



**HIGH DEFINITION INDUCTION LOG<sup>SM</sup>**  
**COMPENSATED Z-DENS LOG<sup>SM</sup>**  
**GAMMA RAY LOG**  
**CALIPER LOG**

|   |  |
|---|--|
| FILE NO:<br>US089777                                      | COMPANY<br>WPX ENERGY ROCKY MTN LLC  |
| WELL<br>FEDERAL NER 24-32                                 |  |
| FIELD<br>RULISON  |  |
| COUNTY<br>GARFIELD  | STATE<br>CO  |
| API NO:<br>05045217970000                                 |  |
| Ver. 3.87<br>32 GS 93W<br>RU 23-5 PAD<br>NABORS 576       | LOCATION:<br>SHL: 120' FNL & 2573' FWL(5 7S 93W)<br>BHL: 1465' FSL & 1799' FWL(32 GS 93W)<br>SEC 32 TWP 6S RGE 93W |
| PERMANENT DATUM<br>LOG MEASURED FROM<br>DRILL. MEAS. FROM | OTHER SERVICES<br>NONE<br>ELEVATIONS:<br>KB 7629 FT<br>DF<br>GL 7603 FT  |
| GL ELEVATION 7603 FT<br>KB 26 FT ABOVE P.D.<br>KB         |  |

|                        |                          |
|------------------------|--------------------------|
| DATE                   | 27-Aug-2014              |
| RUN                    | 1                        |
| TRIP                   | 1                        |
| SERVICE ORDER          | US089777                 |
| DEPTH DRILLER          | 10328 FT                 |
| DEPTH LOGGER           | 10329 FT                 |
| BOTTOM LOGGED INTERVAL | 10319 FT                 |
| TOP LOGGED INTERVAL    | 0 FT                     |
| CASING DRILLER         | 9.625 IN @ 1133 FT       |
| CASING LOGGER          | 1131 FT                  |
| BIT SIZE               | 8.75 IN                  |
| TYPE OF FLUID IN HOLE  | LSND                     |
| DENSITY                | 11.3 LB/G                |
| VISCOSITY              | 80 CP                    |
| PH                     | 8.6                      |
| FLUID LOSS             | 8 C3                     |
| SOURCE OF SAMPLE       | FLOWLINE                 |
| RM AT MEAS. TEMP.      | 1.603 OHMM @ 74.59 DEGF  |
| RMF AT MEAS. TEMP.     | 1.202 OHMM @ 69.59 DEGF  |
| RMC AT MEAS. TEMP.     | 2.003 OHMM @ 69.59 DEGF  |
| SOURCE OF RMF          | RMC                      |
| CALCULATED             | CALCULATED               |
| RM AT BHT              | 1.113 OHMM @ 218.25 DEGF |
| TIME SINCE CIRCULATION | 8 HOURS                  |
| MAX. RECORDED TEMP.    | 220 DEGF                 |
| EQUIP. NO.             | 6670                     |
| LOCATION               | GRAND JCT.               |
| RECORDED BY            | NEWELL                   |
| WITNESSED BY           | AL HARTL                 |

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE THE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

| BOREHOLE RECORD |         |          |
|-----------------|---------|----------|
| BIT SIZE        | FROM    | TO       |
| 13.5 IN         | 0 FT    | 1133 FT  |
| 8.75 IN         | 1133 FT | 10328 FT |

| CASING RECORD |           |       |      |         |
|---------------|-----------|-------|------|---------|
| SIZE          | WEIGHT    | GRADE | FROM | TO      |
| 9.625 IN      | 32.3 LB/F |       | 0 FT | 1133 FT |

REMARKS

RUN 1 TRIP 1: HDIL ZDL CN GR RAN IN COMBINATION

BVOL AND CVOL CALCULATED IN CUBIC FEET  
BVOL CALCULATED USING PROPOSED 4.5" CASING  
CALIPER VERIFIED INSIDE CASING

RHO MATRIX: 2.68 G/CC  
RHO FLUID: 1.00 G/CC

CN MATRIX: SANDSTONE  
CN RAN DECENTRALIZED

HDIL RAN WITH 1.5" STANDOFFS

ABC TO CALCULATE: STANDOFF

THANK YOU FOR CHOOSING BAKER HUGHES WIRELINE SERVICES  
CREW: NEWELL/HOLLAR/FAVORITE  
RIG: NABORS 576

#### EQUIPMENT DATA

| RUN | TRIP | TOOL       | SERIES NO. | SERIAL NO. | POSITION      |
|-----|------|------------|------------|------------|---------------|
| 1   | 1    | TTRM       | 3981XA     | 10203010   | FREE          |
| 1   | 1    | TELEMETRY  | 3514XB     | 10240730   | FREE          |
| 1   | 1    | GR         | 1329XA     | 10196895   | FREE          |
| 1   | 1    | CN         | 2446XA     | 10202048   | DECENTRALIZED |
| 1   | 1    | ZDL        | 2234XA     | 153015     | PAD DEVICE    |
| 1   | 1    | KNUCKLE    | 3939XA     | 10399278   | FREE          |
| 1   | 1    | HDIL ELECT | 1515EA     | 10049592   | FREE          |
| 1   | 1    | HDIL       | 1515MA     | 10037719   | STOODOFF      |

### MAIN LOG 2"/100FT SCALE

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013

Updates: 1 Patches: 2

Plotted: Wed Aug 27 20:08:09 2014

#### PARAMETER AND FILTER SUMMARY REPORT

File: /dat1a/OH089777/n777q02.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 1012.500 ft BOTTOM DEPTH: 10337.998 ft

#### SYMMETRIC FILTER

| MEASUREMENT TYPE | PARAMETER   | VALUE      | UNITS | INTERVAL (ft) |        |
|------------------|-------------|------------|-------|---------------|--------|
| TTRM             | FILTER ()   | medium (1) |       | TOP           | BOTTOM |
|                  | FILTER (.h) | medium (1) |       | "             | "      |
|                  | FILTER (.i) | medium (1) |       | "             | "      |
| Y AXIS CALIPER   | FILTER ()   | medium (1) |       | "             | "      |
| TENSION          | FILTER ()   | medium (1) |       | "             | "      |
| GR               | FILTER ()   | medium (1) |       | "             | "      |
| CALIPER          | FILTER ()   | medium (1) |       | "             | "      |
|                  | FILTER (.h) | medium (1) |       | "             | "      |
|                  | FILTER (.i) | medium (1) |       | "             | "      |
| SP-SPDH          | FILTER ()   | heavy (3)  |       | "             | "      |

#### BOREHOLE & CEMENT

| MEASUREMENT TYPE              | PARAMETER                 | VALUE         | UNITS        | INTERVAL (ft) |        |
|-------------------------------|---------------------------|---------------|--------------|---------------|--------|
| BIT SIZE                      | BIT SIZE                  | 8.750         | in           | TOP           | BOTTOM |
| MUD SAMPLE RESISTIVITY        | MUD SAMPLE TEMP           | 74.5          | degF         | "             | "      |
|                               | MUD SAMPLE RES            | 1.603         | ohm.m        | "             | "      |
| BOREHOLE TEMP from GRADIENT   | Known BH REF TEMP         | 77.0          | degF         | "             | "      |
|                               | at BH REF DEPTH           | 0.0           | ft           | "             | "      |
|                               | with TEMP GRADIENT        | 1.200         | 0.01 degF/ft | "             | "      |
| BOREHOLE CORR DIAMETER SOURCE | CALIPER/FIXED DIA. (mbh*) | USE CALIPER   |              | "             | "      |
| BOREHOLE CORR DIAMETER        | FIXED DIAMETER (mbh*)     | 8.750         | in           | "             | "      |
| BH MUD RESISTIVITY SOURCE     | RMUD SOURCE (HDIL)        | TOOL MEASURED |              | "             | "      |

#### HDIL PROCESSING

| MEASUREMENT TYPE             | PARAMETER        | VALUE      | UNITS | INTERVAL (ft) |        |
|------------------------------|------------------|------------|-------|---------------|--------|
| HDIL TEMPERATURE CORRECTION  | TEMP CORR SOURCE | USE RXTEMP |       | TOP           | BOTTOM |
| ADAPTIVE BOREHOLE CORRECTION | ABC PROCESSING   | ON         |       | "             | "      |

|                              |                  |            |      |    |
|------------------------------|------------------|------------|------|----|
| ADAPTIVE BOREHOLE CORRECTION | ABC PROCESSING   | ON         | "    | "  |
|                              | ABC TO CALCULATE | STANDOFF   | 1.50 | in |
|                              | STANDOFF         | ECCENTERED | "    | "  |
|                              | TOOL POSITION    |            | "    | "  |
|                              | Rmud MULTIPLIER  | 1.000      | "    | "  |

## CURVE DESCRIPTION REPORT

**CURVE NAME    CREATION DATE    CURVE DESCRIPTION**

|         |                      |  |
|---------|----------------------|--|
| F1:GR   | Aug 27 14:29:39 2014 | GAMMA RAY                                      |
| F1:M0C6 | Aug 27 14:29:39 2014 | FOCUSED CONDUCTIVITY, 60-INCH DOI              |
| F1:M0R2 | Aug 27 14:29:39 2014 | TRUE FOCUSED RESISTIVITY FOR HDIL, 20-INCH DOI |
| F1:M0R6 | Aug 27 14:29:39 2014 | TRUE FOCUSED RESISTIVITY FOR HDIL, 60-INCH DOI |
| F1:SP   | Aug 27 14:29:39 2014 | SPONTANEOUS POTENTIAL                          |
| F1:TEN  | Aug 27 14:29:39 2014 | DIFFERENTIAL TENSION                           |

## CURVE MEASURE POINT OFFSET

**CURVE    OFFSET (ft)    CURVE    OFFSET (ft)    CURVE    OFFSET (ft)    CURVE    OFFSET (ft)**

|      |       |      |      |     |       |
|------|-------|------|------|-----|-------|
| GR   | 52.25 | M0R2 | 8.00 | SP  | 14.00 |
| M0C6 | 8.00  | M0R6 | 8.00 | TEN | 0.00  |

**Presentation** : HL6670:/dat1a/OH089777/MAIN\_2IN.fvpdf [2"/100' Scale]  
**Plot Interval** : 0 - 10334 Feet

**Data File 1** : F1 : HL6670:/dat1a/OH089777/MAIN.xtf  
**Created On** : Aug 27 14:29:39 2014  
**Company** : WPX ENERGY INC.  
**Well** : FEDERAL NER 24-32  
**Field** : RULISON  
**File Interval** : 18 - 11796 Feet  
**OCT** : n777q

GR BACKUP

GAMMA RAY [gr]

0 200

SP [sp]

-200 50

FEET

0

100

TOOL STICKING

DEEP [m0r6]

0 100

DIFF. TENSION [ten]

4750 -250

SHALLOW [m0r2]

0 100 500

60 in. DOI [m0c6]

0

AMPLIFIED SHALLOW [m0r2]

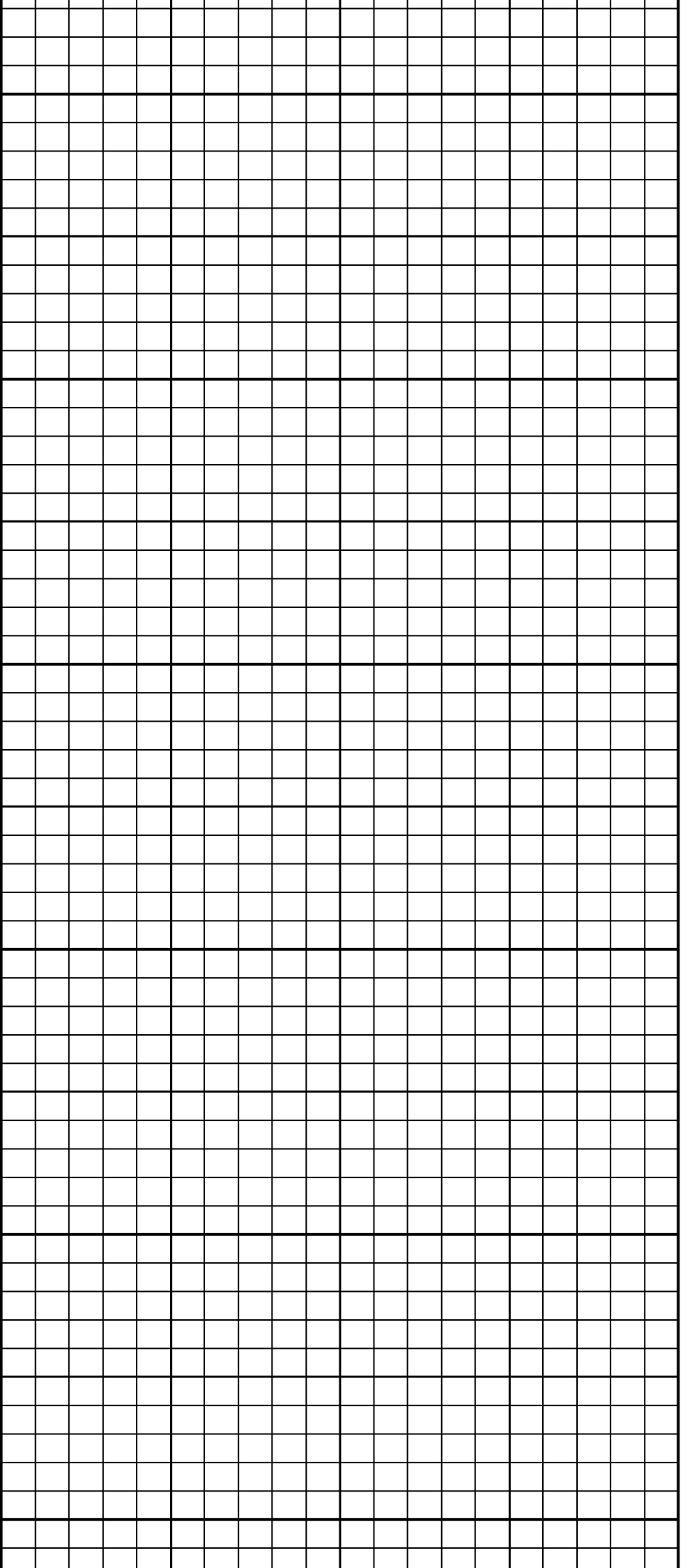
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OVERRANGE DEEP [m0r6]

100 1000

OVERRANGE SHALLOW [m0r2]

100 1000



200

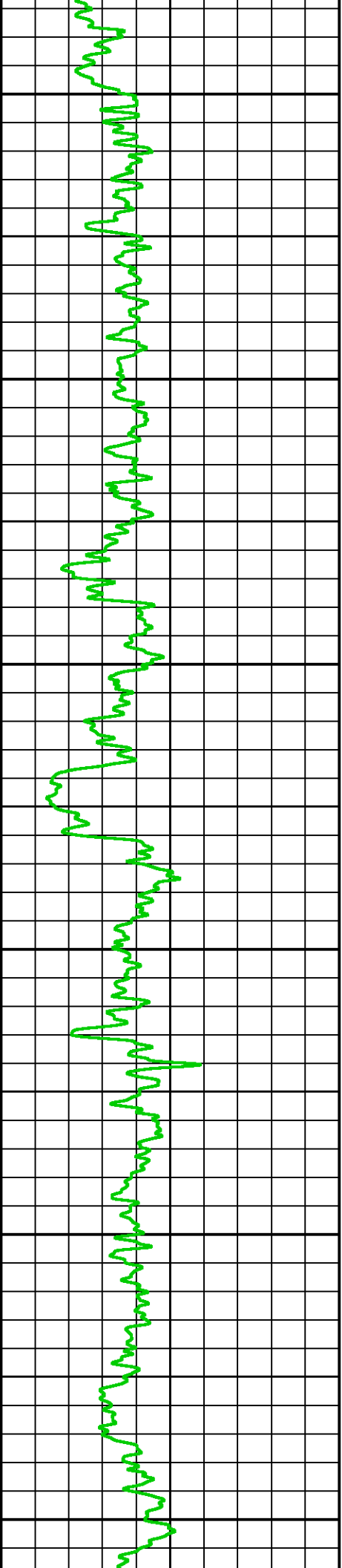
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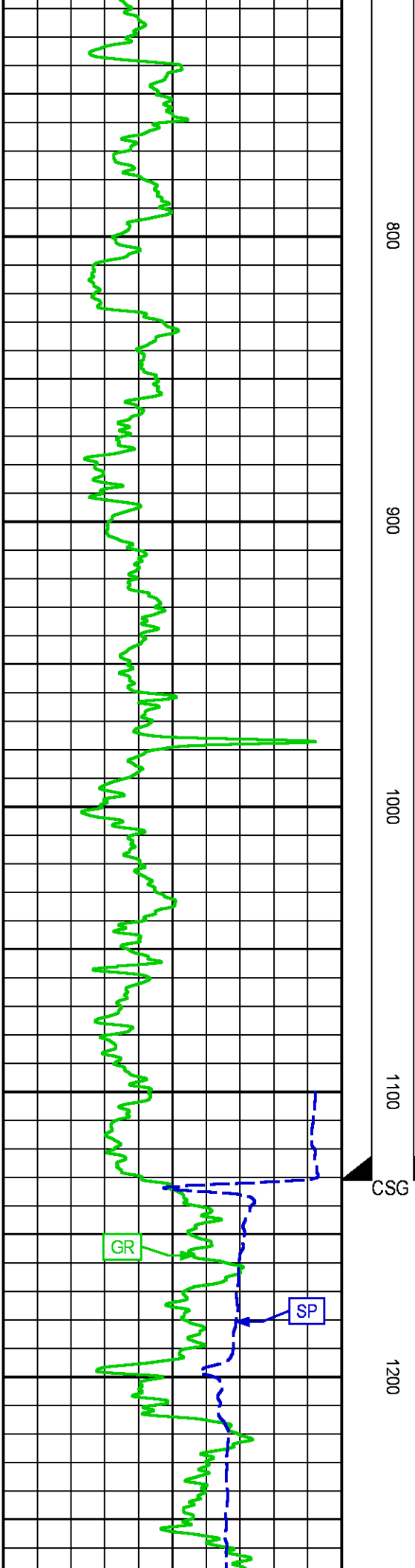
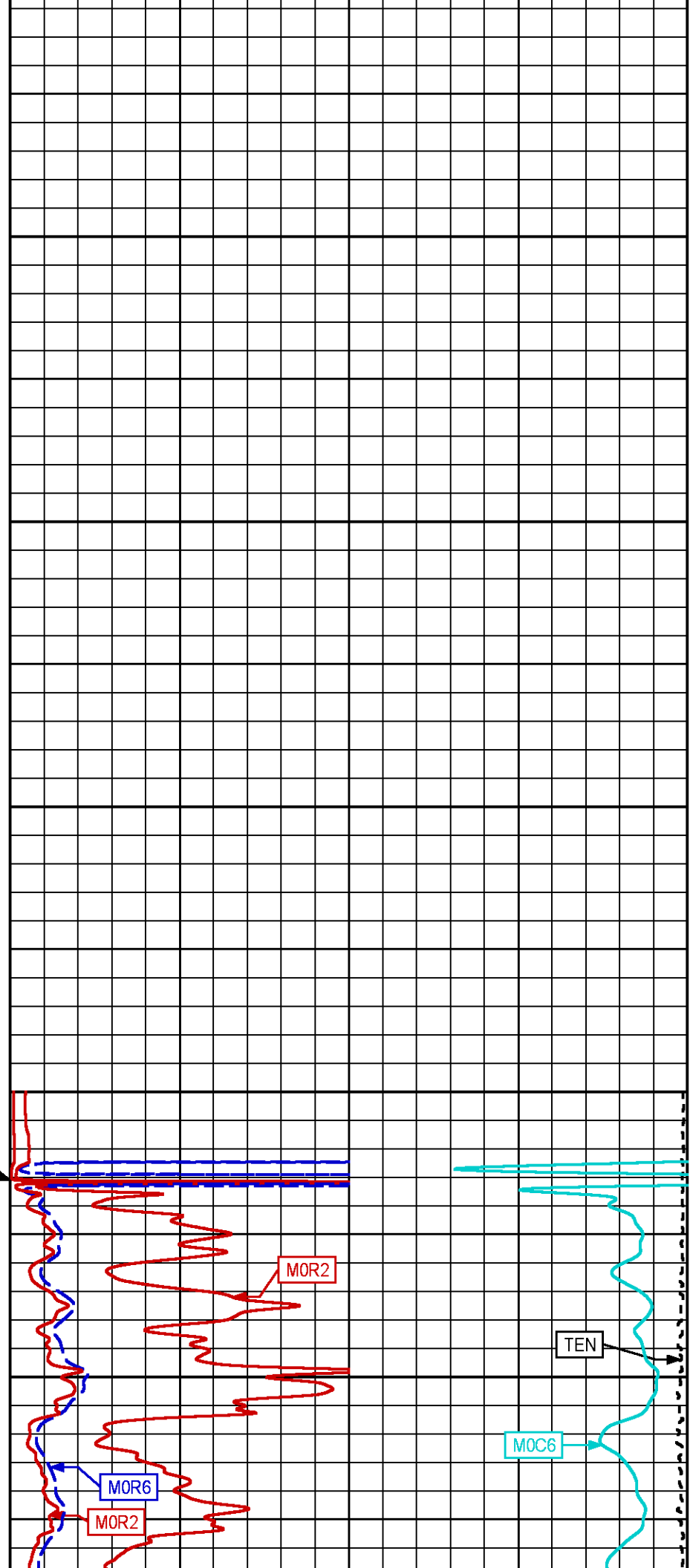
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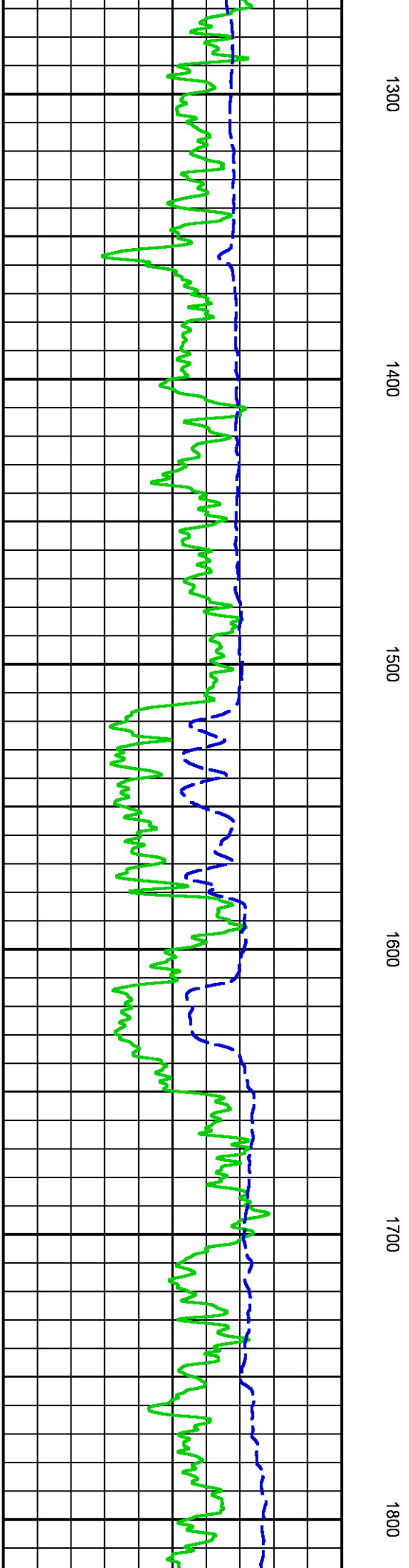
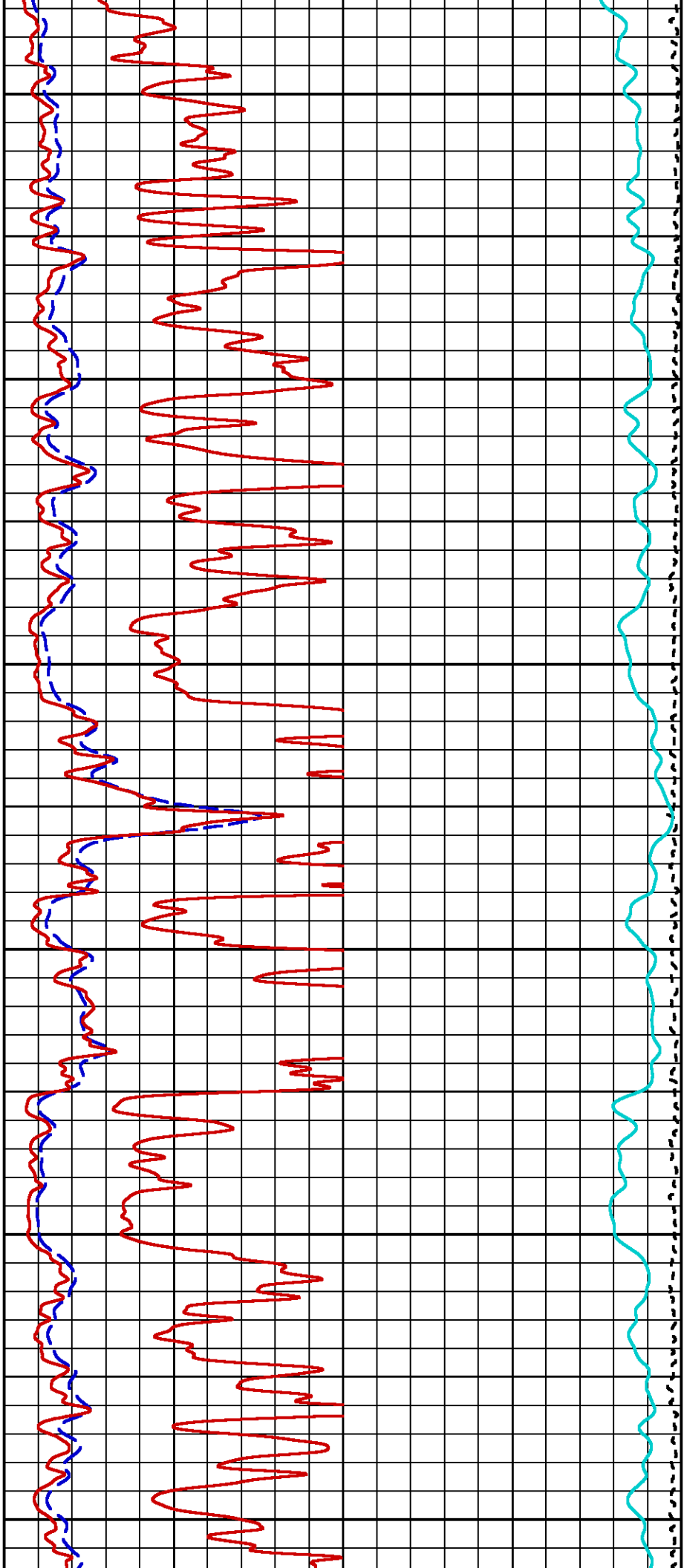
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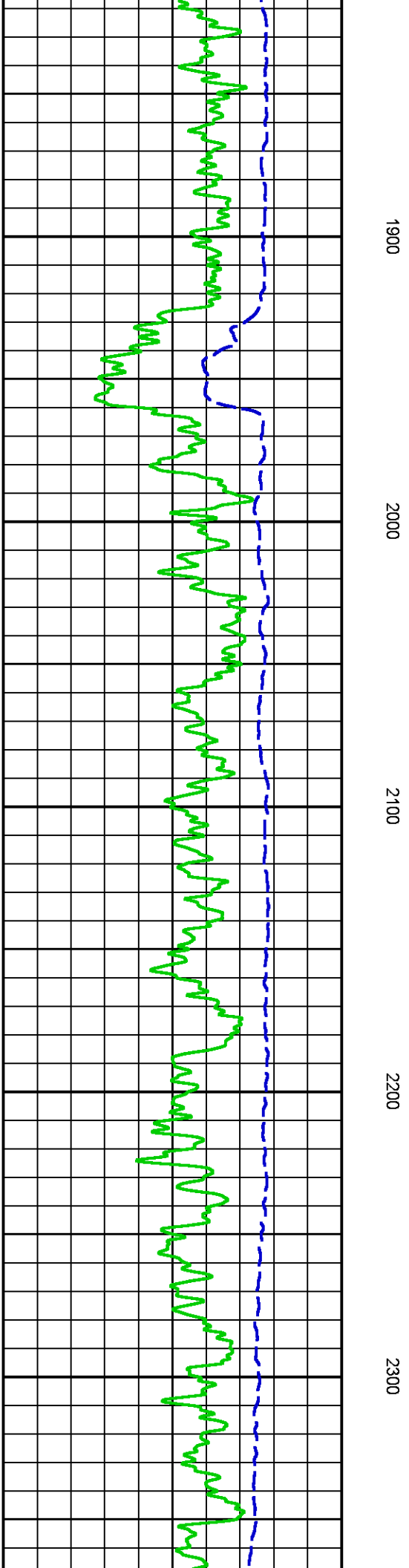
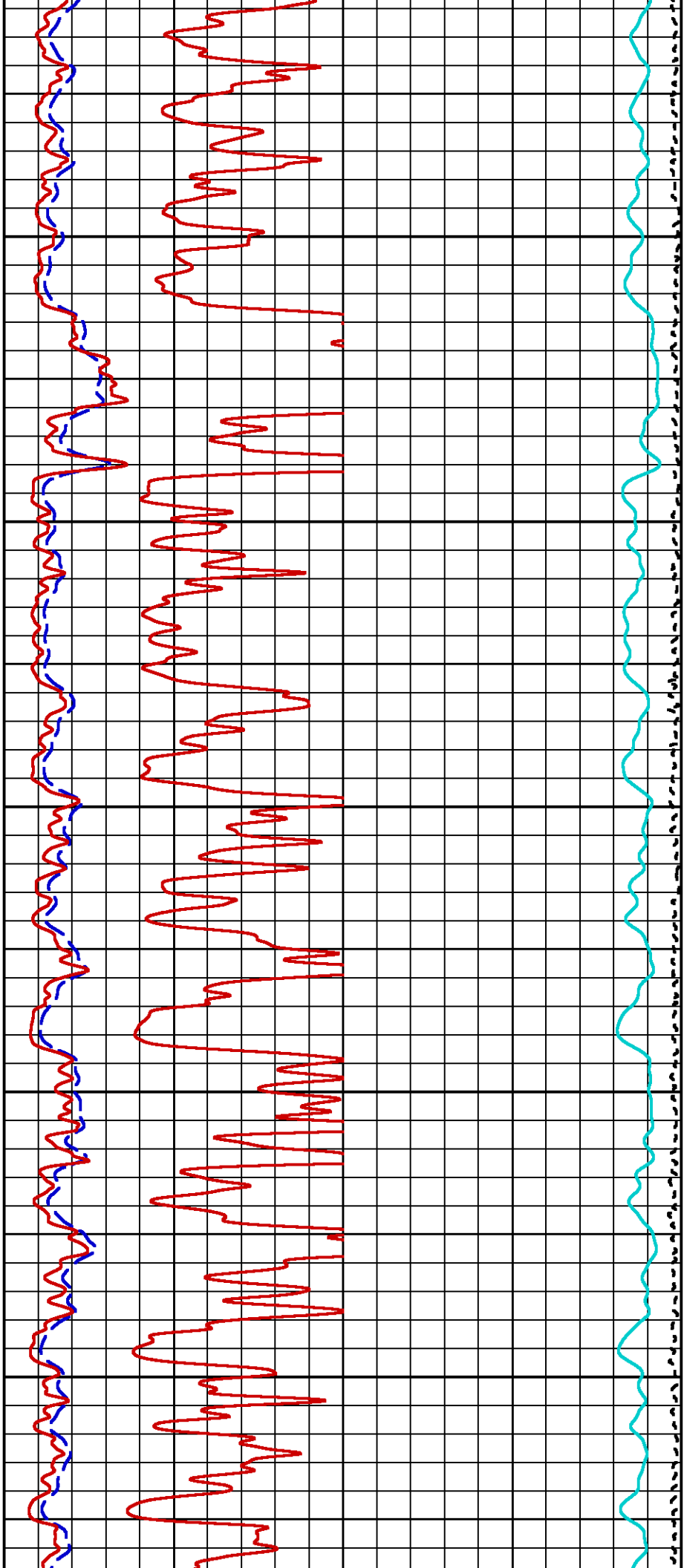
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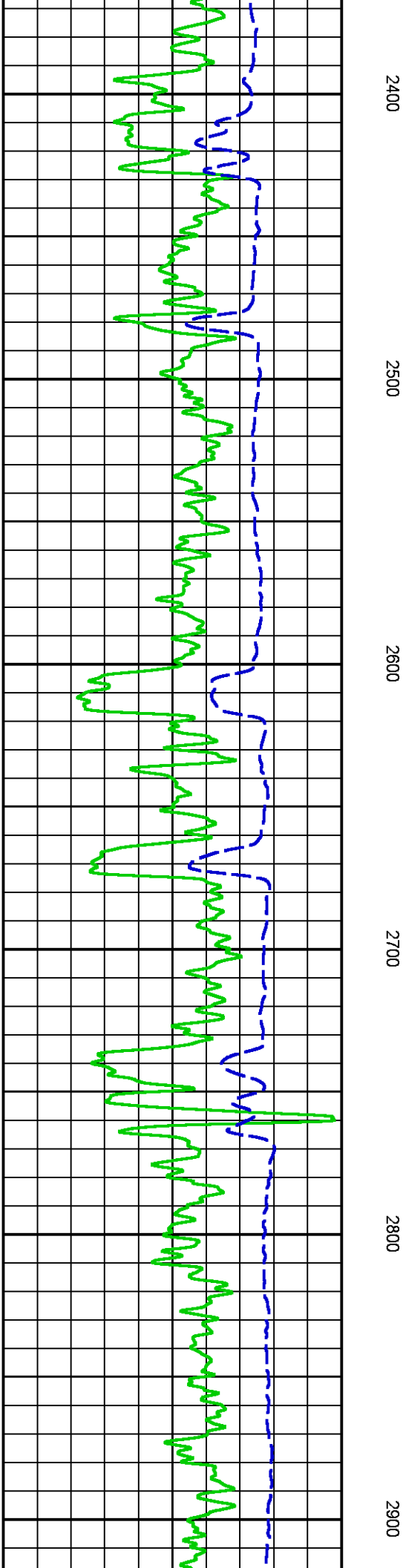
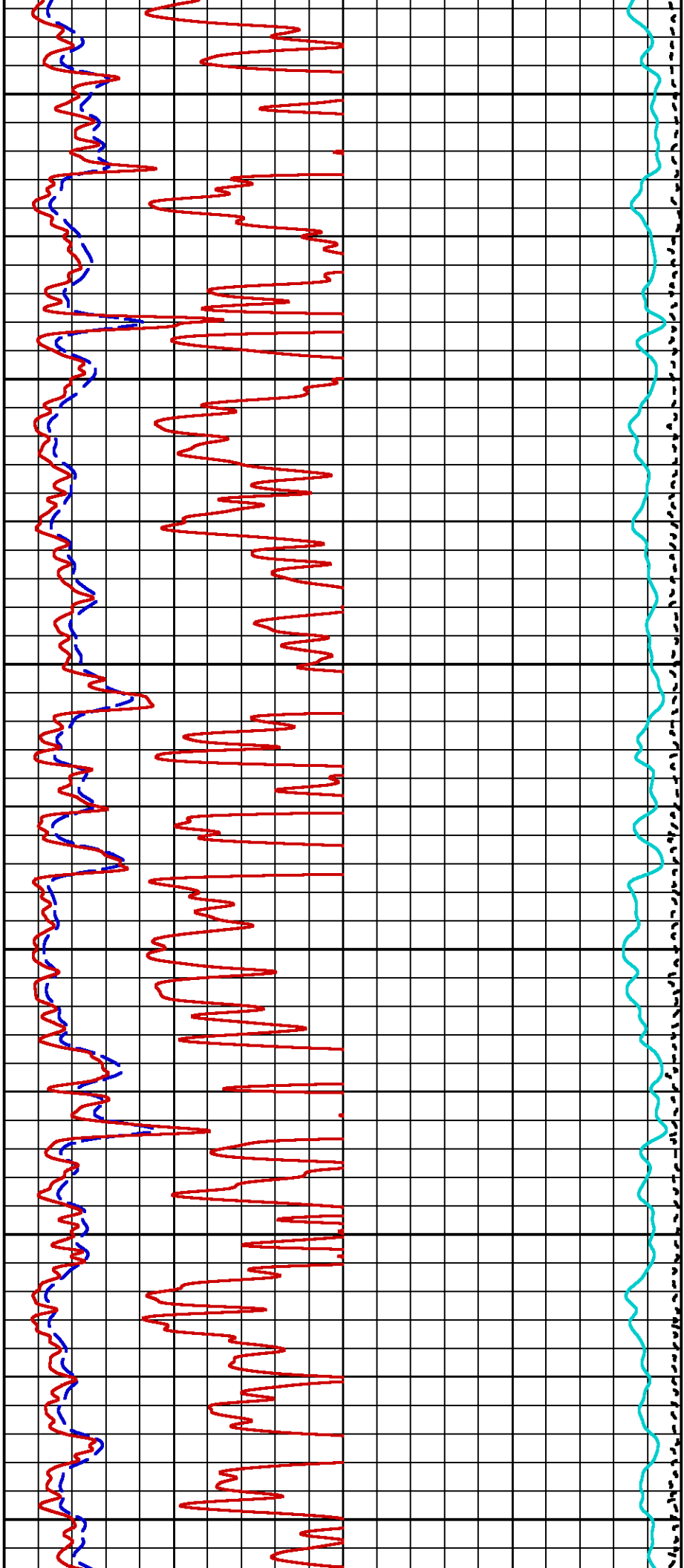
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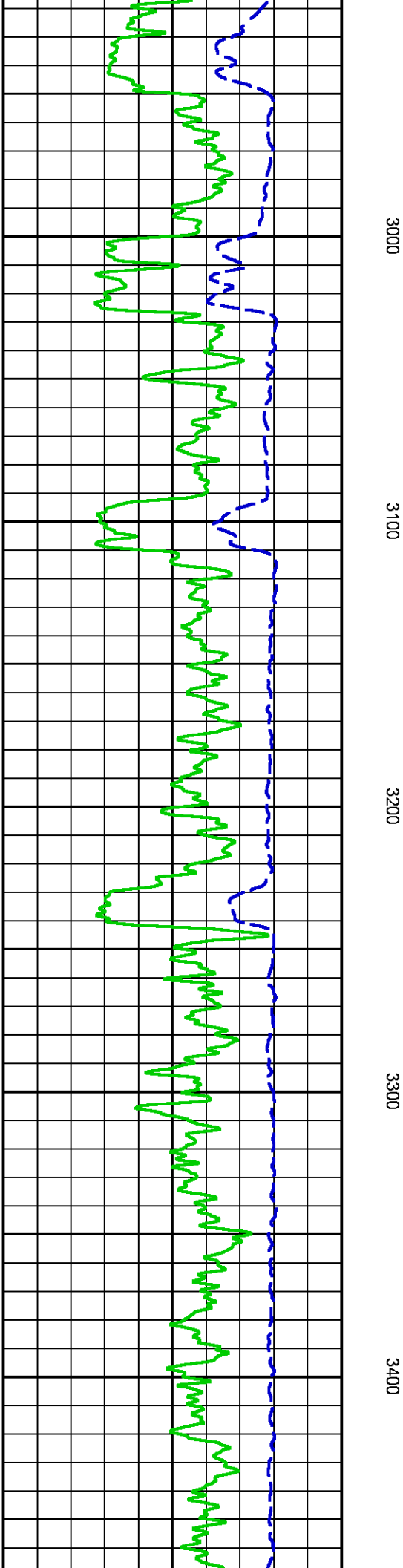
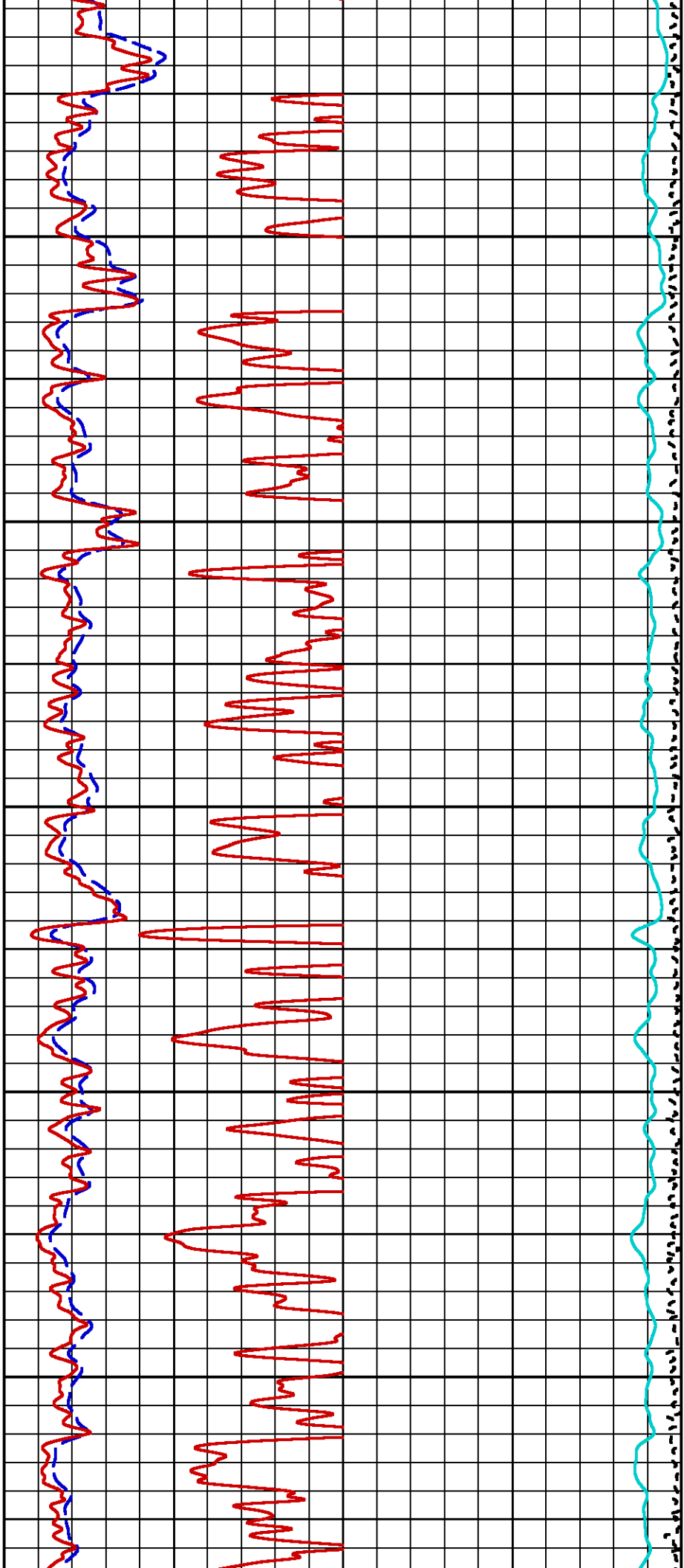


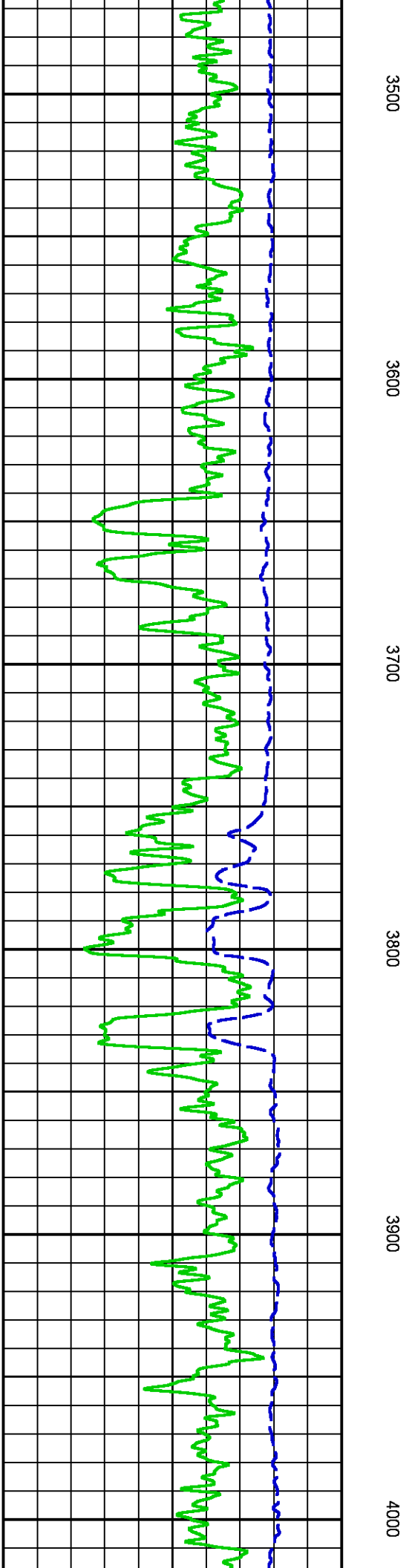
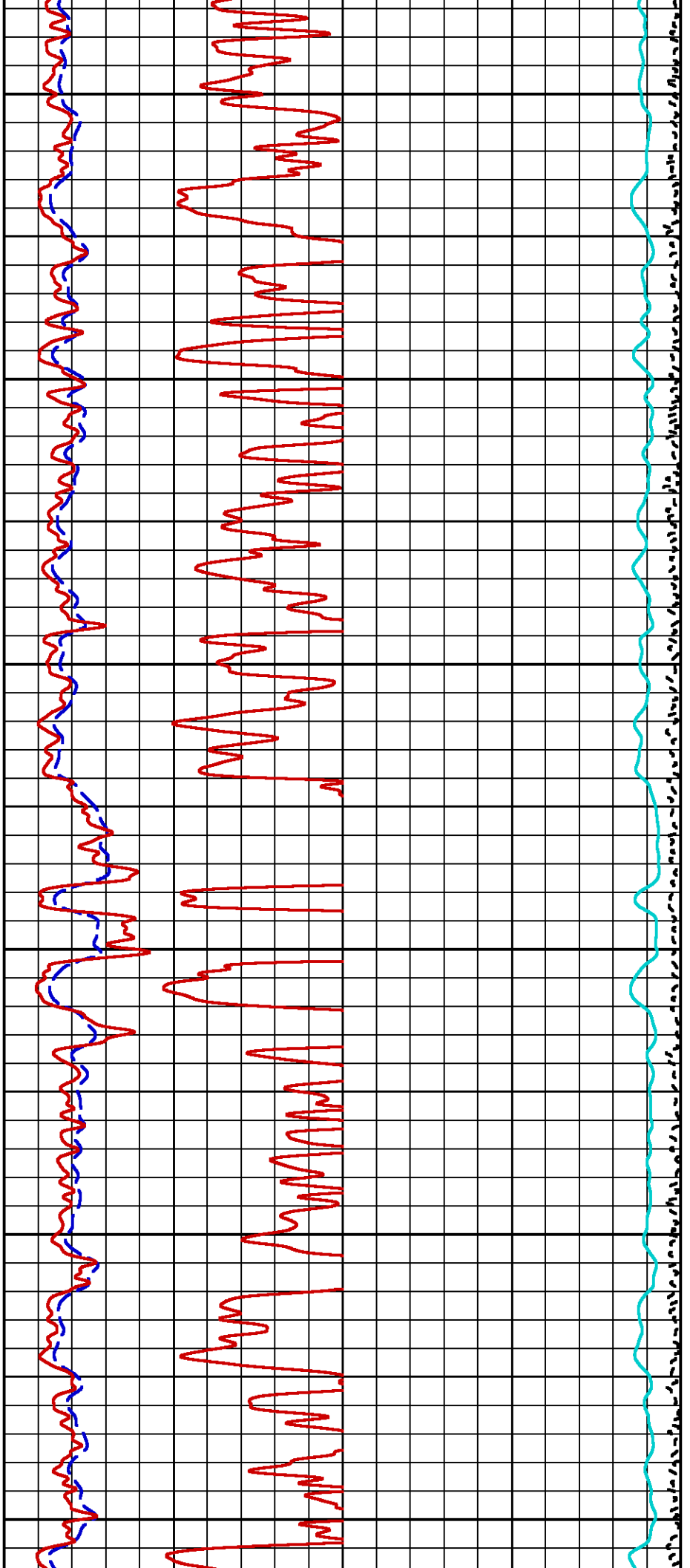


