Company TEP Rocky Mountain LLC
Well Federal RU 524-17
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 524-17
Field Rulison
County Garfield State Colorado

Location: API # : 05-045-23731

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. 8388.6'
G.L. 8365.6'

Date	05-JUN-2018		
Run Number	One		
Depth Driller	10558 FT		
Depth Logger	10480 FT		
Bottom Logged Interval	10466 FT		
Top Log Interval	Surface		
Open Hole Size	8.750"		
Type Fluid	Fresh Water		
Density / Viscosity	8.34 lb/gal		
Max. Recorded Temp.	244°F		
Estimated Cement Top	See Log		
Time Well Ready	ROA		
Time Logger on Bottom	21:26		
Equipment Number	HD-0359		
Location	Grand Junction, CO		
Recorded By	A. Ellsworth		
Witnessed By	D. 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	1141 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	10518 FT
Intermediate #2					
Liner					

<<< Fold Here >>>

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 6344 FT - 6366 FT
Log ran from 10466 FT to Surface
Log ran with 0 PSI Surface Induced Pressure

Thank you for choosing Reliance Oilfield Services, LLC!!

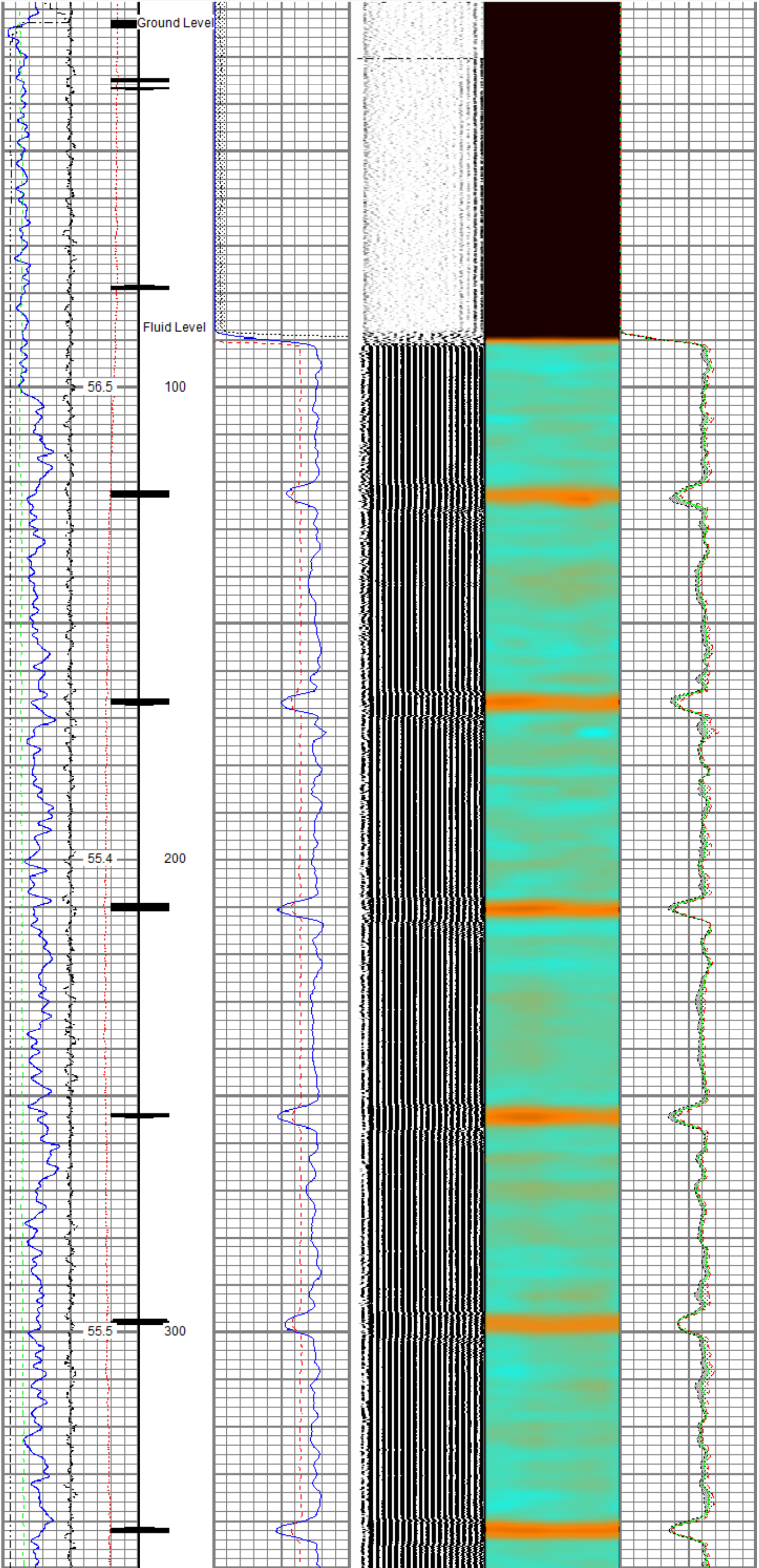
RELIANCE
OILFIELD SERVICES

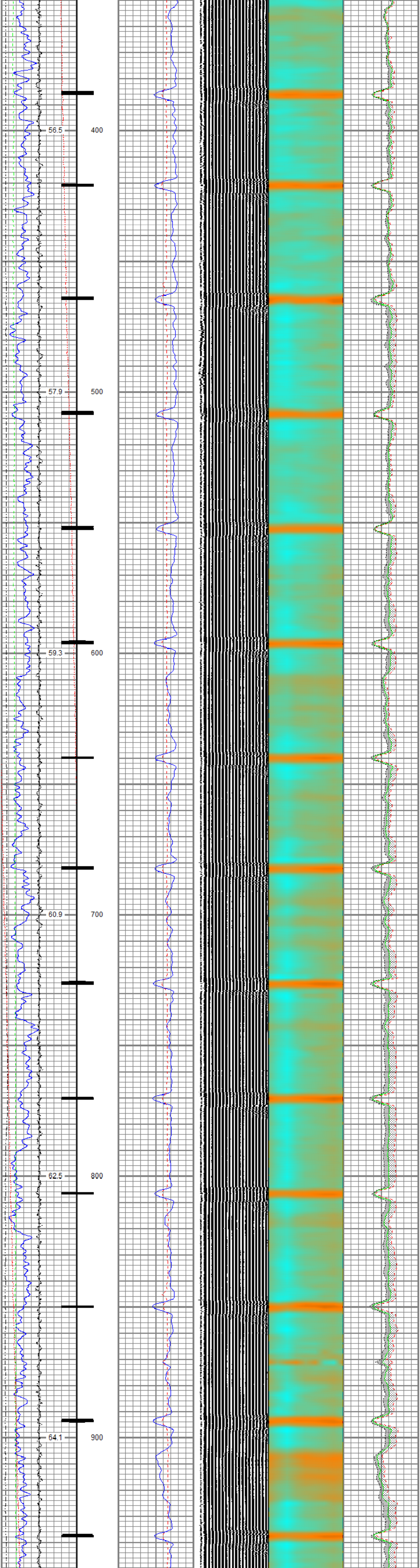
Main Pass

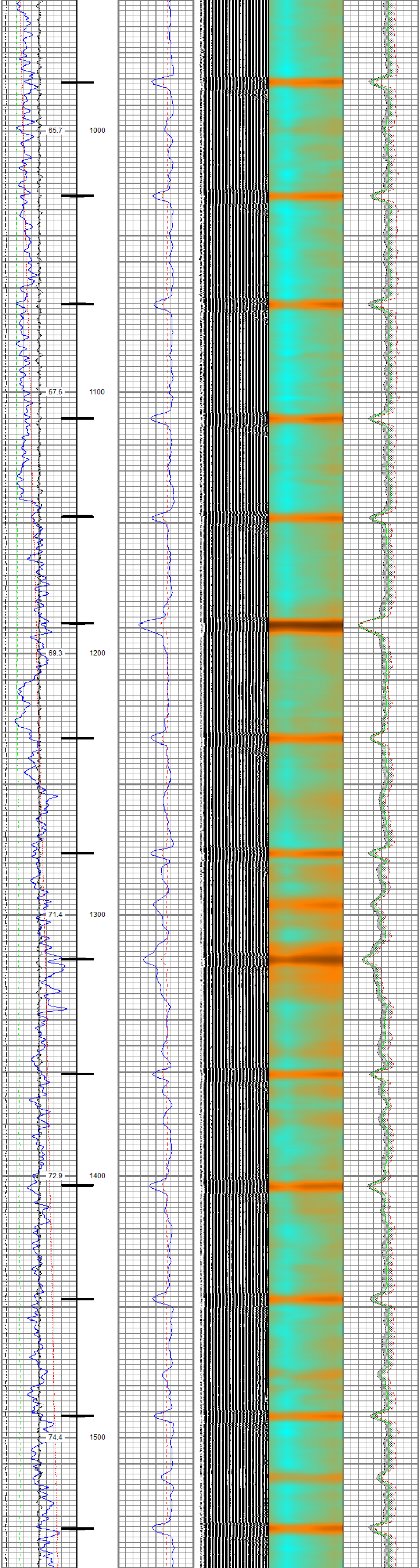
Recorded with 0 PSI Surface Induced Pressure

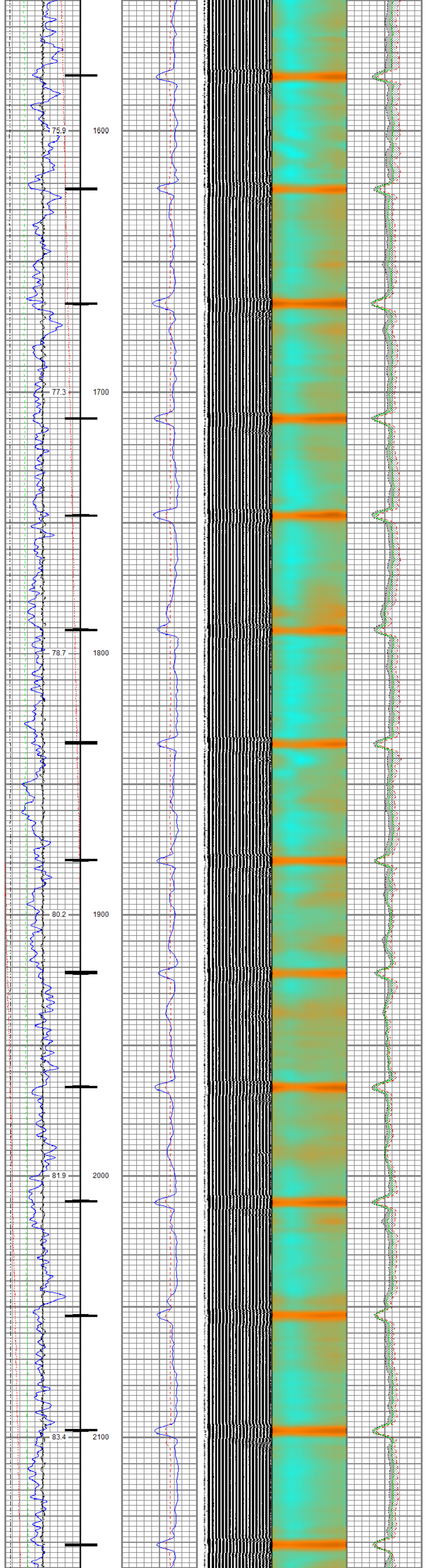
Database File	tep\federal ru 524-17\rbl\tep_federal ru 524-17_rbl_06-05-18.db
Dataset Pathname	main1.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Wed Jun 06 14:38:16 2018
Charted by	Depth in Feet scaled 1:240

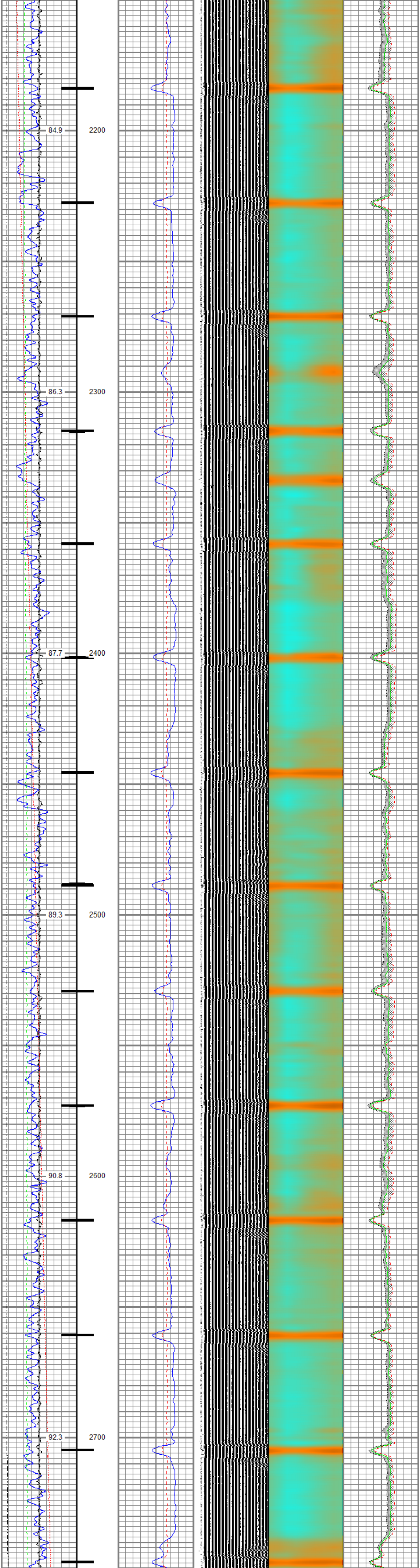
Track 1			Track 3			Track 4			Track 5		Track 6	
Gamma Ray			3' Amplitude			5' Variable Density Log			Sector Map		Average Amplitude	
0	(GAPI)	200	0	(mV)	100	200	(usec)	1200			0	150
Line Speed			3' Amplitude x 5								Mimimum Amplitude	
-150	(ft/min)	150	0	(mV)	20						0	150
Line Tension			3' Travel Time								Maximum Amplitude	
0	(lb)	2000	300	(usec)	200						0	150
Differential Temperature												
-2	(degF)	2										
Temperature												
0	(degF)	20										
10	CCL	0										

