

HALLIBURTON

SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TRUE RESISTIVITY

COMPANY	NOBLE ENERGY INC.
WELL	STROHAUER F32-23
FIELD	WATTENBERG
COUNTY	WELD
STATE	CO
COMPANY	NOBLE ENERGY INC.
WELL	STROHAUER F32-23
FIELD	WATTENBERG
COUNTY	WELD
STATE	CO
API No.	05123313440000
Location	SURFACE: 1269' FSL & 1392' FEL LAT: 40.35196° N LONG: 104.68285° W
Other Services:	CSNG
Secl.	32
Twp.	5N
Rge.	65W
Permanent Datum	GL
Log measured from	KB
Drilling measured from	KB
Elev.	4668.0 ft
Elev. K.B.	4683.0 ft
D.F.	4682.0 ft
G.L.	4668.0 ft

Date	30-Nov-10
Run No.	ONE
Depth - Driller	7280.00 ft
Depth - Logger	7286.0 ft
Bottom - Logged Interval	7277.0 ft
Top - Logged Interval	554.0 ft
Casing - Driller	8.625 in @ 557.0 ft
Casing - Logger	554.0 ft @
Bit Size	7.875 in @
Type Fluid in Hole	WBM
Density	9.4 ppg 48.00 sgqt
PH	8.00 pH 15.2 cp/m
Source of Sample	FLOW LINE
Rm @ Meas. Temperature	1.320 ohmm @ 68.00 degF @
Rmf @ Meas. Temperature	0.95 ohmm @ 75.00 degF @
Rmc @ Meas. Temperature	1.100 ohmm @ 75.00 degF @
Source Rmf	CHART
Rm @ BHT	0.44 ohmm @ 216.0 degF @
Time Since Circulation	10.0 hr
Time on Bottom	30-Nov-10 15:52
Max. Rec. Temperature	216.0 degF @ 7286.0 ft @
Equipment	11072147 BRIGHTON
Recorded By	C. GULLETT
Witnessed By	T. BOWMAN

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Service Ticket No.: 7808997 API Serial No.: 05123313440000 PGM Version: WL INSITE R3.0.6 (Build 4)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE				RESISTIVITY SCALE CHANGES				
Date	Sample No.			Type Log	Depth	Scale Up Hole	Scale Down Hole	
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	N/A	1.5" STANDOFF	N/A
Rmc @ Meas. Temp.	@	@			E6758-S4352			
Source Rmf	Rmc							
Rm @ BHT	@	@						
Rmf @ BHT	@	@						
Rmc @ BHT	@	@						

EQUIPMENT DATA							
GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.	ONE	Run No.	ONE
Serial No.	11277436	Serial No.		Serial No.	I337M319	Serial No.	11219332
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.	102-T	Spacing		Log Type	GAMMA-GAMMA	Log Type	THERMAL
Type	SCINT.			Source Type	Cs137	Source Type	Am241Be
Length	8"	LSA [Y/N]		Serial No.	5256GW	Serial No.	DSN-430
Distance to Source	9.5'	FWDA [Y/N]		Strength	1.5 Ci	Strength	15 Ci

LOGGING DATA

GENERAL GAMMA ACOUSTIC DENSITY NEUTRON

Run	GENERAL		Speed ft/min	GAMMA		ACOUSTIC		Matrix	DENSITY		NEUTRON			
	Depth			Scale		Scale			Scale		Matrix			
	No.	From		To	L	R	L		R	L	R	L	R	
ONE	T.D.	7086	REC	0	250				20%	0%	2.68 g/cc	20%	0%	SAND
ONE	7086	6780	REC	0	250				20%	0%	2.71 g/cc	20%	0%	LIME
ONE	6780	CSG	REC	0	250				20%	0%	2.68 g/cc	20%	0%	SAND

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@
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Remarks:
 RWCH/GTET/CSNG/DSNT/SDLT/ACRt WERE RAN IN COMBINATION.
 A.H.V. CALCULATED FOR 4.5" CASING.
 TENSION PULLS AND HOLE RUGOSITY MAY AFFECT LOG QUALITY.
 CHLORIDES REPORTED AT 650 ppm.

HES CREW: A. LEWIS, A. DUNCAN, N. GOULD. RIG: ENSIGN #128

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES - BRIGHTON, CO - (303)-825-4346

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PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP	DSNT	NLIT	Neutron Lithology	Sandstone	
	SDLT	DMA	Formation Density Matrix	2.680	g/cc
6780.00	DSNT	NLIT	Neutron Lithology	Limestone	
	SDLT	DMA	Formation Density Matrix	2.710	g/cc
7086.00	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDWT	Borehole Fluid Weight	9.400	ppg
	SHARED	OBM	Oil Based Mud System?	No	
	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	7280.00	ft
	SHARED	BHT	Bottom Hole Temperature	200.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GRSO	Gamma Tool Standoff	0.000	in

GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	POTA	Potassium	0.00	%
GTET	MDTP	Mud Type	Natural	
GTET	TPOS	Tool Position	Standoff	
CSNG	CGOK	Process CSNG Data?	Yes	
CSNG	CENT	Is Tool Centralized?	No	
CSNG	MUDT	Mud Type?	Natural	
CSNG	KPCT	Percent K in Mud by Weight?	0.00	%
CSNG	GBOK	Gamma Enviromental Corrections?	Yes	
CSNG	BARF	Barite Correction Factor	1.00	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Sandstone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.000	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	DNOK	Process Density?	Yes	
SDLT	DNOK	Process Density EVR?	No	
SDLT	AD	Is Hole Air Drilled?	No	
SDLT	CB	Logging Calibration Blocks?	No	
SDLT	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT	DTWN	Disable temperature warning	No	
SDLT	MDTP	Weighted Mud Correction Type?	Barite	
SDLT	DMA	Formation Density Matrix	2.680	g/cc
SDLT	DFL	Formation Density Fluid	1.000	g/cc
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT	MLOK	Process MicroLog Outputs?	Yes	
ACRt	RTOK	Process ACRt?	Yes	
ACRt	MNSO	Minimum Tool Standoff	1.50	in
ACRt	TCS1	Temperature Correction Source	FP Lwr & FP Up	
ACRt	TPOS	Tool Position	Free Hanging	
ACRt	RMOP	Rmud Source	Mud Cell	
ACRt	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt	THQY	Threshold Quality	0.50	

