RELIANCE OILFIELD SERVICES

Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Federal RU 413-17
Field	Rulison
County	Garfield
State	Colorado

Company TEP Rocky Mountain LLC

Well Federal RU 413-17

Field Rulison

County Garfield State Colorado

Location: API # : 05-045-23740

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	27-APR-2018		
Run Number	One		
Depth Driller	10722 FT		
Depth Logger	10652 FT		
Bottom Logged Interval	10652 FT		
Top Log Interval	Surface		
Open Hole Size	8.750"		
Type Fluid	Water		
Density / Viscosity	8.34 lb/gal		
Max. Recorded Temp.	245°F		
Estimated Cement Top	See Log		
Time Well Ready	ROA		
Time Logger on Bottom	04:00		
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	32.3	H-40	Surface	1139 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	10682 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 6667 FT-6688 FT
Log ran from 10652 FT to Surface
Recorded with 0 PSI Surface Induced Pressure

Thank you for choosing Reliance Oilfield Services, LLC!

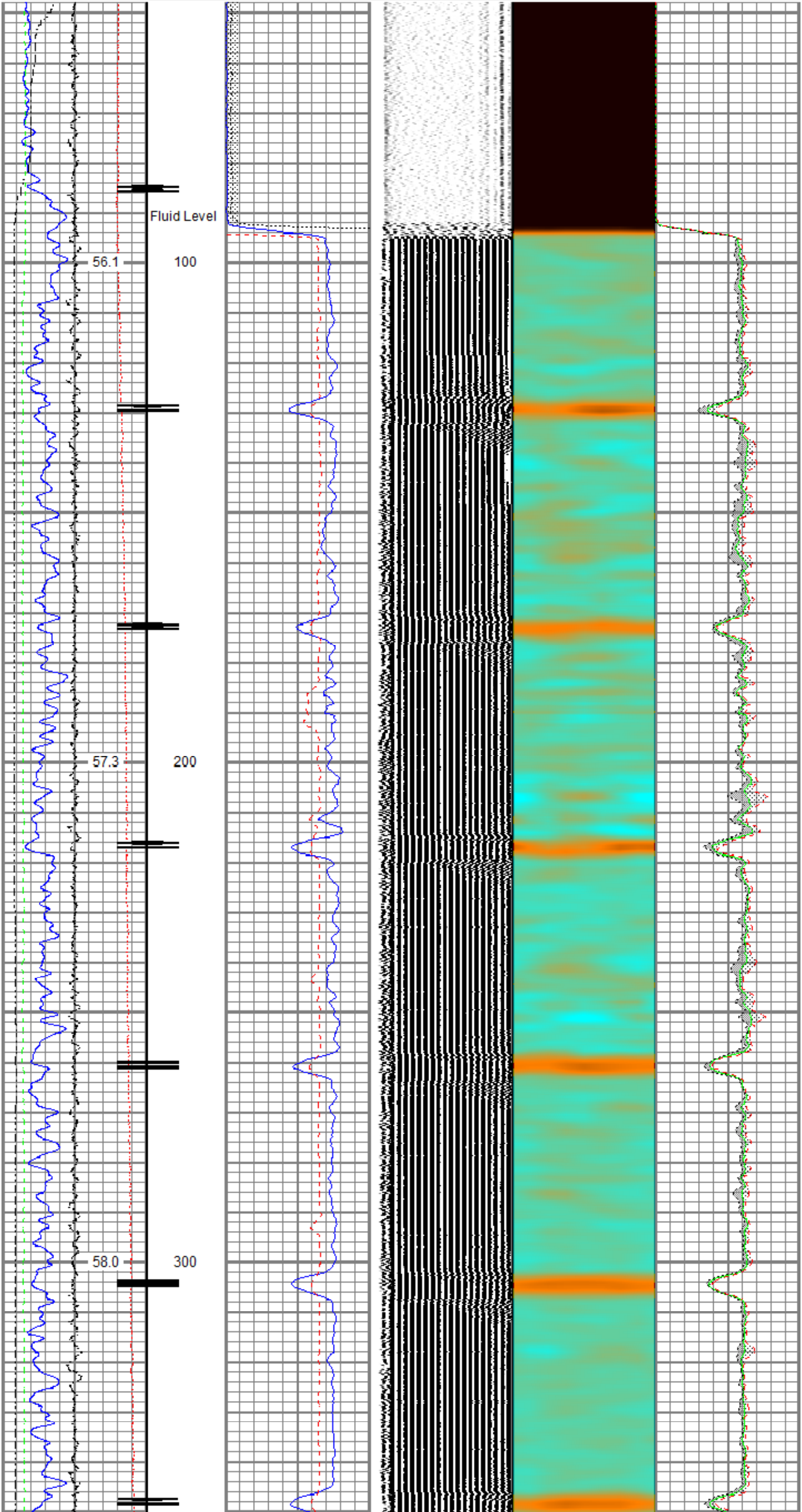
RELIANCE OILFIELD SERVICES

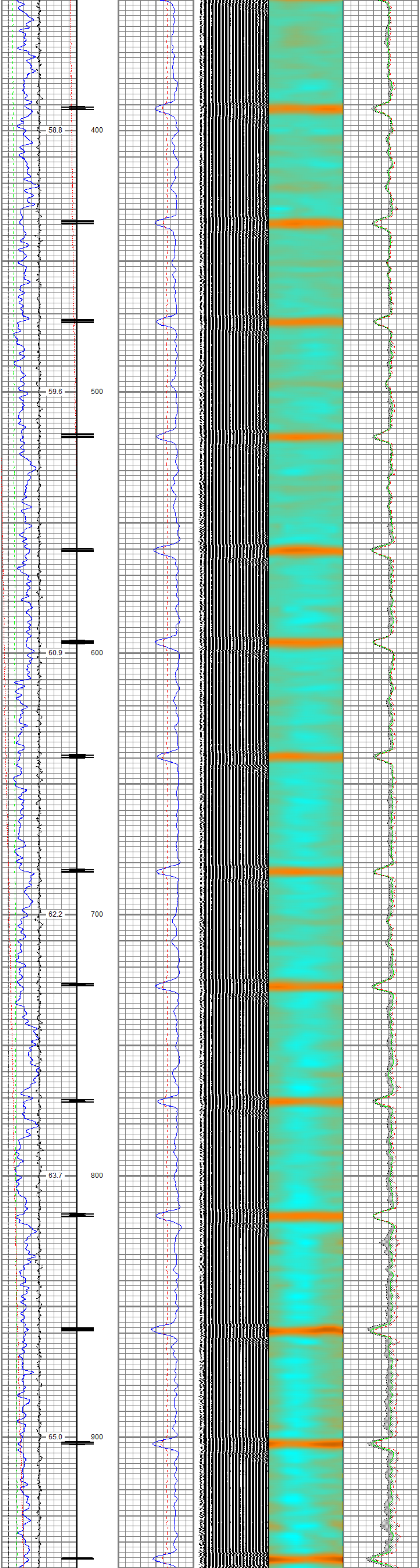
Main Pass

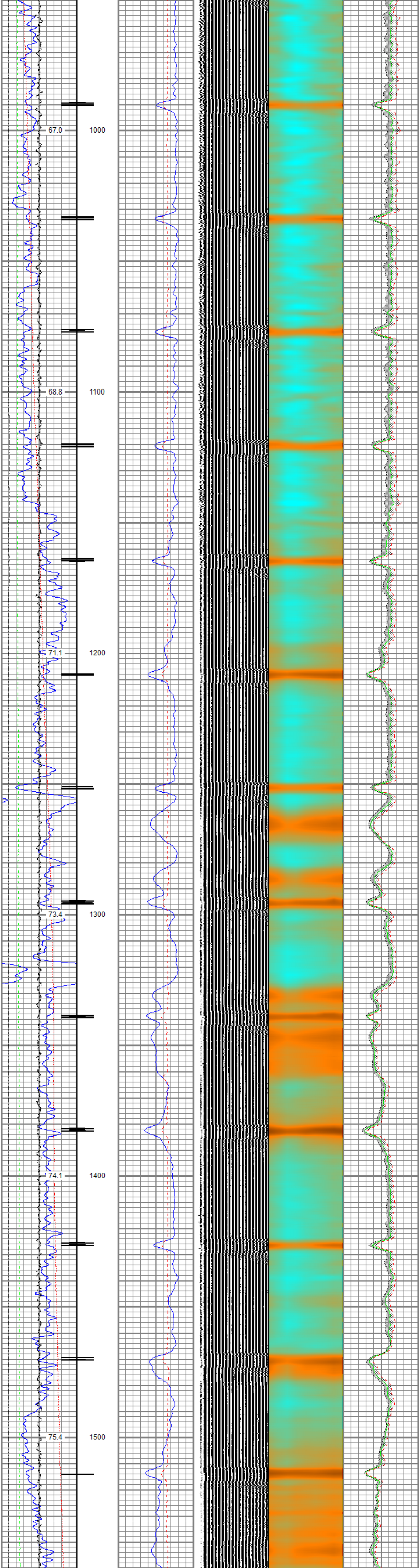
Recorded With 0 PSI Surface Induced Pressure

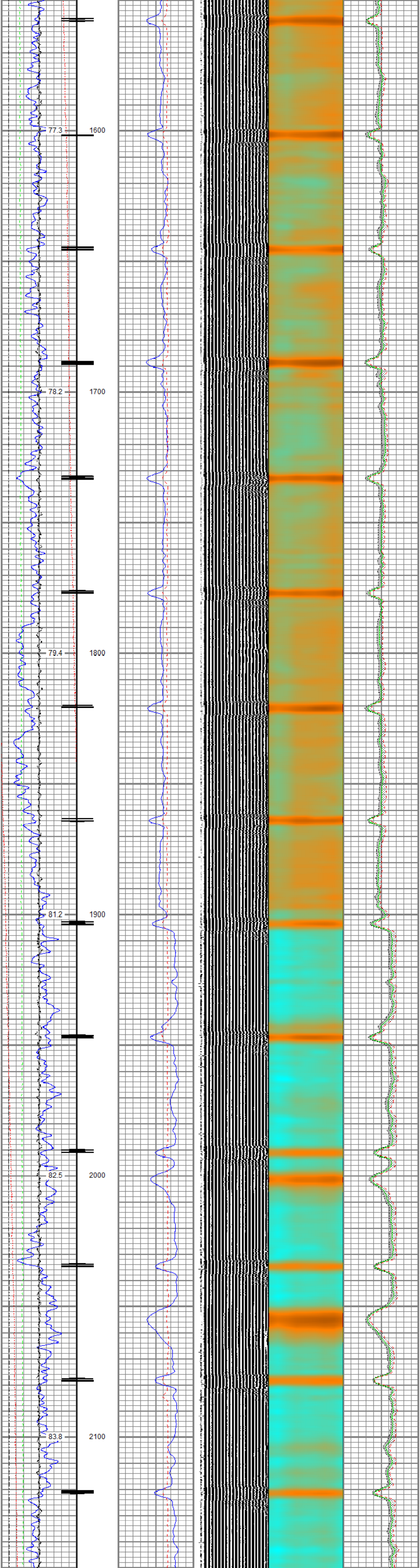
Database File	federal ru 413-17\tep_federal ru 413-17_rbl_04-27-18.db
Dataset Pathname	main.2
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Apr 27 15:14:21 2018
Charted by	Depth in Feet scaled 1:240

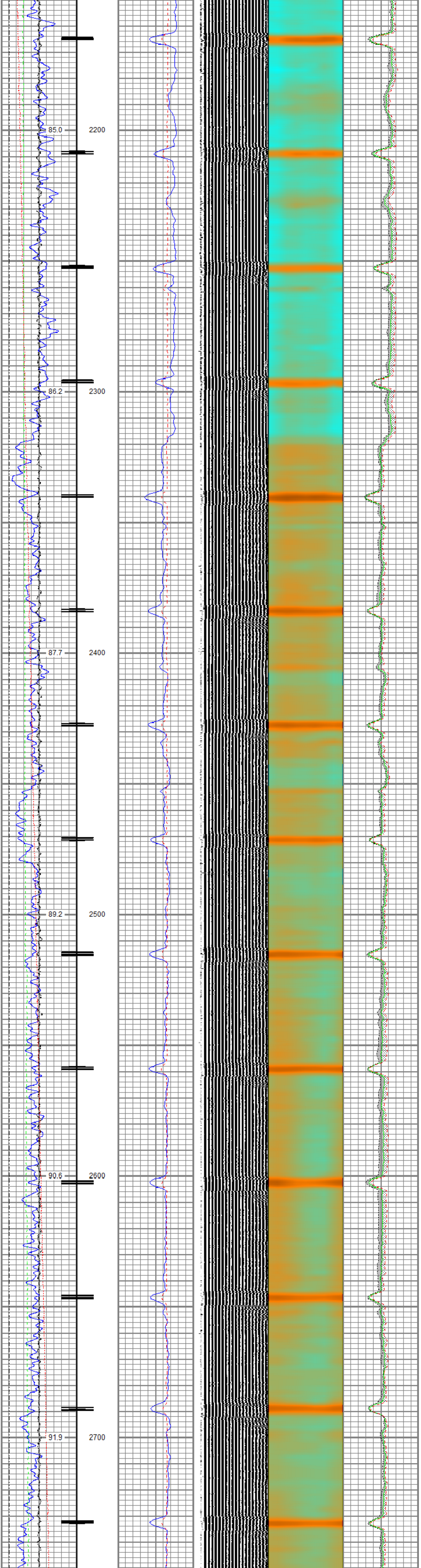
Gamma Ray 0 (GAPI) 200		3' Amplitude 0 (mV) 100	5' Variable Density Log 200 1200	Sector Map 10 110	Average Amplitude 0 150
Line Speed -150 (ft/min) 150		3' Amplitude x 5 0 (mV) 20			Mimimum Amplitude 0 150
Line Tension 0 (lb) 2000		3' Travel Time 300 (usec) 200			Maximum Amplitude 0 150
Differential Temperature -2 (degF) 2					
Temperature 0 (degF) 20					
10 CCL 0					

