



DUAL INDUCTION LOG

PIONEER
Pioneer Energy Services

Company **AMERICAN WARRIOR, INC.**

Well **CRIST #2-28**

Field **UNKNOWN**

County **FINNEY** State **KANSAS**

Location: API #: 15-055-22485-00-00

SEC 28 TWP 21S RGE 34W

Permanent Datum GROUND LEVEL Elevation 2970'

Log Measured From KELLY BUSHING

Drilling Measured From KELLY BUSHING

Other Services
CNL/CDL
MEL

Elevation
K.B. 2981'
D.F. N/A
G.L. 2970'

Date	4/23/2018
Run Number	ONE
Depth Driller	5000'
Depth Logger	4996'
Bottom Logged Interval	4995'
Top Log Interval	1700'
Casing Driller	8.625" @ 1743'
Casing Logger	1744'
Bit Size	7.875"
Type Fluid in Hole	CHEMICAL
Salinity, ppm CL	2300
Density / Viscosity	9.4 51
pH / Fluid Loss	10.5 7.6
Source of Sample	FLOWLINE
Rm @ Meas. Temp	0.80 @ 60
Rmf @ Meas. Temp	0.60 @ 60
Rmc @ Meas. Temp	1.08 @ 60
Source of Rmf / Rmc	CHARTS
Rm @ BHT	0.38 @ 126
Operating Rig Time	3 HOURS
Max Rec. Temp. F	126
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.

GARDEN CITY,
SOUTH TO GANO RD, 10 WEST,
NORTH AND EAST INTO

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

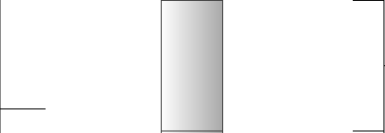
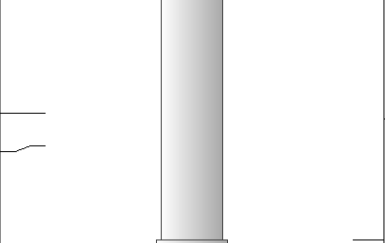
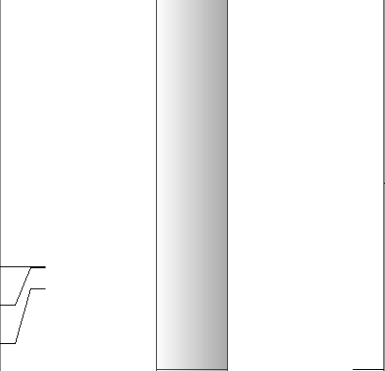
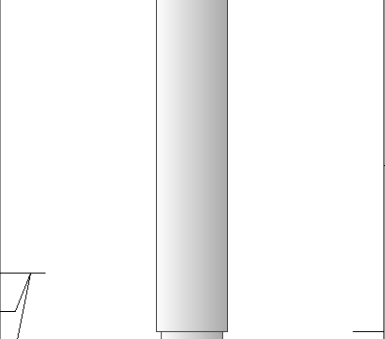
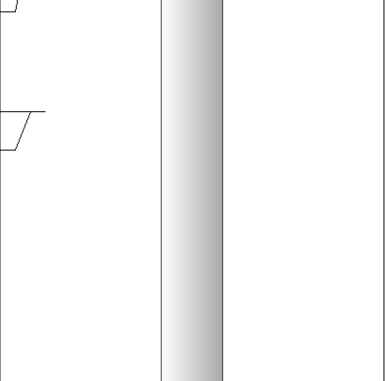
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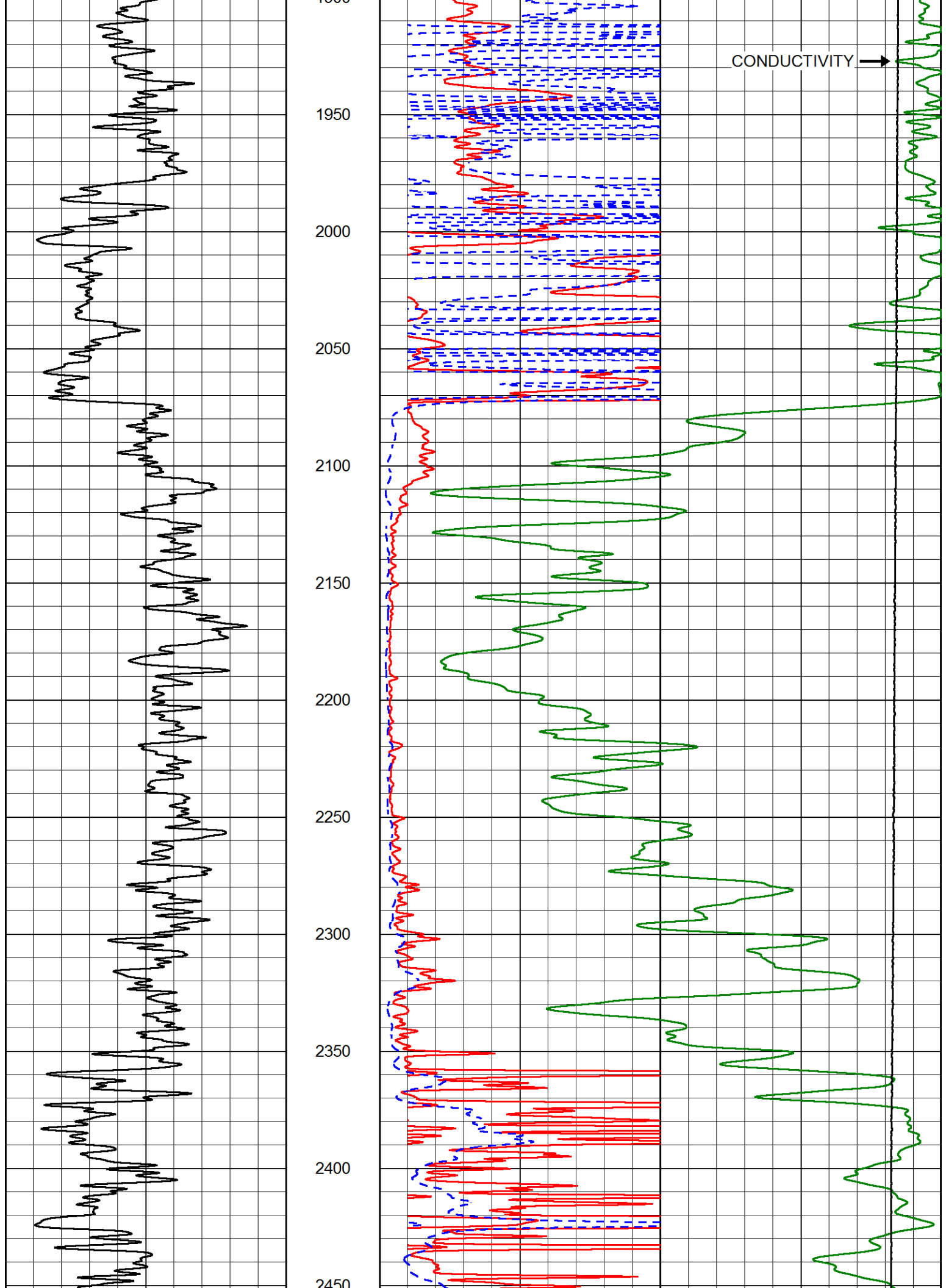
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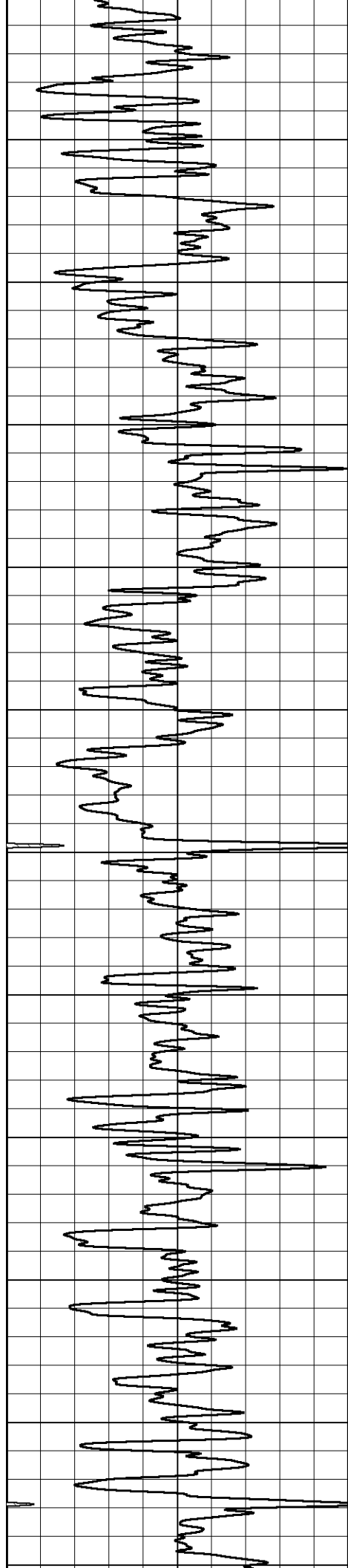
Secondary Witness:

Top - Bottom

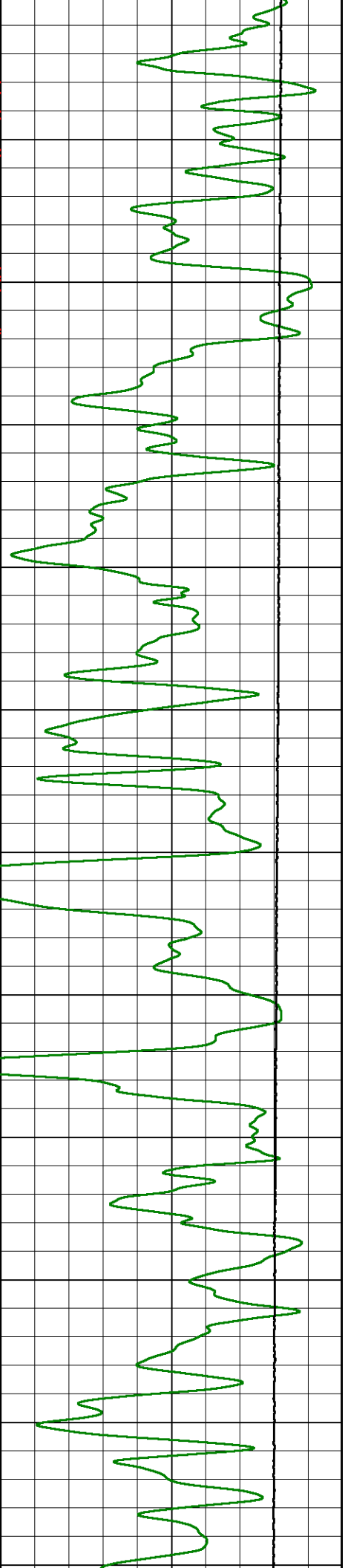
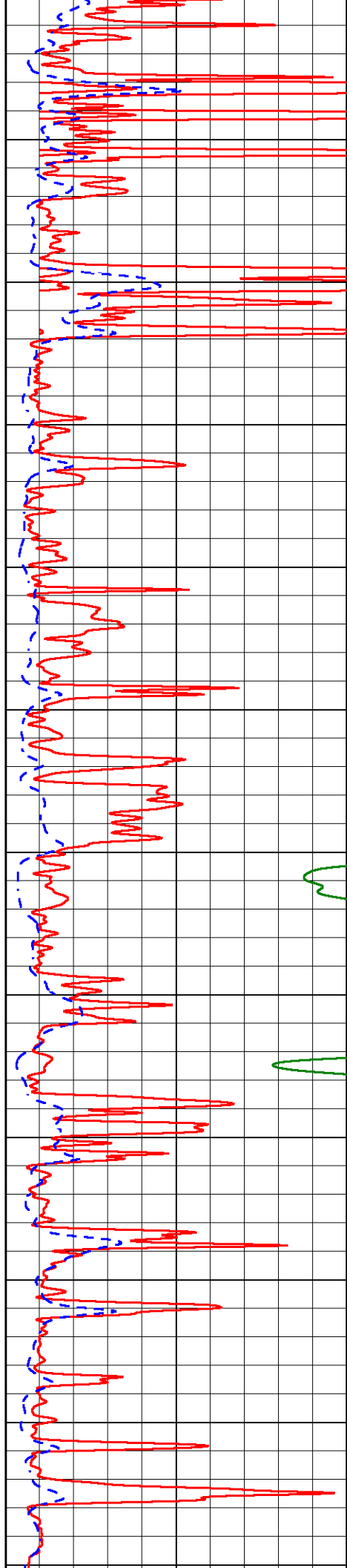
M	A	SZCOR	NPORSEL	FLUIDDEN g/cc	MATRXDEN g/cc	SPSHIFT mV	SNDERRM mmho/m
2	1	Off	Limestone	1	2.71	-110	0
SNDERR mmho/m	SRFTEMP degF	CASETHCK in	CASEOD in	PERFS	TDEPTH ft	BOTTEMP degF	BOREID in
0	68	0	5.5	0	4996	126	7.875

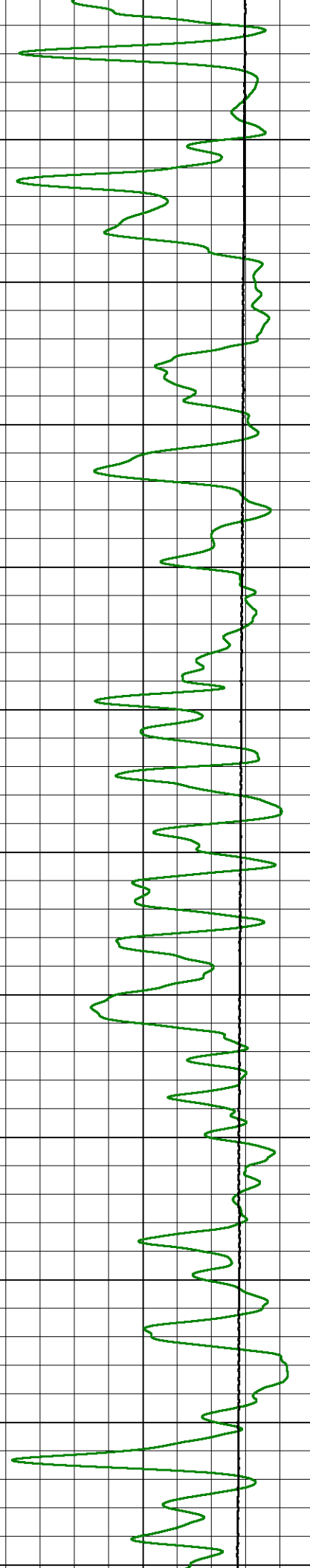
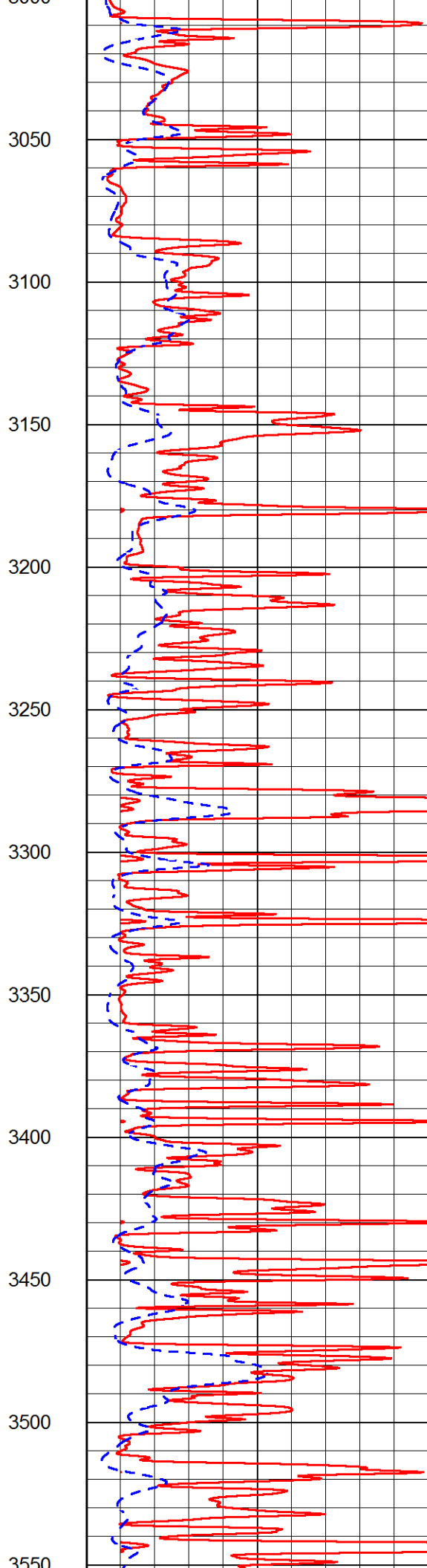
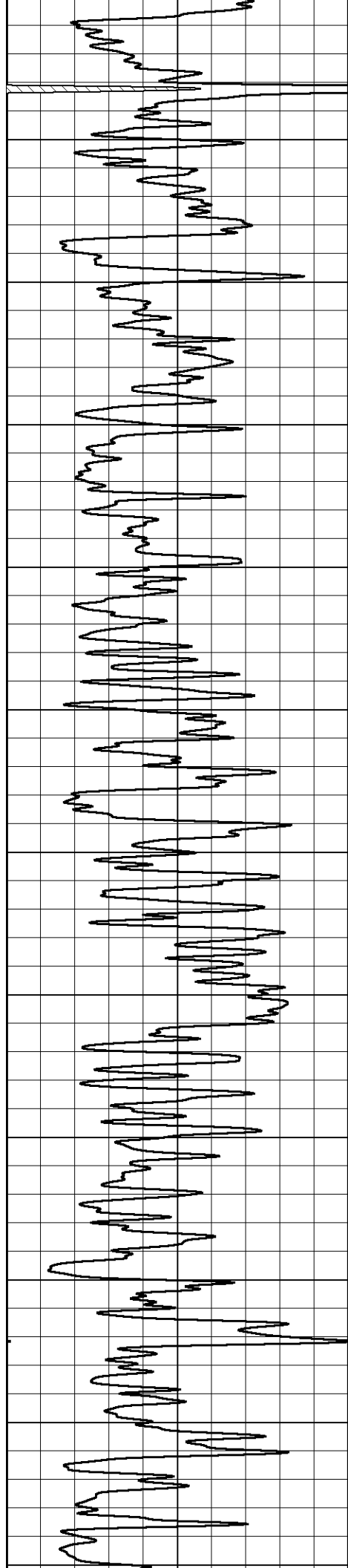
Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58		GR-M&W (89)	3.00	3.50	50.00
CNLSC CNSSC	37.48 36.73		CNT-M&W (207-MW)	5.50	3.50	100.00
LSD DCAL SSD	28.43 28.42 27.93		CDL-M&W (182-152)	8.50	4.00	250.00
MCAL MI MN	19.83 19.83 19.83		ML-PSIML (PSI-01) GO Micro log tools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

