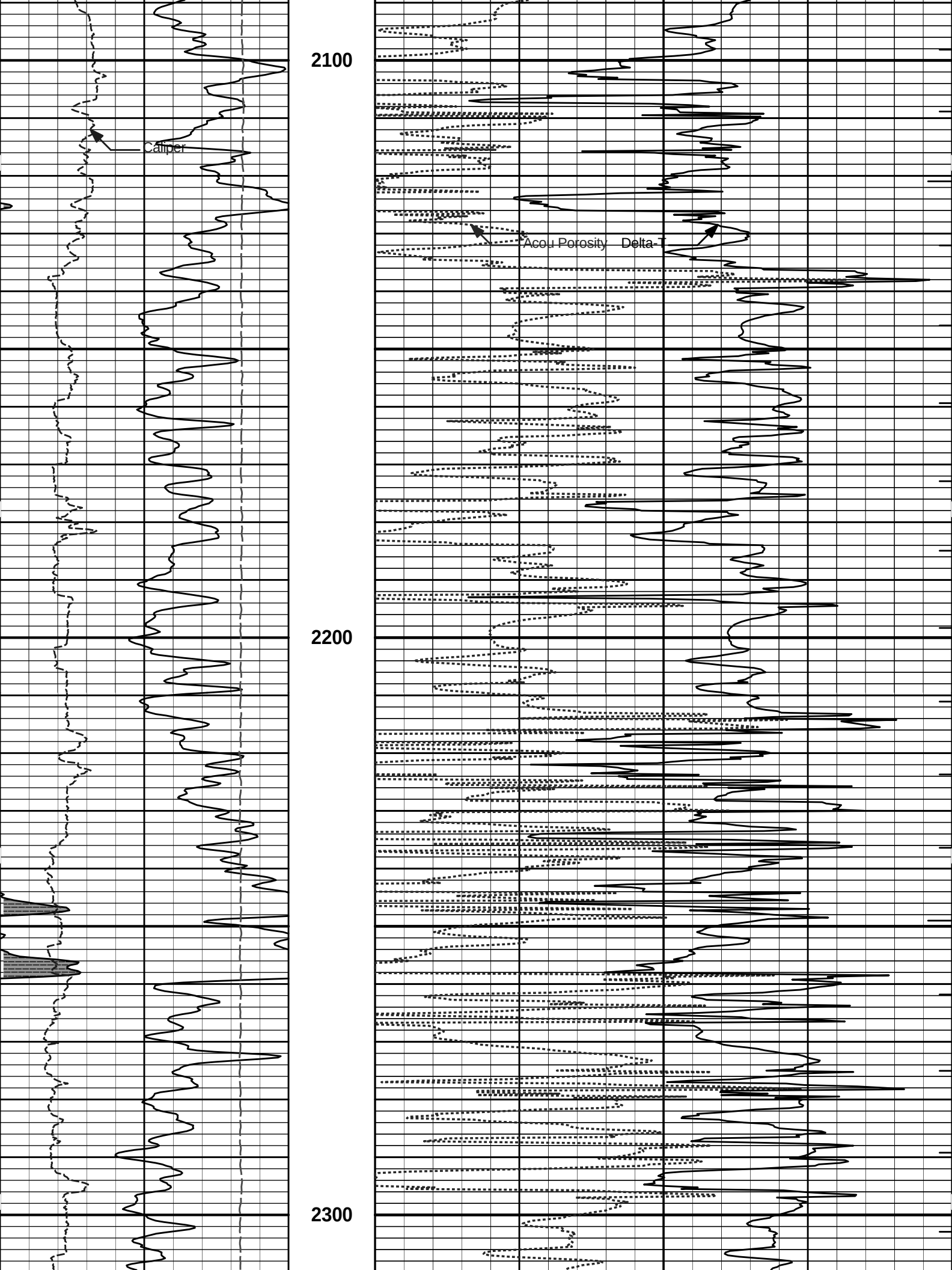
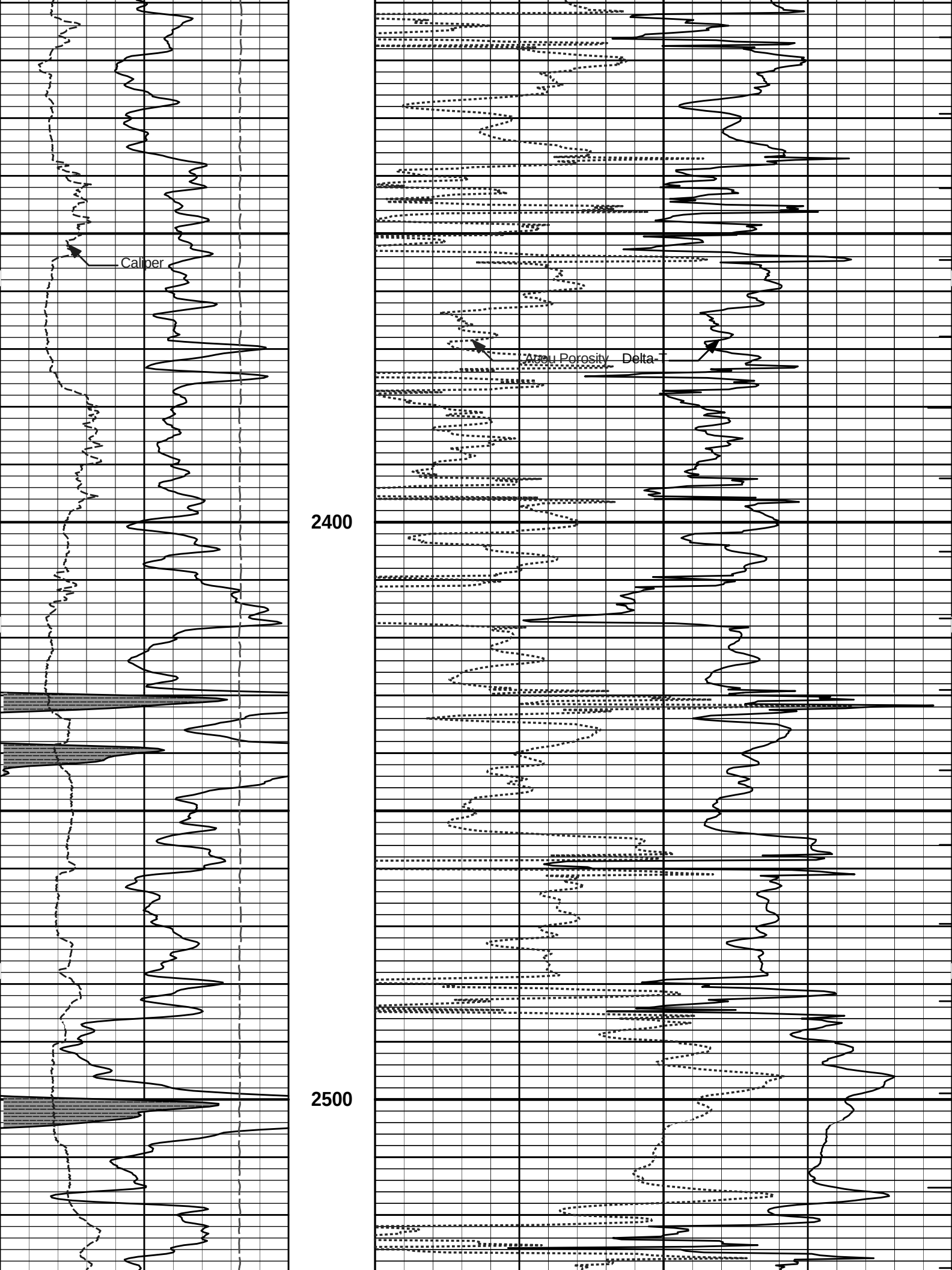
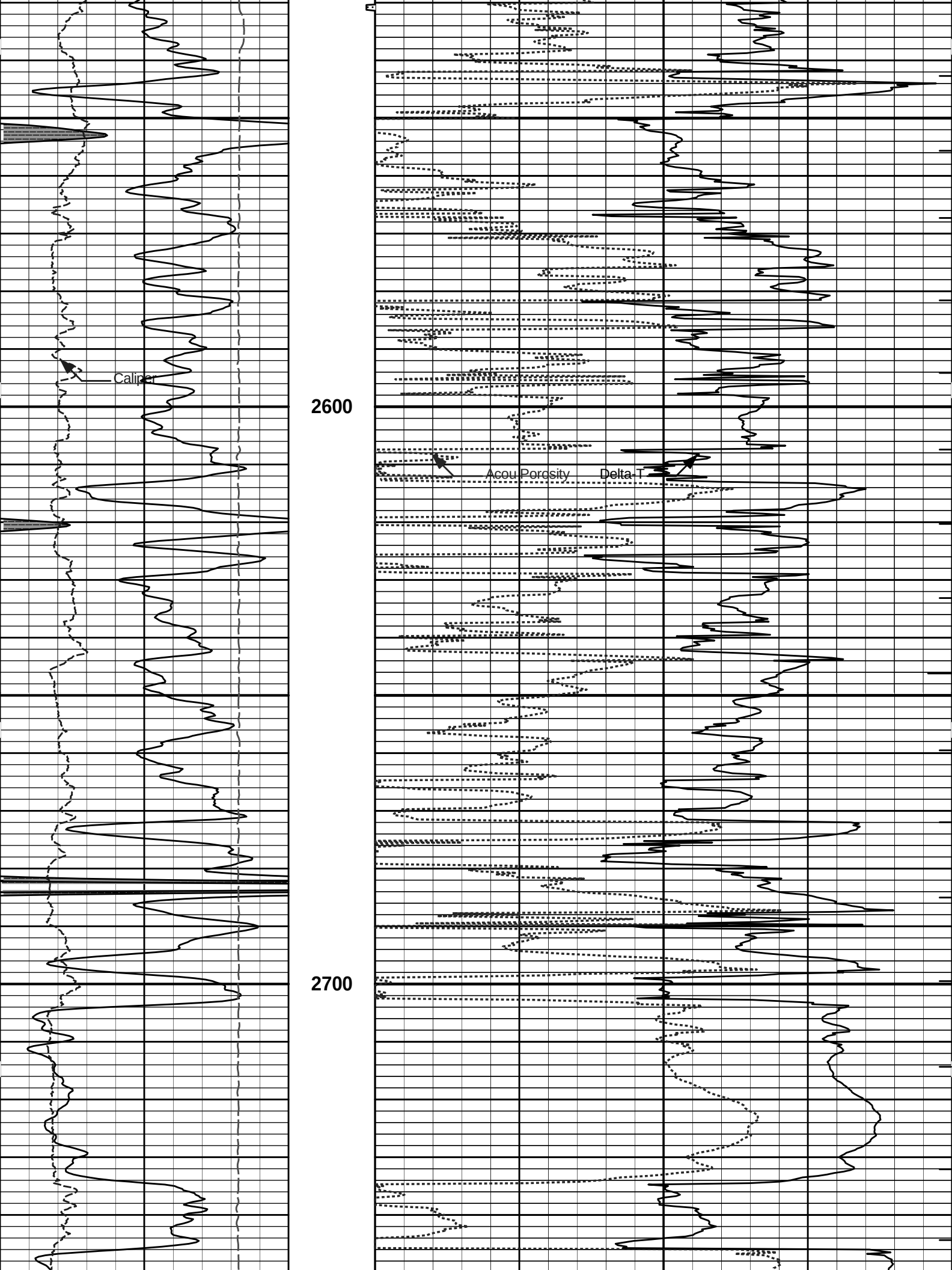