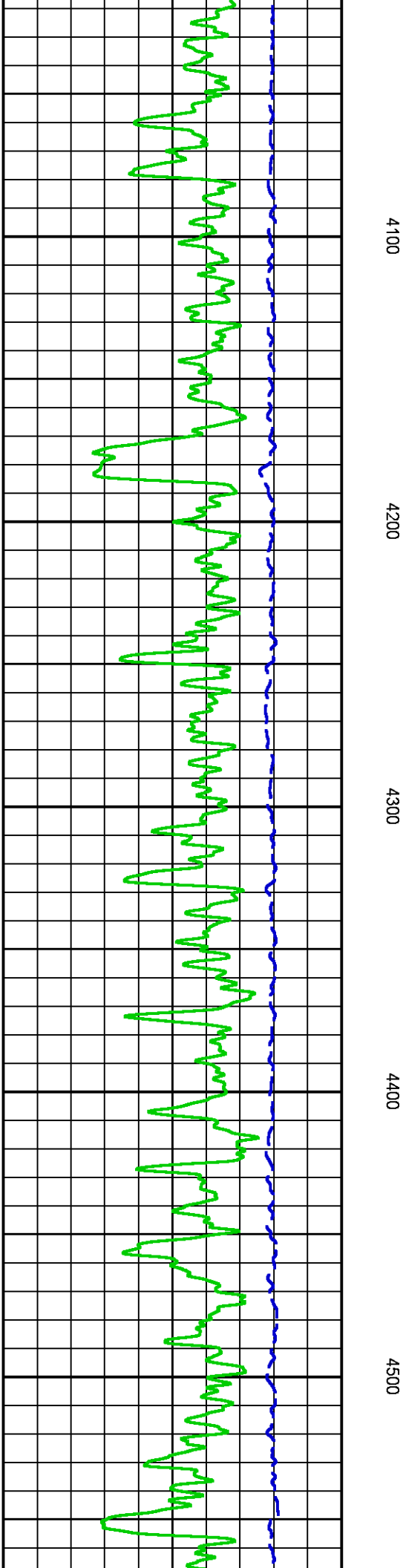
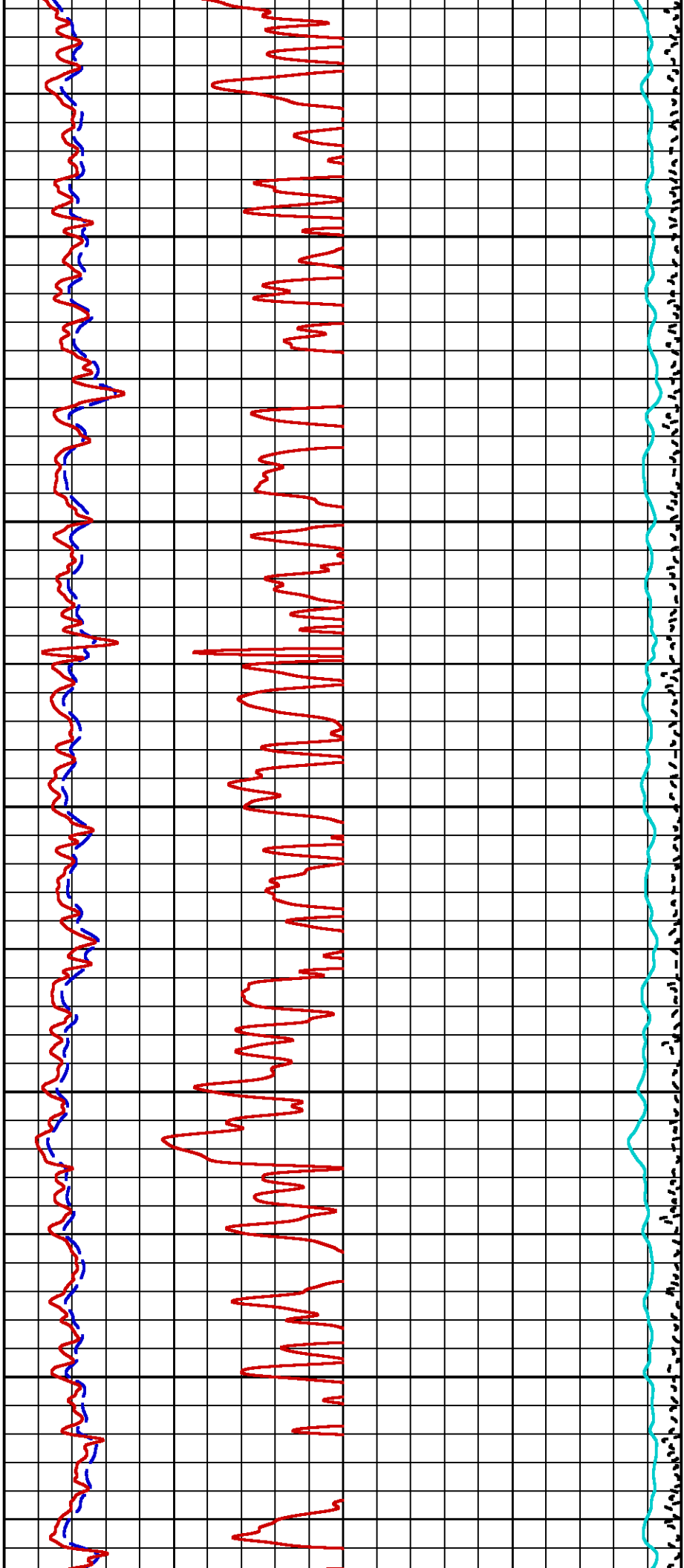


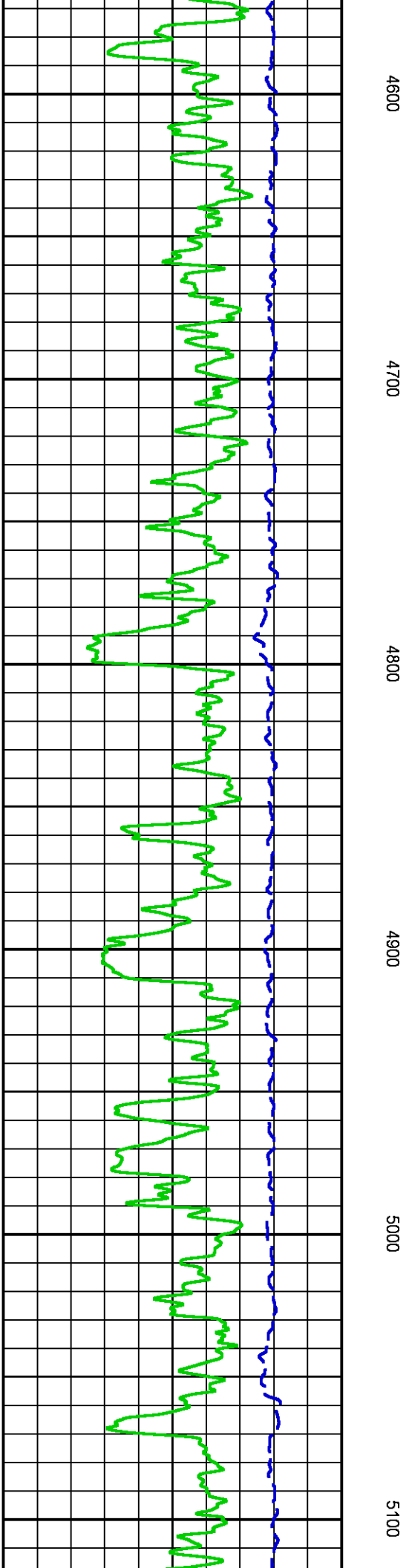
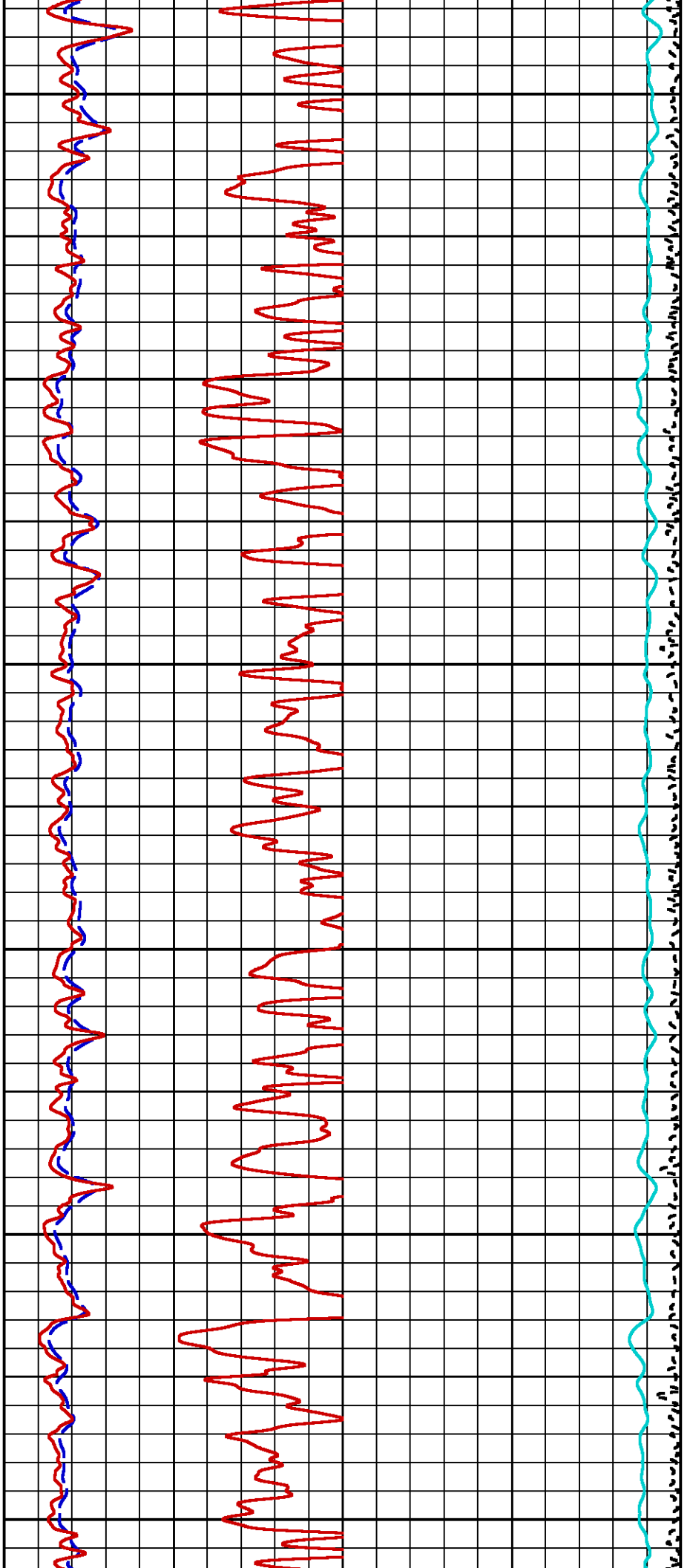


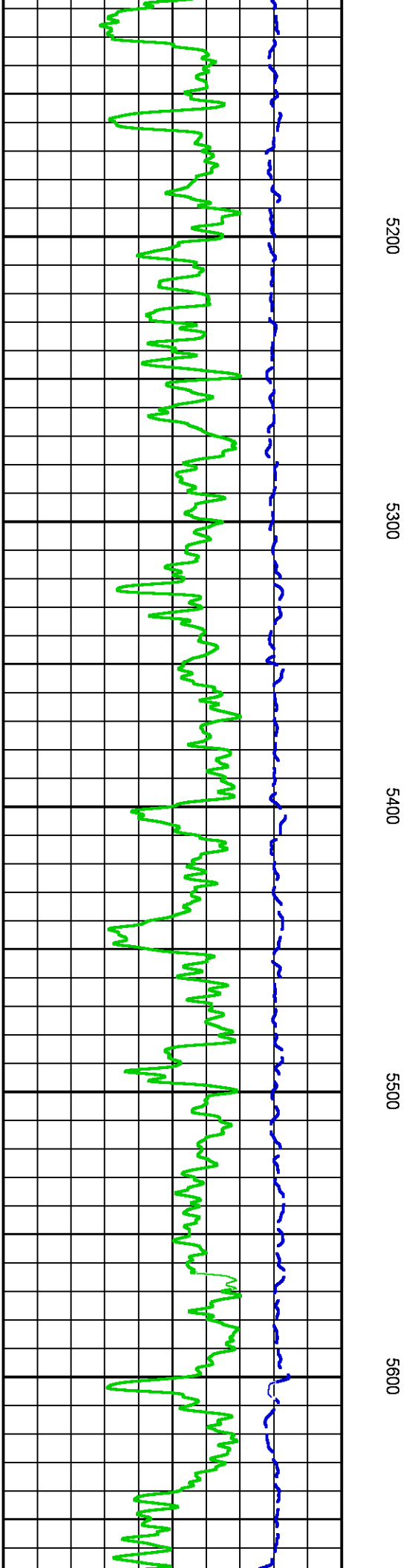
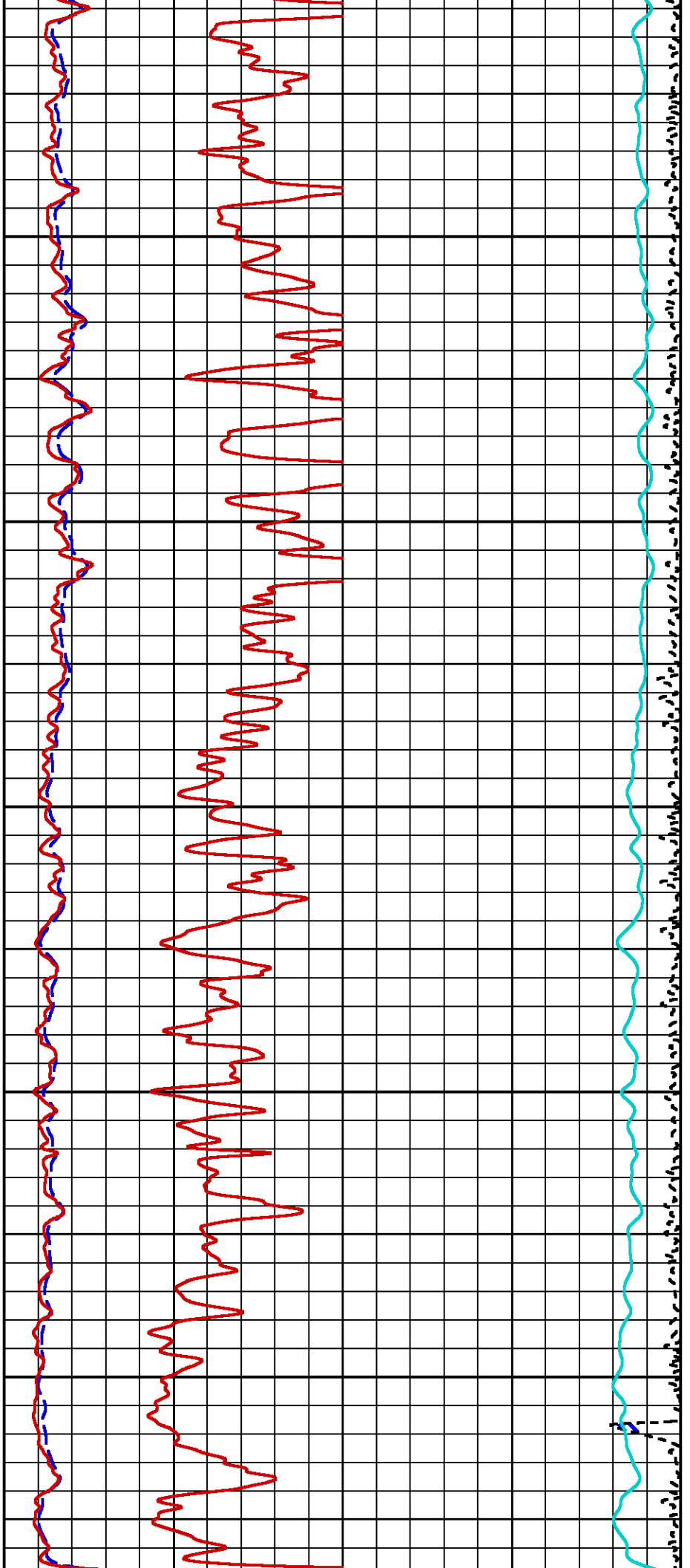


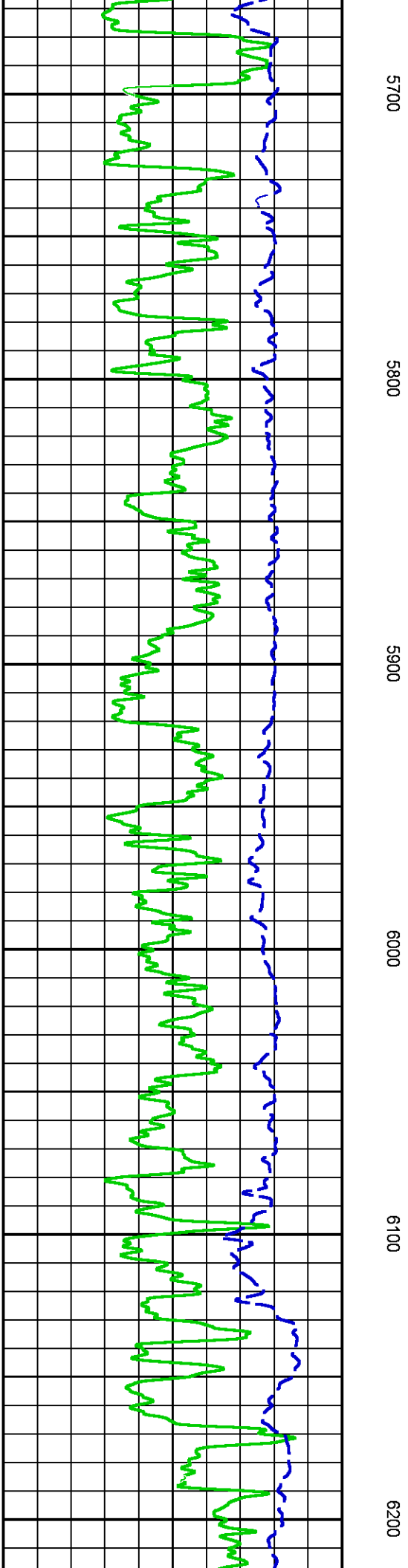
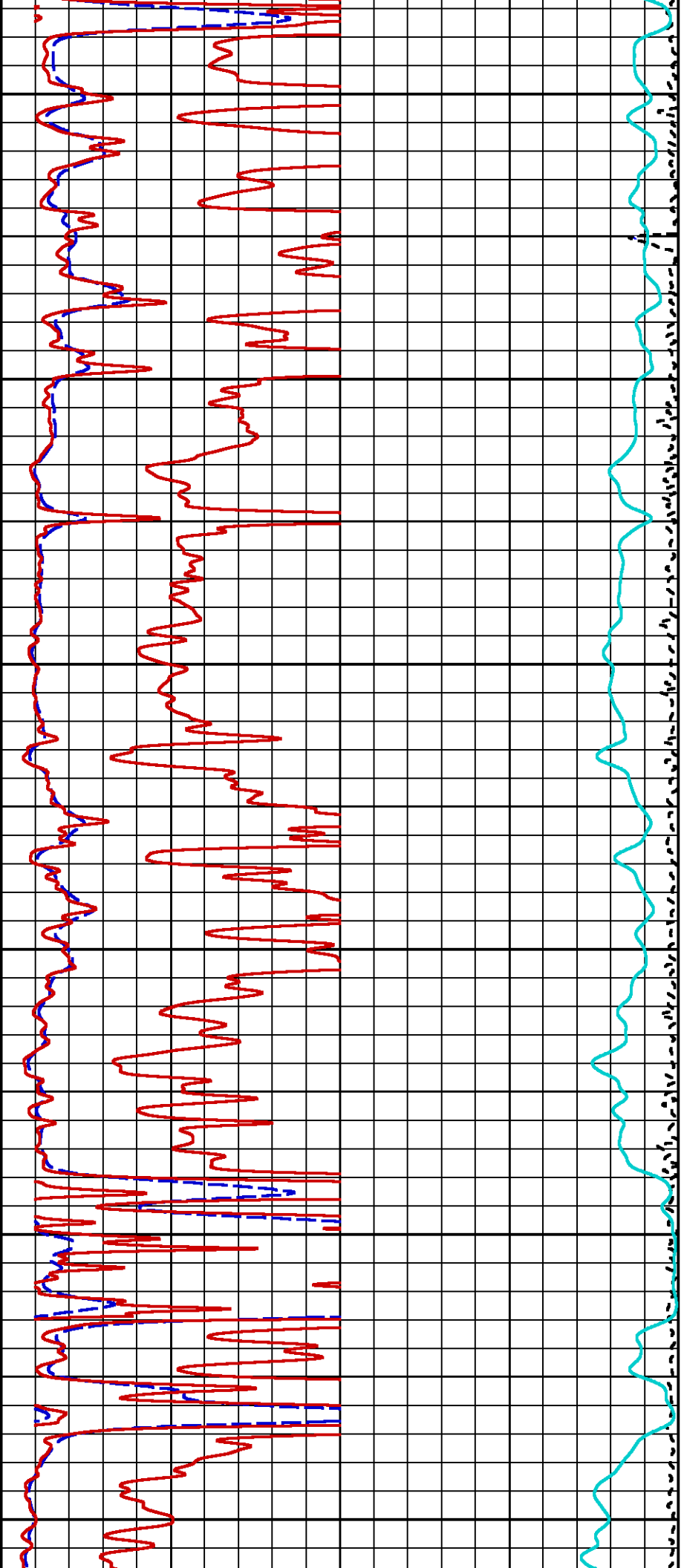


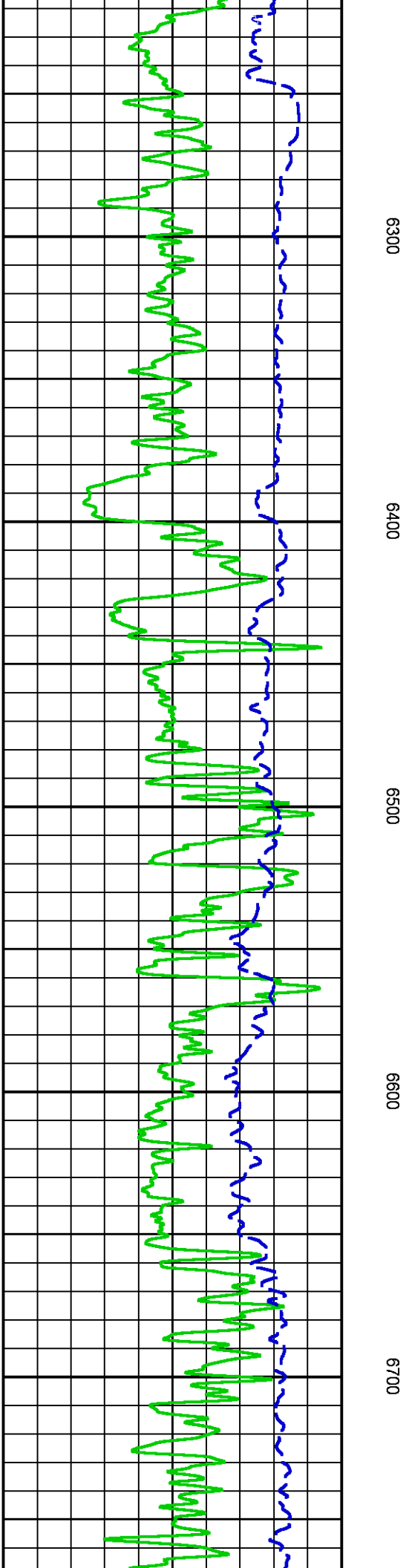
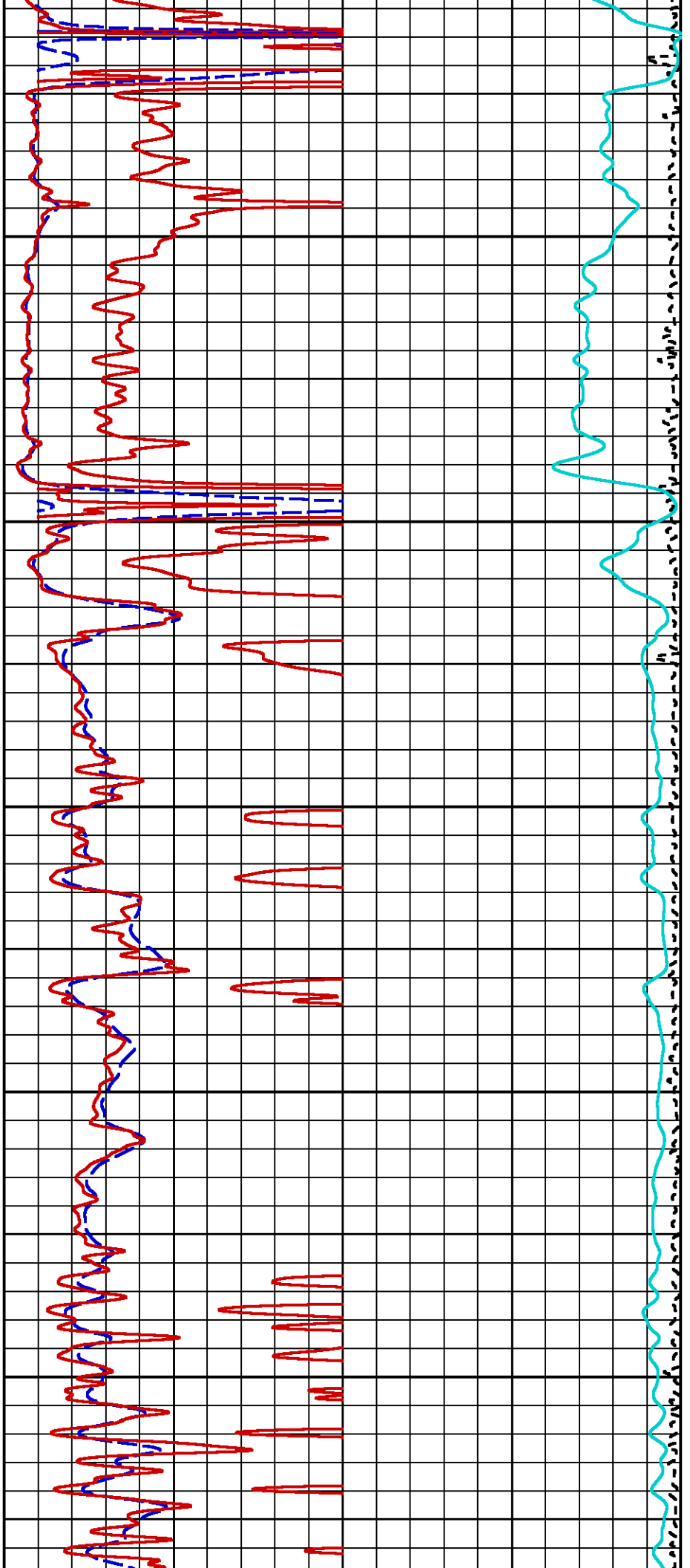


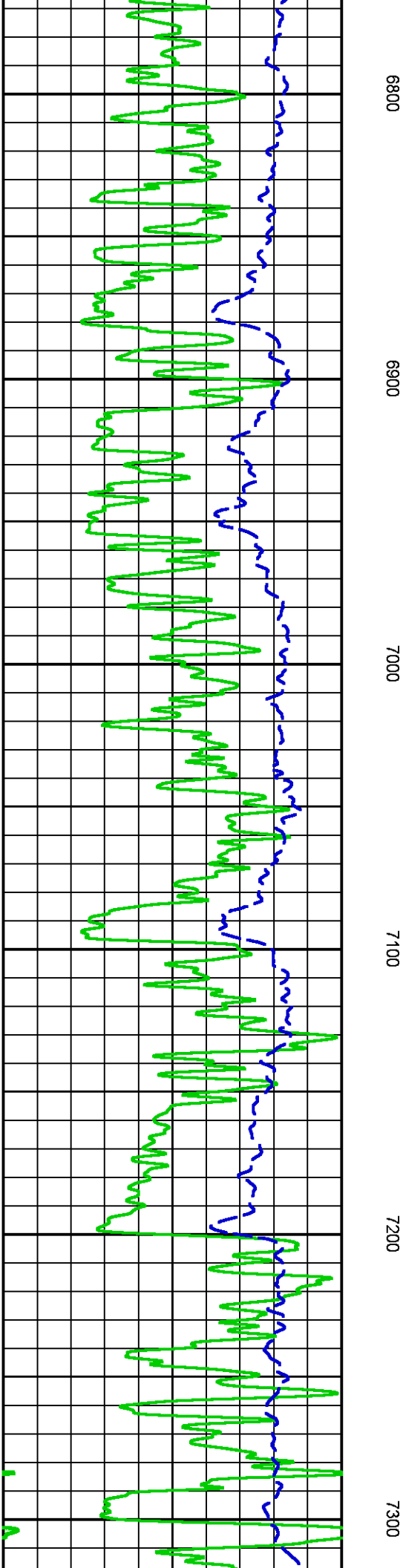
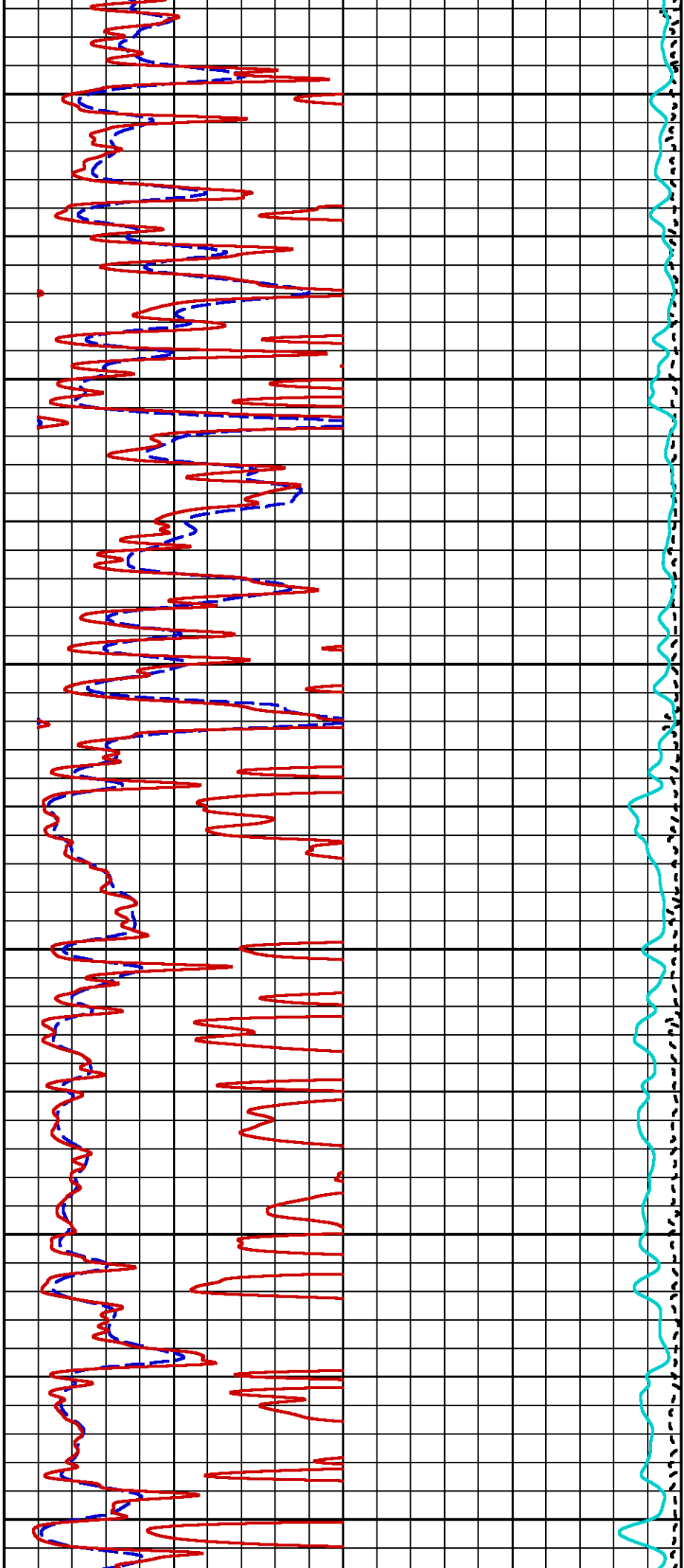




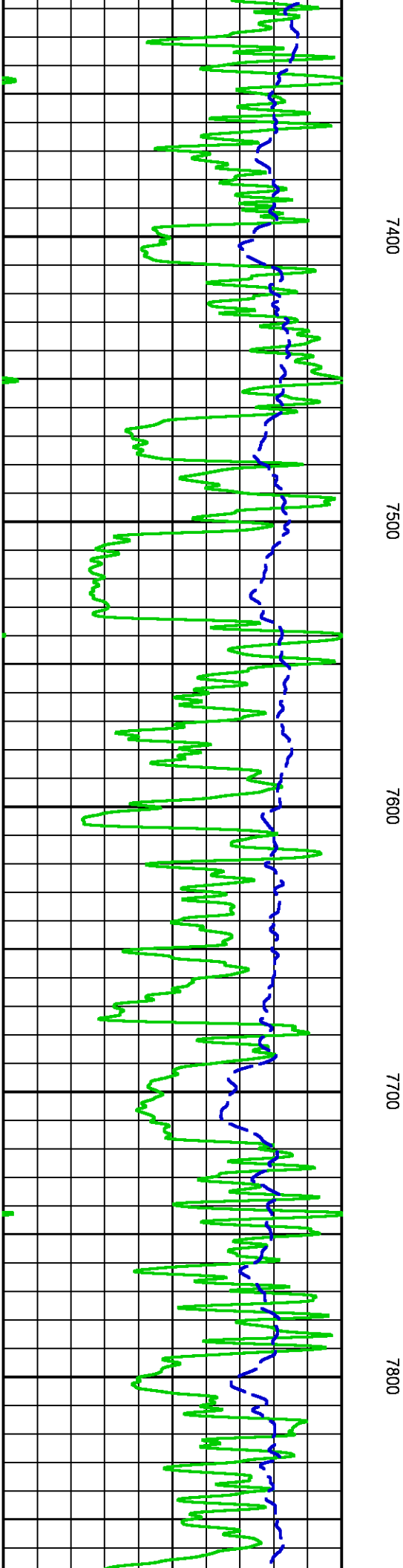
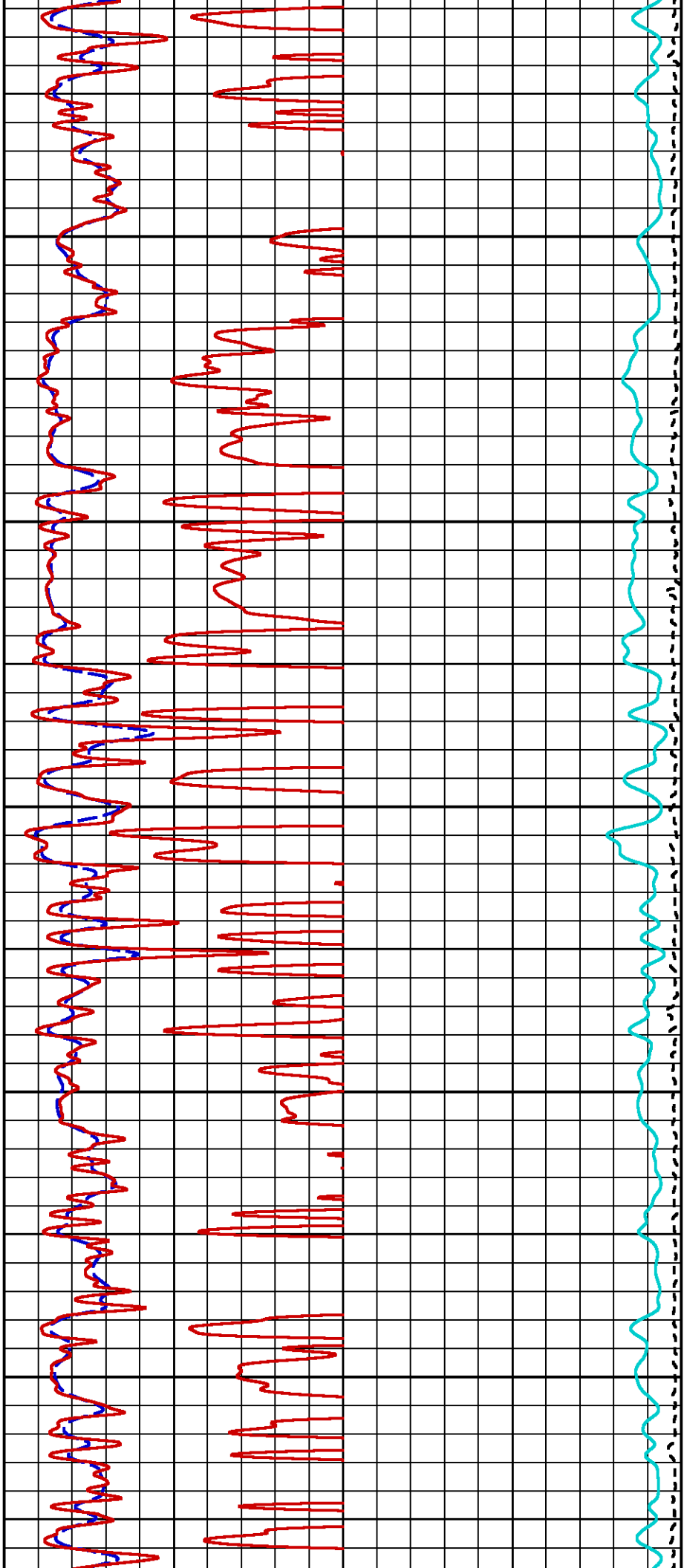


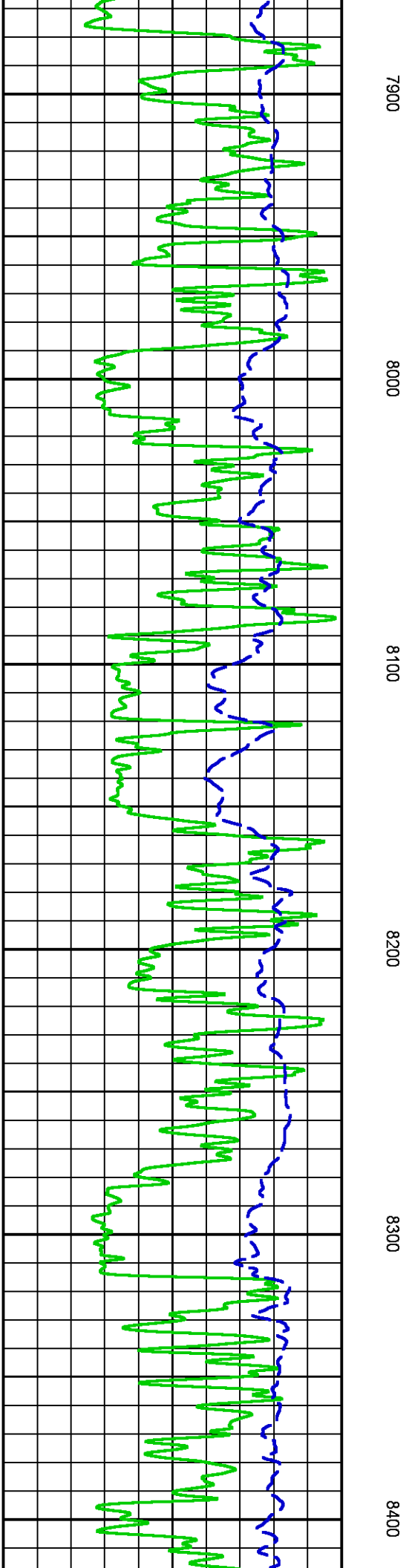
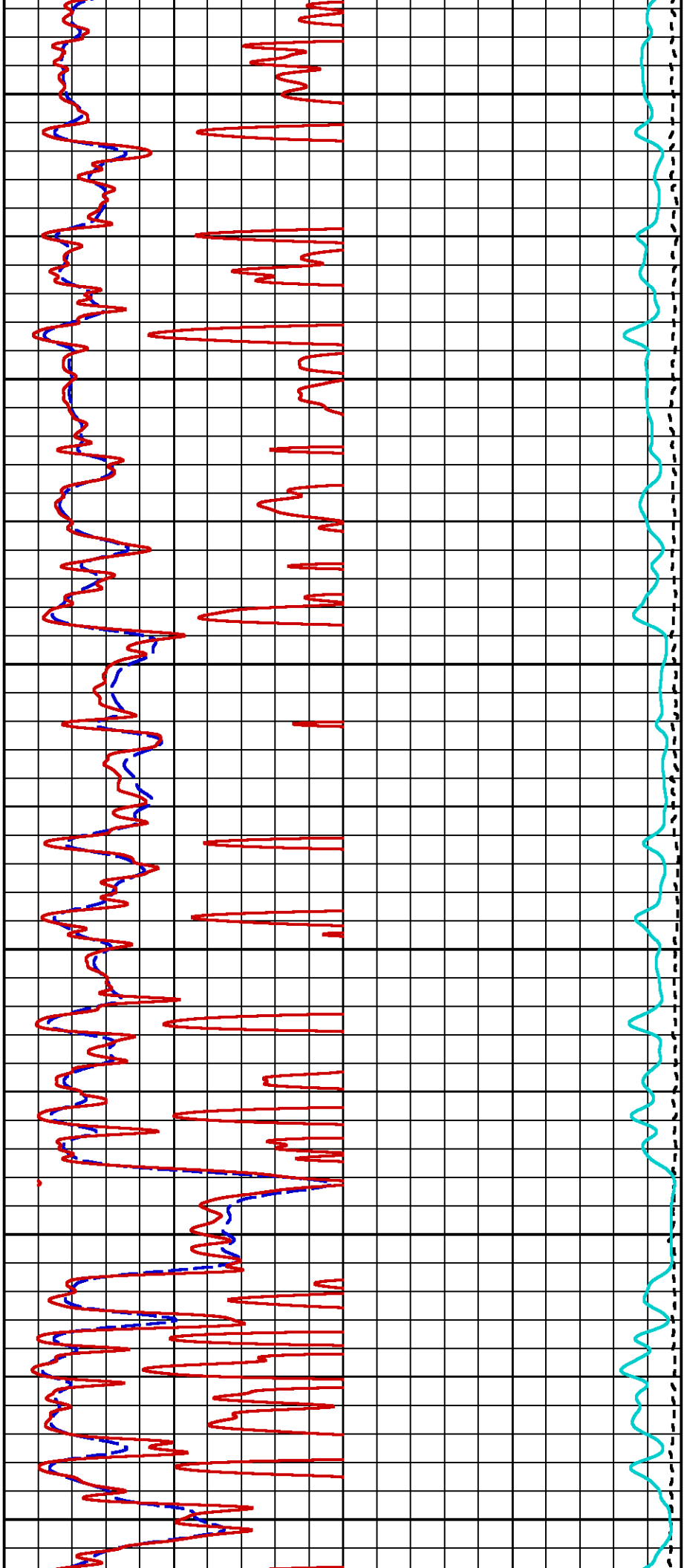


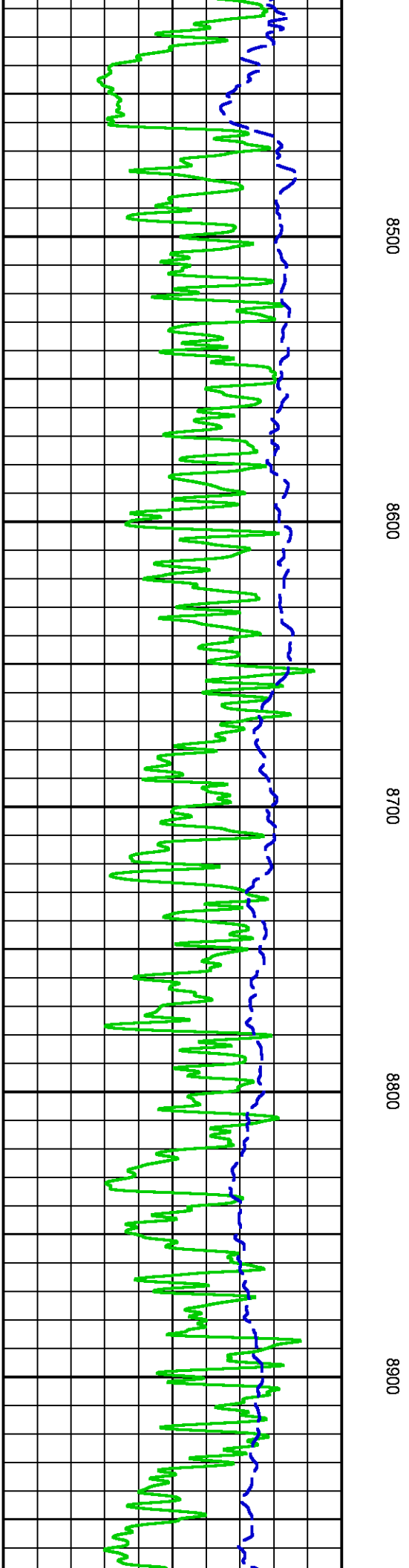
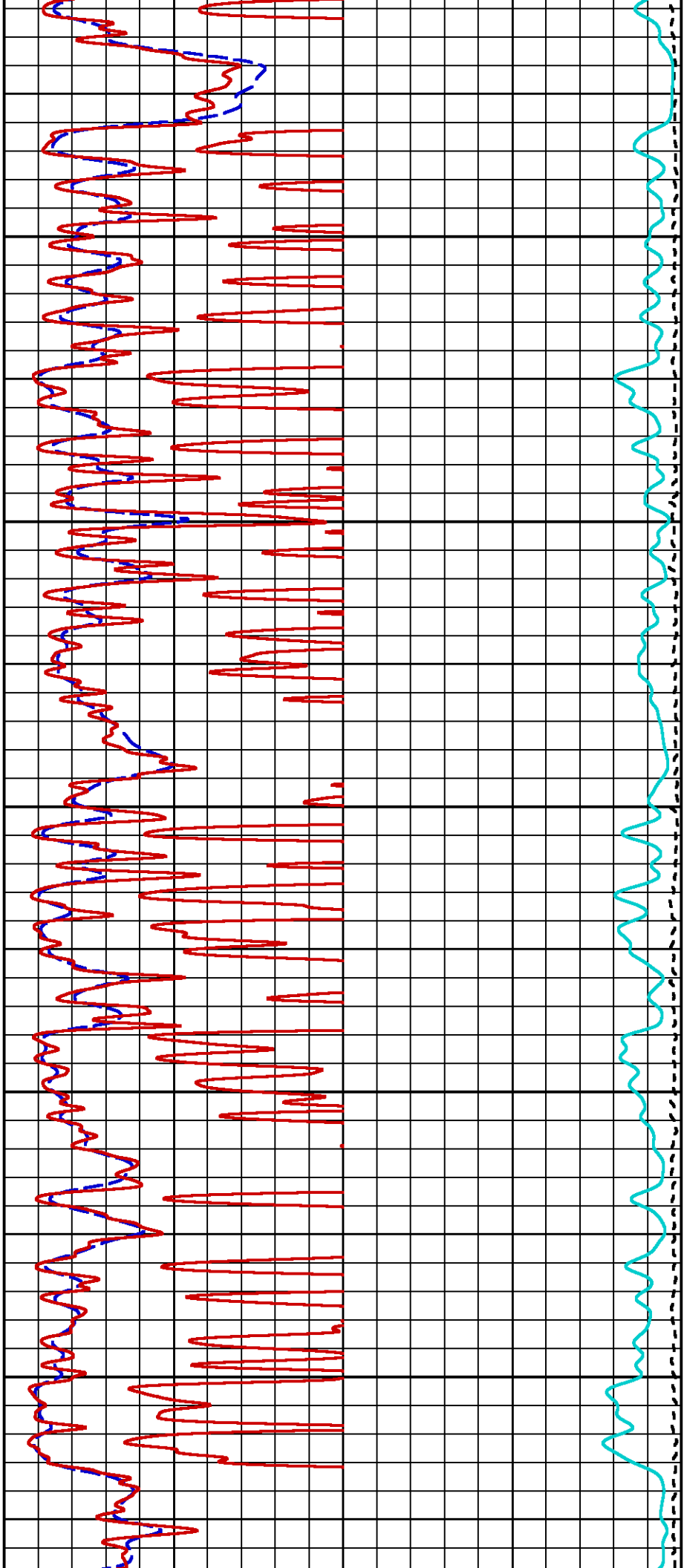


