

# HALLIBURTON

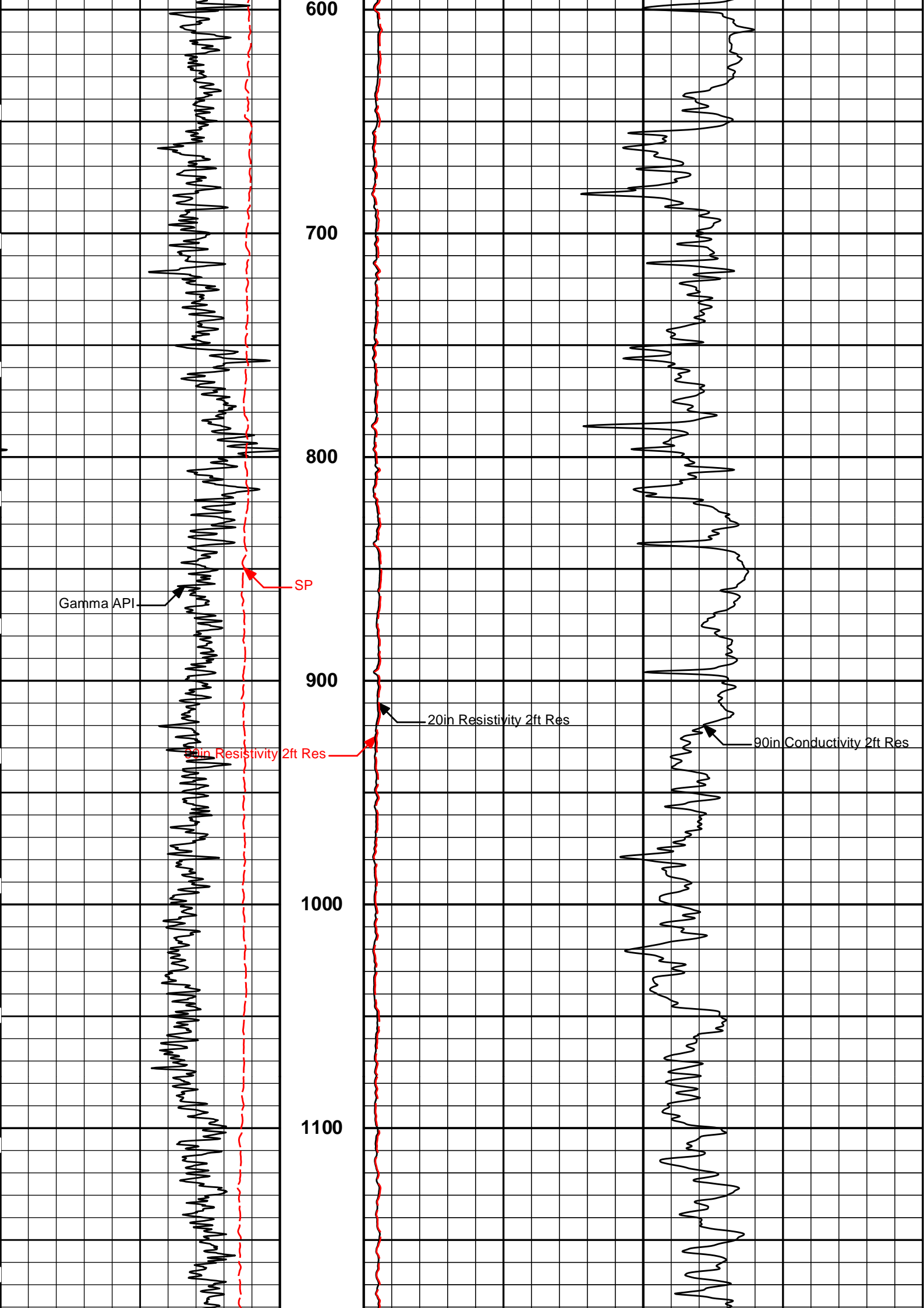
## ARRAY COMPENSATED TRUE RESISTIVITY LOG

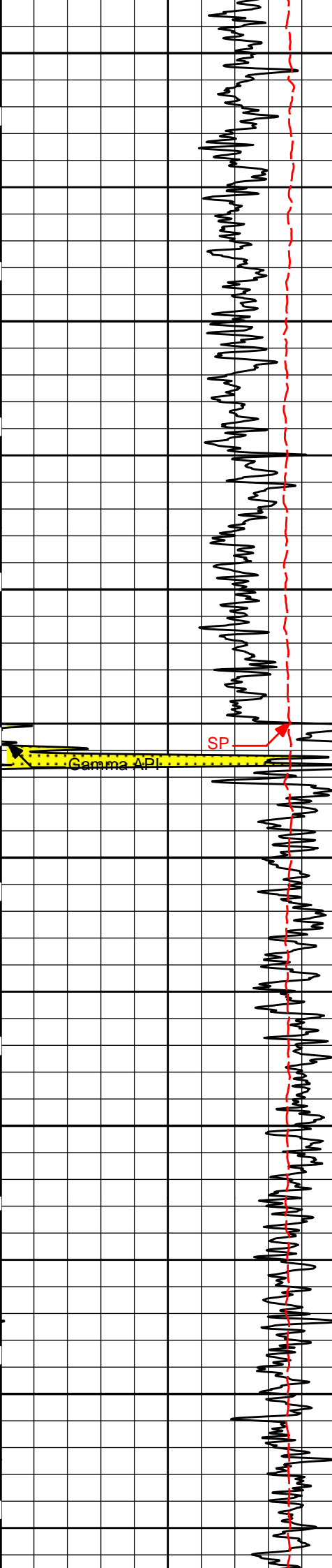
COMPANY WELL FIELD/BLOCK COUNTY STATE				K3 OIL & GAS OPERATING COMPANY CLARK 13-24 WILDCAT LINCOLN COLORADO				COMPANY WELL FIELD/BLOCK COUNTY STATE				K3 OIL & GAS OPERATING COMPANY CLARK 13-24 WILDCAT LINCOLN COLORADO			
Permanent Datum Log measured from Drilling measured from				GL KB KB 18.0 ft above perm. Datum				Other Services: DSNT/SDLT MICROLOG BSAT ACRT				Elev.: K.B. D.F. G.L. 5080.0 ft 5080.0 ft 5062.0 ft			
Date	20-Oct-17														
Run No.	ONE														
Depth - Driller	7500.0 ft														
Depth - Logger	7510.0 ft														
Bottom - Logged Interval	7501.00 ft														
Top - Logged Interval	464.00 ft														
Casing - Driller	13.375 in			@ 470.0 ft				@				@			
Casing - Logger	464.0 ft														
Bit Size	7.875 in			12.250 in				@ 2500.0 ft				@			
Type Fluid in Hole	Water Based Mud														
Density	9.4 ppg			65.00 s/qt											
PH	9.00 pH			8.0 cpm											
Source of Sample	MUD PIT														
Rm @ Meas. Temperature	1.41 ohmm			@ 75.00 degF				@				@			
Rmf @ Meas. Temperature	1.29 ohmm			@ 75.00 degF				@				@			
Rmc @ Meas. Temperature	1.55 ohmm			@ 75.00 degF				@				@			
Source Rmf	MEAS			MEAS											
Rm @ BHT	0.72 ohmm			@ 153.0 degF				@				@			
Time Since Circulation	10.0 hr														
Time on Bottom	20-Oct-17 17:30														
Max. Rec. Temperature	153.00 degF			@ 7510.0 ft				@				@			
Equipment	12147634			EL RENO, OK											
Recorded By	JORGE ORLANDO PEREZ														
Witnessed By	JOHN MARVIN			SUSAN RAINBOLT				RANDY SAY							

Fold here

Service Ticket No.: 904382733						API No.: 05-073-06726-00-00						PGM Version: WL INSITE R5.0.5 (Build 8)											
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.		Other			
Rmf @ Meas. Temp.				@				@				ONE		ACRT		N/A		CENT		N/A			
Rmc @ Meas. Temp.				@				@						I-11022962									
Source Rmf		Rmc										S-11005909											
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.		11048327		Serial No.		10747683		Serial No.		10960494		Serial No.		11055304									
Model No.		GTET		Model No.		BSAT		Model No.		SDLT		Model No.		DSNT									
Diameter		3.625"		No. of Cent.		2		Diameter		5.5"		Diameter		3.625"									
Detector Model No.		T-102		Spacing		EVEN		Log Type		GAM-GAM		Log Type		NEU-NEU									
Type		SCINT						Source Type		CS137		Source Type		AM241BE									
Length		8"		LSA [Y/N]				Serial No.		5168GW		Serial No.		DSN-424									
Distance to Source		N/A		FWDA [Y/N ]				Strength		1.5 Ci		Strength		15.0 Ci									
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	Matrix		L	R	Matrix		L	R	Matrix						
ONE		TD	CSG	REC	0	150	30	10			47.6 uSec/ft	30			10	2.71 gr/cc			30	10	LIME		

ONE	TD	CSG	REC	0	150	30	-10	47.0 uSec/ft	30	-10	2.77 g/cc	30	-10	LIME	
DIRECTIONAL INFORMATION															
Maximum Deviation							@	KOP							@
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING															
CHLORIDES REPORTED AT 400 ppm															





1200

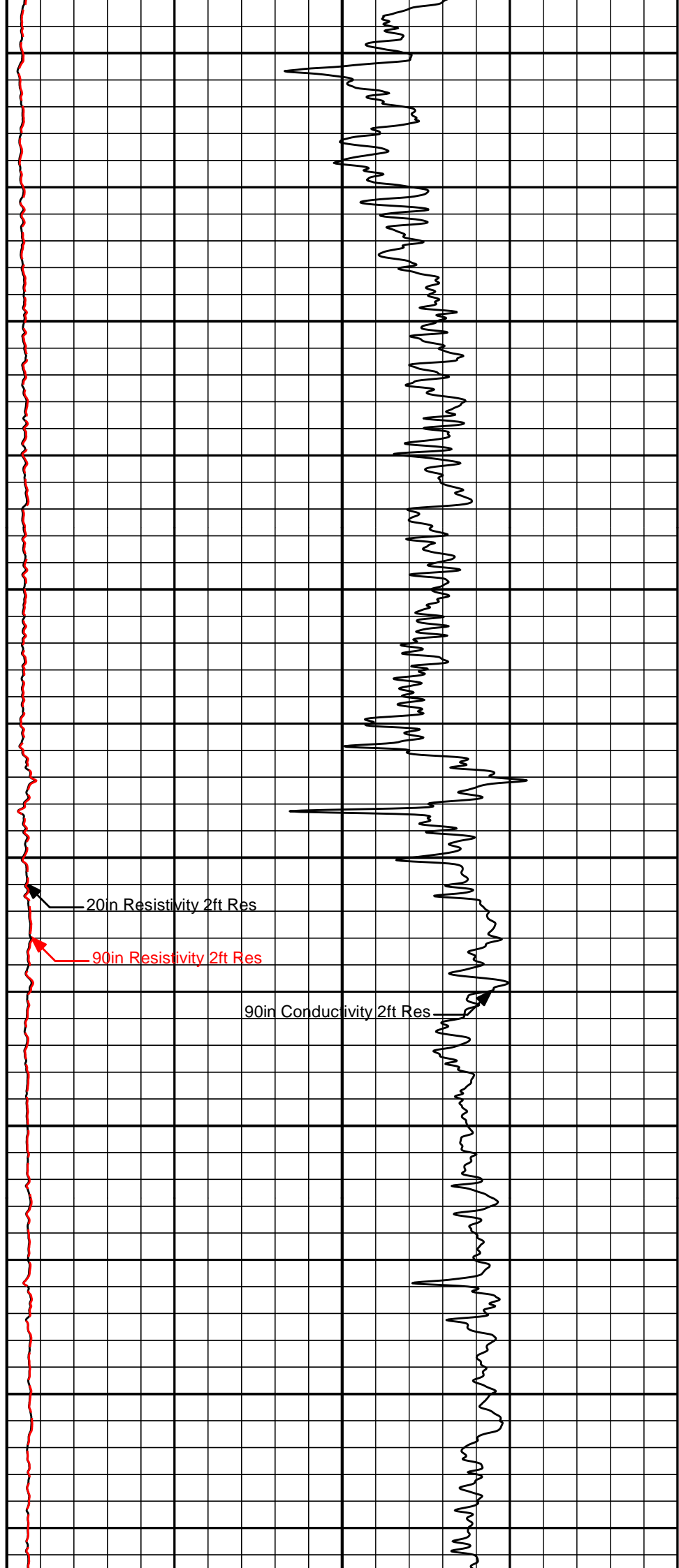
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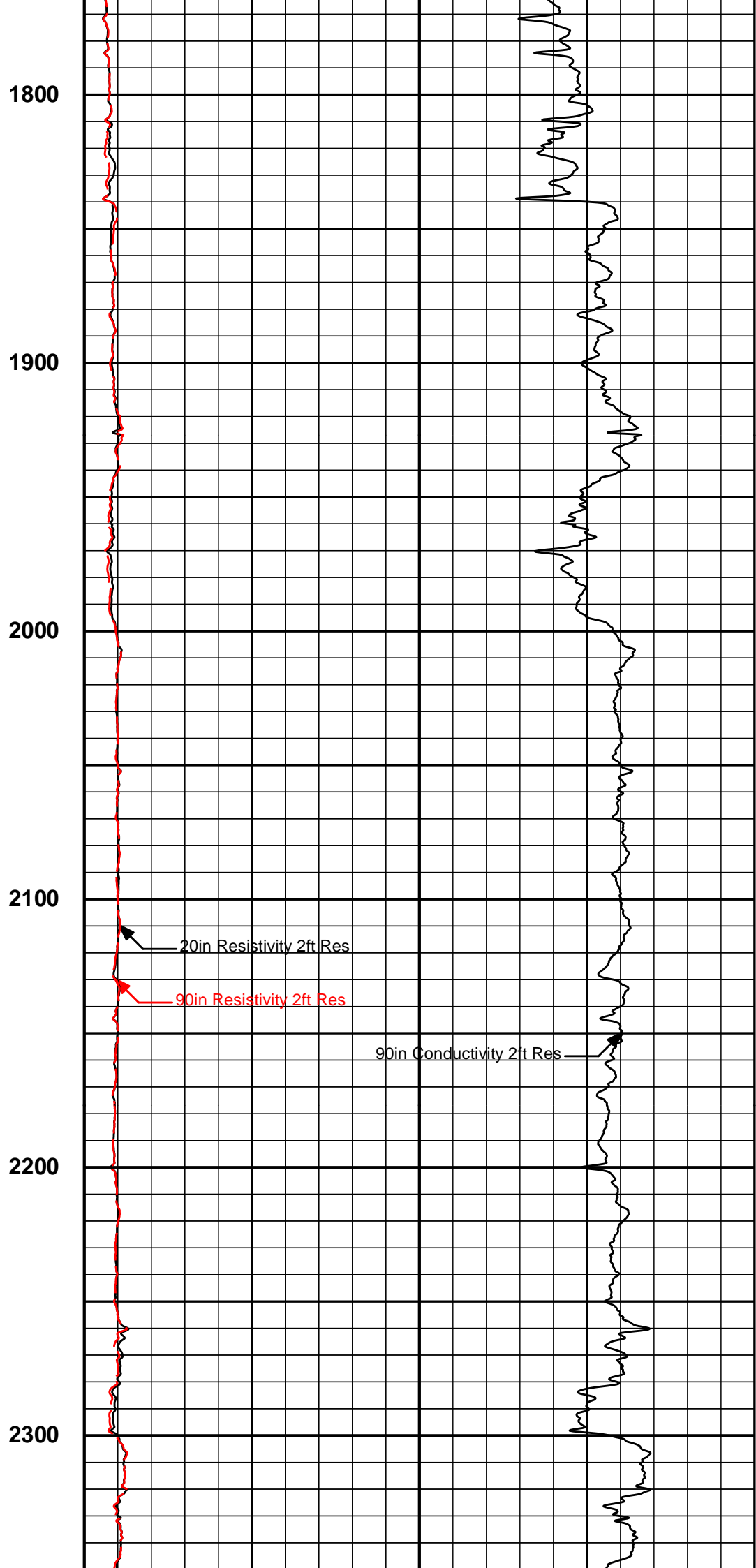
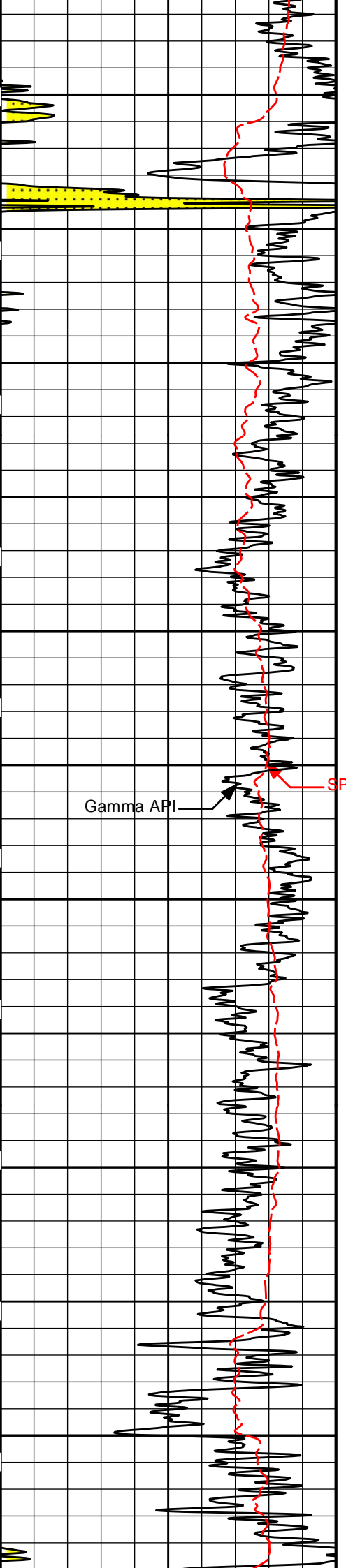
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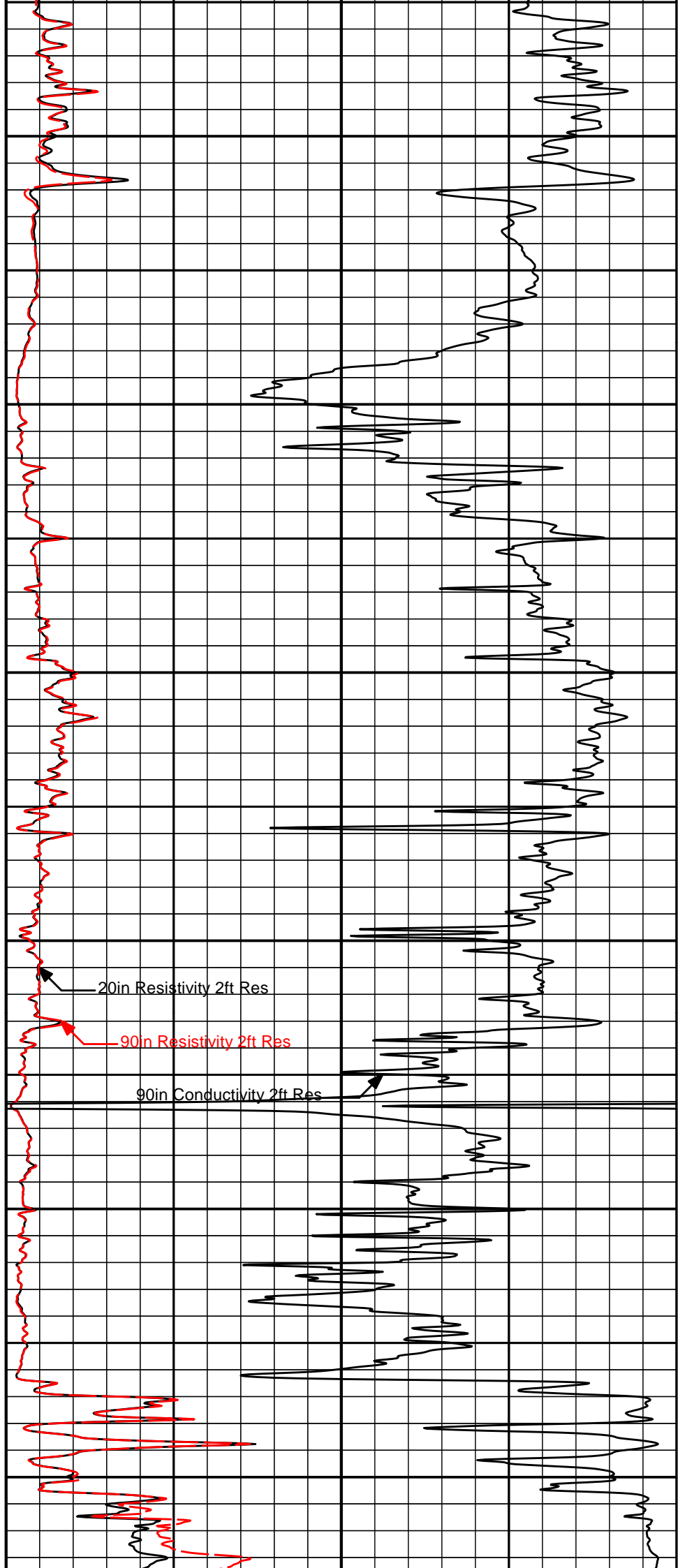
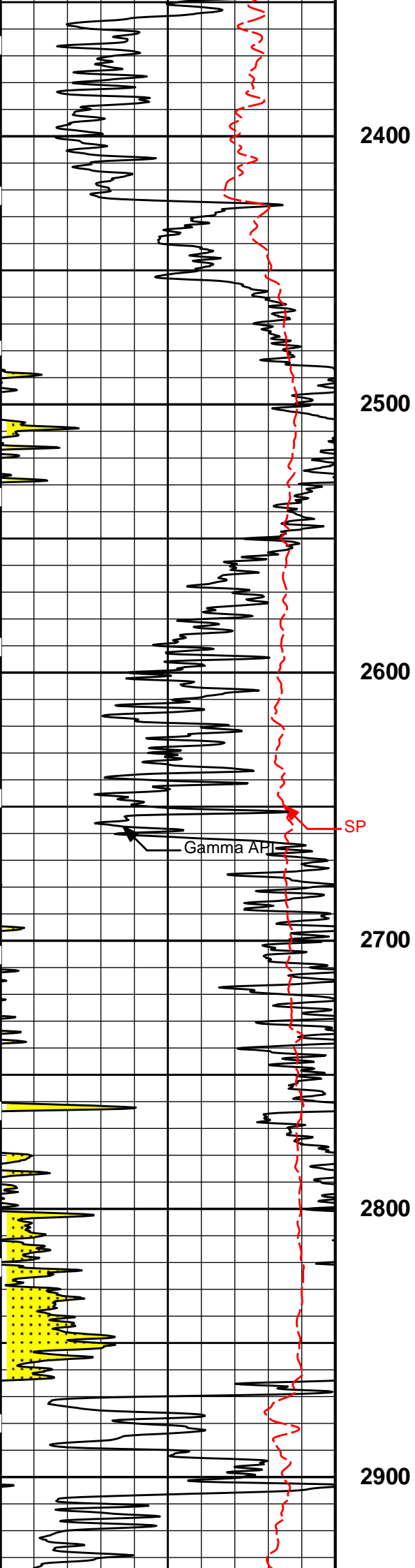
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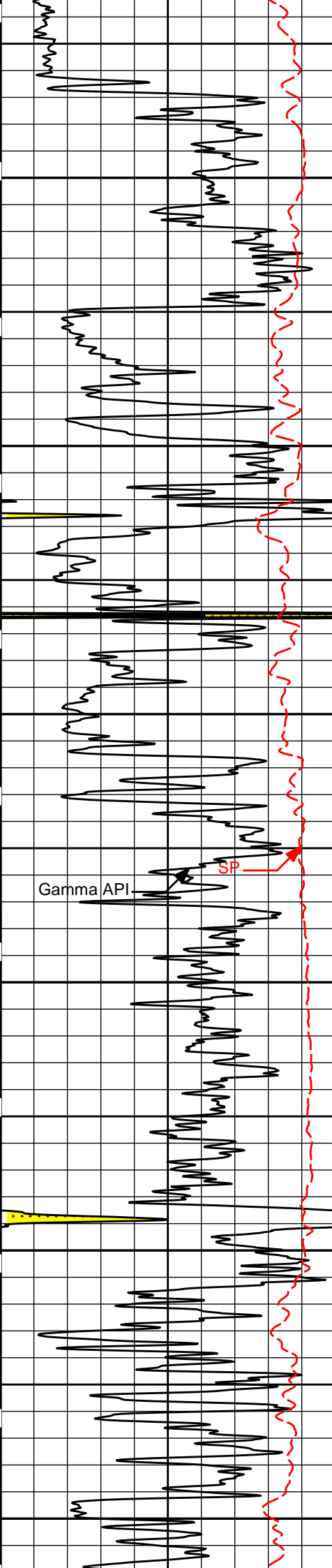
1600

1700









3000

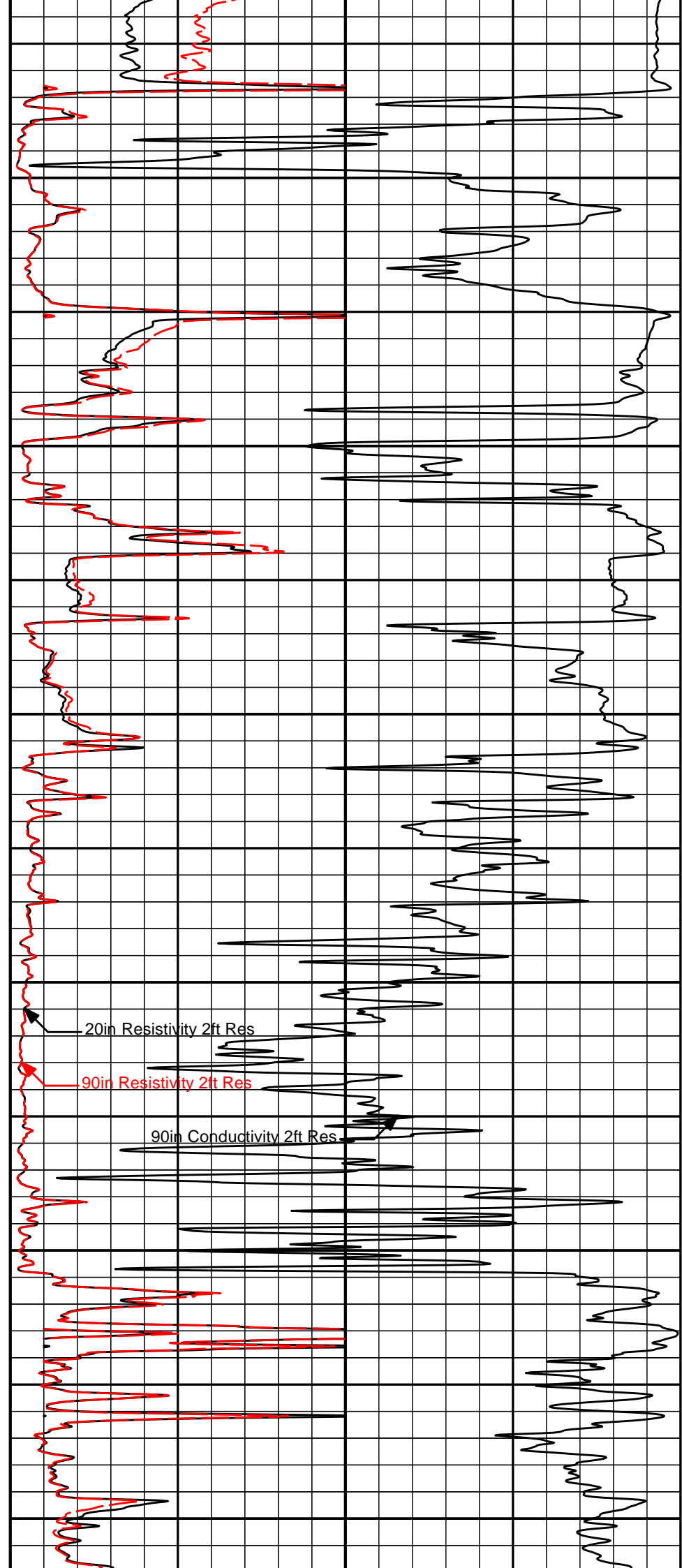
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3200

3300

3400

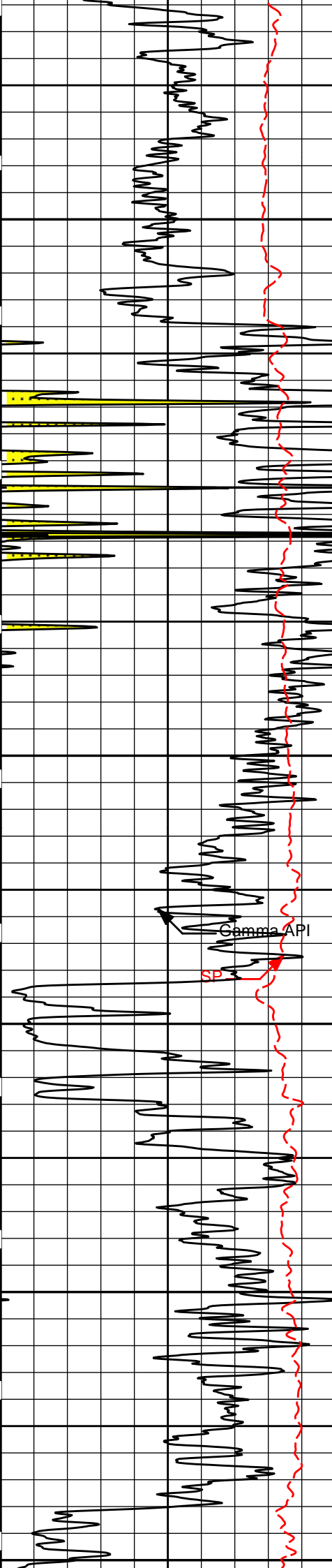
3500



20in Resistivity 2ft Res

90in Resistivity 2ft Res

90in Conductivity 2ft Res



3600

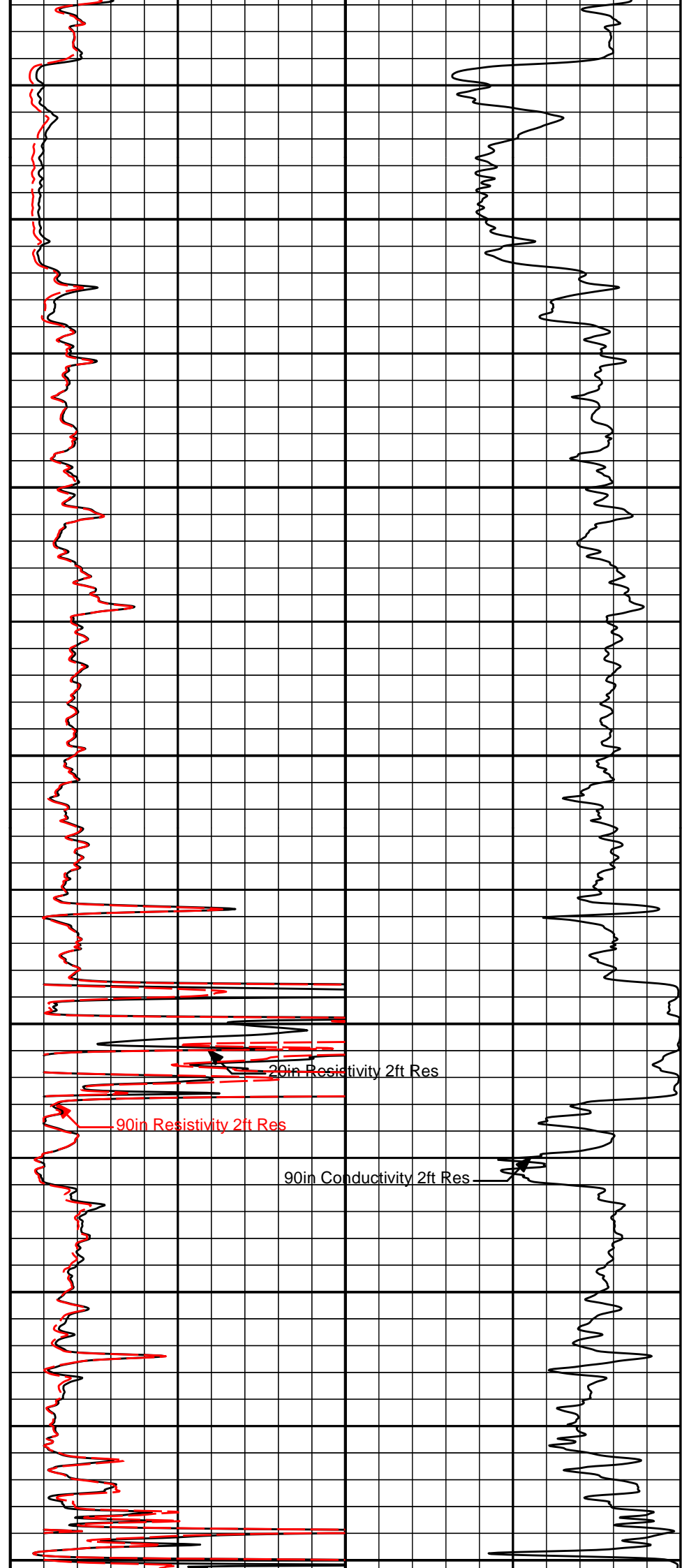
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3800

