

HALLIBURTON

ARRAY COMPENSATED TRUE RESISTIVITY LOG

COMPANY	OXY USA INC.
WELL	ELLIOTT C-1B
FIELD	LEMON VICK PREEDY
COUNTY	HASKELL
STATE	KANSAS
COMPANY	OXY USA INC.
WELL	ELLIOTT C-1B
FIELD	LEMON VICK PREEDY
COUNTY	HASKELL
STATE	KANSAS
API No.	15081220030000
Location	(SHL) 1981' FSL & 669' FEL
Other Services:	DSN / SDL MICROLOG BSAT ACRT
Sect.	28
Twp.	29S
Rge.	33W
Elev.	2946.0 ft
Elev. D.F.	2960.0 ft
Elev. G.L.	2946.0 ft

Permanent Datum	GL	Elev. 2946.0 ft
Log measured from	KB	14.0 ft above perm. Datum
Drilling measured from	KB	G.L. 2946.0 ft
Date	20-Jan-13	
Run No.	ONE	

Depth - Driller	5817.00 ft
Depth - Logger	5816.0 ft
Bottom - Logged Interval	5806
Top - Logged Interval	1824
Casing - Driller	8.625 in @ 1827.0 ft
Casing - Logger	1824.0 ft @
Bit Size	7.875 in @
Type Fluid in Hole	WATER BASED MUD @
Density	9.1 ppg 56.00 sg/qt
PH	11.10 pH 8.4 cp/m
Source of Sample	MUDPIT
Rm @ Meas. Temperature	1.300 ohmm @ 70.00 degF @
Rmf @ Meas. Temperature	1.110 ohmm @ 70.00 degF @
Rmc @ Meas. Temperature	1.500 ohmm @ 70.00 degF @
Source Rmf	MEASURED MEASURED
Rm @ BHT	0.64 ohmm @ 149.0 degF @
Time Since Circulation	18.5 hr
Time on Bottom	20-Jan-13 09:56
Max. Rec. Temperature	149.0 degF @ 5816.0 ft @
Equipment	10782954 LIBERAL
Recorded By	S. INGERSOLL
Witnessed By	CAL WYLLIE
	AUSTIN GARNIER

Fold here

Service Ticket No.: 90014112 API Serial No.: 15081220030000 PGM Version: WL INSITE R3.6.0 (Build 3)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE				RESISTIVITY SCALE CHANGES				
Date	Sample No.			Type Log	Depth	Scale Up Hole	Scale Down Hole	
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.	Other
Rmf @ Meas. Temp.	@	@		ONE	ACRT	N/A	CENT.	
Rmc @ Meas. Temp.	@	@			10929775			
Source Rmf	Rmc							
Rm @ BHT	@	@						
Rmf @ BHT	@	@						
Rmc @ BHT	@	@						

EQUIPMENT DATA							
GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	10748374	Serial No.	10747684	Serial No.	10673803	Serial No.	10735145
Model No.	GTET	Model No.	BSAT	Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.	2	Diameter	5.3"	Diameter	3.625"
Detector Model No.	GTET	Spacing	.5'	Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	CS-137	Source Type	AM-241BE
Length	8"	LSA [Y/N]		Serial No.	5073GW	Serial No.	DSN-4369
Distance to Source	N/A	FWDA [Y/N]		Strength	1.5 CI	Strength	15 CI

LOGGING DATA

GENERAL GAMMA ACOUSTIC DENSITY NEUTRON

Run No.	GENERAL		Speed ft/min	GAMMA		ACOUSTIC		Matrix	DENSITY		NEUTRON		Matrix	
	Depth			L	R	L	R		Scale		Matrix	Scale		
	From	To							L	R		L		R
ONE	5816	1824	REC	0	150	30	-10	47.6 us/ft	30	-10	2.71 gm/cc	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation @ KOP @

Remarks: ANNULAR HOLE VOLUME CALCULATED 5.5 INCH CASING.
 BOTTOM 150' OF SP DOES NOT REPEAT DUE TO FLUID MOVEMENT.
 CHLORIDES REPORTED AT 500 mg/L.

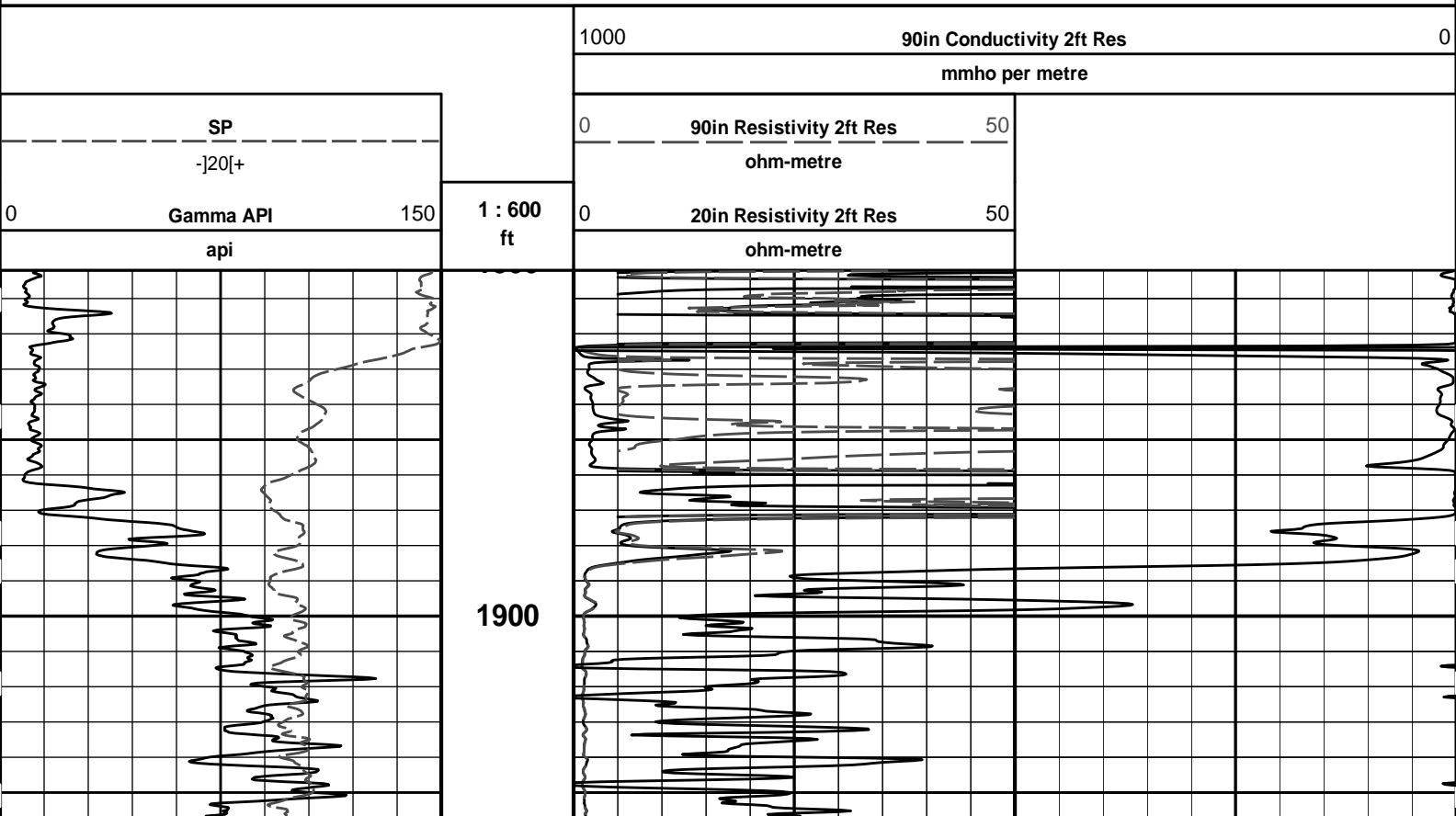
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR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

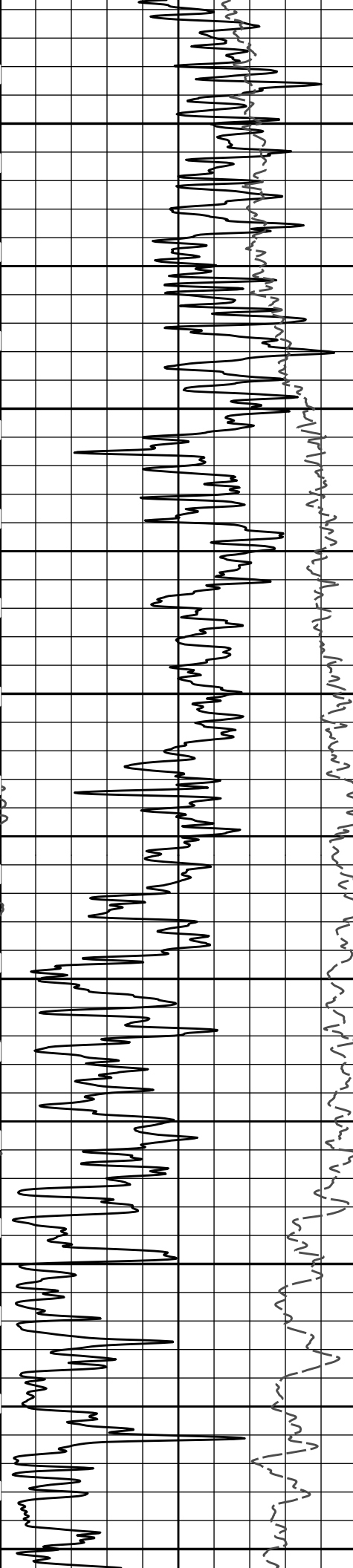
HALLIBURTON

HALLIBURTON

Plot Time: 20-Jan-13 15:33:52
 Plot Range: 1802 ft to 5822 ft
 Data: ELLIOTT_C-1BWell Based\ELLIOTT_C-1B_MAIN_PASS\
 Plot File: \\-LOCAL-\ELLIOTT_C-1BWell Based\ACRT\ACRT_2_lib

