

**Segmented Radial Cement Bond
W/Gamma Ray, CCL
Log**

| | | |
|---|---|-----------------------------------|
| Company Antero Resources Corporation Well Buzzard Unit 2H Field Marcellus County Ritchie State WV Country US | Company Antero Resources Corporation Well Buzzard Unit 2H Field Marcellus County Ritchie State WV Country US | |
| Location: API #: 47085103800000 | | |
| Permanent Datum Log Measured From Drilling Measured From | SEC TWP RGE Ground Level R.K.B. 25' R.K.B. | Elevation K.B. D.F. G.L. |

| | | |
|------------------------|---------------|--|
| Date | 16-NOV-2019 | |
| Run Number | ONE | |
| Depth Driller | 18144' | |
| Depth Logger | 6890' | |
| Bottom Logged Interval | 6890' | |
| Top Log Interval | Surface | |
| Open Hole Size | 8.25" | |
| Type Fluid | FWW | |
| Density / Viscosity | 8.6 | |
| Max. Recorded Temp. | 139 degF | |
| Estimated Cement Top | 3870' | |
| Time Well Ready | N/A | |
| Time Logger on Bottom | N/A | |
| Equipment Number | 214182 | |
| Location | Bridgport, WV | |
| Recorded By | S. Butler | |
| Witnessed By | Jerrako Evans | |

| Borehole Record | | | | Tubing Record | | | |
|-----------------|----------|---------|--------|---------------|--------|------|----|
| Run Number | Bit Size | From | To | Size | Weight | From | To |
| ONE | 24" | Surface | 80' | | | | |
| TWO | 17.5" | 80' | 581' | | | | |
| THREE | 12.25" | 581' | 2660' | | | | |
| FOUR | 8.25" | 2660' | 18144' | | | | |

| Casing Record | | | |
|-------------------|---------|-------|---------|
| Surface String | Size | Vg/ft | Top |
| Surface String | 13.375" | 54.5 | Surface |
| Prot. String | 9.625" | 40 | Surface |
| Production String | 5.5" | 20 | Surface |
| Liner | | | Bottom |

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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

Zero @ R.K.B. 25'
Marker Joint 6186' - 6202'
Log TD 6890'
Cement Top @ 3870'
Log Ran Under 1500 PSI

RECEIVED
 Office of Oil and Gas
AUG 31 2020
 WV Department of
 Environmental Protection



Main Pass

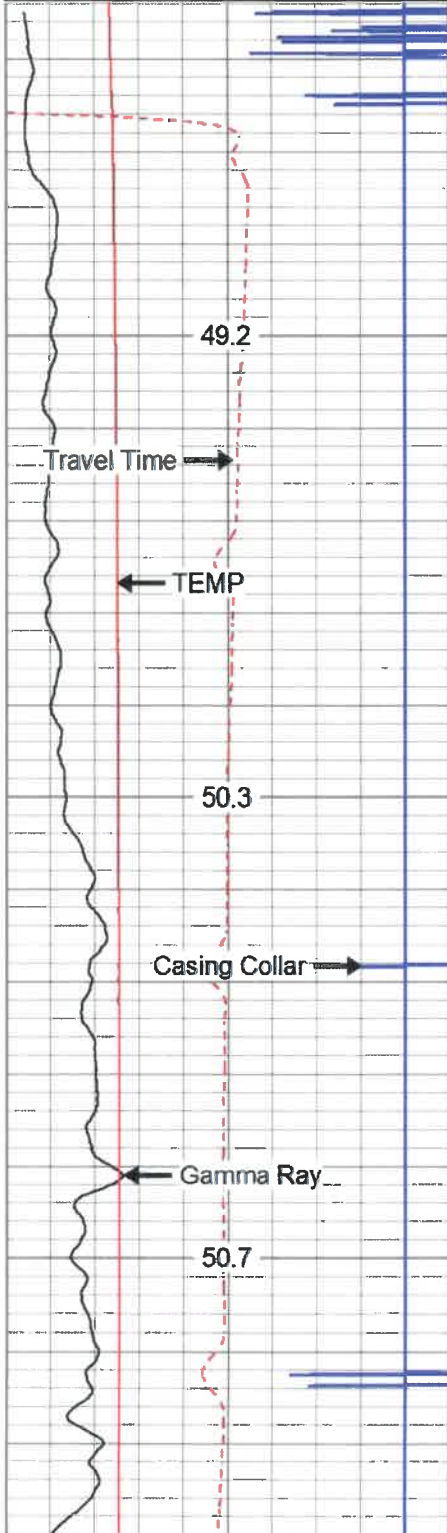
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 Dataset Pathname pass2.1
 Presentation Format antero
 Dataset Creation Sat Nov 16 17:54:44 2019
 Charted by Depth in Feet scaled 1:240

| | | |
|-----|--------------------|-----|
| 280 | Travel Time (usec) | 180 |
| 9 | Casing Collar | -1 |
| 0 | Gamma Ray | 180 |
| 0 | TEMP (degF) | 200 |
| 180 | GR | 360 |

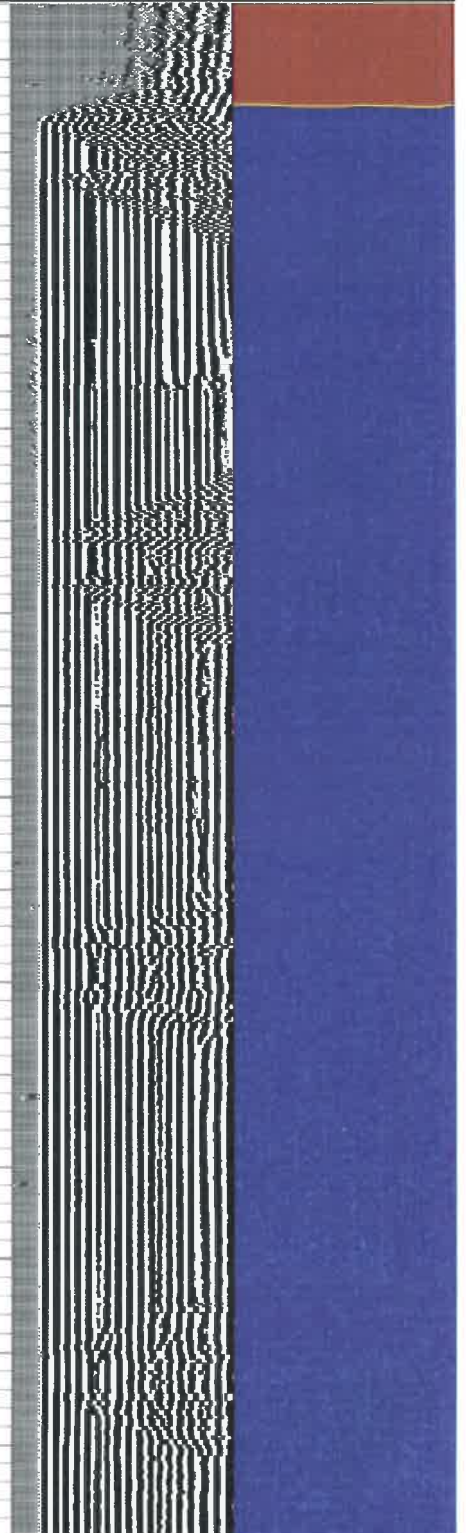
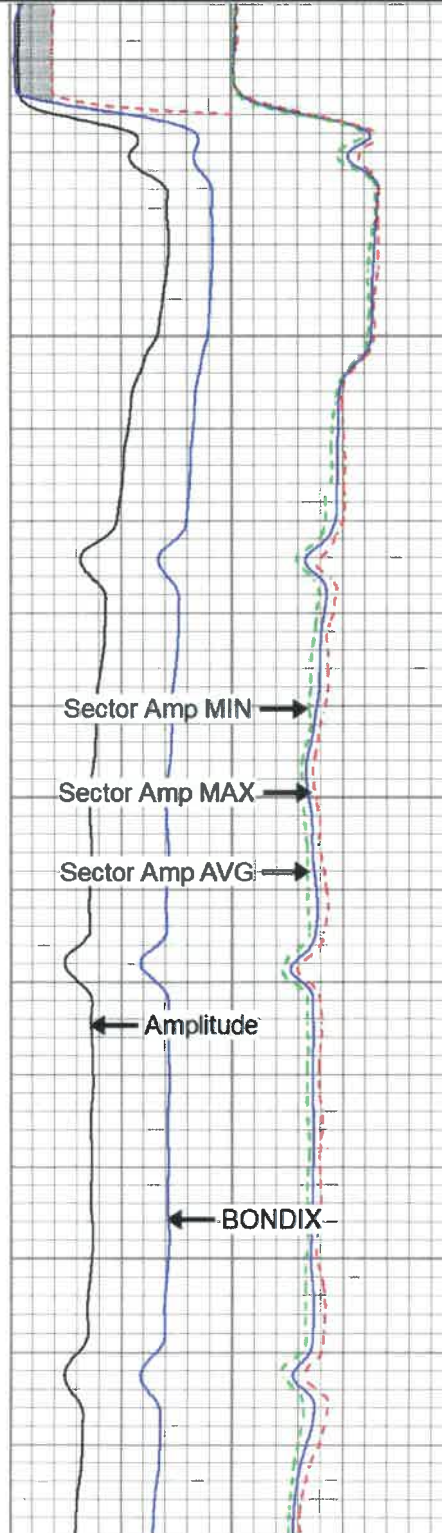
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|-----------|----------|----------------|
| Amplitude | | Sector Amp AVG |
| 0 | (mV) 100 | Sector Amp MAX |
| Amp X5 | | Sector Amp MIN |
| 0 | (mV) 20 | |
| 1 | BONDIX 0 | |

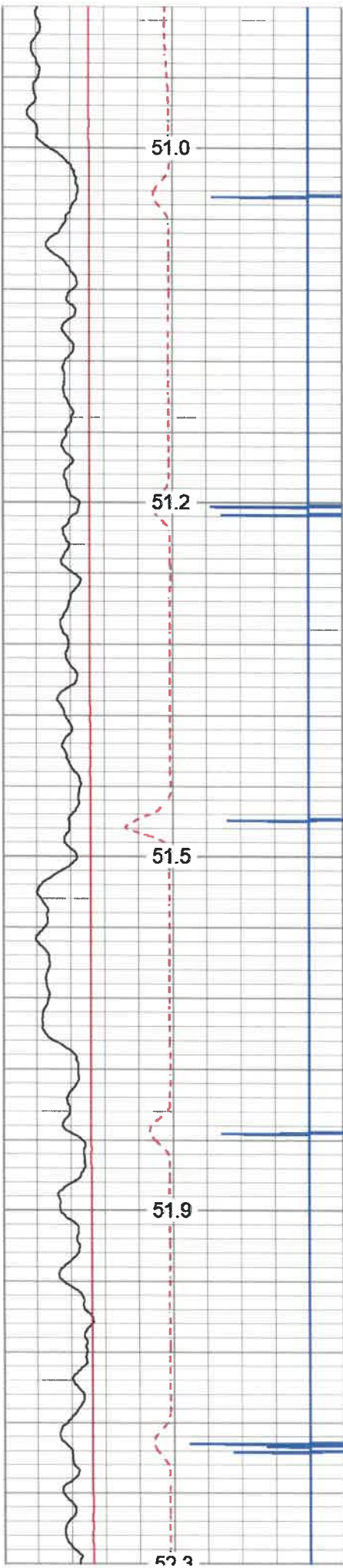
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|--------|-----|------------|----|
| VDL | 1 | Sector Map | 12 |
| (usec) | 200 | | |

TEMP (degF)



50
100
150





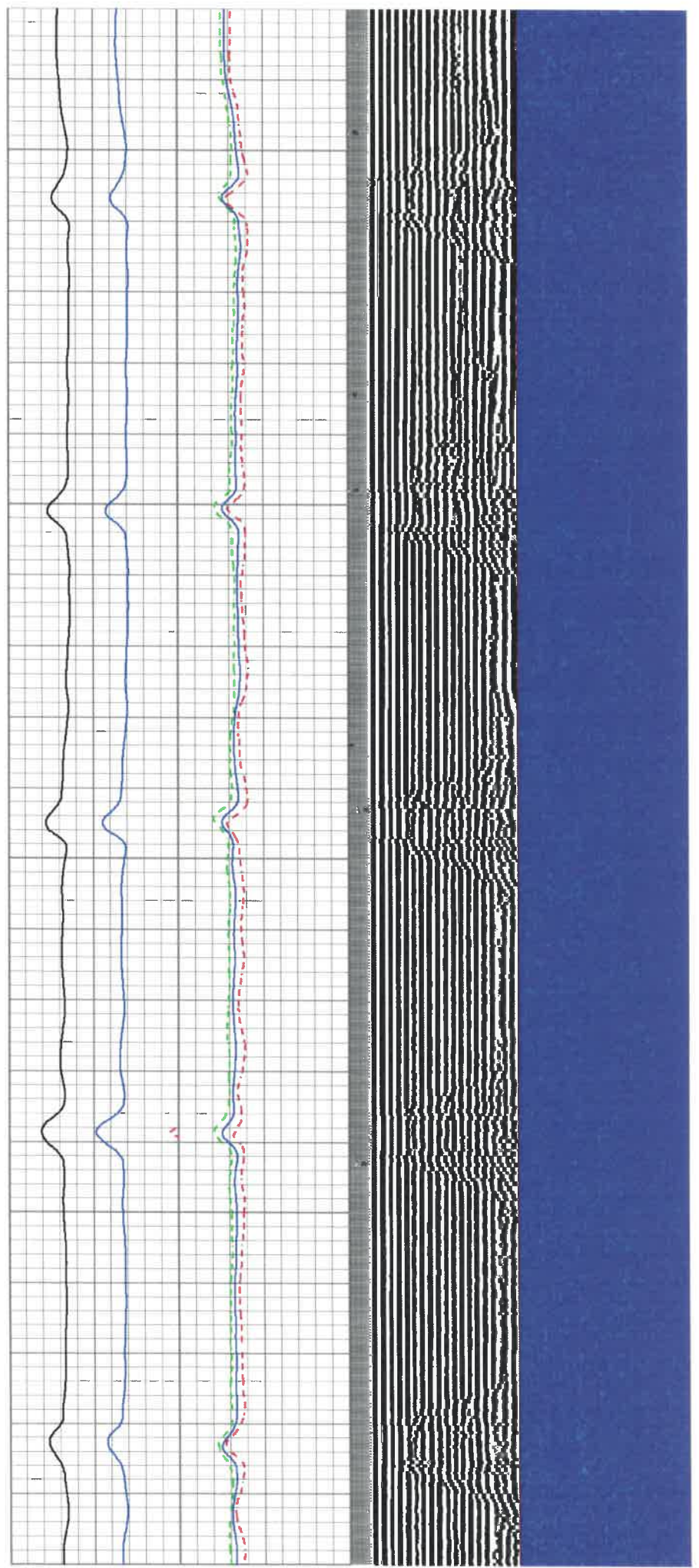
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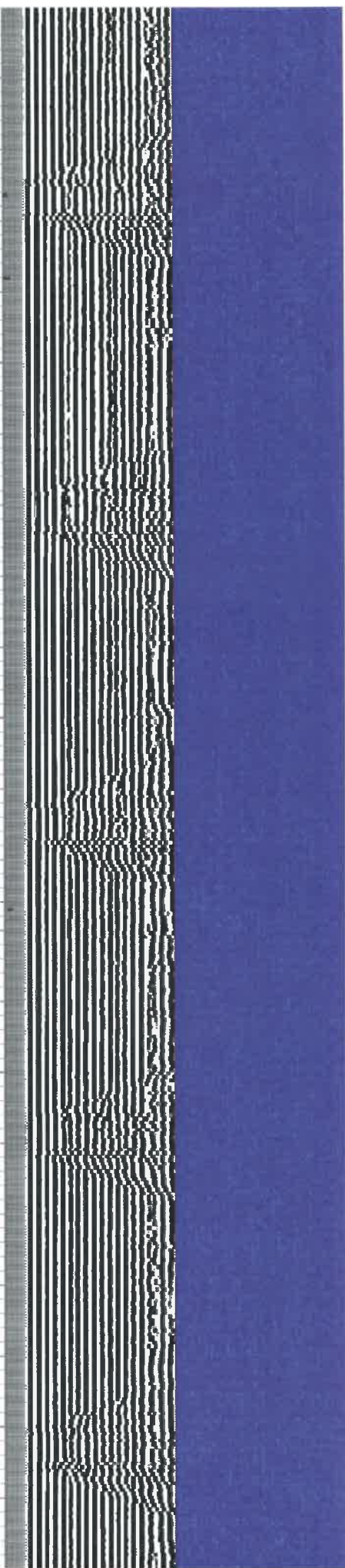
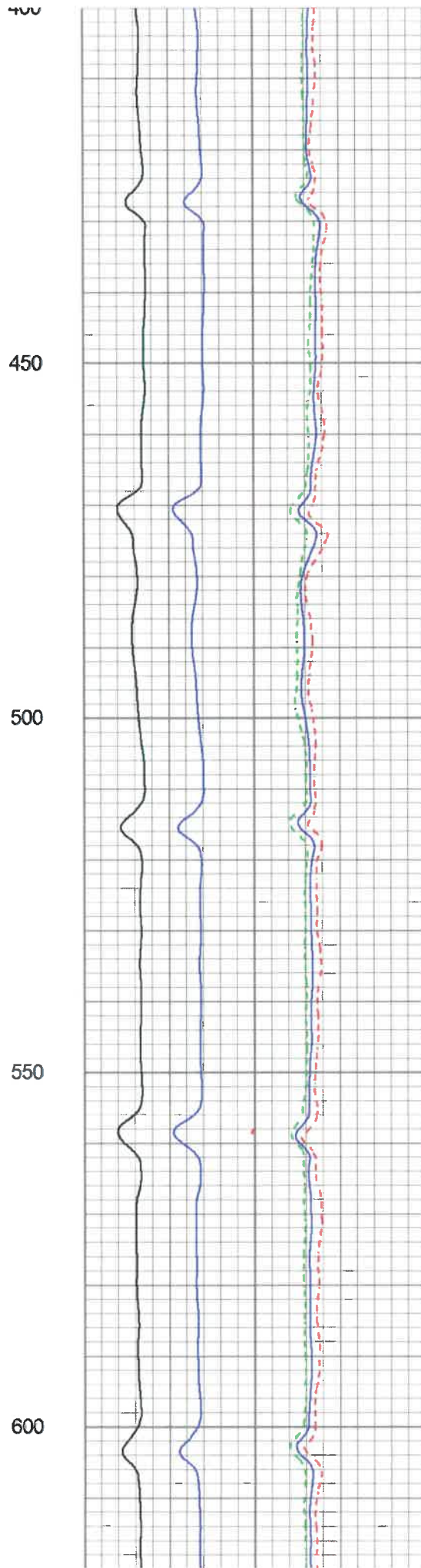
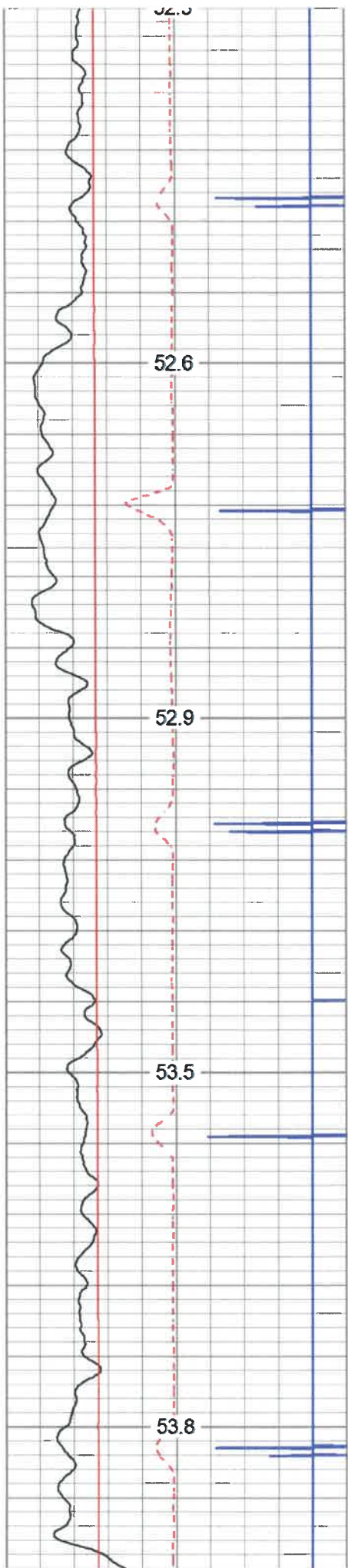
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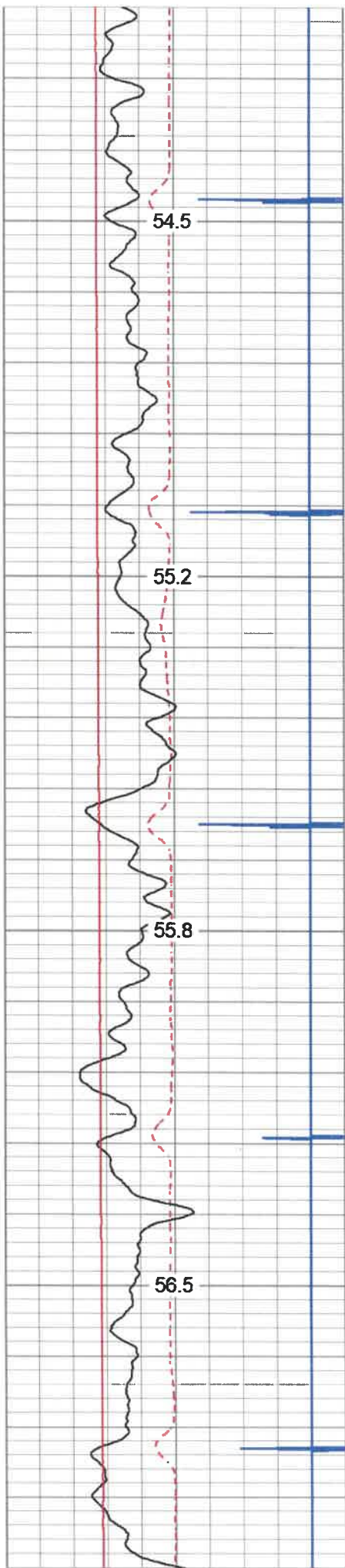
300

