

HALLIBURTON

SPECTRAL DENSITY  
DUAL SPACED NEUTRON  
ARRAY COMPENSATED  
TRUE RESISTIVITY  
LOG

COMPANY	NOBLE ENERGY INC		
WELL	SHERWOOD L30-30D		
FIELD	WATTENBERG		
COUNTY	WELD		
STATE	CO		
Permanent Datum	GL		Elev. 4820.0 ft
Log measured from	KB		D.F. 4835.0 ft
Drilling measured from	KB		G.L. 4820.0 ft
Date	25-Nov-10		
Run No.	ONE		
Depth - Driller	8113.00 ft		
Depth - Logger	8117.0 ft		
Bottom - Logged Interval	8106 ft		
Top - Logged Interval	850 ft		
Casing - Driller	8,625 in @ 608.0 ft		@
Casing - Logger	655.0 ft		
Bit Size	7.875 in		@
Type Fluid in Hole	WBM		
Density	9.2 ppq	29.00 sg/c	
PH	8.00 pH	28.0 cp/m	
Source of Sample	FLOW LINE		
Rm @ Meas. Temperature	1.100 ohmm @ 85.00 degF		@
Rmf @ Meas. Temperature	1.06 ohmm @ 75.00 degF		@
Rmc @ Meas. Temperature	1.093 ohmm @ 75.00 degF		@
Source Rmf	CHART	CHART	
Rm @ BHT	0.46 ohmm @ 213.0 degF		@
Time Since Circulation	8.0 hr		
Time on Bottom	26-Nov-10 00:15		
Max. Rec. Temperature	213.0 degF @ 8113.0 ft		@
Equipment	11454566	BRIGHTON	
Recorded By	F. LODER		
Witnessed By	S. BIGGS		

COMPANY NOBLE ENERGY INC  
WELL SHERWOOD L30-30D  
FIELD WATTENBERG  
COUNTY WELD  
STATE CO

API No. 05123311270000  
Location SURFACE LOCATION: 717' FNL & 763' FWL NWNW  
BOTTOM LOCATION: 75' FSL & 165' FSL SWSW  
LATITUDE: 40.200840°  
LONGITUDE: -104.827340°

Other Services:  
RWCH  
CSNG

Fold here

Service Ticket No.: 7797204						API Serial No.: 05123311270000						PGM Version: WL INSITE R3.0.4 (Build 6)																	
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE												RESISTIVITY SCALE CHANGES																	
Date		Sample No.										Type Log		Depth		Scale Up Hole				Scale Down Hole									
Depth-Driller																													
Type Fluid in Hole																													
Density		Viscosity																											
Ph		Fluid Loss																											
Source of Sample												RESISTIVITY EQUIPMENT DATA																	
Rm @ Meas. Temp				@				@				Run No.		Tool Type & No.				Pad Type				Tool Pos.				Other			
Rmf @ Meas. Temp.				@				@				ONE		ACRt 817-353				N/A				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.						Run No.		ONE				Run No.		ONE									
Serial No.		11277436				Serial No.						Serial No.		I440M335				Serial No.		11277440									
Model No.		GTET				Model No.						Model No.		SDLT				Model No.		DSNT									
Diameter		3.625"				No. of Cent.						Diameter		4.75"				Diameter		3.625"									
Detector Model No.		2G8-BICORN				Spacing						Log Type		GAM-GAM				Log Type		NEU-NEU									
Type		SCINT										Source Type		Cs137				Source Type		Am241Be									
Length		8"				LSA [Y/N]						Serial No.		2770GW				Serial No.		DSN434									
Distance to Source		15"				FWDA [Y/N ]						Strength		1.5 Ci				Strength		15 Ci									

GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON						
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix				
No.	From	To	ft/min	L	R	L	R		L	R	L	R			
ONE	8117'	7868"	REC	0 API	250 API				20 %	0 %	2.65 g/cc	20 %	0 %	SAND	
ONE	7868'	7431'	REC	0 API	250 API				20 %	0 %	2.68 g/cc	20 %	0 %	SAND	
ONE	7431'	7157'	REC	0 API	250 API				20 %	0 %	2.71 g/cc	20 %	0 %	LIME	
ONE	7157'	650'	REC	0 API	250 API				20 %	0 %	2.68 g/cc	20 %	0 %	SAND	
DIRECTIONAL INFORMATION															
Maximum Deviation								@	KOP						
Remarks: RWCH-GTET-CSNG-DSNT-SDLT-ACRT RAN IN COMBINATION															
ANNULAR HOLE VOLUME CALCULATED USING 4.5 INCH PRODUCTION CASING															
TENSION PULLS AND BOREHOLE RUGOSITY AFFECT LOG RESPONSE															
CHLORIDES REPORTED AT 650 PPM															
CREW: M. BURNETT, S. SMITH, A. DUNCAN															
RIG: ENSIGN 128															
THANK YOU FOR USING 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	Mnemonic	Description	Value	Units
TOP					
	DSNT	NLIT	Neutron Lithology	Sandstone	
	SDLT	DMA	Formation Density Matrix	2.680	g/cc
7157.00					
	DSNT	NLIT	Neutron Lithology	Limestone	
	SDLT	DMA	Formation Density Matrix	2.710	g/cc
7409.00					
	SDLT	DMA	Formation Density Matrix	2.680	g/cc
7868.00					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDWT	Borehole Fluid Weight	9.200	ppg
	SHARED	OBM	Oil Based Mud System?	No	
	SHARED	RMUD	Mud Resistivity	1.100	ohmm
	SHARED	TRM	Temperature of Mud	85.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	4.500	in
	SHARED	ST	Surface Temperature	20.0	degF
	SHARED	TD	Total Well Depth	8113.00	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	DSNO	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?	None	
SDLT	DMA	Formation Density Matrix	2.650	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: SHRWD\_L30\_30D\0001 TRIPLE\_CSNG\_RED\003.01 26-Nov-10 01:49 Up

Date: 26-Nov-10 01:58:09

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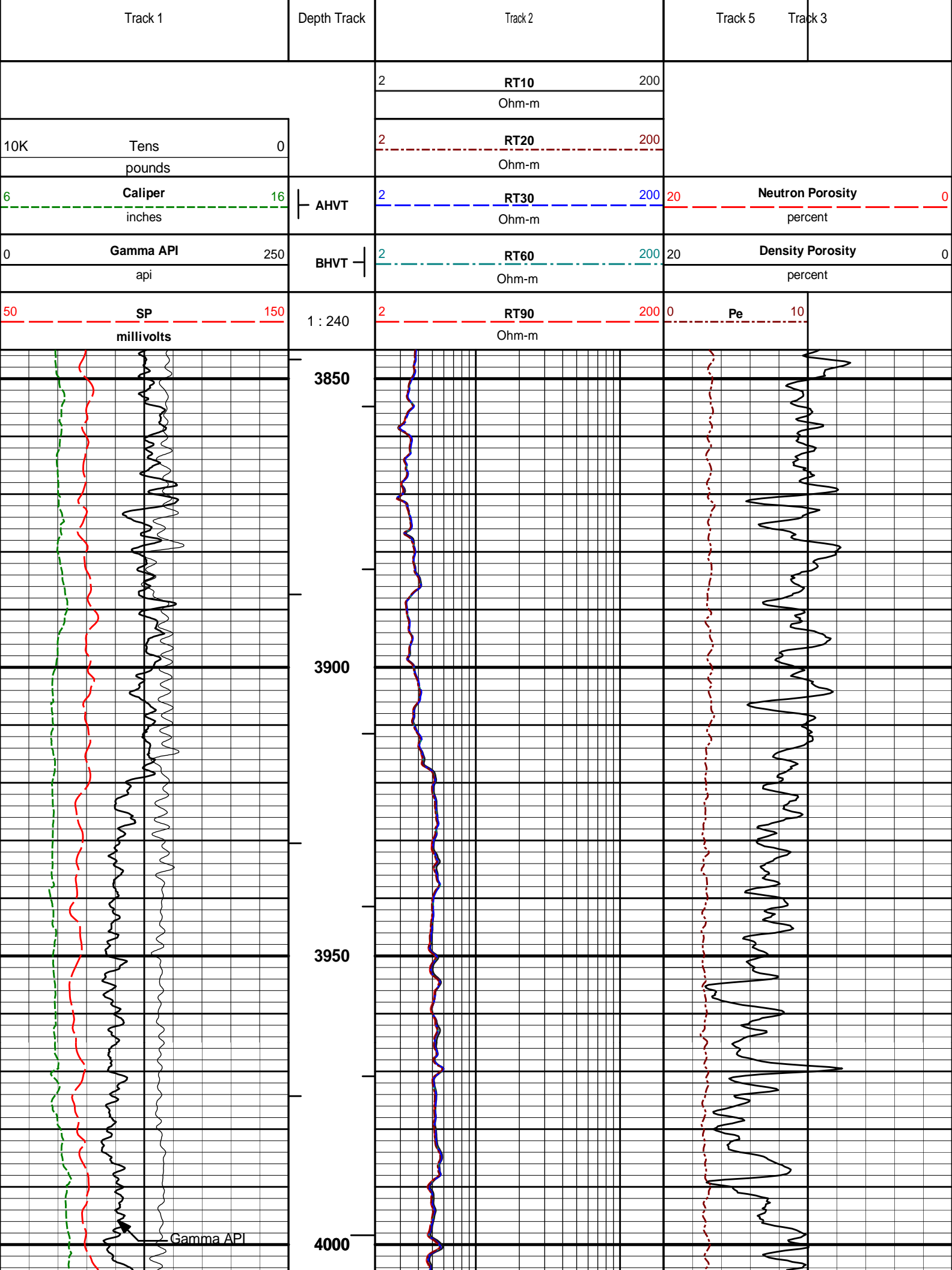
Plot Time: 26-Nov-10 02:28:15

