RELIANCE
OILFIELD SERVICES

Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Federal RU 23-17
Field	Rulison
County	Garfield
State	Colorado

Company TEP Rocky Mountain LLC
Well Federal RU 23-17
Field Rulison
County Garfield State Colorado

Location: API # : 05-045-23739
SEC 17 TWP 7S RGE 93W

Other Services

Permanent Datum	Ground Level	Elevation	8365.6'
Log Measured From	Kelly Bushing	24 FT	
Drilling Measured From	Kelly Bushing		

Elevation
K.B. 8389.6'
D.F. ---
G.L. 8365.6'

Date	07-APR-2018		
Run Number	One		
Depth Driller	10425 FT		
Depth Logger	10354 FT		
Bottom Logged Interval	10340 FT		
Top Log Interval	Surface		
Open Hole Size	8.750"		
Type Fluid	Water		
Density / Viscosity	8.34 lb/gal		
Max. Recorded Temp.	249°F		
Estimated Cement Top	See Log		
Time Well Ready	ROA		
Time Logger on Bottom	01:05		
Equipment Number	HD-0359		
Location	Grand Junction, CO		
Recorded By	A. Ellsworth		
Witnessed By	Dustin Welsh		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To

Casing Record	Size (in)	Wgt (lbs/Ft)	Grade	Top	Bottom
Surface Casing	9 5/8	36	J-55	Surface	1102 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	10384 FT
Intermediate #2					
Liner					

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, 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. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Log ran as per customer request
Depth referenced to Kelly Bushing at 24 FT
Marker Joint Logged from 6648 FT - 6670 FT
Log ran from 10340 FT to Surface
Recorded with 0 PSI Surface Induced Pressure

Thank you for choosing Reliance Oilfield Services, LLC!

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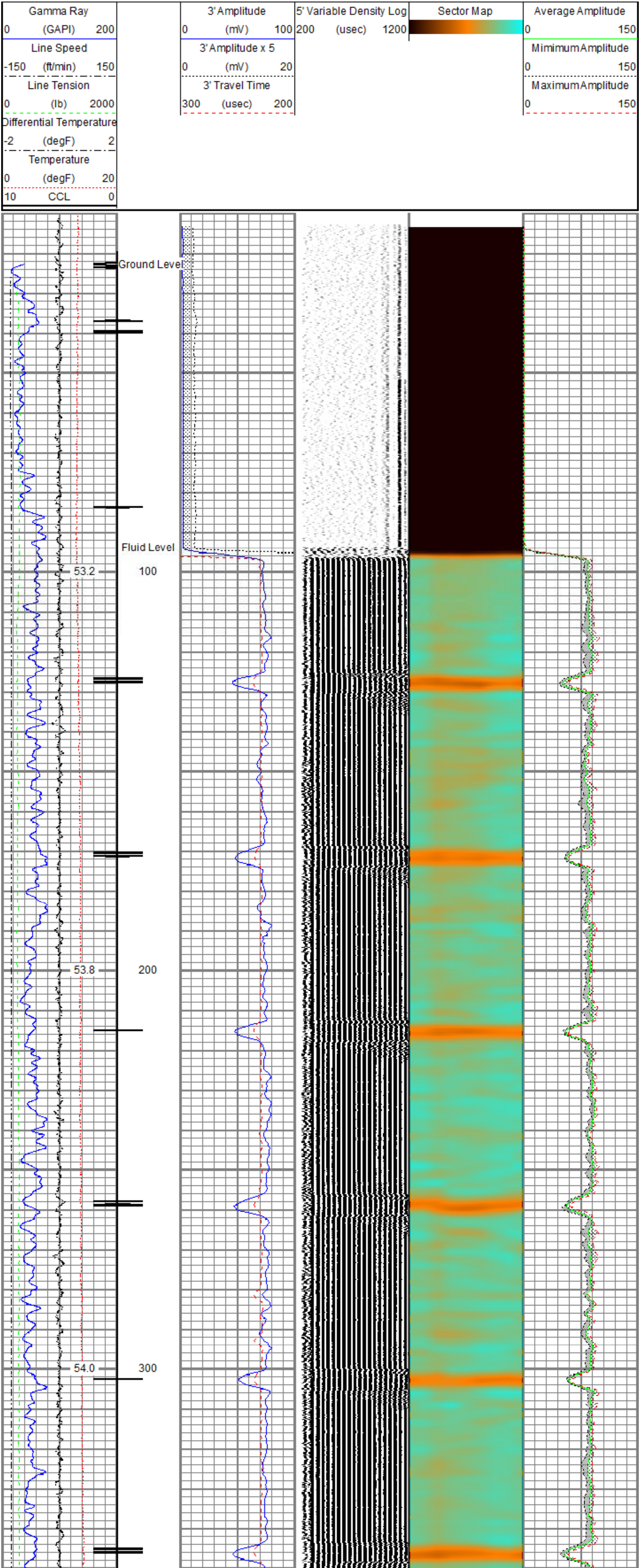
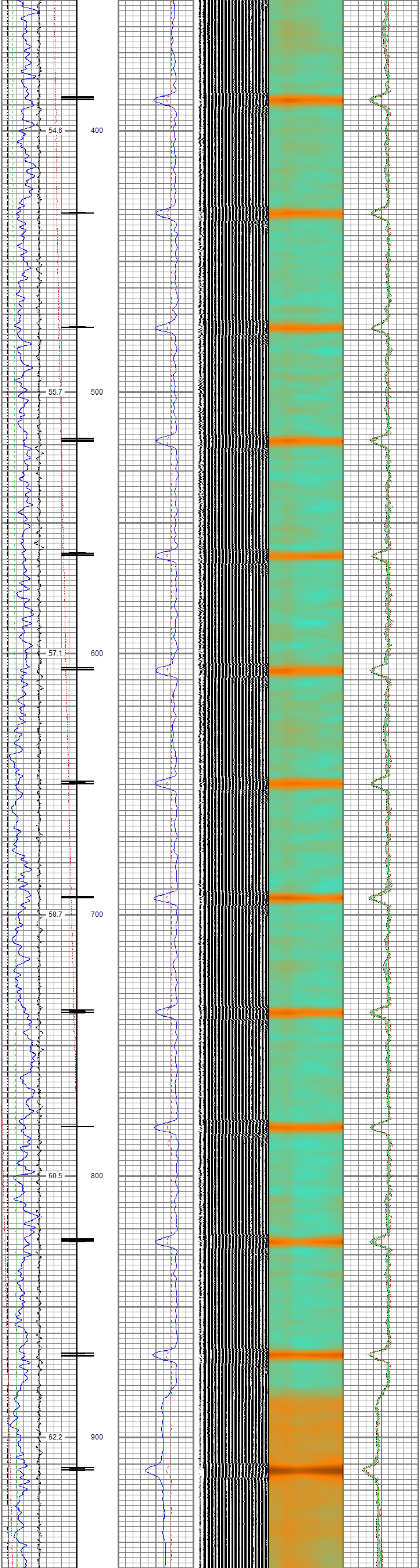
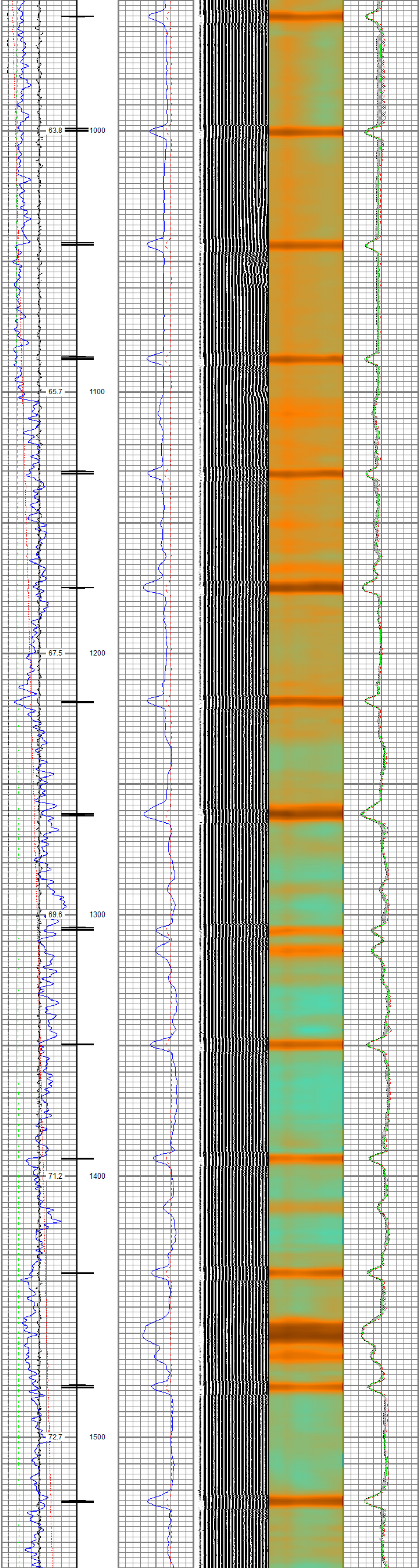
Main Pass