3900

4000

4100

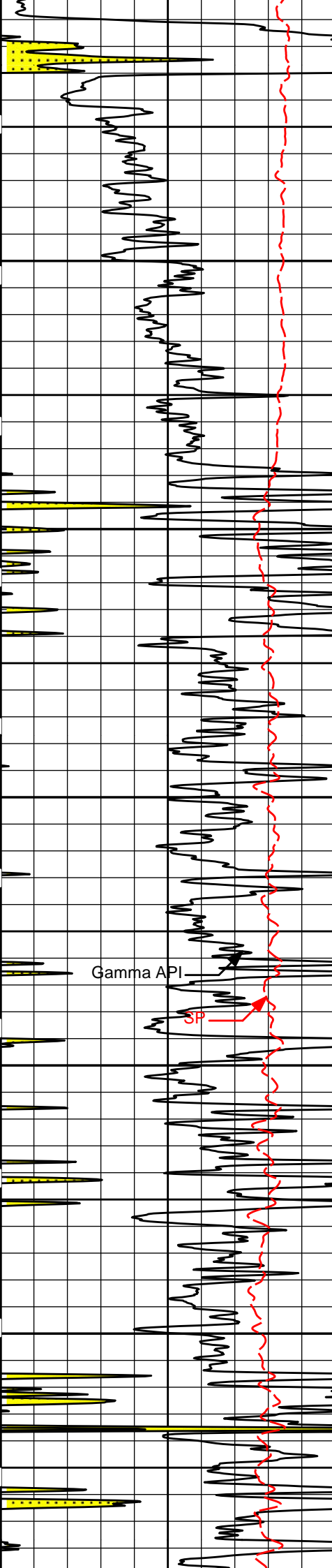


20in Resistivity 2ft Res

90in Resistivity 2ft Res

90in Conductivity 2ft Res





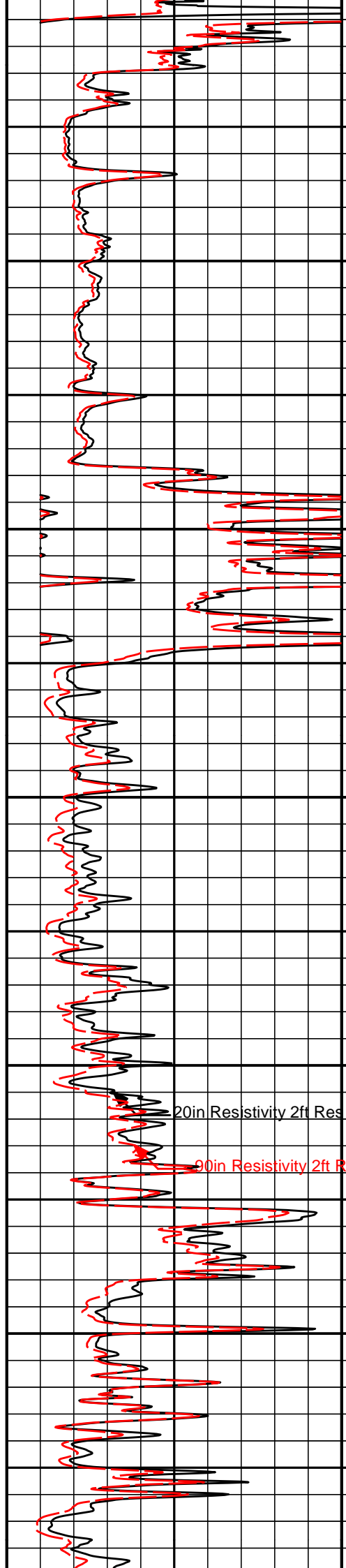
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4400

4500

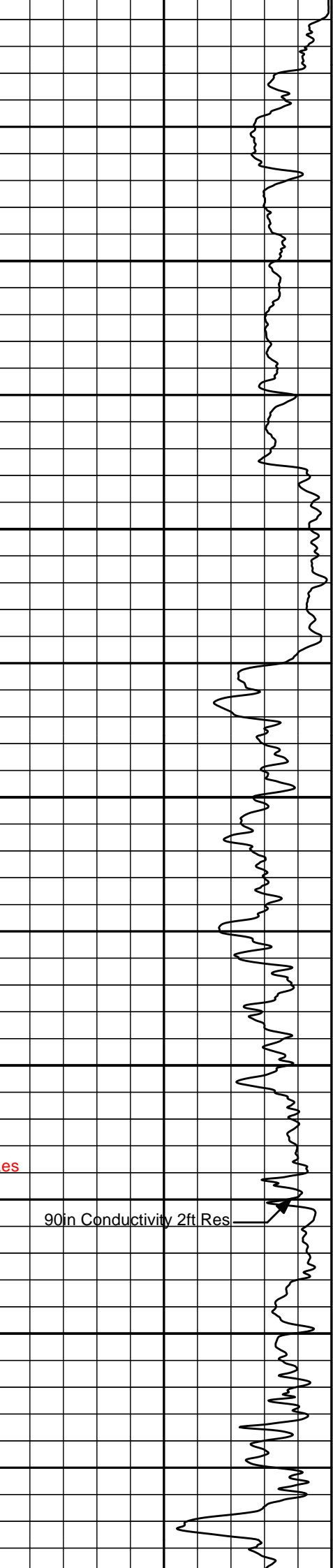
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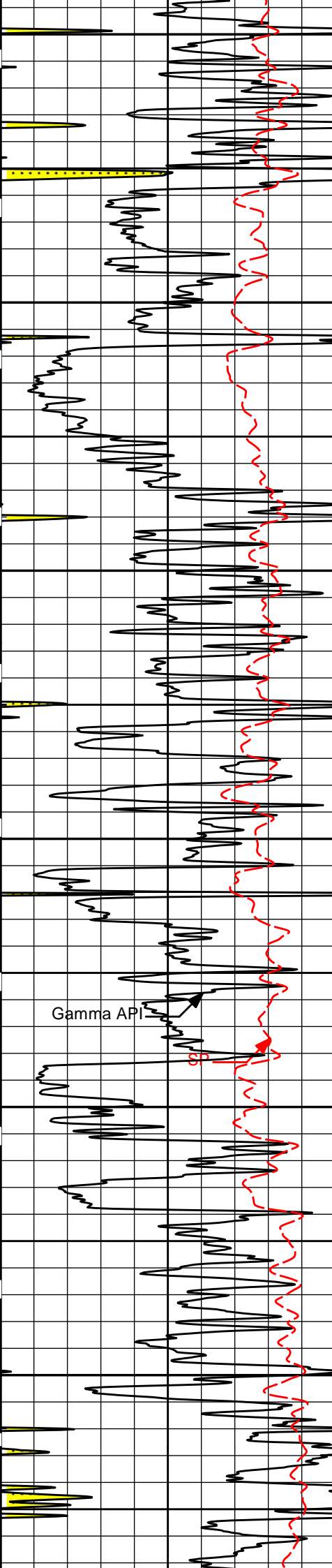


20in Resistivity 2ft Res

90in Resistivity 2ft Res

90in Conductivity 2ft Res





4700

4800

4900

5000

5100

5200

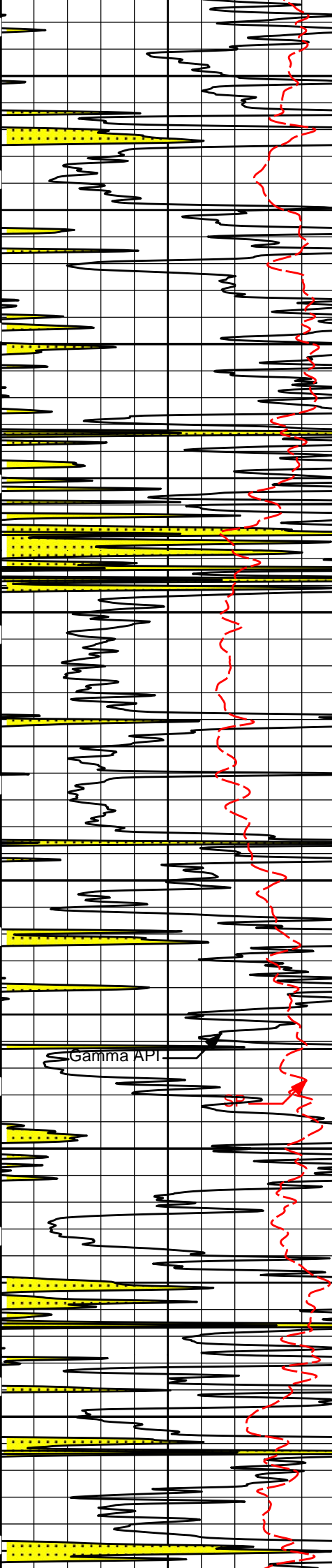
Gamma API

90

20in Resistivity 2ft Res

90in Resistivity 2ft Res

90in Conductivity 2ft Res



5300

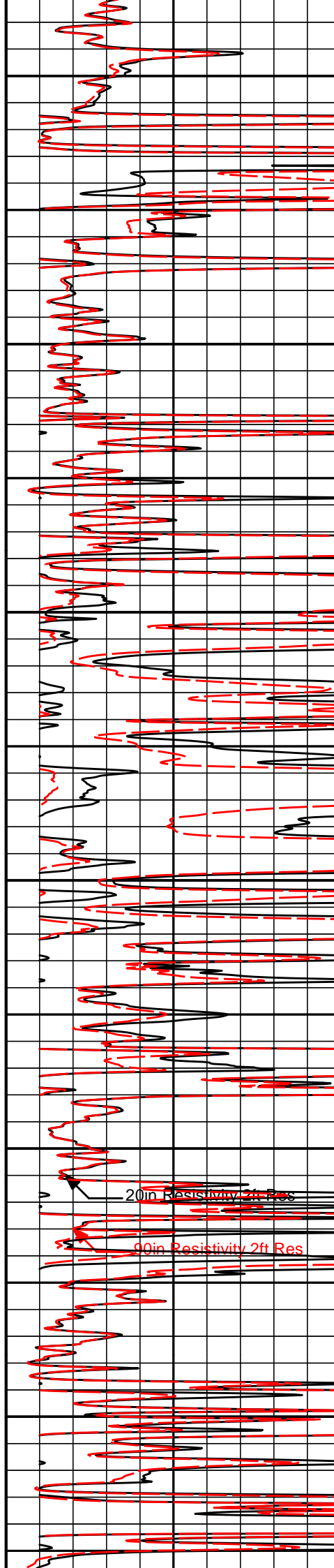
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5500

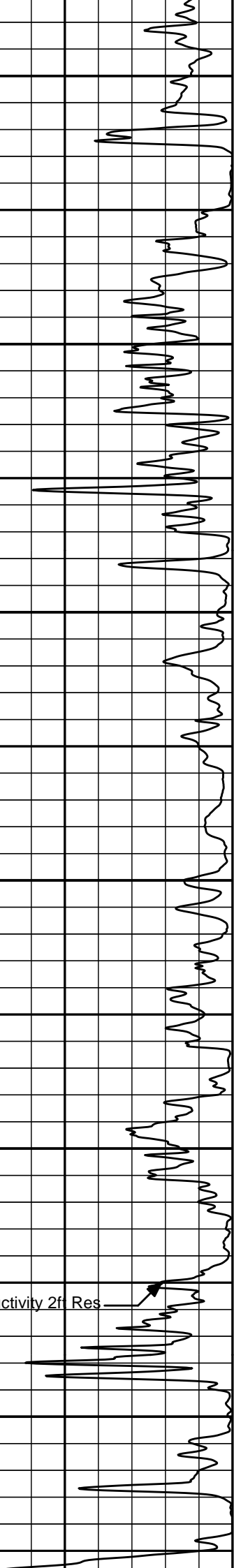
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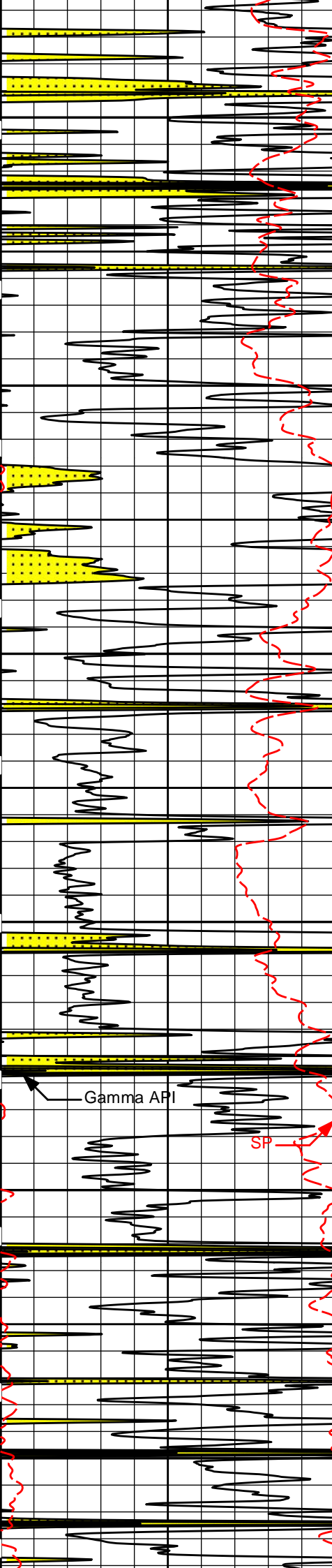
5700

5800



90in Conductivity 2ft Res





5900

6000

6100

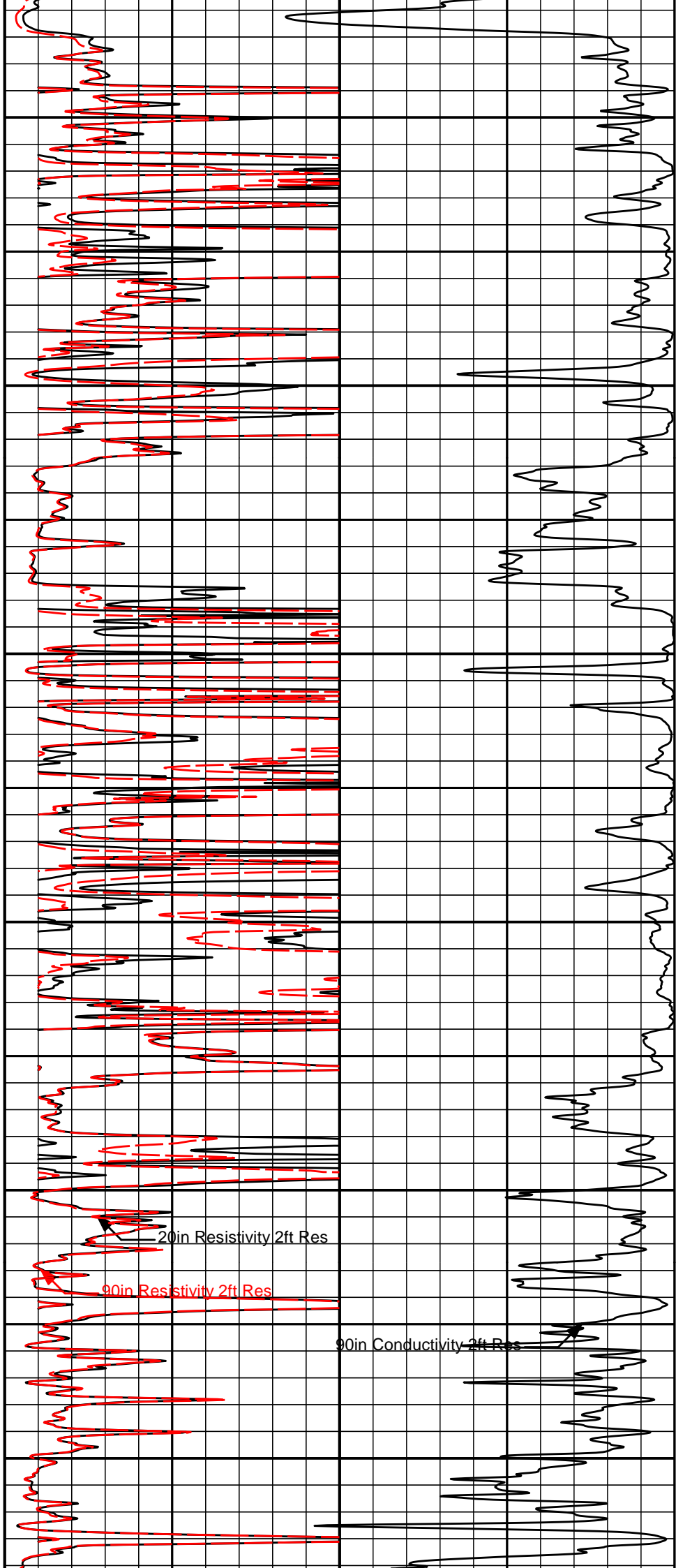
6200

6300

6400

Gamma API

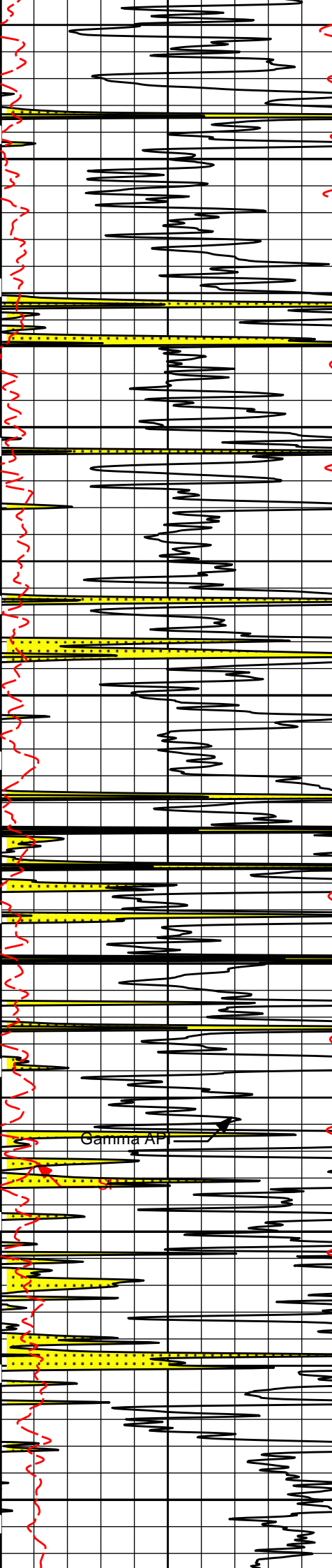
SP



20in Resistivity 2ft Res

90in Resistivity 2ft Res

90in Conductivity 2ft Res



6500

6600

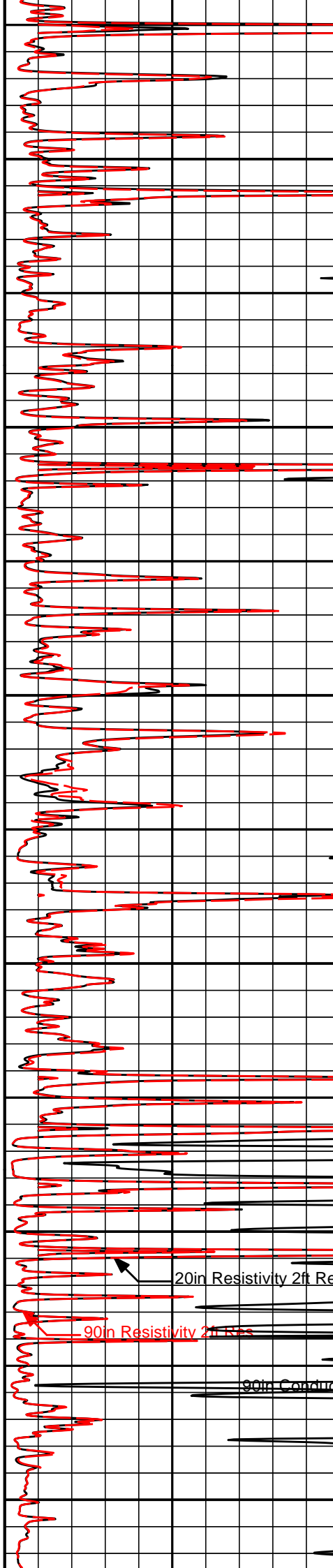
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6800

6900

7000

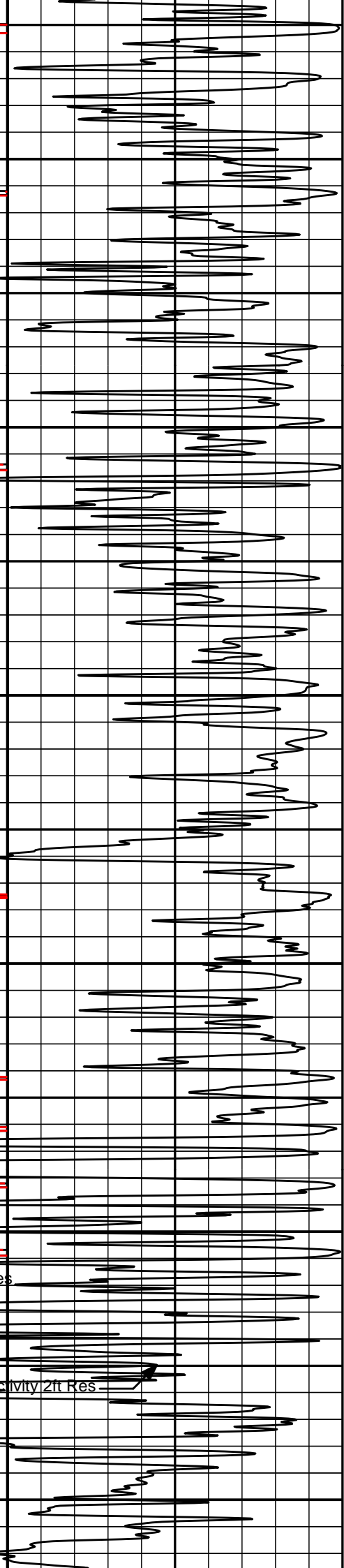
Gamma API

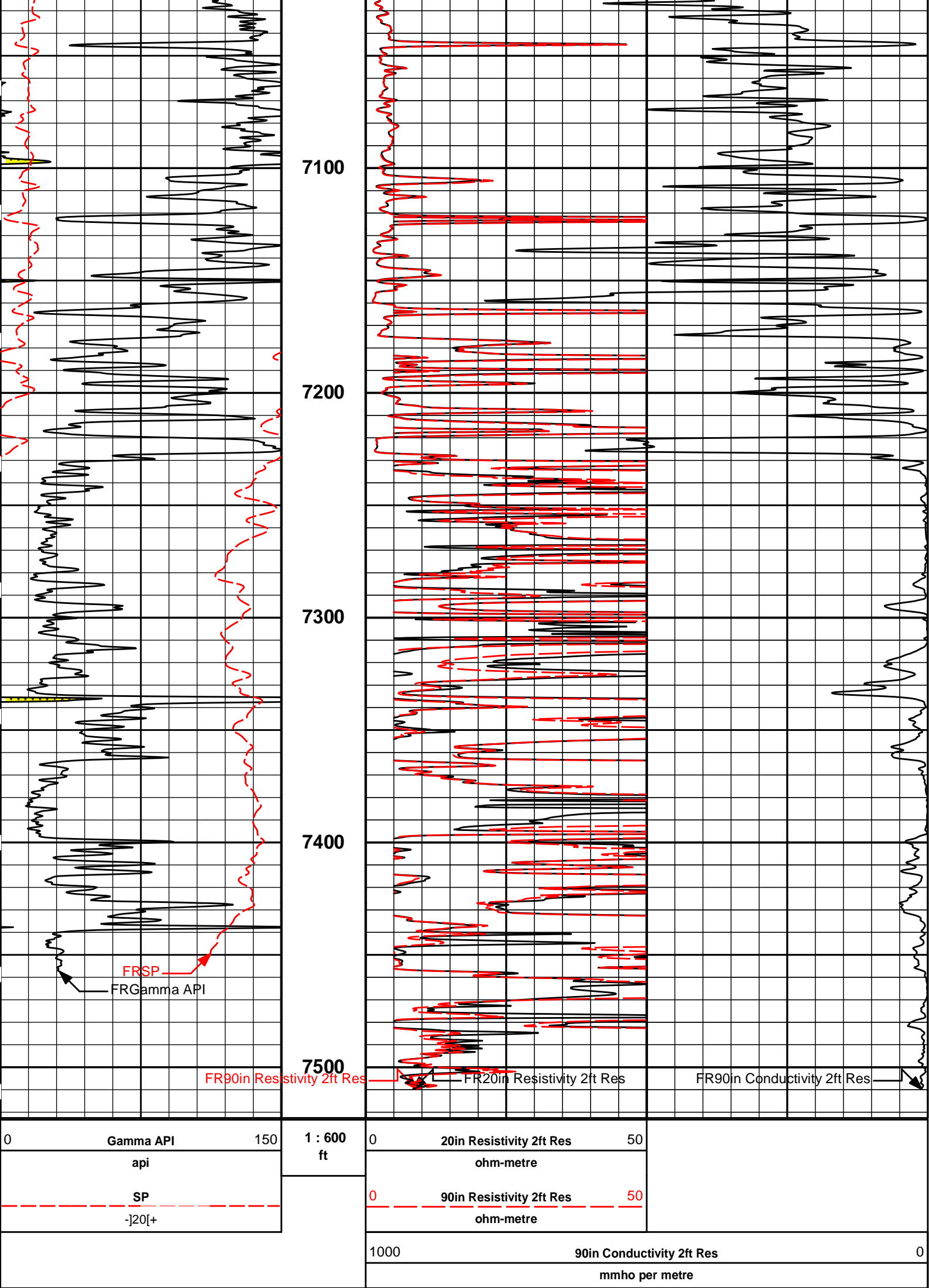


20in Resistivity 2ft Res

90in Resistivity 2ft Res

90in Conductivity 2ft Res





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		

2 INCH MAIN LOG

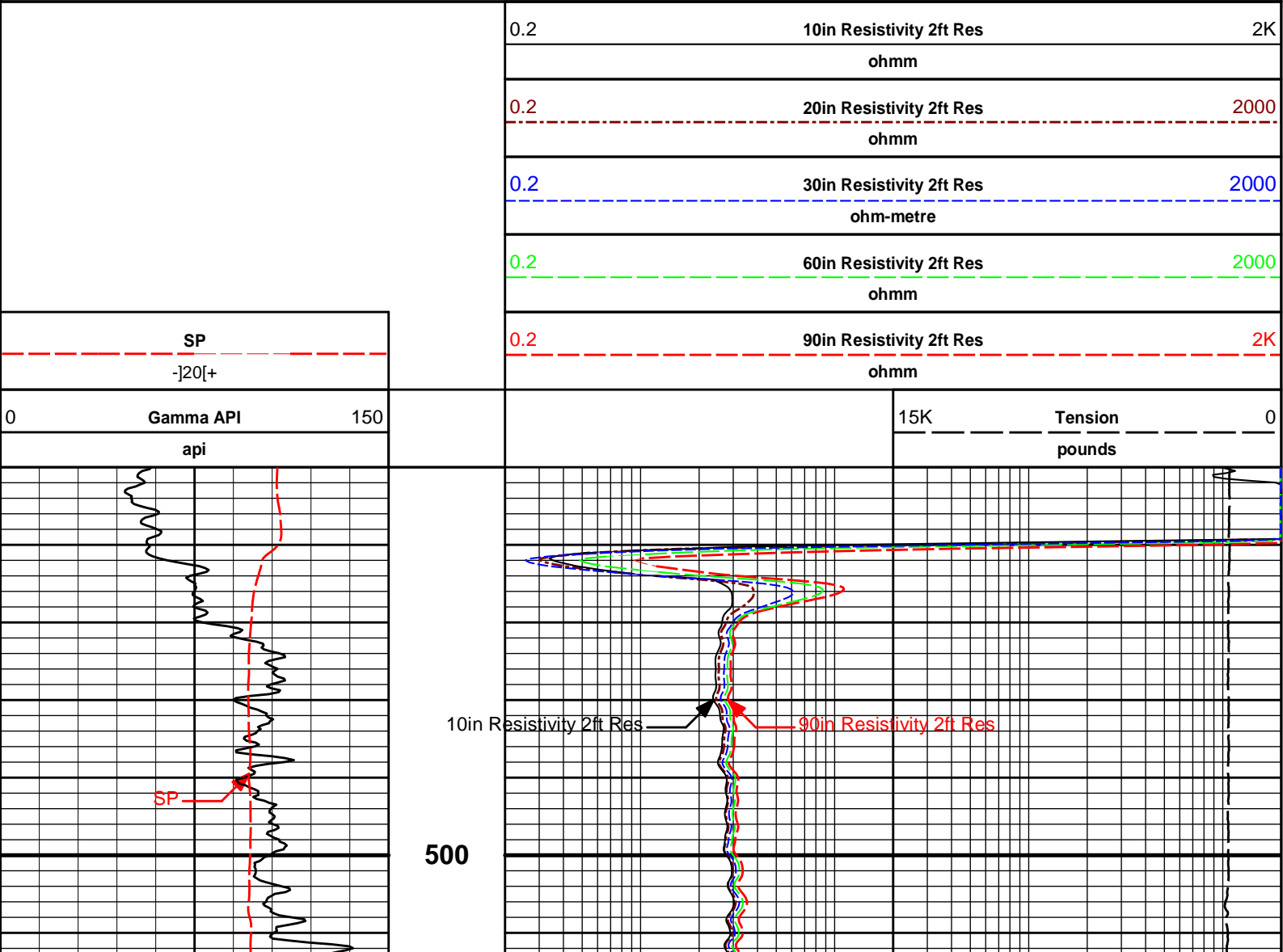
2 INCH MAIN LOG

HALLIBURTON

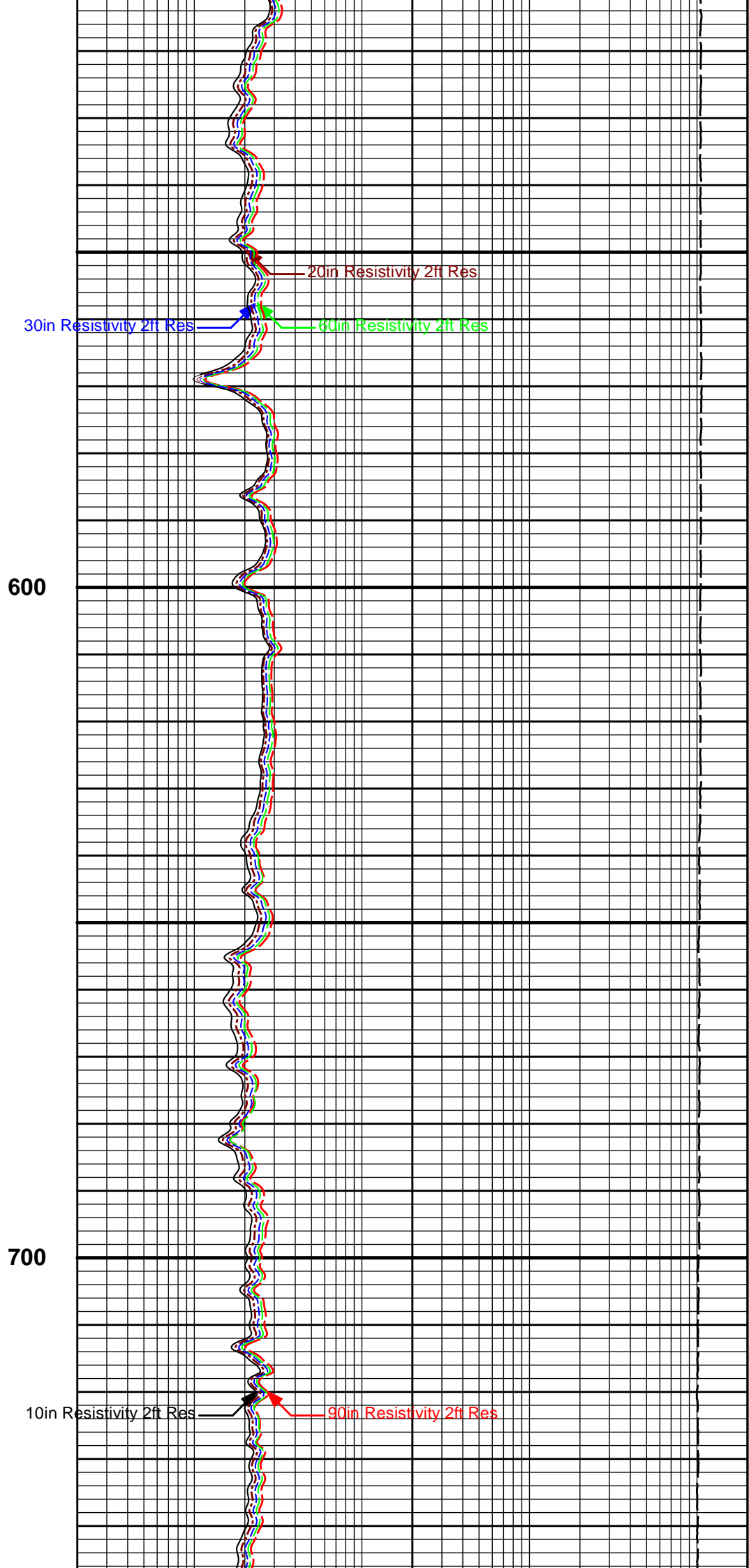
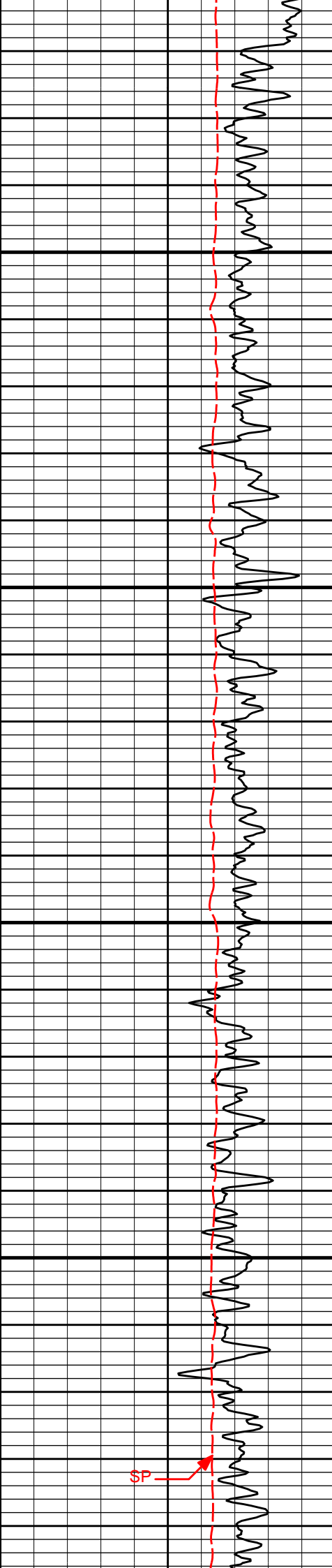
Plot Time: 20-Oct-17 21:04:33  
Plot Range: 450 ft to 7522.58 ft  
Data: CLARK\_13-24\Well Based\MAIN\  
Plot File: \\-LOCAL-\\CLARK\_13-24\Well Based\ACRT\ACRT\_5inch\_main