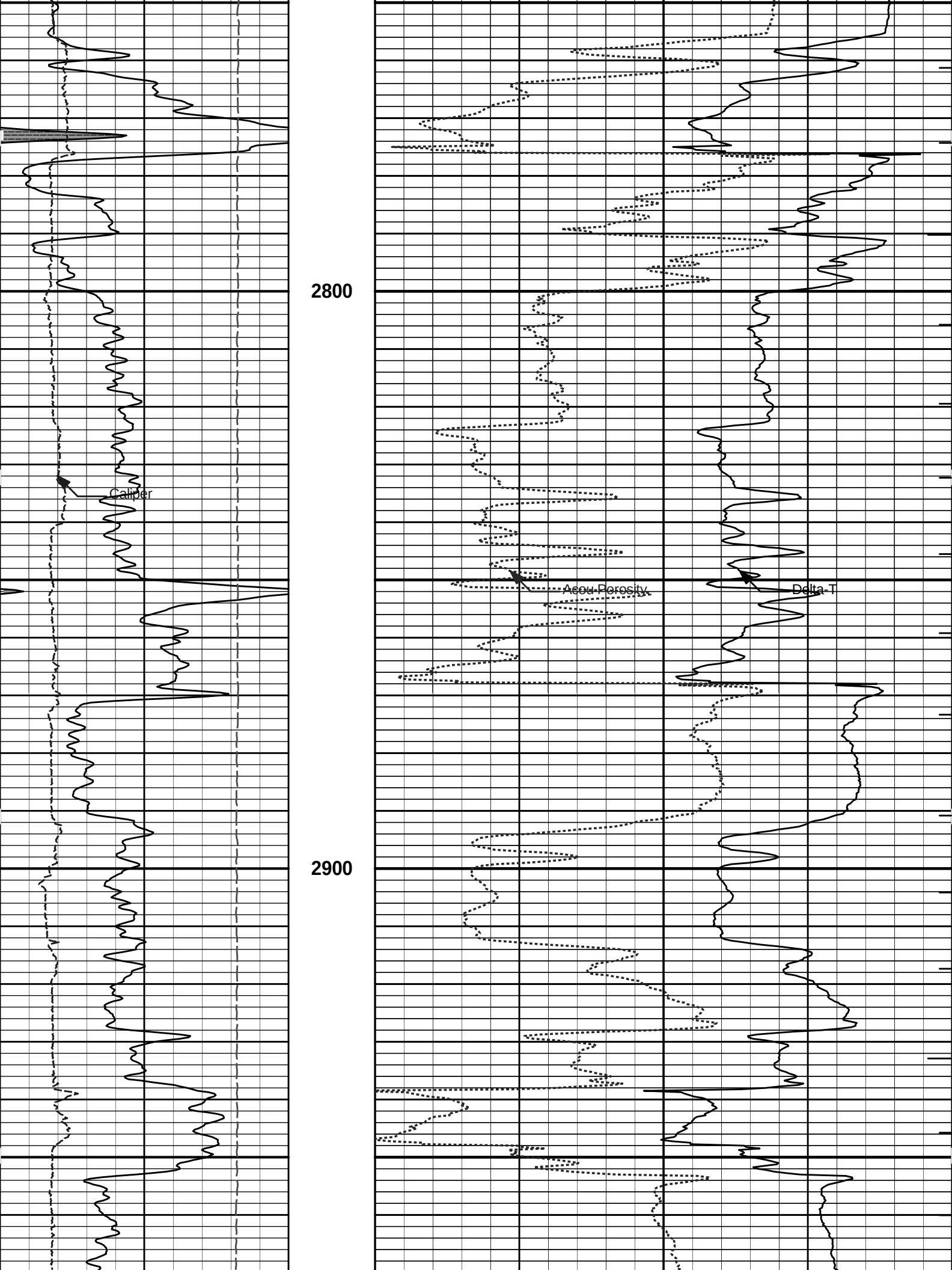
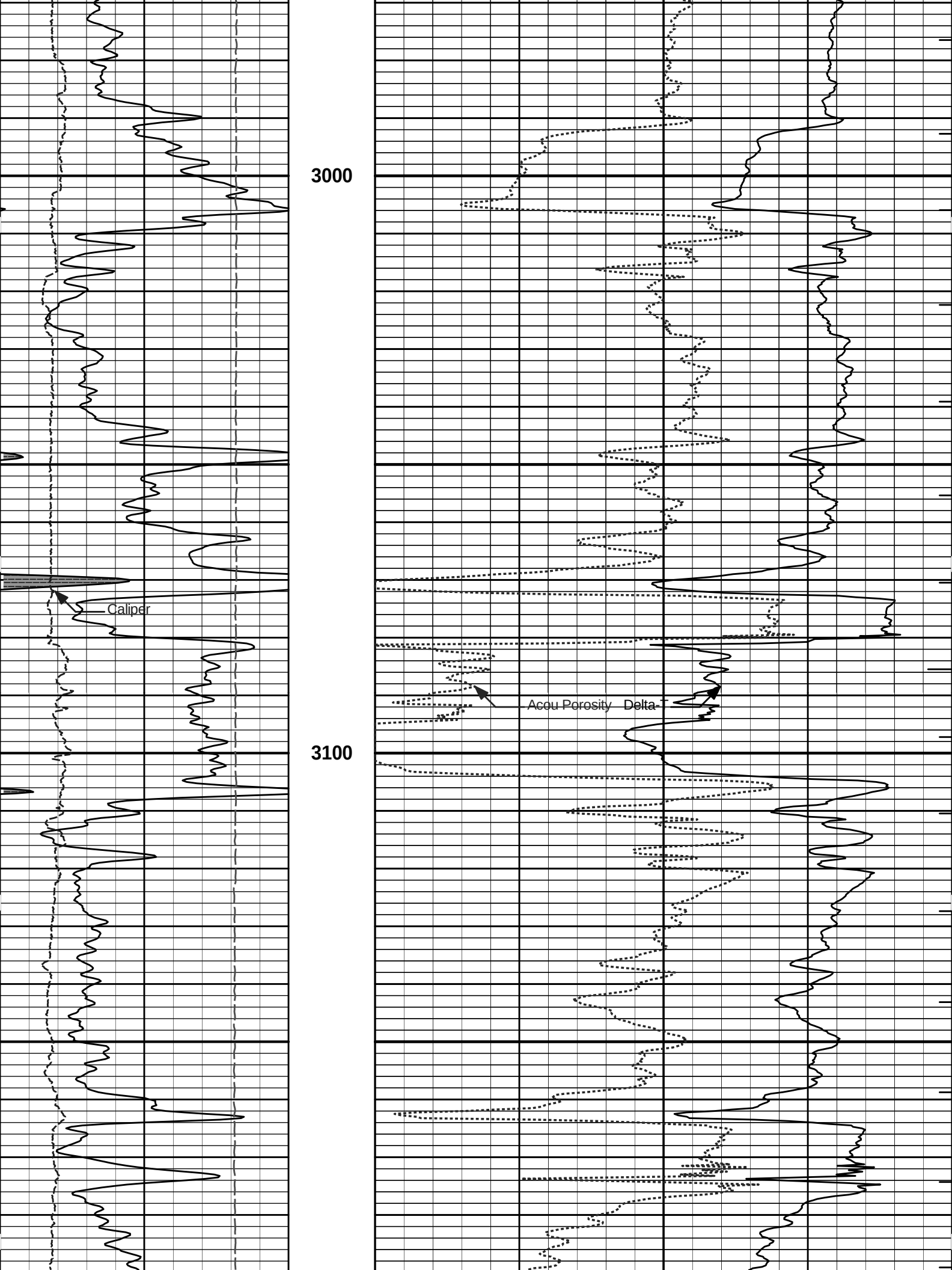
Delta-T
1900
2000