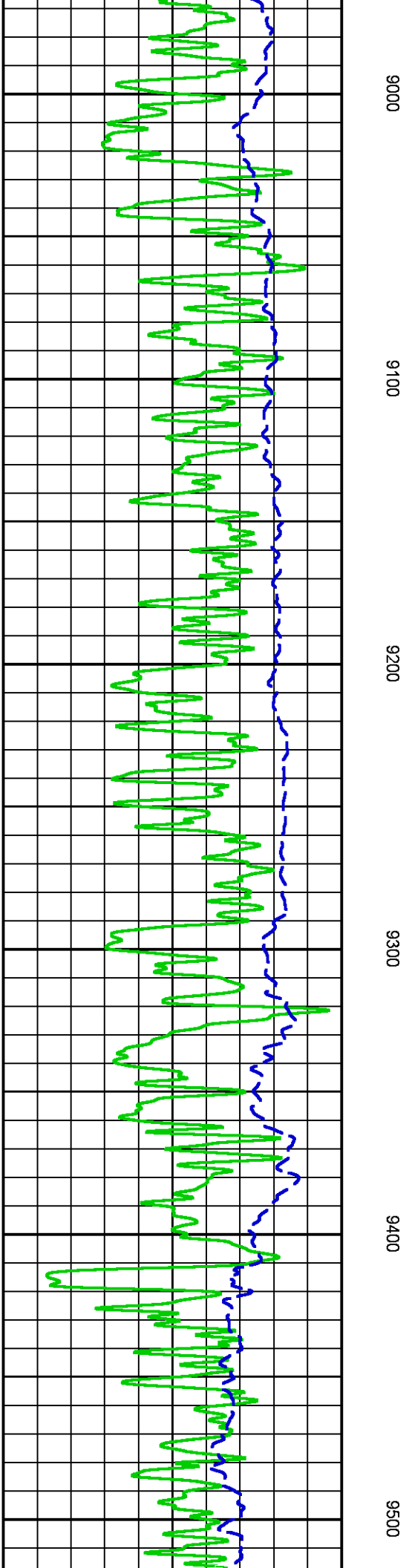
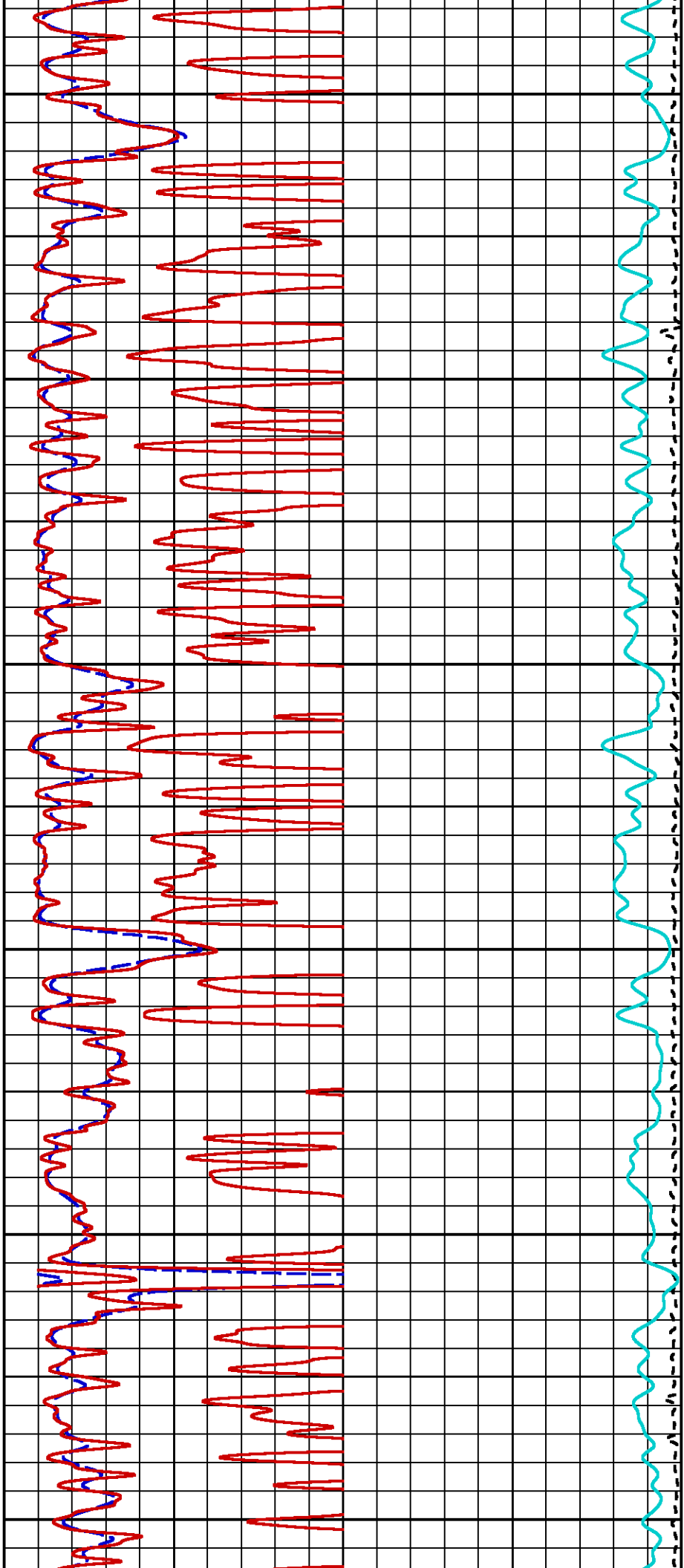


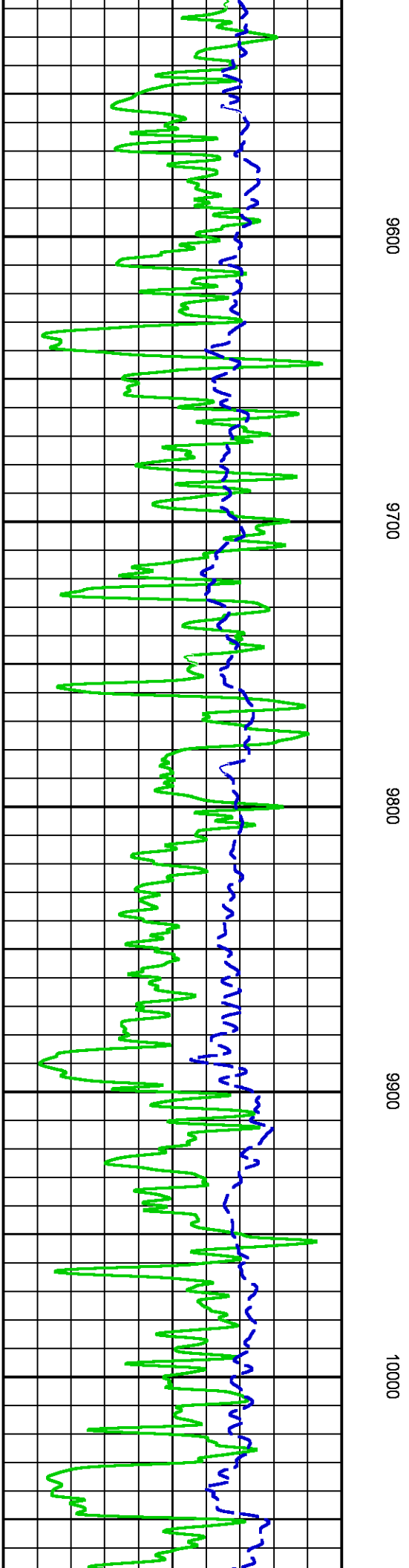
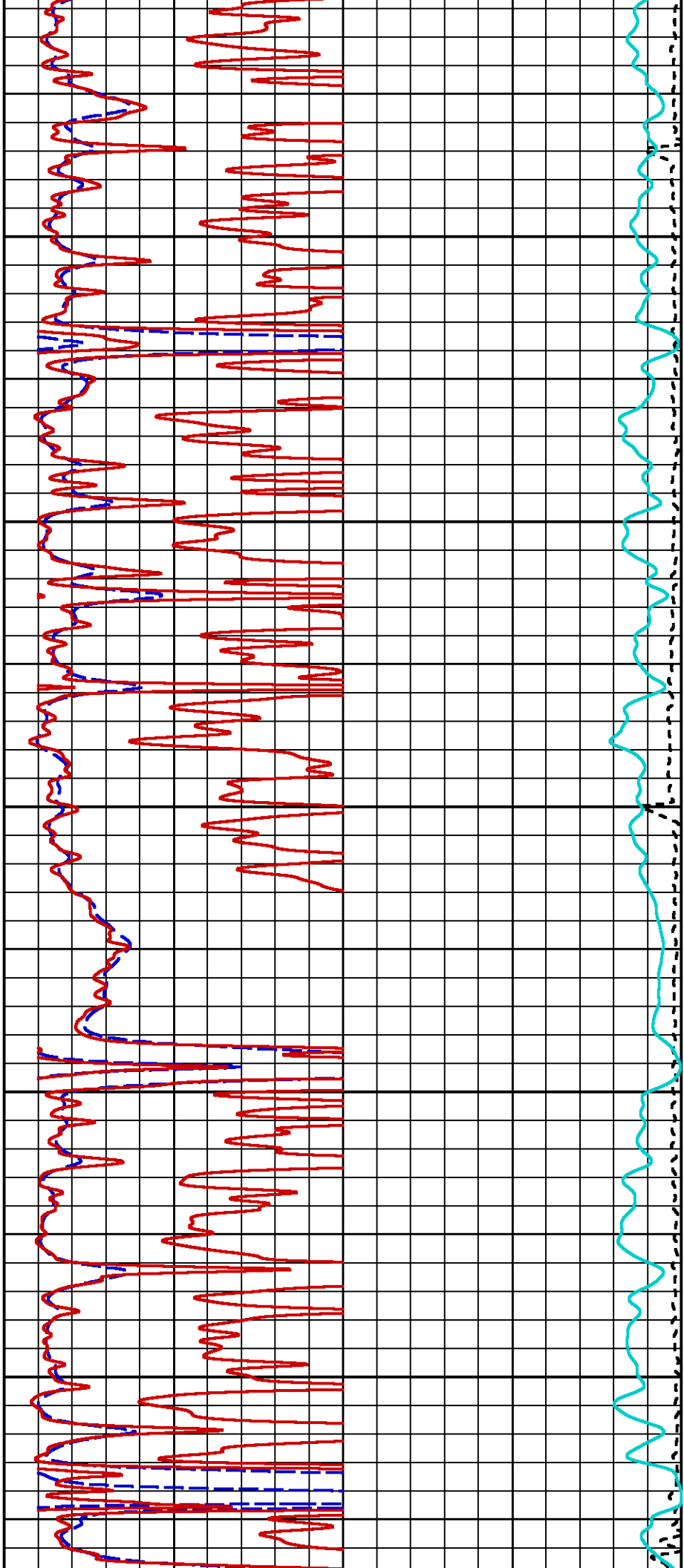


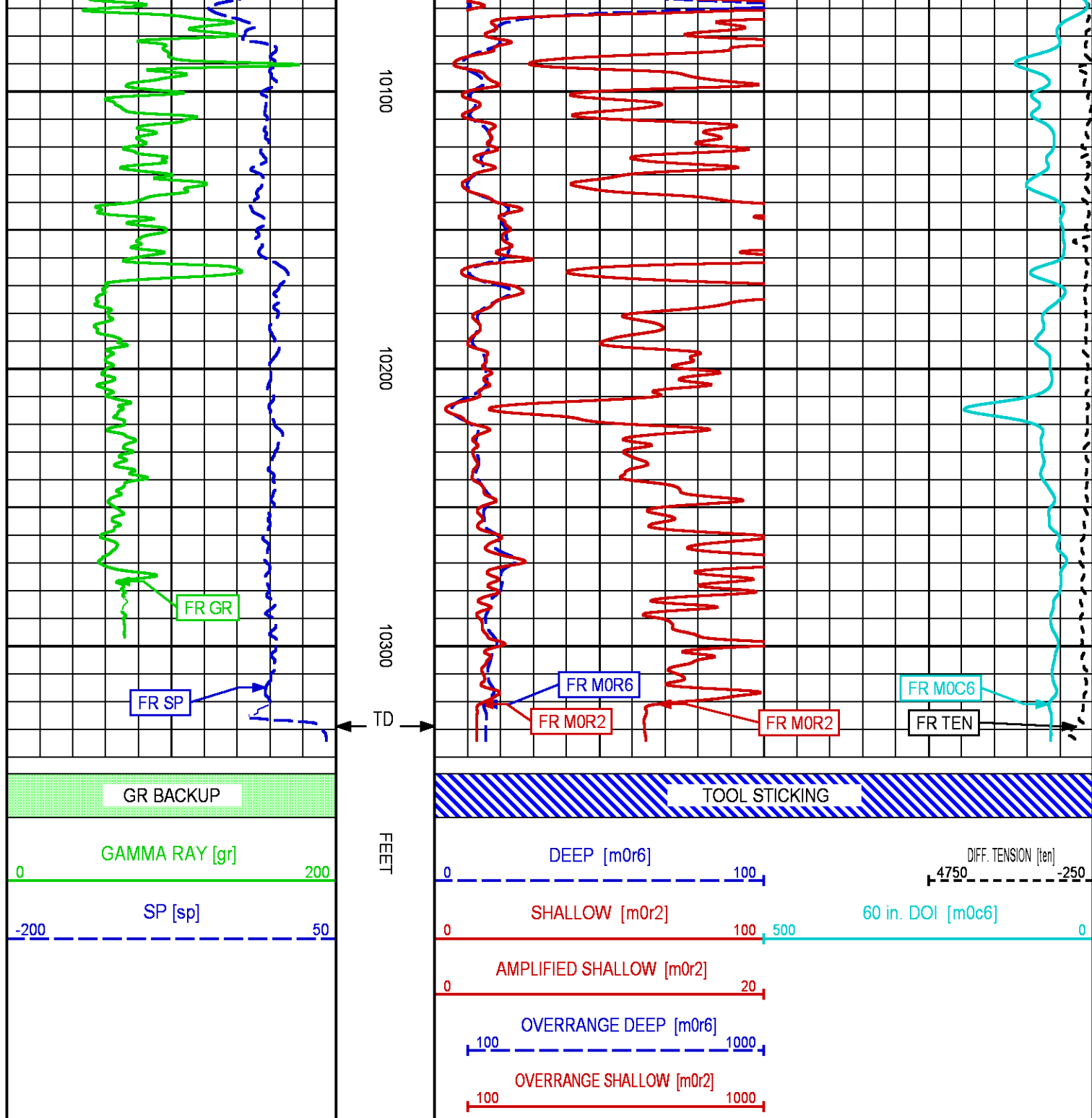












## MAIN LOG 5"/100FT SCALE

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013  
Updates: 1 Patches: 2

Plotted: Wed Aug 27 20:14:37 2014

PARAMETER AND FILTER SUMMARY REPORT

| SYMMETRIC FILTER |                 |            |       |               |        |
|------------------|-----------------|------------|-------|---------------|--------|
| MEASUREMENT TYPE | PARAMETER       | VALUE      | UNITS | INTERVAL (ft) |        |
| TTRM             | FILTER ( )      | medium (1) |       | TOP           | BOTTOM |
|                  | FILTER (.h)     | medium (1) |       | "             | "      |
|                  | FILTER (.i)     | medium (1) |       | "             | "      |
| Y AXIS CALIPER   | FILTER ( )      | medium (1) |       | "             | "      |
| TENSION          | FILTER ( )      | medium (1) |       | "             | "      |
| GR               | FILTER ( )      | medium (1) |       | "             | "      |
| CN               | FILTER ( )      | medium (1) |       | "             | "      |
| CALIPER          | FILTER ( )      | medium (1) |       | "             | "      |
|                  | FILTER (.h)     | medium (1) |       | "             | "      |
|                  | FILTER (.i)     | medium (1) |       | "             | "      |
| ZDL MED RES      | FILTER (hrd1*)  | medium     |       | "             | "      |
|                  | FILTER (hrd1s*) | medium     |       | "             | "      |
|                  | FILTER (hrd2*)  | medium     |       | "             | "      |
|                  | FILTER (hrd2s*) | medium     |       | "             | "      |
|                  | FILTER (soft*)  | medium     |       | "             | "      |
| SP-SPDH          | FILTER ( )      | heavy (3)  |       | "             | "      |
|                  | FILTER (.i)     | heavy (3)  |       | "             | "      |

| BOREHOLE & CEMENT                 |                            |               |              |               |        |
|-----------------------------------|----------------------------|---------------|--------------|---------------|--------|
| MEASUREMENT TYPE                  | PARAMETER                  | VALUE         | UNITS        | INTERVAL (ft) |        |
| CASING - BOREHOLE & CEMENT VOLUME | CASING O.D.                | 4.500         | in           | TOP           | BOTTOM |
|                                   | CASING THICKNESS           | 0.000         | in           | "             | "      |
| BIT SIZE                          | BIT SIZE                   | 8.750         | in           | "             | "      |
| MUD SAMPLE RESISTIVITY            | MUD SAMPLE TEMP            | 74.5          | degF         | "             | "      |
|                                   | MUD SAMPLE RES             | 1.603         | ohm.m        | "             | "      |
| BOREHOLE TEMP from GRADIENT       | Known BH REF TEMP          | 77.0          | degF         | "             | "      |
|                                   | at BH REF DEPTH            | 0.0           | ft           | "             | "      |
|                                   | with TEMP GRADIENT         | 1.200         | 0.01 degF/ft | "             | "      |
| BOREHOLE CORR DIAMETER SOURCE     | CALIPER/FIXED DIA. (cnbh*) | USE CALIPER   |              | "             | "      |
|                                   | CALIPER/FIXED DIA. (mbh*)  | USE CALIPER   |              | "             | "      |
| BOREHOLE CORR DIAMETER            | FIXED DIAMETER (cnbh*)     | 8.750         | in           | "             | "      |
|                                   | FIXED DIAMETER (mbh*)      | 8.750         | in           | "             | "      |
| BH MUD RESISTIVITY SOURCE         | RMUD SOURCE (HDIL)         | TOOL MEASURED |              | "             | "      |

| CN PROCESSING                 |                      |           |       |               |        |
|-------------------------------|----------------------|-----------|-------|---------------|--------|
| MEASUREMENT TYPE              | PARAMETER            | VALUE     | UNITS | INTERVAL (ft) |        |
| 2446 CN MATRIX                | 2446 MATRIX          | SANDSTONE |       | TOP           | BOTTOM |
| CN SALINITY CORRECTION        | SALINITY             | 800       | ppm   | "             | "      |
| CN TOOL STANDOFF              | ENABLE STANDOFF CORR | OFF       |       | "             | "      |
|                               | STANDOFF AMOUNT      | 0.00      | in    | "             | "      |
| CN CASING & CEMENT CORRECTION | CORRECTION           | OFF       |       | "             | "      |
|                               | BIT SIZE BEHIND CSNG | 7.875     | in    | "             | "      |

| ZDL PROCESSING   |                      |                |       |               |        |
|------------------|----------------------|----------------|-------|---------------|--------|
| MEASUREMENT TYPE | PARAMETER            | VALUE          | UNITS | INTERVAL (ft) |        |
| DENSITY POROSITY | RHOmatrix            | 2.680          | g/cm3 | TOP           | BOTTOM |
|                  | RHOfluid             | 1.000          | g/cm3 | "             | "      |
| ZDL              | DENX TRACKING        | ON             |       | "             | "      |
| TRACKING TIME    | Logging Spd for Gain | Over 10 ft/min |       | "             | "      |

| HDIL PROCESSING              |                  |            |       |               |        |
|------------------------------|------------------|------------|-------|---------------|--------|
| MEASUREMENT TYPE             | PARAMETER        | VALUE      | UNITS | INTERVAL (ft) |        |
| HDIL TEMPERATURE CORRECTION  | TEMP CORR SOURCE | USE RXTEMP |       | TOP           | BOTTOM |
| ADAPTIVE BOREHOLE CORRECTION | ABC PROCESSING   | ON         |       | "             | "      |
|                              | ABC to CALCULATE | STANDOFF   |       | "             | "      |
|                              | STANDOFF         | 1.50       | in    | "             | "      |
|                              | TOOL POSITION    | ECCENTERED |       | "             | "      |
|                              | Rmud MULTIPLIER  | 1.000      |       | "             | "      |

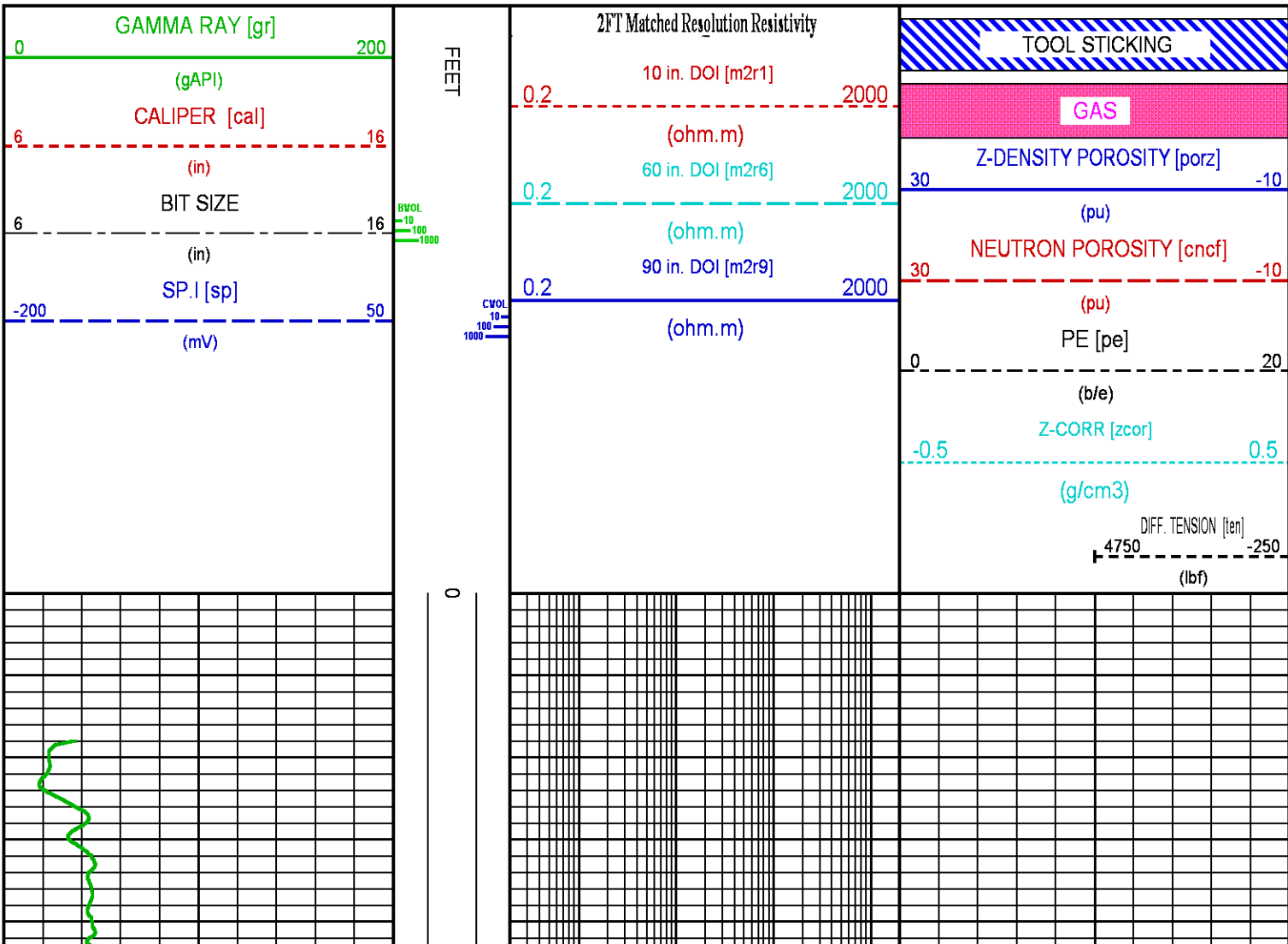
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|------------|----------------------|---|
| F1:BIT     | Aug 27 14:29:39 2014 | BIT SIZE  |
| F1:BVOL    | Aug 27 14:29:39 2014 | BOREHOLE VOLUME   |
| F1:CAL     | Aug 27 14:29:39 2014 | CALIPER   |
| F1:CNCF    | Aug 27 14:29:39 2014 | FIELD NORMALIZED COMPENSATED NEUTRON POROSITY               |
| F1:CVOL    | Aug 27 14:29:39 2014 | CEMENT VOLUME   |
| F1:GR      | Aug 27 14:29:39 2014 | GAMMA RAY   |
| F1:M2R1    | Aug 27 14:29:39 2014 | VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI |
| F1:M2R6    | Aug 27 14:29:39 2014 | VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI |
| F1:M2R9    | Aug 27 14:29:39 2014 | VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI |
| F1:PE      | Aug 27 14:29:39 2014 | PHOTO ELECTRIC CROSS-SECTION                                |
| F1:PORZ    | Aug 27 14:29:39 2014 | POROSITY FOR SELECTABLE MATRIX                              |
| F1:SP      | Aug 27 14:29:39 2014 | SPONTANEOUS POTENTIAL                                       |
| F1:TEN     | Aug 27 14:29:39 2014 | DIFFERENTIAL TENSION  |
| F1:ZCOR    | Aug 27 14:29:39 2014 | DENSITY CORRECTION  |

### CURVE MEASURE POINT OFFSET

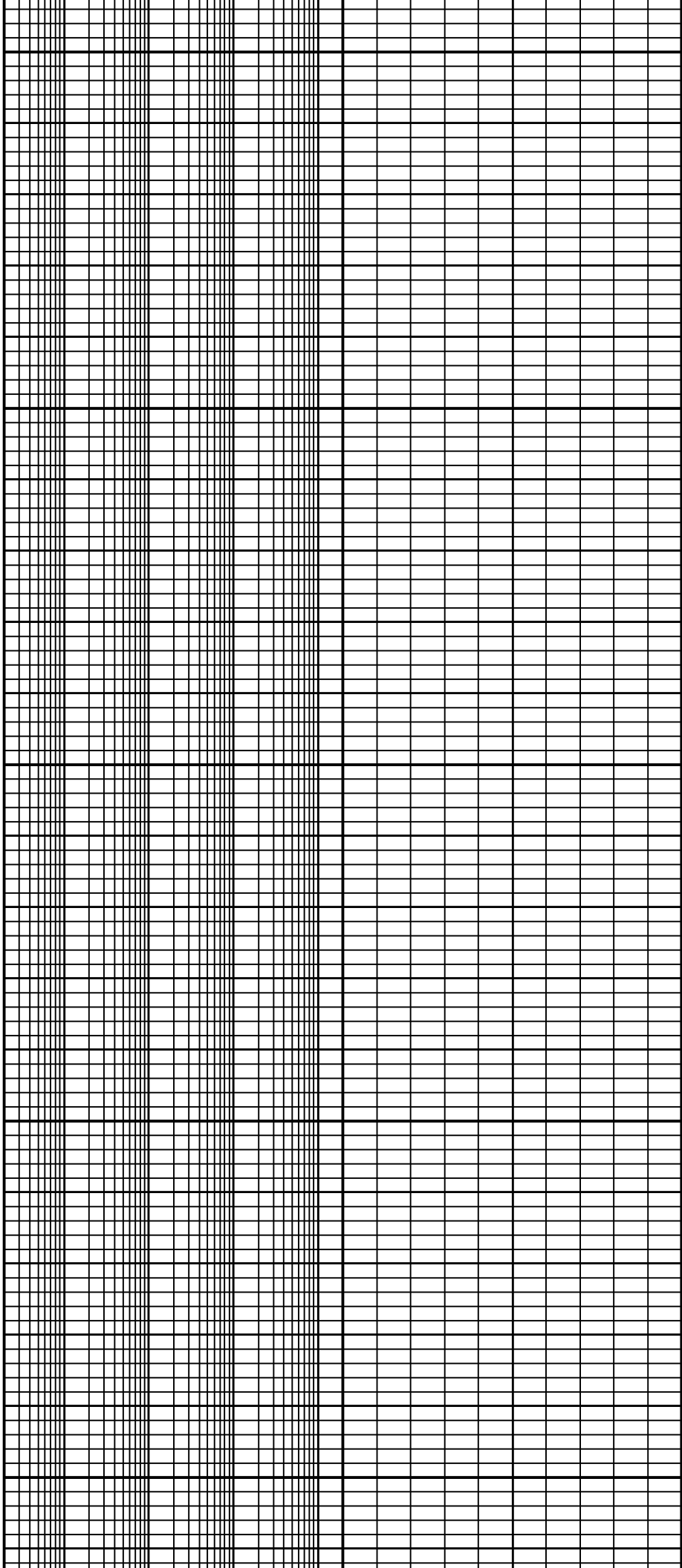
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|-------|-------------|-------|-------------|-------|-------------|-------|-------------|
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| CAL   | 35.00       | M2R1  | 8.00        | PE    | 34.25       | TEN   | 0.00        |
| CNCF  | 45.25       | M2R6  | 8.00        | PORZ  | 34.25       | ZCOR  | 34.25       |

Presentation : HL6670:/dat1a/OH089777/MAIN.fvpdf [5"/100' Scale]  
Plot Interval : 0 - 10334 Feet

Data File 1 : F1 : HL6670:/dat1a/OH089777/MAIN.xtf  
Created On : Aug 27 14:29:39 2014  
Company : WPX ENERGY INC.  
Well : FEDERAL NER 24-32  
Field : RULISON  
File Interval : 18 - 11796 Feet  
OCT : n777q

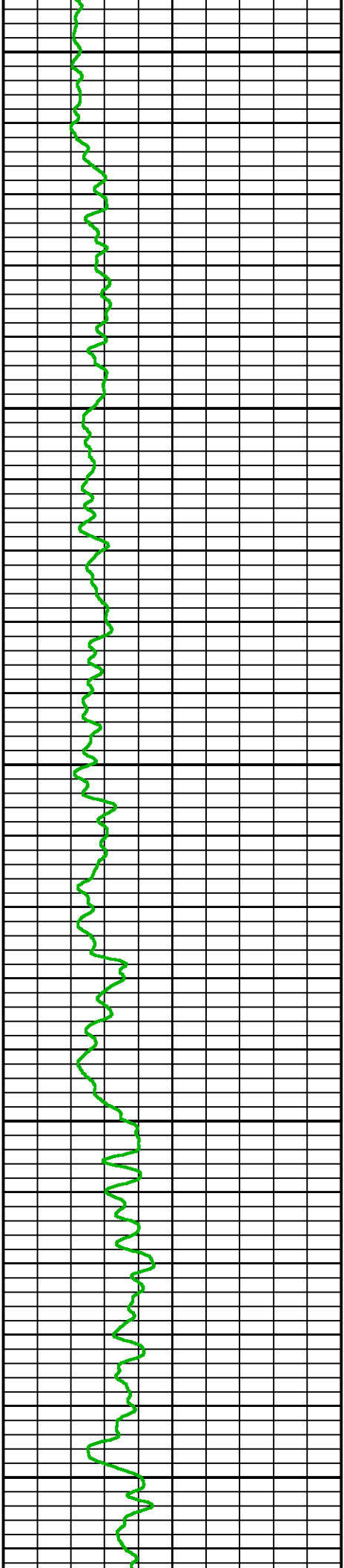




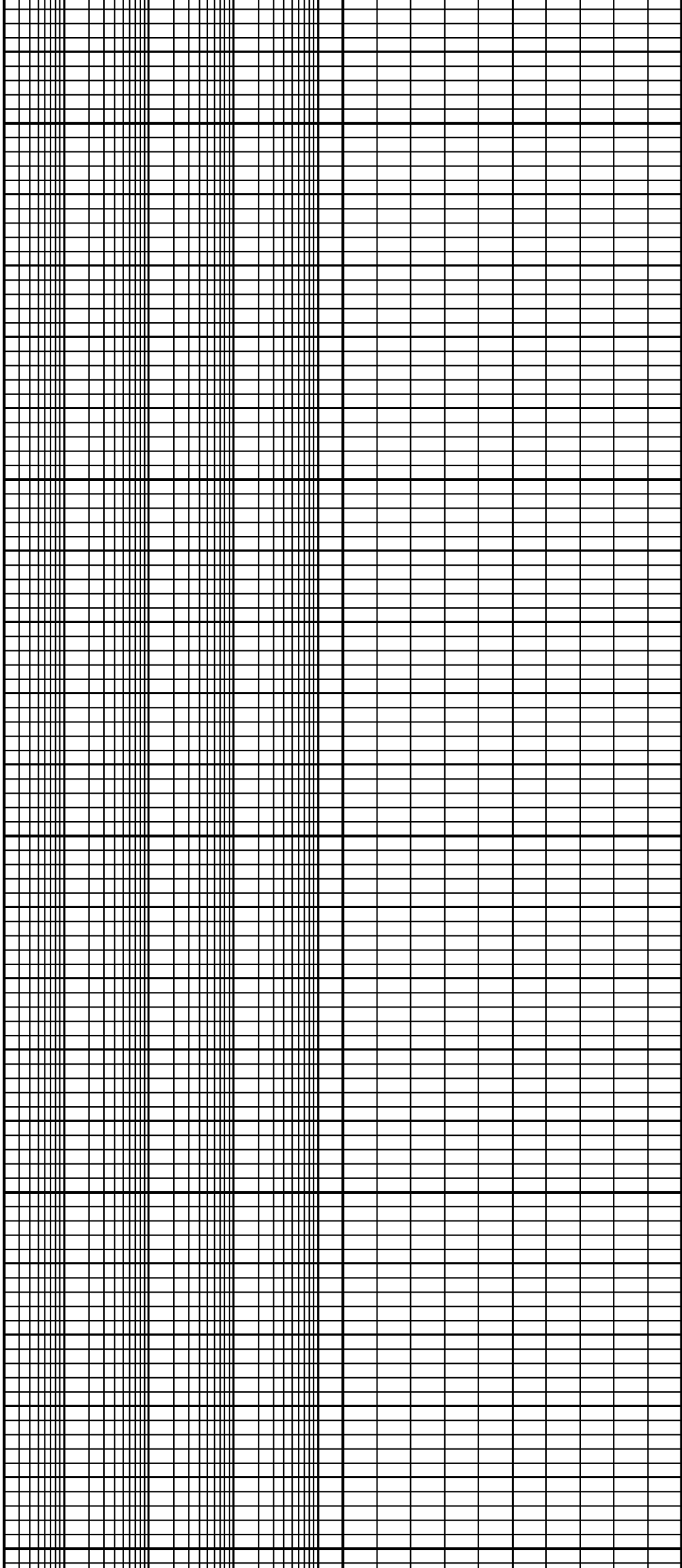


100

200



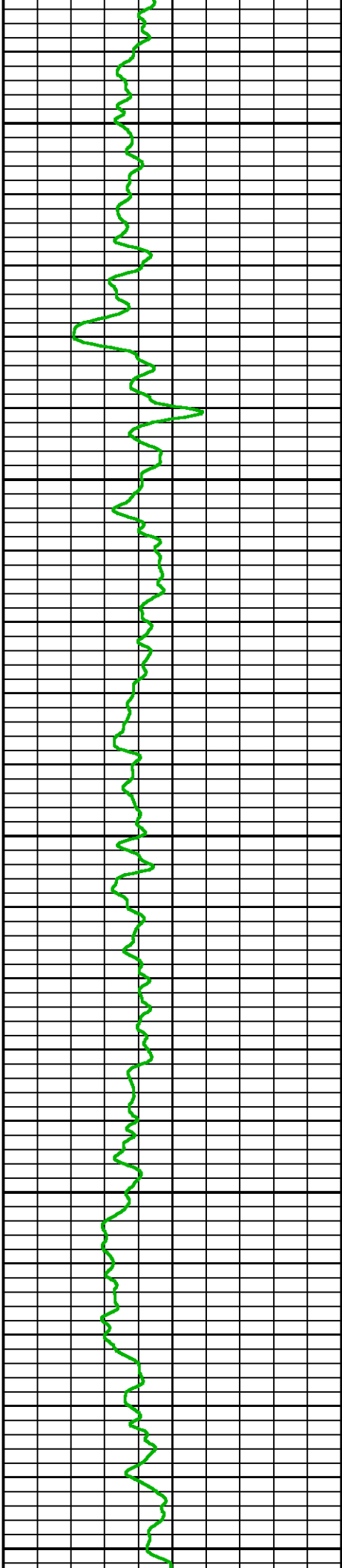


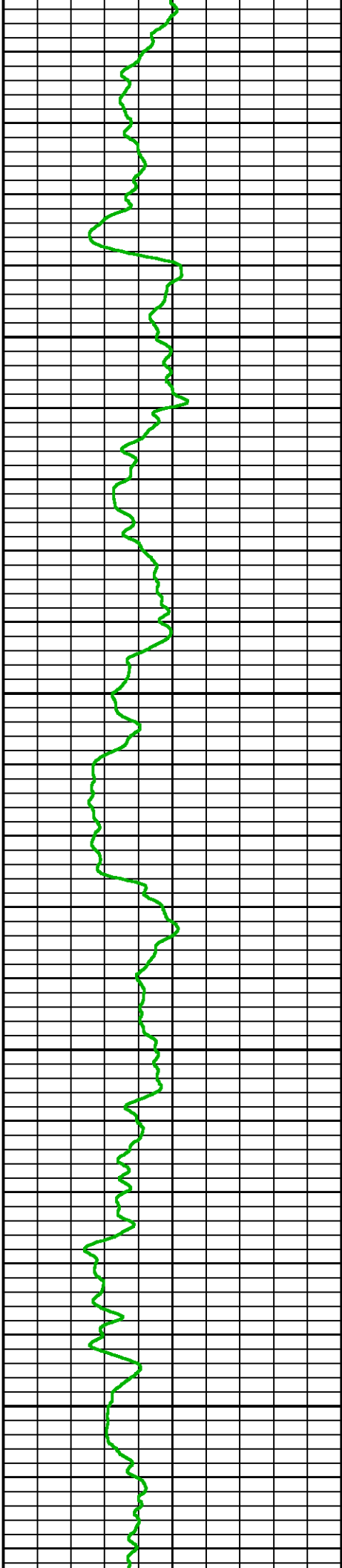


500

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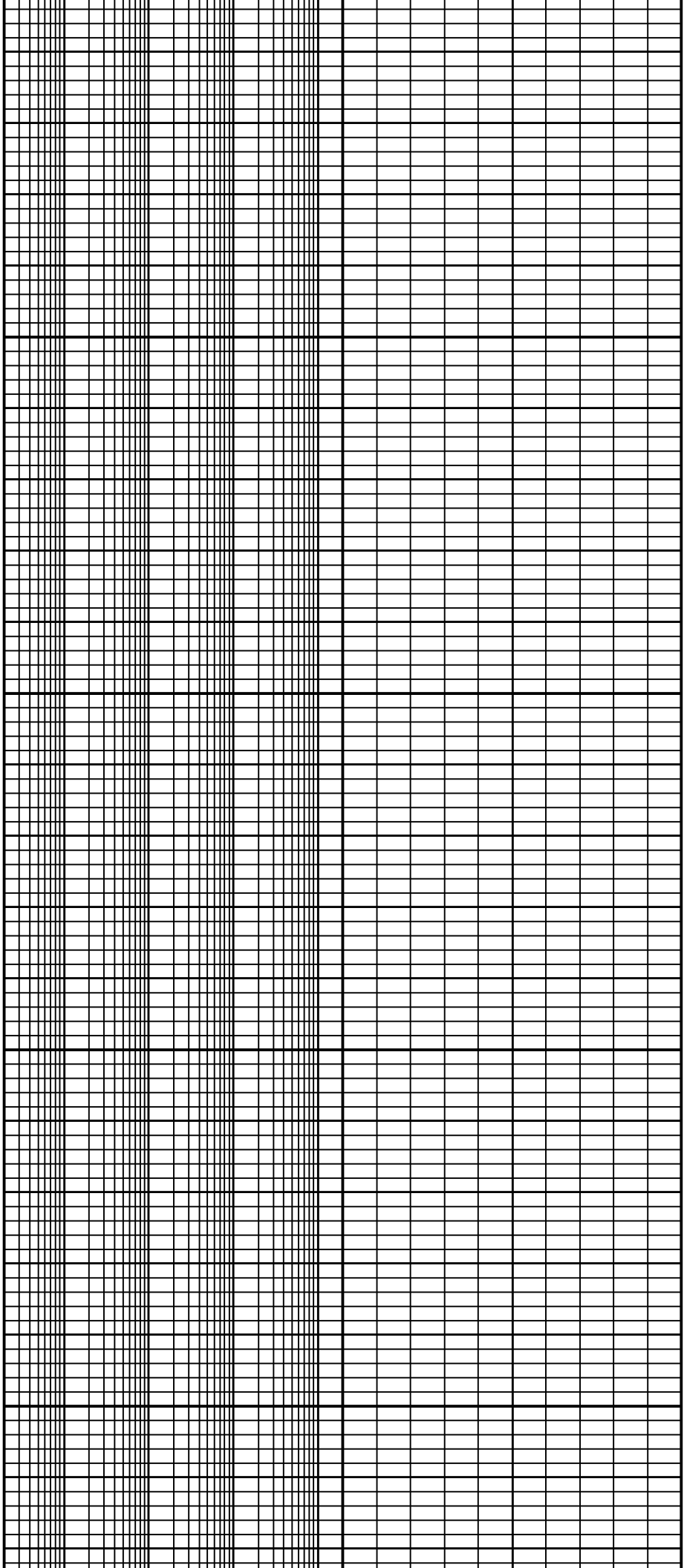
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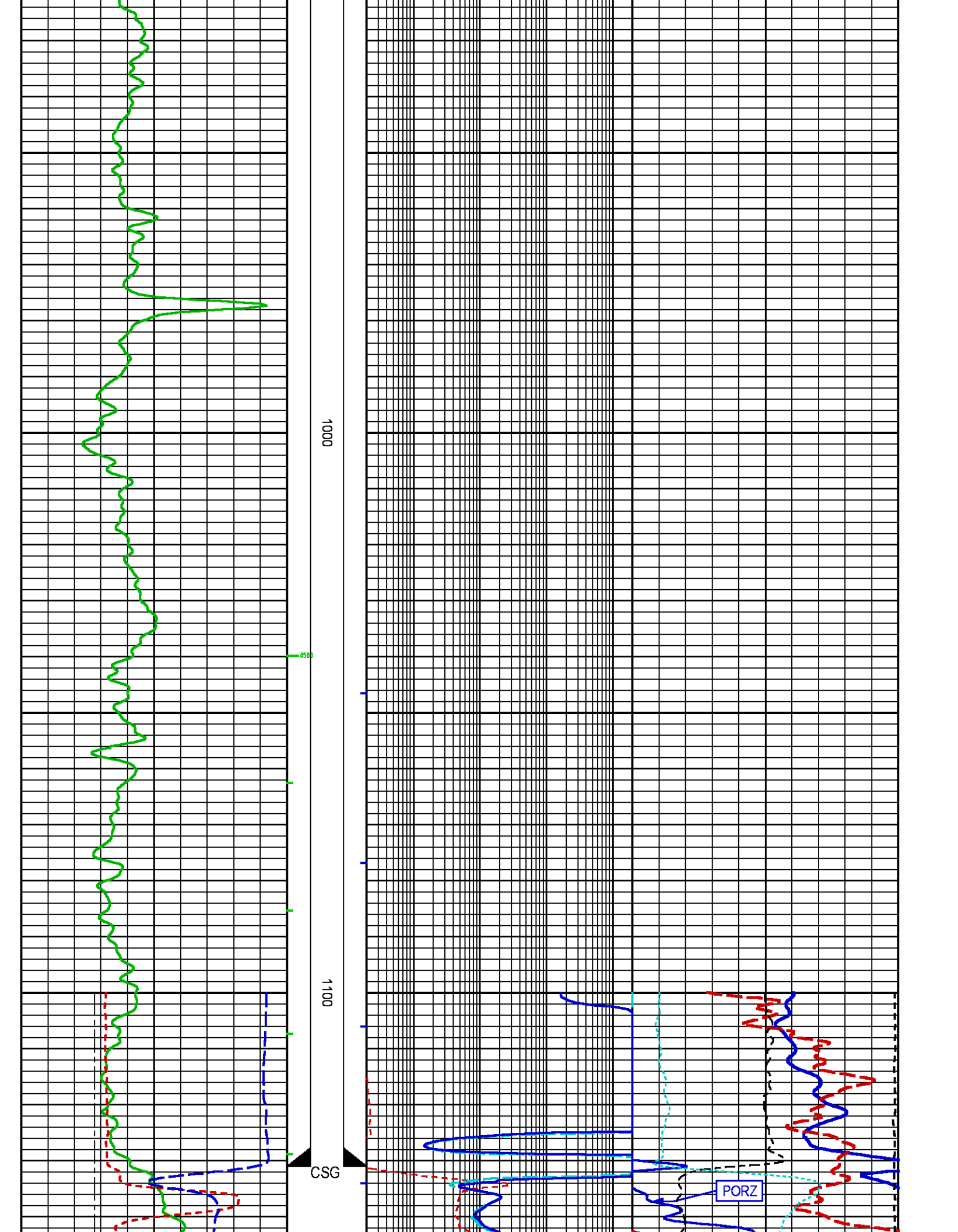