5 INCH MAIN LOG

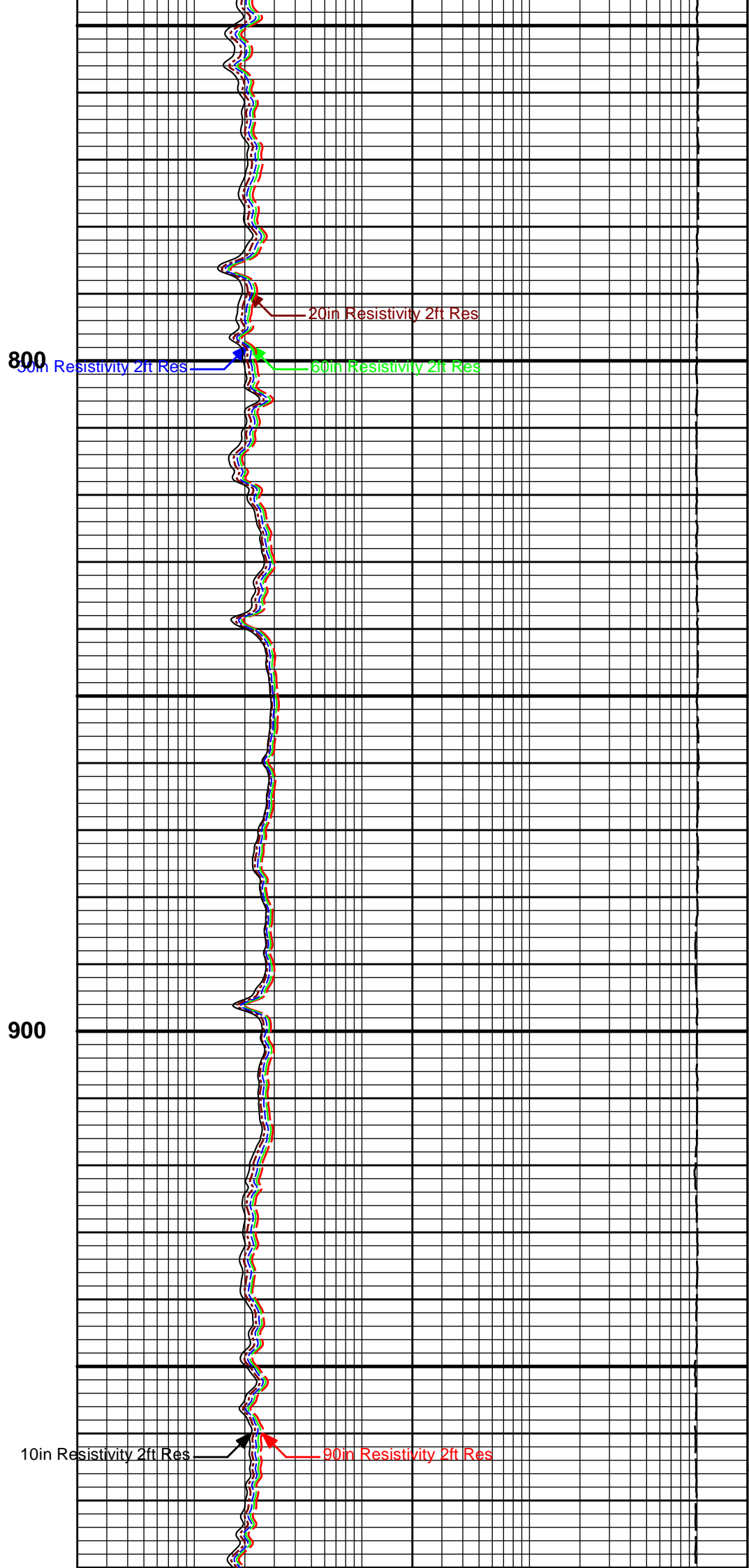
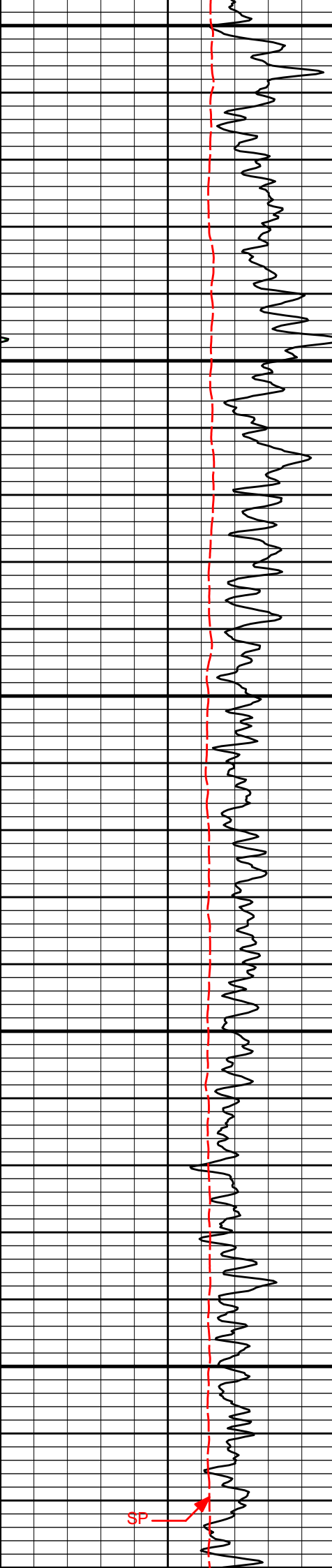
5 INCH MAIN LOG

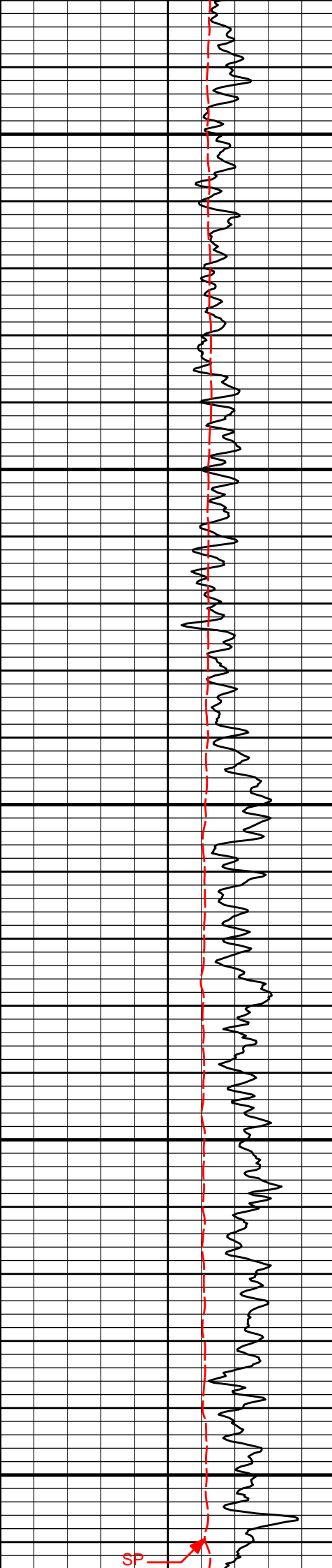












1000

1100

1200

30in Resistivity 2ft Res

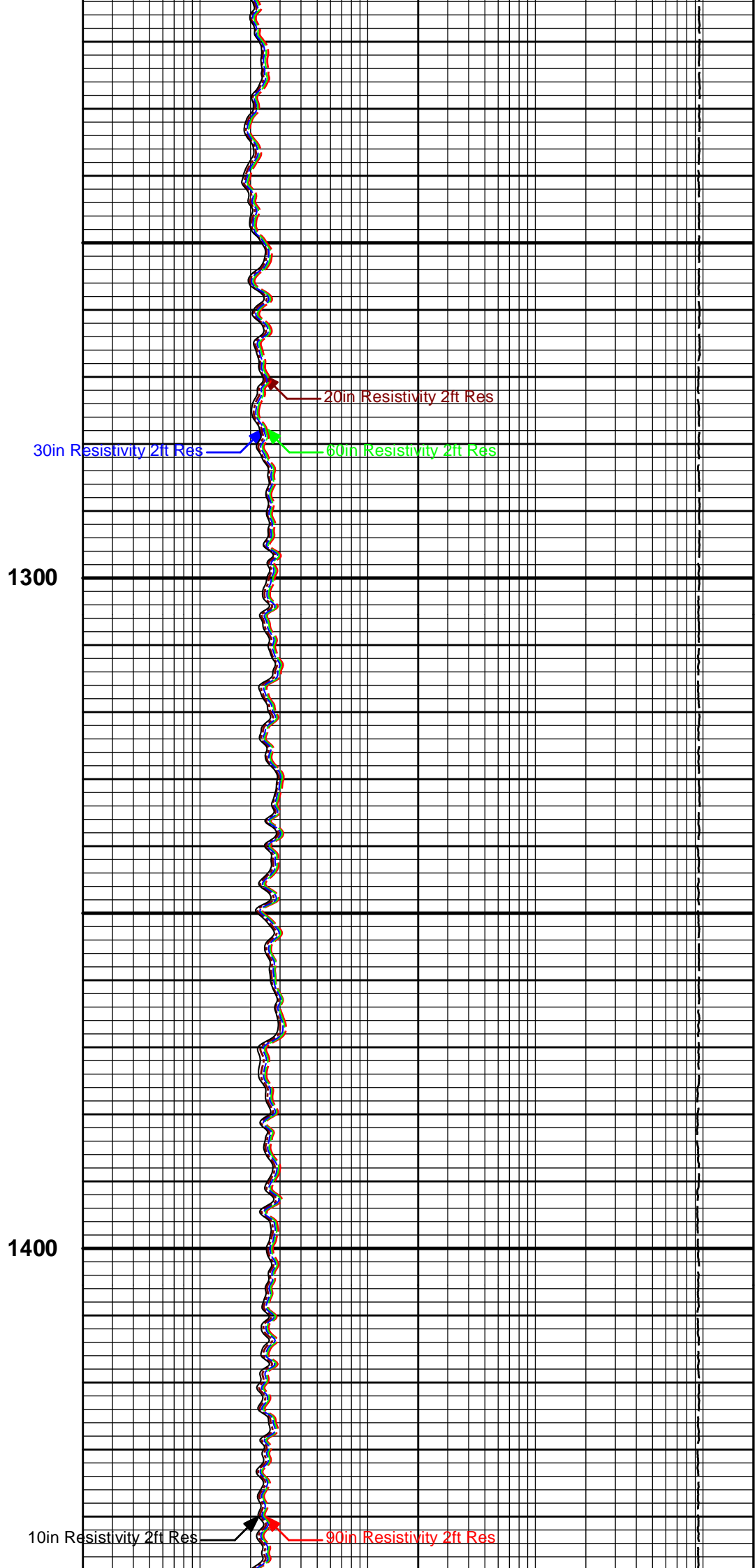
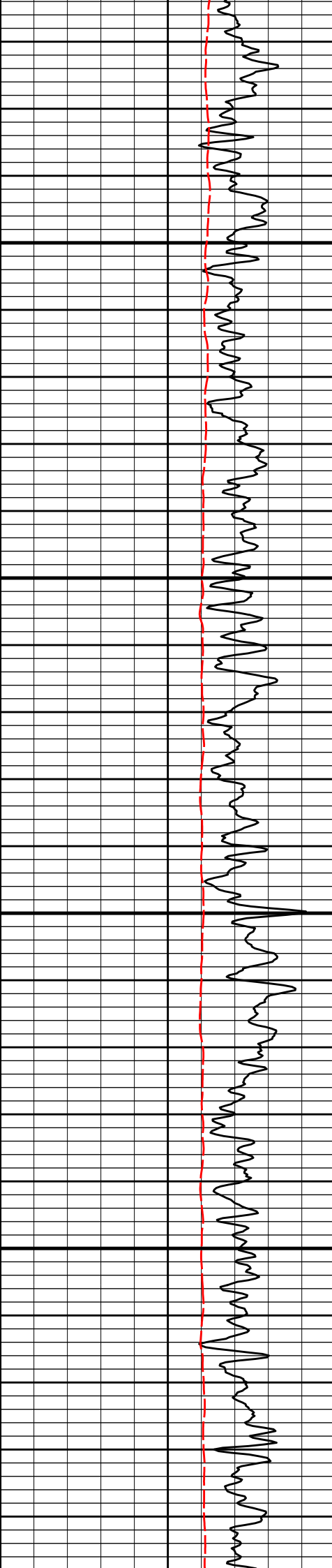
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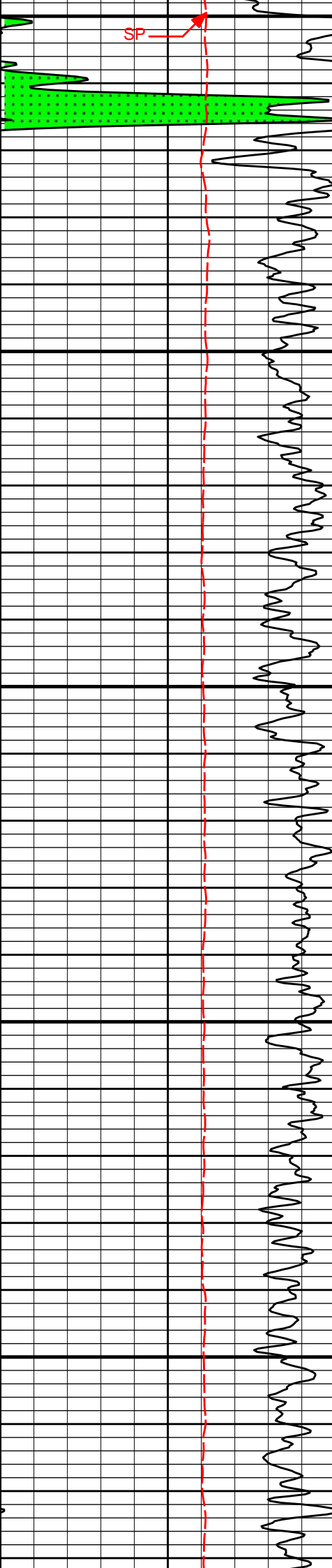
60in Resistivity 2ft Res

10in Resistivity 2ft Res

90in Resistivity 2ft Res

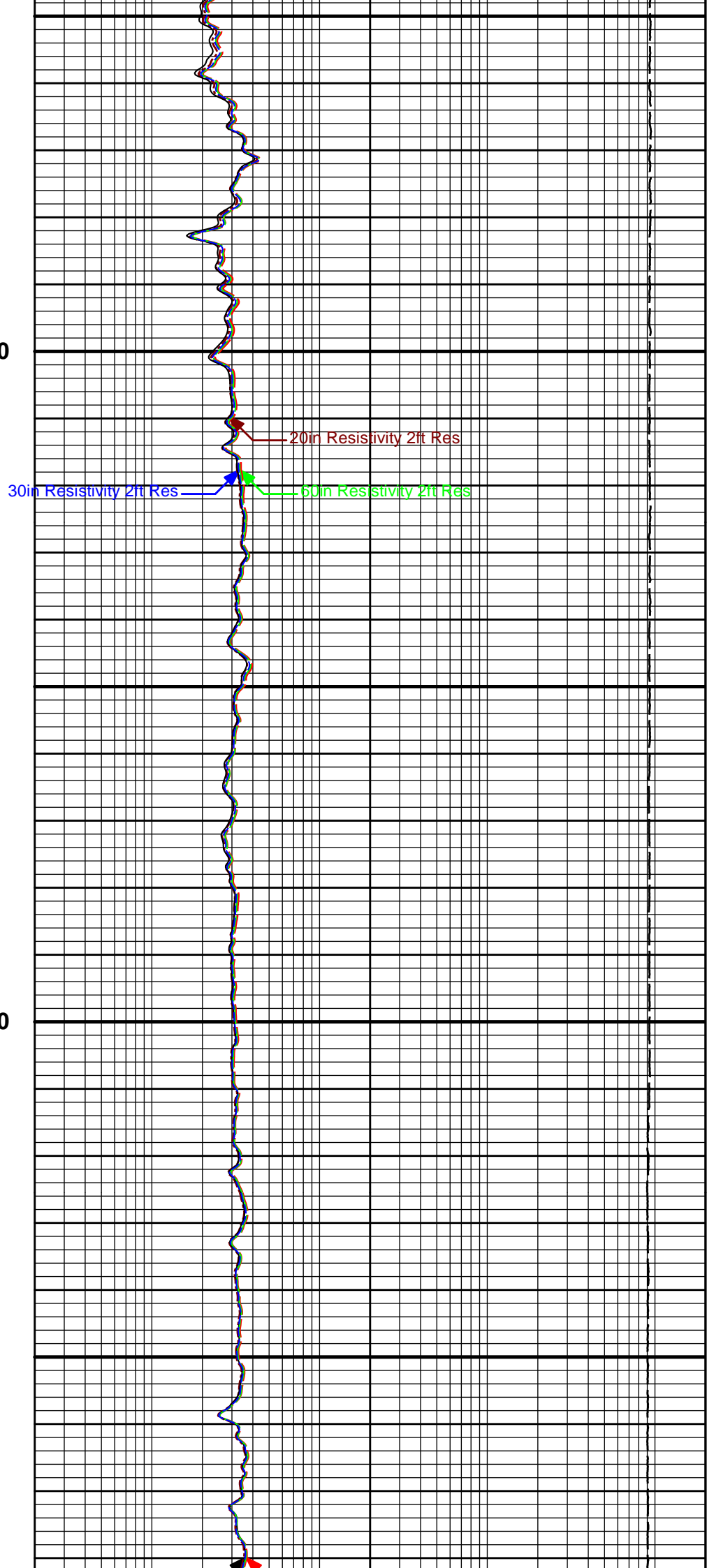
SP

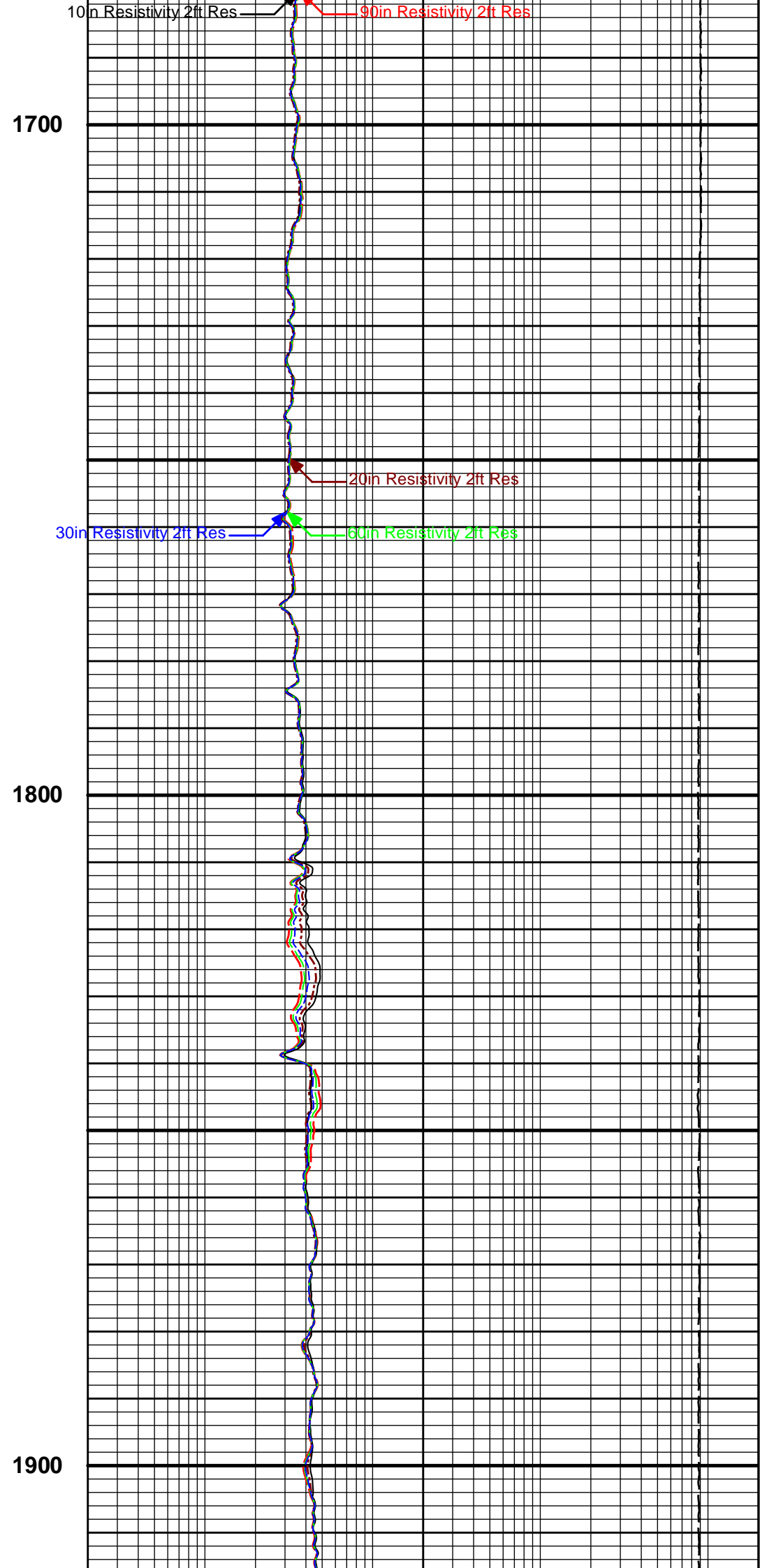
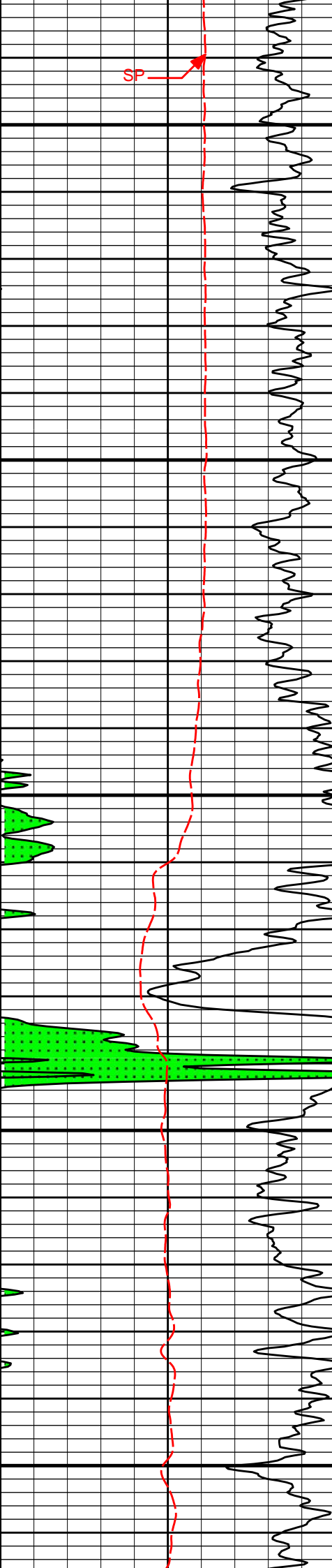


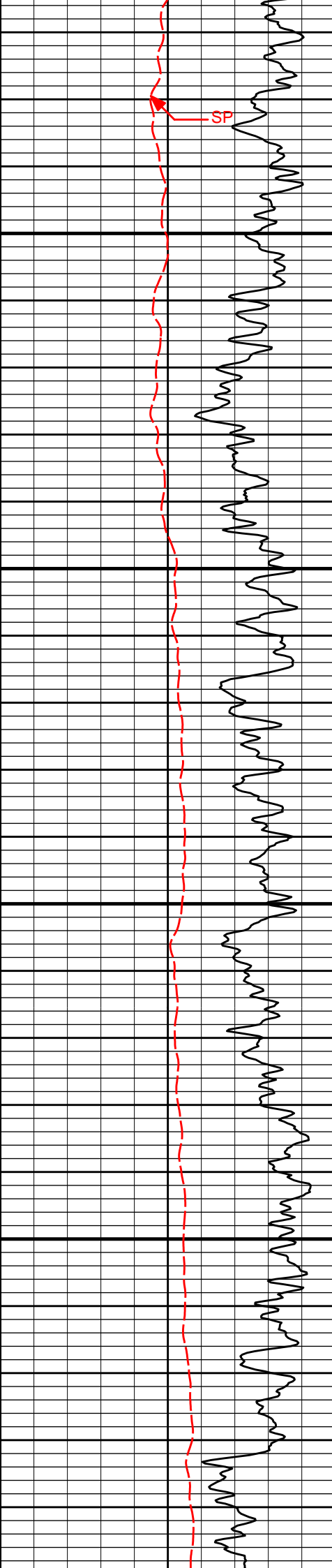


1500

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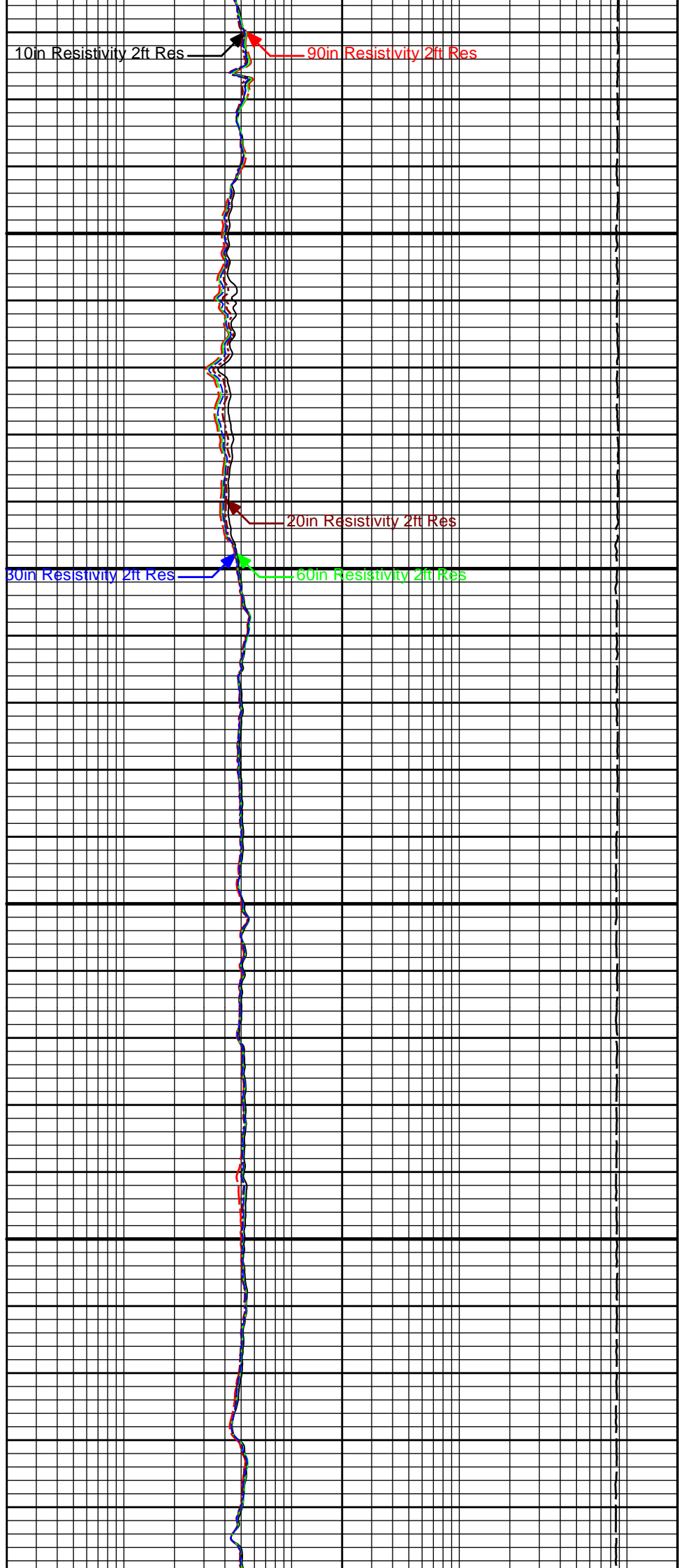