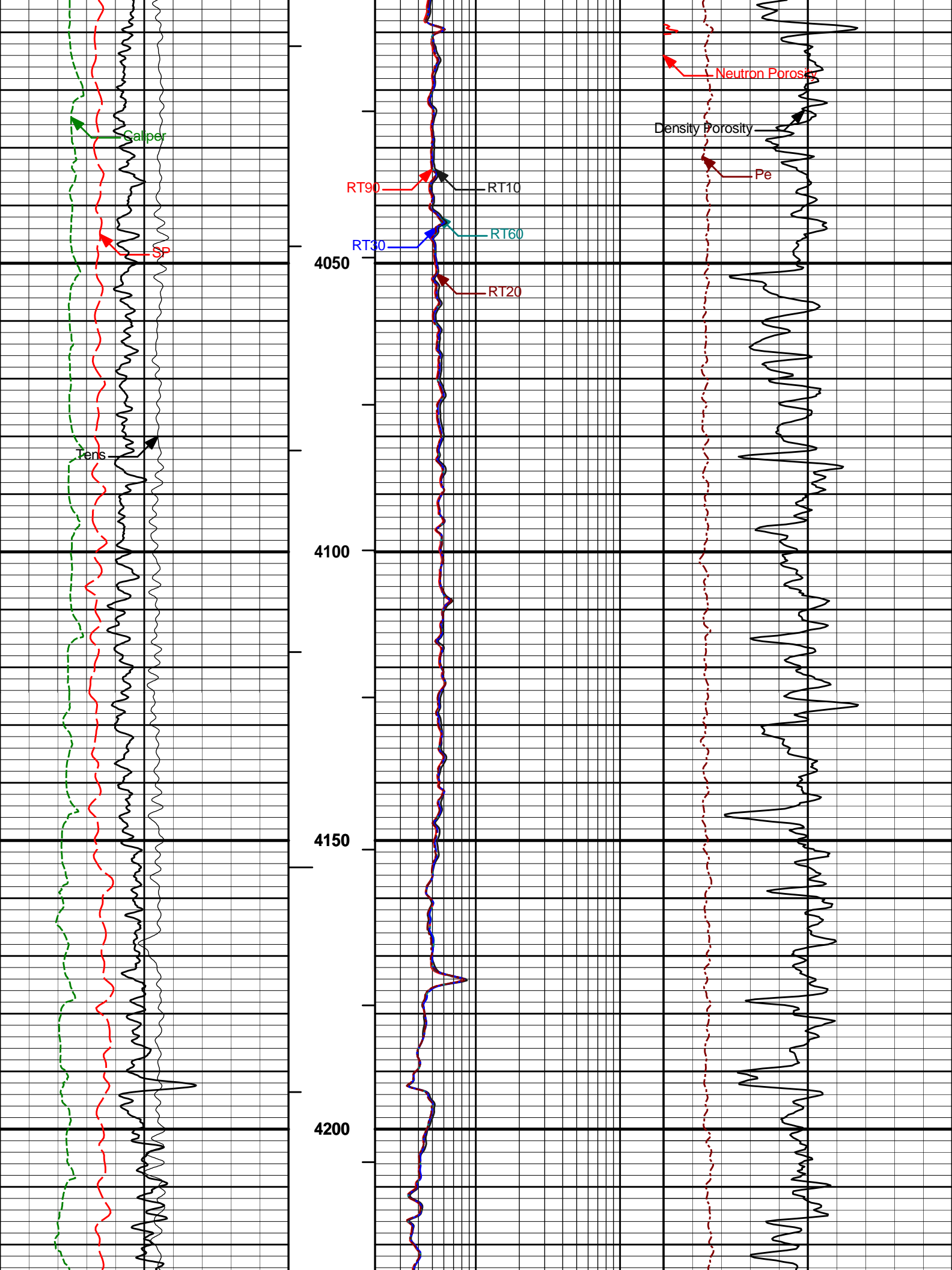
Plot Range: 3845 ft to 4445 ft

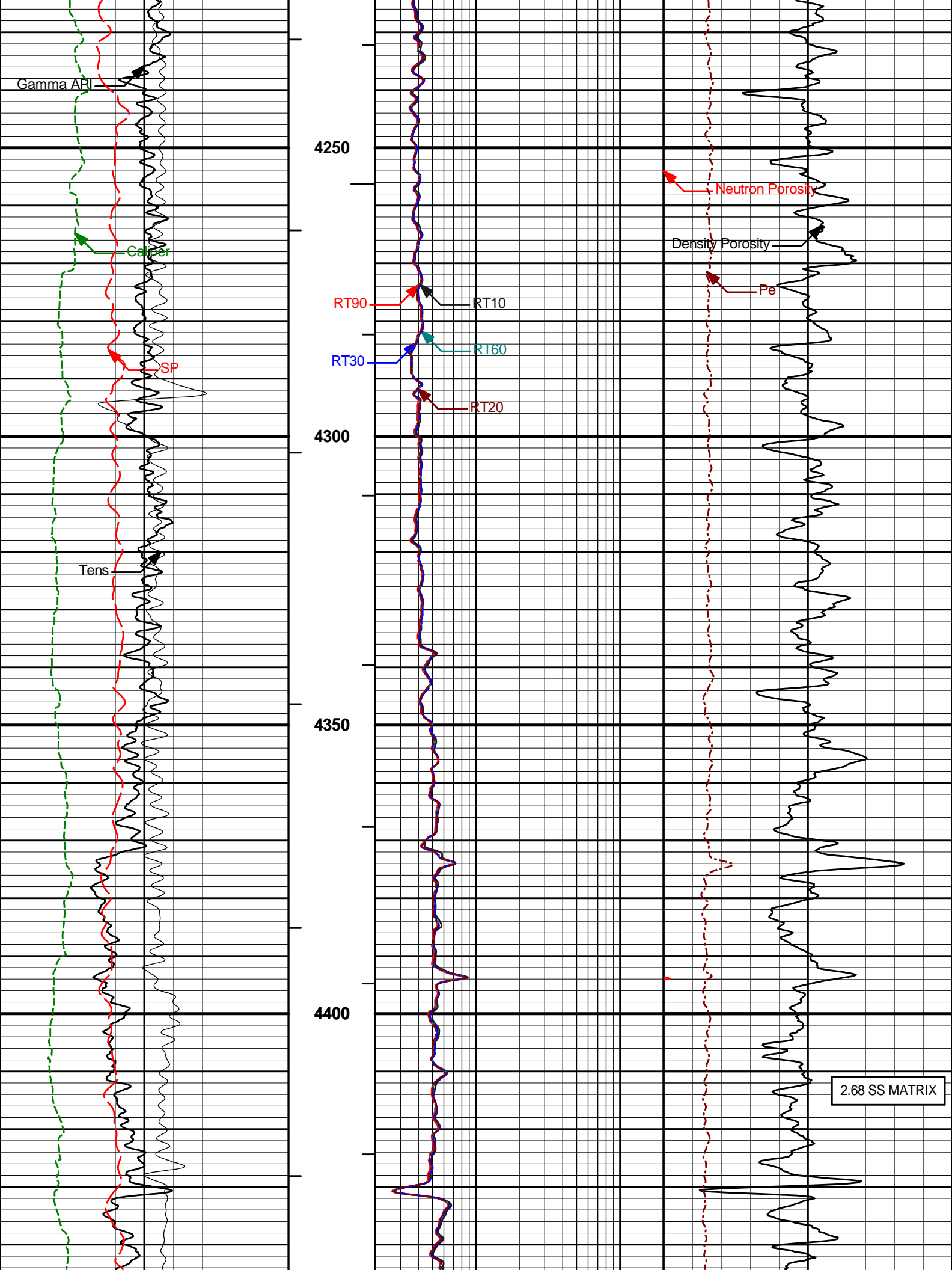
Data: {ActiveWell}\Well Based\MAIN\*

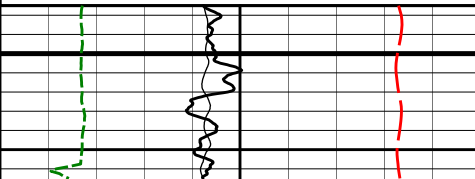
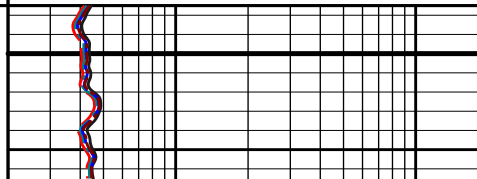

