



PIONEER
Pioneer Energy Services

DUAL INDUCTION LOG

Company AMERICAN WARRIOR, INC.
Well SUNRAY #3-12
Field UNNAMED
County GREELEY
State KANSAS

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Well SUNRAY #3-12
Field UNNAMED
County GREELEY State KANSAS

Location: API #: 15-071-20886-00-00

1323' FNL & 1057' FWL

SEC 12 TWP 16S RGE 42W

Permanent Datum GROUND LEVEL Elevation 3776'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING

Other Services
CNL/CDL
MEL
Elevation
K.B. 3787'
D.F. N/A
G.L. 3776'

Date	10/8/2018		
Run Number	ONE		
Depth Driller	5220'		
Depth Logger	5220'		
Bottom Logged Interval	5219'		
Top Log Interval	400'		
Casing Driller	8.625" @ 437'		
Casing Logger	435'		
Bit Size	7.875"		
Type Fluid in Hole	CHEMICAL		
Salinity, ppm CL	2500		
Density / Viscosity	9.2 56		
pH / Fluid Loss	10.0 8.0		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	0.60 @ 50		
Rmt @ Meas. Temp	0.45 @ 50		
Rmc @ Meas. Temp	0.81 @ 50		
Source of Rmt / Rmc	CHARTS		
Rm @ BHT	0.23 @ 128		
Operating Rig Time	4 HOURS		
Max Rec. Temp. F	128		
Equipment Number	91		
Location	HAYS		
Recorded By	D. SCHMIDT		
Witnessed By	LUKE THOMPSON		

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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.

SHARRON SPRINGS,
SOUTH TO D RD, 9 WEST TO 7 RD, 1 1/2 NORTH,
EAST & NORTH INTO AT TB

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

THANK YOU FOR USING PIONEER ENERGY SERVICES
www.pioneerenergy.com 785-625-3858

Your Pioneer Energy Services Crew

Engineer: D. SCHMIDT
Operator:
Operator:
Operator:

This Log Record Was Witnessed By

Primary Witness: LUKE THOMPSON
Secondary Witness:
Secondary Witness:
Secondary Witness:

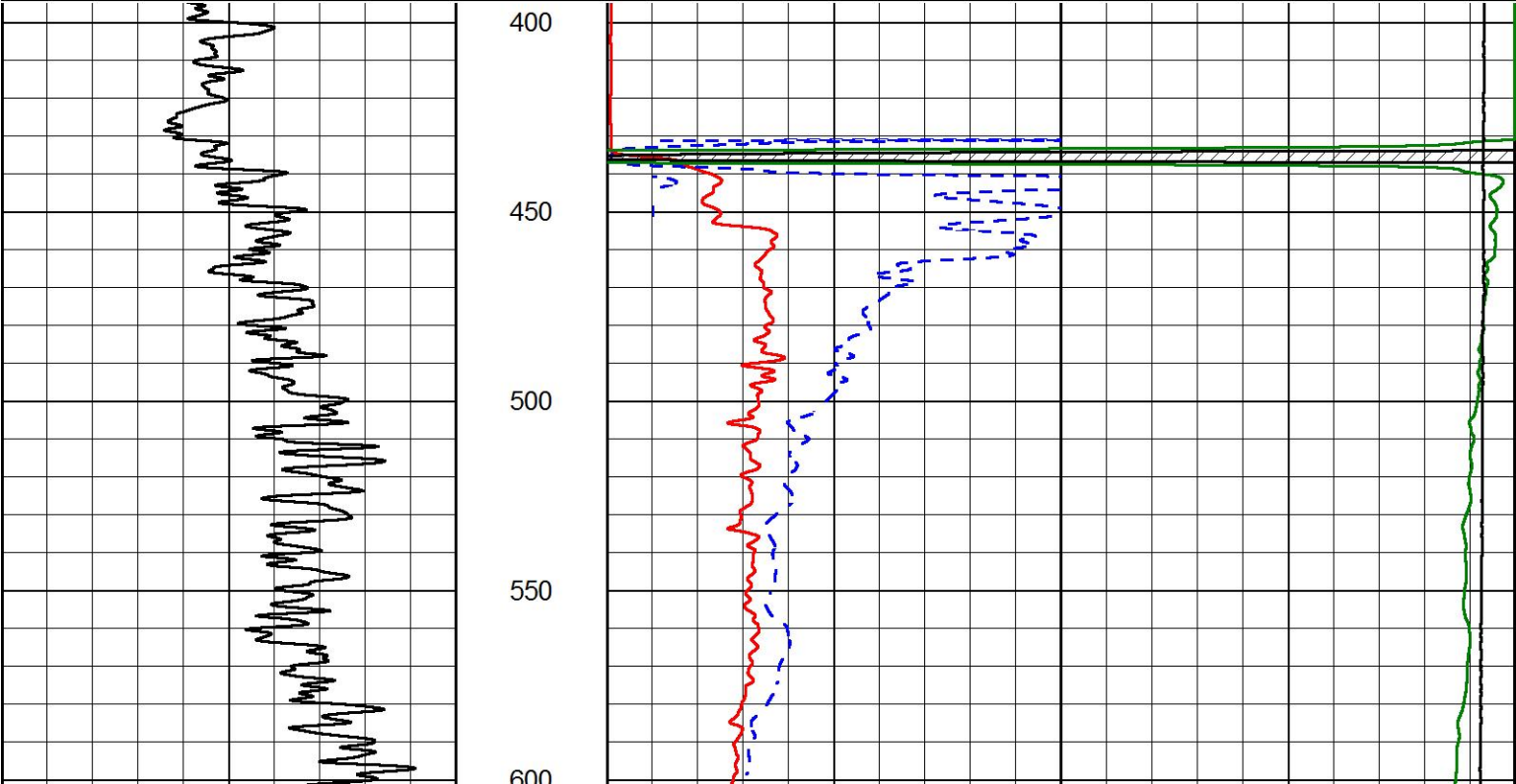
Top - Bottom							
M	A	SZCOR	NPORSEL	FLUIDDEN	MATRXDEN	SPSHIFT	SNDERRM
2	1	Off	Limestone	g/cc 1	g/cc 2.71	mV 385	mmho/m 0
SNDERR mmho/m 0	SRFTEMP degF 50	CASETHCK in 0	CASEOD in 5.5	PERFS 0	TDEPTH ft 5220	BOTTEMP degF 128	BOREID in 7.875

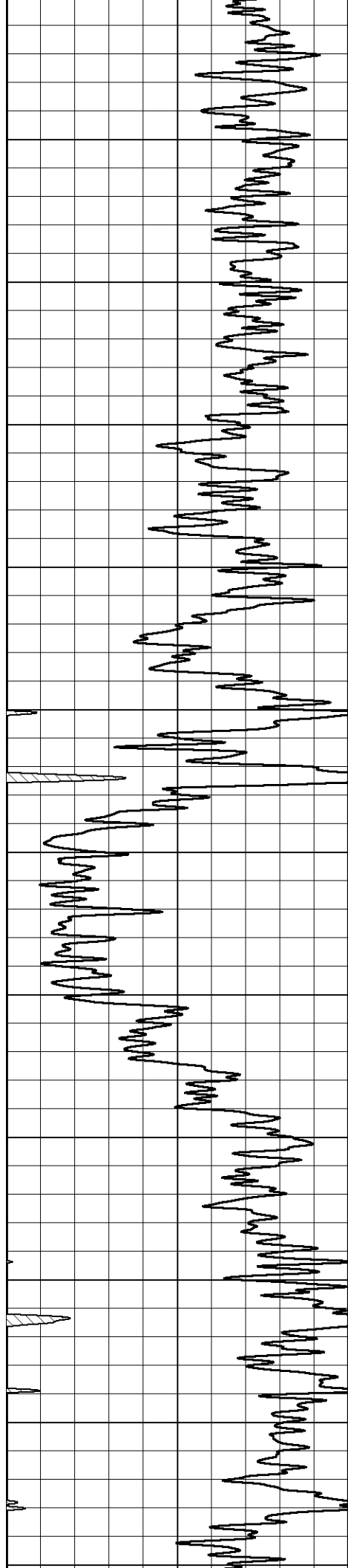


MAIN PASS

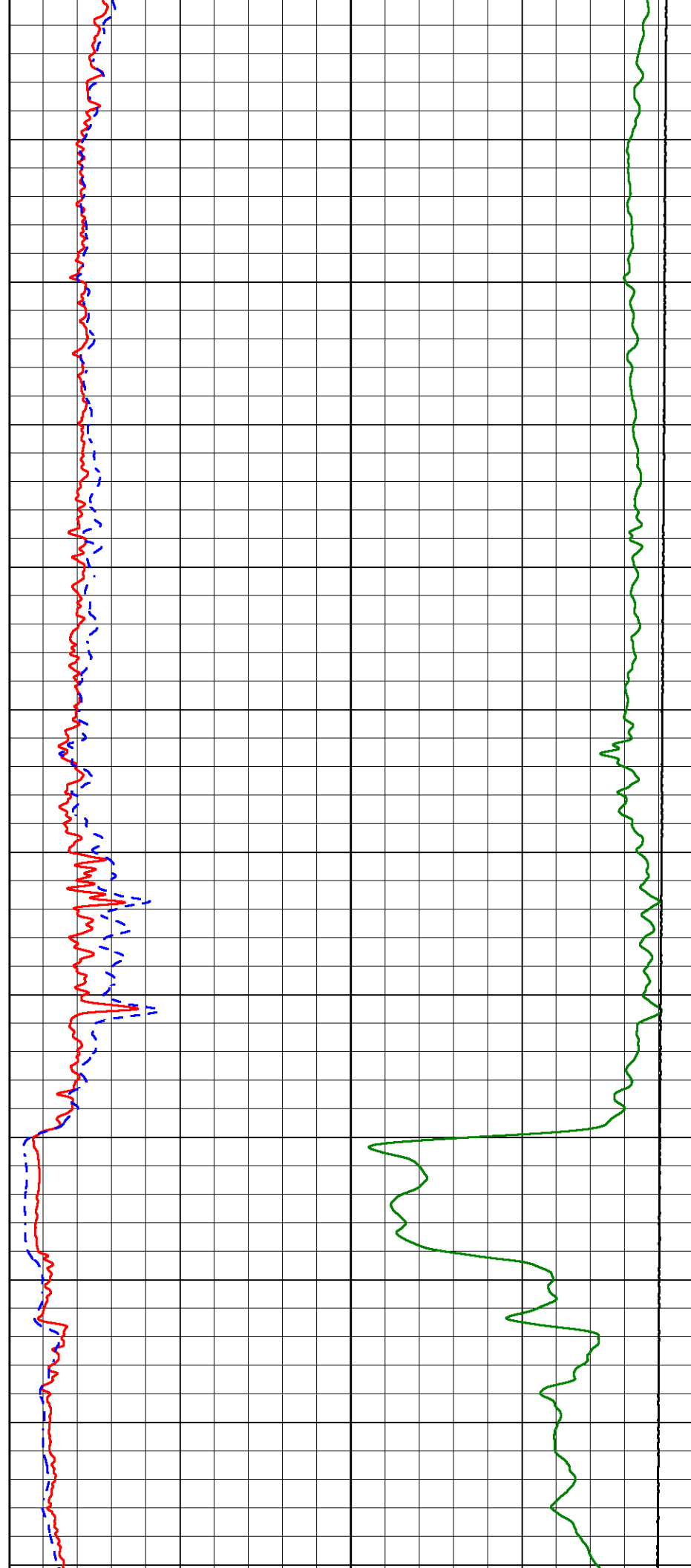
Database File american warrior_sunray 3-12.db
Dataset Pathname STACK/pass5.1
Presentation Format dil2in
Dataset Creation Mon Oct 08 06:34:19 2018
Charted by Depth in Feet scaled 1:600

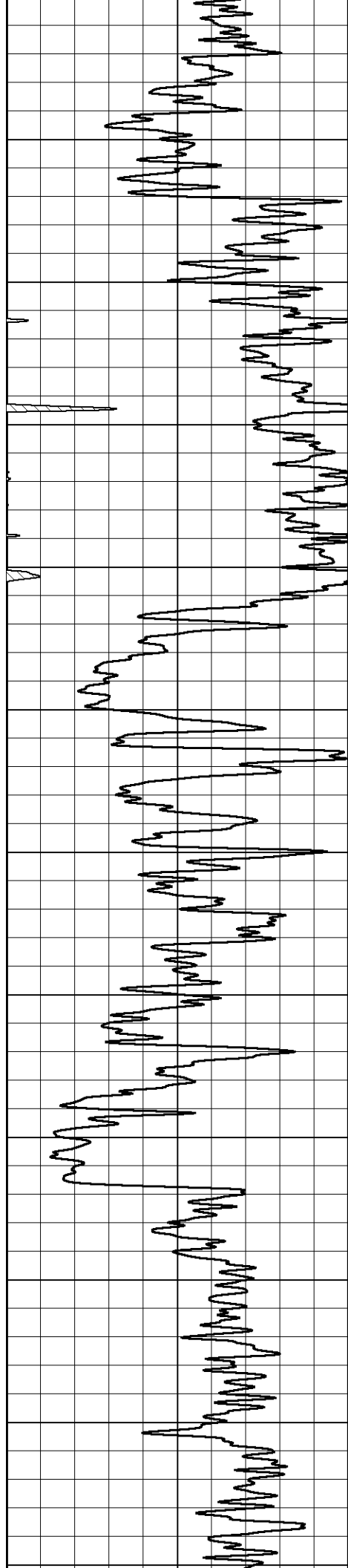
GAMMA RAY		1000 CONDUCTIVITY (mmho/m)		0
		15000 Line Tension (lb)		0
0	(GAPI)	150	0 RLL3 (Ohm-m)	50
		0 DEEP RESISTIVITY (Ohm-m)		50
		50 RLL3 (Ohm-m)		500
		50 Deep Resistivity (Ohm-m)		500