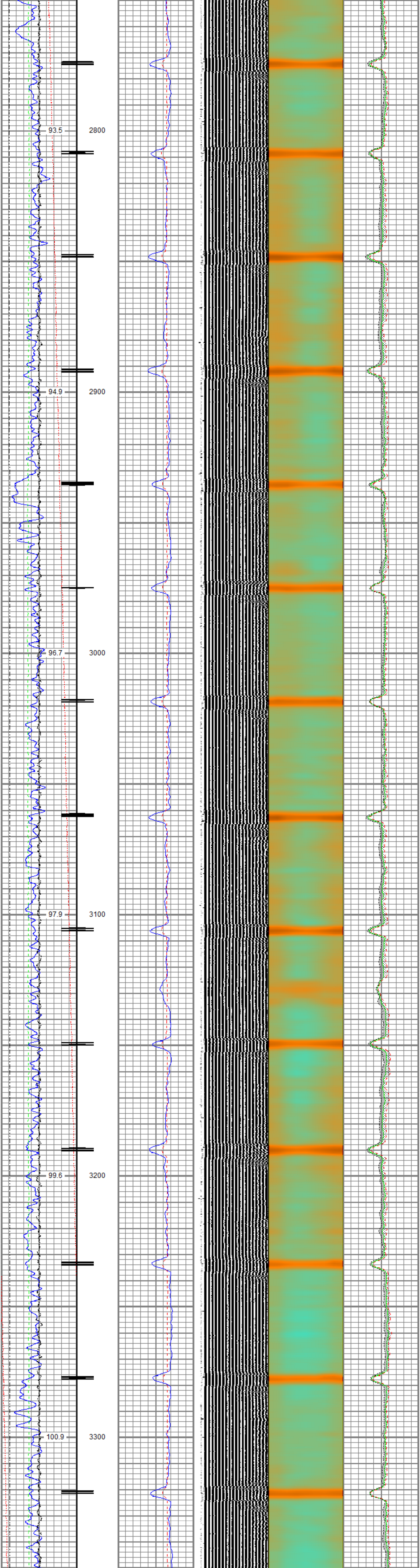


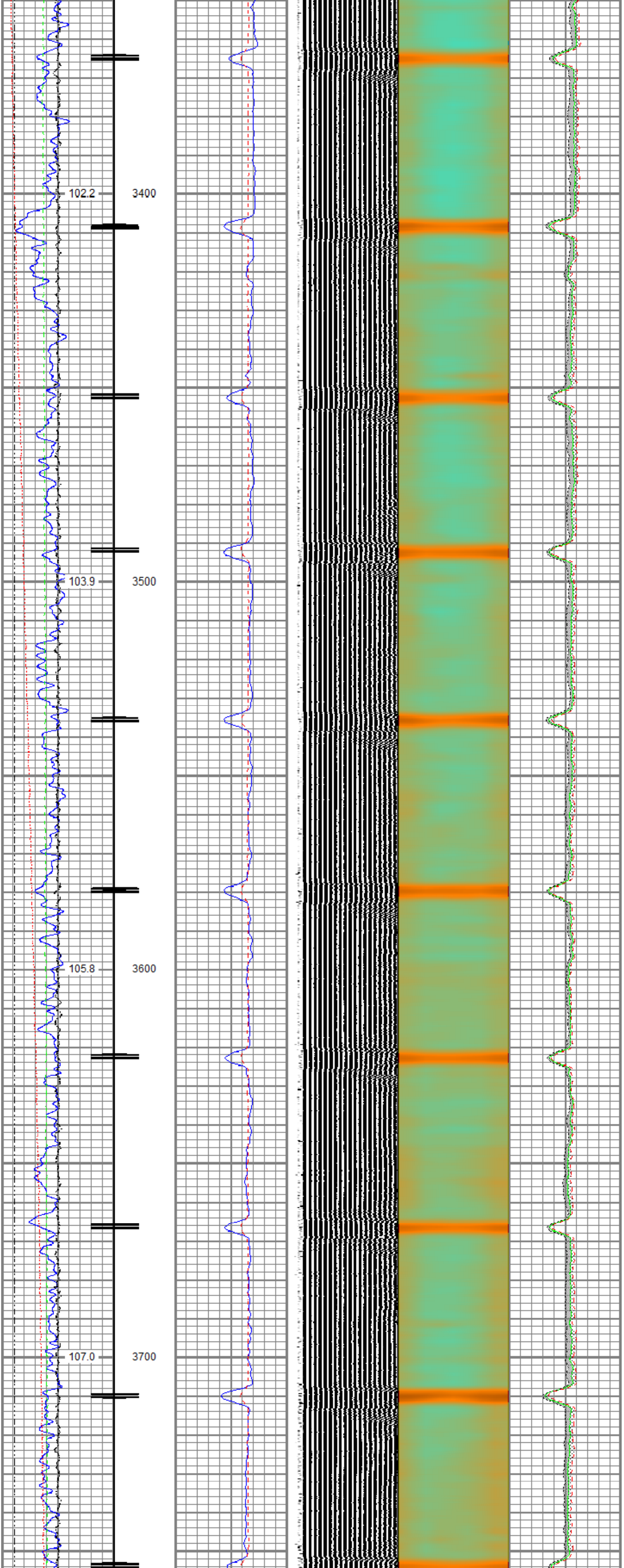


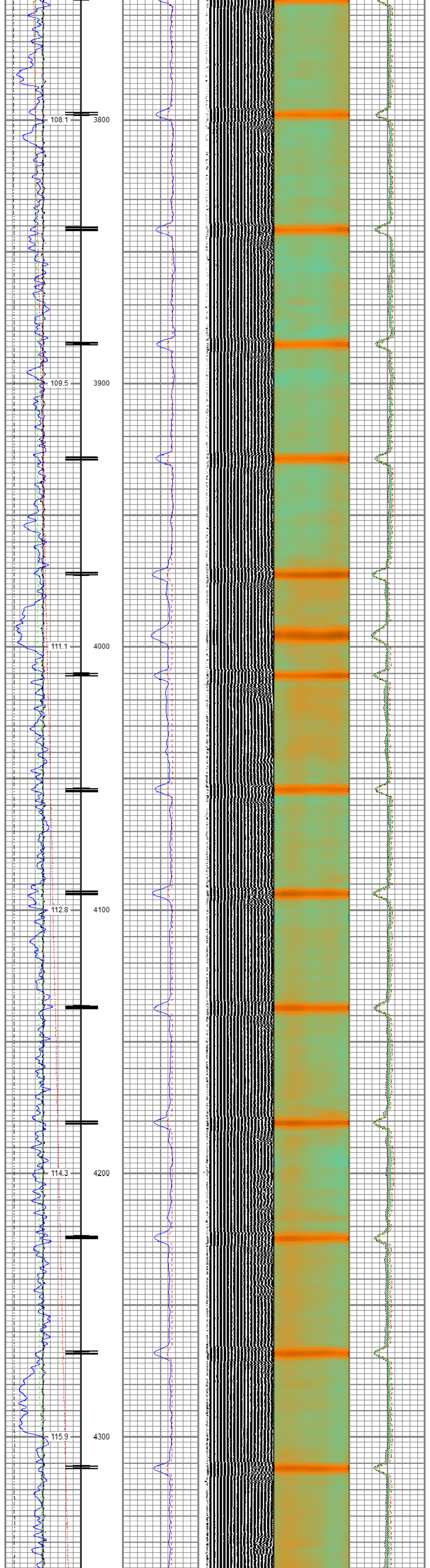








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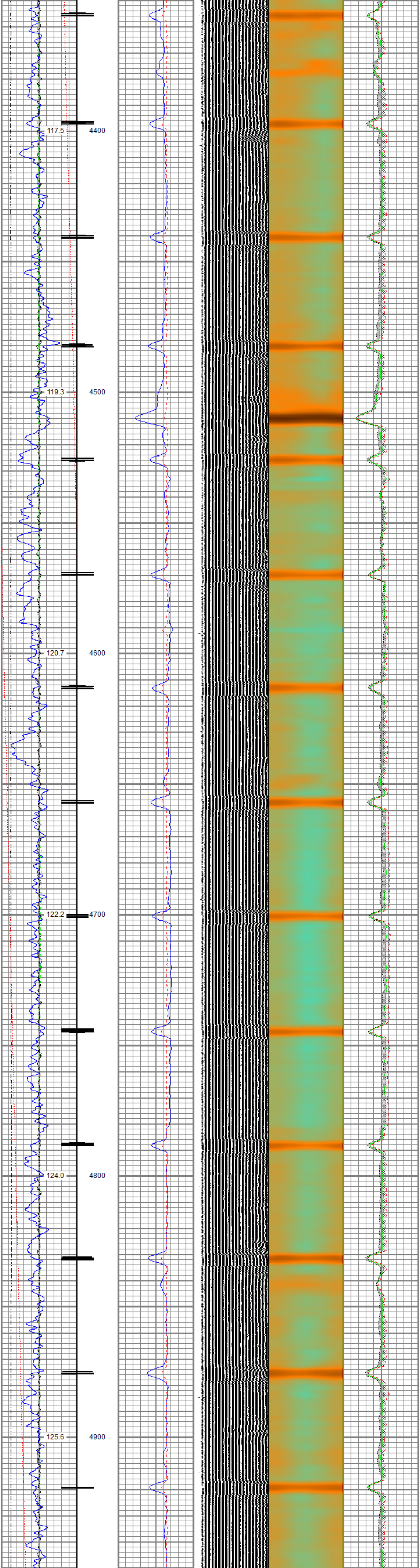