350

400





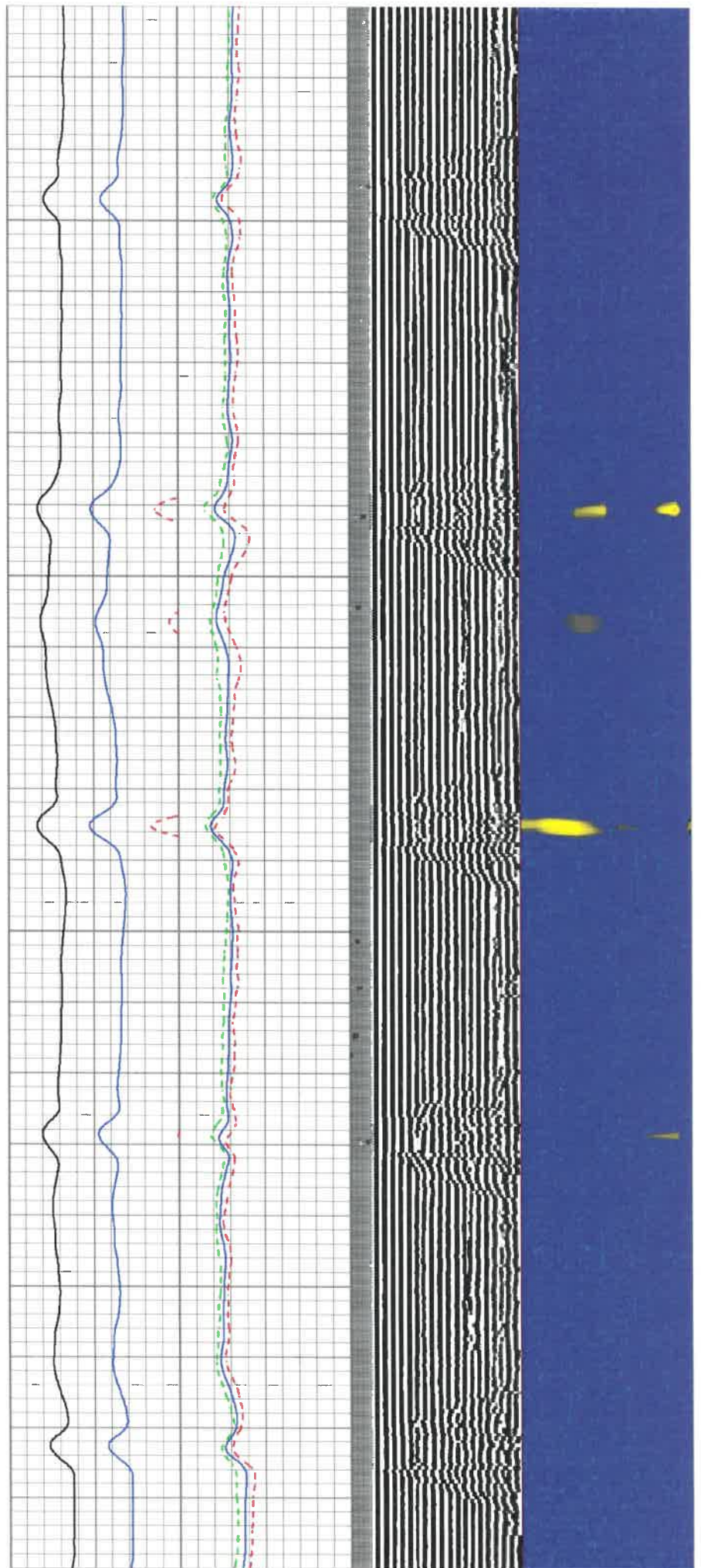


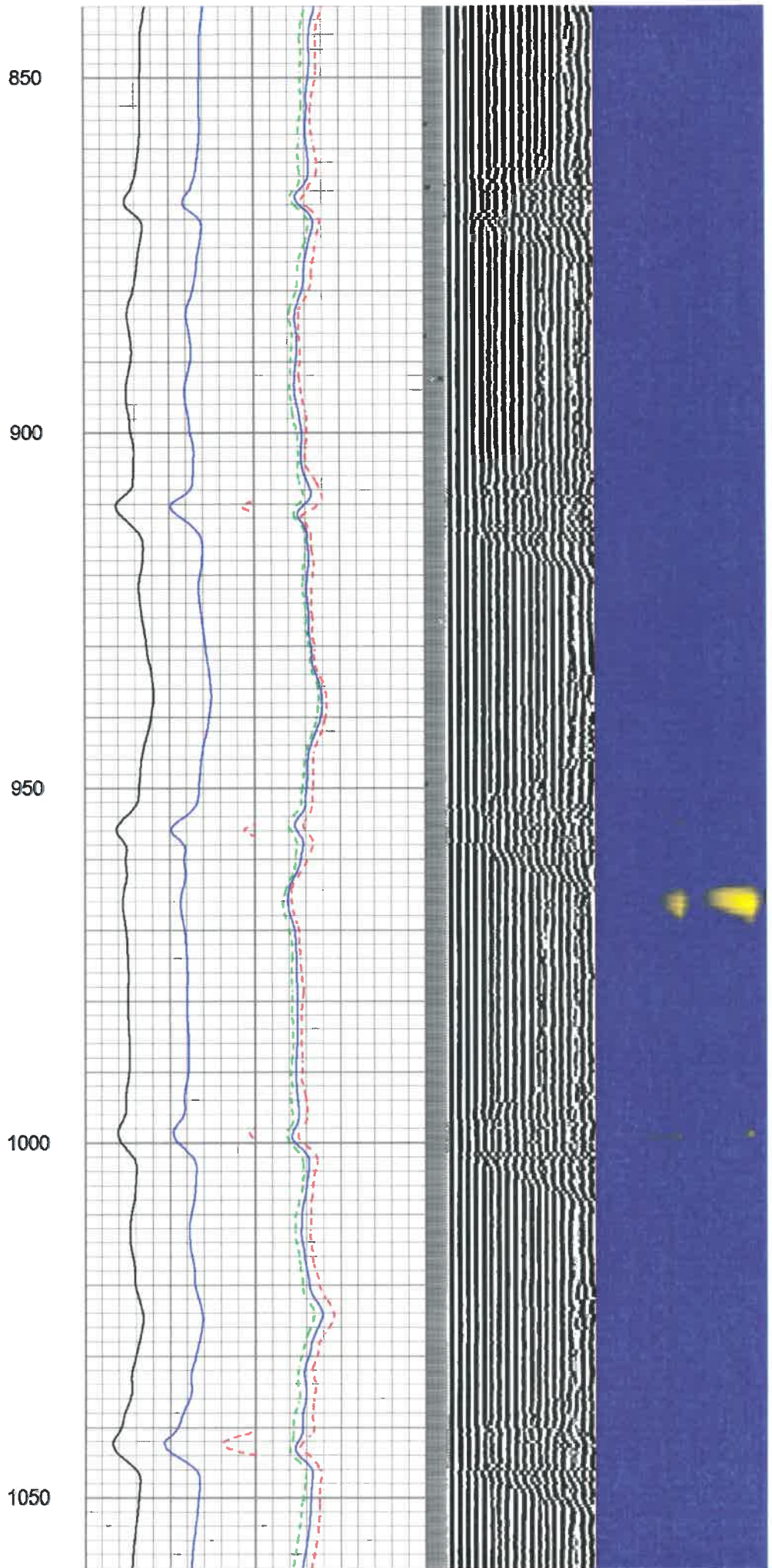
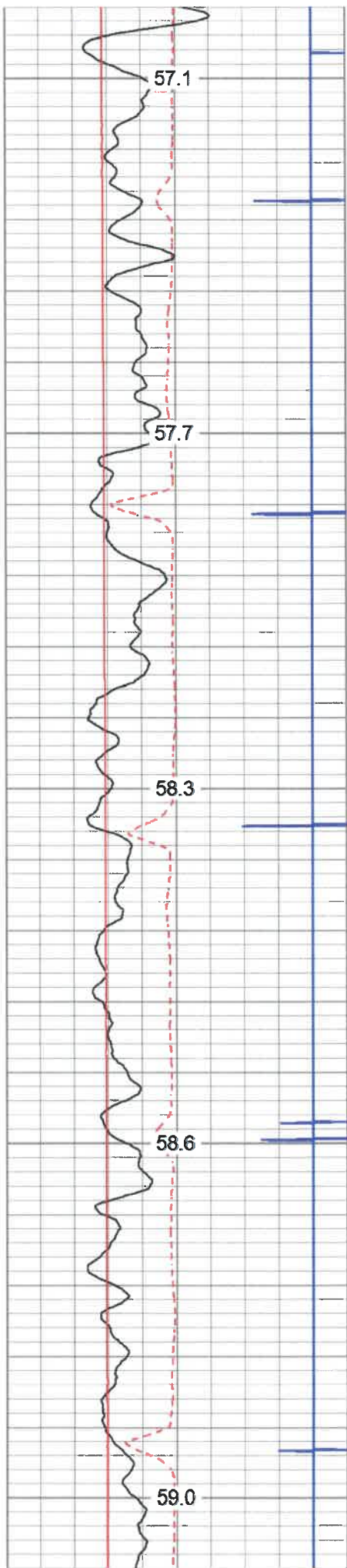
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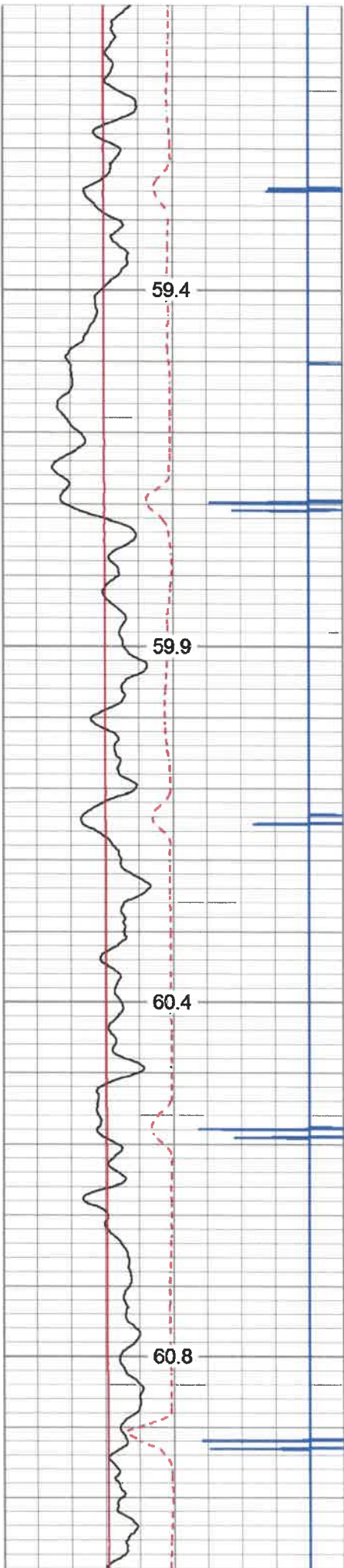
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750

800





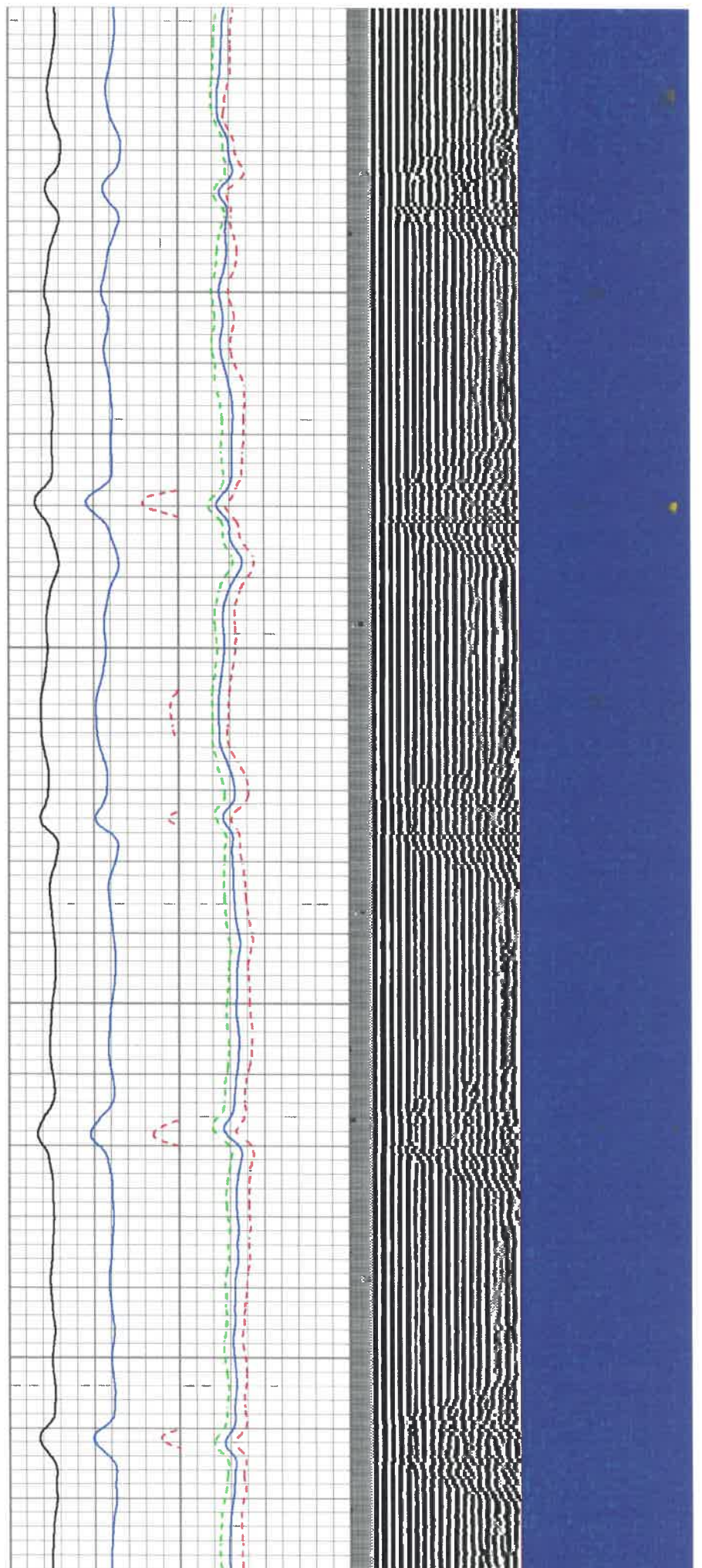


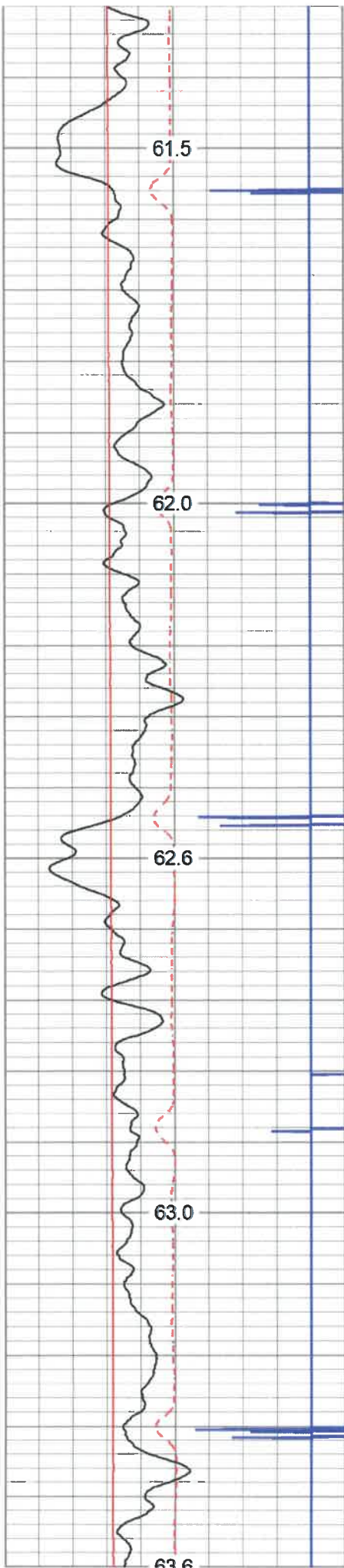
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1150

1200

1250





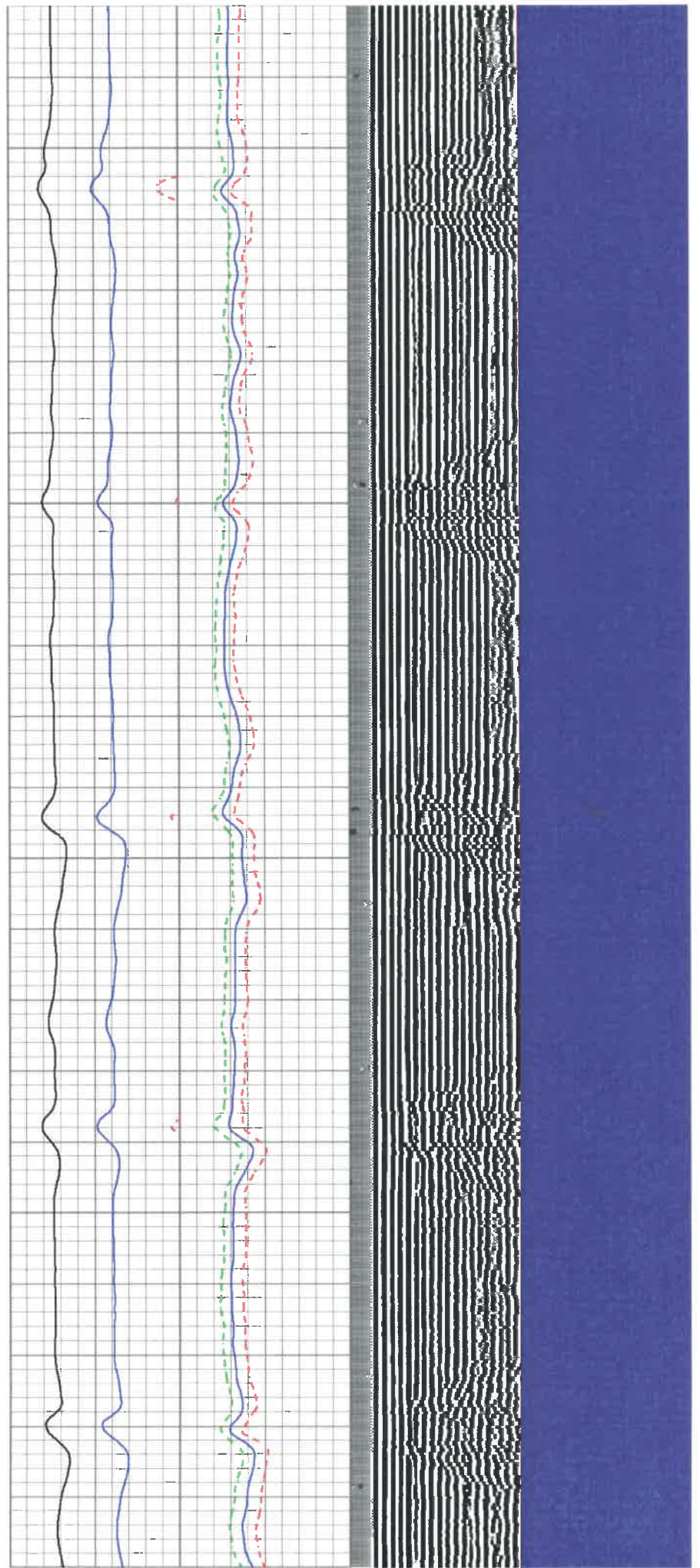
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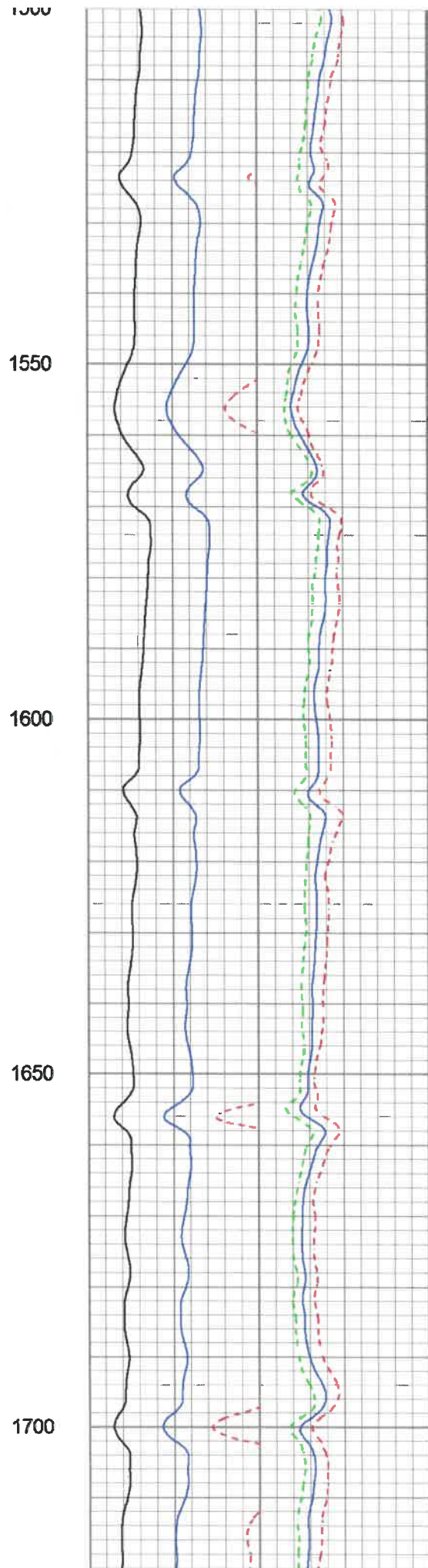
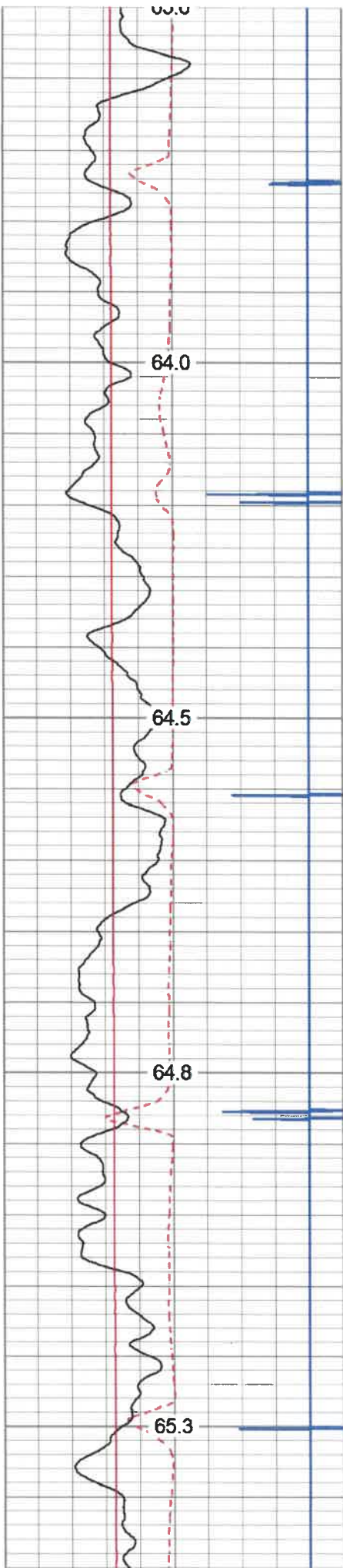
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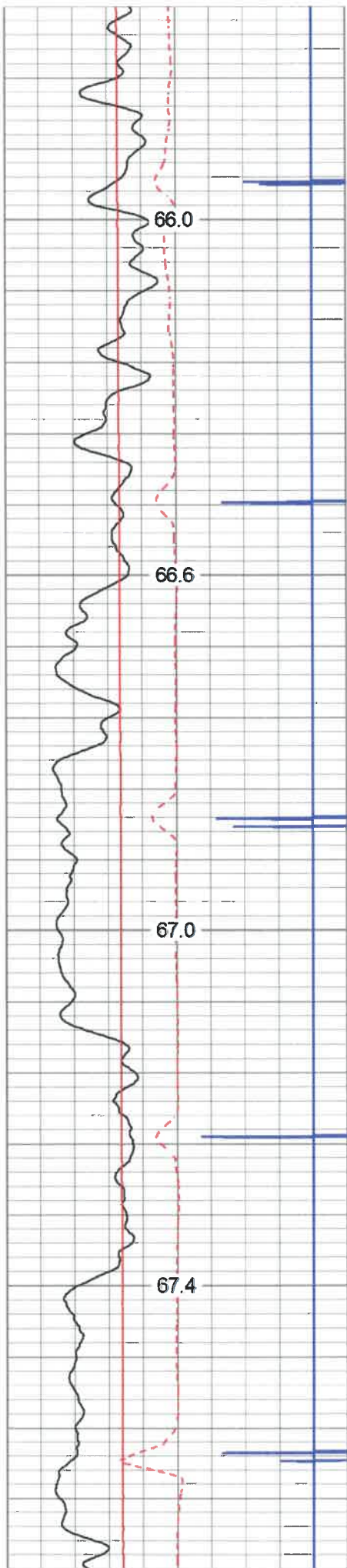
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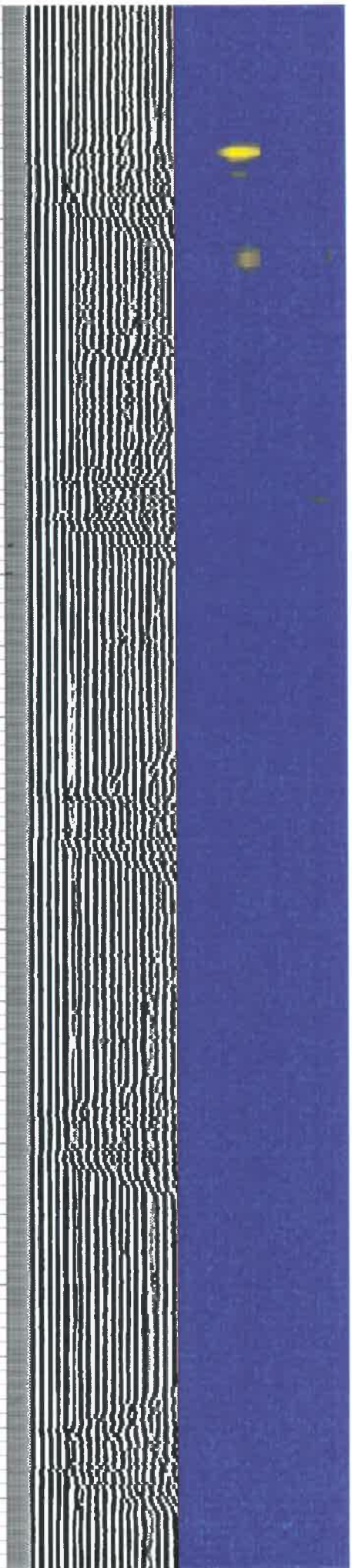
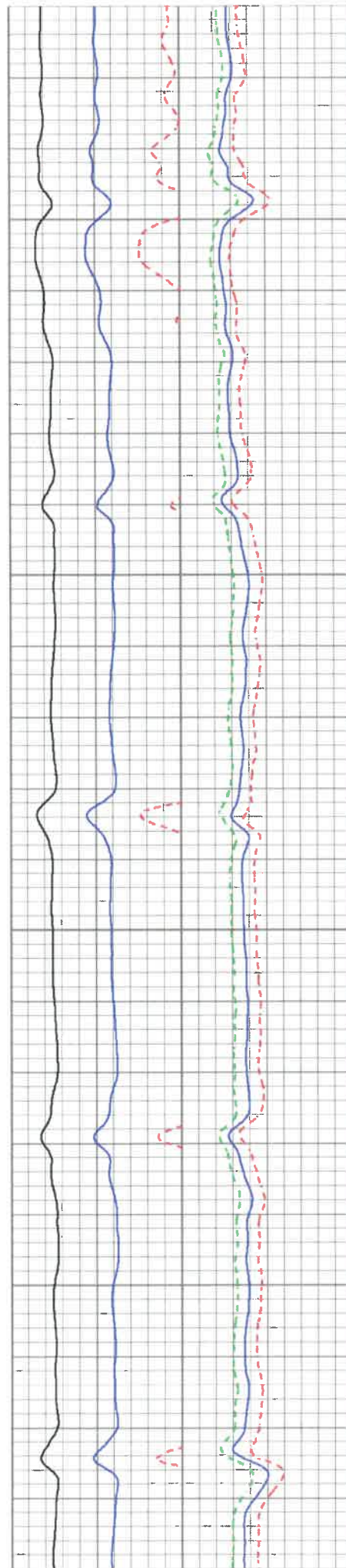


