



DUAL INDUCTION LOG

Company ELK ENERGY HOLDINGS, LLC
 Well LIPPELMANN NO 1-14
 Field WILDCAT
 County THOMAS
 State KANSAS

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 Well LIPPELMANN NO 1-14
 Field WILDCAT
 County THOMAS State KANSAS

Location: API #: 15-193-20998-00-00
 2305' FNL & 2110' FWL
 SEC 14 TWP 10S RGE 33W
 Permanent Datum GROUND LEVEL Elevation 3139'
 Log Measured From KELLY BUSHING
 Drilling Measured From KELLY BUSHING
 Other Services
 CNL/CDL
 MEL
 Elevation
 K.B. 3144'
 D.F. N/A
 G.L. 3139'

Date	9/7/2017
Run Number	ONE
Depth Driller	4720'
Depth Logger	4718'
Bottom Logged Interval	4717'
Top Log Interval	300'
Casing Driller	8.625" @ 347'
Casing Logger	344'
Bit Size	7.875"
Type Fluid in Hole	CHEMICAL
Salinity, ppm CL	3,500
Density / Viscosity	9.4 58
pH / Fluid Loss	9.0 9.6
Source of Sample	FLOWLINE
Rm @ Meas. Temp	.80 @ 65
Rmt @ Meas. Temp	.60 @ 65
Rmc @ Meas. Temp	1.08 @ 65
Source of Rmf / Rmc	CHARTS
Rm @ BHT	.42 @ 123
Operating Rig Time	3 HOURS
Max Rec. Temp. F	123 DEGF
Equipment Number	108
Location	HAYS
Recorded By	J. HENRICKSON
Witnessed By	SEAN DEENIHAN

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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.
 OAKLEY WEST EXIT
 1 NORTH TO F RD, 6 WEST TO RD 23, 3/4 SOUTH, 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	This Log Record Was Witnessed By
Engineer: J. HENRICKSON	Primary Witness: SEAN DEENIHAN
Operator:	Secondary Witness:
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Log Variables

DatabaseC:\ProgramData\Warrior\Data\elk_energy_lippelmann_1_14.db
 Dataset field/well/stackml/pass3.1/_vars_

Top - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	125	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	-260	76	Off	4718

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	37.48		CNT-M&W (tk10-MW)	5.50	3.50	100.00
CNSSC	36.73					
LSD	28.43		CDL-M&W (168-986)	8.50	4.00	250.00
DCAL	28.42					
SSD	27.93					
ML-PSI STKBL ML (PSI-02) Stackable Microlog Tools			ML-PSI STKBL ML (PSI-02) Stackable Microlog Tools	7.58	4.00	65.00
MCAL	19.83					
MI	19.83					
MN	19.83					
RLL3	15.80					
RLL3F	15.79					
CILD	8.00		DIL-M&W (1987)	18.50	3.50	220.00

CILM 4.70

SP 0.20

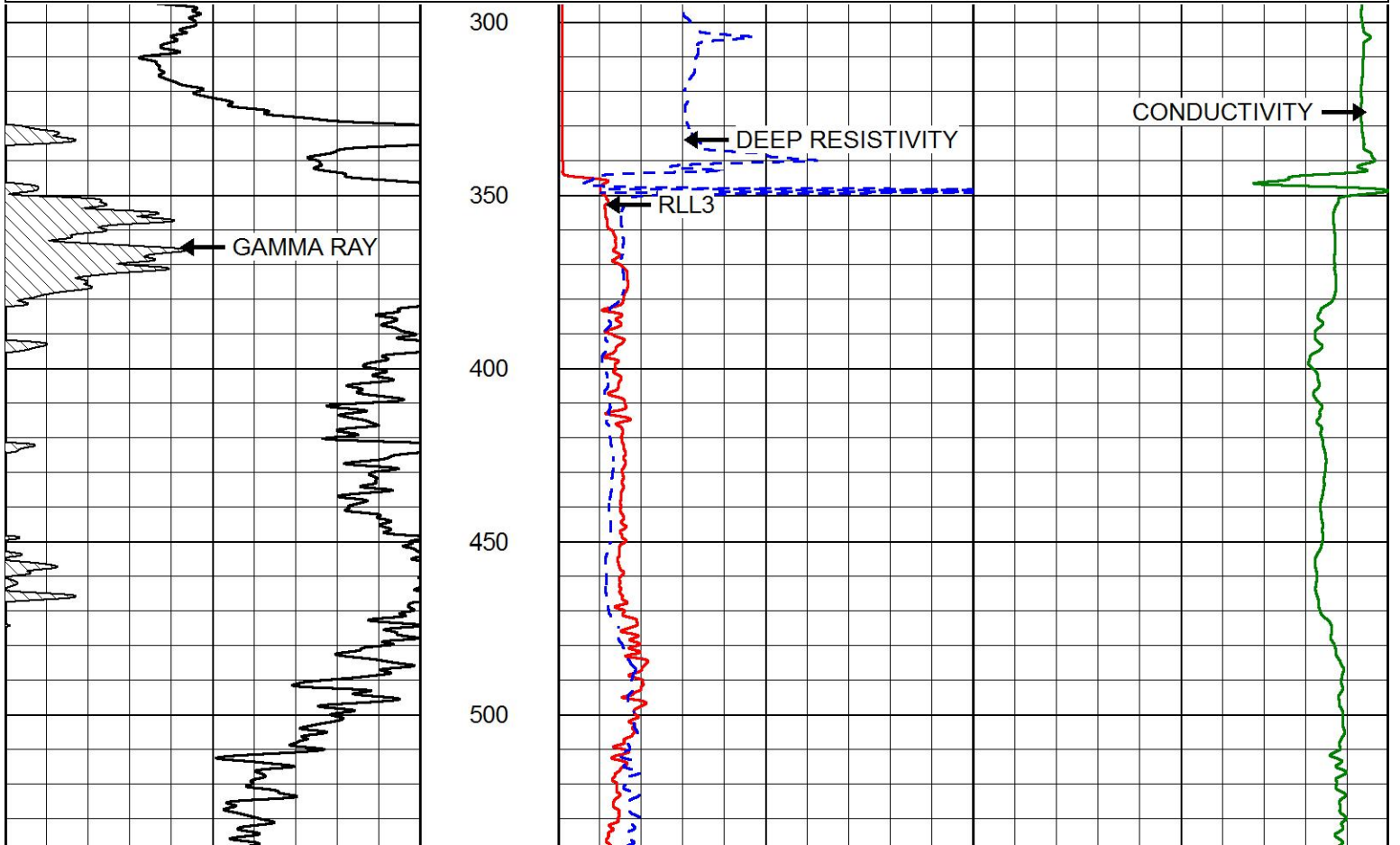
Dataset: elk_energy_lippelmann_1_14.db: field/well/stackml/pass3.1
 Total length: 43.08 ft
 Total weight: 685.00 lb
 O.D.: 4.00 in

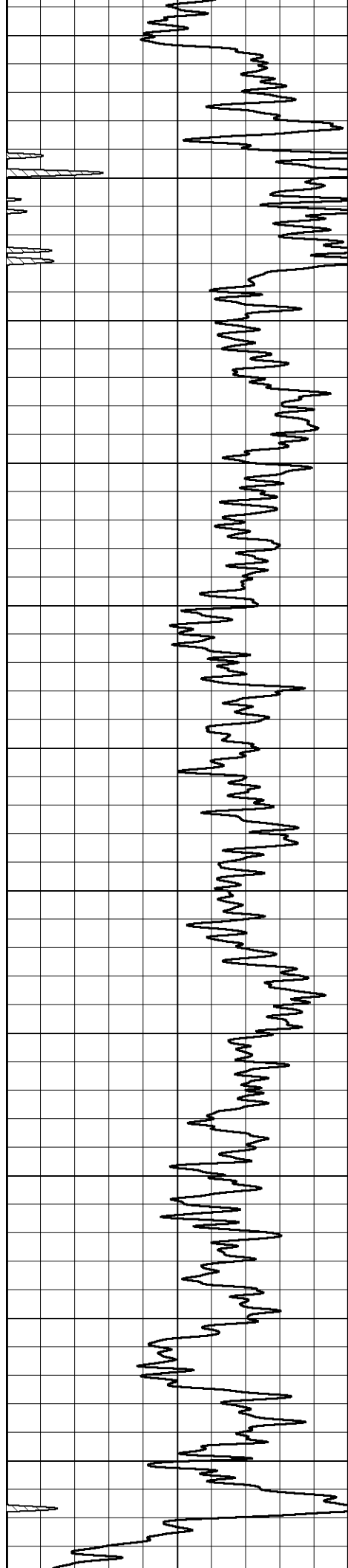


MAIN PASS

Database File elk_energy_lippelmann_1_14.db
 Dataset Pathname stackml/pass3.1
 Presentation Format dil2in
 Dataset Creation Thu Sep 07 14:06:47 2017
 Charted by Depth in Feet scaled 1:600

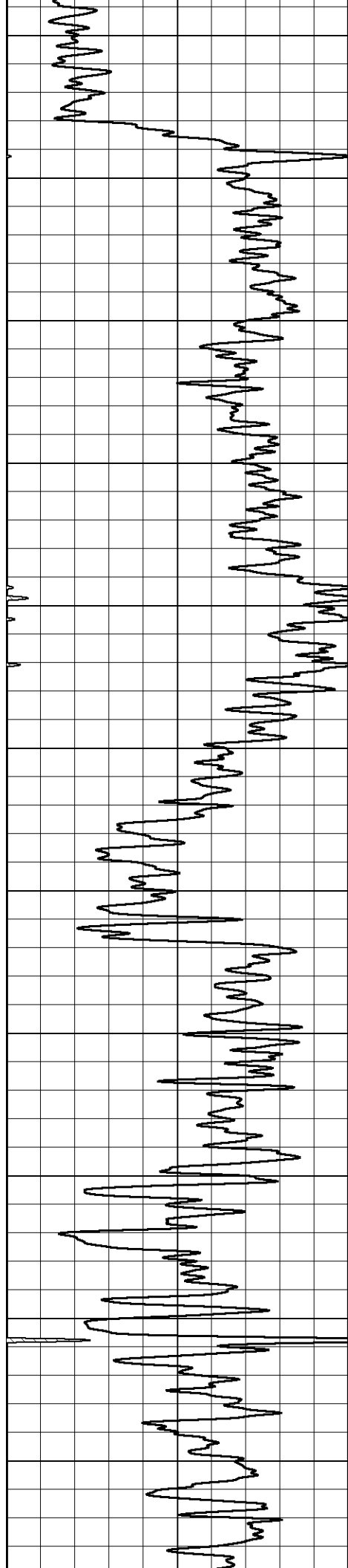
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			0	RLL3 (Ohm-m)	50
			0	DEEP RESISTIVITY (Ohm-m)	50
			50	RLL3 (Ohm-m)	500
				DEEP RESISTIVITY	
			50	(Ohm-m)	500





