HALLIBURTON

ARRAY COMPENSATED TRUE RESISTIVITY LOG

HERMAN L. LOEB
UNRUH 'D' 1-21
WILDCAT
KIOWA
KANSAS

COMPANY / WELL / FIELD/BLOCK / COUNTY / STATE

COMPANY **HERMAN L. LOEB**

WELL **UNRUH 'D' 1-21**

FIELD/BLOCK **WILDCAT**

COUNTY **KIOWA** STATE **KANSAS**

API No. 15-097-21750-00-00

Location 1100' FSL 2290' FWL

Sect. 21 Twp. 27S Rge. 18W

Other Services:
MICRO
DSNT/SDLT
BSAT

Permanent Datum	GL	Elev. 2191.0 ft	Elev.: K.B. 2202.0 ft
Log measured from	KB	11.0 ft above perm. Datum	D.F. 2200.0 ft
Drilling measured from	KB		G.L. 2191.0 ft

Date		28-Feb-13					
Run No.		ONE					
Depth - Driller		4875.00 ft					
Depth - Logger		4872.0 ft					
Bottom - Logged Interval		4862.0 ft					
Top - Logged Interval		561.0 ft					
Casing - Driller		8.625 in @ 561.0 ft		@		@	
Casing - Logger		561.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	9.3 ppg	64.00 s/qt				
PH	Fluid Loss	10.00 pH	9.6 cptm				
Source of Sample		FLOWLINE					
Rm @ Meas. Temperature		0.420 ohmm @ 70.00 degF		@		@	
Rmf @ Meas. Temperature		0.35 ohmm @ 70.00 degF		@		@	
Rmc @ Meas. Temperature		0.480 ohmm @ 70.00 degF		@		@	
Source Rmf	Rmc	MEASURED	MEASURED				
Rm @ BHT		0.29 ohmm @ 103.0 degF		@		@	
Time Since Circulation		6.0 hr					
Time on Bottom		28-Feb-13 18:26					
Max. Rec. Temperature		103.0 degF @ 4872.0 ft		@		@	
Equipment	Location	10546696	LIBERAL				
Recorded By		THOMAS HYDE					
Witnessed By		J. CHRISTENSEN					

Fold here

Service Ticket No.: 900256448 API Serial No.: 15-097-21750-00-00 PGM Version: WL INSITE R3.8.0 (Build 2)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

RESISTIVITY SCALE CHANGES

	Type Log	Depth	Scale Up Hole	Scale Down Hole
Date				
Sample No.				
Depth-Driller				
Type Fluid in Hole				
Density / Viscosity				
Ph / Fluid Loss				
Source of Sample				
Rm @ Meas. Temp	@	@		

RESISTIVITY EQUIPMENT DATA

Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
@				

Rmf @ Meas. Temp.	@	@	ONE	ACRT	N/A	CENT.	N/A
Rmc @ Meas. Temp.	@	@		I962			
Source Rmf / Rmc				S11005909			
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	

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	4872	561	REC	0	150									

DIRECTIONAL INFORMATION

Maximum Deviation @	KOP @

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING

CHLORIDES REPORTED AT 11000 MG/L

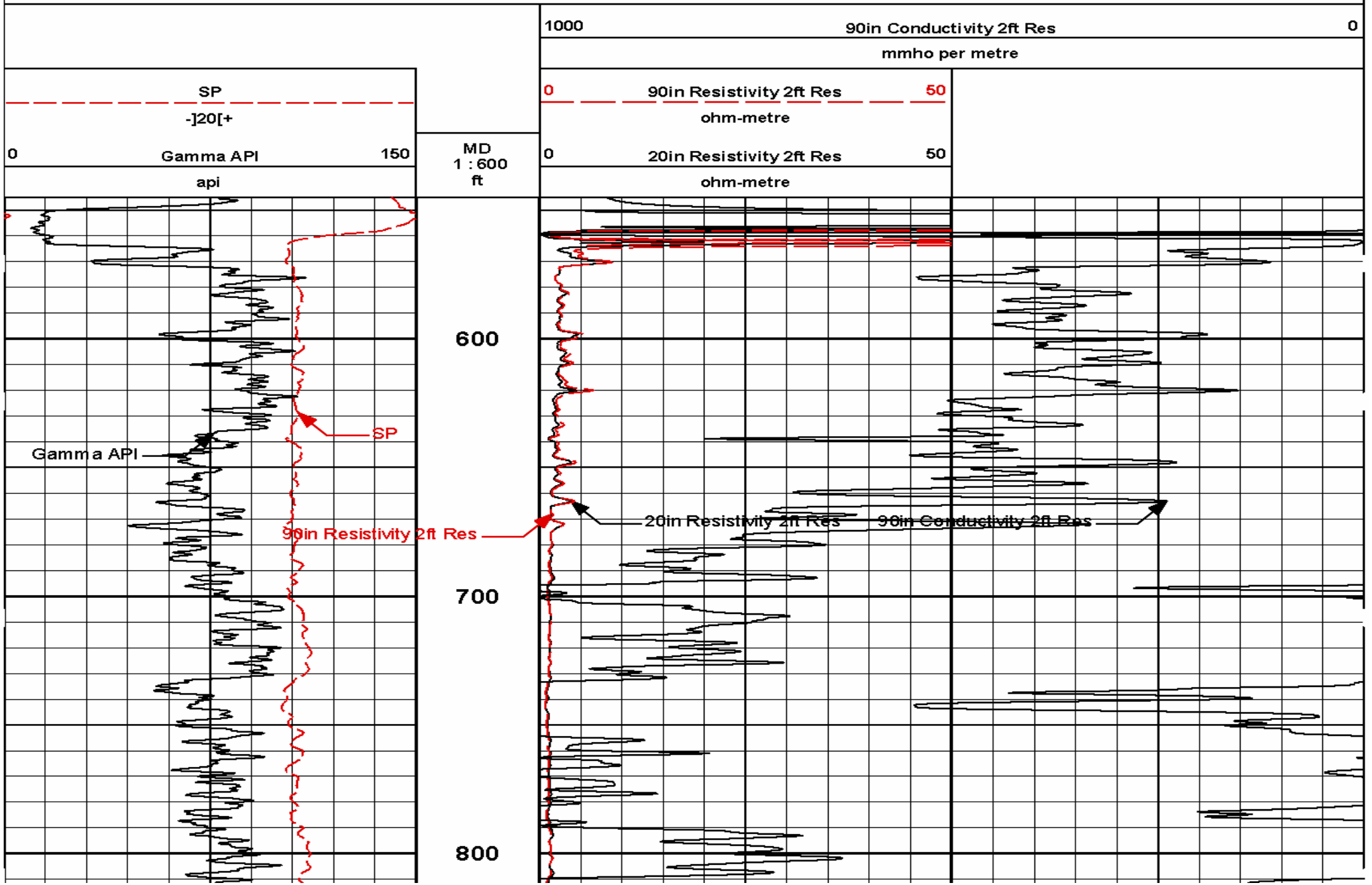
LCM REPORTED AT 2 PPB

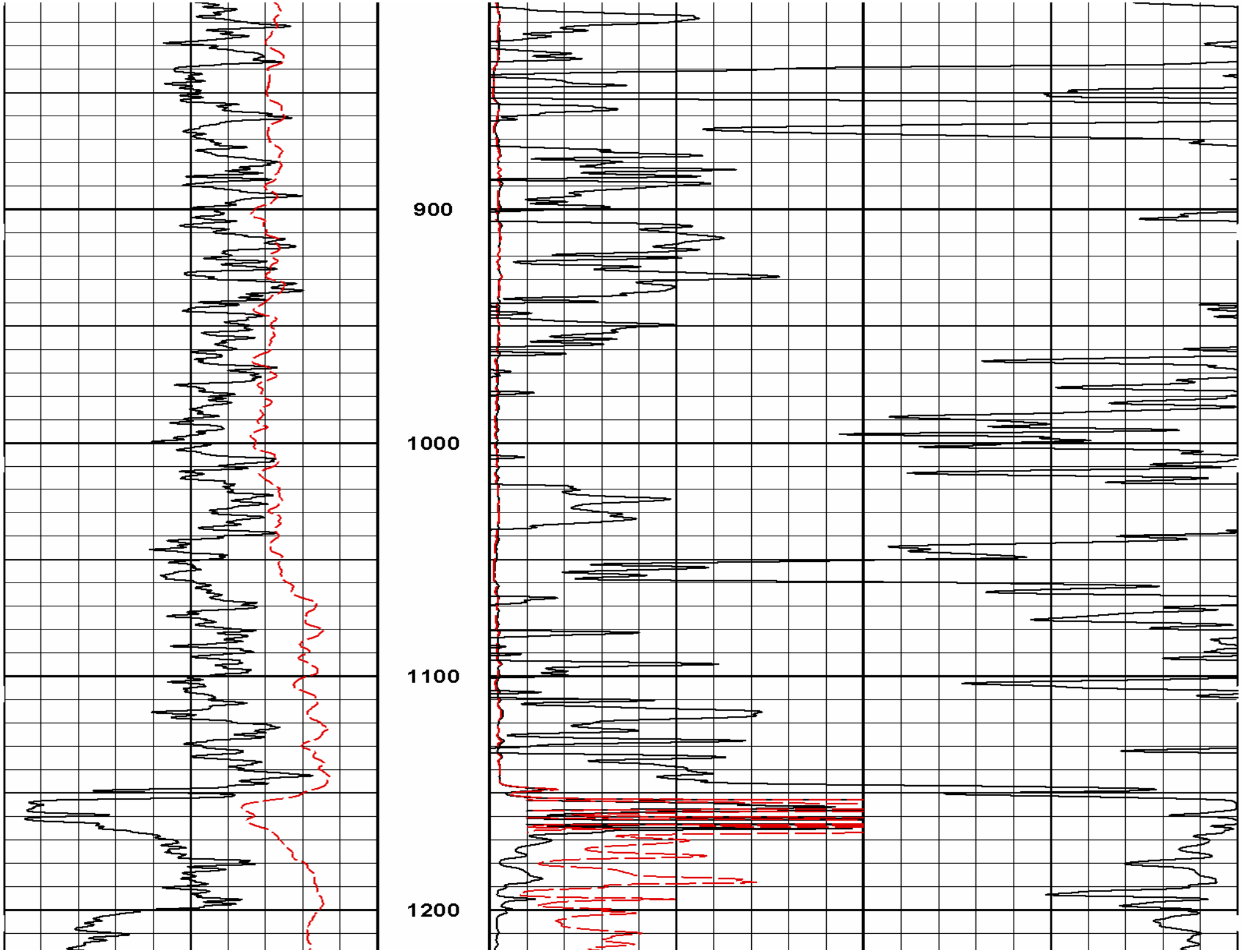
TODAY'S CREW M. GRAHAM B.TERRELL

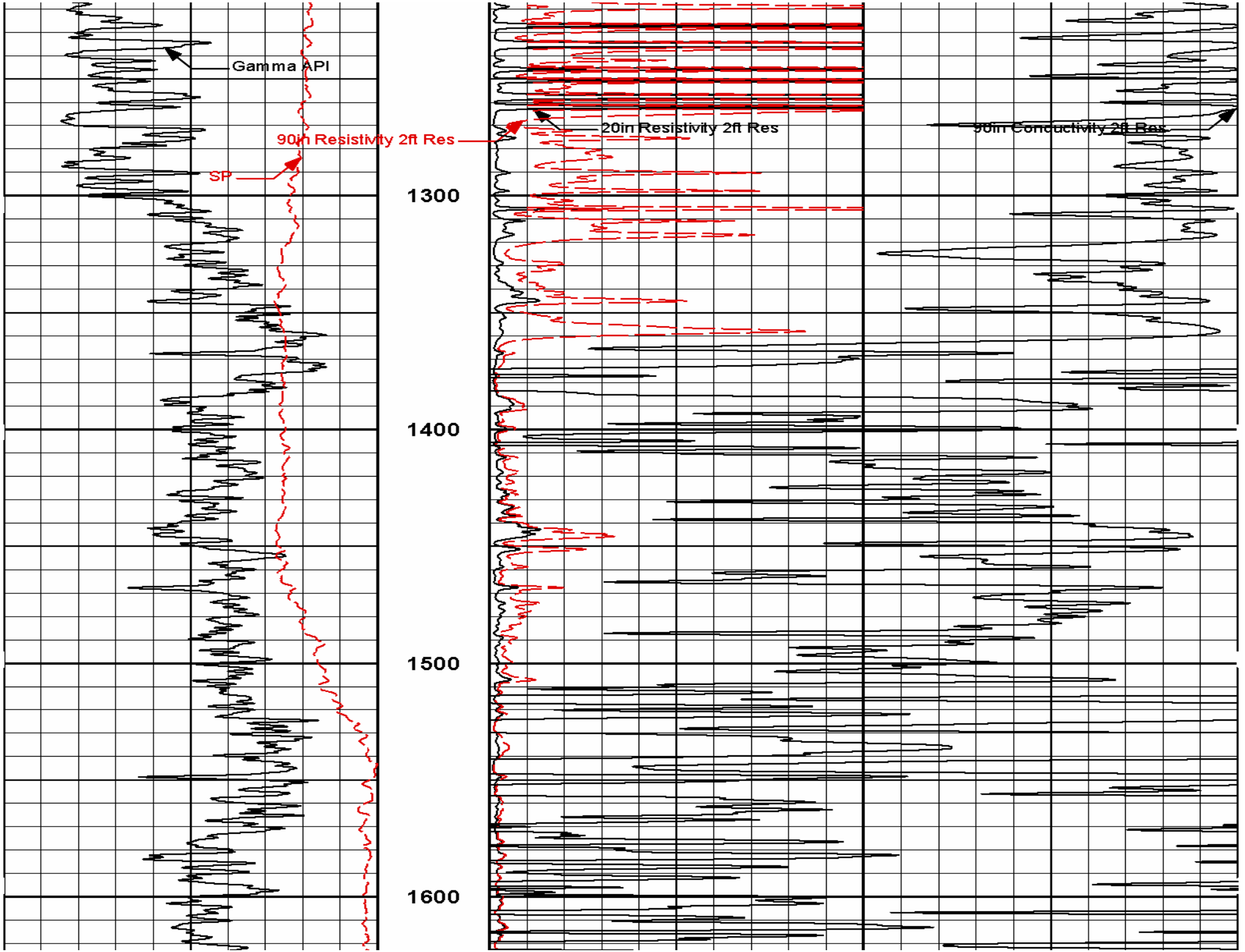
THANK YOU FORCHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KANSAS 620-624-8123

