

HALLIBURTON

RADIAL CEMENT  
BOND LOG

|  |  |                                 |  |
|--|--|---------------------------------|--|
| Company  |  | EXTRACTION OIL & GAS INC        |  |
| Well   |  | LIVINGSTON S19-25-5C            |  |
| Field  |  | WATTENBERG                      |  |
| County   |  | BROOMFIELD CO                   |  |
| Company  |  | EXTRACTION OIL & GAS INC        |  |
| Well   |  | LIVINGSTON S19-25-5C            |  |
| Field  |  | WATTENBERG                      |  |
| County   |  | BROOMFIELD State CO             |  |
| API No.: 050142075500  |  | Serv #: 905895849               |  |
| Location: SURFACE HOLE LOCATION:<br>2332' FSL & 1456' FEL NWSE |  | Other Services                  |  |
| LATITUDE: 39.978563<br>LONGITUDE: -105.039865                  |  | NONE                            |  |
| Sec: 7 Twp: 1S Rge: 68W  |  |                                 |  |
| Permanent Datum  |  | GROUND LEVEL Elevation 5319     |  |
| Log Measured From  |  | KB , 29 Ft. above perm. datum   |  |
| Drilling Measured From   |  | KB                              |  |
| Date @ Time Logged   |  | 08/11/19 @ 16:30                |  |
| Run No.  |  | ONE                             |  |
| Depth - Driller  |  | 21457                           |  |
| Depth - Logger   |  | 8086                            |  |
| Bottom - Logged Interval                                       |  | 8074                            |  |
| Top - Log Interval   |  | SURFACE                         |  |
| Max. Recorded Temp.  |  | 227 F                           |  |
| CEMENTING DATA   |  | Surface String                  |  |
| Date / Time Cemented   |  | String                          |  |
| Primary / Squeeze  |  | String                          |  |
| Expected Compressive Strength                                  |  | psi@ hrs                        |  |
| Cement Volume  |  | psi@ hrs                        |  |
| Cement Type / Weight   |  | psi@ hrs                        |  |
| Formulation  |  | psi@ hrs                        |  |
| Mud Type / Mud Wgt.  |  | psi@ hrs                        |  |
| Borehole Record  |  | Casing & Tubing Record          |  |
| Run Number   |  | Bit From To Size Weight From To |  |
| ONE  |  | 12.25 0 1500 9.625 36 0 1500    |  |
| TWO  |  | 8.5 1500 21457 5.5 17 0 21457   |  |

<<< Fold Here >>>

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

Comments

CBL - GR - CCL RAN IN COMBINATION.

LOG RECORDED WITH 1000 PSI WELLHEAD PRESSURE.

LOG CORRELATED TO MARKER JOINT AT 7943.

BOND INDEX CALCULATED FOR 3000 PSI COMPRESSIVE STRENGTH CEMENT.

\*\*\*THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES.\*\*\*

YOUR CREW TODAY WAS:

M.DEAL, R.MATHE, D. ABERNATHY

|  |           |            |              |            |                      |
|--|-----------|------------|--------------|------------|----------------------|
| Service Ticket No.   | 905895849 | API No.    | 050142075500 | PGM Ver    | WARRIOR 8            |
| The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client |           |            |              |            |                      |
| EQUIPMENT DATA   |           |            |              |            |                      |
| RCBL   |           | GAMMA CCL  |              |            |                      |
| Run No.  | ONE       | Run No.    | ONE          | Run No.    |                      |
| Serial No.   | 11577056  | Serial No. | 11021927     | Serial No. |                      |
| Model No.  | PROBE     | Model No.  | PROBE        | Model No.  |                      |
| Diameter   | 2.75      | Diameter   | 2.75         | Diameter   |                      |
| LOGGING DATA   |           |            |              |            |                      |
| General Data   |           |            |              |            |                      |
| Pass   | Depths    |            | Well Head    | Speed      | Logging Run Comments |
| No   | From      | To         | Pressure     | Ft/Min     |                      |

|                         |           |         |           |     |       |      |            |
|-------------------------|-----------|---------|-----------|-----|-------|------|------------|
| ONE                     | KOP       | SURFACE | 1000 PSI  | 100 |       |      |            |
|                         |           |         |           |     |       |      |            |
|                         | GAMMA RAY |         | AMPLITUDE |     | VDL   |      | RADIAL MAP |
| Pass                    | Scale     |         | Scale     |     | Scale |      | Scale      |
| No.                     | L         | R       | L         | R   | L     | R    | L          |
| ONE                     | 0         | 100     | 0         | 100 | 200   | 1200 | 1          |
|                         |           |         |           |     |       |      | 8          |
|                         |           |         |           |     |       |      |            |
| DIRECTIONAL INFORMATION |           |         |           |     |       |      |            |
| Maximum Deviation       | 90        | deg. @  |           | KOP | 8036  |      |            |
|                         |           |         |           |     |       |      |            |
|                         |           |         |           |     |       |      |            |

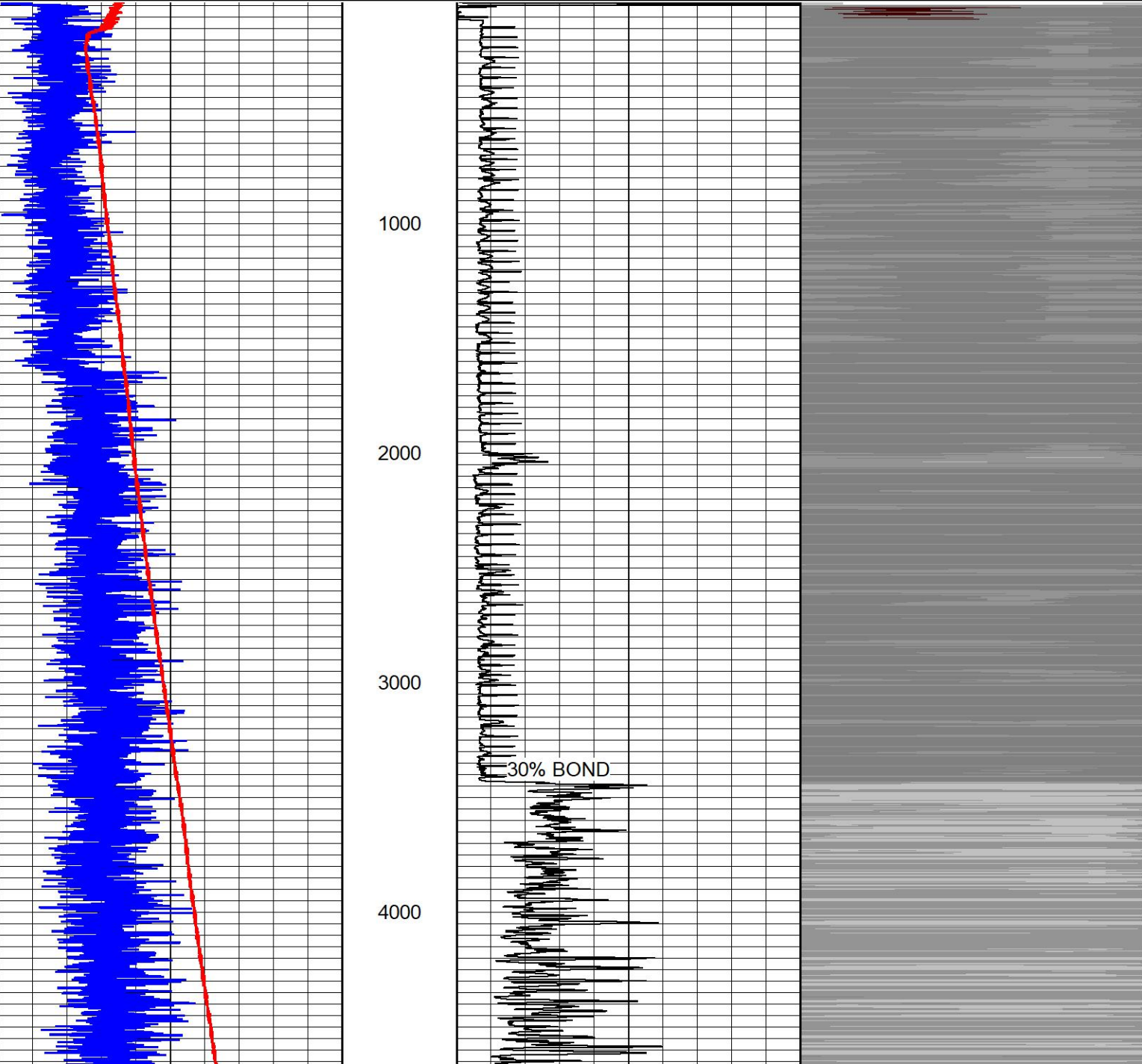
BOND INDEX

HALLIBURTON

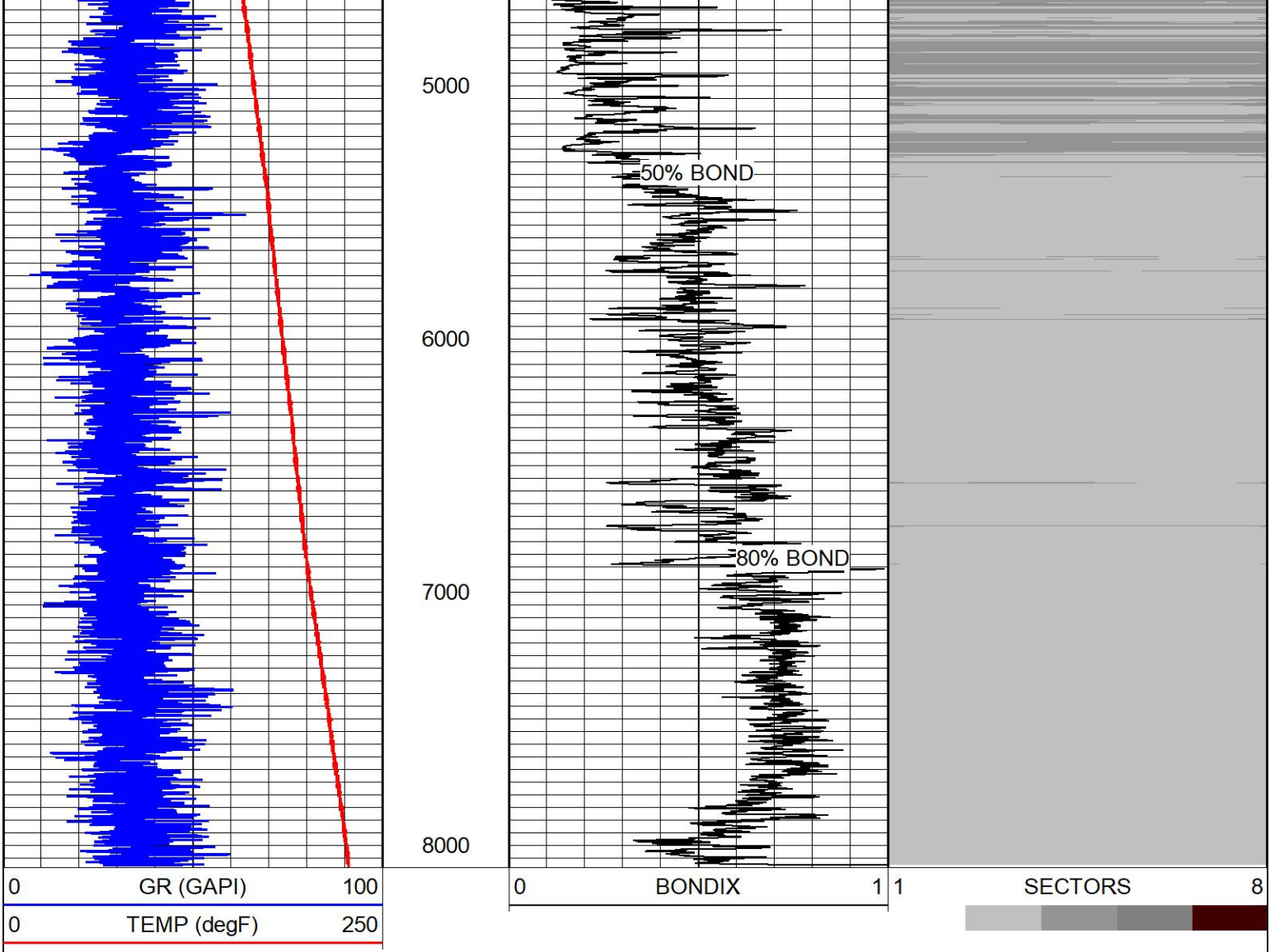
1:7500

Database File        livingston\_s19-25-5c.db  
Dataset Pathname    MAIN\_PASS.1  
Presentation Format   EXTRAC~2  
Dataset Creation     Sun Aug 11 18:35:58 2019  
Charted by           Depth in Feet scaled 1:7500

|   |             |     |   |        |   |   |         |   |
|---|-------------|-----|---|--------|---|---|---------|---|
| 0 | GR (GAPI)   | 100 | 0 | BONDIX | 1 | 1 | SECTORS | 8 |
| 0 | TEMP (degF) | 250 |   |        |   |   |         |   |







BOND INDEX

1:7500

HALLIBURTON

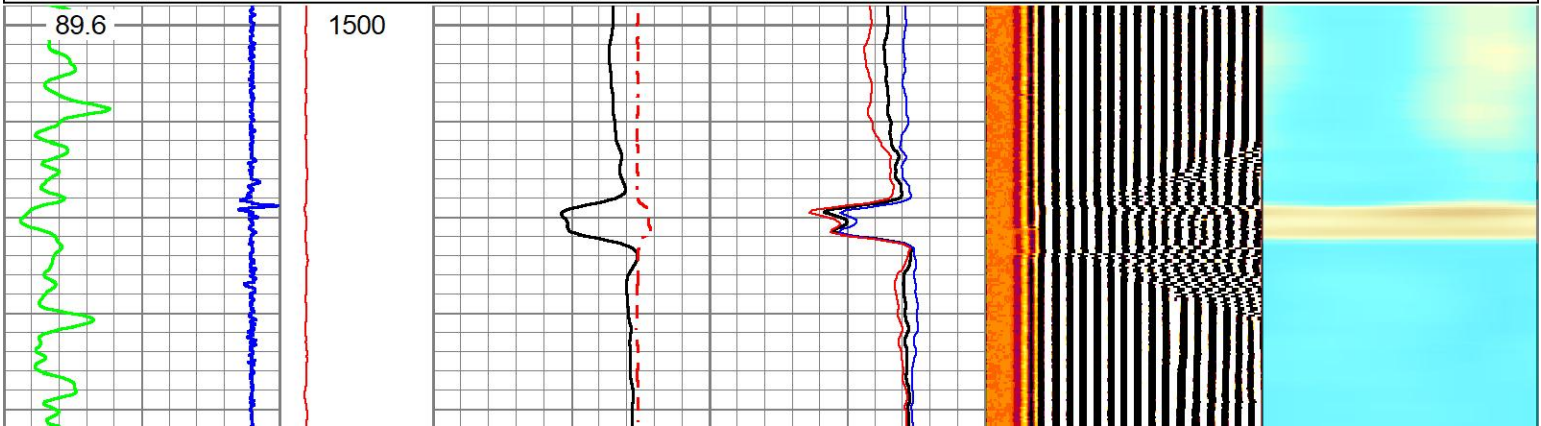
FREE PIPE PASS

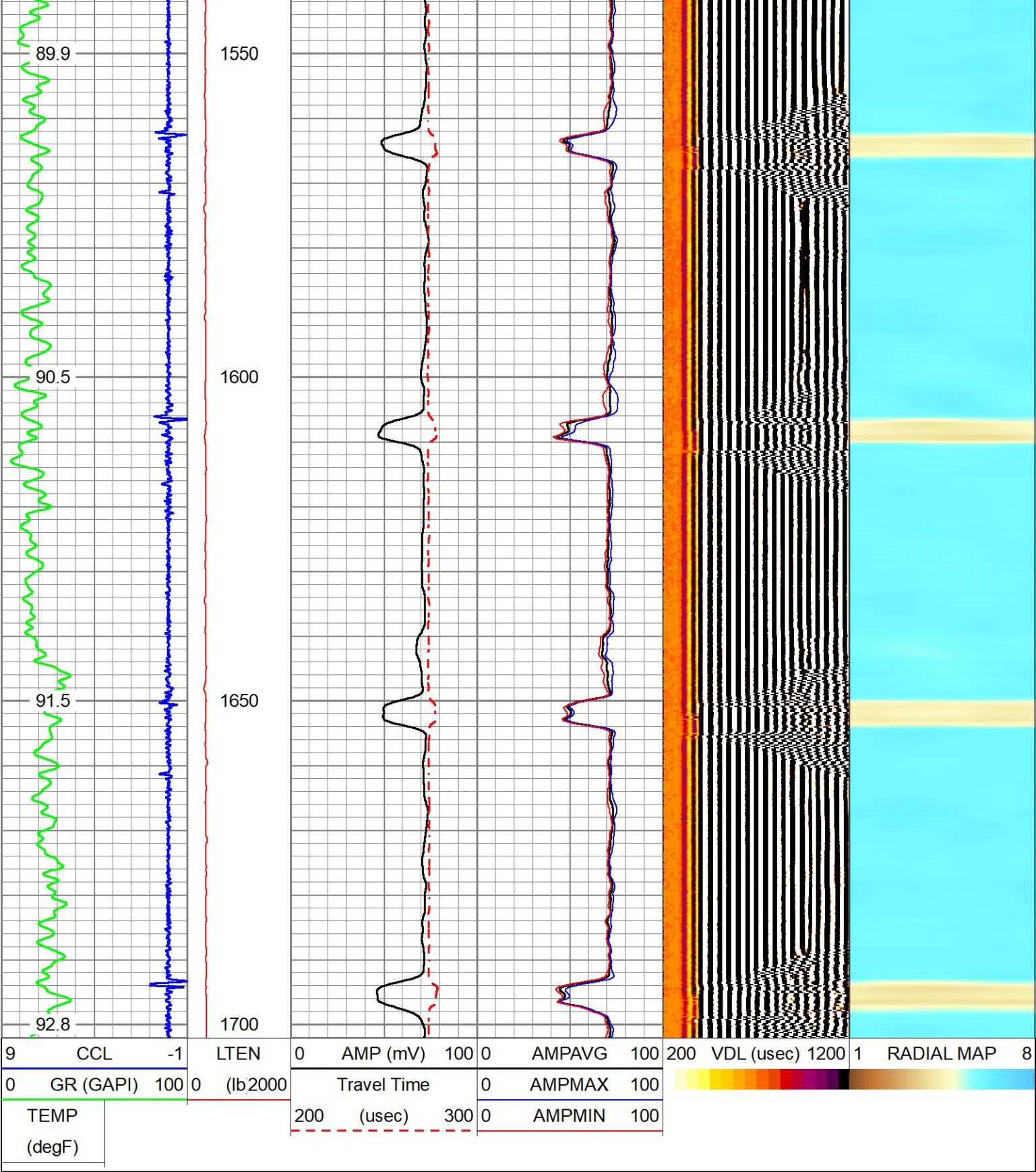
5" = 100'

