



DUAL INDUCTION LOG

Company RITCHEE EXPLORATION, INC.
 Well VMW LAND 16C NO.1
 Field WILDCAT
 County WICHITA
 State KANSAS

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 Well VMW LAND 16C NO.1
 Field WILDCAT
 County WICHITA State KANSAS

Location: API #: 15-203-20313-00-00
 1400' FSL & 695' FWL
 SEC 16 TWP 16S RGE 38W
 Permanent Datum GROUND LEVEL Elevation 3447'
 Log Measured From KELLY BUSHING
 Drilling Measured From KELLY BUSHING
 Other Services CNL/CDL
 Elevation K.B. 3452'
 D.F. N/A
 G.L. 3447'

Date	3/20/17
Run Number	ONE
Depth Driller	5120'
Depth Logger	5119'
Bottom Logged Interval	5118'
Top Log Interval	200'
Casing Driller	8.625" @ 229'
Casing Logger	226'
Bit Size	7.875"
Type Fluid in Hole	CHEMICAL
Salinity, ppm CL	6,500
Density / Viscosity	9.3 57
pH / Fluid Loss	10.0 9.6
Source of Sample	FLOWLINE
Rm @ Meas. Temp	.65 @ 72
Rmt @ Meas. Temp	.49 @ 72
Rmc @ Meas. Temp	.88 @ 72
Source of Rmf / Rmc	CHARTS
Rm @ BHT	.37 @ 127
Operating Rig Time	2 HOURS
Max Rec. Temp. F	127 DEGF
Equipment Number	108
Location	HAYS
Recorded By	J. HENRICKSON
Witnessed By	JOHN GOLDSMITH

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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.
 RUSSELL SPRINGS KANSAS
 SOUTH ON HWY 25 TO D ROAD, 10 WEST, 1/4 NORTH, EAST INTO

Log Measured From: KELLY BUSHING 5 Ft. Above Permanent Datum

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

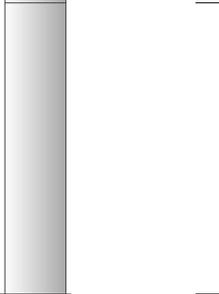
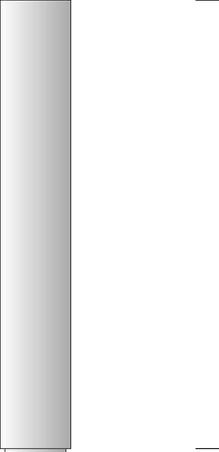
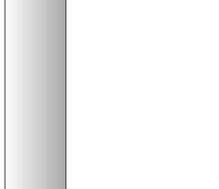
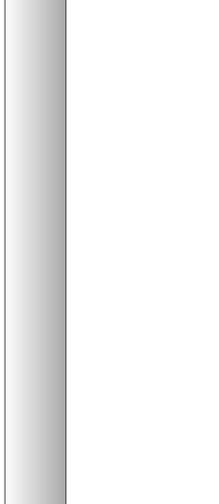
Your Pioneer Energy Services Crew Engineer: J. HENRICKSON Operator: C. PFEIFER Operator: Operator:	This Log Record Was Witnessed By Primary Witness: JOHN GOLDSMITH Secondary Witness: Secondary Witness: Secondary Witness:
----------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------

Log Variables

DatabaseC:\ProgramData\Warrior\Data\ritchie_vmw_land_16c_1.db
 Dataset field/well/STACK/pass3.1/_vars_

Top - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	127	5.5	0	1	2	2.71
NPORSEL	PERFS	SNDERR mmho/m	SNDERRM mmho/m	SPSHIFT mV	SRFTEMP degF	SZCOR	TDEPTH ft
Limestone	0	0	0	-370	76	Off	5119

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	33.00		GR-M&W (89-M&W)	3.00	3.50	50.00
CNLSC CNSSC	29.90 29.15		CNT-M&W (tk10-MW)	5.50	3.50	100.00
LSD DCAL SSD	20.85 20.83 20.35		CDL-M&W (168-986)	8.50	4.00	250.00
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

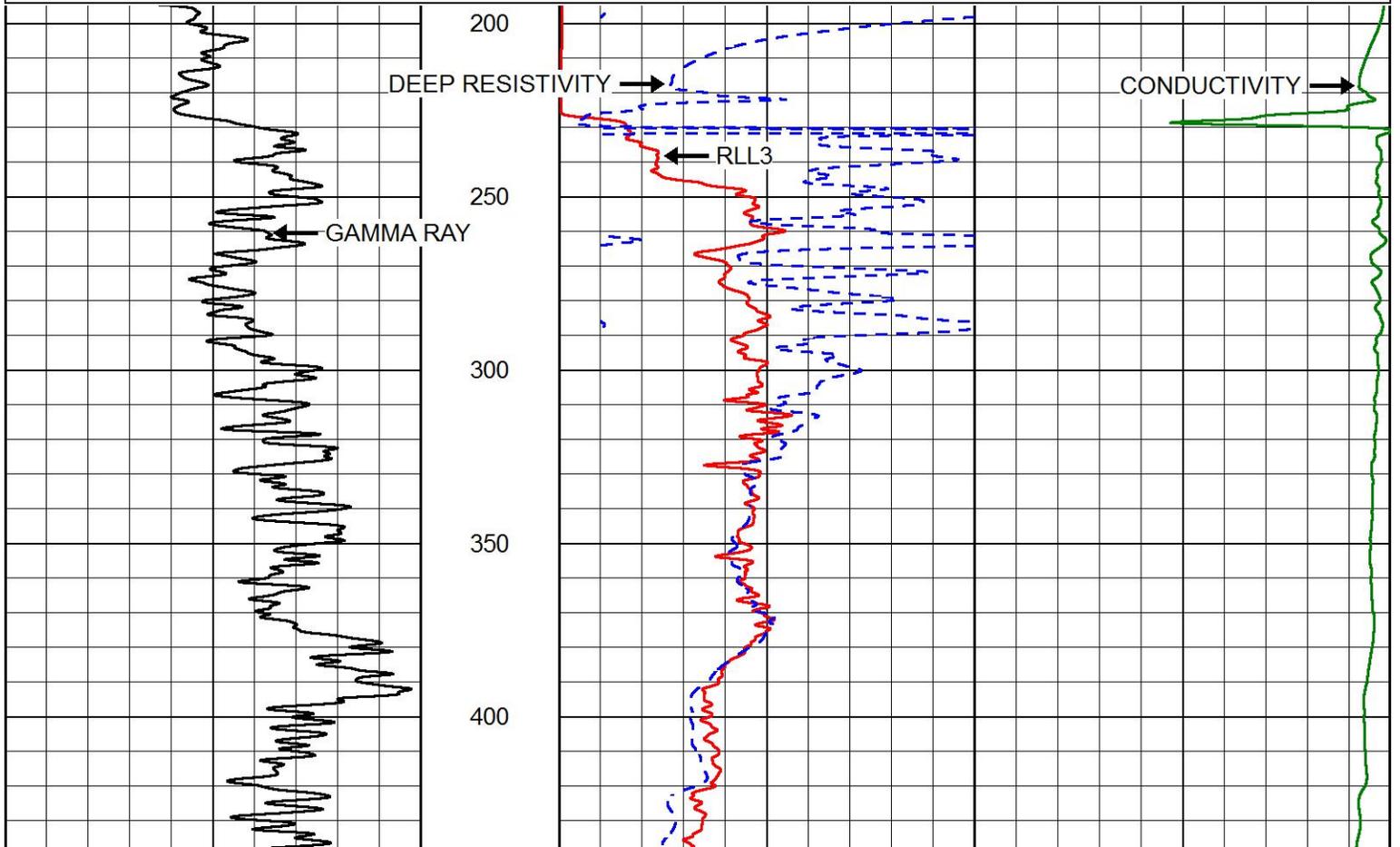
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 Total weight: 620.00 lb
 O.D.: 4.00 in

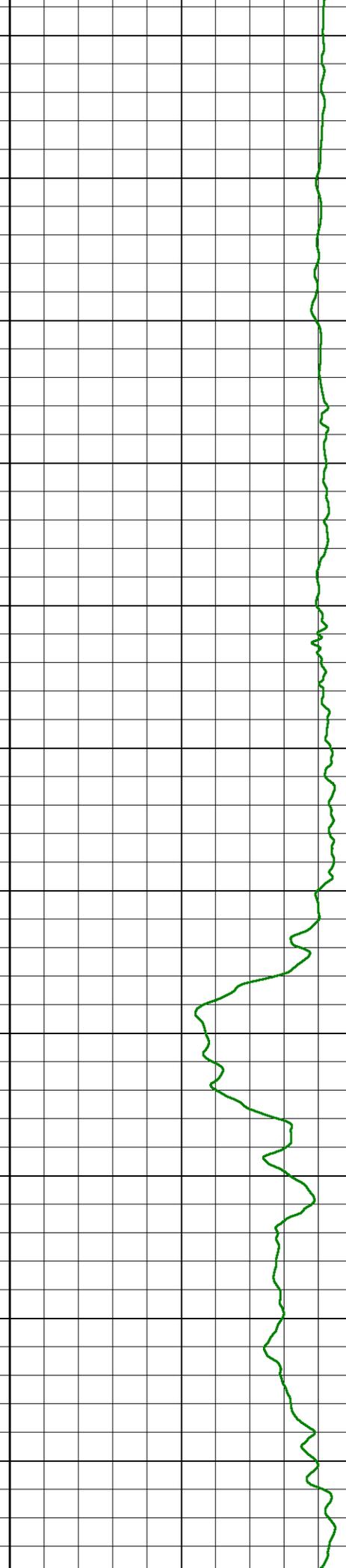
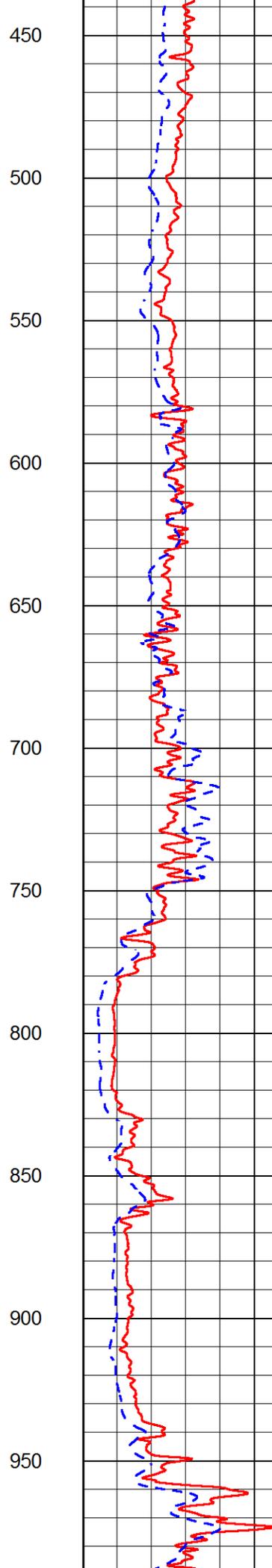
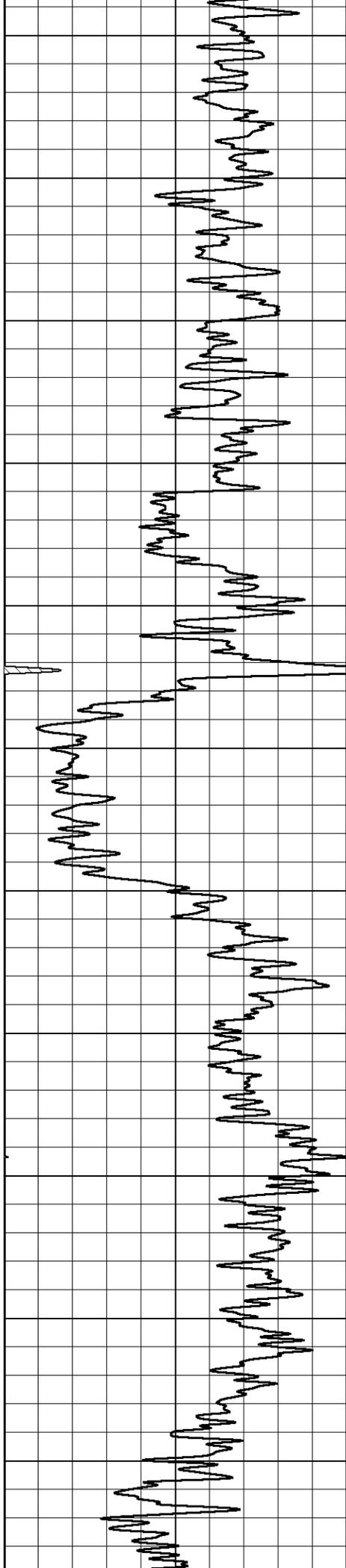