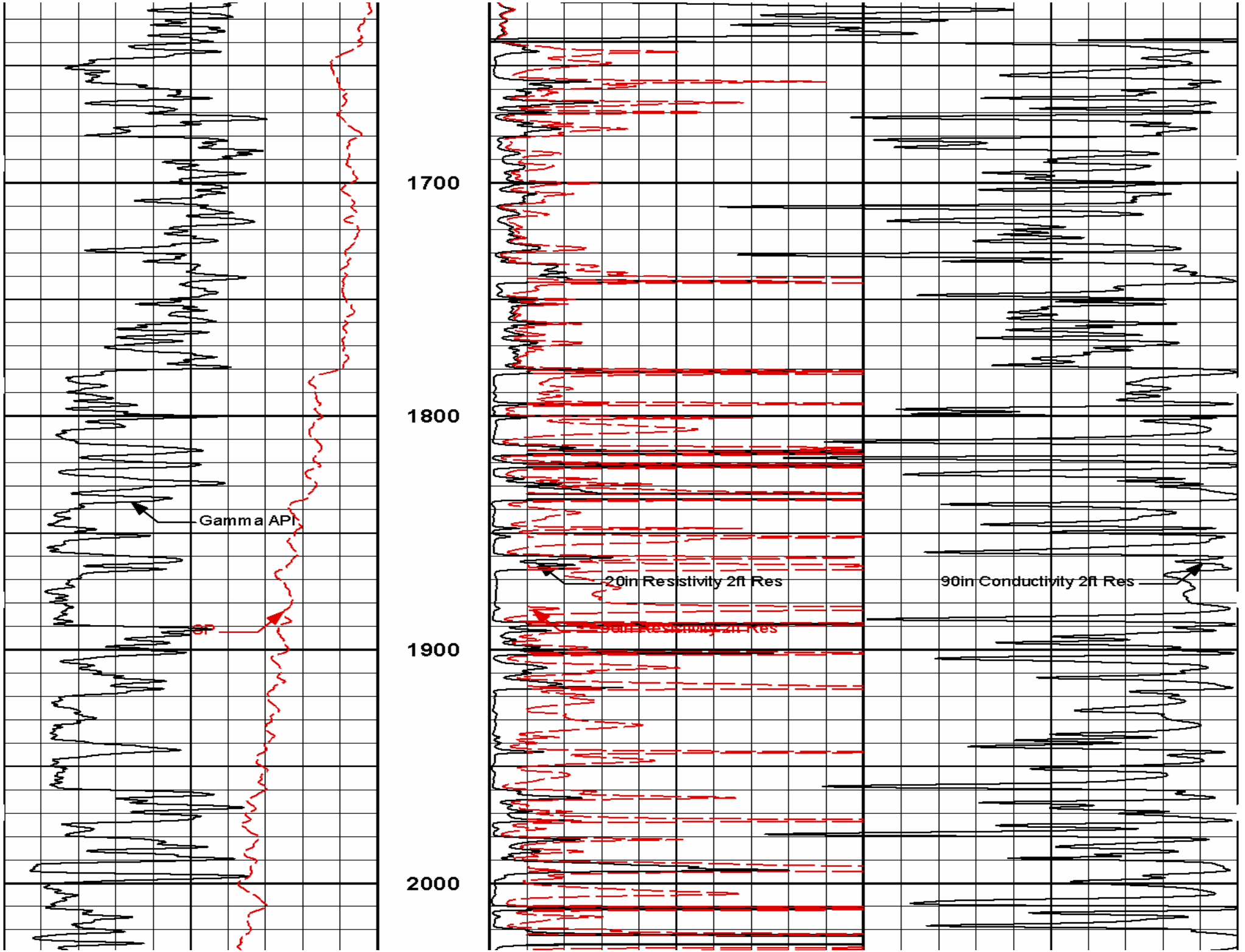
Plot Range: 545 ft to 4875.5 ft
Data: UNRUH 'D' 1-21\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-\UNRUH 'D' 1-21\0001 SP-GTET-BSAT-ACRT-BN\ACRT\ACRT_2_lib

