

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
ARRAY COMPENSATED
TRUE RESISTIVITY

COMPANY		NOBLE ENERGY	
WELL		WELLS RANCH AA26-13X	
FIELD		WATTENBERG	
COUNTY		WELD	
STATE		CO	
Permanent Datum		GL	
Log measured from		KB	
Drilling measured from		KB	
Date	21-Oct-10		
Run No.	ONE		
Depth - Driller	6968.00 ft		
Depth - Logger	6975.0 ft		
Bottom - Logged Interval	6966 ft		
Top - Logged Interval	563 ft		
Casing - Driller	8.625 in @ 564.0 ft		
Casing - Logger	563.0 ft		
Bit Size	7.875 in		
Type Fluid in Hole	WBM		
Density	8.7 ppq	49.00	s/qt
PH	8.00 pH	8.6	cp/m
Source of Sample			
Rm @ Meas. Temperature	0.880 ohmm @ 99.90 degF		
Rmf @ Meas. Temperature	0.98 ohmm @ 75.00 degF		
Rmc @ Meas. Temperature	1.025 ohmm @ 75.00 degF		
Source Rmf	CHART	CHART	
Rm @ BHT	0.45 ohmm @ 202.0 degF		
Time Since Circulation	6.0 hr		
Time on Bottom	21-Oct-10 16:27		
Max. Rec. Temperature	202.0 degF @ 6975.0 ft		
Equipment	11454566	BRIGHTON	
Recorded By	C. BLUE		
Witnessed By	T. BOWMAN		

COMPANY	NOBLE ENERGY		
WELL	WELLS RANCH AA26-13X		
FIELD	WATTENBERG		
COUNTY	WELD		
STATE	CO		
API No.	05123306730000		
Location	SHL: 667' FSL & 670' FWL SMSW LAT: 40.45206° LONG: -104.41128°		
Other Services:	RWCH GTET CSNG WSTT XRMI		
Sect. 26	Twp. 6N	Rge. 63W	Elev. 4820.0 ft
			Elev. K.B. 4835.0 ft
			D.F. 4835.0 ft
			G.L. 4820.0 ft

Fold here

Service Ticket No.: 7707818										API Serial No.: 05123306730000										PGM Version: WL INSITE R3.0.4 (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 817-353					N/A					0.5" S.O.					N/A				
Rmc @ Meas. Temp.					@					@																													
Source Rmf					Rmc																																		
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.					11215095					Serial No.										Serial No.					I337M319					Serial No.					11919337				
Model No.					GTET					Model No.										Model No.					SDLT					Model No.					DSNT				
Diameter					3.625"					No. of Cent.										Diameter					4.5"					Diameter					3.625"				
Detector Model No.					102A					Spacing										Log Type					GAM/GAM					Log Type					NEU/NEU				
Type					SCINT															Source Type					Cs137					Source Type					Am241Be				
Length					8"					LSA [Y/N]										Serial No.					5256GW					Serial No.					DSN 430				
Distance to Source					17'					FWDA [Y/N]										Strength					1.5 Ci					Strength					15 Ci				
LOGGING DATA																																							
GENERAL					GAMMA					ACOUSTIC					DENSITY					NEUTRON																			

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	6975	6824	REC	0	250				20%	0%	2.68 g/cc	20%	0%	SAND
ONE	6824	6547	REC	0	250				20%	0%	2.71 g/cc	20%	0%	LIME
ONE	6547	563	REC	0	250				20%	0%	2.68 g/cc	20%	0%	SAND
DIRECTIONAL INFORMATION														
Maximum Deviation @									KOP @					
Remarks: RUN ONE: RWCH/GTET/CSNG/DSNT/SDLT/ACRT RAN IN COMBINATION														
RUN ONE: RWCH/GTET/CSNG/DSNT/SDLT/ACRT RAN IN COMBINATION														
RUN TWO: RWCH/D4TGX/WSST/XRMI RAN IN COMBINATION														
ANNULAR HOLE VOLUME CALCULATED FOR 4.5 INCH PRODUCTION CASING														
TENSION PULLS, WASHOUTS, AND BOREHOLE RUGOSITY AFFECT TOOL RESPONSE														
CREW: A. LEWIS, T. BINEAU, R. TWEETEN														
RIG: ENSIGN 128														
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES -- BRIGHTON, CO -- (303) 825-4346														
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.														
HALLIBURTON														



PARAMETERS REPORT

Depth (ft)	Tool Name	Description	Value	Units
TOP				
	DSNT	Neutron Lithology	Sandstone	
	SDLT	Formation Density Matrix	2.680	g/cc
6547.00				
	DSNT	Neutron Lithology	Limestone	
	SDLT	Formation Density Matrix	2.710	g/cc
6824.00				
	SHARED	Bit Size	7.875	in
	SHARED	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	Borehole Fluid Weight	8.700	ppg
	SHARED	Oil Based Mud System?	No	
	SHARED	Mud Resistivity	0.880	ohmm
	SHARED	Temperature of Mud	99.9	degF
	SHARED	Logging Interval is Cased?	No	
	SHARED	AHV Casing OD	4.500	in
	SHARED	Surface Temperature	75.0	degF
	SHARED	Total Well Depth	6975.00	ft
	SHARED	Bottom Hole Temperature	202.0	degF
	SHARED	Navigation and Survey Master Tool	NONE	
	SHARED	High Res Z Accelerometer Master Tool	GTET	
	SHARED	Temperature Master Tool	NONE	
	SHARED	Borehole Size Master Tool	NONE	
	GTET	Process Gamma Ray?	Yes	
	GTET	Gamma Tool Standoff	0.000	in

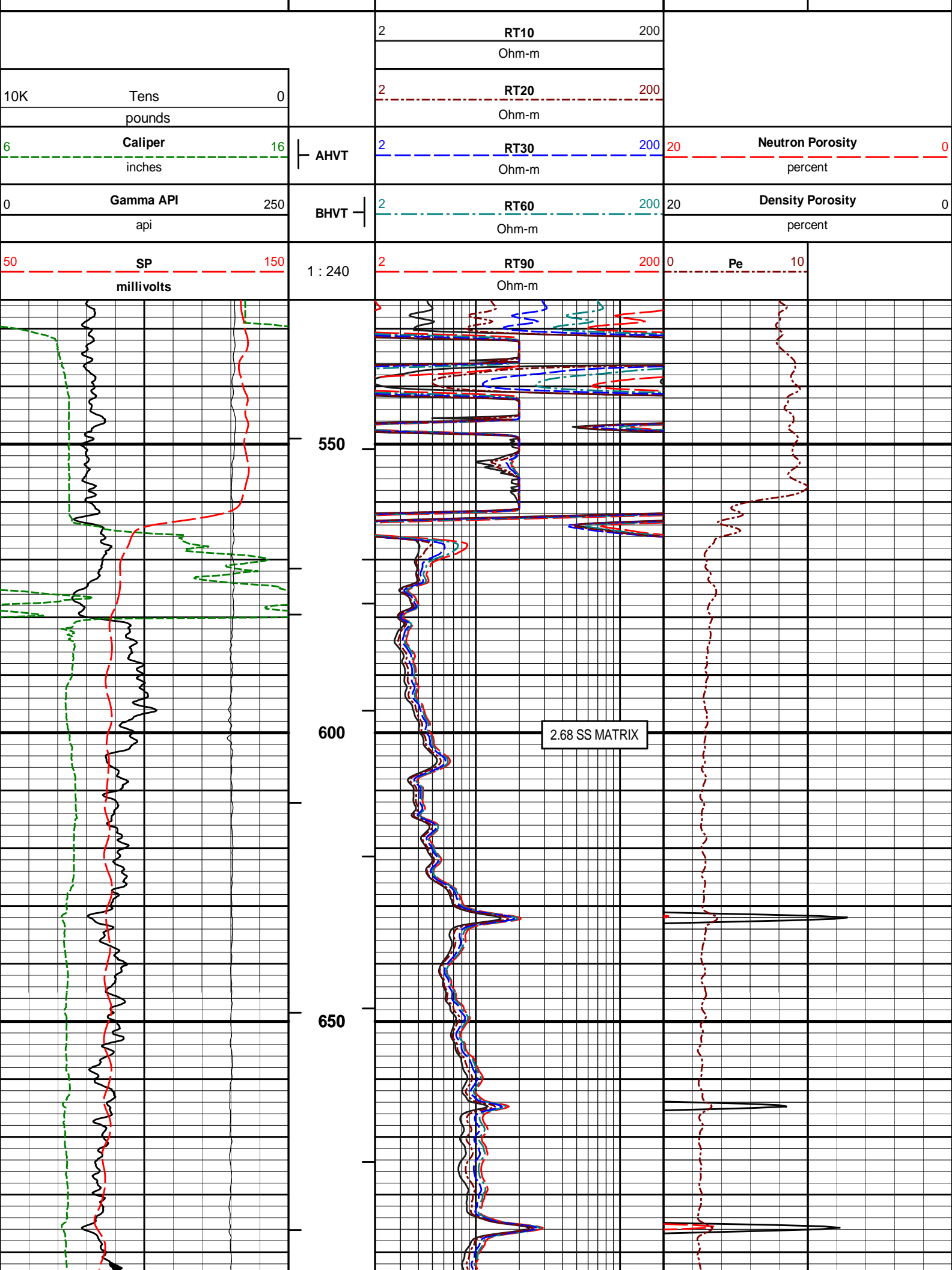
GTET	Process Gamma Ray EVR?	No	
GTET	Potassium	0.00	%
GTET	Mud Type	Natural	
GTET	Tool Position	Standoff	
CSNG	Process CSNG Data?	Yes	
CSNG	Is Tool Centralized?	No	
CSNG	Mud Type?	Natural	
CSNG	Percent K in Mud by Weight?	0.00	%
CSNG	Gamma Enviromental Corrections?	Yes	
CSNG	Barite Correction Factor	1.00	
DSNT	Process DSN?	Yes	
DSNT	Process DSN EVR?	No	
DSNT	Neutron Lithology	Sandstone	
DSNT	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.000	in
DSNT	Temperature Correction Type	None	
DSNT	DSN Pressure Correction Type	None	
DSNT	View More Correction Options	No	
DSNT	Use TVD for Gradient Corrections?	No	
DSNT	Logging Horizontal Water Tank?	No	
SDLT	Process Density?	Yes	
SDLT	Process Density EVR?	No	
SDLT	Is Hole Air Drilled?	No	
SDLT	Logging Calibration Blocks?	No	
SDLT	SDLT Pad Temperature Valid?	Yes	
SDLT	Disable temperature warning	No	
SDLT	Weighted Mud Correction Type?	None	
SDLT	Formation Density Matrix	2.680	g/cc
SDLT	Formation Density Fluid	1.000	g/cc
SDLT	Process Caliper Outputs?	Yes	
SDLT	Process MicroLog Outputs?	Yes	
ACRt	Process ACRt?	Yes	
ACRt	Minimum Tool Standoff	0.50	in
ACRt	Temperature Correction Source	FP Lwr & FP Up	
ACRt	Tool Position	Free Hanging	
ACRt	Rmud Source	Mud Cell	
ACRt	Minimum Resistivity for MAP	0.20	ohmm
ACRt	Maximum Resistivity for MAP	200.00	ohmm
ACRt	Threshold Quality	0.50	

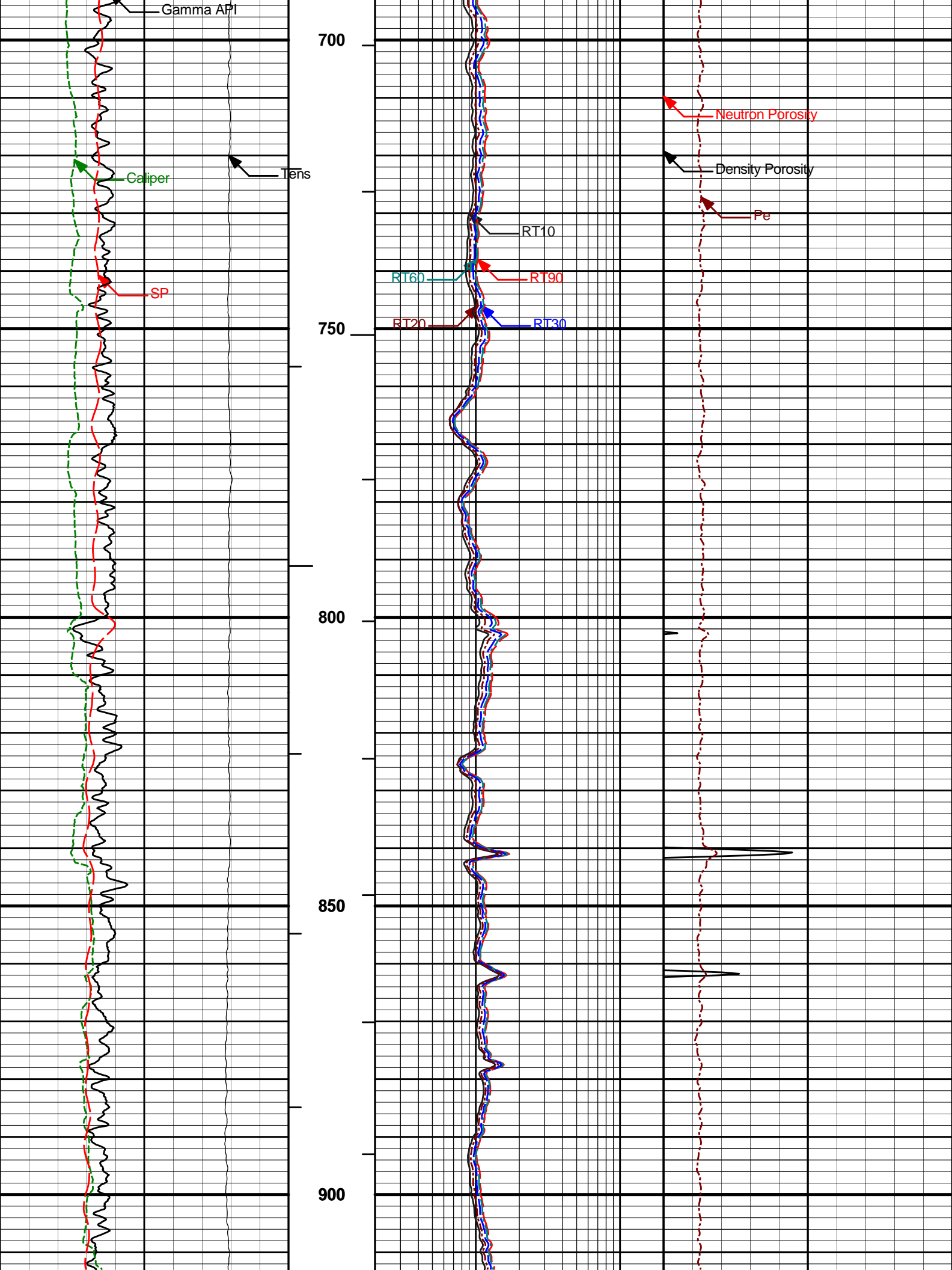


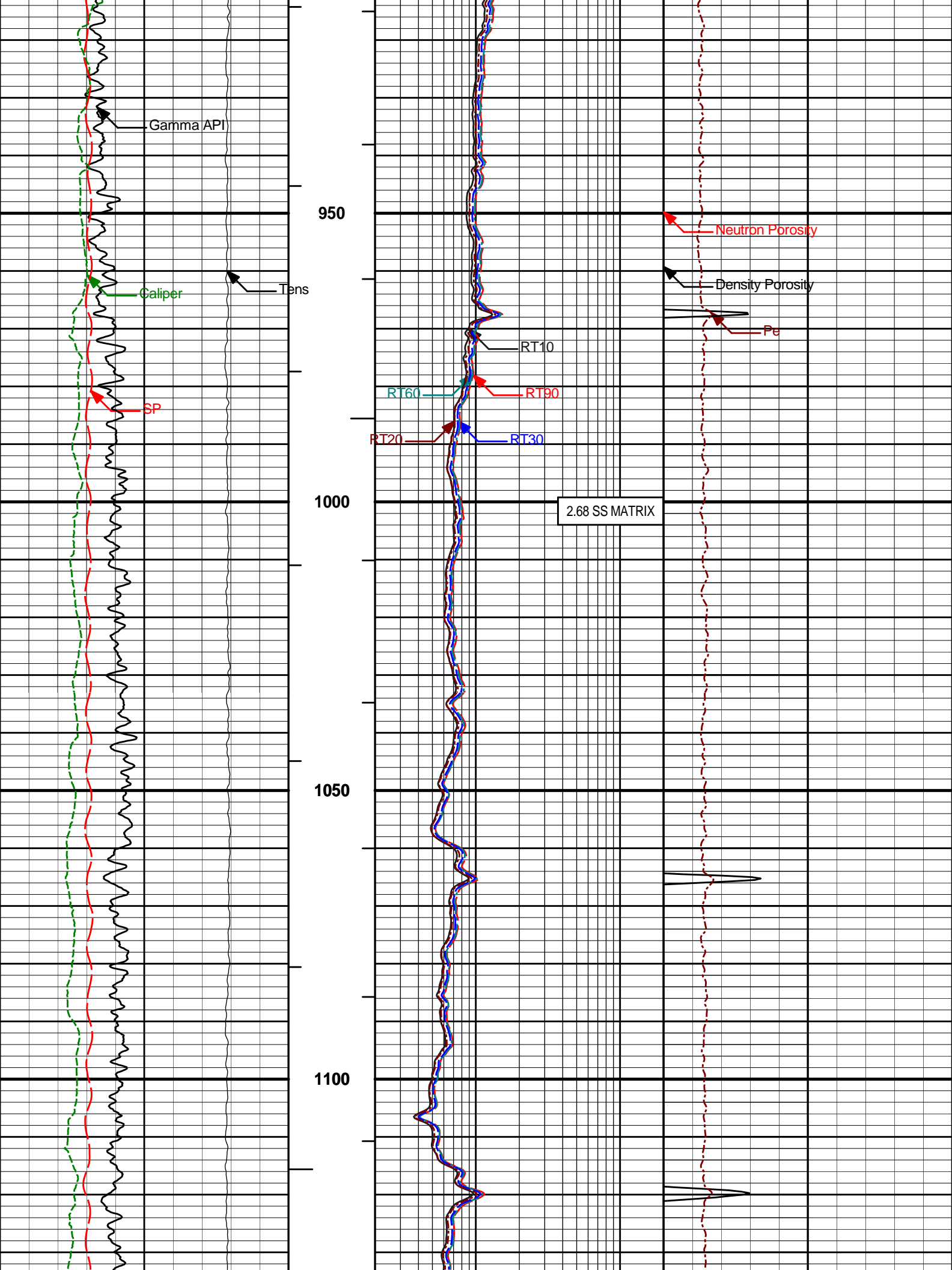
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 Data: WELLS_AA26_13X\Well Based\MAIN*
 Plot File: \COMP\MAIN