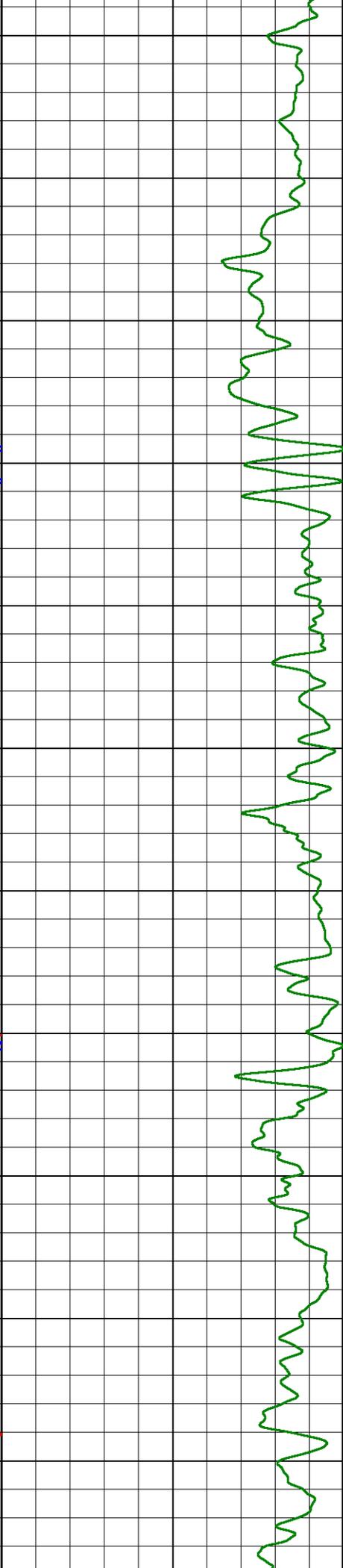
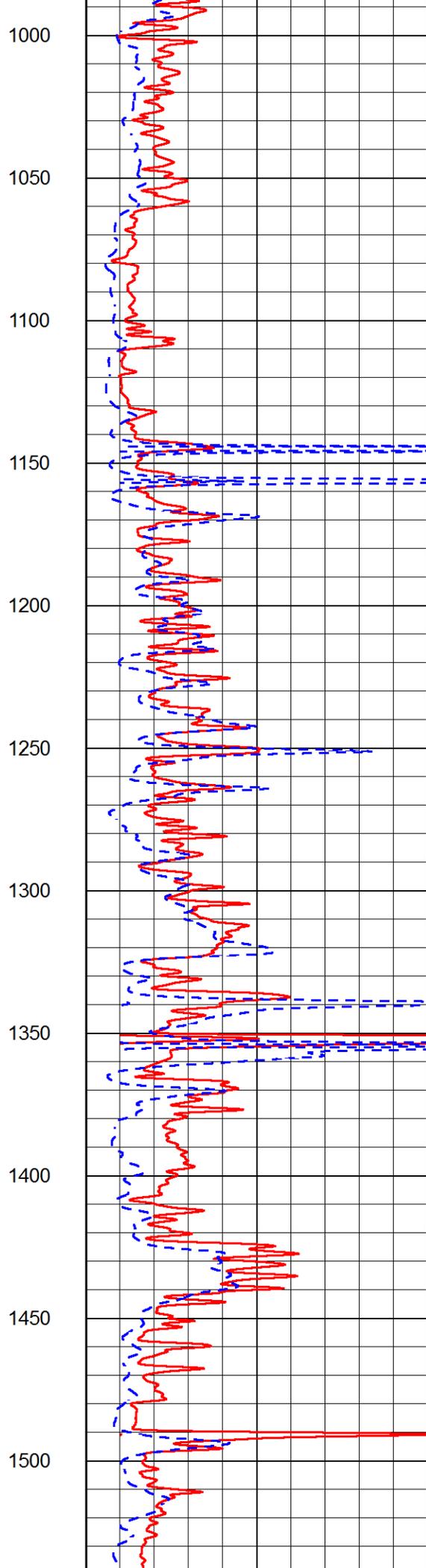
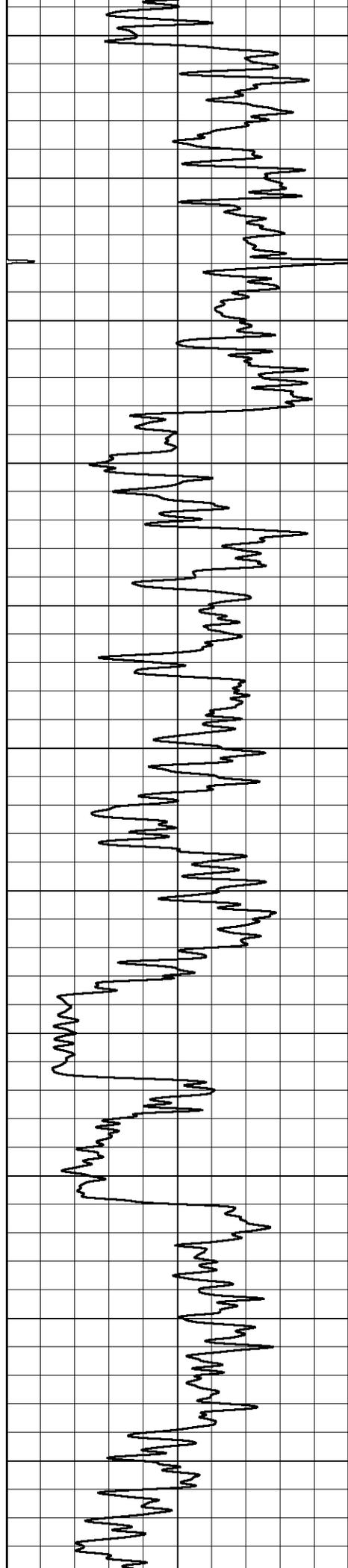
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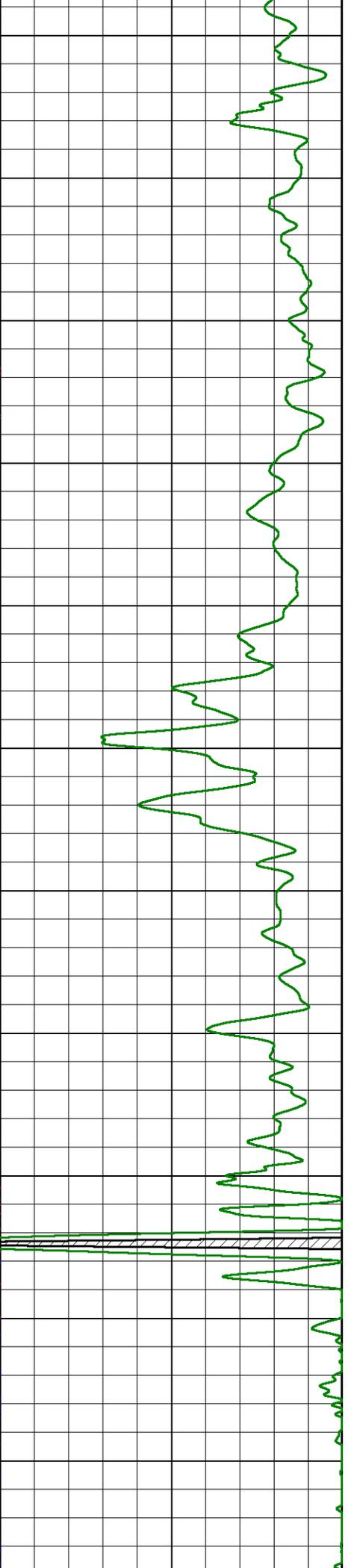
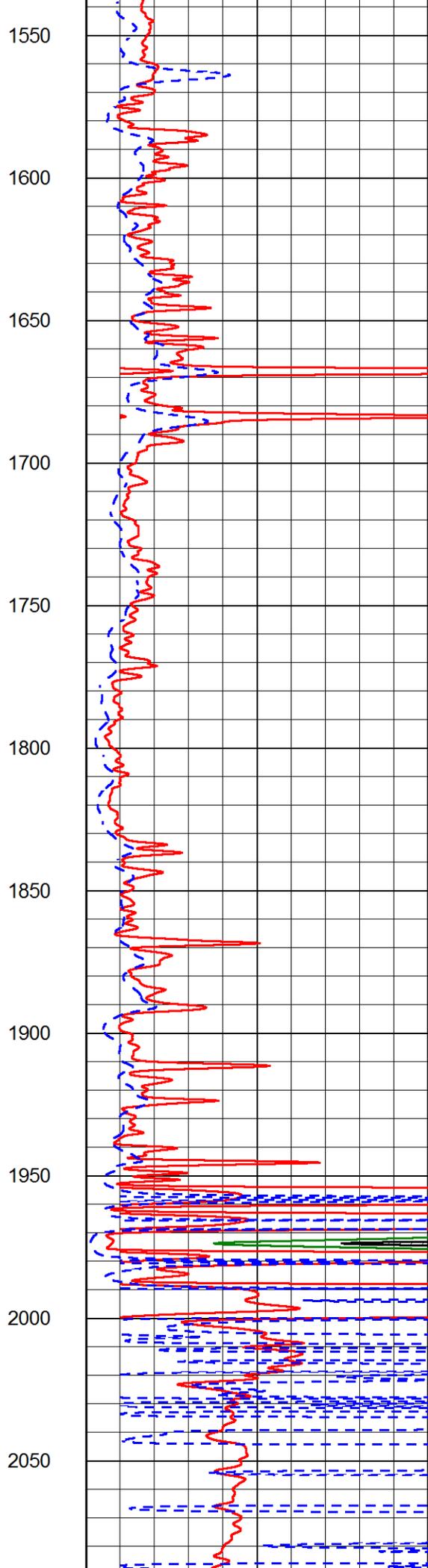
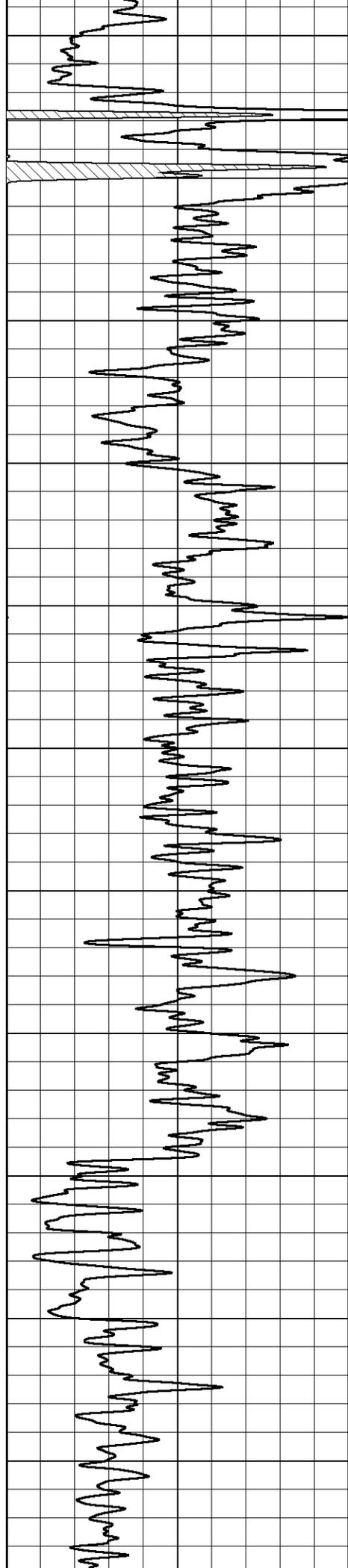
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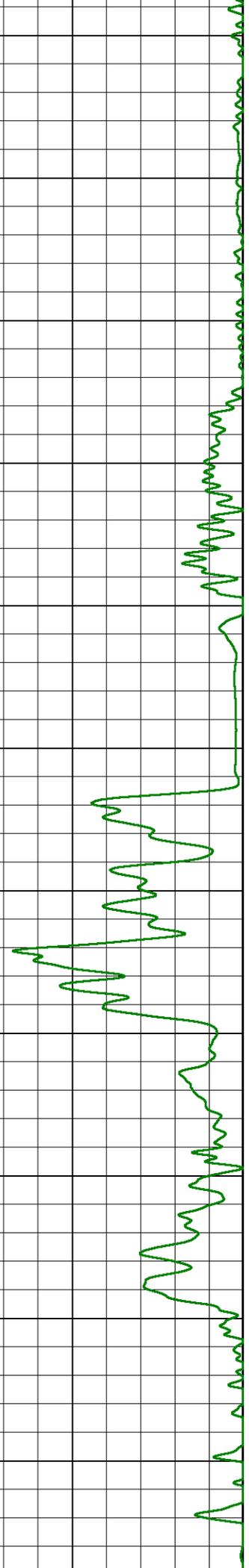
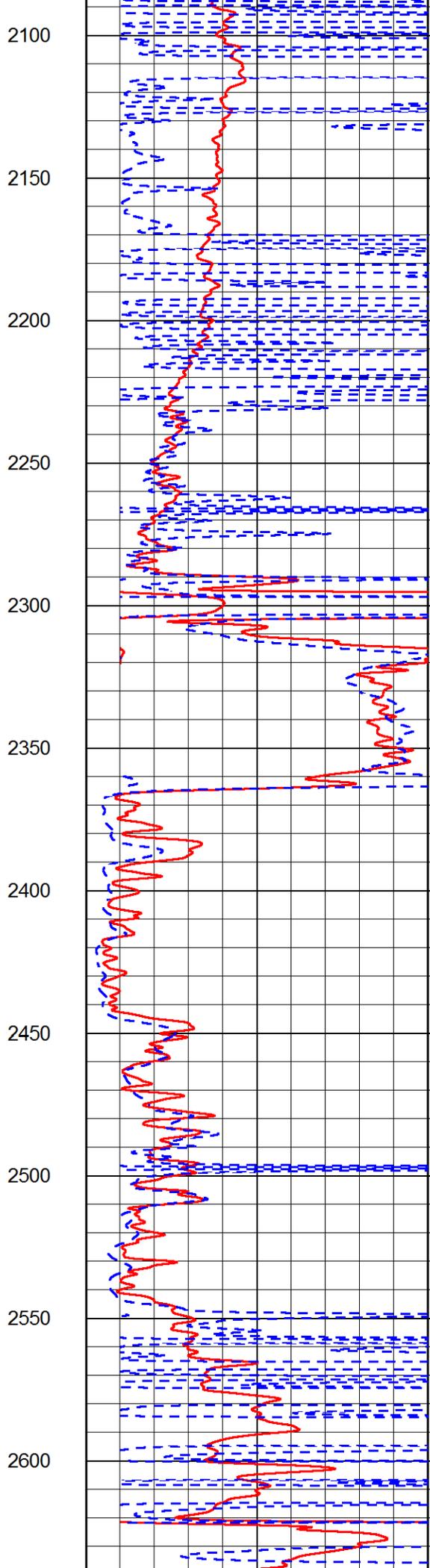
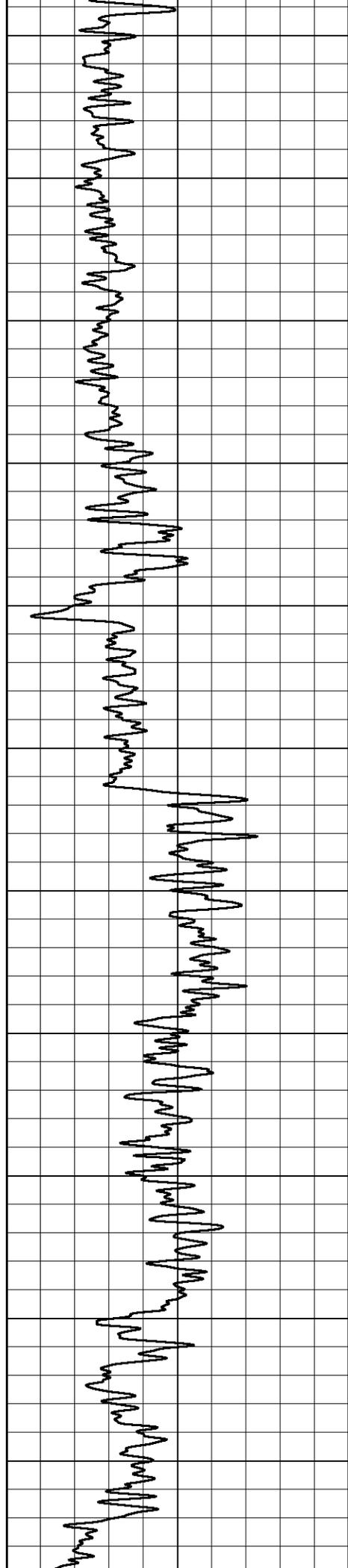
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			0	RLL3 (Ohm-m)	50
			0	DEEP RESISTIVITY (Ohm-m)	50
			50	RLL3 (Ohm-m)	500
				DEEP RESISTIVITY	
			50	(Ohm-m)	500