550
600
650
700
750
800
850
900
950
1000
1050





1100

1150

1200

1250

1300

1350

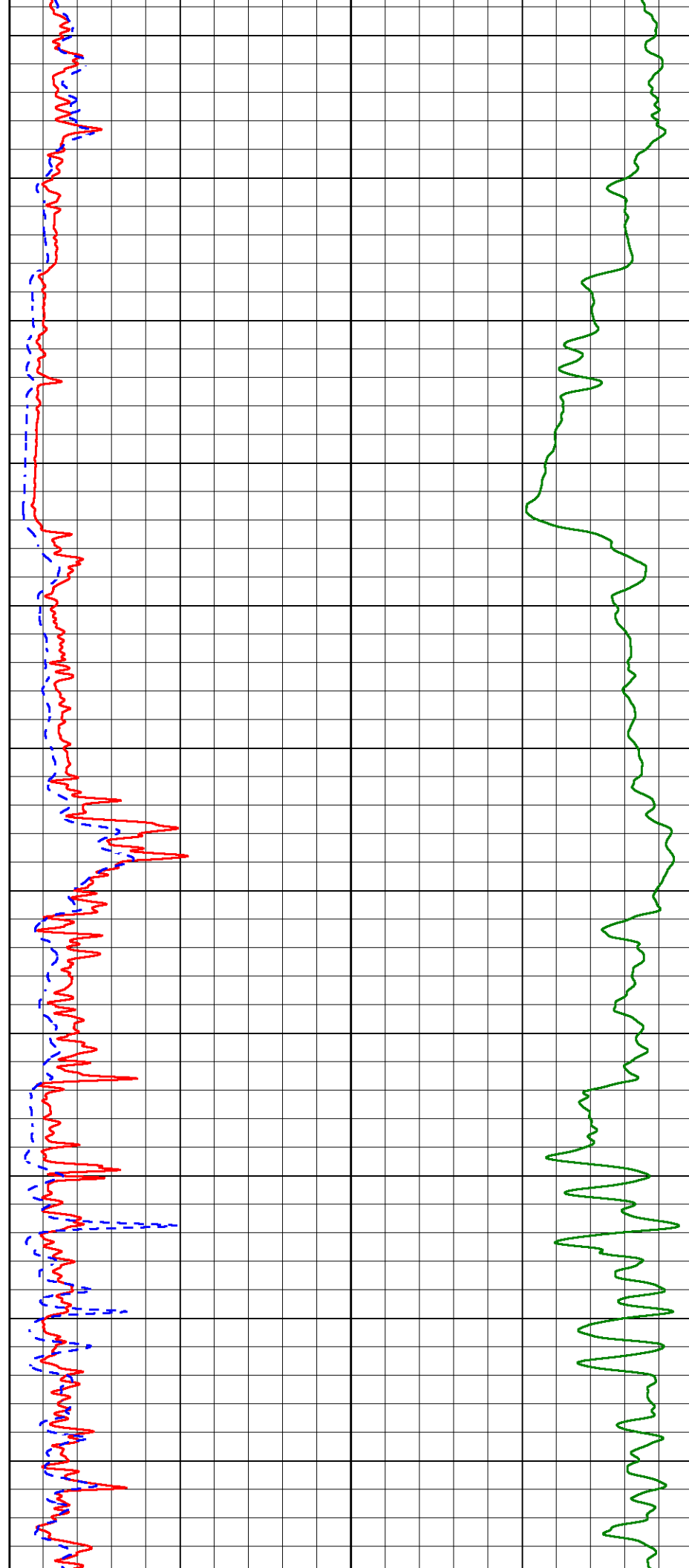
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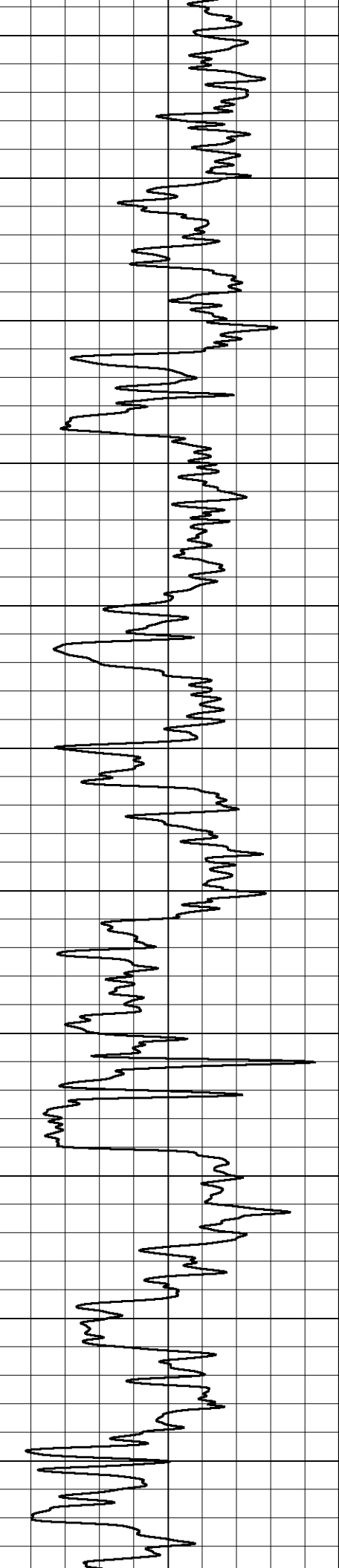
1450