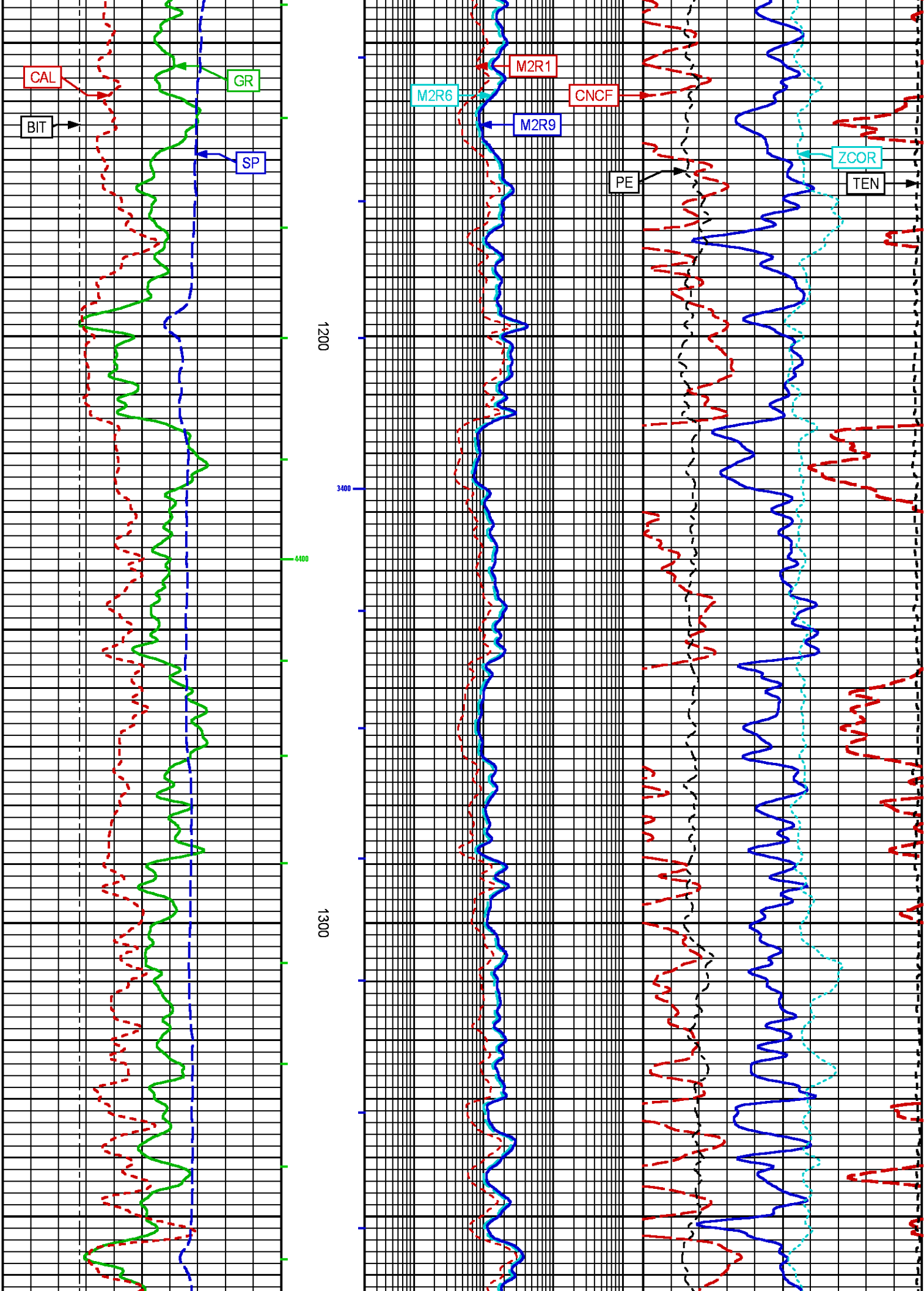


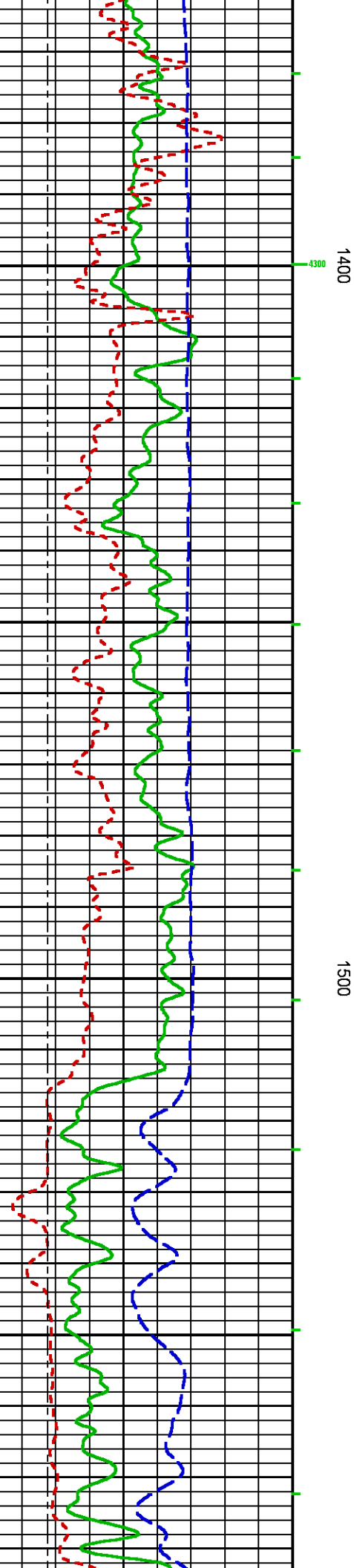
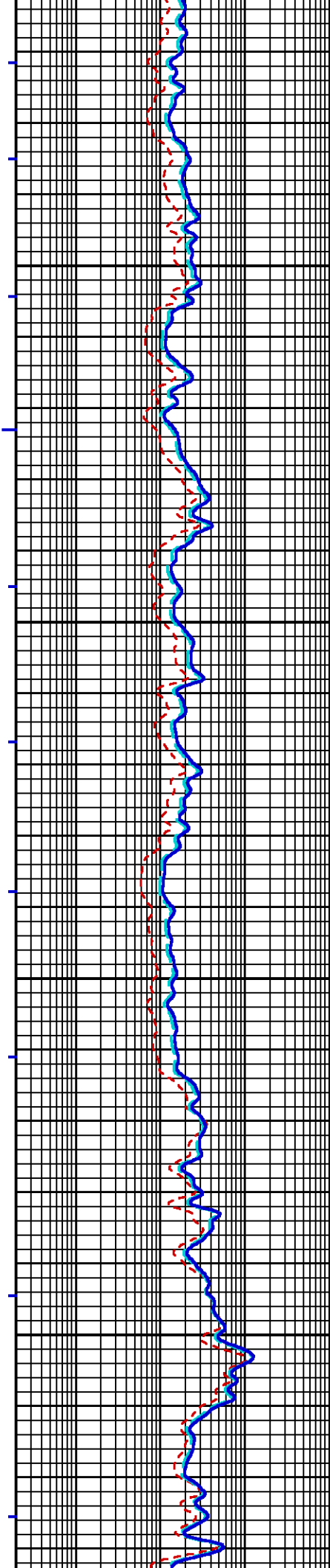
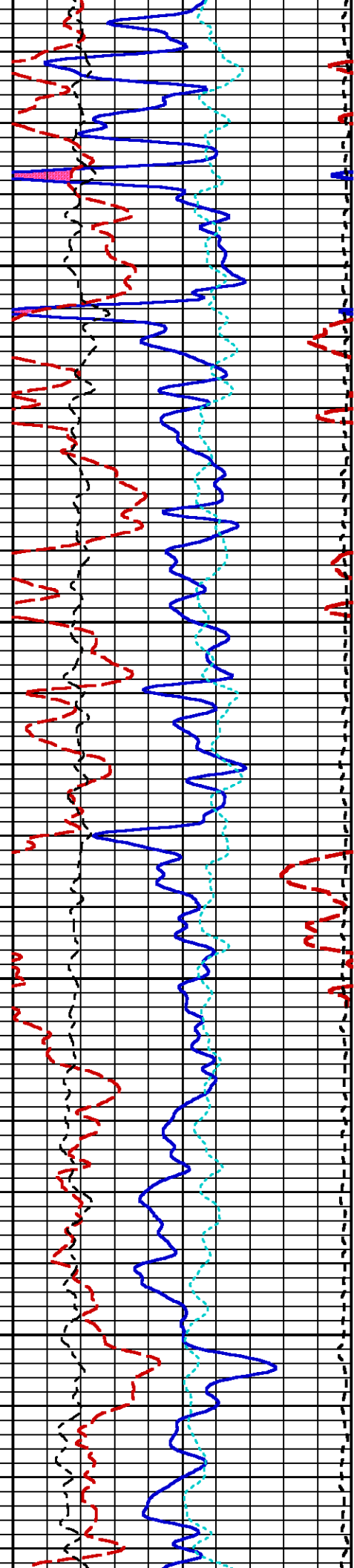
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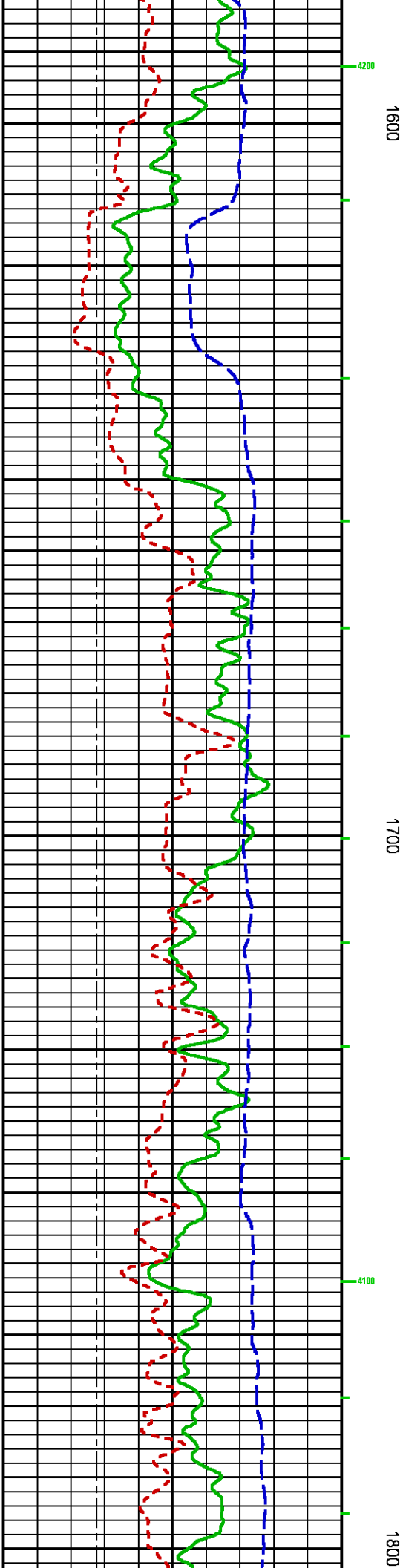
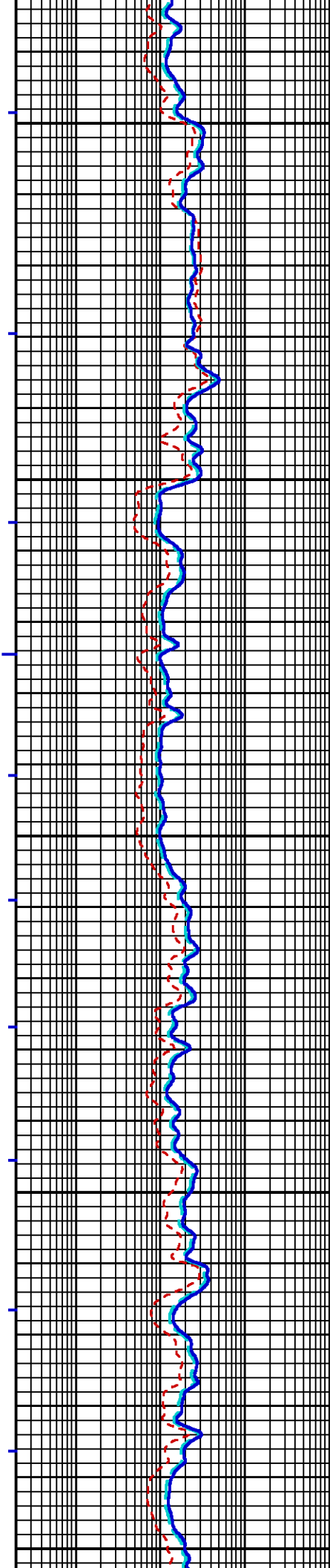
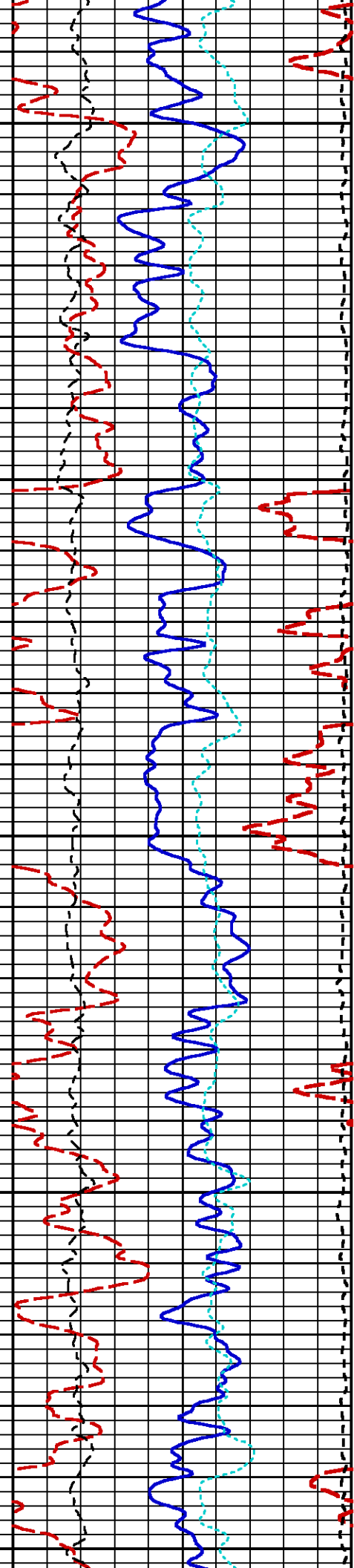
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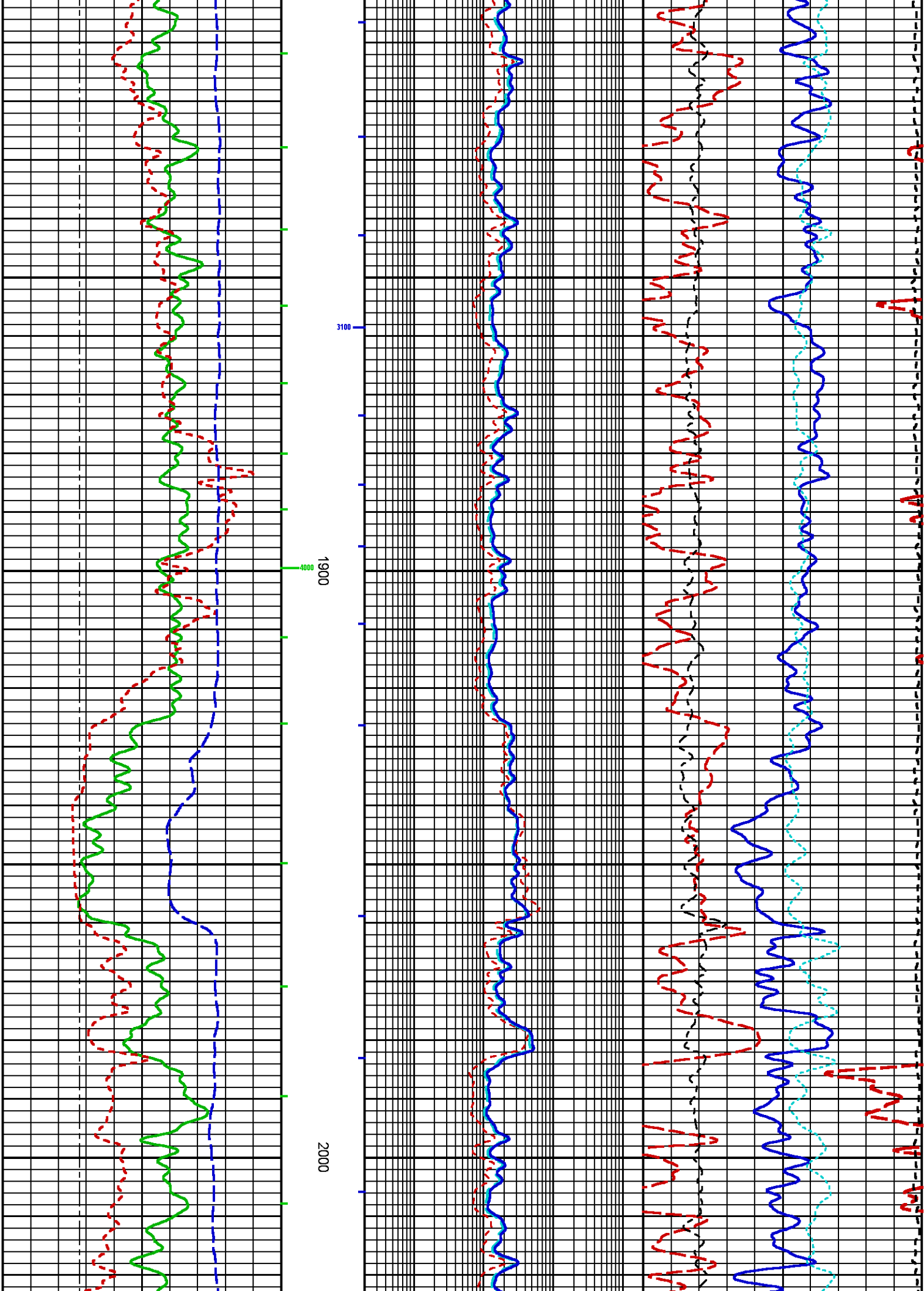


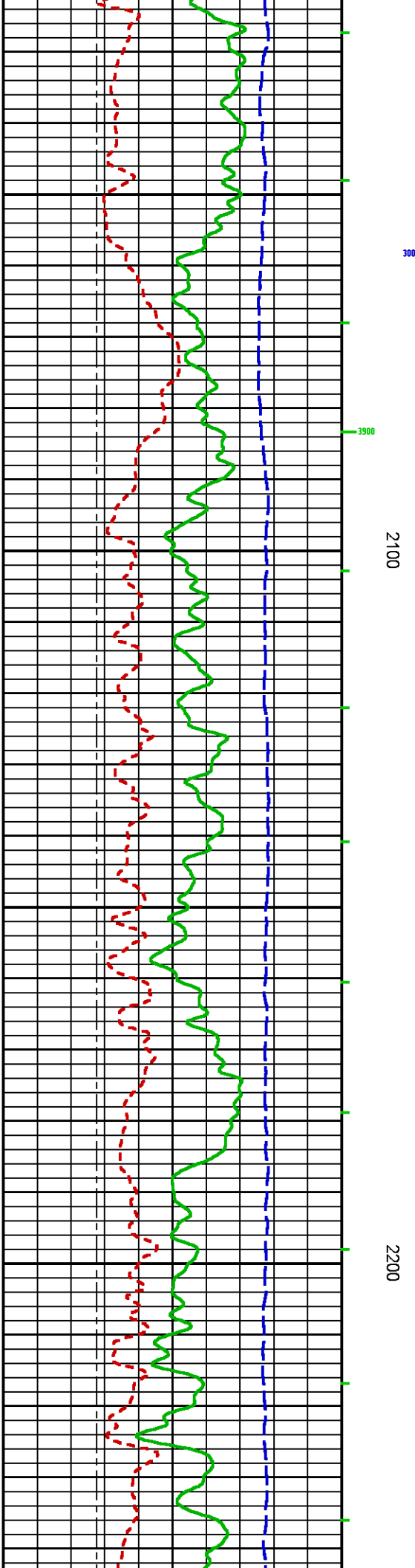
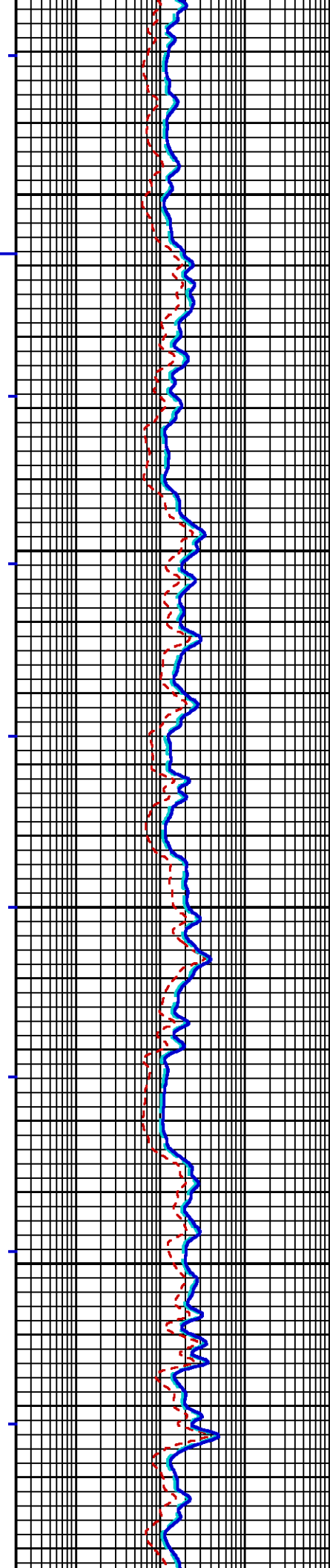
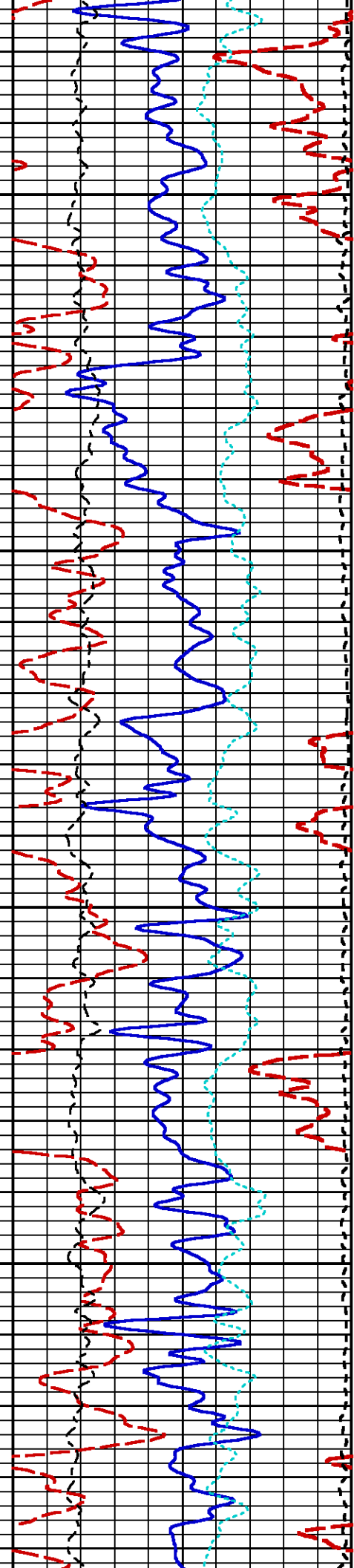


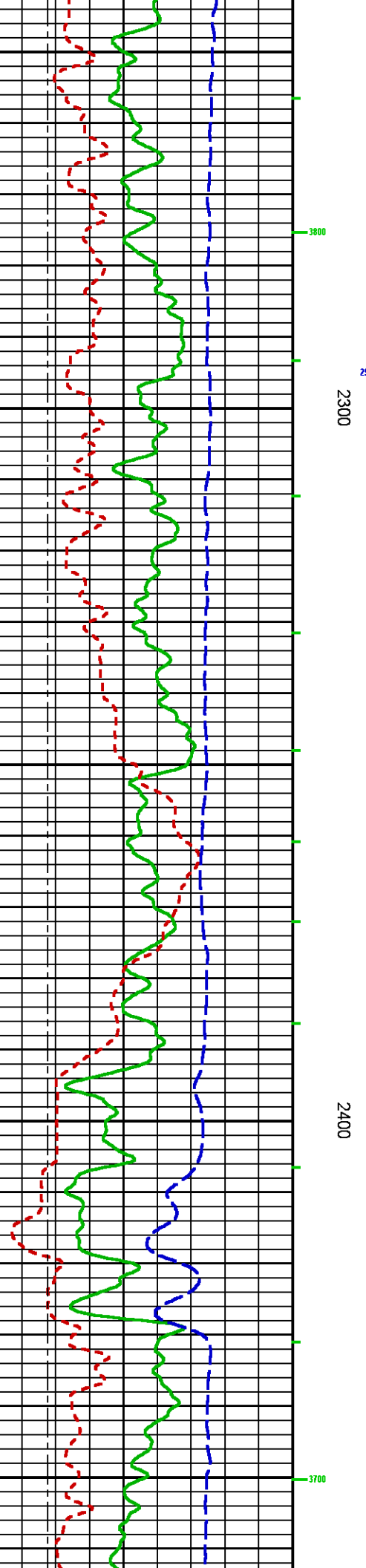
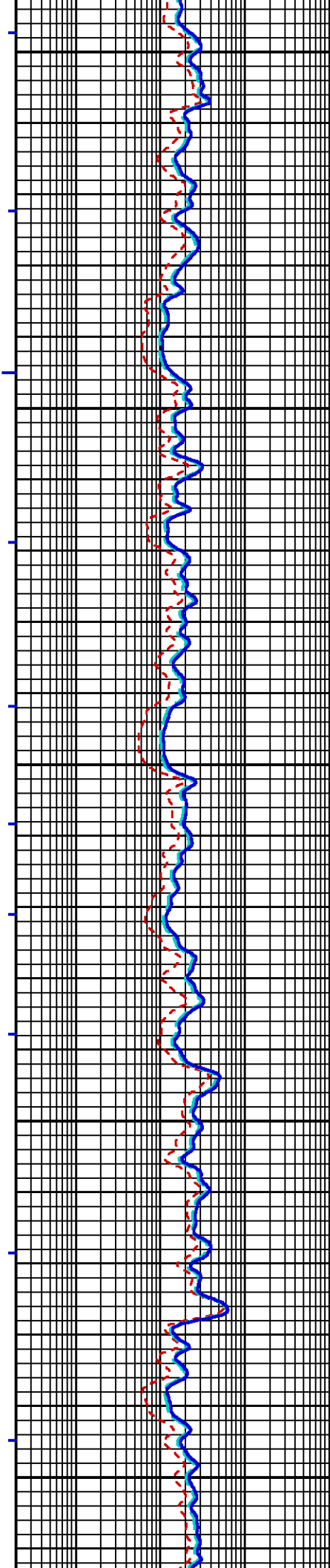
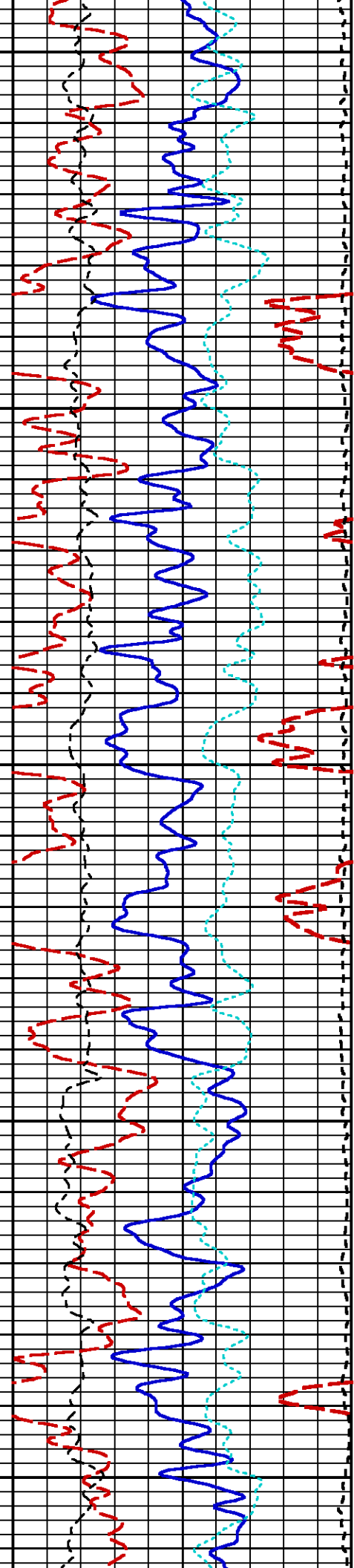


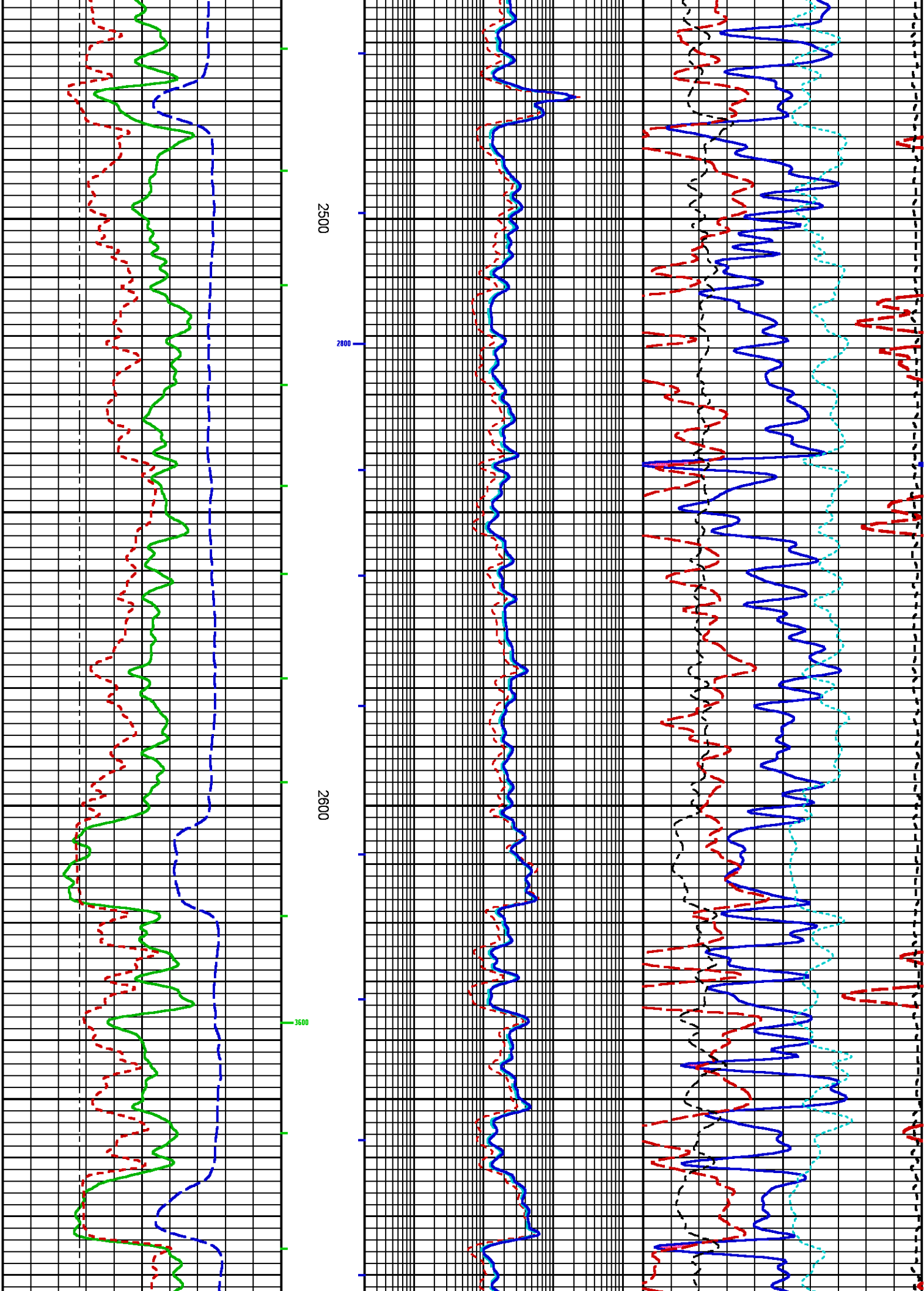


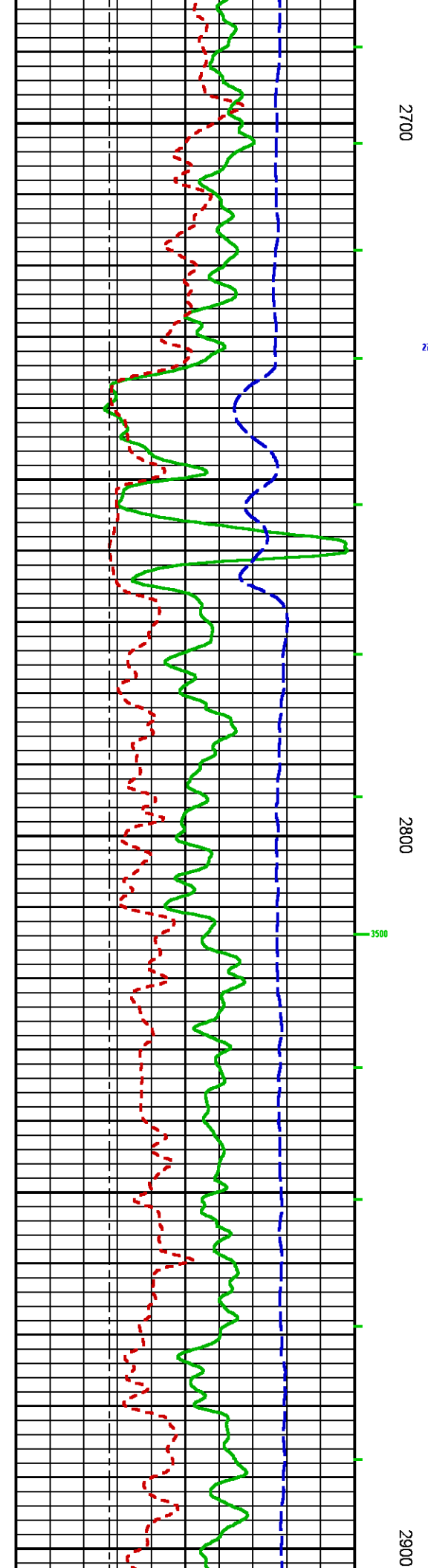
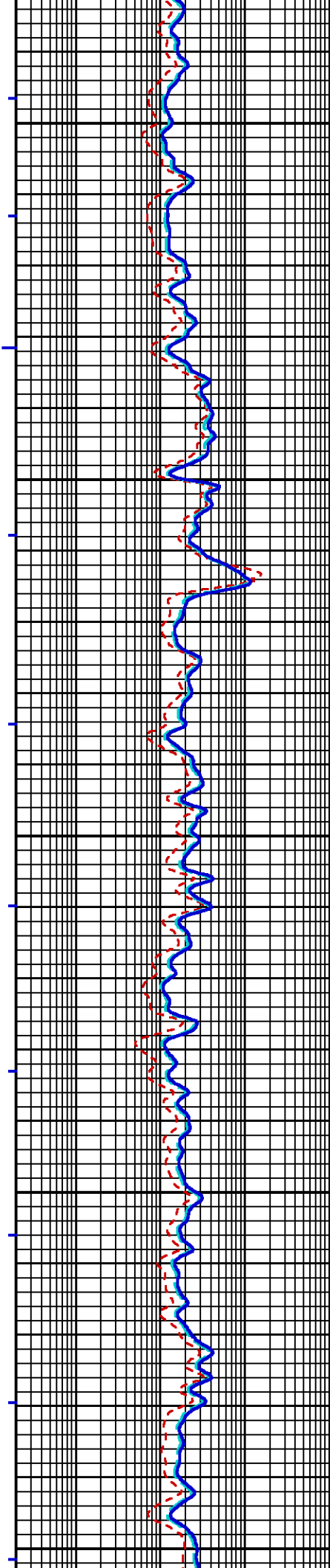
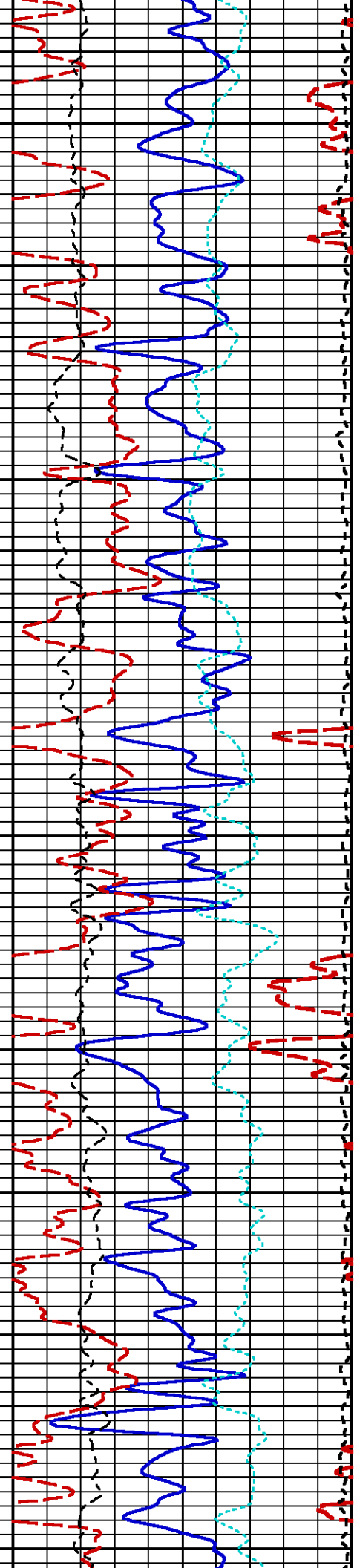


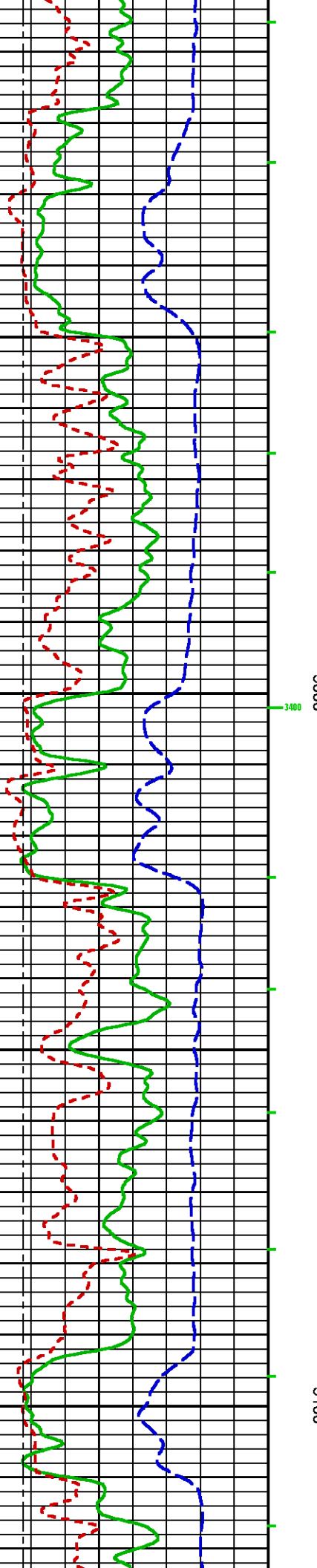
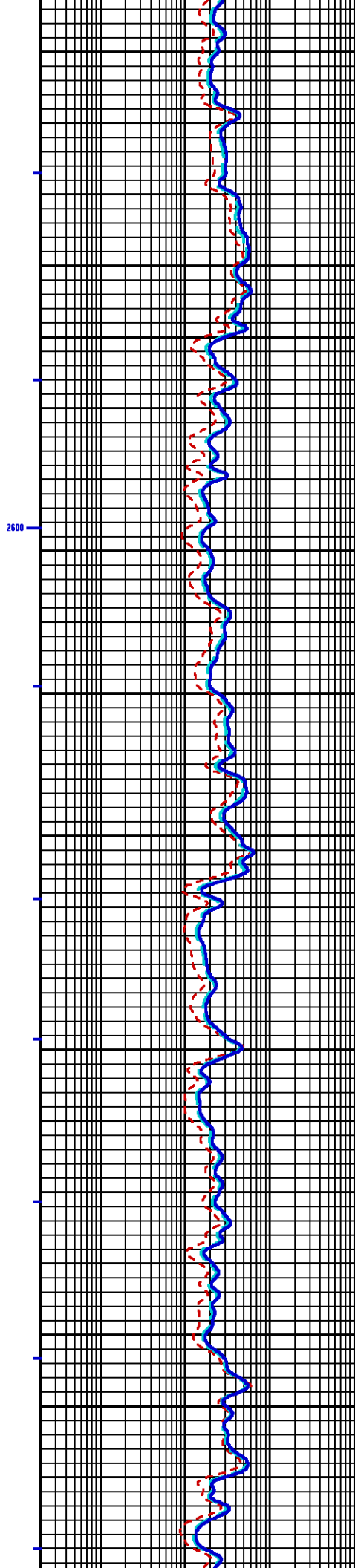
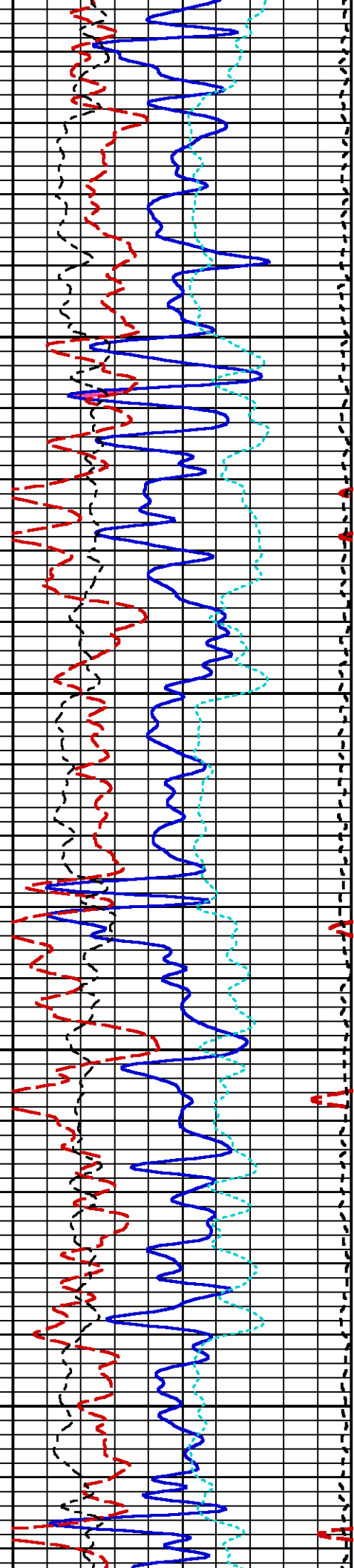


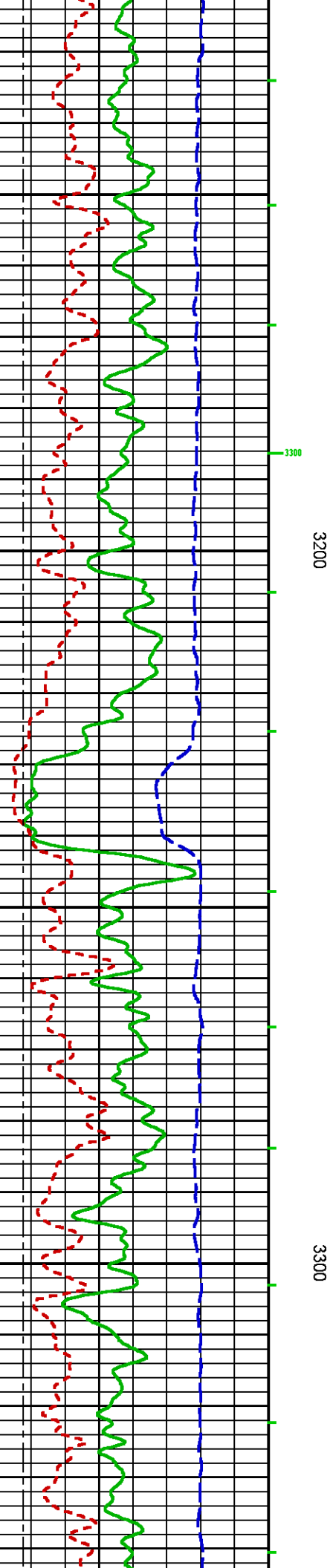
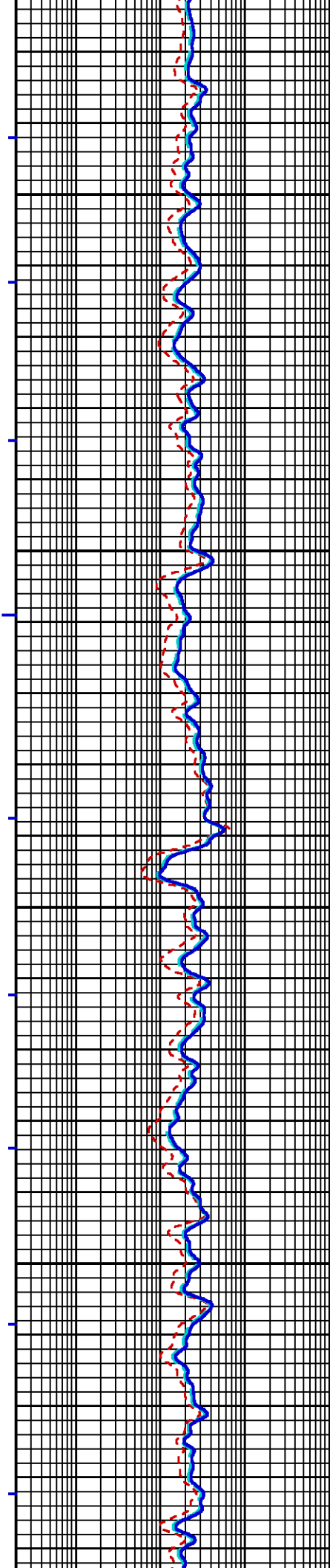
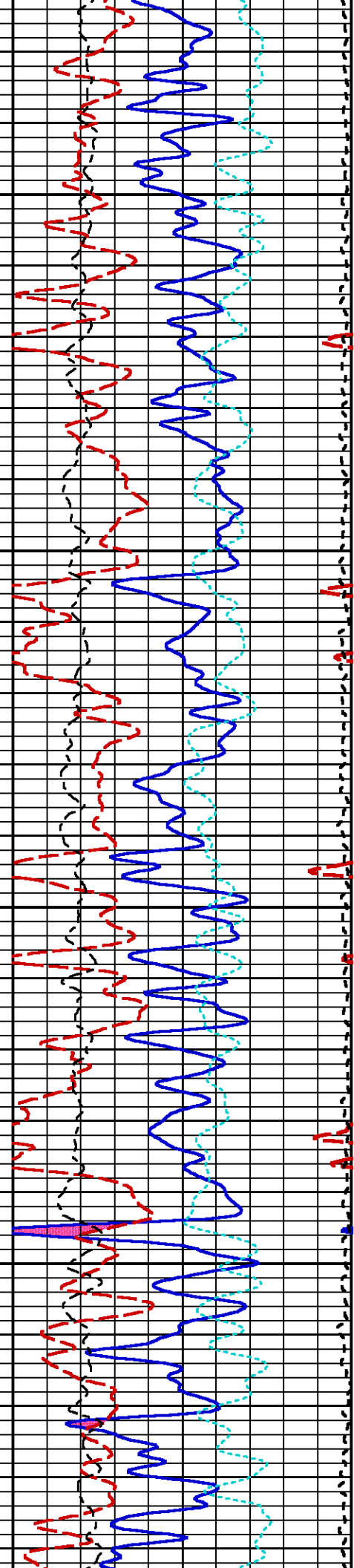




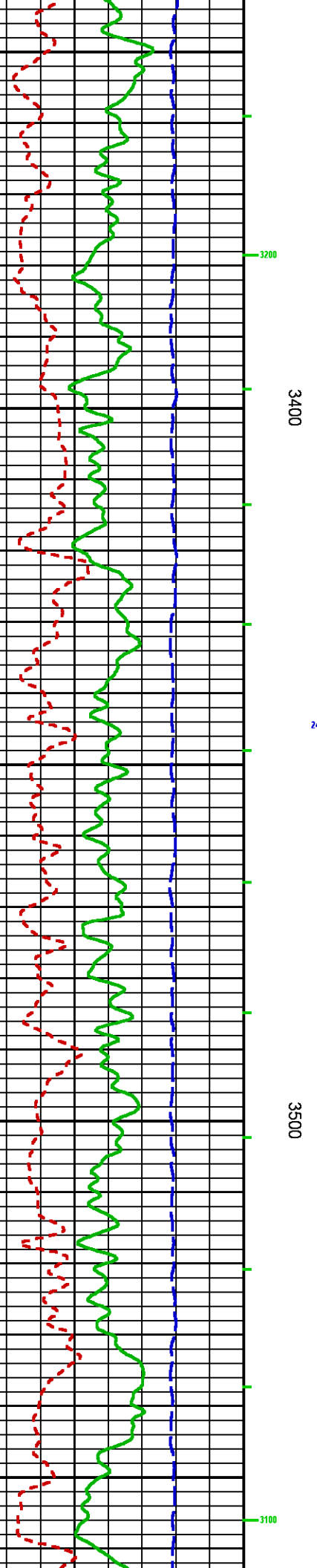
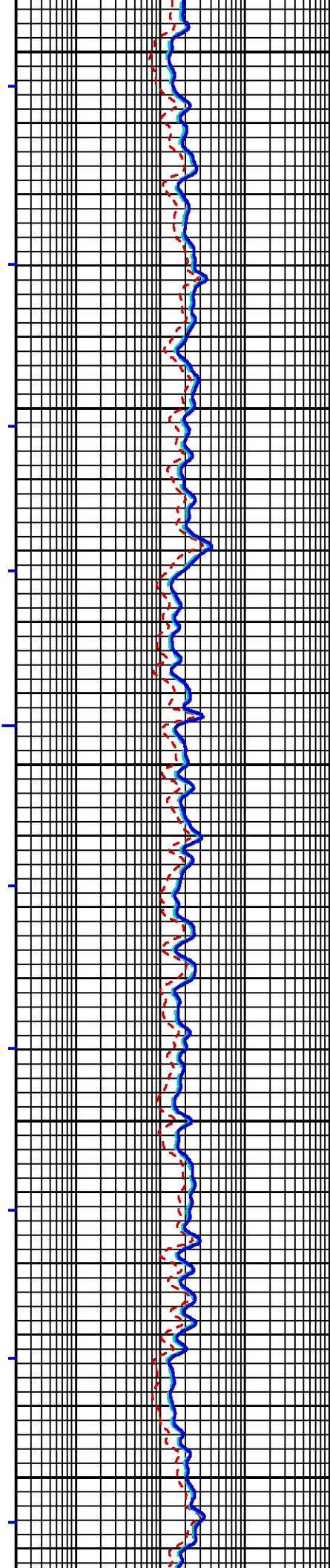
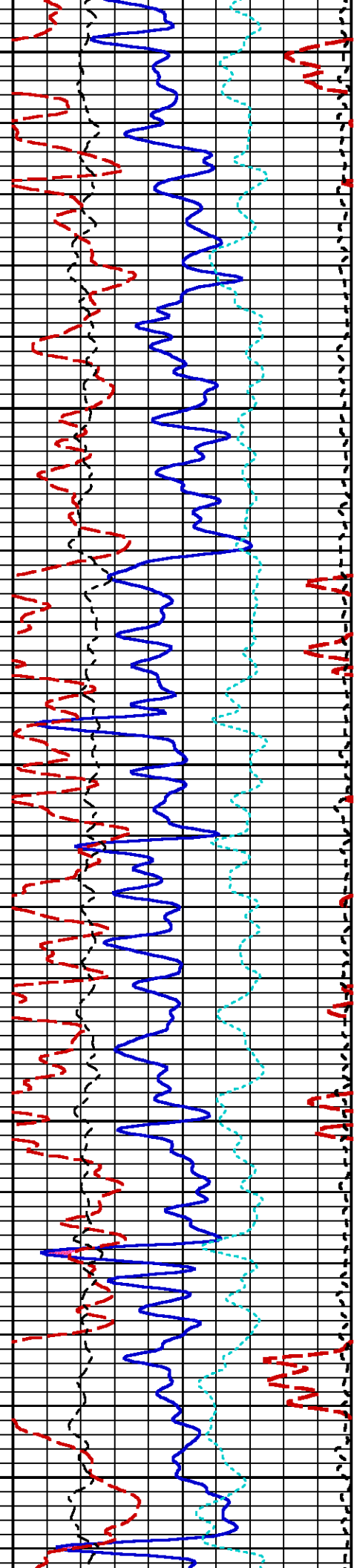




