

HALLIBURTON

SPECTRAL DENSITY  
DUAL SPACED NEUTRON  
ARRAY COMPENSATED  
TRUE RESISTIVITY

COMPANY		NOBLE	
WELL		FABRIZIUS 1161-34-22	
FIELD		WATTENBERG	
COUNTY		WELD	
STATE		CO	
Permanent Datum		GL	
Log measured from		KB	
Drilling measured from		KB	
Date		10-Apr-10	
Run No.		ONE	
Depth - Driller		7735.00 ft	
Depth - Logger		7719.0 ft	
Bottom - Logged Interval		7710 ft	
Top - Logged Interval		1087 ft	
Casing - Driller		8.625 in @ 1082.0 ft	
Casing - Logger		1087.0 ft	
Bit Size		7.875 in	
Type Fluid in Hole		WBM	
Density		9.1 ppg	
Viscosity		36.00 s/qt	
PH		8.50 pH	
Fluid Loss		9.6 cpm	
Source of Sample		FLOWLINE	
Rm @ Meas. Temperature		2.65 ohmm @ 83.60 degF	
Rmf @ Meas. Temperature		2.67 ohmm @ 75.00 degF	
Rmc @ Meas. Temperature		2.35 ohmm @ 75.00 degF	
Source Rmf		CHART	
Rmc		CHART	
Rm @ BHT		1.12 ohmm @ 207.0 degF	
Time Since Circulation		6.0 hr	
Time on Bottom		10-Apr-10 18:48	
Max. Rec. Temperature		207.0 degF @ 7719.0 ft	
Equipment		10549597	
Location		BRIGHTON	
Recorded By		C. BLUE	
Witnessed By		GARY STAPLETON	

COMPANY	NOBLE
WELL	FABRIZIUS 1161-34-22
FIELD	WATTENBERG
COUNTY	WELD
STATE	CO
API No.	05123303030000
Location	SHL: 657' FNL & 627' FWL SEC 34 BHL: 657' FNL & 627' FWL SEC 34 LAT: 40.88366° LONG: -104.1987°
Other Services:	RWCH GTET IDT ICT CSNG BSAT ACRT

Elev. 5106.0 ft  
D.F.  
G.L.  
5117.0 ft  
5117.0 ft  
5106.0 ft

Fold here

Service Ticket No.: 7298052		API Serial No.: 05123303030000		PGM Version: WL INSITE R2.4 (Build 20)					
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.		
Rmf @ Meas. Temp.	@	@		ONE	ACRT 758-352	N/A	1.5" S.O.		
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.	11277436	Serial No.	11105780	Serial No.	I132M302	Serial No.	11301132		
Model No.	GTET	Model No.	BSAT	Model No.	SDLT	Model No.	DSNT		
Diameter	3.625"	No. of Cent.	2	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	38'	FWDA [Y/N]	N	Strength	1.5 Ci	Strength	15 Ci		
LOGGING DATA									
GENERAL		GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run	Depth	Speed	Scale	Scale		Scale		Scale	
No.	From	To	ft/min	L	R	L	R	L	R
ONE	7719	7289	REC	0	250	30%	-15%	2.65 g/cc	20%
ONE	7289	6936	REC	0	250	30%	-15%	2.68 g/cc	20%

ONE	7289	6936	REC	0	250	30%	-15%	55.5 us/ft	20%	0%	2.68 g/cc	20%	0%	SAND
ONE	6936	6475	REC	0	250	30%	-15%	47.6 us/ft	20%	0%	2.71 g/cc	20%	0%	LIME
ONE	6475	1087	REC	0	250	30%	-15%	55.5 us/ft	20%	0%	2.68 g/cc	20%	0%	SAND
DIRECTIONAL INFORMATION														
Maximum Deviation @									KOP @					
Remarks:														
RWCH/GTET/IDT/ICT/CSNG/DSNT/SDLT/BSAT/ACRT RAN IN COMBINATION														
ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH PRODUCTION CASING														
TENSION PULLS AFFECT TOOL RESPONSE														
CREW: A. LEWIS, J. BREBRICK 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.														
HALLIBURTON														