HALLIBURTON

Database File      livingston\_s19-25-5c.db  
Dataset Pathname    FREE\_PIPE\_PASS1  
Presentation Format    EXTRAC~1  
Dataset Creation      Sun Aug 11 15:54:22 2019  
Charted by            Depth in Feet scaled 1:240

|        |           |     |      |           |             |        |     |        |        |     |            |      |   |            |   |
|--------|-----------|-----|------|-----------|-------------|--------|-----|--------|--------|-----|------------|------|---|------------|---|
| 9      | CCL       | -1  | LTEN | 0         | AMP (mV)    | 100    | 0   | AMPAVG | 100    | 200 | VDL (usec) | 1200 | 1 | RADIAL MAP | 8 |
| 0      | GR (GAPI) | 100 | 0    | (lb/2000) | Travel Time |        | 0   | AMPMAX | 100    |     |            |      |   |            |   |
| TEMP   |           |     |      |           | 200         | (usec) | 300 | 0      | AMPMIN | 100 |            |      |   |            |   |
| (degF) |           |     |      |           | -----       |        |     |        |        |     |            |      |   |            |   |





FREE PIPE PASS

HALLIBURTON

5" = 100'

MAIN PASS

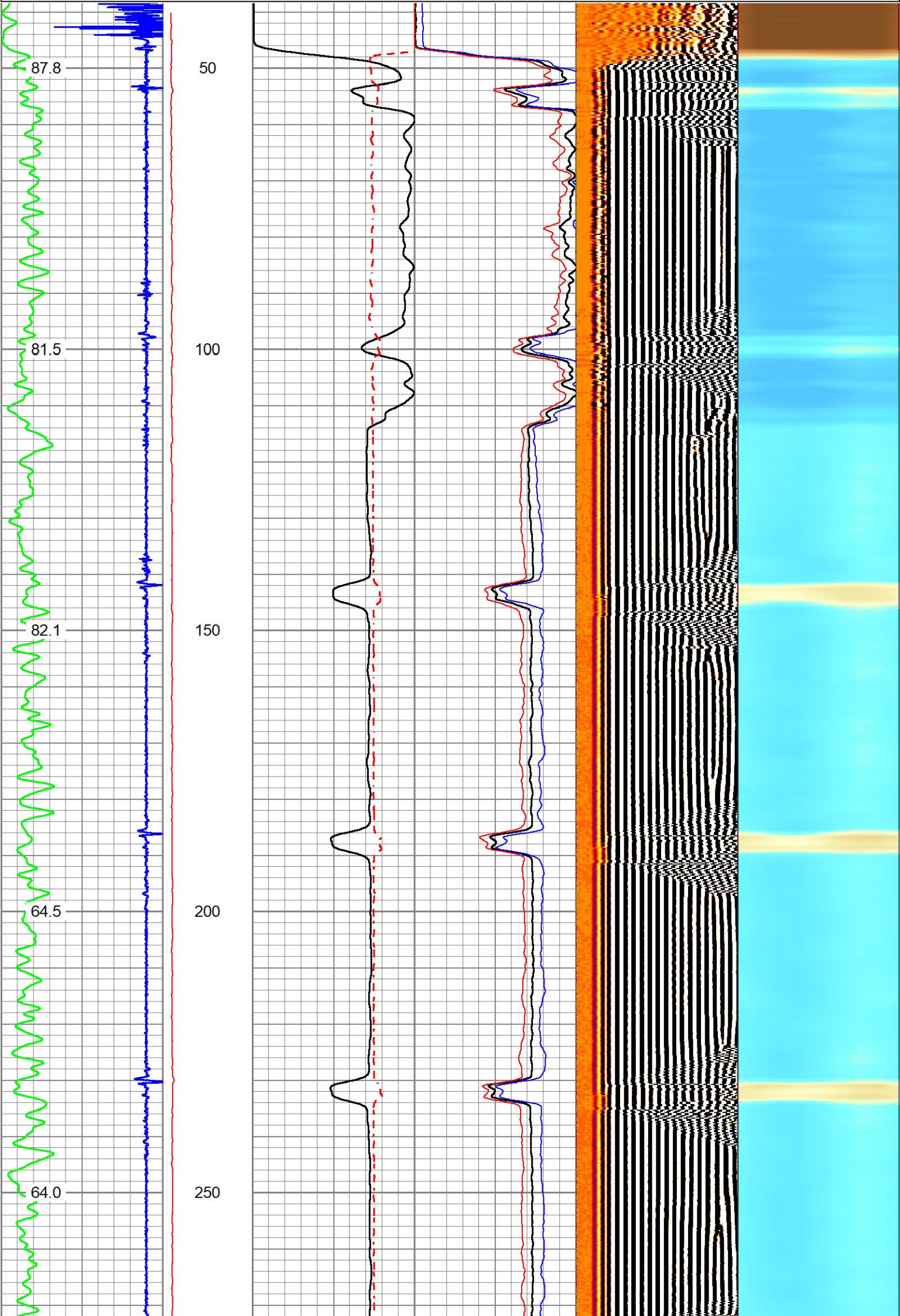
HALLIBURTON

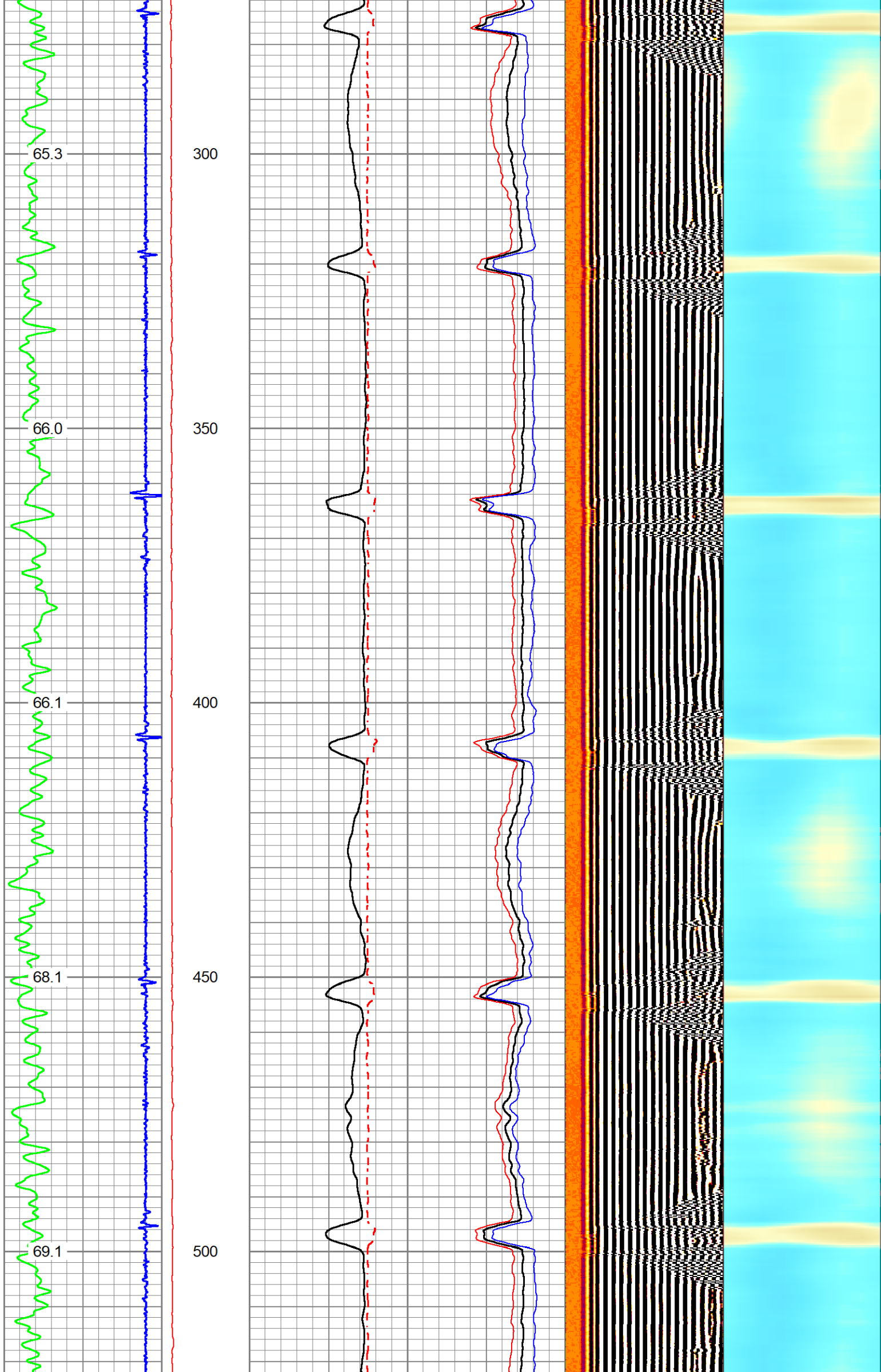
5" = 100'

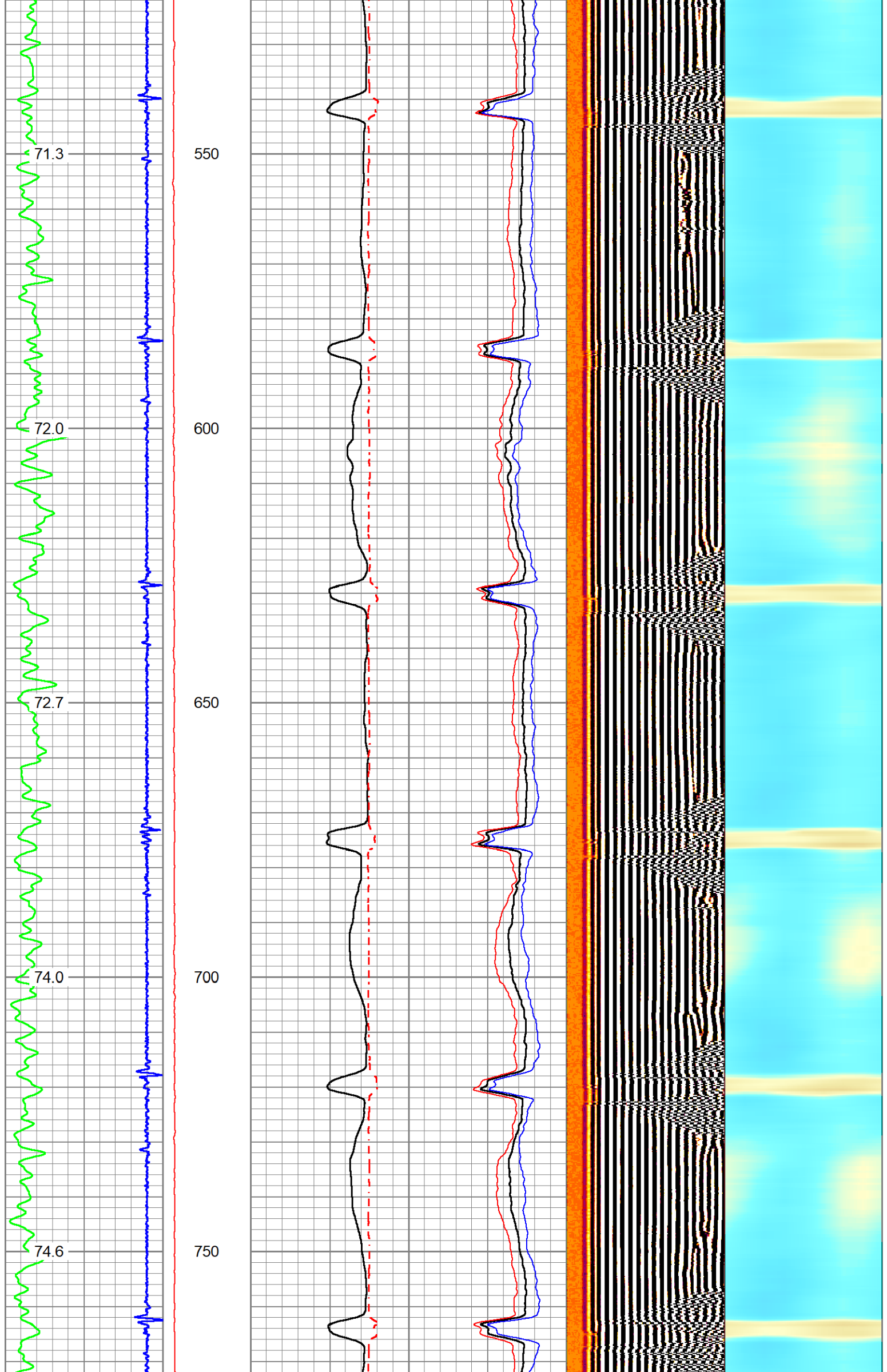
Database File        livingston\_s19-25-5c.db  
Dataset Pathname    MAIN\_PASS  
Presentation Format    EXTRAC~1  
Dataset Creation      Sun Aug 11 16:27:39 2019  
Charted by            Depth in Feet scaled 1:240



|   |           |     |   |           |             |   |        |     |
|---|-----------|-----|---|-----------|-------------|---|--------|-----|
| 0 | GR (GAPI) | 100 | 0 | (lb 2000) | Travel Time | 0 | AMPMAX | 100 |
|   | TEMP      |     |   |           | (usec)      | 0 | AMPMIN | 100 |
|   | (degF)    |     |   |           | 200         |   |        |     |
|   |           |     |   |           | 300         |   |        |     |