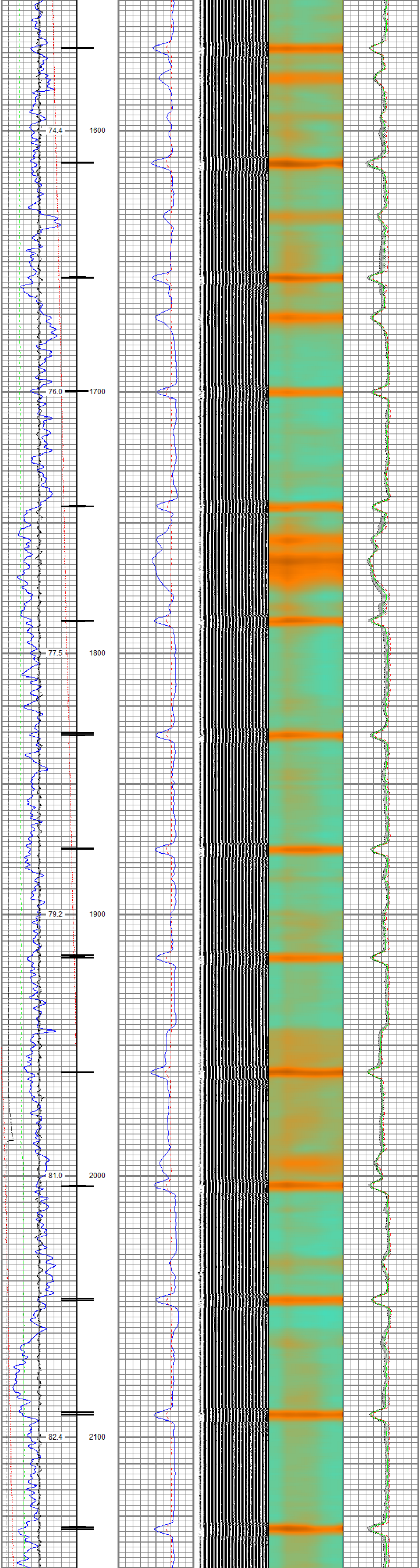
Recorded with 0 PSI Surface Induced Pressure

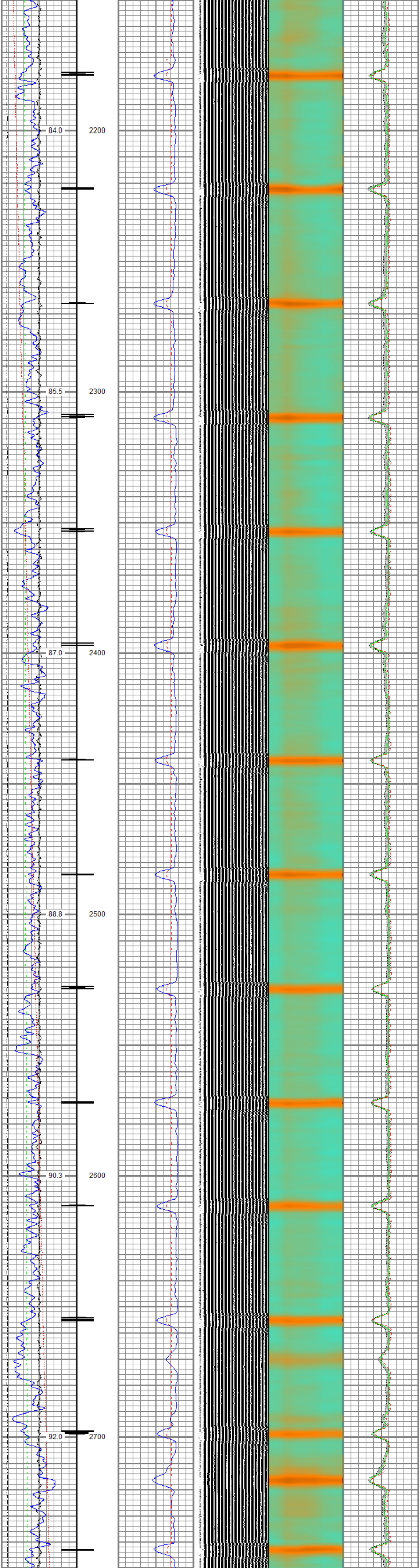
Database File	tep\federal ru 23-17\processed_tep_federal ru 23-17_rbl_04-07-2018.db
Dataset Pathname	main.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Sat Apr 07 13:13:29 2018
Charted by	Depth in Feet scaled 1:240

