



# DUAL INDUCTION LOG

Company AMERICAN WARRIOR, INC.  
 Well HUBIN #2-10B  
 Field LIPPOLDT WEST  
 County HODGMAN  
 State KANSAS

Company AMERICAN WARRIOR, INC.  
 Well HUBIN #2-10B  
 Field LIPPOLDT WEST  
 County HODGMAN State KANSAS

Location: API #: 15-083-21954-00-00  
 455' FSL & 2220' FWL  
 SEC 10 TWP 23S RGE 23W  
 Permanent Datum GROUND LEVEL Elevation 2318'  
 Log Measured From KELLY BUSHING  
 Drilling Measured From KELLY BUSHING  
 Other Services  
 CNL/CDL  
 MEL  
 Elevation  
 K.B. 2329'  
 D.F. N/A  
 G.L. 2318'

Date	8/11/2018
Run Number	ONE
Depth Driller	4650'
Depth Logger	4650'
Bottom Logged Interval	4649'
Top Log Interval	250'
Casing Driller	8.625" @ 265'
Casing Logger	265'
Bit Size	7.875"
Type Fluid in Hole	CHEMICAL
Salinity, ppm CL	4600'
Density / Viscosity	9.35 48
pH / Fluid Loss	10.5 9.2
Source of Sample	FLOWLINE
Rm @ Meas. Temp	.65 @ 65
Rmt @ Meas. Temp	.49 @ 65
Rmc @ Meas. Temp	.88 @ 65
Source of Rmf / Rmc	CHARTS
Rm @ BHT	.38 @ 111
Operating Rig Time	3 HOURS
Max Rec. Temp. F	111 DEGF
Equipment Number	108
Location	HAYS
Recorded By	IAN MABB
Witnessed By	KEVIN TIMSON

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and Pioneer Wireline Services, LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Pioneer Wireline Services, LLC will not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees.

Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

JETMORE, KS.  
 SOUTH SIDE 283 & L RD EAST .7 MILES,  
 TO RD 219, SOUTH 1 MILE TO RD K, EAST 2.2 MILE NORTH INTO

Log Measured From: KELLY BUSHING 11 Ft. Above Permanent Datum

THANK YOU FOR USING PIONEER ENERGY SERVICES  
[www.pioneerenergy.com](http://www.pioneerenergy.com) 785-625-3858

Your Pioneer Energy Services Crew Engineer: IAN MABB Operator: Operator: Operator:	This Log Record Was Witnessed By Primary Witness: KEVIN TIMSON Secondary Witness: Secondary Witness: Secondary Witness:
------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\American\_warrior\_hubin\_2\_10.db  
 Dataset field/well/stackmel/pass3.1/\_vars\_

## Top - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	110	5.5	0	1	2	2.71
NPORSEL	PERFS	SNDERR mmho/m	SNDERRM mmho/m	SPSHIFT mV	SRFTEMP degF	SZCOR	TDEPTH ft
Limestone	0	30	-4	-274	0	Off	4650

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58		GR-M&W (89-M&W)	3.00	3.50	50.00
CNLSC CNSSC	37.48 36.73		CNT-M&W (tk10-MW)	5.50	3.50	100.00
LSD DCAL SSD	28.43 28.42 27.93		CDL-M&W (168-130)	8.50	4.00	250.00
MCAL MI MN	19.83 19.83 19.83		ML-PSI STKBL ML (PSI-01) Stackable Microlog Tools	7.58	4.00	65.00
RLL3 RLL3F	15.80 15.79					
CILD	8.00		DIL-M&W (1987)	18.50	3.50	220.00

CILM 4.70

SP 0.20

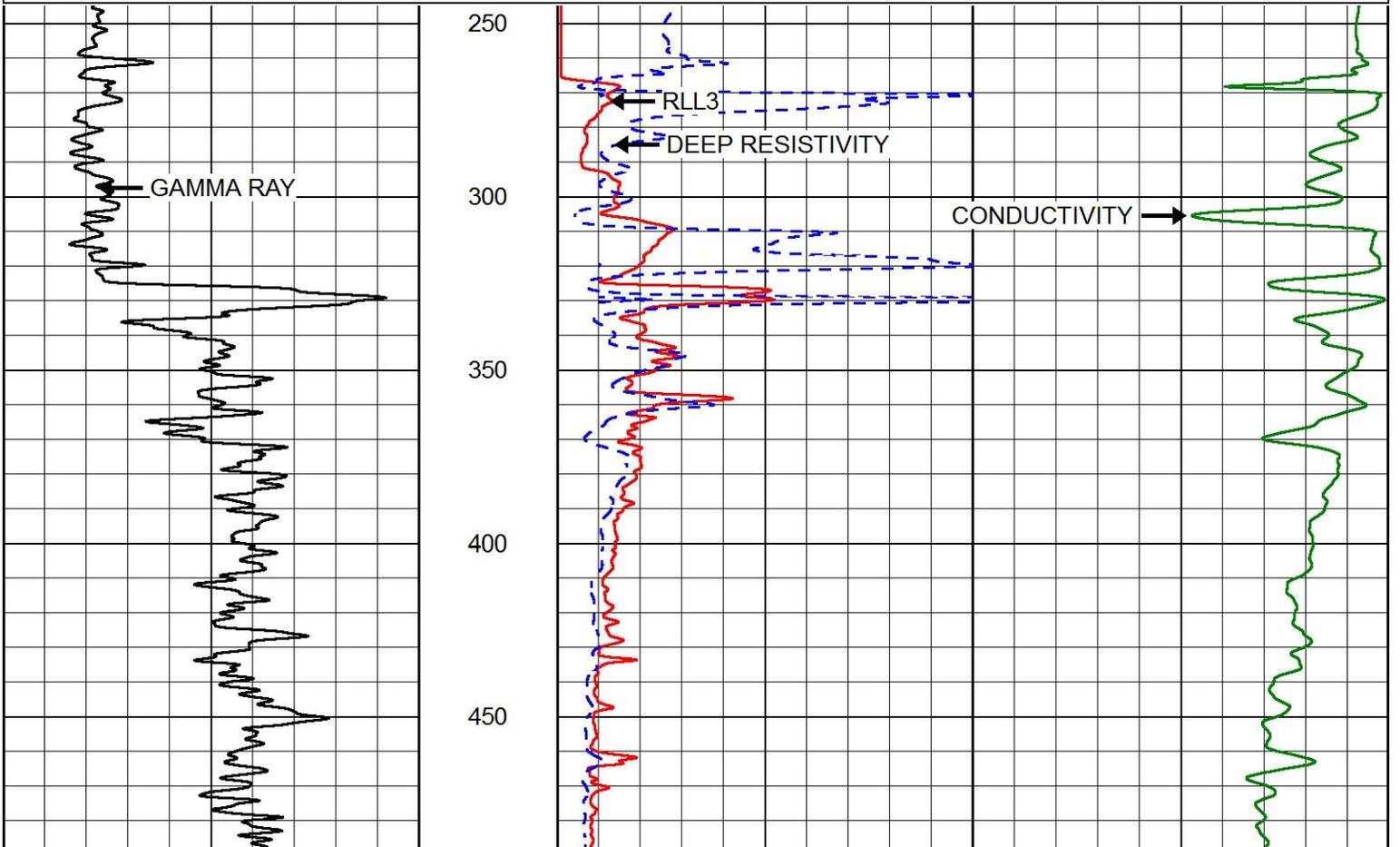
Dataset: american\_warrior\_hubin\_2\_10.db: field/well/stackmel/pass3.1  
 Total length: 43.08 ft  
 Total weight: 685.00 lb  
 O.D.: 4.00 in