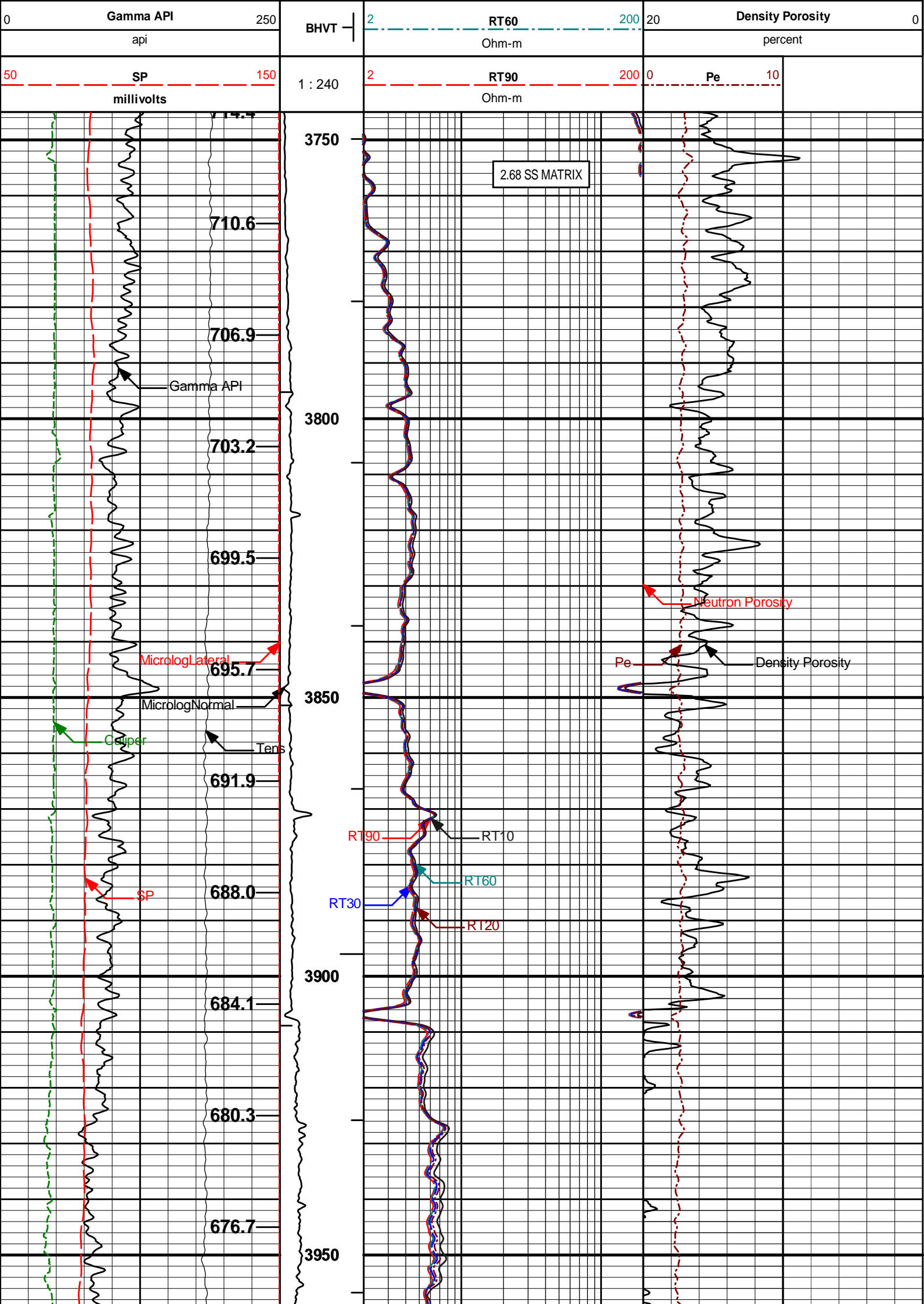


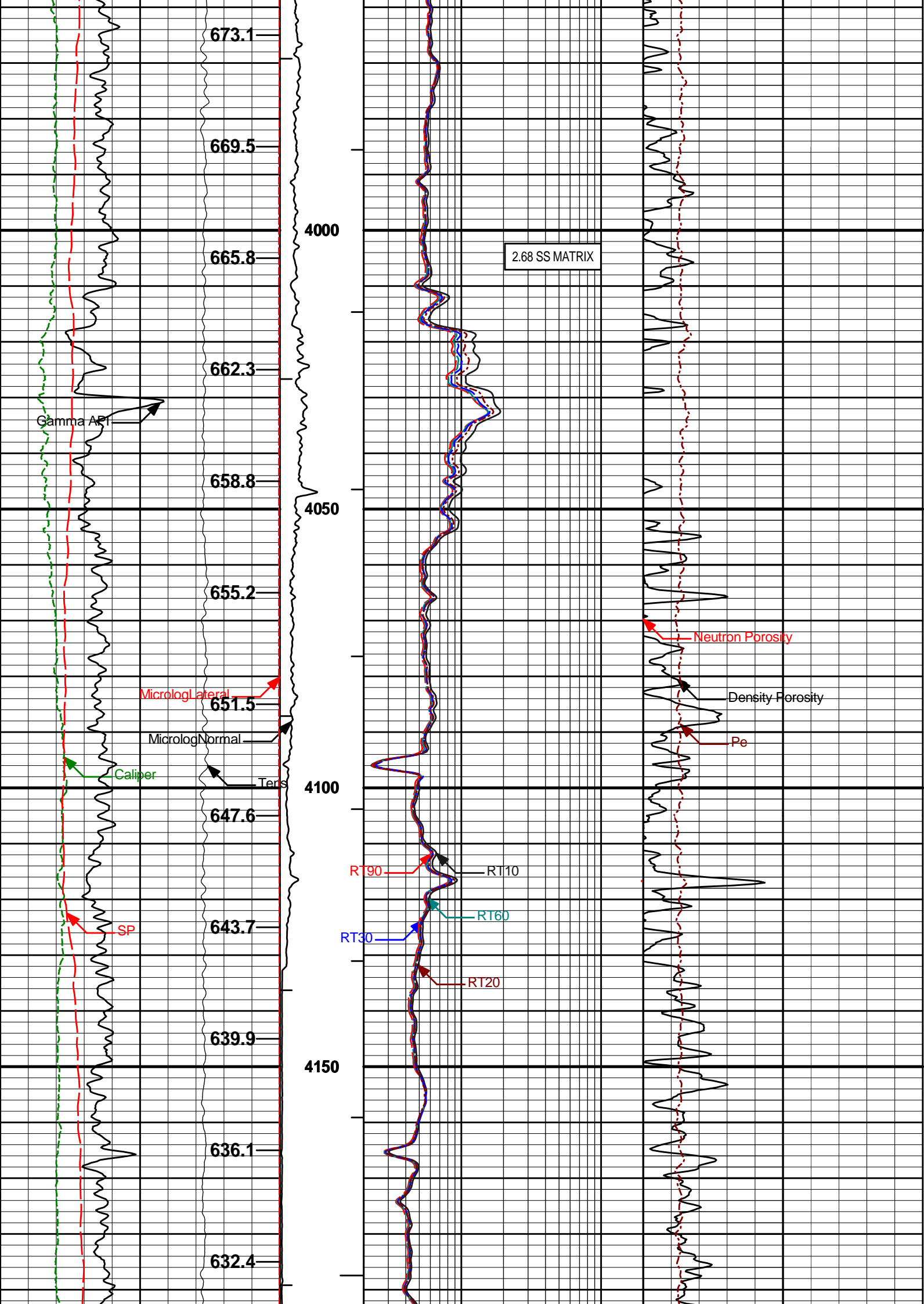
# PARAMETERS REPORT

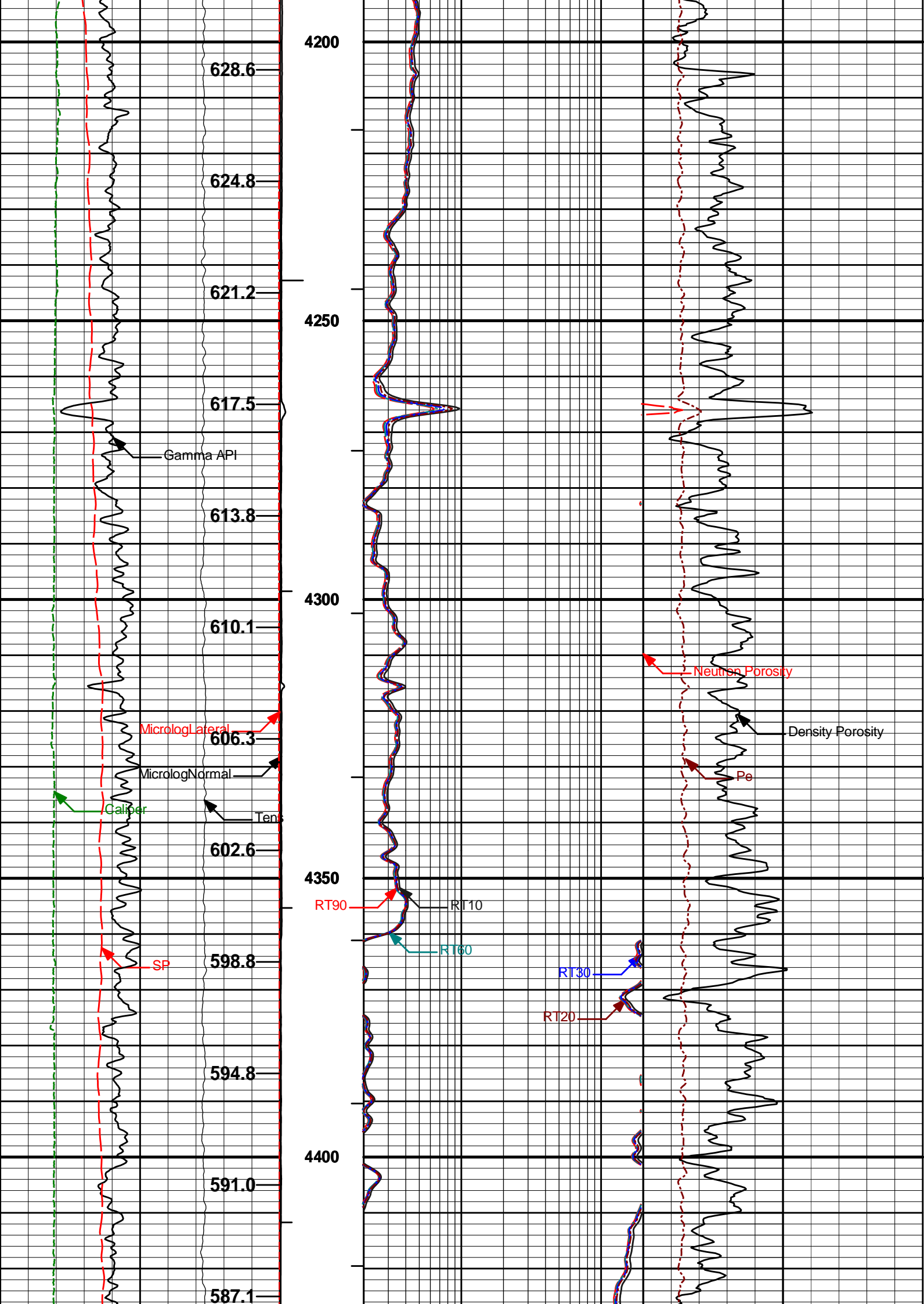
Depth (ft)	Tool Name	Description	Value	Units
TOP				
	DSNT	Neutron Lithology	Sandstone	
	SDLT	Formation Density Matrix	2.680	g/cc
	BSAT	Delta -T Matrix Type	Sandstone 55.5	
6475.00				
	DSNT	Neutron Lithology	Limestone	
	SDLT	Formation Density Matrix	2.710	g/cc
	BSAT	Delta -T Matrix Type	User define	
	BSAT	Delta -T Matrix	47.60	uspf
6936.00				
	SDLT	Formation Density Matrix	2.680	g/cc
7289.00				
	SHARED	Bit Size	7.875	in
	SHARED	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	Borehole Fluid Weight	9.100	ppg
	SHARED	Mud Resistivity	2.650	ohmm
	SHARED	Temperature of Mud	83.6	degF
	SHARED	Oil Based Mud System?	No	
	SHARED	Logging Interval is Cased?	No	
	SHARED	AHV Casing OD	5.500	in
	SHARED	Surface Temperature	55.0	degF
	SHARED	Total Well Depth	7719.00	ft
	SHARED	Bottom Hole Temperature	207.0	degF
	GTET	Process Gamma Ray?	Yes	
	GTET	Gamma Tool Standoff	0.000	in
	GTET	Process Gamma Ray EVR?	No	
	IDT	Survey Writing Interval	30	ft
	ICT	Process Caliper Outputs?	Yes	
	CSNG	Process CSNG Data?	Yes	
	CSNG	Is Tool Centralized?	No	
	CSNG	Mud Type?	Natural	

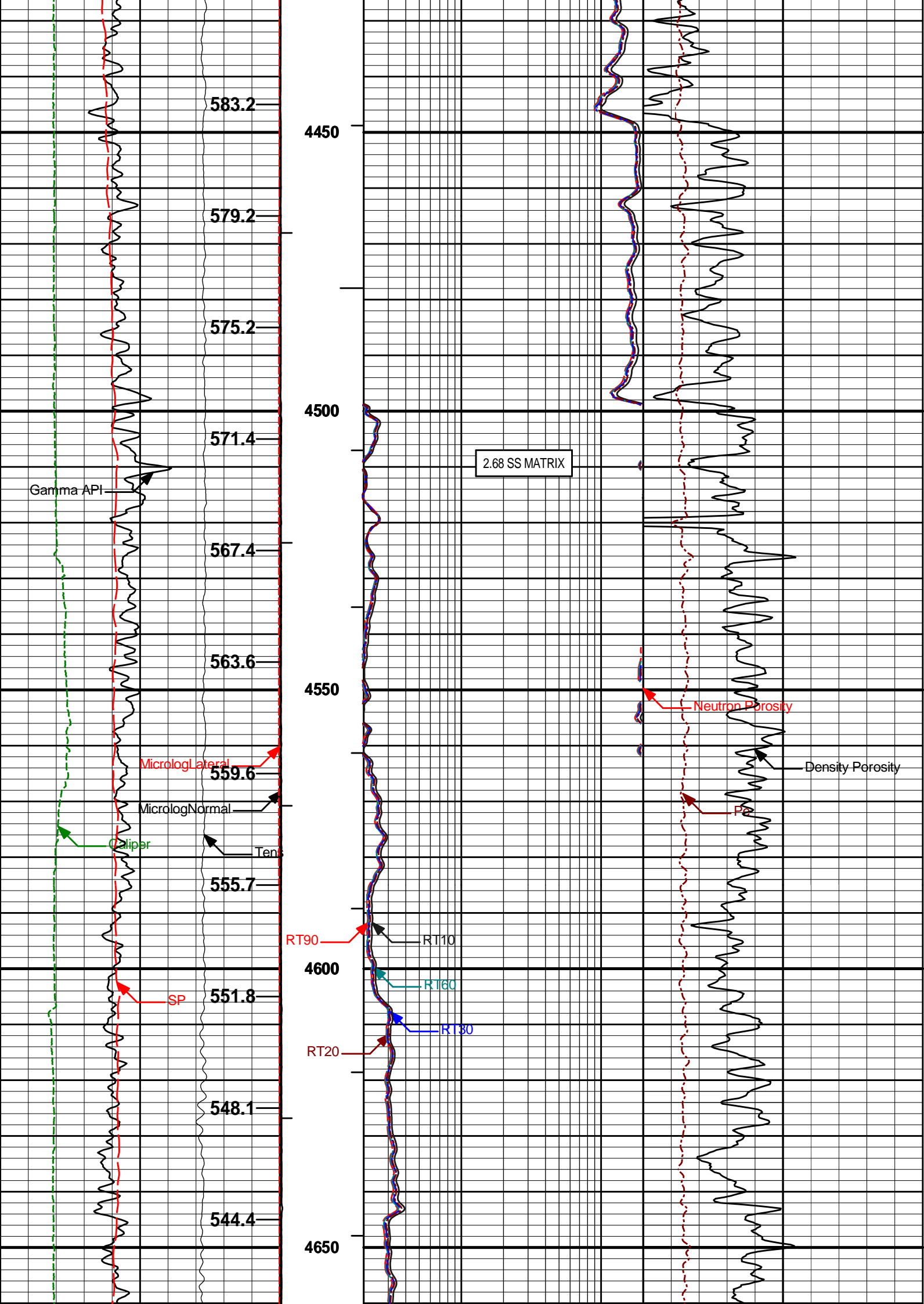
CSNG	Mud Type?	Natural	
CSNG	Percent K in Mud by Weight?	0.00	%
CSNG	Gamma Enviromental Corrections?	Yes	
CSNG	Barite Correction Factor	1.0	
DSNT	Process DSN?	Yes	
DSNT	Process DSN EVR?	No	
DSNT	Neutron Lithology	Sandstone	
DSNT	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.000	in
DSNT	Temperature Correction 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	Use 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	
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
BOTTOM			
Data: FABRIZIUS\0001 QUAD-IDT-ICT-CSNG\003.03 10-Apr-10 22:48 Up			Date: 10-Apr-10 22:51:27

<div> <div>HALLIBURTON</div> <div>           Plot Time: 10-Apr-10 23:42:09            Plot Range: 3745 ft to 7724.92 ft            Data: FABRIZIUS\Well Based\1*            Plot File: \\COMP\PARK_SUS         </div> </div>			
MAIN PASS 5" = 100'			
Annular Volume Total		<div> <div>MicrologNormal</div> <div>0302</div> <div>ohm-metre</div> </div>	<div> <div>RT10</div> <div>200</div> <div>Ohm-m</div> </div>
10K	Tens	<div> <div>MicrologLateral</div> <div>0302</div> <div>ohm-metre</div> </div>	<div> <div>RT20</div> <div>200</div> <div>Ohm-m</div> </div>
	pounds		
6	Caliper	<div> <div>AHVT</div> <div>2</div> <div>Ohm-m</div> </div>	<div> <div>RT30</div> <div>200</div> <div>Ohm-m</div> </div>
	inches		<div> <div>Neutron Porosity</div> <div>0</div> <div>percent</div> </div>