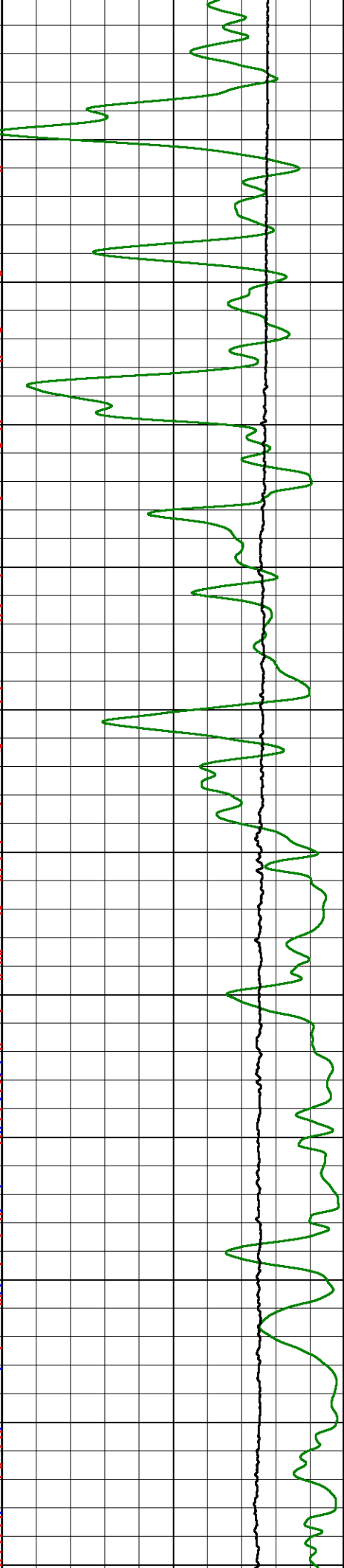
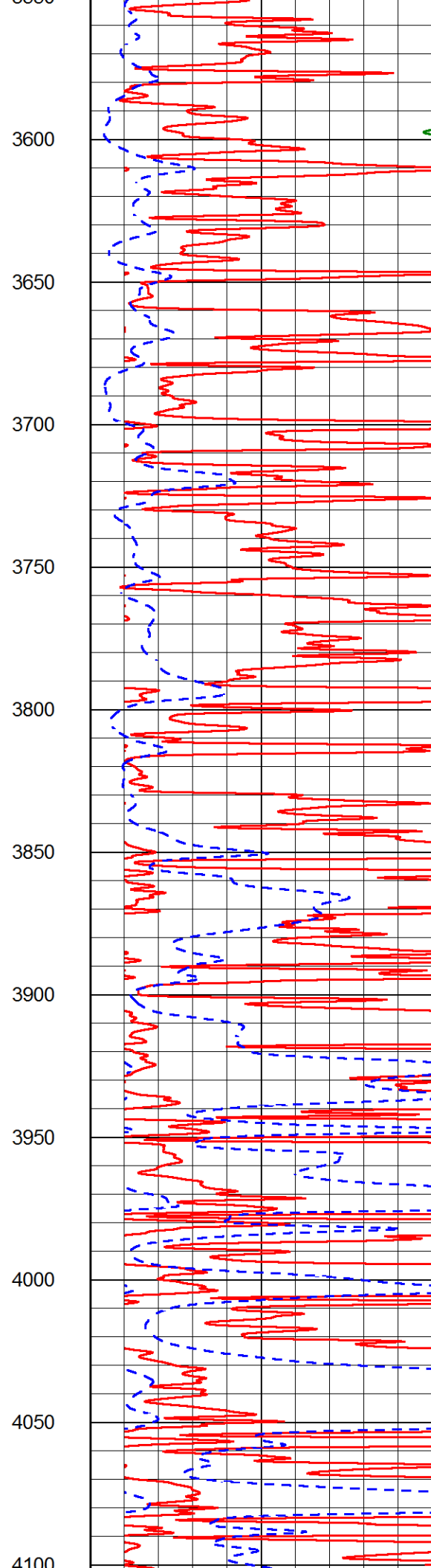
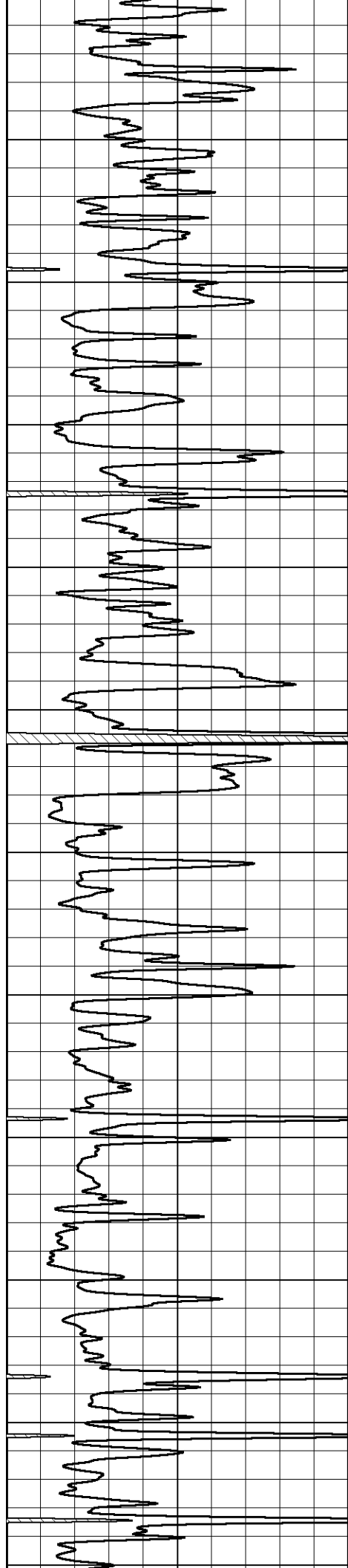


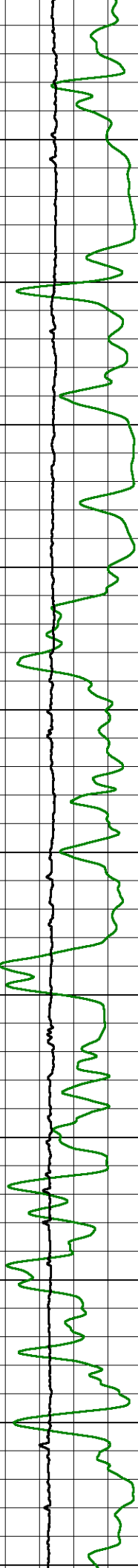
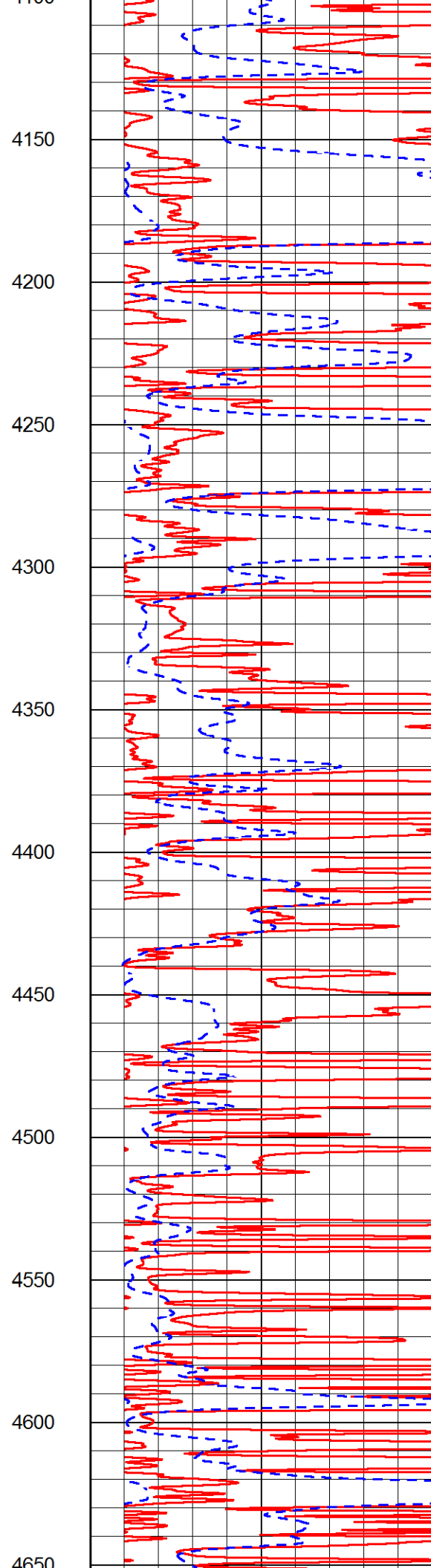
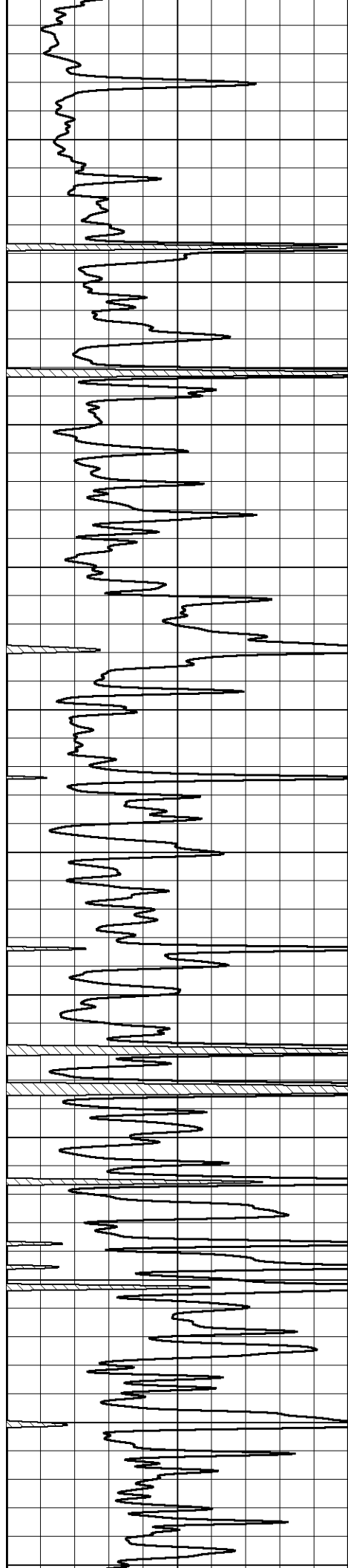


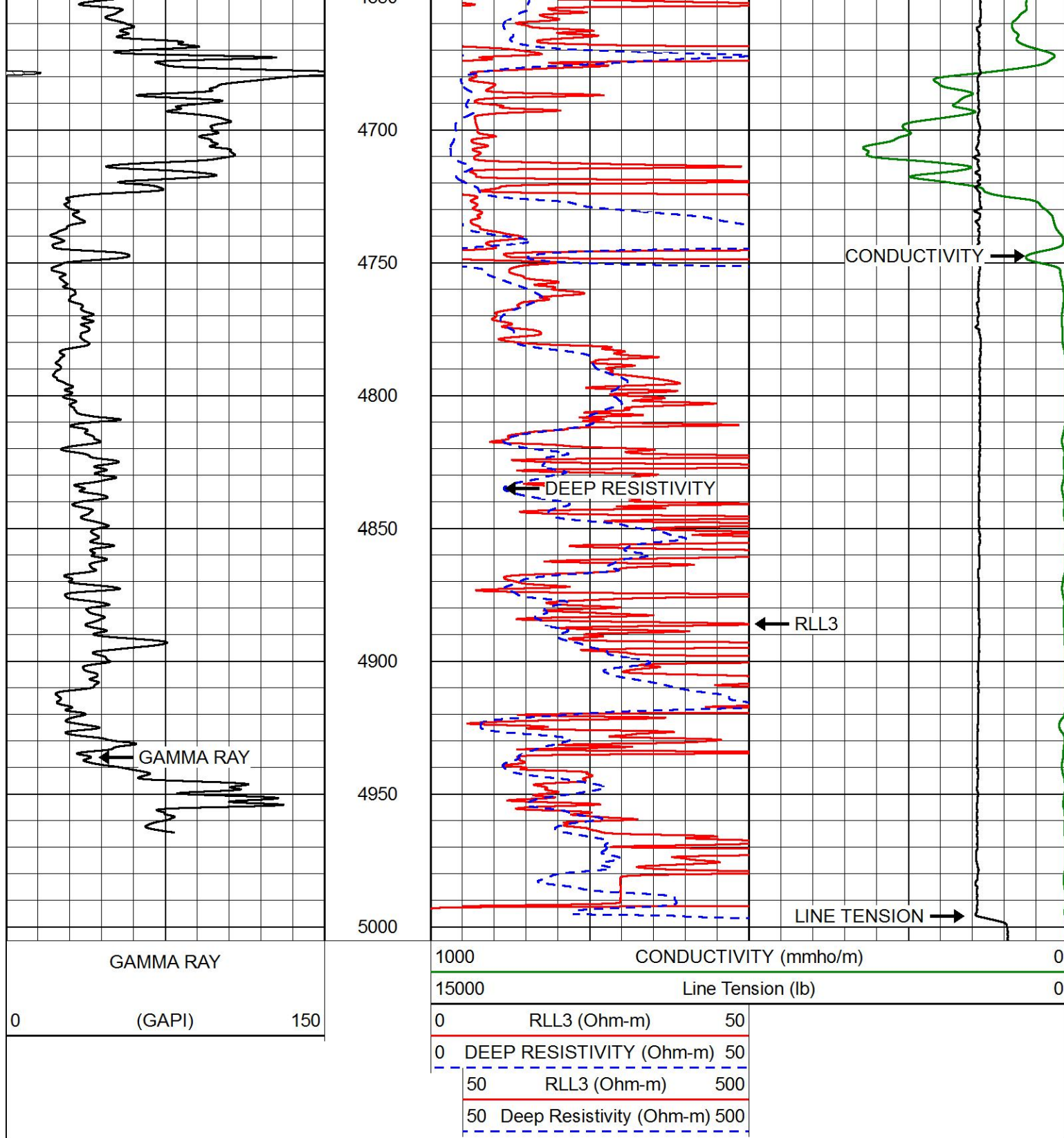
2450
2500
2550
2600
2650
2700
2750
2800
2850
2900
2950
3000