Plot File: \COMP\PARK\_SUS

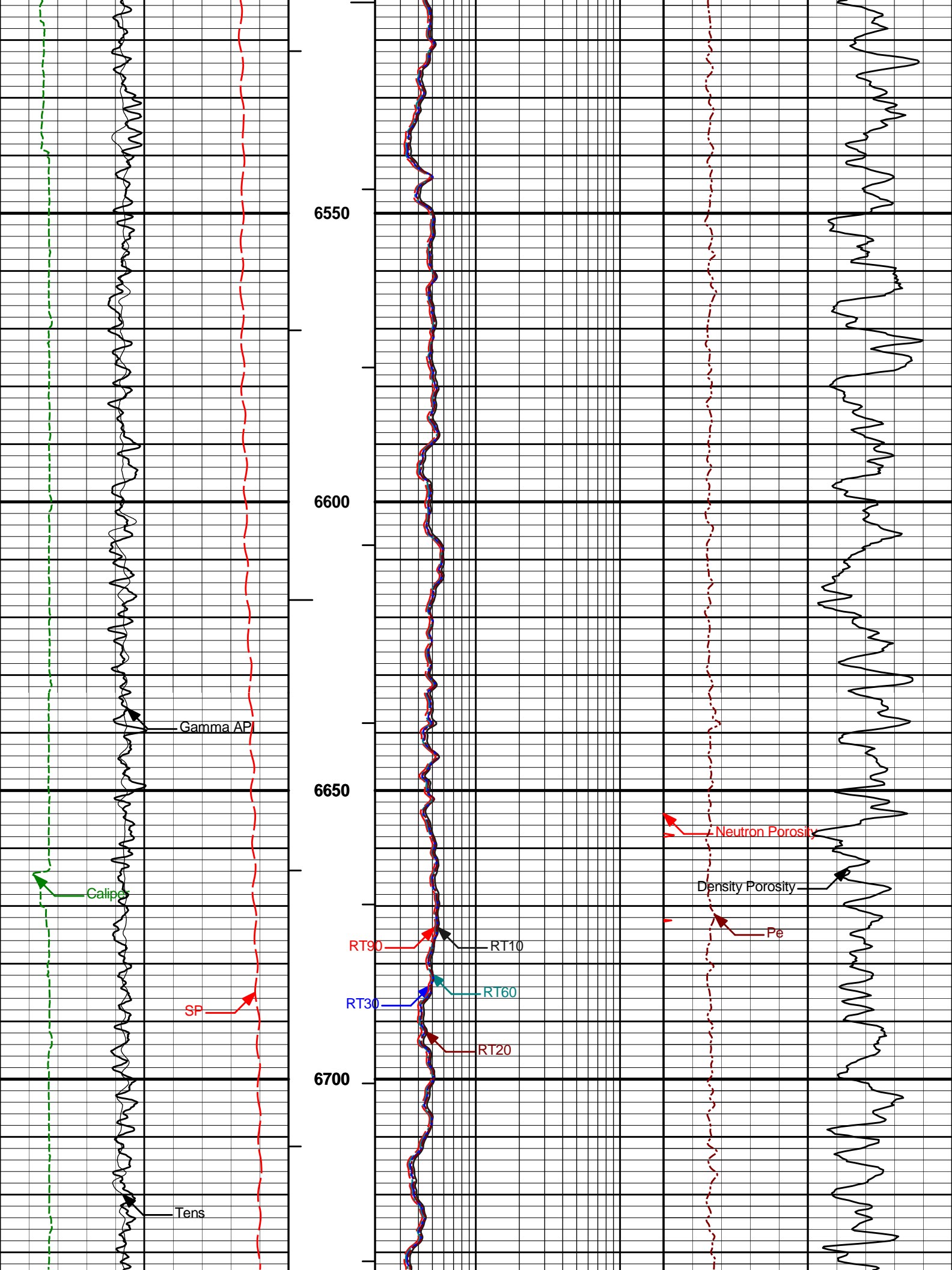
MAIN PASS 5" = 100'



