

HALLIBURTON				ARRAY COMPENSATED TRUE RESISTIVITY LOG			
COMPANY WELL FIELD/BLOCK COUNTY STATE				HERMAN L. LOEB, LLC YOST 4-28 EINSEL KIOWA KANSAS			
Permanent Datum Log measured from Drilling measured from				GL KB KB			
Date Run No. Depth - Driller Depth - Logger Bottom - Logged Interval Top - Logged Interval Casing - Driller Casing - Logger Bit Size				12-Oct-18 ONE 4840.0 ft 4838.0 ft 4829.0 ft 607.0 ft 8.625 in 607.0 ft 7.875 in			
Type Fluid in Hole Density PH				Water Based Mud 9.1 ppg 10.50 pH			
Source of Sample Rm @ Meas. Temperature Rmf @ Meas. Temperature Rmc @ Meas. Temperature Source Rmf Rm @ BHT Time Since Circulation Time on Bottom Max. Rec. Temperature Equipment				FLOWLINE 0.56 ohmm 0.45 ohmm 0.67 ohmm MEAS 0.36 ohmm 04:21 hr 12-Oct-18 22:56 121.00 degF 12156883			
Recorded By Witnessed By				SEAN WOLTEMATH JON CHRISTENSEN			
				Other Services: GTET DSNT SDLT MICROLOG ACRT			
				Elev. 2199.0 ft Elev.: K.B. D.F. G.L.			
				2210.0 ft 2209.0 ft 2199.0 ft			

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Service Ticket No.: 905191351						API No.: 15-097-21845-00-00		PGM Version: WL INSITE R5.8.9 (Build 6)						
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		ECEN.		N/A		
Rmc @ Meas. Temp.		@		@			I-11830684							
Source Rmf	Rmc						S-11830728							
Rm @ BHT		@		@										
Rmf @ BHT		@		@										
Rmc @ BHT		@		@										
EQUIPMENT DATA														
GAMMA			ACOUSTIC			DENSITY			NEUTRON					
Run No.	ONE		Run No.			Run No.	ONE		Run No.	ONE				
Serial No.	11013113		Serial No.			Serial No.	11213308		Serial No.	11019641				
Model No.	GTET		Model No.			Model No.	SDLT		Model No.	DSNT				
Diameter	3.625"		No. of Cent.			Diameter	5.5"		Diameter	3.625"				
Detector Model No.	GTET		Spacing			Log Type	GAM-GAM		Log Type	NEU-NEU				
Type	SCINT					Source Type	Cs-137		Source Type	Am241Be				
Length	8"		LSA [Y/N]			Serial No.	5475GW		Serial No.	DSN-436				
Distance to Source	10'		FWDA [Y/N]			Strength	1.78 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		L	R		L	R	
ONE	TD	CSC	REC	0	150				20	10	2.71 g/cc	20	10	LIME

[illegible]

HALLIBURTON

Plot Time: 13-Oct-18 01:41:55

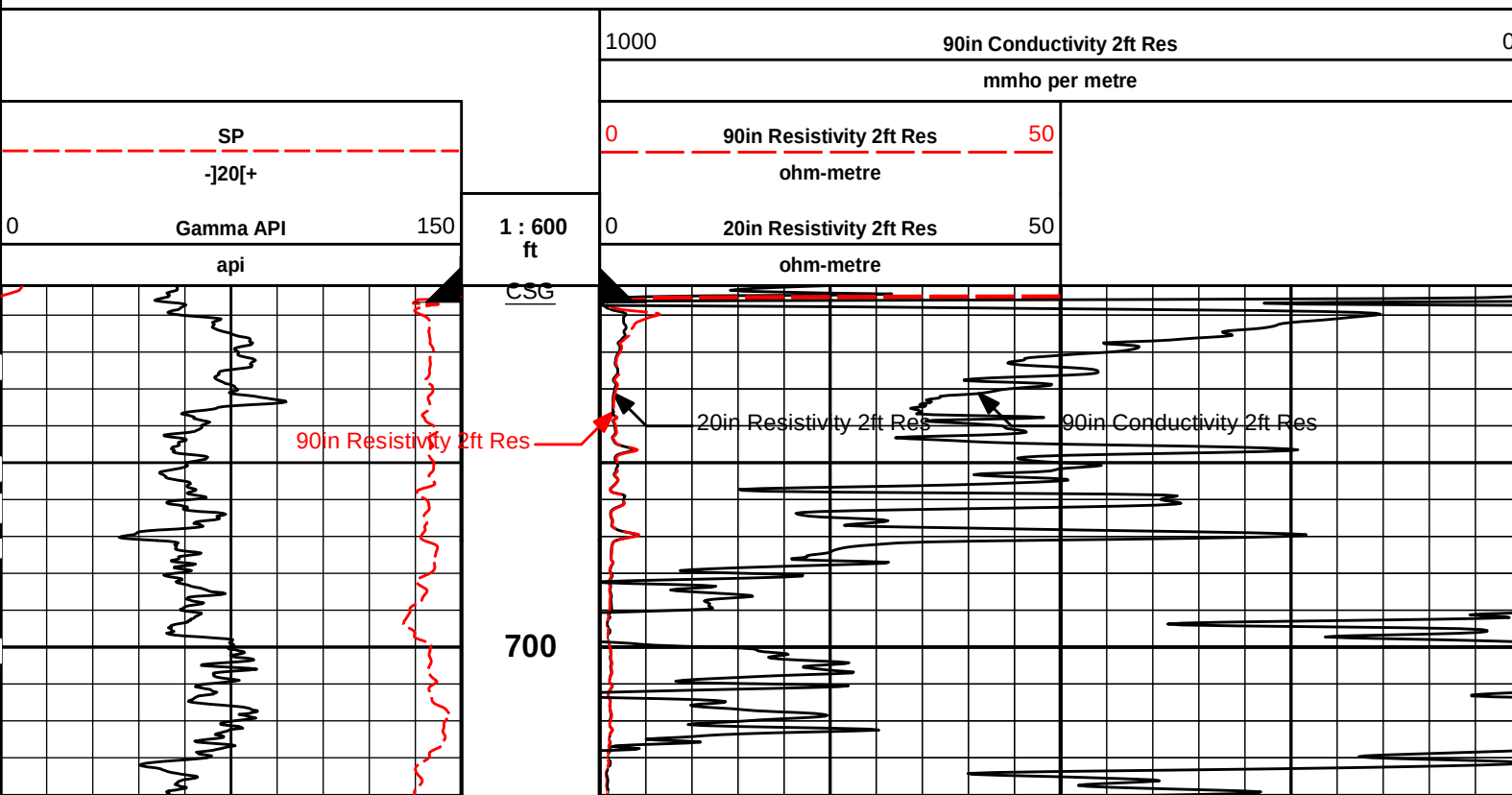
Plot Range: 602 ft to 4843.83 ft

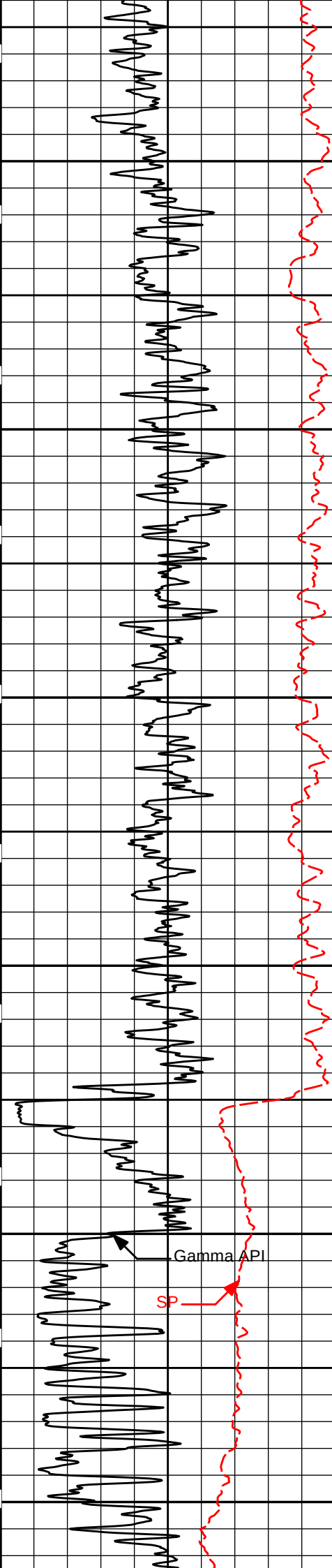
Data: HERMAN_YOST4-28\Well Based\MAIN_ACRT

