HALLIBURTON

SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TRUE RESISTIVITY

COMPANY NOBLE ENERGY INC.

WELL DECHANT USX X29-05

FIELD WATTENBERG

COUNTY WELD STATE CO

COMPANY	NOBLE ENERGY INC.	
WELL	DECHANT USX X29-05	
FIELD	WATTENBERG	
COUNTY	WELD	STATE CO
API No.	05123329290000	Other Services: RWCH, GTET, CSNG
Location	SHL: 2072' FNL & 602' FWL SWNW LAT: 40.111062° LONG: -104.695083°	
Sect. 29	Twp. 2N	Rge. 65W

Permanent Datum	GL	Elev. 4946.0 ft	Elev.: K.B. 4959.0 ft
Log measured from	KB	13.0 ft above perm. Datum	D.F. 4959.0 ft
Drilling measured from	KB		G.L. 4946.0 ft

Date		01-Nov-11					
Run No.		ONE					
Depth - Driller		7946.00 ft					
Depth - Logger		7922.0 ft					
Bottom - Logged Interval		7913 ft					
Top - Logged Interval		CSG					
Casing - Driller		8.625 in	@ 935.0 ft	@		@	
Casing - Logger		934.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	9.4 ppg	48.00 s/qt				
PH	Fluid Loss	7.00 pH	17.2 cptm				
Source of Sample		MUD CELL					
Rm @ Meas. Temperature		0.890 ohmm	@ 72.30 degF	@		@	
Rmf @ Meas. Temperature		0.72 ohmm	@ 75.00 degF	@		@	
Rmc @ Meas. Temperature		0.795 ohmm	@ 75.00 degF	@		@	
Source Rmf	Rmc	CHART	CHART				
Rm @ BHT		0.31 ohmm	@ 219.0 degF	@		@	
Time Since Circulation		5.0 hr					
Time on Bottom		01-Nov-11 18:39					
Max. Rec. Temperature		219.0 degF	@ 7922.0 ft	@		@	
Equipment	Location	10800785	BRIGHTON				
Recorded By		C. BLUE					
Witnessed By		J. KANWISCHER					

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Service Ticket No.: 9030649 API Serial No.: 05123329290000 PGM Version: WL INSITE R3.4.2 (Build 2)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

RESISTIVITY SCALE CHANGES

	Type Log	Depth	Scale Up Hole	Scale Down Hole
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 EQUIPMENT DATA

	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
@					
@	ONE	ACRT 584-585	N/A	0.5" S.O.	N/A
@					
@					
@					
@					
@					

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.	ONE	Run No.	ONE
Serial No.	11259758	Serial No.		Serial No.	11812177	Serial No.	10935690
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.	102A	Spacing		Log Type	GAM/GAM	Log Type	THERM/THERM
Type	SCINT			Source Type	Cs137	Source Type	Am241Be
Length	8"	LSA [Y/N]		Serial No.	5256 GW	Serial No.	DSN 430
Distance to Source	17'	FWDA [Y/N]		Strength	1.5 Ci	Strength	15 Ci

LOGGING DATA

GENERAL			GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	TD	7773	REC	0	250				20%	0%	2.65 g/cc	20%	0%	SAND
ONE	7773	7310	REC	0	250				20%	0%	2.68 g/cc	20%	0%	SAND
ONE	7310	7020	REC	0	250				20%	0%	2.71 g/cc	20%	0%	LIME
ONE	7020	CSG	REC	0	250				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 FOR 4.5 INCH PRODUCTION CASING

TENSION PULLS, WASHOUTS, AND BOREHOLE RUGOSITY AFFECT TOOL RESPONSE

CREW: M. BURNETT, N. GOULD RIG: ENSIGN 126

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

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PARAMETERS REPORT

Depth ((ft))	Tool Name	Description	Value	Units
TOP				
	DSNT	Neutron Lithology	Sandstone	
	SDLT Pad	Formation Density Matrix	2.680	g/cc
7020.00				
	DSNT	Neutron Lithology	Limestone	
	SDLT Pad	Formation Density Matrix	2.710	g/cc
7310.00				
	SDLT Pad	Formation Density Matrix	2.680	g/cc
7773.00				
	SHARED	Bit Size	7.875	in
	SHARED	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	Mud Base	Water	
	SHARED	Borehole Fluid Weight	9.400	ppg
	SHARED	Weighting Agent	Barite	
	SHARED	Borehole salinity	0.00	ppm
	SHARED	Formation Salinity NaCl	0.00	ppm
	SHARED	Percent K in Mud by Weight?	0.00	%
	SHARED	Mud Resistivity	0.890	ohmm
	SHARED	Temperature of Mud	72.3	degF
	SHARED	Logging Interval is Cased?	No	
	SHARED	AHV Casing OD	4.500	in
	SHARED	Surface Temperature	45.0	degF
	SHARED	Total Well Depth	7922.00	ft
	SHARED	Bottom Hole Temperature	219.0	degF

SHARED	Navigation and Survey Master Tool	NONE	
SHARED	High Res Z Accelerometer Master Tool	GTET	
SHARED	Temperature Master Tool	NONE	
SHARED	Borehole Size Master Tool	NONE	
GTET	Process Gamma Ray?	Yes	
GTET	Gamma Tool Standoff	0.000	in
GTET	Process Gamma Ray EVR?	No	
GTET	Tool Position for Gamma Ray Tools.	Eccentered	
CSNG	Process CSNG Data?	Yes	
CSNG	Is Tool Centralized?	No	
CSNG	Gamma Enviromental Corrections?	Yes	
CSNG	Barite Correction Factor	1.00	
CSNG	Use Fixed Gain	No	
CSNG	Use Fixed Offset	No	
CSNG	Use Fixed Resolution Degradation Factor	No	
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 Caliper Outputs?	Yes	
SDLT Pad	Process Density?	Yes	
SDLT Pad	Process Density EVR?	No	
SDLT Pad	Logging Calibration Blocks?	No	
SDLT Pad	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	Disable temperature warning	No	
SDLT Pad	Formation Density Matrix	2.650	g/cc
SDLT Pad	Formation Density Fluid	1.000	g/cc
ACRt Sonde	Process ACRt?	Yes	
ACRt Sonde	Minimum Tool Standoff	0.50	in
ACRt Sonde	Temperature Correction Source	FP Lwr & FP Upr	
ACRt Sonde	Tool Position	Free Hanging	
ACRt Sonde	Rmud Source	Mud Cell	
ACRt Sonde	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	Threshold Quality	0.50	

BOTTOM

Data: DECH_USX_X29_05\0001 NOBLE\002.01 01-Nov-11 20:10 Up **Date: 01-Nov-11 20:11:28**