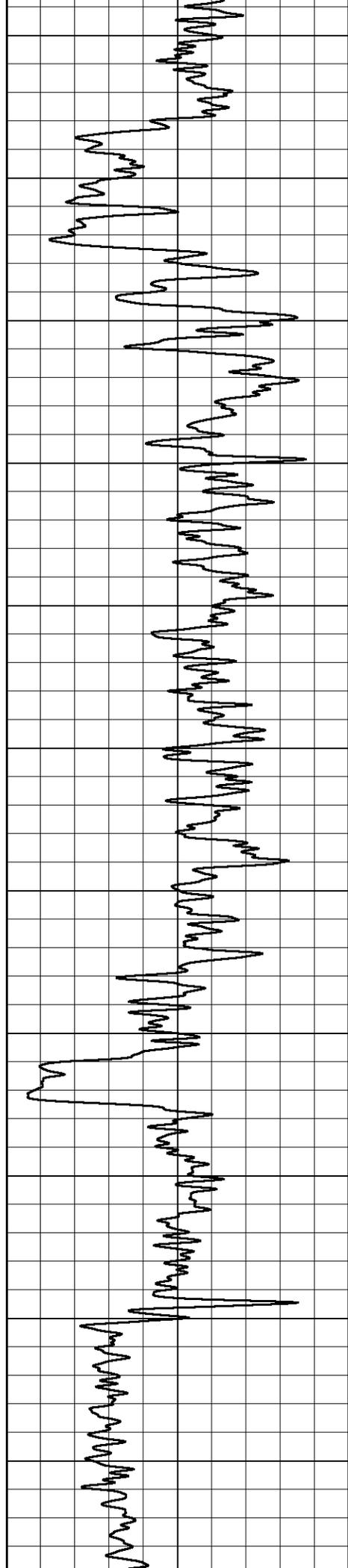


# MAIN PASS

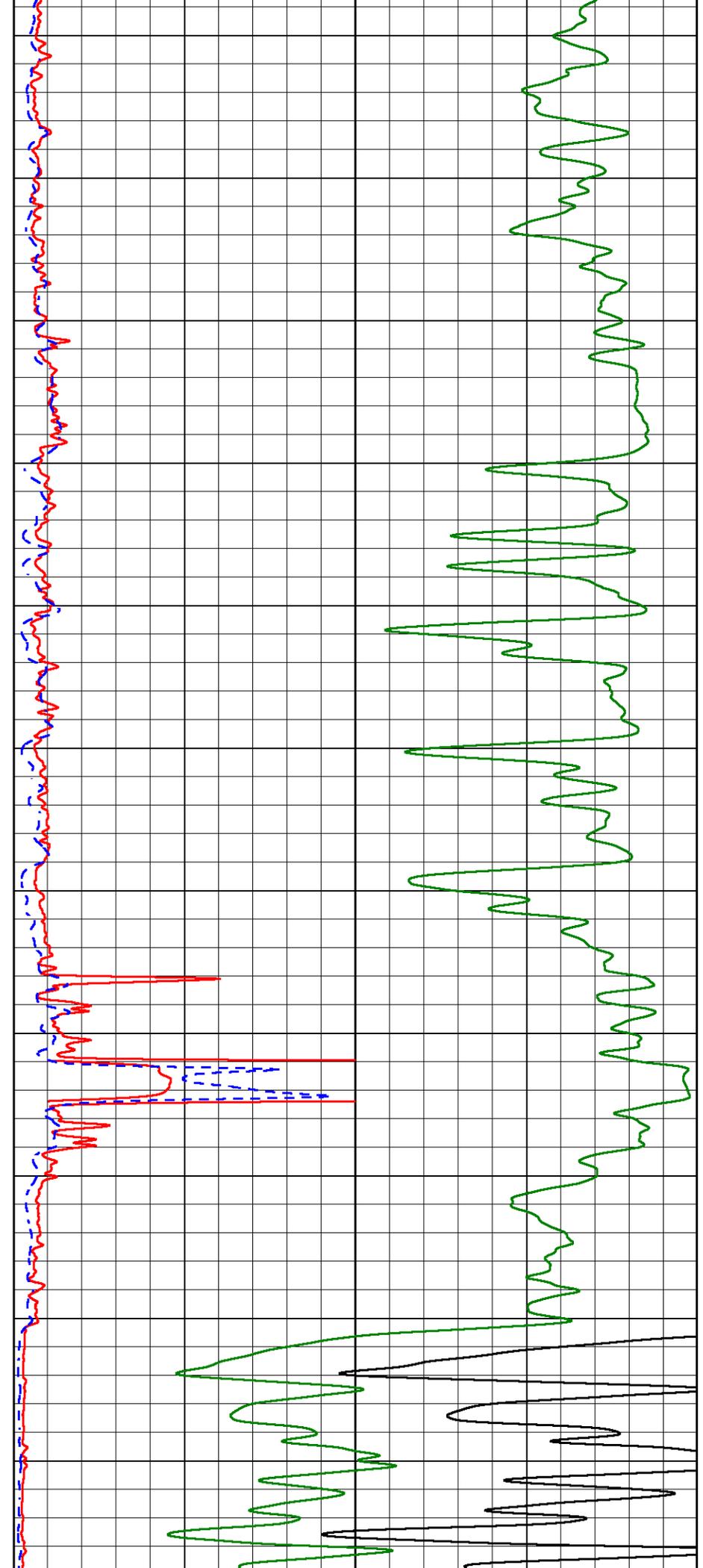
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 Dataset Pathname stackmel/pass4.1  
 Presentation Format dil2in  
 Dataset Creation Sat Aug 11 11:16:49 2018  
 Charted by Depth in Feet scaled 1:600

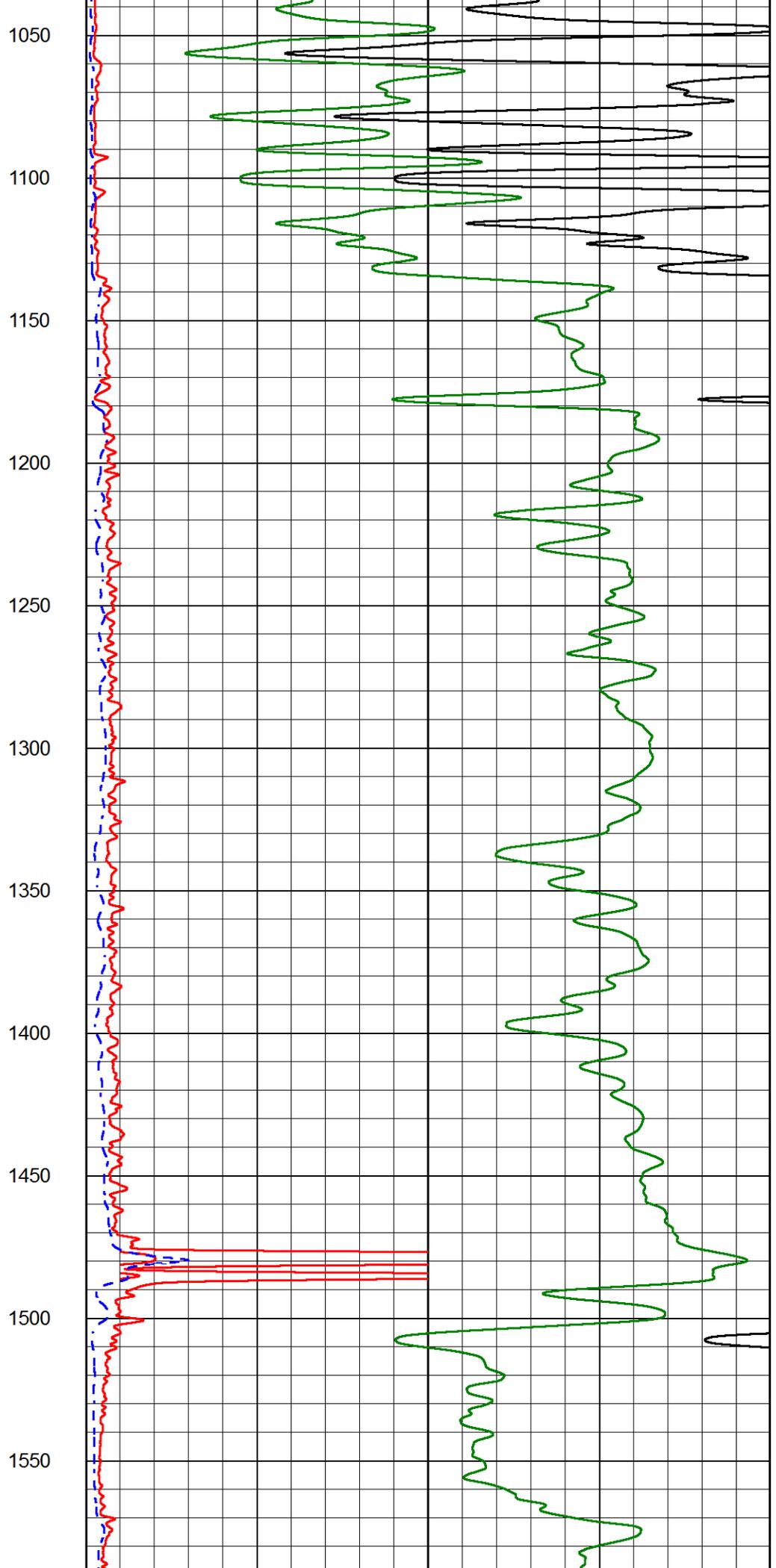
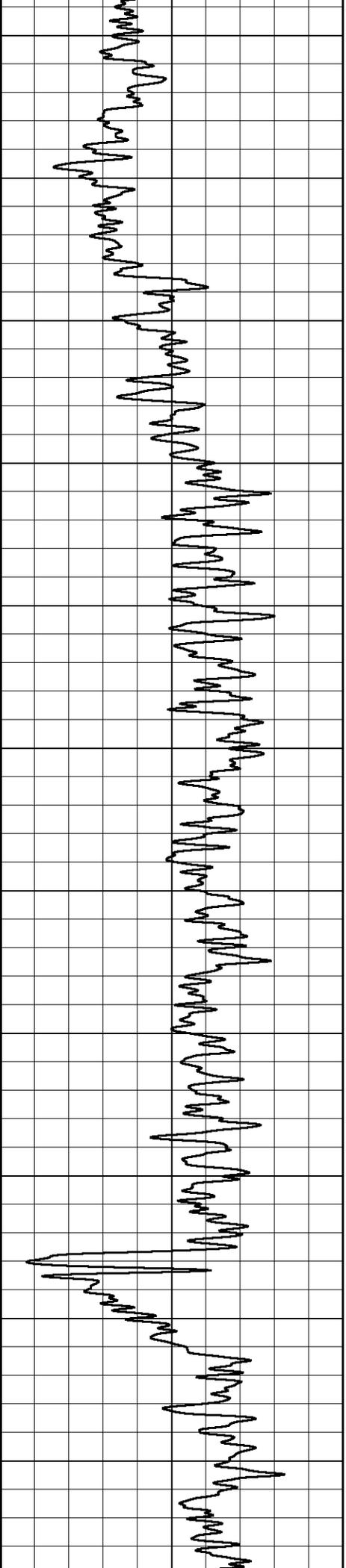
0	GAMMA RAY (GAPI)	150	2000	CONDUCTIVITY (mmho/m)	0
			0	RLL3 (Ohm-m)	50
			0	DEEP RESISTIVITY (Ohm-m)	50
			50	RLL3 (Ohm-m)	500
				DEEP RESISTIVITY	
			50	(Ohm-m)	500