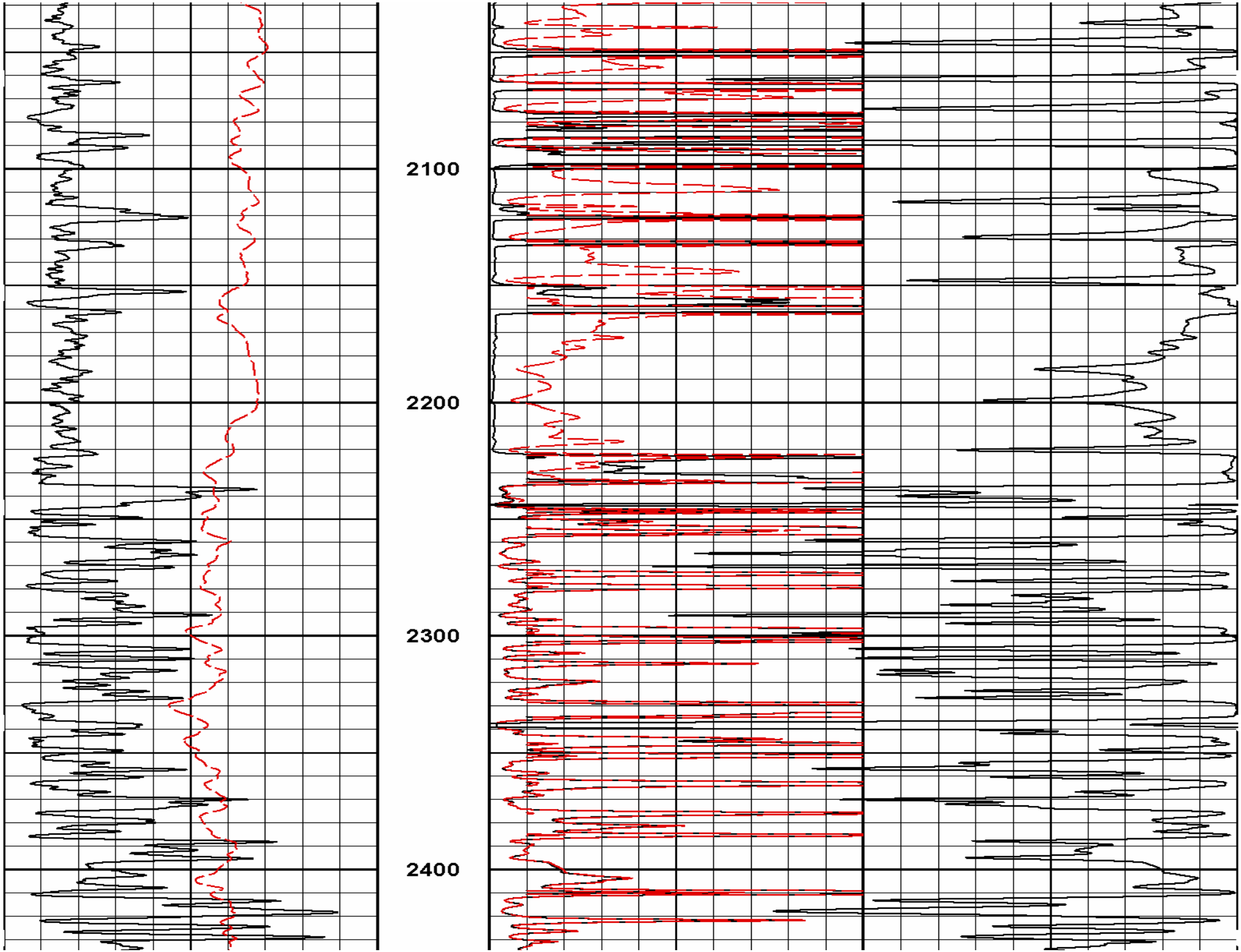
2 INCH MAIN LOG

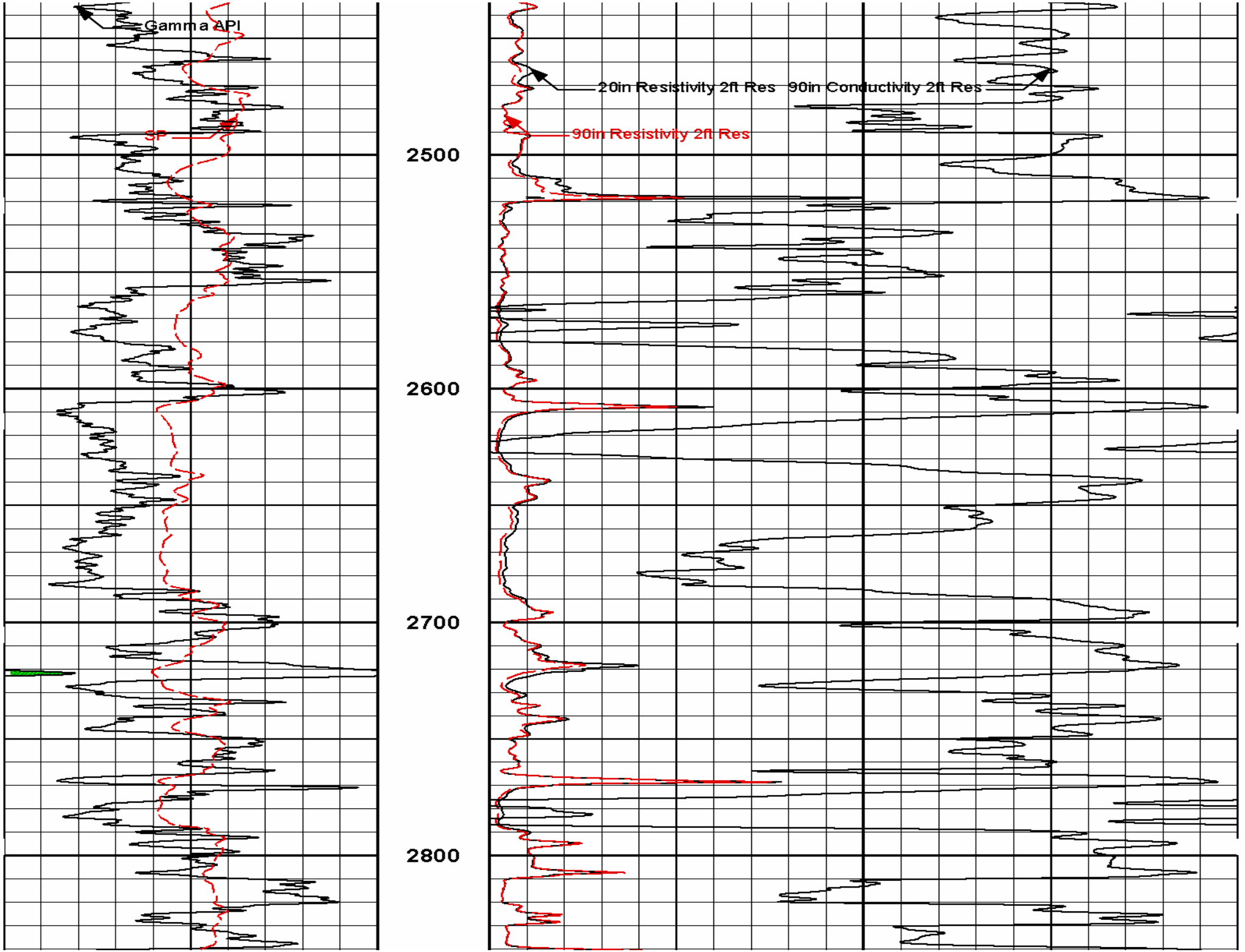


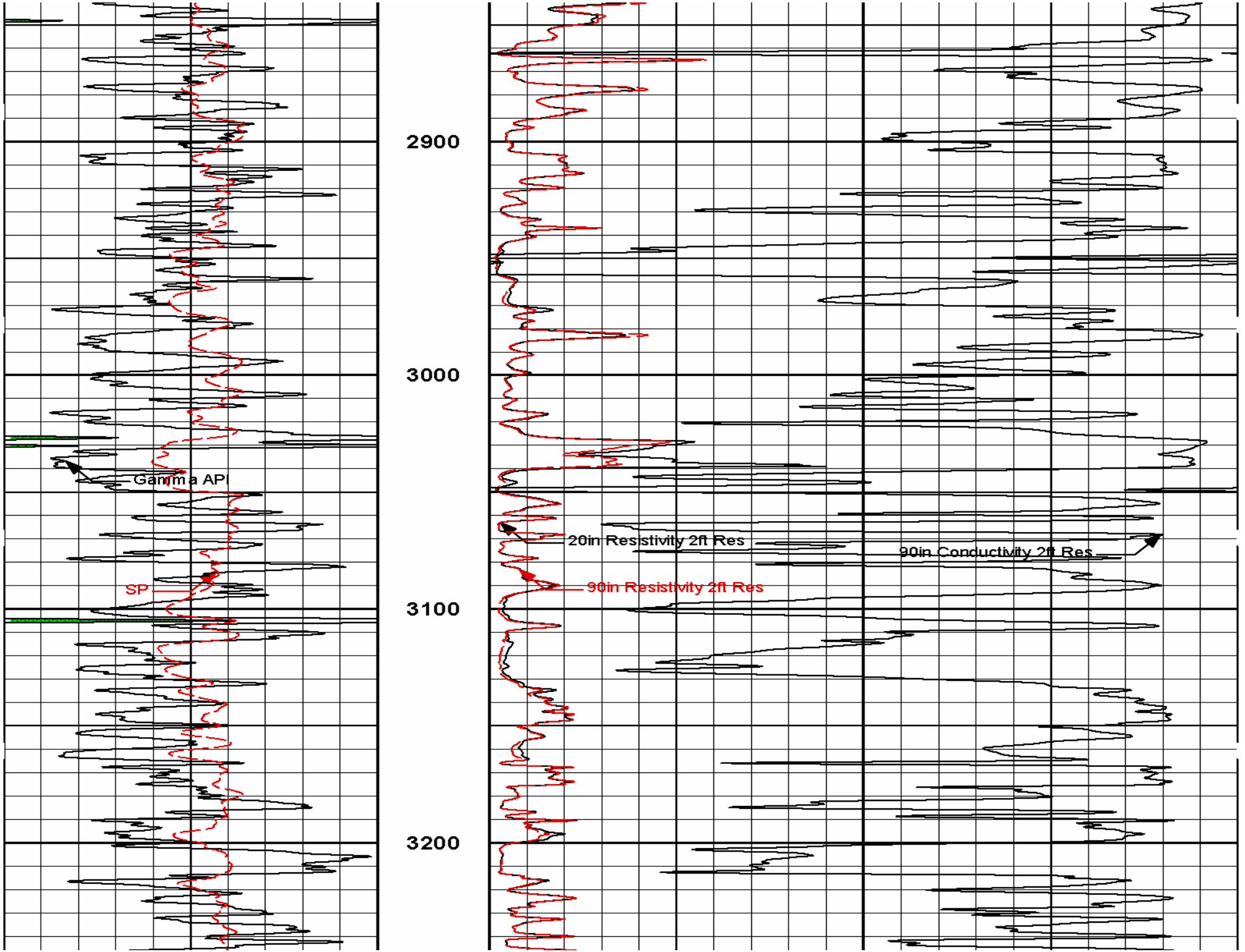

900
1000
1100
1200

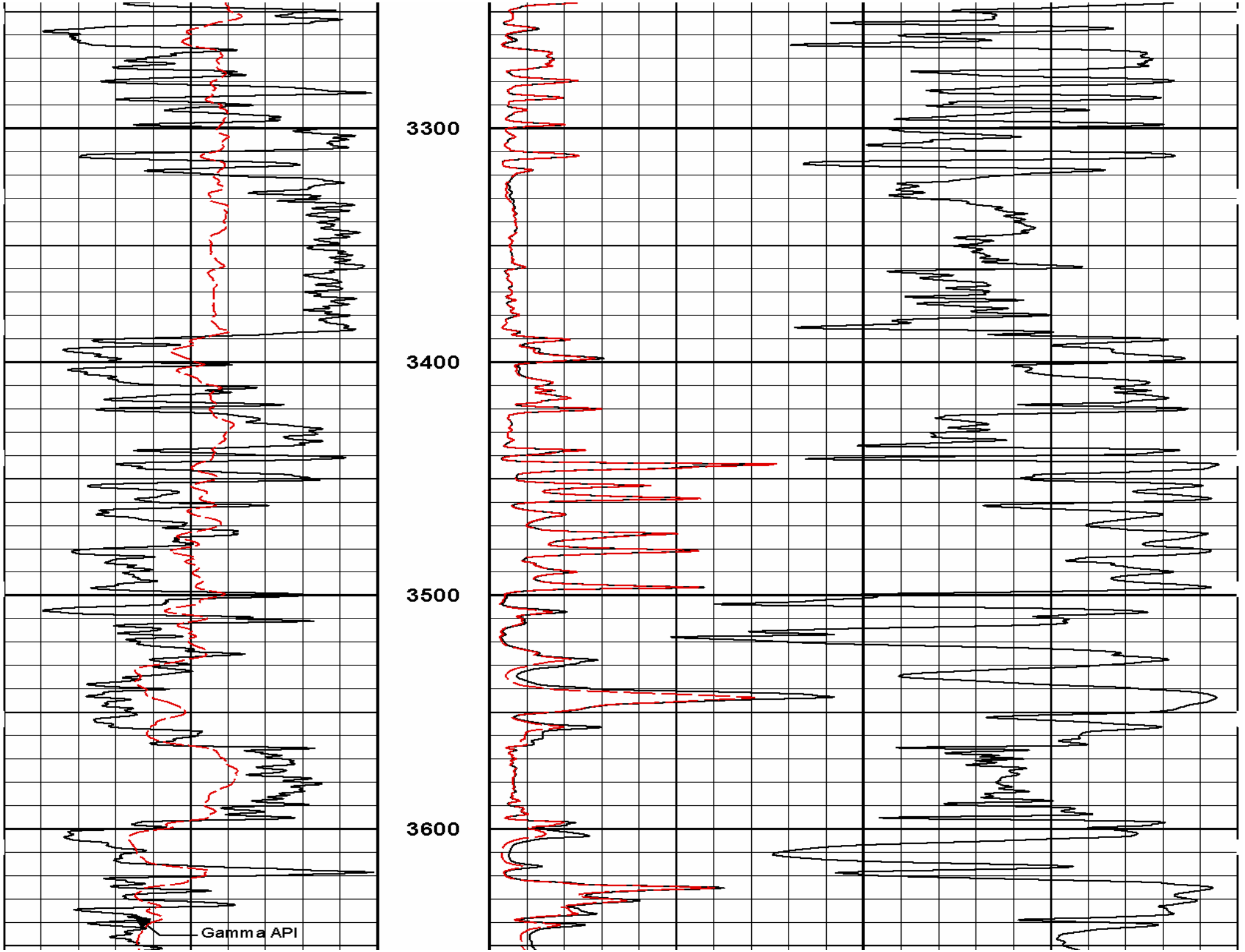

Gamma API
90in Resistivity 2ft Res
SP
1300
1400
1500
1600
20in Resistivity 2ft Res
90in Conductivity 2ft Res

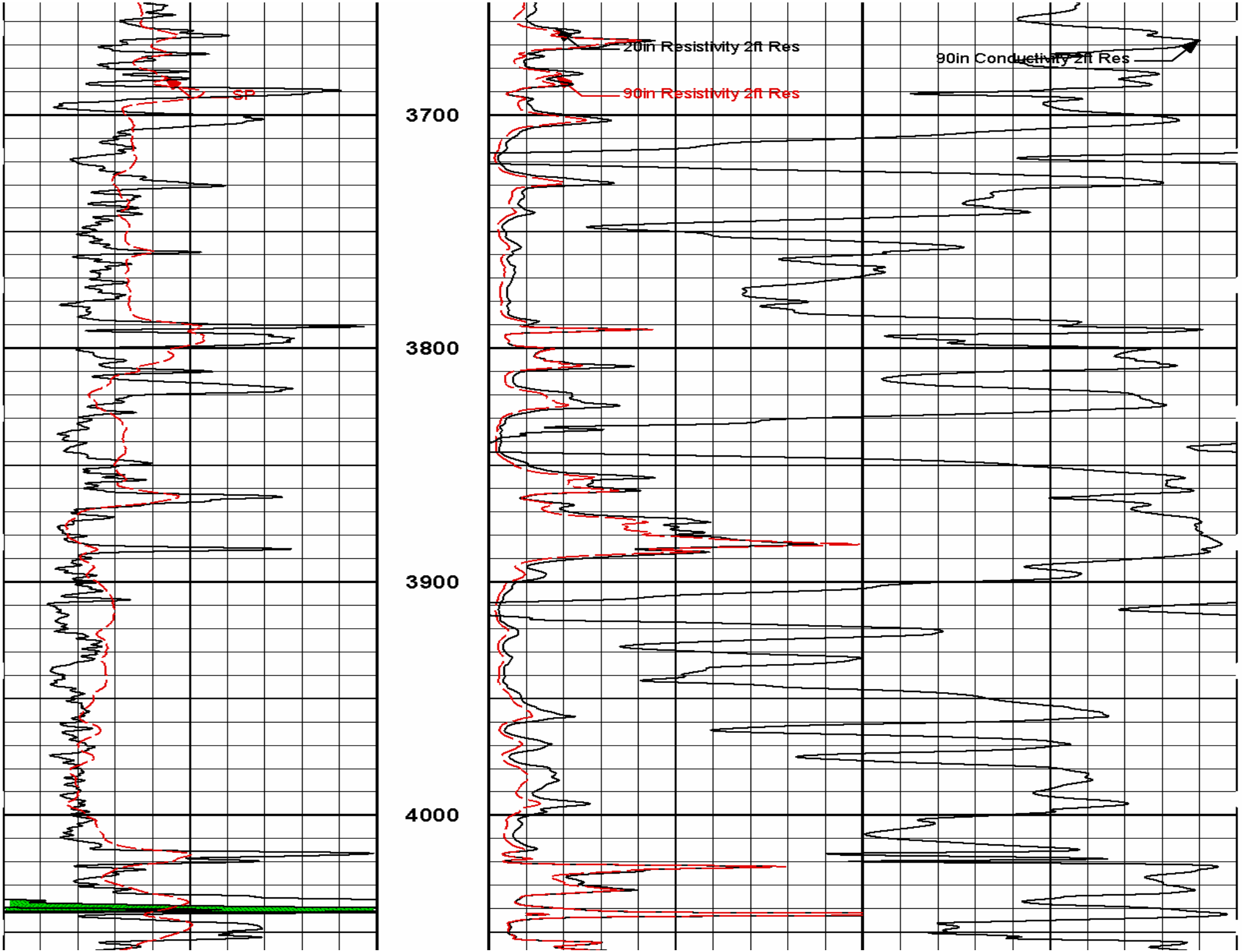

1700
1800
1900
2000
Gamma API
SP
20in Resistivity 2ft Res
90in Conductivity 2ft Res

