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DUAL INDUCTION LOG

Company AMERICAN WARRIOR, INC.
Well RUFF UNIT #1-11
Field LIPPOLDT NORTHWEST
County HODGEMAN State KANSAS

Location: API #: 15-083-21959-00-00
259' FNL & 121' FWL
SEC 11 TWP 23S RGE 23W

Other Services
CNL/CDL
MEL/BHCS

Permanent Datum GROUND LEVEL Elevation 2279'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING

Elevation
K.B. 2290'
D.F. N/A
G.L. 2279'

Company	AMERICAN WARRIOR, INC.			
Well	RUFF UNIT #1-11			
Field	LIPPOLDT NORTHWEST			
County	HODGEMAN			
State	KANSAS			
Location:	API #: 15-083-21959-00-00			
	259' FNL & 121' FWL			
	SEC 11 TWP 23S RGE 23W			
Permanent Datum	GROUND LEVEL	Elevation	2279'	
Log Measured From	KELLY BUSHING			
Drilling Measured From	KELLY BUSHING			
Date	9/1/2018			
Run Number	ONE			
Depth Driller	5300'			
Depth Logger	5296'			
Bottom Logged Interval	5295'			
Top Log Interval	250'			
Casing Driller	8.625" @ 270'			
Casing Logger	265'			
Bit Size	7.875"			
Type Fluid in Hole	CHEMICAL			
Salinity,ppm CL	6100			
Density / Viscosity	9.7	54		
pH / Fluid Loss	10.5	10.4		
Source of Sample	FLOWLINE			
Rm @ Meas. Temp	0.40 @ 80			
Rmf @ Meas. Temp	0.30 @ 80			
Rmc @ Meas. Temp	0.54 @ 80			
Source of Rmf / Rmc	CHARTS			
Rm @ BHT	0.25 @ 129			
Operating Rig Time	5 HOURS			
Max Rec. Temp. F	129			
Equipment Number	108			
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.

JETMORE,
1 EAST TO 219, SOUTH TO K RD, 3 EAST,
NORTH INTO

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

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

Your Pioneer Energy Services Crew	This Log Record Was Witnessed By
Engineer: D. SCHMIDT	Primary Witness: LUKE THOMPSON
Operator:	Secondary Witness:
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Log Variables

DatabaseC:\ProgramData\Warrior\Data\american warrior_ruff unit 1-11.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	129	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	-110	80	Off	5296

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			GR-M&W (89-M&W)	3.00	3.50	50.00
GR	33.00					
CNLSC	29.90		CNT-M&W (tk10-MW)	5.50	3.50	100.00
CNSSC	29.15					
			CDL-M&W (126-186)	8.50	4.00	250.00
LSD	20.85					
DCAL	20.83					
SSD	20.35					
RLL3	15.80					
RLL3F	15.79					
			DIL-M&W (1987)	18.50	3.50	220.00
CILD	8.00					

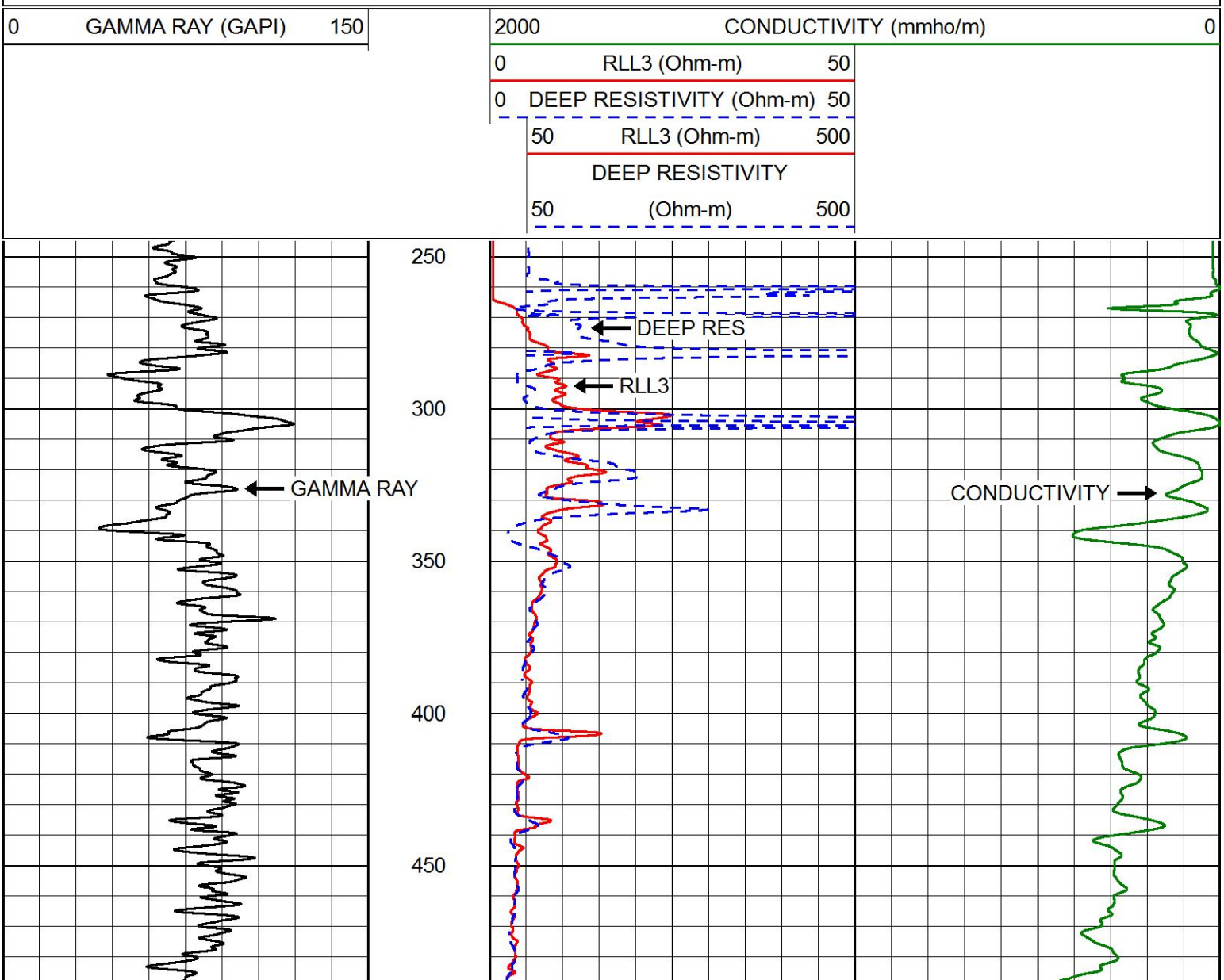
CILM	4.70					
SP	0.20					

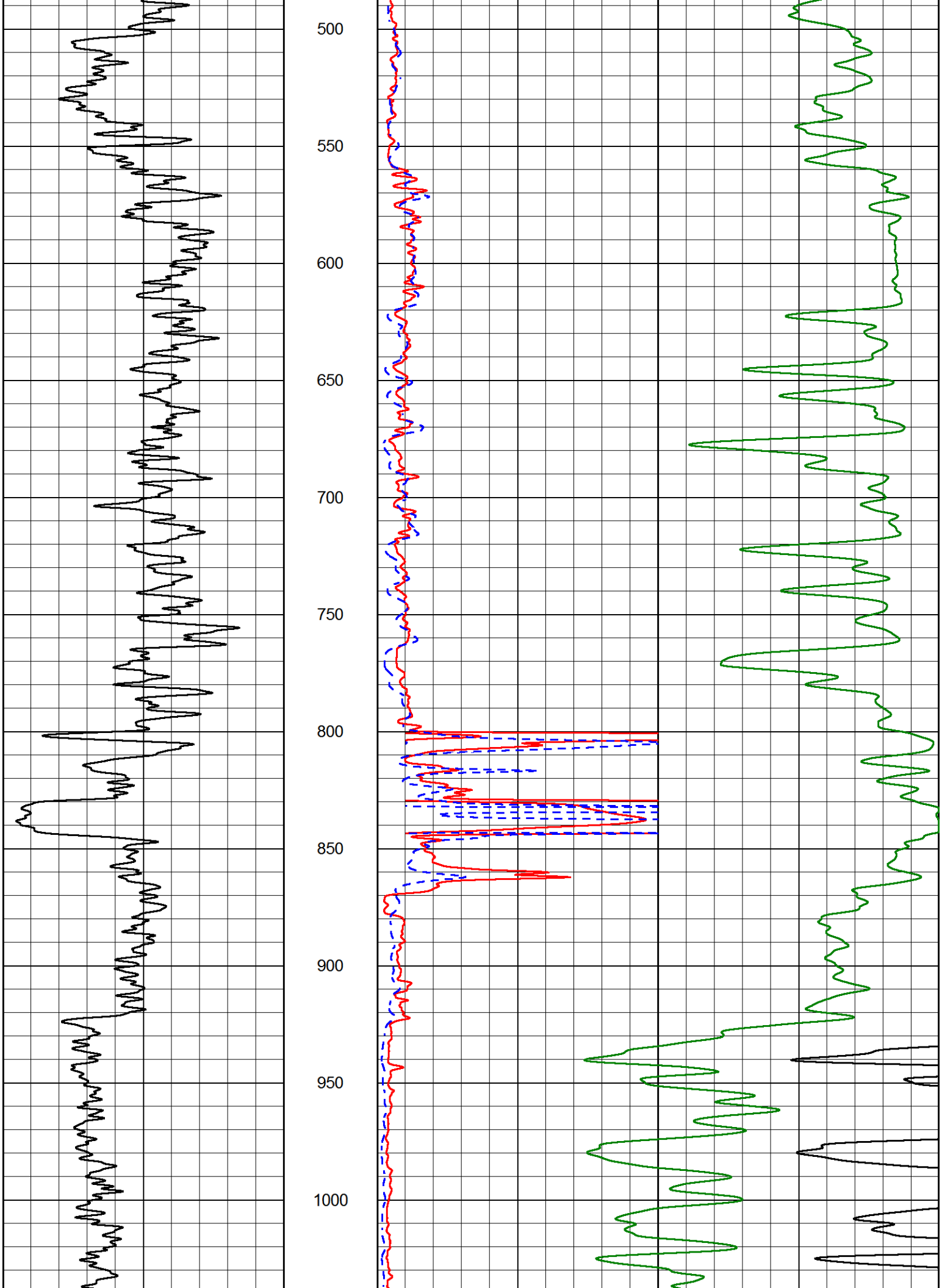
Dataset: american warrior_ruff unit 1-11.db: field/well/STACK/pass3.1
Total length: 35.50 ft
Total weight: 620.00 lb
O.D.: 4.00 in