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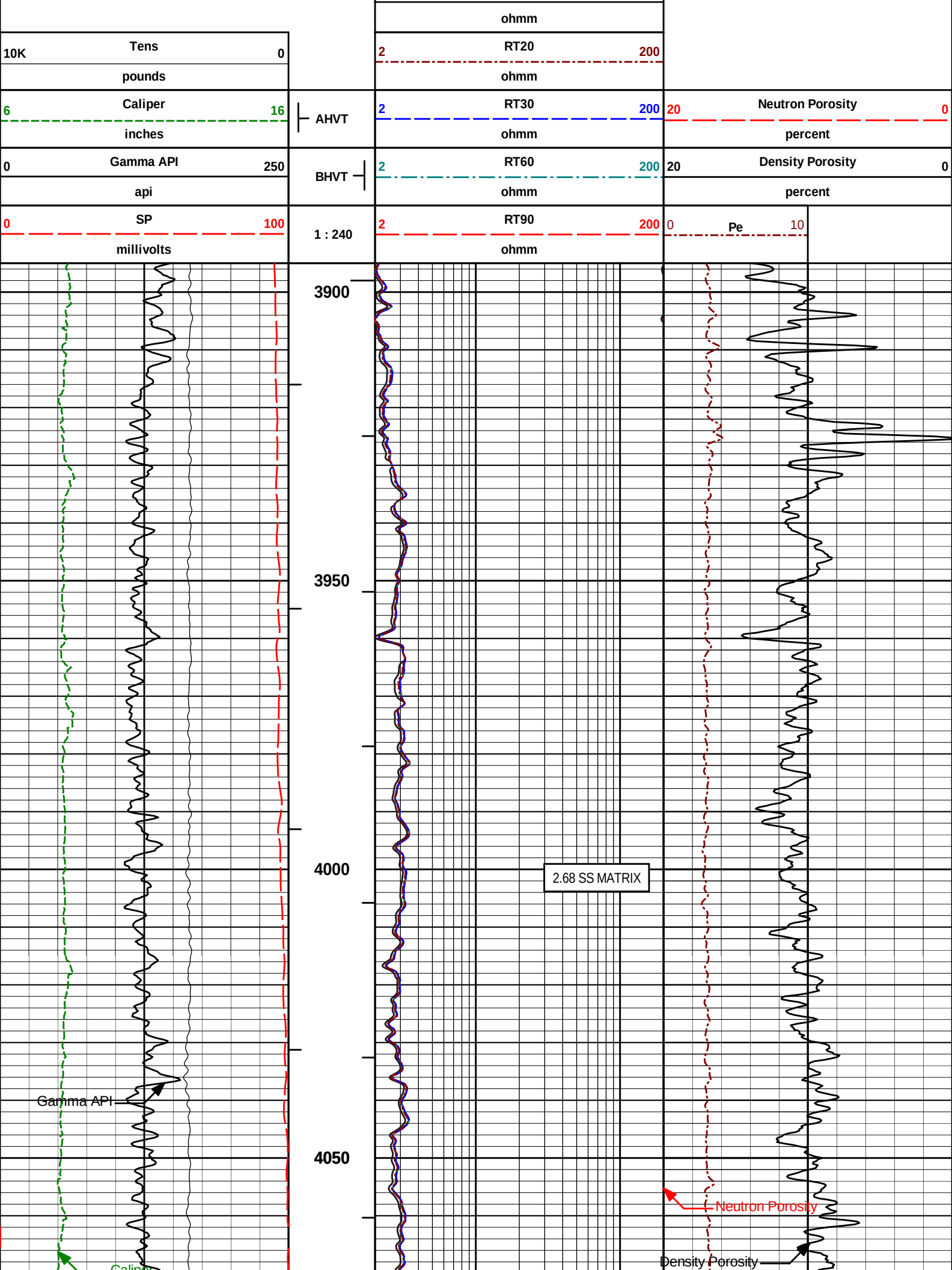
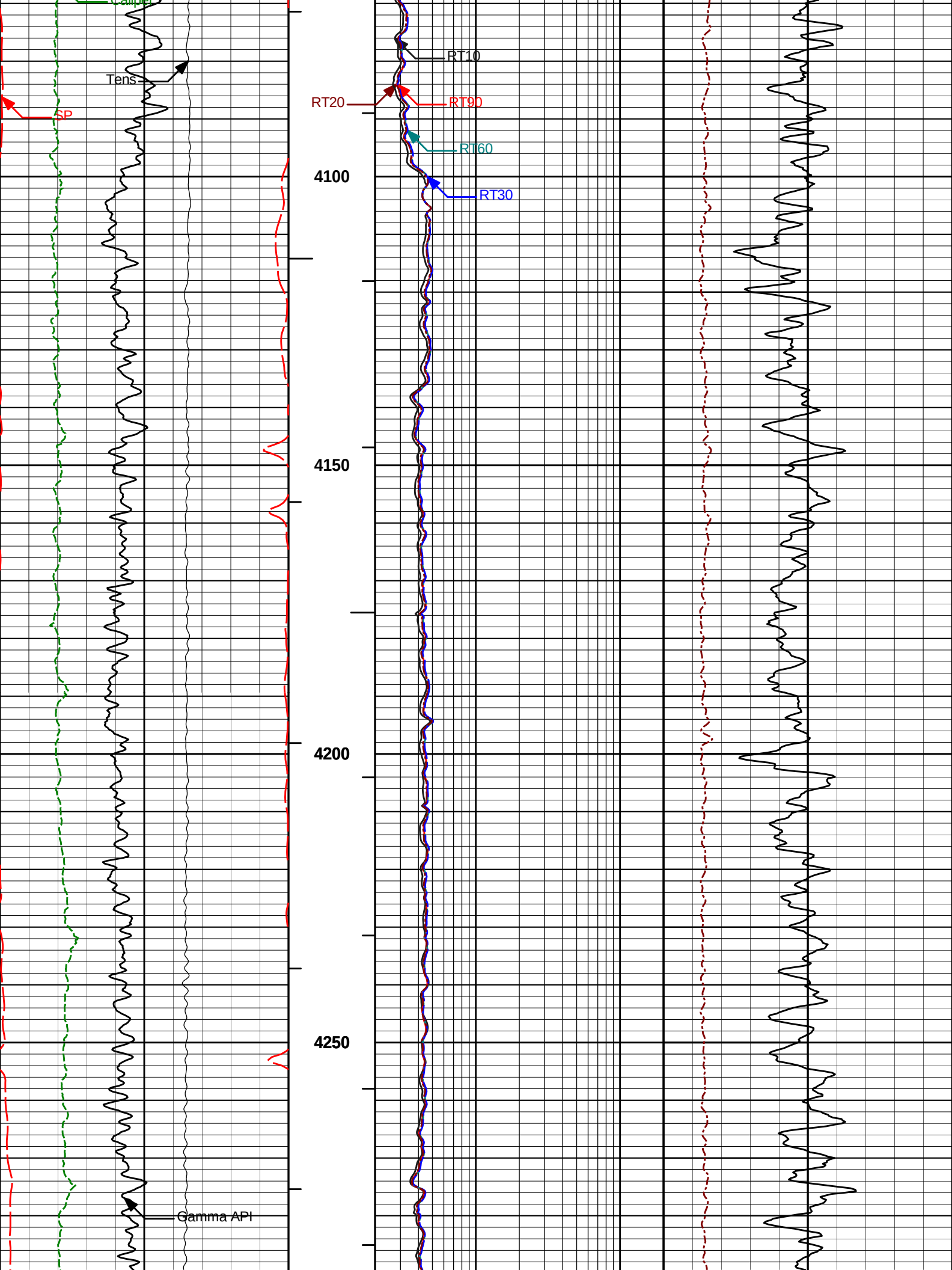
Plot Time: 01-Nov-11 20:46:38
Plot Range: 3895 ft to 5005 ft
Data: DECH_USX_X29_05\Well Based\MAIN*
Plot File: \\COMP\MAIN

MAIN PASS 5" = 100'