BOTTOM

Data: STROHAUER_F3223\0001 TRIPLE_CSNG\002.01 30-Nov-10 19:55 Up

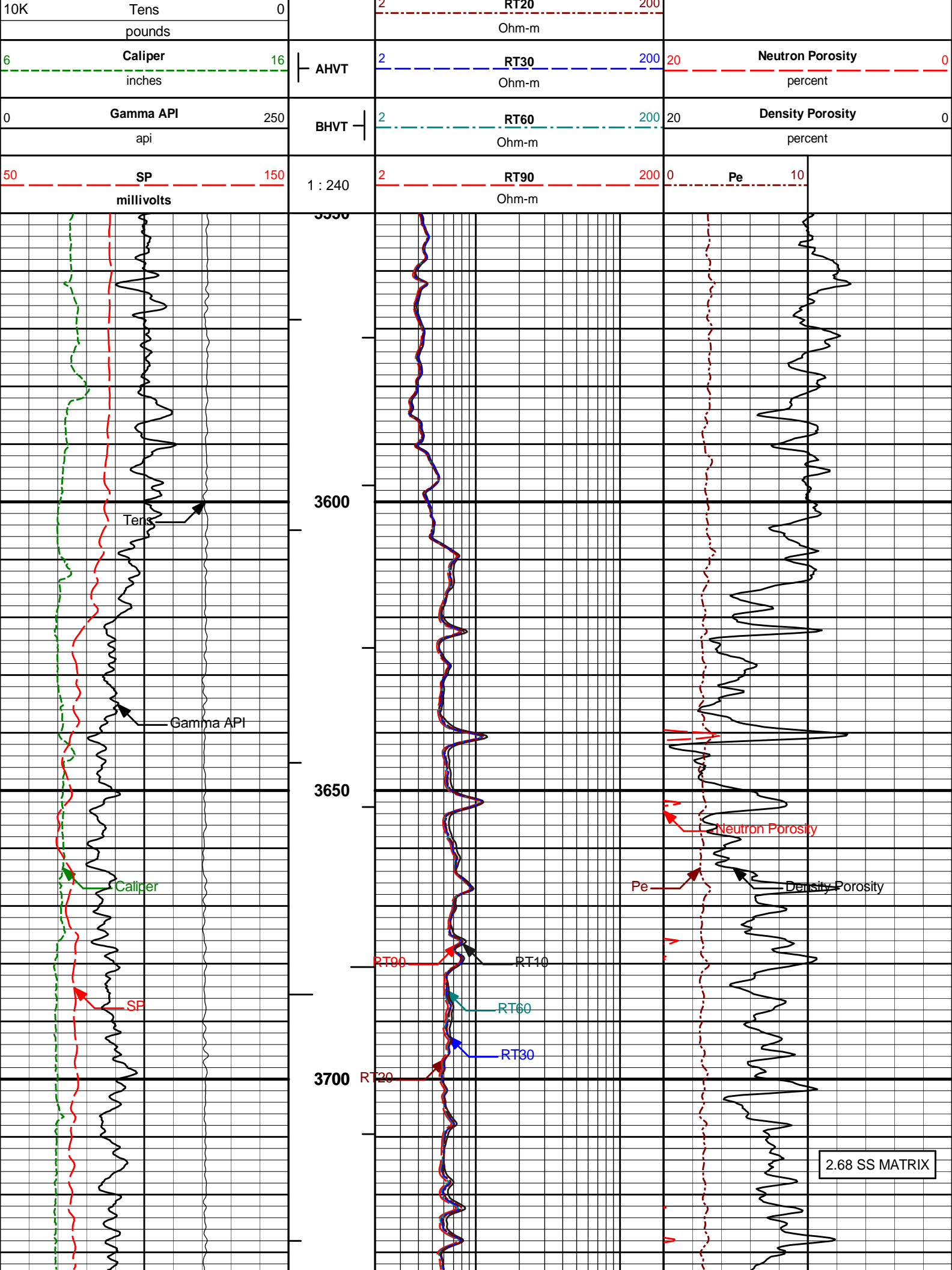
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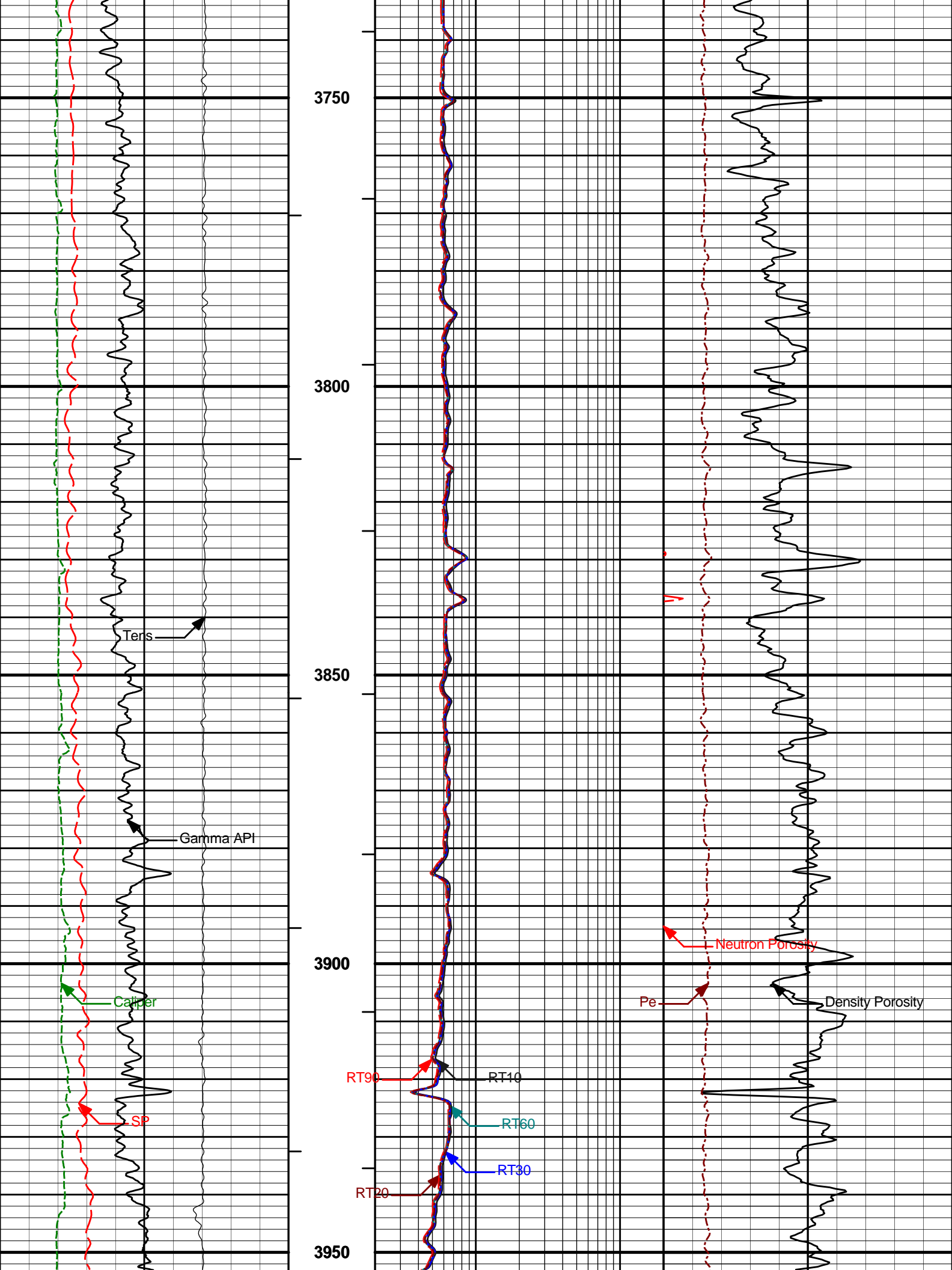


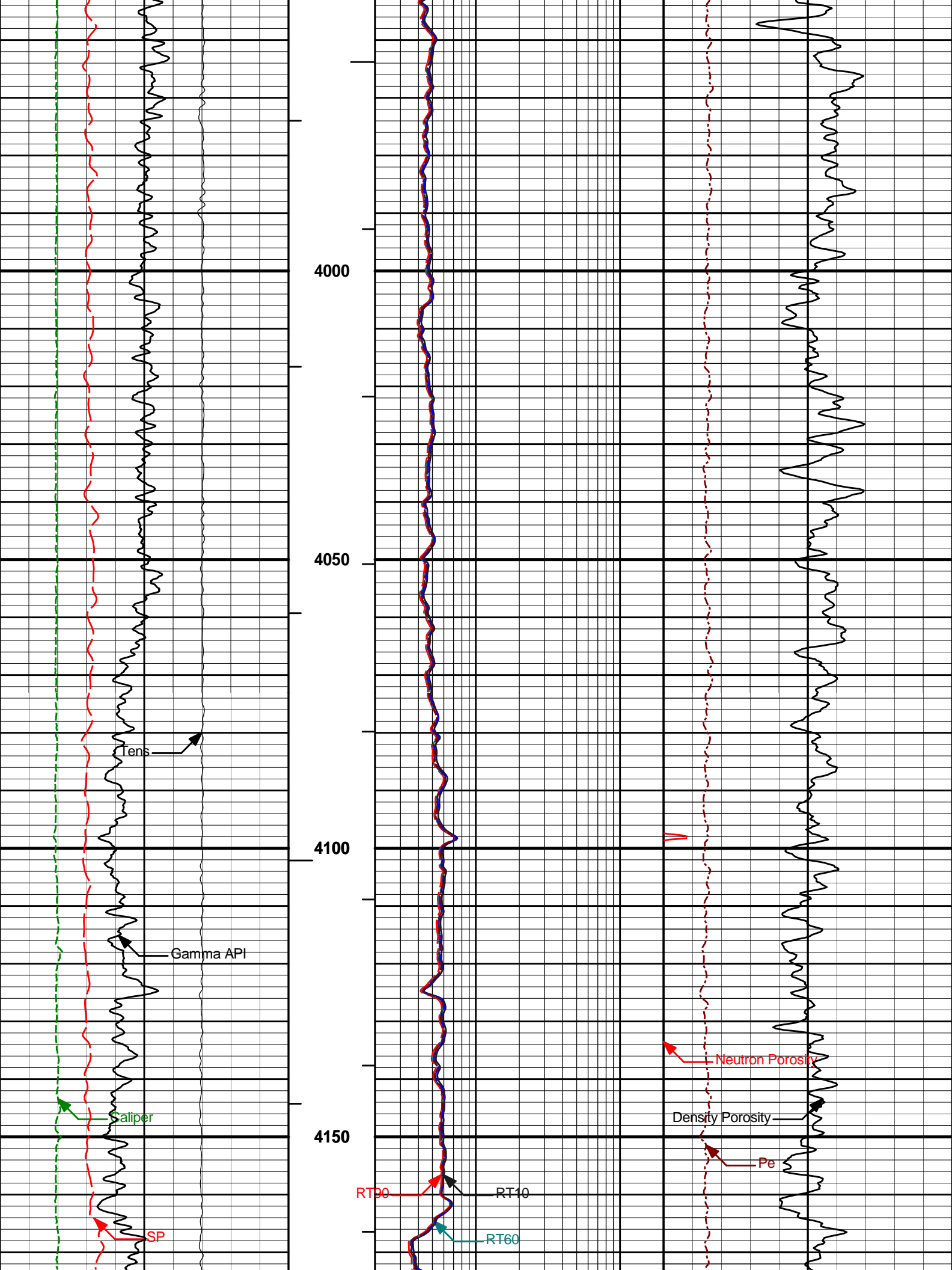
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 Plot File: \COMP\PARK_SUS

