

## Radial Cement Bond Gamma Ray Casing Collar Log

**Company** Kerr-McGee Oil & Gas Onshore, L.P.  
**Well** HSR CANNON 9-18A  
**Field** Wattenberg  
**County** Weld  
**State** Colorado

**Location:**

API #: 0512320177

SEC 18 TWP 2N RGE 66W

**Permanent Datum** Ground Level  
**Log Measured From** Ground Level  
**Drilling Measured From** Kelly Bushing

**Elevation**  
 K.B. 4874'  
 D.F. ---  
 G.L. 4863'

 Other Services  
None

Date

11-MAR-2019

Run Number

ONE

Depth Driller

8122 FT

Depth Logger

2000 FT

Bottom Logged Interval

1996 FT

Top Log Interval

Surface

Open Hole Size

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Type Fluid

Water

Density / Viscosity

8.34 lb/gal

Max. Recorded Temp.

90°F

Estimated Cement Top

See Log

Time Well Ready

ROA

Time Logger on Bottom

16:00

Equipment Number

HD-343

Location

Platteville, CO

Recorded By

Dennis Roberts

Witnessed By

Nate Winholdtz

**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

8 5/8"

24

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Surface

674 FT

Intermediate #1

4 1/2"

11.6

I-80

Surface

8121 FT

Intermediate #2

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Liner

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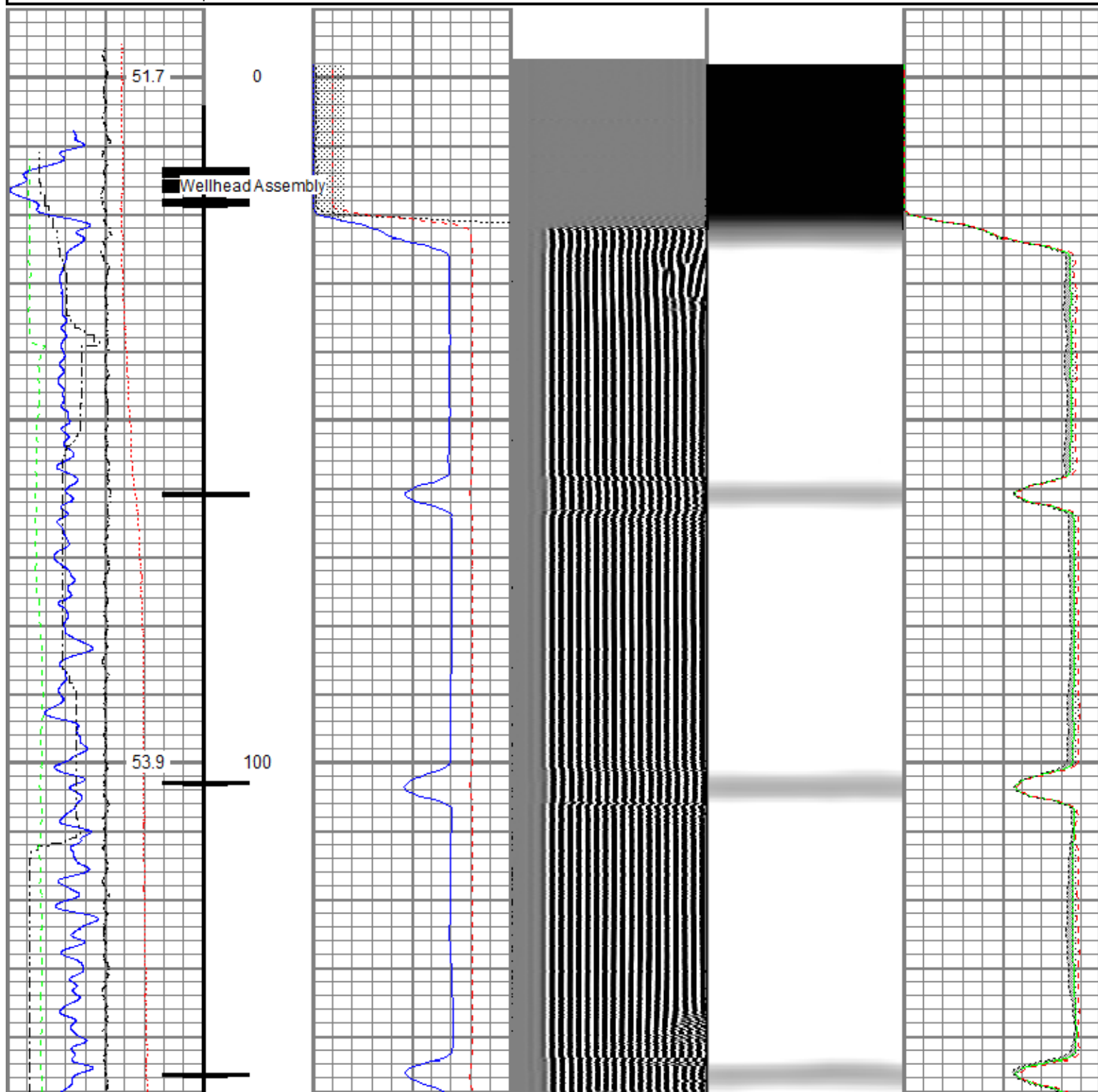
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, 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.