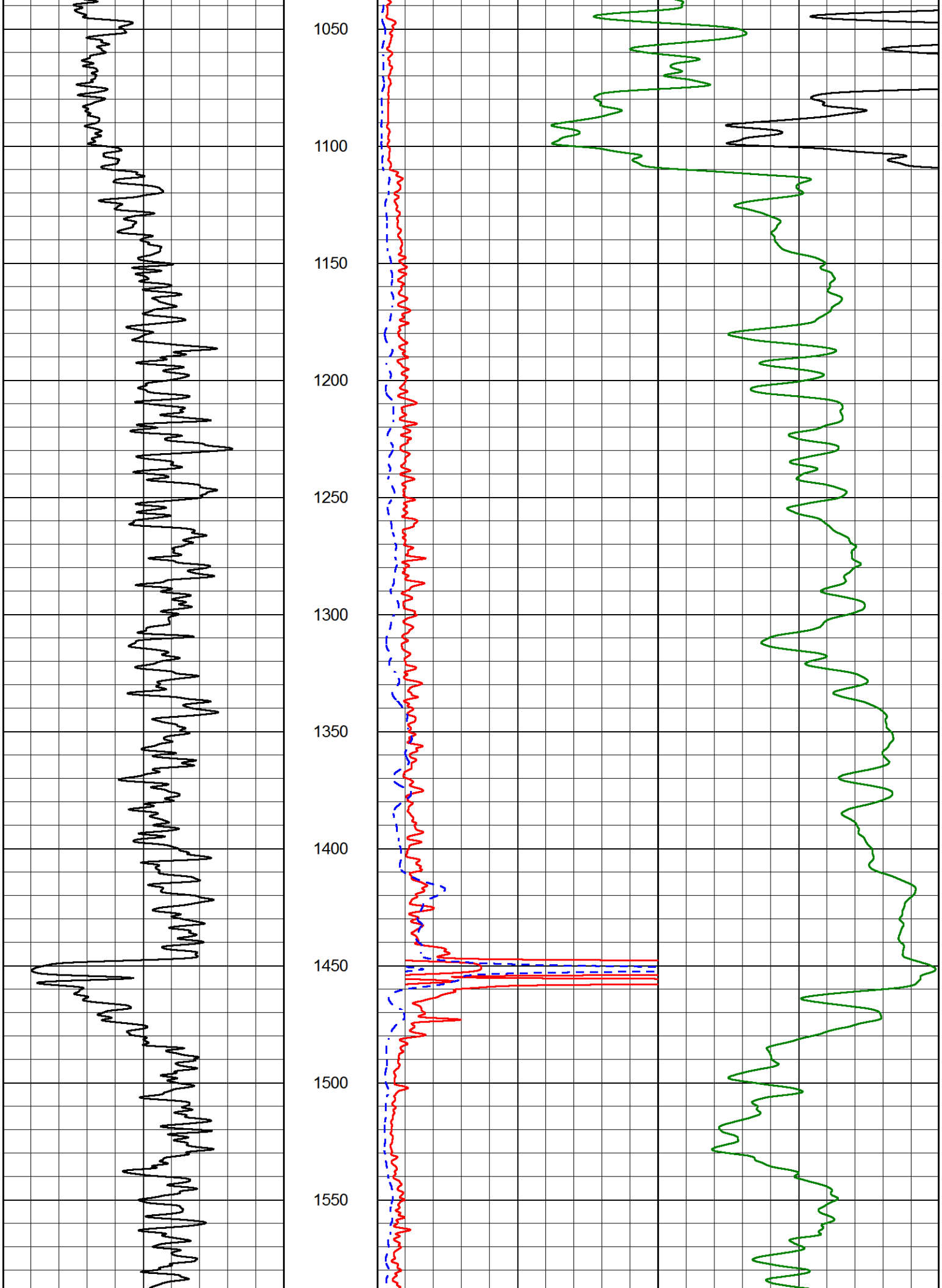
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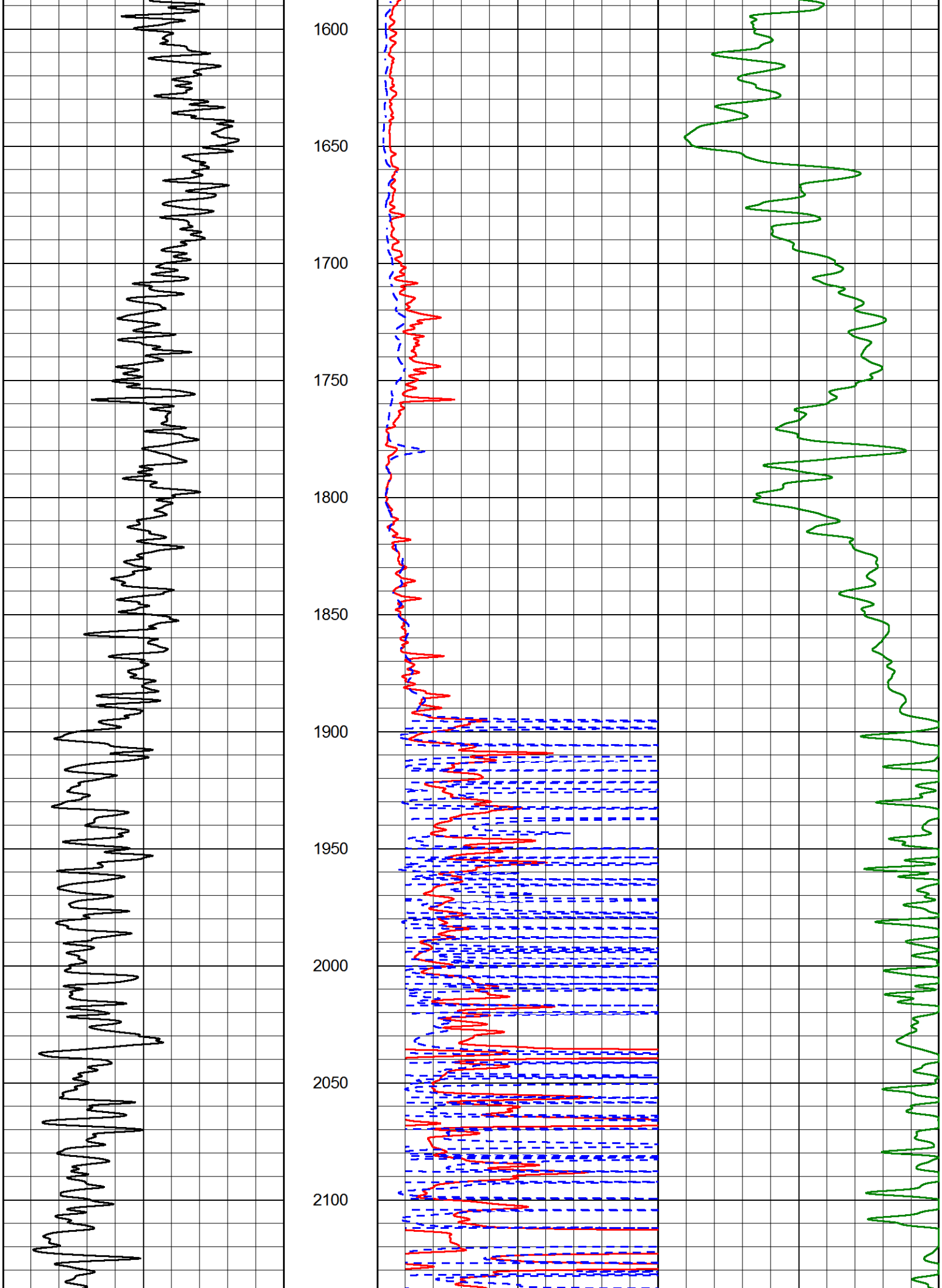
MAIN PASS

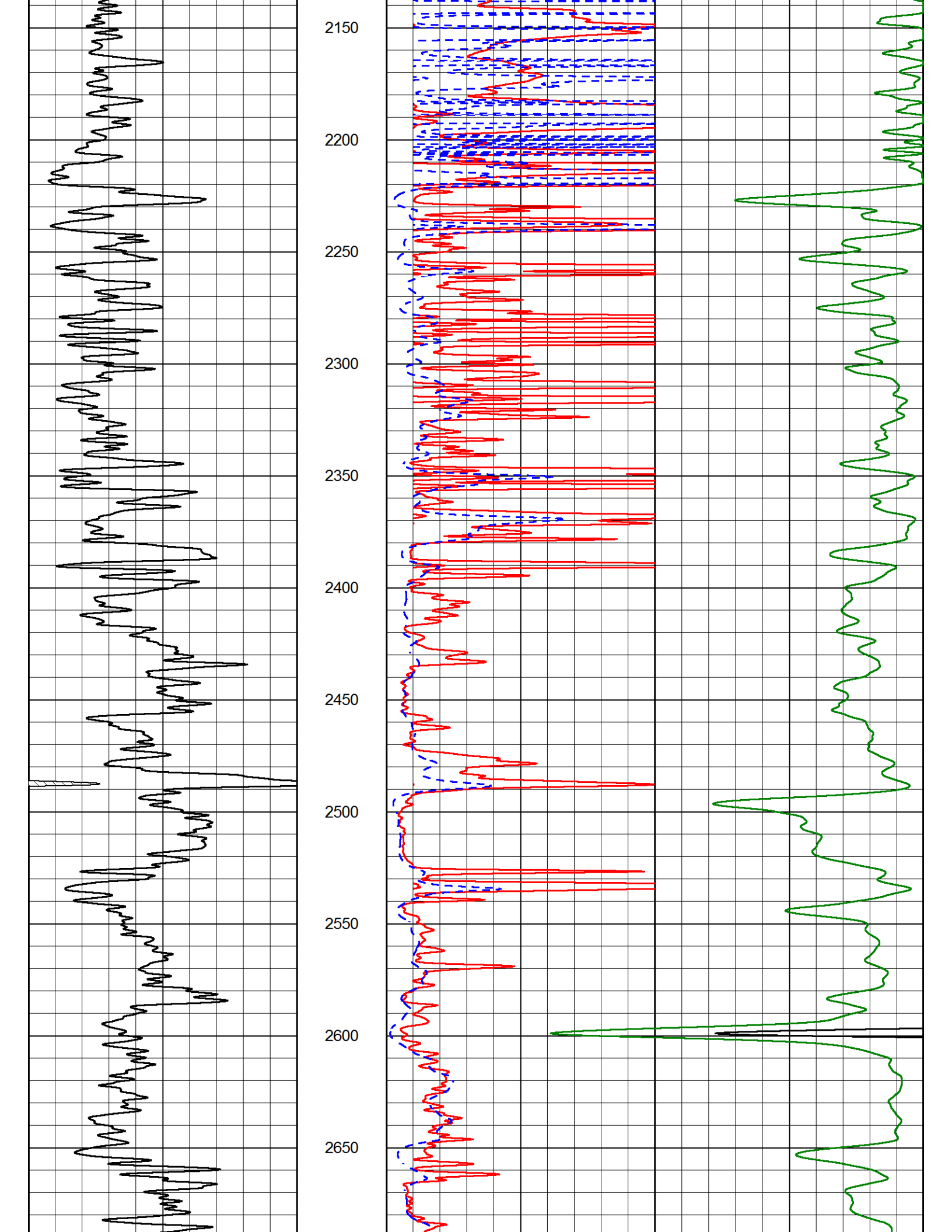
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Dataset Pathname	STACK/pass4.1
Presentation Format	dil2in
Dataset Creation	Sat Sep 01 03:17:45 2018
Charted by	Depth in Feet scaled 1:600

