# Radial Cement Bond
# Gamma Ray
# Casing Collar Log

| | |
|---|---|
| Company | TEP Rocky Mountain LLC |
| Well | Clough NR 13-3 |
| Field | Rulison |
| County | Garfield |
| State | Colorado |

Company TEP Rocky Mountain LLC
Well Clough NR 13-3
Field Rulison
County Garfield State Colorado

Location: API # : 05-045-23924
SEC 3 TWP 6S RGE 94W

Other Services
--

| | | | |
|---|---|---|---|
| Permanent Datum | Ground Level | Elevation 6719.1' | Elevation<br>K.B. 6743.1'<br>D.F. 6742.1'<br>G.L. 6719.1' |
| Log Measured From | Kelly Bushing | 24 FT | |
| Drilling Measured From | Kelly Bushing | | |

| | | | |
|---|---|---|---|
| Date | 13-NOV-2018 | | |
| Run Number | One | | |
| Depth Driller | 10142 FT | | |
| Depth Logger | 10054 FT | | |
| Bottom Logged Interval | 10040 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 | 5:00 | | |
| 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 | 36 | J-55 | Surface | 1125 FT |
| Intermediate #1 | 4 1/2 | 11.6 | P-110 | Surface | 10100 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 6147-6161 FT
Log ran from 10040 FT to Surface
Recorded with 0 PSI Surface Induced Pressure

Thank you for choosing Reliance Oilfield Services, LLC!

## Main Pass

Recorded With 0 PSI Surface Induced Pressure

| | |
|---|---|
| Database File | tep\tep_clough nr 13-3_rbl_11-13-18\tep_clough nr 13-3_rbl_11-13-18.db |
| Dataset Pathname | main.2 |
| Presentation Format | ros_rbt004_tep |
| Dataset Creation | Wed Nov 14 08:58:38 2018 |
| Charted by | Depth in Feet scaled 1:240 |

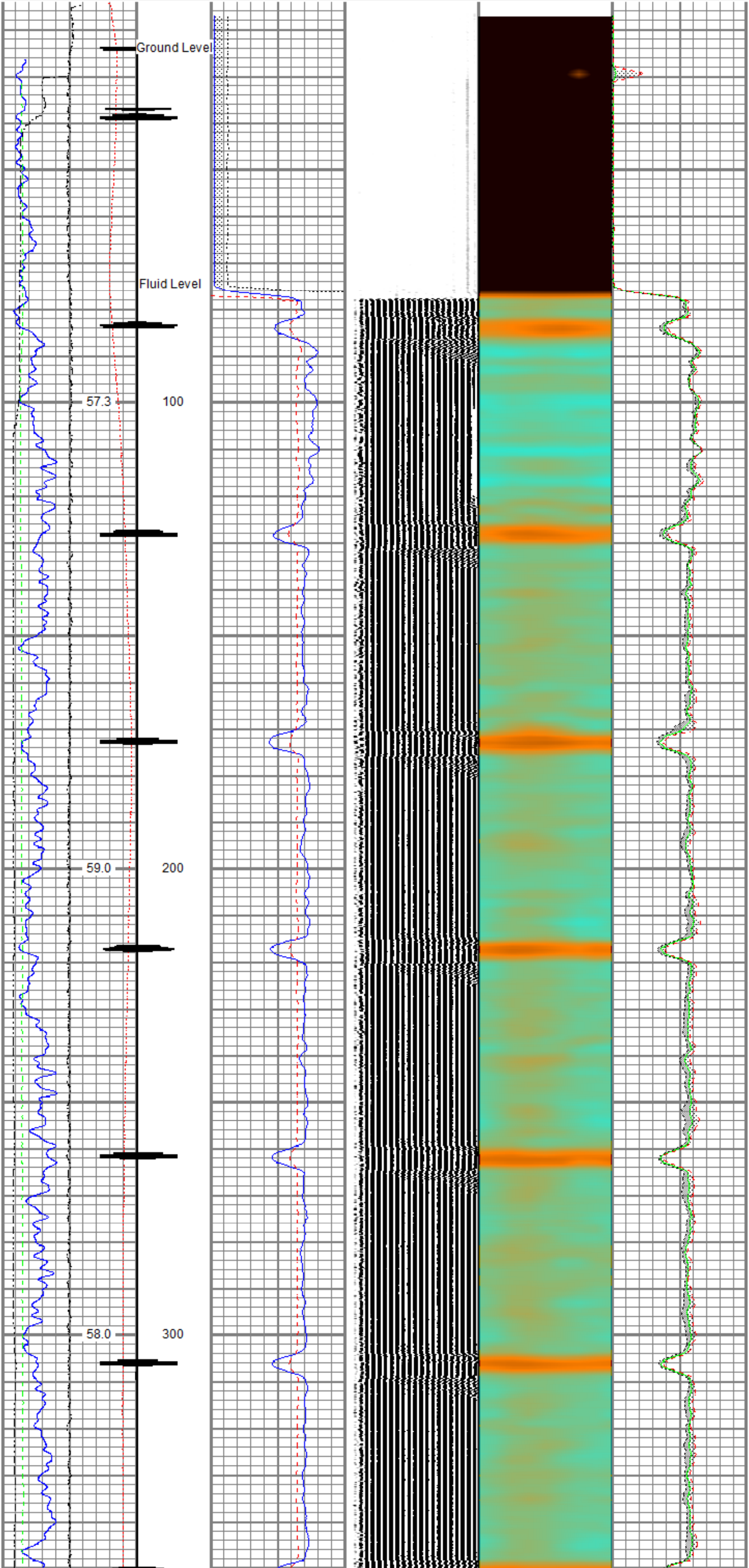
Gamma Ray 0 (GAPI) 200
Line Speed -150 (ft/min) 150
Line Tension 0 (lb) 2000
Differential Temperature -2 (degF) 2
Temperature 0 (degF) 20
10 CCL 0

