

HALLIBURTON										ARRAY COMPENSATED TRUE RESISTIVITY LOG				
COMPANY					STRATA EXPLORATION									
WELL					RICHARDSON 1-3									
FIELD					GREENSBURG									
COUNTY					KIOWA									
STATE					KANSAS									
Permanent Datum					GL					Elev.: 2208.0 ft				
Log measured from					KB					D.F. 2217.0 ft				
Drilling measured from					KB					G.L. 2208.0 ft				
Date					10-Apr-12									
Run No.					ONE									
Depth - Driller					4890.00 ft									
Depth - Logger					4890.0 ft									
Bottom - Logged Interval					4880.0 ft									
Top - Logged Interval					625.0 ft									
Casing - Driller					8.625 in @ 622.0 ft					@				
Casing - Logger					622.0 ft									
Bit Size					7.875 in					@				
Type Fluid in Hole					WATER BASED MUD									
Density					9.2 ppg		65.00 s/qt							
PH					10.00 pH		10.8 cp/m							
Source of Sample					FLOW LINE									
Rm @ Meas. Temperature					0.310 ohmm		@ 75.00 degF			@				
Rmf @ Meas. Temperature					0.27 ohmm		@ 75.00 degF			@				
Rmc @ Meas. Temperature					0.360 ohmm		@ 75.00 degF			@				
Source Rmf					Rmc		MEAS							
Rm @ BHT					0.22 ohmm		@ 109.0 degF			@				
Time Since Circulation					10.0 hr									
Time on Bottom					10-Apr-12 09:46									
Max. Rec. Temperature					109.0 degF		@ 4890.0 ft			@				
Equipment					Location		10546696			LIBERAL				
Recorded By					T. HYDE									
Witnessed By					J. CHRISTENSEN									

Fold here

Service Ticket No.: 9425816						API Serial No.: 15-097-21721-00-00						PGM Version: WL INSITE R3.4.2 (Build 2)																	
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				1.5" S.O.				N/A			
Rmc @ Meas. Temp.				@				@						I962_S909															
Source Rmf		Rmc																											
