



DUAL INDUCTION LOG

Pioneer Energy Services

PIONEER

Company RICHLAND OIL INVESTMENTS, LLC
Well MICHAELIS #25-1
Field WILDCAT
County LOGAN
State KANSAS

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Well MICHAELIS #25-1
Field WILDCAT
County LOGAN State KANSAS

Location: API #: 15-109-21541-00-00

653' FSL & 1913' FWL

SEC 25 TWP 11S RGE 33W

Permanent Datum GROUND LEVEL Elevation 3077'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING

Elevation
K.B. 3087'
D.F. N/A
G.L. 3077'

Date 4/19/2018

Run Number ONE

Depth Driller 4730'

Depth Logger 4729'

Bottom Logged Interval 4728'

Top Log Interval 200'

Casing Driller 8.625" @ 226'

Casing Logger 224'

Bit Size 7.875"

Type Fluid in Hole CHEMICAL

Salinity, ppm CL 4000

Density / Viscosity 9.3 64

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 0.24 @ 123

Operating Rig Time 3 HOURS

Max Rec. Temp. F 123

Equipment Number 91

Location HAYS

Recorded By D. SCHMIDT

Witnessed By STEVE MURPHY

<<< 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.

OAKLEY (HWY 40 & 83),
4 WEST TO 400 RD, 4 SOUTH,
WEST INTO

Log Measured From: KELLY BUSHING 10 Ft. Above Permanent Datum

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

Your Pioneer Energy Services Crew

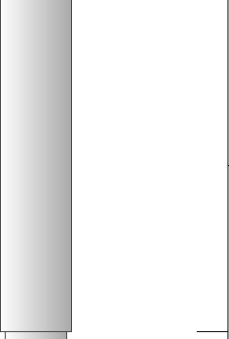
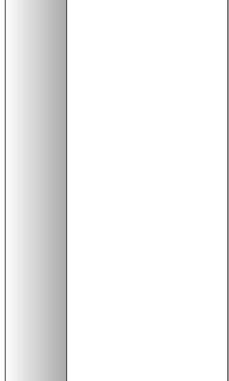
Engineer: D. SCHMIDT
Operator:
Operator:
Operator:

This Log Record Was Witnessed By

Primary Witness: STEVE MURPHY
Secondary Witness:
Secondary Witness:
Secondary Witness:

Top - Bottom

M	A	SZCOR	NPORSEL	FLUIDDEN g/cc	MATRXDEN g/cc	SPSHIFT mV	SNDERRM mmho/m
2	1	Off	Limestone	1	2.71	-94	0
SNDERR mmho/m	SRFTEMP degF	CASETHCK in	CASEOD in	PERFS	TDEPTH ft	BOTTEMP degF	BOREID in
0	50	0	5.5	0	4729	123	7.875

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58		GR-M&W (89)	3.00	3.50	50.00
CNLSC CNSSC	37.48 36.73		CNT-M&W (207-MW)	5.50	3.50	100.00
LSD DCAL SSD	28.43 28.42 27.93		CDL-M&W (182-152)	8.50	4.00	250.00
MCAL MI MN	19.83 19.83 19.83		ML-PSIML (PSI-01) GO Micro log tools converted to Simplec electronics	7.58	4.00	65.00
RLL3F RLL3	15.80 15.80					

			DIL-PSI HIGH TEMP (933 (HT))	18.50	3.50	220.00
CILD	8.00					
CILM	4.70					
SP	0.20					
Dataset: richland_michaelis 25-1.db: field/well/STKML/pass3.1 Total length: 43.08 ft Total weight: 685.00 lb O.D.: 4.00 in						



Database File

richland_michaelis 25-1.db

Dataset Pathname

STKML/pass4.1

Presentation Format

dil2in

Dataset Creation

Thu Apr 19 05:19:33 2018

Charted by

Depth in Feet scaled 1:600

GAMMA RAY

0 (GAPI) 150

1000 CONDUCTIVITY (mmho/m) 0

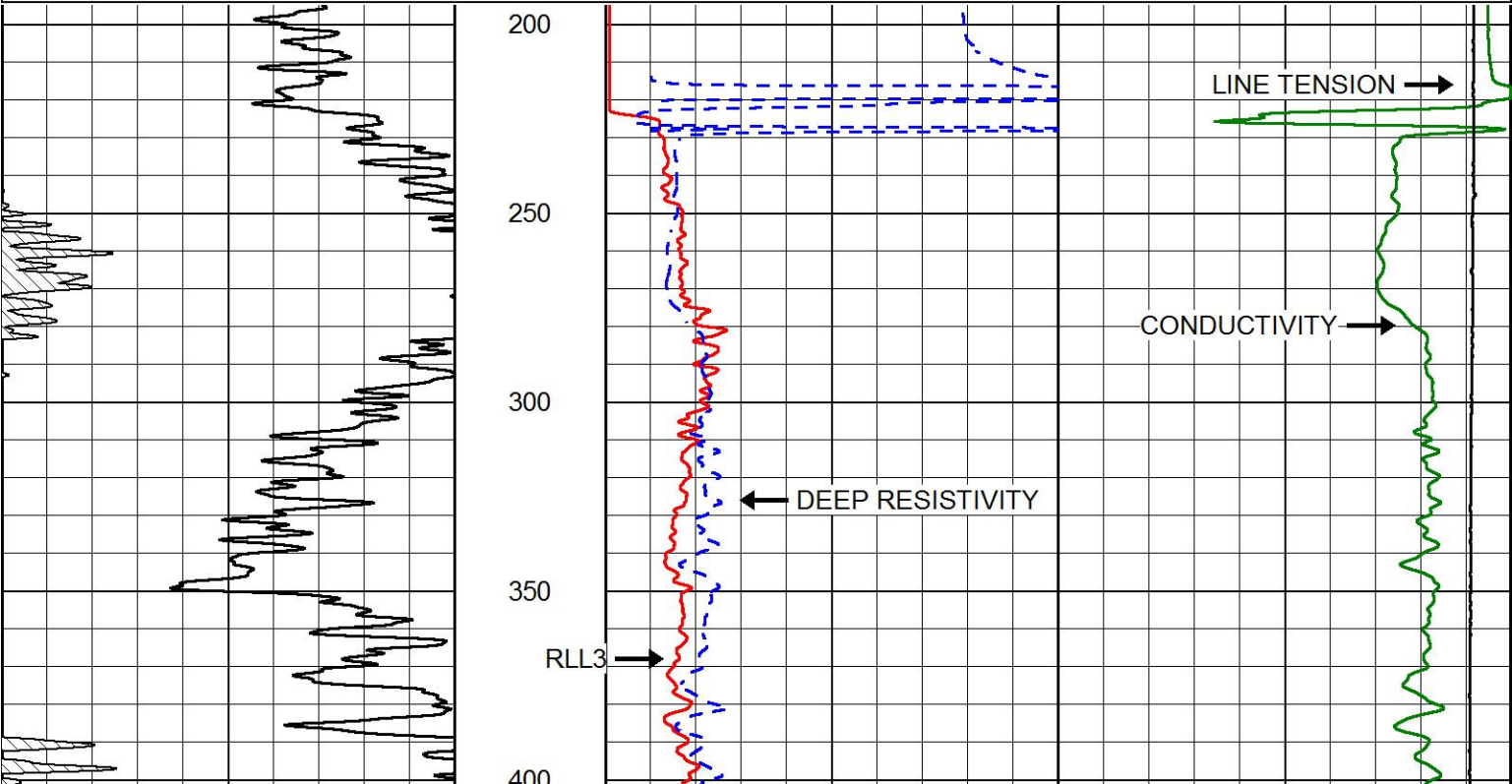
15000 Line Tension (lb) 0

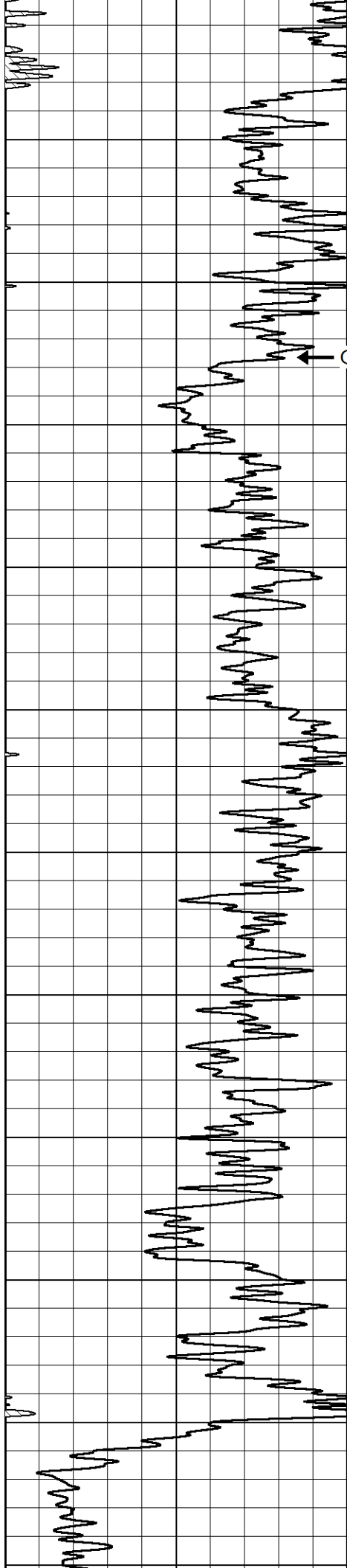
0 RLL3 (Ohm-m) 50

0 DEEP RESISTIVITY (Ohm-m) 50

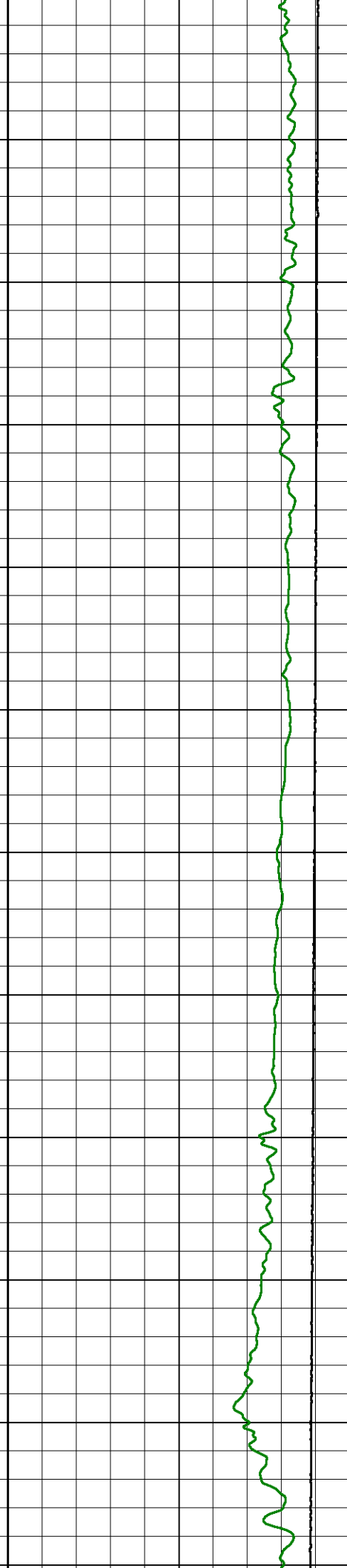
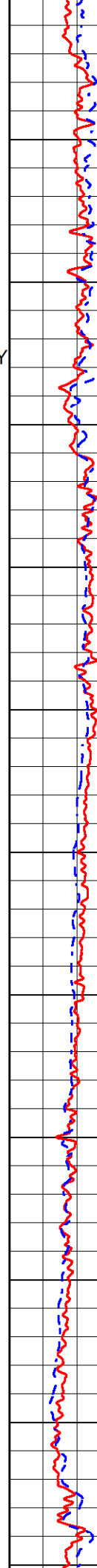
50 RLL3 (Ohm-m) 500