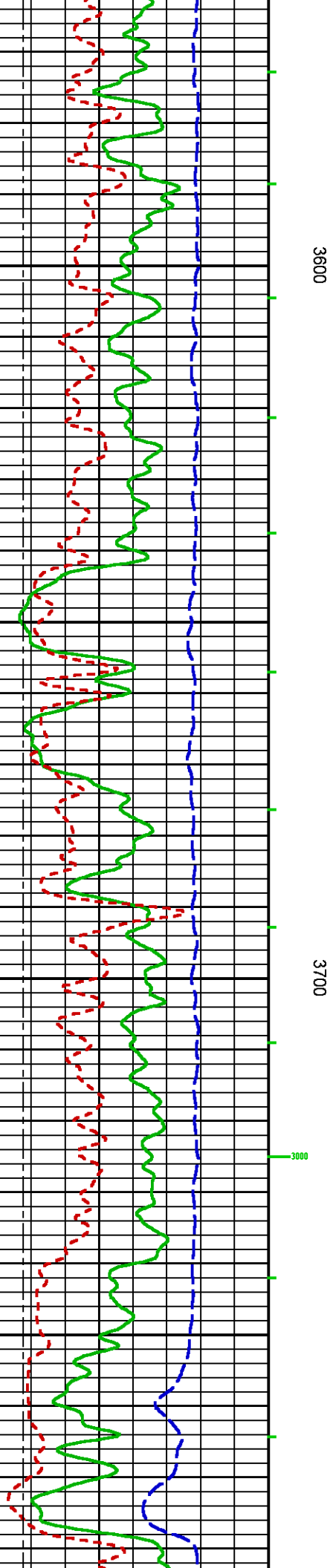
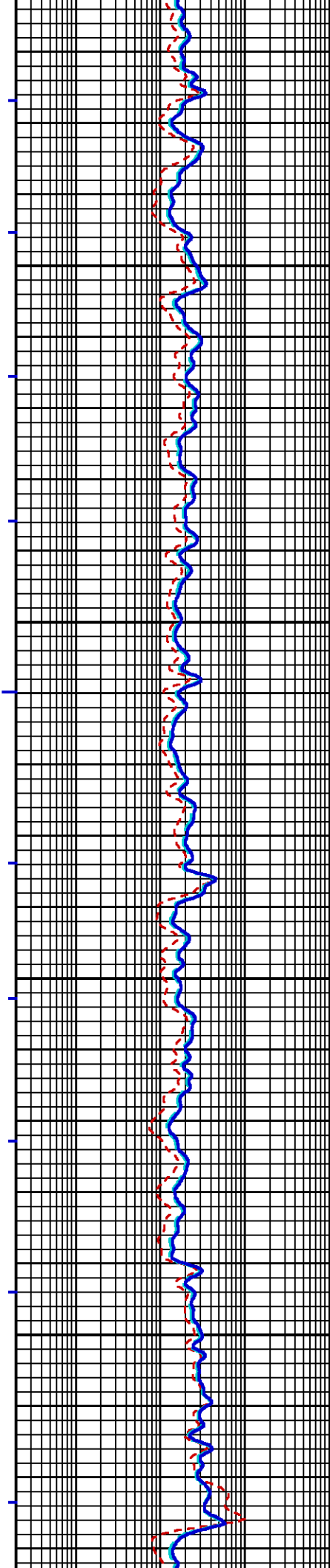
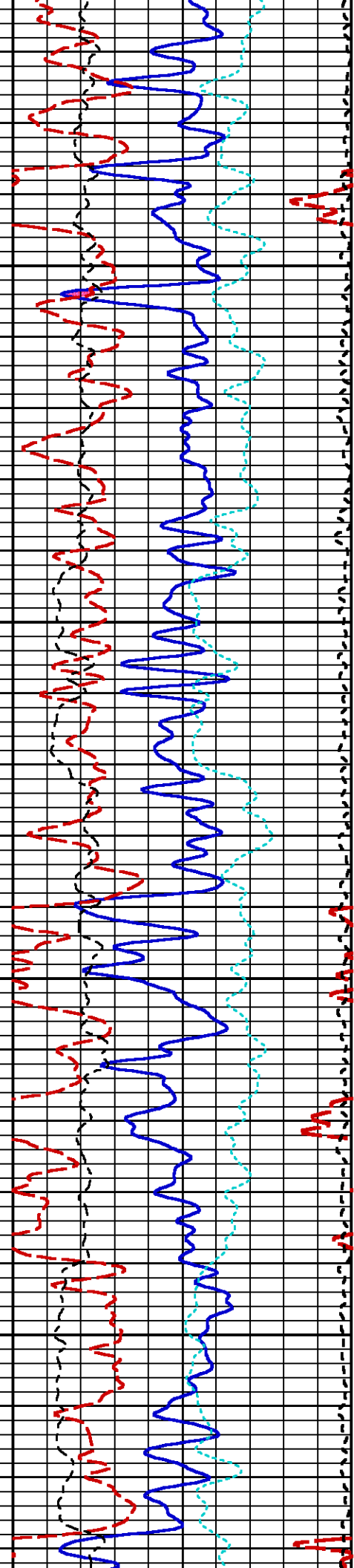


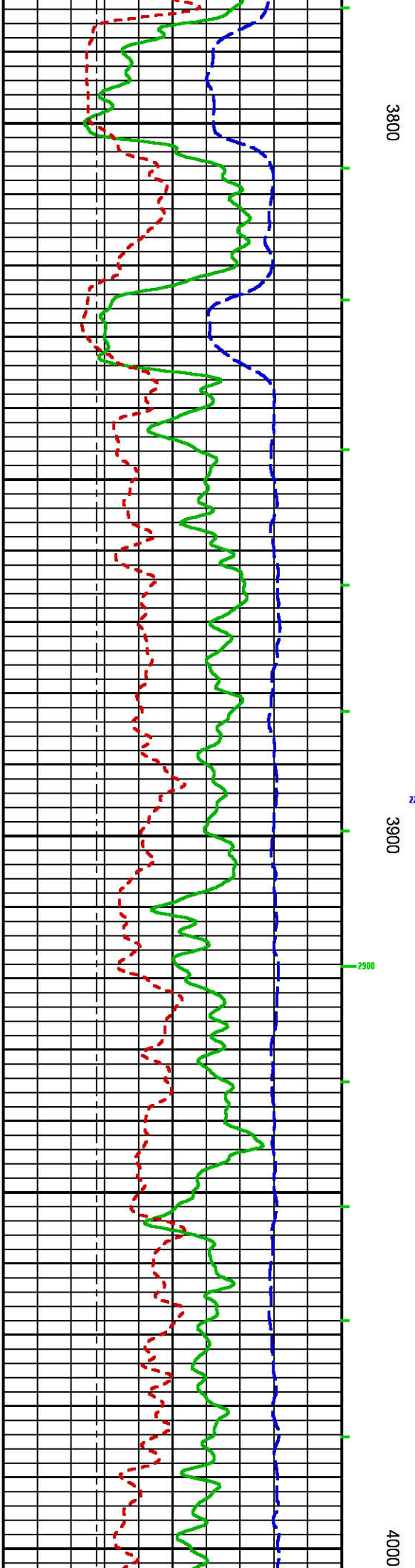
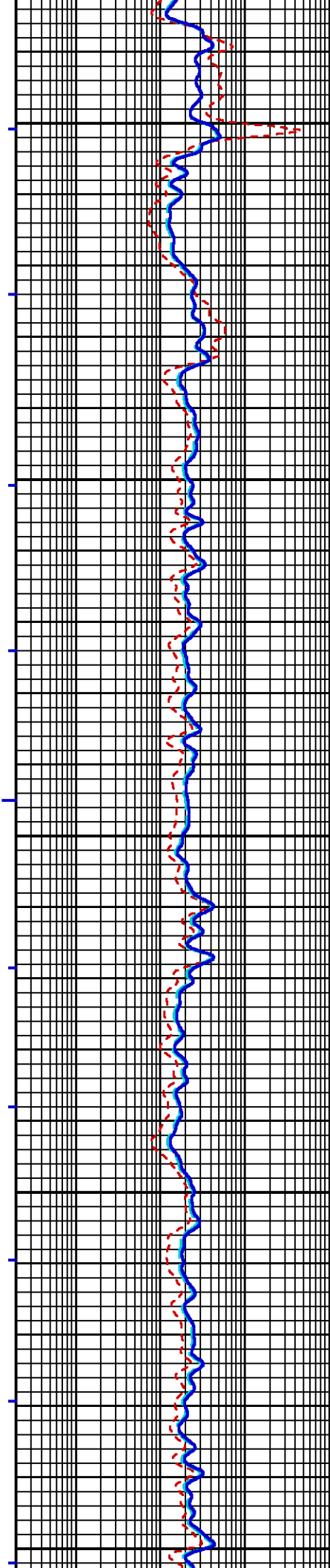
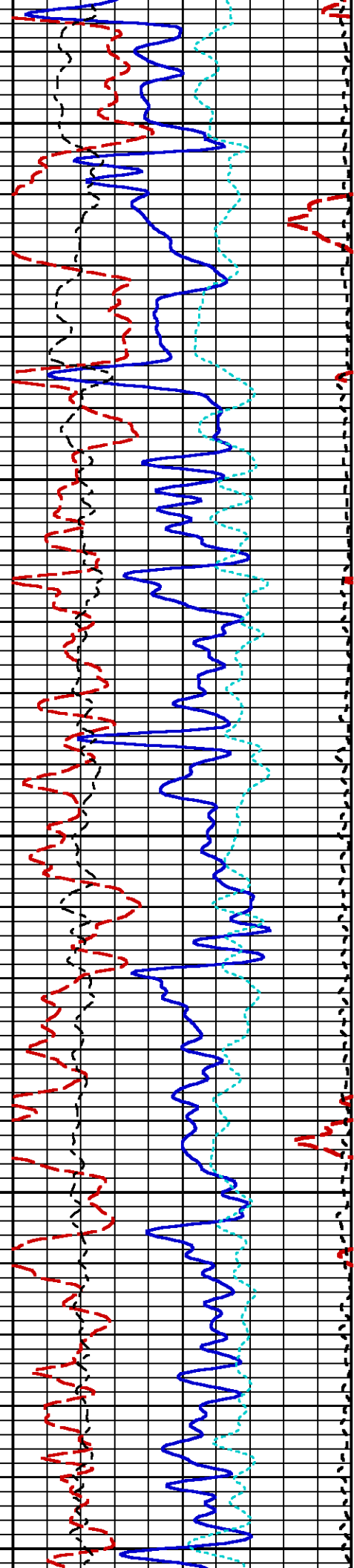


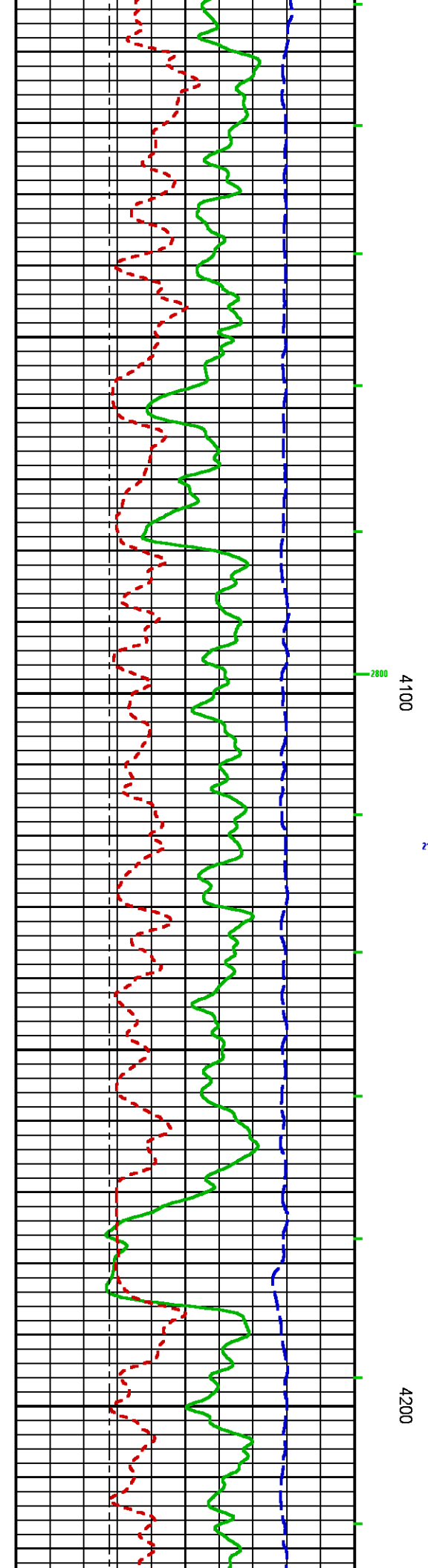
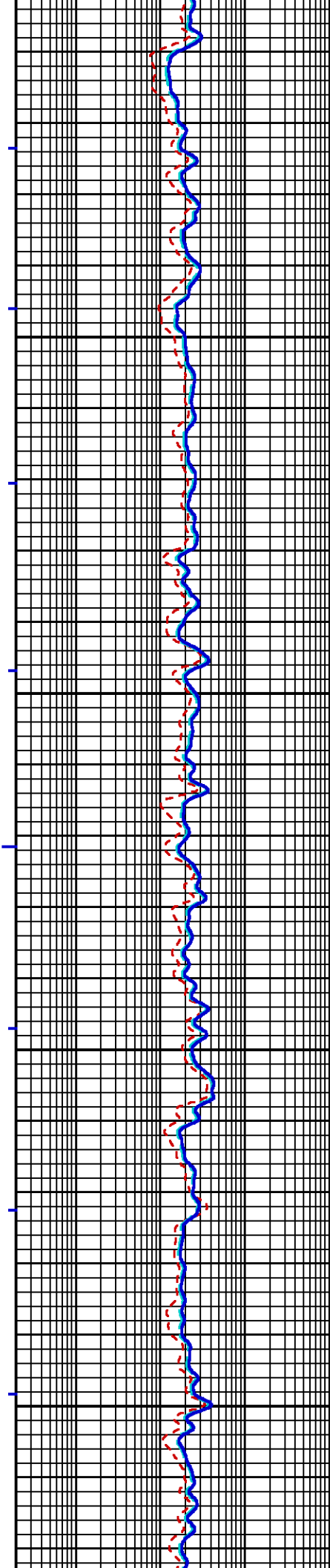
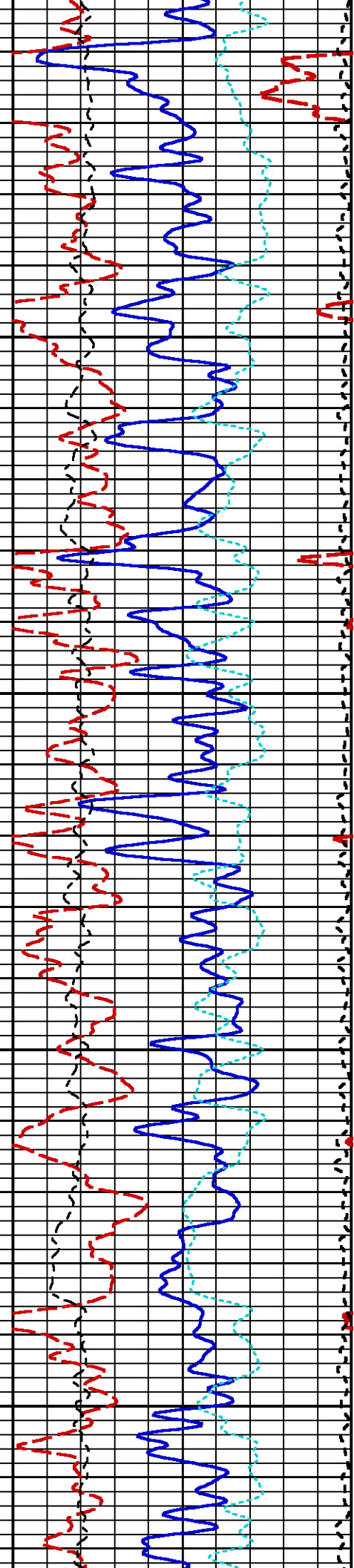


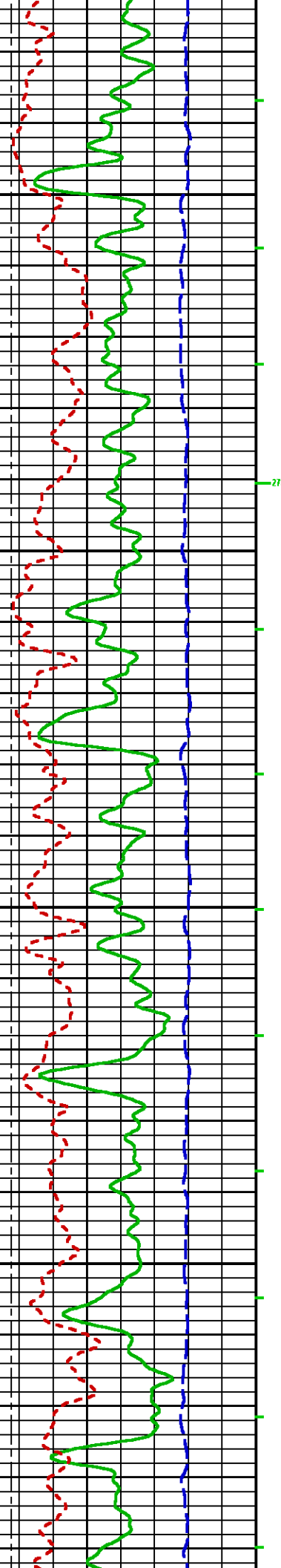
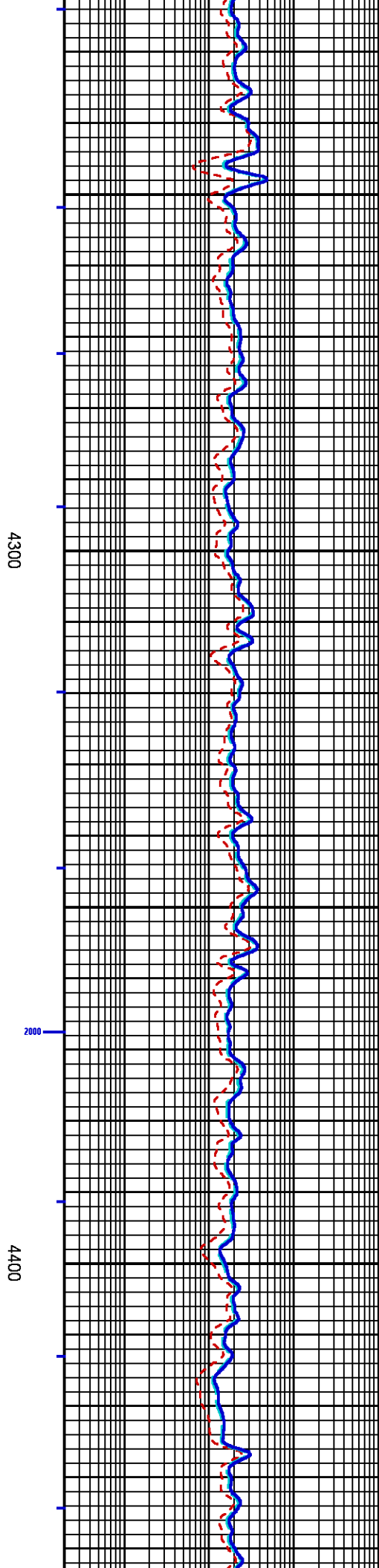
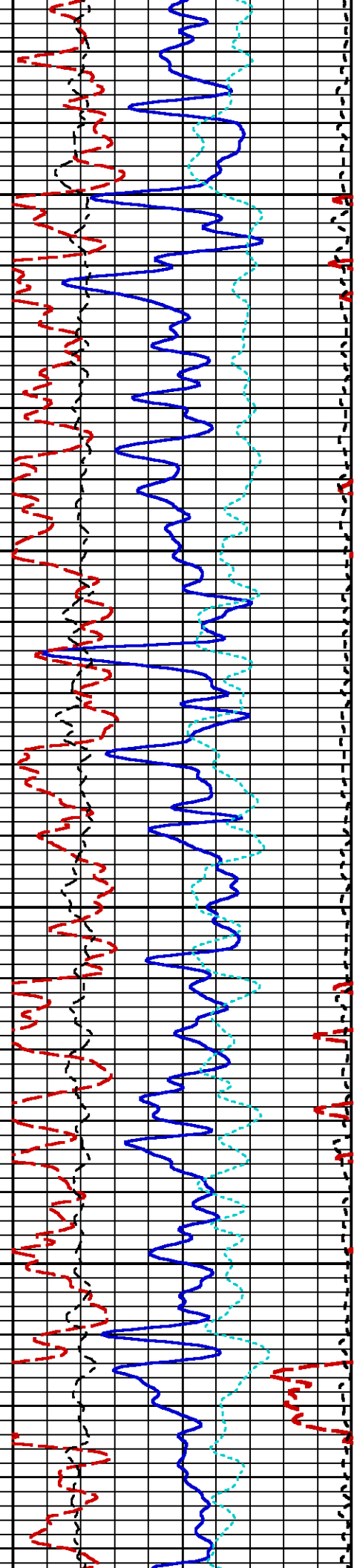


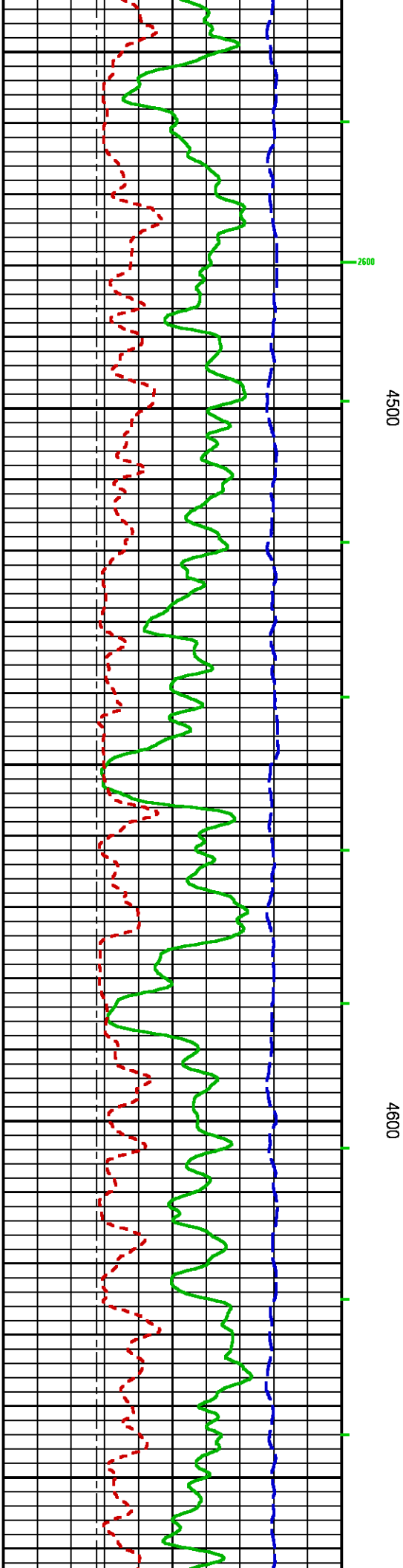
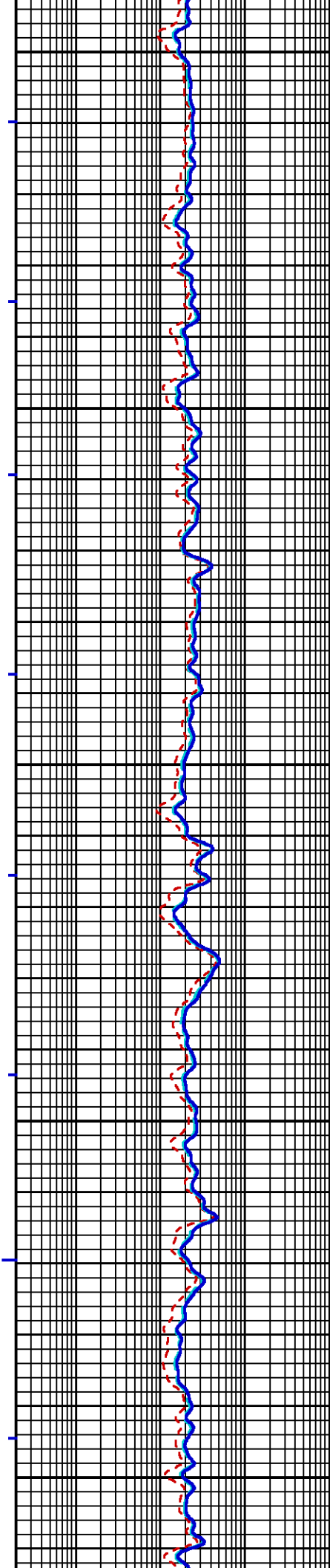
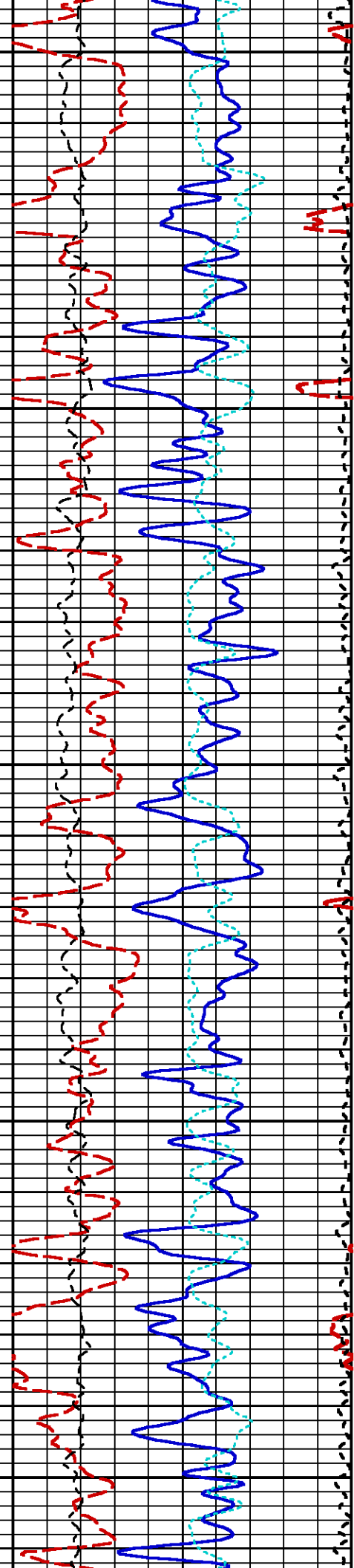


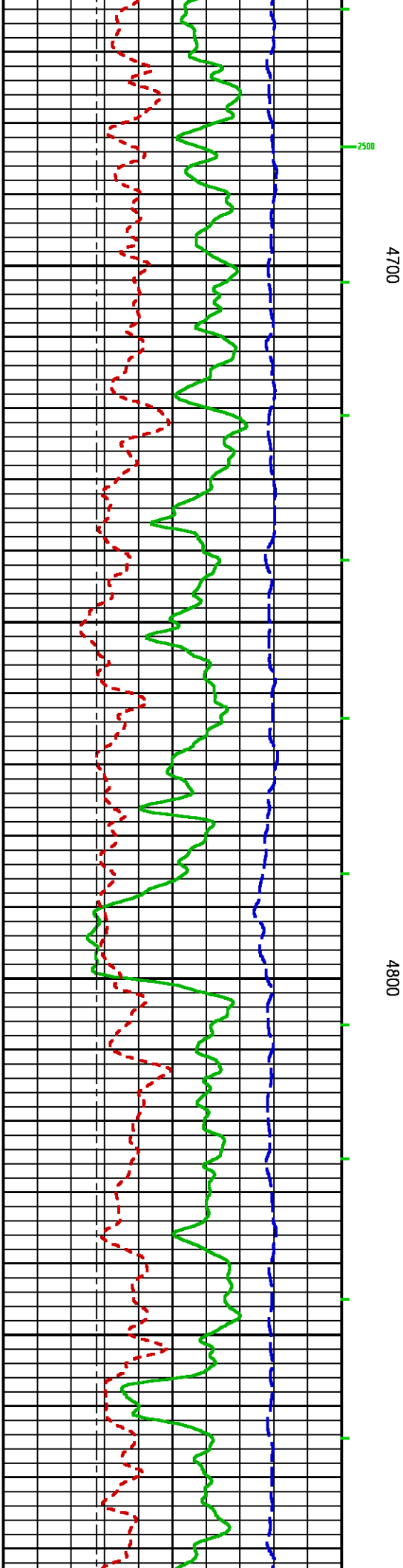
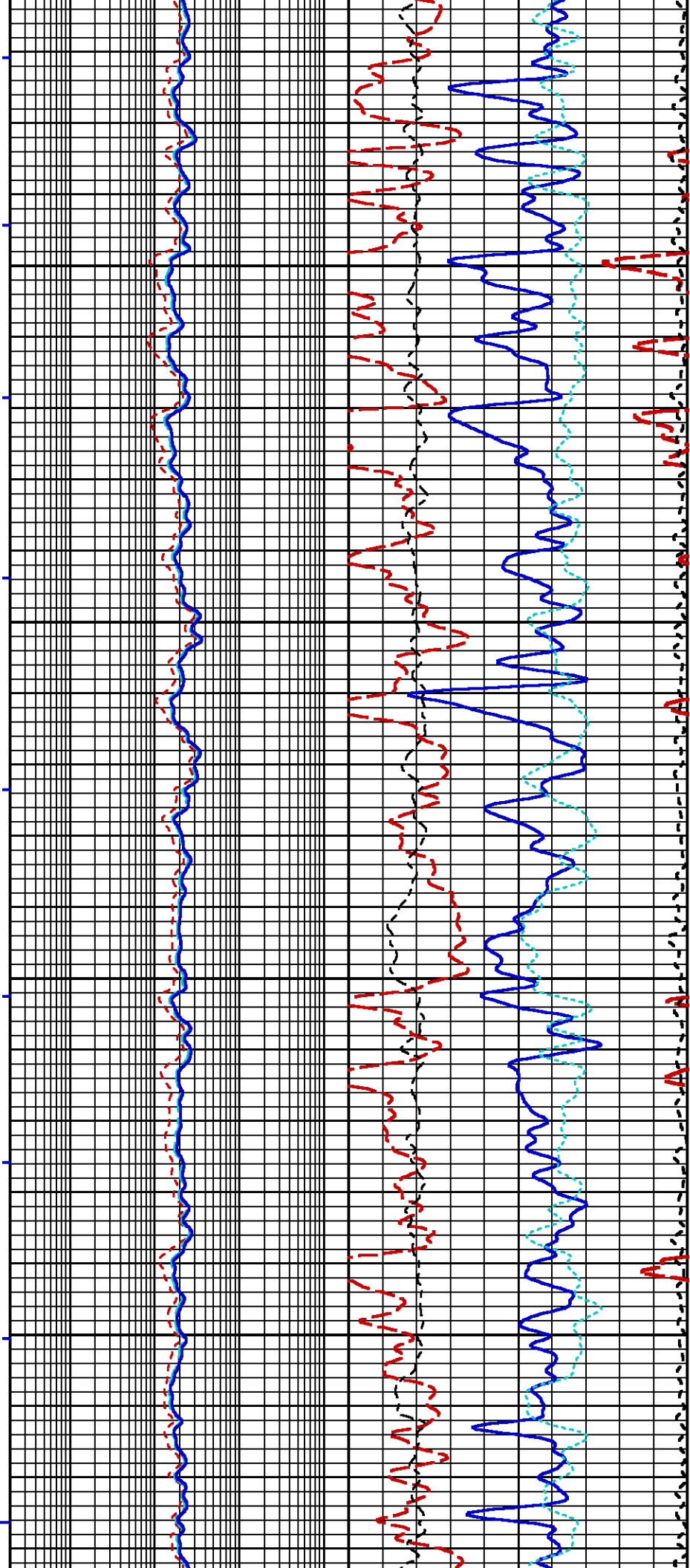


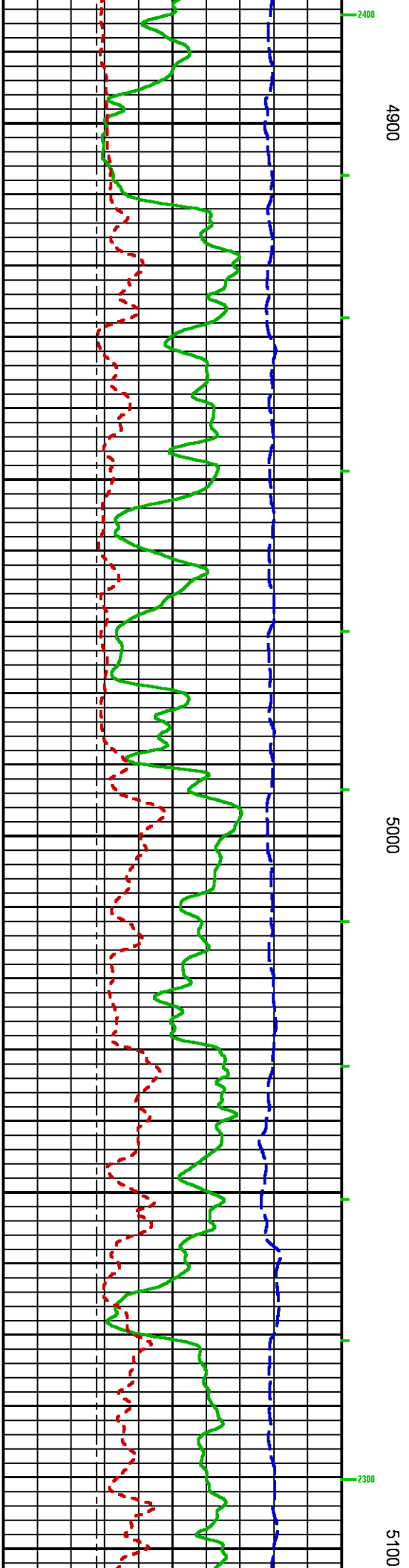
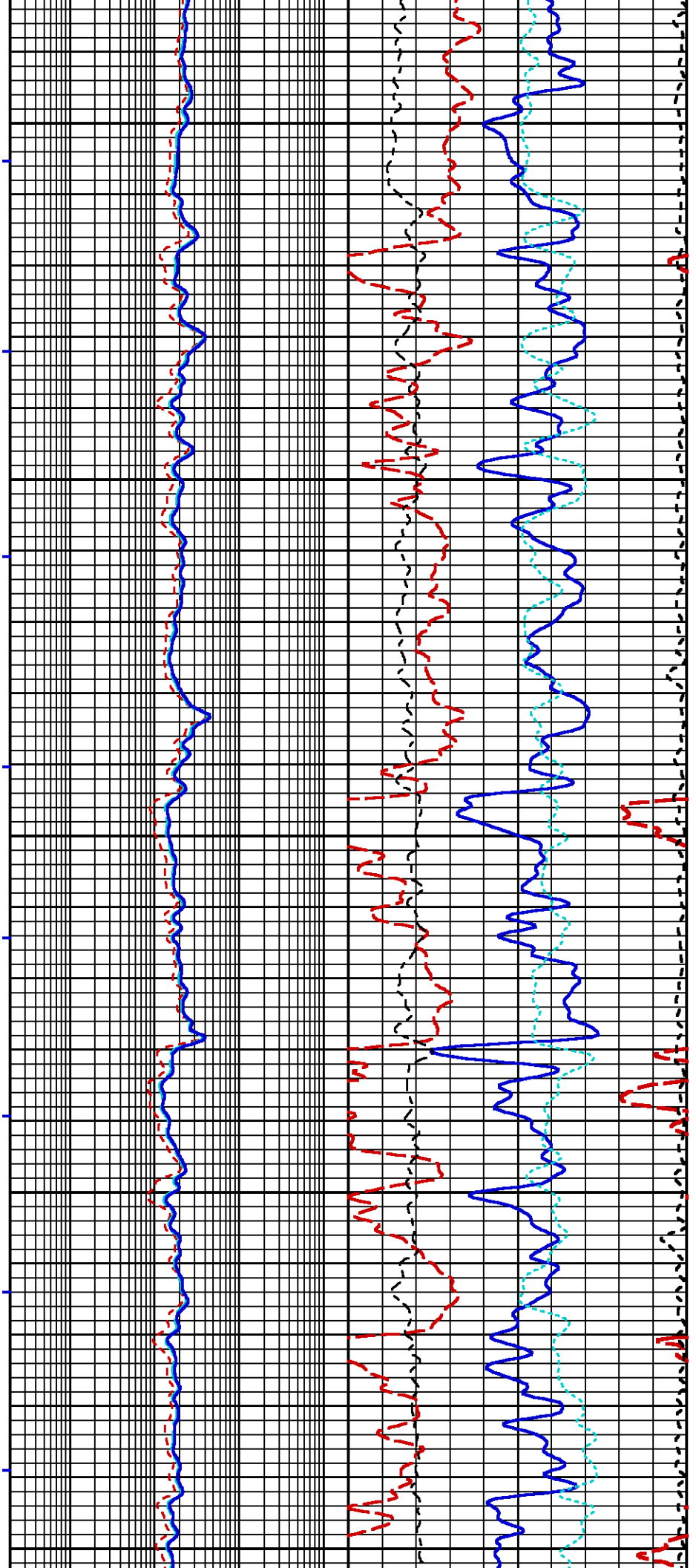




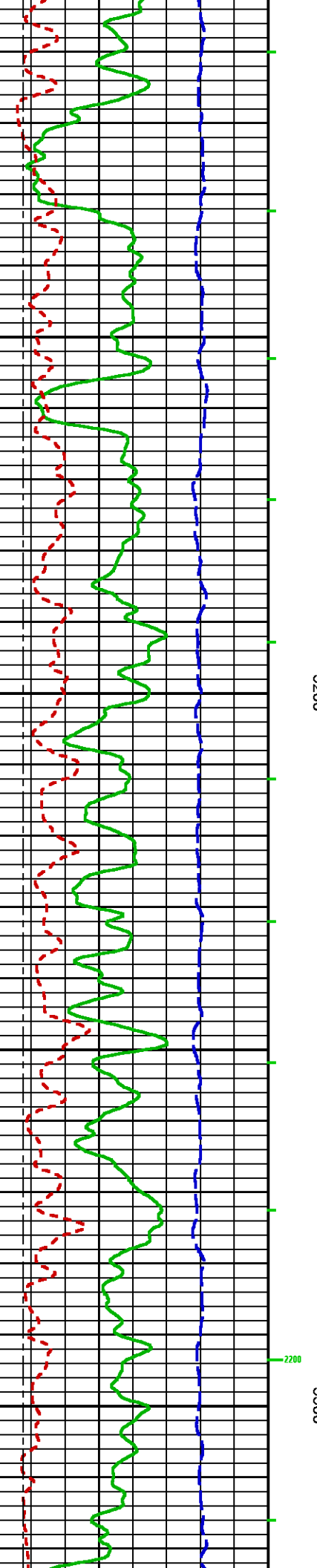
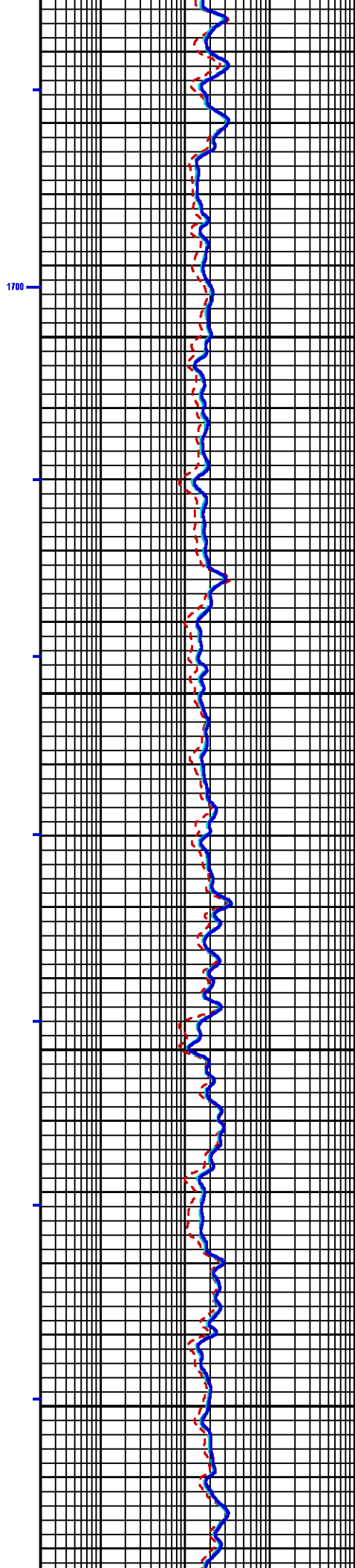
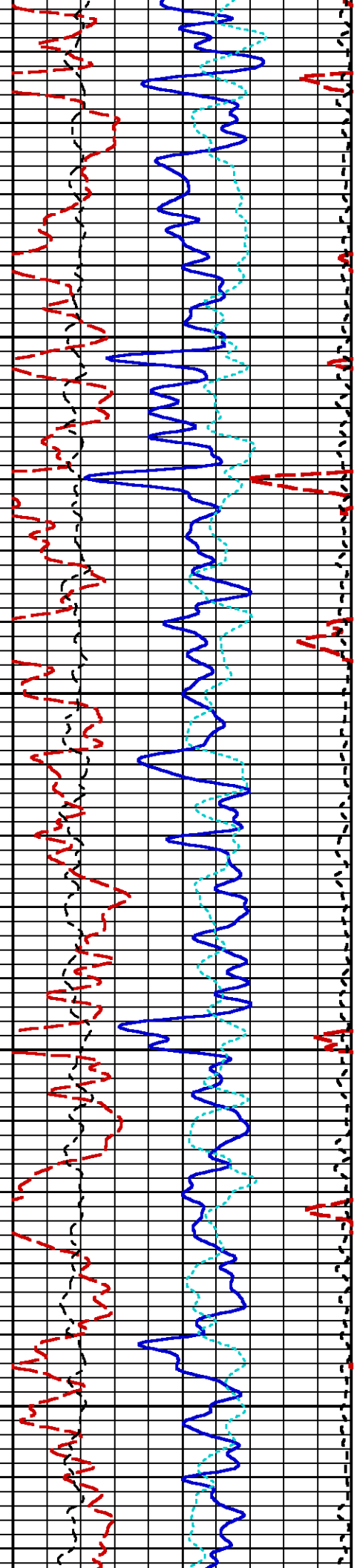