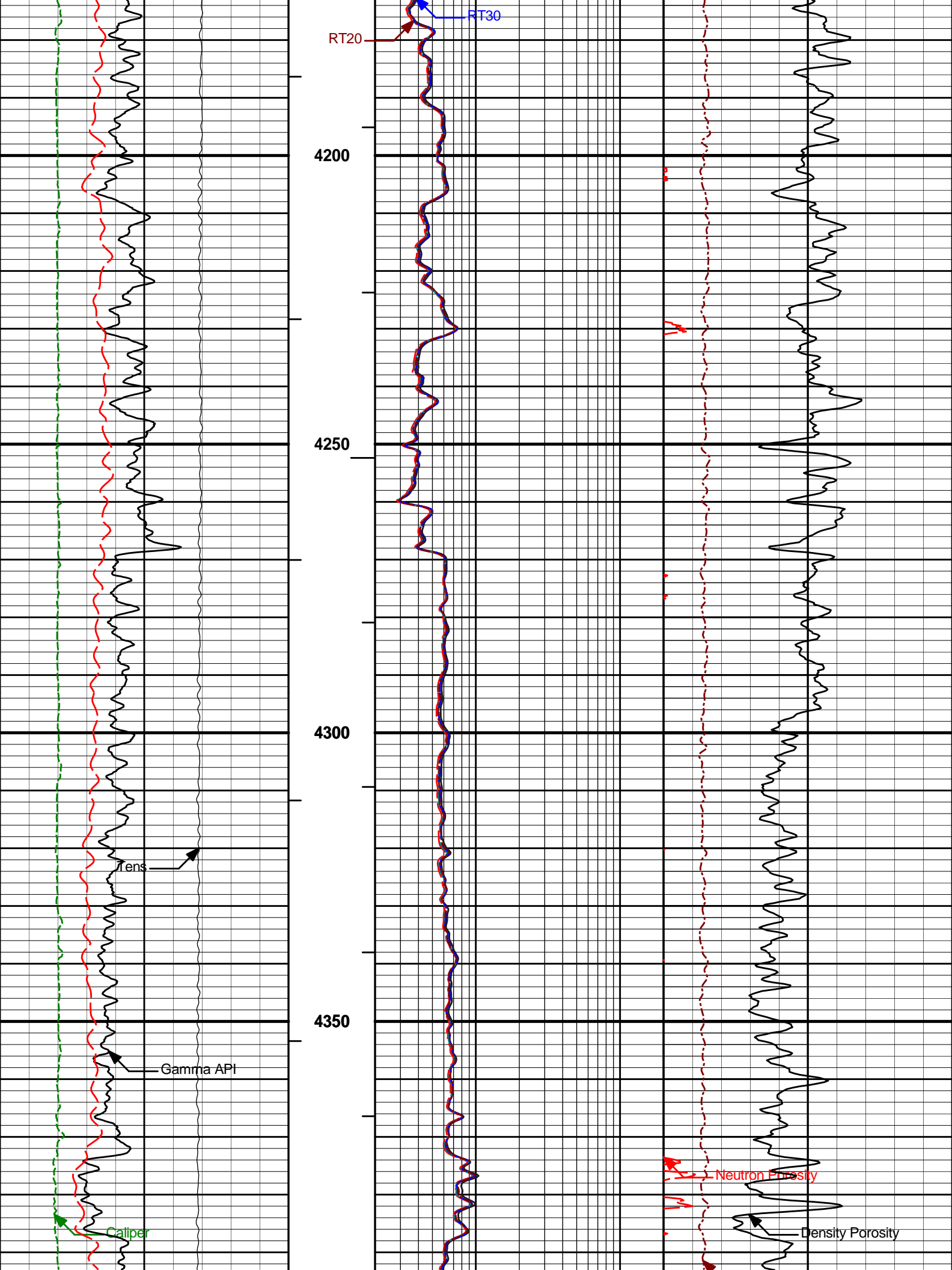
MAIN PASS 5" = 100'

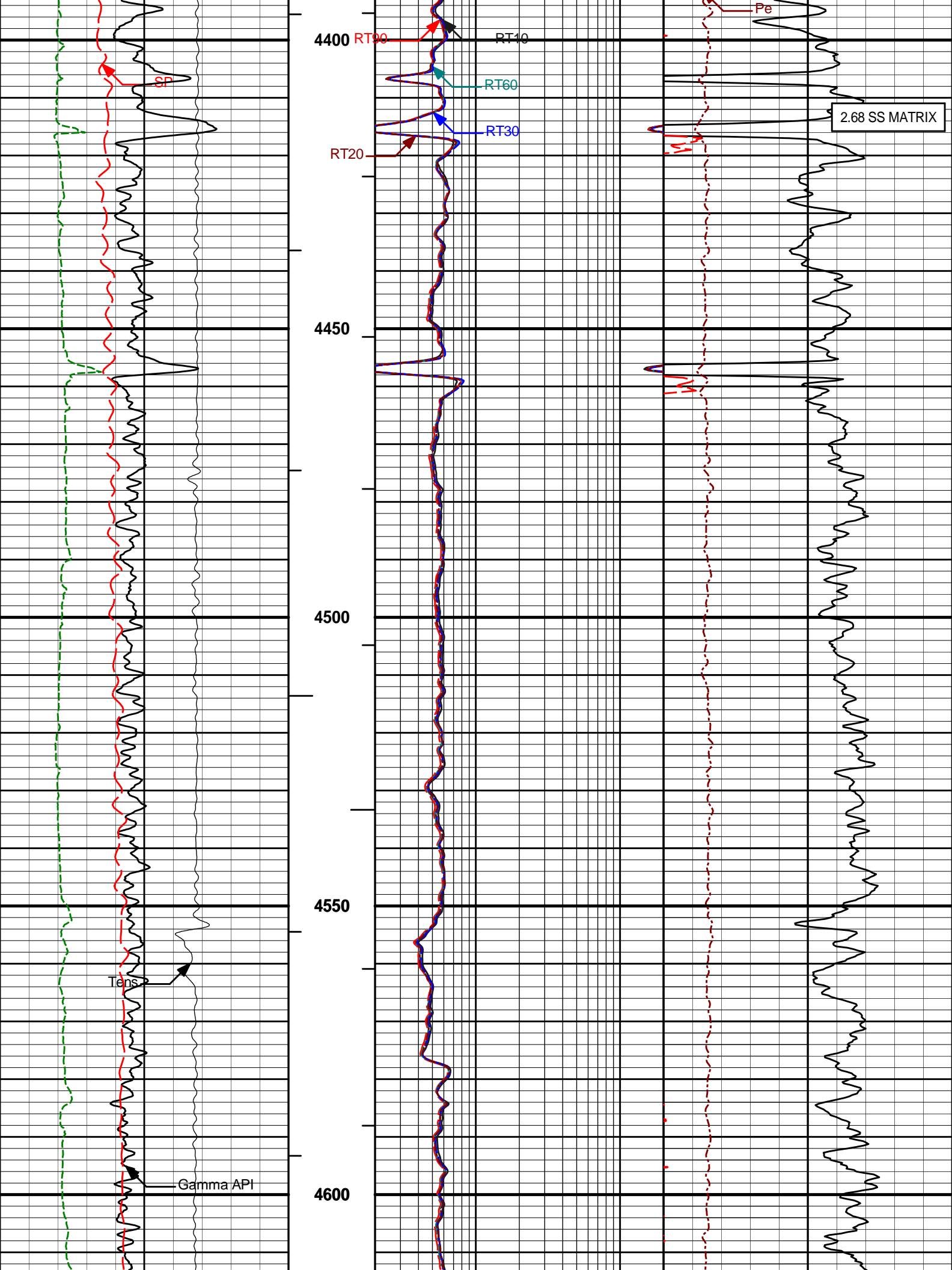
Annular Volume Total		2	RT10	200
			Ohm-m	
		6	RT10	200