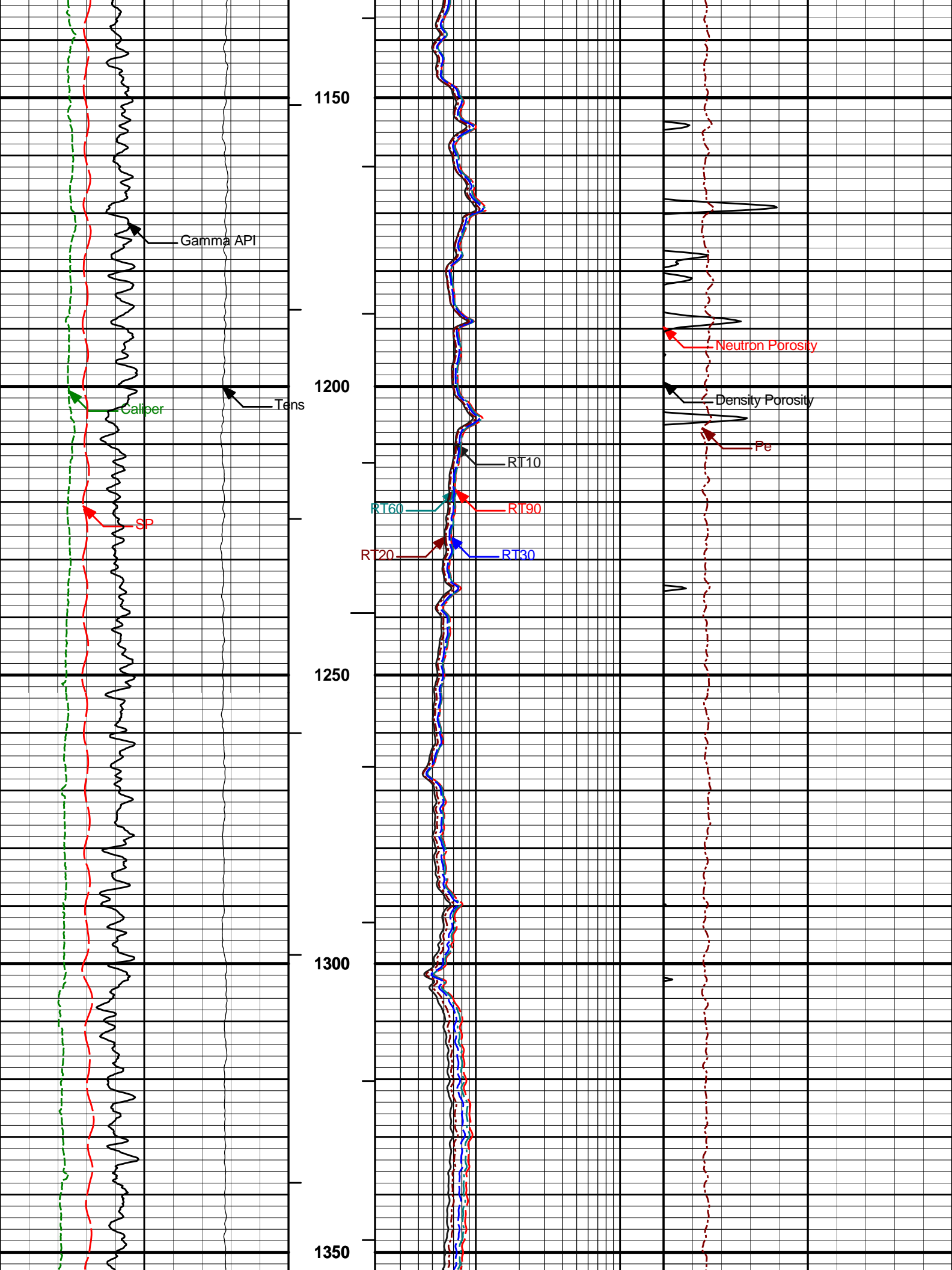
MAIN PASS 5" = 100'

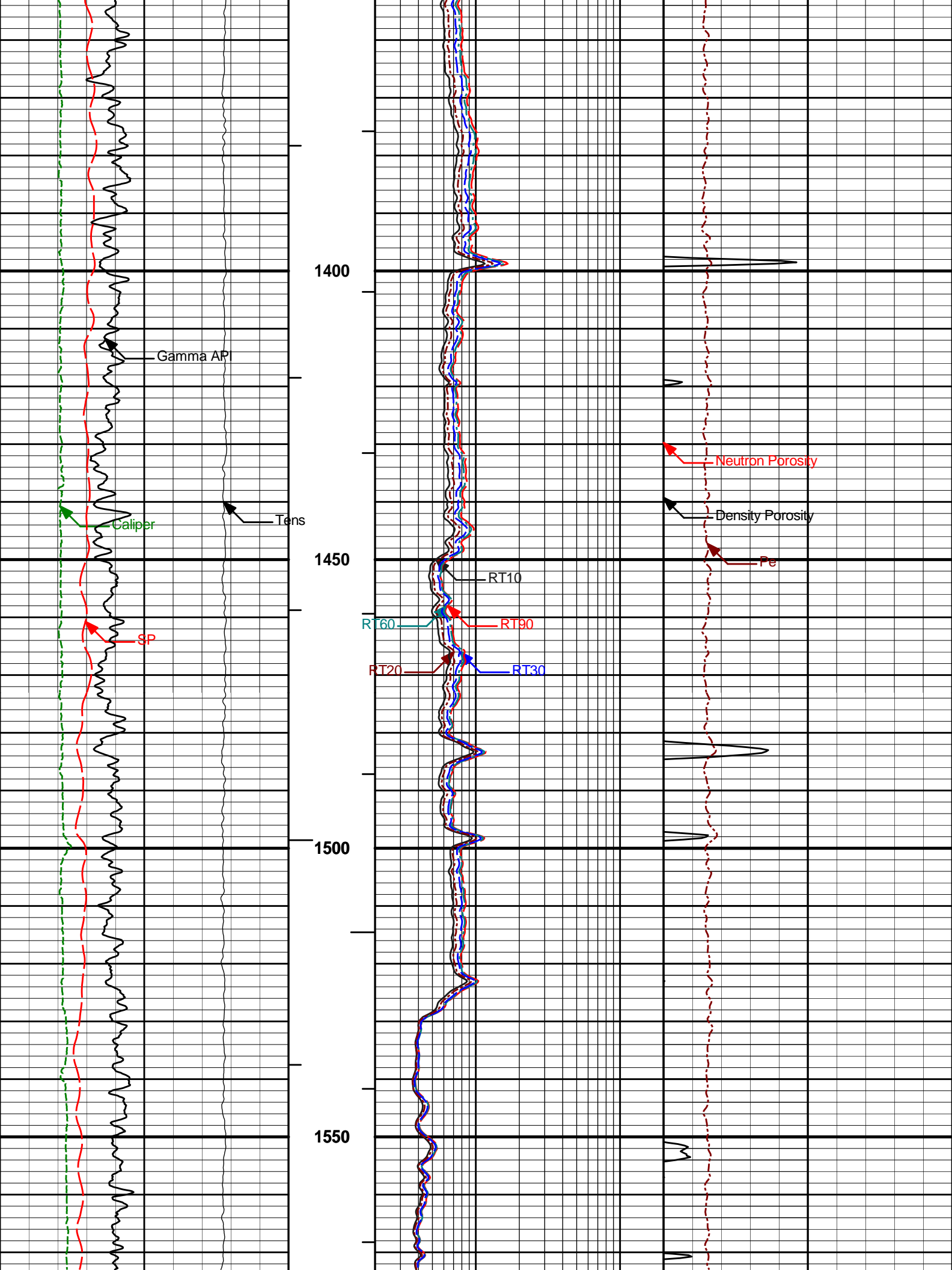
Track 1	Depth Track	Track 2	Track 5	Track 3
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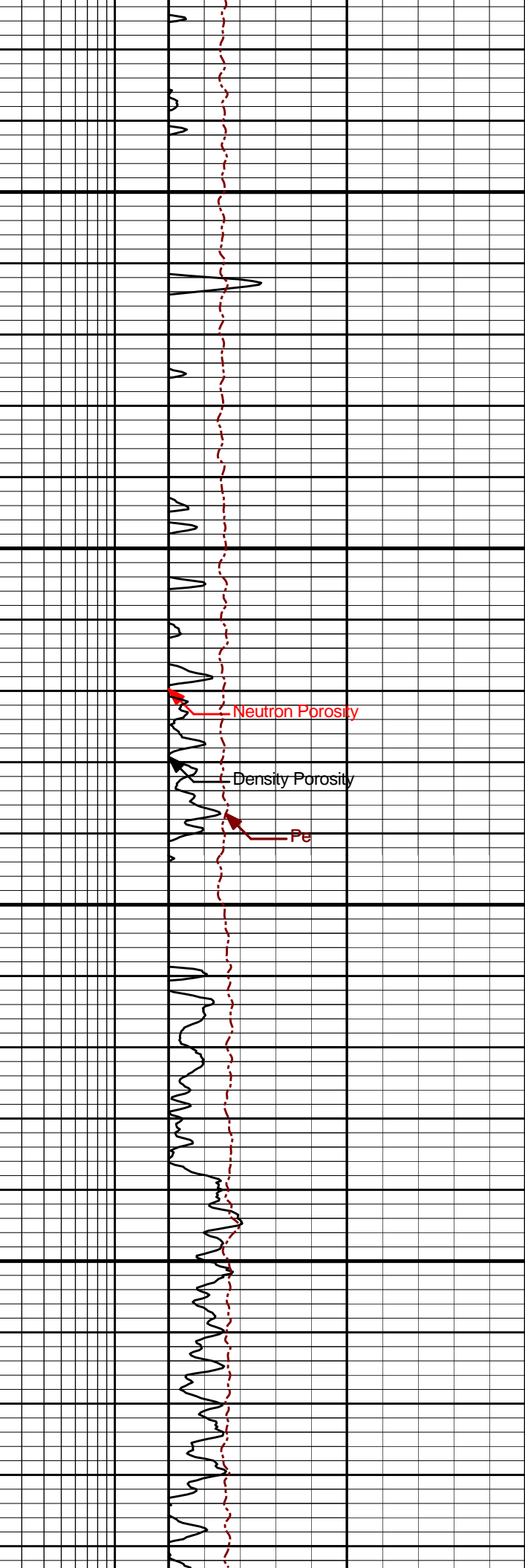
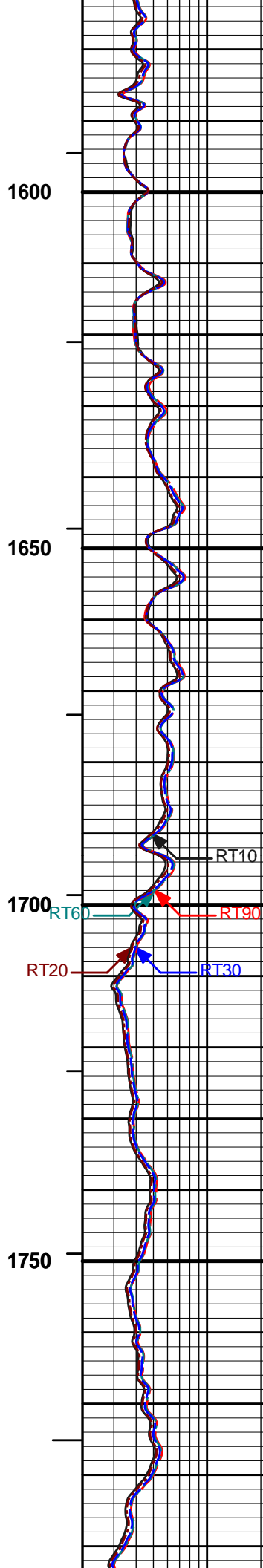
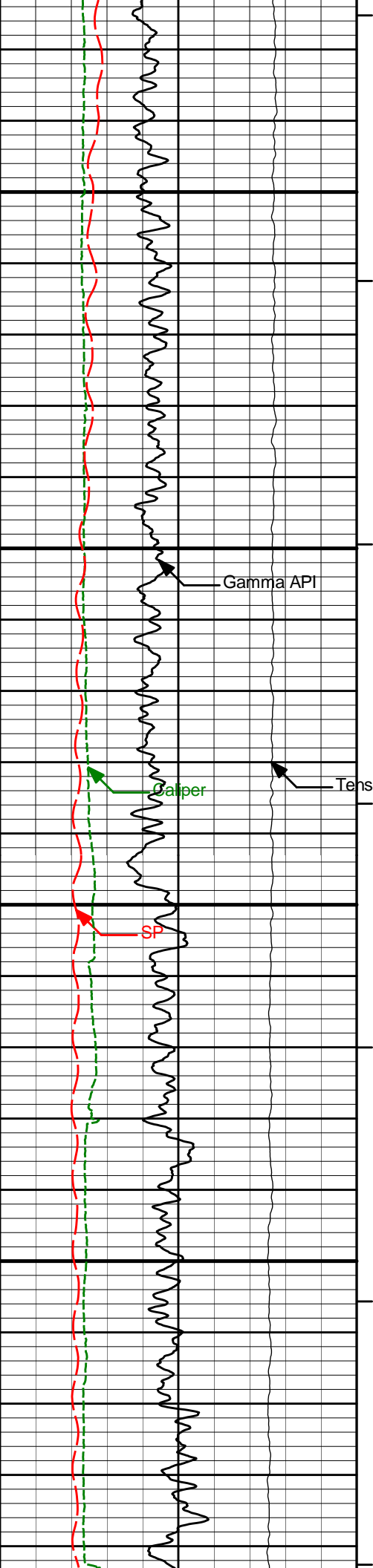