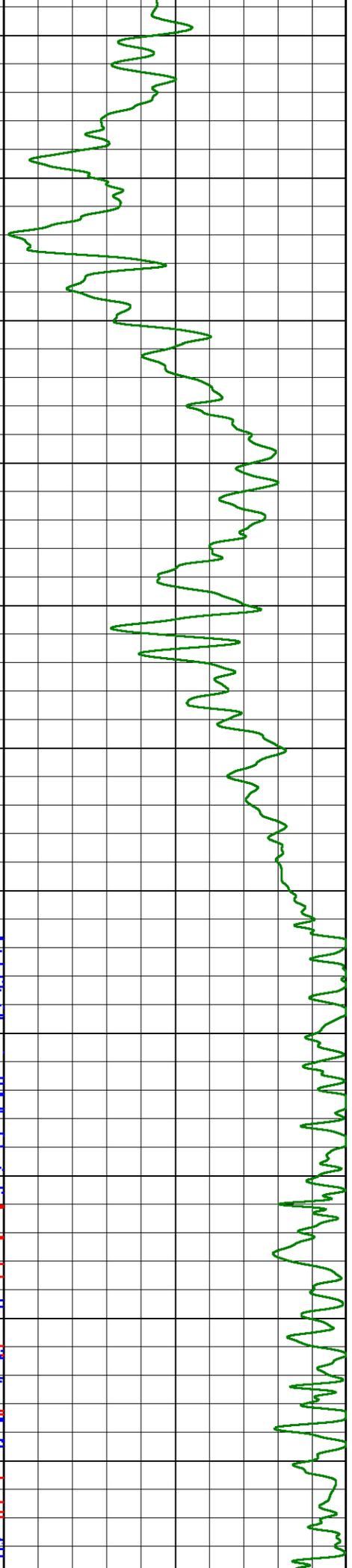
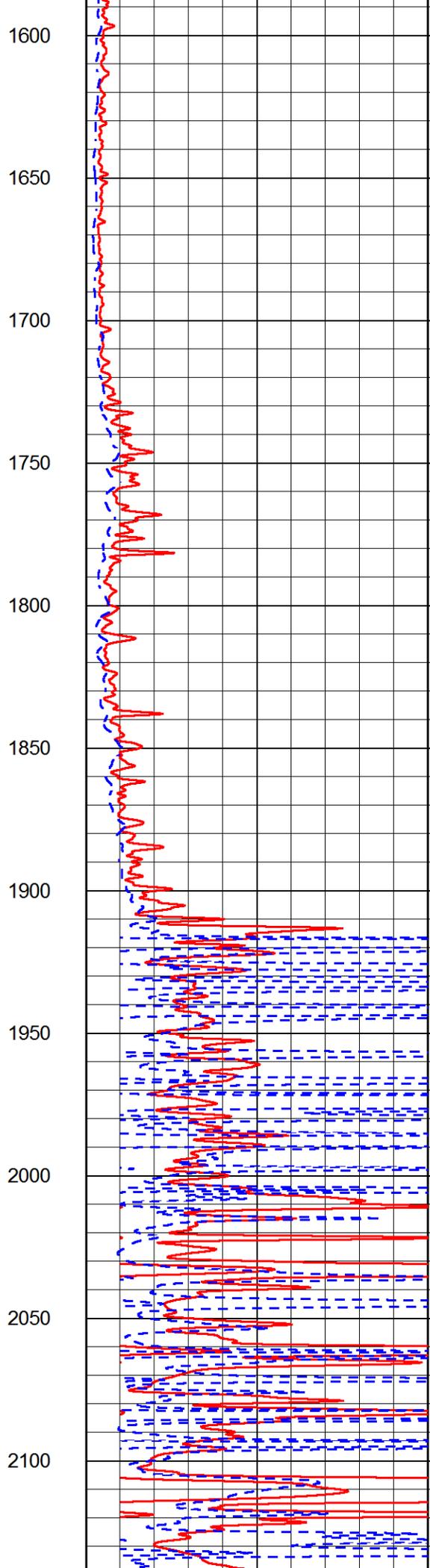
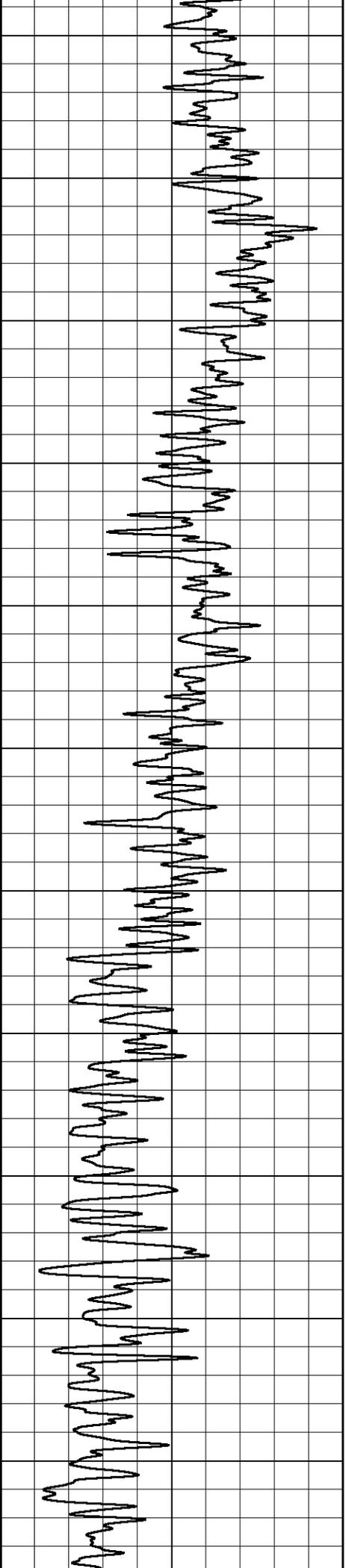


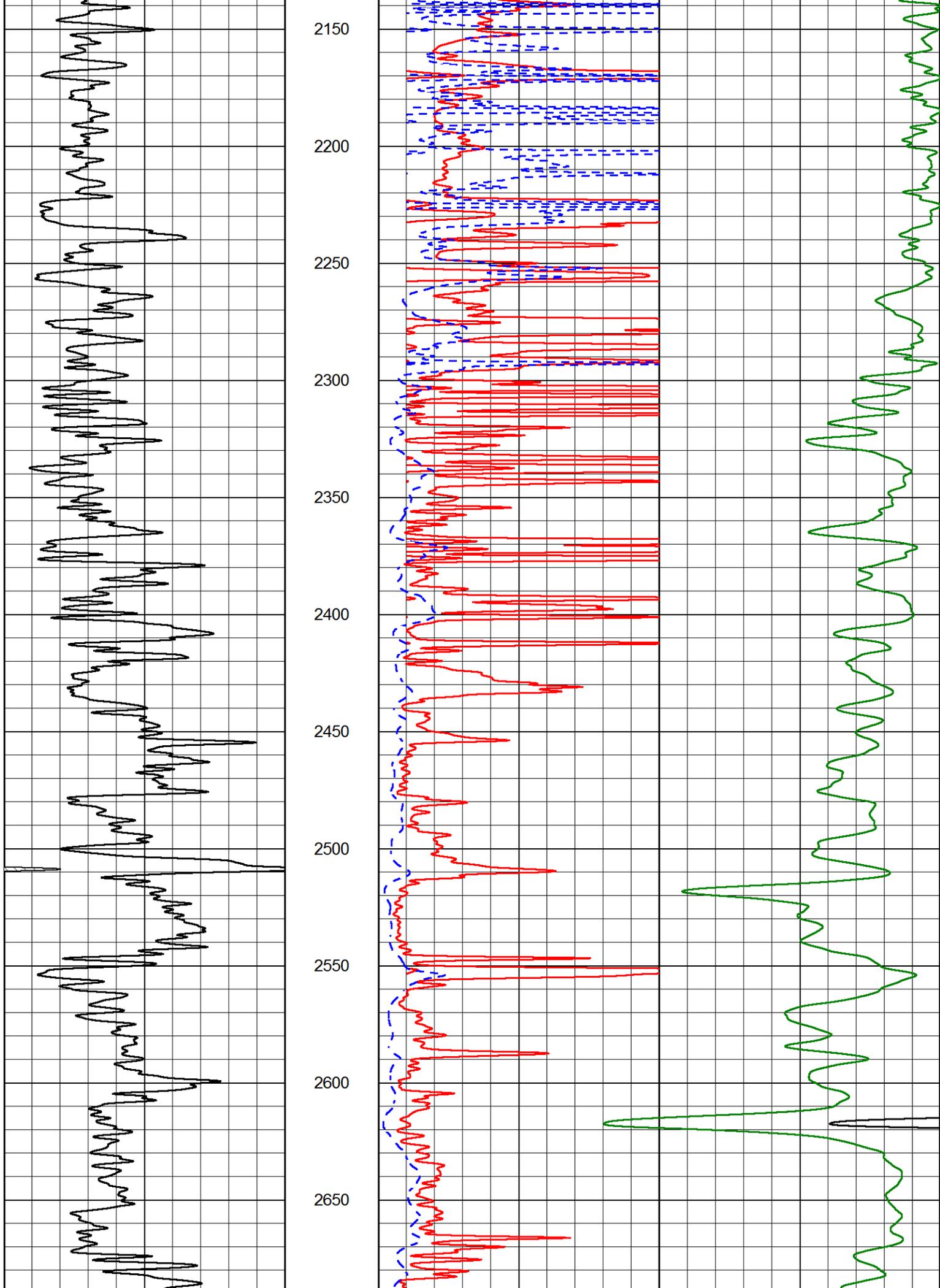


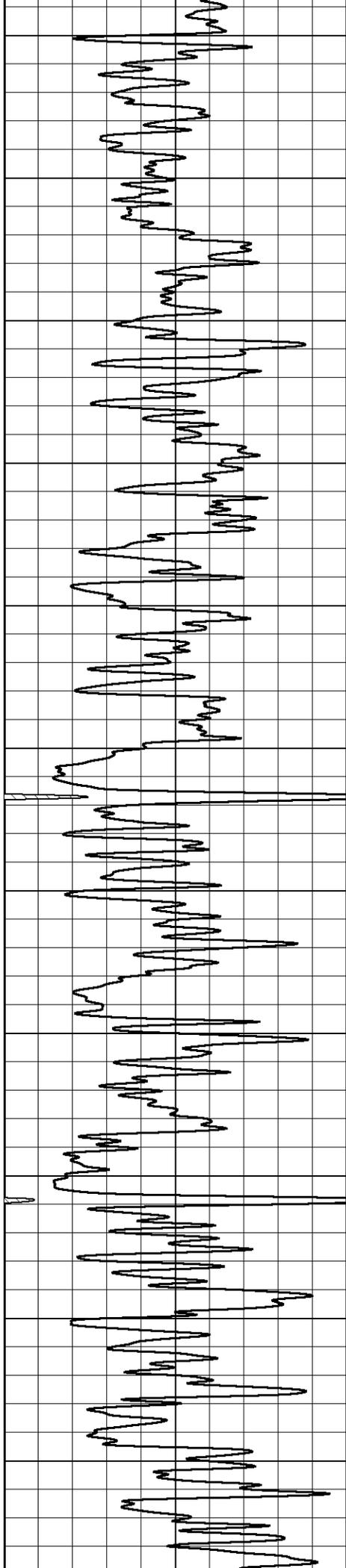
500  
550  
600  
650  
700  
750  
800  
850  
900  
950  
1000



