

**SPECTRAL DENSITY  
DUAL SPACED NEUTRON  
ARRAY COMPENSATED  
TRUE RESISTIVITY**

COMPANY	NOBLE ENERGY
WELL	DF RANCH 1161-8-12
FIELD	WATTENBERG
COUNTY	WELD
STATE	CO

COMPANY	NOBLE ENERGY
WELL	DF RANCH 1161-8-12
FIELD	WATTENBERG
COUNTY	WELD

API No. 05123310760000

Location SHL: 660' FNL & 1980' FEL NWNE  
LAT: 40.94169°  
LONG: -104.226997

API No.	05123310760000	Other Services
Location	SHL: 660' FNL & 1980' FEL NWNE LAT: 40.94169° LONG: -104.226997	<div> <div>RMCH</div> <div>GJET</div> <div>IDT</div> <div>CSNG</div> <div>ICT</div> <div>BSAT</div> </div>
Sect.	8	Twp.
	11N	Rge.
		61W

Permanent Datum	GL	Elev. 5256.0 ft	Elev.: K.B.	5268.0 ft
Log measured from	KB	12.0 ft above perm. Datum	D.F.	5267.0 ft
Drilling measured from	KB		GL.	5256.0 ft

Date	17-Jun-10		
Run No.	ONE		
Depth - Driller	1058.00 ft		
Depth - Logger	7942.0 ft		
Bottom - Logged Interval	7933 ft		
Top - Logged Interval	1059 ft		
Casing - Driller	8.625 in @ 7953.0 ft	@	@
Casing - Logger	1059.0 ft		
Bit Size	7.875 in	@	@

Type Fluid in Hole	WBM			
Density	9.2 ppg	51.00 s/qt		
Viscosity				
Fluid Loss	9.00 pH	9.6 cpm		
PH				
Source of Sample	FLOW LINE			

[illegible]

Rm @ BHT	0.43 ohmm @ 220.0 degF	@	@
Time Since Circulation	6.0 hr		
Time on Bottom	17-Jun-10 03:56		

Max. Rec. Temperature	220.0 degF	@ 7942.0 ft	@
Equipment	Location	11454566	BRIGHTON

Recorded By	C. BLUE	
Witnessed By	S. HEARD	M. SCANNIELLO

Service Ticket No.: N/A      API Serial No.: 05123310760000      PGM Version: WL INSITE R3.0.4 (Build 6)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE	RESISTIVITY SCALE CHANGES
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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	1.5" 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.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	11294346	Serial No.	1105781	Serial No.	I132M275	Serial No.	11301132
Model No.	GTET	Model No.	BSAT	Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.	3.625"	Diameter	4.5"	Diameter	3.625"
Detector Model No.	102A	Spacing	0.5'	Log Type	GAM/GAM	Log Type	NEU/NEU
Type	SCINT			Source Type	Cs137	Source Type	Am241Be
Length	8"	LSA [Y/N]	N	Serial No.	2770 GW	Serial No.	DSN 434
Distance to Source	26'	FWDA [Y/N ]	N	Strength	1.5 Ci	Strength	15 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	7942	7529	REC	0	250	30%	-10%	55.5 us/ft	20%	0%	2.65 g/cc	20%	0%	SAND
ONE	7529	7169	REC	0	250	30%	-10%	55.5 us/ft	20%	0%	2.68 g/cc	20%	0%	SAND

ONE	7529	7169	REC	0	250	30%	-10%	55.5 us/ft	20%	0%	2.68 g/cc	20%	0%	SAND
ONE	7169	6750	REC	0	250	30%	-10%	47.6 us/ft	20%	0%	2.71 g/cc	20%	0%	LIME
ONE	6750	1059	REC	0	250	30%	-10%	55.5 us/ft	20%	0%	2.68 g/cc	20%	0%	SAND
DIRECTIONAL INFORMATION														
Maximum Deviation @									KOP @					
Remarks:														
RWCH/GTET/IDT/CSNG/DSNT/SDLT/ICT/BSAT/ACRT RAN IN COMBINATION														
ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH PRODUCTION CASING														
TENSION PULLS AFFECT TOOL RESPONSE														
CREW: A. LEWIS, T. BINEAU RIG: FORT DRILLING 5														
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.														
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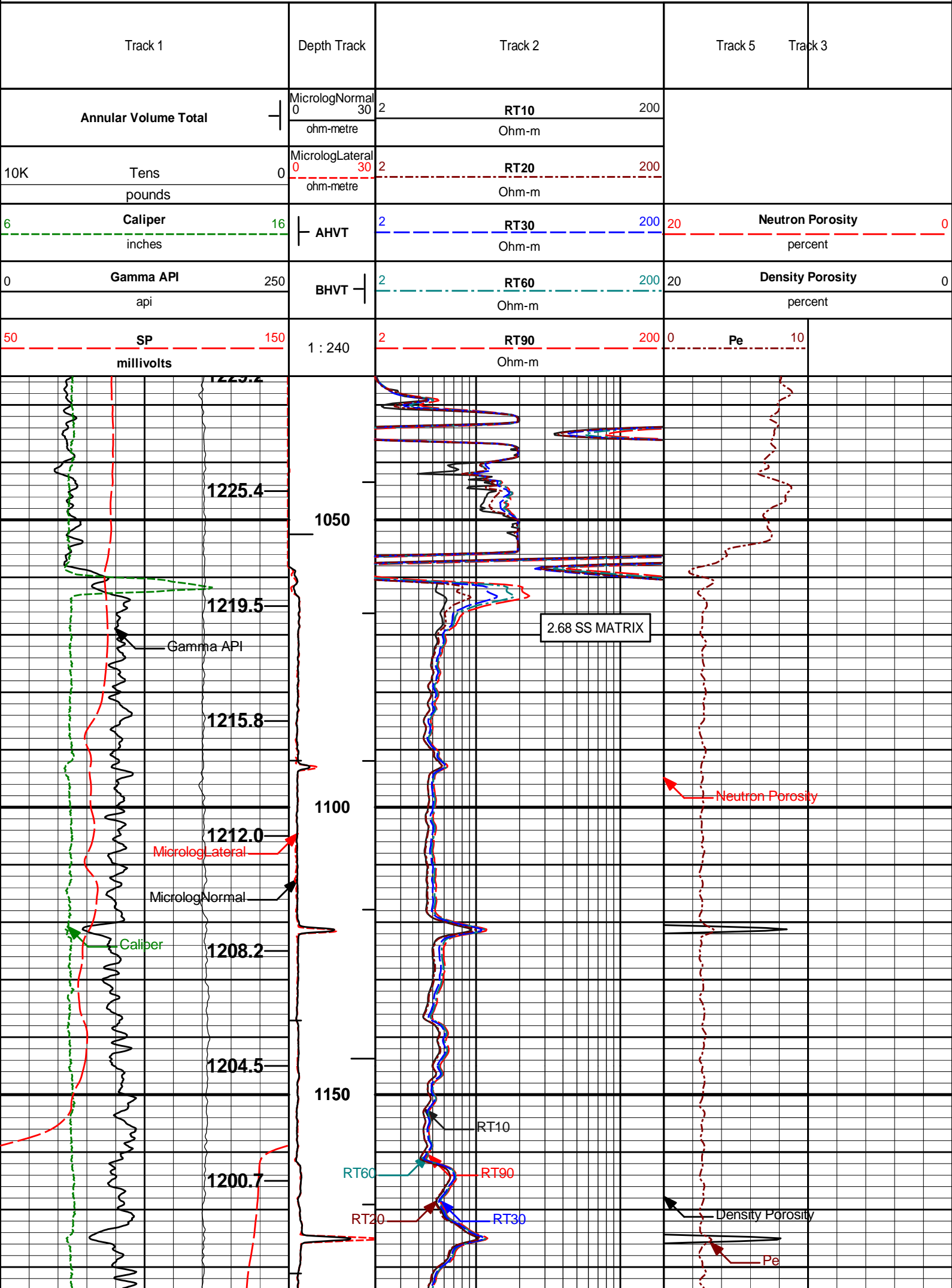
PARAMETERS REPORT

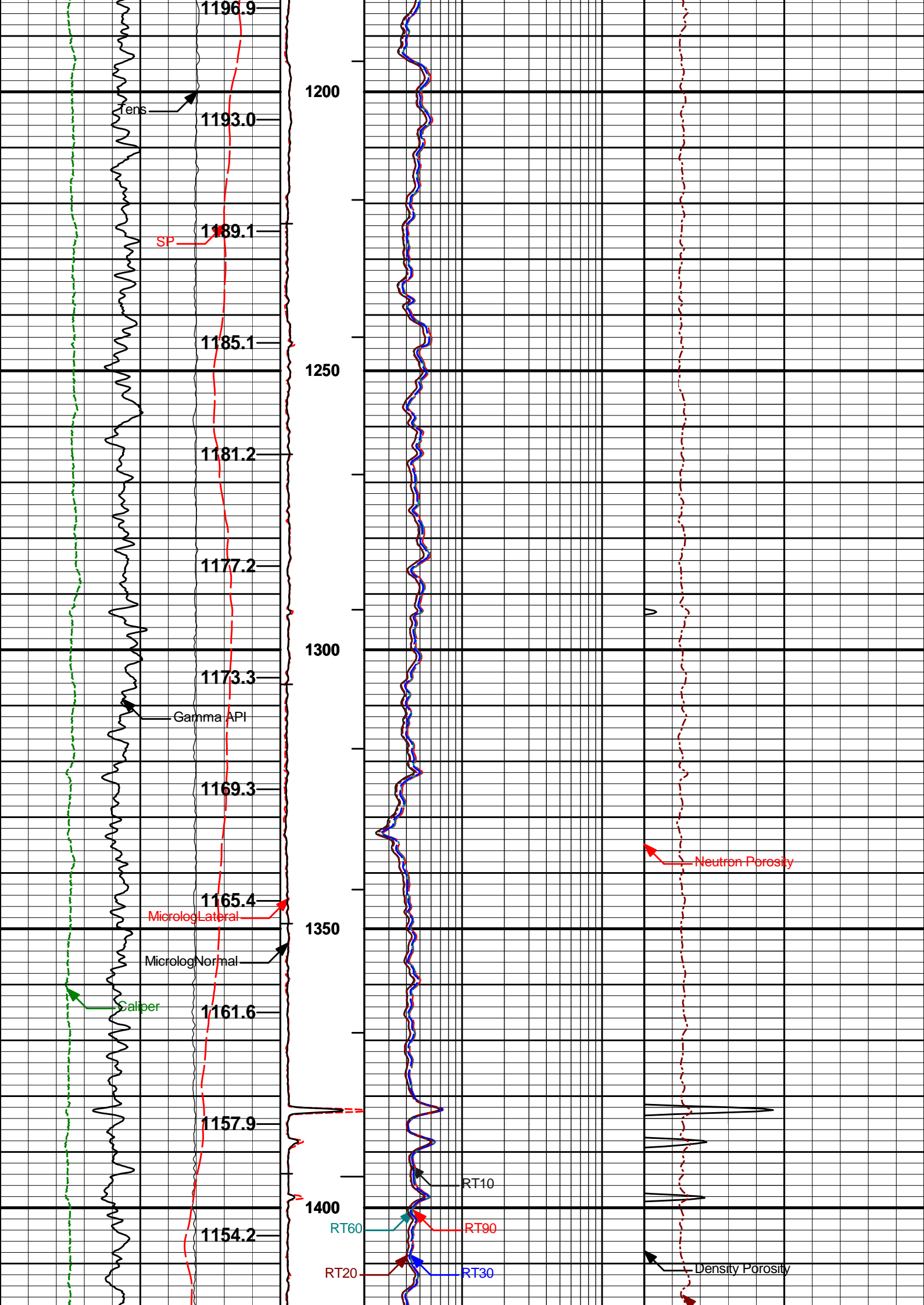
Depth (ft)	Tool Name	Description	Value	Units
TOP				
	DSNT	Neutron Lithology	Sandstone	
	SDLT	Formation Density Matrix	2.680	g/cc
	BSAT	Delta -T Matrix Type	Sandstone 55.5	
6750.00				
	DSNT	Neutron Lithology	Limestone	
	SDLT	Formation Density Matrix	2.710	g/cc
	BSAT	Delta -T Matrix Type	User define	
	BSAT	Delta -T Matrix	47.60	uspf
7169.00				
	SDLT	Formation Density Matrix	2.680	g/cc
7529.00				
	SHARED	Bit Size	7.875	in
	SHARED	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	Borehole Fluid Weight	9.200	ppg
	SHARED	Oil Based Mud System?	No	
	SHARED	Mud Resistivity	0.960	ohmm
	SHARED	Temperature of Mud	95.5	degF
	SHARED	Logging Interval is Cased?	No	
	SHARED	AHV Casing OD	5.500	in
	SHARED	Surface Temperature	60.0	degF
	SHARED	Total Well Depth	7942.00	ft
	SHARED	Bottom Hole Temperature	220.0	degF
	SHARED	Navigation and Survey Master Tool	IDT	
	SHARED	High Res Z Accelerometer Master Tool	IDT	
	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	%

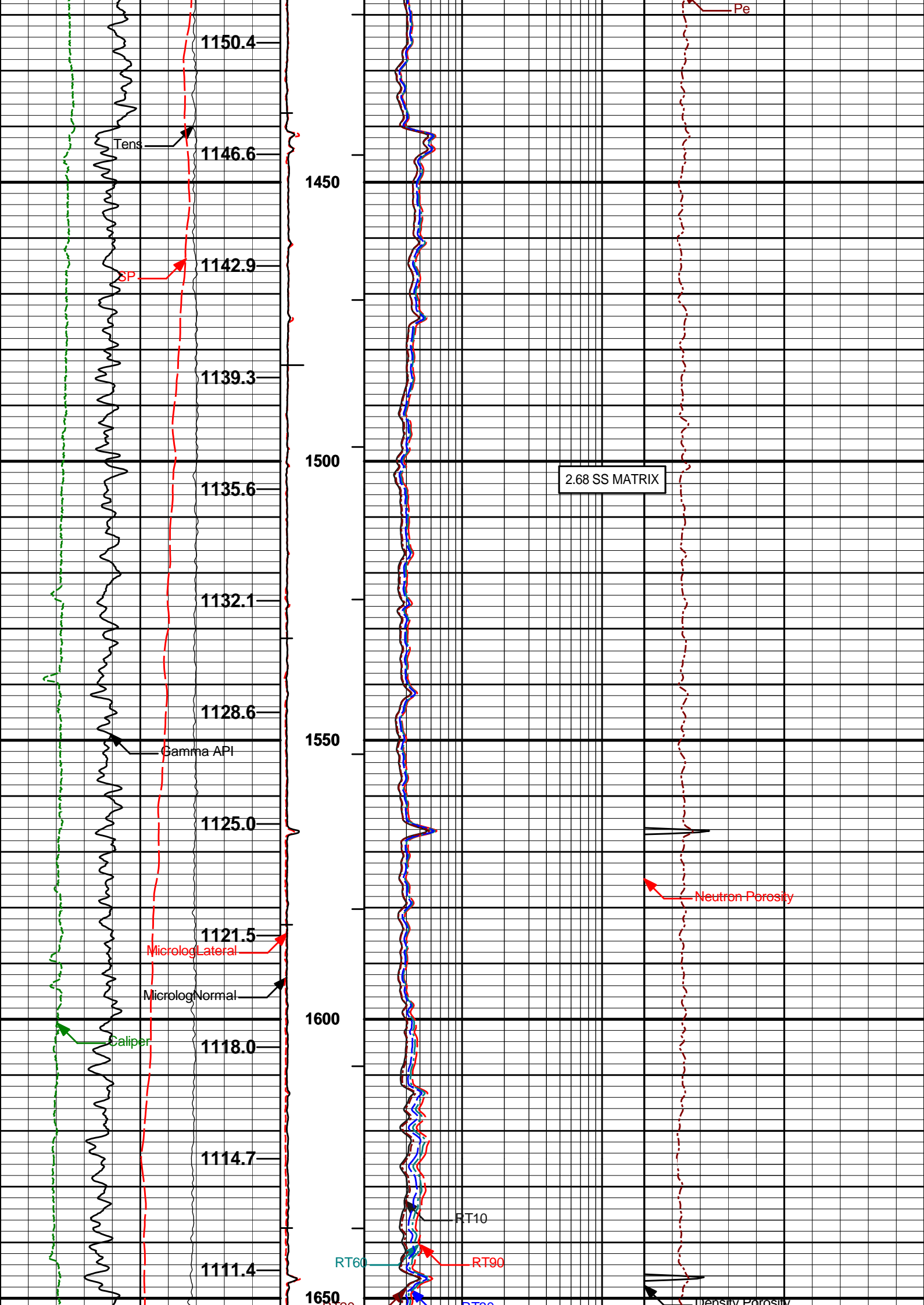
GTET	Mud Type	Natural	
GTET	Tool Position	Standoff	
IDT	Survey Writing Interval	30	ft
IDT	Smoothing Option	None	
CSNG	Process CSNG Data?	Yes	
CSNG	Is Tool Centralized?	No	
CSNG	Mud Type?	Natural	
CSNG	Percent K in Mud by Weight?	0.00	%
CSNG	Gamma Enviromental Corrections?	Yes	
CSNG	Barite Correction 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	2.650	g/cc
SDLT	Formation Density Fluid	1.000	g/cc
SDLT	Process Caliper Outputs?	Yes	
SDLT	Process MicroLog Outputs?	Yes	
ICT	Process Caliper Outputs?	Yes	
ICT	Navigation Source Tool	IDT	
BSAT	Compute BCAS Results?	Yes	
BSAT	Semblance Filter Low Pass Value?	5000	Hz
BSAT	Semblance Filter High Pass Value?	27000	Hz
BSAT	Delta -T Fluid	189.00	uspf
BSAT	Delta -T Matrix Type	Sandstone 55.5	
BSAT	Delta -T Shale	100.00	uspf
BSAT	Acoustic Porosity Equation	Wylie	
ACRt	Process ACRt?	Yes	
ACRt	Minimum Tool Standoff	1.50	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	
BOTTOM			
Data: DF_RANCH_1161_8\0001 NOBLE_RED_BSAT\004.01 17-Jun-10 05:42 Up			Date: 17-Jun-10 05:43:32