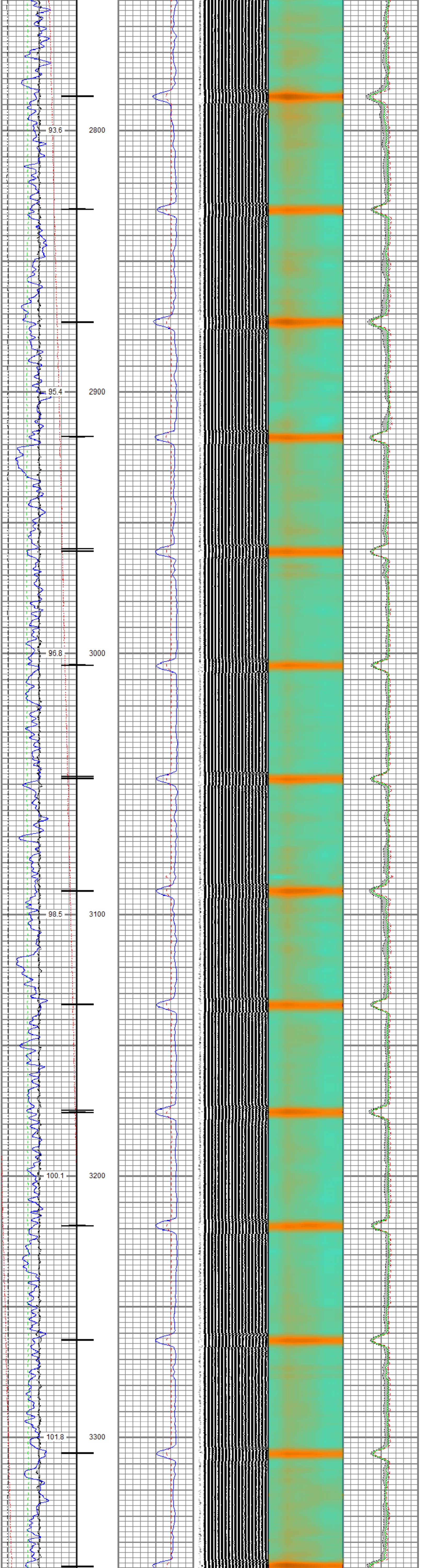


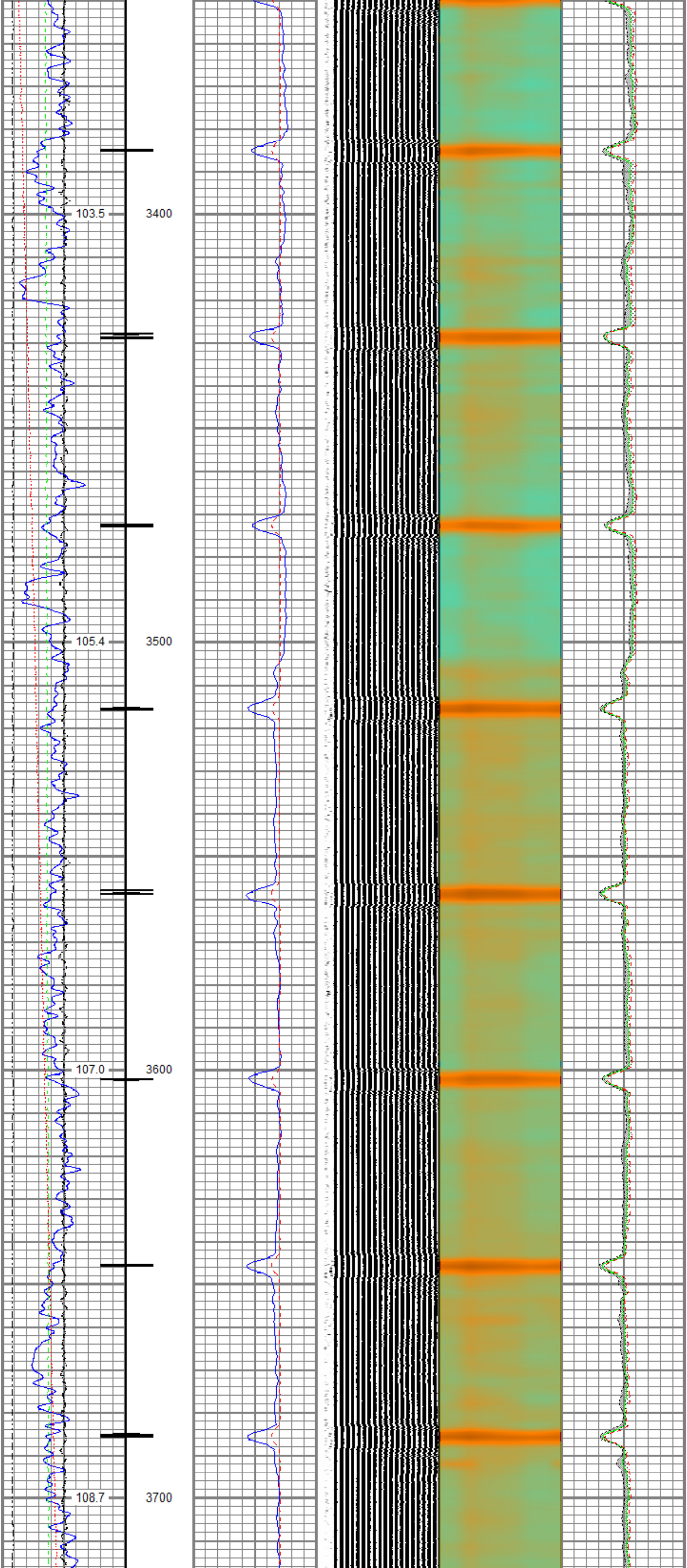


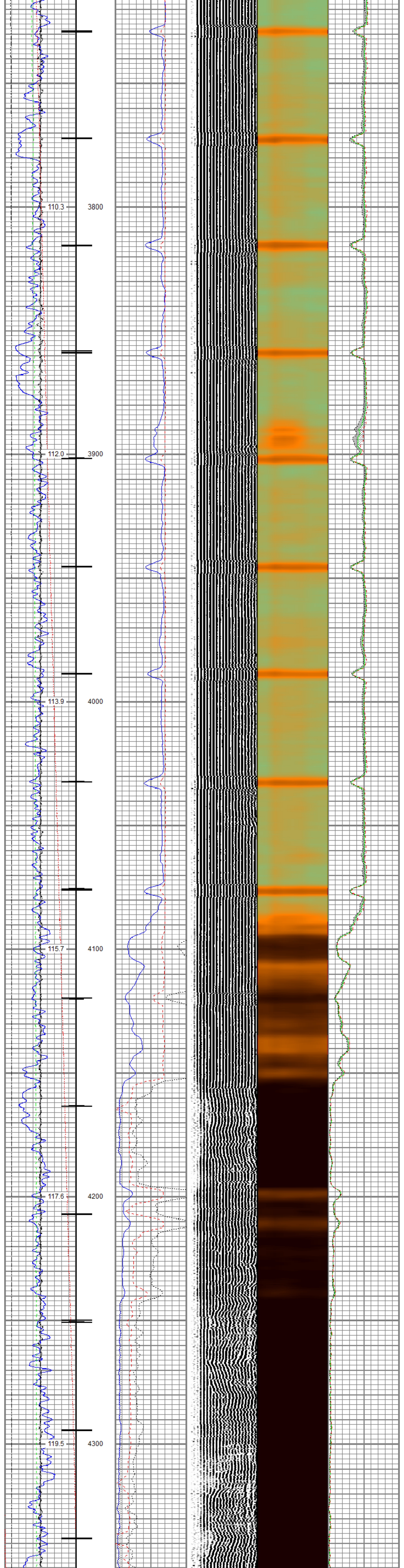








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113.9
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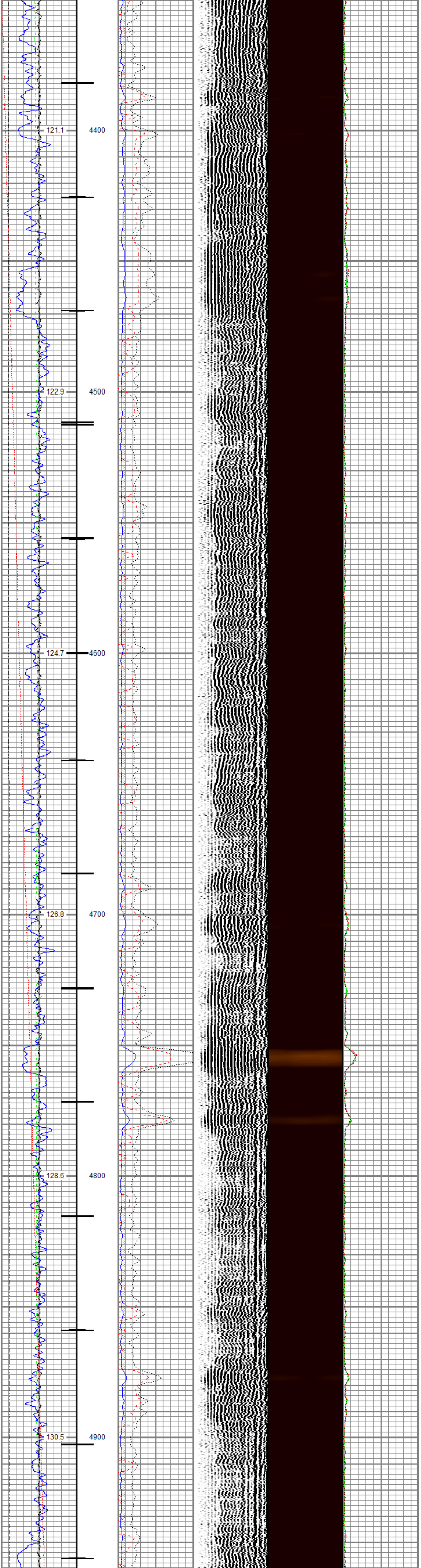