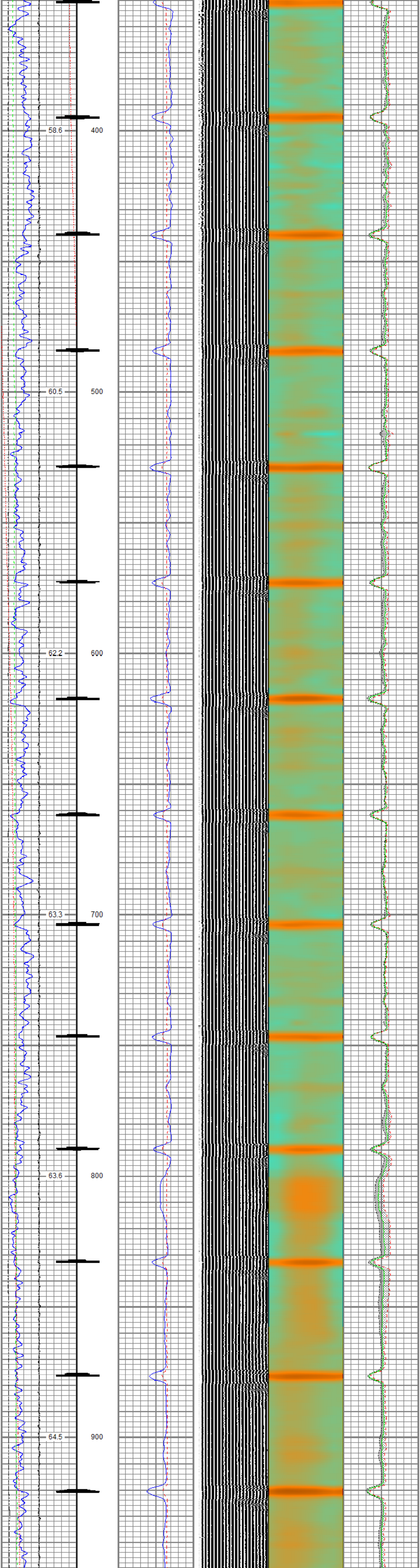
3' Amplitude 0 (mV) 100
3' Amplitude x 5 0 (mV) 20
3' Travel Time 300 (usec) 200

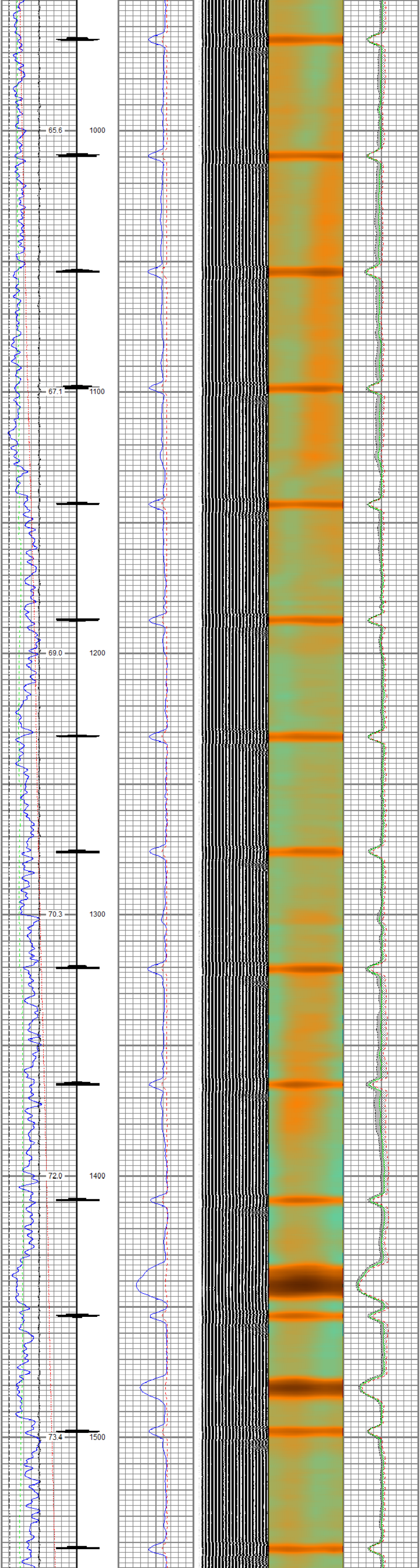
5' Variable Density Log 200 1200

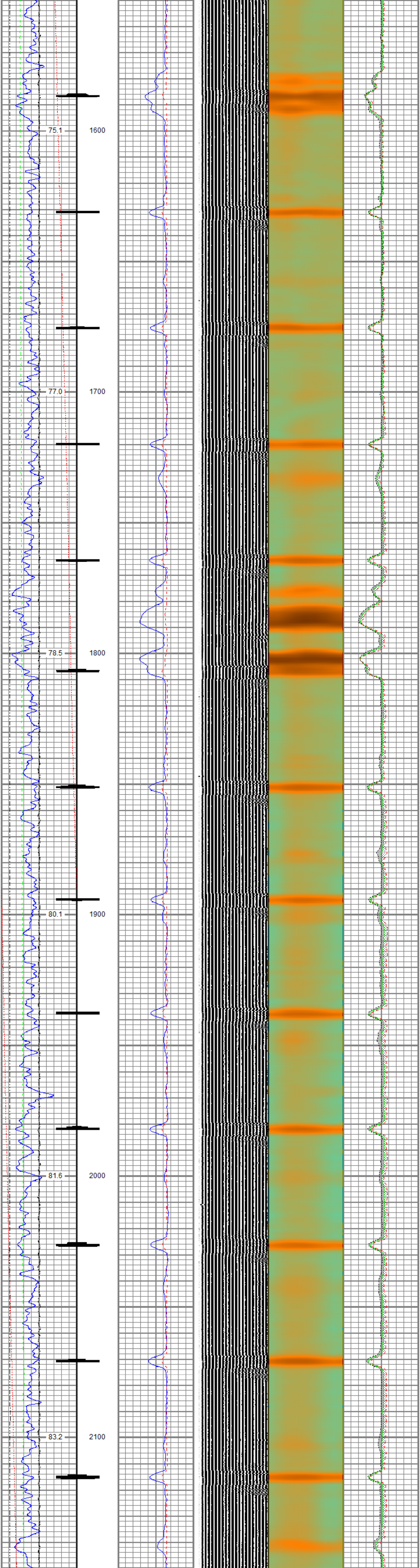
Sector Map 10 110

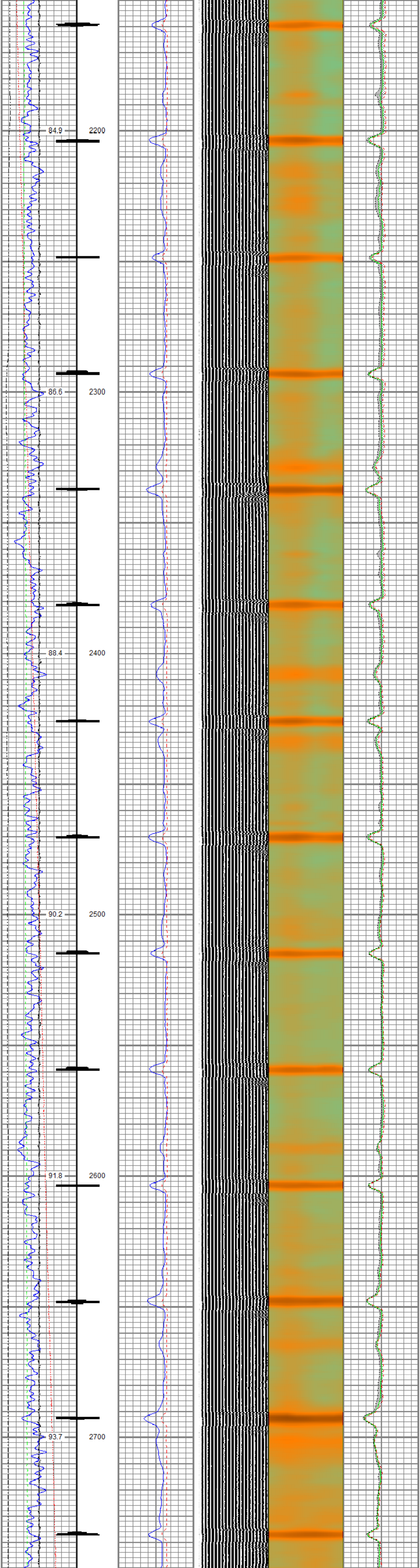
Average Amplitude 0 150
Mimimum Amplitude 0 150
Maximum Amplitude 0 150

