HALLIBURTON

DUAL SPACED NEUTRON SPECTRAL DENSITY ARRAY COMPENSATED TRUE RESISTIVITY

COMPANY ANADARKO E&P ONSHORE LLC
WELL SWITCHMAN 1647-17-11H
FIELD/BLOCK WILDCAT
COUNTY CHEYENNE STATE CO

COMPANY **ANADARKO E&P ONSHORE LLC**

WELL **SWITCHMAN 1647-17-11H**

FIELD/BLOCK **WILDCAT**

COUNTY **CHEYENNE** STATE **CO**

API No. 05017077770000

Location SHL: 350' FSL & 600' FWL SWSW

LATITUDE: 38.658071
LONGITUDE: -102.711518

Sect. 17 Twp. 16S Rge. 47W

Other Services:
DTDD
CSNG
XRMI

Permanent Datum	GL	Elev. 4186.0 ft	Elev.: K.B. 4205.0 ft
Log measured from	KB	19.0 ft above perm. Datum	D.F. 4205.0 ft
Drilling measured from	KB		G.L. 4186.0 ft

Date		25-Jan-14					
Run No.		ONE					
Depth - Driller		9230.00 ft					
Depth - Logger		9196.0 ft					
Bottom - Logged Interval		9175 ft					
Top - Logged Interval		CASING					
Casing - Driller		7.000 in @ 5654.0 ft		@		@	
Casing - Logger		5654.0 ft					
Bit Size		6.125 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	8.4 ppg	39.00 s/qt				
PH	Fluid Loss	9.60 pH	10.8 cptm				
Source of Sample		MEASURED					
Rm @ Meas. Temperature		2.890 ohmm @ 59.80 degF		@		@	
Rmf @ Meas. Temperature		3.64 ohmm @ 60.20 degF		@		@	
Rmc @ Meas. Temperature		3.950 ohmm @ 60.40 degF		@		@	
Source Rmf	Rmc	MEASURED	MEASURED				
Rm @ BHT		1.21 ohmm @ 151.0 degF		@		@	
Time Since Circulation		40.0 hr					
Time on Bottom		25-Jan-14 16:30					
Max. Rec. Temperature		151.0 degF @ 9177.0 ft		@		@	
Equipment	Location	11454566	BRIGHTON				
Recorded By		J. SCHMIDT					
Witnessed By		MICAH BEALE					

Fold here

Service Ticket No.: N/A
API Serial No.: 05017077770000
PGM Version: WL INSITE R3.8.12 (Build 3)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

Date	Sample No.						
Depth-Driller							
Type Fluid in Hole							
Density	Viscosity						
Ph	Fluid Loss						
Source of Sample							
Rm @ Meas. Temp		@	@	@	@	@	@
Rmf @ Meas. Temp.		@	@	@	@	@	@
Rmc @ Meas. Temp.		@	@	@	@	@	@
Source Rmf	Rmc						
Rm @ BHT		@	@	@	@	@	@
Rmf @ BHT		@	@	@	@	@	@
Rmc @ BHT		@	@	@	@	@	@

RESISTIVITY SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

RESISTIVITY EQUIPMENT DATA

Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
ONE	ACRT	N/A	0.25" S.O.	N/A
	11302817			
	11294353			

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.	ONE	Run No.	ONE
Serial No.	11812983	Serial No.		Serial No.	11795867	Serial No.	11812167
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.	GTET	Spacing		Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	Cs-137	Source Type	Am241Be
Length	8"	LSA [Y/N]		Serial No.	5471GW	Serial No.	DSN 434
Distance to Source	24'	FWDA [Y/N]		Strength	1.78 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	TD	CSG	REC	0	200				1.95	2.95	271	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@

Remarks: DTDD/HDDS/GTET/CSNG/DSNT/SDLT/XRMI/ACRT RAN IN COMBINATION

TENSION PULLS, WASHOUTS, AND BOREHOLE RUGOSITY CAN AFFECT TOOL RESPOSE

ANNULAR HOLE VOLUME CALCULATED FOR 4.5-INCH CASING

YOUR CREW: A. AXE, K. PRIEST, N. EHLERS RIG: PIONEER 54

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES - BRIGHTON, CO - (303) 655-4700

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PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	6.125	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	8.450	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	1200.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	2.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	4.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	9230.00	ft
	SHARED	BHT	Bottom Hole Temperature	200.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	XRMI-I Instrument	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	XRMI-I Instrument	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa /	AFAC	Archie A factor	0.6200	

CrossPlot	AFAC	Archie A factor	0.6200	
Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
CSNG	CGOK	Process CSNG Data?	Yes	
CSNG	CENT	Is Tool Centralized?	No	
CSNG	GBOK	Gamma Enviromental Corrections?	Yes	
CSNG	BARF	Barite Correction Factor	1.00	
CSNG	ORDG	Use Fixed Gain	No	
CSNG	ORDO	Use Fixed Offset	No	
CSNG	ORDR	Use Fixed Resolution Degradation Factor	No	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTP	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
XRMI-I Instrument	WRTI	Survey Writing Interval	30	ft
XRMI-I Instrument	SOPT	Smoothing Option	None	
XRMI-I Mandrel	DIMG	Process XRMI?	Yes	
XRMI-I Mandrel	ROTI	Rotate Image (N-E-S-W-N)?	No	
XRMI-I Mandrel	AGN	Use Button Auto Gain?	Yes	
XRMI-I Mandrel	BCLR	Button Auto Gain Color	127	
XRMI-I Mandrel	BFIL	Button Auto Gain Filter	0.020	
XRMI-I Mandrel	BGAN	Button Gain Value	0.001	
XRMI-I Mandrel	BOFF	Button Offset	0	
XRMI-I Mandrel	DIPE	Process Dipmeter Calculations?	Yes	
XRMI-I Mandrel	BHCS	Process Borehole Corrections?	Yes	
XRMI-I Mandrel	CLOK	Process Caliper Outputs?	Yes	
XRMI-I Mandrel	CMAX	Caliper Maximum Limit	100.0	in
XRMI-I Mandrel	CMIN	Caliper Mimimum Limit	3.5	in
XRMI-I Mandrel	NAVS	Navigation Source Tool	XRMI-I Instrument	
XRMI-I Mandrel	BHVC	Radius type for borehole volume calcuations	Elliptical	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in

ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
ACRt Sonde	TPOS	Tool Position	Eccentered	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm

BOTTOM

Data: SWITCHMAN_1647\0002 TC_CSNG_XRMI_TPL\001 25-Jan-14 14:14 Dn @5497.5f

Date: 25-Jan-14 15:35:39

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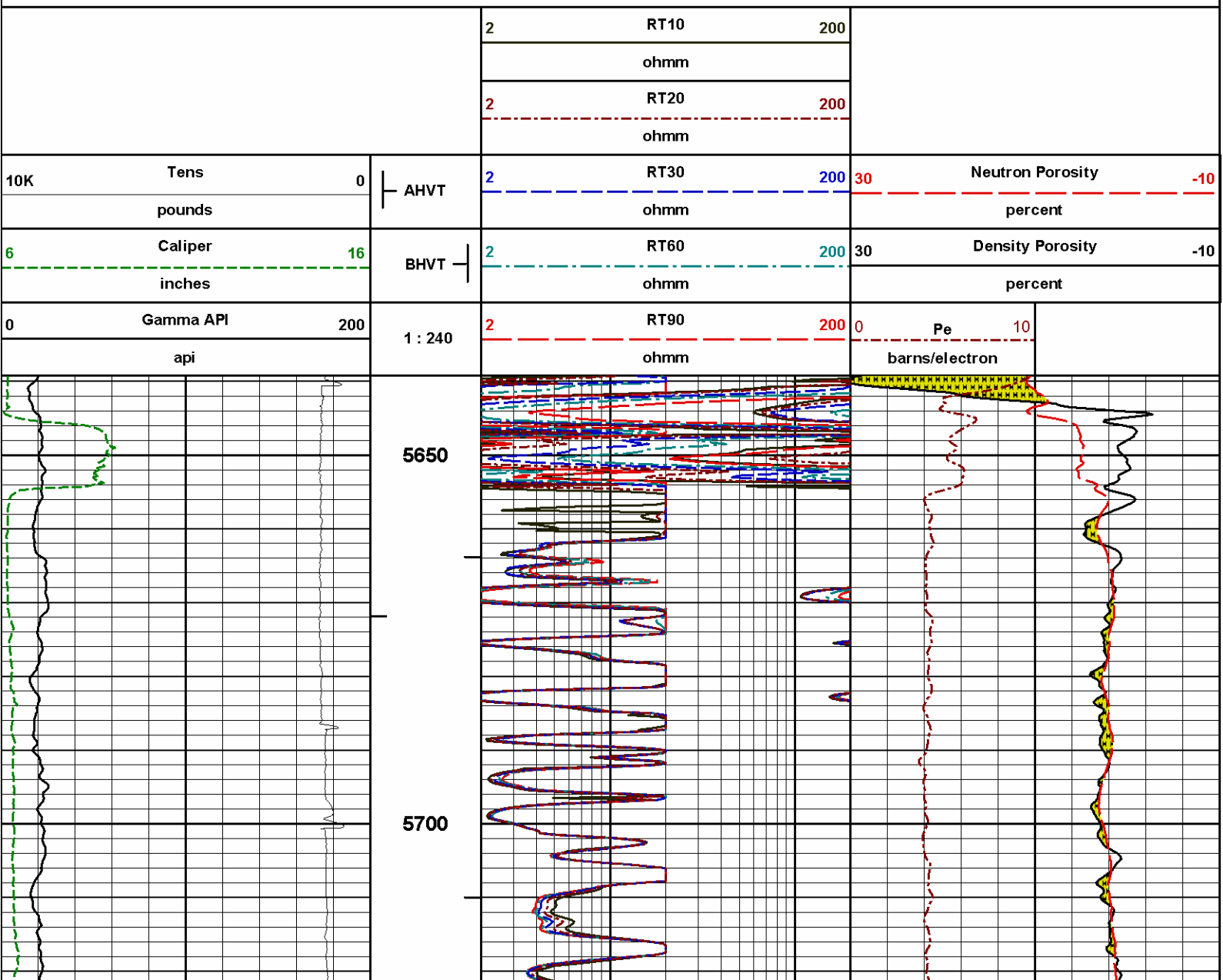
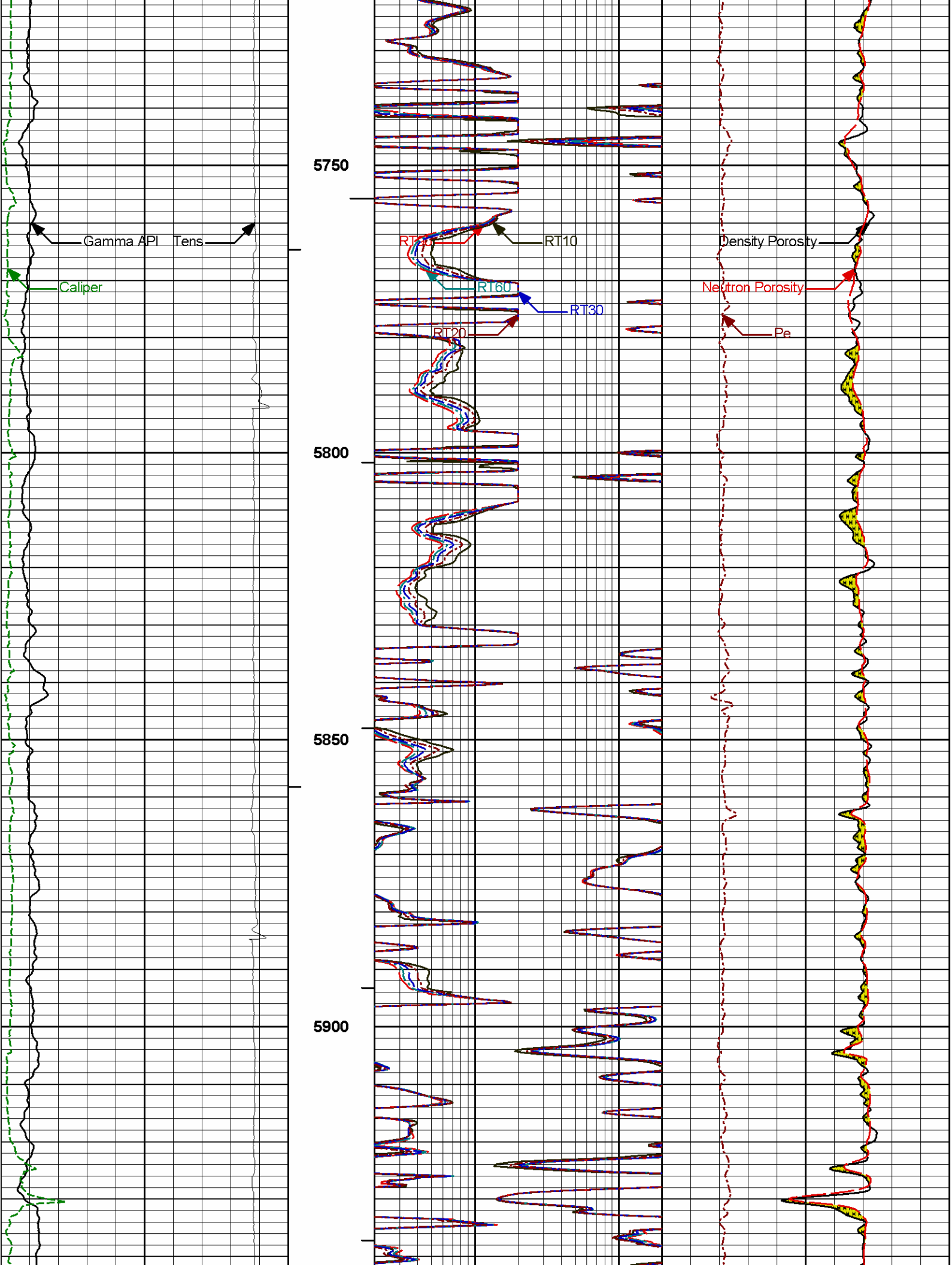
Plot Time: 26-Jan-14 00:03:08
Plot Range: 5639.25 ft to 9187.5 ft
Data: SWITCHMAN_1647\Well Based\MAIN\
Plot File: \\COMP\MAIN