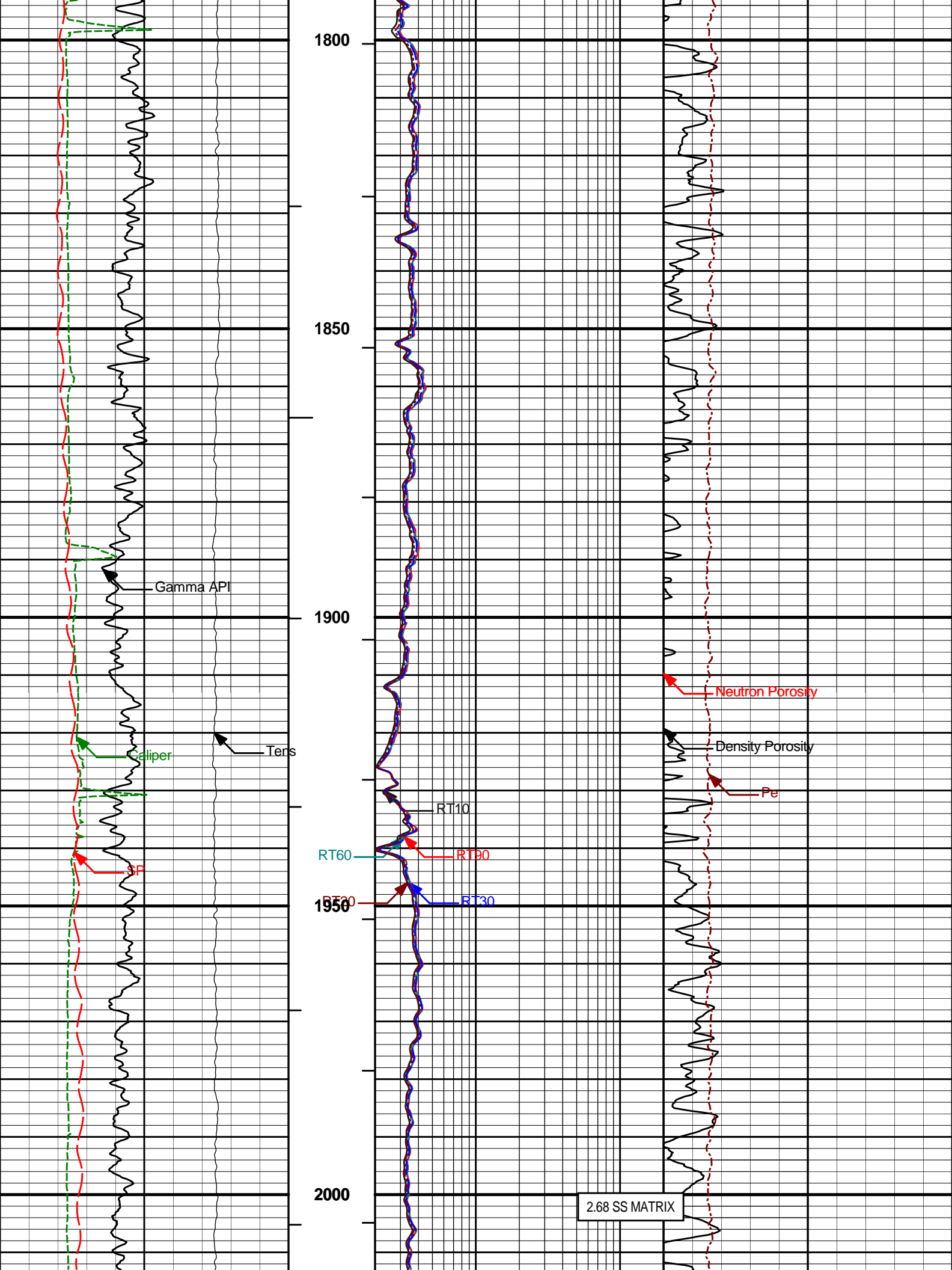


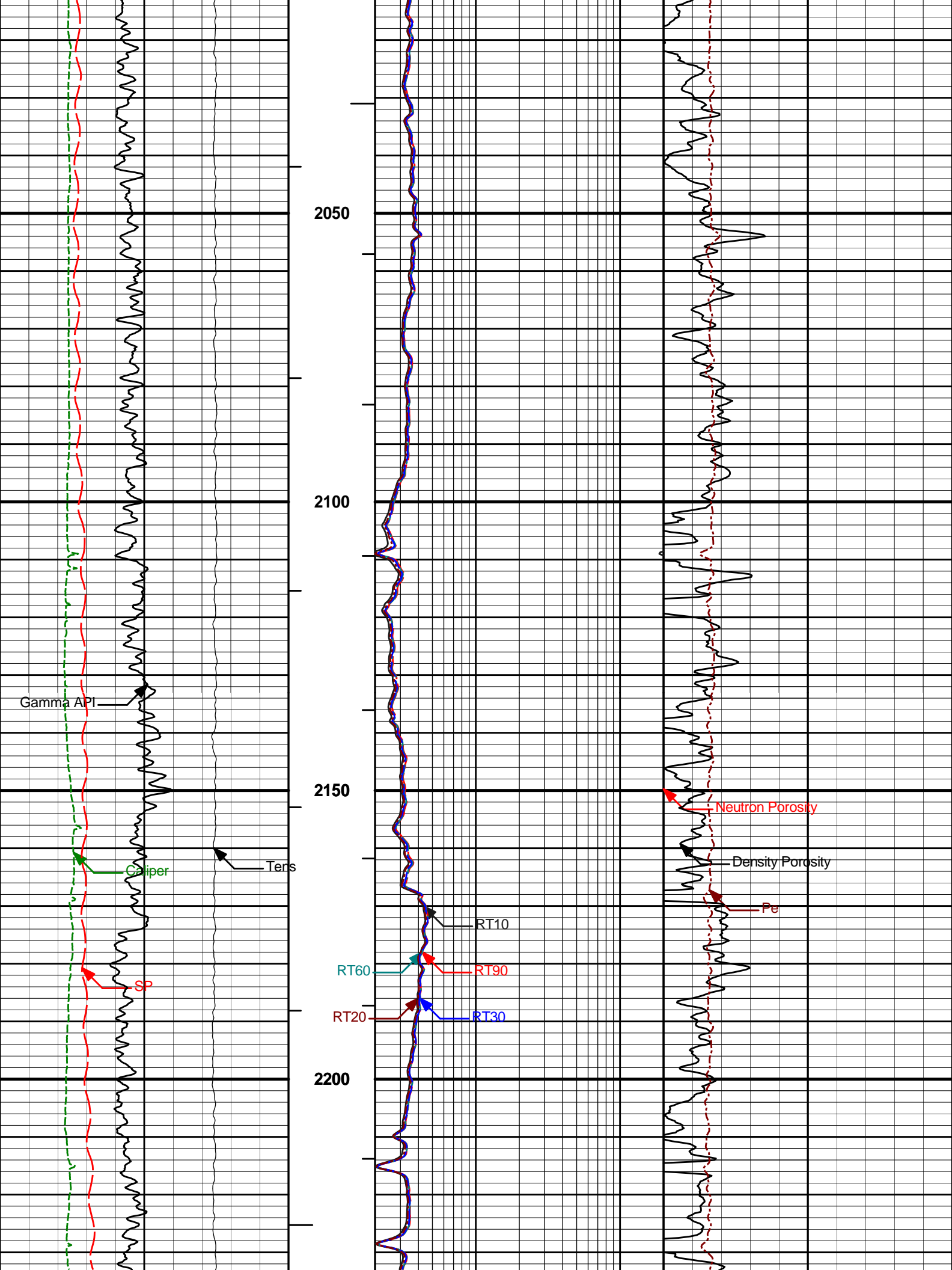


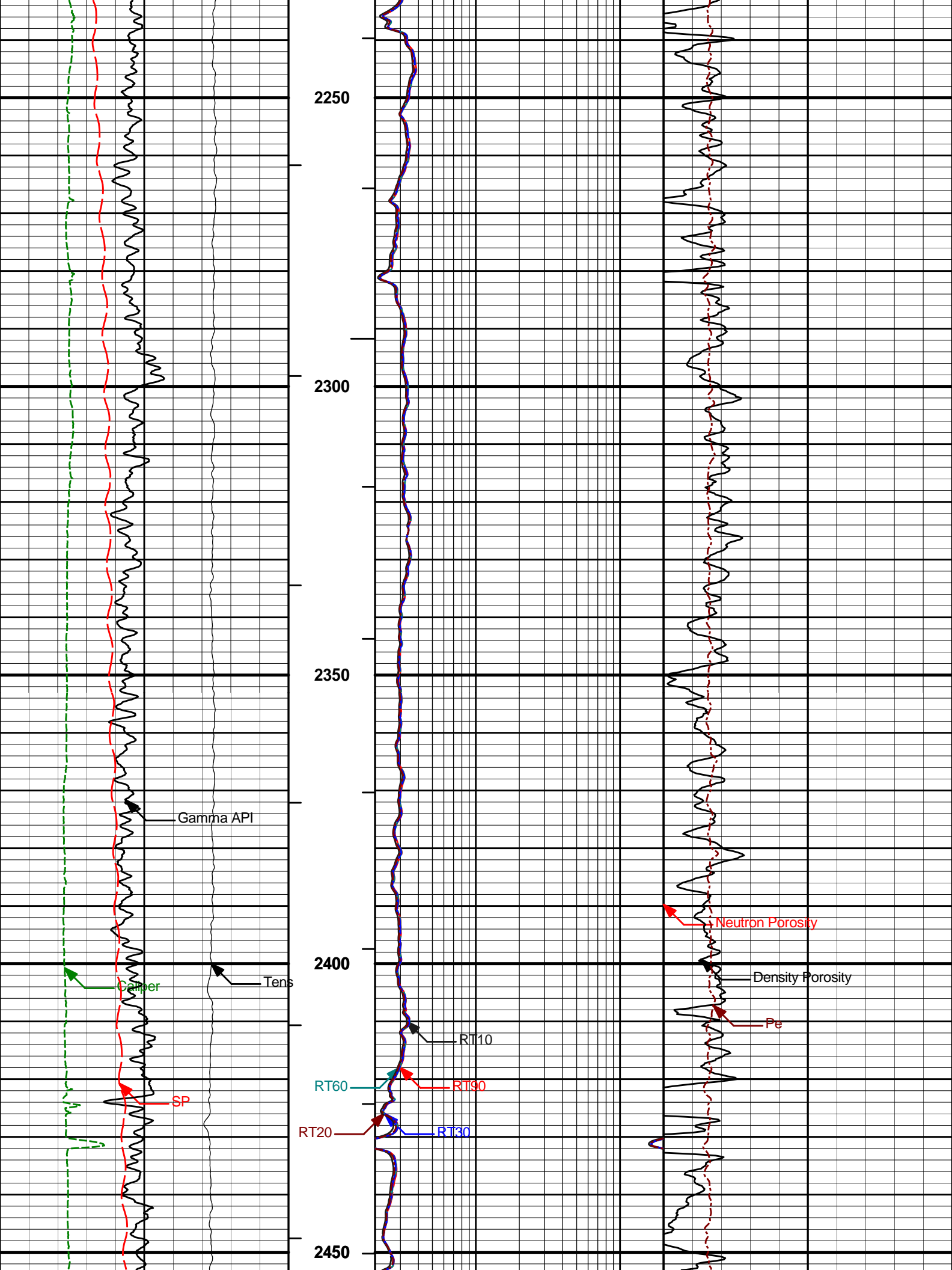


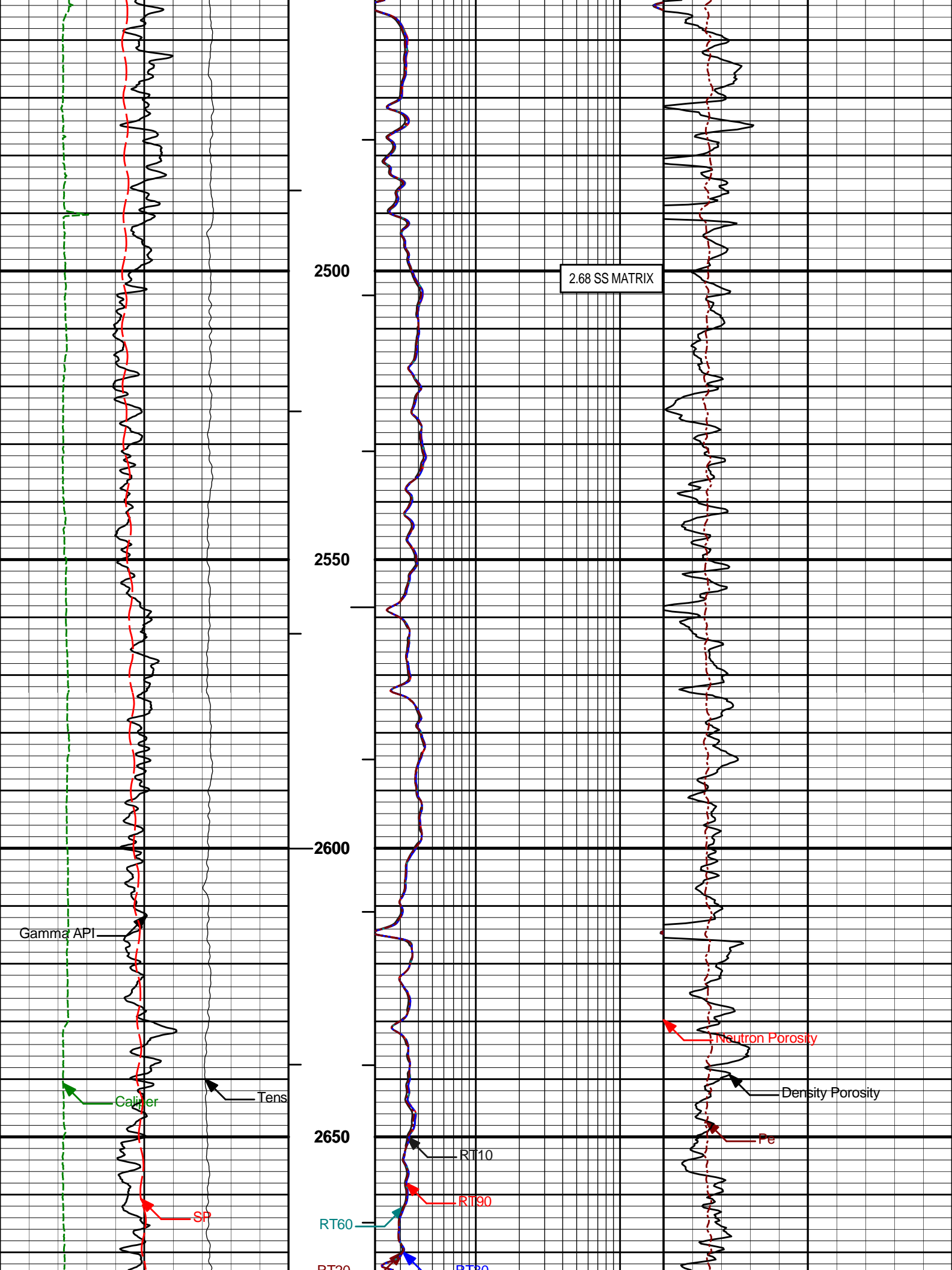


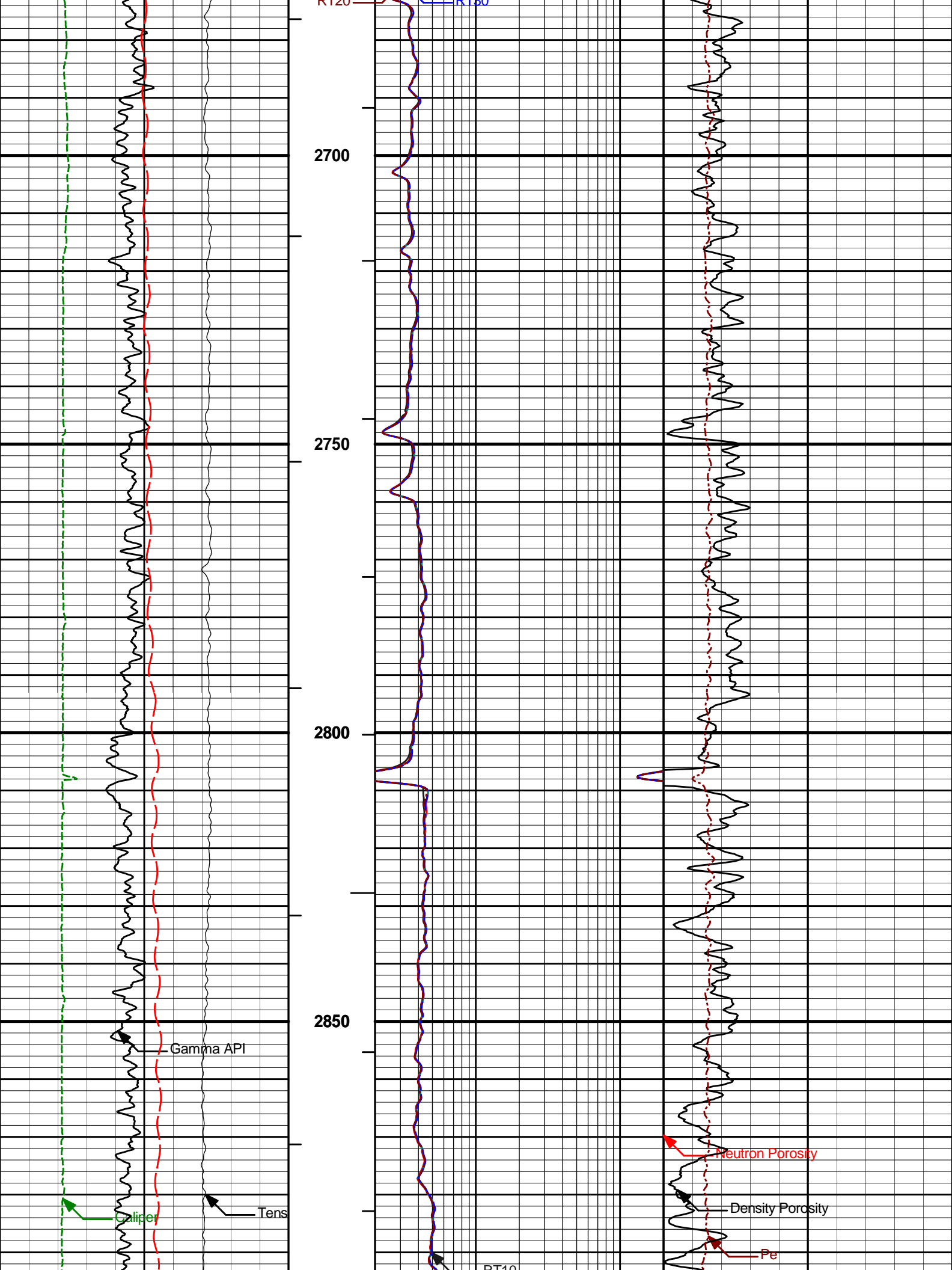


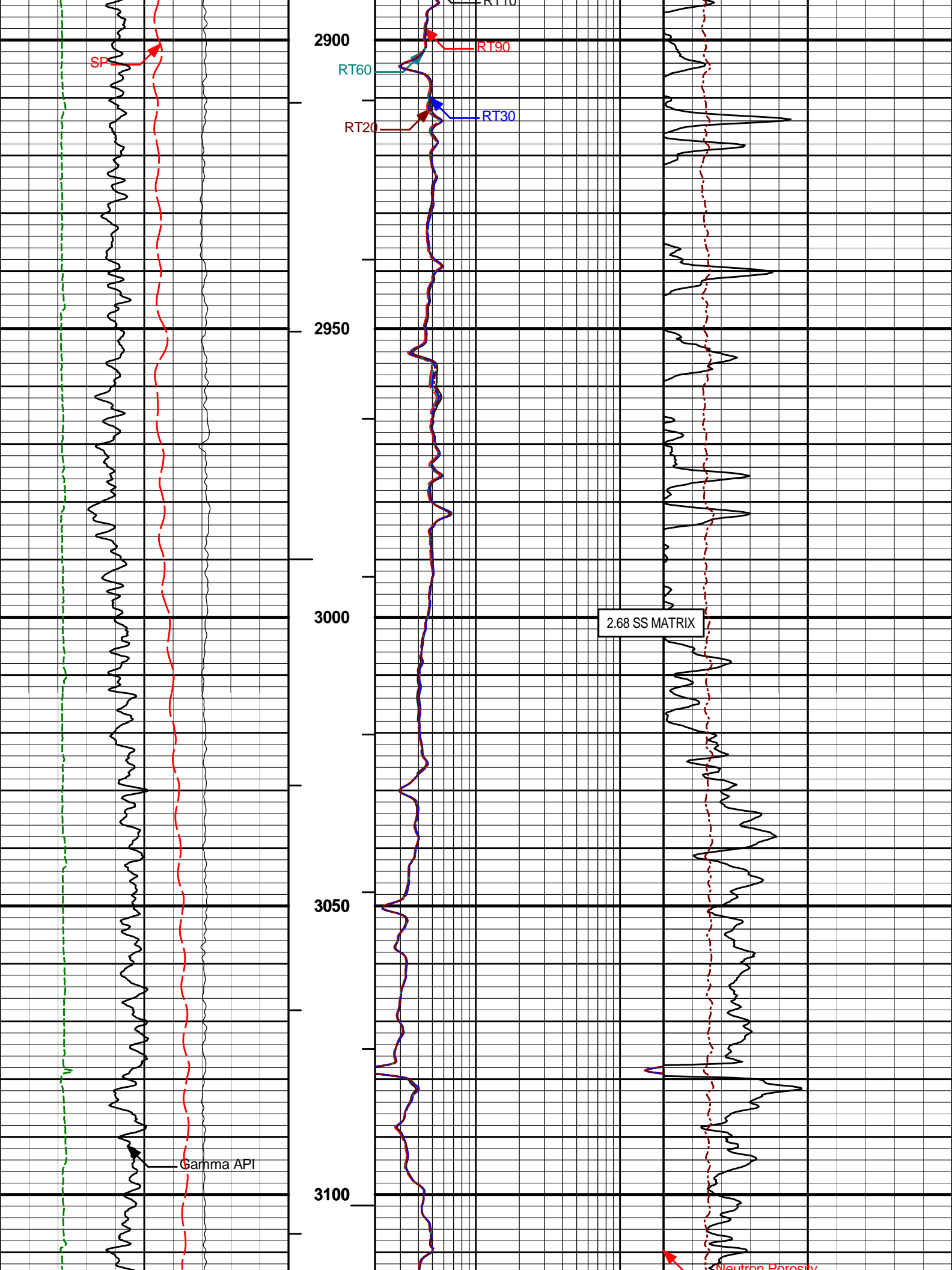


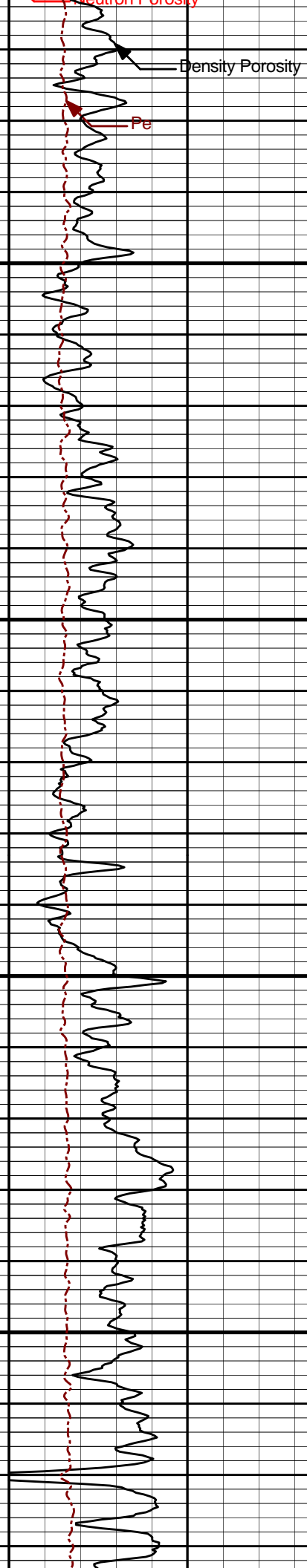
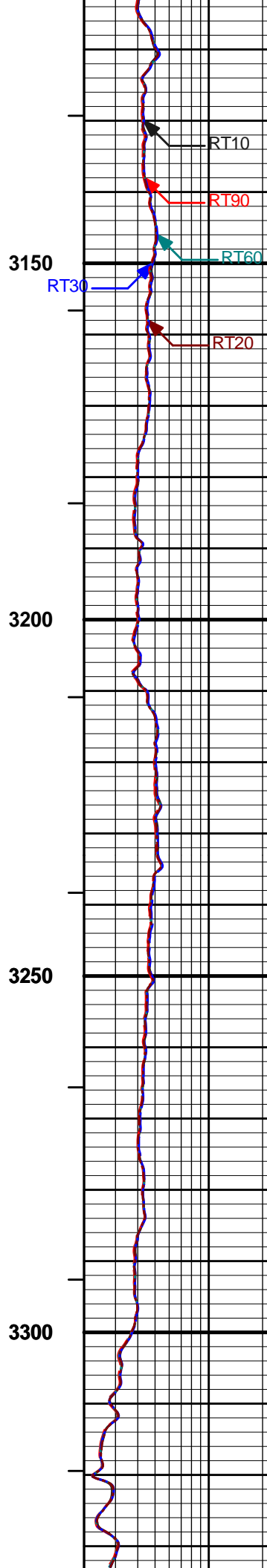
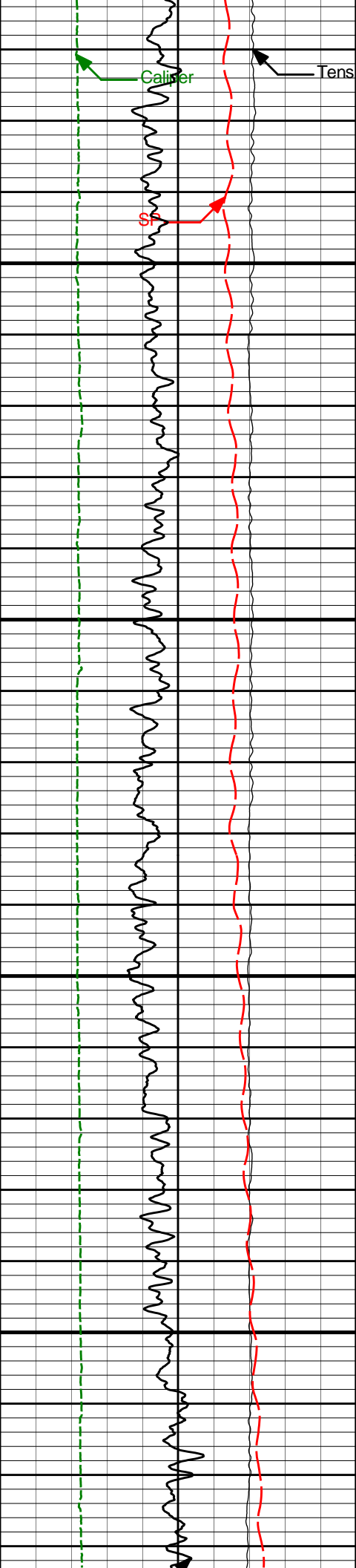