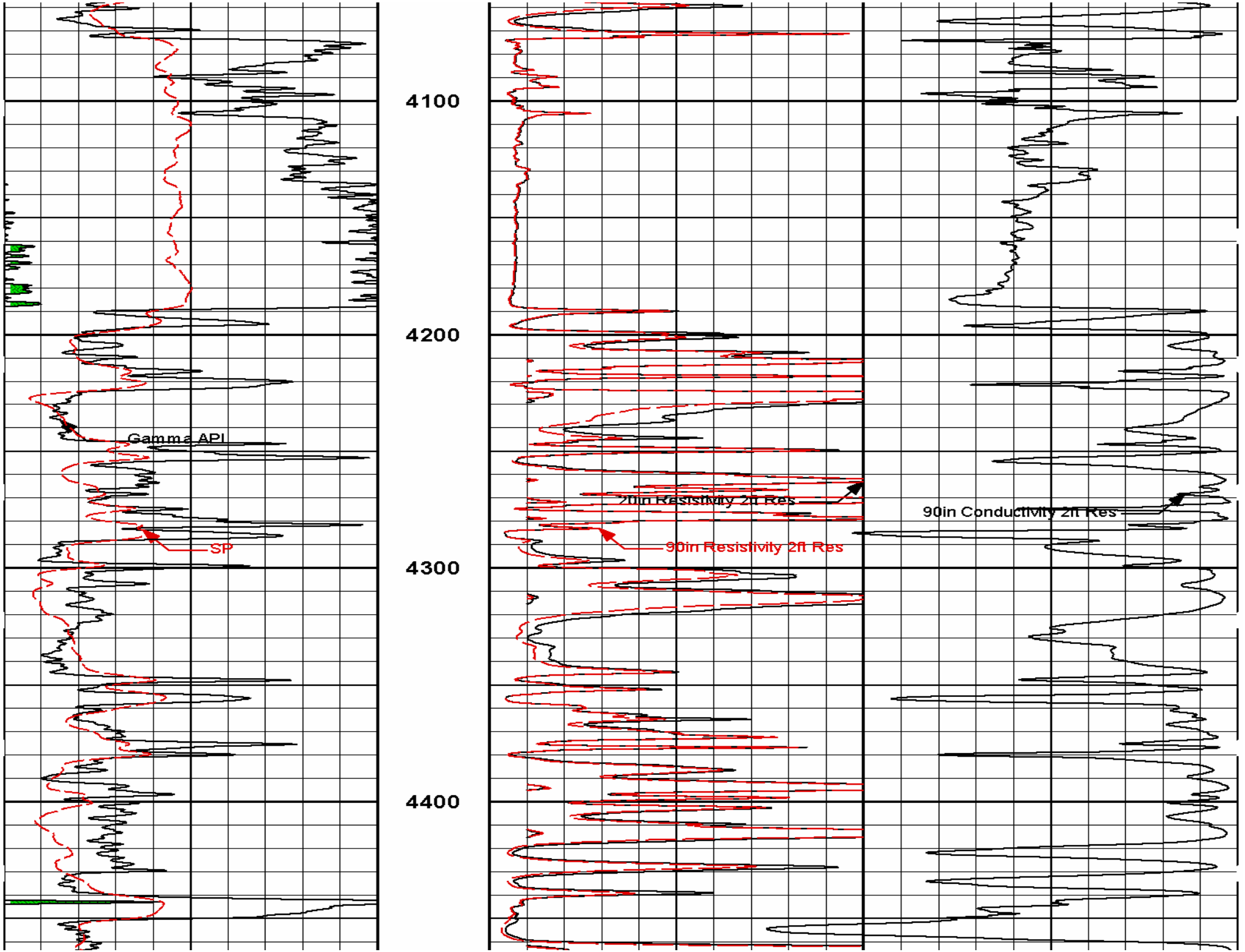

2100
2200
2300
2400

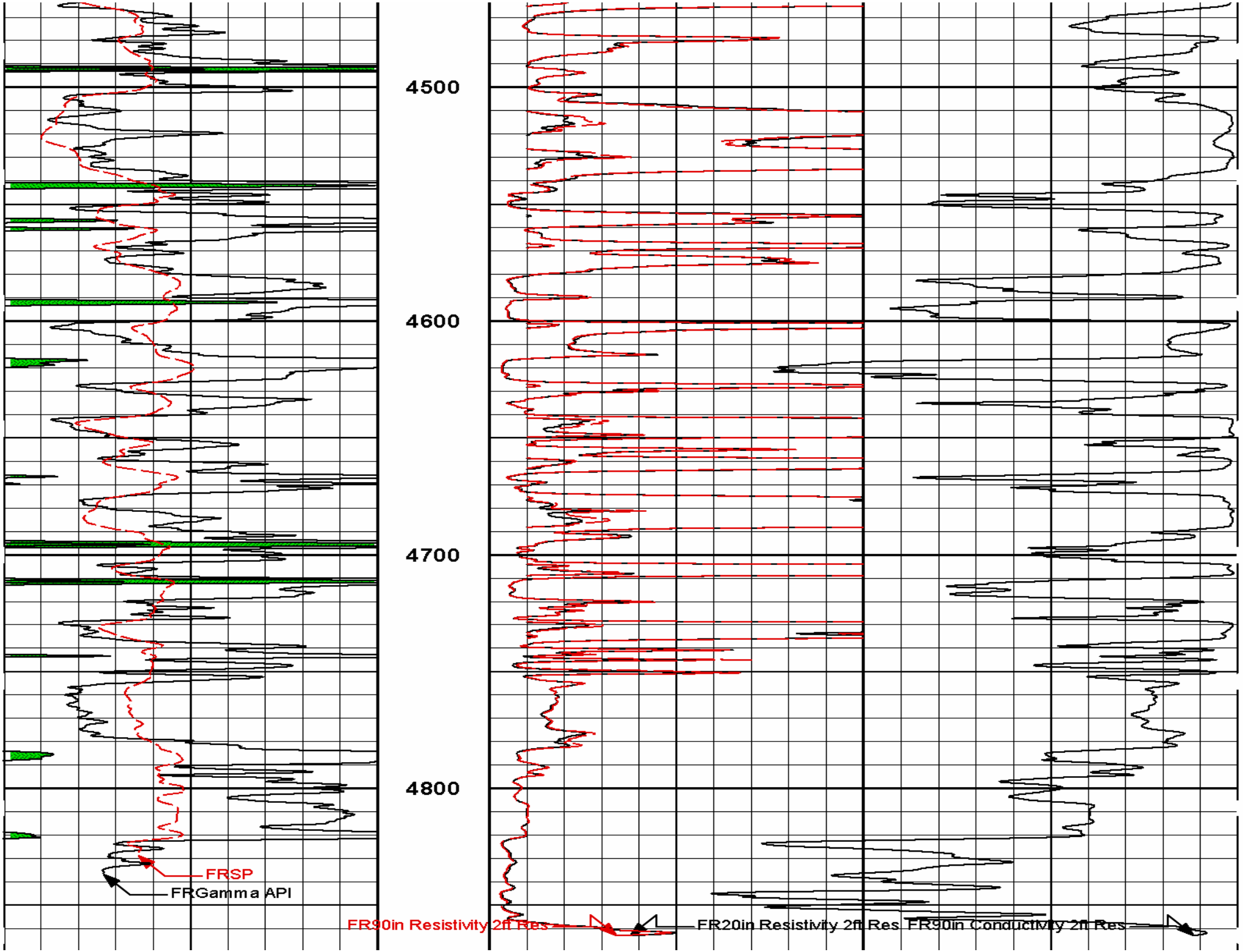

Gamma API
SP
20in Resistivity 2ft Res
90in Conductivity 2ft Res
90in Resistivity 2ft Res
2500
2600
2700
2800

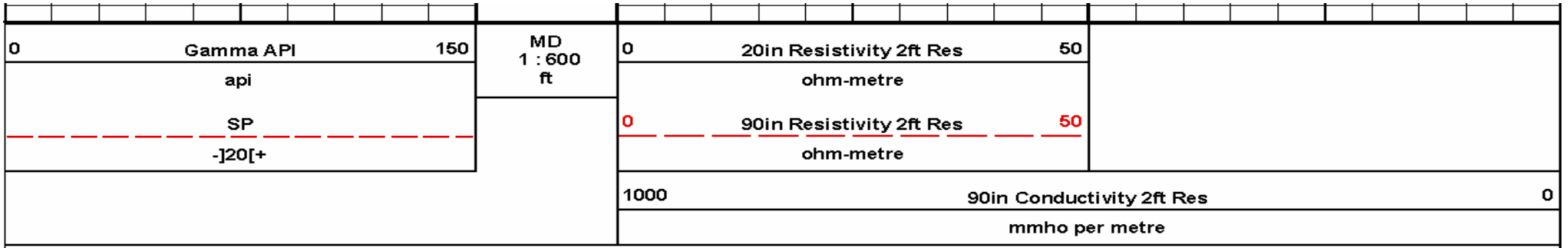

2900
3000
3100
3200
Gamma API
SP
20in Resistivity 2ft Res
90in Resistivity 2ft Res
90in Conductivity 2ft Res


3300
3400
3500
3600
Gamma API


SP
20in Resistivity 2ft Res
90in Resistivity 2ft Res
90in Conductivity 2ft Res
3700
3800
3900
4000


4100
4200
4300
4400
Gamma API
SP
20in Resistivity 2ft Res
90in Resistivity 2ft Res
90in Conductivity 2ft Res


4500
4600
4700
4800
FRSP
FRGamma API
FR90in Resistivity 2ft Res
FR20in Resistivity 2ft Res
FR90in Conductivity 2ft Res



HALLIBURTON

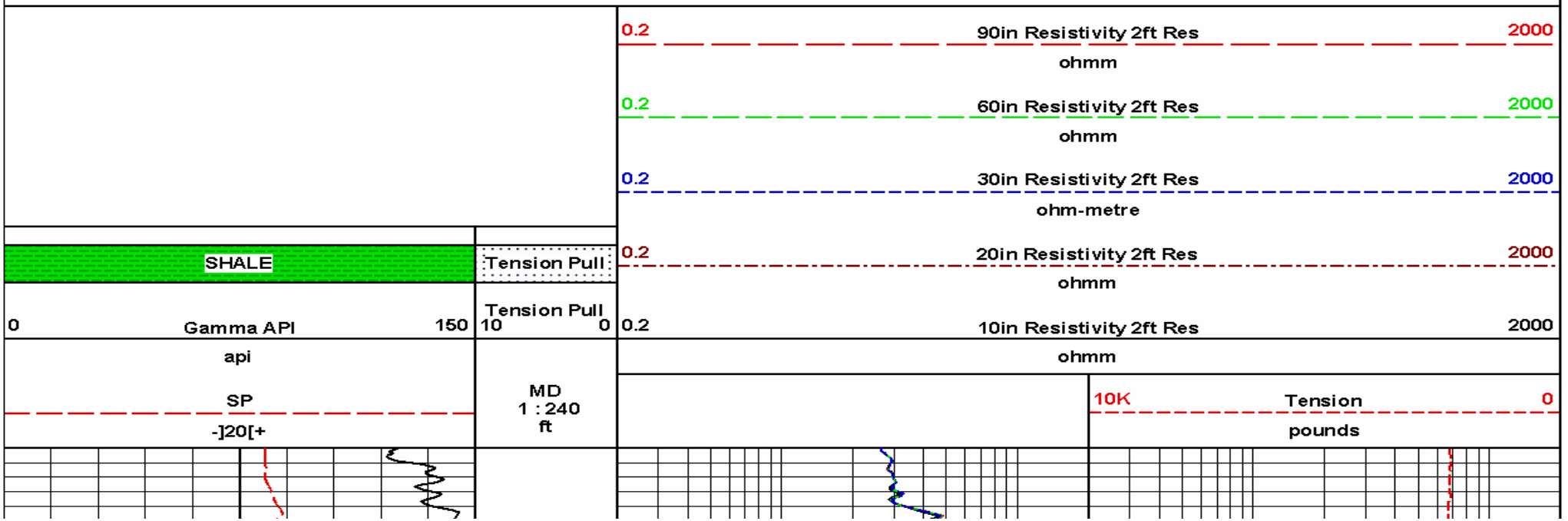
Plot Time: 28-Feb-13 19:28:14
Plot Range: 545 ft to 4875.5 ft
Data: UNRUH 'D' 1-21\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-\UNRUH 'D' 1-21\0001 SP-GTET-BSAT-ACRT-BN\ACRT\ACRT_2_lib