MAIN PASS 5" = 100'

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RT10
RT60
RT30
RT20
Density Porosity
Neutron Porosity
Pe
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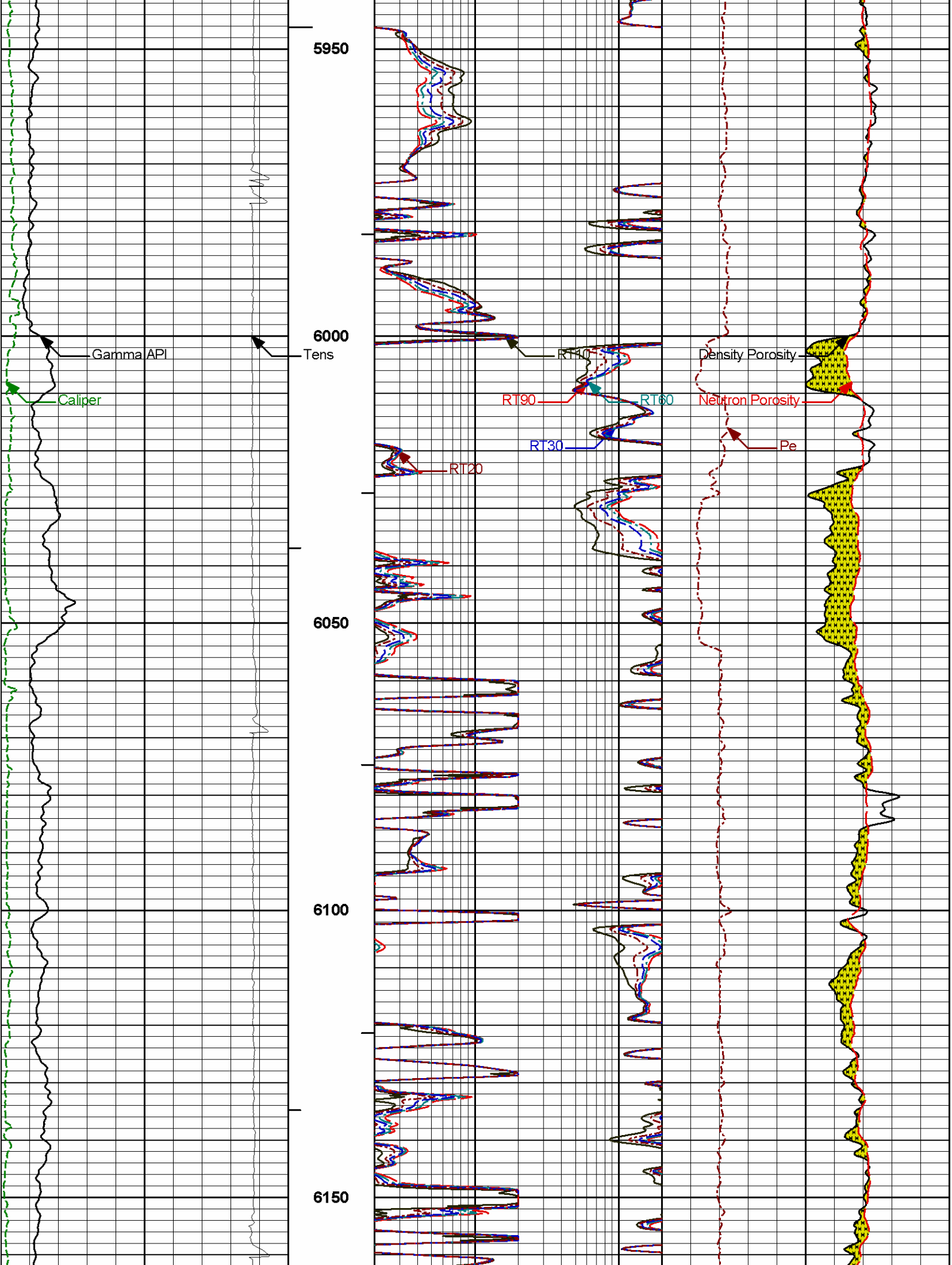
5800
5850
5900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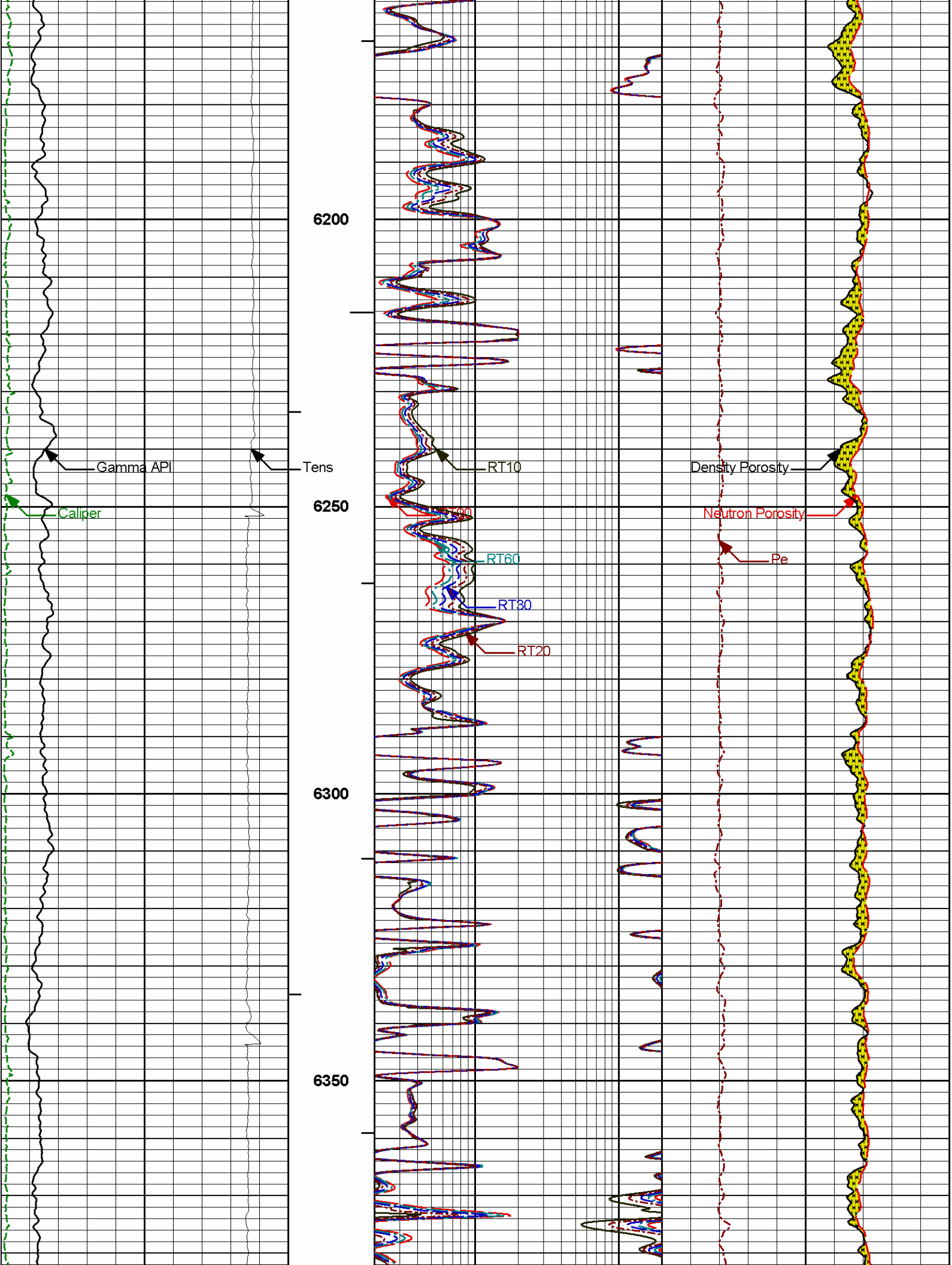
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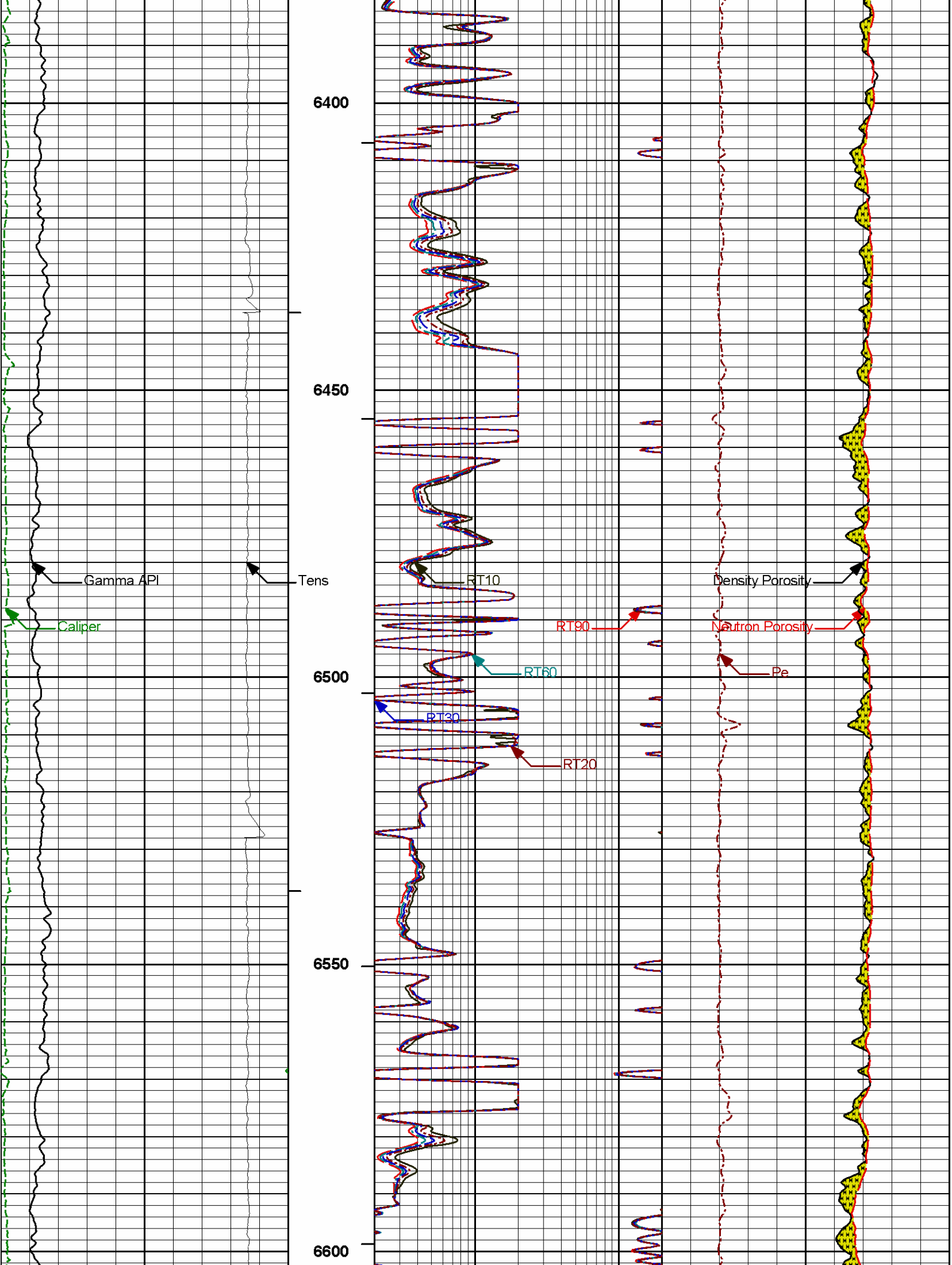