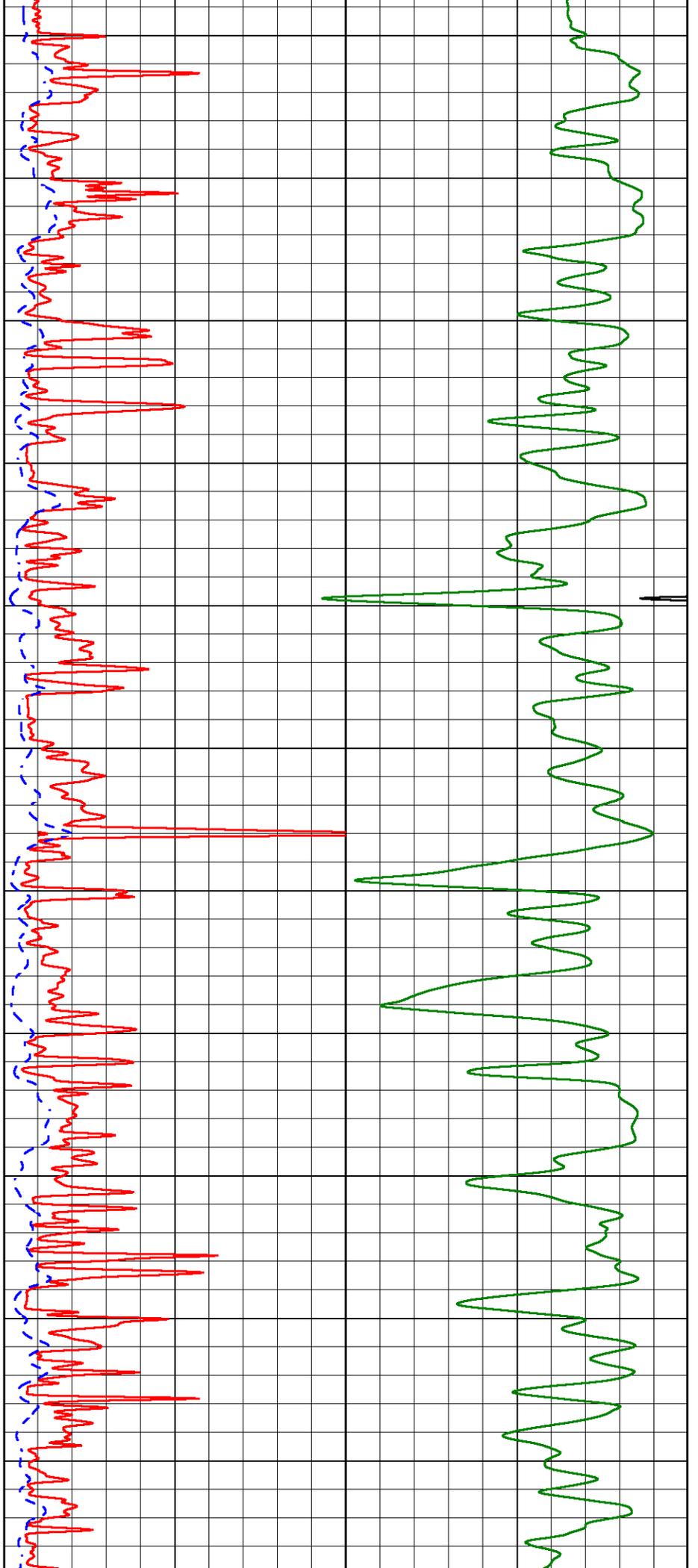


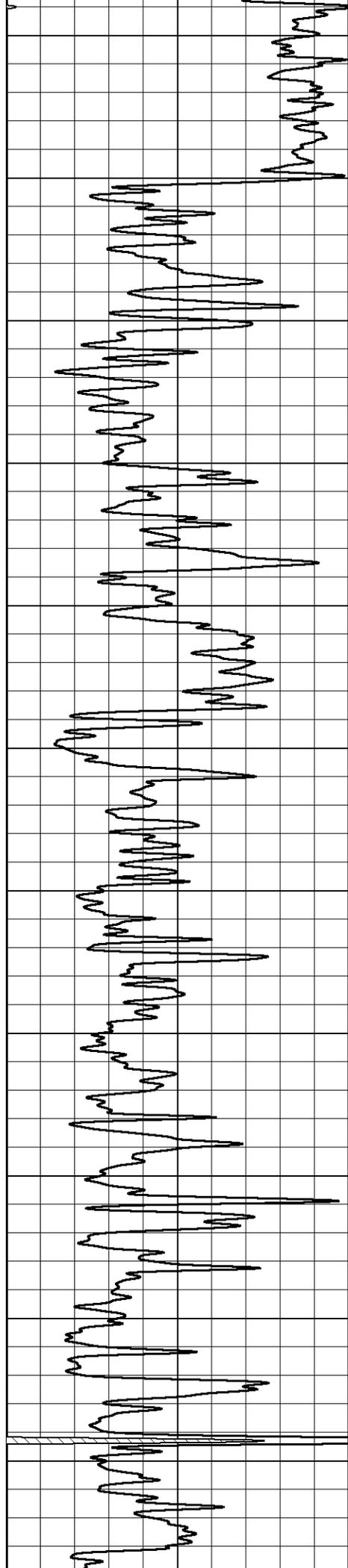






2700  
2750  
2800  
2850  
2900  
2950  
3000  
3050  
3100  
3150  
3200





3250

3300

3350

3400

3450

3500

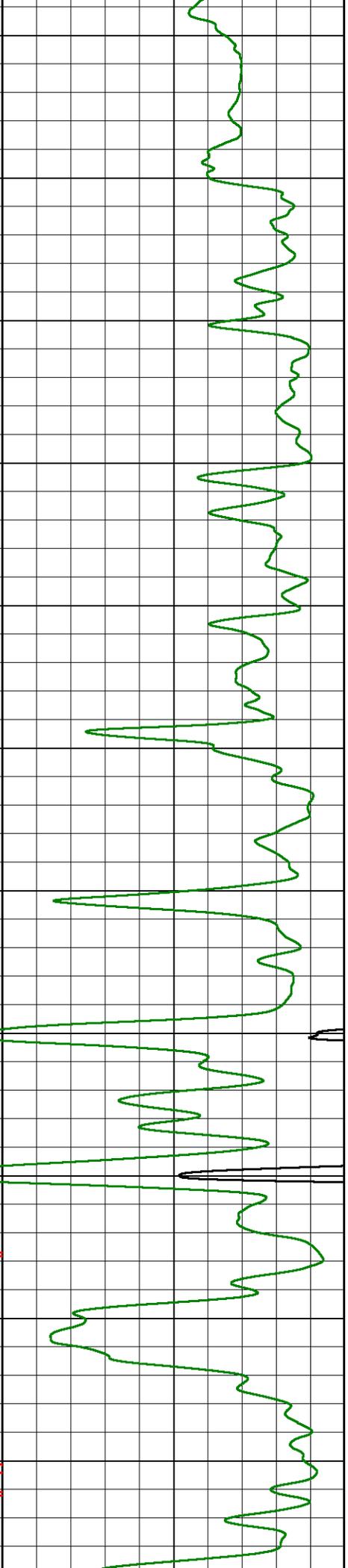
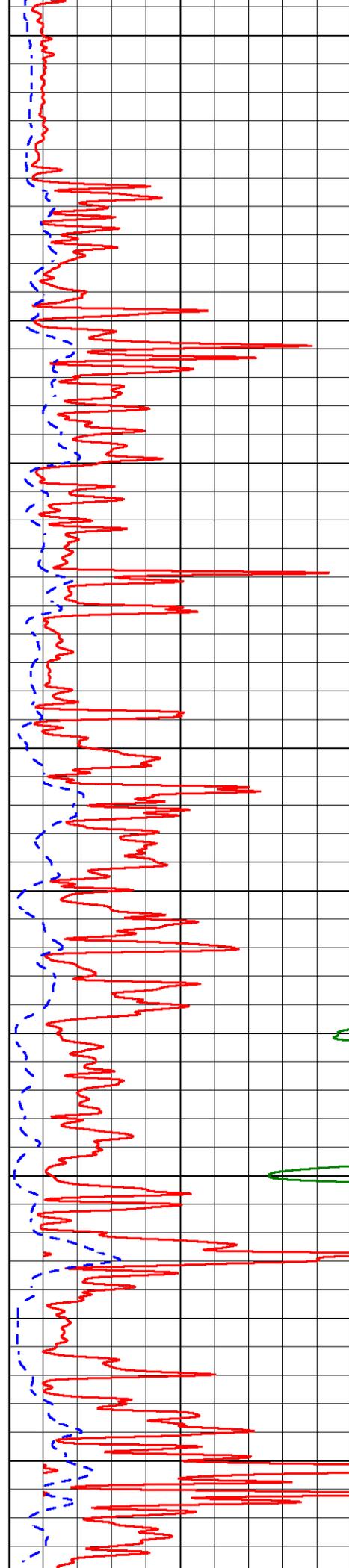
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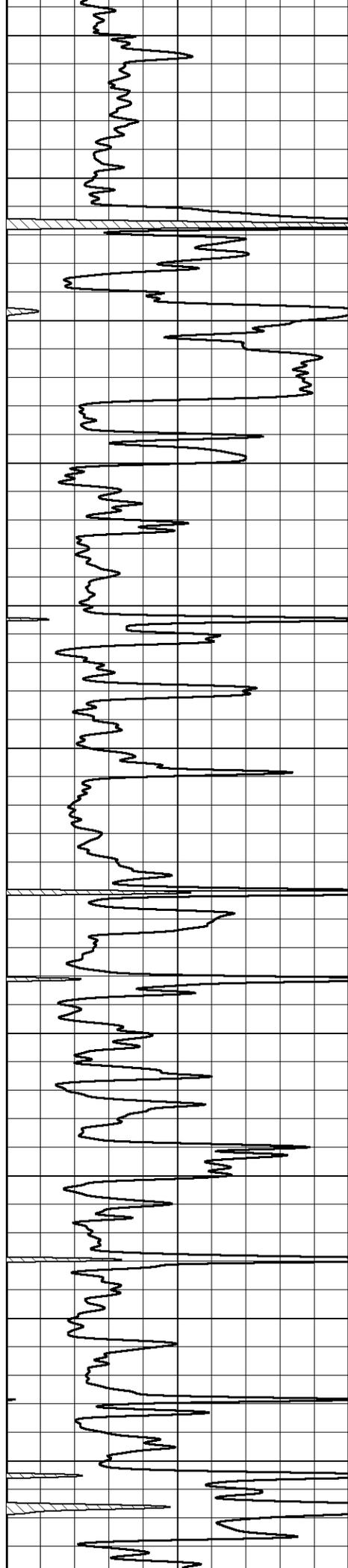
3600