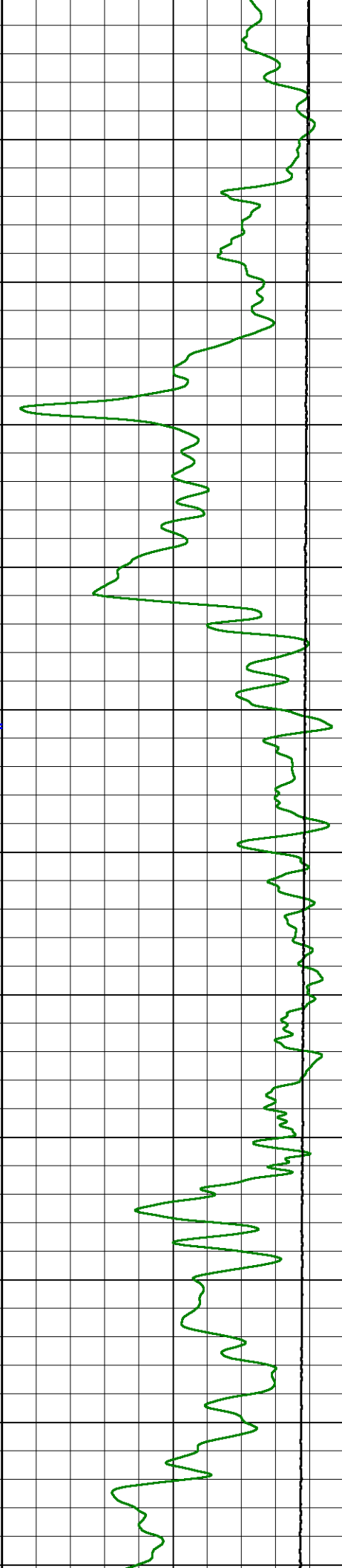
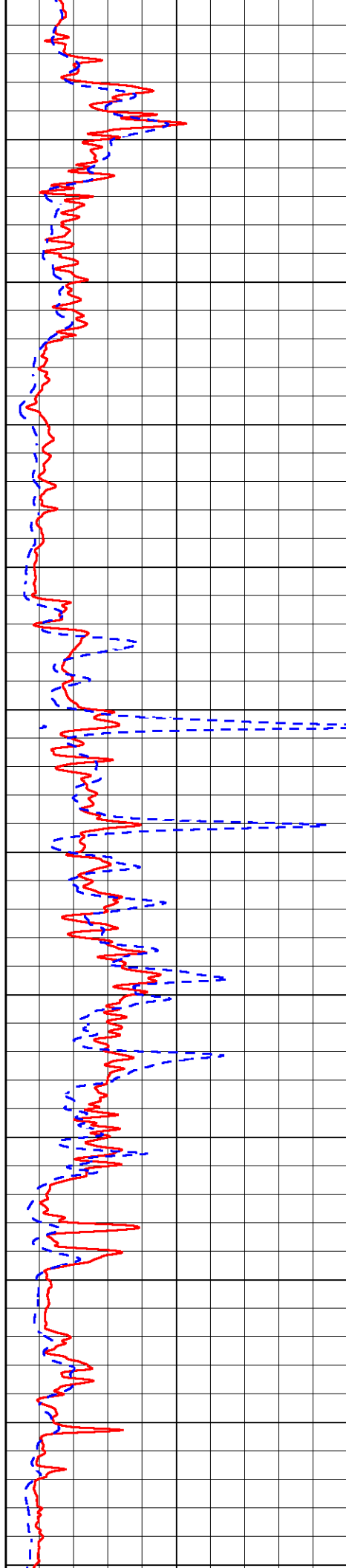


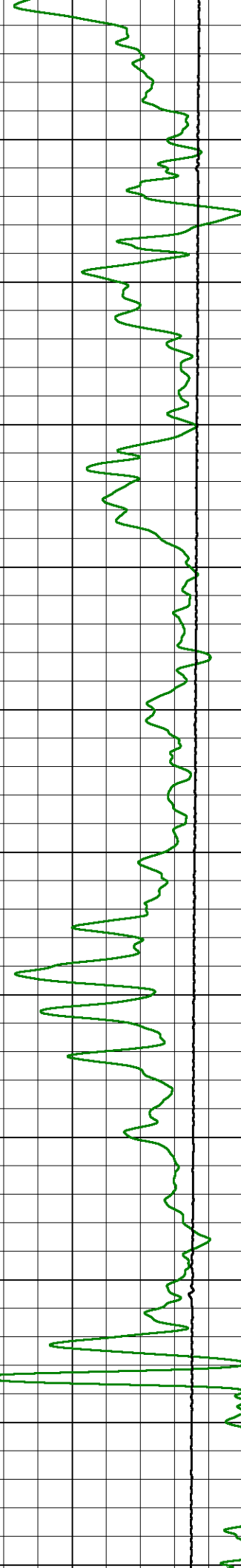
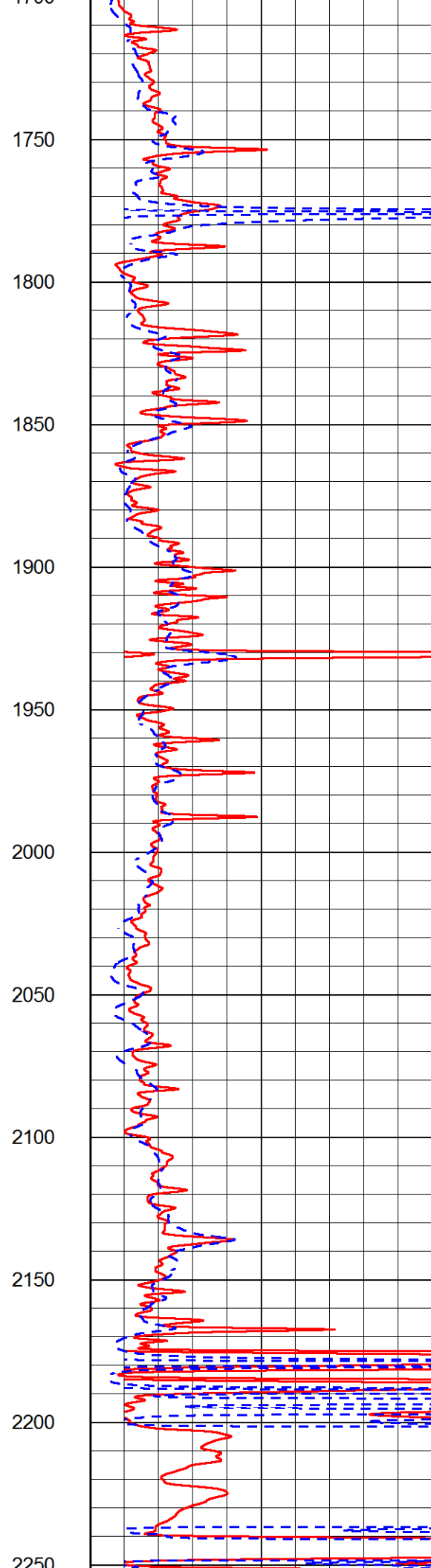
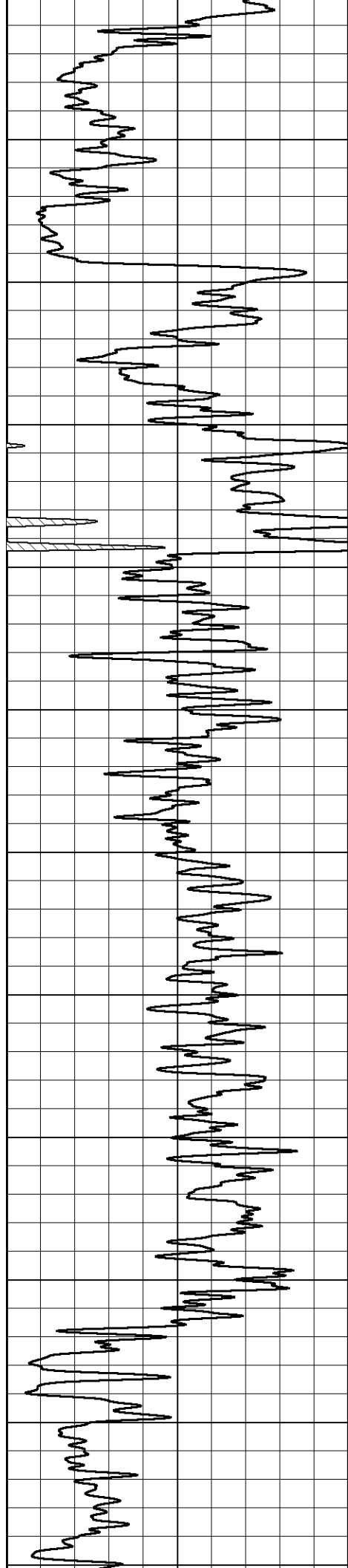
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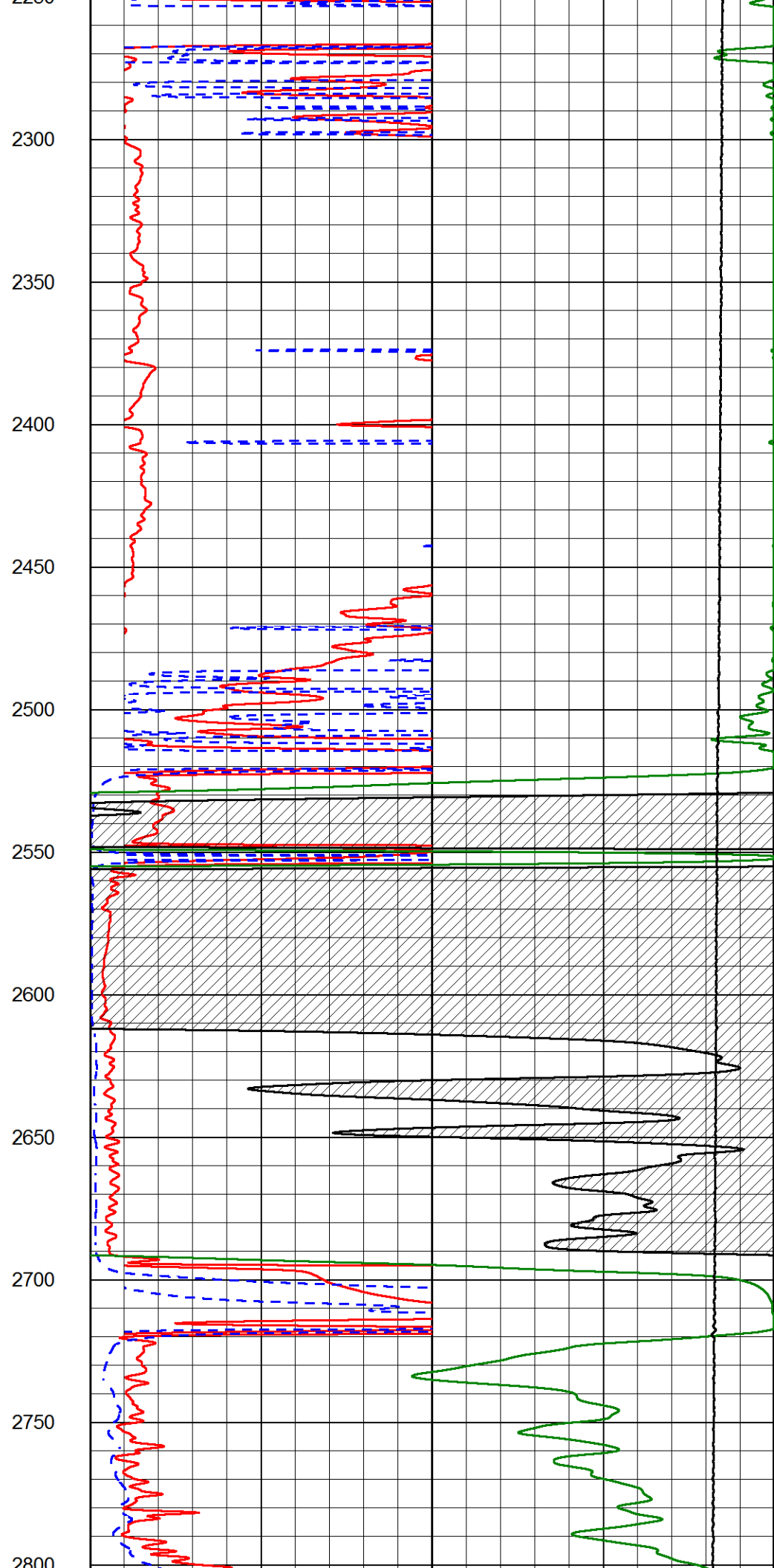
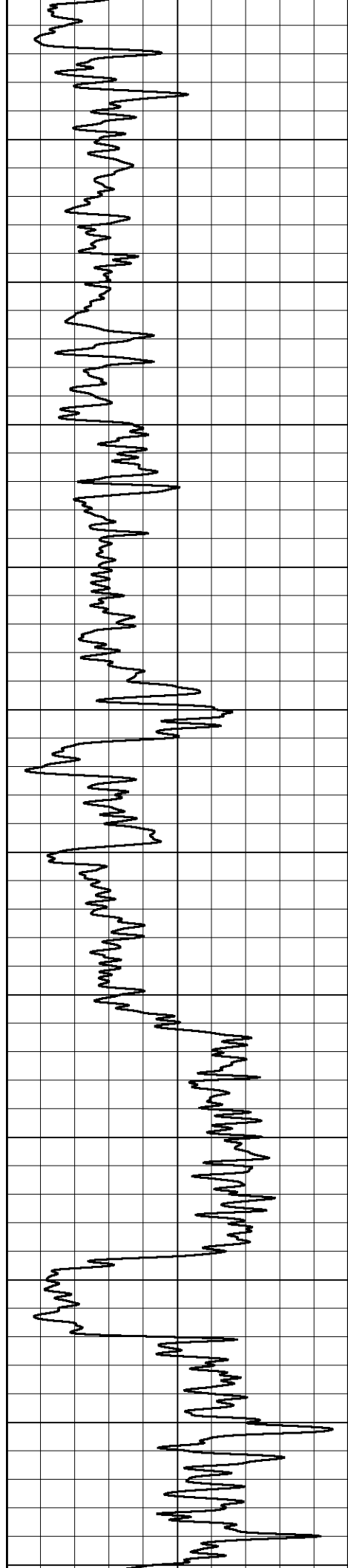