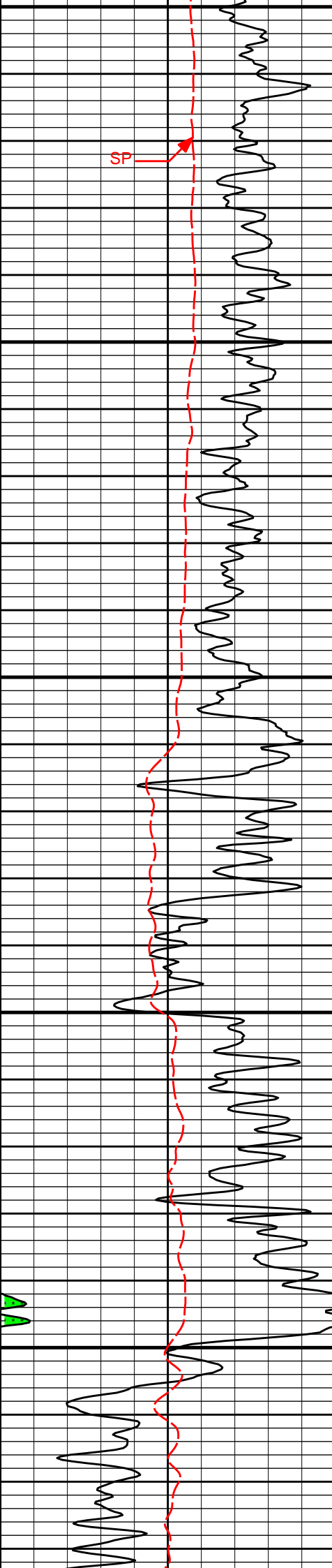




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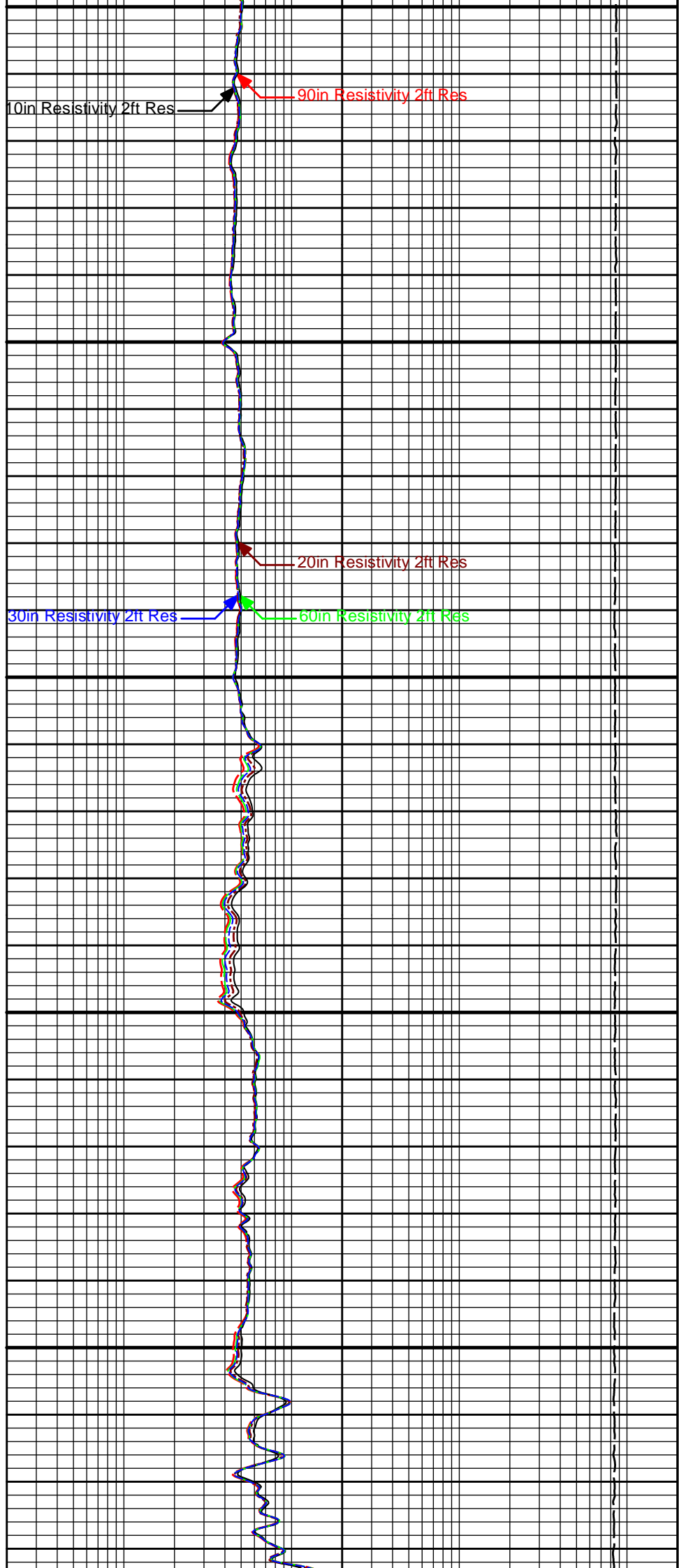
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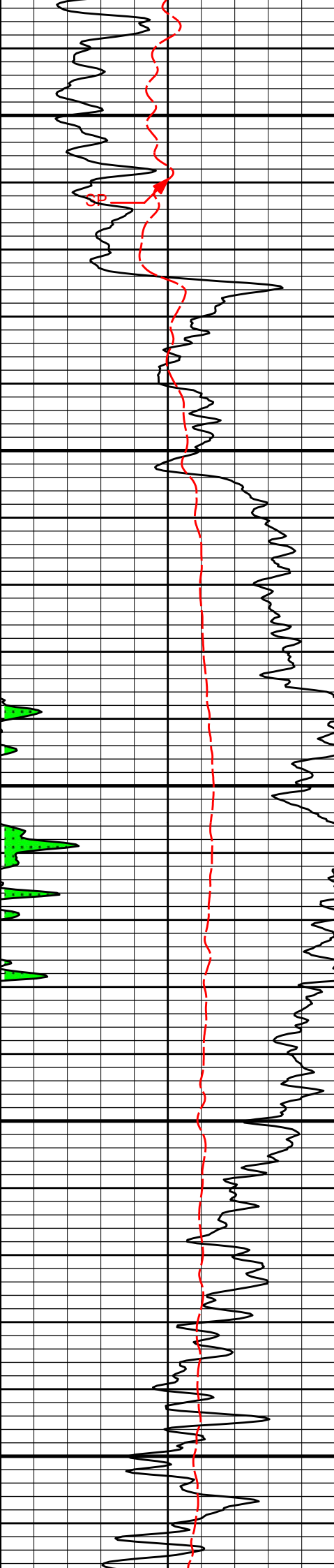




2200

2300

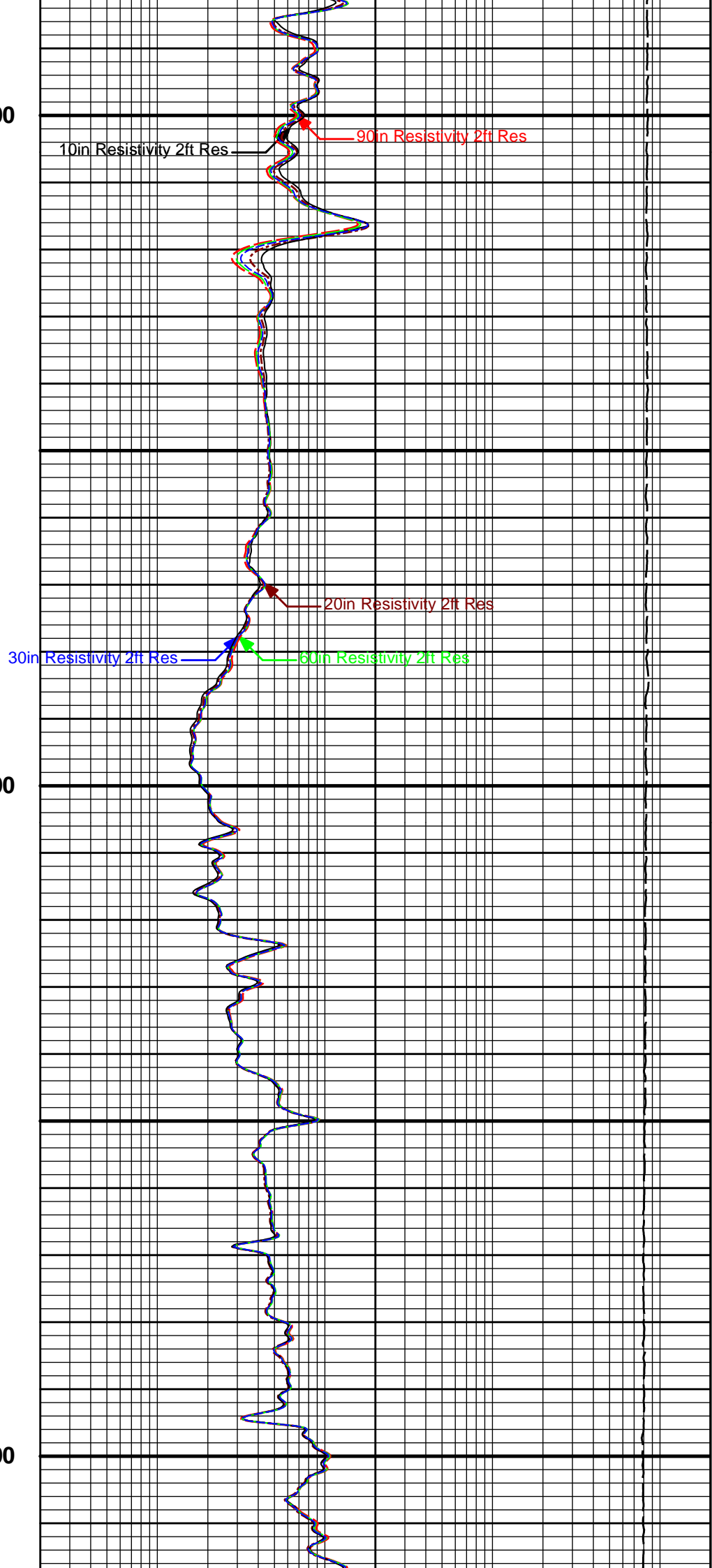




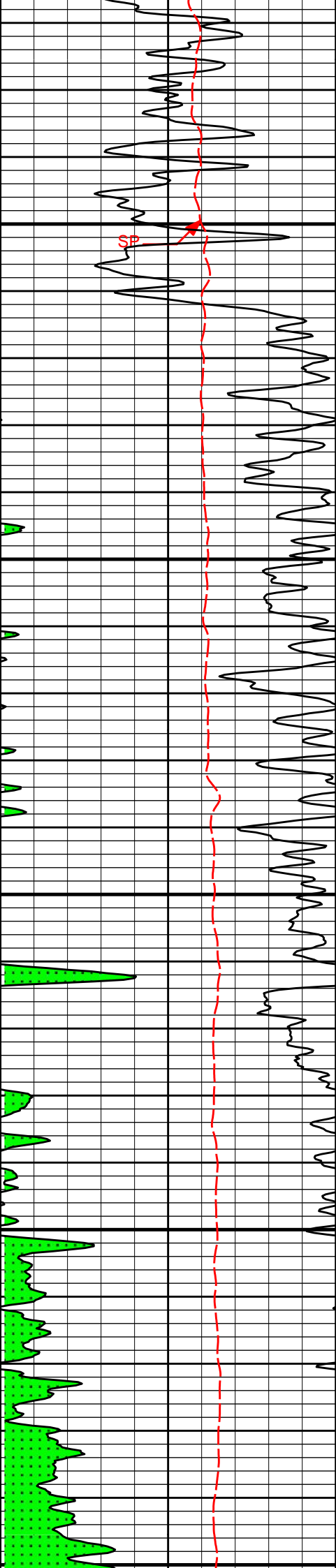
2400

2500

2600

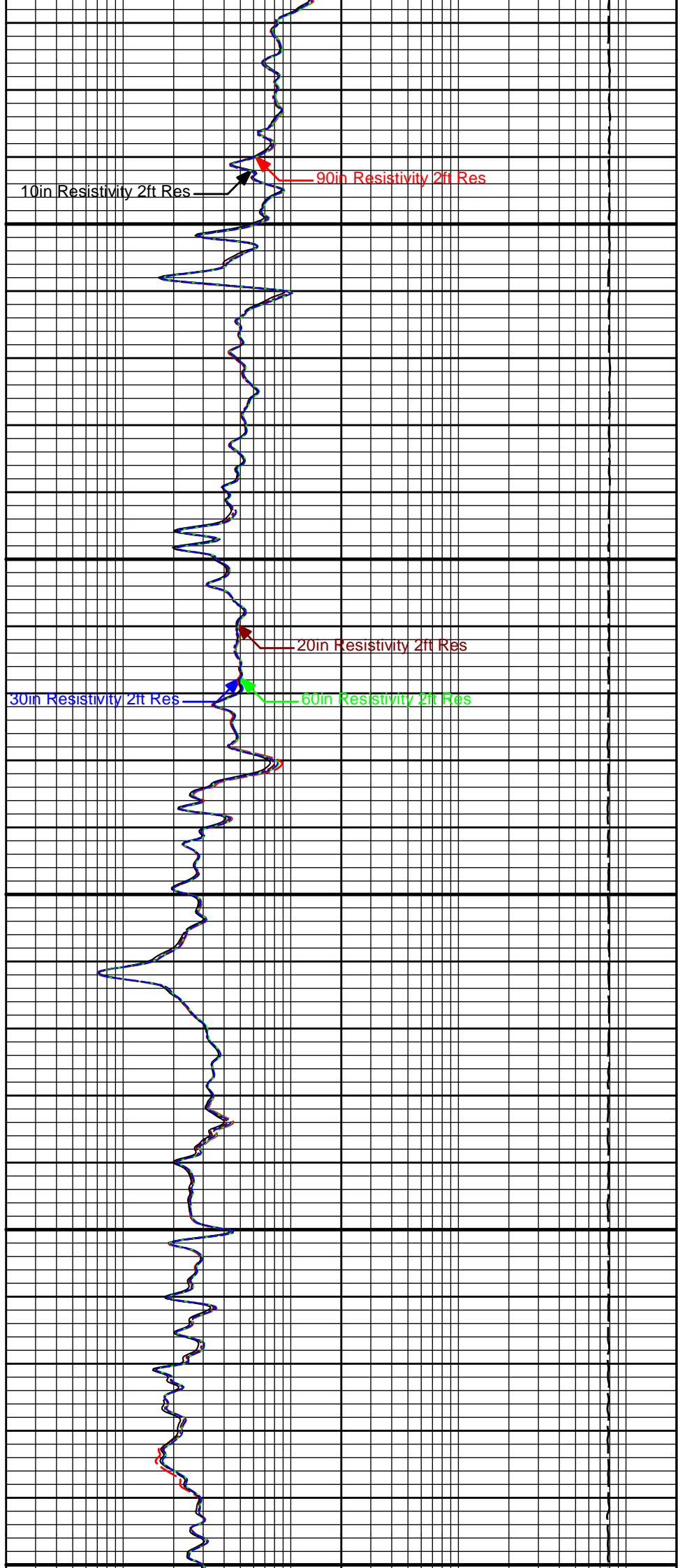


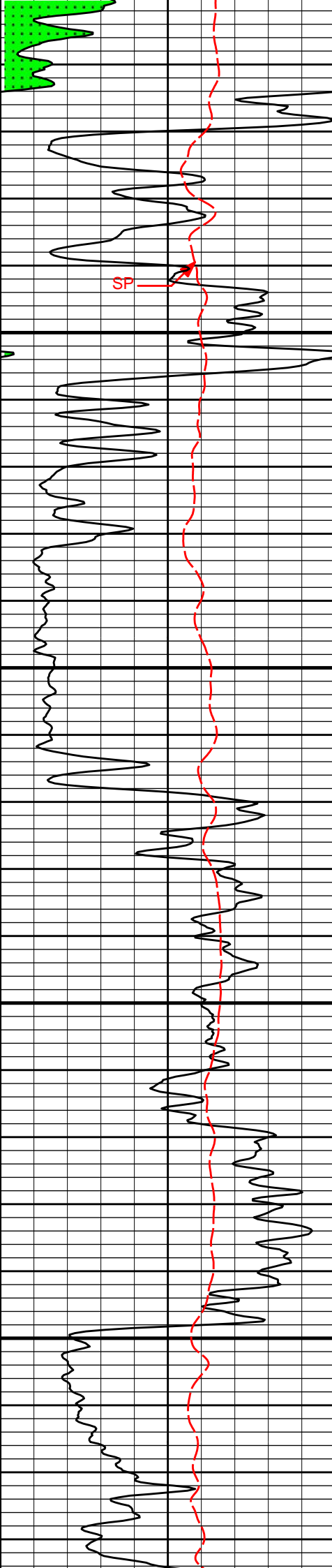




2700

2800





2900

3000

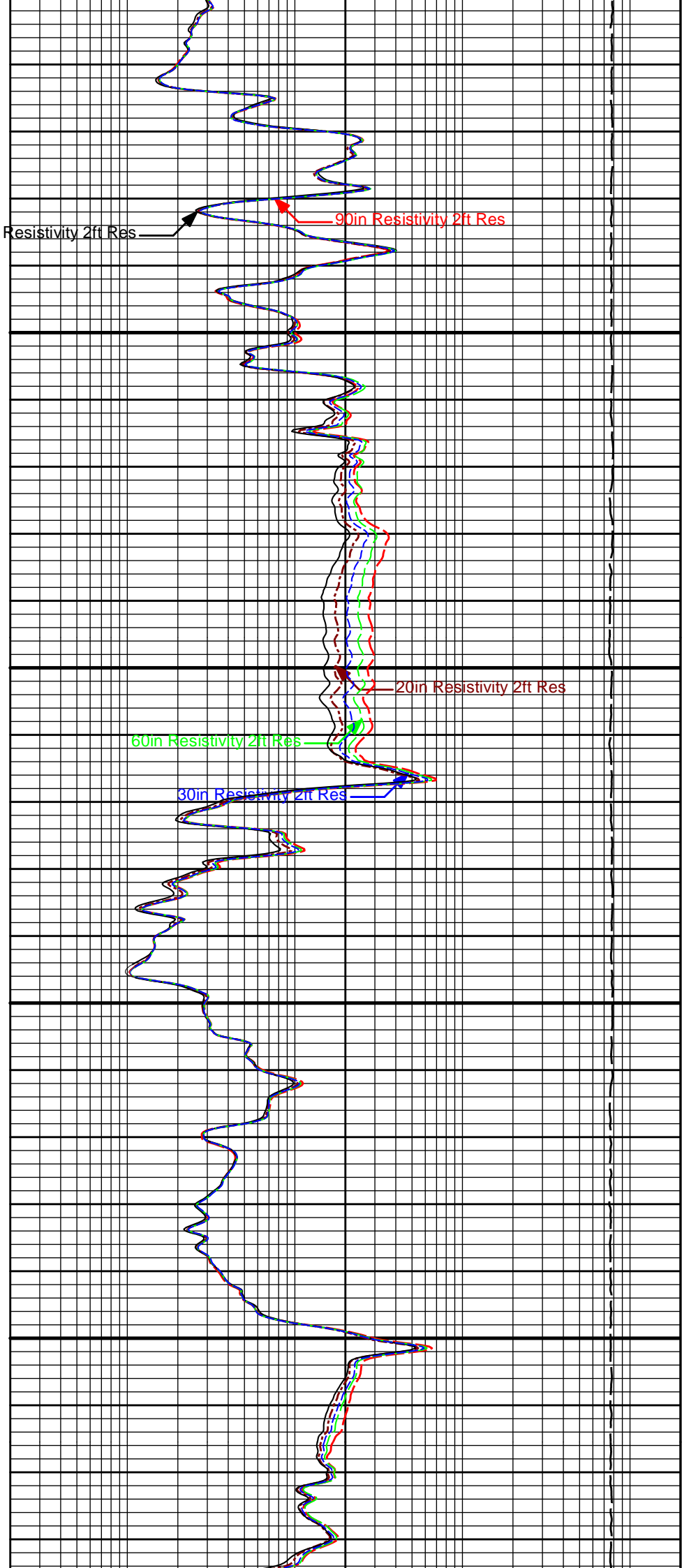
10in Resistivity 2ft Res

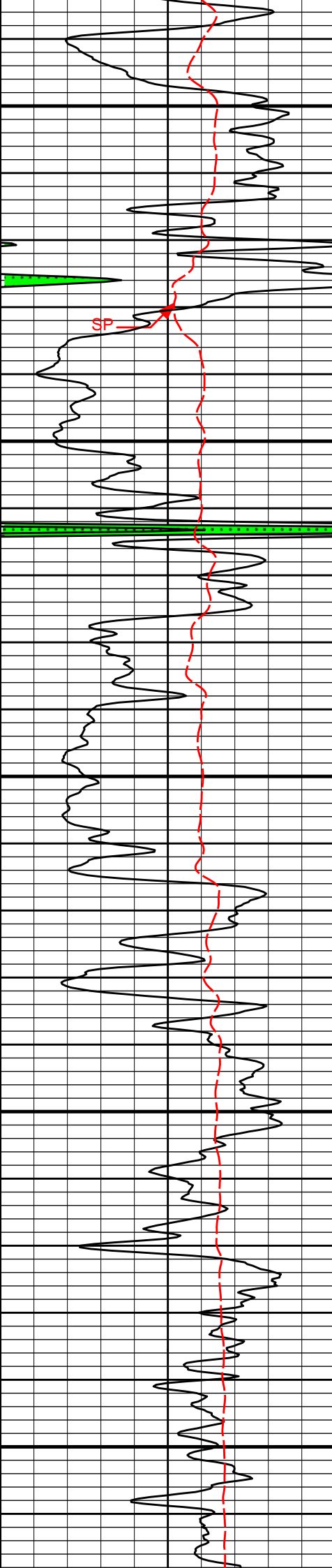
90in Resistivity 2ft Res

20in Resistivity 2ft Res

60in Resistivity 2ft Res

30in Resistivity 2ft Res



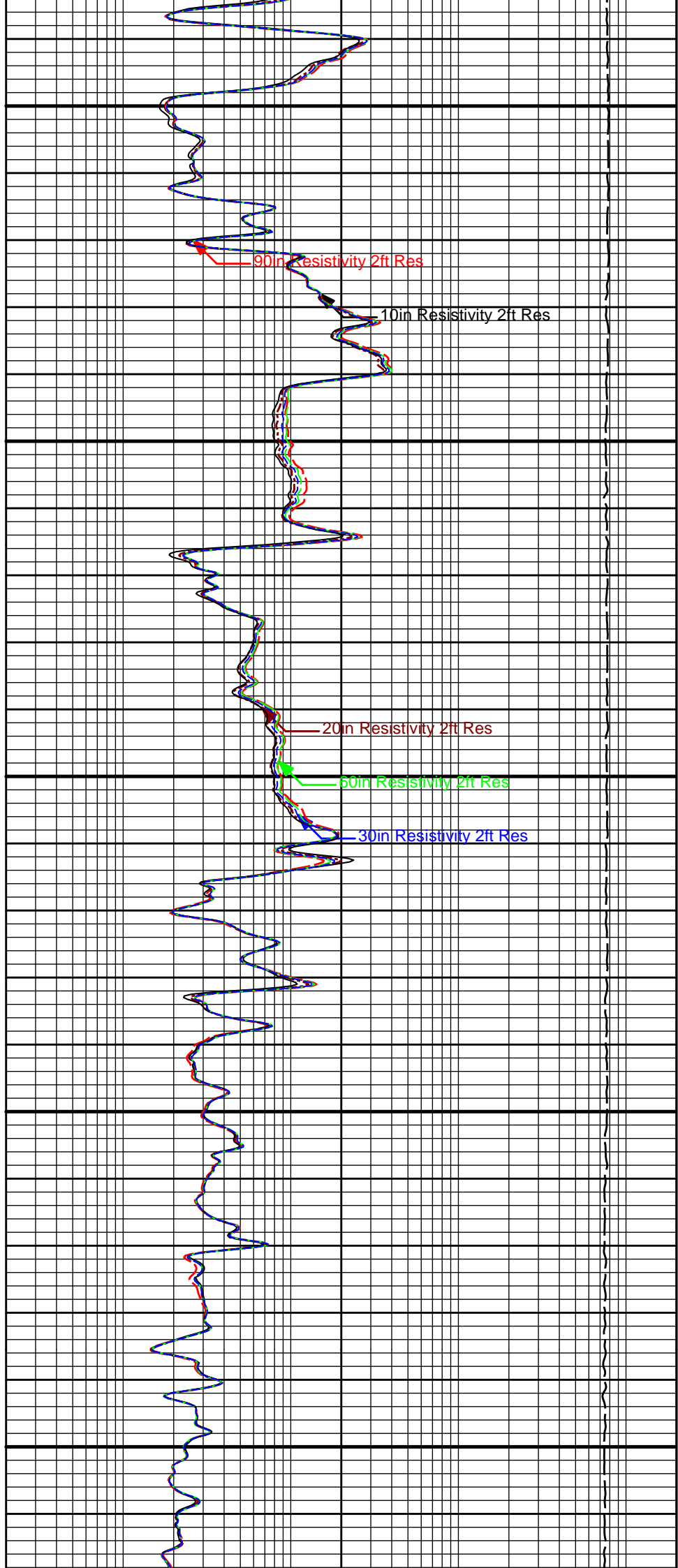


3100

SP

3200

3300



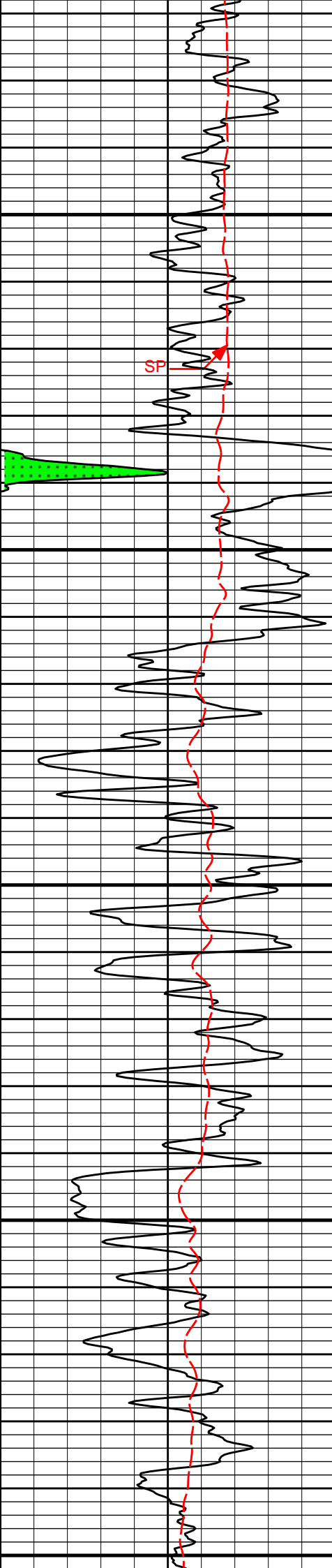
90in Resistivity 2ft Res

10in Resistivity 2ft Res

20in Resistivity 2ft Res

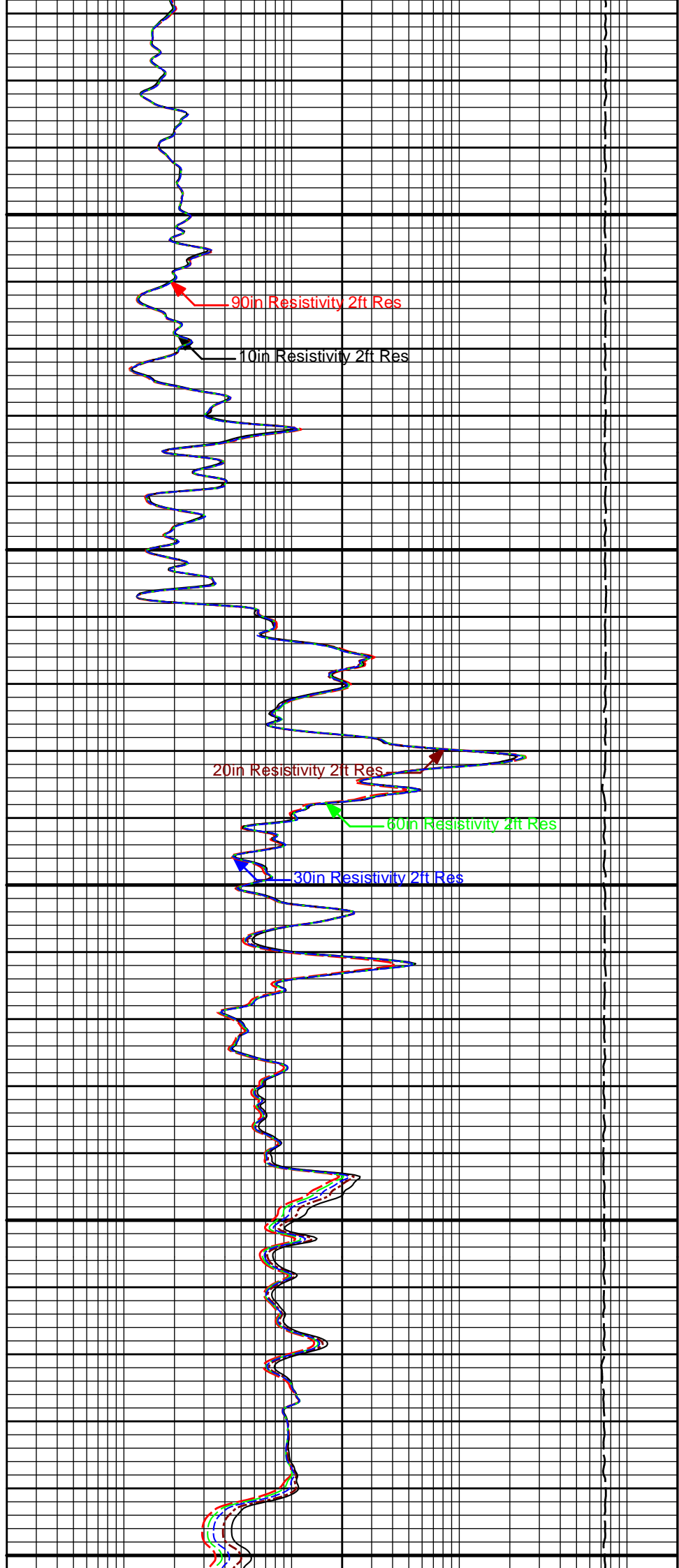
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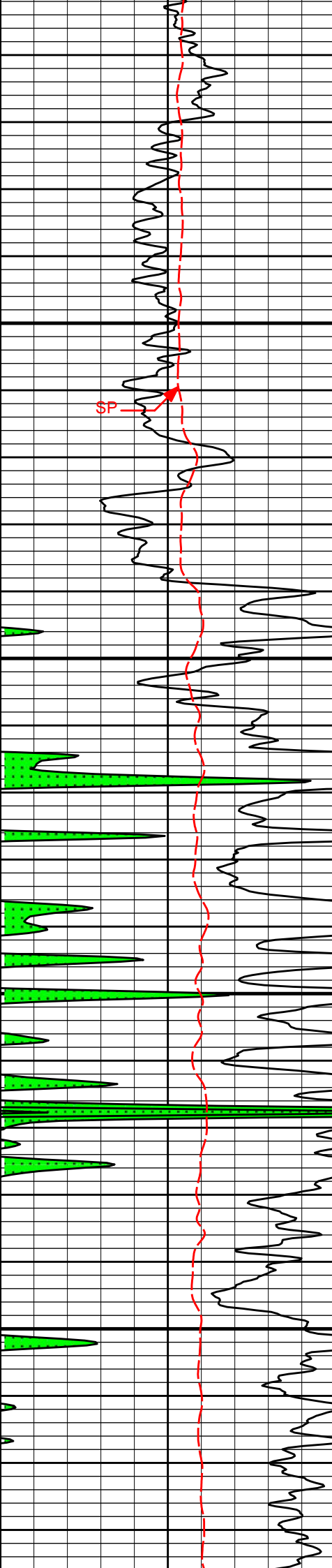
30in Resistivity 2ft Res



