

HALLIBURTON

SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TRUE RESISTIVITY

COMPANY WPX ENERGY ROCKY MOUNTAIN LLC
WELL LANGSTAFF RWF 724-16
FIELD/BLOCK RULISON
COUNTY GARFIELD
STATE CO

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API No. 05045221570000
 Location SURFACE HOLE LOCATION:
 1722' FSL & 1578' FWL
 BOTTOM HOLE LOCATION:
 976' FSL & 1681' FWL

Sect. 16 Twp. 6S Rge. 94W
 Elev. 5582.0 ft
 21.0 ft above perm. Datum

Other Services:
 RWCH

Elev.: K.B. 5603.0 ft
 D.F. 5603.0 ft
 G.L. 5582.0 ft

Date	16-Dec-13	Run No.	TWO
Depth - Driller	13797.00 ft	Depth - Logger	13567.0 ft
Bottom - Logged Interval	13557.0 ft	Top - Logged Interval	8948.0 ft
Casing - Driller	9.625 in	Casing - Logger	8948.0 ft
Bit Size	7.875 in	Type Fluid in Hole	WBM
Density	14.7 ppg	Viscosity	72.00 s/qt
PH	10.50 pH	Fluid Loss	5.2 cphm
Source of Sample	MUD TANK	Rm @ Meas. Temperature	1.740 ohmm @ 58.00 degF
Rmf @ Meas. Temperature	0.96 ohmm @ 58.20 degF	Rmc @ Meas. Temperature	2.750 ohmm @ 66.10 degF
Source Rmf	MEASURED	Rmc	MEASURED
Rm @ BHT	0.33 ohmm @ 335.0 degF	Time Since Circulation	14.2 hr
Time on Bottom	16-Dec-13 13:41	Max. Rec. Temperature	335.0 degF @ 13567.0 ft
Equipment	11335318	Location	VERNAL, UT
Recorded By	Z. TAYLOR	Witnessed By	A. DUNIHOO

Fold here

Service Ticket No.: 900961488 API Serial No.: 05045221570000 PGM Version: WL INSITE R3.8.0 (Build 2)

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							
Rm @ Meas. Temp		@	@	Run No.	Tool Type & No.	Pad Type	Tool Pos.
Rmf @ Meas. Temp.		@	@	TWO	HACRT	N/A	1" S.O.
Rmc @ Meas. Temp.		@	@		11005910		
Source Rmf	Rmc						
Rm @ BHT		@	@				
Rmf @ BHT		@	@				
Rmc @ BHT		@	@				

EQUIPMENT DATA							
GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	TWO	Run No.		Run No.	TWO	Run No.	TWO
Serial No.	11232143	Serial No.		Serial No.	10815425	Serial No.	10706985
Model No.	H4TG	Model No.		Model No.	HSDL	Model No.	HDSN
Diameter	2.75"	No. of Cent.		Diameter	3.5"	Diameter	2.75"
Detector Model No.	H4TG	Spacing		Log Type	GAMMA	Log Type	THERMAL
Type	SCINT			Source Type	Cs137	Source Type	Am241Be
Length	8"	LSA [Y/N]		Serial No.	5257GW	Serial No.	08-037
Distance to Source	18'	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	
TWO	13567	8948	REC	0	150				30%	-10%	2.68 g/cc	30%	-10%	SAND

DIRECTIONAL INFORMATION

Maximum Deviation @ KOP @

Remarks: TOOL STRING CONFIGURATION: RWCH/XODH/H4TG/HSSP/HGNI/HDSN/HSDL/HHFS/HACRT/BN

ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING

HDSN DECENTRALIZER WAS NOT USED DUE TO BOREHOLE CONDITIONS AT CUSTOMER REQUEST

HDSL CALIPER CLOSED AT 13457', 12917', 12847', & 12786' DUE TO TENSION PULLS

TENSION PULLS AND BOREHOLE RUGOSITY MAY AFFECT LOG QUALITY

LATITUDE: 39° 31' 22.0794 " N

LONGITUDE: 107° 53' 50.28" W

CREW: T. BISHOP, A. GRAFF

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES - VERNAL, UT (435) 781-5517

RIG: CYCLONE #17

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					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	14.700	ppg
	SHARED	WAGT	Weighting Agent	Barite	
	SHARED	BSAL	Borehole salinity	700.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	1.740	ohmm
	SHARED	TRM	Temperature of Mud	58.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	20.0	degF
	SHARED	TD	Total Well Depth	13797.00	ft
	SHARED	BHT	Bottom Hole Temperature	350.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	H4TG-A	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	H4TG-A	GROK	Process Gamma Ray?	Yes	
	H4TG-A	GRSO	Gamma Tool Standoff	0.000	in
	H4TG-A	GEOK	Process Gamma Ray EVR?	No	
	H4TG-A	TPOS	Tool Position for Gamma Ray Tools	Eccentered	

HDSN	DNOK	Process DSN?	Yes	
HDSN	DEOK	Process DSN EVR?	No	
HDSN	NLIT	Neutron Lithology	Sandstone	
HDSN	DSOK	DSN Standoff Correction Source?	Fixed	
HDSN	DNSO	DSNTool Standoff	0.000	in
HDSN	TMPC	Temperature Correction Type	None	
HDSN	DPRS	DSN Pressure Correction Type	None	
HDSN	SHCO	View More Correction Options	No	
HDSN	UTVD	Use TVD for Gradient Corrections?	No	
HSDL_M	CLOK	Process Caliper Outputs?	Yes	
HSDL_M Pad	DNOK	Process Density?	Yes	
HSDL_M Pad	DNOK	Process Density EVR?	No	
HSDL_M Pad	DMA	Formation Density Matrix	2.680	g/cc
HSDL_M Pad	DFL	Formation Density Fluid	1.000	g/cc
HSDL_M Pad	CB	Logging Calibration Blocks?	No	
HACRT Sonde	RTOK	Process ACRT?	Yes	
HACRT Sonde	MNSO	Minimum Tool Standoff	1.00	in
HACRT Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Up	
HACRT Sonde	TPOS	Tool Position	Free Hanging	
HACRT Sonde	RMOP	Rmud Source	Mud Cell	
HACRT Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
HACRT Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
HACRT Sonde	THQY	Threshold Quality	0.50	
HACRT Sonde	MRFX	Fixed mud resistivity	2000	ohmm

BOTTOM

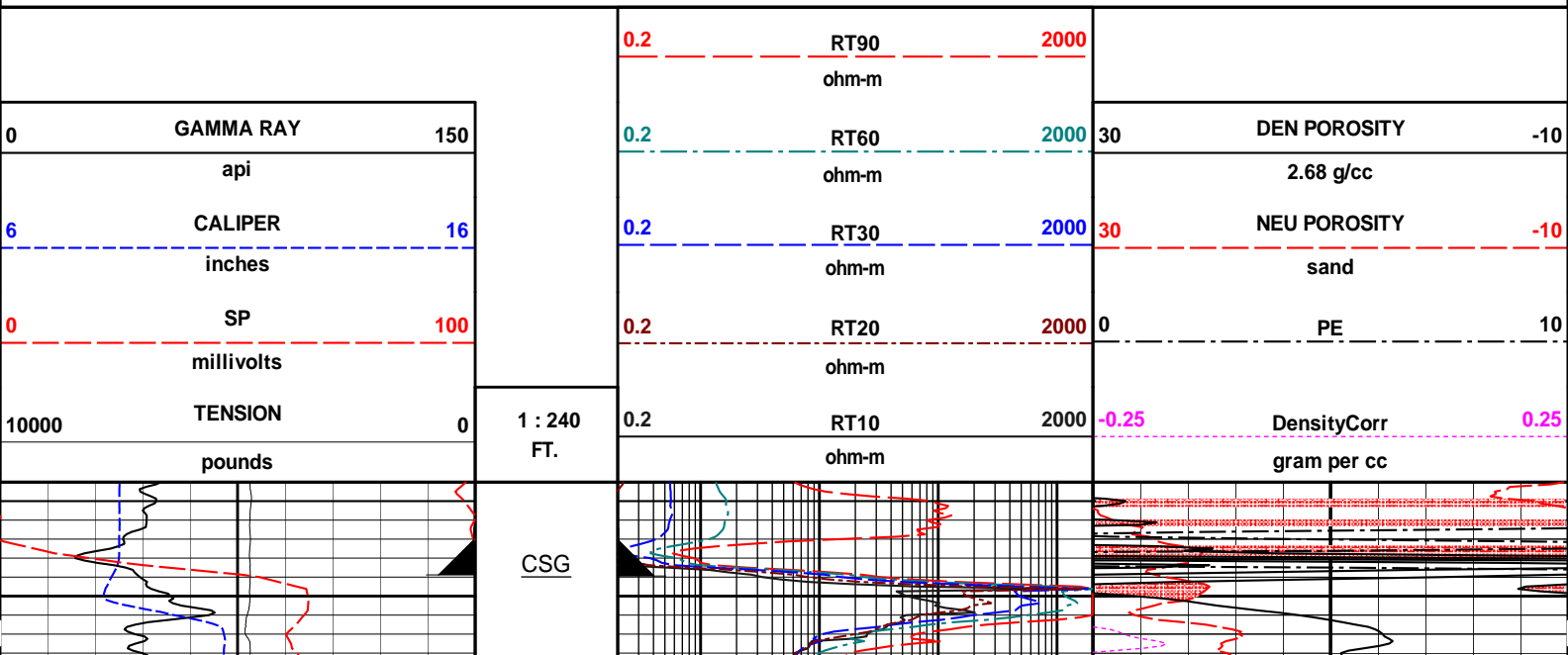
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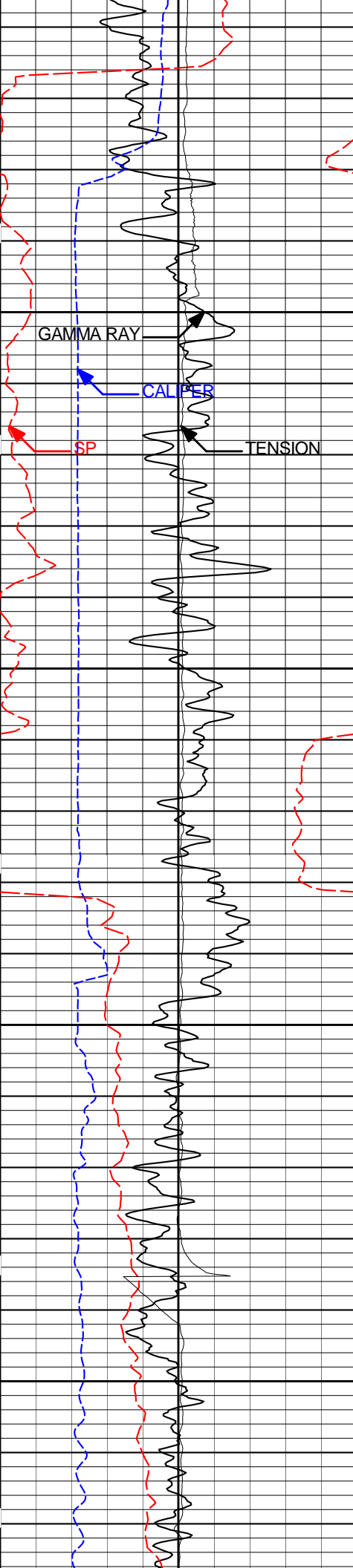
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Plot Time: 16-Dec-13 17:47:26
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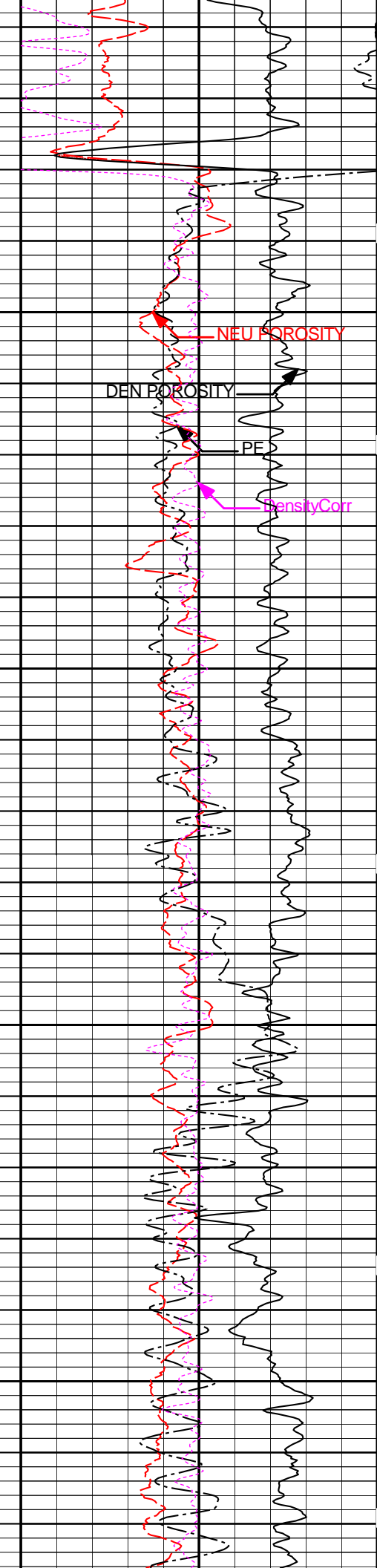
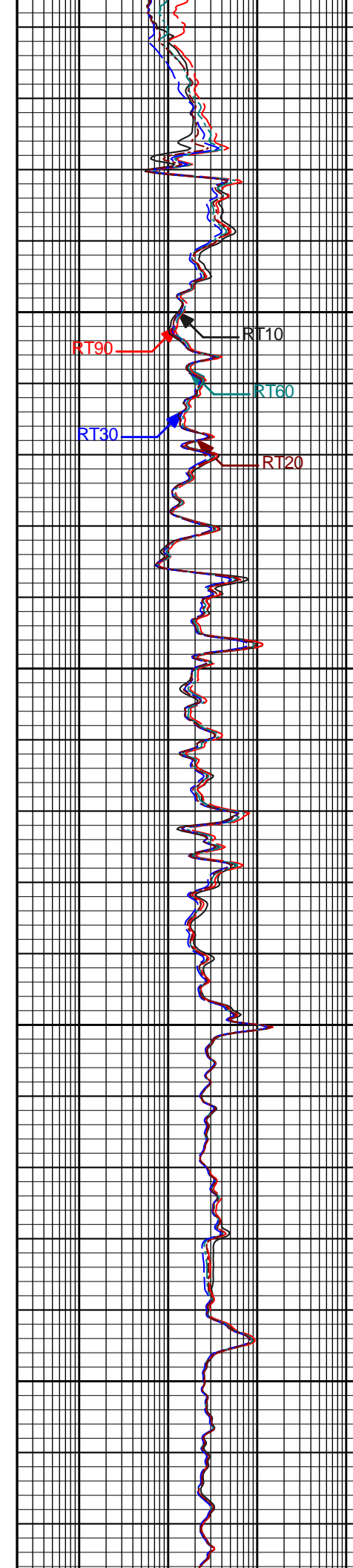
MAIN PASS 5" = 100'