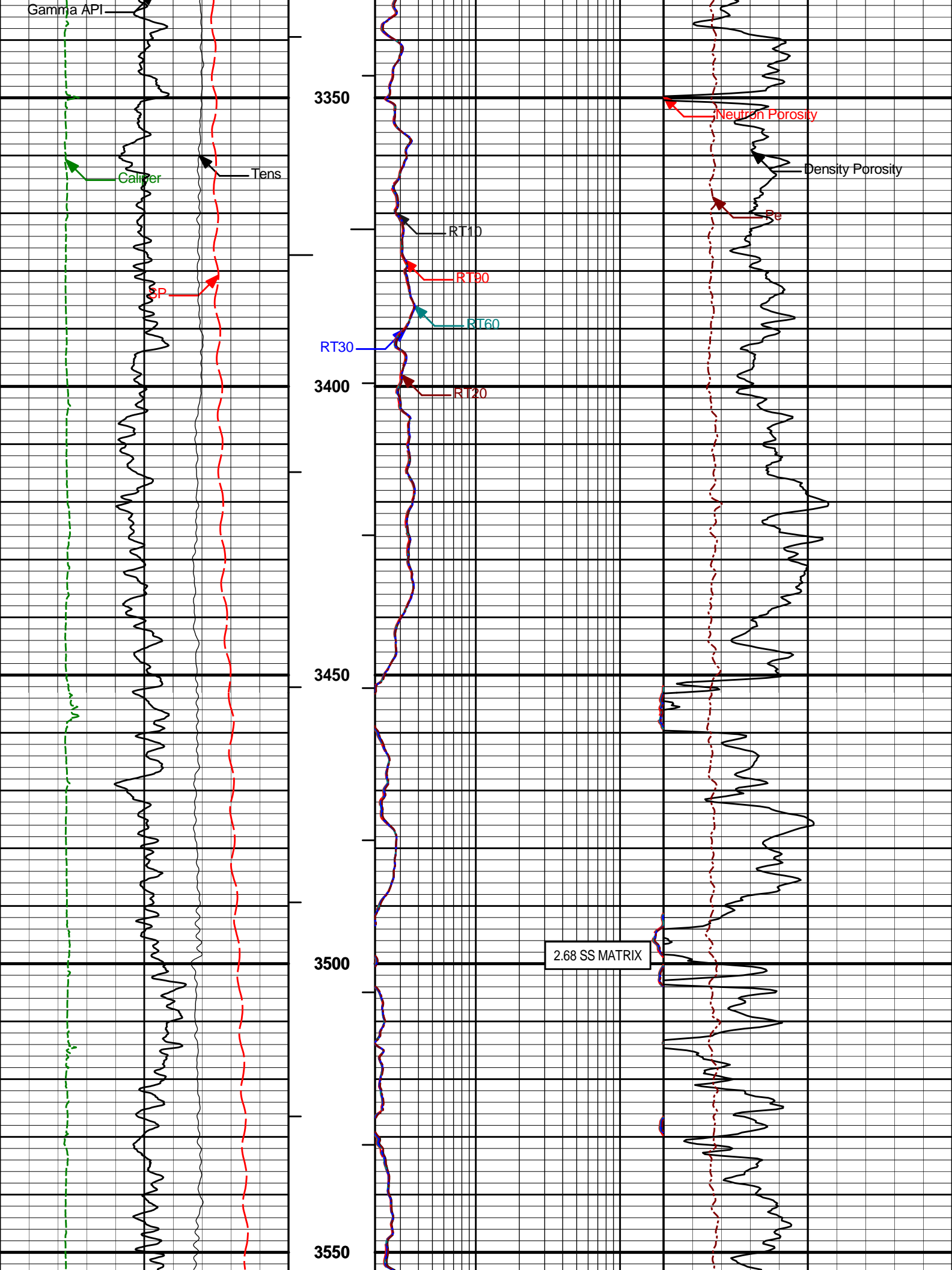


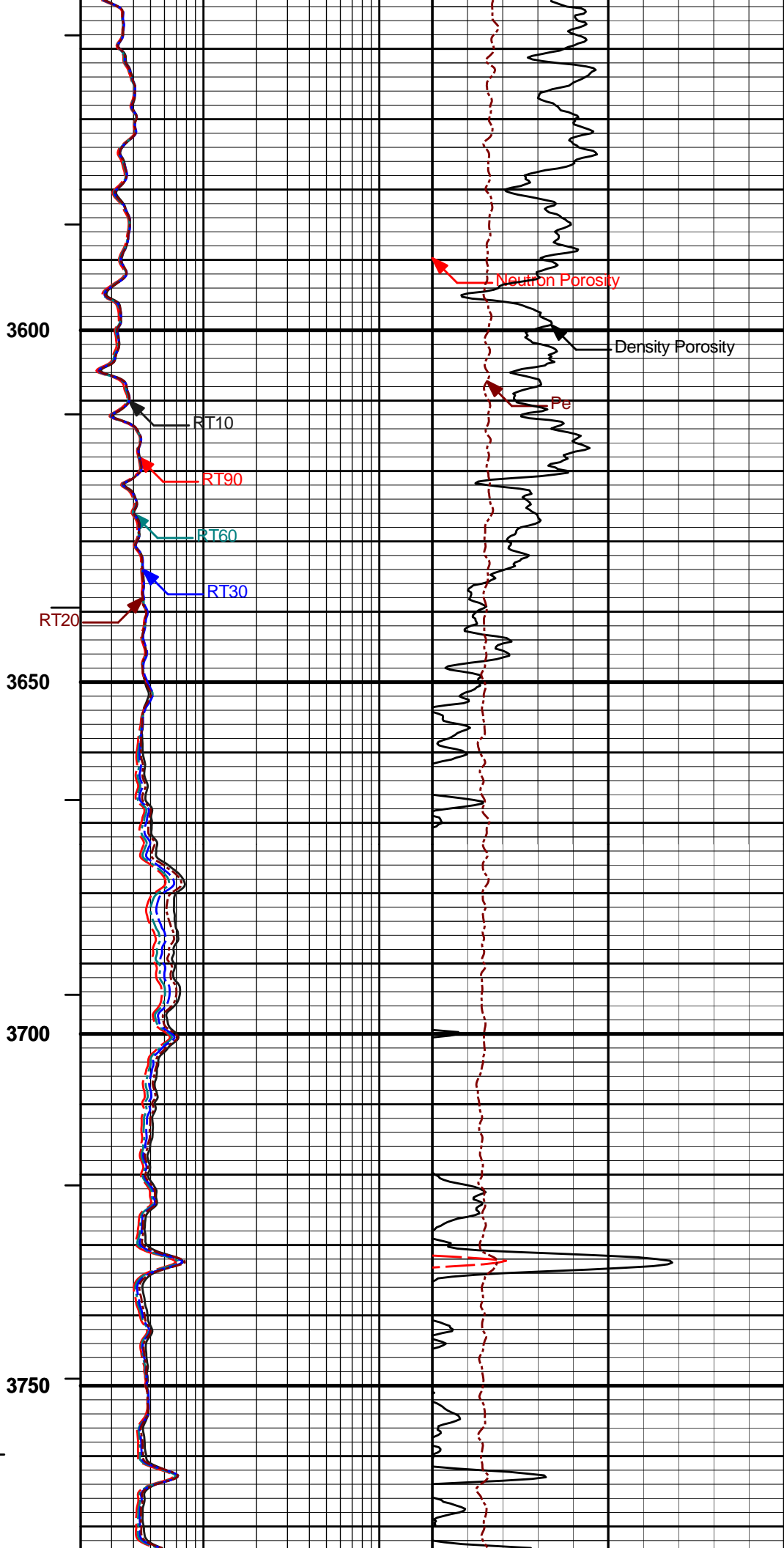
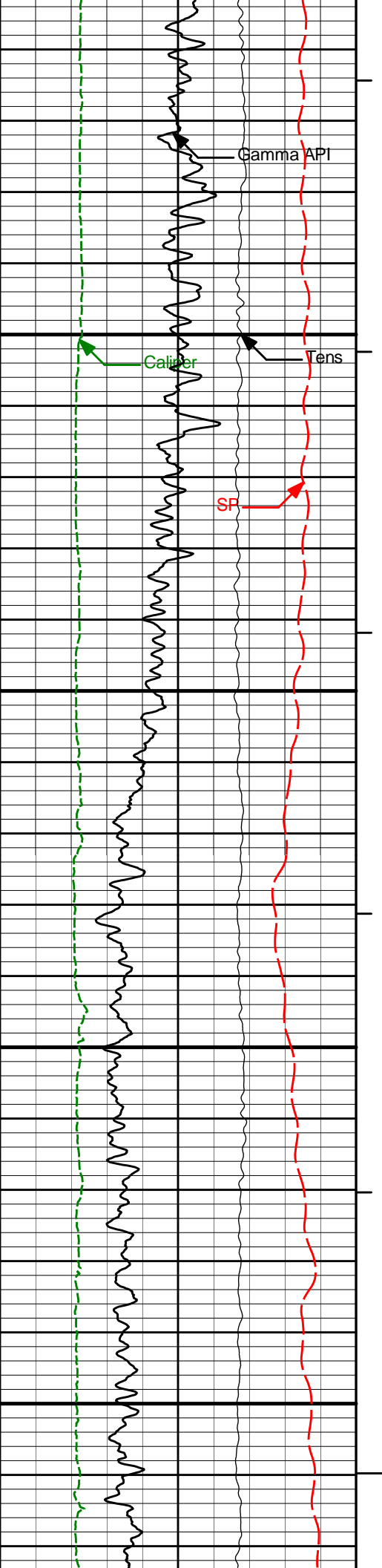