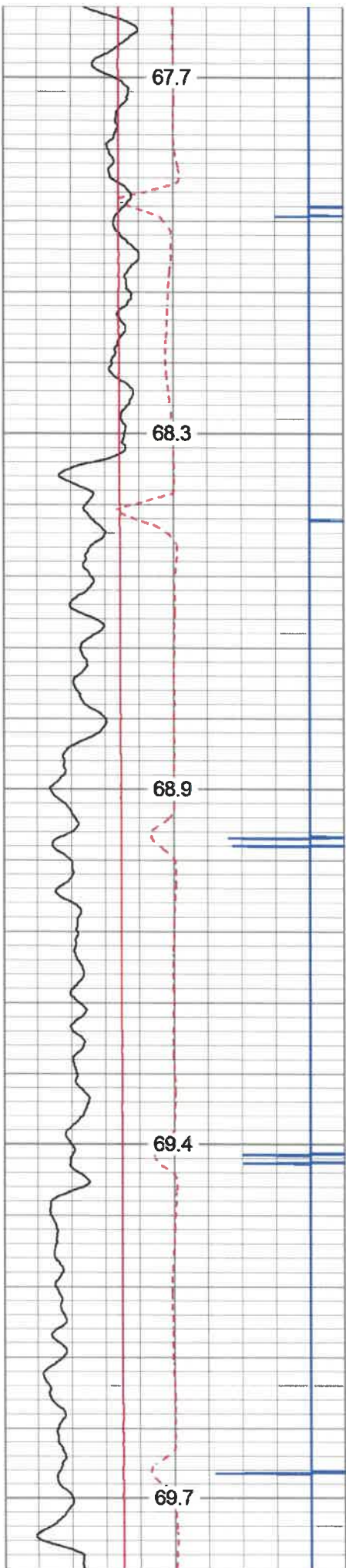
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1800

1850

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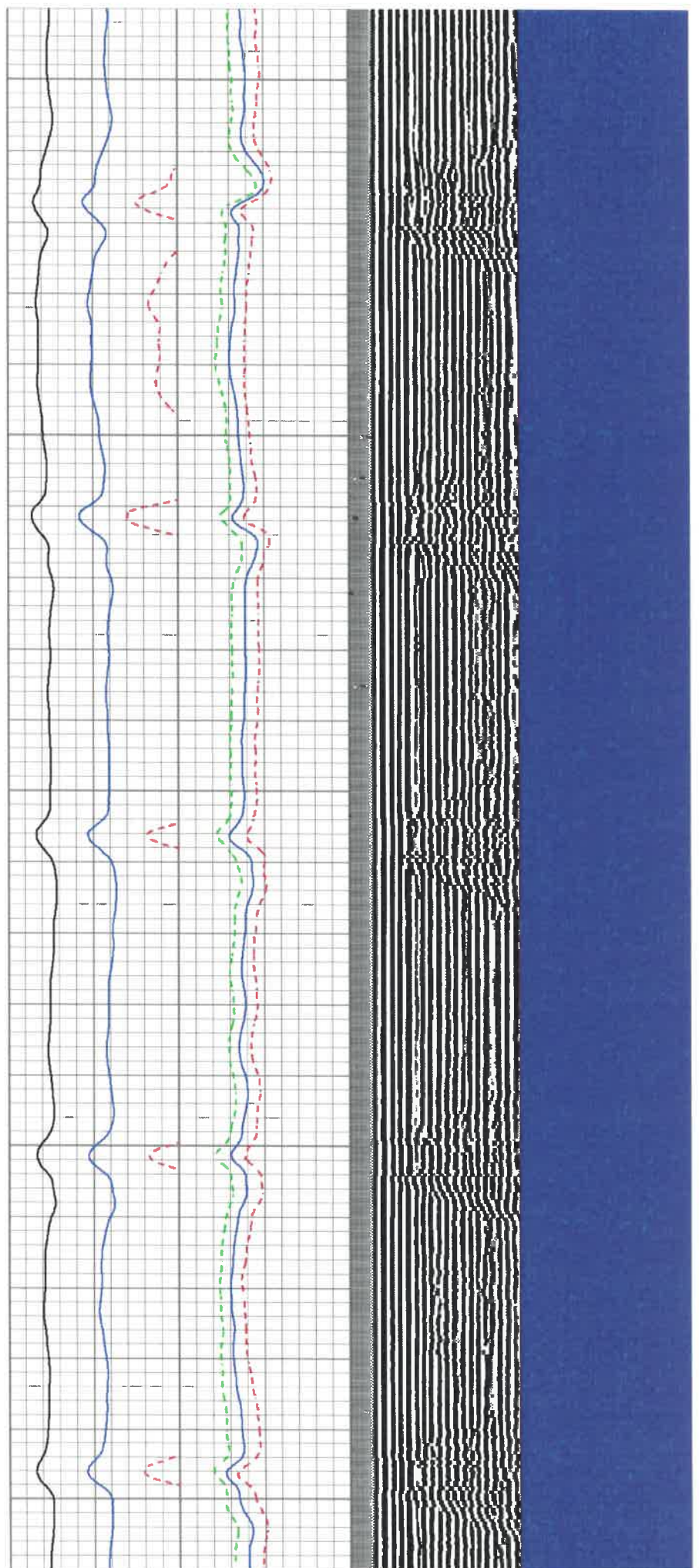
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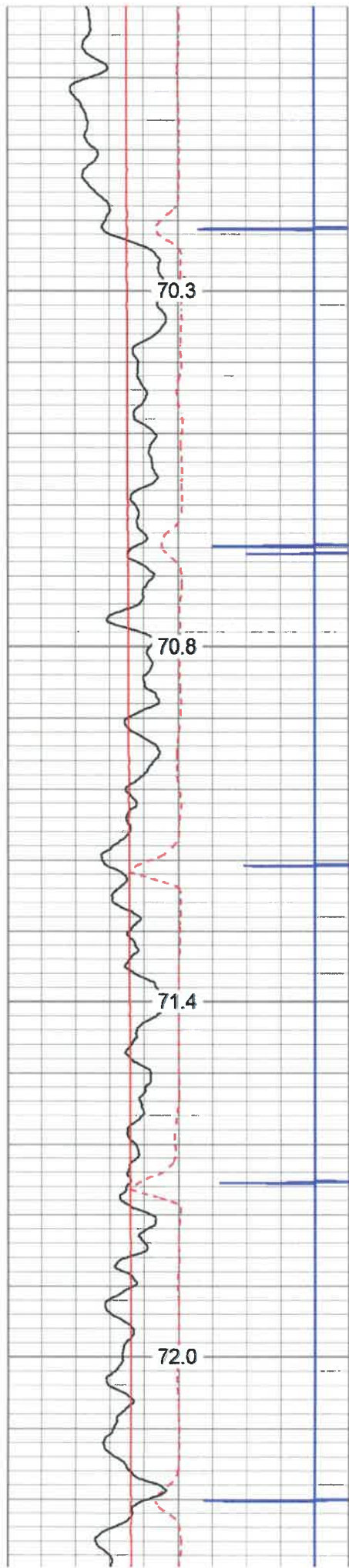
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2050

2100

2150



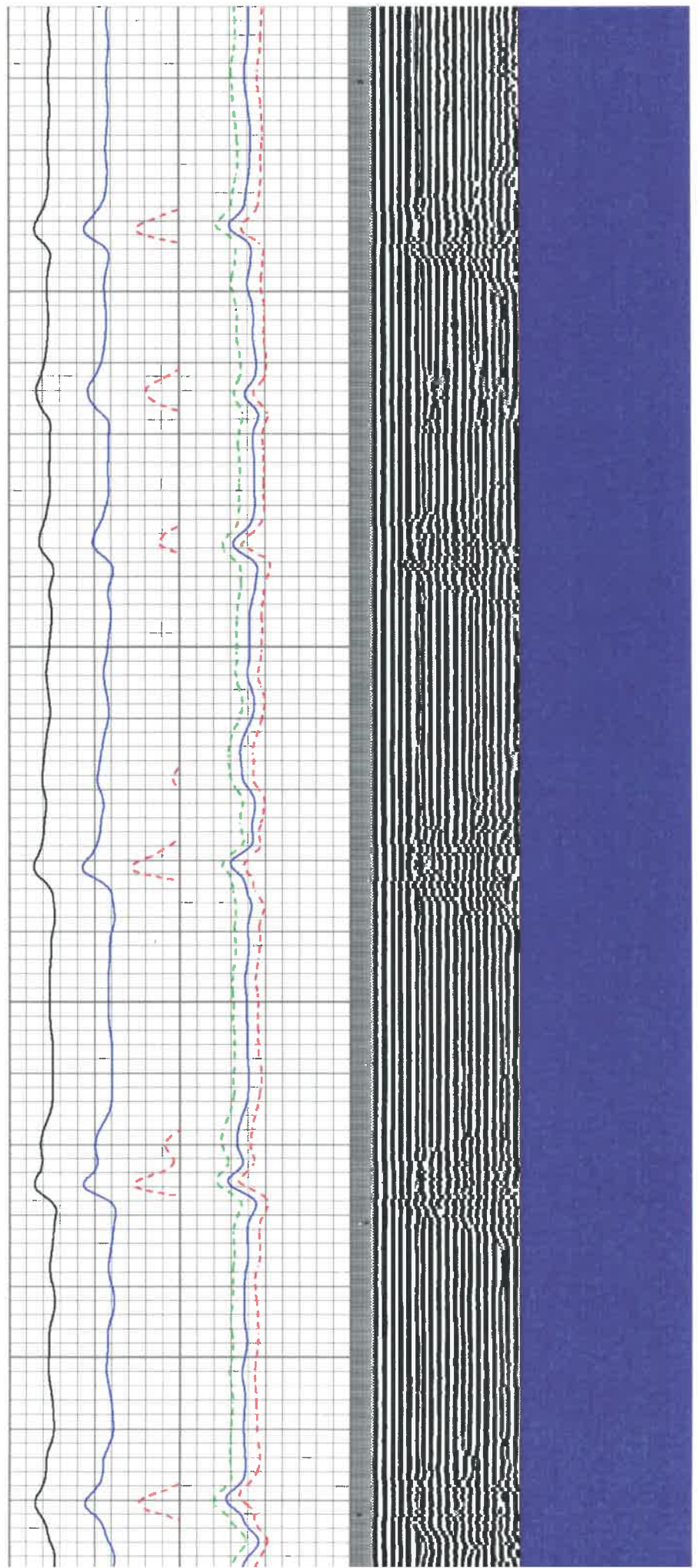


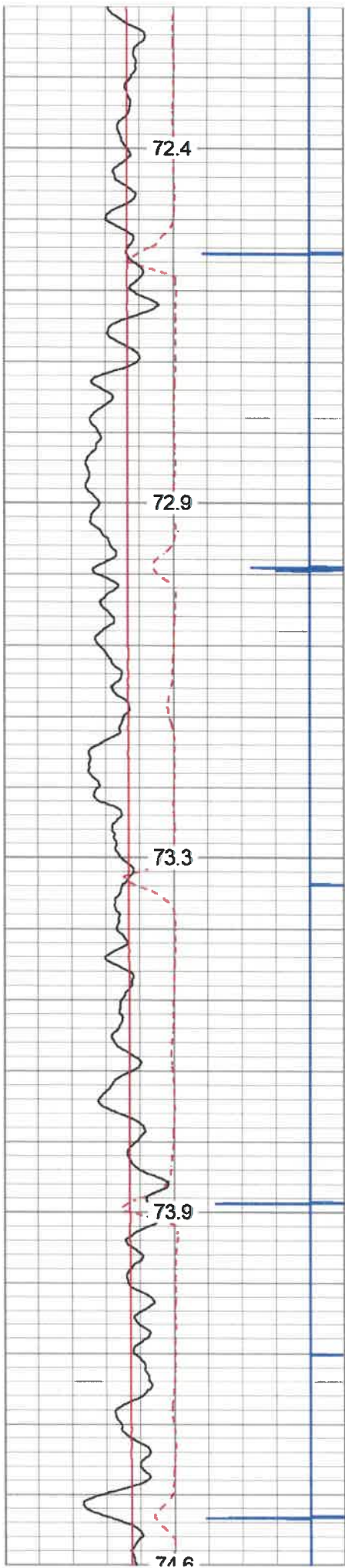
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2300

