HALLIBURTON

MICROLOG

COMPANY **WOOLSEY OPERATING**

WELL **LANDWEHR A-1**

FIELD

COUNTY **HARPER** STATE **KANSAS**

API No. 15-077-21714

Location 990' FNL' & 990 FEL

Other Services:
DSNT/SDLT
ACRT
WSTT/IDT

Sect. 20 Twp. 33S Rge. 9W

Permanent Datum	GL	Elev. 1347.0 ft	Elev.: K.B. 1356.0 ft
Log measured from	KB	, 9.0 ft above perm. Datum	D.F. 1355.0 ft
Drilling measured from	KB		G.L. 1347.0 ft

Date		20-Nov-10					
Run No.		1					
Depth - Driller		5050.00 ft					
Depth - Logger		5053.0 ft					
Bottom - Logged Interval		5030.0 ft					
Top - Logged Interval		1500.0 ft					
Casing - Driller		10.750 in @ 245.0 ft		@		@	
Casing - Logger		243.0 ft					
Bit Size		8.625 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	9.2 ppg	50.00 s/qt				
PH	Fluid Loss	9.50 pH	9.6 cptm				
Source of Sample		MUD PIT					
Rm @ Meas. Temperature		0.740 ohmm @ 60.00 degF		@		@	
Rmf @ Meas. Temperature		0.63 ohmm @ 60.00 degF		@		@	
Rmc @ Meas. Temperature		0.890 ohmm @ 60.00 degF		@		@	
Source Rmf	Rmc	MEAS.	MEAS.				
Rm @ BHT		0.09 ohmm @ 115.0 degF		@		@	
Time Since Circulation		3.0 hr					
Time on Bottom		20-Nov-10 04:49					
Max. Rec. Temperature		115.0 degF @ 5053.0 ft		@		@	
Equipment	Location	10546696	LIBERAL				
Recorded By		J. BOSH					
Witnessed By		C.COVEY					

Fold here

Service Ticket No.: 7786295 API Serial No.: 15-077-21714 PGM Version: WL INSITE R3.2.0 (Build 7)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

RESISTIVITY SCALE CHANGES

	Sample No.	Type Log	Depth	Scale Up Hole	Scale Down Hole
Date					
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 EQUIPMENT DATA

	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
	@				
	@	ONE	MICRO P81	RUBBER	ADJ.	N/A
	@				
	@				
	@				
	@				

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.		Run No.	
Serial No.	11039640	Serial No.		Serial No.		Serial No.	
Model No.	GTET	Model No.		Model No.		Model No.	
Diameter	3.625	No. of Cent.		Diameter		Diameter	
Detector Model No.	T-102	Spacing		Log Type		Log Type	
Type	SCINT			Source Type		Source Type	
Length	8"	LSA [Y/N]		Serial No.		Serial No.	
Distance to Source	10'	FWDA [Y/N]		Strength		Strength	

LOGGING DATA

GENERAL GAMMA ACOUSTIC DENSITY NEUTRON

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	1500	5030	REC	0	150									

DIRECTIONAL INFORMATION

Maximum Deviation @	KOP @

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 4.5 INCH CASING

CHLORIDES: 4500 PPM

GPS COORDINATES: LAT: 37º9' N LONG: 98º18' W

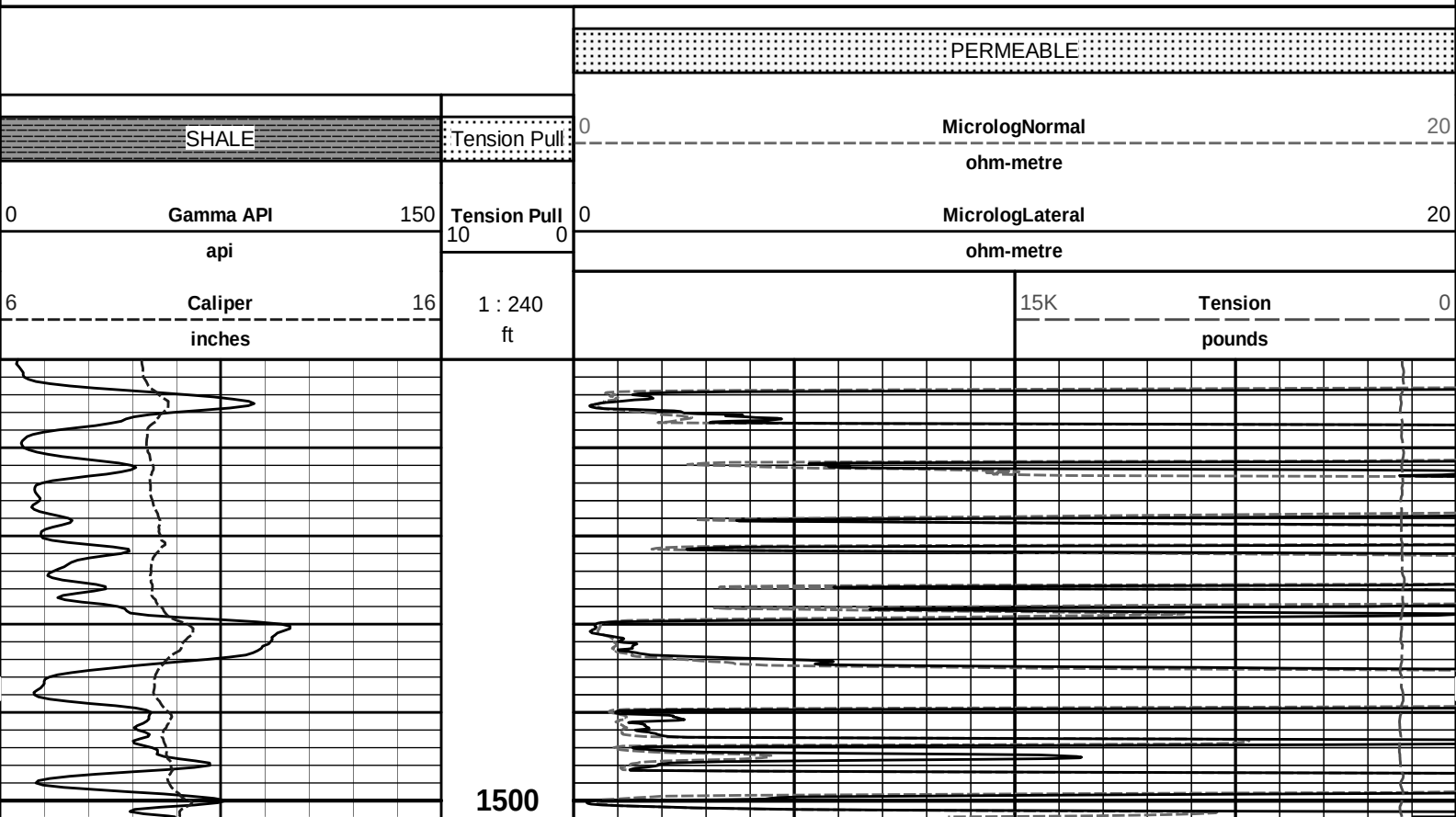
TODAY'S CREW: K. KING, C. PARKER

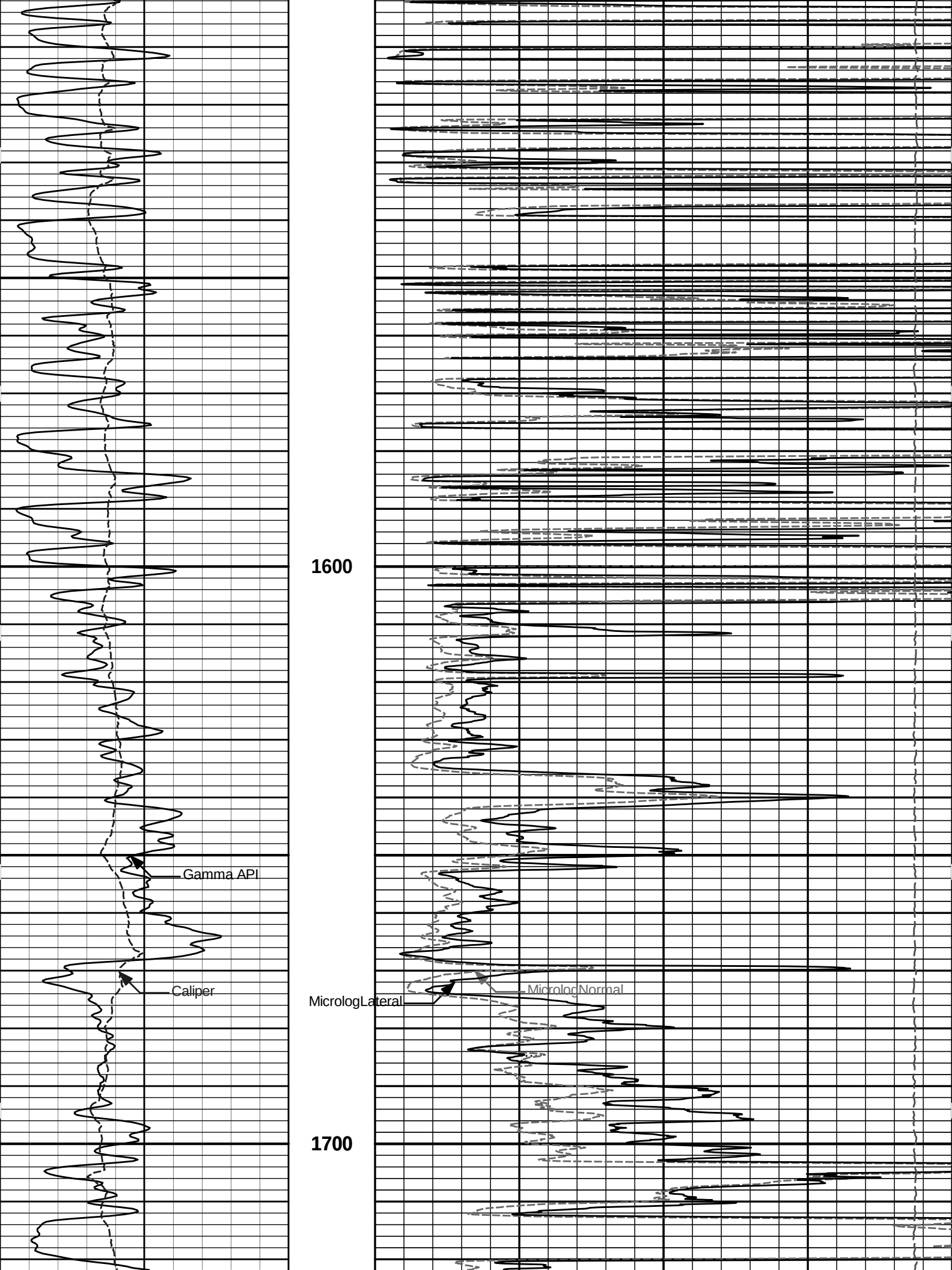
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, LIBERAL, KS 620-624-8123

HALLIBURTON

Plot Time: 20-Nov-10 07:55:50
Plot Range: 1450 ft to 5056.92 ft
Data: LANDWEHR_A_1\Well Based\DAQ-0001-003
Plot File: \\-LOCAL-\LANDWEHR_A_1\0001 SP-GTET-DSN-SDL-ACRT-CH\MICRO\Microlog_IQ_5_main_lib