2 INCH MAIN LOG





2000

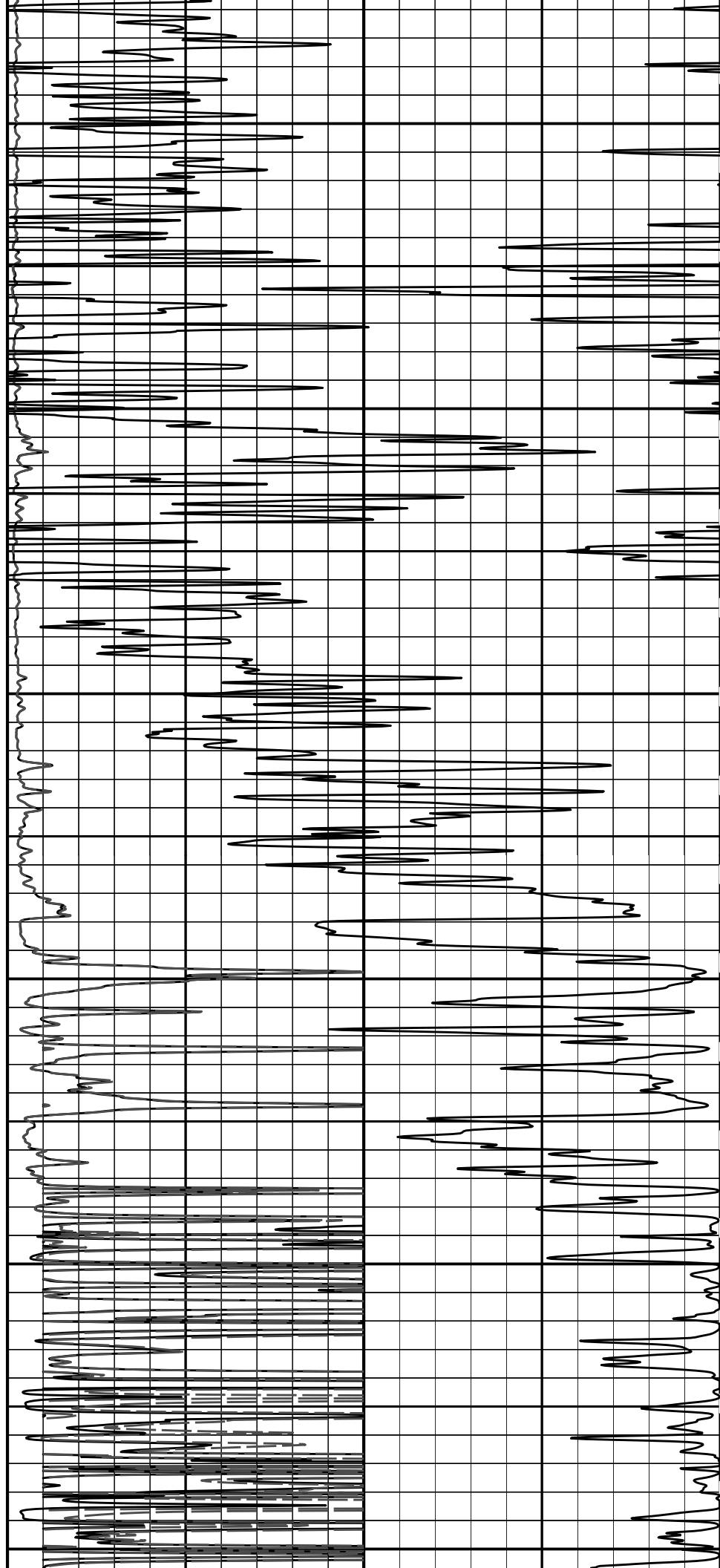
2100

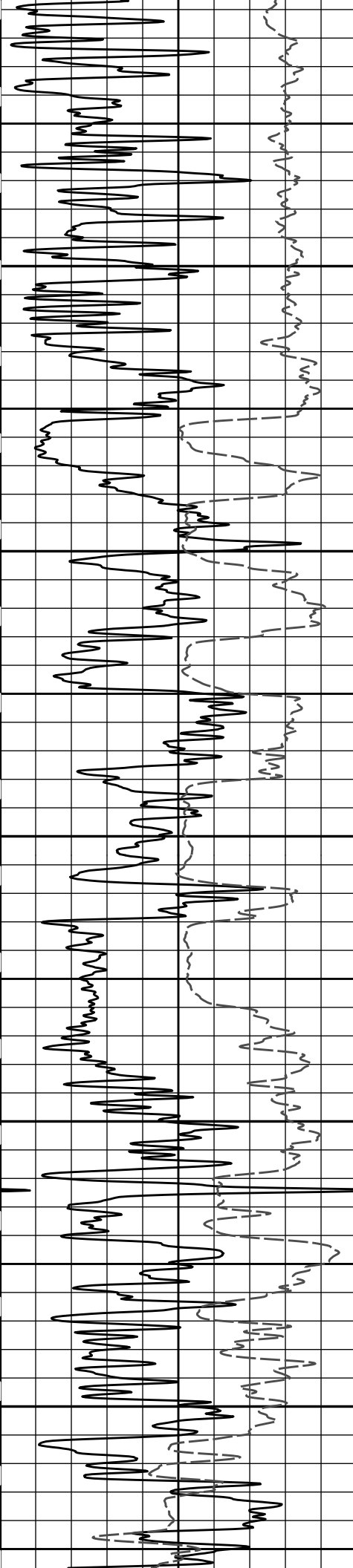
2200

2300

2400

2500





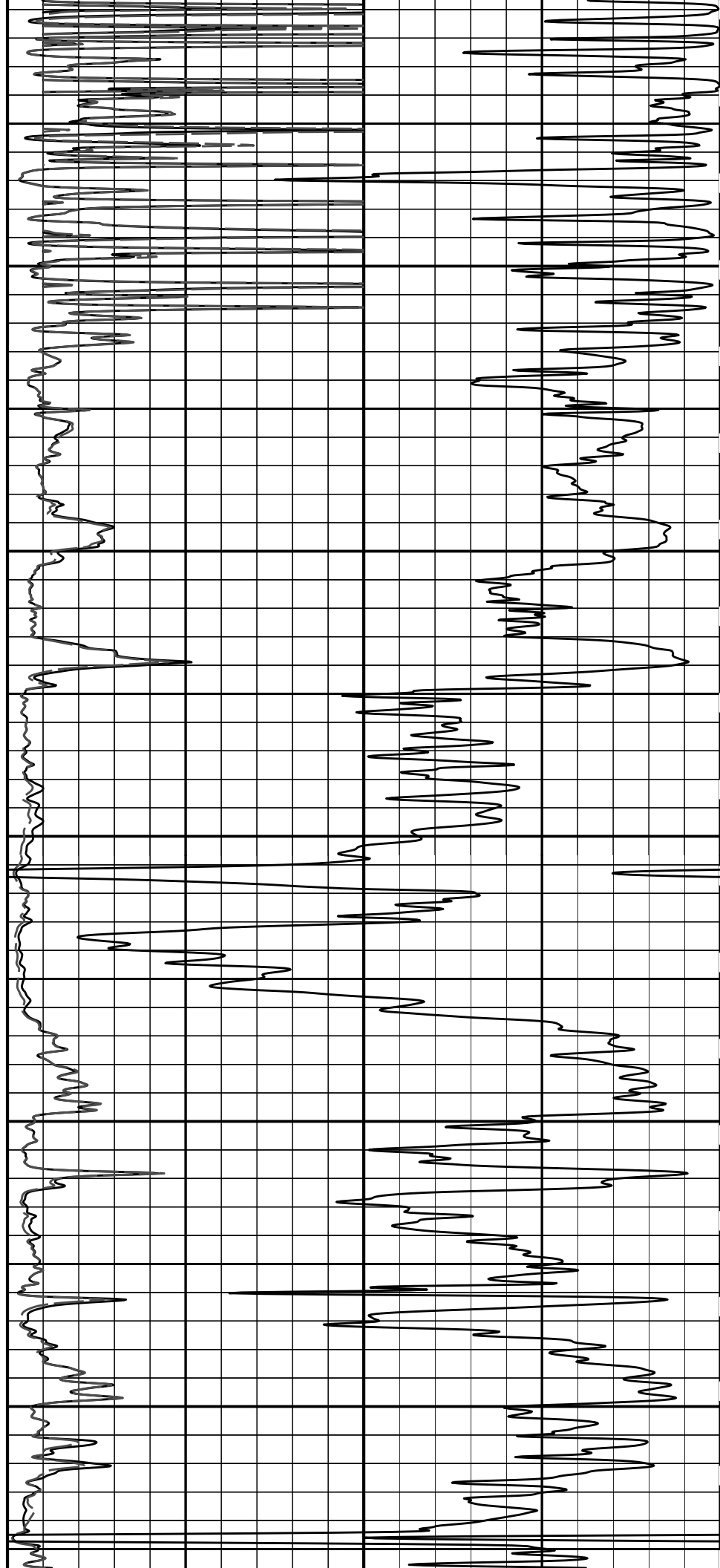
2600

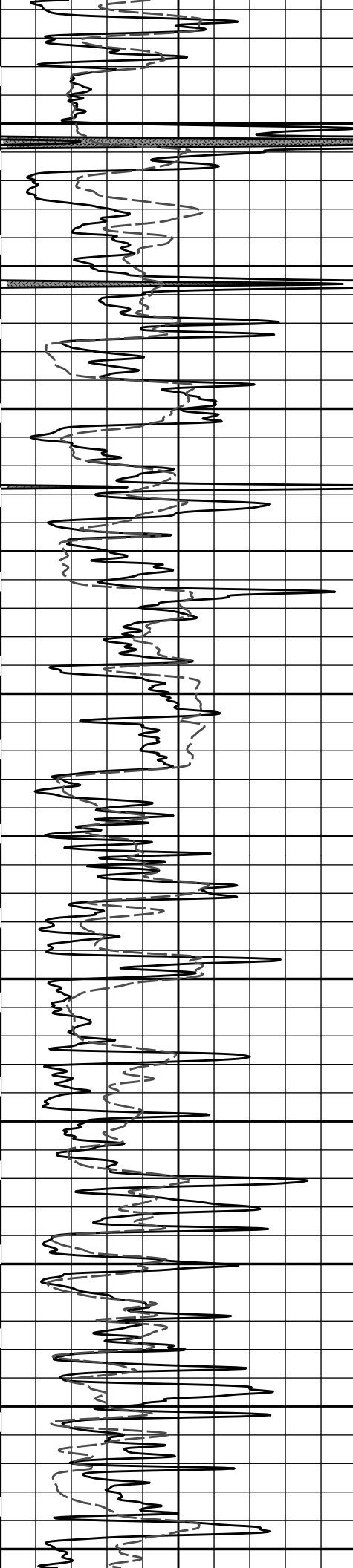
2700

2800

2900

3000





3100

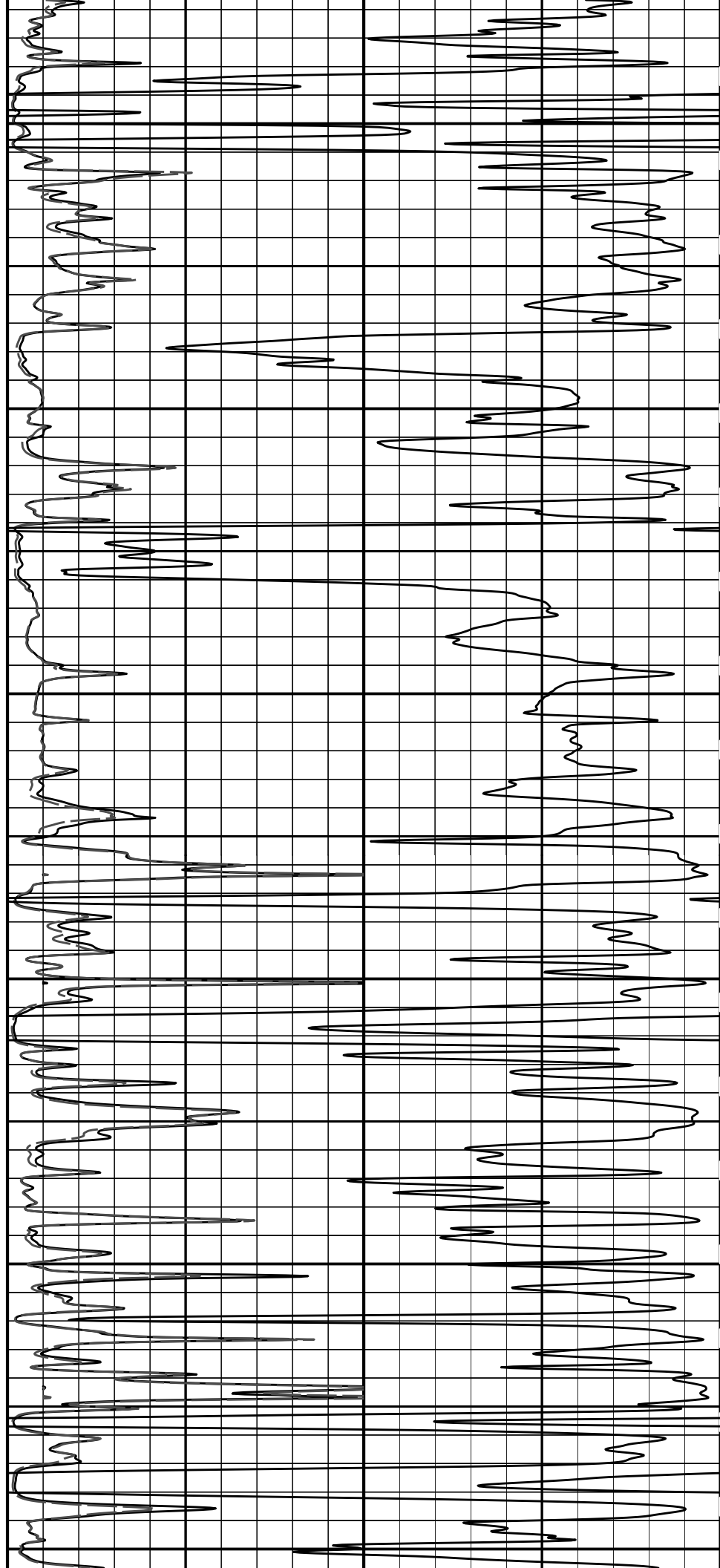
3200

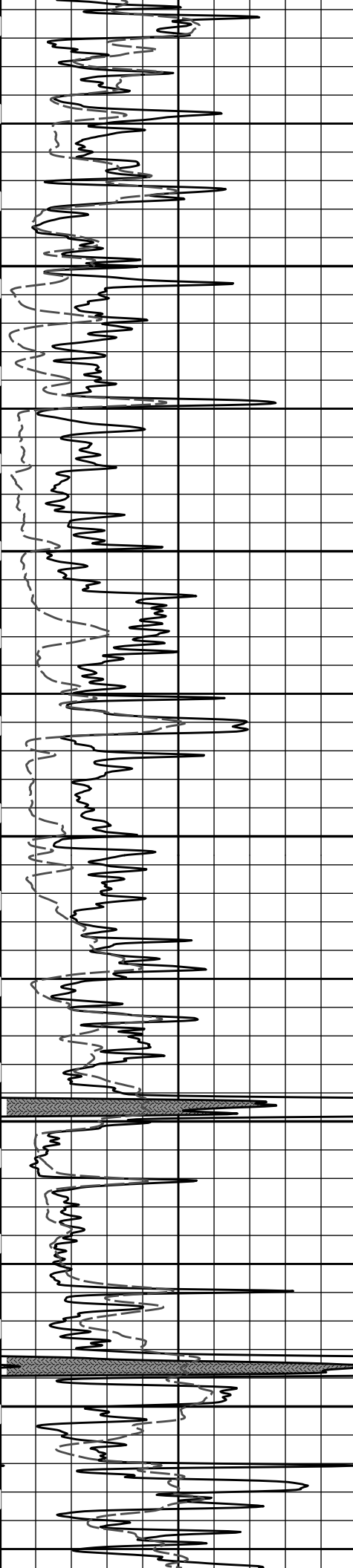
3300

3400

3500

3600





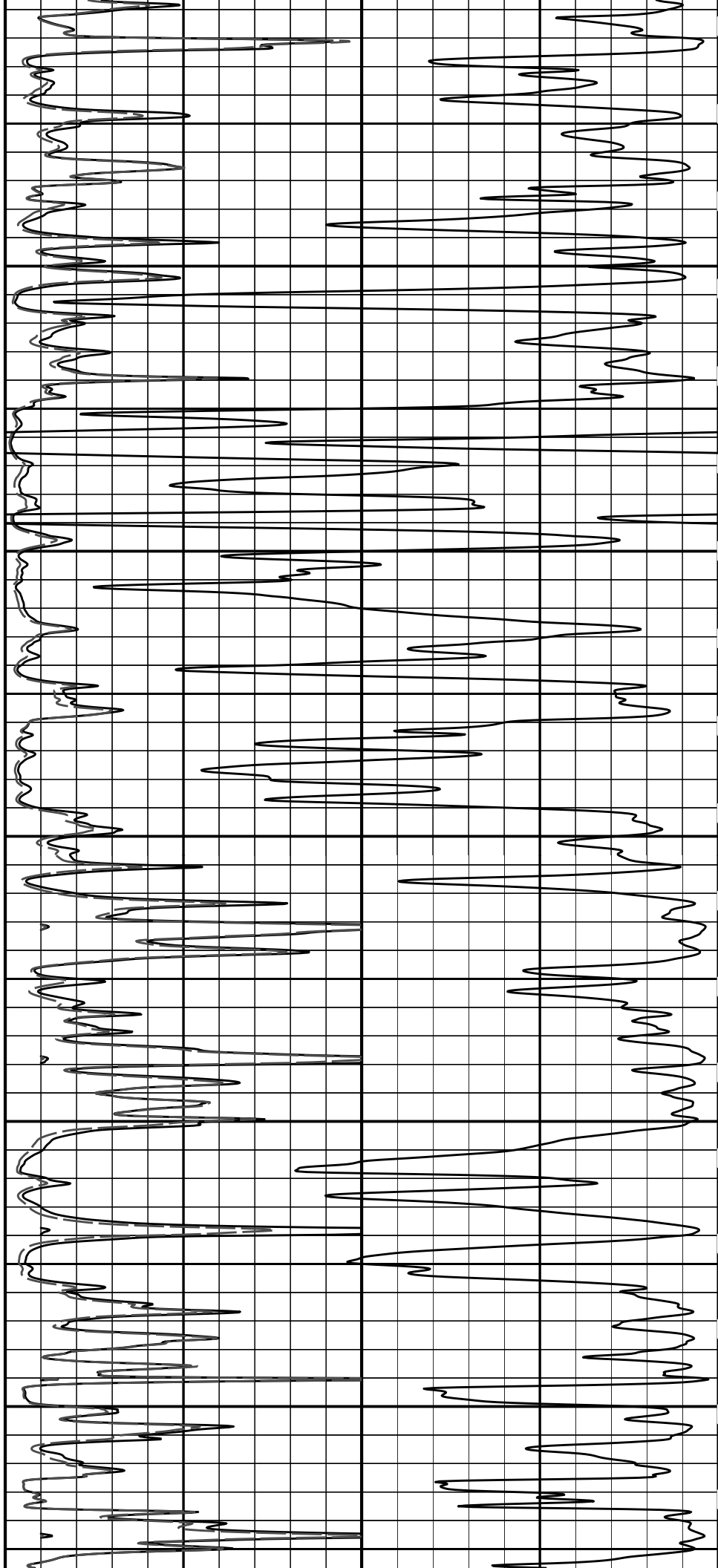
3700

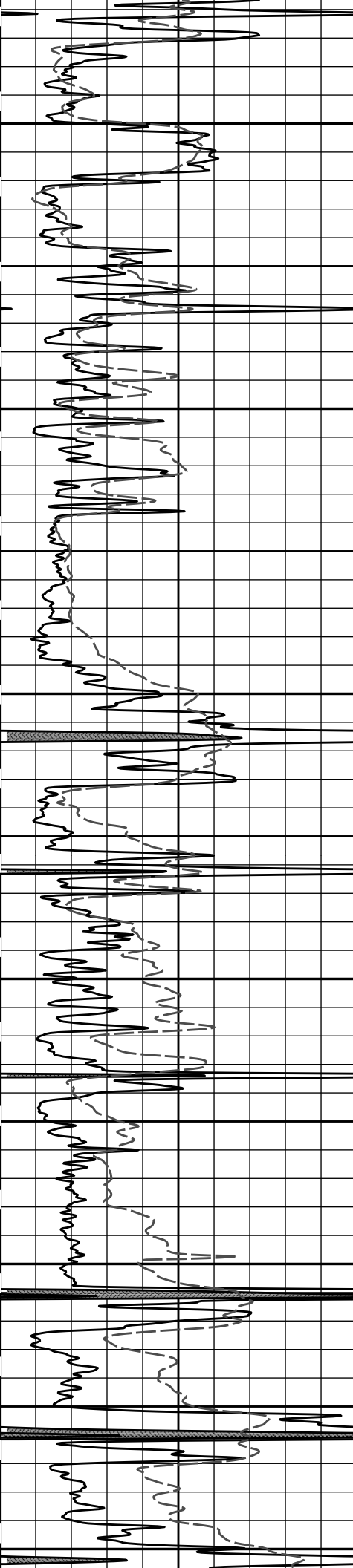
3800

3900

4000

4100





4200

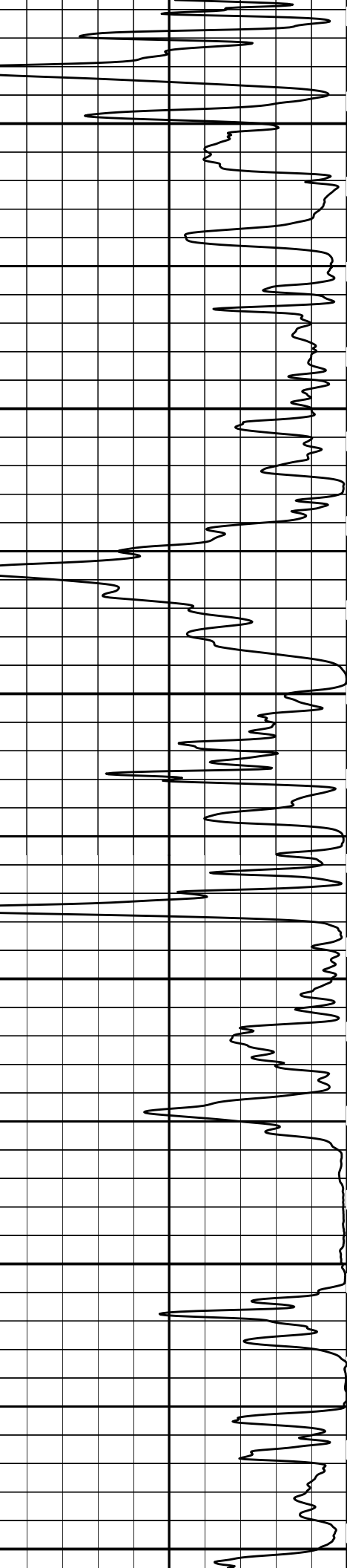
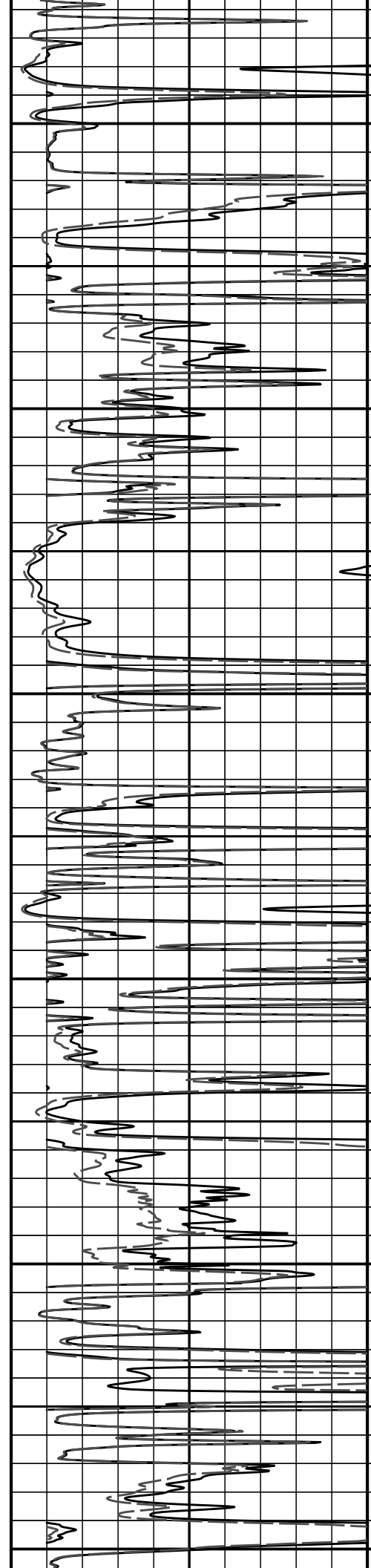
4300

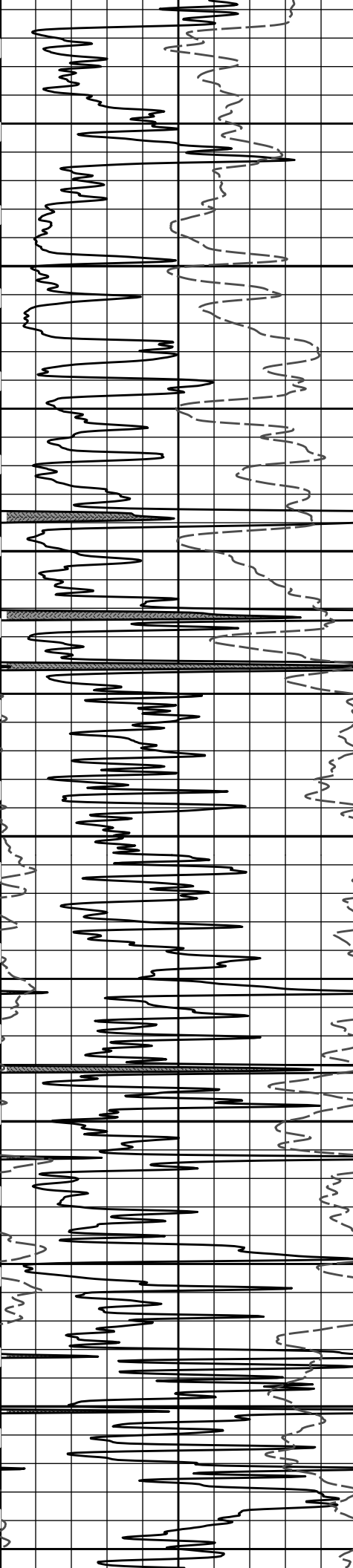
4400

4500

4600

4700





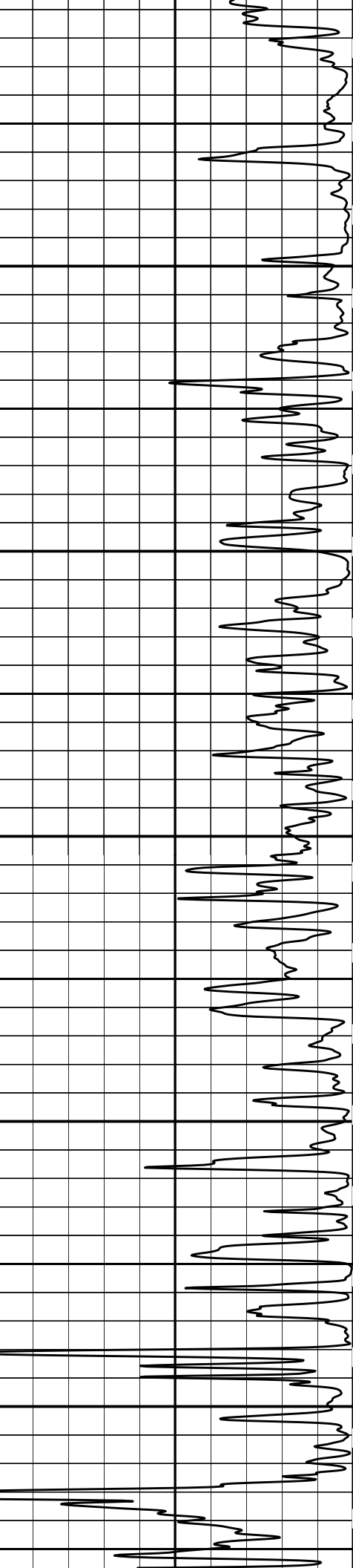
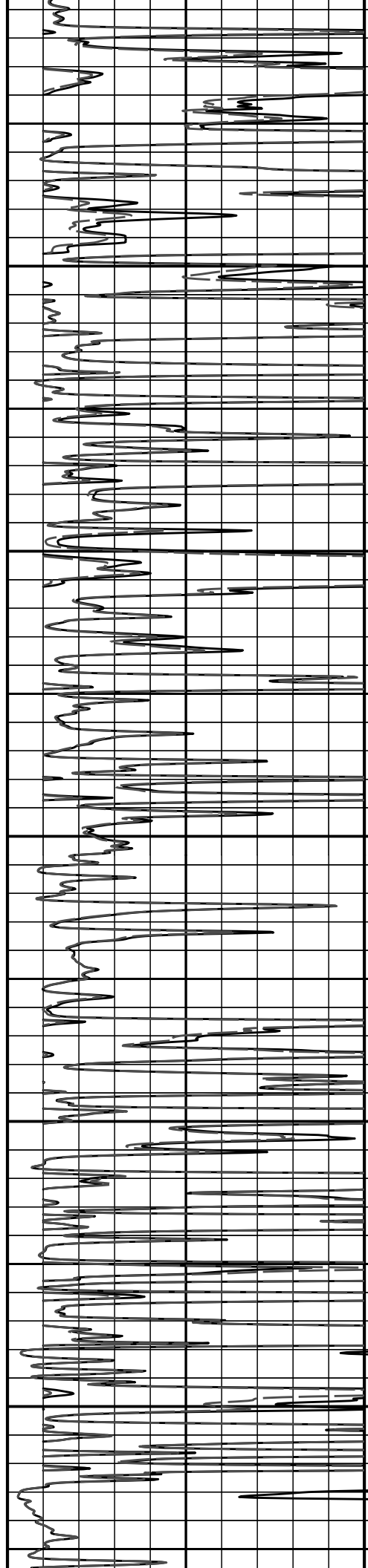
4800

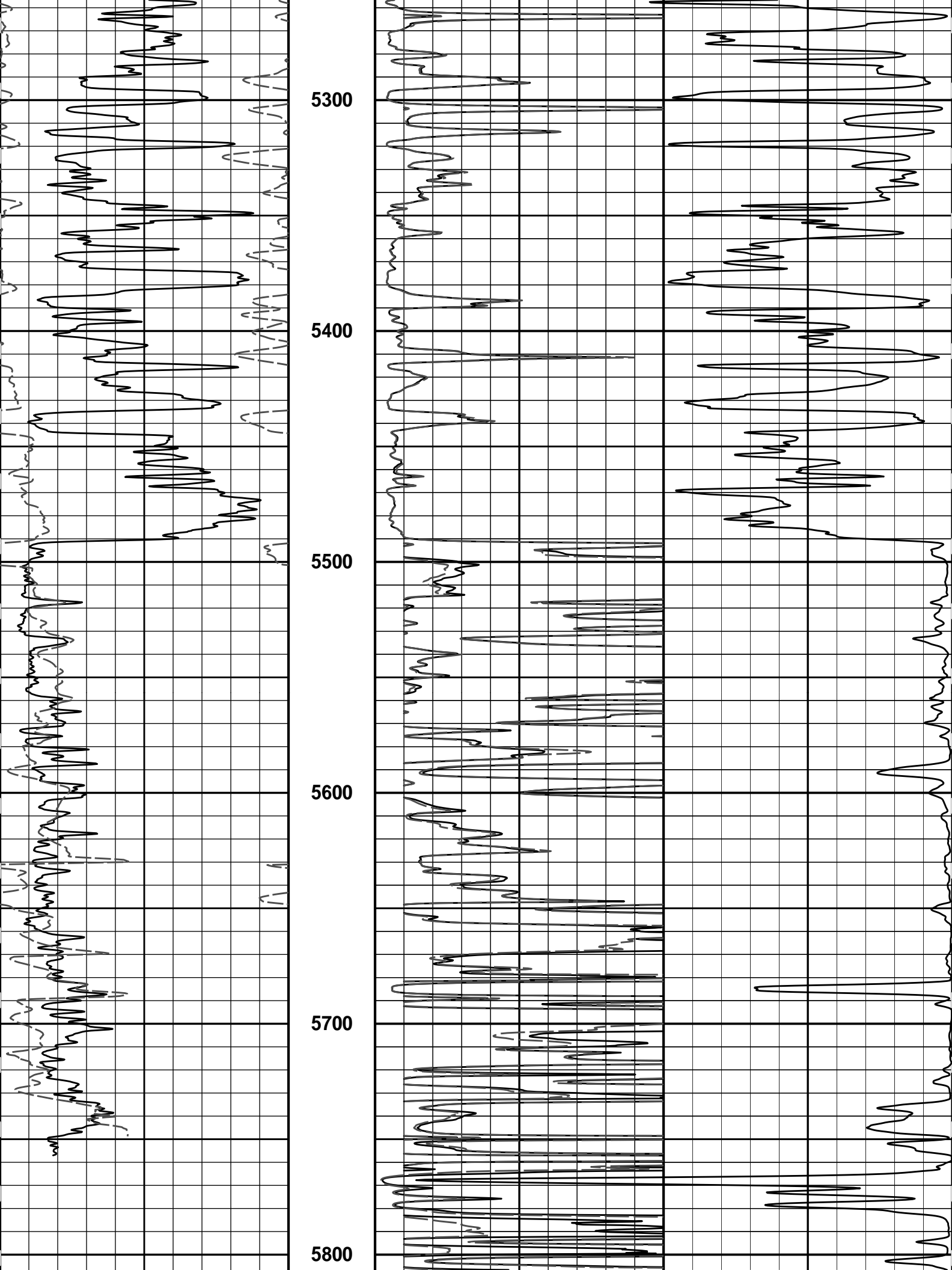
4900

5000

5100

5200





0	Gamma API	150
	api	
	SP	
	-]20[+	

1 : 600
ft

0	20in Resistivity 2ft Res	50
	ohm-metre	