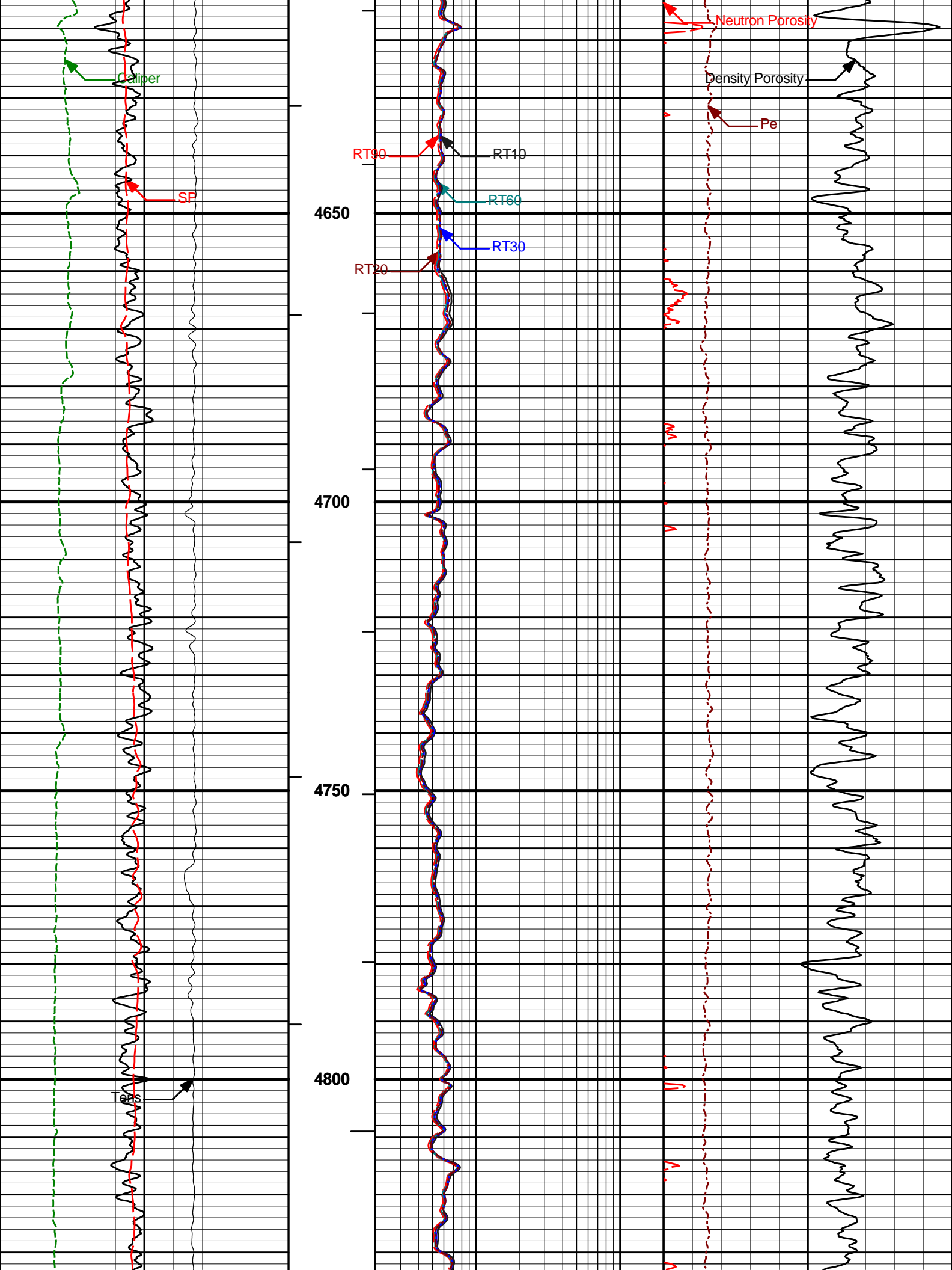


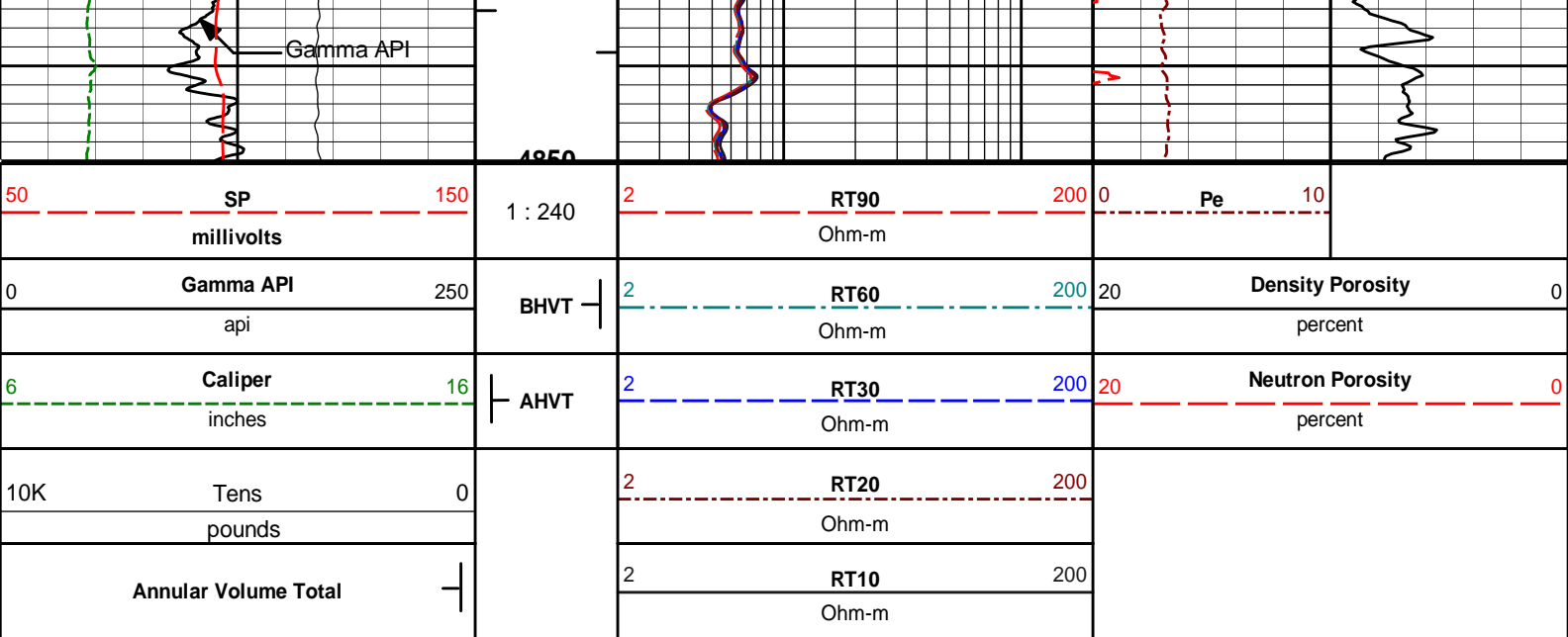












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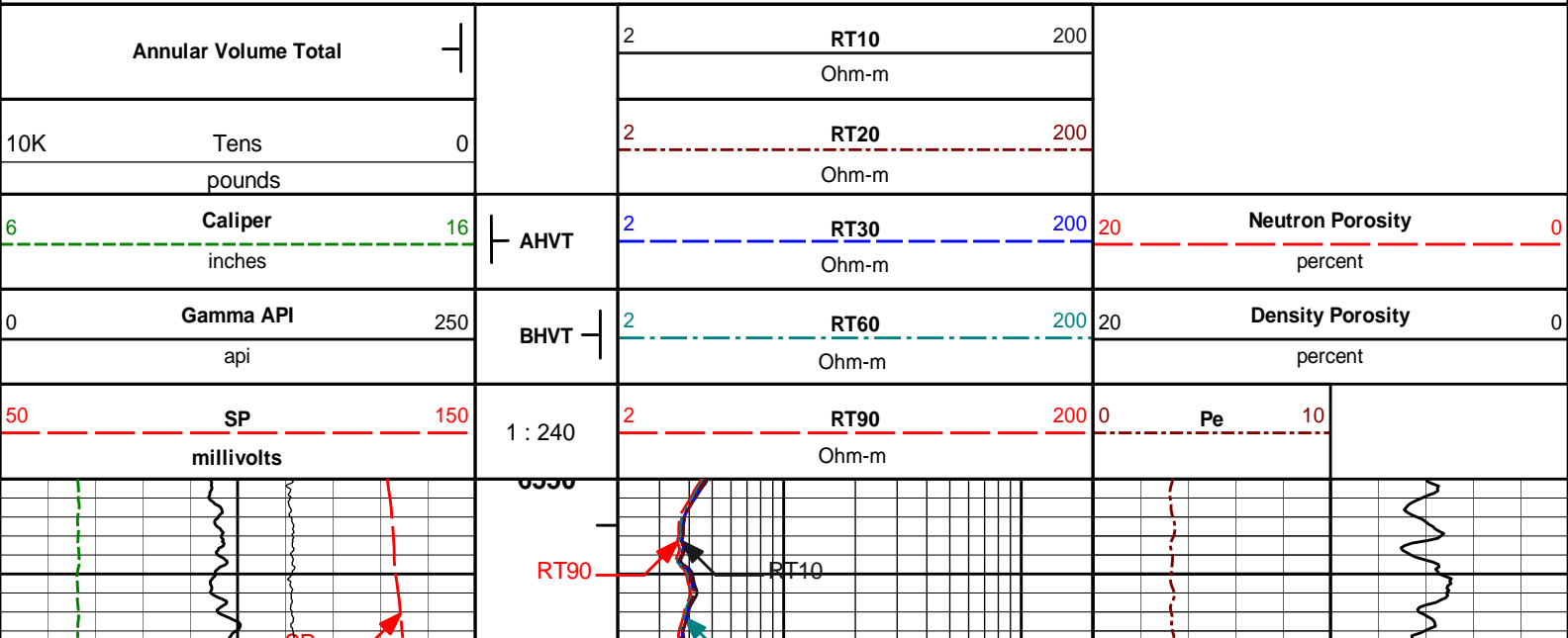
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 Plot Range: 3550 ft to 4850 ft
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 Plot File: \\COMP\PARK_SUS