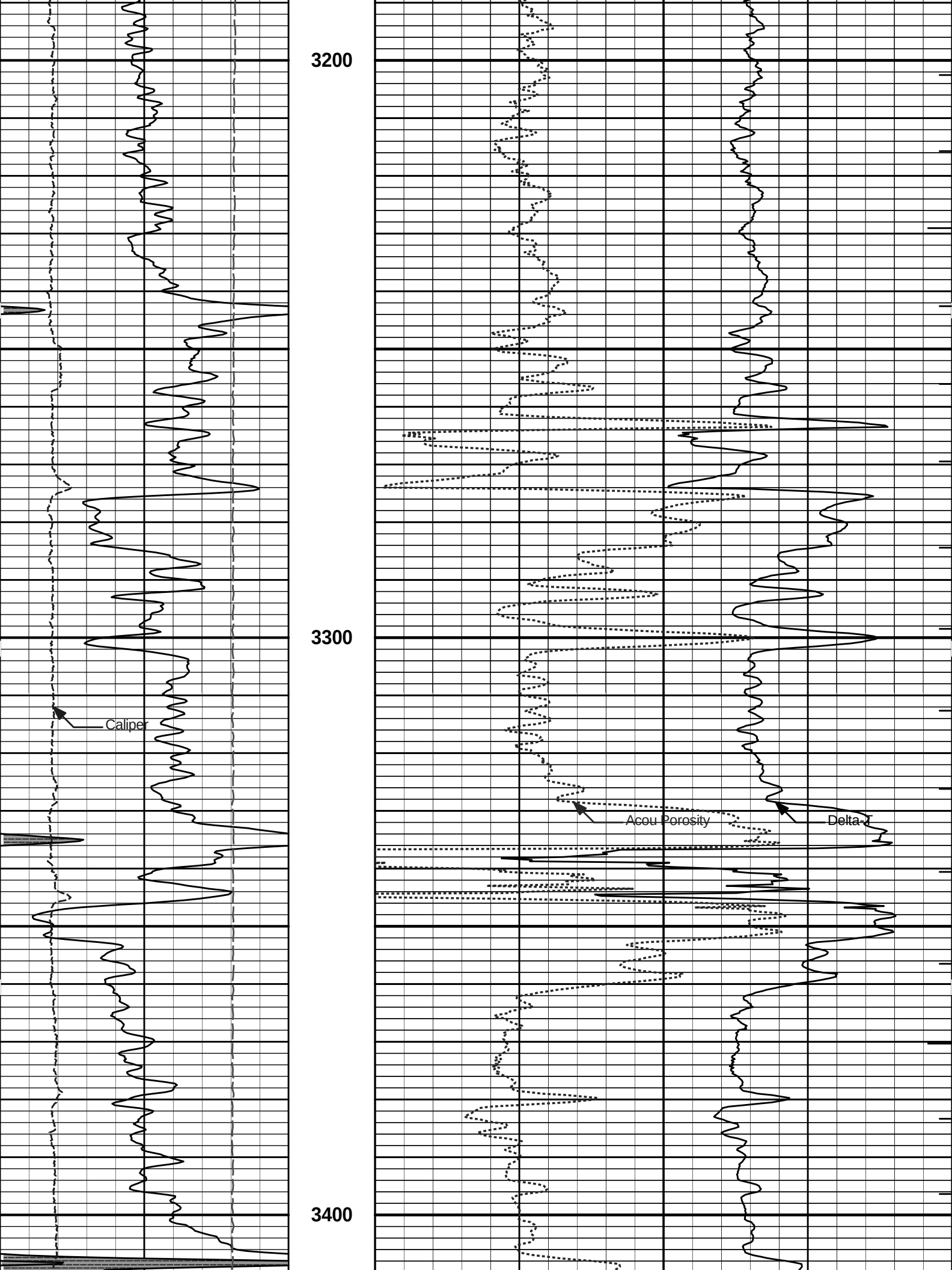

2100
2200
2300
Caliper
Acou Porosity
Delta-T

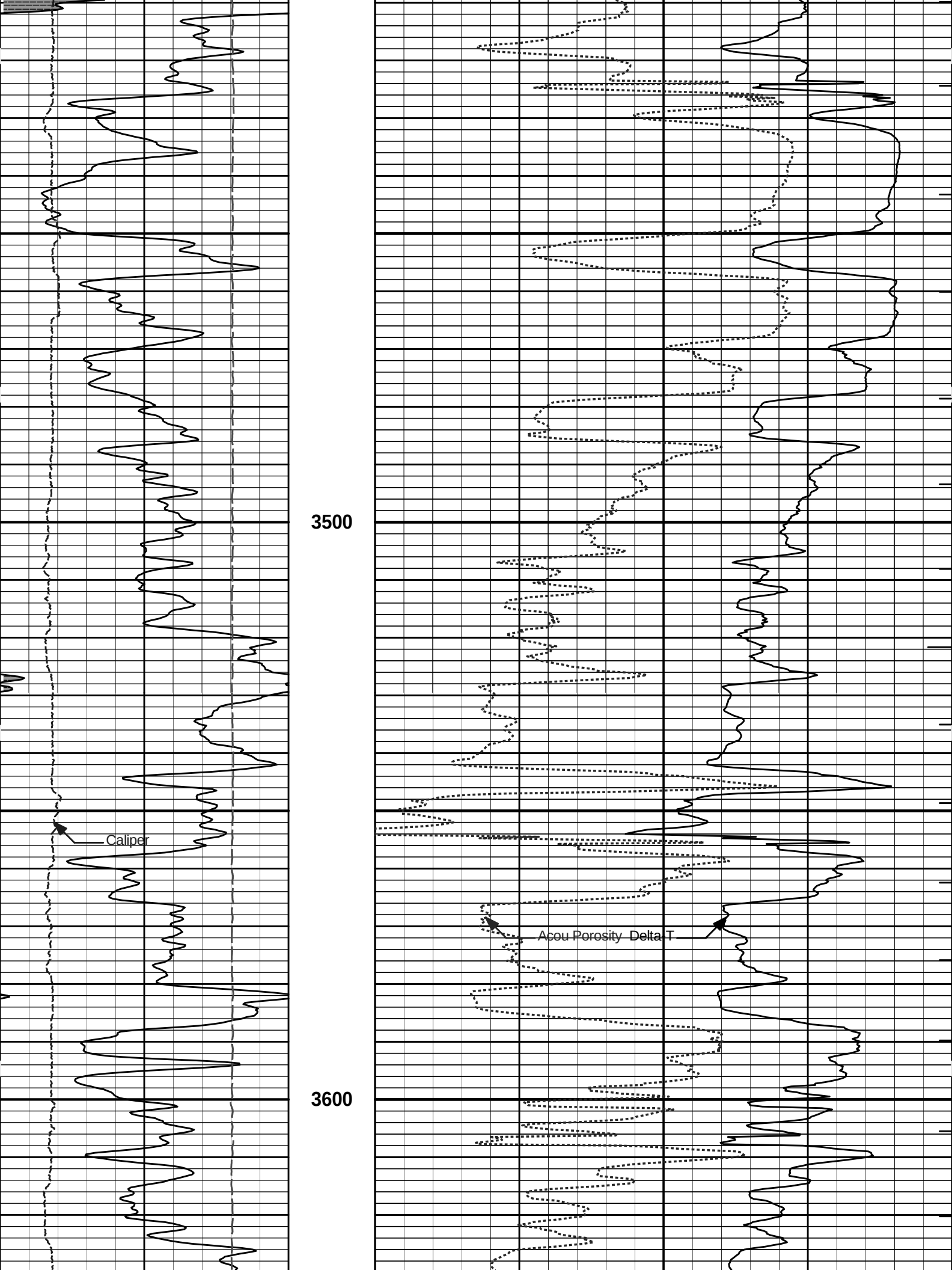

Caliper
Atoll Porosity
Delta-T
2400
2500

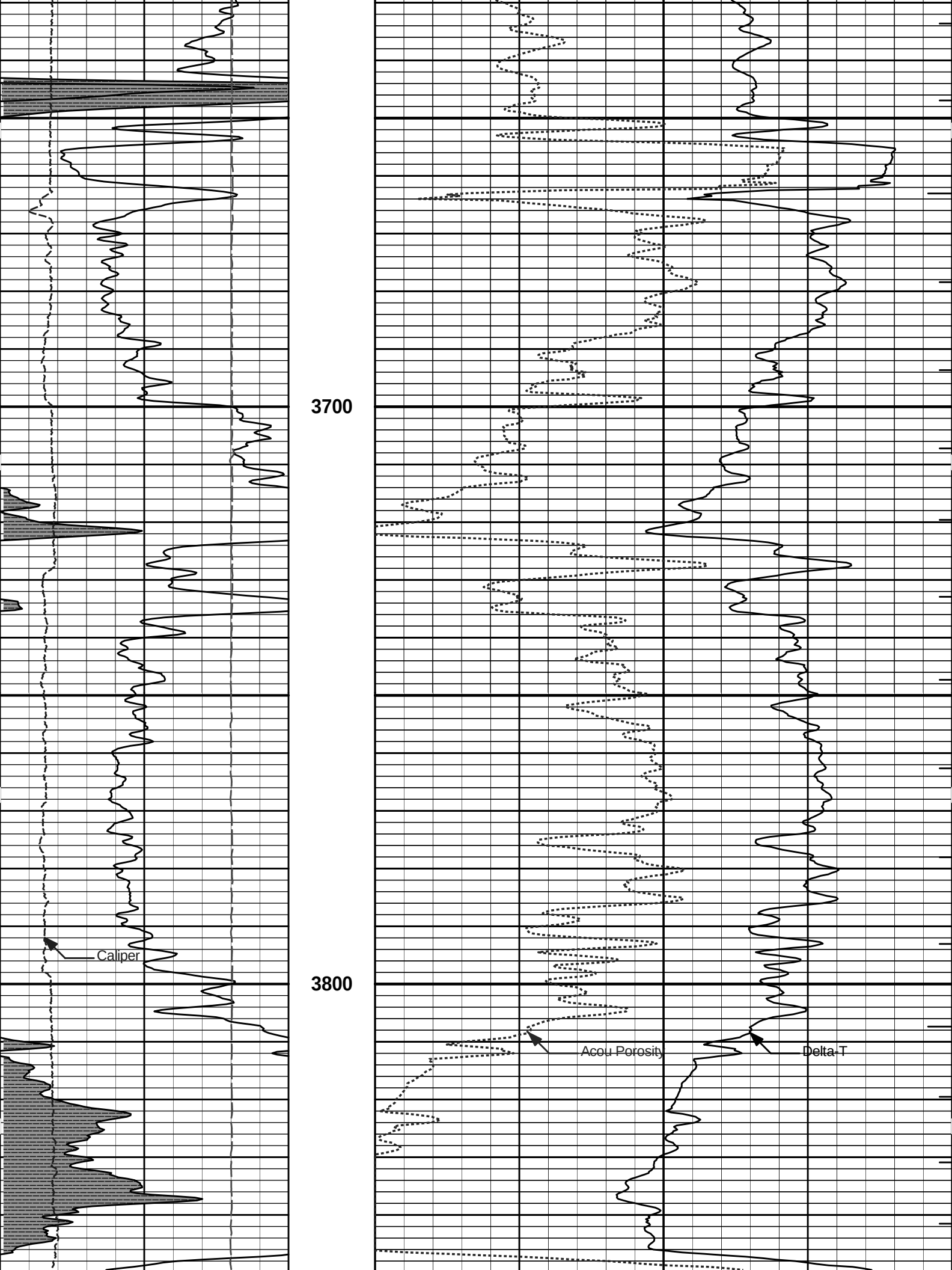

Caliper
2600
Acou Porosity
Delta-T
2700

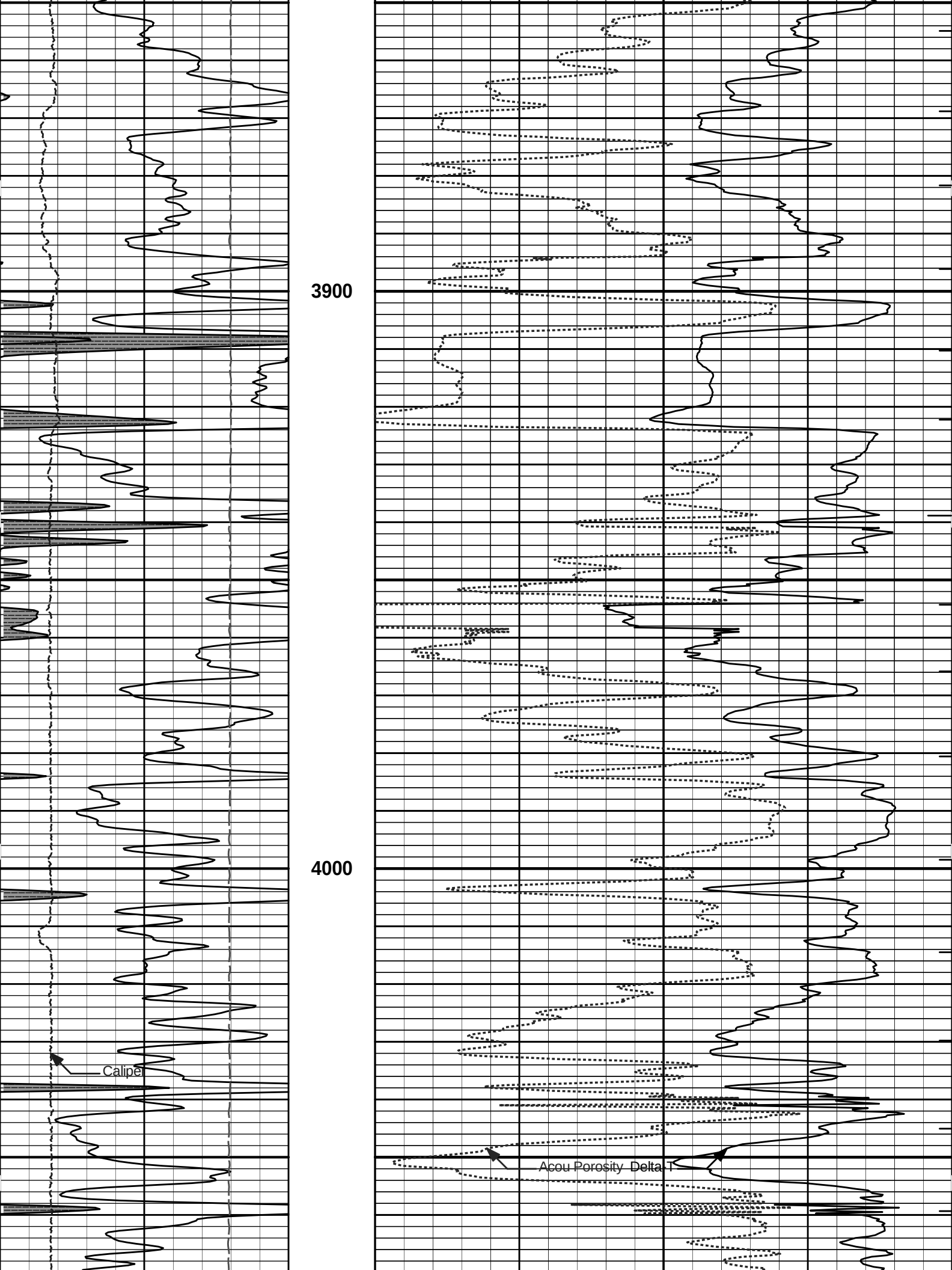