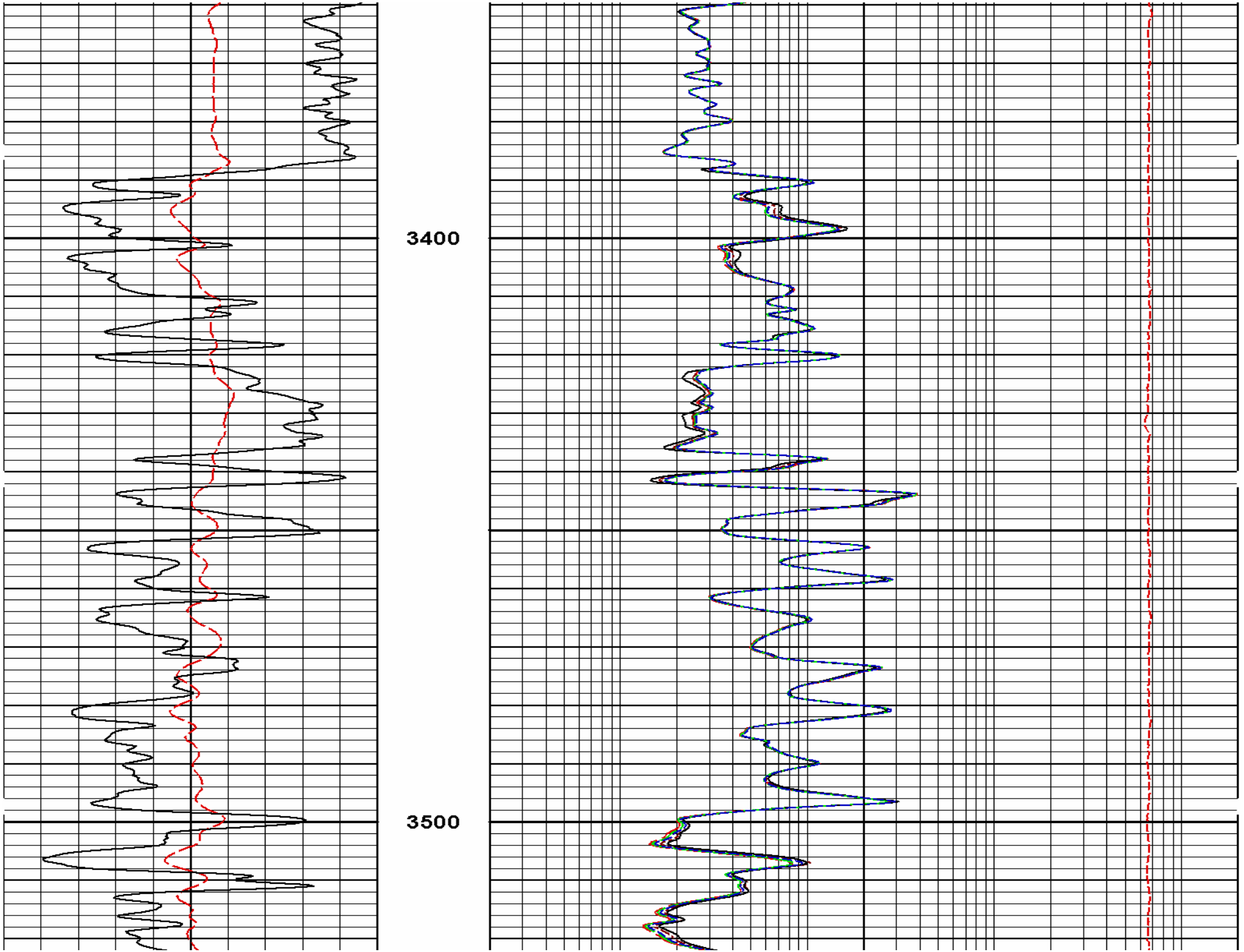
2 INCH MAIN LOG

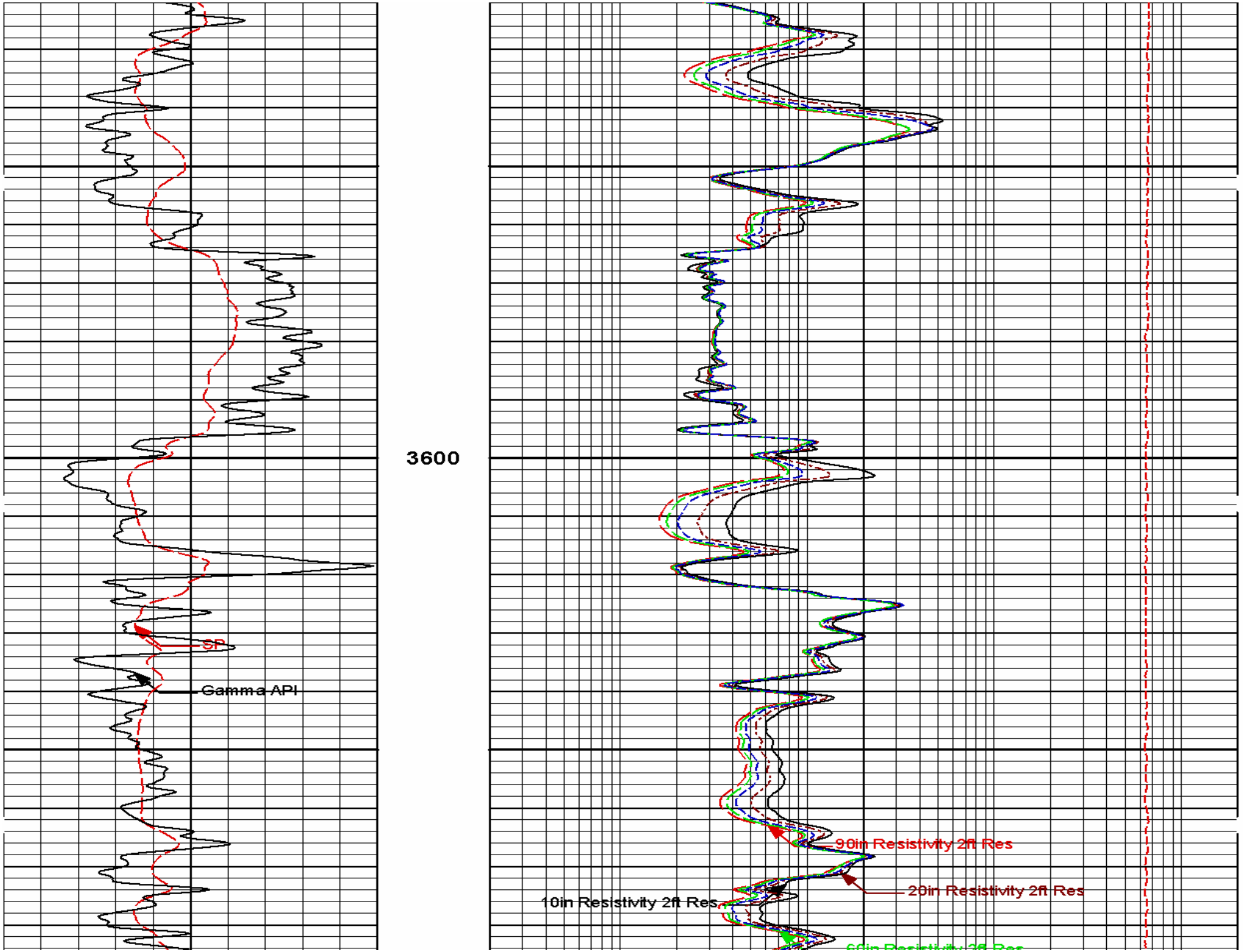
HALLIBURTON

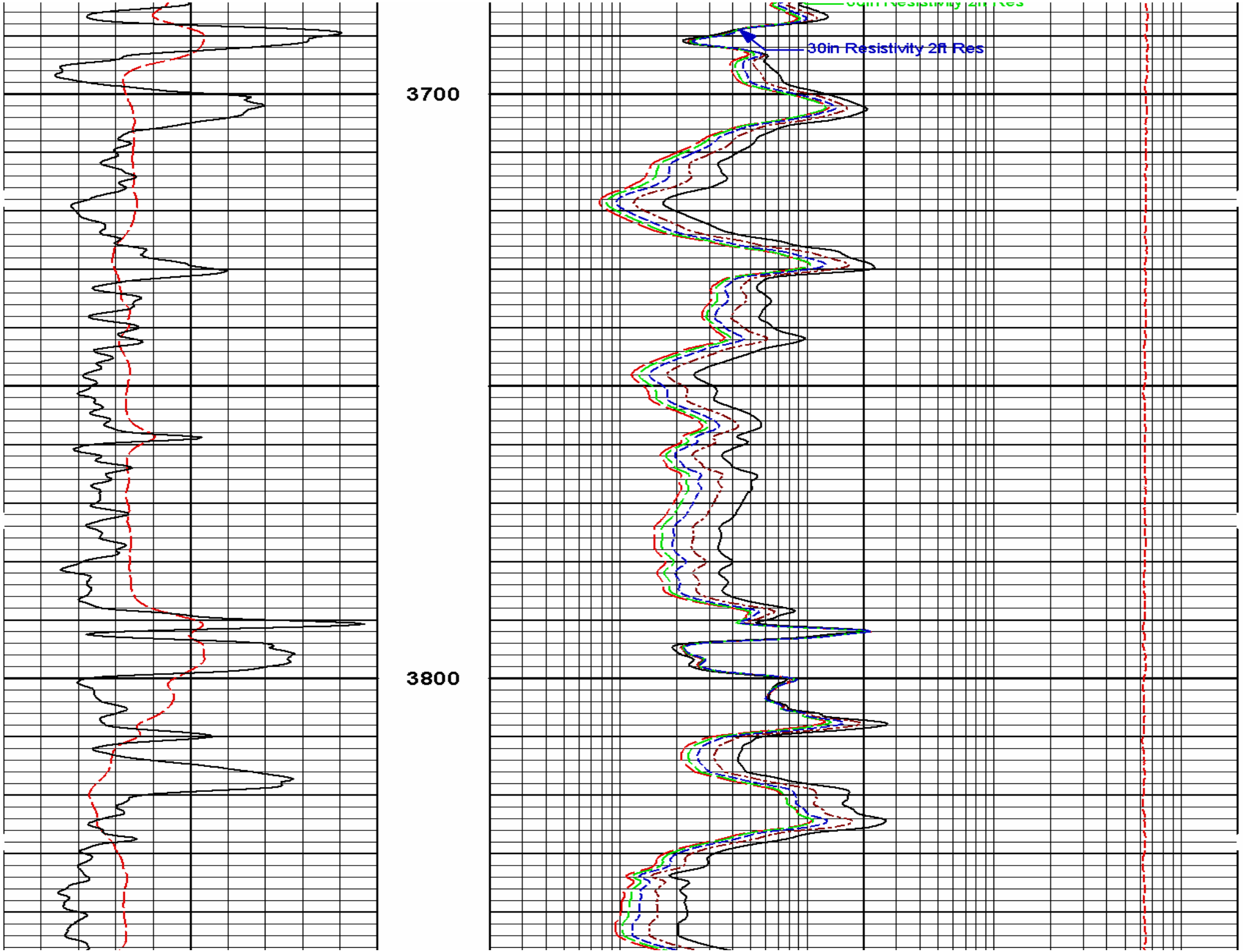
Plot Time: 28-Feb-13 19:28:14
Plot Range: 3350 ft to 4875.5 ft
Data: UNRUH 'D' 1-21\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-\UNRUH 'D' 1-21\0001 SP-GTET-BSAT-ACRT-BN\ACRT\ACRT_5_main_lib