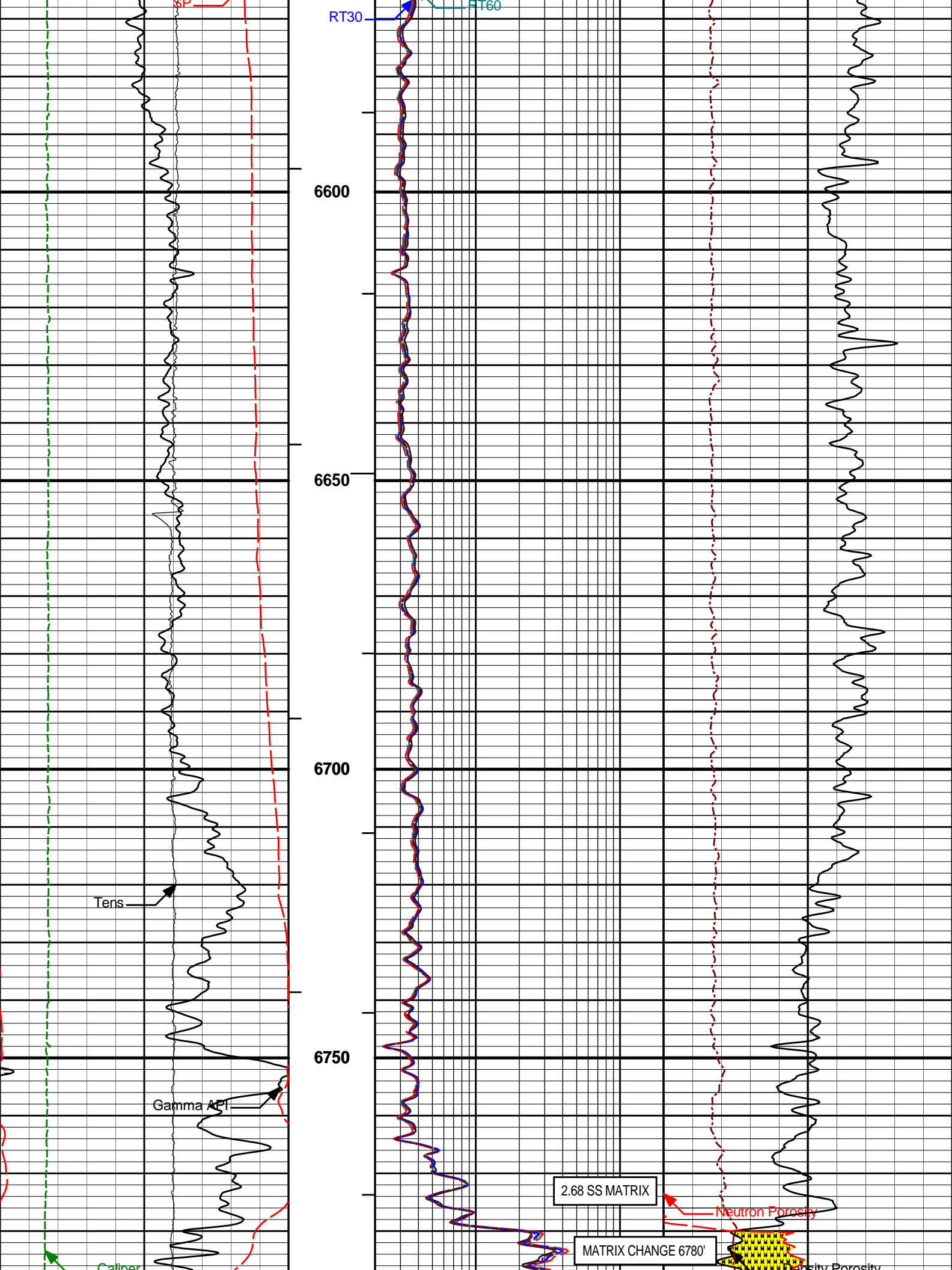
MAIN PASS 5" = 100'

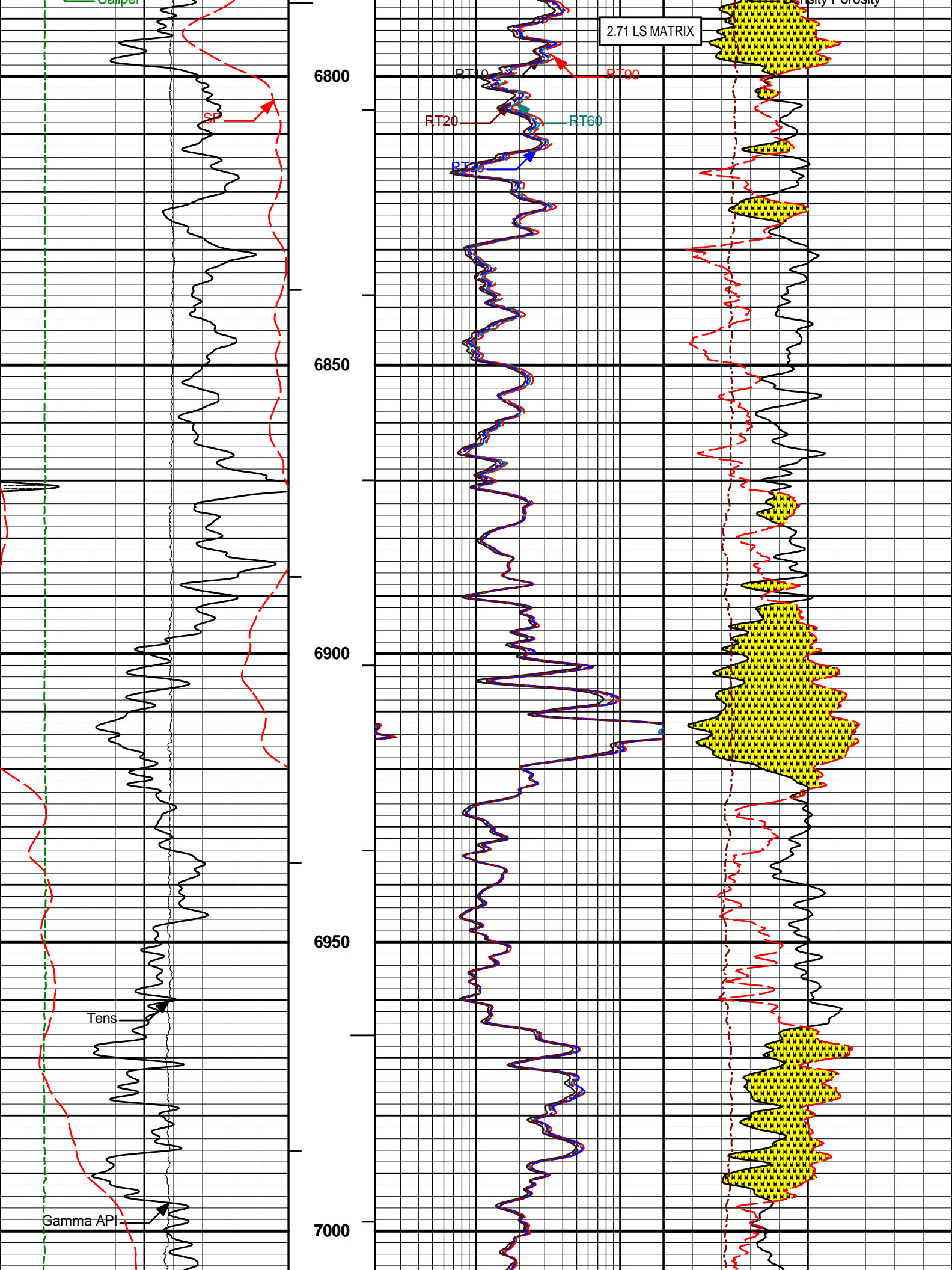
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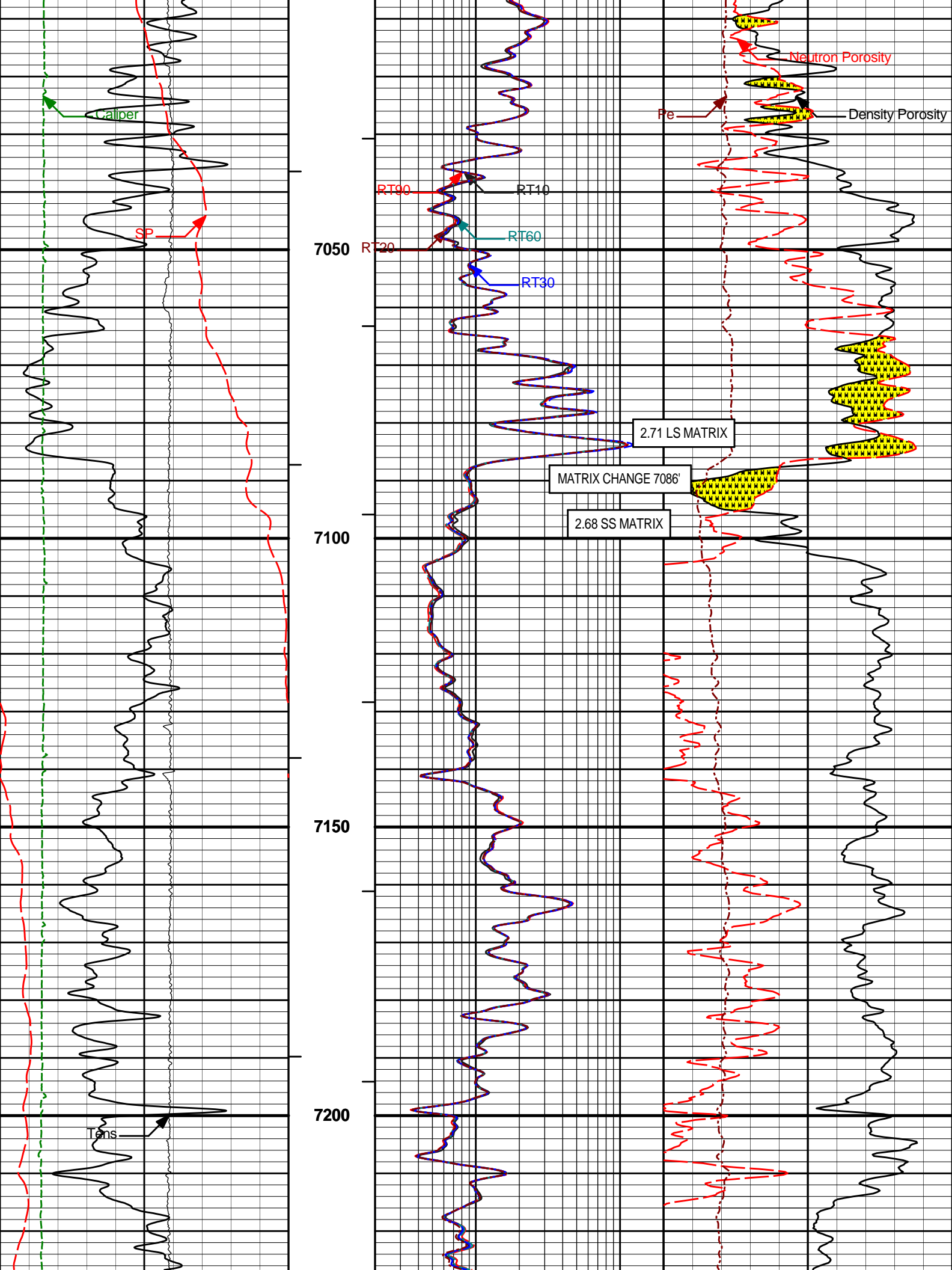
Plot Time: 30-Nov-10 20:47:42
 Plot Range: 6550 ft to 7291.92 ft
 Data: {ActiveWell}\Well Based\MAIN*
 Plot File: \\COMP\NIO_COD