1500

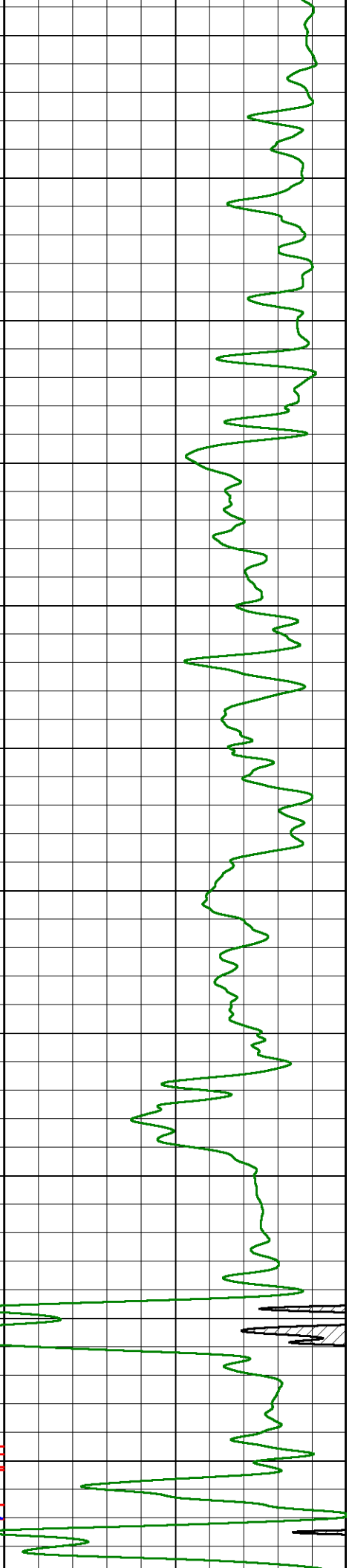
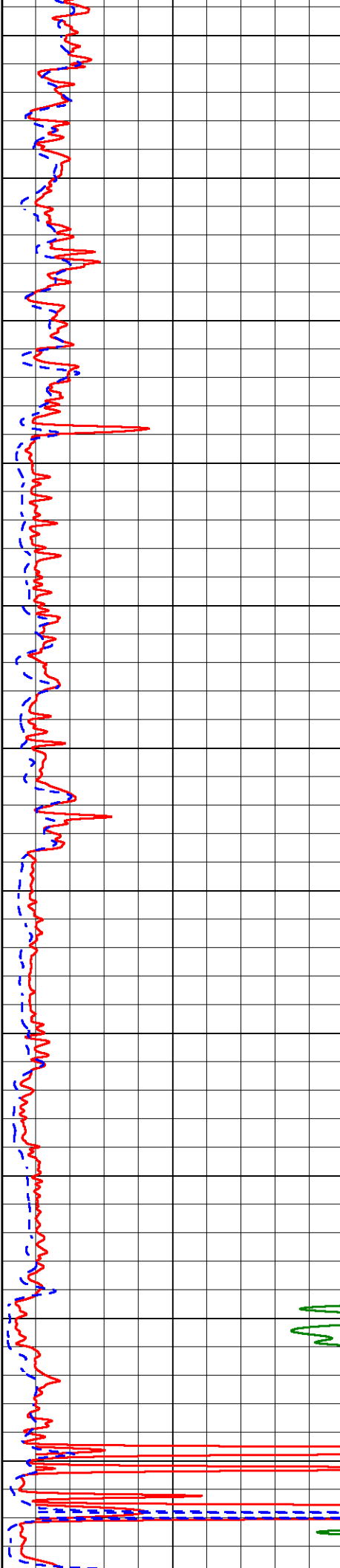
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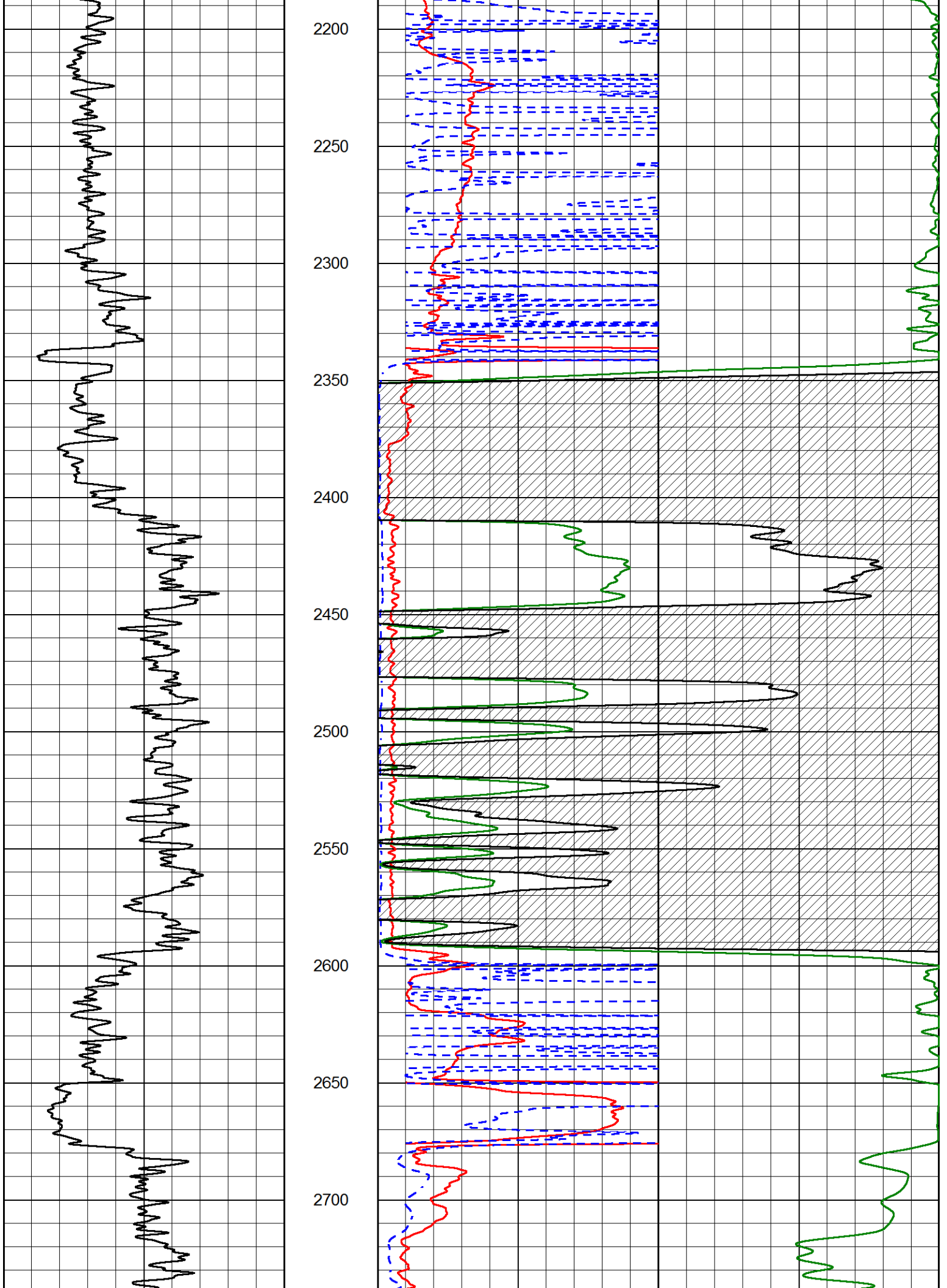
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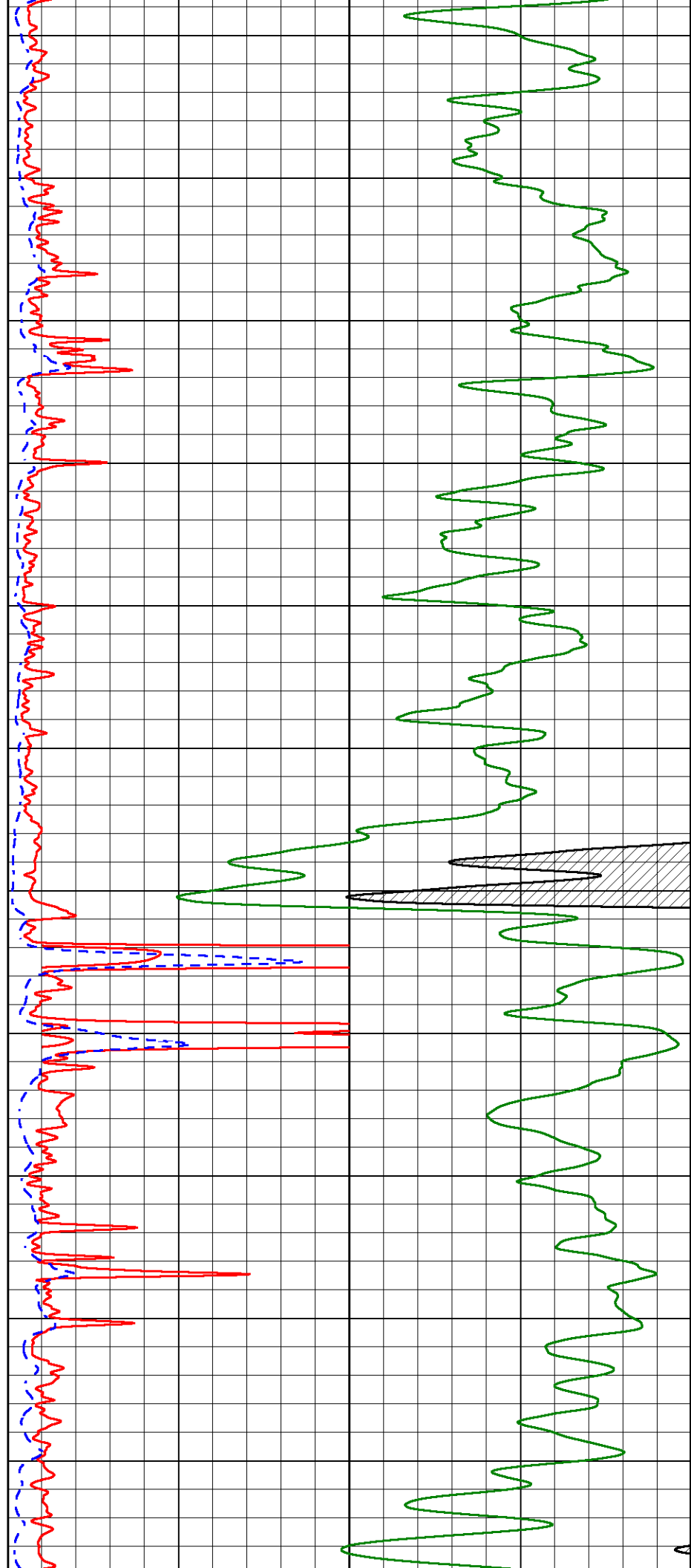
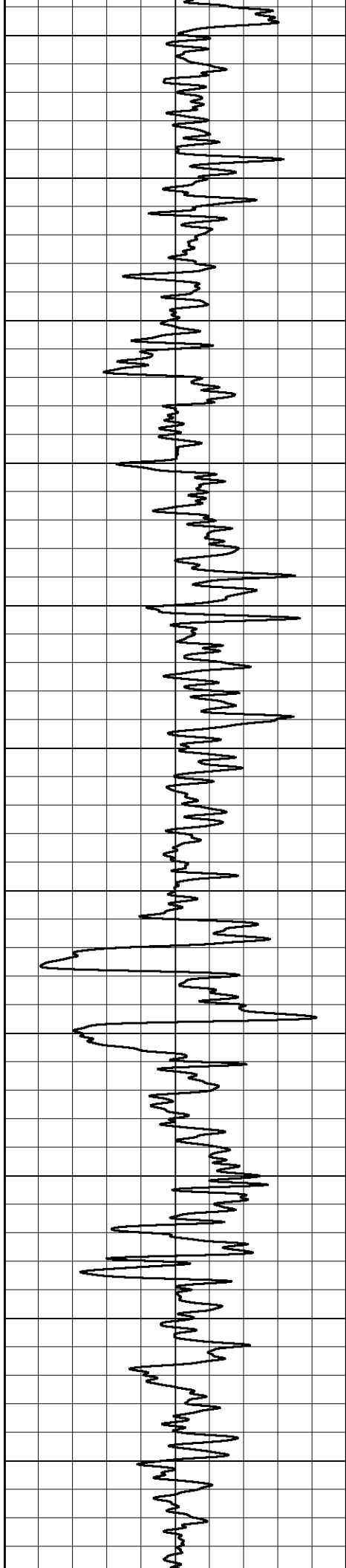