4100
114.3
4200
115.9
4300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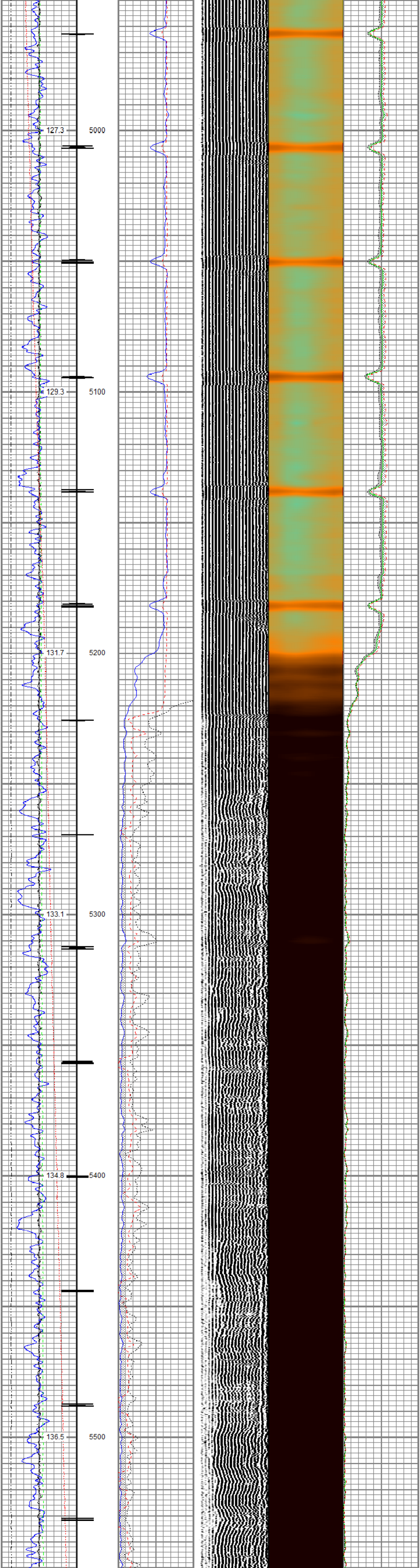
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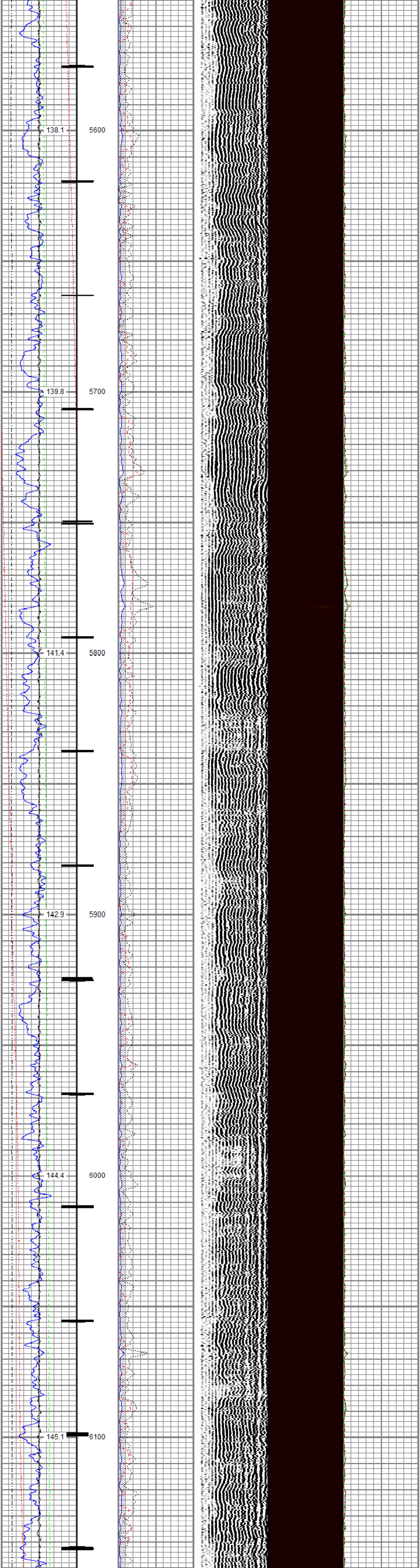