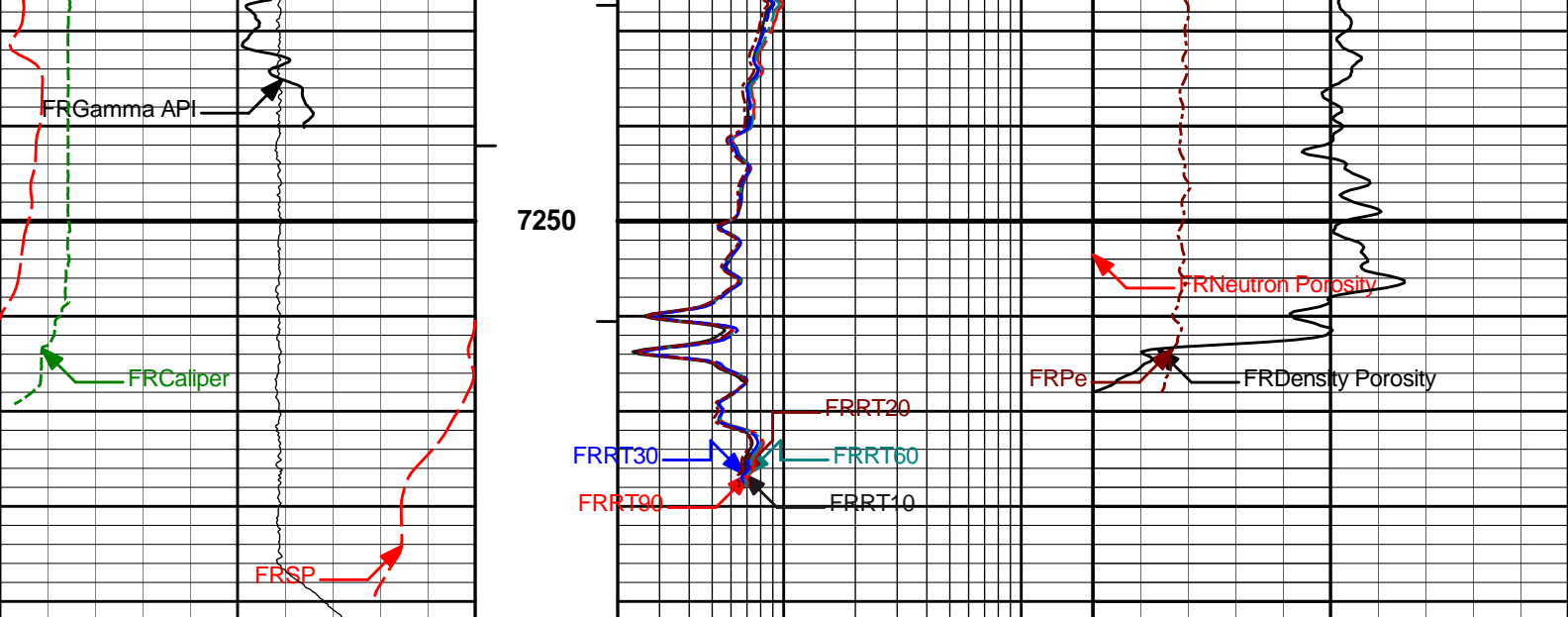
MAIN PASS 5" = 100'











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

HALLIBURTON Plot Time: 30-Nov-10 20:47:47
 Plot Range: 6550 ft to 7291.92 ft
 Data: {ActiveWell}\Well Based\MAIN*
 Plot File: \\COMP\NIO_COD

MAIN PASS 5" = 100'

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CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
Tool Name:	GTET - 11277436	Reference Calibration Date:	18-Nov-10 14:23:59
Engineer:	C. BLUE	Calibration Date:	18-Nov-10 14:28:34
Software Version:	WL INSITE R3.0.6 (Build 4)	Calibration Version:	1

Calibrator Source S/N: 10770395
 Calibrator API Reference: 251.00 api

Measurement	Measured	Calibrated	Units
Background	79.2	79.4	api
Background + Calibrator	333.8	334.8	api
Calibrator	255.6	255.4	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 11277436

Reference Calibration Date: 18-Nov-10 14:28:34

Engineer: F. LODER

Calibration Date: 29-Nov-10 21:50:54

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

Calibration Version: 1

Calibrator Source S/N: 10770395

Calibrator API Reference:251.00 api

Field Verification	Shop	Field	Units
Background	79.4	74.8	api
Background + Calibrator	334.8	326.9	api
Calibrator	255.4	252.1	api

Shop	Field	Difference	Tolerance
255.4	252.1	3.3	+/- 9.00

ACCELEROMETER SHOP CALIBRATION

Tool Name: GTET - 11277436

Reference Calibration Date: 25-Feb-09 10:23:32

Engineer: F. LODER

Calibration Date: 25-Feb-09 10:27:28

Software Version: WL INSITE R2.4 (Build 1)

Calibration Version: 1

Horizontal-1 Telemetry	Horizontal-2 Telemetry	Vertical Telemetry	Units
-229.00	-168.64	-16316.18	cnts

Coefficient	Coefficient Value	Tolerance
Gain	-0.000062	-0.0100 - 0.0100
Offset	-0.012	-----
Noise	0.0015	0.0030

Orientation	Measured	Calibrated
Horizontal	0.01	0.00
Vertical	1.00	1.00

CSNG-FS SHOP CALIBRATION

Tool Name: CSNG - 11212563

Reference Calibration Date: 10-Nov-10 12:13:41

Engineer: C. BLUE

Calibration Date: 10-Nov-10 12:34:55

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

Calibration Version: 1

Source SN: TB-255

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.0	23.0	Channel #
583 KEV Peak Channel #	51.1	51.4	Channel #
2614 KEV Peak Channel #	210.1	210.3	Channel #
Calibrate Temperature	66.0	71.9	degF