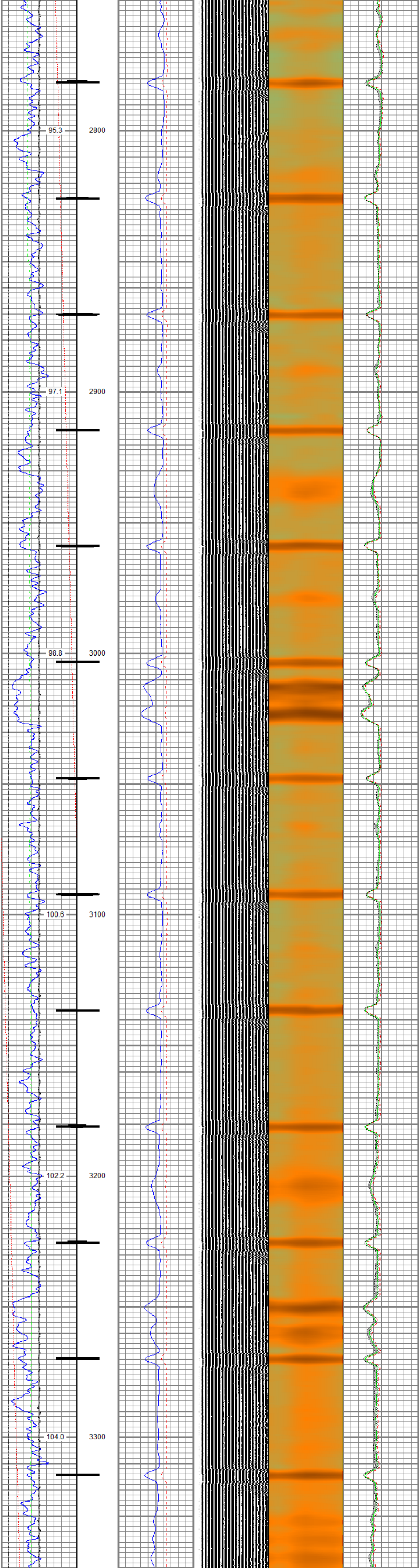


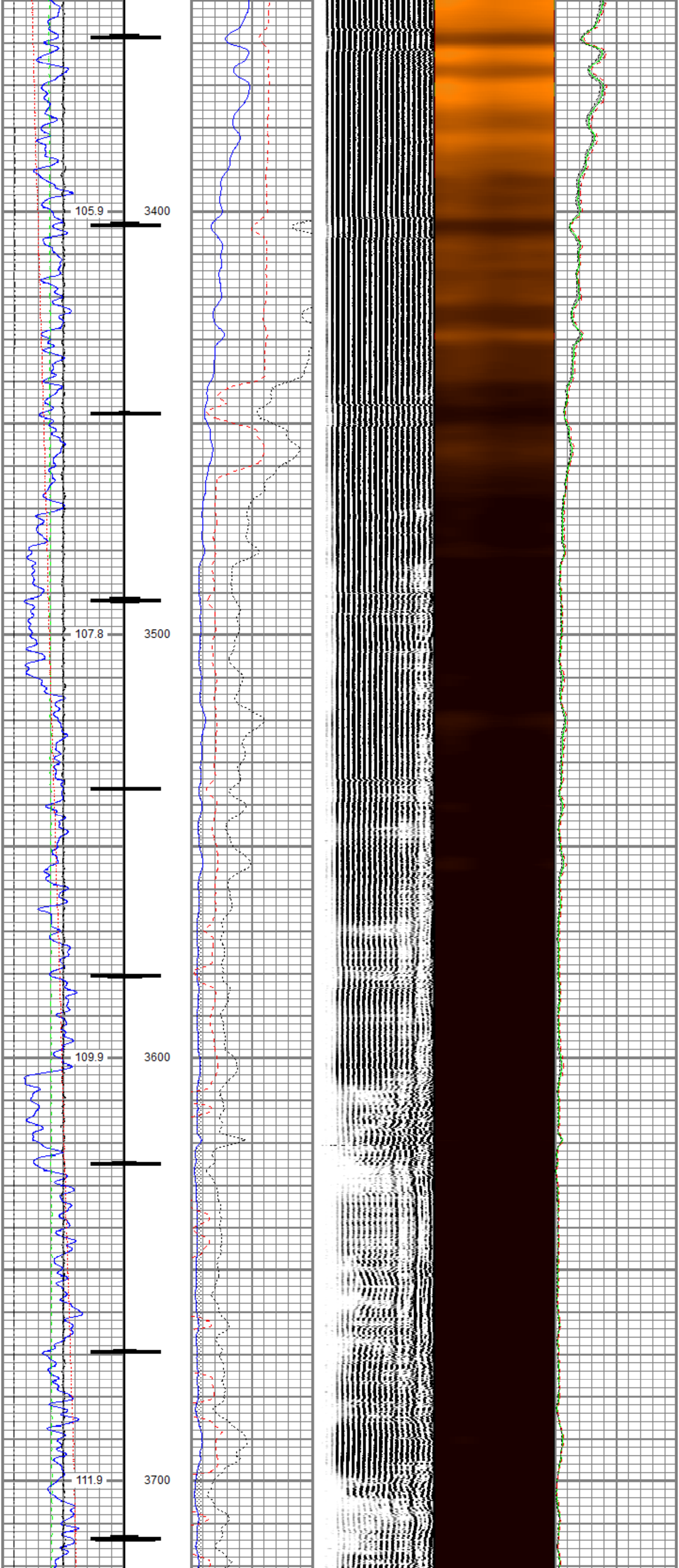


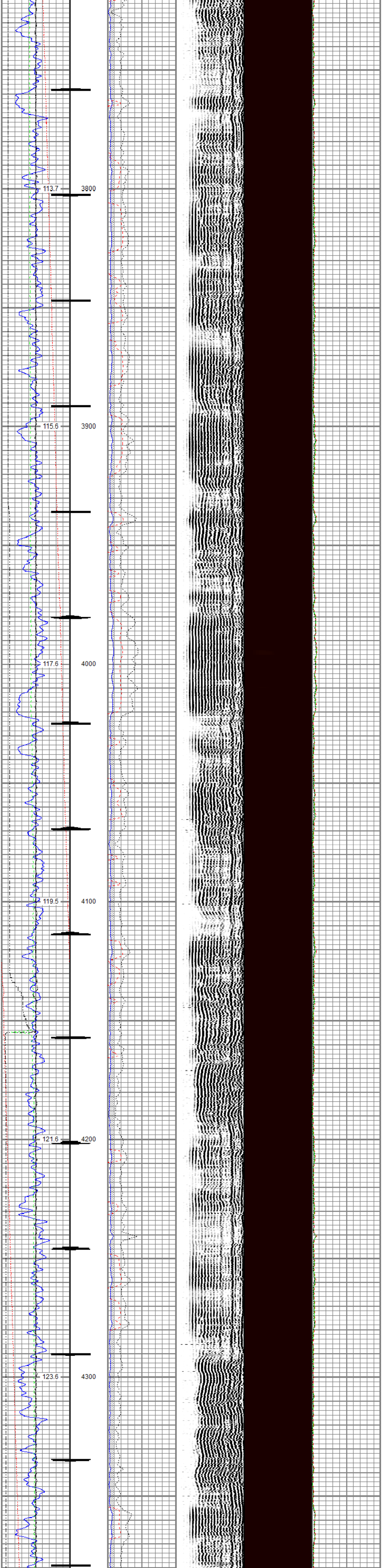








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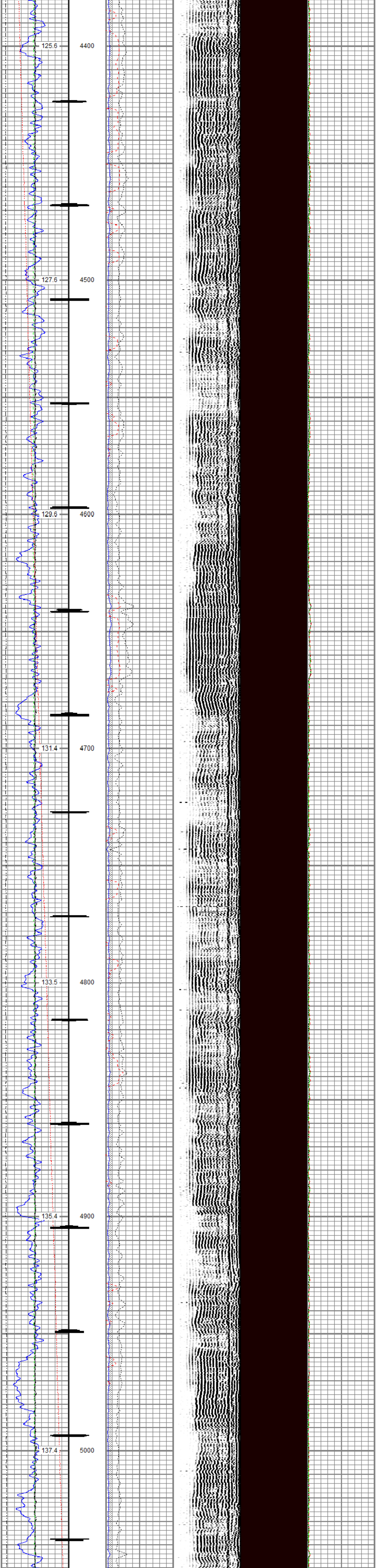
115.6
3900
117.6
4000
119.5
4100
121.6
4200
123.6
4300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4500