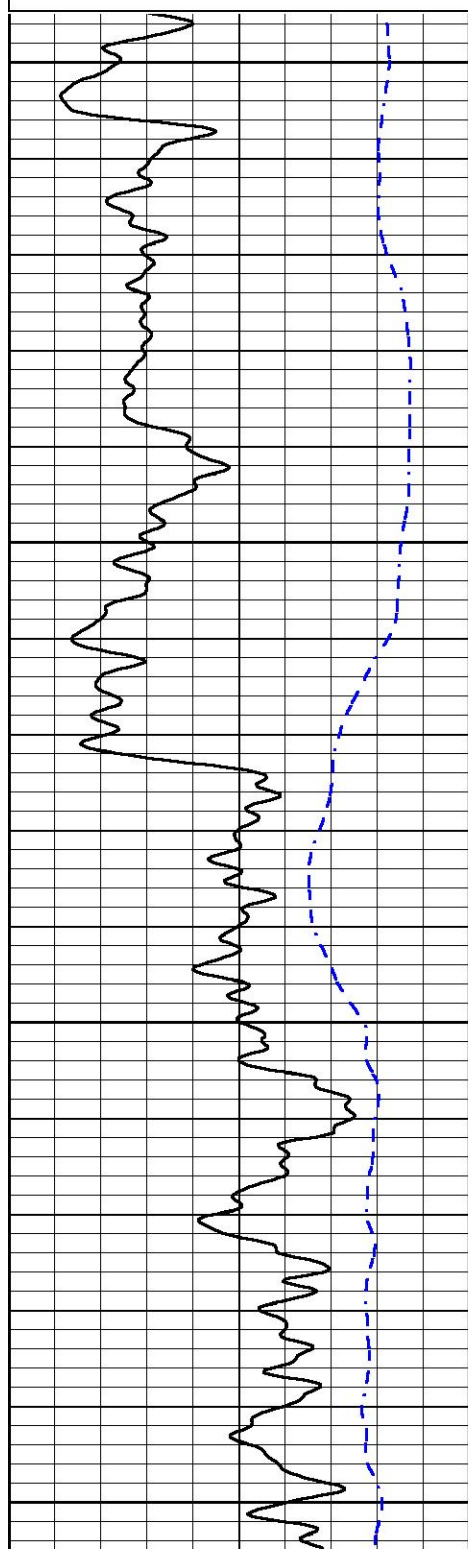




MAIN PASS

Database File	american warrior_crist 2-28.db
Dataset Pathname	STKML/pass4.1
Presentation Format	dil
Dataset Creation	Mon Apr 23 15:51:16 2018
Charted by	Depth in Feet scaled 1:240