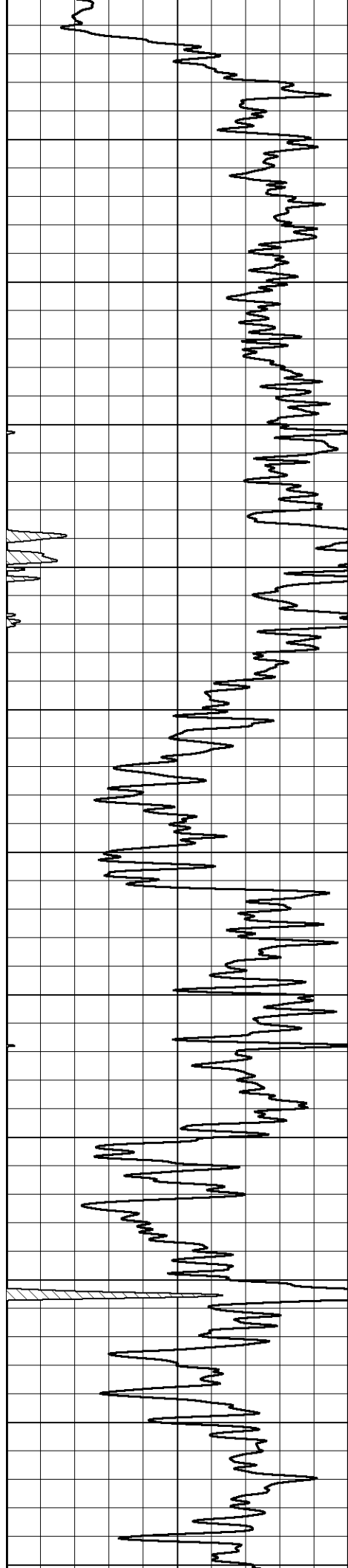
50 Deep Resistivity (Ohm-m) 500



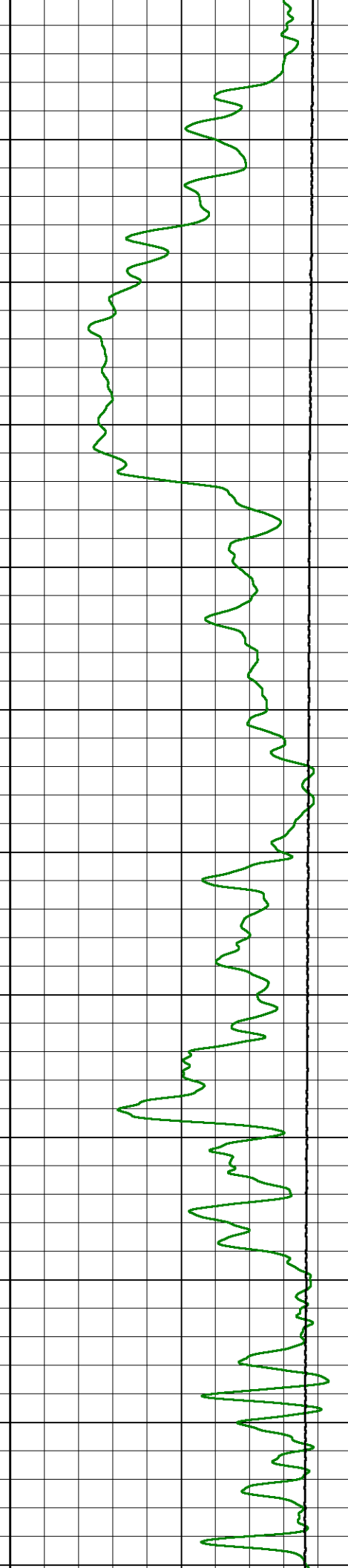
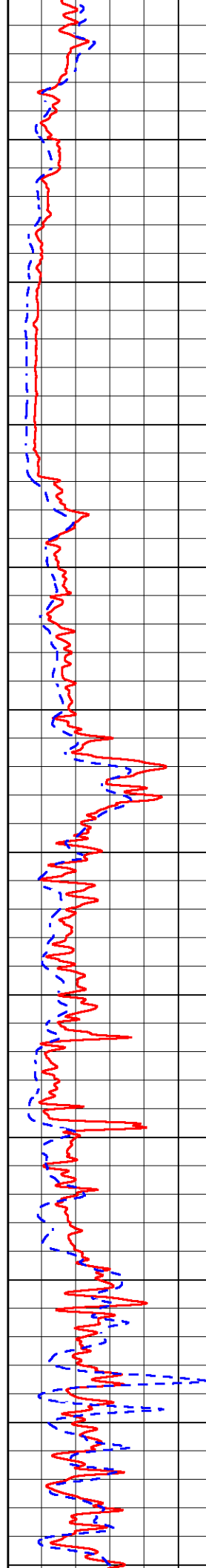


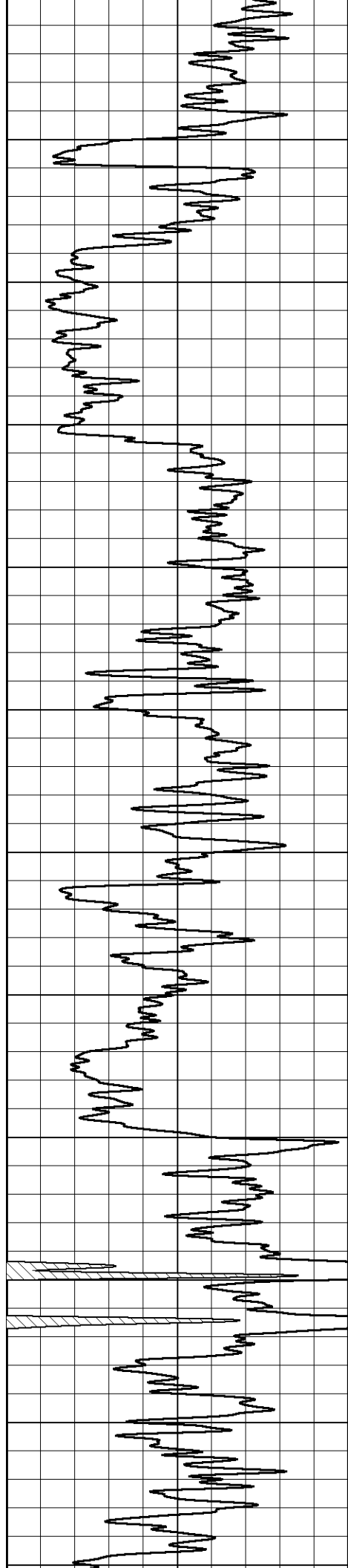
400
450
500
550
600
650
700
750
800
850
900
950



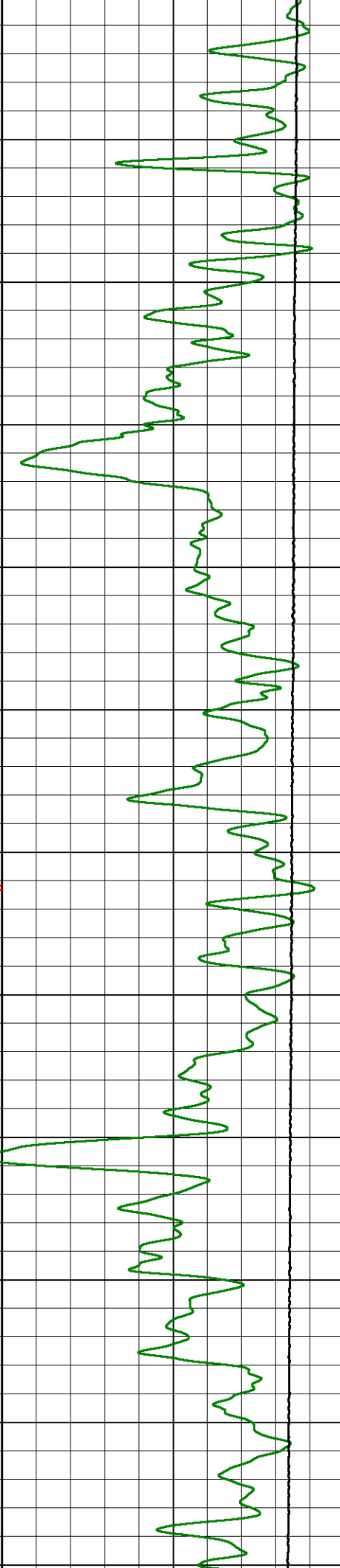
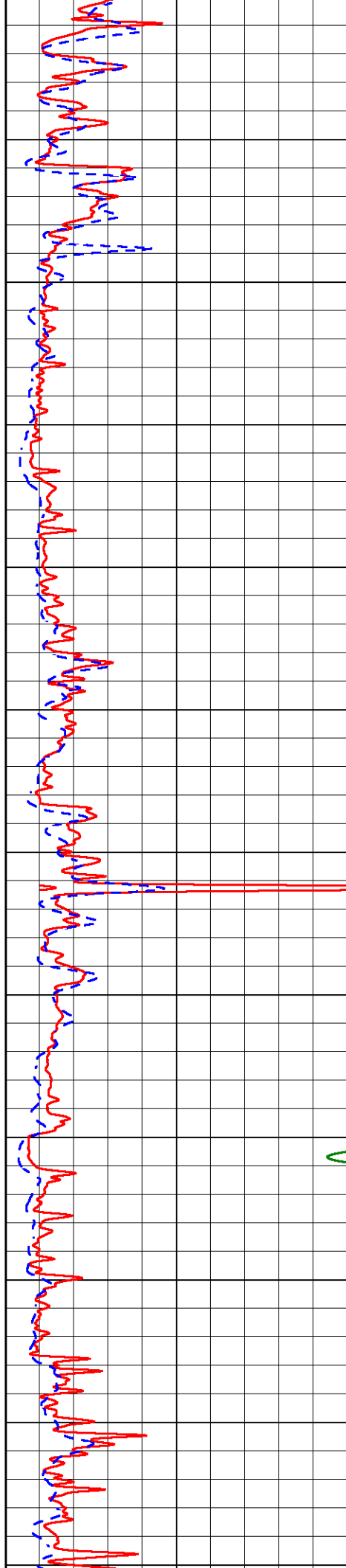