129.6
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4700
133.5
4800
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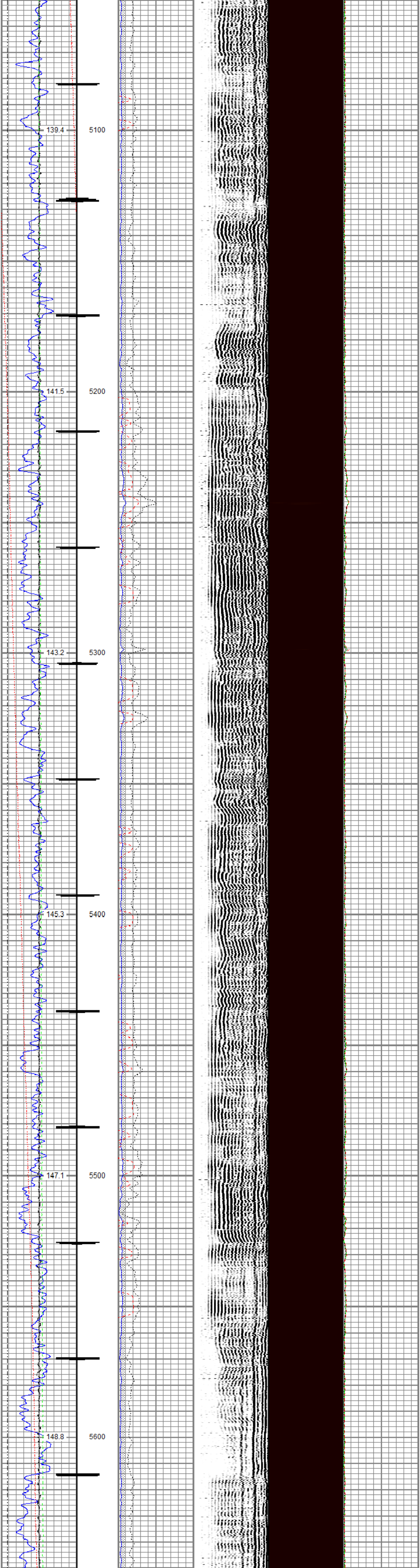
4900
137.4
5000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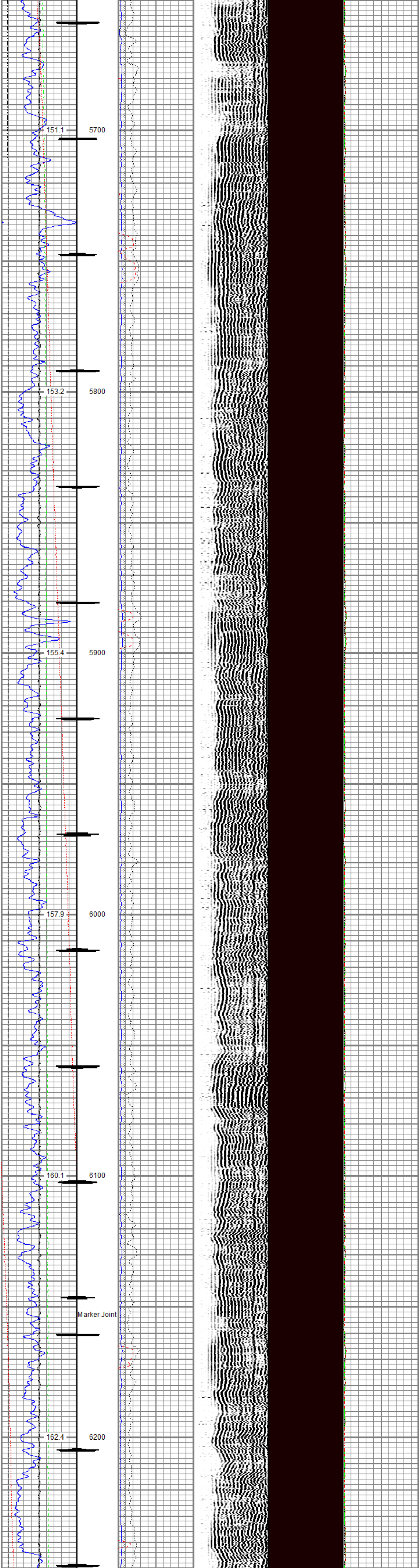
147.1
5500
148.8