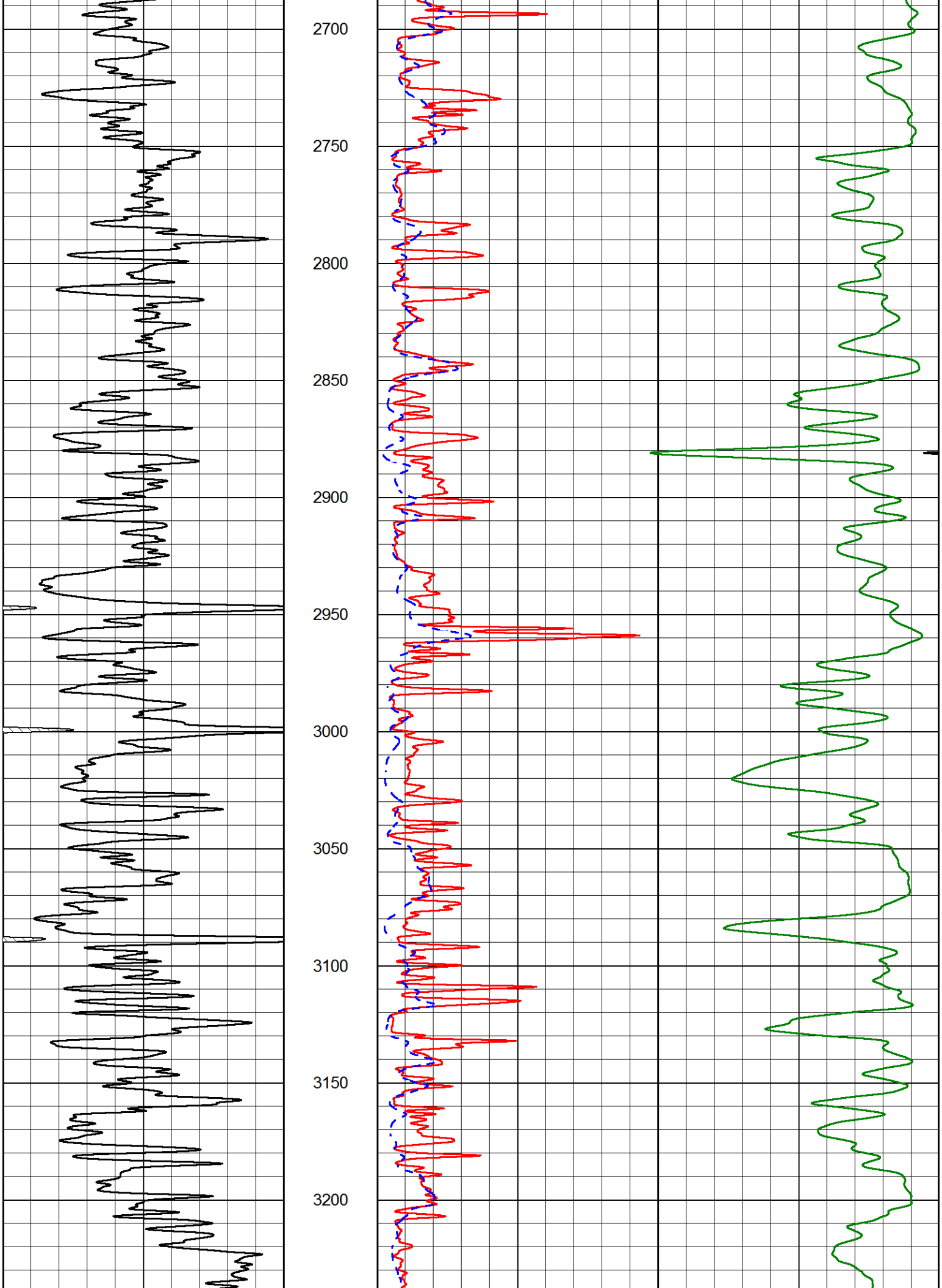


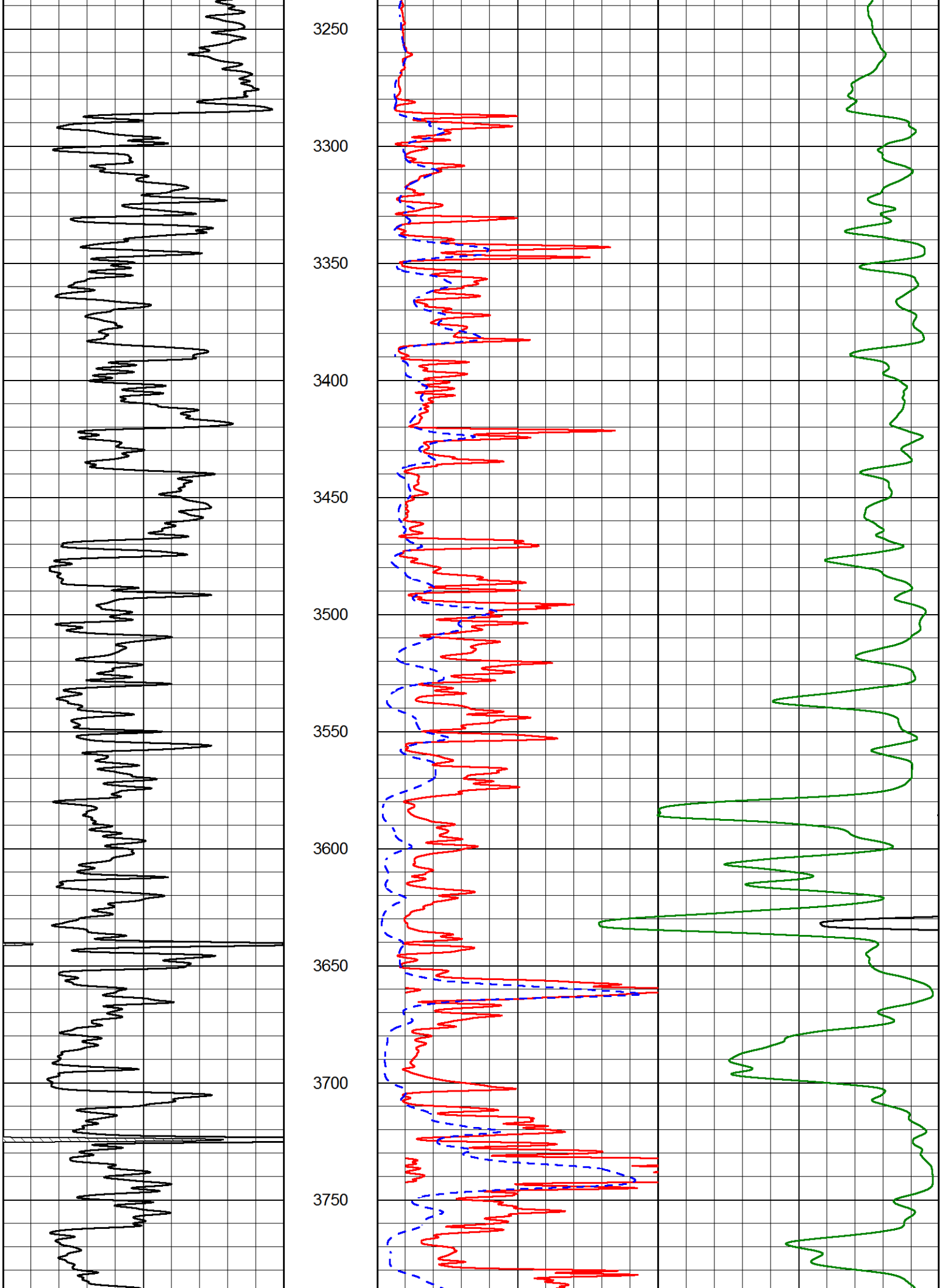

500
550
600
650
700
750
800
850
900
950
1000

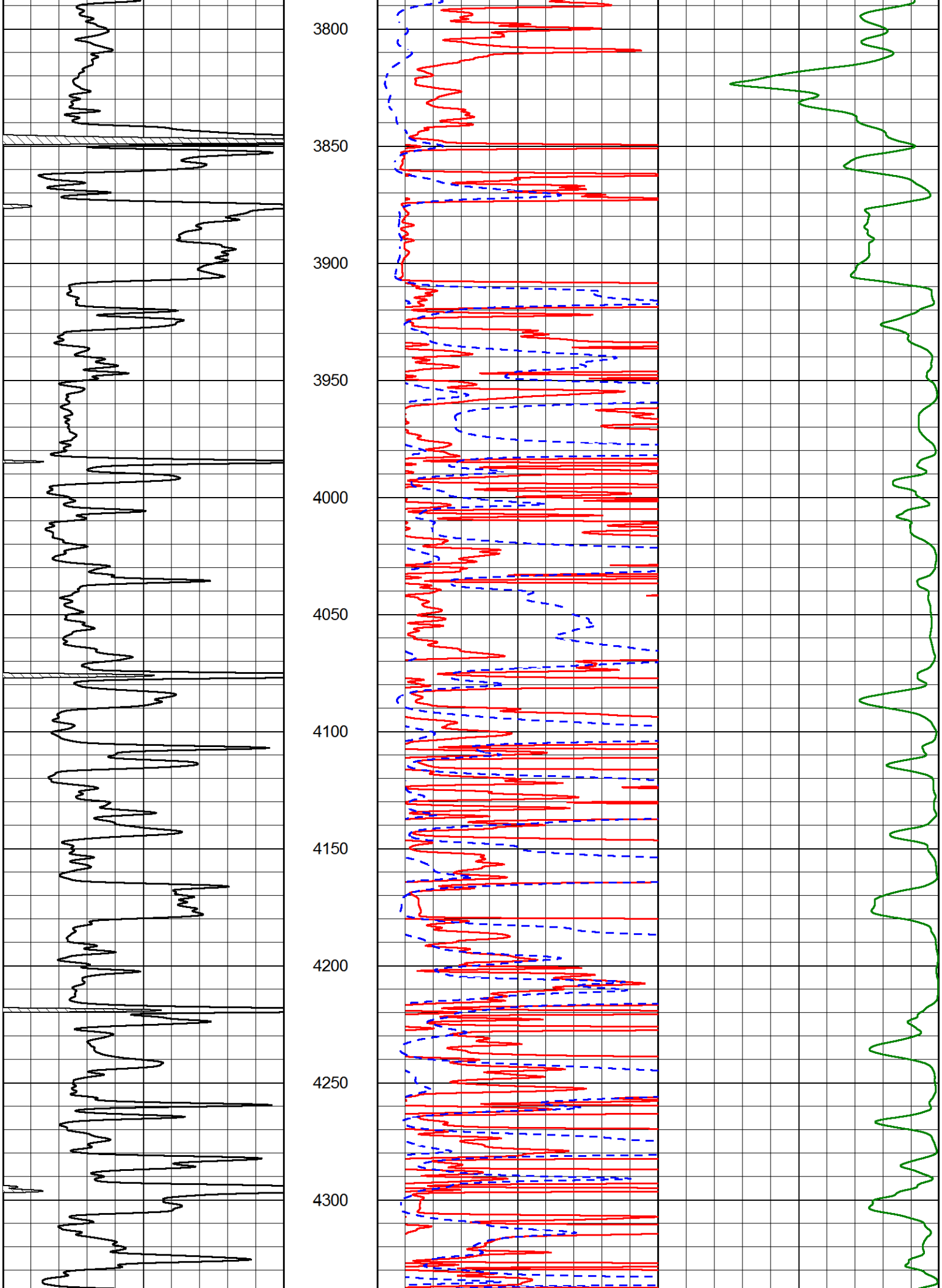

1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550

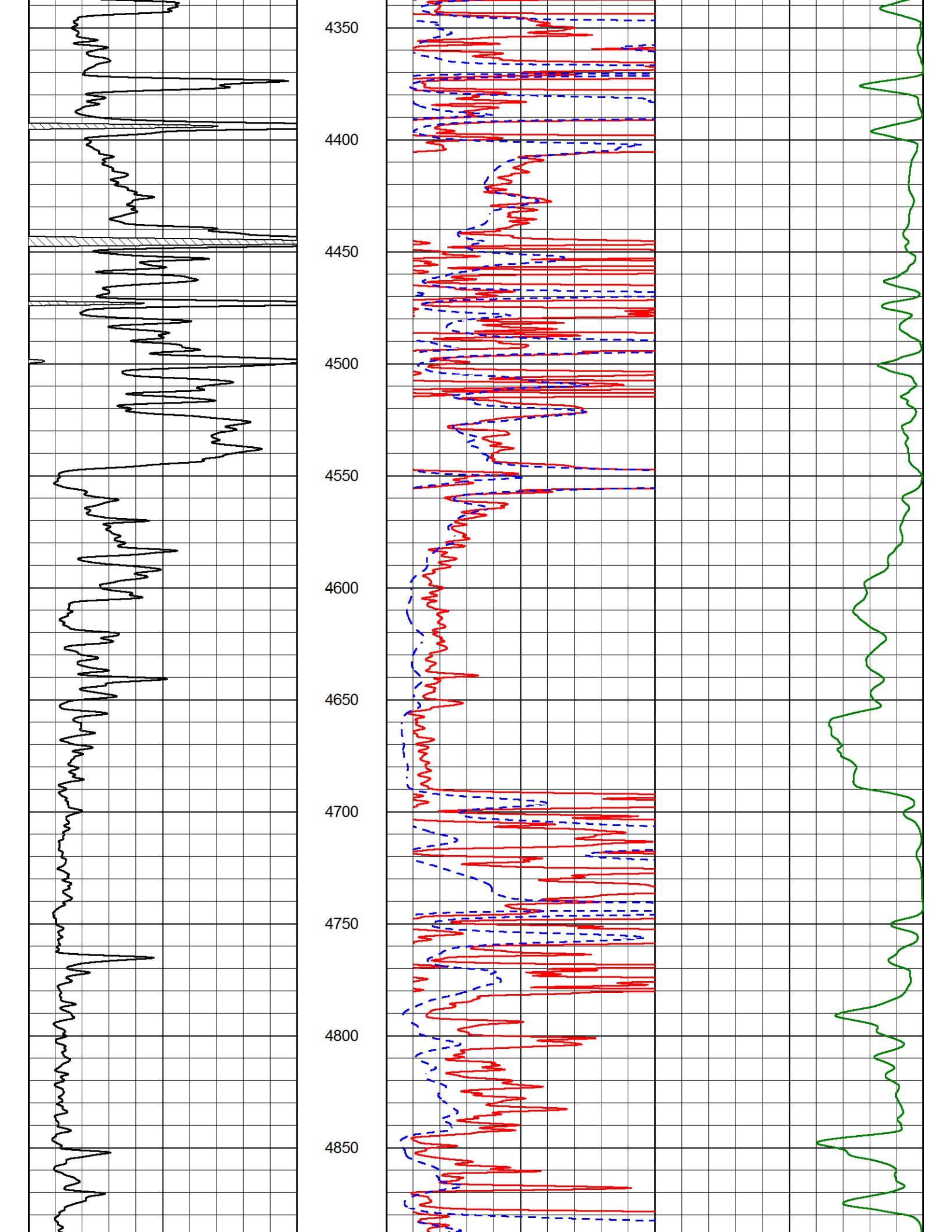

1600
1650
1700
1750
1800
1850
1900
1950
2000
2050
2100