ohmm
10K
Tens
0
pounds
2
RT20
200
ohmm
6
Caliper
16
inches
AHVT
2
RT30
200
ohmm
20
Neutron Porosity
0
percent
0
Gamma API
250
api
BHVT
2
RT60
200
ohmm
20
Density Porosity
0
percent
0
SP
100
millivolts
1 : 240
2
RT90
200
ohmm
0
Pe
10
3900
3950
4000
4050
2.68 SS MATRIX
Gamma API
Neutron Porosity
Density Porosity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RT90
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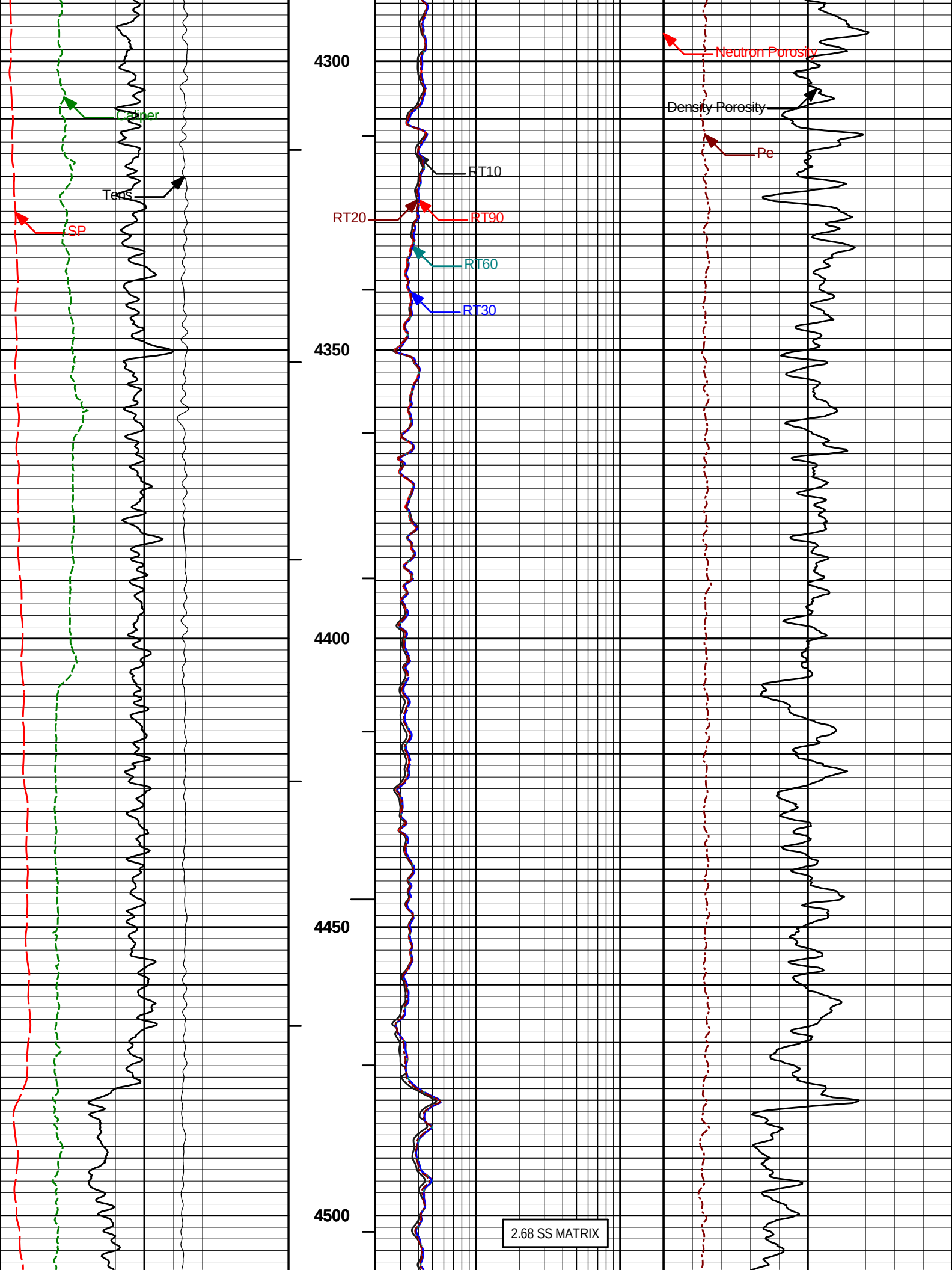
RT30
4100
4150
4200
4250
Gamma API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Tens
SP
RT10
RT20
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RT60
RT30
Neutron Porosity
Density Porosity
Pe
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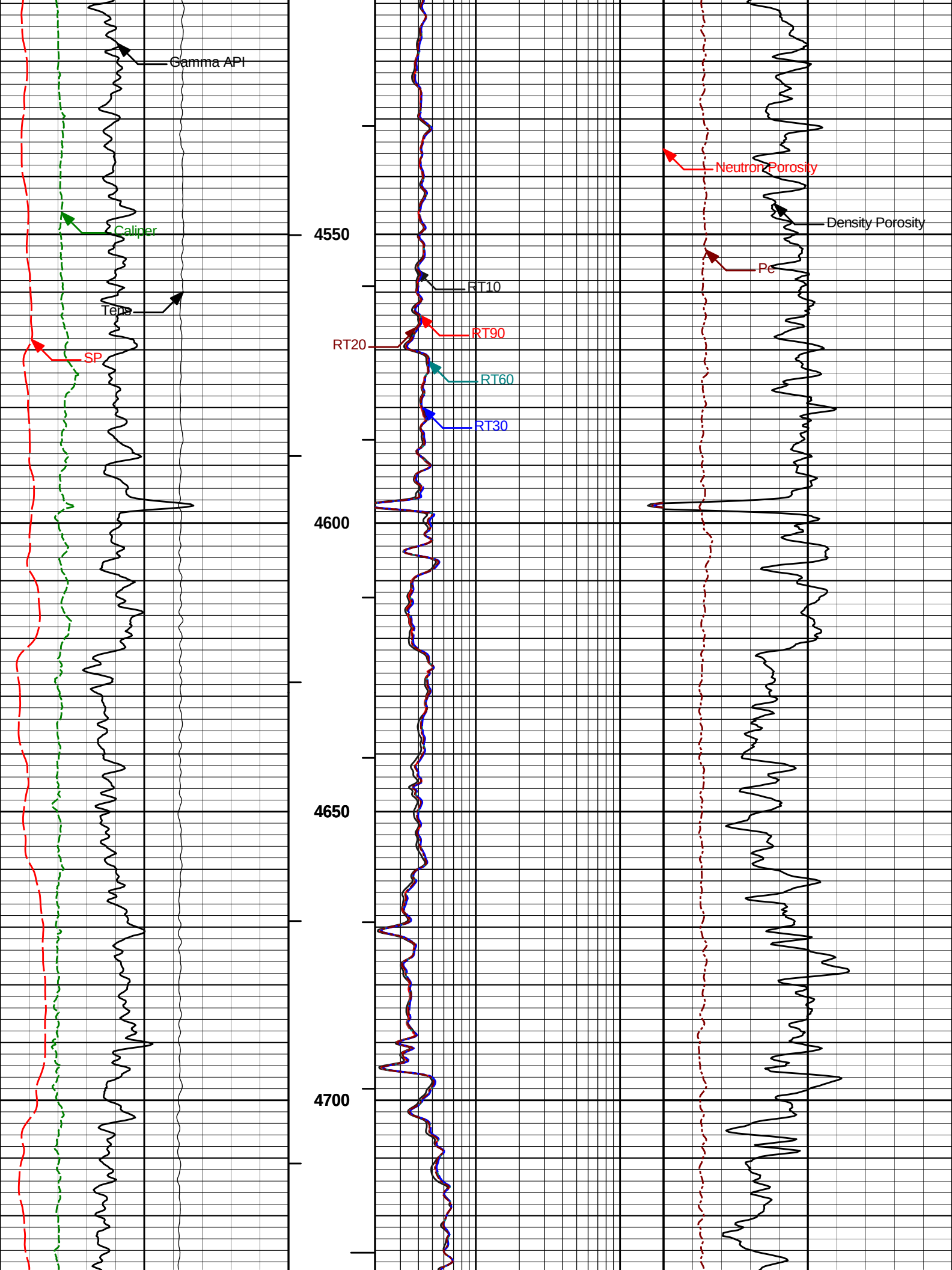
4350
4400
4450
4500
2.68 SS MATRIX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Caliper
Tens
SP
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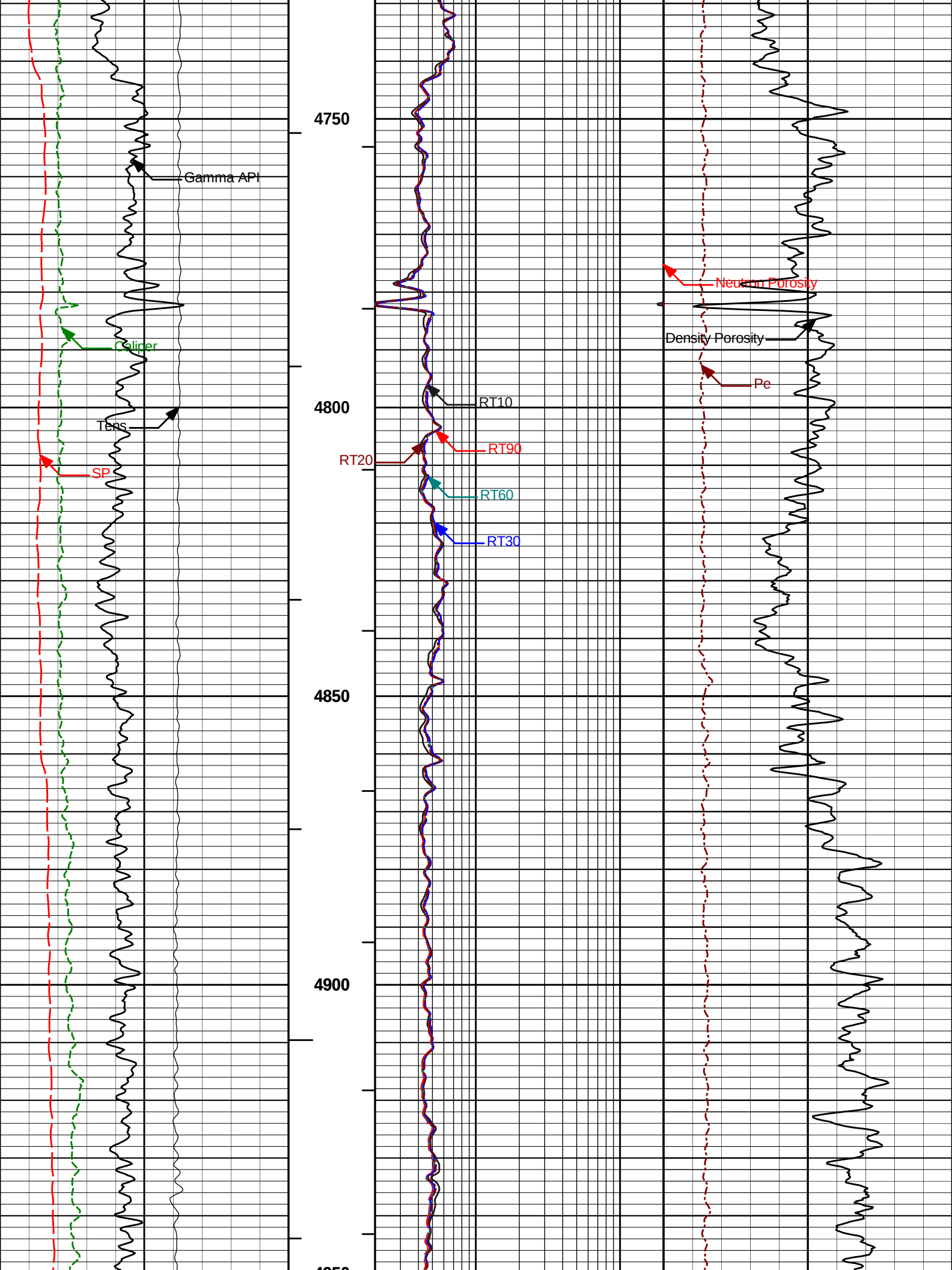
4600
4650
4700
RT10
RT90
RT20
RT60
RT30
Neutron Porosity
Density Porosity
Pe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4800
4850
4900
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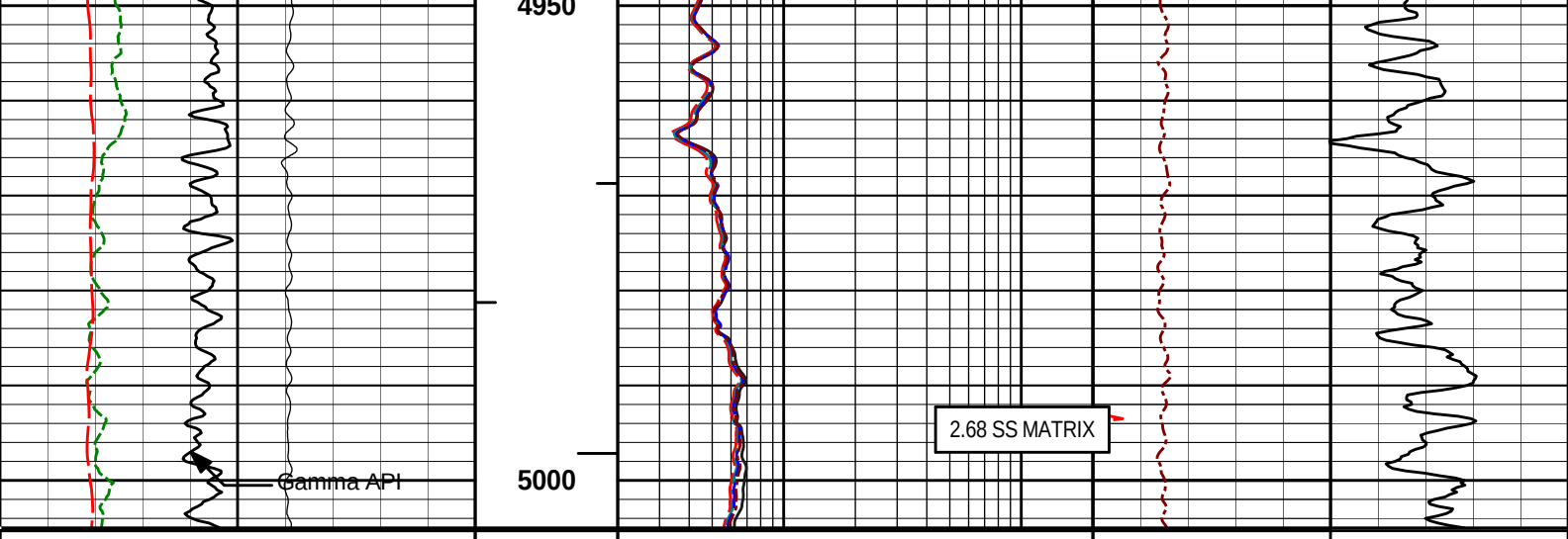
Caliper
Tens
SP
RT10
RT90
RT20
RT60
RT30
Neutron Porosity
Density Porosity
Pe



0 SP 100		2 RT90 200	0 Pe 10	
millivolts	1 : 240	ohmm		
0 Gamma API 250	BHVT	2 RT60 200	20 Density Porosity 0	
api		ohmm	percent	
6 Caliper 16	AHVT	2 RT30 200	20 Neutron Porosity 0	
inches		ohmm	percent	
10K Tens 0		2 RT20 200		
pounds		ohmm		
		2 RT10 200		
		ohmm		

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Plot Time: 01-Nov-11 20:46:40
Plot Range: 3895 ft to 5005 ft
Data: DECH_USX_X29_05\Well Based\MAIN*
Plot File: \\COMP\MAIN