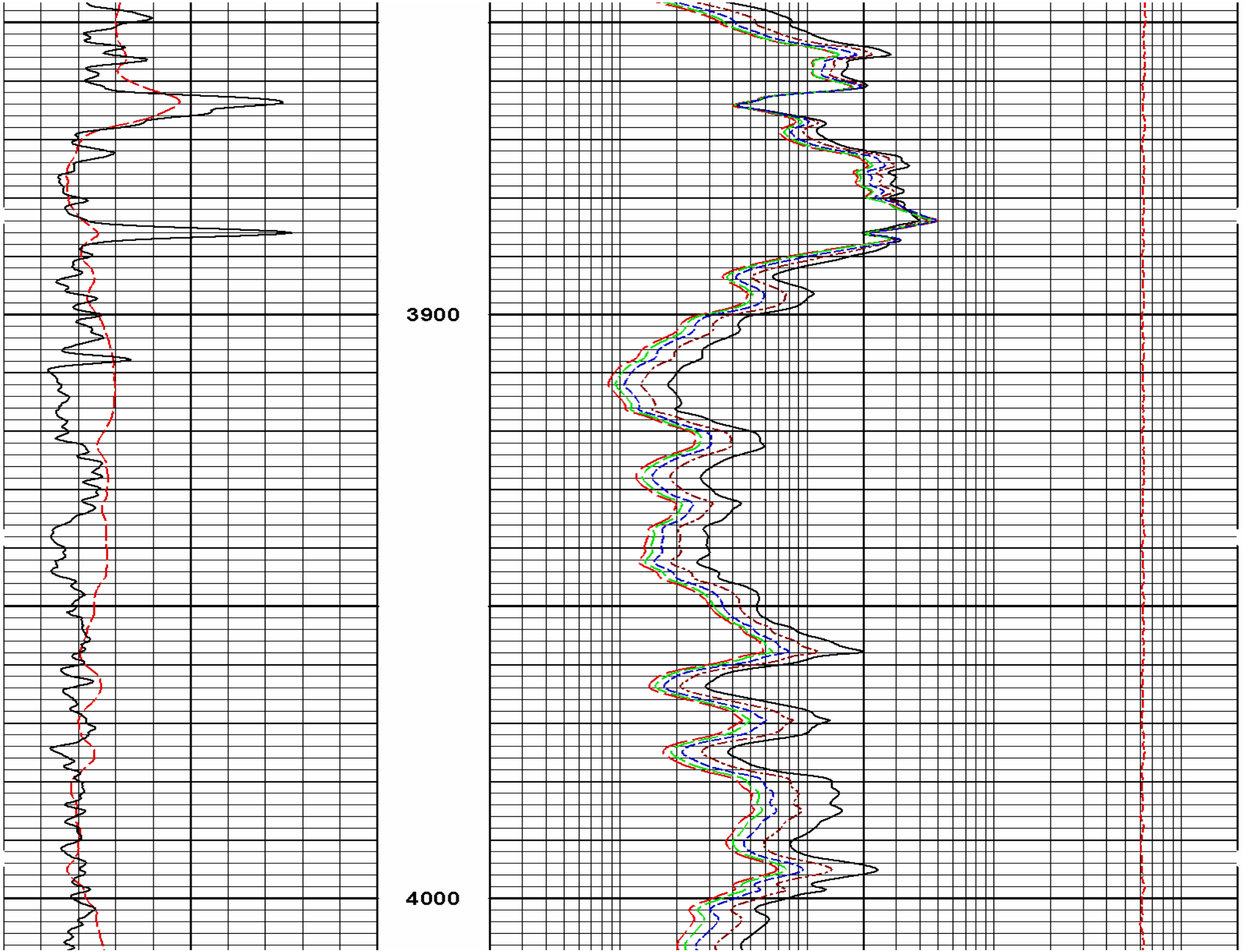
5 INCH MAIN LOG

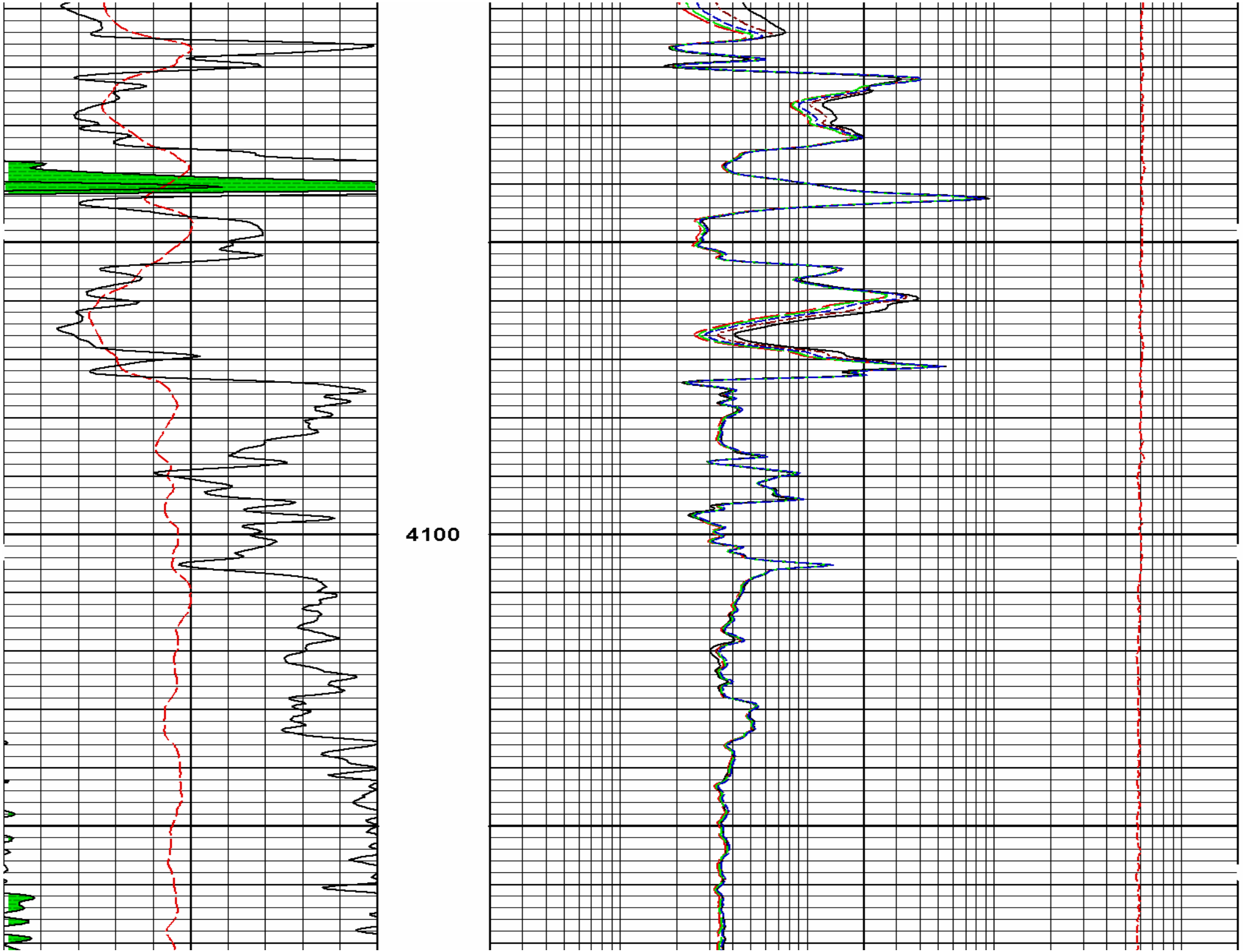


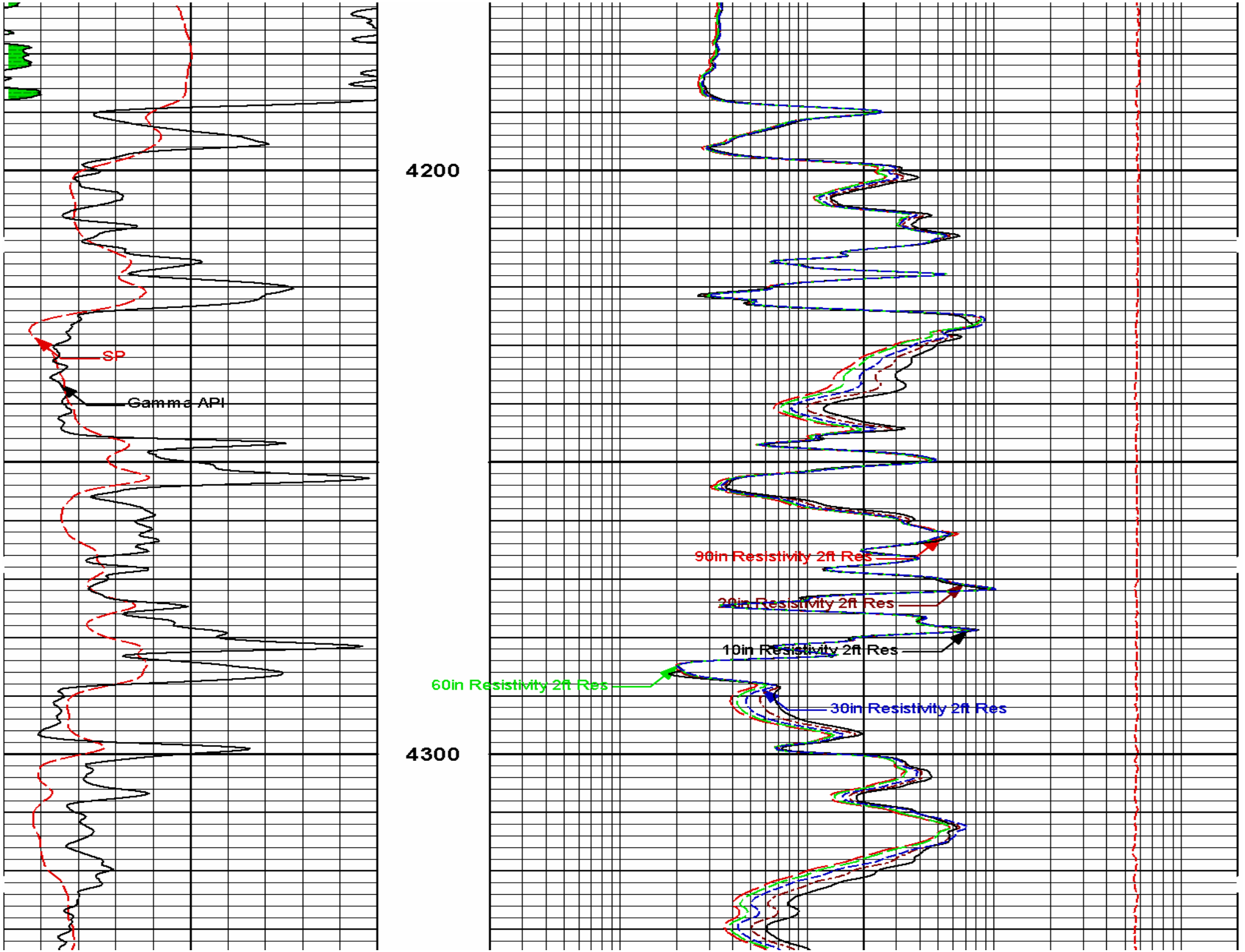

3400
3500

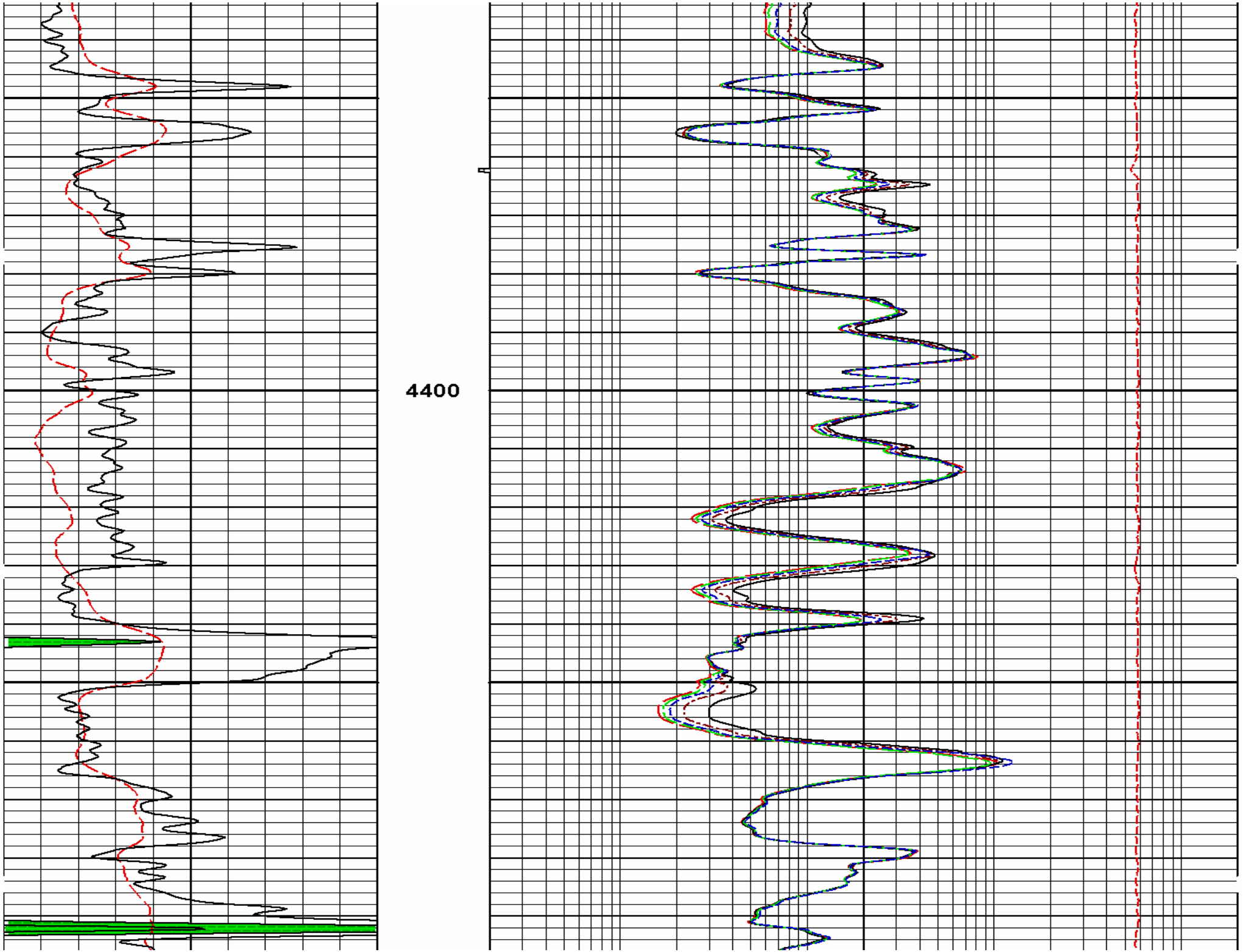

3600
SP
Gamma API
90in Resistivity 2ft Res
20in Resistivity 2ft Res
10in Resistivity 2ft Res

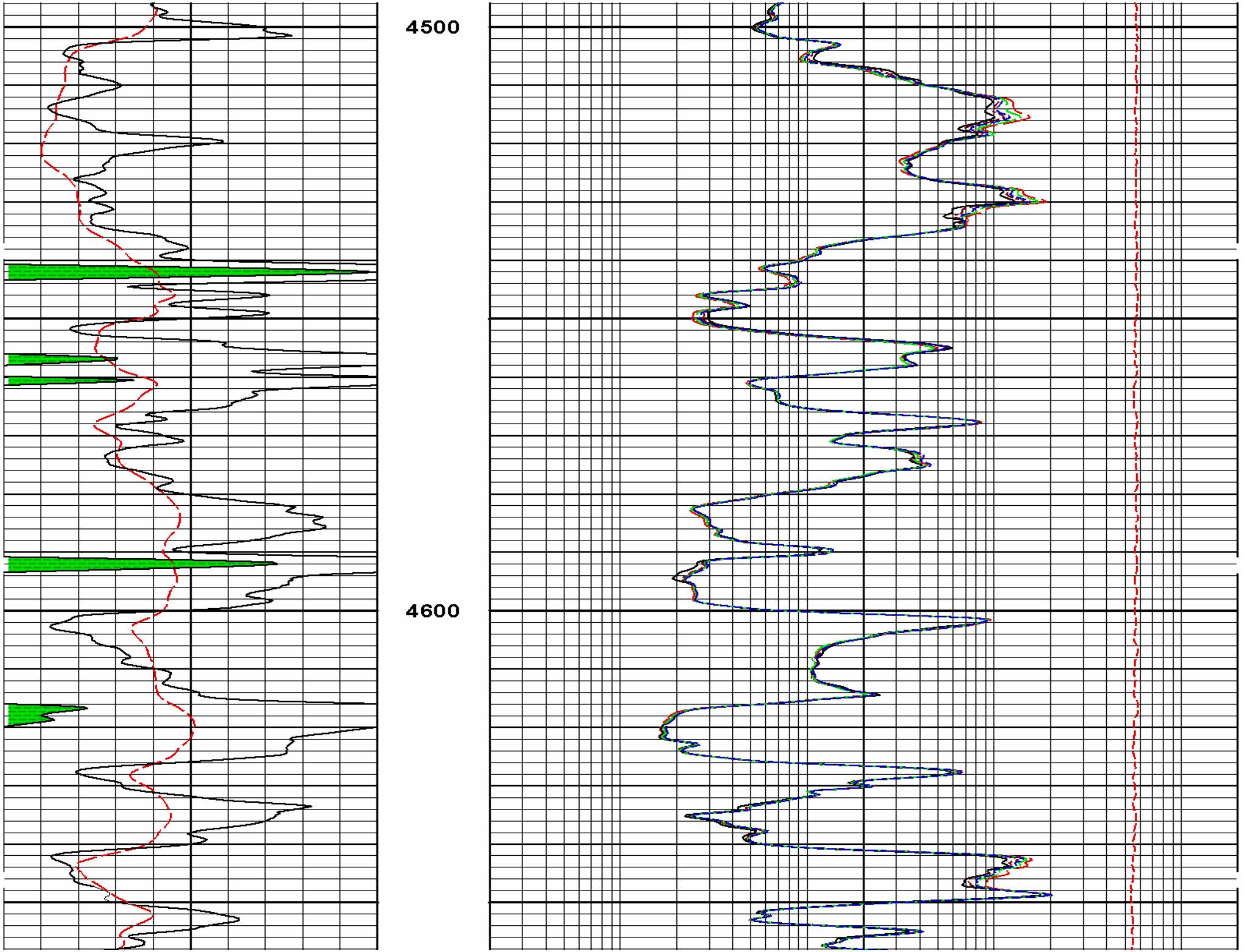

30in Resistivity 2ft Res
3700
3800

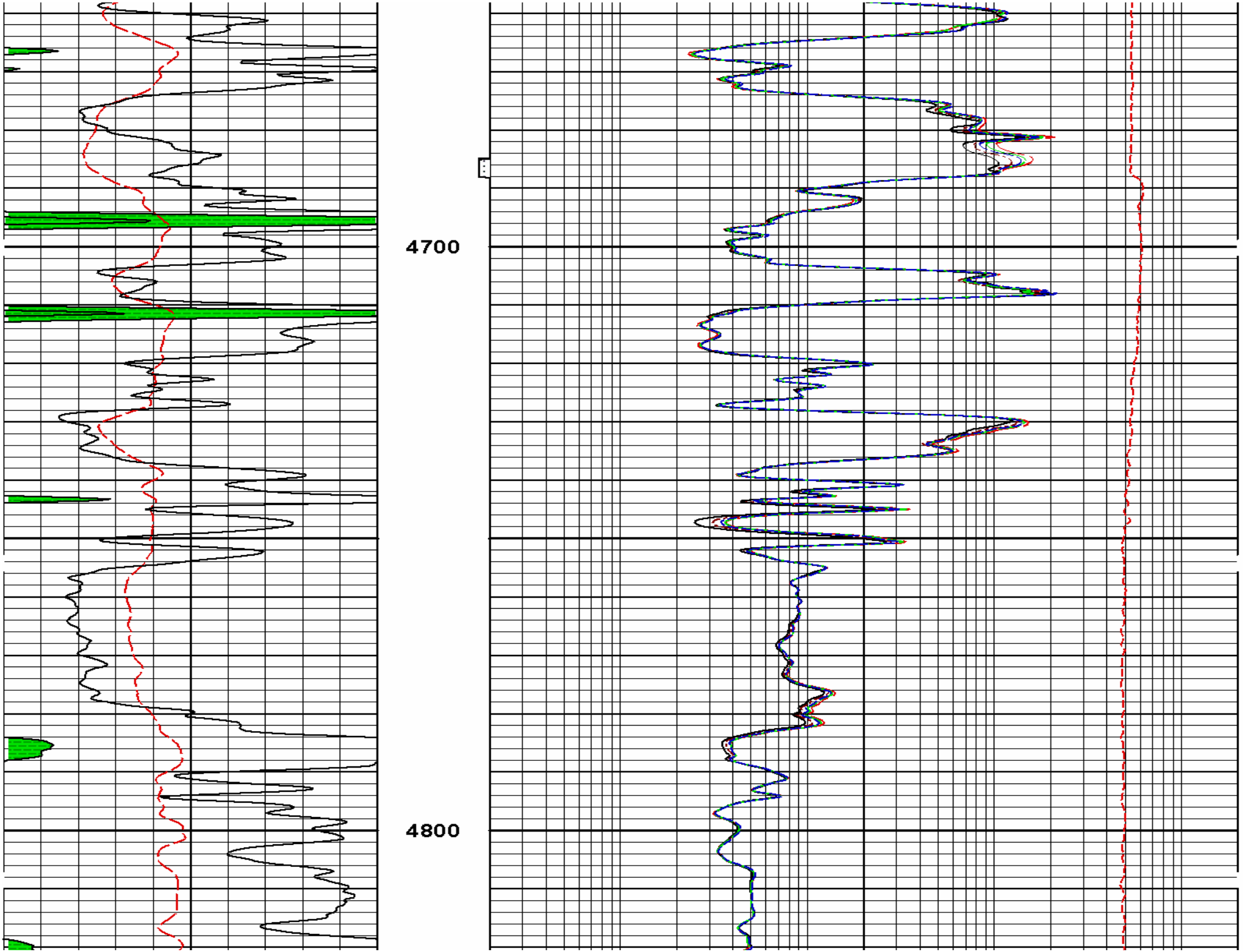

3900
4000

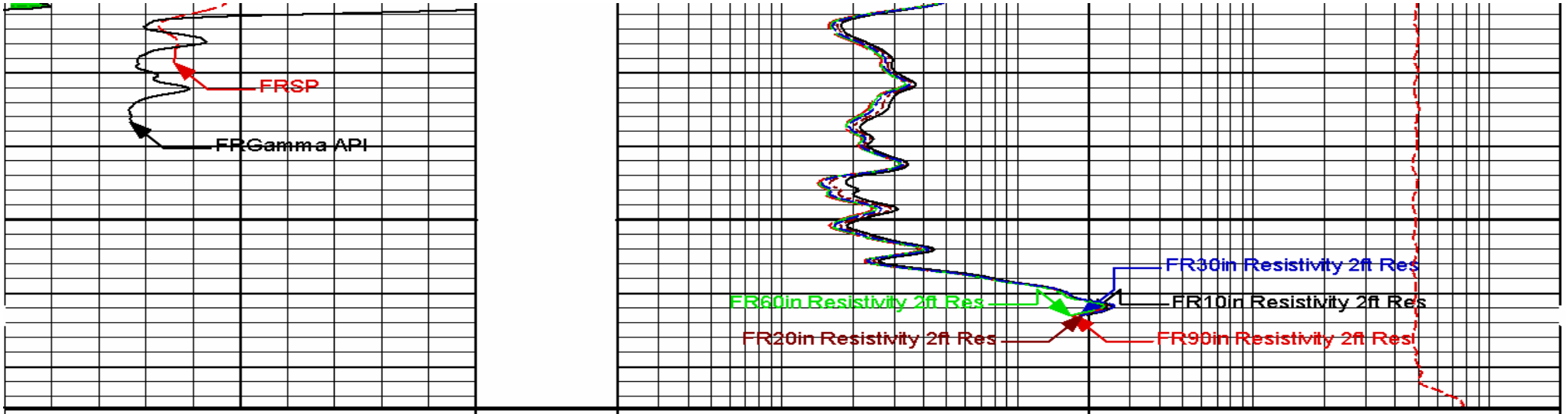

4100


4200
SP
Gamma API
90in Resistivity 2ft Res
20in Resistivity 2ft Res
10in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res
4300


4400


4500
4600


4700
4800