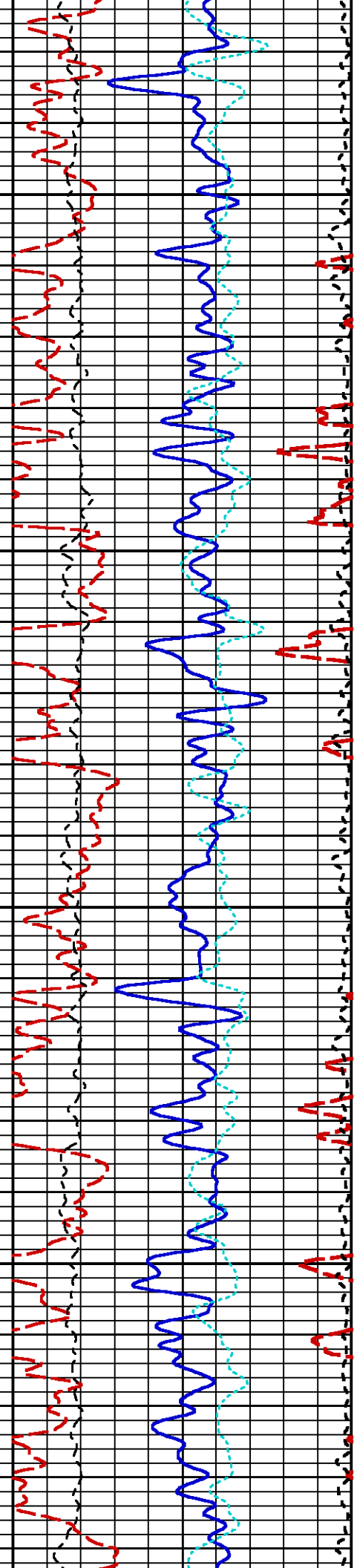










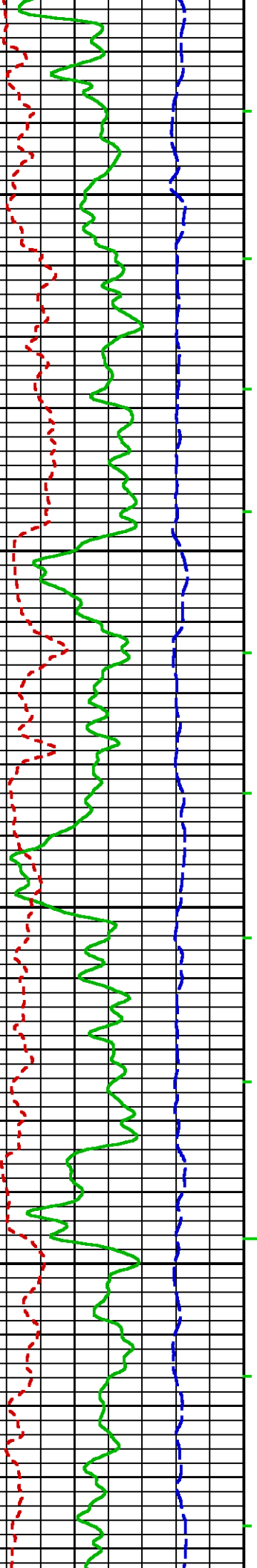


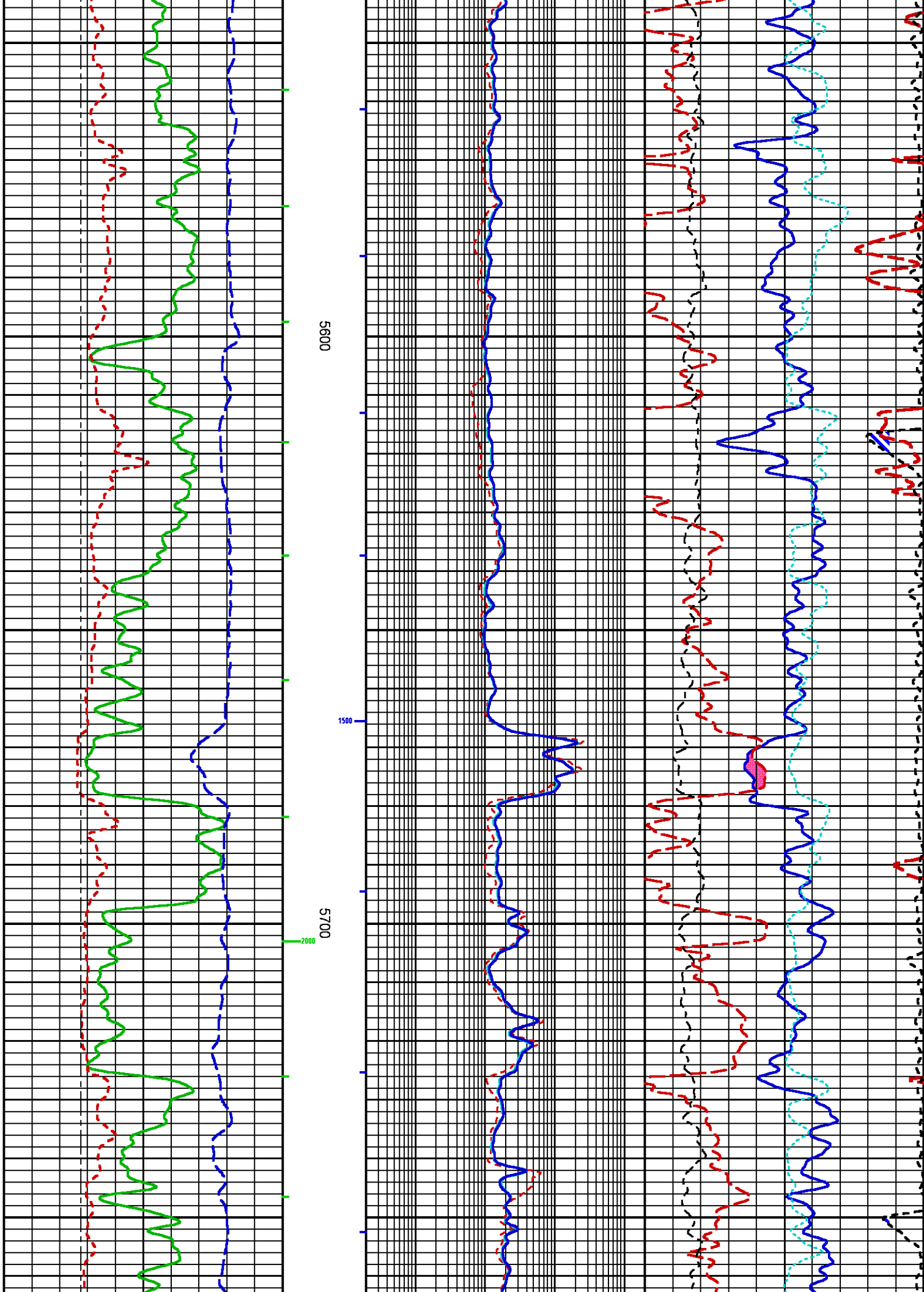
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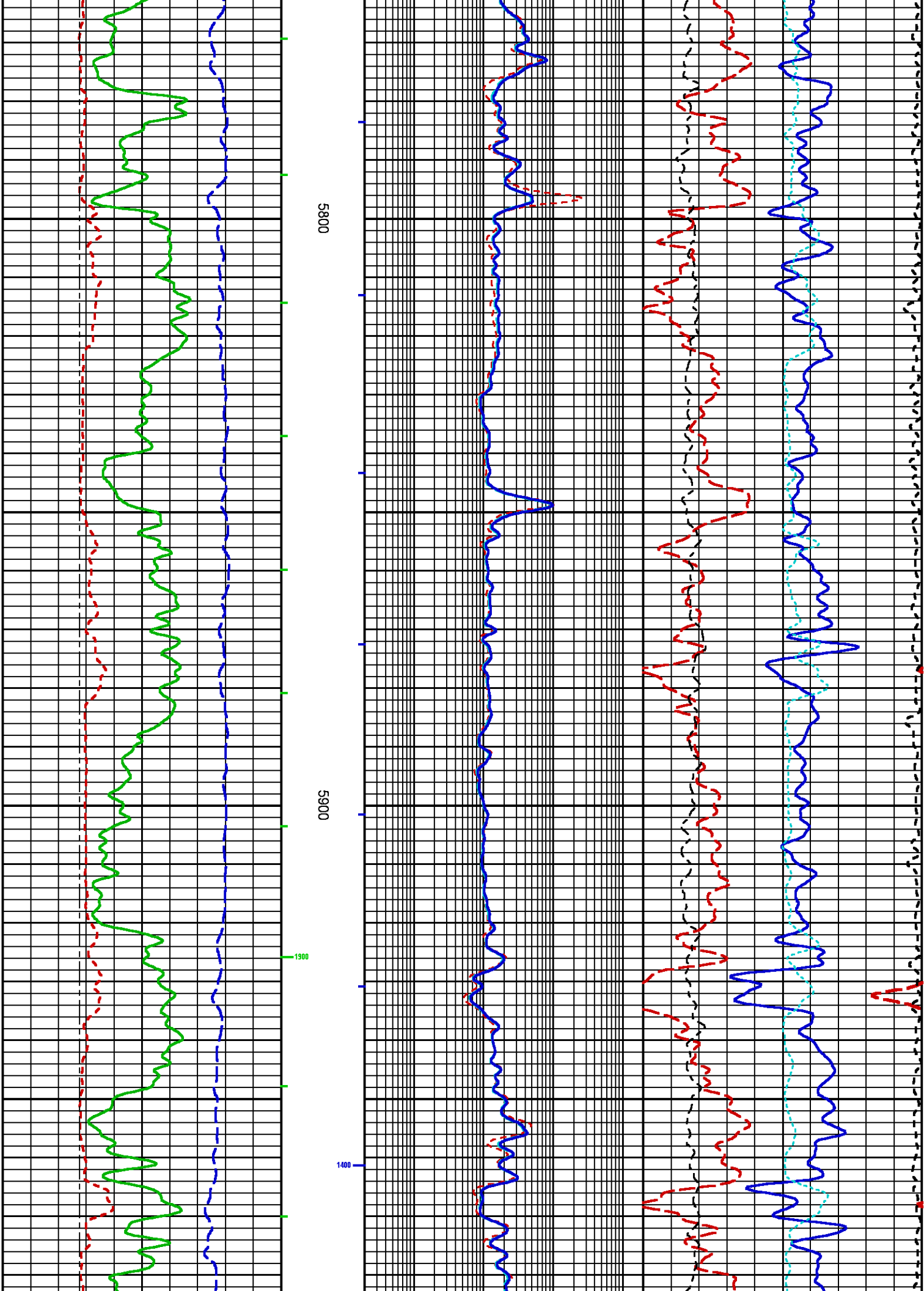
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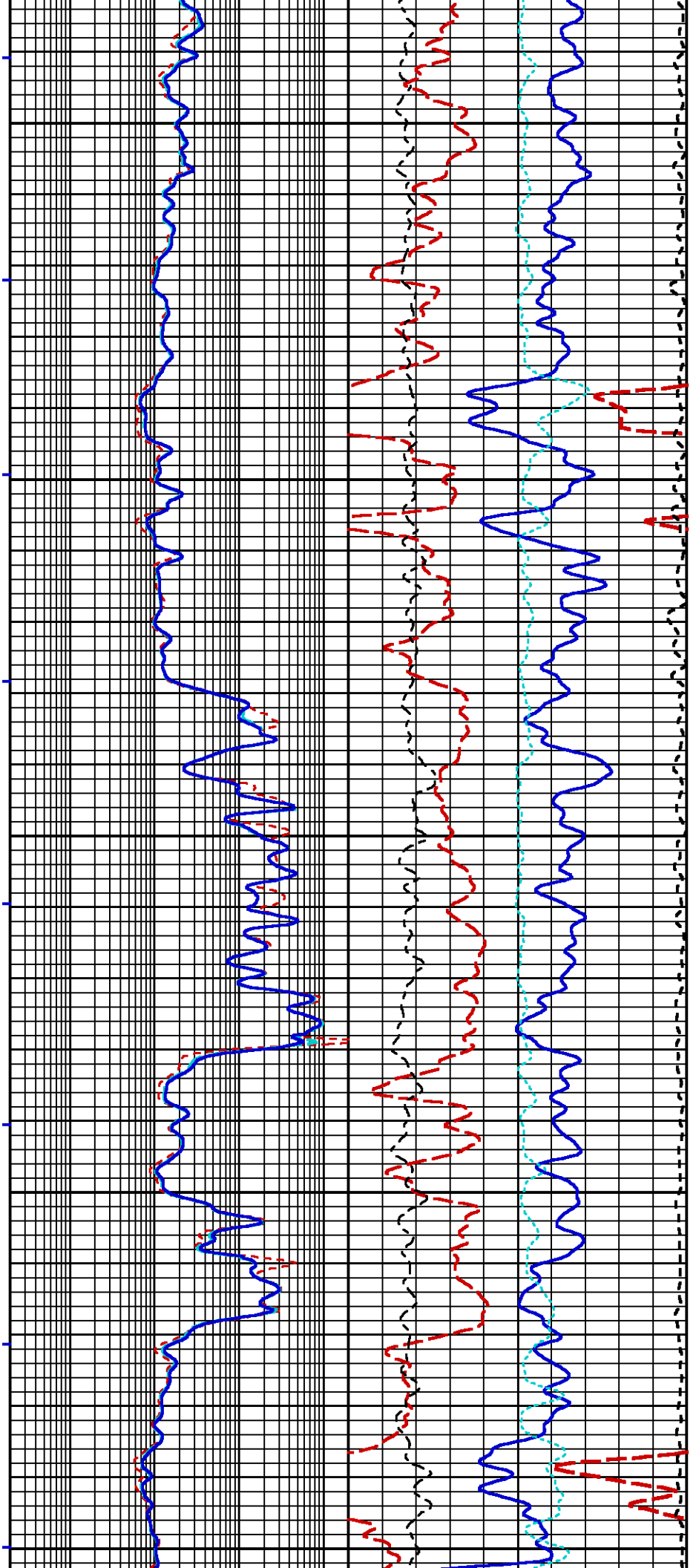
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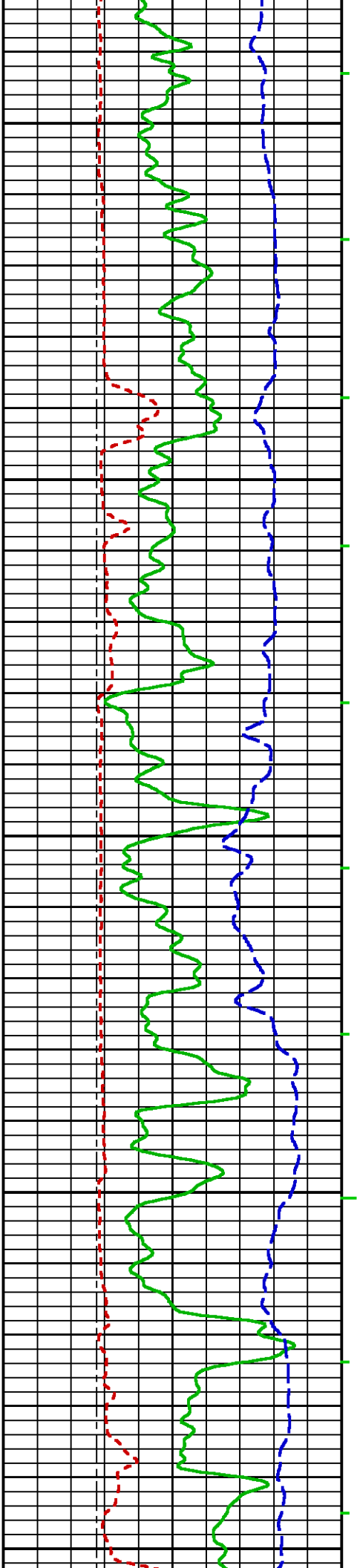


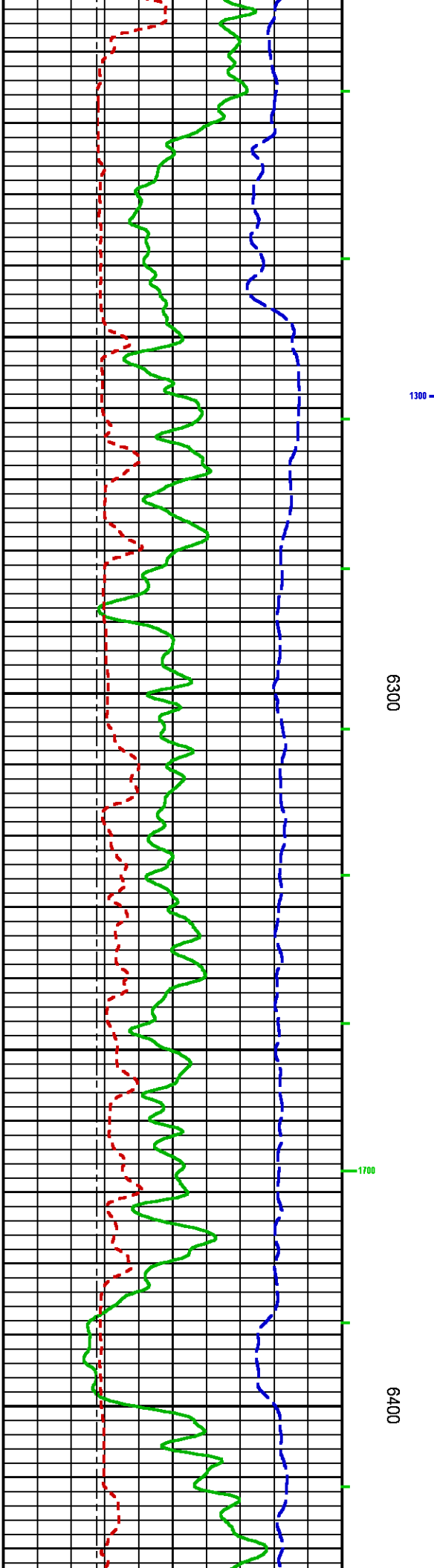
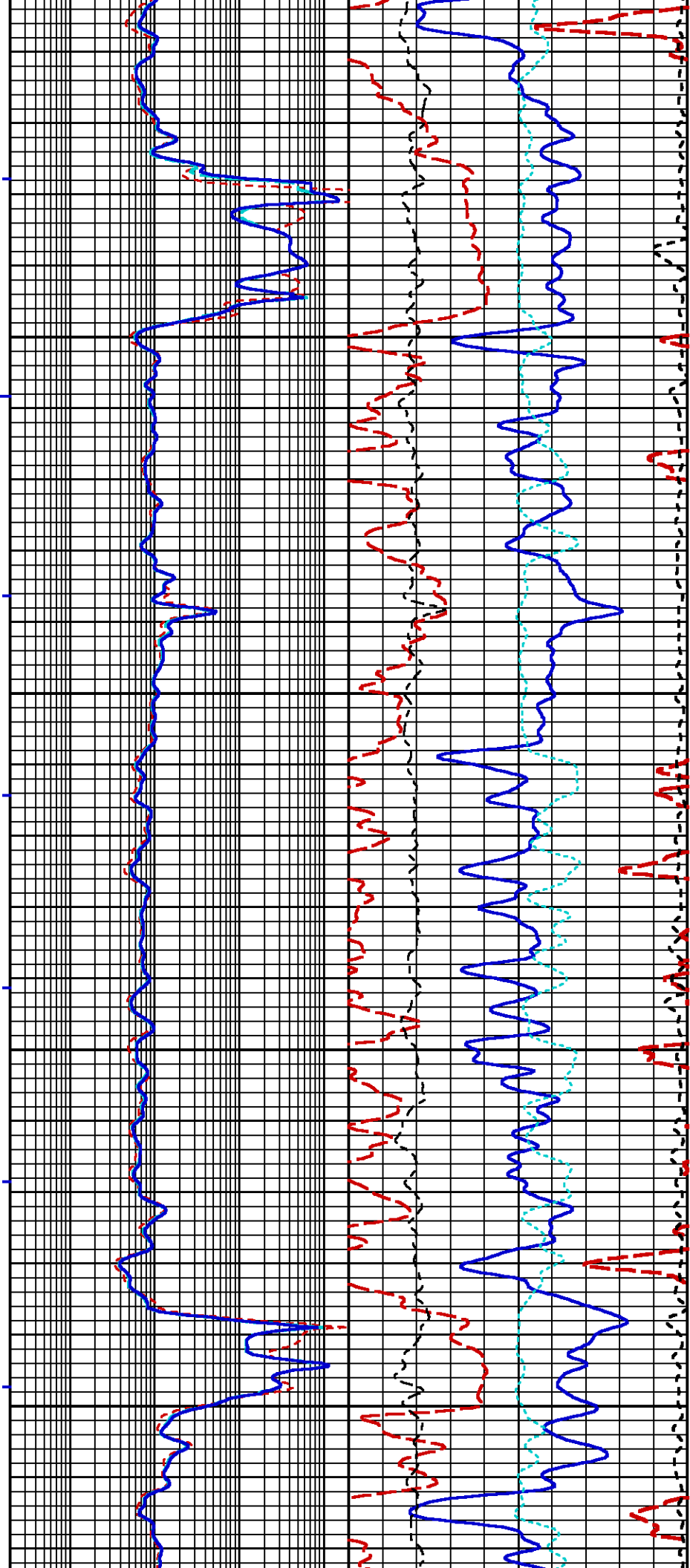
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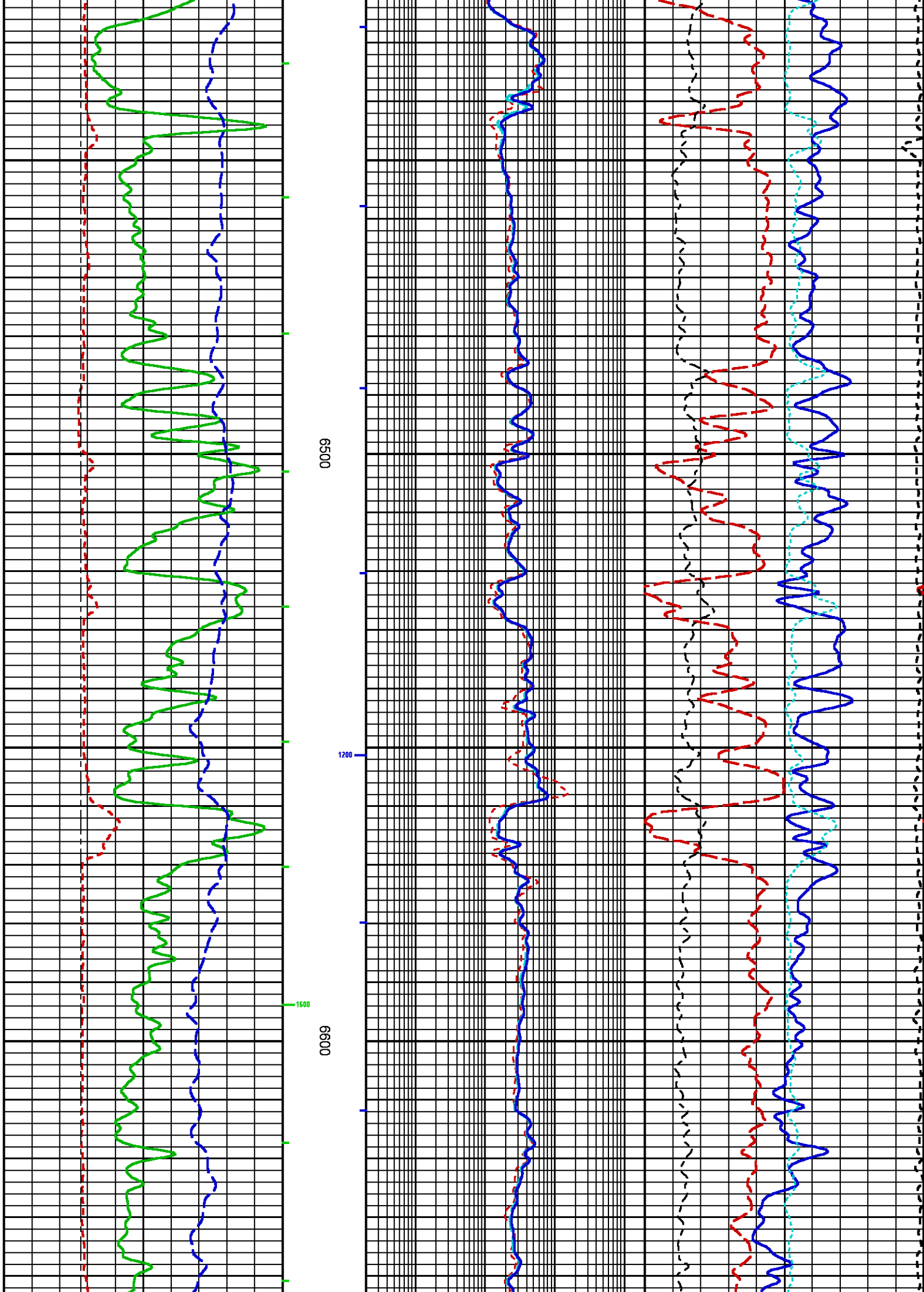
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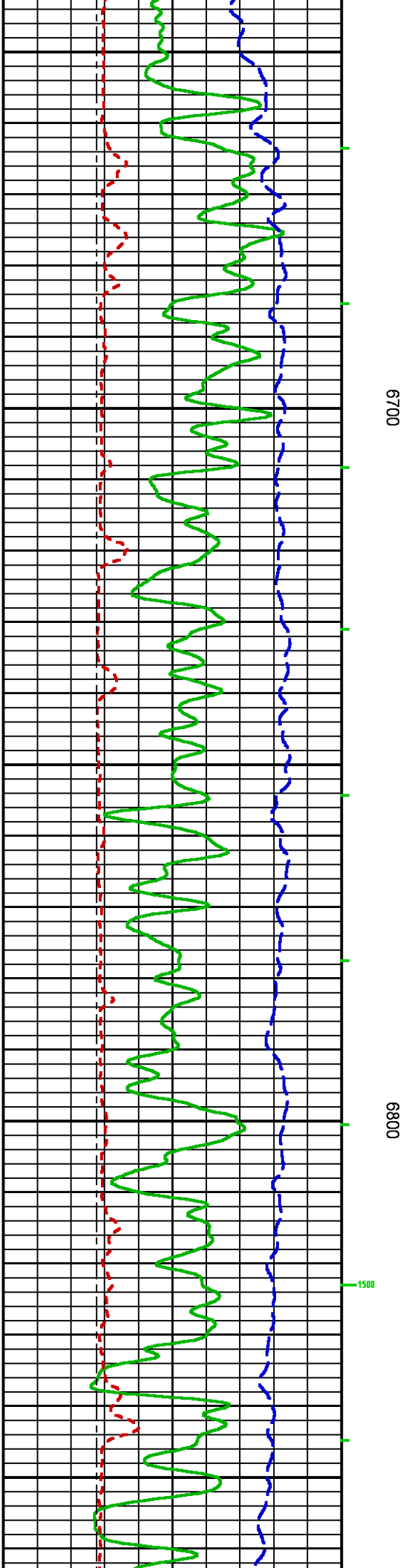
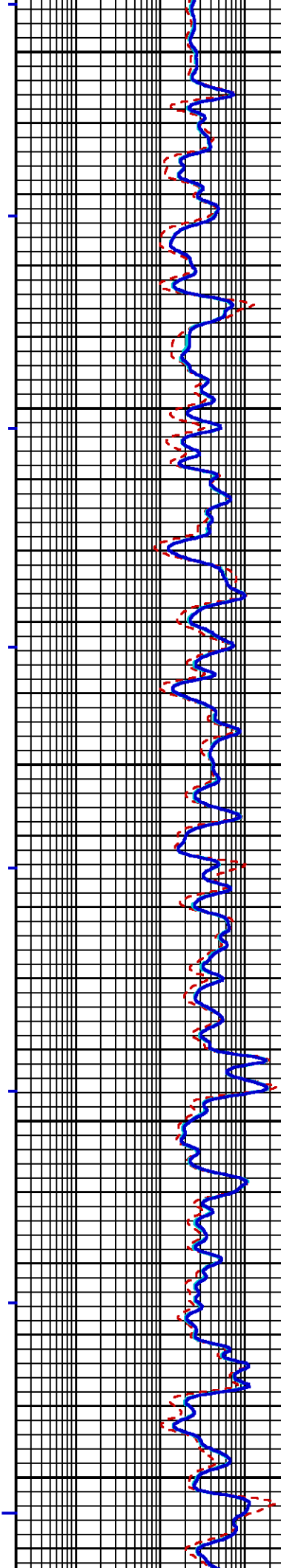
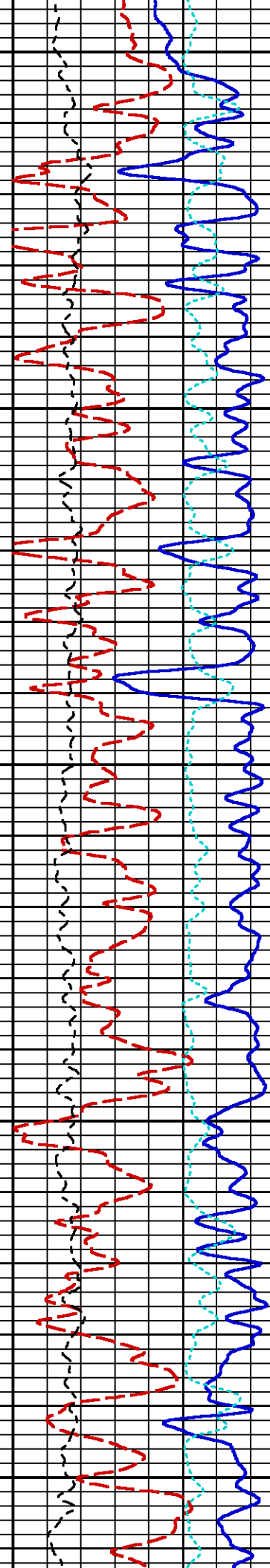
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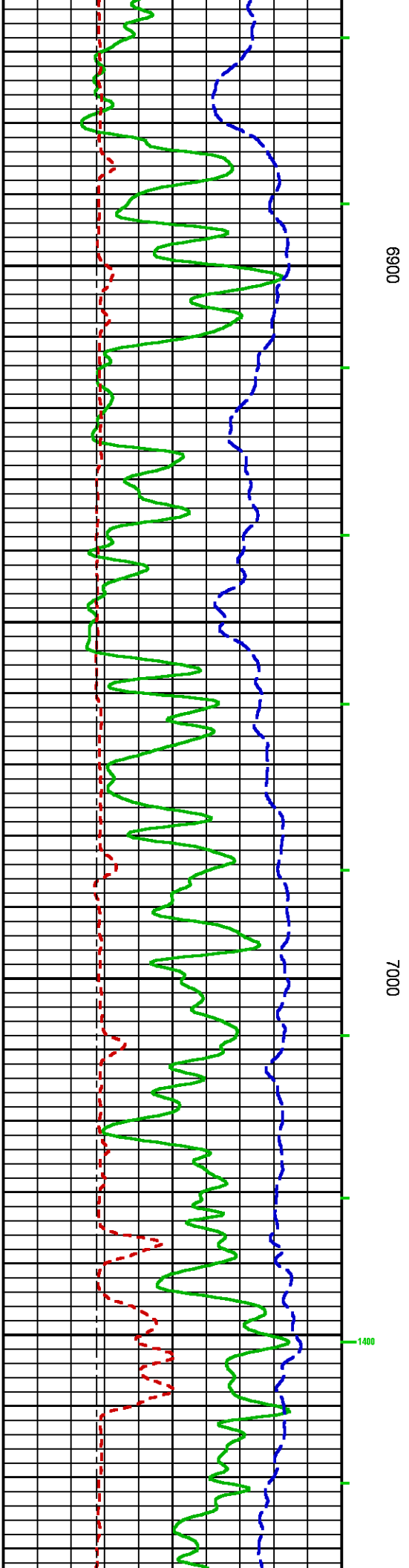
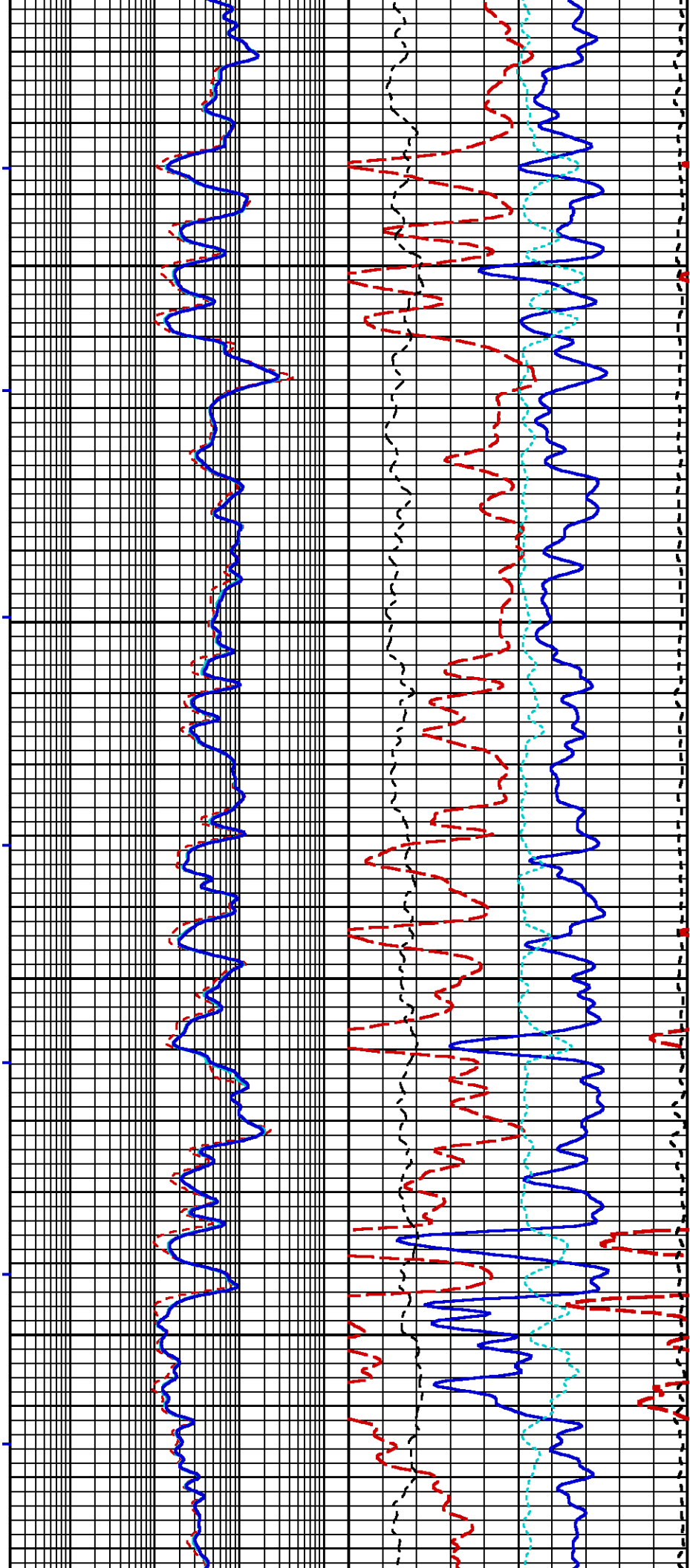




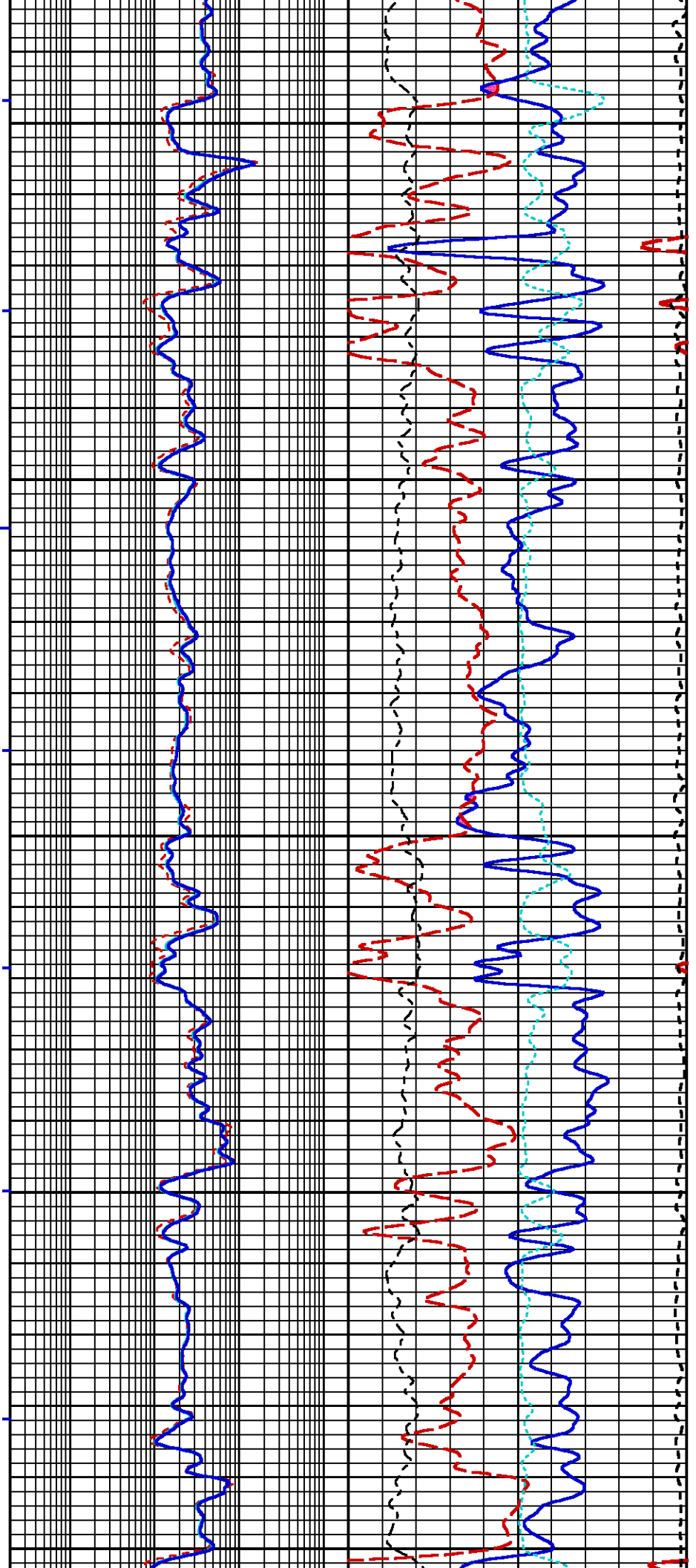










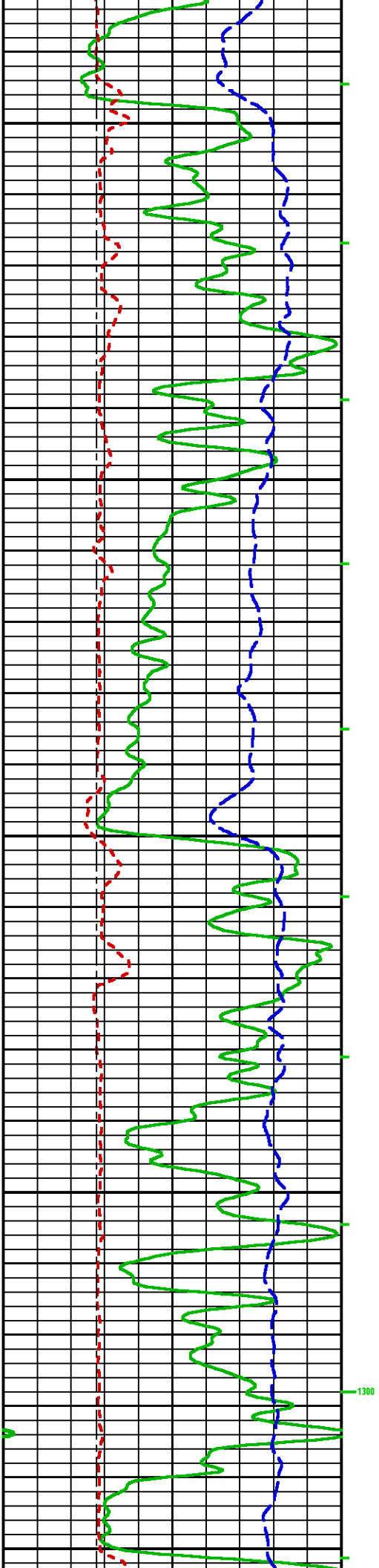


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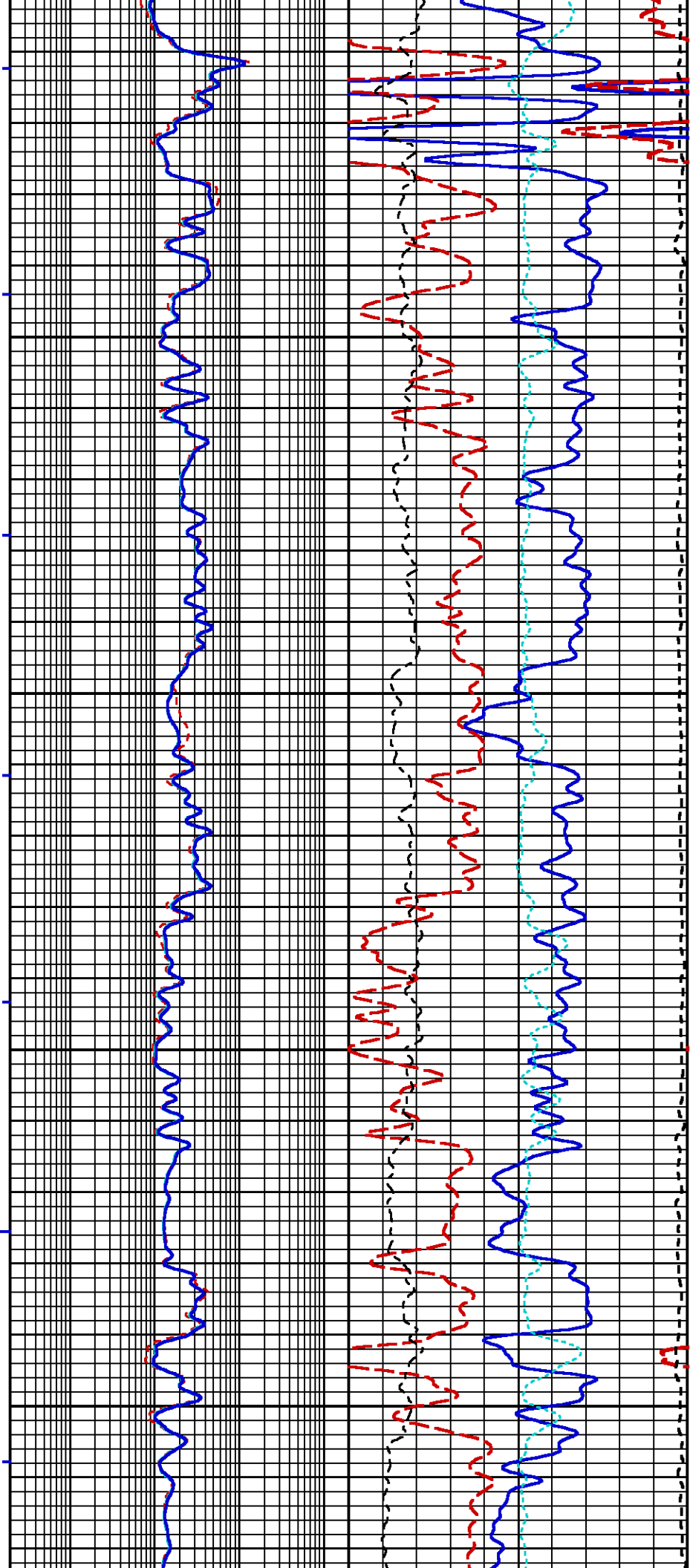
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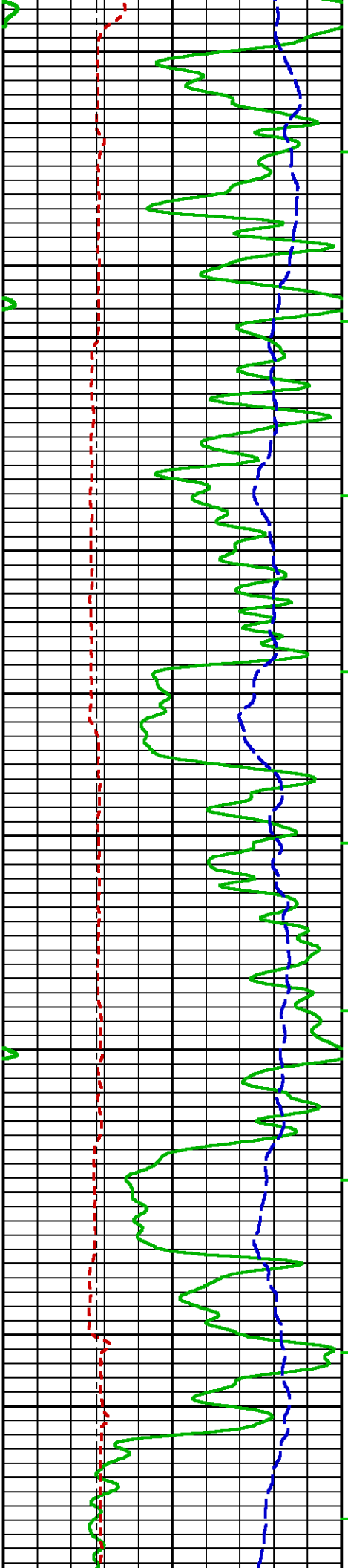
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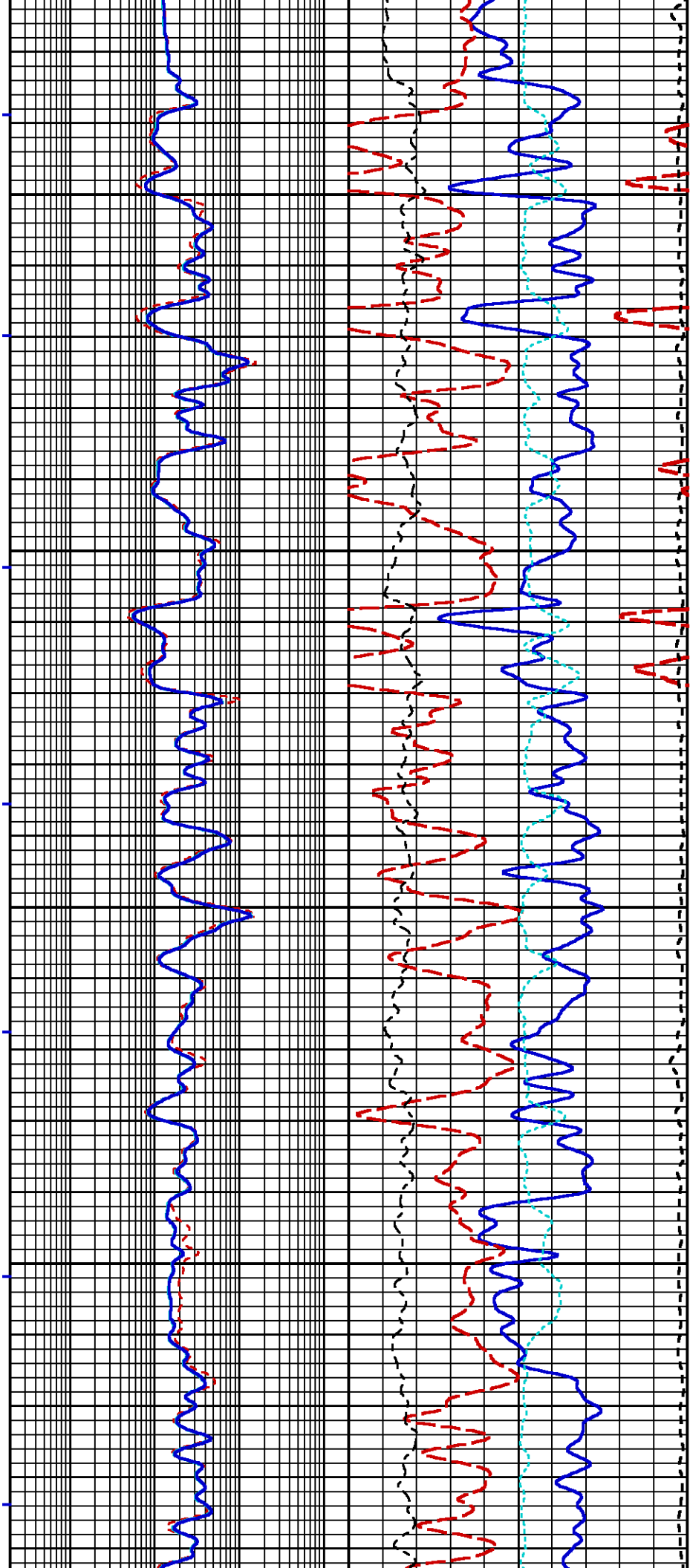