5 INCH MAIN LOG

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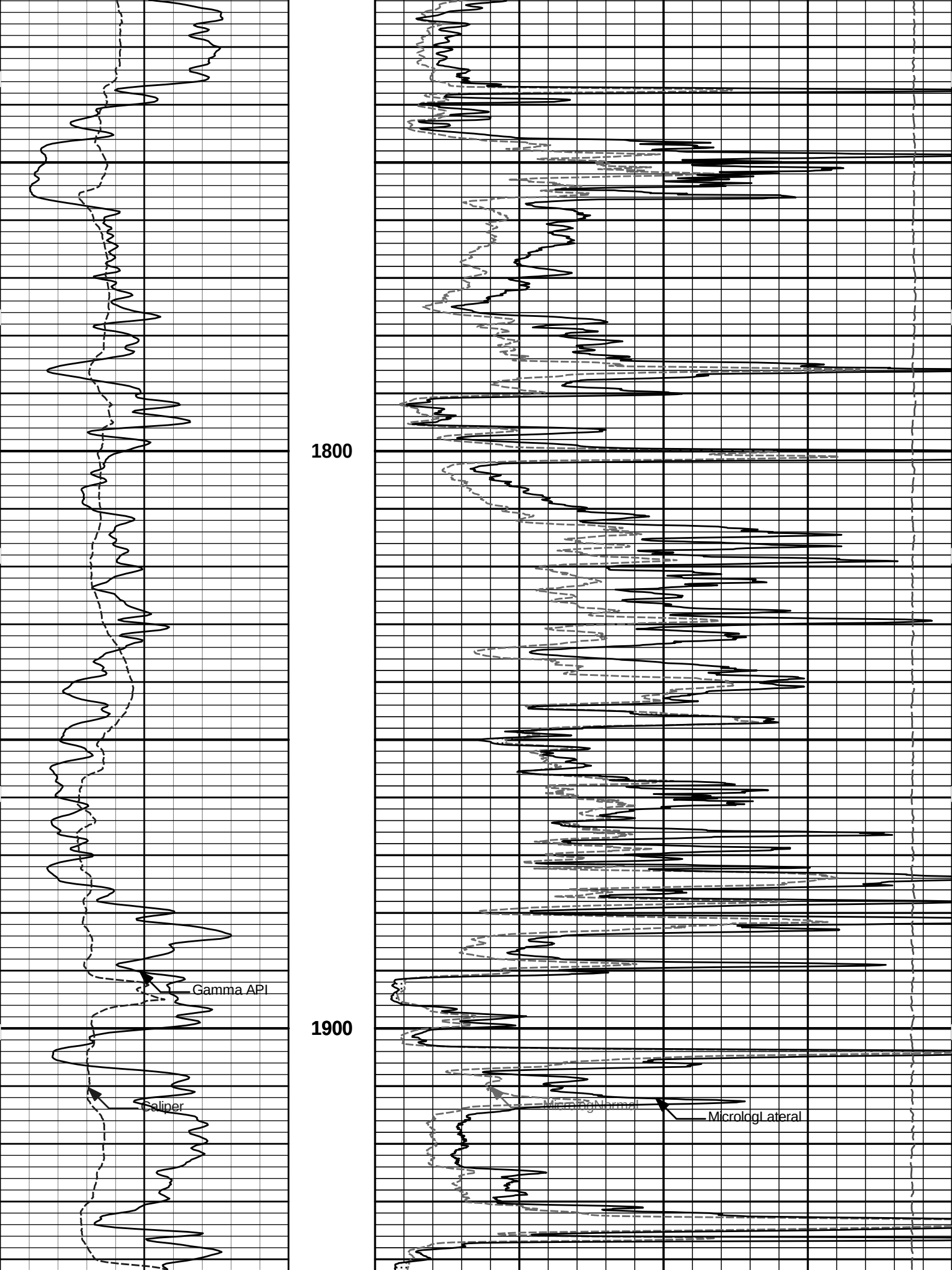
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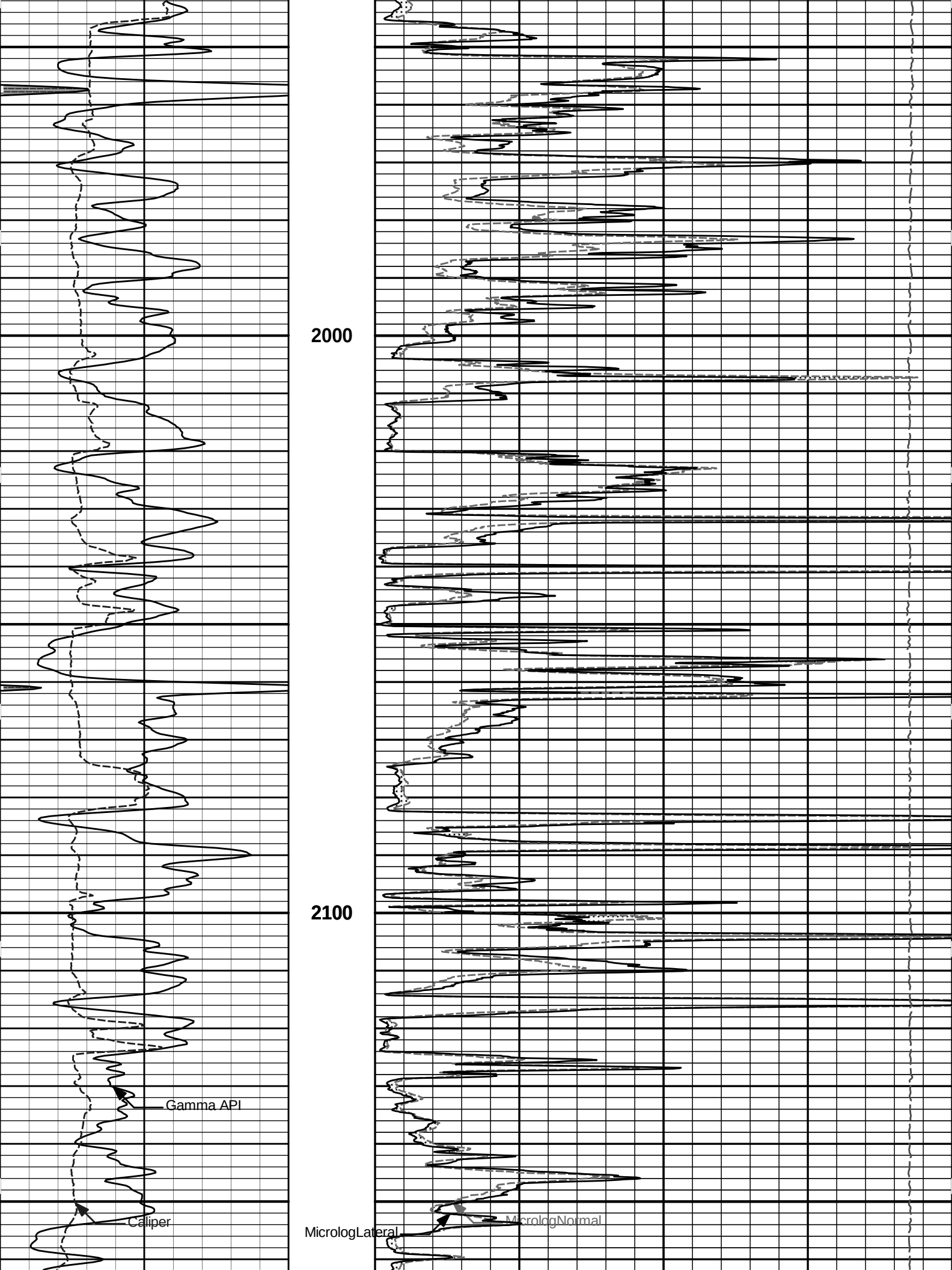
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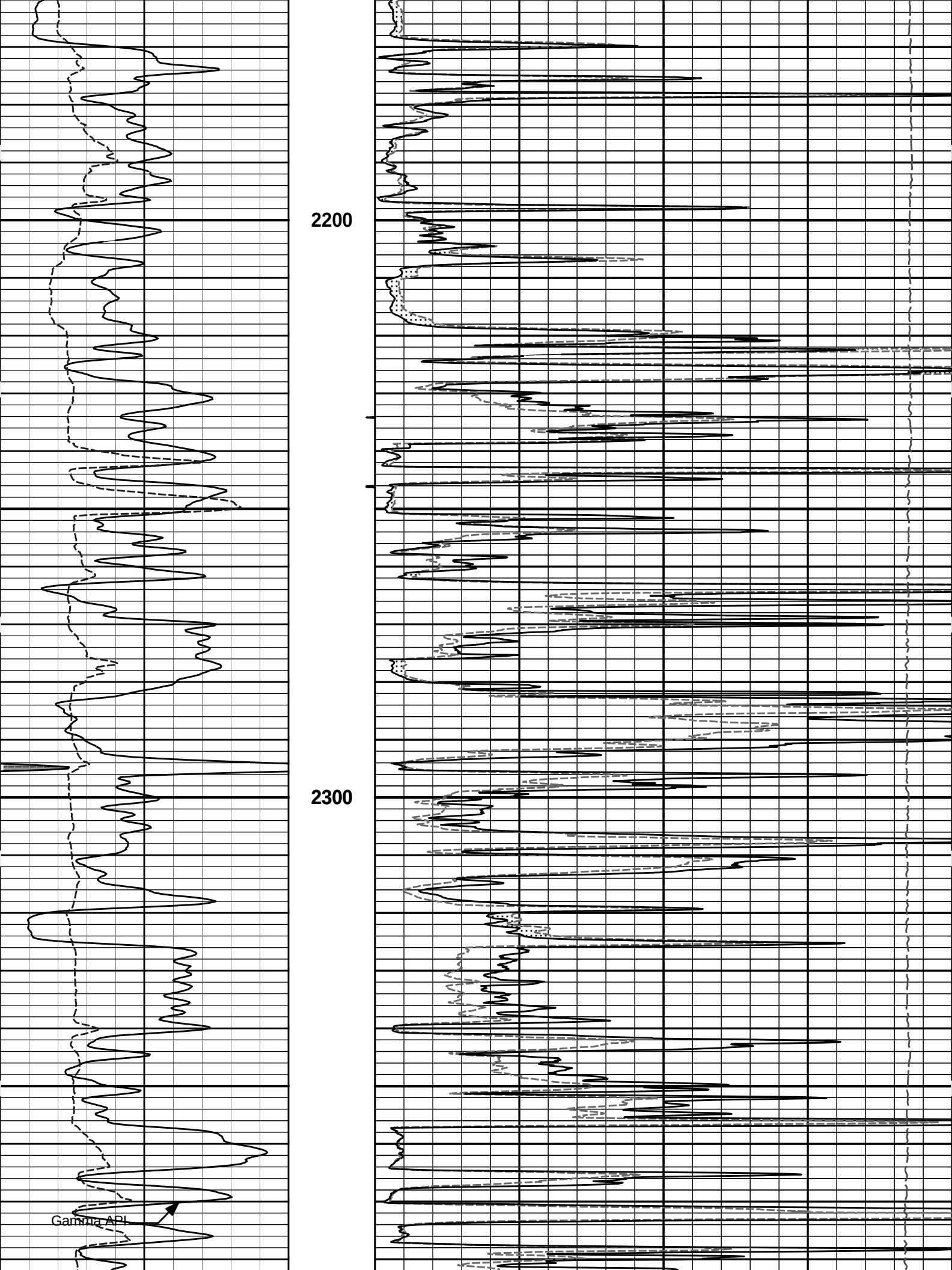