5600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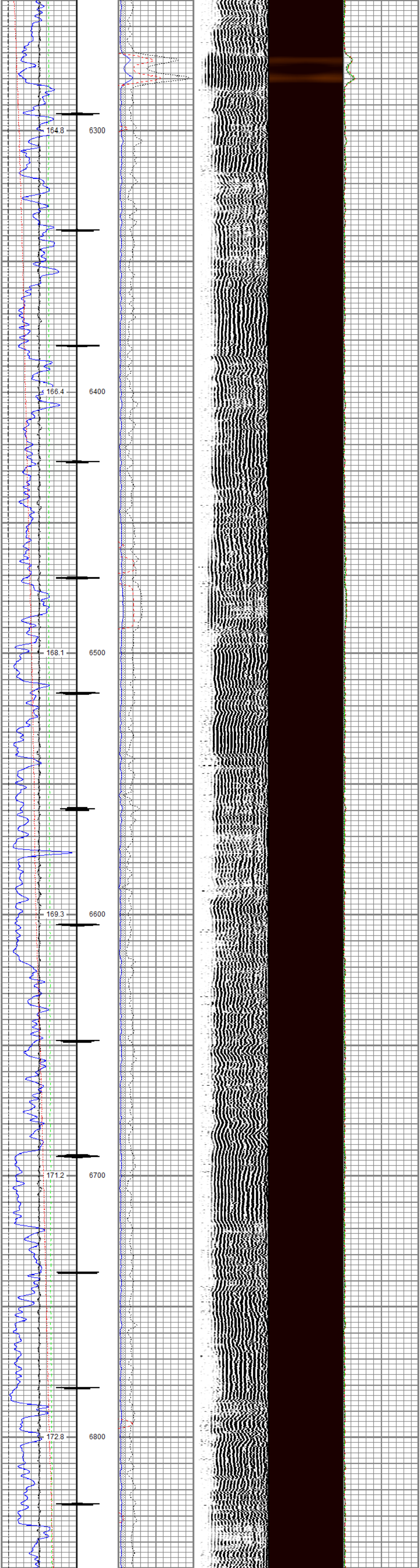
153.2
5800
155.4
5900
157.9
6000
160.1
6100
Marker Joint
162.4
6200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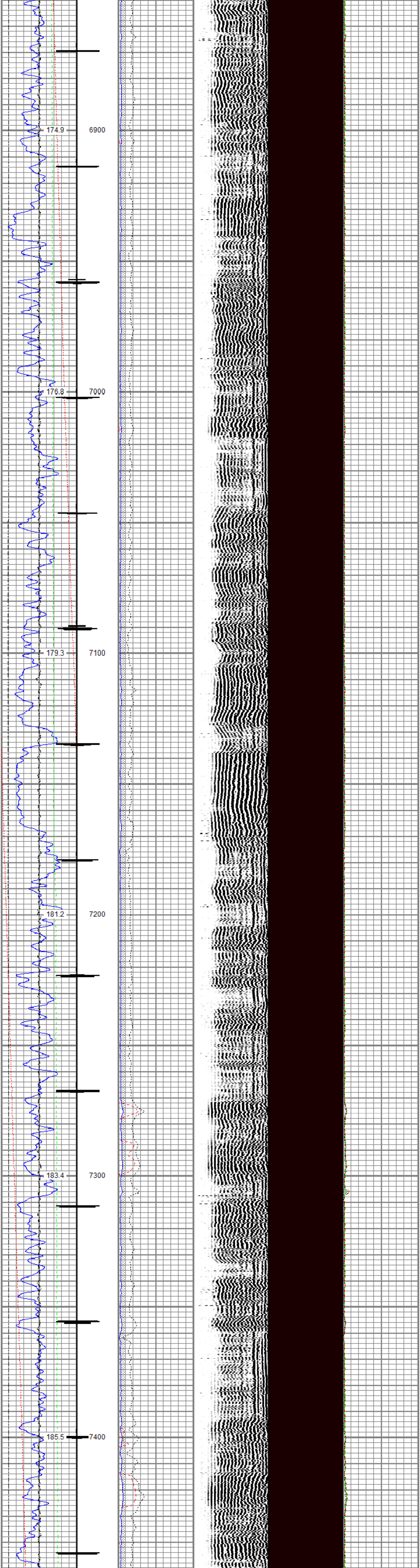
171.2
6700
172.8
6800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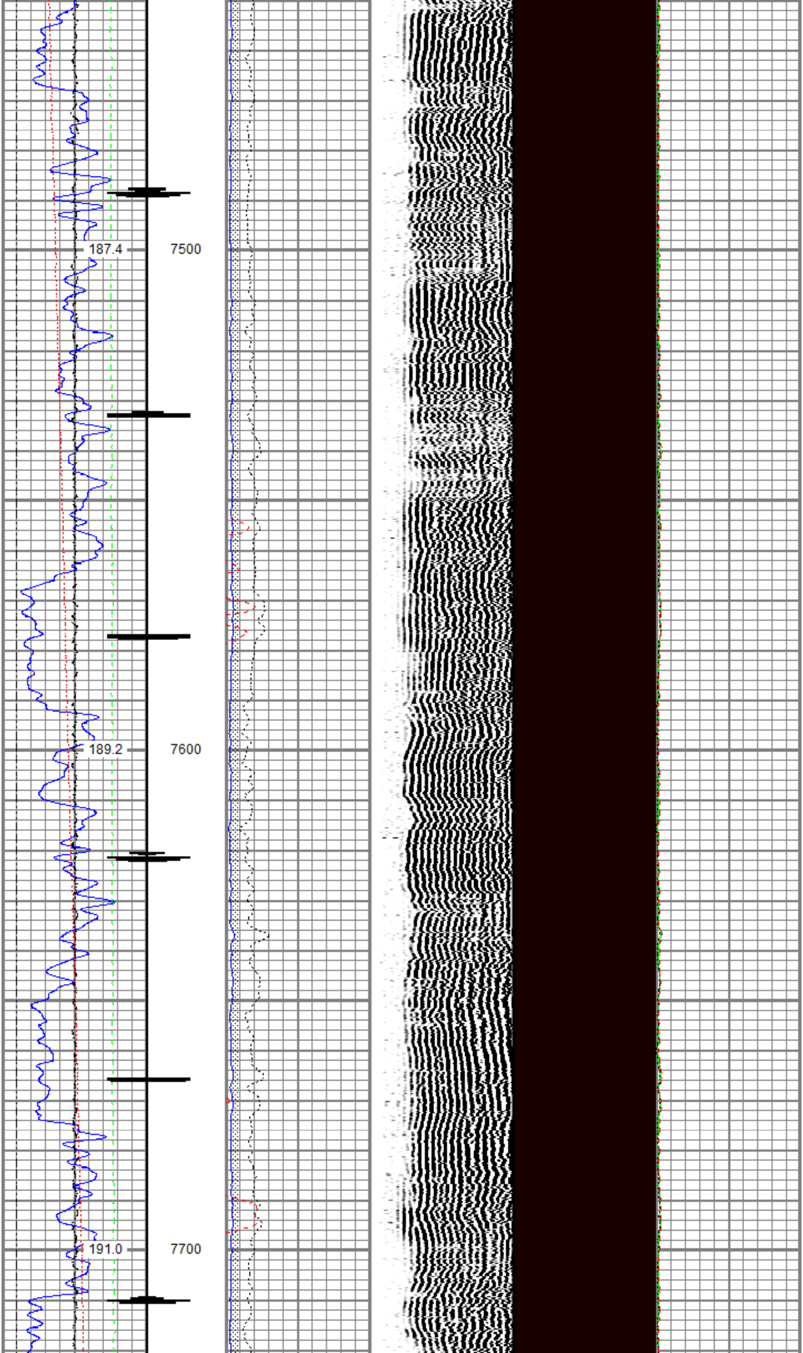