136.5
5500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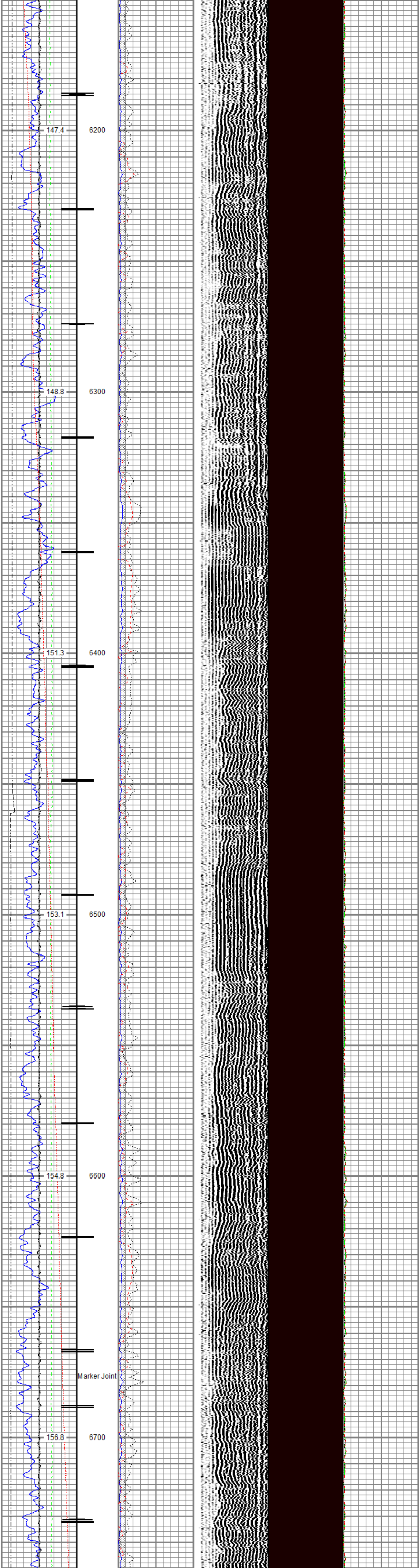
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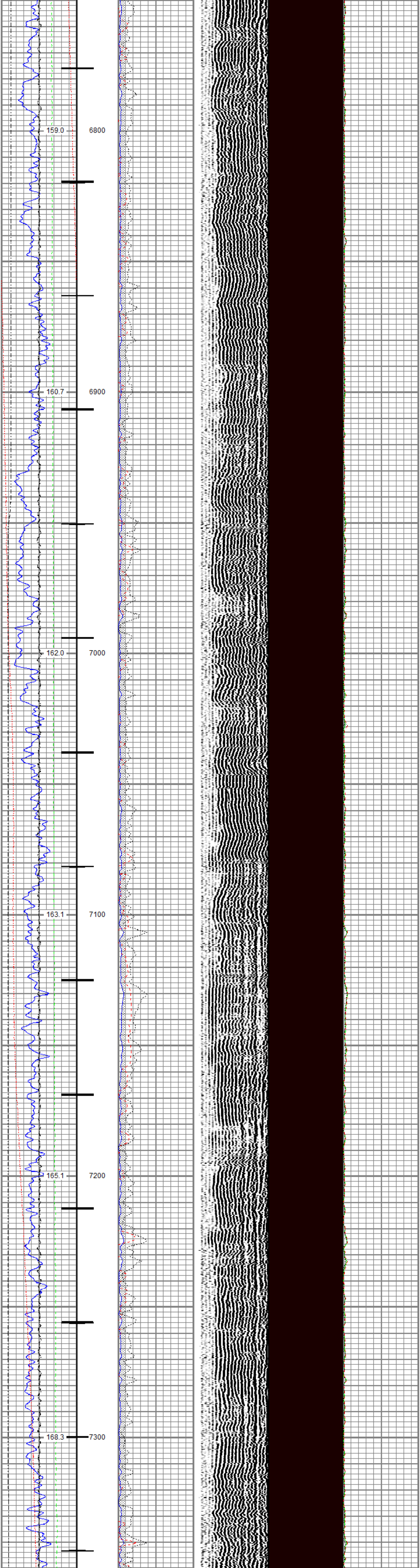