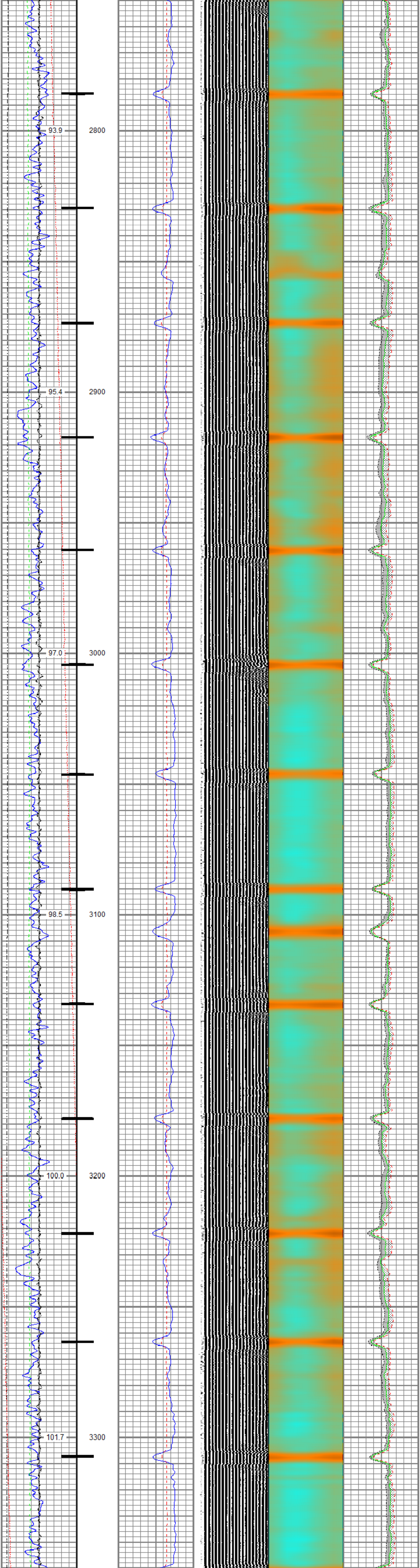


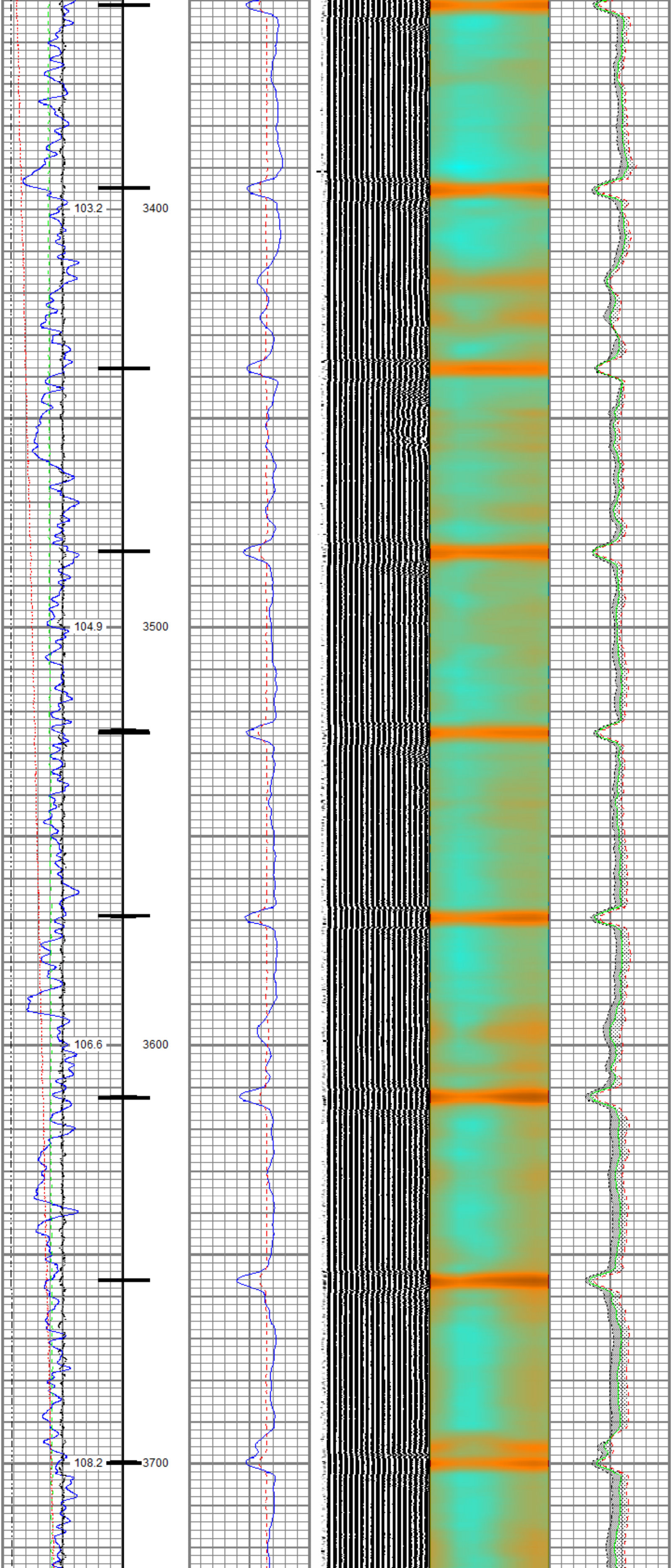


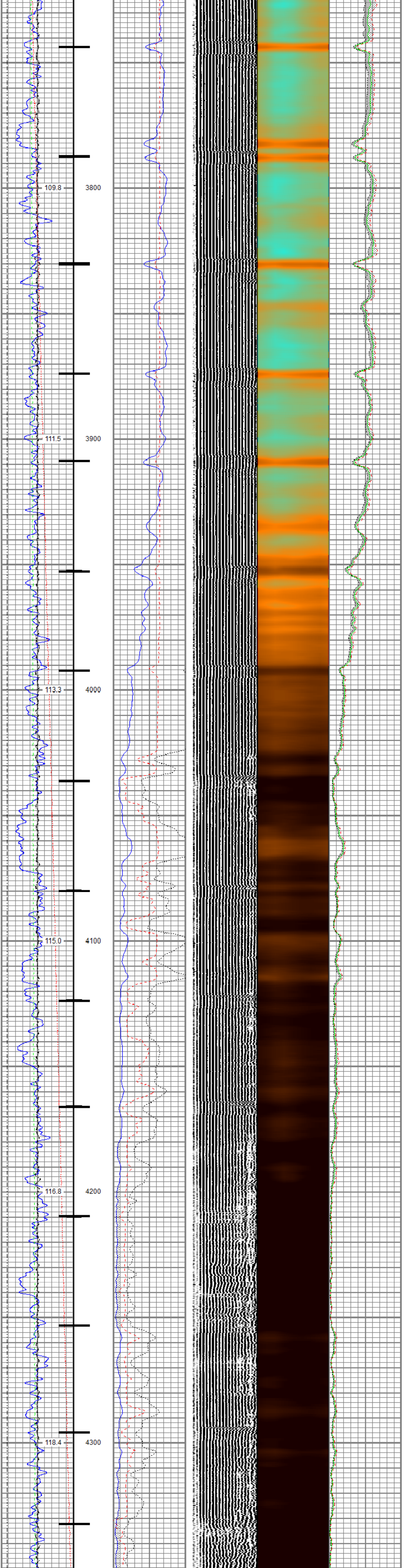


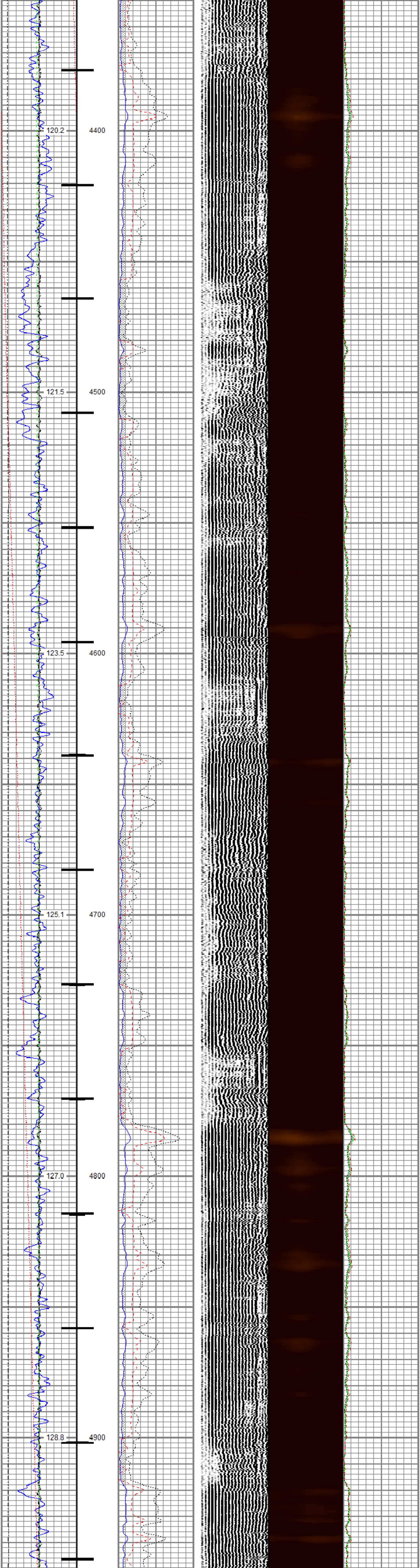