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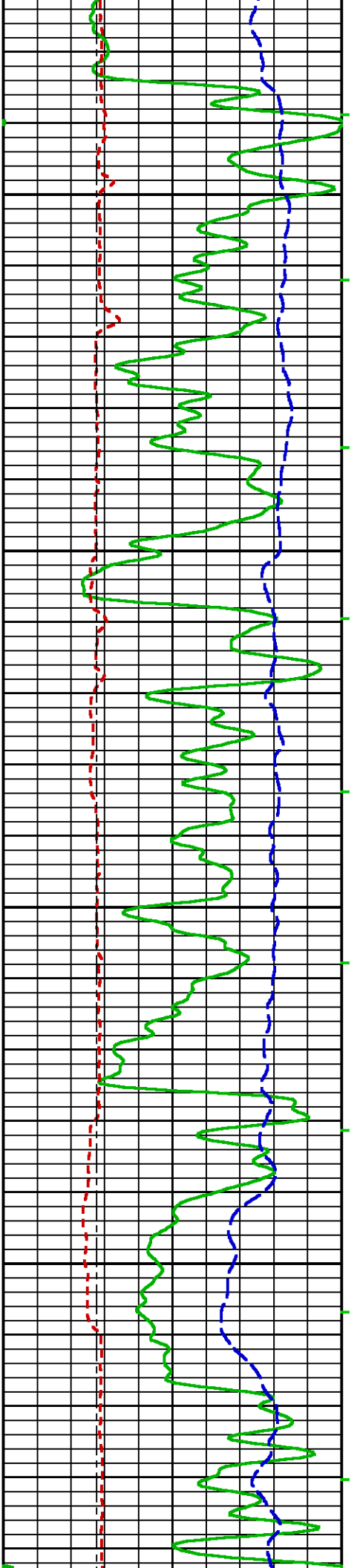
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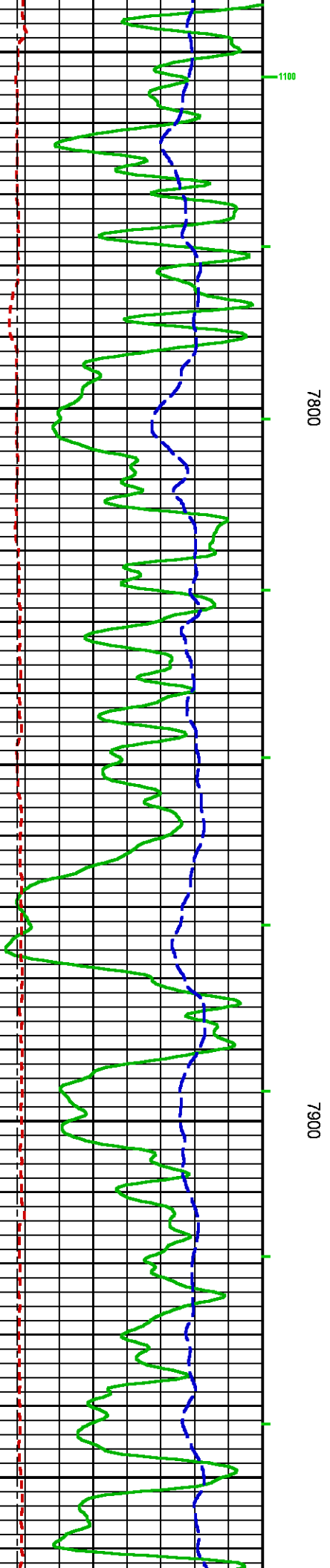
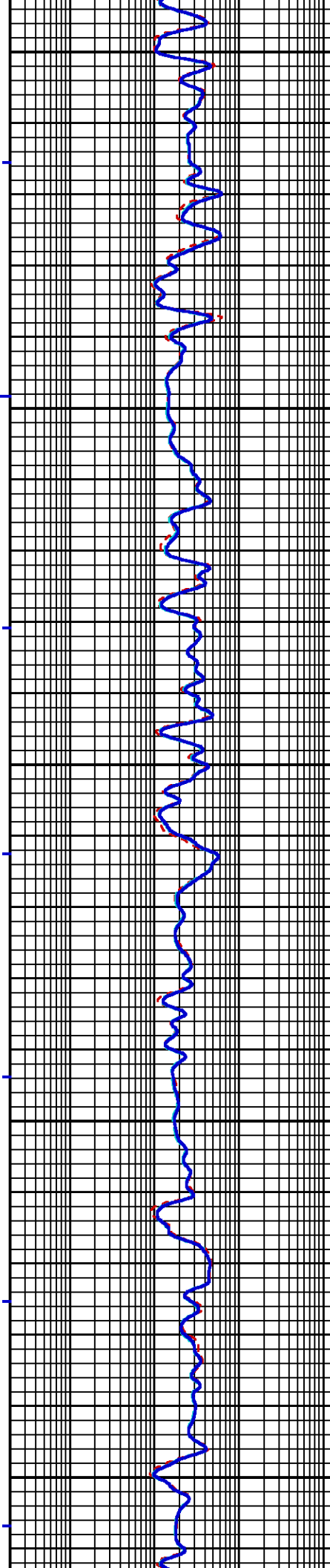
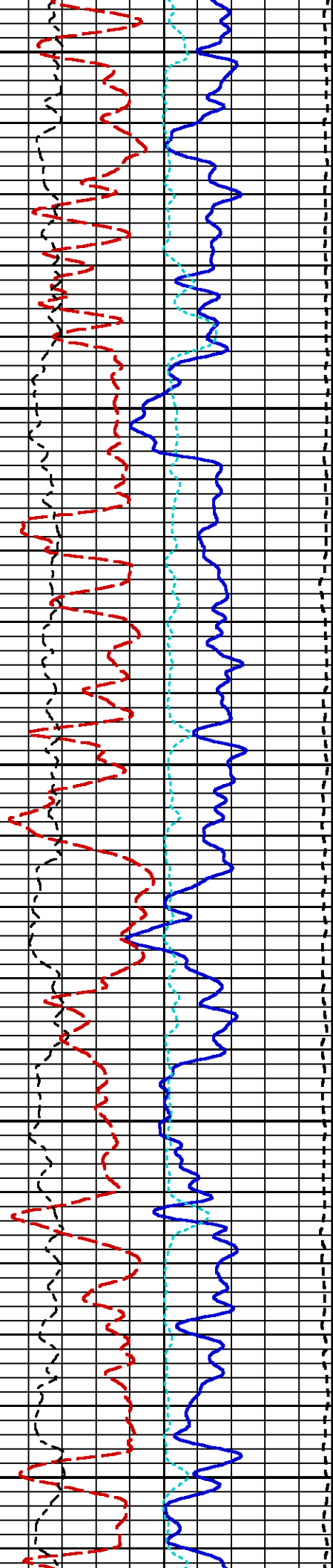


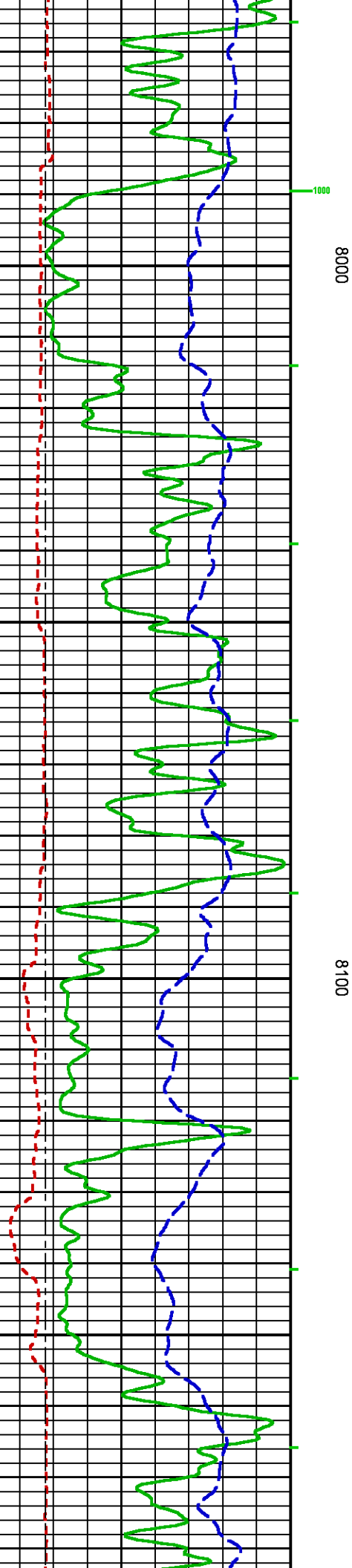
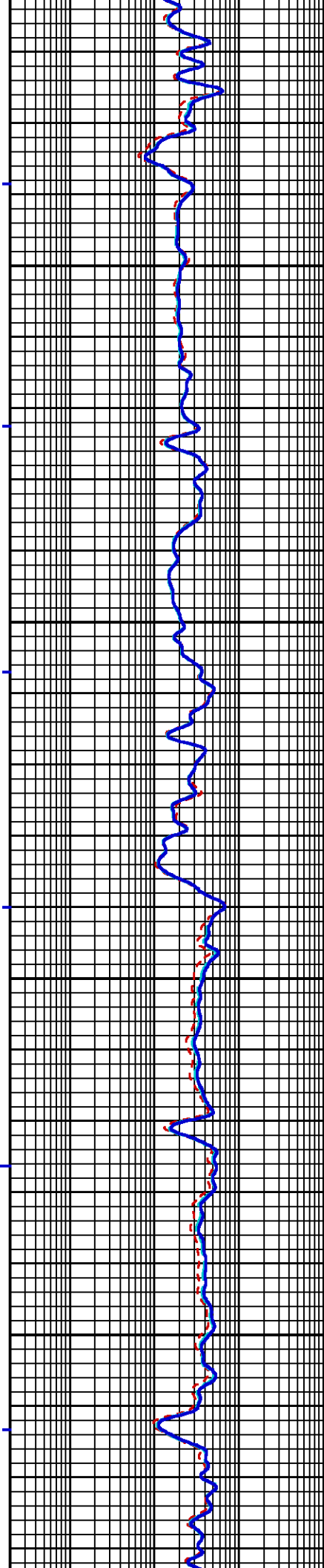
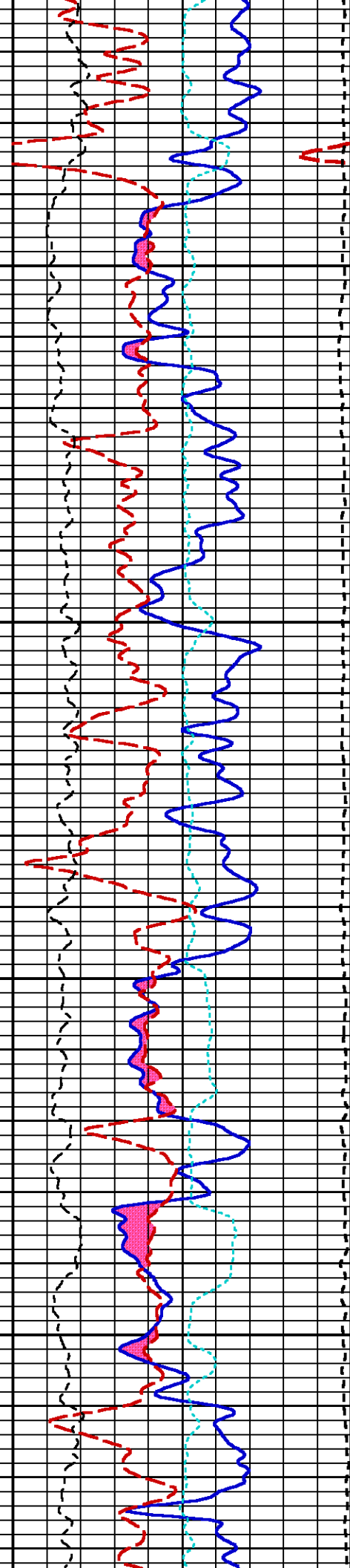


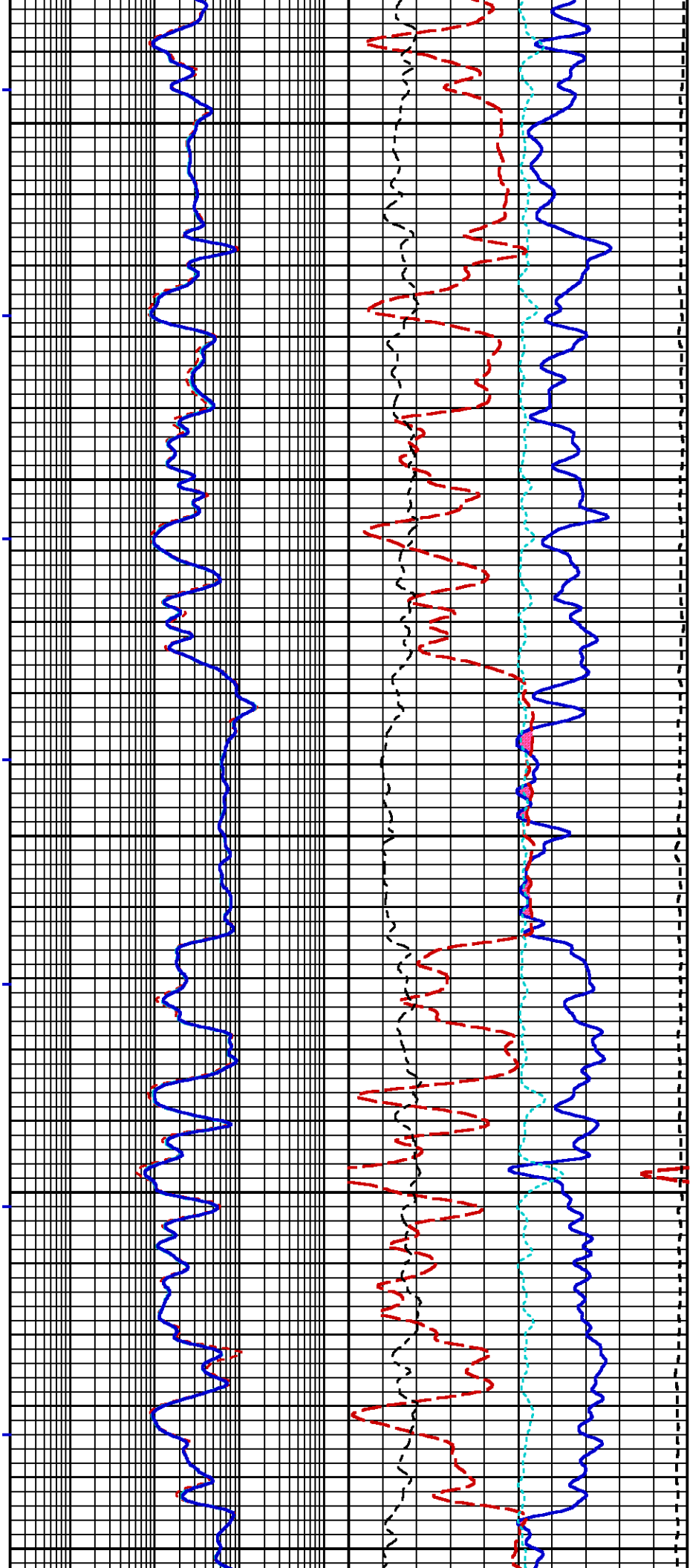
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7700





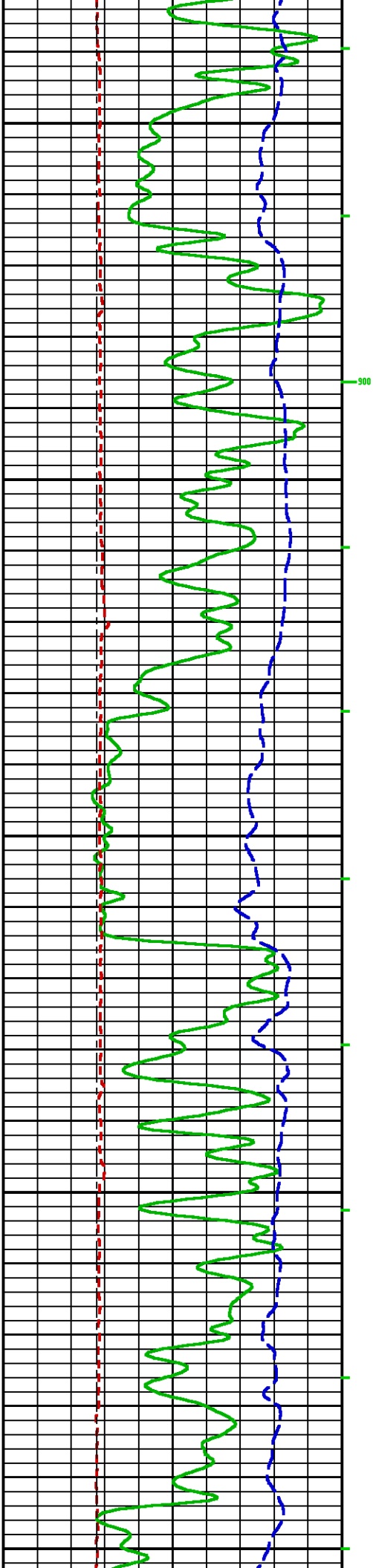




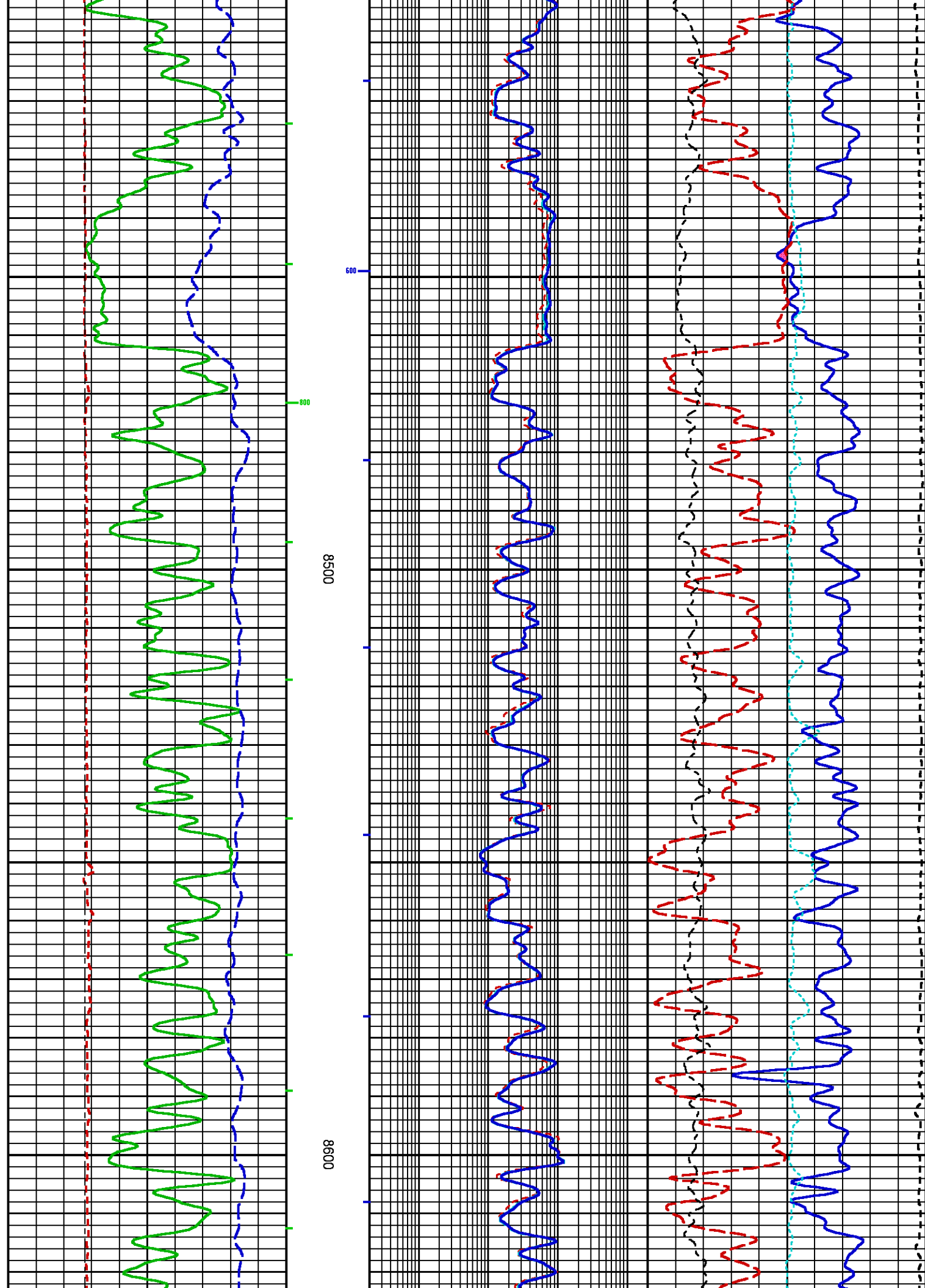
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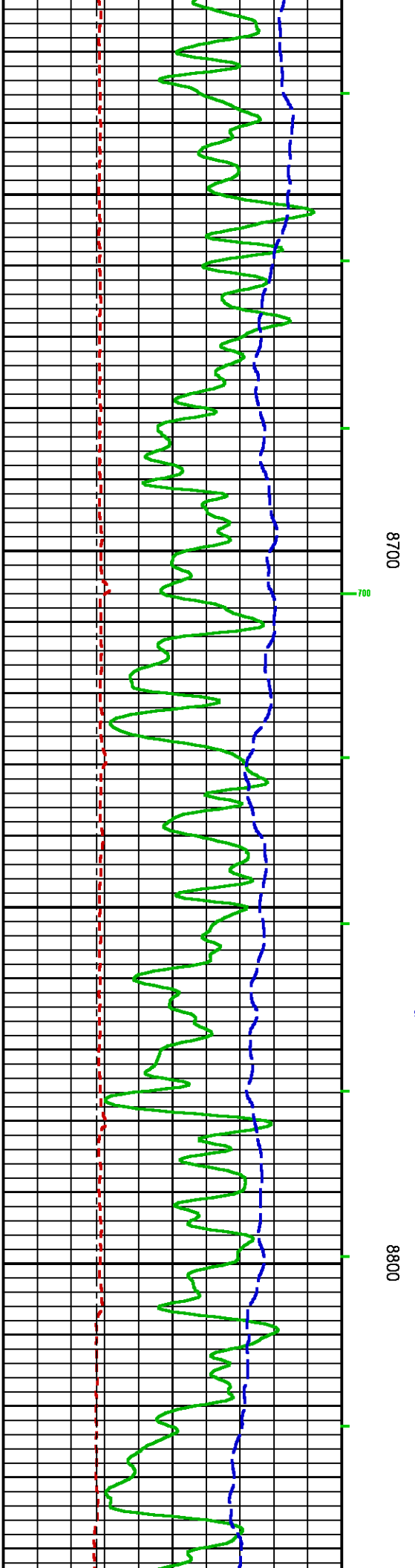
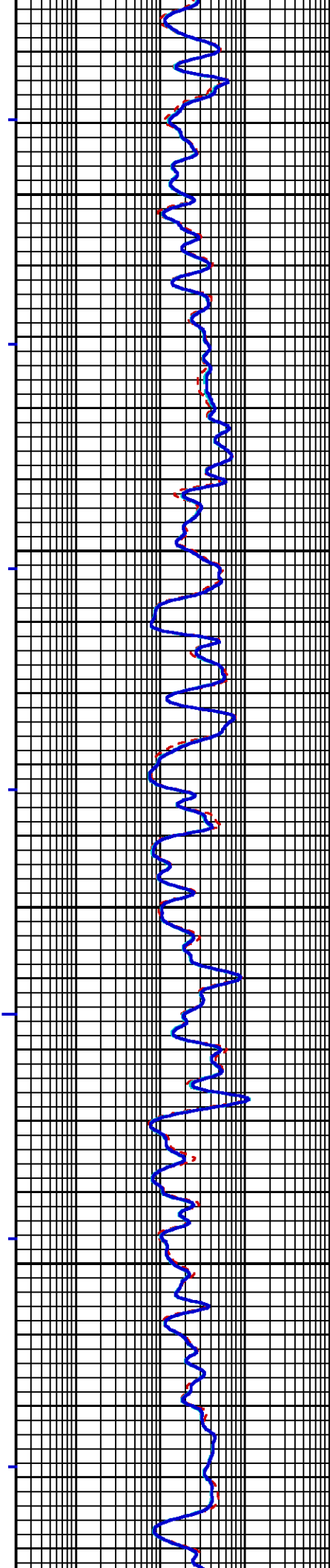
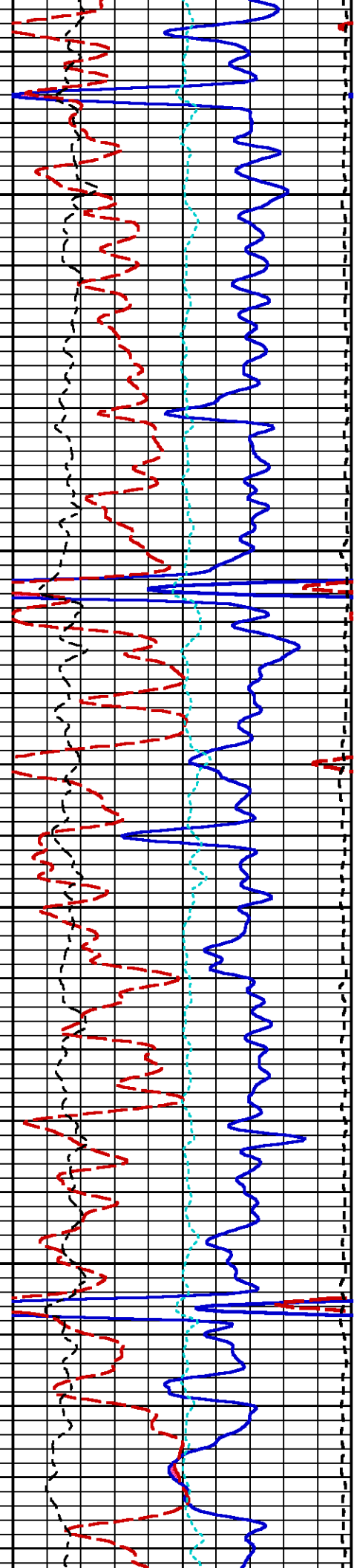
8400



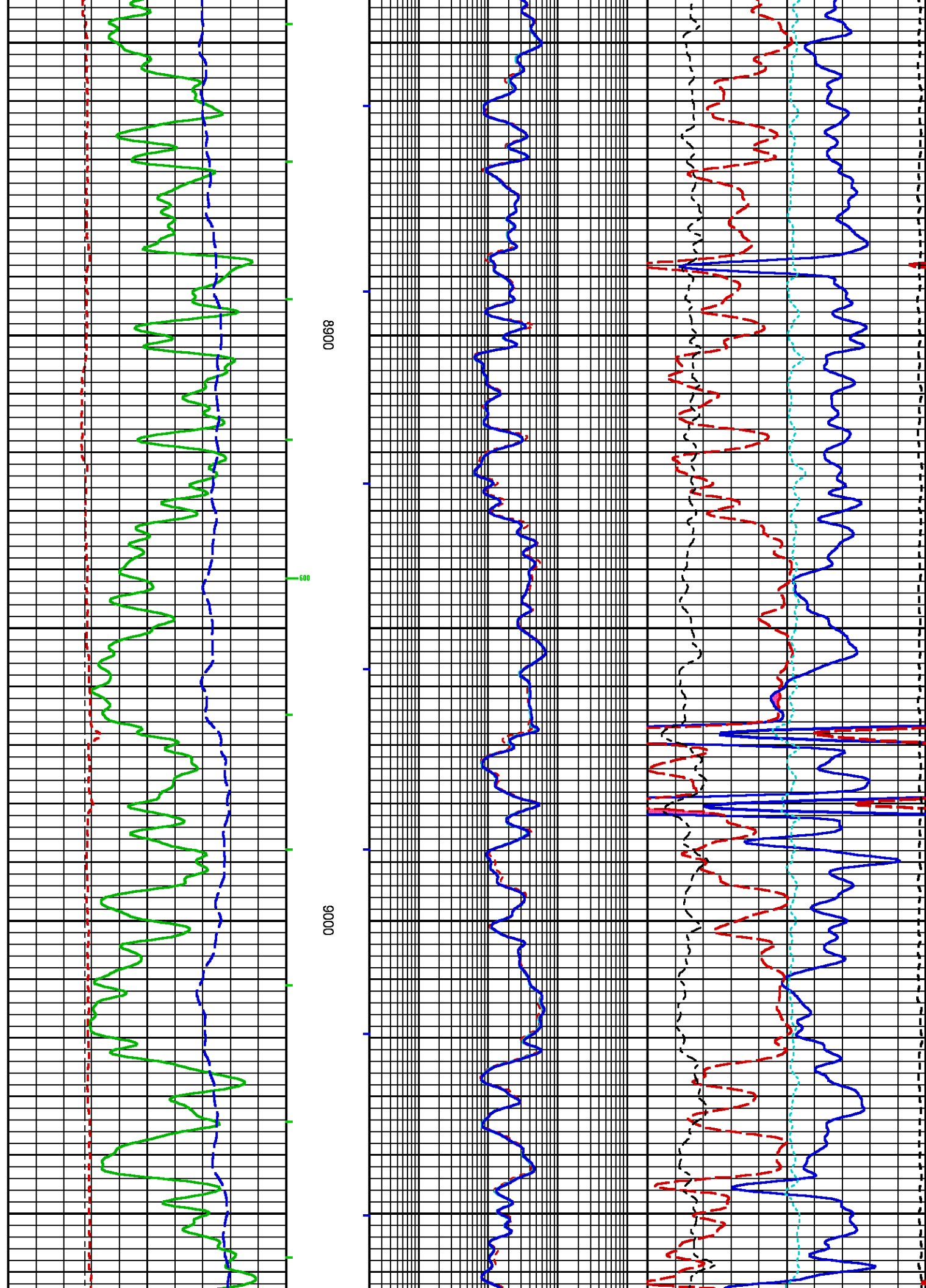
900

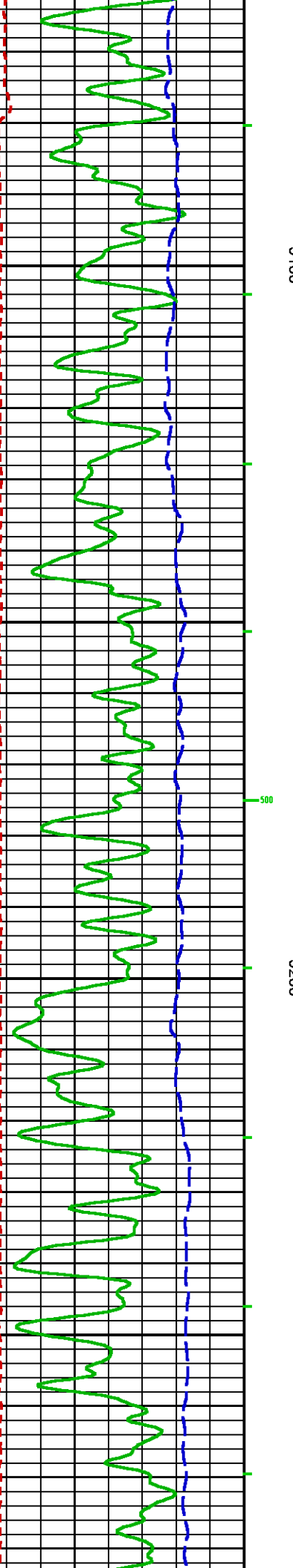
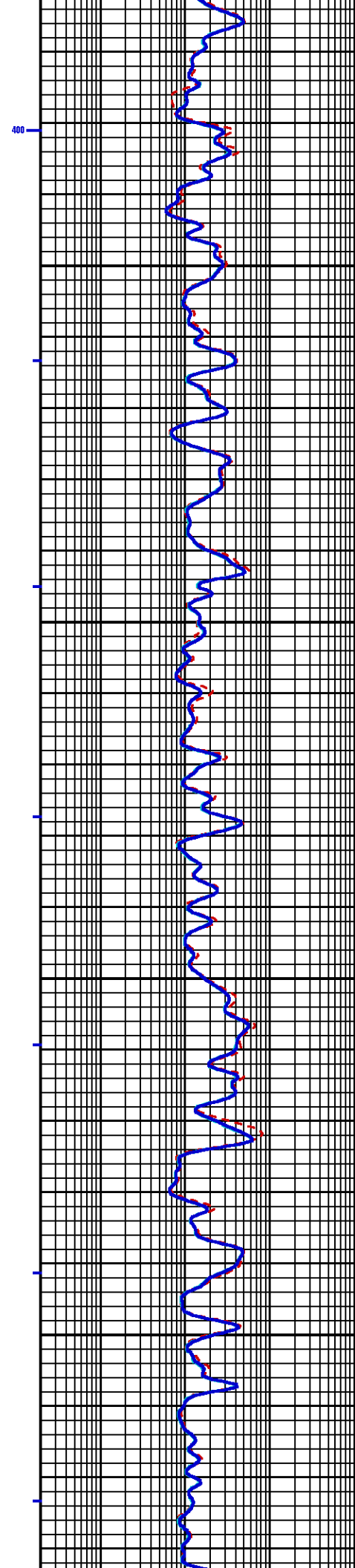
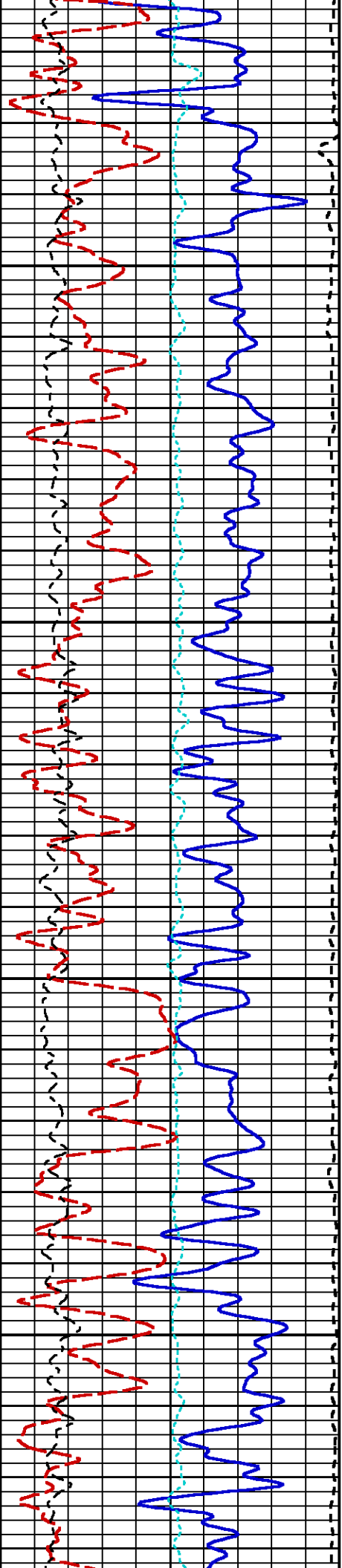


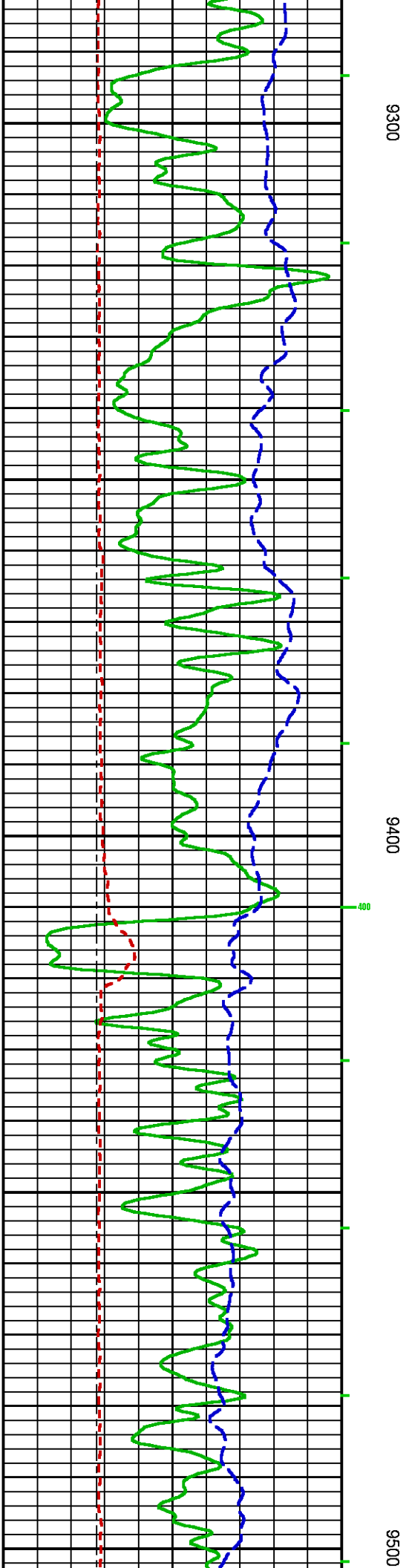
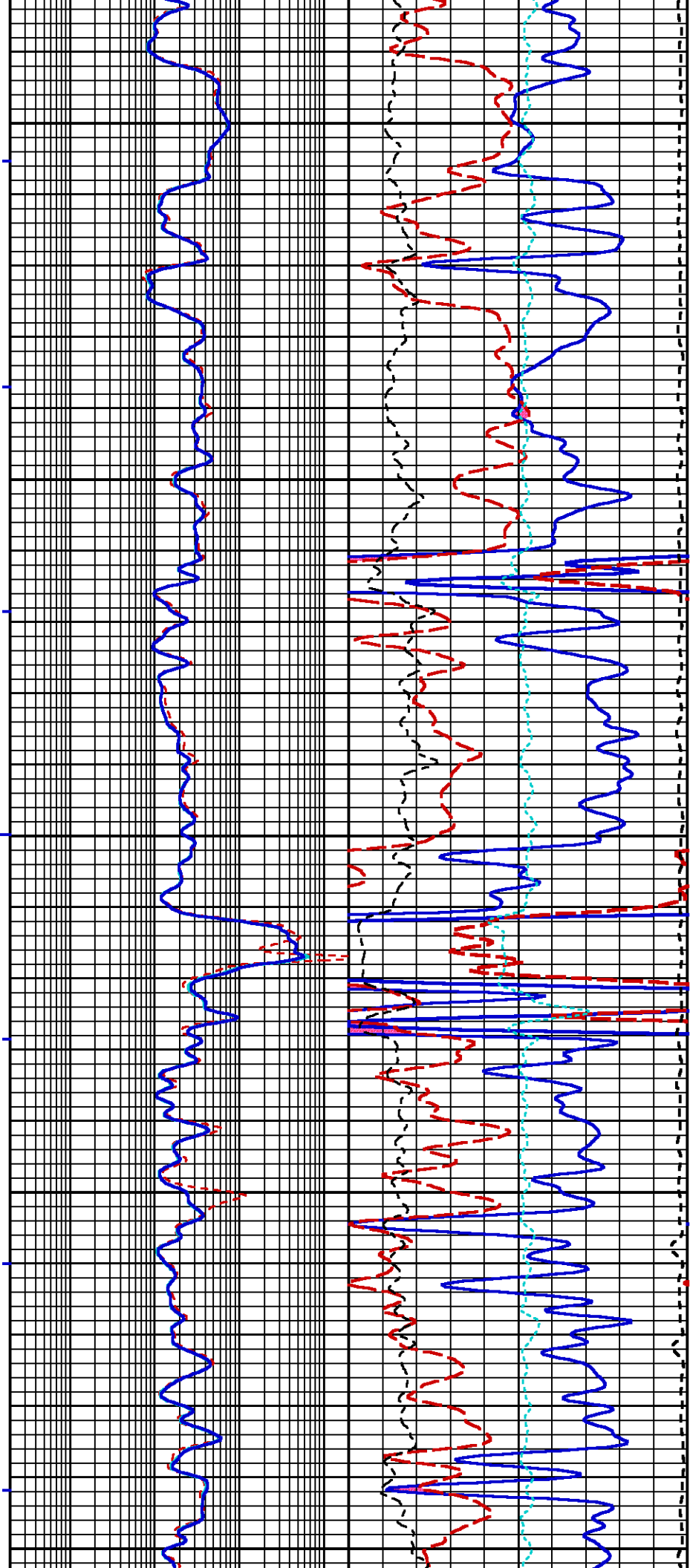


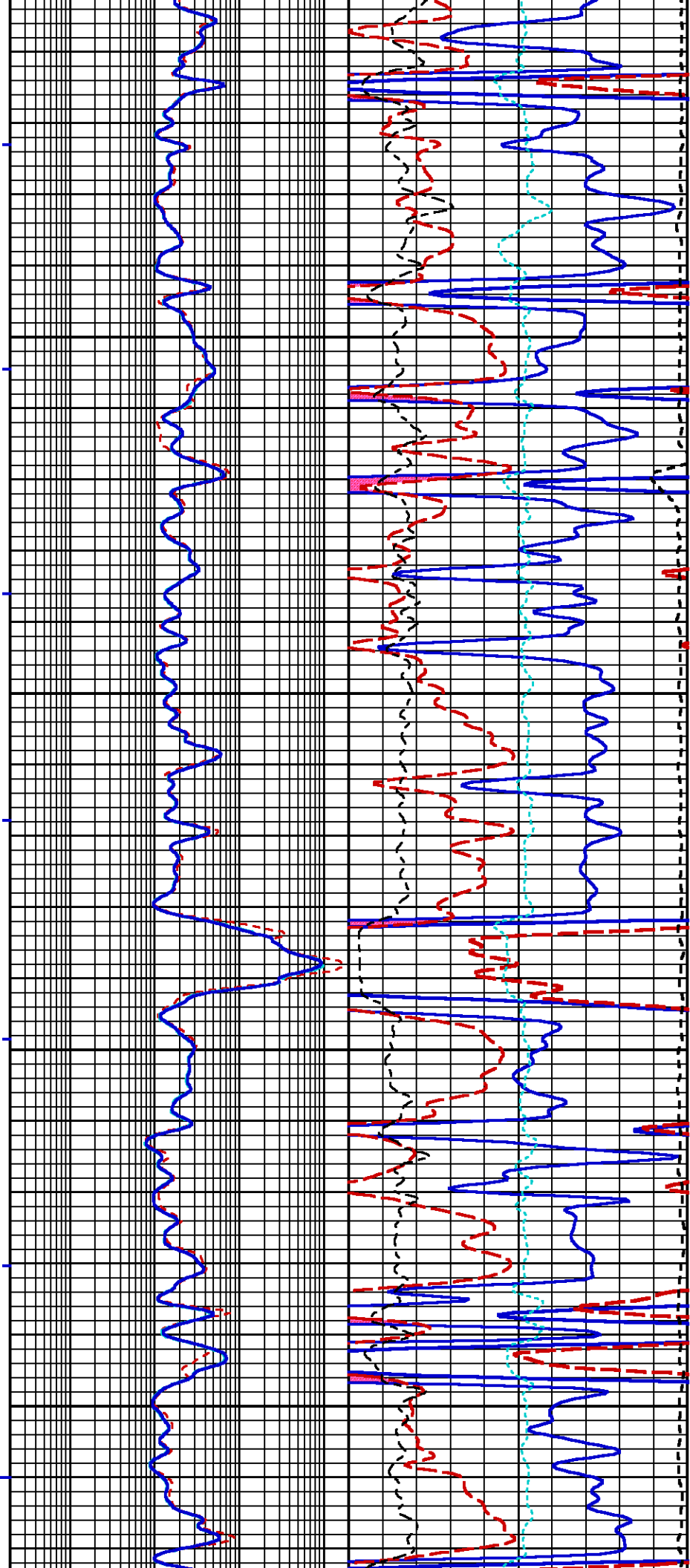






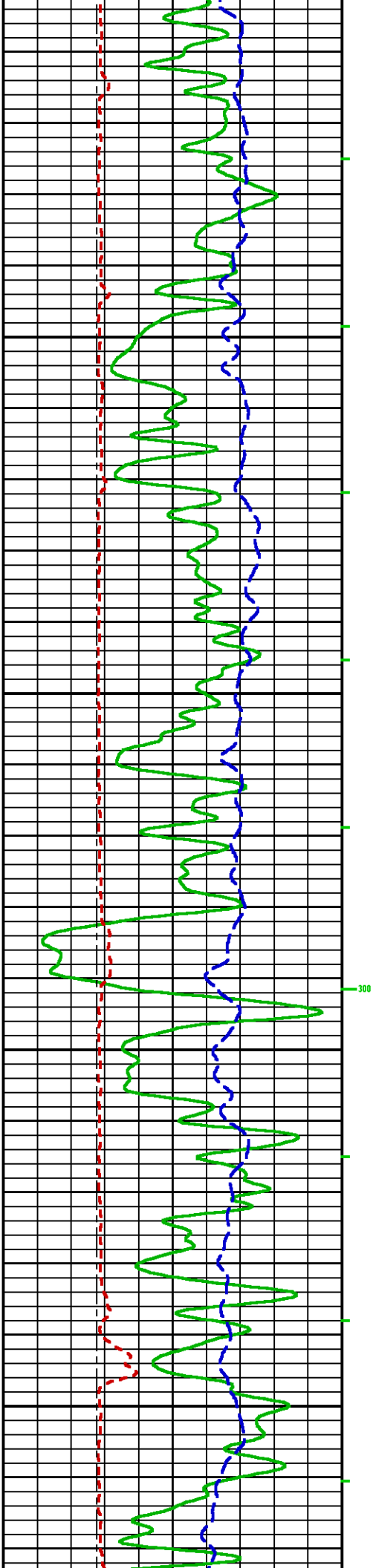


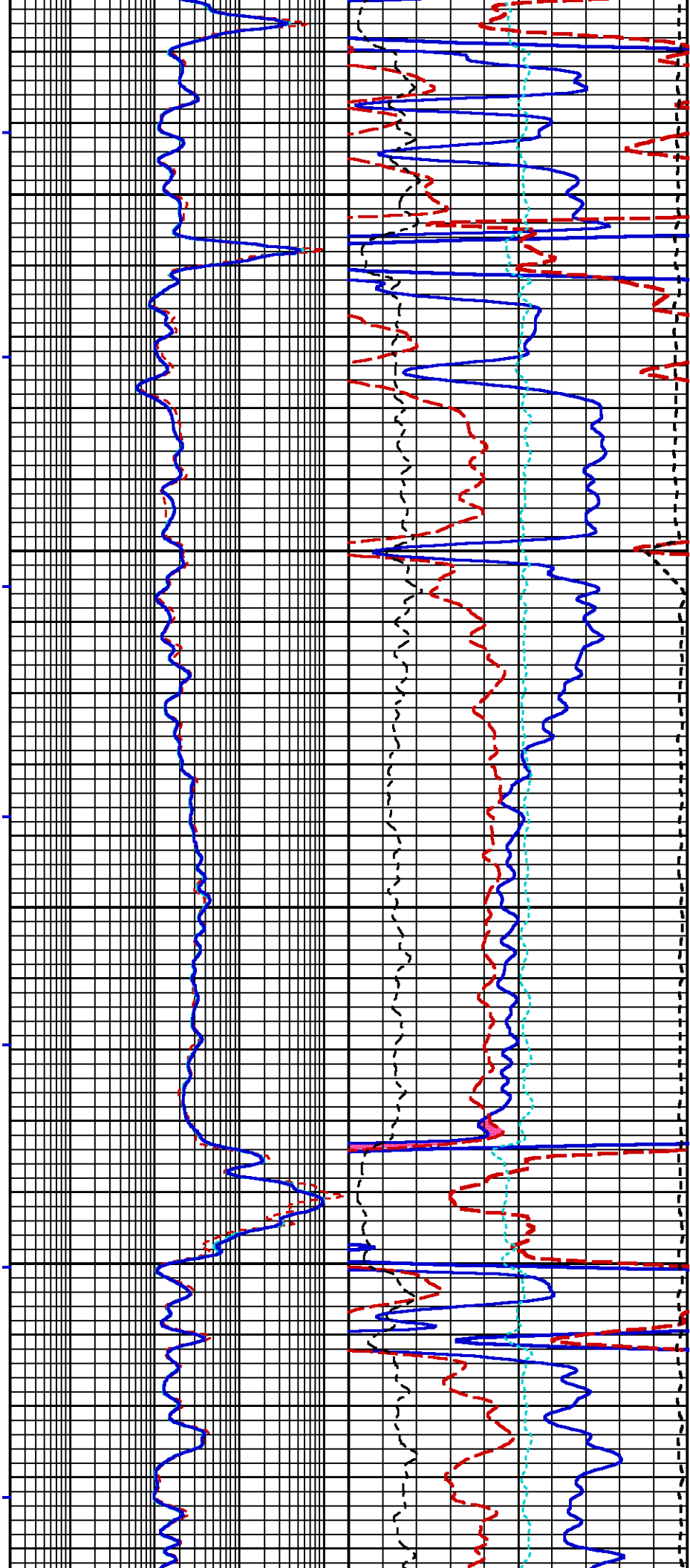
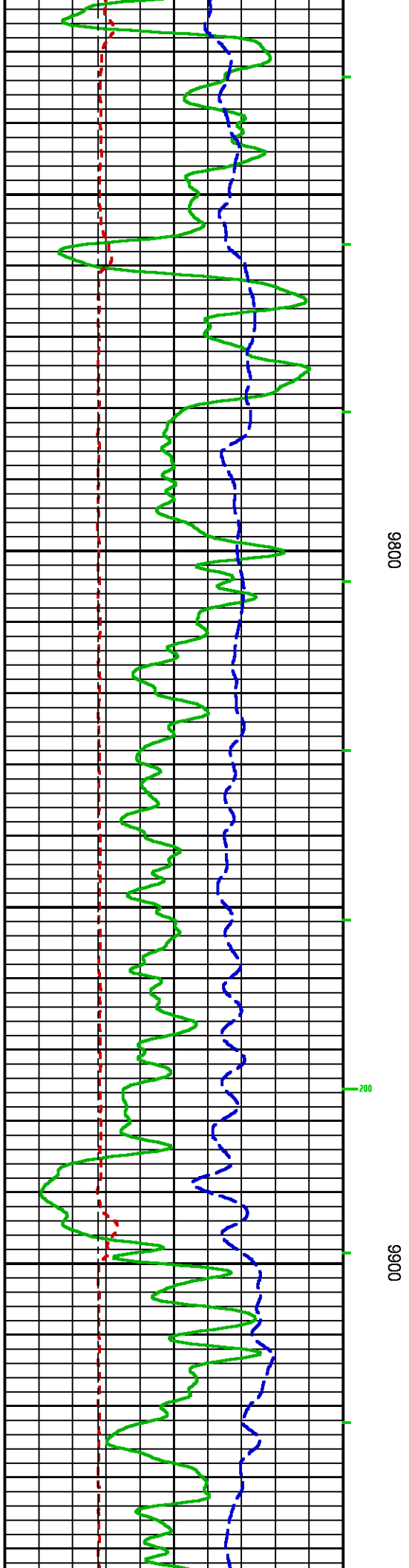


