Company TEP Rocky Mountain LLC
Well Federal RU 323-17
Field Rulison
County Garfield
State Colorado

RELIANCE OILFIELD SERVICES

Radial Cement Bond Gamma Ray Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Federal RU 323-17
Field	Rulison
County	Garfield
State	Colorado

Location: API # : 05-045-23737

SEC 17 TWP 7S RGE 93W

Other Services: ---

Permanent Datum	Ground Level	Elevation 8365.6'	Elevation K.B. 8389.6' D.F. 8388.6' G.L. 8365.6'
Log Measured From	Kelly Bushing	24 FT	
Drilling Measured From	Kelly Bushing		

Date	11-APR-2018		
Run Number	One		
Depth Driller	10403 FT		
Depth Logger	10340 FT		
Bottom Logged Interval	10324 FT		
Top Log Interval	Surface		
Open Hole Size	8.750"		
Type Fluid	Water		
Density / Viscosity	8.34 lb/gal		
Max. Recorded Temp.	255°F		
Estimated Cement Top	See Log		
Time Well Ready	ROA		
Time Logger on Bottom	21:00		
Equipment Number	HD-0359		
Location	Grand Junction, CO		
Recorded By	Z. Fisher		
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	32.3	H-40	Surface	1107 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	10363 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 6507-6529 FT
Log ran from 10324 FT to Surface
Recorded with 0 PSI Surface Induced Pressure

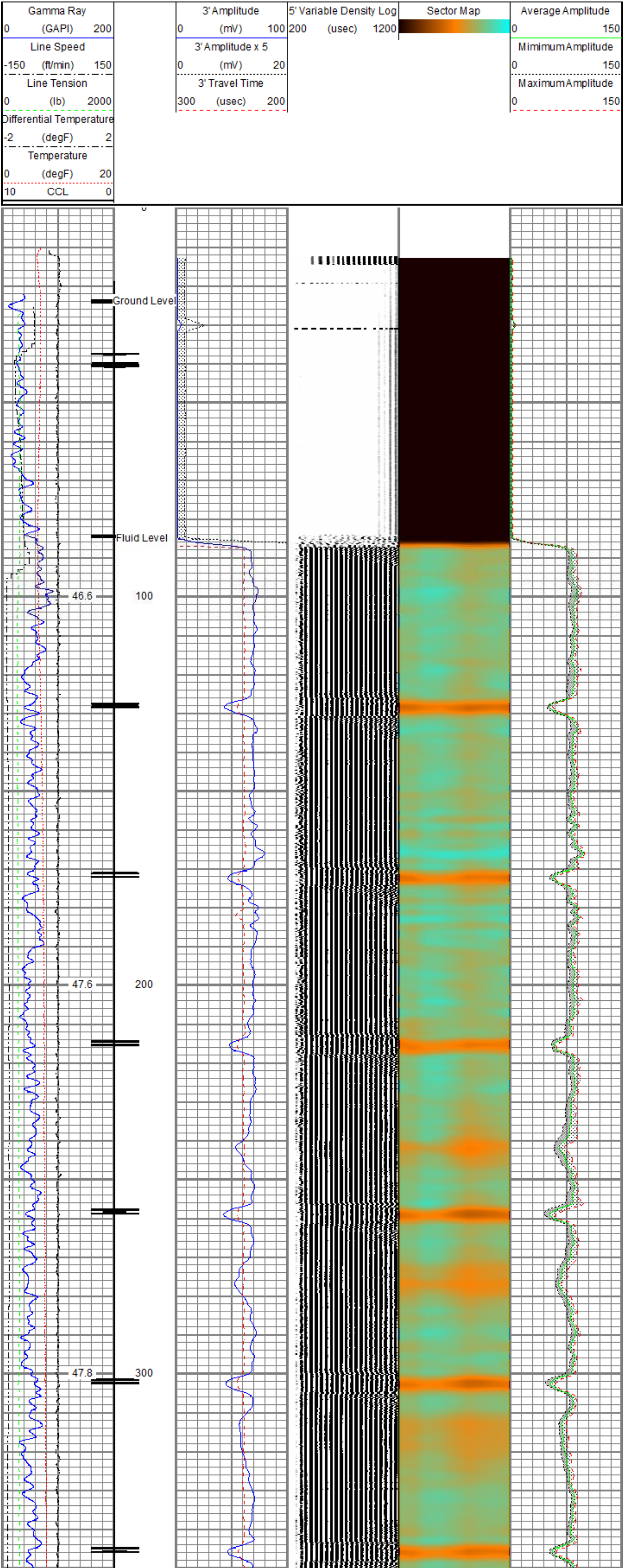
Thank you for choosing Reliance Oilfield Services, LLC!