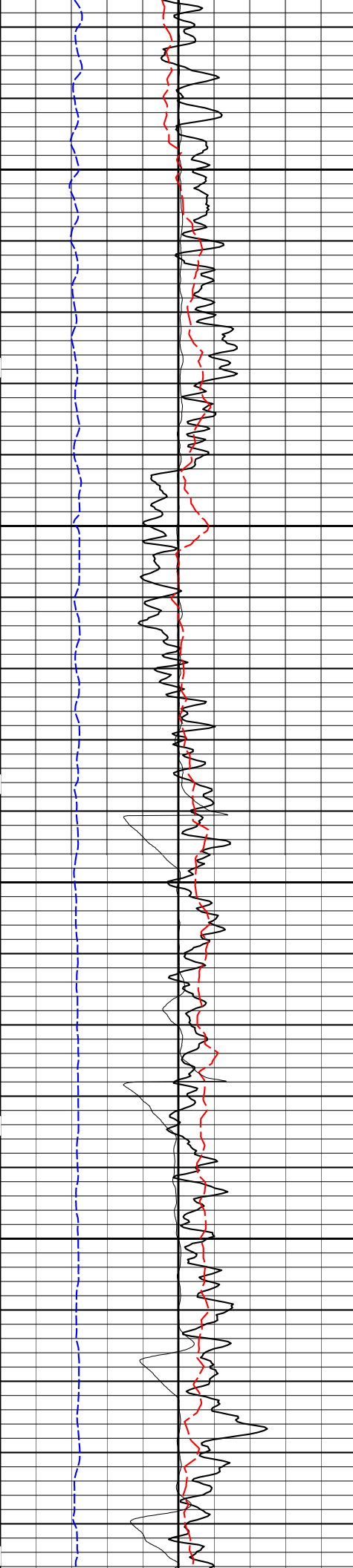




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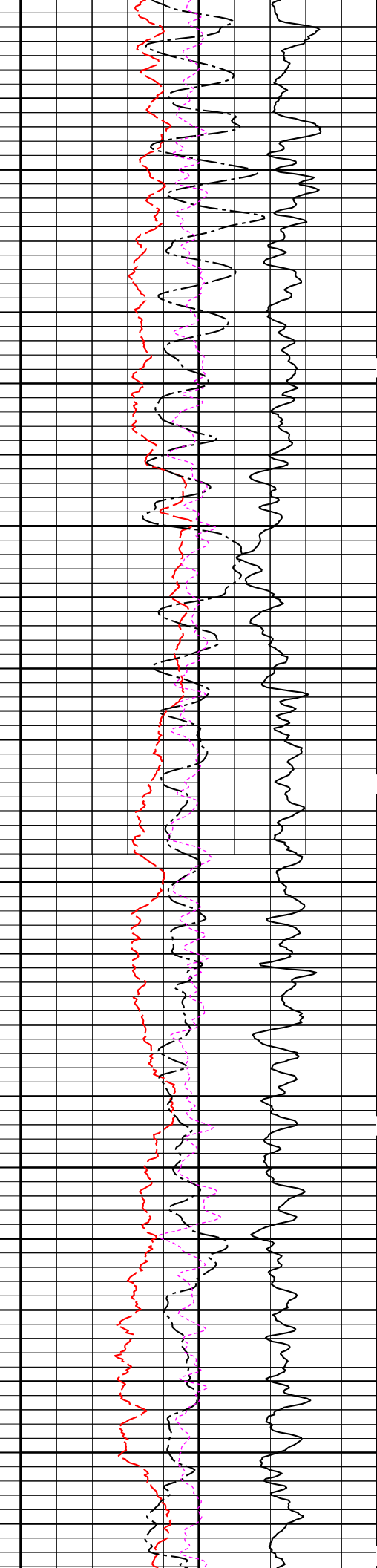
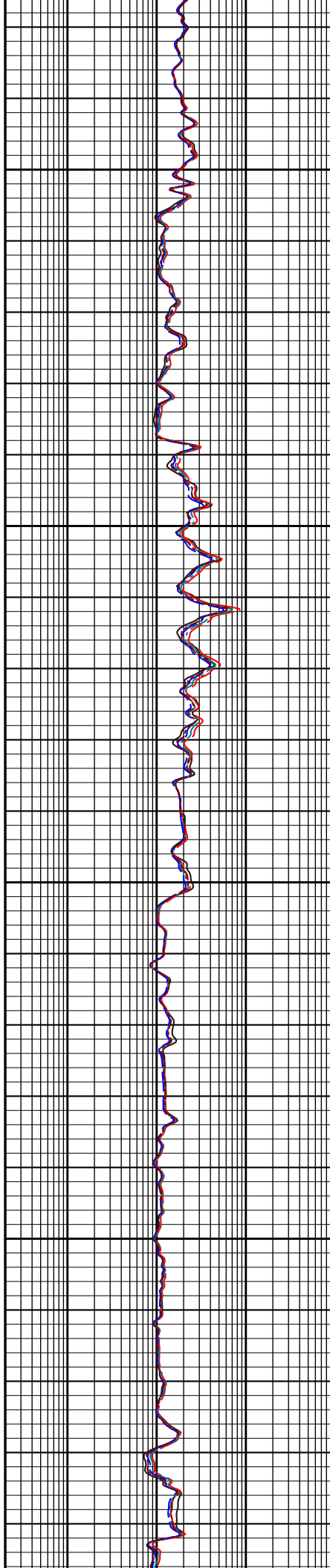
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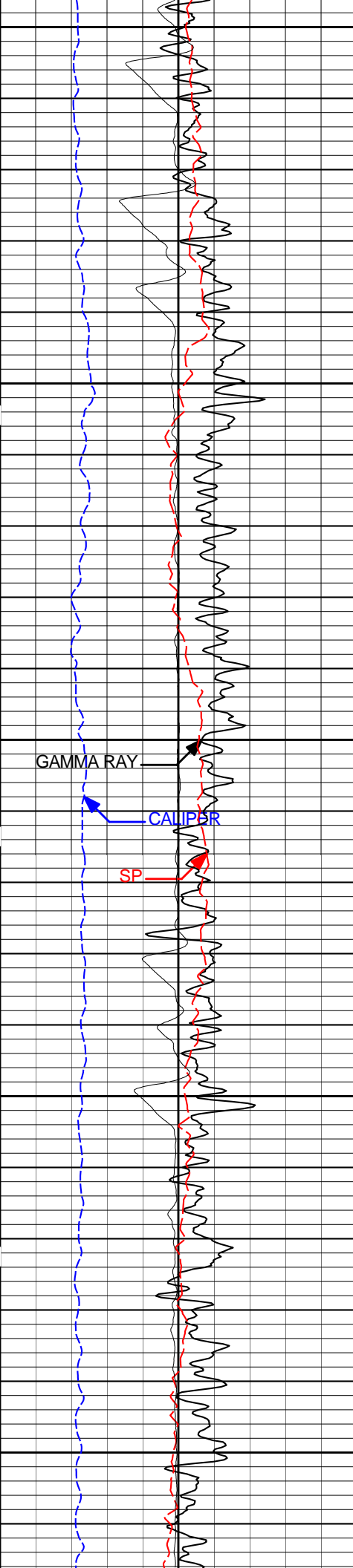




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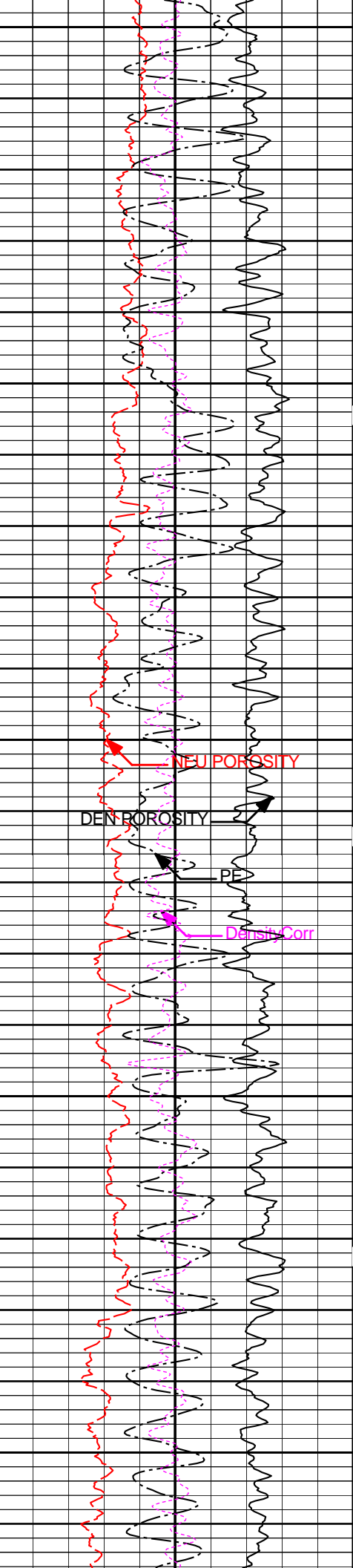
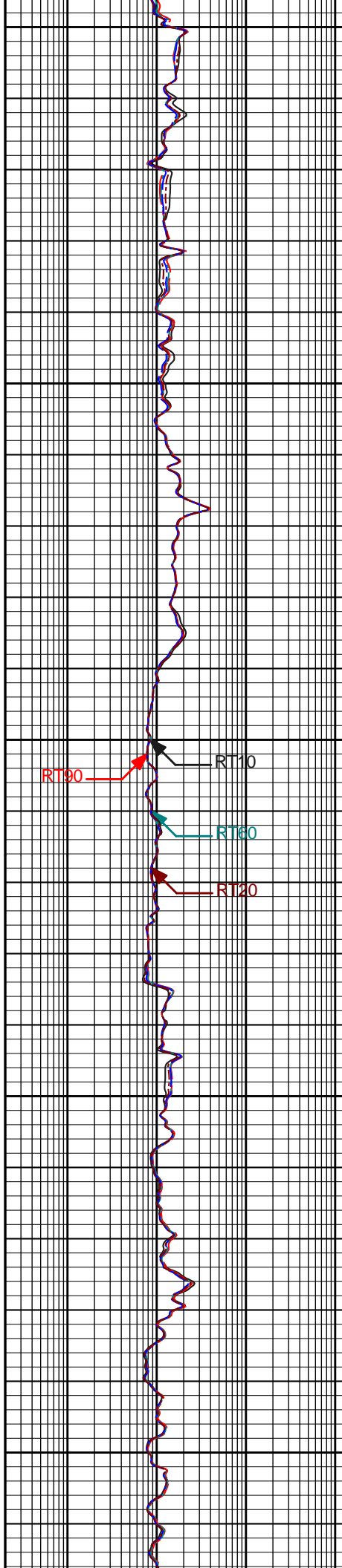


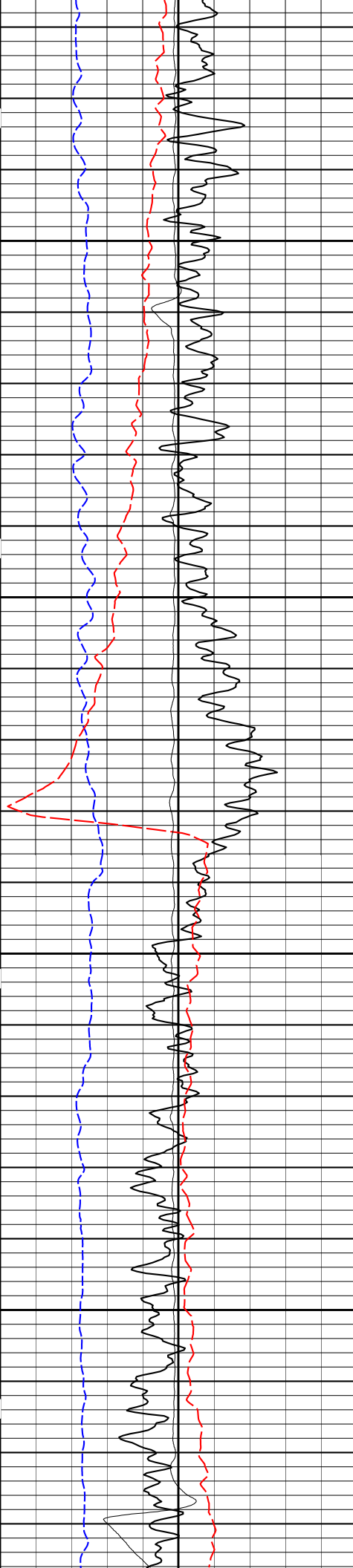


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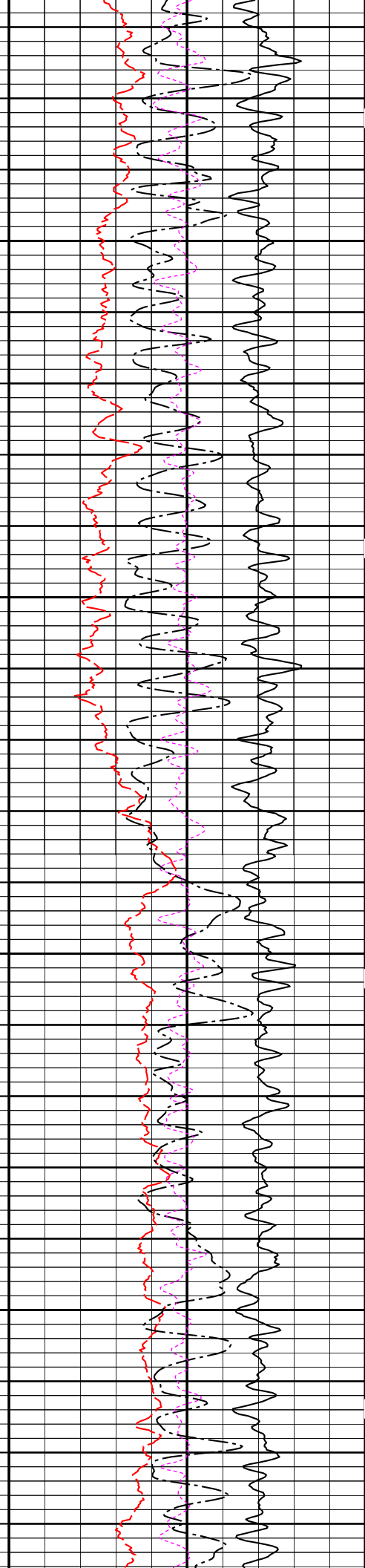
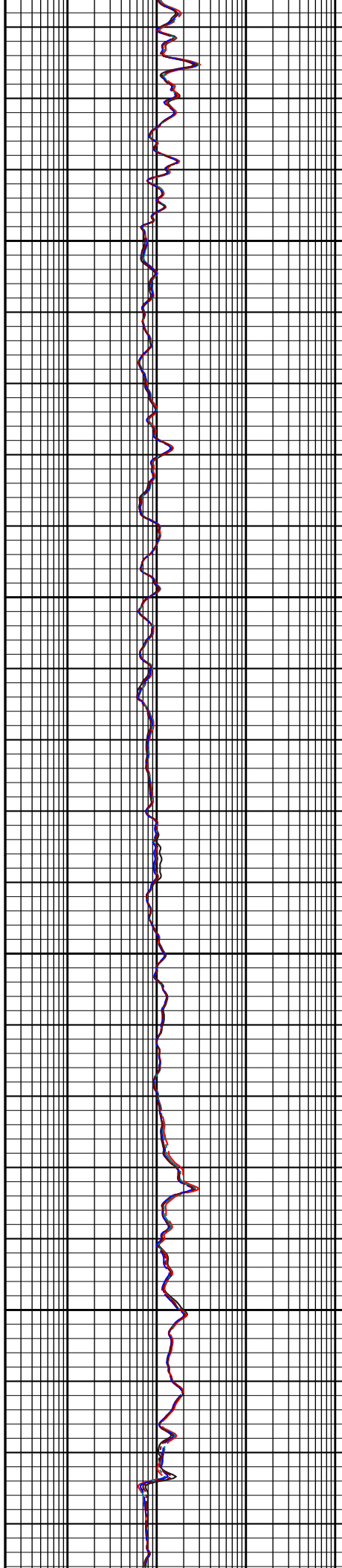
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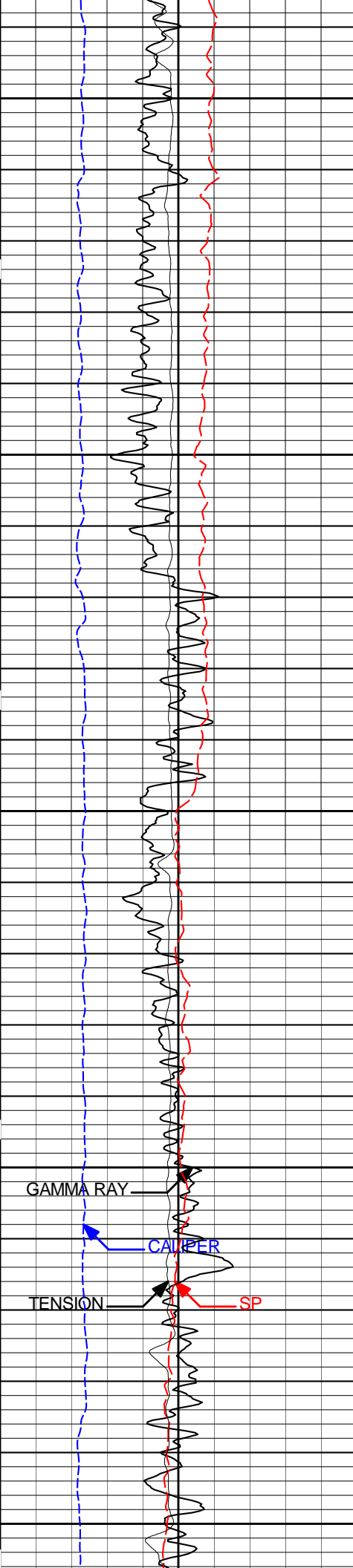