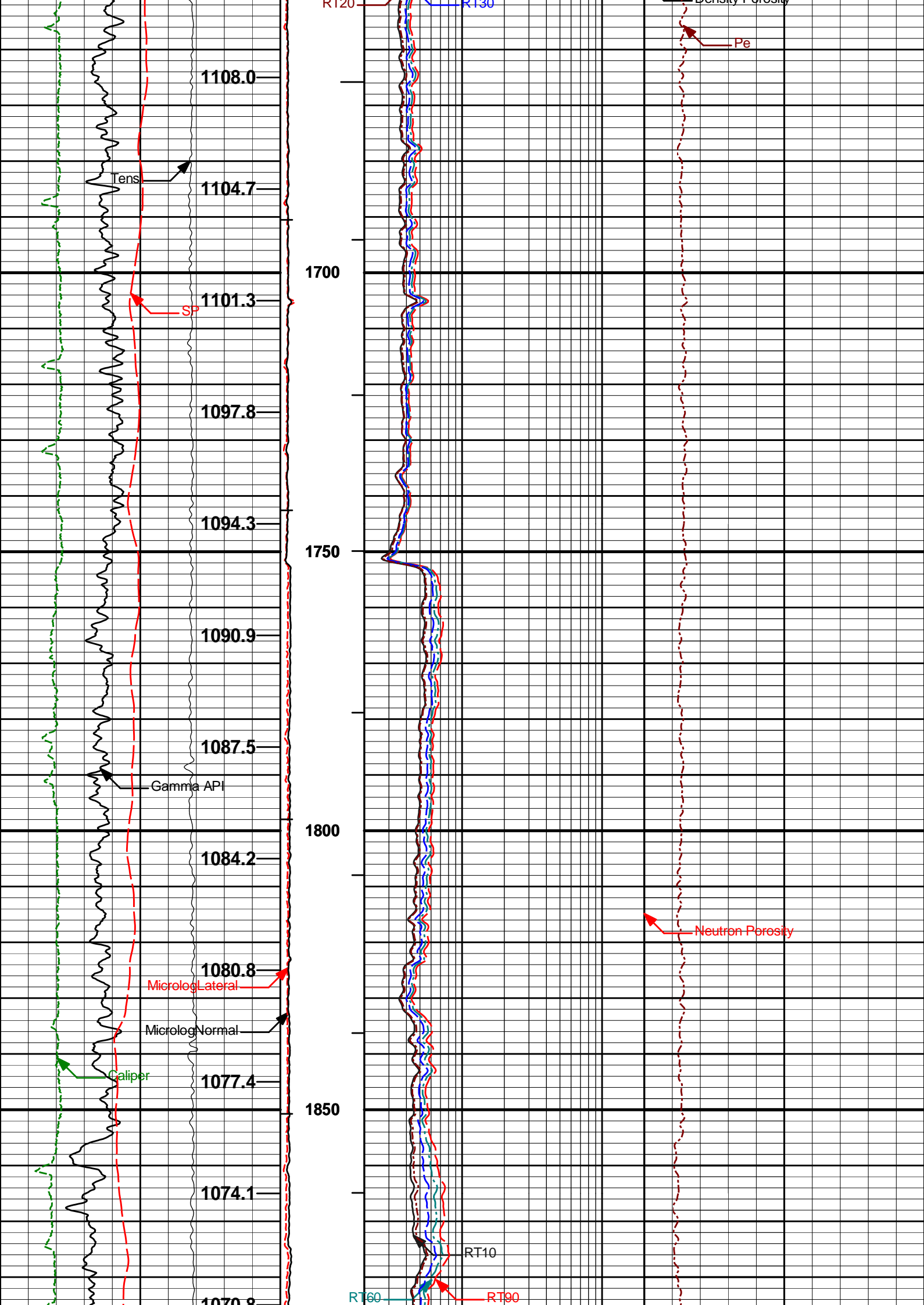
<b>HALLIBURTON</b>	Plot Time: 17-Jun-10 07:13:57 Plot Range: 1025 ft to 7946.33 ft Data: DF_RANCH_1161_8\Well Based\** Plot File: \\COMP\MAIN
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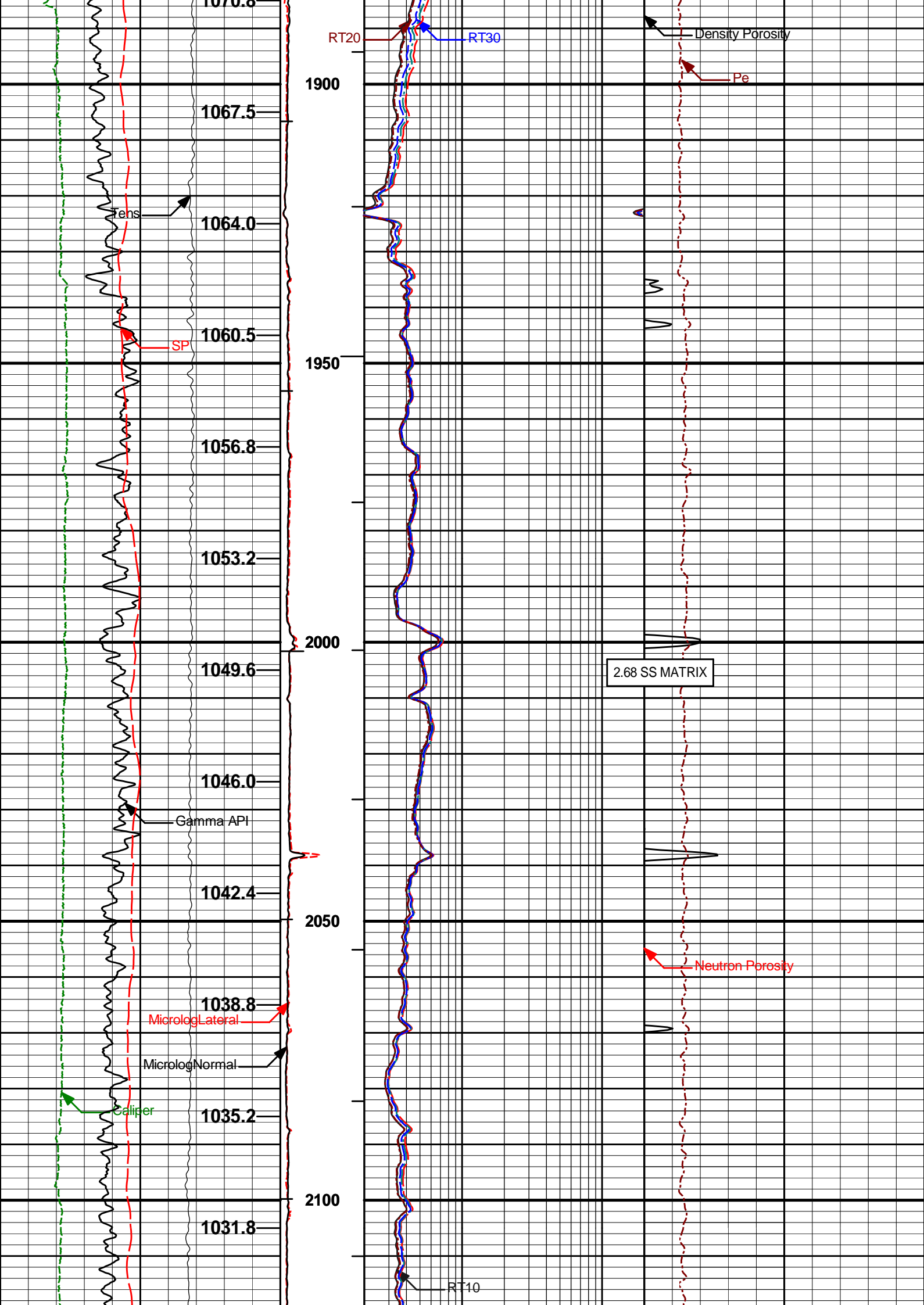
MAIN PASS 5" = 100'
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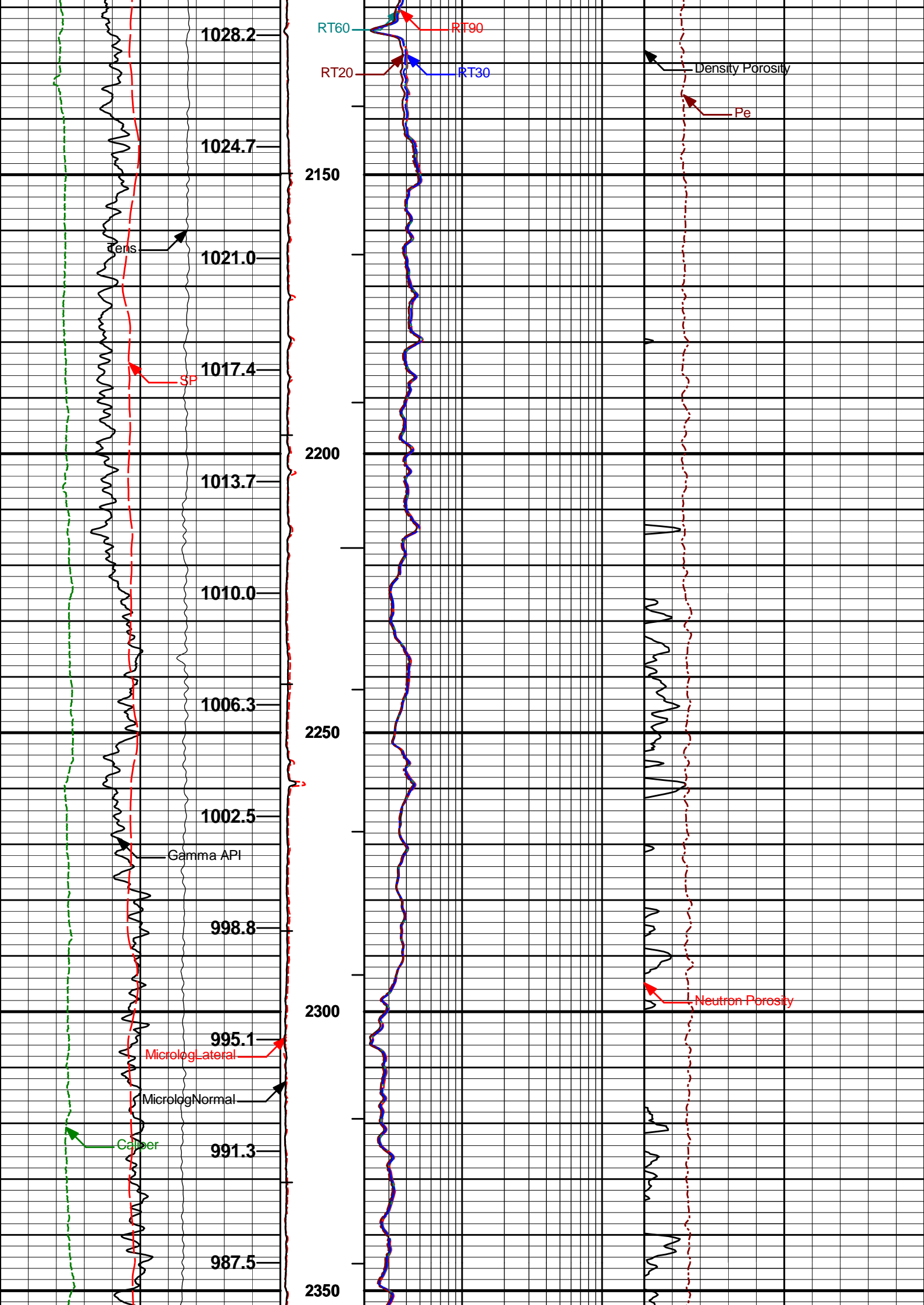