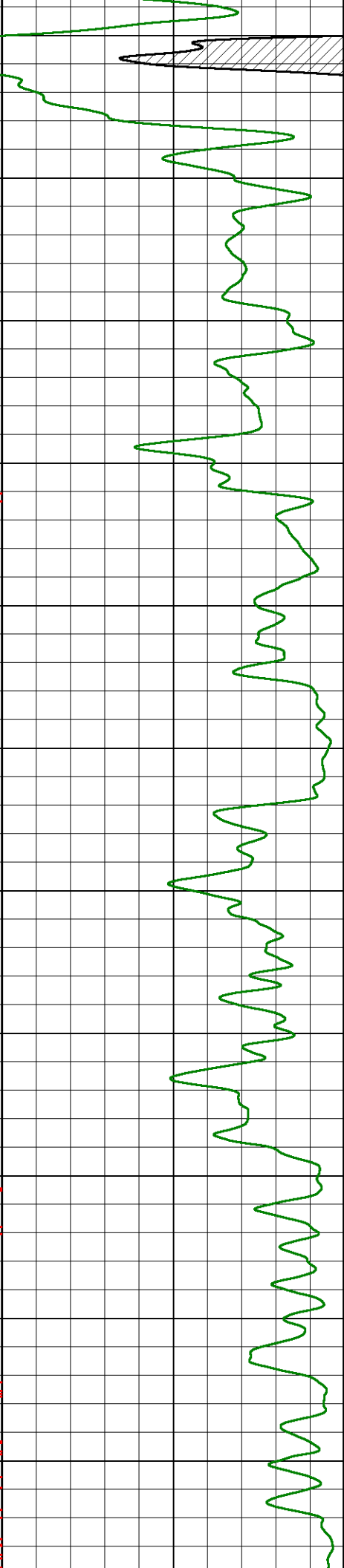
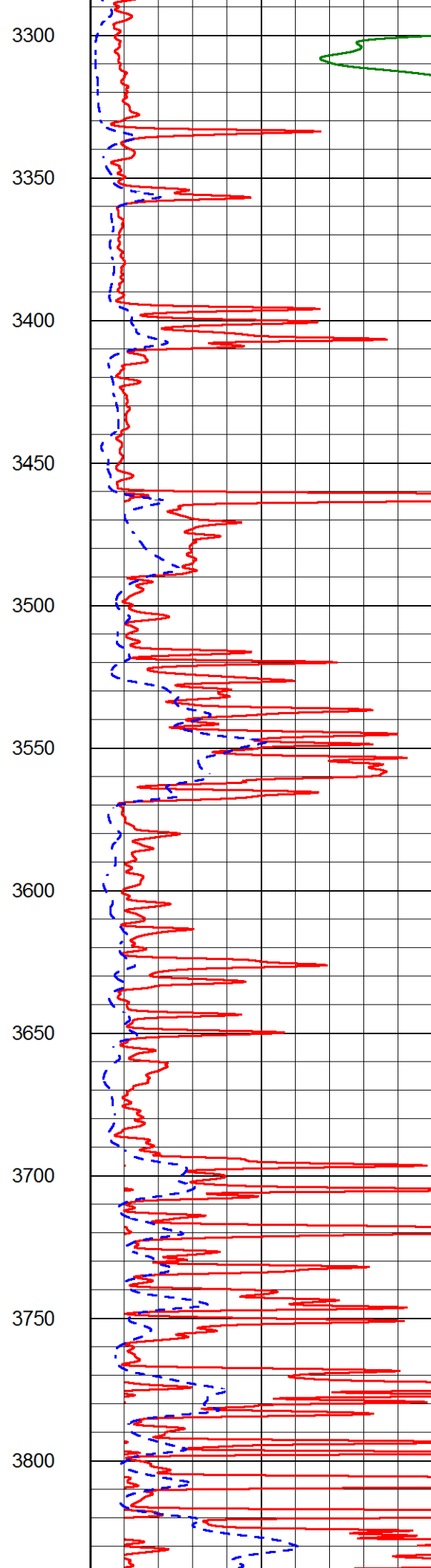
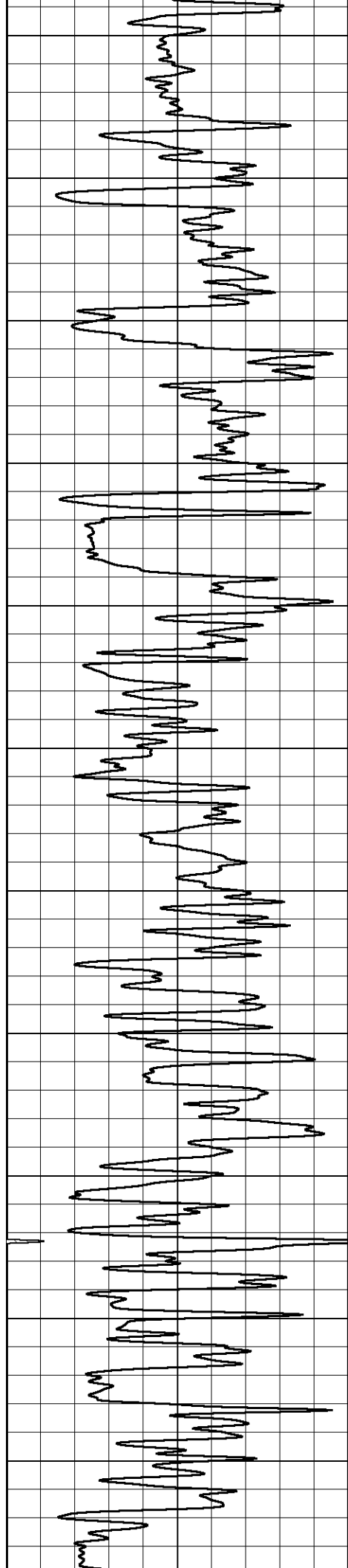


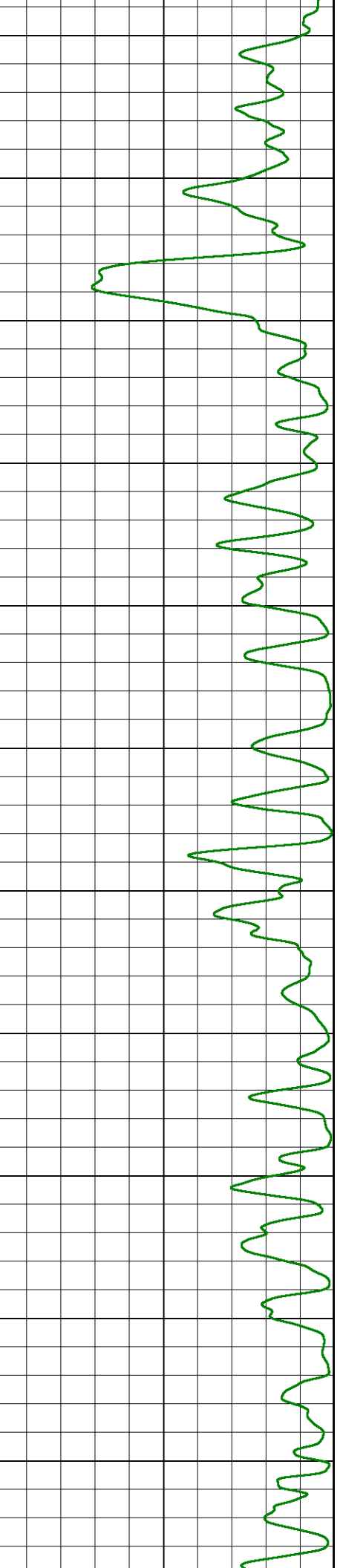
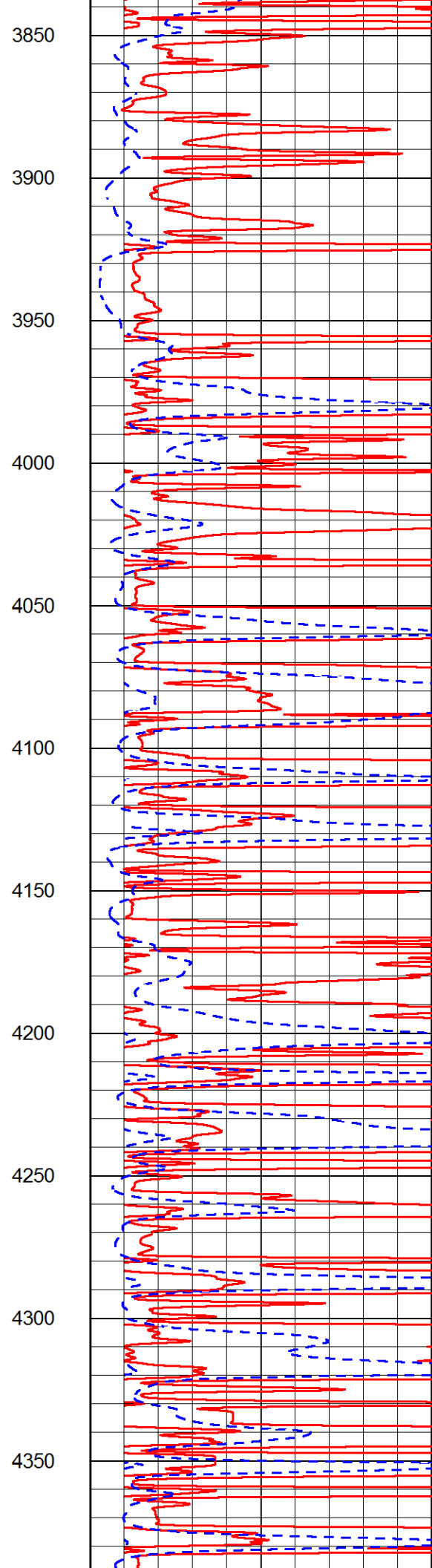
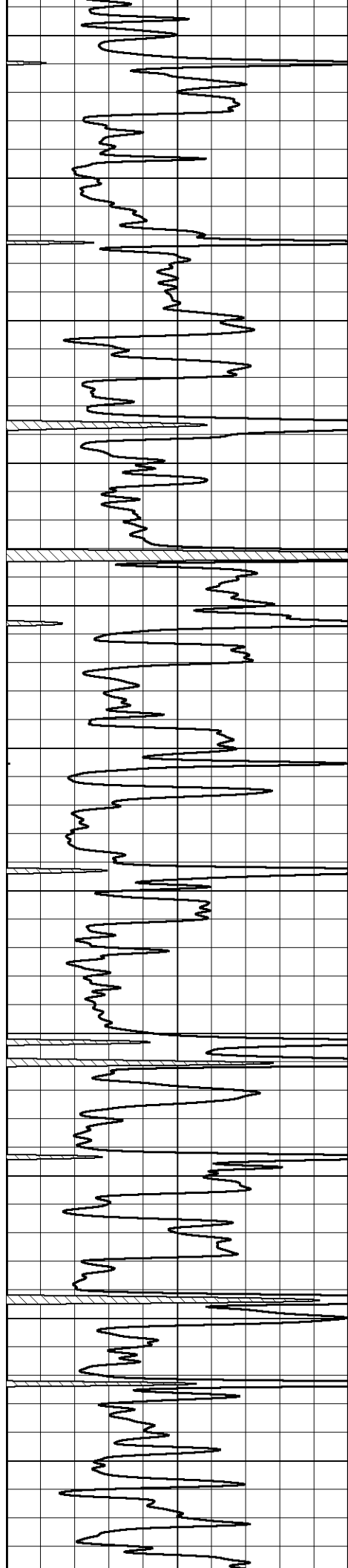
1650
1700
1750
1800
1850
1900
1950
2000
2050
2100
2150