Rm @ BHT				@				@																					
Rmf @ BHT				@				@																					
Rmc @ BHT				@				@																					
EQUIPMENT DATA																													
GAMMA						ACOUSTIC						DENSITY						NEUTRON											
Run No.		ONE				Run No.						Run No.						Run No.											
Serial No.		11039640				Serial No.						Serial No.						Serial No.											
Model No.		GTET				Model No.						Model No.						Model No.											
Diameter		3.625"				No. of Cent.						Diameter						Diameter											
Detector Model No.		T-102				Spacing						Log Type						Log Type											
Type		SCINT										Source Type						Source Type											
Length		8"				LSA [Y/N]						Serial No.						Serial No.											
Distance to Source		10'				FWDA [Y/N]						Strength						Strength											

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	4890	625	REC	0	150									
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING														
CHLORIDES 7000 MG/L														
LCM 1 PPB														
TODAY'S CREW K. KING V. JAMIE														
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KANSAS 620-624-8123														
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.														
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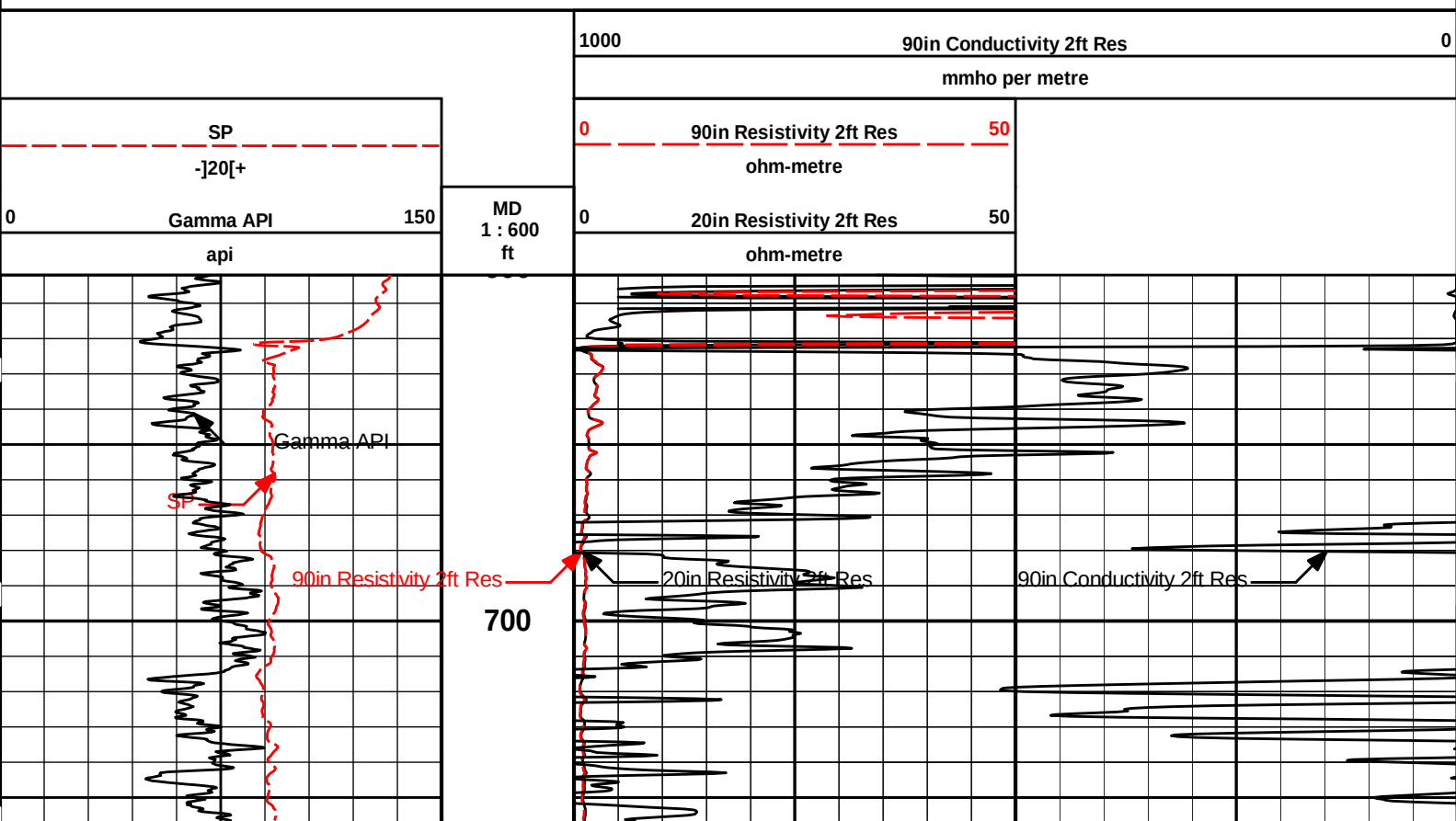
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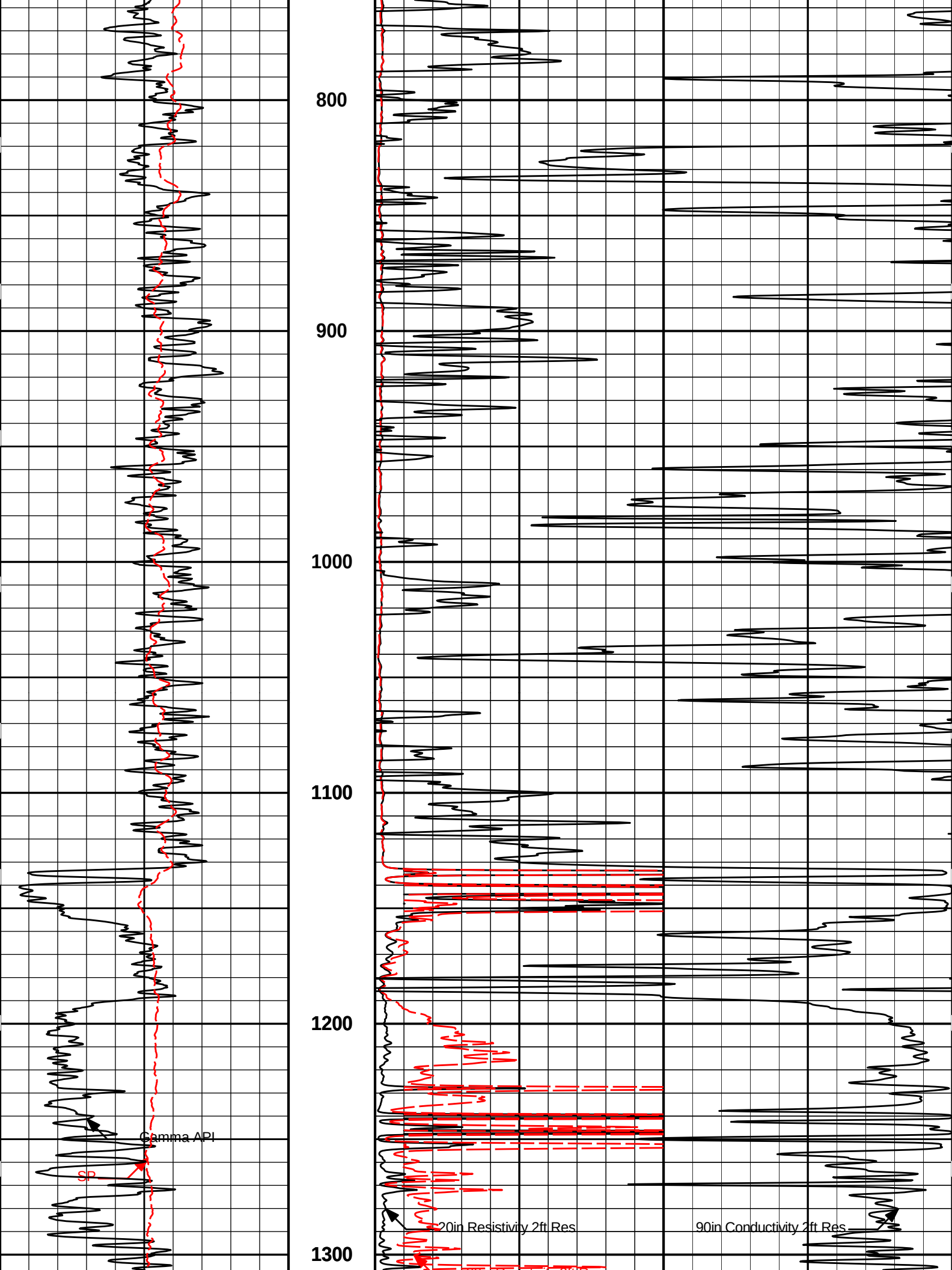
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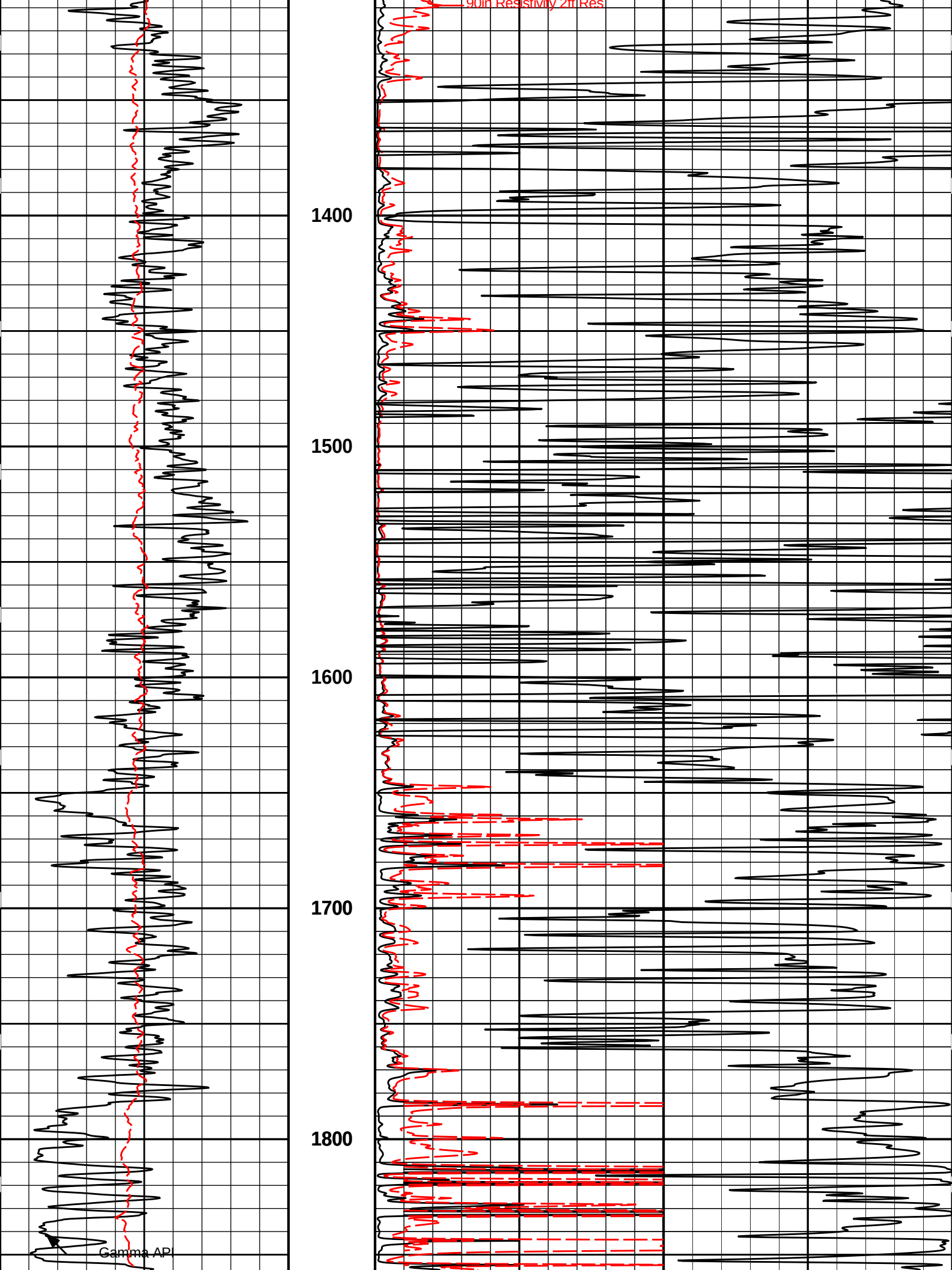
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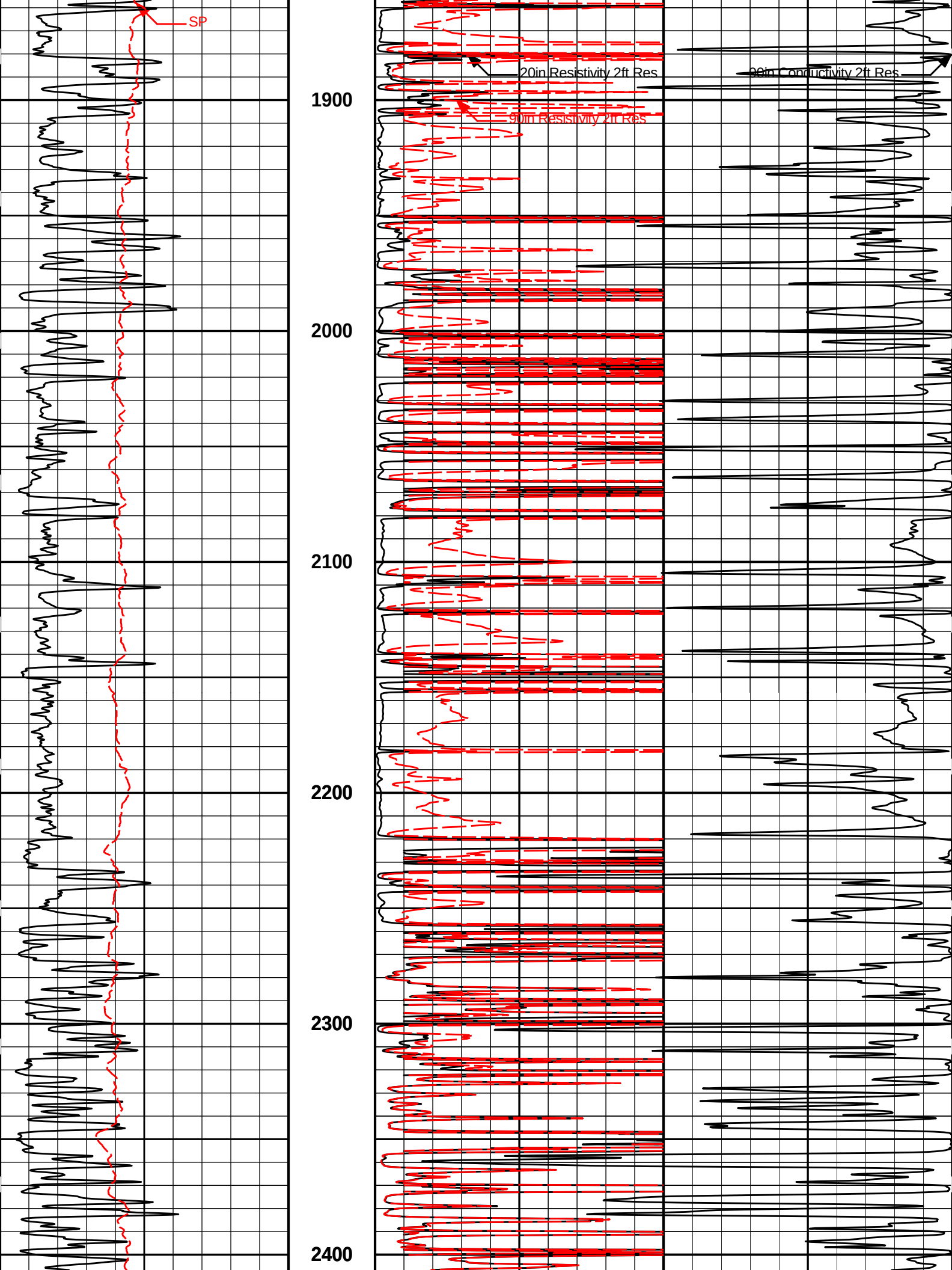
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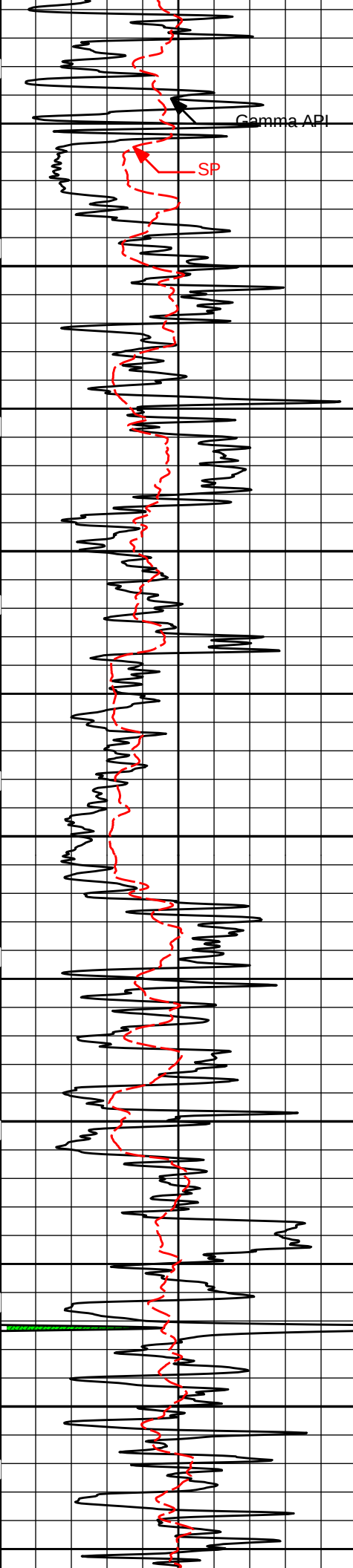
2 INCH MAIN LOG