3650

3700

3750





3800

3850

3900

3950

4000

4050

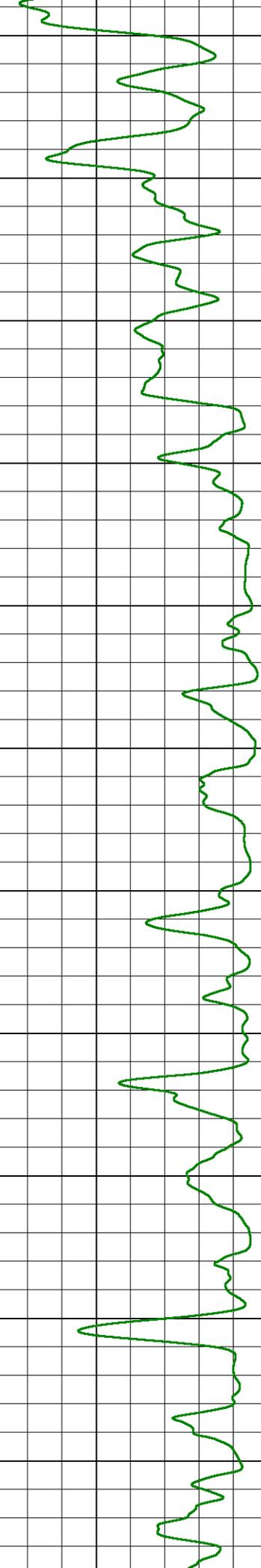
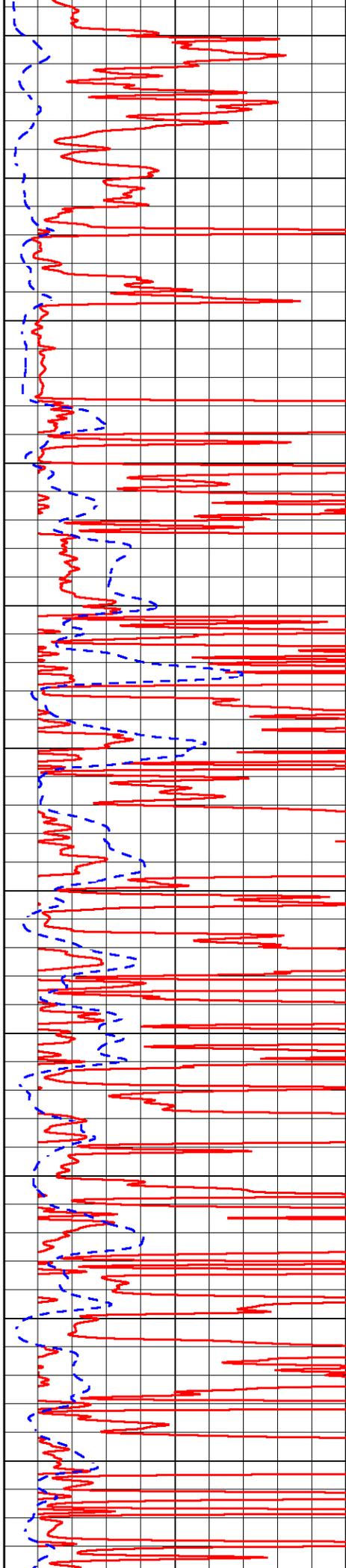
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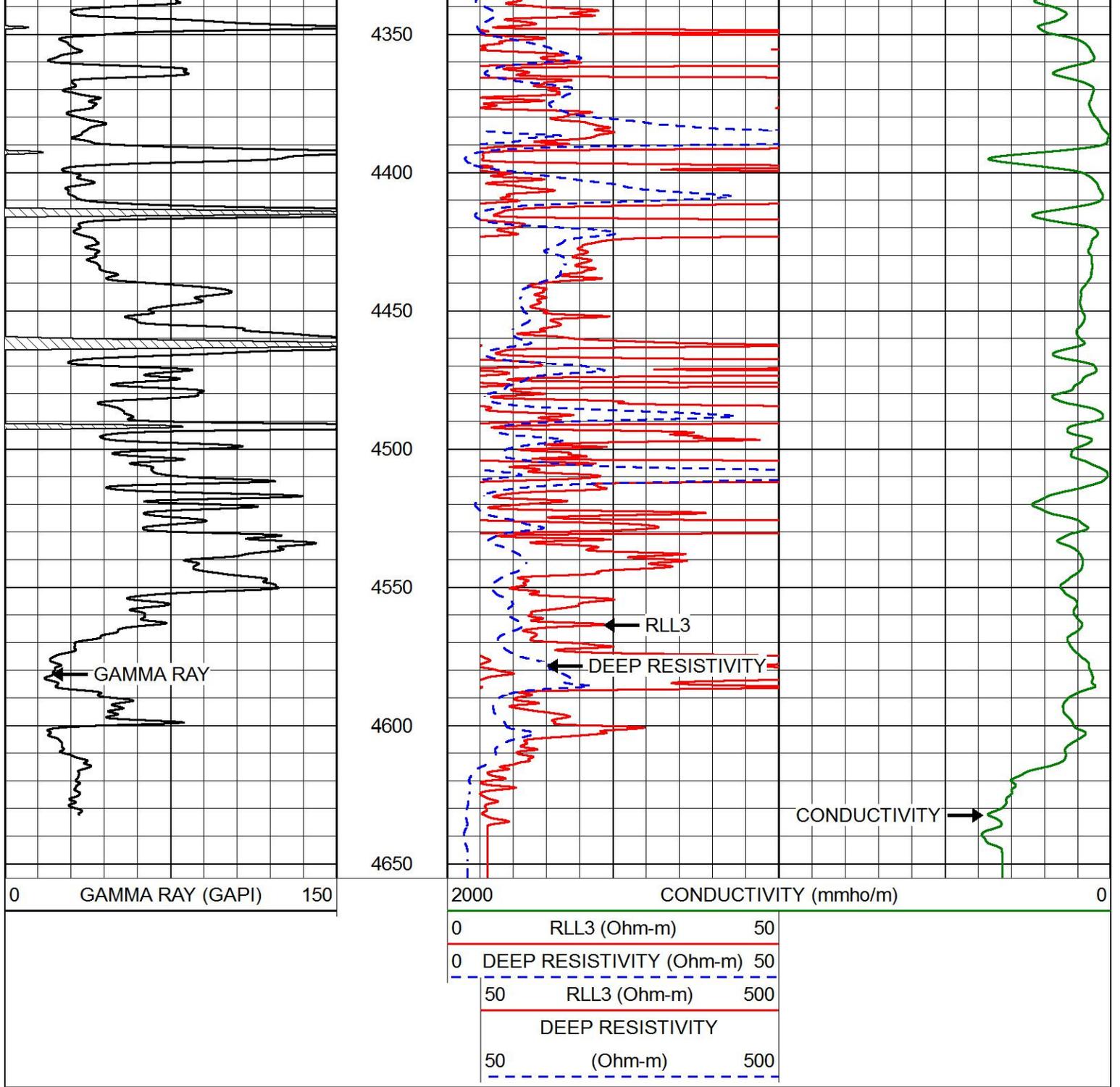
4150

4200

4250

4300

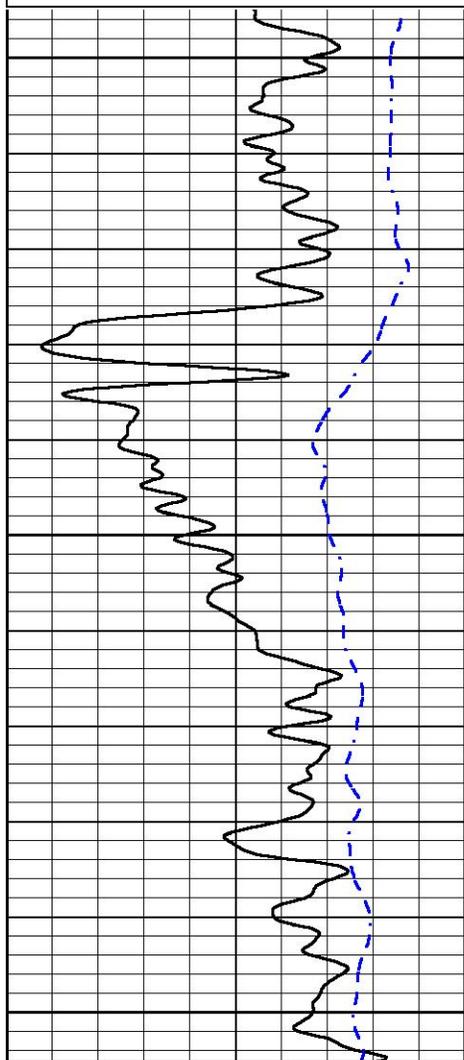




# MAIN PASS

Database File: american\_warrior\_hubin\_2\_10.db  
 Dataset Pathname: stackmel/pass4.1  
 Presentation Format: dil  
 Dataset Creation: Sat Aug 11 11:16:49 2018  
 Charted by: Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150	0.2	DEEP RESISTIVITY (Ohm-m)	2000
-200	SP (mV)	0	0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
			0.2	RLL3 (Ohm-m)	2000
			15000	LINE TENSION (lb)	0

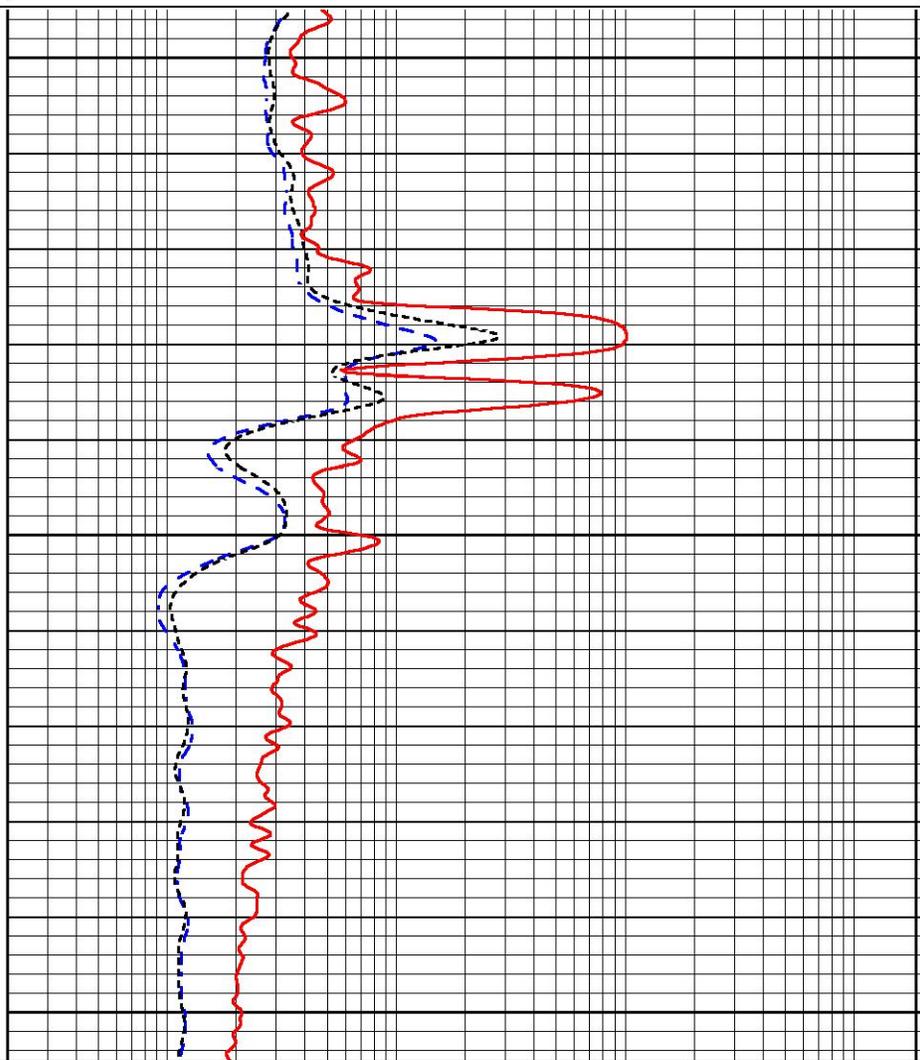


1450

1500

1550

0 GAMMA RAY (GAPI) 150  
 -200 SP (mV) 0



0.2 DEEP RESISTIVITY (Ohm-m) 2000  
 0.2 MEDIUM RESISTIVITY (Ohm-m) 2000  
 0.2 RLL3 (Ohm-m) 2000  
 15000 LINE TENSION (lb) 0