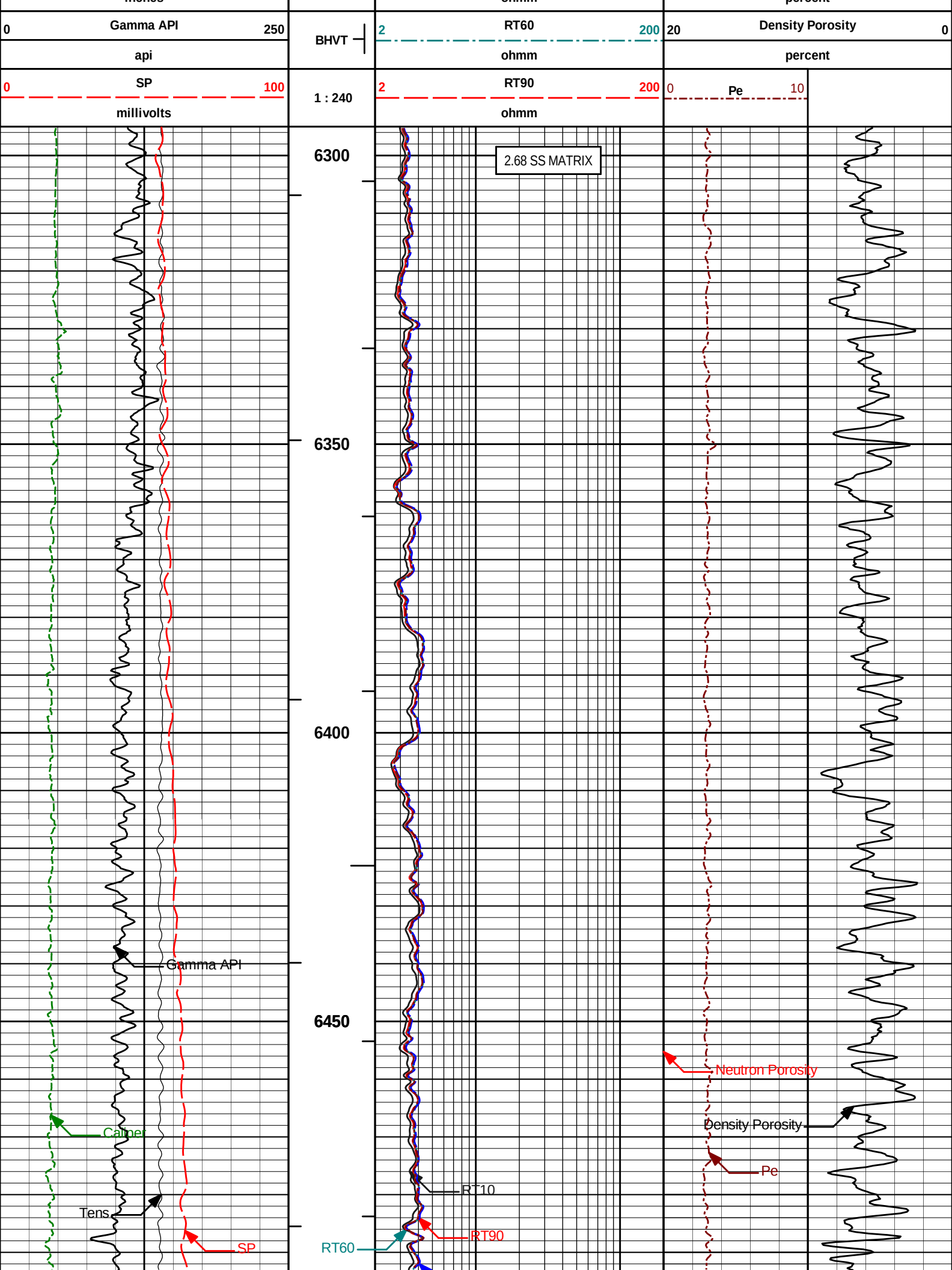
MAIN PASS 5" = 100'

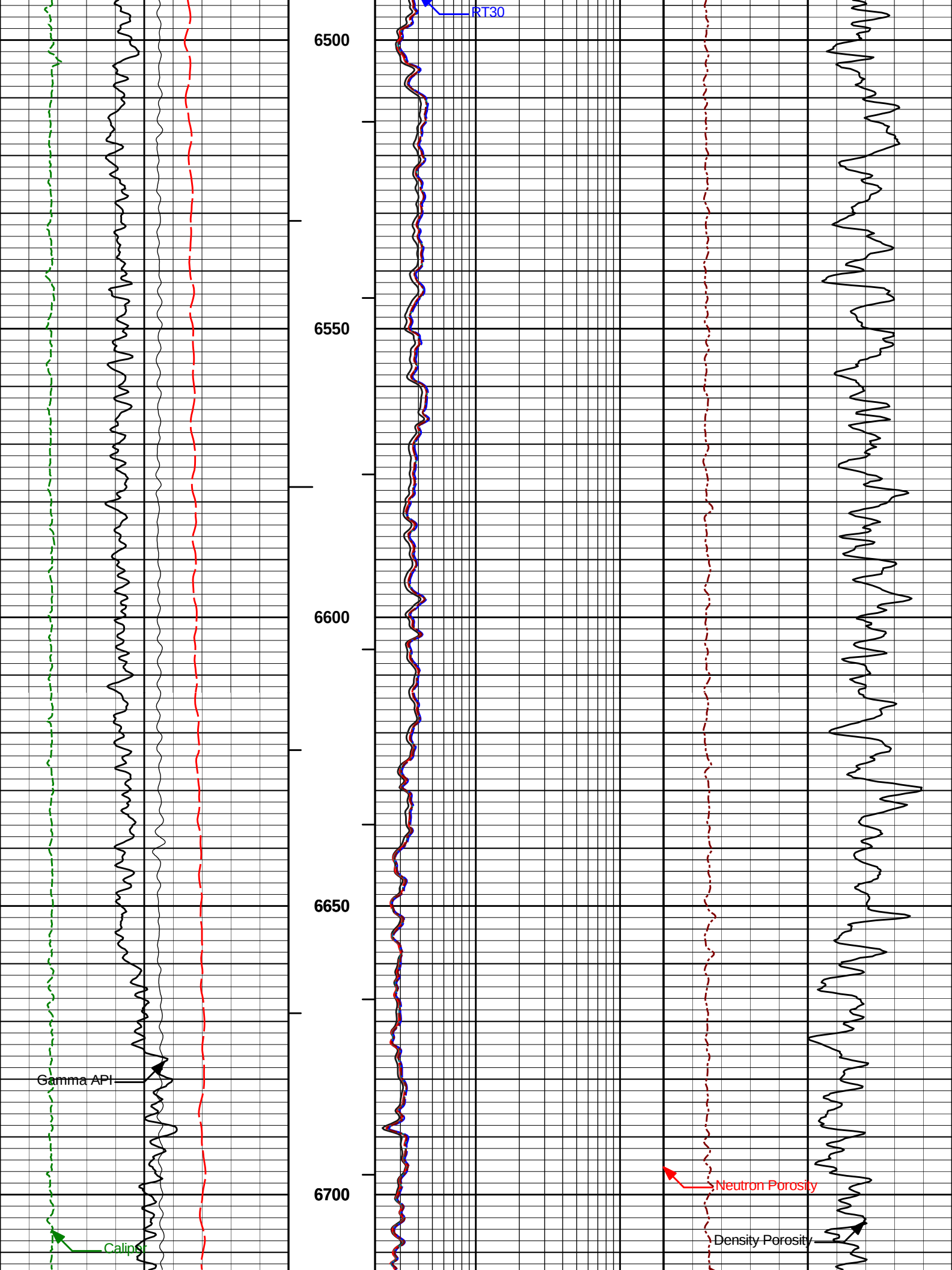
HALLIBURTON

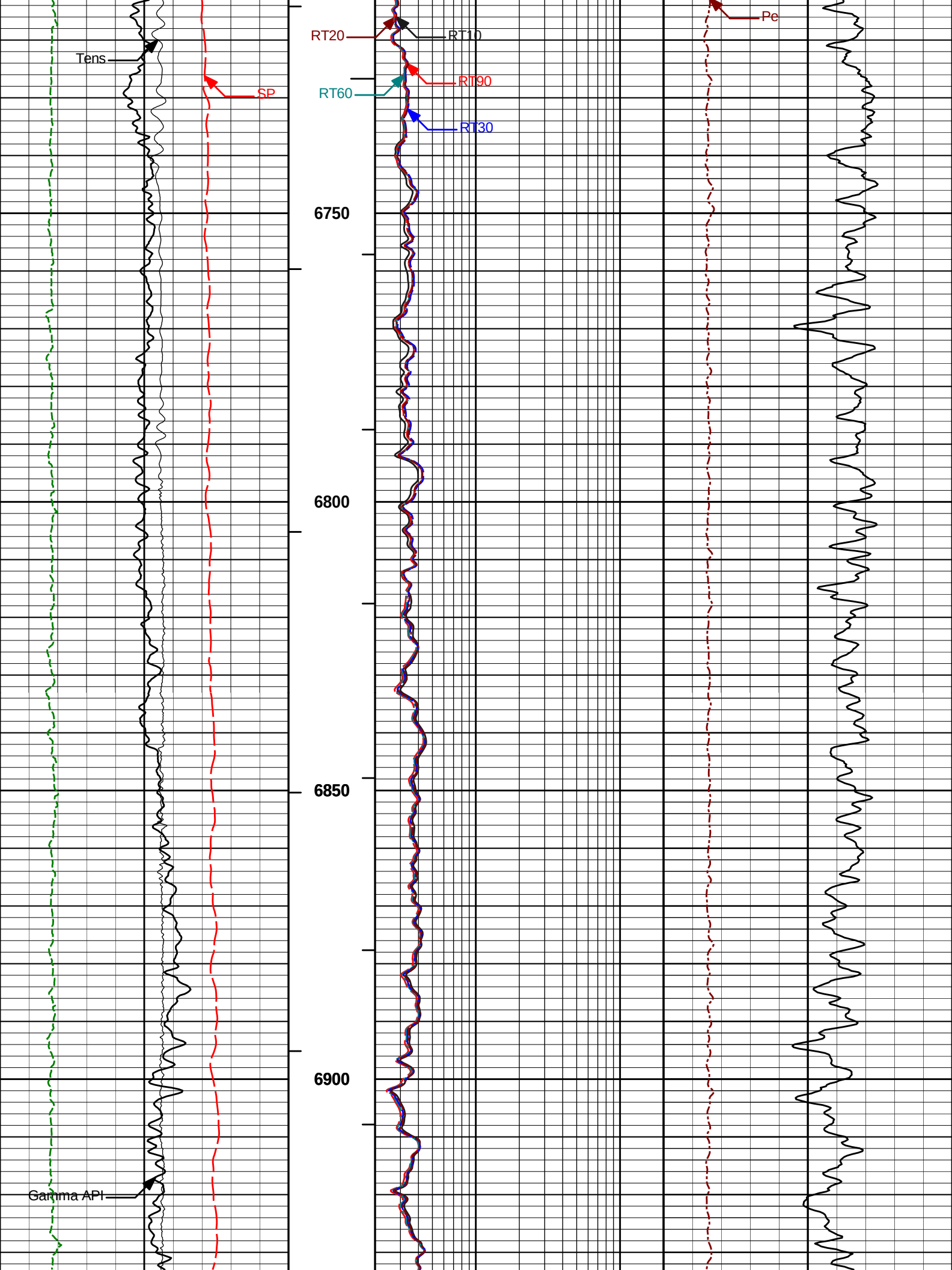
Plot Time: 01-Nov-11 20:46:41
Plot Range: 6295 ft to 7928.83 ft
Data: DECH_USX_X29_05\Well Based\MAIN*
Plot File: \\COMP\MAIN