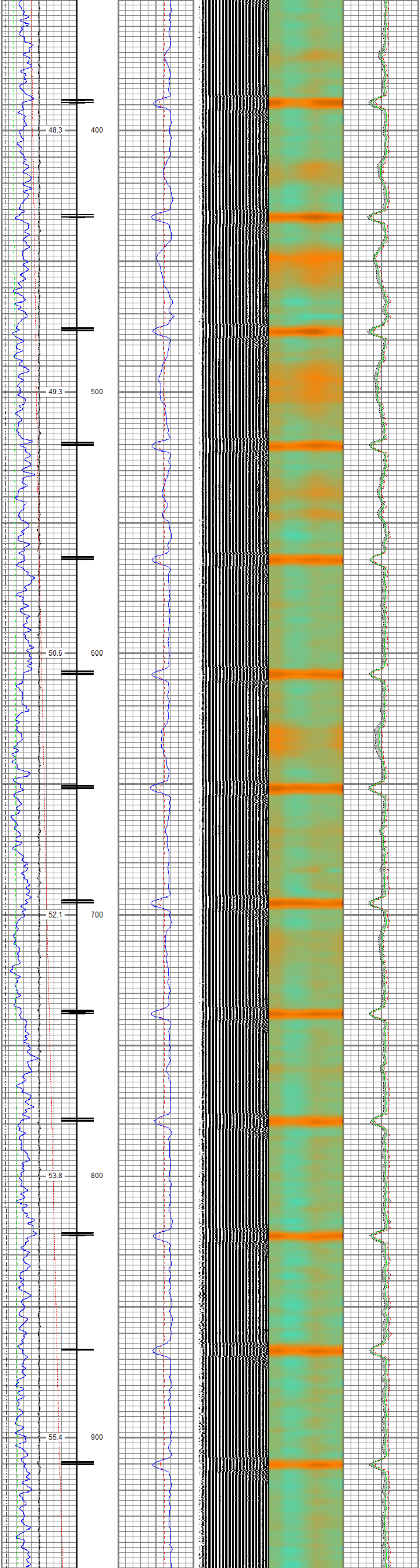
RELIANCE OILFIELD SERVICES

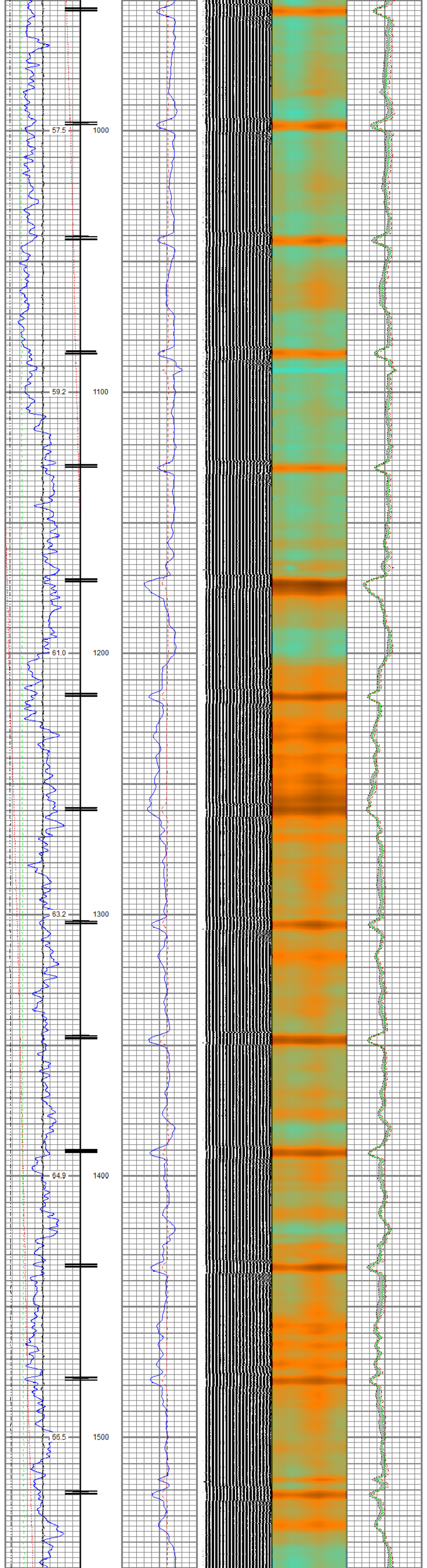
Main Pass

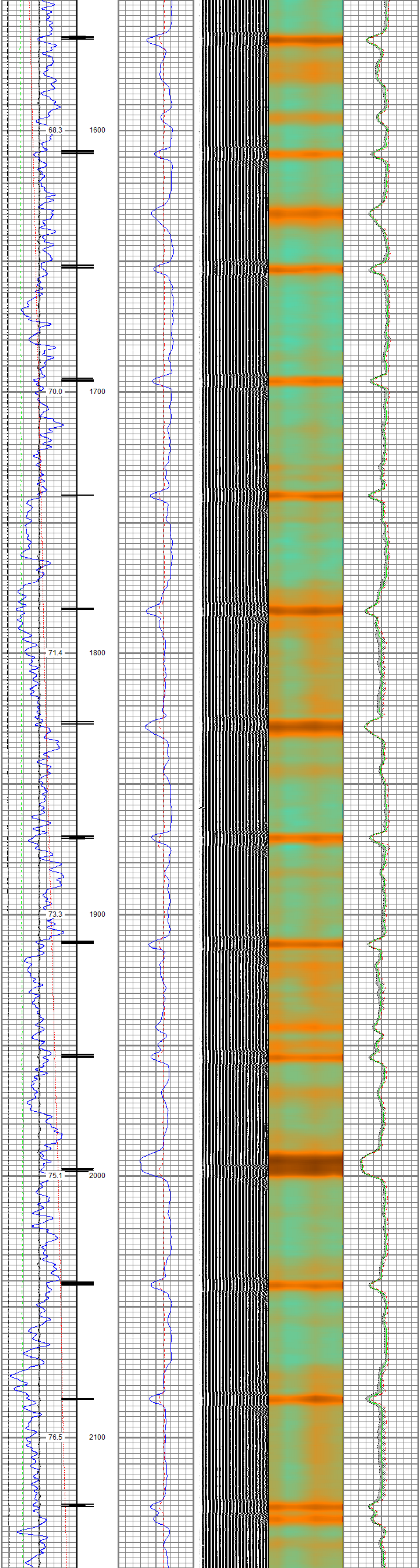
Recorded with 0 PSI Surface Induced Pressure

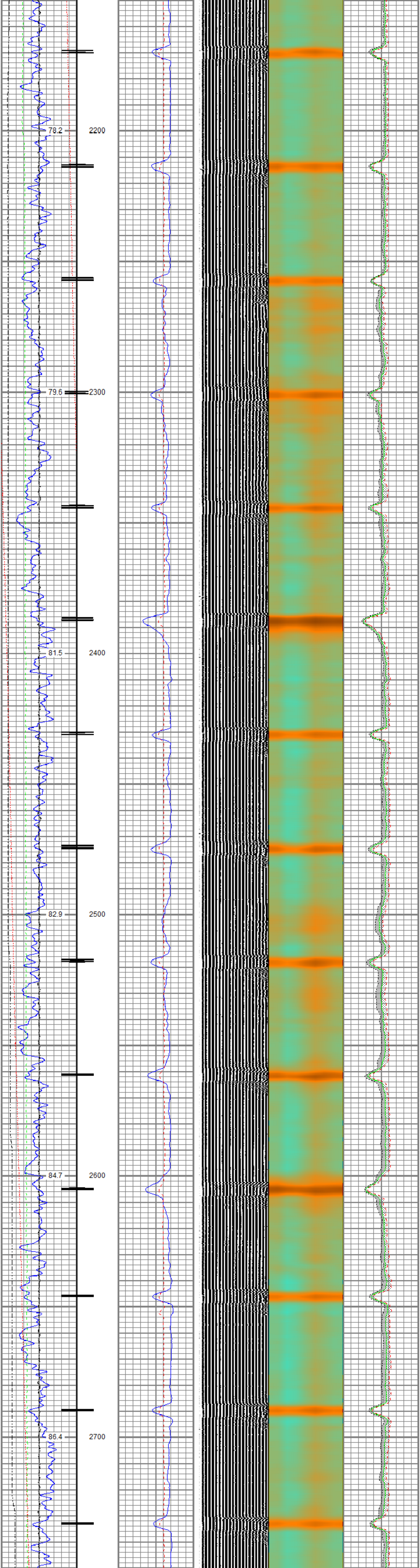
Database File	tep\federal ru 323-17\tep_federal ru 323-17_rbl_04-11-18.db
Dataset Pathname	main.2
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Apr 13 14:57:39 2018
Charted by	Depth in Feet scaled 1:240