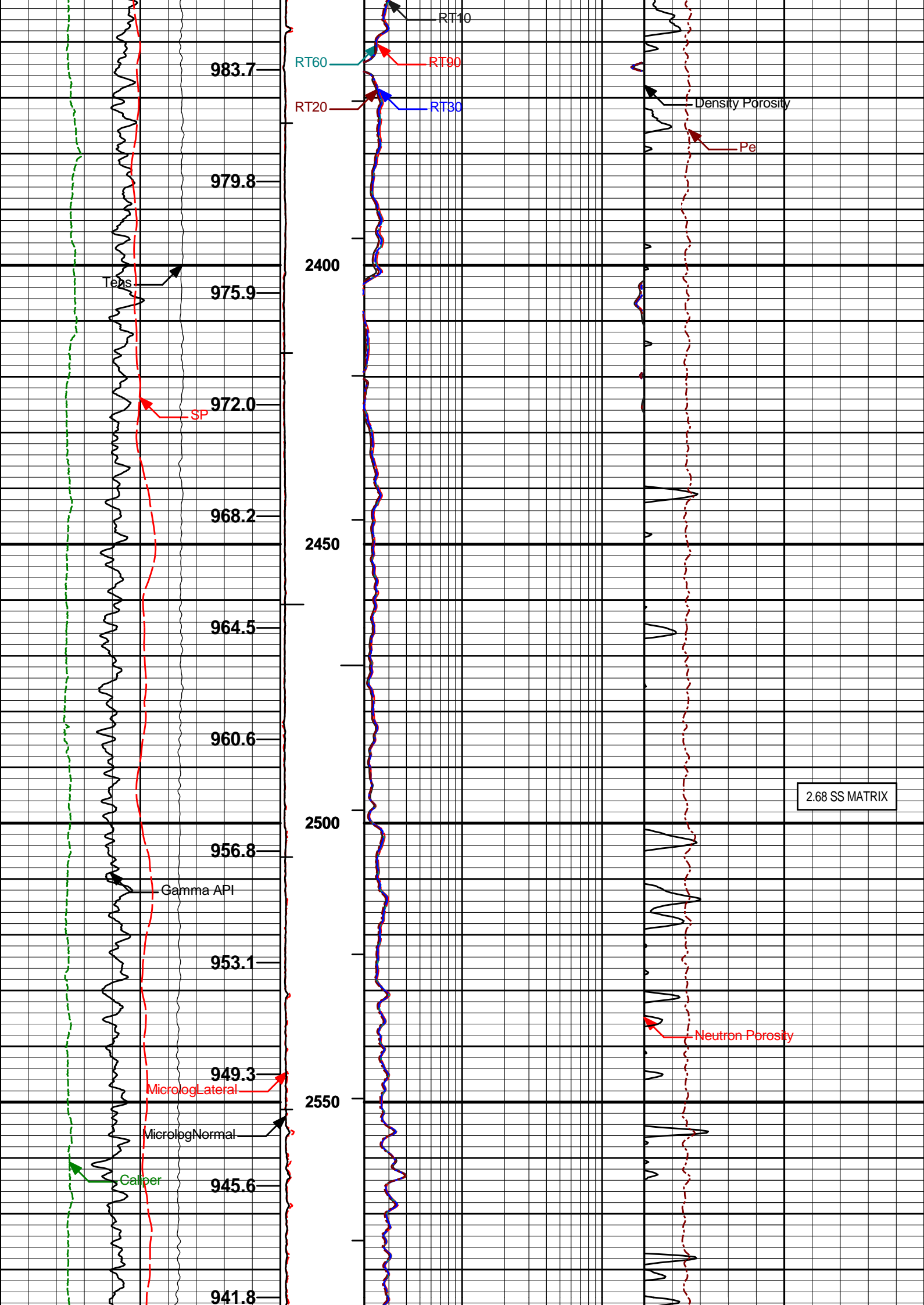


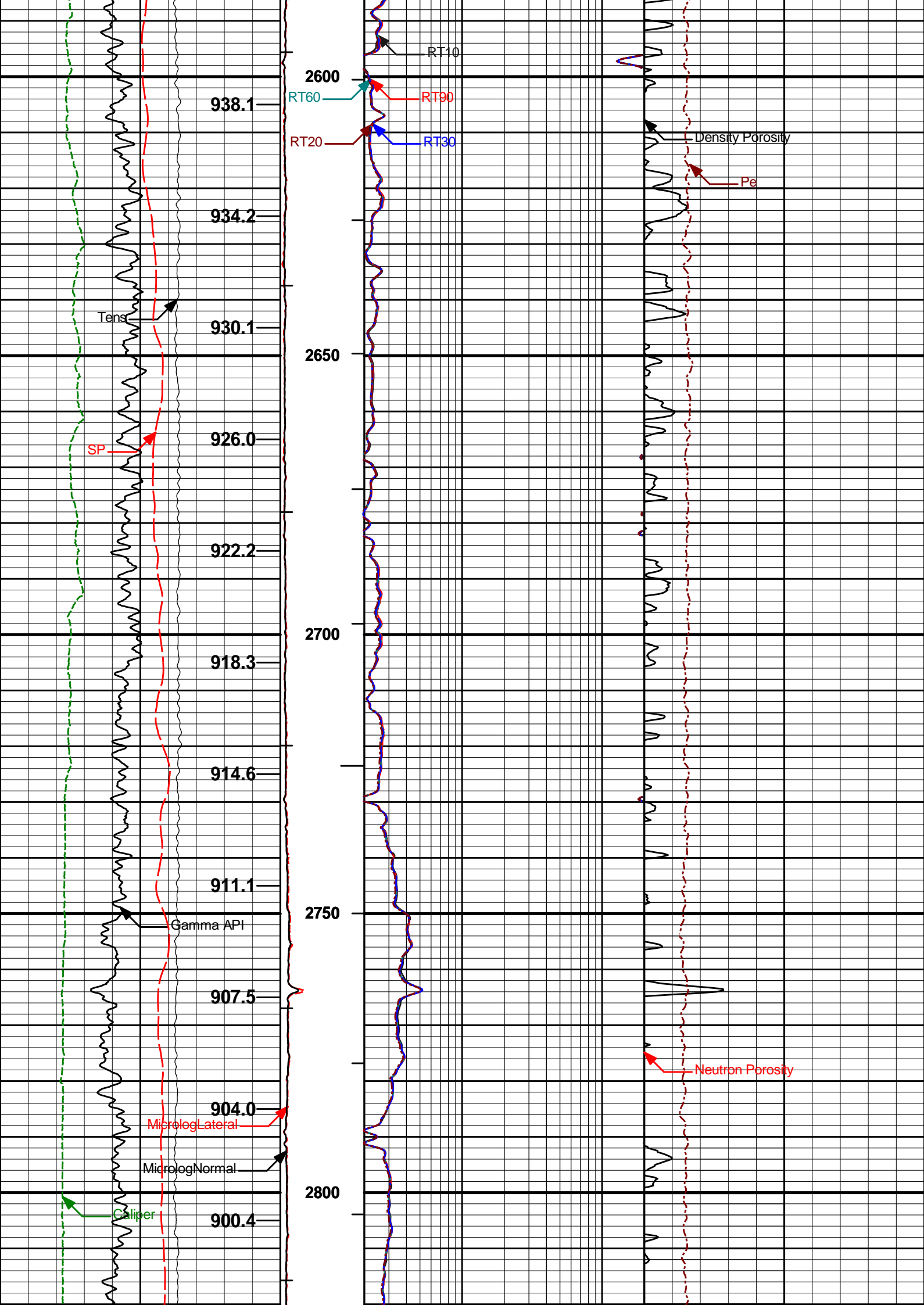


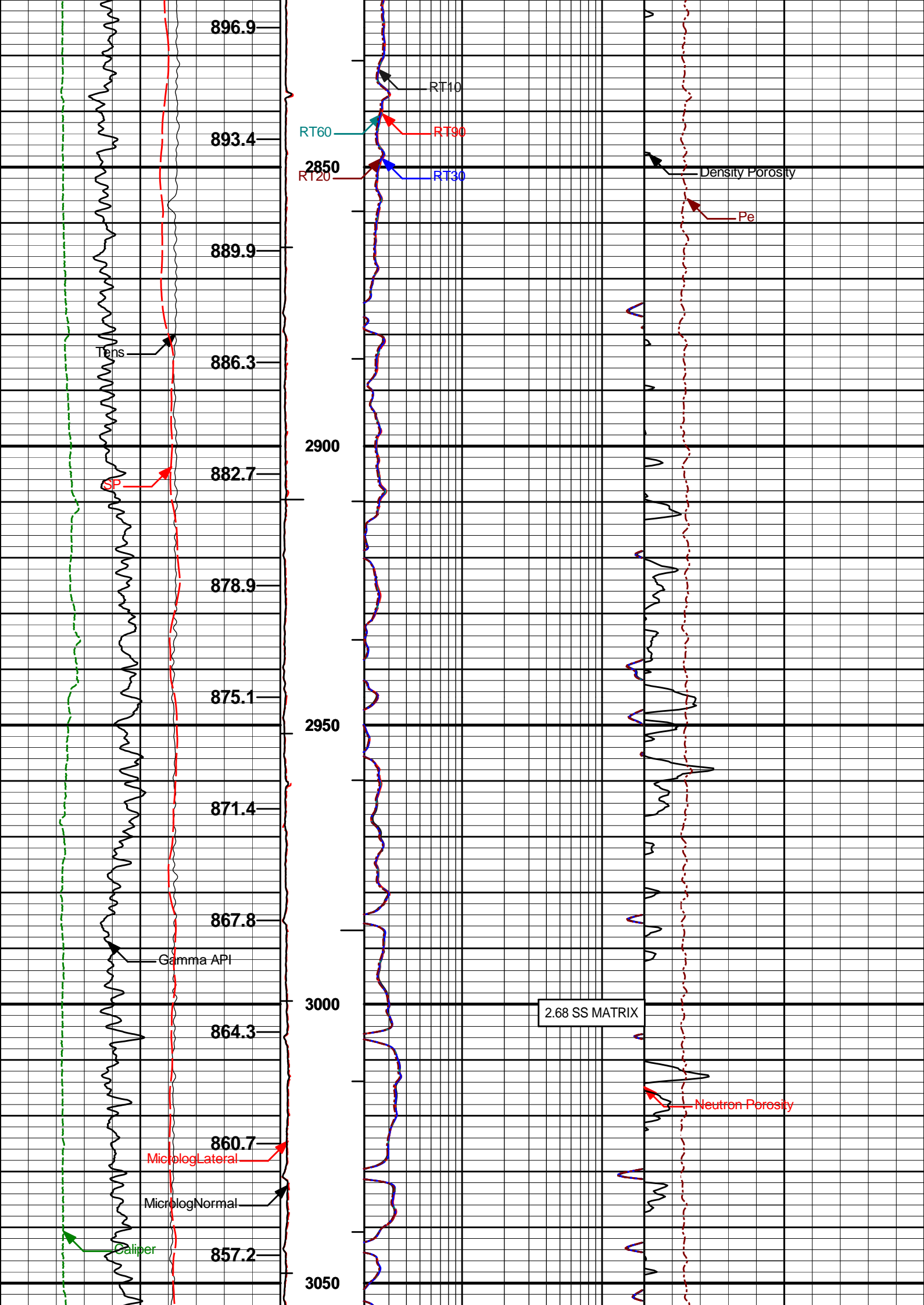


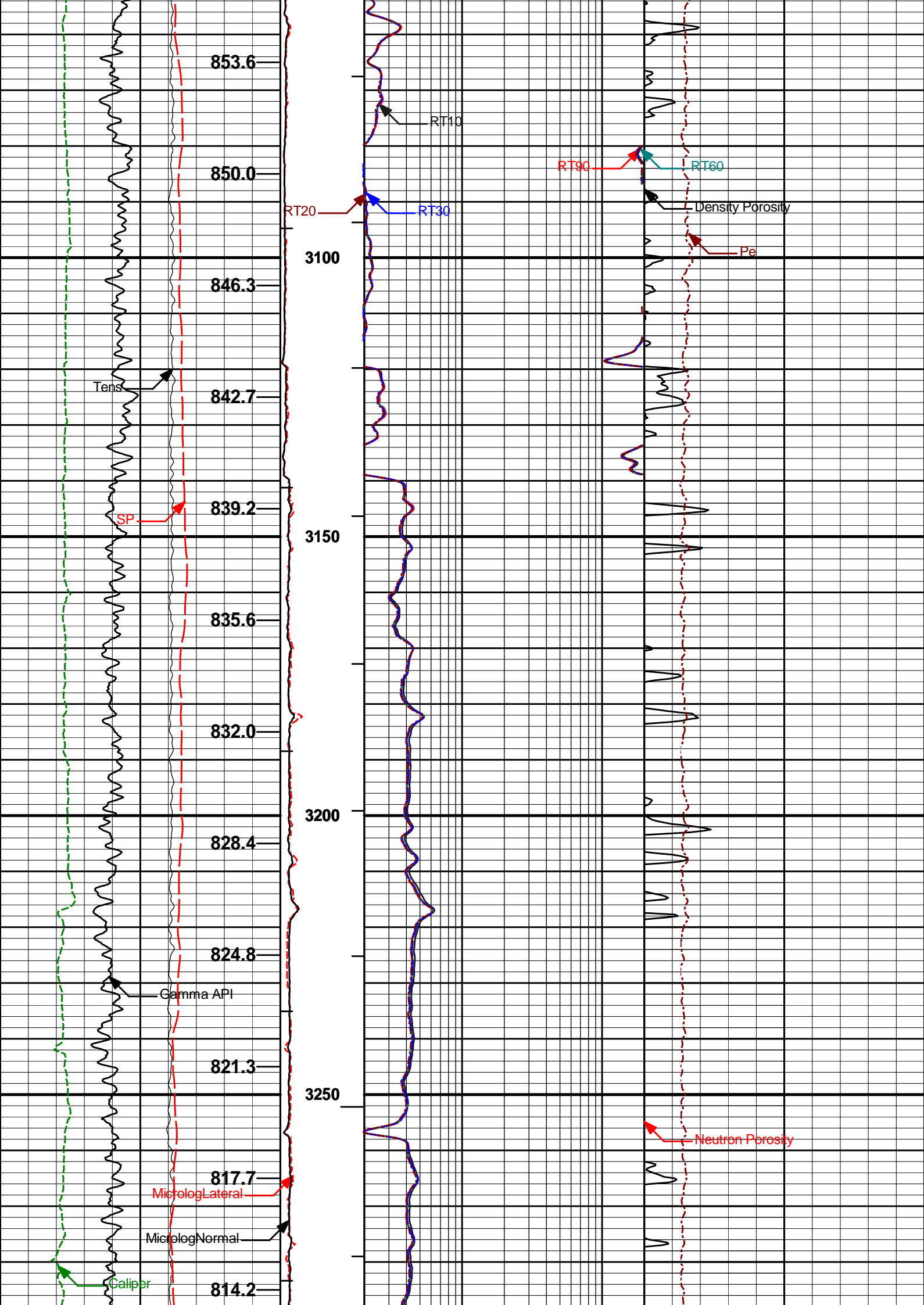


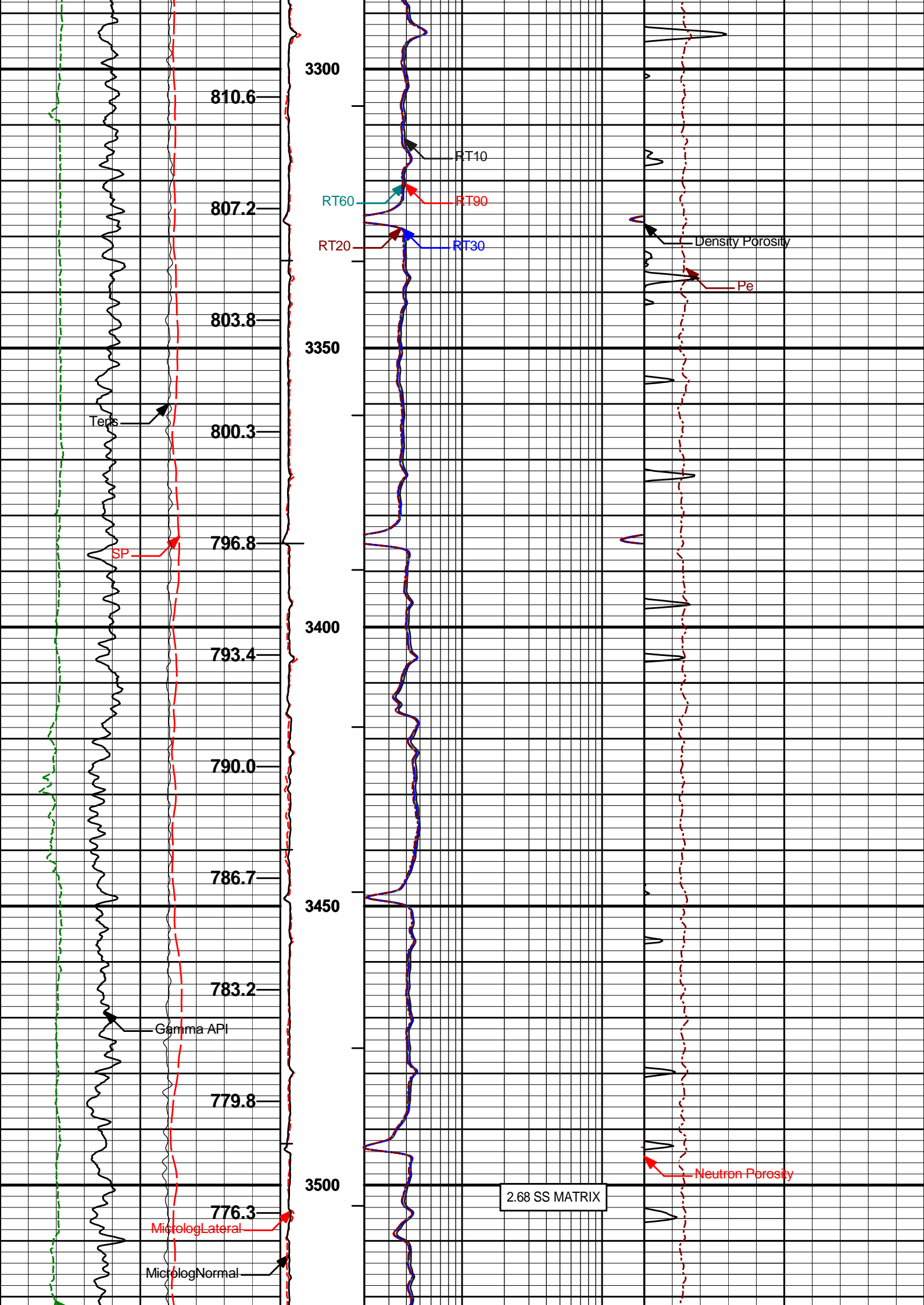


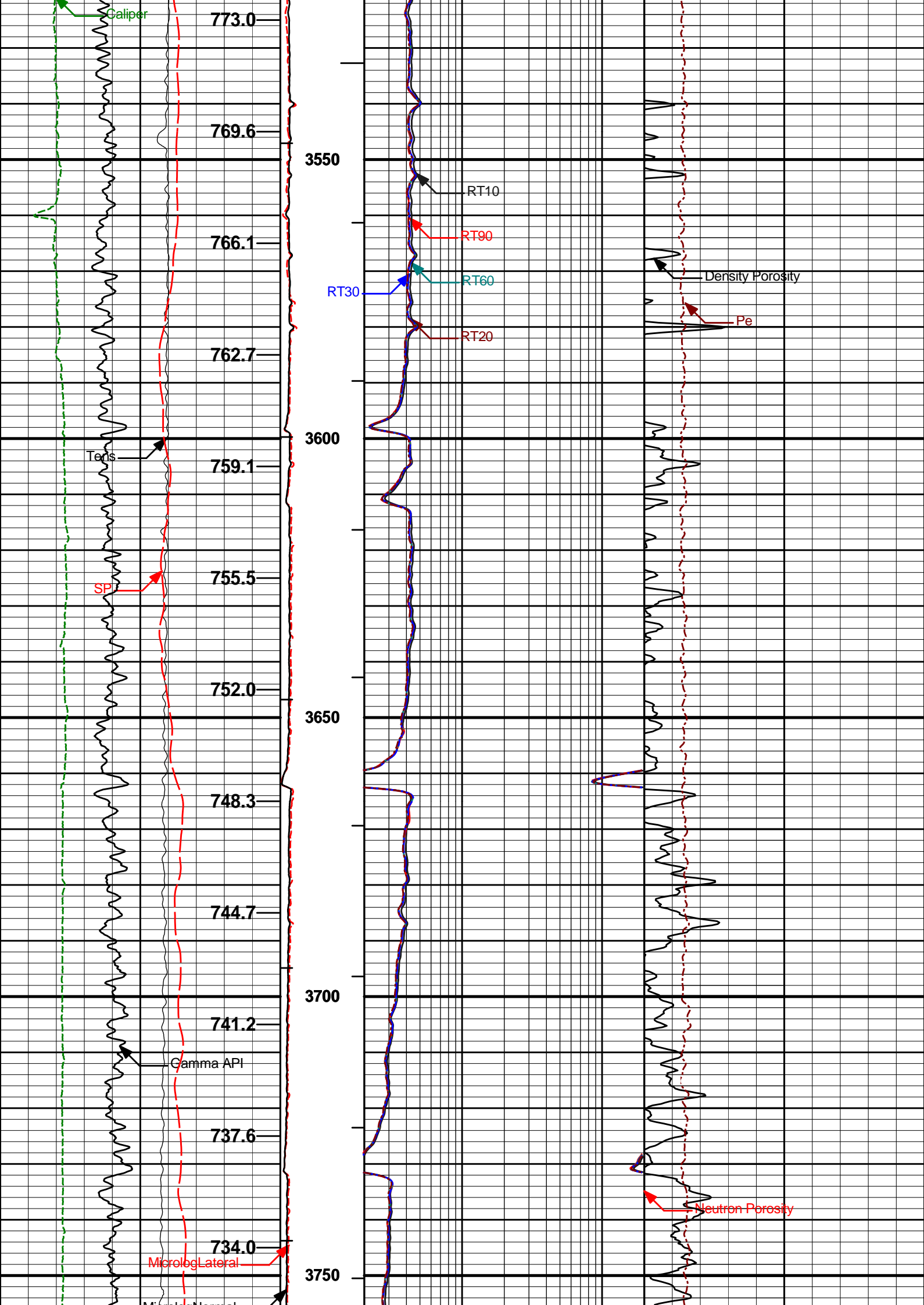


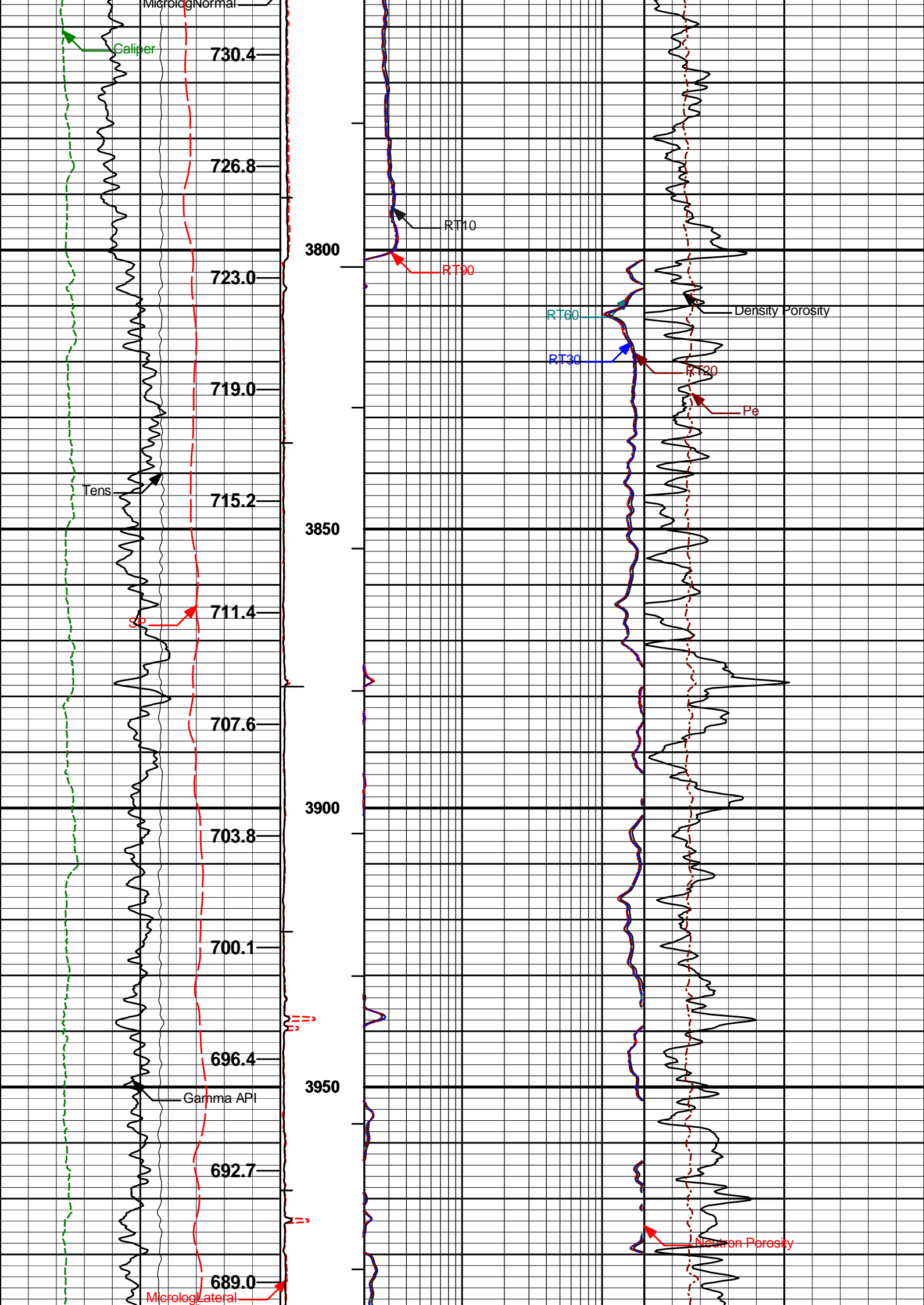




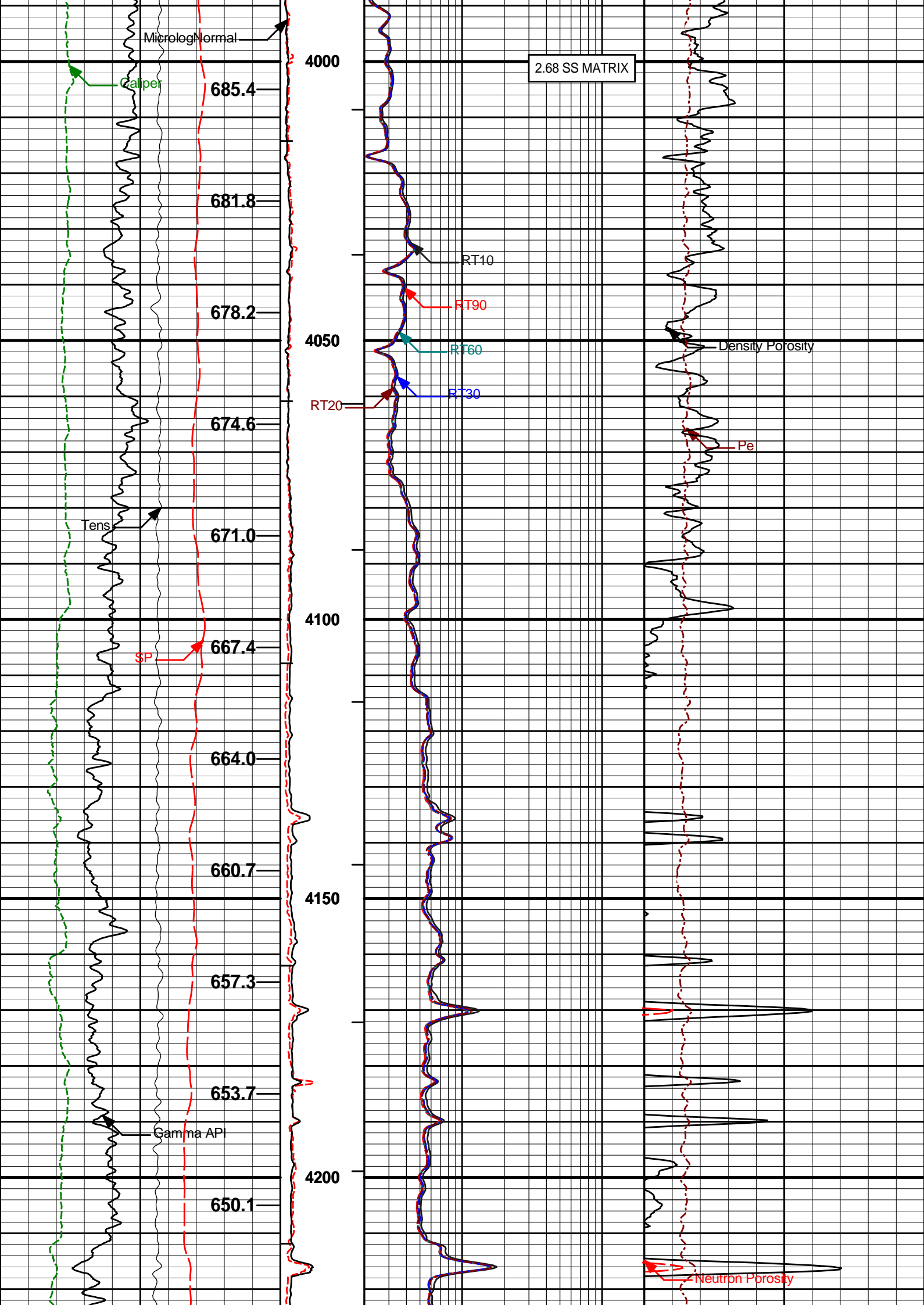


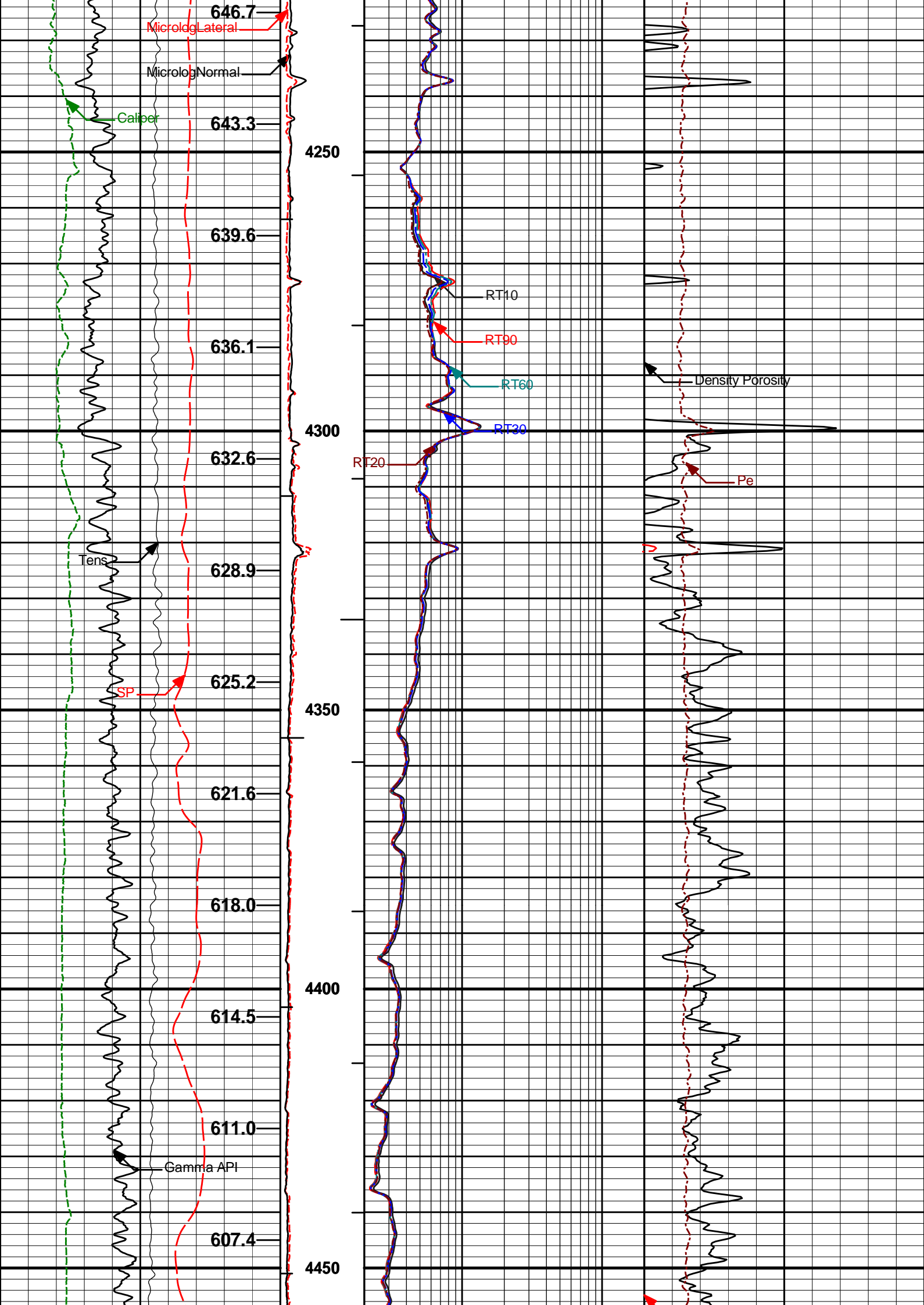


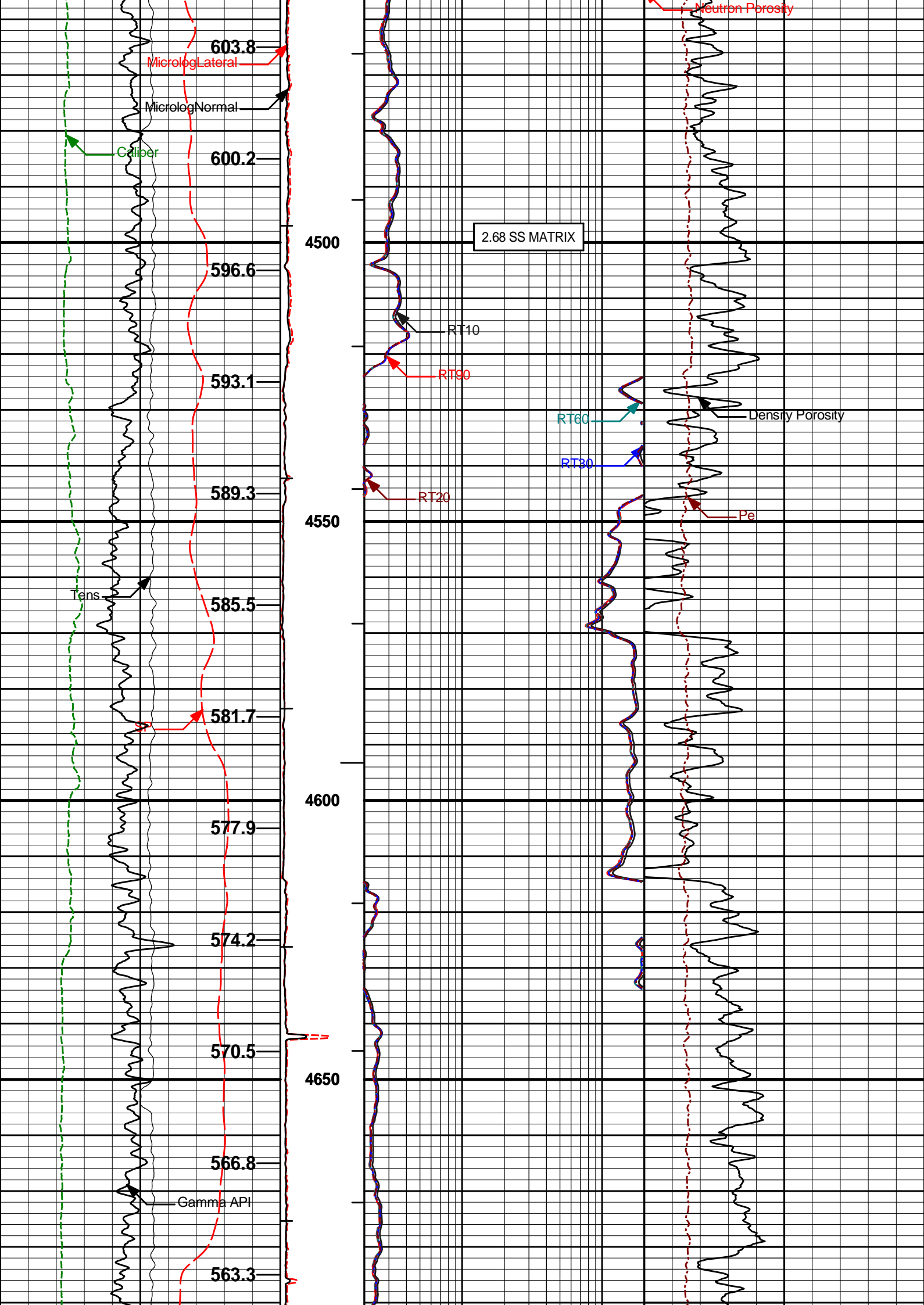


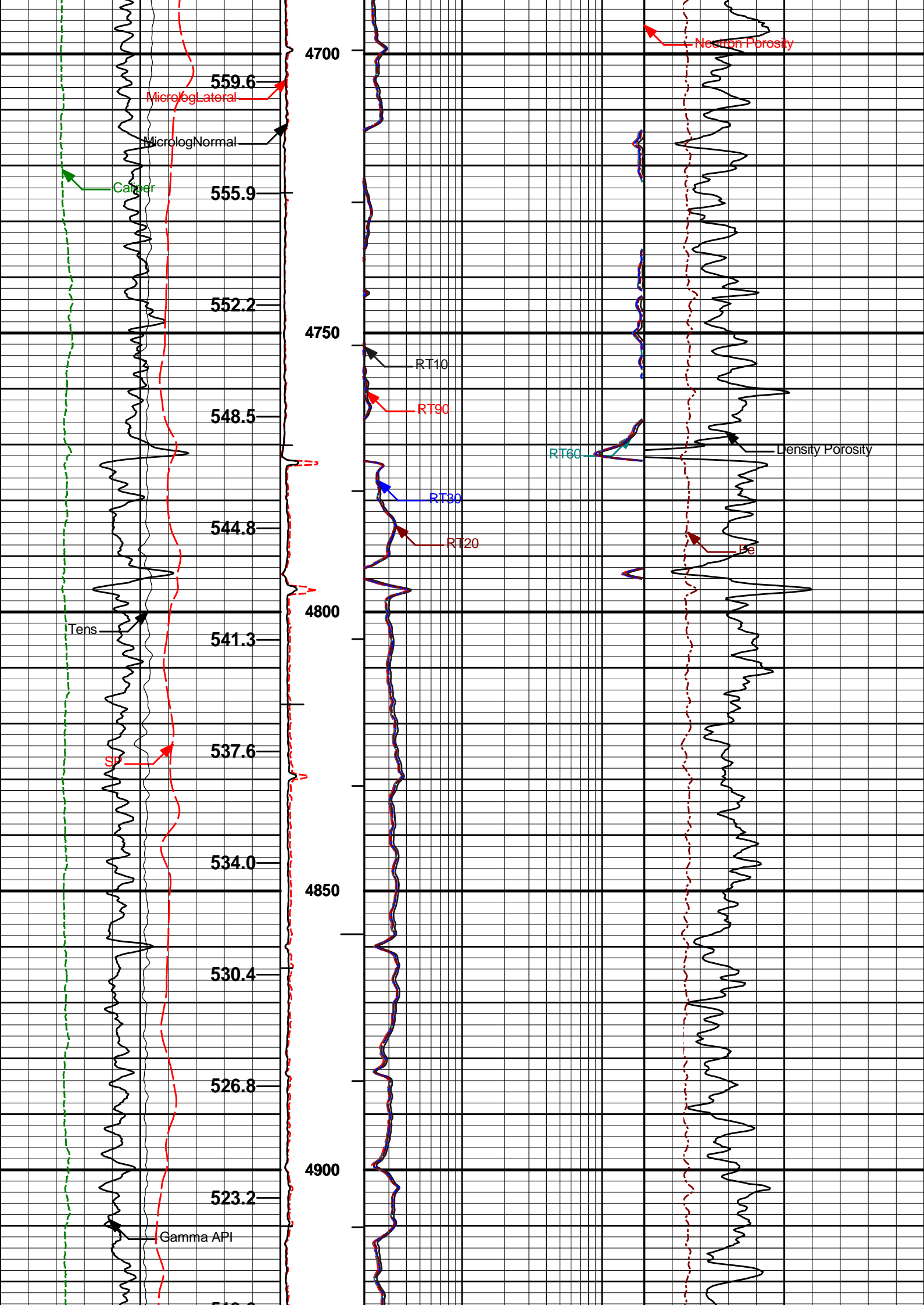


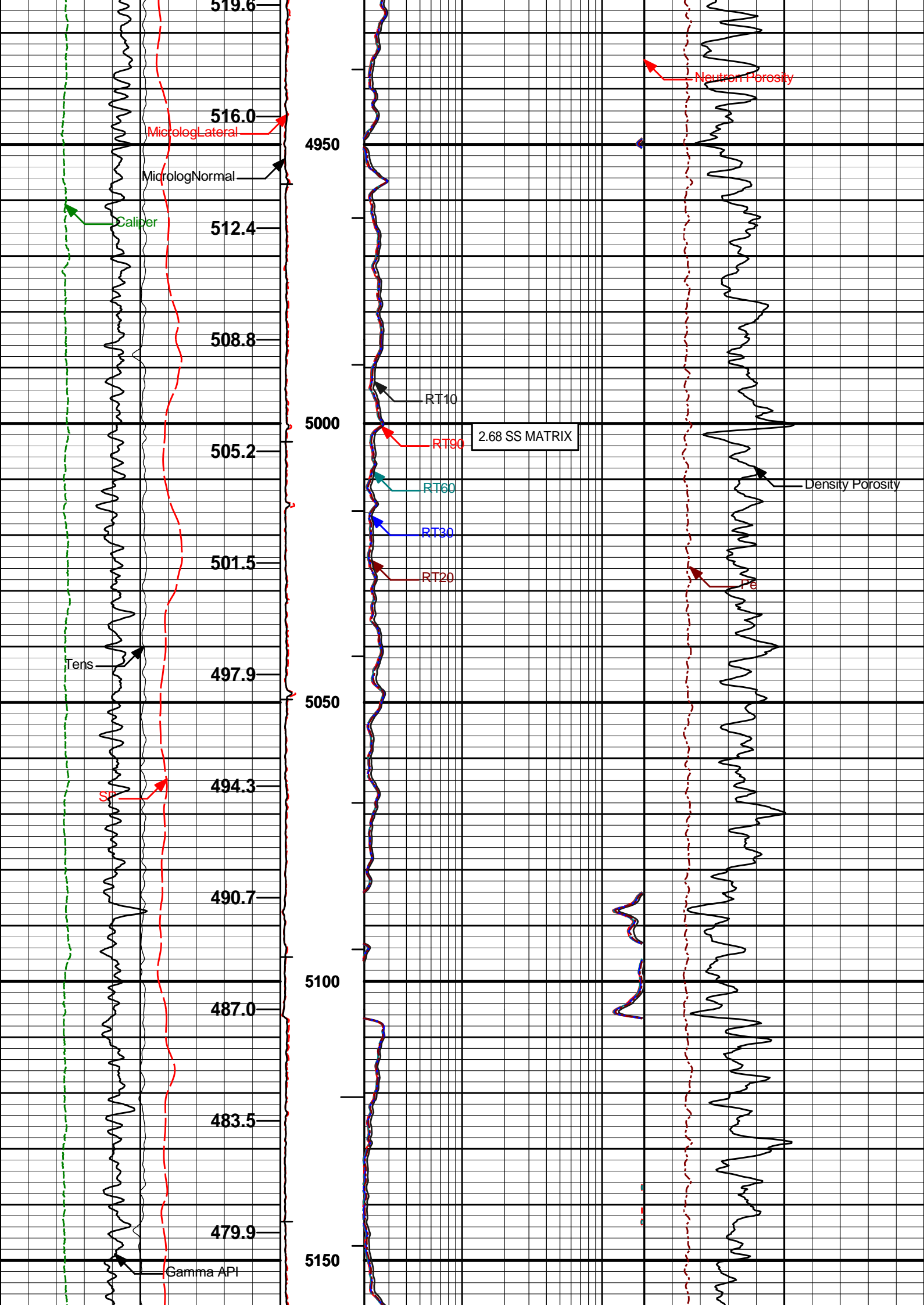


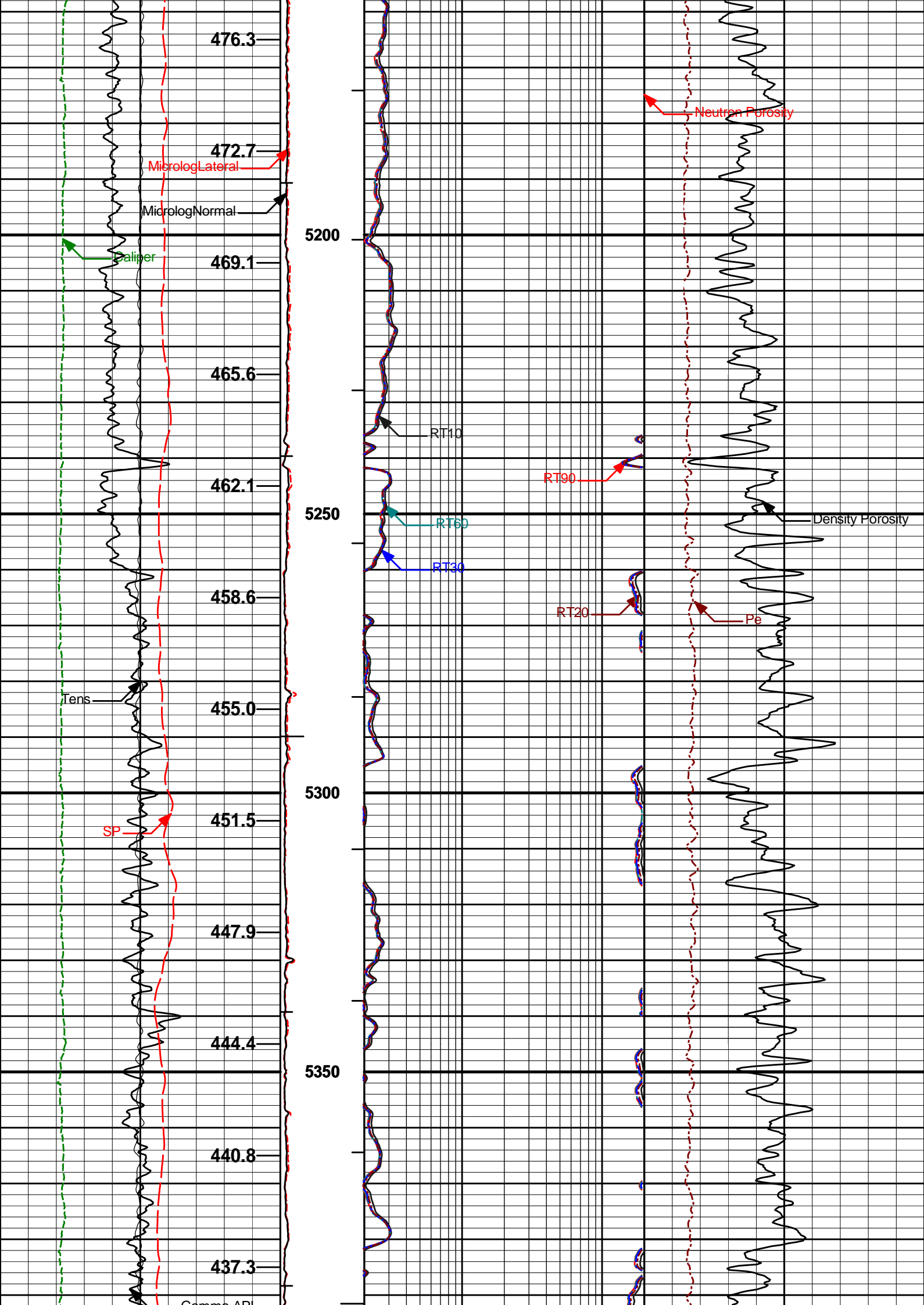


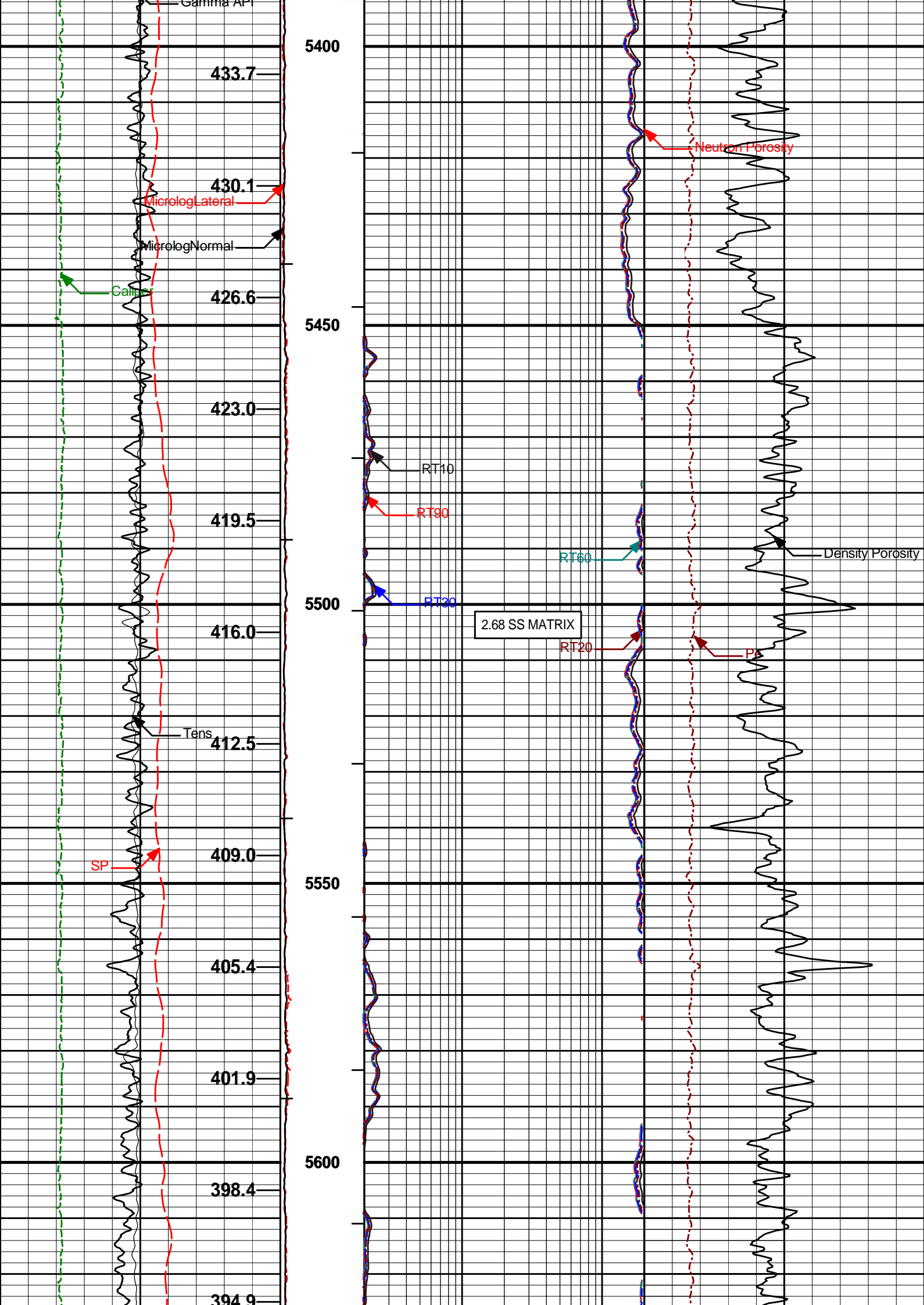




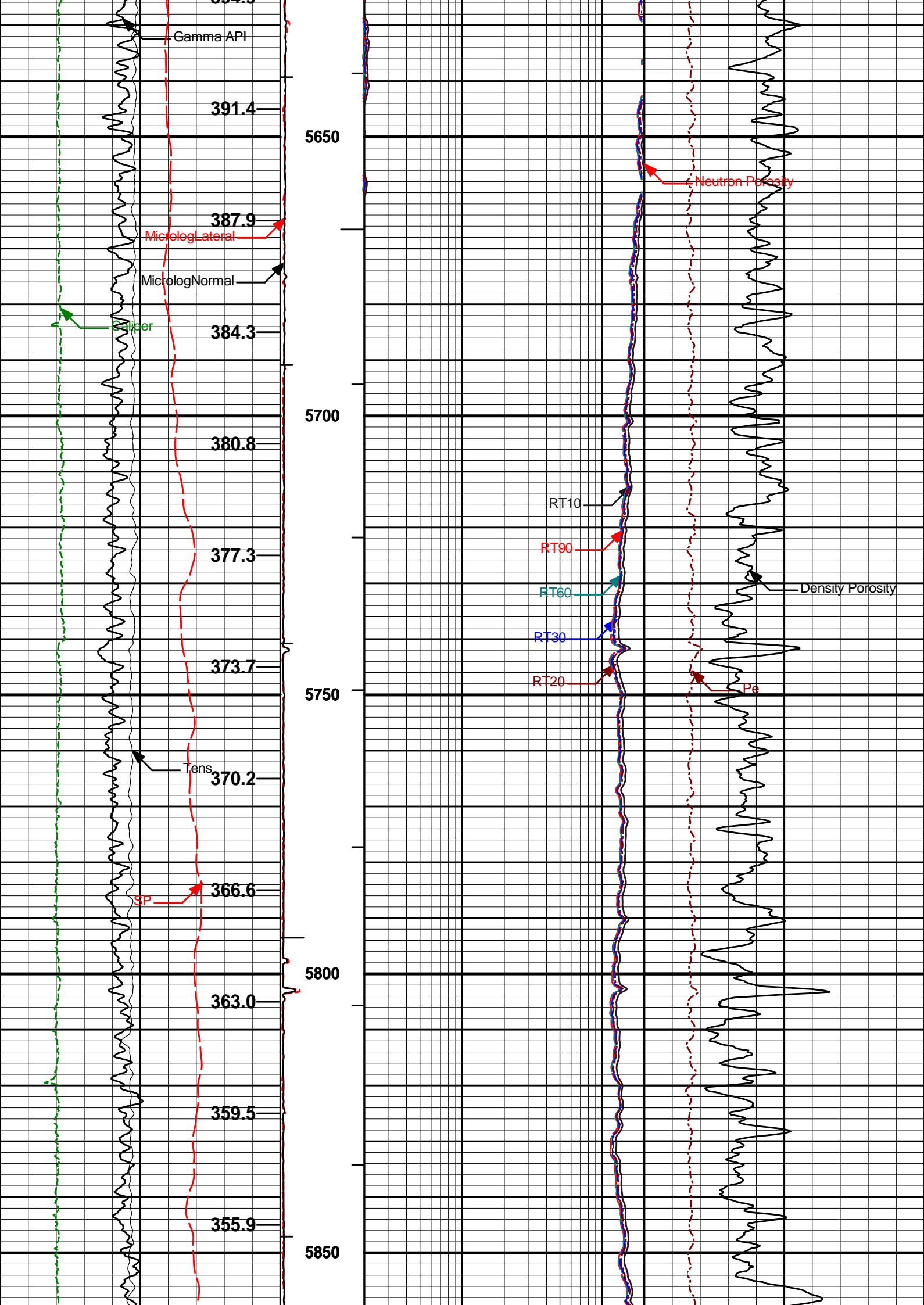




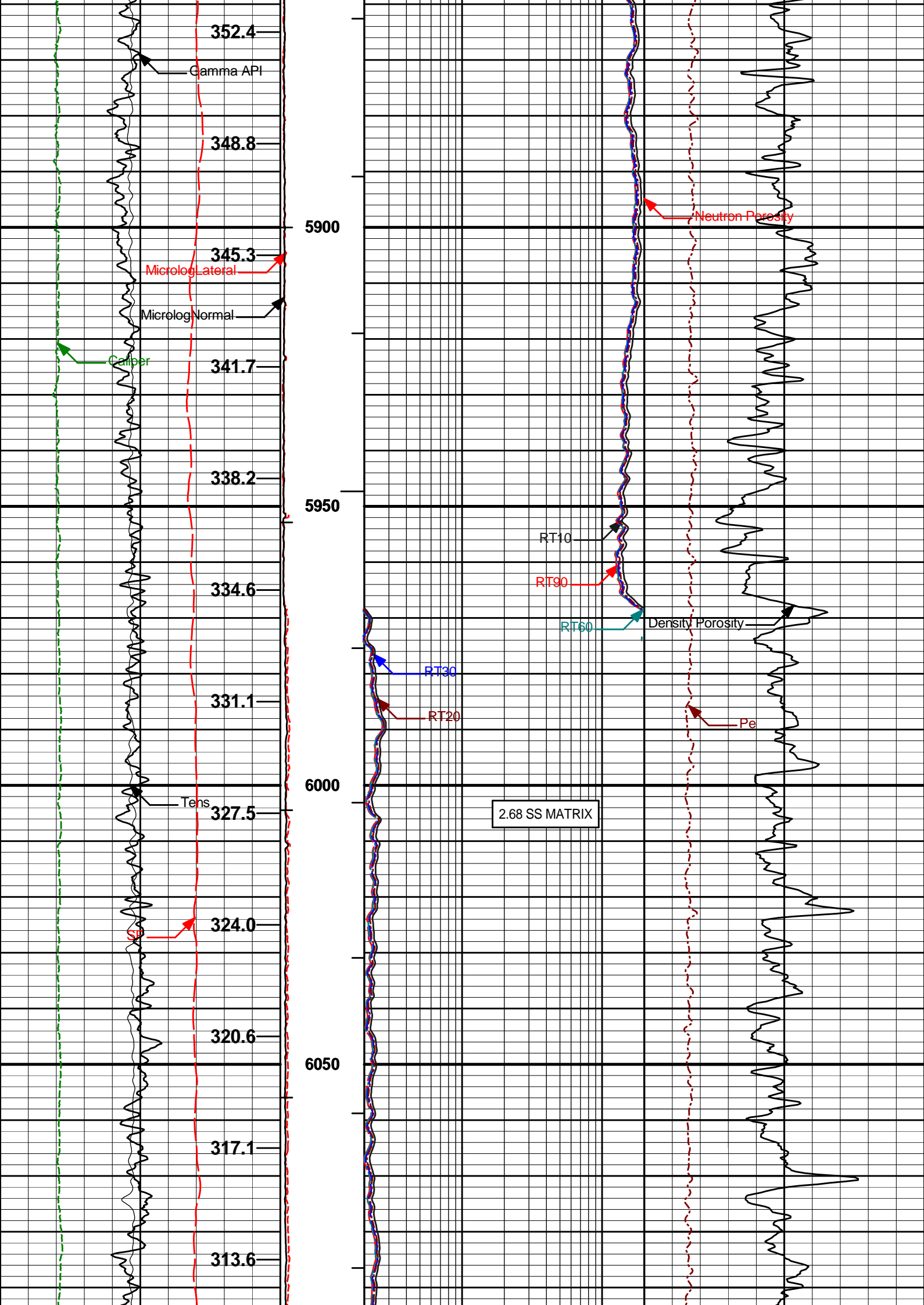


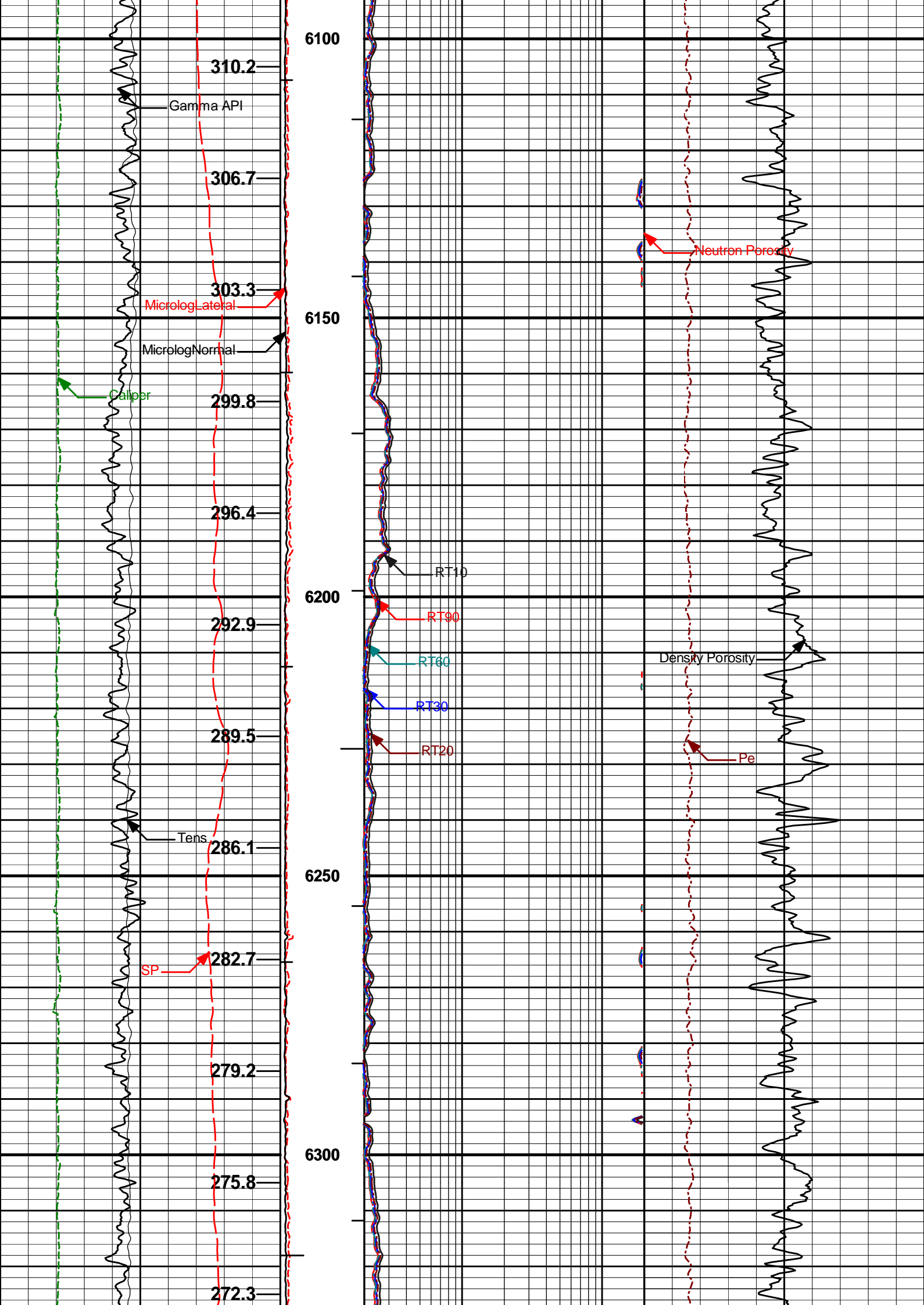


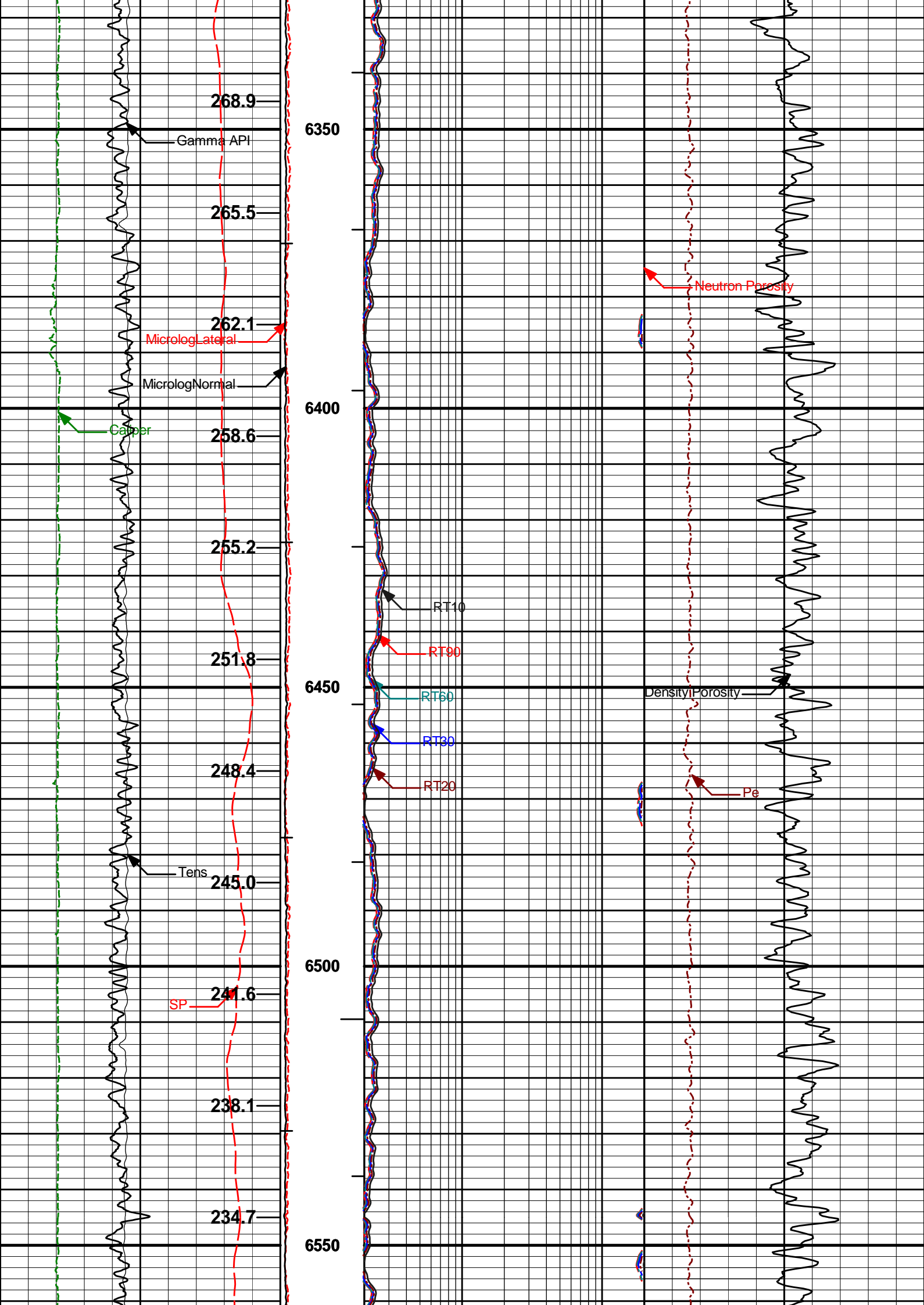


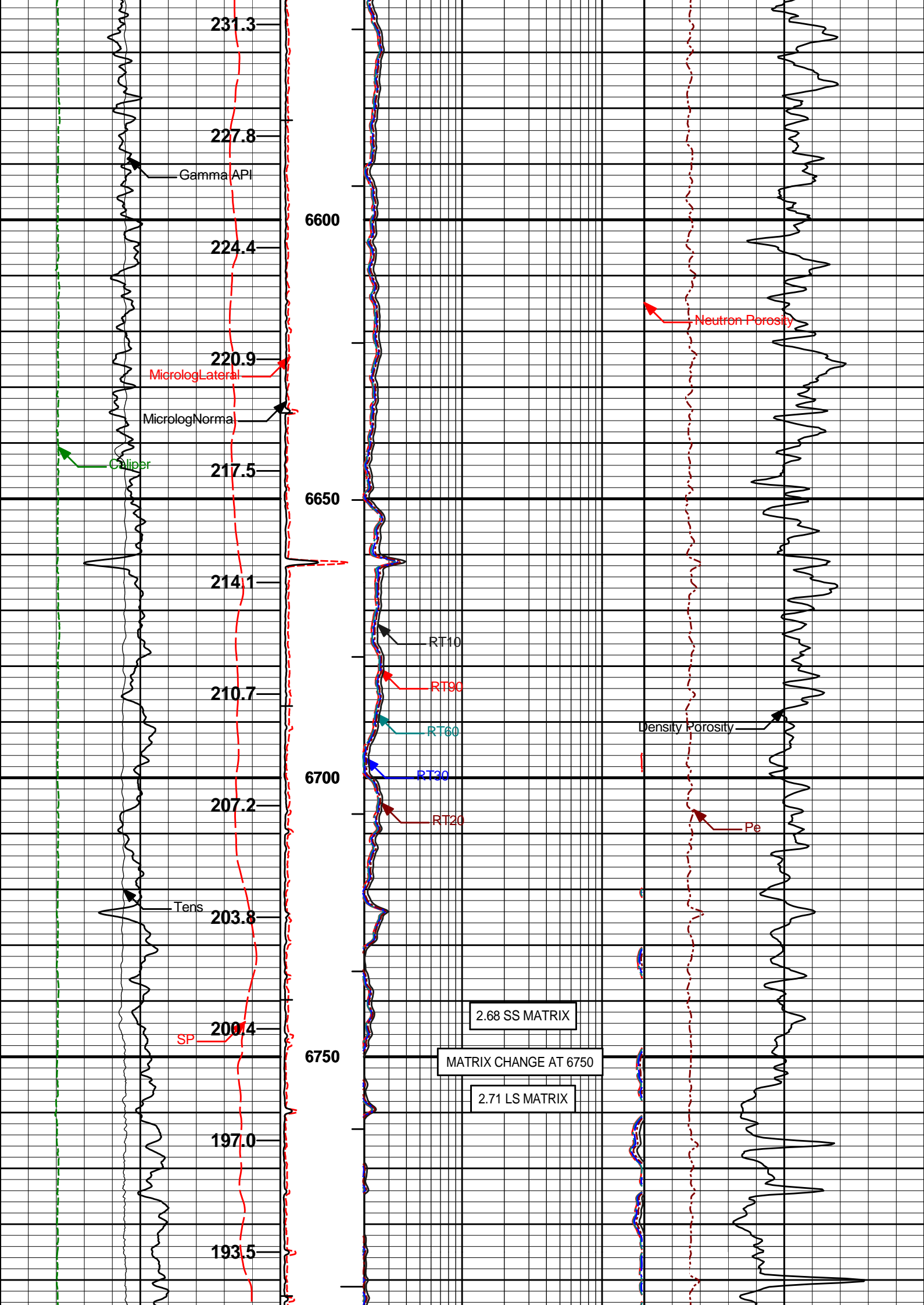


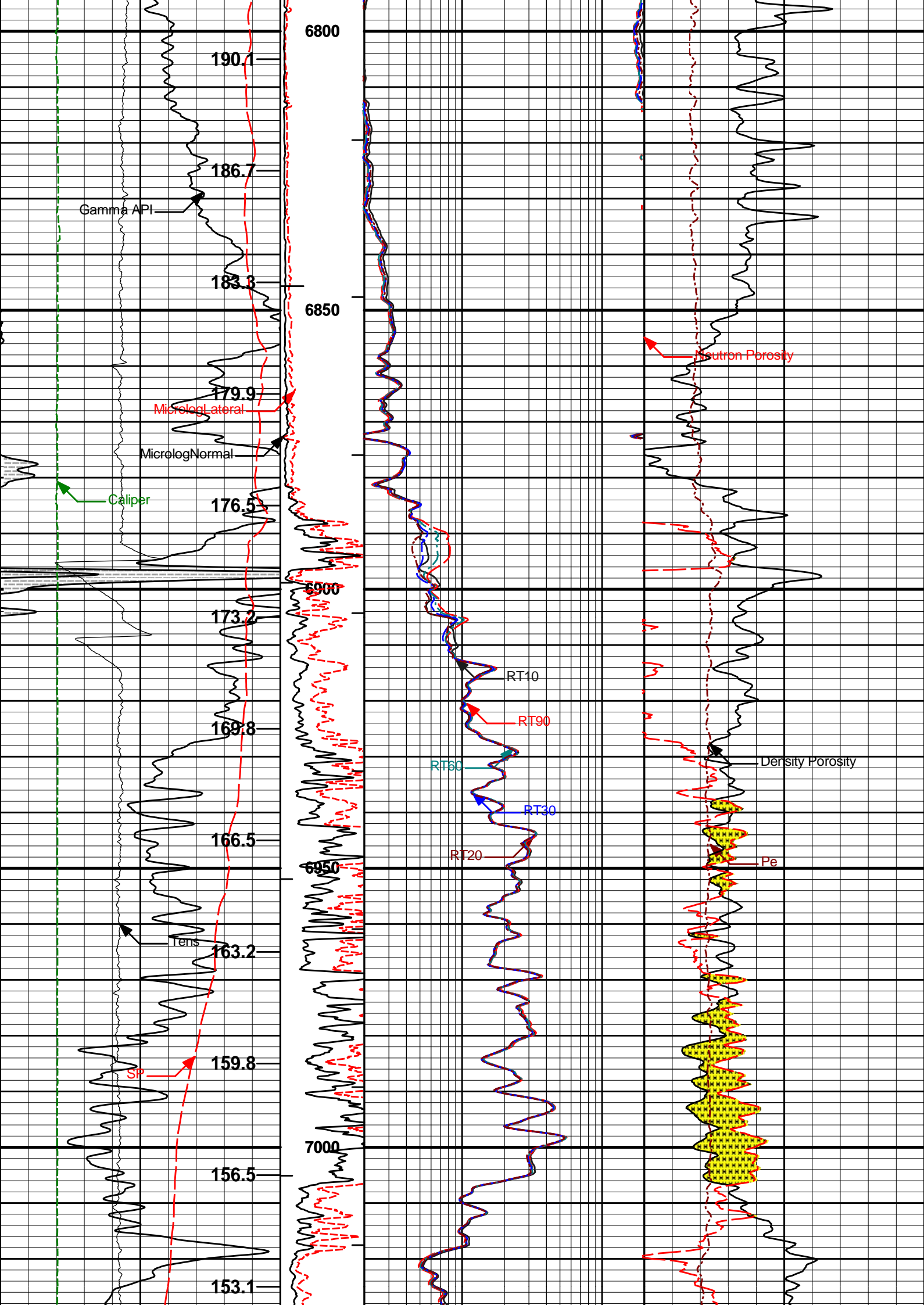


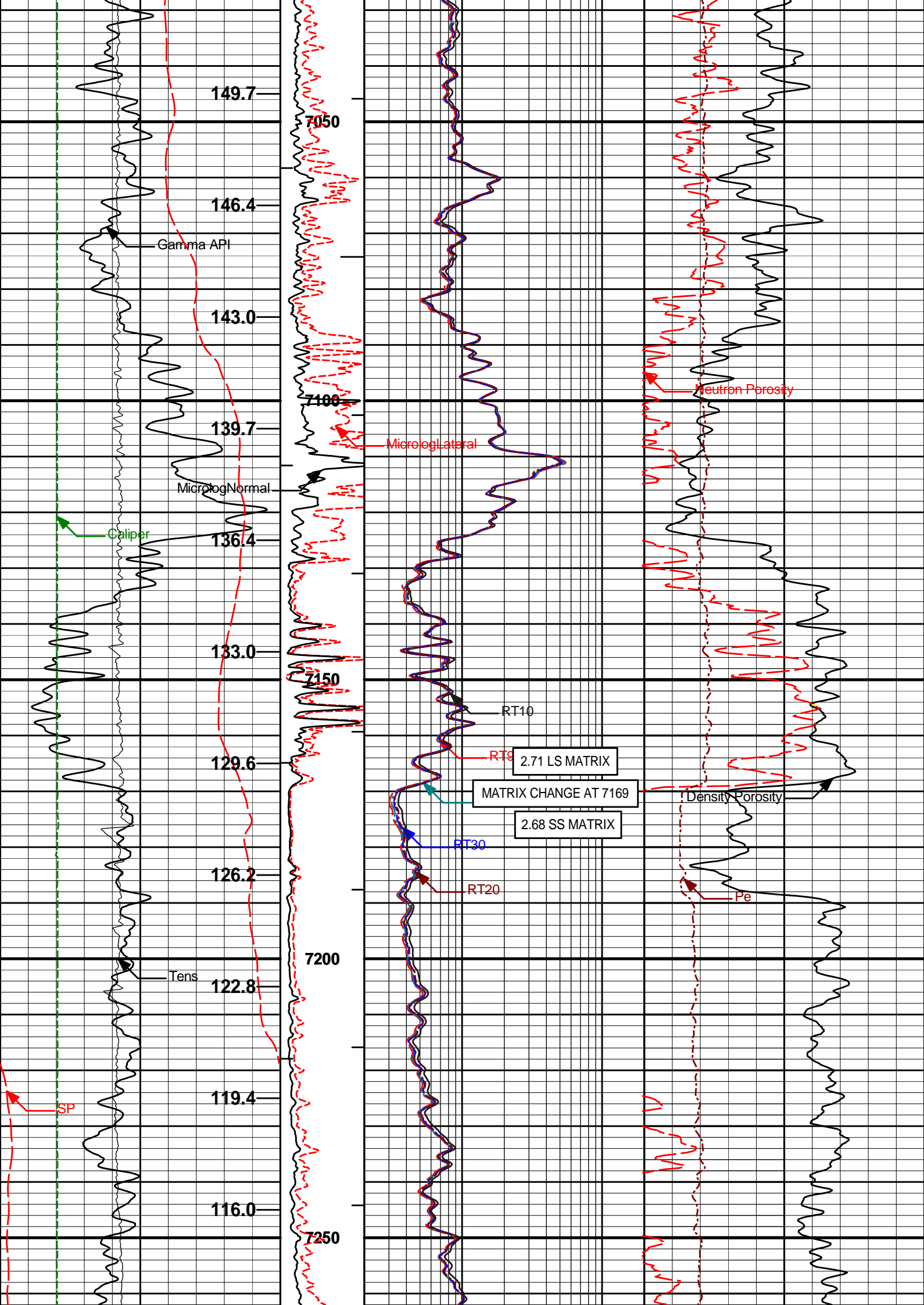




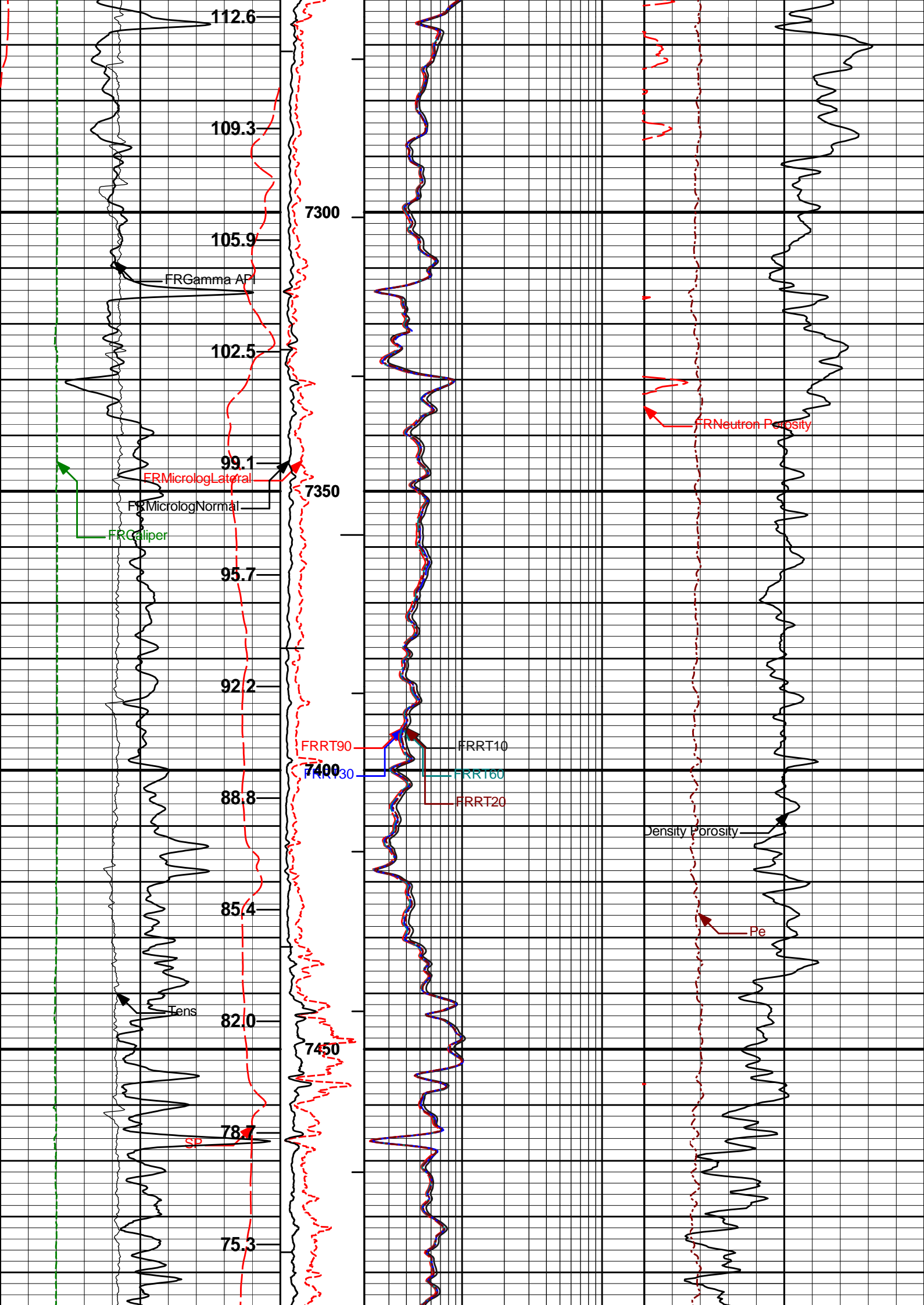


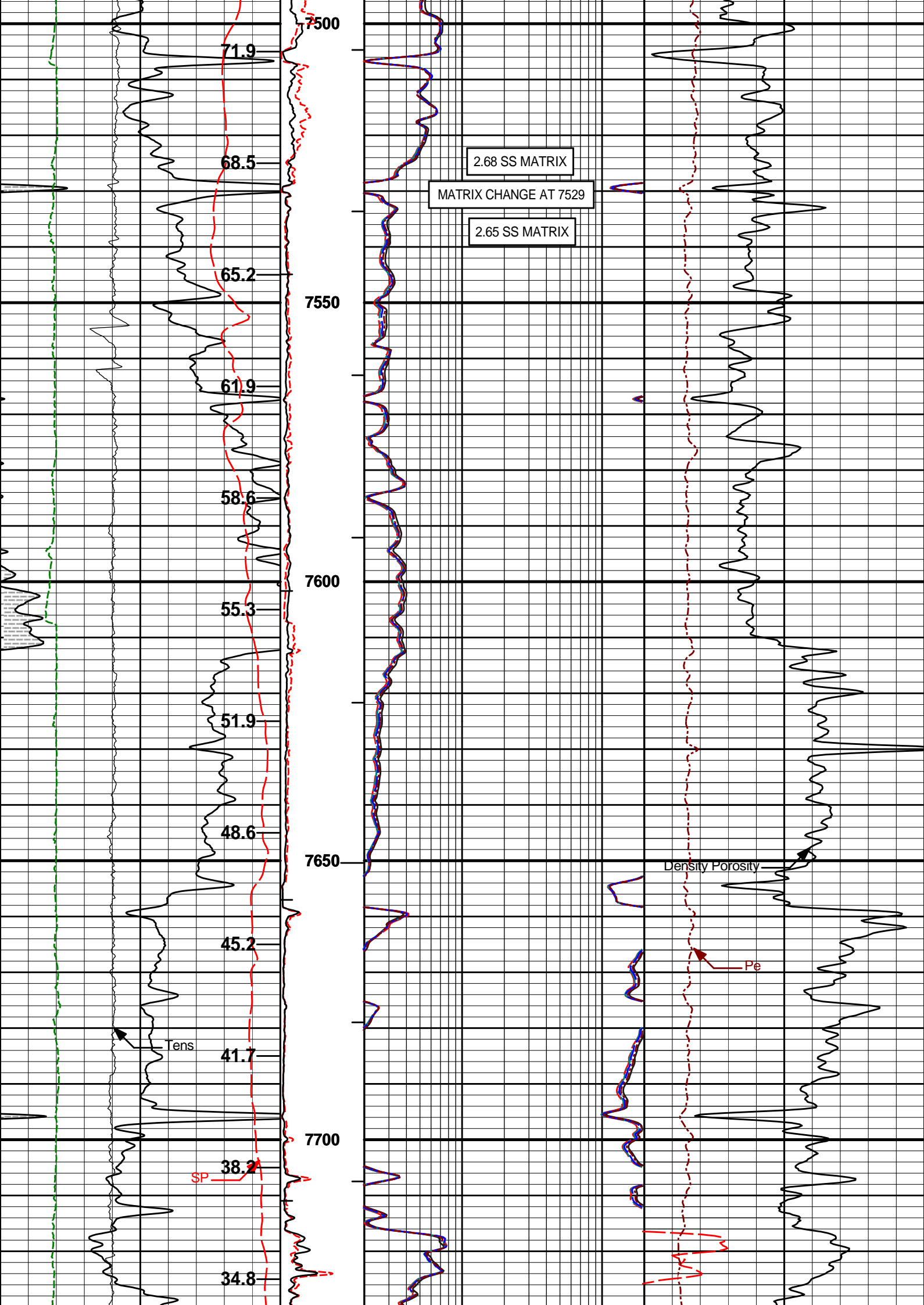




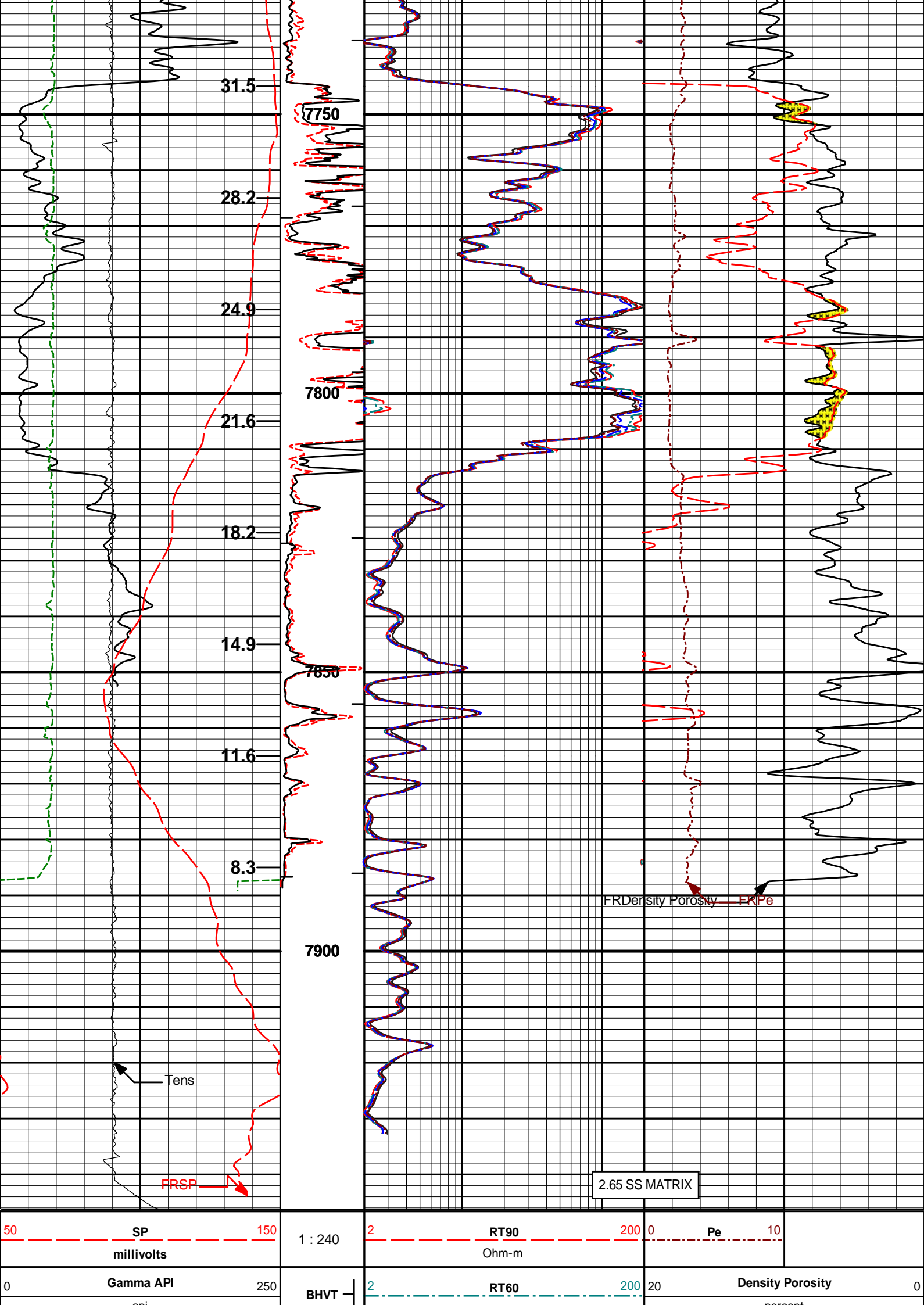