0	90in Resistivity 2ft Res	50
	ohm-metre	
1000	90in Conductivity 2ft Res	0
	mmho per metre	

HALLIBURTON

Plot Time: 20-Jan-13 15:34:19
 Plot Range: 1802 ft to 5822 ft
 Data: ELLIOTT_C-1BWell Based\ELLIOTT_C-1B_MAIN_PASS\
 Plot File: \\-LOCAL-\ELLIOTT_C-1BWell Based\ACRT\ACRT_2_lib

2 INCH MAIN LOG

HALLIBURTON

Plot Time: 20-Jan-13 15:34:19
 Plot Range: 1802 ft to 5822 ft
 Data: ELLIOTT_C-1BWell Based\ELLIOTT_C-1B_MAIN_PASS\
 Plot File: \\-LOCAL-\ELLIOTT_C-1BWell Based\ACRT\ACRT_5_MAIN_lib

MAIN PASS

0	Gamma API	150
	api	
	SP	
	-]20[+	

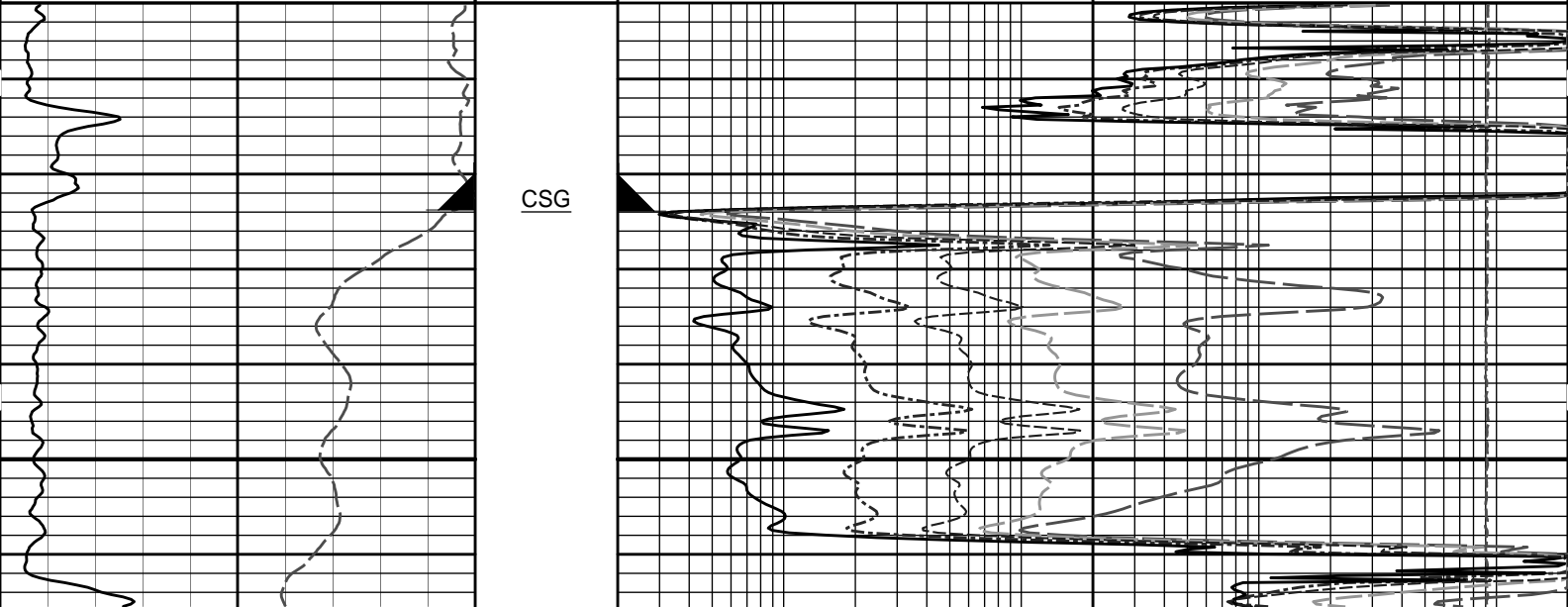
SHALE

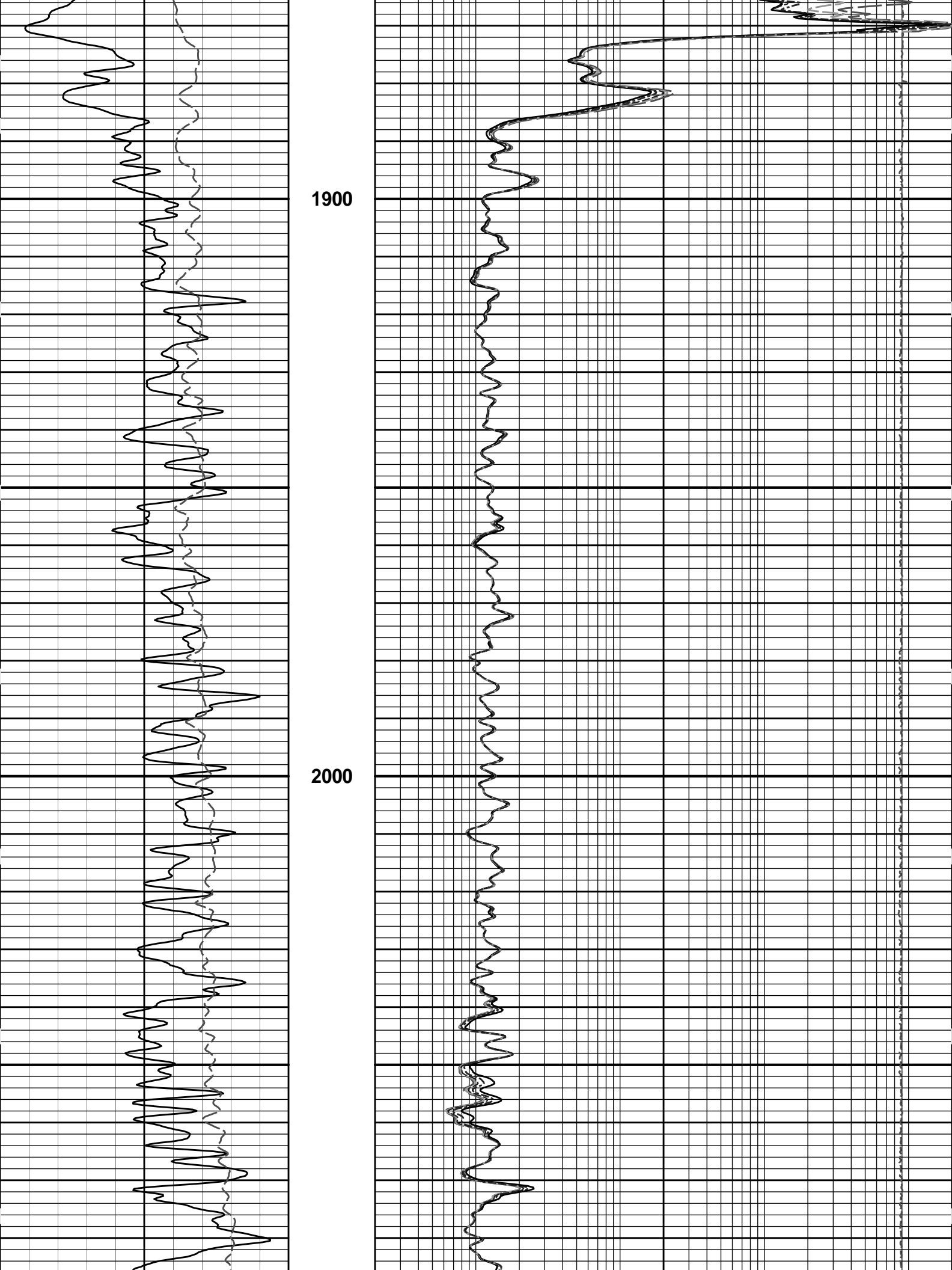
1 : 240
ft

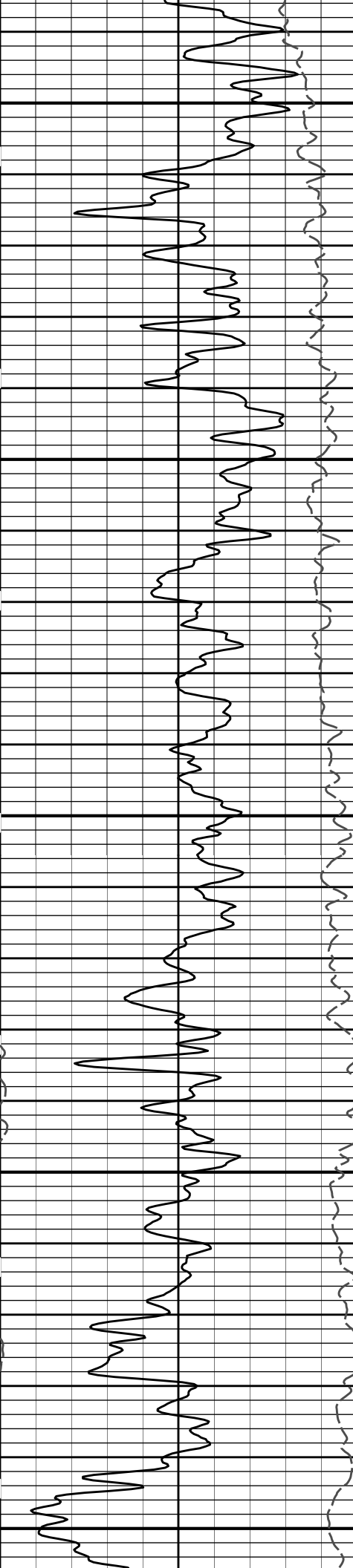
0.2	90in Resistivity 2ft Res	2000
	ohmm	
0.2	60in Resistivity 2ft Res	2000
	ohmm	
0.2	30in Resistivity 2ft Res	2000
	ohm-metre	
0.2	20in Resistivity 2ft Res	2000
	ohmm	
0.2	10in Resistivity 2ft Res	2000
	ohmm	