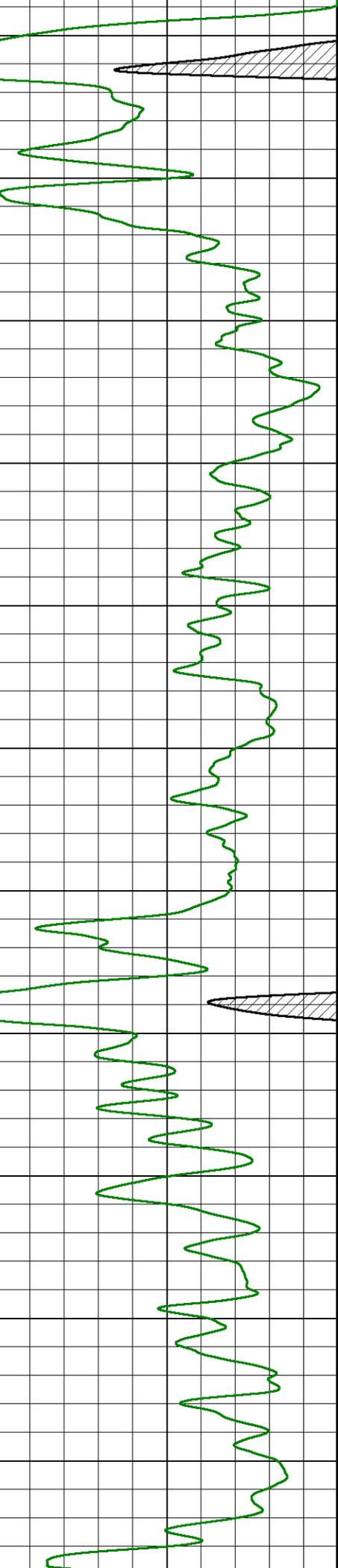
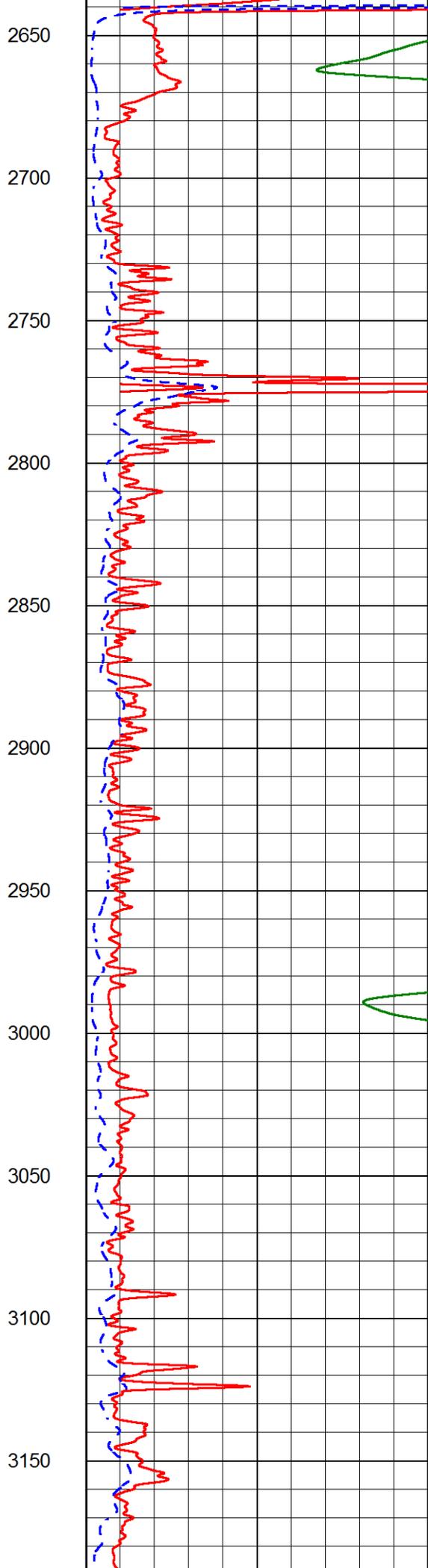
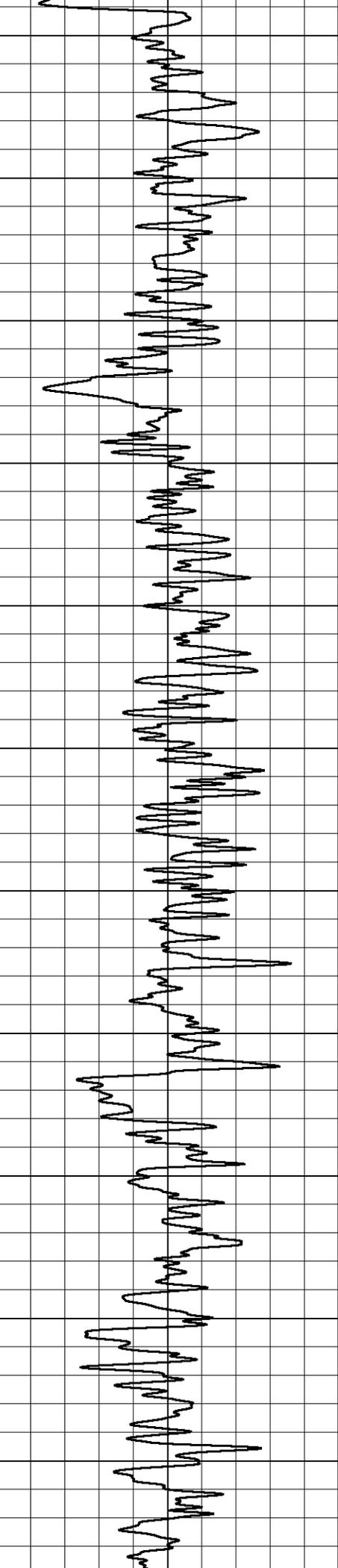