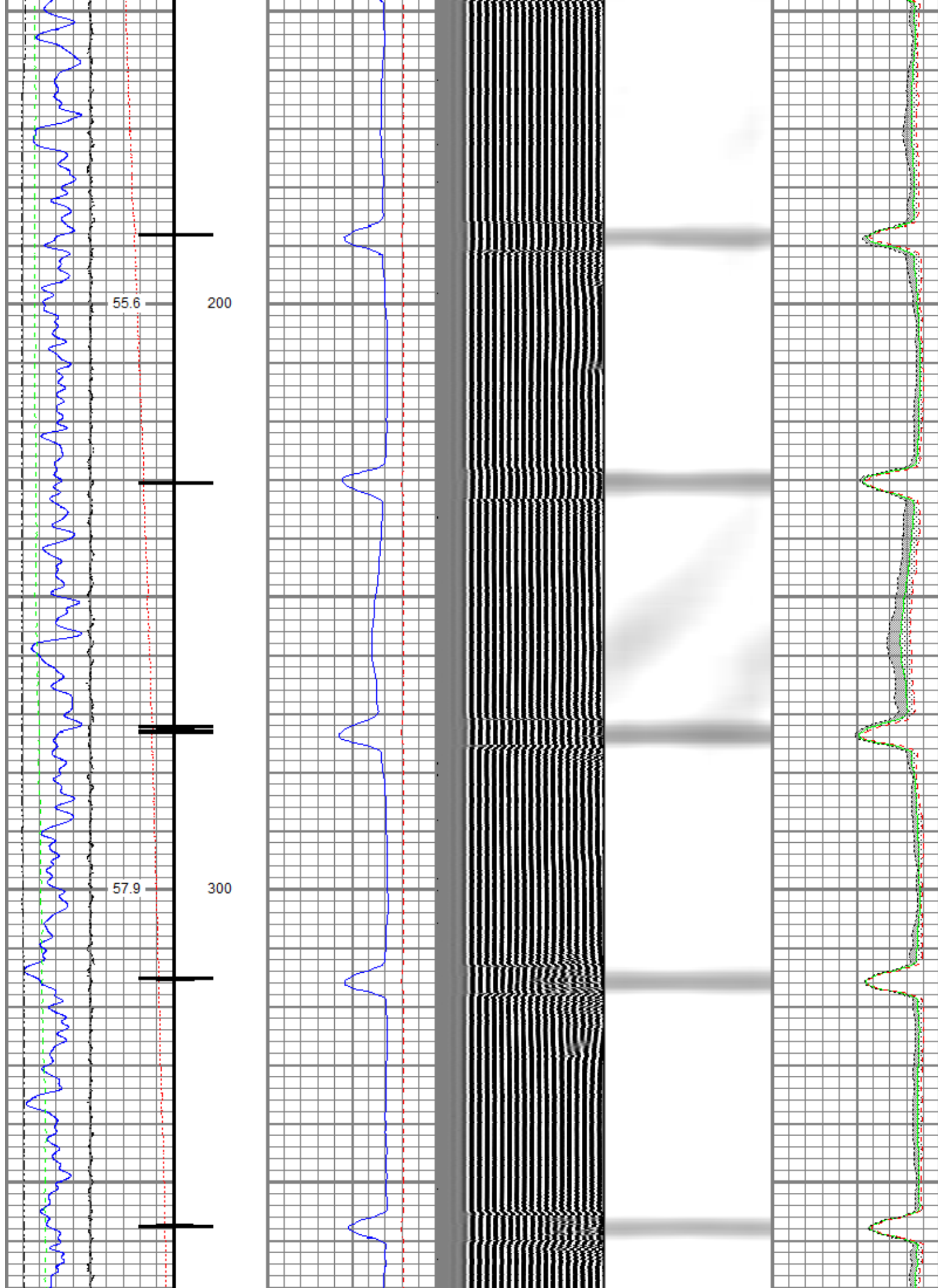
### Comments

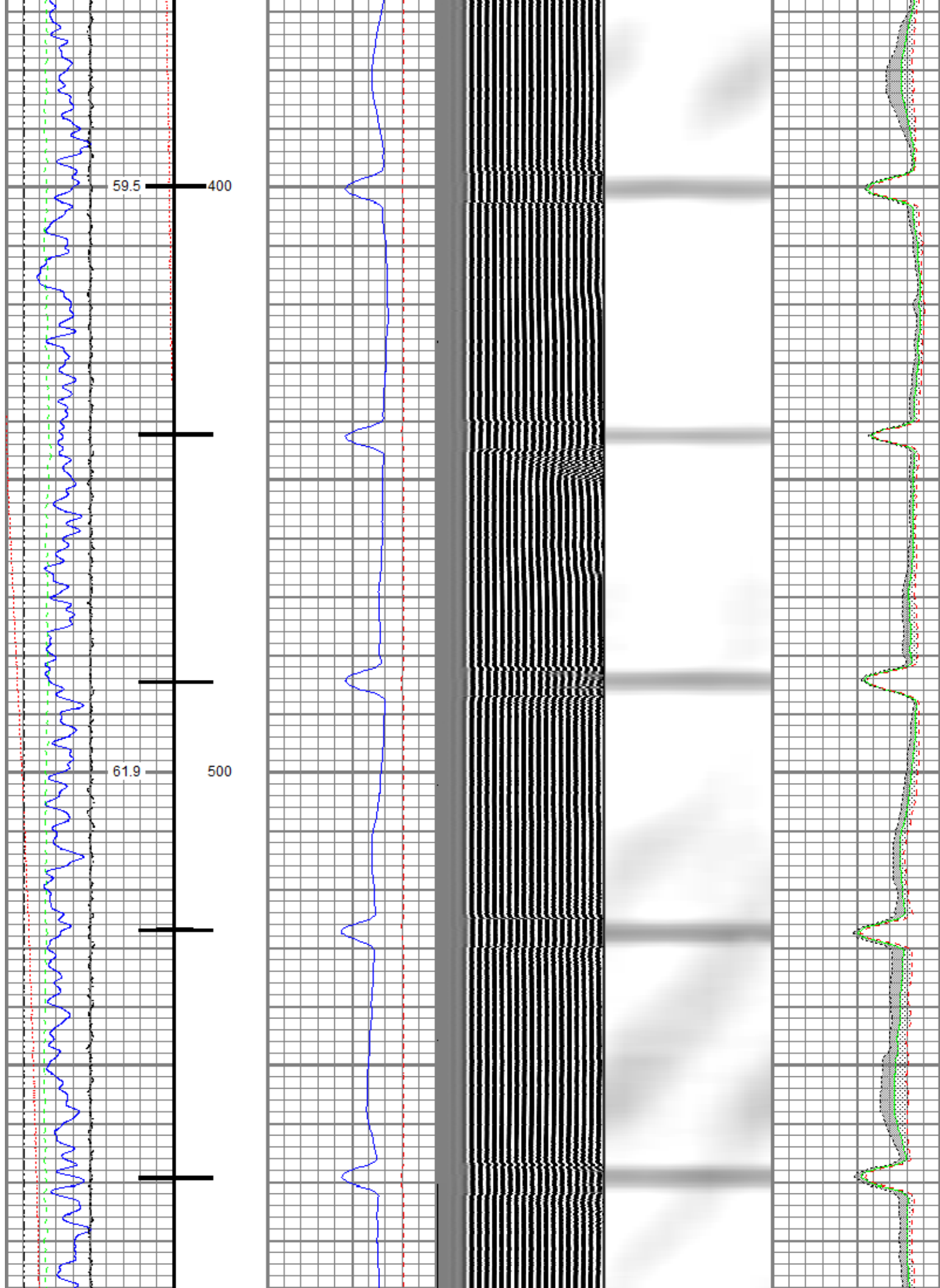
**Log ran as per customer request**  
**Depth referenced to Cement Stage Tool at 4950 FT**  
**Adjusted +17 FT to correlate with Cement Stage Tool**  
**Shop calibrations preformed on the RBL Tool on 10-MAR-2019**  
**Free Pipe Calibrated at 5083 FT**  
**GOBO indicates 80% Bond Index for 4.5-inch casing (16.24 mV)**  
**Log ran with 500 PSI surface induced pressure**  
**Logging tools were clean and free of debris upon completion of operations**  
  
**Thank you for choosing Reliance Oilfield Services, LLC!!**

Database File anadarko\_hsr-cannon\_9-18a\_rcbl\_11-mar-2019.db  
Dataset Pathname RCBL/pass11  
Presentation Format ros\_radli\_anadarko\_vert\_gobo\_45  
Dataset Creation Mon Mar 11 16:09:15 2019  
Charted by Depth in Feet scaled 1:240