115.7
4100
117.6
4200
119.5
4300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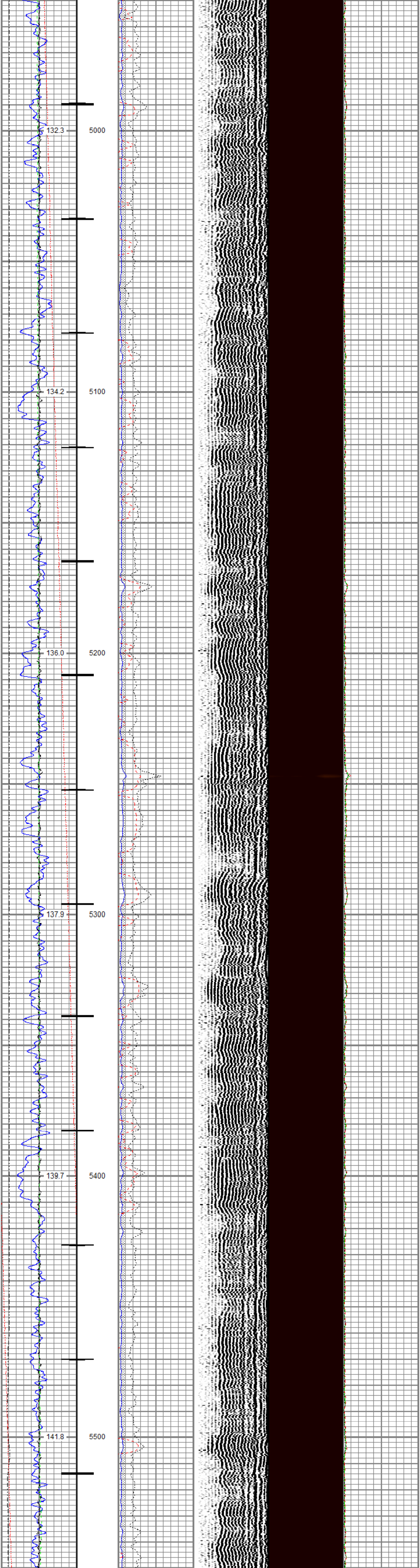
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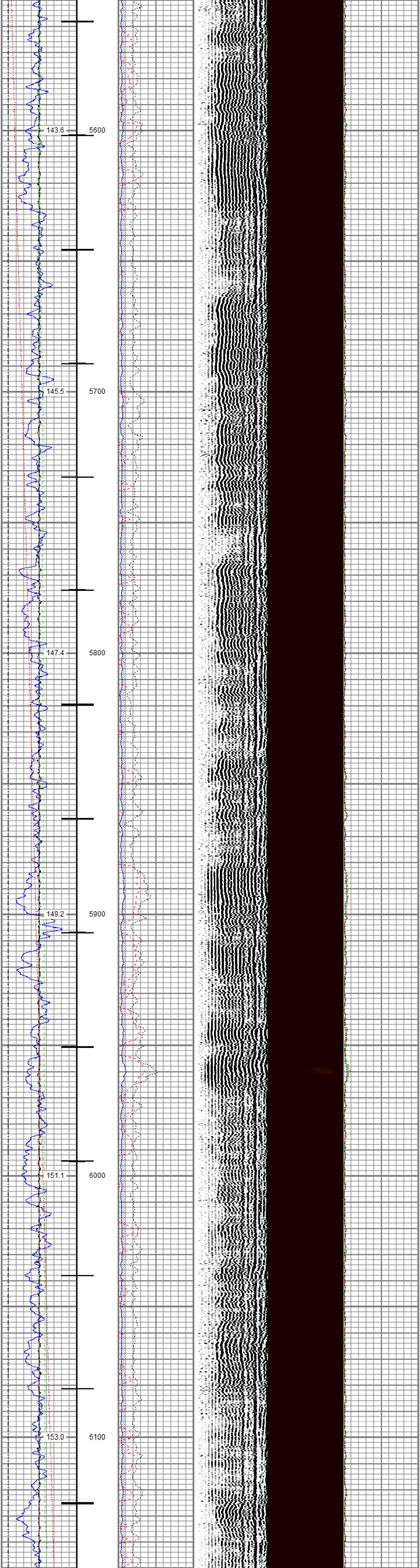