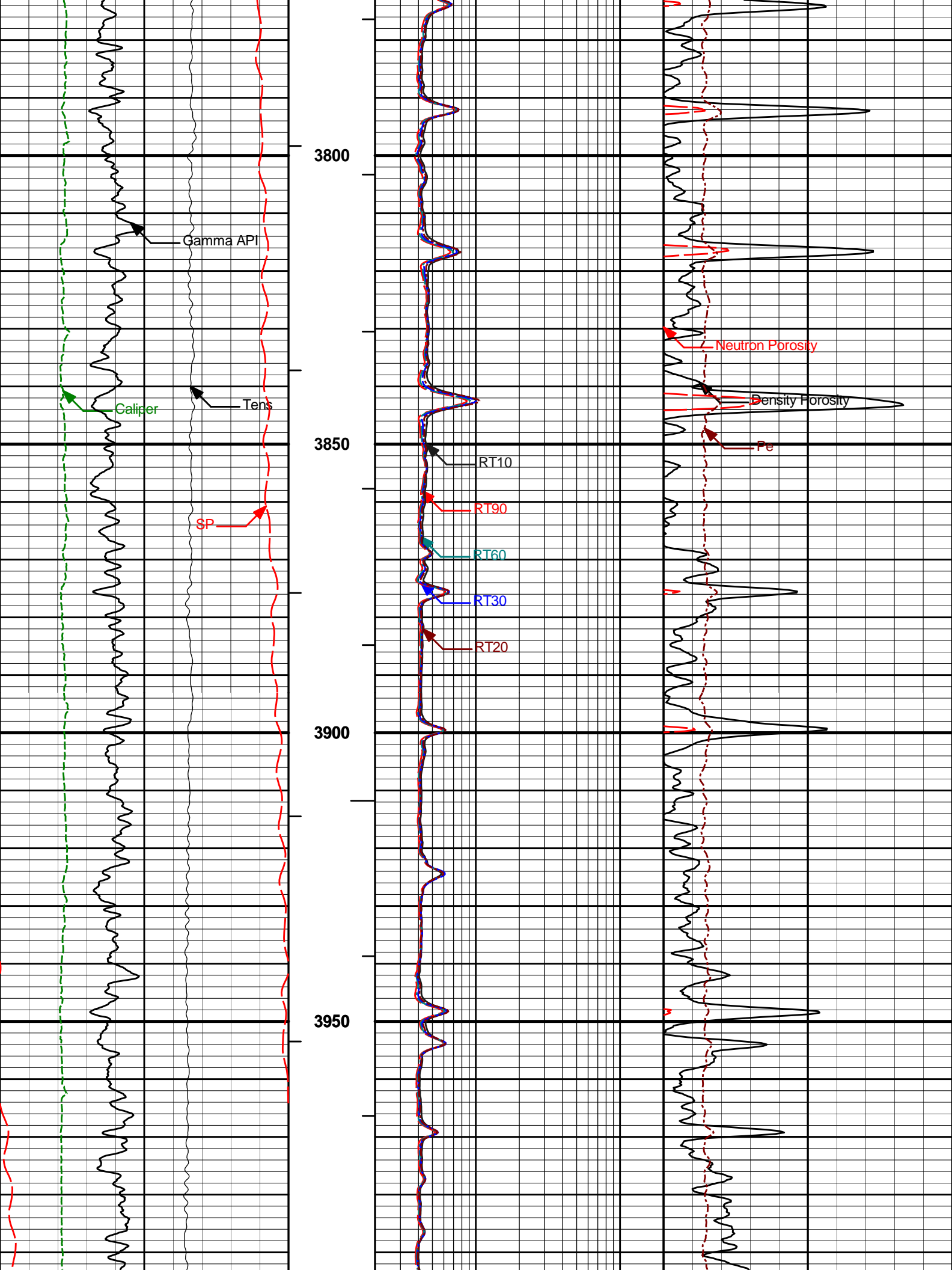


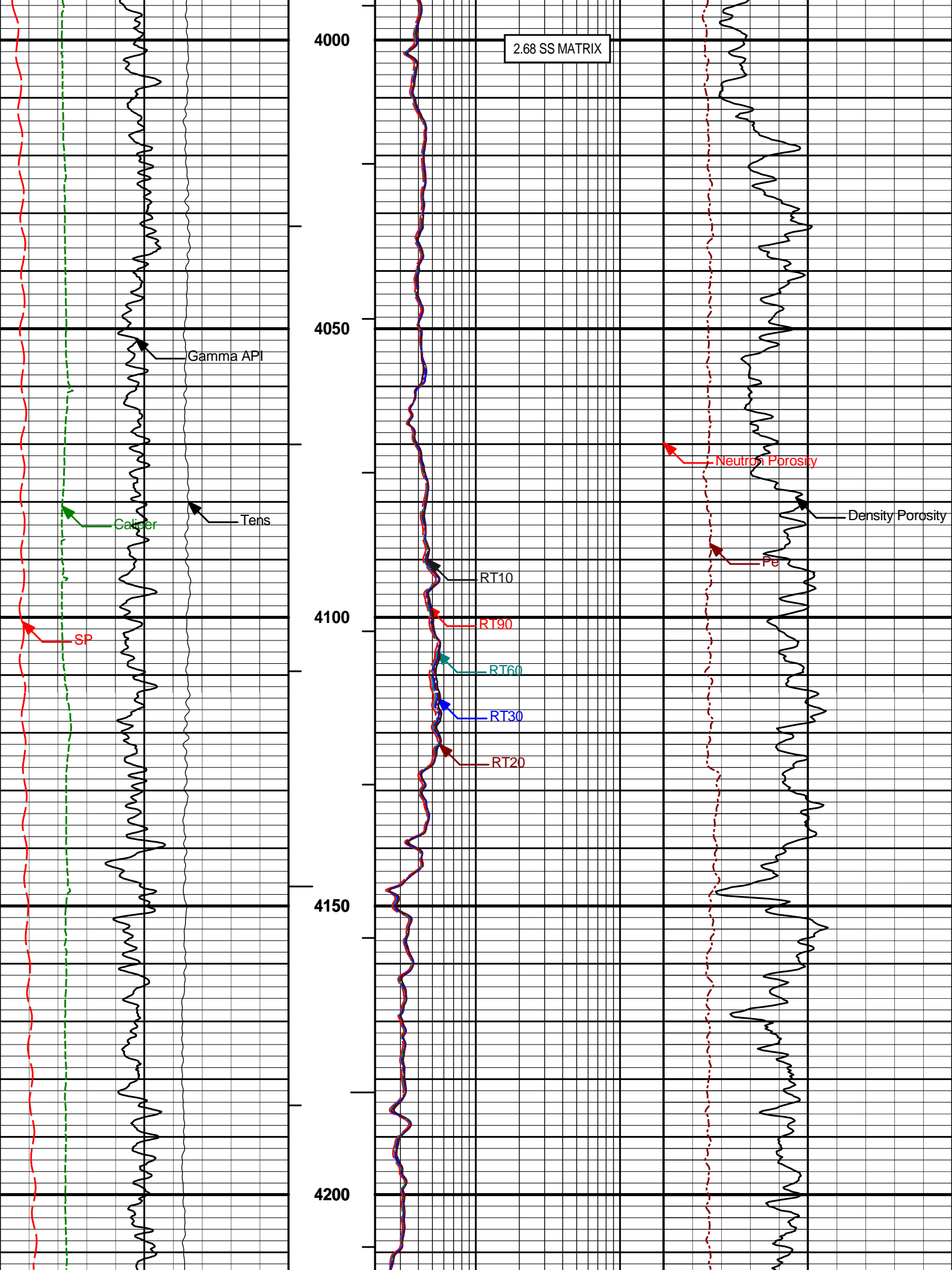


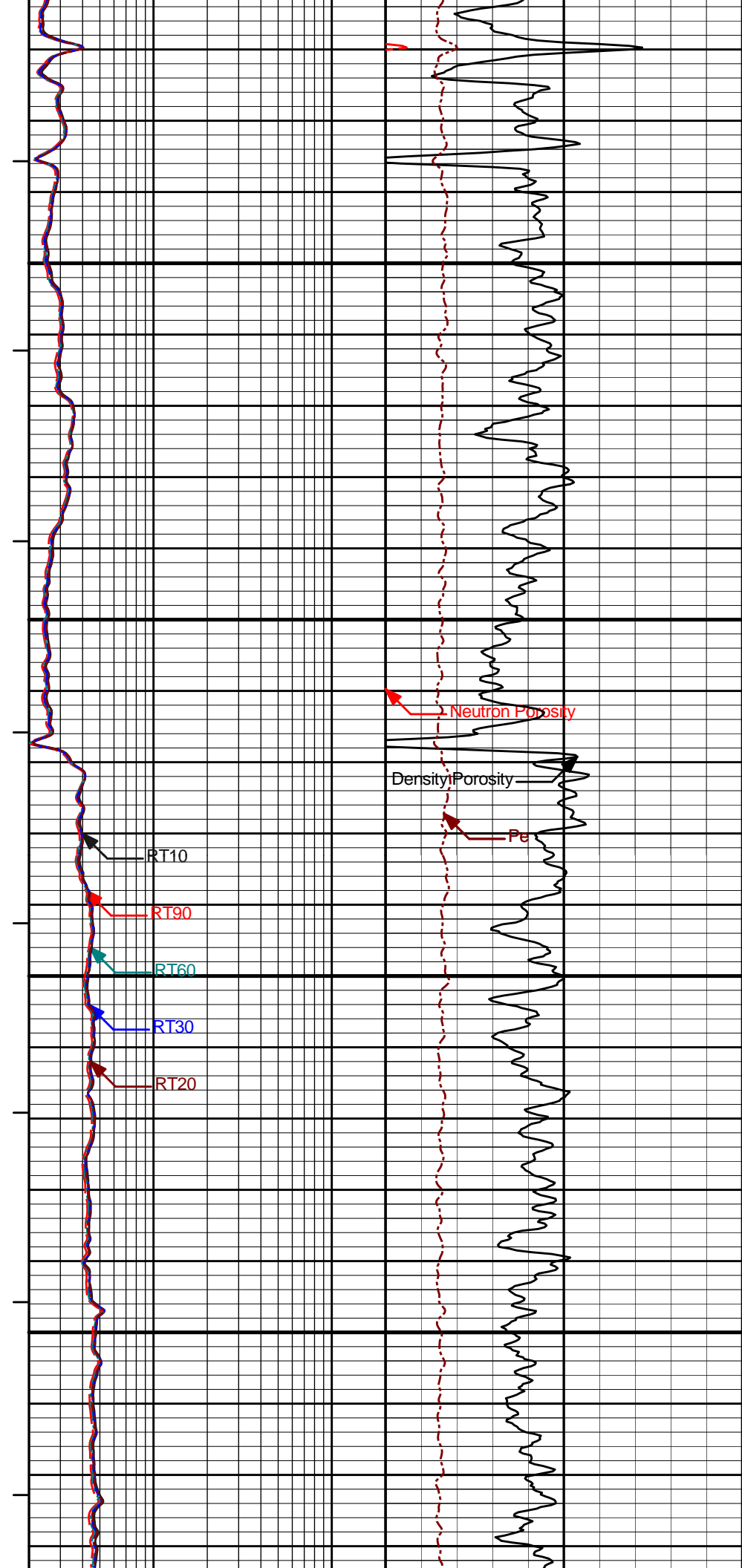
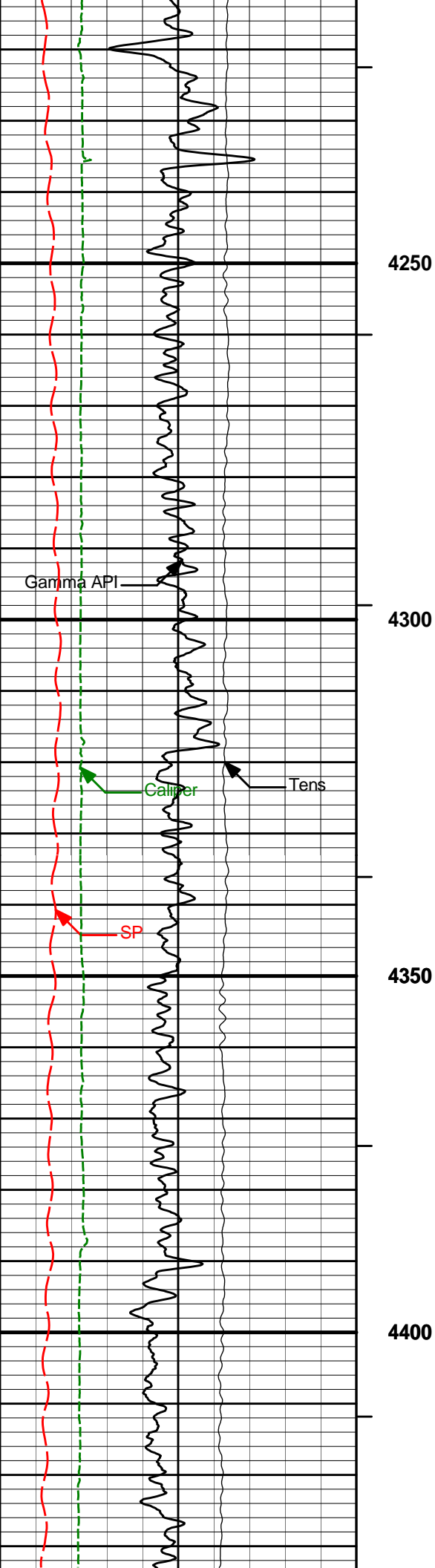