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



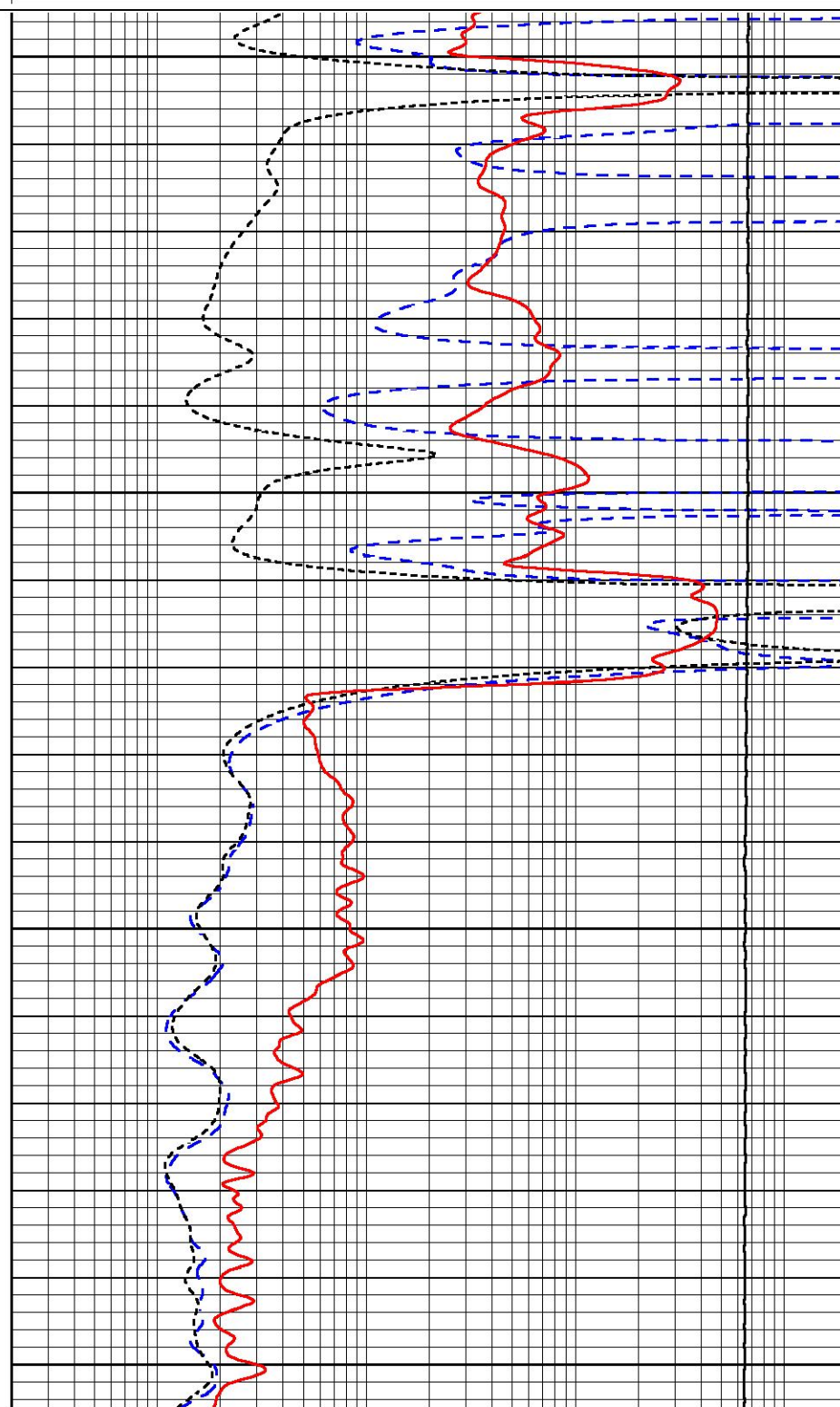
0 GAMMA RAY (GAPI) 150
 -200 SP (mV) 0

2000

2050

2100

2150

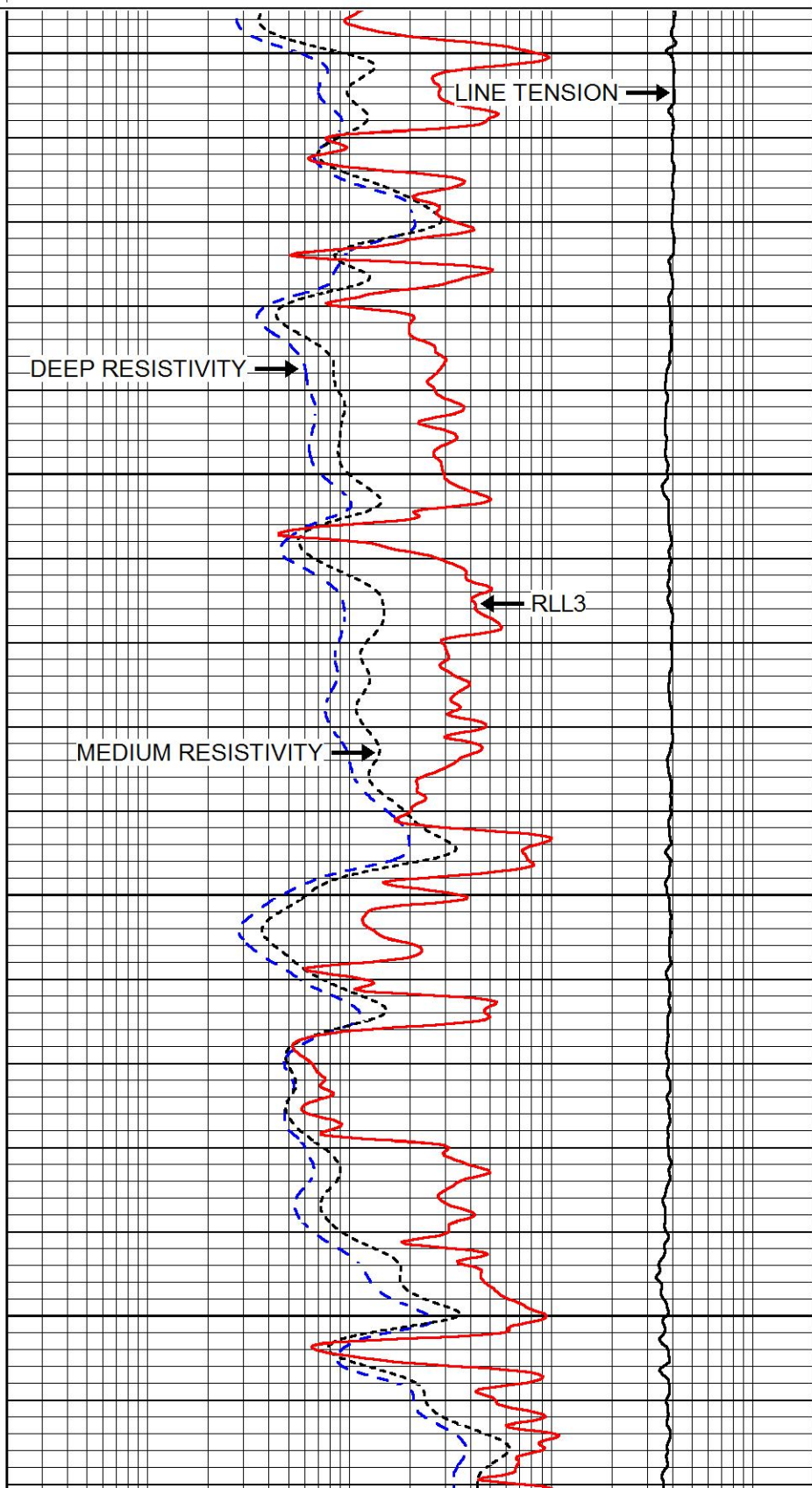
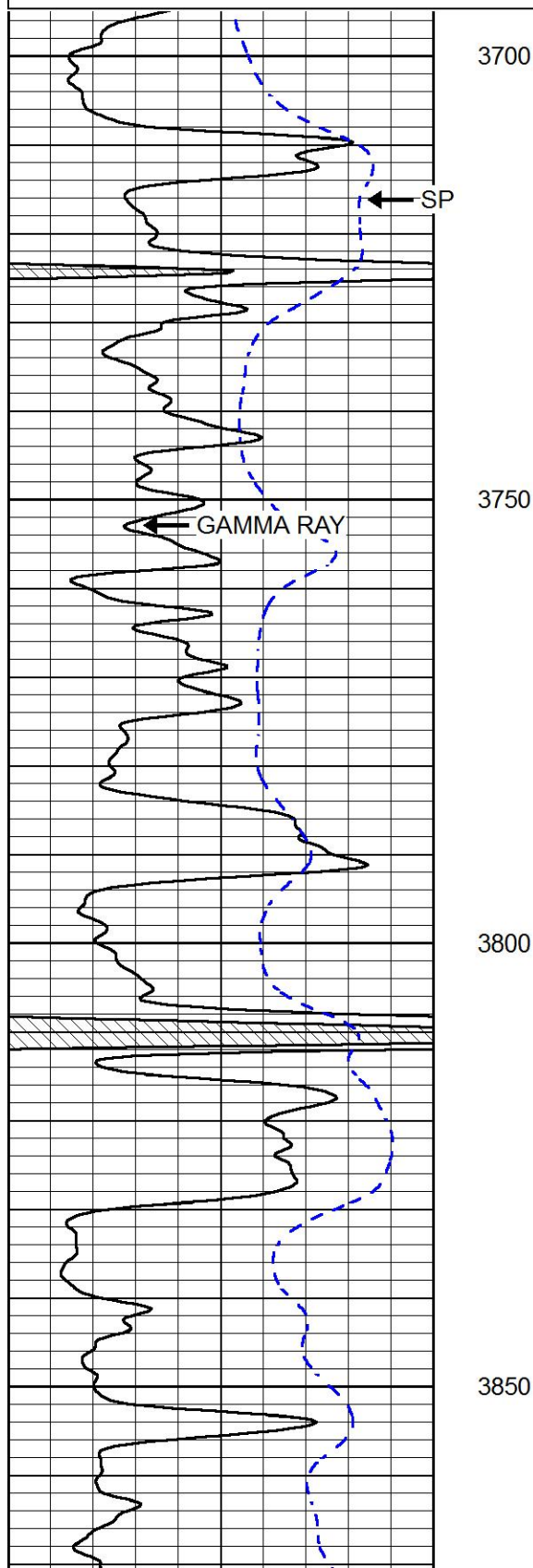


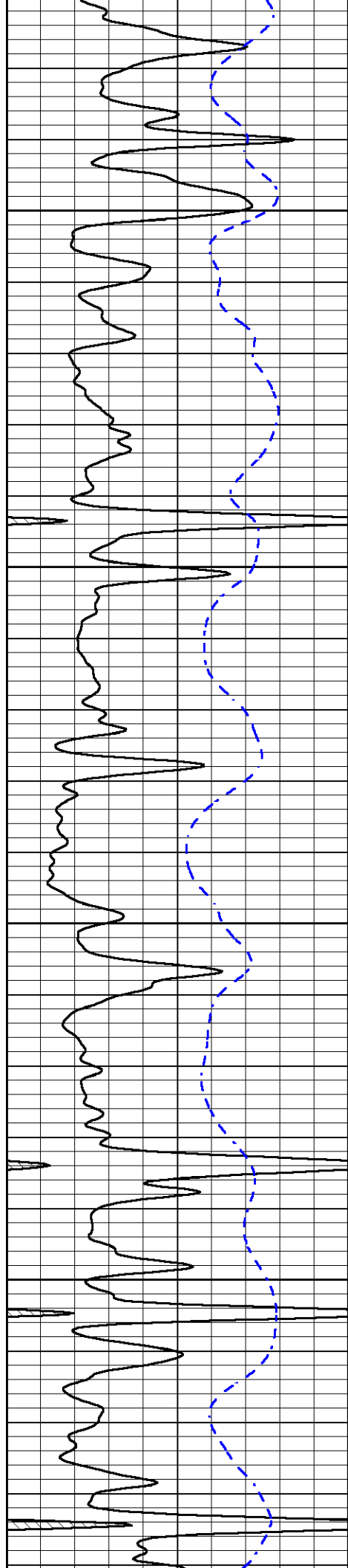
0.2 DEEP RESISTIVITY (Ohm-m) 2000
 0.2 MEDIUM RESISTIVITY (Ohm-m) 2000
 0.2 RLL3 (Ohm-m) 2000
 10000 LINE TENSION (lb) 0

Database File american_warrior_crist 2-28.db
Dataset Pathname STKML/pass3.1
Presentation Format dil
Dataset Creation Mon Apr 23 15:23:02 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