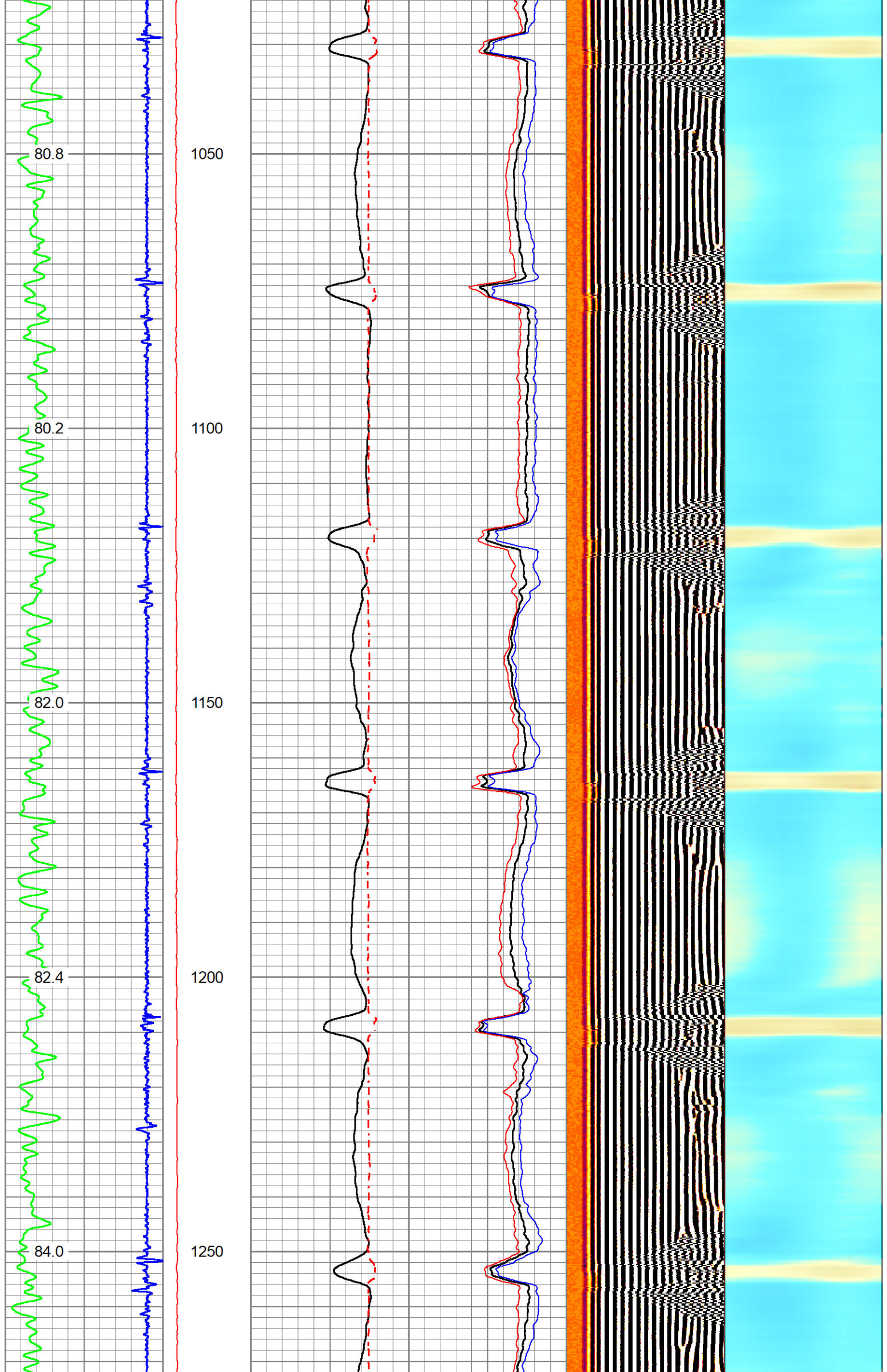


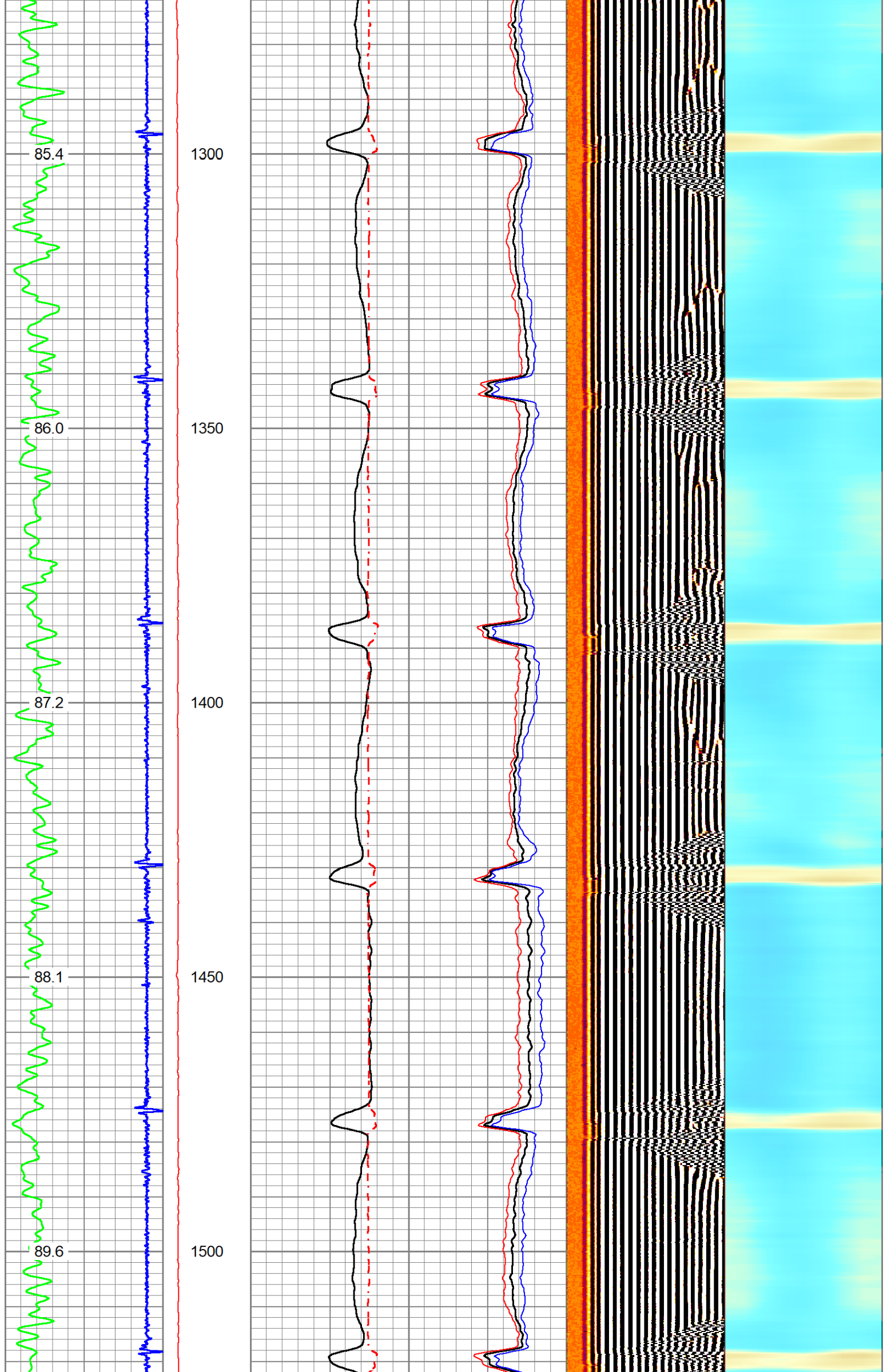




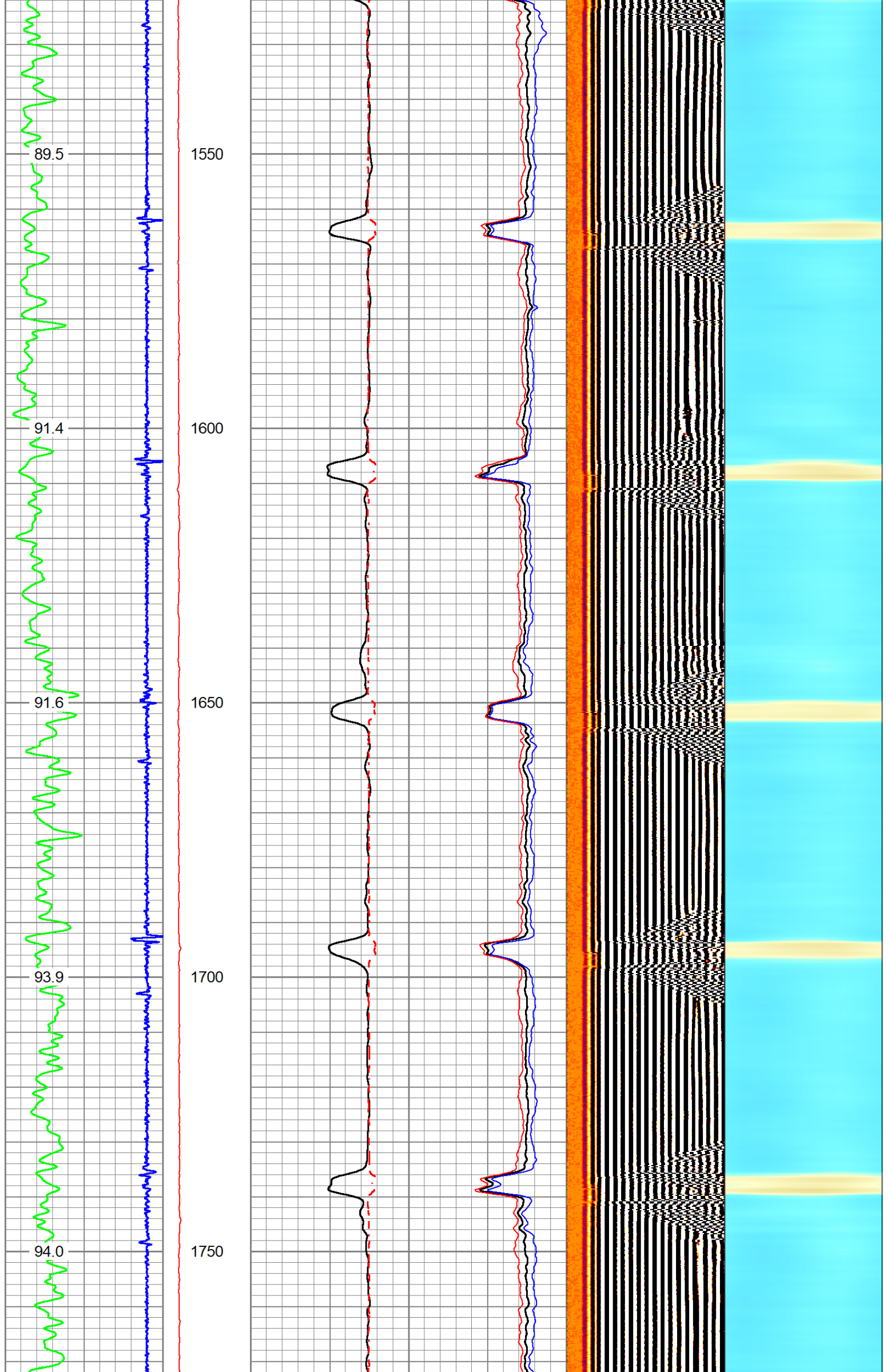


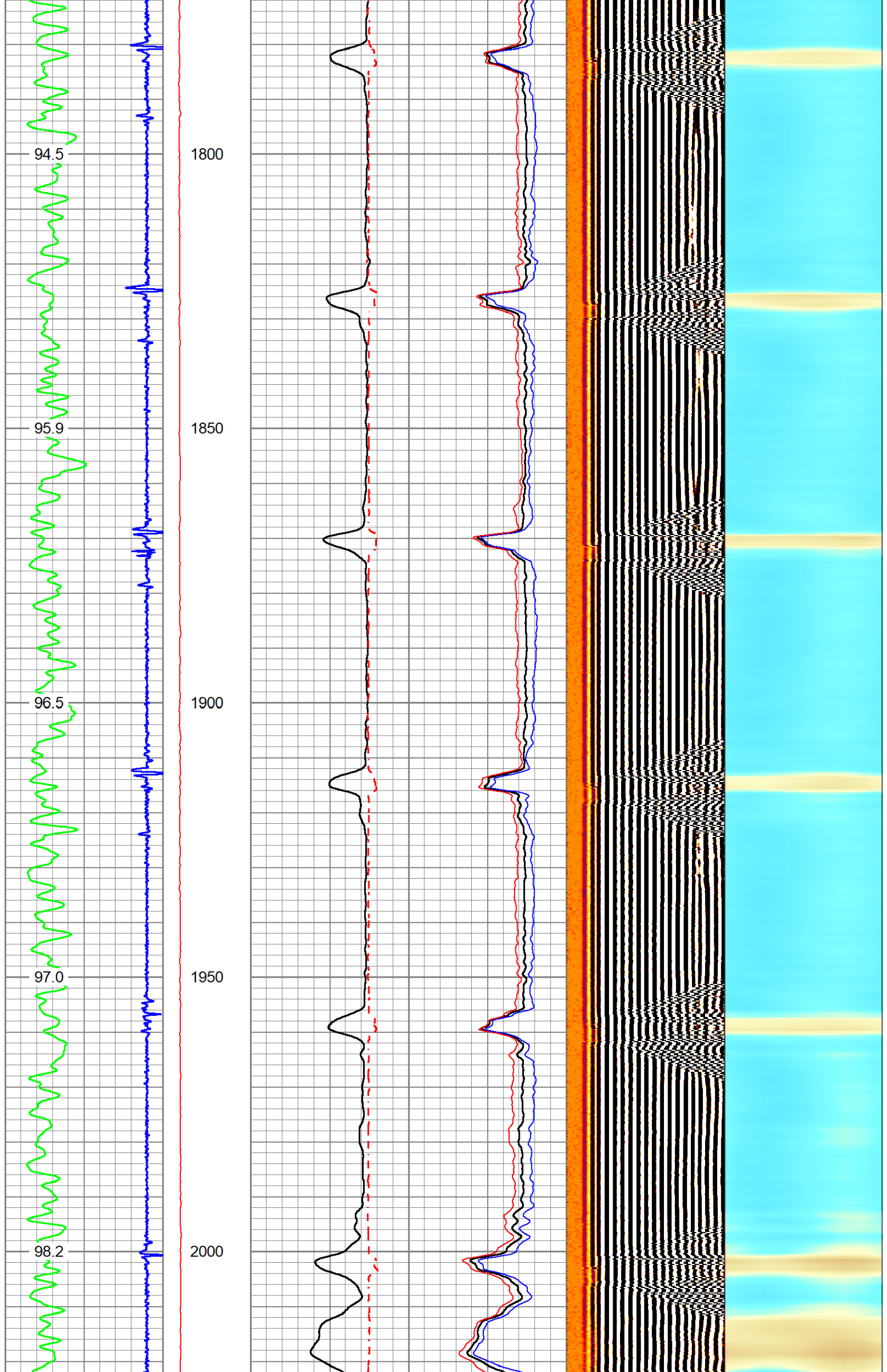




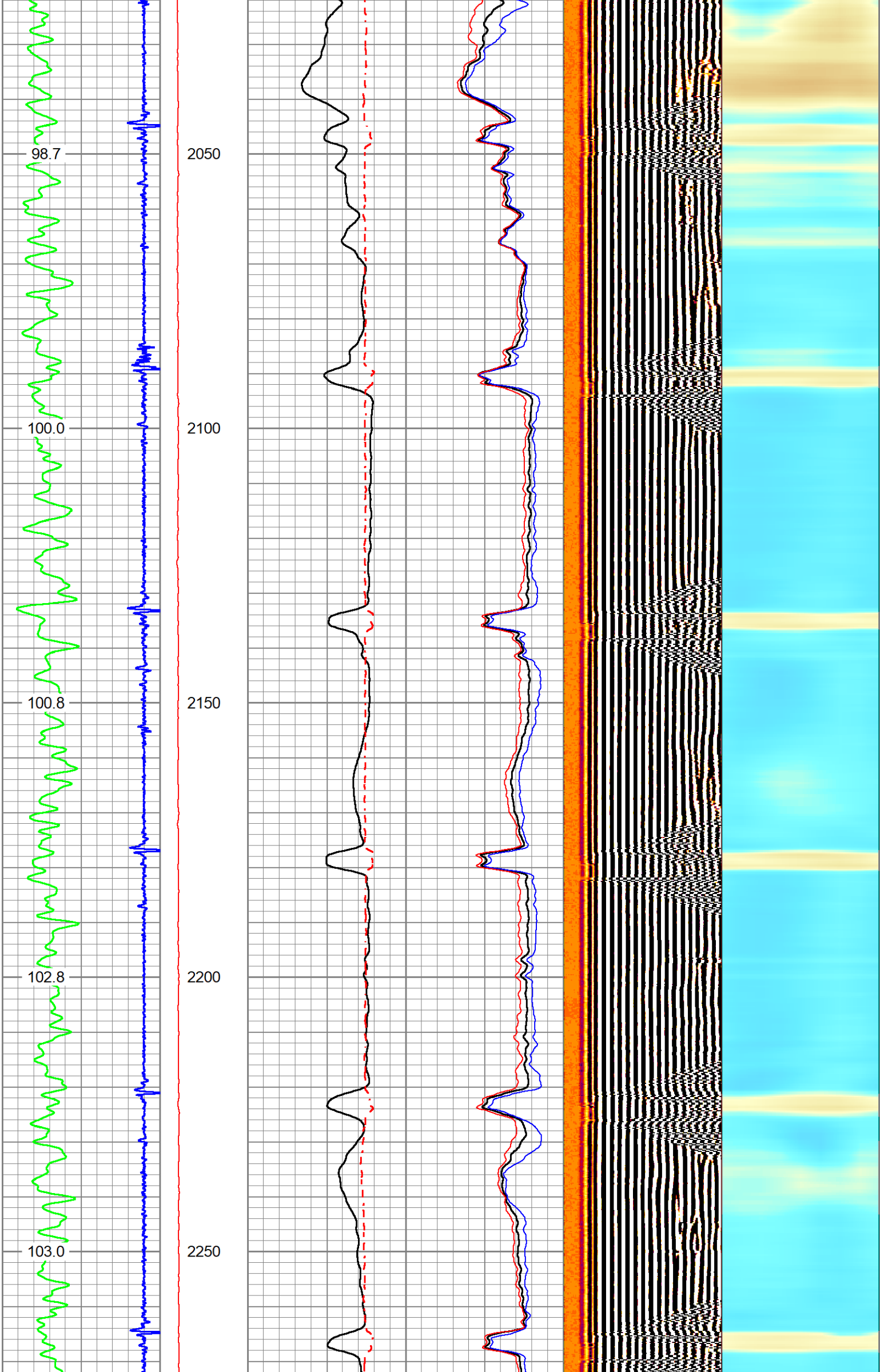


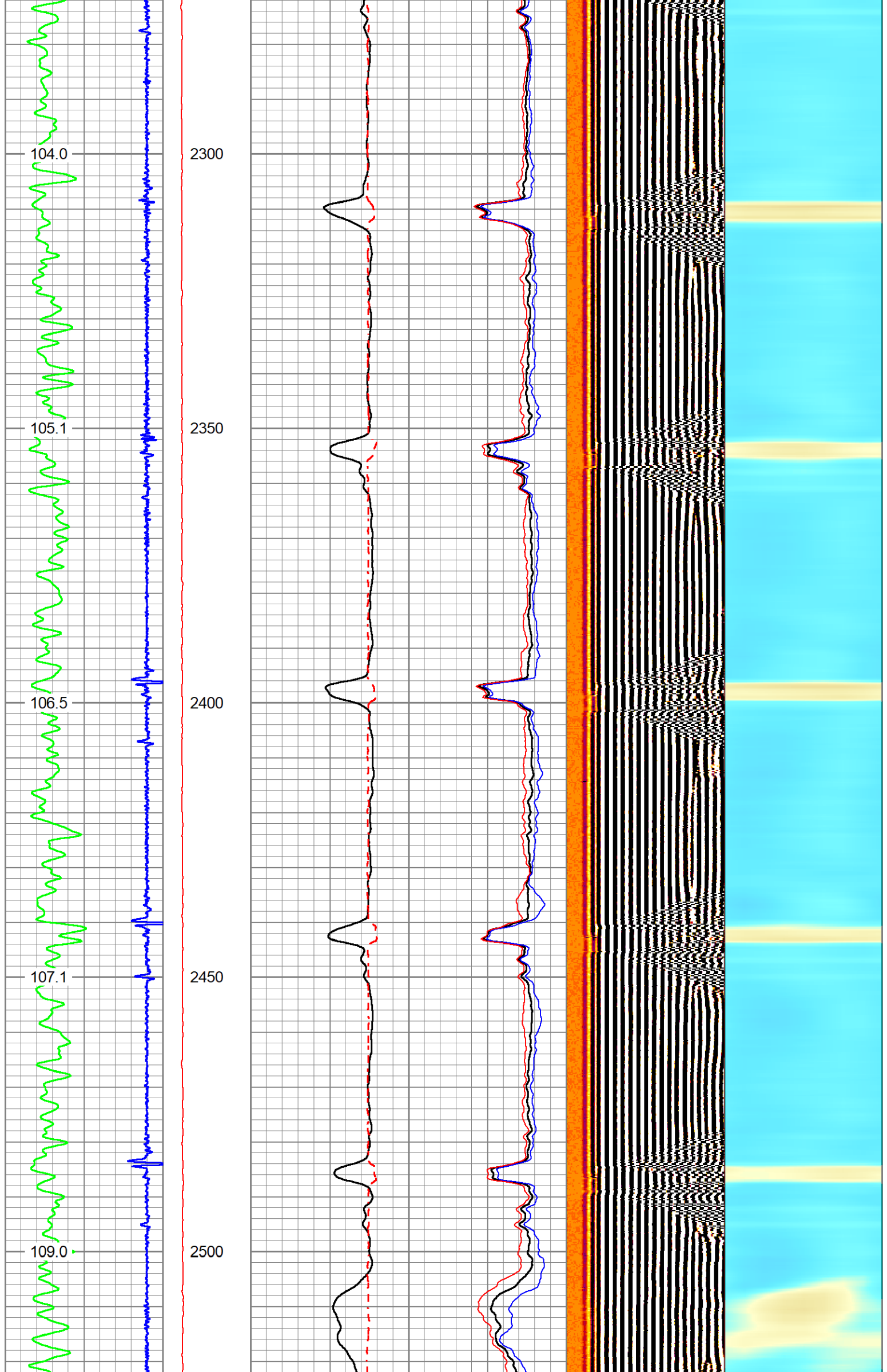




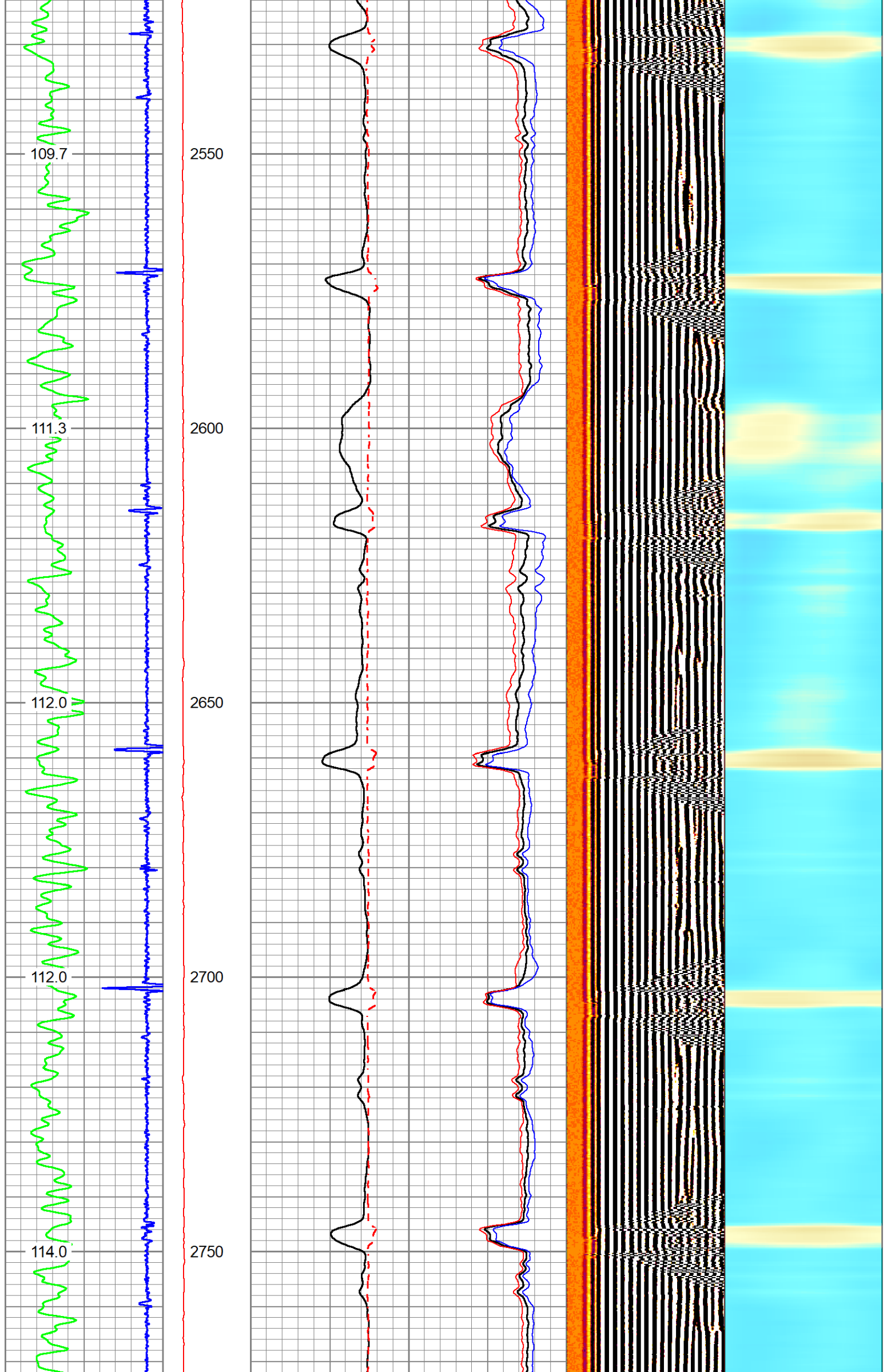


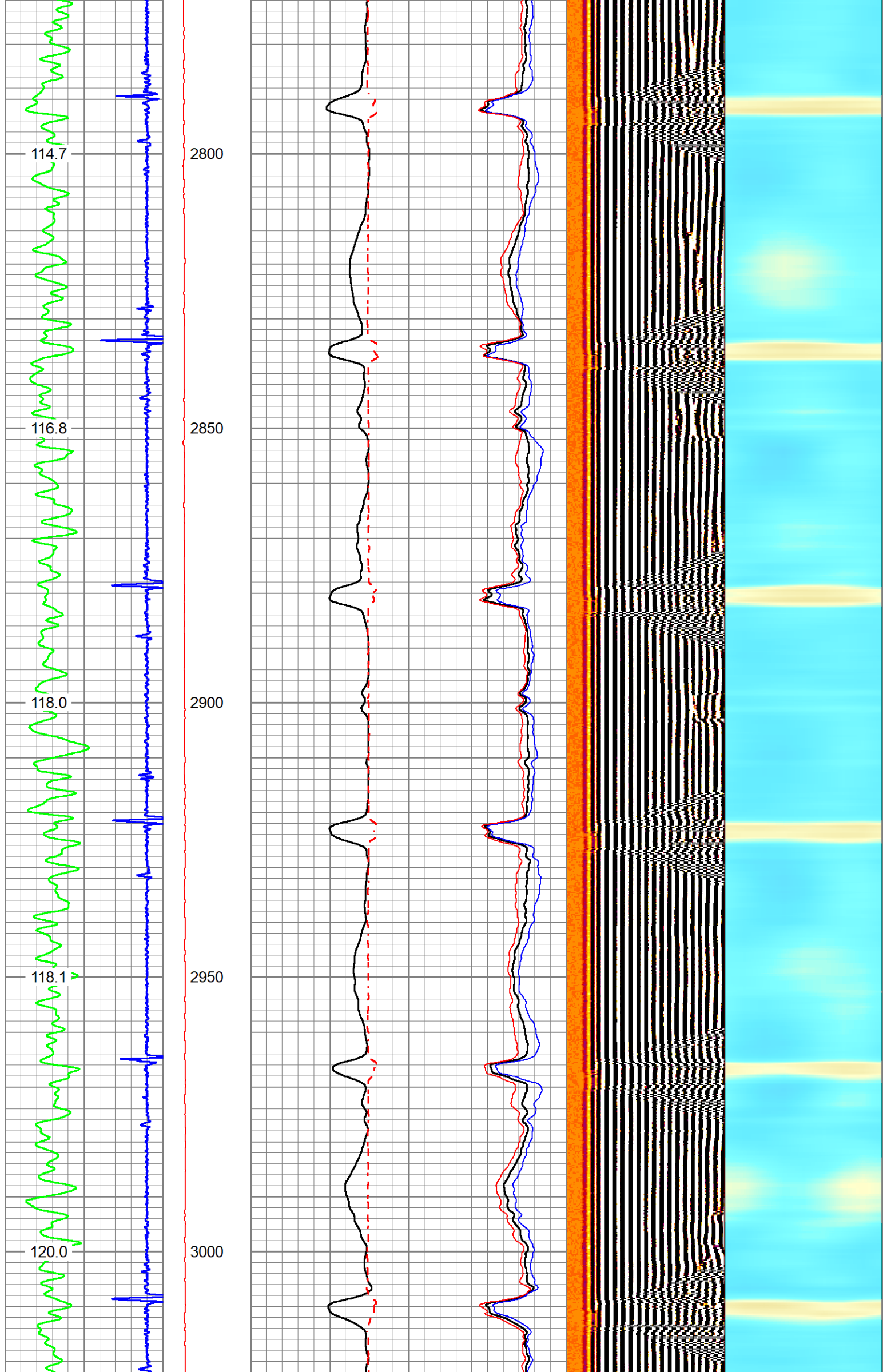




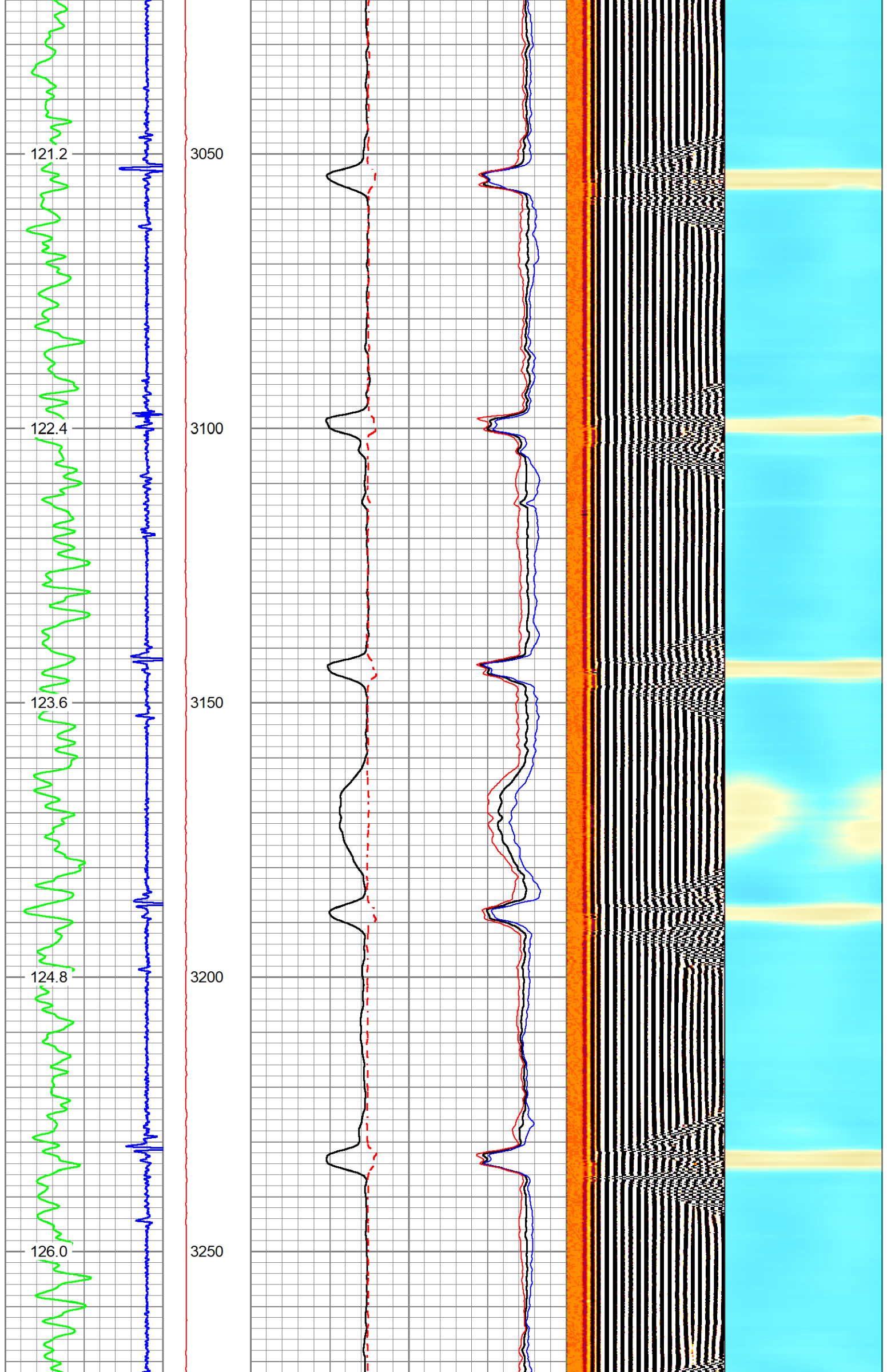


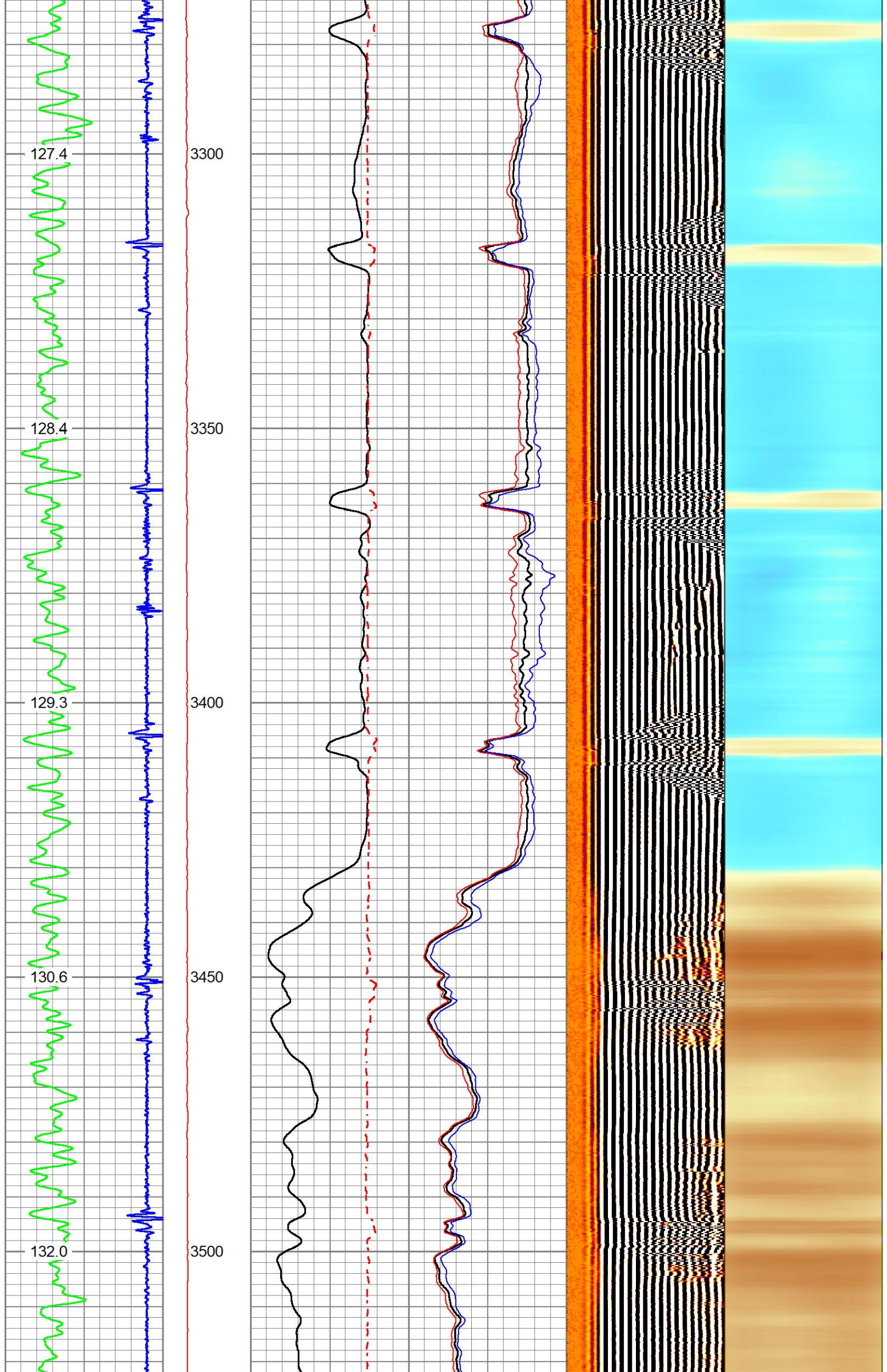




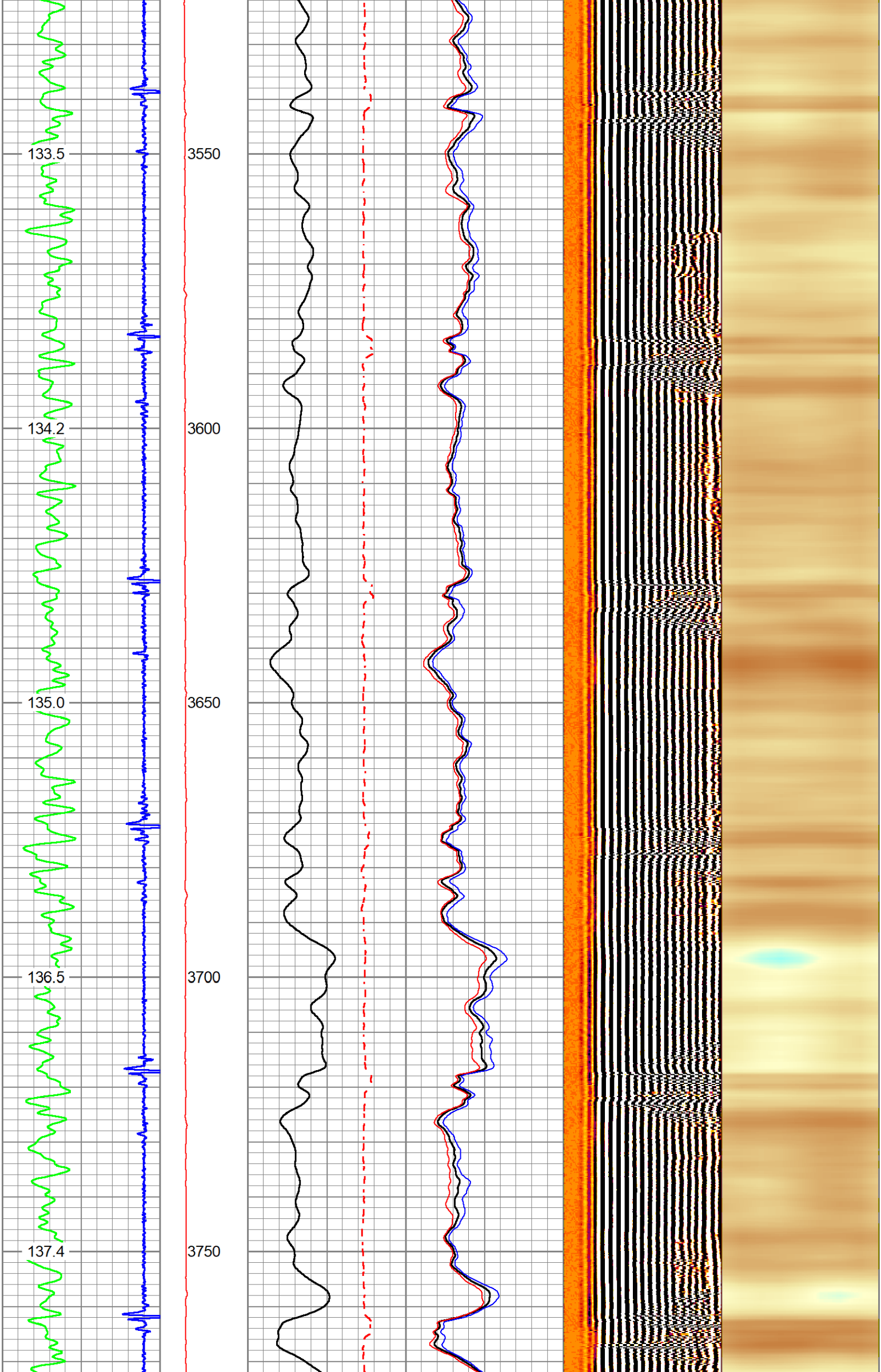




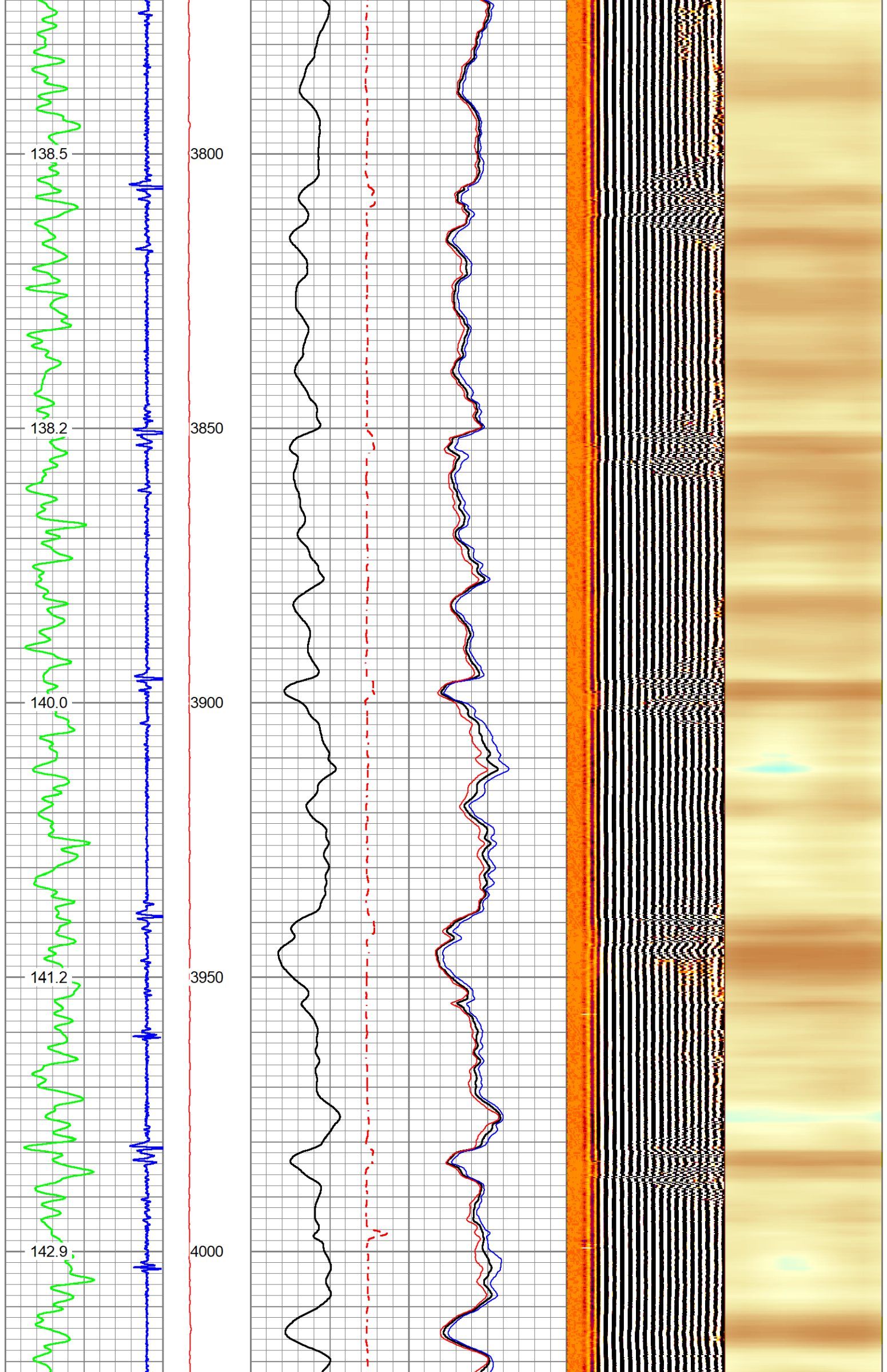


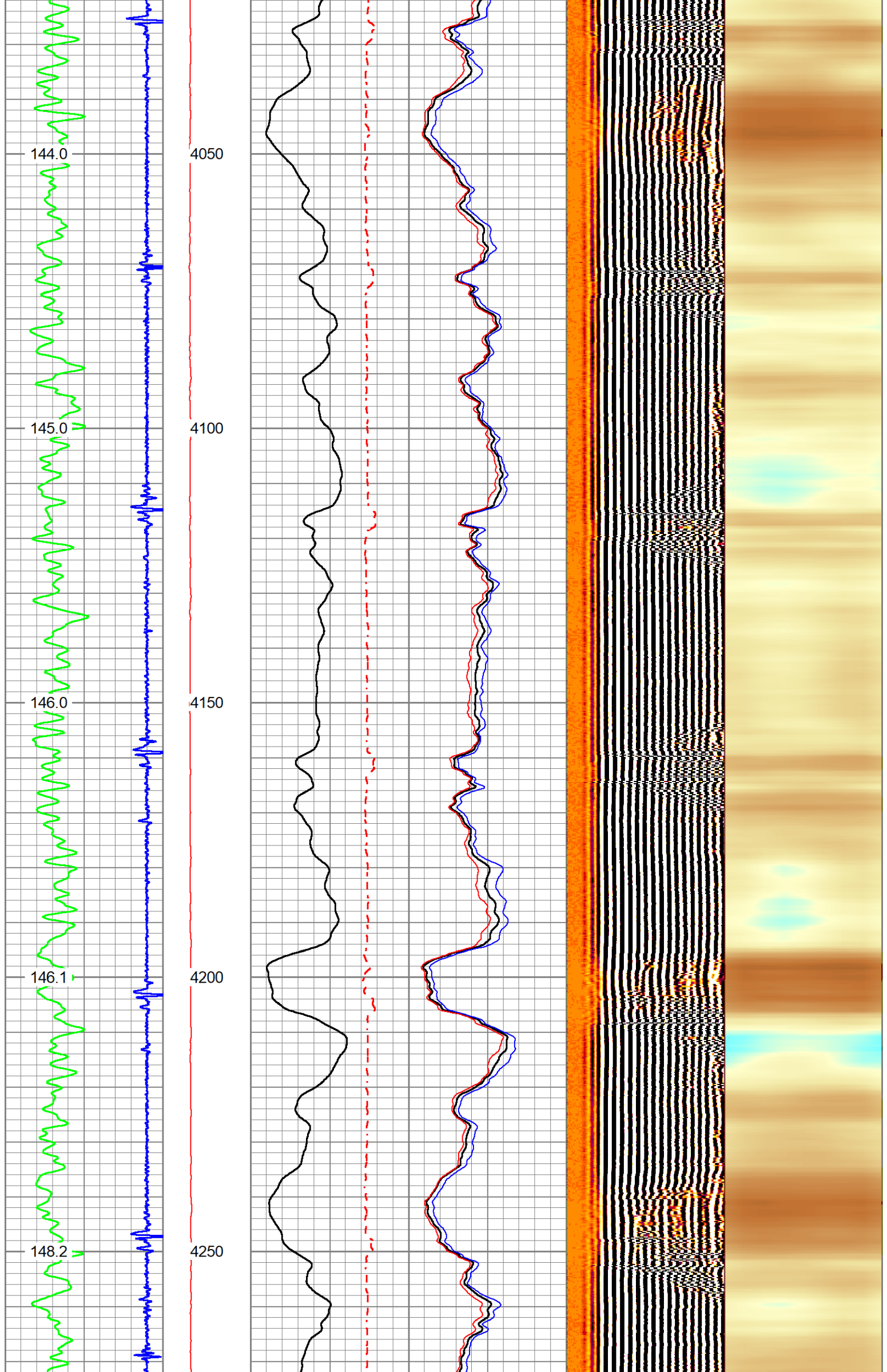


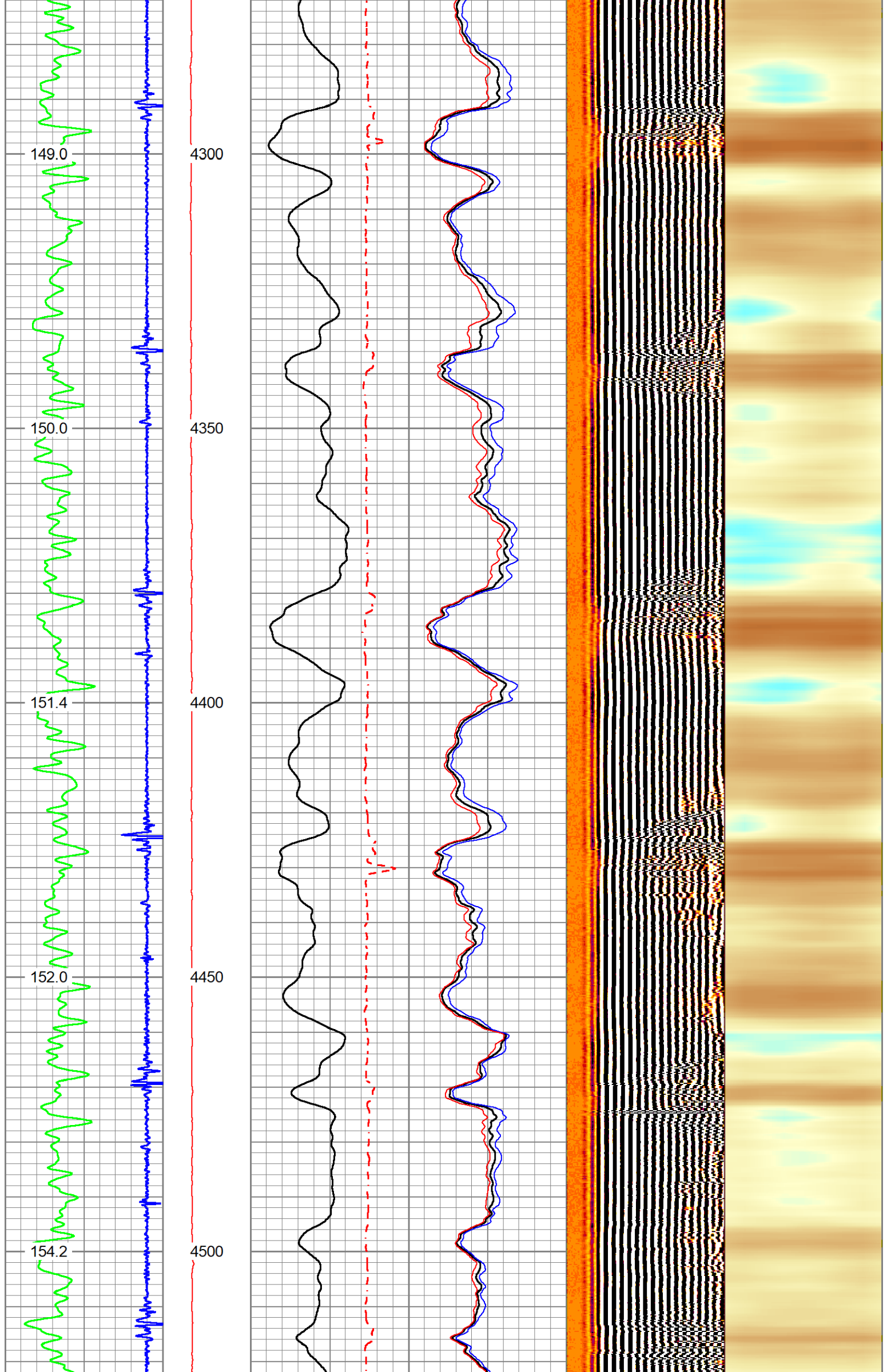




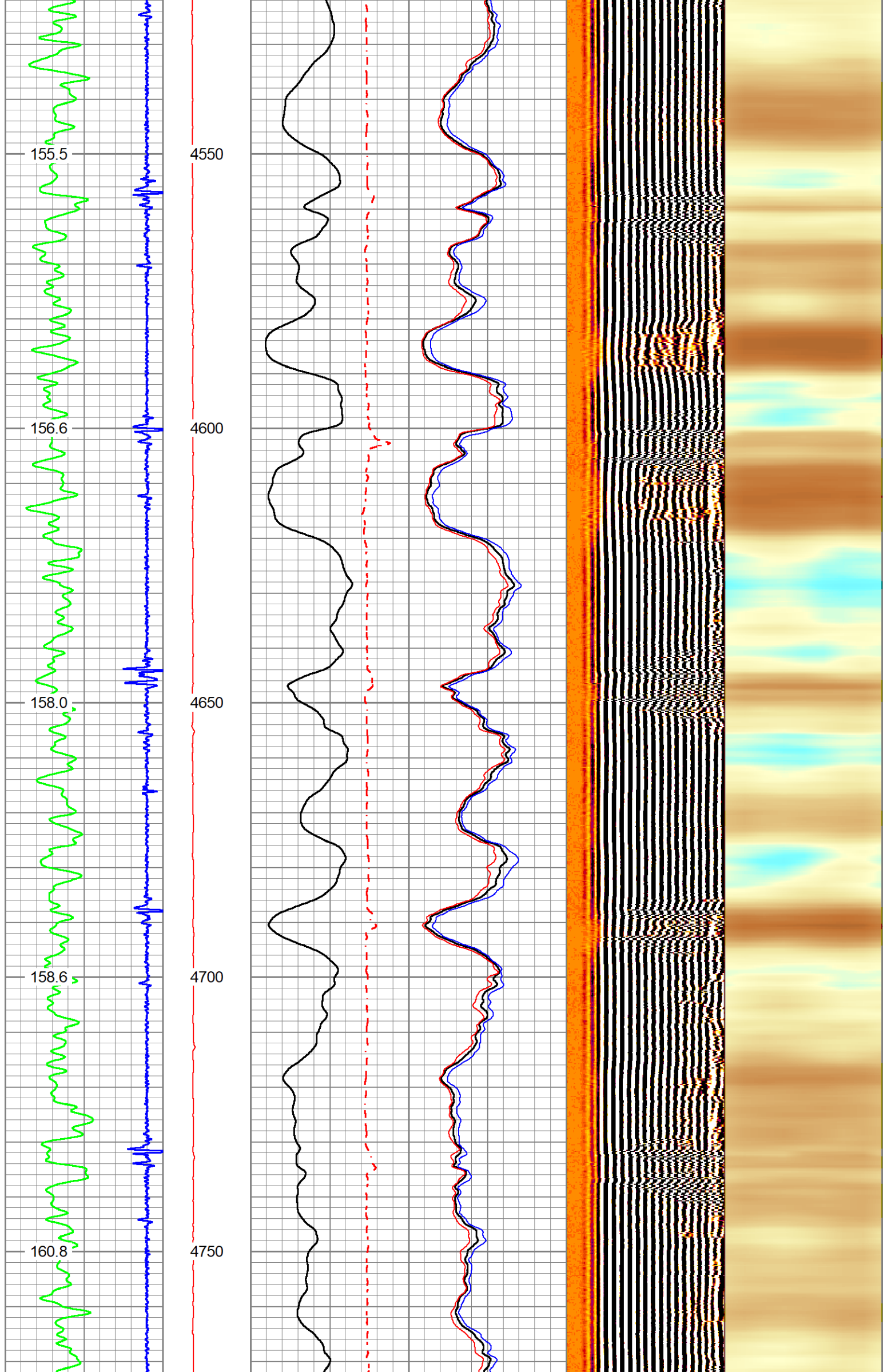


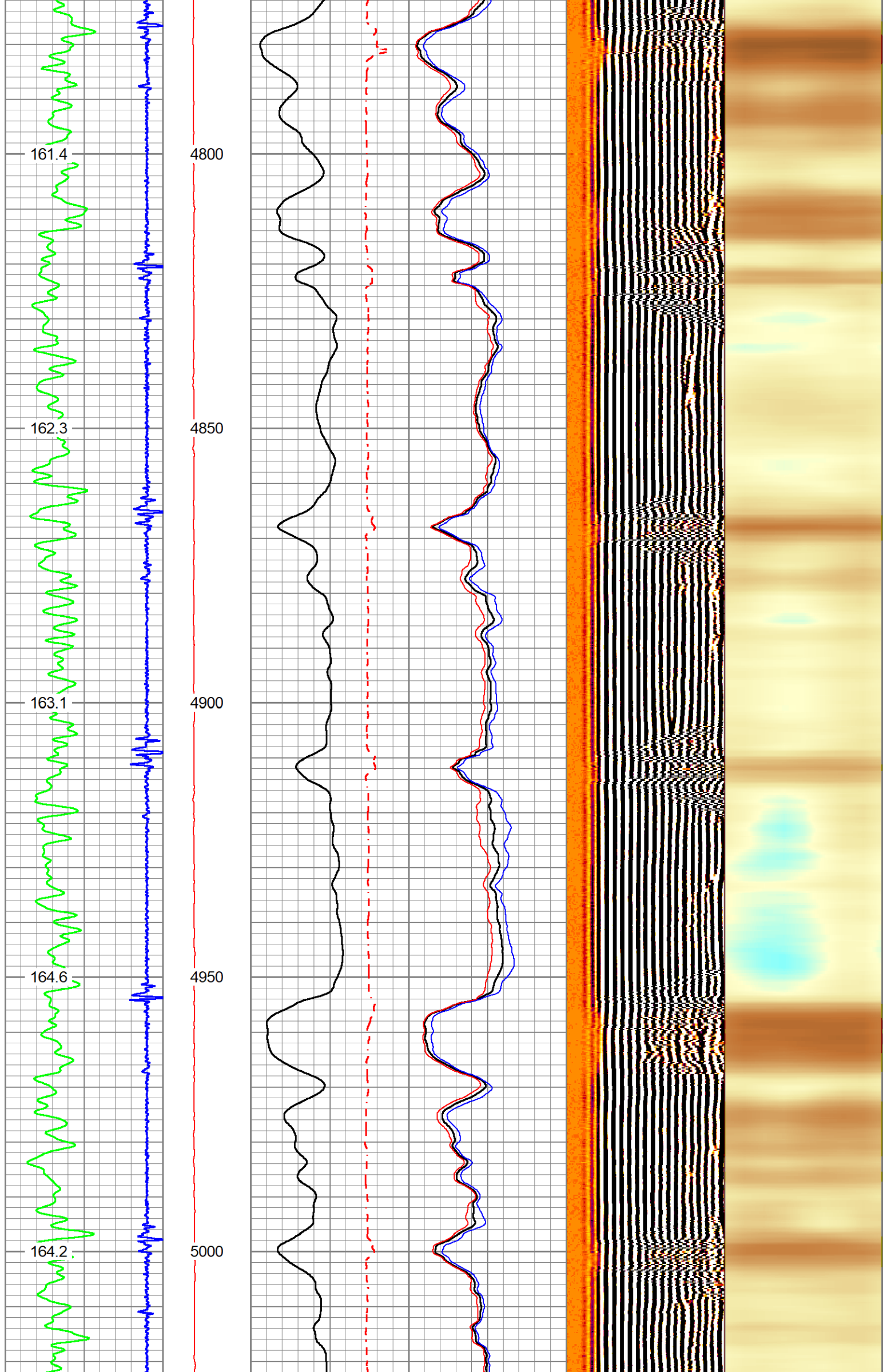


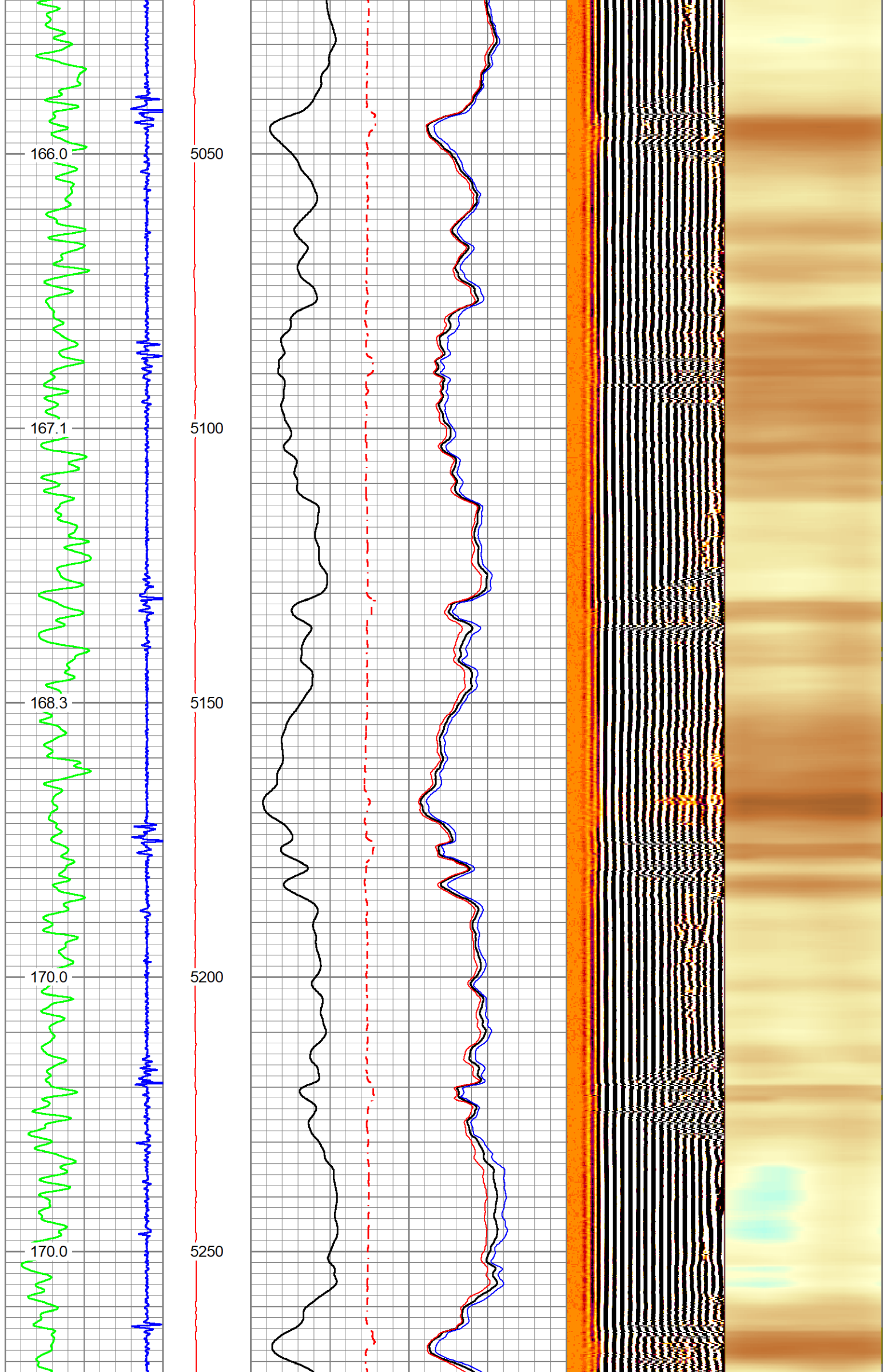




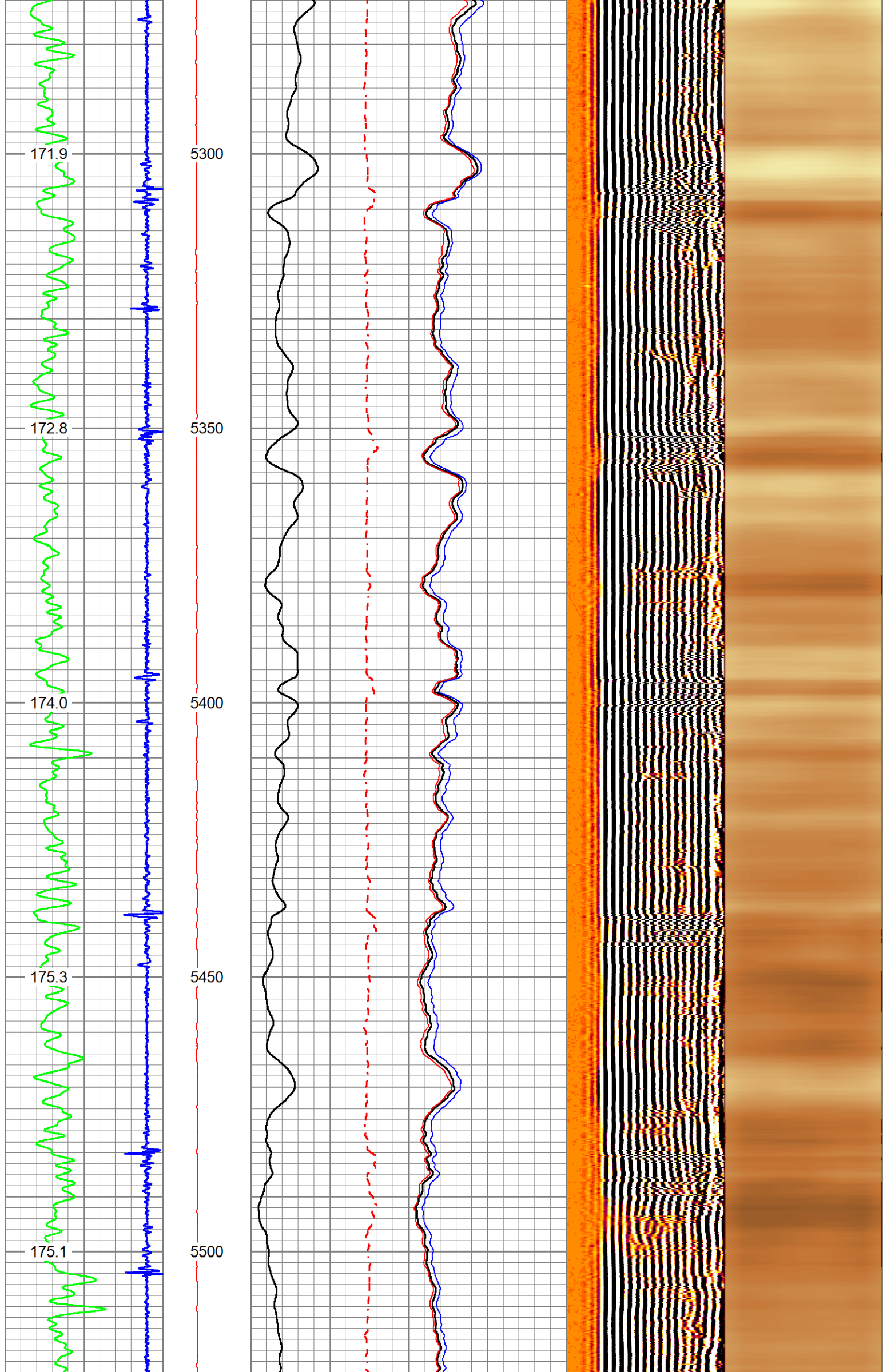


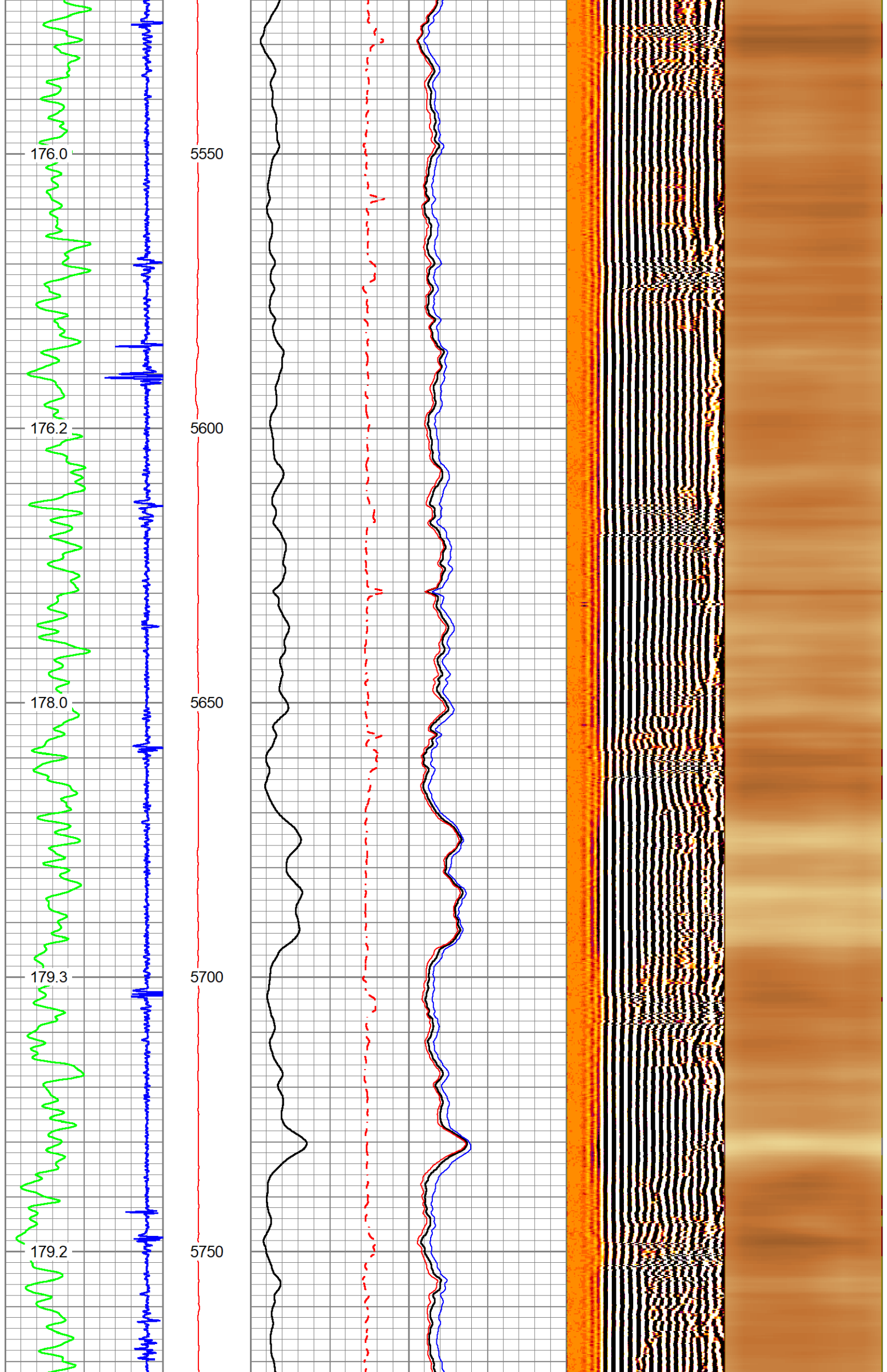


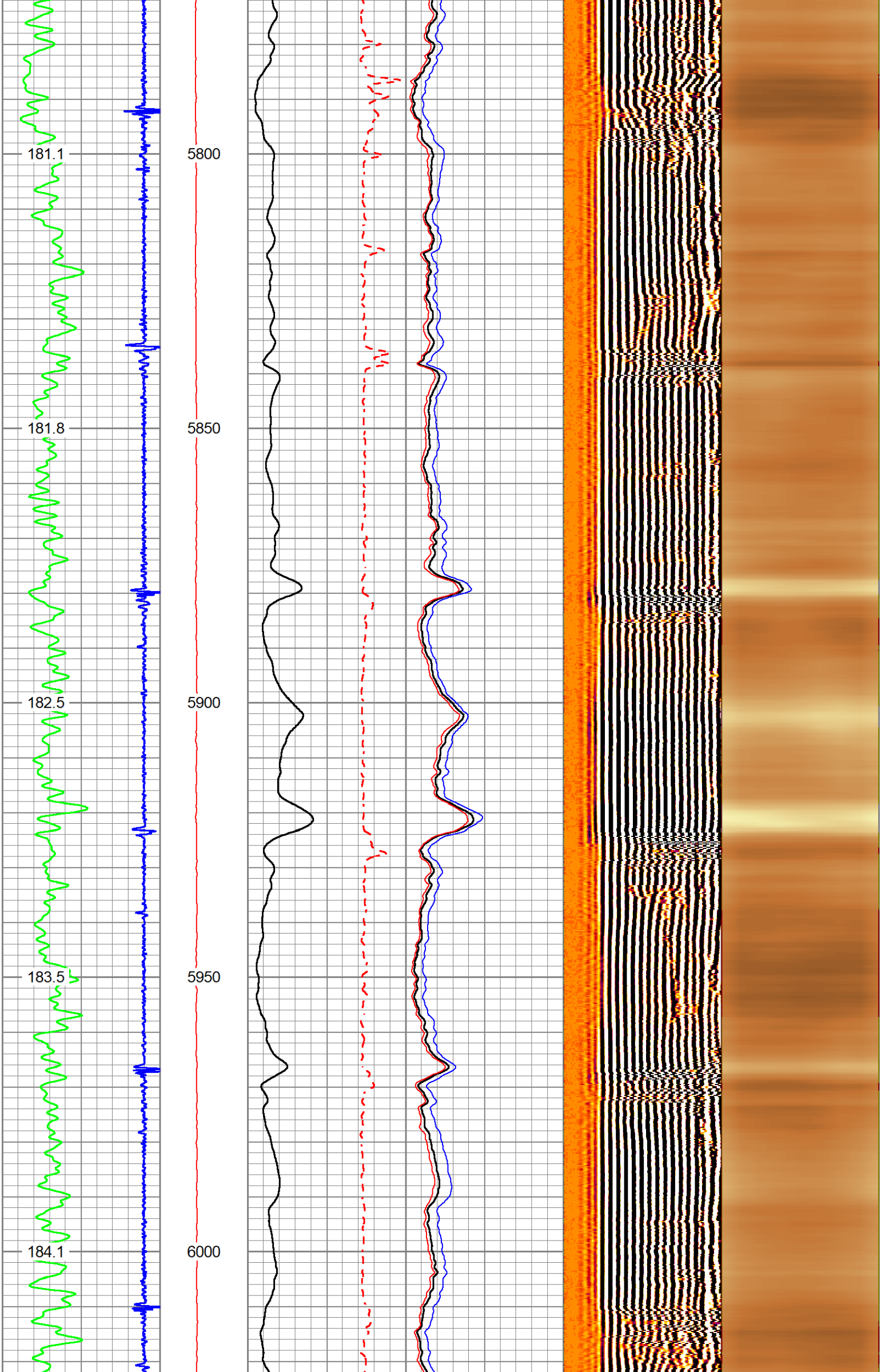




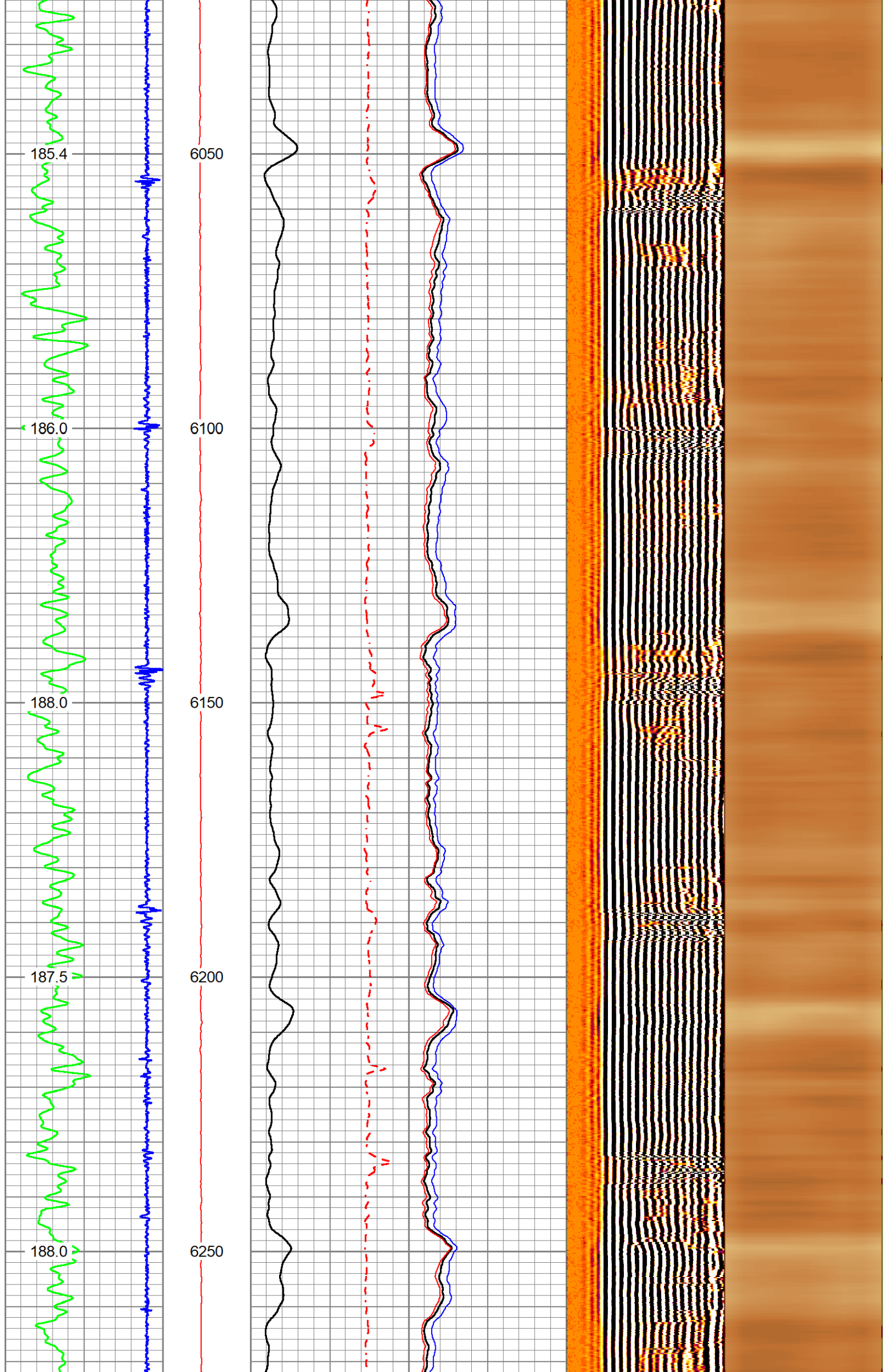




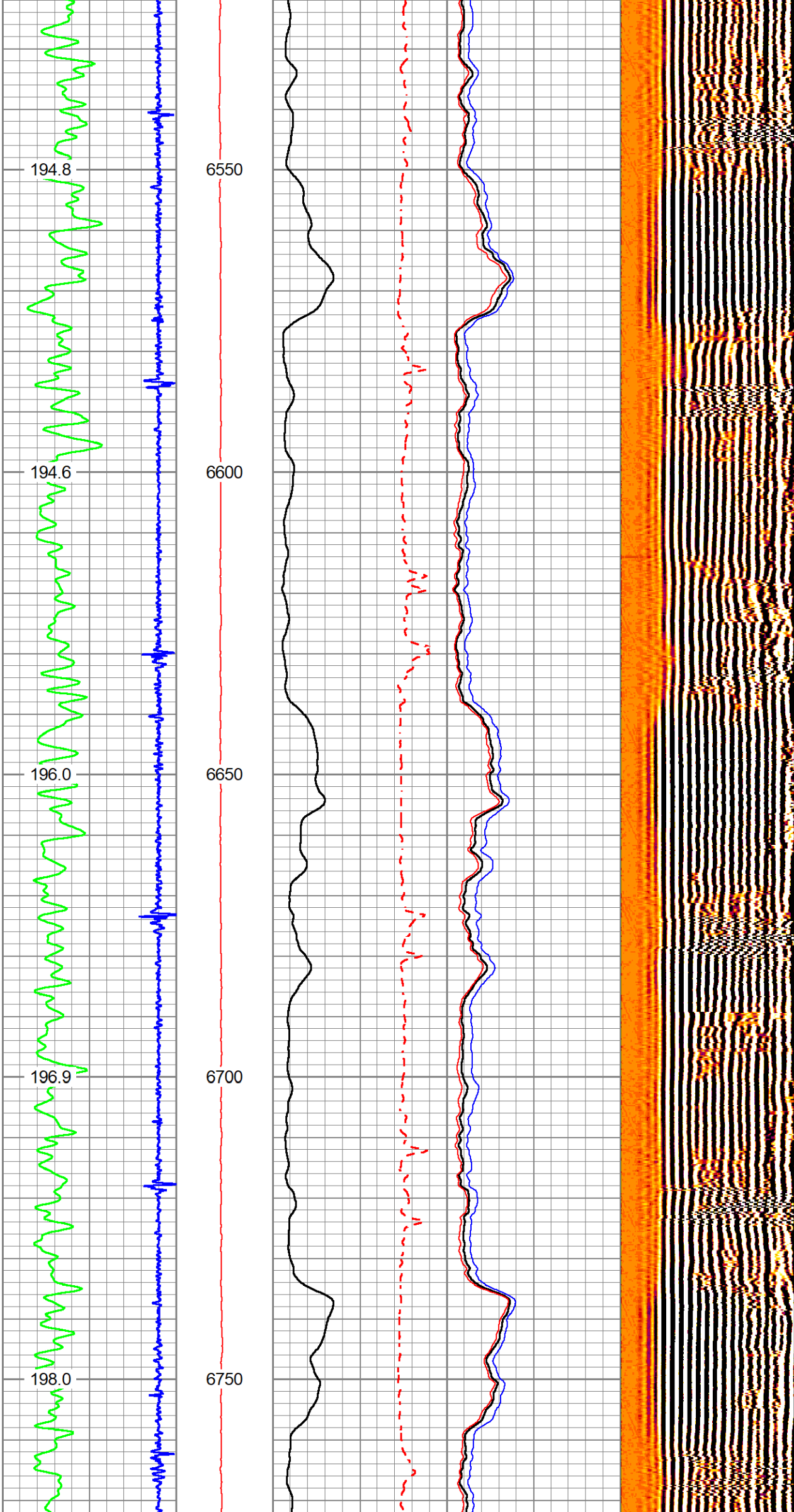




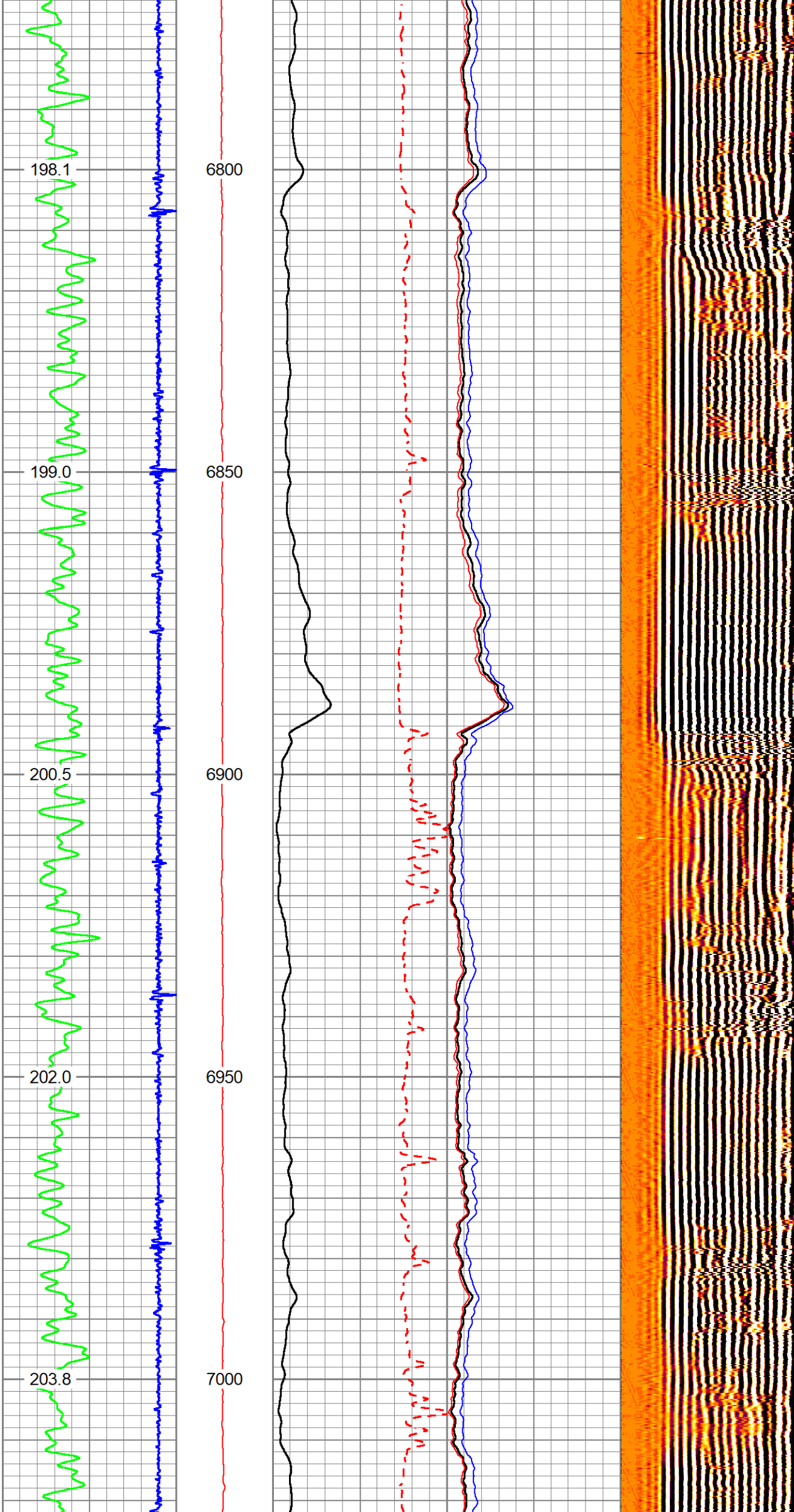


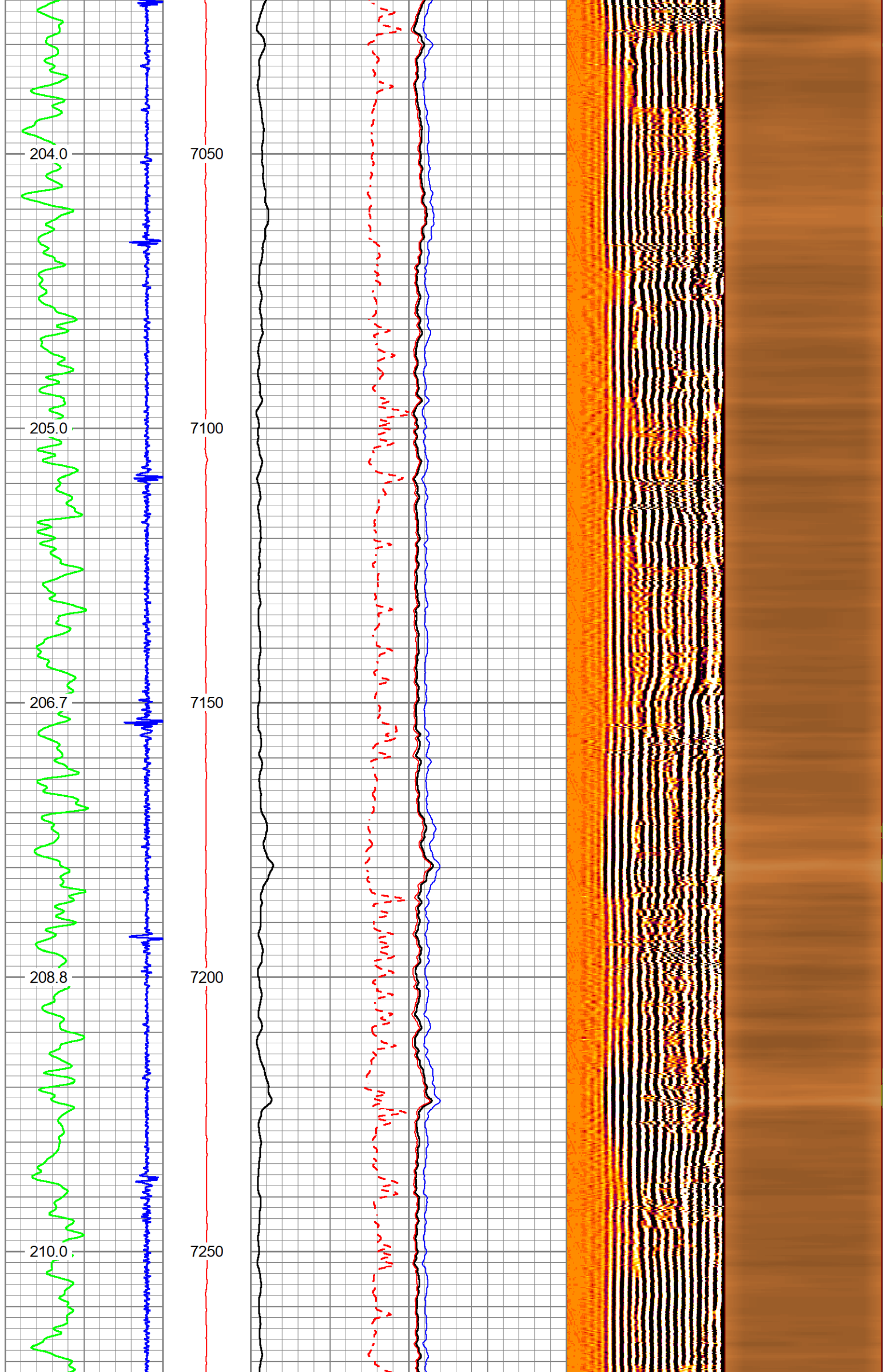


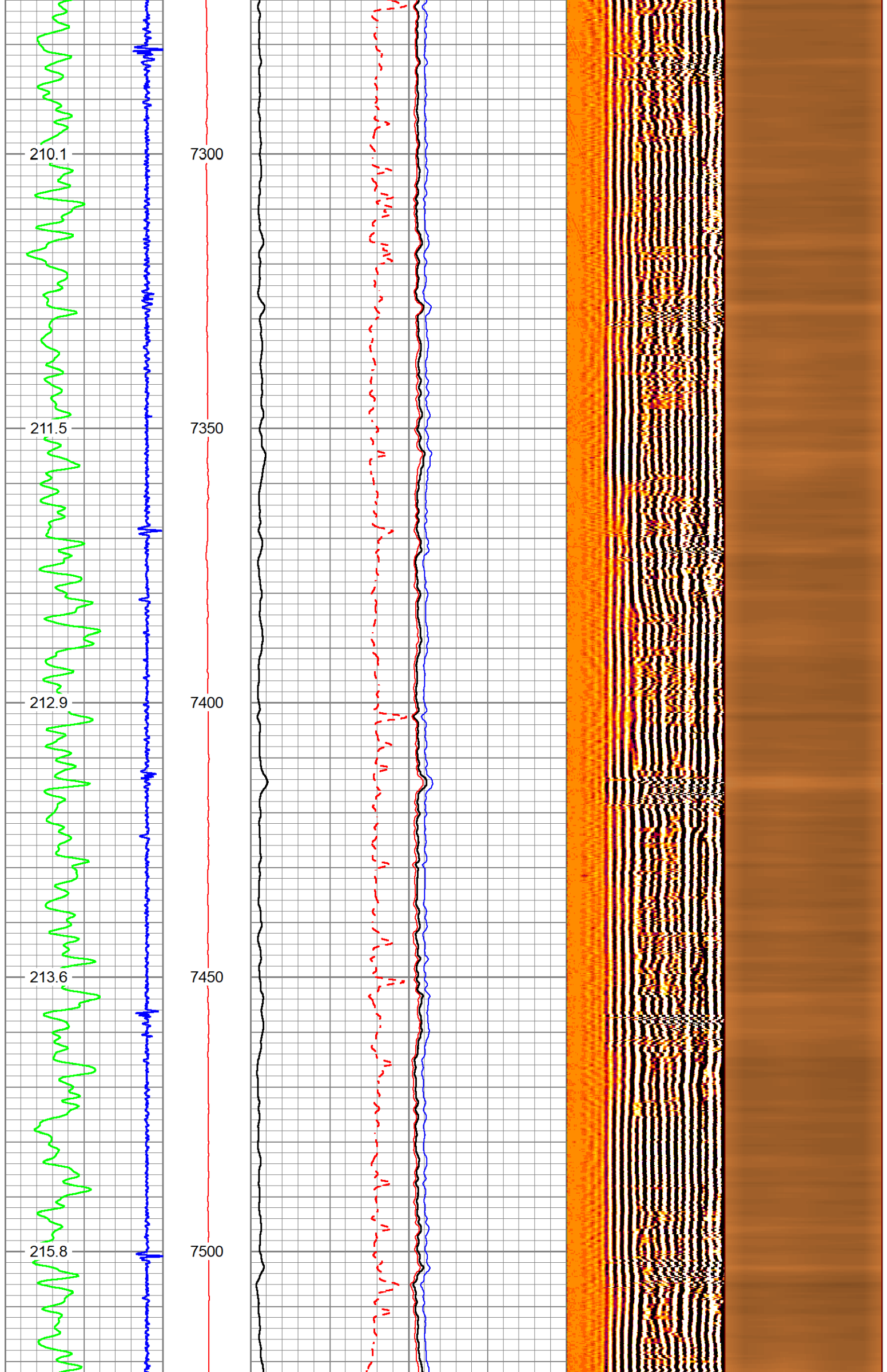




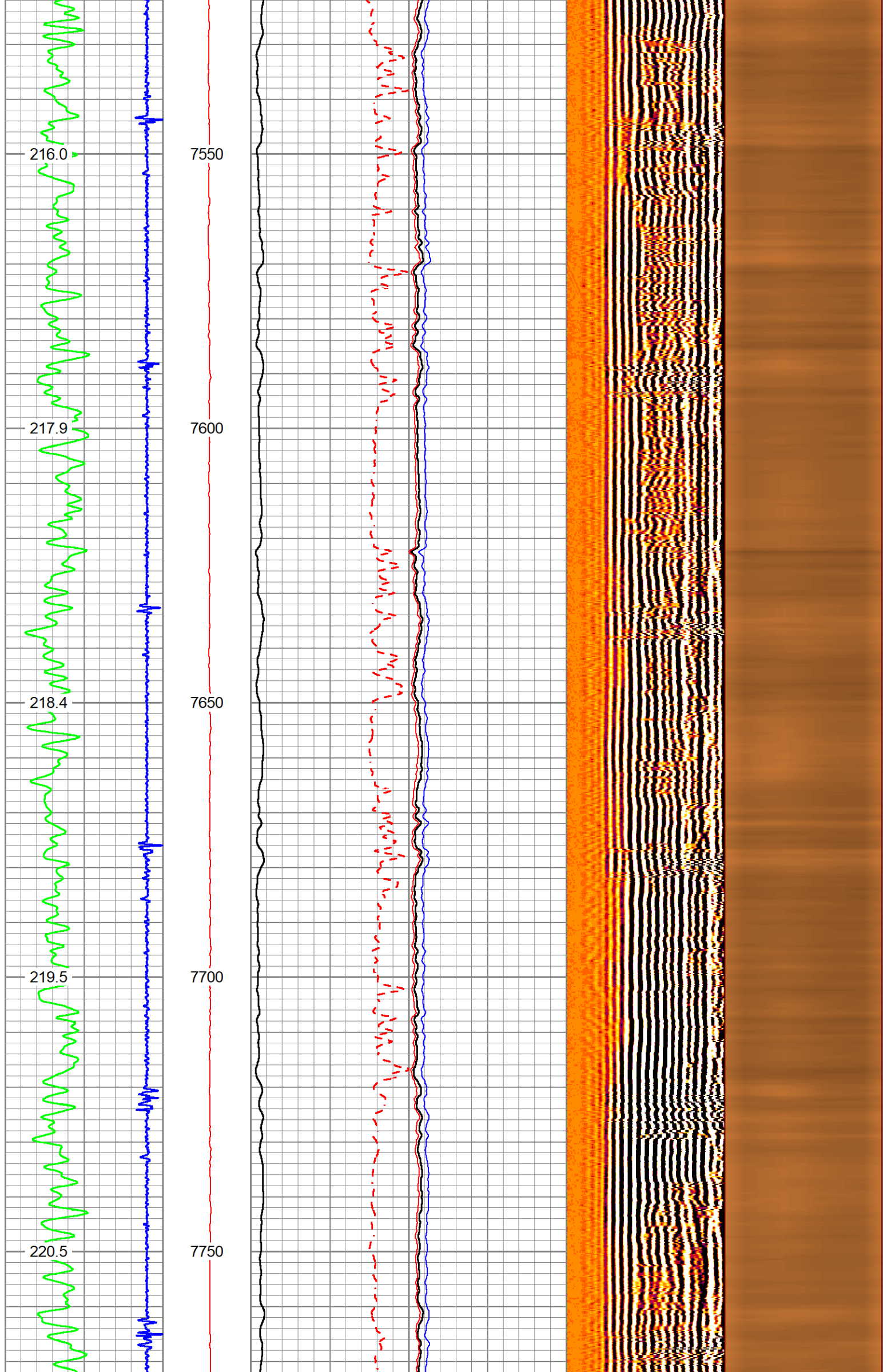


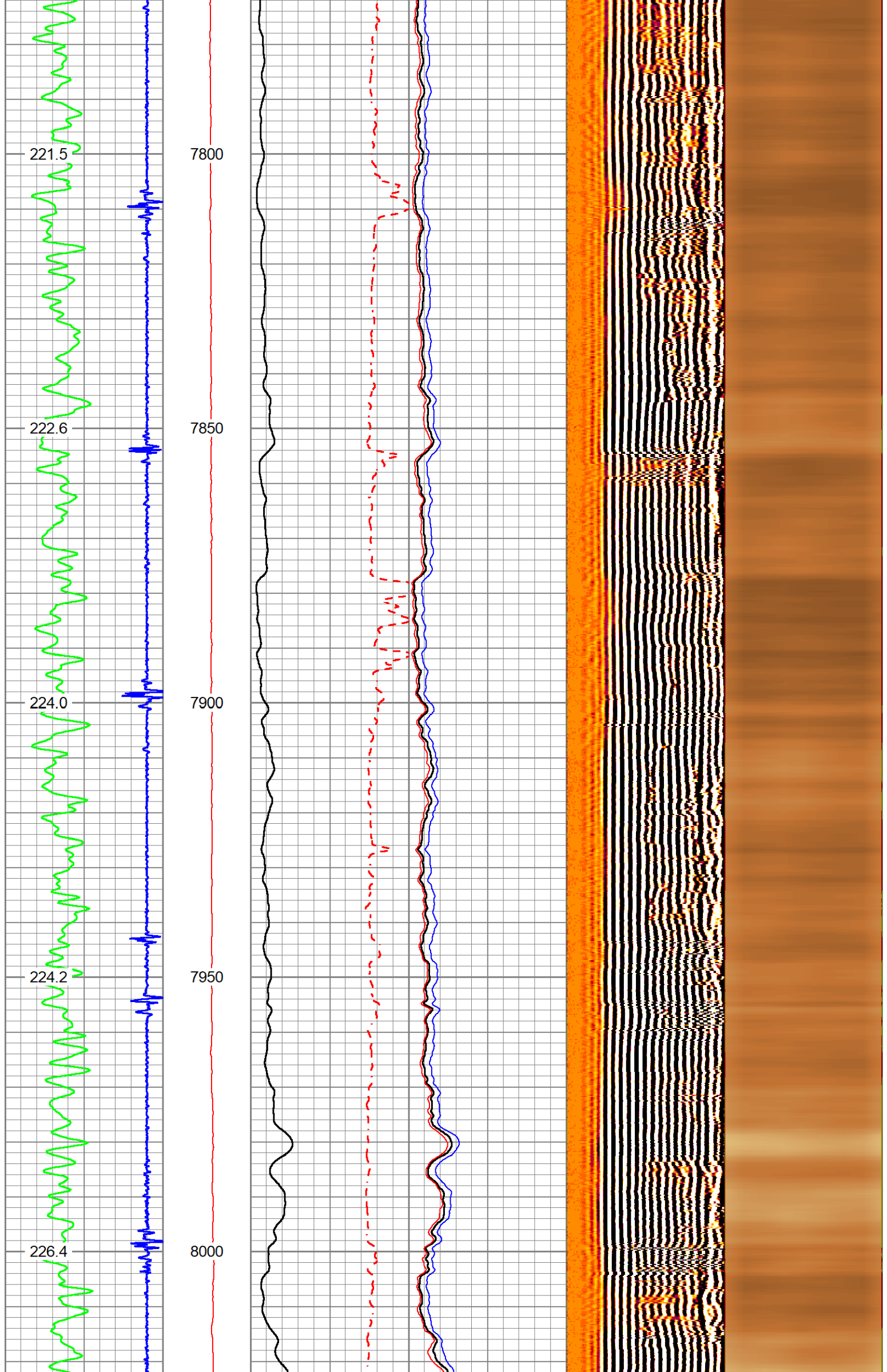




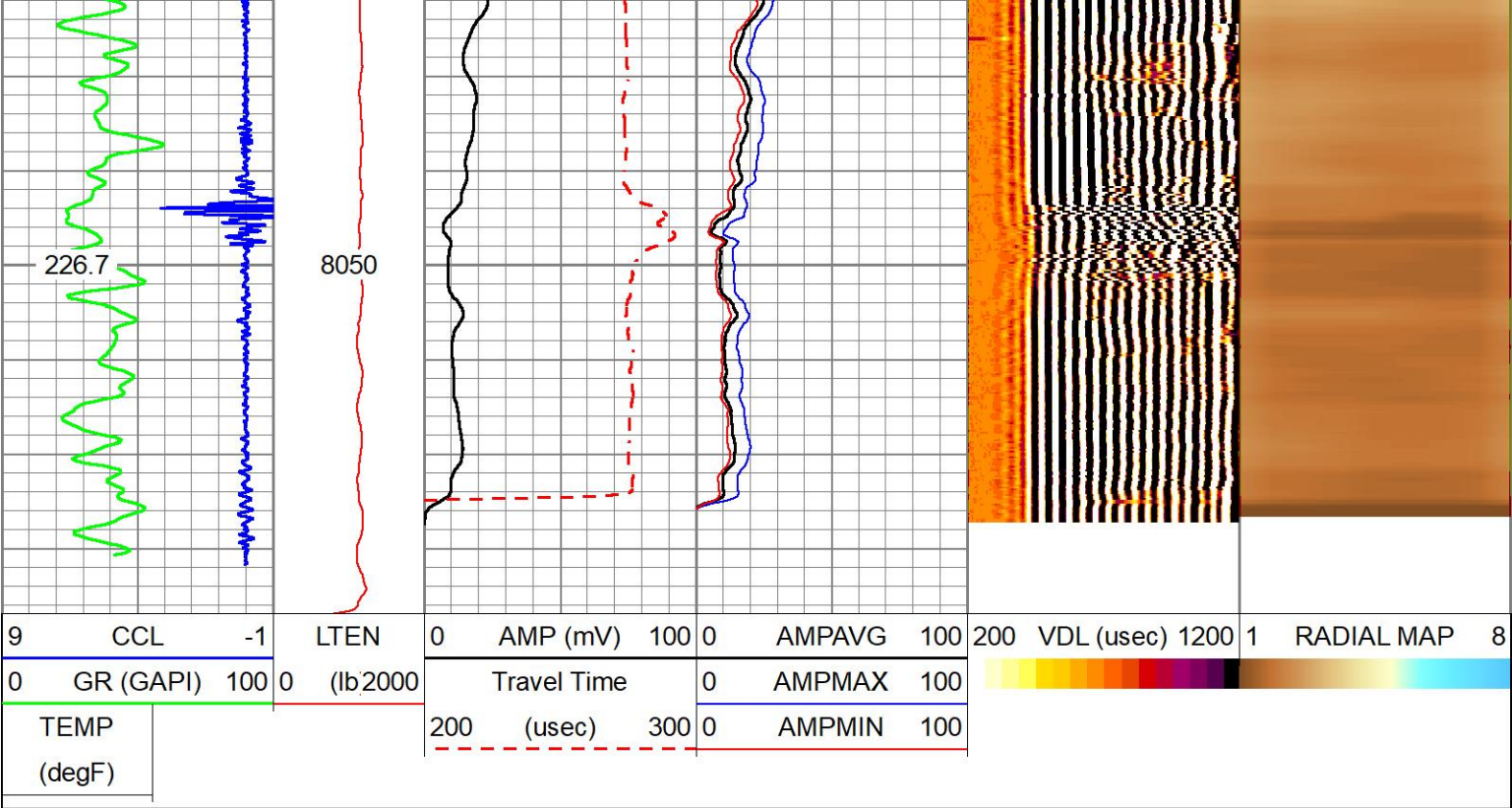






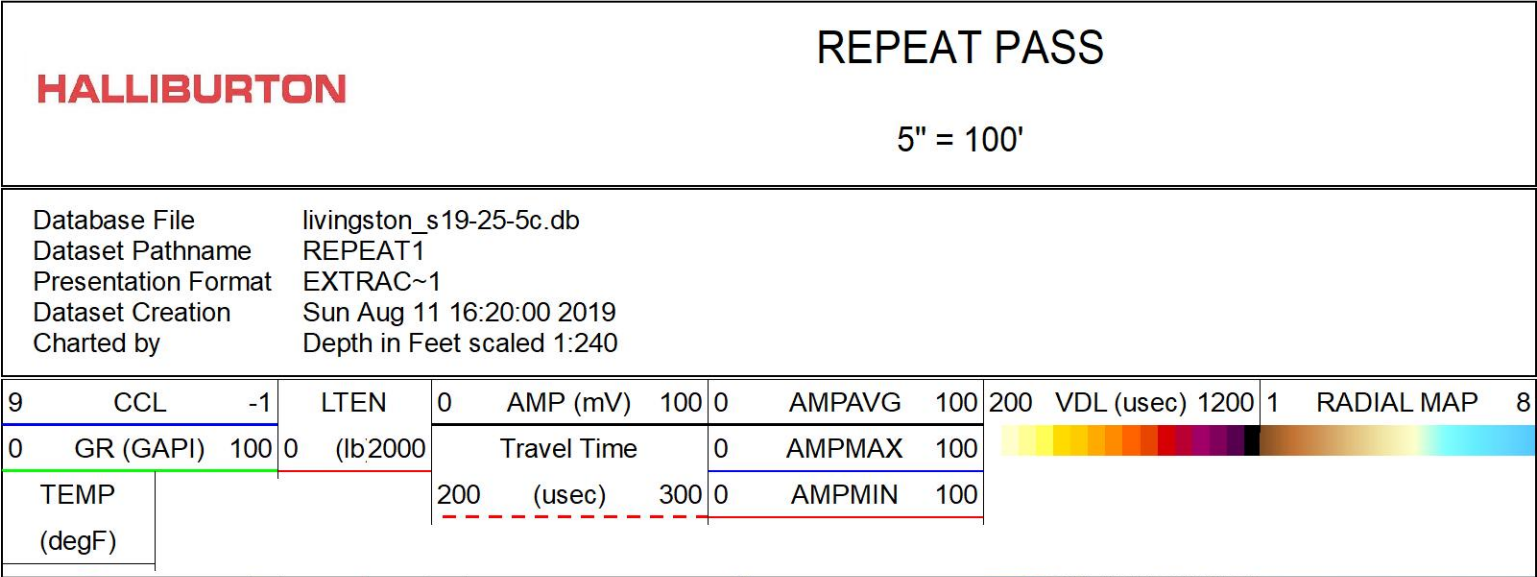






MAIN PASS

5" = 100'

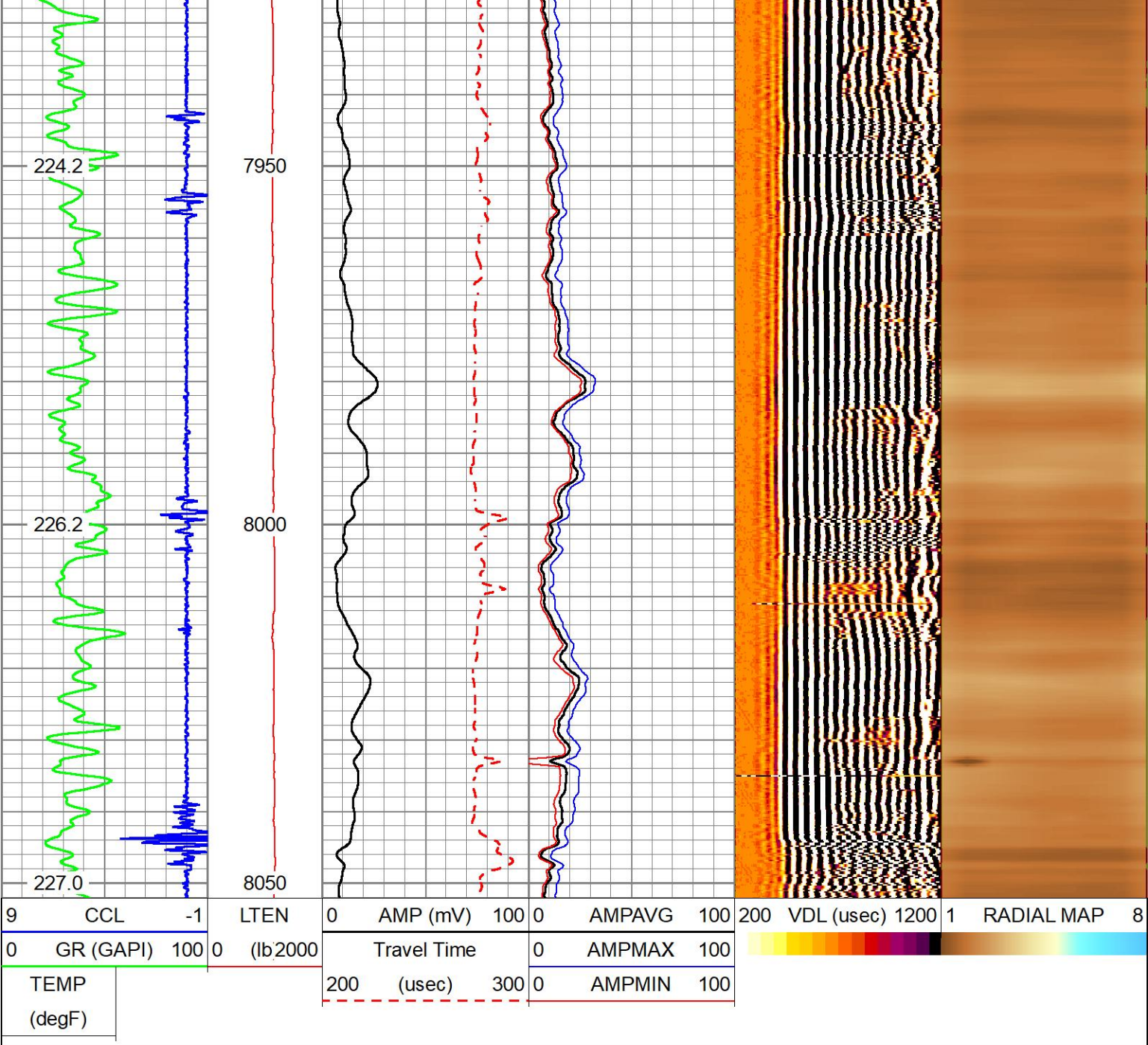


REPEAT PASS

5" = 100'

Database File livingston\_s19-25-5c.db  
Dataset Pathname REPEAT1  
Presentation Format EXTRAC~1  
Dataset Creation Sun Aug 11 16:20:00 2019  
Charted by Depth in Feet scaled 1:240





REPEAT PASS

HALLIBURTON