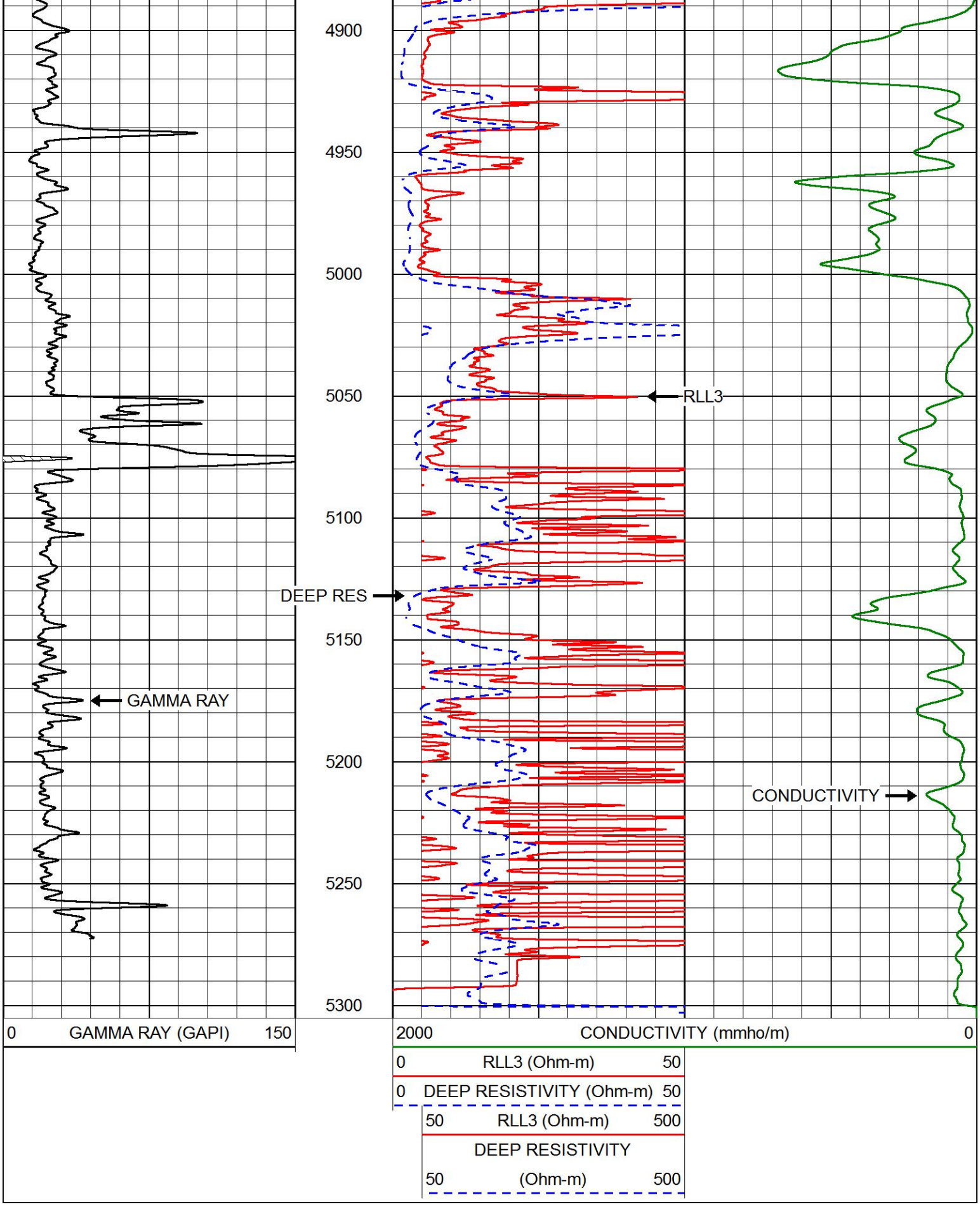

2150
2200
2250
2300
2350
2400
2450
2500
2550
2600
2650


2700
2750
2800
2850
2900
2950
3000
3050
3100
3150
3200


3250
3300
3350
3400
3450
3500
3550
3600
3650
3700
3750


3800
3850
3900
3950
4000
4050
4100
4150
4200
4250
4300


4350
4400
4450
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4650
4700
4750
4800
4850