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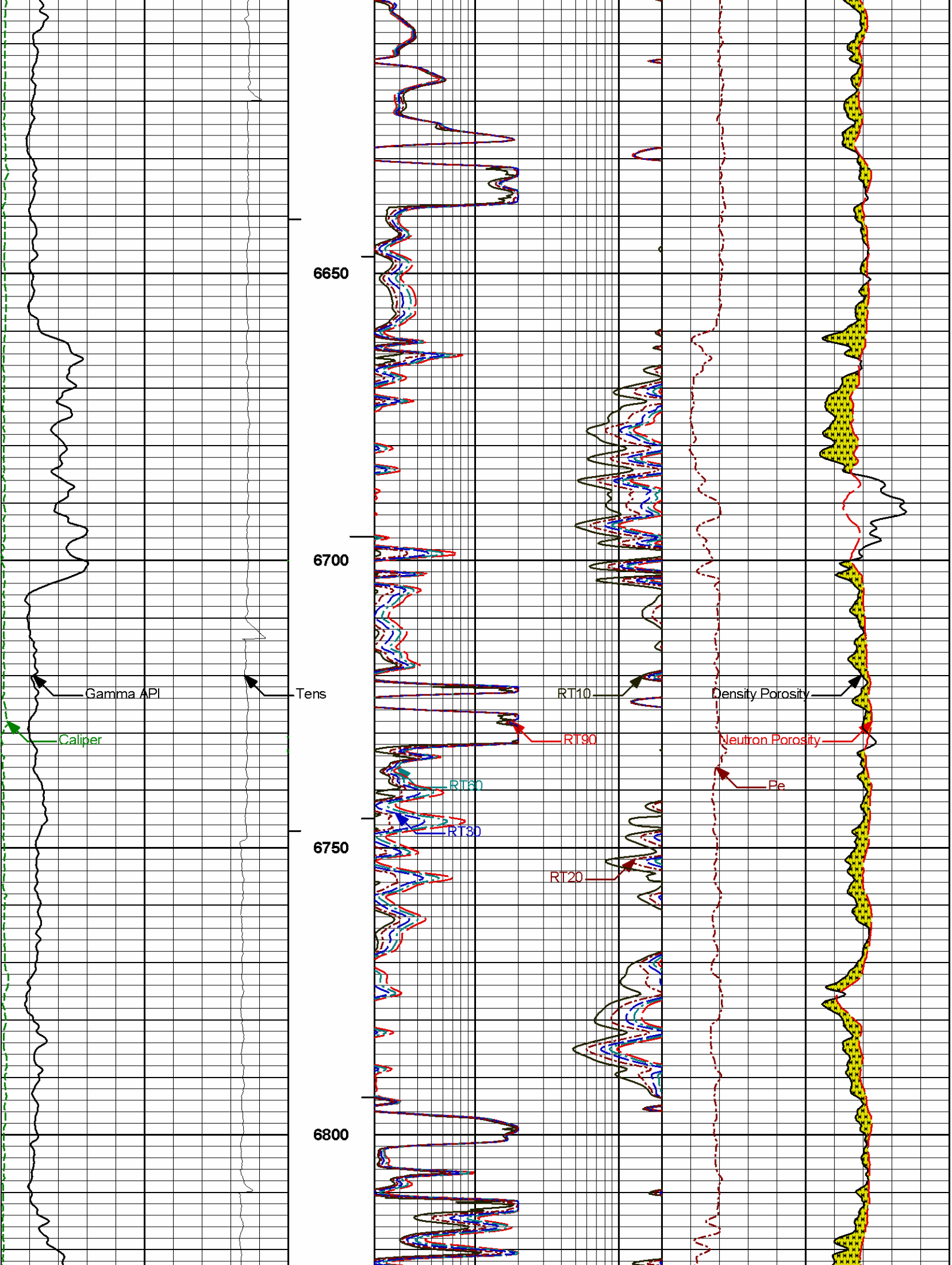
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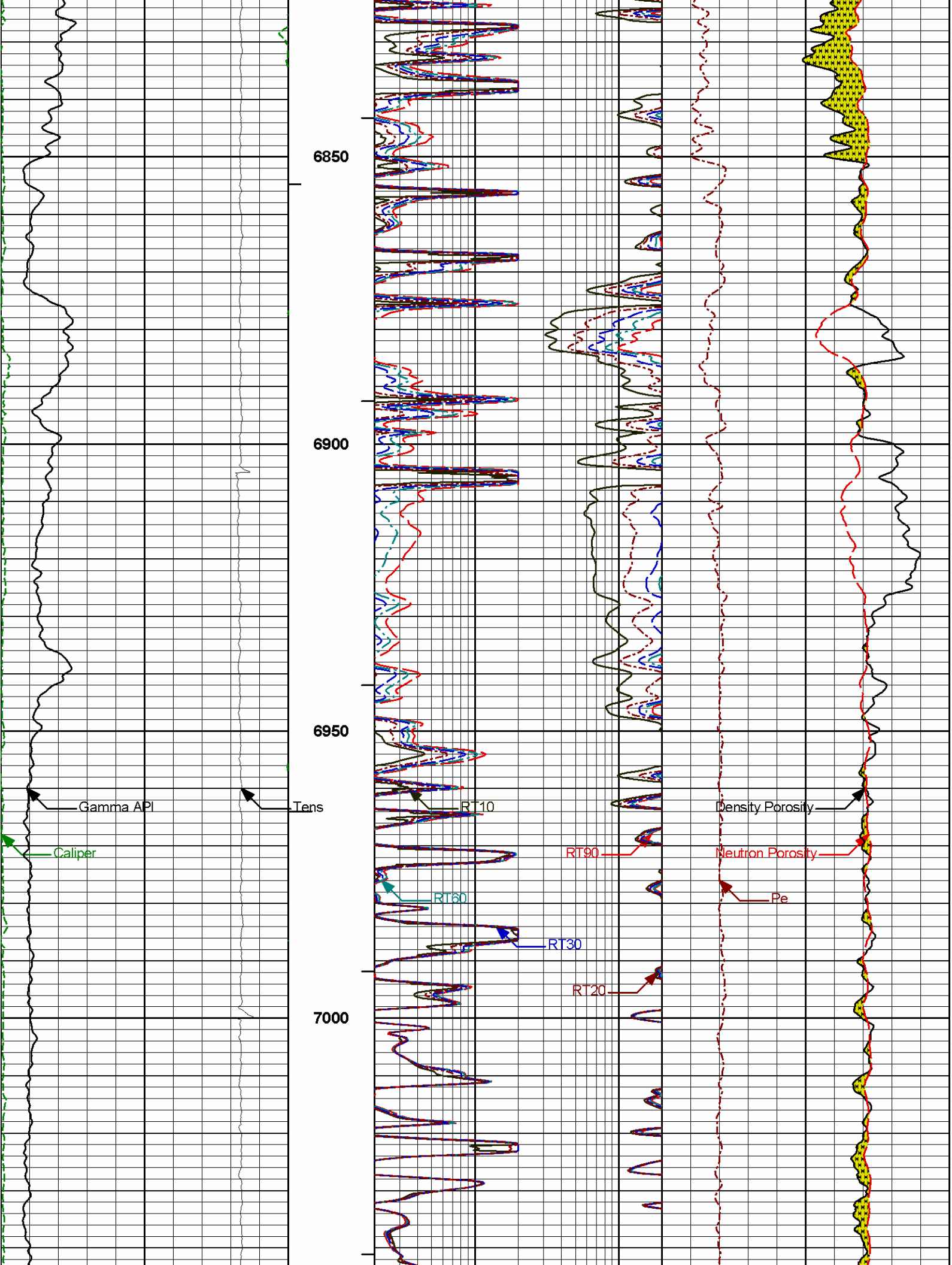
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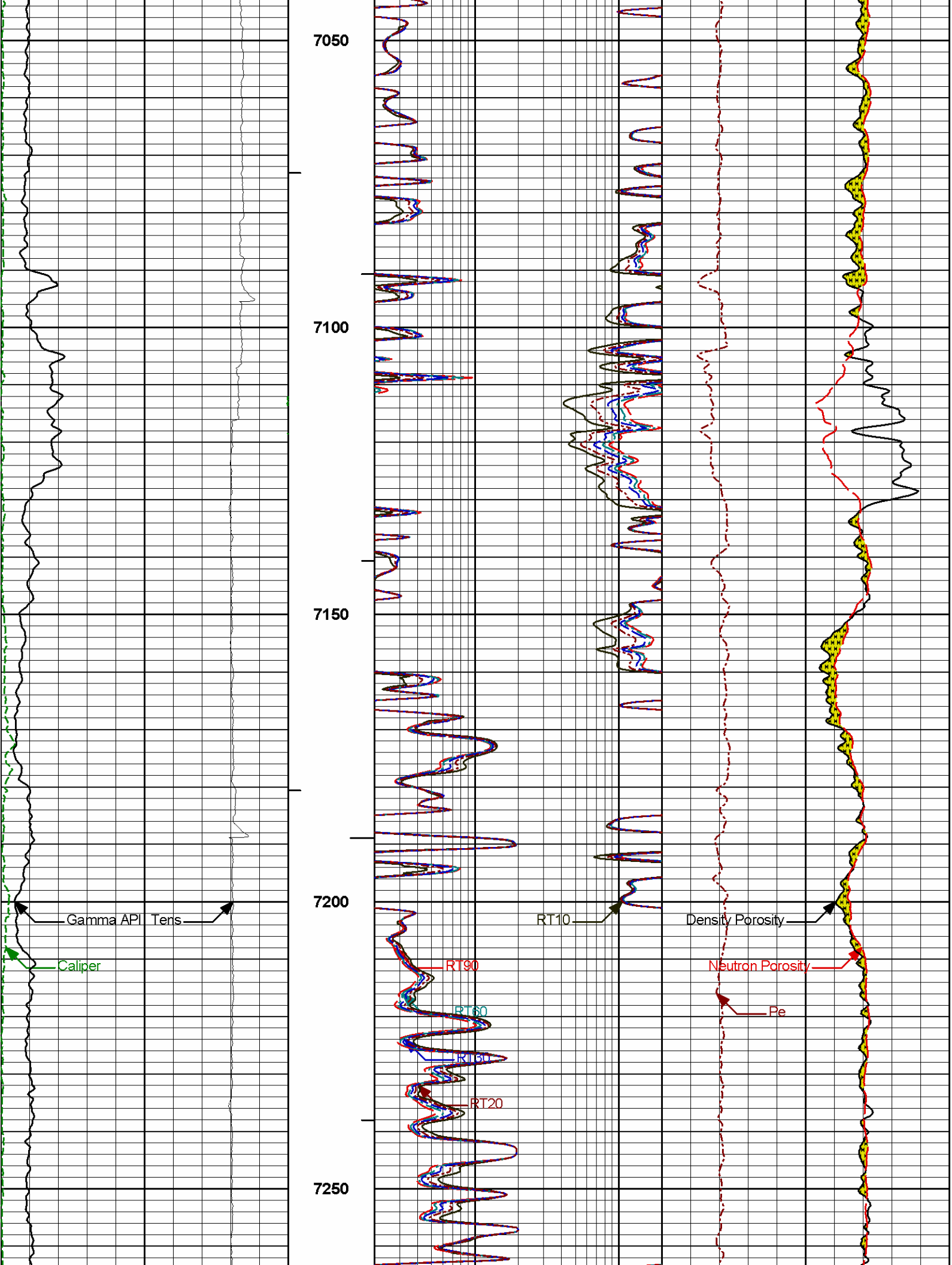
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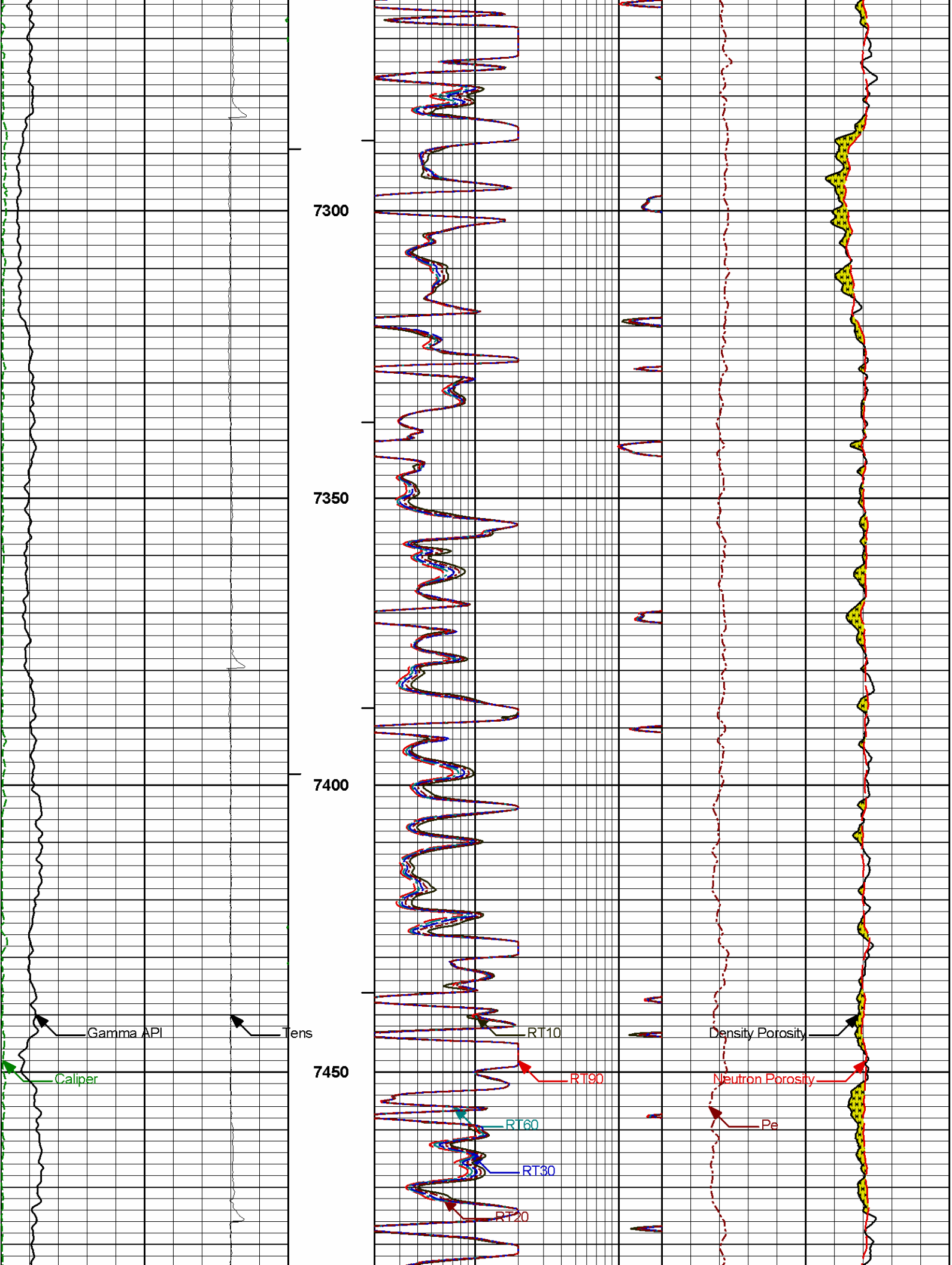