MAIN PASS 5" = 100'

		2 RT10 200		
		ohmm		
10K Tens 0		2 RT20 200		
pounds		ohmm		
6 Caliper 16	AHVT	2 RT30 200	20 Neutron Porosity 0	
inches		ohmm	percent	


0
Gamma API
250
api
0
SP
100
millivolts
BHVT
1 : 240
2
RT60
200
ohmm
2
RT90
200
ohmm
20
Density Porosity
0
percent
0
Pe
10
2.68 SS MATRIX
6300
6350
6400
6450
Gamma API
Caliper
Tens
SP
RT10
RT90
RT60
Neutron Porosity
Density Porosity
Pe


RT30
6500
6550
6600
6650
6700
Gamma API
Caliper
Neutron Porosity
Density Porosity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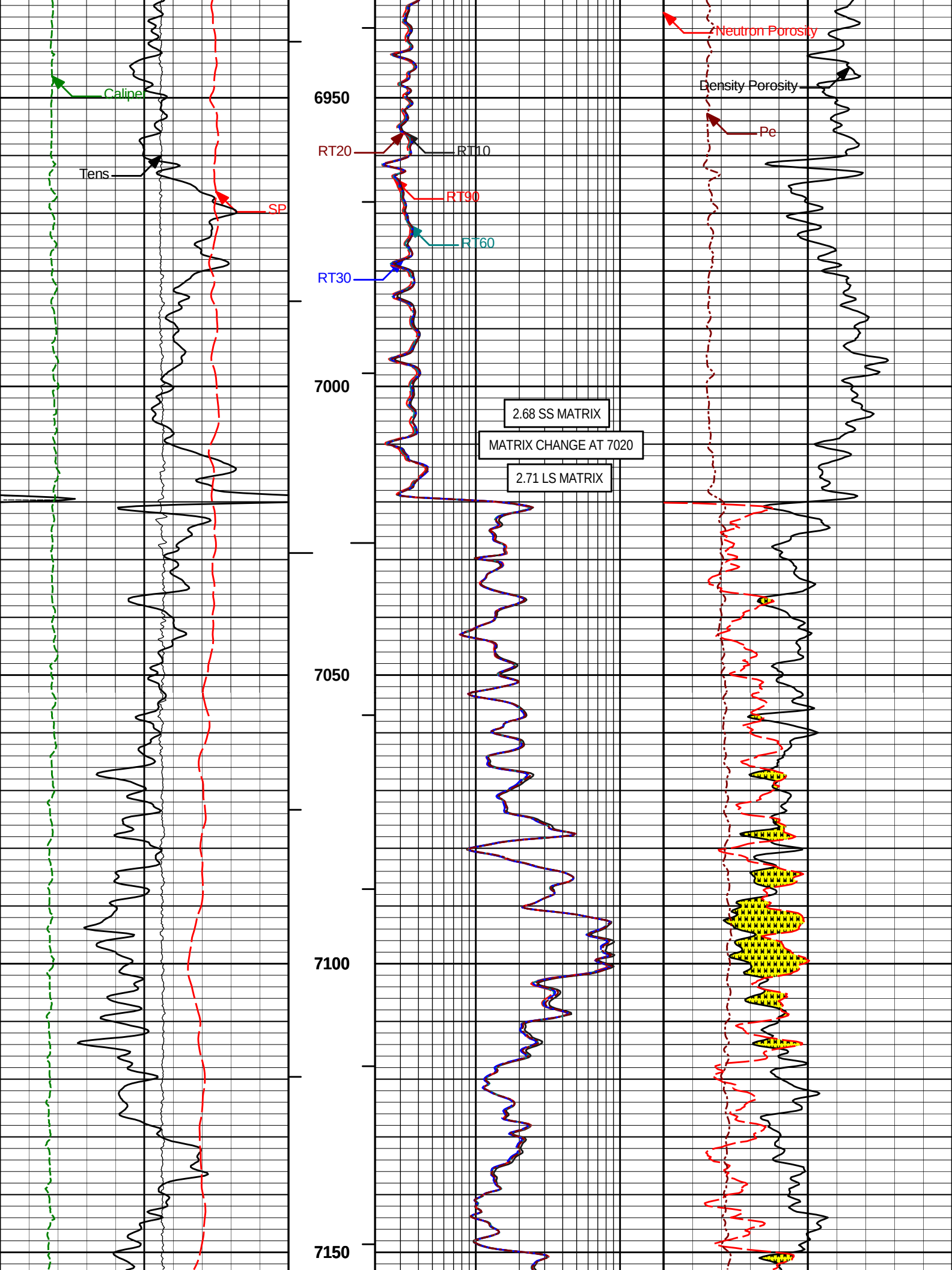
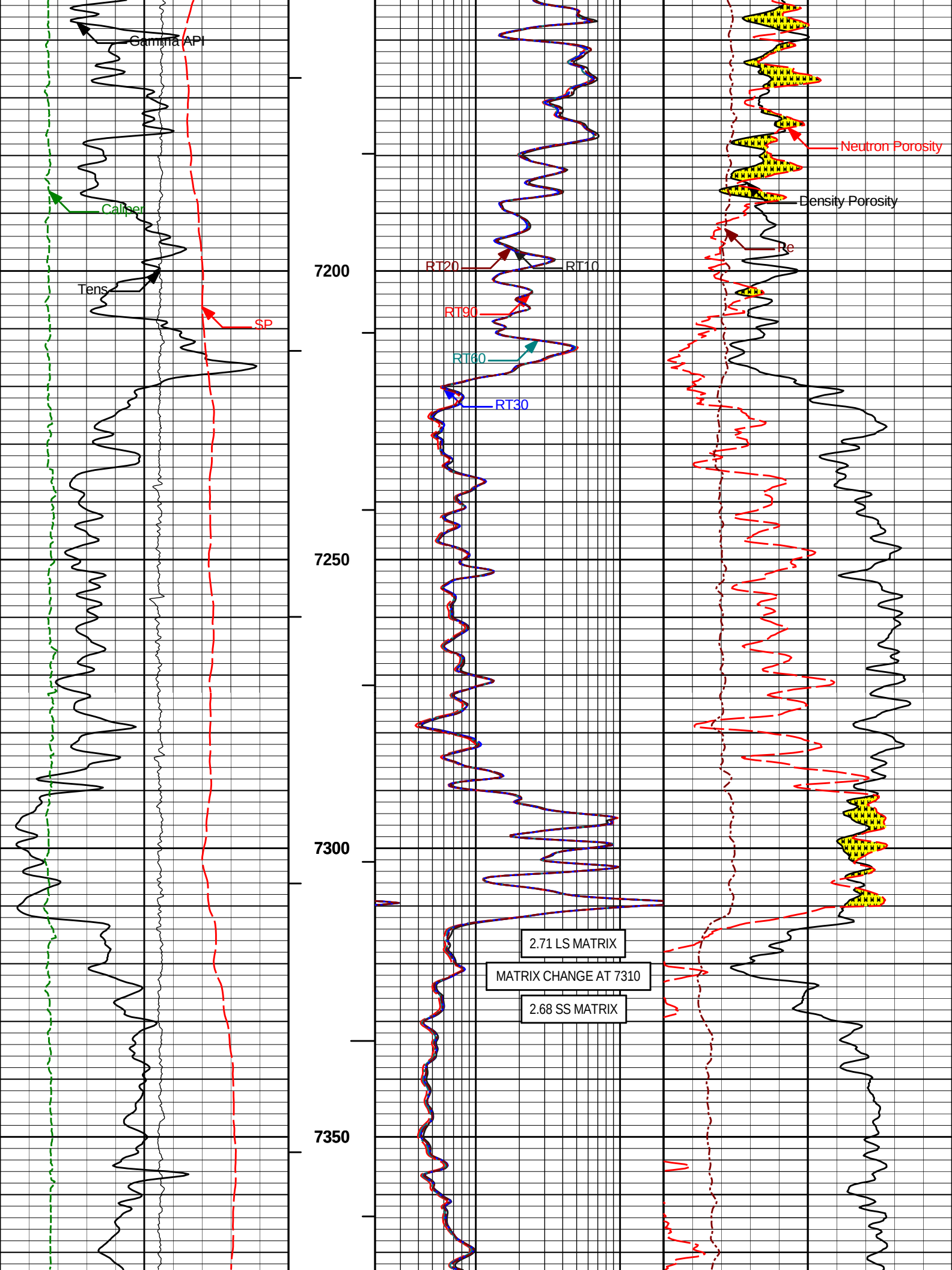
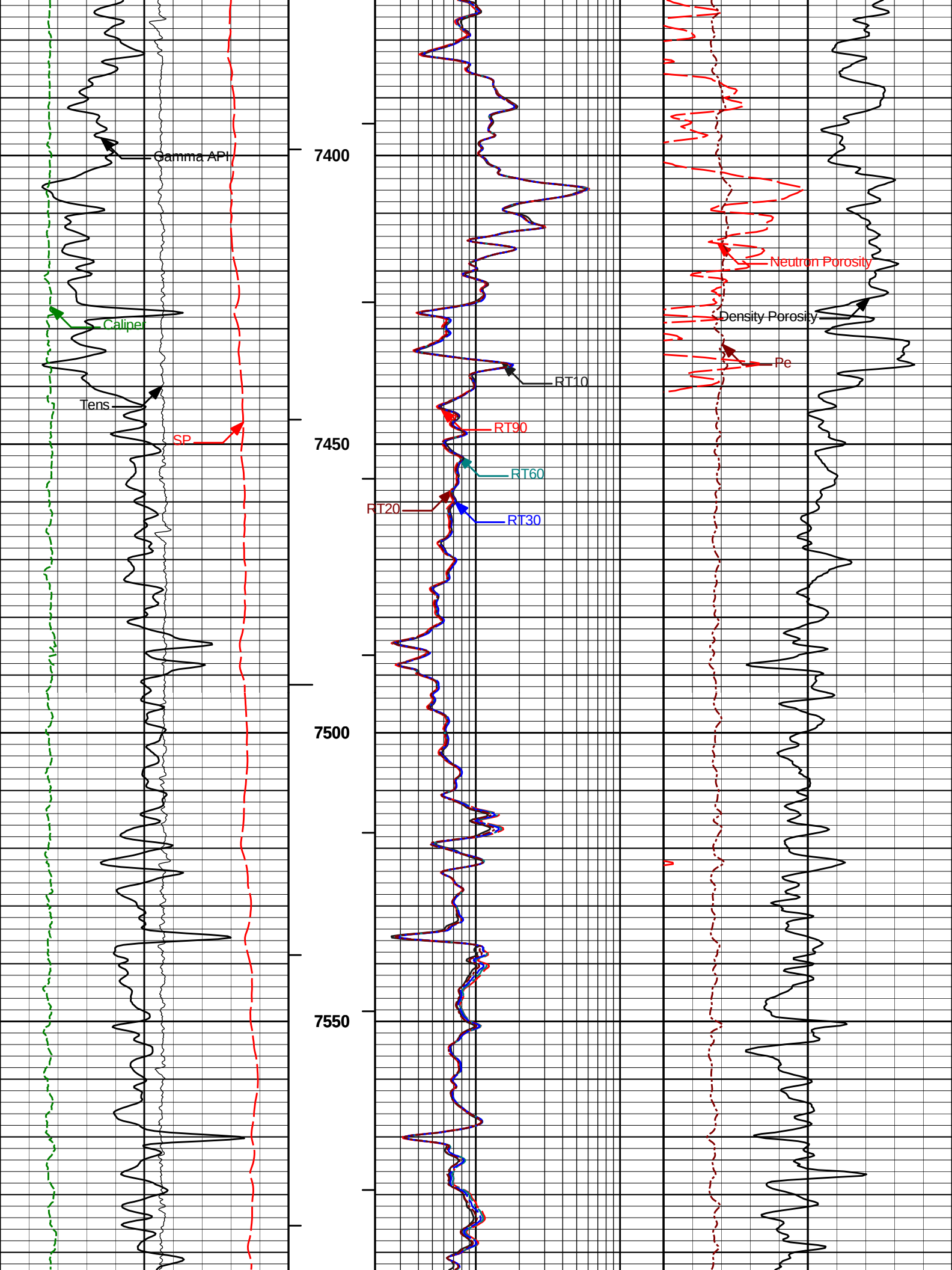
SP
Gamma API
RT20
RT10
RT90
RT60
RT30
Pe
6750
6800
6850
6900