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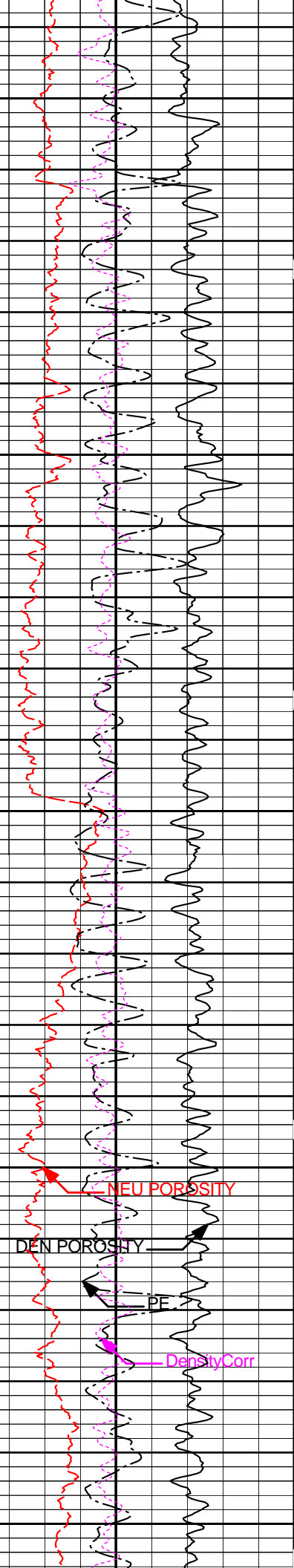
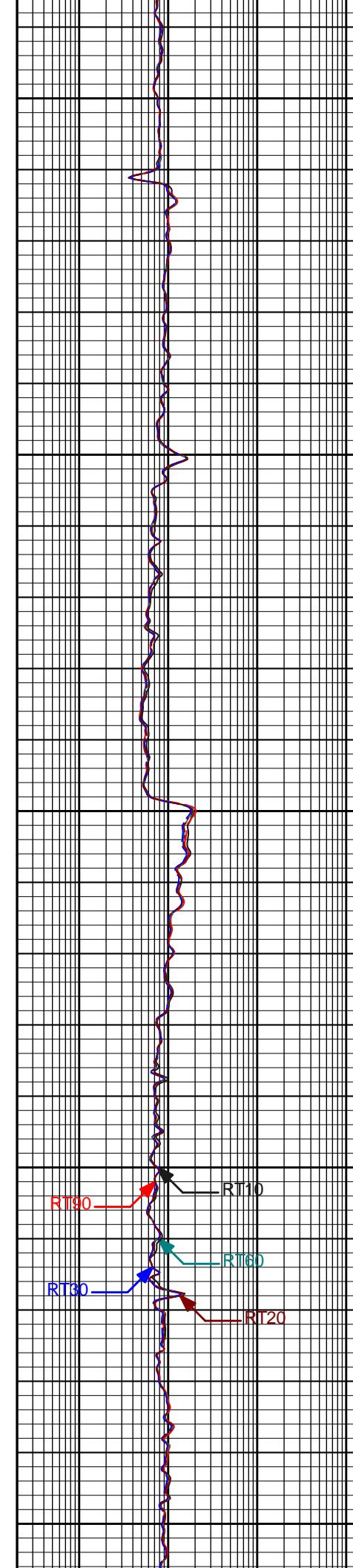
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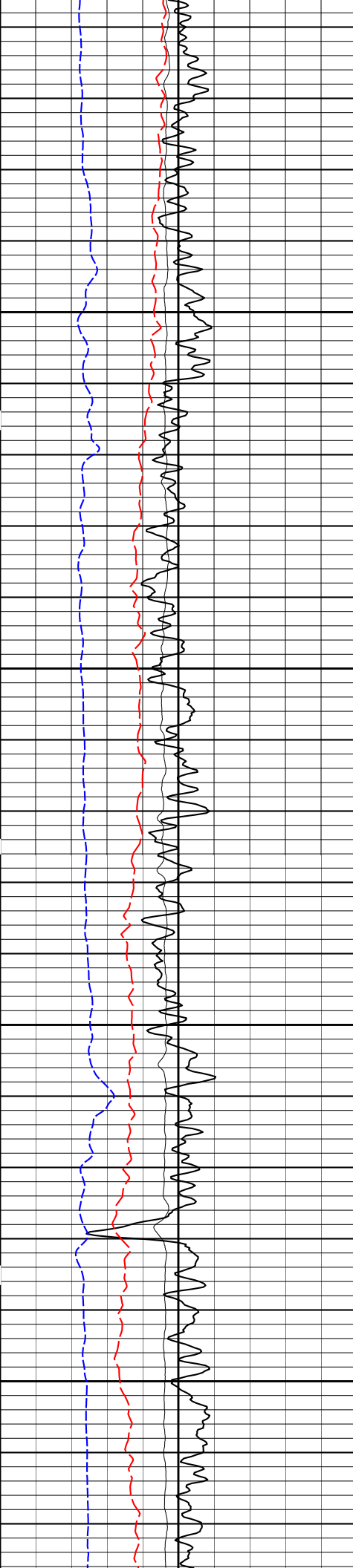




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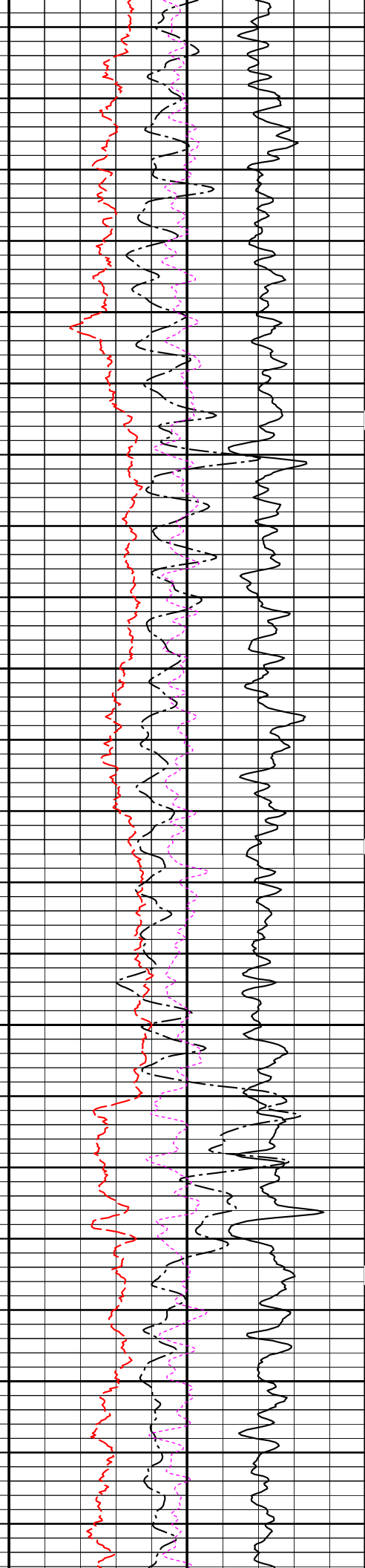
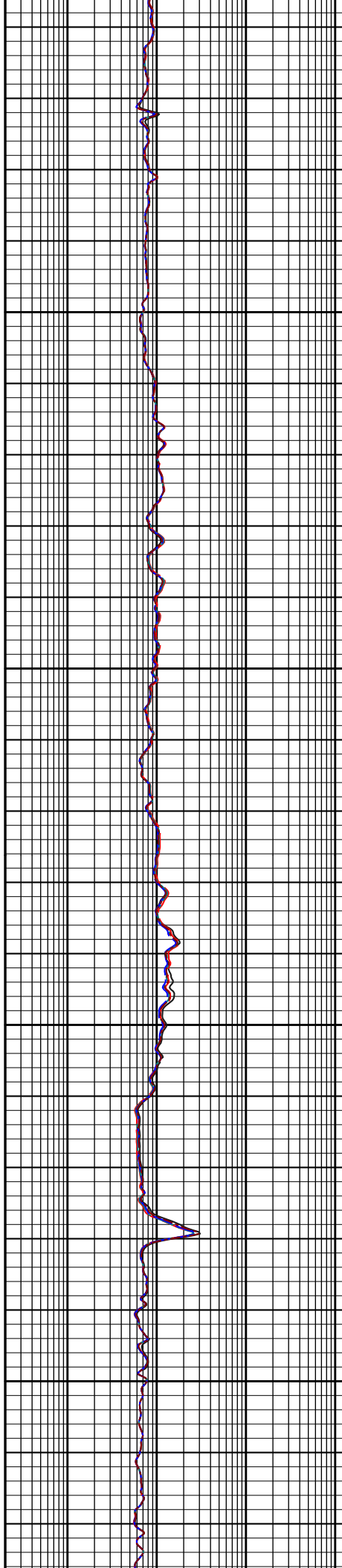
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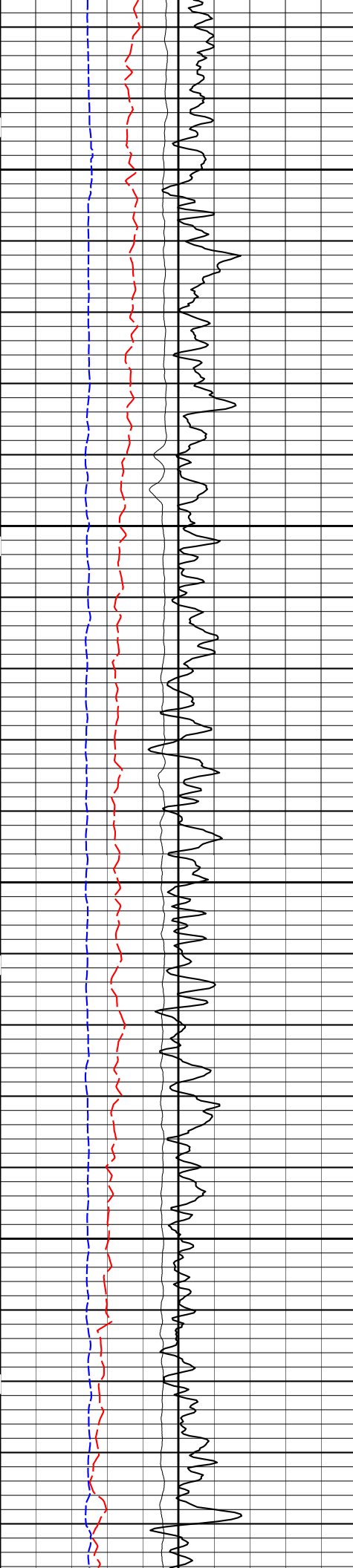




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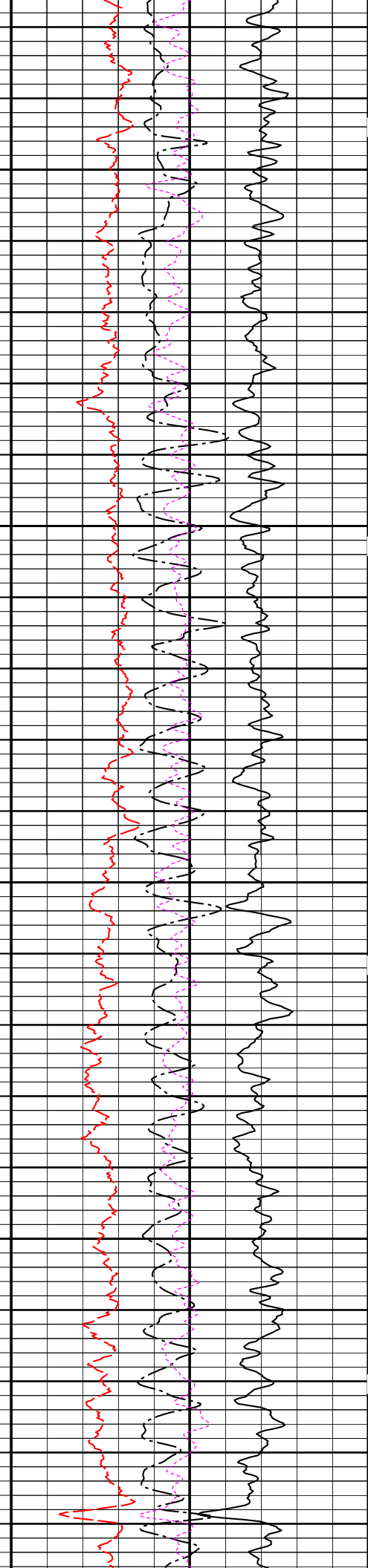
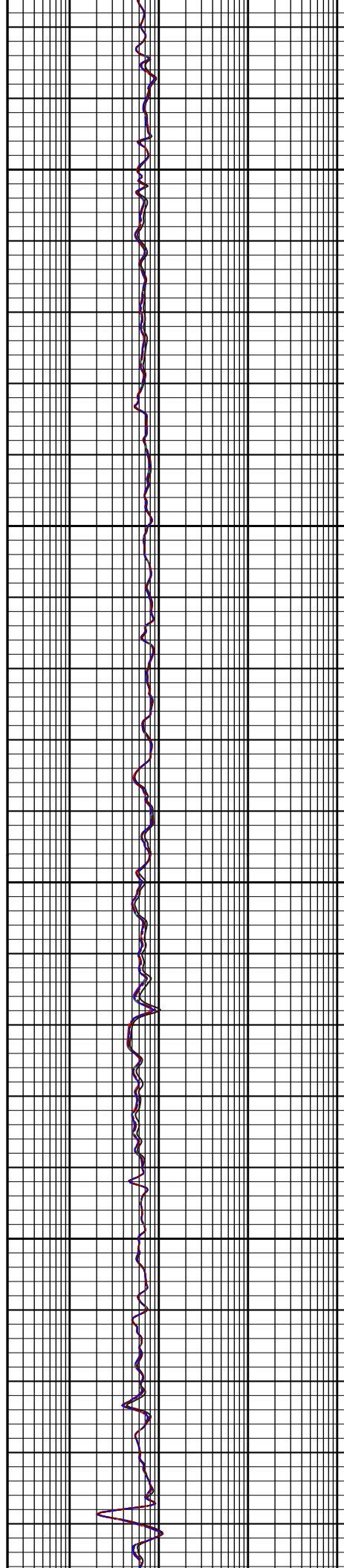
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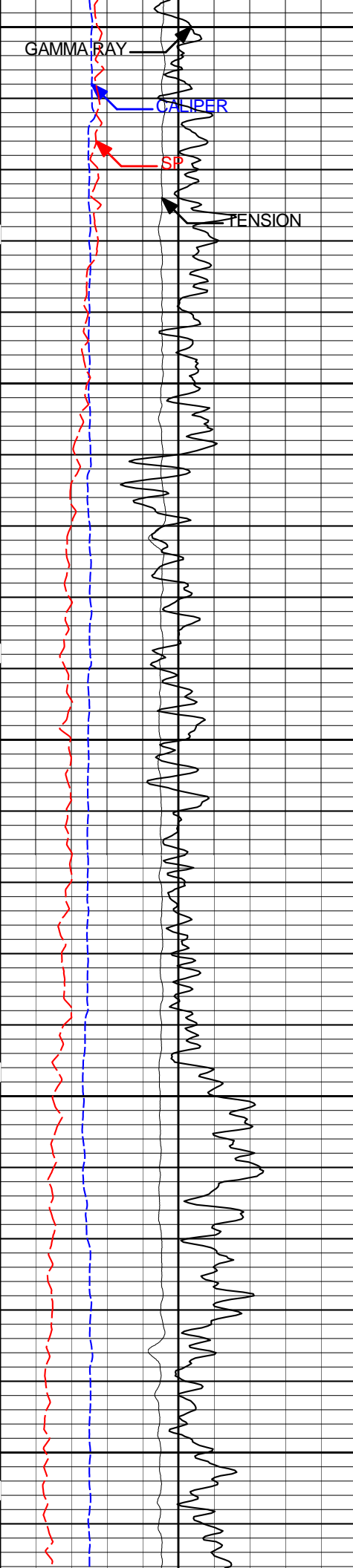




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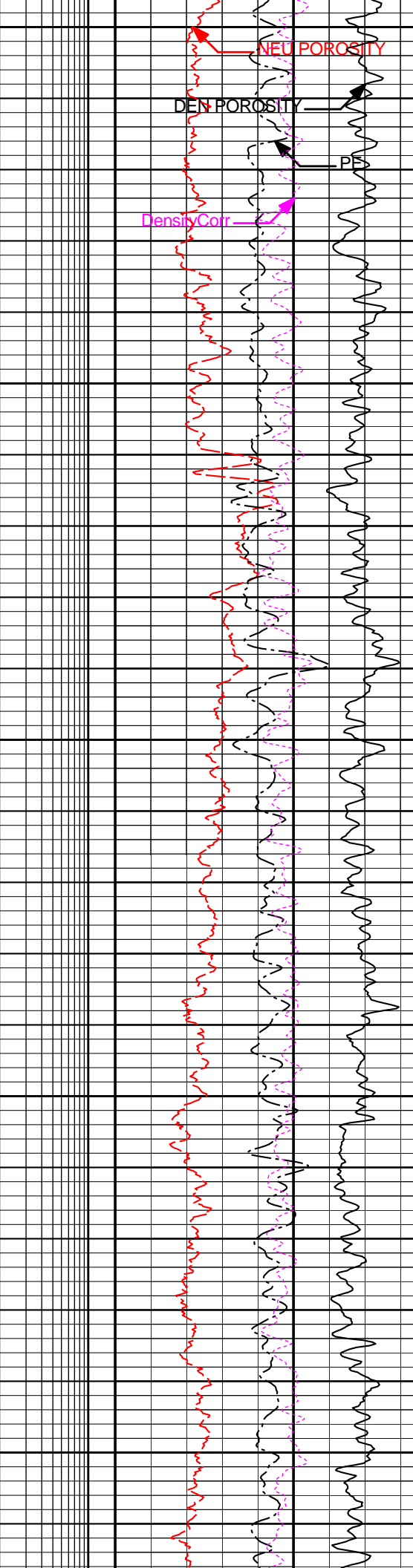
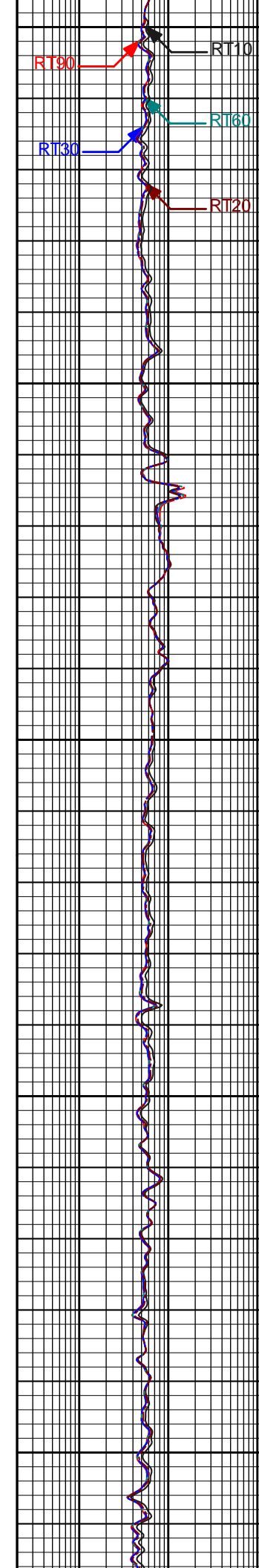