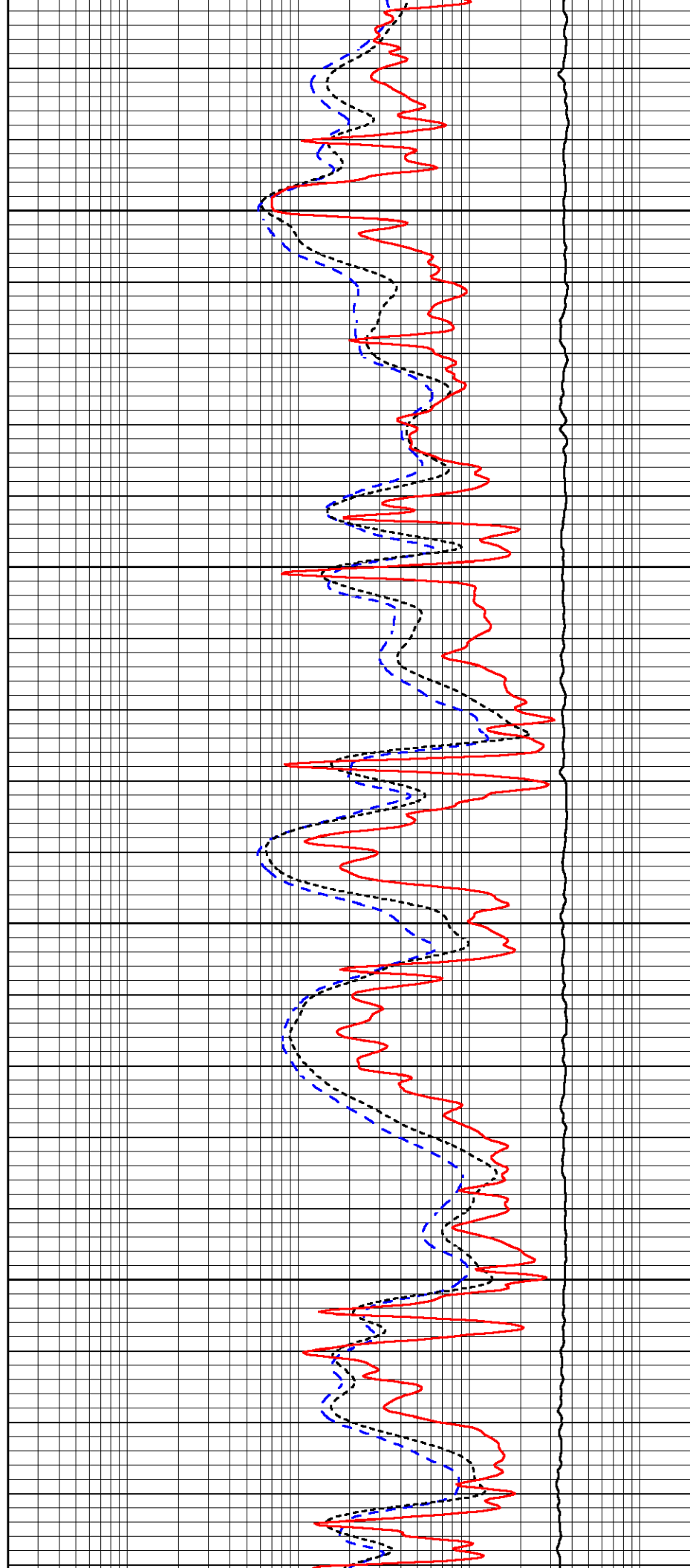


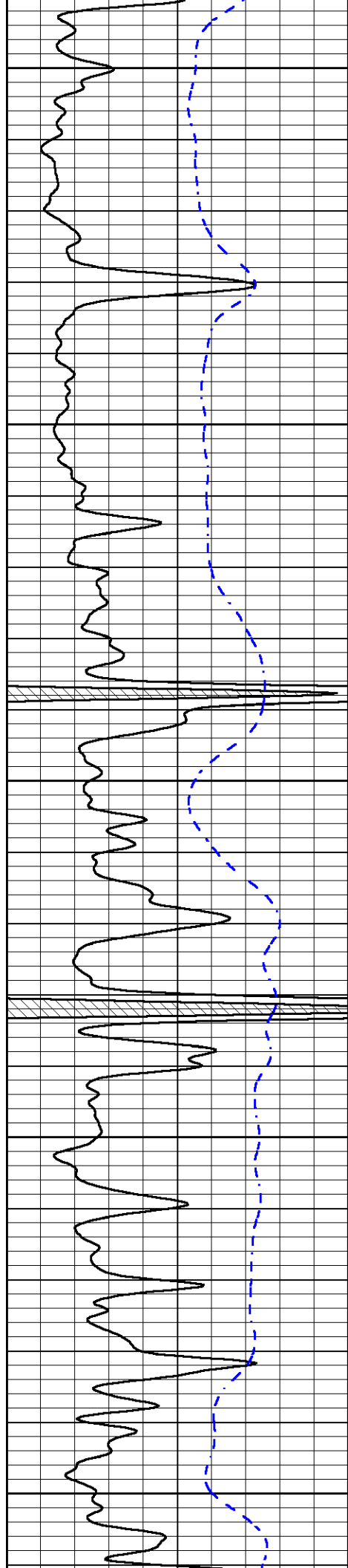
3900

3950

4000

4050





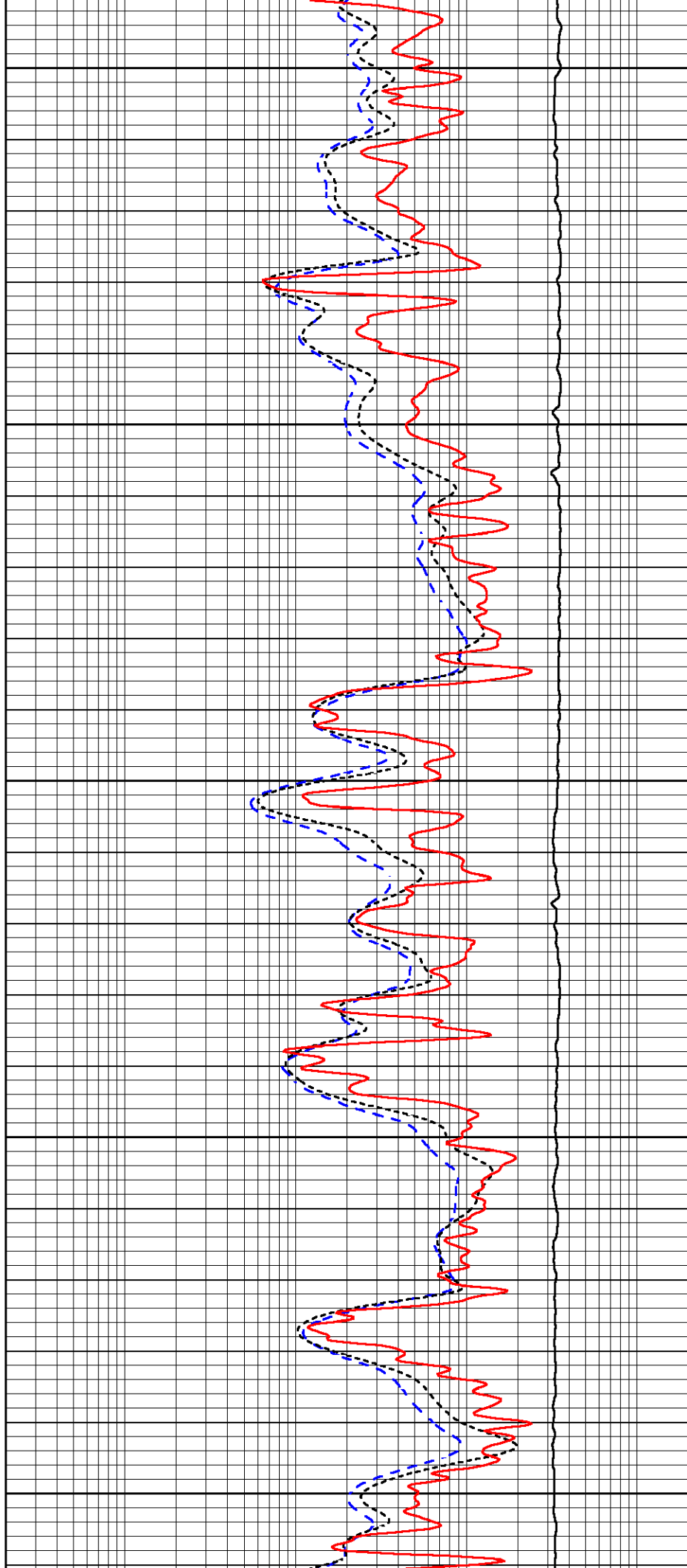
4100

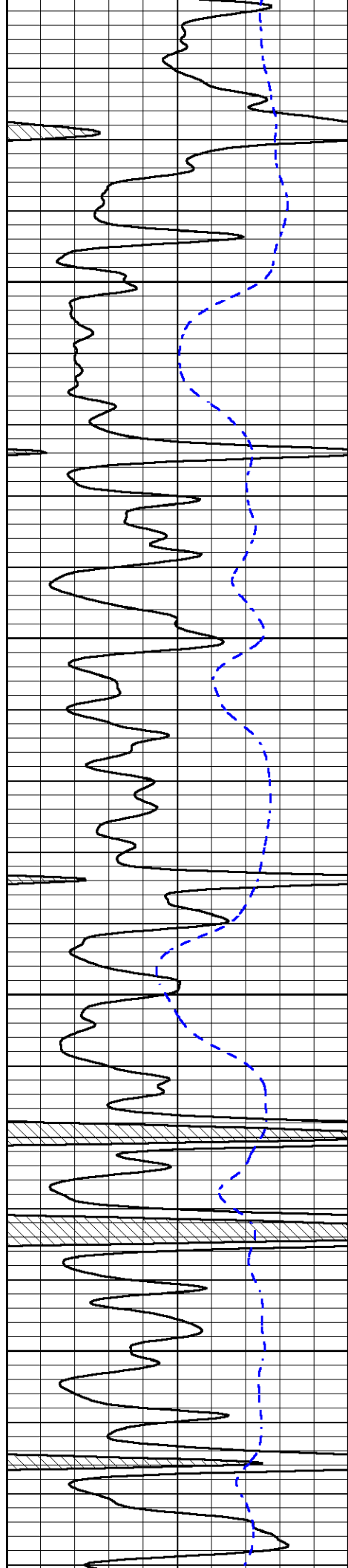
4150

4200

4250

4300



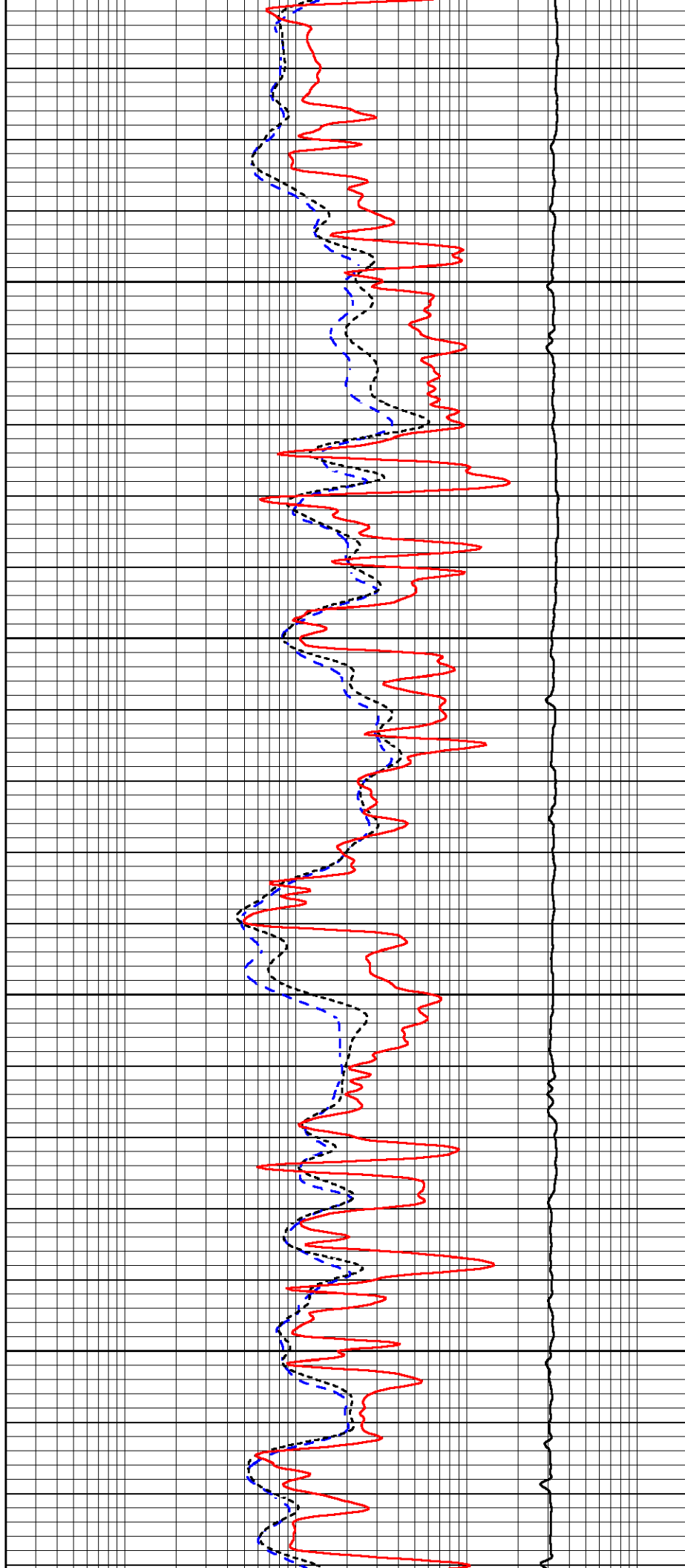


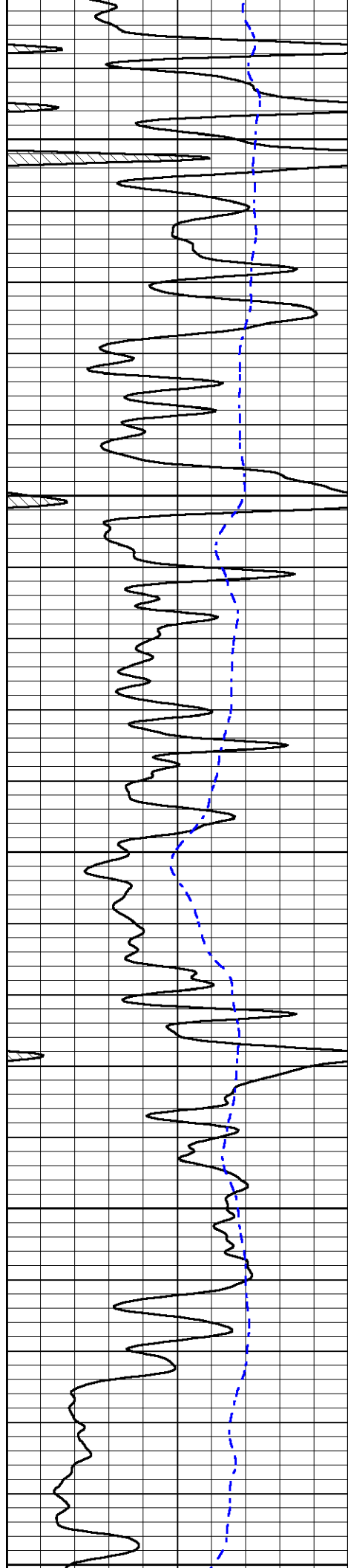
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4400