5500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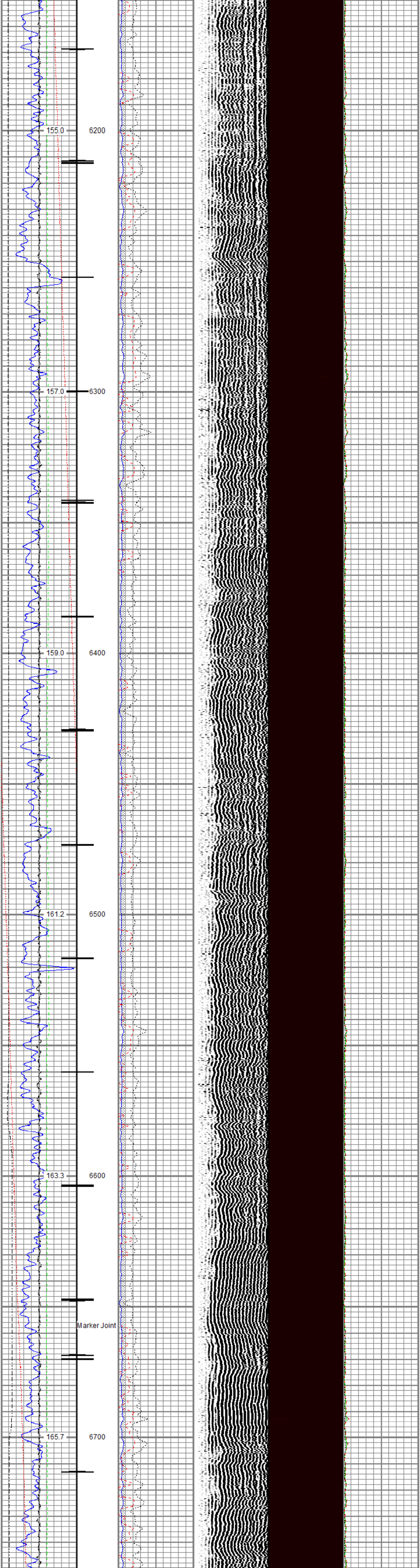
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163.3
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Marker Joint