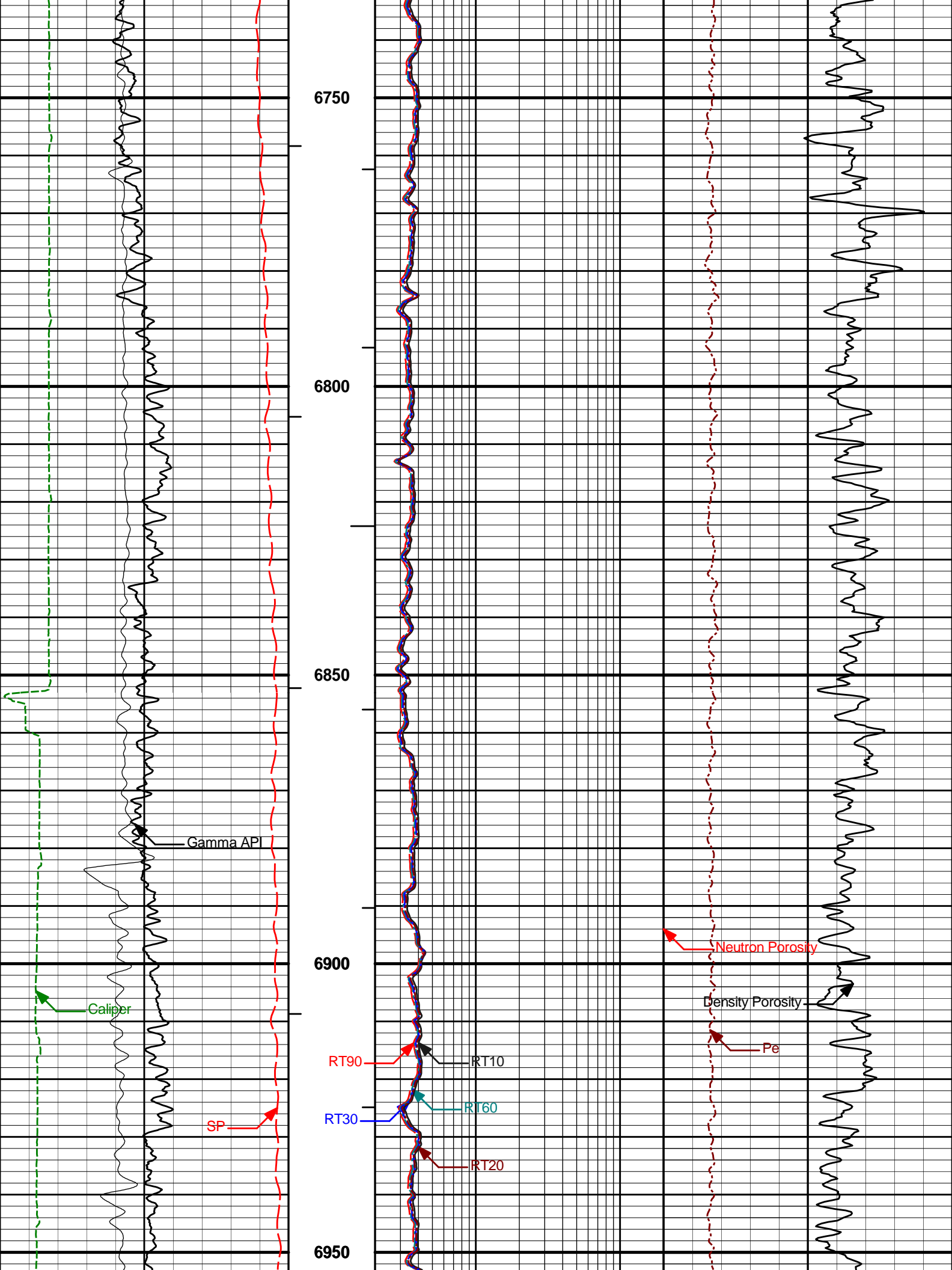


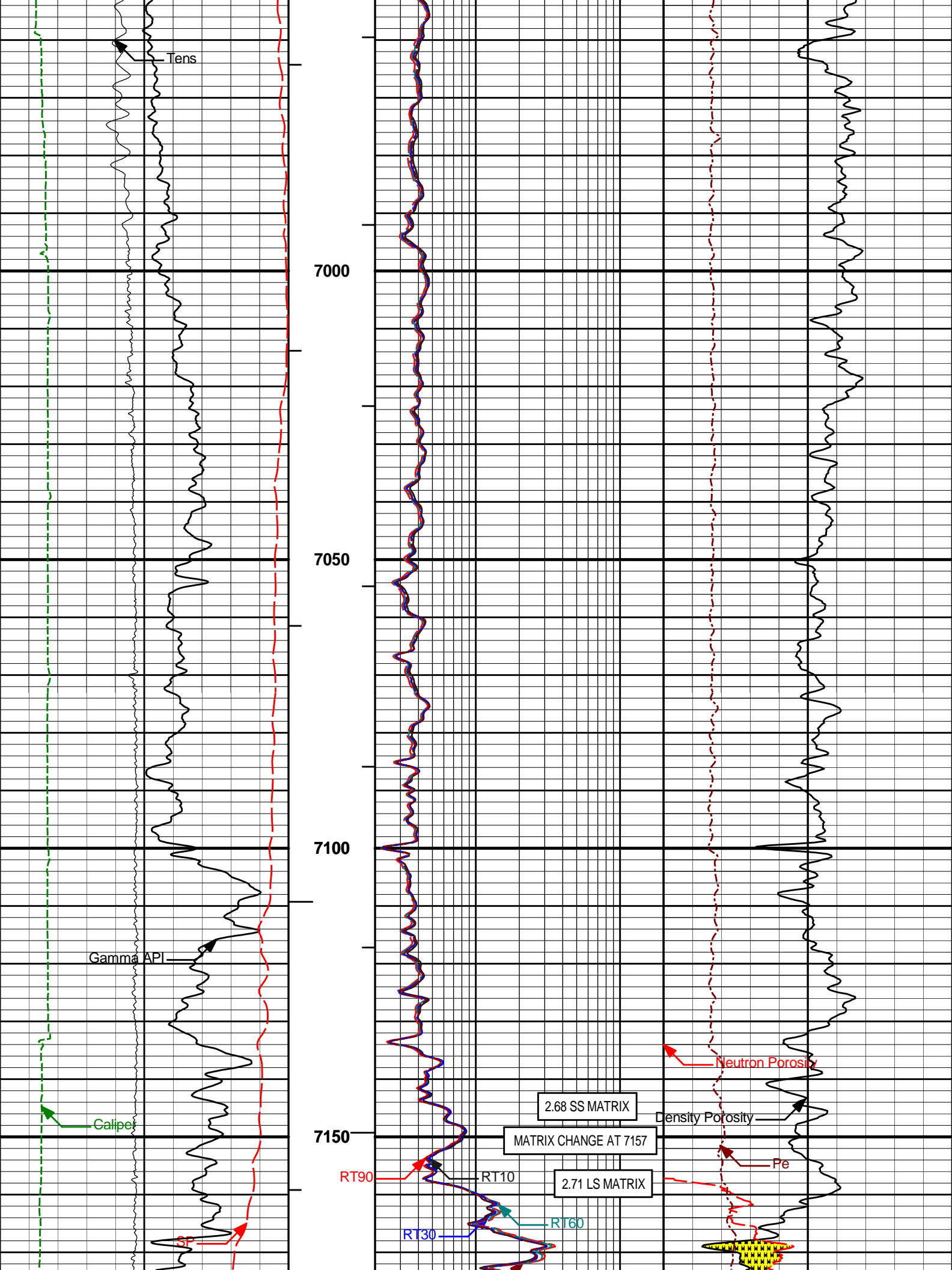


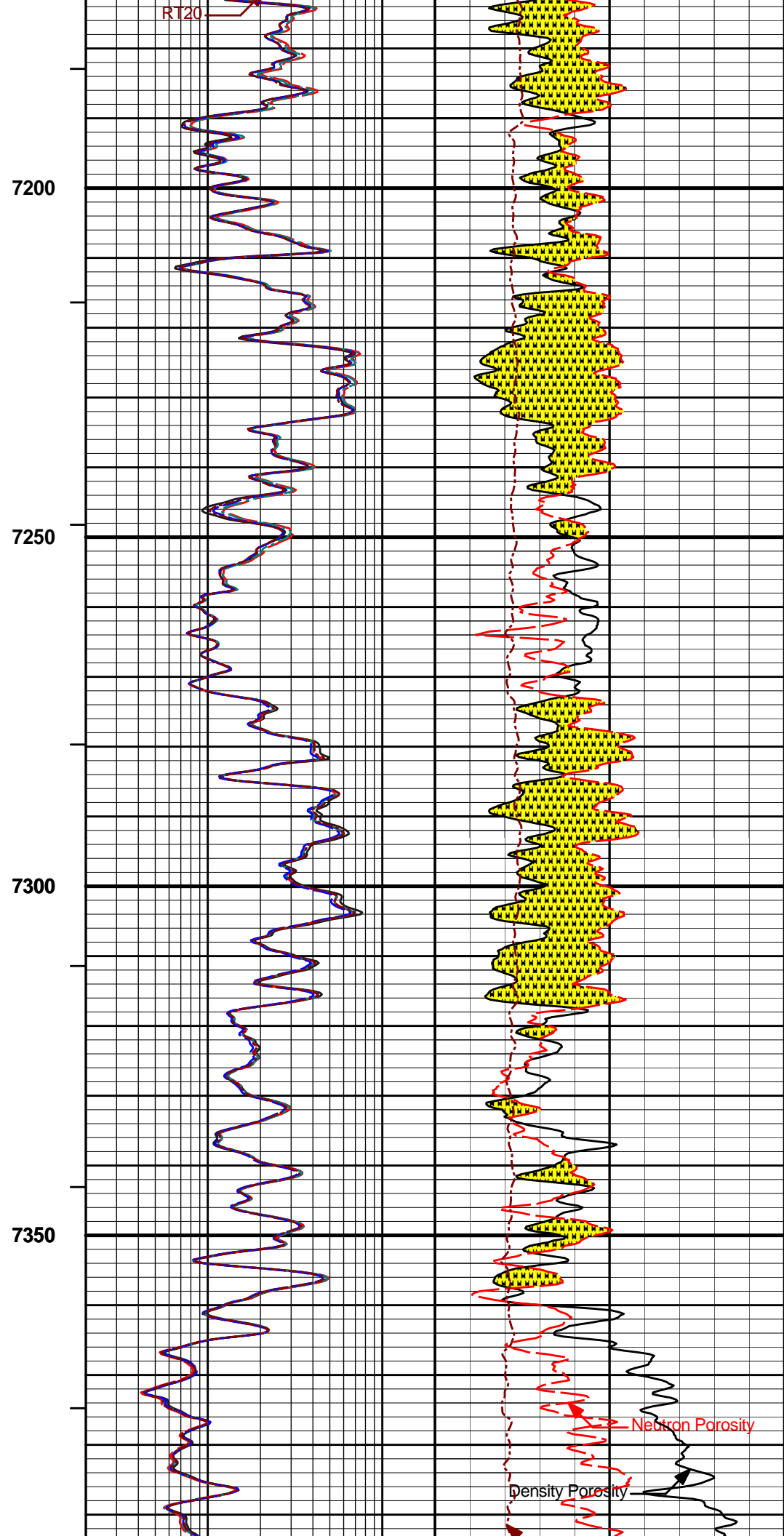
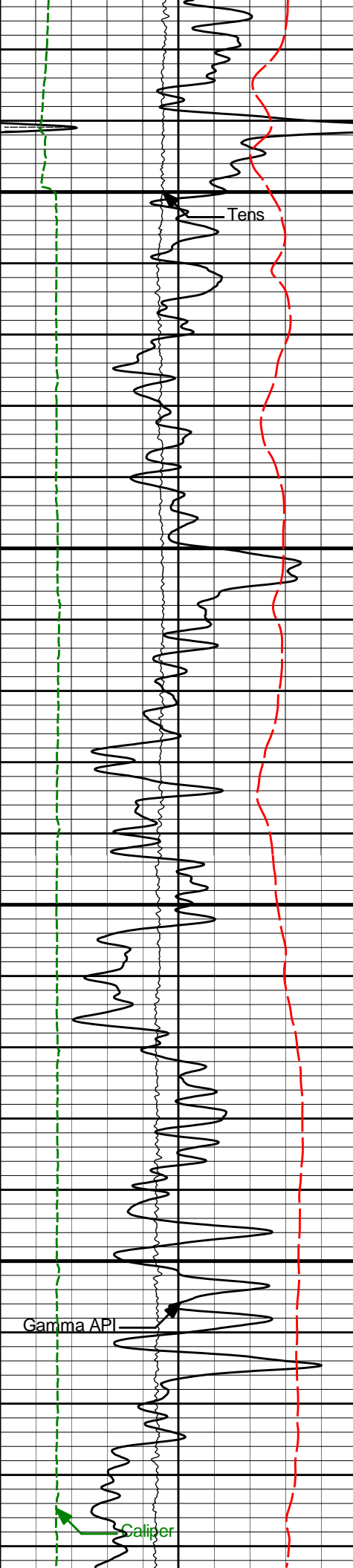
Track 1			Depth Track	Track 2		Track 5	Track 3
				2	<b>RT10</b> 200		
				Ohm-m			
10K	Tens	0		2	<b>RT20</b> 200		
pounds				Ohm-m			
6	<b>Caliper</b>	16	AHVT	2	<b>RT30</b> 200	20	<b>Neutron Porosity</b> 0
inches				Ohm-m		percent	
0	<b>Gamma API</b>	250	BHVT	2	<b>RT60</b> 200	20	<b>Density Porosity</b> 0
api				Ohm-m		percent	
50	<b>SP</b>	150	1 : 240	2	<b>RT90</b> 200	0	<b>Pe</b> 10
millivolts				Ohm-m			
			6500				