Caliper
Tens
SP
RT20
RT10
RT90
RT60
RT30
6950
7000
7050
7100
7150
2.68 SS MATRIX
MATRIX CHANGE AT 7020
2.71 LS MATRIX
Neutron Porosity
Density Porosity
Pe


Gamma API
Caliper
Tens
SP
RT20
RT10
RT90
RT60
RT30
Neutron Porosity
Density Porosity
Re
7200
7250
7300
7350
2.71 LS MATRIX
MATRIX CHANGE AT 7310
2.68 SS MATRIX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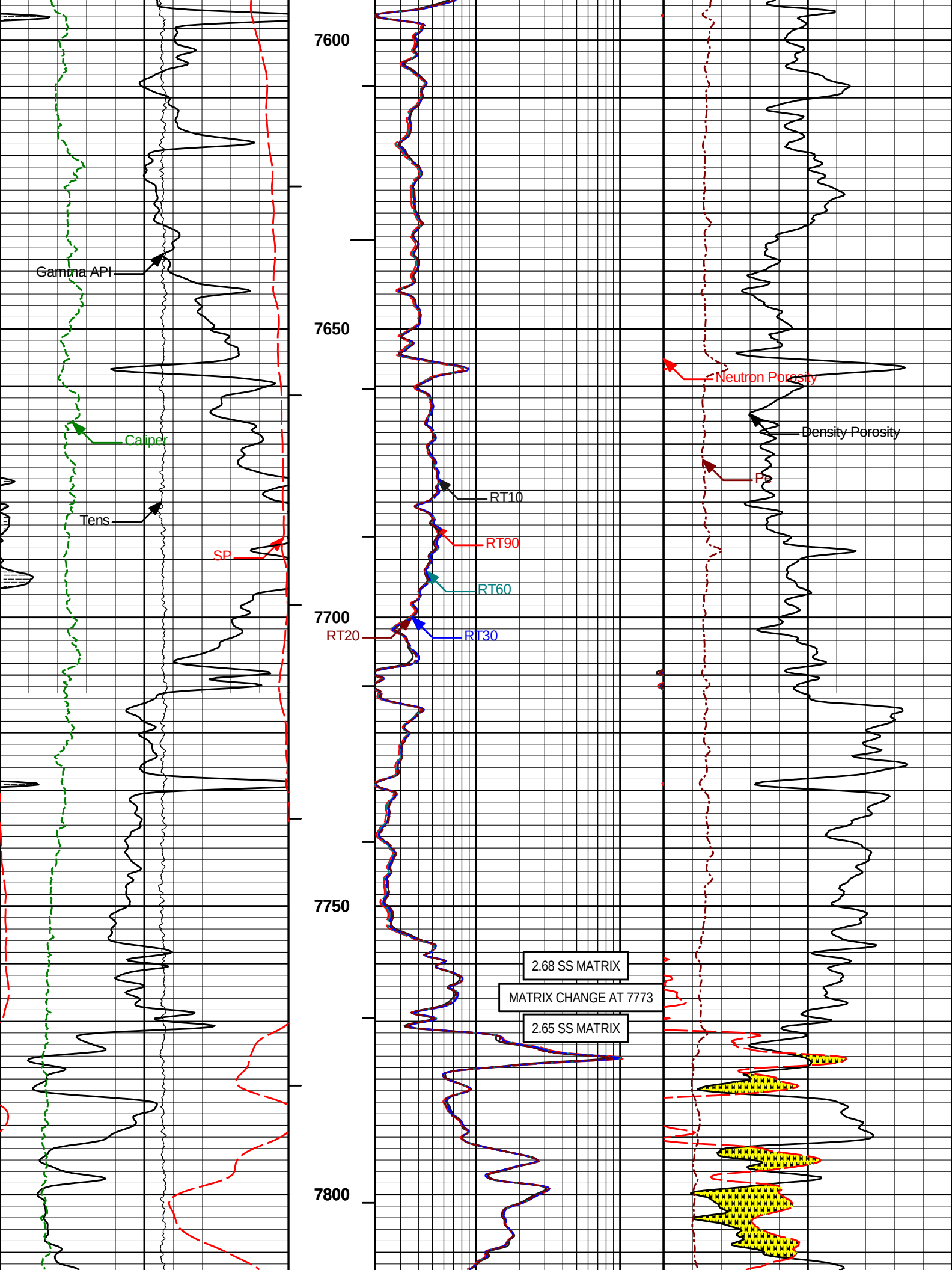
RT20
RT30
Neutron Porosity
Density Porosity
Pe


7600
7650
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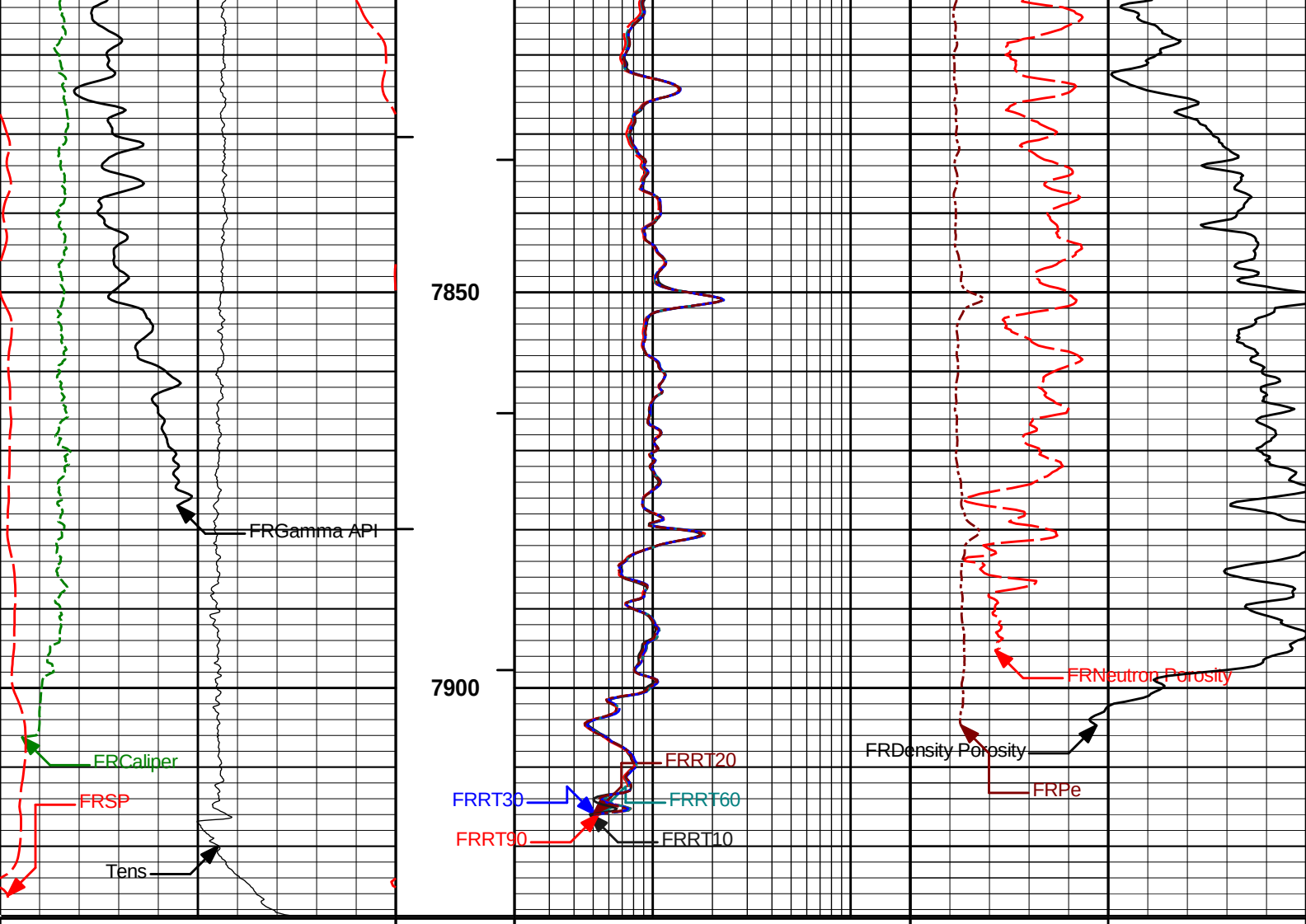
Gamma API
Caliper
Tens
SP
RT10
RT90
RT60
RT30
RT20
Neutron Porosity
Density Porosity
Pe
2.68 SS MATRIX
MATRIX CHANGE AT 7773
2.65 SS MATRIX