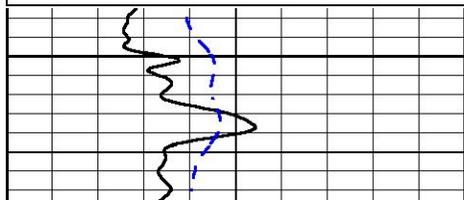


# MAIN PASS

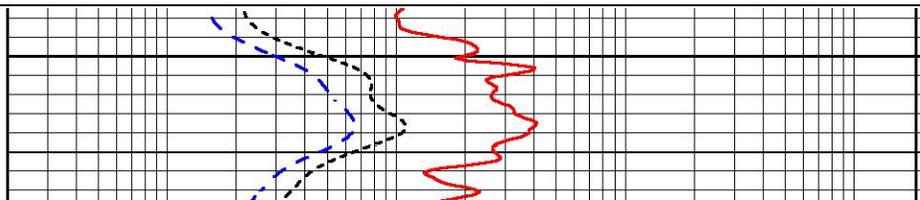
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 Dataset Pathname stackmel/pass3.1  
 Presentation Format dil  
 Dataset Creation Sat Aug 11 10:26:24 2018  
 Charted by Depth in Feet scaled 1:240

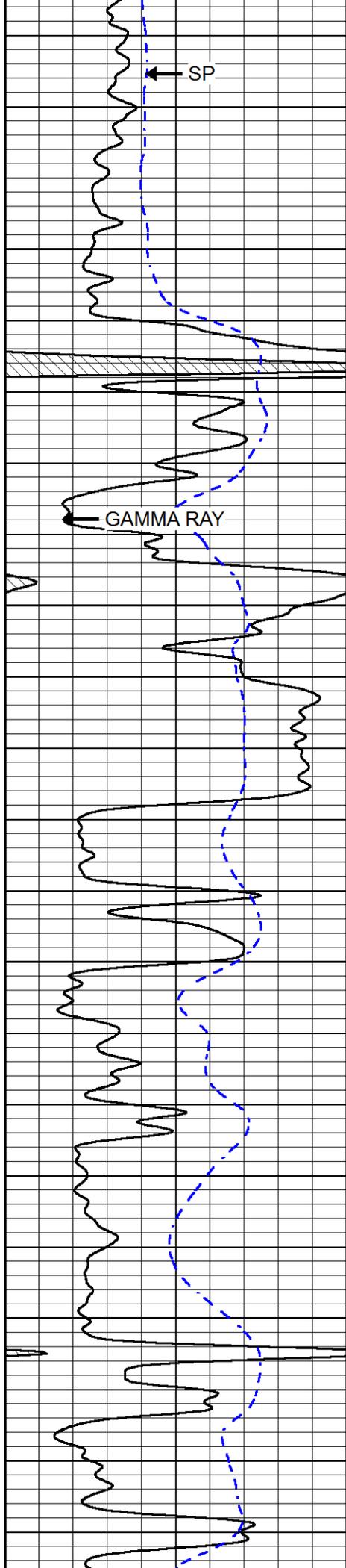
0 GAMMA RAY (GAPI) 150  
 -200 SP (mV) 0

0.2 DEEP RESISTIVITY (Ohm-m) 2000  
 0.2 MEDIUM RESISTIVITY (Ohm-m) 2000  
 0.2 RLL3 (Ohm-m) 2000  
 15000 LINE TENSION (lb) 0



3800



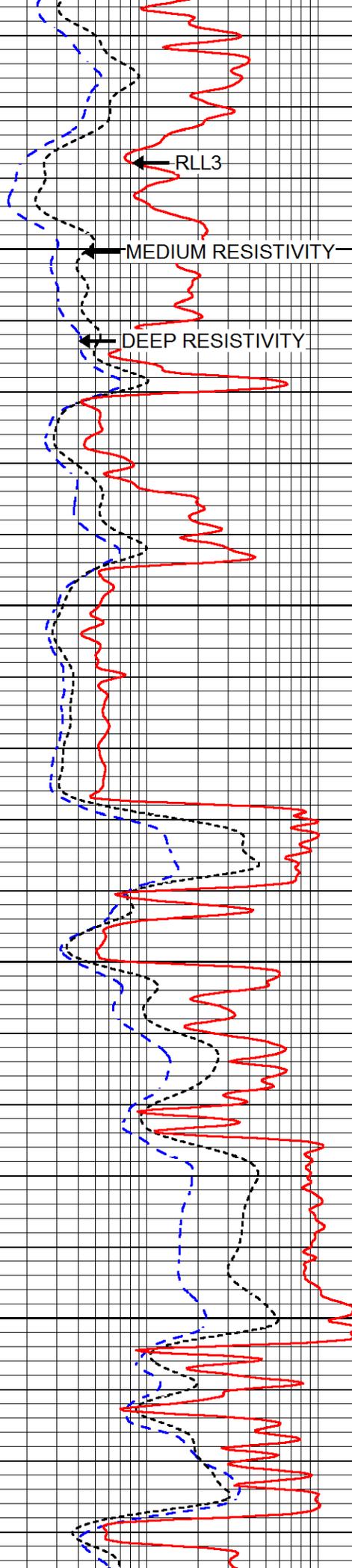


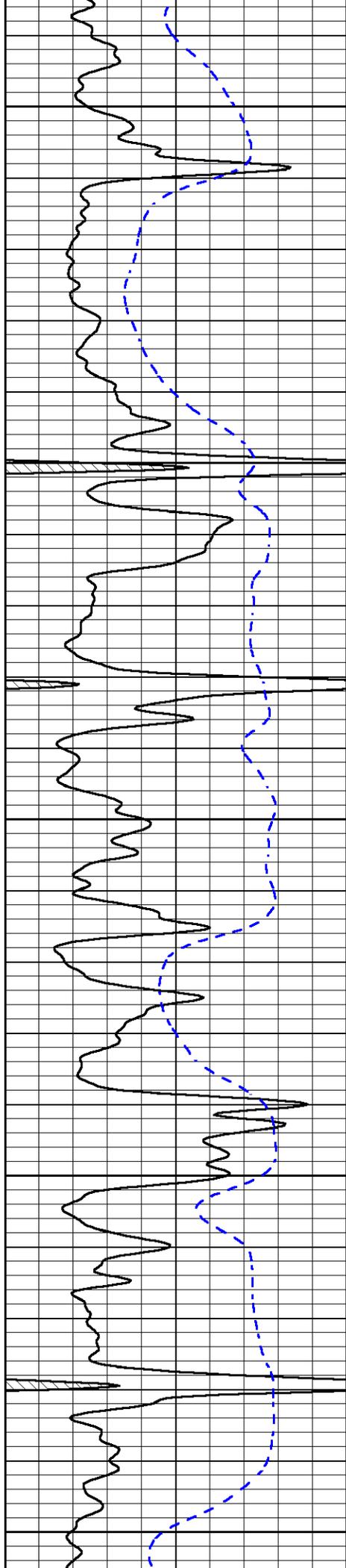
3850

3900

3950

4000





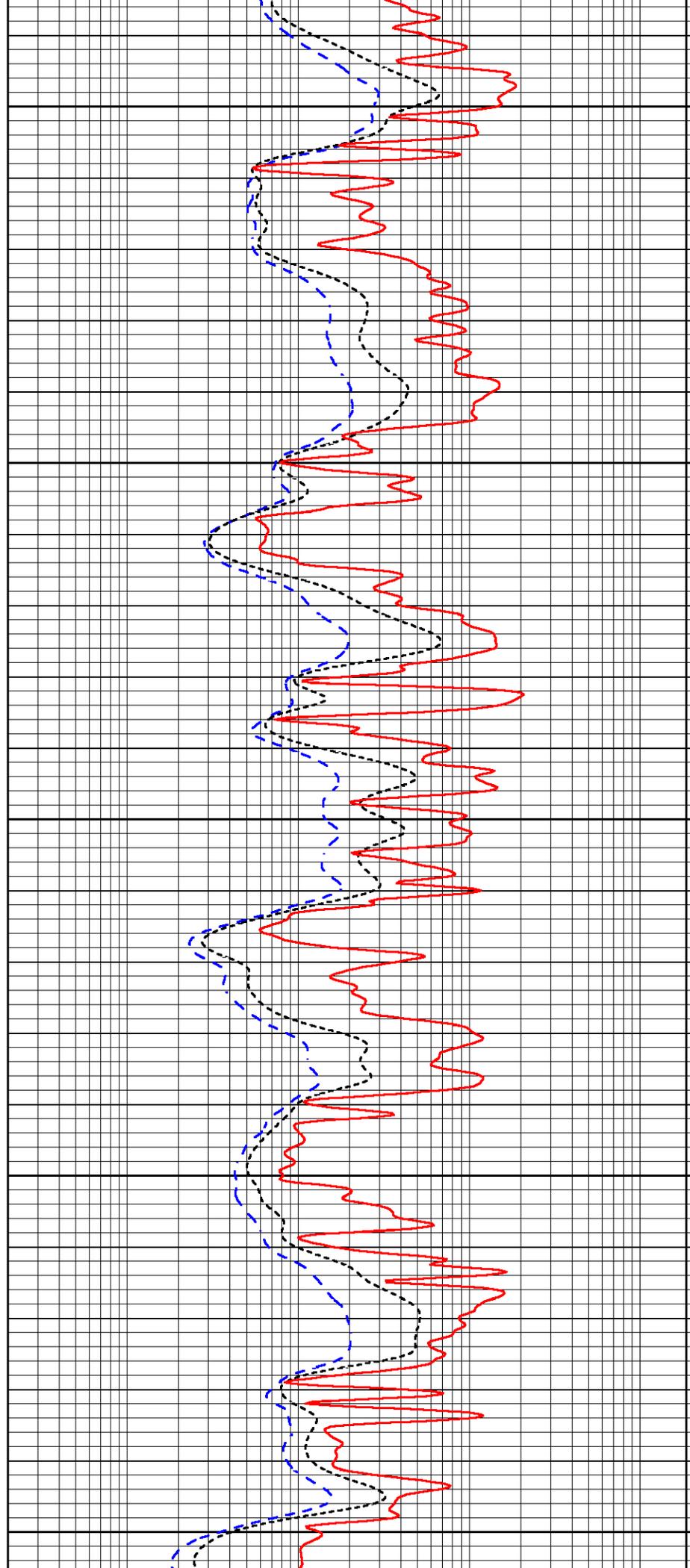
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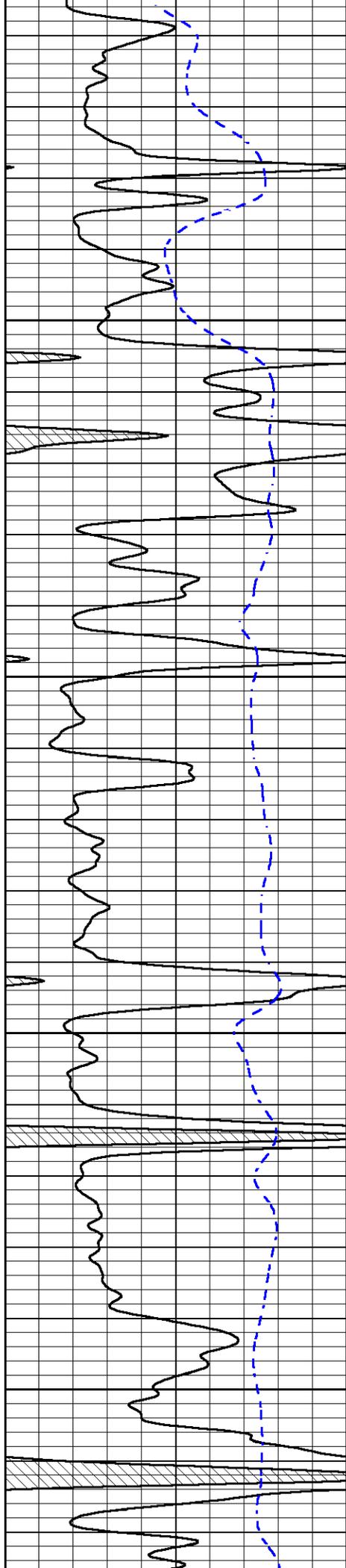
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4150