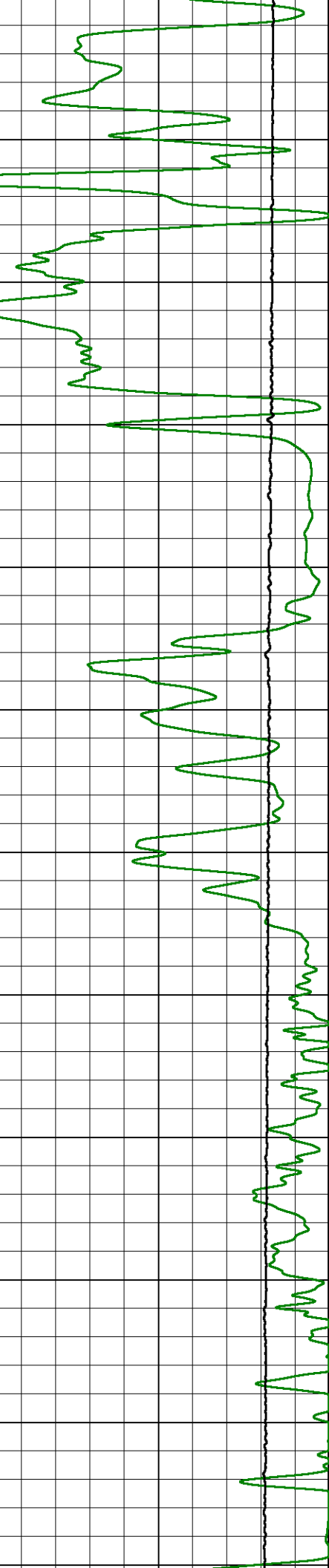
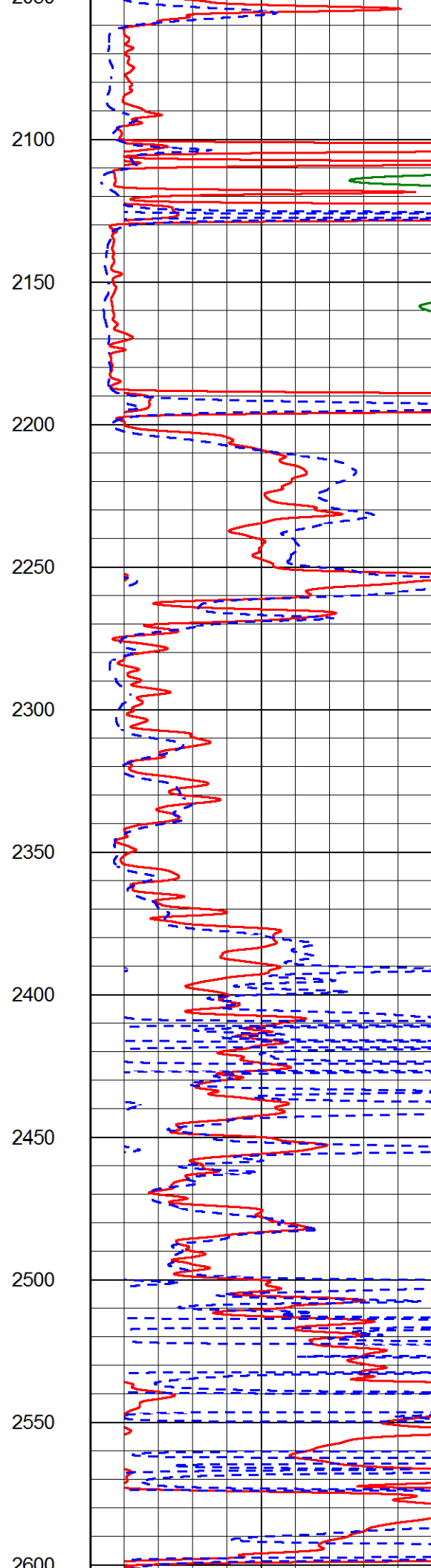
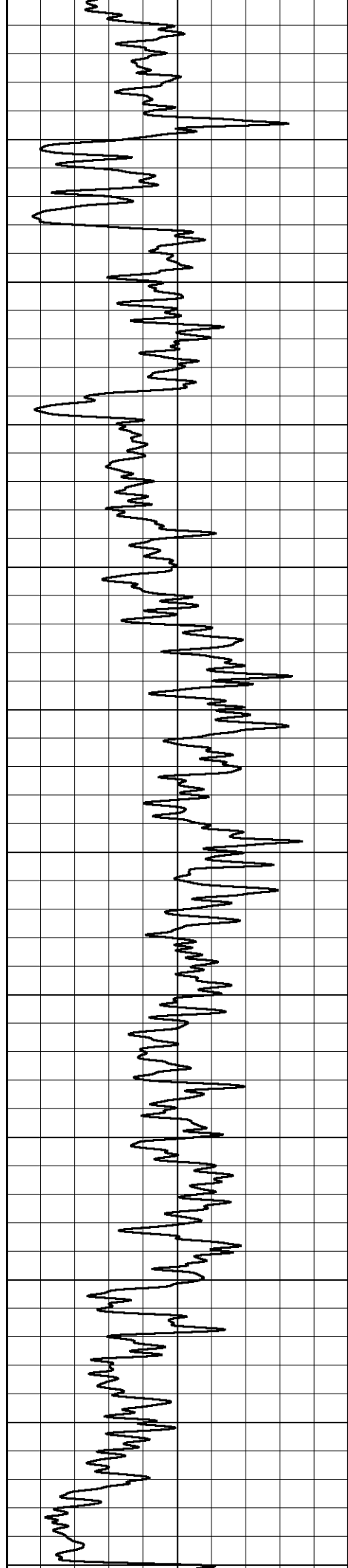
950
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500

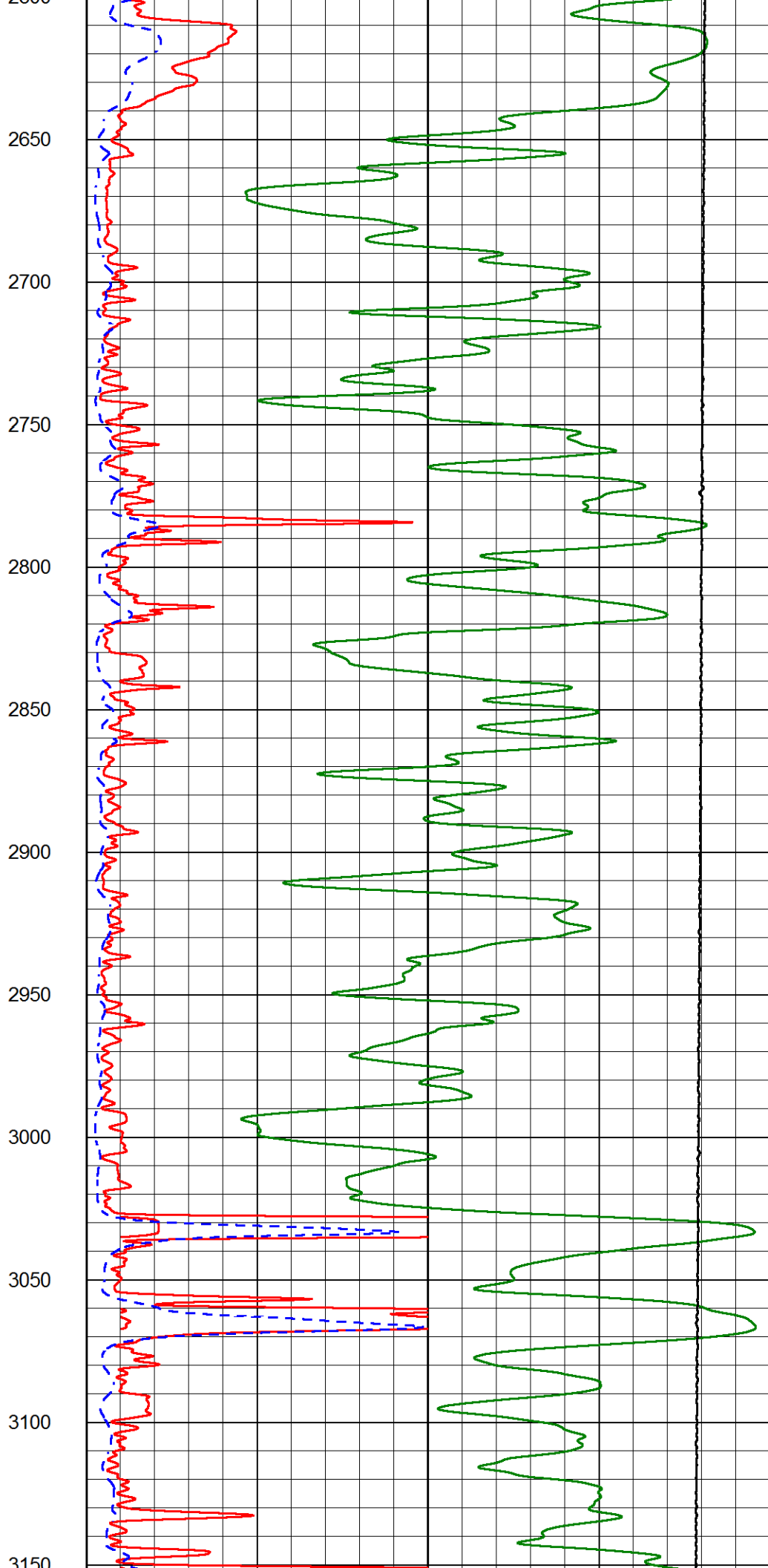
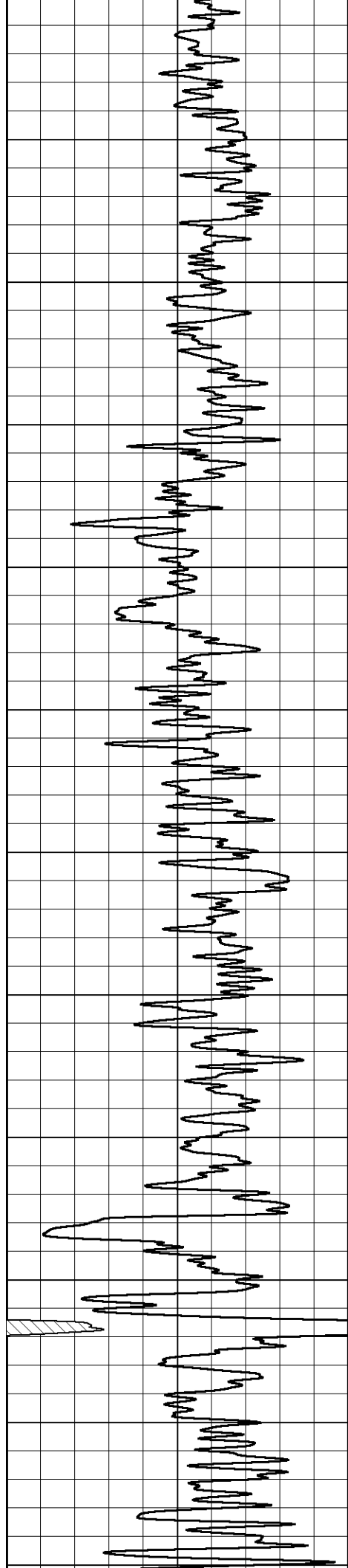