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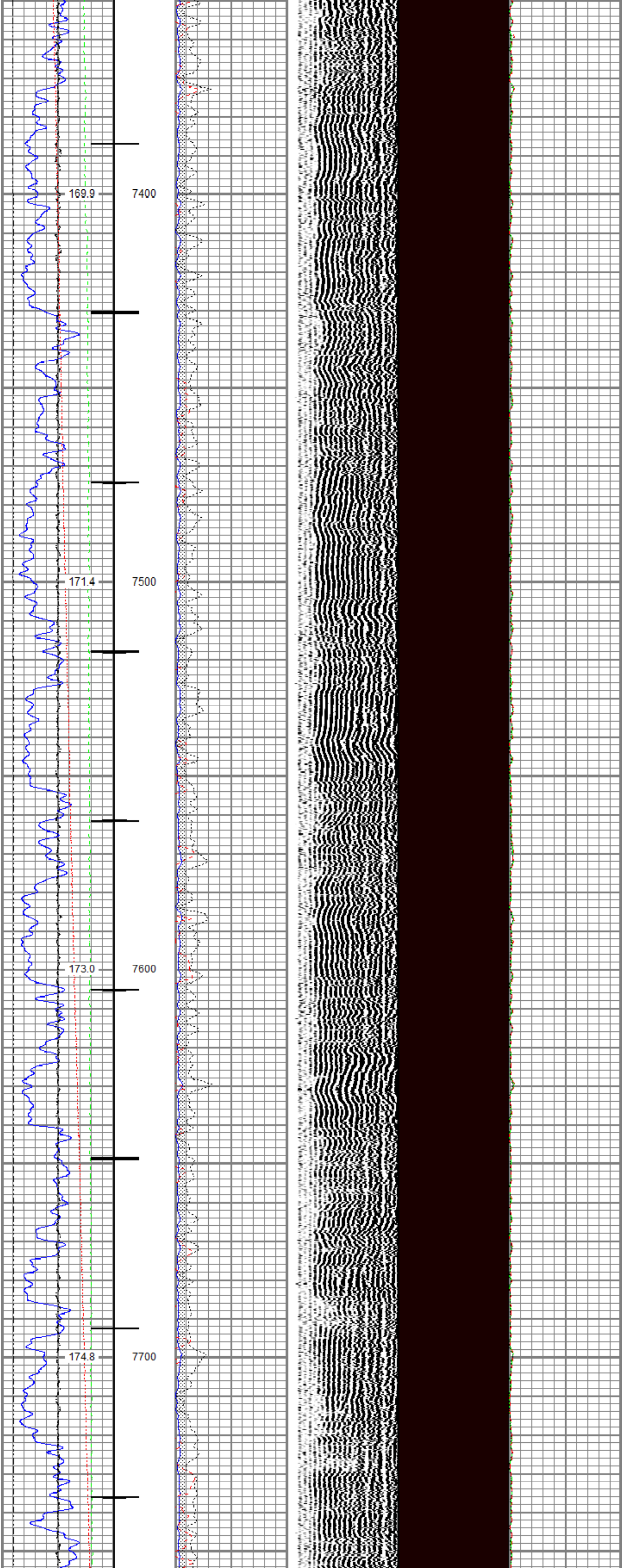
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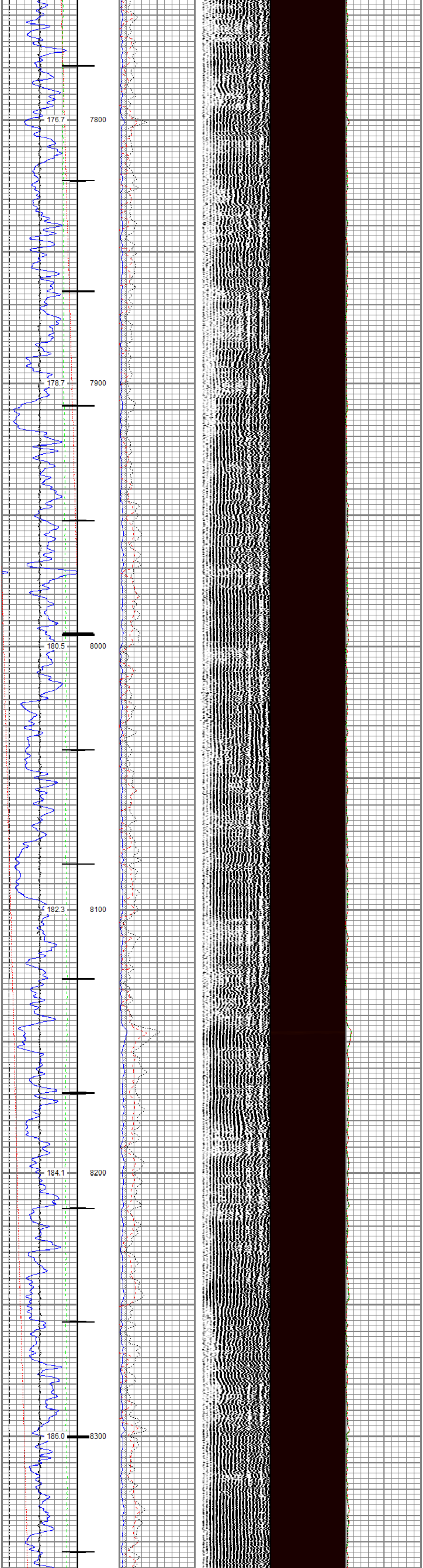