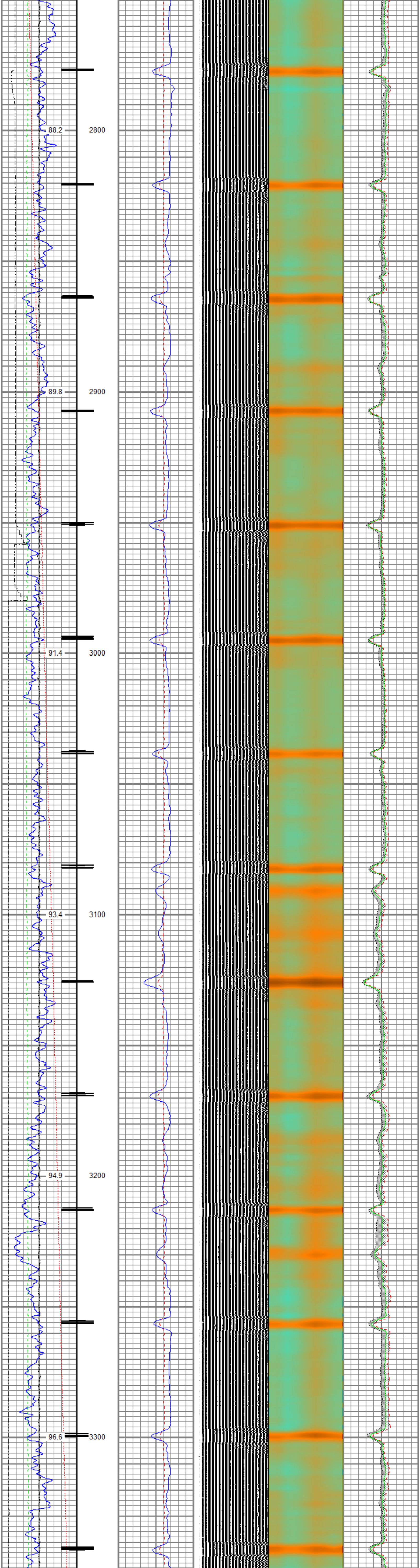


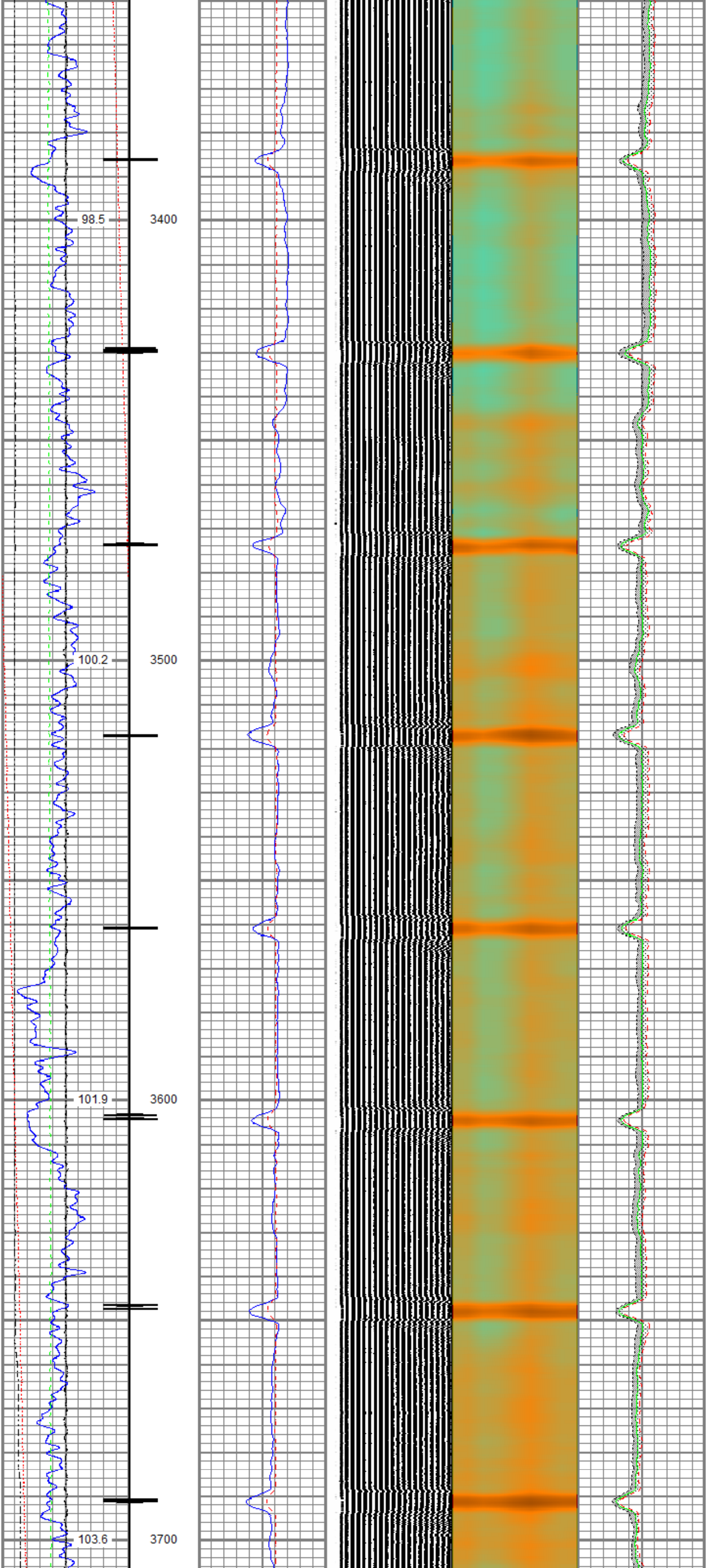


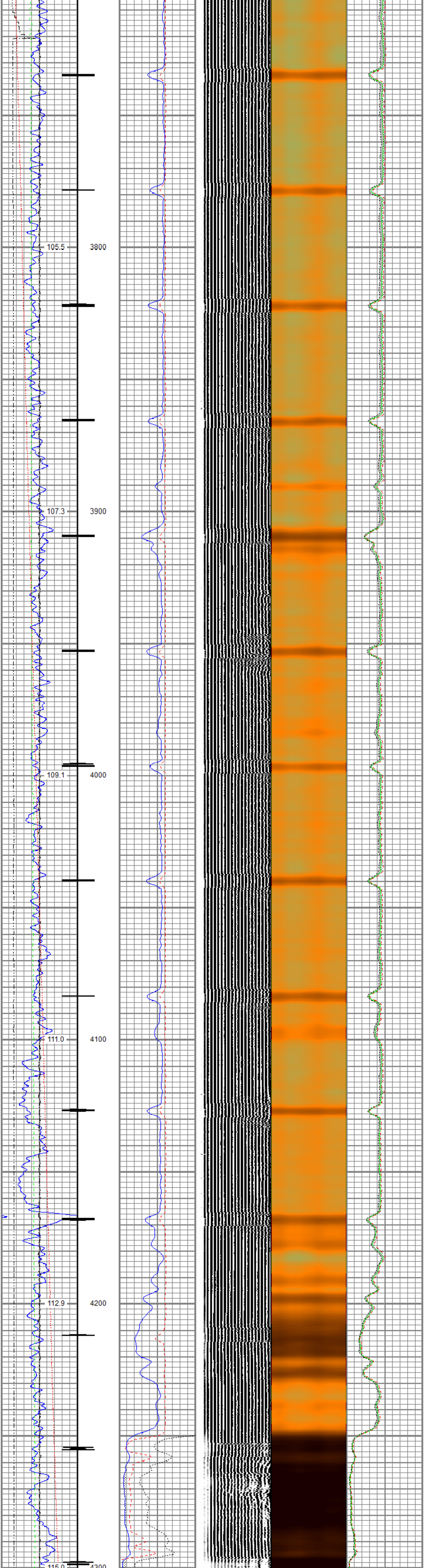








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109.1
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