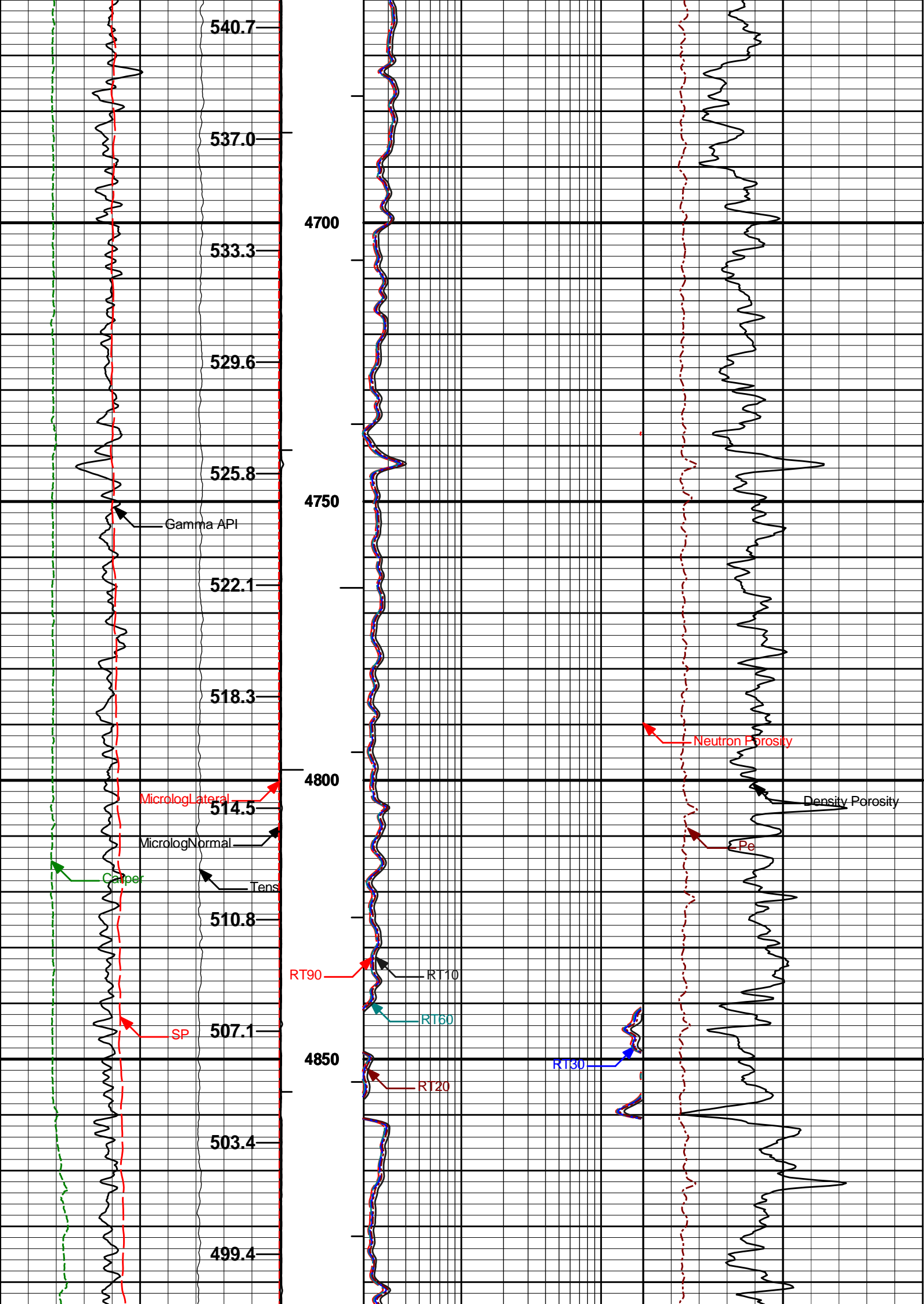




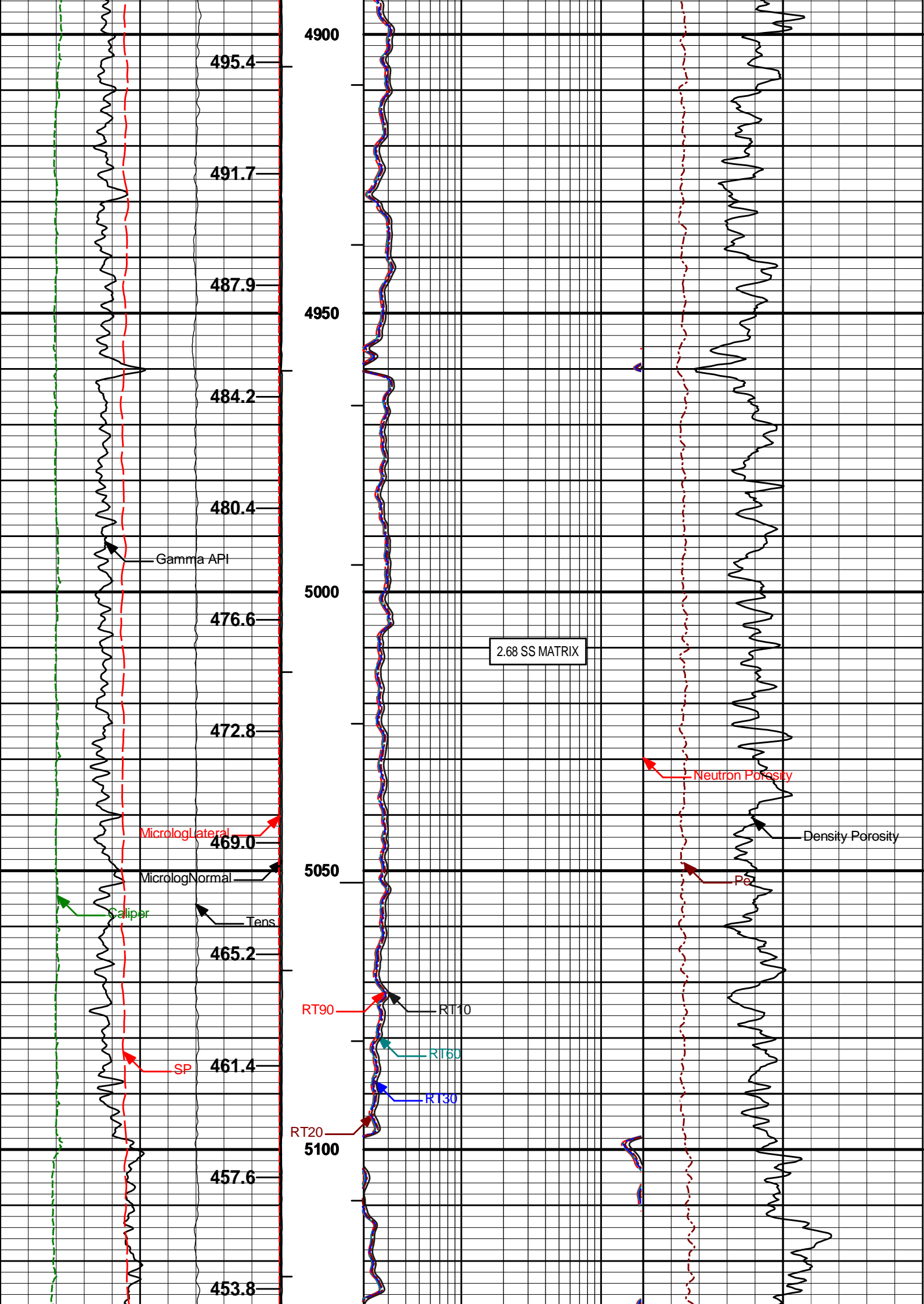


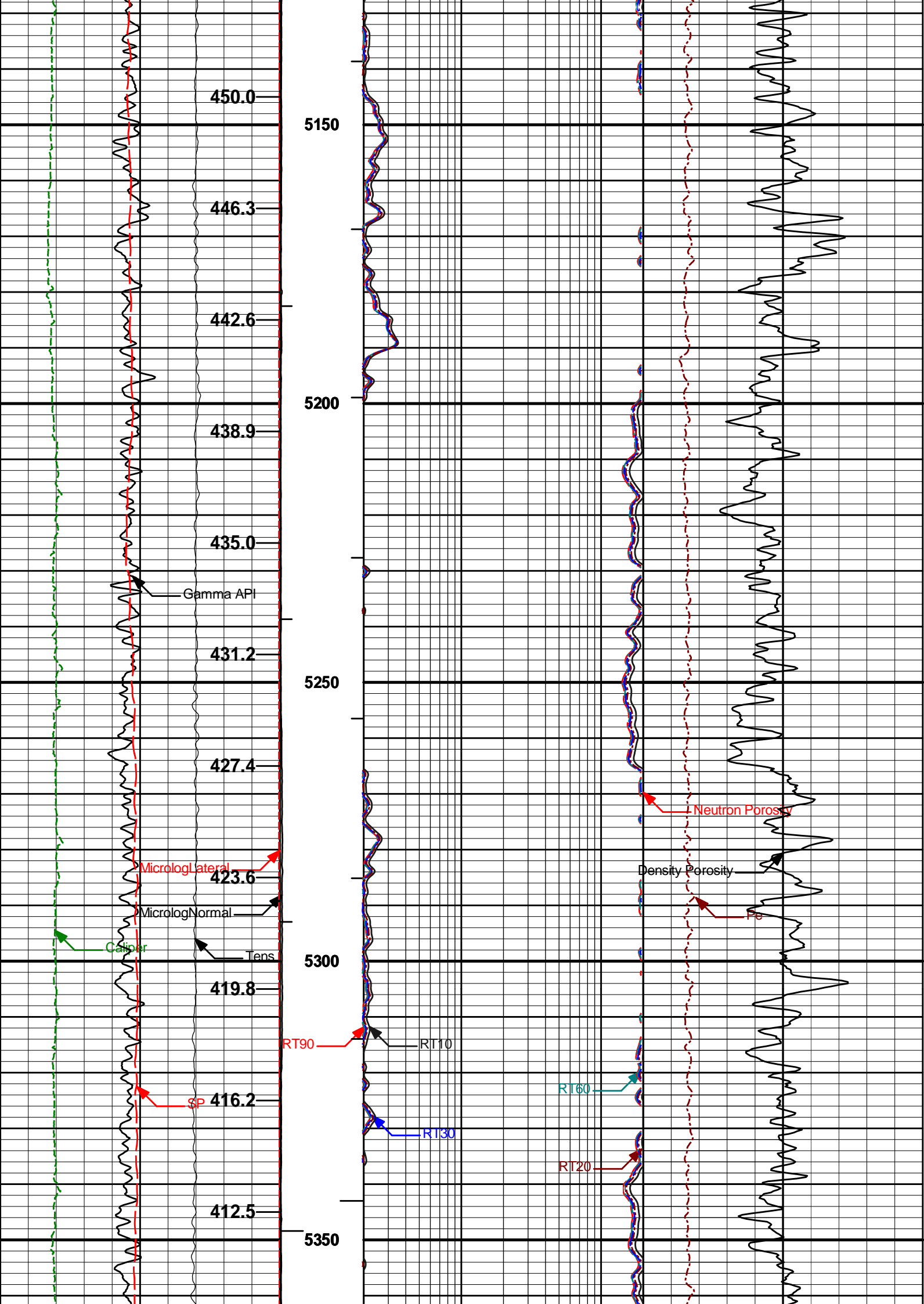


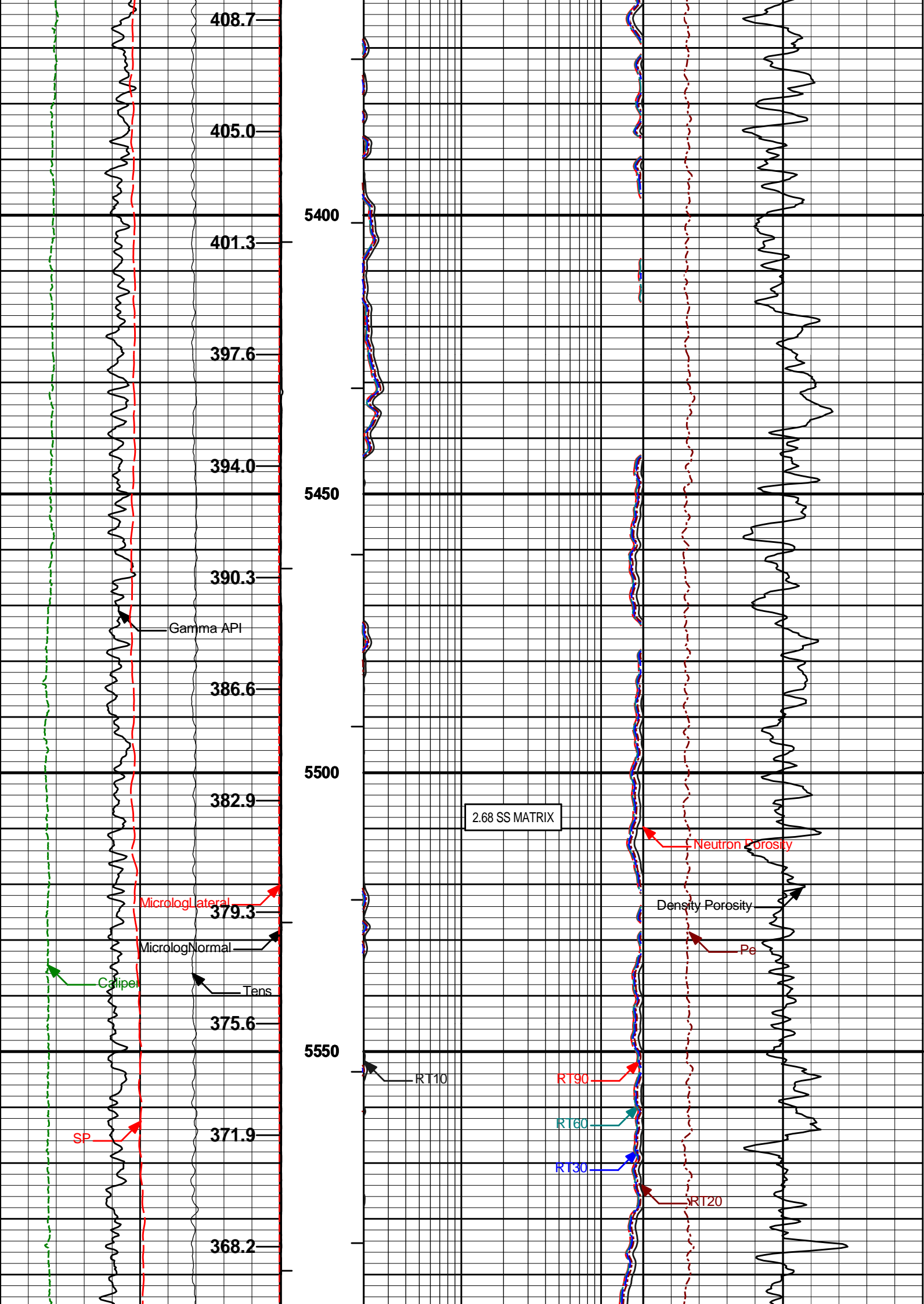


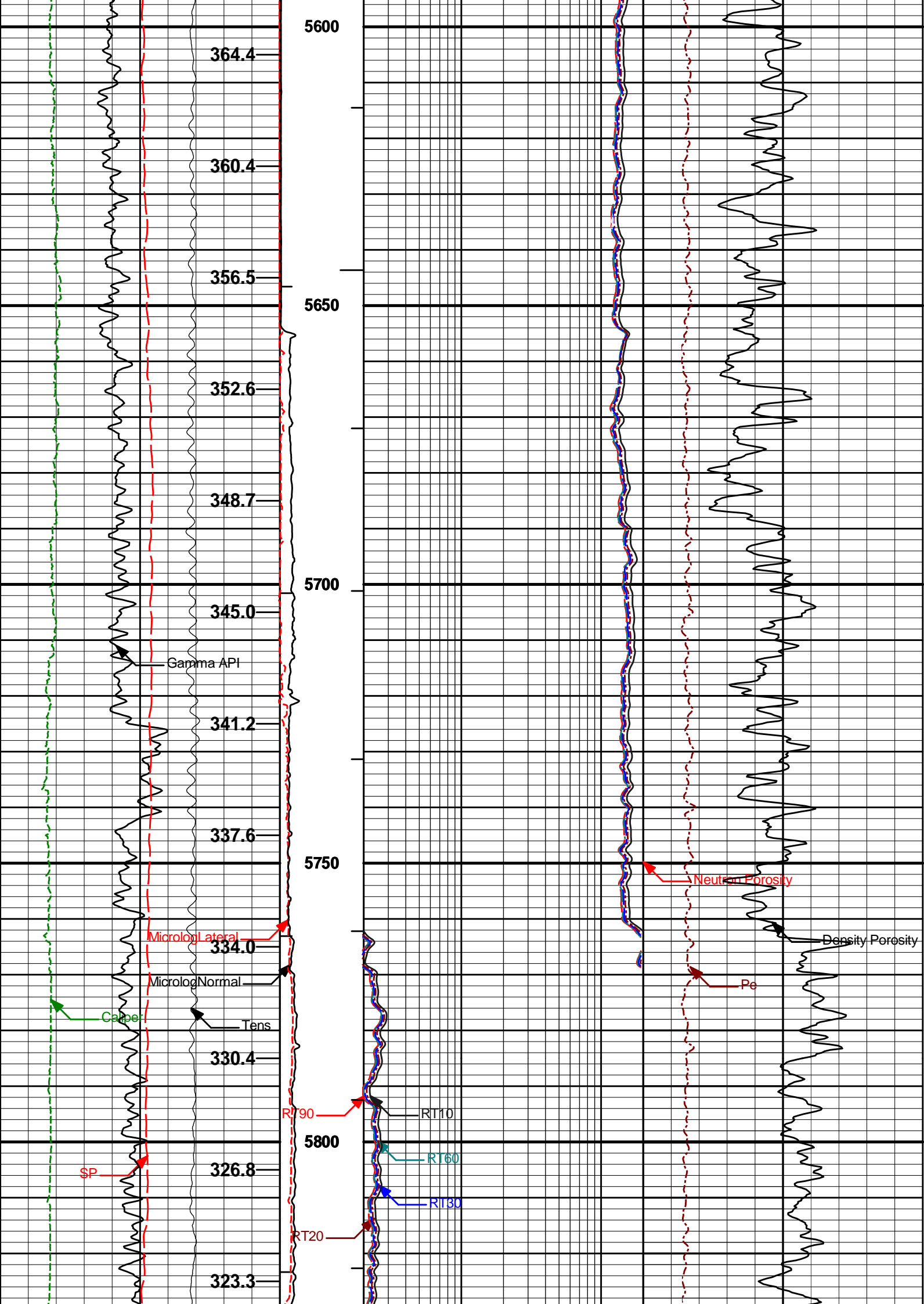


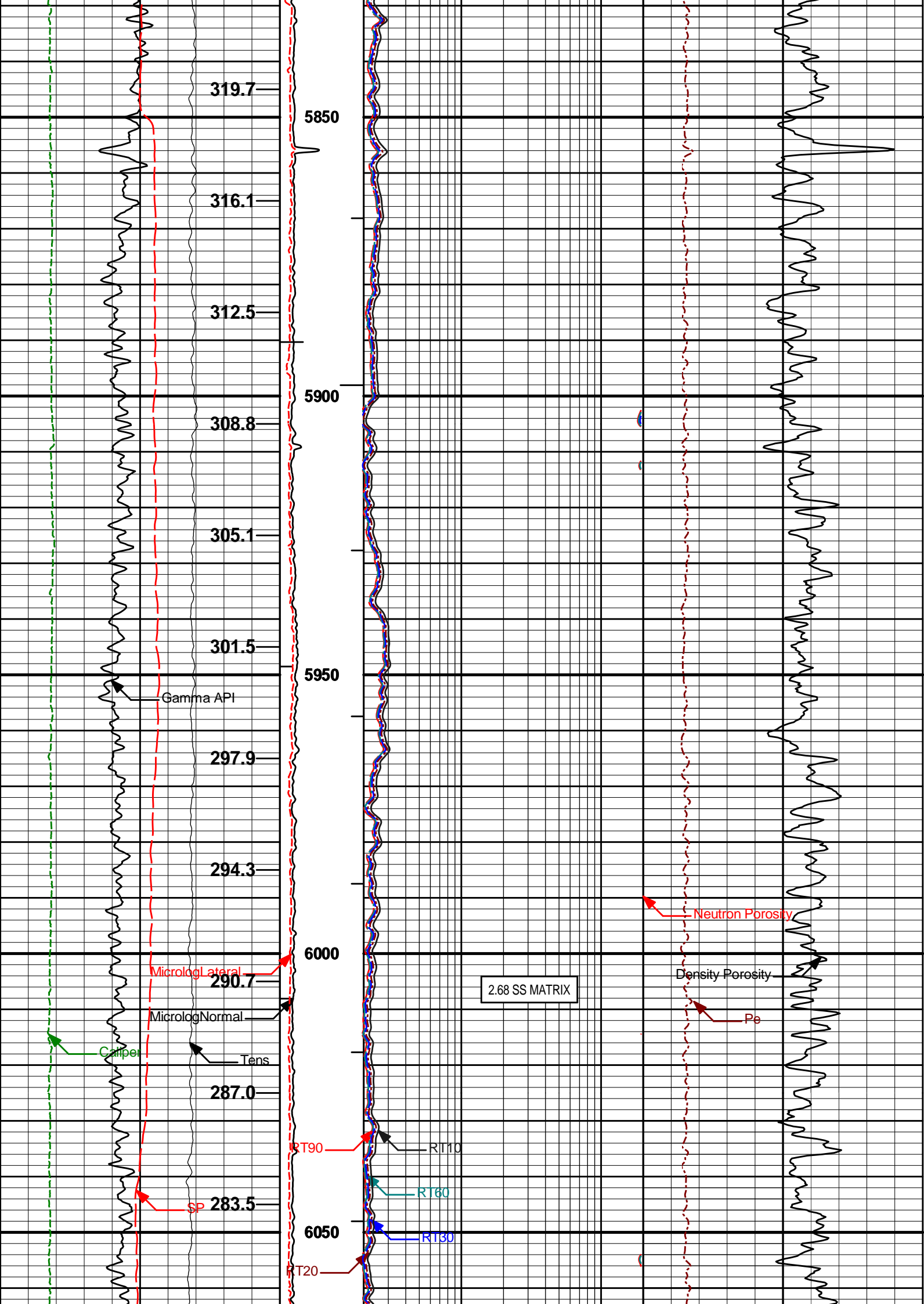


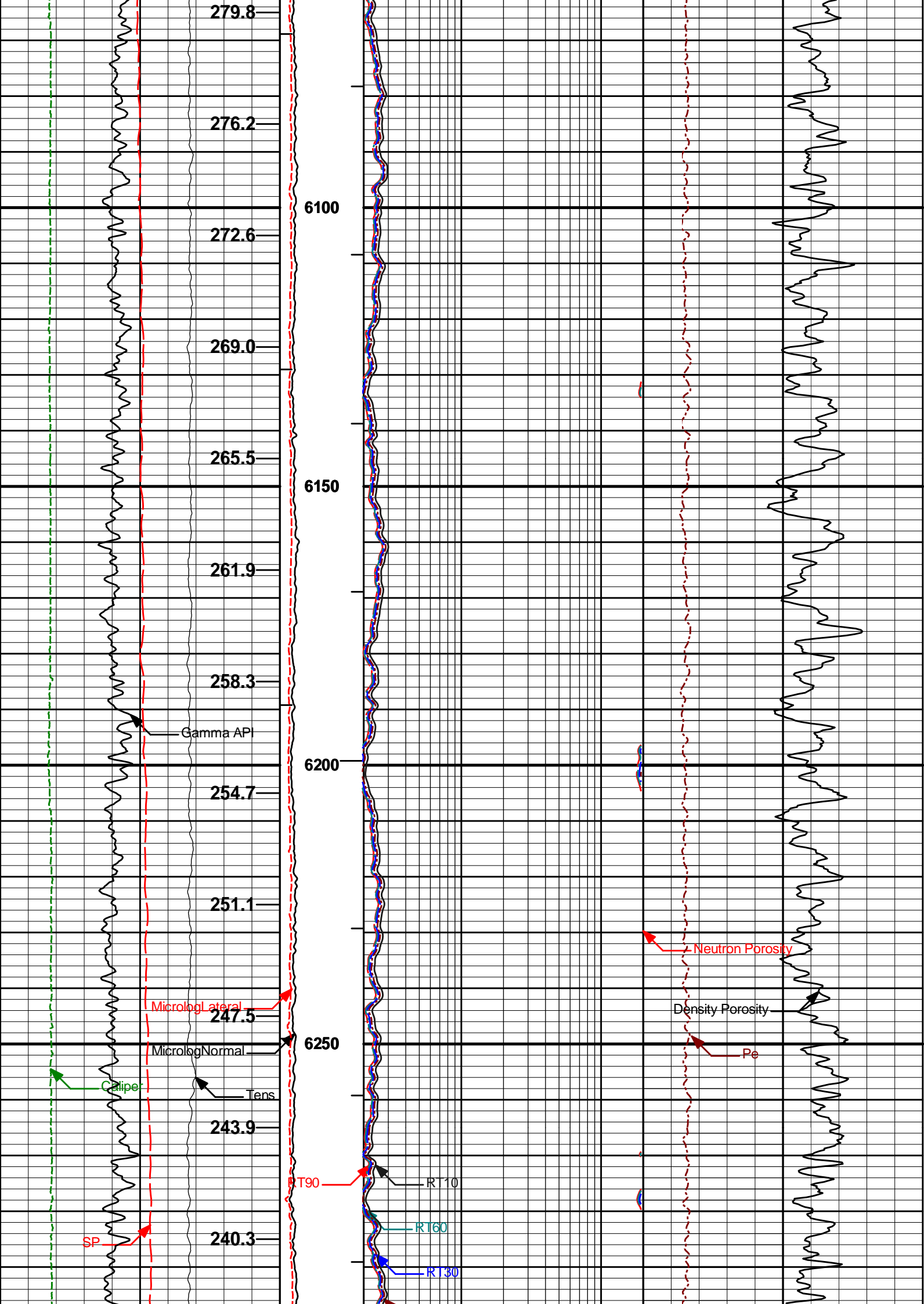


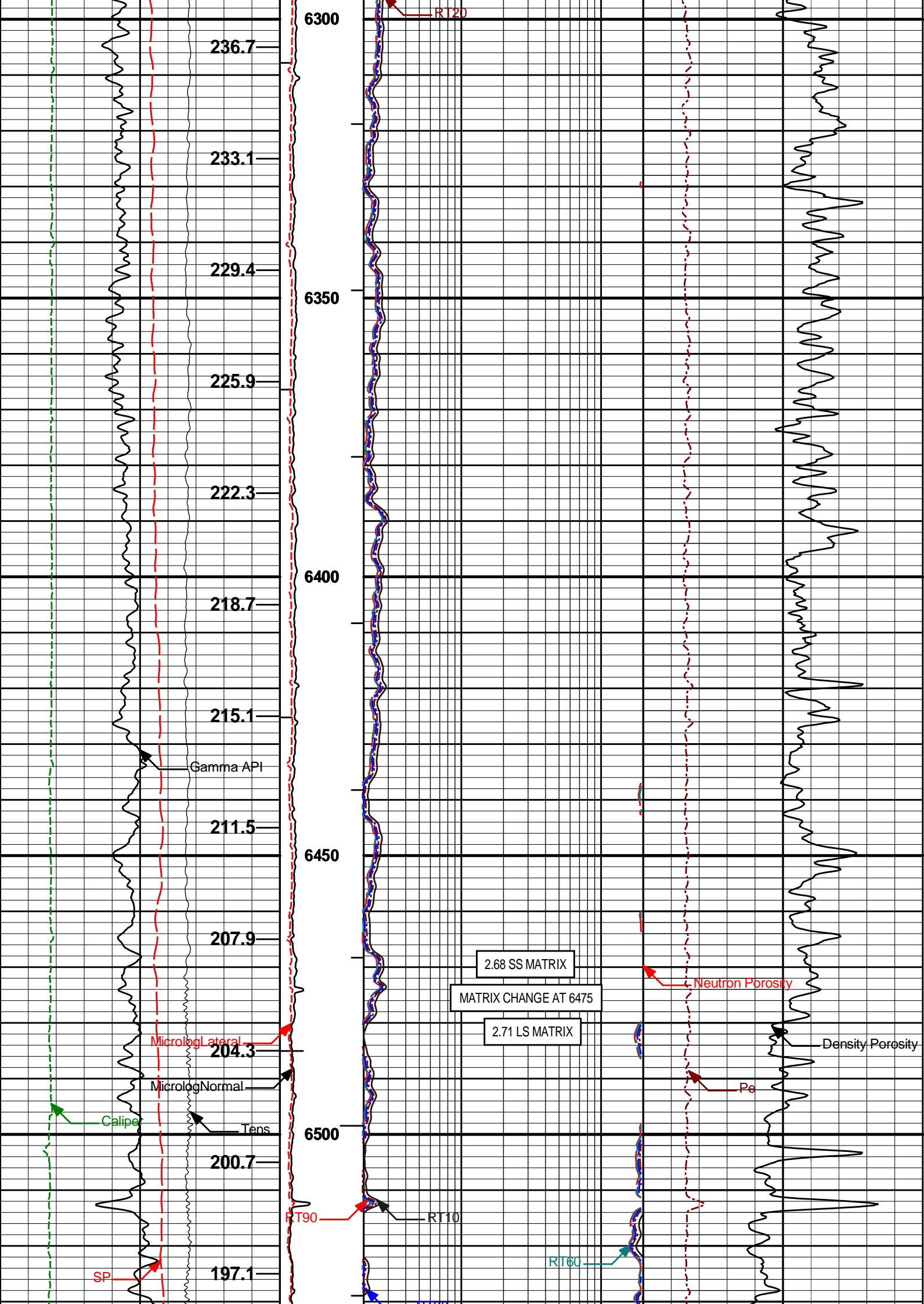




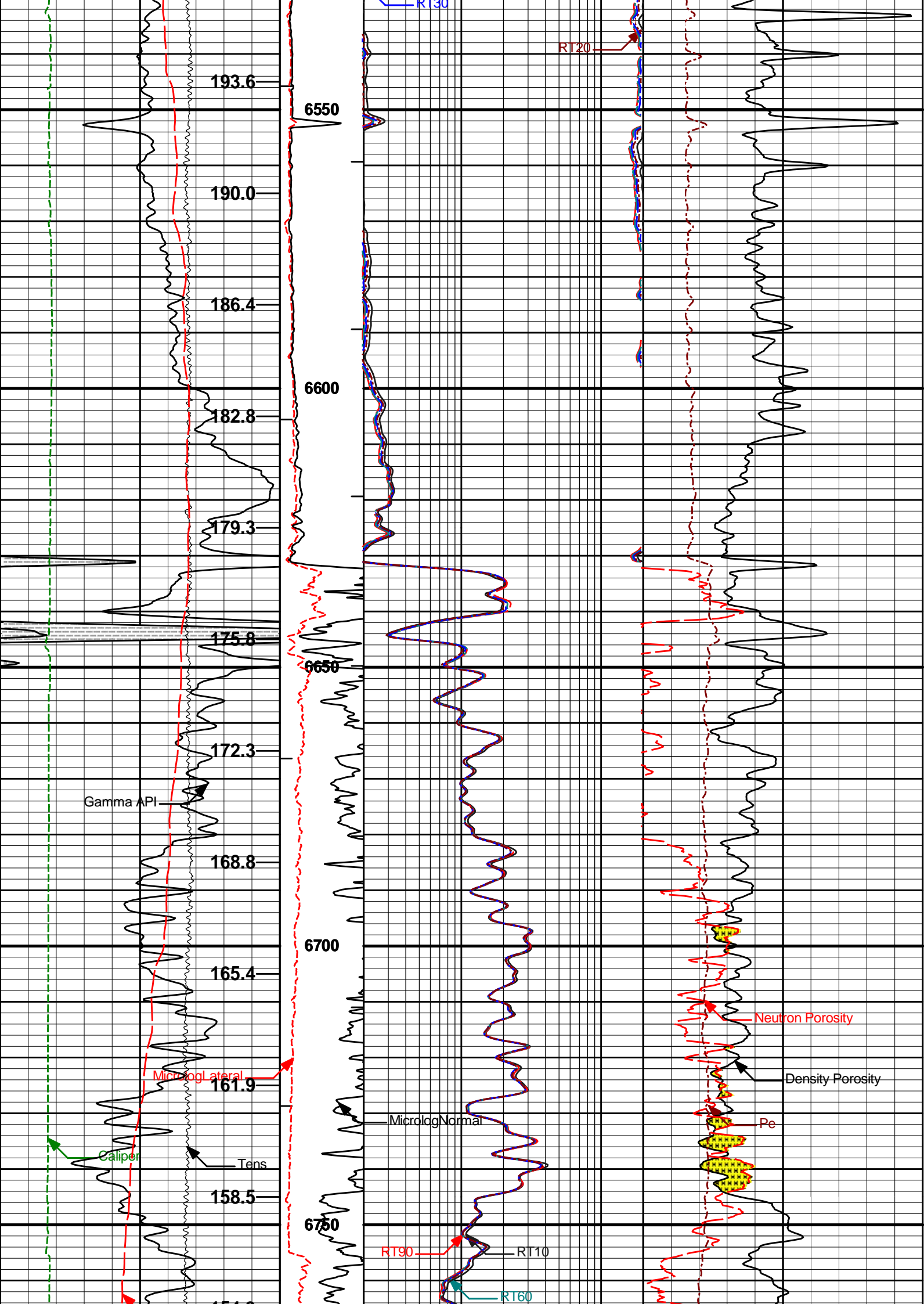


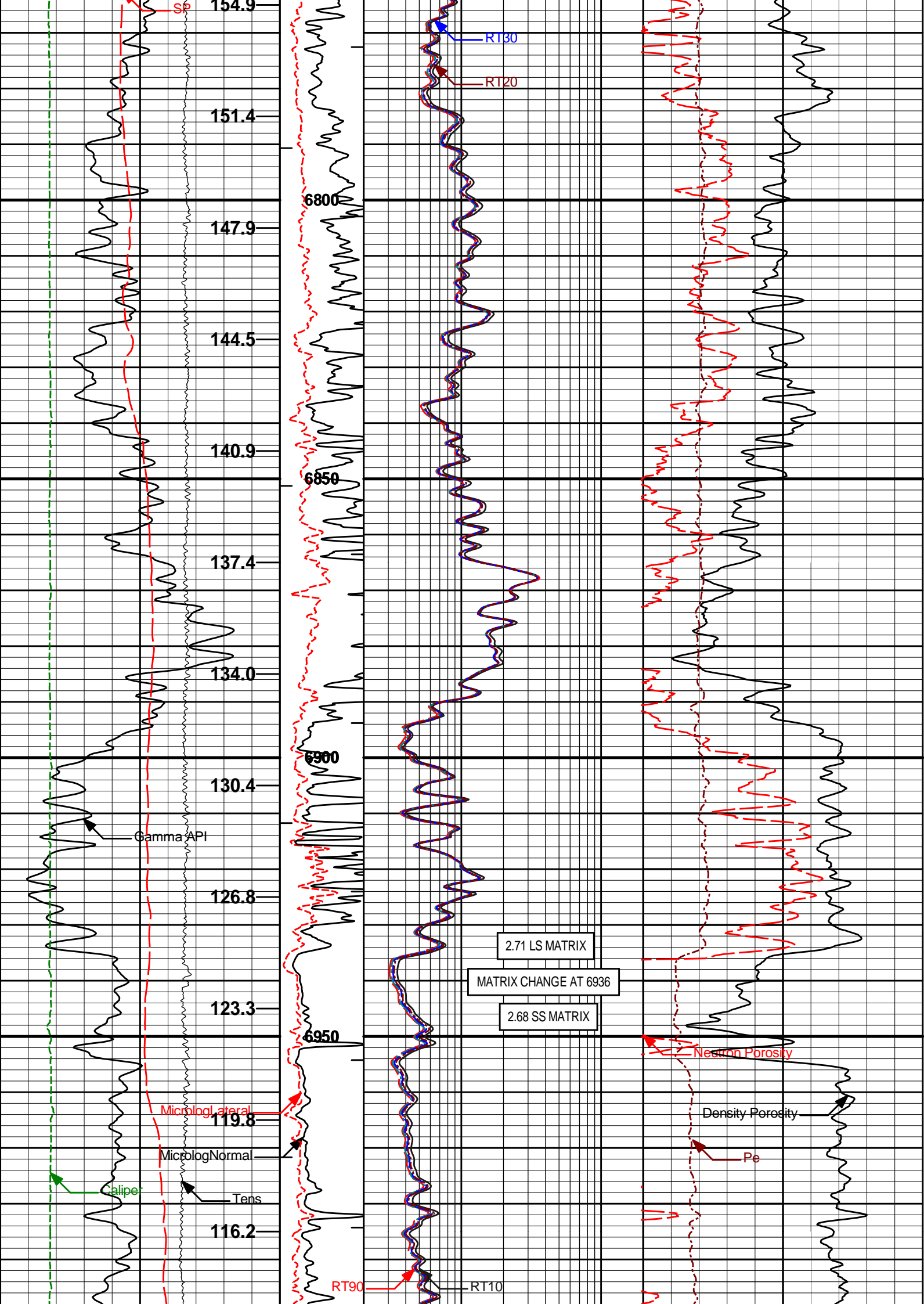


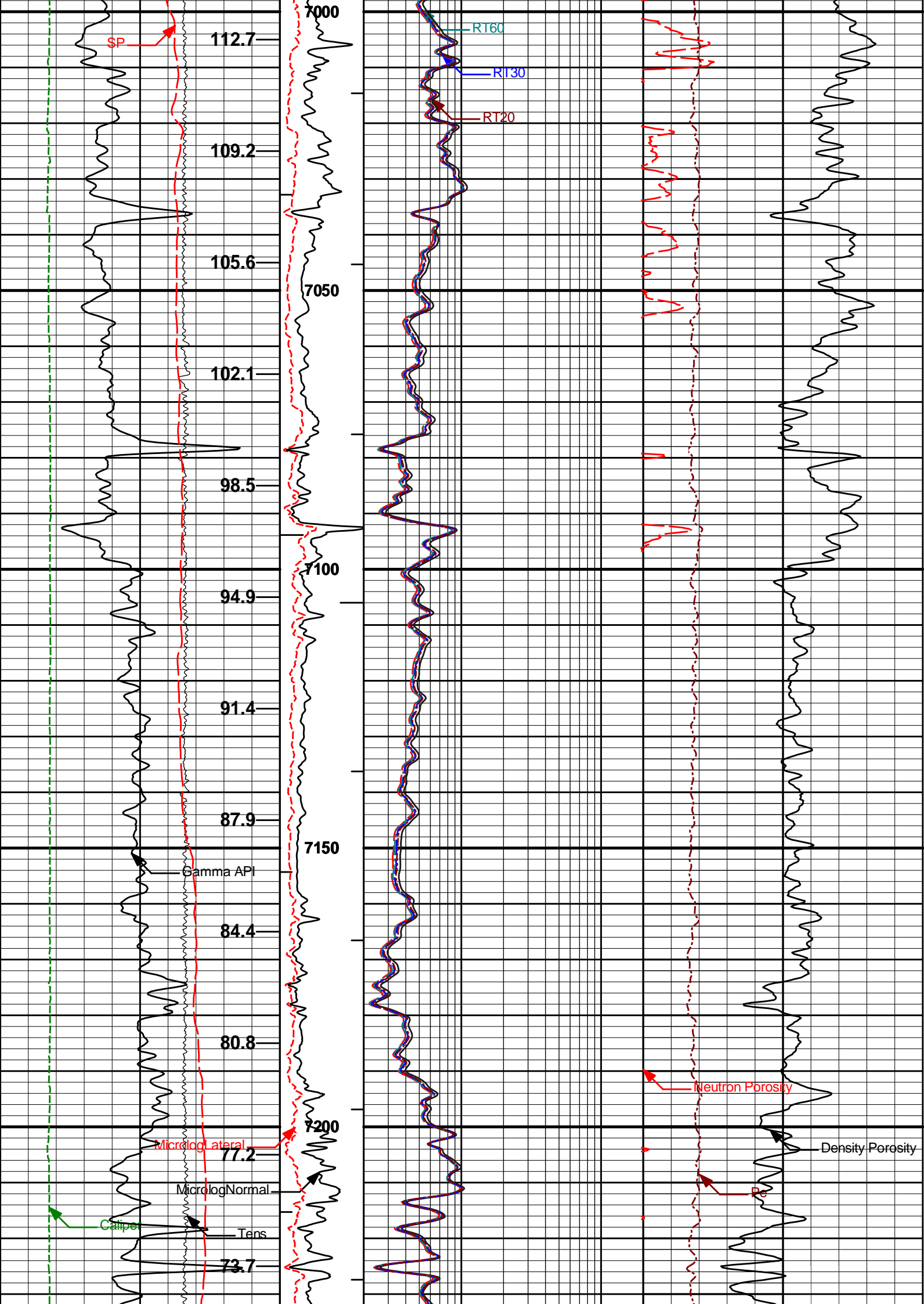


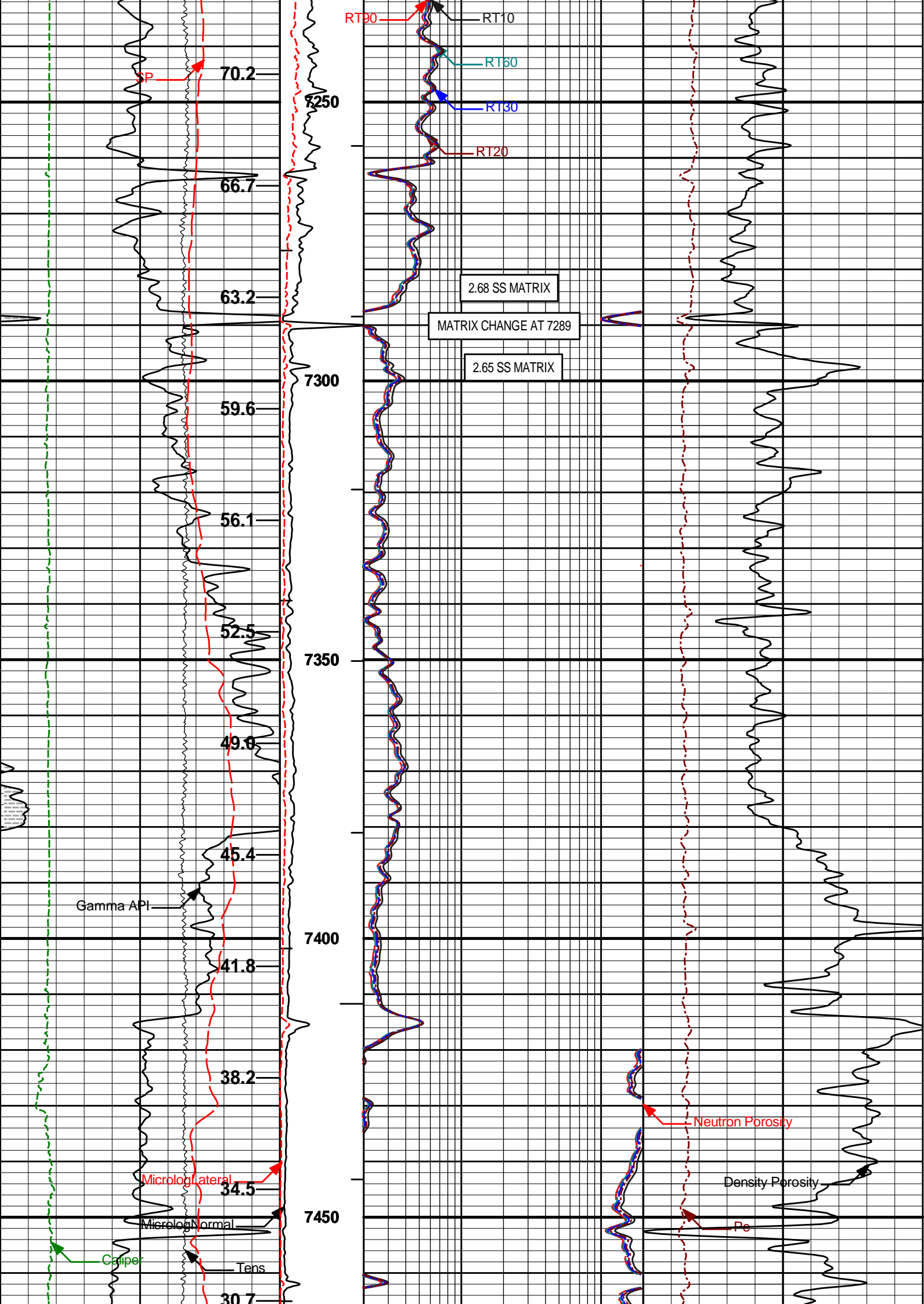


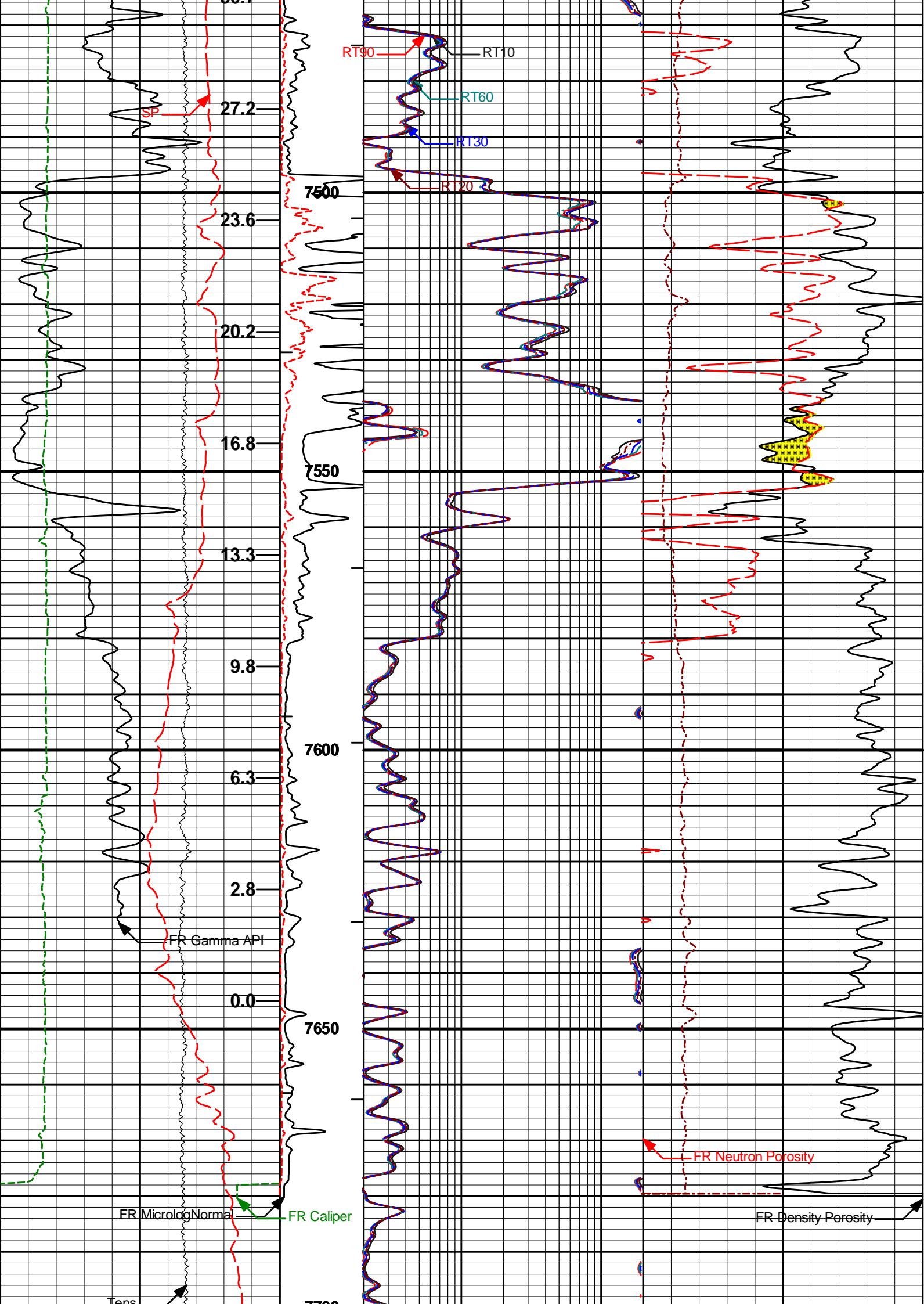


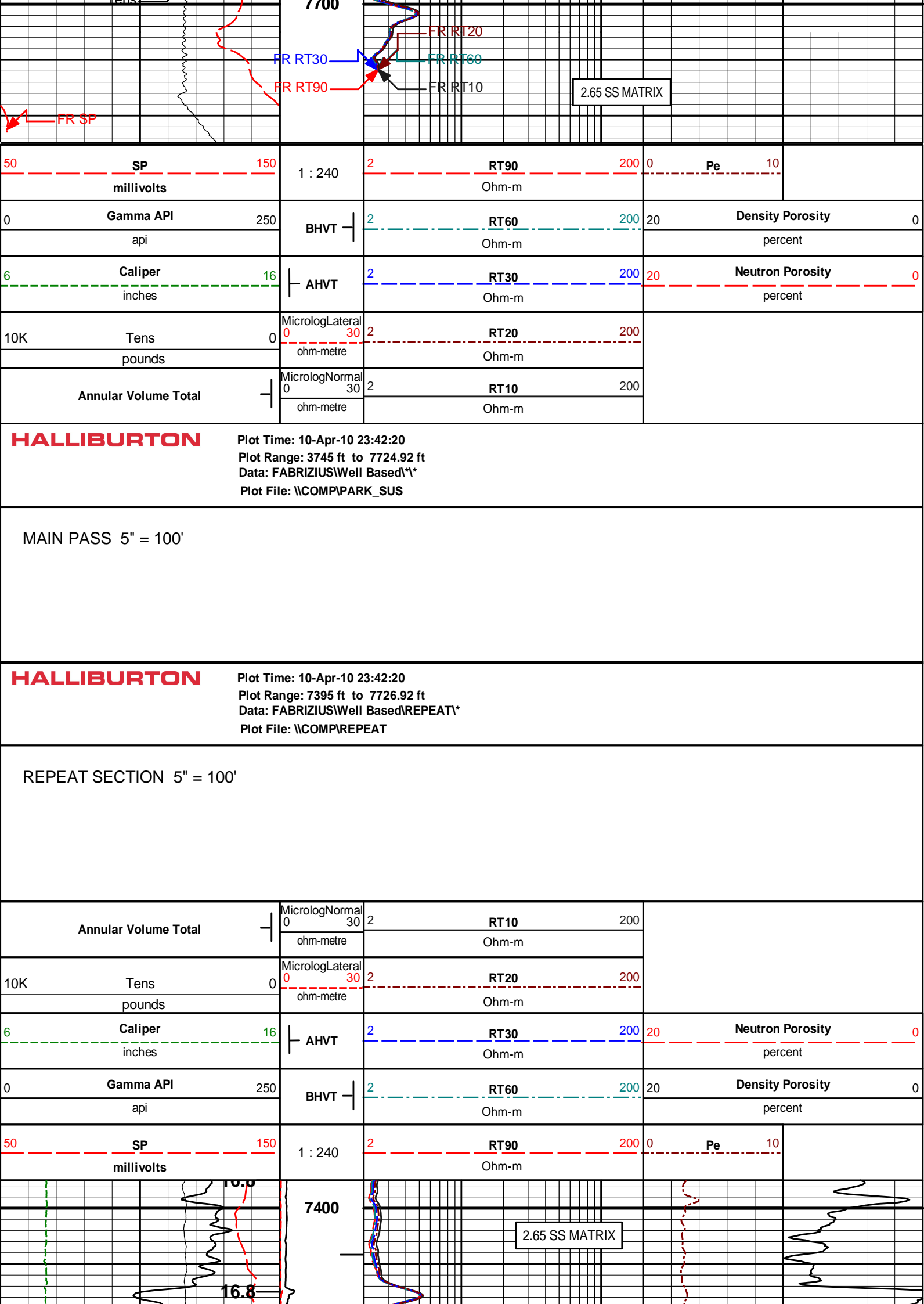




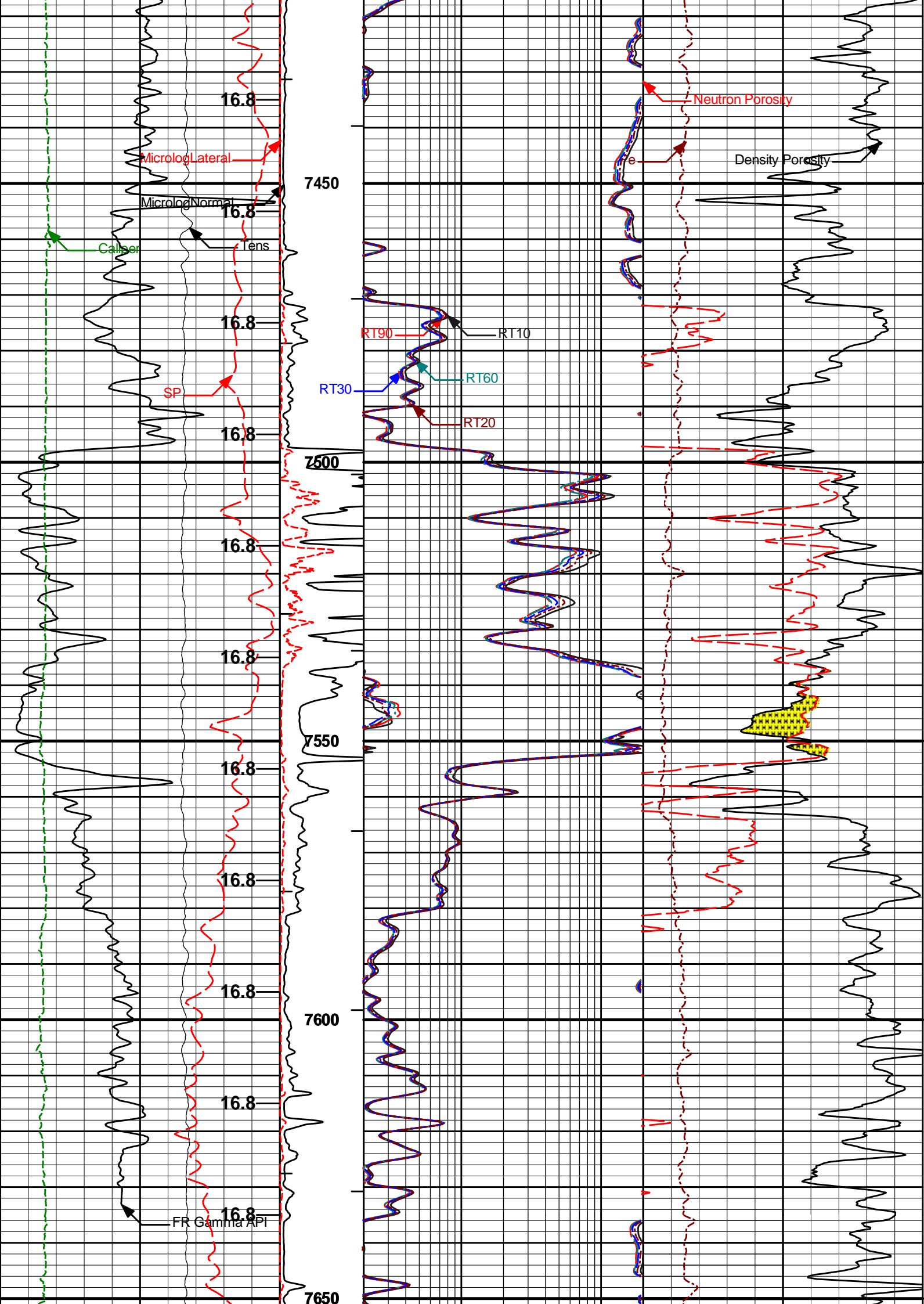




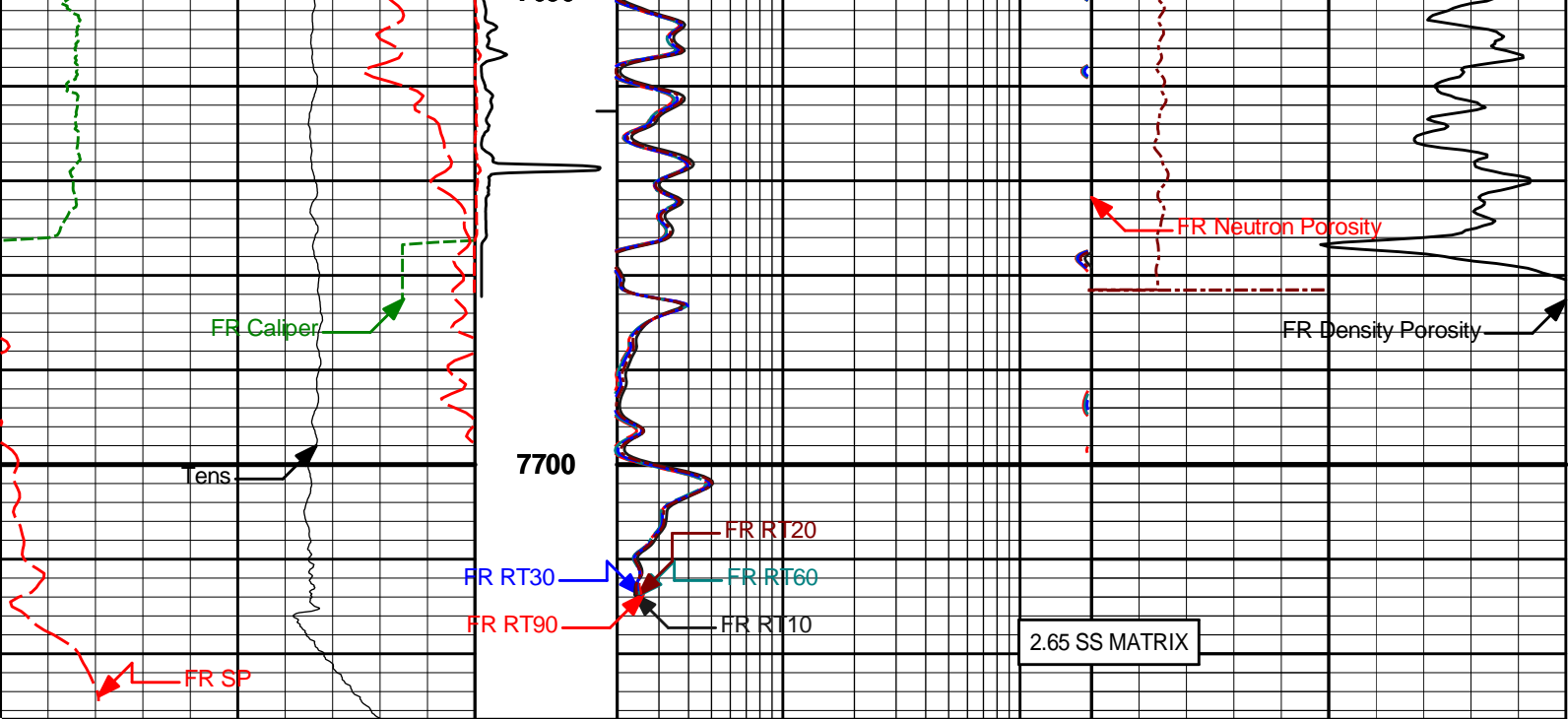












50	SP	150	1 : 240	2	RT90	200	0	Pe	10
	millivolts				Ohm-m				
0	Gamma API	250	BHVT	2	RT60	200	20	Density Porosity	0
	api				Ohm-m			percent	
6	Caliper	16	AHVT	2	RT30	200	20	Neutron Porosity	0
	inches				Ohm-m			percent	
10K	Tens	0	MicrologLateral	2	RT20	200			
	pounds		ohm-metre		Ohm-m				
	Annular Volume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

**HALLIBURTON** Plot Time: 10-Apr-10 23:42:23  
 Plot Range: 7395 ft to 7726.92 ft  
 Data: FABRIZIUS\Well Based\REPEAT\*  
 Plot File: \COMP\REPEAT

REPEAT SECTION 5" = 100'

**HALLIBURTON**

## CALIBRATION REPORT

### NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	GTET - 11277436	Reference Calibration Date:	12-Feb-10 13:50:04
Engineer:	C. BLUE	Calibration Date:	16-Mar-10 21:31:02
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	104.5	100.0	api
Background + Calibrator	344.9	330.0	api