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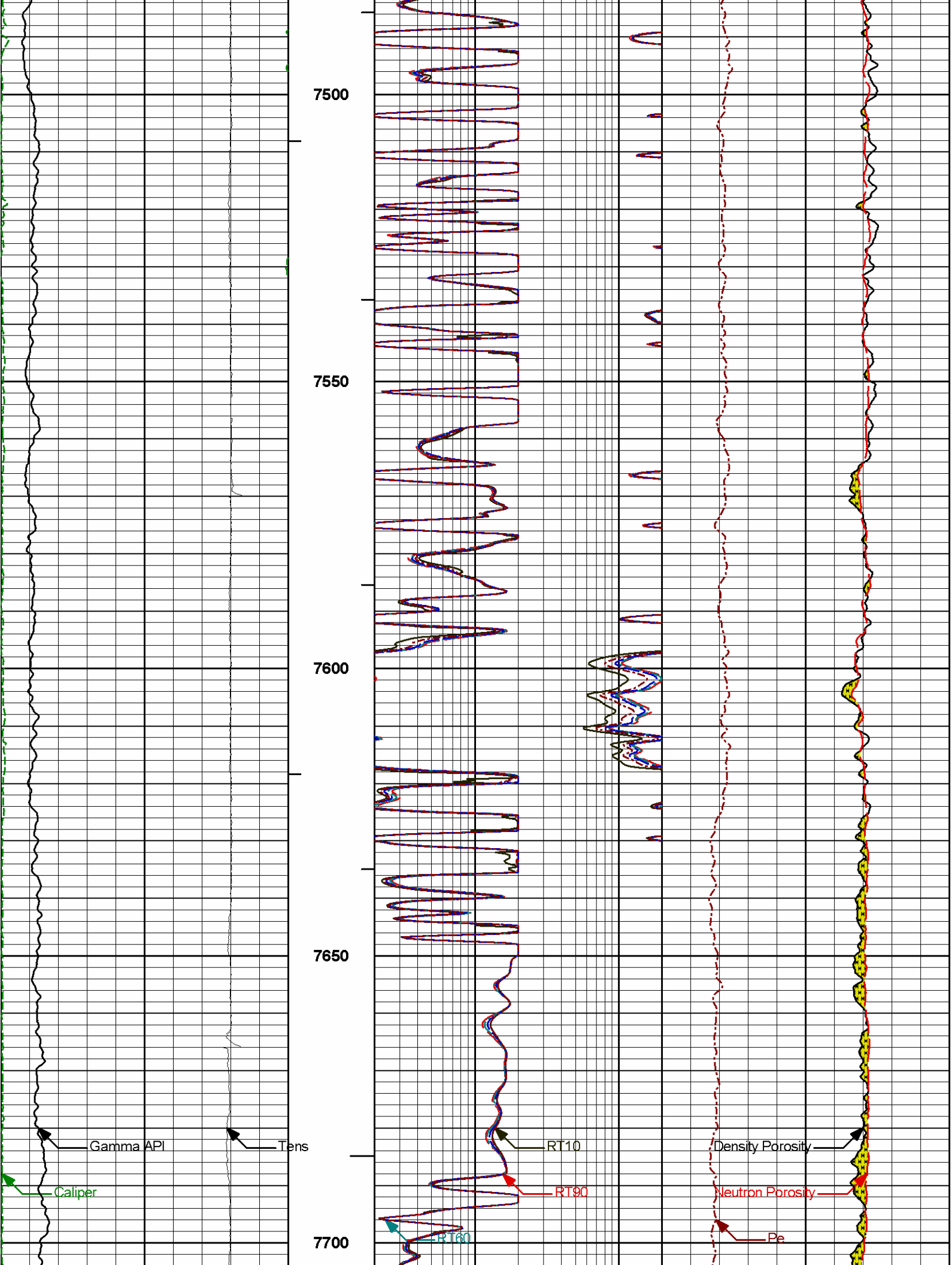
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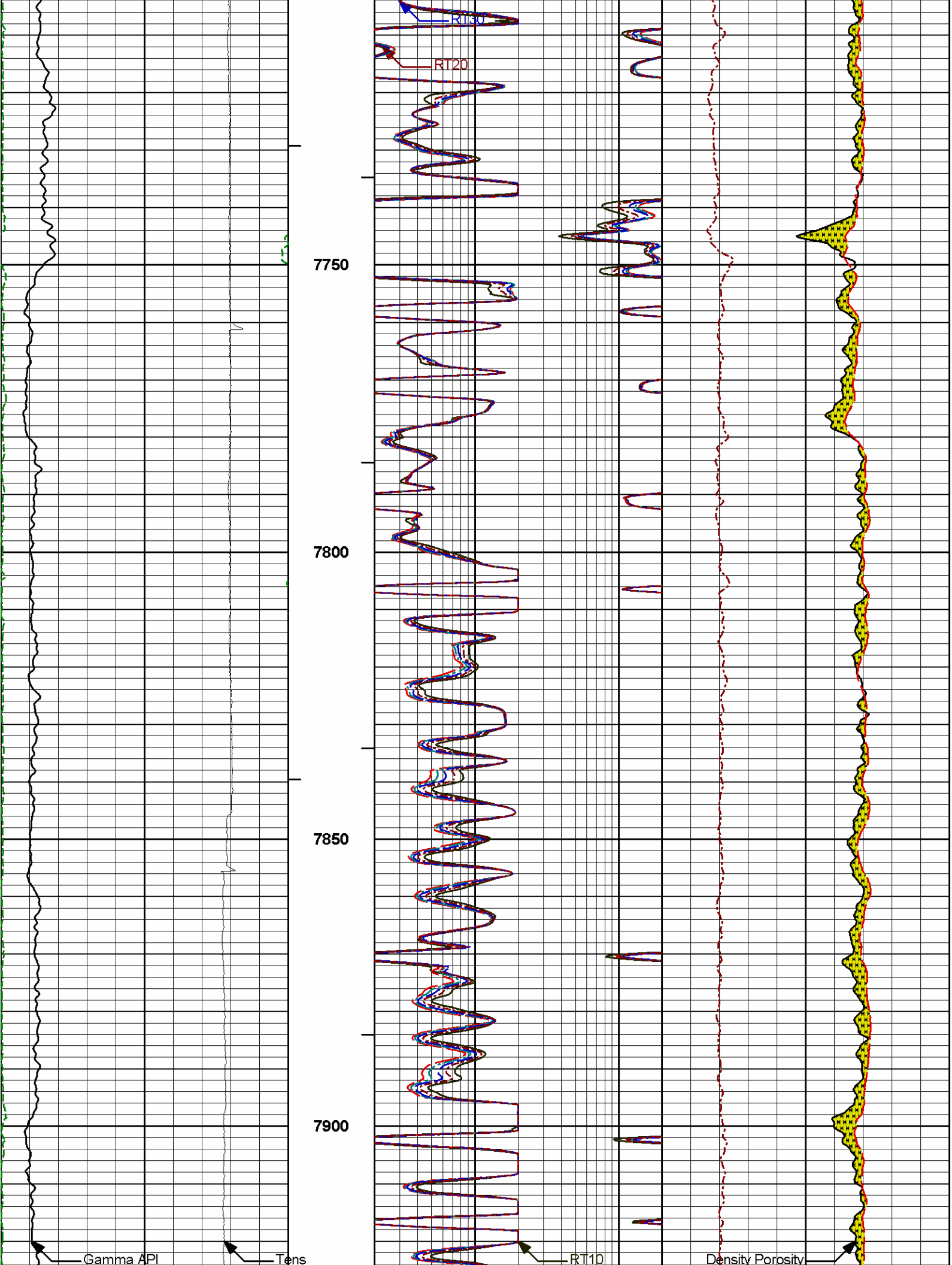
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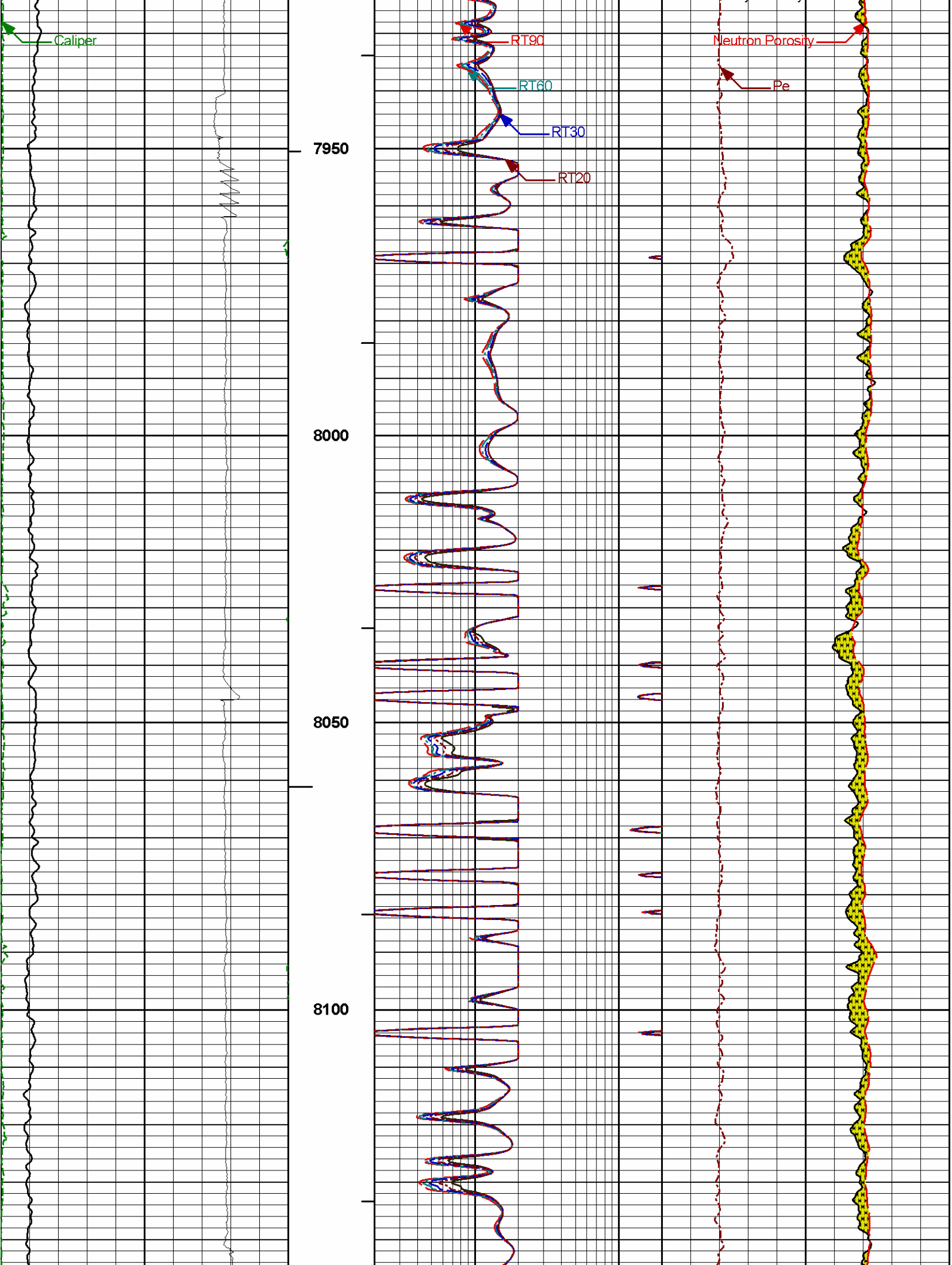
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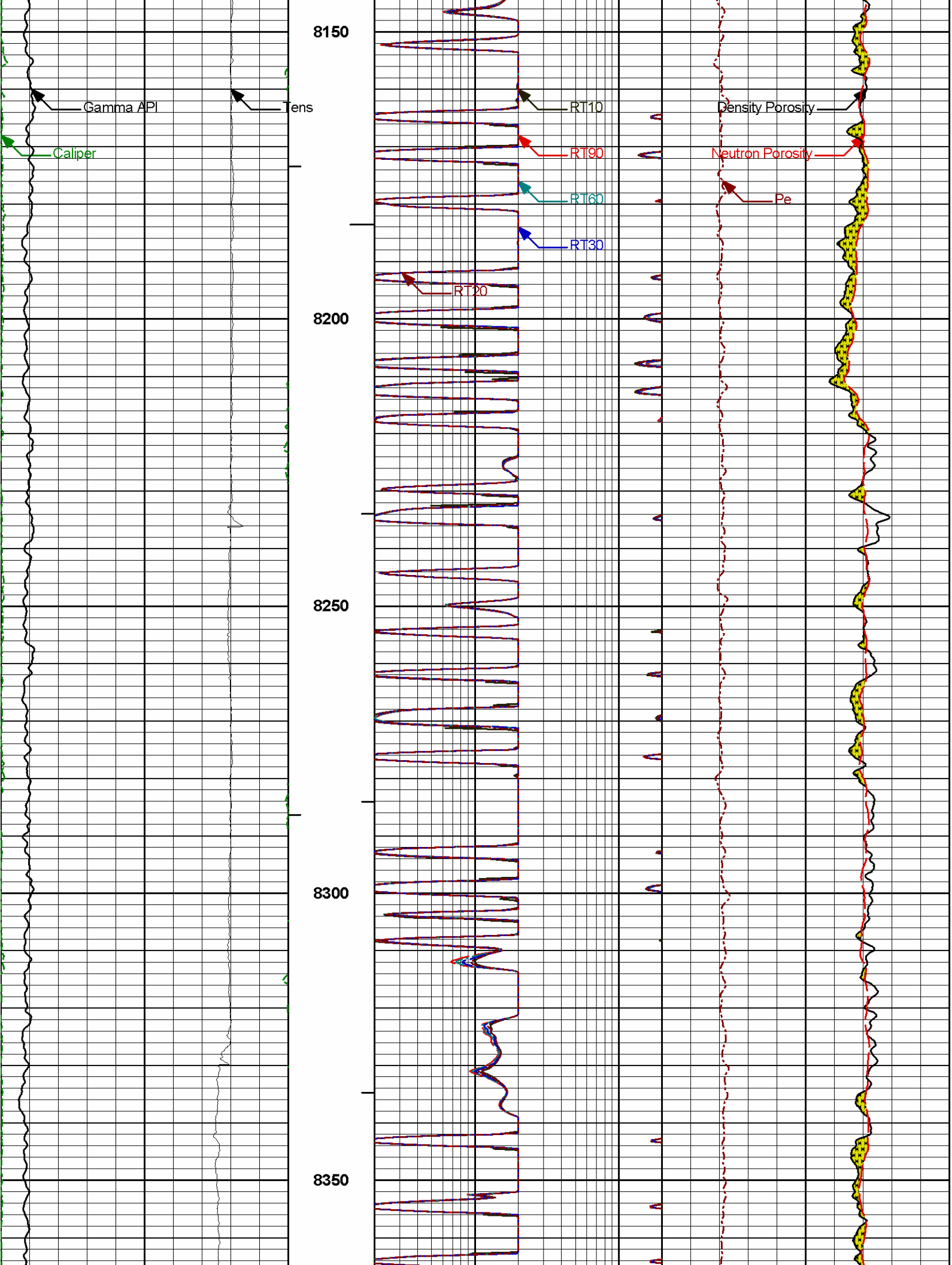