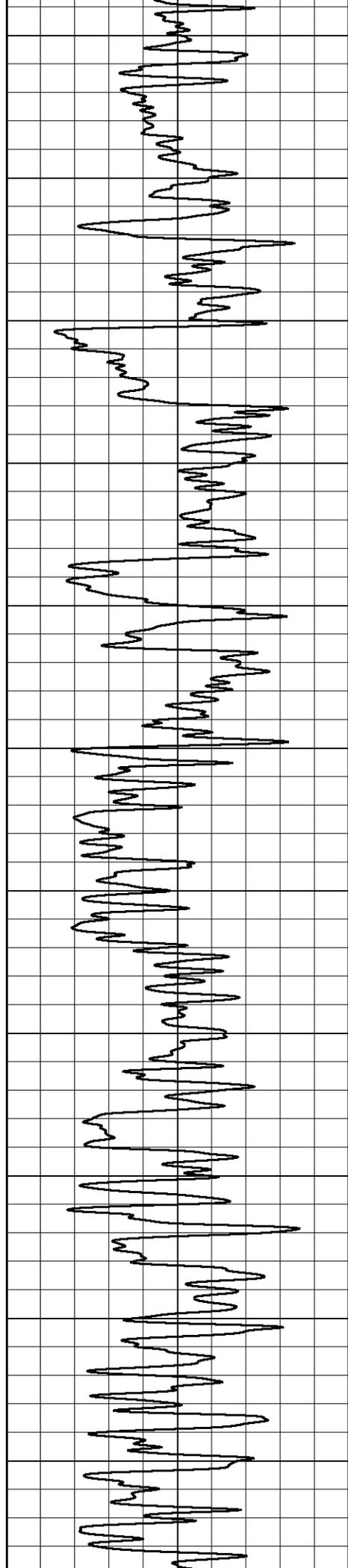












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3250

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3450

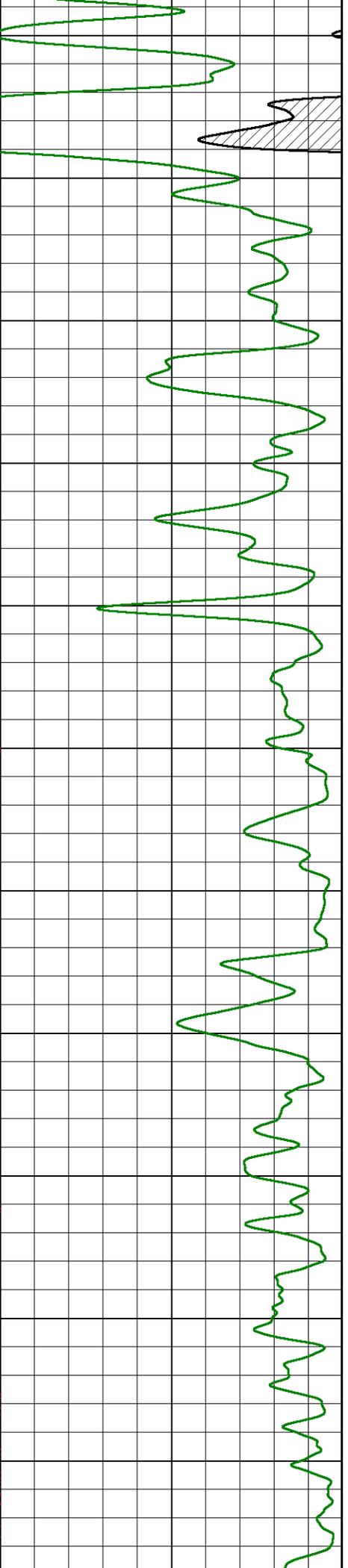
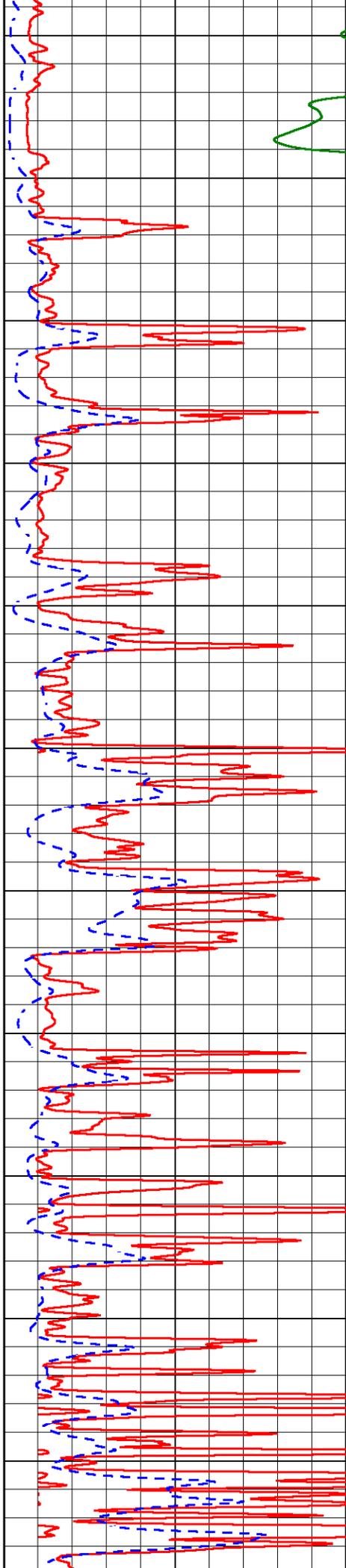
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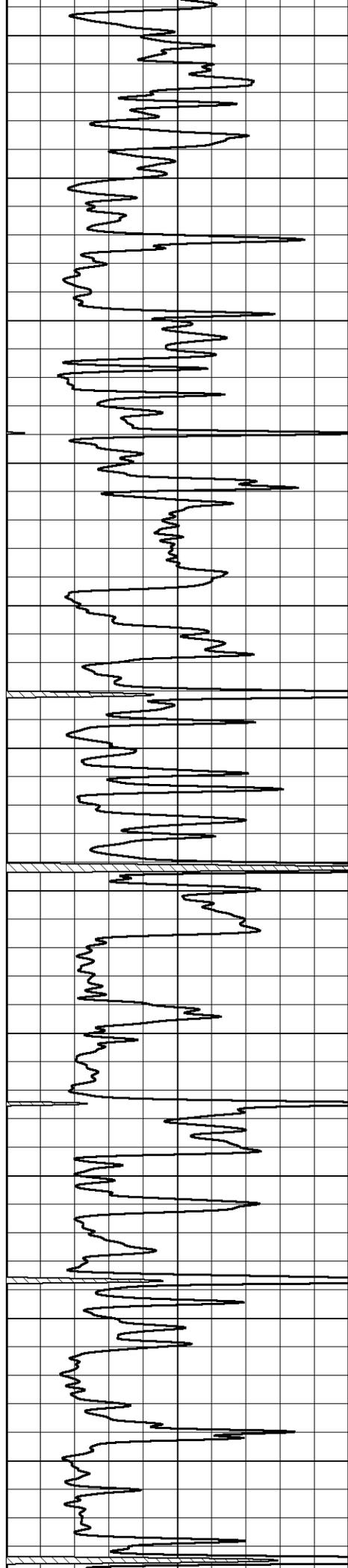
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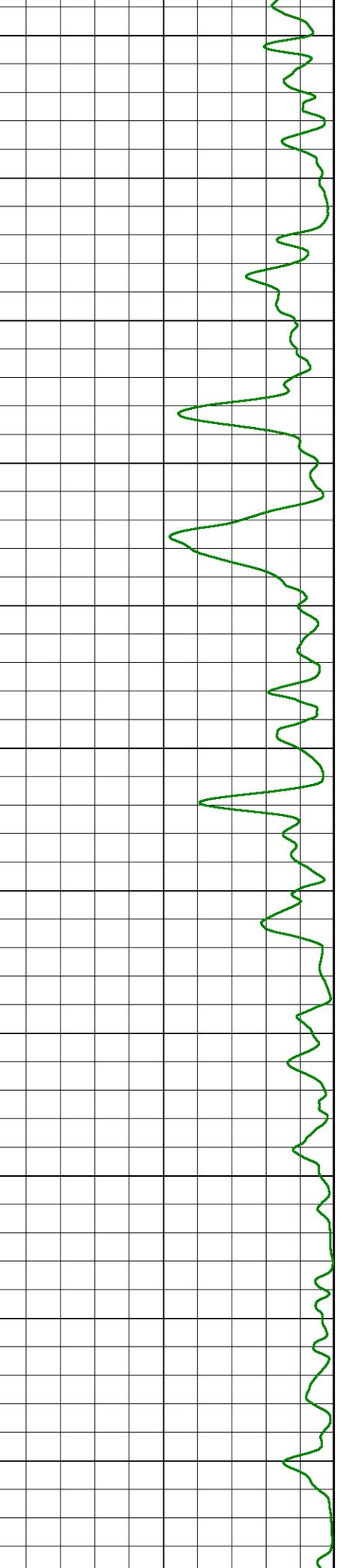
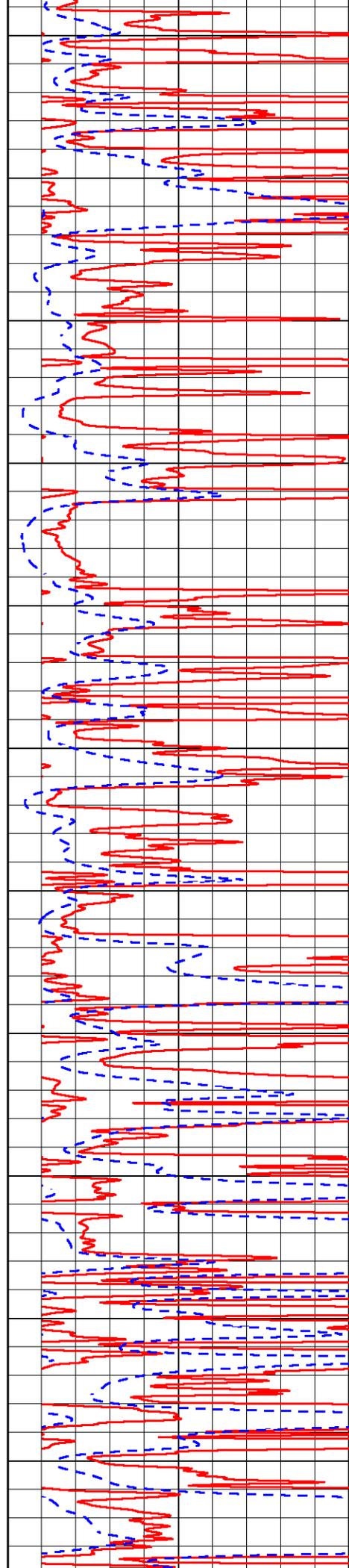
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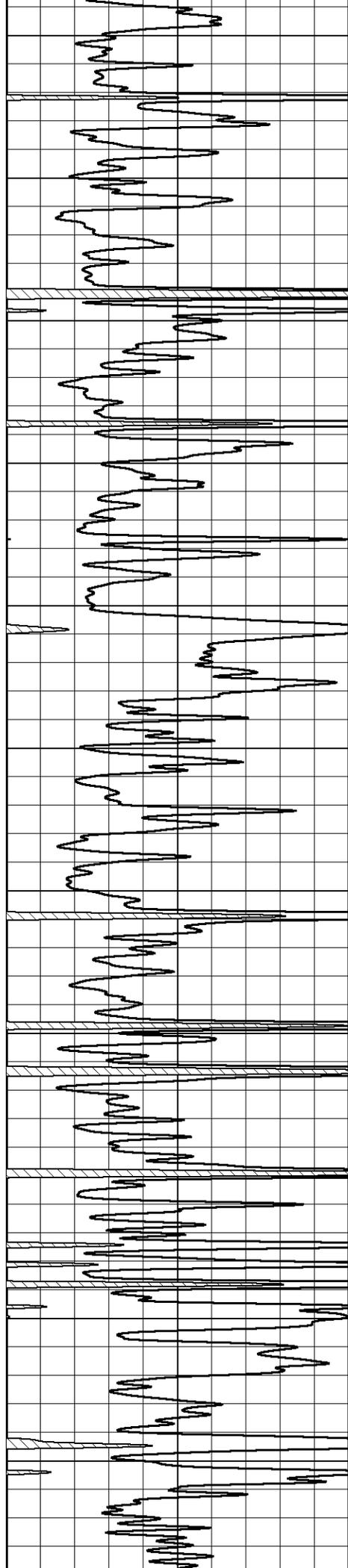
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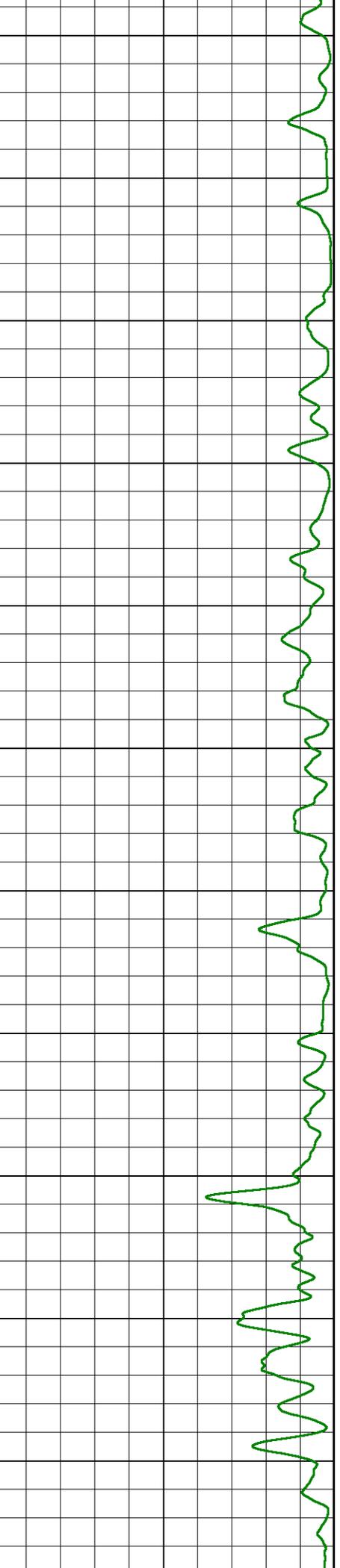
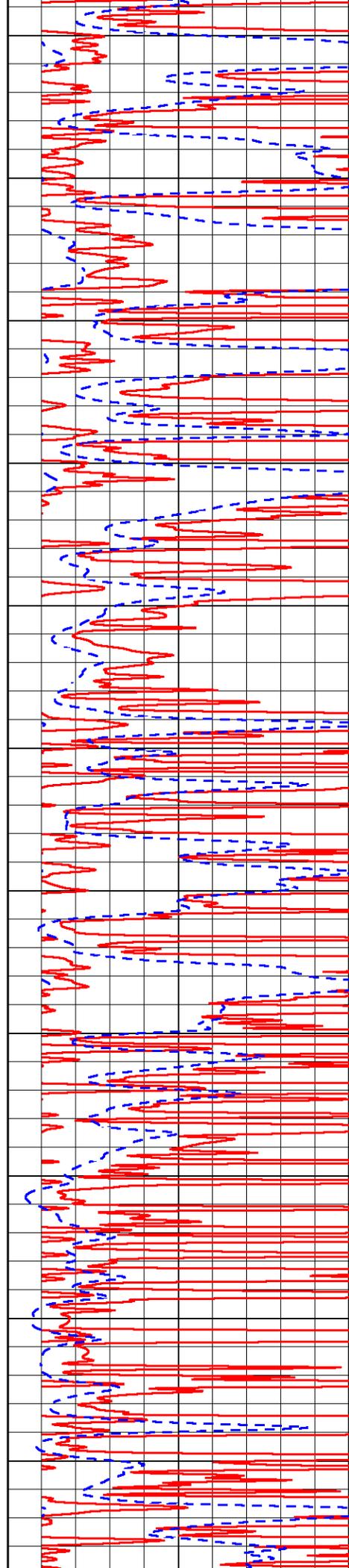
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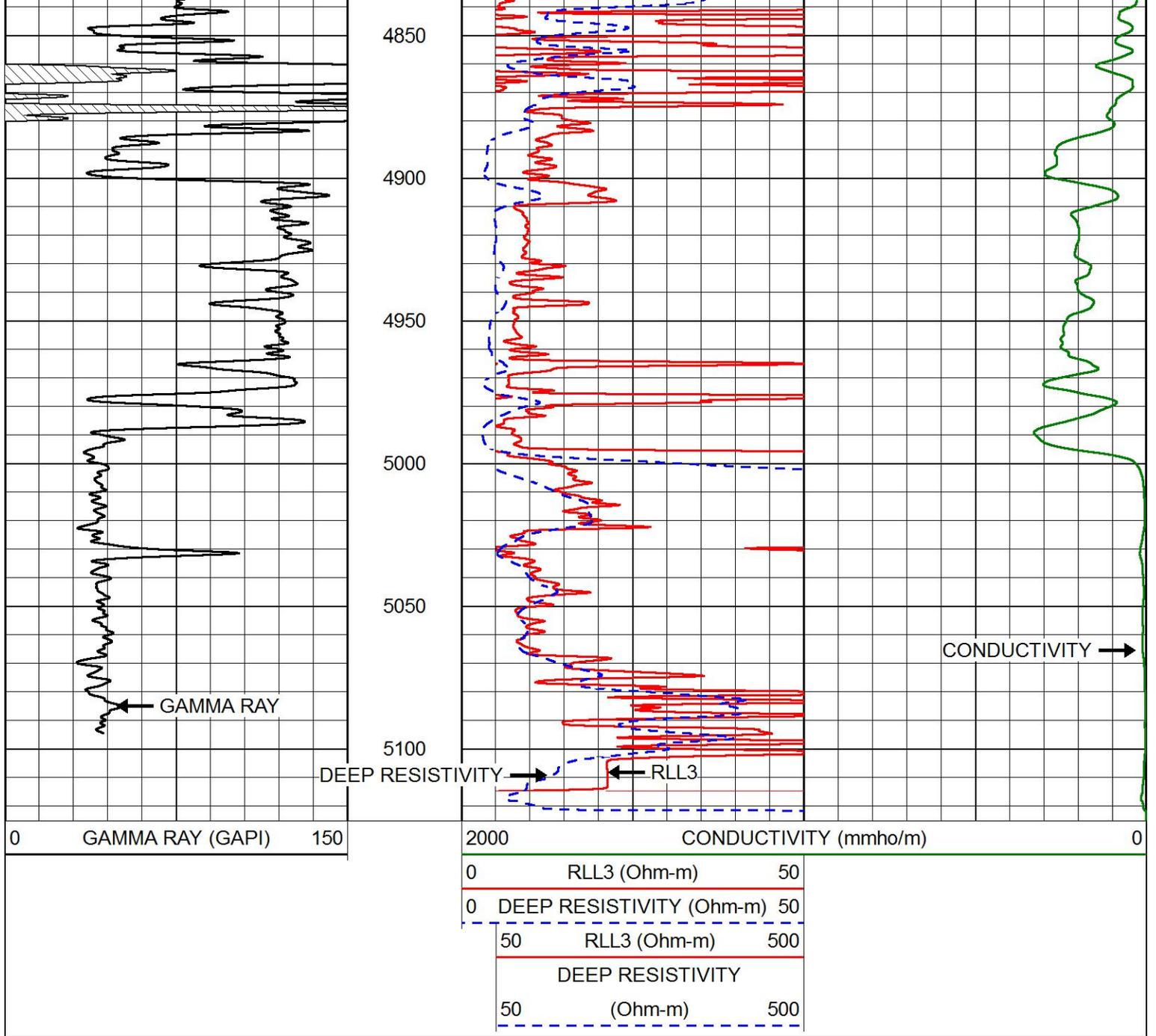
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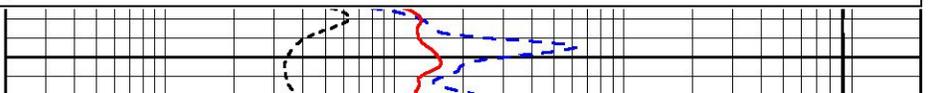
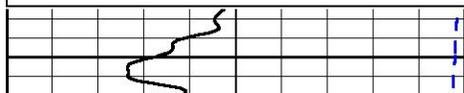