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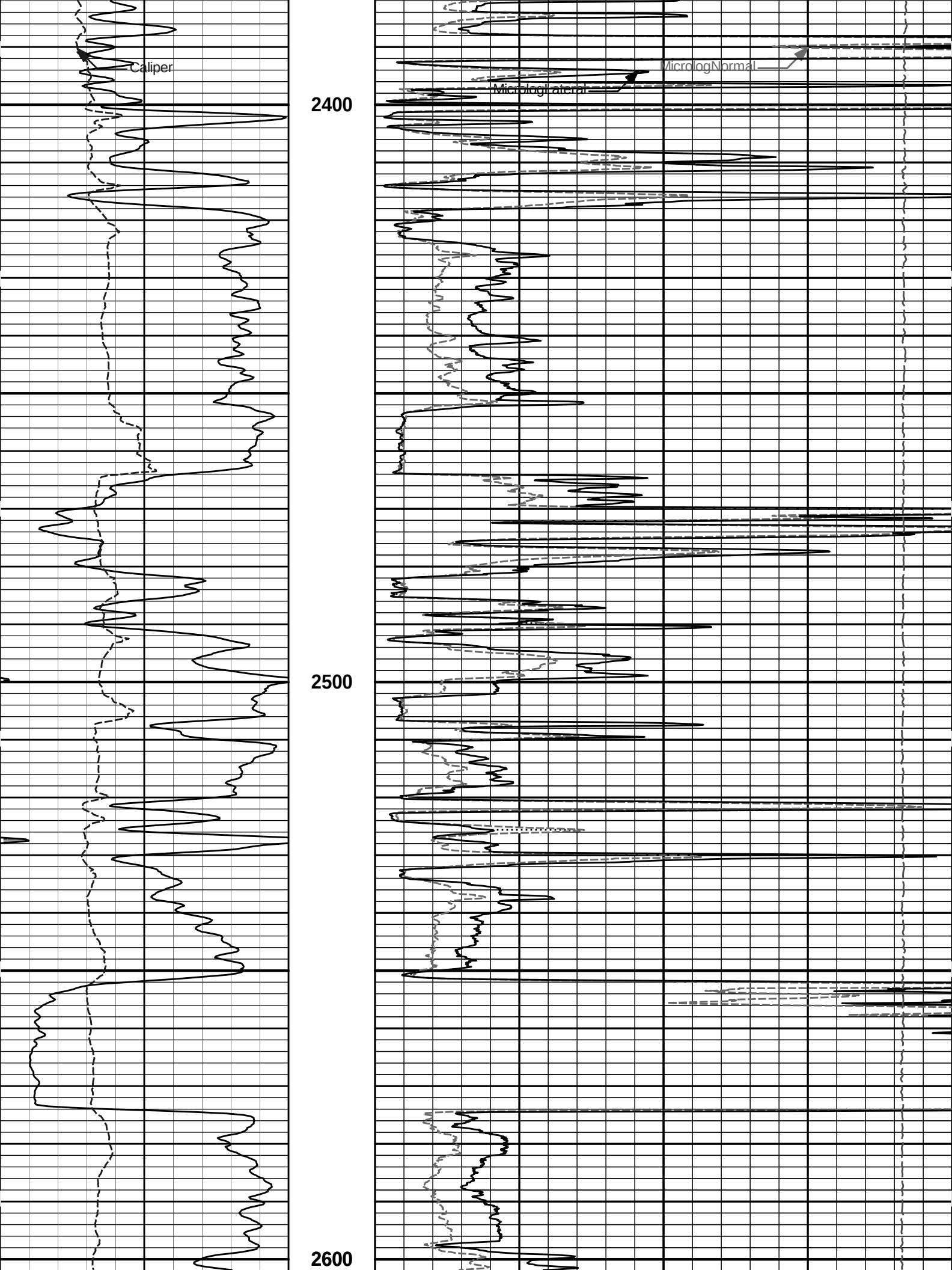
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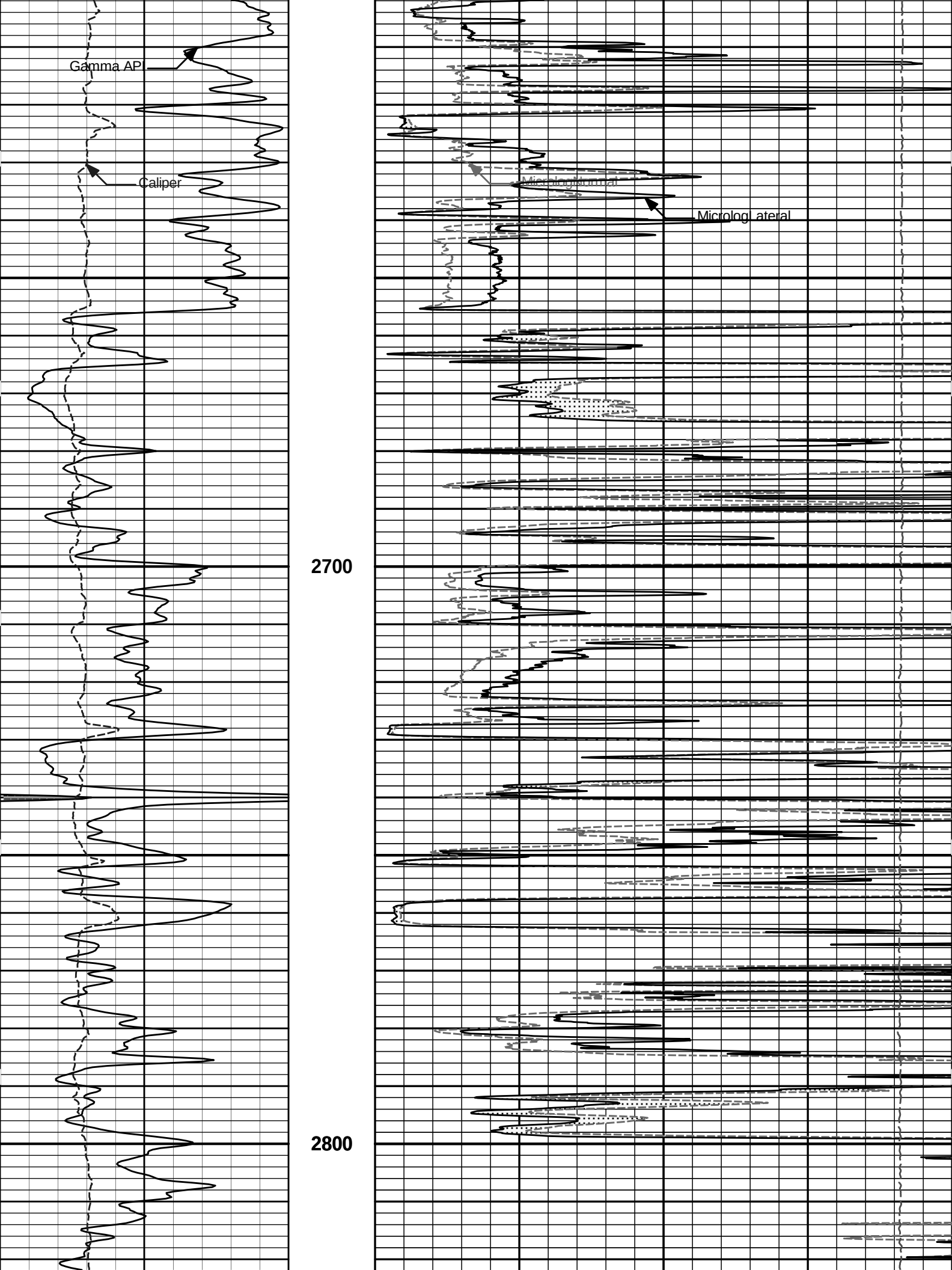
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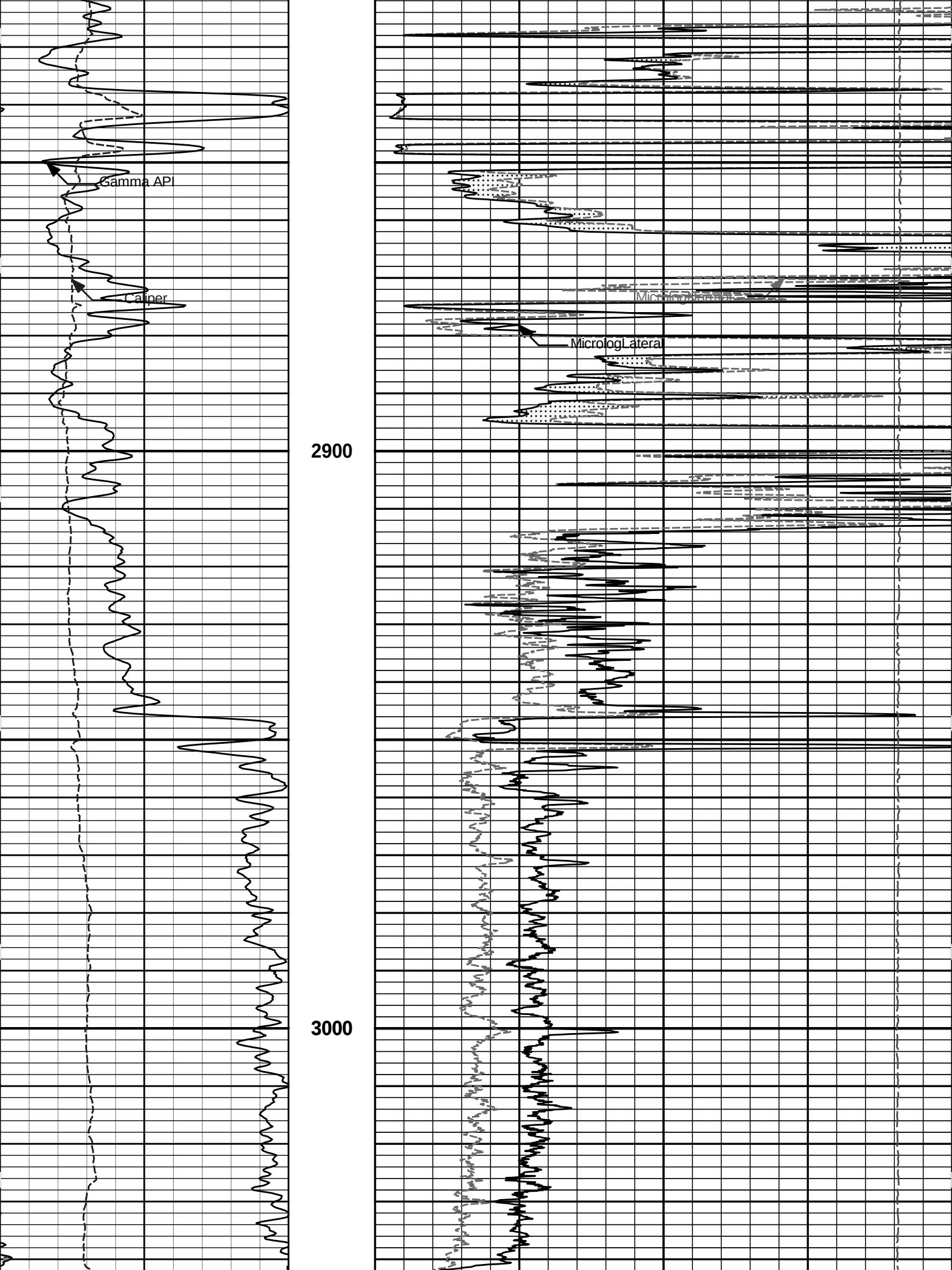