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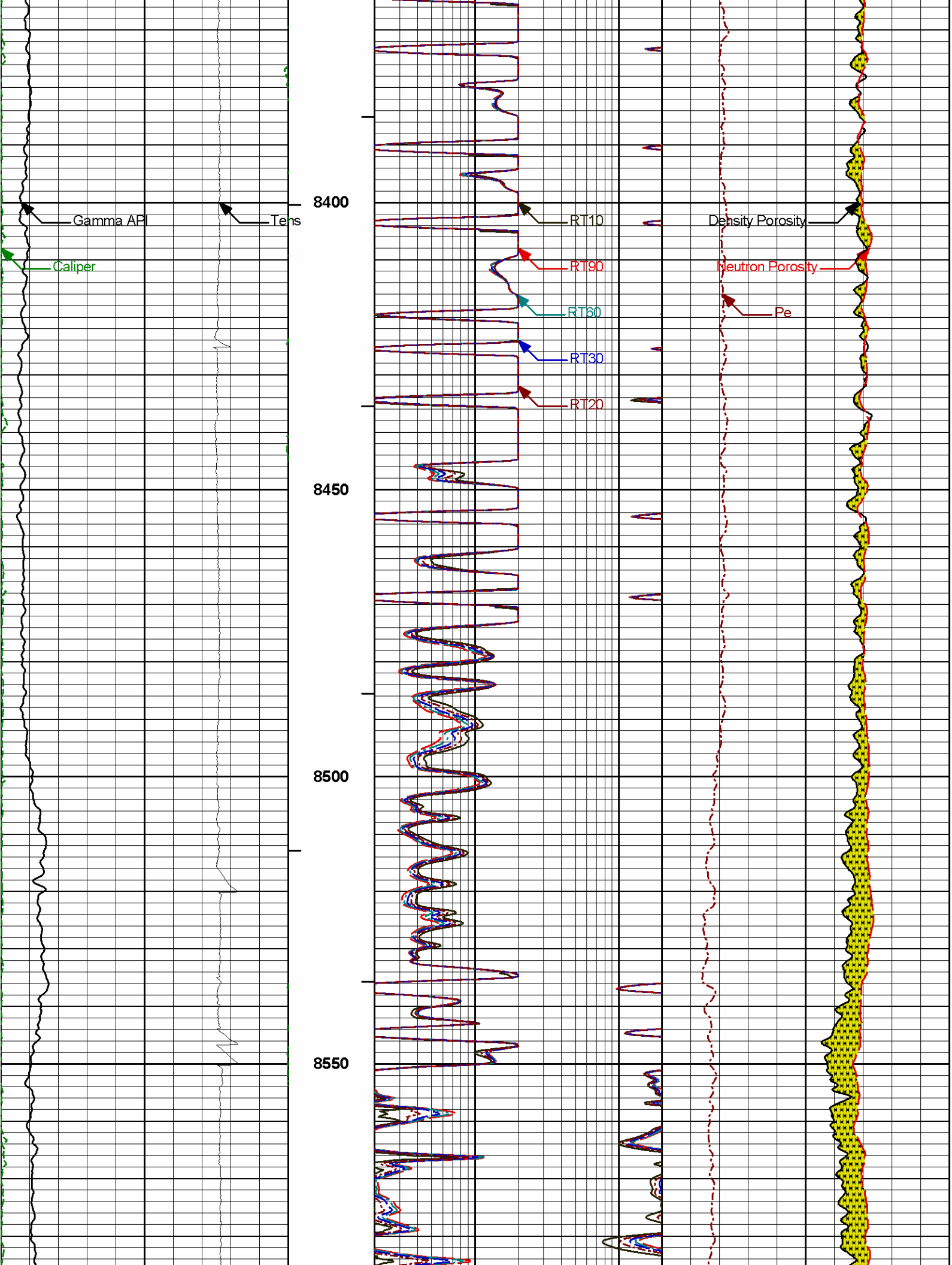
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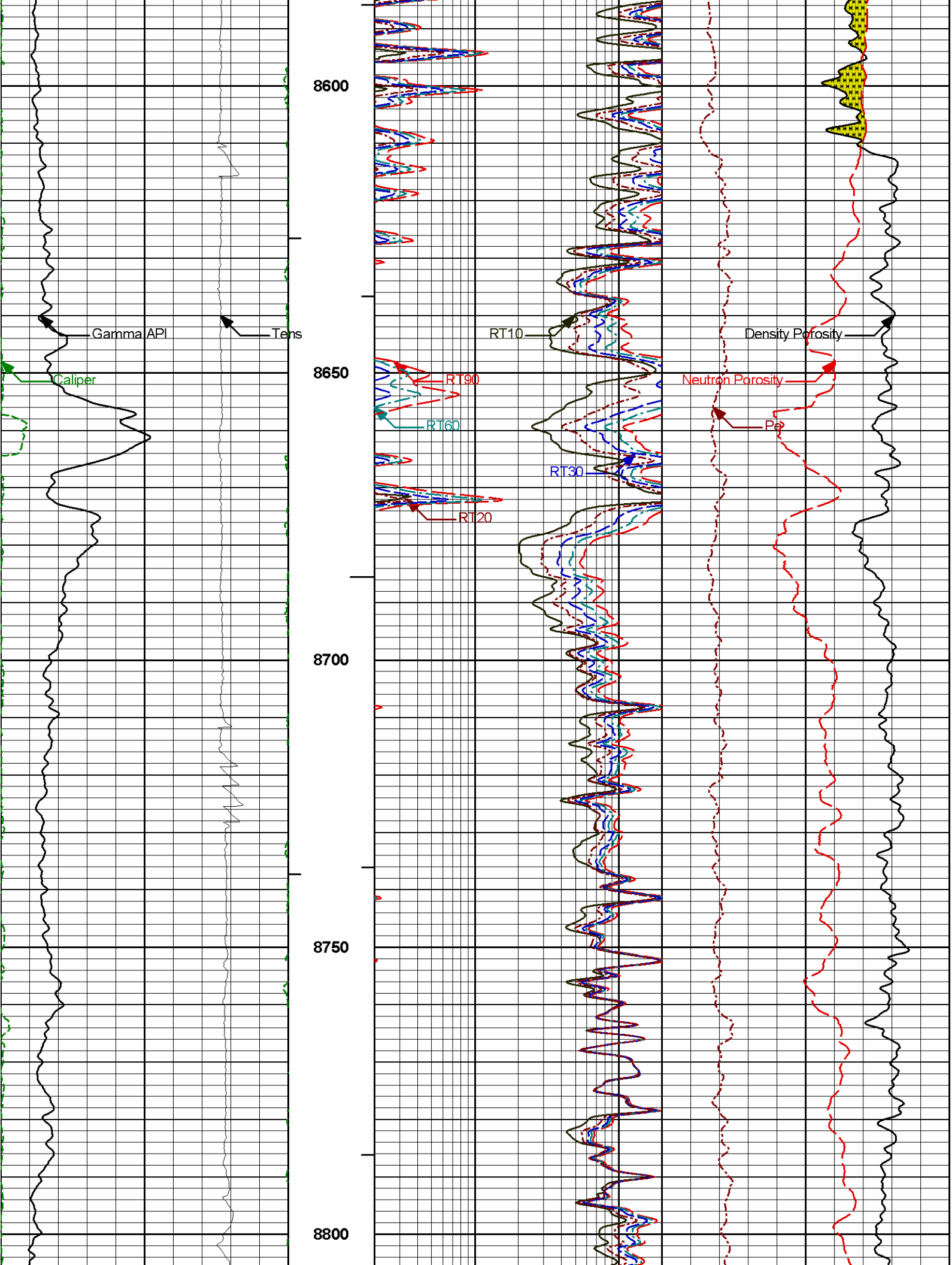
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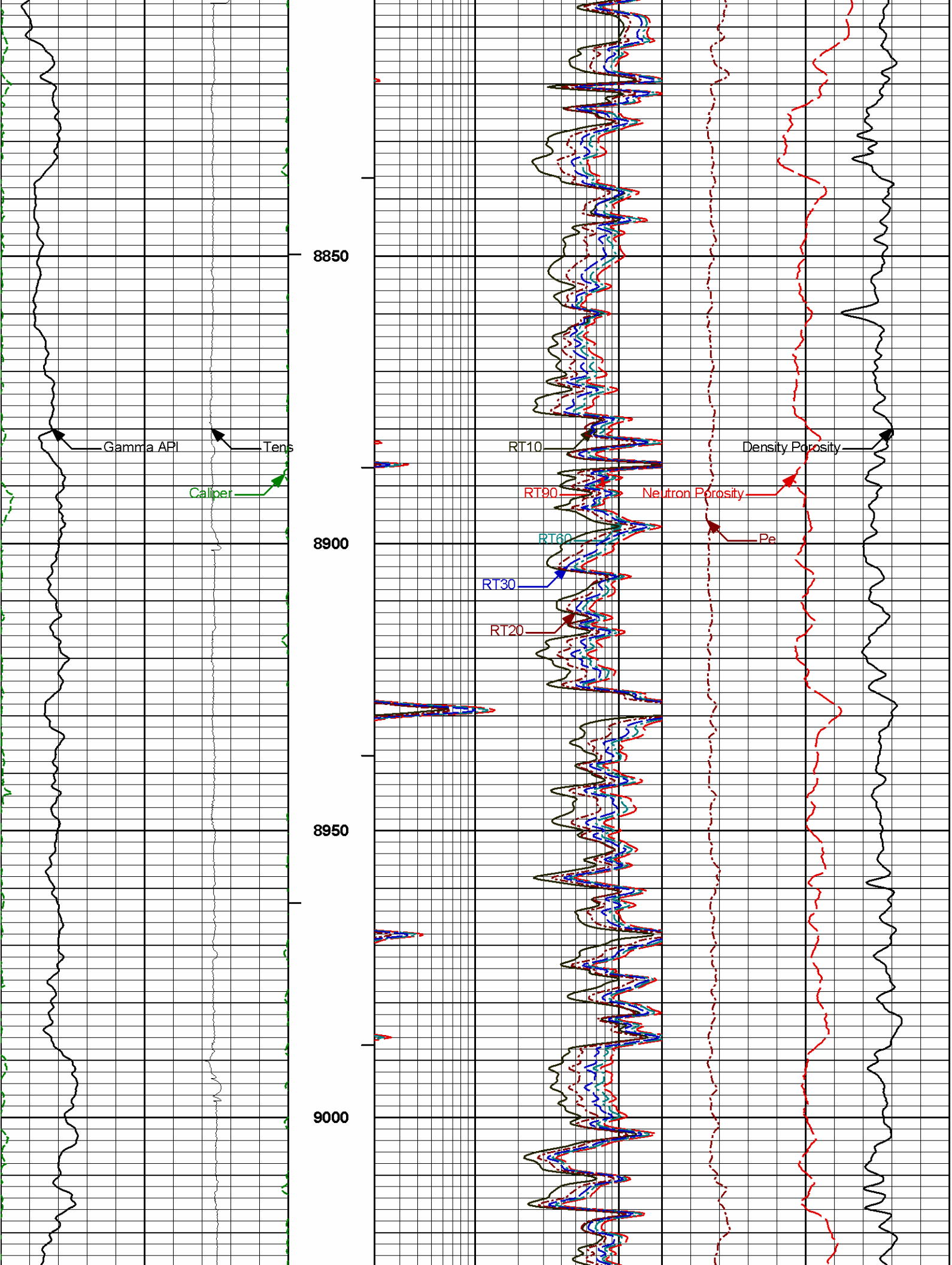
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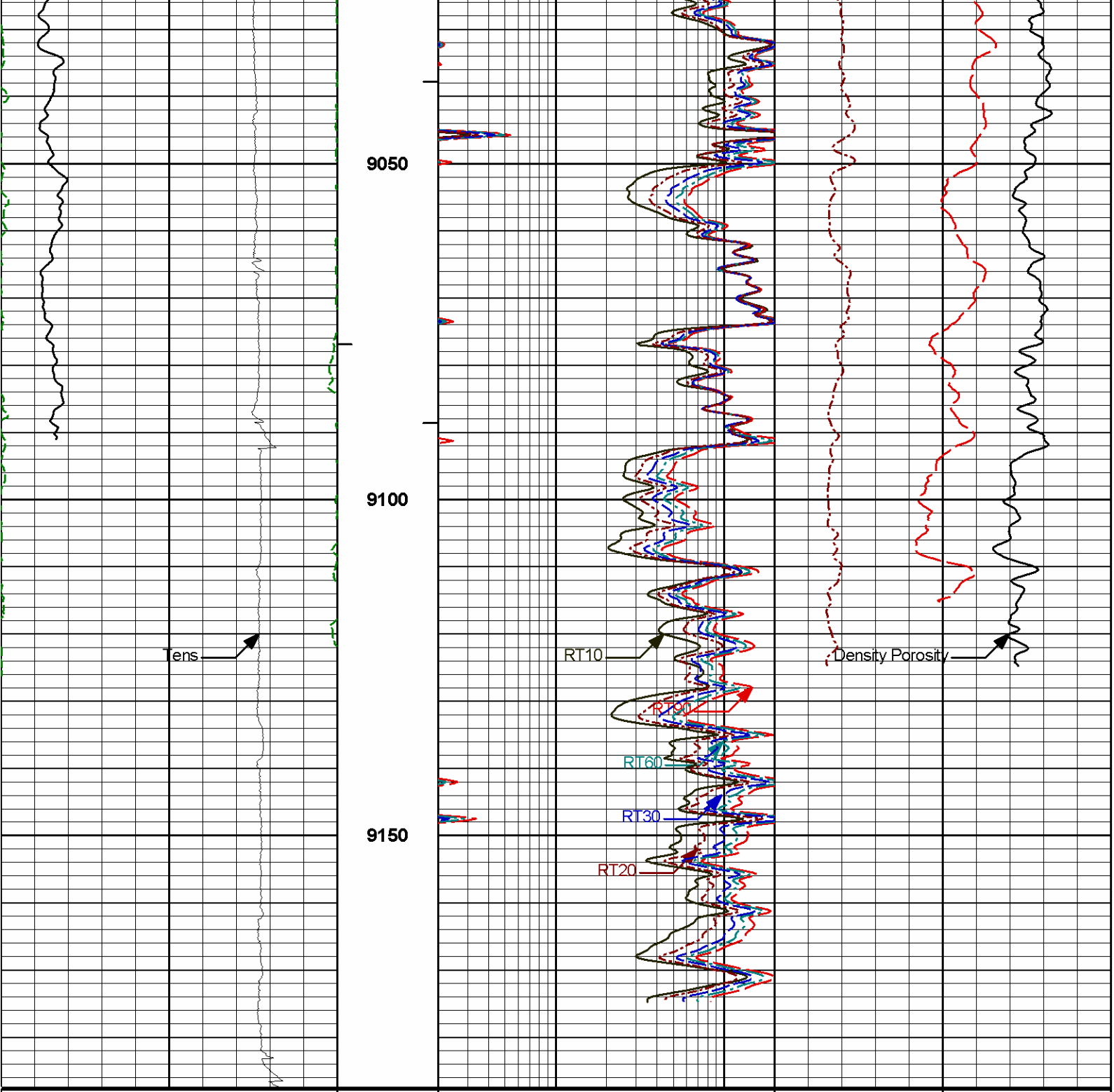