Calibrator	225.5	230.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION				
Tool Name:	GTET - 11277436		Reference Calibration Date:	16-Mar-10 21:31:02
Engineer:	C. BLUE		Calibration Date:	10-Apr-10 11:53:42
Software Version:	WL INSITE R2.4 (Build 20)		Calibration Version:	1
Calibrator Source S/N: KW-290 Calibrator API Reference:230.00 api				
Field Verification		Shop	Field	Units
Background		100.0	131.9	api
Background + Calibrator		330.0	355.9	api
Calibrator		230.0	224.0	api
Shop		Field	Difference	Tolerance
230.0		224.0	6.0	+/- 9.00

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) or > (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) or > (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
0.1119	1.1157	0.0000	52101.1011	0.0000	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

ICT SHOP CALIBRATION

Tool Name:	ICT - 111294351	Reference Calibration Date:	21-Jan-10 09:33:08
Engineer:	C. BLUE	Calibration Date:	17-Mar-10 14:12:27
Software Version:	WL INSITE R2.4 (Build 20)	Calibration Version:	1

CALIPERS AND RINGS				
Ring	Measured	Calibrated	Units	
CALIPER 1:				
Small Ring	3.58	3.63	in	
Medium Ring	7.94	8.00	in	
Large Ring	14.91	15.00	in	
X-Large Ring	21.00	21.00	in	
CALIPER 2:				
Small Ring	3.59	3.63	in	
Medium Ring	8.08	8.00	in	
Large Ring	15.07	15.00	in	
X-Large Ring	21.06	21.00	in	
CALIPER 3:				
Small Ring	3.68	3.63	in	
Medium Ring	8.04	8.00	in	
Large Ring	15.07	15.00	in	
X-Large Ring	20.99	21.00	in	
CALIPER 4:				
Small Ring	3.57	3.63	in	
Medium Ring	7.96	8.00	in	