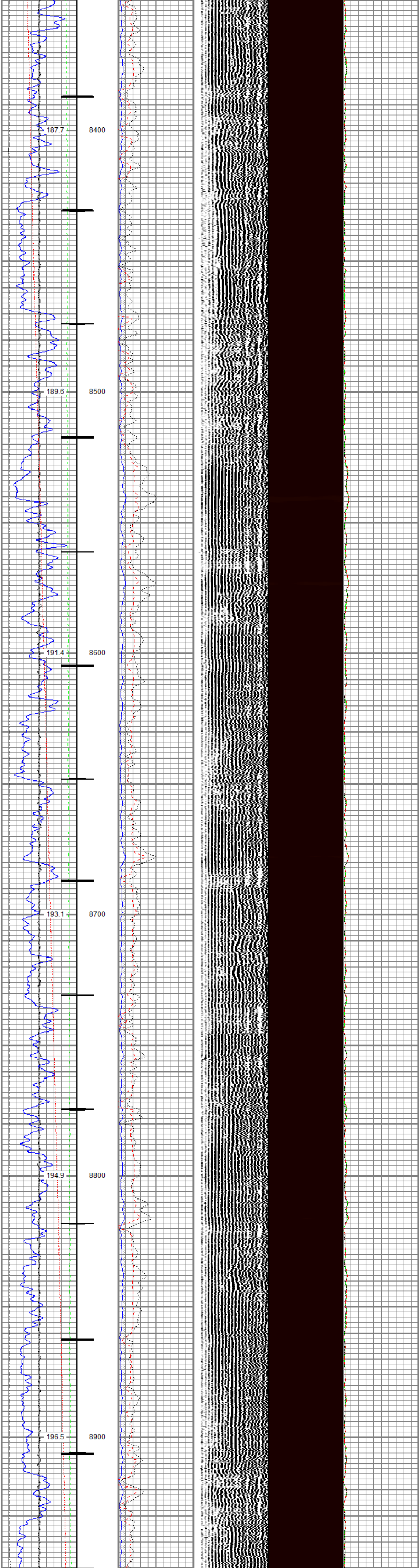

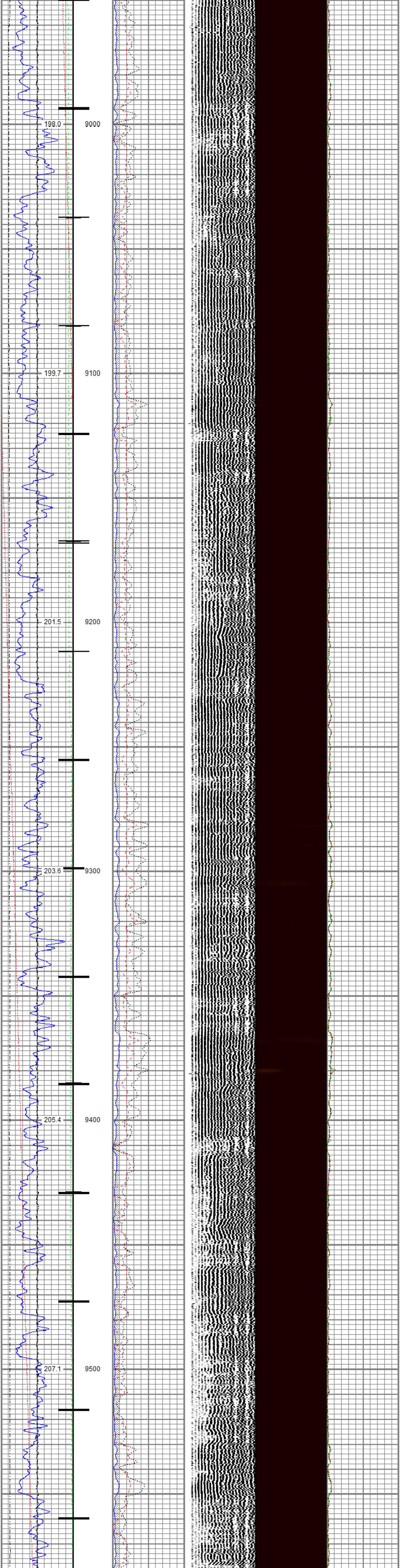

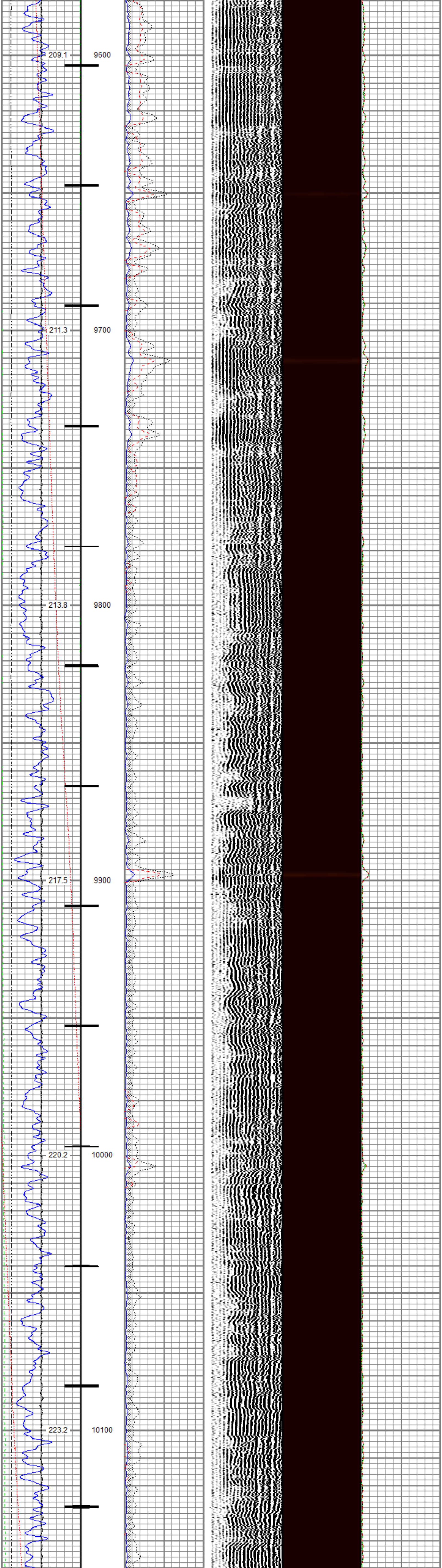

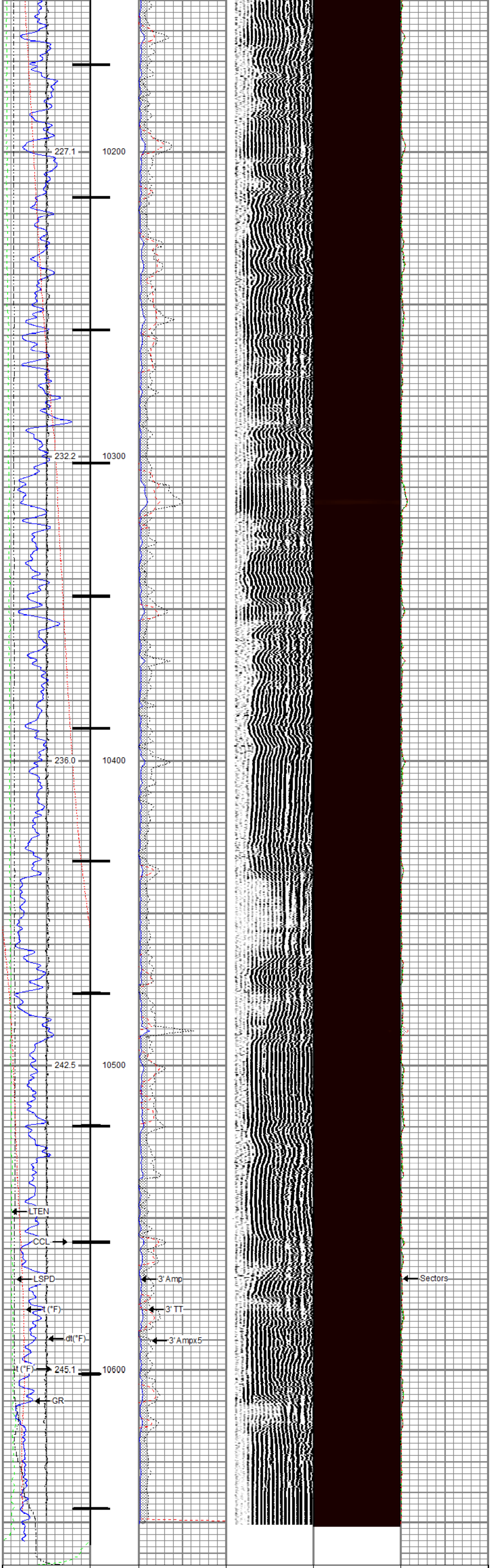

Gamma Ray 0 (GAPI) 200	3' Amplitude 0 (mV) 100	5' Variable Density Log 200 1200	Sector Map 10 110	Average Amplitude 0 150
Line Speed -150 (ft/min) 150	3' Amplitude x 5 0 (mV) 20			Mimimum Amplitude 0 150
Line Tension 0 (lb) 2000	3' Travel Time 300 (usec) 200			Maximum Amplitude 0 150
Differential Temperature -2 (degF) 2				
Temperature 0 (degF) 20				
10 CCL 0				

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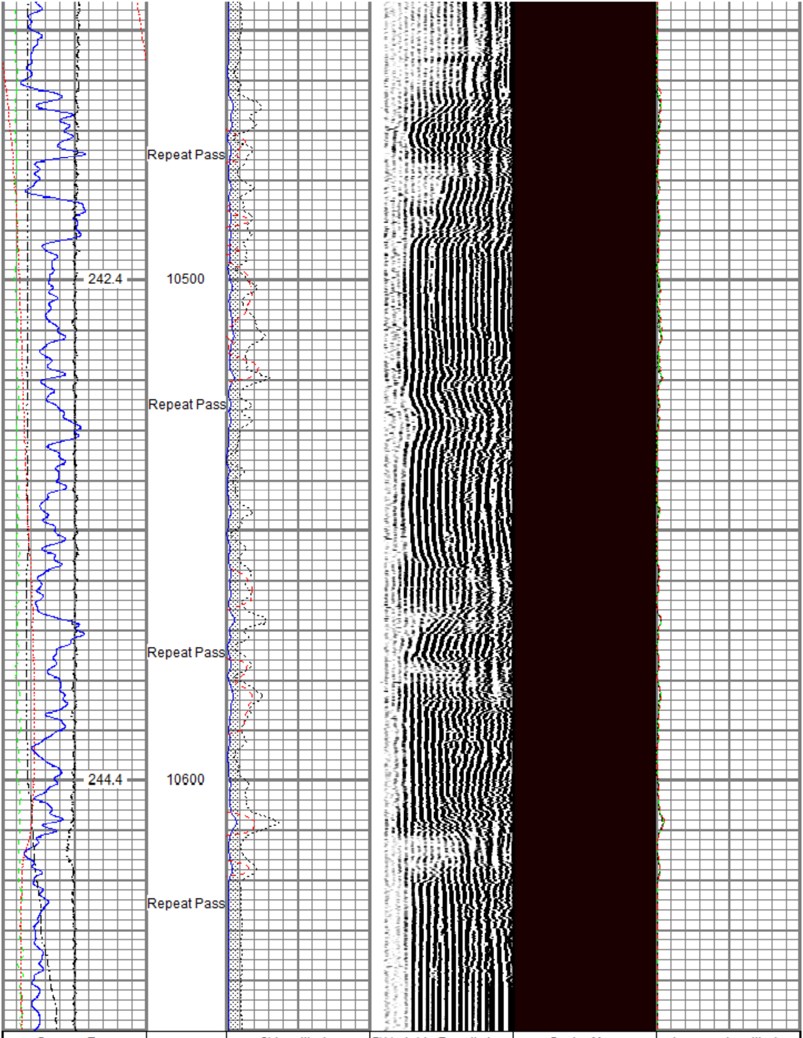
Repeat Pass

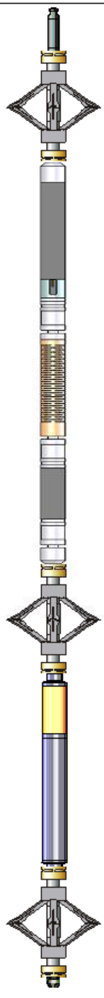
Recorded With 0 PSI Surface Induced Pressure

Database File	federal ru 413-17\tep_federal ru 413-17_rbl_04-27-18.db
Dataset Pathname	repeat.2
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Apr 27 15:19:29 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 1200	10 110	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 1200	10 110	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

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 (FW1302-001) 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: tep_federal ru 413-17_rbl_04-27-18.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\federal ru 413-17\tep_federal ru 413-17_rbl_04-27-18.db
Dataset Pathname	main.2
Dataset Creation	Fri Apr 27 15:14:21 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:	FW1302-001	