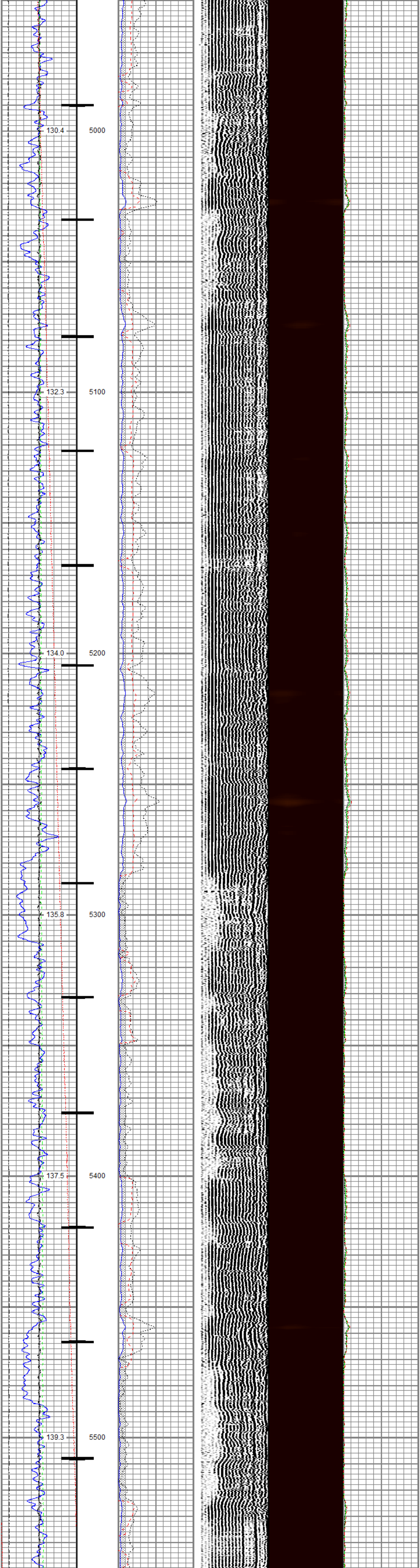


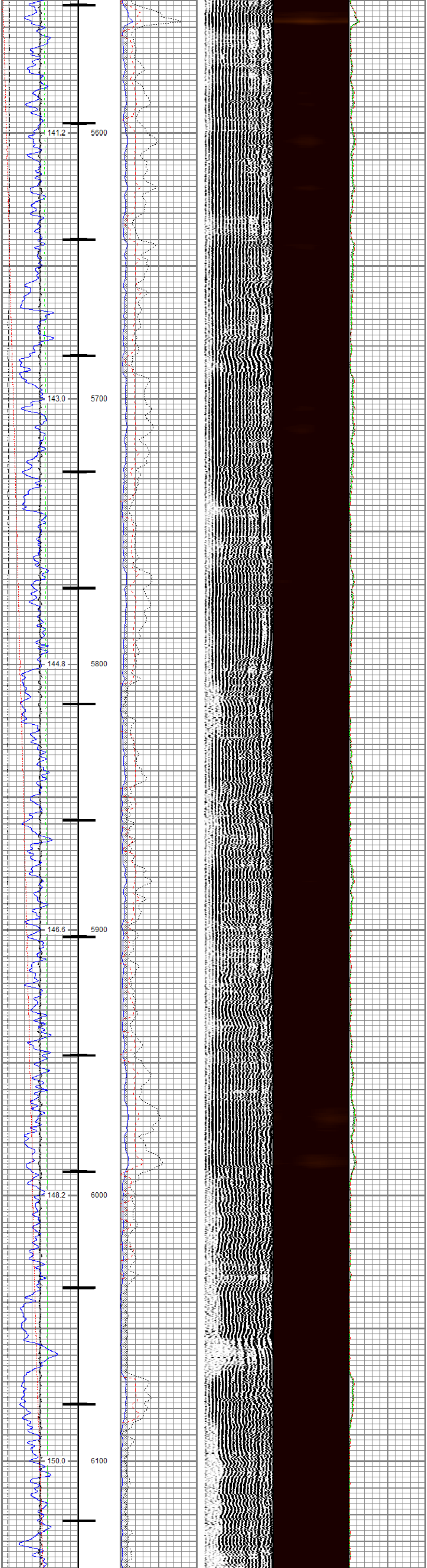


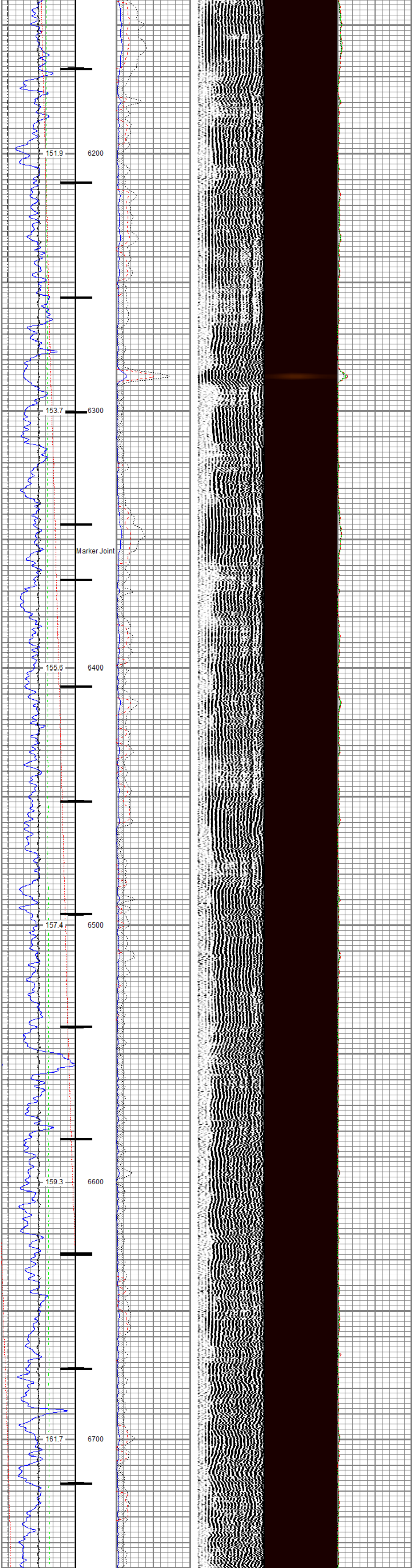

109.8
3800
111.5
3900
113.3
4000
115.0
4100