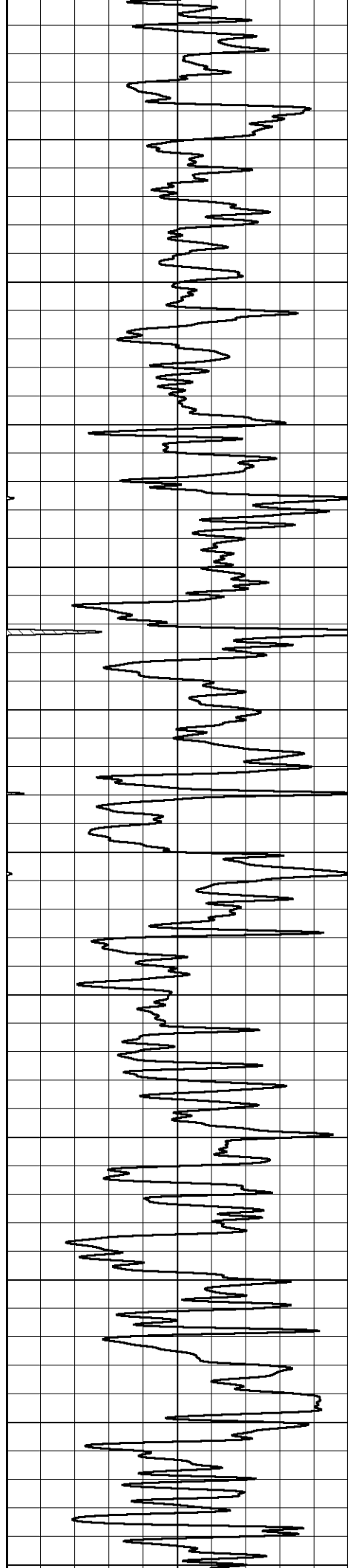


1500
1550
1600
1650
1700
1750
1800
1850
1900
1950
2000
2050

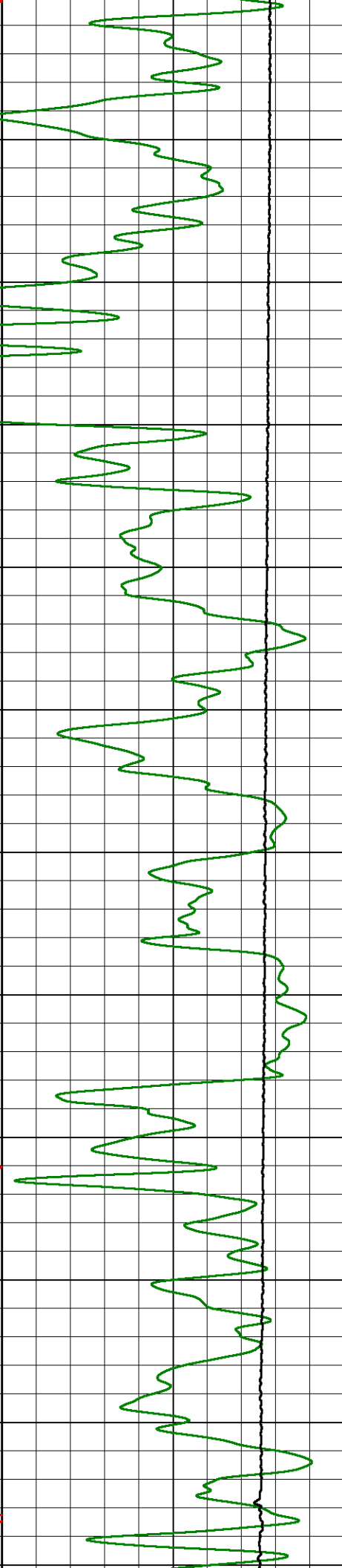
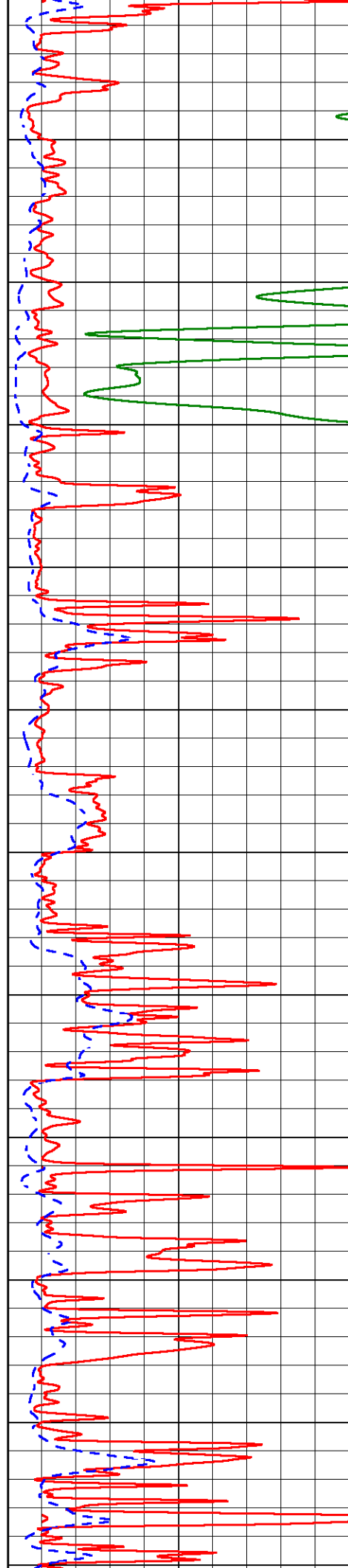


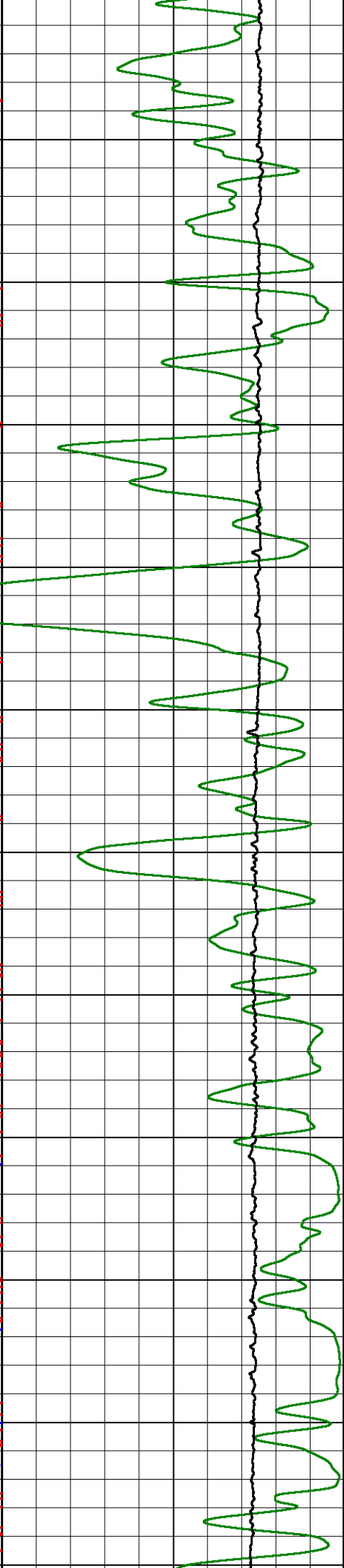
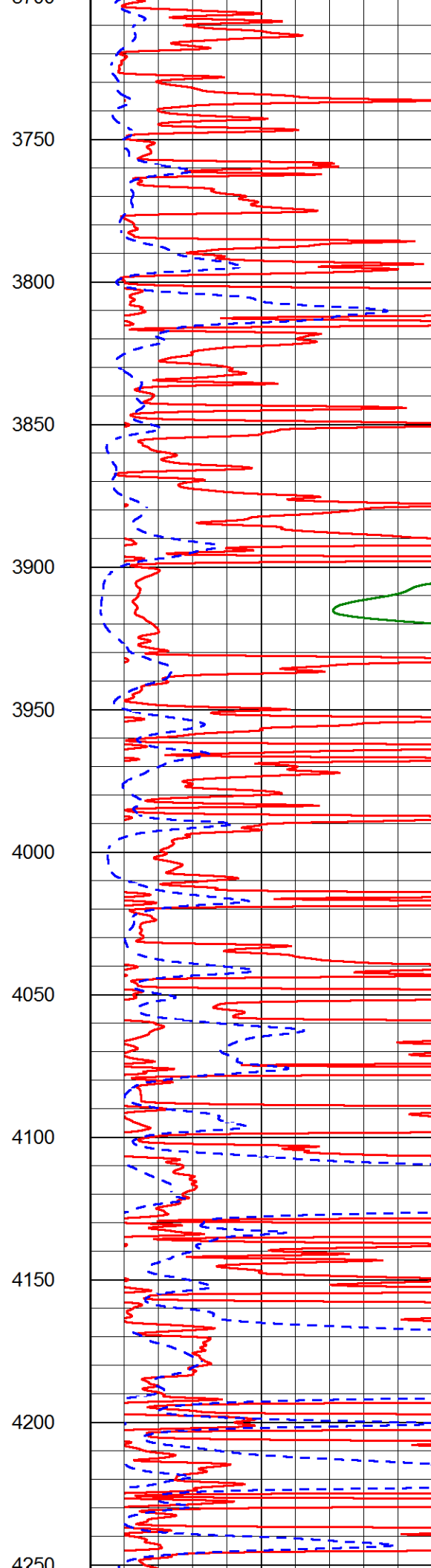
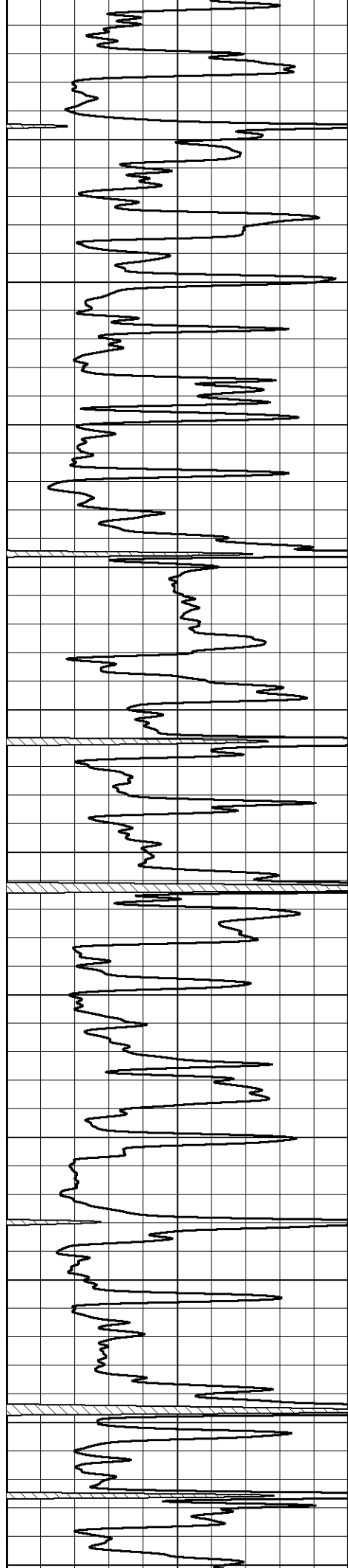