Plot File: \\-LOCAL-\\HERMAN_YOST4-28\\Well Based\\ACRT\\ACRT_2_MAIN

2 INCH MAIN LOG

2 INCH MAIN LOG





800

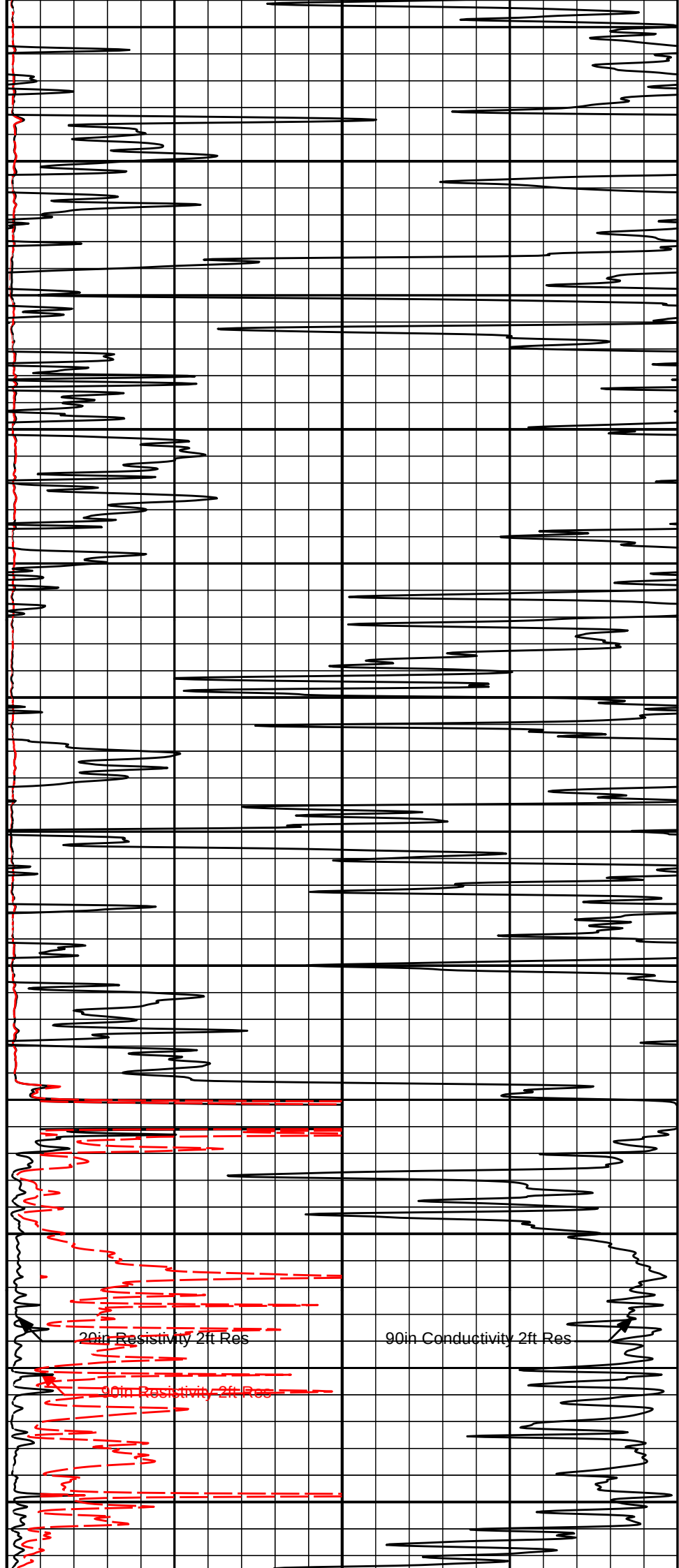
900

1000

1100

1200

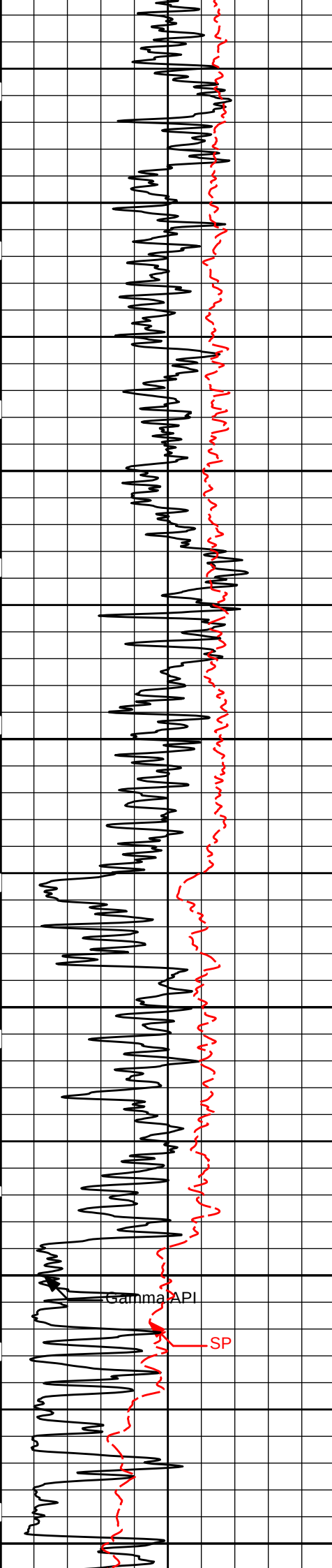
1300



20in Resistivity 2ft Res

90in Resistivity 2ft Res

90in Conductivity 2ft Res



1400

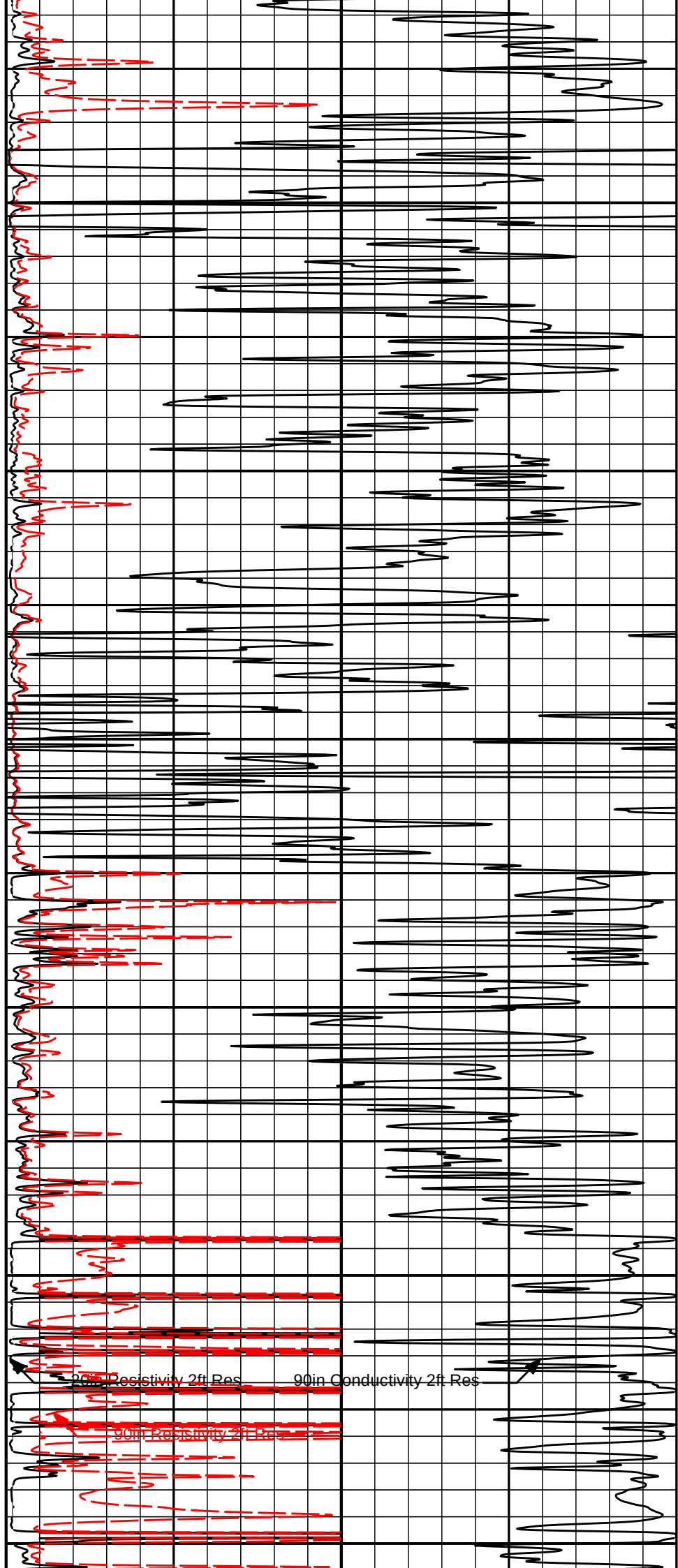
1500

1600

1700

1800