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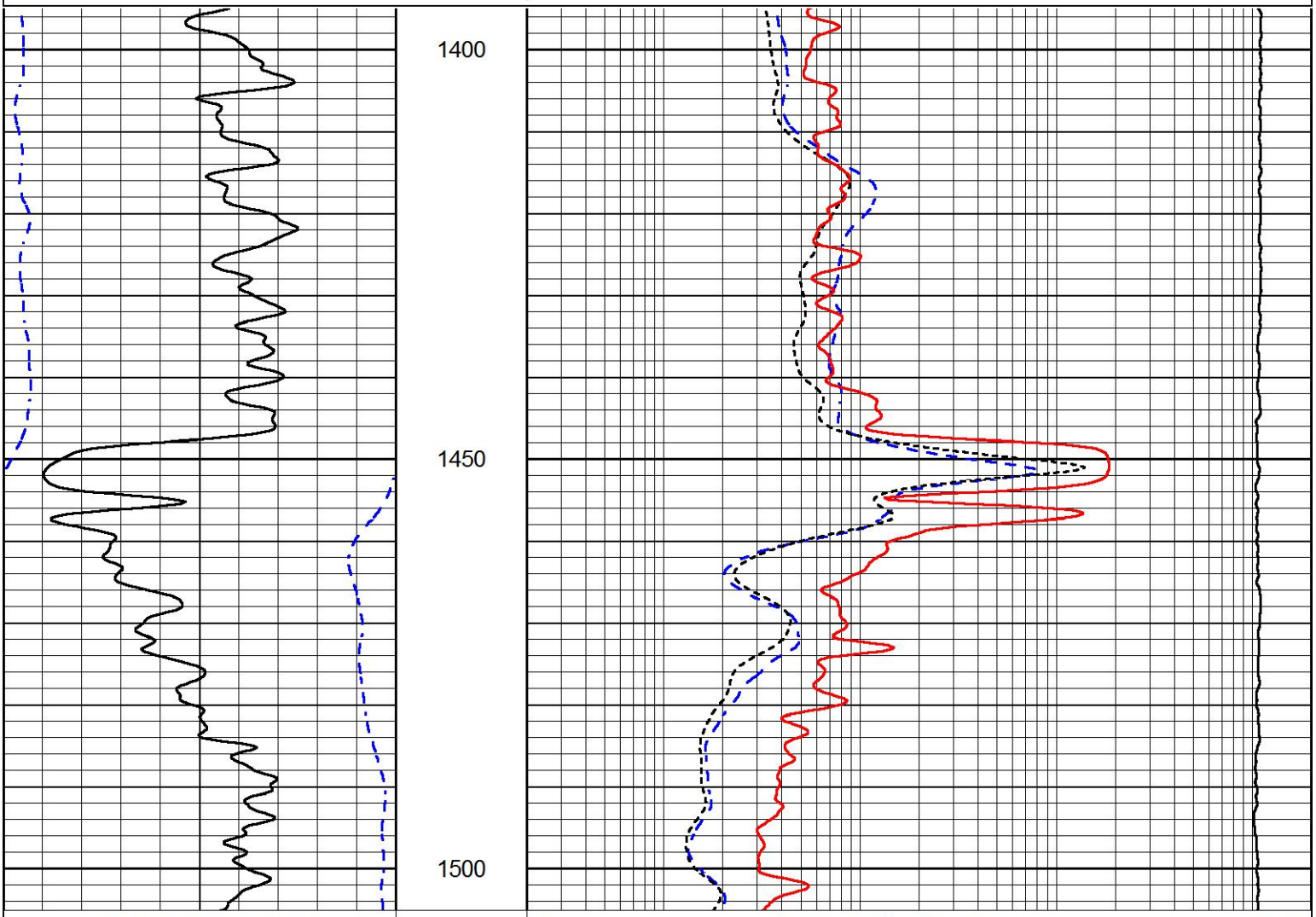
MAIN PASS

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Database File	american warrior_ruff unit 1-11.db
Dataset Pathname	STACK/pass4.1
Presentation Format	dil
Dataset Creation	Sat Sep 01 03:17:45 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
15000	LINE TENSION (lb)	0



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

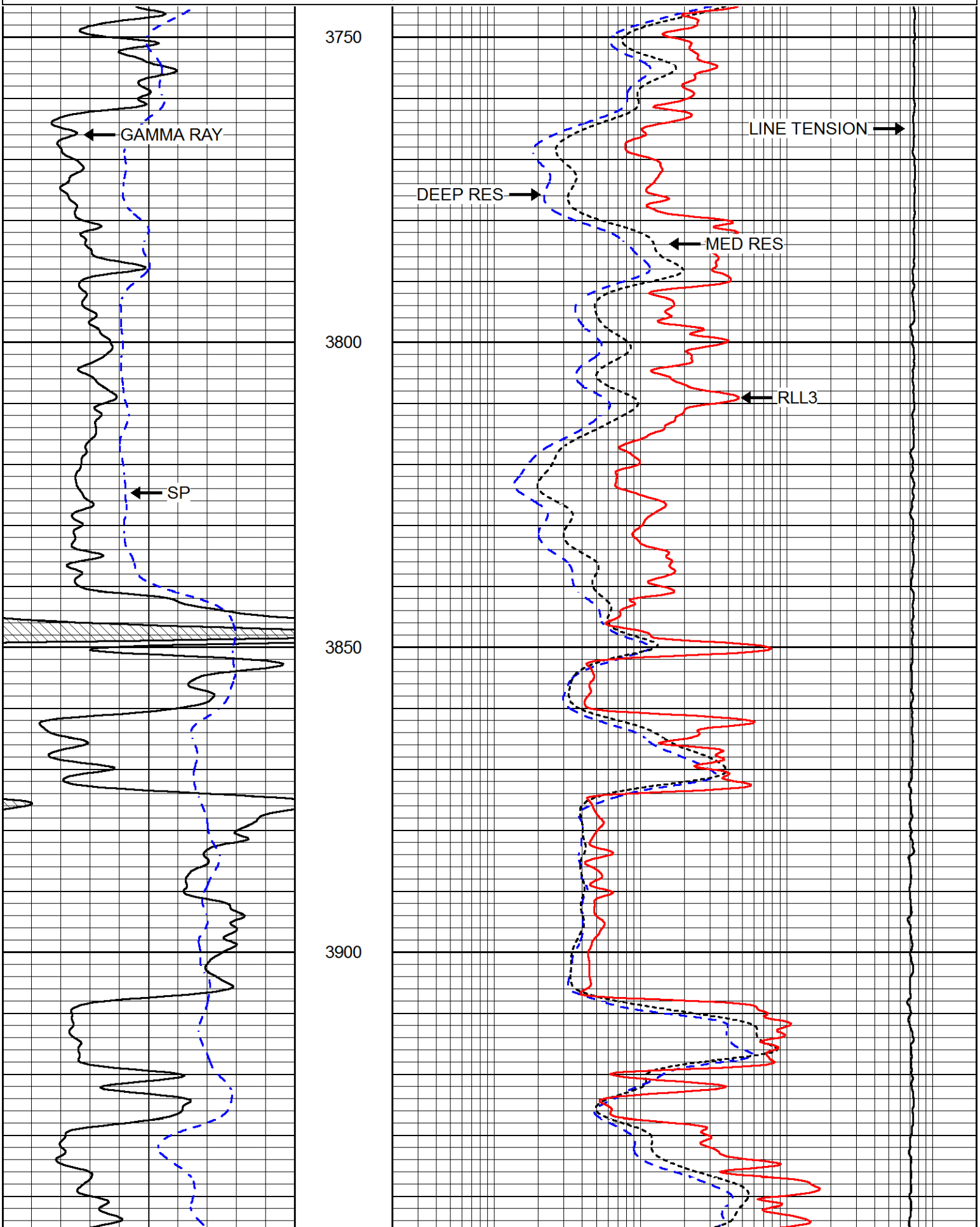
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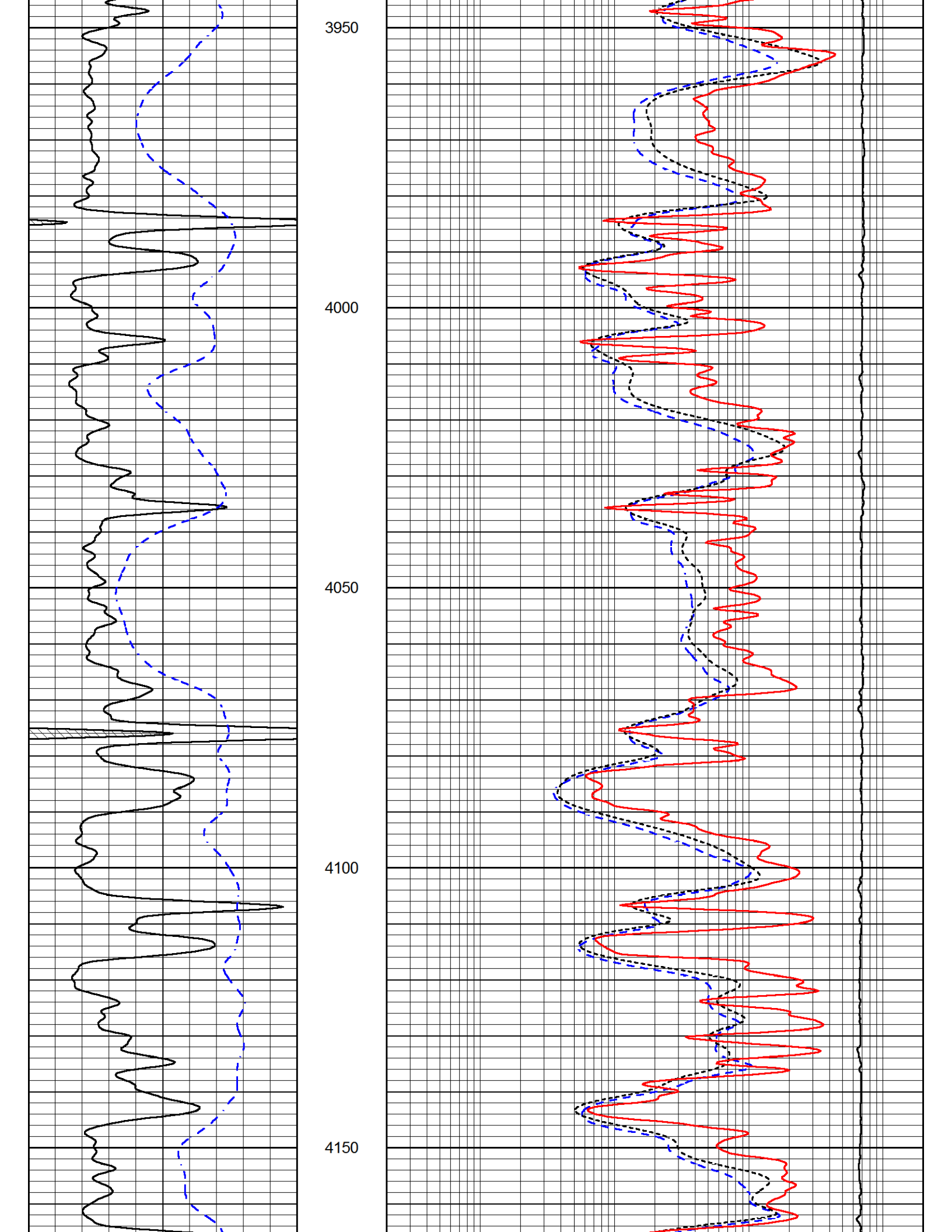
MAIN PASS