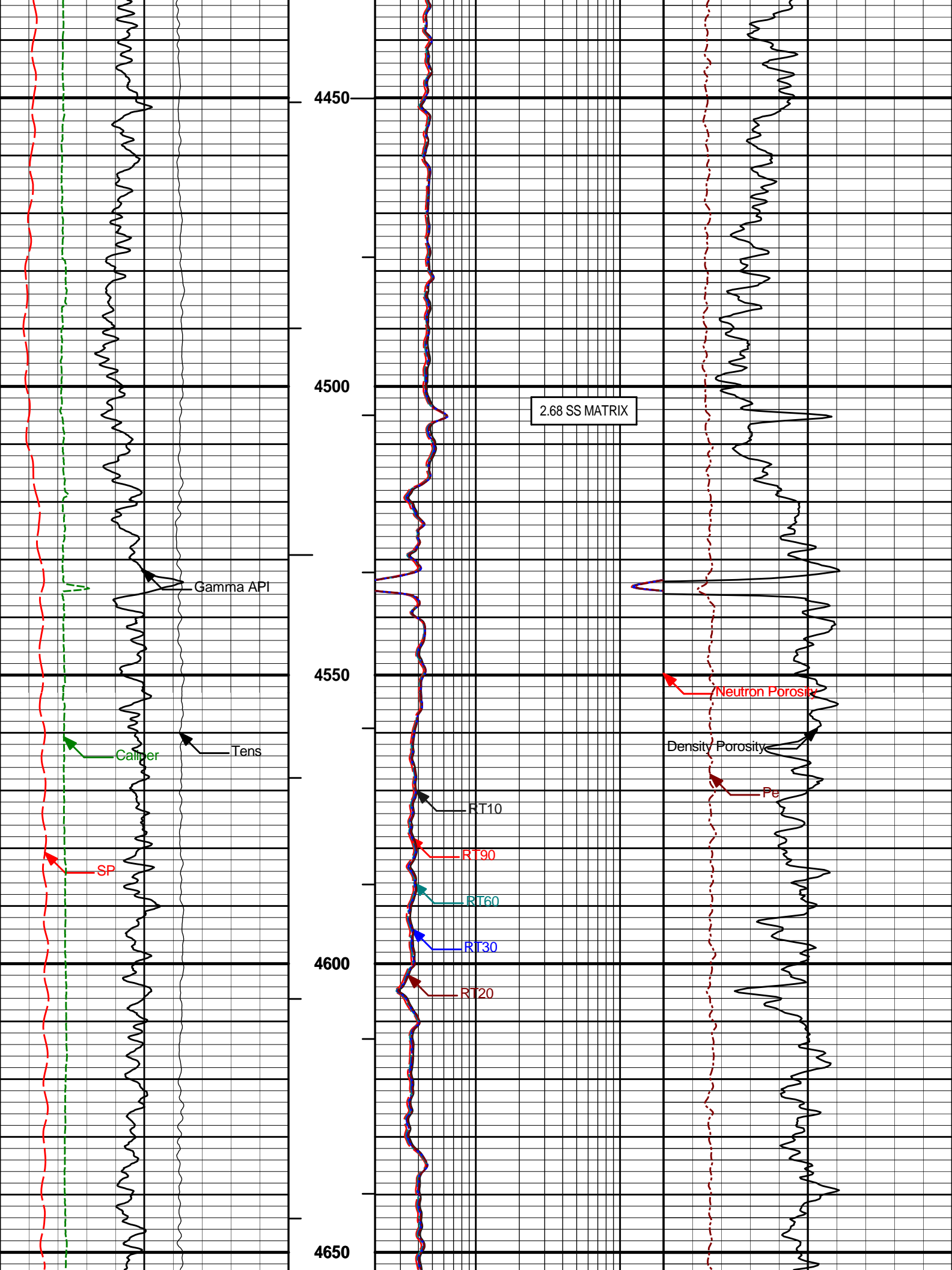


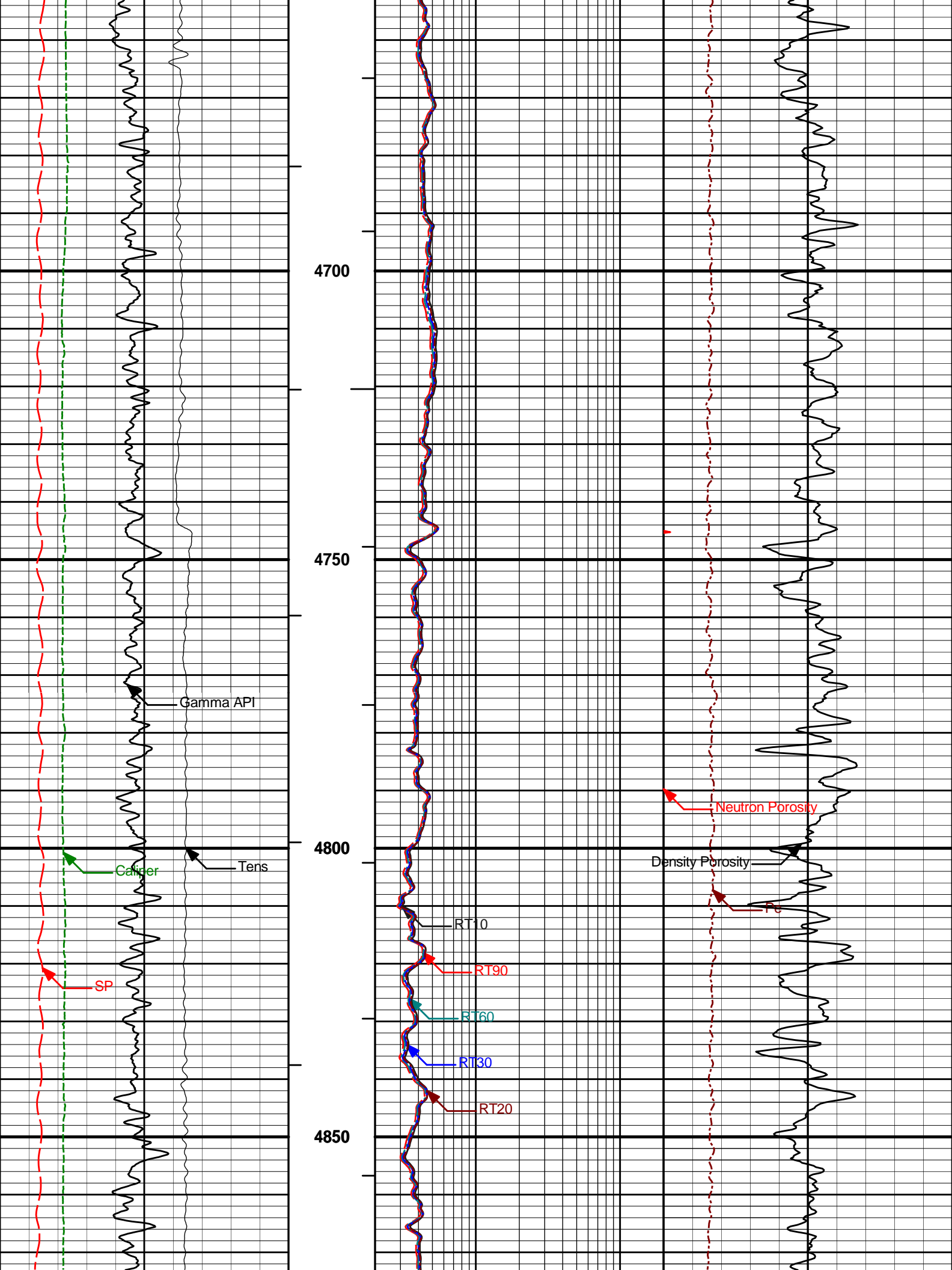


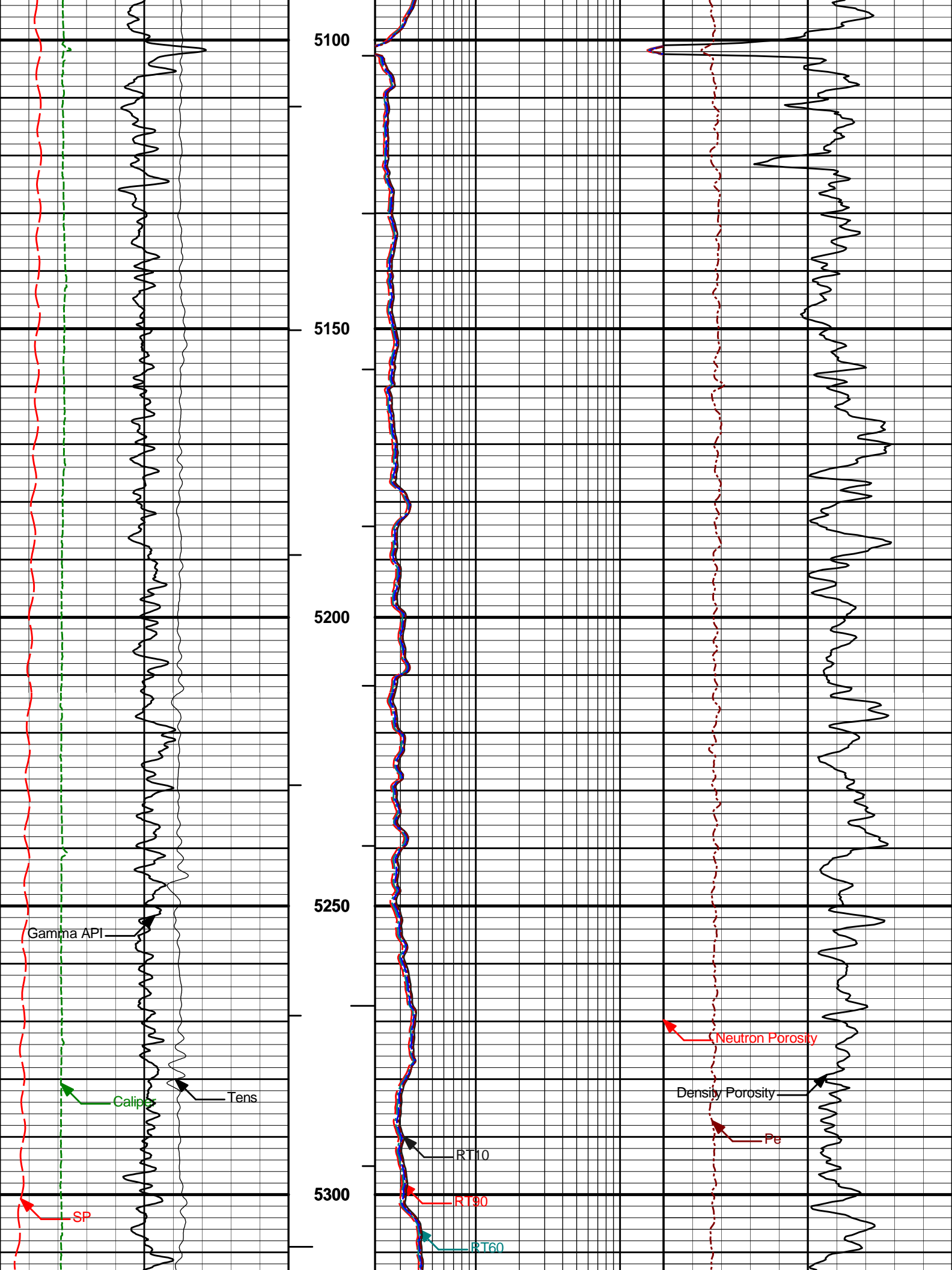


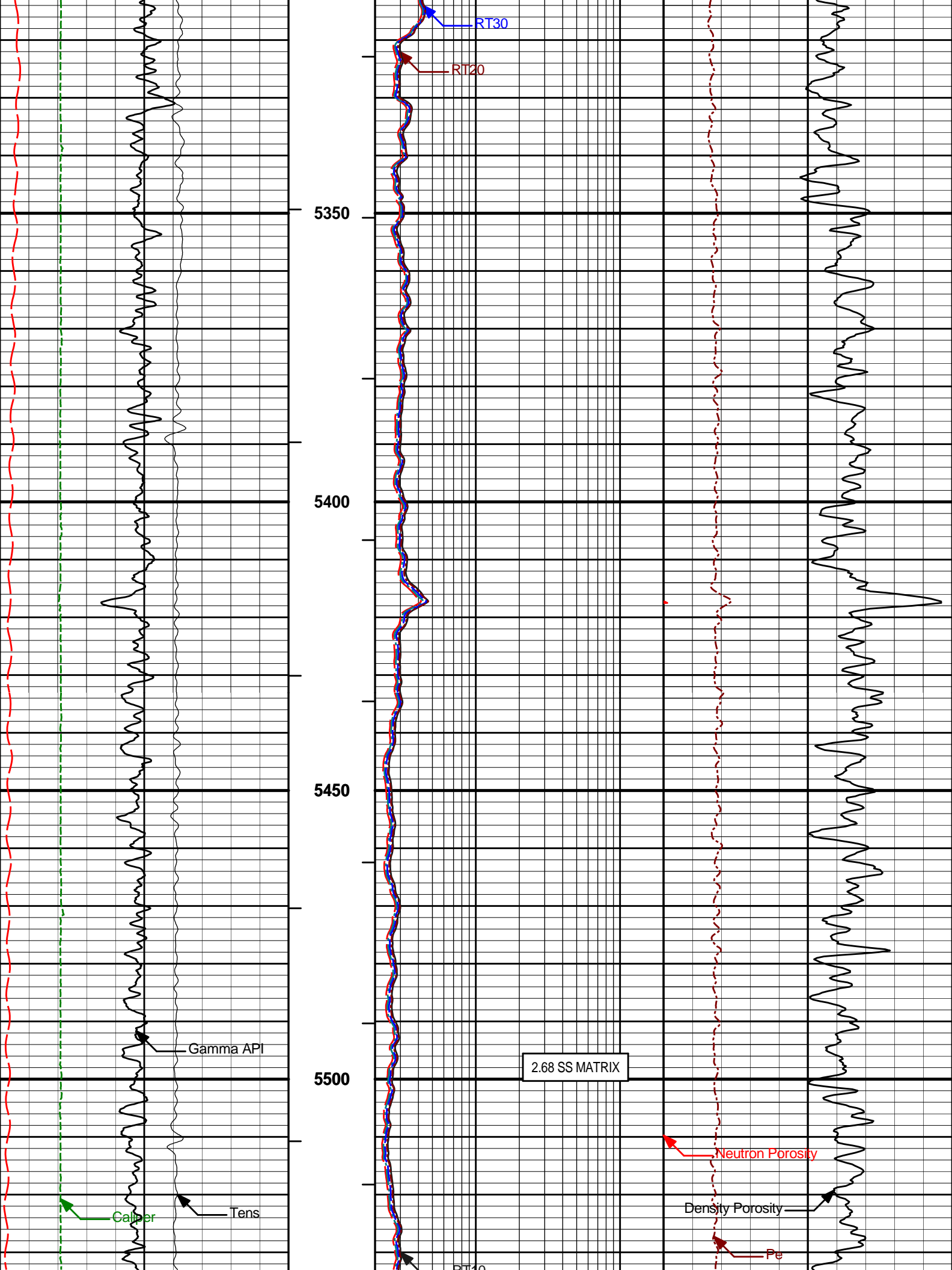


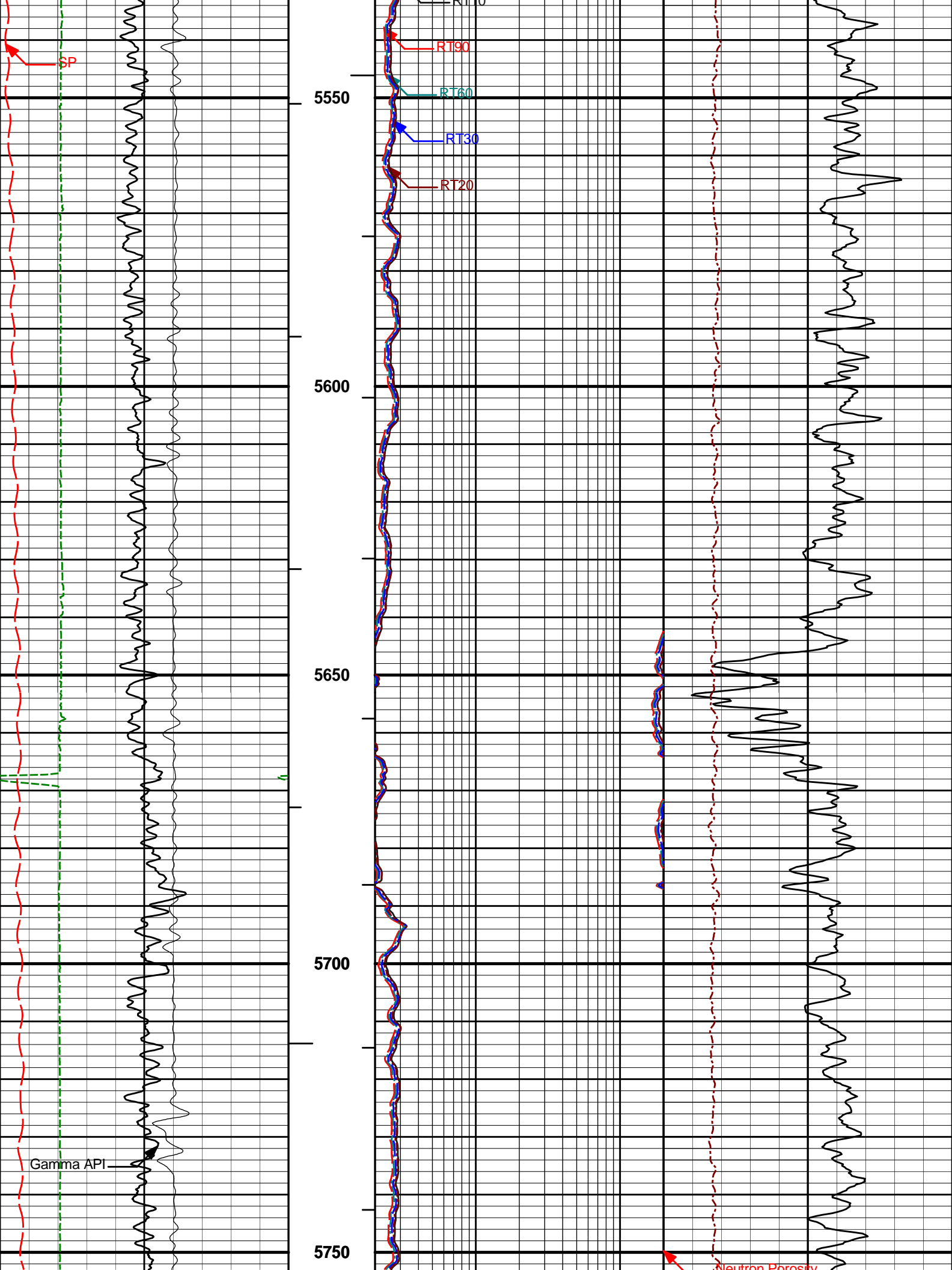


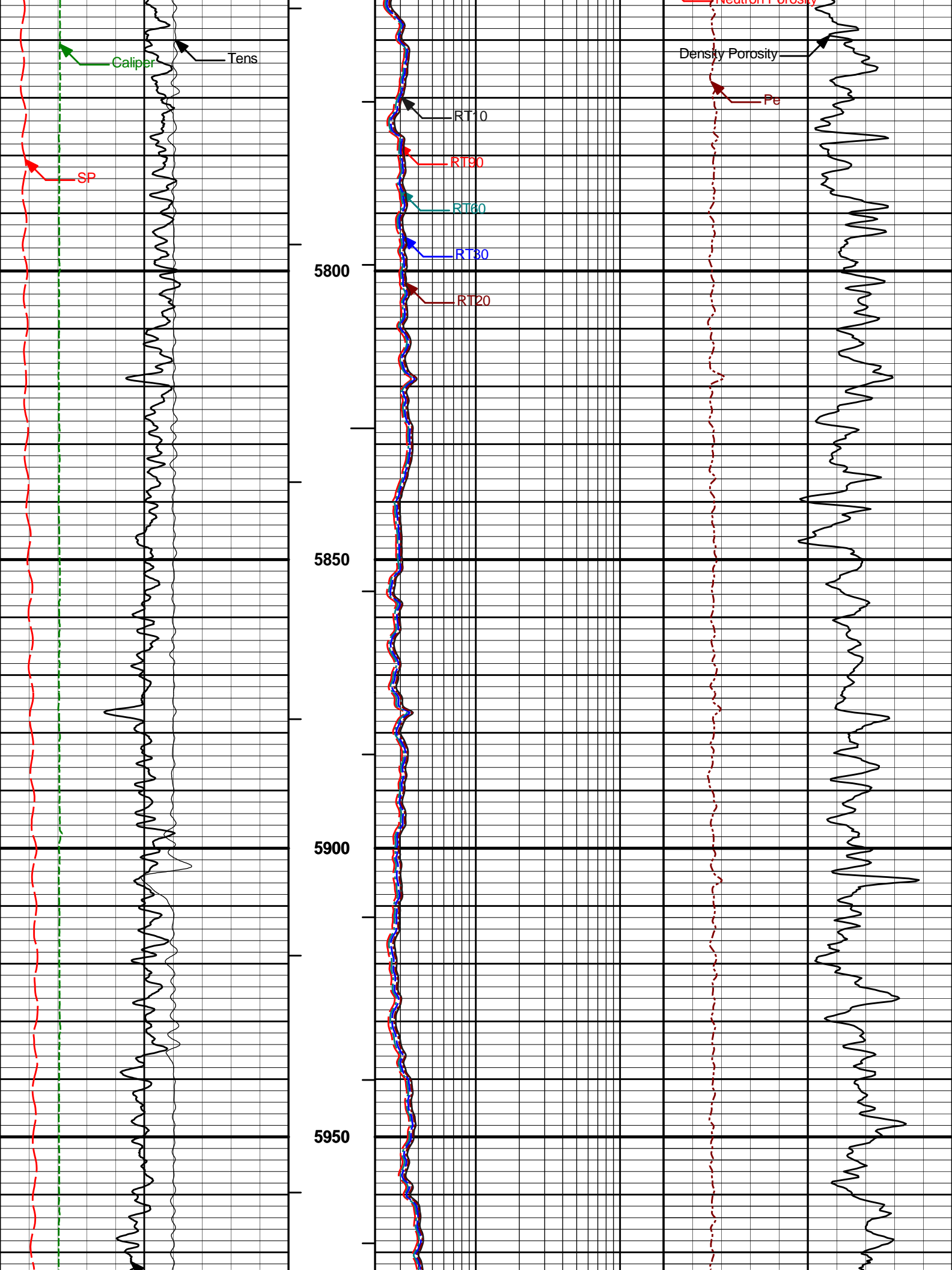


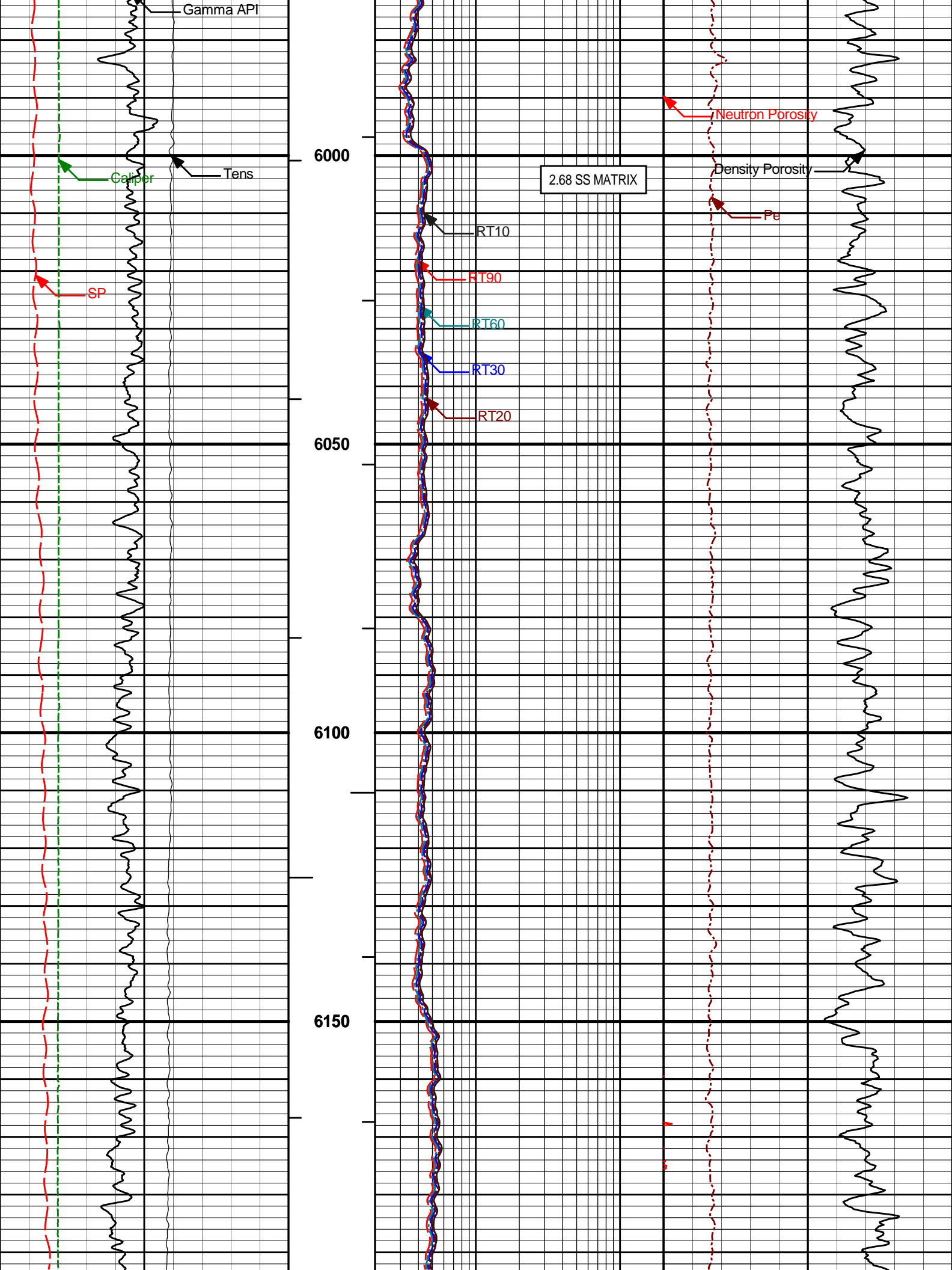


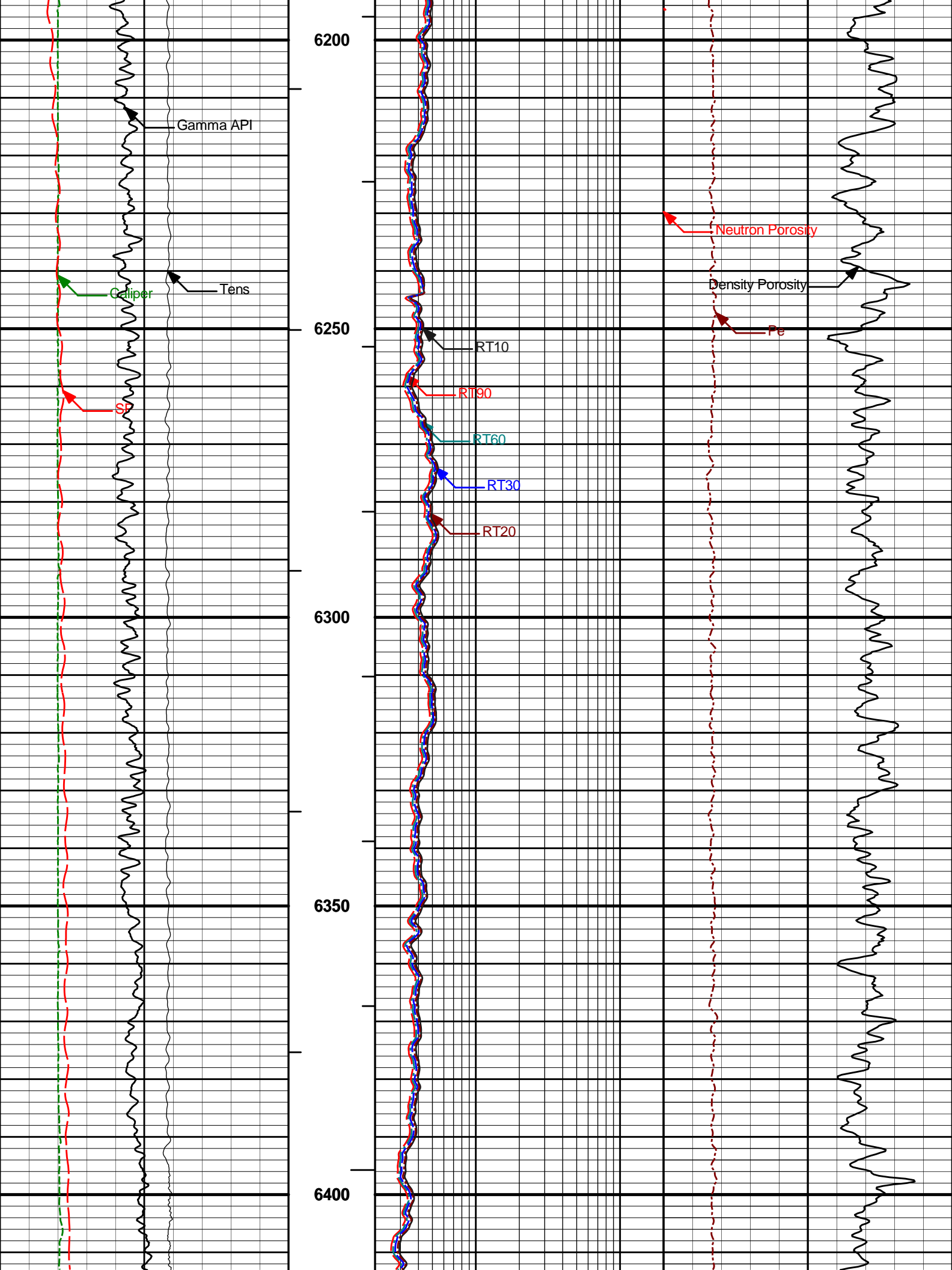


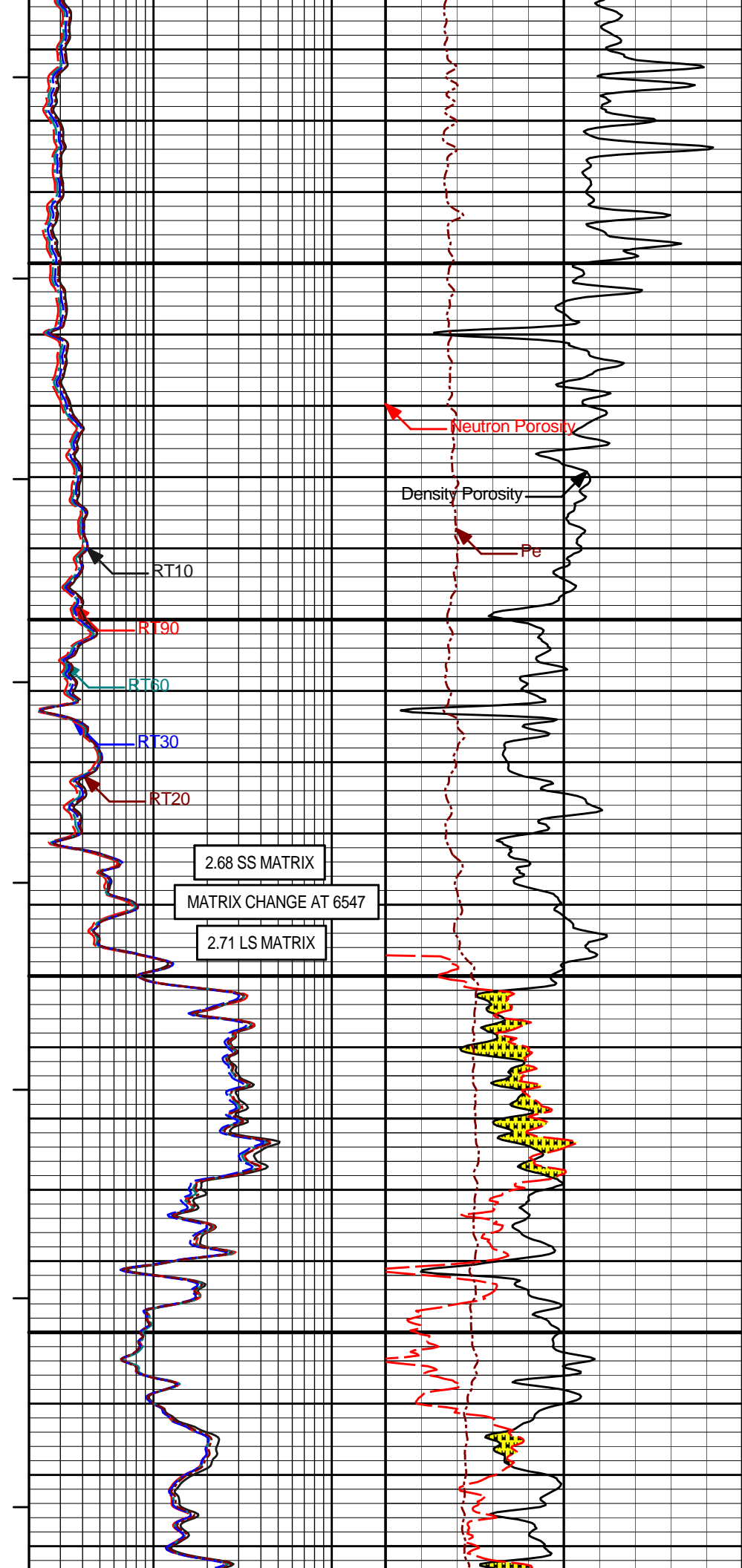
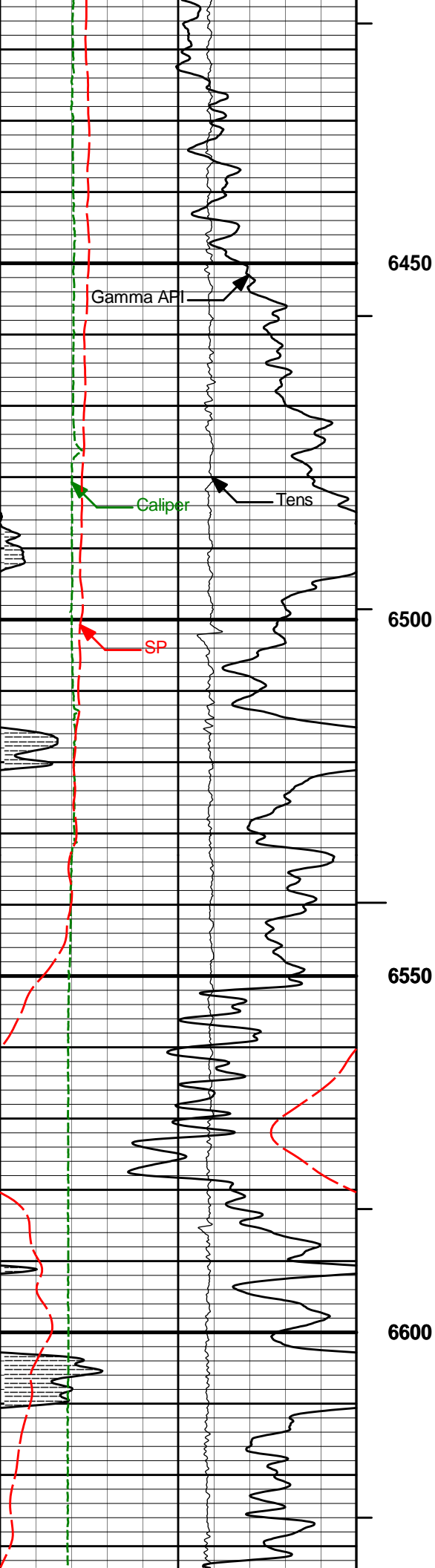


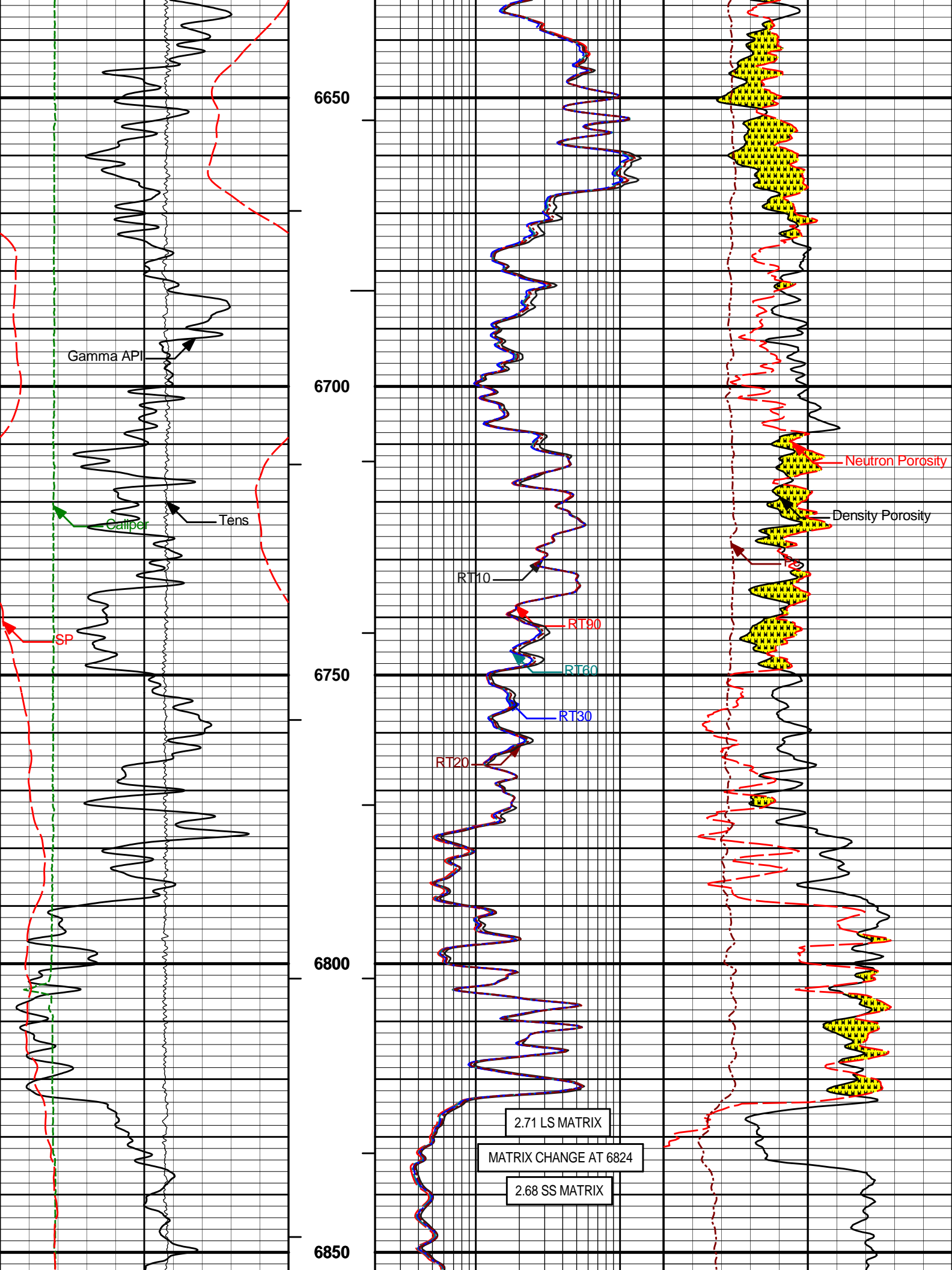


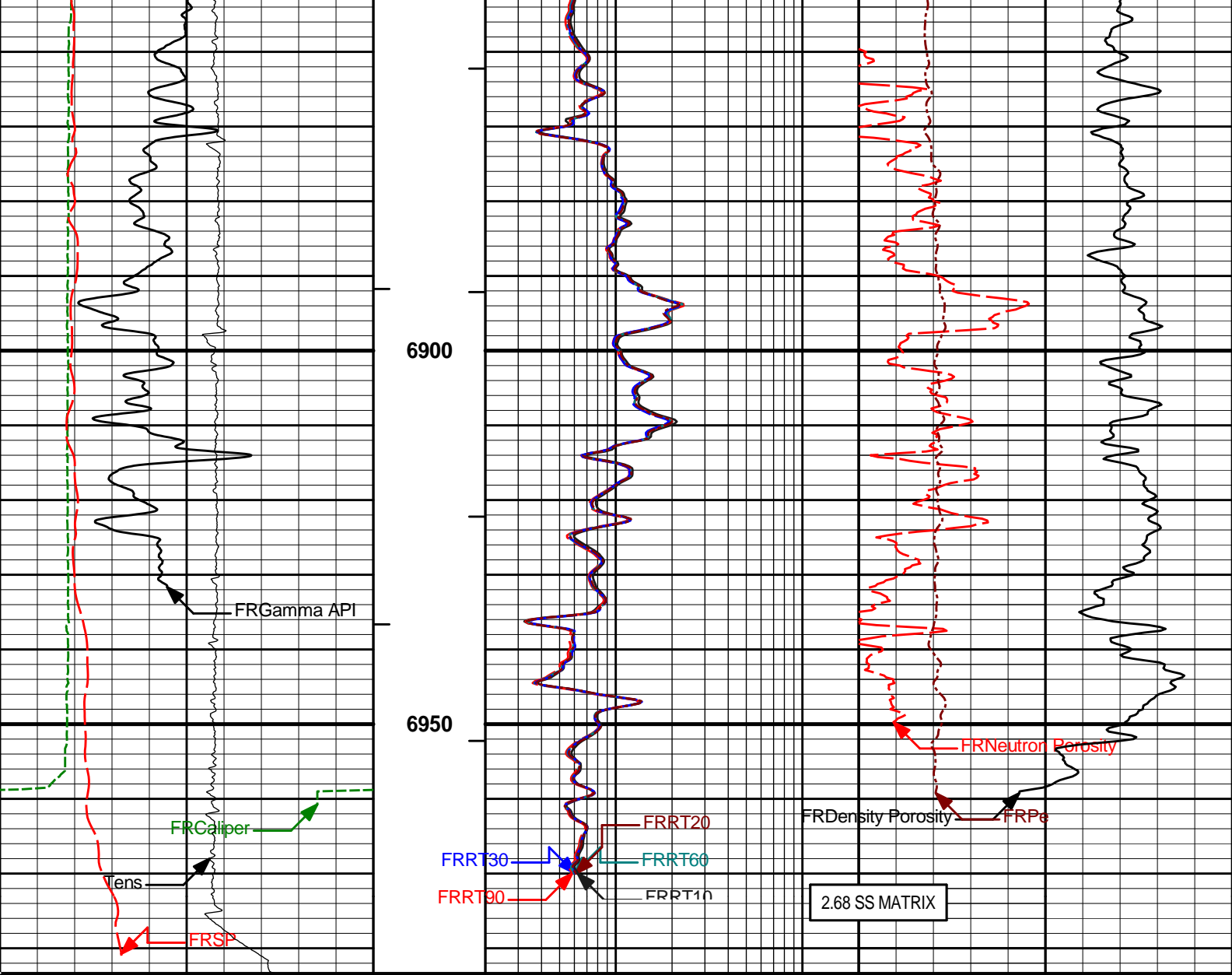