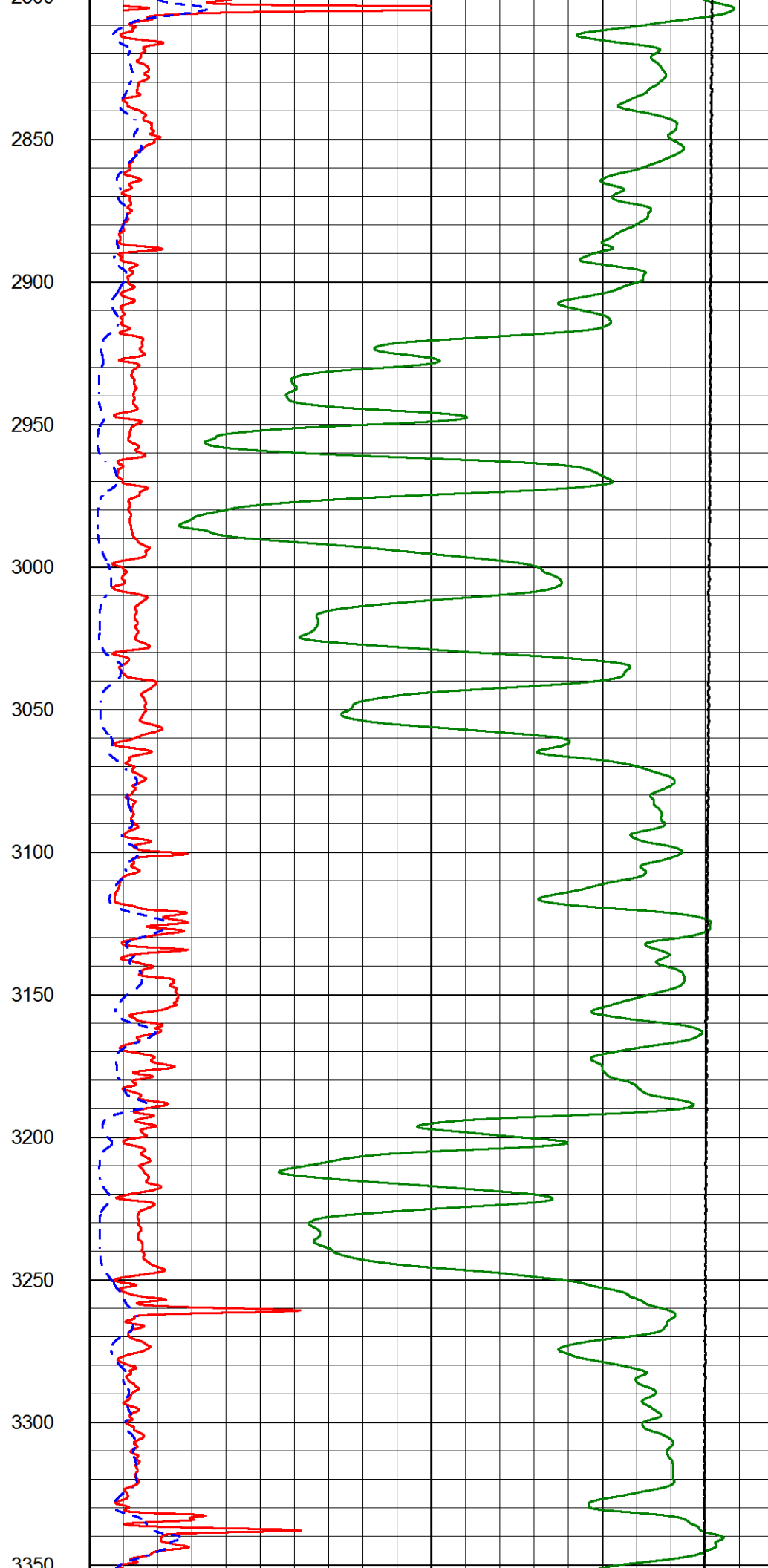
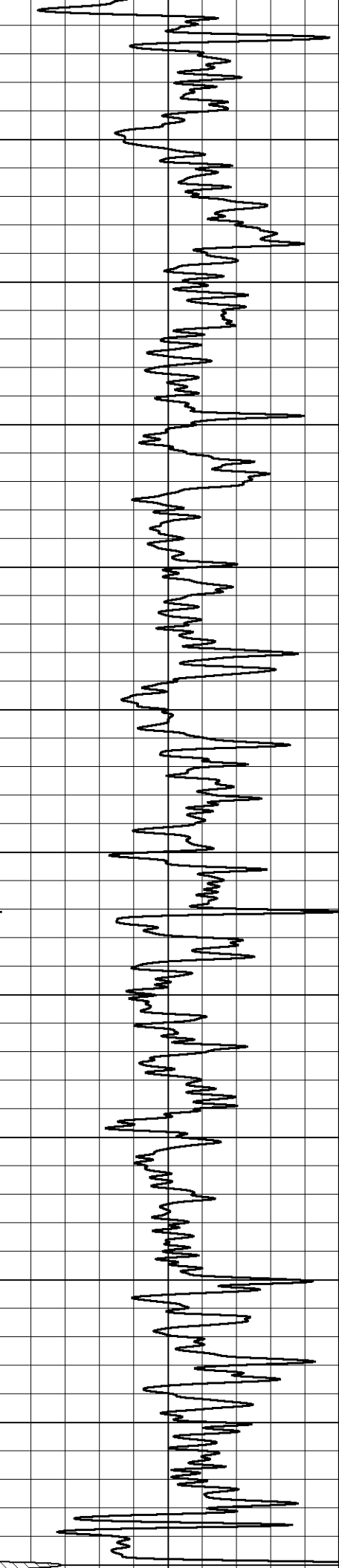


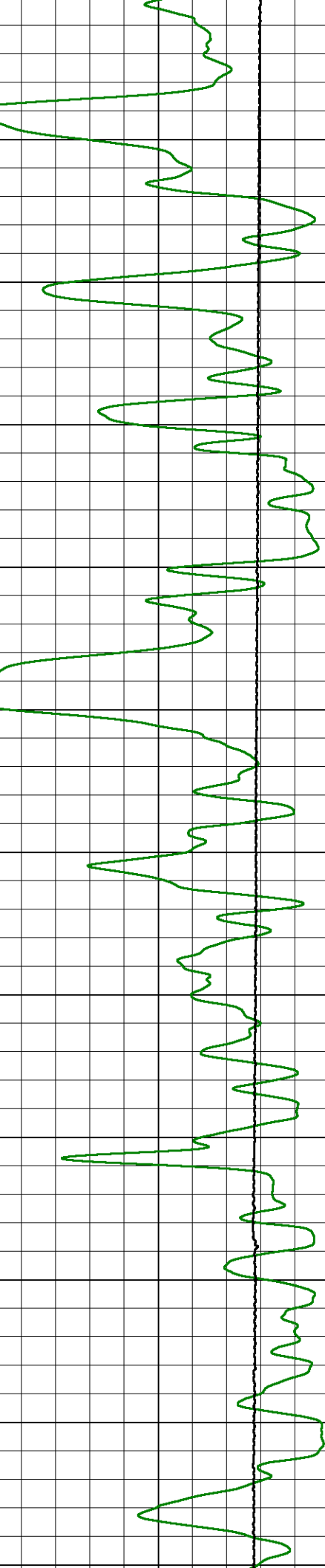
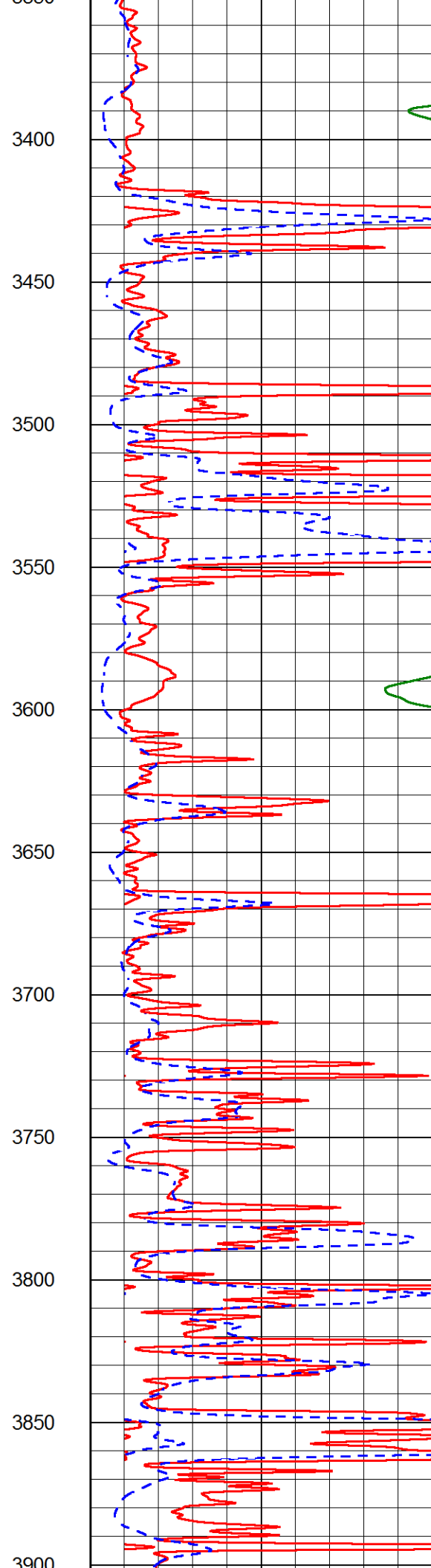
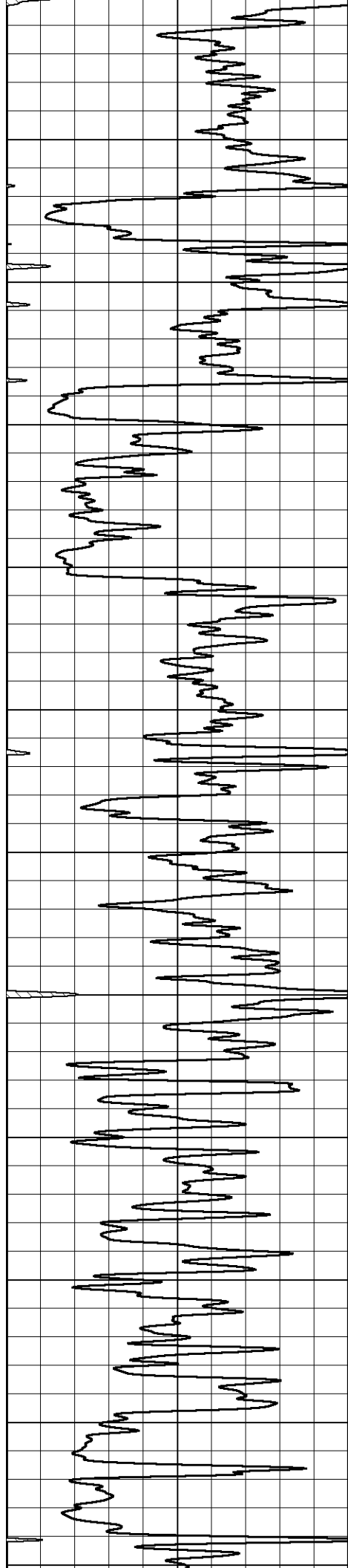
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1650
1700