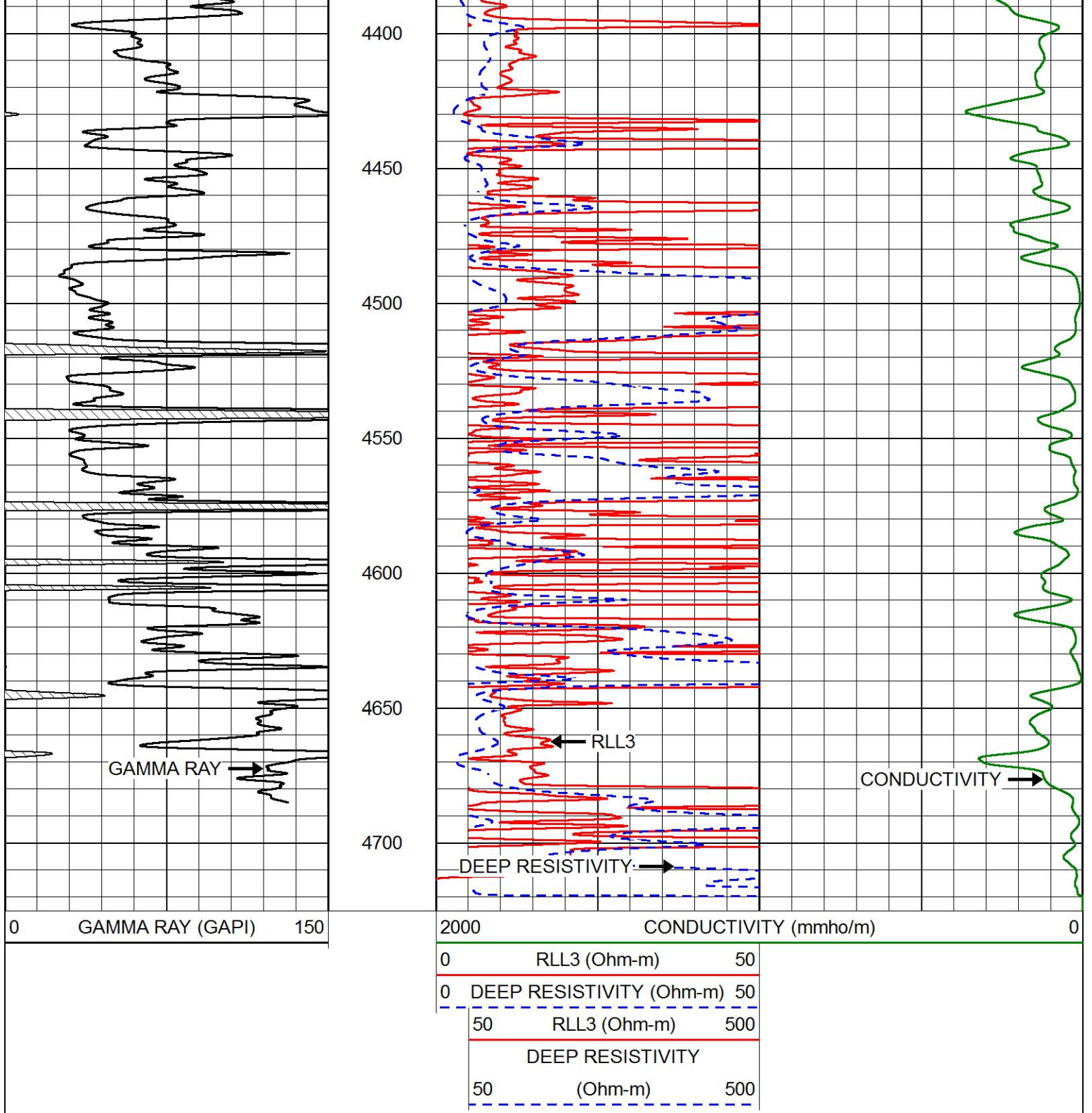








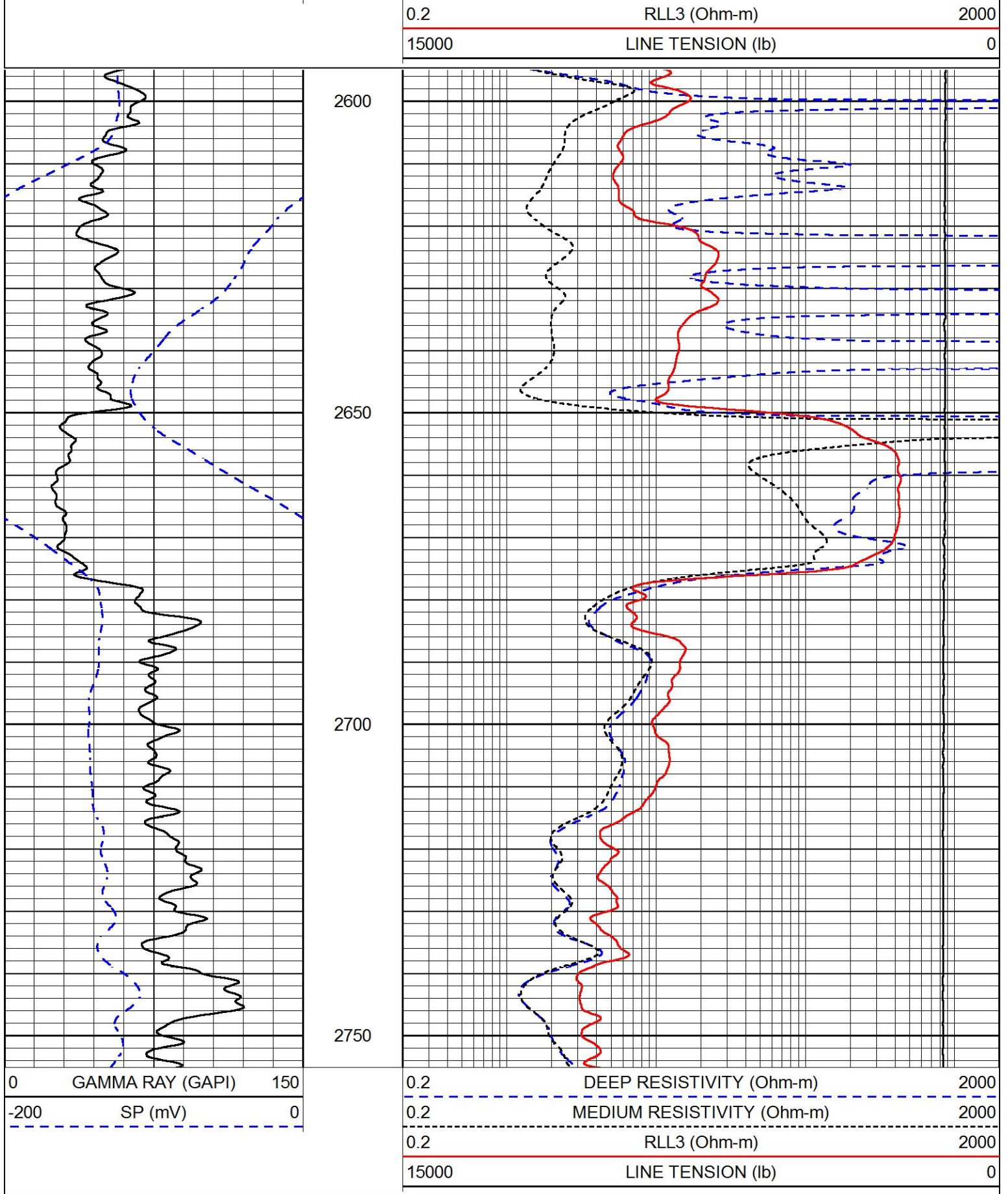




MAIN PASS

Database File elk_energy_lippelmann_1_14.db
 Dataset Pathname stackml/pass3.1
 Presentation Format dil
 Dataset Creation Thu Sep 07 14:06:47 2017
 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