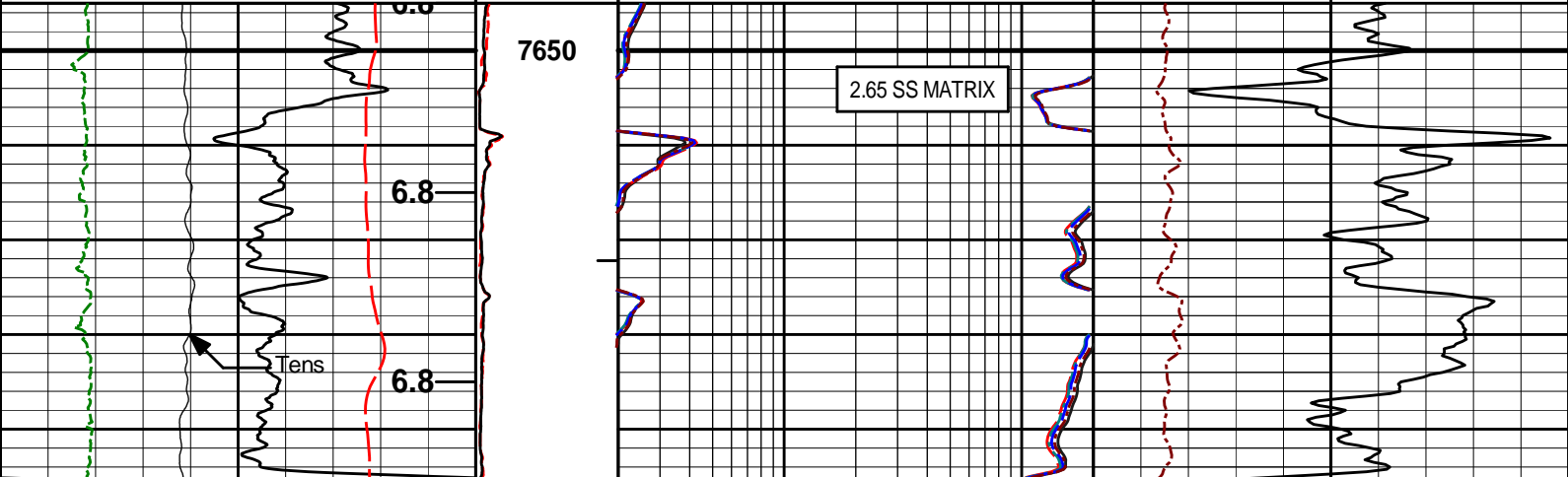


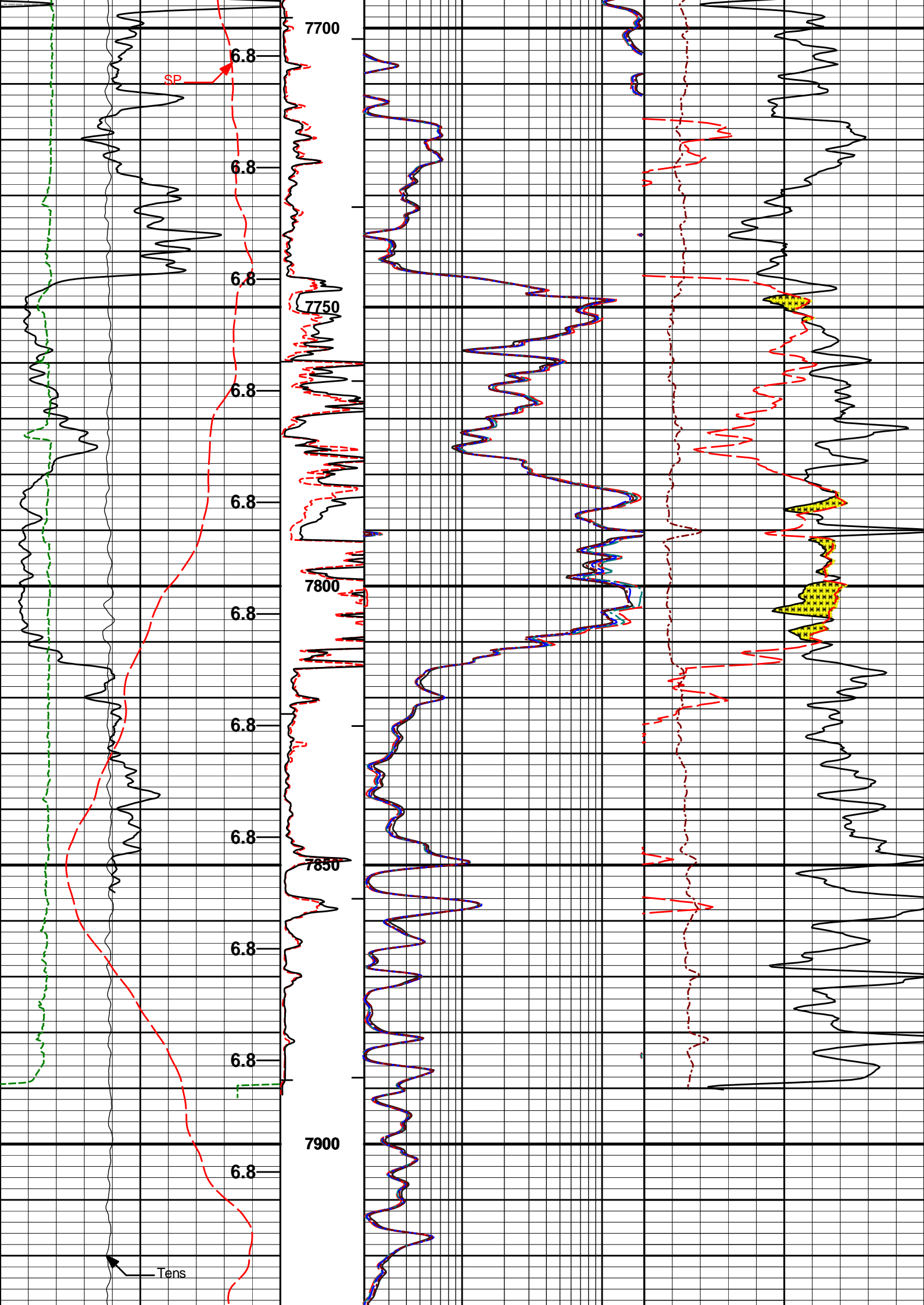


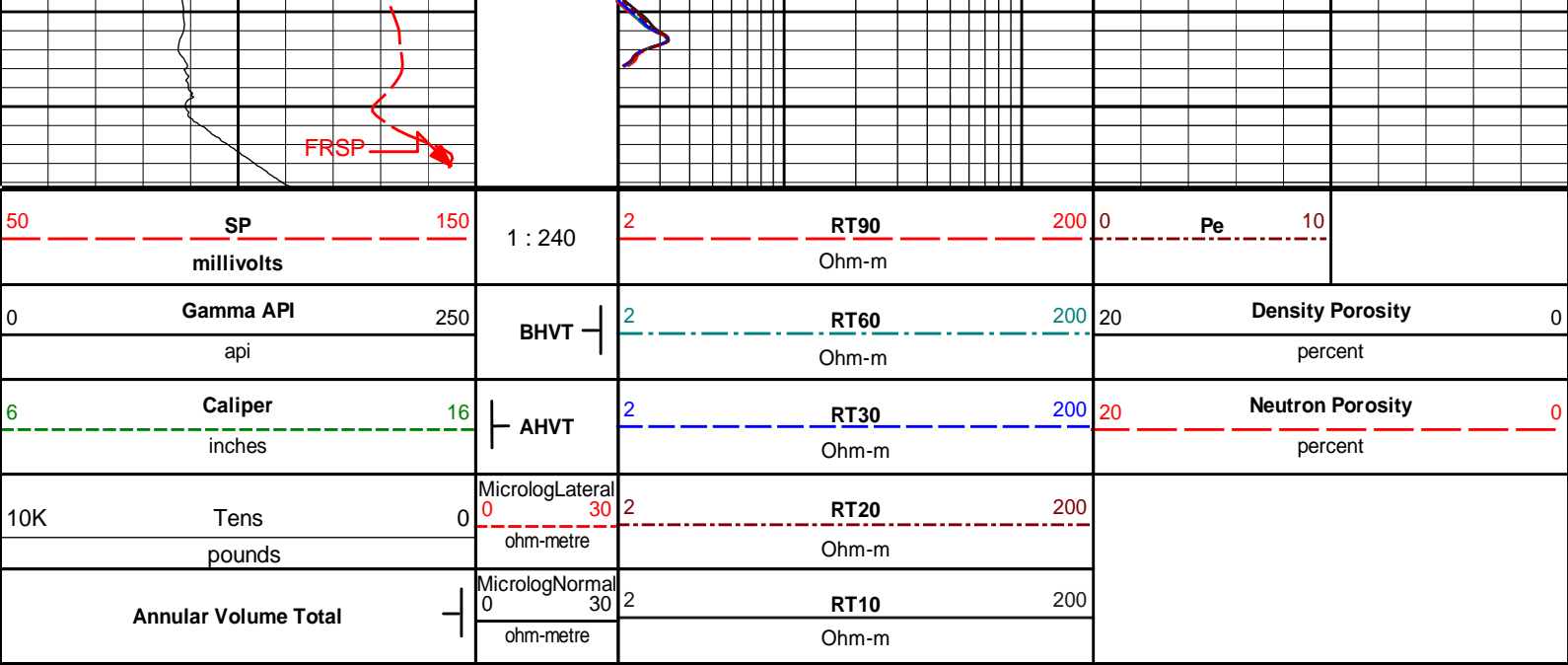


<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 20%;"> <h1 style="margin: 0;">HALLIBURTON</h1> </div> <div style="width: 80%;"> <p>Plot Time: 17-Jun-10 07:14:30</p> <p>Plot Range: 1025 ft to 7946.33 ft</p> <p>Data: DF_RANCH_1161_8\Well Based\**</p> <p>Plot File: \\COMP\MAIN</p> </div> </div>	
	<p>MAIN PASS 5" = 100'</p>

Track 1		Depth Track	Track 2		Track 5	Track 3	
Annular Volume Total		MicrologNormal 0 30 2	RT10 200				
		ohm-metre	Ohm-m				
10K Tens	0	MicrologLateral 0 30 2	RT20 200				
pounds		ohm-metre	Ohm-m				
6 Caliper 16		AHVT	2 RT30 200		20 Neutron Porosity 0		
inches			Ohm-m		percent		
0 Gamma API 250		BHVT	2 RT60 200		20 Density Porosity 0		
api			Ohm-m		percent		
50 SP 150	1 : 240	2	RT90 200		0 Pe 10		
millivolts			Ohm-m				







HALLIBURTON

Plot Time: 17-Jun-10 07:14:32  
Plot Range: 7645 ft to 7948.5 ft  
Data: DF\_RANCH\_1161\_8\Well Based\REPEAT\\*  
Plot File: \\COMP\REPEAT