2350





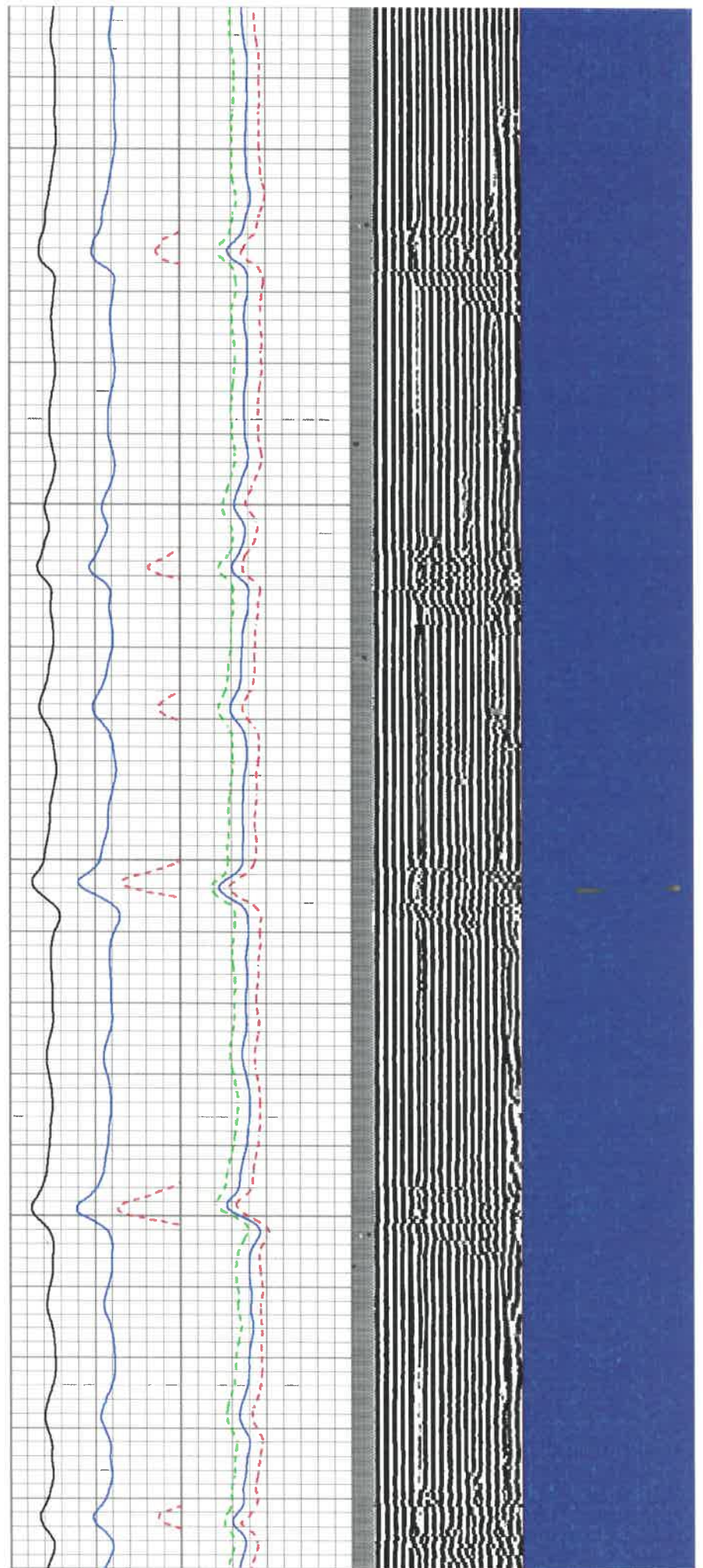
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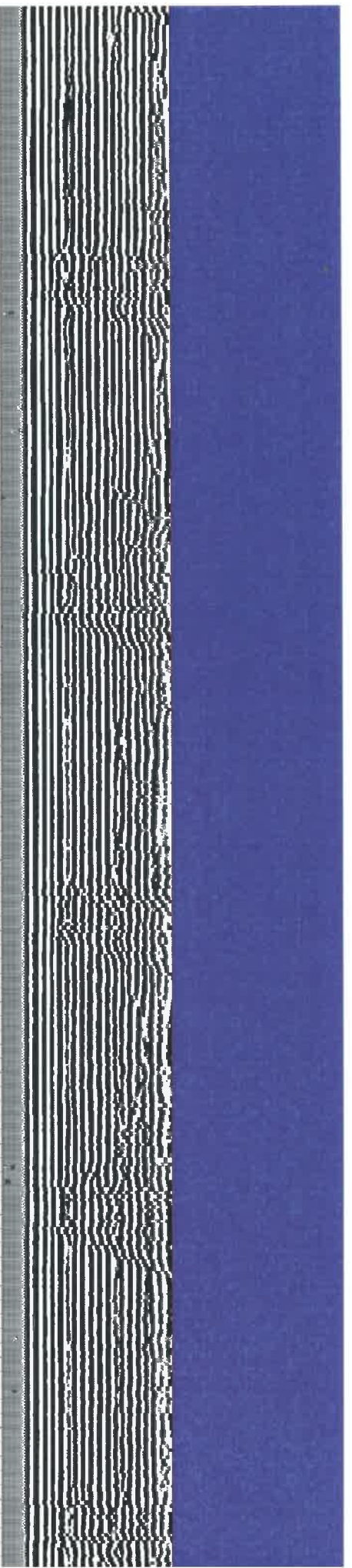
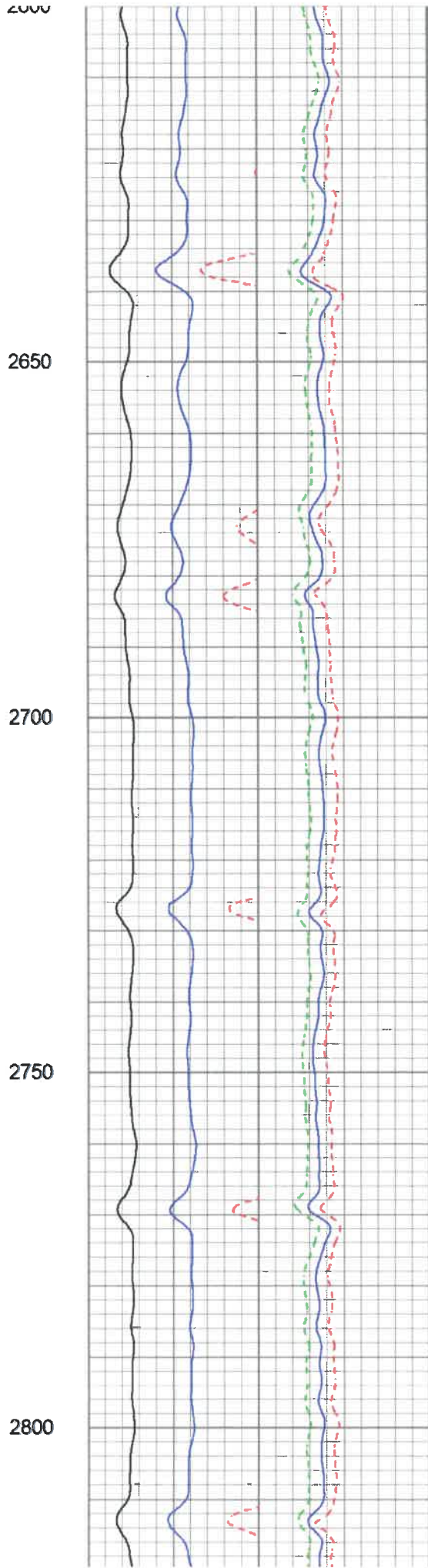
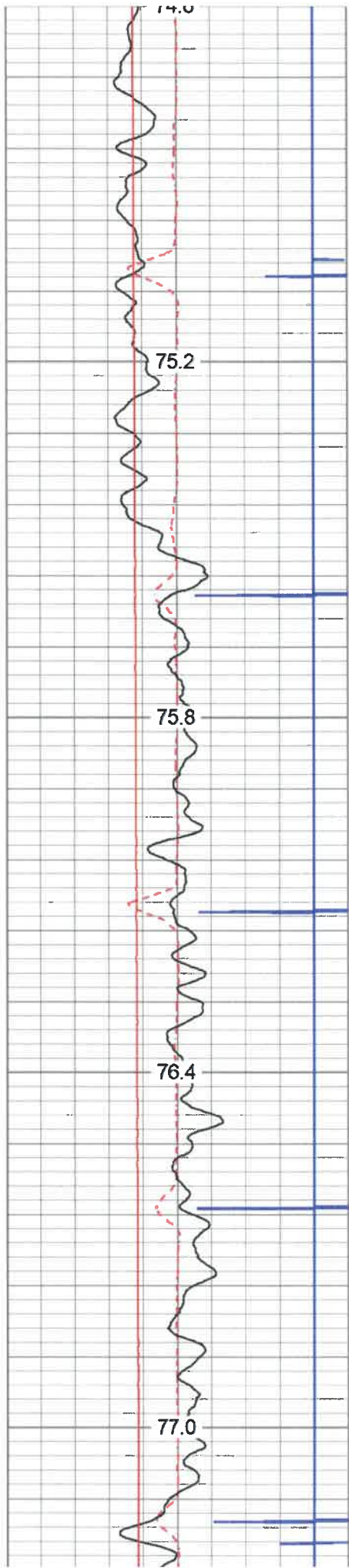
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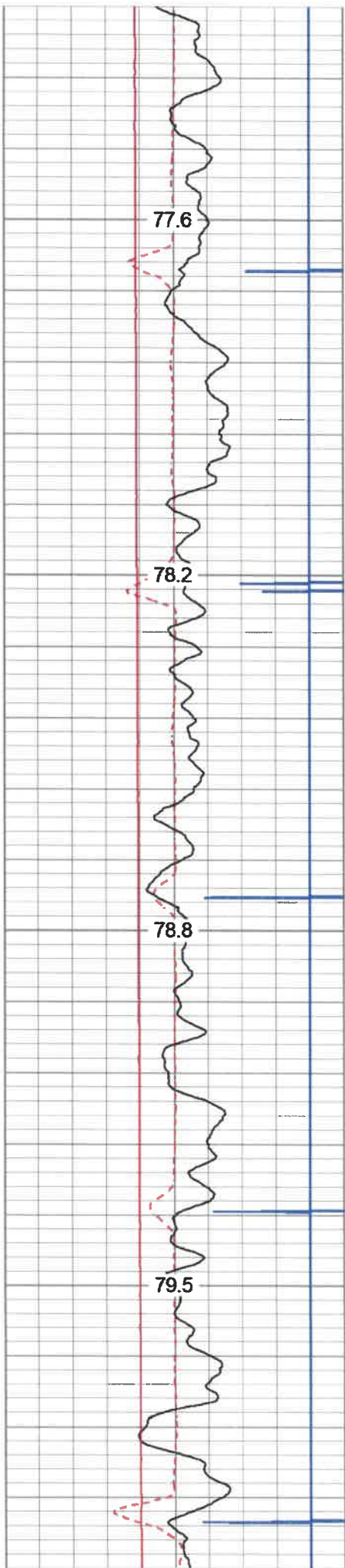
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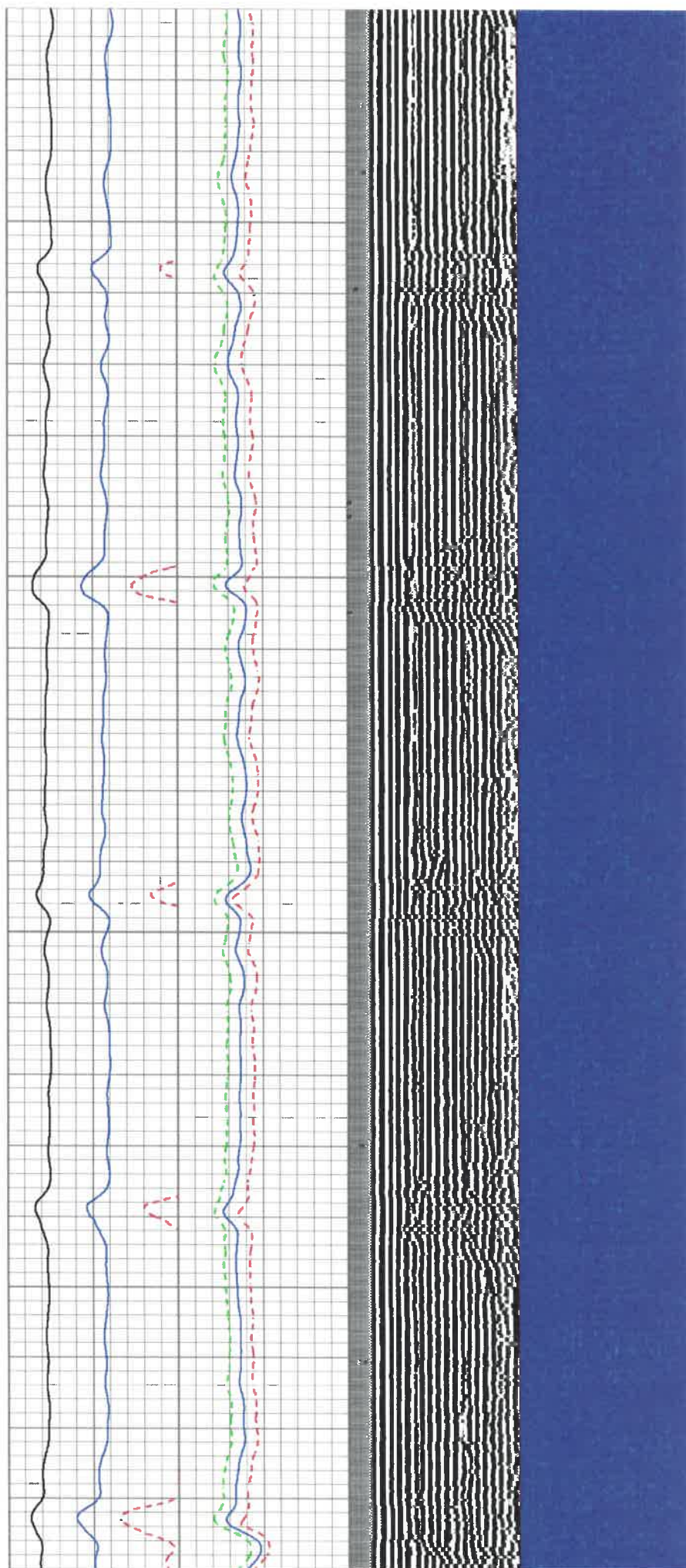
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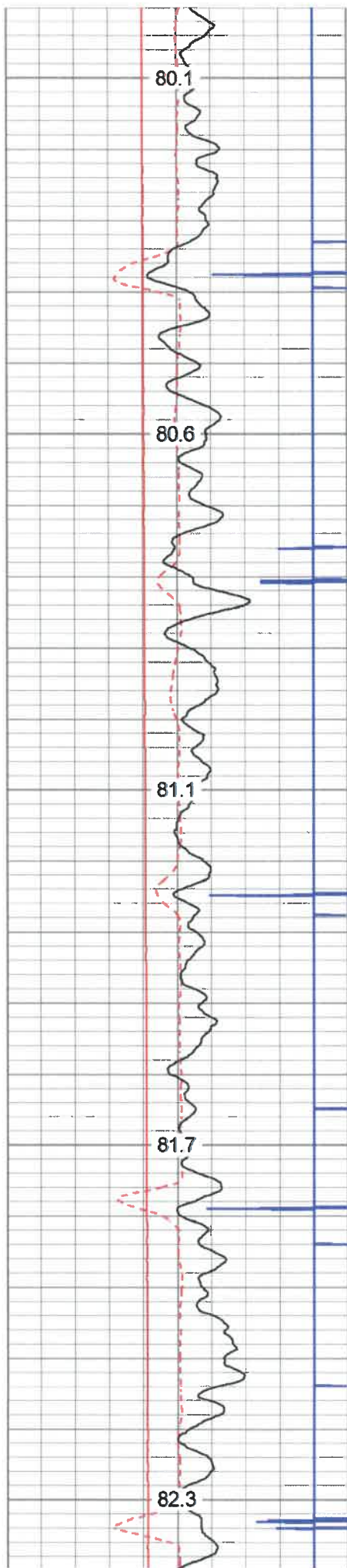






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2900
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3000





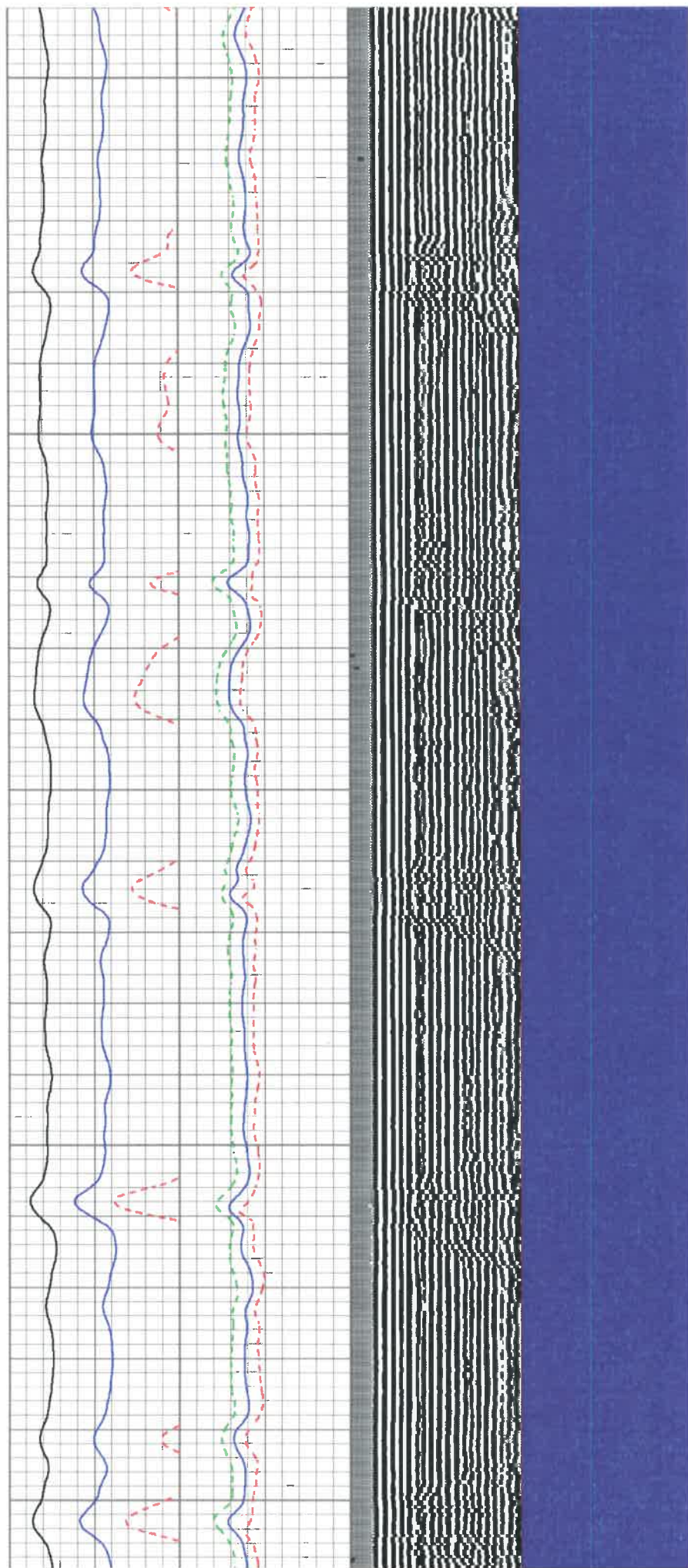
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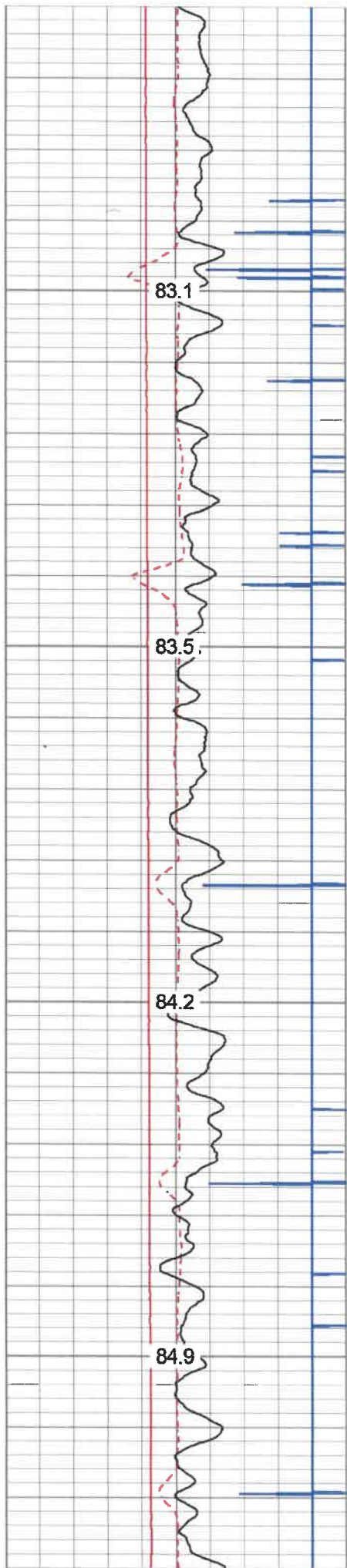
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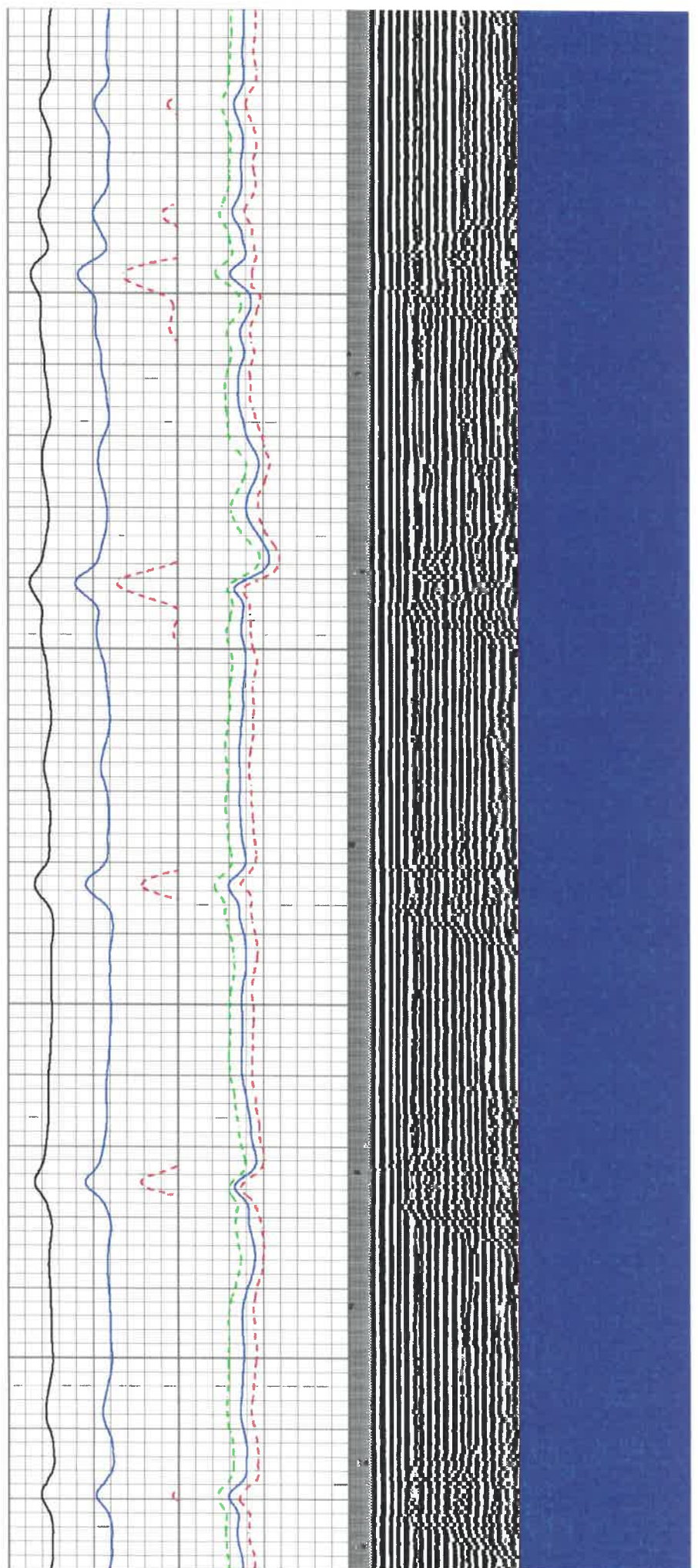