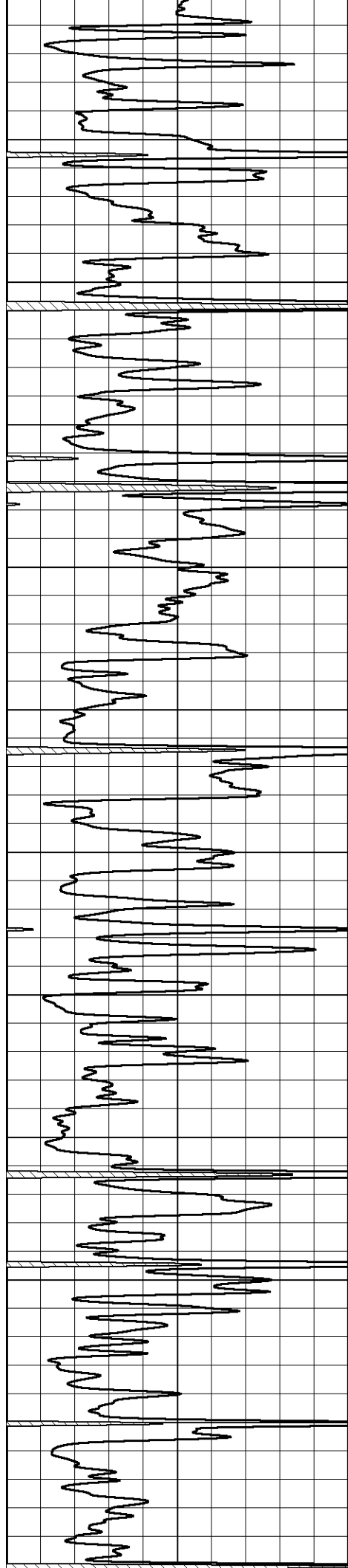




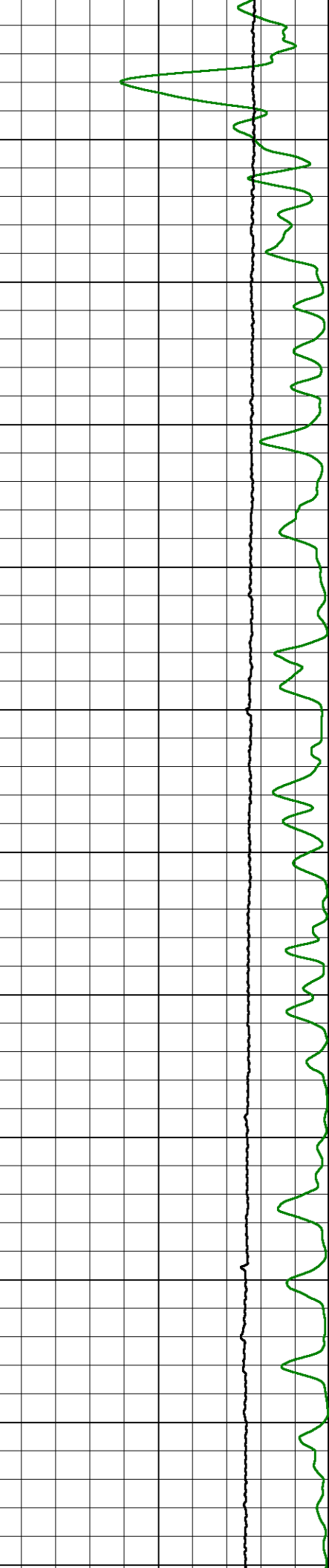
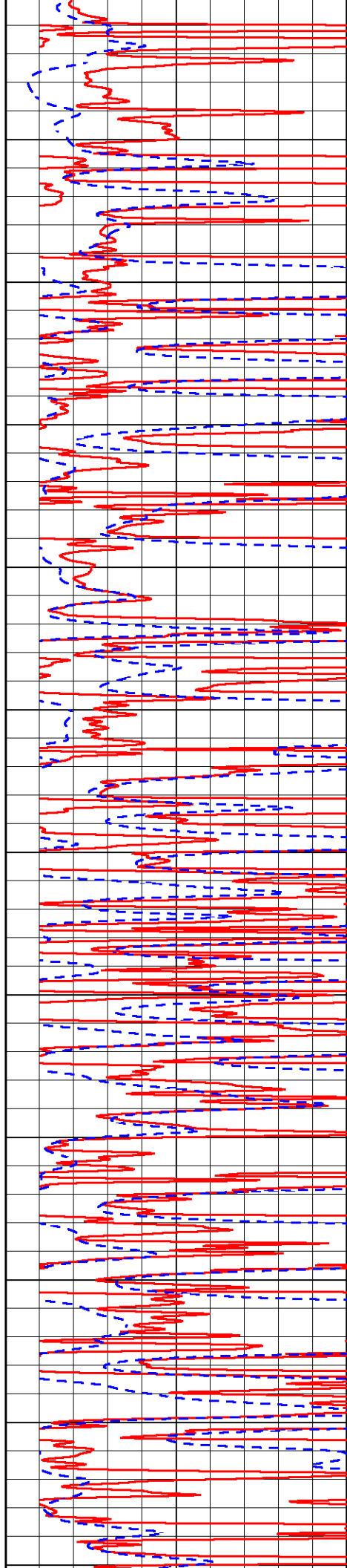


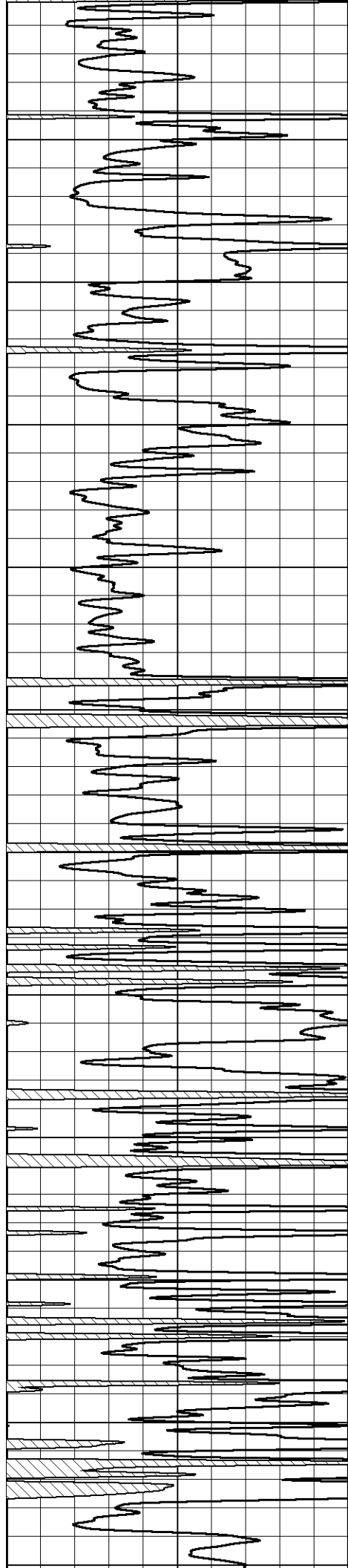




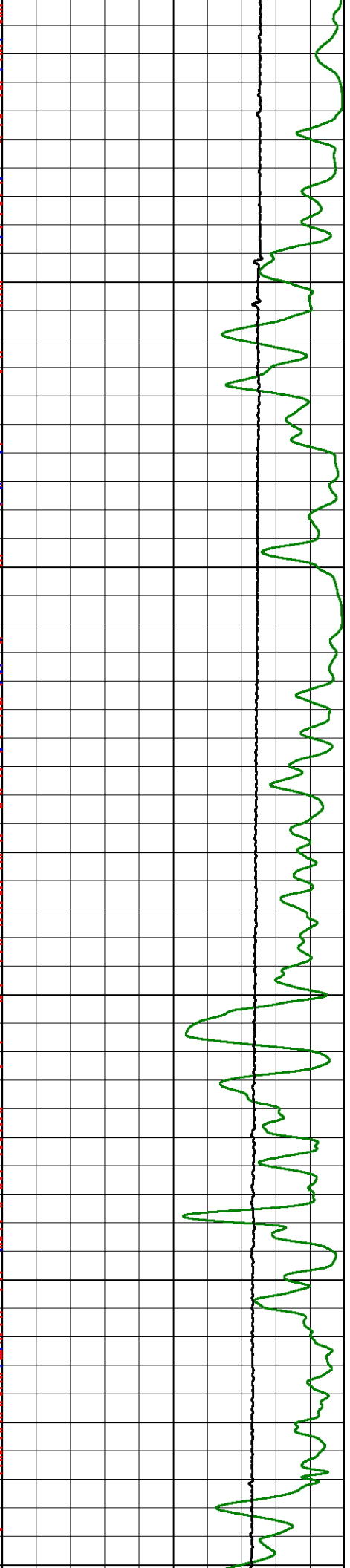
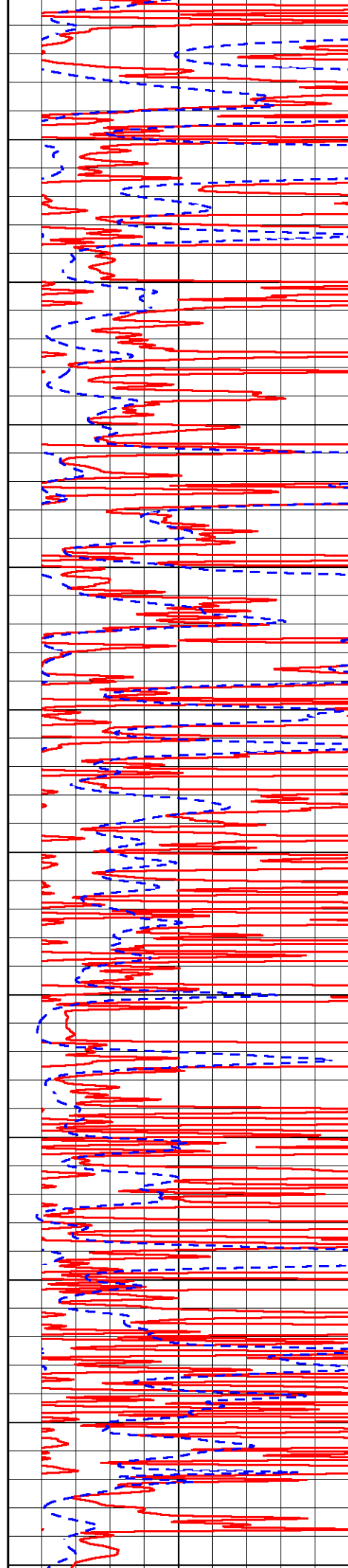


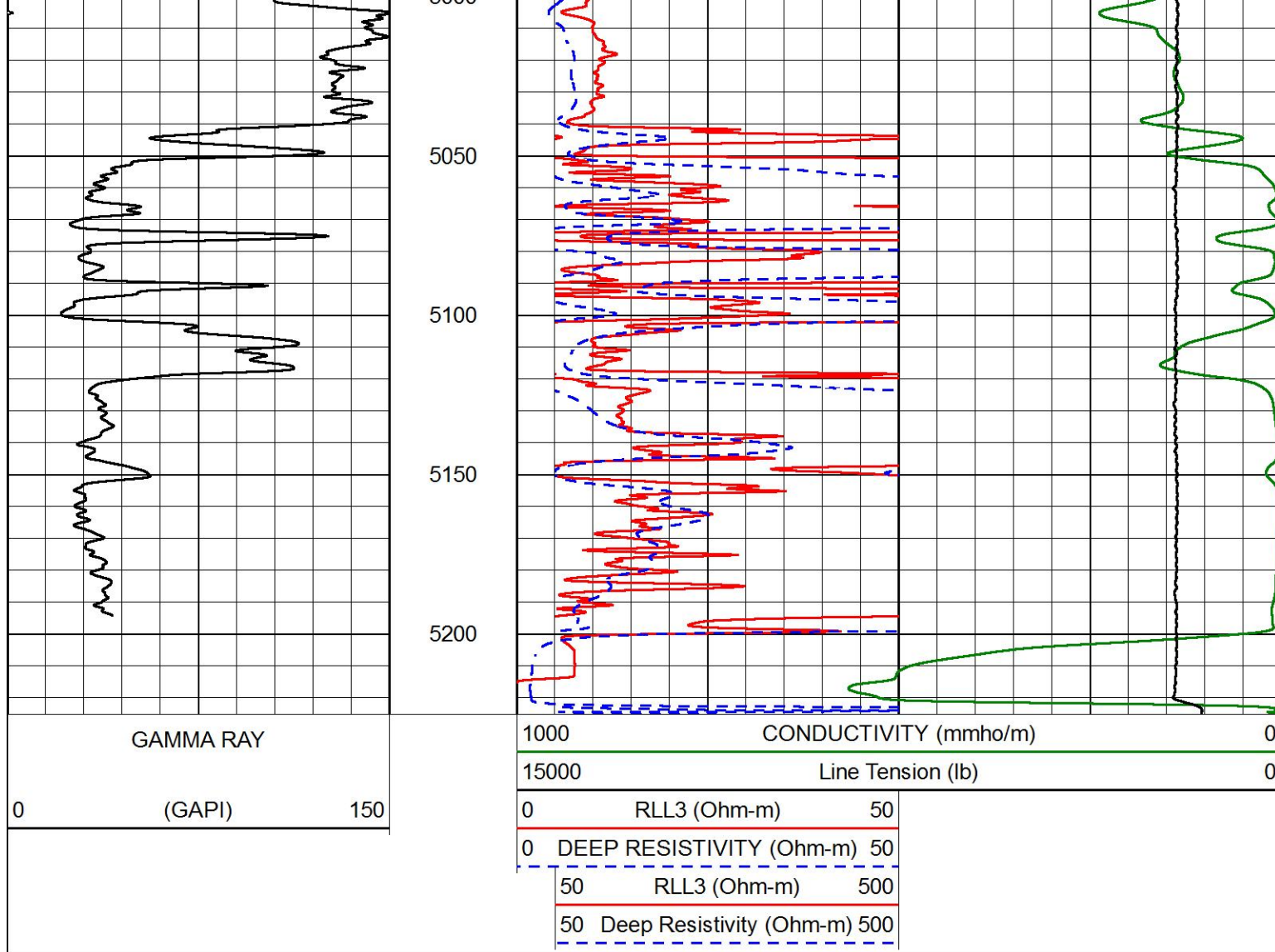
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4300
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4900
4950
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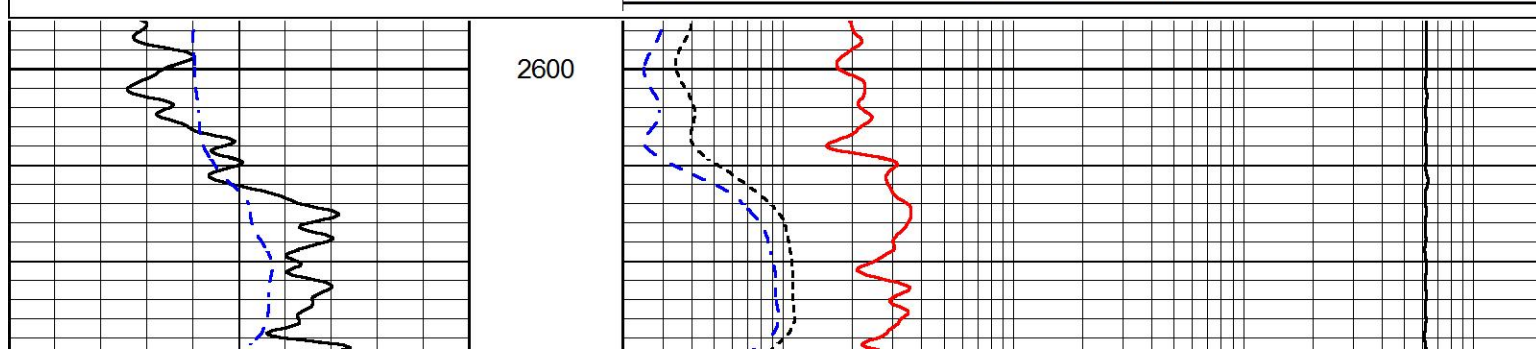