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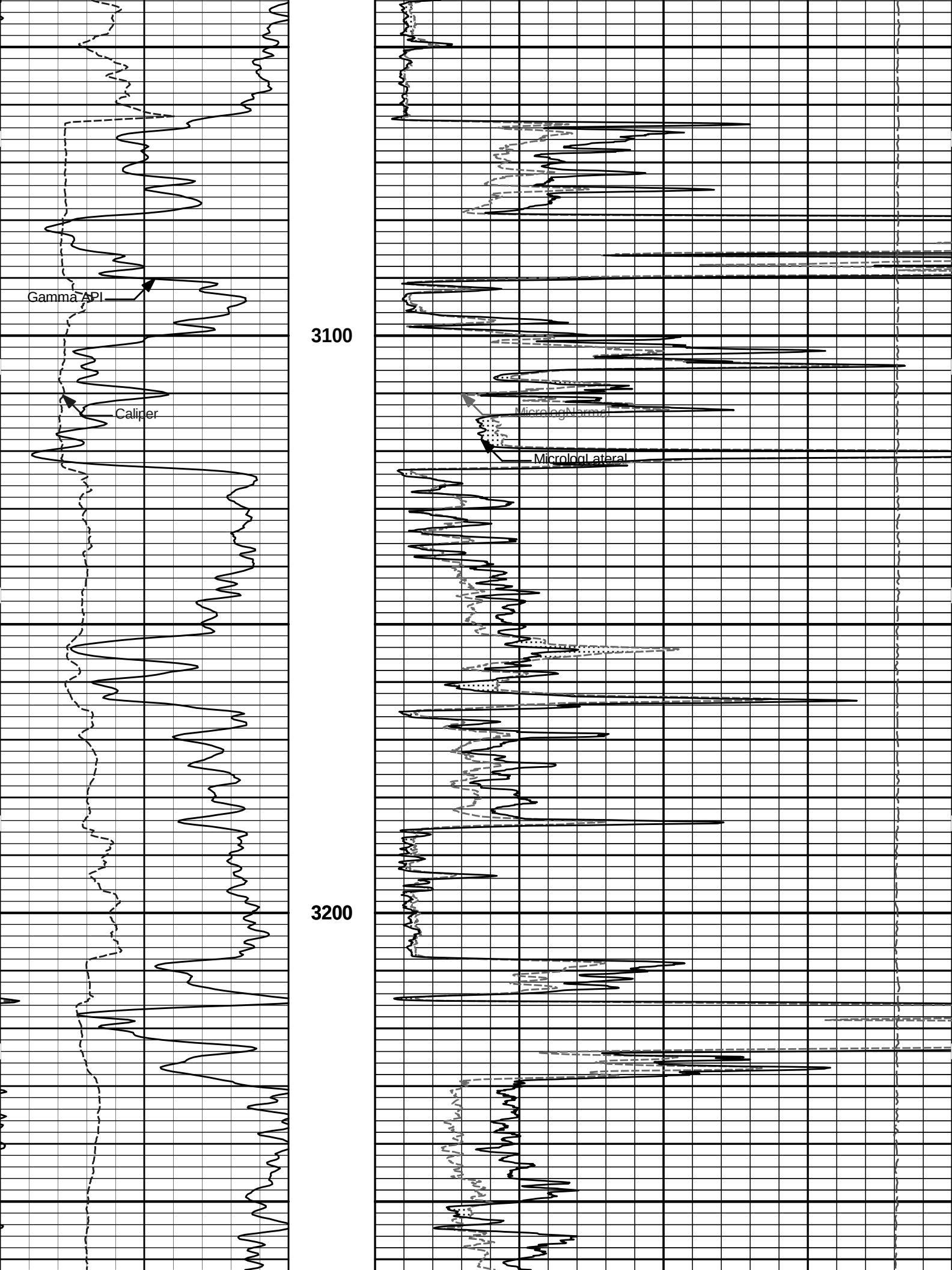
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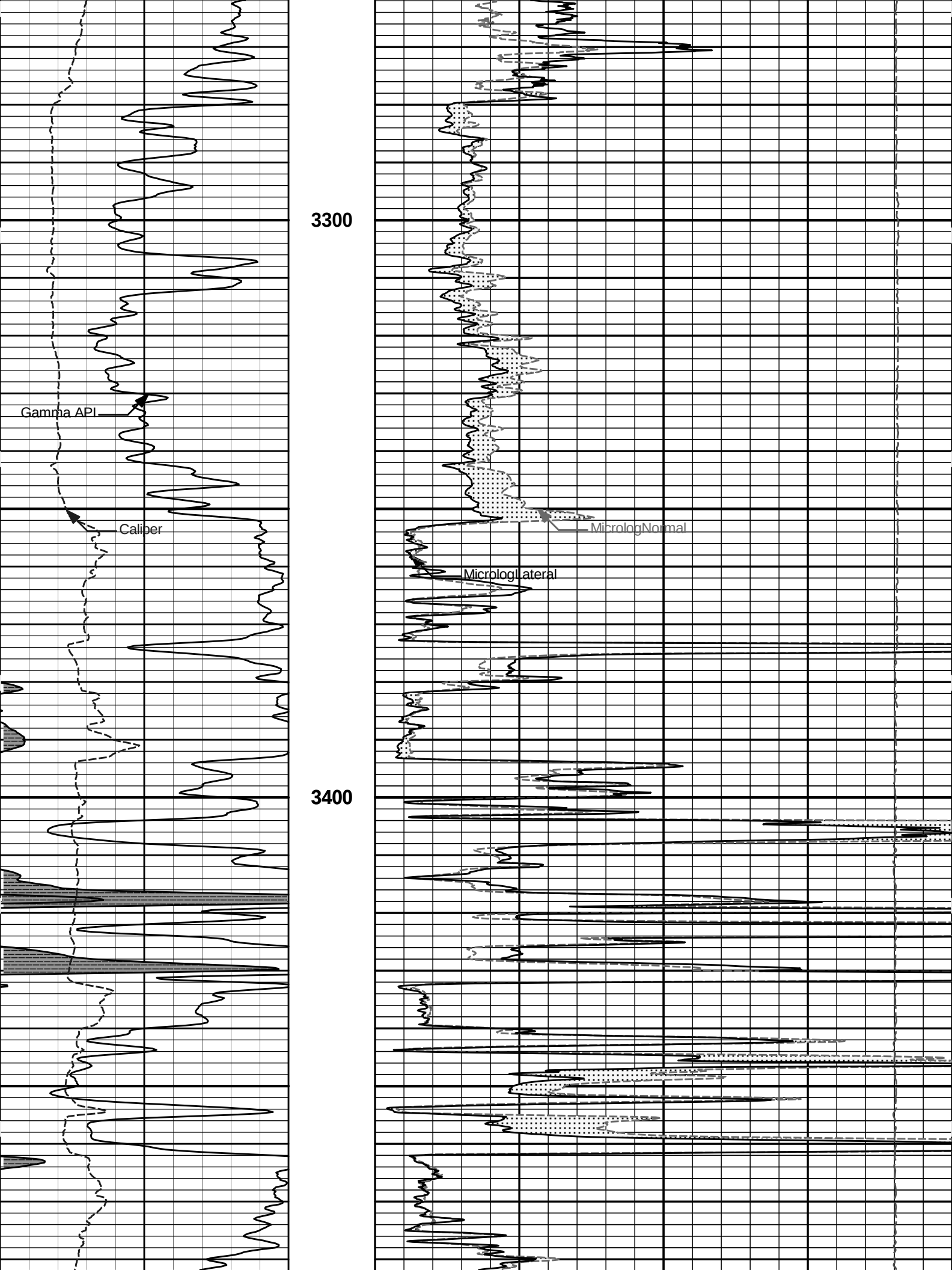
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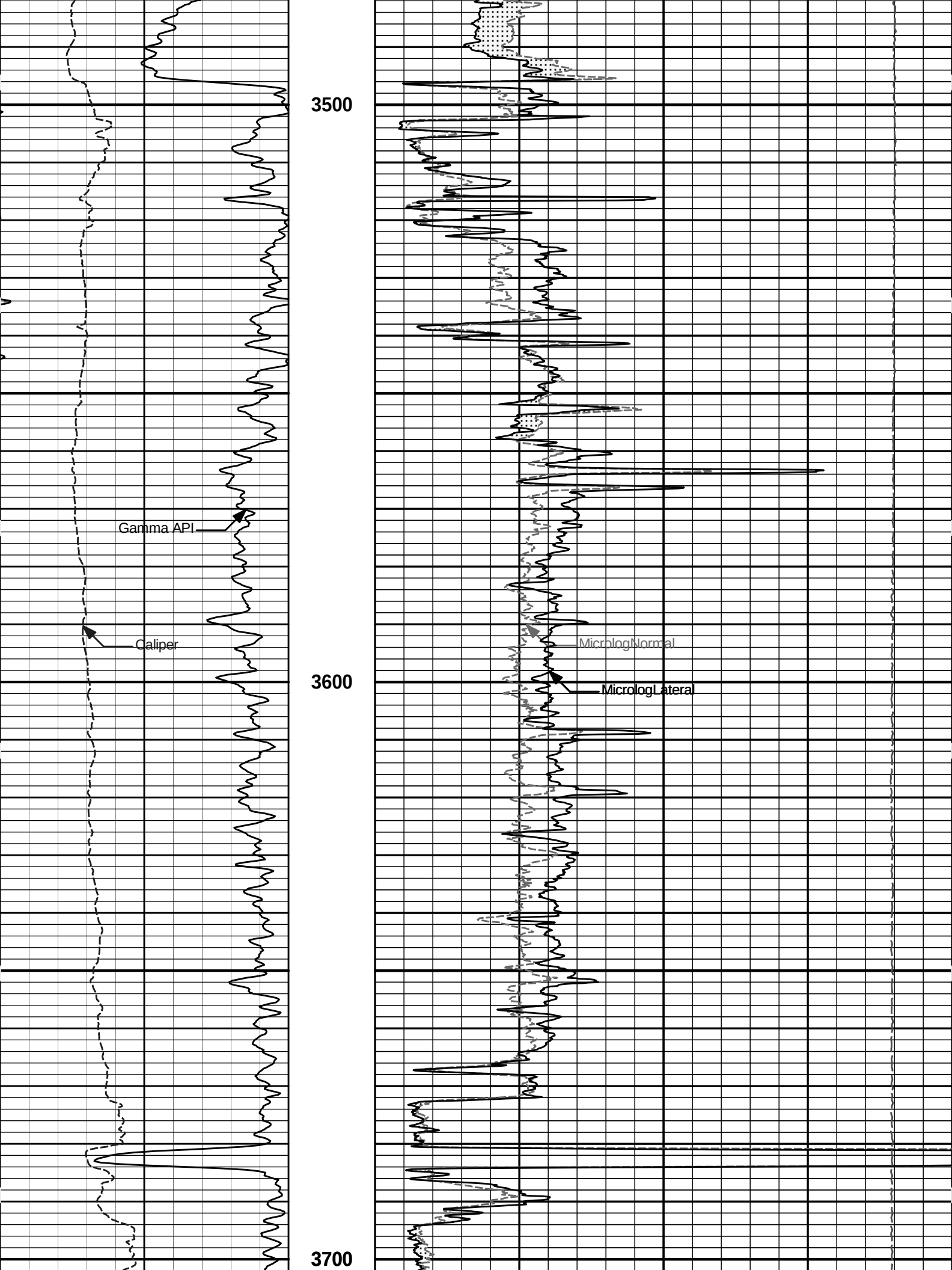
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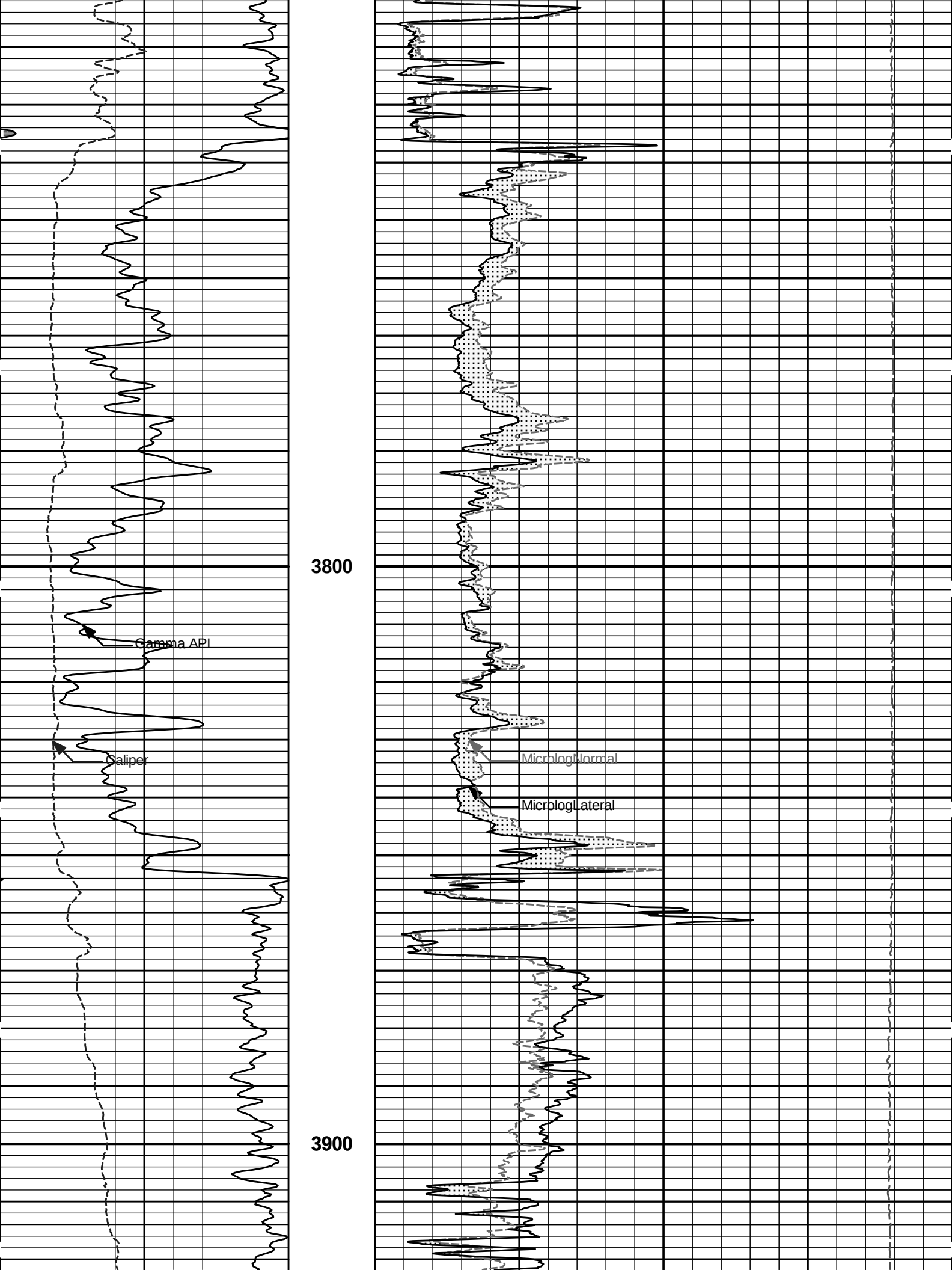