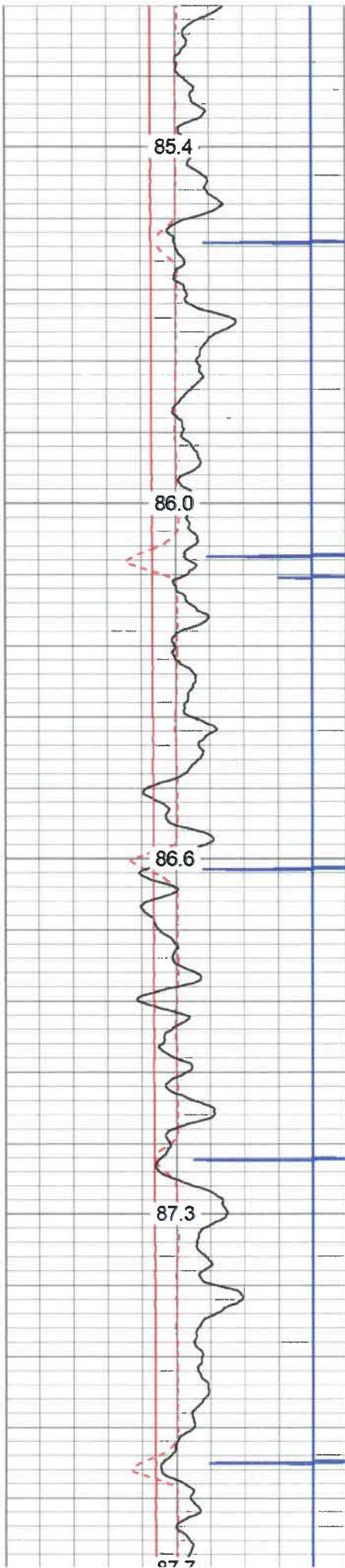
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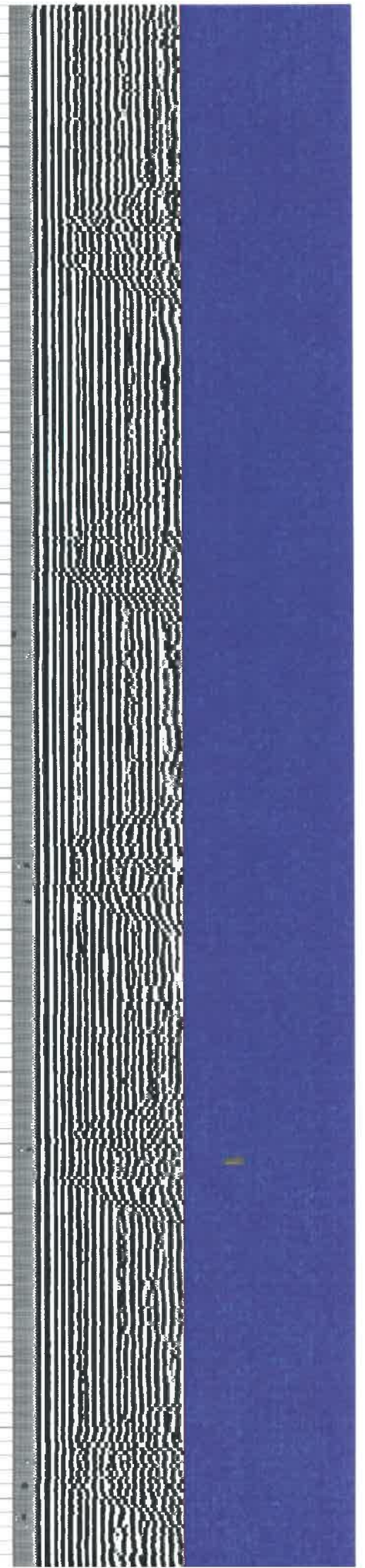
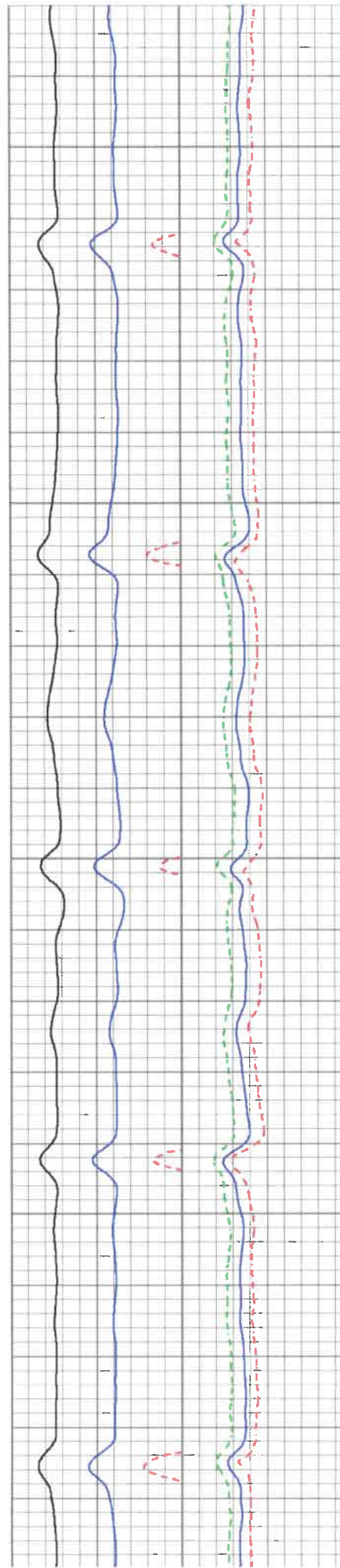
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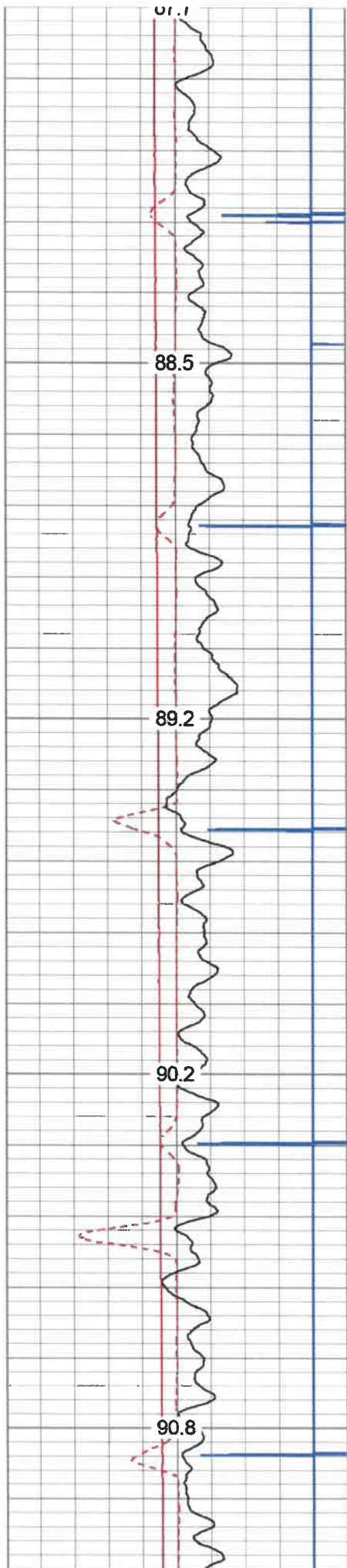
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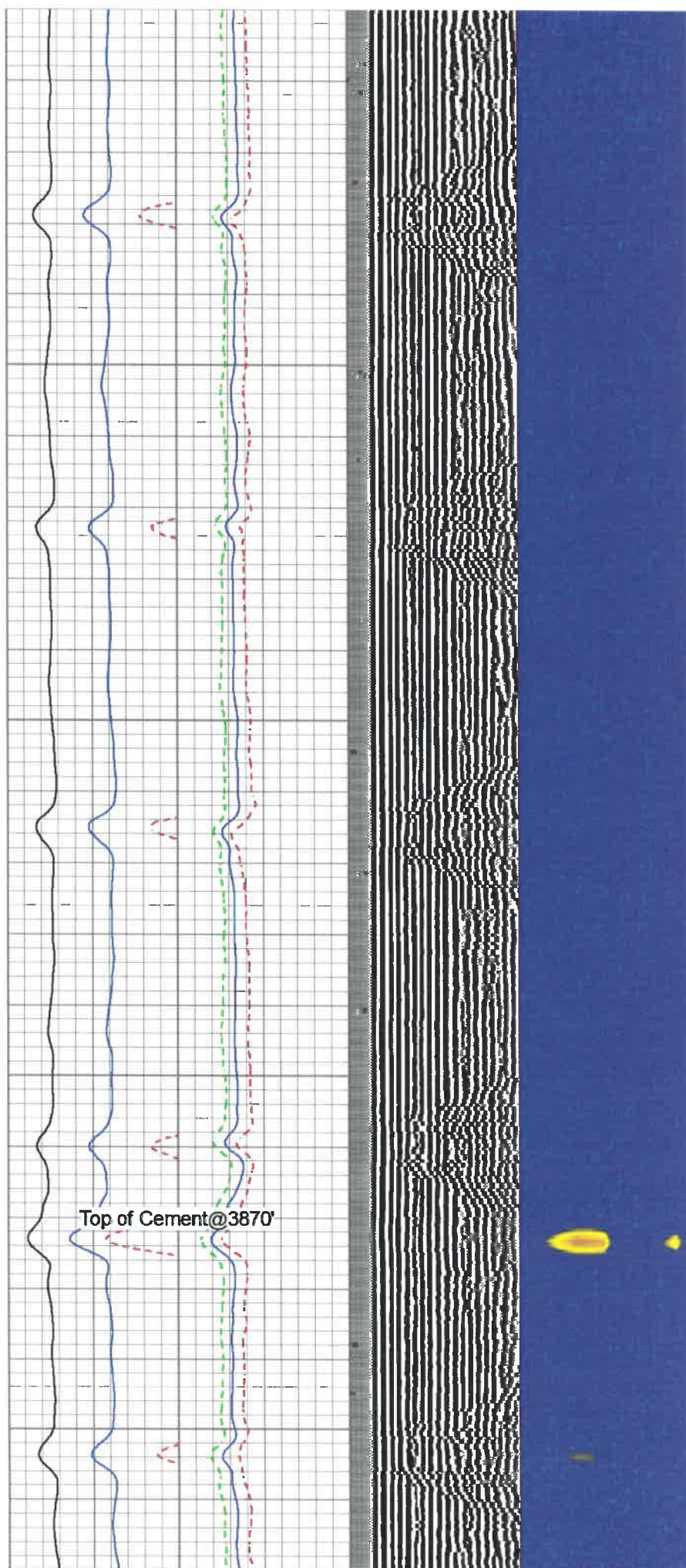
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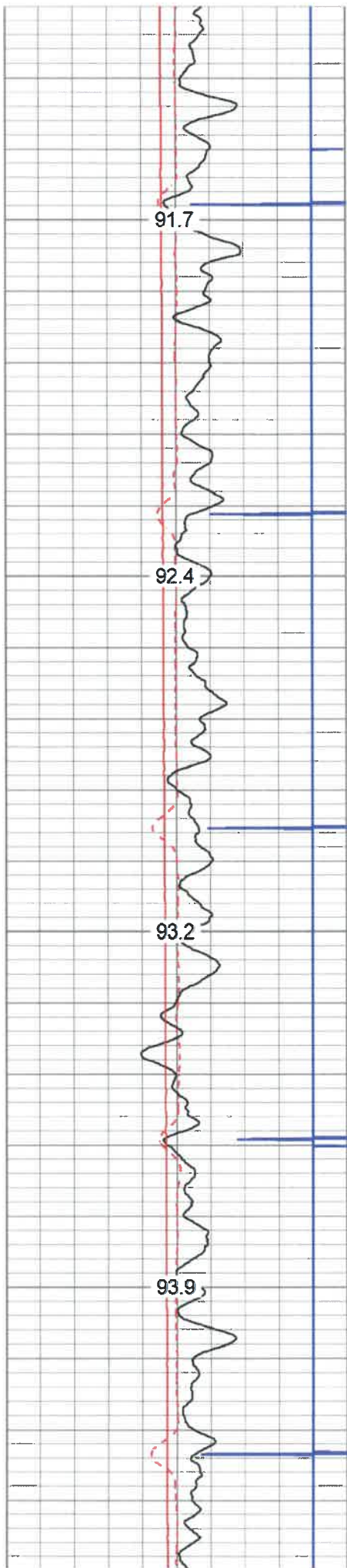
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3700
3750
3800
3850
3900



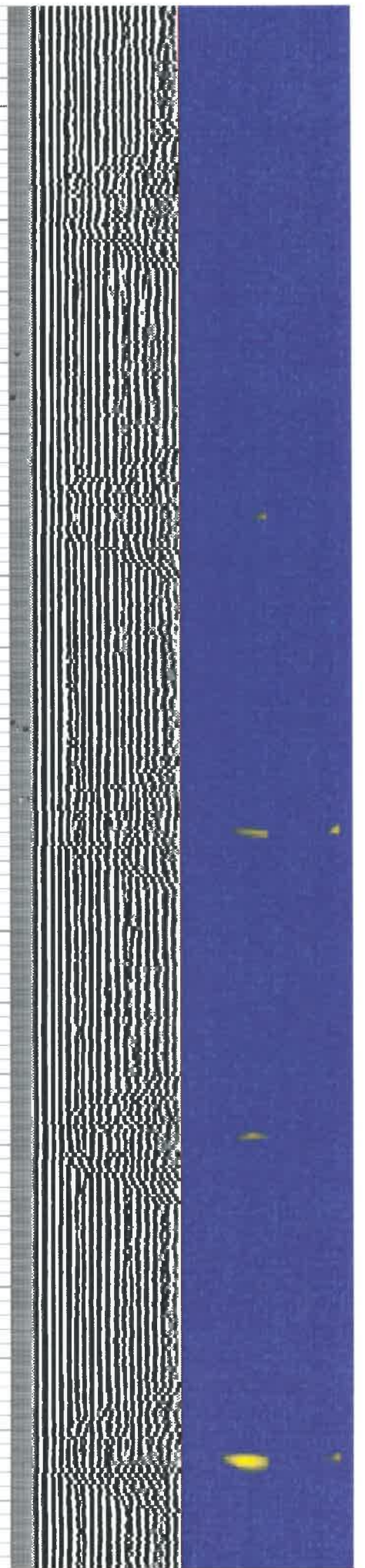
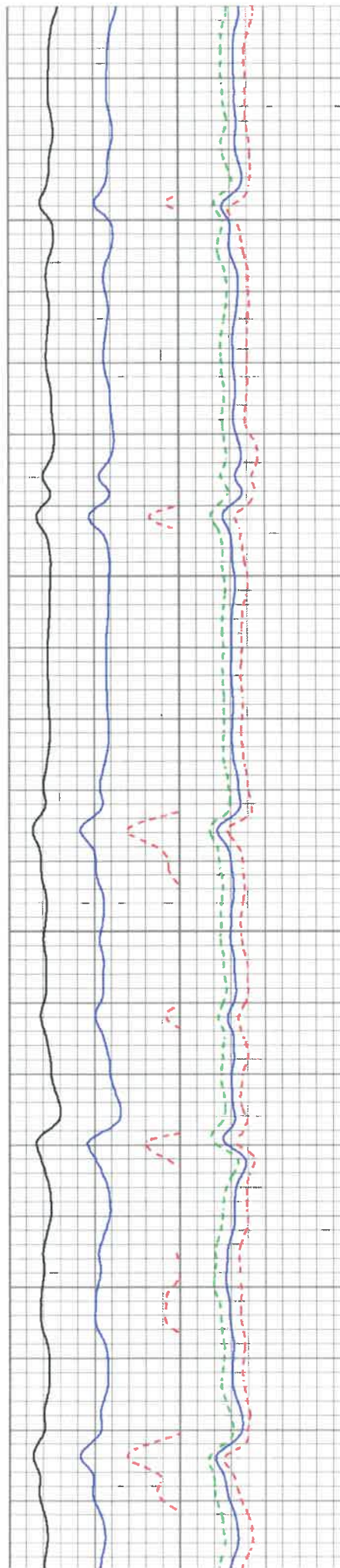


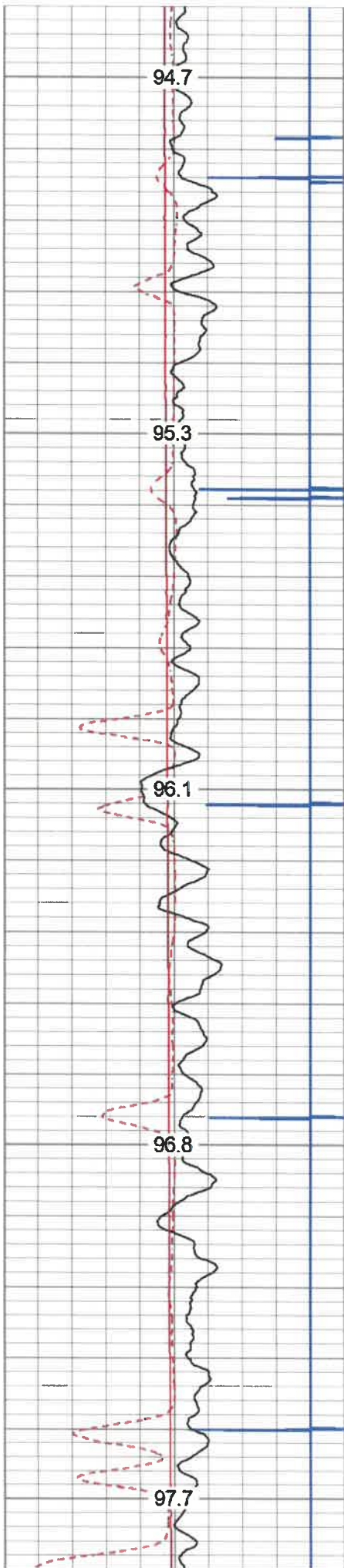
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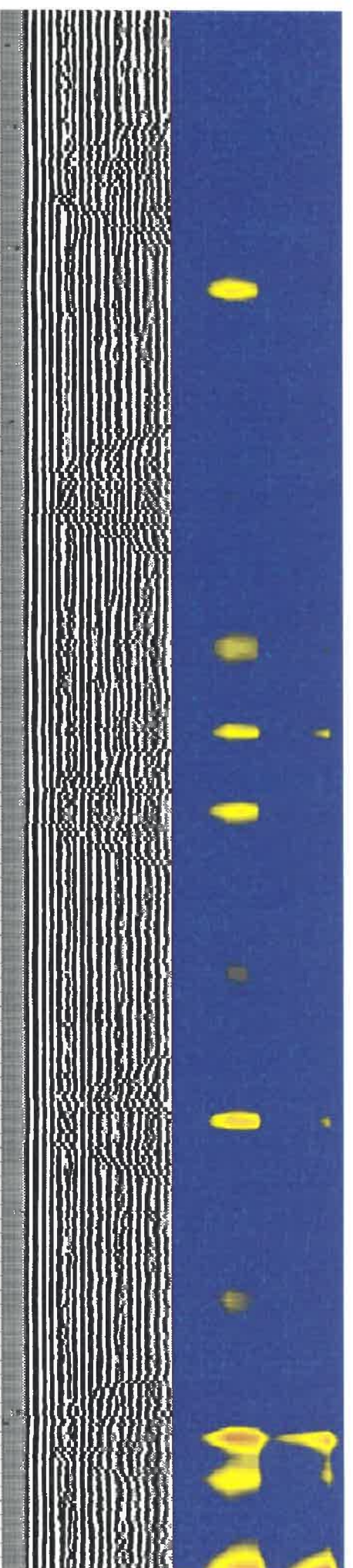
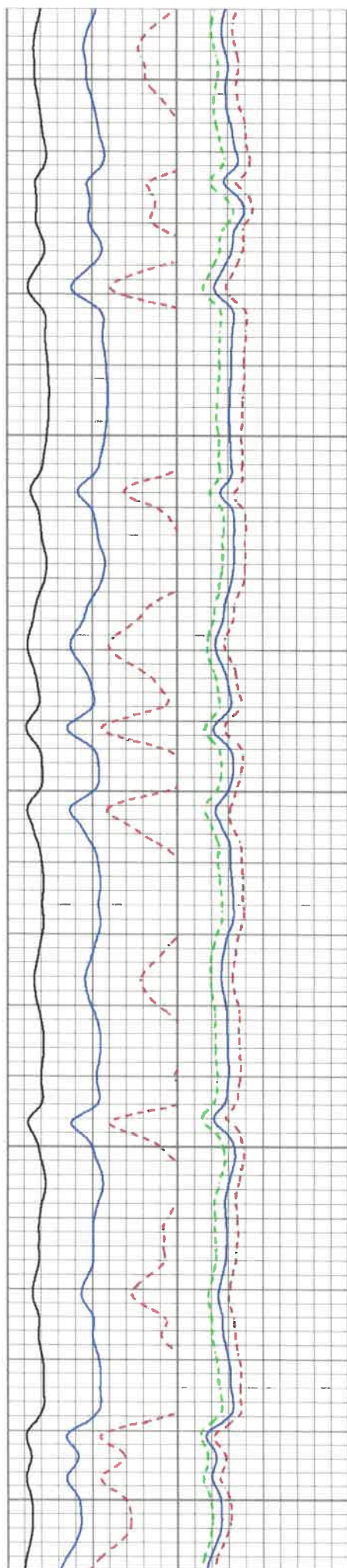
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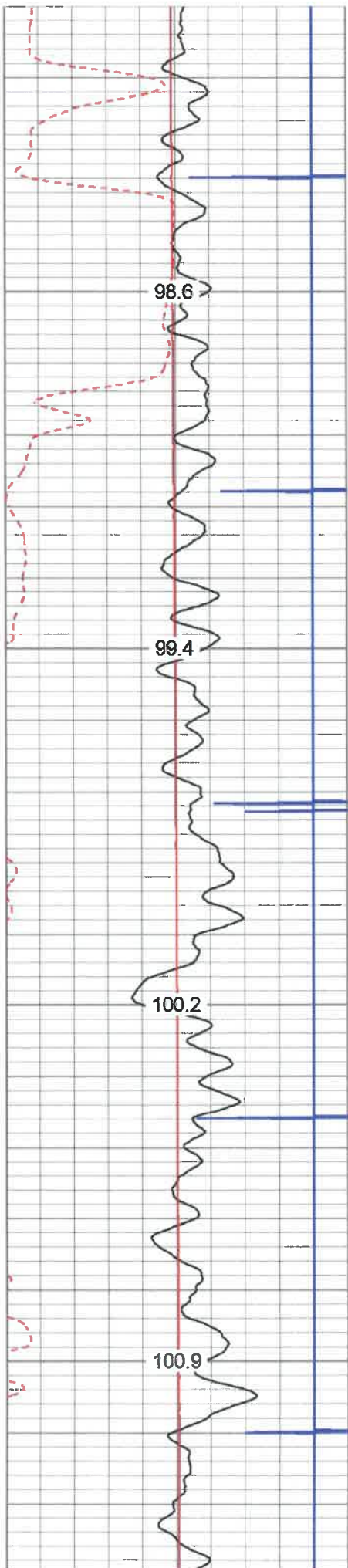
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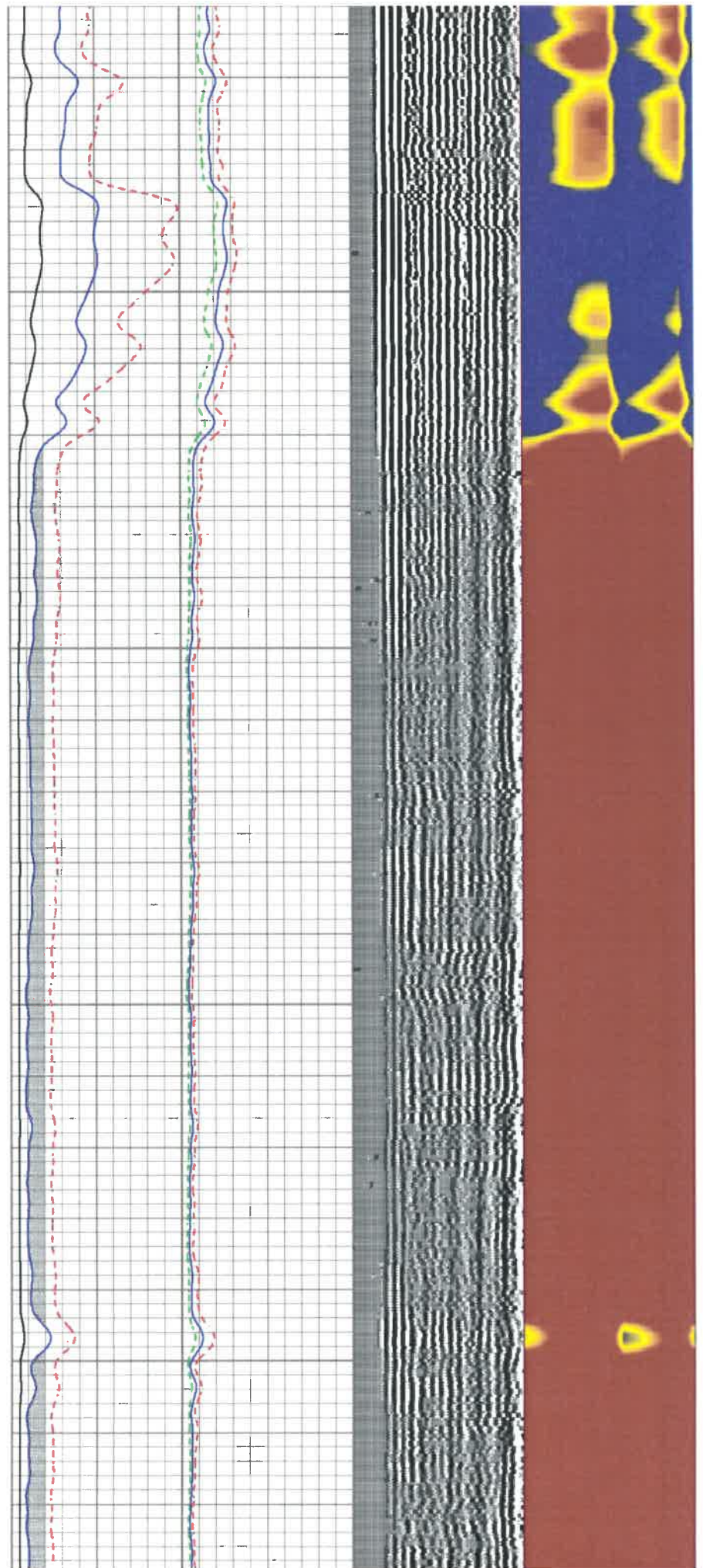