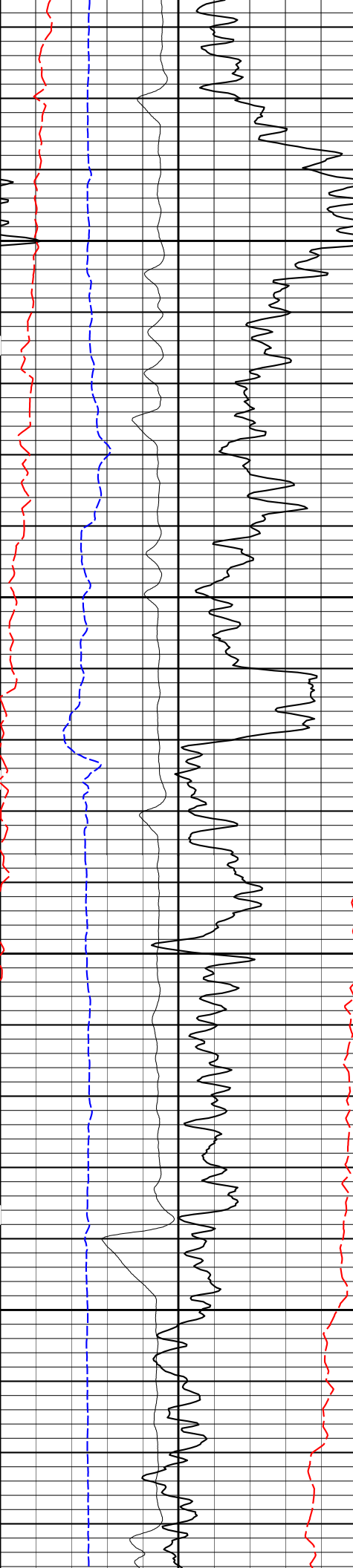


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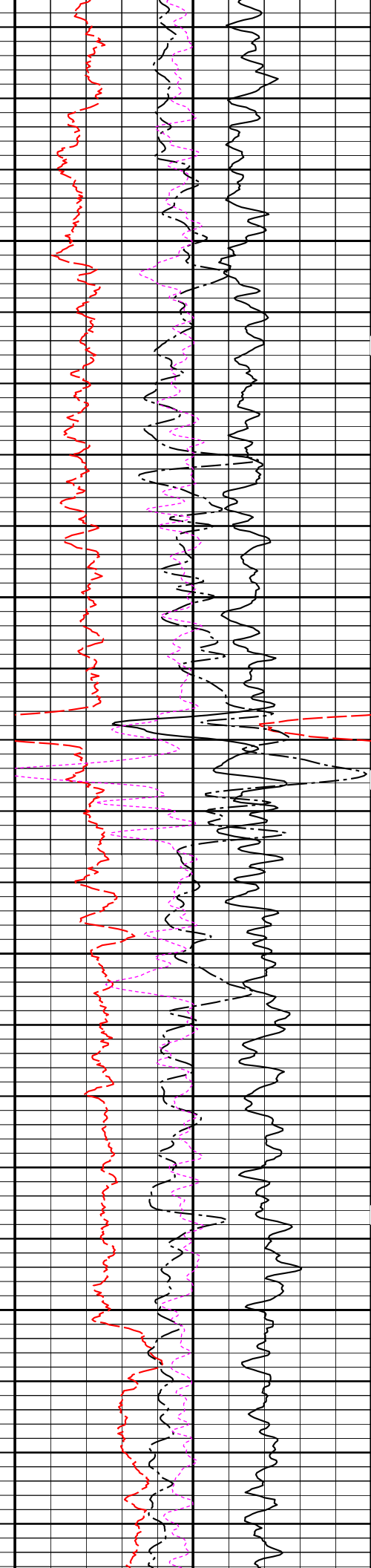
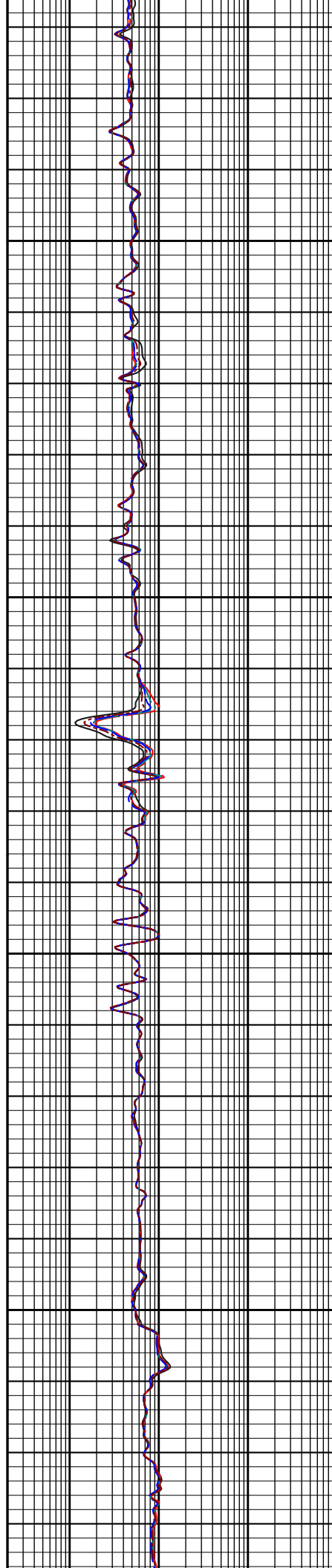
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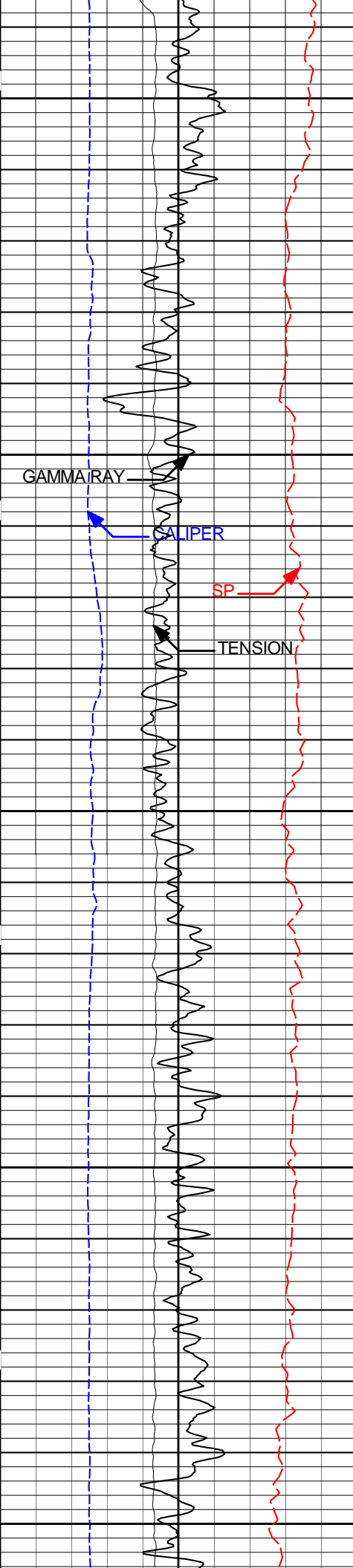




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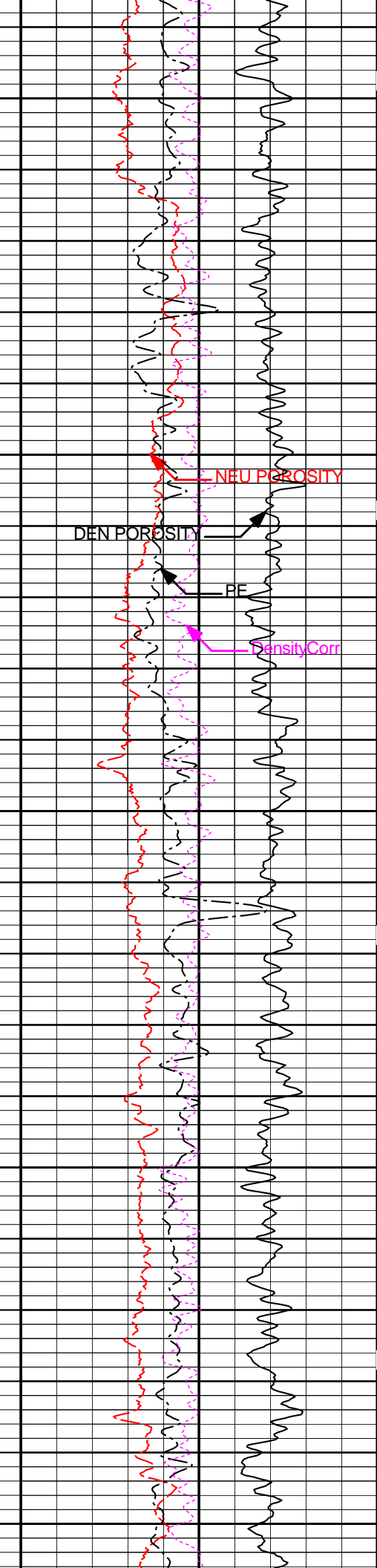
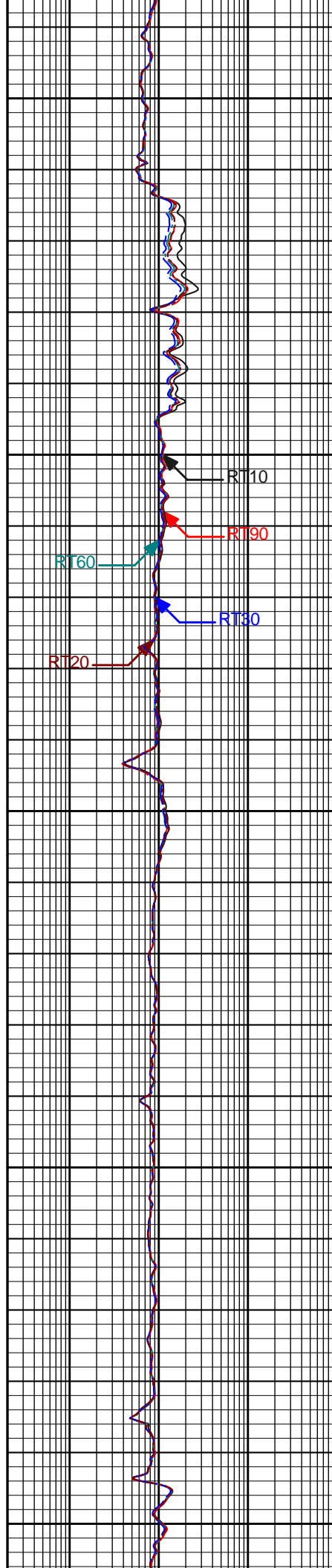
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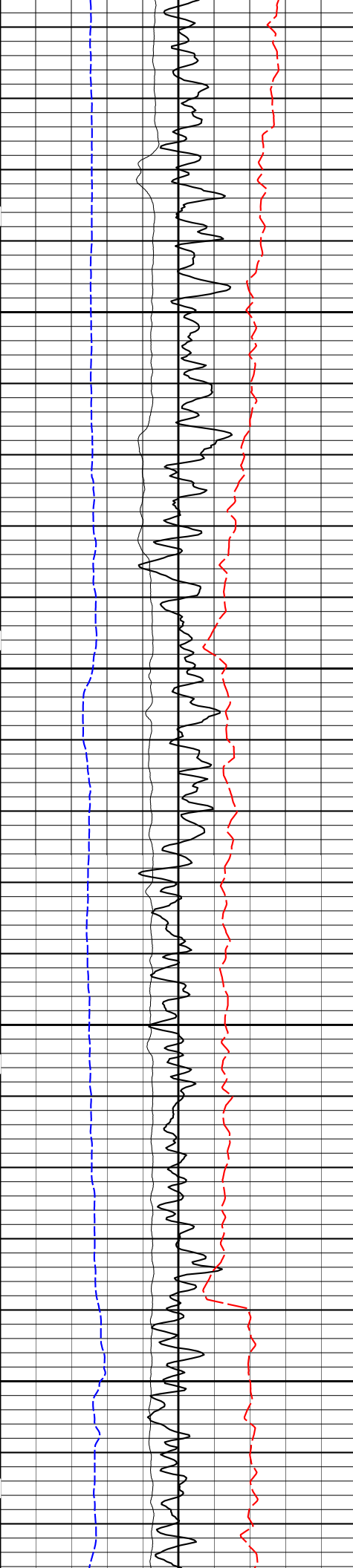




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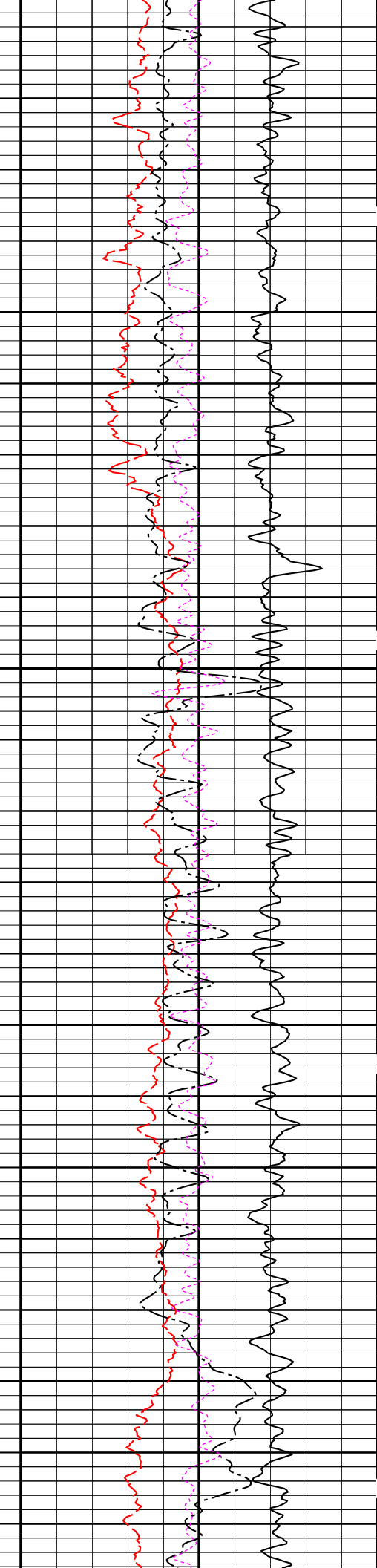
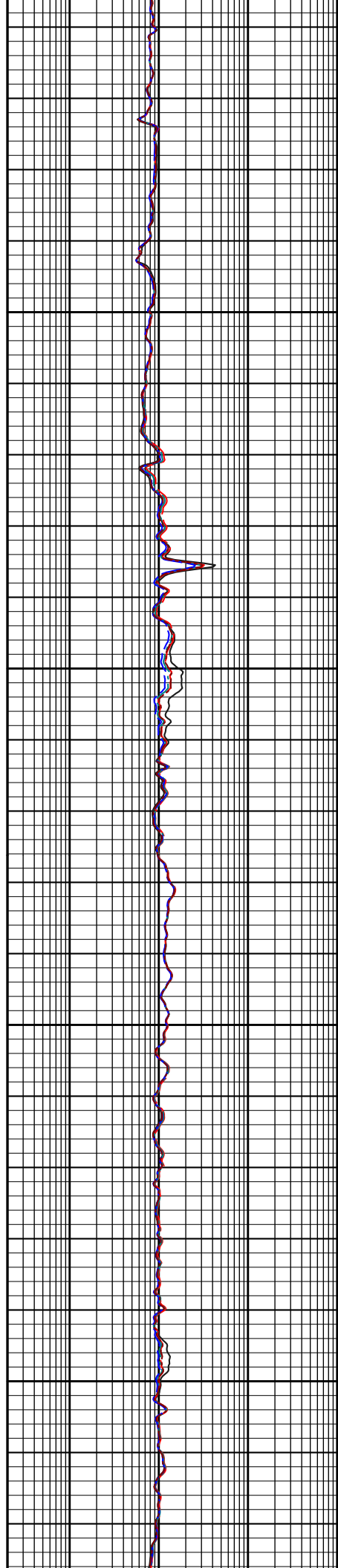
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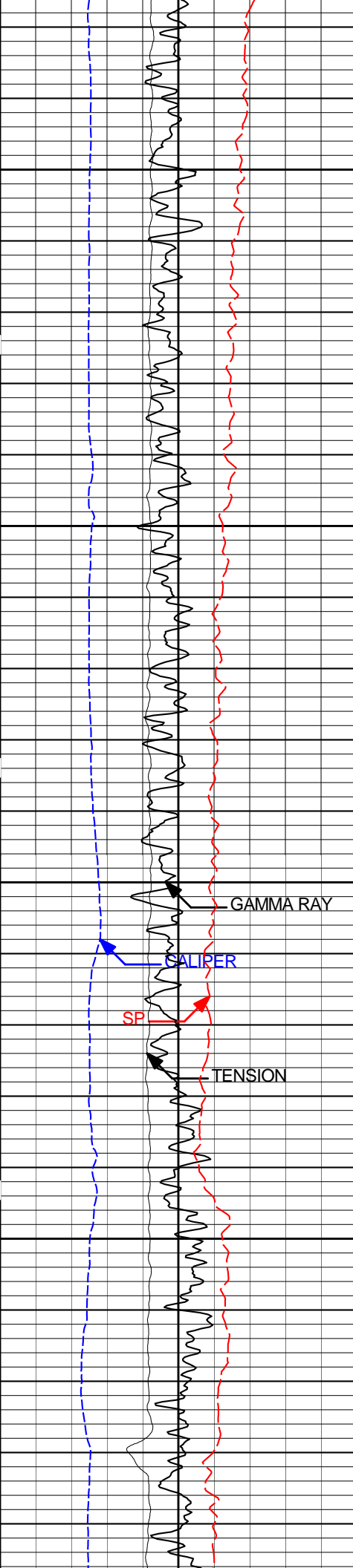