SP -]20[+ 0 Gamma API 150 api	MD 1 : 240 ft Tension Pull 10 0	10K Tension 0 pounds 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
SHALE	Tension Pull	

HALLIBURTON

Plot Time: 28-Feb-13 19:28:17
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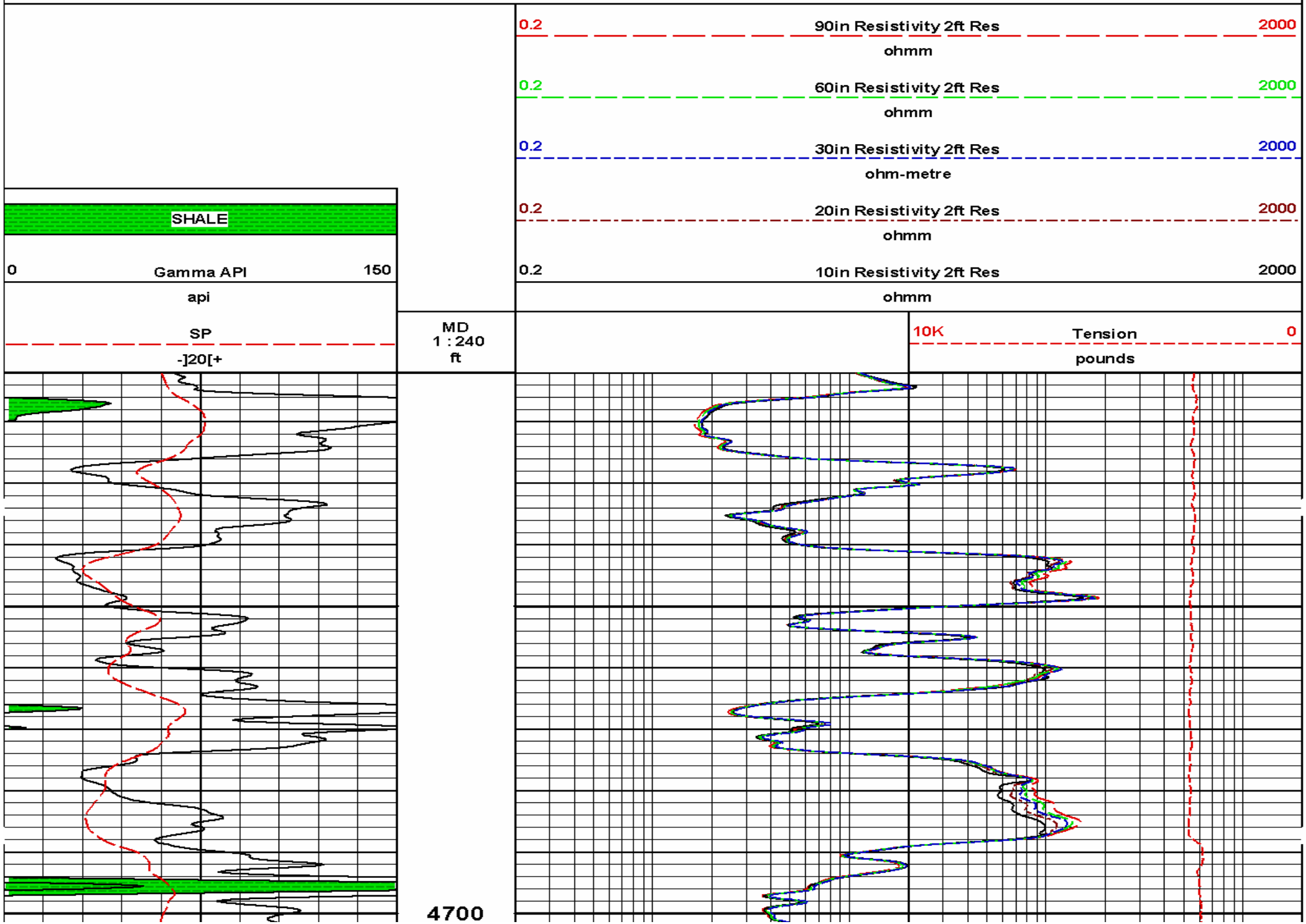
Data: UNRUH 'D' 1-21\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-\UNRUH 'D' 1-21\0001 SP-GTET-BSAT-ACRT-BN\ACRT\ACRT_5_main_lib

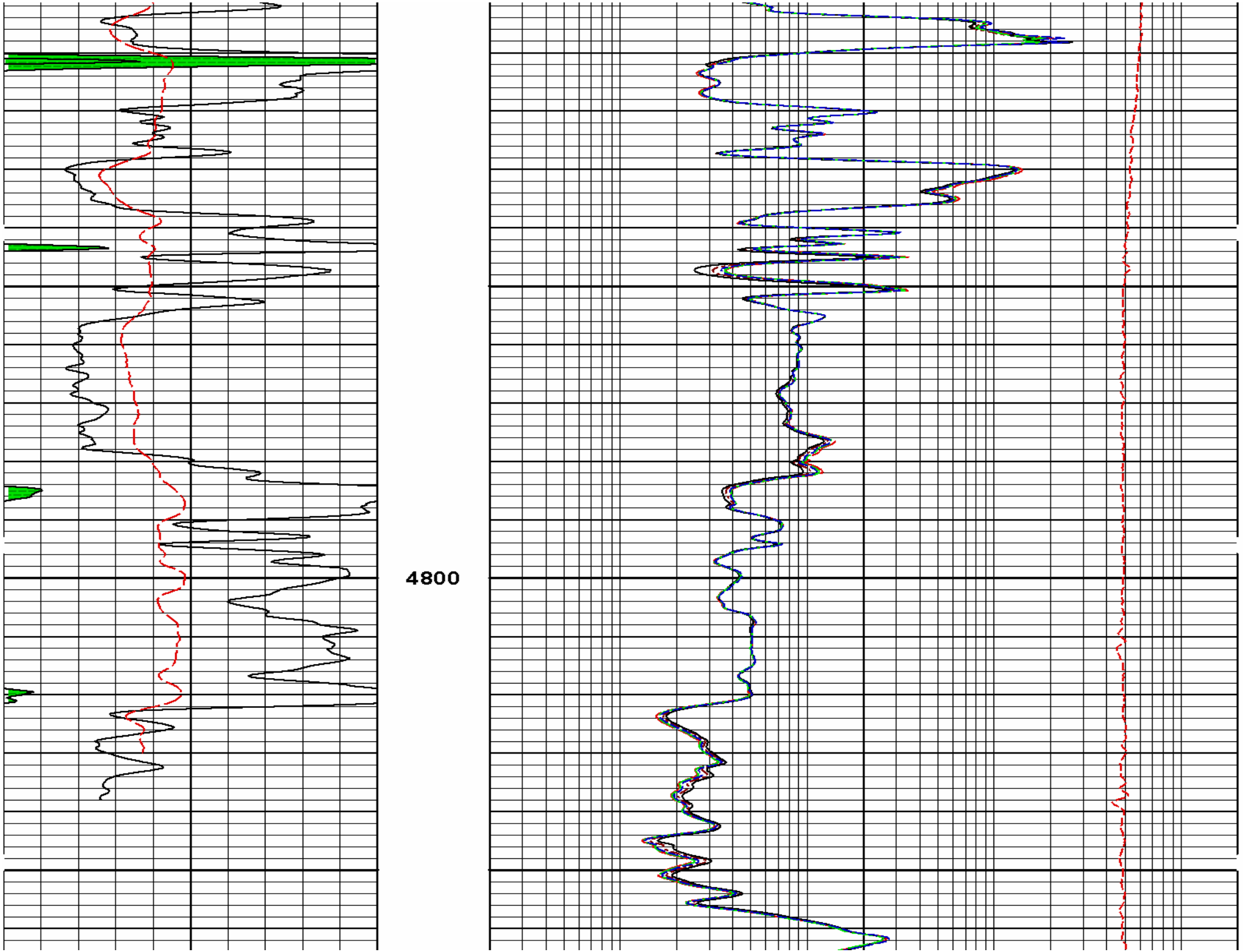
5 INCH MAIN LOG

HALLIBURTON

Plot Time: 28-Feb-13 19:28:17
Plot Range: 4612 ft to 4876.75 ft
Data: UNRUH 'D' 1-21\Well Based\DAQ-0001-002\
Plot File: \\-LOCAL-\UNRUH 'D' 1-21\0001 SP-GTET-BSAT-ACRT-BN\ACRT\ACRT_5_repeat_lib