4200

4250



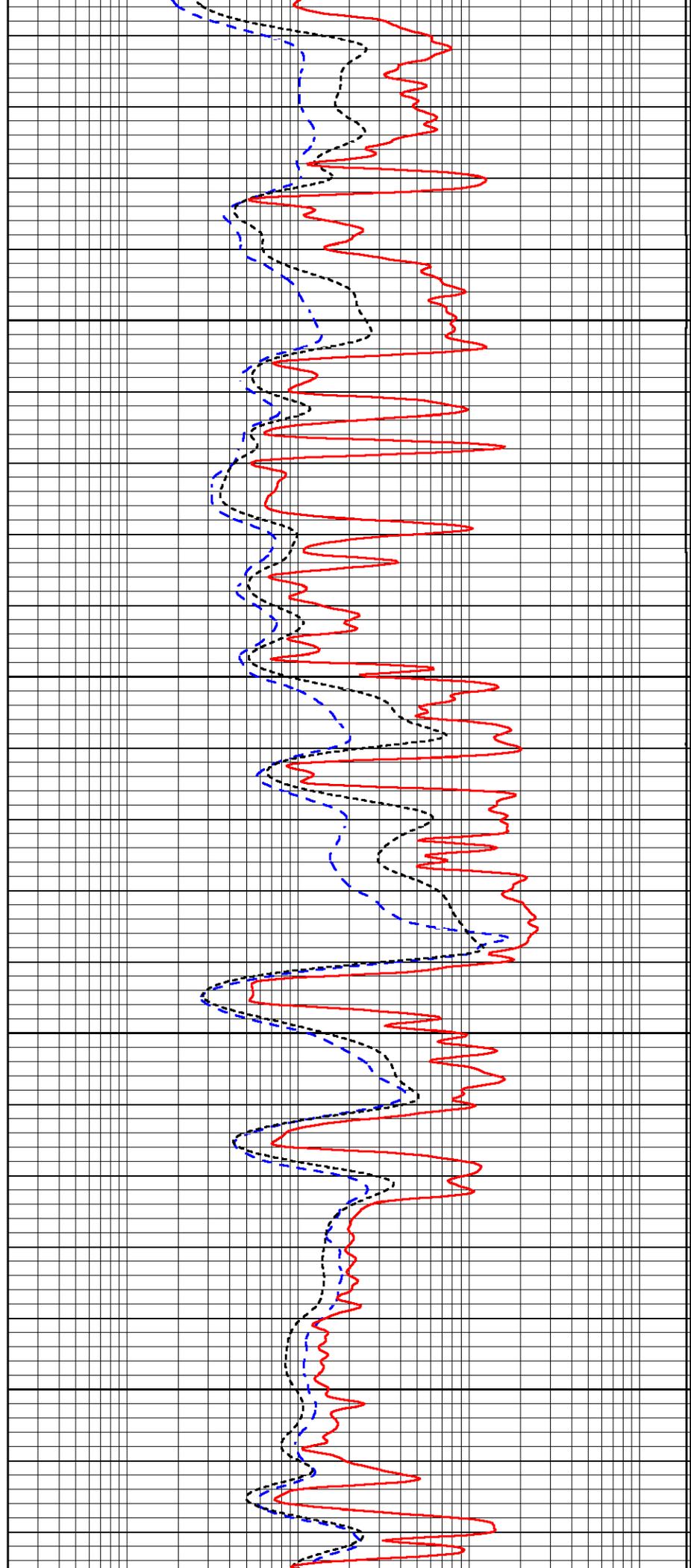


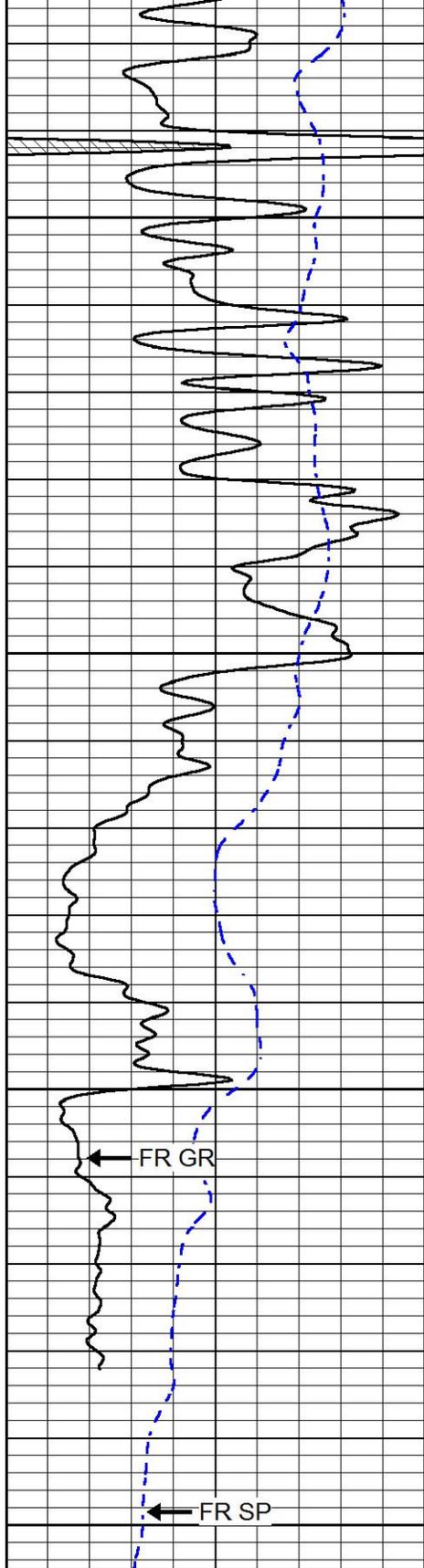
4300

4350

4400

4450





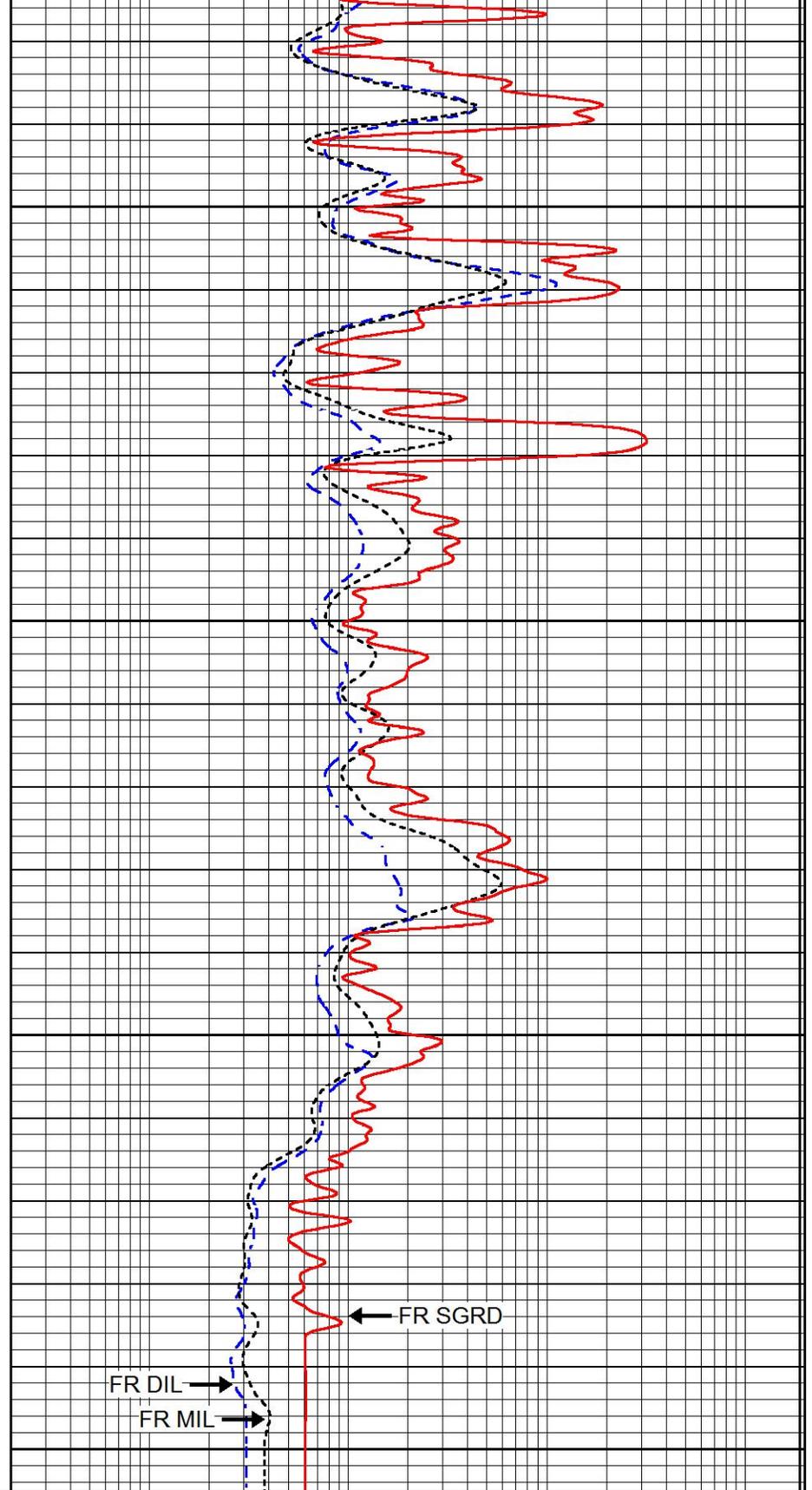
4500

4550

4600

4650

0      GAMMA RAY (GAPI)      150  
 -200      SP (mV)      0



FR DIL →

FR MIL →

← FR SGRD

0.2      DEEP RESISTIVITY (Ohm-m)      2000  
 0.2      MEDIUM RESISTIVITY (Ohm-m)      2000  
 0.2      RLL3 (Ohm-m)      2000  
 15000      LINE TENSION (lb)      0

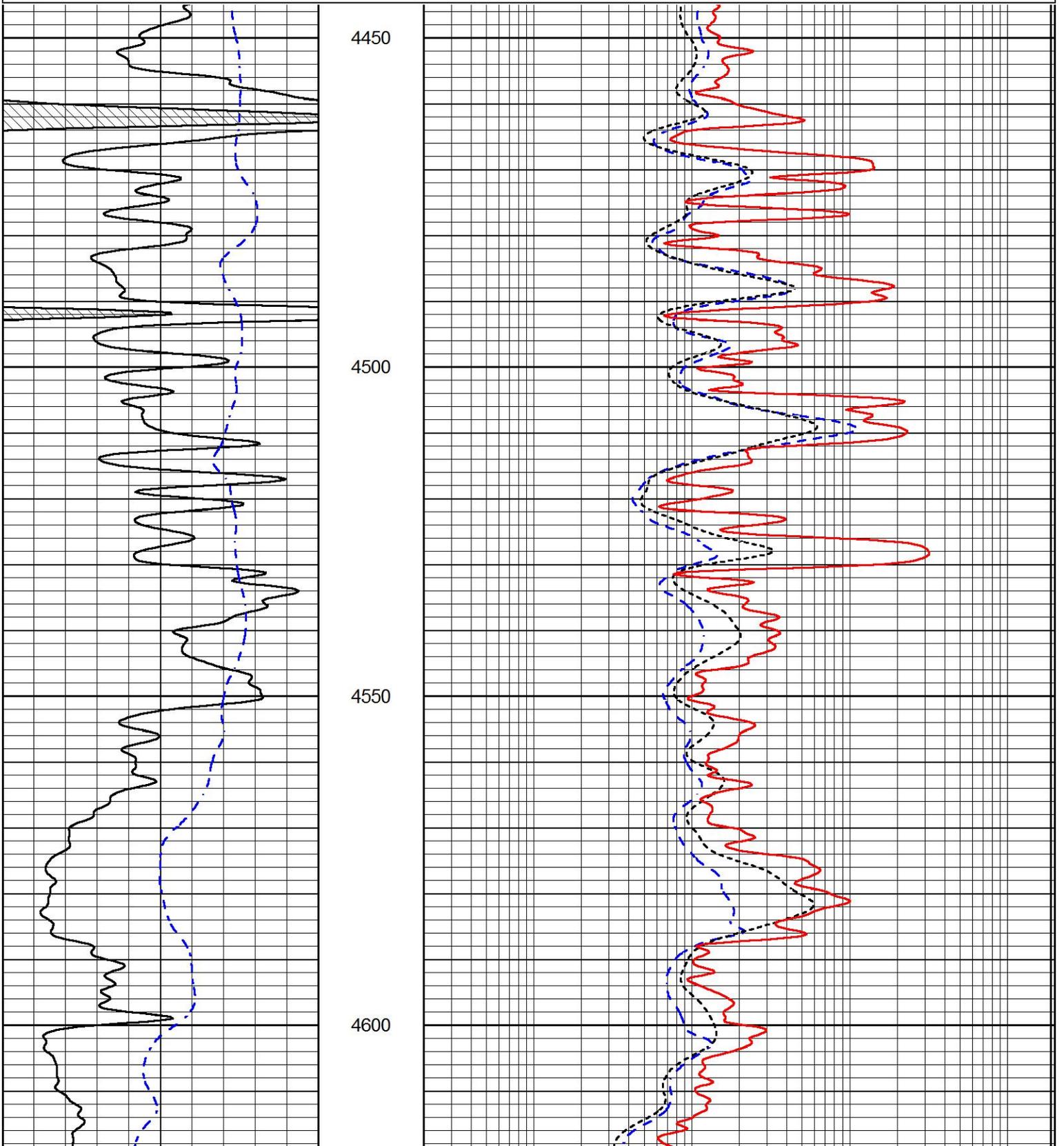


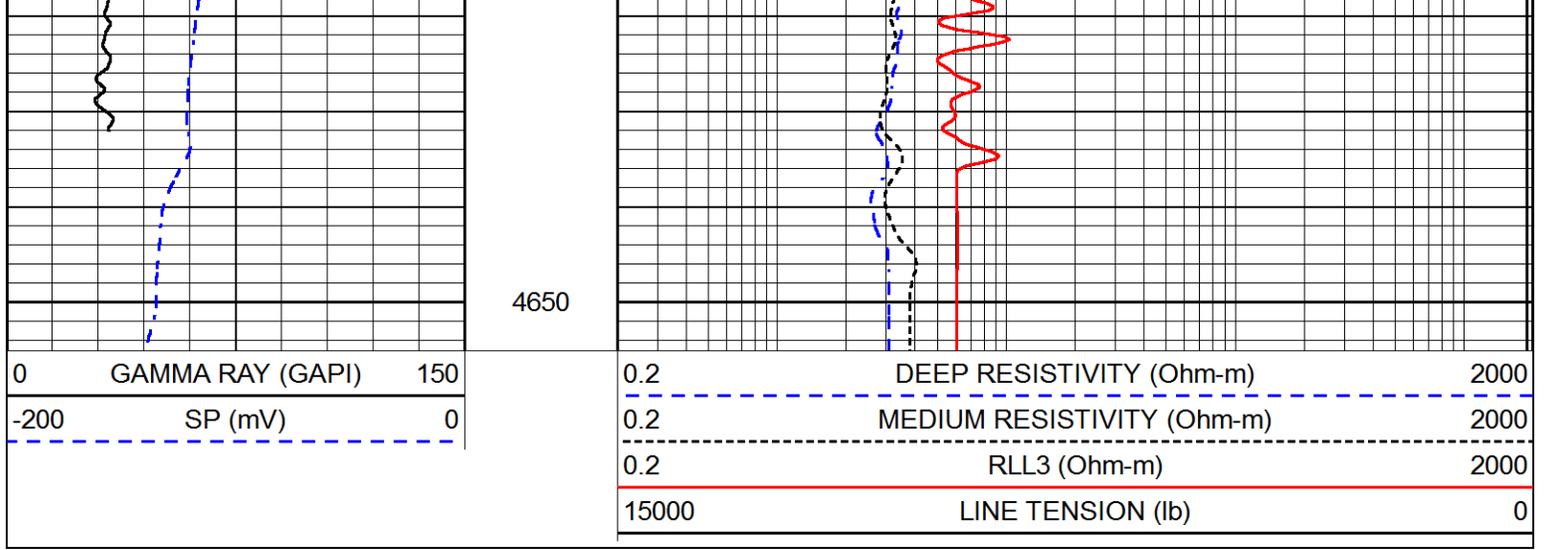
# REPEAT SECTION

Database File american\_warrior\_hubin\_2\_10.db  
 Dataset Pathname stackmel/pass2.1  
 Presentation Format dil  
 Dataset Creation Sat Aug 11 10:27:07 2018  
 Charted by Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
15000	LINE TENSION (lb)	0





### Calibration Report

Database File american\_warrior\_hubin\_2\_10.db  
 Dataset Pathname stackmel/pass3.1  
 Dataset Creation Sat Aug 11 10:26:24 2018

### Dual Induction Calibration Report

Serial-Model: 1987-M&W  
 Calibration Performed: Thu Aug 09 22:42:18 2018

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		Gain	Offset
Deep	178.615	710.235	0.000	255.800	mmho/m	0.530	-36.500
Medium	161.982	1441.110	0.000	255.800	mmho/m	0.440	-110.500