0 Gamma API 200		2 RT90 200	0 Pe 10	
api	1 : 240	ohmm	barns/electron	
6 Caliper 16	BHVT	2 RT60 200	30 Density Porosity -10	
inches		ohmm	percent	
10K Tens 0	AHVT	2 RT30 200	30 Neutron Porosity -10	
pounds		ohmm	percent	
		2 RT20 200		
		ohmm		
		2 RT10 200		
		ohmm		

HALLIBURTON

Plot Time: 26-Jan-14 00:03:28

Plot Range: 5639.25 ft to 9187.5 ft

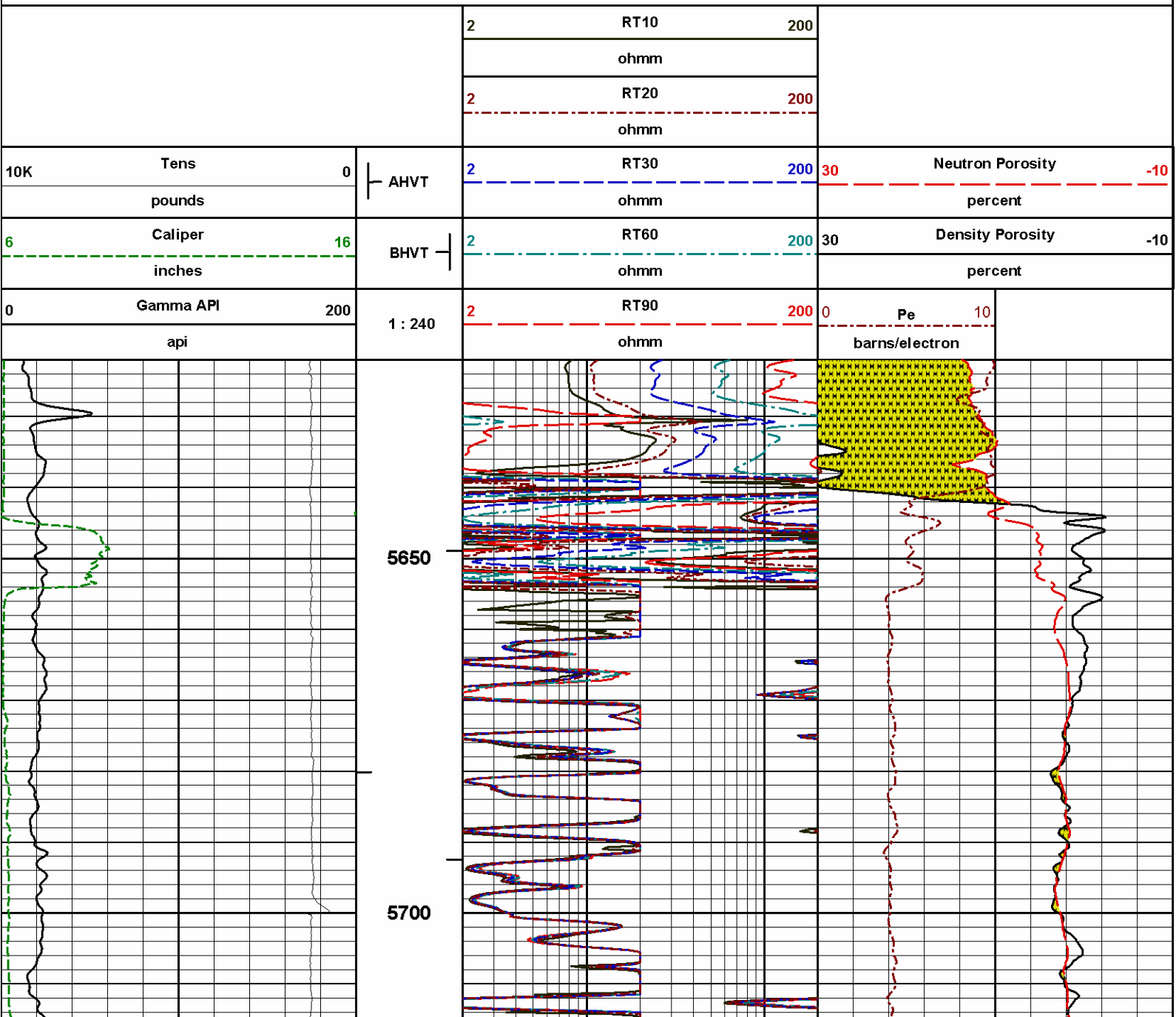
Data: SWITCHMAN_1647\Well Based\MAIN\
Plot File: \\COMP\MAIN

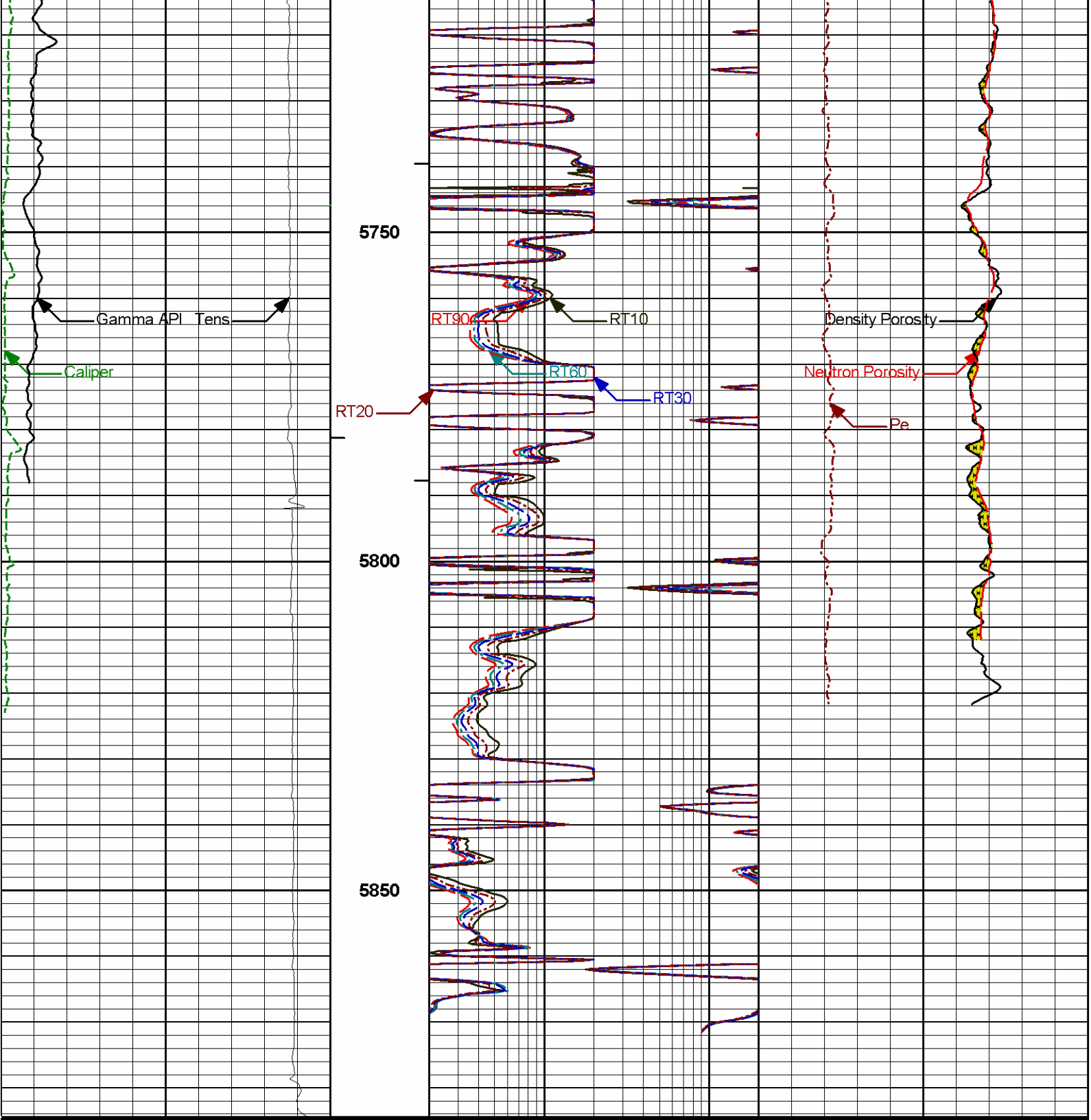
MAIN PASS 5" = 100'

HALLIBURTON

Plot Time: 26-Jan-14 00:03:28
Plot Range: 5622 ft to 5884.42 ft
Data: SWITCHMAN_1647\Well Based\REPEAT\
Plot File: \\COMP\REPEAT

MAIN PASS 5" = 100'





0 Gamma API 200	1 : 240	2 RT90 200	0 Pe 10	
api		ohmm	barns/electron	
6 Caliper 16	BHVT	2 RT60 200	30 Density Porosity -10	
inches		ohmm	percent	
10K Tens 0	AHVT	2 RT30 200	30 Neutron Porosity -10	
pounds		ohmm	percent	
		2 RT20 200		
		ohmm		
		2 RT10 200		
		ohmm		

HALLIBURTON

Plot Time: 26-Jan-14 00:03:29
Plot Range: 5622 ft to 5884.42 ft
Data: SWITCHMAN_1647\Well Based\REPEAT\
Plot File: \\COMP\REPEAT