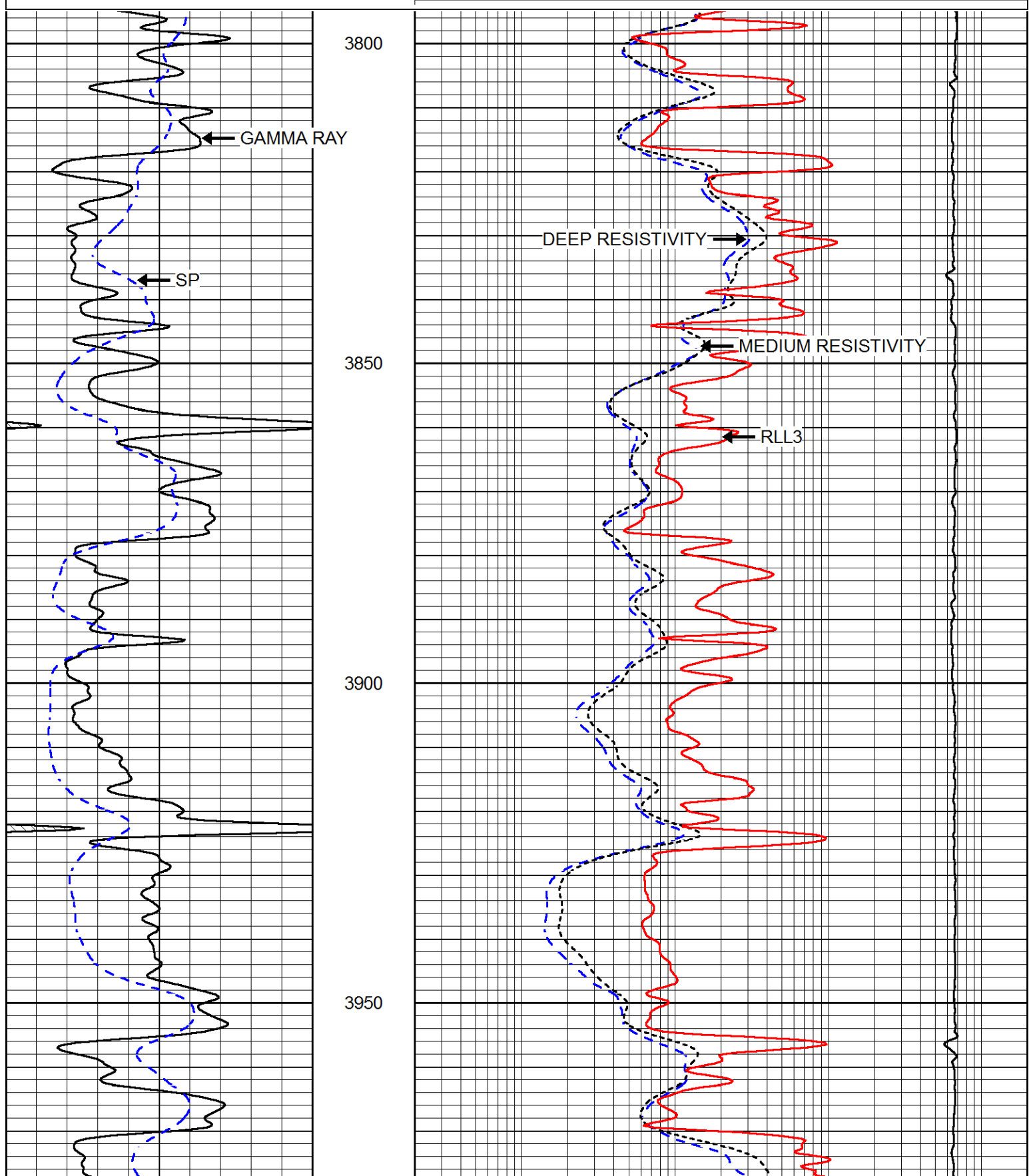


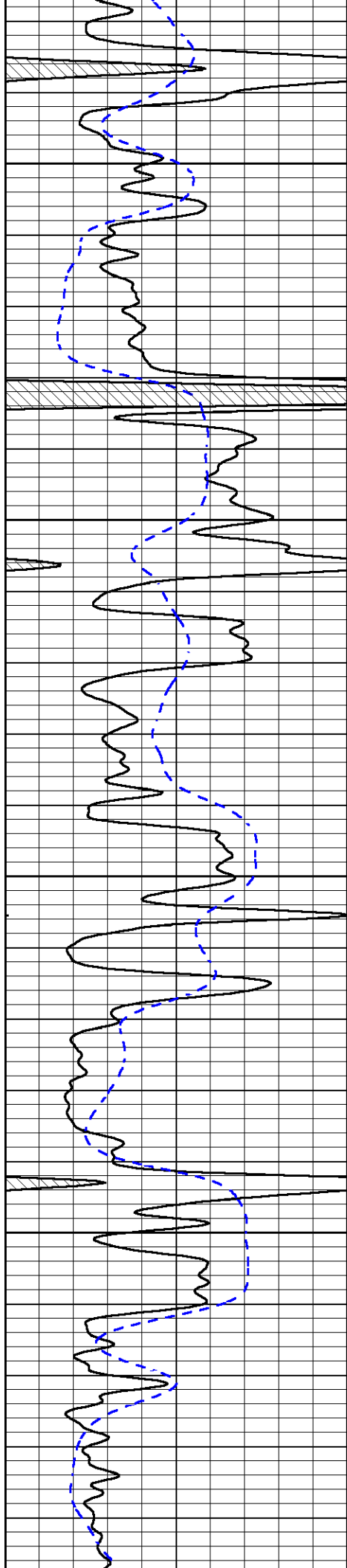
MAIN PASS

Database File elk_energy_hippelmann_1_14.db
 Dataset Pathname stackml/pass3.1
 Presentation Format dil
 Dataset Creation Thu Sep 07 14:06:47 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



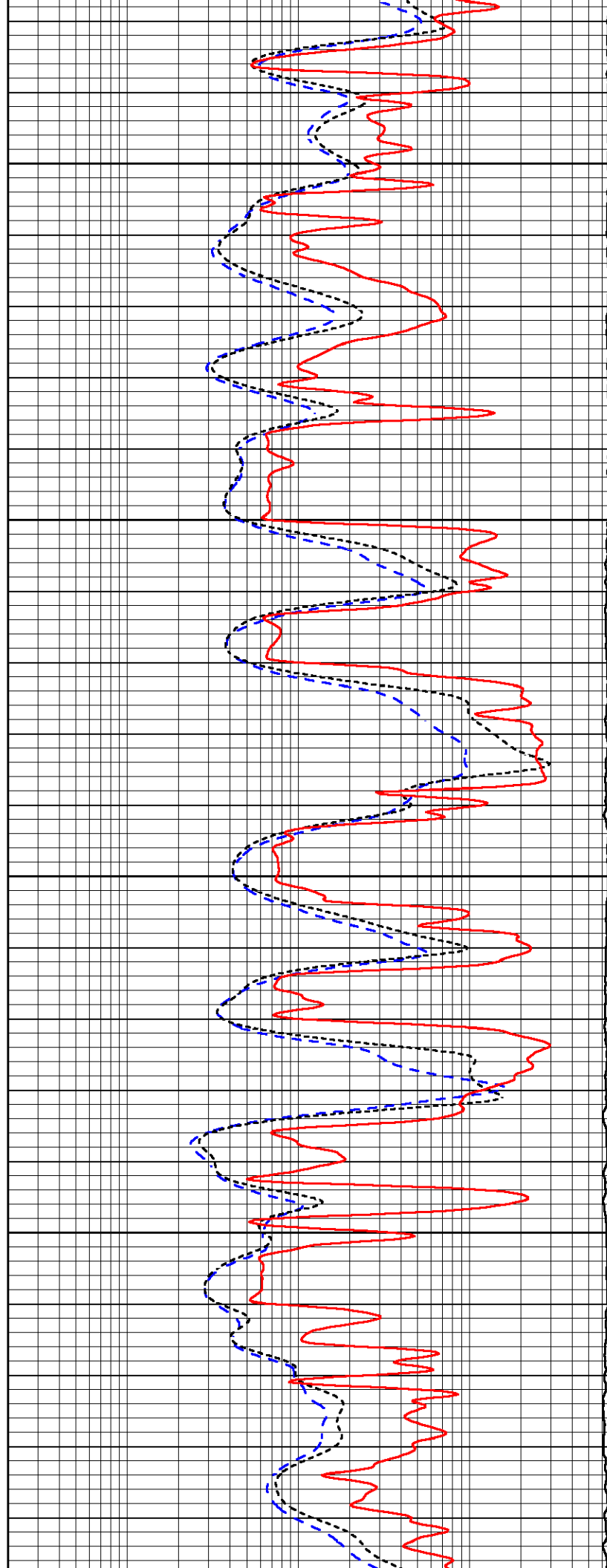


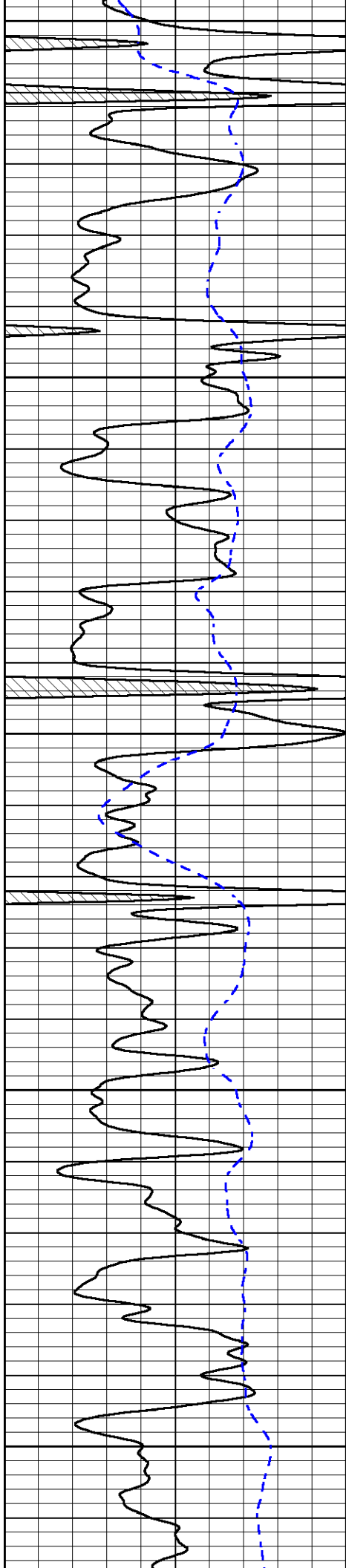
4000

4050

4100

4150





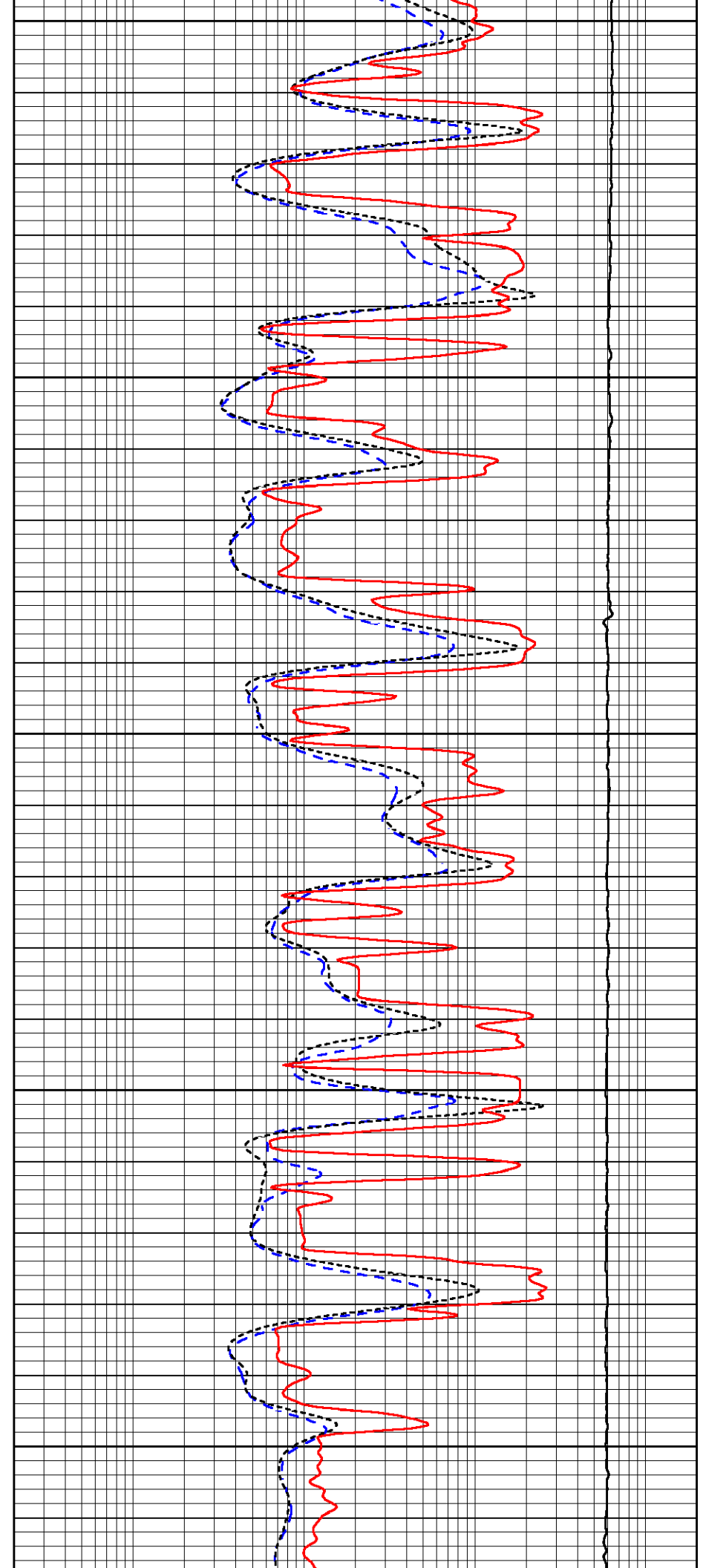
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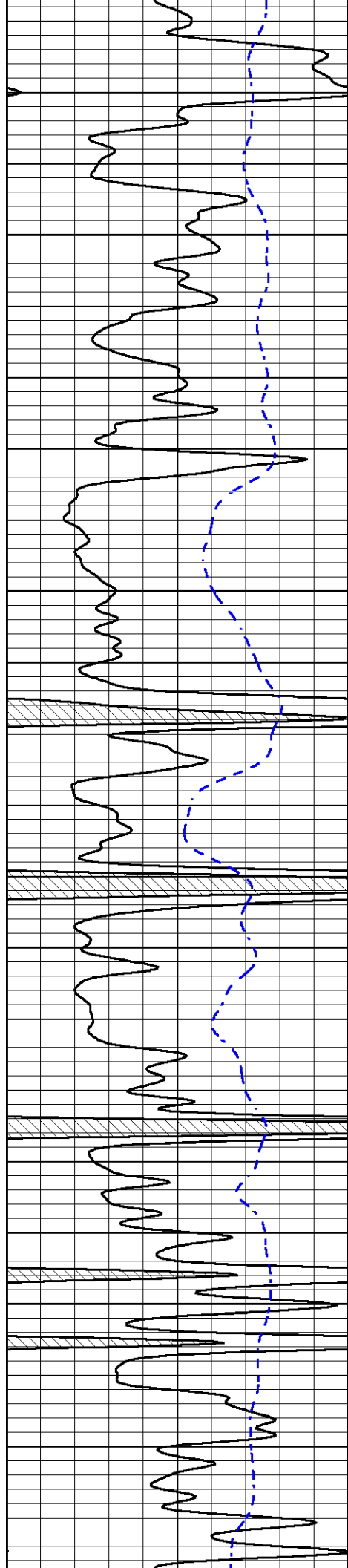
4250