3400

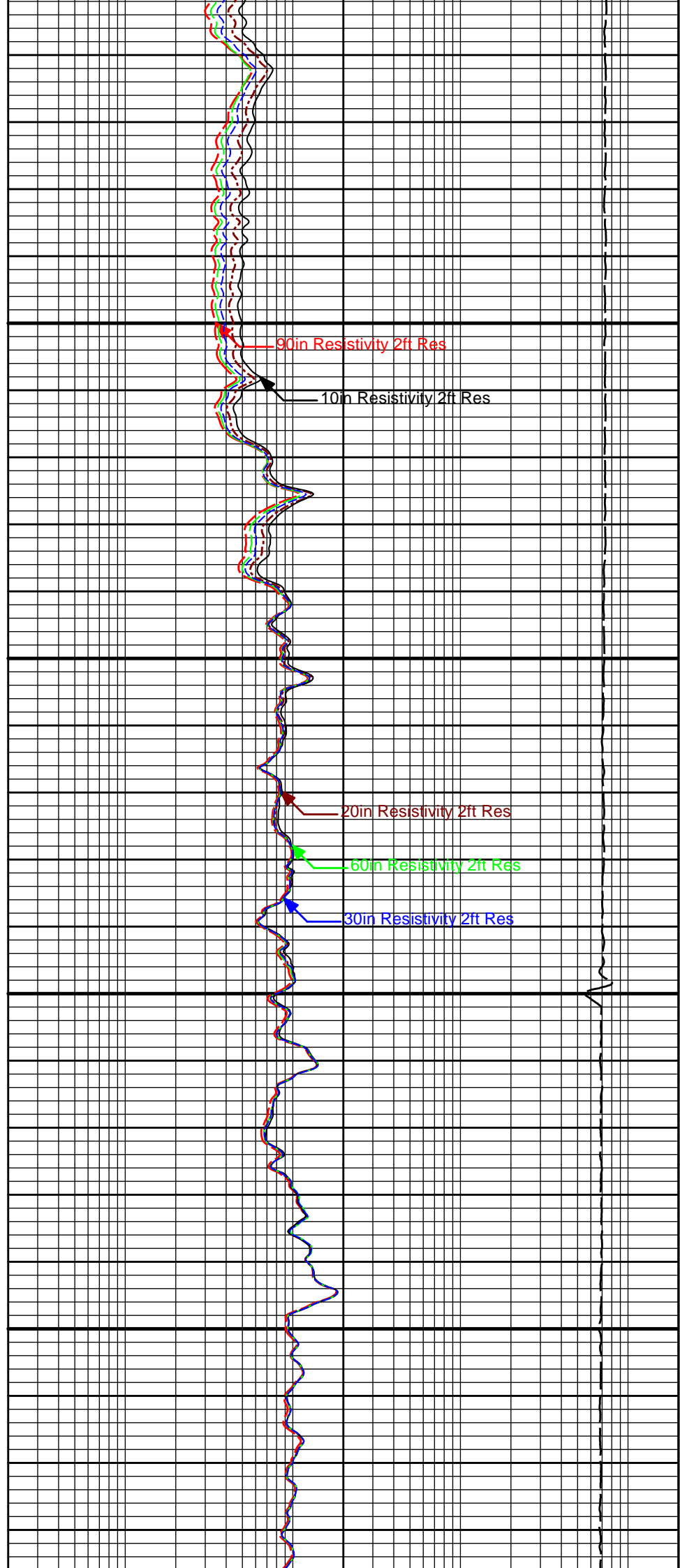
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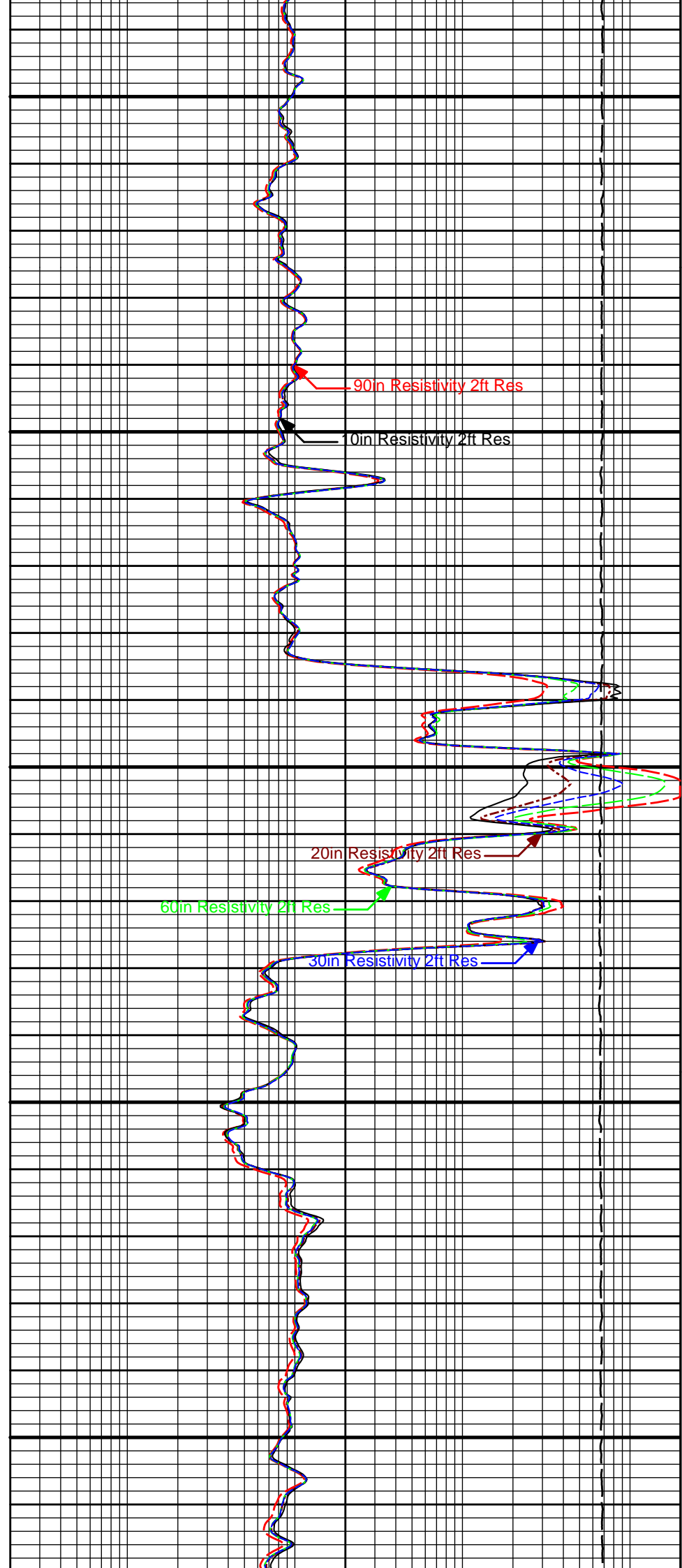
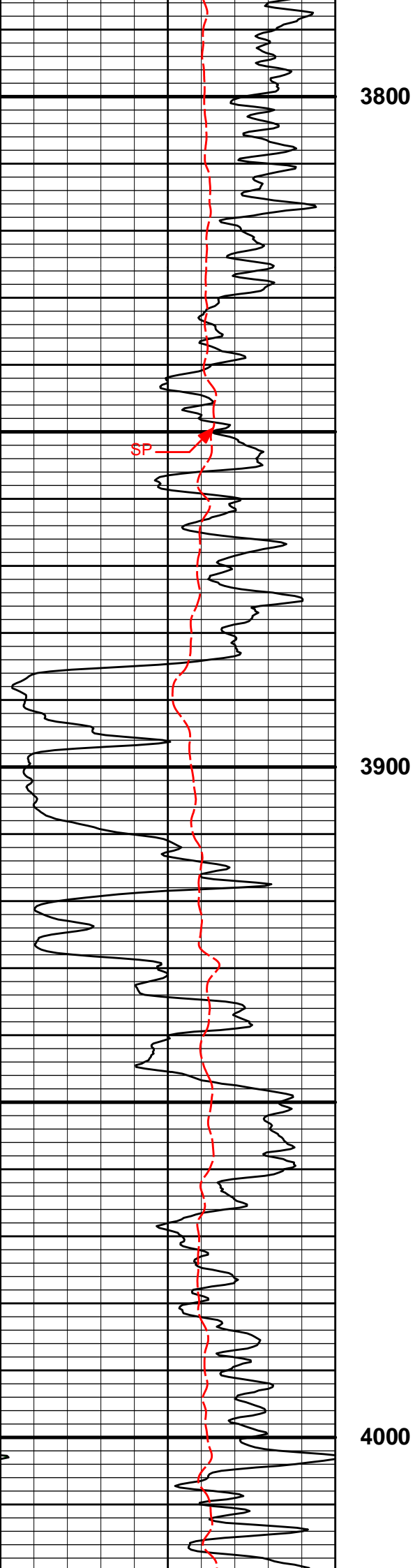




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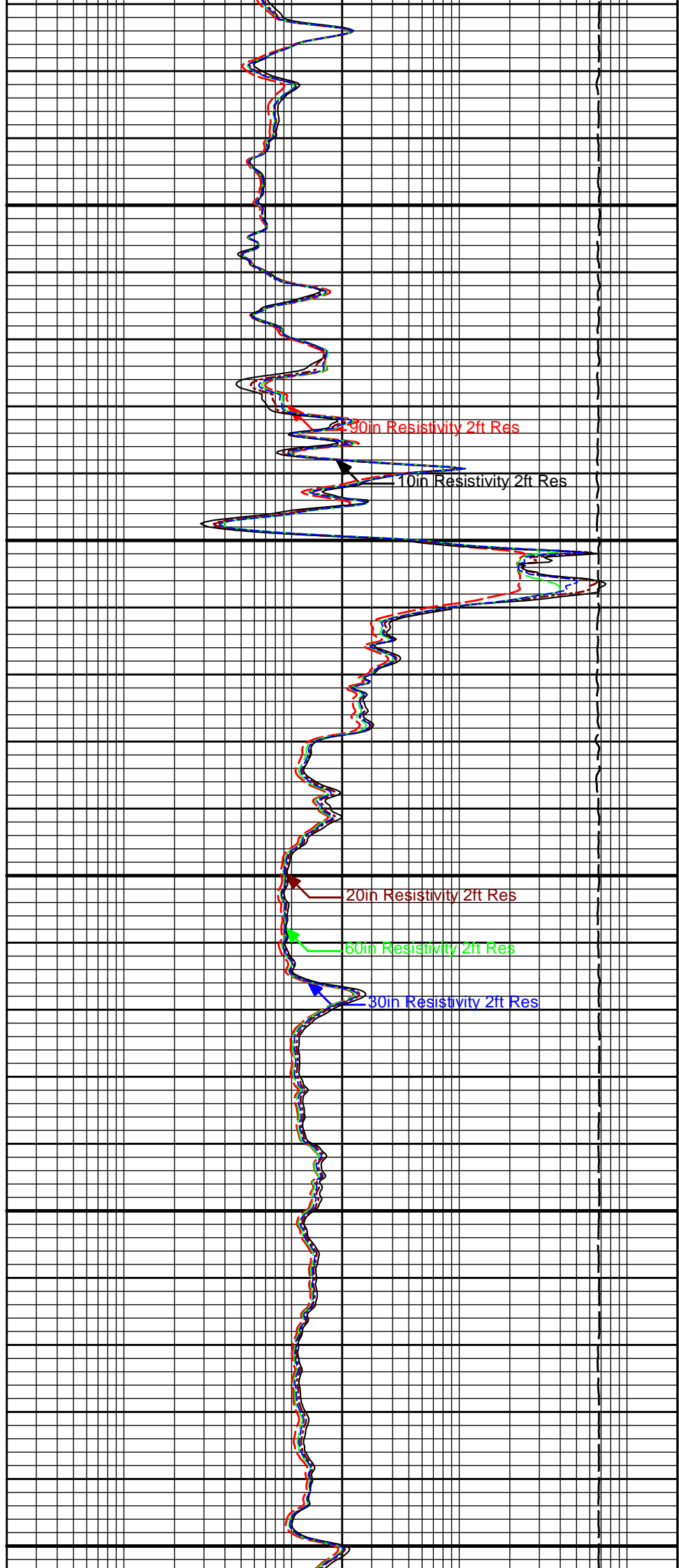


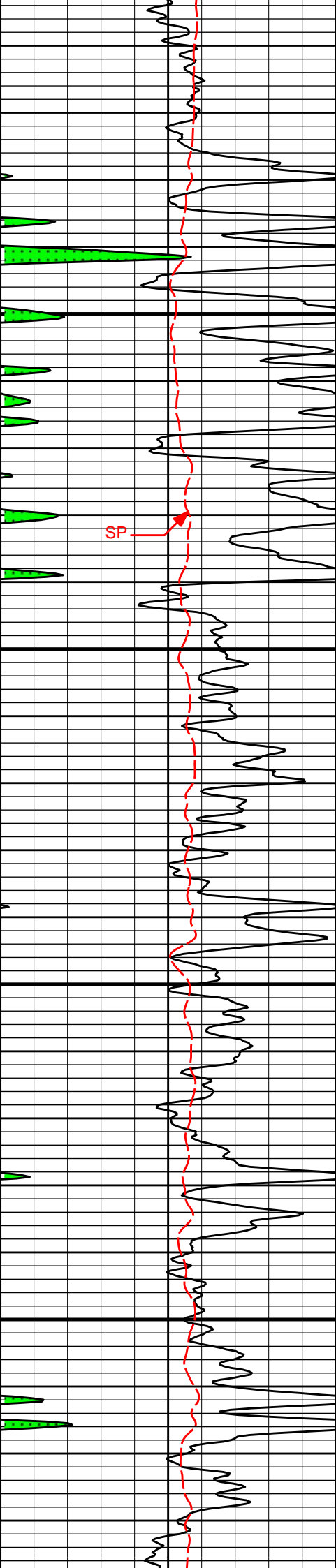




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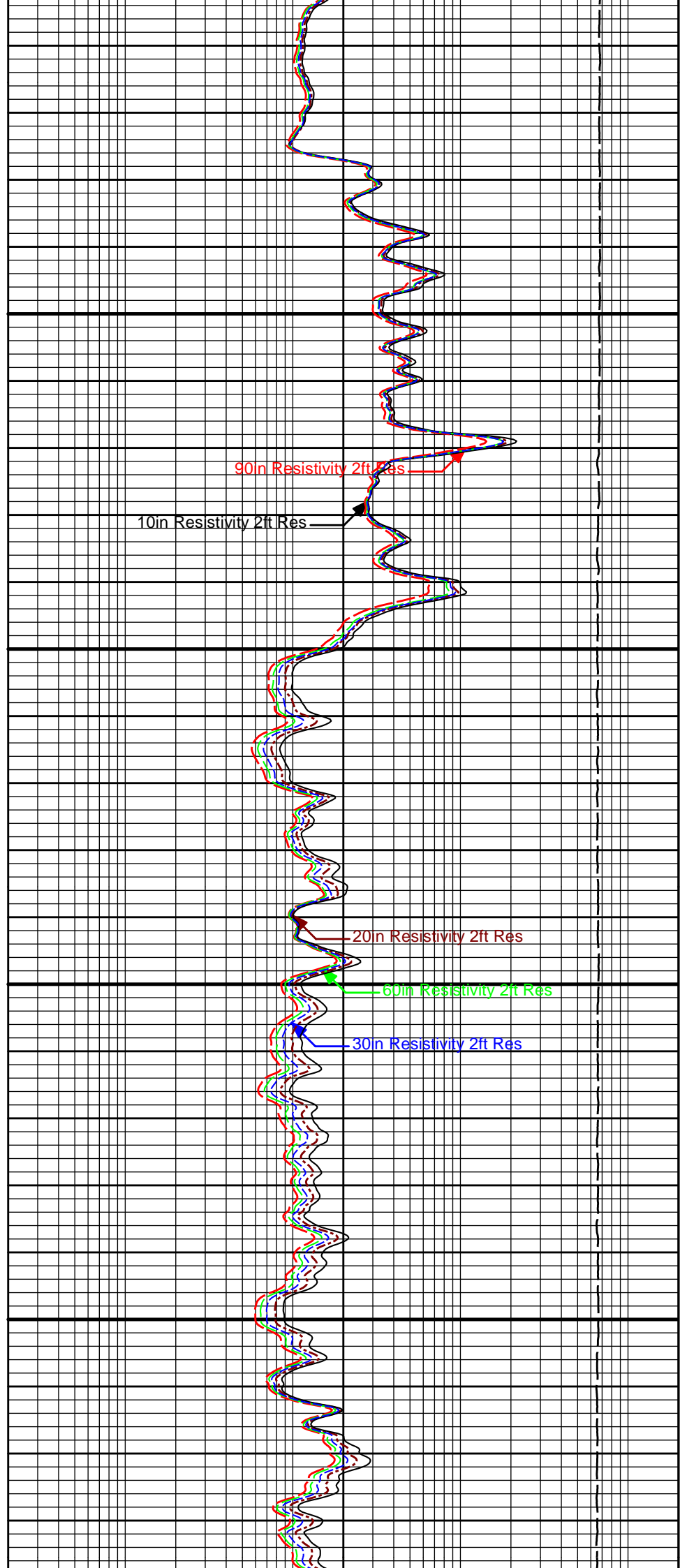
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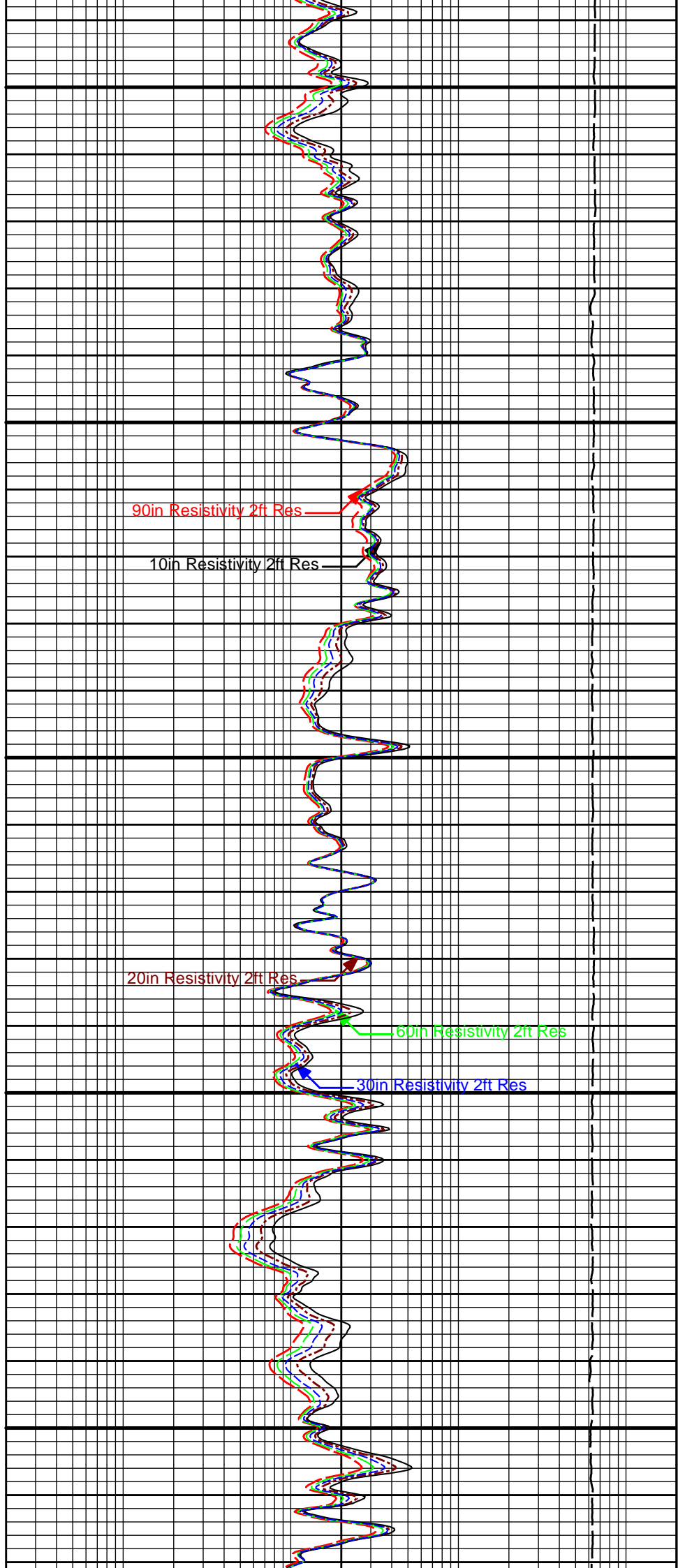
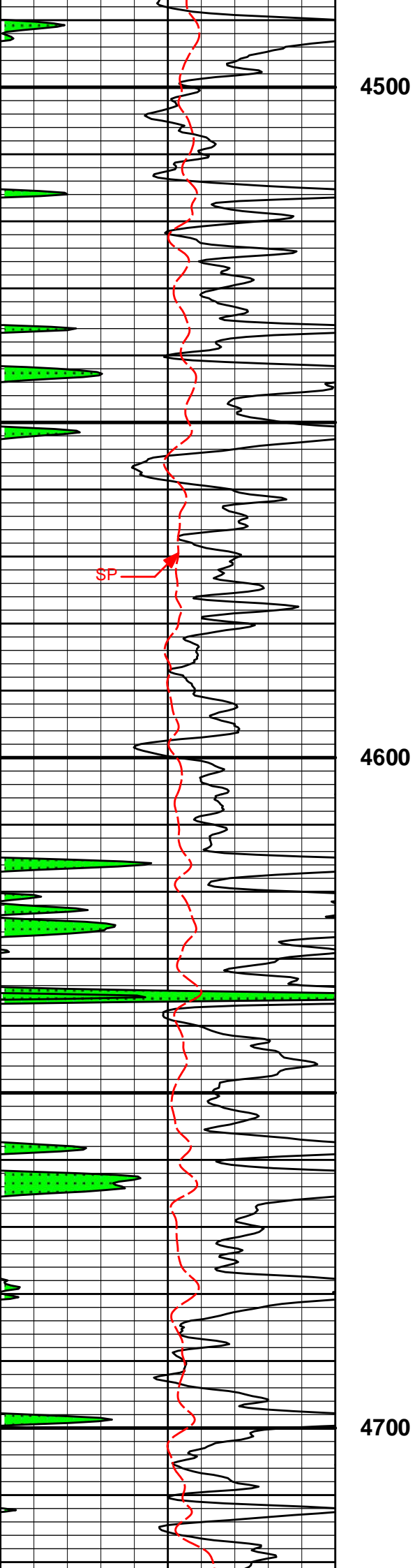


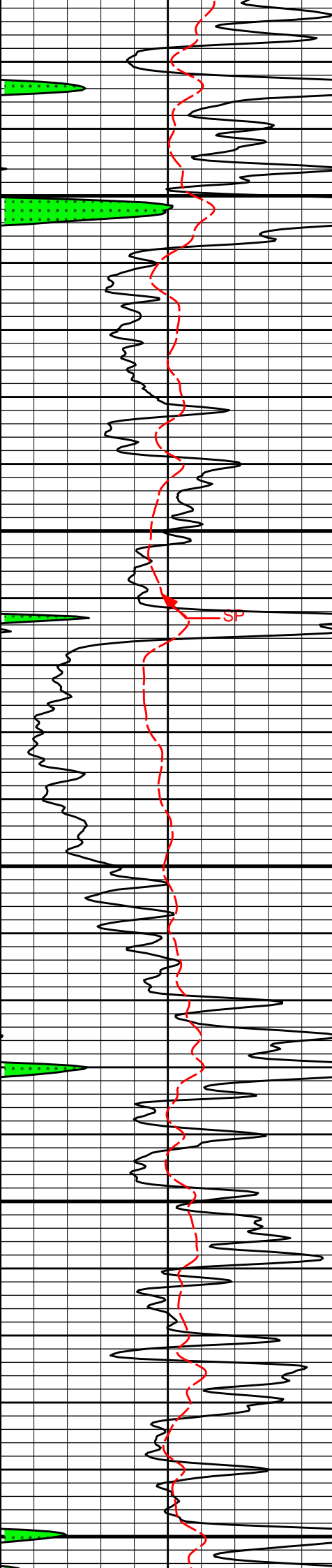
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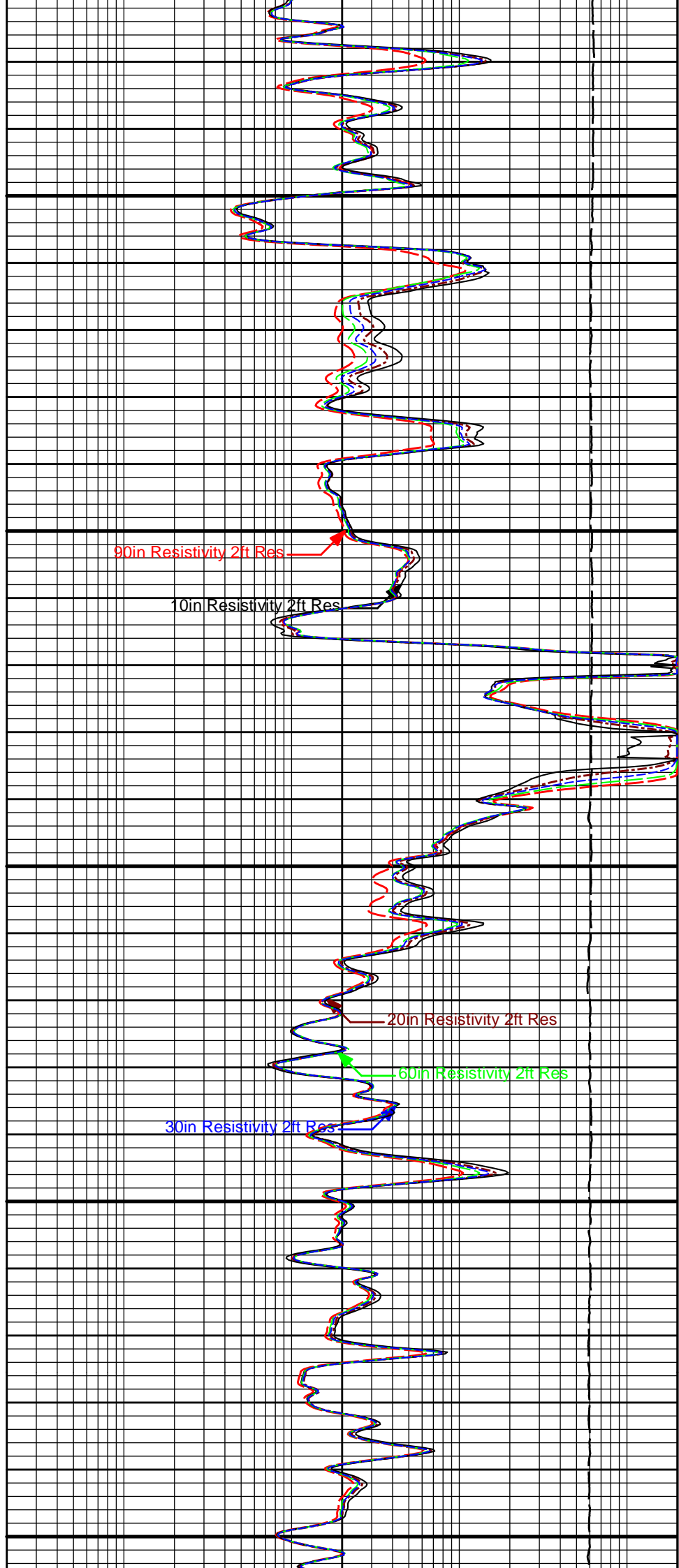


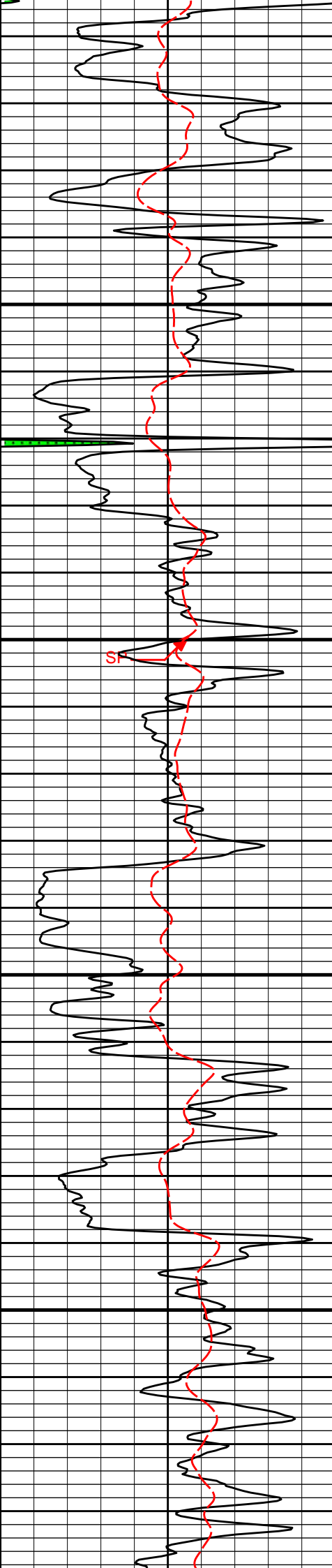




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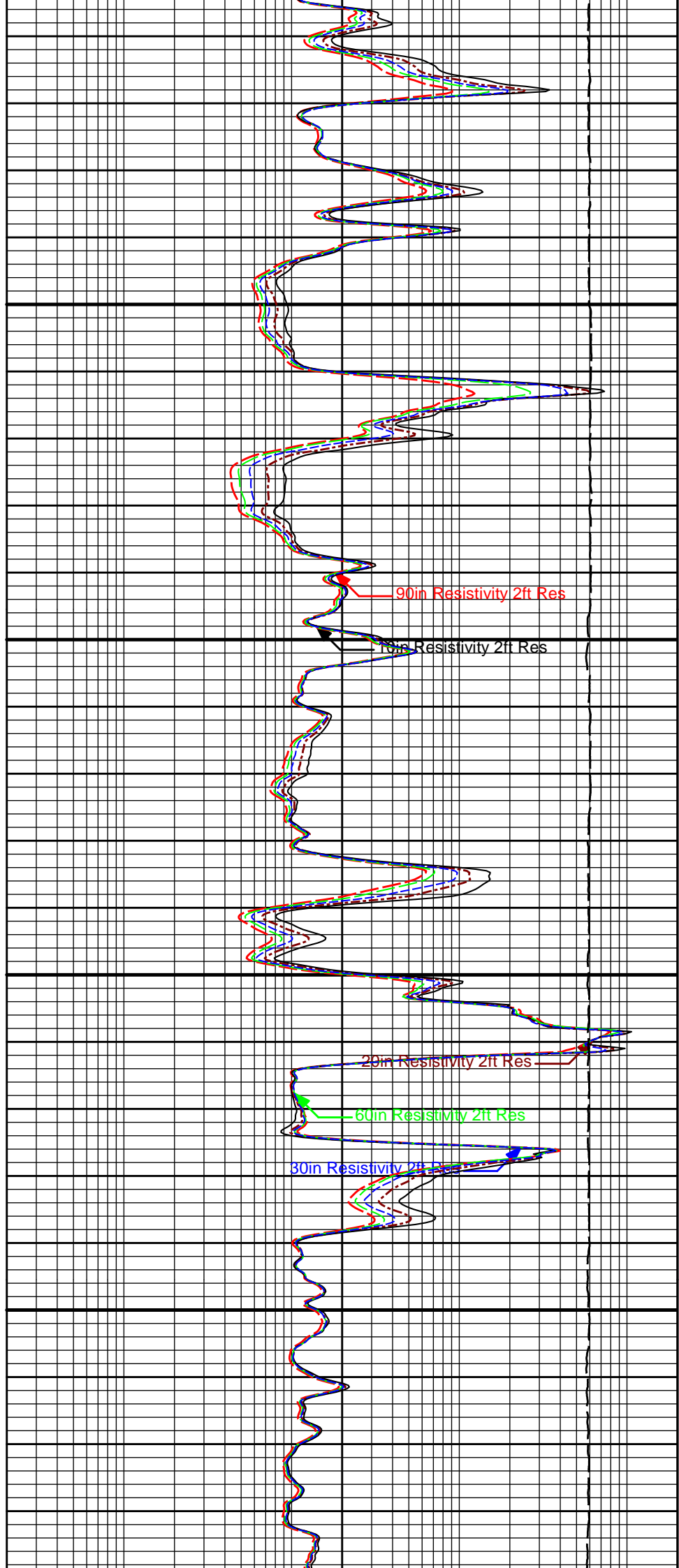
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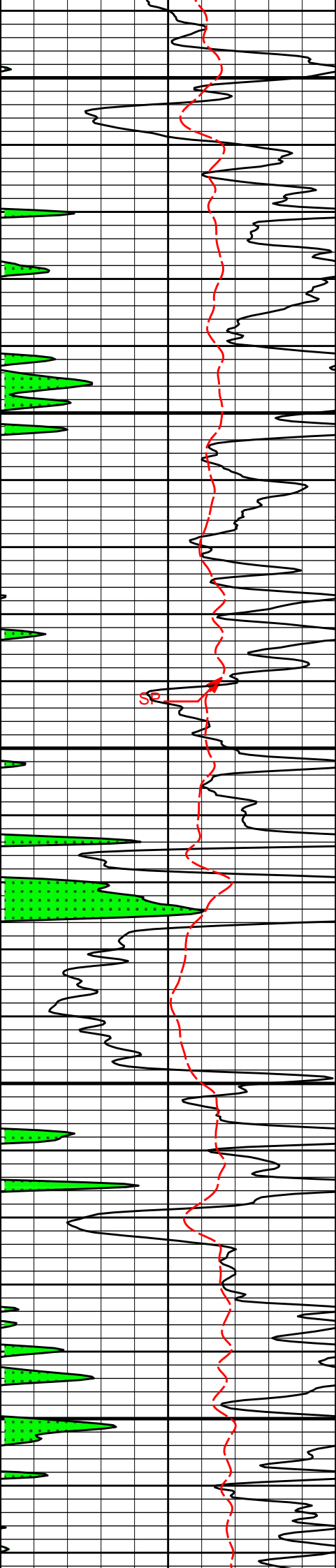