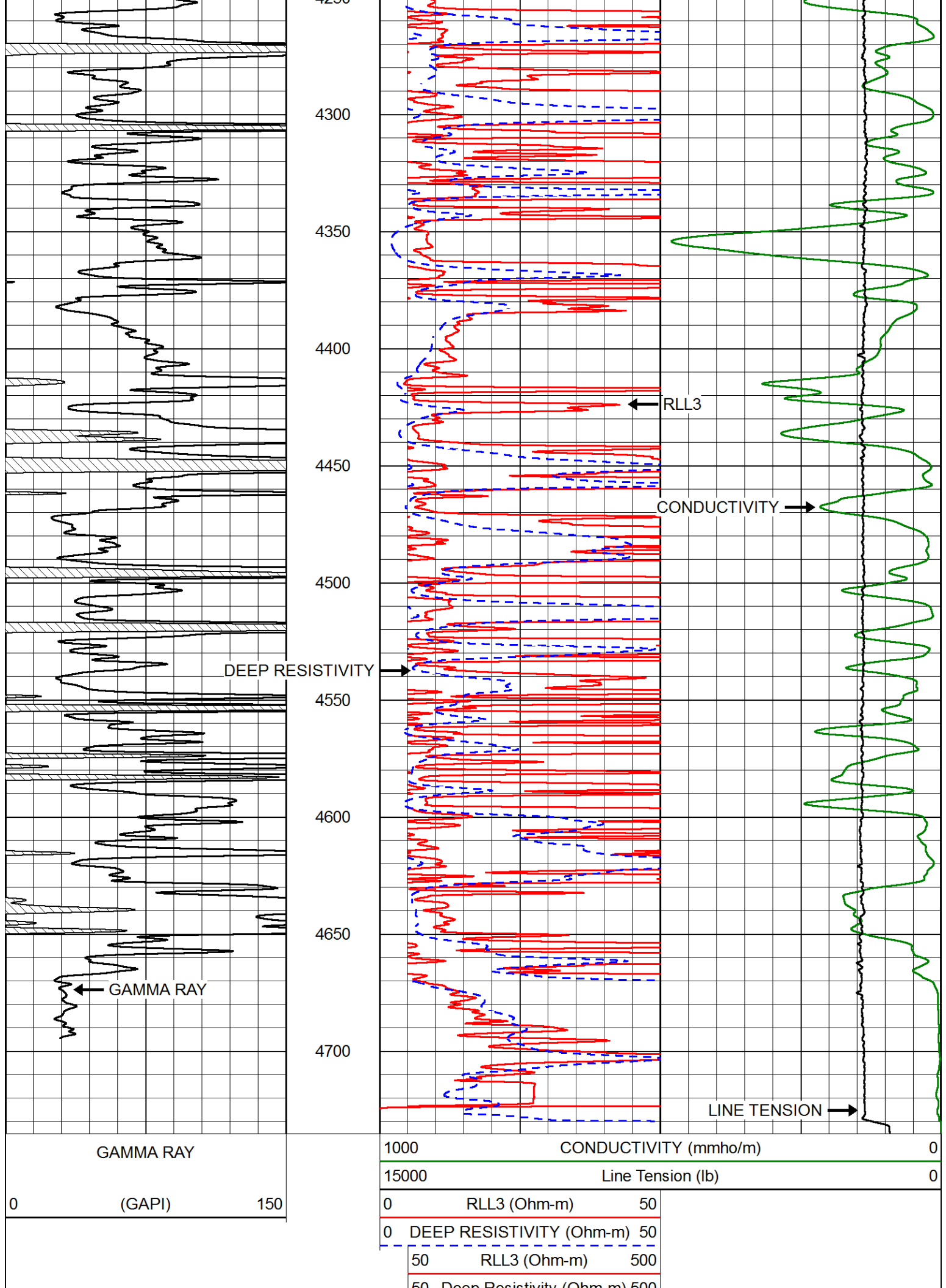




3100
3200
3250
3300
3350
3400
3450
3500
3550
3600
3650
3700







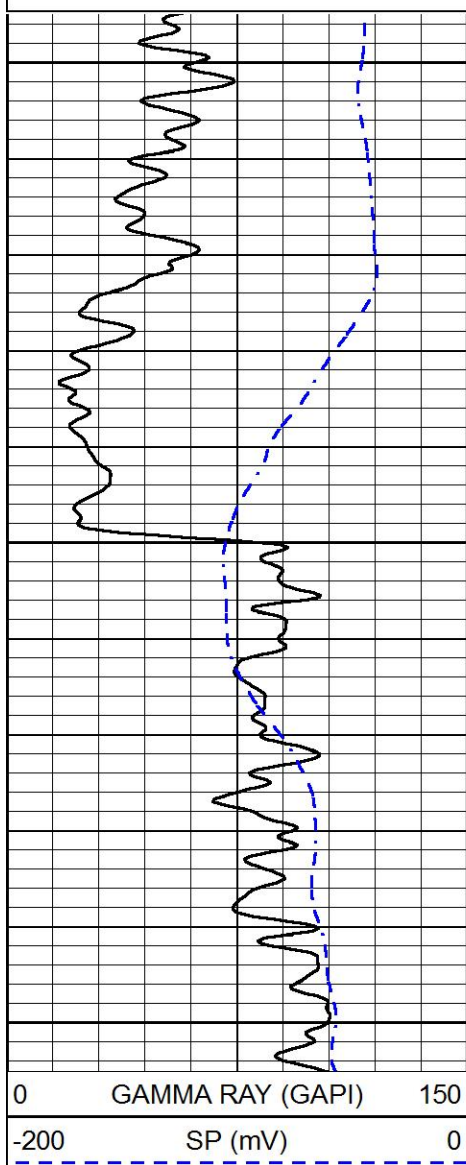


MAIN PASS

Database File richland_michaelis 25-1.db
Dataset Pathname STKML/pass4.1
Presentation Format dil
Dataset Creation Thu Apr 19 05:19:33 2018
Charted by Depth in Feet scaled 1:240

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

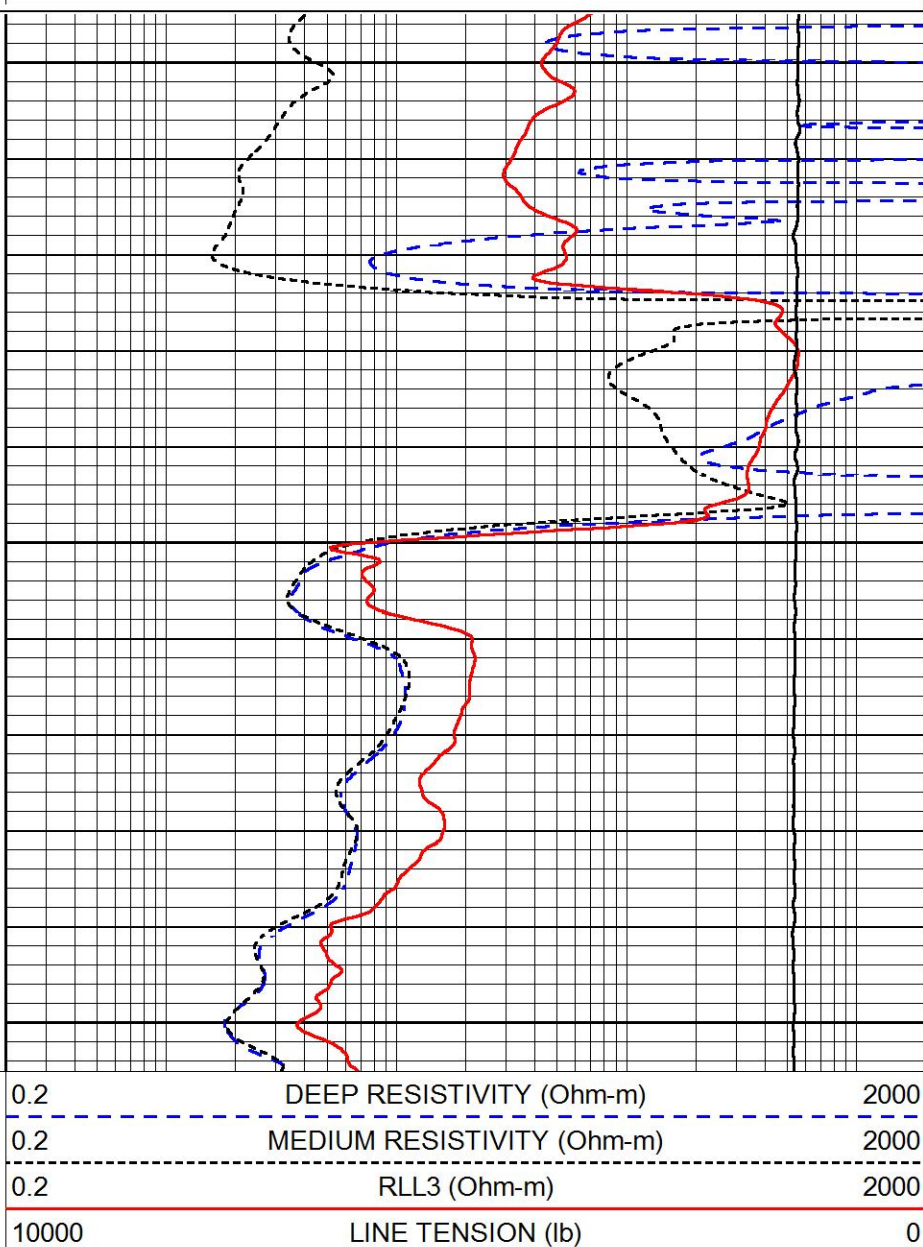
0.2 DEEP RESISTIVITY (Ohm-m) 2000
0.2 MEDIUM RESISTIVITY (Ohm-m) 2000
0.2 RLL3 (Ohm-m) 2000
10000 LINE TENSION (lb) 0