5" = 100'

Log Variables

DatabaseC:\ProgramData\Warrior\Data\livingston\_s19-25-5c.db  
Dataset field/well/run1/MAIN\_PASS/\_vars\_

Top - Bottom

|            |         |         |        |          |          |         |         |
|------------|---------|---------|--------|----------|----------|---------|---------|
| BHTEMP_Src | BITSIZE | BOTTEMP | CASEOD | CASETHCK | CASEWGHT | MAXAMPL | MINAMPL |
| TEMP       | in      | degF    | in     | in       | lb/ft    | mV      | mV      |
|            | 8.5     | 220     | 5.5    | 0.304    | 17       | 72      | 2       |
| MINATTN    | MudWgt  | PERFS   | PPT    | SRFTEMP  | TDEPTH   |         |         |
| db/ft      | lb/gal  |         | usec   | degF     | ft       |         |         |
| 0.8        | 8.4     | No      | 214    | 75       | 0        |         |         |

Calibration Report

Database File livingston\_s19-25-5c.db  
Dataset Pathname REPEAT1  
Dataset Creation Sun Aug 11 16:20:00 2019

Temperature Calibration Report

Serial Number: 001  
Tool Model: T\_Temp

|                 |           |                          |
|-----------------|-----------|--------------------------|
| Tool Model:     | Temp      | Mon Apr 04 13:27:25 2011 |
|                 | Reference | Reading                  |
| Low Reference:  | 0.00 degF | 0.00 cps                 |
| High Reference: | 1.00 degF | 1.00 cps                 |
| Gain:           | 0.10      |                          |
| Offset:         | 0.00      |                          |
| Delta Spacing   | 1         |                          |