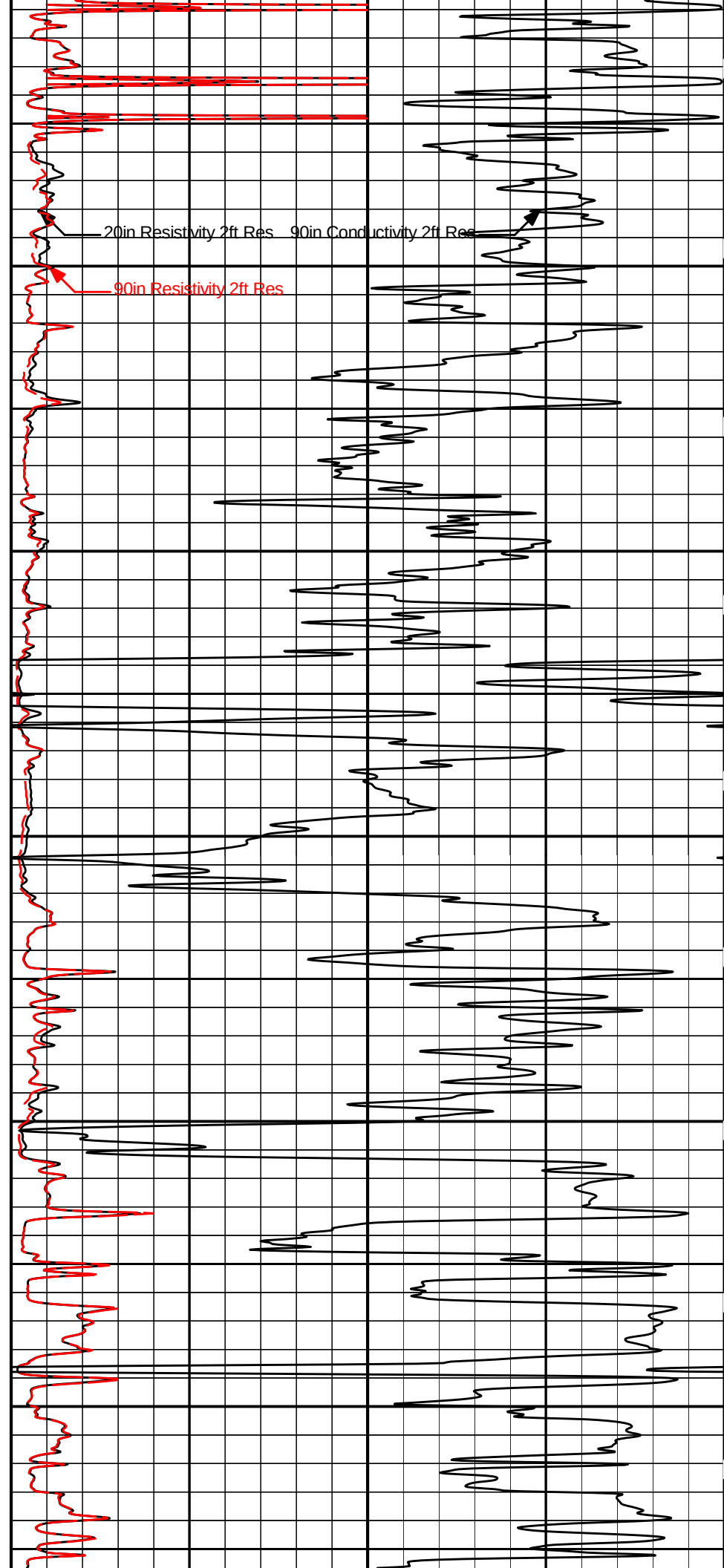
2500

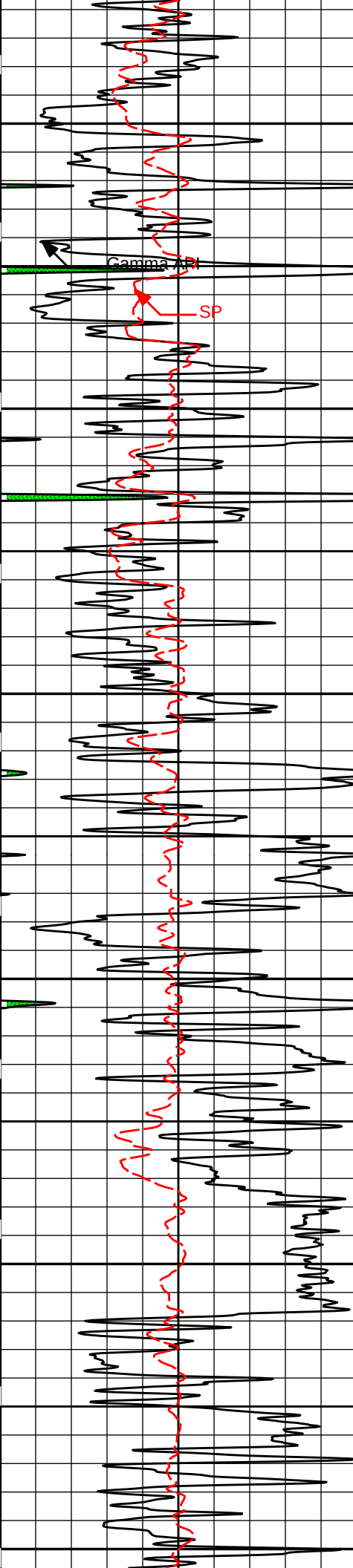
2600

2700

2800

2900





3000

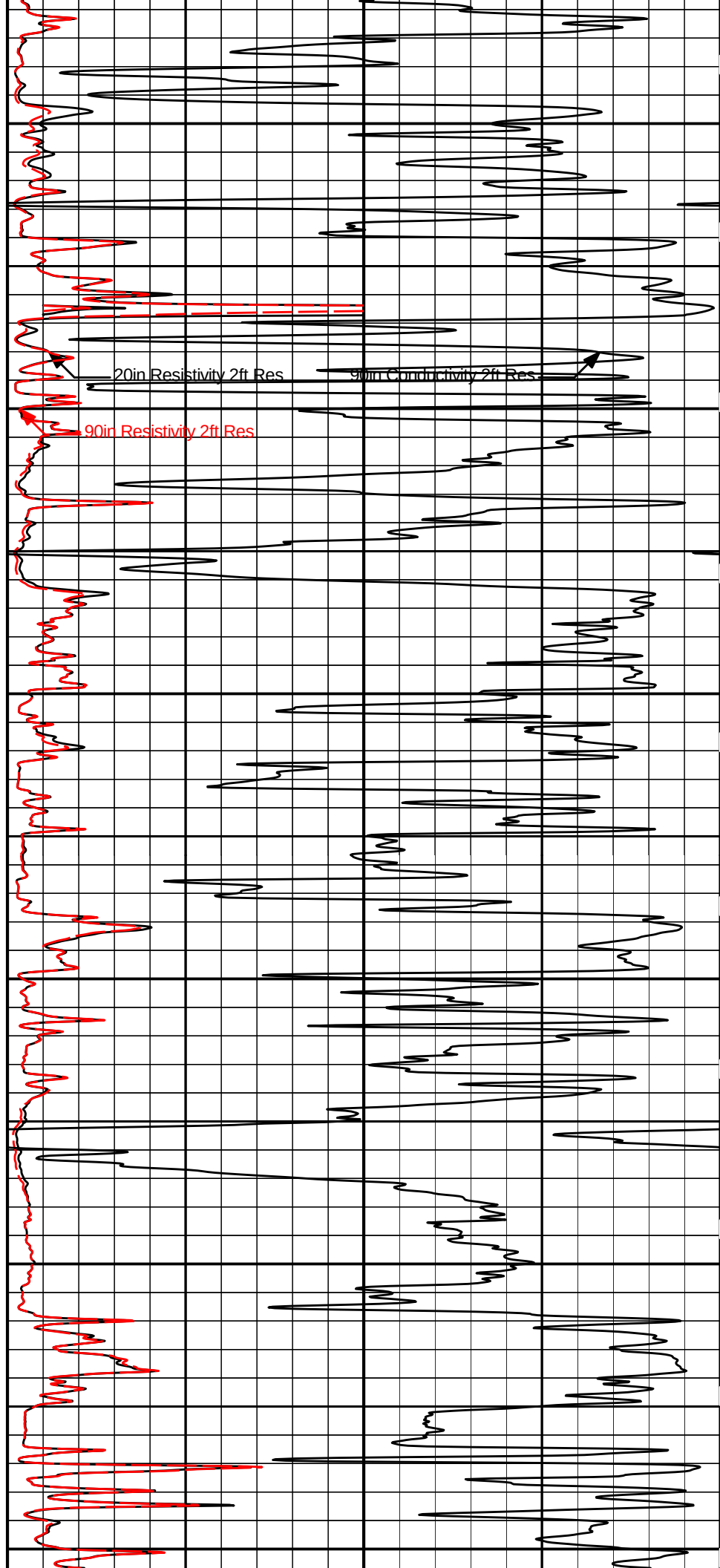
3100

3200

3300

3400

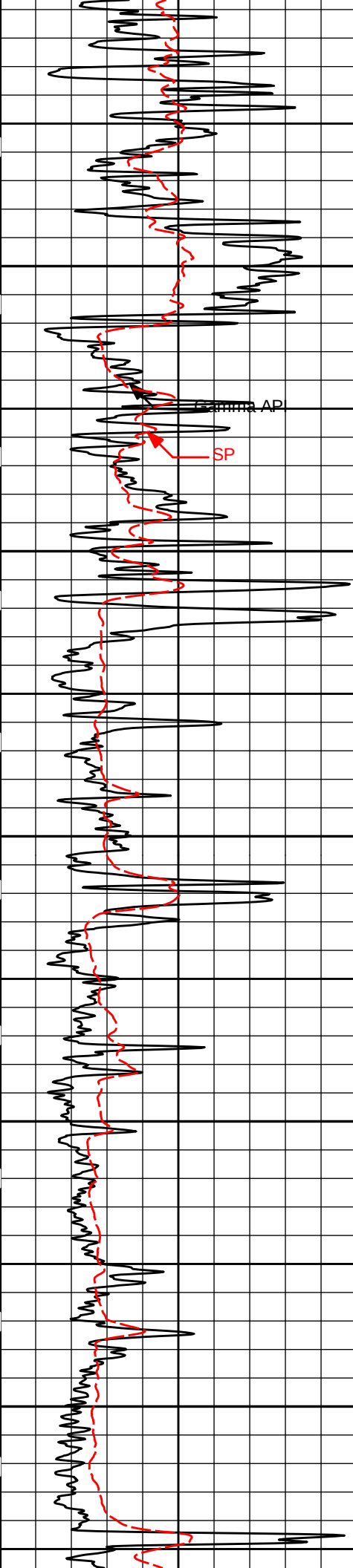
3500



20in Resistivity 2ft Res

90in Conductivity 2ft Res

90in Resistivity 2ft Res



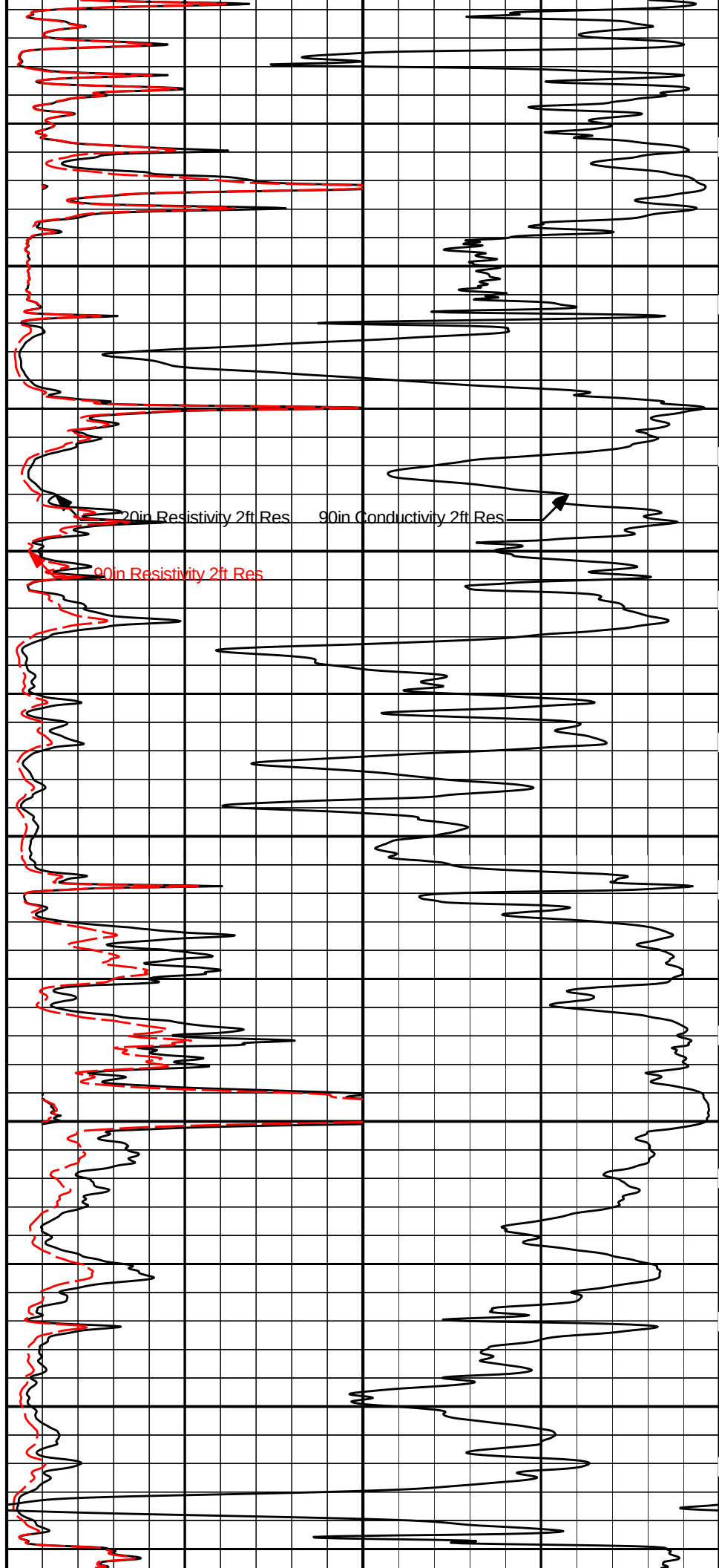
3600

3700

3800

3900

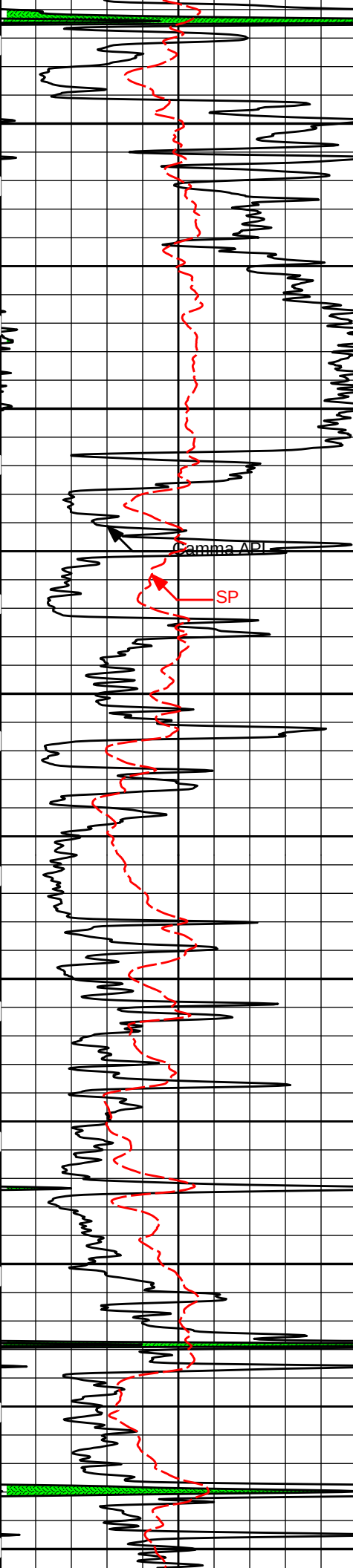
4000



20in Resistivity 2ft Res

90in Conductivity 2ft Res

90in Resistivity 2ft Res



4100

4200

4300

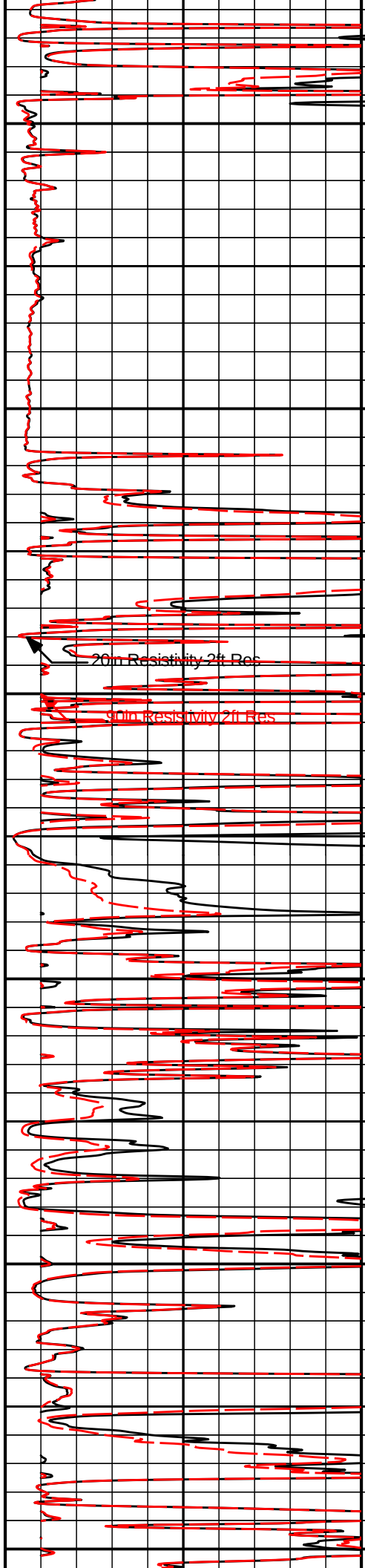
4400

4500

4600