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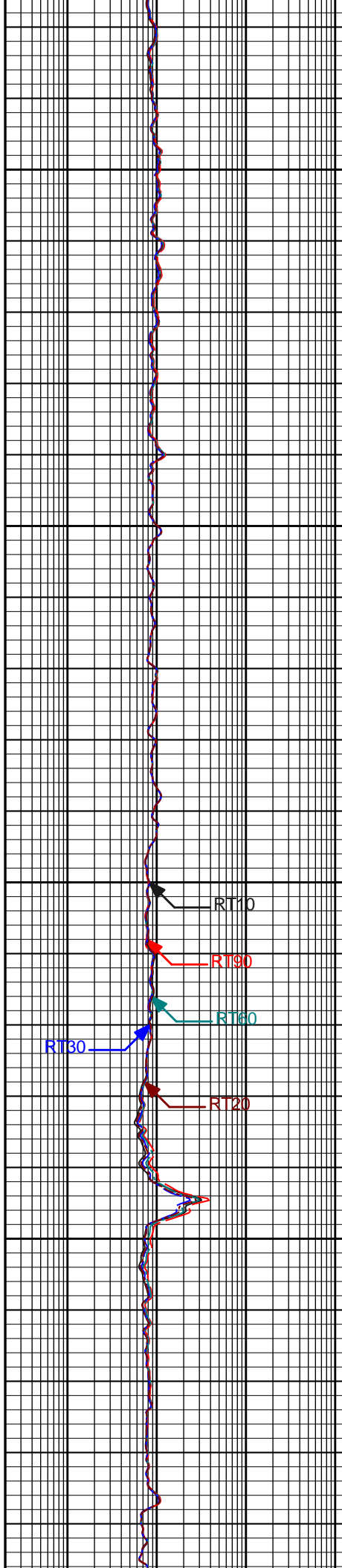




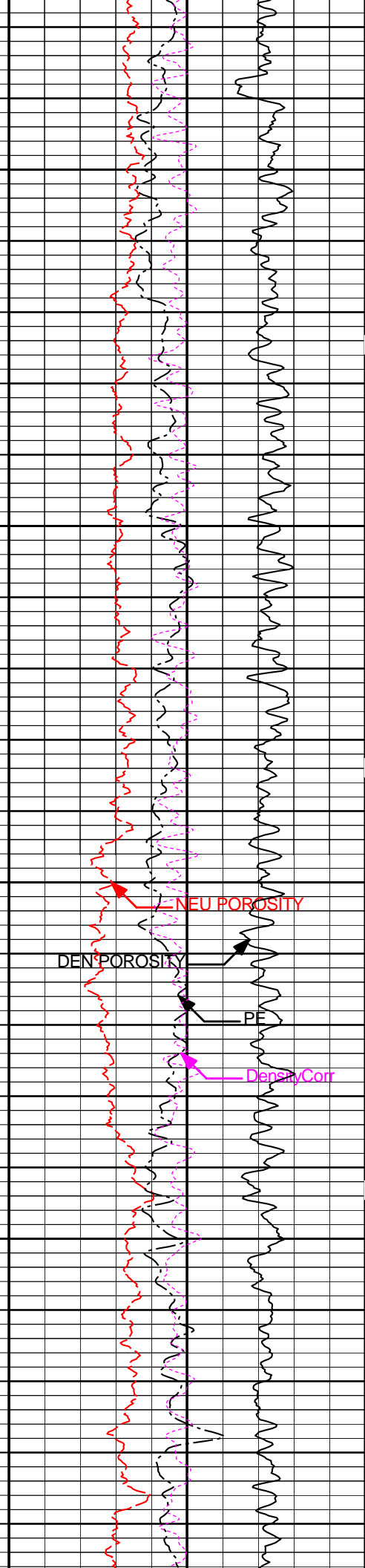
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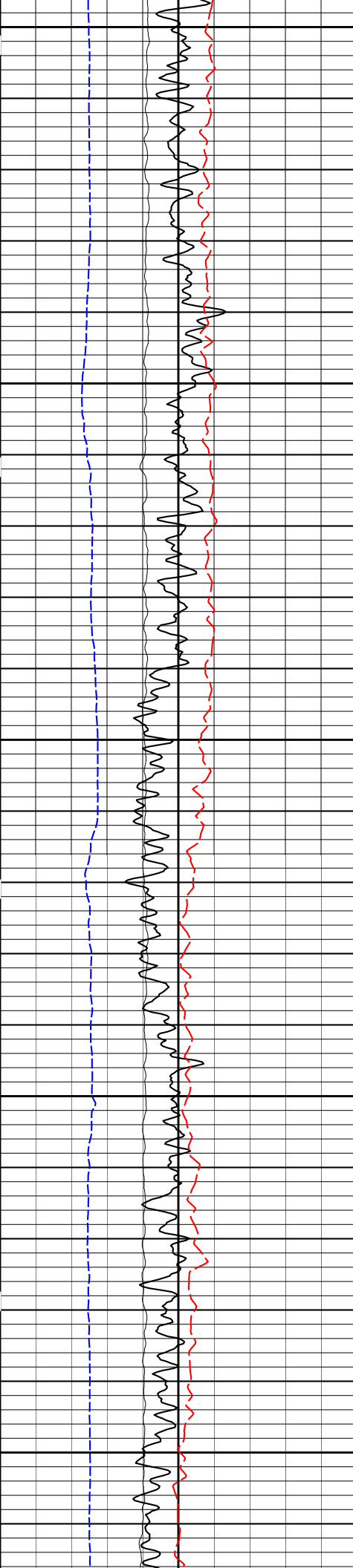
GAMMA RAY
CALIPER
SP
TENSION



RT10
RT90
RT60
RT30
RT20



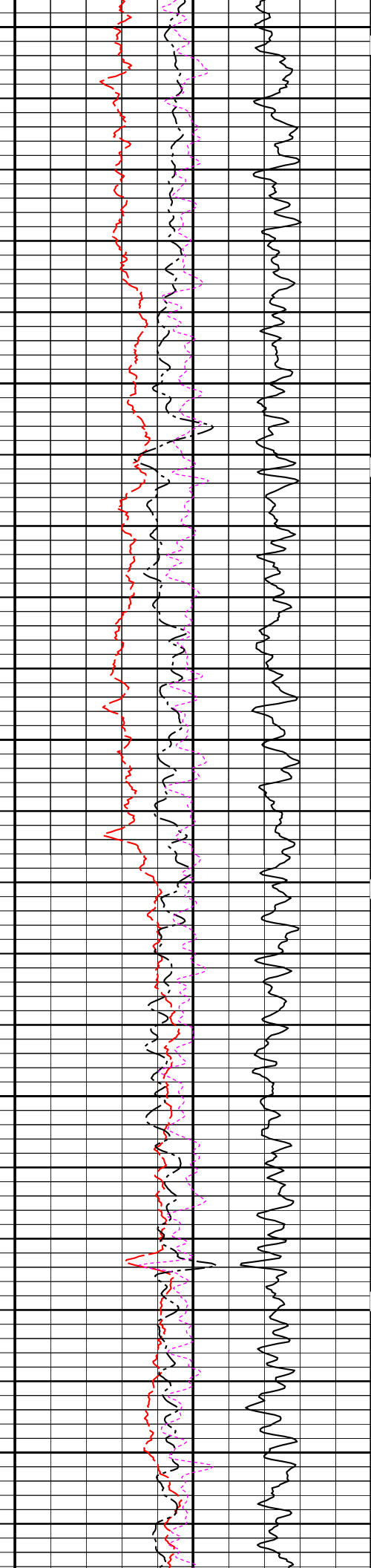
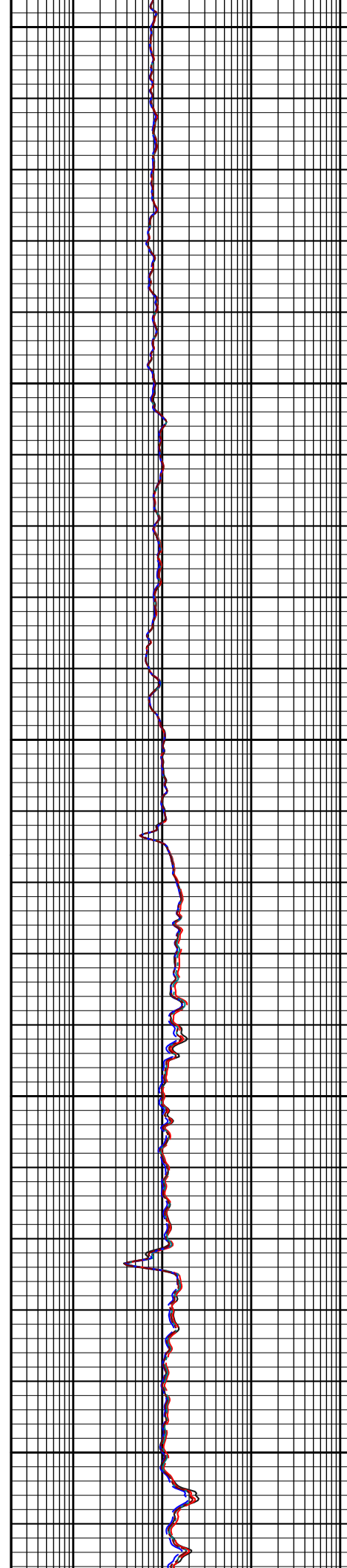
DEN POROSITY
NEU POROSITY
Density Corr

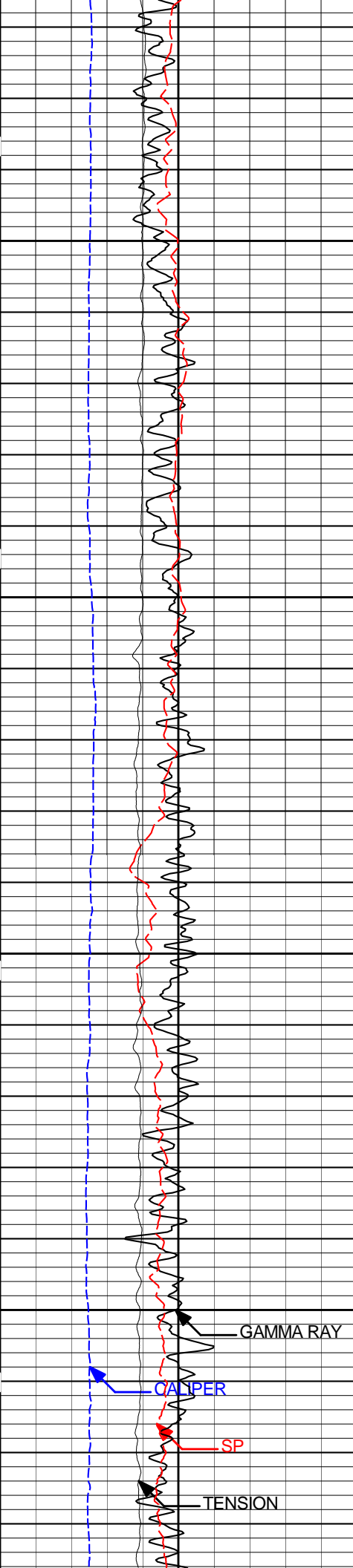


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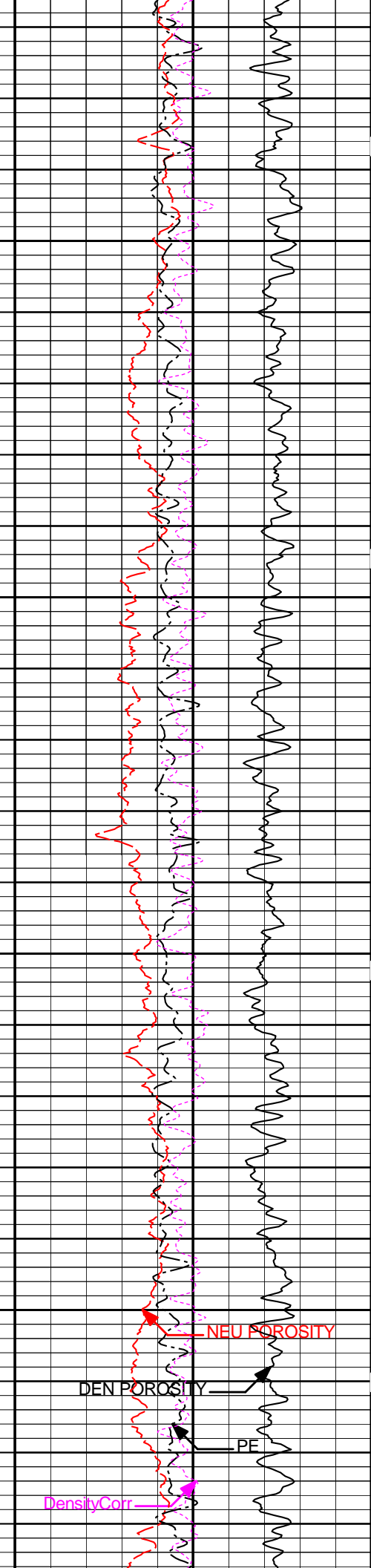
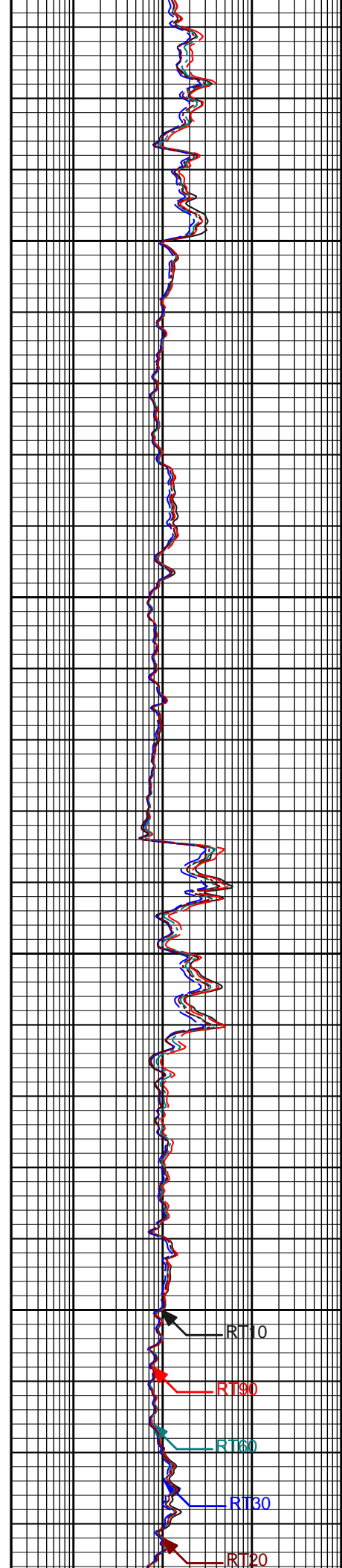
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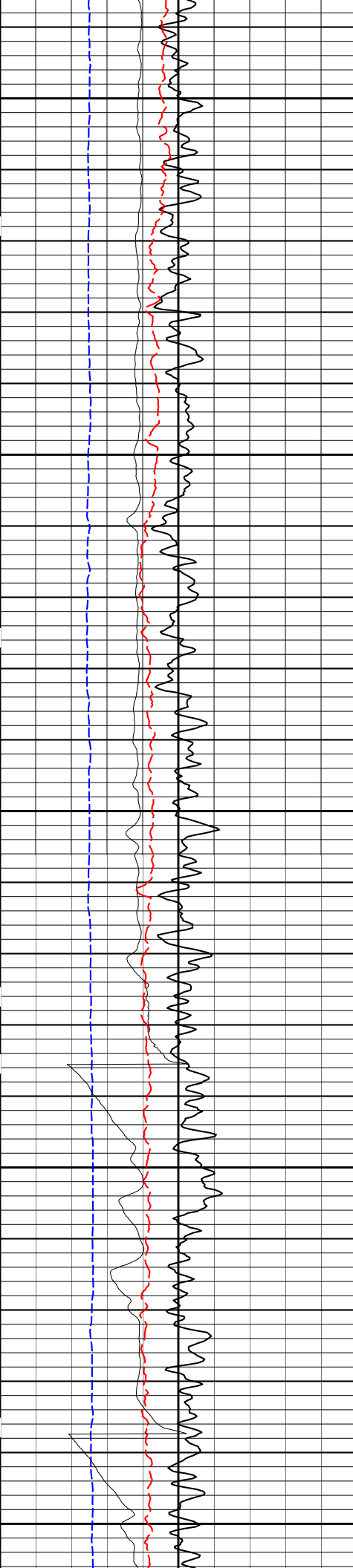