2800
Caliper
Acou-Porosity
Delta-T
2900

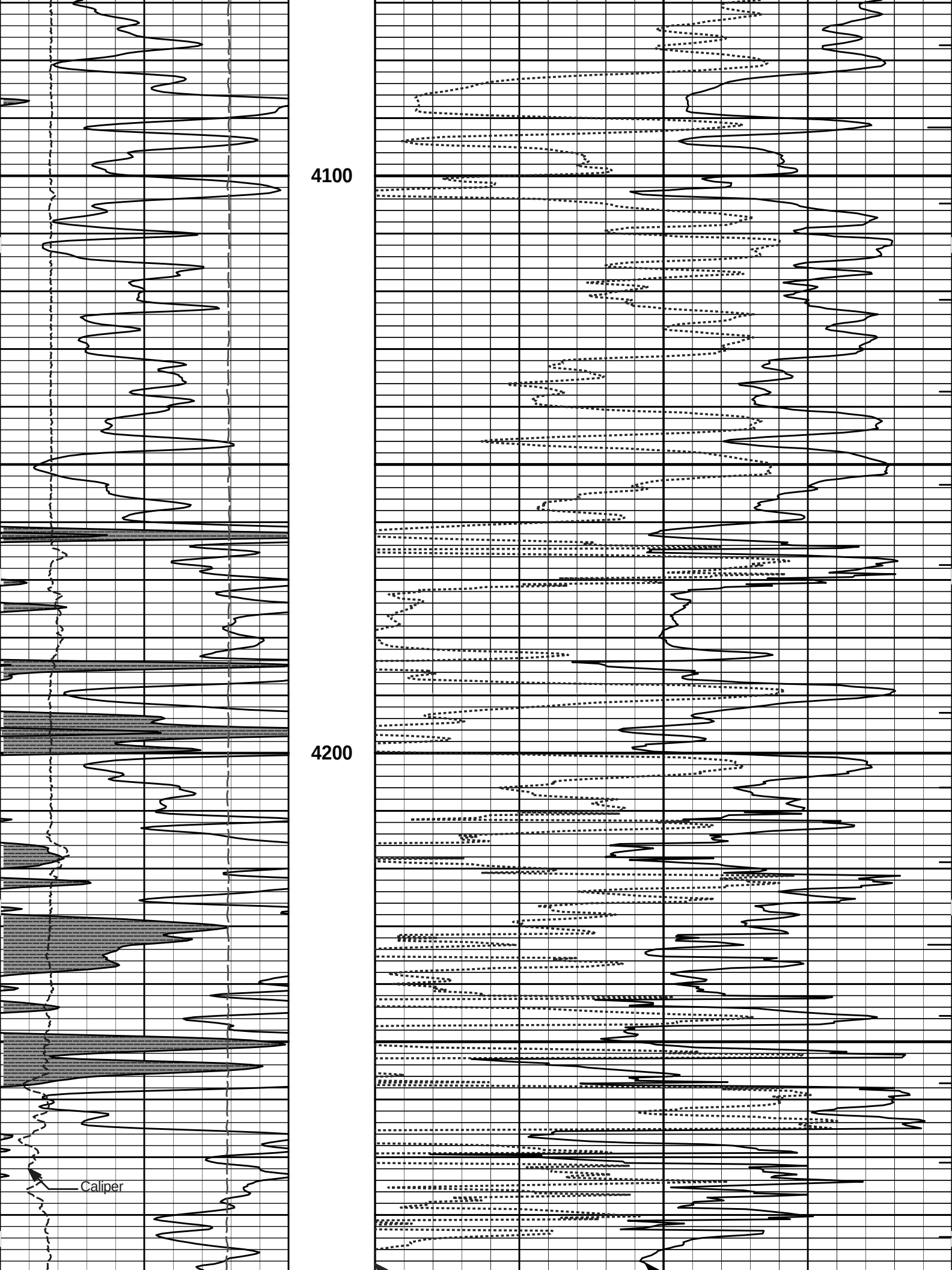

3000
Caliper
Acou Porosity
Delta-T
3100

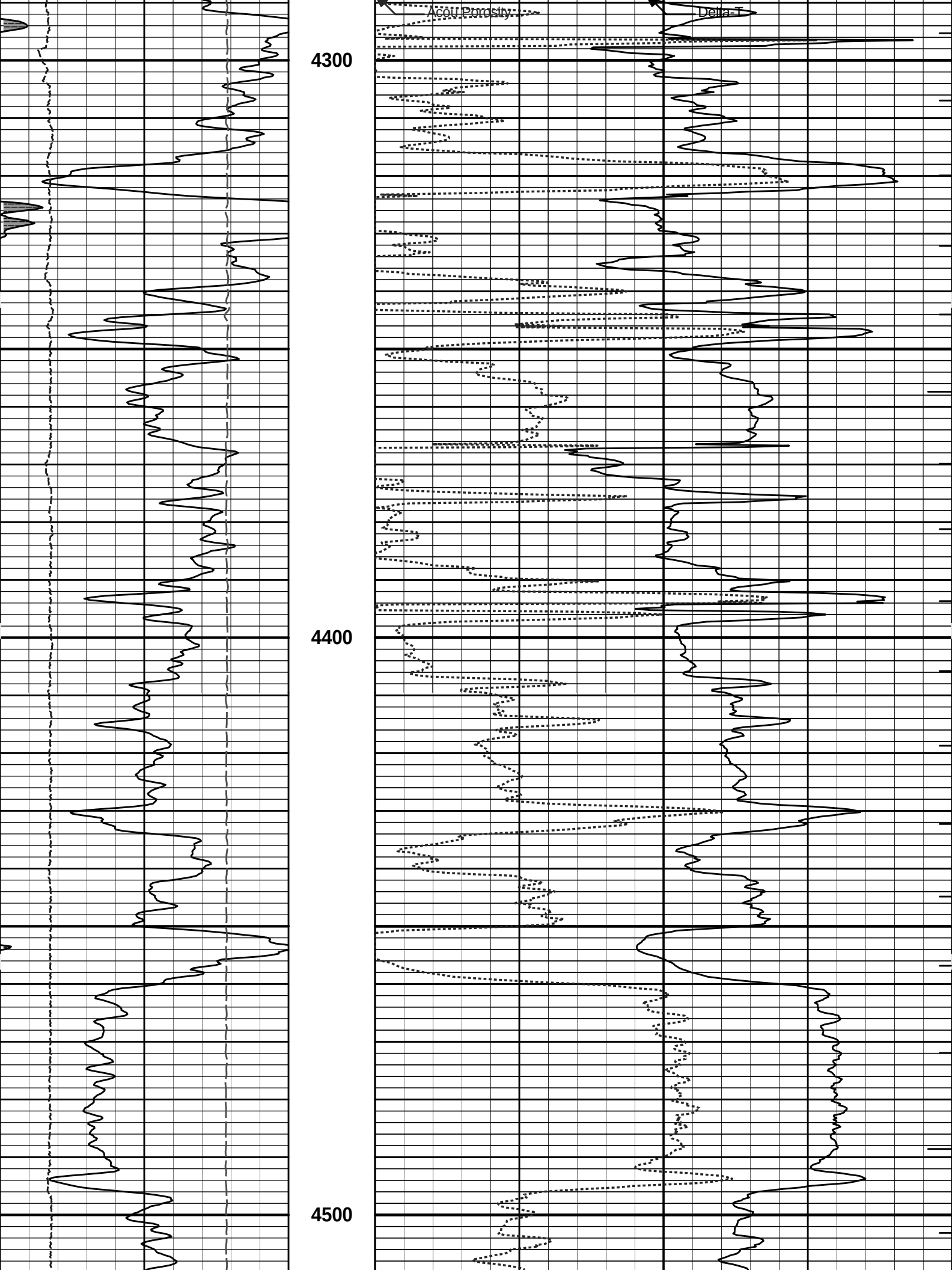

3200
3300
3400
Caliper
Acou Porosity
Delta-T

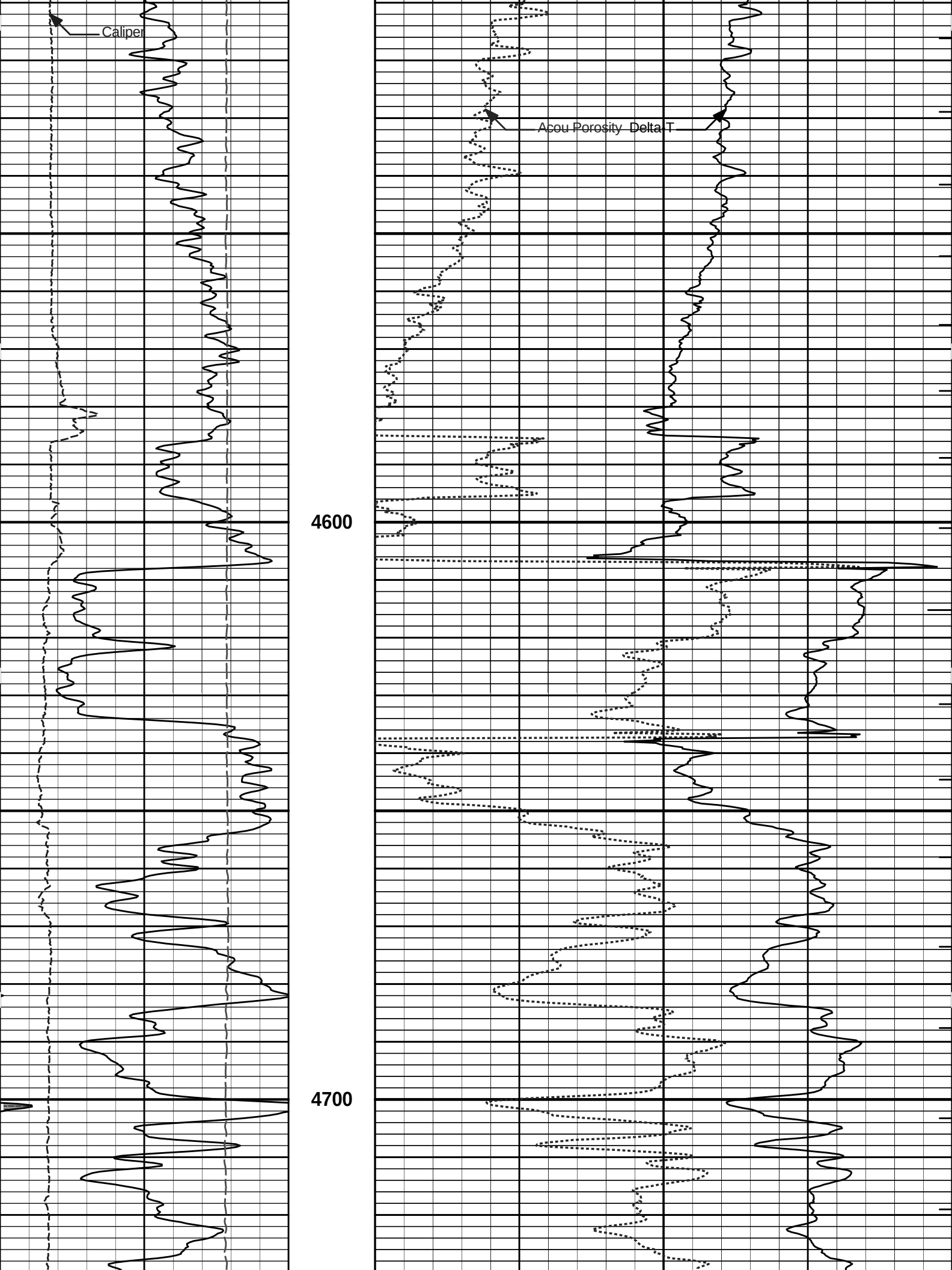

3500
3600
Caliper
Acou Porosity