10K Tension
pounds

CSG



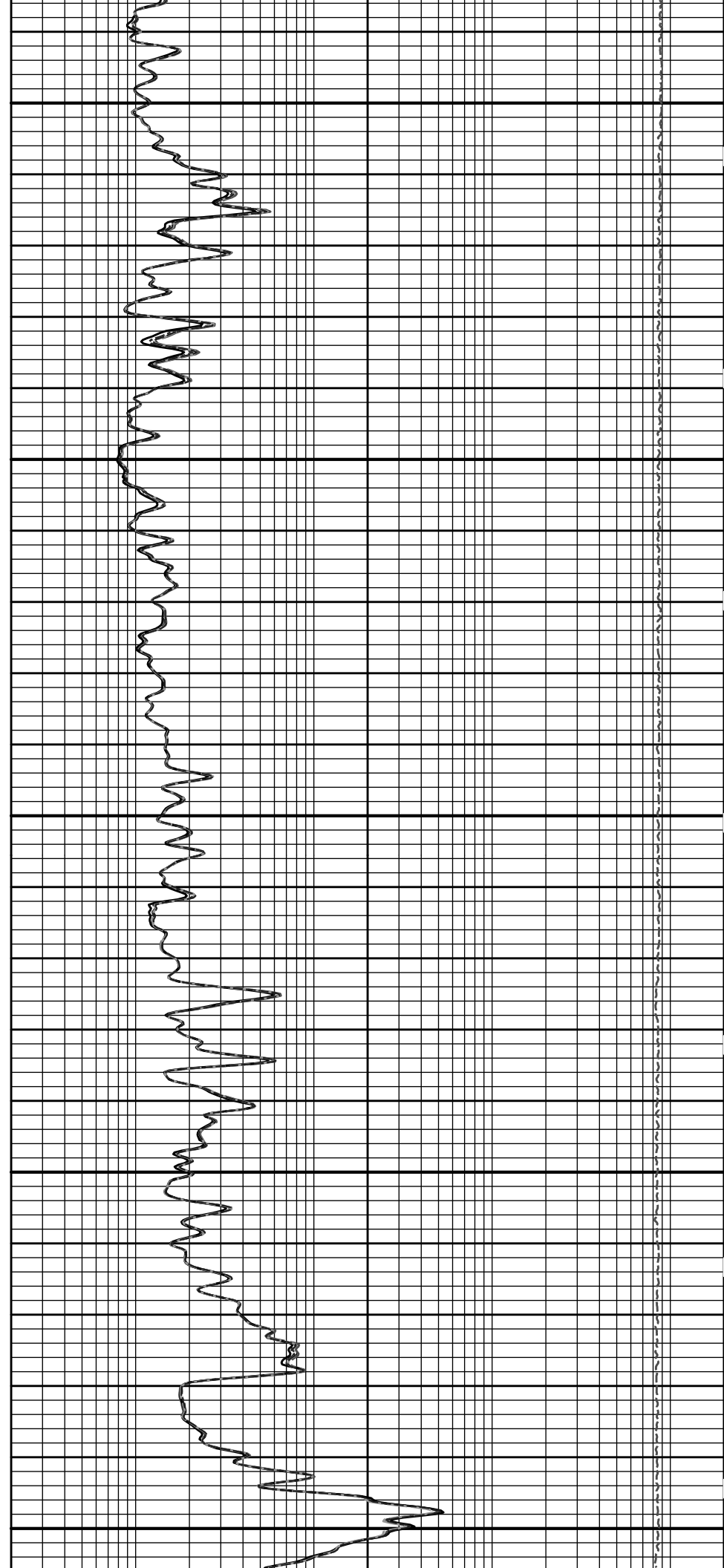


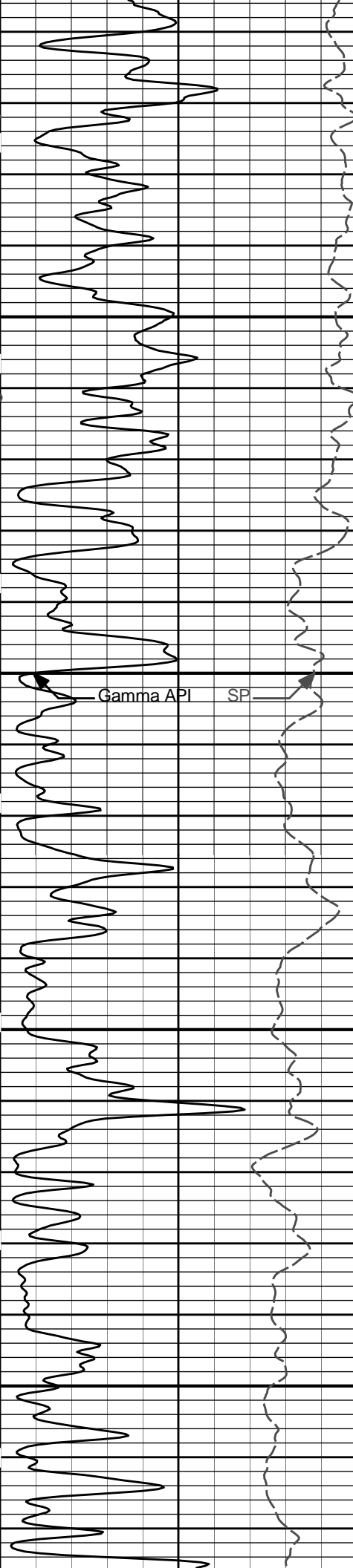


2100

2200

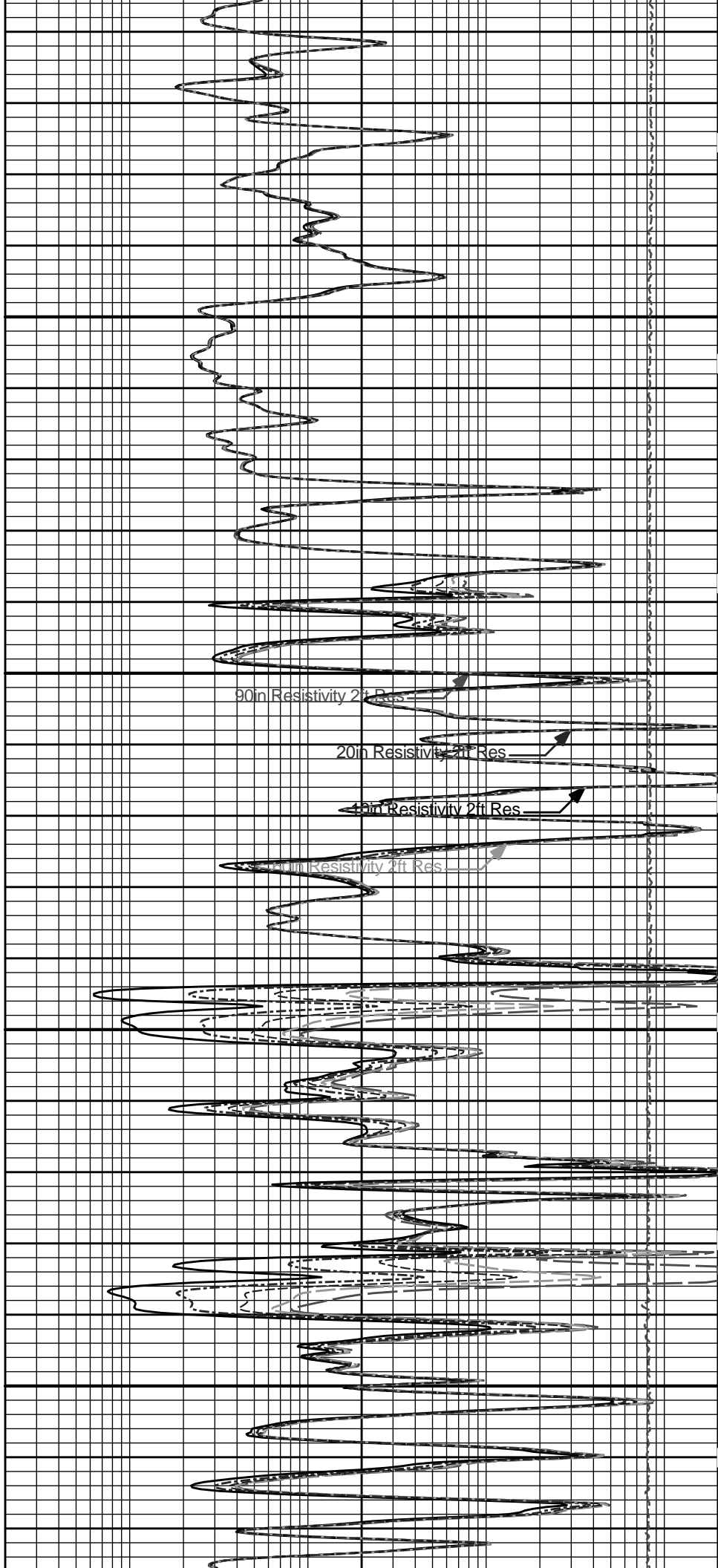
2300





2400

2500

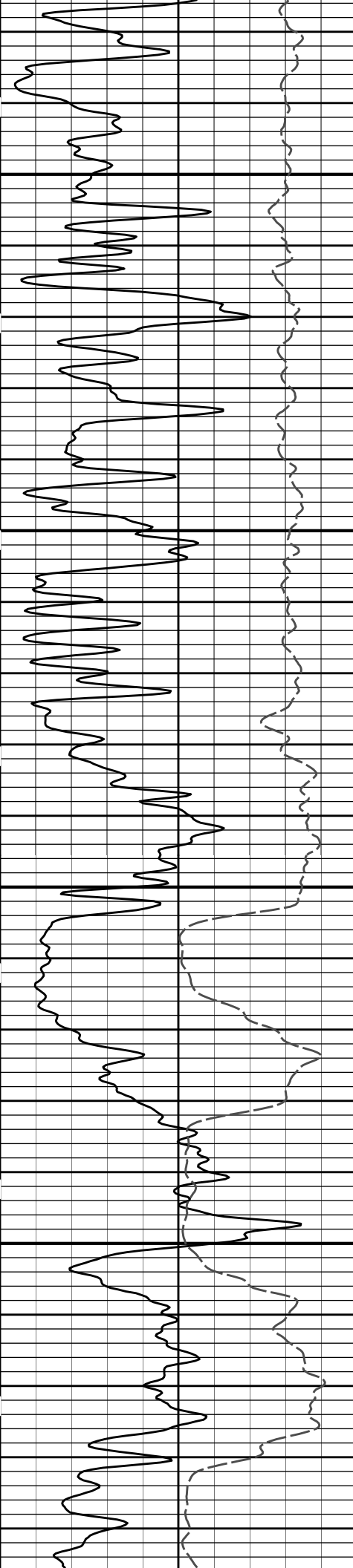


90in Resistivity 2ft Res

20in Resistivity 2ft Res

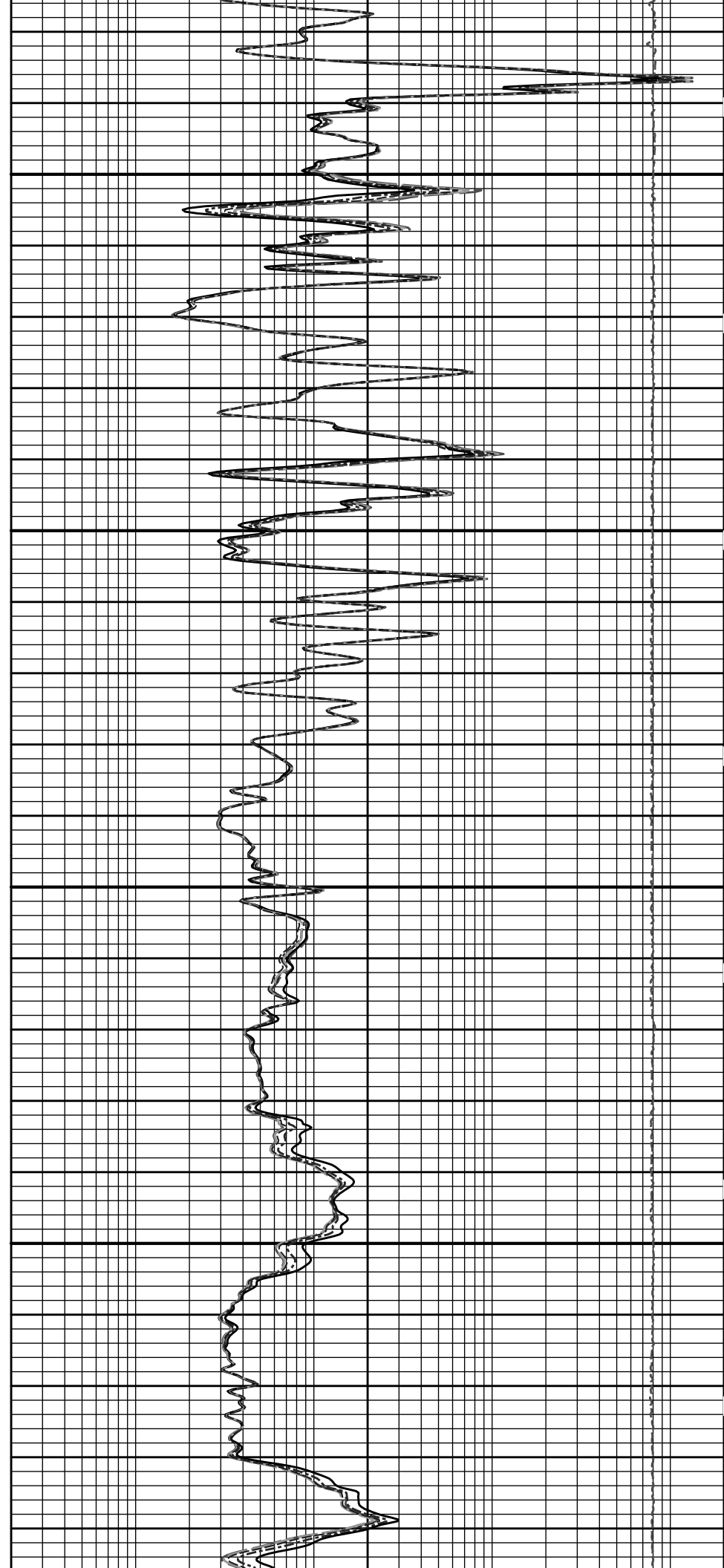
4in Resistivity 2ft Res

1in Resistivity 2ft Res



2600

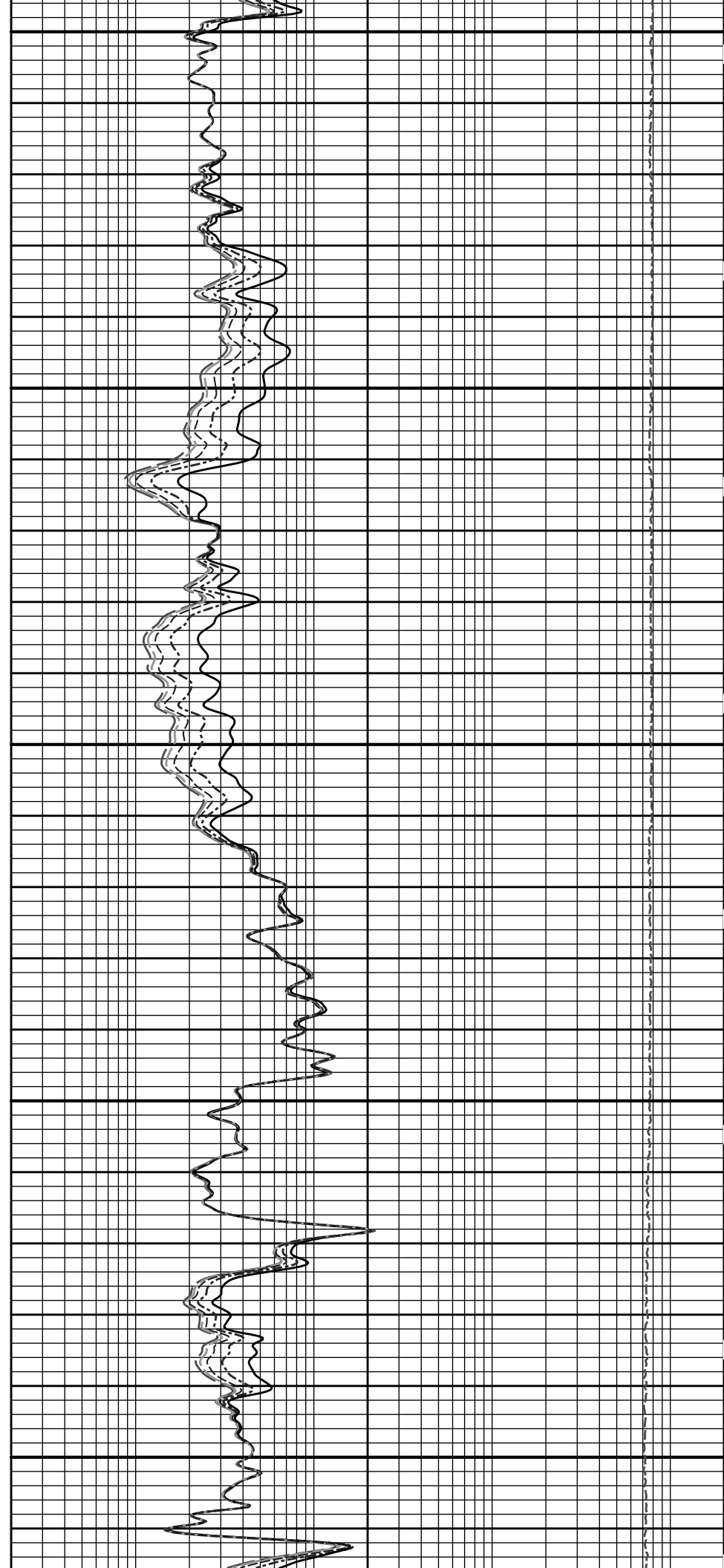
2700

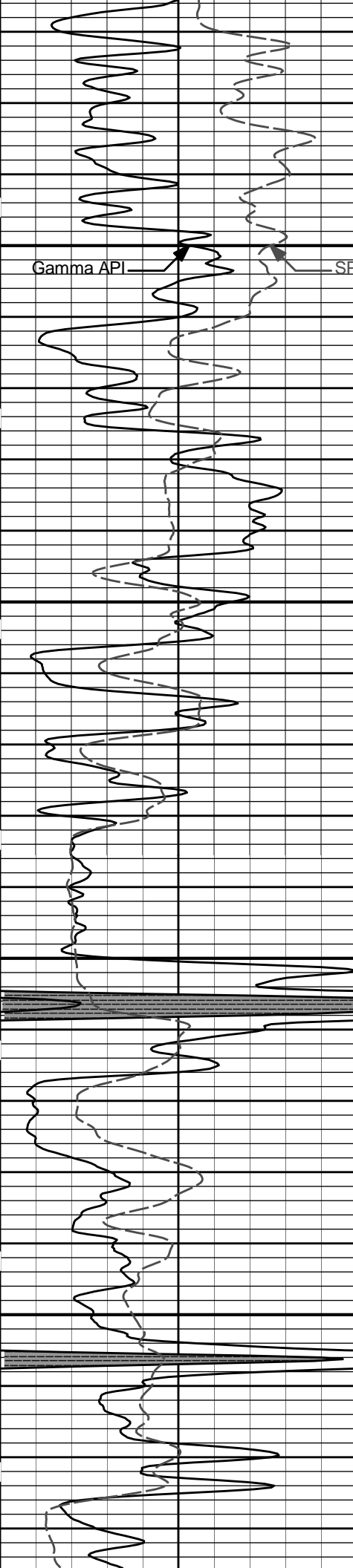




2800

2900



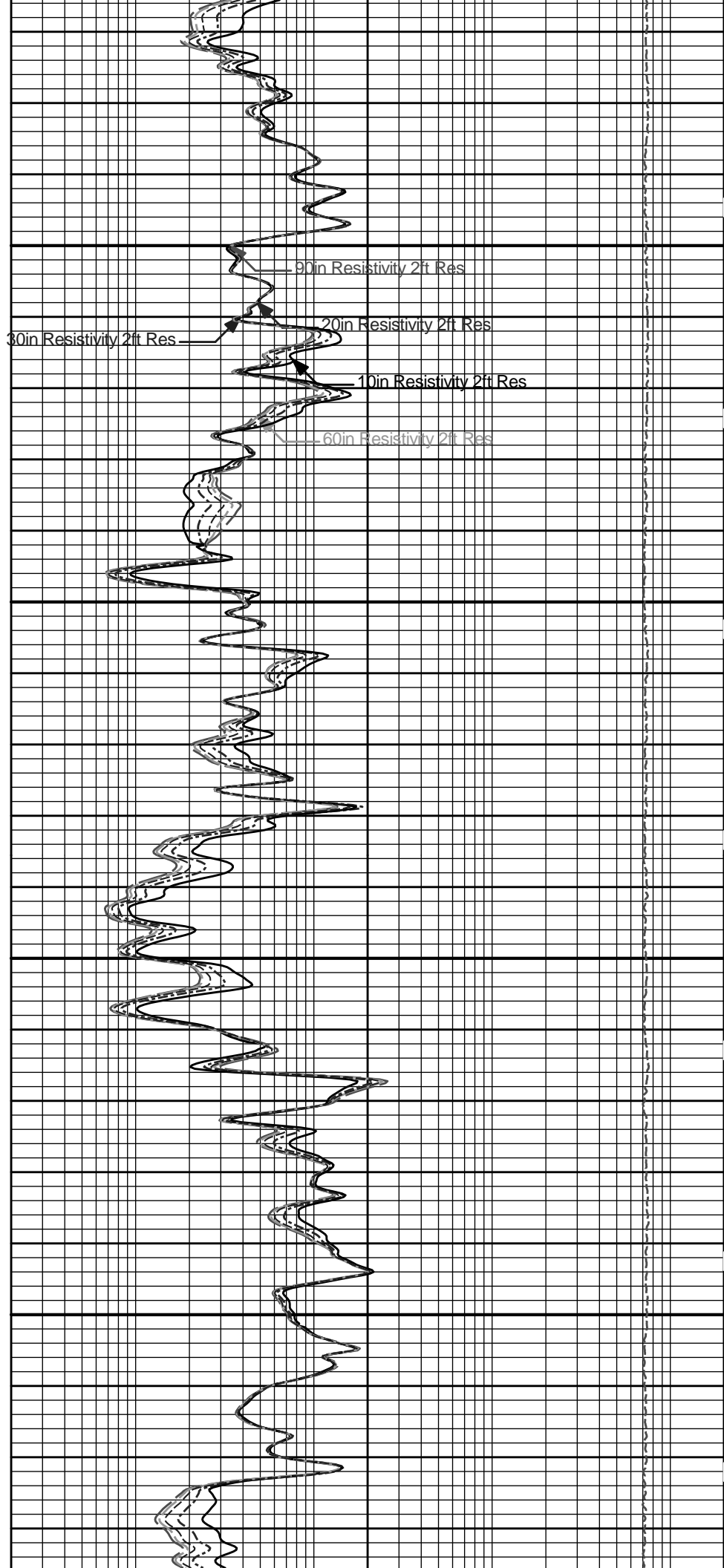


3000

Gamma API

SP

3100



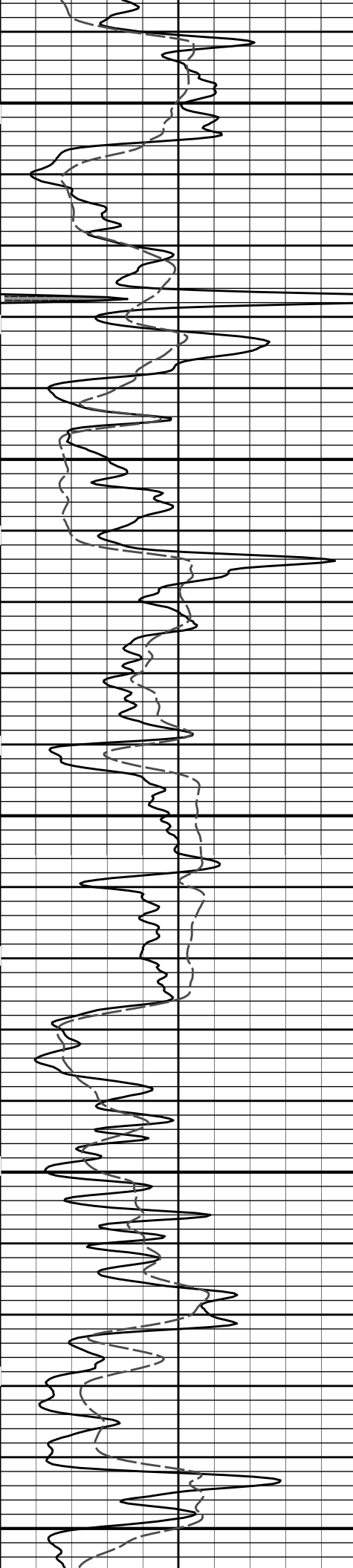
90in Resistivity 2ft Res

30in Resistivity 2ft Res

20in Resistivity 2ft Res

10in Resistivity 2ft Res

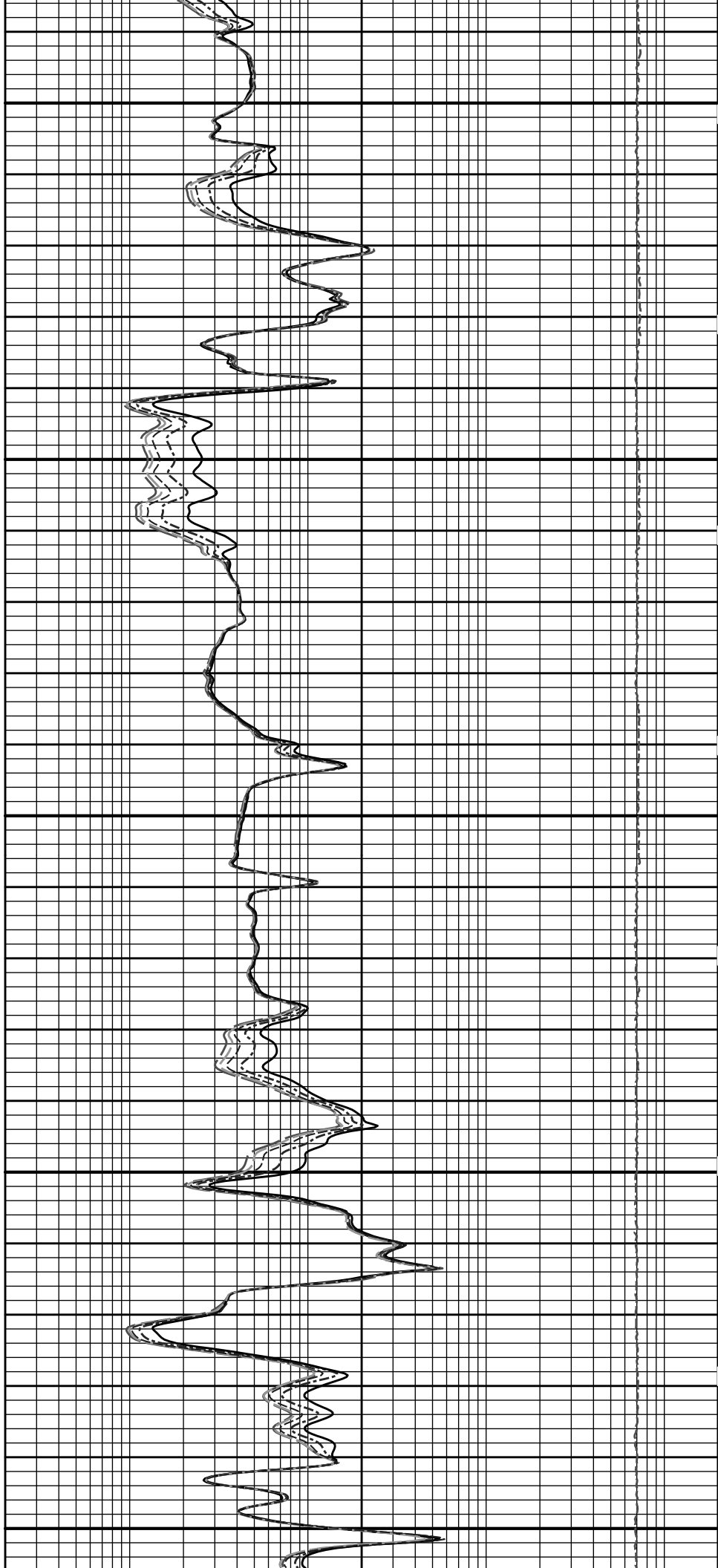
60in Resistivity 2ft Res

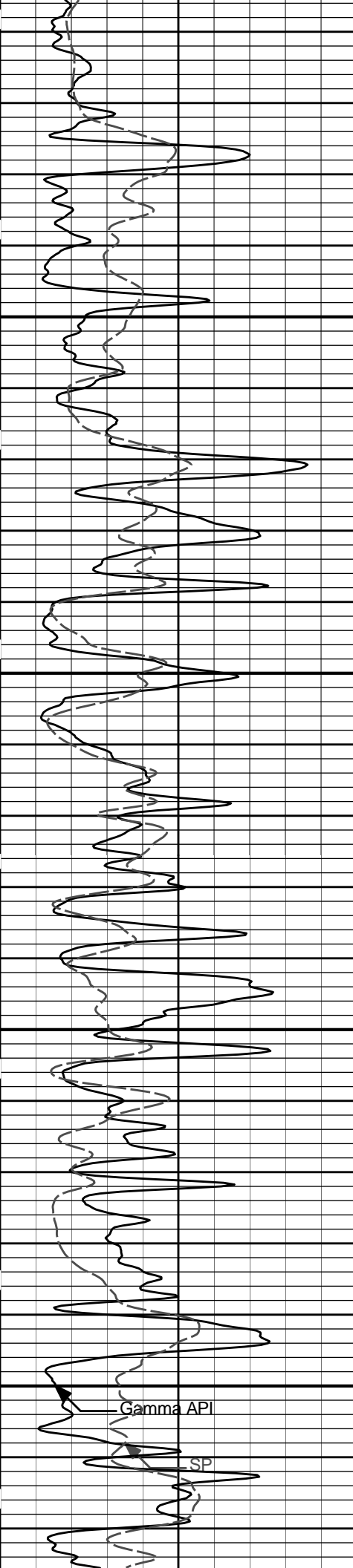


3200

3300

3400



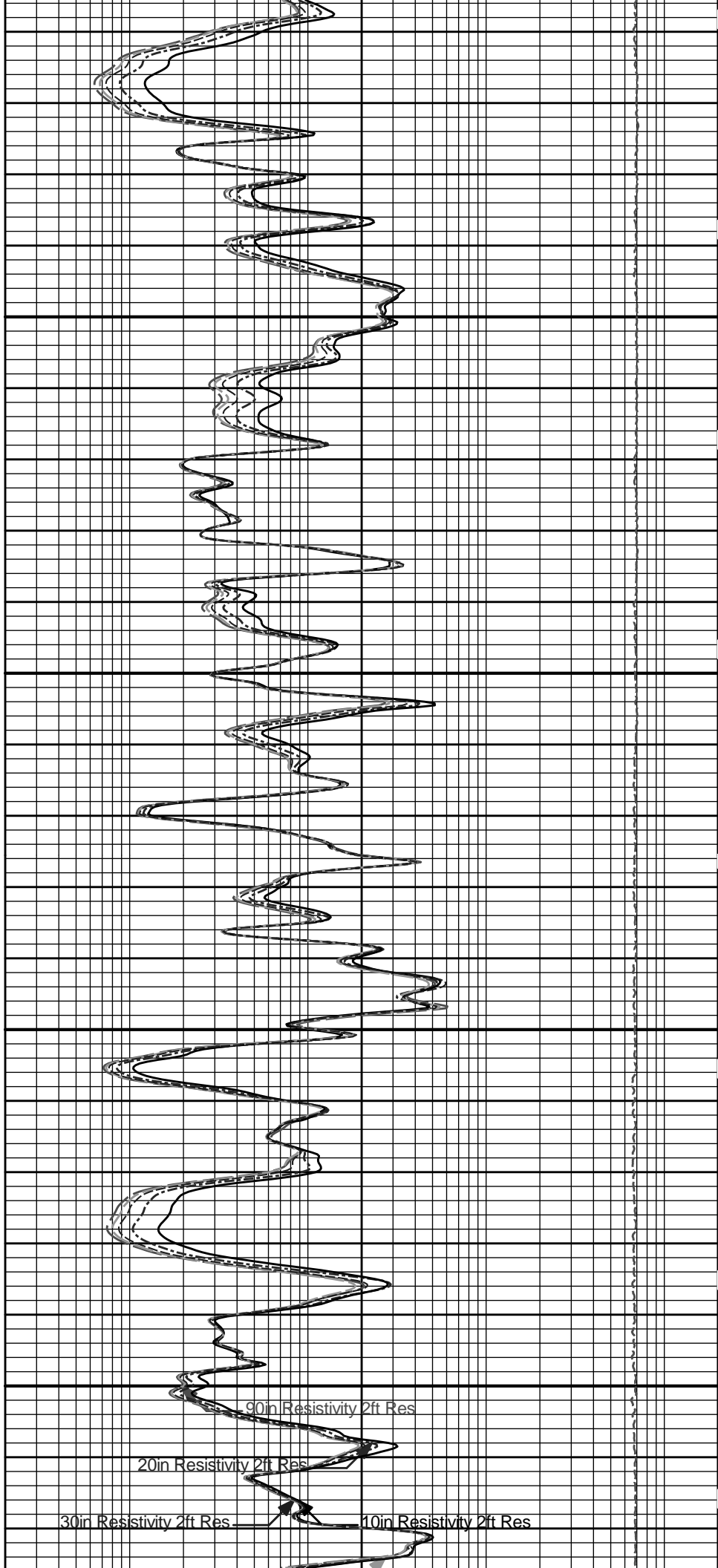


3500

3600

Gamma API

SP



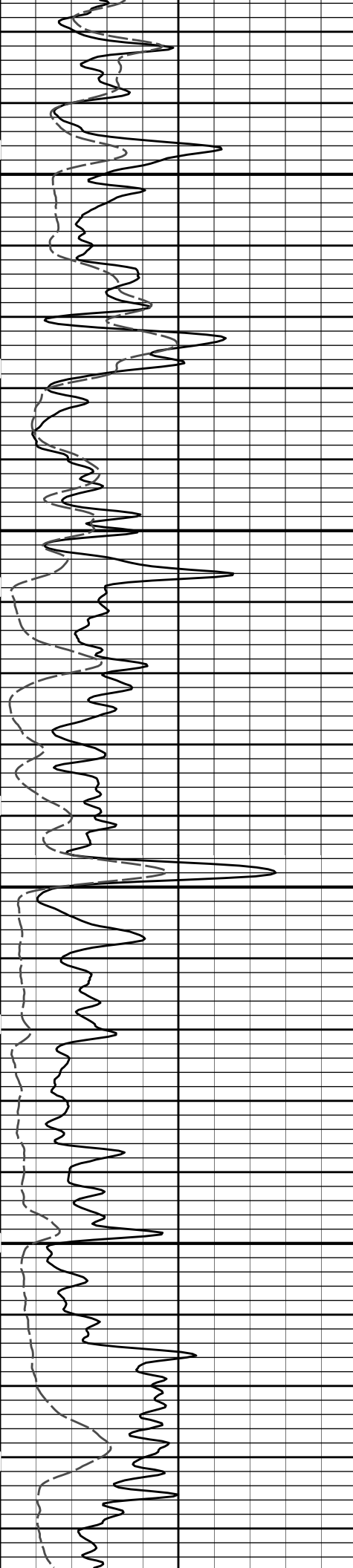
90in Resistivity 2ft Res

20in Resistivity 2ft Res

30in Resistivity 2ft Res

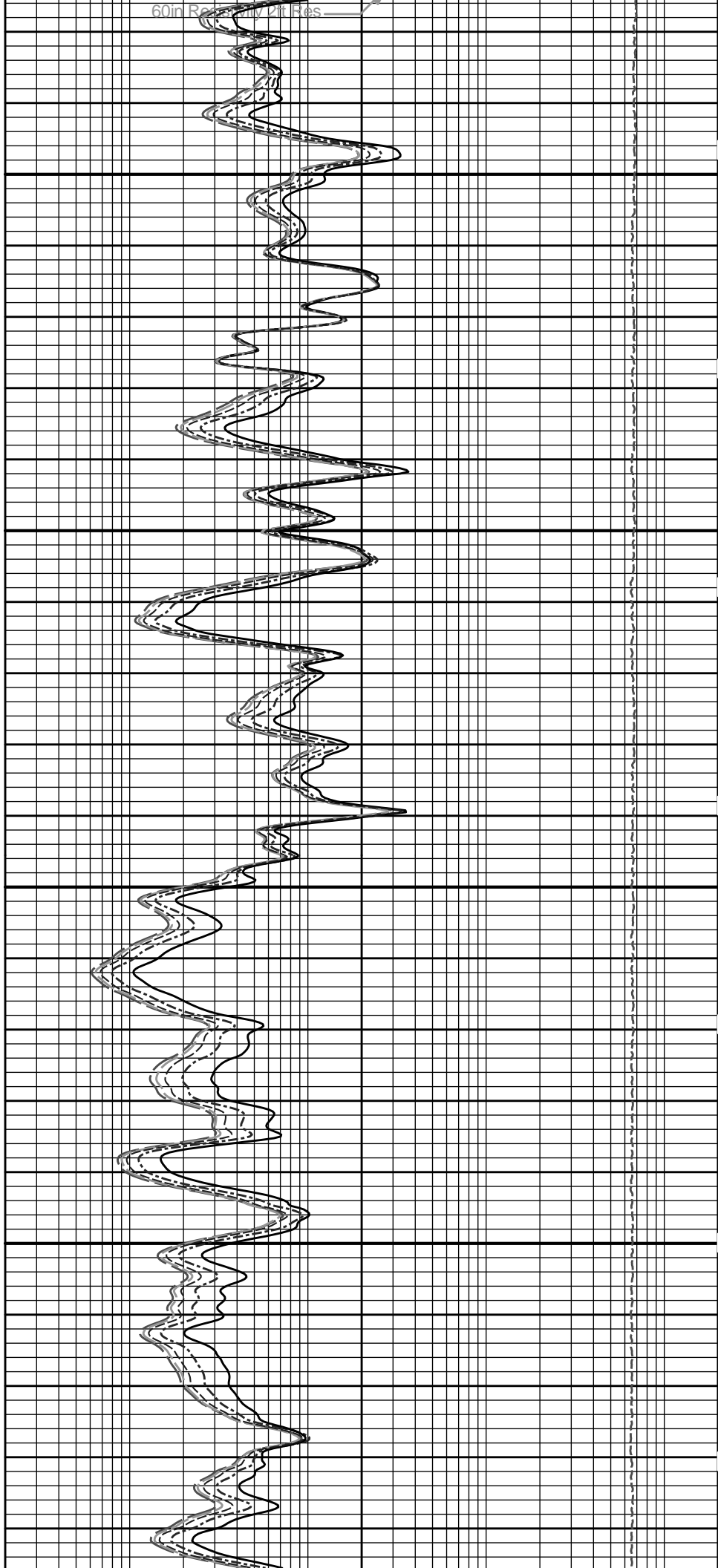