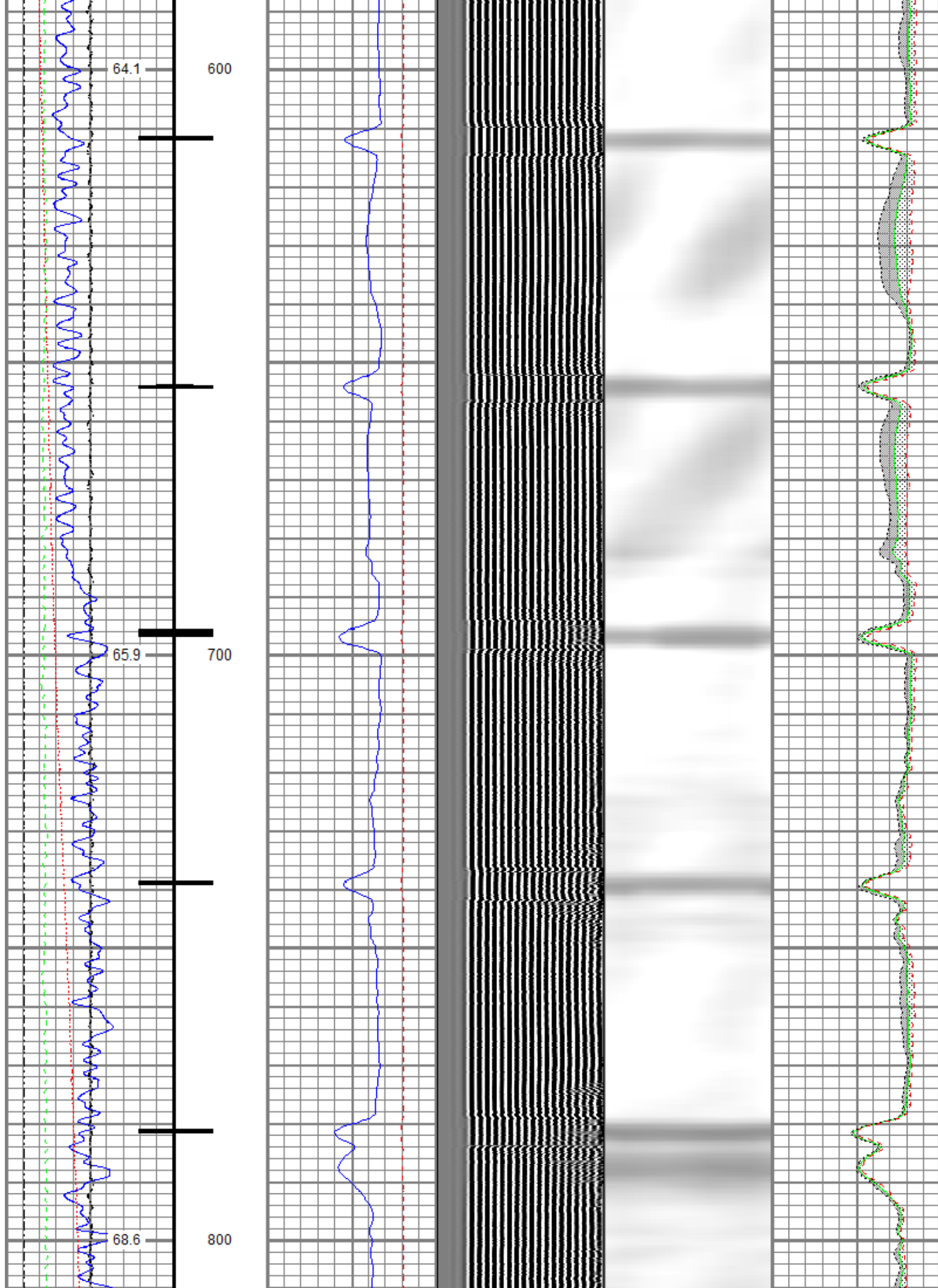
Gamma Ray	0 3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	Average Amplitude
(GAPI) 120	3' Amplitude x 5	200 (usec) 1200		0 100
Temperature	0 (mV) 20			Minimum Amplitude
(degF) 20	3' Travel Time			0 100
Line Speed	650 (usec) 150			Maximum Amplitude
(ft/min) 150				0 100
Line Tension (lb) 000				
Differential Temperature				
(degF) 2				
Casing Collar Locator				