116.8
4200
118.4
4300

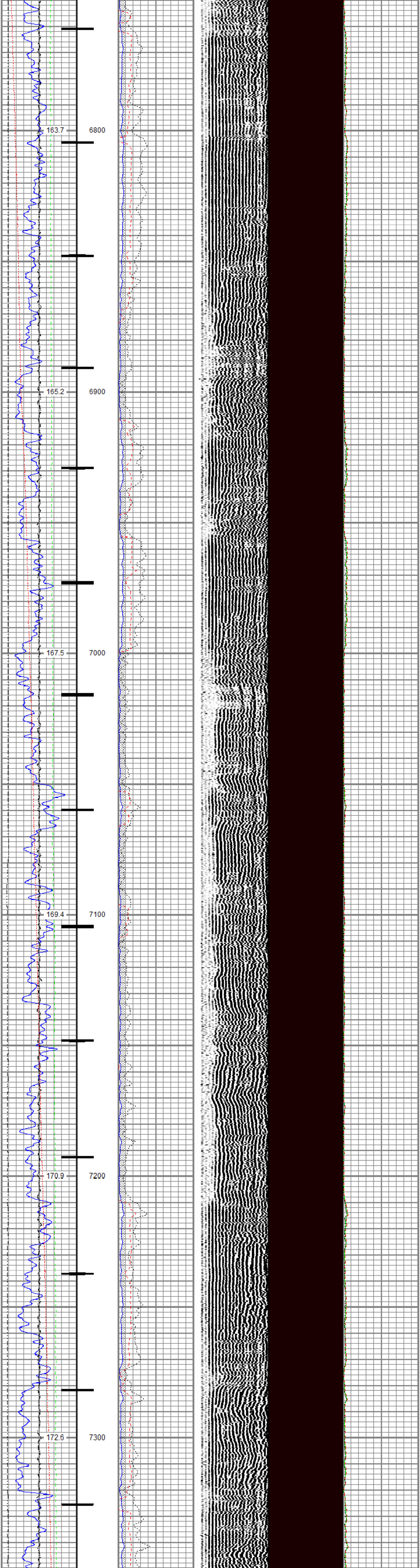


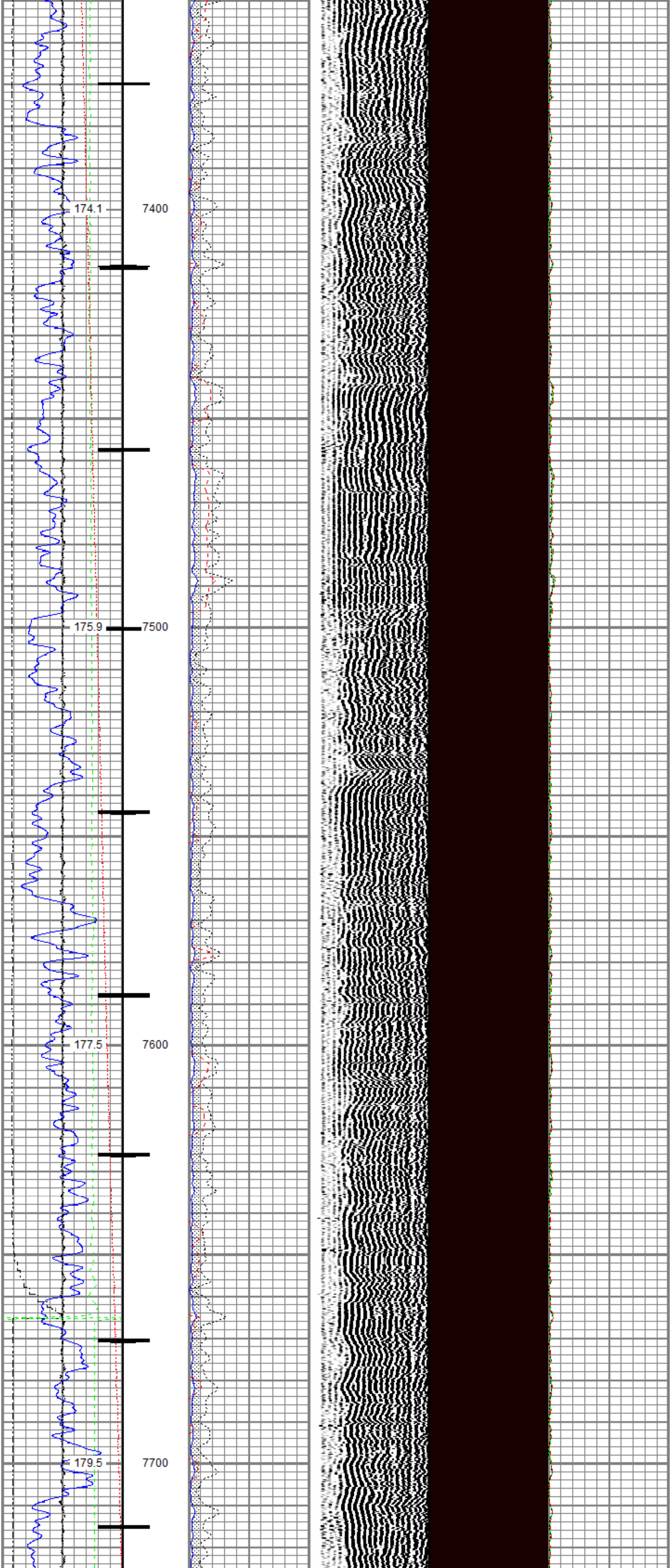
120.2
4400
121.5
4500
123.5
4600
125.1
4700
127.0
4800
128.8
4900