Tool Model:	2750 RBT	
Calibration Casing Diameter:	4.500	in
Calibration Depth:	-1705.394	ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.001	0.902	0.800	81.196	89.215	0.751
CAL	-0.005	0.745				
5'	0.011	0.739	0.800	81.196	110.335	-0.386
SUM						
S1	0.006	1.049	0.000	100.000	95.831	-0.541
S2	0.002	0.990	0.000	100.000	101.222	-0.191
S3	0.002	0.882	0.000	100.000	113.627	-0.232
S4	-0.001	0.824	0.000	100.000	121.286	0.071
S5	-0.000	0.813	0.000	100.000	122.935	0.043
S6	-0.000	0.836	0.000	100.000	119.538	0.034
S7	0.000	0.890	0.000	100.000	112.361	-0.004
S8	0.004	0.996	0.000	100.000	100.783	-0.373

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.005	0.745	1.000	0.000

Air Zero Calibration, performed Fri Apr 27 02:01:58 2018:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	-0.000	0.000	-0.000
5'	0.011	0.000	0.000
SUM			
S1	0.001	0.000	0.000
S2	0.000	0.000	-0.001
S3	0.000	0.000	-0.000
S4	0.000	0.000	-0.001
S5	0.000	0.000	-0.000
S6	0.001	0.000	-0.000
S7	0.001	0.000	-0.001
S8	0.001	0.000	0.000

Temperature Calibration Report

Serial Number:	FW1302-001
Tool Model:	2750 RBT
Performed:	Sun Nov 12 13:24:58 2017

	Reference	Reading
Low Reference:	100.00 degF	107.47 degF
High Reference:	350.00 degF	404.08 degF

Gain:	0.84
Offset:	9.42
Delta Spacing	1

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Company	TEP Rocky Mountain LLC
Well	Federal RU 413-17
Field	Rulison
County	Garfield
State	Colorado