Delta-T

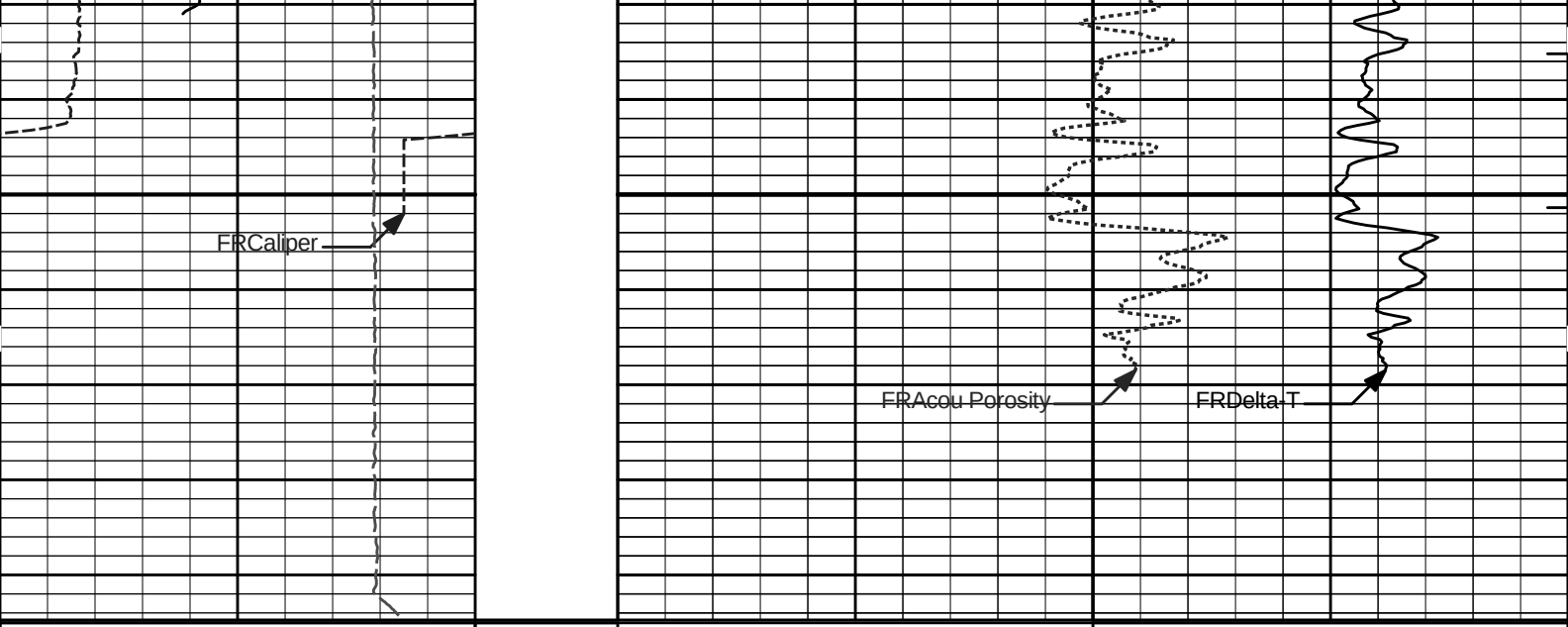

3700
3800
Caliper
Acou Porosity
Delta-T


3900
4000
Caliper
Acou Porosity Delta-T


4100
4200
Caliper


Acou Porosity
Delta-T
4300
4400
4500


Caliper
Acou Porosity Delta-T
4600
4700



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