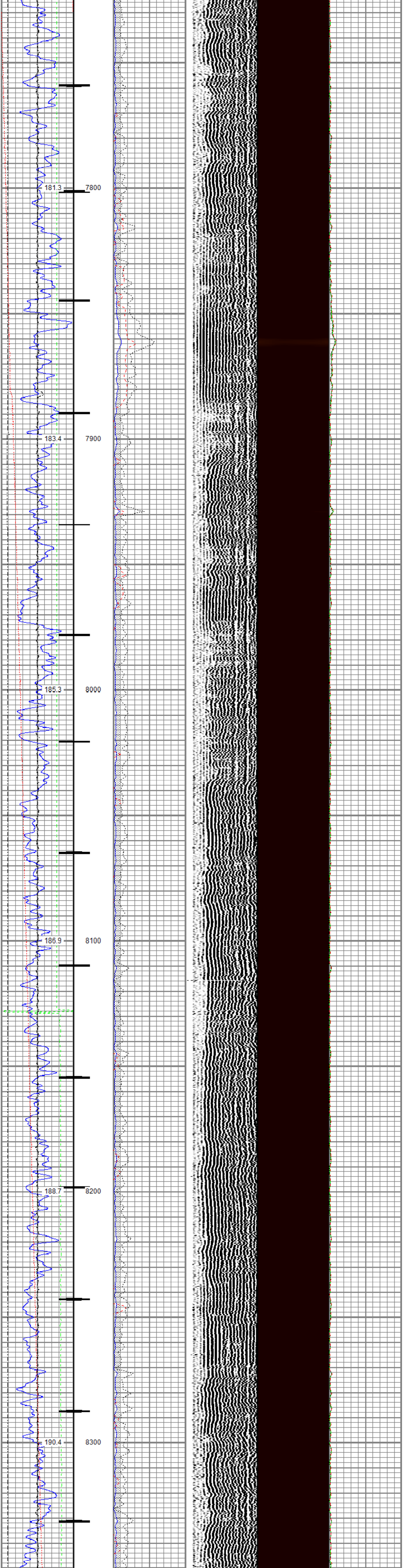

130.4
5000
132.3
5100
134.0
5200
135.8
5300
137.5
5400
139.3
5500

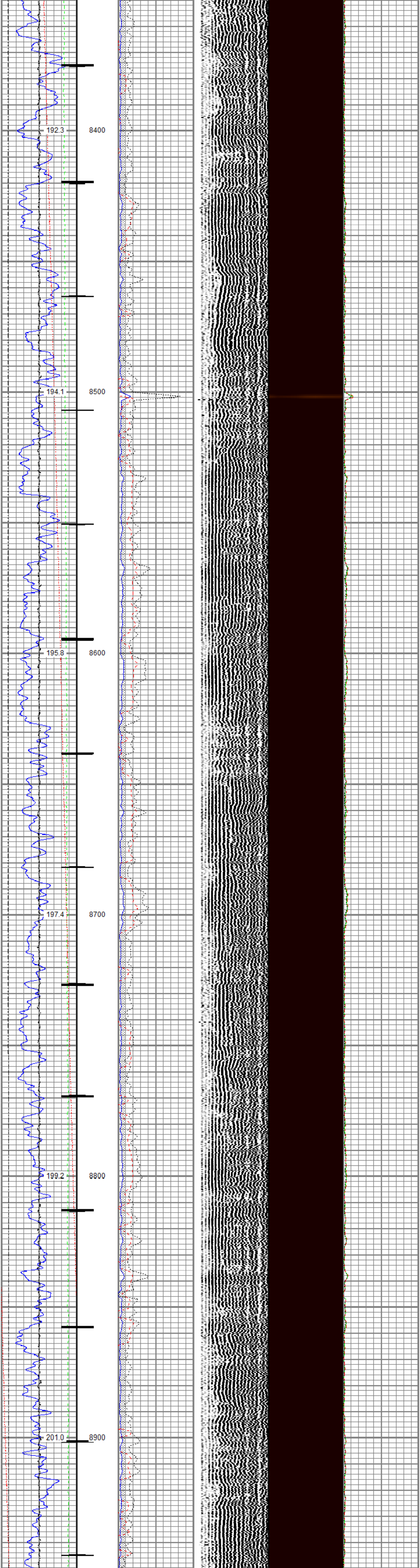

141.2
5600
143.0
5700
144.8
5800
146.6
5900
148.2
6000
150.0
6100

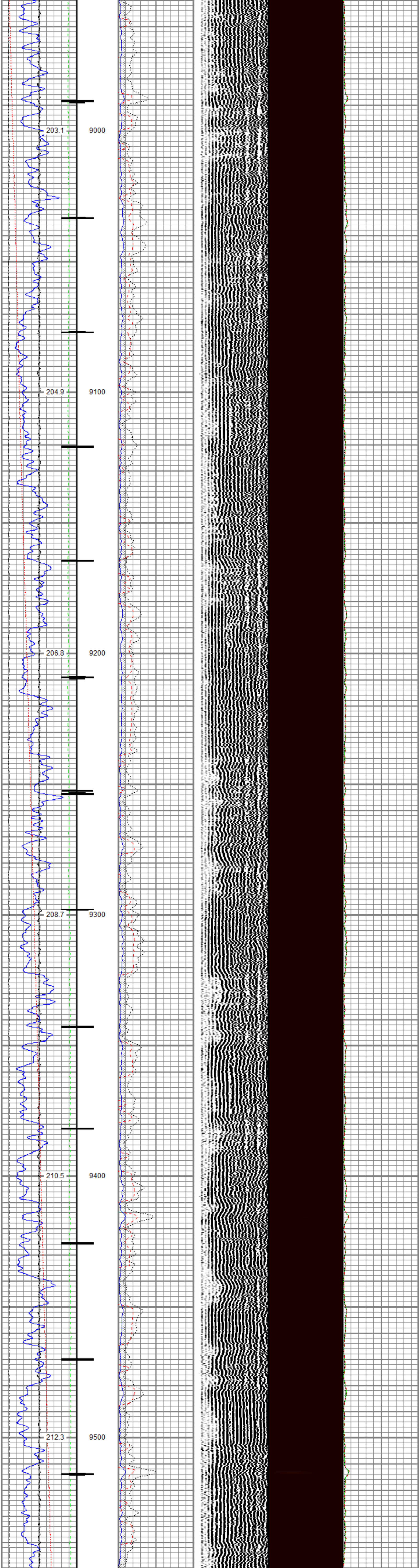

151.9
6200
153.7
6300
Marker Joint
155.6
6400
157.4
6500
159.3
6600
161.7
6700

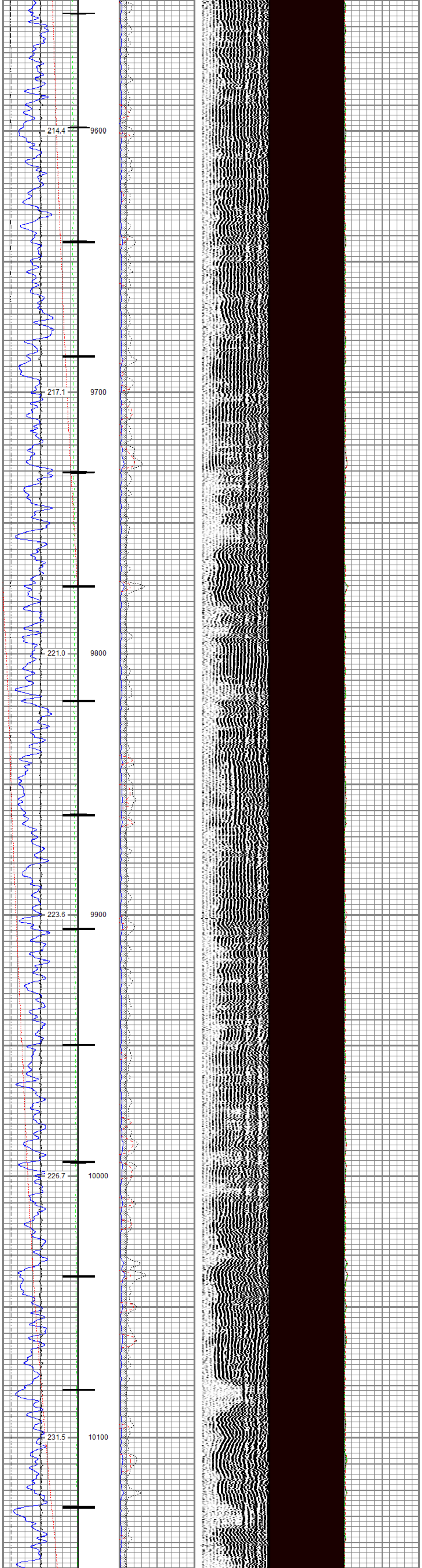

163.7
6800
165.2
6900
167.5
7000
169.4
7100
170.9
7200
172.6
7300

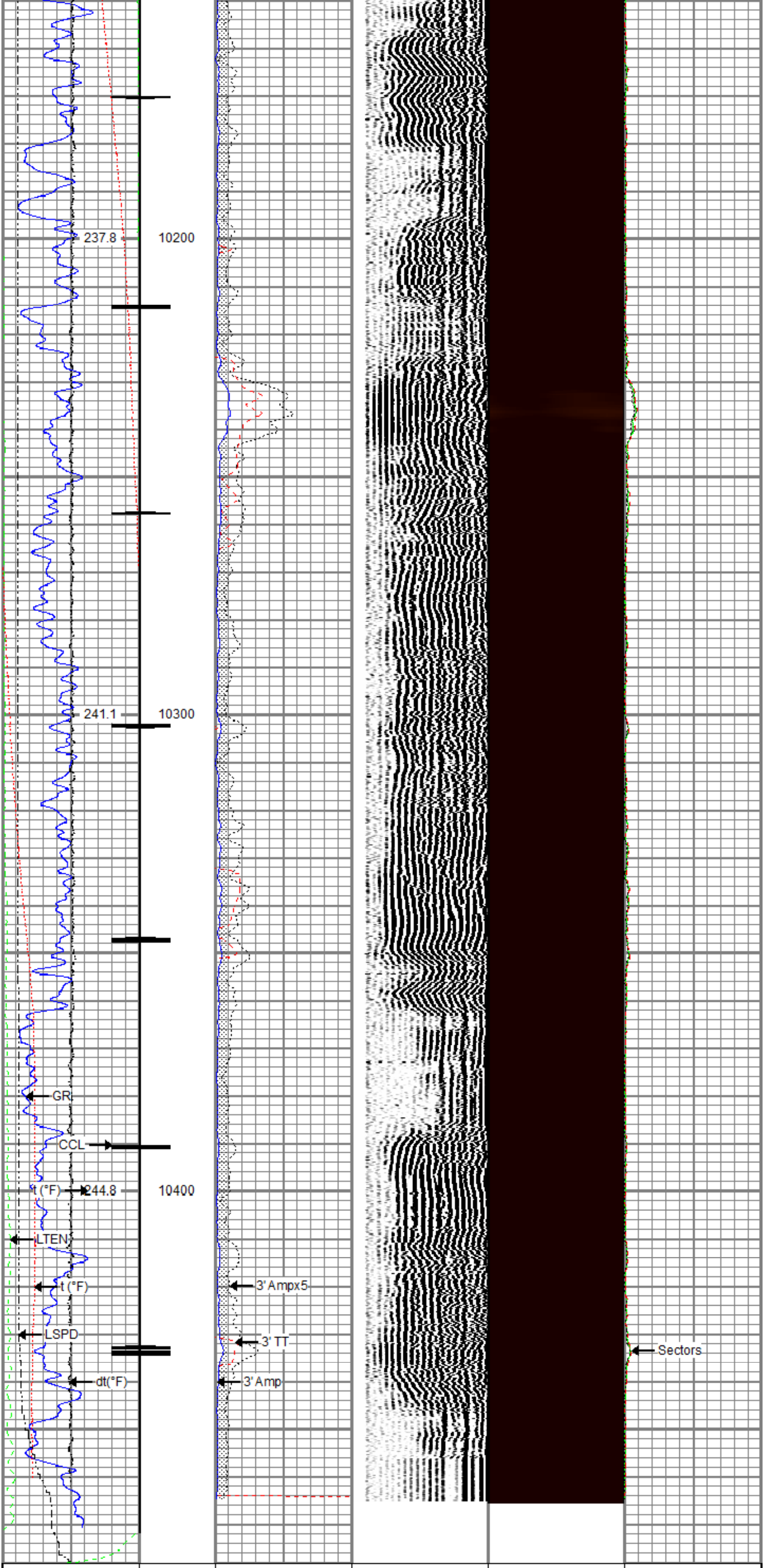

174.1
7400
175.9
7500
177.5
7600
179.5
7700











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				

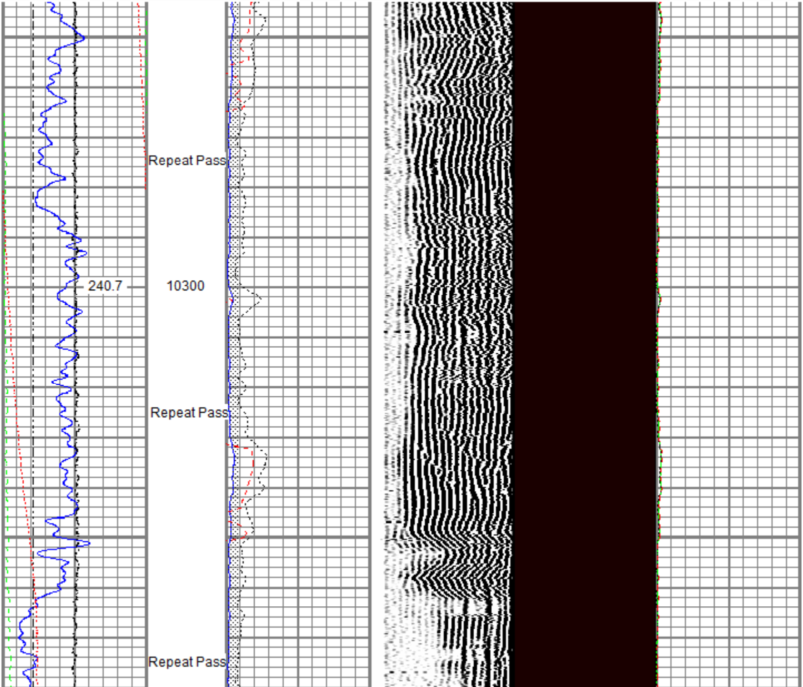
RELIANCE OILFIELD SERVICES

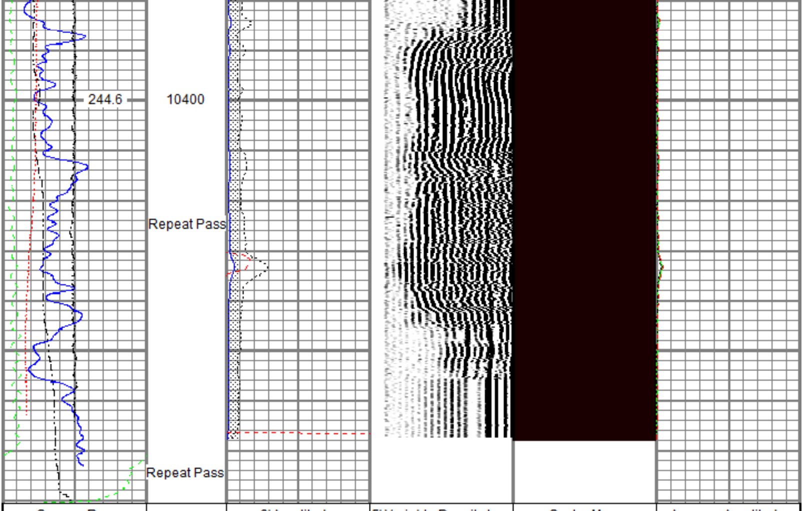
Repeat Pass

Recorded with 0 PSI Surface Induced Pressure

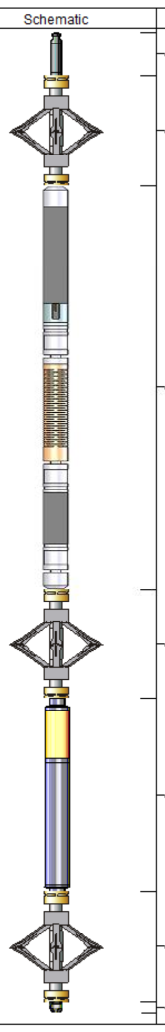
Database File	tep\federal ru 524-17\rbl\tep_federal ru 524-17_rbl_06-05-18.db