10in Resistivity 2ft Res

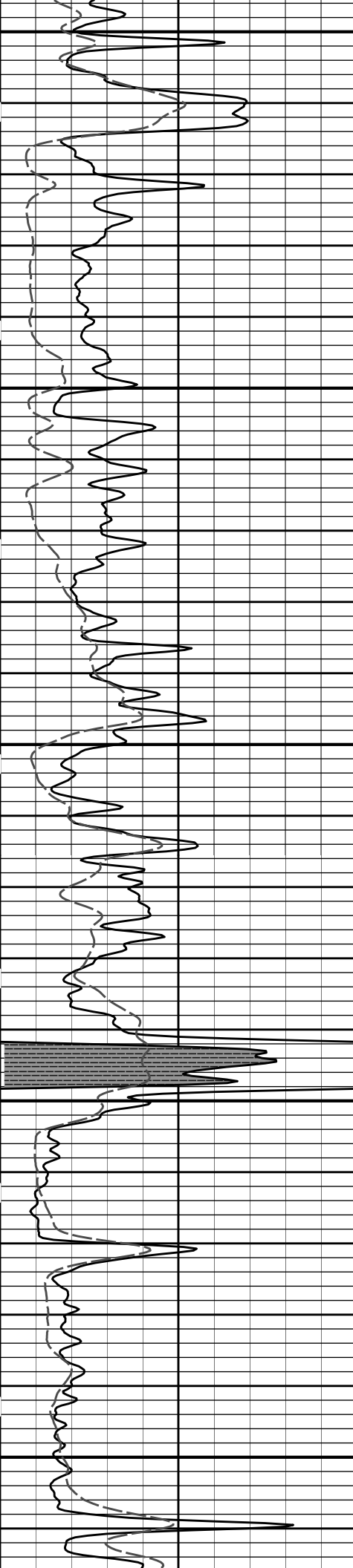
60in Res



3700

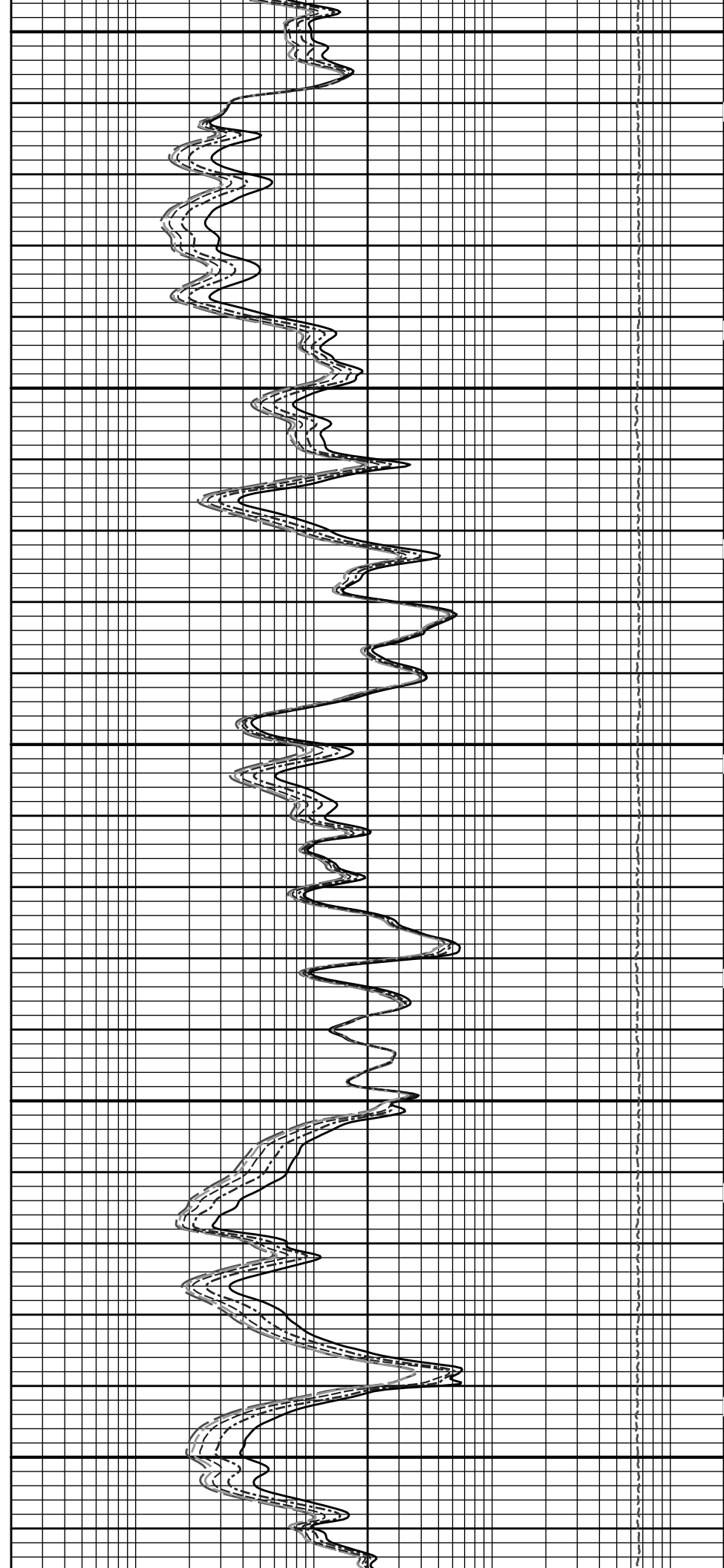
3800

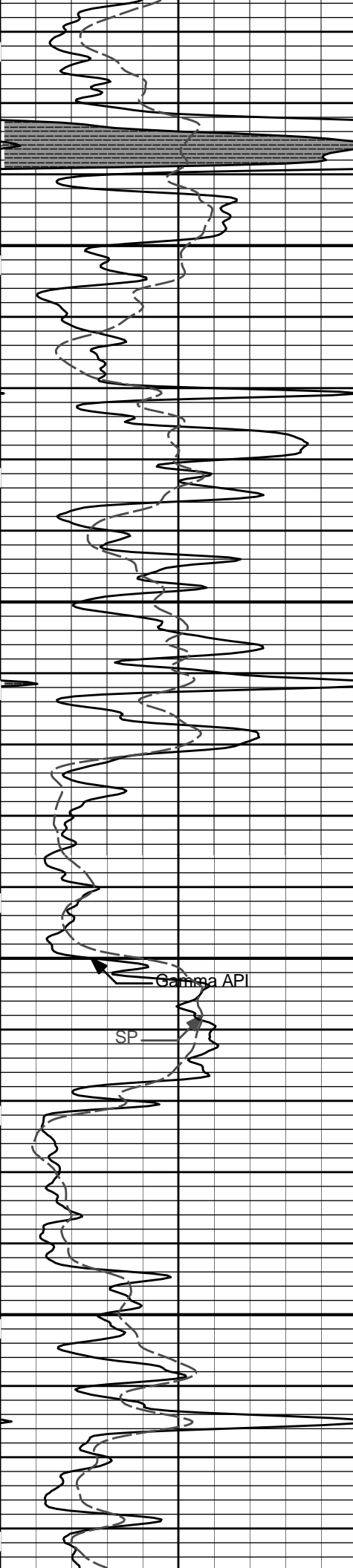




3900

4000





4100

4200

Gamma API

SP

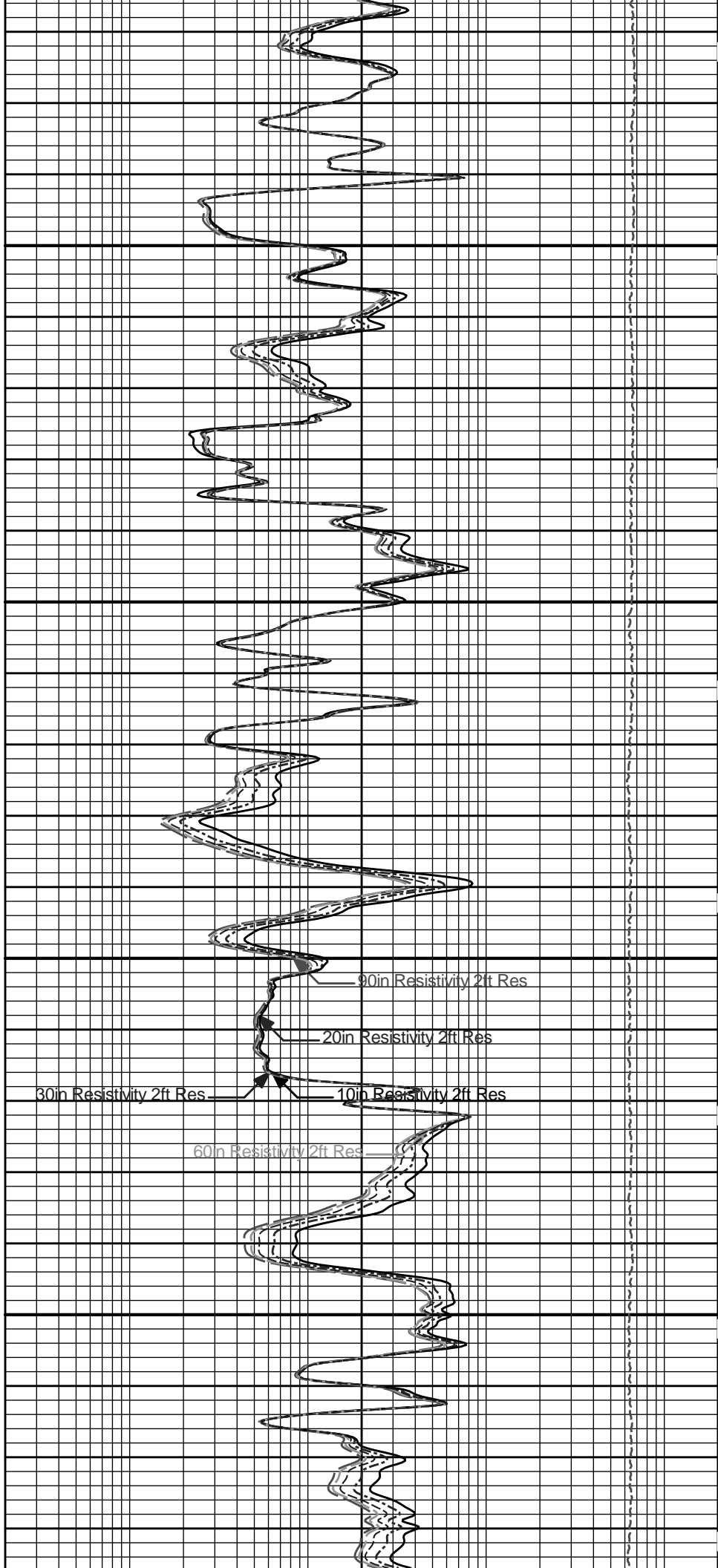
30in Resistivity 2ft Res

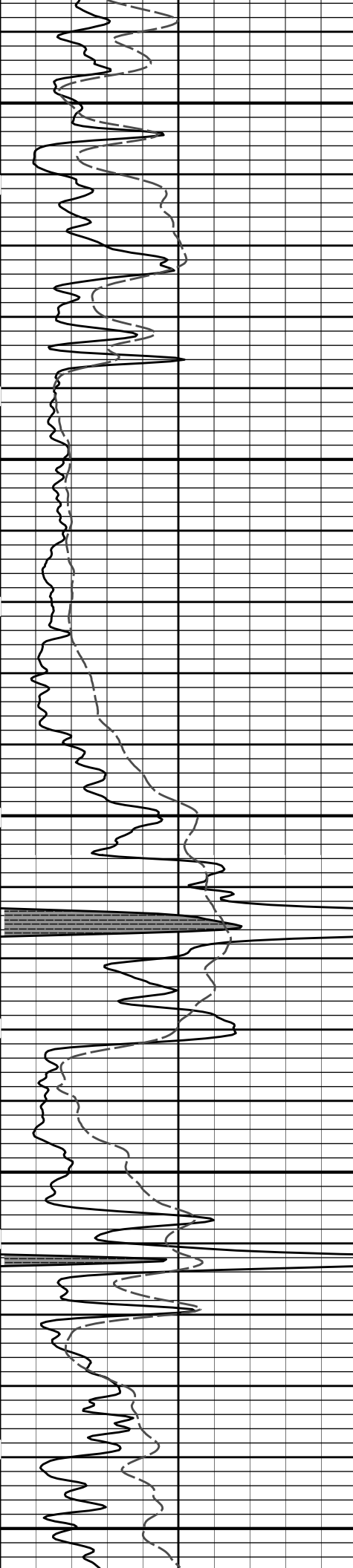
90in Resistivity 2ft Res

20in Resistivity 2ft Res

10in Resistivity 2ft Res

60in Resistivity 2ft Res

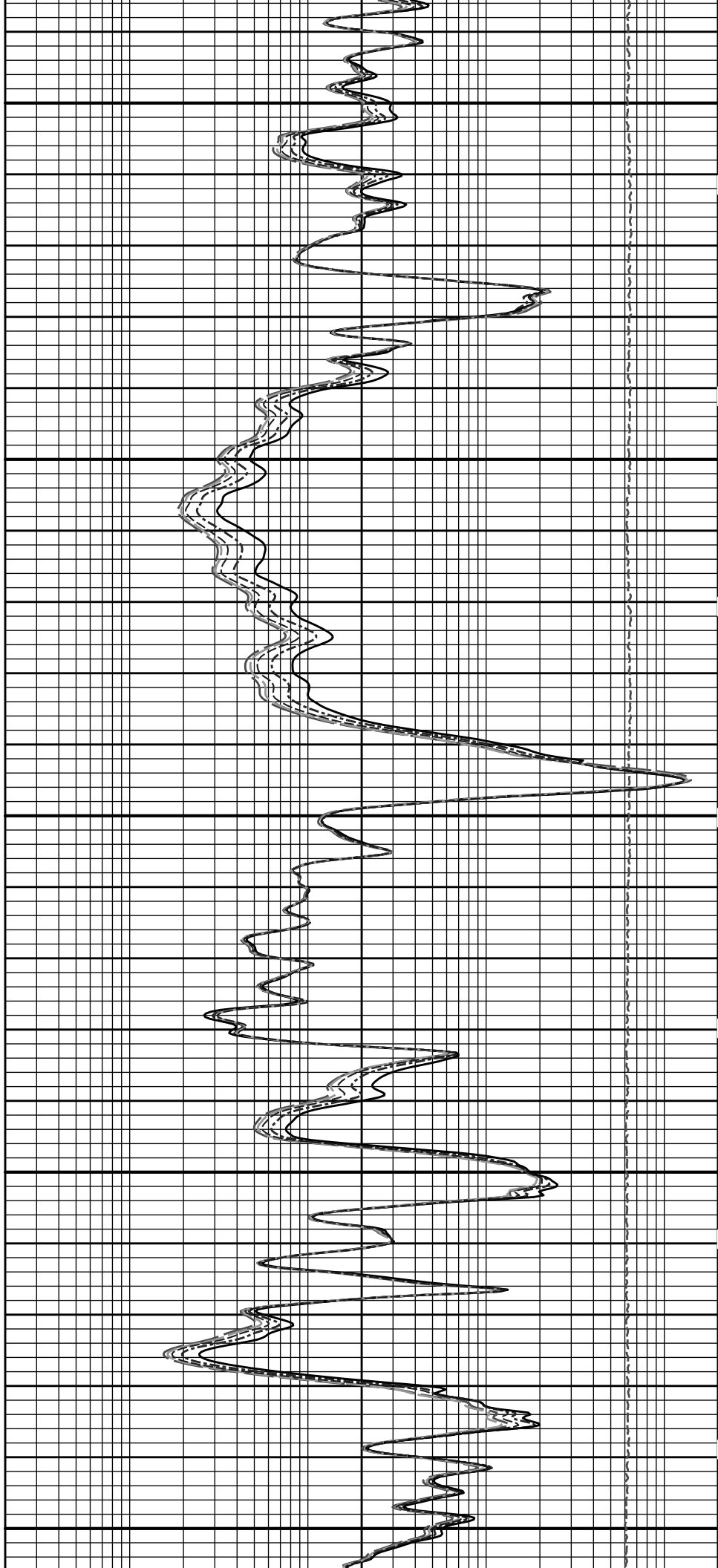


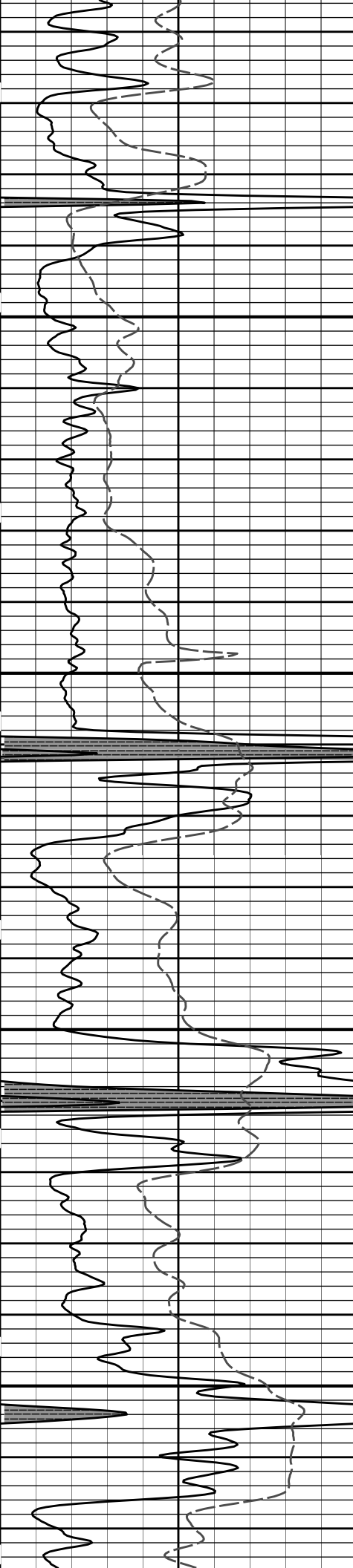


4300

4400

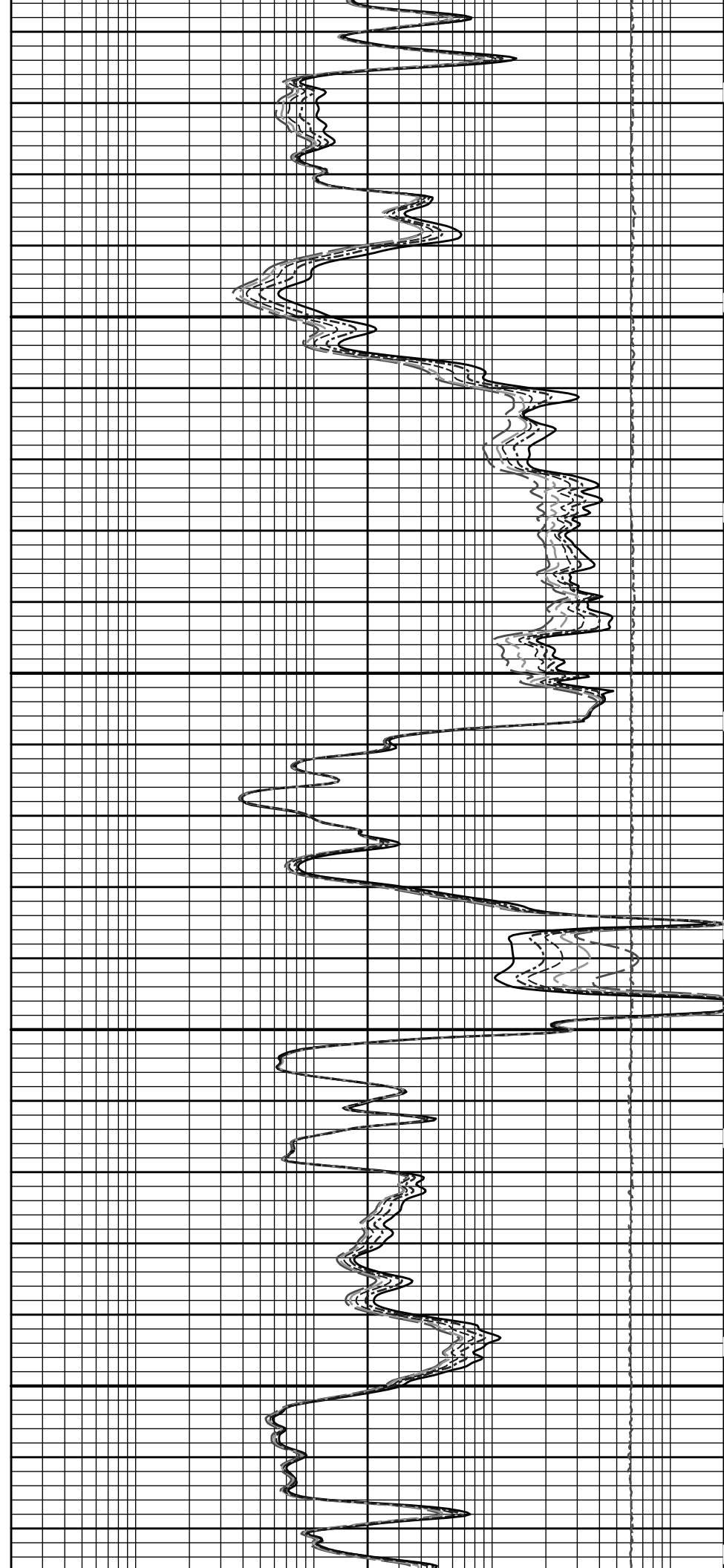
4500

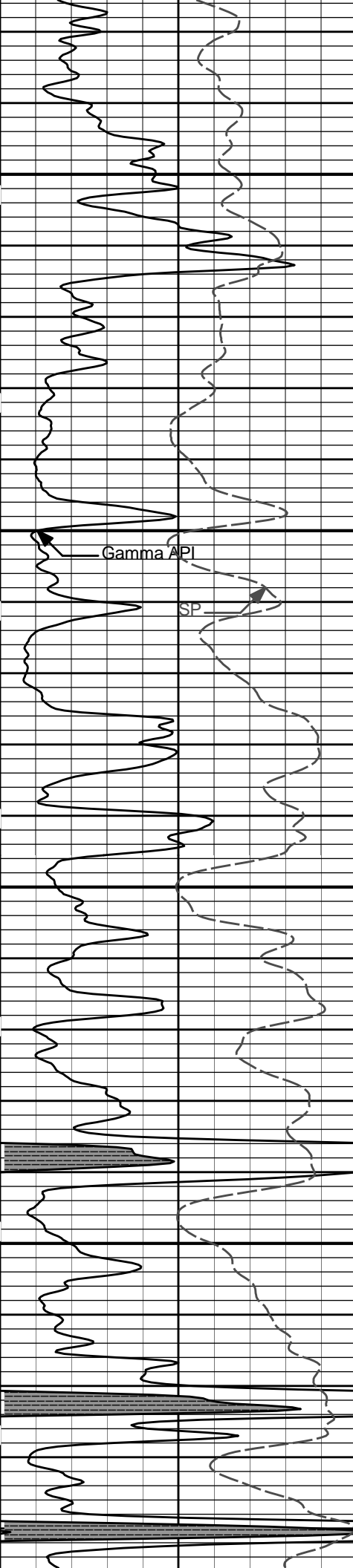




4600

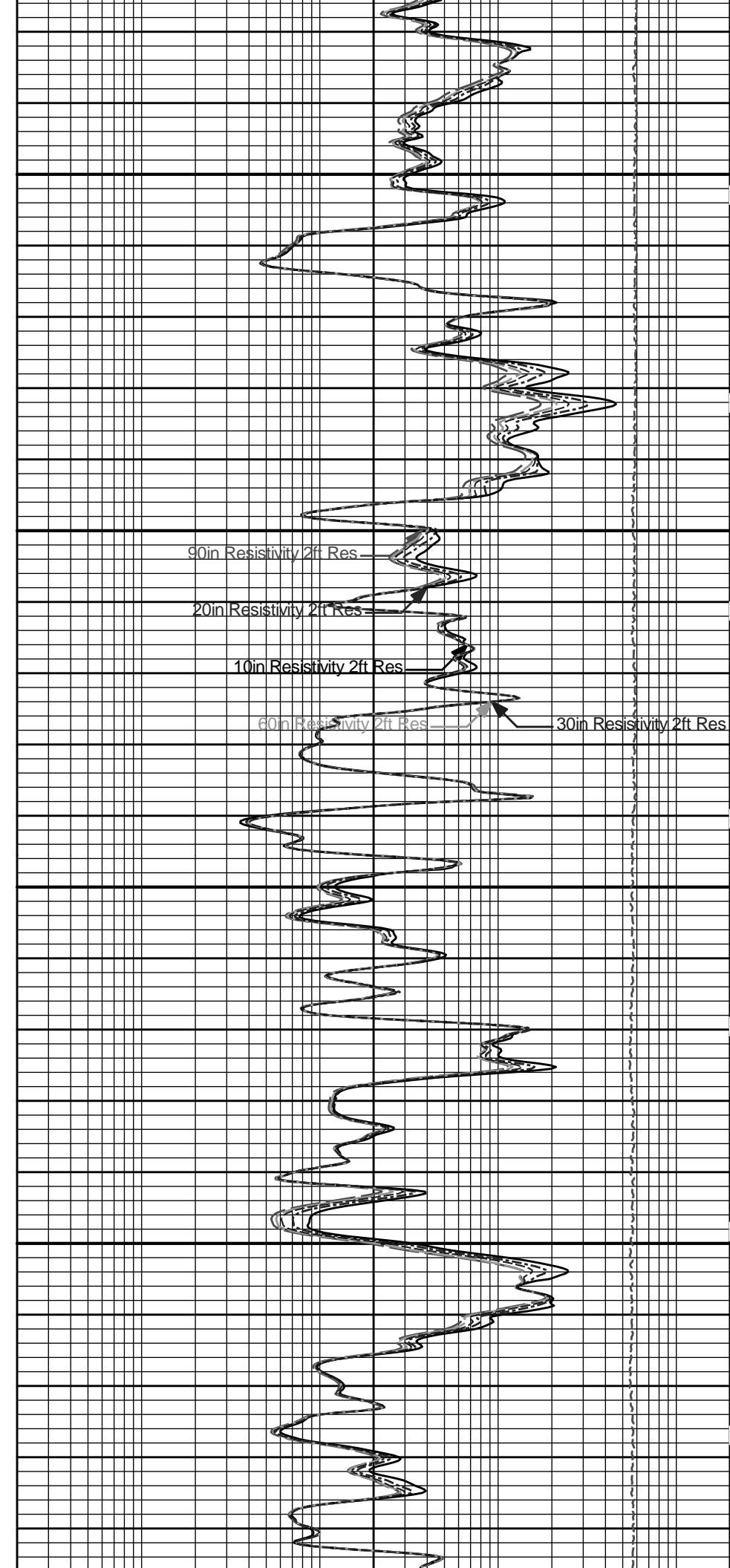
4700





4800

4900



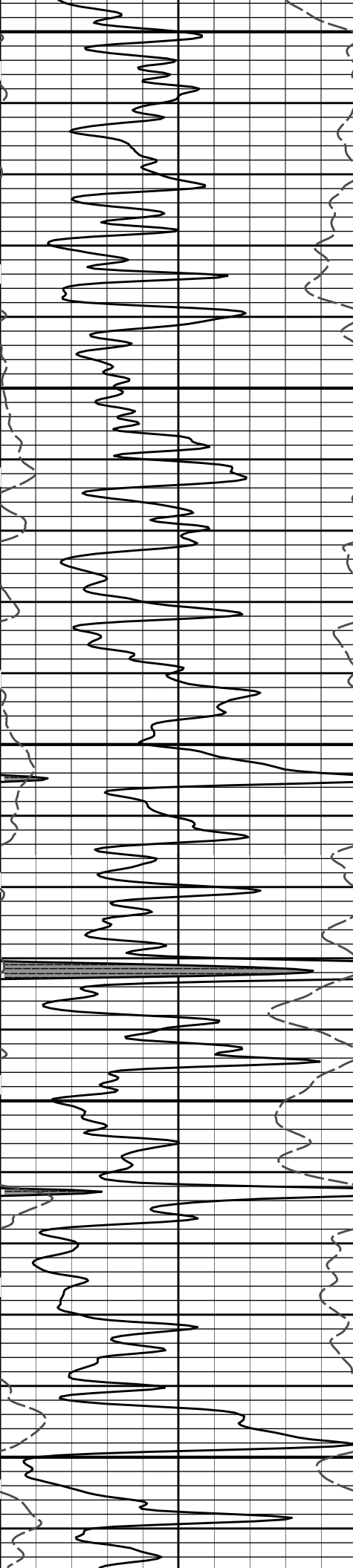
90in Resistivity 2ft Res

20in Resistivity 2ft Res

10in Resistivity 2ft Res

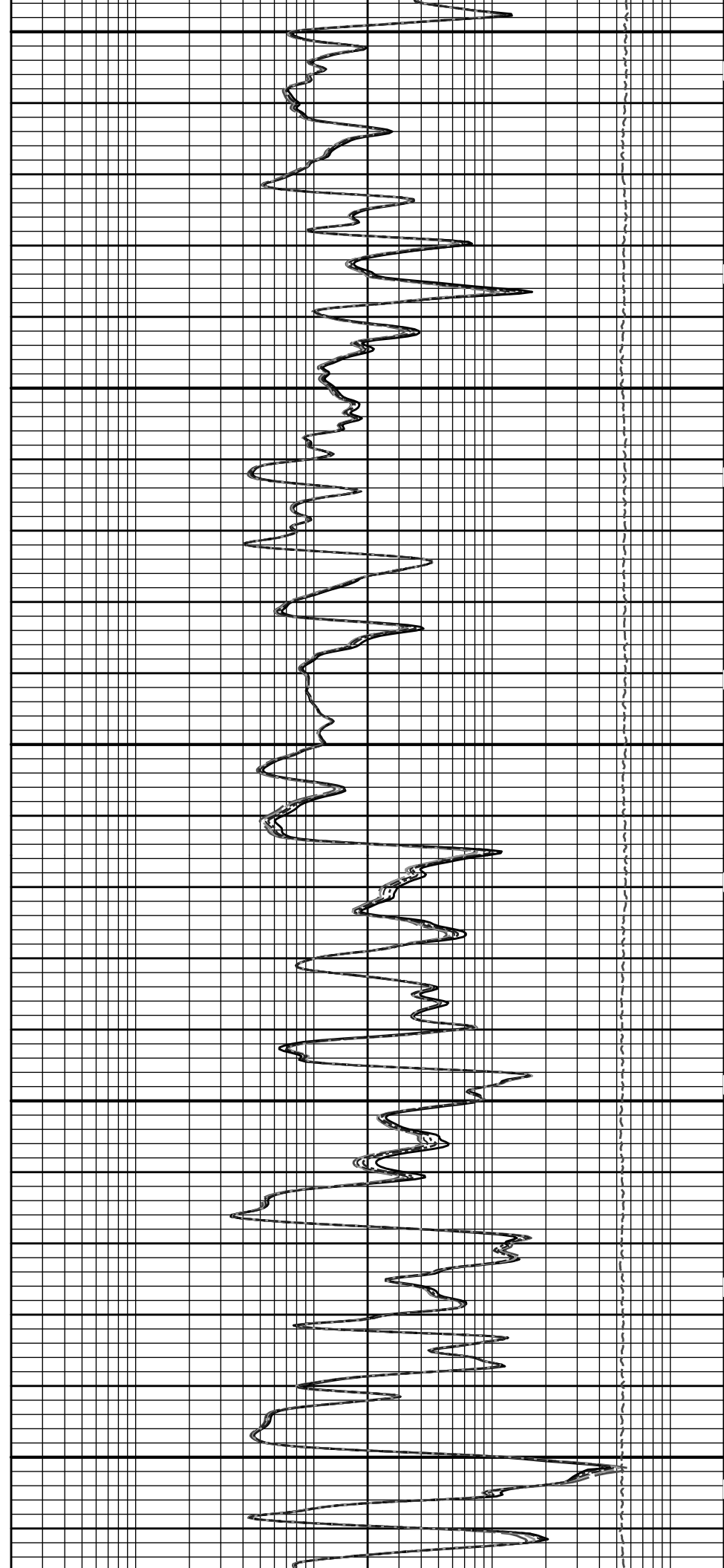
60in Resistivity 2ft Res

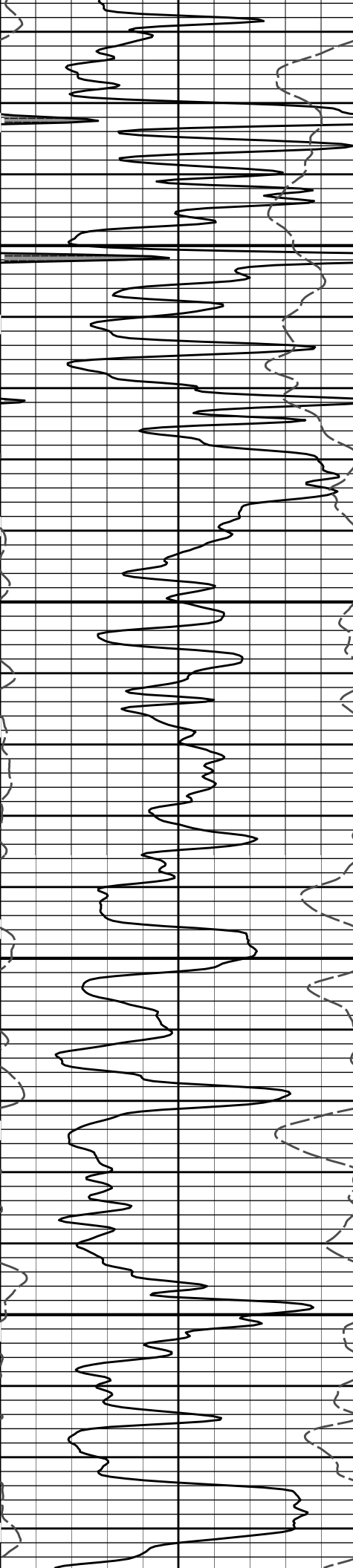
30in Resistivity 2ft Res



5000

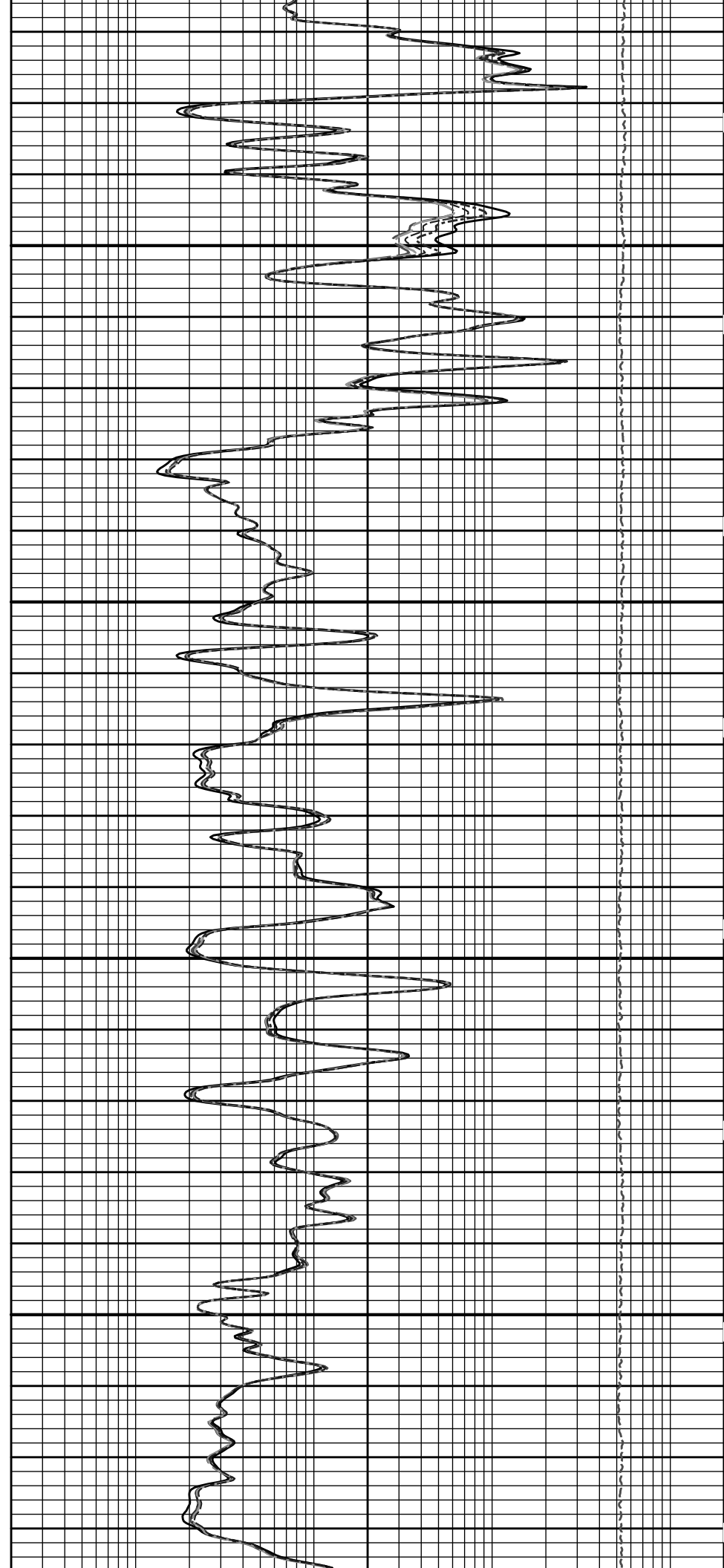
5100

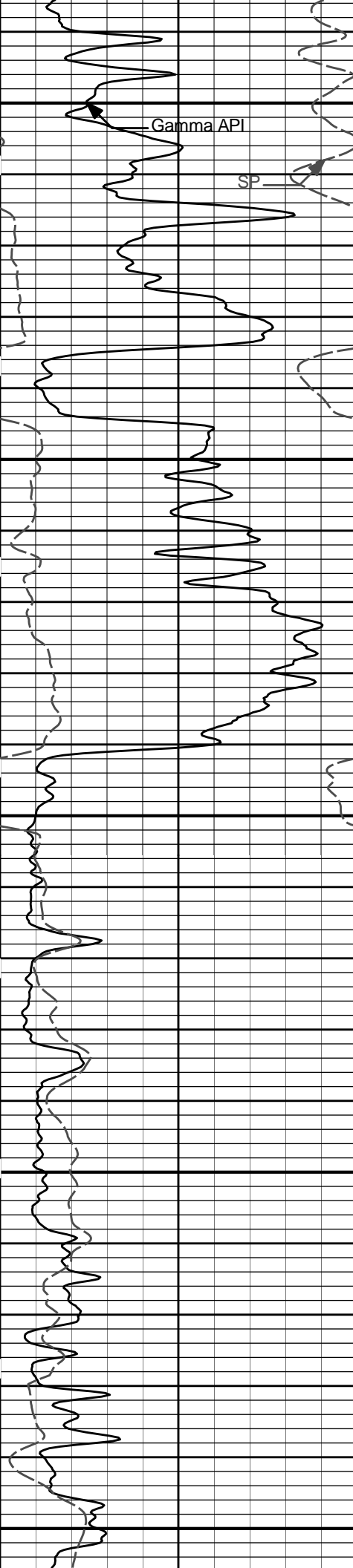




5200

5300