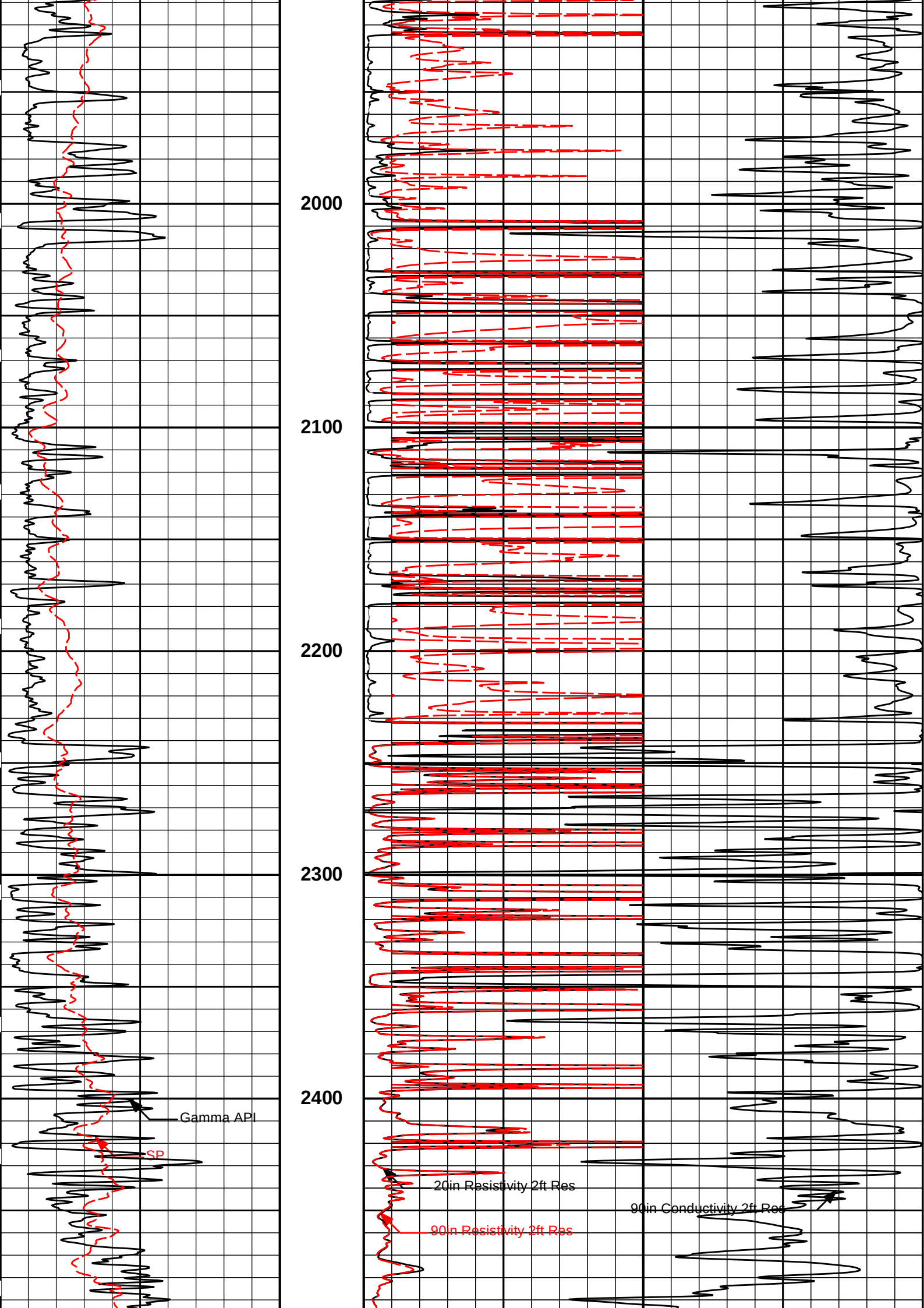
1900

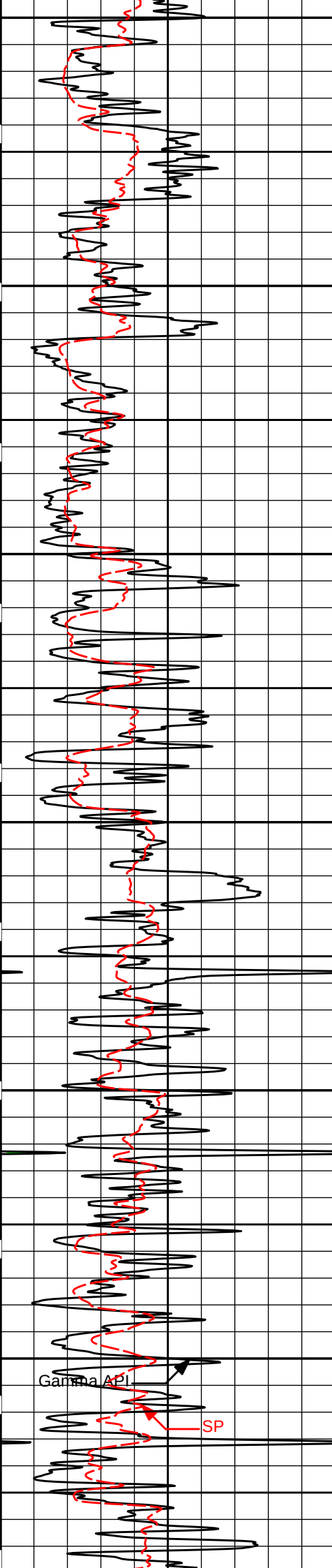


20in Resistivity 2ft Res

90in Conductivity 2ft Res

90in Resistivity 2ft Res





2500

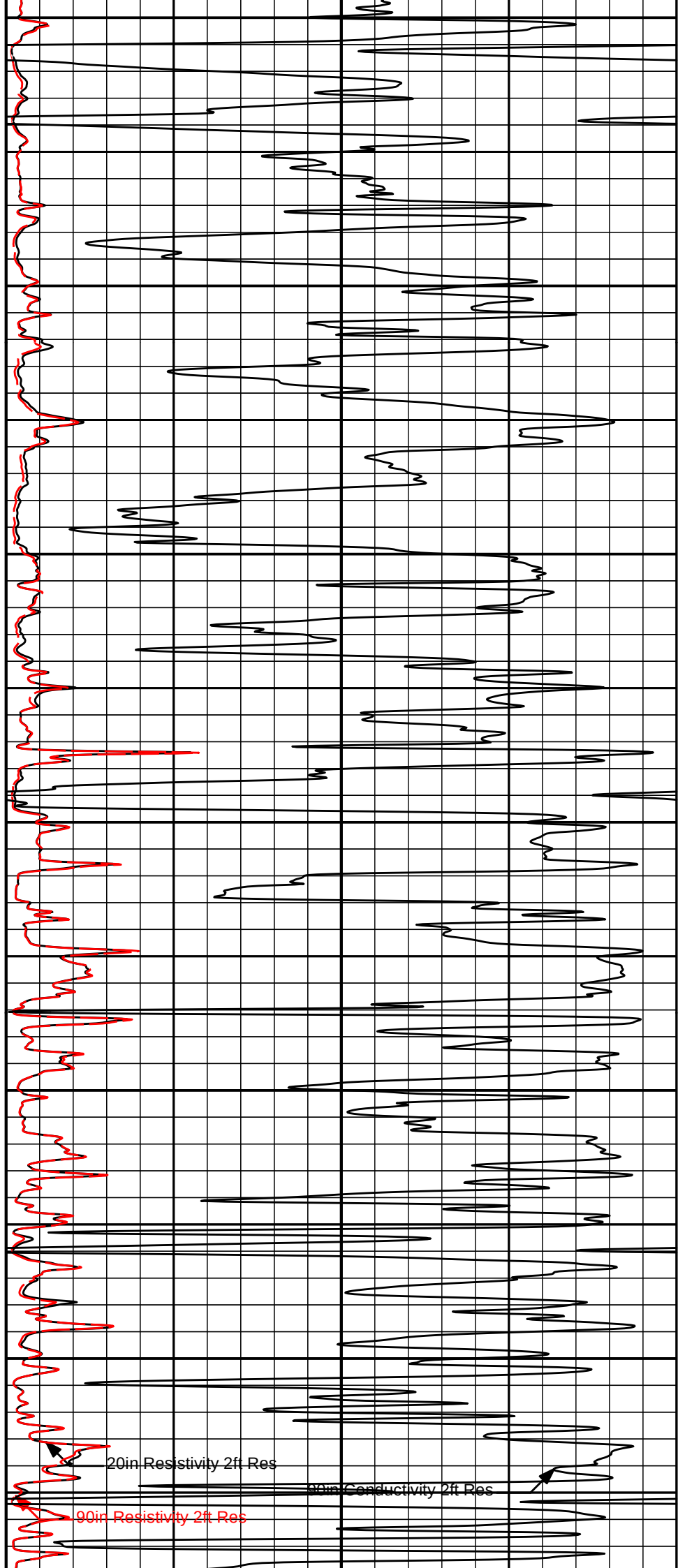
2600

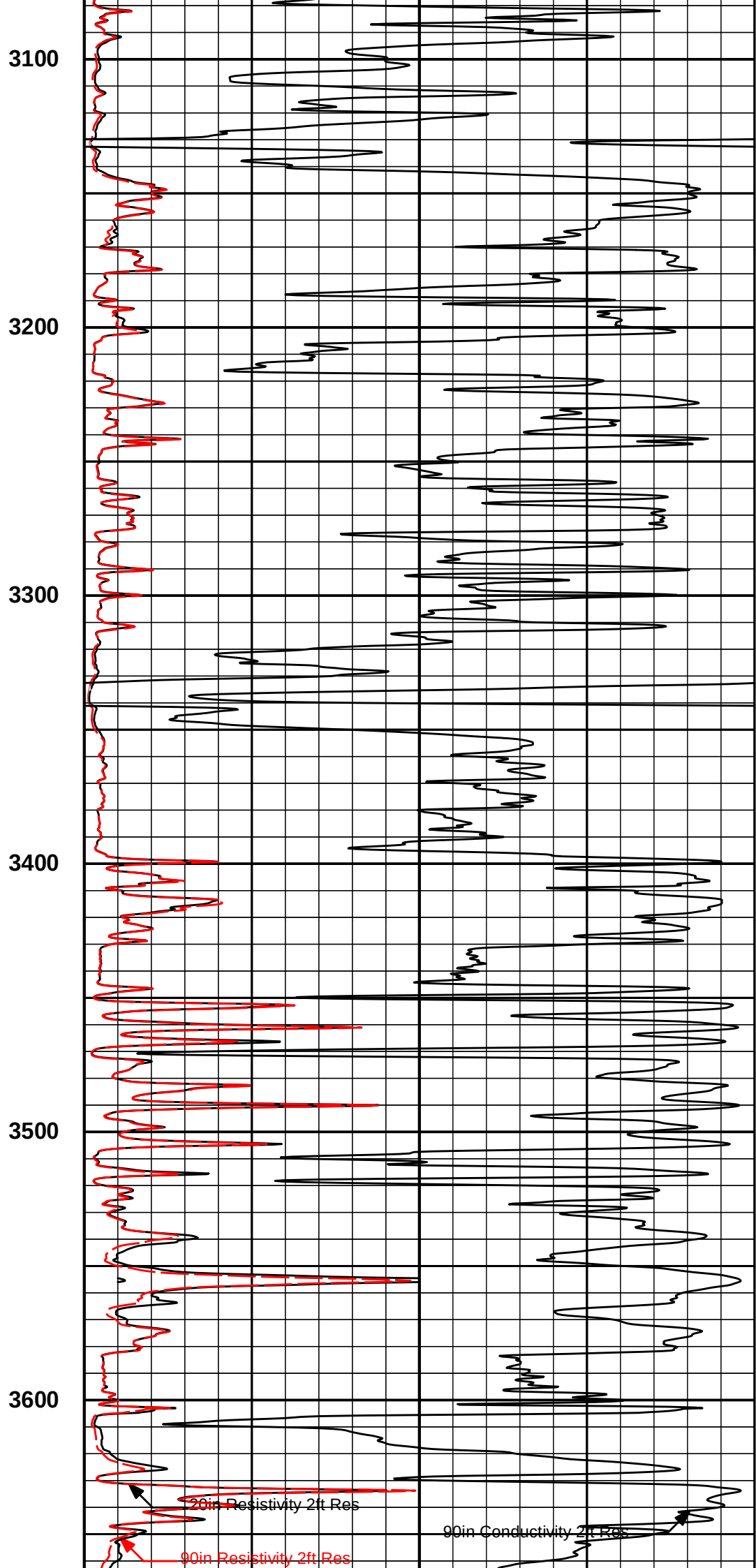
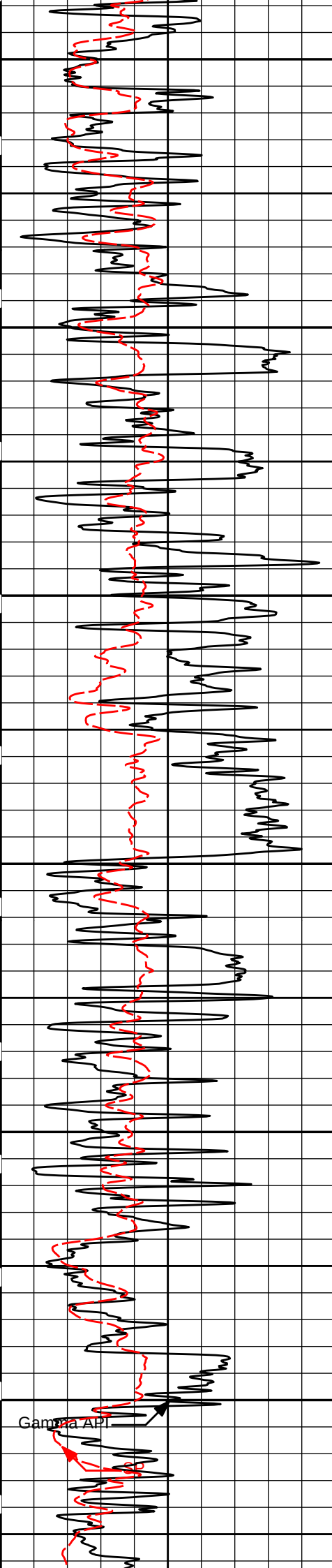
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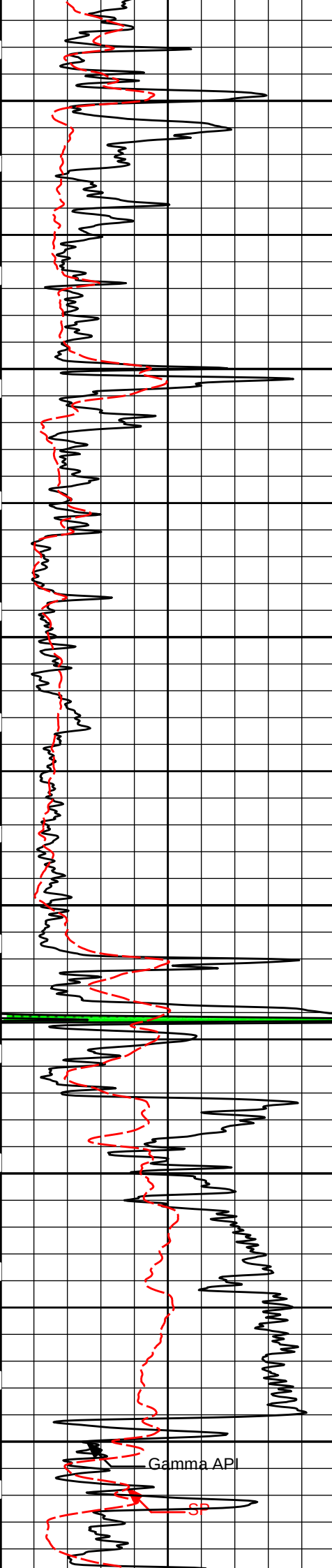
2800