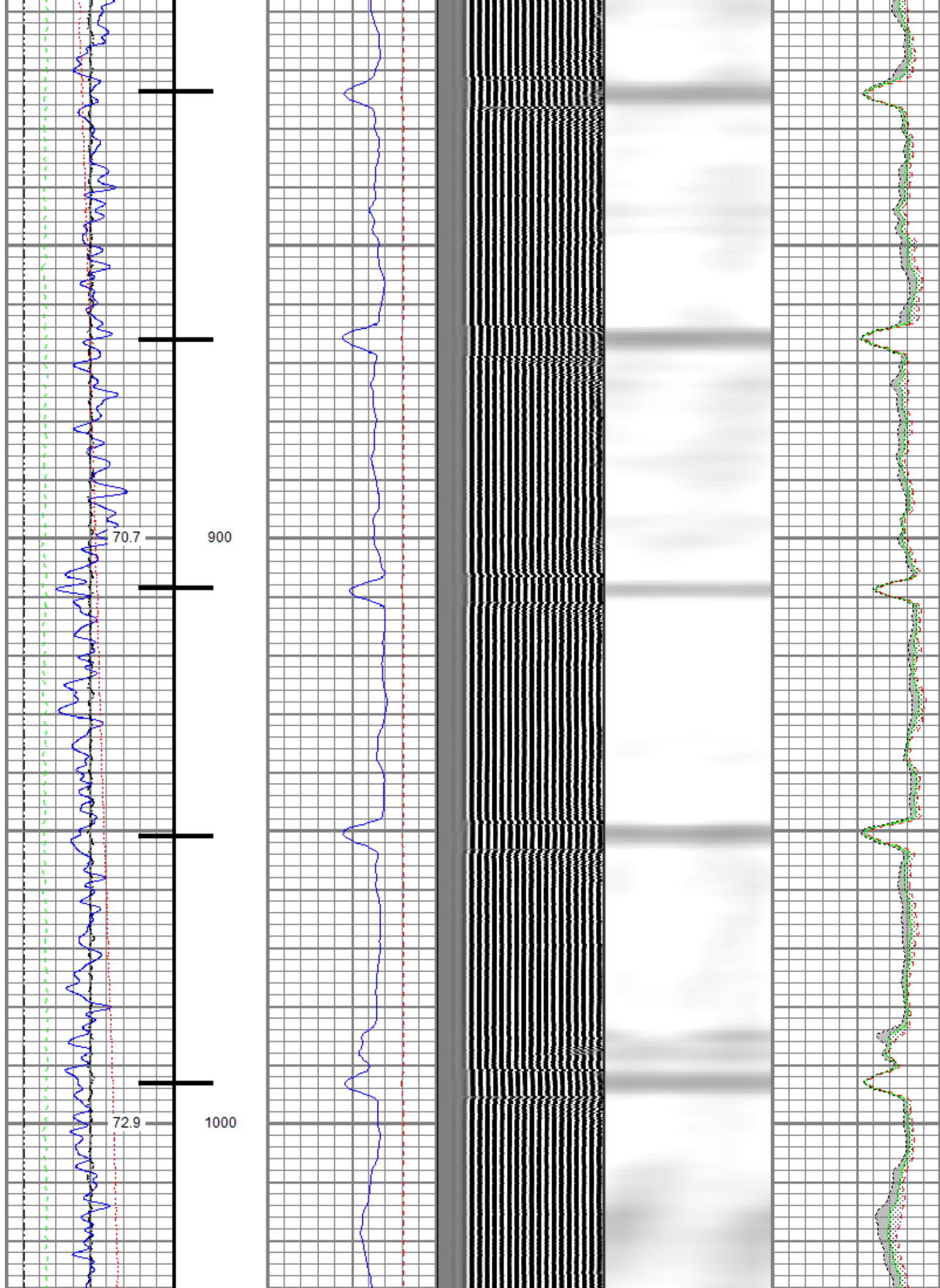


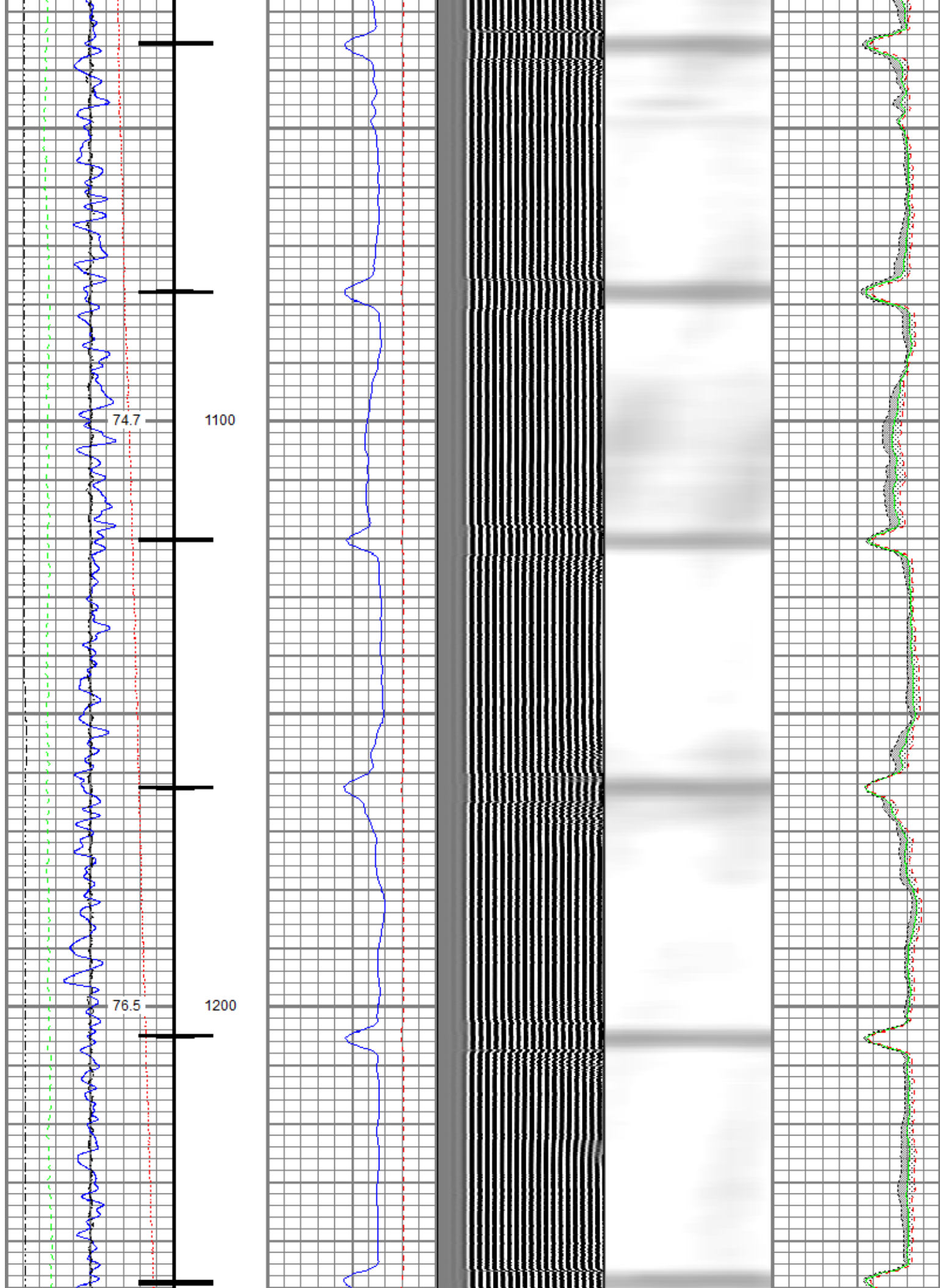


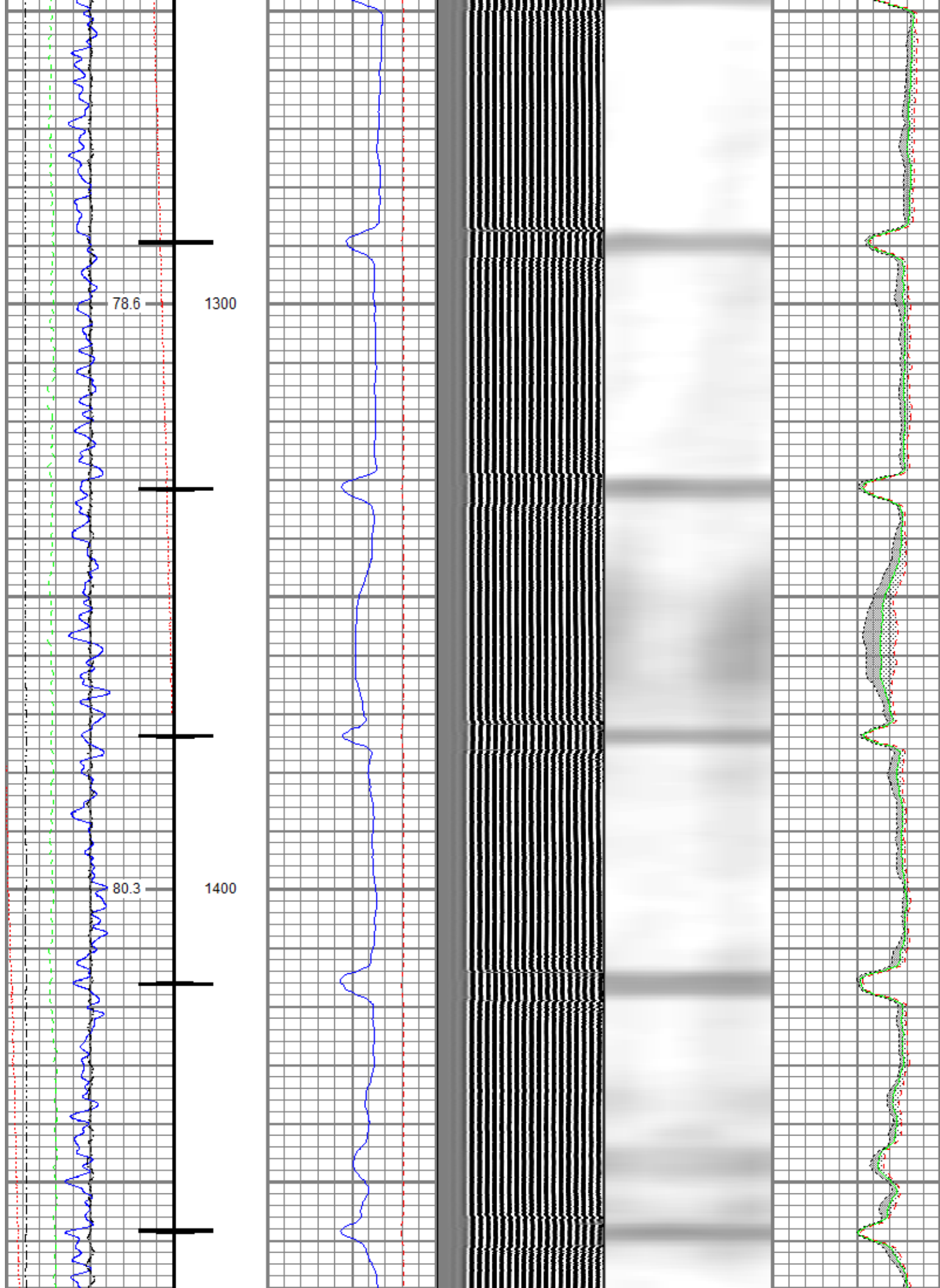




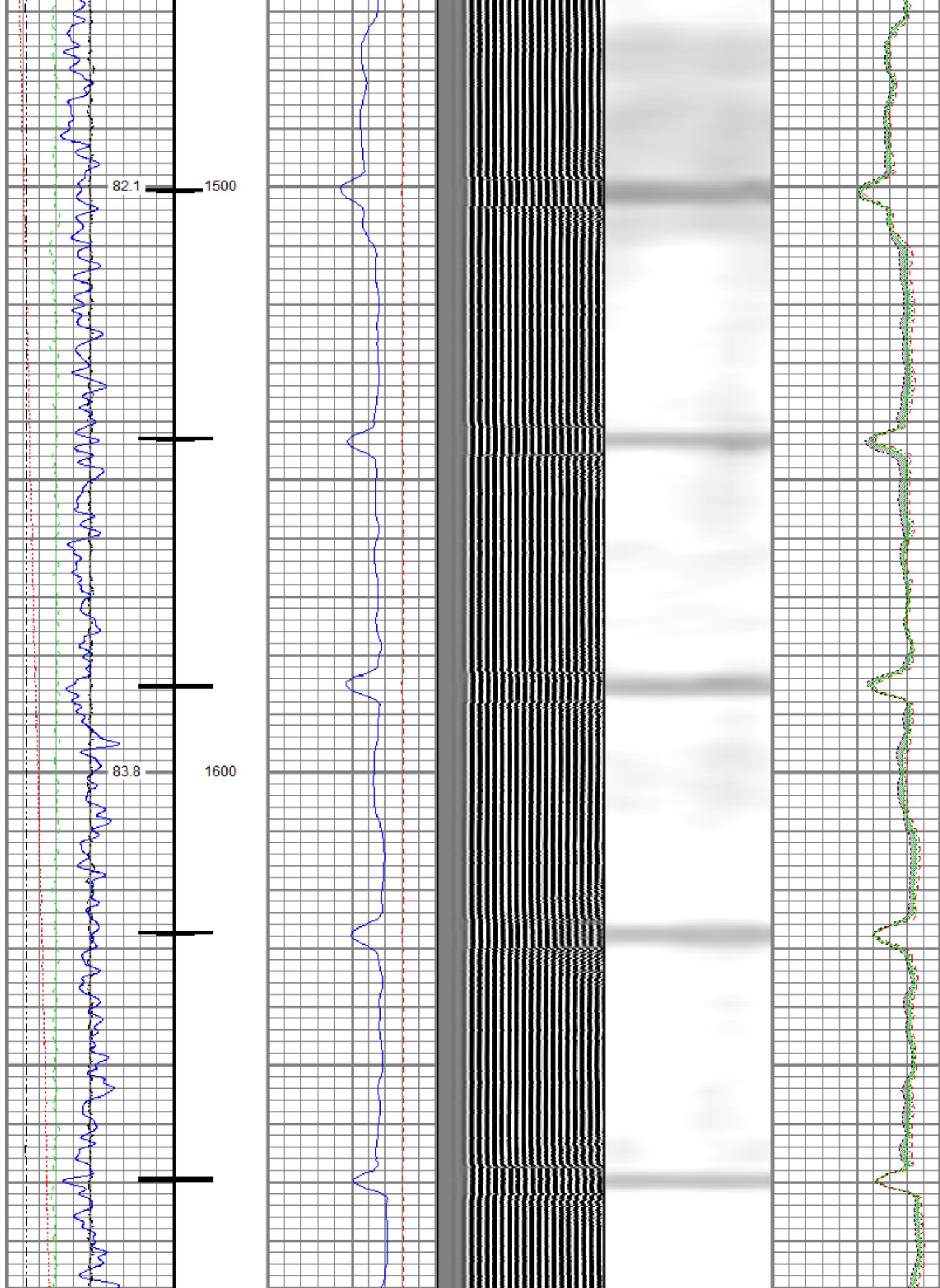


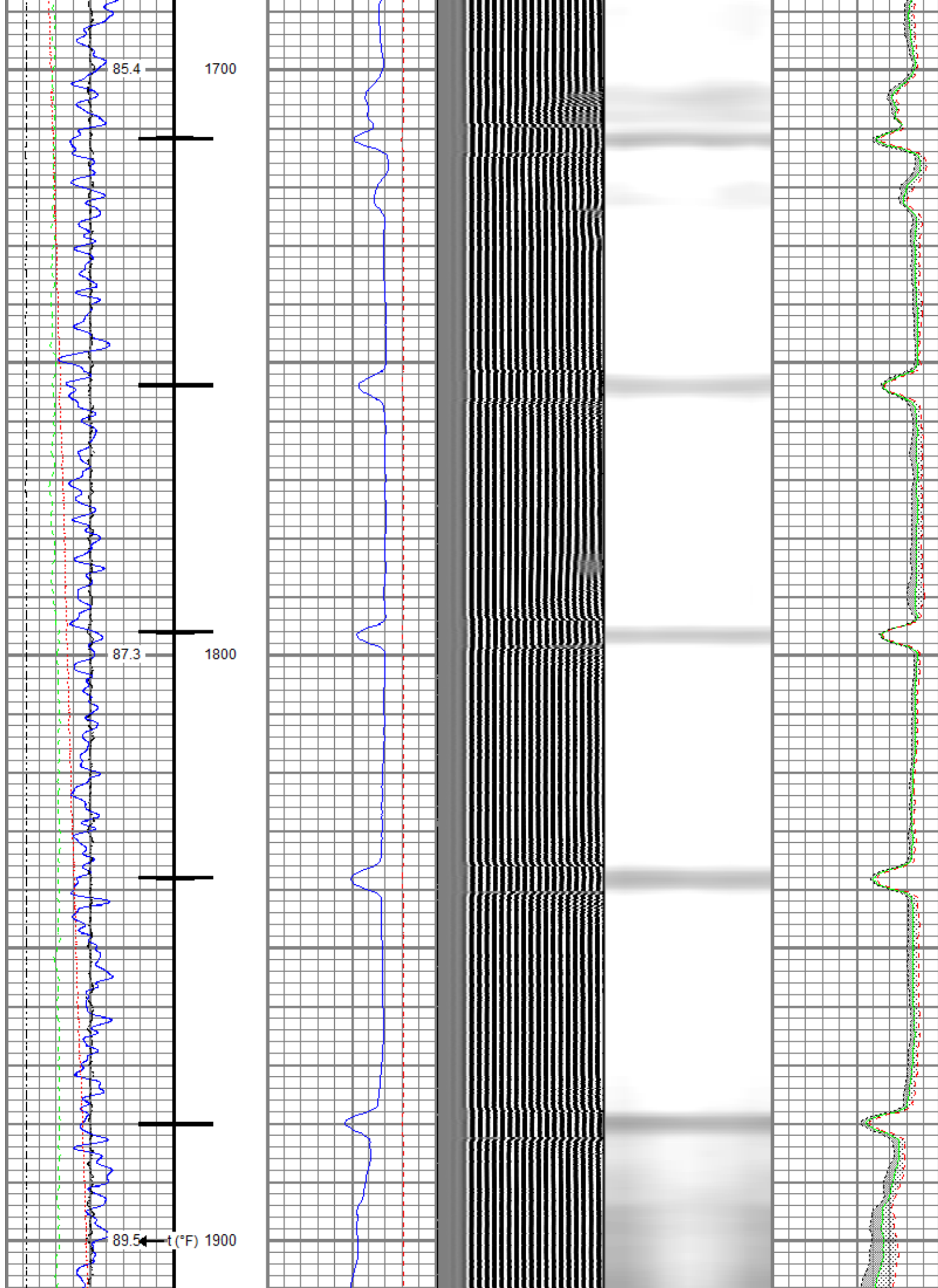