|                              |
|------------------------------|
| Gamma Ray Calibration Report |
|------------------------------|

|                |                        |
|----------------|------------------------|
| Type / Serial: | probe275dig / pr050806 |
|----------------|------------------------|

|                            |             |                          |        |       |          |
|----------------------------|-------------|--------------------------|--------|-------|----------|
| SHOP CALIBRATION           |             | Tue Nov 01 09:40:24 2005 |        |       |          |
|                            | Counts/Sec. | Gain                     | Offset | Jig   | Units    |
| Background                 | 79.3        |                          |        |       | cps      |
| Calibrator                 | 459.5       |                          |        |       | cps      |
|                            |             | 0.6312                   |        |       | GAPI/cps |
| PRIMARY VERIFICATION       |             | 00:00:00                 |        |       |          |
| Background                 | 48.3        |                          |        |       | cps      |
| Calibrator                 | 288.5       |                          |        |       | cps      |
| Difference                 |             |                          |        | 240.2 | GAPI     |
| BEFORE SURVEY VERIFICATION |             | 00:00:00                 |        |       |          |
| Background                 | 47.8        |                          |        |       | cps      |
| Calibrator                 | 290.6       |                          |        |       | cps      |
| Difference                 |             |                          |        | 242.8 | GAPI     |
| AFTER SURVEY VERIFICATION  |             | 00:00:00                 |        |       |          |
| Background                 | 35.8        |                          |        |       | cps      |
| Calibrator                 | 286.1       |                          |        |       | cps      |
| Difference                 |             |                          |        | 250.2 | GAPI     |


|  |
|--|
| Segmented Cement Bond Log Calibration Report |
|--|

|                              |             |
|------------------------------|-------------|
| Serial Number:               | 051010      |
| Tool Model:                  | Probe       |
| Calibration Casing Diameter: | 5.500 in    |
| Calibration Depth:           | 1555.363 ft |

|   |         |       |                 |        |         |        |
|---|---------|-------|-----------------|--------|---------|--------|
| Master Calibration, performed Sun Aug 11 15:52:54 2019: |         |       |                 |        |         |        |
|   | Raw (v) |       | Calibrated (mv) |        | Results |        |
|   | Zero    | Cal   | Zero            | Cal    | Gain    | Offset |
| 3'  | 0.012   | 1.241 | 1.000           | 72.000 | 57.736  | 0.329  |
| CAL   | 0.012   | 1.509 |                 |        |         |        |
| 5'  | 0.017   | 0.895 | 1.000           | 72.000 | 80.863  | -0.400 |