MD
1 : 240
ft

Tension Pull
10 0
Tension Pull

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

HALLIBURTON

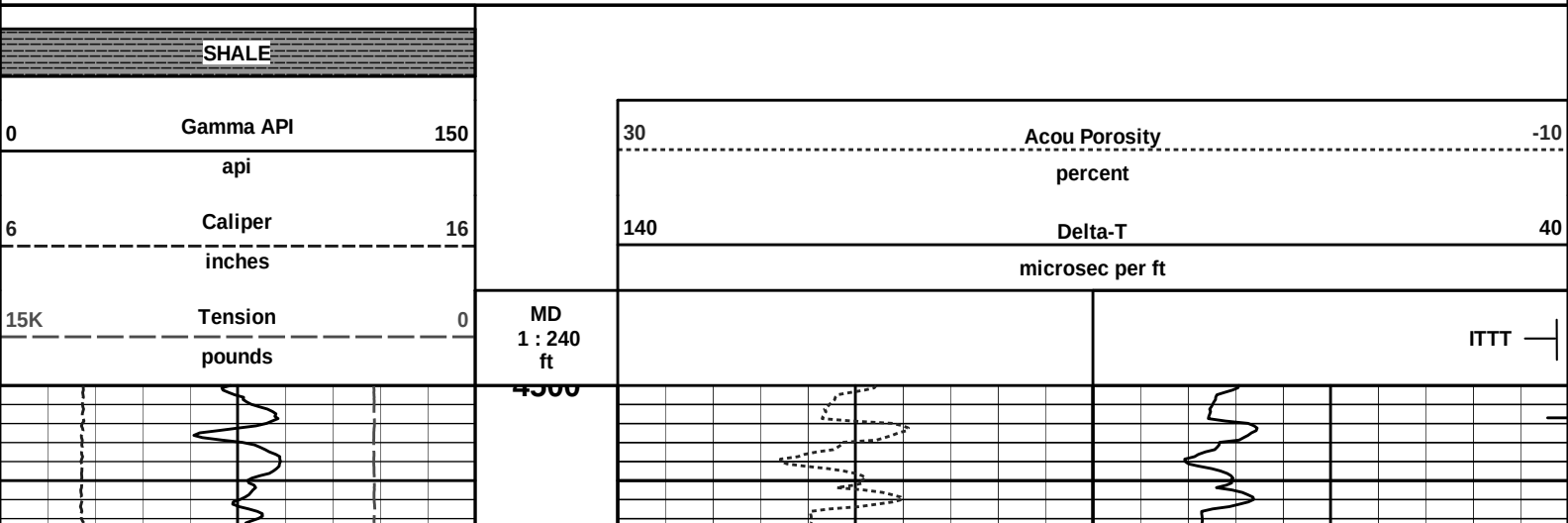
Plot Time: 16-Sep-13 08:04:31
Plot Range: 1380 ft to 4794.75 ft
Data: HOLT_1\Well Based\CASING\
Plot File: \\BSAT\BSAT_5_MAIN_LIB