Dataset Pathname	repeat.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Wed Jun 06 14:43:47 2018
Charted by	Depth in Feet scaled 1:240

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 WVFS8 WVFS7 WVFS6 WVFS5 WVFS4 WVFS3 WVFS2 WVFS1 WVFCAL WVF3FT WVF5FT	16.33 14.10 14.10 14.10 14.10 14.10 14.10 14.10 14.10 14.10 14.10 13.10		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
CCL$2 CCL$1 GR	6.42 6.42 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 524-17_rbl_06-05-18.db: field/well/run1/main1.1
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 524-17\rbl\tep_federal ru 524-17_rbl_06-05-18.db
Dataset Pathname	main1.1
Dataset Creation	Wed Jun 06 14:38:16 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:	33.334	ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.001	0.871	0.800	81.196	92.397	0.736
CAL	-0.005	0.729				
5'	0.013	0.673	0.800	81.196	121.710	-0.769
SUM						
S1	0.003	1.003	0.000	100.000	100.039	-0.314
S2	0.000	0.935	0.000	100.000	106.922	-0.022
S3	0.003	0.840	0.000	100.000	119.350	-0.307
S4	0.003	0.793	0.000	100.000	126.531	-0.369
S5	0.003	0.781	0.000	100.000	128.598	-0.401
S6	0.003	0.812	0.000	100.000	123.544	-0.334
S7	0.004	0.877	0.000	100.000	114.561	-0.429
S8	-0.001	0.979	0.000	100.000	102.072	0.073

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.005	0.729	1.000	0.000

Air Zero Calibration, performed Tue Jun 05 21:47:47 2018:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	-0.001	0.000	0.000
5'	0.008	0.000	0.001
SUM			
S1	0.001	0.000	-0.001
S2	0.000	0.000	-0.001
S3	0.000	0.000	-0.000
S4	-0.000	0.000	0.000
S5	0.000	0.000	-0.000
S6	-0.000	0.000	-0.000
S7	-0.000	0.000	0.000
S8	-0.000	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	

RELIANCE
OILFIELD SERVICES

Company	TEP Rocky Mountain LLC
Well	Federal RU 524-17
Field	Rulison
County	Garfield
State	Colorado