2900

3000







3700

3800

3900

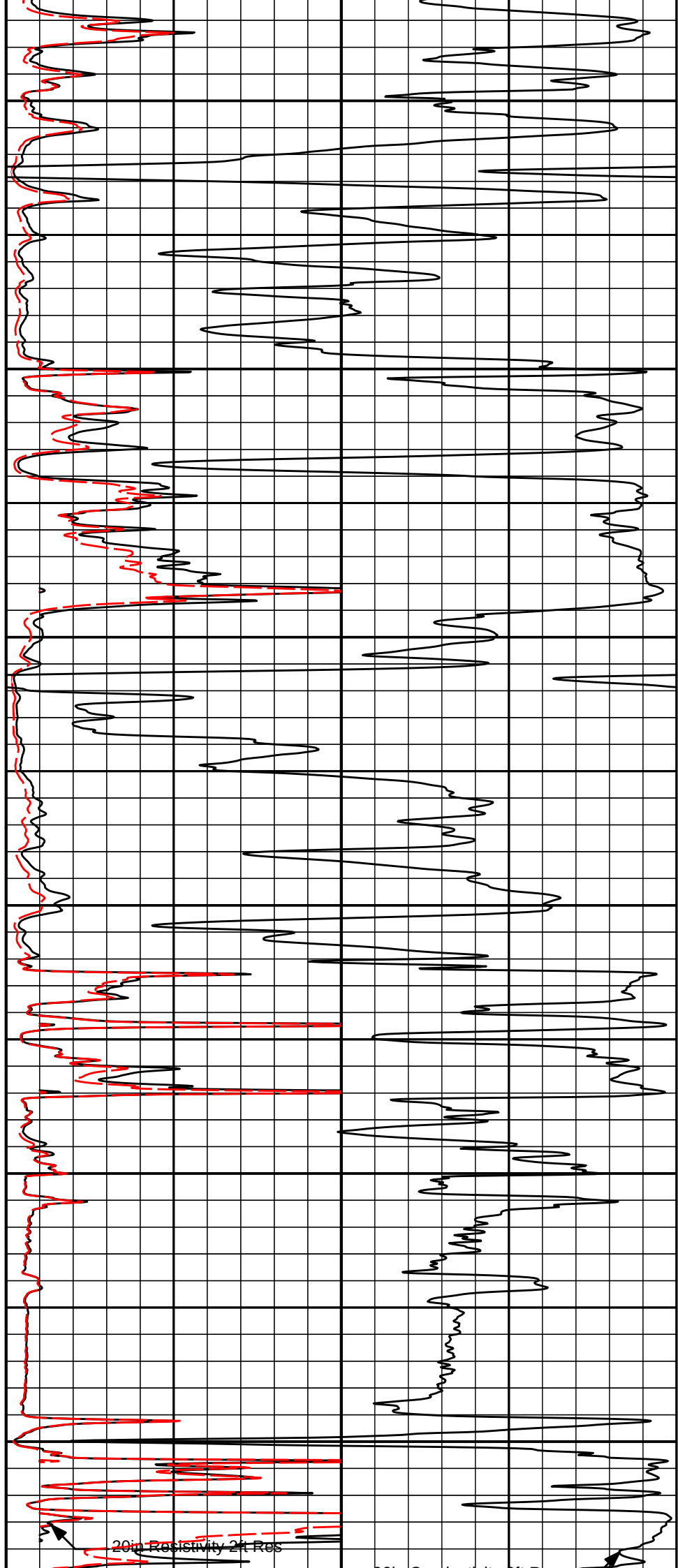
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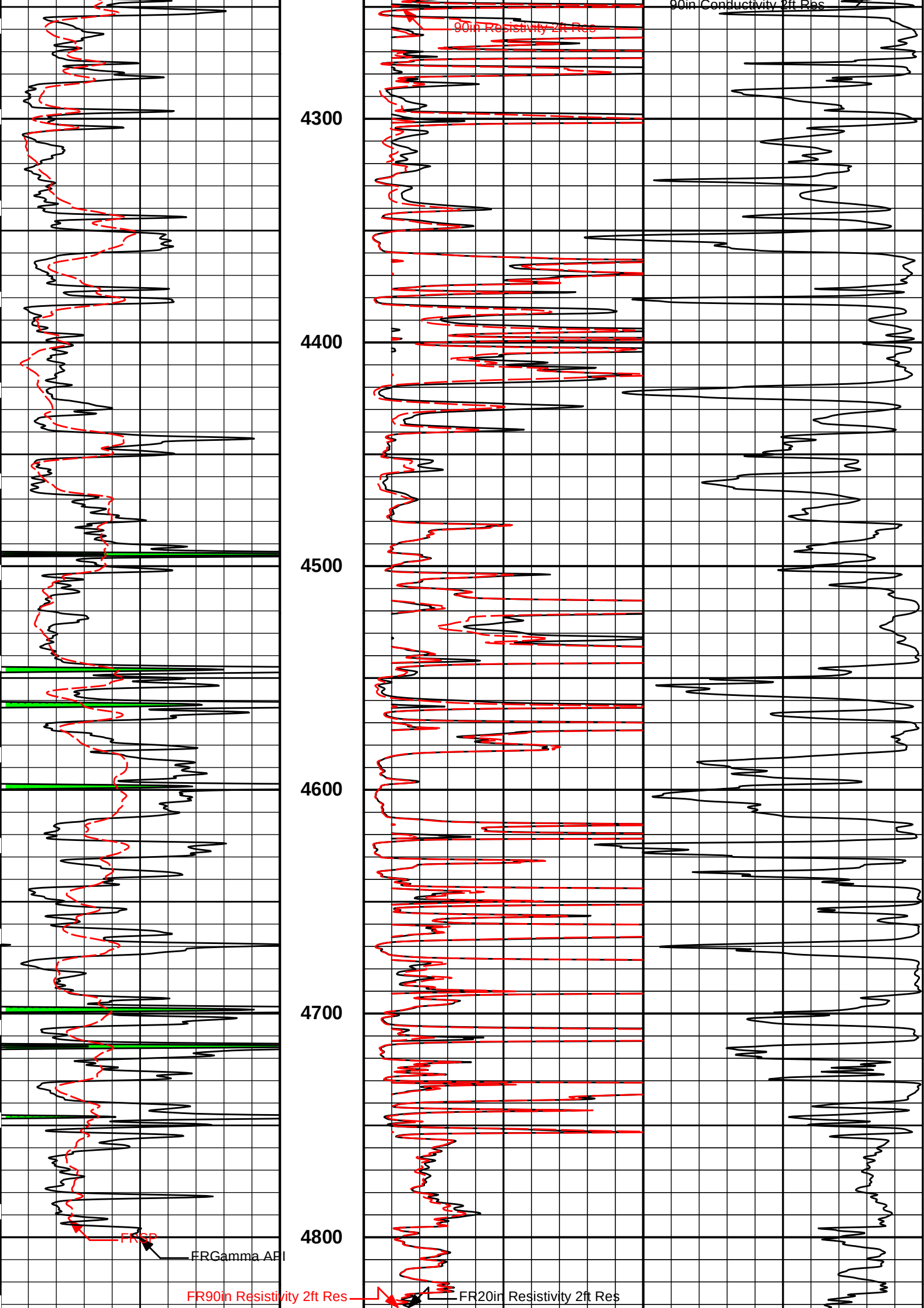
4100