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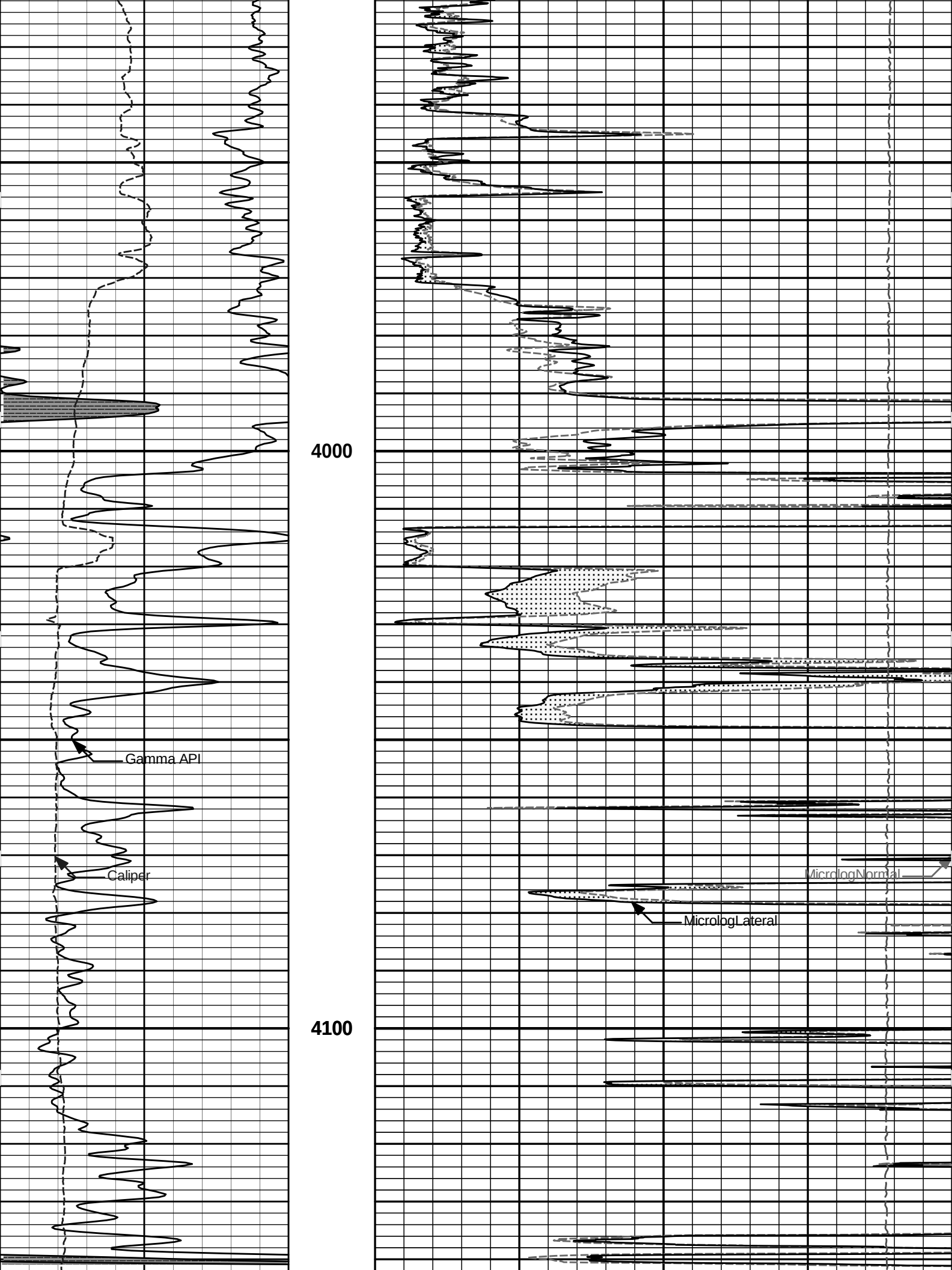
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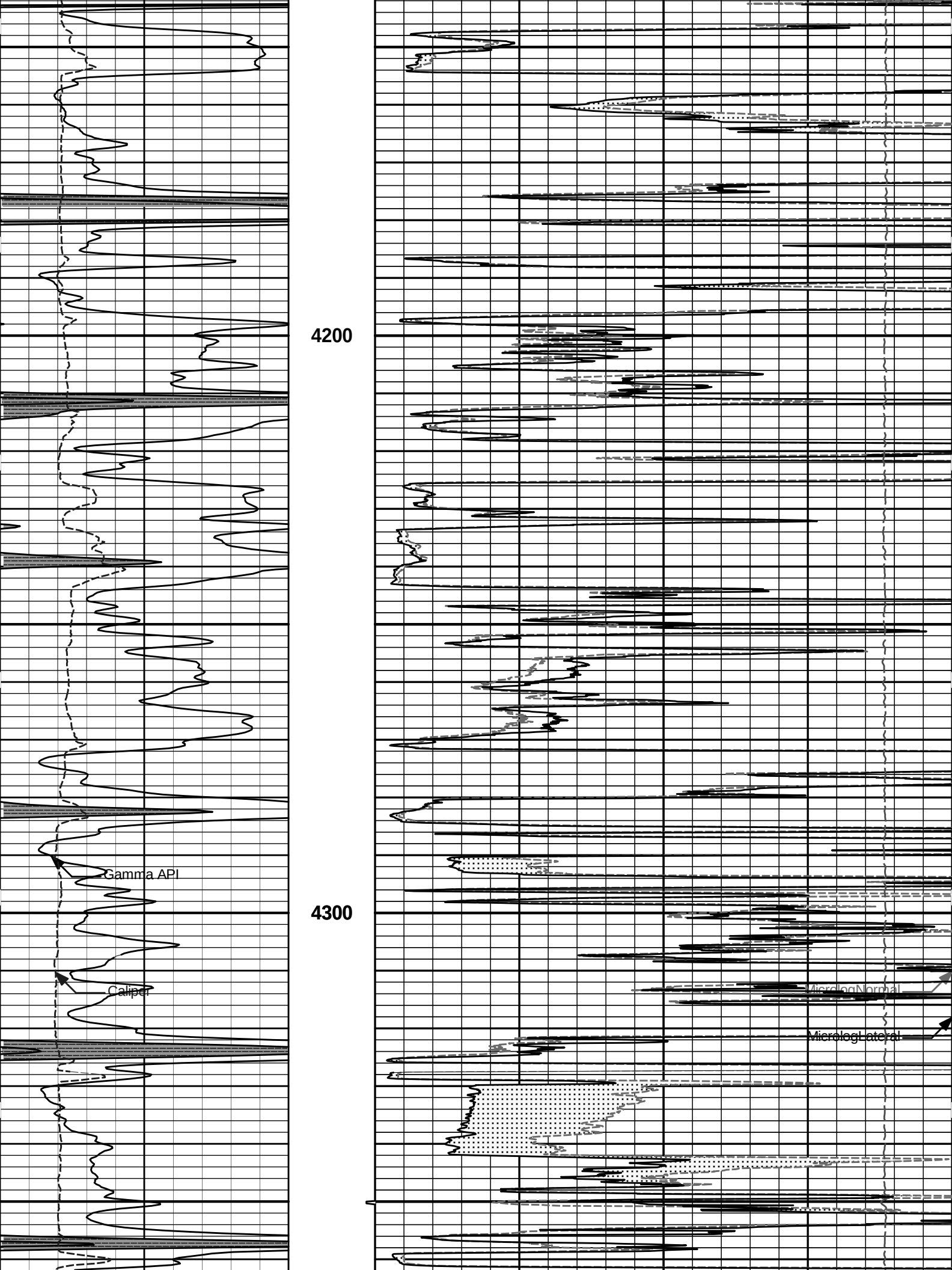
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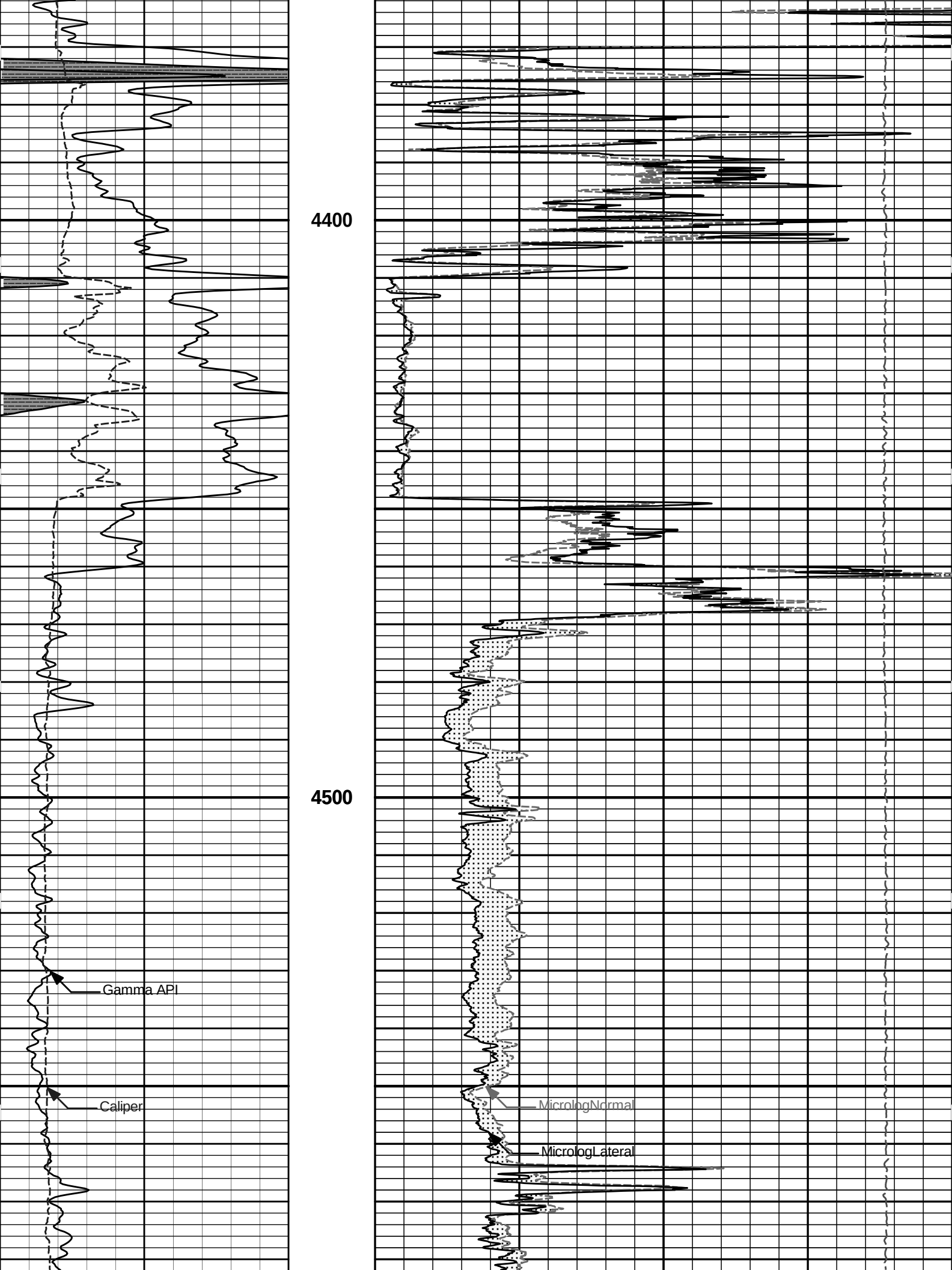