2550

2600

2650

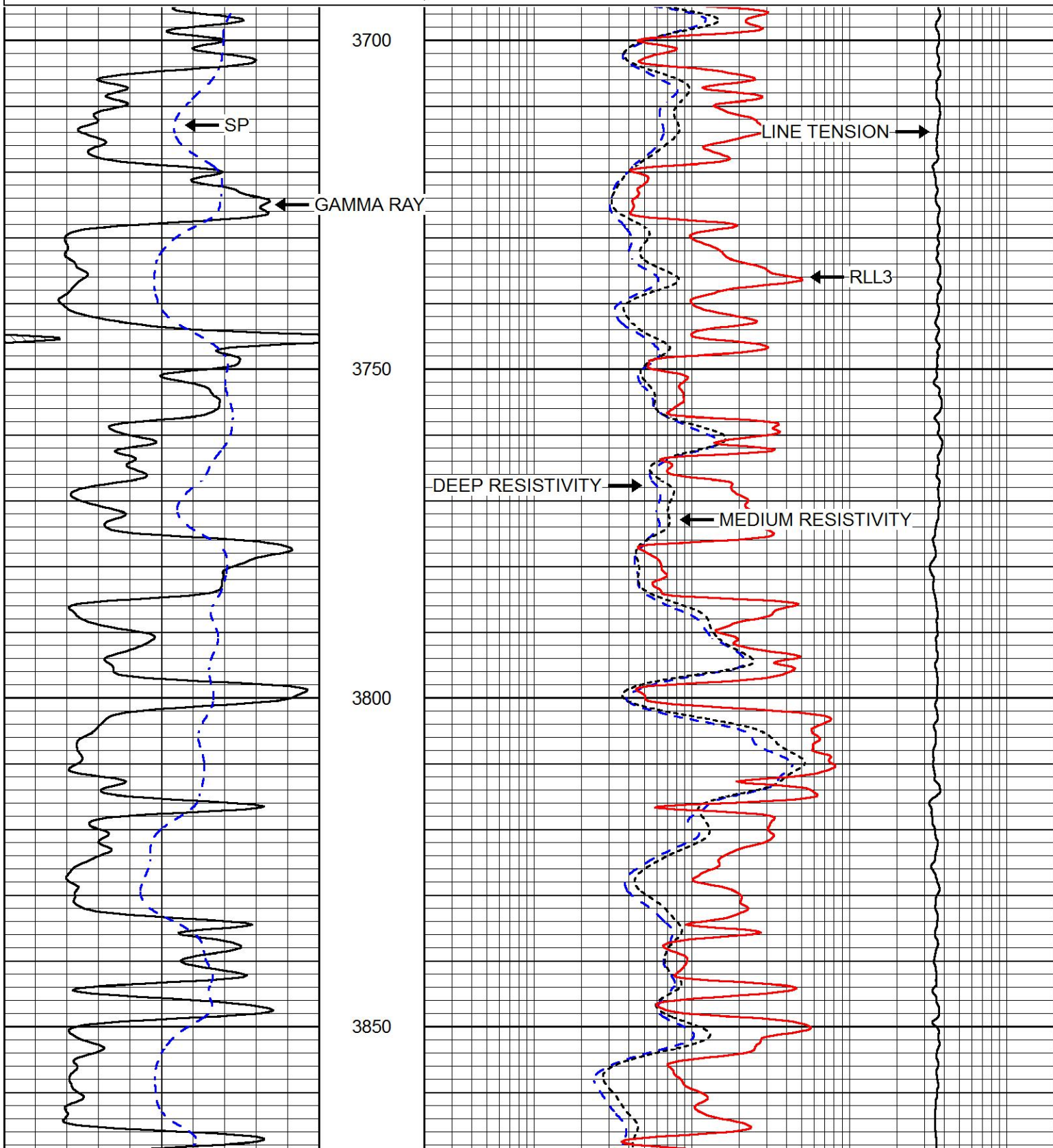


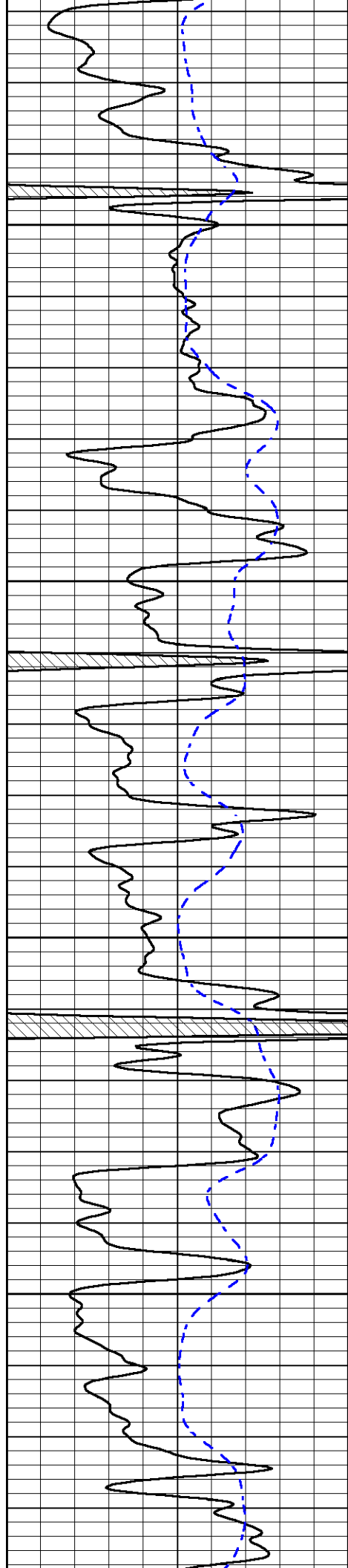
MAIN PASS

Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass3.1
 Presentation Format dil
 Dataset Creation Thu Apr 19 04:47:31 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