4200

Gamma API

20in Resistivity 2ft Res

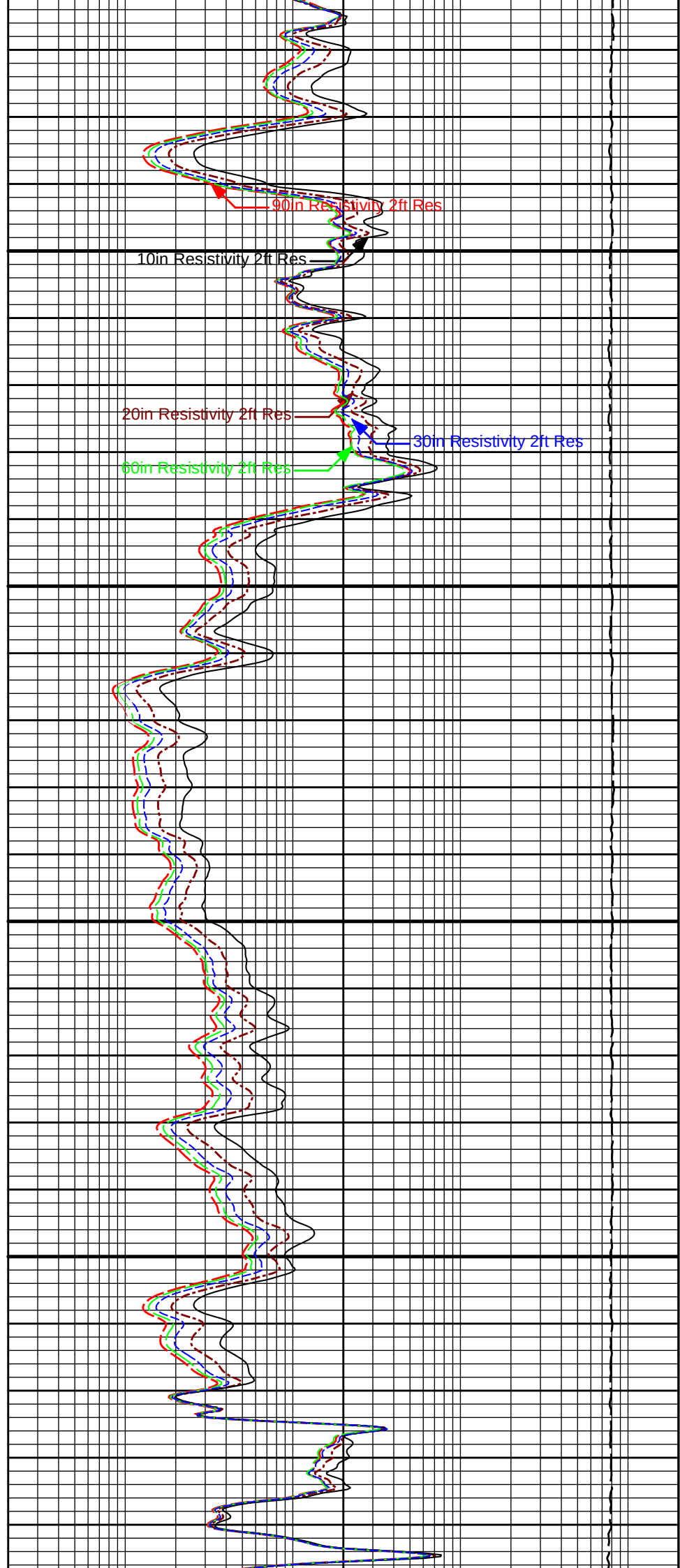


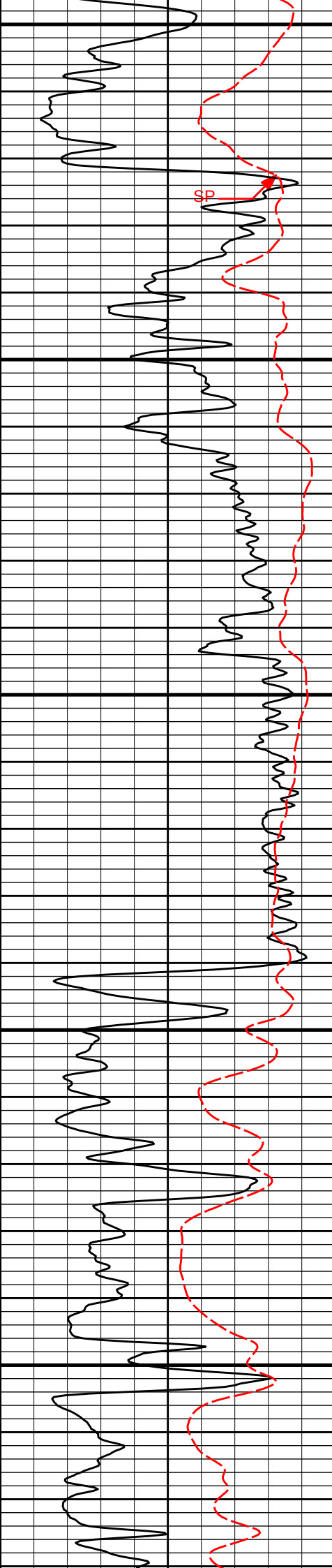




3900

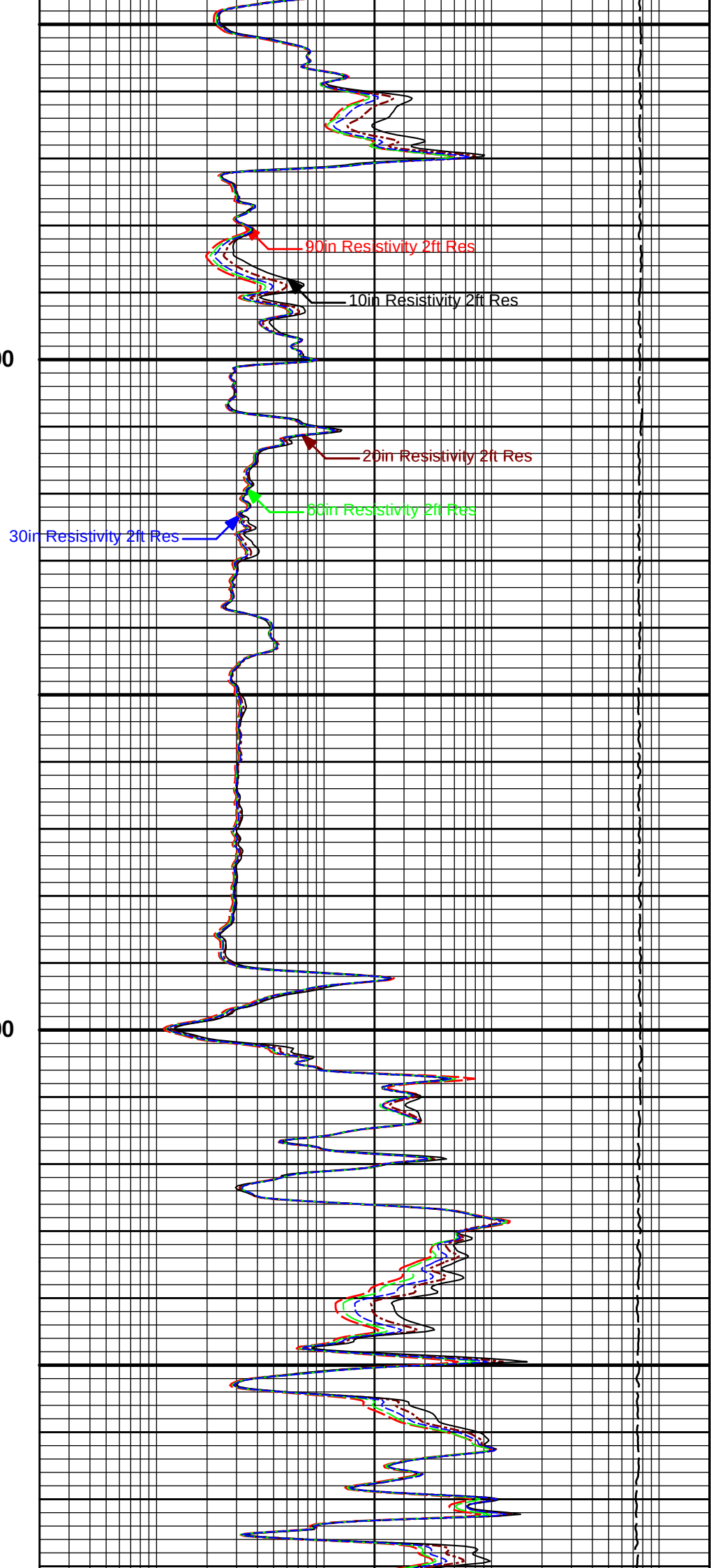
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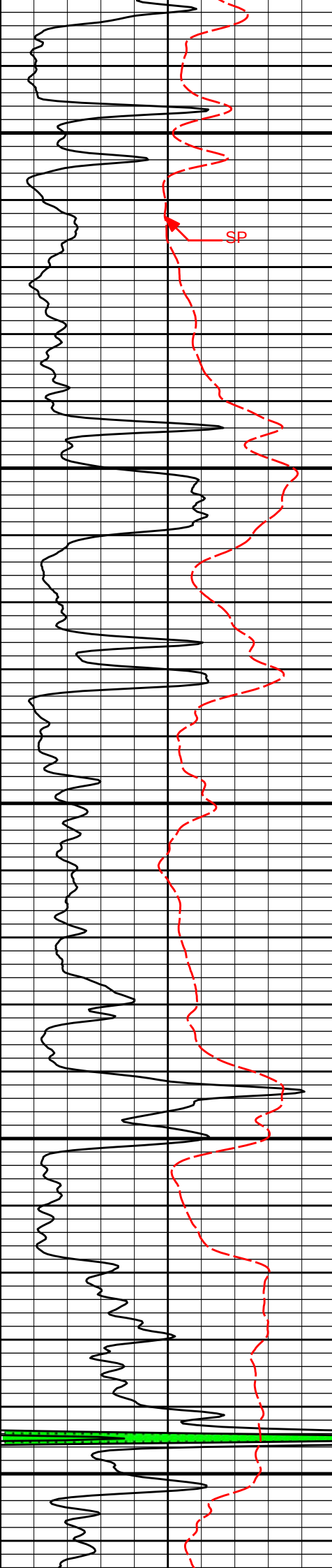