Large Ring	15.03	15.00	in	
X-Large Ring	20.98	21.00	in	
CALIPER 5:				
Small Ring	3.54	3.63	in	
Medium Ring	7.86	8.00	in	
Large Ring	14.88	15.00	in	
X-Large Ring	20.94	21.00	in	
CALIPER 6:				
Small Ring	3.48	3.63	in	
Medium Ring	7.87	8.00	in	
Large Ring	14.82	15.00	in	
X-Large Ring	20.92	21.00	in	

ICT FIELD CALIBRATION

Tool Name: ICT - 111294351		Reference Calibration Date: 17-Mar-10 14:12:27	
Engineer: C. BLUE		Calibration Date: 10-Apr-10 12:12:11	
Software Version: WL INSITE R2.4 (Build 20)		Calibration Version: 1	

CALIPERS				
Caliper	Shop	Field	Units	
Caliper 1	8.00	8.05	in	
Caliper 2	8.00	7.99	in	
Caliper 3	8.00	8.10	in	
Caliper 4	8.00	8.04	in	
Caliper 5	8.00	8.04	in	
Caliper 6	8.00	8.06	in	

CSNG-FS SHOP CALIBRATION			
Tool Name: CSNG - 10846351		Reference Calibration Date: 02-Dec-09 10:44:01	
Engineer: C. BLUE		Calibration Date: 21-Jan-10 14:42:19	
Software Version: WL INSITE R2.4 (Build 20)		Calibration Version: 1	
Source SN: TB-290			

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.1	23.0	Channel #
583 KEV Peak Channel #	52.3	52.2	Channel #
2614 KEV Peak Channel #	215.4	215.0	Channel #
Calibrate Temperature	44.5	49.1	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	1698.7	CPS	329.6	335.0	API
Background	374.0	CPS	68.4	73.8	API

Gamma Ray Gain: 0.99

CSNG-FS FIELD CALIBRATION			
Tool Name: CSNG - 10846351		Reference Calibration Date: 21-Jan-10 14:42:19	
Engineer: C. BLUE		Calibration Date: 10-Apr-10 12:28:20	
Software Version: WL INSITE R2.4 (Build 20)		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	23.2	Channel #