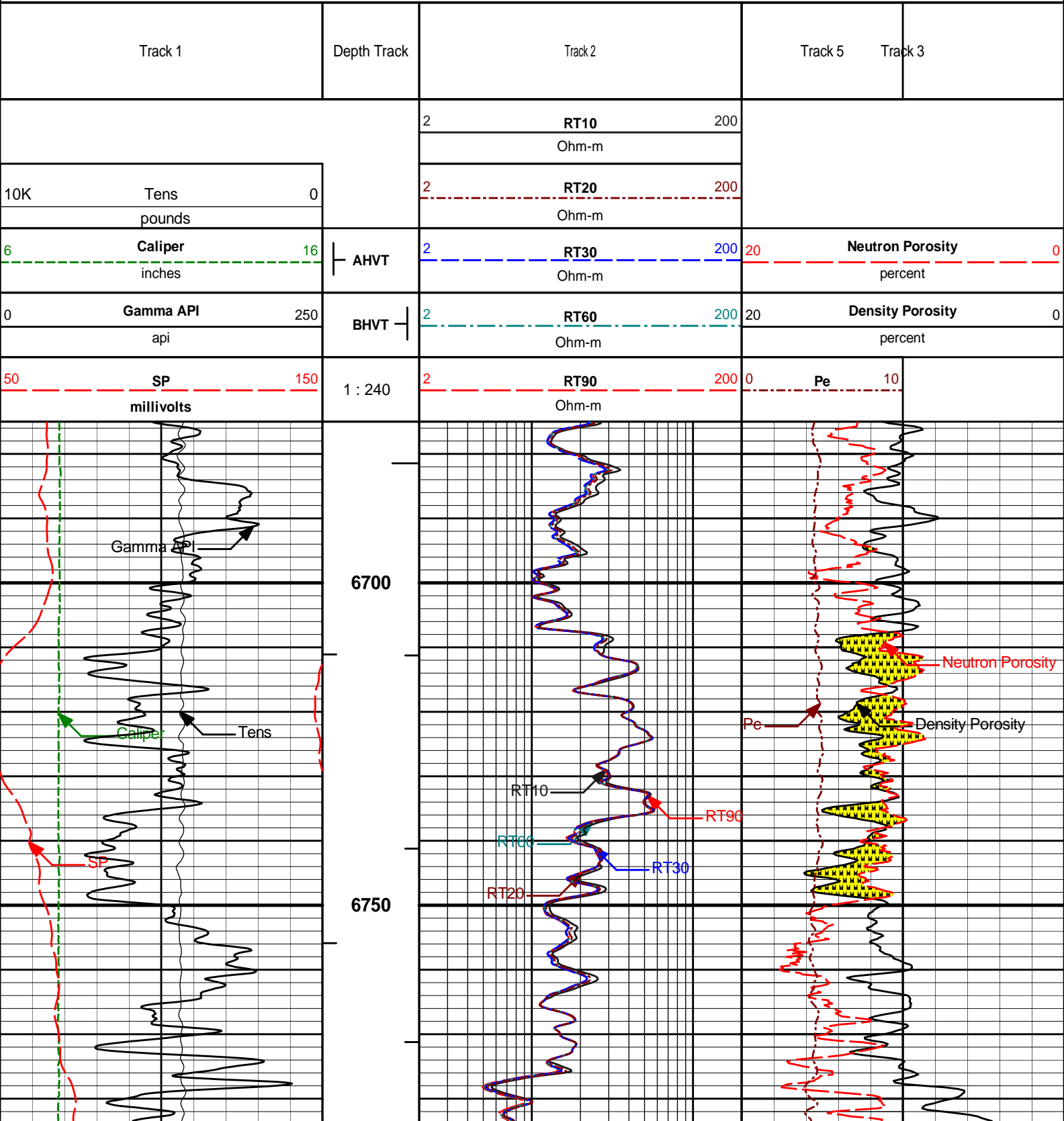
50	SP	150	1 : 240	2	RT90	200	0	Pe	10
	millivolts				Ohm-m				
0	Gamma API	250	BHVT	2	RT60	200	20	Density Porosity	0
	api				Ohm-m			percent	
6	Caliper	16	AHVT	2	RT30	200	20	Neutron Porosity	0
	inches				Ohm-m			percent	
10K	Tens	0		2	RT20	200			
	pounds				Ohm-m				
				2	RT10	200			
					Ohm-m				

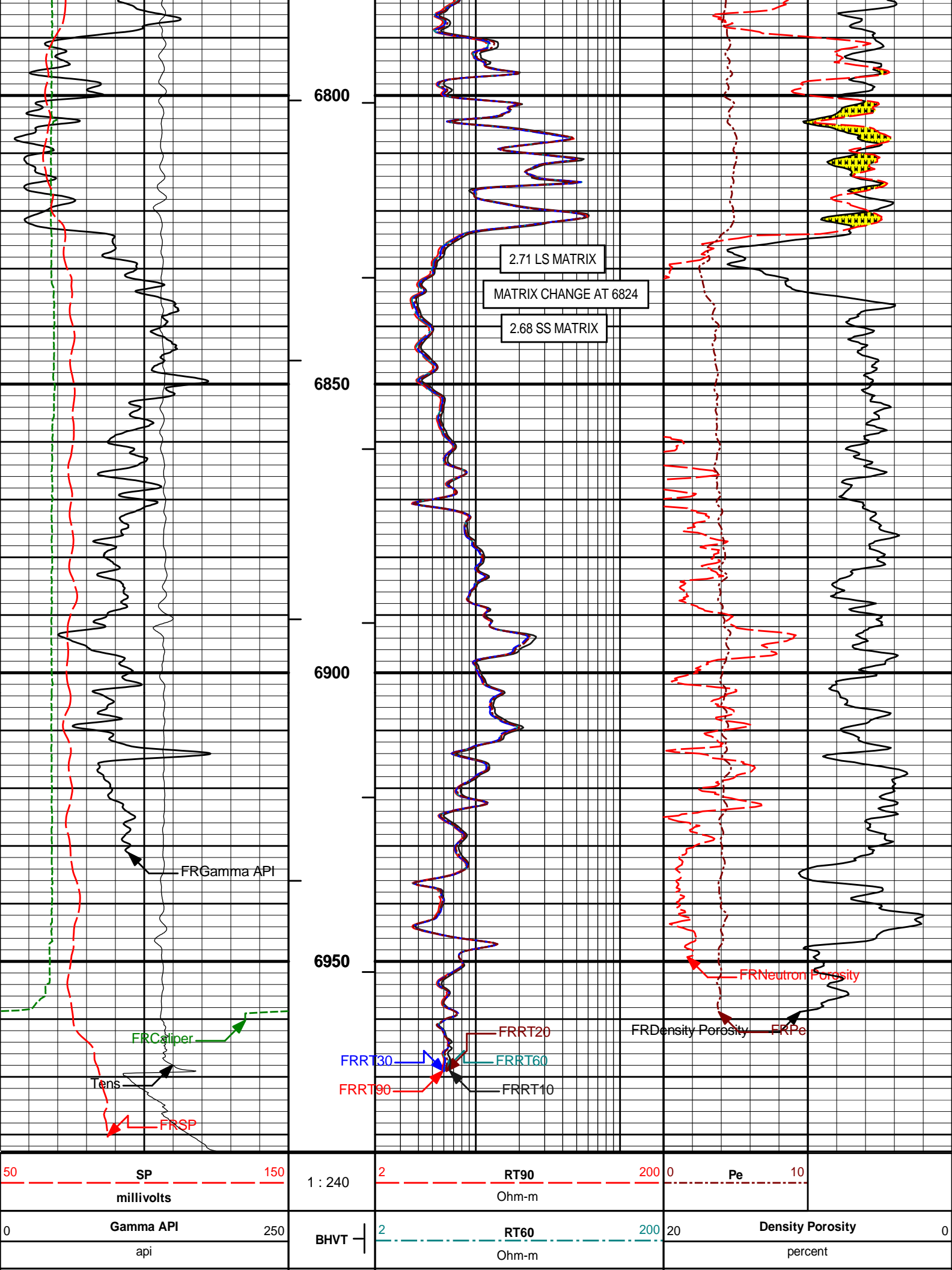
HALLIBURTON

Plot Time: 21-Oct-10 18:45:23
 Plot Range: 525 ft to 6983.33 ft
 Data: WELLS_AA26_13XWell Based\MAIN*
 Plot File: \COMP\MAIN