MAIN PASS 5" = 100'

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	**GTET - 11812883**	**Reference Calibration Date:**	**18-Dec-13 08:57:03**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**14-Jan-14 09:54:13**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB-289
Calibrator API Reference:243.00 api
Equivalent Calibrator API Reference:247.3 api

Measurement	Measured	Calibrated	Units
Background	70.0	68.3	api
Background + Calibrator	323.5	315.5	api
Calibrator	253.5	247.3	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	**GTET - 11812883**	**Reference Calibration Date:**	**14-Jan-14 09:54:13**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**22-Jan-14 22:09:11**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB-289
Calibrator API Reference:243.00 api
Equivalent Calibrator API Reference:247.3 api

Field Verification	Shop	Field	Units
Background	68.3	68.6	api
Background + Calibrator	315.5	311.4	api
Calibrator	247.3	242.8	api

Shop	Field	Difference	Tolerance
247.3	242.8	4.5	+/- 9.00

CSNG-FS SHOP CALIBRATION

Tool Name:	**CSNG - 10971168**	**Reference Calibration Date:**	**19-Dec-13 10:35:12**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**15-Jan-14 09:34:10**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**
Source SN:	**TB-289**		

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.7	23.6	Channel #
583 KEV Peak Channel #	52.5	52.5	Channel #

2614 KEV Peak Channel #	214.0	214.7	Channel #
Calibrate Temperature	69.5	58.5	degF

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

Blanket Reference Value: 243.00 API
Calibrator Value: 276.0 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1811.9	CPS	341.5	337.2	API
Background	328.8	CPS	65.5	61.2	API

Gamma Ray Gain: 0.94
Expected Gain Range: 0.85 - 1.15
Gamma Gain Check: Passed

CSNG-FS FIELD CALIBRATION

Tool Name:	**CSNG - 10971168**	**Reference Calibration Date:**	**15-Jan-14 09:34:10**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**22-Jan-14 22:18:09**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**
Source SN:			

TITANIUM CASE	Shop	Field	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.6	23.7	Channel #
583 KEV Peak Channel #	52.5	52.5	Channel #
2614 KEV Peak Channel #	214.7	214.3	Channel #
Calibrate Temperature	58.5	59.0	degF

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

Blanket Reference Value: 243.00 API
Calibrator Value: 276.0 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1812.1	CPS	337.2	334.0	API
Background	314.6	CPS	61.2	58.0	API

Gamma Ray Gain: 0.93
Expected Gain Range: 0.85 - 1.15
Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	**DSNT - 11812167**	**Reference Calibration Date:**	**18-Dec-13 09:23:01**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**14-Jan-14 09:49:43**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**

Logging Source S/N: DSN 434
Tank Serial Number: 11068236
Reference value assigned to Tank: 53.720
Snow Block S/N: Brighton
Calibration Tank Water Temperature: 50 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	1.000	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):	0.2231	0.2223	0.0007	+/- 0.0020
Calibrated Ratio:	10.14	10.11	0.024	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0647	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 - 11812167**	**Reference Calibration Date:**	**14-Jan-14 09:49:43**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**22-Jan-14 22:41:10**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**

Logging Source S/N: DSN 434
Snow Block S/N: Brighton

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0647	0.0750	0.0103	+/- 0.0150

PASS/FAIL SUMMARY	
Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	**SDLT - 11812177**	**Reference Calibration Date:**	**18-Dec-13 10:43:18**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**14-Jan-14 11:46:57**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**
Host Tool Name:	**DSNT - 11812167**		

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-3834.32	-3642.74	-7000.00 - -1000.00

Pad Gain	0.0003859	0.0003855	0.000200 - 0.000600
Arm Offset	-4446.16	-4479.02	-5000.00 - 3000.00
Arm Gain	0.0005619	0.0005566	0.000300 - 0.000700
Arm Power	-0.000004782	-0.000004552	-0.000010000 - 0.000010000

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)	1.93	2.00	0.07	+/- 0.20
Medium Ring (in)	3.68	3.75	0.07	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.46	6.50	0.04	+/- 0.20
Medium Ring (in)	8.22	8.25	0.03	+/- 0.20
Large Ring (in)	14.99	15.00	0.01	+/- 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 - 11812177**	**Reference Calibration Date:**	**14-Jan-14 11:46:57**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**22-Jan-14 22:30:44**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.81	0.06	+/- 0.10
Ring Diameter	8.25	8.20	-0.05	+/- 0.15

PASS/FAIL SUMMARY

Pad Extension Check:	Passed
Diameter Check:	Passed

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	**SDLT Pad - 11795867**	**Reference Calibration Date:**	**18-Dec-13 10:18:07**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**14-Jan-14 11:04:11**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**

Logging Source S/N: 5471GW

Aluminum Block S/N: 63066	Density: 2.602g/cc	Pe: 3.100
Magnesium Block S/N: BRIGHTON MAGNESIUM BLOCK	Density: 1.691g/cc	Pe: 2.650

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0429	1.0433	0.90 - 1.10
Near Dens Gain	1.0119	1.0021	0.90 - 1.10
Near Peak Gain	1.0067	0.9933	0.90 - 1.10
Near Lith Gain	0.9556	0.9537	0.90 - 1.10
Far Bar Gain	1.0067	1.0042	0.90 - 1.10

Far Dens Gain	0.9945	0.9929	0.90 - 1.10
Far Peak Gain	0.9884	0.9891	0.90 - 1.10
Far Lith Gain	0.9732	0.9789	0.90 - 1.10
Near Bar Offset	-0.4477	-0.4163	NONE
Near Dens Offset	-0.1438	-0.0283	NONE
Near Peak Offset	-0.0930	0.0462	NONE
Near Lith Offset	0.3137	0.3589	NONE
Far Bar Offset	-0.1598	-0.1045	NONE
Far Dens Offset	-0.0386	0.0019	NONE
Far Peak Offset	-0.0025	0.0250	NONE
Far Lith Offset	0.1304	0.1191	NONE
Near Bar Background	824.01	820.24	700 - 1450
Near Dens Background	272.33	274.24	230 - 480
Near Peak Background	118.81	119.41	100 - 210
Near Lith Background	146.30	145.87	125 - 260
Far Bar Background	644.67	643.93	450 - 900
Far Dens Background	253.36	251.76	175 - 345
Far Peak Background	100.80	99.46	70 - 140
Far Lith Background	102.21	103.26	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.681	1.691	0.010	+/- 0.015
Pe	2.569	2.596	0.027	+/- 0.150
ALUMINUM				
Density (g/cc)	2.589	2.602	0.013	+/- 0.01500
Pe	3.022	3.056	0.034	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0021	+/- 0.0110	-0.0007	+/- 0.0140
Magnesium Block	-0.0011	+/- 0.0110	-0.0008	+/- 0.0140
Aluminum Block	-0.0008	+/- 0.0110	0.0006	+/- 0.0140
Resolution	8.61	6.00 - 11.50	8.78	6.00 - 11.50
Internal Verifier(B+D+P+L)	1360	1200 - 2700	1098	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 Pad - 11795867**	**Reference Calibration Date:**	**14-Jan-14 11:04:11**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**22-Jan-14 23:52:37**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**

Pad Temperature: 50.5 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1359.768	1359.884	0.116	14.906
Far (B+D+P+L) cps	1098.401	1095.862	-2.539	17.499
Near Resolution	8.61	8.70	0.090	0.50
Far Resolution	8.78	9.19	0.410	1.00

PASS/FAIL SUMMARY

Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

DIPMETER SHOP CALIBRATION

Tool Name:	**XRMI-I Mandrel - 11355244**	**Reference Calibration Date:**	**21-Aug-12 08:40:38**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**23-Jan-14 00:54:38**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**

Tool Temperature: 50.20 degF

PAD RESISTIVITIES

Measurement	Measured	Calibrated	Measured	Calibrated	Measured	Calibrated	Units
Pads #1-3:	0.450	0.450	0.450	0.450	0.449	0.450	ohmm
Pads #4-6:	0.450	0.450	0.449	0.450	0.449	0.450	ohmm
Cal0 #1-3:	0.081	-----	0.082	-----	0.085	-----	ohmm
Cal0 #4-6:	0.082	-----	0.083	-----	0.084	-----	ohmm

RELATIVE PAD VOLTS

Measurement	Measured	Calibrated
Air:	1.000	2.190
Zero:	0.001	0.001
Calibrate:	0.001	0.002

DIPMETER FIELD CALIBRATION

Tool Name:	**XRMI-I Mandrel - 11355244**	**Reference Calibration Date:**	**23-Jan-14 00:54:38**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**23-Jan-14 01:00:11**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**1**

PAD RESISTIVITIES

Measurement	Shop	Field	Units
Reflvl Pad 1:	19.958	19.958	ohmm
Reflvl Pad 2:	19.990	20.036	ohmm
Reflvl Pad 3:	20.917	20.972	ohmm
Reflvl Pad 4:	20.010	19.961	ohmm
Reflvl Pad 5:	20.280	20.254	ohmm
Reflvl Pad 6:	20.593	20.599	ohmm

SIX ARM CALIPER SHOP CALIBRATION

Tool Name:	**XRMI-I Mandrel - 11355244**	**Reference Calibration Date:**	**23-Jan-14 00:27:03**
Engineer:	**J. SCHMIDT**	**Calibration Date:**	**23-Jan-14 00:34:35**
Software Version:	**WL INSITE R3.8.12 (Build 3)**	**Calibration Version:**	**2**

Software Version: WL INSITE R3.8.12 (Build 3) Calibration Version: 3

CALIPERS AND RINGS			
Caliper	Large 15.00 in	Small 7.000 in	Units
CALIPER 1-4:			
Measured	14.989	6.997	in
Calibrated	15.000	7.000	in
CALIPER 2-5:			
Measured	15.015	7.002	in
Calibrated	15.000	7.000	in
CALIPER 3-6:			
Measured	15.073	6.996	in
Calibrated	15.000	7.000	in

TOLERANCE CHECK				
Measurment	Difference	Tolerance	Pass/Fail	Units
Caliper 1-4 Large	0.010	0.250	Passed	in
Caliper 1-4 Small	0.000	0.250	Passed	in
Caliper 2-5 Large	-0.020	0.250	Passed	in
Caliper 2-5 Small	0.000	0.250	Passed	in
Caliper 3-6 Large	-0.070	0.250	Passed	in
Caliper 3-6 Small	0.000	0.250	Passed	in

PRESSURE PAD		
	Measured	Calibrated
Closed	0.004	0.000
Opened	1.003	1.000

SIX ARM CALIPER FIELD CALIBRATION

Tool Name: XRMI-I Mandrel - 11355244
Reference Calibration Date: 23-Jan-14 00:34:35
Engineer: J. SCHMIDT
Calibration Date: 23-Jan-14 00:38:35
Software Version: WL INSITE R3.8.12 (Build 3)
Calibration Version: 2

CALIPERS AND RINGS					
Caliper	Shop	Field	Difference	Tolerance	Units
Caliper 1-4	7.000	6.979	0.021	0.250	in
Caliper 2-5	7.000	7.001	-0.001	0.250	in
Caliper 3-6	7.000	6.974	0.026	0.250	in

PASS/FAIL SUMMARY	
Ring Check:	Passed

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name: ACRt Sonde - 11294353
Reference Calibration Date: 30-Dec-13 16:00:03
Engineer: J. PINKETT
Calibration Date: 20-Jan-14 11:04:15
Software Version: WL INSITE R3.8.4 (Build 5)
Calibration Version: 1
Host Tool Name: ACRt Instrument - 11302817

TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper

A1 (80")	0.95	1.01	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A2 (50")	0.95	1.01	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A3 (29")	0.95	1.01	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A4 (17")	0.95	1.01	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.00	1.05	0.95	1.00	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.99	1.05	0.95	0.98	1.05

SONDE OFFSET

Subarray	R12KHz (mmho/m)	R36KHz (mmho/m)	R72KHz (mmho/m)
A1 (80")	-1.13	-4.66	-5.21
A2 (50")	-1.32	-3.03	-4.86
A3 (29")	-12.89	-3.56	-3.66
A4 (17")	-91.42	-29.15	-25.11
A5 (10")	N/A	-96.83	-46.11
A6 (6")	N/A	345.25	177.26

TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper
12K	0.6	0.87	1.3
36K	1.0	1.85	2.0
72K	1.0	1.12	2.0