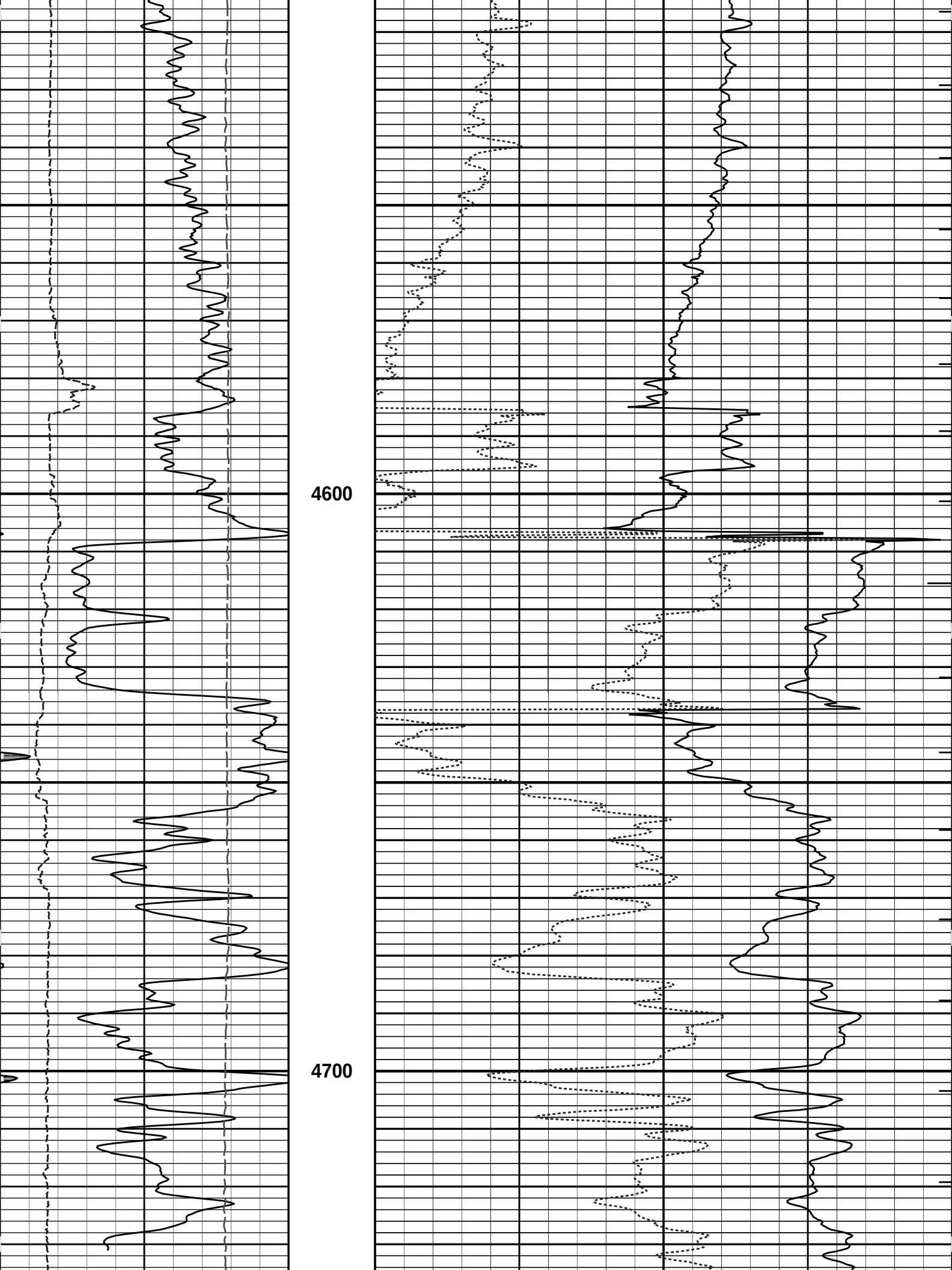
5 INCH MAIN LOG

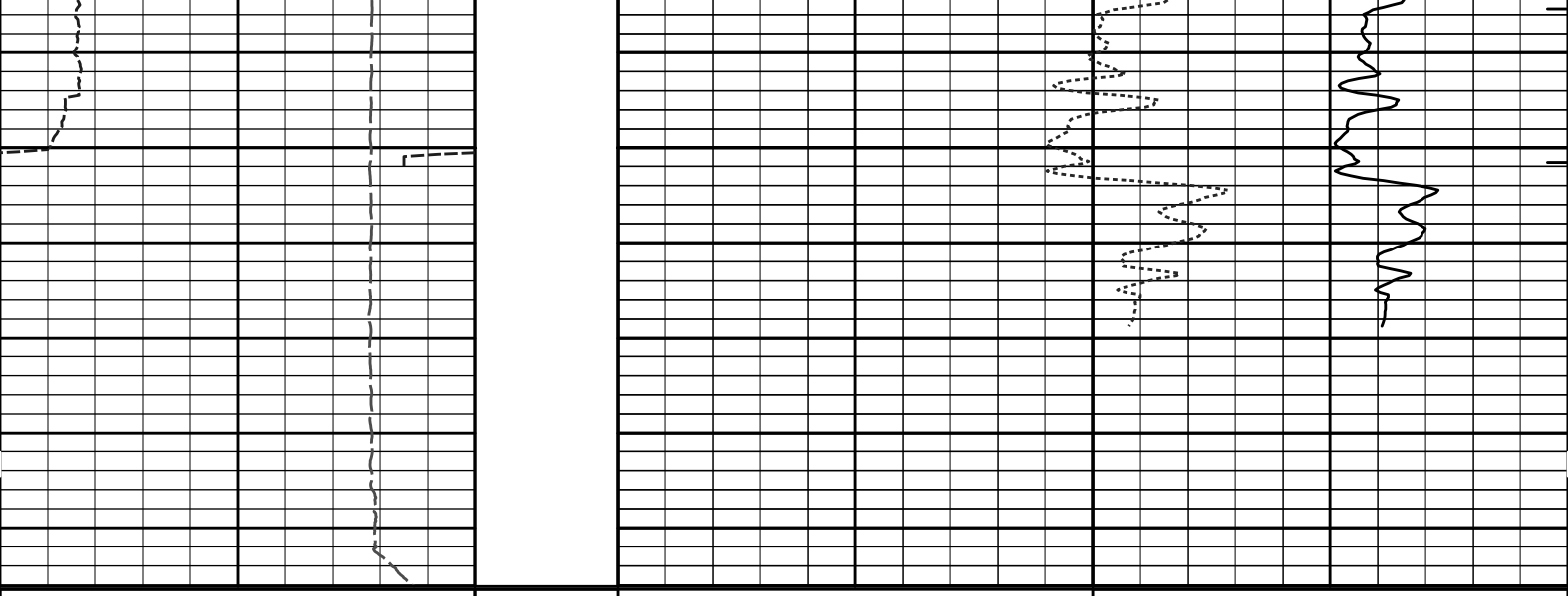
HALLIBURTON

Plot Time: 16-Sep-13 08:04:31
Plot Range: 4500 ft to 4796.17 ft
Data: HOLT_1\Well Based\REPEAT\
Plot File: \\BSAT\BSAT_5_REP_LIB

REPEAT SECTION




4600
4700



15K	Tension (pounds)	0	
6	Caliper (inches)	16	
0	Gamma API (api)	150	
	SHALE		

MD
1 : 240
ft

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

HALLIBURTON

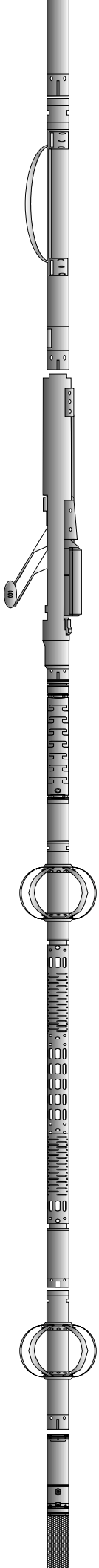
Plot Time: 16-Sep-13 08:04:32
Plot Range: 4500 ft to 4796.17 ft
Data: HOLT_1\Well Based\REPEAT\
Plot File: \\BSAT\BSAT_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						80.04 ft
RWCH-12156658 135.00 lbs		Ø 3.625 in		Load Cell @ 76.35 ft BH Temperature @ 75.79 ft	6.25 ft	
						73.79 ft
SP Sub-11441455 60.00 lbs		Ø 3.625 in		SP @ 72.01 ft	3.74 ft	
						70.05 ft
GTET-11048627 165.00 lbs		Ø 3.625 in			8.52 ft	