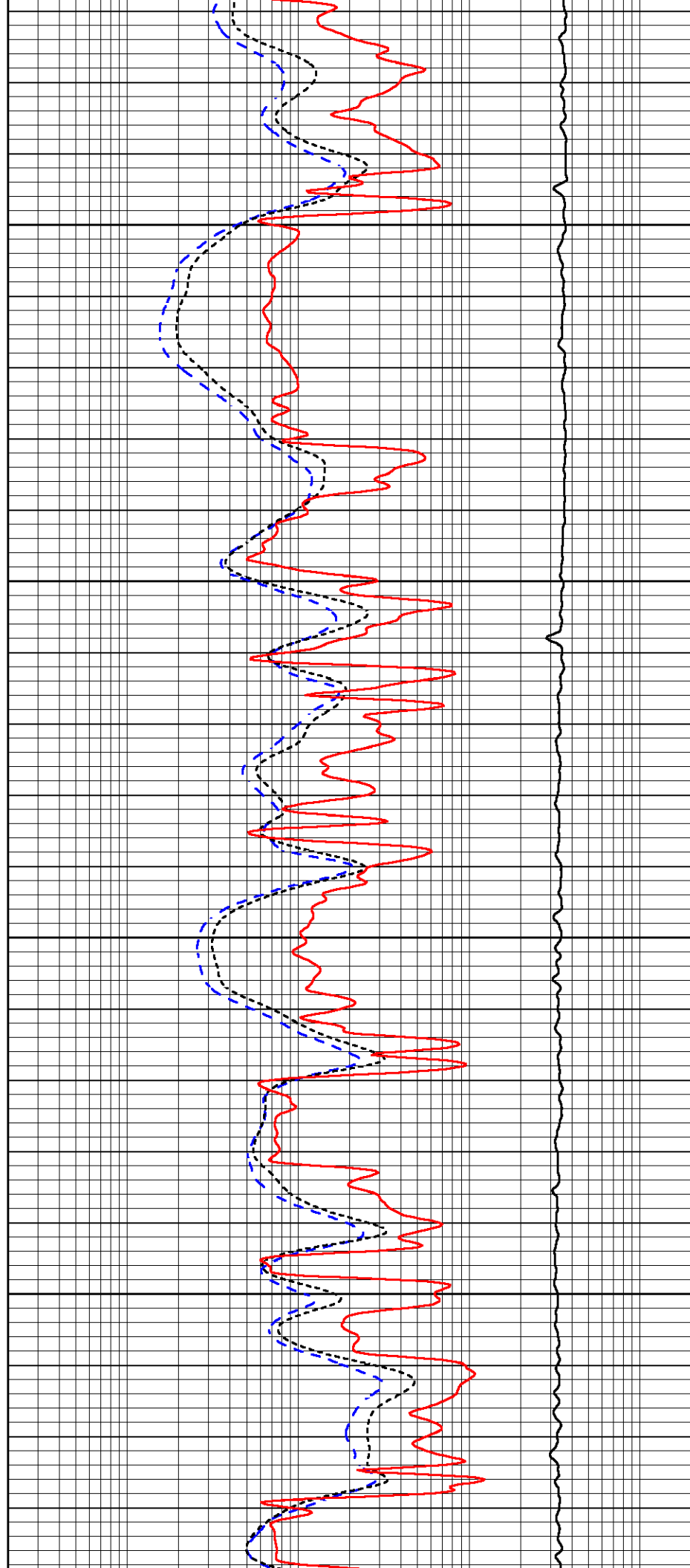


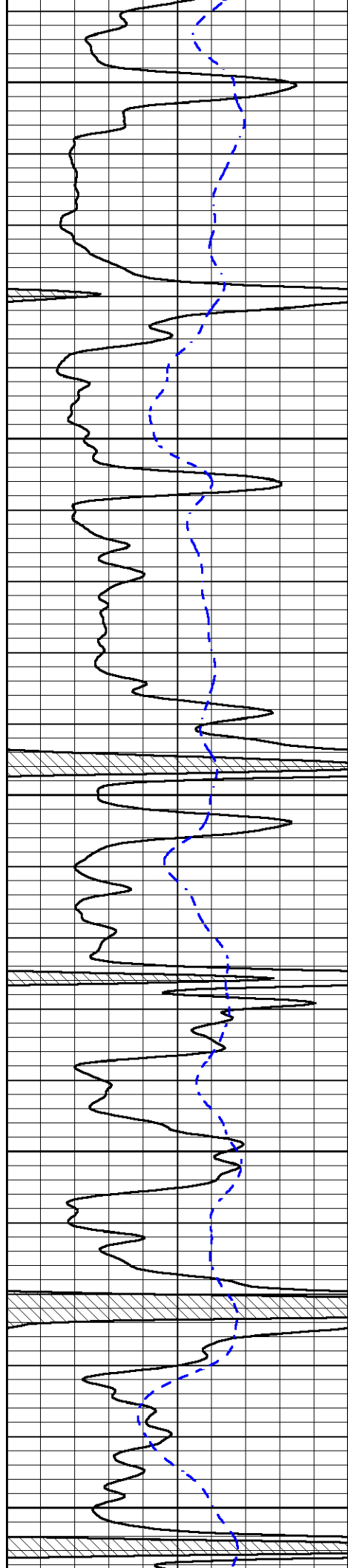
3900

3950

4000

4050





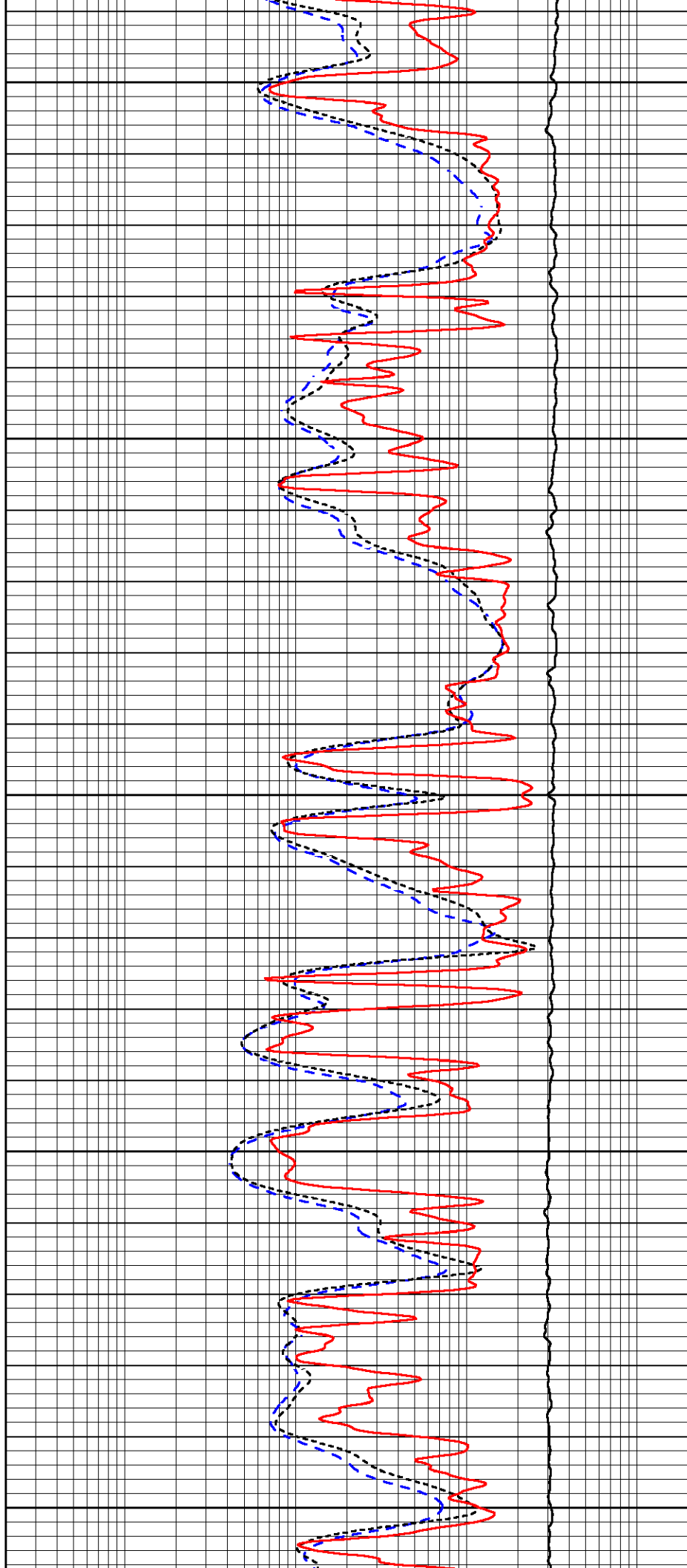
4100

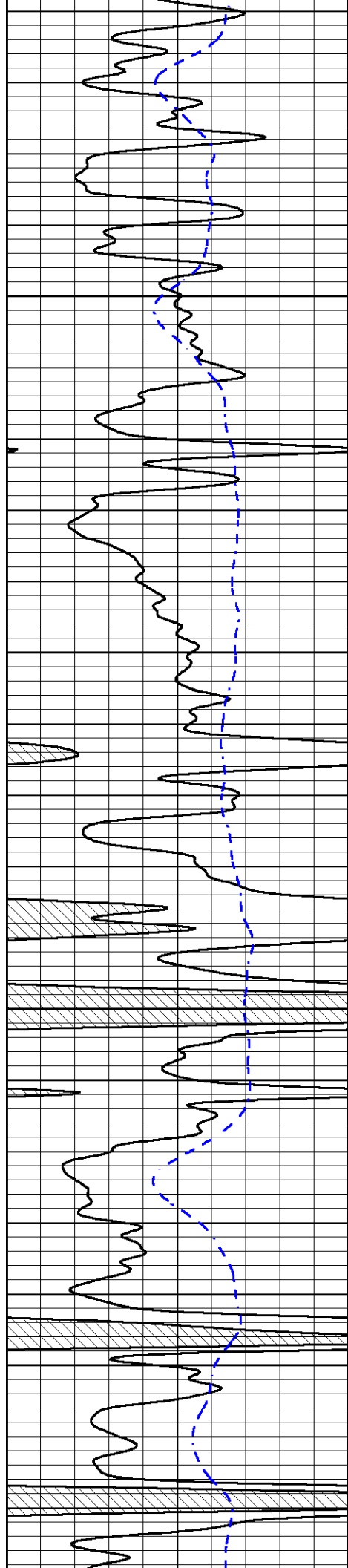
4150

4200

4250

4300



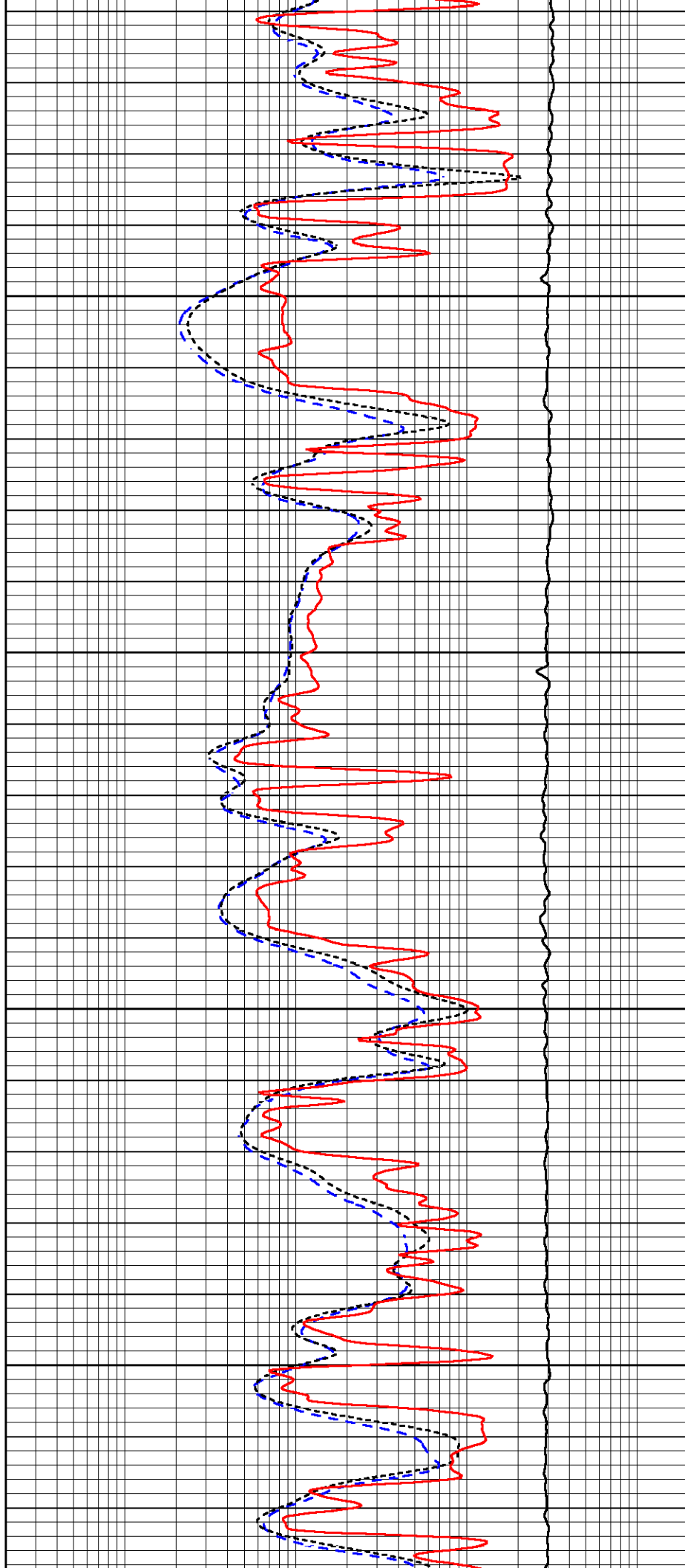


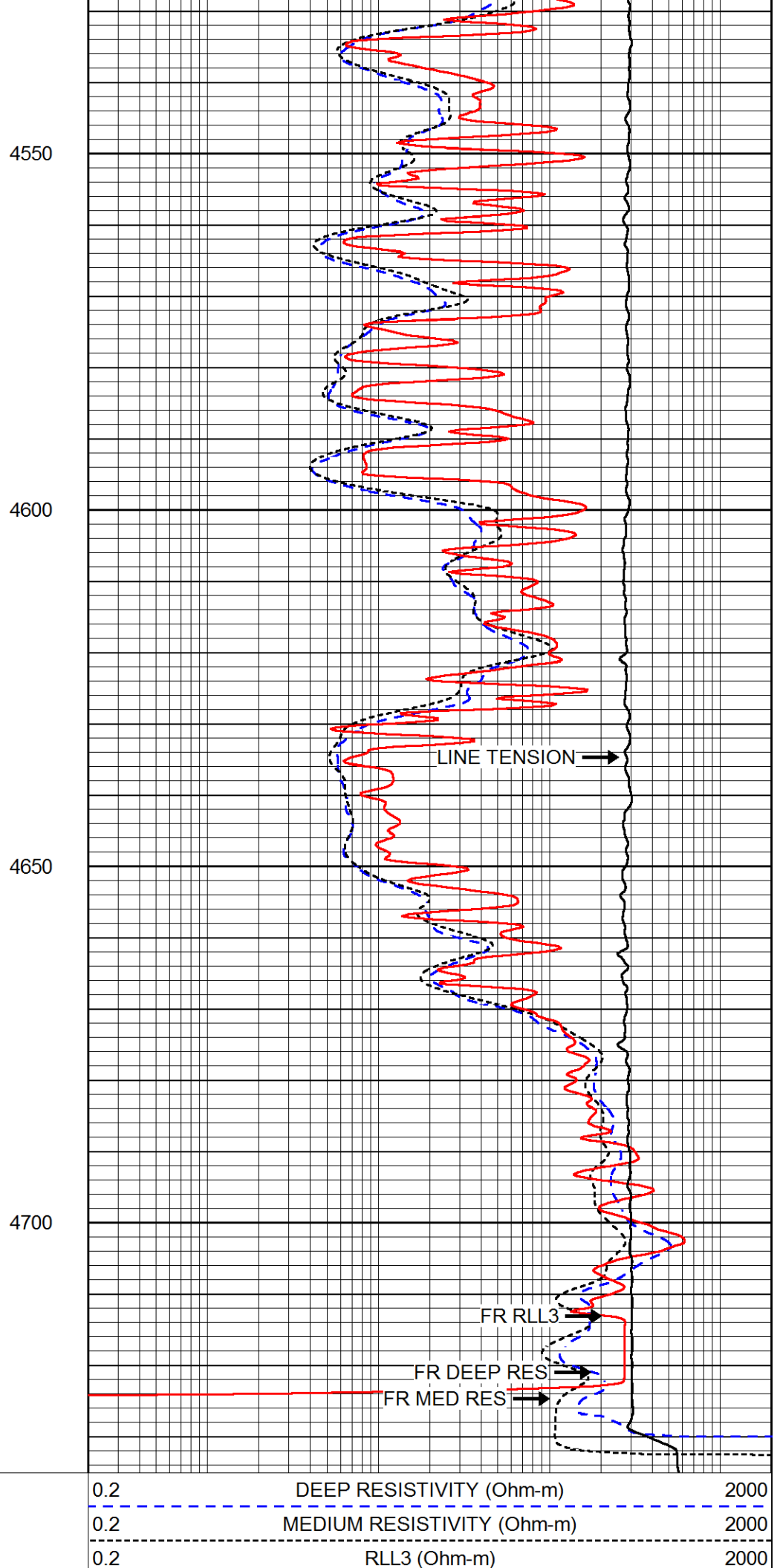
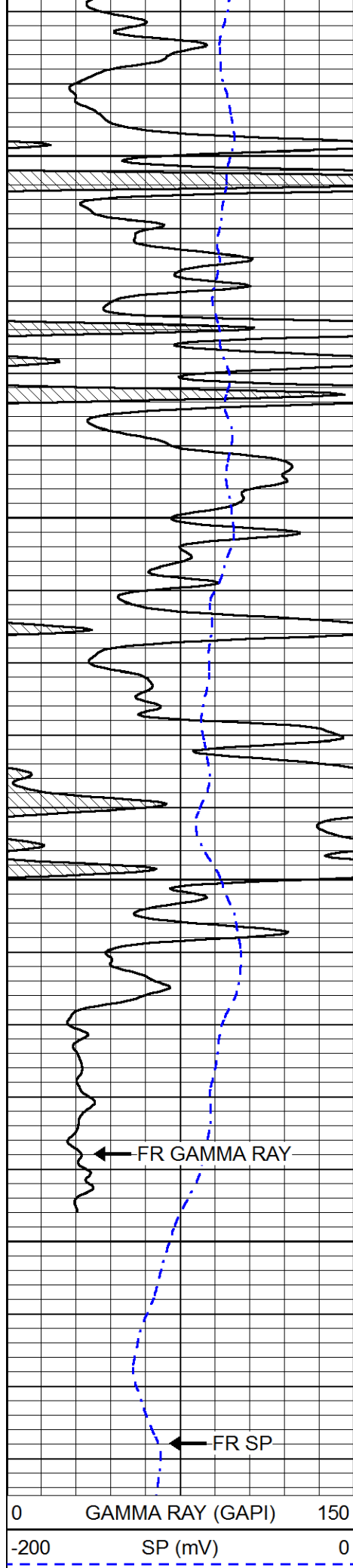
4350