4100

4200



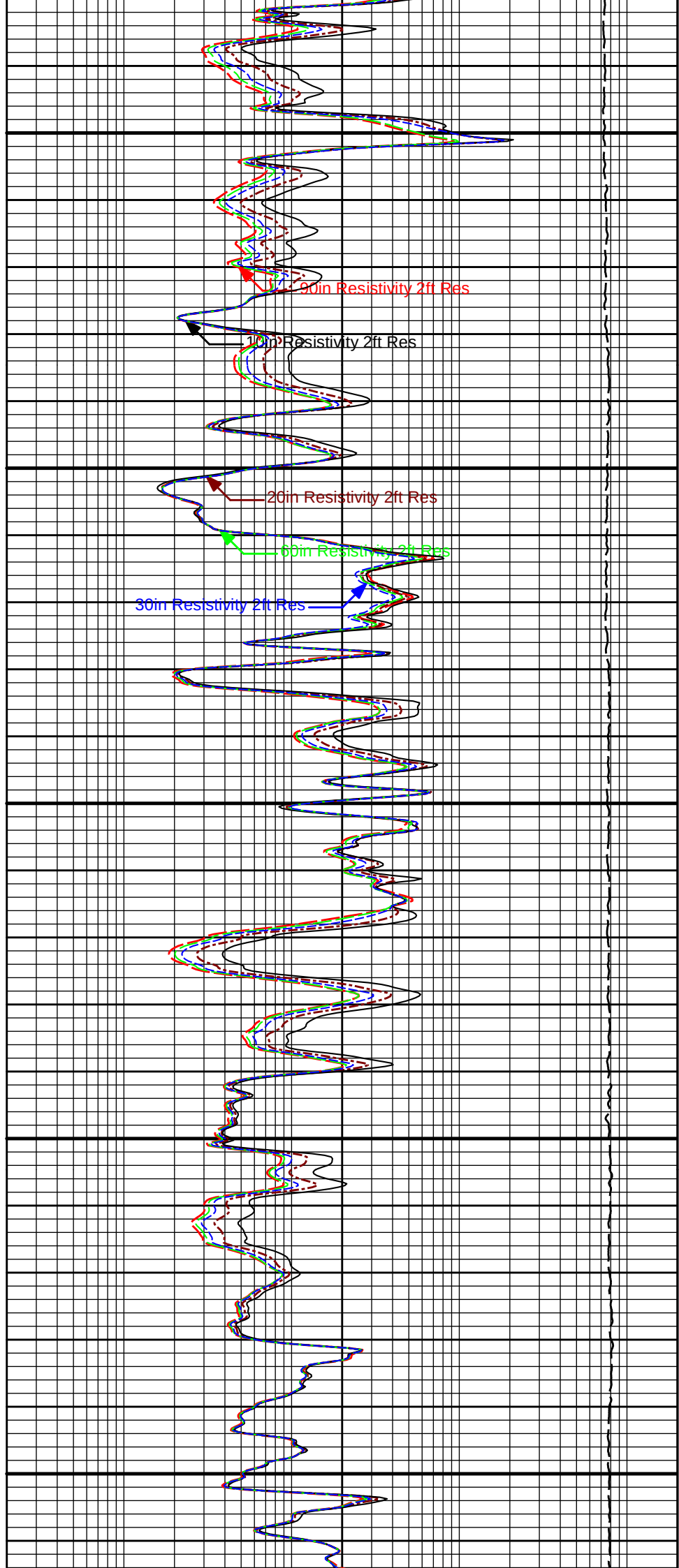


4300

SP

4400

4500



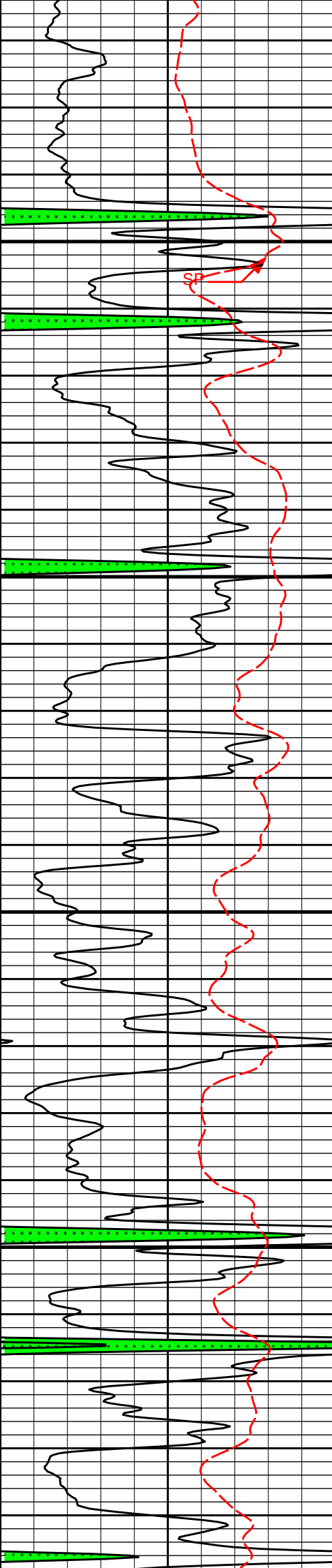
90in Resistivity 2ft Res

10in Resistivity 2ft Res

20in Resistivity 2ft Res

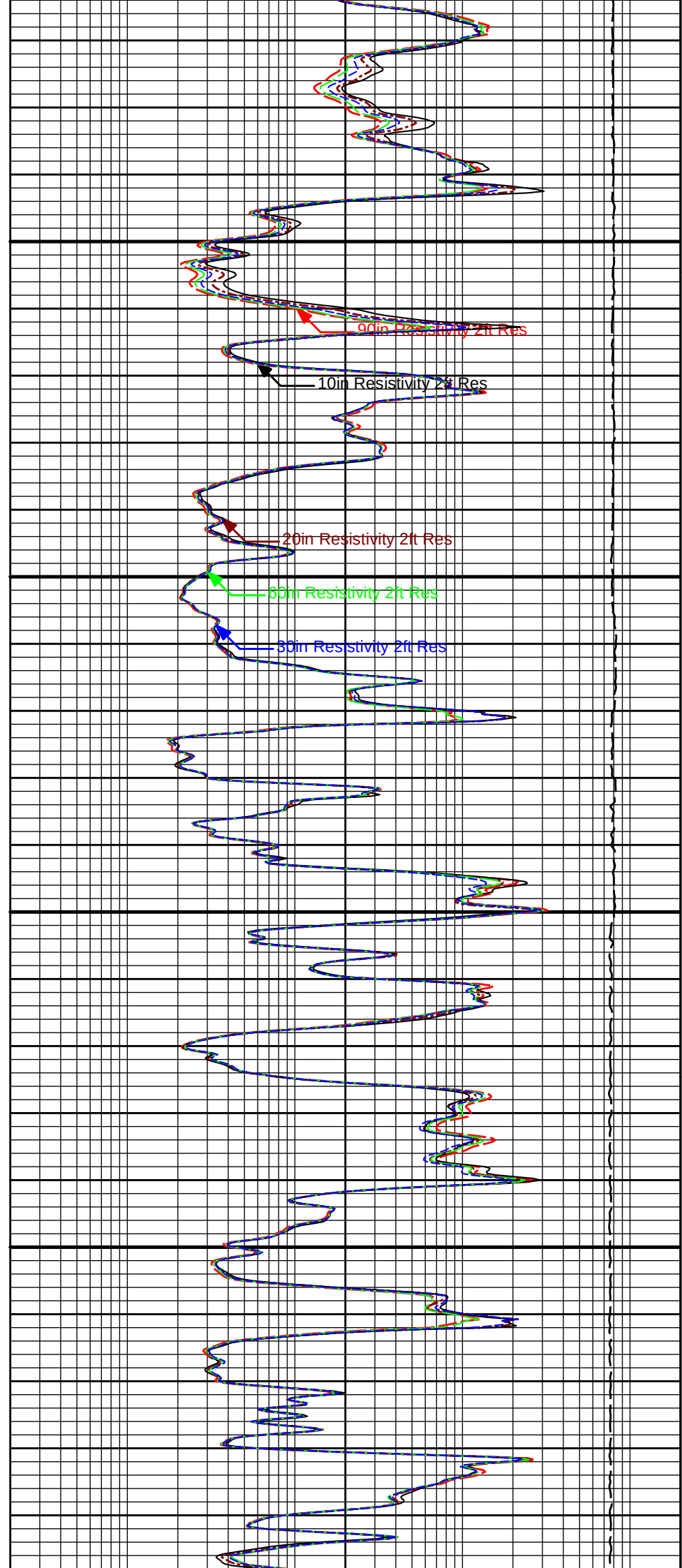
60in Resistivity 2ft Res

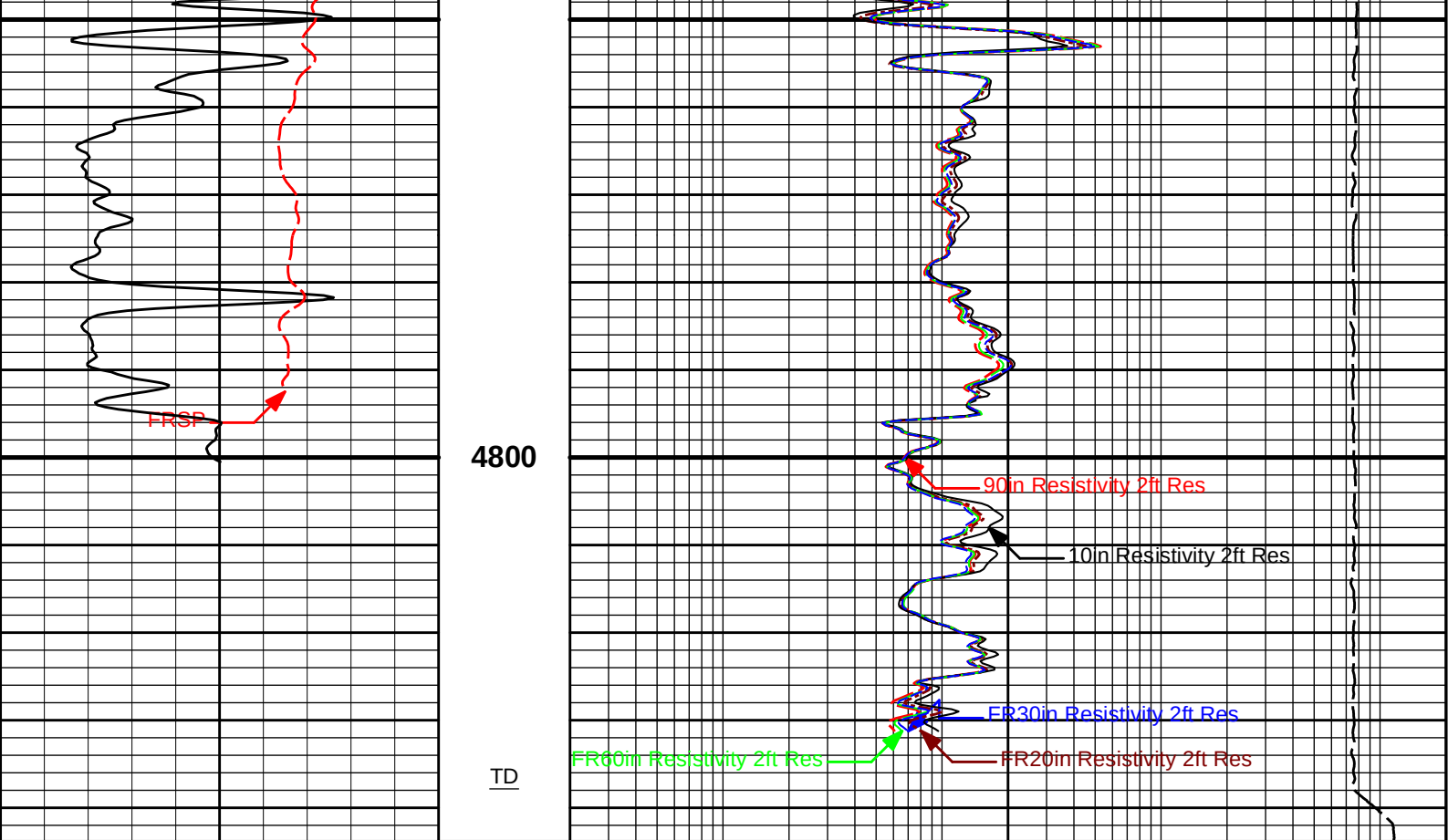
30in Resistivity 2ft Res



4600

4700





0	Gamma API	150	1 : 240 ft	15K	Tension	0
	api				pounds	
	SP			0.2	90in Resistivity 2ft Res	2000
	-]20[+				ohm-metre	
				0.2	60in Resistivity 2ft Res	2000
					ohm-metre	
				0.2	30in Resistivity 2ft Res	2000
					ohm-metre	
				0.2	20in Resistivity 2ft Res	2000
					ohm-metre	
				0.2	10in Resistivity 2ft Res	2000
					ohm-metre	

HALLIBURTON

Plot Time: 13-Oct-18 01:42:00
Plot Range: 3790 ft to 4843.83 ft
Data: HERMAN_YOST4-28\Well Based\DETAILS\
Plot File: \\-LOCAL-\\HERMAN_YOST4-28\Well Based\ACRT\ACRT_5inch_MAIN

5 INCH MAIN LOG

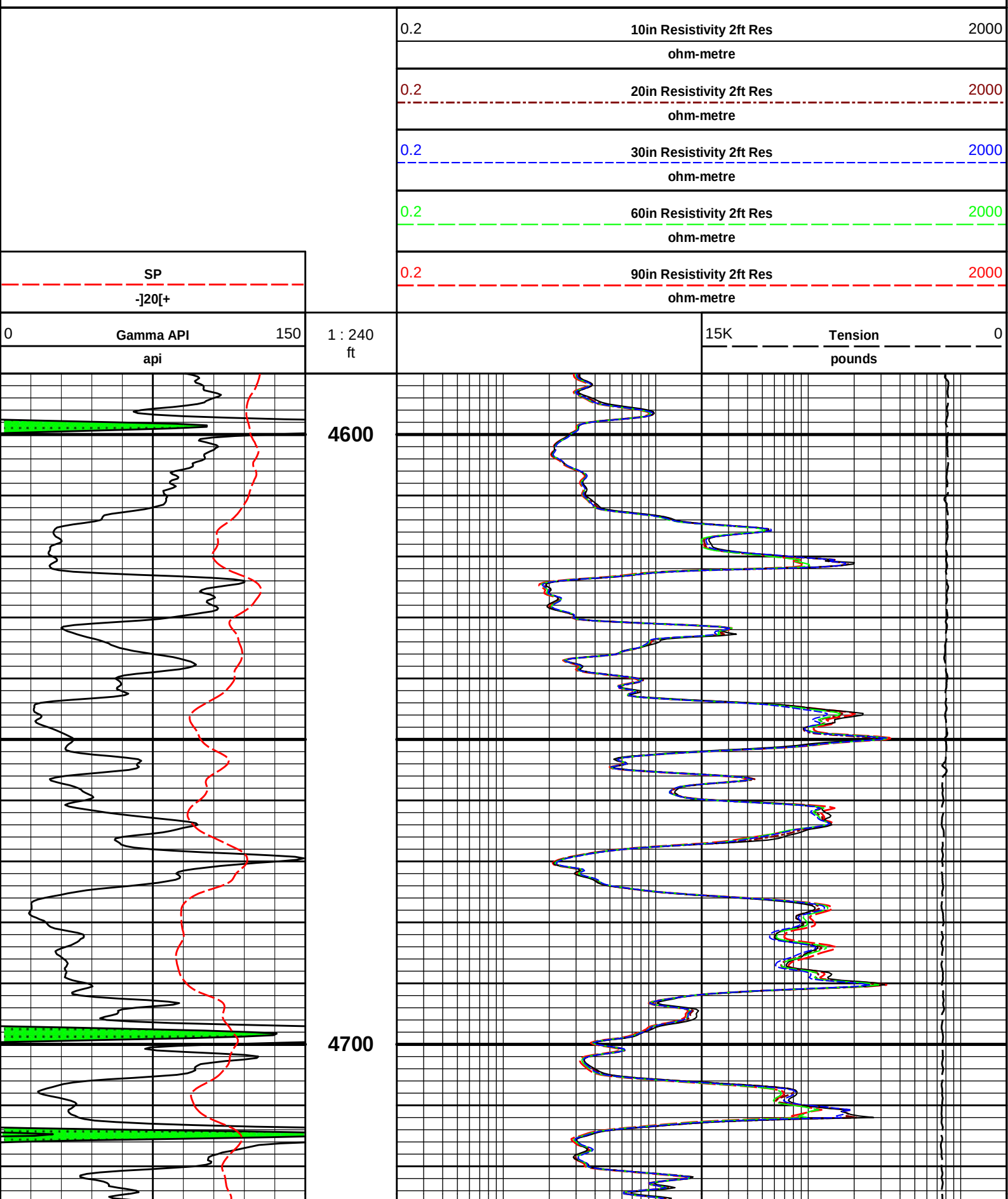
MAIN LOG 5" PER 100'

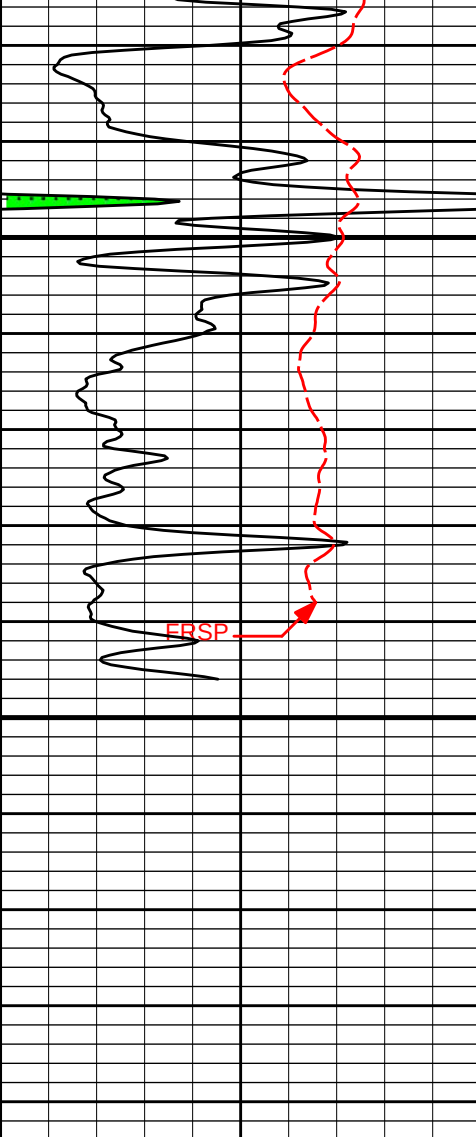
HALLIBURTON

Plot Time: 13-Oct-18 01:42:00
Plot Range: 4590 ft to 4844 ft
Data: HERMAN_YOST4-28\Well Based\REPEAT\
Plot File: \\-LOCAL-\\HERMAN_YOST4-28\Well Based\ACRT\ACRT_5inch_REPEAT