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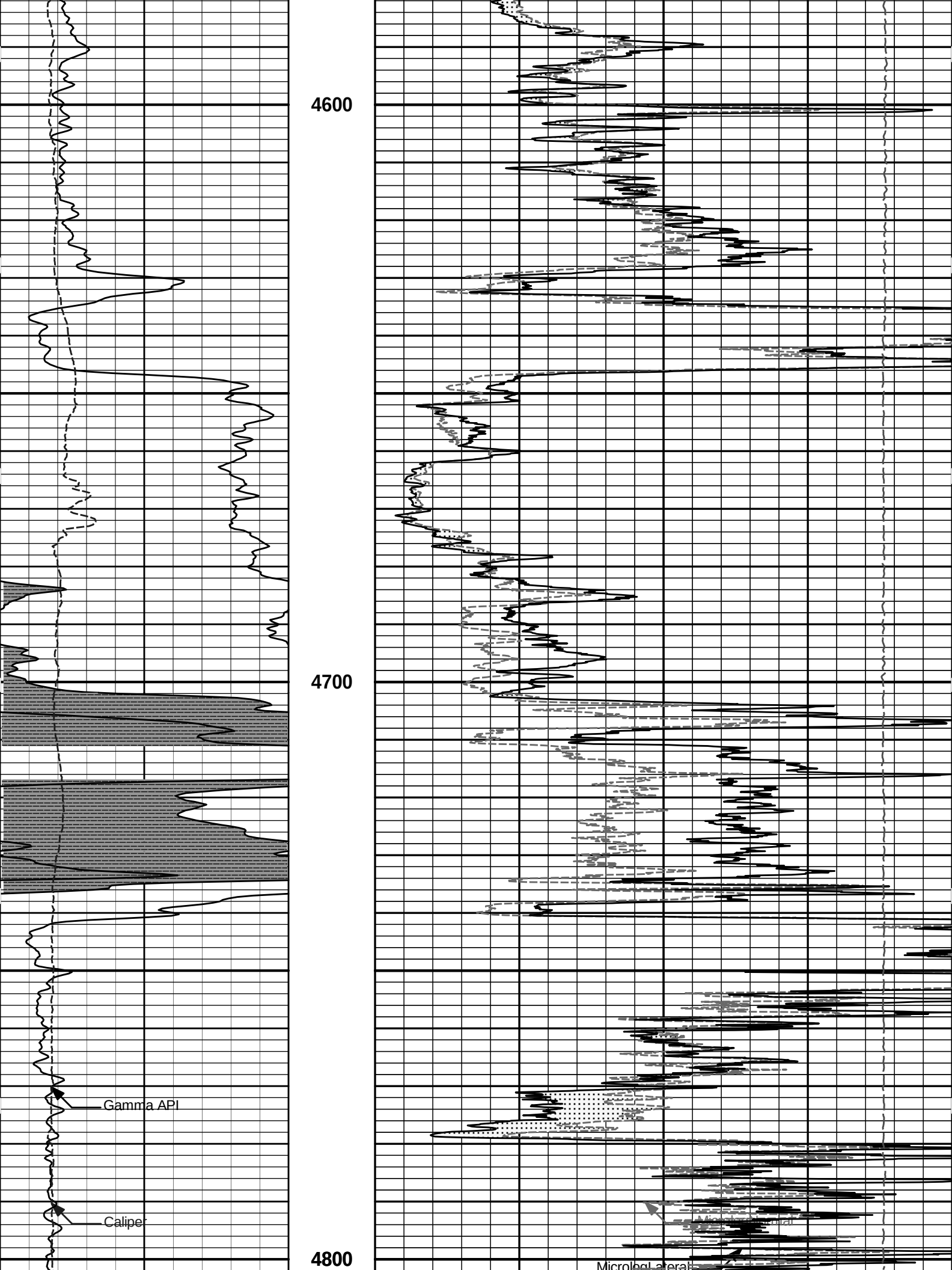
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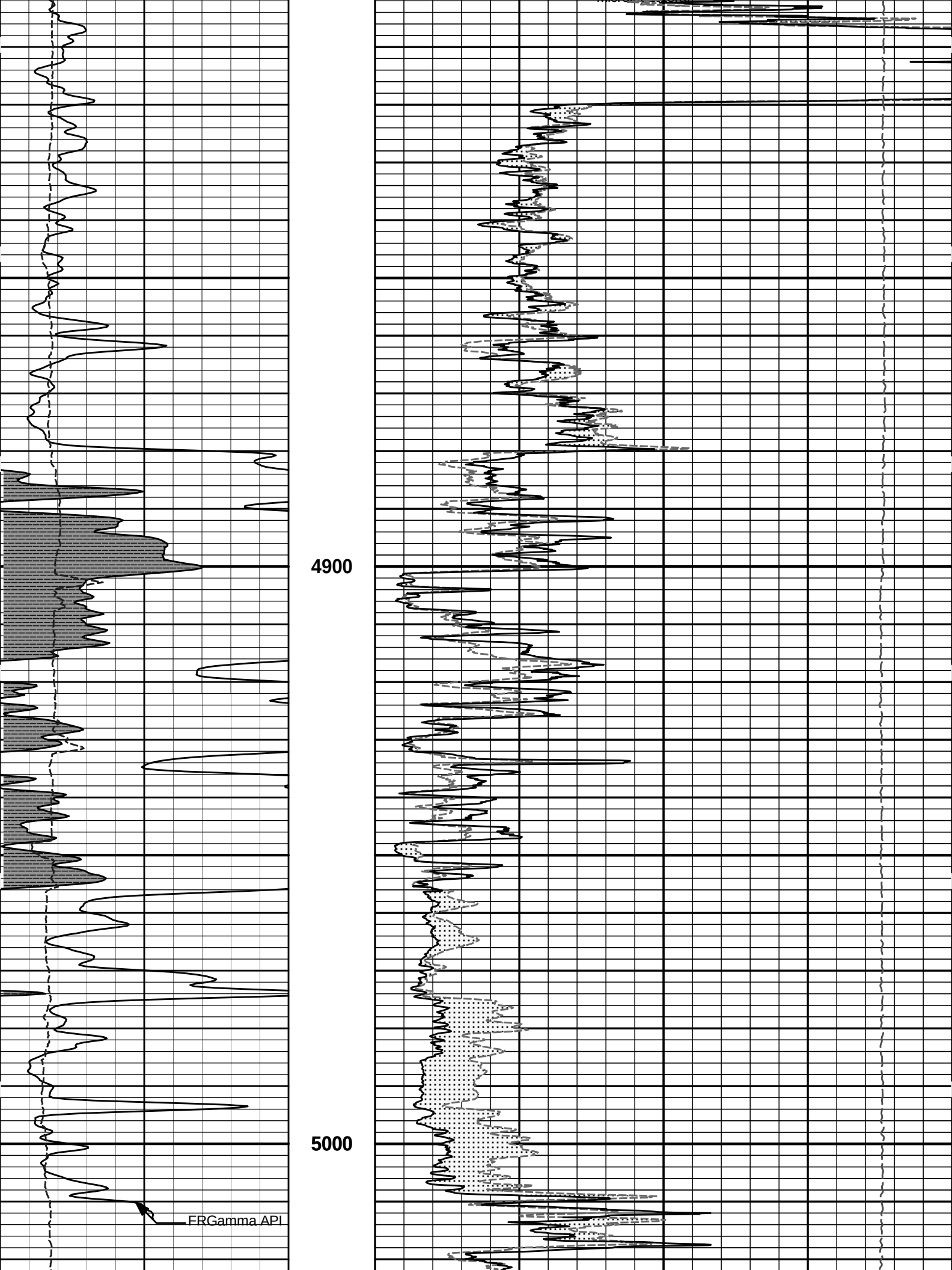
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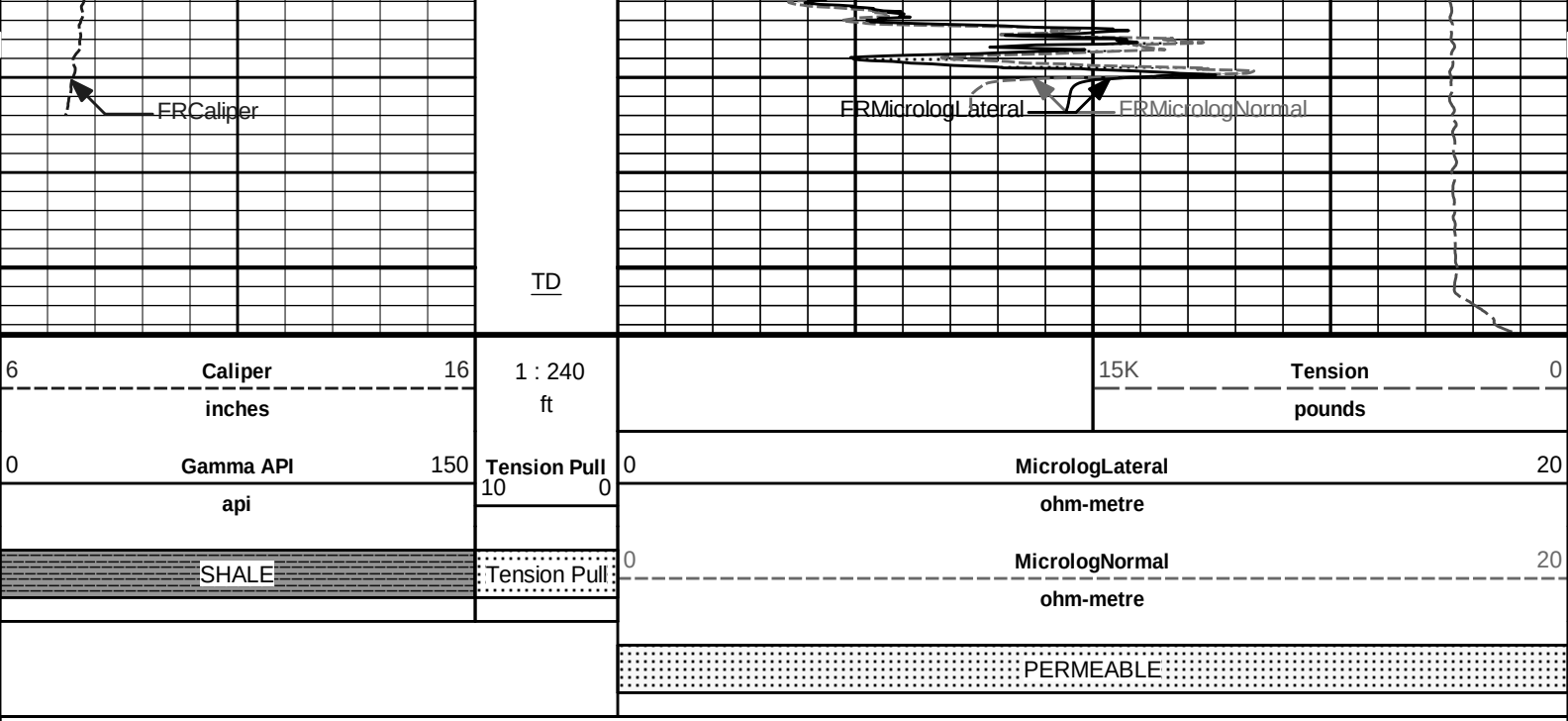