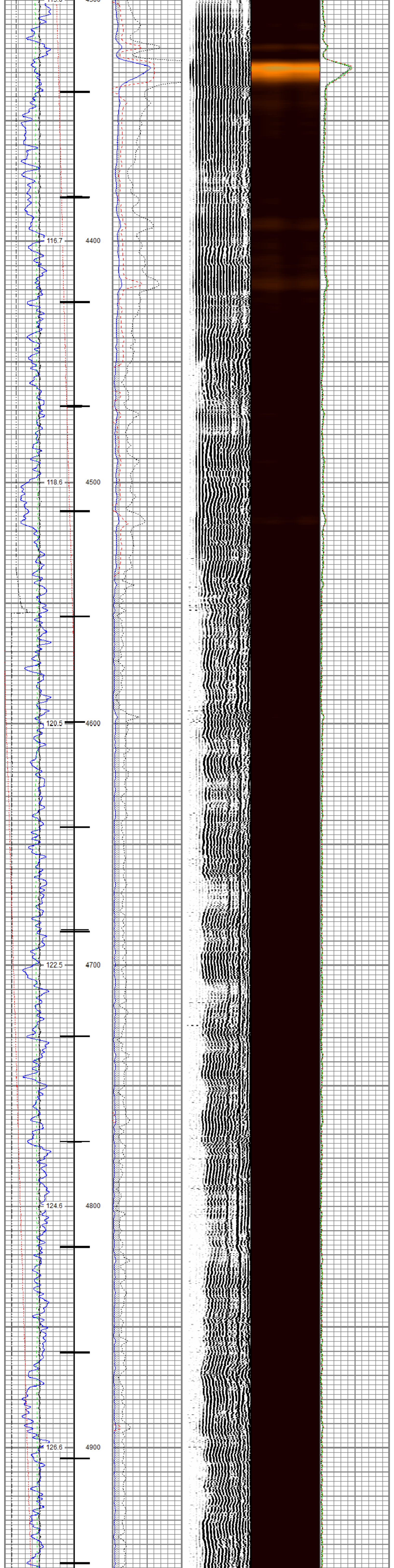
111.0
4100
112.9
4200
115.0
4300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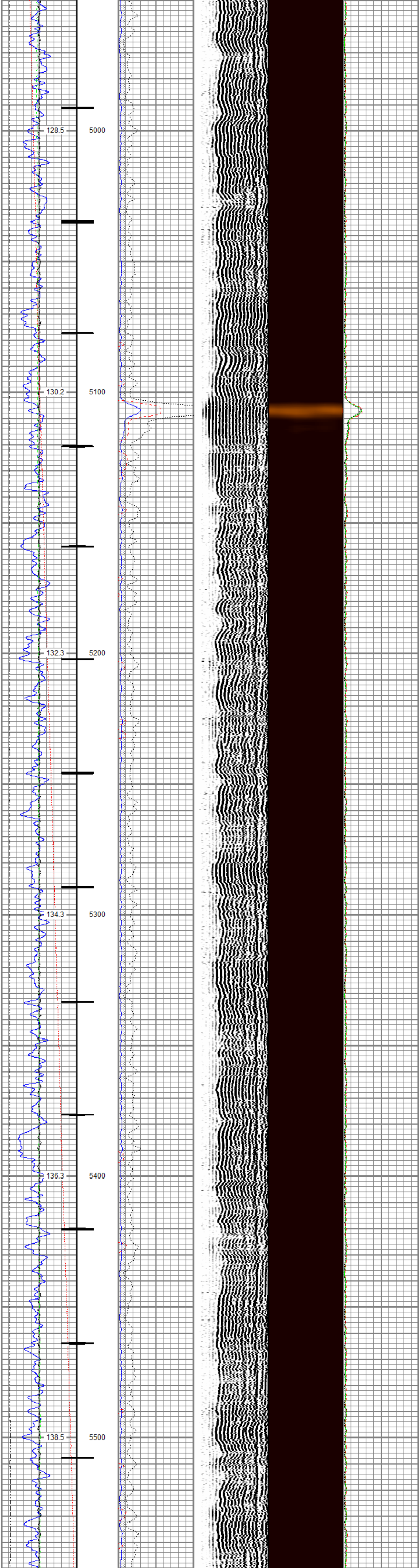
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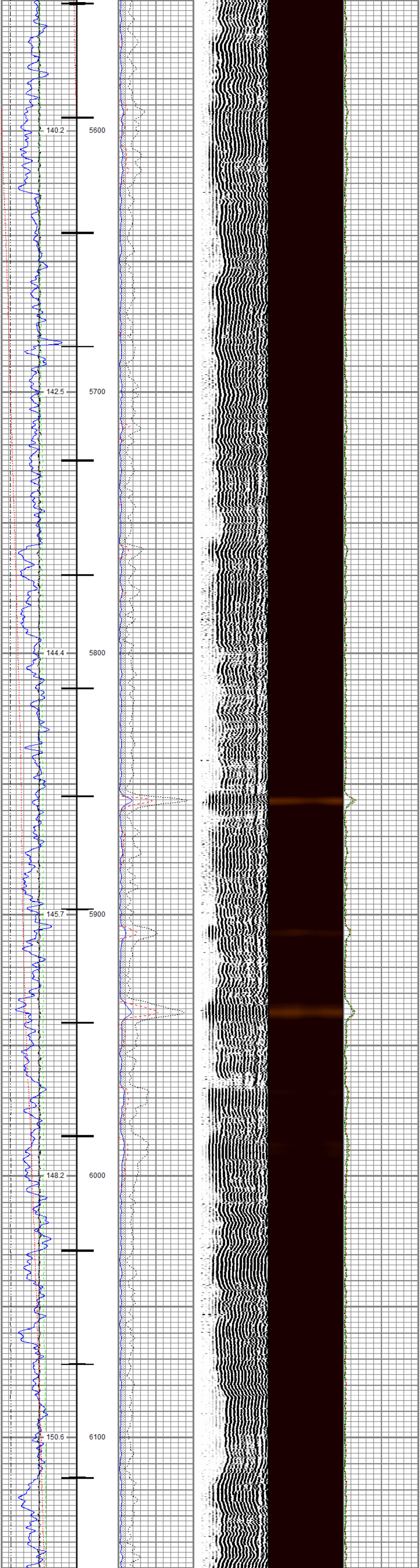