0 SP 100	millivolts	1 : 240	2 RT90 200	ohmm	0 Pe 10
0 Gamma API 250	api	BHVT	2 RT60 200	ohmm	20 Density Porosity 0 percent
6 Caliper 16	inches	AHVT	2 RT30 200	ohmm	20 Neutron Porosity 0 percent
10K Tens 0	pounds		2 RT20 200	ohmm	
			2 RT10 200	ohmm	

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Plot Time: 01-Nov-11 20:46:44
Plot Range: 6295 ft to 7928.83 ft
Data: DECH_USX_X29_05\Well Based\MAIN*
Plot File: \\COMP\MAIN

MAIN PASS 5" = 100'

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	**GTET - 11259758**	**Reference Calibration Date:**	**07-Sep-11 15:26:43**
Engineer:	**C. BLUE**	**Calibration Date:**	**13-Oct-11 16:53:13**
Software Version:	**WL INSITE R3.4.2 (Build 2)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB 290
Calibrator API Reference:230.00 api
Equivalent Calibrator API Reference:234.0 api

Measurement	Measured	Calibrated	Units
Background	71.3	70.7	api
Background + Calibrator	307.3	304.7	api
Calibrator	236.0	234.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	**GTET - 11259758**	**Reference Calibration Date:**	**13-Oct-11 16:53:13**
Engineer:	**C. BLUE**	**Calibration Date:**	**01-Nov-11 14:42:47**
Software Version:	**WL INSITE R3.4.2 (Build 2)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB 290
Calibrator API Reference:230.00 api
Equivalent Calibrator API Reference:234.0 api

Field Verification	Shop	Field	Units
Background	70.7	70.8	api
Background + Calibrator	304.7	304.2	api
Calibrator	234.0	233.4	api

Shop	Field	Difference	Tolerance
234.0	233.4	0.6	+/- 9.00

CSNG-FS SHOP CALIBRATION

Tool Name:	**CSNG - 10846351**	**Reference Calibration Date:**	**11-Oct-11 11:03:35**
Engineer:	**C. BLUE**	**Calibration Date:**	**11-Oct-11 11:35:16**
Software Version:	**WL INSITE R3.4.2 (Build 2)**	**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 #	23.6	23.6	Channel #
583 KEV Peak Channel #	52.9	53.2	Channel #
2614 KEV Peak Channel #	218.7	219.1	Channel #
Calibrate Temperature	55.0	60.2	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	1682.4	CPS	223.6	223.6	API

Thorium Blanket	1682.4	CPS	323.6	323.6	API
Background	324.2	CPS	62.3	62.4	API

Gamma Ray Gain: 0.97
Expected Gain Range: 0.85 - 1.15
Gamma Gain Check: Passed

CSNG-FS FIELD CALIBRATION

Tool Name: CSNG - 10846351 **Reference Calibration Date:** 11-Oct-11 11:35:16
Engineer: C. BLUE **Calibration Date:** 01-Nov-11 14:56:42
Software Version: WL INSITE R3.4.2 (Build 2) **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 #	53.2	53.2	Channel #
2614 KEV Peak Channel #	219.1	219.7	Channel #
Calibrate Temperature	60.2	42.1	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	1686.0	CPS	323.6	323.3	API
Background	323.6	CPS	62.4	62.0	API

Gamma Ray Gain: 0.96
Expected Gain Range: 0.85 - 1.15
Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 10935690 **Reference Calibration Date:** 04-Oct-11 15:06:32
Engineer: C. BLUE **Calibration Date:** 04-Oct-11 15:19:43
Software Version: WL INSITE R3.4.2 (Build 2) **Calibration Version:** 1

Logging Source S/N: DSN-430
Tank Serial Number: 11068236
Reference value assigned to Tank: 53.720
Snow Block S/N: 100133139C
Calibration Tank Water Temperature: 75 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	**Prev. Value**	**New Value**	**Control Limit On New Value**
Gain:	1.045	1.045	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)			
Measurement	**Prev. Value**	**New Value**	**Control Limit On New Value**
Gain:	1.045	1.045	0.900 - 1.100

Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2225	0.2224	0.0002	+/- 0.0020
Calibrated Ratio:	10.12	10.11	0.006	+/- 0.050

VERIFIER		
Measurement	**Value**	**Control Limit**
Snow-Block Porosity (decp):	0.0864	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 - 10935690 **Reference Calibration Date:** 04-Oct-11 15:19:43

Engineer: C. BLUE **Calibration Date:** 01-Nov-11 15:02:32

Software Version: WL INSITE R3.4.2 (Build 2) **Calibration Version:** 1

Logging Source S/N: DSN-430

Snow Block S/N: 100133139C

NEUTRON FIELD-CHECK SUMMARY				
	Shop	**Field**	**Difference**	**Control Limit On Change**
Snow-Block Porosity (decp):	0.0864	0.0807	-0.0057	+/- 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:** 13-Oct-11 16:22:52

Engineer: C. BLUE **Calibration Date:** 13-Oct-11 16:26:51

Software Version: WL INSITE R3.4.2 (Build 2) **Calibration Version:** 1

CALIBRATION COEFFICIENTS			
Measurement	**Previous Value**	**New Value**	**Control Limit On New Value**
Pad Offset	-2097.79	-2119.39	-7000.00 - -1000.00
Pad Gain	0.0003846	0.0003850	0.000200 - 0.000600
Arm Offset	-2586.35	-2477.70	-5000.00 - 3000.00
Arm Gain	0.0005637	0.0005344	0.000300 - 0.000700
Arm Power	-0.000005783	-0.000003638	-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)	2.01	2.00	-0.01	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.54	6.50	-0.04	+/- 0.20
Medium Ring (in)	8.34	8.25	-0.09	+/- 0.20

Large Ring (in)	15.00	15.00	0.00	+/- 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:**	**13-Oct-11 16:26:51**
Engineer:	**C. BLUE**	**Calibration Date:**	**01-Nov-11 14:46:31**
Software Version:	**WL INSITE R3.4.2 (Build 2)**	**Calibration Version:**	**1**

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.79	0.04	+/- 0.10
Ring Diameter	8.25	8.34	0.09	+/- 0.15

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

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	**ACRt Sonde - E2584-S2585**	**Reference Calibration Date:**	**28-Jul-11 15:52:08**
Engineer:	**C. BLUE**	**Calibration Date:**	**28-Jul-11 16:05:50**
Software Version:	**WL INSITE R3.2.5 (Build 2)**	**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	1.0012	1.05	0.95	1.0001	1.05	0.95	1.0006	1.05
A2 (50")	0.95	0.9994	1.05	0.95	1.0037	1.05	0.95	1.0091	1.05
A3 (29")	0.95	0.9959	1.05	0.95	1.0005	1.05	0.95	1.0031	1.05
A4 (17")	0.95	1.0040	1.05	0.95	1.0060	1.05	0.95	1.0110	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0014	1.05	0.95	1.0048	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9776	1.05	0.95	0.9812	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	-0.761	2	-6	-4.073	-2	-8	-5.268	-2
A2 (50")	-7	-1.957	-1	-6	-3.509	-2	-7	-4.574	-2
A3 (29")	-27	-12.918	-9	-9	-3.439	-3	-7	-3.298	-1
A4 (17")	-180	-94.666	-60	-45	-30.479	-15	-39	-25.503	-13
A5 (10")	N/A	N/A	N/A	-150	-86.802	-50	-80	-43.996	-10
A6 (6")	N/A	N/A	N/A	175	306.164	525	90	153.096	270

TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper
12K	0.6	0.9962	1.3
36K	1.0	1.9266	2.0
72K	1.0	1.2354	2.0

R-MUD VERIFICATION

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

72K 1.0 1.2554 2.0

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	**SDLT Pad - M177P867**	**Reference Calibration Date:**	**13-Oct-11 15:32:57**
Engineer:	**C. BLUE**	**Calibration Date:**	**13-Oct-11 15:58:53**
Software Version:	**WL INSITE R3.4.2 (Build 2)**	**Calibration Version:**	**1**