REPEAT SECTION 5" = 100'

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11294346 Reference Calibration Date: 27-Apr-10 14:22:21  
Engineer: F. LODER Calibration Date: 23-May-10 14:56:41  
Software Version: WL INSITE R2.4 (Build 20) Calibration Version: 1

Calibrator Source S/N: KW-290  
Calibrator API Reference:230.00 api

Measurement	Measured	Calibrated	Units
Background	107.3	106.8	api
Background + Calibrator	338.4	336.8	api
Calibrator	229.5	230.0	api

ACCELEROMETER AND MAGNETOMETER SHOP CALIBRATION

Tool Name: IDT - 11277452 Reference Calibration Date: 26-Mar-09 13:54:58  
Engineer: K. WOOD Calibration Date: 26-Mar-09 14:07:28  
Software Version: WL INSITE R2.4 (Build 11) Calibration Version: 1

Reference Gravity Field: 1.0000 g  
Reference Magnetic Field: 52176.0000 nT

\* QF : value of 0 is shown for bad quality if | data - reference | > (2 \* standard deviation) and > (0.5% of reference value)

ACCELEROMETER CALIBRATION RAW DATA VALUE

Raw Acc X	Raw Acc Y	Raw Acc Z	Quality(Gravity)	Quality Error(%)	QF