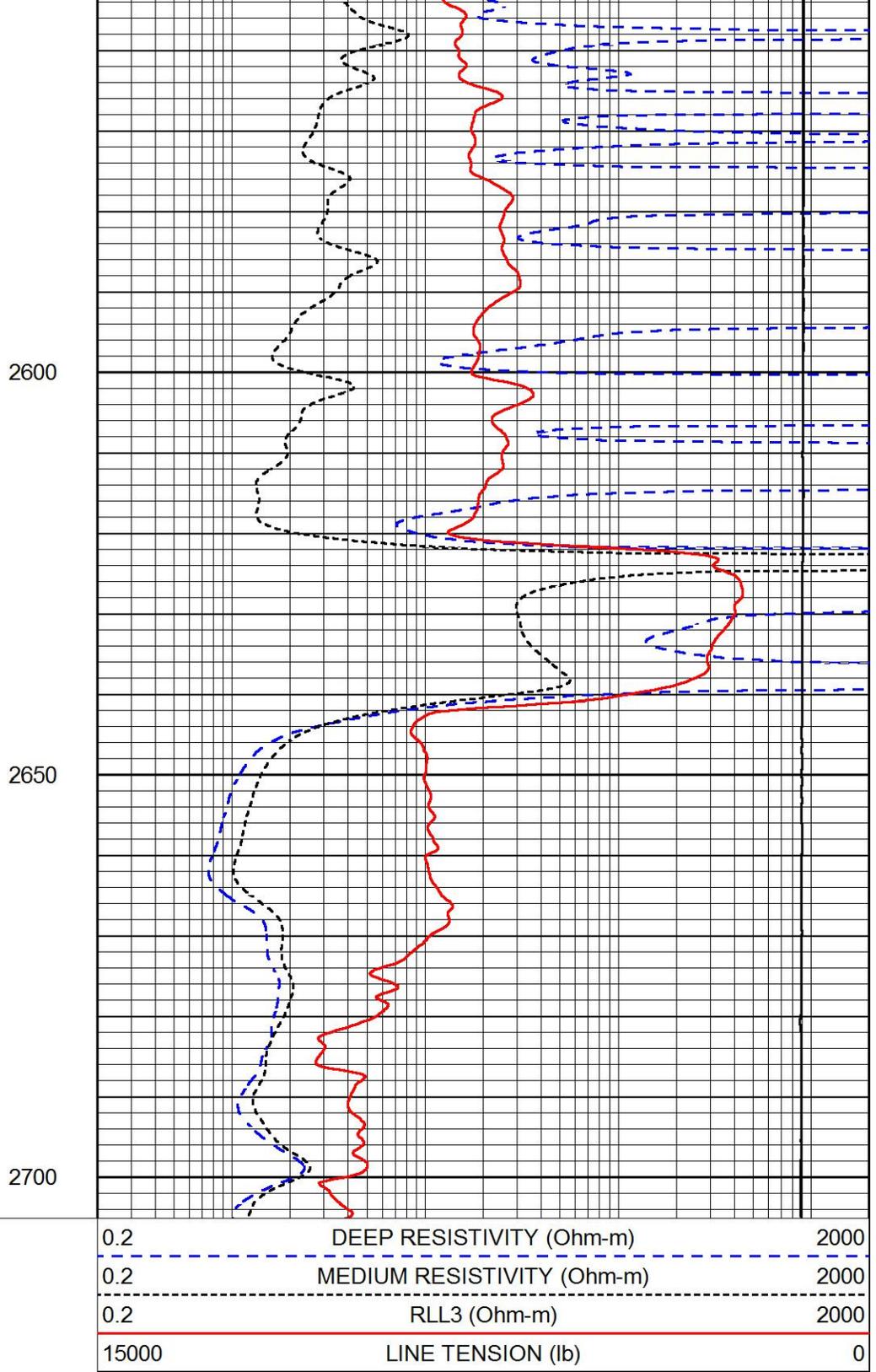
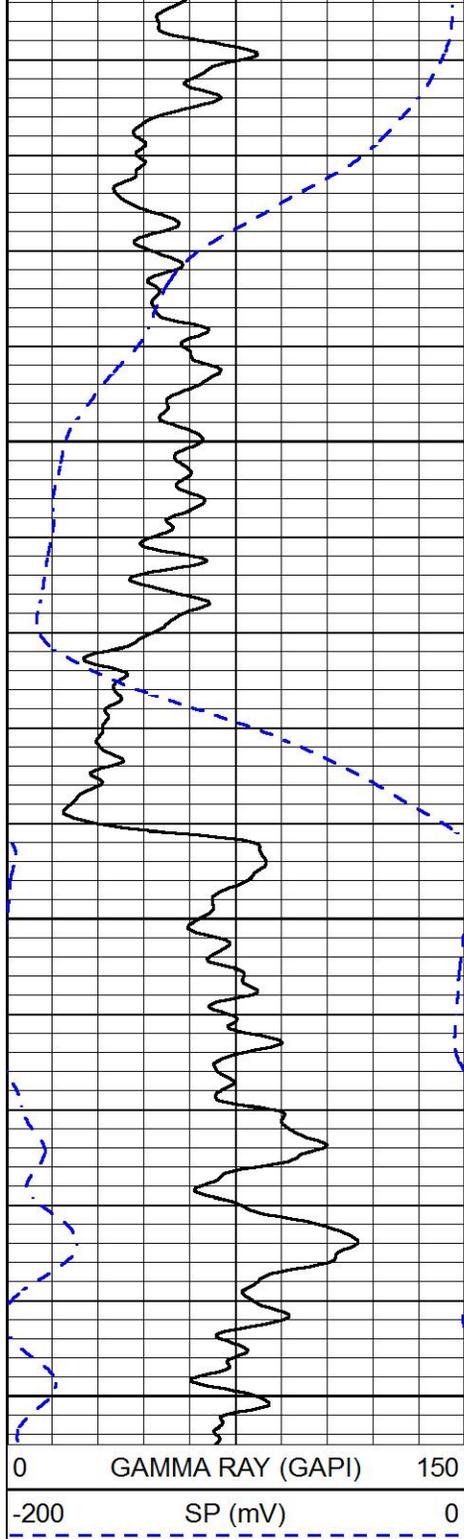
MAIN PASS

Database File ritchie_vmw_land_16c_1.db
 Dataset Pathname STACK/pass3.1
 Presentation Format dil
 Dataset Creation Mon Mar 20 19:50:31 2017
 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





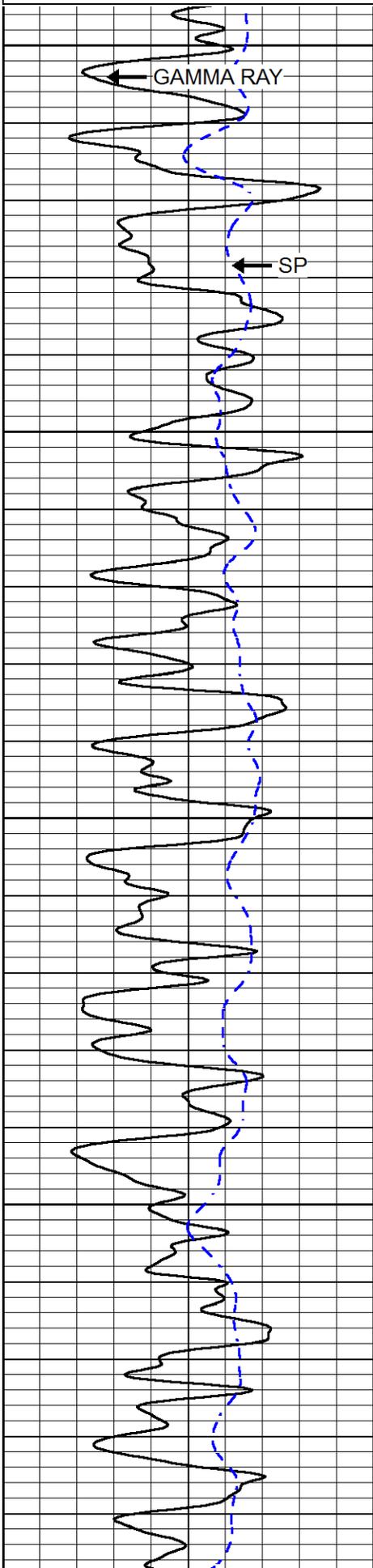
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 Presentation Format dil
 Dataset Creation Mon Mar 20 19:50:31 2017
 Charted by Depth in Feet scaled 1:240