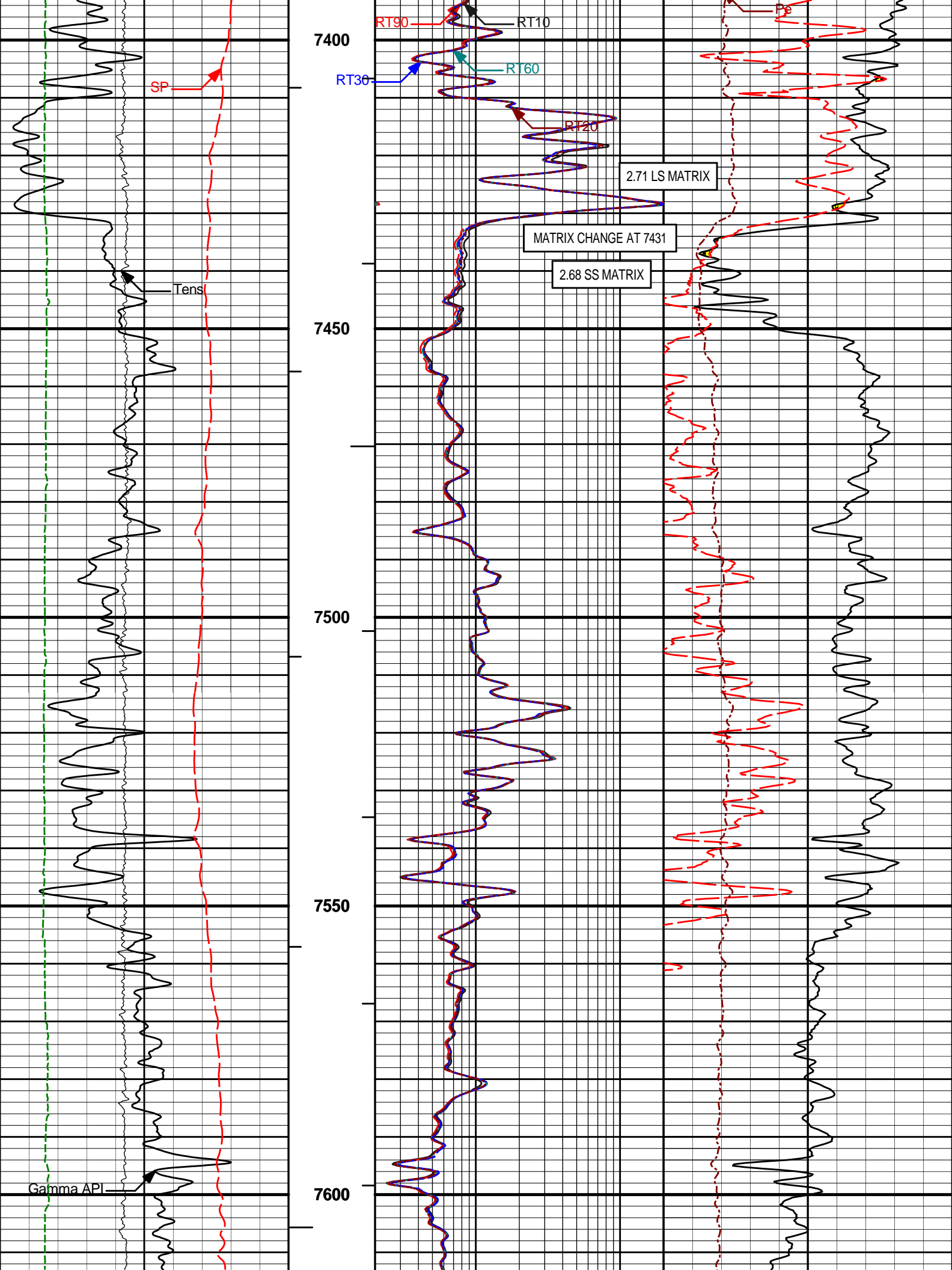


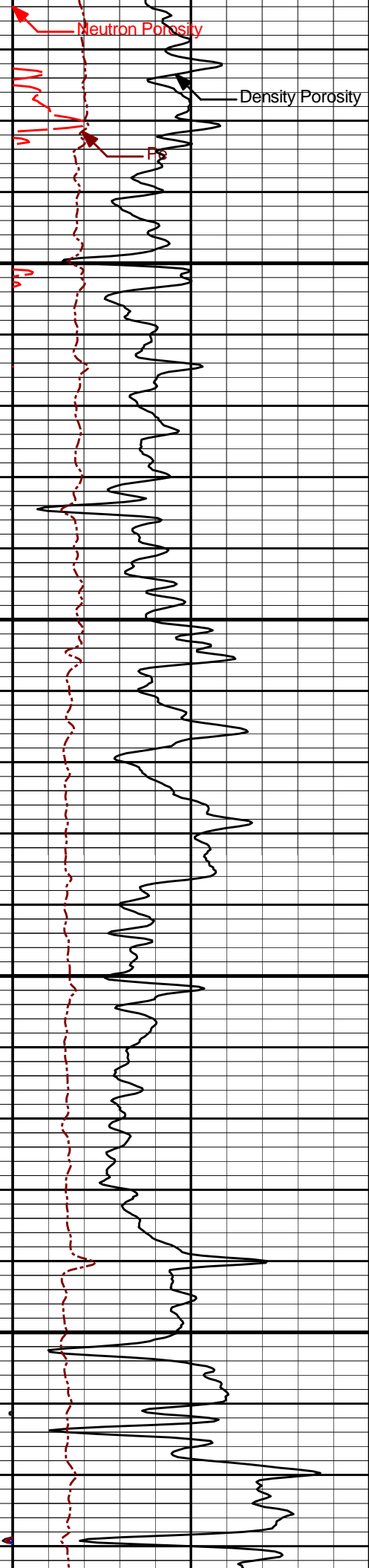
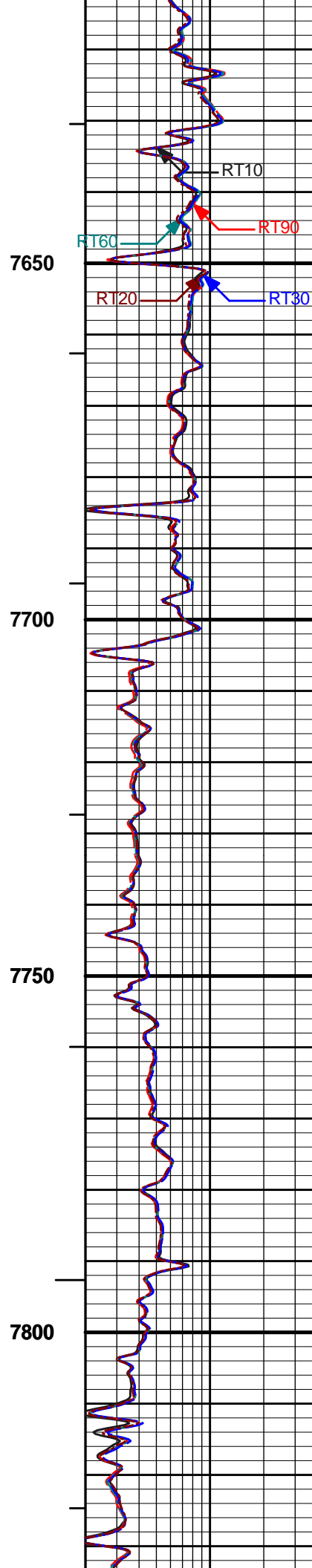
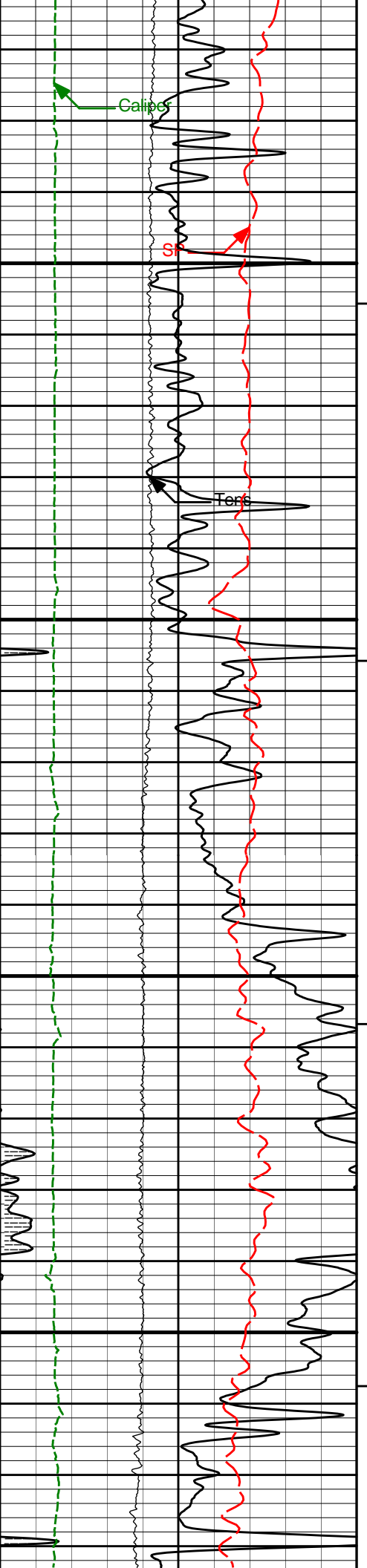