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

Blanket Reference Value: 253.00 API

Calibrator Value: 287.3 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1696.5	CPS	353.4	355.8	API
Background	326.4	CPS	66.1	68.4	API

Gamma Ray Gain: 1.06
Gamma Gain Check: Passed

CSNG-FS FIELD CALIBRATION

Tool Name: CSNG - 11212563 **Reference Calibration Date:** 10-Nov-10 12:34:55
Engineer: C. BLUE **Calibration Date:** 28-Nov-10 04:54:14
Software Version: WL INSITE R3.0.6 (Build 4) **Calibration Version:** 1
Source SN:

TITANIUM CASE	Shop	Field	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.0	23.1	Channel #
583 KEV Peak Channel #	51.4	51.3	Channel #
2614 KEV Peak Channel #	210.3	211.3	Channel #
Calibrate Temperature	71.9	55.5	degF

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

Blanket Reference Value: 253.00 API
Calibrator Value: 287.3 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1660.2	CPS	355.8	346.7	API
Background	284.3	CPS	68.4	59.4	API

Gamma Ray Gain: 1.05
Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 11919337 **Reference Calibration Date:** 18-Nov-10 18:54:18
Engineer: C. BLUE **Calibration Date:** 18-Nov-10 19:09:00
Software Version: WL INSITE R3.0.6 (Build 4) **Calibration Version:** 1

Logging Source S/N: DSN 430
Tank Serial Number: 11068236
Reference value assigned to Tank: 53.720
Snow Block S/N: 1223
Calibration Tank Water Temperature: 65 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.982	0.978	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):	0.2235	0.2224	0.0011	+/- 0.0020
Calibrated Ratio:	10.15	10.11	0.039	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0705	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 - I337M319

Reference Calibration Date: 19-Oct-10 18:50:11

Engineer: C. BLUE

Calibration Date: 18-Nov-10 17:38:15

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

Calibration Version: 1

Logging Source S/N: 5256GW

Aluminum Block S/N: BRIGHTON

Density: 2.600g/cc

Pe: 3.100

Magnesium Block S/N: BRIGHTON

Density: 1.680g/cc

Pe: 2.594

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0118	1.0158	0.90 - 1.10
Near Dens Gain	0.9947	1.0015	0.90 - 1.10
Near Peak Gain	0.9723	0.9897	0.90 - 1.10
Near Lith Gain	0.9646	0.9646	0.90 - 1.10
Far Bar Gain	1.0138	1.0077	0.90 - 1.10
Far Dens Gain	1.0042	1.0003	0.90 - 1.10
Far Peak Gain	0.9973	0.9968	0.90 - 1.10
Far Lith Gain	0.9720	0.9785	0.90 - 1.10
<hr/>			
Near Bar Offset	-0.1063	-0.1401	NONE
Near Dens Offset	0.0178	-0.0360	NONE
Near Peak Offset	0.2118	0.0760	NONE
Near Lith Offset	0.2561	0.2779	NONE
Far Bar Offset	-0.1686	-0.1204	NONE
Far Dens Offset	-0.1001	-0.0681	NONE
Far Peak Offset	-0.0600	-0.0560	NONE
Far Lith Offset	0.1167	0.0710	NONE
<hr/>			
Near Bar Background	865.00	864.95	700 - 1450
Near Dens Background	282.93	283.26	230 - 480
Near Peak Background	120.40	120.82	100 - 210
Near Lith Background	151.73	151.79	125 - 260
Far Bar Background	546.22	543.50	450 - 900
Far Dens Background	210.83	211.16	175 - 345
Far Peak Background	82.11	82.29	70 - 140
Far Lith Background	86.80	86.20	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.669	1.681	0.012	+/- 0.015
Pe	2.717	2.586	-0.131	+/- 0.150
ALUMINUM				
Density (g/cc)	2.593	2.600	0.007	+/- 0.01500
Pe	3.228	3.091	-0.137	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0008	+/- 0.0110	-0.0008	+/- 0.0140
Magnesium Block	-0.0007	+/- 0.0110	-0.0005	+/- 0.0140
Aluminum Block	0.0001	+/- 0.0110	-0.0004	+/- 0.0140
Resolution	9.37	6.00 - 11.50	9.68	6.00 - 11.50
Internal Verifier(B+D+P+L)	1421	1200 - 2700	923	800 - 1700

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

SPECTRAL DENSITY FIELD CHECK			
Tool Name:	SDLT - I337M319	Reference Calibration Date:	18-Nov-10 17:38:15
Engineer:	F. LODER	Calibration Date:	29-Nov-10 21:51:01
Software Version:	WL INSITE R3.0.6 (Build 4)	Calibration Version:	1

Pad Temperature: 43.5 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1420.821	1416.751	-4.070	15.215
Far (B+D+P+L) cps	923.143	923.591	0.448	16.458
Near Resolution	9.37	9.44	0.070	0.50
Far Resolution	9.68	9.79	0.110	1.00

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

DENSITY CALIPER SHOP CALIBRATION			
Tool Name:	SDLT - I337M319	Reference Calibration Date:	18-Nov-10 18:04:39
Engineer:	C. BLUE	Calibration Date:	18-Nov-10 18:08:43
Software Version:	WL INSITE R3.0.6 (Build 4)	Calibration Version:	1

CALIBRATION COEFFICIENTS

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-5592.06	-5532.24	-7000.00 - -1000.00
Pad Gain	0.0003880	0.0003857	0.000200 - 0.000600
Arm Offset	-3353.91	-3728.62	-5000.00 - 3000.00
Arm Gain	0.0005314	0.0005617	0.000300 - 0.000700
Arm Power	-0.000002179	-0.000004077	-0.000010 - 0.000010

The ring diameter is computed from: $DIAMETER = PAD\ EXTENSION + ARM\ EXTENSION + TOOL\ DIAMETER$

Tool Diameter: 4.50 in

CALIBRATION RINGS				
Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				
Small Ring (in)	1.99	2.00	0.01	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.57	6.50	-0.07	+/- 0.20
Medium Ring (in)	8.26	8.25	-0.01	+/- 0.20
Large Ring (in)	15.01	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

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION			
Tool Name:	ACRt - 90199007-E6758-S4352	Reference Calibration Date:	04-Jun-10 17:35:57
Engineer:	C. BLUE	Calibration Date:	13-Aug-10 20:36:17
Software Version:	WL INSITE R3.0.4 (Build 6)	Calibration Version:	1

TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0222	1.05	0.95	1.0229	1.05	0.95	1.0194	1.05
A2 (50")	0.95	0.9997	1.05	0.95	1.0021	1.05	0.95	0.9995	1.05
A3 (29")	0.95	0.9946	1.05	0.95	0.9956	1.05	0.95	0.9917	1.05
A4 (17")	0.95	0.9997	1.05	0.95	0.9975	1.05	0.95	0.9947	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0022	1.05	0.95	0.9988	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9802	1.05	0.95	0.9754	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	-0.767	2	-6	-4.245	-2	-8	-5.212	-2
A2 (50")	-7	-3.191	-1	-6	-4.049	-2	-7	-4.429	-2
A3 (29")	-27	-14.006	-9	-9	-4.120	-3	-7	-3.109	-1
A4 (17")	-180	-96.845	-60	-45	-31.787	-15	-39	-25.716	-13
A5 (10")	N/A	N/A	N/A	-150	-89.499	-50	-80	-43.805	-10
A6 (6")	N/A	N/A	N/A	175	295.504	525	90	152.604	270

TRANSMITTER CURRENT GAIN			
Signal	Lower	Upper	Measured

R-MUD VERIFICATION		
Signal	Lower	Upper

Signal	Lower	R	Upper	Signal	(ohm-m)	(ohm-m)	(ohm-m)
12K	0.6	0.8902	1.3	Mud Cell	0.95	1.010	1.05
36K	1.0	1.8792	2.0				
72K	1.0	1.1270	2.0				