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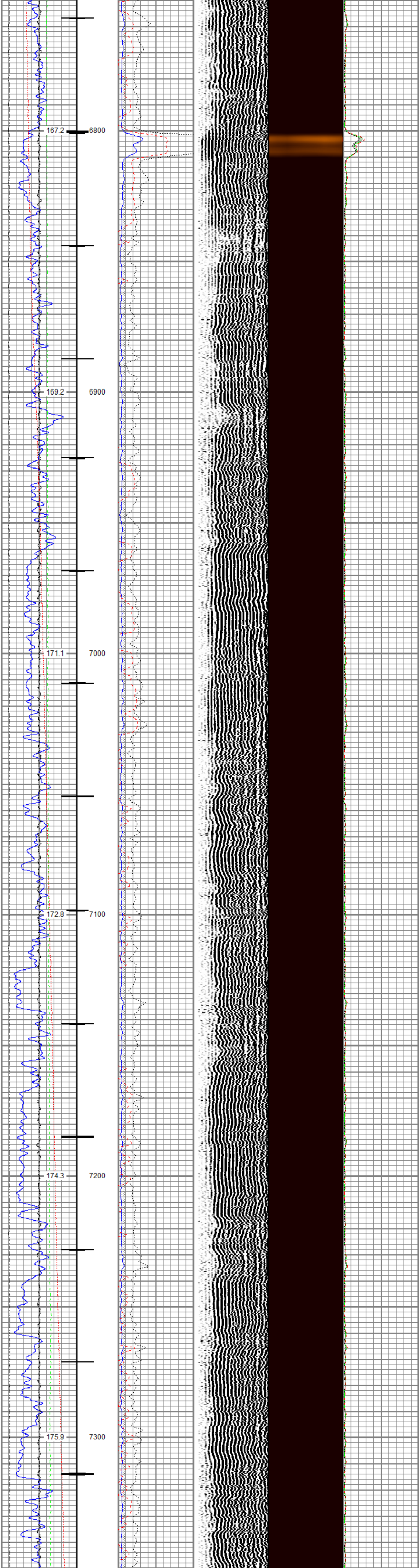
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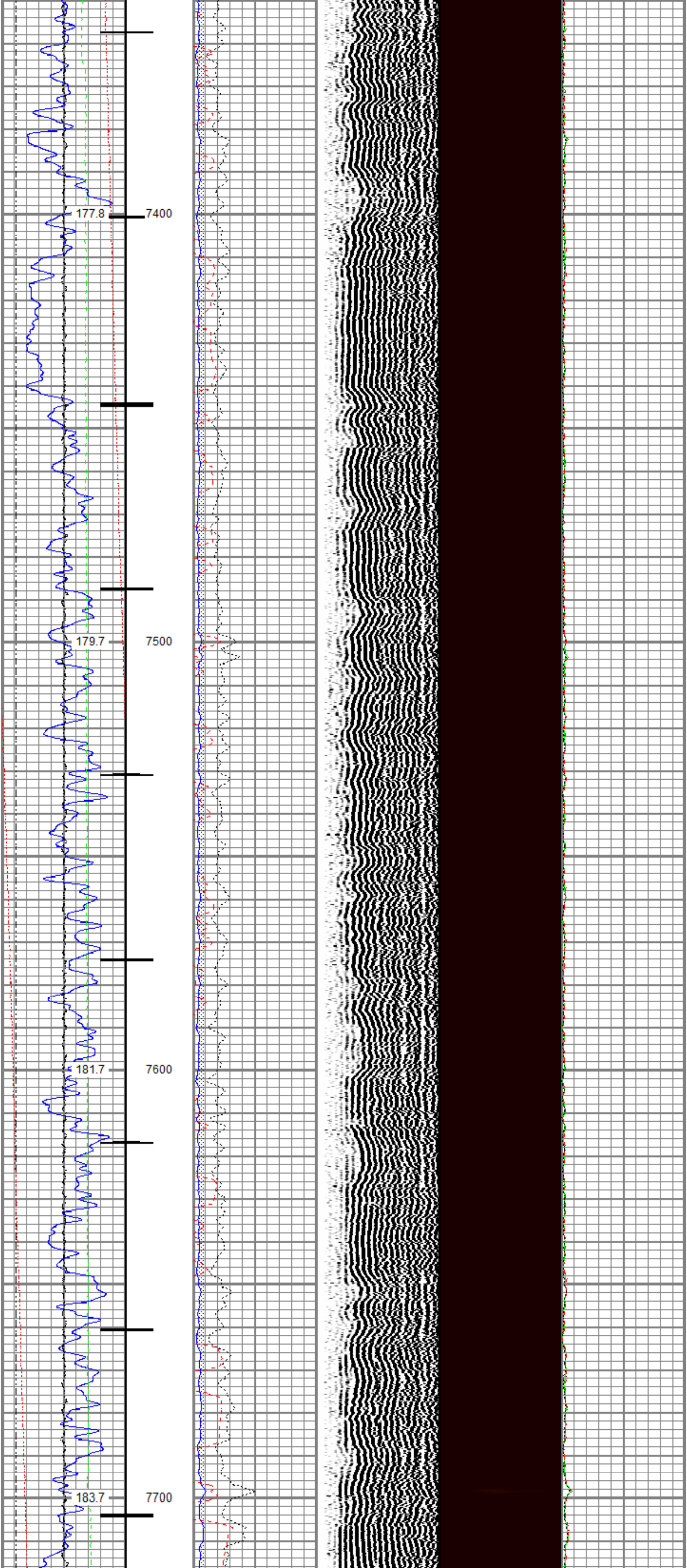
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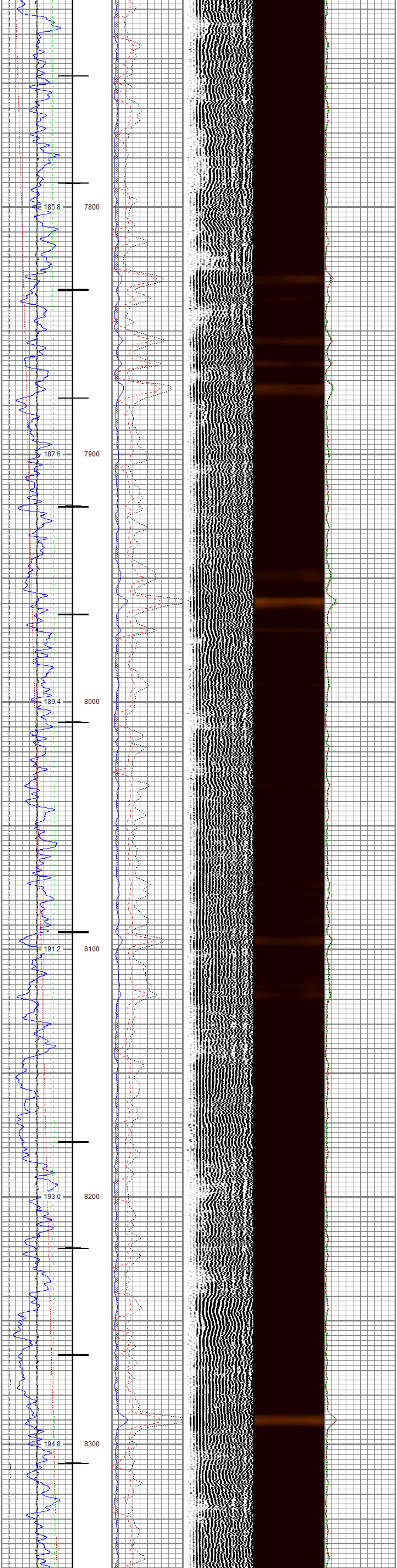