583 KEV Peak Channel #	52.2	52.3	Channel #
2614 KEV Peak Channel #	215.0	215.0	Channel #
Calibrate Temperature	49.1	65.4	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	1987.0	CPS	335.0	383.4	API
Background	633.0	CPS	73.8	122.1	API

Gamma Ray Gain: 0.97

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 11301132	Reference Calibration Date:	16-Mar-10 21:54:57
Engineer:	C. BLUE	Calibration Date:	16-Mar-10 22:06:47
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:	0.990	0.988	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):	0.2229	0.2224	0.0006	+/- 0.0020
Calibrated Ratio:	10.13	10.11	0.020	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0798	0.02000 - 0.09000

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

DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name:	DSNT - 11301132	Reference Calibration Date:	16-Mar-10 22:06:47
Engineer:	C. BLUE	Calibration Date:	10-Apr-10 12:02:51
Software Version:	WL INSITE R2.4 (Build 20)	Calibration Version:	1

Logging Source S/N: CASPER 434  
Snow Block S/N: CASPER IQ

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0798	0.0716	-0.0081	+/- 0.0150

PASS/FAIL SUMMARY	
Block Change Check:	Passed

Block Change Check:		Passed		
Snow Block Stat Check:		Passed		
Temperature Check:		Passed		
SPECTRAL DENSITY SHOP CALIBRATION				
Tool Name:	SDLT - I132M302	Reference Calibration Date:	16-Mar-10 18:12:09	
Engineer:	C. BLUE	Calibration Date:	07-Apr-10 11:49:07	
Software Version:	WL INSITE R2.4 (Build 20)	Calibration Version:	1	
Logging Source S/N: 2770 GW				