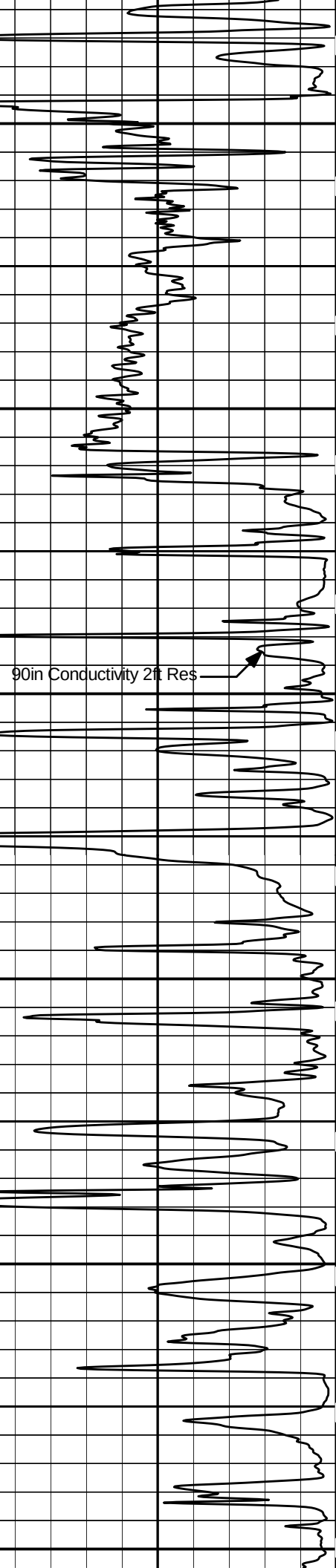
Gamma API

SP

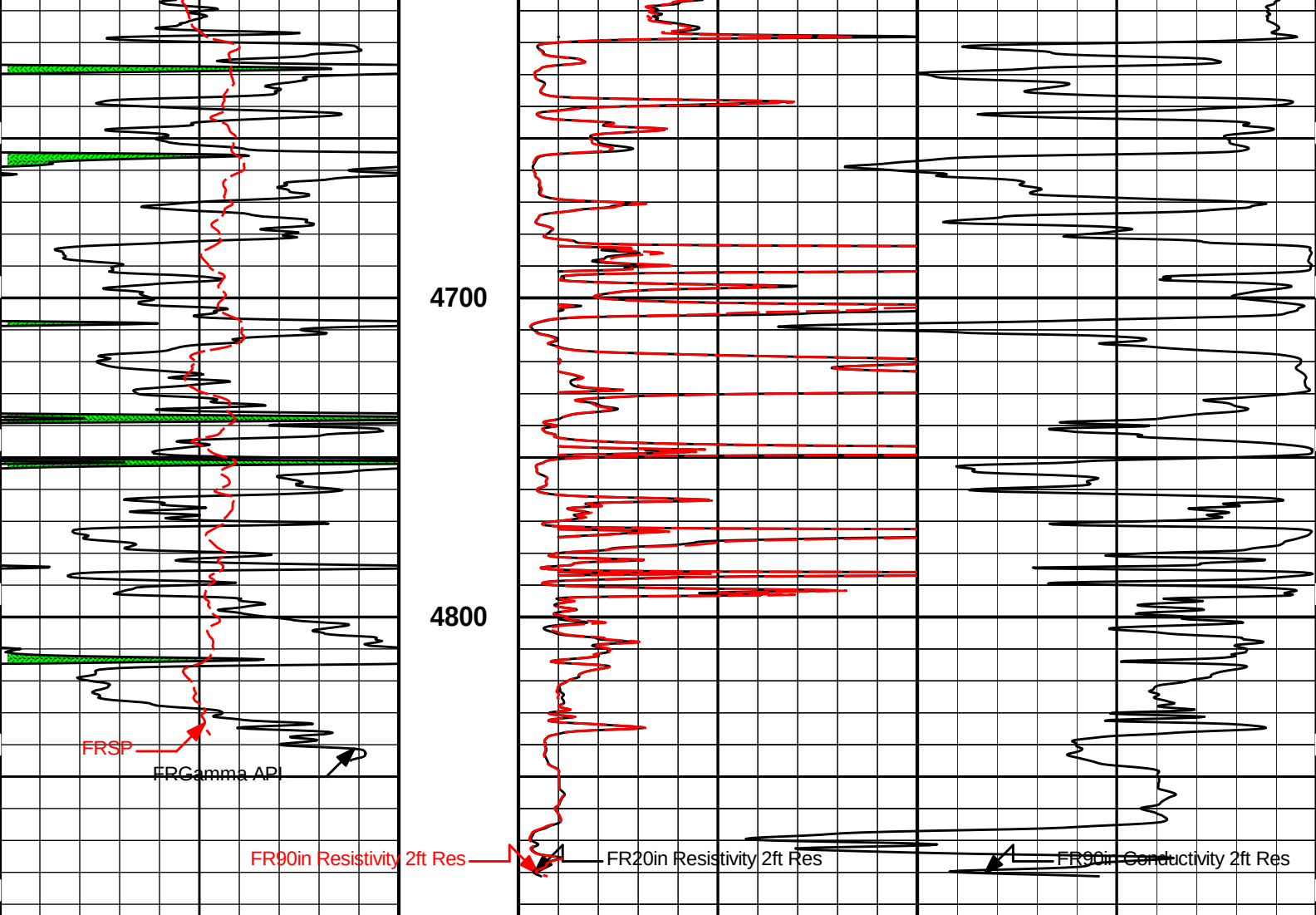


20in Resistivity 2ft Res

90in Resistivity 2ft Res



90in Conductivity 2ft Res



0	Gamma API	150	MD	1 : 600	ft	0	20in Resistivity 2ft Res	50	
	api						ohm-metre		
	SP					0	90in Resistivity 2ft Res	50	
	-]20[+						ohm-metre		
						1000	90in Conductivity 2ft Res		0
							mmho per metre		

HALLIBURTON

Plot Time: 10-Apr-12 11:18:54
Plot Range: 602 ft to 4894.25 ft
Data: {ActiveWell}\Well Based\DAQ Current\
Plot File: \\-LOCAL-\\RICHARDSON_1_3\\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHI\\ACRT\\ACRT_2_lib