4300

4350

4400



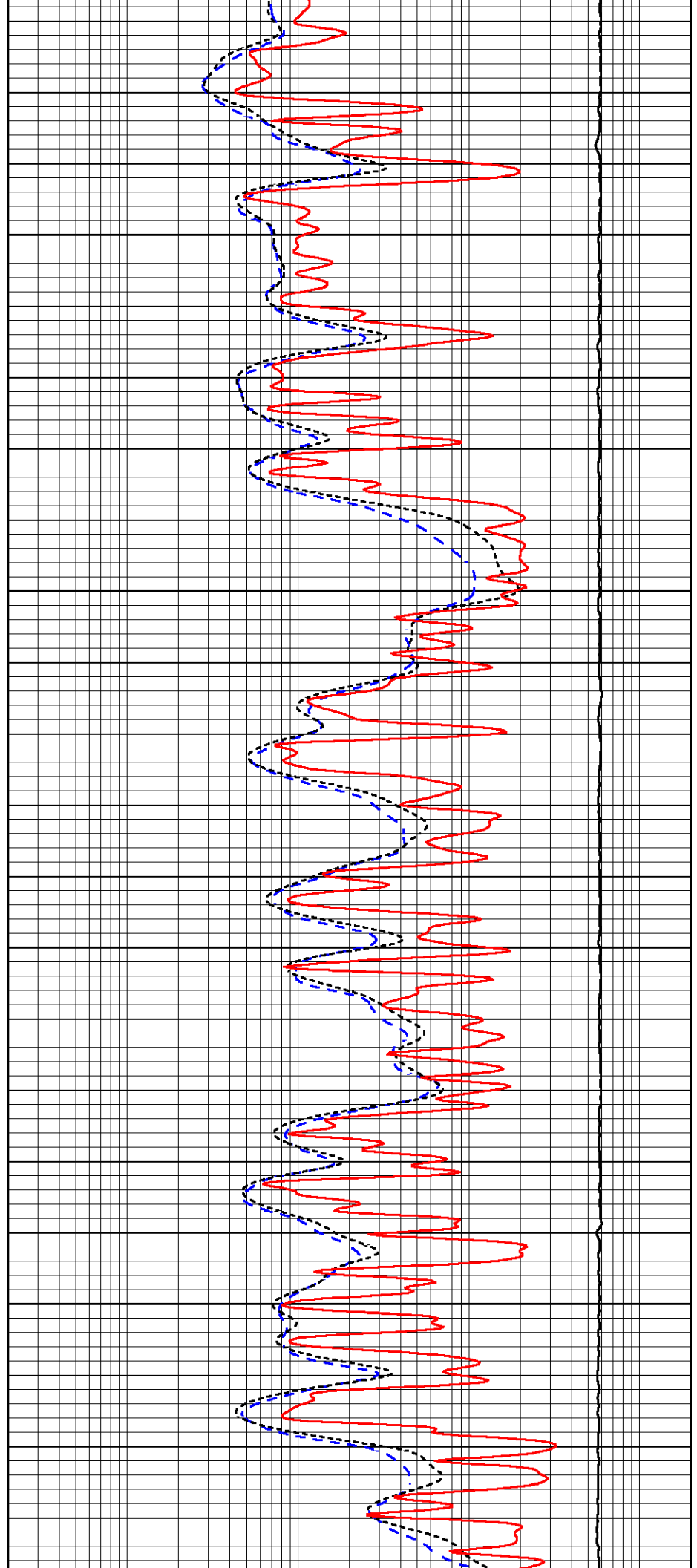


4450

4500

4550

4600

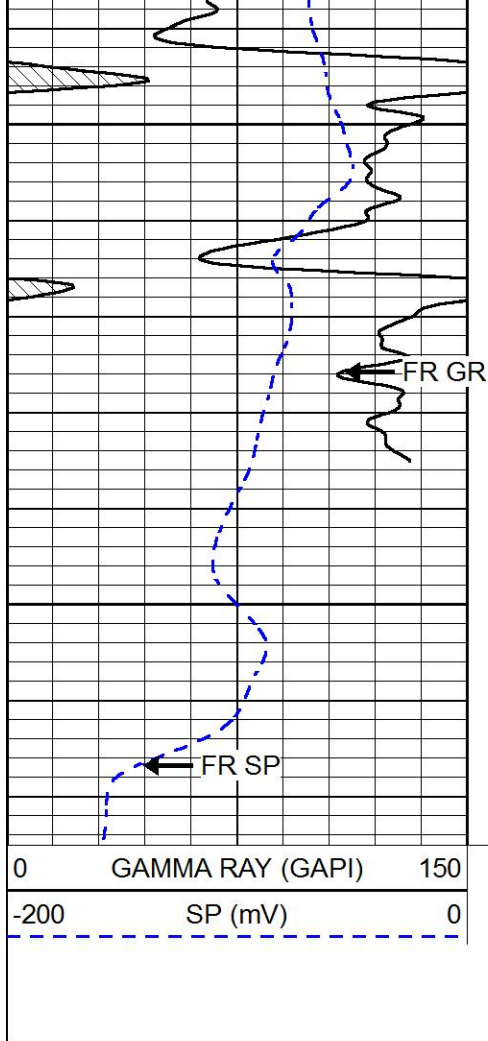


4450

4500

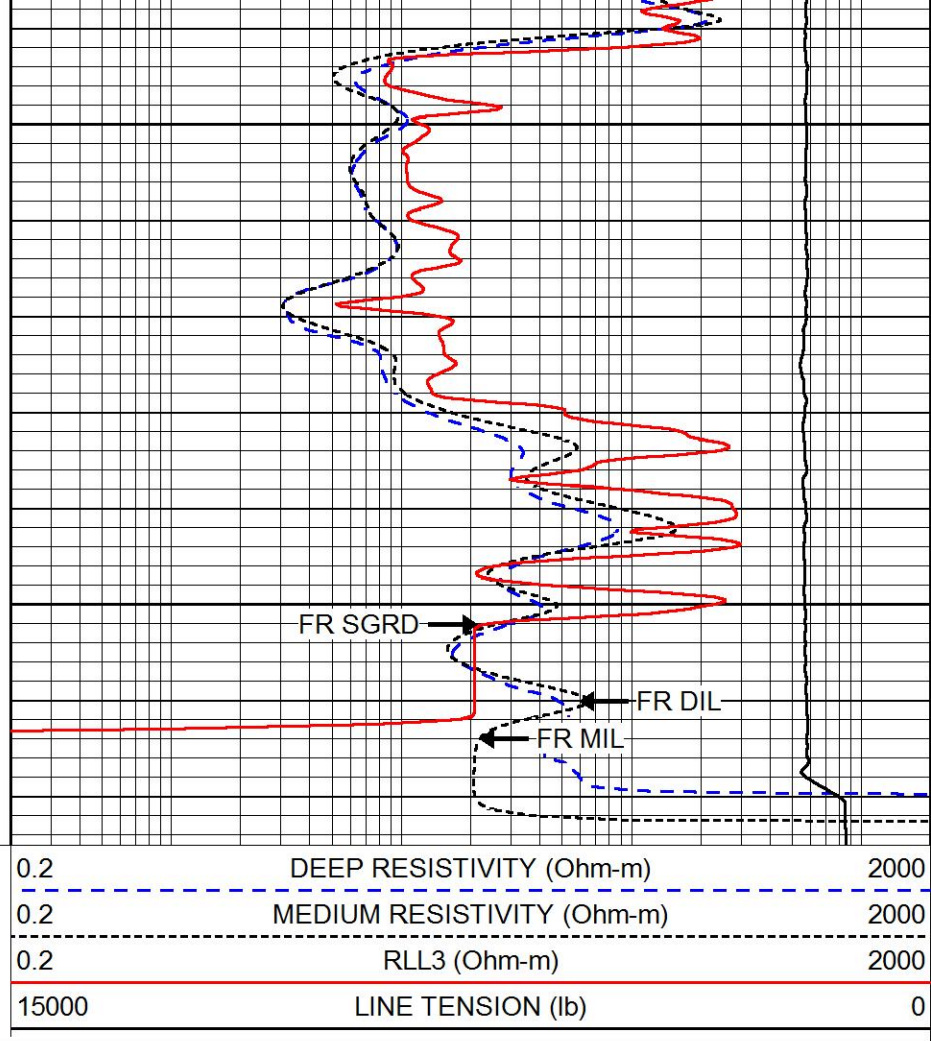
4550

4600



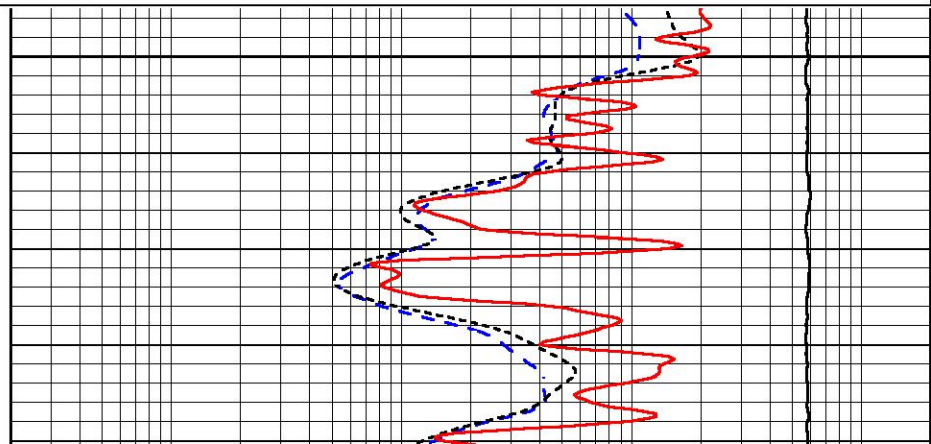
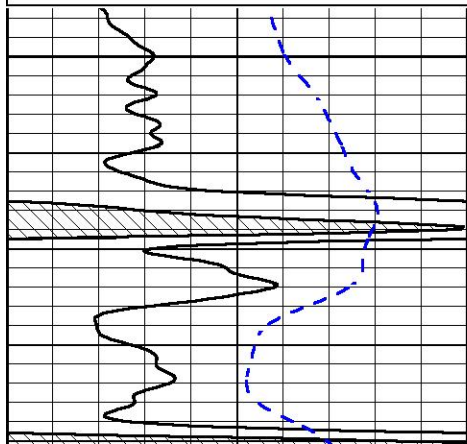
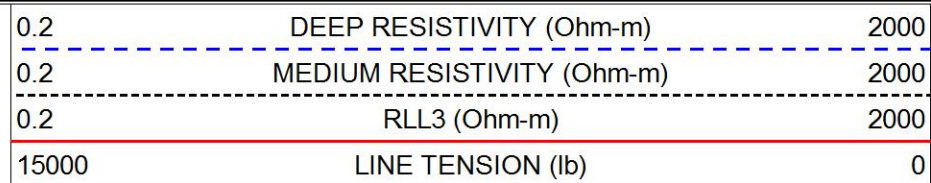
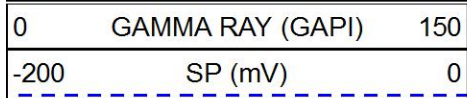
4650

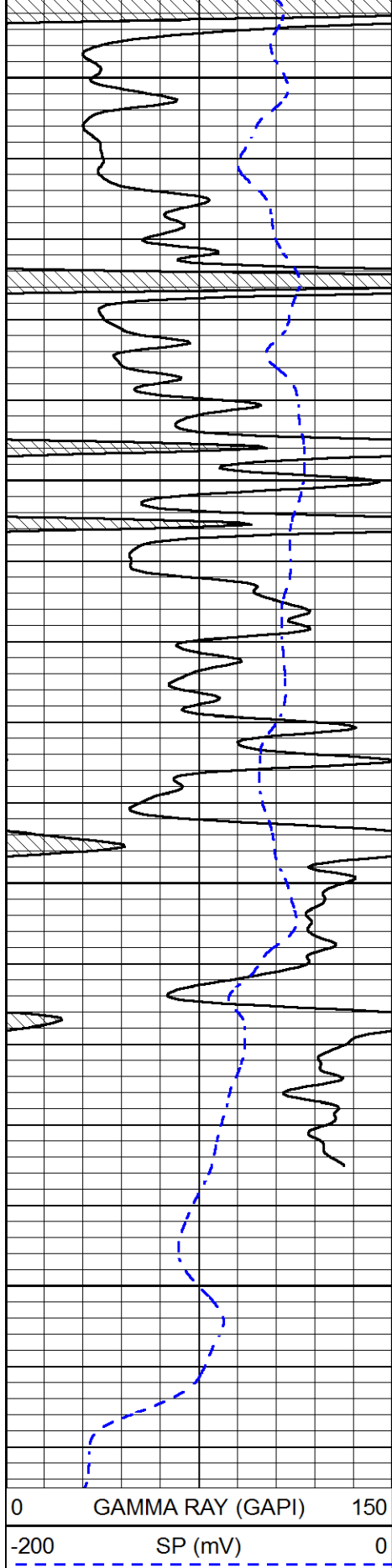
4700



REPEAT SECTION

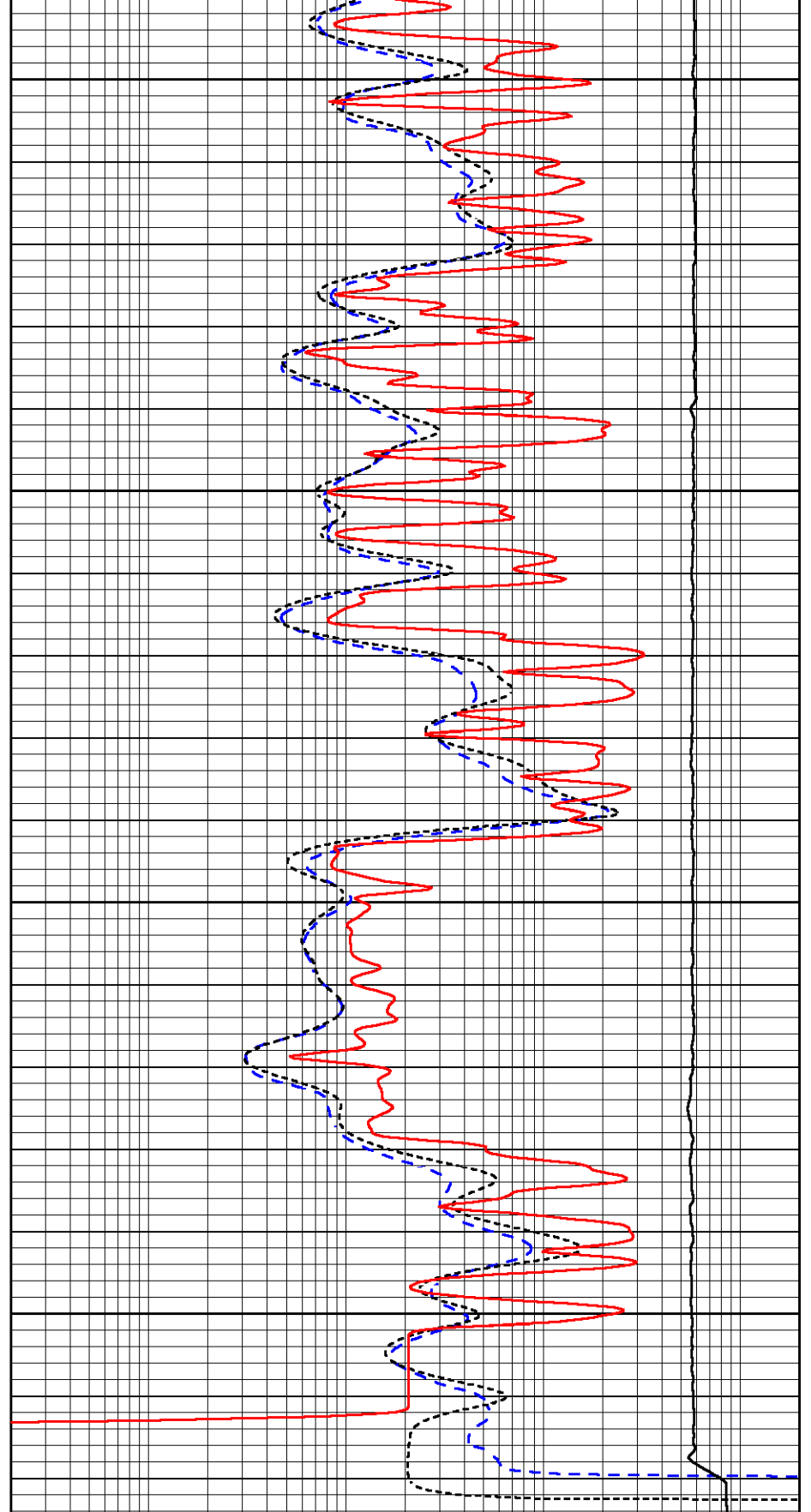
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Dataset Pathname stackml/pass2.1
Presentation Format dil
Dataset Creation Thu Sep 07 13:12:05 2017
Charted by Depth in Feet scaled 1:240





4550
4600
4650
4700

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

Dual Induction Calibration Report

Serial-Model: 1987-M&W
 Calibration Performed: Tue Apr 11 16:07:38 2017

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-02-PSI STKBL ML
 Performed: Fri Jun 23 00:25:19 2017

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0031	0.0043	0.0000	10.0000	Ohm-m	16000.0000	0.0000
Inverse	0.0000	0.0013	0.0000	10.0000	Ohm-m	18000.0000	0.0000
Caliper	1.0020	1.0834	5.5000	16.5000	in	135.1560	-131.4000

Compensated Density Calibration Report

Serial-Model: 168-986-M&W
 Source / Verifier: /
 Master Calibration Performed: Tue Apr 11 16:07:47 2017

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

Serial Number:	00 M&W	
Tool Model:	M&W	
Calibration Performed:	Tue Apr 11 16:08:01 2017	
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	ELK ENERGY HOLDINGS, LLC
Well	LIPPELMANN NO 1-14
Field	WILDCAT
County	THOMAS
State	KANSAS