4450

4500





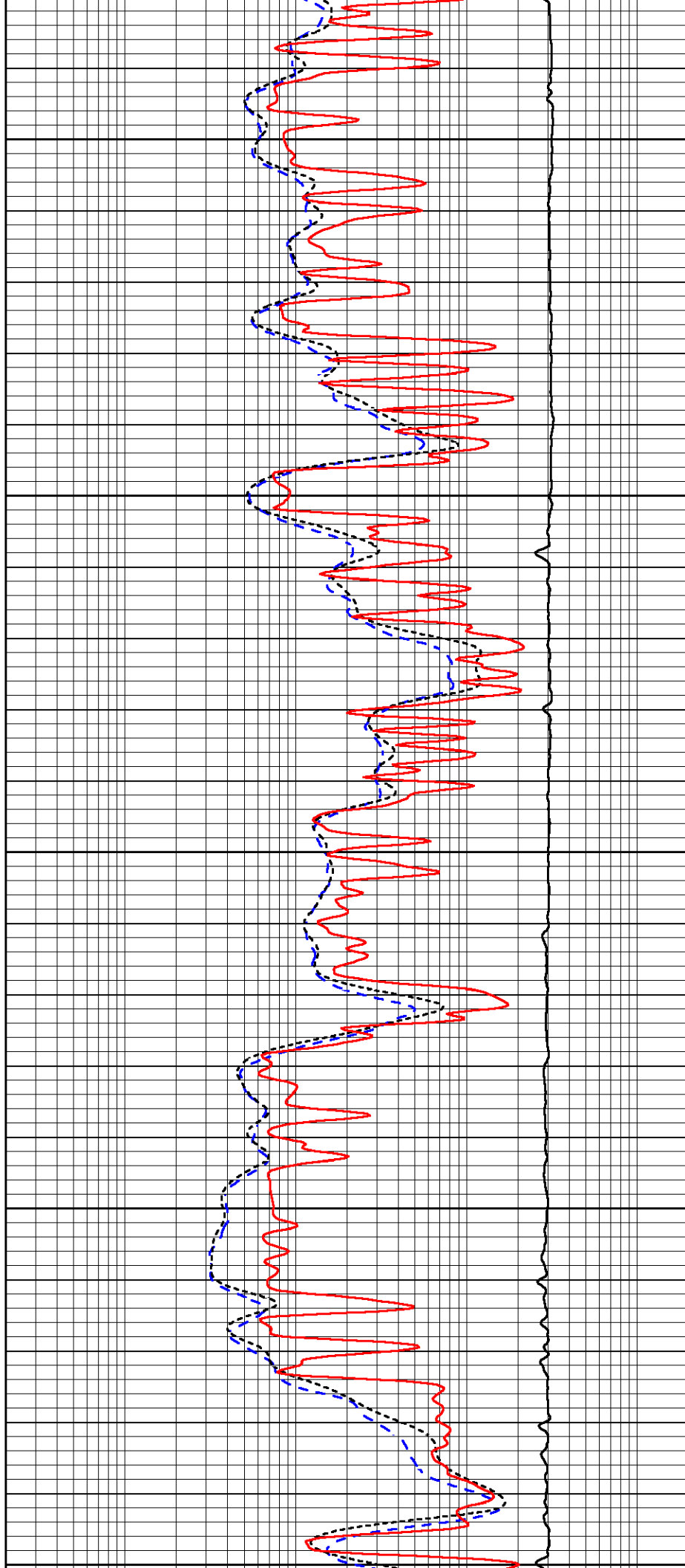
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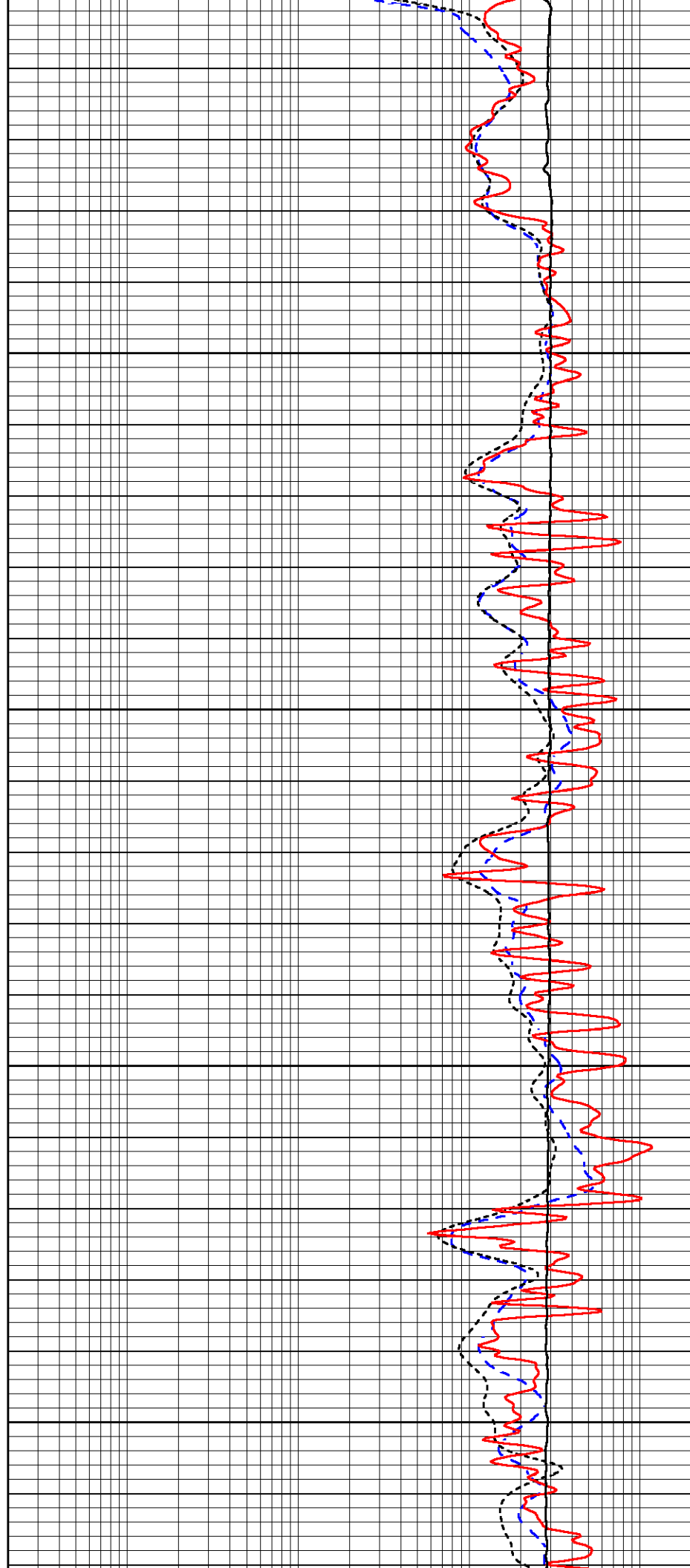
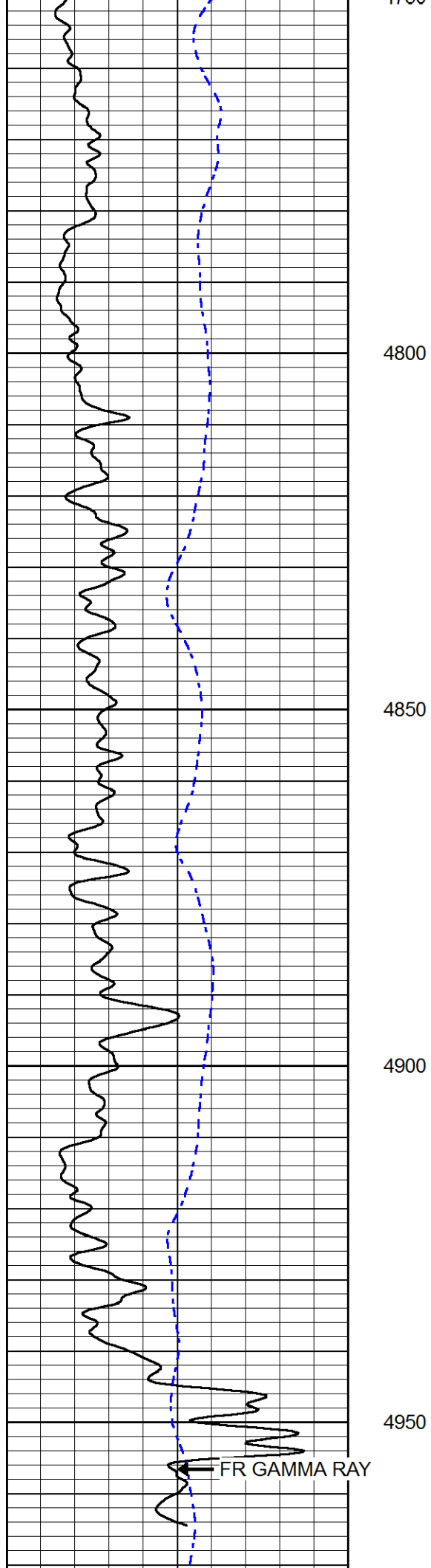
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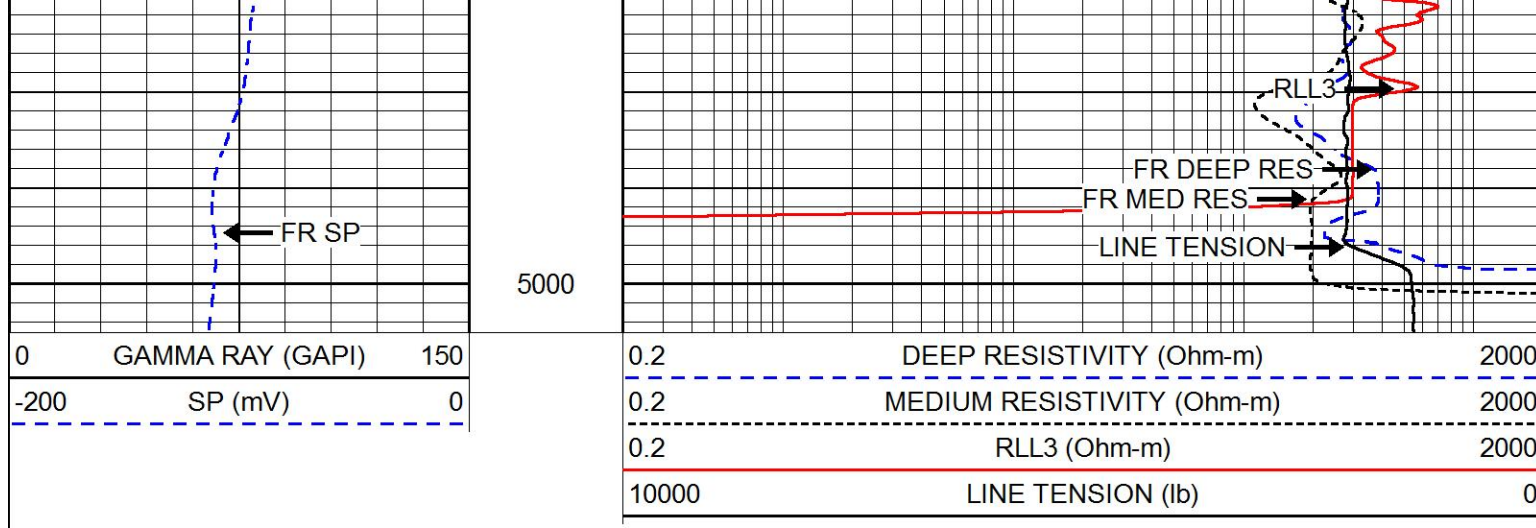
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4700