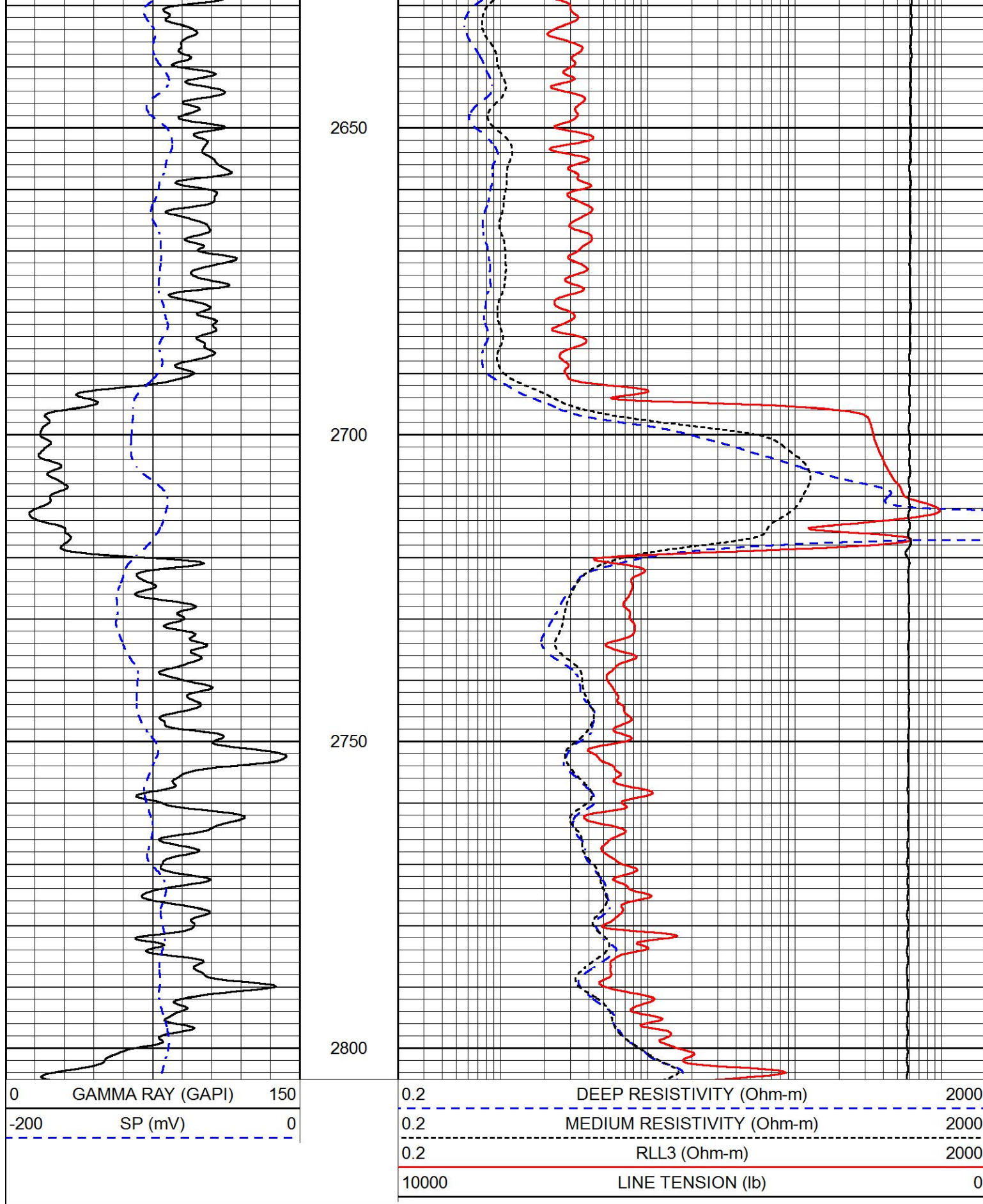


MAIN PASS

Database File	american warrior_sunray 3-12.db
Dataset Pathname	STACK/pass5.1
Presentation Format	dil
Dataset Creation	Mon Oct 08 06:34:19 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	
	10000 LINE TENSION (lb) 0	

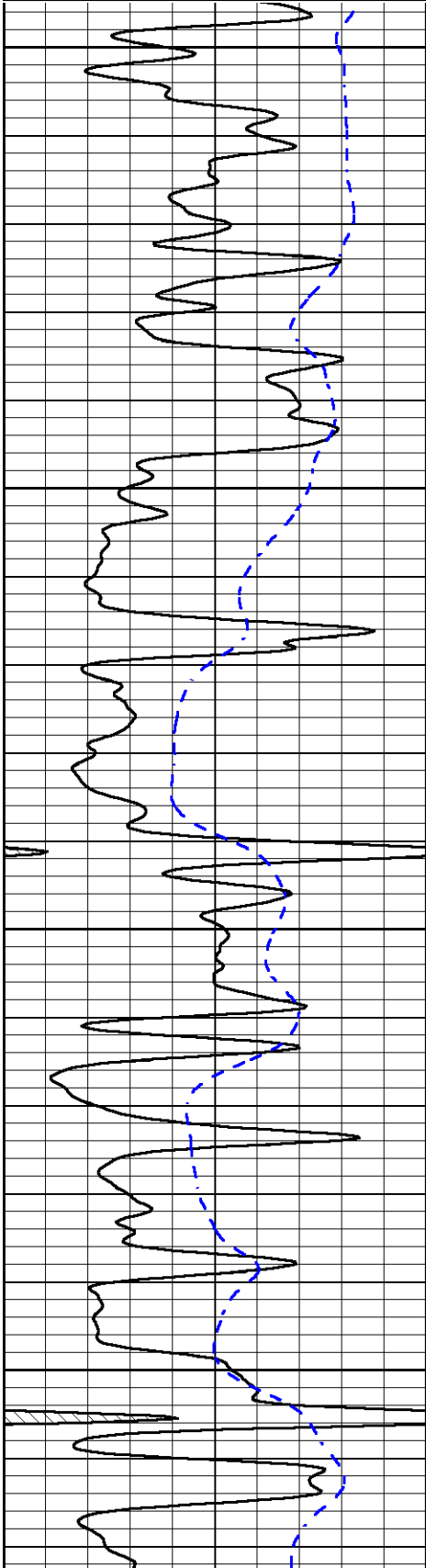




Database File american_warrior_sunray_3-12.db
Dataset Pathname STACK/pass4.1
Presentation Format dil
Dataset Creation Mon Oct 08 06:05:39 2018
Charted by Depth in Feet scaled 1:240

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
10000	LINE TENSION (lb)	0

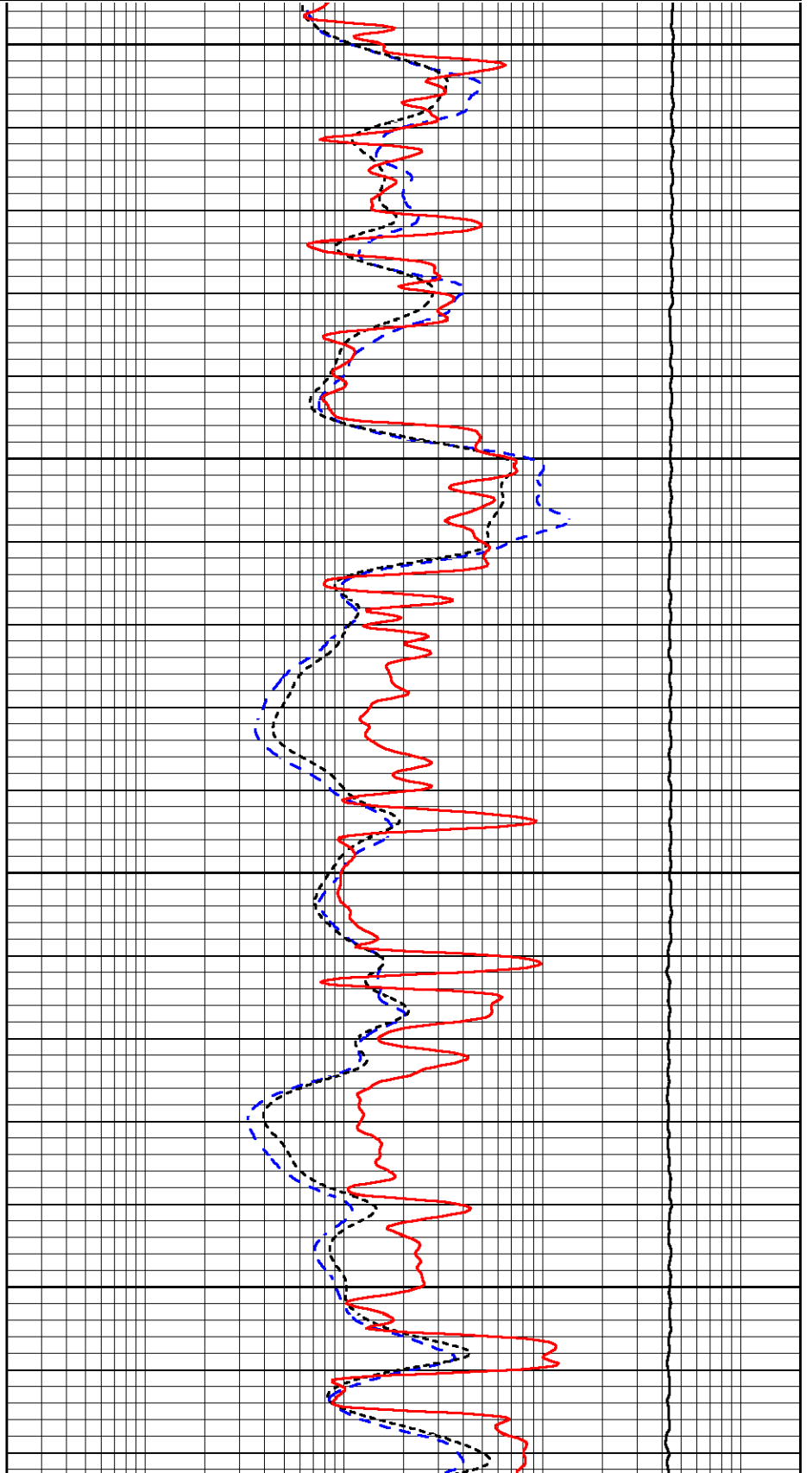


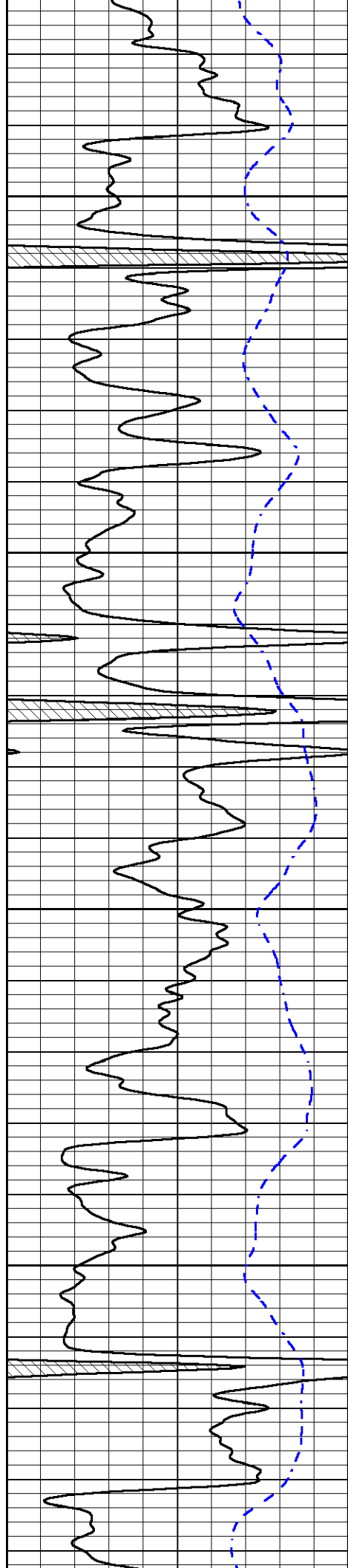
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3900