| SUM   |         |       |                 |        |         |        |
| S1  | 0.011   | 1.471 | 0.000           | 72.000 | 49.297  | -0.529 |
| S2  | 0.010   | 1.378 | 0.000           | 72.000 | 52.631  | -0.547 |
| S3  | 0.011   | 1.299 | 0.000           | 72.000 | 55.864  | -0.590 |
| S4  | 0.011   | 1.230 | 0.000           | 72.000 | 59.046  | -0.634 |
| S5  | 0.011   | 1.178 | 0.000           | 72.000 | 61.685  | -0.691 |
| S6  | 0.011   | 1.130 | 0.000           | 72.000 | 64.359  | -0.724 |
| S7  | 0.011   | 1.167 | 0.000           | 72.000 | 62.318  | -0.711 |
| S8  | 0.011   | 1.262 | 0.000           | 72.000 | 57.528  | -0.626 |

|   |         |       |                |       |         |        |
|---|---------|-------|----------------|-------|---------|--------|
| Internal Reference Calibration, performed Tue Oct 11 09:01:28 2005: |         |       |                |       |         |        |
|   | Raw (v) |       | Calibrated (v) |       | Results |        |
|   | Zero    | Cal   | Zero           | Cal   | Gain    | Offset |
| CAL   | 0.000   | 0.000 | 0.012          | 1.509 | 1.000   | 0.000  |

|     | 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   |

| Sensor           | Offset (ft) | Schematic  | Description   | Length (ft) | O.D. (in) | Weight (lb) |
|------------------|-------------|--|---|-------------|-----------|-------------|
| WVFCAL<br>WVF3FT | 11.94       |  | CHD-1-7/16 (12345678)<br>Monocable Head Assembly                          | 1.28        | 1.44      | 1.50        |