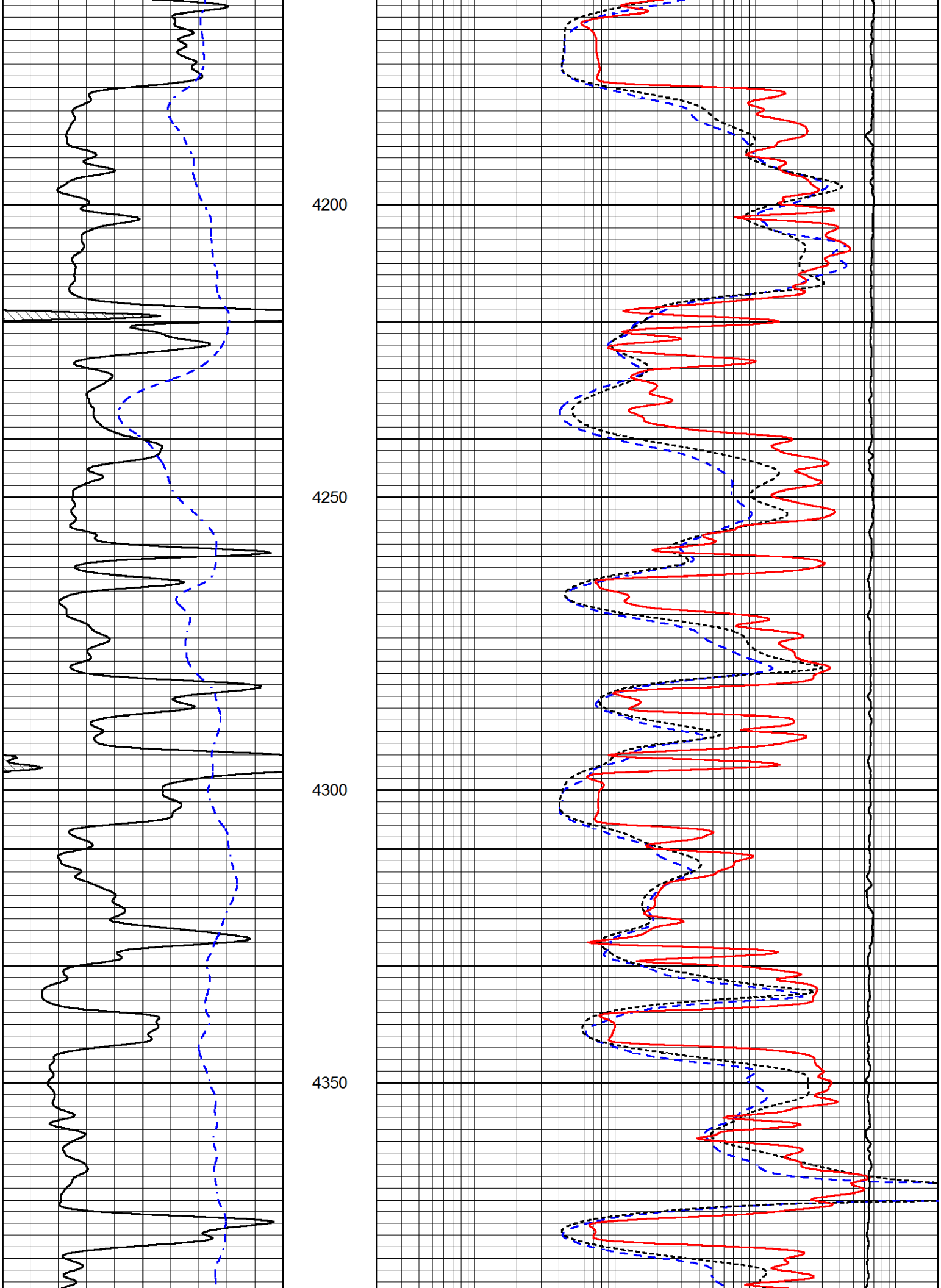
Database File	american warrior_ruff unit 1-11.db
Dataset Pathname	STACK/pass3.1
Presentation Format	dil
Dataset Creation	Sat Sep 01 02:36:54 2018
Charted by	Depth in Feet scaled 1:240

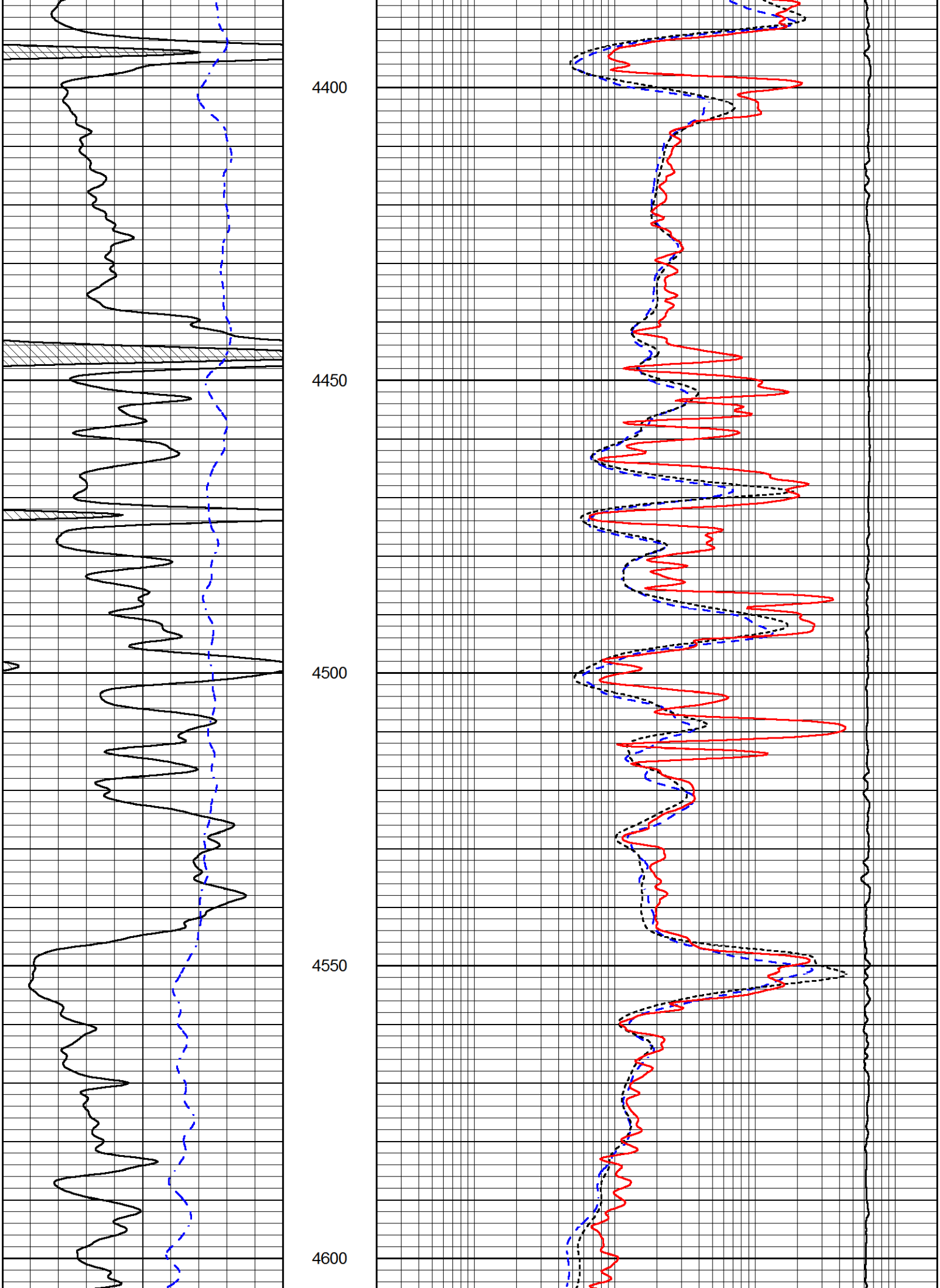
0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

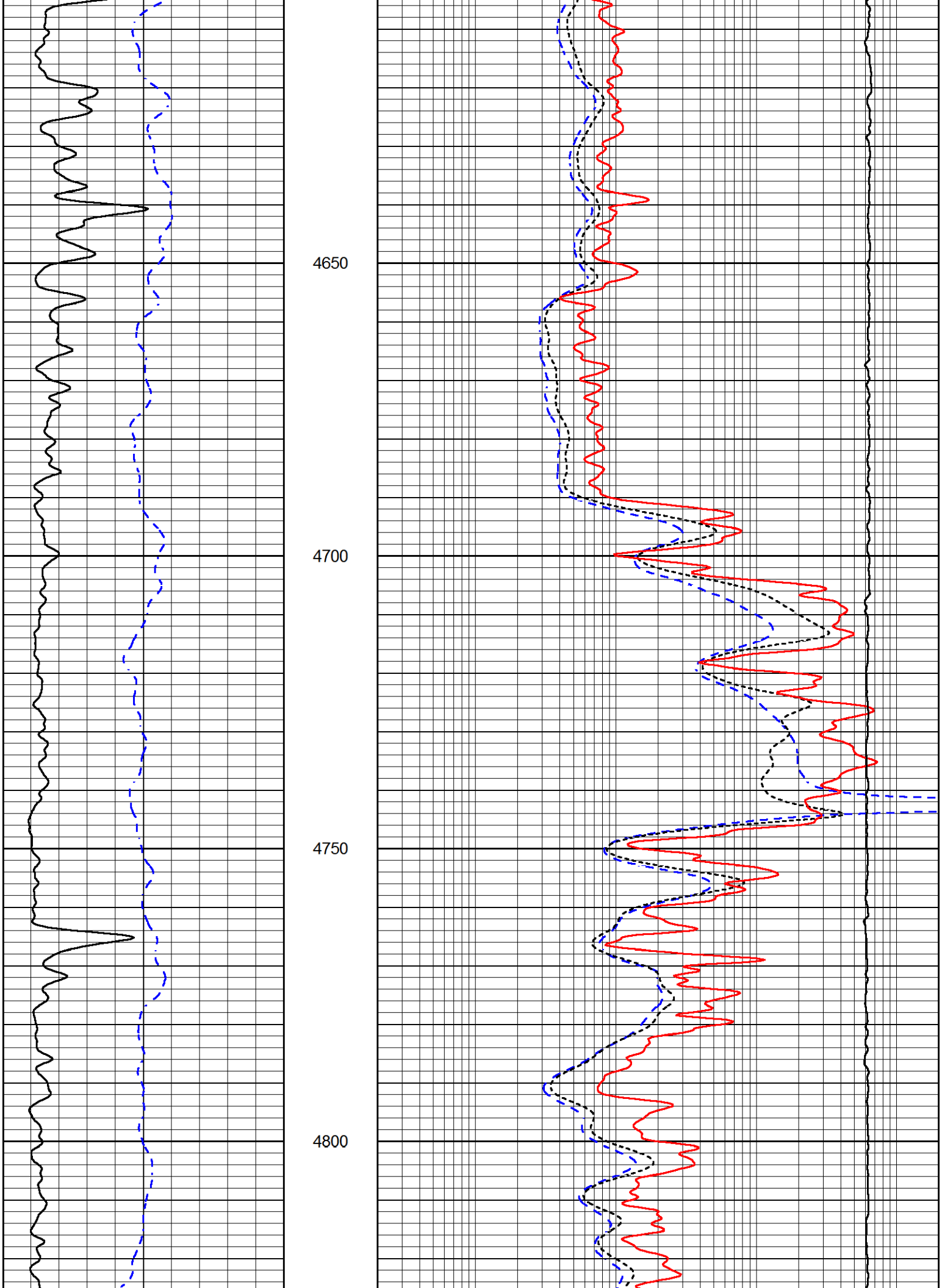
0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
15000	LINE TENSION (lb)	0