3950



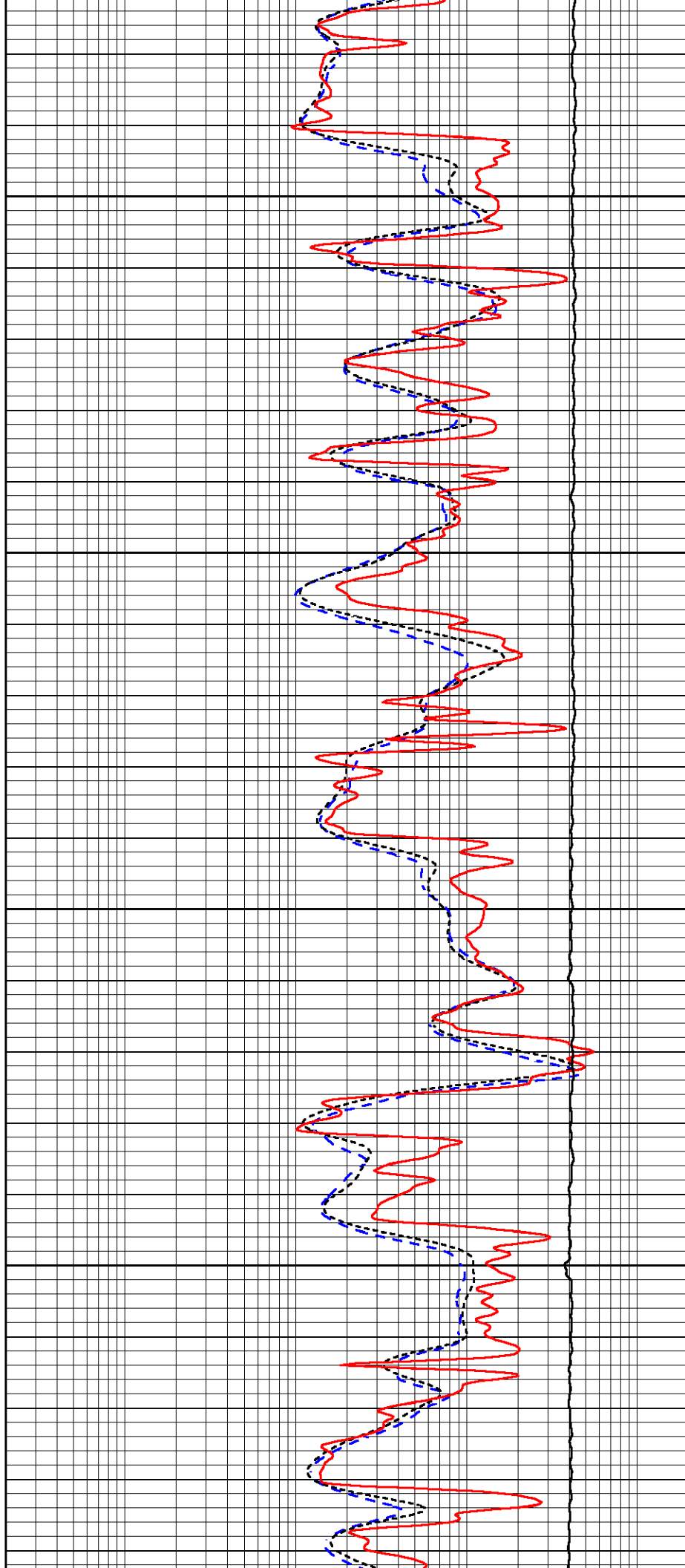


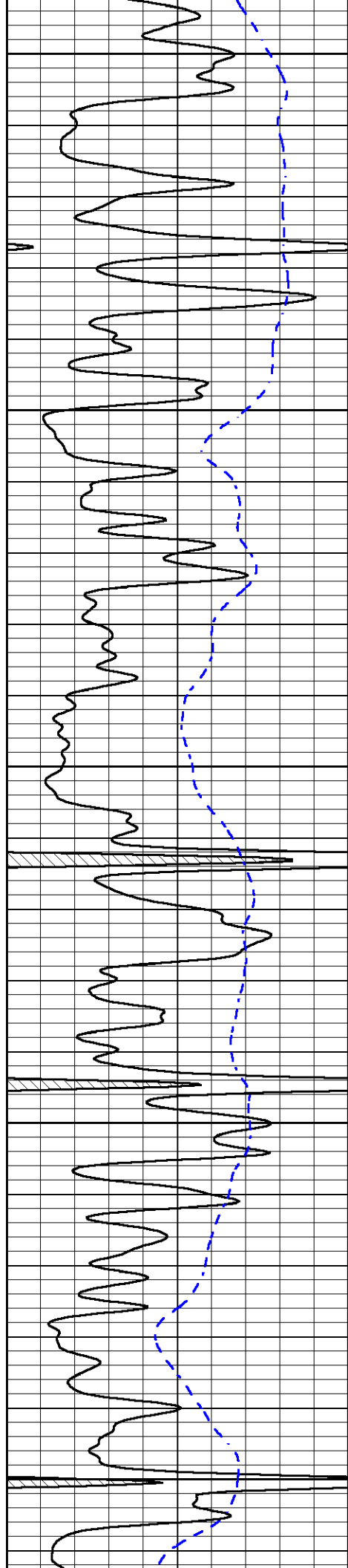
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4050

4100

4150





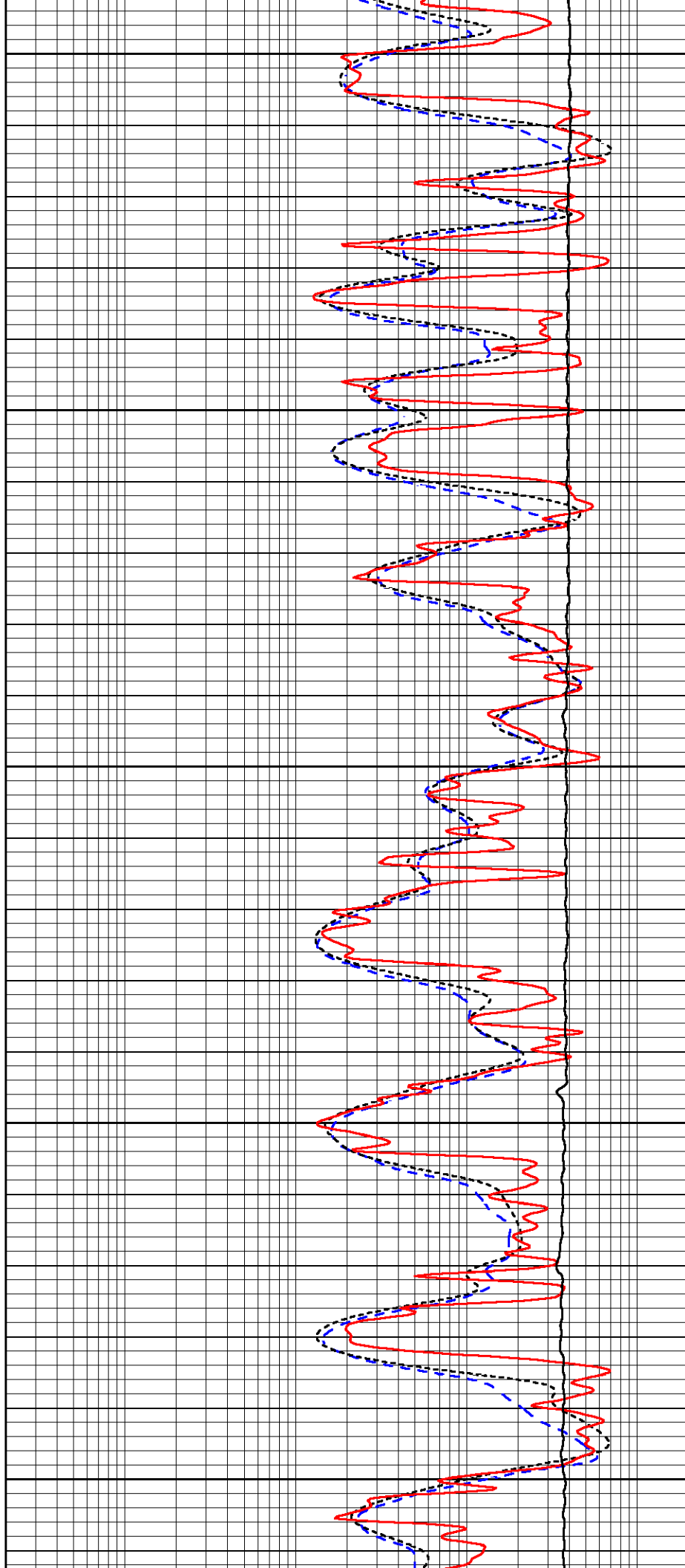
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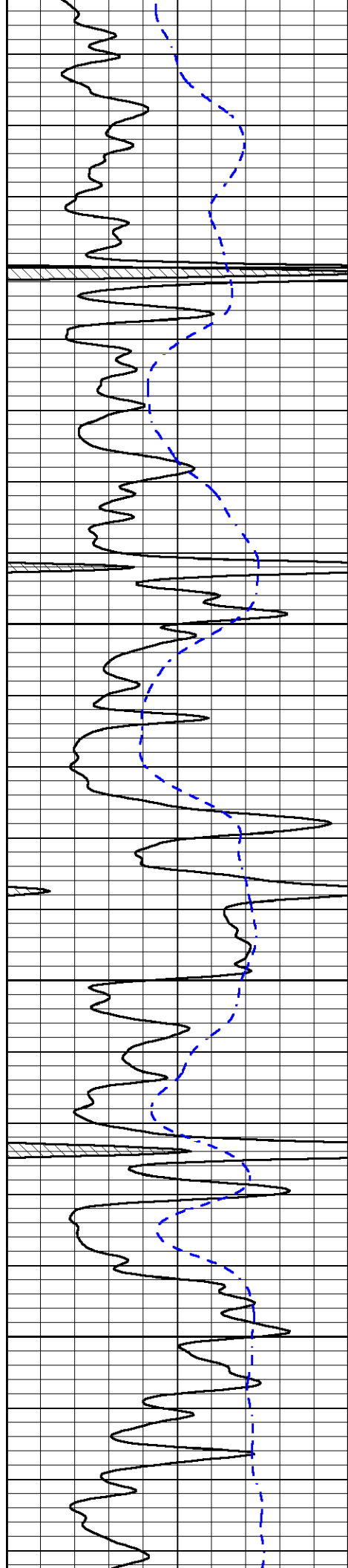
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4400