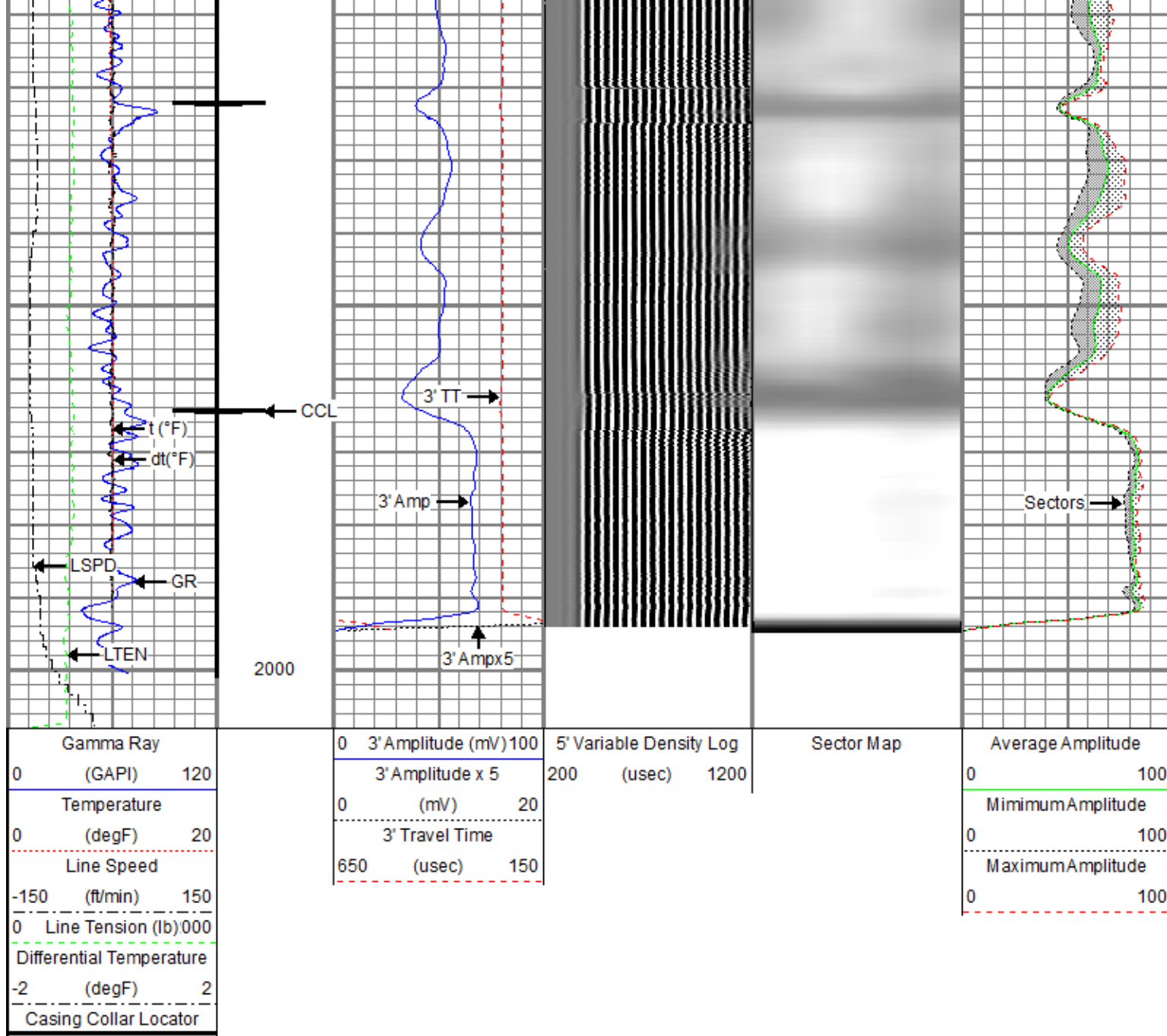








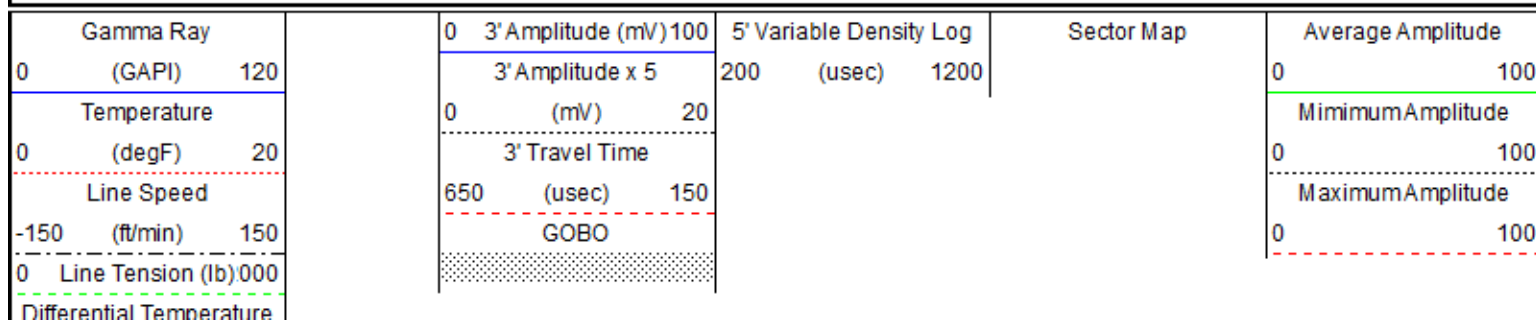


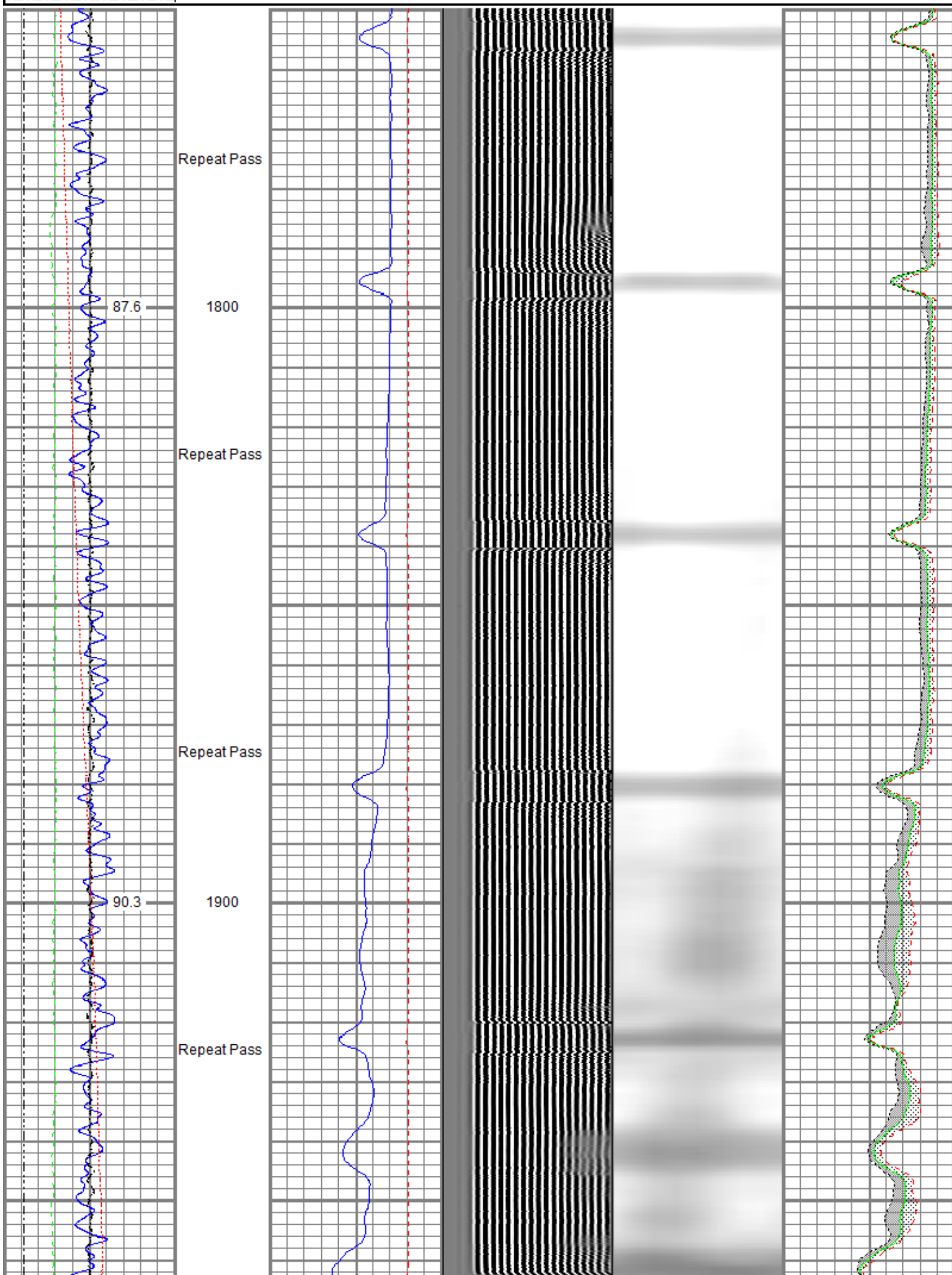


## Repeat Pass

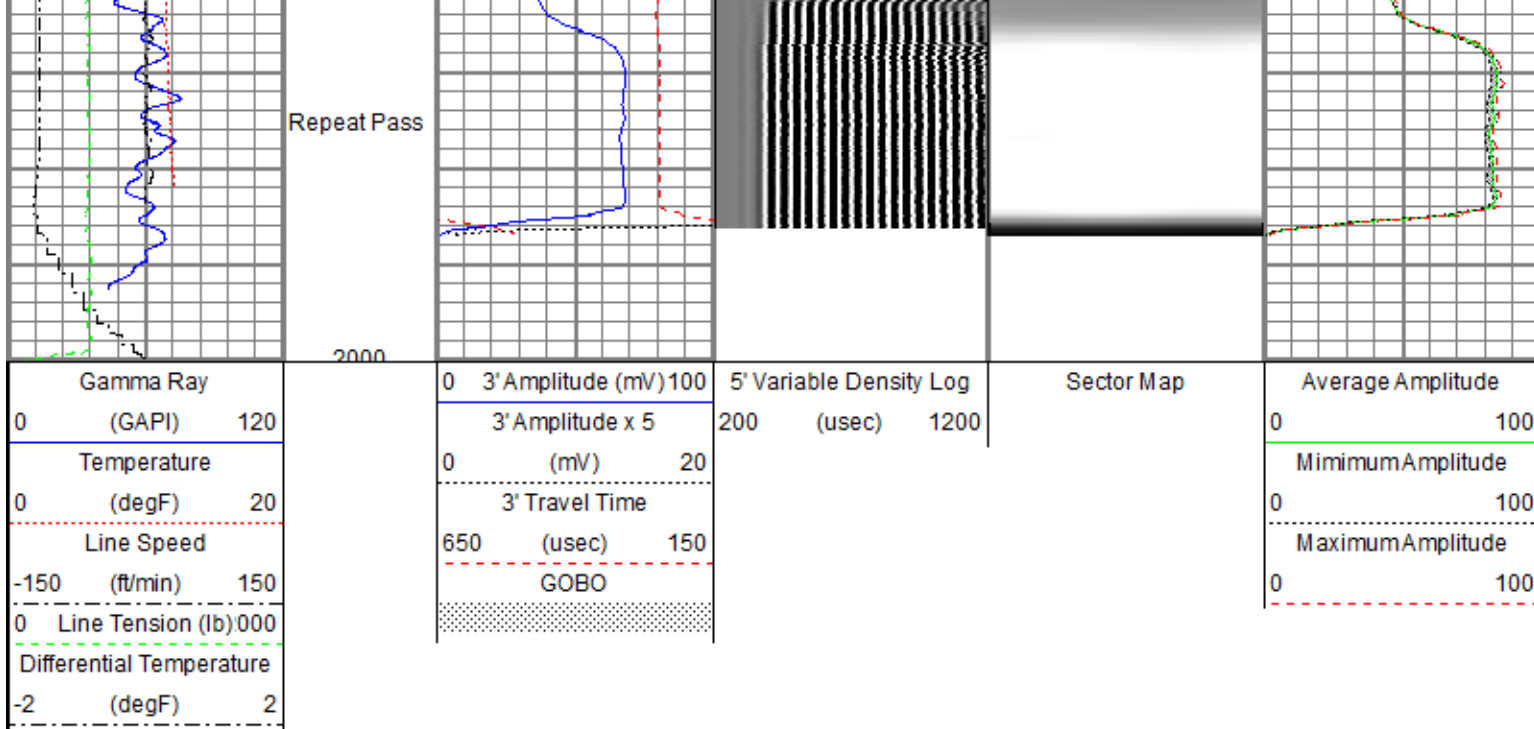