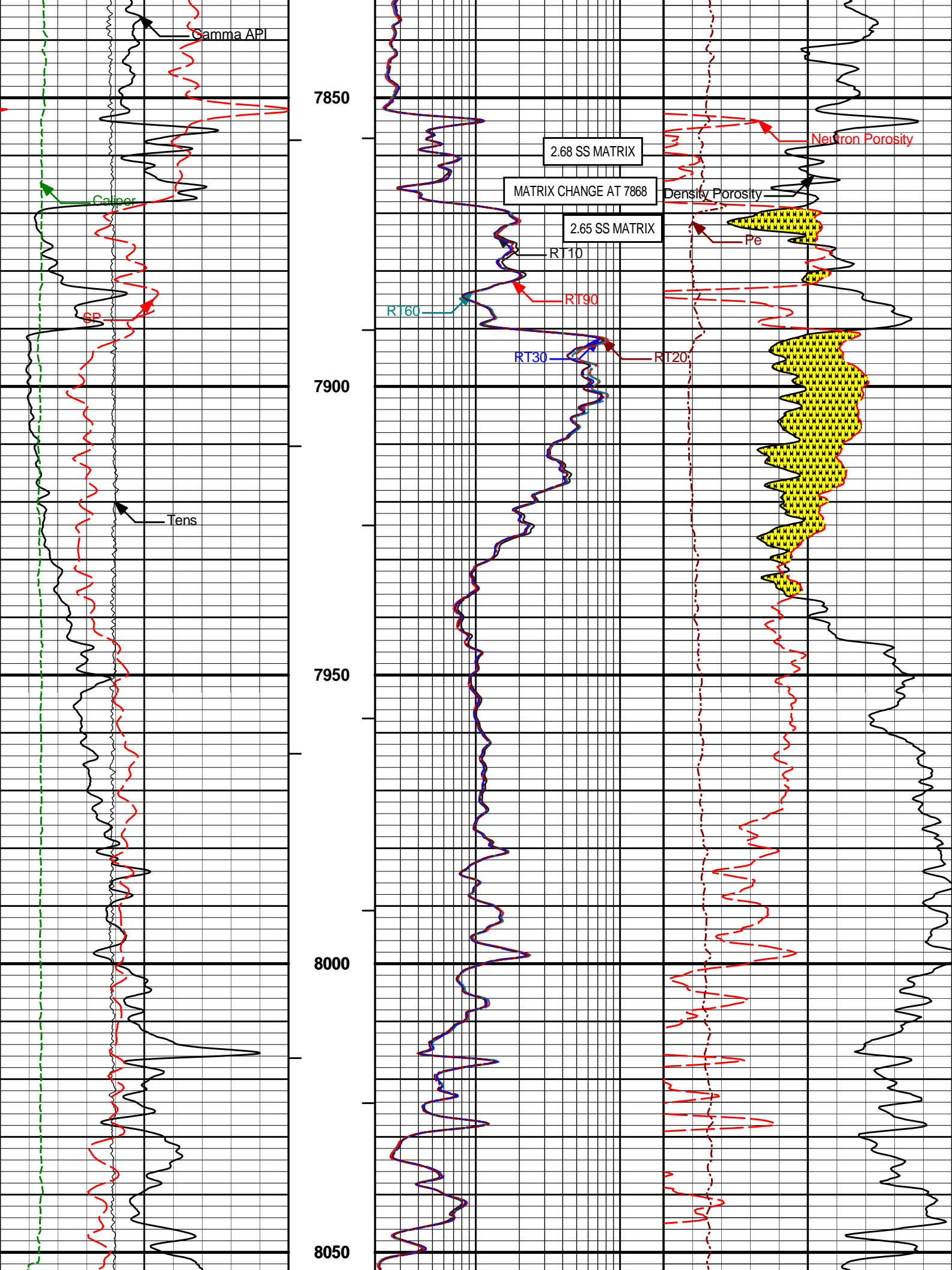


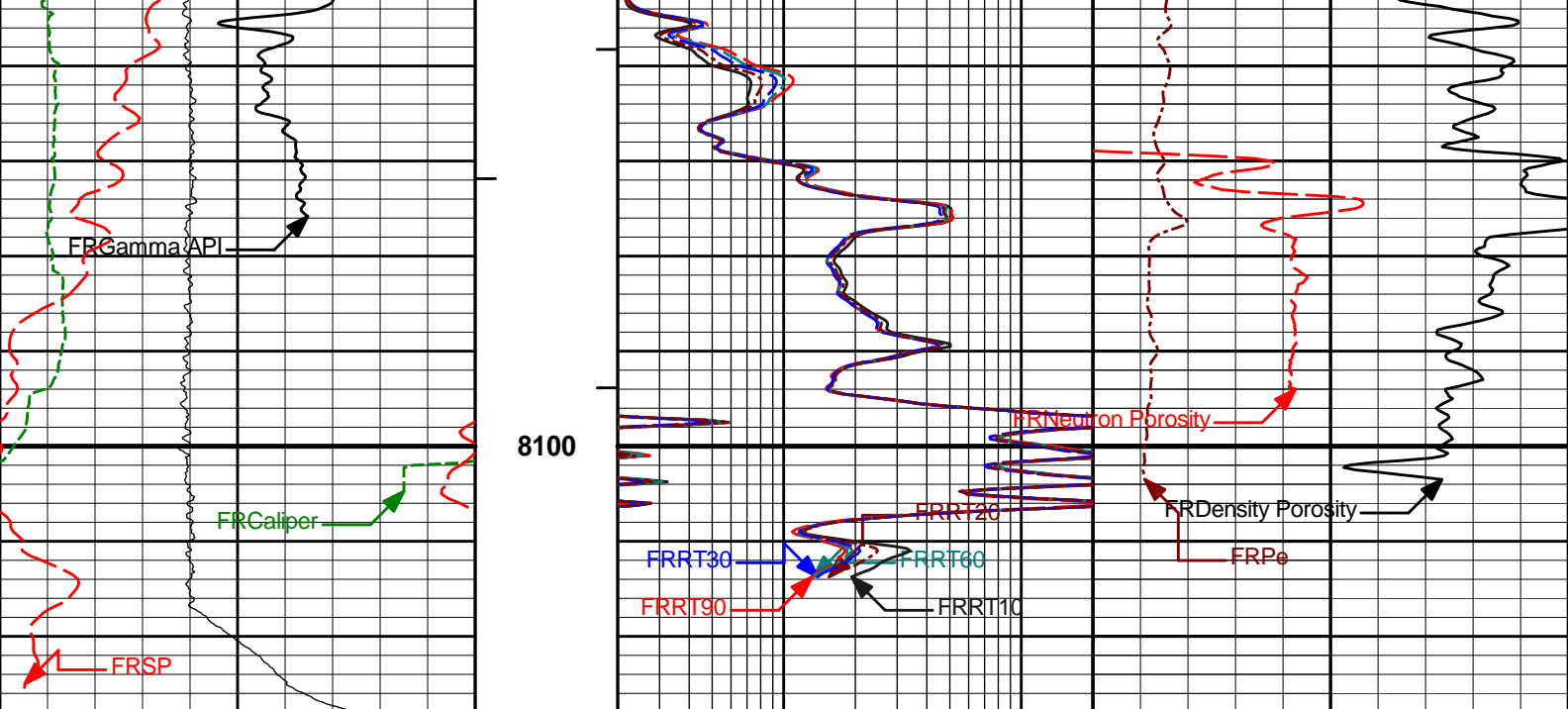












50	SP	150	1 : 240	2	RT90	200	0	Pe	10
	millivolts				Ohm-m				
0	Gamma API	250	BHVT	2	RT60	200	20	Density Porosity	0
	api				Ohm-m			percent	
6	Caliper	16	AHVT	2	RT30	200	20	Neutron Porosity	0
	inches				Ohm-m			percent	
10K	Tens	0		2	RT20	200			
	pounds				Ohm-m				
				2	RT10	200			
					Ohm-m				