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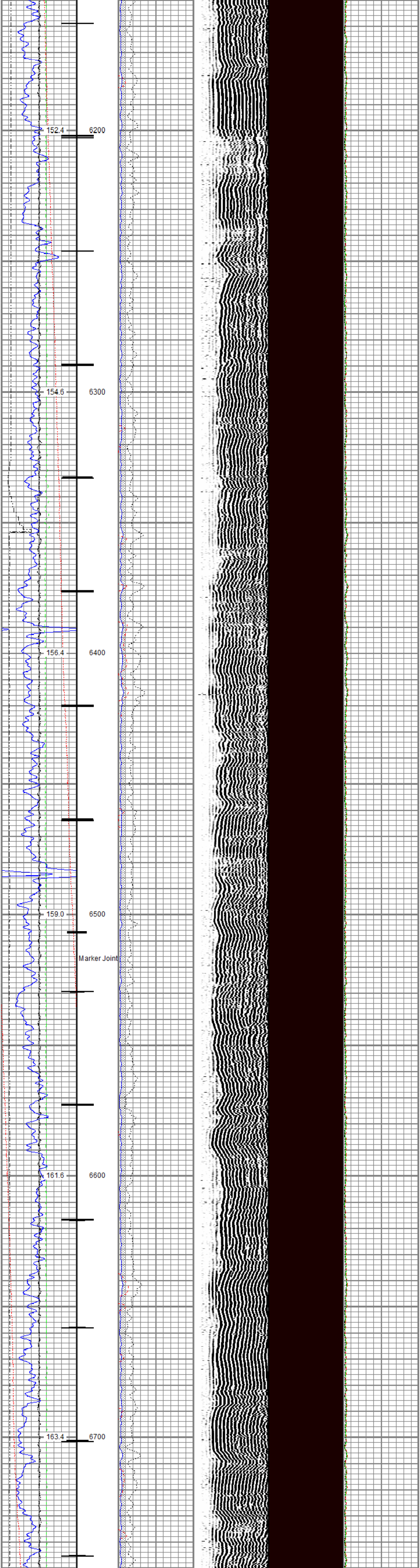
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6600
163.4
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