5000

5100

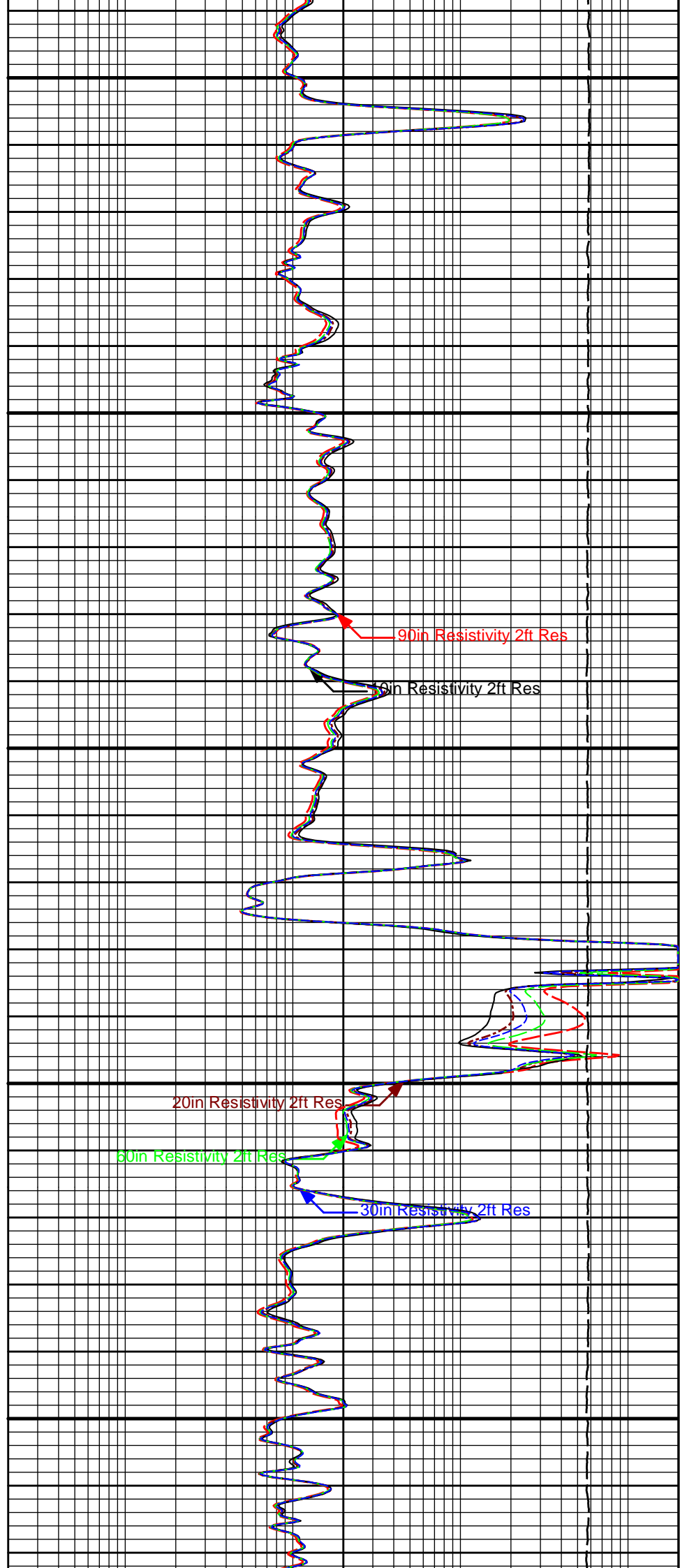




5200

5300

5400



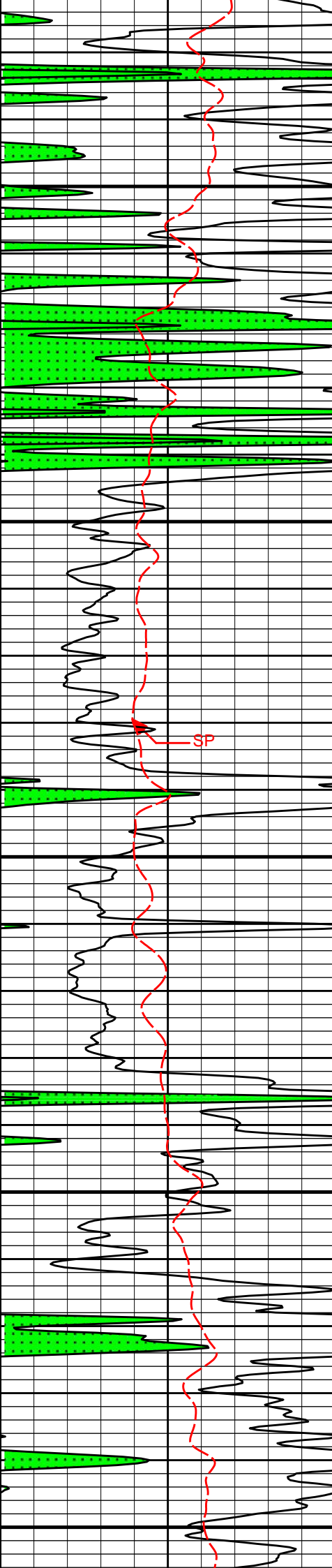
90in Resistivity 2ft Res

60in Resistivity 2ft Res

20in Resistivity 2ft Res

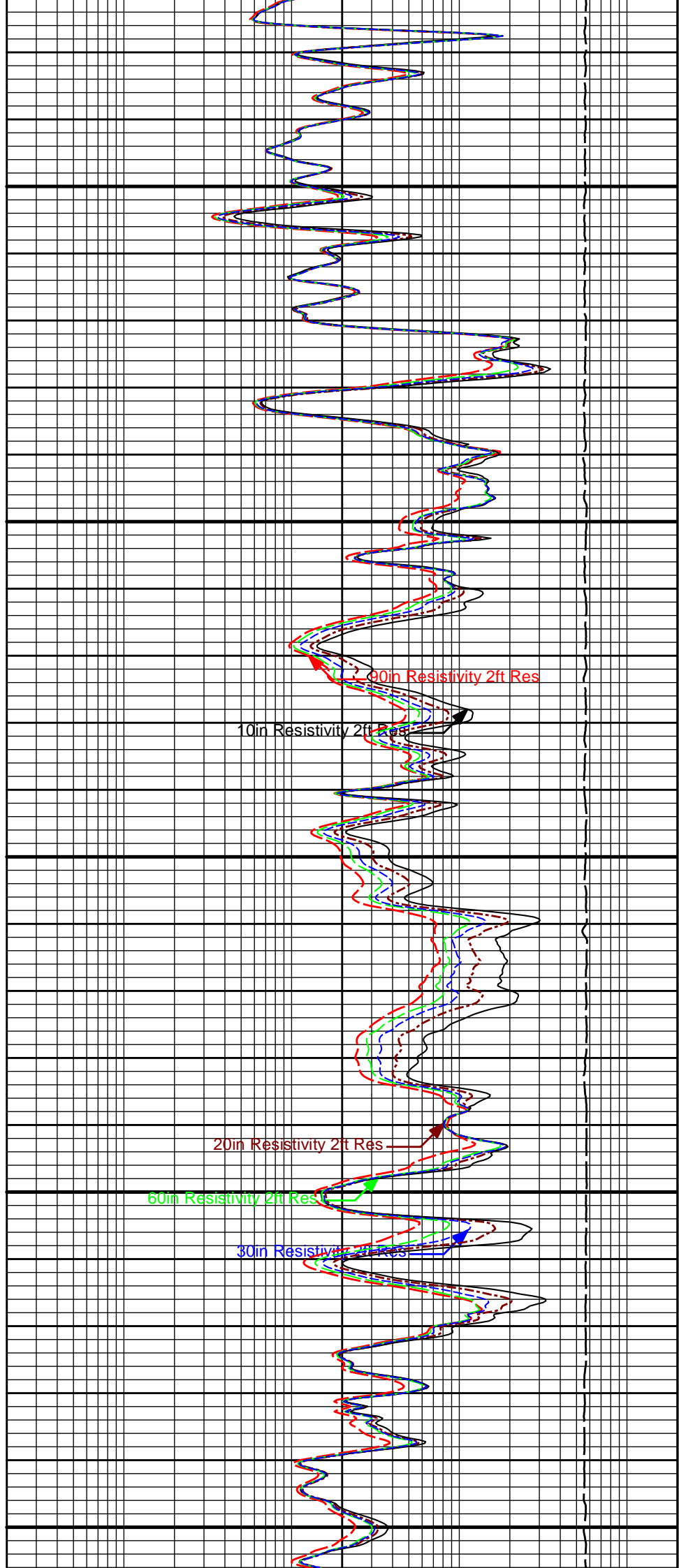
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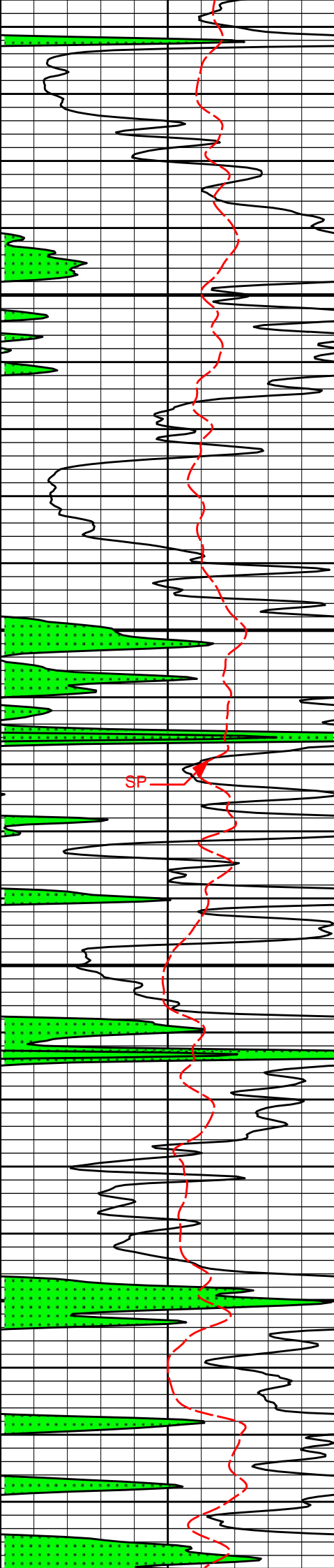
30in Resistivity 2ft Res