Recorded With 500 PSI Surface Induced Pressure

Database File: anadarko\_hsr-cannon\_9-18a\_rcbl\_11-mar-2019.db  
 Dataset Pathname: RCBL/pass9  
 Presentation Format: ros\_radri\_anadarko\_vert\_gobo\_45  
 Dataset Creation: Mon Mar 11 16:04:50 2019  
 Charted by: Depth in Feet scaled 1:240





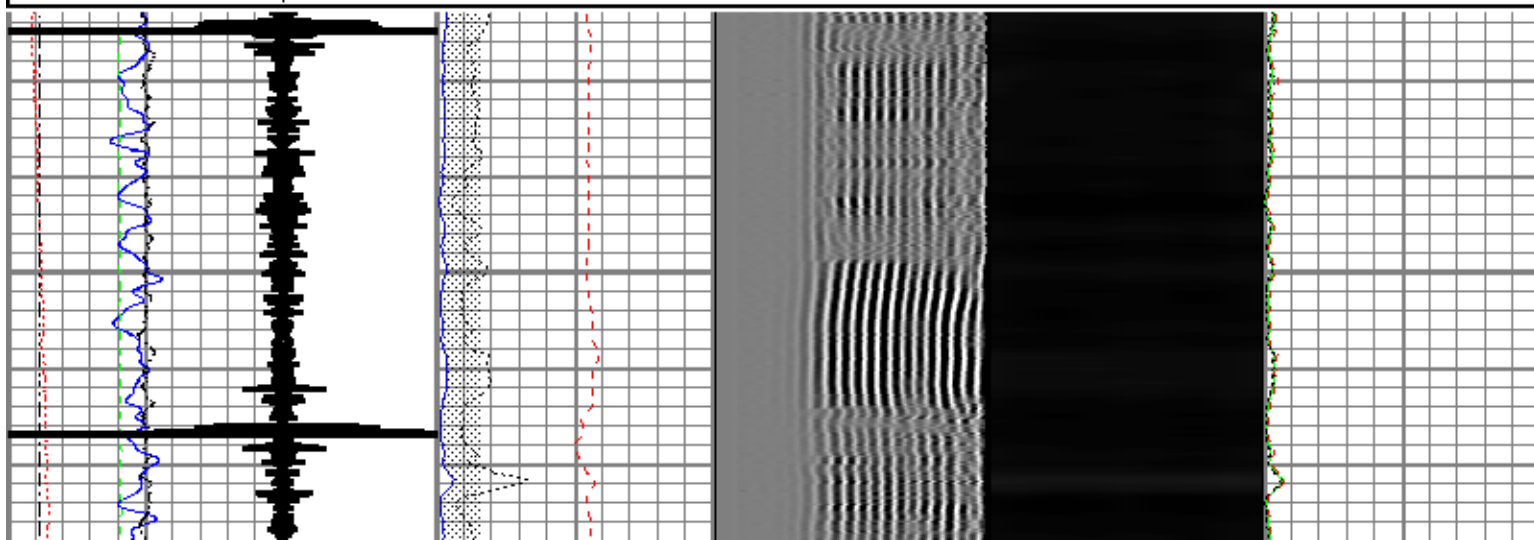
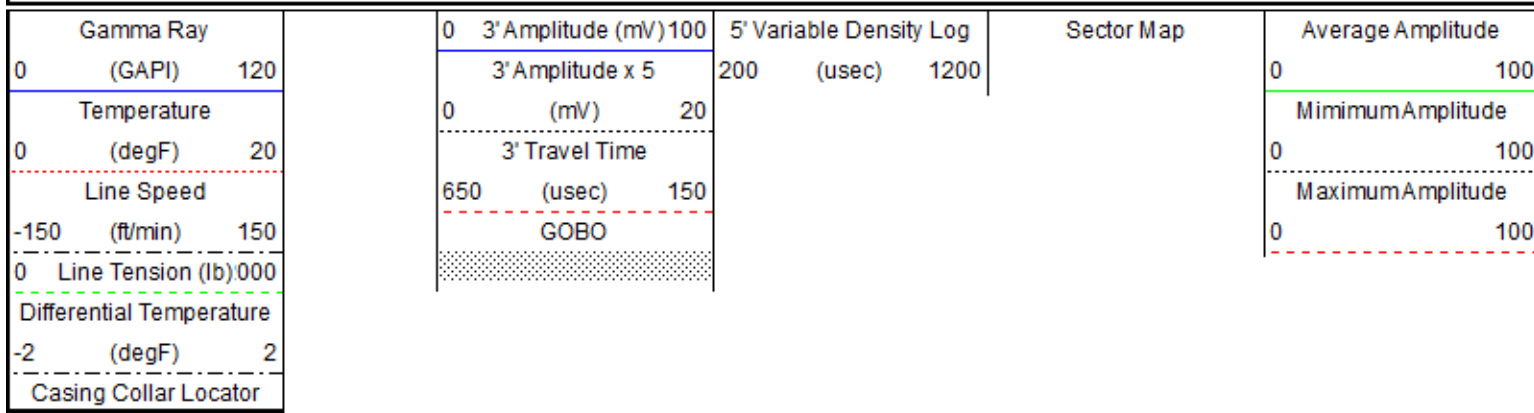