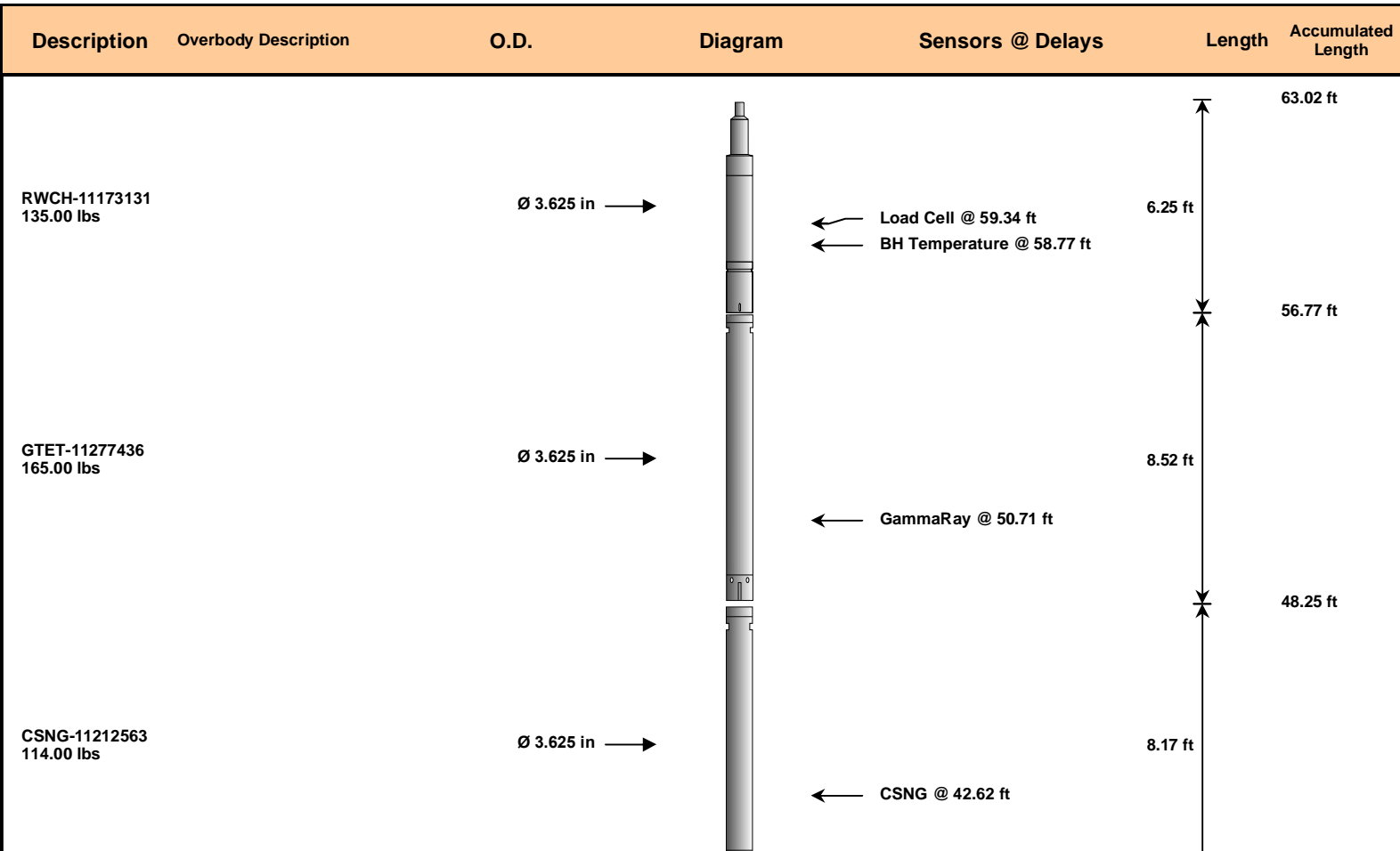
CALIBRATION SUMMARY

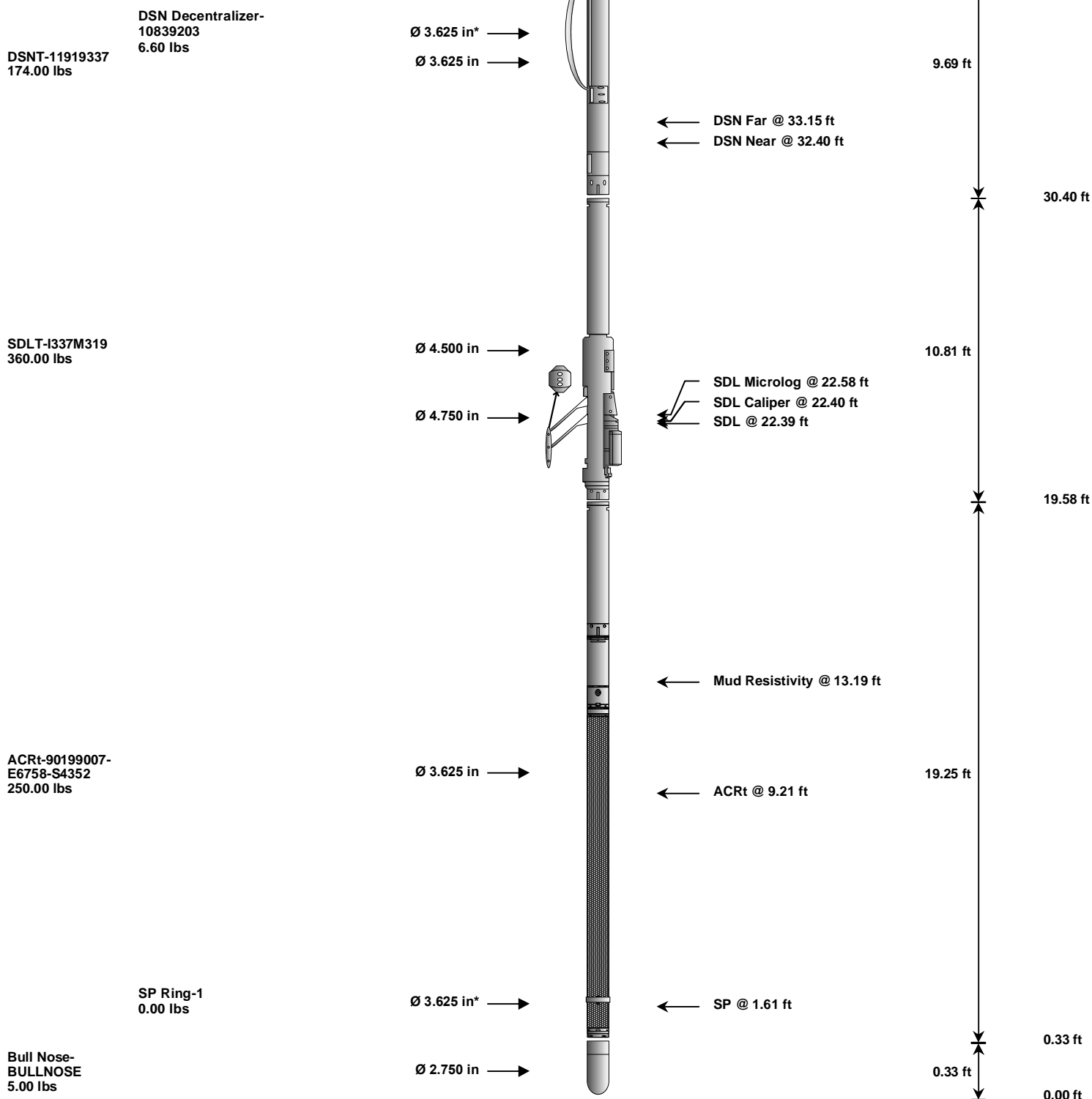
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11277436						
Gamma Ray Calibrator	255.4	252.1	-----	3.3	+/- 9.00	api
CSNG-11212563						
60 KEV Peak Channel #	48.0	48.0	-----	0.0	-----	Channel #
239 KEV Peak Channel #	23.0	23.1	-----	-0.1	-----	Channel #
583 KEV Peak Channel #	51.4	51.3	-----	0.1	-----	Channel #
2614 KEV Peak Channel #	210.3	211.3	-----	-1.0	-----	Channel #
DSNT-11919337						
Snow-Block Porosity	0.0705	-----	-----	0.0000	+/- .--	decp
SDLT-I337M319						
Near(B+D+P+L)	1420.821	1416.751	-----	4.070	+/-15.215	cps
Far(B+D+P+L)	923.143	923.591	-----	-0.448	+/-16.458	cps
Pad Extension	3.75	-----	-----	0.00	+/-0.20	in
Ring Diameter	8.25	-----	-----	0.00	+/-0.20	in
ACRt-90199007-E6758-S4352						
Mud Cell	1.010	-----	-----	0.000	-----	ohm-m

Data: STROHAUER_F3223\0001 TRIPLE_CSNGIDLE Date: 30-Nov-10 16:02:59



TOOL STRING DIAGRAM REPORT





Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)	
RWCH	Releasable Wireline Cable Head	11173131	135.00	6.25	56.77	300.00	
GTET	Gamma Telemetry Tool	11277436	165.00	8.52	48.25	60.00	
CSNG	Compensated Spectral Natural Gamma	11212563	114.00	8.17	40.08	15.00	
DSNT	Dual Spaced Neutron	11919337	174.00	9.69	30.40	60.00	
DCNT	DSN Decentralizer	10839203	6.60	5.13	*	33.73	300.00
SDLT	Spectral Density Tool	I337M319	360.00	10.81	19.58	60.00	
ACRt	Array Compensated True Resistivity	90199007-E6758-S4352	250.00	19.25	0.33	300.00	
SP	SP Ring	1	0.00	0.25	*	1.61	300.00
BLNS	Bull Nose	BULLNOSE	5.00	0.33	0.00	300.00	

Total **1,209.60** **63.02**

* Not included in Total Length and Length Accumulation.

COMPANY	NOBLE ENERGY INC.		
WELL	STROHAUER F32-23		
FIELD	WATTENBERG		
COUNTY	WELD	STATE	CO
HALLIBURTON		SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TRUE RESISTIVITY	