HALLIBURTON

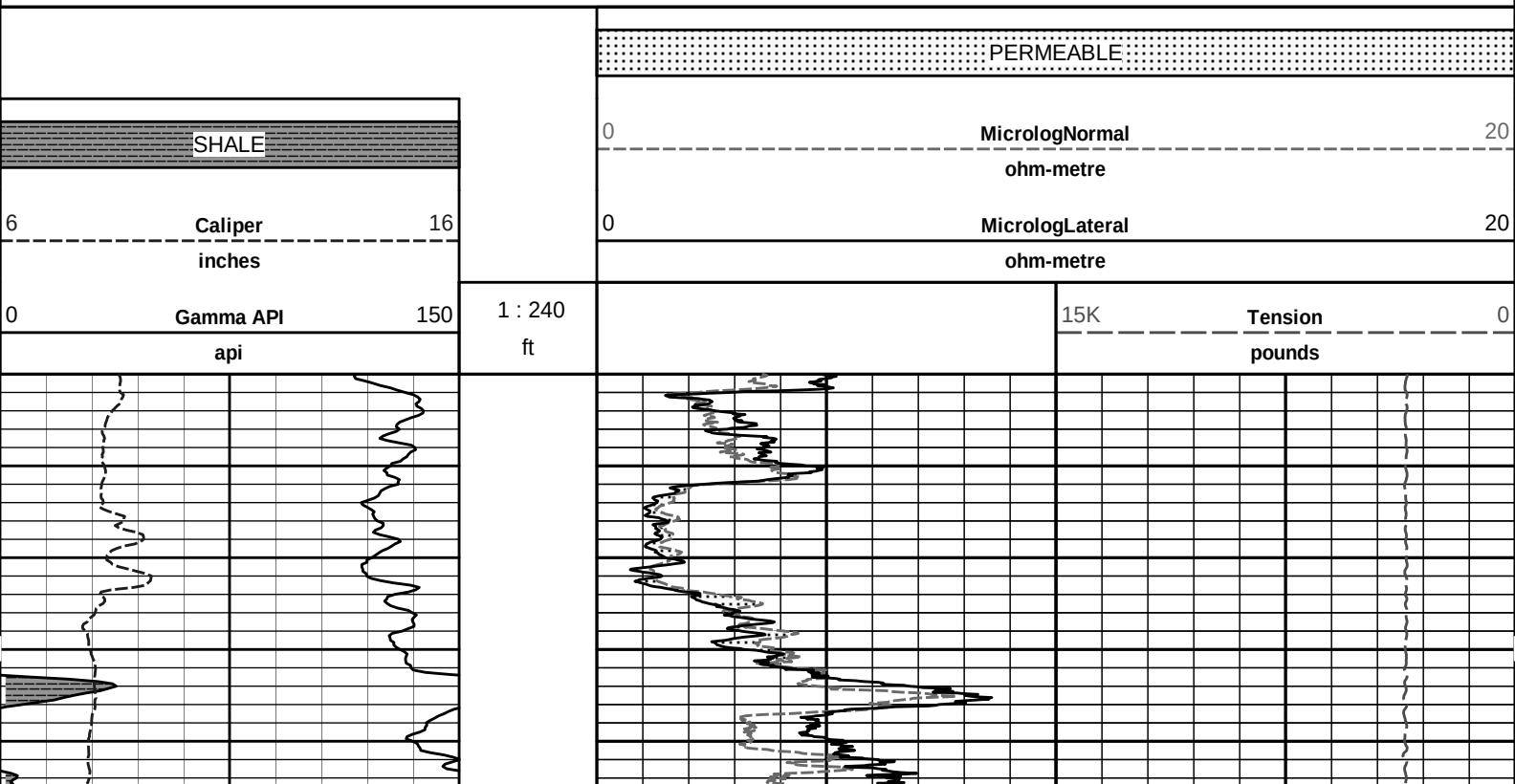
Plot Time: 20-Nov-10 07:56:33
Plot Range: 1450 ft to 5056.92 ft
Data: LANDWEHR_A_1\Well Based\DAQ-0001-003
Plot File: \\-LOCAL-\LANDWEHR_A_1\0001 SP-GTET-DSN-SDL-ACRT-CH\MICRO\Microlog_IQ_5_main_lib

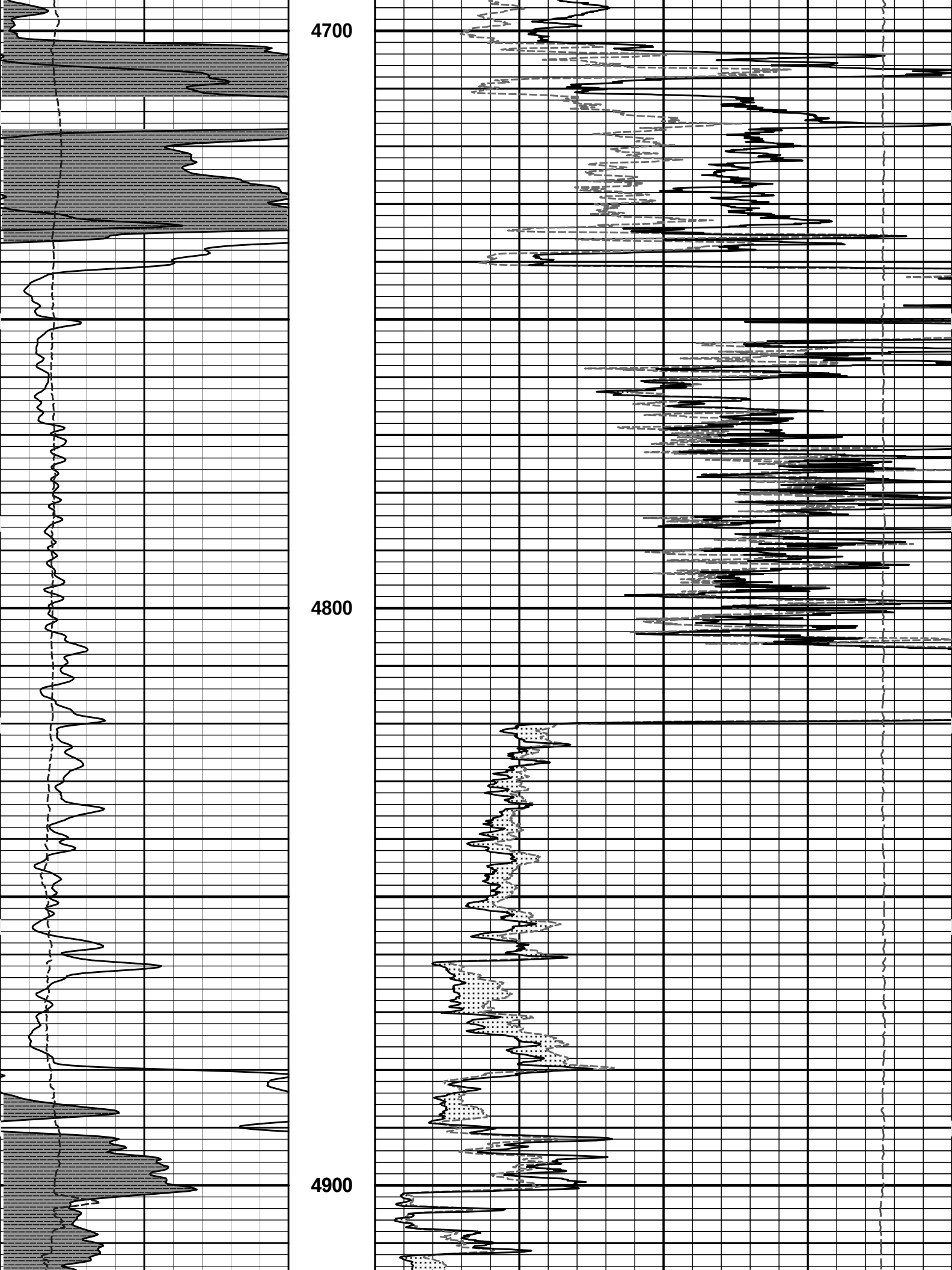
5 INCH MAIN LOG

HALLIBURTON

Plot Time: 20-Nov-10 07:56:33
Plot Range: 4650 ft to 5056.67 ft
Data: LANDWEHR_A_1\Well Based\DAQ-0001-002
Plot File: \\-LOCAL-\LANDWEHR_A_1\0001 SP-GTET-DSN-SDL-ACRT-CH\MICRO\Microlog_IQ_5_rep_lib

REPEAT SECTION

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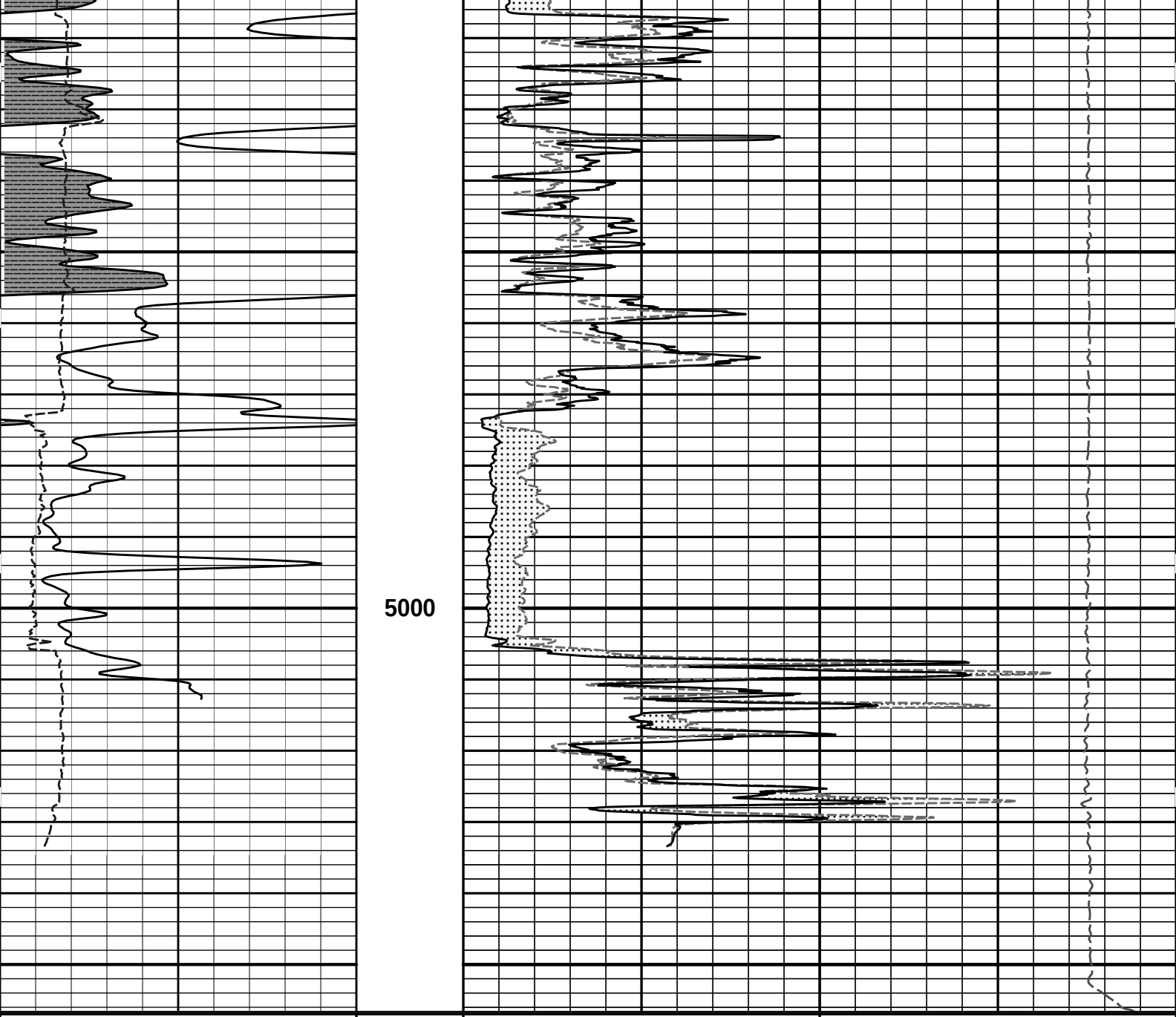