**HALLIBURTON** Plot Time: 26-Nov-10 02:28:27  
Plot Range: 6495 ft to 8127.83 ft  
Data: {ActiveWell}\Well Based\MAIN\*  
Plot File: \COMP\NIO\_COD

MAIN PASS 5" = 100'

## HALLIBURTON

### CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
Tool Name:	GTET - 11277436	Reference Calibration Date:	27-Oct-10 13:55:35
Engineer:	C. GULLETT	Calibration Date:	24-Nov-10 09:25:03
Software Version:	WL INSITE R3.0.4 (Build 6)	Calibration Version:	1

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

Measurement	Measured	Calibrated	Units
Background	76.2	77.5	api

Background	76.3	77.3	api
Background + Calibrator	306.6	311.5	api
Calibrator	235.3	234.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION			
Tool Name:	GTET - 11277436	Reference Calibration Date:	24-Nov-10 09:25:03
Engineer:	F. LODER	Calibration Date:	25-Nov-10 18:53:40
Software Version:	WL INSITE R3.0.4 (Build 6)	Calibration Version:	1

Calibrator Source S/N: KW-290			
Calibrator API Reference:230.00 api			
Field Verification	Shop	Field	Units
Background	77.5	76.7	api
Background + Calibrator	311.5	309.7	api
Calibrator	234.0	232.9	api
Shop	Field	Difference	Tolerance
234.0	232.9	1.1	+/- 9.00

CSNG-FS SHOP CALIBRATION			
Tool Name:	CSNG - 11212563	Reference Calibration Date:	27-Oct-10 13:43:32
Engineer:	C. GULLETT	Calibration Date:	24-Nov-10 10:10:08
Software Version:	WL INSITE R3.0.4 (Build 6)	Calibration Version:	1
Source SN:	KW-290		

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.1	23.1	Channel #
583 KEV Peak Channel #	51.8	51.9	Channel #
2614 KEV Peak Channel #	212.5	212.6	Channel #
Calibrate Temperature	63.7	46.2	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	1625.1	CPS	326.4	325.6	API
Background	321.3	CPS	65.1	64.4	API

Gamma Ray Gain: 1.01

Gamma Gain Check: Passed

CSNG-FS FIELD CALIBRATION			
Tool Name:	CSNG - 11212563	Reference Calibration Date:	24-Nov-10 10:10:08
Engineer:	F. LODER	Calibration Date:	25-Nov-10 19:08:58
Software Version:	WL INSITE R3.0.4 (Build 6)	Calibration Version:	1
Source SN:			



TITANIUM CASE	Shop	Field	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.1	23.1	Channel #
583 KEV Peak Channel #	51.9	51.7	Channel #
2614 KEV Peak Channel #	212.6	212.1	Channel #
Calibrate Temperature	46.2	52.0	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	1615.8	CPS	325.6	323.8	API
Background	312.2	CPS	64.4	62.6	API

Gamma Ray Gain: 1.01  
Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 11277440	Reference Calibration Date:	26-Oct-10 15:03:11
Engineer:	F. LODER	Calibration Date:	26-Oct-10 15:19:22
Software Version:	WL INSITE R3.0.4 (Build 6)	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: 62 degF  
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	1.026	1.027	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):	0.2221	0.2223	0.0003	+/- 0.0020
Calibrated Ratio:	10.10	10.11	0.009	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0799	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 - 11277440

Reference Calibration Date: 26-Oct-10 15:19:22

**Engineer: F. LODER**

**Calibration Date: 25-Nov-10 19:10:00**

**Software Version:** WL INSITE R3.0.4 (Build 6)

**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):	0.0799	0.0779	-0.0020	+/- 0.0150

## PASS/FAIL SUMMARY

Block Change Check: Passed

Snow Block Stat Check: Passed

Temperature Check:	Passed
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## SPECTRAL DENSITY SHOP CALIBRATION

**Tool Name: SDLT - I440M335**

Reference Calibration Date: 26-Oct-10 11:27:27

**Engineer: F. LODER**

**Calibration Date: 26-Oct-10 11:47:09**

**Software Version:** WL INSITE R3.0.4 (Build 6)

**Calibration Version: 1**

Logging Source S/N: 2770GW

Aluminum Block S/N: BRIGHTON\_AL

Density: 2.600g/cc

Pe: 3.100

Magnesium Block S/N: BRIGHTON\_MG

Density: 1.680g/cc

Pe: 2.594

## DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0842	1.0737	0.90 - 1.10
Near Dens Gain	1.0302	1.0349	0.90 - 1.10
Near Peak Gain	1.0392	1.0336	0.90 - 1.10
Near Lith Gain	1.0137	1.0035	0.90 - 1.10
Far Bar Gain	1.0196	1.0192	0.90 - 1.10
Far Dens Gain	1.0071	1.0052	0.90 - 1.10
Far Peak Gain	0.9984	0.9977	0.90 - 1.10
Far Lith Gain	0.9751	0.9745	0.90 - 1.10

Near Bar Offset	-0.5353	-0.4423	NONE
Near Dens Offset	-0.0122	-0.0561	NONE
Near Peak Offset	-0.0768	-0.0302	NONE
Near Lith Offset	0.1078	0.1912	NONE
Far Bar Offset	0.0238	0.0281	NONE
Far Dens Offset	0.1153	0.1322	NONE
Far Peak Offset	0.1781	0.1814	NONE
Far Lith Offset	0.3260	0.3279	NONE

Near Bar Background	1074.49	1073.57	700 - 1450
Near Dens Background	351.33	350.31	230 - 480
Near Peak Background	154.24	153.27	100 - 210
Near Lith Background	186.09	188.01	125 - 260
Far Bar Background	561.13	562.53	450 - 900
Far Dens Background	220.02	220.95	175 - 345
Far Peak Background	86.17	85.60	70 - 140
Far Lith Background	89.99	90.30	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.682	1.680	-0.002	+/- 0.015
Pe	2.587	2.587	0.000	+/- 0.150
ALUMINUM				
Density (g/cc)	2.601	2.600	-0.001	+/- 0.01500
Pe	3.096	3.093	-0.003	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0002	+/- 0.0110	-0.0005	+/- 0.0140
Magnesium Block	-0.0006	+/- 0.0110	-0.0004	+/- 0.0140
Aluminum Block	0.0006	+/- 0.0110	-0.0000	+/- 0.0140
Resolution	9.14	6.00 - 11.50	9.72	6.00 - 11.50
Internal Verifier(B+D+P+L)	1765	1200 - 2700	959	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 - I440M335

Reference Calibration Date: 26-Oct-10 11:47:09

Engineer: F. LODER

Calibration Date: 25-Nov-10 18:54:31

Software Version: WL INSITE R3.0.4 (Build 6)

Calibration Version: 1

Pad Temperature: 50.5 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1765.163	1763.484	-1.679	16.844
Far (B+D+P+L) cps	959.382	955.762	-3.620	16.681
Near Resolution	9.14	9.19	0.050	0.50
Far Resolution	9.72	9.71	-0.010	1.00

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

### DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - I440M335

Reference Calibration Date: 24-Nov-10 18:32:52

Engineer: F. LODER

Calibration Date: 24-Nov-10 18:37:38

Software Version: WL INSITE R3.2.1 (Build 7)

Calibration Version: 1

CALIBRATION COEFFICIENTS				
Measurement	Previous Value	New Value	Control Limit On New Value	
Pad Offset	-2480.61	-2390.42	-7000.00 - -1000.00	
Pad Gain	0.0003988	0.0003917	0.000200 - 0.000600	
Arm Offset	-773.92	-631.87	-5000.00 - 3000.00	
Arm Gain	0.0005147	0.0005077	0.000300 - 0.000700	
Arm Power	-0.000005662	-0.000005207	-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)	2.00	2.00	0.00	+/- 0.20
Medium Ring (in)	3.78	3.75	-0.03	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.42	6.50	0.08	+/- 0.20
Medium Ring (in)	8.18	8.25	0.07	+/- 0.20
Large Ring (in)	14.92	15.00	0.08	+/- 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 - 90199477-E2817-S4353			Reference Calibration Date: 04-Jun-10 17:05:07
Engineer:	C. BLUE			Calibration Date: 13-Aug-10 20:06:47
Software Version:	WL INSITE R3.0.4 (Build 6)			Calibration Version: 1