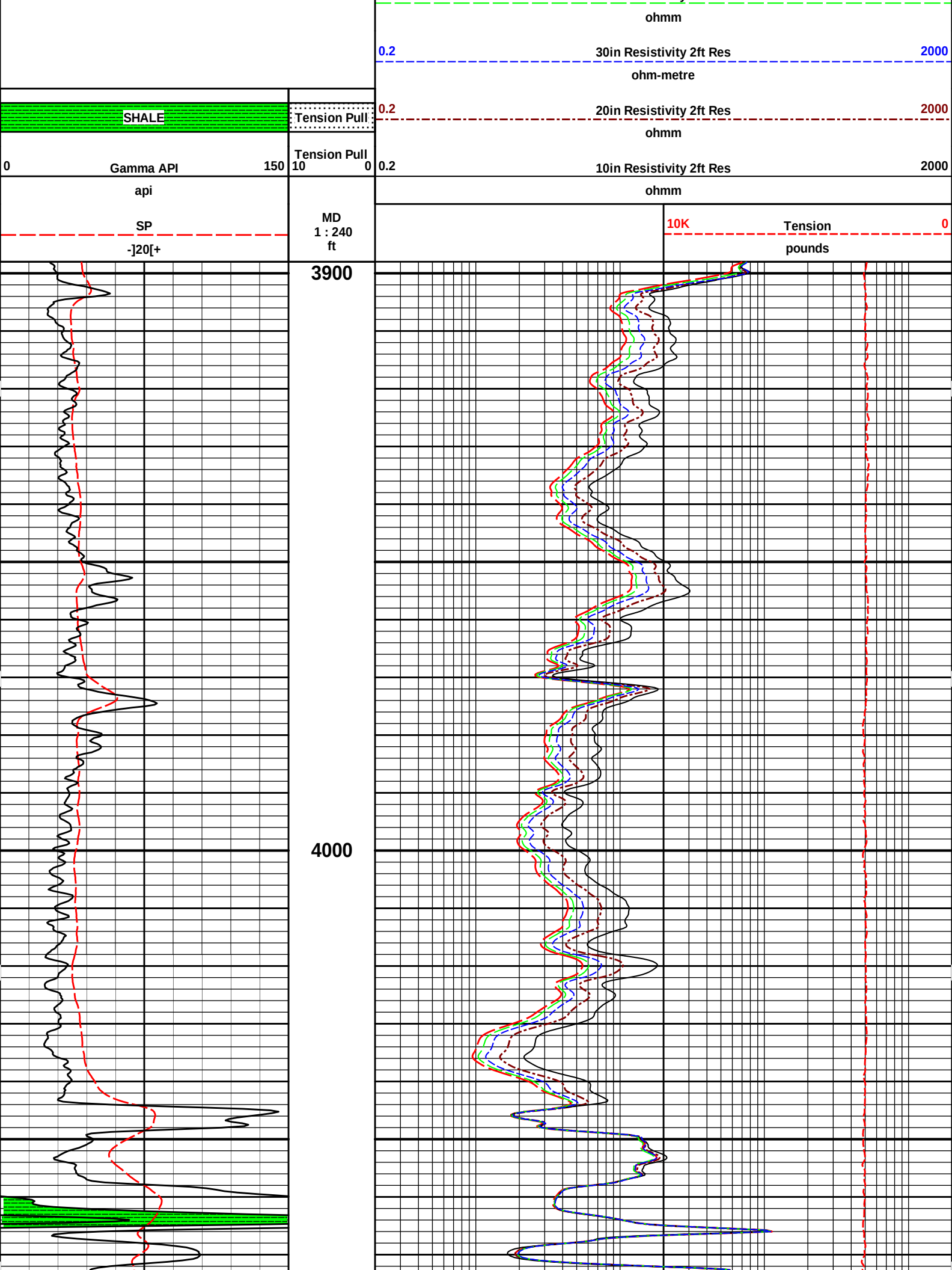
2 INCH MAIN LOG

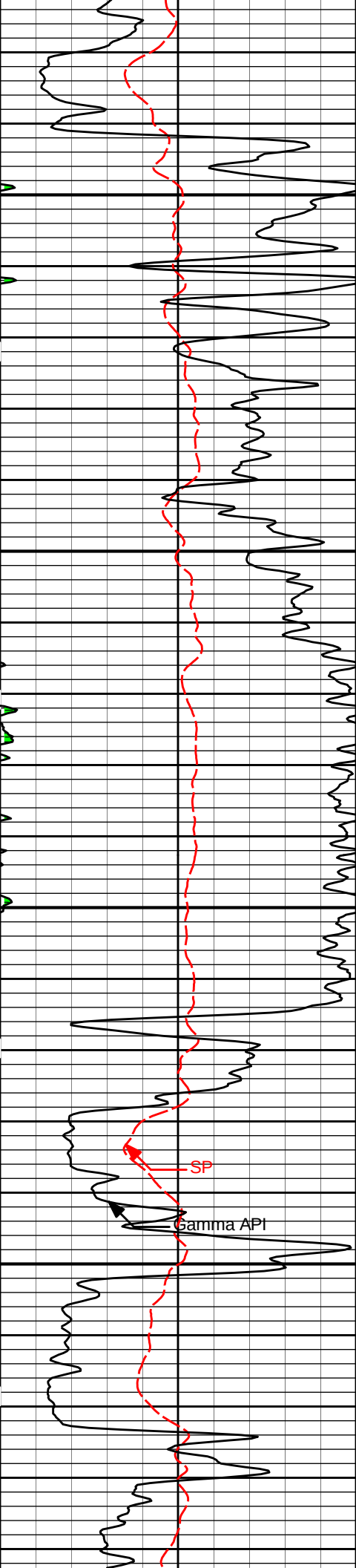
HALLIBURTON

Plot Time: 10-Apr-12 11:18:54
Plot Range: 3898 ft to 4894.25 ft
Data: {ActiveWell}\Well Based\DAQ Current\
Plot File: \\-LOCAL-\\RICHARDSON_1_3\\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHI\\ACRT\\ACRT_5_main_lib