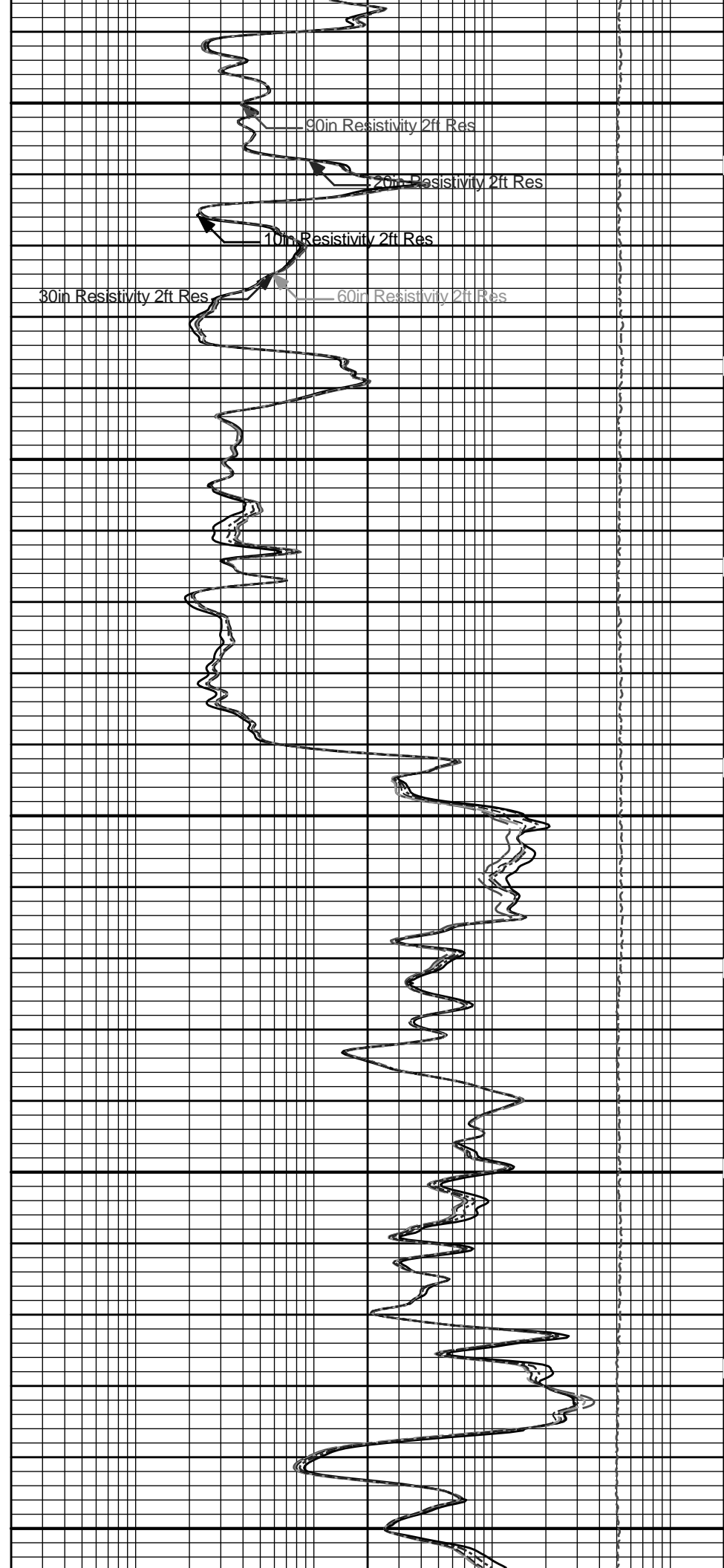
5400

Gamma API

SP

5500

5600



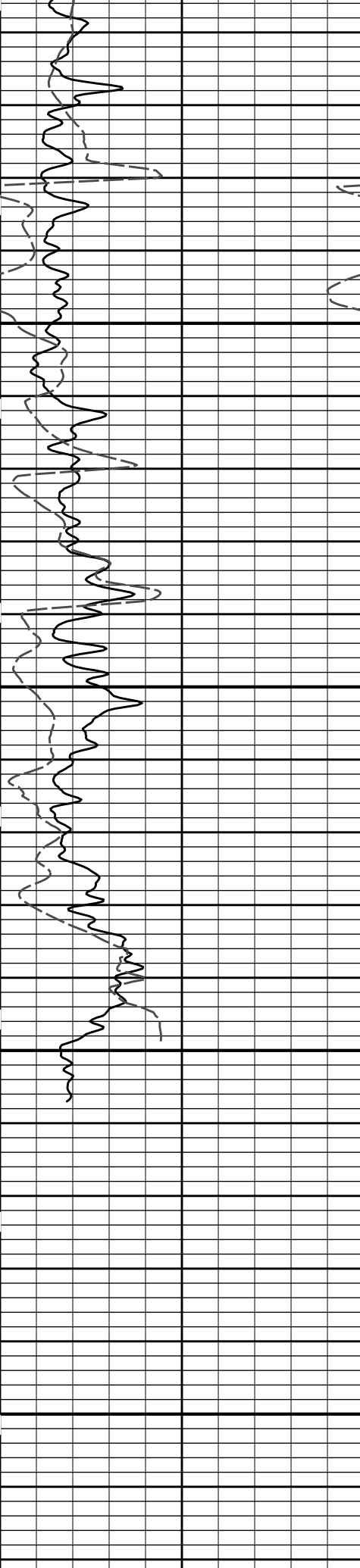
90in Resistivity 2ft Res

20in Resistivity 2ft Res

10in Resistivity 2ft Res

30in Resistivity 2ft Res

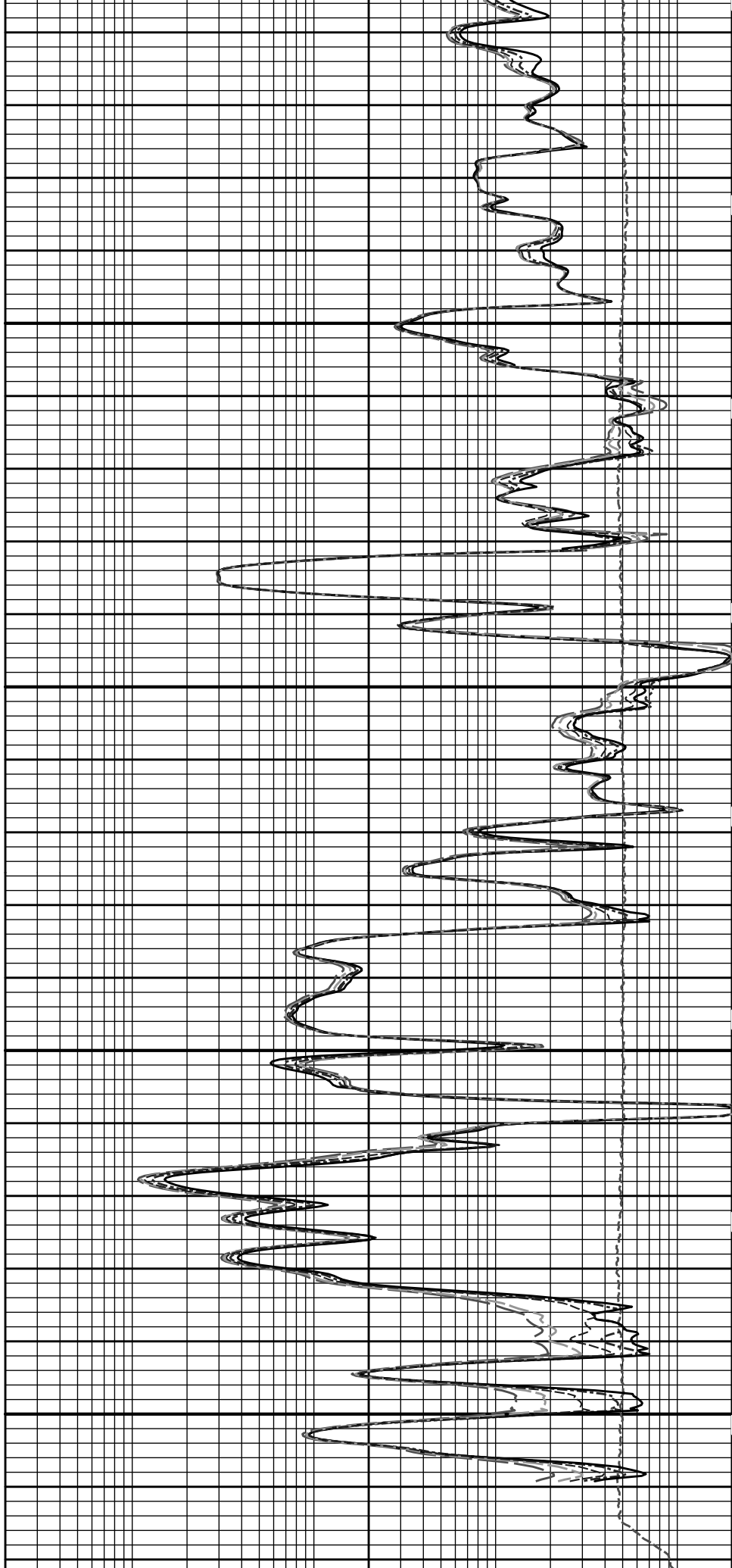
60in Resistivity 2ft Res



5700

5800

TD



2P

1.010

10K

7.0

SP -]20[+	1 : 240 ft	10K	Tension pounds
0 Gamma API api 150		0.2	10in Resistivity 2ft Res ohmm 2000
SHALE		0.2	20in Resistivity 2ft Res ohmm 2000
		0.2	30in Resistivity 2ft Res ohm-metre 2000
		0.2	60in Resistivity 2ft Res ohmm 2000
		0.2	90in Resistivity 2ft Res ohmm 2000

HALLIBURTON

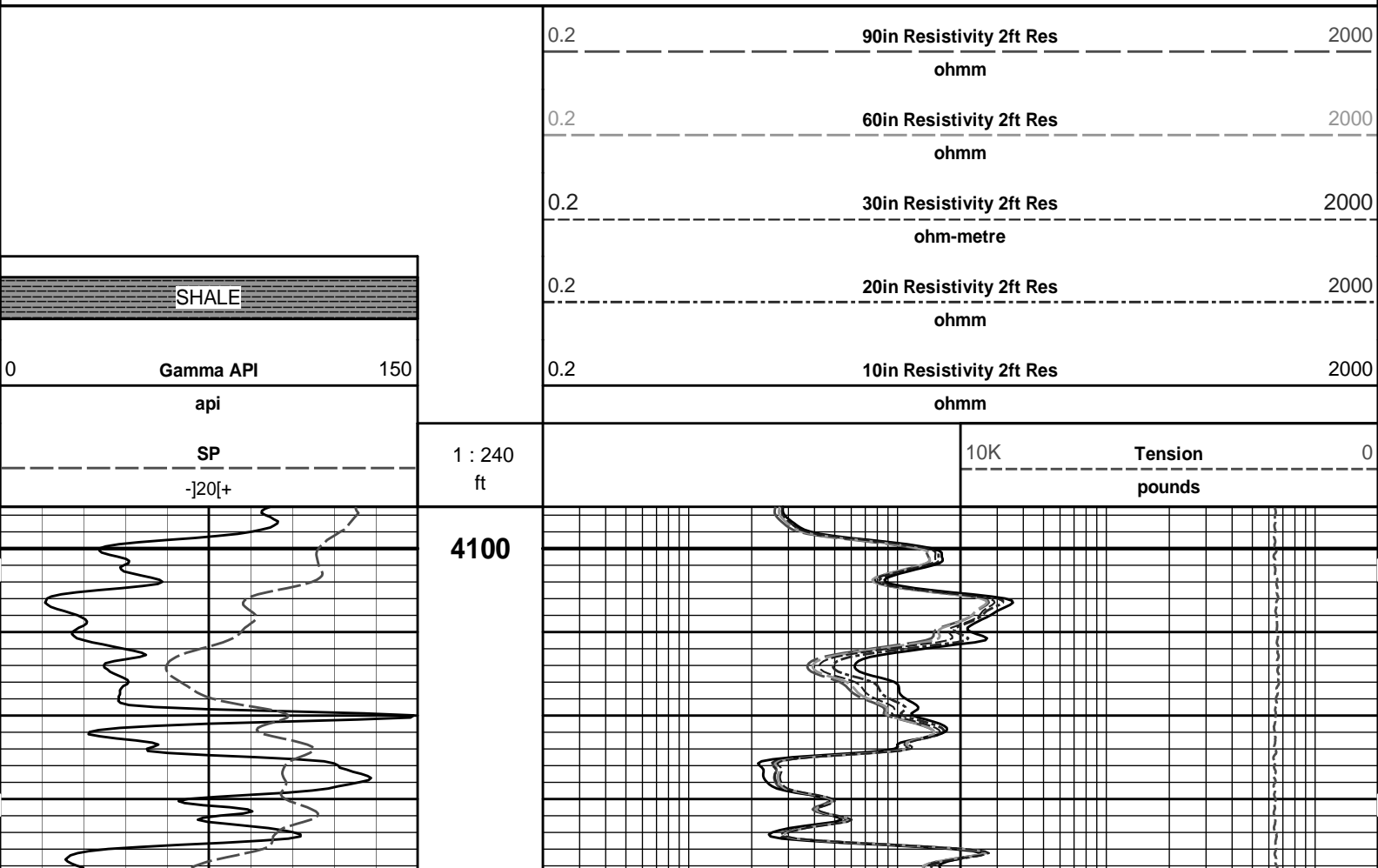
Plot Time: 20-Jan-13 15:34:22
 Plot Range: 1802 ft to 5822 ft
 Data: ELLIOTT_C-1BWell Based\ELLIOTT_C-1B_MAIN_PASS\
 Plot File: \\-LOCAL-ELLIOTT_C-1BWell Based\ACRT\ACRT_5_MAIN_lib

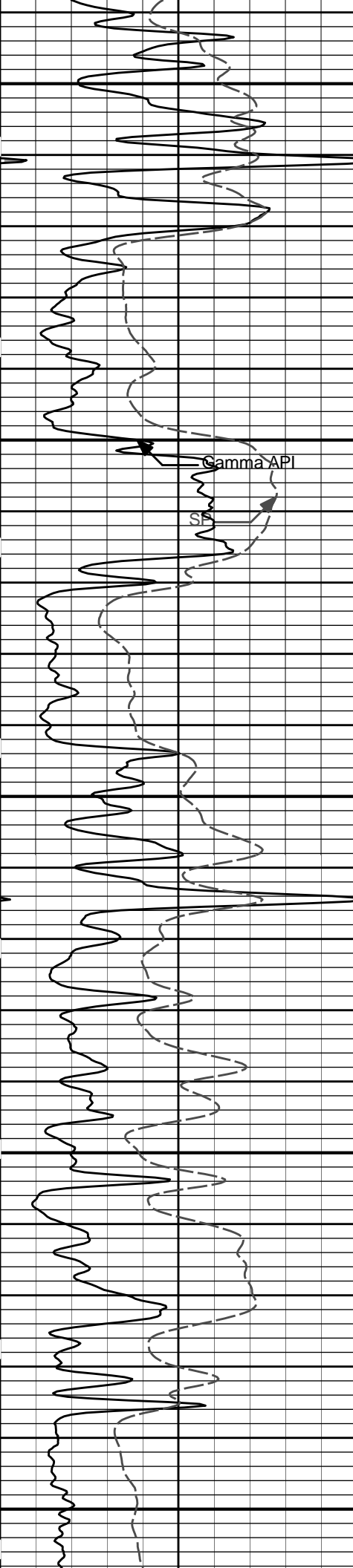
MAIN PASS

HALLIBURTON

Plot Time: 20-Jan-13 15:34:23
 Plot Range: 4095 ft to 5817.92 ft
 Data: ELLIOTT_C-1BWell Based\ELLIOTT_C-1B_REPEAT\
 Plot File: \\-LOCAL-ELLIOTT_C-1BWell Based\ACRT\ACRT_5_repeat_lib