REPEAT SECTION

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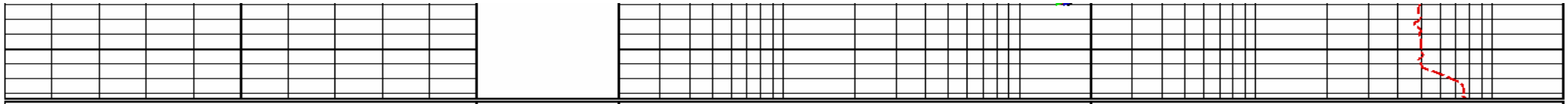


SP	MD 1 : 240 ft	10K Tension 0
-]20[+		pounds
0 Gamma API 150		0.2 10in Resistivity 2ft Res 2000
api		ohmm
SHALE		0.2 20in Resistivity 2ft Res 2000
		ohmm
		0.2 30in Resistivity 2ft Res 2000
		ohm-metre
		0.2 60in Resistivity 2ft Res 2000
		ohmm
		0.2 90in Resistivity 2ft Res 2000
		ohmm

HALLIBURTON

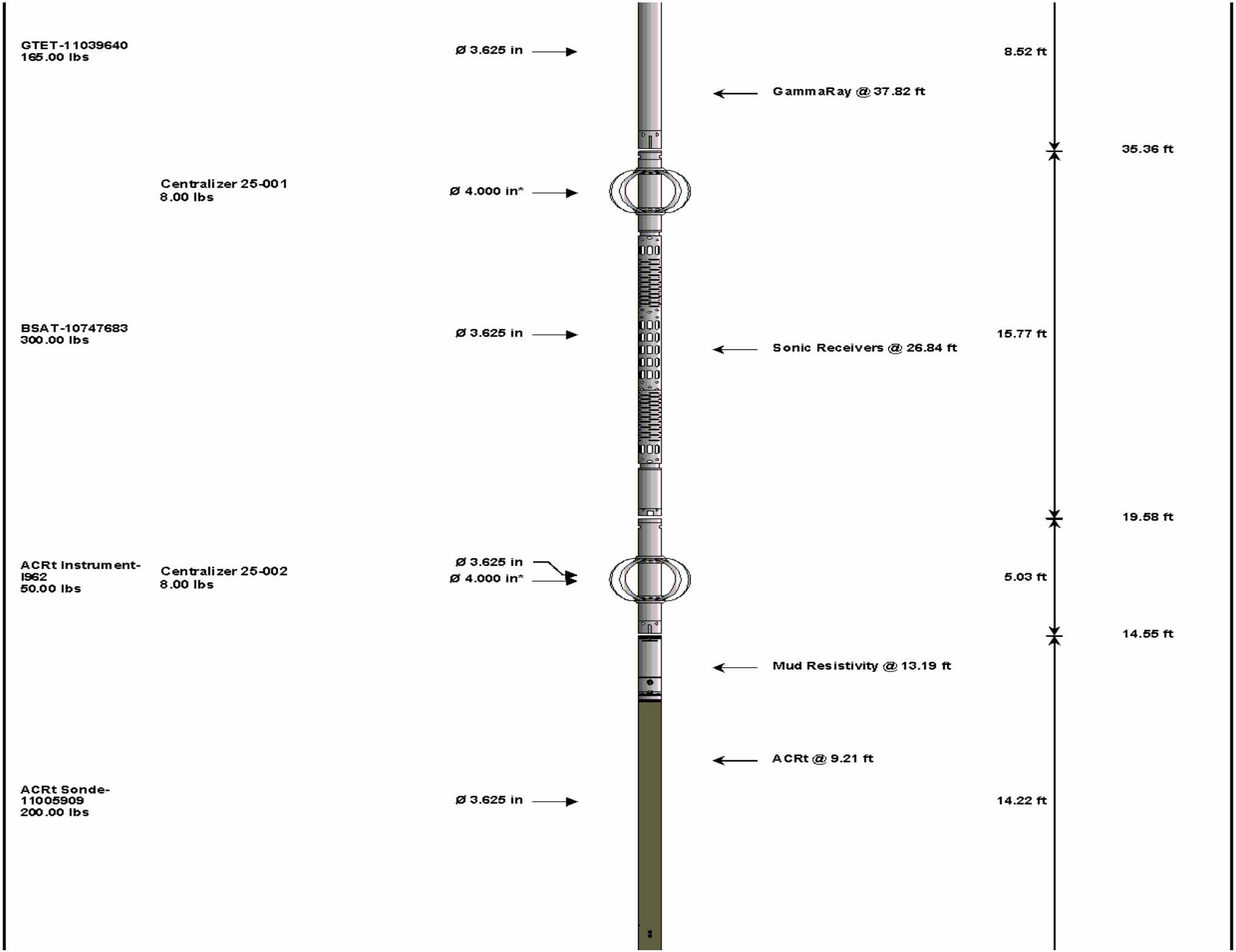
Plot Time: 28-Feb-13 19:28:19
Plot Range: 4612 ft to 4876.75 ft
Data: UNRUH 'D' 1-21\Well Based\DAQ-0001-002\
Plot File: \\-LOCAL-\UNRUH 'D' 1-21\0001 SP-GTET-BSAT-ACRT-BN\ACRT\ACRT_5_repeat_lib

REPEAT SECTION

HALLIBURTON

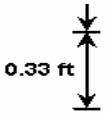
TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
Cable Head-PROT01 30.00 lbs		Ø 3.625 in →			1.92 ft	49.54 ft
						47.62 ft
SP Sub-11441455 60.00 lbs		Ø 3.625 in →		← SP @ 45.84 ft	3.74 ft	
						43.88 ft


GTET-11039640
165.00 lbs
Ø 3.625 in
8.52 ft
GammaRay @ 37.82 ft
35.36 ft
Centralizer 25-001
8.00 lbs
Ø 4.000 in*
BSAT-10747683
300.00 lbs
Ø 3.625 in
15.77 ft
Sonic Receivers @ 26.84 ft
19.58 ft
ACRt Instrument-I962
50.00 lbs
Centralizer 25-002
8.00 lbs
Ø 3.625 in
Ø 4.000 in*
5.03 ft
14.55 ft
Mud Resistivity @ 13.19 ft
ACRt @ 9.21 ft
ACRt Sonde-11005909
200.00 lbs
Ø 3.625 in
14.22 ft

Bull Nose-001
5.00 lbs

Ø 2.750 in



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
CH	Standard OH Cable Head	PROT01	30.00	1.92		47.62	300.00
SP	SP Sub	11441455	60.00	3.74		43.88	300.00
GTET	Gamma Telemetry Tool	11039640	165.00	8.52		35.36	60.00
BSAT	Borehole Sonic Array Tool	10747683	300.00	15.77		19.58	60.00
OBCEN	Centralizer - 25 in. Overbody	001	8.00	2.08	*	32.51	300.00
ACRt	Array Compensated True Resistivity Instrument Section	I962	50.00	5.03		14.55	300.00
OBCEN	Centralizer - 25 in. Overbody	002	8.00	2.08	*	15.87	300.00
ACRt	Array Compensated True Resistivity Sonde Section	11005909	200.00	14.22		0.33	300.00
BLNS	Bull Nose	001	5.00	0.33		0.00	300.00
Total			**826.00**	**49.54**			

* Not included in Total Length and Length Accumulation.

Data: UNRUH 'D' 1-21\0001 SP-GTET-BSAT-ACRT-BN\IDLE **Date: 28-Feb-13 17:14:08**

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	**GTET - 11039640**	**Reference Calibration Date:**	**14-Jan-13 11:39:27**
Engineer:	**J. BOLLOM**	**Calibration Date:**	**13-Feb-13 13:51:32**
Software Version:	**WL INSITE R3.8.0 (Build 2)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB146
Calibrator API Reference:265.00 api
Equivalent Calibrator API Reference:269.6 api

Measurement	Measured	Calibrated	Units
Background	77.6	79.8	api
Background + Calibrator	339.7	349.5	api
Calibrator	262.1	269.6	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	**GTET - 11039640**	**Reference Calibration Date:**	**13-Feb-13 13:51:32**
Engineer:	**THOMAS HYDE**	**Calibration Date:**	**28-Feb-13 16:56:33**
Software Version:	**WL INSITE R3.8.0 (Build 2)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB146

Calibrator Source S/N: TB146
Calibrator API Reference:265.00 api
Equivalent Calibrator API Reference:269.6 api

Field Verification	Shop	Field	Units
Background	79.8	51.9	api
Background + Calibrator	349.5	326.6	api
Calibrator	269.6	274.7	api

Shop	Field	Difference	Tolerance
269.6	274.7	-5.1	+/- 9.00

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	**ACRt Sonde - 11005909**	**Reference Calibration Date:**	**19-Dec-12 12:28:33**
Engineer:	**S. INGERSOLL**	**Calibration Date:**	**31-Jan-13 14:33:59**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**
Host Tool Name:	**ACRt Instrument - I962**		

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.01	1.05	0.95	1.02	1.05	0.95	1.02	1.05
A2 (50")	0.95	1.01	1.05	0.95	1.02	1.05	0.95	1.02	1.05
A3 (29")	0.95	1.00	1.05	0.95	1.01	1.05	0.95	1.00	1.05
A4 (17")	0.95	1.00	1.05	0.95	1.00	1.05	0.95	1.00	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.00	1.05	0.95	0.99	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.99	1.05	0.95	0.99	1.05

TYPICAL SONDE OFFSET RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-0.33	2	-6	-3.29	-2	-8	-5.20	-2
A2 (50")	-7	-1.71	0	-7	-3.50	0	-7	-4.56	0
A3 (29")	-27	-14.29	-9	-9	-4.50	-3	-7	-2.75	-1
A4 (17")	-180	-100.84	-60	-45	-30.70	-15	-39	-25.63	-13
A5 (10")	N/A	N/A	N/A	-150	-99.05	-50	-80	-44.76	-10
A6 (6")	N/A	N/A	N/A	175	287.66	525	90	152.31	270

TRANSMITTER CURRENT GAIN

R-MUD VERIFICATION

Lower | Measured | Upper

Signal	Lower	R	Upper
12K	0.6	0.88	1.3
36K	1.0	1.34	2.0
72K	1.0	1.57	2.0

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 RANGE CHK	PASS
Tx CURRENT GAIN	PASS
Rmud VERIFICATION	PASS

TOOL OK TO LOG

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11039640						
Gamma Ray Calibrator	269.6	274.7	----------	-5.1	+/- 9.00	api
ACRt Sonde-11005909						
Mud Cell	1.00	----------	----------	0.00	----------	ohm-m

Data: UNRUH 'D' 1-21\0001 SP-GTET-BSAT-ACRT-BN\IDLE

Date: 28-Feb-13 17:24:17

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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	70.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	

SHARED	ICOD	AHV Casing OD	5.500	in
SHARED	ST	Surface Temperature	70.0	degF
SHARED	TD	Total Well Depth	4875.00	ft
SHARED	BHT	Bottom Hole Temperature	200.0	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	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	User define	
BSAT	DTMA	Delta -T Matrix	47.60	uspf
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP 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	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	

ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm

BOTTOM

Data: UNRUH 'D' 1-21\0001 SP-GTET-BSAT-ACRT-BN\IDLE

Date: 28-Feb-13 17:24:54

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INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
	Depth Panel			
TENS	Tension	0.00	NO	
	SP Sub			
PLTC	Plot Control Mask	45.84	NO	
SP	Spontaneous Potential	45.84	BLK	1.250
SPR	Raw Spontaneous Potential	45.84	NO	
SPO	Spontaneous Potential Offset	45.84	NO	
	GTET			
TPUL	Tension Pull	37.82	NO	
GR	Natural Gamma Ray API	37.82	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	37.82	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	37.82	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
	BSAT			
TPUL	Tension Pull	26.84	NO	
STAT	Status	26.84	NO	
DLYT	Delay Time	26.84	NO	
SI	Sample Interval	26.84	NO	
TXRX	Raw Telemetry 10 Receivers	26.84	NO	
FRMC	Tool Frame Count	26.84	NO	
GMOD	Gain processing mode	19.58	NO	
	ACRt Sonde			
TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000

F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	4.98	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	4.98	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	3.98	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	3.98	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.48	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.48	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.23	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.23	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	8.98	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	8.98	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.48	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.48	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	4.98	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	4.98	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	3.98	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	3.98	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.48	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.48	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.23	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter Current Raw 12K X Receiver	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	

Data: UNRUH 'D' 1-21\0001 SP-GTET-BSAT-ACRT-BN\IDLE Date: 28-Feb-13 17:25:02

COMPANY	**HERMAN L. LOEB**		
WELL	**UNRUH 'D' 1-21**		
FIELD	**WILDCAT**		
COUNTY	**KIOWA**	STATE	**KANSAS**

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ARRAY COMPENSATED TRUE RESISTIVITY LOG