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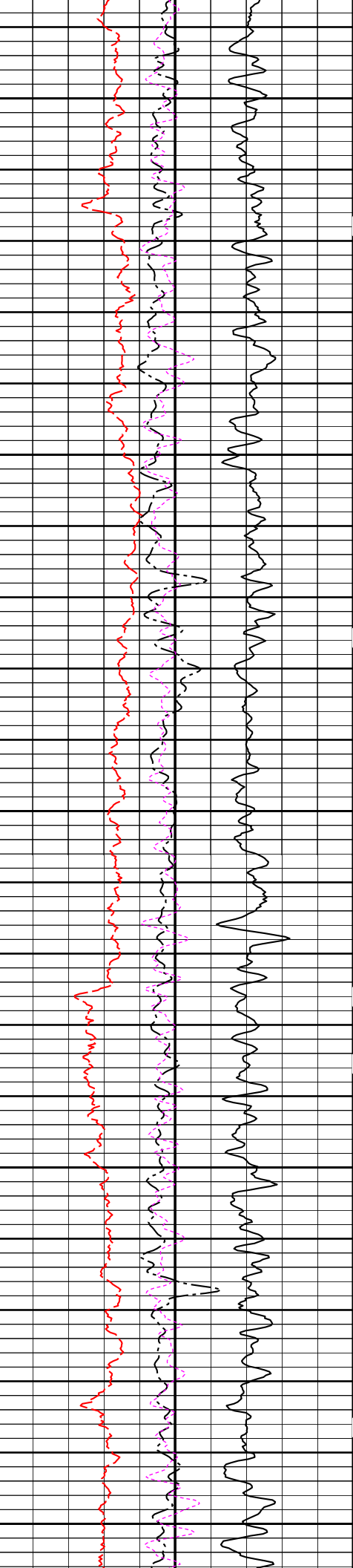
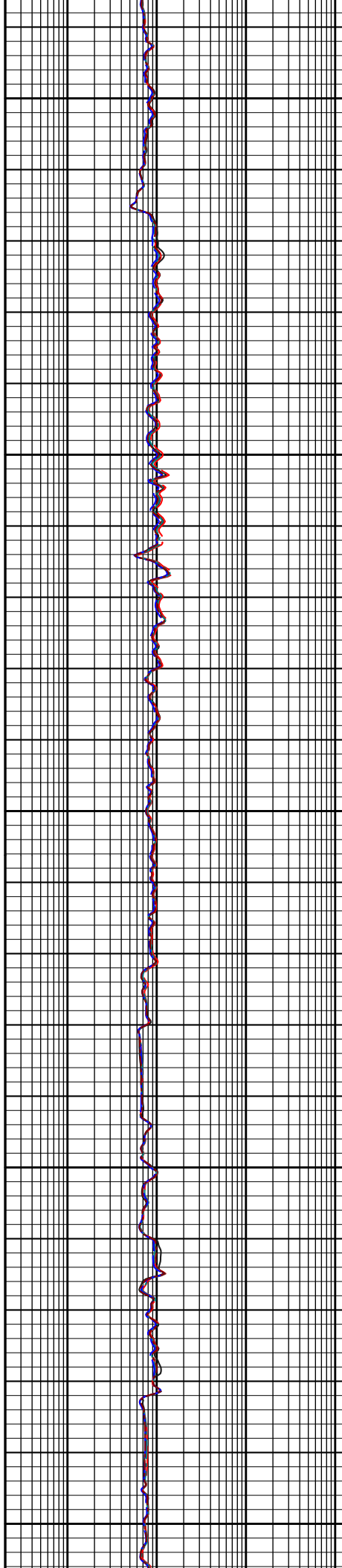
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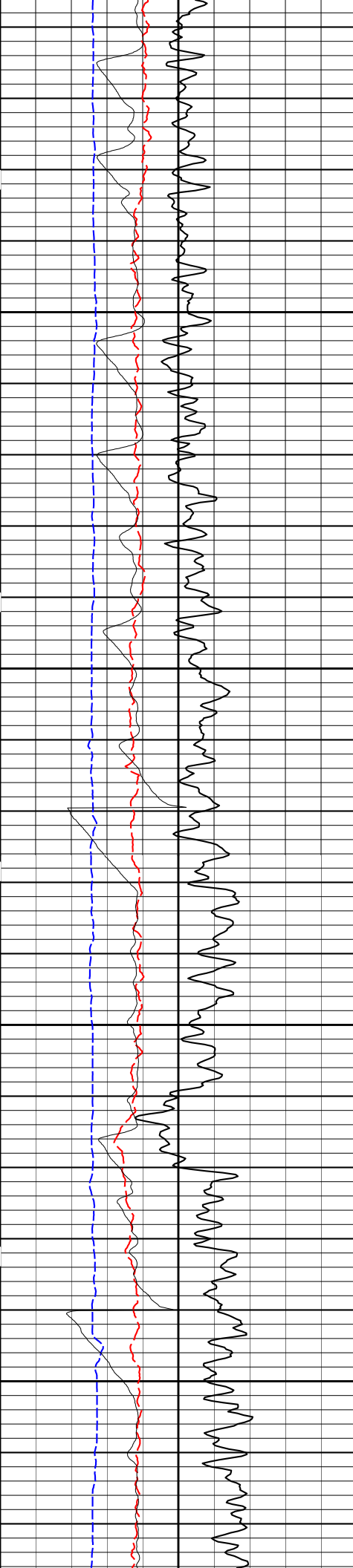




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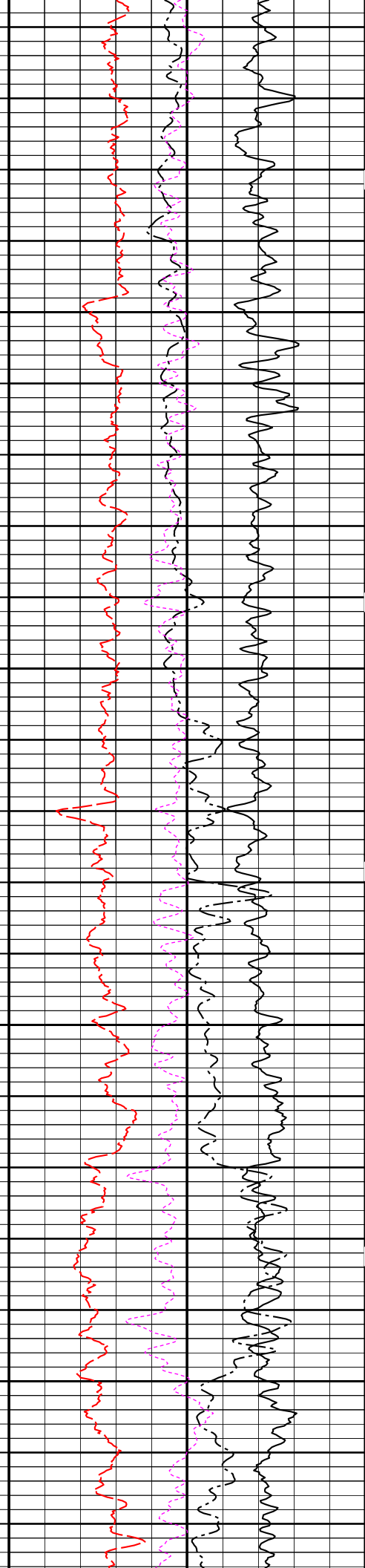
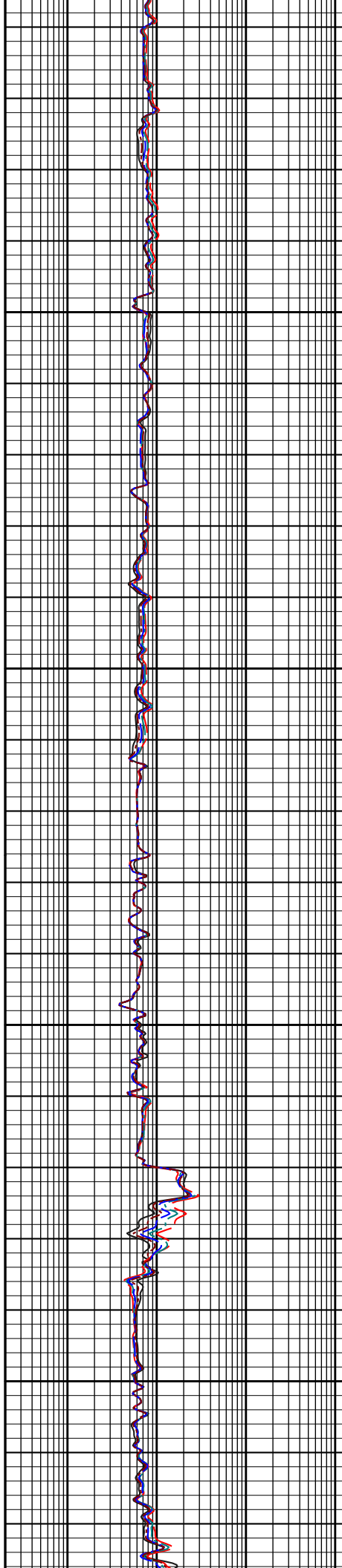
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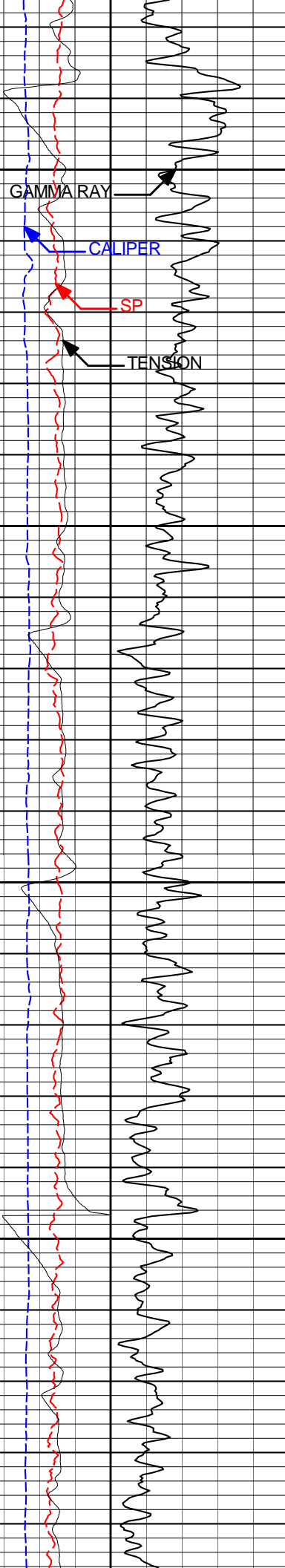




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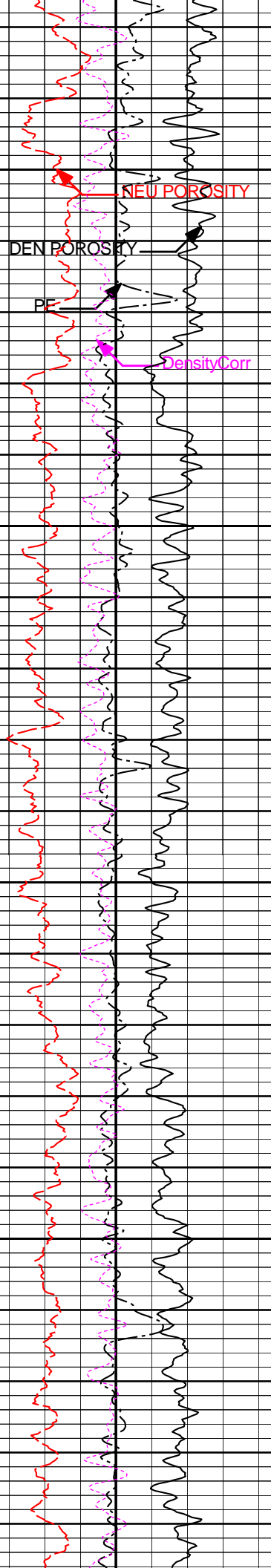
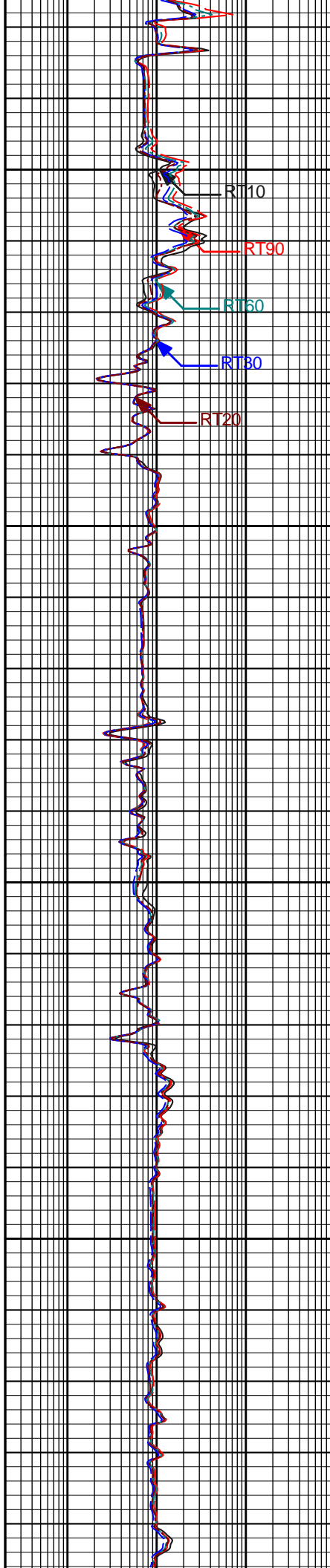
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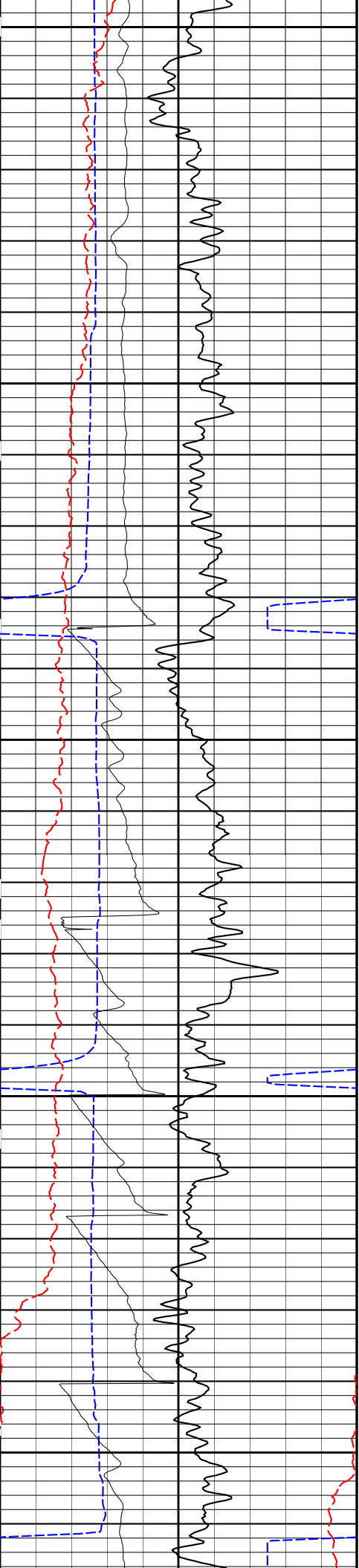




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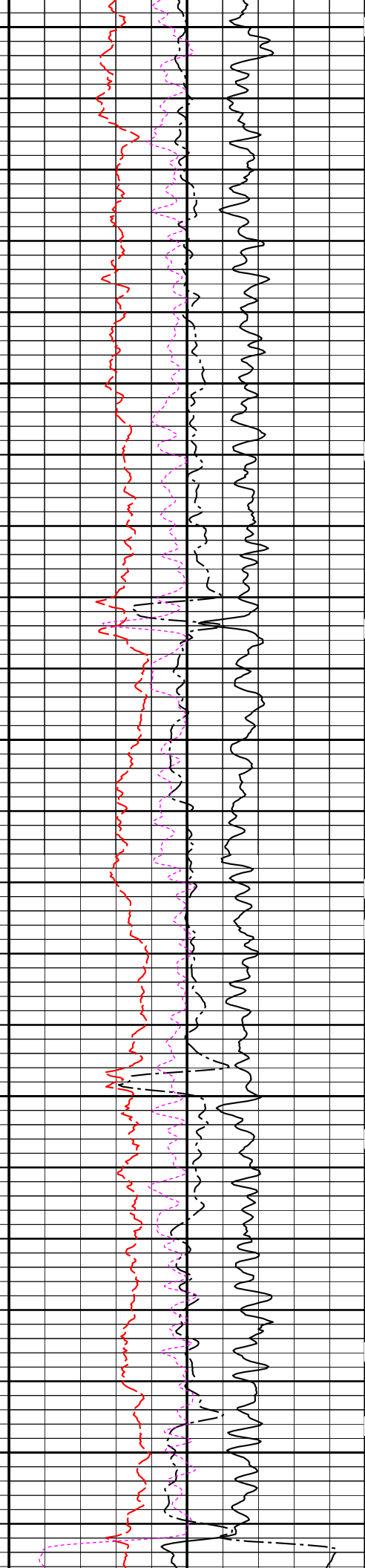
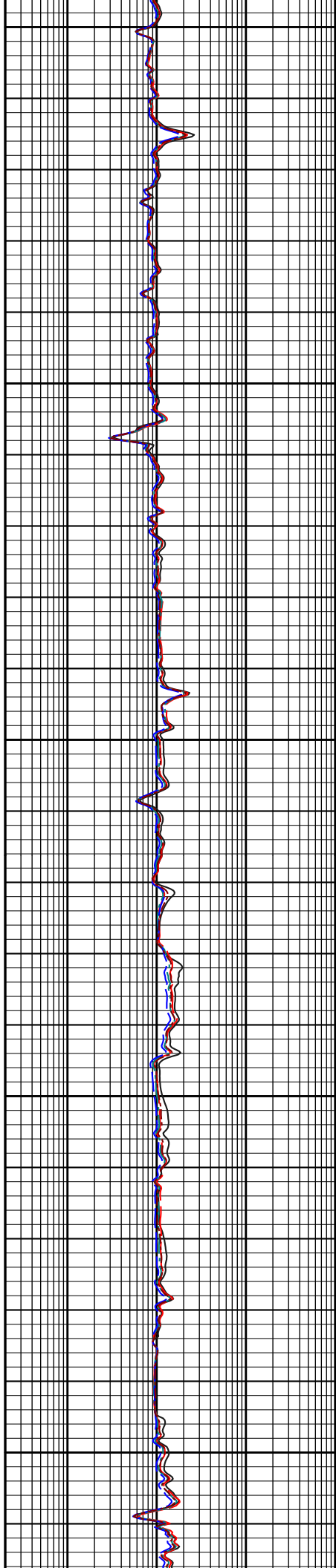