R-MUD VERIFICATION

Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
Mud Cell	0.95	1.00	1.05

PASS/FAIL SUMMARY

GAIN RANGE CHK	PASS
SONDE OFFSET CHK	PASS

TOOL OK TO LOG

CALIBRATION SUMMARY

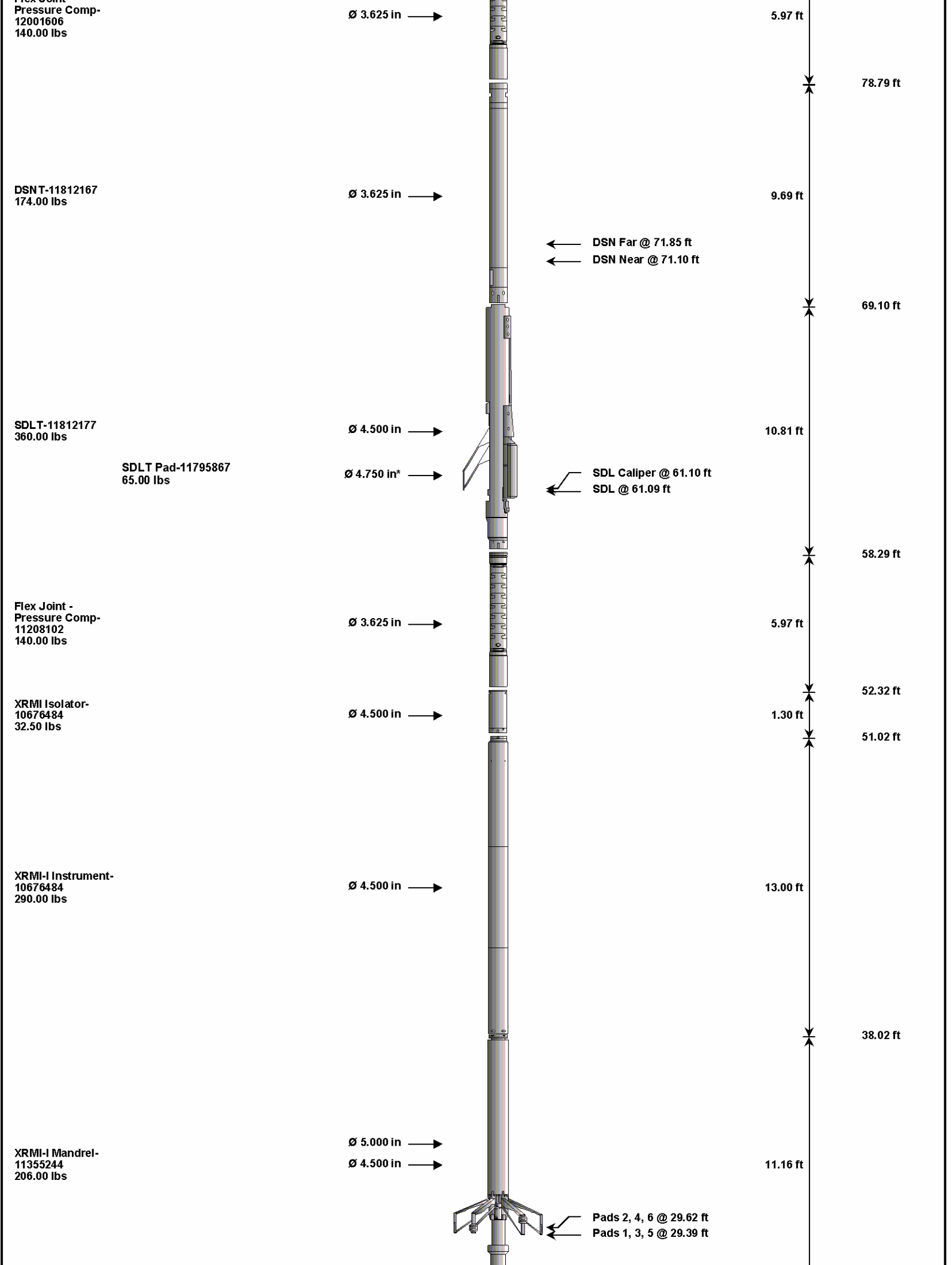
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11812883						
Gamma Ray Calibrator	247.3	242.8	----------	4.5	+/- 9.00	api
CSNG-10971168						
60 KEV Peak Channel #	48.0	48.0	----------	0.0	----------	Channel #
239 KEV Peak Channel #	23.6	23.7	----------	-0.1	----------	Channel #
583 KEV Peak Channel #	52.5	52.5	----------	0.0	----------	Channel #
2614 KEV Peak Channel #	214.7	214.3	----------	0.4	----------	Channel #
DSNT-11812167						
Snow-Block Porosity	0.0647	0.0750	----------	-0.0103	+/- 0.0150	decp
SDLT-11812177						
Pad Extension	3.75	3.81	----------	-0.06	+/-0.10	in
Ring Diameter	8.25	8.20	----------	0.05	+/-0.15	in
SDLT Pad-11795867						
Near(B+D+P+L)	1359.768	1359.884	----------	-0.116	+/-14.906	cps
Far(B+D+P+L)	1098.401	1095.862	----------	2.539	+/-17.499	cps
XRMI-I Mandrel-11355244						
Reflvl Pad 1	19.958	19.958	----------	0.000	N/A	ohmm
Reflvl Pad 2	19.990	20.036	----------	-0.046	N/A	ohmm
Reflvl Pad 3	20.917	20.972	----------	-0.055	N/A	ohmm
Reflvl Pad 4	20.010	19.961	----------	0.049	N/A	ohmm
Reflvl Pad 5	20.280	20.254	----------	0.026	N/A	ohmm

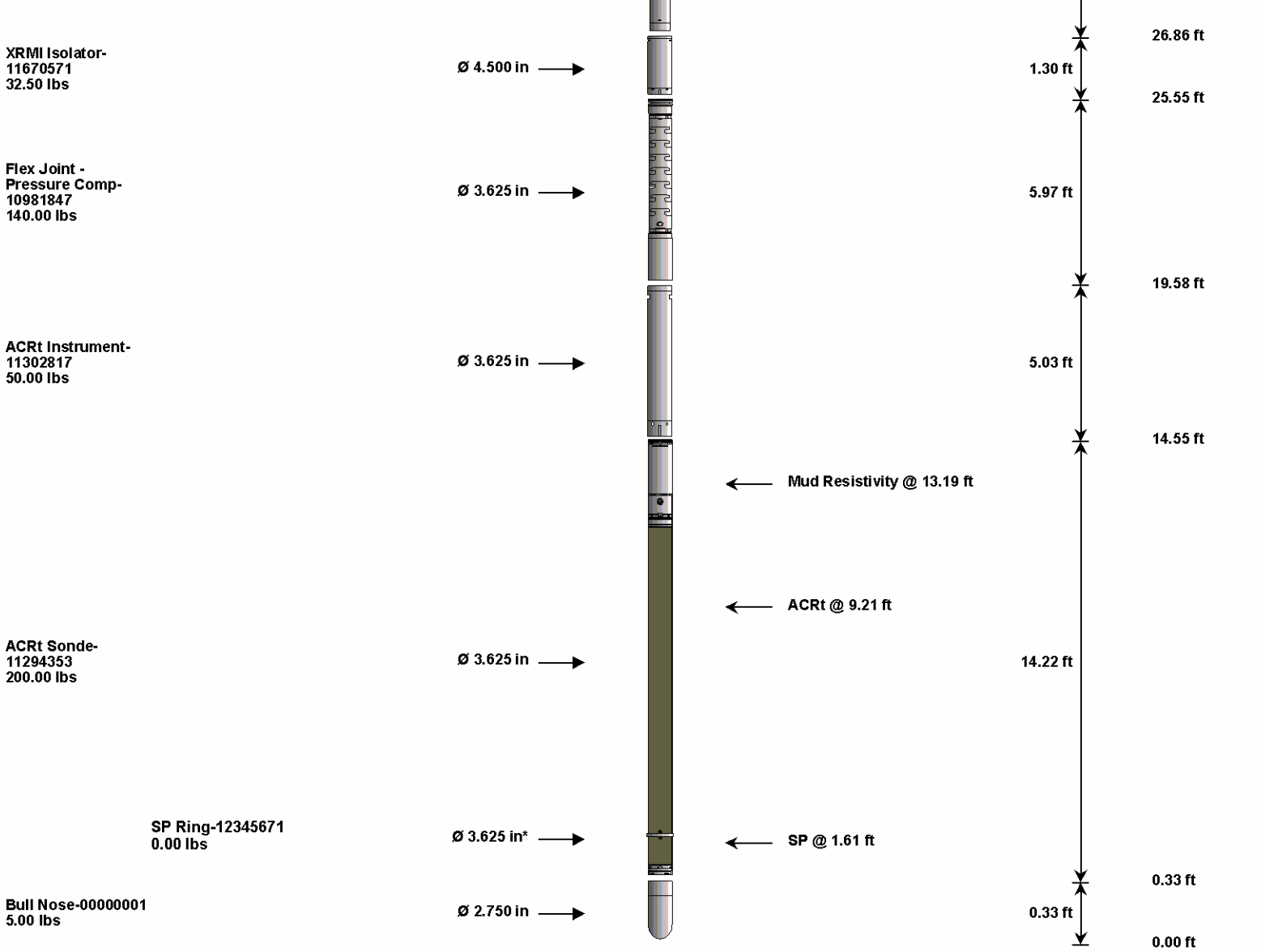
Reflvl Pad 6	20.593	20.599	----------	-0.006	N/A	ohmm
CAL 1-4	7.000	6.979	----------	0.021	+/- 0.250	in
CAL 2-5	7.000	7.001	----------	-0.001	+/- 0.250	in
CAL 3-6	7.000	6.974	----------	0.026	+/- 0.250	in
ACRt Sonde-11294353						
Mud Cell	1.00	----------	----------	0.00	----------	ohm-m

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						124.20 ft
Spacer-12345678 100.00 lbs		Ø 3.625 in →			9.00 ft	
	Regal Standoff 6_75-00000001 20.00 lbs	Ø 6.750 in* →				115.20 ft
Flex Joint - Pressure Comp-10271067 140.00 lbs		Ø 3.625 in →			5.97 ft	
						109.23 ft
DTDD-11997802 90.00 lbs		Ø 3.625 in →		← Load Cell @ 108.14 ft ← Pad Locator @ 106.55 ft	3.66 ft	
						105.57 ft
HDDS-A-11736444 125.00 lbs		Ø 4.060 in →			4.13 ft	
						101.45 ft
GTET-11812883 165.00 lbs		Ø 3.625 in →		← GammaRay @ 95.38 ft	8.52 ft	
						92.93 ft
CSNG-10971168 114.00 lbs	UnivWearRing3.6-10846351 5.00 lbs	Ø 4.200 in* → Ø 3.625 in →		← CSNG @ 87.30 ft	8.17 ft	
						84.76 ft
Flex Joint -						


Flex Joint -
Pressure Comp-
12001606
140.00 lbs
Ø 3.625 in
5.97 ft
78.79 ft
DSNT-11812167
174.00 lbs
Ø 3.625 in
9.69 ft
DSN Far @ 71.85 ft
DSN Near @ 71.10 ft
69.10 ft
SDLT-11812177
360.00 lbs
Ø 4.500 in
10.81 ft
SDLT Pad-11795867
65.00 lbs
Ø 4.750 in*
SDL Caliper @ 61.10 ft
SDL @ 61.09 ft
58.29 ft
Flex Joint -
Pressure Comp-
11208102
140.00 lbs
Ø 3.625 in
5.97 ft
52.32 ft
XRMI Isolator-
10676484
32.50 lbs
Ø 4.500 in
1.30 ft
51.02 ft
XRMI-I Instrument-
10676484
290.00 lbs
Ø 4.500 in
13.00 ft
38.02 ft
XRMI-I Mandrel-
11355244
206.00 lbs
Ø 5.000 in
Ø 4.500 in
11.16 ft
Pads 2, 4, 6 @ 29.62 ft
Pads 1, 3, 5 @ 29.39 ft



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
SPC	Test	12345678	100.00	9.00		115.20	100.00
RSOF	Regal Standoff 6.75in	00000001	20.00	0.52	*	117.36	300.00
FLEX	Flex Joint - Pressure Compensated	10271067	140.00	5.97		109.23	300.00
DTDD	Downhole Tension Device	11997802	90.00	3.66		105.57	300.00
HDDS-A	Heavy Duty DITS Swivel tool.	11736444	125.00	4.13		101.45	300.00
GTET	Gamma Telemetry Tool	11812883	165.00	8.52		92.93	60.00
CSNG	Compensated Spectral Natural Gamma	10971168	114.00	8.17		84.76	15.00
UWR3P6	Universal Wear Ring 3 5-8 inch	10846351	5.00	0.35	*	88.84	300.00
FLEX	Flex Joint - Pressure Compensated	12001606	140.00	5.97		78.79	300.00
DSNT	Dual Spaced Neutron	11812167	174.00	9.69		69.10	60.00
SDLT	Spectral Density Tool	11812177	360.00	10.81		58.29	60.00
SDLP	Density Insite Pad	11795867	65.00	2.55	*	60.50	60.00
FLEX	Flex Joint - Pressure Compensated	11208102	140.00	5.97		52.32	300.00
	Isolator for the XRMI tool	10676484	32.50	1.30		51.02	300.00
XRMI	XRMI Navigation - Insite	10676484	290.00	13.00		38.02	30.00
XRMI-I	XRMI Imager - Insite	11355244	206.00	11.16		26.86	30.00
	Isolator for the XRMI tool	11670571	32.50	1.30		25.55	300.00
FLEX	Flex Joint - Pressure Compensated	10981847	140.00	5.97		19.58	300.00
ACRt	Array Compensated True Resistivity Instrument Section	11302817	50.00	5.03		14.55	300.00
ACRt	Array Compensated True Resistivity Sonde Section	11294353	200.00	14.22		0.33	300.00
SP	SP Ring	12345671	0.00	0.25	*	1.61	300.00
BLNS	Bull Nose	00000001	5.00	0.33		0.00	300.00
Total			**2,594.00**	**124.20**			

* Not included in Total Length and Length Accumulation.

Data: SWITCHMAN_1647\0002 TC_CSNG_XRMI_TPL\001 25-Jan-14 14:14 Dn @5497.5f **Date: 25-Jan-14 15:31:08**

COMPANY	**ANADARKO E&P ONSHORE LLC**
WELL	**SWITCHMAN 1647-17-11H**
FIELD	**WILDCAT**
COUNTY	**CHEYENNE** STATE **CO**

HALLIBURTON

DUAL SPACED NEUTRON
SPECTRAL DENSITY
ARRAY COMPENSATED
TRUE RESISTIVITY