0.0115	-0.7203	-0.0012	1.0004	0.0004	1
-0.7373	0.0806	-0.0038	1.0013	0.0013	1
0.2307	0.6981	-0.0088	0.9987	0.0013	1

0.7091	-0.1672	-0.0045	1.0004	0.0004	1
-0.0003	0.7387	-0.0018	1.0018	0.0018	1
0.0009	0.7023	0.1063	1.0002	0.0002	1
0.0007	0.7369	-0.0061	0.9992	0.0008	1
0.7283	-0.0477	-0.0065	0.9999	0.0001	1
-0.0543	-0.7183	-0.0025	0.9996	0.0004	1
-0.7353	-0.0623	-0.0008	0.9985	0.0015	1
-0.0050	0.0157	0.3602	1.0000	0.0000	1
-0.4725	-0.3767	-0.2126	1.0001	0.0001	1

ACCELEROMETER QUALITY SUMMARY		
Average Calculated Gravity Field	1.0000	g
Standard Deviation Calculated Gravity Field	0.0010	g

ACCELEROMETER GAIN AND OFFSET		
	GAIN	OFFSET
ACC X	1.3600647449	0.0064371051
ACC Y	1.3719524145	-0.0117922658
ACC Z	2.7273550034	0.0175894219

\* QF : value of 0 is shown for bad quality if | data - reference | > (3 \* standard deviation) and > (1% of reference value)

MAGNETOMETER CALIBRATION RAW DATA VALUE					
Raw Mag X	Raw Mag Y	Raw Mag Z	Quality(Magnetic)	Quality Error(%)	QF
0.3824	1.1522	-0.1078	52161.3906	0.0003	1
1.0785	-0.5265	-0.0997	52223.0000	0.0009	1