5500

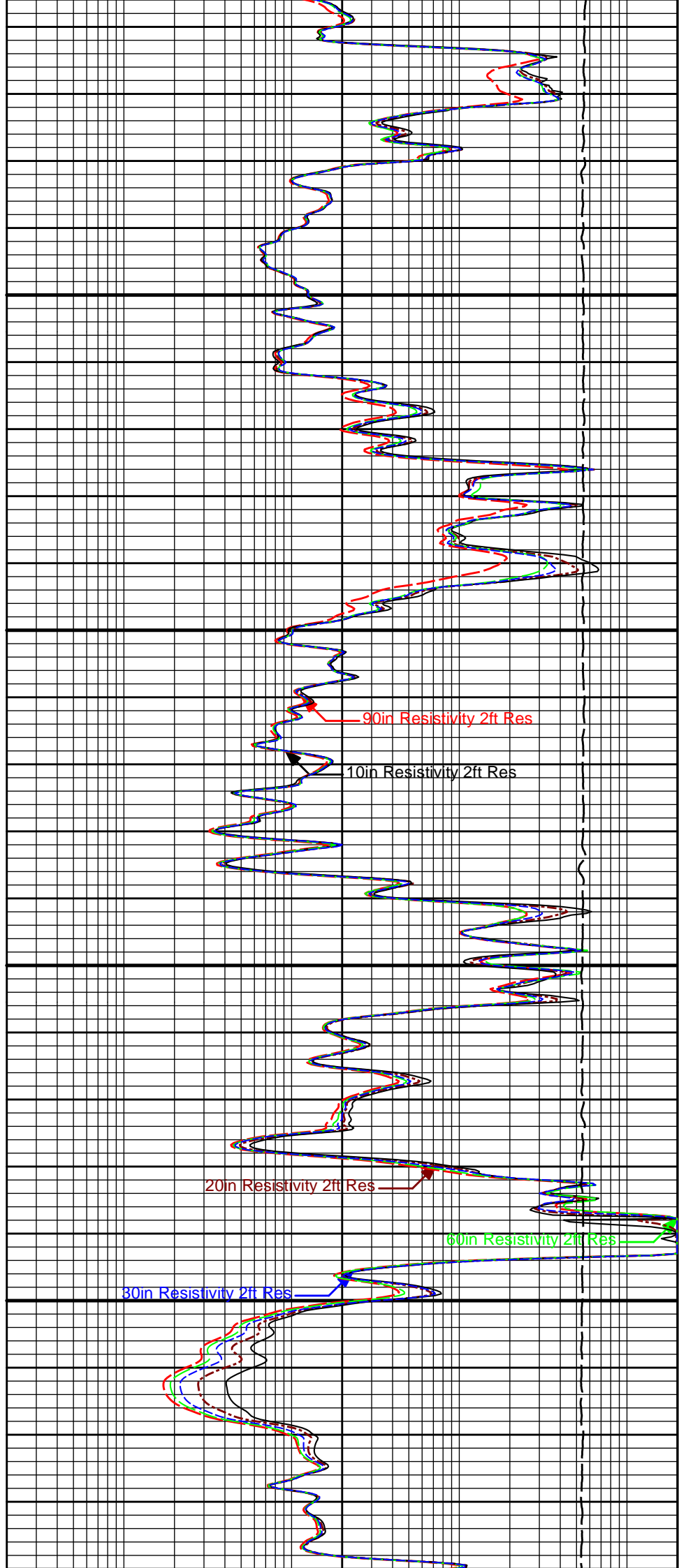
5600



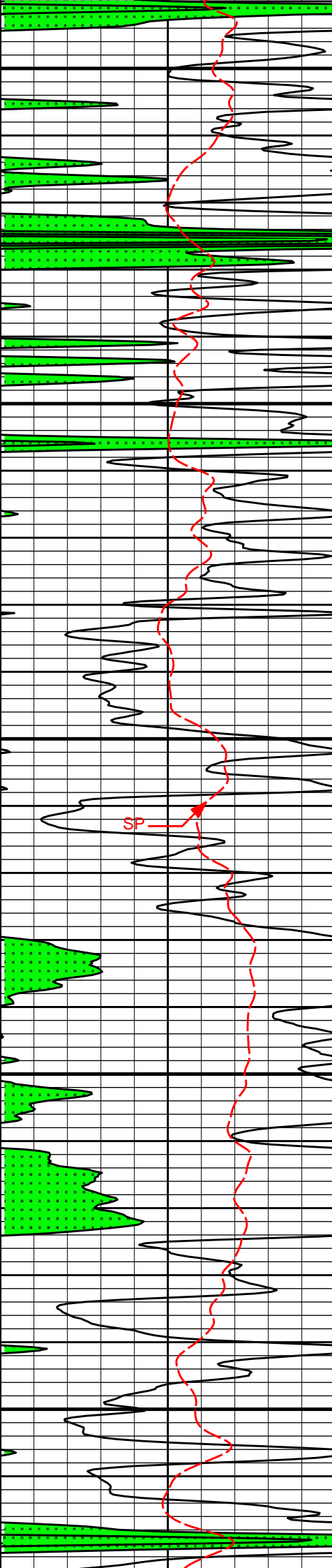


5700

5800





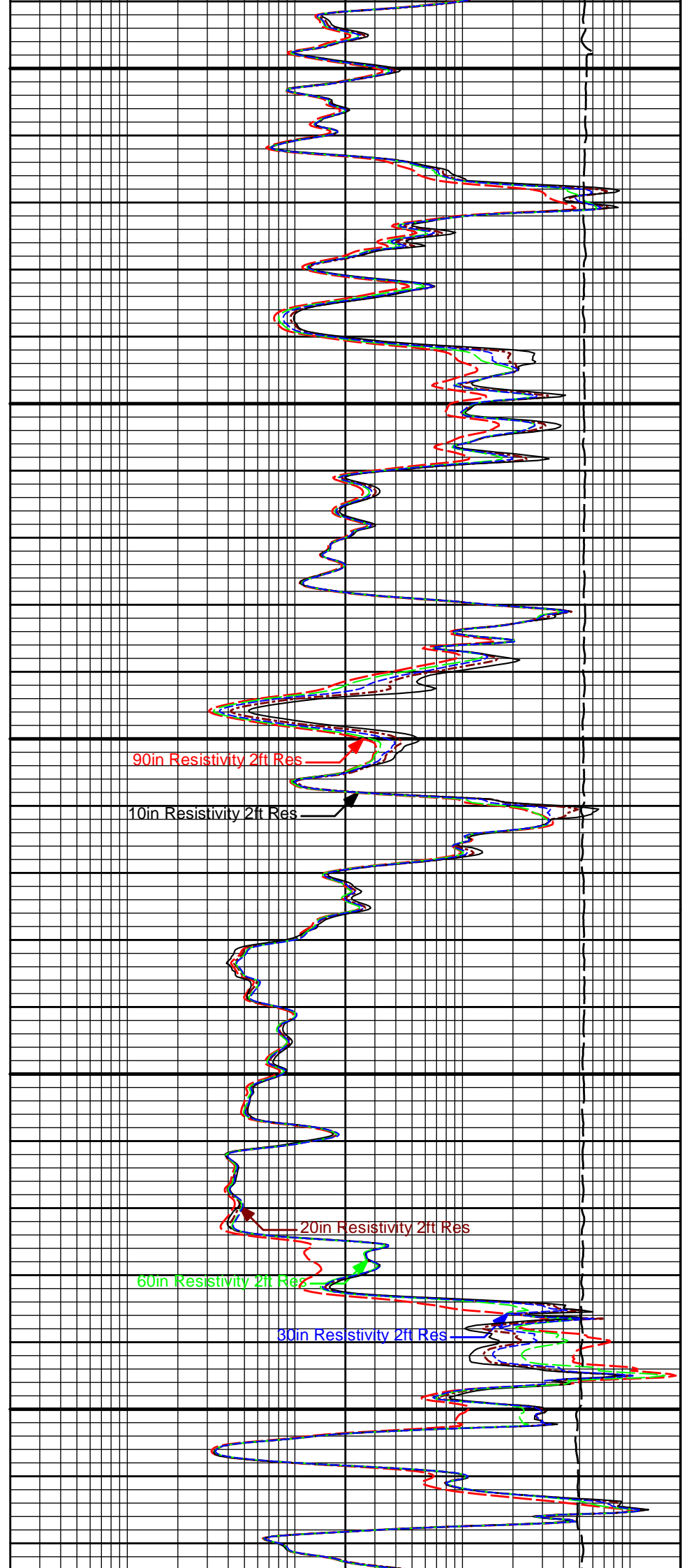


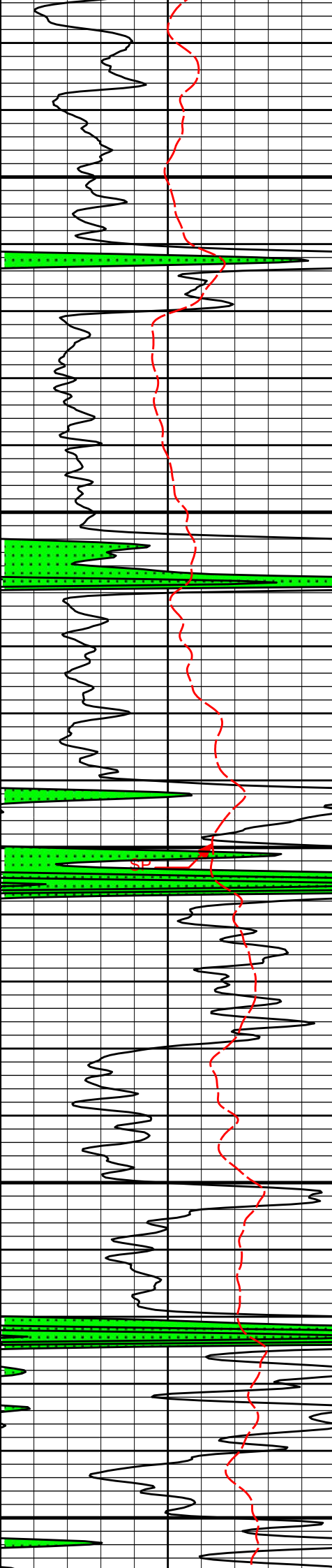
5900

6000

6100

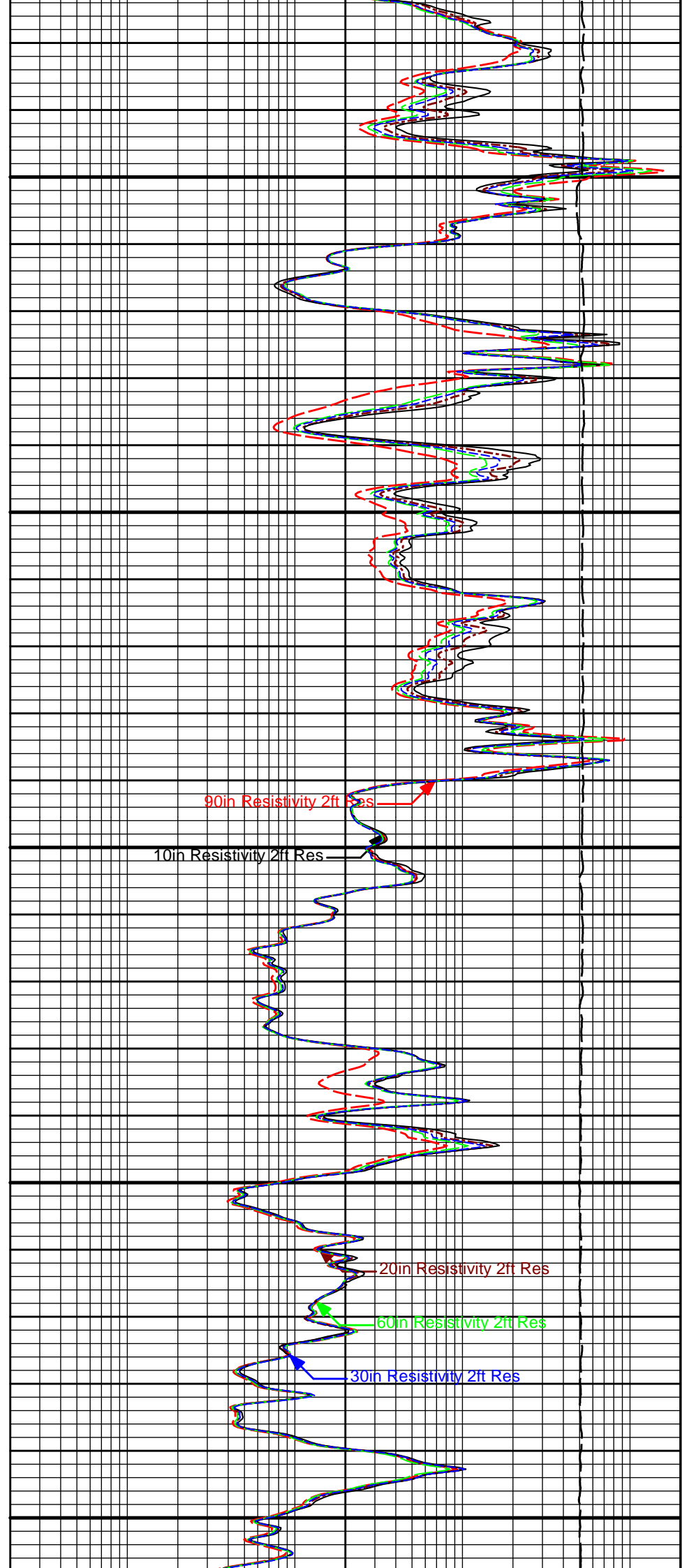
SP



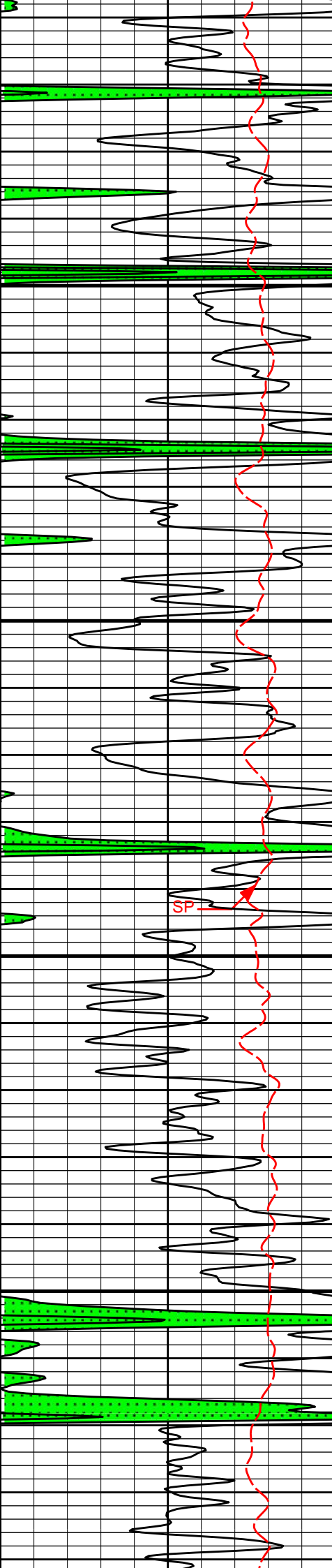


6200

6300

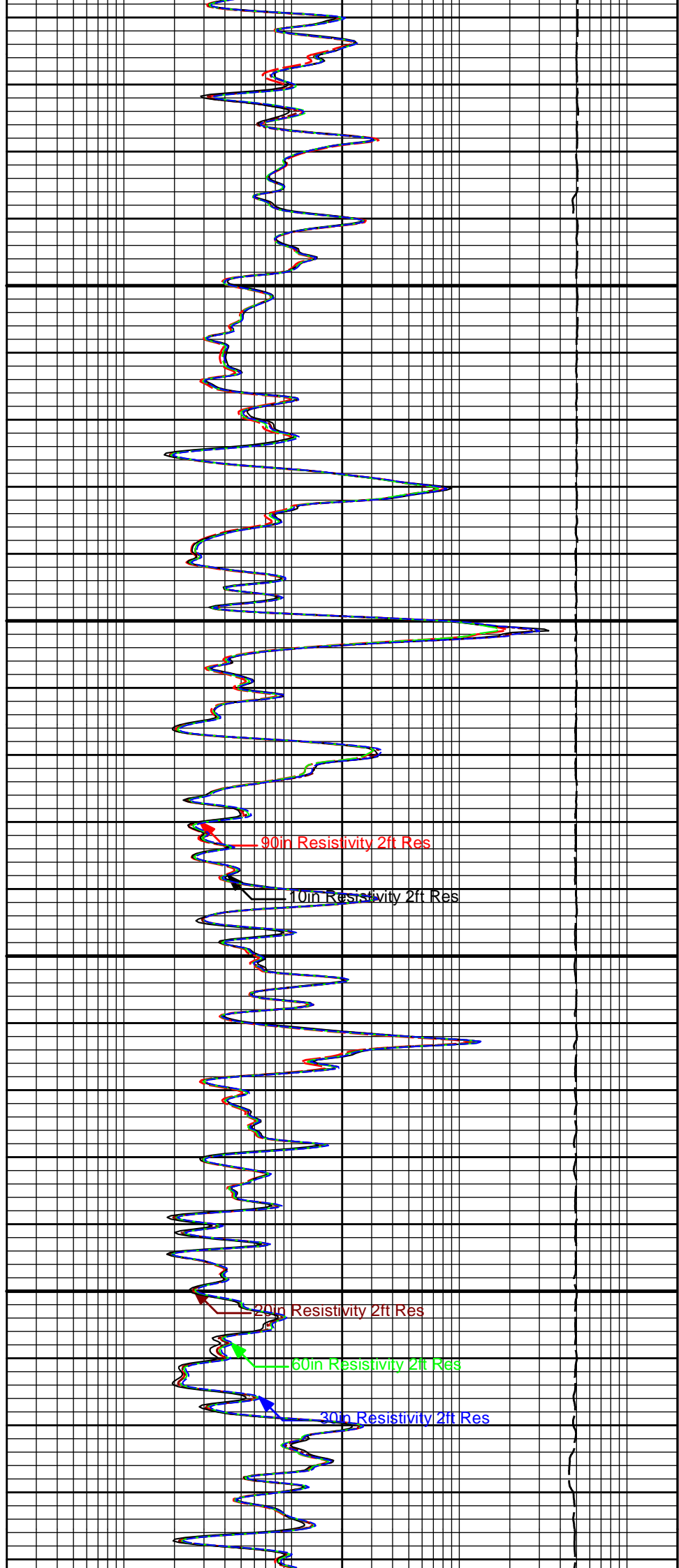


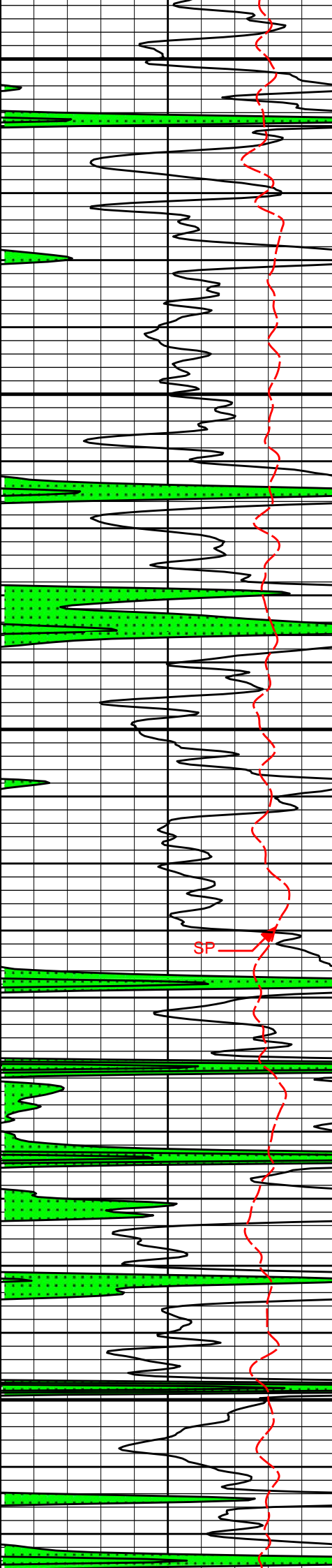




6400

6500

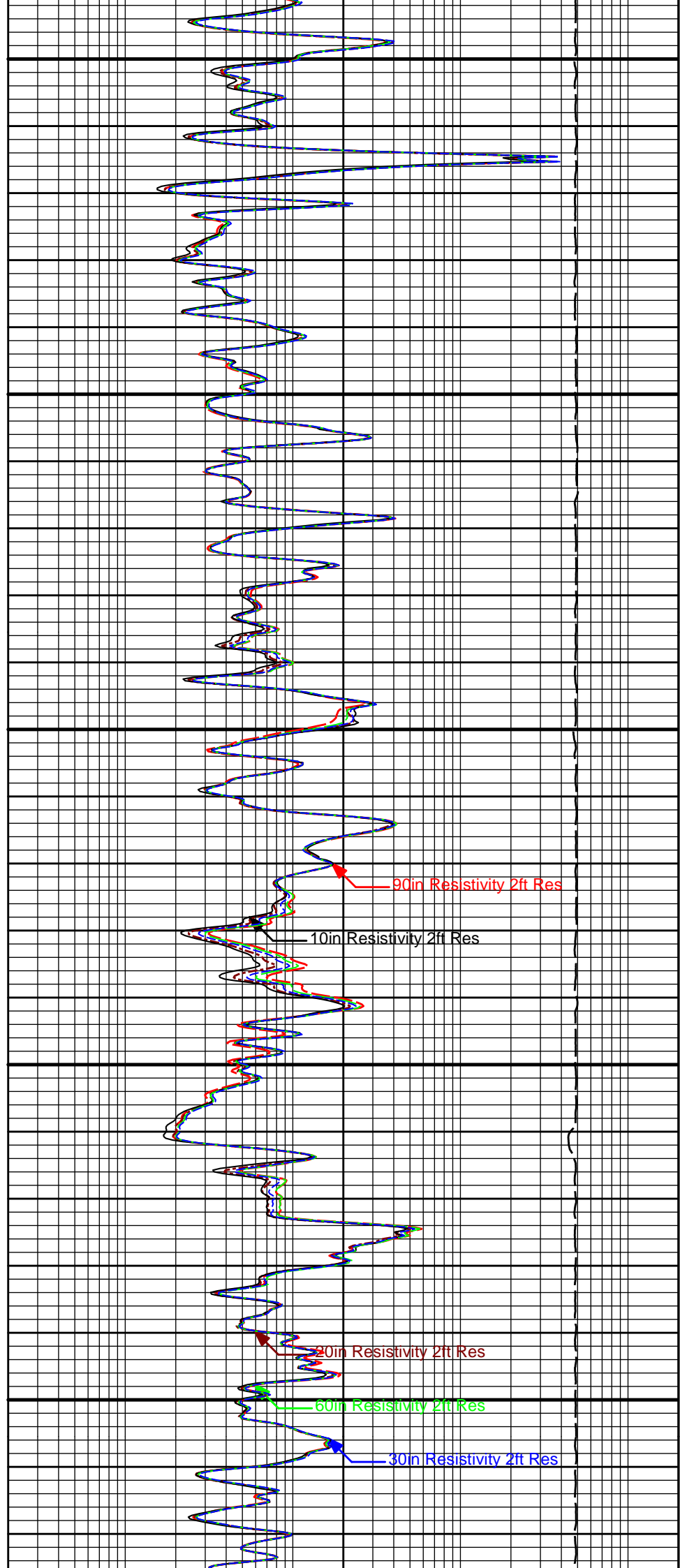


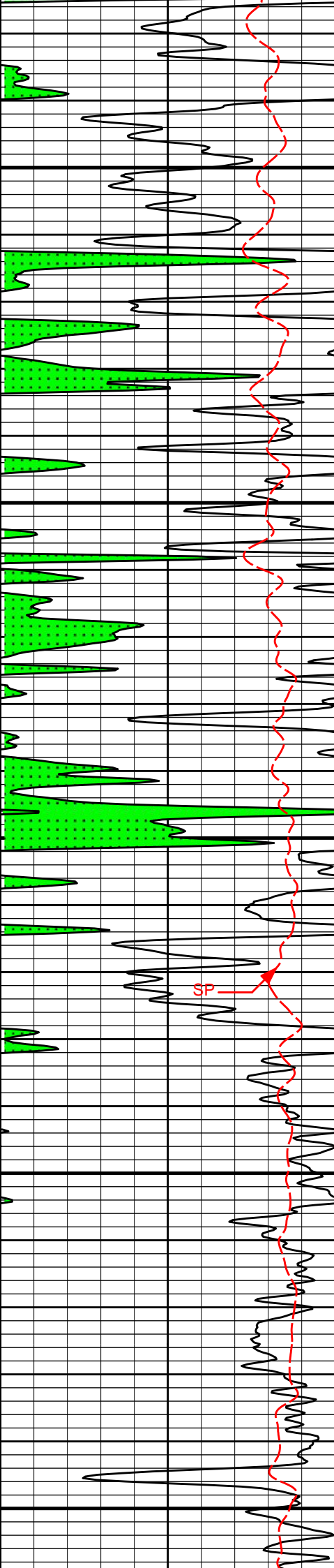


6600

6700

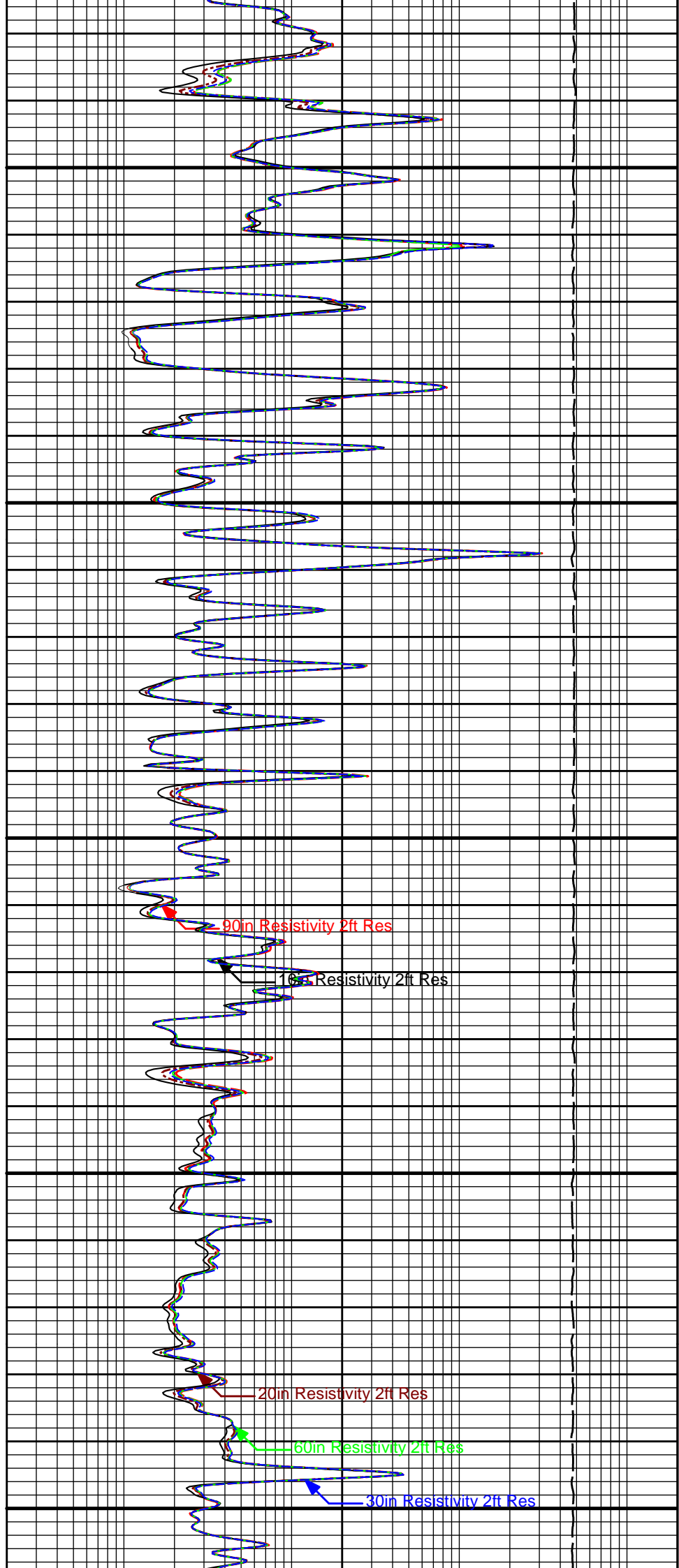
6800





6900

7000



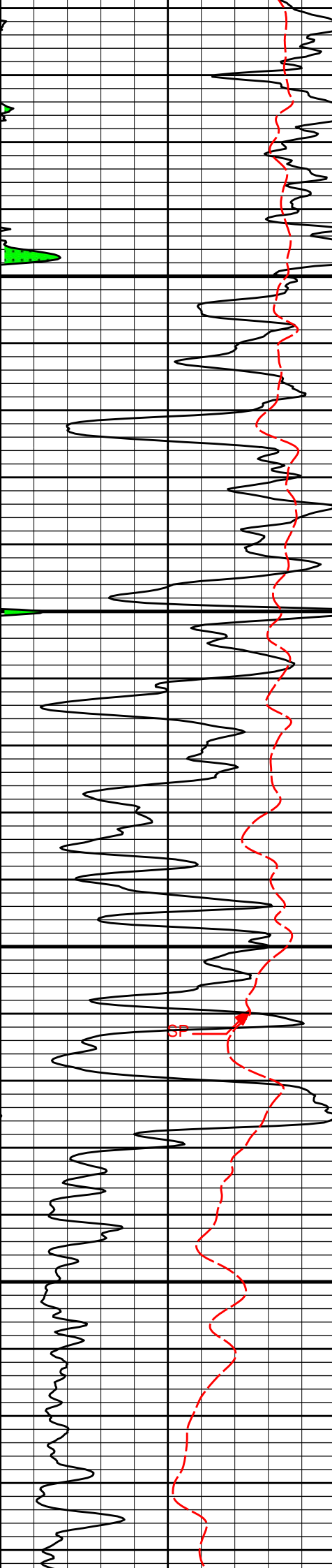
90in Resistivity 2ft Res

16in Resistivity 2ft Res

20in Resistivity 2ft Res

60in Resistivity 2ft Res

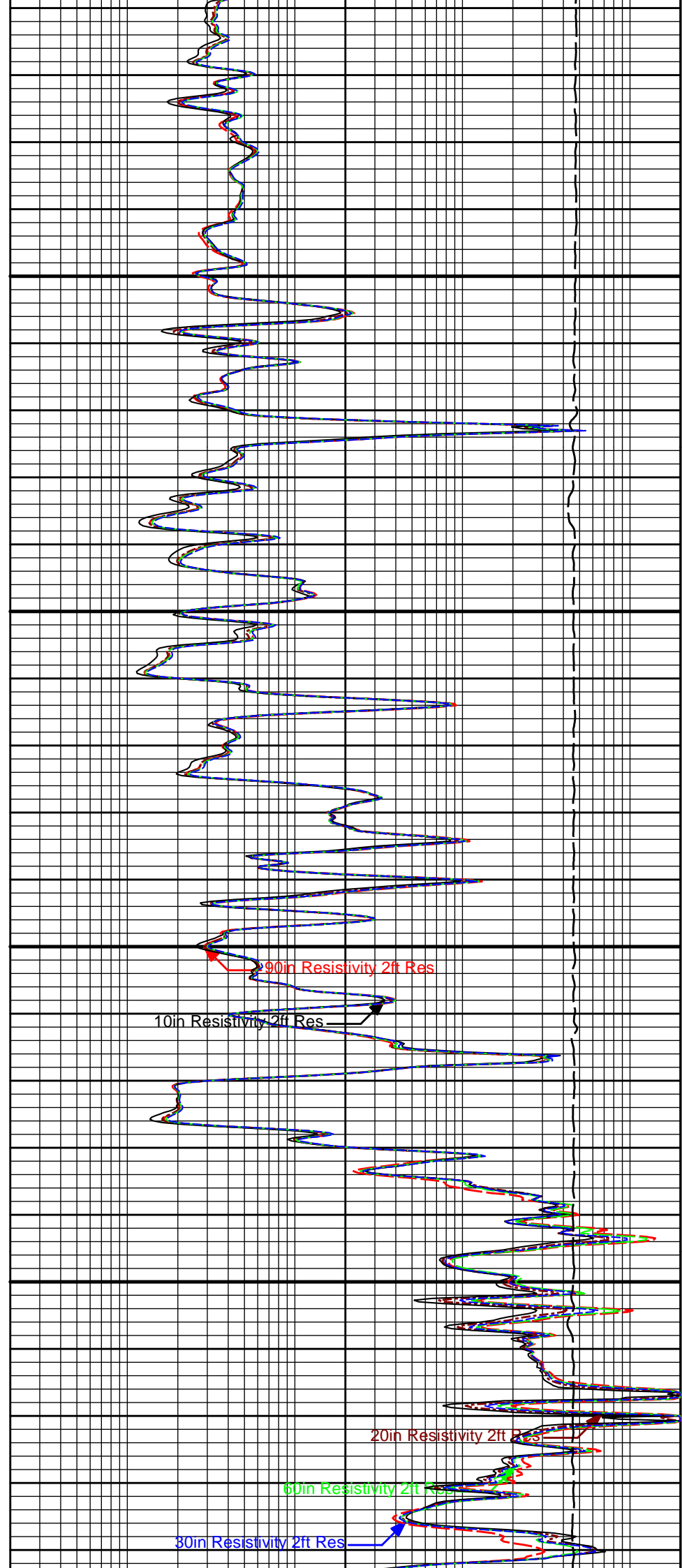
30in Resistivity 2ft Res

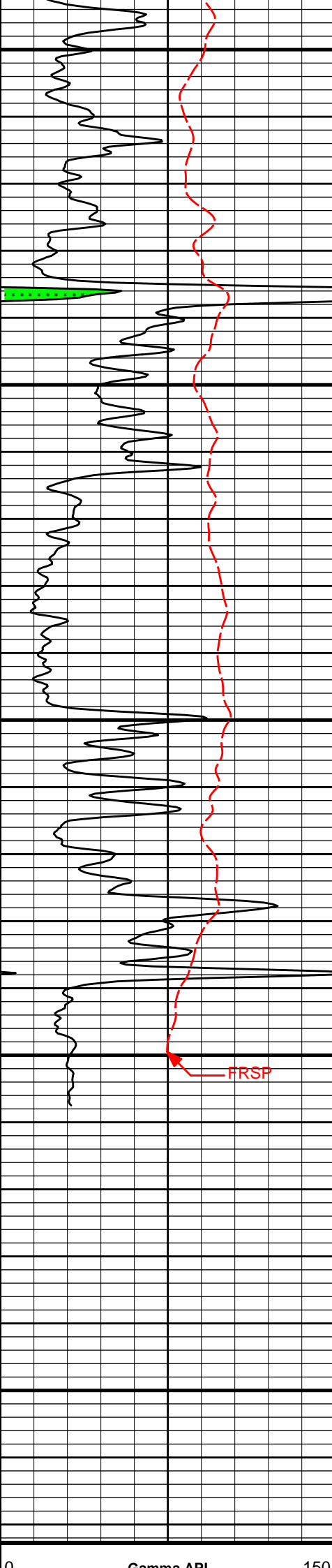


7100

7200

SP



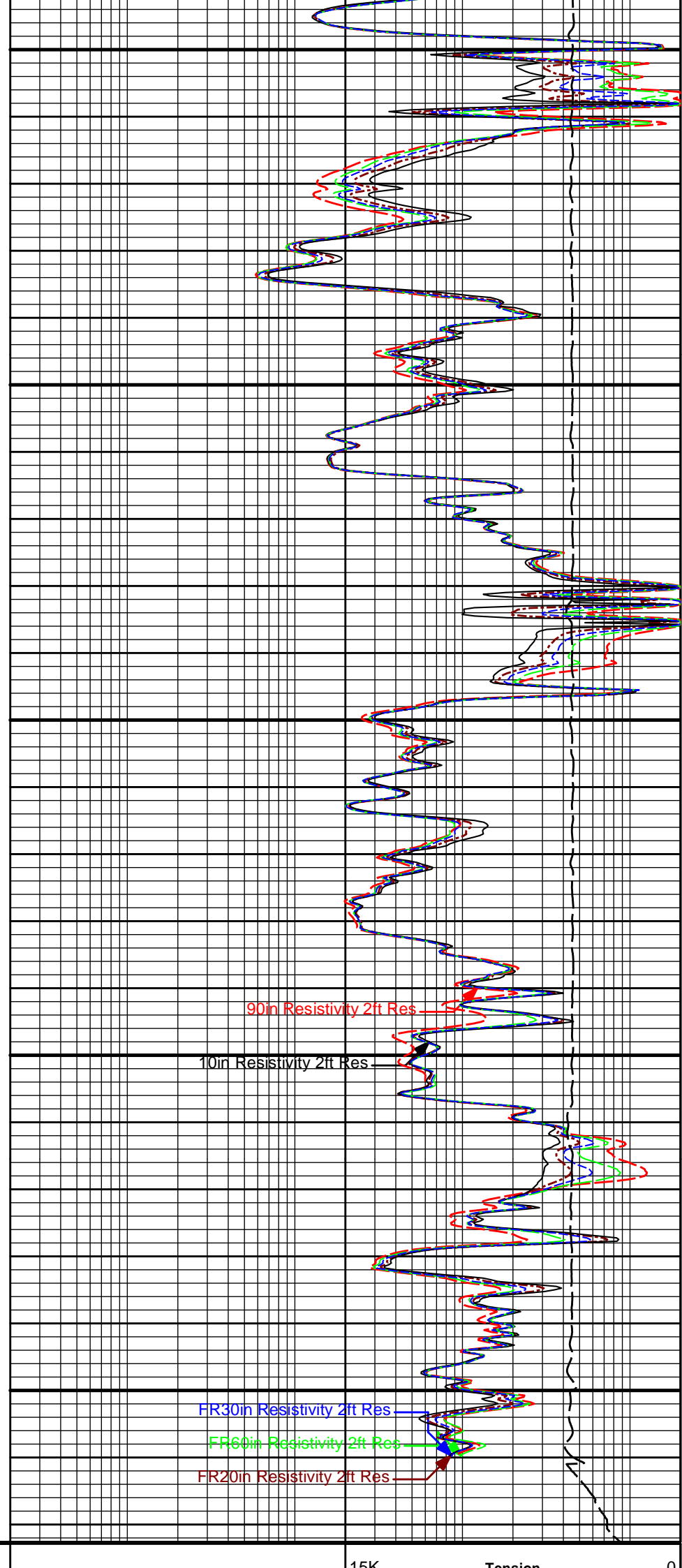


7300

7400

7500

TD



90in Resistivity 2ft Res

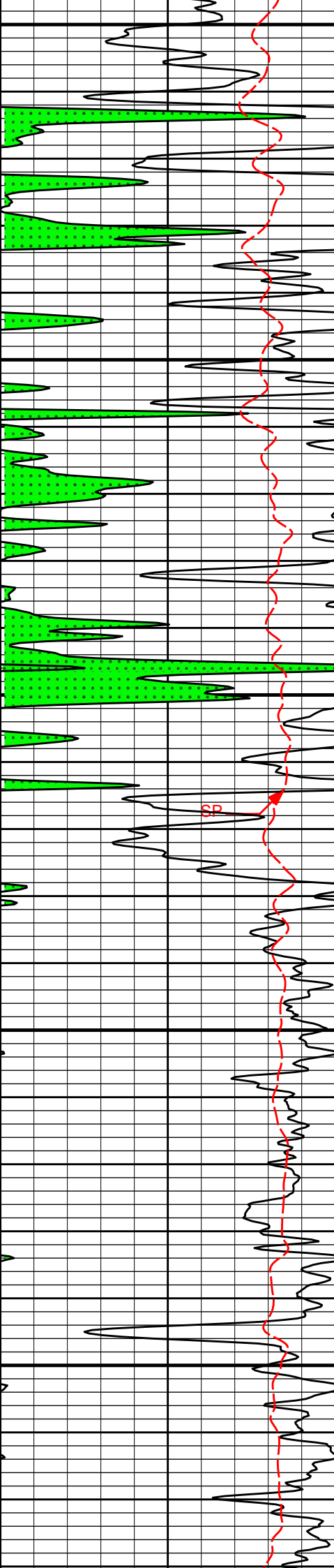
10in Resistivity 2ft Res

FR30in Resistivity 2ft Res

FR60in Resistivity 2ft Res

FR20in Resistivity 2ft Res

Gamma API150		15K		Tension		0	
api				pounds			
SP			0.290in Resistivity 2ft Res2K				
-]20[+			ohmm				
			0.260in Resistivity 2ft Res2000				
			ohmm				
			0.230in Resistivity 2ft Res2000				
			ohm-metre				
			0.220in Resistivity 2ft Res2000				
			ohmm				
			0.210in Resistivity 2ft Res2K				
			ohmm				
HALLIBURTON		Plot Time: 20-Oct-17 21:04:40 Plot Range: 450 ft to 7522.58 ft Data: CLARK_13-24\Well Based\MAIN\ Plot File: \\-LOCAL-\\CLARK_13-24\Well Based\ACRT\ACRT_5inch_main					
5 INCH MAIN LOG							
5 INCH MAIN LOG							
HALLIBURTON		Plot Time: 20-Oct-17 21:04:41 Plot Range: 6845 ft to 7519.67 ft Data: CLARK_13-24\Well Based\REPEAT\ Plot File: \\-LOCAL-\\CLARK_13-24\Well Based\ACRT\ACRT_5inch_main					
5 INCH REPEAT LOG							
5 INCH REPEAT LOG							
			0.210in Resistivity 2ft Res2K				
			ohmm				
			0.220in Resistivity 2ft Res2000				
			ohmm				
			0.230in Resistivity 2ft Res2000				
			ohm-metre				
			0.260in Resistivity 2ft Res2000				
			ohmm				
			0.290in Resistivity 2ft Res2K				
			ohmm				
SP							
-]20[+							
0	Gamma API150				15K	Tension	0
	api					pounds	

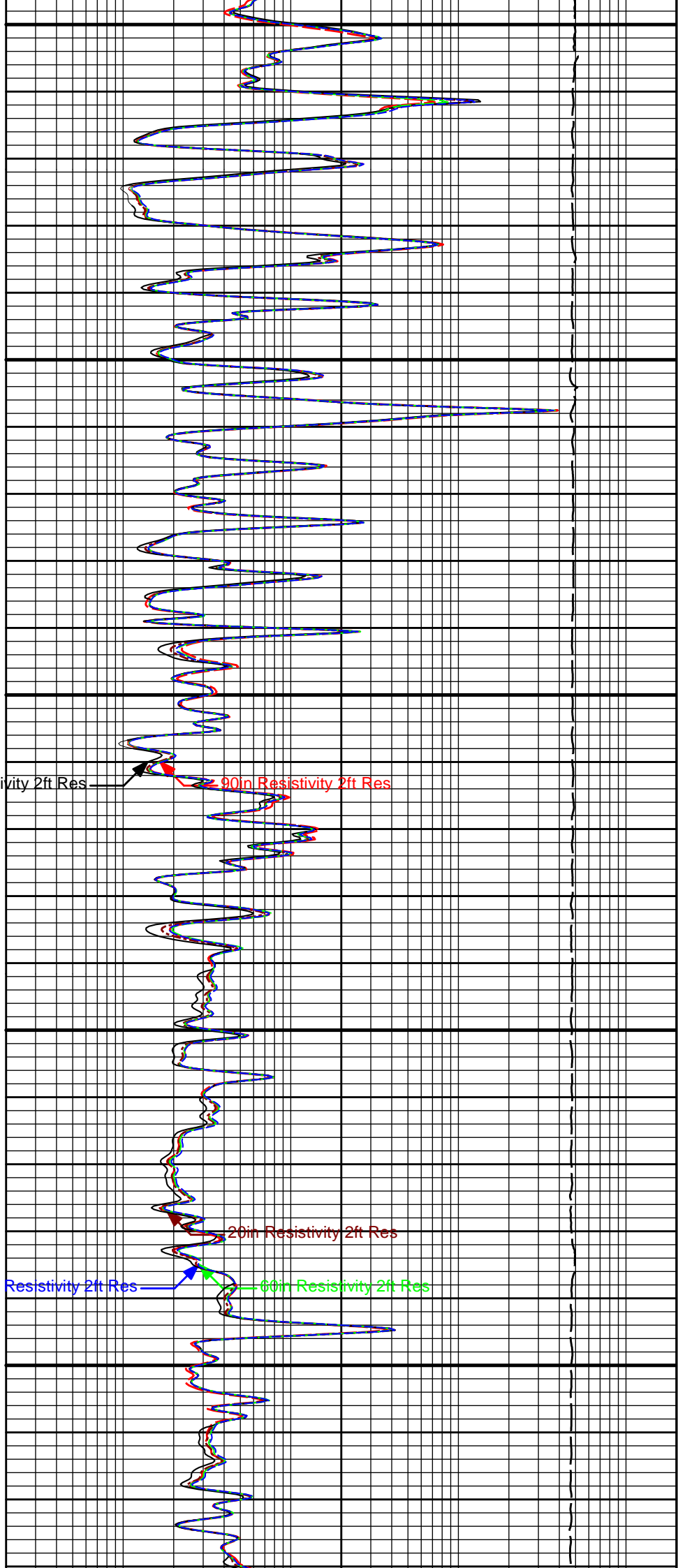


6900

10in Resistivity 2ft Res

7000

30in Resistivity 2ft Res

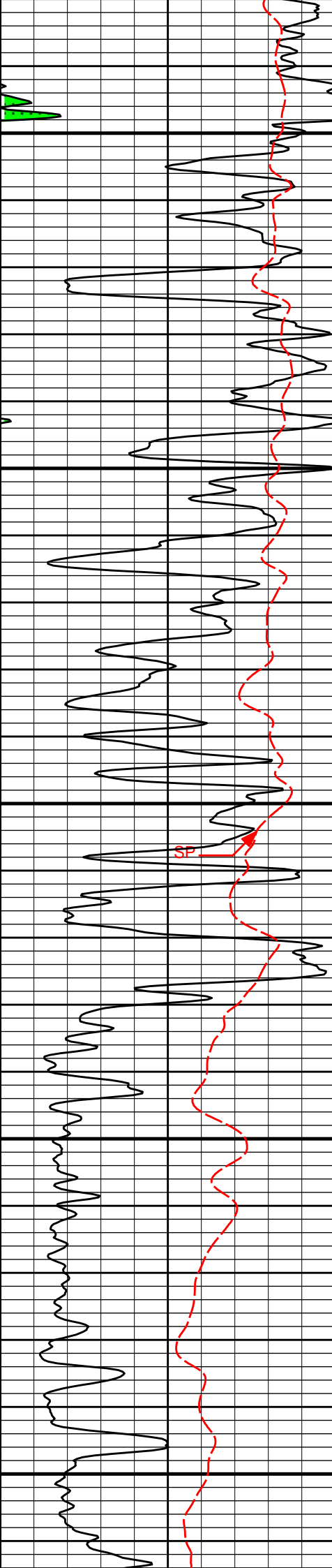


90in Resistivity 2ft Res

20in Resistivity 2ft Res

60in Resistivity 2ft Res





7100

7200

7300

10in Resistivity 2ft Res

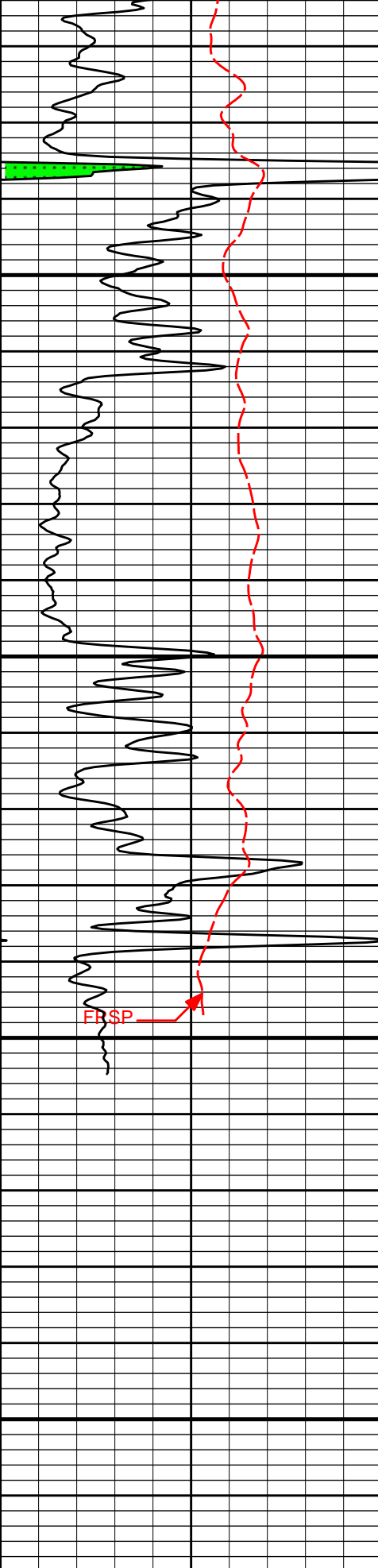
90in Resistivity 2ft Res

20in Resistivity 2ft Res

60in Resistivity 2ft Res

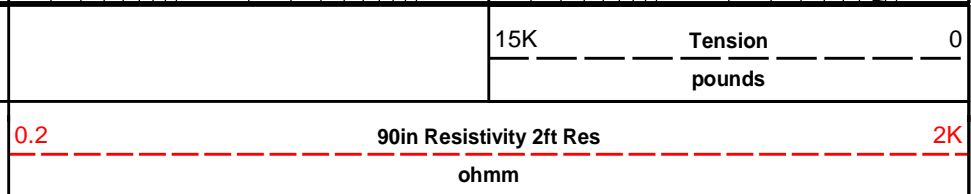
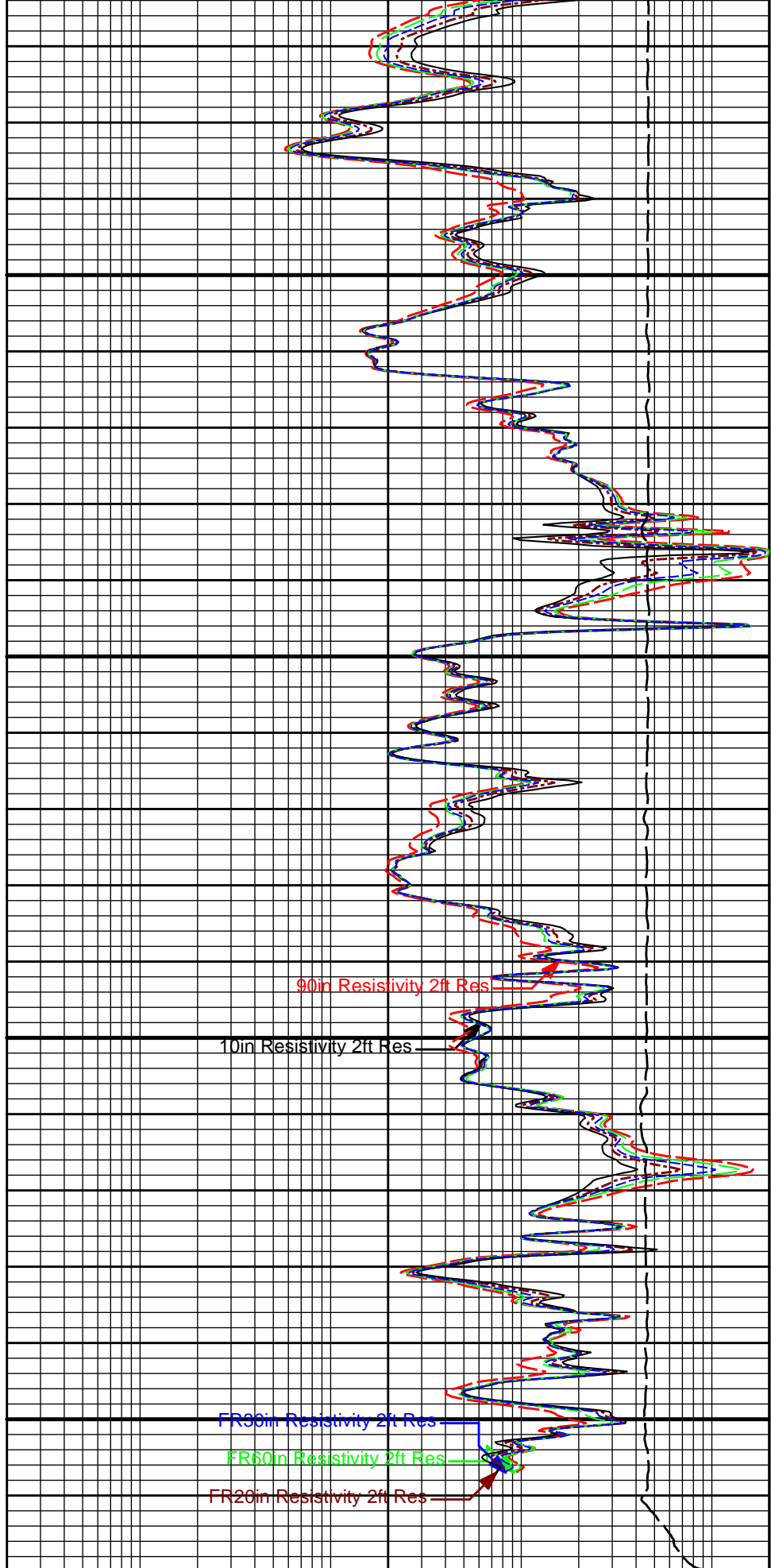
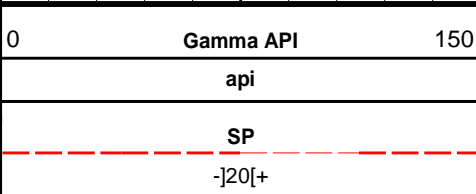
30in Resistivity 2ft Res





7400

7500



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

HALLIBURTON

Plot Time: 20-Oct-17 21:04:43  
Plot Range: 6845 ft to 7519.67 ft  
Data: CLARK\_13-24\Well Based\REPEAT\  
Plot File: \\-LOCAL-\\CLARK\_13-24\Well Based\ACRT\ACRT\_5inch\_main