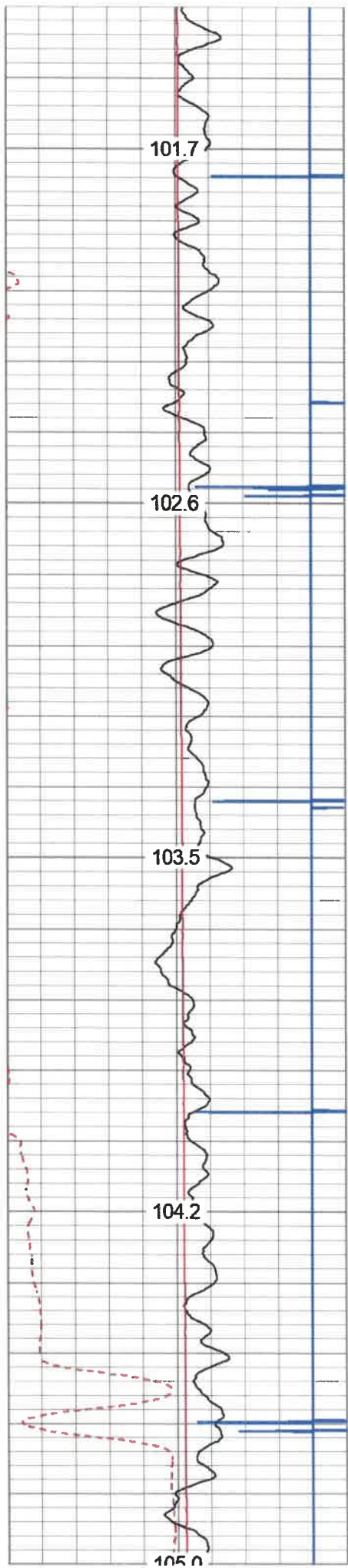
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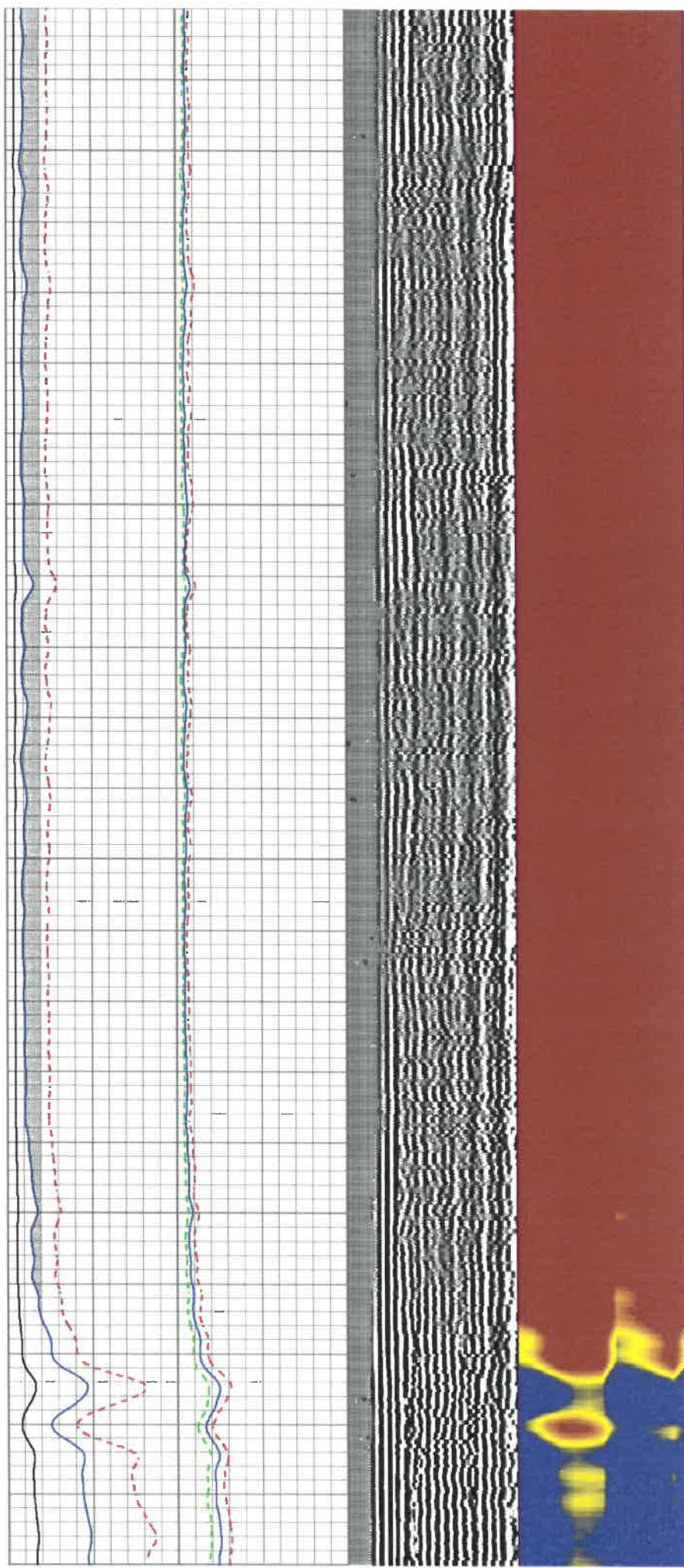
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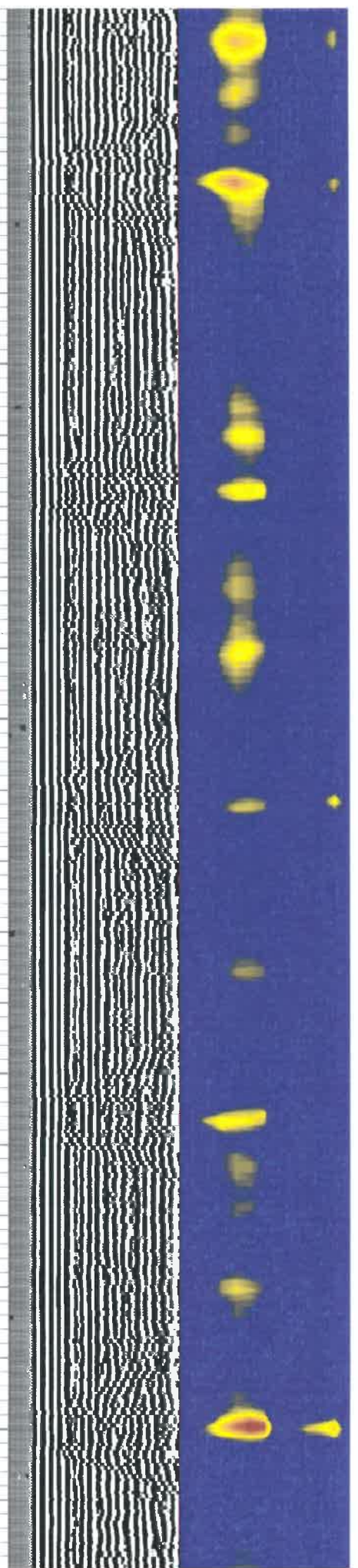
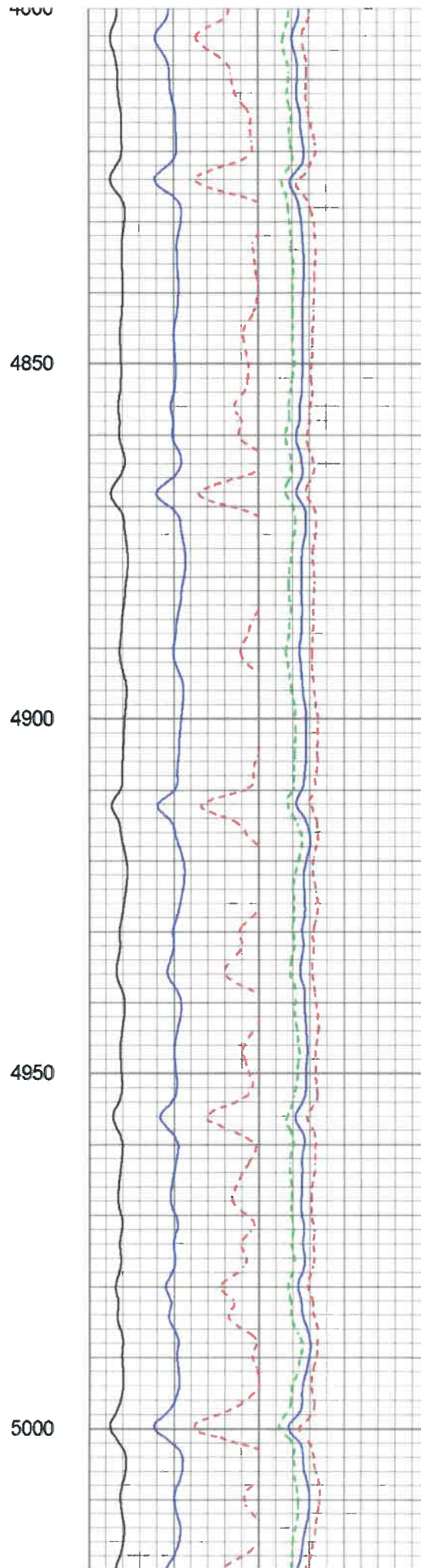
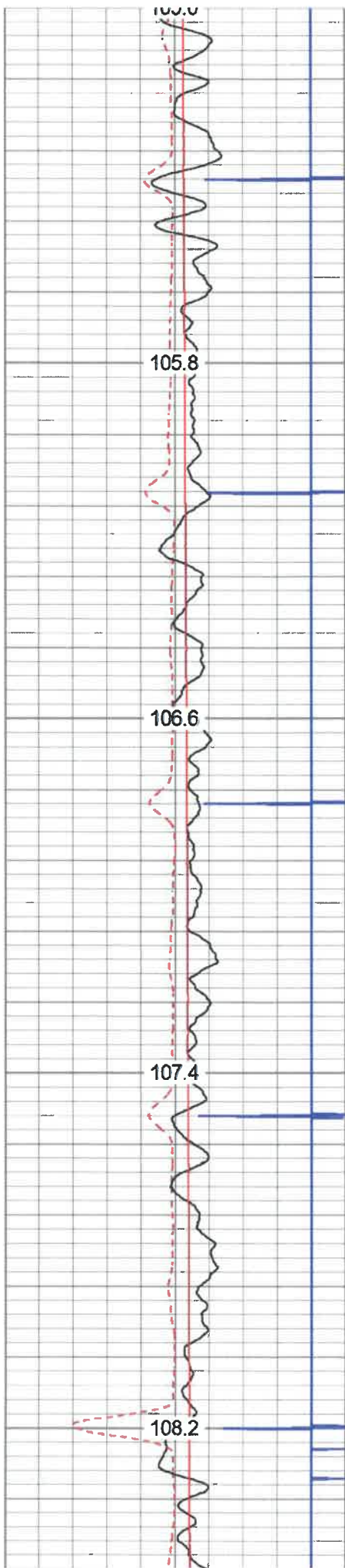
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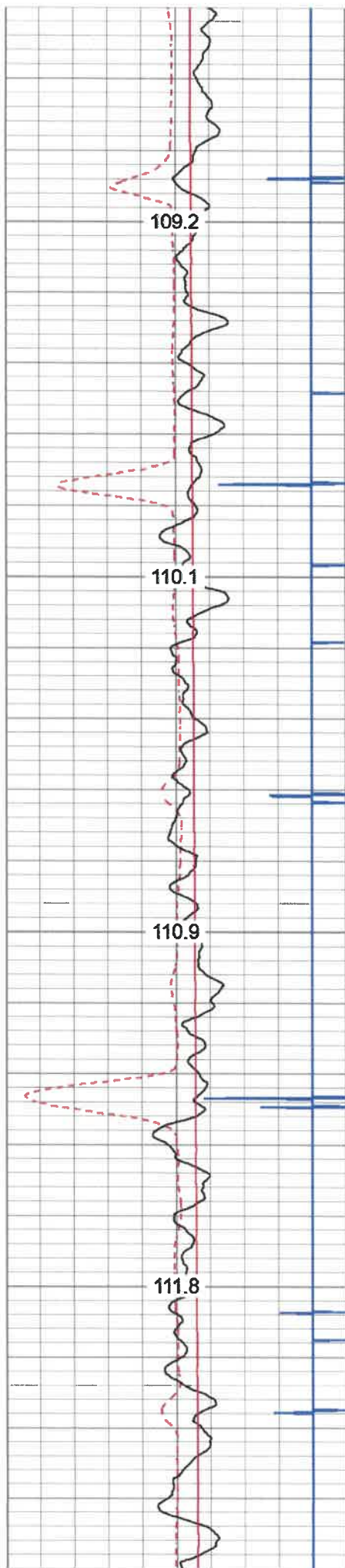




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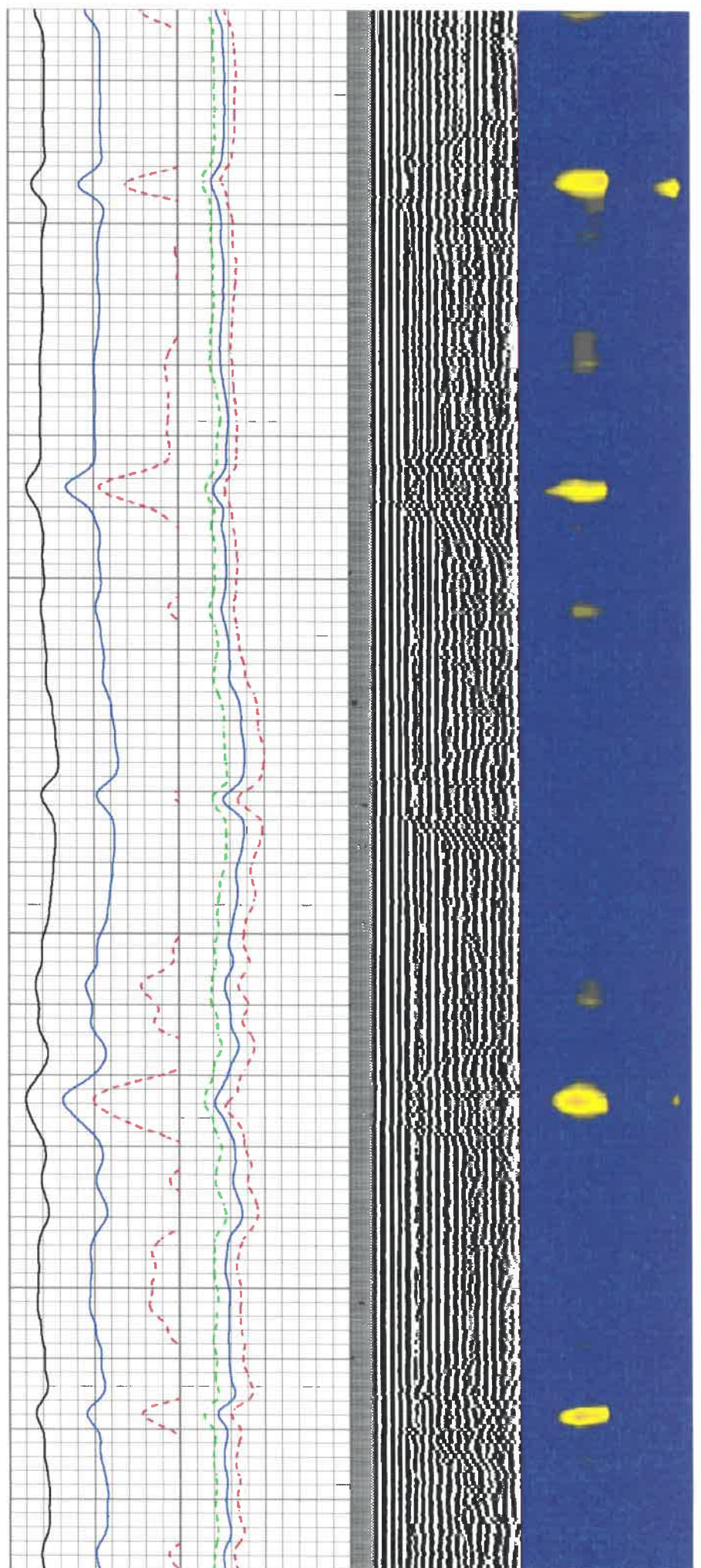


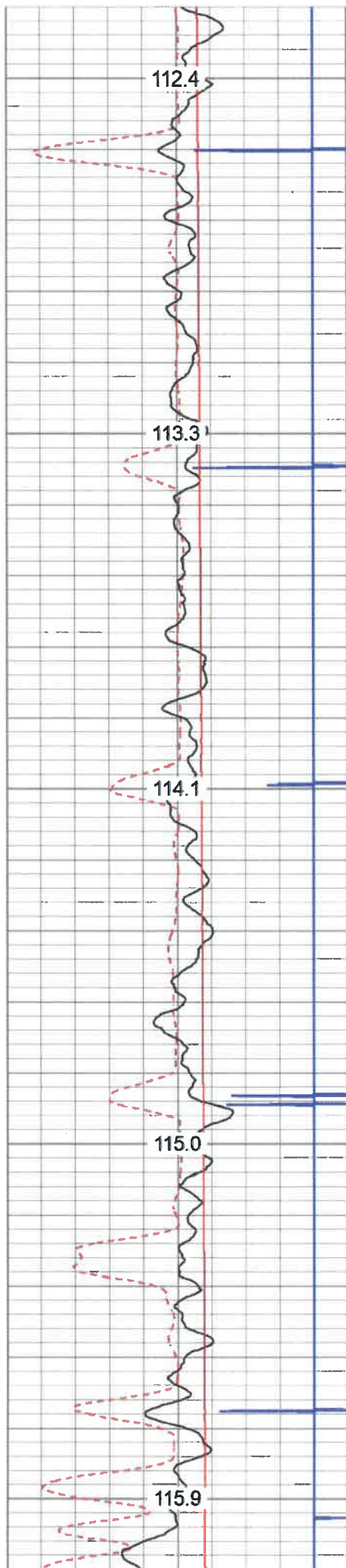
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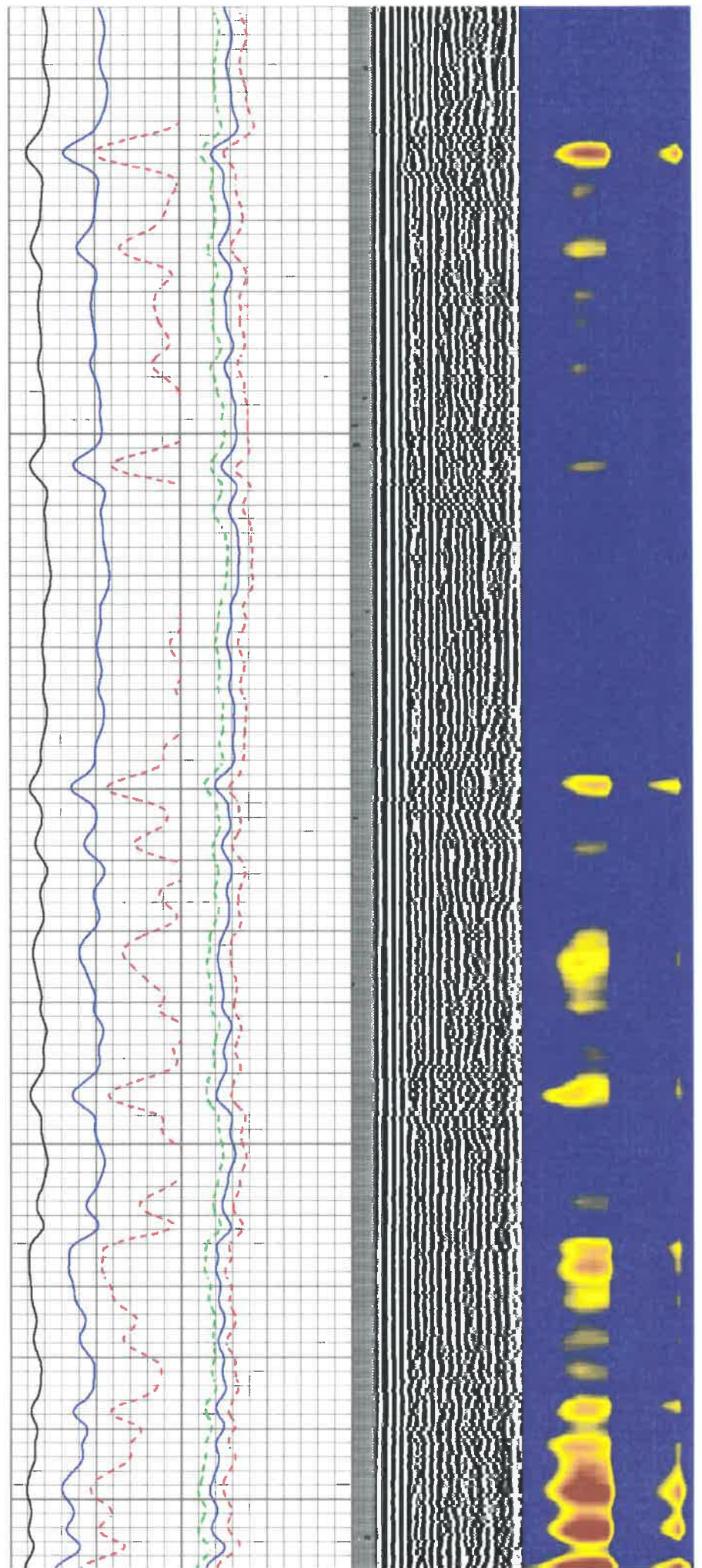
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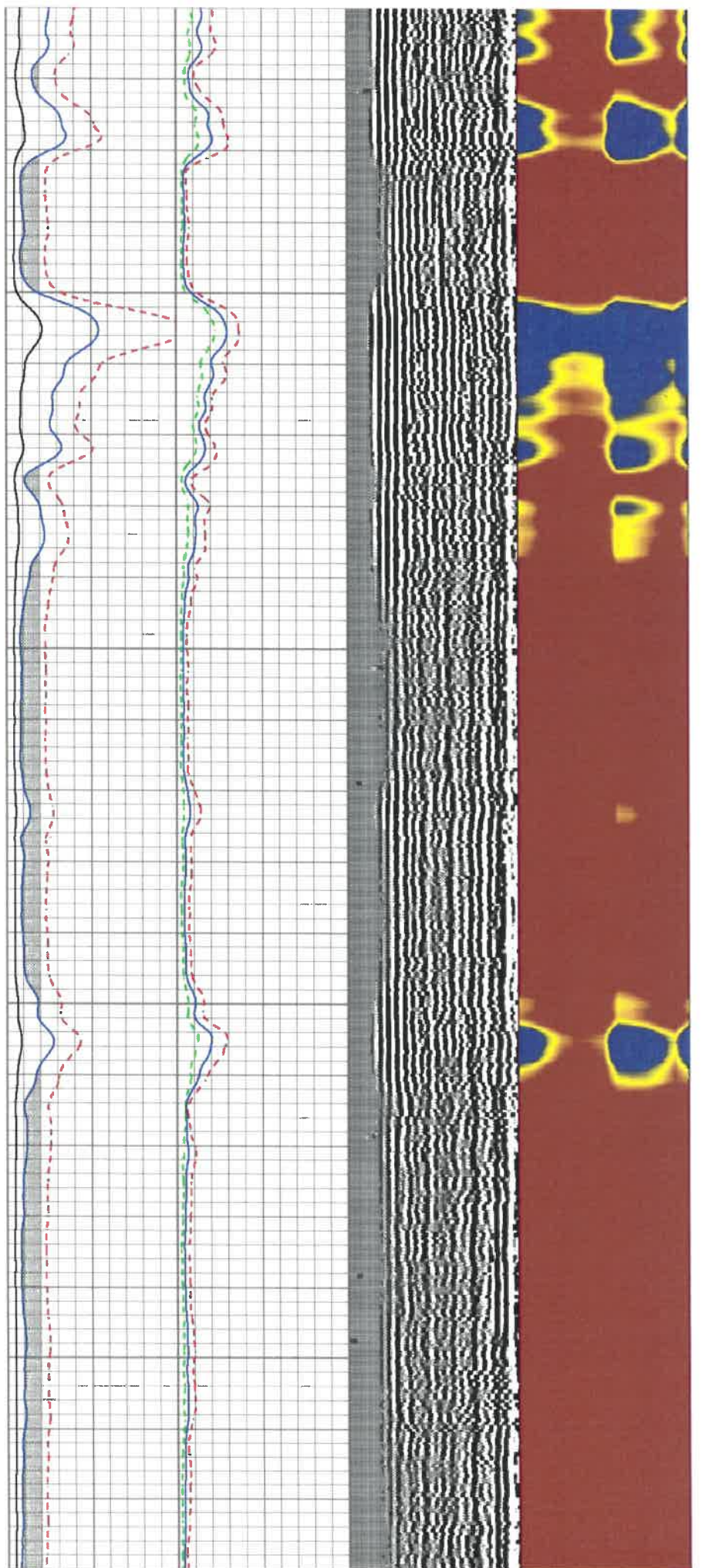