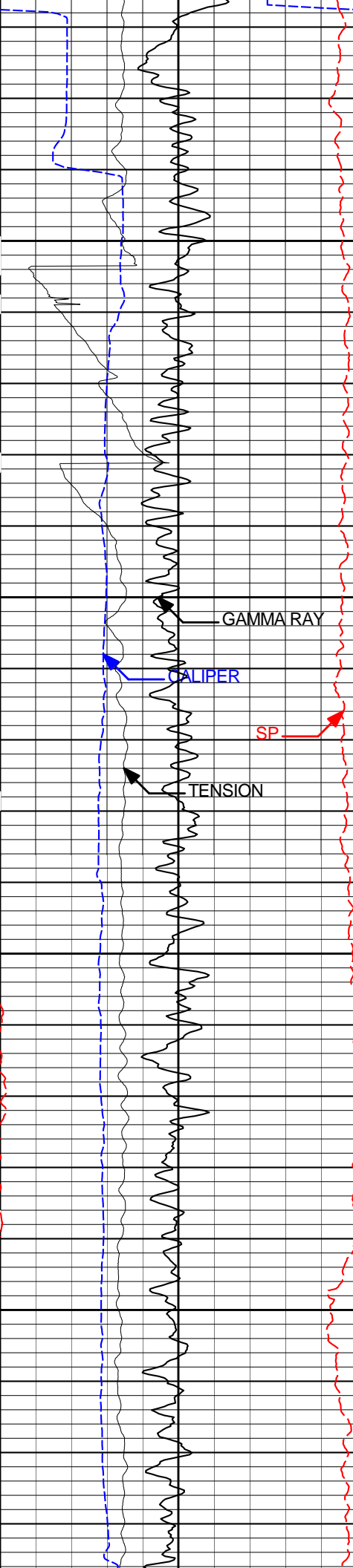


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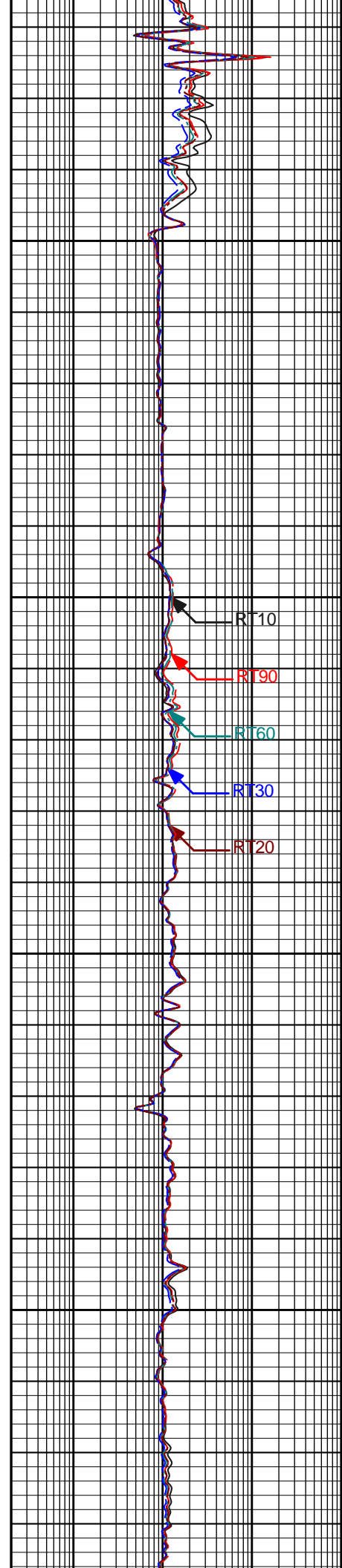
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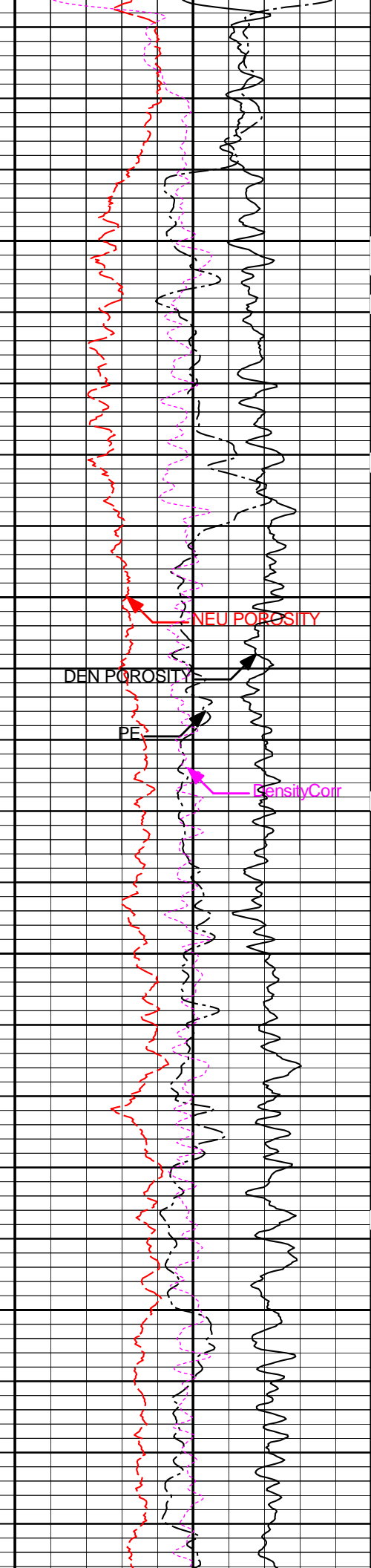


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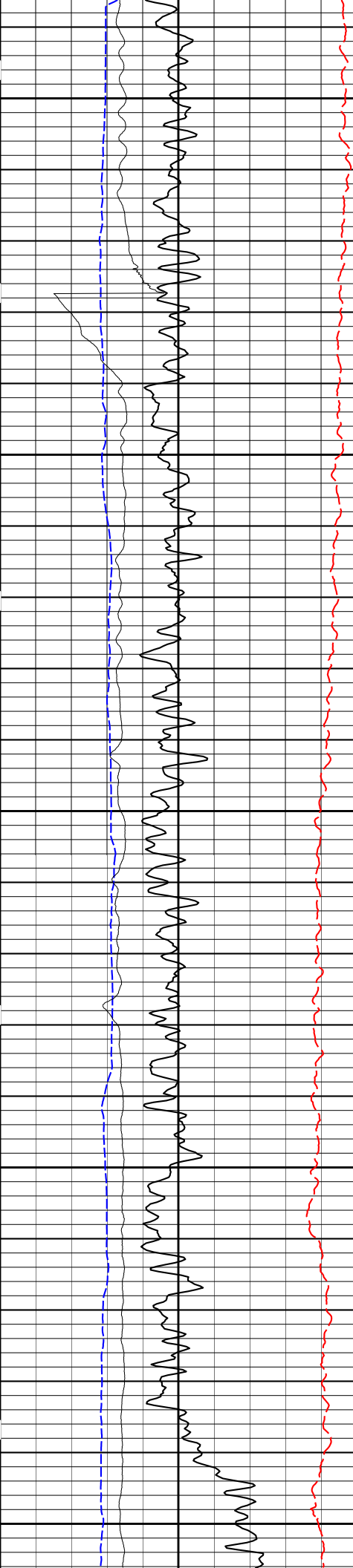
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RT10
RT90
RT60
RT30
RT20

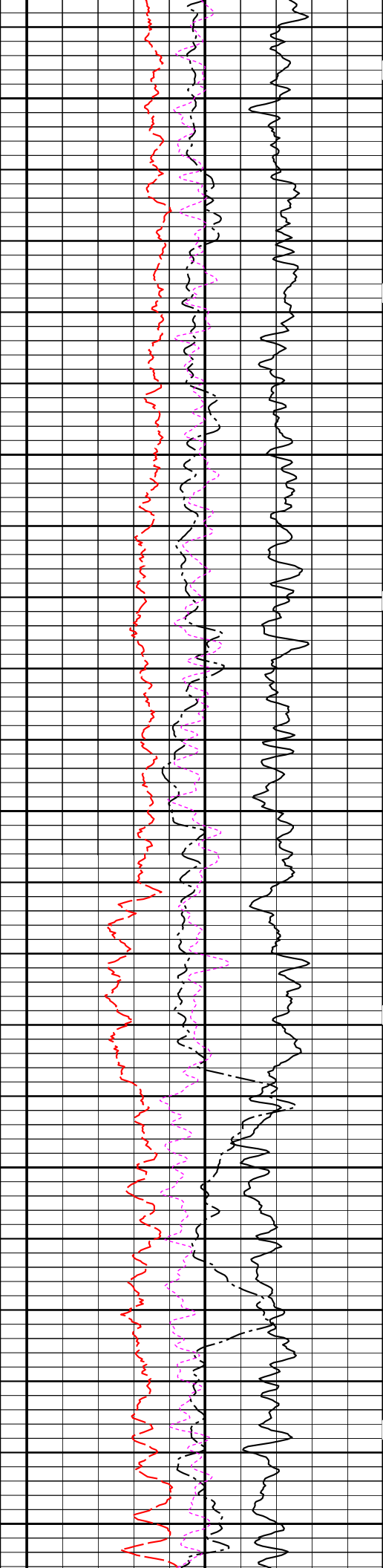
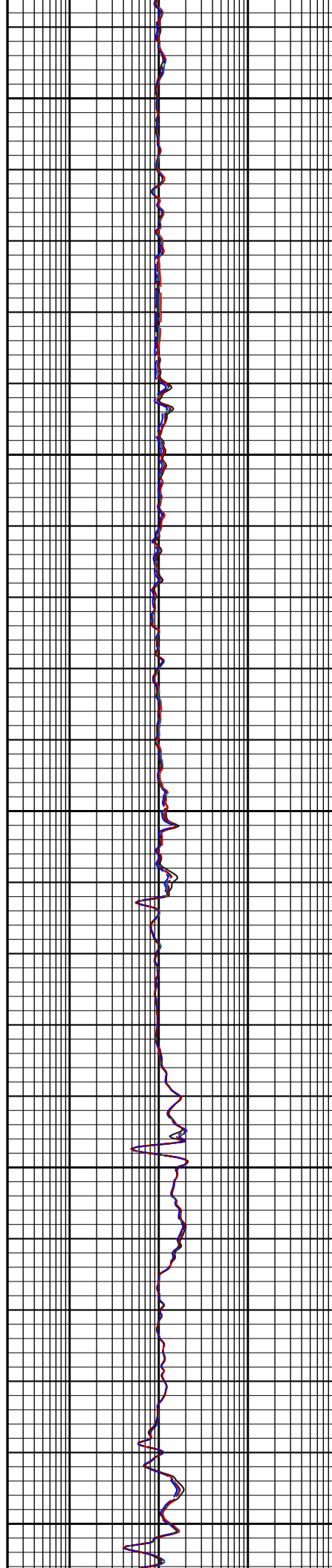


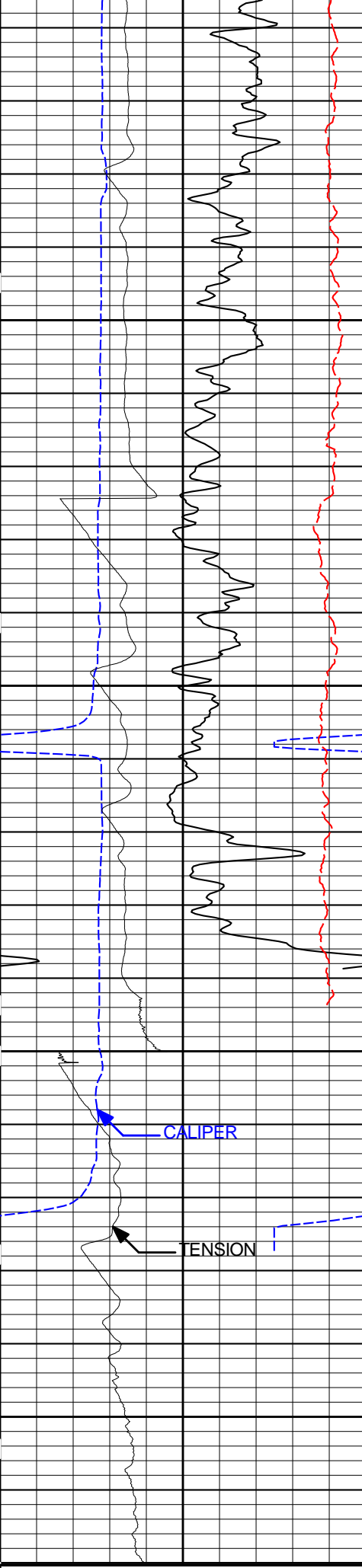
NEU POROSITY
DEN POROSITY
PE
Density Corr



13200

13300





13400

13500

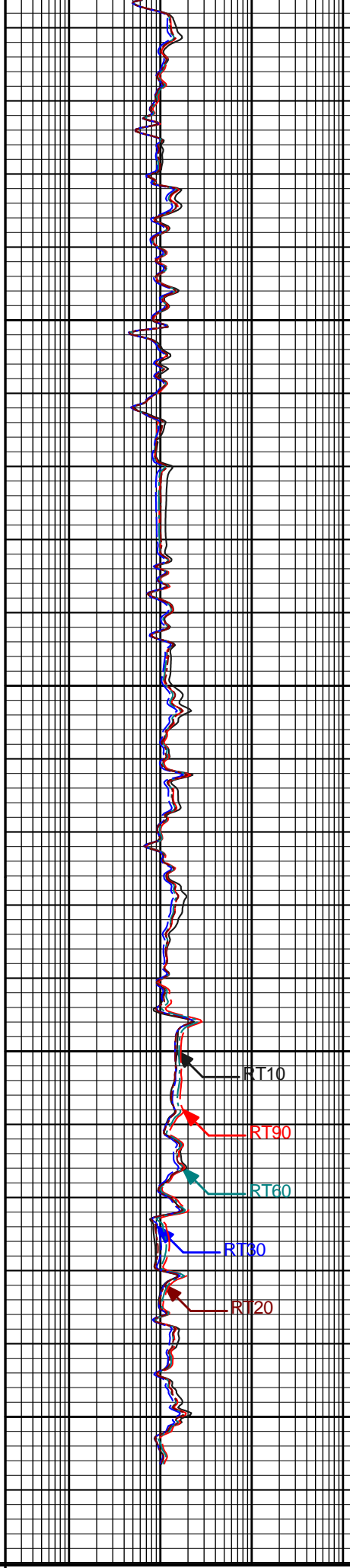
TENSION

CALIPER

TENSION

10000 0

1 : 240



RT10

RT90

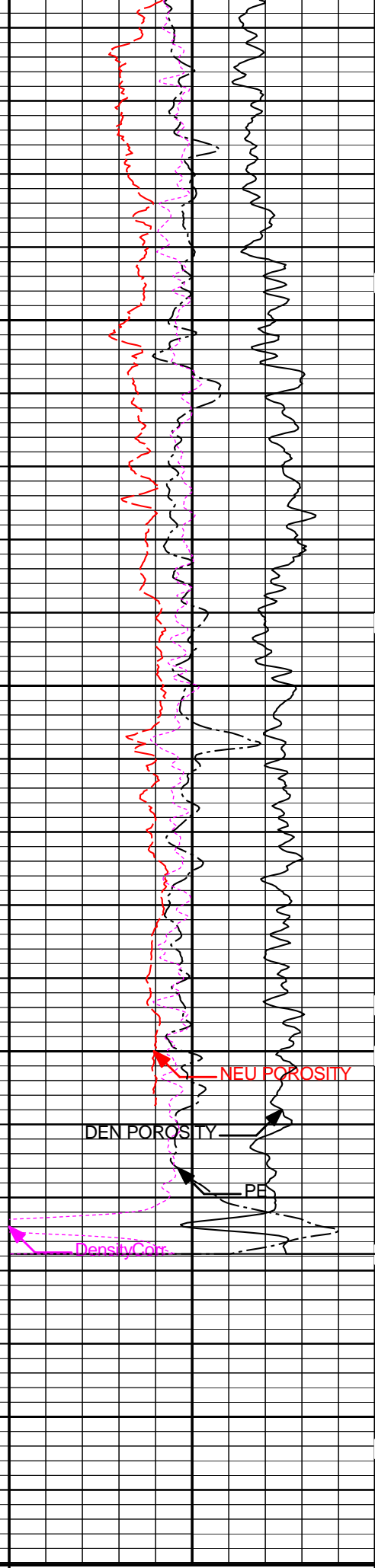
RT60

RT30

RT20

RT10

0.2 2000



NEU POROSITY

DEN POROSITY

PE

DensityCorr

DensityCorr

-0.25 0.25

pounds	FT.	ohm-m	gram per cc
0 SP 100		0.2 RT20 2000 0	PE 10
millivolts		ohm-m	
6 CALIPER 16		0.2 RT30 2000 30	NEU POROSITY -10
inches		ohm-m	sand
0 GAMMA RAY 150		0.2 RT60 2000 30	DEN POROSITY -10
api		ohm-m	2.68 g/cc
		0.2 RT90 2000	
		ohm-m	