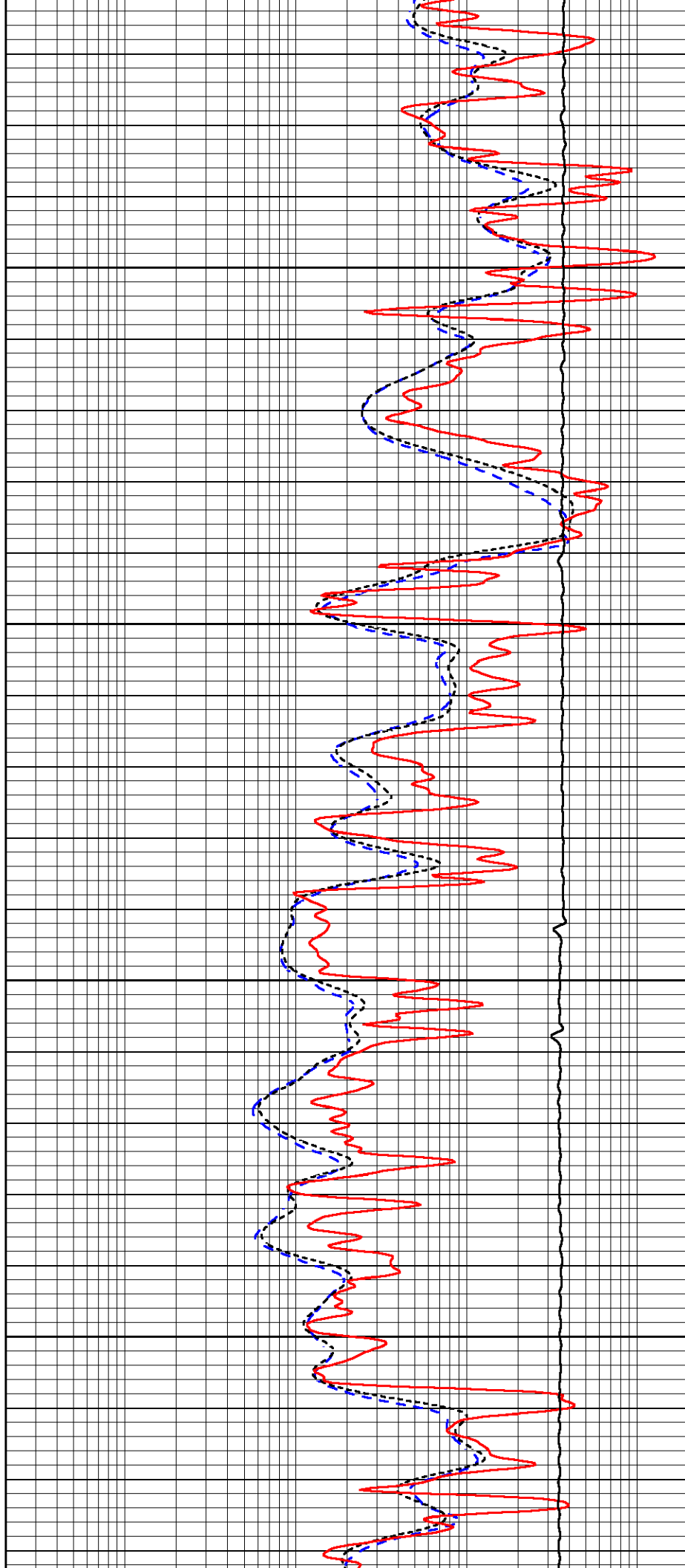


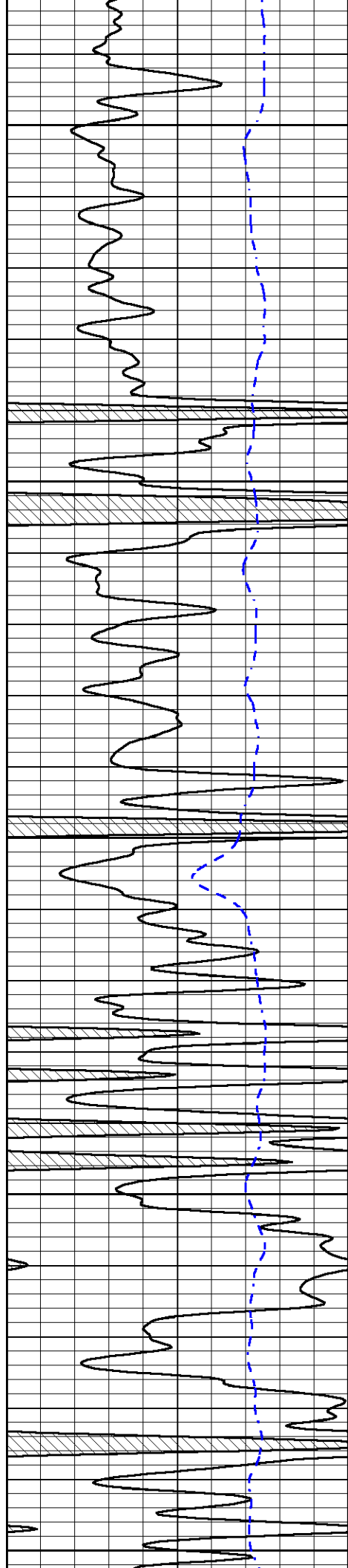
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4600





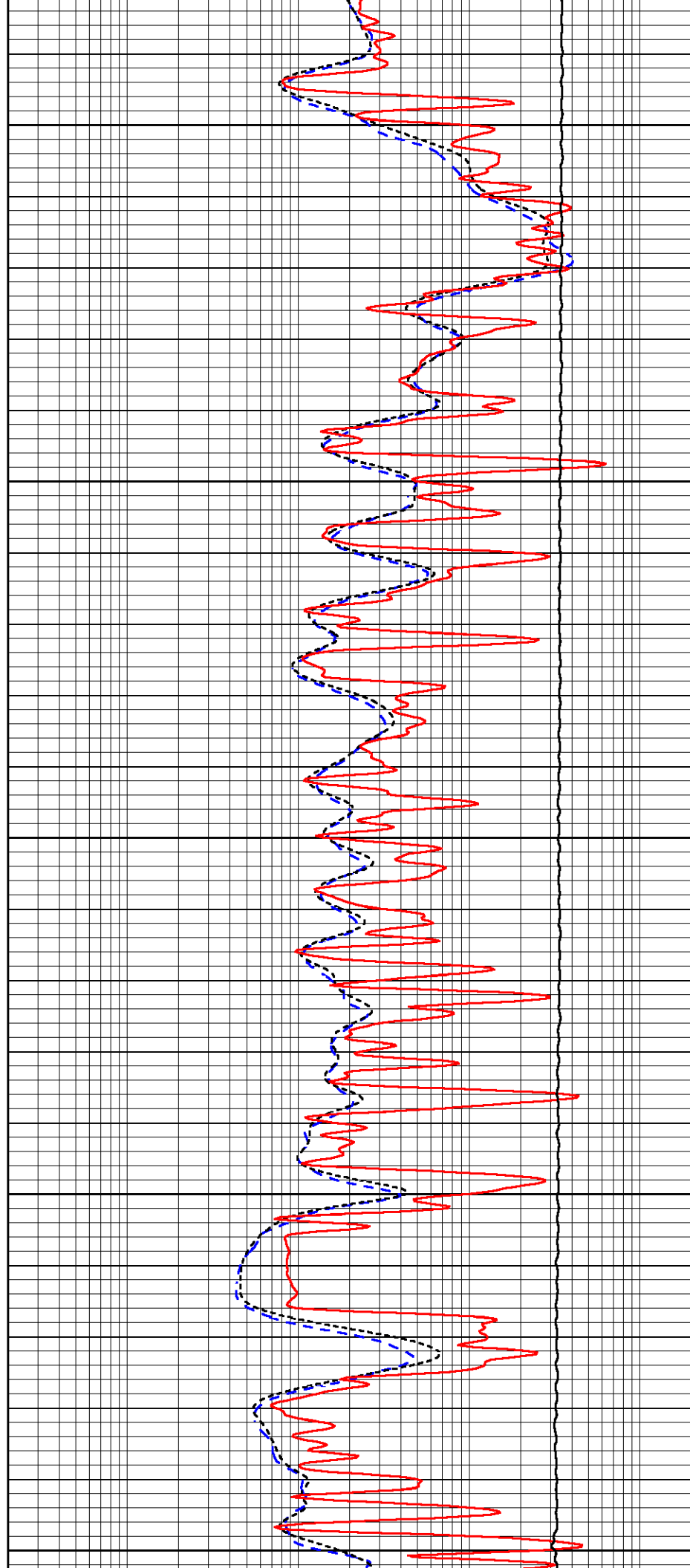
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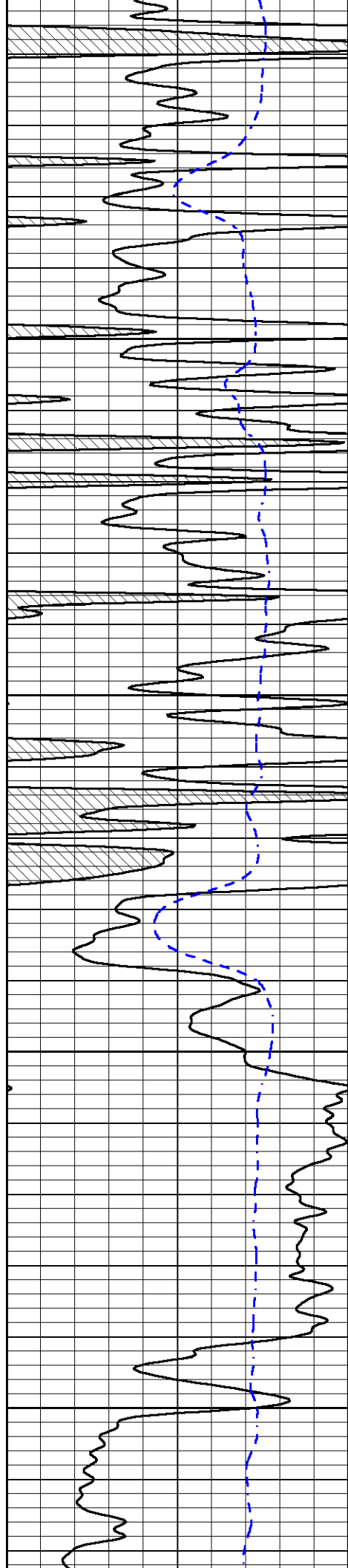
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4800