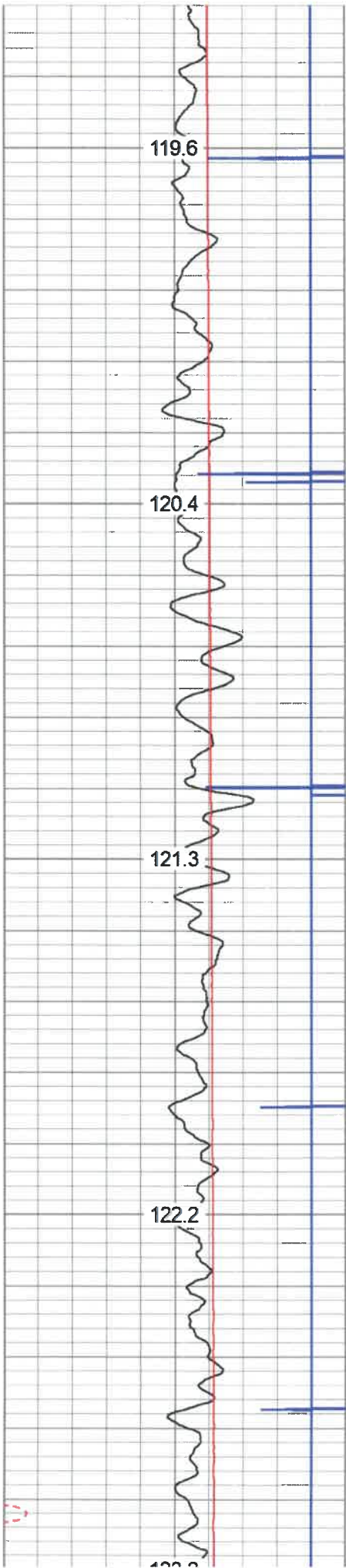
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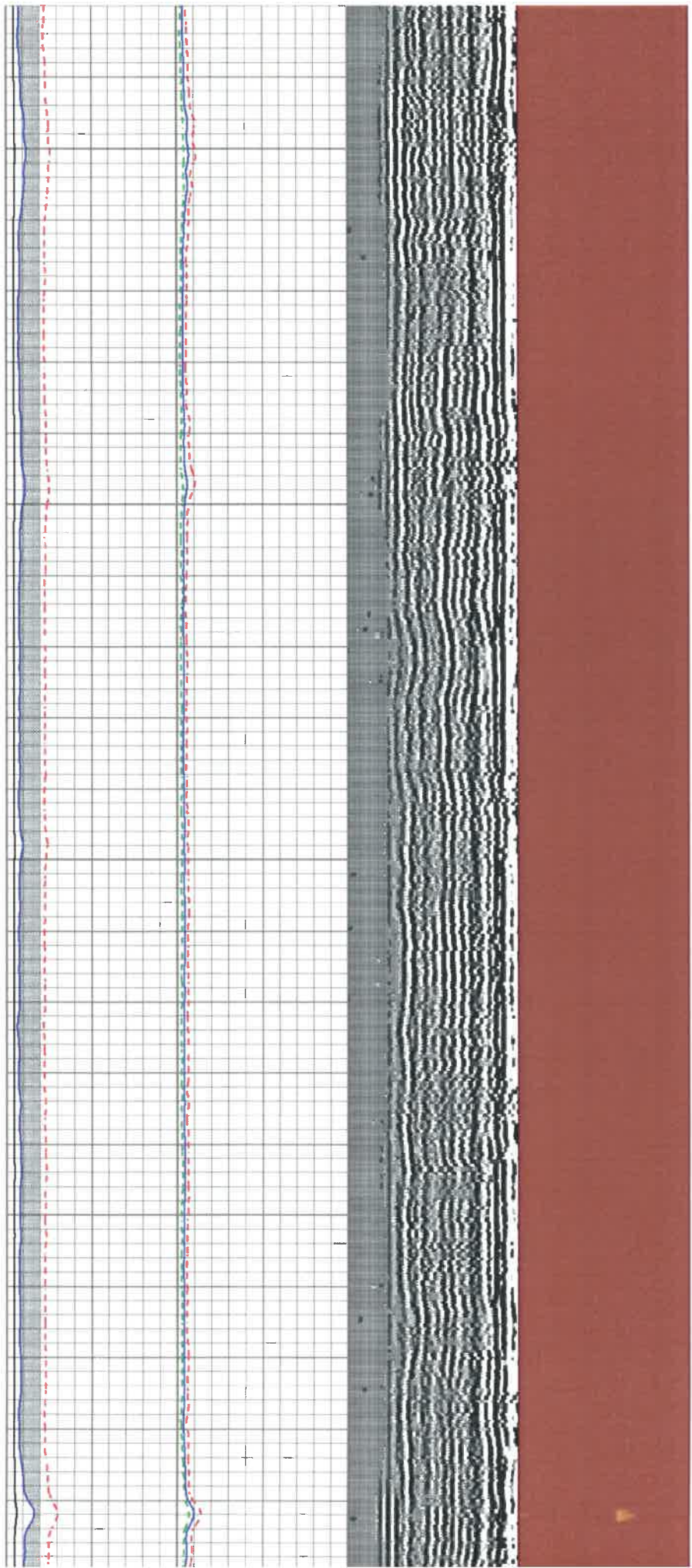


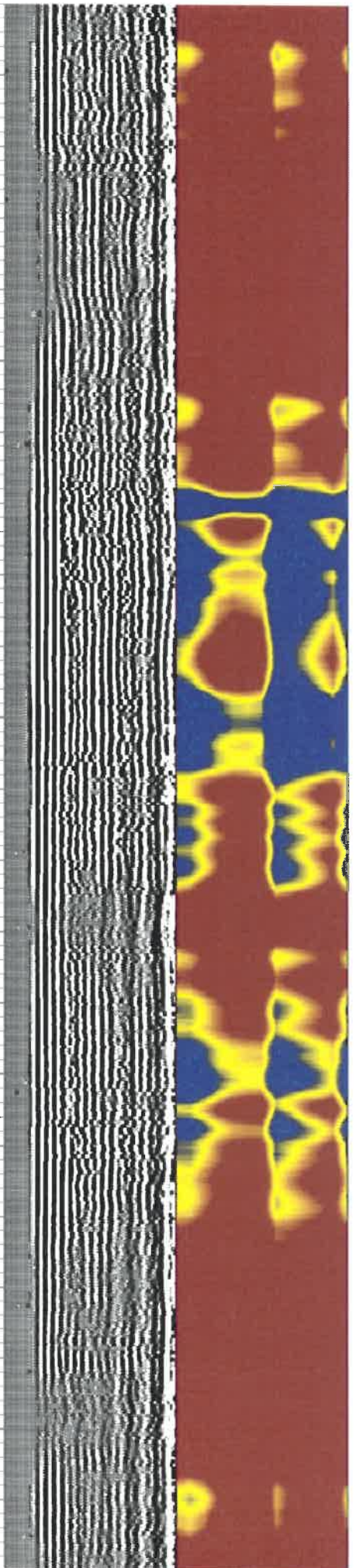
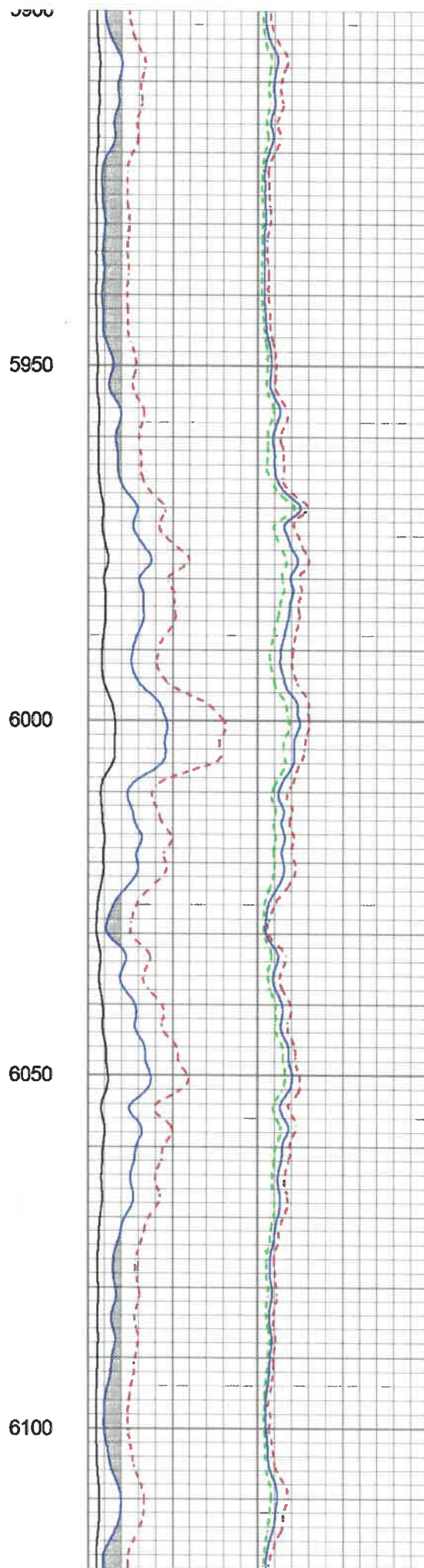
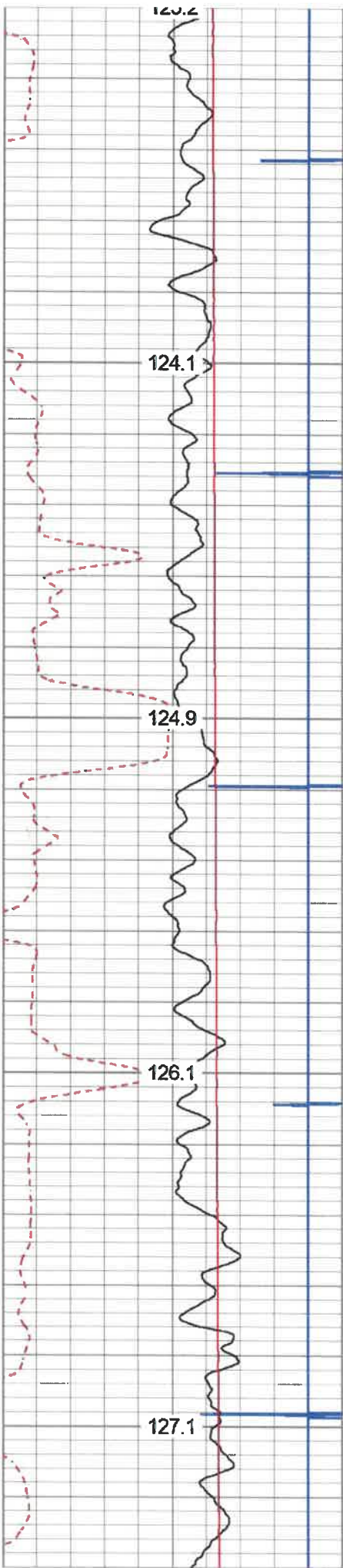
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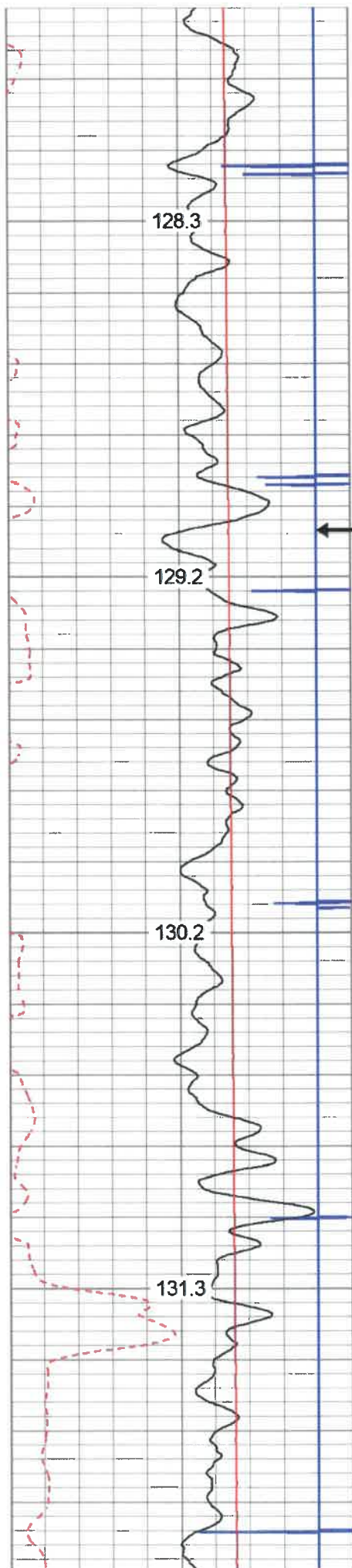
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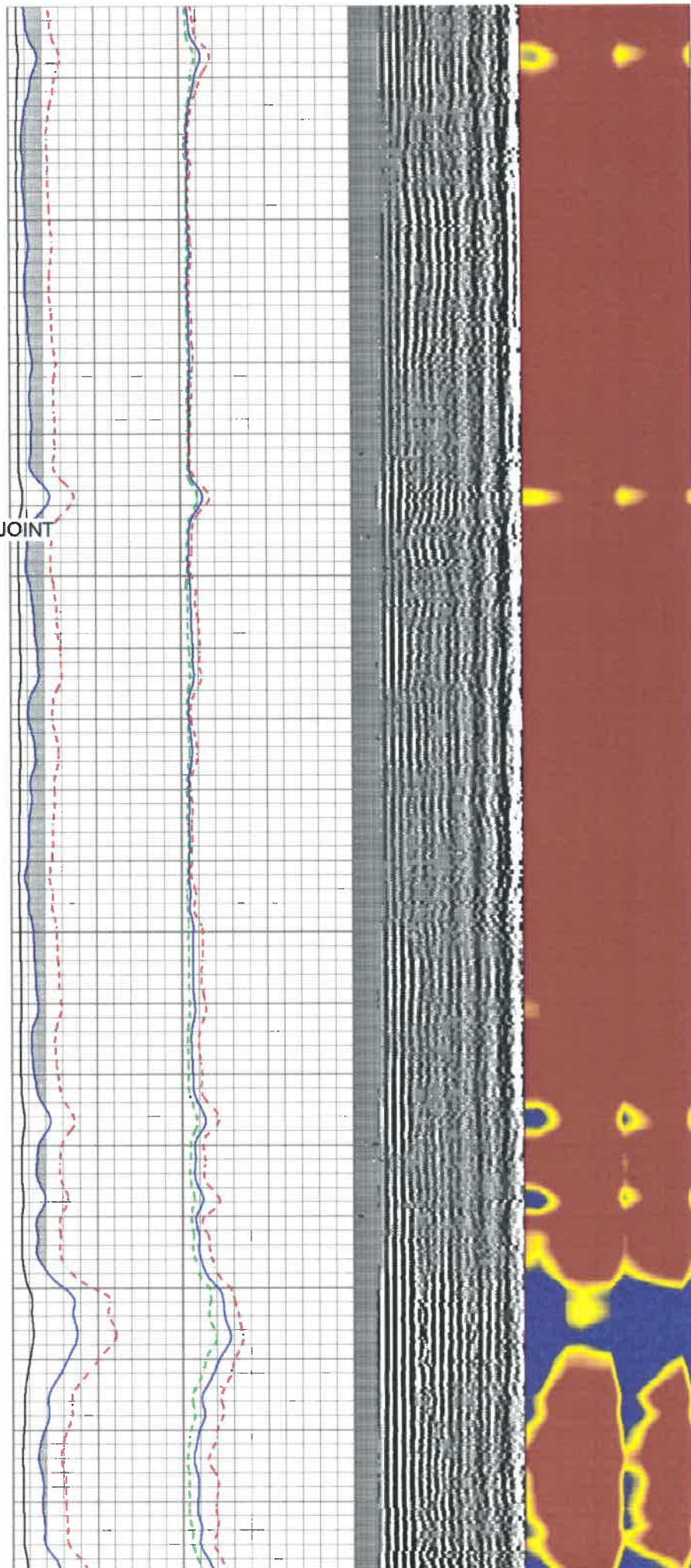
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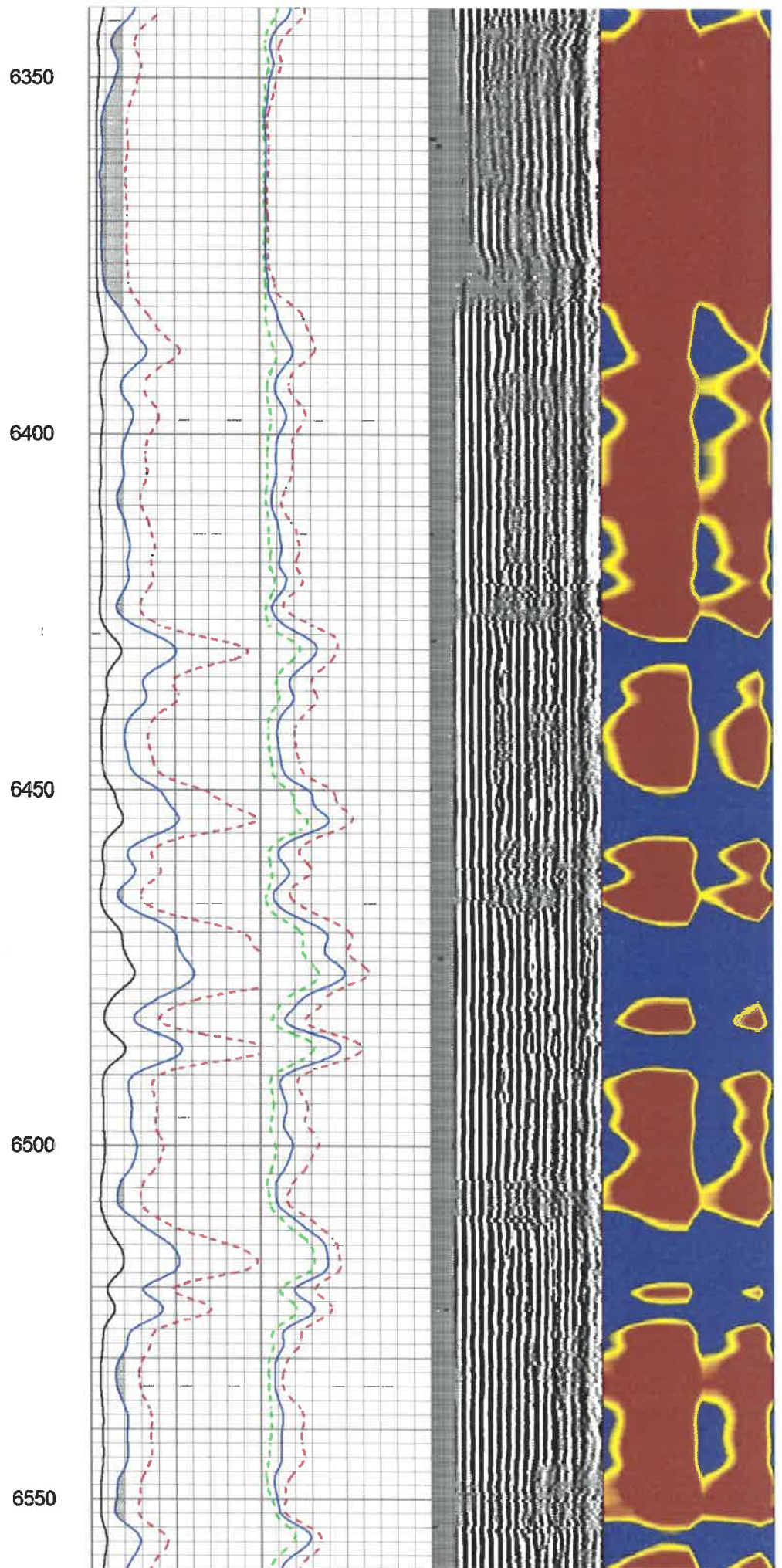
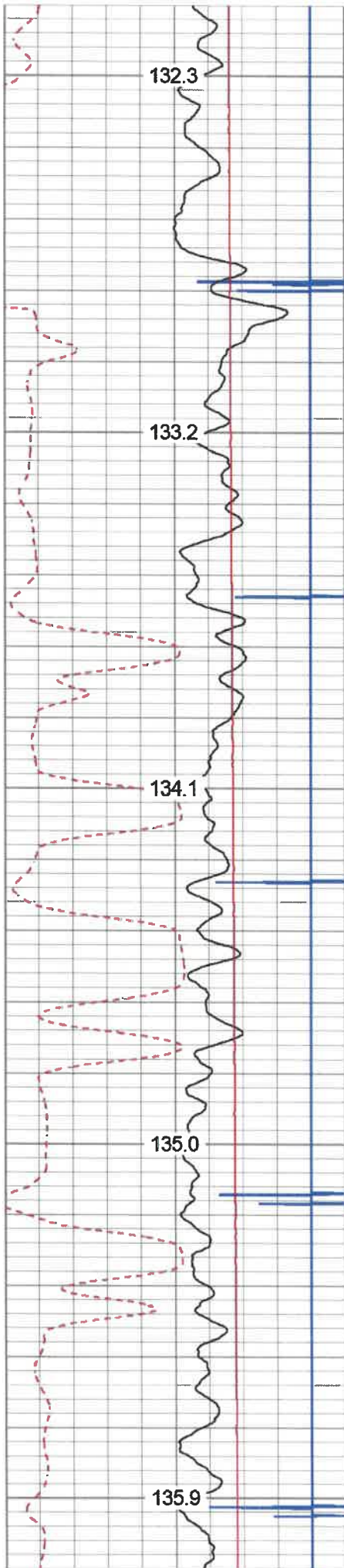
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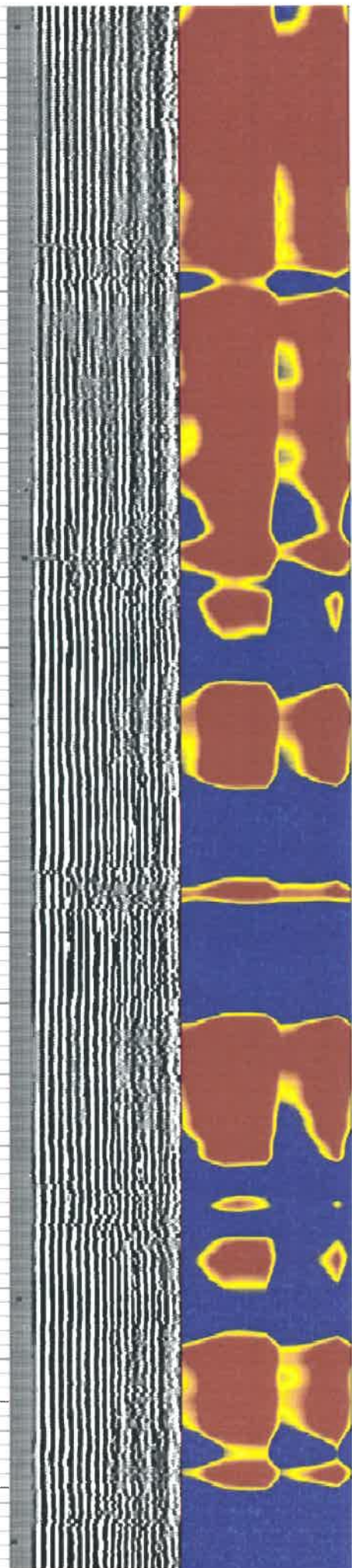
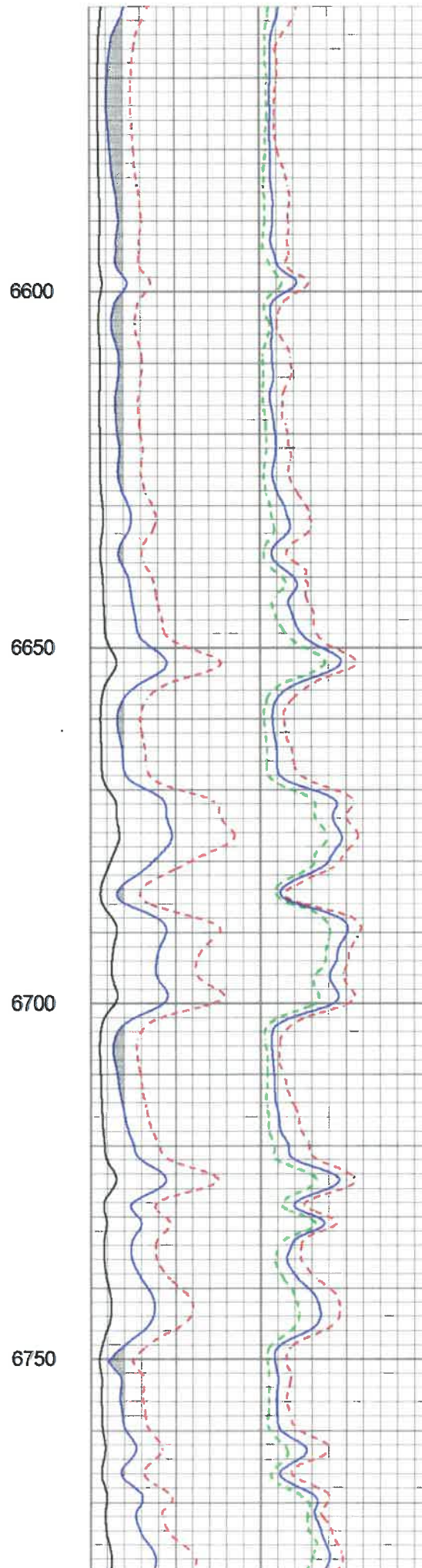
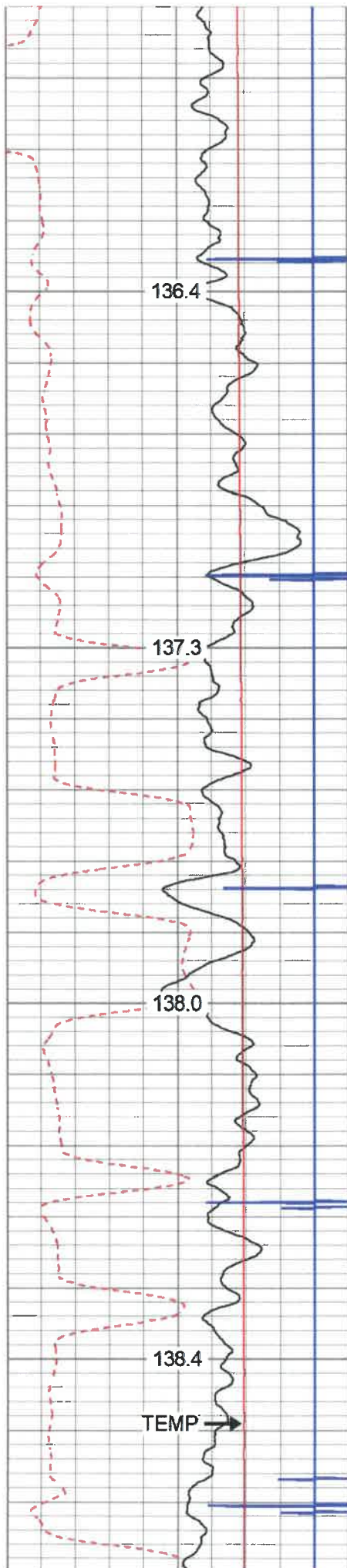
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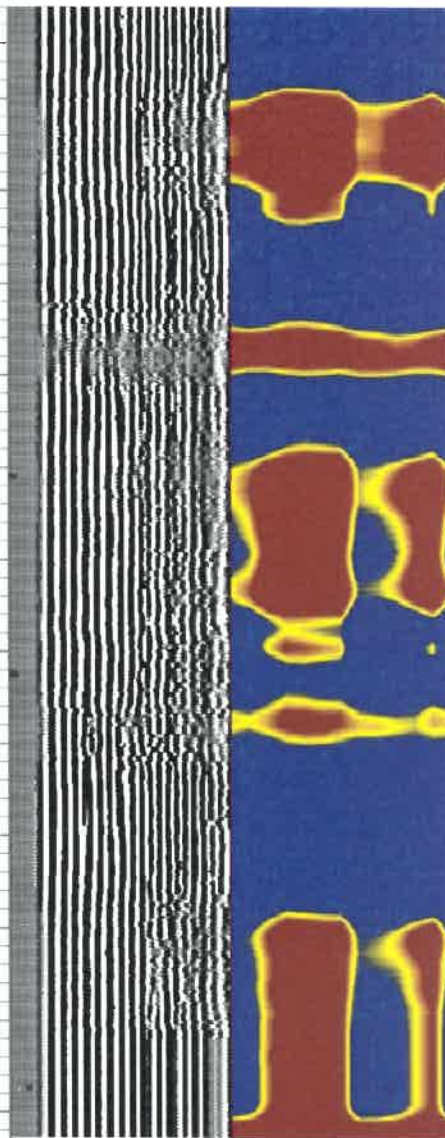
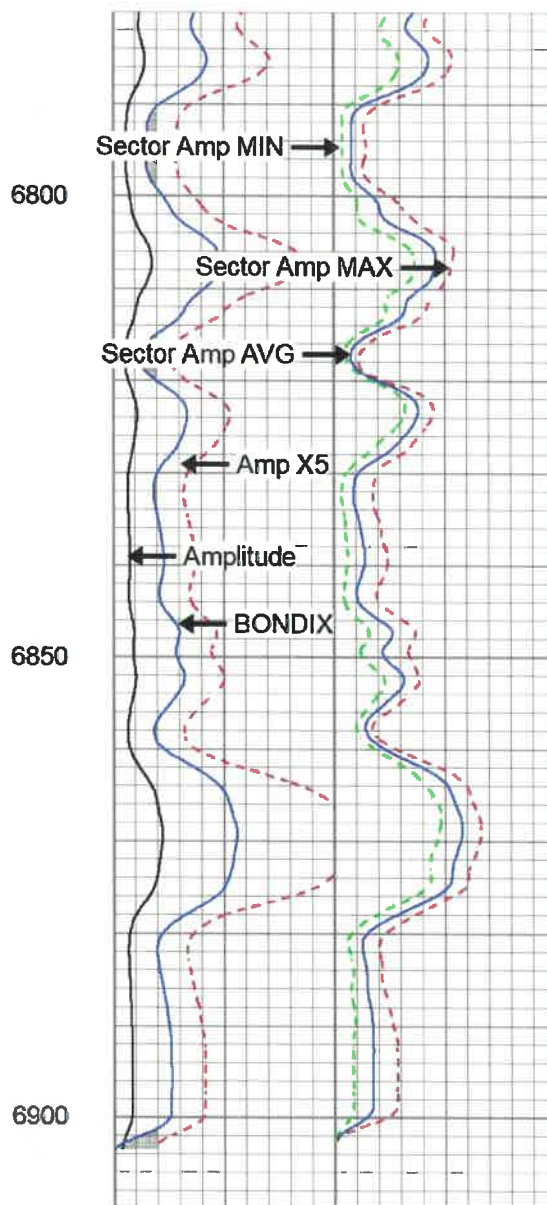
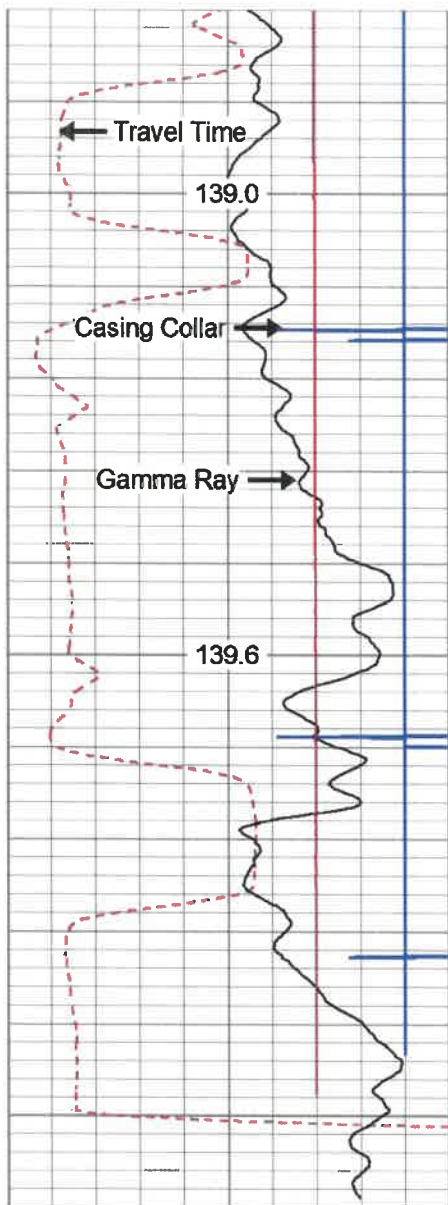
6250