REPEAT SECTION



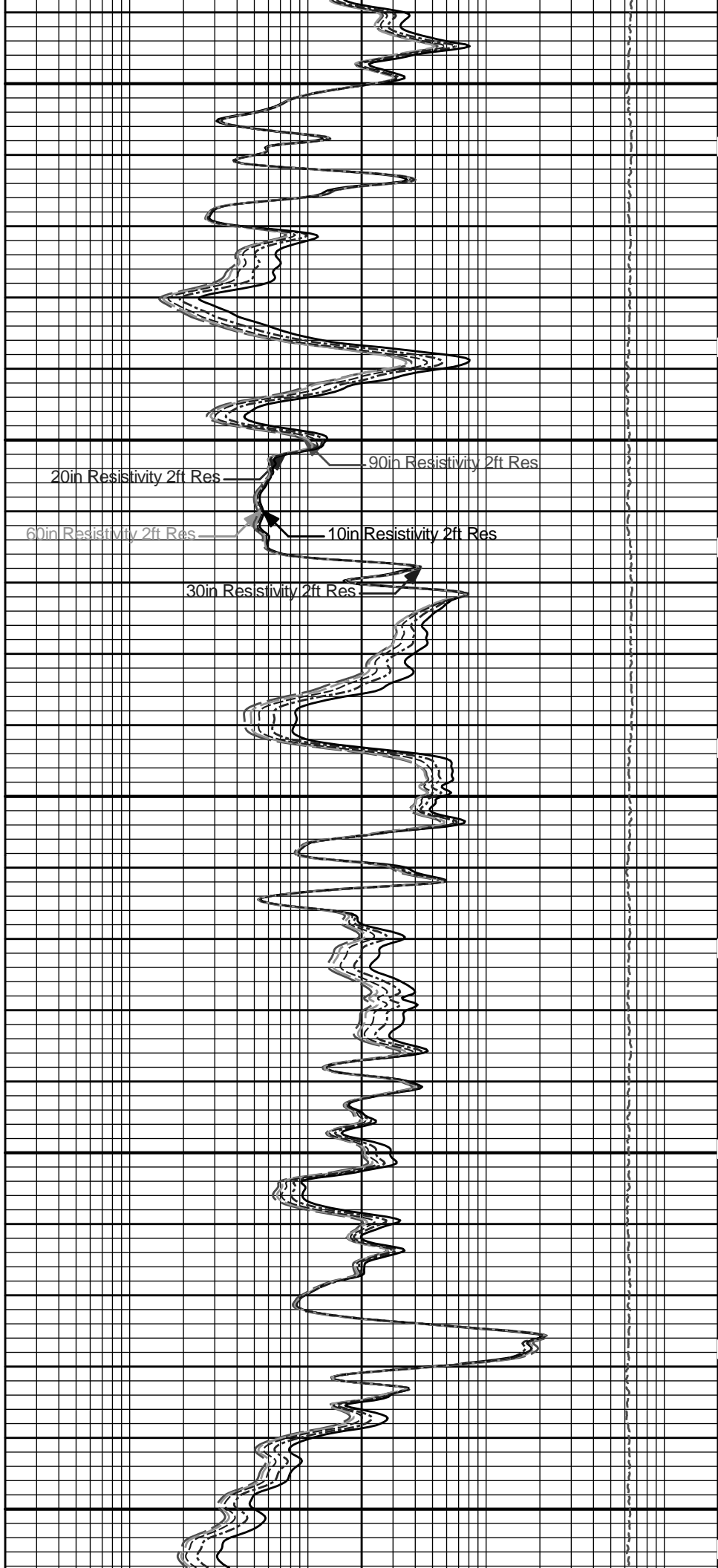


4200

Gamma API

S12

4300



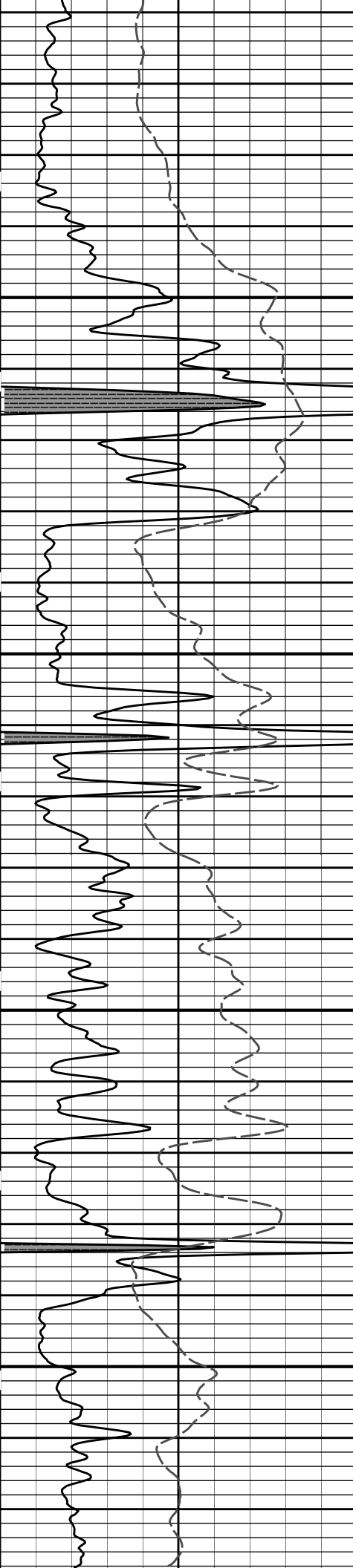
20in Resistivity 2ft Res

90in Resistivity 2ft Res

60in Resistivity 2ft Res

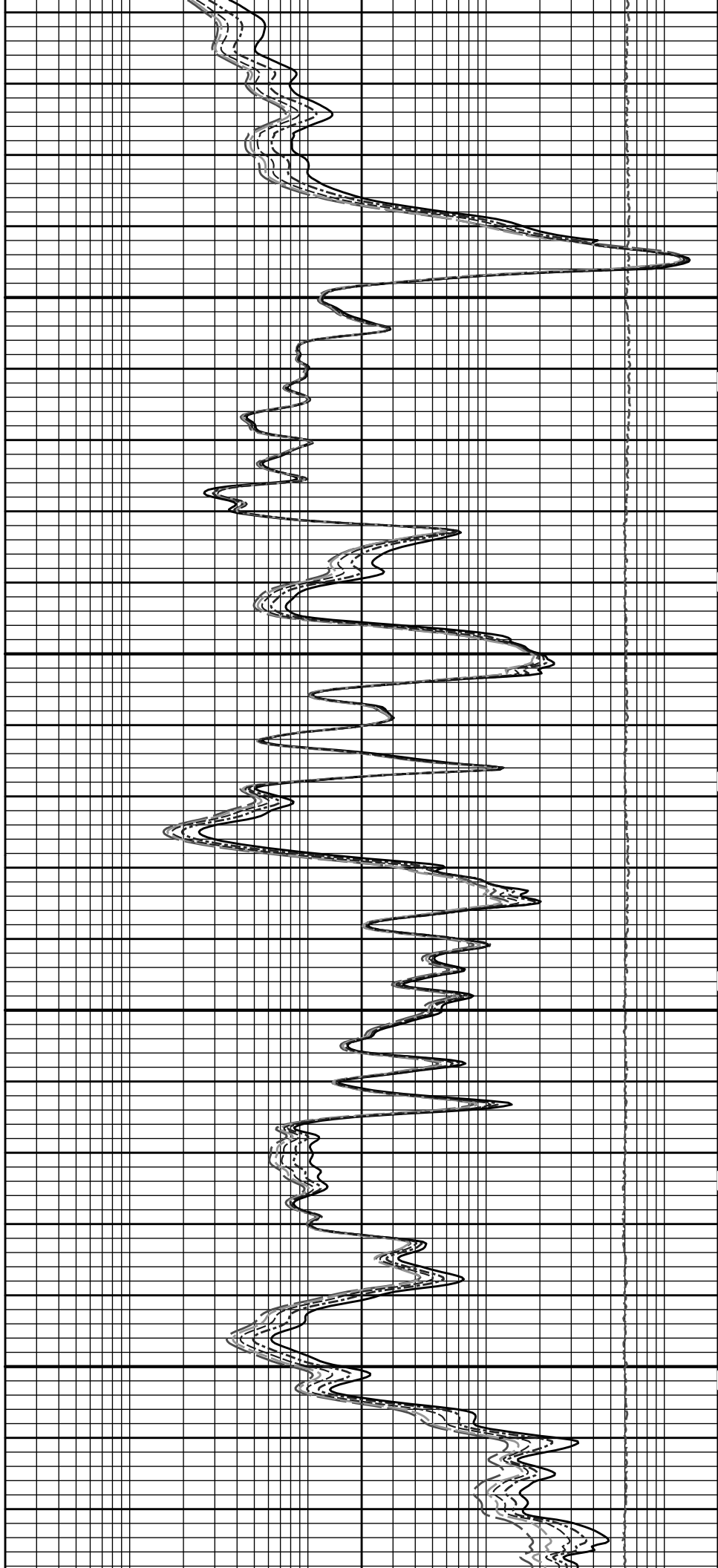
10in Resistivity 2ft Res

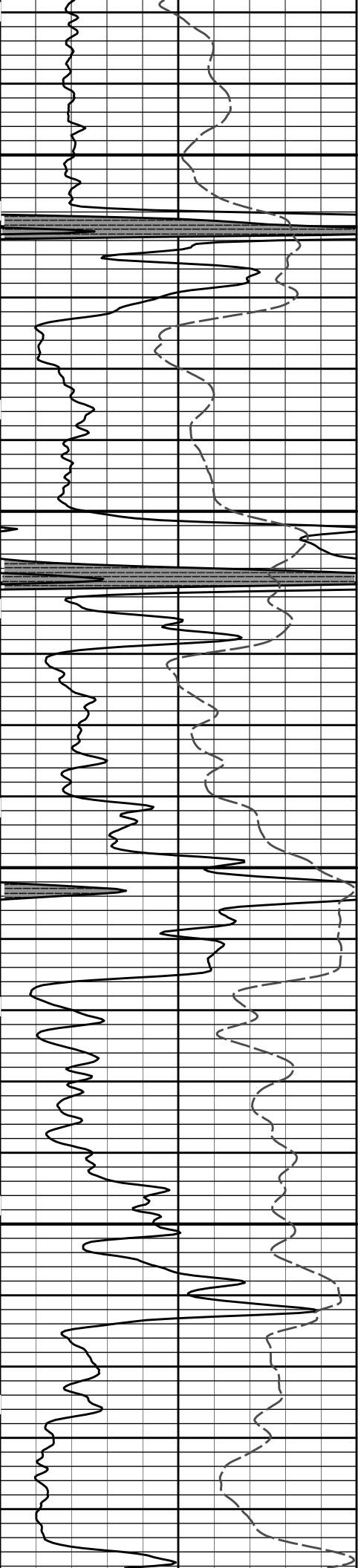
30in Resistivity 2ft Res



4400

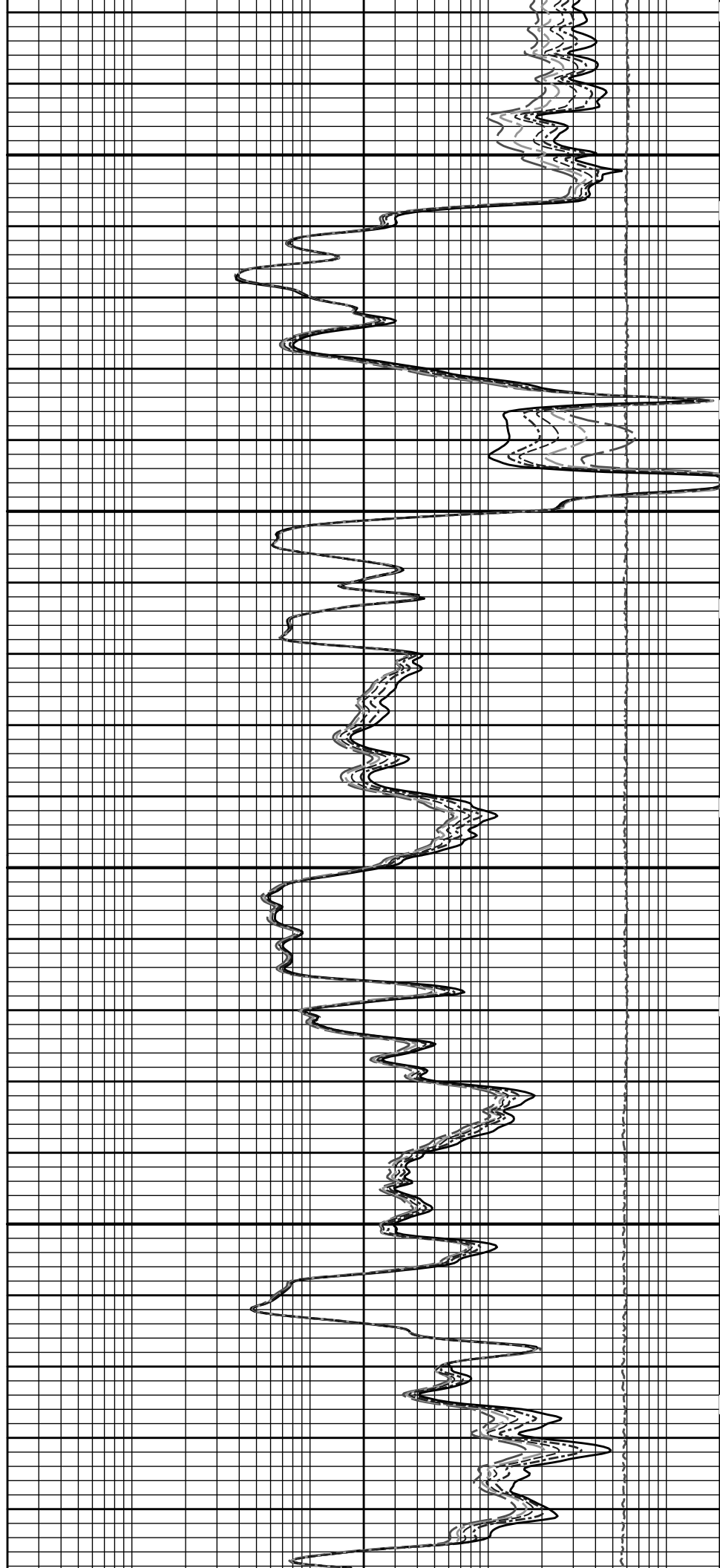
4500

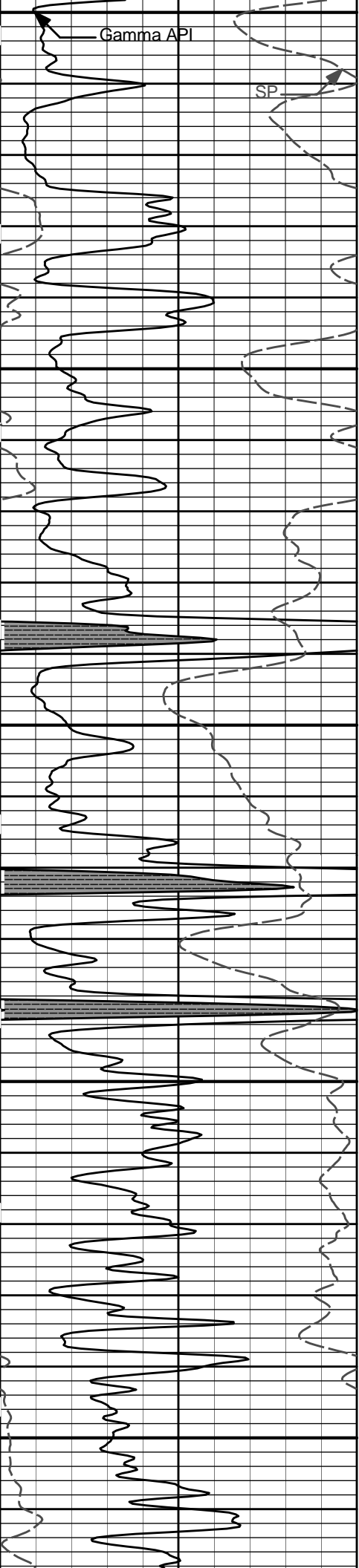




4600

4700

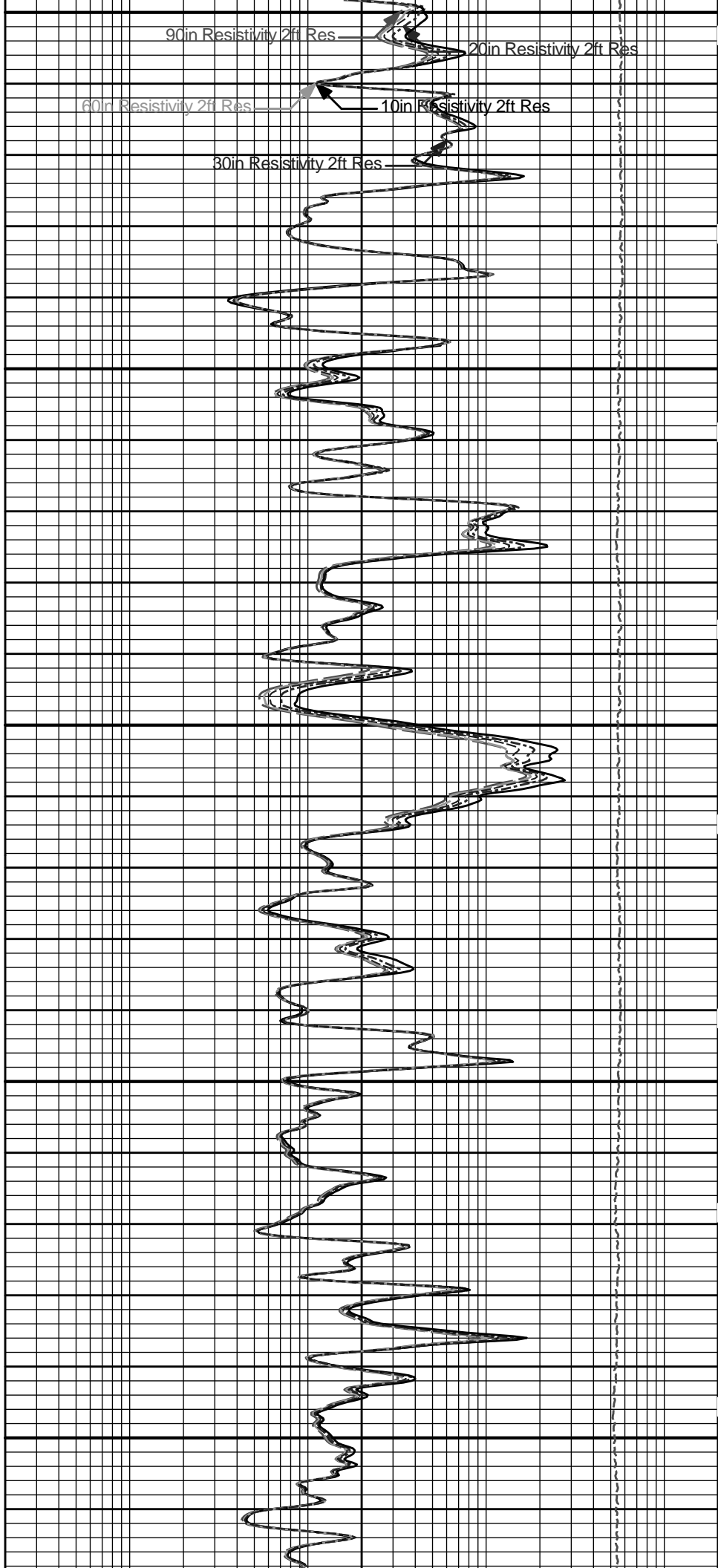


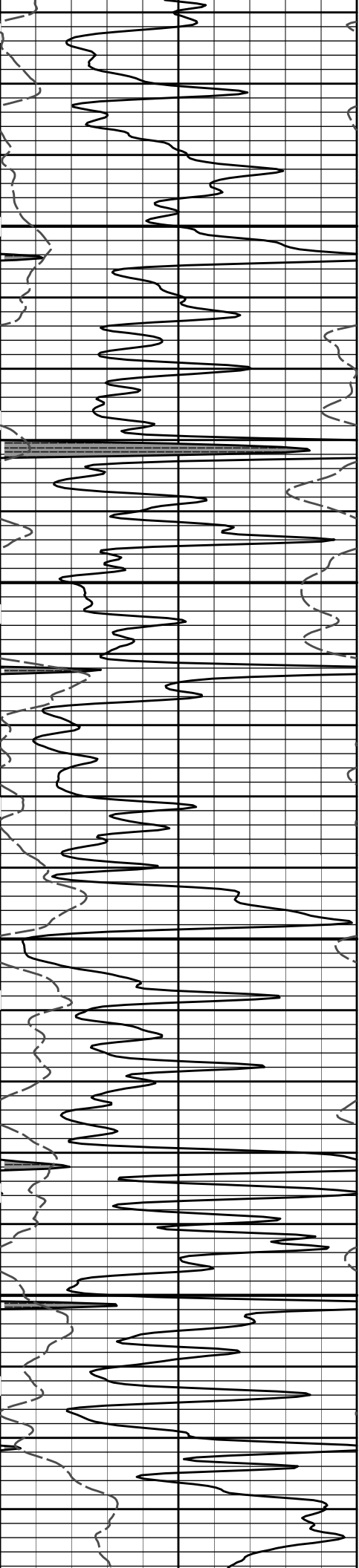


4800

4900

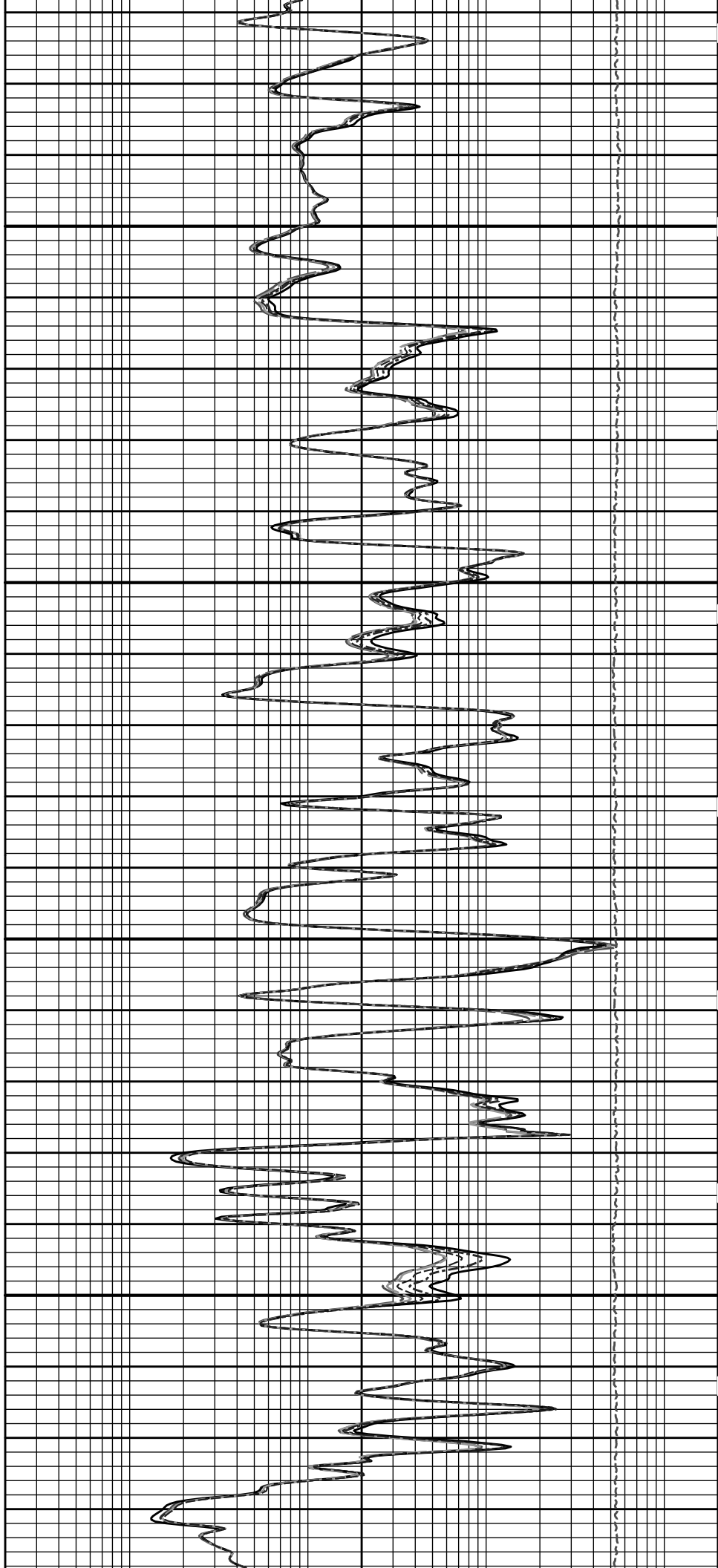
5000

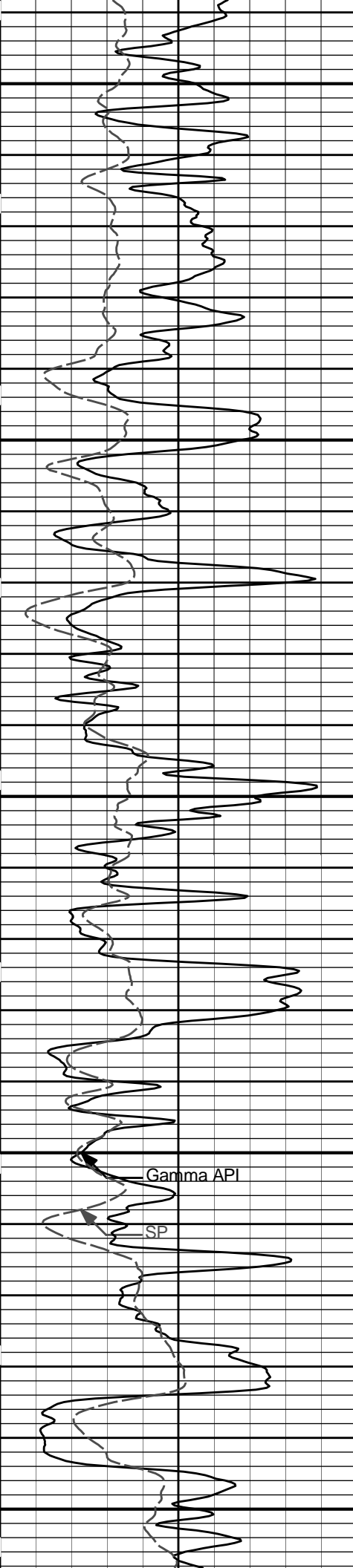




5100

5200



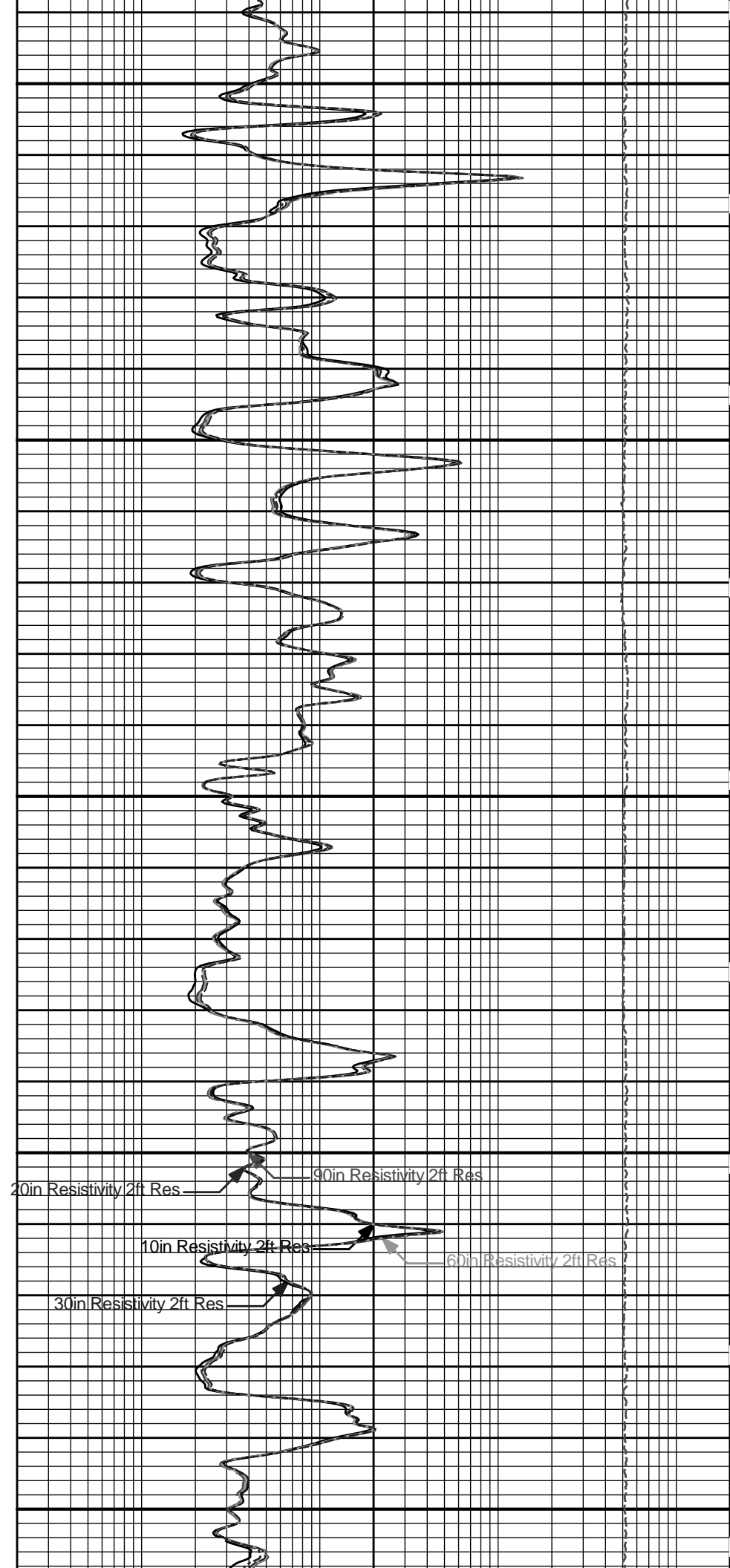


5300

5400

Gamma API

SP



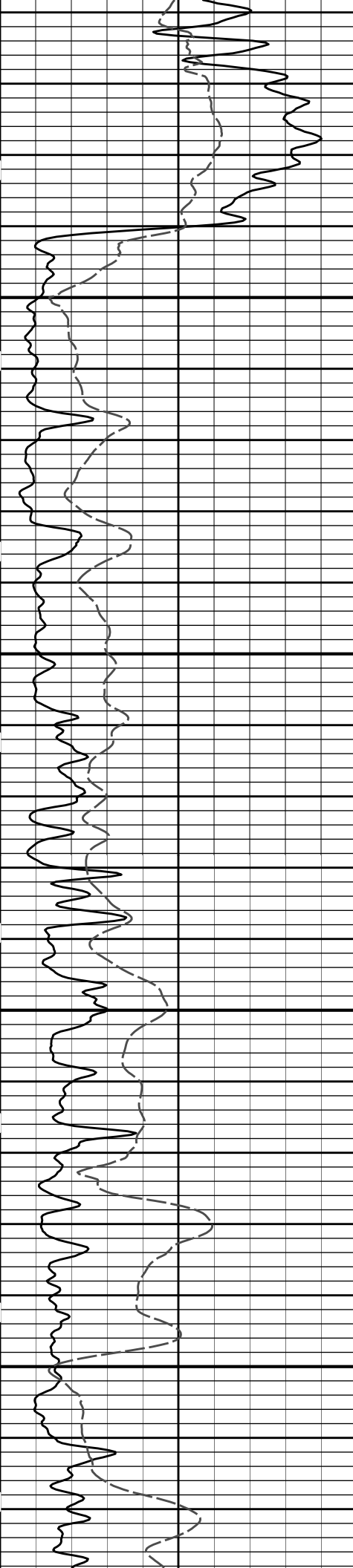
20in Resistivity 2ft Res

30in Resistivity 2ft Res

10in Resistivity 2ft Res

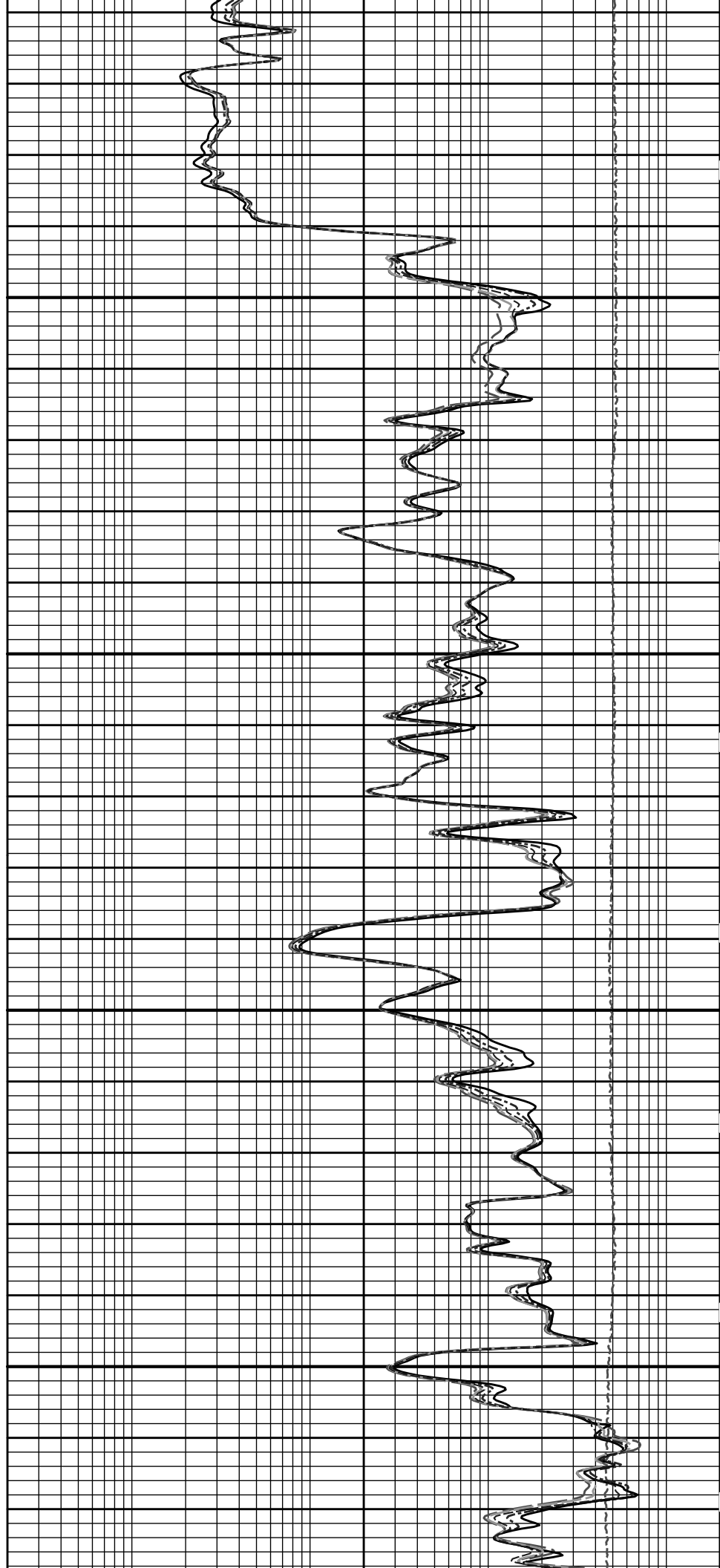
90in Resistivity 2ft Res

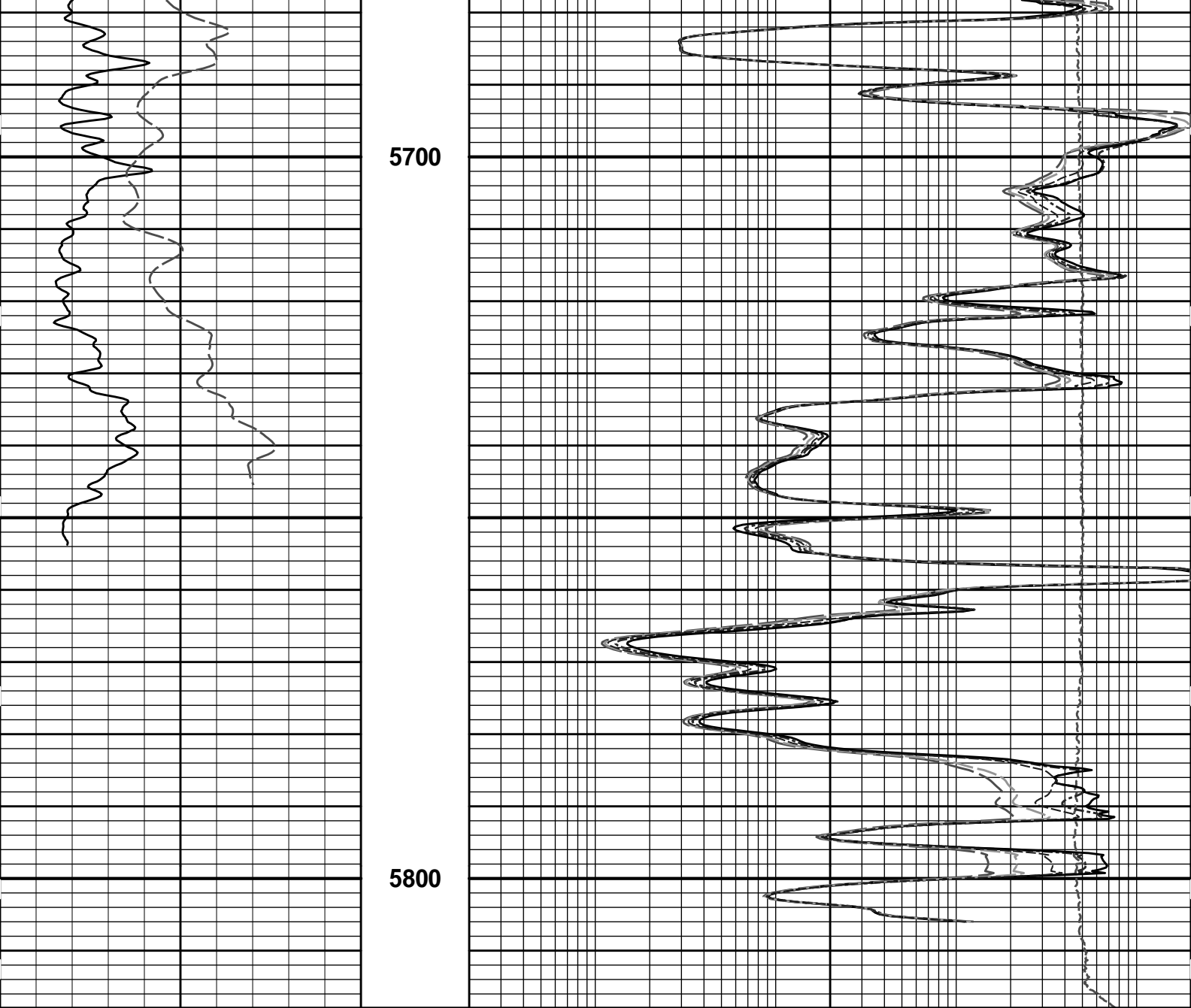
60in Resistivity 2ft Res



5500

5600





SP -]20[+	1 : 240 ft	10K	Tension pounds	0
0 Gamma API api	150	0.2	10in Resistivity 2ft Res ohmm	2000
SHALE		0.2	20in Resistivity 2ft Res ohmm	2000
		0.2	30in Resistivity 2ft Res ohm-metre	2000
		0.2	60in Resistivity 2ft Res ohmm	2000
		0.2	90in Resistivity 2ft Res ohmm	2000

HALLIBURTON

Plot Time: 20-Jan-13 15:34:38
 Plot Range: 4095 ft to 5817.92 ft
 Data: ELLIOTT_C-1BWell Based\ELLIOTT_C-1B_REPEAT\
 Plot File: \\-LOCAL-ELLIOTT_C-1BWell Based\ACRT\ACRT_5_repeat.lib

REPEAT SECTION

HALLIBURTON

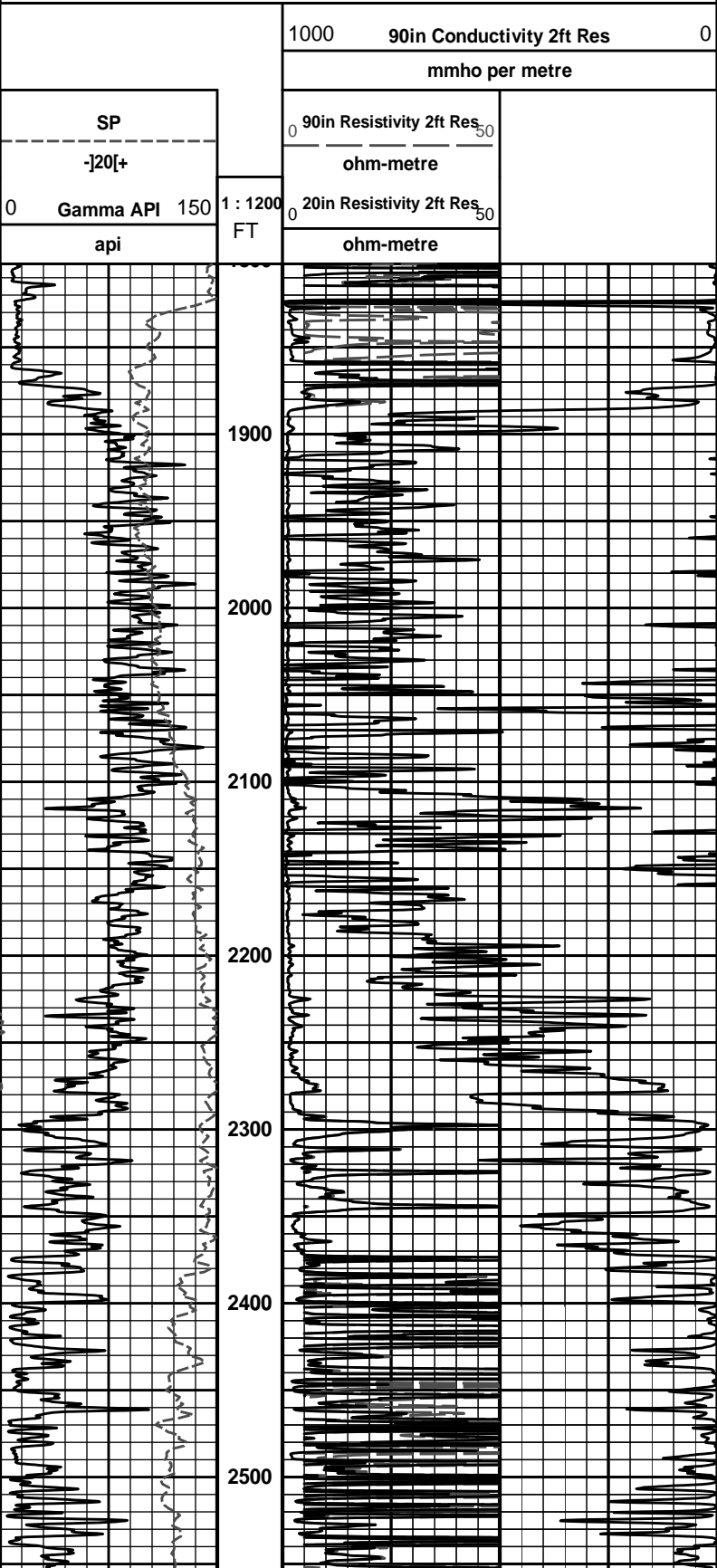
Plot Time: 20-Jan-13 15:34:38

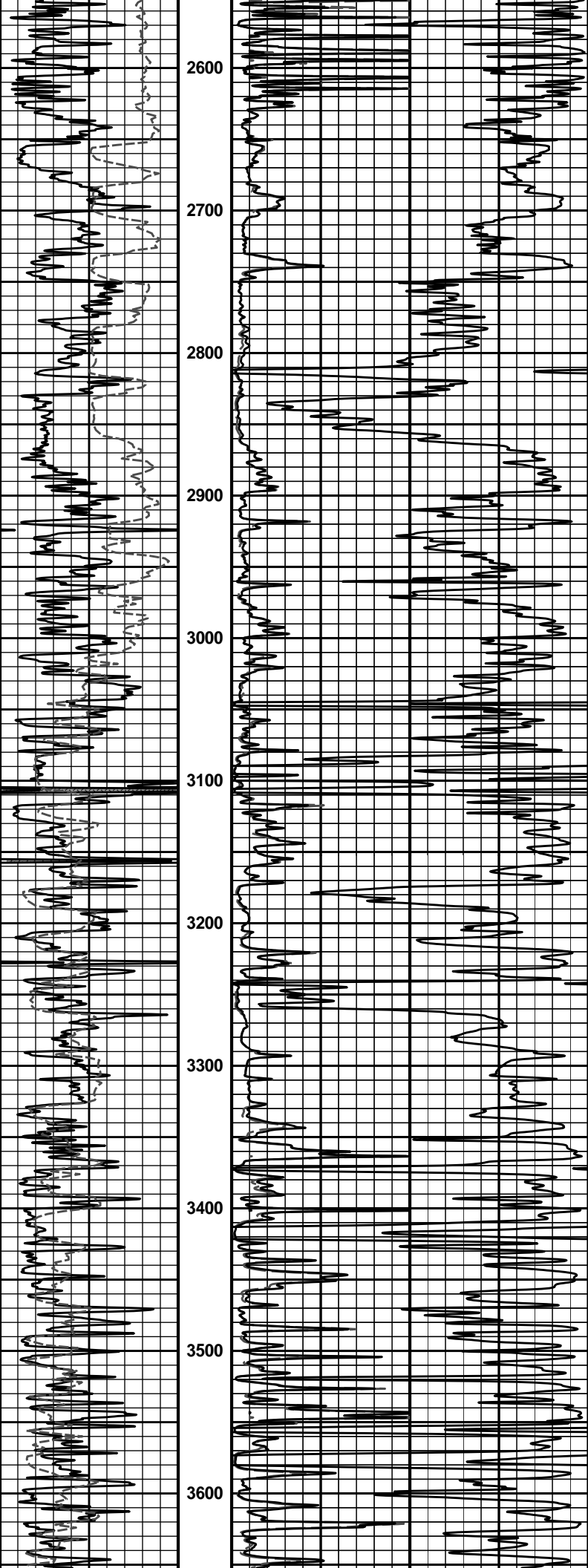
Plot Range: 1802 ft to 5809.25 ft

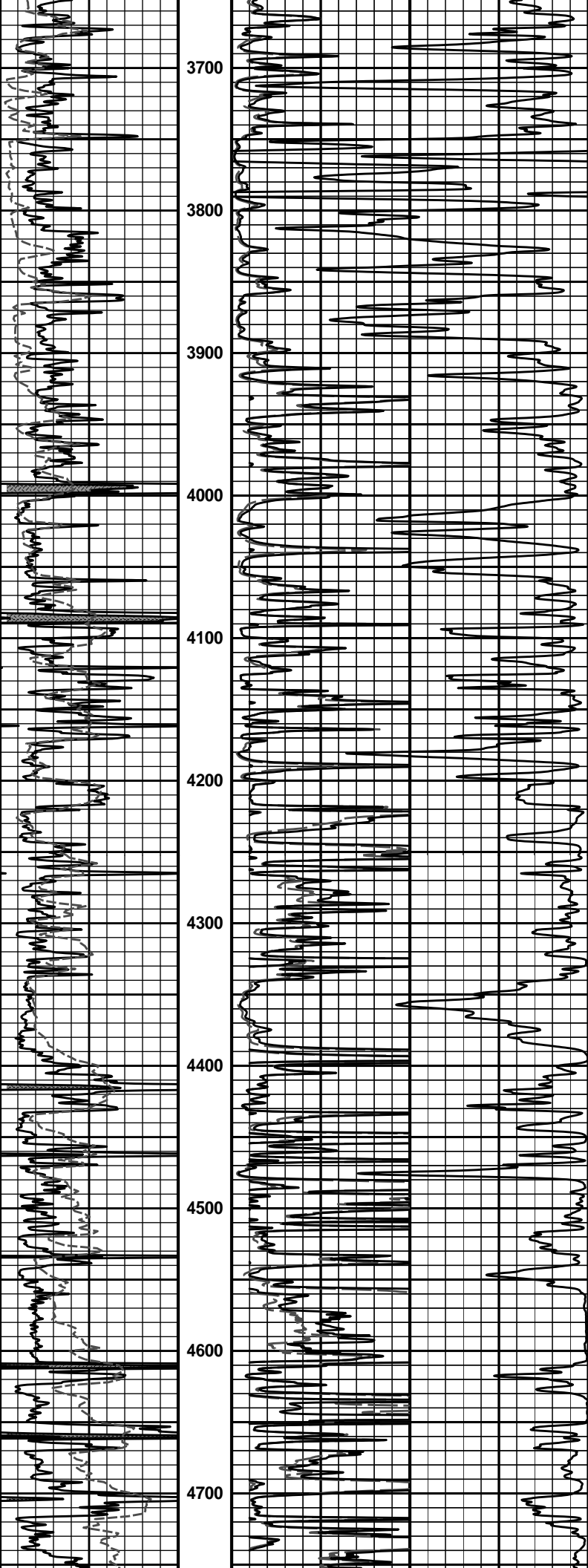
Data: ELLIOTT_C-1BWell Based\ELLIOTT_C-1B_MAIN_PASS\

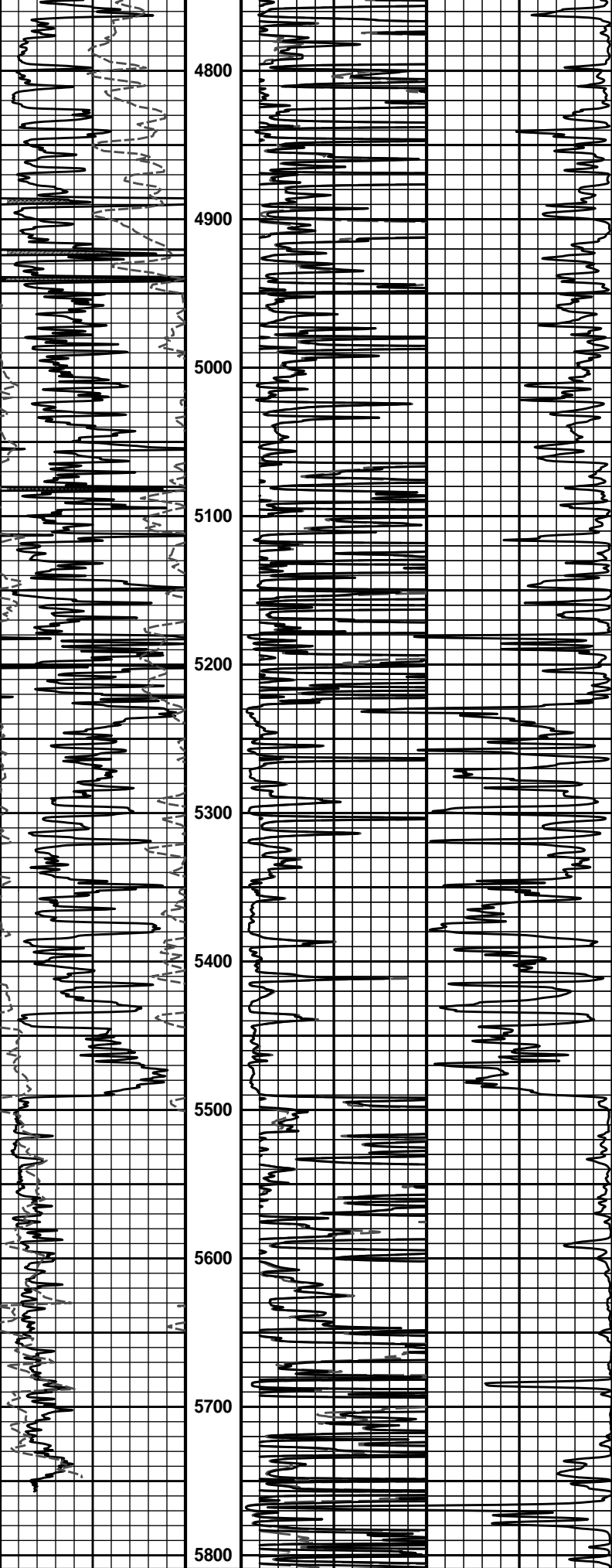
Plot File: \\-LOCAL-ELLIOTT_C-1BWell Based\ACRT\ACRT_1_lib

1 INCH MAIN LOG









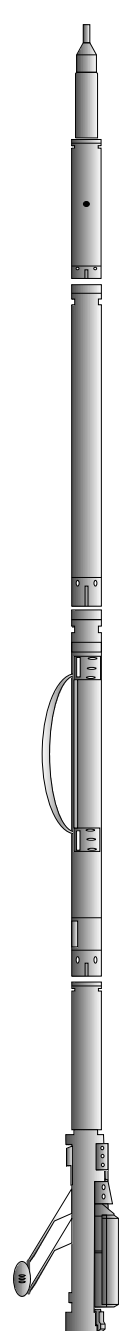
0	Gamma API	150	1 : 1200	0	20in Resistivity 2ft Res ₅₀
	api		FT		ohm-metre

SP	90in Resistivity 2ft Res	50
-]20[+	ohm-metre	
	1000	90in Conductivity 2ft Res
		0
	mmho per metre	

HALLIBURTON
 Plot Time: 20-Jan-13 15:34:54
 Plot Range: 1802 ft to 5809.25 ft
 Data: ELLIOTT_C-1BWell Based\ELLIOTT_C-1B_MAIN_PASS\
 Plot File: \\-LOCAL-ELLIOTT_C-1BWell Based\ACRT\ACRT_1_lib

1 INCH MAIN LOG

HALLIBURTON TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-954 37.50 lbs		Ø 2.750 in →		← Temperature @ 75.79 ft	3.03 ft	76.82 ft
SP Sub-TRK954 60.00 lbs		Ø 3.625 in →		← SP @ 72.01 ft	3.74 ft	73.79 ft
GTET-10748374 165.00 lbs		Ø 3.625 in →		← GammaRay @ 63.99 ft	8.52 ft	70.05 ft
DSN Decentralizer-10735145 6.60 lbs		Ø 5.000 in* →				61.53 ft
DSNT-10735145 174.00 lbs		Ø 3.625 in →		← DSN Far @ 54.59 ft ← DSN Near @ 53.84 ft	9.69 ft	51.84 ft
SDLT-10673803 360.00 lbs	SDLT Pad-10673790 65.00 lbs Microlog Pad-10673803 8.00 lbs	Ø 4.500 in → Ø 4.750 in* → Ø 4.750 in* →		Microlog @ 44.03 ft SDL Caliper @ 43.84 ft SDL @ 43.83 ft	10.81 ft	

Flex Joint-
10989947
140.00 lbs

Ø 3.625 in →

5.67 ft

41.03 ft

Centralizer 25-001
8.00 lbs

Ø 4.000 in* →

35.36 ft

BSAT-10747684
300.00 lbs

Ø 3.625 in →

← Sonic Receivers @ 26.84 ft

15.77 ft

ACRt Instrument-
I776
50.00 lbs

Centralizer 25-002
8.00 lbs

Ø 4.000 in*
Ø 3.625 in →

5.03 ft

19.58 ft

ACRt Sonde-
10929775
200.00 lbs

Ø 3.625 in →

← Mud Resistivity @ 13.19 ft

14.55 ft

← ACRt @ 9.21 ft

14.22 ft

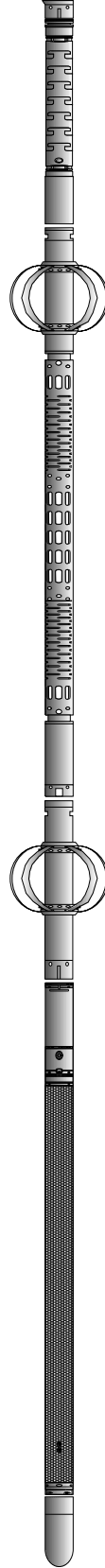
Bull Nose-001
5.00 lbs

Ø 2.750 in →

0.33 ft

0.33 ft

0.00 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	954	37.50	3.03	73.79	300.00
SP	SP Sub	TRK954	60.00	3.74	70.05	300.00
GTET	Gamma Telemetry Tool	10748374	165.00	8.52	61.53	60.00
DSNT	Dual Spaced Neutron	10735145	174.00	9.69	51.84	60.00
DCNT	DSN Decentralizer	10735145	6.60	5.13	* 55.17	300.00
SDLT	Spectral Density Tool	10673803	360.00	10.81	41.03	60.00
MICP	Microlog Pad	10673803	8.00	1.00	* 43.53	60.00
SDLP	Density Insite Pad	10673790	65.00	2.55	* 43.24	60.00
FLEX	Flex Joint	10989947	140.00	5.67	35.36	300.00
BSAT	Borehole Sonic Array Tool	10747684	300.00	15.77	19.58	60.00