5 INCH MAIN LOG

	0.2	90in Resistivity 2ft Res	2000
		ohmm	
	0.2	60in Resistivity 2ft Res	2000



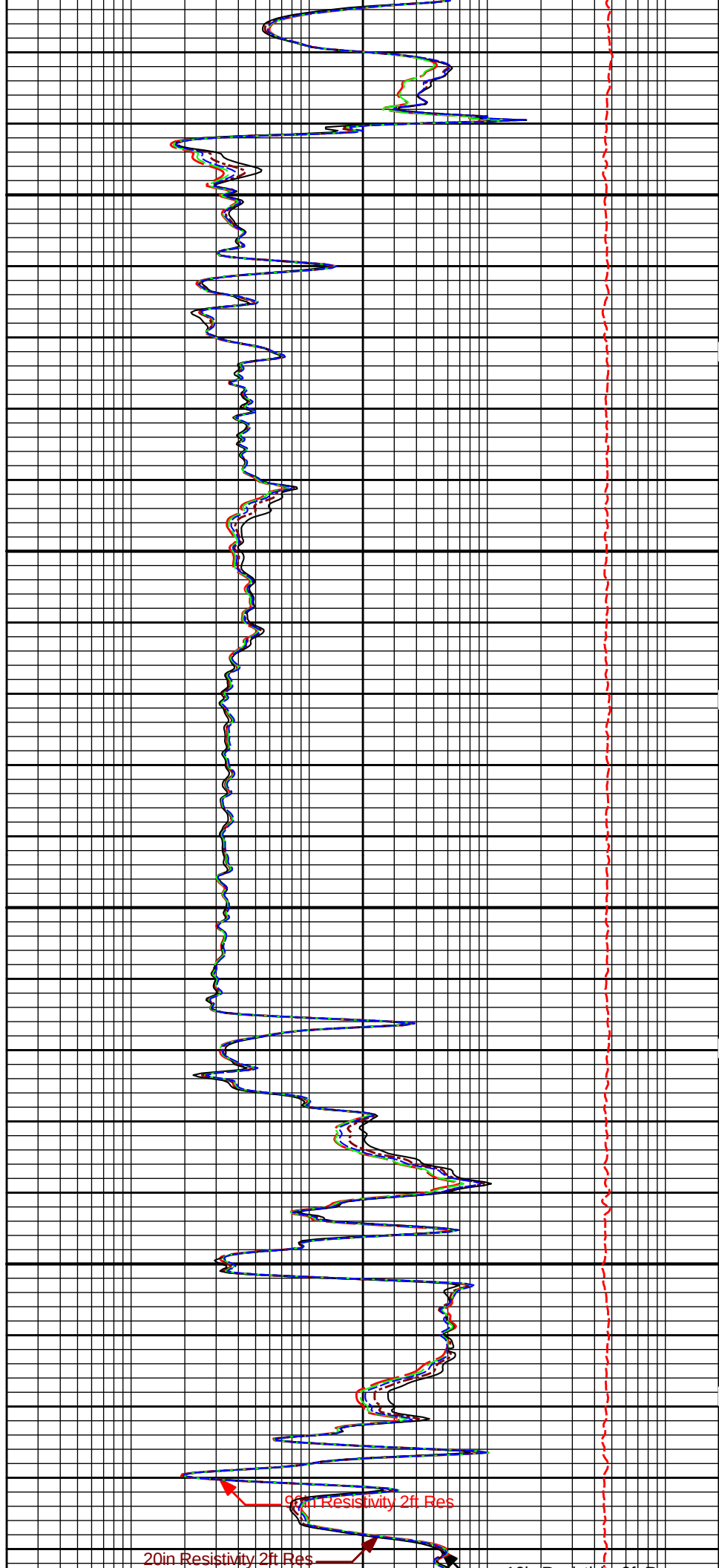


4100

4200

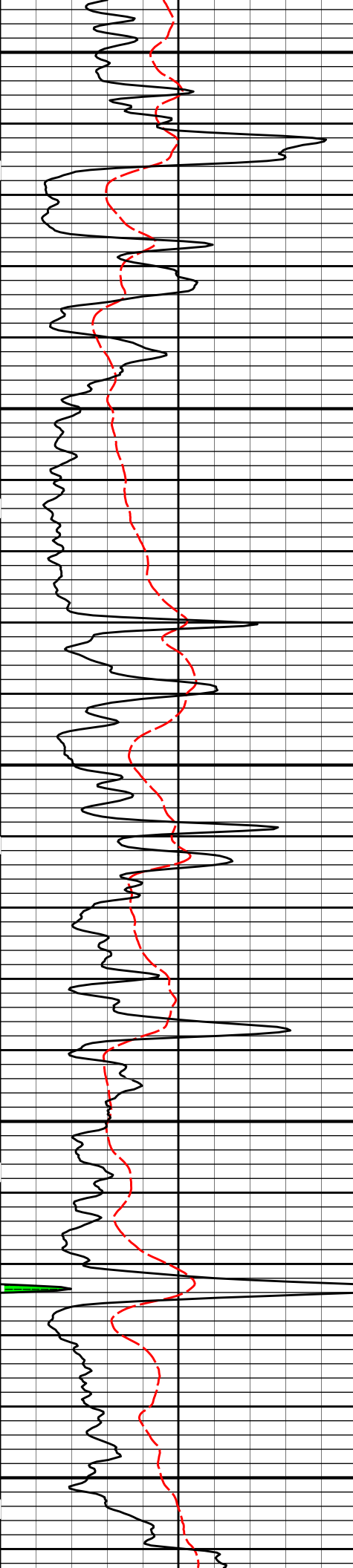
SP

Gamma API



20in Resistivity 2ft Res

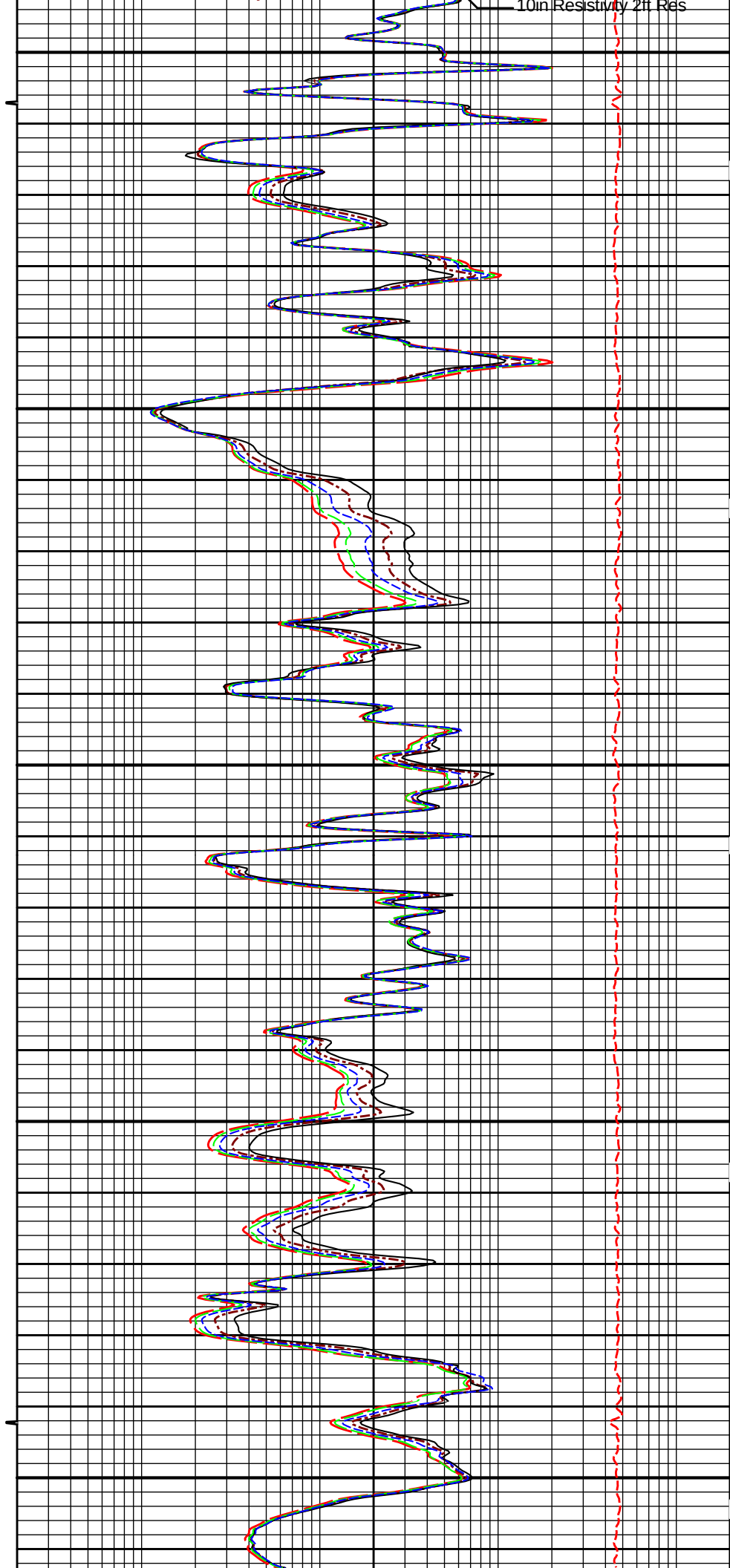
96in Resistivity 2ft Res



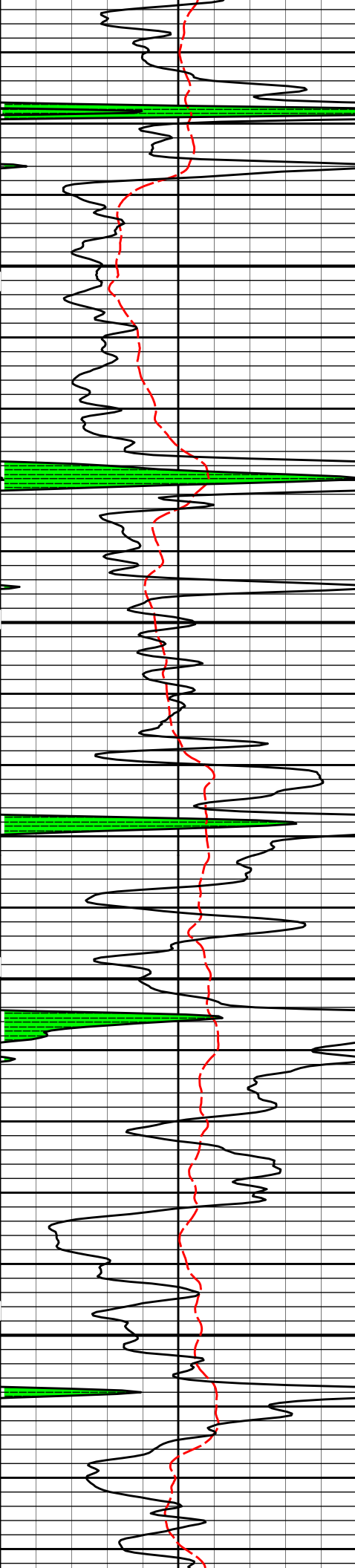
4300

4400

4500

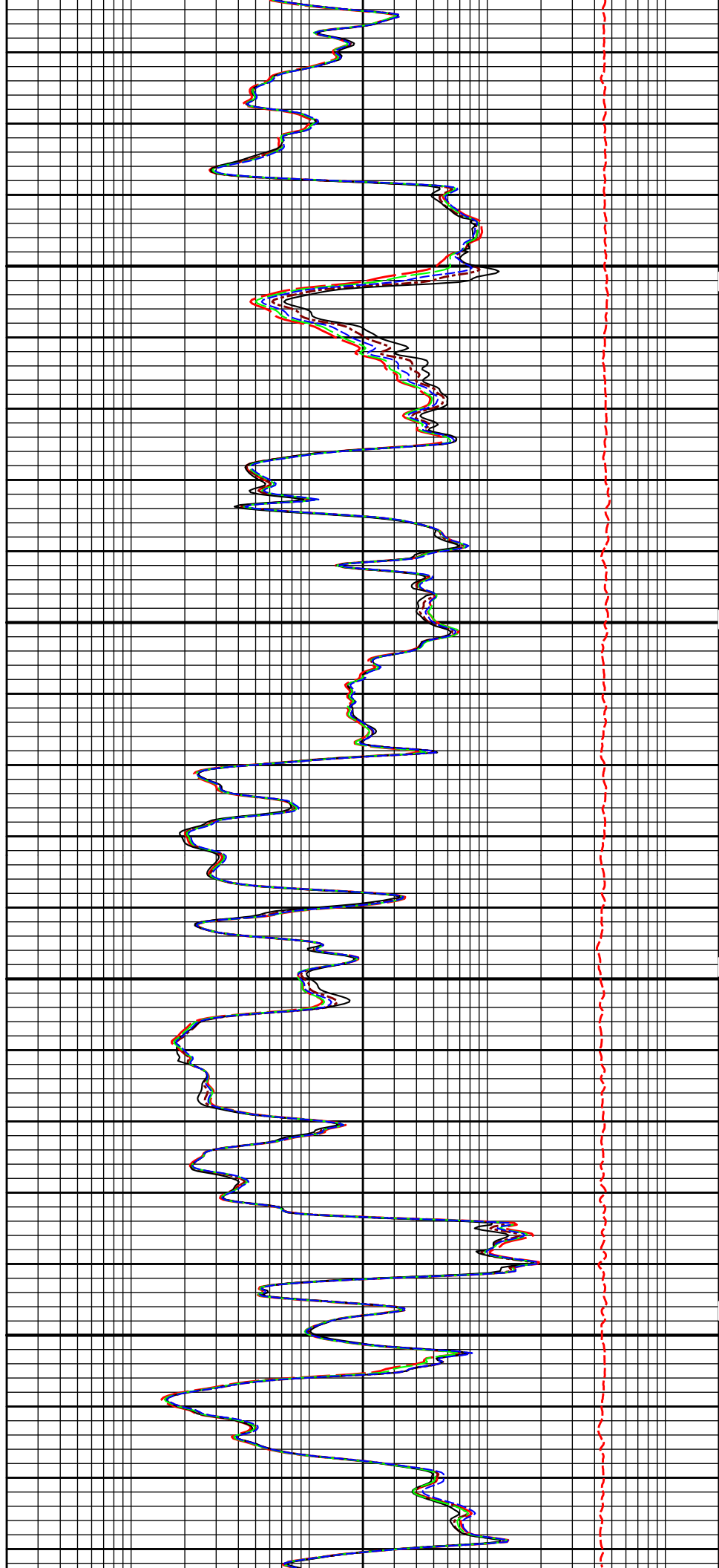


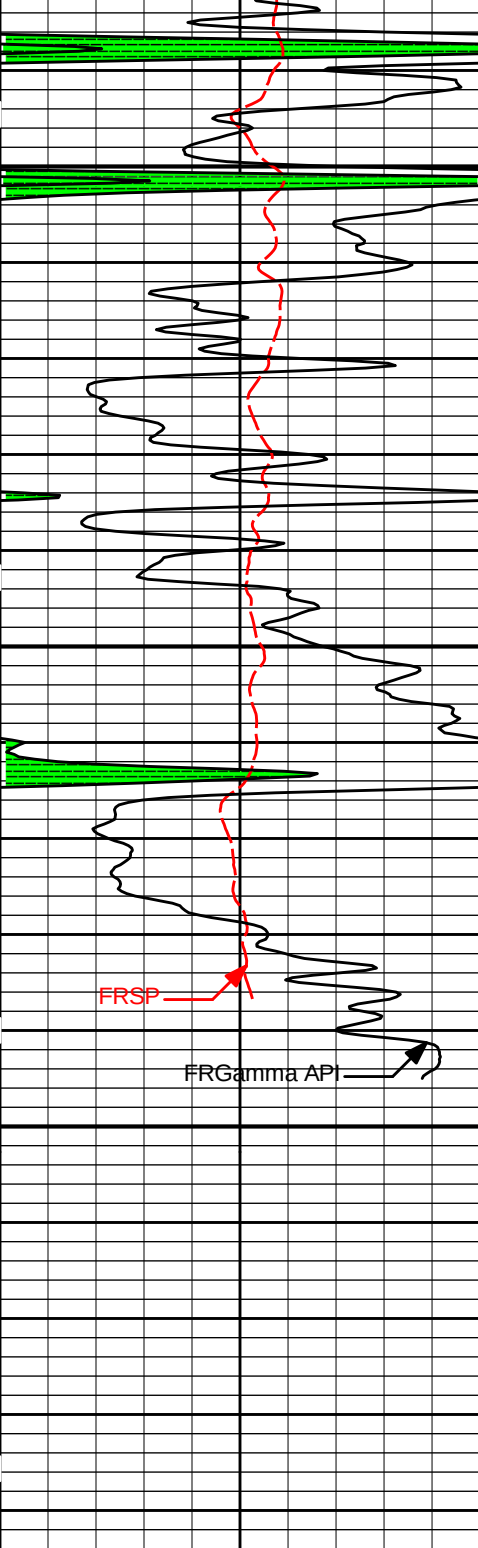
10in Resistivity 2ft Res