4850



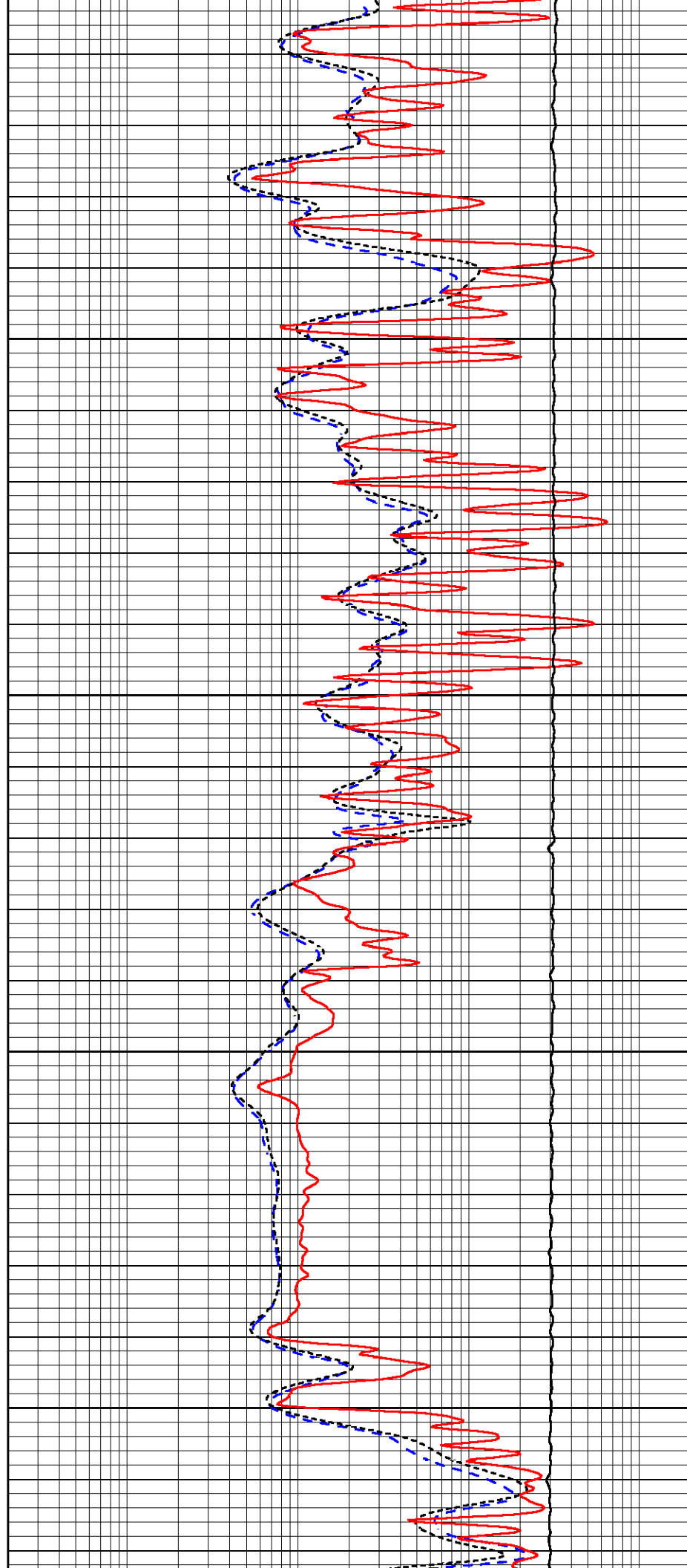


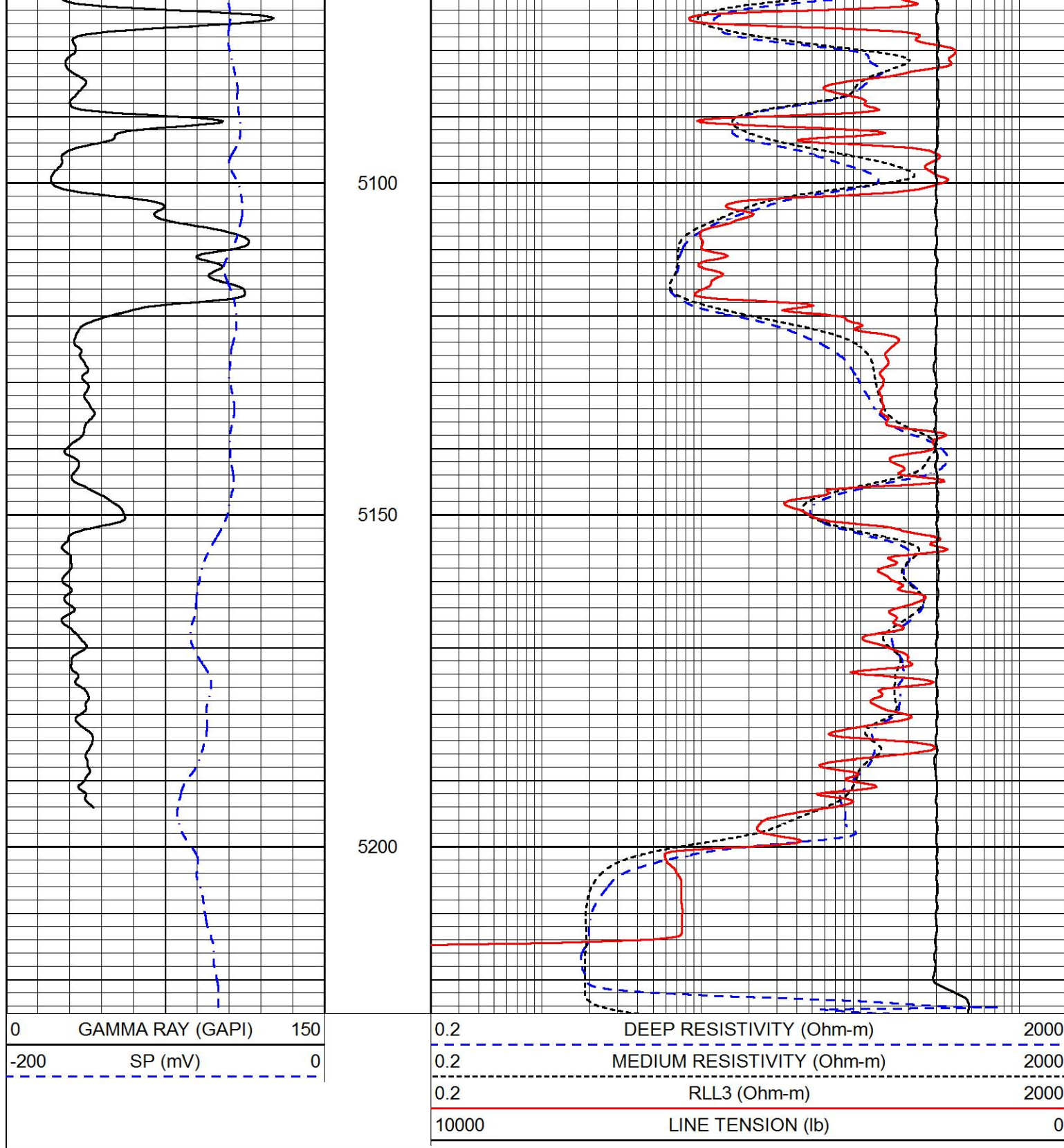
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5050



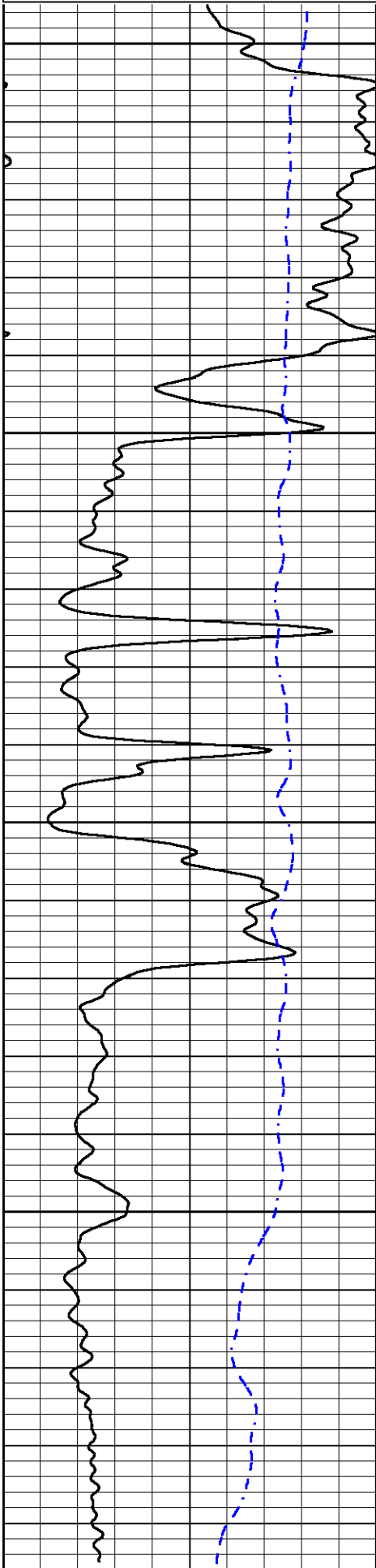


REPEAT SECTION

Database File american_warrior_sunray 3-12.db
Dataset Pathname STACK/pass2.1
Presentation Format dil
Dataset Creation Mon Oct 08 05:50:52 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
10000	LINE TENSION (lb)	0

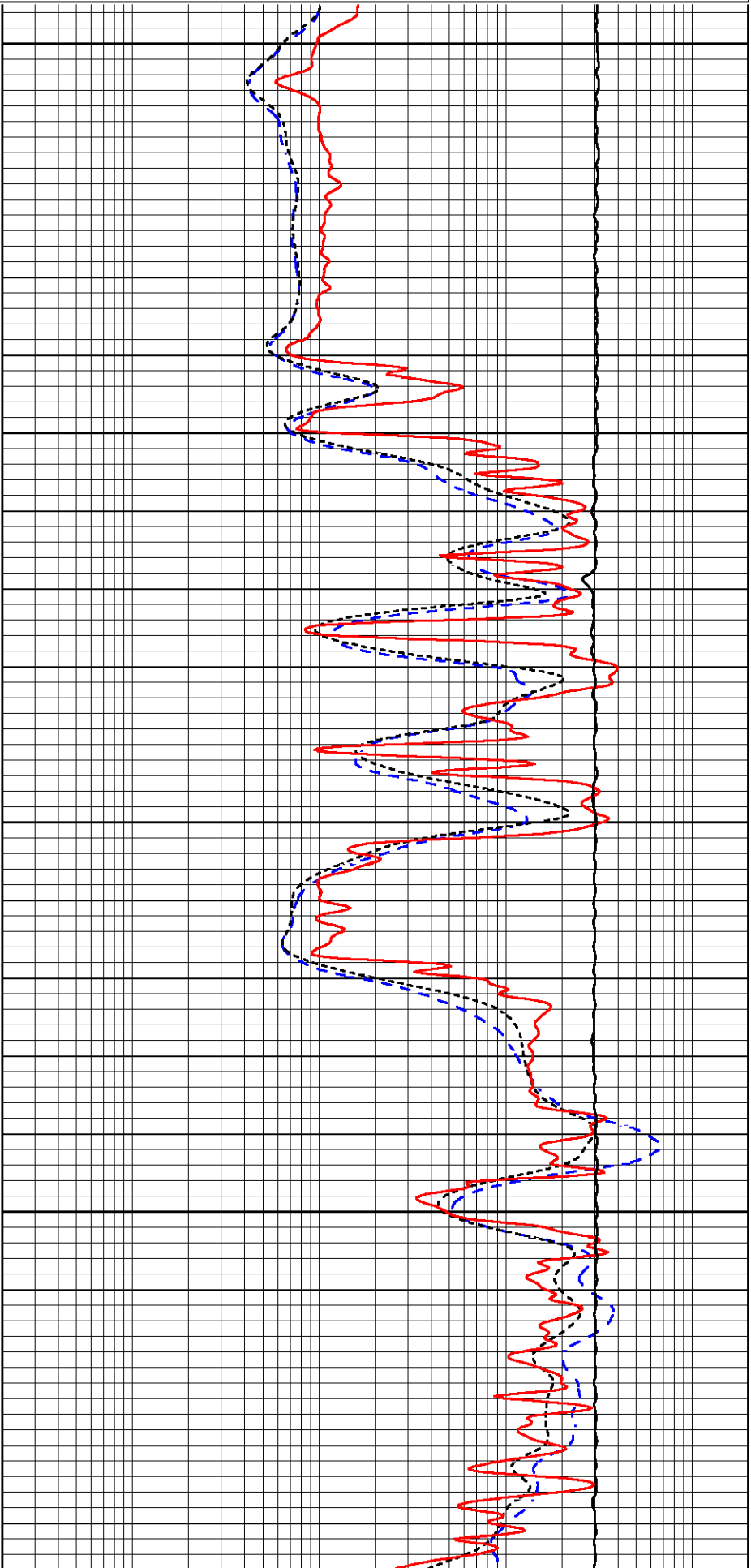


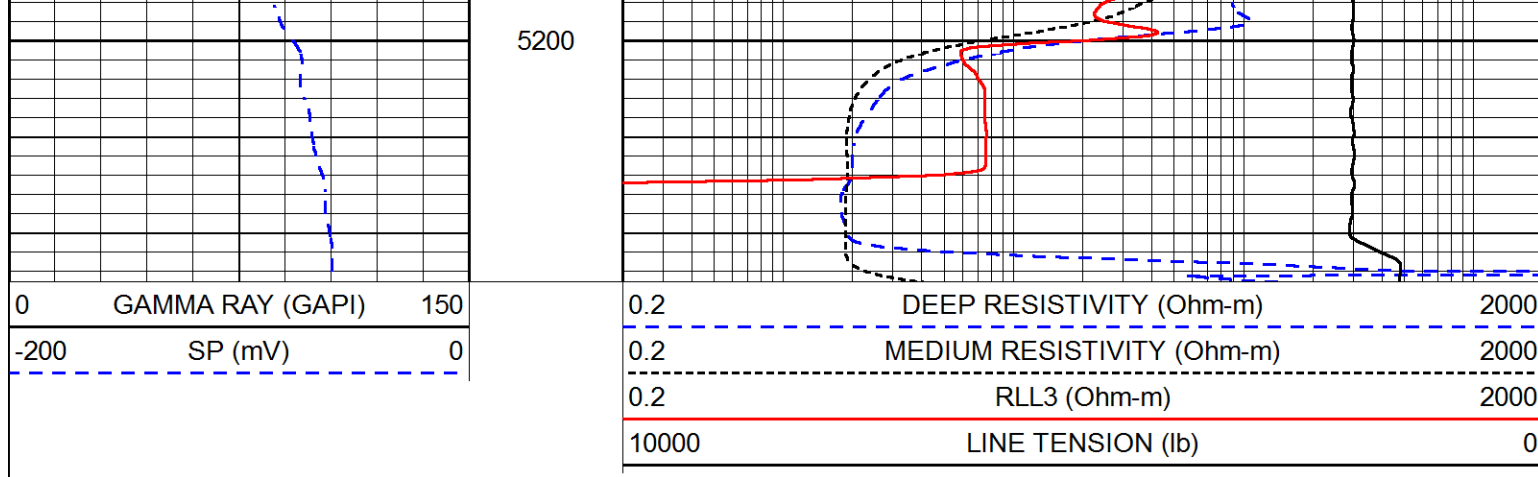
5000

5050

5100

5150





Calibration Report	
Database File	american warrior_sunray 3-12.db
Dataset Pathname	STACK/pass4.1
Dataset Creation	Mon Oct 08 06:05:39 2018

Dual Induction Calibration Report	
Serial-Model:	967 (HT)-PSI HIGH TEMP
Calibration Performed:	Sun Oct 07 19:24:22 2018

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		Gain	Offset
Deep	167.000	835.000	0.000	255.800	mmho/m	0.565	-20.500
Medium	0.000	1348.000	142.000	255.800	mmho/m	0.390	-38.000

Compensated Density Calibration Report	
Serial-Model:	144-84-M&W
Source / Verifier:	16955B / 2ci
Master Calibration Performed:	Thu Aug 30 10:10:19 2018

Master Calibration						
	Density			Far Detector	Near Detector	
Magnesium	1.755	g/cc		4867.47	6031.92	cps
Aluminum	2.670	g/cc		906.23	3806.99	cps
Spine Angle = 74.69			Density/Spine Ratio = 0.525			
	Size			Reading		
Small Ring	5.00	in		0.70		
Large Ring	15.00	in		0.04		

Compensated Neutron Calibration Report	
Serial Number:	207-MW
Tool Model:	M&W
Calibration Performed:	FRI AUG 24 10:30:30 2018

Detector	Readings	Target	Normalization
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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	
Tool Model:	M&W	
Calibration Performed:	Fri Aug 24 11:16:10 2018	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	0.6000	GAPI/cps



Company	AMERICAN WARRIOR, INC.
Well	SUNRAY #3-12
Field	UNNAMED
County	GREELEY
State	KANSAS