Logging Source S/N: 5256 GW

Aluminum Block S/N: 63066 Density: 2.602g/cc Pe: 3.100

Magnesium Block S/N: BRIGHTON Density: 1.691g/cc Pe: 2.650

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0540	1.0384	0.90 - 1.10
Near Dens Gain	1.0134	1.0115	0.90 - 1.10
Near Peak Gain	0.9885	0.9920	0.90 - 1.10
Near Lith Gain	0.9431	0.9449	0.90 - 1.10
Far Bar Gain	1.0103	1.0085	0.90 - 1.10
Far Dens Gain	0.9946	0.9934	0.90 - 1.10
Far Peak Gain	0.9872	0.9881	0.90 - 1.10
Far Lith Gain	0.9696	0.9666	0.90 - 1.10
Near Bar Offset	-0.4780	-0.3338	NONE
Near Dens Offset	-0.0866	-0.0719	NONE
Near Peak Offset	0.1316	0.1012	NONE
Near Lith Offset	0.4947	0.4800	NONE
Far Bar Offset	-0.1015	-0.0844	NONE
Far Dens Offset	0.0467	0.0579	NONE
Far Peak Offset	0.1020	0.0938	NONE
Far Lith Offset	0.2427	0.2670	NONE
Near Bar Background	870.17	865.48	700 - 1450
Near Dens Background	285.74	286.18	230 - 480
Near Peak Background	124.58	124.41	100 - 210
Near Lith Background	153.03	152.63	125 - 260
Far Bar Background	675.65	676.54	450 - 900
Far Dens Background	265.10	267.58	175 - 345
Far Peak Background	105.08	104.20	70 - 140
Far Lith Background	108.29	108.55	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.693	1.691	-0.002	+/- 0.015
Pe	2.621	2.604	-0.017	+/- 0.150
ALUMINUM				
Density (g/cc)	2.603	2.602	-0.001	+/- 0.01500
Pe	3.059	3.064	0.005	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0001	+/- 0.0110	0.0007	+/- 0.0140

Background	-0.0001	+/- 0.0110	-0.0007	+/- 0.0140
Magnesium Block	-0.0003	+/- 0.0110	0.0000	+/- 0.0140
Aluminum Block	-0.0014	+/- 0.0110	-0.0005	+/- 0.0140
Resolution	8.44	6.00 - 11.50	8.75	6.00 - 11.50
Internal Verifier(B+D+P+L)	1429	1200 - 2700	1157	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

CALIBRATION SUMMARY

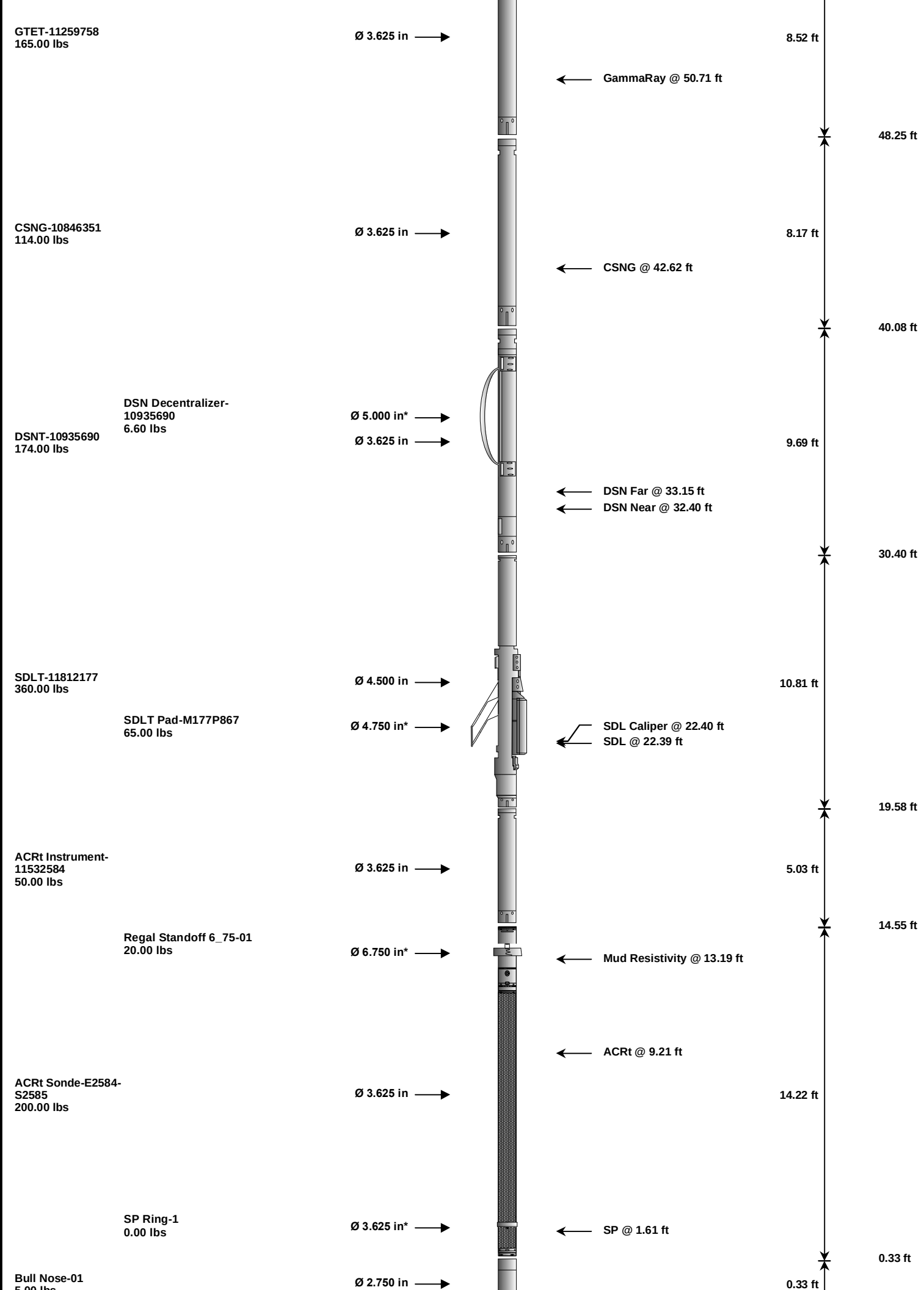
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11259758						
Gamma Ray Calibrator	234.0	233.4	----------	0.6	+/- 9.00	api
CSNG-10846351						
60 KEV Peak Channel #	48.0	48.0	----------	0.0	----------	Channel #
239 KEV Peak Channel #	23.6	23.7	----------	-0.1	----------	Channel #
583 KEV Peak Channel #	53.2	53.2	----------	0.0	----------	Channel #
2614 KEV Peak Channel #	219.1	219.7	----------	-0.6	----------	Channel #
DSNT-10935690						
Snow-Block Porosity	0.0864	0.0807	----------	0.0057	+/- 0.0150	decp
SDLT-11812177						
Pad Extension	3.75	3.79	----------	-0.04	+/-0.10	in
Ring Diameter	8.25	8.34	----------	-0.090	+/-0.15	in
ACRt Sonde-E2584-S2585						
Mud Cell	0.997	----------	----------	0.000	----------	ohm-m
SDLT Pad-M177P867						
Near(B+D+P+L)	1428.701	----------	----------	0.000	+/-13.345	cps
Far(B+D+P+L)	1156.874	----------	----------	0.000	+/-16.109	cps

Data: DECH_USX_X29_05\0001 NOBLE\IDLE **Date: 01-Nov-11 20:17:16**

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-11078326 135.00 lbs		Ø 3.625 in		Load Cell @ 59.34 ft BH Temperature @ 58.77 ft	6.25 ft 56.77 ft	63.02 ft


GTET-11259758
165.00 lbs
Ø 3.625 in
8.52 ft
GammaRay @ 50.71 ft
48.25 ft
CSNG-10846351
114.00 lbs
Ø 3.625 in
8.17 ft
CSNG @ 42.62 ft
40.08 ft
DSN Decentralizer-10935690
6.60 lbs
Ø 5.000 in*
DSNT-10935690
174.00 lbs
Ø 3.625 in
9.69 ft
DSN Far @ 33.15 ft
DSN Near @ 32.40 ft
30.40 ft
SDLT-11812177
360.00 lbs
Ø 4.500 in
10.81 ft
SDLT Pad-M177P867
65.00 lbs
Ø 4.750 in*
SDL Caliper @ 22.40 ft
SDL @ 22.39 ft
19.58 ft
ACRt Instrument-11532584
50.00 lbs
Ø 3.625 in
5.03 ft
14.55 ft
Regal Standoff 6_75-01
20.00 lbs
Ø 6.750 in*
Mud Resistivity @ 13.19 ft
ACRt @ 9.21 ft
ACRt Sonde-E2584-S2585
200.00 lbs
Ø 3.625 in
14.22 ft
SP Ring-1
0.00 lbs
Ø 3.625 in*
SP @ 1.61 ft
0.33 ft
Bull Nose-01
Ø 2.750 in
0.33 ft

5.00 lbs

0.00 ft

Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	11078326	135.00	6.25		56.77	300.00
GTET	Gamma Telemetry Tool	11259758	165.00	8.52		48.25	60.00
CSNG	Compensated Spectral Natural Gamma	10846351	114.00	8.17		40.08	15.00
DSNT	Dual Spaced Neutron	10935690	174.00	9.69		30.40	60.00
DCNT	DSN Decentralizer	10935690	6.60	5.13	*	33.73	300.00
SDLT	Spectral Density Tool	11812177	360.00	10.81		19.58	60.00
SDLP	Density Insite Pad	M177P867	65.00	2.55	*	21.79	60.00
ACRt	Array Compensated True Resistivity Instrument Section	11532584	50.00	5.03		14.55	300.00
ACRt	Array Compensated True Resistivity	E2584-S2585	200.00	14.22		0.33	300.00
SP	SP Ring	1	0.00	0.25	*	1.61	300.00
RSOF	Regal Standoff 6.75in	01	20.00	0.52	*	13.24	300.00
BLNS	Bull Nose	01	5.00	0.33		0.00	300.00
Total			**1,294.60**	**63.02**			

* Not included in Total Length and Length Accumulation.

Data: DECH_USX_X29_05\0001 NOBLE\IDLE **Date: 01-Nov-11 17:38:07**

COMPANY	**NOBLE ENERGY INC.**
WELL	**DECHANT USX X29-05**
FIELD	**WATTENBERG**
COUNTY	**WELD** STATE **CO**

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
ARRAY COMPENSATED
TRUE RESISTIVITY