GammaRay @ 63.99 ft

61.53 ft

DSN Decentralizer-10755066
6.60 lbs

Ø 5.000 in*

DSNT-11019643
174.00 lbs

Ø 3.625 in

9.69 ft

DSN Far @ 54.59 ft

DSN Near @ 53.84 ft

51.84 ft

SDLT-10950489
360.00 lbs

Ø 4.500 in

10.81 ft

SDLT Pad-10844781
65.00 lbs

Microlog Pad-10950489
8.00 lbs

Ø 4.750 in*

Ø 4.750 in*

Microlog @ 44.03 ft

SDL Caliper @ 43.84 ft

SDL @ 43.83 ft

41.03 ft

IQ Flex-00000696
140.00 lbs

Ø 3.625 in

5.67 ft

35.36 ft

Centralizer 25-00000027
8.00 lbs

Ø 4.000 in*

BSAT-10747683
300.00 lbs

Ø 3.625 in

15.77 ft

Sonic Receivers @ 26.84 ft

19.58 ft

Centralizer 25-00000029
8.00 lbs

Ø 4.000 in*

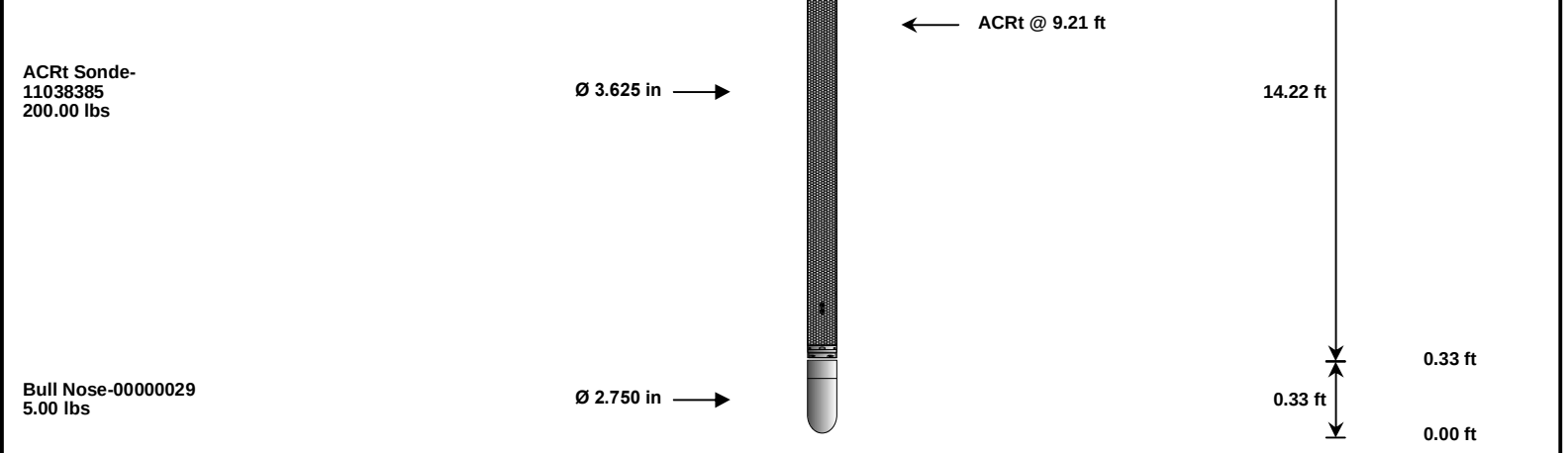
ACRt Instrument-11055059
50.00 lbs

Ø 3.625 in

5.03 ft

14.55 ft

Mud Resistivity @ 13.19 ft



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	12156658	135.00	6.25		73.79	300.00
SP	SP Sub	11441455	60.00	3.74		70.05	300.00
GTET	Gamma Telemetry Tool	11048627	165.00	8.52		61.53	60.00
DSNT	Dual Spaced Neutron	11019643	174.00	9.69		51.84	60.00
DCNT	DSN Decentralizer	10755066	6.60	5.13	*	55.17	300.00
SDLT	Spectral Density Tool	10950489	360.00	10.81		41.03	60.00
MICP	Microlog Pad	10950489	8.00	1.00	*	43.53	60.00
SDLP	Density Insite Pad	10844781	65.00	2.55	*	43.24	60.00
IQF	IQ Flex tool	00000696	140.00	5.67		35.36	300.00
BSAT	Borehole Sonic Array Tool	10747683	300.00	15.77		19.58	60.00
OBCEN	Centralizer - 25 in. Overbody	00000027	8.00	2.08	*	32.52	300.00
ACRt	Array Compensated True Resistivity Instrument Section	11055059	50.00	5.03		14.55	300.00
OBCEN	Centralizer - 25 in. Overbody	00000029	8.00	2.08	*	16.39	300.00
ACRt	Array Compensated True Resistivity Sonde Section	11038385	200.00	14.22		0.33	300.00
BLNS	Bull Nose	00000029	5.00	0.33		0.00	300.00
Total			**1,684.60**	**80.04**			

* Not included in Total Length and Length Accumulation.

Data: HOLT_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE **Date: 16-Sep-13 06:19:15**

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	9.200	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	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	75.0	degF
	SHARED	TD	Total Well Depth	4800.00	ft
	SHARED	BHT	Bottom Hole Temperature	200.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	

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.	Eccentered	
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	
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	Wylie	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
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

HALLIBURTON

INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
	Depth Panel			
TENS	Tension	0.00	NO	
	RWCH			
DHTN	DownholeTension	0.00	BLK	0.000
	SP Sub			
PLTC	Plot Control Mask	72.01	NO	
SP	Spontaneous Potential	72.01	BLK	1.250
SPR	Raw Spontaneous Potential	72.01	NO	
SPO	Spontaneous Potential Offset	72.01	NO	
	GTET			
TPUL	Tension Pull	63.99	NO	
GR	Natural Gamma Ray API	63.99	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	63.99	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	63.99	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
	DSNT			
TPUL	Tension Pull	53.74	NO	
RNDS	Near Detector Telemetry Counts	53.84	BLK	1.417
RFDS	Far Detector Telemetry Counts	54.59	TRI	0.583
DNTT	DSN Tool Temperature	53.84	NO	
DSNS	DSN Tool Status	53.74	NO	
ERND	Near Detector Telemetry Counts EVR	53.84	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	54.59	BLK	0.000
ENTM	DSN Tool Temperature EVR	53.84	NO	
	SDLT			
TPUL	Tension Pull	43.84	NO	
PCAL	Pad Caliper	43.84	TRI	0.250
ACAL	Arm Caliper	43.84	TRI	0.250
	BSAT			
TPUL	Tension Pull	26.84	NO	
STAT	Status	26.84	NO	
DLYT	Delay Time	26.84	NO	
SI	Sample Interval	26.84	NO	
TXRX	Raw Telemetry 10 Receivers	26.84	NO	
FRMC	Tool Frame Count	26.84	NO	
GMOD	Gain processing mode	19.58	NO	
	ACRt Sonde			
TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000

F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	4.98	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	4.98	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	3.98	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	3.98	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.48	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.48	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.23	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.23	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	8.98	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	8.98	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.48	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.48	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	4.98	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	4.98	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	3.98	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	3.98	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.48	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.48	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.23	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter Current Raw 12K X Receiver	2.73	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.73	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.73	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.73	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.73	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.73	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.73	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.73	BLK	0.000
ITMP	Instrument Temperature	2.73	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.73	NO	
TIDV	Instrument Temperature Derivative	2.73	NO	
TUDV	Upper Temperature Derivative	2.73	NO	
TLDV	Lower Temperature Derivative	2.73	NO	
TRBD	Receiver Board Temperature	2.73	NO	

	SDLT Pad			
TPUL	Tension Pull	43.83	NO	
NAB	Near Above	43.66	BLK	0.920
NHI	Near Cesium High	43.66	BLK	0.920

NLO	Near Cesium Low	43.66	BLK	0.920
NVA	Near Valley	43.66	BLK	0.920
NBA	Near Barite	43.66	BLK	0.920
NDE	Near Density	43.66	BLK	0.920
NPK	Near Peak	43.66	BLK	0.920
NLI	Near Lithology	43.66	BLK	0.920
NBAU	Near Barite Unfiltered	43.66	BLK	0.250
NLIU	Near Lithology Unfiltered	43.66	BLK	0.250
FAB	Far Above	44.01	BLK	0.250
FHI	Far Cesium High	44.01	BLK	0.250
FLO	Far Cesium Low	44.01	BLK	0.250
FVA	Far Valley	44.01	BLK	0.250
FBA	Far Barite	44.01	BLK	0.250
FDE	Far Density	44.01	BLK	0.250
FPK	Far Peak	44.01	BLK	0.250
FLI	Far Lithology	44.01	BLK	0.250
PTMP	Pad Temperature	43.84	BLK	0.920
NHV	Near Detector High Voltage	43.24	NO	
FHV	Far Detector High Voltage	43.24	NO	
ITMP	Instrument Temperature	43.24	NO	
DDHV	Detector High Voltage	43.24	NO	

Microlog Pad

TPUL	Tension Pull	44.03	NO	
MINV	Microlog Lateral	44.03	BLK	0.750
MNOR	Microlog Normal	44.03	BLK	0.750

Data: HOLT_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE **Date: 16-Sep-13 06:23:34**

COMPANY	**RAMSEY PROPERTY MANAGEMENT**		
WELL	**HOLT #1**		
FIELD	**VERDE**		
COUNTY	**BACA**	STATE	**COLORADO**

HALLIBURTON

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