-0.7399	-0.9560	-0.1158	52265.3477	0.0017	1
-0.9956	0.6690	-0.1192	52145.9961	0.0006	1
-0.1180	-1.1449	0.4203	52738.3633	0.0108	1
0.1133	-1.2018	-0.0203	51610.7891	0.0108	1
0.1142	-1.1457	-0.3868	52131.1211	0.0009	1
-1.1277	-0.0236	-0.3931	52085.1367	0.0017	1
-0.0346	1.1555	-0.3821	52207.7031	0.0006	1
1.1163	0.2298	-0.3714	52214.3203	0.0007	1
0.4262	0.2383	1.0582	52015.6250	0.0031	1
0.4893	0.5587	-0.9274	52279.8438	0.0020	1

MAGNETOMETER QUALITY SUMMARY		
Average Calculated Magnetic Field	52173.2188	nT
Standard Deviation Calculated Magnetic Field	251.5726	nT

MAGNETOMETER GAIN AND OFFSET		
	GAIN	OFFSET
MAG X	43507.8046875000	-1.0816415548
MAG Y	42729.5312500000	-18.4995326996
MAG Z	44767.4218750000	152.0572509766

Noise Level Value: 0.000236 cnts  
Noise Level Cal Value: 0.0006 g

CSNG-FS SHOP CALIBRATION			
Tool Name:	CSNG - 10965402	Reference Calibration Date:	06-Apr-10 13:29:42
Engineer:	F. LODER	Calibration Date:	23-May-10 20:14:49
Software Version:	WL INSITE R2.4 (Build 20)	Calibration Version:	1
Source SN:	KW-290		