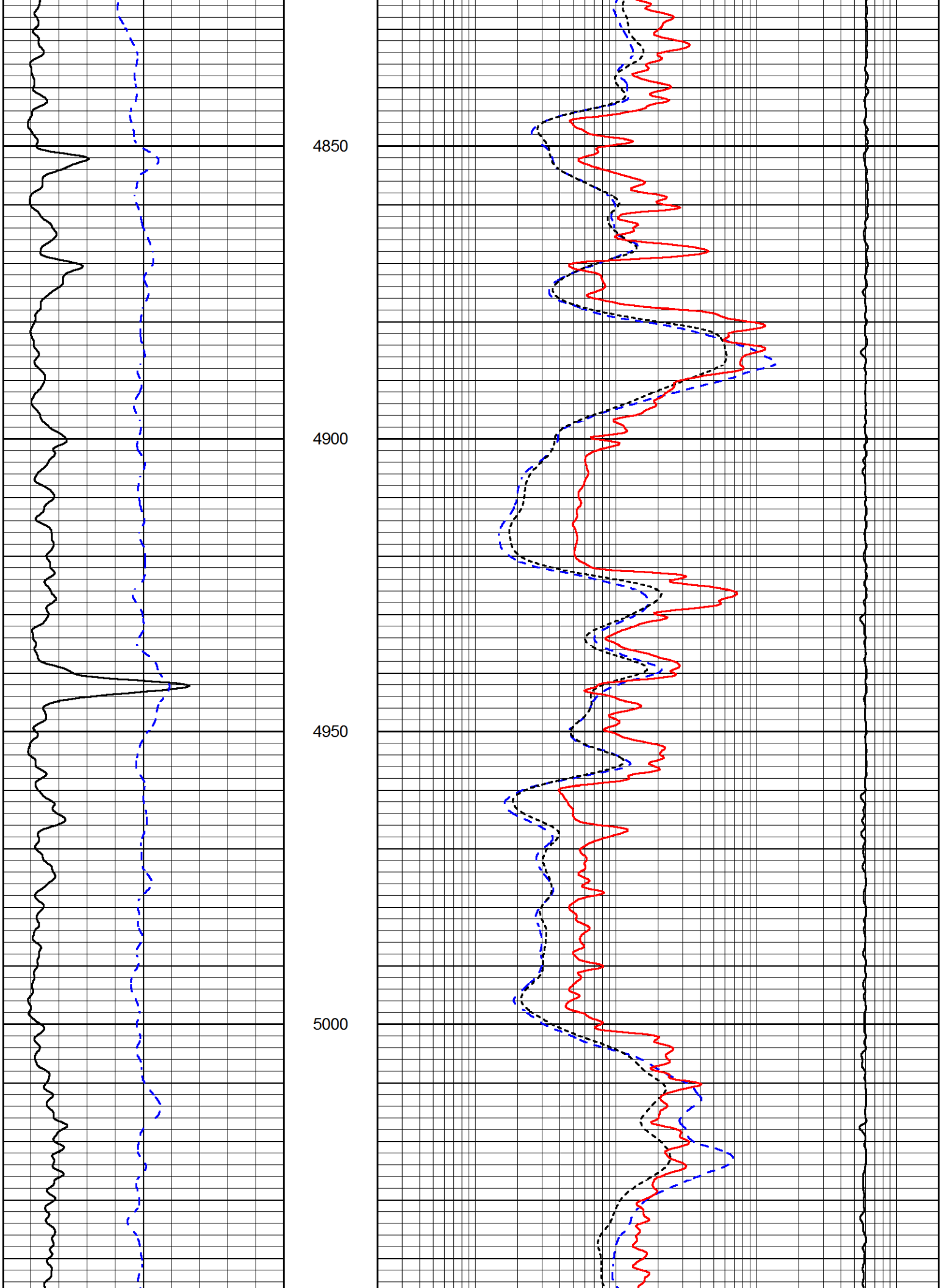


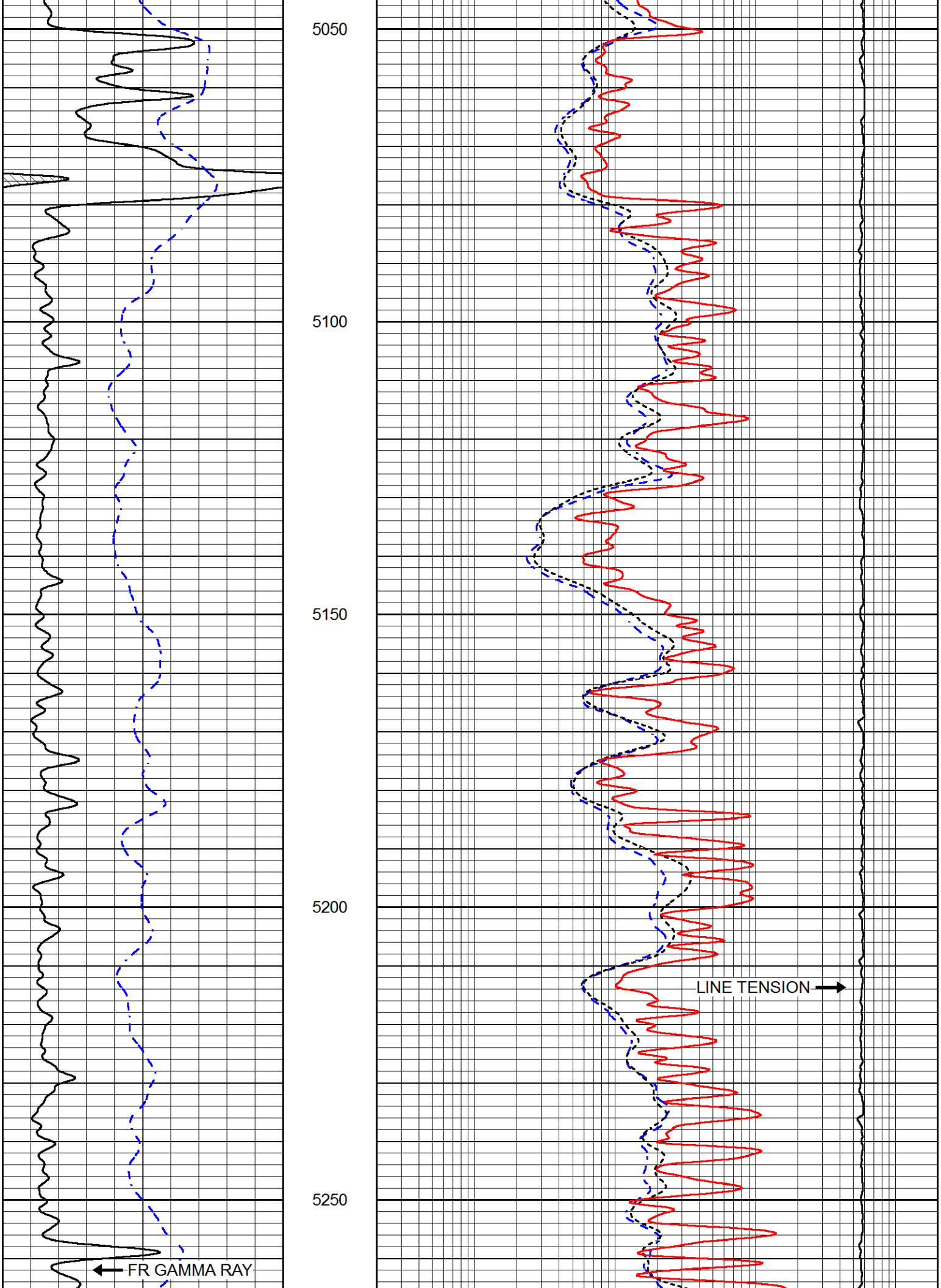

3950
4000
4050
4100
4150

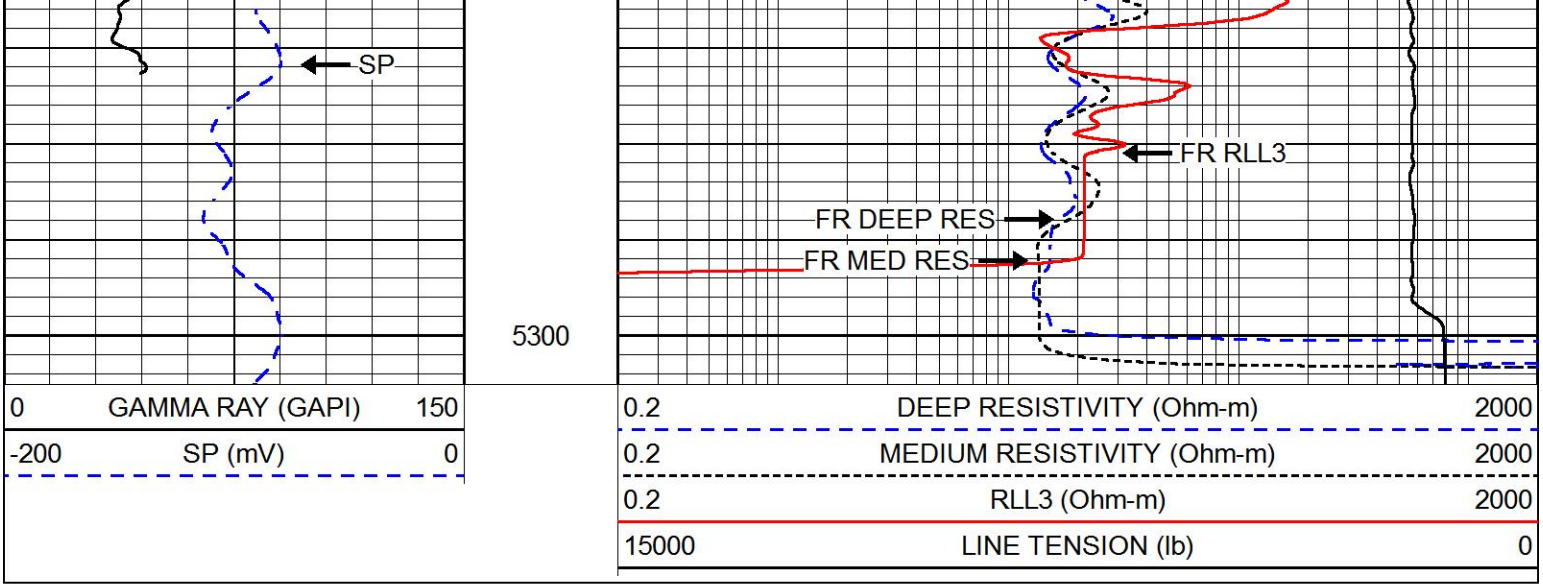

4200
4250
4300
4350


4400
4450
4500
4550
4600


4650
4700
4750
4800


4850
4900
4950
5000

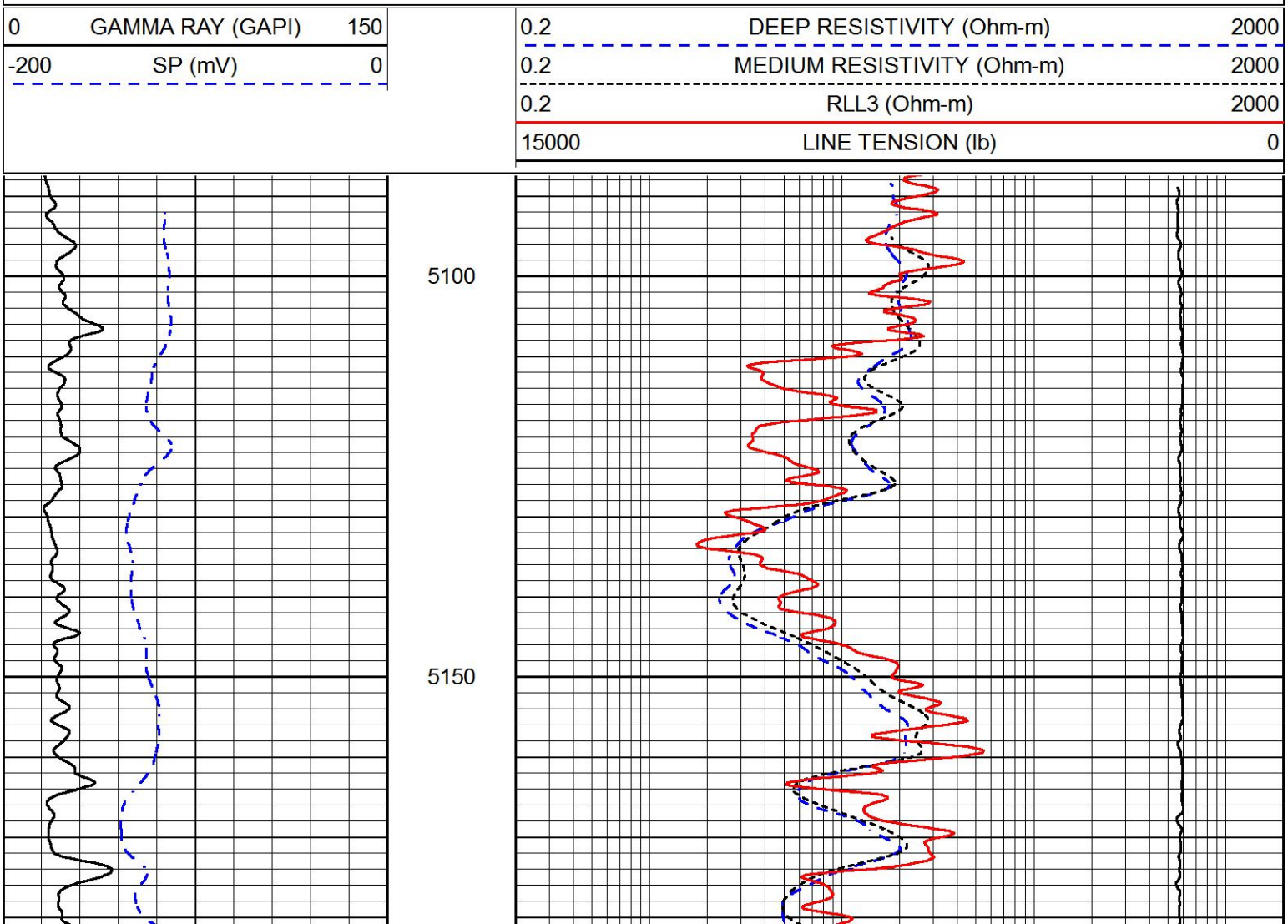

5050
5100
5150
5200
5250
LINE TENSION
FR GAMMA RAY

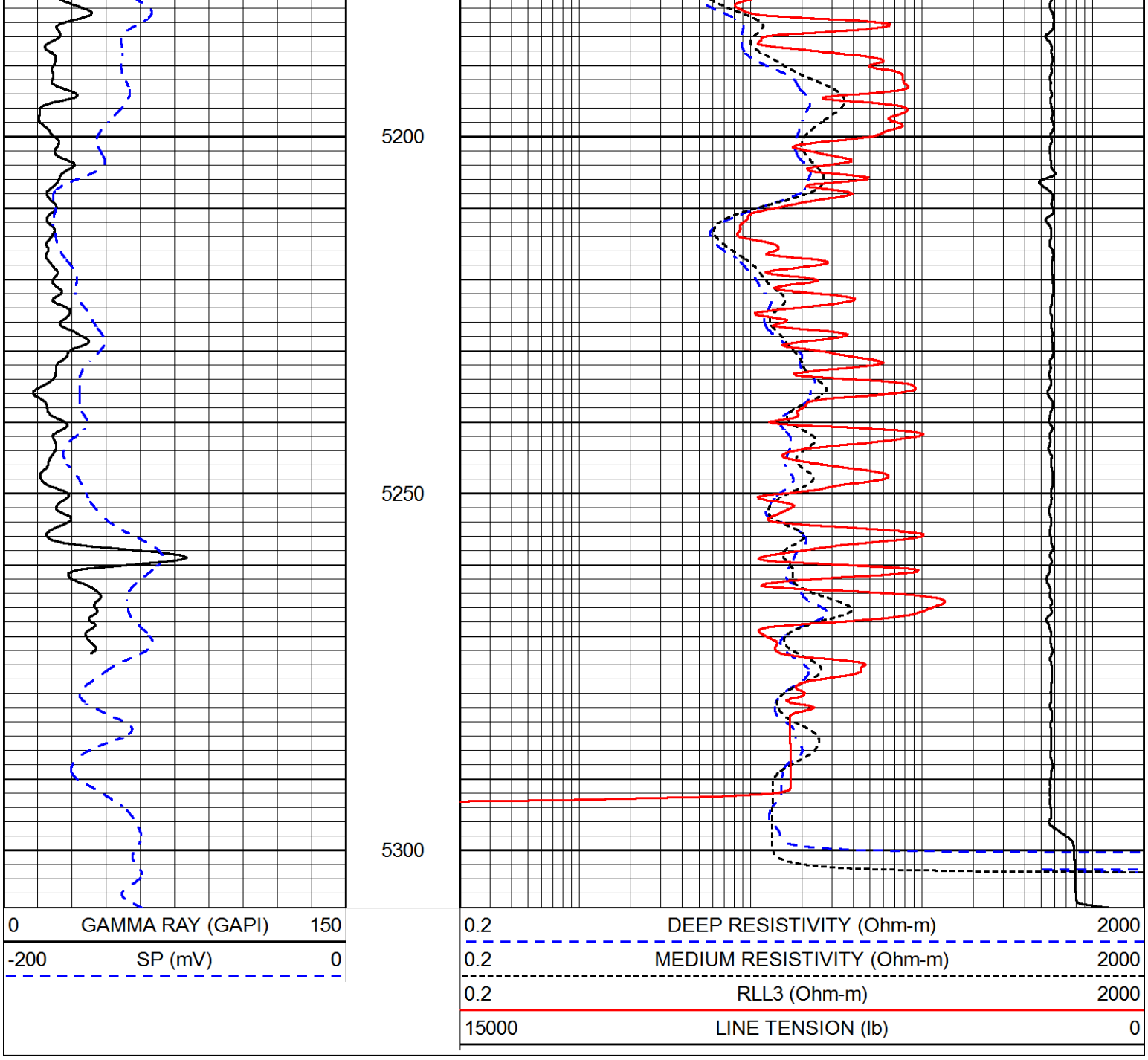


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REPEAT SECTION

Database File	american warrior_ruff unit 1-11.db
Dataset Pathname	STACK/pass2.1
Presentation Format	dil
Dataset Creation	Sat Sep 01 02:48:31 2018
Charted by	Depth in Feet scaled 1:240





Calibration Report

Database File	american warrior_ruff unit 1-11.db
Dataset Pathname	STACK/pass3.1
Dataset Creation	Sat Sep 01 02:36:54 2018

Dual Induction Calibration Report

Serial-Model:	1987-M&W
Calibration Performed:	Thu Aug 09 22:42:18 2018

	Readings		References			Results	
Loop:	Air	Loop	Air	Loop		Gain	Offset
Deep	178.615	710.235	0.000	255.800	mmho/m	0.505	-40.500
Medium	161.982	1441.110	0.000	255.800	mmho/m	0.390	-110.000

Compensated Density Calibration Report

Serial-Model:	126-186-M&W
Source / Verifier:	/
Master Calibration Performed:	Wed Aug 29 10:37:15 2018

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4403.06	6298.47	cps
Aluminum	2.670	g/cc	836.60	3999.09	cps

Spine Angle = 74.70 Density/Spine Ratio = 0.531

	Size		Reading
Small Ring	4.00	in	2.62
Large Ring	16.00	in	1.66

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:	Tue Apr 11 17:08:01 2017	
Calibrator Value:	1000.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	6.2	cps
Sensitivity:	0.5200	GAPI/cps

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Company	AMERICAN WARRIOR, INC.
Well	RUFF UNIT #1-11
Field	LIPPOLDT NORTHWEST
County	HODGEMAN
State	KANSAS