Aluminum Block S/N: BRIGHTON ALUMINUM BLOCK		Density: 2.600g/cc		
Magnesium Block S/N: BRIGHTON MAGNESIUM BLOCK		Density: 1.680g/cc		
DENSITY CALIBRATION SUMMARY				
Measurement	Previous Value	New Value	Control Limit	
Near Bar Gain	1.0655	1.0945	0.90 - 1.10	
Near Dens Gain	1.0265	1.0469	0.90 - 1.10	
Near Peak Gain	1.0258	1.0482	0.90 - 1.10	
Near Lith Gain	0.9981	1.0222	0.90 - 1.10	
Far Bar Gain	1.0225	1.0251	0.90 - 1.10	
Far Dens Gain	1.0072	1.0119	0.90 - 1.10	
Far Peak Gain	1.0015	1.0068	0.90 - 1.10	
Far Lith Gain	0.9743	0.9791	0.90 - 1.10	
Near Bar Offset	-0.3486	-0.6057	NONE	
Near Dens Offset	-0.0056	-0.1783	NONE	
Near Peak Offset	-0.0004	-0.1809	NONE	
Near Lith Offset	0.2051	0.0132	NONE	
Far Bar Offset	0.0115	-0.0045	NONE	
Far Dens Offset	0.1284	0.0888	NONE	
Far Peak Offset	0.1433	0.1009	NONE	
Far Lith Offset	0.3056	0.2685	NONE	
Near Bar Background	961.28	958.81	700 - 1450	
Near Dens Background	319.18	316.93	230 - 480	
Near Peak Background	137.07	136.46	100 - 210	
Near Lith Background	166.97	167.96	125 - 260	
Far Bar Background	507.92	507.91	450 - 900	
Far Dens Background	204.98	202.36	175 - 345	
Far Peak Background	79.01	79.43	70 - 140	
Far Lith Background	82.87	82.25	75 - 145	
CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.675	1.680	0.005	+/- 0.015
Pe	2.610	2.594	-0.016	+/- 0.150
ALUMINUM				
Density (g/cc)	2.595	2.600	0.005	+/- 0.01500
Pe	3.107	3.100	-0.007	+/- 0.150
TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0020	+/- 0.0110	0.0008	+/- 0.0140
Magnesium Block	-0.0007	+/- 0.0110	-0.0024	+/- 0.0140