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48 0	48 0	Channel #

50 KEV Peak Channel #	48.6	48.6	Channel #
239 KEV Peak Channel #	22.8	22.8	Channel #
583 KEV Peak Channel #	51.6	51.3	Channel #
2614 KEV Peak Channel #	211.8	210.7	Channel #
Calibrate Temperature	88.2	93.4	degF

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

Blanket Reference Value: 230.00 API  
Calibrator Value: 261.2 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1755.8	CPS	342.5	339.0	API
Background	403.0	CPS	81.3	77.8	API

Gamma Ray Gain: 0.97  
Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 11301132	Reference Calibration Date:	23-May-10 16:50:08
Engineer:	F. LODER	Calibration Date:	23-May-10 17:02:37
Software Version:	WL INSITE R2.4 (Build 20)	Calibration Version:	1

Logging Source S/N: CASPER 434  
Tank Serial Number: 11068236  
Reference value assigned to Tank: 53.720  
Snow Block S/N: CASPER IQ  
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:	0.999	0.998	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):	0.2226	0.2224	0.0002	+/- 0.0020
Calibrated Ratio:	10.12	10.11	0.008	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0812	0.02000 - 0.09000

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

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	SDLT - I132M275	Reference Calibration Date:	23-May-10 12:48:25
Engineer:	C. BLUE	Calibration Date:	23-May-10 13:06:58
Software Version:	WL INSITE R2.4 (Build 20)	Calibration Version:	1

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0652	1.0412	0.90 - 1.10
Near Dens Gain	1.0258	1.0176	0.90 - 1.10
Near Peak Gain	1.0122	1.0098	0.90 - 1.10
Near Lith Gain	0.9912	0.9717	0.90 - 1.10
Far Bar Gain	1.0186	1.0200	0.90 - 1.10
Far Dens Gain	1.0040	1.0069	0.90 - 1.10
Far Peak Gain	1.0001	0.9987	0.90 - 1.10
Far Lith Gain	0.9730	0.9686	0.90 - 1.10
Near Bar Offset	-0.3498	-0.1361	NONE
Near Dens Offset	-0.0118	0.0579	NONE
Near Peak Offset	0.0928	0.1109	NONE
Near Lith Offset	0.2475	0.4050	NONE
Far Bar Offset	0.0487	0.0364	NONE
Far Dens Offset	0.1584	0.1308	NONE
Far Peak Offset	0.1611	0.1702	NONE
Far Lith Offset	0.3064	0.3414	NONE
Near Bar Background	960.90	956.19	700 - 1450
Near Dens Background	316.93	316.58	230 - 480
Near Peak Background	136.27	137.02	100 - 210
Near Lith Background	167.93	166.13	125 - 260
Far Bar Background	505.57	507.63	450 - 900
Far Dens Background	204.20	199.79	175 - 345
Far Peak Background	77.80	79.07	70 - 140
Far Lith Background	82.50	83.00	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	0.000	1.684	1.684	+/- 0.015
Pe	0.000	2.585	2.585	+/- 0.150
ALUMINUM				
Density (g/cc)	0.000	2.599	2.599	+/- 0.01500
Pe	0.000	3.097	3.097	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0007	+/- 0.0110	0.0010	+/- 0.0140
Magnesium Block	-0.0005	+/- 0.0110	0.0006	+/- 0.0140
Aluminum Block	0.0002	+/- 0.0110	-0.0015	+/- 0.0140
Resolution	8.83	6.00 - 11.50	9.88	6.00 - 11.50
Internal Verifier(B+D+P+L)	1576	1200 - 2700	869	800 - 1700

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed

Background Resolution Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

MICRO LOG SHOP CALIBRATION

Tool Name:	SDLT - I132M275	Reference Calibration Date:	23-May-10 13:26:14
Engineer:	F. LODER	Calibration Date:	11-Jun-10 13:14:03
Software Version:	WL INSITE R3.0.4 (Build 6)	Calibration Version:	1

CALIBRATION COEFFICIENT SUMMARY					
Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.08	-0.05	0.01	0.00	ohmm
Calibration Point #1	-0.03	0.00	0.00	0.00	ohmm
Calibration Point #2	20.11	20.00	20.13	20.00	ohmm
Internal Reference	20.06	19.95	20.14	20.01	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	-0.18	3.55	V
Calibration Point #1	12.67	1.84	V
Calibration Point #2	5232.13	6838.88	V
Internal Reference	5220.00	6842.14	V

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	SDLT - I132M275	Reference Calibration Date:	13-Feb-10 12:46:38
Engineer:	F. LODER	Calibration Date:	23-May-10 13:32:45
Software Version:	WL INSITE R2.4 (Build 20)	Calibration Version:	1

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-1641.40	-1866.95	-7000.00 - -1000.00
Pad Gain	0.0003728	0.0003790	0.000200 - 0.000600
Arm Offset	-1071.69	-890.58	-5000.00 - 3000.00
Arm Gain	0.0005221	0.0005428	0.000300 - 0.000700
Arm Power	-0.000005891	-0.000006915	-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)	2.05	2.00	-0.05	+/- 0.20
Medium Ring (in)	3.77	3.75	-0.02	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.43	6.50	0.07	+/- 0.20
Medium Ring (in)	8.13	8.25	0.12	+/- 0.20
Large Ring (in)	14.90	15.00	0.10	+/- 0.20

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



ICT SHOP CALIBRATION									
Tool Name:		ICT - 11294350				Reference Calibration Date:		06-Apr-10 13:20:00	
Engineer:		C. BLUE				Calibration Date:		05-May-10 12:16:50	
Software Version:		WL INSITE R2.4 (Build 20)				Calibration Version:		1	
	CALIPERS AND RINGS								
	Ring		Measured		Calibrated		Units		
	CALIPER 1:								
	Small Ring		3.75		3.63		in		
	Medium Ring		7.99		8.00		in		
	Large Ring		14.94		15.00		in		
	X-Large Ring		21.01		21.00		in		
	CALIPER 2:								
	Small Ring		3.65		3.63		in		
	Medium Ring		8.03		8.00		in		
	Large Ring		14.94		15.00		in		
	X-Large Ring		21.00		21.00		in		
	CALIPER 3:								
	Small Ring		3.65		3.63		in		
	Medium Ring		8.05		8.00		in		
	Large Ring		15.05		15.00		in		
	X-Large Ring		21.07		21.00		in		
	CALIPER 4:								
	Small Ring		3.77		3.63		in		
	Medium Ring		8.10		8.00		in		
	Large Ring		15.14		15.00		in		
	X-Large Ring		21.07		21.00		in		
	CALIPER 5:								
	Small Ring		3.76		3.63		in		
	Medium Ring		8.06		8.00		in		
	Large Ring		15.16		15.00		in		
	X-Large Ring		21.04		21.00		in		
	CALIPER 6:								
	Small Ring		3.66		3.63		in		
	Medium Ring		7.99		8.00		in		
	Large Ring		15.00		15.00		in		
	X-Large Ring		21.04		21.00		in		

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION									
Tool Name:		ACRt - 90199477-E2817-S4353				Reference Calibration Date:		14-Apr-10 10:45:08	
Engineer:		C. BLUE				Calibration Date:		14-Apr-10 10:59:55	
Software Version:		WL INSITE R2.4 (Build 20)				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	1.0035	1.05	0.95	1.0074	1.05	0.95	1.0054	1.05
A2 (50")	0.95	1.0102	1.05	0.95	1.0142	1.05	0.95	1.0148	1.05
A3 (29")	0.95	1.0033	1.05	0.95	1.0060	1.05	0.95	1.0035	1.05
A4 (17")	0.95	1.0065	1.05	0.95	1.0067	1.05	0.95	1.0075	1.05
A5 (10")	N/A	N/A	N/A	0.95	0.9957	1.05	0.95	0.9949	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9826	1.05	0.95	0.9817	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	-1.158	2	-6	-4.357	-2	-8	-4.686	-2

A2 (50")	-7	-1.911	-1	-6	-2.967	-2	-7	-4.615	-2
A3 (29")	-27	-12.876	-9	-9	-3.485	-3	-7	-3.402	-1
A4 (17")	-180	-91.122	-60	-45	-29.375	-15	-39	-24.941	-13
A5 (10")	N/A	N/A	N/A	-150	-86.818	-50	-80	-42.414	-10
A6 (6")	N/A	N/A	N/A	175	316.205	525	90	158.894	270

TRANSMITTER CURRENT GAIN			
Signal	Lower	R	Upper
12K	0.6	0.8991	1.3
36K	1.0	1.8313	2.0
72K	1.0	1.1404	2.0

R-MUD VERIFICATION			
Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
Mud Cell	0.95	0.997	1.05


CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11294346						
Gamma Ray Calibrator	230.0	-----	-----	0.0	+/- 9.00	api
CSNG-10965402						
60 KEV Peak Channel #	48.0	-----	-----	0.0	-----	Channel #
239 KEV Peak Channel #	22.8	-----	-----	0.0	-----	Channel #
583 KEV Peak Channel #	51.3	-----	-----	0.0	-----	Channel #
2614 KEV Peak Channel #	210.7	-----	-----	0.0	-----	Channel #
DSNT-11301132						
Snow-Block Porosity	0.0812	-----	-----	0.0000	+/- -.--	decp
SDLT-I132M275						
Near(B+D+P+L)	1575.910	-----	-----	0.000	+/-13.965	cps
Far(B+D+P+L)	869.492	-----	-----	0.000	+/-14.630	cps
MicroLog Normal	19.95	-----	-----	0.00	-----	ohmm
MicroLog Lateral	20.01	-----	-----	0.00	-----	ohmm
Pad Extension	3.75	-----	-----	0.00	+/-0.20	in
Ring Diameter	8.25	-----	-----	0.00	+/-0.20	in
ICT-11294350						
Caliper 1	8.00	-----	-----	0.00	-----	in
Caliper 2	8.00	-----	-----	0.00	-----	in
Caliper 3	8.00	-----	-----	0.00	-----	in
Caliper 4	8.00	-----	-----	0.00	-----	in
Caliper 5	8.00	-----	-----	0.00	-----	in
Caliper 6	8.00	-----	-----	0.00	-----	in
ACRt-90199477-E2817-S4353						
Mud Cell	0.997	-----	-----	0.000	-----	ohm-m

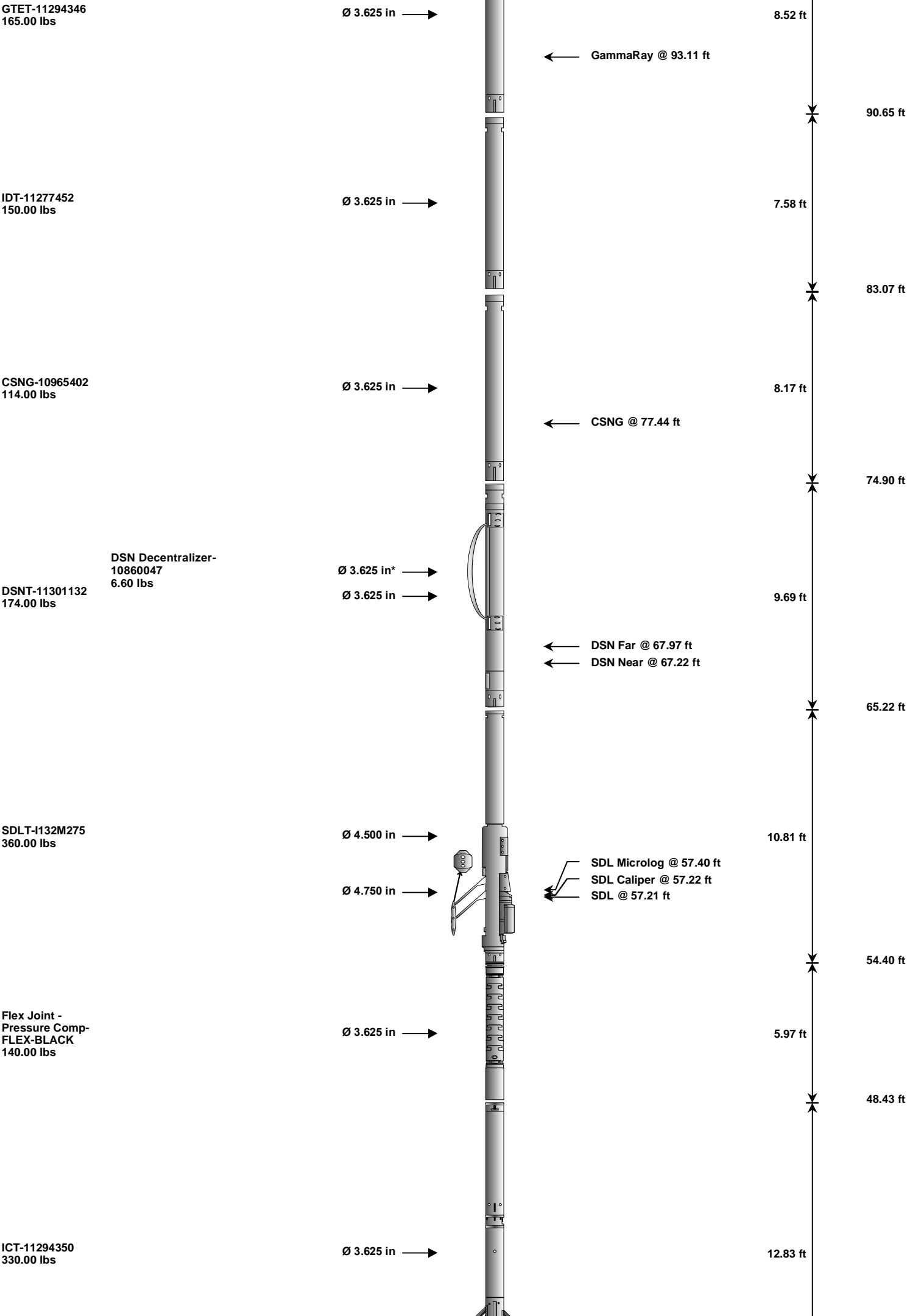
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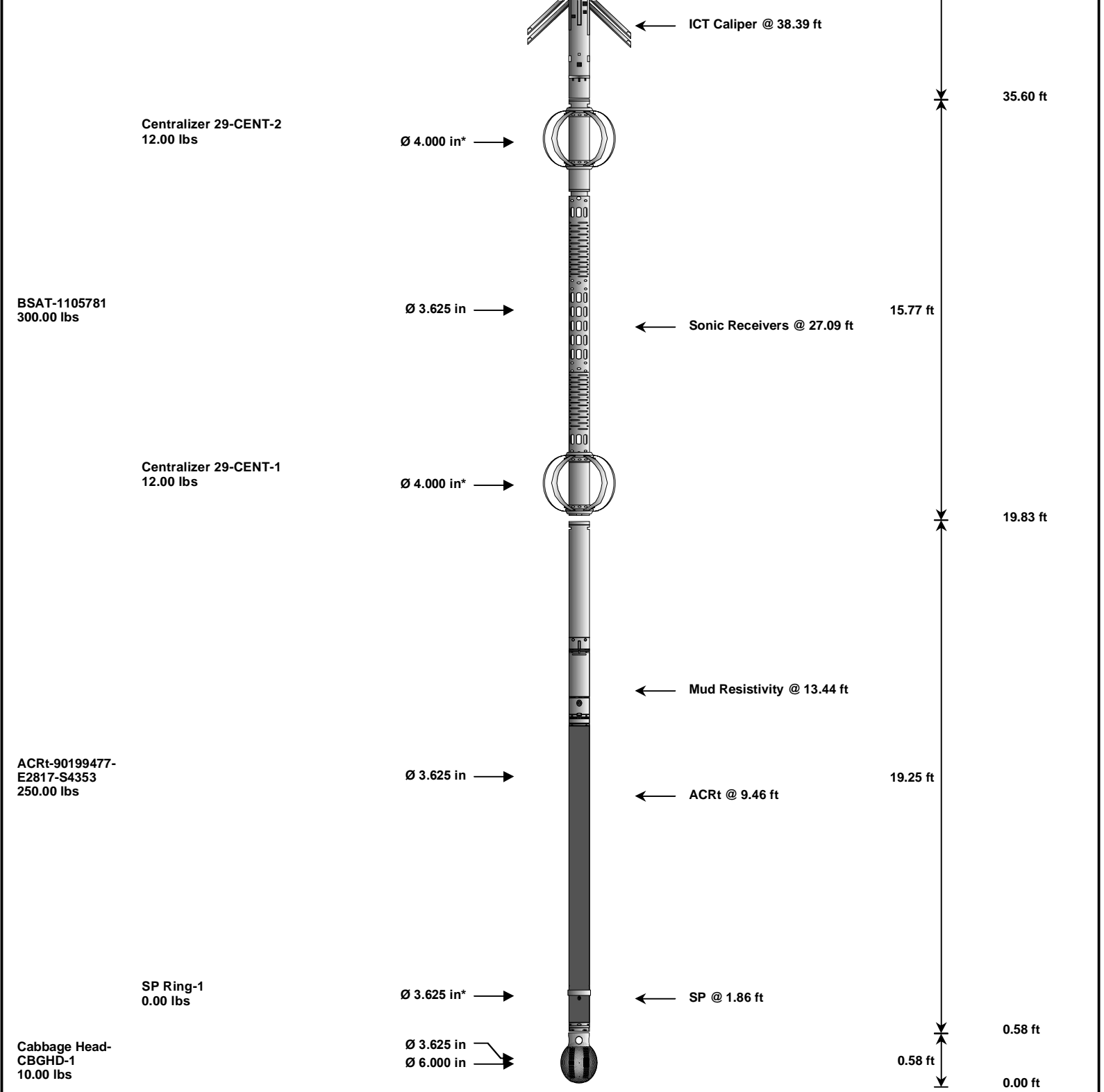
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HALLIBURTON

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 @ 101.74 ft ← BH Temperature @ 101.17 ft	6.25 ft  99.17 ft	105.42 ft  99.17 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	99.17	300.00
GTET	Gamma Telemetry Tool		11294346	165.00	8.52	90.65	60.00
IDT	Insite Directional Tool		11277452	150.00	7.58	83.07	30.00
CSNG	Compensated Spectral Natural Gamma		10965402	114.00	8.17	74.90	15.00
DSNT	Dual Spaced Neutron		11301132	174.00	9.69	65.22	60.00
DCNT	DSN Decentralizer		10860047	6.60	5.13	* 68.55	300.00
SDLT	Spectral Density Tool		1132M275	360.00	10.81	54.40	60.00
FLEX	Flex Joint - Pressure Compensated		FLEX-BLACK	140.00	5.97	48.43	300.00
ICT	Six Independent Arm Caliper		11294350	330.00	12.83	35.60	60.00
BCAS	Borehole Sonic Array Tool		1105781	300.00	15.77	19.83	60.00
OBCEN	Centralizer - 29 in.Overbody		CENT-2	12.00	2.42	* 32.82	300.00
OBCEN	Centralizer - 29 in.Overbody		CENT-1	12.00	2.42	* 19.93	300.00
ACRt	Array Compensated True Resistivity		90199477-E2817-S4353	250.00	19.25	0.58	300.00
SP	SP Ring		1	0.00	0.25	* 1.86	300.00
CBHD	Cabbage Head		CBGHD-1	10.00	0.58	0.00	300.00
Total				2,158.60	105.42		

\* Not included in Total Length and Length Accumulation.

COMPANY	NOBLE ENERGY		
WELL	DF RANCH 1161-8-12		
FIELD	WATTENBERG		
COUNTY	WELD	STATE	CO
<b>HALLIBURTON</b>		SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TRUE RESISTIVITY	