MAIN PASS 5" = 100'

REPEAT SECTION 5" = 100'





6	Caliper	16	AHVT	2	RT30	200	20	Neutron Porosity	0
	inches				Ohm-m			percent	
10K	Tens	0		2	RT20	200			
	pounds				Ohm-m				
				2	RT10	200			
					Ohm-m				

HALLIBURTON

Plot Time: 21-Oct-10 18:45:25
Plot Range: 6675 ft to 6982.92 ft
Data: WELLS_AA26_13X\Well Based\REPEAT*
Plot File: \\COMP\REPEAT

REPEAT SECTION 5" = 100'

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:
GTET - 11215095

Reference Calibration Date:
18-Oct-10 16:50:43

Engineer:
R. STONE

Calibration Date:
18-Oct-10 16:54:41

Software Version:
WL INSITE R3.0.6 (Build 4)

Calibration Version:
1

Calibrator Source S/N: TB-255
Calibrator API Reference:253.00 api

Measurement	Measured	Calibrated	Units
Background	191.4	195.1	api
Background + Calibrator	444.1	452.5	api
Calibrator	261.1	257.4	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:
GTET - 11215095

Reference Calibration Date:
18-Oct-10 16:54:41

Engineer:
C. BLUE

Calibration Date:
20-Oct-10 08:50:00

Software Version:
WL INSITE R3.0.6 (Build 4)

Calibration Version:
1

Calibrator Source S/N: TB-255
Calibrator API Reference:253.00 api

Field Verification	Shop	Field	Units
Background	195.1	131.0	api
Background + Calibrator	452.5	395.6	api
Calibrator	257.4	264.6	api

Shop	Field	Difference	Tolerance
257.4	264.6	-7.2	+/- 9.00

CSNG-FS SHOP CALIBRATION

Tool Name:
CSNG - 10965402

Reference Calibration Date:
20-Oct-10 09:48:12

Engineer:
C. BLUE

Calibration Date:
20-Oct-10 10:19:29

Software Version:
WL INSITE R3.0.6 (Build 4)

Calibration Version:
1

Source SN:
TB-255

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.0	23.0	Channel #
583 KEV Peak Channel #	51.3	51.3	Channel #
2614 KEV Peak Channel #	210.9	211.1	Channel #
Calibrate Temperature	98.1	105.1	degF

Pass/Fail Summary	Centroid
239 KEV Peak	Passed
583 KEV Peak	Passed
2614 KEV Peak	Passed

Blanket Reference Value: 253.00 API

Calibrator Value: 287.3 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1789.6	CPS	373.4	371.2	API
Background	404.2	CPS	86.1	83.8	API

Gamma Ray Gain: 1.04

Gamma Gain Check: Passed

CSNG-FS FIELD CALIBRATION

Tool Name:	CSNG - 10965402	Reference Calibration Date:	20-Oct-10 10:19:29
Engineer:	C. BLUE	Calibration Date:	20-Oct-10 10:32:10
Software Version:	WL INSITE R3.0.6 (Build 4)	Calibration Version:	1
Source SN:			

TITANIUM CASE	Shop	Field	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.0	22.8	Channel #
583 KEV Peak Channel #	51.3	51.3	Channel #
2614 KEV Peak Channel #	211.1	211.4	Channel #
Calibrate Temperature	105.1	108.6	degF

Pass/Fail Summary	Centroid
239 KEV Peak	Passed
583 KEV Peak	Passed
2614 KEV Peak	Passed

Blanket Reference Value: 253.00 API

Calibrator Value: 287.3 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1829.6	CPS	371.2	370.3	API
Background	410.1	CPS	83.8	83.0	API

Gamma Ray Gain: 1.02

Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 11919337	Reference Calibration Date:	13-Oct-10 19:05:46
Engineer:	Russell Stone	Calibration Date:	13-Oct-10 20:19:56
Software Version:	WL INSITE R3.2.1 (Build 7)	Calibration Version:	1

Logging Source S/N: DSN430
Tank Serial Number: GRAND JUNCTION1
Reference value assigned to Tank: 52.750
Snow Block S/N: 1223
Calibration Tank Water Temperature: 68 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value

Gain:	0.970	0.969	0.900 - 1.100
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WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2173	0.2169	0.0004	+/- 0.0020
Calibrated Ratio:	9.94	9.93	0.013	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit

Snow-Block Porosity (decp):	0.0622	0.02000 - 0.09000
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PASS/FAIL SUMMARY	
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Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed

DUAL SPACED NEUTRON FIELD CALIBRATION			
Tool Name:	DSNT - 11919337	Reference Calibration Date:	13-Oct-10 20:19:56
Engineer:	C. BLUE	Calibration Date:	20-Oct-10 09:06:21
Software Version:	WL INSITE R3.0.6 (Build 4)	Calibration Version:	1

Logging Source S/N: DSN430
Snow Block S/N: 1223

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change

Snow-Block Porosity (decp):	0.0622	0.0593	-0.0029	+/- 0.0150
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PASS/FAIL SUMMARY	
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Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

SPECTRAL DENSITY SHOP CALIBRATION			
Tool Name:	SDLT - I337M319	Reference Calibration Date:	19-Oct-10 18:27:11
Engineer:	C. BLUE	Calibration Date:	19-Oct-10 18:50:11
Software Version:	WL INSITE R3.0.6 (Build 4)	Calibration Version:	1

Logging Source S/N: 5256GW	Density: 2.600g/cc	Pe: 3.100
Aluminum Block S/N: BRIGHTON		

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0342	1.0118	0.90 - 1.10
Near Dens Gain	0.9665	0.9947	0.90 - 1.10
Near Peak Gain	1.0050	0.9723	0.90 - 1.10
Near Lith Gain	0.9543	0.9646	0.90 - 1.10
Far Bar Gain	1.0168	1.0138	0.90 - 1.10
Far Dens Gain	1.0002	1.0042	0.90 - 1.10
Far Peak Gain	1.0022	0.9973	0.90 - 1.10
Far Lith Gain	0.9872	0.9720	0.90 - 1.10
Near Bar Offset	-0.3129	-0.1063	NONE
Near Dens Offset	0.2651	0.0178	NONE
Near Peak Offset	-0.0666	0.2118	NONE
Near Lith Offset	0.3391	0.2561	NONE
Far Bar Offset	-0.1928	-0.1686	NONE
Far Dens Offset	-0.0671	-0.1001	NONE
Far Peak Offset	-0.0973	-0.0600	NONE
Far Lith Offset	0.0050	0.1167	NONE
Near Bar Background	865.20	865.00	700 - 1450
Near Dens Background	283.24	282.93	230 - 480
Near Peak Background	120.64	120.40	100 - 210
Near Lith Background	151.28	151.73	125 - 260
Far Bar Background	545.74	546.22	450 - 900
Far Dens Background	211.32	210.83	175 - 345
Far Peak Background	82.31	82.11	70 - 140
Far Lith Background	86.75	86.80	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.678	1.680	0.002	+/- 0.015
Pe	2.659	2.595	-0.064	+/- 0.150
ALUMINUM				
Density (g/cc)	2.597	2.600	0.003	+/- 0.01500
Pe	3.122	3.100	-0.022	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0009	+/- 0.0110	0.0014	+/- 0.0140
Magnesium Block	0.0016	+/- 0.0110	-0.0013	+/- 0.0140
Aluminum Block	-0.0003	+/- 0.0110	0.0007	+/- 0.0140
Resolution	9.35	6.00 - 11.50	9.78	6.00 - 11.50
Internal Verifier(B+D+P+L)	1420	1200 - 2700	926	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 - I337M319	Reference Calibration Date:	19-Oct-10 18:50:11
Engineer:	C. BLUE	Calibration Date:	20-Oct-10 08:48:47
Software Version:	WL INSITE R3.0.6 (Build 4)	Calibration Version:	1

Pad Temperature: 68.0 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1420.057	1425.052	4.995	15.211
Far (B+D+P+L) cps	925.967	928.335	2.368	16.476
Near Resolution	9.35	9.43	0.080	0.50
Far Resolution	9.78	9.84	0.060	1.00

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	SDLT - I337M319	Reference Calibration Date:	20-Oct-10 08:54:59
Engineer:	C. BLUE	Calibration Date:	20-Oct-10 08:59:15
Software Version:	WL INSITE R3.0.6 (Build 4)	Calibration Version:	1

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-5353.42	-5104.59	-7000.00 - -1000.00
Pad Gain	0.0003928	0.0003808	0.000200 - 0.000600
Arm Offset	-3285.26	-3754.96	-5000.00 - 3000.00
Arm Gain	0.0005927	0.0006107	0.000300 - 0.000700
Arm Power	-0.000006320	-0.000007158	-0.000010 - 0.000010

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)	1.97	2.00	0.03	+/- 0.20
Medium Ring (in)	3.77	3.75	-0.02	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.62	6.50	-0.12	+/- 0.20
Medium Ring (in)	8.32	8.25	-0.07	+/- 0.20
Large Ring (in)	15.00	15.00	0.00	+/- 0.20

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed

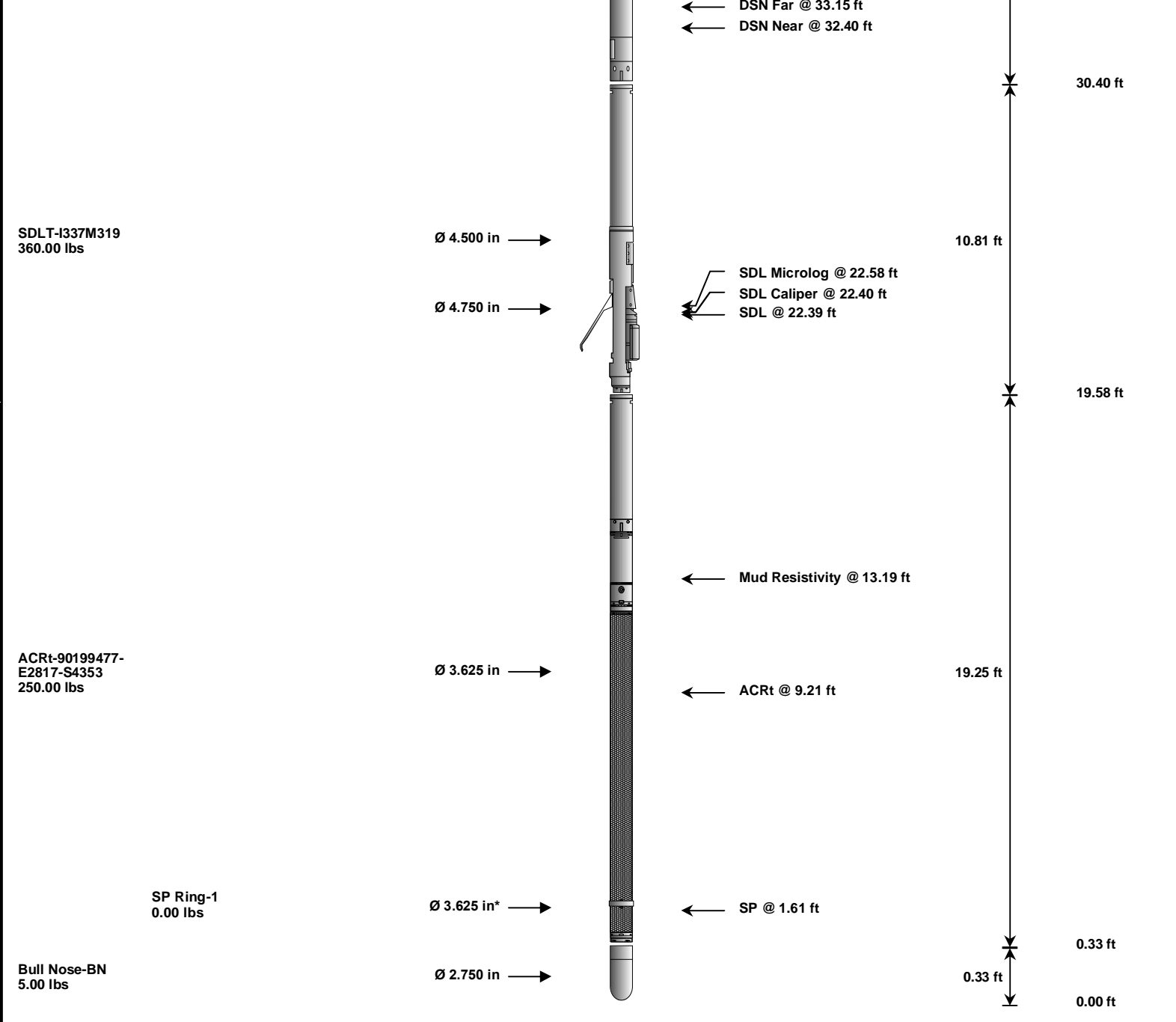
Ring-Measurement Check:					Passed				
PASS/FAIL SUMMARY									
Calibration-Coefficients Range Check:					Passed				
SDLT CALIPER FIELD CALIBRATION									
Tool Name: SDLT - I337M319					Reference Calibration Date: 20-Oct-10 08:59:15				
Engineer: C. BLUE					Calibration Date: 20-Oct-10 09:00:47				
Software Version: WL INSITE R3.0.6 (Build 4)					Calibration Version: 1				
MEASURED CALIPER VALUES									
Measurement		Shop		Field		Change		Control Limit On New Value	
Pad Extension		3.75		3.75		0.00		+/- 0.10	
Ring Diameter		8.25		8.20		-0.05		+/- 0.15	
PASS/FAIL SUMMARY									
Pad Extension Check:					Passed				
Diameter Check:					Passed				
ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION									
Tool Name: ACRt - 90199477-E2817-S4353					Reference Calibration Date: 04-Jun-10 17:05:07				
Engineer: C. BLUE					Calibration Date: 13-Aug-10 20:06:47				
Software Version: WL INSITE R3.0.4 (Build 6)					Calibration Version: 1				
TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0167	1.05	0.95	1.0163	1.05	0.95	1.0146	1.05
A2 (50")	0.95	1.0118	1.05	0.95	1.0132	1.05	0.95	1.0128	1.05
A3 (29")	0.95	1.0069	1.05	0.95	1.0085	1.05	0.95	1.0057	1.05
A4 (17")	0.95	1.0150	1.05	0.95	1.0133	1.05	0.95	1.0143	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0000	1.05	0.95	0.9992	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9881	1.05	0.95	0.9862	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	-0.995	2	-6	-4.514	-2	-8	-4.963	-2
A2 (50")	-7	-1.354	-1	-6	-2.867	-2	-7	-4.762	-2
A3 (29")	-27	-13.303	-9	-9	-3.580	-3	-7	-3.628	-1
A4 (17")	-180	-90.373	-60	-45	-29.209	-15	-39	-25.034	-13
A5 (10")	N/A	N/A	N/A	-150	-90.980	-50	-80	-43.898	-10
A6 (6")	N/A	N/A	N/A	175	329.261	525	90	166.175	270
TRANSMITTER CURRENT GAIN					R-MUD VERIFICATION				
Signal	Lower	R		Upper	Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)	
12K	0.6	0.9189		1.3	Mud Cell	0.95	0.996	1.05	
36K	1.0	1.8306		2.0					
72K	1.0	1.1584		2.0					
CALIBRATION SUMMARY									
Sensor		Shop		Field	Post	Difference	Tolerance		Units

GTET-11215095						
Gamma Ray Calibrator	257.4	264.6	-----	-7.2	+/- 9.00	api
CSNG-10965402						
60 KEV Peak Channel #	48.0	48.0	-----	0.0	-----	Channel #
239 KEV Peak Channel #	23.0	22.8	-----	0.2	-----	Channel #
583 KEV Peak Channel #	51.3	51.3	-----	0.0	-----	Channel #
2614 KEV Peak Channel #	211.1	211.4	-----	-0.3	-----	Channel #
DSNT-11919337						
Snow-Block Porosity	0.0622	0.0593	-----	0.0029	+/- 0.0150	decp
SDLT-I337M319						
Near(B+D+P+L)	1420.057	1425.052	-----	-4.995	+/-15.211	cps
Far(B+D+P+L)	925.967	928.335	-----	-2.368	+/-16.476	cps
Pad Extension	3.75	3.75	-----	0.00	+/-0.10	in
Ring Diameter	8.25	8.20	-----	0.050	+/-0.15	in
ACRt-90199477-E2817-S4353						
Mud Cell	0.996	-----	-----	0.000	-----	ohm-m
Data: WELLS_AA26_13X\0001 NOBLEVDLE					Date: 21-Oct-10 17:24:23	

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-A094 135.00 lbs		Ø 3.625 in →		← Load Cell @ 59.34 ft ← BH Temperature @ 58.77 ft	6.25 ft	63.02 ft
GTET-11215095 165.00 lbs		Ø 3.625 in →		← GammaRay @ 50.71 ft	8.52 ft	56.77 ft
CSNG-10965402 114.00 lbs		Ø 3.625 in →		← CSNG @ 42.62 ft	8.17 ft	48.25 ft
DSN Decentralizer- 10860047 6.60 lbs		Ø 3.625 in* →				40.08 ft
DSNT-11919337 174.00 lbs		Ø 3.625 in →			9.69 ft	



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	A094	135.00	6.25	56.77	300.00
GTET	Gamma Telemetry Tool	11215095	165.00	8.52	48.25	60.00
CSNG	Compensated Spectral Natural Gamma	10965402	114.00	8.17	40.08	15.00
DSNT	Dual Spaced Neutron	11919337	174.00	9.69	30.40	60.00
DCNT	DSN Decentralizer	10860047	6.60	5.13	33.73	300.00
SDLT	Spectral Density Tool	I337M319	360.00	10.81	19.58	60.00
ACRt	Array Compensated True Resistivity	90199477-E2817-S4353	250.00	19.25	0.33	300.00
SP	SP Ring	1	0.00	0.25	1.61	300.00
BLNS	Bull Nose	BN	5.00	0.33	0.00	300.00
Total			1,209.60	63.02		

* Not included in Total Length and Length Accumulation.

Data: WELLS_AA26_13X\0001 NOBLEIDLE

Date: 21-Oct-10 15:48:51

COMPANY NOBLE ENERGY

WELL WELLS RANCH AA26-13X

FIELD	WATTENBERG		
COUNTY	WELD	STATE	CO
HALLIBURTON		SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TRUE RESISTIVITY	