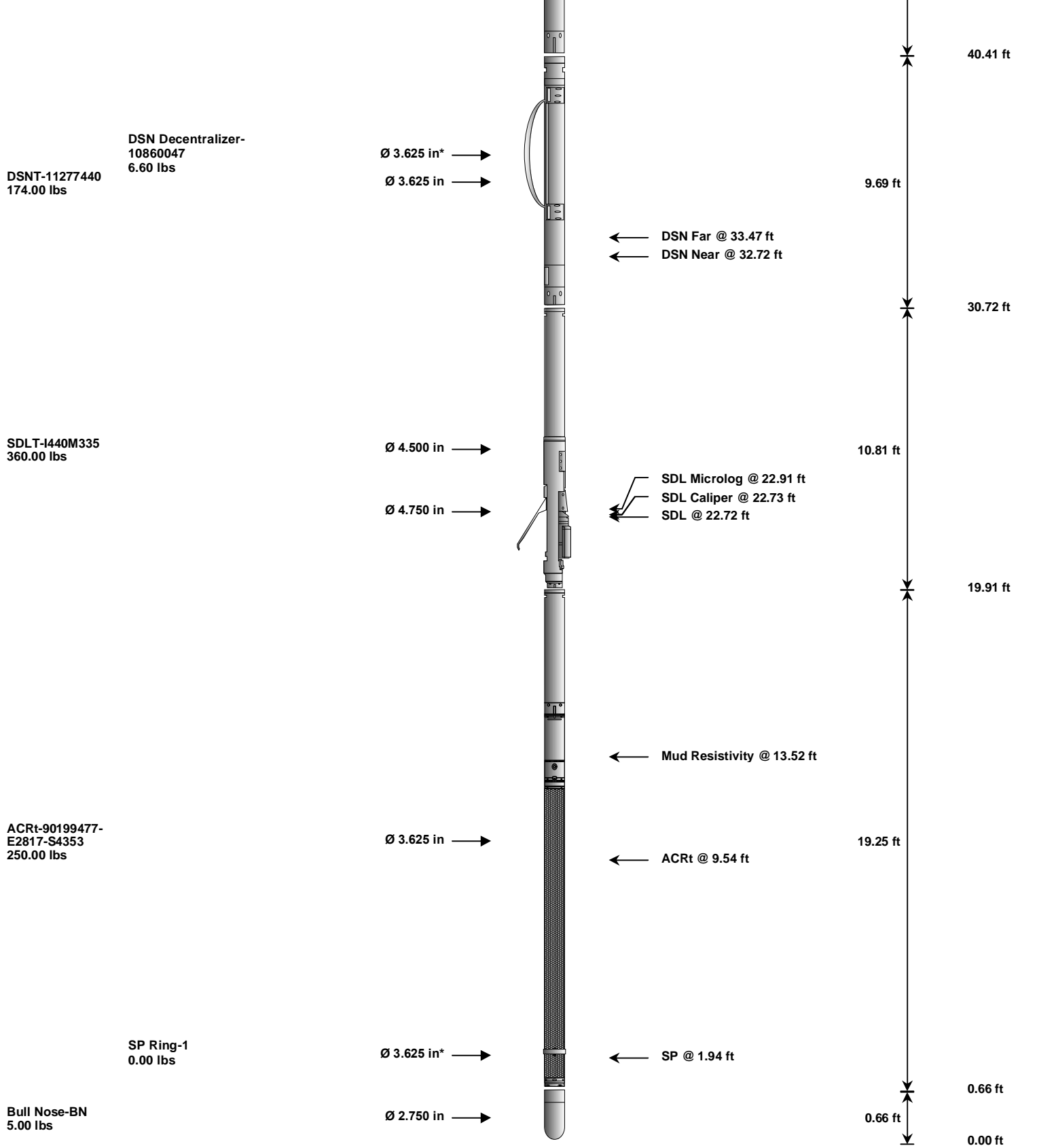
TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0167	1.05	0.95	1.0163	1.05	0.95	1.0146	1.05
A2 (50")	0.95	1.0118	1.05	0.95	1.0132	1.05	0.95	1.0128	1.05
A3 (29")	0.95	1.0069	1.05	0.95	1.0085	1.05	0.95	1.0057	1.05
A4 (17")	0.95	1.0150	1.05	0.95	1.0133	1.05	0.95	1.0143	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0000	1.05	0.95	0.9992	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9881	1.05	0.95	0.9862	1.05

TYPICAL SONDE OFFSET RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-0.995	2	-6	-4.514	-2	-8	-4.963	-2
A2 (50")	-7	-1.354	-1	-6	-2.867	-2	-7	-4.762	-2
A3 (29")	-27	-13.303	-9	-9	-3.580	-3	-7	-3.628	-1
A4 (17")	-180	-90.373	-60	-45	-29.209	-15	-39	-25.034	-13
A5 (10")	N/A	N/A	N/A	-150	-90.980	-50	-80	-43.898	-10
A6 (6")	N/A	N/A	N/A	175	329.261	525	90	166.175	270

TRANSMITTER CURRENT GAIN					R-MUD VERIFICATION				
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TRANSMITTER CURRENT GAIN				R MOD VERIFICATION			
Signal	Lower	R	Upper	Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6	0.9189	1.3	Mud Cell	0.95	0.996	1.05
36K	1.0	1.8306	2.0				
72K	1.0	1.1584	2.0				
CALIBRATION SUMMARY							
Sensor	Shop	Field	Post	Difference	Tolerance	Units	
GTET-11277436							
Gamma Ray Calibrator	234.0	232.9	-----	1.1	+/- 9.00	api	
CSNG-11212563							
60 KEV Peak Channel #	48.0	48.0	-----	0.0	-----	Channel #	
239 KEV Peak Channel #	23.1	23.1	-----	0.0	-----	Channel #	
583 KEV Peak Channel #	51.9	51.7	-----	0.2	-----	Channel #	
2614 KEV Peak Channel #	212.6	212.1	-----	0.5	-----	Channel #	
DSNT-11277440							
Snow-Block Porosity	0.0799	0.0779	-----	0.0020	+/- 0.0150	decp	
SDLT-I440M335							
Near(B+D+P+L)	1765.163	1763.484	-----	1.679	+/-16.844	cps	
Far(B+D+P+L)	959.382	955.762	-----	3.620	+/-16.681	cps	
Pad Extension	3.75	-----	-----	0.00	+/-0.20	in	
Ring Diameter	8.25	-----	-----	0.00	+/-0.20	in	
ACRt-90199477-E2817-S4353							
Mud Cell	0.996	-----	-----	0.000	-----	ohm-m	
Data: SHRWD_L30_30D\0001 TRIPLE_CSNG_RED\IDLE							
Date: 26-Nov-10 01:40:54							

HALLIBURTON							
TOOL STRING DIAGRAM REPORT							
Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length	
RWCH-A094 135.00 lbs		Ø 3.625 in →		← Load Cell @ 59.66 ft ← BH Temperature @ 59.10 ft	6.25 ft	63.35 ft	
GTET-11277436 165.00 lbs		Ø 3.625 in →		← GammaRay @ 51.03 ft	8.52 ft	57.10 ft	
CSNG-11212563 114.00 lbs		Ø 3.625 in →		← CSNG @ 42.95 ft	8.17 ft	48.58 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	57.10	300.00
GTET	Gamma Telemetry Tool		11277436	165.00	8.52	48.58	60.00
CSNG	Compensated Spectral Natural Gamma		11212563	114.00	8.17	40.41	15.00
DSNT	Dual Spaced Neutron		11277440	174.00	9.69	30.72	60.00
DCNT	DSN Decentralizer		10860047	6.60	5.13	34.05	300.00
SDLT	Spectral Density Tool		I440M335	360.00	10.81	19.91	60.00
ACRt	Array Compensated True Resistivity		90199477-E2817-S4353	250.00	19.25	0.66	300.00
SP	SP Ring		1	0.00	0.25	1.94	300.00
BLNS	Bull Nose		BN	5.00	0.66	0.00	300.00
Total				1,232.00	82.85		

COMPANY	NOBLE ENERGY INC		
WELL	SHERWOOD L30-30D		
FIELD	WATTENBERG		
COUNTY	WELD	STATE	CO
<b>HALLIBURTON</b>		SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TRUE RESISTIVITY LOG	