GAMMA RAY (GAPI) 0.2
-200 SP (mV) 0

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

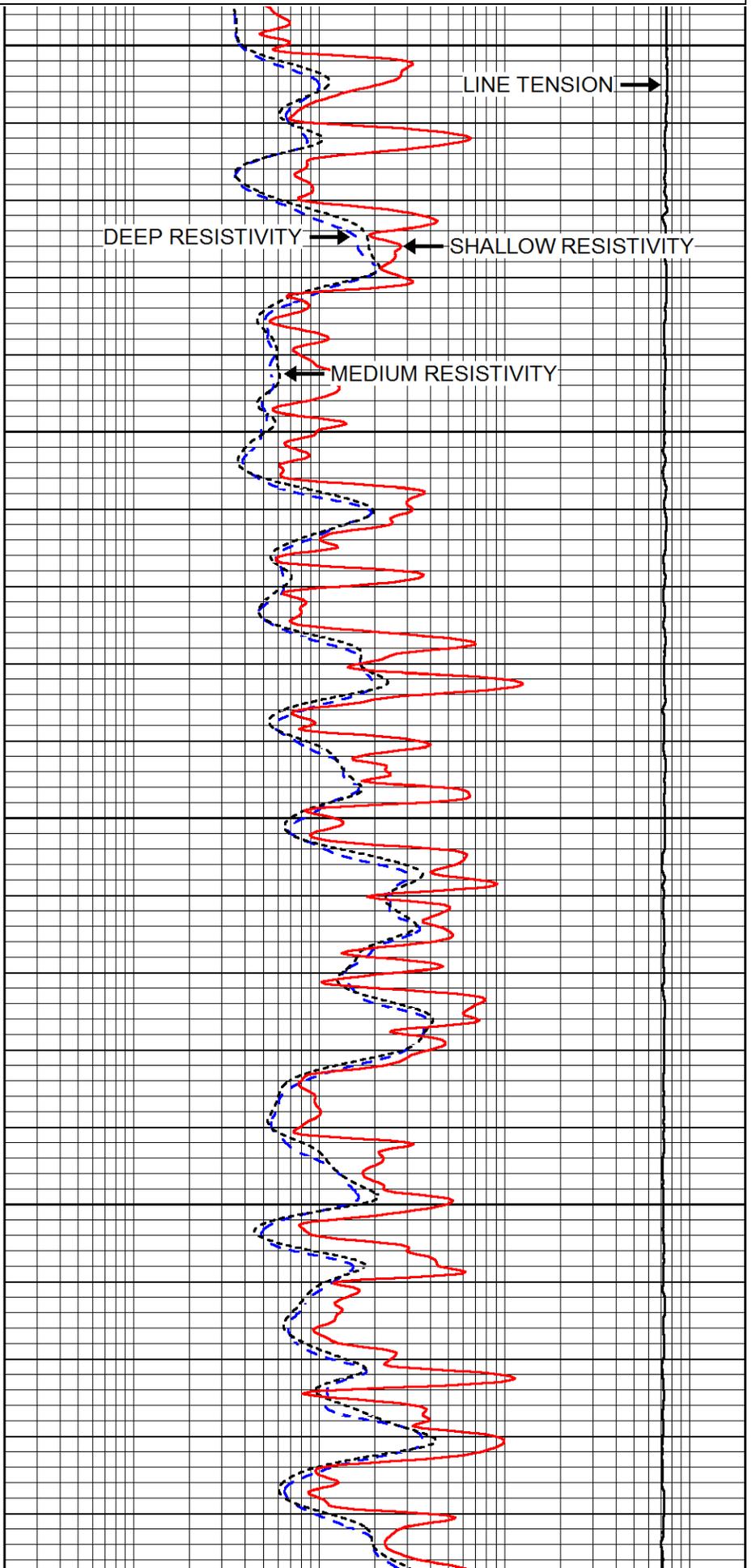


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3750

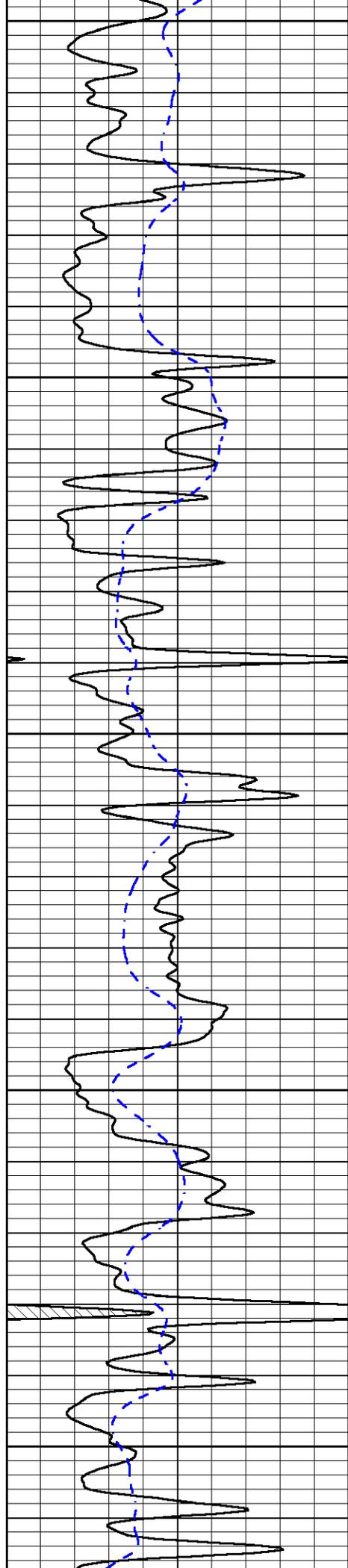


LINE TENSION →

DEEP RESISTIVITY →

← SHALLOW RESISTIVITY

← MEDIUM RESISTIVITY



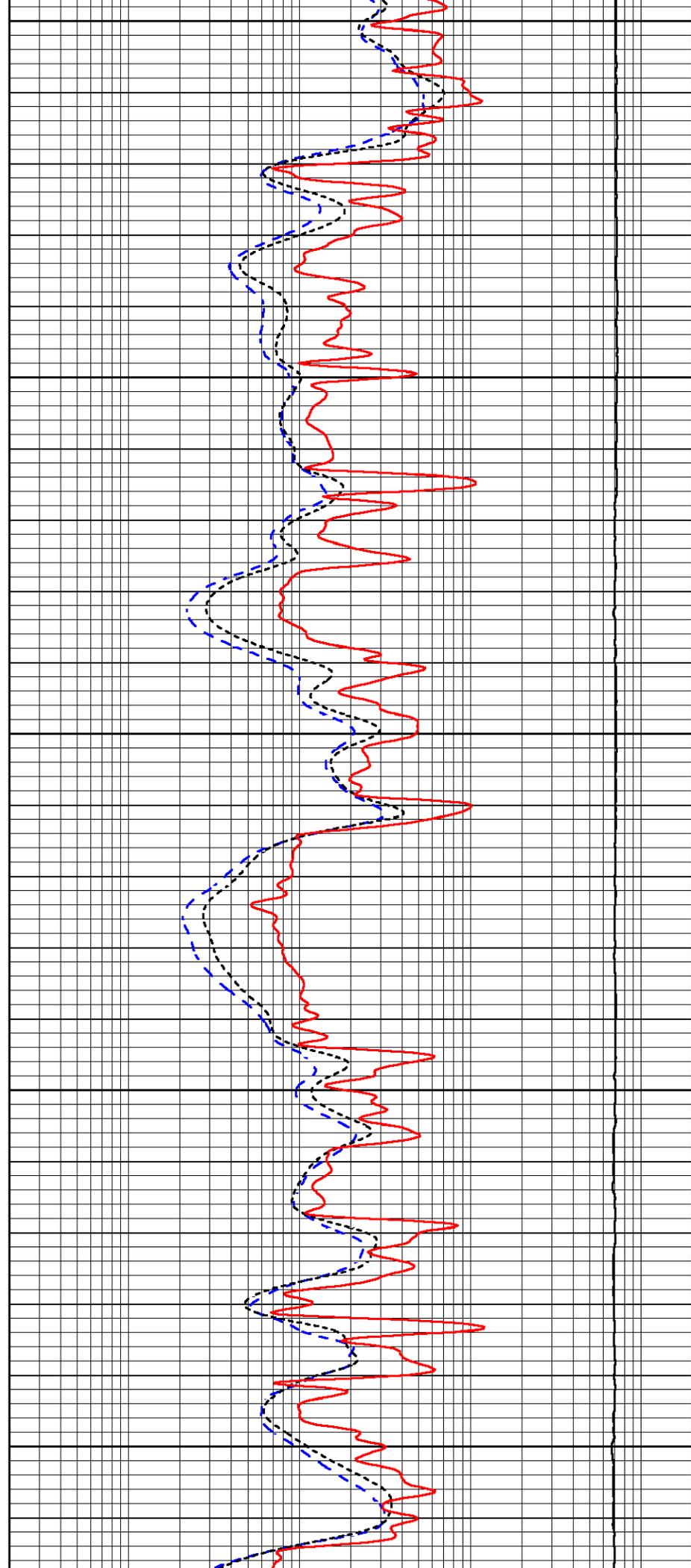
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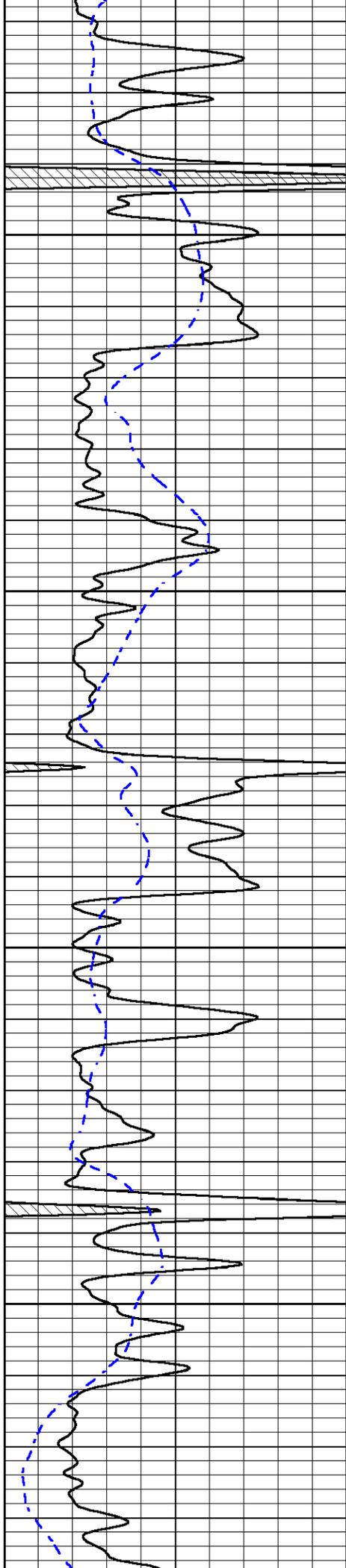
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4000



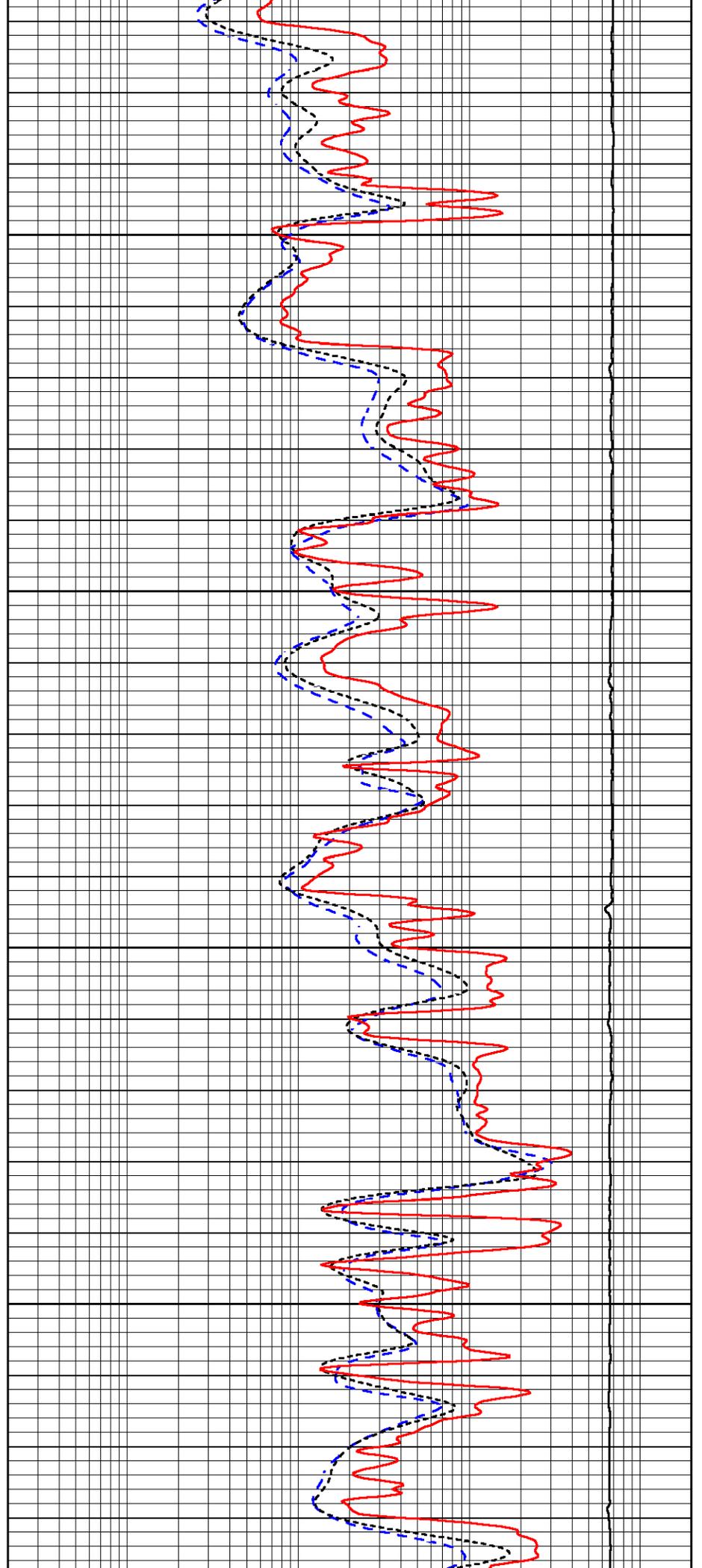


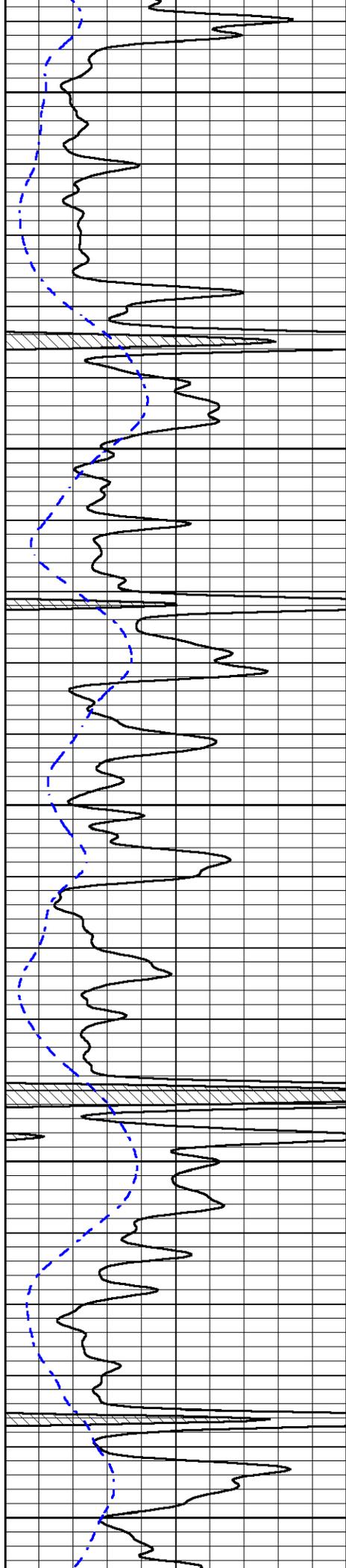
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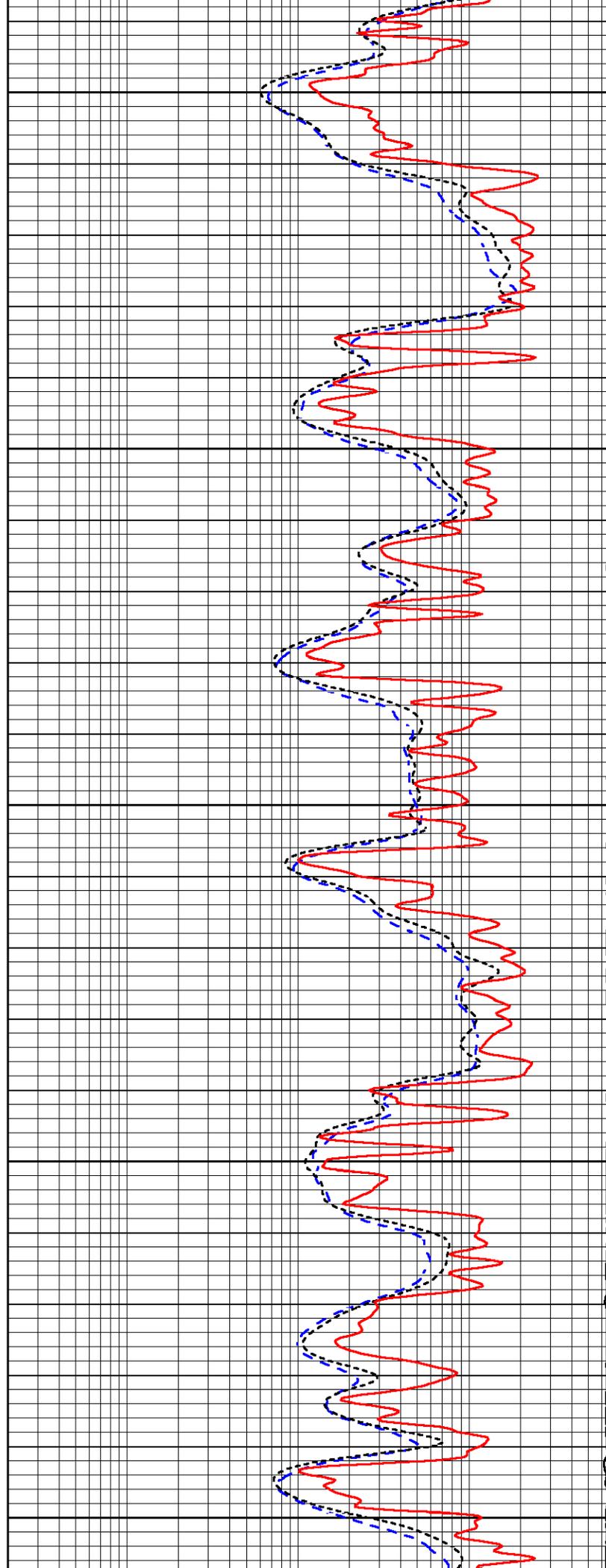
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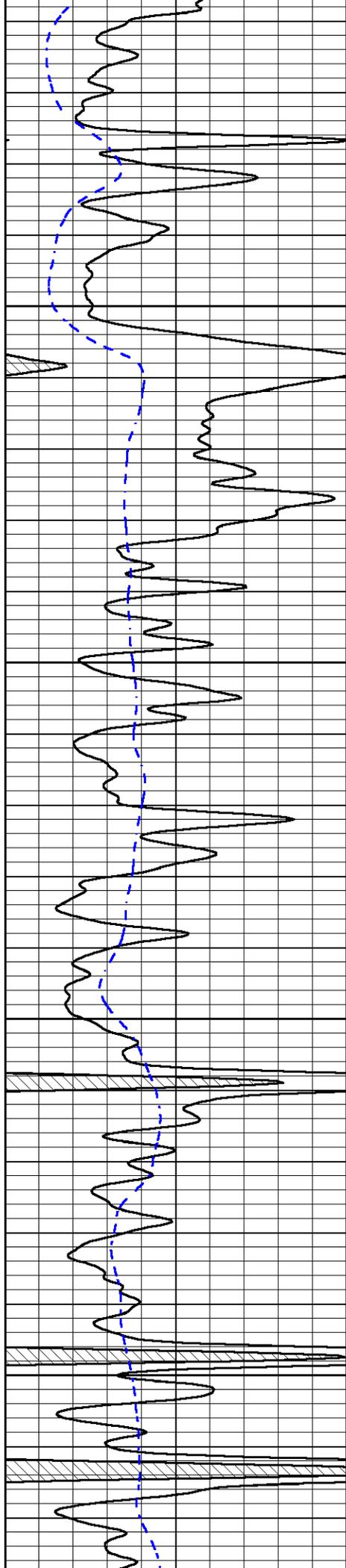
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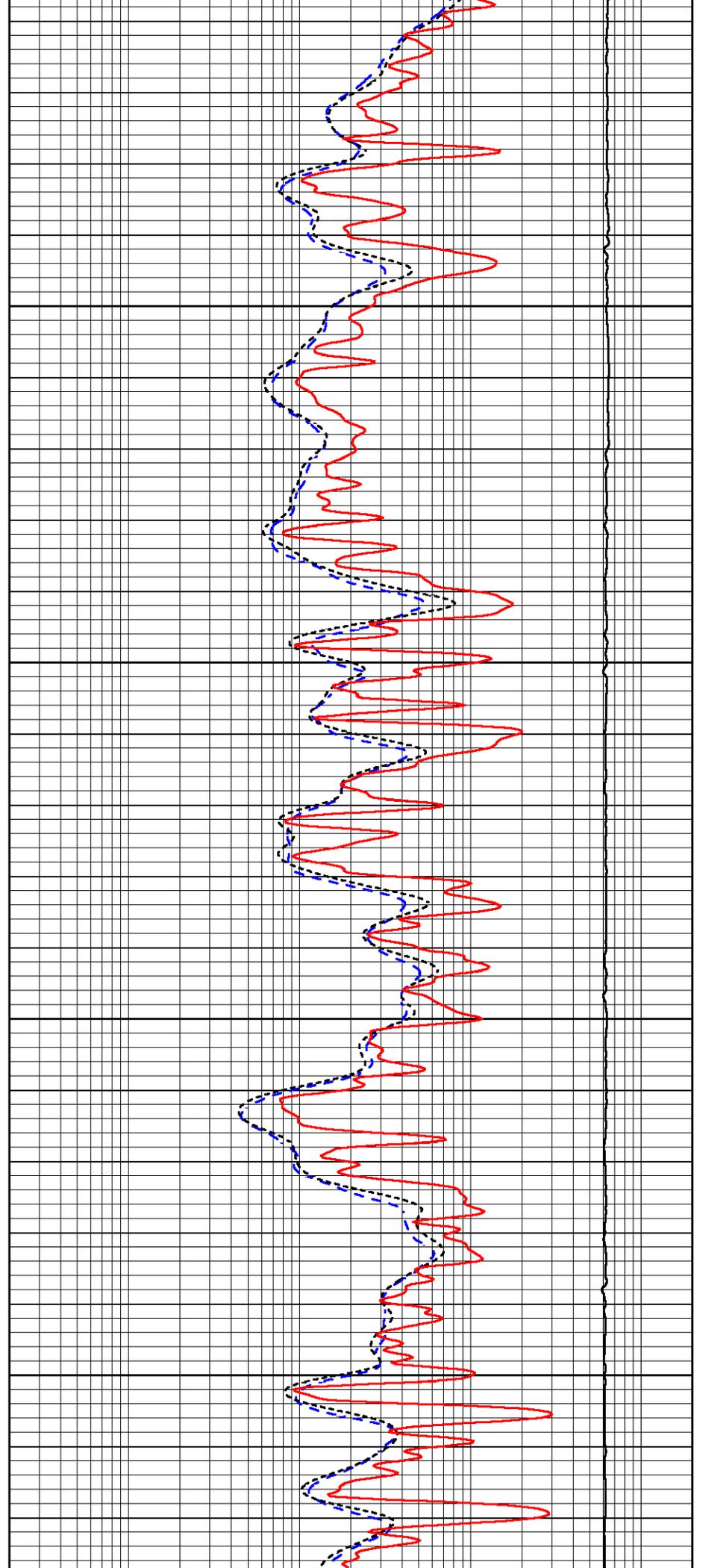