OBCEN	Centralizer - 25 in. Overbody	001	8.00	2.08	* 32.34	300.00

ACRt	Array Compensated True Resistivity Instrument Section	1776	50.00	5.03	14.55	300.00
OBCEN	Centralizer - 25 in. Overbody	002	8.00	2.08 *	16.27	300.00
ACRt	Array Compensated True Resistivity Sonde Section	10929775	200.00	14.22	0.33	300.00
BLNS	Bull Nose	001	5.00	0.33	0.00	300.00
Total			1,587.10	76.82		
* Not included in Total Length and Length Accumulation.						
Data: ELLIOTT_C-1B\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\006 20-Jan-13 09:56 Up @5820.0f				Date: 20-Jan-13 12:04:25		

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	9.100	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	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	5817.00	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	
	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 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: ELLIOTT_C-1B\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\006 20-Jan-13 09:56 Up @5820.0f

Date: 20-Jan-13 12:05:40

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 10748374

Reference Calibration Date: 19-Dec-12 08:49:49

Engineer: T. HYDE

Calibration Date: 17-Jan-13 13:03:23

Software Version: WL INSITE R3.6.0 (Build 3)

Calibration Version: 1

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Measurement	Measured	Calibrated	Units
Background	47.0	47.4	api
Background + Calibrator	277.4	279.4	api
Calibrator	230.4	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 10748374

Reference Calibration Date: 17-Jan-13 13:03:23

Software Version: WL INSITE R3.6.0 (Build 3)

Calibration Version: 1

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Field Verification	Shop	Field	Units
Background	47.4	29.1	api
Background + Calibrator	279.4	264.1	api
Calibrator	232.0	235.0	api

Shop	Field	Difference	Tolerance
232.0	235.0	-3.0	+/- 9.00

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name: ACRt Sonde - 10929775

Reference Calibration Date: 21-Nov-12 11:21:31

Engineer: T. HYDE

Calibration Date: 19-Dec-12 11:12:24

Software Version: WL INSITE R3.6.0 (Build 3)

Calibration Version: 1

Host Tool Name: ACRt Instrument - I776

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.02	1.05	0.95	1.02	1.05	0.95	1.02	1.05
A2 (50")	0.95	1.03	1.05	0.95	1.03	1.05	0.95	1.03	1.05
A3 (29")	0.95	1.00	1.05	0.95	1.01	1.05	0.95	1.00	1.05
A4 (17")	0.95	1.01	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.01	1.05	0.95	1.01	1.05
A6 (6")	N/A	N/A	N/A	0.95	1.00	1.05	0.95	1.00	1.05

TYPICAL SONDE OFFSET RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-2.12	2	-6	-4.63	-2	-8	-4.79	-2
A2 (50")	-7	-2.79	0	-7	-4.29	0	-7	-4.43	0
A3 (29")	-27	-14.78	-9	-9	-4.66	-3	-7	-2.92	-1
A4 (17")	-180	-103.17	-60	-45	-32.42	-15	-39	-25.28	-13
A5 (10")	N/A	N/A	N/A	-150	-114.86	-50	-80	-53.59	-10
A6 (6")	N/A	N/A	N/A	175	272.16	525	90	136.16	270

TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper
12K	0.6	0.84	1.3
36K	1.0	1.17	2.0
72K	1.0	1.46	2.0

R-MUD VERIFICATION

Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
Mud Cell	0.95	0.99	1.05

PASS/FAIL SUMMARY

GAIN RANGE CHK	PASS
SONDE OFFSET RANGE CHK	PASS
Tx CURRENT GAIN	PASS
Rmud VERIFICATION	PASS

TOOL OK TO LOG

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-10748374						
Gamma Ray Calibrator	232.0	235.0	-----	-3.0	+/- 9.00	api
ACRt Sonde-10929775						
Mud Cell	0.99	-----	-----	0.00	-----	ohm-m

Data: ELLIOTT_C-1B\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\006 20-Jan-13 09:56 Up @5820.0f

Date: 20-Jan-13 12:07:17

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	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 Reference 12 KHz Real Signal	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	

LDV	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: ELLIOTT_C-1B0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN006 20-Jan-13 09:56 Up @5820.0f Date: 20-Jan-13 12:06:16

COMPANY	OXY USA INC.			
WELL	ELLIOTT C-1B			
FIELD	LEMON VICK PREEDY			
COUNTY	HASKELL	STATE	KANSAS	
HALLIBURTON		ARRAY COMPENSATED TRUE RESISTIVITY LOG		