HALLIBURTON

Plot Time: 16-Dec-13 17:47:54
 Plot Range: 8938 ft to 13570 ft
 Data: RWF_724_16\Well Based\HOSTILE_MAIN_2\
 Plot File: \HOSTILE_2_COMPWPX_TRIPLE_M

MAIN PASS 5" = 100'

HALLIBURTON

CALIBRATION REPORT

ACCELEROMETER SHOP CALIBRATION

Tool Name: H4TG-A - 11232143 Reference Calibration Date: 10-Dec-13 16:47:49
 Engineer: Z. TAYLOR Calibration Date: 10-Dec-13 16:54:14
 Software Version: WL INSITE R3.8.0 (Build 2) Calibration Version: 1

Horizontal-1 Telemetry	Horizontal-2 Telemetry	Vertical Telemetry	Units
0.03	0.02	1.06	cnts

Coefficient	Coefficient Value	Tolerance
Gain	0.965233	----
Offset	-0.027	----
Noise	0.0009	0.0000 - 0.0030

Orientation	Measured	Tolerance	Calibrated	Tolerance
Horizontal	-0.01	-0.10 - 0.10	0.00	-0.10 - 0.10
Vertical	1.00	0.90 - 1.10	1.00	0.90 - 1.10

HOSTILE DITS 4 TELEMETRY GAMMA SHOP CALIBRATION

Tool Name: H4TG-A - 11232143 Reference Calibration Date: 19-Sep-13 10:47:14
 Engineer: Z. TAYLOR Calibration Date: 10-Dec-13 16:36:09
 Software Version: WL INSITE R3.8.0 (Build 2) Calibration Version: 1

Calibrator Source S/N: TB-750
 Calibrator API Reference: 729.00
 Equivalent Calibrator API Reference: 700.7 api

Measurement	Measured	Calibrated	Units
Background	36.7	36.7	api
Background + Calibrator	738.5	737.3	api

HOSTILE DITS 4 TELEMETRY GAMMA FIELD CALIBRATION

Tool Name: H4TG-A - 11232143

Reference Calibration Date: 10-Dec-13 16:36:09

Engineer: Z. TAYLOR

Calibration Date: 10-Dec-13 16:38:36

Software Version: WL INSITE R3.8.0 (Build 2)

Calibration Version: 1

Calibrator Source S/N: TB-750

Calibrator API Reference:729.00 api

Equivalent Calibrator API Reference:700.7 api

Field Verification	Shop	Field	Units
Background	36.7	37.6	api
Background + Calibrator	737.3	741.7	api
Calibrator	700.7	704.1	api

Shop	Field	Difference	Tolerance
700.7	704.1	-3.4	+/- 9.00

HOSTILE DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: HDSN - 10271001

Reference Calibration Date: 25-Sep-13 14:05:02

Engineer: Z. TAYLOR

Calibration Date: 10-Dec-13 14:49:41

Software Version: WL INSITE R3.8.0 (Build 2)

Calibration Version: 1

Water Tank S/N	105045	Logging Source S/N	08-037
Water Tank Value	52.630	Snow Block S/N	HOSTILE
Calibration Tank Water Temperature	64 degF	Min. Tool Housing Outside Diameter	2.750

CALIBRATION CONSTANTS

Measurement	Previous Value	New Value	Control Limit On New Value
Gain	0.977	0.973	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)

Measurement	Measured	Calibrated	Change	Control Limit On Change
Ratio	6.193	6.165	0.028	+/-0.15
Porosity (decp)	0.07127	0.07071	0.001	+/-0.003

SNOW BLOCK SUMMARY

Measurement	Measured	Calibrated	Change	Control Limit On Change
Ratio	6.870	6.839	0.031	+/- 0.25
Porosity (decp)	0.08416	0.08479	-0.001	----

PASS/FAIL SUMMARY

Background Check	Passed
Gain Range Check	Passed
Snow-Block Ratio Check	Passed
Water Tank Check	Passed

HOSTILE DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name: HDSN - 10271001

Reference Calibration Date: 10-Dec-13 14:49:41

Engineer: Z. TAYLOR

Calibration Date: 10-Dec-13 14:51:08

Software Version: WL INSITE R3.8.0 (Build 2)

Calibration Version: 1

SNOW BLOCK SUMMARY			
Measurement	Shop	Field	Units
Ratio	6.839	6.837	
Porosity	0.08479	0.08413	decp

HDSN Sensitivity: 0.973

HOSTILE DUAL SPACED NEUTRON POST CALIBRATION

Tool Name: HDSN - 10271001	Reference Calibration Date: 10-Dec-13 14:51:08
Engineer: Z. TAYLOR	Calibration Date: 16-Dec-13 17:44:13
Software Version: WL INSITE R3.8.0 (Build 2)	Calibration Version: 1

SNOW BLOCK SUMMARY			
Measurement	Field	Post	Units
Ratio	6.837	6.643	
Porosity	0.08413	0.08023	decp

HDSN Sensitivity: 0.973

HOSTILE DENSITY CALIPER SHOP CALIBRATION

Tool Name: HSDL_M - 10280067	Reference Calibration Date: 26-Oct-13 02:59:06
Engineer: Z. TAYLOR	Calibration Date: 10-Dec-13 14:10:08
Software Version: WL INSITE R3.8.0 (Build 2)	Calibration Version: 1
Host Tool Name: HSDL - 10812414	

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

Tool Diameter: 3.50 in

RING DIAMETER			
Measurement	Current Reading (Previous Coeff.)		Calibrated (New Coeff.)
Small Ring (in)	3.85		4.000
Medium Ring (in)	5.80		6.00
Large Ring (in)	10.82		11.000

Measurement	STANDOFF PAD		BACKUP ARM	
	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)
PAD ONLY:				
Small Ring (in)	0.39	0.50		
Medium Ring (in)	2.42	2.50		
PAD & ARM:				
Small Ring (in)	-0.29	-0.18	0.64	0.68
Medium Ring (in)	-0.16	-0.04	2.46	2.54
Large Ring (in)	0.08	0.19	7.25	7.31

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check: Passed

HOSTILE SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: HSDL_M Pad - 10815425

Reference Calibration Date: 10-Dec-13 10:54:20

Engineer: Z. TAYLOR

Calibration Date: 10-Dec-13 11:41:46

Software Version: WL INSITE R3.8.0 (Build 2)

Calibration Version: 1

Logging Source S/N: 5257GW

Aluminum Block S/N: 63069

Density: 2.588 g/cc

Pe: 3.160

Magnesium Block S/N: 63376

Density: 1.685 g/cc

Pe: 2.594

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	0.9798	0.889	0.850 - 1.150
Near Dens Gain	1.0423	1.031	0.850 - 1.150
Near Peak Gain	1.0056	1.011	0.850 - 1.150
Near Lith Gain	0.9201	0.908	0.850 - 1.150
Far Bar Gain	0.9926	0.992	0.850 - 1.150
Far Dens Gain	1.0051	1.006	0.850 - 1.150
<hr/>			
Near Bar Offset	-0.1906	0.596	NONE
Near Dens Offset	-0.6730	-0.559	NONE
Near Peak Offset	-0.3530	-0.394	NONE
Near Lith Offset	0.3883	0.481	NONE
Far Bar Offset	-0.1303	-0.127	NONE
Far Dens Offset	-0.1563	-0.165	NONE
<hr/>			
Near Bar Background	593.63	594.59	385 - 850
Near Dens Background	628.54	630.17	415 - 915
Near Peak Background	130.39	129.50	90 - 200
Near Lith Background	149.47	149.20	100 - 220
Far Bar Background	292.91	292.56	205 - 450
Far Dens Background	356.60	358.89	250 - 550
Far Peak Background	73.91	72.81	55 - 120
Far Lith Background	76.60	75.59	55 - 120

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.697	1.683	0.013	+/- 0.015
Pe	2.449	2.564	-0.115	+/- 0.150
ALUMINUM				
Density (g/cc)	2.586	2.587	-0.001	+/- 0.015
Pe	3.078	3.147	-0.069	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limit	Value	Control Limit
QUALITY				
Background	-0.0032	+/- 0.010	0.0018	+/- 0.021
Magnesium Block	-0.0005	+/- 0.016	0.0010	+/- 0.021
Aluminum Block	0.0013	+/- 0.012	0.0023	+/- 0.015
<hr/>				
Resolution	8.56	6.00 - 11.50	8.88	6.00 - 11.50

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

HOSTILE SPECTRAL DENSITY FIELD CALIBRATION

Tool Name:	HSDL_M Pad - 10815425	Reference Calibration Date:	10-Dec-13 11:41:46
Engineer:	Z. TAYLOR	Calibration Date:	10-Dec-13 14:16:35
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

Logging Source S/N: 5257GW

PASS/FAIL SUMMARY

Background Check:	Passed
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HOSTILE SPECTRAL DENSITY POST CALIBRATION

Tool Name:	HSDL_M Pad - 10815425	Reference Calibration Date:	10-Dec-13 14:16:35
Engineer:	Z. TAYLOR	Calibration Date:	16-Dec-13 17:36:42
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

Logging Source S/N: 5257GW

PASS/FAIL SUMMARY

Background Check:	Passed
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HOSTILE DENSITY CALIPER FIELD CALIBRATION

Tool Name:	HSDL_M - 10280067	Reference Calibration Date:	10-Dec-13 14:10:08
Engineer:	Z. TAYLOR	Calibration Date:	10-Dec-13 14:12:30
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	2.50	2.52	0.02	+/- 0.25
Ring Diameter	6.00	6.00	-0.00	+/- 0.25

PASS/FAIL SUMMARY

Pad Extension Check:	Passed
Diameter Check:	Passed

HOSTILE ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	HACRT Sonde - 11005910	Reference Calibration Date:	22-Oct-13 16:22:29
Engineer:	P. DIMPFL	Calibration Date:	22-Oct-13 16:32:57
Software Version:	WL INSITE R3.6.0 (Build 3)	Calibration Version:	1
Host Tool Name:	HACRT Instrument - 10996985		

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	1.03	1.05	0.95	1.02	1.05	0.95	1.02	1.05
A4 (17")	0.95	1.02	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.02	1.05	0.95	1.02	1.05
A6 (6")	N/A	N/A	N/A	0.95	1.02	1.05	0.95	1.02	1.05

TYPICAL SONDE OFFSET RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-20	-14.27	20	-10	-6.19	5	-10	-5.72	5
A2 (50")	-15	-11.53	10	-10	-5.15	5	-10	-4.92	5
A3 (29")	-50	-20.28	0	-15	-9.53	5	-12	-7.18	0
A4 (17")	-180	-140.98	-60	-60	-41.50	0	-50	-29.01	0
A5 (10")	N/A	N/A	N/A	-300	-240.22	-100	-150	-114.35	-50
A6 (6")	N/A	N/A	N/A	-100	58.05	300	-75	7.70	75

TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper
12K	1.2	1.49	1.8
36K	1.5	1.82	2.1
72K	1.6	1.90	2.2

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 RANGE CHK	PASS
Tx CURRENT GAIN	PASS
Rmud VERIFICATION	PASS

TOOL OK TO LOG

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
H4TG-A-11232143						
AccZ Horizontal	-0.00	-----	-----	0.00	-----	g
AccZ Vertical	1.00	-----	-----	0	-----	g
Gamma Ray Calibrator	700.7	704.1	-----	-3.4	+/- 9.00	api
HDSN-10271001						
Snow Block Ratio	6.839	6.837	6.643	0.194	+/- 0.50	-----
Snow Block Porosity	0.08479	0.08413	0.08023	0.00390	+/- 0.009	decp
HSDL_M-10280067						
Pad Extension	2.50	2.52	-----	-0.02	+/-0.25	in
Ring Diameter	6.00	6.00	-----	0.00	+/-0.25	in
HSDL_M Pad-10815425						
Near(B+D+P+L)	1498.354	1495.957	1509.955	-13.998	+/-15.598	cps
Far(B+D+P+L)	798.435	801.012	806.569	-5.557	+/-15.656	cps
HACRT Sonde-11005910						
Mud Cell	1.00	-----	-----	0.00	-----	ohm-m

CUSTOMER EVENT LOG

Event Type	Time & Date	Depth (ft)	Event Description
	16-Dec-13 11:34:47	9257.25	Logging 001 16-Dec-13 11:34 Up @9257.3f
	16-Dec-13 11:44:36	8899.89	Halting 001 16-Dec-13 11:34 Up @9257.3f
	16-Dec-13 11:45:33	8791.75	Logging 002 16-Dec-13 11:45 Dn @8791.8f
	16-Dec-13 13:39:01	13541.60	Halting 002 16-Dec-13 11:45 Dn @8791.8f
	16-Dec-13 13:41:36	13557.75	Logging 003 16-Dec-13 13:41 Up 13557.8f
	16-Dec-13 15:17:26	8837.30	Halting 003 16-Dec-13 13:41 Up 13557.8f

Data: RWF_724_16\0004 HOSTILE_TRIPLELAB Date: 16-Dec-13 15:19:56

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-11830872 135.00 lbs		Ø 3.625 in →		← Load Cell @ 94.69 ft ← BH Temperature @ 94.13 ft	6.25 ft	98.38 ft
XODH-00000001 20.00 lbs		Ø 2.750 in ↙ Ø 3.625 in →		0.88 ft	92.13 ft	
					91.25 ft	
H4TG-A-11232143 221.00 lbs		Ø 2.750 in →		13.77 ft		
				← GammaRay @ 80.51 ft		77.48 ft
HSSP-A-11107776 82.00 lbs		Ø 2.750 in →		3.85 ft	← SP @ 75.57 ft	
HGNI-10584728 95.00 lbs		Ø 2.750 in →	7.67 ft			65.96 ft

HDSN-10271001
86.00 lbs

Ø 2.750 in →

← HDSN Far @ 62.27 ft
← HDSN Near @ 61.77 ft

6.27 ft

59.69 ft

HSDL-10812414
120.00 lbs

Ø 2.750 in →

9.25 ft

50.44 ft

HSDL_M-10280067
310.00 lbs

Ø 3.500 in →

13.37 ft

HSDL_M Pad-10815425
65.00 lbs

Ø 4.750 in* →

← SDL Arm Caliper @ 41.57 ft
← SDL @ 40.88 ft
← SDL Pad Caliper @ 40.82 ft

37.07 ft

HHFS-00000001
90.00 lbs

Ø 3.125 in →

6.84 ft

30.23 ft

HACRT Instrument-
10996985
50.00 lbs

Ø 2.790 in →

10.85 ft

Hostile Metal Standoff-
00000001
8.80 lbs

Ø 3.125 in →

Ø 3.750 in* →

19.38 ft

← Mud Resistivity @ 13.84 ft

HACRT Sonde-
11005910
370.00 lbs

Ø 3.125 in →

← ACRt @ 10.24 ft

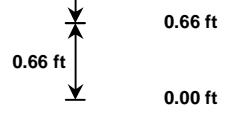
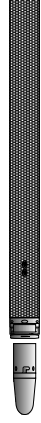
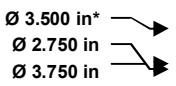
18.72 ft



370.00 lbs

HACRt Sleeve Protector-
11005910
1.00 lbs

Hostile Bull Nose-
00000001
5.00 lbs



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	11830872	135.00	6.25	92.13	300.00
XODH	Dits to Hostile Cross Over	00000001	20.00	0.88	91.25	300.00
H4TG	Hostile Quad Telemetry Gamma Sub	11232143	221.00	13.77	77.48	60.00
HSSP	Hostile SP Sub	11107776	82.00	3.85	73.63	300.00
HGNI_A	Hostile Gamma Neutron Instrument	10584728	95.00	7.67	65.96	300.00
HDSN-A	Hostile Dual Spaced Neutron	10271001	86.00	6.27	59.69	45.00
HSDL_A	Hostile Spectral Density Instrument	10812414	120.00	9.25	50.44	300.00
HSDL_M	Hostile Spectral Density Mandrel	10280067	310.00	13.37	37.07	45.00
SDLP	Hostile Density Extendable Pad	10815425	65.00	2.55 *	39.88	60.00
HHFS	High Temp High Press Flex Sub	00000001	90.00	6.84	30.23	300.00
HACRT	Array Compensated True Resistivity Instrument Section 20K	10996985	50.00	10.85	19.38	100.00
HACRT_S	Array Compensated True Resistivity Sonde Section	11005910	370.00	18.72	0.66	100.00
HSP	HACRt sleeve protector	11005910	1.00	0.15 *	0.66	300.00
HMSO	Hostile Tool Metal Standoff	00000001	8.80	0.66 *	18.12	300.00
BLNS	Bull Nose	00000001	5.00	0.66	0.00	300.00
Total			1,658.80	98.38		

* Not included in Total Length and Length Accumulation.

Data: RWF_724_16\0004 HOSTILE_TRIPLE\003 16-Dec-13 13:41 Up 13557.8f

Date: 16-Dec-13 14:40:32

COMPANY	WPX ENERGY ROCKY MOUNTAIN LLC		
WELL	LANGSTAFF RWF 724-16		
FIELD	RULISON		
COUNTY	GARFIELD	STATE	CO
HALLIBURTON		SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TRUE RESISTIVITY	