|                  | 11.94       |  | CENT-Probe_275<br>Probe 2 3/4 Centralizer                                 | 2.88        | 2.75      | 20.00       |
|                  |             |  | RBT_PRB275-Probe (051010)<br>Probe Radii Bond Tool with Digital Telemetry | 8.33        | 2.75      | 90.00       |
|                  |             |  | CENT-Probe_275<br>Probe 2 3/4 Centralizer                                 | 2.88        | 2.75      | 20.00       |
| WVF5FT           | 9.94        |  |   |             |           |             |
| CCL              | 5.40        |  |   |             |           |             |



|   |              |  |   |      |      |       |
|---|--------------|--|---|------|------|-------|
| GR  | 4.02         |  | GR_PRB275-probe275dig (pr050806)<br>Probe Digital Gamma CCL | 4.75 | 2.75 | 57.00 |
| TEMP<br>LLMTEN  | 0.42<br>0.00 |  | TEMP-T_Temp (001)<br>Titan 1.375 Temp Tool                  | 1.48 | 1.38 | 5.00  |
| Dataset: livingston_s19-25-5c.db: field/well/run1/MAIN_PASS<br>Total length: 21.59 ft<br>Total weight: 193.50 lb<br>O.D.: 2.75 in |              |  |   |      |      |       |

|             |                           |  |  |       |    |
|-------------|---------------------------|--|--|-------|----|
| Company     | EXTRACTION OIL & GAS INC  |  |  |       |    |
| Well        | LIVINGSTON S19-25-5C      |  |  |       |    |
| Field       | WATTENBERG                |  |  |       |    |
| County      | BROOMFIELD                |  |  | State | CO |
| HALLIBURTON | RADIAL CEMENT<br>BOND LOG |  |  |       |    |