6300









| | | |
|-----|--------------------|-----|
| 280 | Travel Time (usec) | 180 |
| 9 | Casing Collar | -1 |
| 0 | Gamma Ray | 180 |
| 0 | TEMP (degF) | 200 |
| 180 | GR | 360 |

| | |
|------------|----------------|
| Amplitude | Sector Amp AVG |
| 0 (mV) 100 | Sector Amp MAX |
| Amp X5 | Sector Amp MIN |
| 0 (mV) 20 | |
| 1 BONDIX 0 | |

| | |
|-----------------|-----------------|
| VDL | 1 Sector Map 12 |
| 200 (usec) 1200 | |

TEMP
(degF)



Repeat Pass

Database File antero_buzzard_2h.db
 Dataset Pathname pass1
 Presentation Format antero
 Dataset Creation Sat Nov 16 16:11:27 2019
 Charted by Depth in Feet scaled 1:240

| | | |
|-----|--------------------|-----|
| 280 | Travel Time (usec) | 180 |
| 9 | Casing Collar | -1 |

| | |
|------------|----------------|
| Amplitude | Sector Amp AVG |
| 0 (mV) 100 | Sector Amp MAX |

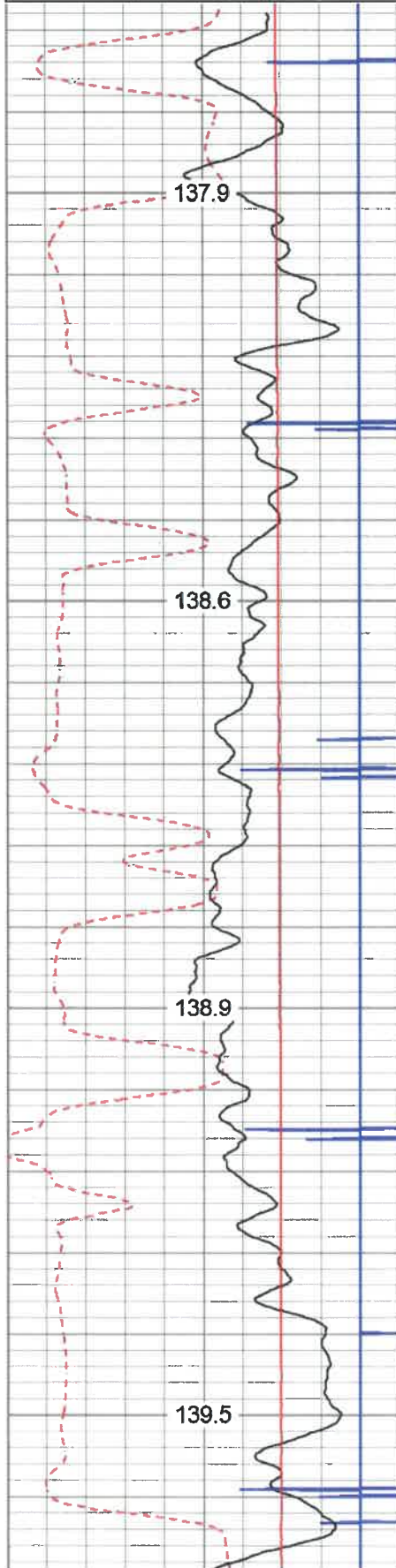
| | |
|-----------------|-----------------|
| VDL | 1 Sector Map 12 |
| 200 (usec) 1200 | |

| 0 | Gamma Ray | 180 |
|-----|-------------|-----|
| 0 | TEMP (degF) | 200 |
| 180 | GR | 360 |

TEMP
(degF)

| 0 | Amp X5 | 20 |
|---|--------|----|
| 0 | (mV) | 20 |
| 1 | BONDIX | 0 |

Sector Amp MIN

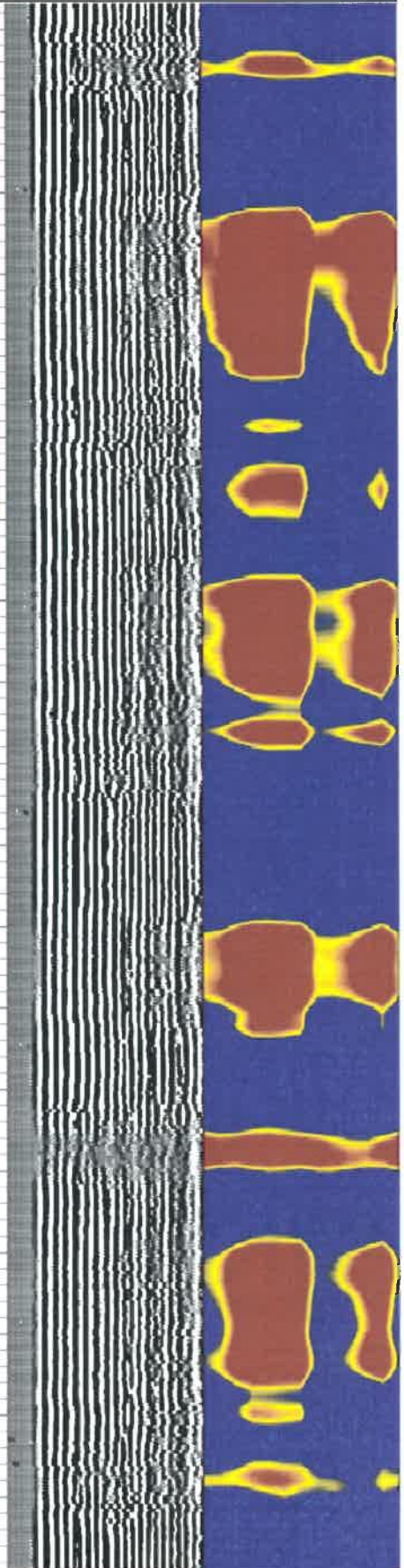
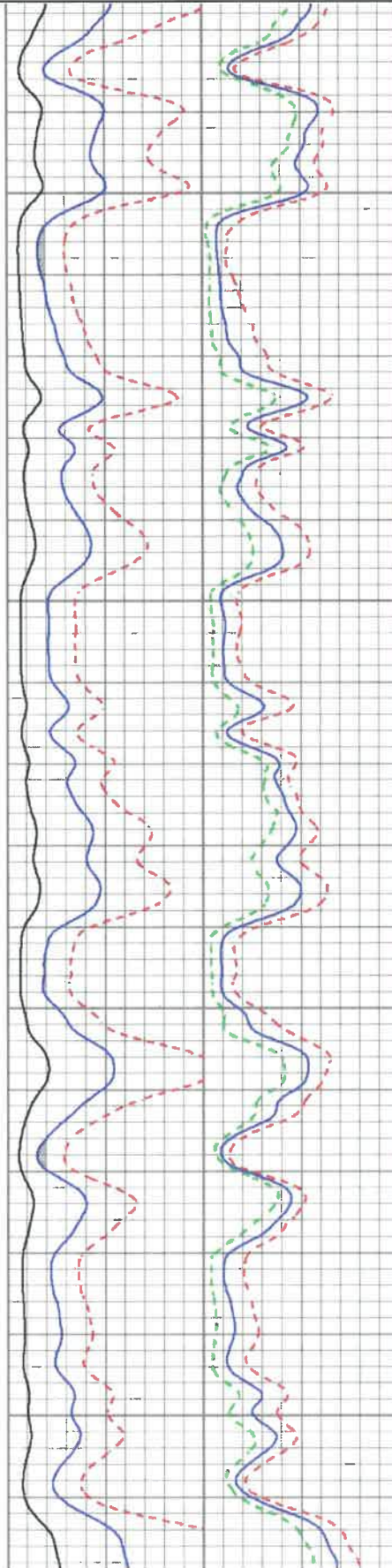


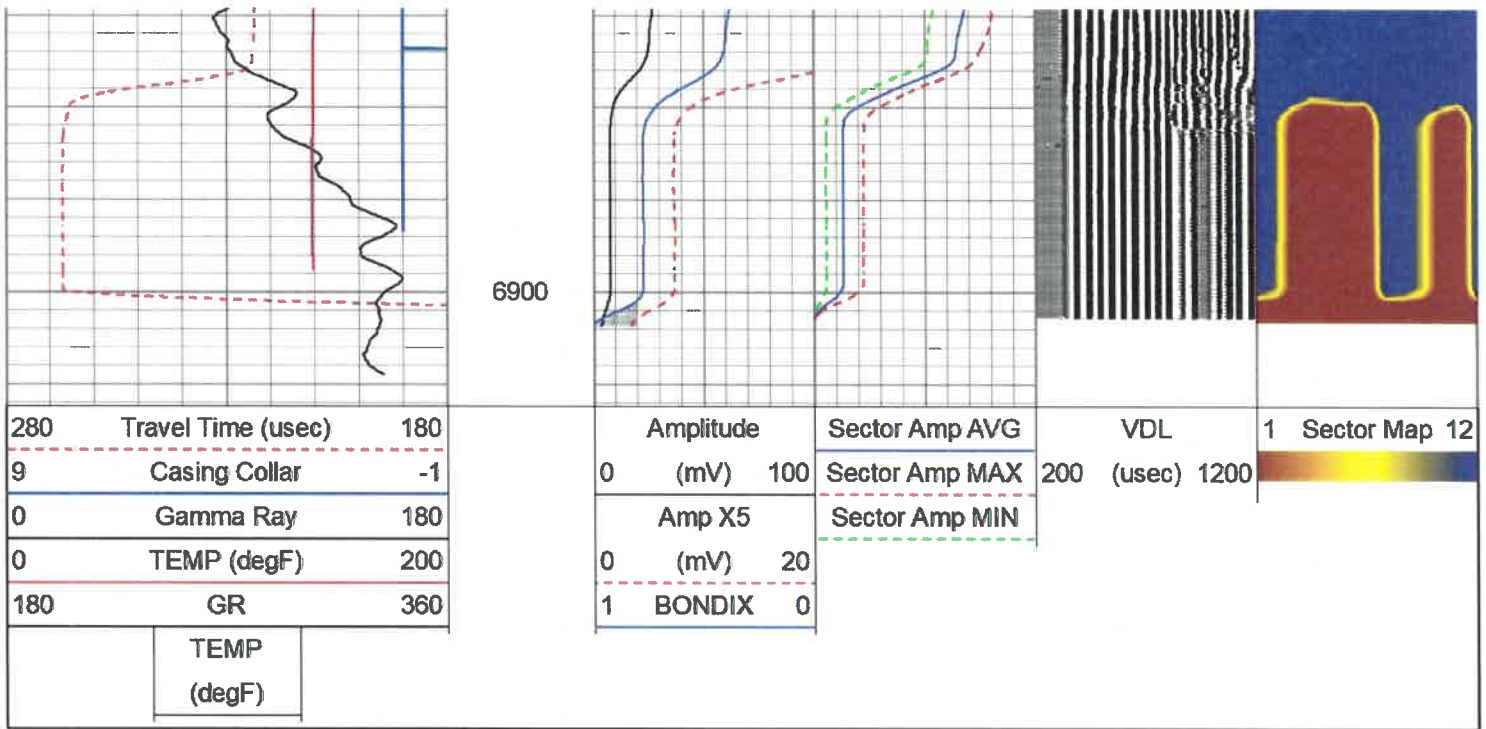
6700

6750

6800

6850





Log Variables

DatabaseC:\ProgramData\Warrior\Data\antero_buzzard_2h.db
 Dataset field/well/run1/pass2/_vars_

Top - Bottom

| | | | | | | | |
|--------------|------------|-------------|-----------|----------|-------------|------------|-----------|
| BHTEMP_Src | BOREID | BOTTEMP | CASEOD | CASETHCK | CASEWGHT | MAXAMPL | MINAMPL |
| TEMP | in 8.25 | degF 100 | in 5.5 | in 0 | lb/ft 20 | mV 71.9 | mV 3.5 |
| MINATTN | PERFS | PPT | SRFTEMP | TDEPTH | | | |
| db/ft 0.8 | No | uSec 219 | degF 0 | ft 0 | | | |

Variable Description

BHTEMP_Src : BHTEMP Input Source Selector
 BOREID : Borehole I.D.
 BOTTEMP : Bottom Hole Temperature
 CASEOD : Casing O.D.
 CASETHCK : Casing Thickness
 CASEWGHT : Casing Weight
 MAXAMPL : Maximum Amplitude

MINAMPL : Minimum Amplitude
 MINATTN : Minimum Attenuation
 PERFS : Perforation Flag
 PPT : Predicted Pipe Time
 SRFTEMP : Surface Temperature
 TDEPTH : Total Depth

Calibration Report

Database File antero_buzzard_2h.db
 Dataset Pathname pass2
 Dataset Creation Sat Nov 16 16:23:18 2019

Gamma Ray Calibration Report

Serial Number: IPSNO-03
 Tool Model: Tek-Co 2 3/4
 Performed: Tue Nov 12 16:11:18 2019

Calibrator Value: 1.0

Background Reading: 0.0 cps
 Calibrator Reading: 1.0 cps

Sensitivity: 0.5000 cps

Segmented Cement Bond Log Calibration Report

Serial Number: IOL40-05
 Tool Model: Tek12
 Calibration Casing Diameter: 5.500 in
 Calibration Depth: 55.875 ft


Master Calibration, performed Sat Nov 16 15:37:20 2019:

| | Raw (v) | | Calibrated (mv) | | Results | |
|-----|---------|-------|-----------------|---------|---------|--------|
| | Zero | Cal | Zero | Cal | Gain | Offset |
| 3' | 0.004 | 1.370 | 3.500 | 71.921 | 50.085 | 3.292 |
| CAL | 0.012 | 0.516 | | | | |
| 5' | 0.000 | 1.432 | 3.500 | 71.921 | 47.791 | 3.499 |
| SUM | | | | | | |
| S1 | 0.020 | 2.026 | 0.000 | 100.000 | 49.860 | -1.005 |
| S2 | 0.018 | 2.112 | 0.000 | 100.000 | 47.754 | -0.869 |
| S3 | 0.017 | 2.030 | 0.000 | 100.000 | 49.677 | -0.824 |
| S4 | 0.016 | 1.916 | 0.000 | 100.000 | 52.653 | -0.862 |
| S5 | 0.018 | 1.765 | 0.000 | 100.000 | 57.240 | -1.003 |
| S6 | 0.019 | 1.604 | 0.000 | 100.000 | 63.077 | -1.179 |
| S7 | 0.020 | 1.620 | 0.000 | 100.000 | 62.484 | -1.240 |
| S8 | 0.023 | 2.042 | 0.000 | 100.000 | 49.532 | -1.134 |
| S9 | 0.020 | 1.891 | 0.000 | 100.000 | 53.442 | -1.062 |
| S10 | 0.015 | 1.762 | 0.000 | 100.000 | 57.234 | -0.856 |
| S11 | 0.014 | 1.638 | 0.000 | 100.000 | 61.572 | -0.860 |
| S12 | 0.016 | 1.557 | 0.000 | 100.000 | 64.899 | -1.040 |

Temperature Calibration Report

Serial Number: IOL40-05
 Tool Model: Tek12
 Performed: Wed Jul 31 10:53:14 2013

| | Reference | Reading |
|-----------------|-----------|-----------|
| Low Reference: | 0.00 degF | 0.00 usec |
| High Reference: | 1.00 degF | 1.00 usec |
| Gain: | 0.33 | |
| Offset: | 0.00 | |
| Delta Spacing | 2 | |

| Sensor | Offset (ft) | Schematic | Description | Length (ft) | O.D. (in) | Weight (lb) |
|--------|-------------|---|---|-------------|-----------|-------------|
| CCL | 18.93 |  | CCL-312tekco (IO8X3-01) Tekco 3 1/8" 450 Deg. "F" SmCo Logging CCL | 1.82 | 3.12 | 25.00 |
| | | | Tek-2.75 2 3/4" Tekco Adjustable Centralizer | 2.73 | 2.75 | 25.00 |