5 INCH REPEAT SECTION

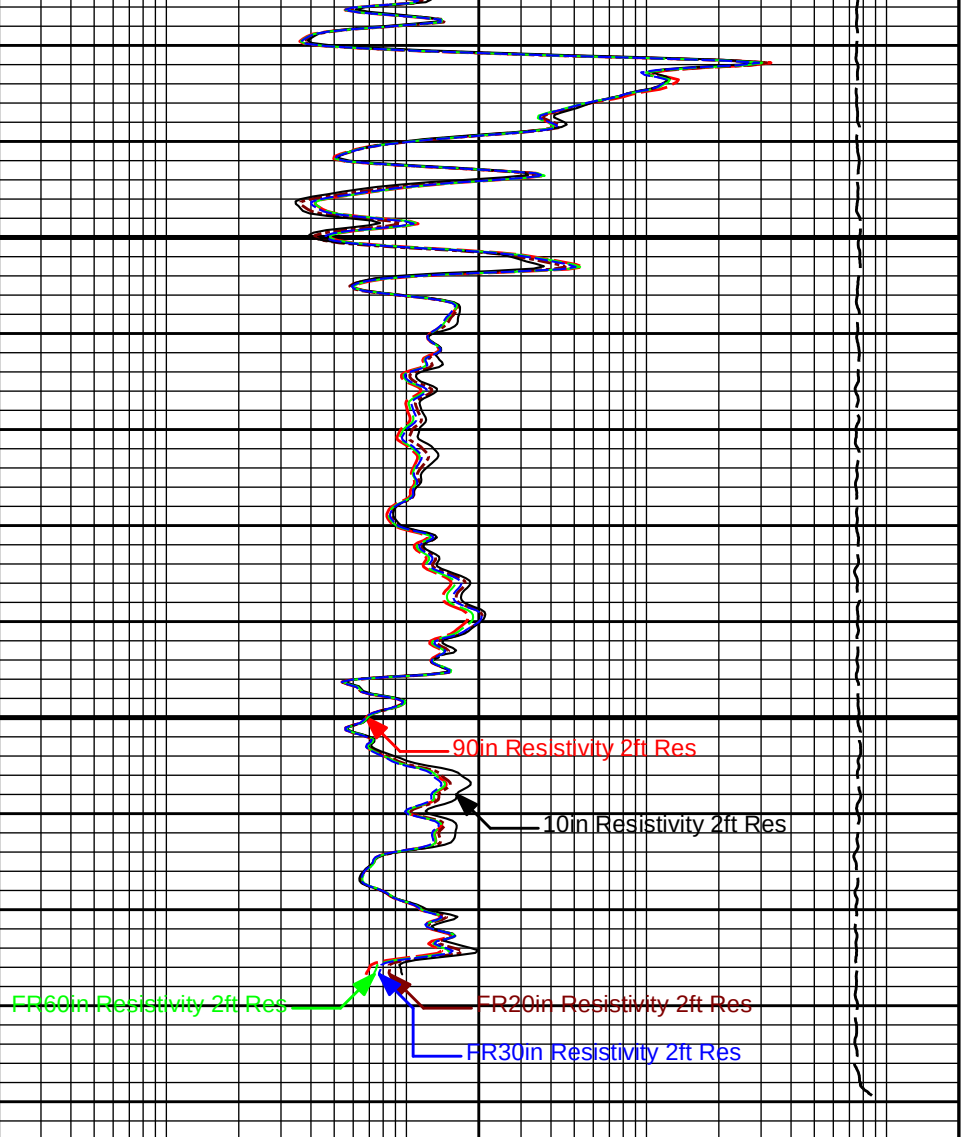
REPEAT SECTION 5" PER 100'





4800

TD



0	Gamma API	150
	api	
	SP	
	-]20[+	

1 : 240
ft

15K	Tension	0
	pounds	

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

HALLIBURTON

Plot Time: 13-Oct-18 01:42:01
Plot Range: 4590 ft to 4844 ft
Data: HERMAN_YOST4-28\Well Based\REPEAT\
Plot File: \\-LOCAL-\\HERMAN_YOST4-28\Well Based\ACRT\ACRT_5inch_REPEAT

5 INCH REPEAT SECTION

REPEAT SECTION 5" PER 100'

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	CSTR	Compressive Strength	1000.00	psia
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	4840.00	ft
	SHARED	BHT	Bottom Hole Temperature	120.0	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	
	SHARED	SOCI	Source of Casing Information	Parameters	
	SHARED	MSAL	Water-base mud filtrate salinity	0.00	ppm
	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	
	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	DNSO	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	UCLA	Classic Neutron Parameter utilized?	No	
	DSNT	BHSM	Borehole Size Source Tool	SDLT	

225.9

223.2

2.7

+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 11019641	Reference Calibration Date:	04-Aug-18 12:03:14
Engineer:	SCHLIEM	Calibration Date:	04-Aug-18 12:26:27
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1

Logging Source S/N: DSN-436
Tank Serial Number: EL RENO HWT
Reference value assigned to Tank: 56.100
Snow Block S/N: 12156883
Calibration Tank Water Temperature: 89 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.97922	0.97742	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2364	0.2358	0.0006	+/- 0.0020
Calibrated Ratio:	10.5794	10.5599	0.019	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0667	0.02000 - 0.09000

PASS/FAIL SUMMARY	
Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed

DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name:	DSNT - 11019641	Reference Calibration Date:	04-Aug-18 12:26:27
Engineer:	SEAN WOLTEMATH	Calibration Date:	10-Oct-18 14:28:25
Software Version:	WL INSITE R5.8.9 (Build 6)	Calibration Version:	1

Logging Source S/N: DSN-436
Snow Block S/N: 12156883

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0667	0.0766	0.0099	+/- 0.0150

PASS/FAIL SUMMARY	
Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	SDLT - 10960494	Reference Calibration Date:	01-Jan-70 00:00:00
Engineer:	SEAN WOLTEMATH	Calibration Date:	10-Oct-18 14:49:27
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1
Host Tool Name:	DSNT - 11019641		

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On

Measurement	Previous Value	New Value	New Value
Pad Offset	-3977.11	-3977.11	-7000.00 - -1000.00
Pad Gain	0.0003897	0.0003897	0.0002000 - 0.0006000
Arm Offset	-3073.13	-3073.13	-5000.00 - 3000.00
Arm Gain	0.0005210	0.0005210	0.000300 - 0.000700
Arm Power	-0.000005094	-0.000005094	-0.000010000 - 0.000010000

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Tool Diameter: 4.50 in

CALIBRATION RINGS				
Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				
Small Ring (in)	2.00	2.00	0.00	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.50	6.50	0.00	+/- 0.20
Medium Ring (in)	8.25	8.25	0.00	+/- 0.20
Large Ring (in)	15.00	15.00	0.00	+/- 0.20

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed
PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed

SDLT CALIPER FIELD CALIBRATION

Tool Name:	SDLT - 10960494	Reference Calibration Date:	10-Oct-18 14:49:27
Engineer:	SEAN WOLTEMATH	Calibration Date:	10-Oct-18 15:10:30
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.79	0.04	+/- 0.10
Ring Diameter	8.25	8.25	-0.00	+/- 0.15
PASS/FAIL SUMMARY				
Pad Extension Check:			Passed	
Diameter Check:			Passed	

MICRO LOG SHOP CALIBRATION

Tool Name:	Microlog Pad - 10960494	Reference Calibration Date:	08-Jun-18 16:08:54
Engineer:	WHITLOCK	Calibration Date:	30-Sep-18 13:47:51
Software Version:	WL INSITE R5.8.9 (Build 6)	Calibration Version:	1
Host Tool Name:	DSNT - 11019641		

CALIBRATION COEFFICIENT SUMMARY					
Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.07	-0.14	-0.00	-0.01	ohmm
Calibration Point #1	0.07	0.00	0.00	0.00	ohmm
Calibration Point #2	20.01	20.00	19.95	20.00	ohmm
Internal Reference	19.84	19.83	19.92	19.97	ohmm
Measurement	Micro Log Normal Tool Value		Micro Log Lateral Tool Value		Units
Tool Zero	-0.08		0.35		V
Calibration Point #1	37.72		2.09		V

Calibration Point #2	5356.95	6956.77	V
Internal Reference	5312.51	6945.81	V

MICRO LOG FIELD CHECK			
Tool Name:	Microlog Pad - 10960494	Reference Calibration Date:	30-Sep-18 13:47:51
Engineer:	SEAN WOLTEMATH	Calibration Date:	10-Oct-18 14:04:57
Software Version:	WL INSITE R5.8.9 (Build 6)	Calibration Version:	1

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Shop	Field	Shop	Field	
Tool Zero	-0.14	-0.14	-0.01	-0.01	ohmm
Internal Reference	19.83	19.79	19.97	19.93	ohmm
Summary					
Signal	Shop	Field	Difference		Tolerance
Microlog Normal	19.83	19.79	0.04		+/- 0.80
Microlog Lateral	19.97	19.93	0.04		+/- 0.80

SPECTRAL DENSITY SHOP CALIBRATION			
Tool Name:	SDLT Pad - 11213308	Reference Calibration Date:	17-Sep-18 12:07:25
Engineer:	WHITLOCK	Calibration Date:	17-Sep-18 12:30:06
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1

Logging Source S/N: 5475GW			
Aluminum Block S/N: EL RENO		Density: 2.581g/cc	Pe: 3.170
Magnesium Block S/N: EL RENO		Density: 1.687g/cc	Pe: 2.594

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0089	1.0095	0.90 - 1.10
Near Dens Gain	0.9949	0.9972	0.90 - 1.10
Near Peak Gain	1.0098	1.0259	0.90 - 1.10
Near Lith Gain	1.0052	1.0142	0.90 - 1.10
Far Bar Gain	1.0078	1.0061	0.90 - 1.10
Far Dens Gain	0.9950	0.9953	0.90 - 1.10
Far Peak Gain	0.9901	0.9911	0.90 - 1.10
Far Lith Gain	0.9745	0.9764	0.90 - 1.10
Near Bar Offset	0.0471	0.0438	NONE
Near Dens Offset	0.1758	0.1544	NONE
Near Peak Offset	0.0270	-0.1077	NONE
Near Lith Offset	0.0345	-0.0412	NONE
Far Bar Offset	-0.0195	-0.0036	NONE
Far Dens Offset	0.1103	0.1086	NONE
Far Peak Offset	0.1339	0.1248	NONE
Far Lith Offset	0.2115	0.1964	NONE
Near Bar Background	945.62	947.60	700 - 1450
Near Dens Background	315.82	314.50	230 - 480
Near Peak Background	136.57	137.87	100 - 210
Near Lith Background	168.89	168.30	125 - 260
Far Bar Background	482.51	480.15	450 - 900
Far Dens Background	193.40	193.79	175 - 345
Far Peak Background	78.35	78.65	70 - 140
Far Lith Background	80.88	79.56	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change