4400

4450

4500





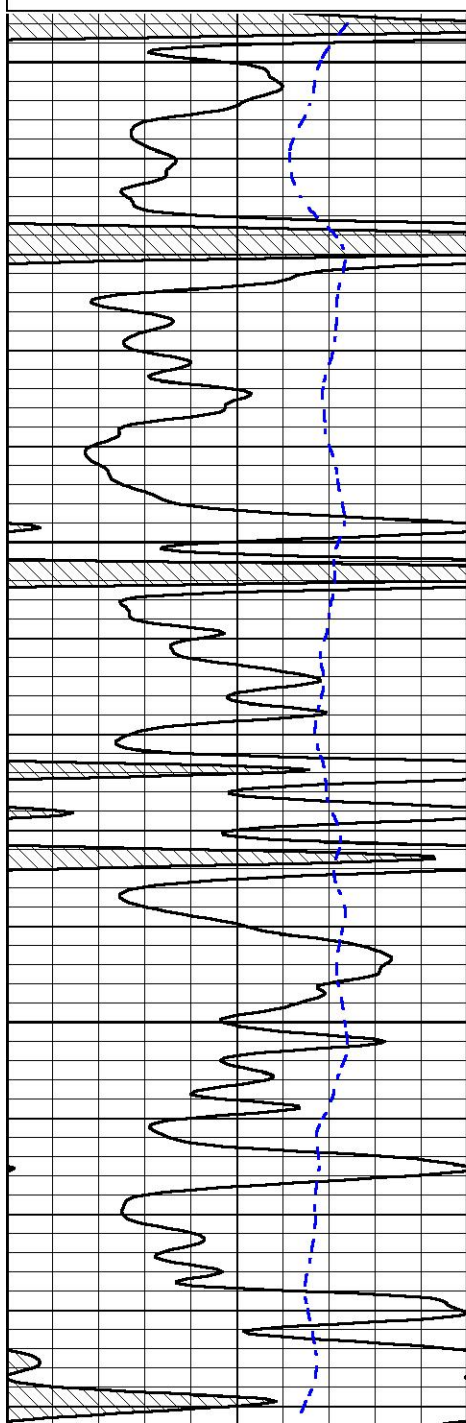


REPEAT SECTION

Database File richland_michaelis 25-1.db
Dataset Pathname STKML/pass2.1
Presentation Format dil
Dataset Creation Thu Apr 19 04:42:57 2018
Charted by Depth in Feet scaled 1:240

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

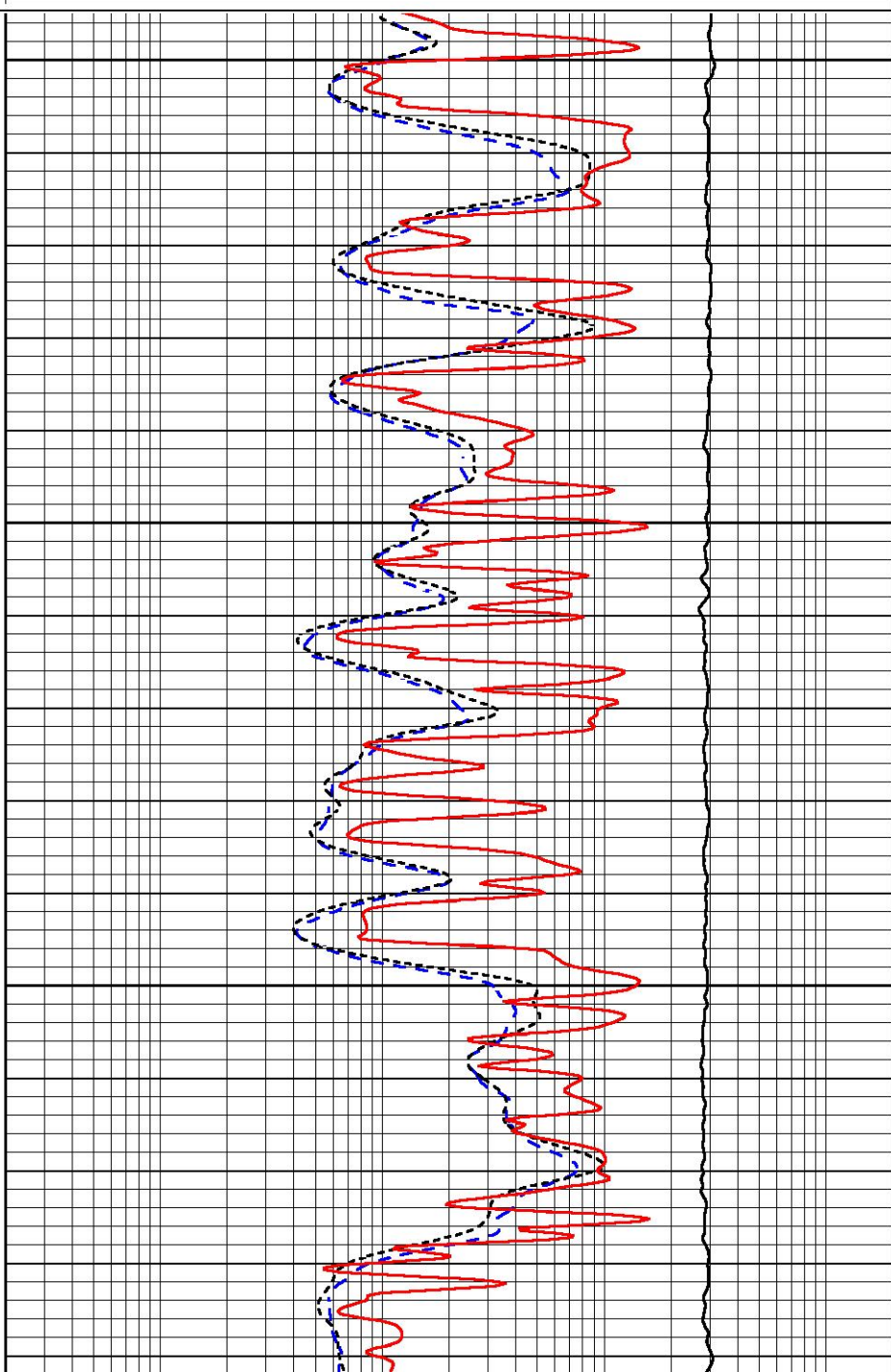
0.2 DEEP RESISTIVITY (Ohm-m) 2000
0.2 MEDIUM RESISTIVITY (Ohm-m) 2000
0.2 RLL3 (Ohm-m) 2000
10000 LINE TENSION (lb) 0

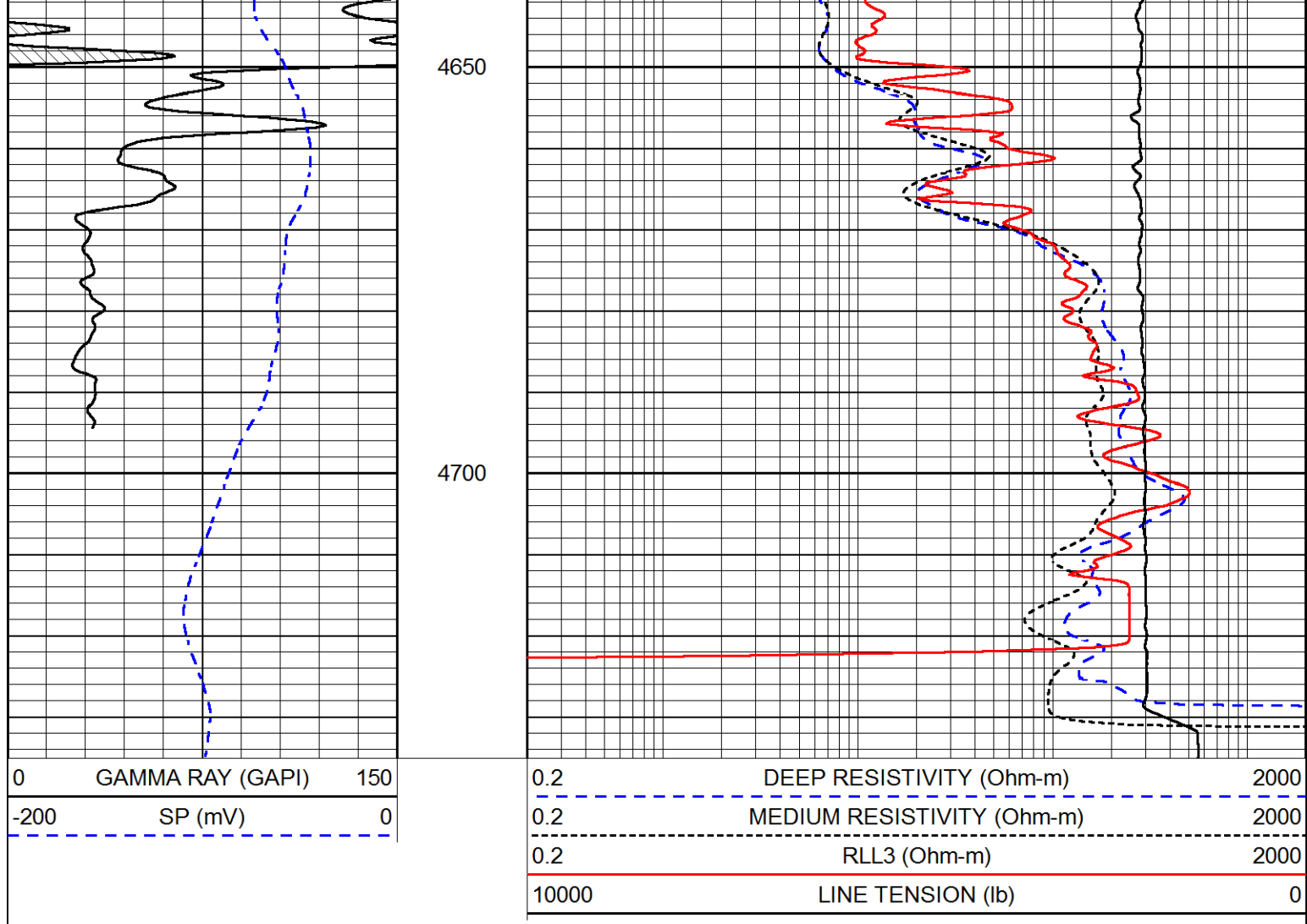


4500

4550

4600





Calibration Report

Database File richland_michaelis 25-1.db
Dataset Pathname STKML/pass3.1
Dataset Creation Thu Apr 19 04:47:31 2018

Dual Induction Calibration Report

Serial-Model: 933 (HT)-PSI HIGH TEMP
Calibration Performed: Mon Apr 16 20:15:16 2018

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		Gain	Offset
Deep	167.000	835.000	0.000	255.000	mmho/m	0.700	-18.200
Medium	142.000	1349.000	0.000	255.000	mmho/m	0.565	-60.500

Microlog Calibration Report

Serial-Model: PSI-01-PSIML
Performed: Mon Apr 16 11:11:21 2018

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	25000.0000	-0.7000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	32000.0000	-0.6000
Caliper	1.0001	1.1397	6.5000	18.5000	in	70.0000	-65.8750

Compensated Density Calibration Report

Serial-Model: 182-152-M&W
 Source / Verifier: 16955B / 2ci
 Master Calibration Performed: Thu Apr 19 03:28:52 2018

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4992.81	6098.44	cps
Aluminum	2.660	g/cc	945.67	3945.60	cps
Spine Angle = 75.33			Density/Spine Ratio = 0.526		
	Size		Reading		
Small Ring	4.50	in	1.09		
Large Ring	15.00	in	1.03		

Compensated Neutron Calibration Report

Serial Number: 207-MW
 Tool Model: M&W
 Calibration Performed: MON APR 16 10:30:30 2018

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
 Tool Model: M&W
 Calibration Performed: Mon Jan 15 11:20:44 2018

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
 Calibrator Reading: 1.0 cps

Sensitivity: 0.6000 GAPI/cps



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