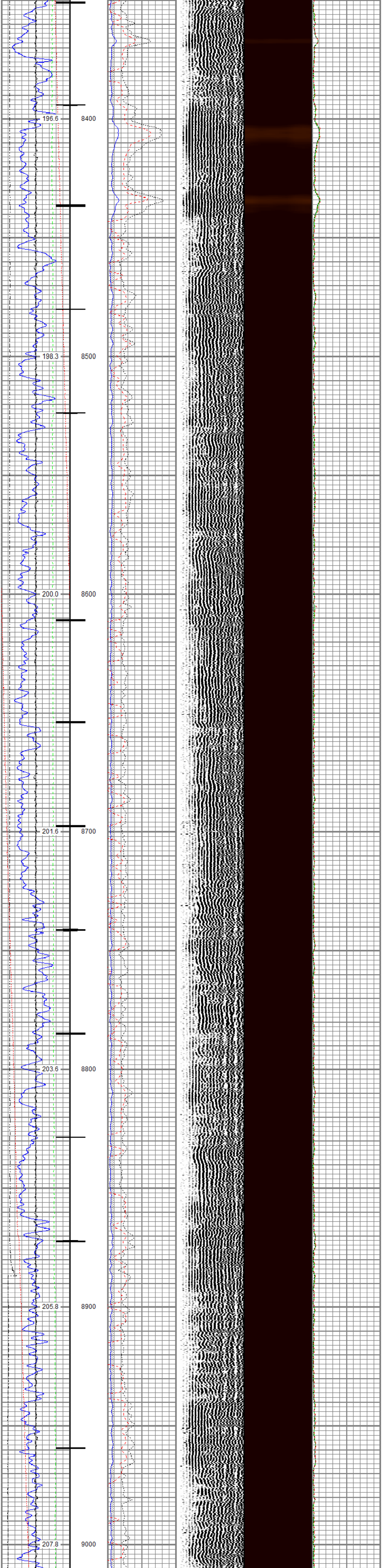

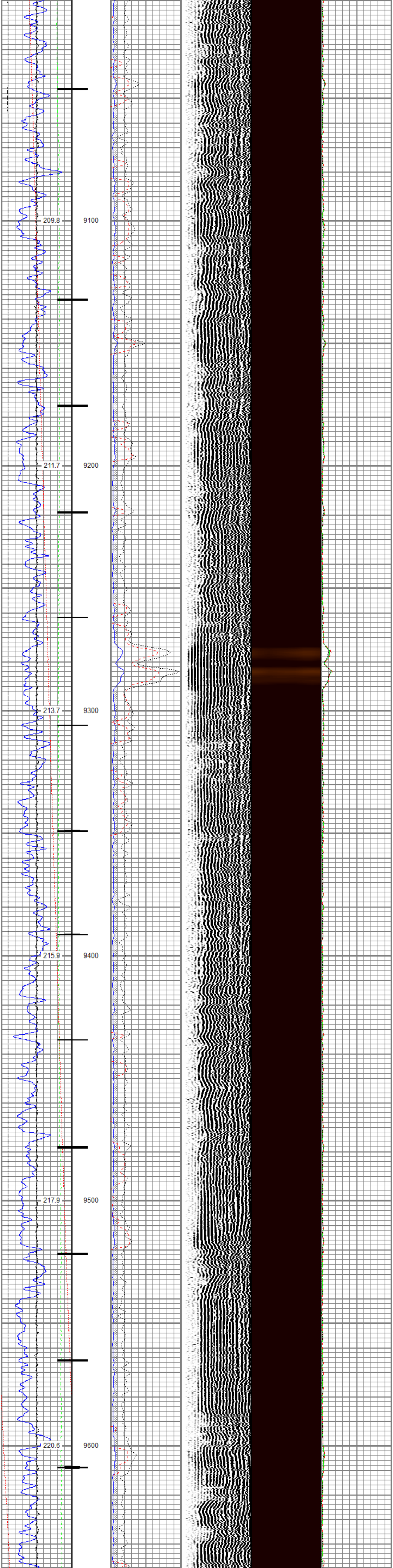

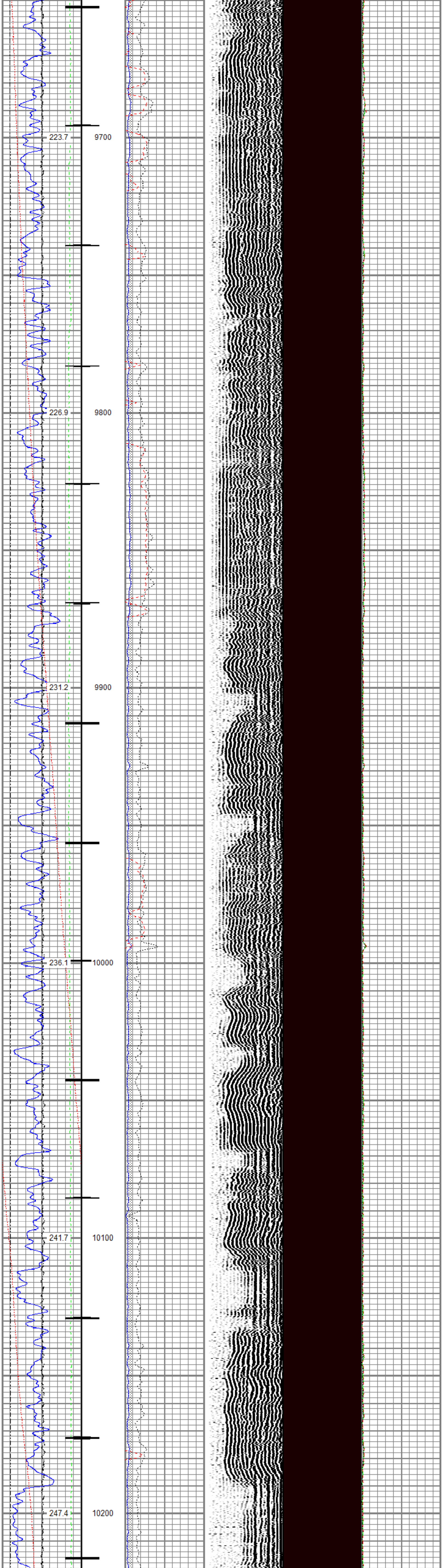

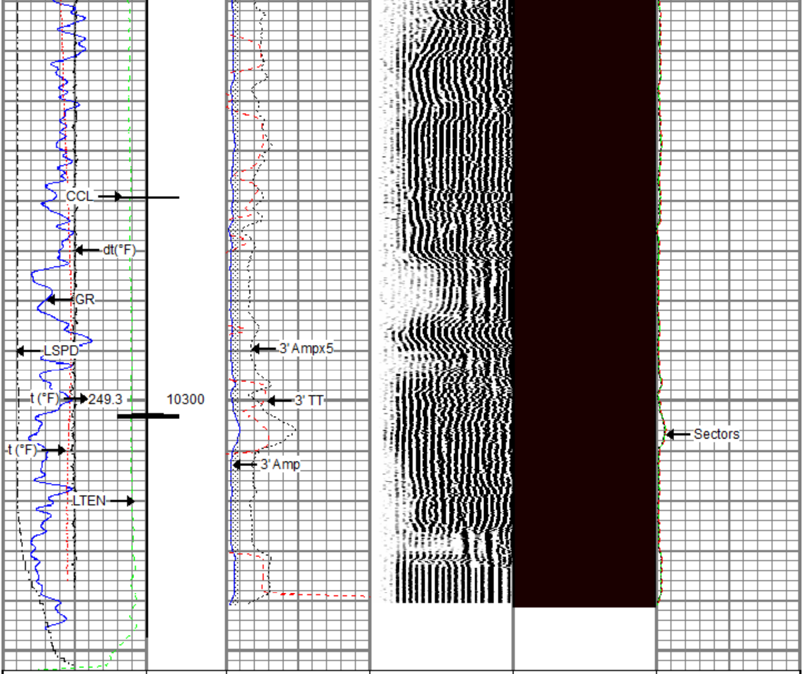

Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 (usec) 1200		0 150
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150	0 (mV) 20			0 150
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Differential Temperature				
-2 (degF) 2				
Temperature				
0 (degF) 20				
10 CCL 0				