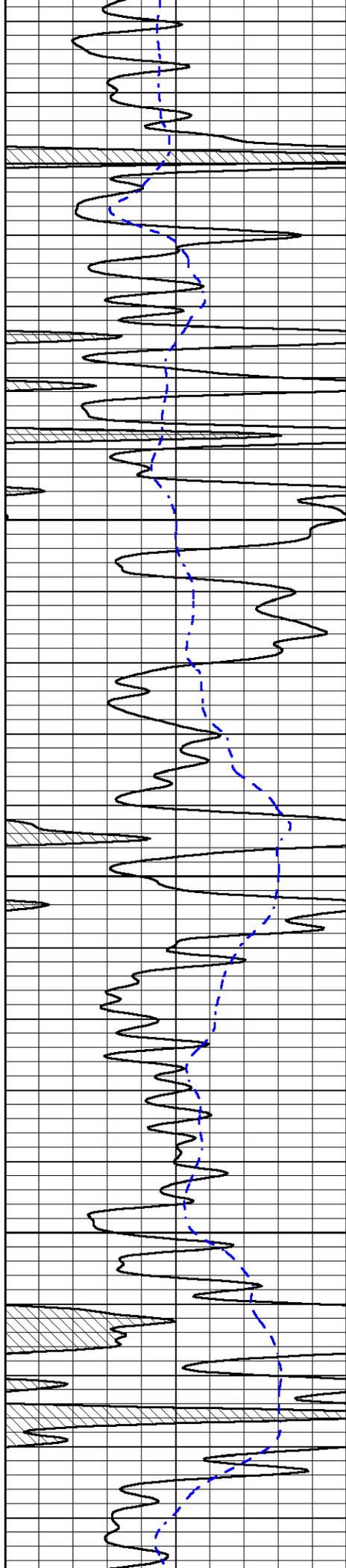
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4650