183.4
7300
185.5
7400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7500
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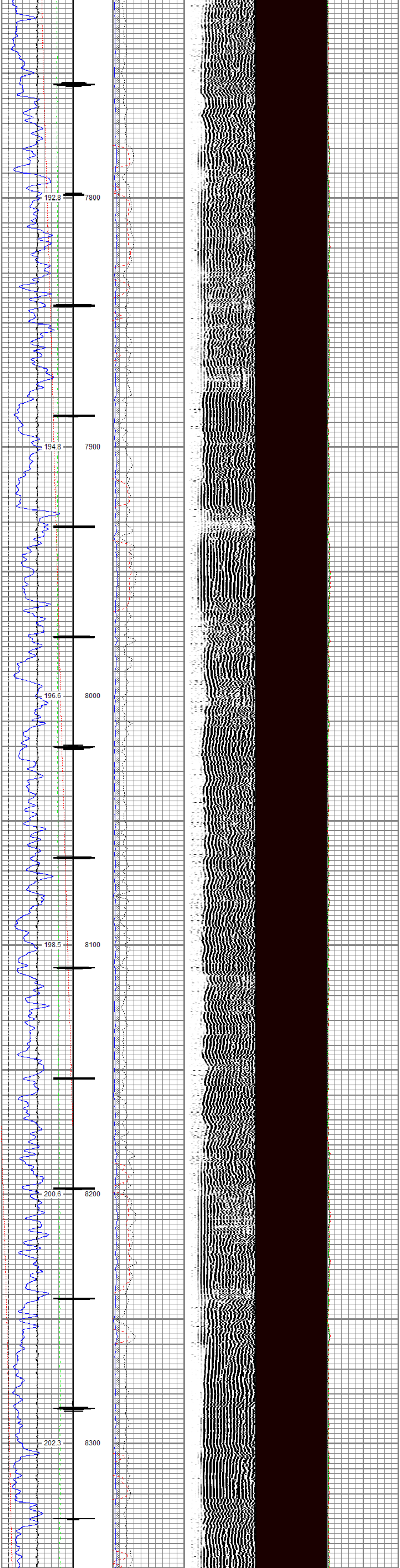
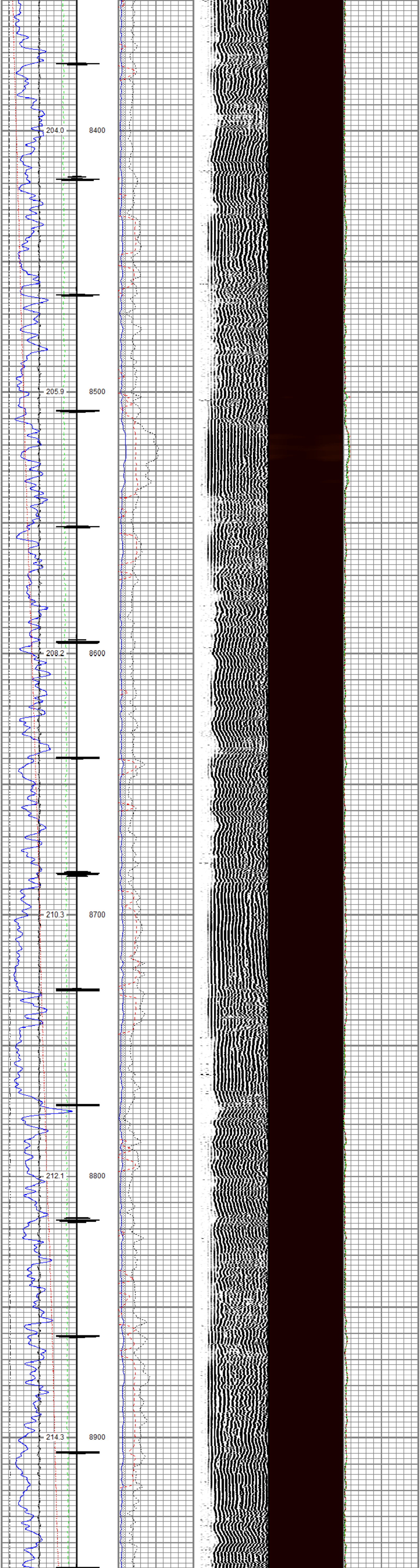
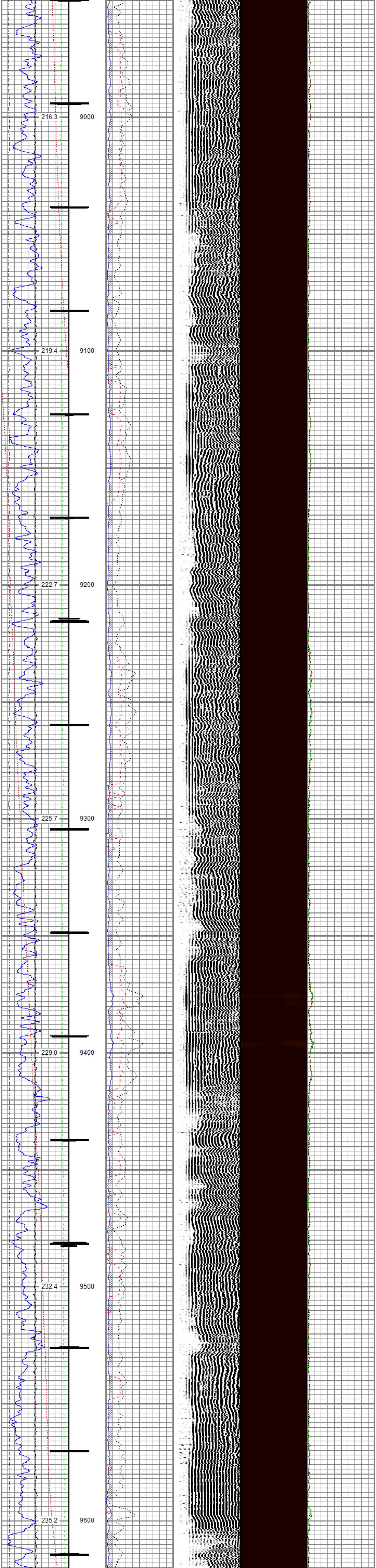
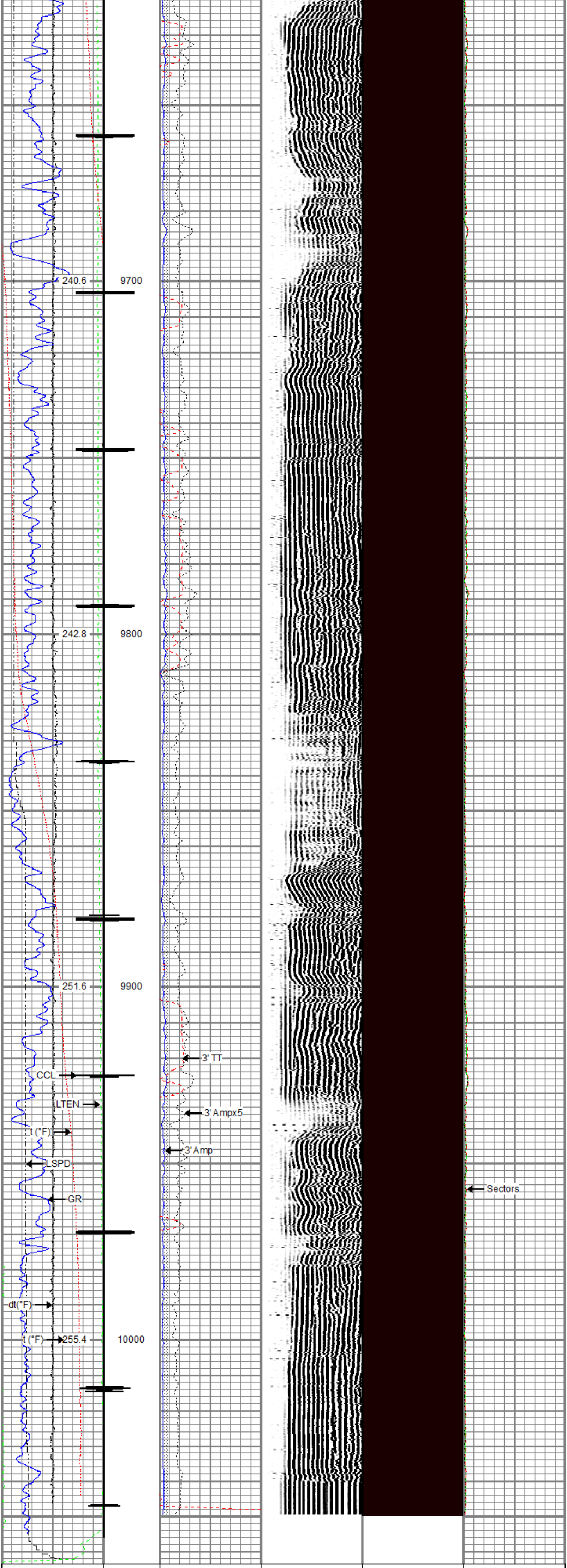
7600
191.0
7700