0 Gamma API 150	1 : 240 ft	15K Tension 0
api		pounds
6 Caliper 16		0 MicrologLateral 20
inches		ohm-metre
SHALE		0 MicrologNormal 20
		ohm-metre
		PERMEABLE

HALLIBURTON

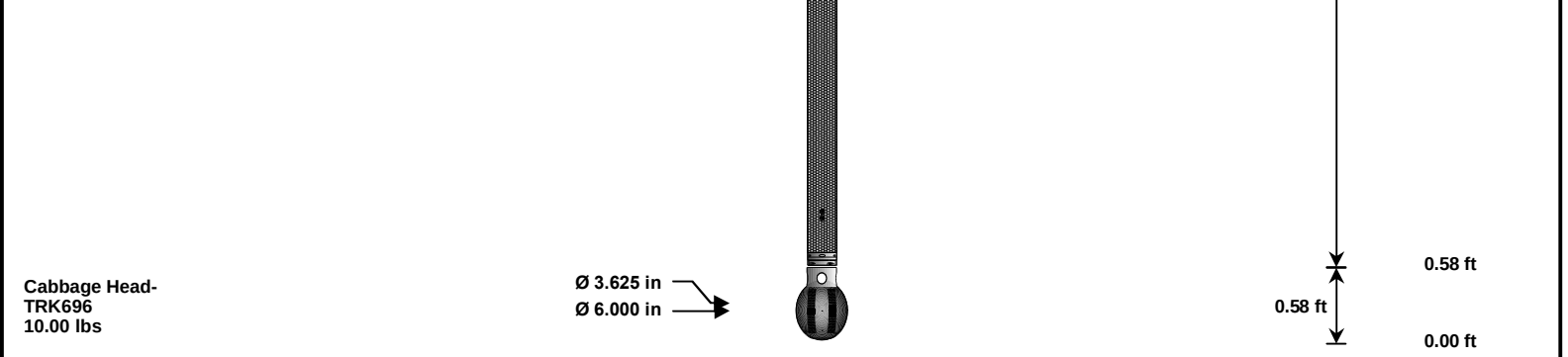
Plot Time: 20-Nov-10 07:56:40
Plot Range: 4650 ft to 5056.67 ft
Data: LANDWEHR_A_1\Well Based\DAQ-0001-002\
Plot File: \\-LOCAL-\LANDWEHR_A_1\0001 SP-GTET-DSN-SDL-ACRT-CH\MICRO\Microlog_IQ_5_rep_lib

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						56.57 ft
CH_HOS-CH_696 37.50 lbs		Ø 2.750 in		Temperature @ 55.54 ft	3.03 ft	
						53.54 ft
XOHD-TRK696 20.00 lbs		Ø 2.750 in Ø 3.625 in			0.95 ft	
						52.59 ft
SP Sub-PROT01 60.00 lbs		Ø 3.625 in		SP @ 50.81 ft	3.74 ft	
						48.85 ft
GTET-11039640 165.00 lbs		Ø 3.625 in			8.52 ft	
				GammaRay @ 42.79 ft		
						40.33 ft
DSNT-11019643 174.00 lbs	DSN Decentralizer-10755066 6.60 lbs	Ø 3.625 in* Ø 3.625 in		DSN Far @ 33.39 ft DSN Near @ 32.64 ft	9.69 ft	
						30.64 ft
SDLT-I43_P81 360.00 lbs		Ø 4.500 in Ø 4.750 in		SDL Microlog @ 22.83 ft SDL Caliper @ 22.65 ft SDL @ 22.64 ft	10.81 ft	
						19.83 ft
				Mud Resistivity @ 13.44 ft		
ACRt-I5059_S8385 250.00 lbs		Ø 3.625 in		ACRt @ 9.46 ft	19.25 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_696	37.50	3.03		53.54	300.00
XOHD	Hostile to Dits Cross Over	TRK696	20.00	0.95		52.59	300.00
SP	SP Sub	PROT01	60.00	3.74		48.85	300.00
GTET	Gamma Telemetry Tool	11039640	165.00	8.52		40.33	60.00
DSNT	Dual Spaced Neutron	11019643	174.00	9.69		30.64	60.00
DCNT	DSN Decentralizer	10755066	6.60	5.13	*	33.97	300.00
SDLT	Spectral Density Tool	I43_P81	360.00	10.81		19.83	60.00
ACRt	Array Compensated True Resistivity	I5059_S8385	250.00	19.25		0.58	300.00
CBHD	Cabbage Head	TRK696	10.00	0.58		0.00	300.00
Total			**1,083.10**	**56.57**			

* Not included in Total Length and Length Accumulation.

Data: LANDWEHR_A_1\0001 SP-GTET-DSN-SDL-ACRT-CH\IDLE **Date: 20-Nov-10 02:32:39**

HALLIBURTON

CALIBRATION REPORT

MICRO LOG SHOP CALIBRATION

Tool Name: SDLT - I43_P81 **Reference Calibration Date:** 23-Sep-10 08:31:40

Engineer: T. BRIDGEMAN **Calibration Date:** 22-Oct-10 16:26:46

Software Version: WL INSITE R3.2.0 (Build 7) **Calibration Version:** 1

CALIBRATION COEFFICIENT SUMMARY

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.07	-0.06	-0.01	-0.12	ohmm
Calibration Point #1	-0.00	0.00	0.12	0.00	ohmm
Calibration Point #2	21.02	20.00	21.96	20.00	ohmm
Internal Reference	20.95	19.94	21.50	19.58	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	0.93	0.93	V
Calibration Point #1	18.27	41.74	V
Calibration Point #2	5361.50	7050.40	V
Internal Reference	5344.46	6903.72	V

MICRO LOG FIELD CHECK

Tool Name: SDLT - I43_P81 **Reference Calibration Date:** 22-Oct-10 16:26:46

Engineer: J. BOSH **Calibration Date:** 20-Nov-10 02:24:25

Software Version: WL INSITE R3.2.0 (Build 7) **Calibration Version:** 1

Measurement	Micro Log Normal		Micro Log Lateral	

	Shop	Field	Shop	Field	Units
Tool Zero	-0.06	-0.07	-0.12	-0.12	ohmm
Internal Reference	19.94	19.87	19.58	19.50	ohmm

Summary

Signal	Shop	Field	Difference	Tolerence
Microlog Normal	19.94	19.87	0.07	+/- 0.80
Microlog Lateral	19.58	19.50	0.08	+/- 0.80

MICRO LOG POST CHECK

Tool Name: SDLT - I43_P81 **Reference Calibration Date:** 20-Nov-10 02:24:25

Engineer: J. BOSH **Calibration Date:** 20-Nov-10 07:26:53

Software Version: WL INSITE R3.2.0 (Build 7) **Calibration Version:** 1

Measurement	Micro Log Normal		Micro Log Lateral		
	Field	Post	Field	Post	Units
Tool Zero	-0.07	69.58	-0.12	78.90	ohmm
Internal Reference	19.87	19.92	19.50	19.58	ohmm

Summary

Signal	Field	Post	Difference	Tolerence
Microlog Normal	19.87	19.92	0.05	+/- 0.80
Microlog Lateral	19.50	19.58	0.08	+/- 0.80

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
SDLT-I43_P81						
MicroLog Normal	19.94	19.87	19.92	-0.05	+/-0.80	ohmm
MicroLog Lateral	19.58	19.50	19.58	-0.08	+/-0.80	ohmm

Data: LANDWEHR_A_1\0001 SP-GTET-DSN-SDL-ACRT-CH\IDLE **Date: 20-Nov-10 07:43:33**

HALLIBURTON

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	
1440.00					
	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	9.600	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	0.740	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	

SHARED	CSD	Logging Interval is Cased?	No	
SHARED	ICOD	AHV Casing OD	4.500	in
SHARED	ST	Surface Temperature	75.0	degF
SHARED	TD	Total Well Depth	5050.00	ft
SHARED	BHT	Bottom Hole Temperature	115.0	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	0.300	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	
ACRt	RTOK	Process ACRt?	Yes	
ACRt	MNSO	Minimum Tool Standoff	1.50	in
ACRt	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
ACRt	TPOS	Tool Position	Free Hanging	
ACRt	RMOP	Rmud Source	Mud Cell	
ACRt	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt	THQY	Threshold Quality	0.50	

BOTTOM

Data: LANDWEHR_A_1\0001 SP-GTET-DSN-SDL-ACRT-CH\IDLE **Date: 20-Nov-10 05:01:06**

HALLIBURTON

INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
	Depth Panel			
TENS	Tension	0.00	NO	
	CH_HOS			
DHTN	DownholeTension	0.00	BLK	0.000
	SP Sub			
PLTC	Plot Control Mask	50.81	NO	

SP	Spontaneous Potential	50.81	BLK	1.250
SPR	Raw Spontaneous Potential	50.81	NO	
SPO	Spontaneous Potential Offset	50.81	NO	

GTET				
TPUL	Tension Pull	42.79	NO	
GR	Natural Gamma Ray API	42.79	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	42.79	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	42.79	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	

DSNT				
TPUL	Tension Pull	32.54	NO	
RNDS	Near Detector Telemetry Counts	32.64	BLK	1.417
RFDS	Far Detector Telemetry Counts	33.39	TRI	0.583
DNTT	DSN Tool Temperature	32.64	NO	
DSNS	DSN Tool Status	32.54	NO	
ERND	Near Detector Telemetry Counts EVR	32.64	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	33.39	BLK	0.000
ENTM	DSN Tool Temperature EVR	32.64	NO	

SDLT				
TPUL	Tension Pull	22.64	NO	
NAB	Near Above	22.46	BLK	0.920
NHI	Near Cesium High	22.46	BLK	0.920
NLO	Near Cesium Low	22.46	BLK	0.920
NVA	Near Valley	22.46	BLK	0.920
NBA	Near Barite	22.46	BLK	0.920
NDE	Near Density	22.46	BLK	0.920
NPK	Near Peak	22.46	BLK	0.920
NLI	Near Lithology	22.46	BLK	0.920
NBAU	Near Barite Unfiltered	22.46	BLK	0.250
NLIU	Near Lithology Unfiltered	22.46	BLK	0.250
FAB	Far Above	22.81	BLK	0.250
FHI	Far Cesium High	22.81	BLK	0.250
FLO	Far Cesium Low	22.81	BLK	0.250
FVA	Far Valley	22.81	BLK	0.250
FBA	Far Barite	22.81	BLK	0.250
FDE	Far Density	22.81	BLK	0.250
FPK	Far Peak	22.81	BLK	0.250
FLI	Far Lithology	22.81	BLK	0.250
PTMP	Pad Temperature	22.65	BLK	0.920
NHV	Near Detector High Voltage	19.83	NO	
FHV	Far Detector High Voltage	19.83	NO	
ITMP	Instrument Temperature	19.83	NO	
DDHV	Detector High Voltage	19.83	NO	
TPUL	Tension Pull	22.65	NO	
PCAL	Pad Caliper	22.65	TRI	0.250
ACAL	Arm Caliper	22.65	TRI	0.250
TPUL	Tension Pull	22.83	NO	
MINV	Microlog Lateral	22.83	BLK	0.750
MNOR	Microlog Normal	22.83	BLK	0.750

ACRt				
TPUL	Tension Pull	2.97	NO	
F1R1	ACRT 12KHz - 80in R value	0.22	BLK	0.000

F1RT	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
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	

COMPANY **WOOLSEY OPERATING**

WELL	**LANDWEHR A-1**		
FIELD			
COUNTY	**HARPER**	STATE	**KANSAS**

HALLIBURTON	**MICROLOG**