### Microlog Calibration Report

Serial-Model: PSI-01-PSI STKBL ML  
 Performed: Thu Mar 31 18:14:32 2016

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	22500.0000	-1.0000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	29500.0000	-1.0000
Caliper	1.0001	1.1397	6.5000	18.5000	in	86.0000	-82.8000

### Compensated Density Calibration Report

Serial-Model: 168-130-M&W  
 Source / Verifier: /  
 Master Calibration Performed: Thu Aug 09 22:42:28 2018

### Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4659.47	5064.14	cps
Aluminum	2.680	g/cc	853.93	3180.74	cps

	Size		Reading
Small Ring	4.00	in	0.88
Large Ring	16.00	in	0.22

## Compensated Neutron Calibration Report

Serial Number: tk10-MW  
 Tool Model: M&W  
 Calibration Performed: Wed Nov 16 11:21:36 2016

Detector	Readings	Target	Normalization
Short Space	6240.00 cps	1000.00 cps	1.6025
Long Space	460.00 cps	1000.00 cps	1.9500

## Gamma Ray Calibration Report

Serial Number: 89-M&W  
 Tool Model: M&W  
 Calibration Performed: Tue Apr 11 17:08:01 2017

Calibrator Value: 1000.0 GAPI  
 Background Reading: 0.0 cps  
 Calibrator Reading: 6.2 cps  
 Sensitivity: 0.5200 GAPI/cps



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