| 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 | | | | |
| 10 CCL 0 | | | | |

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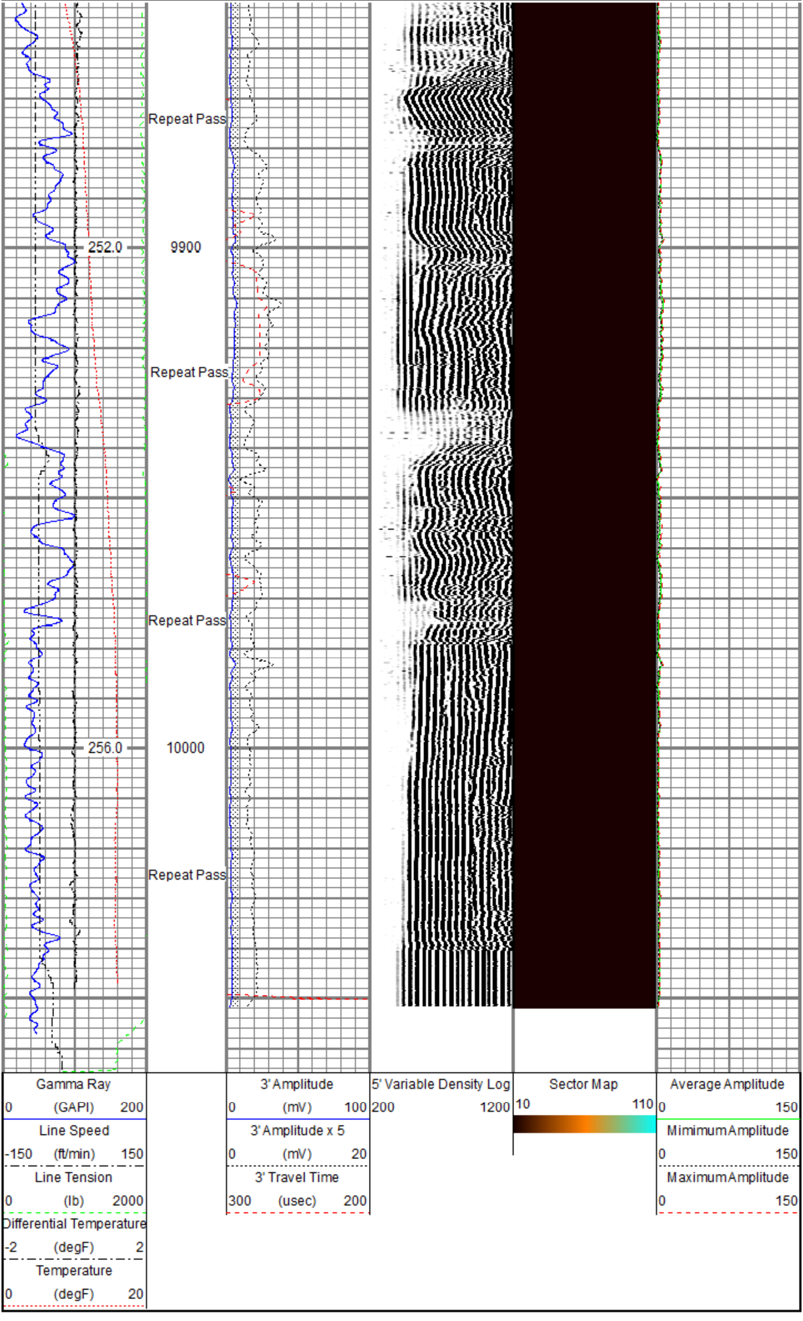
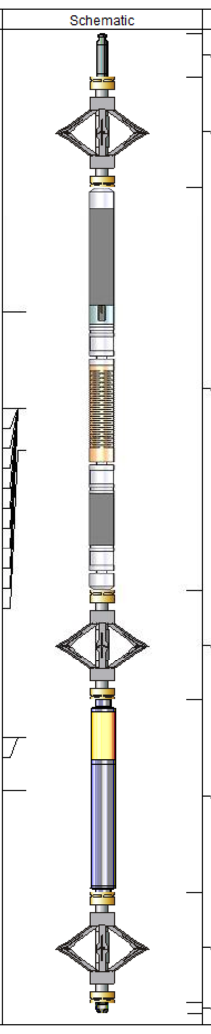
## Repeat Pass