5 INCH REPEAT LOG

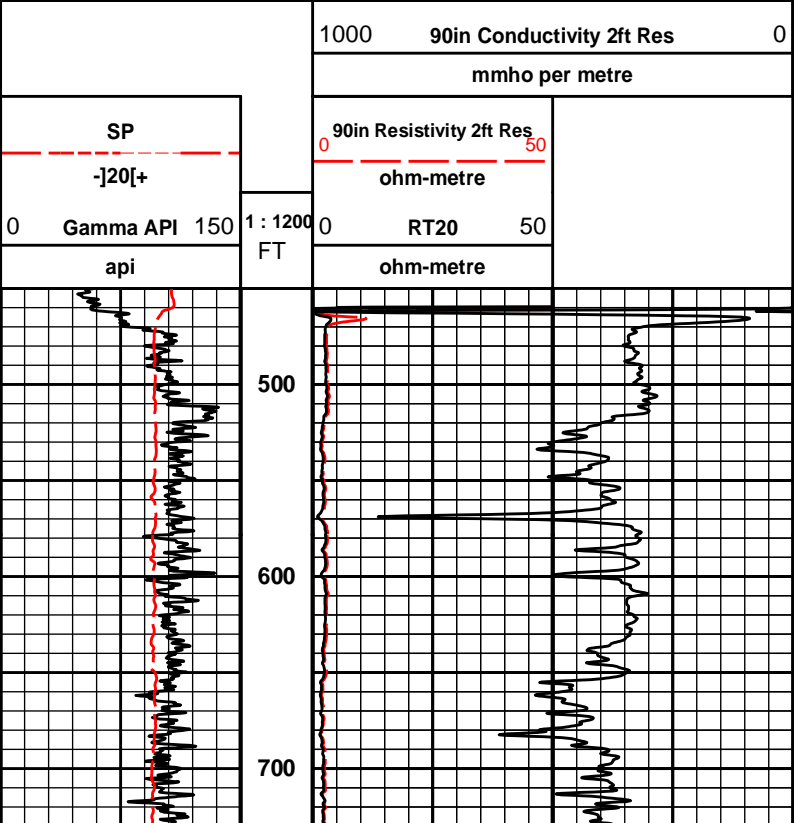
5 INCH REPEAT LOG

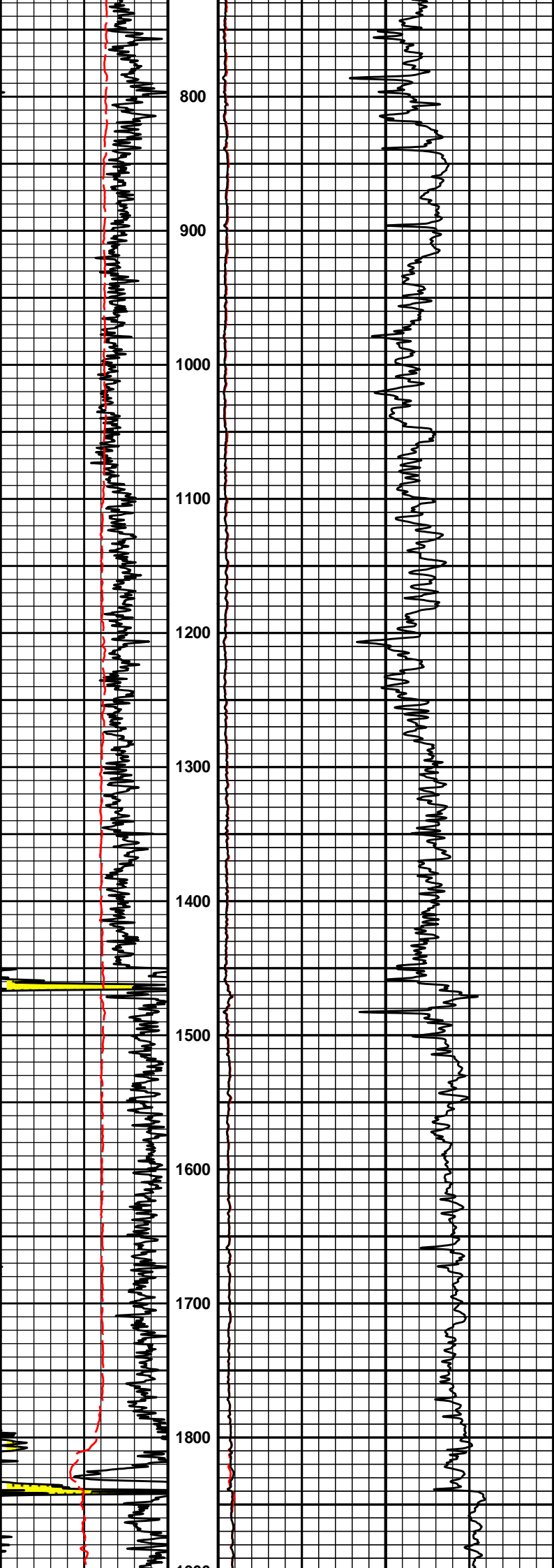
HALLIBURTON

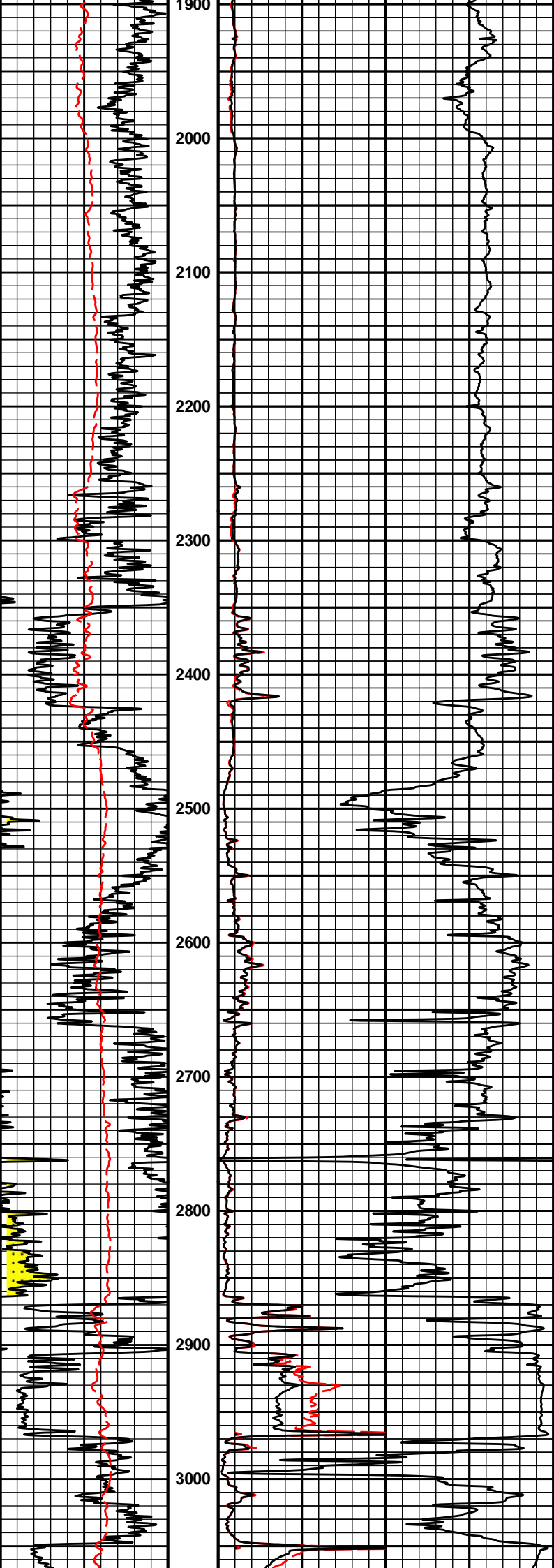
Plot Time: 20-Oct-17 21:04:44  
Plot Range: 450 ft to 7509.75 ft  
Data: CLARK\_13-24\Well Based\MAIN\  
Plot File: \\-LOCAL-\\CLARK\_13-24\Well Based\ACRT\ACRT\_1\_main

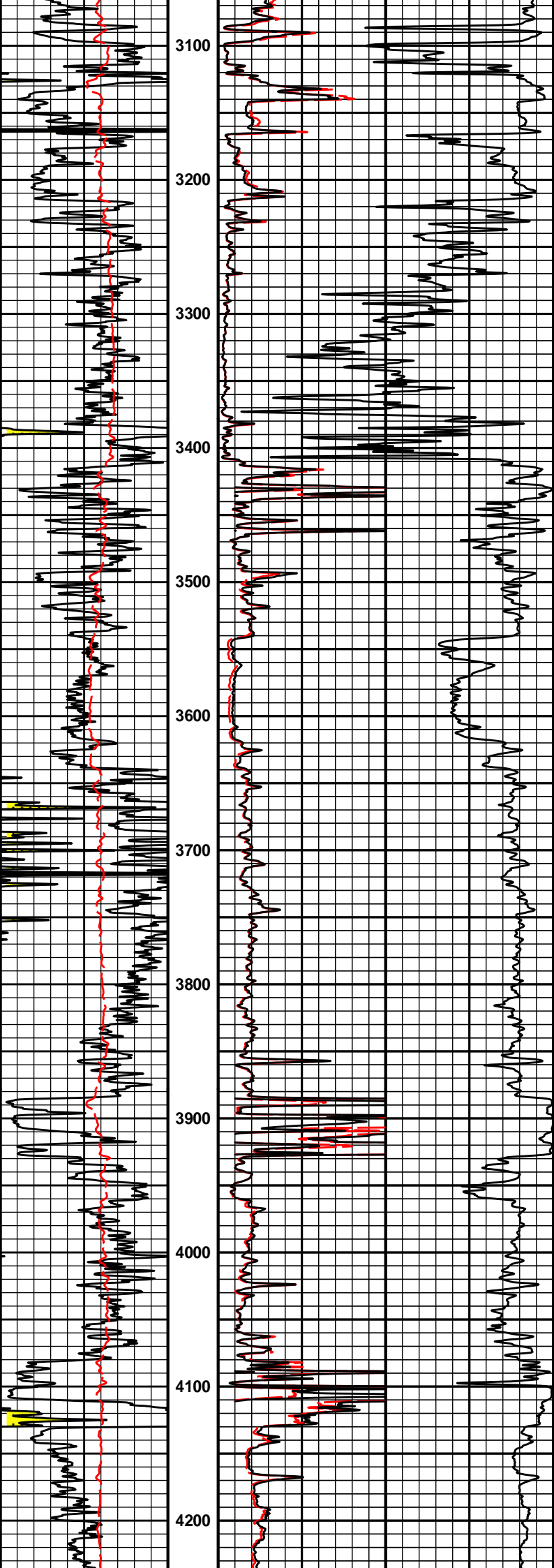
1 INCH MAIN LOG

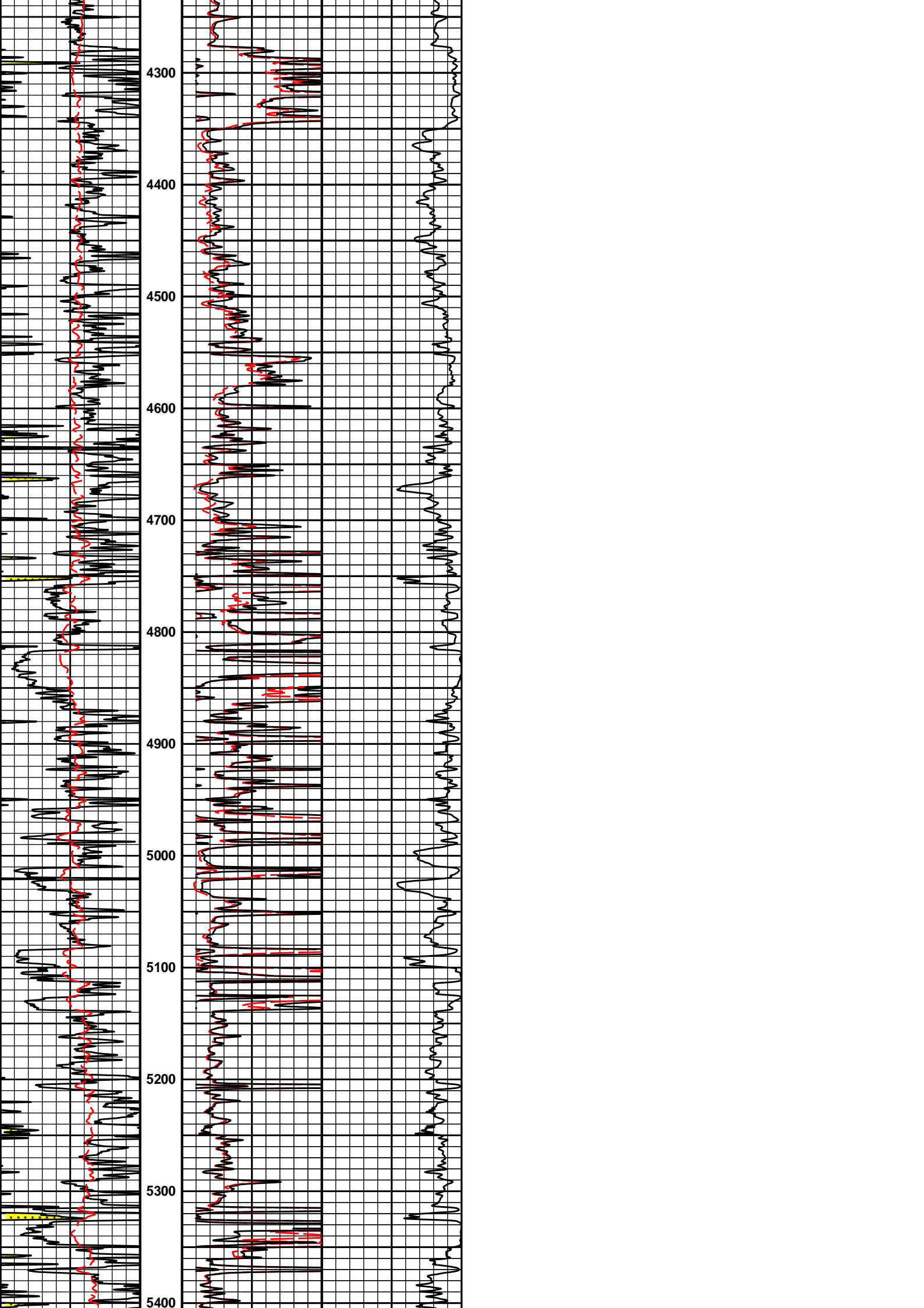
1 INCH CORRELATION LOG

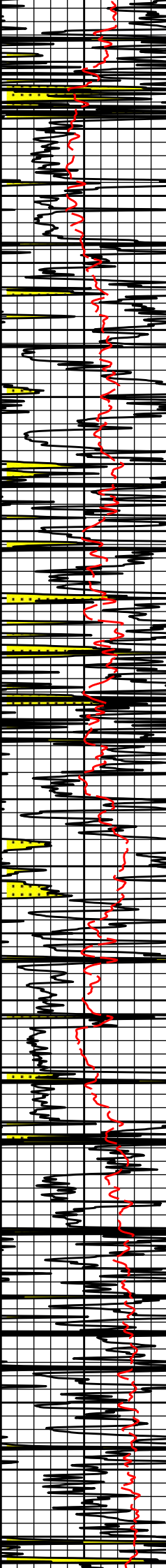




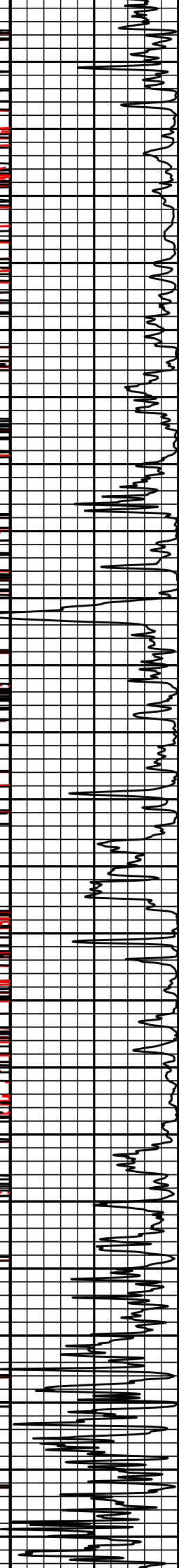
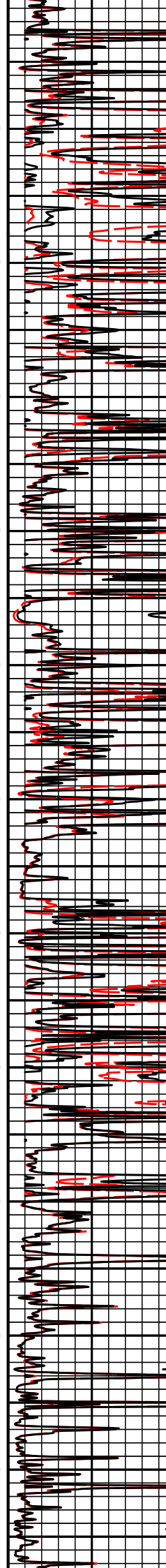


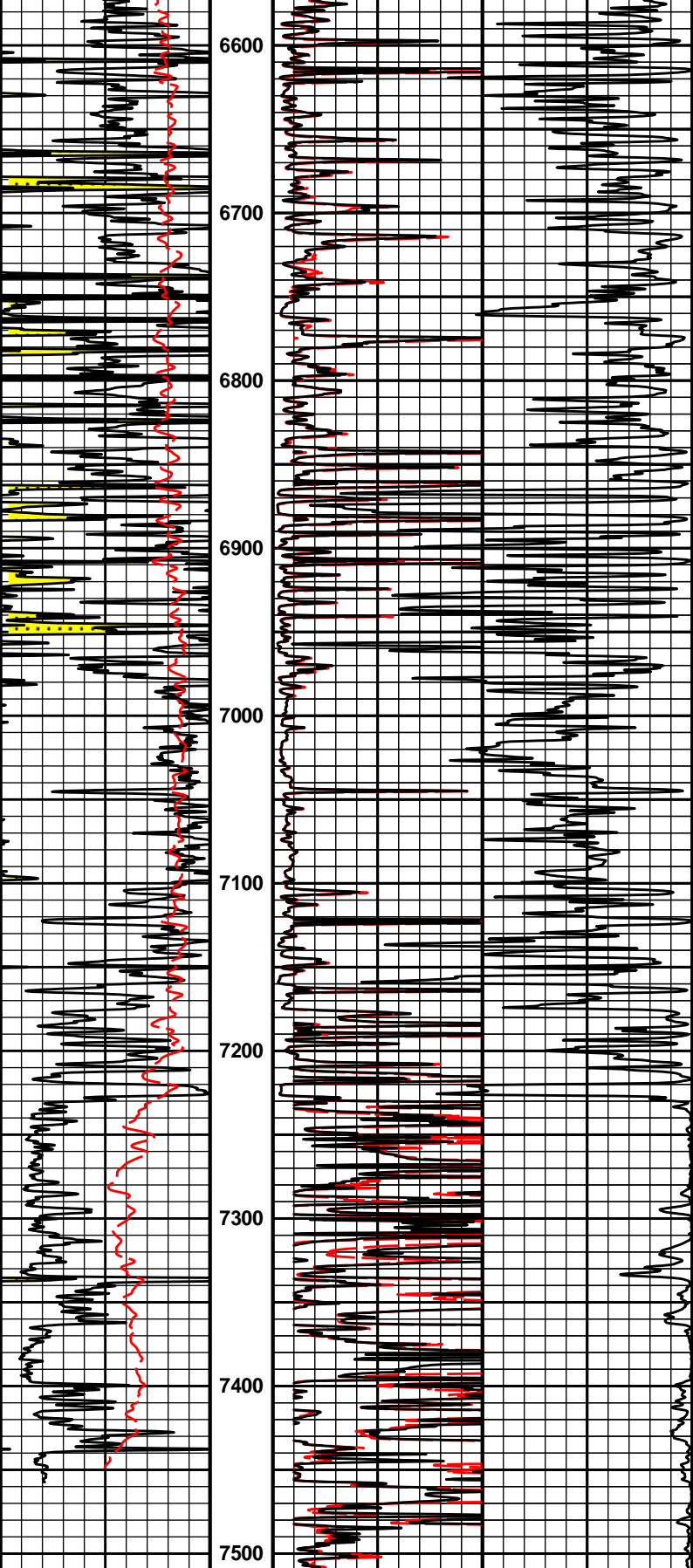






5500  
5600  
5700  
5800  
5900  
6000  
6100  
6200  
6300  
6400  
6500





0	Gamma API	150	1 : 1200	0	RT20	50	
	api		FT		ohm-metre		
	SP				90in Resistivity 2ft Res		
	-]20[+				ohm-metre		
				1000	90in Conductivity 2ft Res	0	
					mmho per metre		

**HALLIBURTON**

Plot Time: 20-Oct-17 21:04:46  
Plot Range: 450 ft to 7509.75 ft  
Data: CLARK\_13-24\Well Based\MAIN\  
Plot File: \\LOCAL-CLARK\_13-24\Well Based\ACRT\ACRT\_1\_main

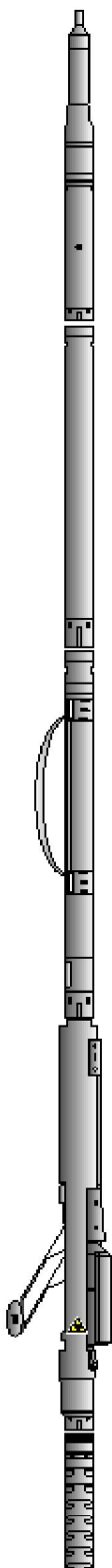


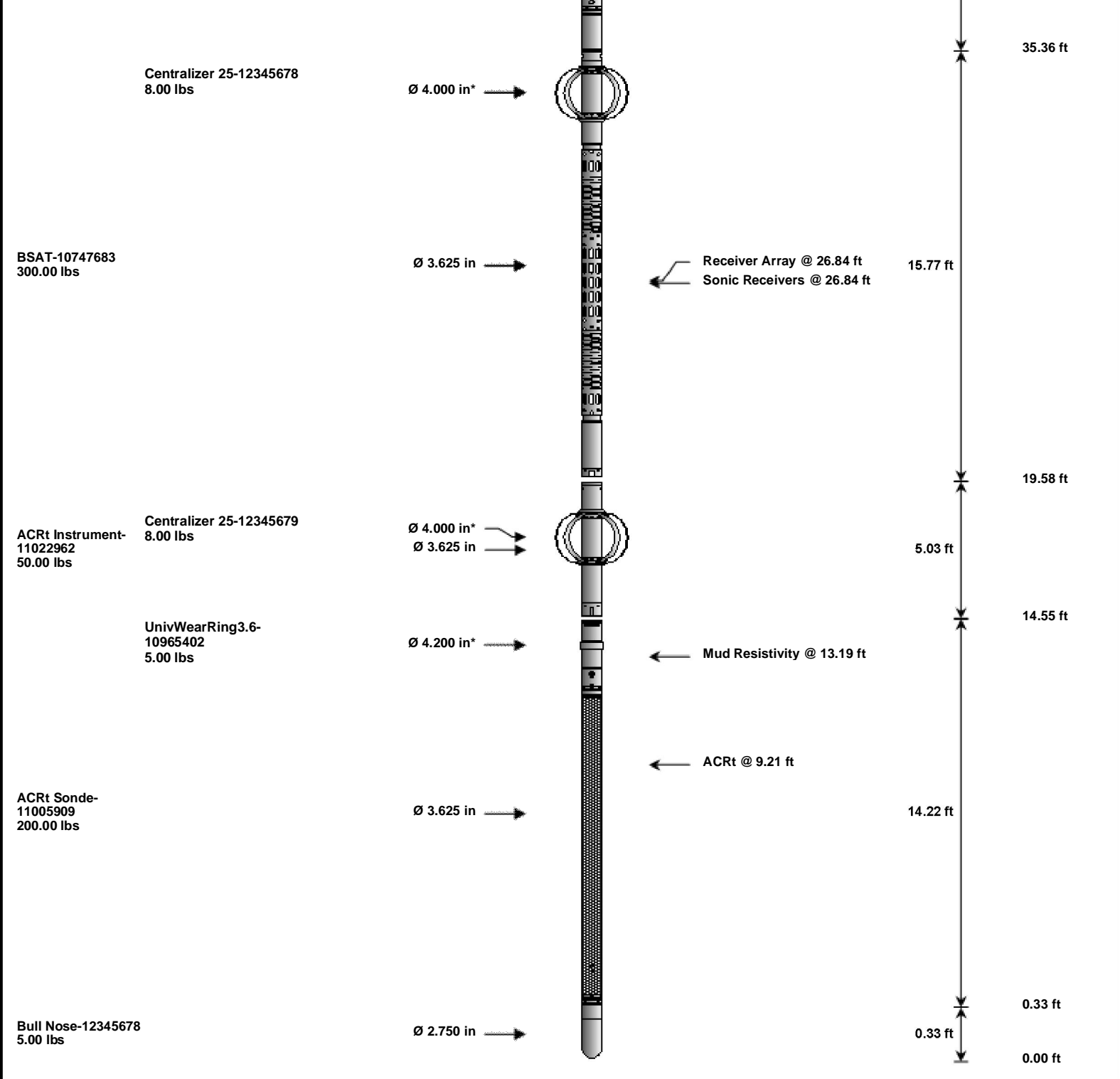
# 1 INCH MAIN LOG

1 INCH CORRELATION LOG

**HALLIBURTON**

## TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-11459024 37.50 lbs		Ø 2.750 in →		← Temperature @ 76.74 ft	2.50 ft	77.24 ft
XOHD-11572809 20.00 lbs		Ø 2.750 in → Ø 3.625 in →			0.95 ft	74.74 ft
SP Sub-11441455 60.00 lbs		Ø 3.625 in →		← SP @ 72.01 ft	3.74 ft	73.79 ft
				← Z-Accelerometer @ 69.60 ft		70.05 ft
GTET-11048627 165.00 lbs		Ø 3.625 in →			8.52 ft	
				← GammaRay @ 63.99 ft		61.53 ft
DSNT-11055304 174.00 lbs	DSN Decentralizer- 11055304 6.60 lbs	Ø 5.000 in* → Ø 3.625 in →		← DSN Far @ 54.59 ft ← DSN Near @ 53.84 ft	9.69 ft	51.84 ft
SDLT-10960494 360.00 lbs	SDLT Pad-10844781 65.00 lbs Microlog Pad-10960494 8.00 lbs RAM-Cs137-00005168 1.00 lbs	Ø 4.500 in → Ø 4.500 in* → Ø 4.750 in* → Ø 0.800 in* →		Microlog @ 44.03 ft SDL Caliper @ 43.84 ft SDL @ 43.83 ft	10.81 ft	41.03 ft
IQ Flex-11021611 140.00 lbs		Ø 3.625 in →			5.67 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	11459024	37.50	2.50	74.74	300.00
XOHD	Hostile to Dits Cross Over	11572809	20.00	0.95	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	11055304	174.00	9.69	51.84	60.00
DCNT	DSN Decentralizer	11055304	6.60	5.13	* 55.17	300.00
SDLT	Spectral Density Tool	10960494	360.00	10.81	41.03	60.00
SDLP	Density Insite Pad	10844781	65.00	2.55	* 43.24	60.00
Cs137	Logging Source, SDLT-I, 1.78 Ci - Cs137	00005168	1.00	0.80	* 43.47	300.00
MICP	Microlog Pad	10960494	8.00	1.00	* 43.53	60.00
IQF	IQ Flex tool	11021611	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	12345678	8.00	2.08	* 32.79	300.00
ACRt	Array Compensated True Resistivity Instrument Section	11022962	50.00	5.03	14.55	120.00
OBCEN	Centralizer - 25 in. Overbody	12345679	8.00	2.08	* 16.42	300.00
ACRt	Array Compensated True Resistivity Sonde Section	11005909	200.00	14.22	0.33	120.00
UWR3P6	Universal Wear Ring 3 5-8 inch	10965402	5.00	0.35	* 13.40	300.00
BLNS	Bull Nose	12345678	5.00	0.33	0.00	300.00
<b>Total</b>			<b>1,613.10</b>	<b>77.24</b>		

\* Not included in Total Length and Length Accumulation



PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	12.250	in
2500.00					
	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	9.400	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	1.408	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	CSTR	Compressive Strength	1000.00	psia
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	7500.00	ft
	SHARED	BHT	Bottom Hole Temperature	152.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	CBM Temperature Master Tool	GTET	
	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	1.29	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	
	Rwa / CrossPlot	BHSM	Borehole Size Source Tool	SDLT	
	Rwa / CrossPlot	ROIN	Input for RO Calculation	Rwa	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GEOK	Process Gamma Ray EVR?	No	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	GTET	BHSM	Borehole Size Source Tool	SDLT	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	DSNT	NLIT	Neutron Lithology	Limestone	
	DSNT	DSNO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
	DSNT	DNTT	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	
DSNT	BHSM	Borehole Size Source Tool	SDLT	
SDLT	CLOK	Process Caliper Outputs?	Yes	
Microlog Pad	MLOK	Process MicroLog 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
SDLT Pad	BHSM	Borehole Size Source Tool	SDLT	
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 Pore Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	Limestone 47.6	
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wyllie	
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	RMAX	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	
ACRt Sonde	MBFL	Apply Corkscrew Effect?	No	
BOTTOM_____				
Data: CLARK_13-24\0002 GTET-DSNT-SDLT-BSAT-ACRTIDLE			Date: 20-Oct-17 18:46:55	

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	GTET - 11048627	Reference Calibration Date:	20-Aug-17 14:02:22
Engineer:	WHITLOCK	Calibration Date:	21-Sep-17 09:43:40
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Calibrator Source S/N: TB-146

Calibrator API Reference:265.00 api

Equivalent Calibrator API Reference:269.6 api

Measurement	Measured	Calibrated	Units
Background	29.7	29.3	api
Background + Calibrator	303.0	299.0	api
Calibrator	273.2	269.6	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	GTET - 11048627	Reference Calibration Date:	21-Sep-17 09:43:40
Engineer:	JORGE ORLANDO PEREZ	Calibration Date:	19-Oct-17 09:44:29
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Calibrator Source S/N: TB-146

Calibrator API Reference:265.00 api

Field Verification	Shop	Field	Units
Background	29.3	26.5	api
Background + Calibrator	299.0	298.4	api
Calibrator	269.6	271.9	api

Shop	Field	Difference	Tolerance
269.6	271.9	-2.3	+/- 9.00

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	ACRt Sonde - 11005909	Reference Calibration Date:	11-Feb-16 14:59:24
Engineer:	JORGE ORLANDO PEREZ	Calibration Date:	20-Aug-17 14:06:40
Software Version:	WL INSITE R5.0.0 (Build 4)	Calibration Version:	1
Host Tool Name:	ACRt Instrument - 11022962		

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0115	1.05	0.95	1.0146	1.05	0.95	1.0127	1.05
A2 (50")	0.95	1.0116	1.05	0.95	1.0152	1.05	0.95	1.0142	1.05
A3 (29")	0.95	1.0038	1.05	0.95	1.0063	1.05	0.95	1.0031	1.05
A4 (17")	0.95	1.0195	1.05	0.95	1.0196	1.05	0.95	1.0175	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0054	1.05	0.95	1.0012	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9992	1.05	0.95	0.9967	1.05

SONDE OFFSET

Subarray	R12KHz			R36KHz			R72KHz		
	(mmho/m)			(mmho/m)			(mmho/m)		
A1 (80")	-0.494			-3.435			-5.305		
A2 (50")	-2.120			-3.948			-4.446		
A3 (29")	-15.675			-4.932			-2.952		
A4 (17")	-102.777			-31.305			-26.433		
A5 (10")	N/A			-99.200			-45.302		
A6 (6")	N/A			289.143			151.739		

TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper
12K	0.6	0.91	1.3
36K	1.0	1.36	2.0
72K	1.0	1.60	2.0

R-MUD VERIFICATION

Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
Mud Cell	0.95	1.00	1.05

PASS/FAIL SUMMARY

GAIN RANGE CHK	PASS
SONDE OFFSET CHK	PASS

TOOL OK TO LOG

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11048627						
Gamma Ray Calibrator	269.6	271.9	-----	-2.3	+/- 9.00	api
ACRt Sonde-11005909						
Mud Cell	1.00	-----	-----	0	-----	ohm-m



INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	
Rwa / CrossPlot				
TPUL	Tension Pull	77.24	NO	
BS	Bit Size	77.24	NO	
HDIA	Measured Hole Diameter	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
HDIA	Measured Hole Diameter	0.00	NO	
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	
ERNR	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	
HDIA	Measured Hole Diameter	0.00	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	

	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	
TRBD	Receiver Board Temperature	2.73	NO	
HDIA	Measured Hole Diameter	0.00	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
SDLT Pad				
FPUL	Feedpipe Pull	12.52	BLK	

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	
HDIA	Measured Hole Diameter	0.00	NO	
Data: CLARK_13-24\0001 GTET-DSNT-SDLT-BSAT-ACRTVDLE			Date: 20-Oct-17 18:47:19	

COMPANY	K3 OIL & GAS OPERATING COMPANY		
WELL	CLARK 13-24		
FIELD	WILDCAT		
COUNTY	LINCOLN	STATE	COLORADO
HALLIBURTON		ARRAY COMPENSATED TRUE RESISTIVITY LOG	