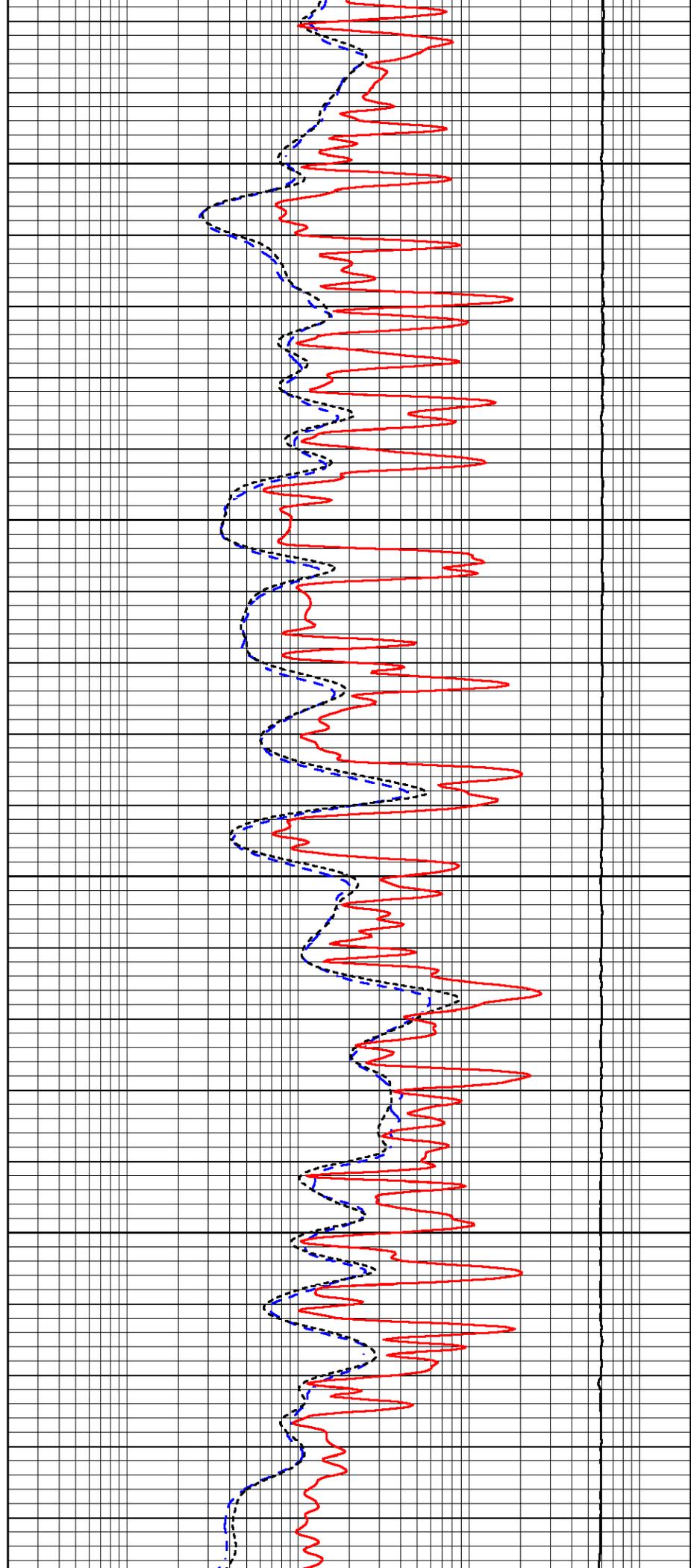


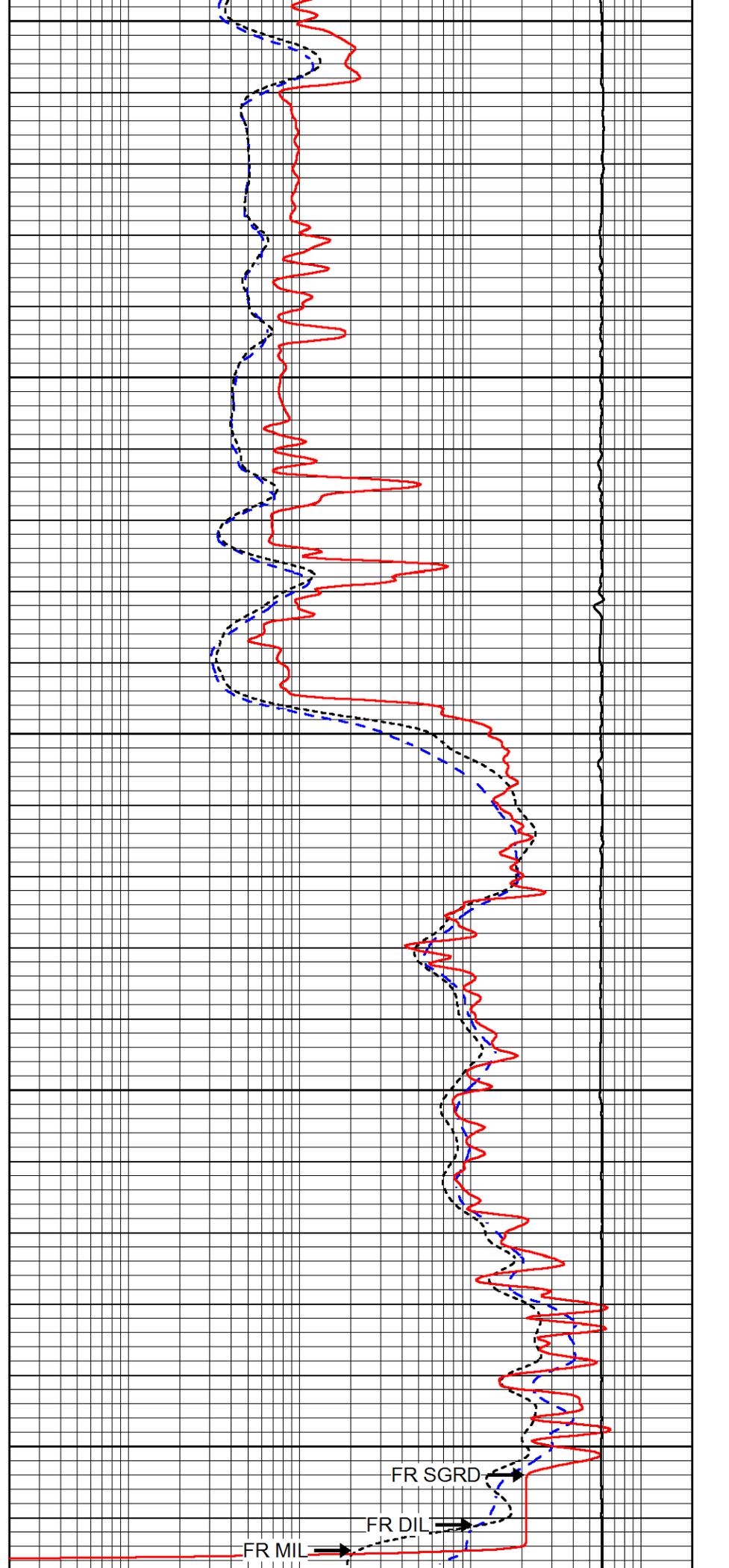
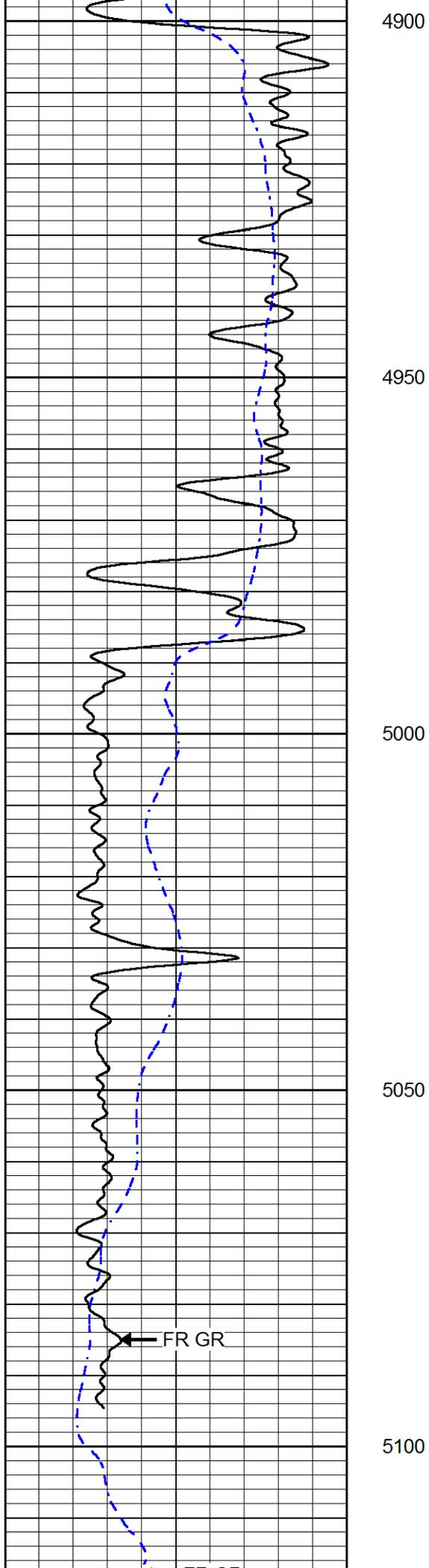
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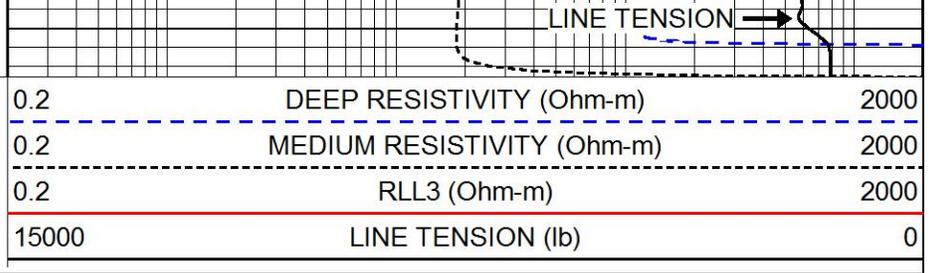
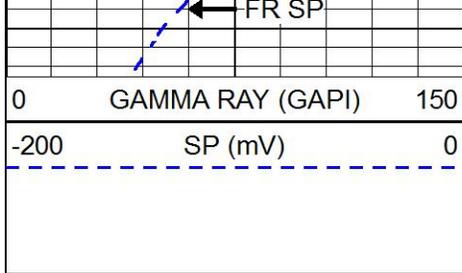
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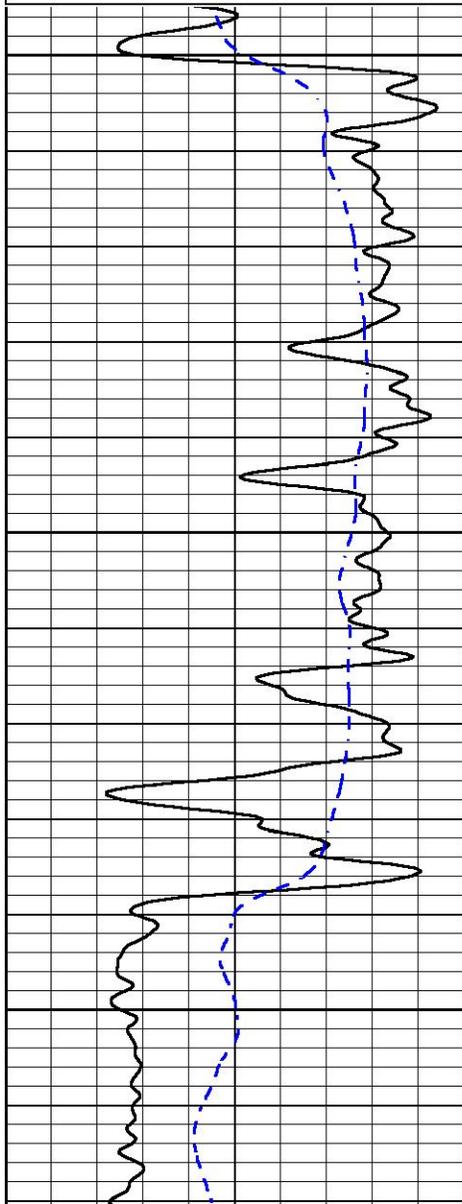
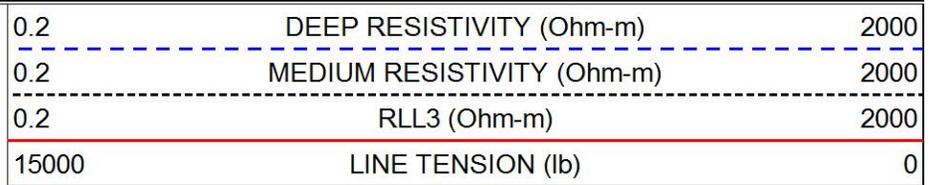
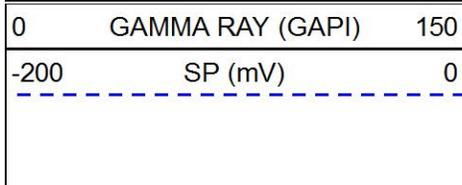






REPEAT SECTION

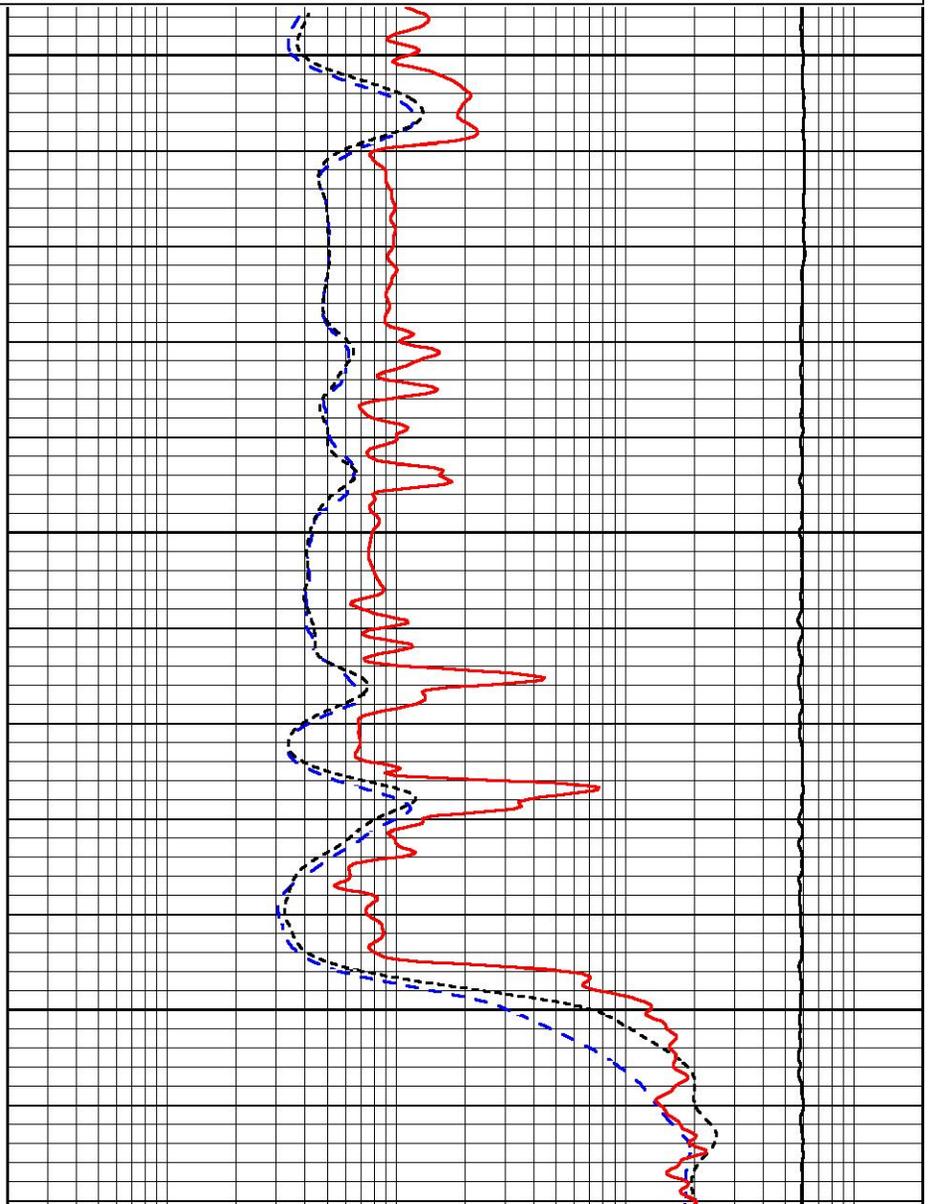
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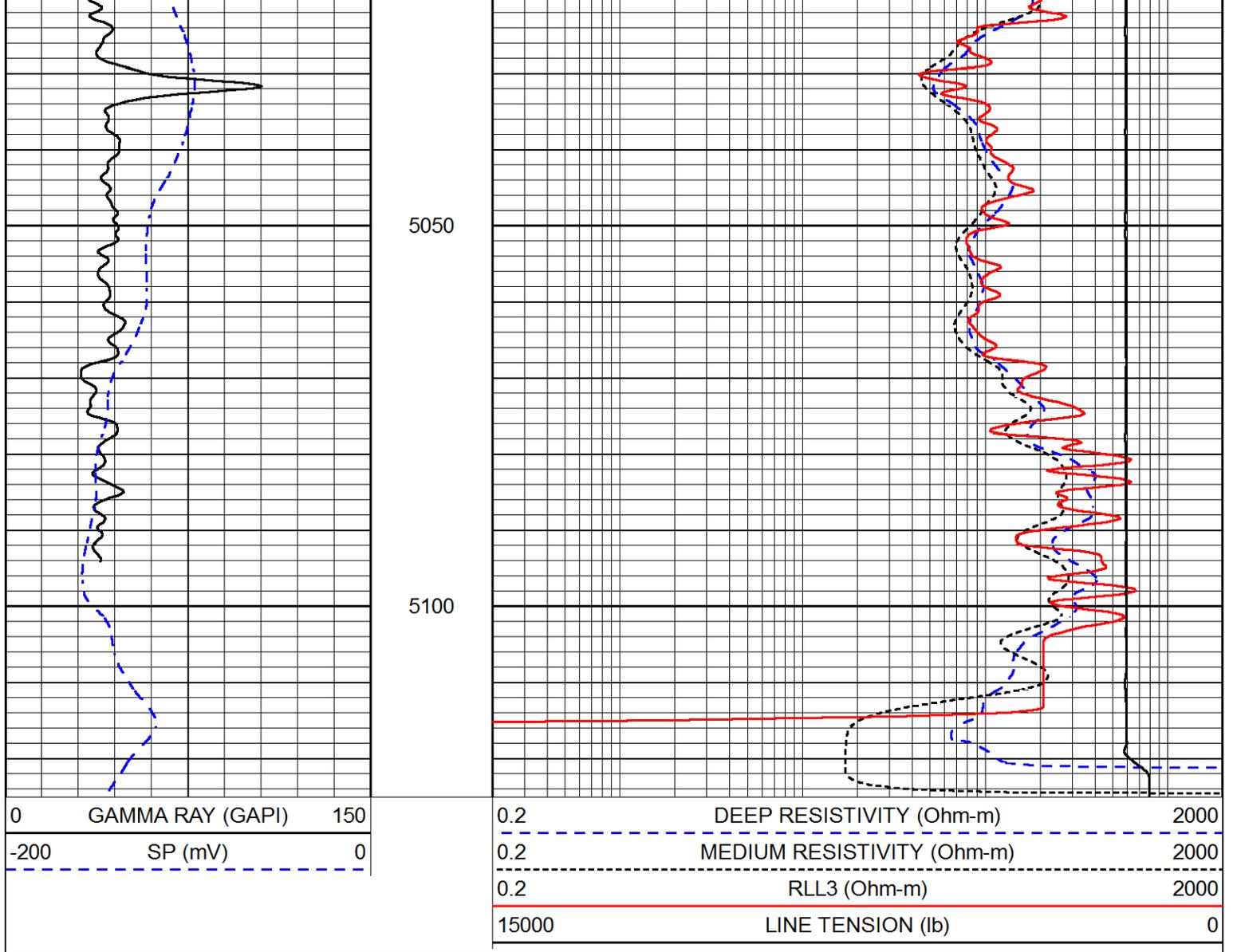


4900

4950

5000





Calibration Report

Database File ritchie_vmw_land_16c_1.db
 Dataset Pathname STACK/pass3.1
 Dataset Creation Mon Mar 20 19:50:31 2017

Dual Induction Calibration Report

Serial-Model: 1987-M&W
 Calibration Performed: Fri Dec 23 14:41:51 2016

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop	mmho/m	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

Compensated Density Calibration Report

Serial-Model: 168-986-M&W
 Source / Verifier: /
 Master Calibration Performed: Fri Nov 18 10:05:18 2016

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4691.86	4818.19	cps
Aluminum	2.675	g/cc	859.57	3020.22	cps
Spine Angle = 74.61			Density/Spine Ratio = 0.523		
	Size		Reading		
Small Ring	4.00	in	1.03		
Large Ring	14.00	in	1.23		

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: Fri Dec 23 14:43:38 2016

Calibrator Value: 1000.0 GAPI

Background Reading: 0.0 cps
 Calibrator Reading: 6.2 cps

Sensitivity: 0.5200 GAPI/cps



PIONEER
 Pioneer Energy Services

Company RITCHIE EXPLORATION, INC.
 Well VMW LAND 16C NO. 1
 Field WILDCAT
 County WICHITA
 State KANSAS