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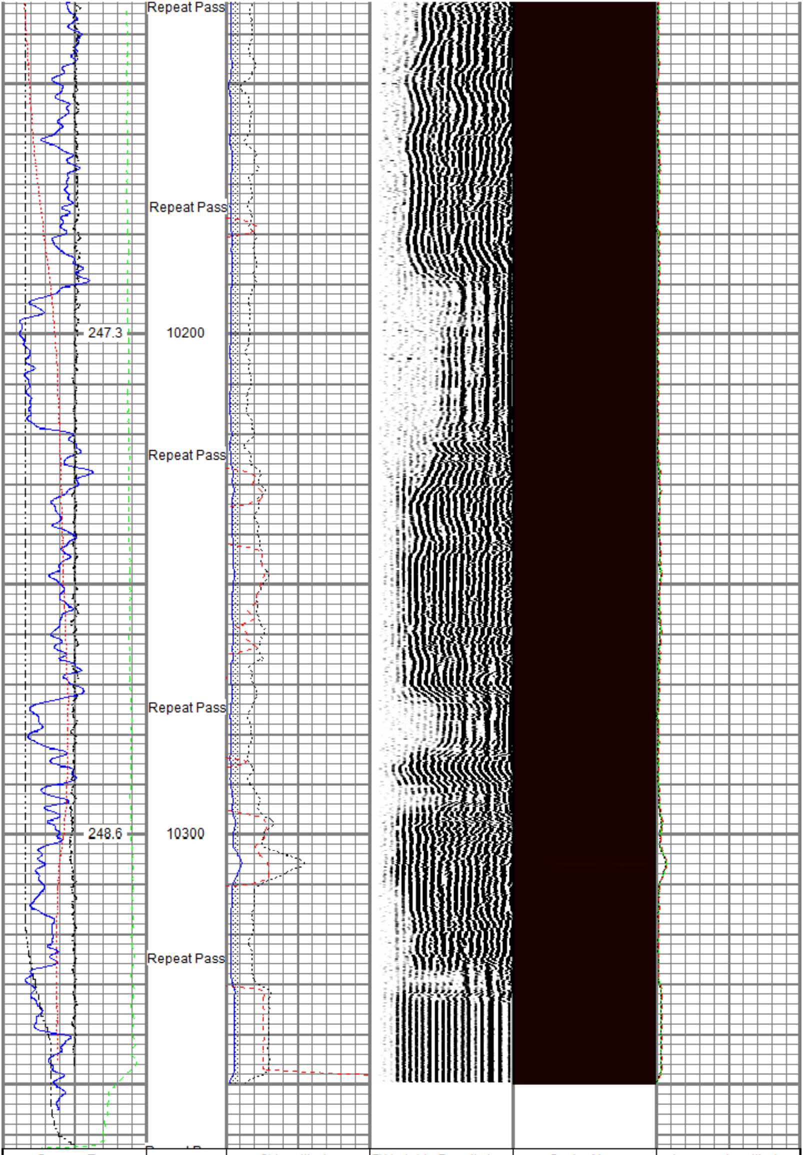
Repeat Pass

Recorded with 0 PSI Surface Induced Pressure

Database File	tep\federal ru 23-17\processed_tep_federal ru 23-17_rbl_04-07-2018.db
Dataset Pathname	repeat.2
Presentation Format	ros_rbt004_tep
Dataset Creation	Sat Apr 07 19:06:06 2018
Charted by	Depth in Feet scaled 1:240

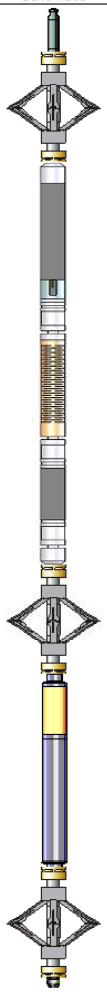
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 (usec) 1200		0 150
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150	0 (mV) 20			0 150
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Differential Temperature				
-2 (degF) 2				
Temperature				
0 (degF) 20				



Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 (usec) 1200		0 150
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150	0 (mV) 20			0 150
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Differential Temperature				
-2 (degF) 2				
Temperature				
0 (degF) 20				

Sensor	Offset (ft)
TEMP	16.33
WVFS8	14.10
WVFS7	14.10
WVFS6	14.10
WVFS5	14.10
WVFS4	14.10
WVFS3	14.10
WVFS2	14.10
WVFS1	14.10
WVFCAL	14.10
WVF3FT	14.10
WVF5FT	13.10
CCL$2	6.42
CCL$1	6.42
GR	5.18

Schematic



Description	Length (ft)	O.D. (in)	Weight (lb)
Titan CHD-14375 GO Titan 1-7/16" Assembled Electric Cable Head w/ 1" Fishing Neck	1.03	1.44	3.60
DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
Probe Radii-2750 RBT (FW1308-089) Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub	9.39	2.75	105.00
DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
Probe GR-CCL-2750 GOB (FW1307-038) Probe 2-3/4" rev.2 Digital Scintillation Gamma Ray/CCL Combined	4.51	2.75	55.00
DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
GO BN-14375 GO 1 7/16" Bull Nose with Go Box Top	0.25	1.44	1.00

Dataset: PROCESSED_TEP_Federal RU 23-17_RBL_04-07-2018.db: field/well/run1/main.1
Total length: 22.82 ft
Total weight: 260.60 lb
O.D.: 2.75 in

Calibration Report

Database File C:\ProgramData\Warrior\Data\TEP\Federal RU 23-17\PROCESSED_TEP_Federal RU 23-17_RBL_04-07-20
Dataset Pathname main.1
Dataset Creation Sat Apr 07 13:13:29 2018

Gamma Ray Calibration Report

Serial Number: FW1307-038
Tool Model: 2750 GOB
Performed: Sun Nov 12 12:44:12 2017

Calibrator Value: 637.0 GAPI

Background Reading: 113.2 cps
Calibrator Reading: 1022.4 cps

Sensitivity: 0.7007 GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number: FW1308-089
Tool Model: 2750 RBT

Calibration Casing Diameter: 4.500 in
Calibration Depth: 32.602 ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.021	0.915	0.800	81.196	85.827	2.624
CAL	-0.005	0.751				
5'	-0.030	1.019	0.800	81.196	76.589	3.114
SUM						
S1	-0.006	1.081	0.000	100.000	92.020	0.572
S2	-0.012	1.027	0.000	100.000	96.256	1.122
S3	-0.013	0.981	0.000	100.000	100.568	1.333
S4	-0.014	0.894	0.000	100.000	110.159	1.569
S5	-0.012	0.886	0.000	100.000	111.363	1.358
S6	-0.013	0.902	0.000	100.000	109.295	1.412
S7	-0.019	0.930	0.000	100.000	105.387	1.966
S8	-0.019	1.026	0.000	100.000	95.671	1.820

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.005	0.751	1.000	0.000

Air Zero Calibration, performed Fri Apr 06 22:47:09 2018:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	-0.001	0.000	-0.000
5'	0.010	0.000	-0.001
SUM			
S1	0.000	0.000	0.001
S2	0.001	0.000	-0.001
S3	0.000	0.000	0.000
S4	-0.000	0.000	0.000
S5	-0.001	0.000	0.001
S6	0.000	0.000	0.000
S7	0.000	0.000	-0.000
S8	-0.001	0.000	0.001

Temperature Calibration Report

Serial Number: FW1308-089
Tool Model: 2750 RBT
Performed: Sun Nov 12 13:49:09 2017

	Reference	Reading
Low Reference:	100.00 degF	106.47 degF
High Reference:	350.00 degF	395.10 degF

Gain: 0.87
Offset: 7.78
Delta Spacing 1

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County	Garfield
State	Colorado