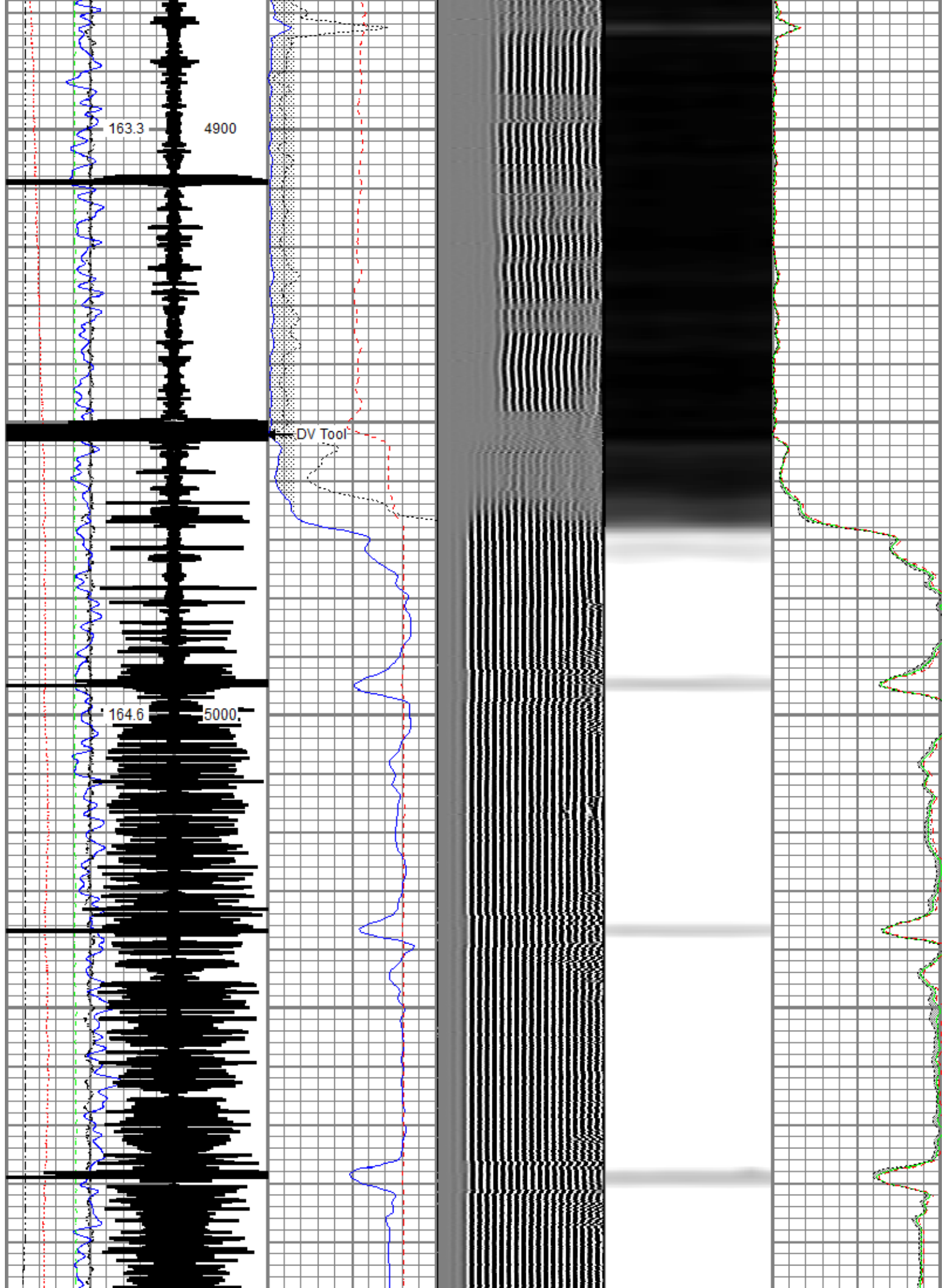


## Tie In Strip

Corralate to DV Tool

Database File: anadarko\_hsr-cannon\_9-18a\_rcbl\_11-mar-2019.db  
 Dataset Pathname: RCBL/pass7  
 Presentation Format: ros\_radrii\_anadarko\_vert\_gobo\_45  
 Dataset Creation: Mon Mar 11 15:50:05 2019  
 Charted by: Depth in Feet scaled 1:240





Gamma Ray	0	3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	Average Amplitude
(GAPI) 120		3' Amplitude x 5	200 (usec) 1200		0 100
Temperature	0	(mV) 20			Minimum Amplitude
(degF) 20		3' Travel Time			0 100
Line Speed	-150	(usec) 150			Maximum Amplitude
(ft/min) 150		GOBO			0 100
Line Tension (lb) 000					
Differential Temperature	-2				
(degF) 2					
Casing Collar Locator					

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
			Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00
TEMP	16.75					
			Probe Radii-2750 RBT (FW1302-001) Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub	9.39	2.75	105.00
WVFS8	14.52					
WVFS7	14.52					
WVFS6	14.52					
WVFS5	14.52					
WVFS4	14.52					
WVFS3	14.52					
WVFS2	14.52					
WVFS1	14.52					
WVFCAL	14.52					
WVF3FT	14.52					
WVF5FT	13.52					
HEADVOLT	10.27		Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00
CCL\$2	6.51					
CCL\$1	6.51					
GR	5.26		Probe GR-CCL-2750 GOB (FW1212-026) Probe 2-3/4" rev.2 Digital Scintillation Gamma Ray/CCL Combined with GO Bottom	4.51	2.75	55.00



Probe CENT-2750  
Probe 2-3/4" Electric Inline Bowspring Centralizer

2.88

2.75

20.00

Dataset: anadarko\_hsr-cannon\_9-18a\_rcbl\_11-mar-2019.db: field/well/RCBL/pass11  
Total length: 23.57 ft  
Total weight: 223.60 lb  
O.D.: 2.75 in

#### Calibration Report

Database File anadarko\_hsr-cannon\_9-18a\_rcbl\_11-mar-2019.db  
Dataset Pathname RCBL/pass11  
Dataset Creation Mon Mar 11 16:09:15 2019

#### Gamma Ray Calibration Report

Serial Number: FW1212-026  
Tool Model: 2750 GOB  
Performed: Mon Mar 11 15:20:32 2019  
  
Calibrator Value: 637.0 GAPI  
  
Background Reading: 113.7 cps  
Calibrator Reading: 1029.1 cps  
  
Sensitivity: 0.5000 GAPI/cps

#### Segmented Cement Bond Log Calibration Report

Serial Number: FW1302-001  
Tool Model: 2750 RBT  
  
Calibration Casing Diameter: 4.500 in  
Calibration Depth: 5055.700 ft

Master Calibration, performed Mon Mar 11 15:49:12 2019:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.008	0.641	0.800	81.196	126.992	-0.237
CAL	0.730	0.714				
5'	0.009	0.517	0.800	81.196	158.216	-0.666
SUM						
S1	0.001	0.599	0.000	100.000	167.255	-0.163
S2	0.008	0.602	0.000	100.000	168.127	-1.262
S3	0.008	0.623	0.000	100.000	162.633	-1.292
S4	0.007	0.671	0.000	100.000	150.685	-1.045
S5	0.007	0.735	0.000	100.000	137.392	-0.973
S6	0.007	0.745	0.000	100.000	135.553	-0.923
S7	0.007	0.696	0.000	100.000	145.071	-1.018
S8	0.007	0.641	0.000	100.000	157.720	-1.173

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.730	0.714	1.000	0.000



Air Zero Calibration, performed Mon Mar 11 15:25:40 2019:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	0.000	0.000	0.000
5'	0.000	0.000	0.000
SUM			
S1	0.000	0.000	0.000
S2	0.000	0.000	0.000
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: Mon Oct 01 11:32:14 2018

	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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**Well** HSR CANNON 9-18A  
**Field** Wattenberg  
**County** Weld  
**State** Colorado