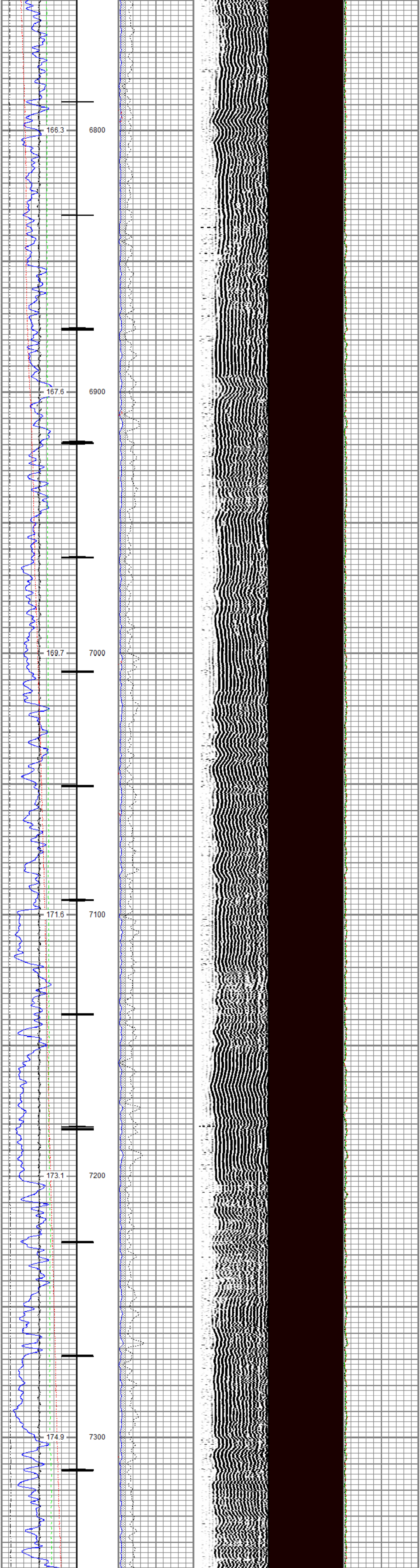
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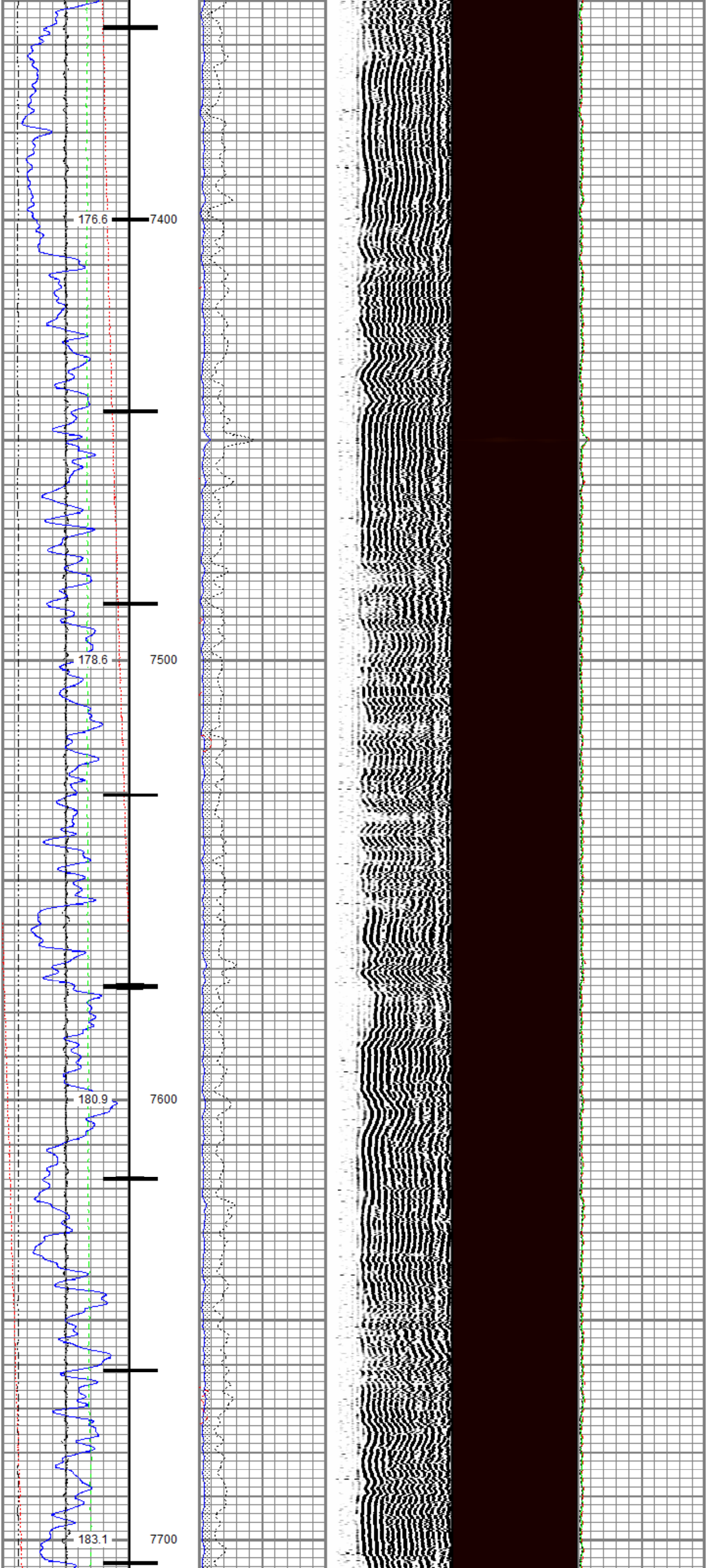
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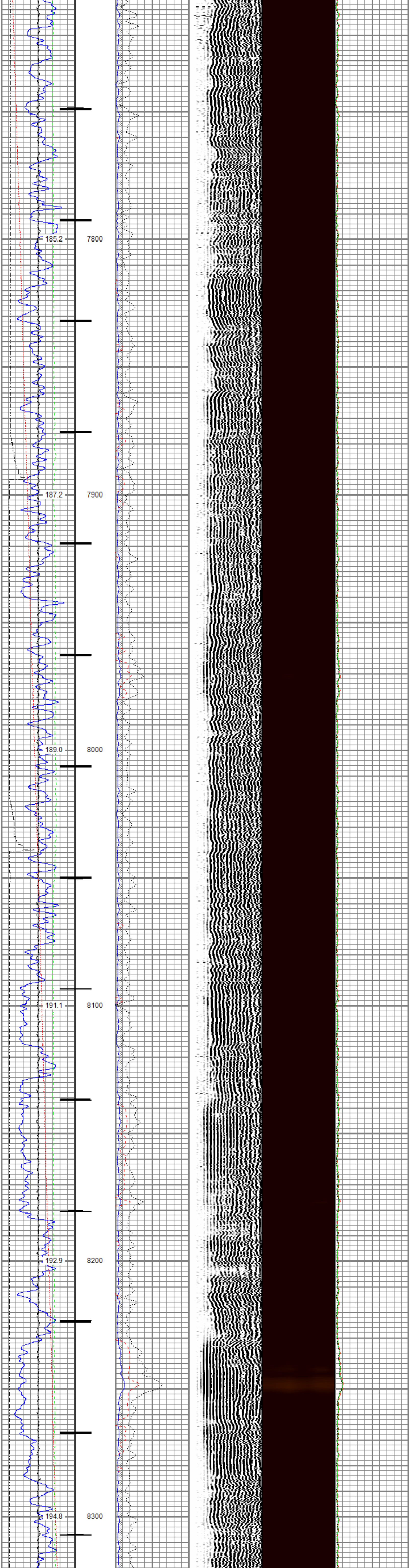