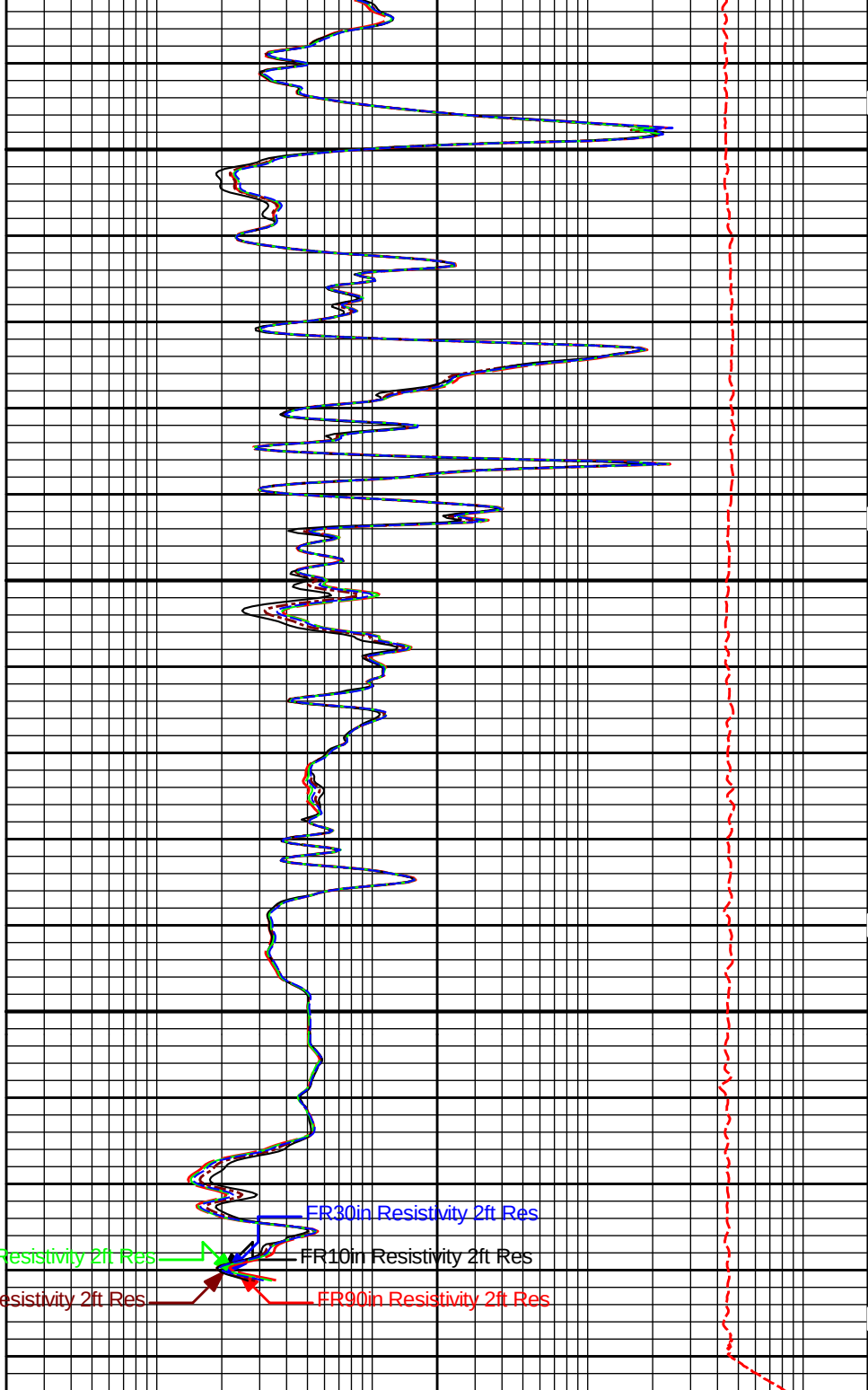
4600

4700





4800



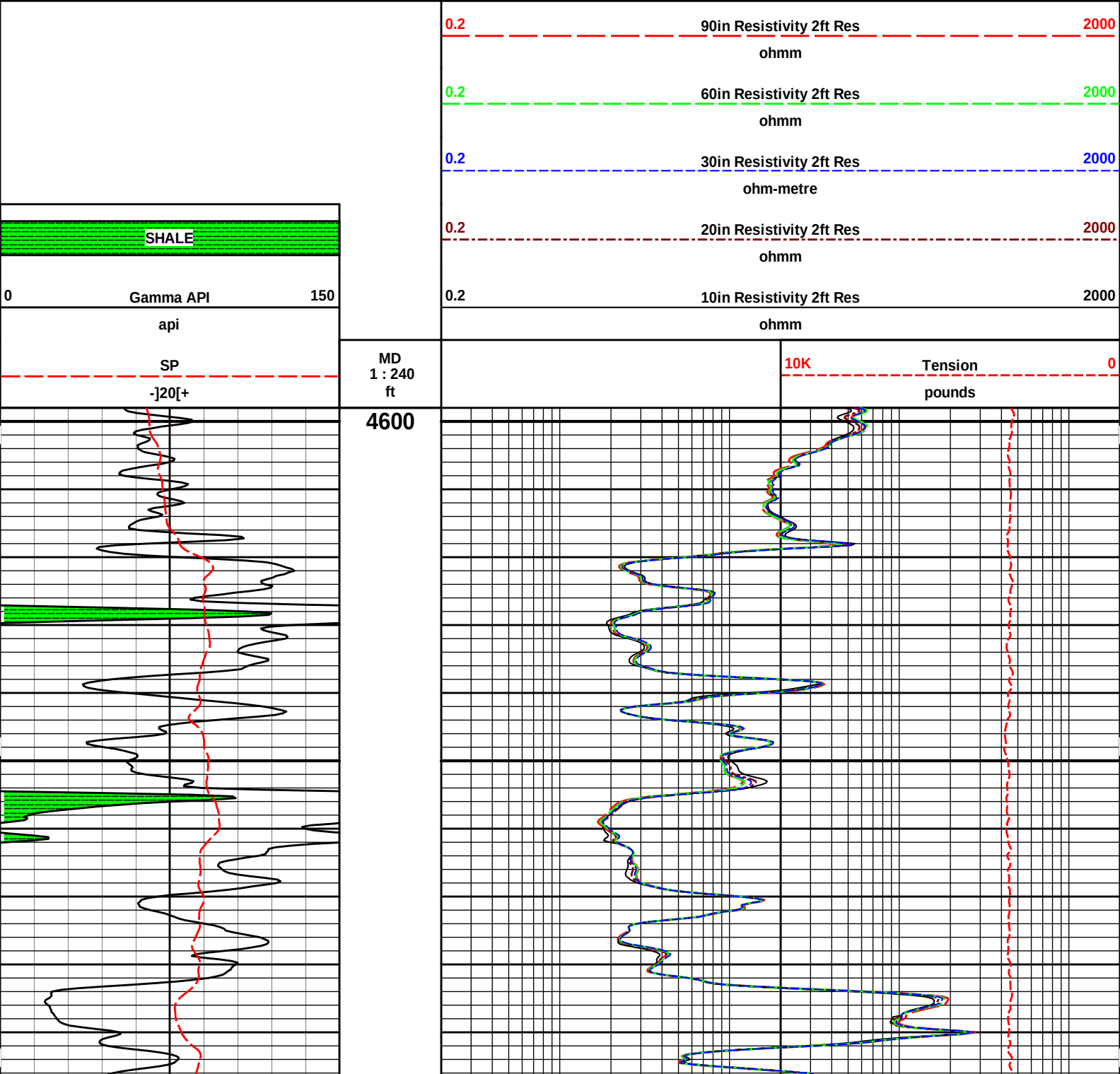
SP -]20[+	
0	150
Gamma API	
api	
SHALE	

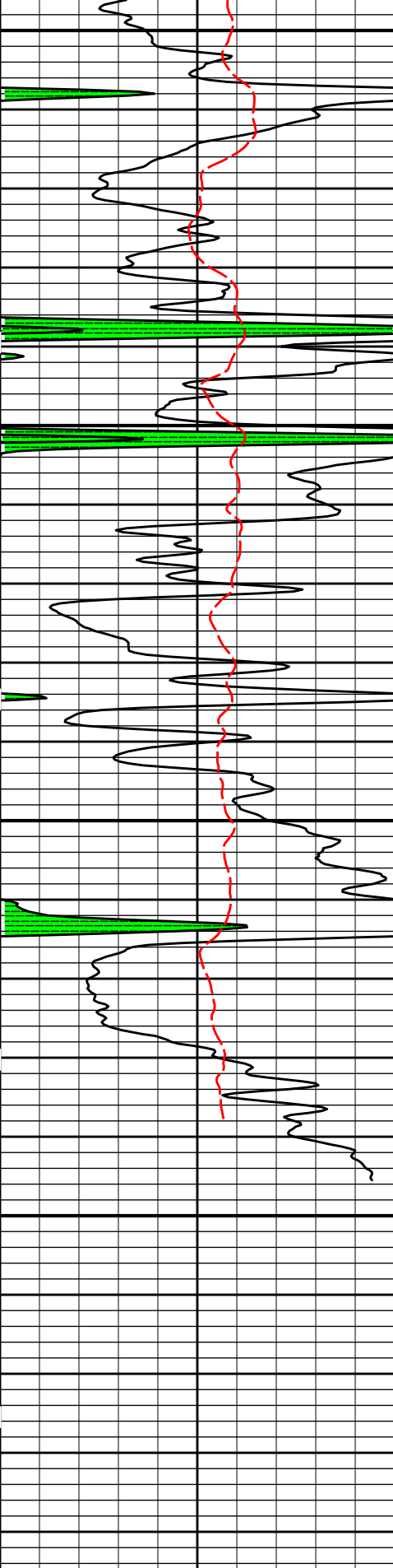
MD 1 : 240 ft
Tension Pull 10 0
Tension Pull

10K		Tension pounds	0
0.2	10in Resistivity 2ft Res		2000
ohmm			
0.2	20in Resistivity 2ft Res		2000
ohmm			
0.2	30in Resistivity 2ft Res		2000
ohm-metre			
0.2	60in Resistivity 2ft Res		2000
ohmm			
0.2	90in Resistivity 2ft Res		2000
ohmm			