	(Previous Cst.)	(New Cst.)	On Change	
MAGNESIUM				
Density (g/cc)	1.685	1.687	0.002	+/- 0.015
Pe	2.557	2.563	0.006	+/- 0.150
ALUMINUM				
Density (g/cc)	2.580	2.580	-0.000	+/- 0.01500
Pe	3.115	3.136	0.021	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0003	+/- 0.0110	0.0015	+/- 0.0140
Magnesium Block	0.0001	+/- 0.0110	-0.0007	+/- 0.0140
Aluminum Block	-0.0000	+/- 0.0110	-0.0006	+/- 0.0140
Resolution	9.24	6.00 - 11.50	9.28	6.00 - 11.50
Internal Verifier(B+D+P+L)	1568	1200 - 2700	832	800 - 1700

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

SPECTRAL DENSITY FIELD CHECK

Tool Name:	SDLT Pad - 11213308	Reference Calibration Date:	17-Sep-18 12:30:06
Engineer:	SEAN WOLTEMATH	Calibration Date:	10-Oct-18 14:13:05
Software Version:	WL INSITE R5.8.9 (Build 6)	Calibration Version:	1

Pad Temperature: 68.2 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1568.269	1563.061	-5.208	15.935
Far (B+D+P+L) cps	832.156	829.464	-2.692	15.879
Near Resolution	9.24	9.27	0.030	0.50
Far Resolution	9.28	9.42	0.140	1.00

PASS/FAIL SUMMARY	
Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	ACRt Sonde - 11830728	Reference Calibration Date:	23-Feb-18 10:15:37
Engineer:	WHITLOCK	Calibration Date:	06-Jun-18 13:24:46
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1
Host Tool Name:	ACRt Instrument - 11830684		

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0279	1.05	0.95	1.0076	1.05	0.95	0.9997	1.05

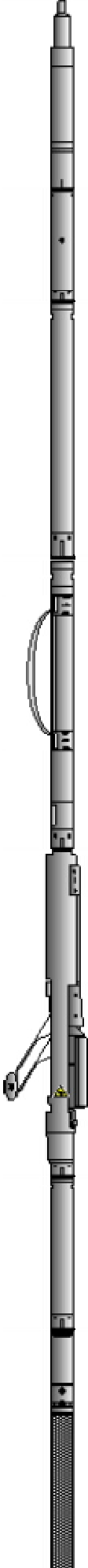
A2 (50")		0.95	1.0334	1.05	0.95	1.0139	1.05	0.95	1.0097	1.05
A3 (29")		0.95	1.0346	1.05	0.95	1.0146	1.05	0.95	1.0081	1.05
A4 (17")		0.95	1.0279	1.05	0.95	1.0063	1.05	0.95	1.0018	1.05
A5 (10")		N/A	N/A	N/A	0.95	1.0001	1.05	0.95	0.9950	1.05
A6 (6")		N/A	N/A	N/A	0.95	0.9869	1.05	0.95	0.9818	1.05
SONDE OFFSET										
Subarray	R12KHz			R36KHz			R72KHz			
(mmho/m)				(mmho/m)			(mmho/m)			
A1 (80")		0.315			-4.964			-5.711		
A2 (50")		0.409			-3.450			-5.485		
A3 (29")		-11.648			-3.720			-3.783		
A4 (17")		-90.980			-28.724			-23.707		
A5 (10")		N/A			-76.200			-37.537		
A6 (6")		N/A			280.488			149.005		
TRANSMITTER CURRENT GAIN						R-MUD VERIFICATION				
Signal		Lower	R	Upper		Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)	
12K		0.6	0.82	1.3		Mud Cell	0.95	0.99	1.05	
36K		1.0	1.80	2.0						
72K		1.0	1.05	2.0						
PASS/FAIL SUMMARY										
GAIN RANGE CHK						PASS				
SONDE OFFSET CHK						PASS				
TOOL OK TO LOG										

QUALITY CHECK SHOP CALIBRATION										
Tool Name:		ACRt Sonde - 11830728				Reference Calibration Date:		23-Feb-18 10:21:17		
Engineer:		WHITLOCK				Calibration Date:		06-Jun-18 14:01:20		
Software Version:		WL INSITE R5.6.3 (Build 4)				Calibration Version:		1		
Host Tool Name:		ACRt Instrument - 11830684								

STANDARD DEVIATIONS									
	R12KHz			R36KHz			R72KHz		
	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail
A1 (80")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A2 (50")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A3 (29")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A4 (17")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A5 (10")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A6 (6")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
AVERAGES									
	R12KHz			R36KHz			R72KHz		
	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail
A1 (80")	0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.006	> -0.500	Pass
A2 (50")	0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.005	> -0.500	Pass
A3 (29")	-0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.003	> -0.500	Pass
A4 (17")	-0.002	> -0.500	Pass	-0.006	> -0.500	Pass	-0.022	> -0.500	Pass
A5 (10")	-0.010	> -0.500	Pass	-0.017	> -0.500	Pass	-0.036	> -0.500	Pass
A6 (6")	0.014	< 0.500	Pass	0.063	< 0.500	Pass	0.138	< 0.500	Pass

GAIN TOLERANCE						
R12KHz						
	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail	
A1 (80")	-213173456.000	-213653808.000	480352.000	10682690.400	Pass	
A2 (50")	-205651744.000	-206143280.000	491536.000	10307164.000	Pass	
A3 (29")	-200817664.000	-201197776.000	380112.000	10059888.800	Pass	
A4 (17")	-200193568.000	-200629872.000	436304.000	10031493.600	Pass	
A5 (10")	-200252336.000	-200678960.000	426624.000	10033948.000	Pass	
A6 (6")	-199820688.000	-200219344.000	398656.000	10010967.200	Pass	
R36KHz						
	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail	
A1 (80")	48114080.000	48477272.000	363192.000	2423863.600	Pass	
A2 (50")	33966292.000	34324412.000	358120.000	1716220.600	Pass	
A3 (29")	28032378.000	28346680.000	314302.000	1417334.000	Pass	
A4 (17")	27853682.000	28207516.000	353834.000	1410375.800	Pass	
A5 (10")	27373208.000	27716930.000	343722.000	1385846.500	Pass	
A6 (6")	26035236.000	26360300.000	325064.000	1318015.000	Pass	
R72KHz						
	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail	
A1 (80")	-92927656.000	-93022904.000	95248.000	4651145.200	Pass	
A2 (50")	-90501024.000	-90617752.000	116728.000	4530887.600	Pass	
A3 (29")	-88192472.000	-88292832.000	100360.000	4414641.600	Pass	
A4 (17")	-88397088.000	-88515880.000	118792.000	4425794.000	Pass	
A5 (10")	-86957704.000	-87076952.000	119248.000	4353847.600	Pass	
A6 (6")	-87976216.000	-88080696.000	104480.000	4404034.800	Pass	
PASS/FAIL SUMMARY						
Std Deviation Verification				Pass		
Average Verification				Pass		
Gain Tolerance Verification				Pass		
CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11013113						
Gamma Ray Calibrator	225.9	223.2	-----	2.7	+/- 9.00	api
DSNT-11019641						
Snow-Block Porosity	0.0667	0.0766	-----	-0.0099	+/- 0.0150	decp
SDLT-10960494						
Pad Extension	3.75	3.79	-----	-0.04	+/-0.10	in
Ring Diameter	8.25	8.25	-----	0.00	+/-0.15	in
Microlog Pad-10960494						
MicroLog Normal	19.83	19.79	-----	0.04	+/-0.80	ohmm
MicroLog Lateral	19.97	19.93	-----	0.04	+/-0.80	ohmm
SDLT Pad-11213308						
Near(B+D+P+L)	1568.269	1563.061	-----	5.208	+/-15.935	cps
Far(B+D+P+L)	832.156	829.464	-----	2.692	+/-15.879	cps
ACRt Sonde-11830728						
Mud Cell	0.99	-----	-----	0	-----	ohm-m
Data: HERMAN_YOST4-28\0001 RWCH-SP-GTET-DSNT-SDLT-ACRT\IDLE				Date: 12-Oct-18 23:13:27		

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						58.59 ft
RWCH-12345678 135.00 lbs	Weak Point Solid- 00000025 0.01 lbs	Ø 2.310 in →		← Fishing Neck @ 57.71 ft		
		Ø 3.625 in →		← Load Cell @ 54.91 ft ← BH Temperature @ 54.34 ft	6.25 ft	
		Ø 0.010 in* →				52.34 ft
SP Sub-11812437 60.00 lbs		Ø 3.625 in →		← SP @ 50.56 ft	3.74 ft	
				← Z-Accelerometer @ 48.15 ft		48.60 ft
GTET-11013113 165.00 lbs		Ø 3.625 in →			8.52 ft	
				← GammaRay @ 42.54 ft		40.08 ft
DSNT-11019641 174.00 lbs	DSN Decentralizer- 11019641 6.60 lbs	Ø 5.000 in* → Ø 3.625 in →			9.69 ft	
				← DSN Far @ 33.15 ft ← DSN Near @ 32.40 ft		30.40 ft
SDLT-10960494 360.00 lbs	SDLT Pad-11213308 65.00 lbs Microlog Pad-10960494 8.00 lbs RAM-Cs137-00005475 1.00 lbs	Ø 4.500 in → Ø 4.500 in* → Ø 4.750 in* → Ø 0.800 in* →		← Microlog @ 22.58 ft ← SDL Caliper @ 22.40 ft ← SDL @ 22.39 ft	10.81 ft	
						19.58 ft
ACRt Instrument- 11830684 50.00 lbs		Ø 3.625 in →			5.03 ft	
				← Mud Resistivity @ 13.19 ft		14.55 ft
				← ACRt @ 9.21 ft		
ACRt Sonde- 11830728 200.00 lbs		Ø 3.625 in →			14.22 ft	

Bull Nose-00000001
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)
RWCH	Releasable Wireline Cable Head	12345678	135.00	6.25	52.34	300.00
WPSS	Weak Point Solid	00000025	0.01	0.01	* 52.34	300.00
SP	SP Sub	11812437	60.00	3.74	48.60	300.00
GTET	Gamma Telemetry Tool	11013113	165.00	8.52	40.08	60.00
DSNT	Dual Spaced Neutron	11019641	174.00	9.69	30.40	60.00
DCNT	DSN Decentralizer	11019641	6.60	5.13	* 33.73	300.00
SDLT	Spectral Density Tool	10960494	360.00	10.81	19.58	60.00
SDLP	Density Insite Pad	11213308	65.00	2.55	* 21.79	60.00
Cs137	Logging Source, SDLT-I, 1.78 Ci - Cs137	00005475	1.00	0.80	* 22.02	300.00
MICP	Microlog Pad	10960494	8.00	1.00	* 22.08	60.00
ACRt	Array Compensated True Resistivity Instrument Section	11830684	50.00	5.03	14.55	120.00
ACRt	Array Compensated True Resistivity Sonde Section	11830728	200.00	14.22	0.33	120.00
BLNS	Bull Nose	00000001	5.00	0.33	0.00	300.00

Total			1,229.61	58.59	* Not included in Total Length and Length Accumulation.
Data: HERMAN_YOST4-28\0001 RWCH-SP-GTET-DSNT-SDLT-ACRT\004 12-Oct-18 22:56 Up @4844.3f					
				Date: 12-Oct-18 23:08:40	

COMPANY HERMAN L. LOEB, LLC

WELL YOST 4-28

FIELD EINSEL

COUNTY KIOWA STATE KANSAS

HALLIBURTON

ARRAY COMPENSATED
TRUE RESISTIVITY
LOG