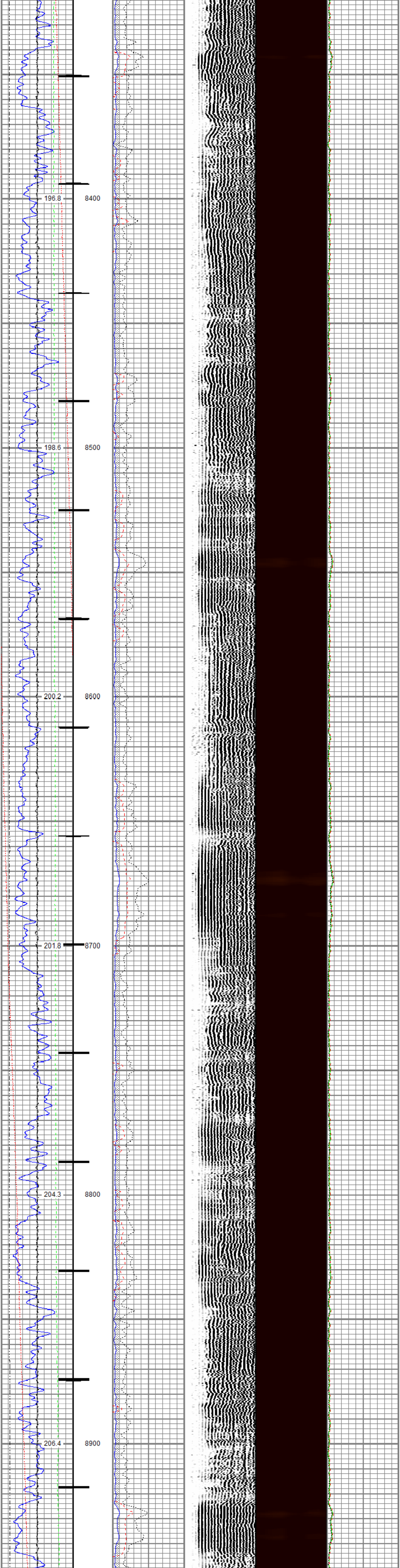

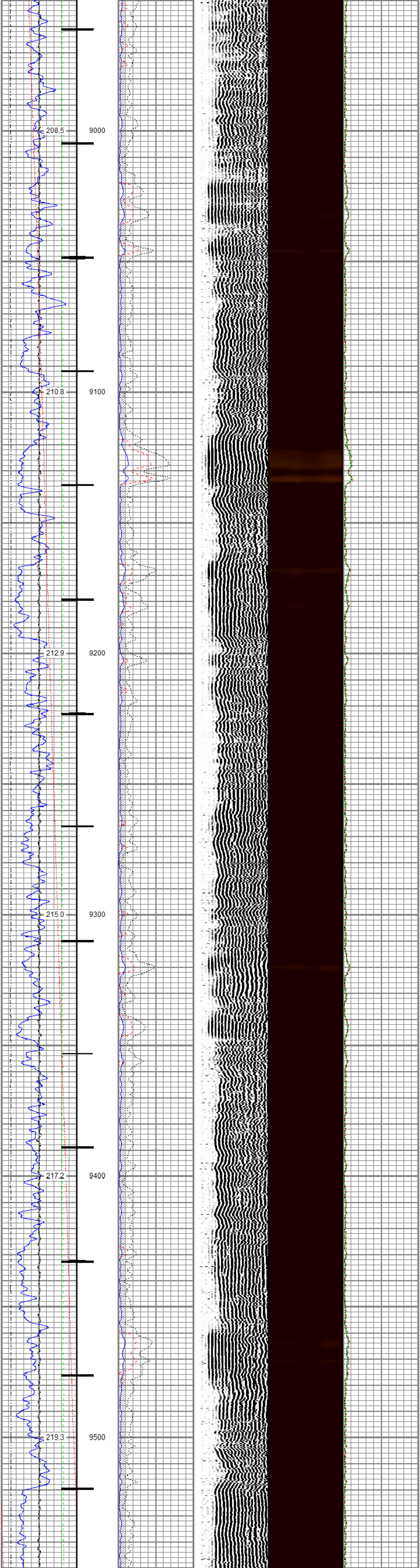

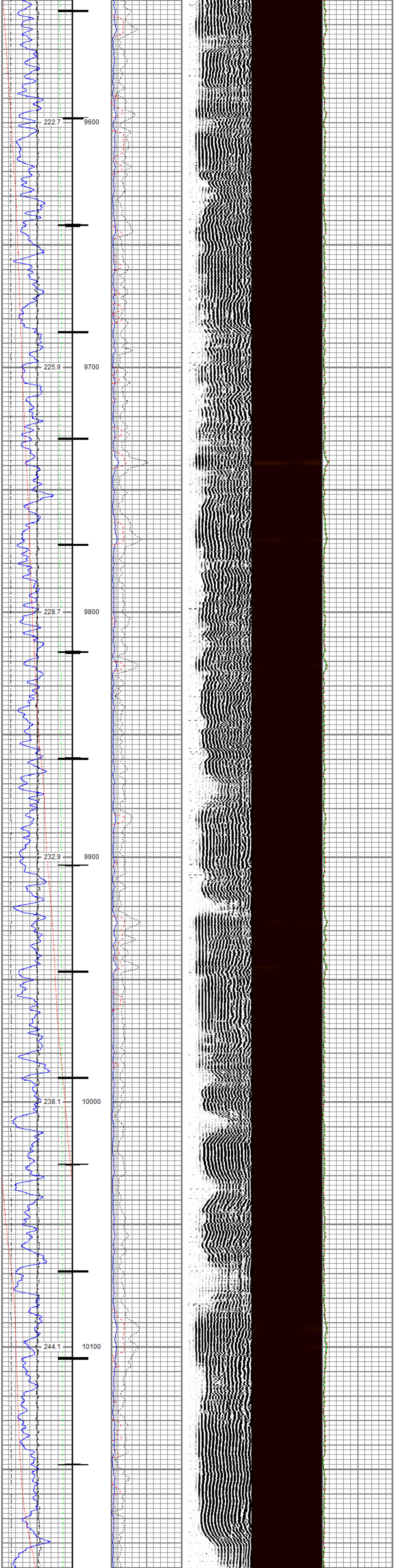

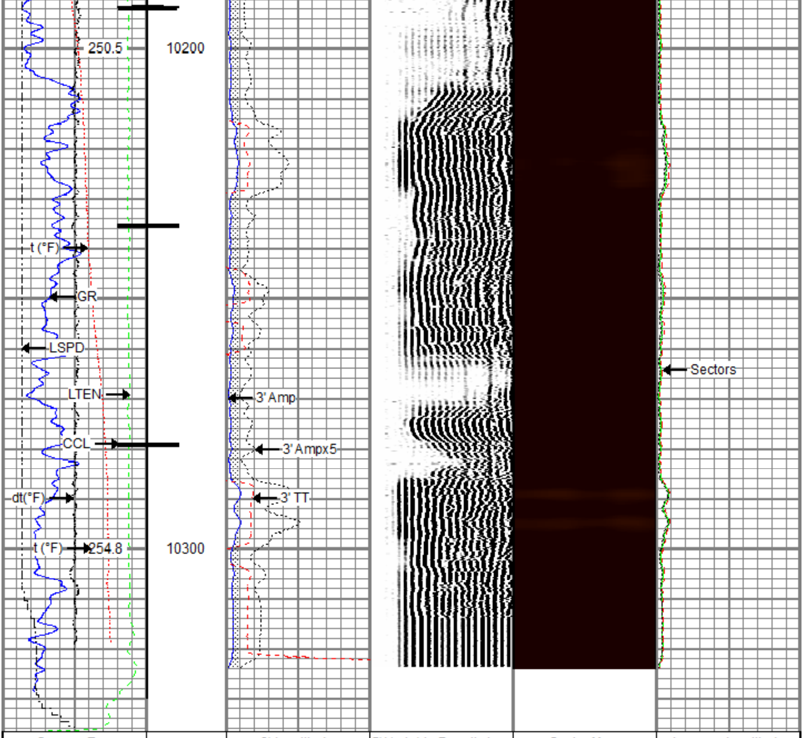

Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 (usec) 1200		0 150
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150	0 (mV) 20			0 150
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Differential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