4750

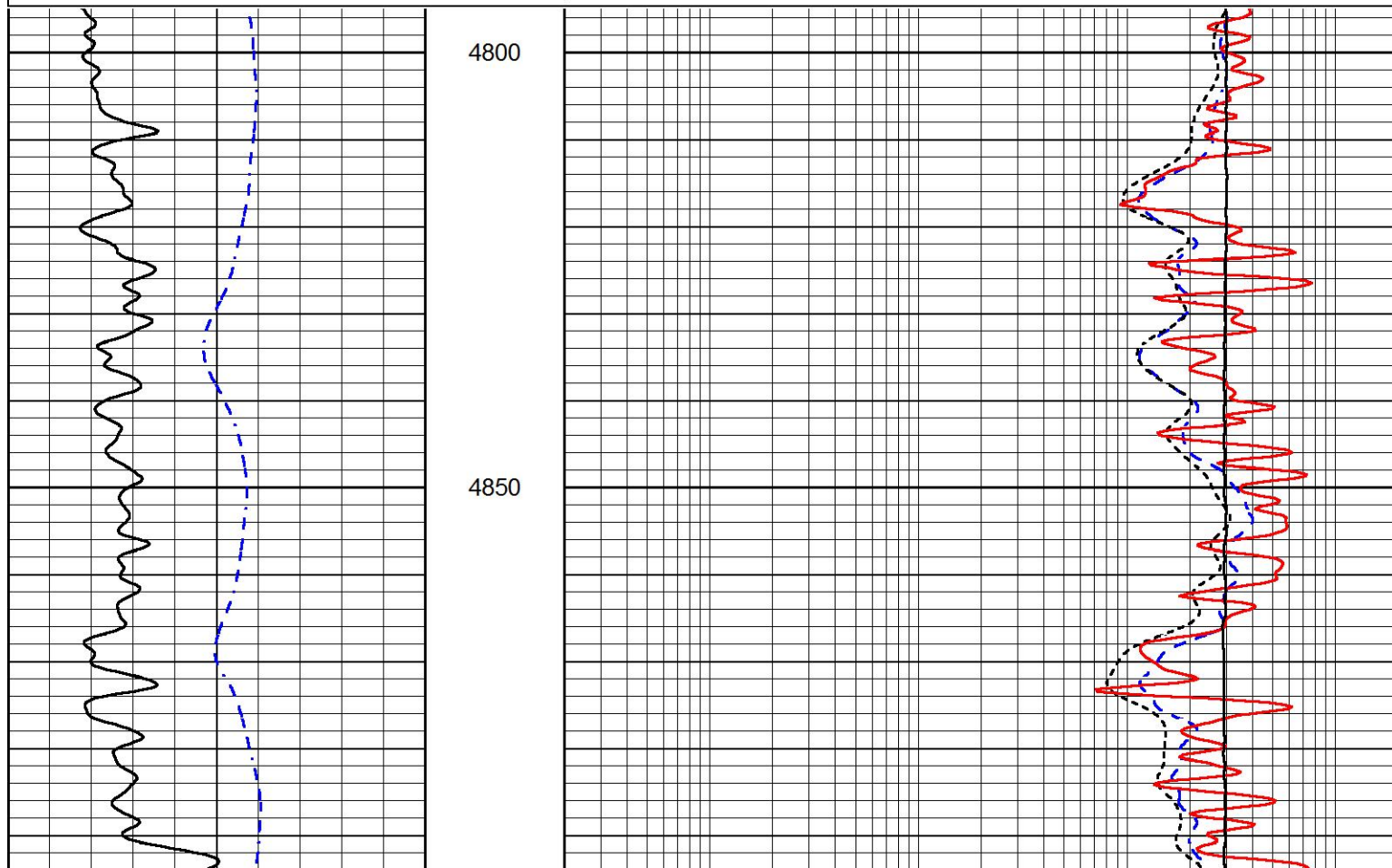
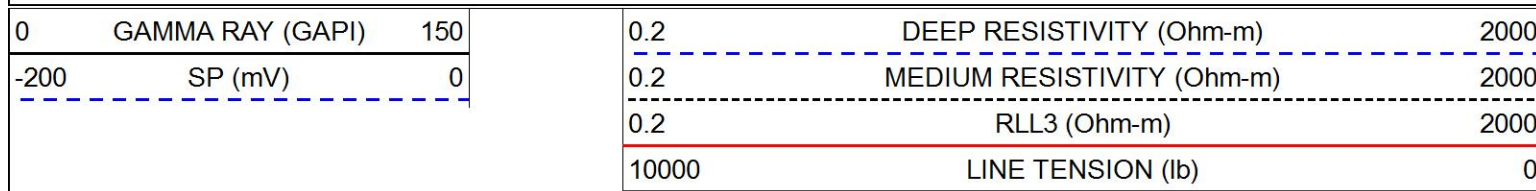


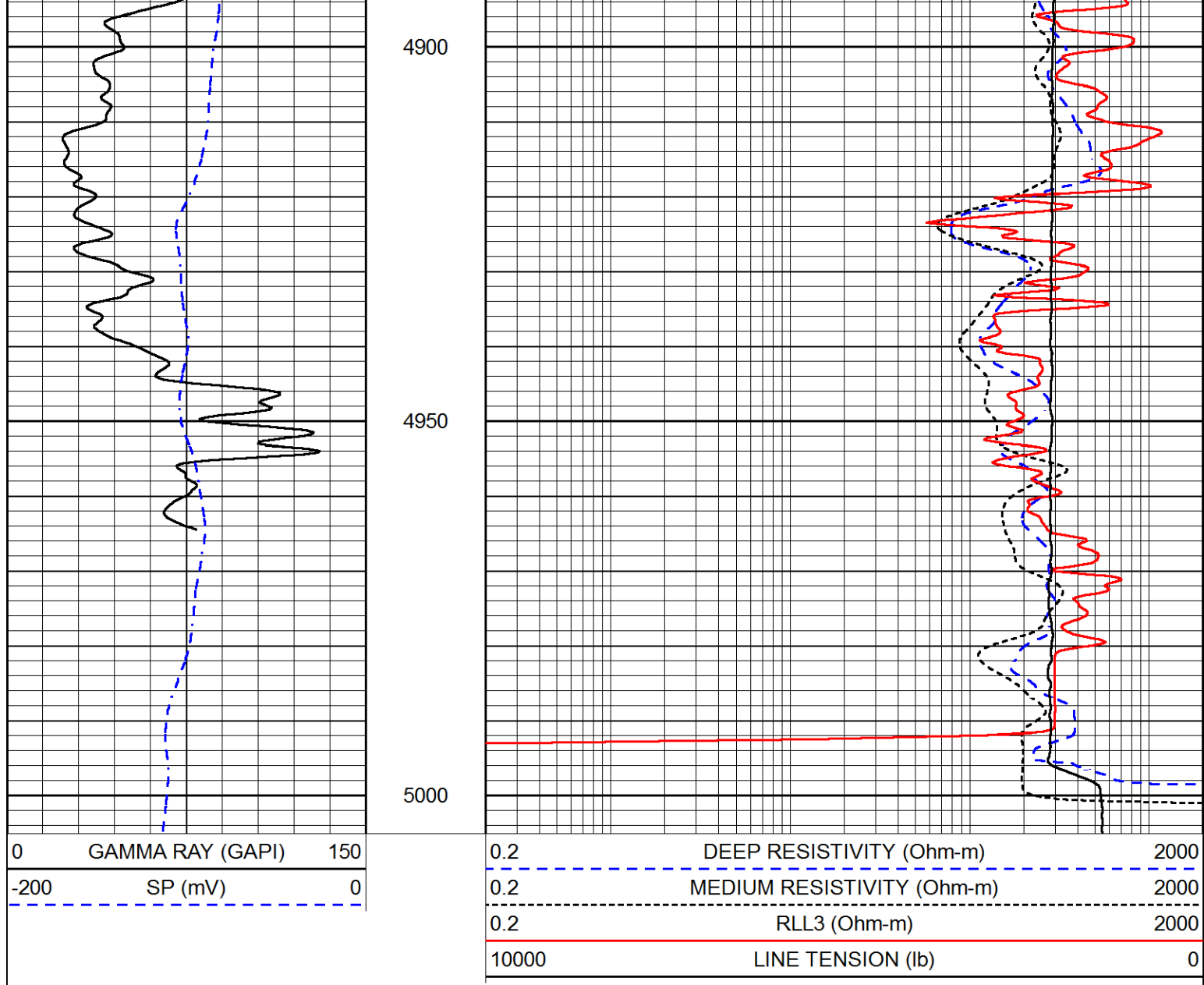




REPEAT SECTION

Database File: american warrior_crist 2-28.db
 Dataset Pathname: STKML/pass2.1
 Presentation Format: dil
 Dataset Creation: Mon Apr 23 15:21:59 2018
 Charted by: Depth in Feet scaled 1:240





Calibration Report

Database File: american_warrior_crist_2-28.db
 Dataset Pathname: STKML/pass3.1
 Dataset Creation: Mon Apr 23 15:23:02 2018

Dual Induction Calibration Report

Serial-Model: 933 (HT)-PSI HIGH TEMP
 Calibration Performed: Mon Apr 23 14:01:41 2018

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		Gain	Offset
Deep	167.000	835.000	0.000	255.000	mmho/m	0.700	-16.500
Medium	142.000	1349.000	0.000	255.000	mmho/m	0.565	-63.000

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	19000.0000	-0.7000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	24000.0000	-0.6000
Caliper	1.0001	1.1397	6.5000	18.5000	in	70.0000	-65.9250

Compensated Density Calibration Report

Serial-Model: 182-152-M&W
 Source / Verifier: 16955B / 2ci
 Master Calibration Performed: Mon Apr 23 14:01:33 2018

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4992.81	6098.44	cps
Aluminum	2.650	g/cc	945.67	3945.60	cps

Spine Angle = 75.33 Density/Spine Ratio = 0.520

	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



PIONEER
 Pioneer Energy Services

Company AMERICAN WARRIOR, INC.
 Well CRIST #2-28
 Field UNKNOWN
 County FINNEY
 State KANSAS