5 INCH MAIN LOG

REPEAT SECTION

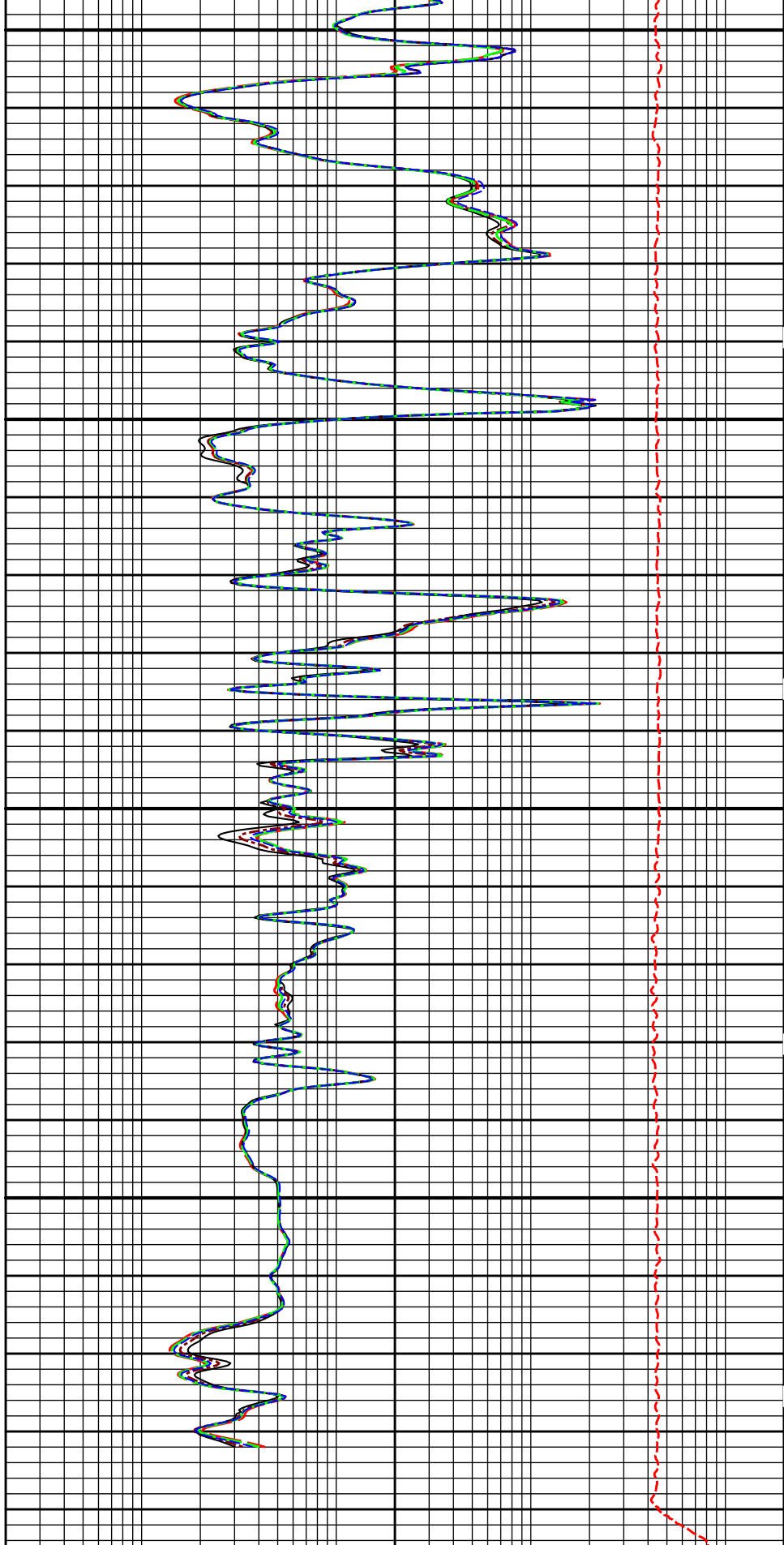




4700

4800

MD
1 : 240
ft



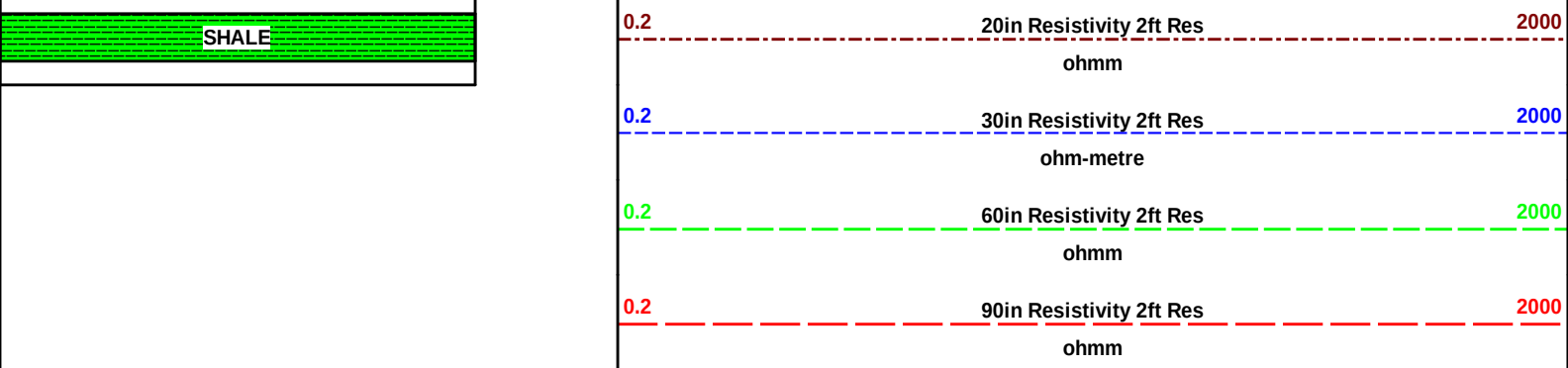
10K

Tension
pounds

0

0
Gamma API
api
150

0.2
10in Resistivity 2ft Res
ohmm
2000



HALLIBURTON

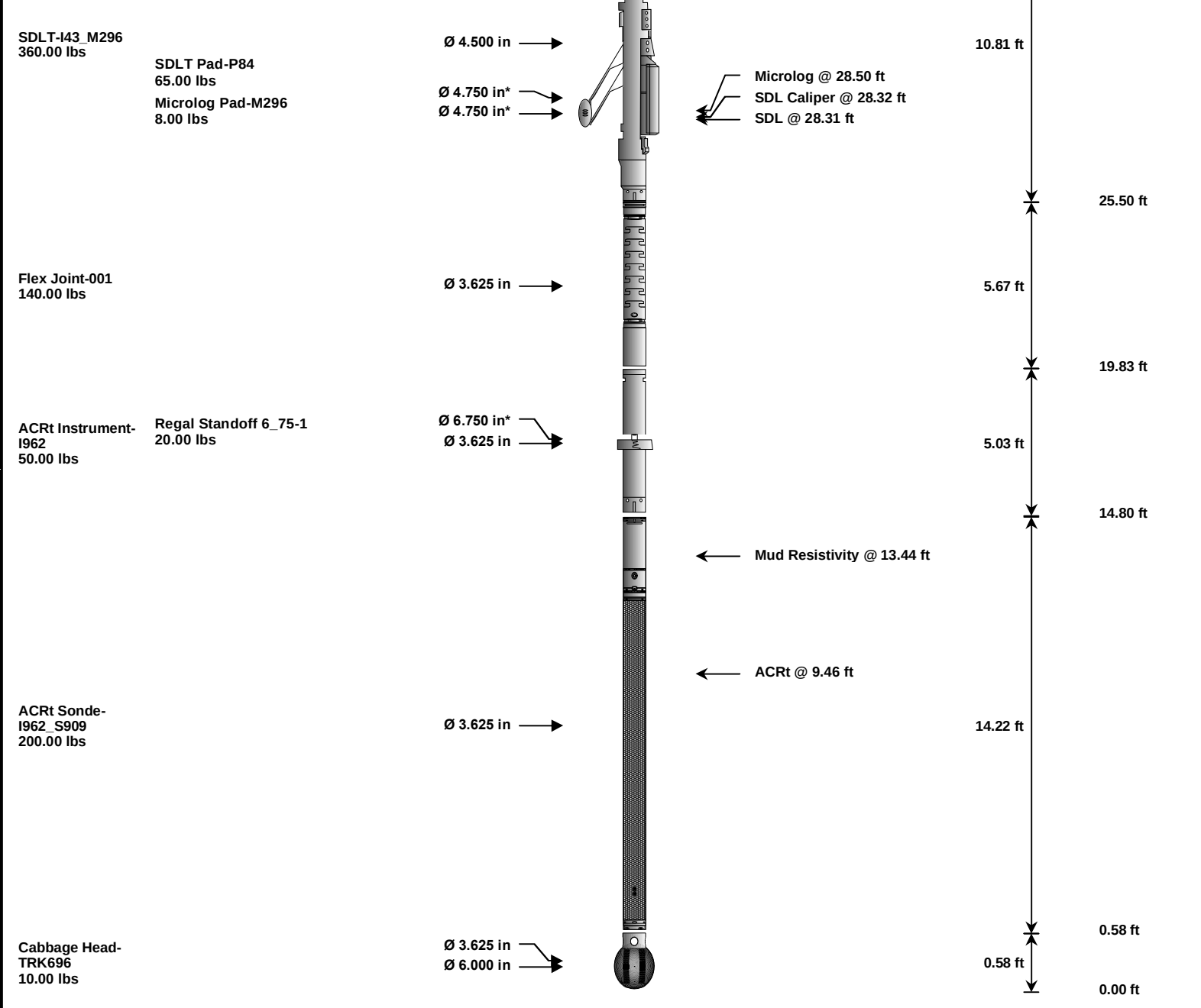
Plot Time: 10-Apr-12 11:18:58
Plot Range: 4598 ft to 4894.75 ft
Data: RICHARDSON_1_3\Well Based\DAQ-0001-003\
Plot File: \\-LOCAL-\\RICHARDSON_1_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHI\ACRT\ACRT_5_repeat.lib

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-CH_696 37.50 lbs		Ø 2.750 in →		← Temperature @ 61.21 ft	3.03 ft	62.24 ft
XOHD-TRK696 20.00 lbs		Ø 2.750 in → Ø 3.625 in →			0.95 ft	59.21 ft
SP Sub-001 60.00 lbs		Ø 3.625 in →		← SP @ 56.48 ft	3.74 ft	58.26 ft
						54.52 ft
GTET-11039640 165.00 lbs		Ø 3.625 in →		← GammaRay @ 48.46 ft	8.52 ft	
						46.00 ft
DSN Decentralizer-11005605 6.60 lbs		Ø 5.000 in* → Ø 3.625 in →		← DSN Far @ 39.06 ft ← DSN Near @ 38.31 ft	9.69 ft	
DSNT-11019643 174.00 lbs						36.31 ft



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
CH_HOS	Hostile Cable Head with Load Cell		CH_696	37.50	3.03	59.21	300.00
XOHD	Hostile to Dits Cross Over		TRK696	20.00	0.95	58.26	300.00
SP	SP Sub		001	60.00	3.74	54.52	300.00
GTET	Gamma Telemetry Tool		11039640	165.00	8.52	46.00	60.00
DSNT	Dual Spaced Neutron		11019643	174.00	9.69	36.31	60.00
DCNT	DSN Decentralizer		11005605	6.60	5.13	* 39.64	300.00
SDLT	Spectral Density Tool		I43_M296	360.00	10.81	25.50	60.00
SDLP	Density Insite Pad		P84	65.00	2.55	* 27.71	60.00
MICP	Microlog Pad		M296	8.00	1.00	* 28.00	60.00
FLEX	Flex Joint		001	140.00	5.67	19.83	300.00
ACRt	Array Compensated True Resistivity Instrument Section		I962	50.00	5.03	14.80	300.00
RSOF	Regal Standoff 6.75in		1	20.00	0.52	* 17.08	300.00
ACRt	Array Compensated True Resistivity		I962_S909	200.00	14.22	0.58	300.00
CBHD	Cabbage Head		TRK696	10.00	0.58	0.00	300.00
Total				1,316.10	62.24		
Data: RICHARDSON_1_3I0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIIDLE							Date: 10-Apr-12 08:50:23

* Not included in Total Length and Length Accumulation.

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	9.300	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	4890.00	ft
	SHARED	BHT	Bottom Hole Temperature	117.0	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	

BOTTOM=====

Data: RICHARDSON_1_310001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIDLE
 Date: 10-Apr-12 09:21:05

INPUTS, DELAYS AND FILTERS TABLE

TPUL	Tension Pull	28.32	NO	
PCAL	Pad Caliper	28.32	TRI	0.250
ACAL	Arm Caliper	28.32	TRI	0.250
ACRt Sonde				
TPUL	Tension Pull	2.97	NO	
F1R1	ACRT 12KHz - 80in R value	9.22	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	9.22	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.72	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.72	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	5.22	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	5.22	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	4.22	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	4.22	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.72	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.72	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.47	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.47	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	9.22	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	9.22	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.72	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.72	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	5.22	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	5.22	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	4.22	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	4.22	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.72	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.72	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.47	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.47	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	9.22	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	9.22	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.72	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.72	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	5.22	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	5.22	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	4.22	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	4.22	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.72	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.72	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.47	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.47	BLK	0.000
RMUD	Mud Resistivity	12.76	BLK	0.000
F1RT	Transmitter Reference 12 KHz Real Signal	2.97	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.97	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.97	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.97	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.97	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.97	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.97	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.97	BLK	0.000
ITMP	Instrument Temperature	2.97	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.97	NO	
TIDV	Instrument Temperature Derivative	2.97	NO	
TUDV	Upper Temperature Derivative	2.97	NO	
TLDV	Lower Temperature Derivative	2.97	NO	

LEDV	Lower Temperature Derivative	2.97	NO	
TRBD	Receiver Board Temperature	2.97	NO	
SDLT Pad				
TPUL	Tension Pull	28.31	NO	
NAB	Near Above	28.13	BLK	0.920
NHI	Near Cesium High	28.13	BLK	0.920
NLO	Near Cesium Low	28.13	BLK	0.920
NVA	Near Valley	28.13	BLK	0.920
NBA	Near Barite	28.13	BLK	0.920
NDE	Near Density	28.13	BLK	0.920
NPK	Near Peak	28.13	BLK	0.920
NLI	Near Lithology	28.13	BLK	0.920
NBAU	Near Barite Unfiltered	28.13	BLK	0.250
NLIU	Near Lithology Unfiltered	28.13	BLK	0.250
FAB	Far Above	28.48	BLK	0.250
FHI	Far Cesium High	28.48	BLK	0.250
FLO	Far Cesium Low	28.48	BLK	0.250
FVA	Far Valley	28.48	BLK	0.250
FBA	Far Barite	28.48	BLK	0.250
FDE	Far Density	28.48	BLK	0.250
FPK	Far Peak	28.48	BLK	0.250
FLI	Far Lithology	28.48	BLK	0.250
PTMP	Pad Temperature	28.32	BLK	0.920
NHV	Near Detector High Voltage	27.71	NO	
FHV	Far Detector High Voltage	27.71	NO	
ITMP	Instrument Temperature	27.71	NO	
DDHV	Detector High Voltage	27.71	NO	
Microlog Pad				
TPUL	Tension Pull	28.50	NO	
MINV	Microlog Lateral	28.50	BLK	0.750
MNOR	Microlog Normal	28.50	BLK	0.750
Data: RICHARDSON_1_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE			Date: 10-Apr-12 09:21:30	

COMPANY	STRATA EXPLORATION		
WELL	RICHARDSON 1-3		
FIELD	GREENSBURG		
COUNTY	KIOWA	STATE	KANSAS
HALLIBURTON		ARRAY COMPENSATED TRUE RESISTIVITY LOG	

HALLIBURTON Plot Time: 10-Apr-12 11:18:58 Plot Range: 602 ft to 4881.25 ft Data: RICHARDSON_1_3\Well Based\DAQ-0001-004\ Plot File: \\LOCAL-IRICHARDSON_1_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\...ACRT_1.lib 1 INCH MAIN LOG	
	1000 90in Conductivity 2ft Res 0