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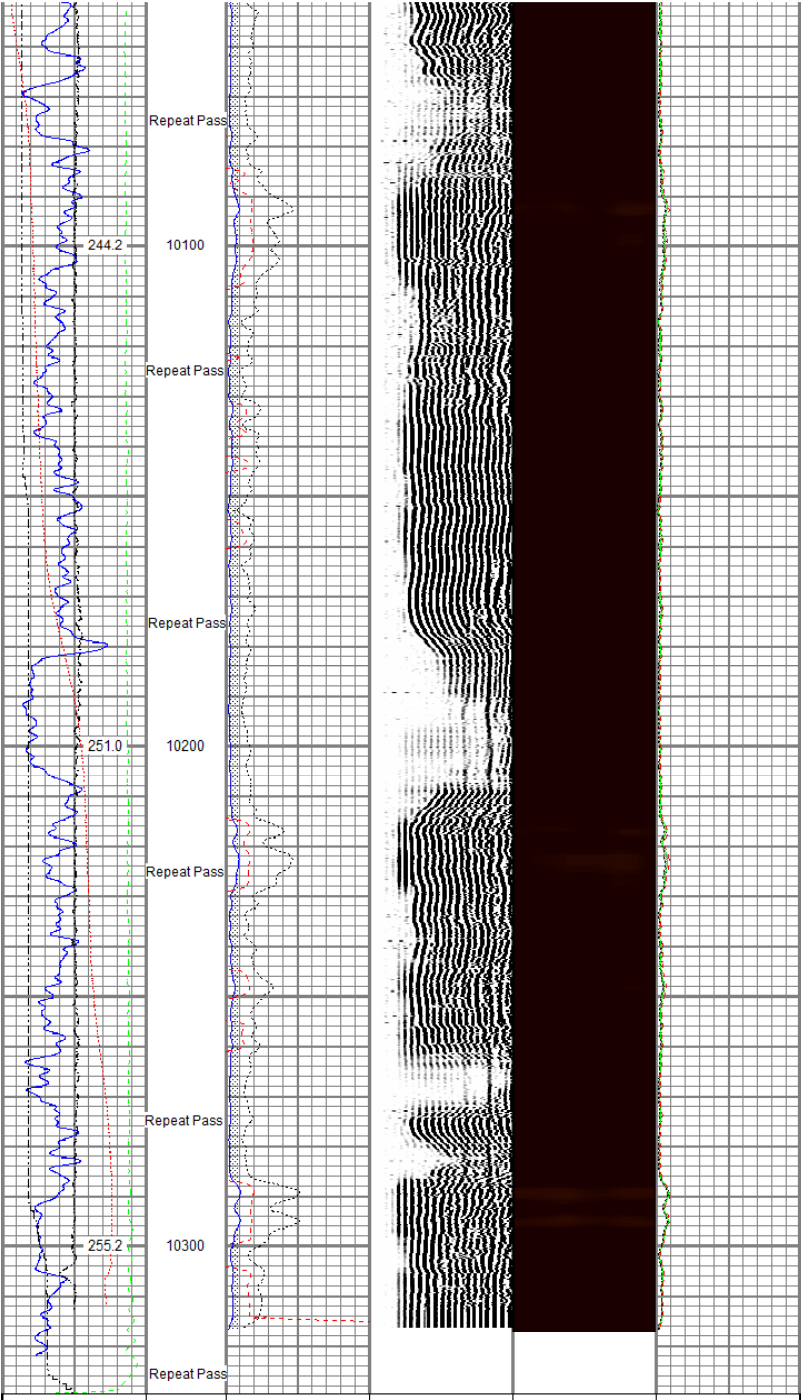
Repeat Pass

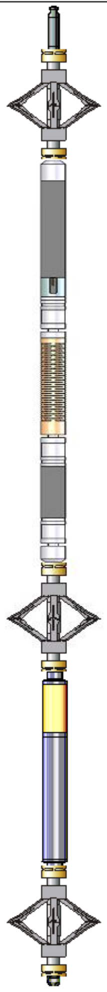
Recorded with 0 PSI Surface Induced Pressure

Database File	tep\federal ru 323-17\tep_federal ru 323-17_rbl_04-11-18.db
Dataset Pathname	repeat.3
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Apr 13 15:00:23 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)	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
TEMP	16.33					
			Probe Radii-2750 RBT (27125) Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub	9.39	2.75	105.00
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					
			DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
CCL$2	6.42					
CCL$1	6.42					
GR	5.18		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:	tep_federal ru 323-17_rbl_04-11-18.db: field/well/run1/main.2
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 323-17\tep_federal ru 323-17_rbl_04-11-18.db
Dataset Pathname	main.2
Dataset Creation	Fri Apr 13 14:57:39 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:	27125	
Tool Model:	2750 RBT	
Calibration Casing Diameter:	4.500	in
Calibration Depth:	32.948	ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.023	0.884	0.000	81.196	89.550	2.051
CAL	-0.006	0.743				
5'	-0.051	0.789	0.000	81.196	96.732	4.906
SUM						
S1	-0.027	0.901	0.000	100.000	107.728	2.886
S2	-0.031	0.902	0.000	100.000	107.219	3.292
S3	-0.029	0.811	0.000	100.000	119.084	3.456
S4	-0.032	0.832	0.000	100.000	115.749	3.646
S5	-0.020	0.875	0.000	100.000	111.651	2.267
S6	-0.023	0.944	0.000	100.000	103.368	2.380
S7	-0.041	0.917	0.000	100.000	104.465	4.256
S8	-0.037	0.912	0.000	100.000	105.331	3.947

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.006	0.743	1.000	0.000

Air Zero Calibration, performed Wed Apr 11 17:09:09 2018:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	-0.005	0.000	0.000
5'	-0.004	0.000	0.000
SUM			
S1	-0.005	0.000	-0.000
S2	-0.004	0.000	-0.000
S3	-0.005	0.000	-0.000
S4	-0.005	0.000	-0.000
S5	-0.004	0.000	-0.000
S6	-0.005	0.000	-0.001
S7	-0.005	0.000	0.000
S8	-0.005	0.000	0.000

Temperature Calibration Report

Serial Number:	27125	
Tool Model:	2750 RBT	
Performed:	(Not Performed)	
	Reference	Reading
Low Reference:	100.00 degF	112.30 degF
High Reference:	350.00 degF	394.75 degF
Gain:	0.89	
Offset:	0.60	
Delta Spacing	1	

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State	Colorado