Aluminum Block	-0.0008	+/- 0.0110	0.0003	+/- 0.0140
Resolution	8.90	6.00 - 11.50	9.78	6.00 - 11.50
Internal Verifier(B+D+P+L)	1580	1200 - 2700	872	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 - I132M302	Reference Calibration Date:	07-Apr-10 11:49:07
Engineer:	C. BLUE	Calibration Date:	10-Apr-10 11:54:51
Software Version:	WL INSITE R2.4 (Build 20)	Calibration Version:	1

Aluminum Block S/N: BRIGHTON ALUMINUM BLOCK      Density: 2.600g/cc  
Magnesium Block S/N: BRIGHTON MAGNESIUM BLOCK      Density: 1.680g/cc  
Pad Temperature: 71.7 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1580.156	1586.159	6.003	15.991
Far (B+D+P+L) cps	871.943	872.133	0.190	16.136
Near Resolution	8.90	8.88	-0.020	0.50
Far Resolution	9.78	10.05	0.270	1.00

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

MICRO LOG SHOP CALIBRATION

Tool Name:	SDLT - I132M302	Reference Calibration Date:	16-Mar-10 18:40:35
Engineer:	C. BLUE	Calibration Date:	10-Apr-10 11:58:53
Software Version:	WL INSITE R2.4 (Build 20)	Calibration Version:	1

CALIBRATION COEFFICIENT SUMMARY					
Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.10	-0.11	-0.00	-0.00	ohmm
Calibration Point #1	0.01	0.00	0.00	0.00	ohmm
Calibration Point #2	19.98	20.00	19.99	20.00	ohmm
Internal Reference	19.88	19.90	19.98	19.99	ohmm
Measurement	Micro Log Normal Tool Value		Micro Log Lateral Tool Value		Units
Tool Zero	0.13		0.05		V
Calibration Point #1	29.41		1.35		V
Calibration Point #2	5383.85		7020.55		V
Internal Reference	5356.70		7017.98		V

MICRO LOG FIELD CHECK

Tool Name:	SDLT - I132M302	Reference Calibration Date:	10-Apr-10 11:58:53
Engineer:	C. BLUE	Calibration Date:	10-Apr-10 11:59:24



Software Version:    WL INSITE R2.4 (Build 20)			Calibration Version:    1		
	Measurement	Micro Log Normal		Micro Log Lateral	
		Shop	Field	Shop	Field
	Units				
	Tool Zero	-0.11	-0.11	-0.00	-0.00
	ohmm				
	Internal Reference	19.90	19.90	19.99	20.00
	ohmm				
Summary					
Signal	Shop	Field	Difference	Tolerance	
Microlog Normal	19.90	19.90	0.00	+/- 0.80	
Microlog Lateral	19.99	20.00	-0.01	+/- 0.80	

DENSITY CALIPER SHOP CALIBRATION					
Tool Name:    SDLT - I132M302		Reference Calibration Date:    16-Mar-10 18:57:30			
Engineer:    C. BLUE		Calibration Date:    07-Apr-10 12:16:22			
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	-1042.23	-1217.68	-7000.00 - -1000.00	
	Pad Gain	0.0003728	0.0003777	0.000200 - 0.000600	
	Arm Offset	-1263.19	-1367.51	-5000.00 - 3000.00	
	Arm Gain	0.0005228	0.0005322	0.000300 - 0.000700	
	Arm Power	-0.000005649	-0.000006641	-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)	2.04	2.00	-0.04	+/- 0.20
	Medium Ring (in)	3.77	3.75	-0.02	+/- 0.20
	RING DIAMETER:				
	Small Ring (in)	6.59	6.50	-0.09	+/- 0.20
Medium Ring (in)	8.33	8.25	-0.08	+/- 0.20	
Large Ring (in)	15.19	15.00	-0.19	+/- 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 - I132M302		Reference Calibration Date:    07-Apr-10 12:16:22			
Engineer:    C. BLUE		Calibration Date:    10-Apr-10 11:56:36			
Software Version:    WL INSITE R2.4 (Build 20)		Calibration Version:    1			

	MEASURED CALIPER VALUES				
	Measurement	Shop	Field	Change	Control Limit On New Value
	Pad Extension	3.75	3.71	-0.04	+/- 0.10
	Ring Diameter	8.25	8.28	0.03	+/- 0.15

PASS/FAIL SUMMARY		
Pad Extension Check:		Passed
Diameter Check:		Passed

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION									
Tool Name:		ACRt - 90199007-E6758-S4352				Reference Calibration Date:		19-Jan-10 22:08:10	
Engineer:		C. BLUE				Calibration Date:		01-Mar-10 17:38:41	
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	0.9939	1.05	0.95	0.9953	1.05	0.95	0.9899	1.05
A2 (50")	0.95	0.9972	1.05	0.95	0.9978	1.05	0.95	0.9960	1.05
A3 (29")	0.95	0.9901	1.05	0.95	0.9915	1.05	0.95	0.9874	1.05
A4 (17")	0.95	0.9925	1.05	0.95	0.9914	1.05	0.95	0.9888	1.05
A5 (10")	N/A	N/A	N/A	0.95	0.9841	1.05	0.95	0.9810	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9753	1.05	0.95	0.9709	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	-0.928	2	-6	-4.042	-2	-8	-5.109	-2
A2 (50")	-7	-3.290	-2	-6	-4.046	-2	-7	-4.468	-2
A3 (29")	-27	-13.749	-9	-9	-3.996	-3	-7	-3.103	-1
A4 (17")	-180	-98.435	-60	-45	-32.130	-15	-39	-25.622	-13
A5 (10")	N/A	N/A	N/A	-150	-86.381	-50	-80	-42.634	-10
A6 (6")	N/A	N/A	N/A	175	292.408	525	90	150.590	270
TRANSMITTER CURRENT GAIN						R-MUD VERIFICATION			
Signal	Lower		R	Upper		Signal	Lower (ohm-m)	Measured (ohmm)	Upper (ohm-m)
12K		0.6	0.8611	1.3		Mud Cell	0.95	1.009	1.05
36K		1.0	1.8842	2.0					
72K		1.0	1.0999	2.0					
CALIBRATION SUMMARY									
Sensor		Shop	Field	Post	Difference	Tolerance	Units		
GTET-11277436									
Gamma Ray Calibrator		230.0	224.0	-----	6.0	+/- 9.00	api		
ICT-111294351									
Caliper 1		8.00	8.05	-----	-0.05	+/-0.25	in		
Caliper 2		8.00	7.99	-----	0.01	+/-0.25	in		
Caliper 3		8.00	8.10	-----	-0.10	+/-0.25	in		
Caliper 4		8.00	8.04	-----	-0.04	+/-0.25	in		
Caliper 5		8.00	8.04	-----	-0.04	+/-0.25	in		
Caliper 6		8.00	8.06	-----	-0.06	+/-0.25	in		
CSNG-10846351									
60 KEV Peak Channel #		48.0	48.0	-----	0.0	-----	Channel #		
239 KEV Peak Channel #		23.0	23.2	-----	-0.2	-----	Channel #		
583 KEV Peak Channel #		52.2	52.3	-----	-0.1	-----	Channel #		
2614 KEV Peak Channel #		215.0	215.0	-----	0.0	-----	Channel #		
DSNT-11301132									
Snow-Block Porosity		0.0798	0.0716	-----	0.0082	+/- 0.0150	decp		
SDLT-I132M302									
Near(B+D+P+L)		1580.156	1586.159	-----	-6.003	+/-15.991	cps		
Far(B+D+P+L)		871.943	872.133	-----	-0.190	+/-16.136	cps		
MicroLog Normal		19.90	19.90	-----	0.00	+/-0.80	ohmm		
MicroLog Lateral		19.99	20.00	-----	-0.01	+/-0.80	ohmm		
Pad Extension		3.75	3.71	-----	0.04	+/-0.10	in		

Ring Diameter	8.25	8.28	-----	-0.030	+/-0.15	in
ACRt-90199007-E6758-S4352						
Mud Cell	1.009	-----	-----	0.000	-----	ohmm
Data: FABRIZIUS\0001 QUAD-IDT-ICT-CSNG\VDLE				Date: 10-Apr-10 19:00:55		

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
					105.42 ft
RWCH-B097 135.00 lbs	Ø 3.625 in →		← Load Cell @ 101.74 ft ← BH Temperature @ 101.17 ft	6.25 ft	
					99.17 ft
GTET-11277436 165.00 lbs	Ø 3.625 in →		← GammaRay @ 93.11 ft	8.52 ft	
					90.65 ft
IDT-11277452 150.00 lbs	Ø 3.625 in →			7.58 ft	
					83.07 ft
ICT-111294351 330.00 lbs	Ø 3.625 in →		← ICT Caliper @ 73.03 ft	12.83 ft	
					70.24 ft
CSNG-10846351 114.00 lbs	Ø 3.625 in →		← CSNG @ 64.61 ft	8.17 ft	
					62.07 ft

DSNT-11301132  
174.00 lbs

Ø 3.625 in →

9.69 ft

← DSN Far @ 55.14 ft  
← DSN Near @ 54.39 ft



52.39 ft

SDLT-1132M302  
360.00 lbs

Ø 4.500 in →

10.81 ft

Ø 4.750 in →

SDL Microlog @ 44.57 ft  
SDL Caliper @ 44.39 ft  
SDL @ 44.38 ft



41.57 ft

Flex Joint - Pressure Comp-KW-BLACK  
140.00 lbs

Ø 3.625 in →

5.97 ft



35.60 ft

BSAT-11105780  
300.00 lbs

Ø 3.625 in →

15.77 ft

← Sonic Receivers @ 27.09 ft



19.83 ft



ACRt-90199007-E6758-S4352  
250.00 lbs

Ø 3.625 in →

19.25 ft

← Mud Resistivity @ 13.44 ft

← ACRt @ 9.46 ft

Cabbage Head-KW_1 10.00 lbs		Ø 3.625 in Ø 6.000 in				SP @ 1.86 ft				0.58 ft	0.00 ft
Mnemonic		Tool Name		Serial Number		Weight (lbs)	Length (ft)	Accumulated Length (ft)		Max.Log. Speed (fpm)	
RWCH	Releasable Wireline Cable Head		B097		135.00		6.25	99.17		300.00	
GTET	Natural Gamma Ray Tool		11277436		165.00		8.52	90.65		60.00	
IDT	Insite Directional Tool		11277452		150.00		7.58	83.07		30.00	
ICT	Six Independent Arm Caliper		111294351		330.00		12.83	70.24		30.00	
OBCEN	Centralizer - 29 in.Overbody		C		12.00		2.42	*	79.80	300.00	
CSNG	Compensated Spectral Natural Gamma		10846351		114.00		8.17	62.07		15.00	
DSNT	Dual Spaced Neutron		11301132		174.00		9.69	52.39		60.00	
DCNT	DSN Decentralizer		10860047		50.00		5.13	*	55.72	300.00	
SDLT	Spectral Density Tool		I132M302		360.00		10.81	41.57		60.00	
FLEX	Flex Joint		KW-BLACK		140.00		5.97	35.60		300.00	
BCAS	Borehole Sonic Array Tool		11105780		300.00		15.77	19.83		60.00	
OBCEN	Centralizer - 29 in.Overbody		A		12.00		2.42	*	32.55	300.00	
ACRt	Array Compensated True Resistivity		90199007-E6758-S4352		250.00		19.25	0.58		300.00	
SP	SP Ring		PROTO1		0.00		0.25	*	1.86	300.00	
OBCEN	Centralizer - 29 in.Overbody		B		12.00		2.42	*	16.33	300.00	
CBHD	Cabbage Head		KW_1		10.00		0.58	0.00		300.00	
Total						2,214.00	105.42				
* Not included in Total Length and Length Accumulation.											
Data: FABRIZIUS\0001 QUAD-IDT-ICT-CSNG\IDLE										Date: 10-Apr-10 18:05:19	

COMPANY	NOBLE		
WELL	FABRIZIUS 1161-34-22		
FIELD	WATTENBERG		
COUNTY	WELD	STATE	CO
HALLIBURTON		SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TRUE RESISTIVITY	