Recorded With 0 PSI Surface Induced Pressure

| | |
|---|---|
| Database File | tep\tep_clough nr 13-3_rbl_11-13-18\tep_clough nr 13-3_rbl_11-13-18.db |
| Dataset Pathname | repeat.2 |
| Presentation Format | ros_rbt004_tep |
| Dataset Creation | Wed Nov 14 09:12:00 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 | | | | |





| 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<br>Titan 1-7/16" Assembled Electric Cable Head w/ 1" Fishing Neck | 1.03 | 1.44 | 3.60 |
| DSS RAC-2750 5A GO<br>DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends | 2.55 | 2.75 | 32.00 |
| Probe Radii-2750 RBT (101013)<br>Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub | 9.39 | 2.75 | 105.00 |
| DSS RAC-2750 5A GO<br>DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends | 2.55 | 2.75 | 32.00 |
| Probe GR-CCL-2750 GOB (FW1211-081)<br>Probe 2-3/4" rev.2 Digital Scintillation Gamma Ray/CCL Combined | 4.51 | 2.75 | 55.00 |
| DSS RAC-2750 5A GO<br>DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends | 2.55 | 2.75 | 32.00 |
| GO BN-14375<br>GO 1 7/16" Bull Nose with Go Box Top | 0.25 | 1.44 | 1.00 |

| | |
|---|---|
| Dataset: | tep_clough nr 13-3_rbl_11-13-18.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\tep_clough nr 13-3_rbl_11-13-18\tep_clough nr 13-3_rbl_11-13-18.db |
| Dataset Pathname | main.2 |
| Dataset Creation | Wed Nov 14 08:58:38 2018 |

### Gamma Ray Calibration Report

| | | |
|---|---|---|
| Serial Number: | FW1211-081 | |
| Tool Model: | 2750 GOB | |
| Performed: | Sun Nov 12 12:22:44 2017 | |
| Calibrator Value: | 637.0 | GAPI |
| Background Reading: | 112.4 | cps |
| Calibrator Reading: | 1008.7 | cps |
| Sensitivity: | 0.7107 | GAPI/cps |

### Segmented Cement Bond Log Calibration Report

| | | |
|---|---|---|
| Serial Number: | 101013 | |
| Tool Model: | 2750 RBT | |
| Calibration Casing Diameter: | 4.500 | in |
| Calibration Depth: | -46.592 | ft |

Master Calibration, performed (Derived):

| | Raw (v) | | Calibrated (mv) | | Results | |
|---|---|---|---|---|---|---|
| | Zero | Cal | Zero | Cal | Gain | Offset |
| 3' | -0.024 | 0.849 | 0.800 | 81.196 | 92.155 | 2.968 |
| CAL | 0.743 | 0.744 | | | | |
| 5' | 0.005 | 0.694 | 0.800 | 81.196 | 116.745 | 0.196 |
| SUM | | | | | | |
| S1 | -0.020 | 0.831 | 0.000 | 100.000 | 117.501 | 2.382 |
| S2 | -0.023 | 0.847 | 0.000 | 100.000 | 114.894 | 2.646 |
| S3 | -0.024 | 0.853 | 0.000 | 100.000 | 113.998 | 2.730 |
| S4 | -0.020 | 0.866 | 0.000 | 100.000 | 112.885 | 2.243 |
| S5 | -0.014 | 0.848 | 0.000 | 100.000 | 115.994 | 1.671 |
| S6 | -0.013 | 0.835 | 0.000 | 100.000 | 117.881 | 1.566 |
| S7 | -0.016 | 0.821 | 0.000 | 100.000 | 119.381 | 1.929 |
| S8 | -0.016 | 0.841 | 0.000 | 100.000 | 116.563 | 1.914 |

Internal Reference Calibration, performed (Not Performed):

| | Raw (v) | | Calibrated (v) | | Results | |
|---|---|---|---|---|---|---|
| | Zero | Cal | Zero | Cal | Gain | Offset |
| CAL | 0.000 | 0.000 | 0.743 | 0.744 | 1.000 | 0.000 |

Air Zero Calibration, performed Tue Nov 13 05:02:29 2018:

| | Raw (v) | Calibrated (v) | Results |
|---|---|---|---|
| | Zero | Zero | Offset |
| 3' | -0.005 | 0.000 | 0.000 |
| 5' | -0.003 | 0.000 | -0.000 |
| SUM | | | |
| S1 | -0.005 | 0.000 | 0.000 |
| S2 | -0.005 | 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 | -0.000 |
| S7 | -0.005 | 0.000 | 0.000 |
| S8 | -0.005 | 0.000 | 0.000 |

### Temperature Calibration Report

| | | |
|---|---|---|
| Serial Number: | 101013 | |
| Tool Model: | 2750 RBT | |
| Performed: | Sun Nov 12 13:21:13 2017 | |
| | 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 | |

RELIANCE
OILFIELD SERVICES

| | |
|---|---|
| Company | TEP Rocky Mountain LLC |
| Well | Clough NR 13-3 |
| Field | Rulison |
| County | Garfield |
| State | Colorado |