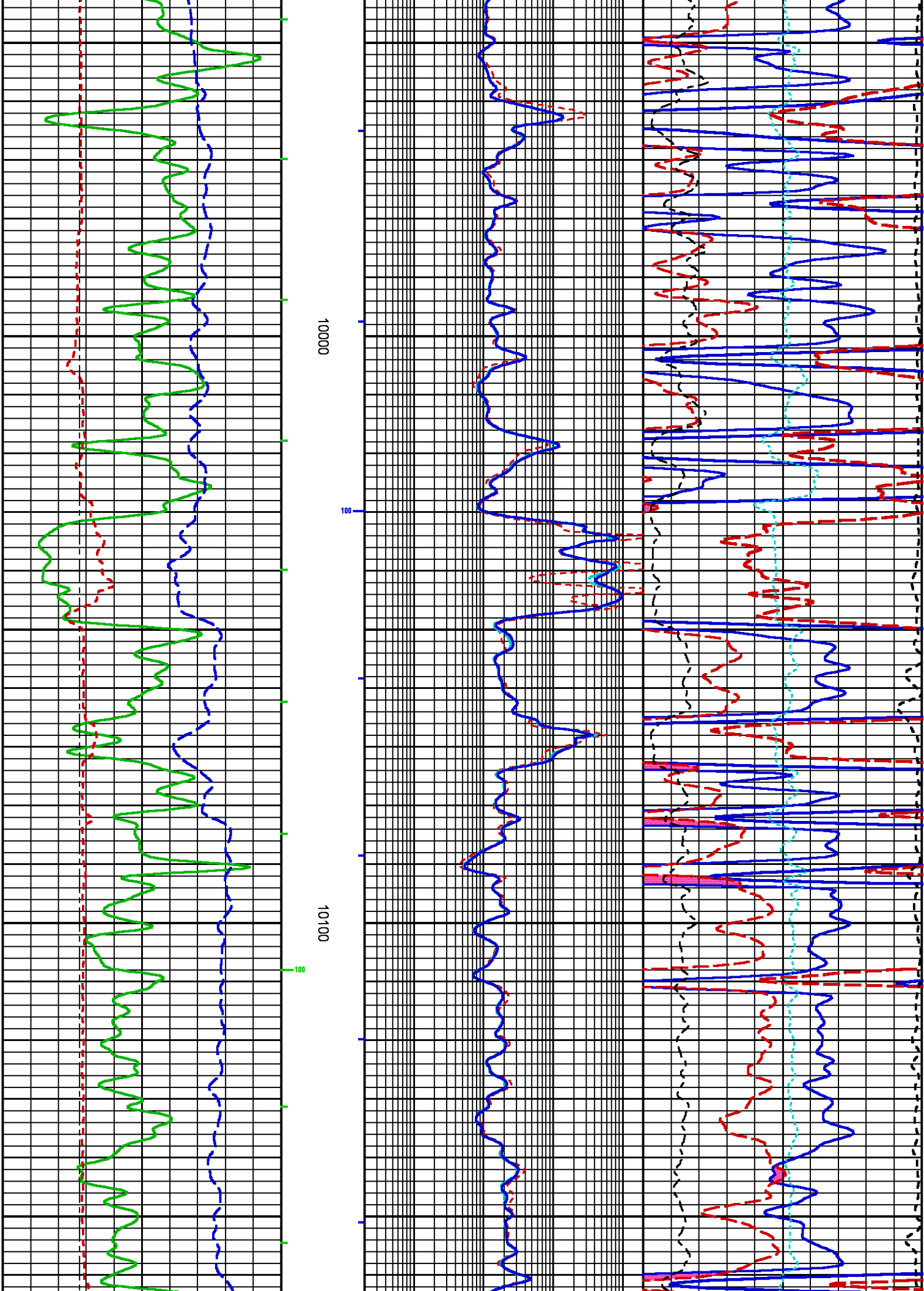


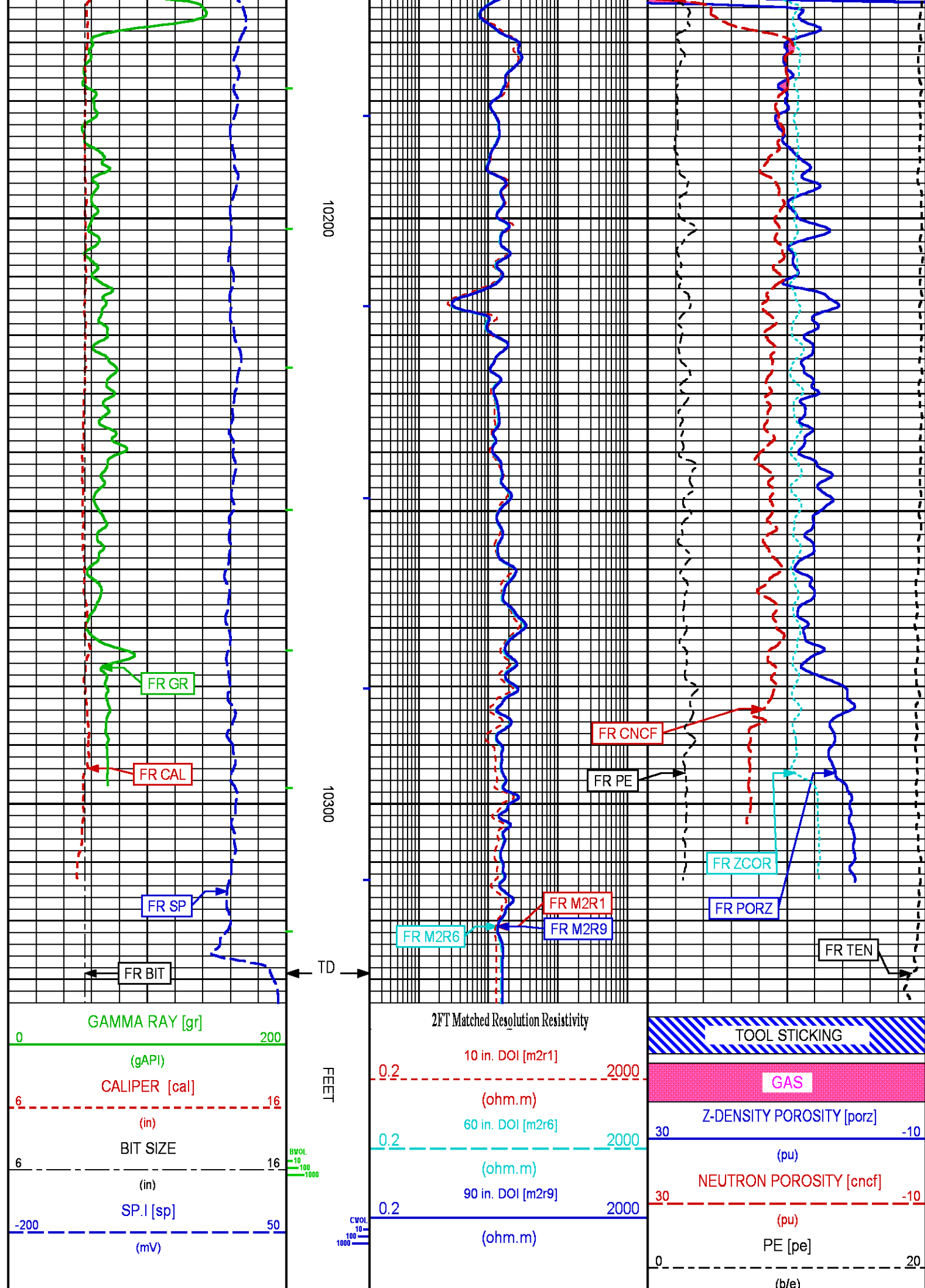
0060

9700









|  |  |  |  |
|--|--|--|--|
|  |  |  | <div>-0.5</div> <div>Z-CORR [zcor]</div> <div>0.5</div> <div>(g/cm3)</div> <div>DIFF. TENSION [ten]</div> <div>4750</div> <div>-250</div> <div>(lbf)</div> |
|--|--|--|--|

## REPEAT LOG

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013

Updates: 1 Patches: 2

Plotted: Wed Aug 27 19:59:29 2014

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/OH089777/n777qR01.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 1049.620 ft BOTTOM DEPTH: 1455.747 ft

#### SYMMETRIC FILTER

| MEASUREMENT TYPE                                 | PARAMETER       | VALUE      | UNITS | INTERVAL (ft) |        |
|--|-----------------|------------|-------|---------------|--------|
| TTRM   | FILTER ()       | medium (1) |       | TOP           | BOTTOM |
|  | FILTER (.h)     | medium (1) |       | "             | "      |
|  | FILTER (.i)     | medium (1) |       | "             | "      |
| Y AXIS CALIPER<br>TENSION<br>GR<br>CN<br>CALIPER | FILTER ()       | medium (1) |       | "             | "      |
|  | FILTER ()       | medium (1) |       | "             | "      |
|  | FILTER ()       | medium (1) |       | "             | "      |
|  | FILTER ()       | medium (1) |       | "             | "      |
|  | FILTER ()       | medium (1) |       | "             | "      |
|  | FILTER (.h)     | medium (1) |       | "             | "      |
| ZDL MED RES                                      | FILTER (.i)     | medium (1) |       | "             | "      |
|  | FILTER (hrd1*)  | medium     |       | "             | "      |
|  | FILTER (hrd1s*) | medium     |       | "             | "      |
|  | FILTER (hrd2*)  | medium     |       | "             | "      |
|  | FILTER (hrd2s*) | medium     |       | "             | "      |
| SP-SPDH  | FILTER (soft*)  | medium     |       | "             | "      |
|  | FILTER ()       | medium (1) |       | "             | "      |
|  | FILTER (.i)     | medium (1) |       | "             | "      |

#### BOREHOLE & CEMENT

| MEASUREMENT TYPE                  | PARAMETER                  | VALUE         | UNITS        | INTERVAL (ft) |        |
|-----------------------------------|----------------------------|---------------|--------------|---------------|--------|
| CASING - BOREHOLE & CEMENT VOLUME | CASING O.D.                | 4.500         | in           | TOP           | BOTTOM |
|                                   | CASING THICKNESS           | 0.000         | in           | "             | "      |
| BIT SIZE                          | BIT SIZE                   | 8.750         | in           | "             | "      |
| MUD SAMPLE RESISTIVITY            | MUD SAMPLE TEMP            | 77.0          | degF         | "             | "      |
|                                   | MUD SAMPLE RES             | 1.000         | ohm.m        | "             | "      |
| BOREHOLE TEMP from GRADIENT       | Known BH REF TEMP          | 77.0          | degF         | "             | "      |
|                                   | at BH REF DEPTH            | 0.0           | ft           | "             | "      |
|                                   | with TEMP GRADIENT         | 1.200         | 0.01 degF/ft | "             | "      |
| BOREHOLE CORR DIAMETER SOURCE     | CALIPER/FIXED DIA. (cnbh*) | USE CALIPER   |              | "             | "      |
|                                   | CALIPER/FIXED DIA. (mbh*)  | USE CALIPER   |              | "             | "      |
| BOREHOLE CORR DIAMETER            | FIXED DIAMETER (cnbh*)     | 8.750         | in           | "             | "      |
|                                   | FIXED DIAMETER (mbh*)      | 8.750         | in           | "             | "      |
| BH MUD RESISTIVITY SOURCE         | RMUD SOURCE (HDIL)         | TOOL MEASURED |              | "             | "      |

#### CN PROCESSING

| MEASUREMENT TYPE | PARAMETER | VALUE | UNITS | INTERVAL (ft) |  |
|------------------|-----------|-------|-------|---------------|--|
|------------------|-----------|-------|-------|---------------|--|



|                               |                      |           |     |     |        |
|-------------------------------|----------------------|-----------|-----|-----|--------|
| 2446 CN MATRIX                | 2446 MATRIX          | SANDSTONE |     | TOP | BOTTOM |
| CN SALINITY CORRECTION        | SALINITY             | 0         | ppm | "   | "      |
| CN TOOL STANDOFF              | ENABLE STANDOFF CORR | OFF       |     | "   | "      |
|                               | STANDOFF AMOUNT      | 0.00      | in  | "   | "      |
| CN CASING & CEMENT CORRECTION | CORRECTION           | OFF       |     | "   | "      |
|                               | BIT SIZE BEHIND CSNG | 7.875     | in  | "   | "      |

### ZDL PROCESSING

| MEASUREMENT TYPE | PARAMETER            | VALUE          | UNITS | INTERVAL (ft) |        |
|------------------|----------------------|----------------|-------|---------------|--------|
| DENSITY POROSITY | RHOmatrix            | 2.680          | g/cm3 | TOP           | BOTTOM |
|                  | RHOfluid             | 1.000          | g/cm3 | "             | "      |
| ZDL              | DENX TRACKING        | ON             |       | "             | "      |
| TRACKING TIME    | Logging Spd for Gain | Over 10 ft/min |       | "             | "      |

### HDIL PROCESSING

| MEASUREMENT TYPE             | PARAMETER        | VALUE      | UNITS | INTERVAL (ft) |        |
|------------------------------|------------------|------------|-------|---------------|--------|
| HDIL TEMPERATURE CORRECTION  | TEMP CORR SOURCE | USE RXTEMP |       | TOP           | BOTTOM |
| ADAPTIVE BOREHOLE CORRECTION | ABC PROCESSING   | ON         |       | "             | "      |
|                              | ABC to CALCULATE | STANDOFF   |       | "             | "      |
|                              | STANDOFF         | 0.75       | in    | "             | "      |
|                              | TOOL POSITION    | ECCENTERED |       | "             | "      |
|                              | Rmud MULTIPLIER  | 1.000      |       | "             | "      |

### CURVE DESCRIPTION REPORT

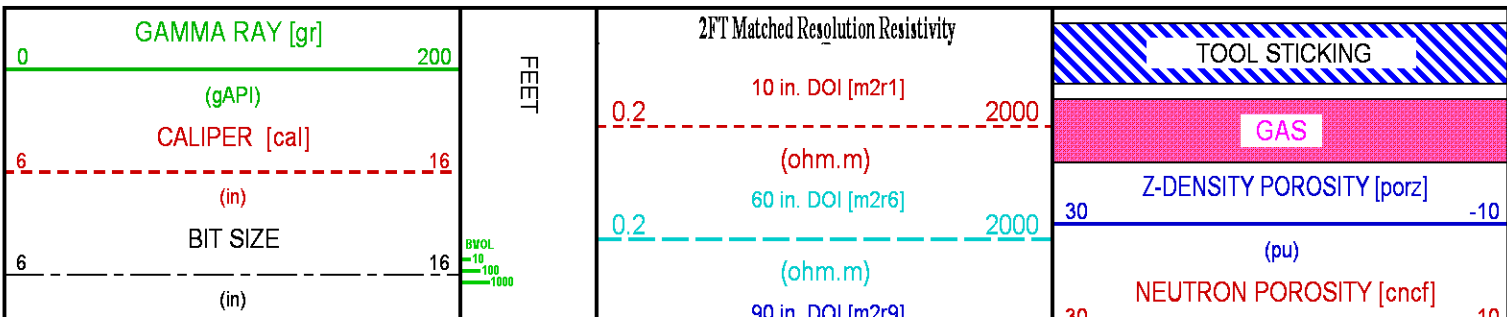
| CURVE NAME | CREATION DATE        | CURVE DESCRIPTION   |
|------------|----------------------|---|
| F1:BIT     | Aug 27 13:26:44 2014 | BIT SIZE  |
| F1:BVOL    | Aug 27 13:26:44 2014 | BOREHOLE VOLUME   |
| F1:CAL     | Aug 27 13:26:44 2014 | CALIPER   |
| F1:CNCF    | Aug 27 13:26:44 2014 | FIELD NORMALIZED COMPENSATED NEUTRON POROSITY               |
| F1:CVOL    | Aug 27 13:26:44 2014 | CEMENT VOLUME   |
| F1:GR      | Aug 27 13:26:44 2014 | GAMMA RAY   |
| F1:M2R1    | Aug 27 13:26:44 2014 | VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI |
| F1:M2R6    | Aug 27 13:26:44 2014 | VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI |
| F1:M2R9    | Aug 27 13:26:44 2014 | VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI |
| F1:PE      | Aug 27 13:26:44 2014 | PHOTO ELECTRIC CROSS-SECTION                                |
| F1:PORZ    | Aug 27 13:26:44 2014 | POROSITY FOR SELECTABLE MATRIX                              |
| F1:SP      | Aug 27 13:26:44 2014 | SPONTANEOUS POTENTIAL                                       |
| F1:TEN     | Aug 27 13:26:44 2014 | DIFFERENTIAL TENSION  |
| F1:ZCOR    | Aug 27 13:26:44 2014 | DENSITY CORRECTION  |

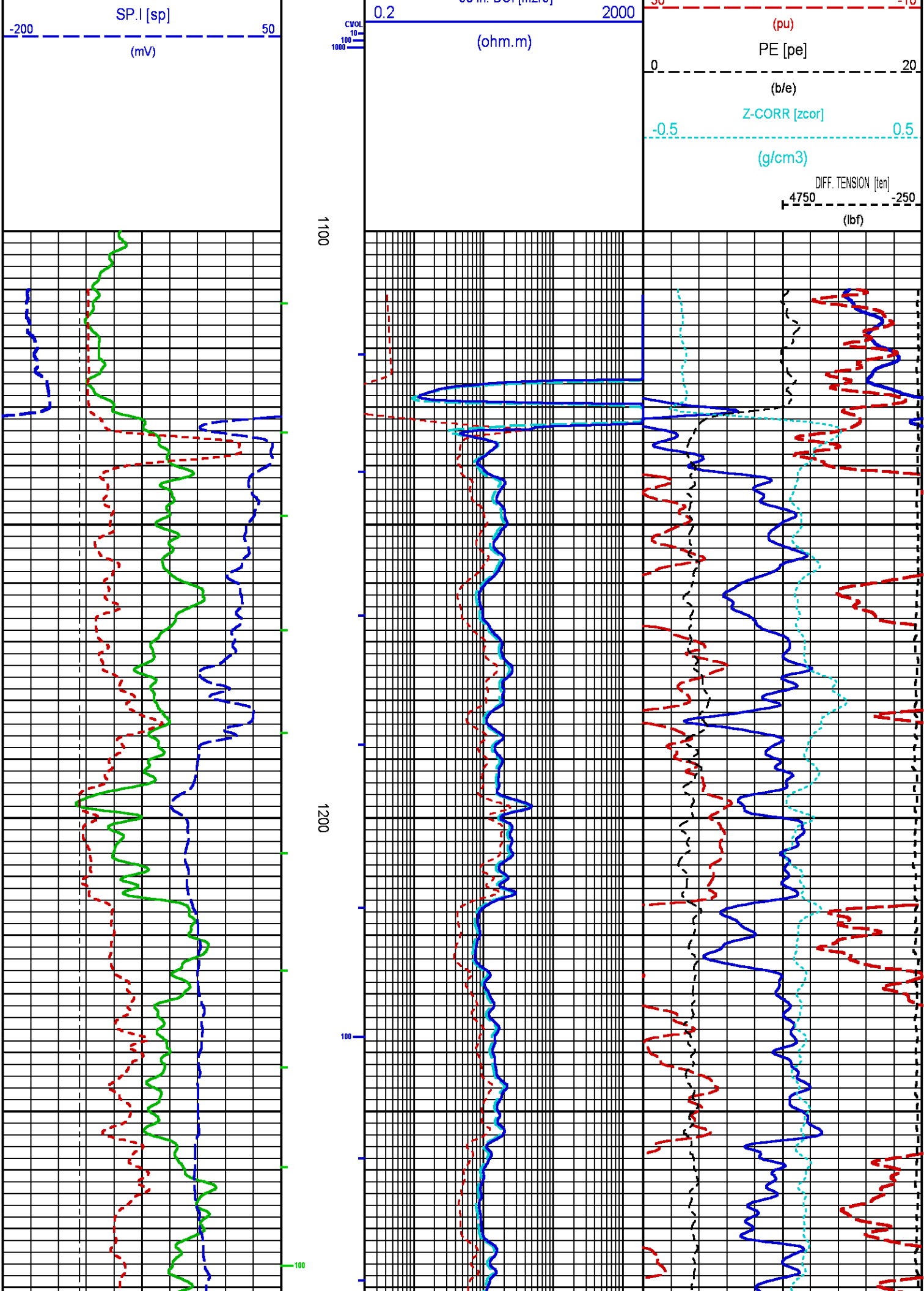
### CURVE MEASURE POINT OFFSET

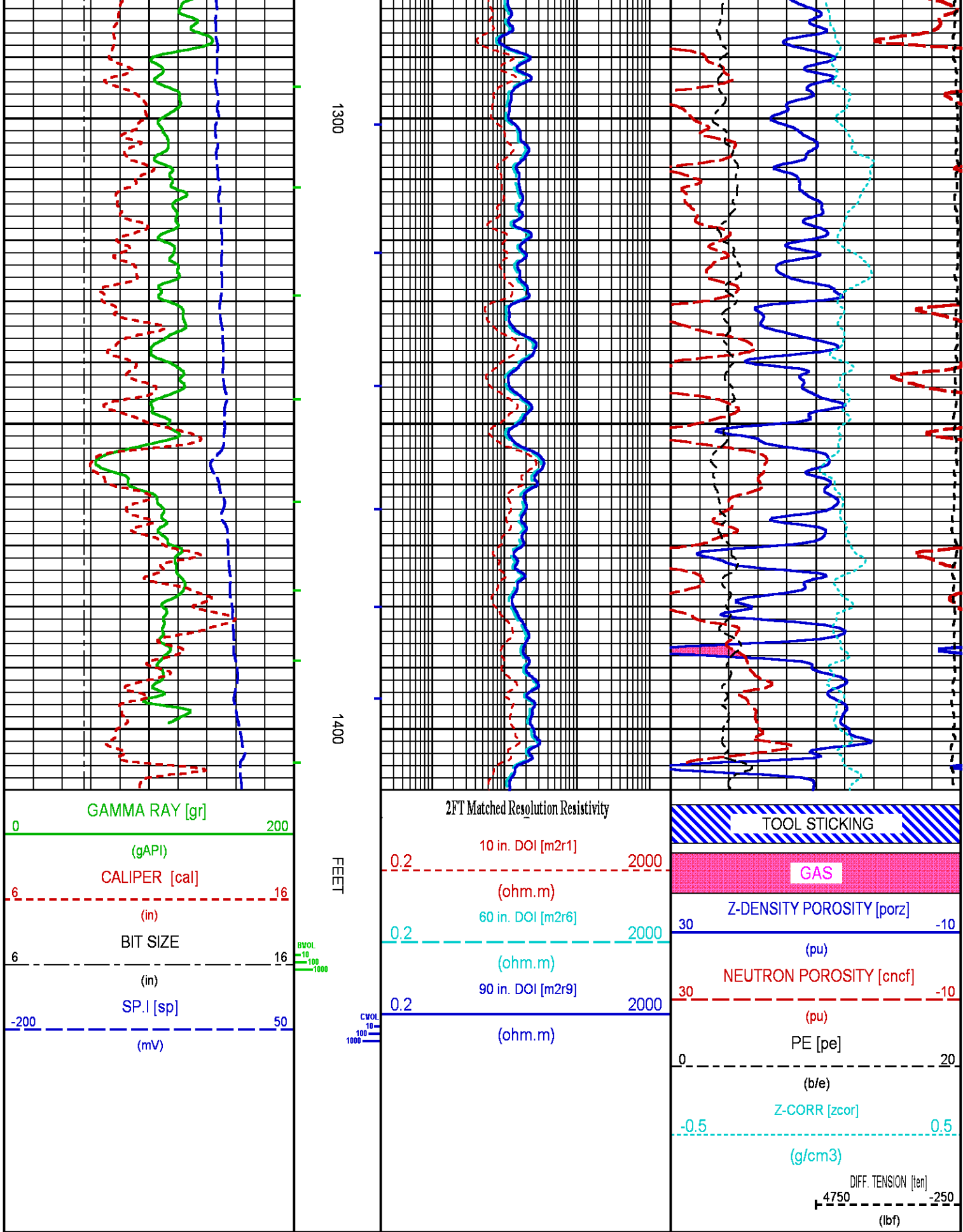
| CURVE | OFFSET (ft) | CURVE | OFFSET (ft) | CURVE | OFFSET (ft) | CURVE | OFFSET (ft) |
|-------|-------------|-------|-------------|-------|-------------|-------|-------------|
| BIT   | 0.00        | GR    | 52.25       | M2R9  | 8.00        | SP    | 14.00       |
| CAL   | 35.00       | M2R1  | 8.00        | PE    | 34.25       | TEN   | 0.00        |
| CNCF  | 45.25       | M2R6  | 8.00        | PORZ  | 34.25       | ZCOR  | 34.25       |

Presentation : HL6670:/dat1a/OH089777/REPEAT.fvpdf [5"/100' Scale]  
Plot Interval : 1100 - 1410 Feet

Data File 1 : F1 : HL6670:/dat1a/OH089777/REPEAT.xtf  
Created On : Aug 27 13:26:44 2014  
Company : WPX ENERGY INC.  
Well : FEDERAL NER 24-32  
Field : RULISON  
File Interval : 5 - 1453.25 Feet  
OCT : n777q







# CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/OH089777In777q.lp1

## CHT PRIMARY CALIBRATION SUMMARY

TOOL #: 3981XA 10203010

DATE/TIME PERFORMED: Wed Aug 27 12:39:39 2014

UNIT #: 3880TA HL6670

|     | Signal Low<br>(raw) | Signal High<br>(raw) | Scale Mult | Scale Add | Engr Low<br>(lbf) | Engr High<br>(lbf) |
|-----|---------------------|----------------------|------------|-----------|-------------------|--------------------|
| CHT | 33.46               | -313.19              | -3.92      | 41.26     | -90.00            | 1270.00            |

## GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 10196895

DATE/TIME PERFORMED: Tue Aug 26 16:29:07 2014

UNIT #: 3880TA HL6670

CALB JIG #: 4702NK DA-041

|    | BACKGROUND CALBRTR ON<br>(cts/s) | CR DIFF<br>(cts/s) | MULT  | BACKGROUND CALBRTR ON<br>(gAPI) | CALBRTR<br>(gAPI) |
|----|----------------------------------|--------------------|-------|---------------------------------|-------------------|
| GR | 349.64                           | 1210.73            | 0.174 | 60.91                           | 210.91            |
|    |                                  | 861.1              |       |                                 | 150               |
|    |                                  | 830.0 960.0        |       |                                 |                   |

## GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 10196895

DATE/TIME PERFORMED: Tue Aug 26 16:34:09 2014

UNIT #: 3880TA HL6670

VERI JIG #: 4702NK DA-041

|    | BACKGROUND CALBRTR ON<br>(cts/s) | MULT  | BACKGROUND CALBRTR ON<br>(gAPI) | DIFF.<br>(gAPI) |
|----|----------------------------------|-------|---------------------------------|-----------------|
| GR | 348.07                           | 0.174 | 60.63                           | 210.99          |
|    |                                  |       |                                 | 150.36          |
|    |                                  |       |                                 | 140.00 160.00   |

## GR BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1329XA 10196895

DATE/TIME PERFORMED: Wed Aug 27 12:44:58 2014

DAYS SINCE CAL: 0

UNIT #: 3880TA HL6670

VERI JIG #: 4702NK DA-041

|    | BACKGROUND CALBRTR ON<br>(cts/s) | MULT  | BACKGROUND CALBRTR ON<br>(gAPI) | DIFF.<br>(gAPI) |
|----|----------------------------------|-------|---------------------------------|-----------------|
| GR | 149.20                           | 0.174 | 25.99                           | 170.15          |
|    |                                  |       |                                 | 144.16          |
|    |                                  |       |                                 | 140.36 160.36   |

## GR AFTER LOG VERIFICATION SUMMARY

TOOL #: 1329XA 10196895

DATE/TIME PERFORMED: Wed Aug 27 18:29:09 2014

DAYS SINCE CAL: 1

UNIT #: 3880TA HL6670

VERI JIG #: 4702NK DA-041

|    | BACKGROUND CALBRTR ON<br>(cts/s) | MULT  | BACKGROUND CALBRTR ON<br>(gAPI) | DIFF.<br>(gAPI) |
|----|----------------------------------|-------|---------------------------------|-----------------|
| GR | 174.73                           | 0.174 | 30.44                           | 177.95          |
|    |                                  |       |                                 | 147.51          |
|    |                                  |       |                                 | 134.16 154.16   |

## CN PRIMARY CALIBRATION SUMMARY

TOOL #: 2446XA 10202048

DATE/TIME PERFORMED: Sat Aug 23 12:21:26 2014

UNIT #: 3880TA HL6670

CALIBRATOR #: 2437XB 112674

SOURCE #: 4717XS N-1026

| MEASURED | DEADTM CORR | DTC     | NOMINAL | CORRECTION | POROSITY |
|----------|-------------|---------|---------|------------|----------|
| CPS      | CPS         | SSN/ SN | SSN/ SN | FACTOR     | (pu)     |

|       |         |         |         |         |         |         |
|-------|---------|---------|---------|---------|---------|---------|
| LSN   | 609.89  | 618.95  |         |         |         |         |
| SSN   | 1611.70 | 1665.38 |         |         |         |         |
| RATIO |         | 2.69067 | 2.75100 | 1.02242 | 0.97000 | 1.07000 |
| CN    |         |         |         |         |         | 21.358  |

### CN PRIMARY VERIFICATION SUMMARY

TOOL #: 2446XA 10202048 DATE/TIME PERFORMED: Sat Aug 23 12:30:10 2014

UNIT #: 3880TA HL6670 ICE BLOCK #: 4717ND VD-147

|       |                 |                    |                |                      |                     |                  |
|-------|-----------------|--------------------|----------------|----------------------|---------------------|------------------|
|       | MEASURED<br>CPS | DEADTM CORR<br>CPS | DTC<br>SSN/LSN | CORRECTION<br>FACTOR | DTC CORR<br>SSN/LSN | POROSITY<br>(pu) |
| LSN   | 1540.18         | 1599.34            |                |                      |                     |                  |
| SSN   | 3647.50         | 3934.61            |                |                      |                     |                  |
| RATIO |                 | 2.46015            | 1.02242        | 2.51681              |                     |                  |
| CN    |                 |                    |                |                      |                     | 18.088           |

### CN BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2446XA 10202048 DATE/TIME PERFORMED: Wed Aug 27 12:48:20 2014 DAYS SINCE CAL: 4

UNIT #: 3880TA HL6670 ICE BLOCK #: 4717ND VD-147

|       |                 |                    |                |                      |                     |                         |
|-------|-----------------|--------------------|----------------|----------------------|---------------------|-------------------------|
|       | MEASURED<br>CPS | DEADTM CORR<br>CPS | DTC<br>SSN/LSN | CORRECTION<br>FACTOR | DTC CORR<br>SSN/LSN | POROSITY<br>(pu)        |
| LSN   | 1510.73         | 1567.61            |                |                      |                     |                         |
| SSN   | 3618.98         | 3901.43            |                |                      |                     |                         |
| RATIO |                 | 2.48878            | 1.02242        | 2.54628              |                     |                         |
| CN    |                 |                    |                |                      |                     | 18.490<br>16.088 20.088 |

### CN AFTER LOG VERIFICATION SUMMARY

TOOL #: 2446XA 10202048 DATE/TIME PERFORMED: Wed Aug 27 18:26:05 2014 DAYS SINCE CAL: 4

UNIT #: 3880TA HL6670 ICE BLOCK #: 4717ND VD-147

|       |                 |                    |                |                      |                     |                         |
|-------|-----------------|--------------------|----------------|----------------------|---------------------|-------------------------|
|       | MEASURED<br>CPS | DEADTM CORR<br>CPS | DTC<br>SSN/LSN | CORRECTION<br>FACTOR | DTC CORR<br>SSN/LSN | POROSITY<br>(pu)        |
| LSN   | 1499.93         | 1555.98            |                |                      |                     |                         |
| SSN   | 3597.69         | 3876.71            |                |                      |                     |                         |
| RATIO |                 | 2.49149            | 1.02242        | 2.54906              |                     |                         |
| CN    |                 |                    |                |                      |                     | 18.529<br>16.490 20.490 |

### CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2234XA 153015 DATE/TIME PERFORMED: Tue Aug 5 13:43:41 2014

UNIT #: 3885TC 6685

|         |            |            |         |          |                    |                    |
|---------|------------|------------|---------|----------|--------------------|--------------------|
|         | SMALL RING | LARGE RING | MULT    | ADD      | SMALL RING<br>(in) | LARGE RING<br>(in) |
| CALIPER | 1405.2     | 1906.8     | 0.00797 | -4.20574 | 7.000              | 11.000             |

# CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2234XA 153015 DATE/TIME PERFORMED: Wed Aug 27 13:22:56 2014 DAYS SINCE CAL: 21  
UNIT #: 3880TA HL6670

I.D. MULT ADD I.D.  
(in)  
CALIPER 1744.8 0.00797 -4.91287 9.001

## CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2234XA 153015 DATE/TIME PERFORMED: Wed Aug 27 17:46:51 2014 DAYS SINCE CAL: 22  
UNIT #: 3880TA HL6670

I.D. MULT ADD I.D.  
(in)  
CALIPER 1744.4 0.00797 -4.91287 8.998  
8.501 9.501

## ZDL PRIMARY CALIBRATION SUMMARY

TOOL: 2234XA 153015 DATE/TIME PERFORMED: Tue Aug 5 14:10:45 2014  
UNIT: 3885TC 6685 CALB BLKS: 2225XA 094292 CS SRC: 4703NT 34631B

|                    | SS CS PK<br>(Channel) | LS CS PK<br>(Channel) | SS_BKGD<br>(cps)     | LS BKGD<br>(cps) |                 |             |
|--------------------|-----------------------|-----------------------|----------------------|------------------|-----------------|-------------|
|                    | 222.7<br>220.0 230.0  | 225.0<br>220.0 230.0  | 1195.5               | 1536.2           |                 |             |
|                    | SS<br>(cps)           | LS<br>(cps)           | SHR                  | DEN<br>(g/cm3)   | CORR<br>(g/cm3) | PE<br>(b/e) |
| MG (LO PE)         | 22608.9               | 11735.1               | 0.592<br>0.565 0.665 | 1.697            | 0.002           | 2.300       |
| AL                 | 13148.2               | 1174.3                |                      | 2.717            | -0.004          |             |
| AL + SHIM          | 18186.8               | 2055.7                |                      | 2.629            | 0.157           |             |
| MG + SHIM (HI PE)  | 10908.7               | 5511.8                | 0.239<br>0.210 0.270 |                  |                 | 8.730       |
| RATIO AL + SHIM/AL | 1.38<br>1.32 1.42     | 1.75<br>1.64 1.84     |                      |                  |                 |             |
| RATIO MG/AL        | 1.72<br>1.65 1.78     | 9.99<br>9.40 10.20    |                      |                  |                 |             |

## ZDL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2234XA 153015 DATE/TIME PERFORMED: Wed Aug 27 12:47:54 2014 DAYS SINCE CAL: 21  
UNIT #: 3880TA HL6670

|    | TOTAL<br>(cps)          | CSPK<br>(Channel)    | HV<br>(V)               |
|----|-------------------------|----------------------|-------------------------|
| LS | 1530.4<br>1436.2 1636.2 | 225.8<br>220.0 230.0 | 1150.2<br>1100.0 1550.0 |
| SS | 1193.9<br>1095.5 1295.5 | 225.6<br>220.0 230.0 | 1260.0<br>1100.0 1550.0 |
|    | LV<br>(V)               | PAD CURRENT<br>(mA)  |                         |
|    | 5.0<br>4.8 5.2          | 70.2<br>50.0 120.0   |                         |

## ZDL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2234XA 153015 DATE/TIME PERFORMED: Wed Aug 27 18:30:35 2014 DAYS SINCE CAL: 22  
UNIT #: 3880TA HL6670

TOTAL CSPK HV

|                |                         |                      |                         |
|----------------|-------------------------|----------------------|-------------------------|
| LS             | TOTAL<br>(cps)          | USPK<br>(Channel)    | HV<br>(V)               |
|                | 1531.3<br>1436.2 1636.2 | 224.1<br>220.0 230.0 | 1164.7<br>1100.0 1550.0 |
| SS             | 1189.5<br>1095.5 1295.5 | 224.4<br>220.0 230.0 | 1270.0<br>1100.0 1550.0 |
|                |                         |                      |                         |
| LV PAD CURRENT |                         |                      |                         |
| (V)            |                         | (mA)                 |                         |
| 5.0<br>4.8 5.2 |                         | 70.9<br>50.0 120.0   |                         |

## HDIL PRIMARY CALIBRATION SUMMARY

TOOL #: 1515MA 10037719

DATE/TIME PERFORMED: Mon Jan 20 14:47:06 2014

UNIT #: 3880TA HL6670

GRCOND ID & DATE: 126 083096

| ZERO DATA(mv) | 10 KHz                 | 30 KHz                 | 50 KHz                 | 70 KHz                 | 90 KHz                 | 110 KHz                | 130 KHz                | 150 KHz                |
|---------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Coil 0 R      | 0.002<br>-0.200 0.200  | 0.002<br>-0.100 0.100  | 0.002<br>-0.100 0.100  | 0.000<br>-0.100 0.100  | -0.001<br>-0.100 0.100 | 0.001<br>-0.100 0.100  | -0.000<br>-0.100 0.100 | -0.001<br>-0.100 0.100 |
| Coil 0 Q      | 0.007<br>-1.000 1.000  | 0.009<br>-0.200 0.200  | 0.002<br>-0.100 0.100  | 0.003<br>-0.100 0.100  | 0.004<br>-0.100 0.100  | 0.002<br>-0.100 0.100  | -0.000<br>-0.100 0.100 | -0.000<br>-0.100 0.100 |
| Coil 1 R      | -0.004<br>-0.200 0.200 | -0.002<br>-0.100 0.100 | 0.000<br>-0.100 0.100  | 0.005<br>-0.100 0.100  | 0.004<br>-0.100 0.100  | 0.001<br>-0.100 0.100  | -0.001<br>-0.100 0.100 | -0.002<br>-0.100 0.100 |
| Coil 1 Q      | -0.008<br>-1.000 1.000 | -0.009<br>-0.200 0.200 | -0.006<br>-0.100 0.100 | -0.002<br>-0.100 0.100 | 0.000<br>-0.100 0.100  | 0.003<br>-0.100 0.100  | 0.003<br>-0.100 0.100  | 0.001<br>-0.100 0.100  |
| Coil 2 R      | 0.004<br>-0.200 0.200  | 0.006<br>-0.100 0.100  | 0.006<br>-0.100 0.100  | 0.004<br>-0.100 0.100  | 0.004<br>-0.100 0.100  | 0.006<br>-0.100 0.100  | 0.009<br>-0.100 0.100  | 0.010<br>-0.100 0.100  |
| Coil 2 Q      | -0.002<br>-1.000 1.000 | 0.001<br>-0.200 0.200  | 0.000<br>-0.100 0.100  | -0.000<br>-0.100 0.100 | -0.004<br>-0.100 0.100 | -0.004<br>-0.100 0.100 | -0.004<br>-0.100 0.100 | -0.002<br>-0.100 0.100 |
| Coil 3 R      | 0.006<br>-0.100 0.100  | 0.007<br>-0.100 0.100  | 0.008<br>-0.100 0.100  | 0.006<br>-0.100 0.100  | 0.006<br>-0.100 0.100  | 0.003<br>-0.100 0.100  | 0.004<br>-0.100 0.100  | 0.002<br>-0.100 0.100  |
| Coil 3 Q      | -0.008<br>-0.500 0.500 | -0.004<br>-0.200 0.200 | 0.002<br>-0.100 0.100  | 0.002<br>-0.100 0.100  | -0.001<br>-0.100 0.100 | 0.001<br>-0.100 0.100  | -0.002<br>-0.100 0.100 | -0.001<br>-0.100 0.100 |
| Coil 4 R      | -0.004<br>-0.200 0.200 | -0.003<br>-0.200 0.200 | 0.000<br>-0.200 0.200  | -0.000<br>-0.200 0.200 | 0.005<br>-0.200 0.200  | 0.006<br>-0.200 0.200  | 0.005<br>-0.200 0.200  | 0.007<br>-0.200 0.200  |
| Coil 4 Q      | -0.008<br>-1.000 1.000 | -0.001<br>-0.400 0.400 | -0.001<br>-0.200 0.200 | 0.000<br>-0.200 0.200  | -0.007<br>-0.200 0.200 | -0.004<br>-0.200 0.200 | -0.003<br>-0.200 0.200 | 0.000<br>-0.200 0.200  |
| Coil 5 R      | 0.005<br>-0.400 0.400  | 0.003<br>-0.400 0.400  | 0.009<br>-0.400 0.400  | 0.009<br>-0.400 0.400  | -0.002<br>-0.400 0.400 | 0.004<br>-0.400 0.400  | 0.005<br>-0.400 0.400  | 0.004<br>-0.400 0.400  |
| Coil 5 Q      | -0.005<br>-2.000 2.000 | 0.002<br>-0.800 0.800  | 0.006<br>-0.400 0.400  | 0.008<br>-0.400 0.400  | 0.003<br>-0.400 0.400  | 0.012<br>-0.400 0.400  | -0.000<br>-0.400 0.400 | -0.005<br>-0.400 0.400 |
| Coil 6 R      | -0.013<br>-1.000 1.000 | 0.016<br>-1.000 1.000  | -0.019<br>-1.000 1.000 | -0.002<br>-1.000 1.000 | -0.008<br>-1.000 1.000 | 0.002<br>-1.000 1.000  | 0.001<br>-1.000 1.000  | 0.032<br>-1.000 1.000  |
| Coil 6 Q      | 0.010<br>-5.000 5.000  | -0.003<br>-2.000 2.000 | 0.006<br>-1.000 1.000  | -0.003<br>-1.000 1.000 | -0.005<br>-1.000 1.000 | -0.017<br>-1.000 1.000 | -0.012<br>-1.000 1.000 | -0.005<br>-1.000 1.000 |

| ELEC. GAINS | 10 KHz                  | 30 KHz                  | 50 KHz                  | 70 KHz                  | 90 KHz                  | 110 KHz                  | 130 KHz                   | 150 KHz                    |
|-------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|---------------------------|----------------------------|
| Coil 0 M    | 125.56<br>100.00 150.00 | 124.07<br>100.00 150.00 | 121.17<br>98.00 150.00  | 116.96<br>96.00 140.00  | 111.53<br>92.00 140.00  | 105.14<br>87.00 130.00   | 97.64<br>82.00 120.00     | 89.46<br>76.00 110.00      |
| Coil 0 P    | 7.720<br>6.000 9.000    | 24.297<br>19.000 28.000 | 40.614<br>32.000 47.000 | 56.846<br>44.000 66.000 | 73.005<br>57.000 85.000 | 89.211<br>70.000 100.000 | 105.261<br>82.000 120.000 | 121.397<br>95.000 140.000  |
| Coil 1 M    | 217.91<br>180.00 270.00 | 215.29<br>180.00 270.00 | 210.30<br>170.00 260.00 | 202.98<br>170.00 250.00 | 193.60<br>160.00 250.00 | 182.50<br>160.00 230.00  | 169.46<br>150.00 220.00   | 155.27<br>140.00 200.00    |
| Coil 1 P    | 7.696<br>6.000 9.000    | 24.246<br>19.000 28.000 | 40.521<br>32.000 48.000 | 56.735<br>45.000 67.000 | 72.881<br>57.000 86.000 | 89.012<br>70.000 110.000 | 105.062<br>83.000 120.000 | 121.231<br>96.000 140.000  |
| Coil 2 M    | 436.05<br>360.00 540.00 | 430.98<br>360.00 540.00 | 421.26<br>350.00 530.00 | 407.00<br>340.00 510.00 | 388.43<br>330.00 500.00 | 366.45<br>310.00 470.00  | 340.70<br>300.00 440.00   | 312.16<br>270.00 410.00    |
| Coil 2 P    | 7.883<br>6.000 9.000    | 24.793<br>19.000 29.000 | 41.460<br>32.000 48.000 | 58.064<br>45.000 67.000 | 74.574<br>58.000 87.000 | 91.207<br>71.000 110.000 | 107.653<br>84.000 130.000 | 124.246<br>96.000 140.000  |
| Coil 3 M    | 707.25<br>590.00 880.00 | 698.26<br>580.00 870.00 | 681.02<br>570.00 850.00 | 655.98<br>550.00 830.00 | 624.05<br>530.00 800.00 | 586.83<br>500.00 760.00  | 544.23<br>470.00 710.00   | 498.72<br>440.00 650.00    |
| Coil 3 P    | 7.849<br>6.000 10.000   | 24.750<br>20.000 29.000 | 41.335<br>33.000 49.000 | 57.794<br>46.000 69.000 | 74.101<br>59.000 89.000 | 90.378<br>72.000 110.000 | 106.417<br>85.000 130.000 | 122.488<br>98.000 150.000  |
| Coil 4 M    | 1138.1<br>900.0 1400.0  | 1121.1<br>900.0 1300.0  | 1089.1<br>900.0 1300.0  | 1043.5<br>850.0 1300.0  | 986.7<br>800.0 1200.0   | 922.7<br>800.0 1200.0    | 851.5<br>750.0 1100.0     | 777.1<br>700.0 1000.0      |
| Coil 4 P    | 8.082<br>6.000 10.000   | 25.375<br>20.000 30.000 | 42.288<br>33.000 50.000 | 59.012<br>46.000 70.000 | 75.437<br>60.000 90.000 | 91.687<br>73.000 110.000 | 107.650<br>86.000 130.000 | 123.478<br>99.000 150.000  |
| Coil 5 M    | 2364.9<br>1900.0 2800.0 | 2334.3<br>1800.0 2800.0 | 2275.3<br>1800.0 2700.0 | 2190.0<br>1800.0 2600.0 | 2080.7<br>1700.0 2500.0 | 1953.9<br>1600.0 2400.0  | 1808.5<br>1500.0 2200.0   | 1653.5<br>1400.0 2100.0    |
| Coil 5 P    | 8.215<br>6.000 10.000   | 25.787<br>20.000 31.000 | 43.065<br>34.000 51.000 | 60.223<br>48.000 72.000 | 77.222<br>62.000 93.000 | 94.151<br>76.000 110.000 | 110.852<br>89.000 130.000 | 127.528<br>100.000 150.000 |
| Coil 6 M    | 6019.4<br>4700.0 7100.0 | 5941.0<br>4700.0 7000.0 | 5788.5<br>4800.0 6900.0 | 5570.2<br>4400.0 6600.0 | 5290.0<br>4200.0 6400.0 | 4963.2<br>4000.0 6000.0  | 4587.5<br>3700.0 5600.0   | 4184.2<br>3400.0 5100.0    |
| Coil 6 P    | 8.163<br>6.000 10.000   | 25.893<br>20.000 31.000 | 43.275<br>34.000 51.000 | 60.548<br>48.000 72.000 | 77.668<br>62.000 93.000 | 94.722<br>76.000 110.000 | 111.567<br>89.000 130.000 | 128.365<br>100.000 150.000 |

[illegible]



|          |              |              |              |              |              |              |              |              |
|----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Coil 0 Q | 0.007        | 0.008        | 0.002        | 0.002        | 0.002        | 0.001        | 0.000        | 0.001        |
|          | -0.200 0.200 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 |
| Coil 1 R | -0.001       | 0.000        | 0.001        | 0.003        | 0.002        | -0.000       | -0.003       | -0.003       |
|          | -0.200 0.200 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 |
| Coil 1 Q | -0.007       | -0.007       | -0.004       | 0.000        | 0.002        | 0.002        | 0.003        | -0.000       |
|          | -1.000 1.000 | -0.200 0.200 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 |
| Coil 2 R | -0.000       | -0.000       | 0.001        | -0.000       | 0.000        | 0.004        | 0.006        | 0.007        |
|          | -0.200 0.200 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 |
| Coil 2 Q | -0.002       | 0.001        | -0.001       | -0.002       | -0.004       | -0.006       | -0.003       | -0.002       |
|          | -1.000 1.000 | -0.200 0.200 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 |
| Coil 3 R | 0.003        | 0.002        | 0.003        | -0.000       | 0.002        | 0.002        | -0.001       | 0.001        |
|          | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 |
| Coil 3 Q | -0.006       | -0.001       | 0.000        | -0.000       | -0.002       | 0.002        | -0.001       | -0.001       |
|          | -0.500 0.500 | -0.200 0.200 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 |
| Coil 4 R | -0.007       | -0.002       | 0.000        | -0.005       | -0.003       | -0.003       | 0.004        | 0.002        |
|          | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 |
| Coil 4 Q | -0.010       | 0.004        | 0.000        | -0.001       | -0.006       | -0.001       | -0.007       | -0.004       |
|          | -1.000 1.000 | -0.400 0.400 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 |
| Coil 5 R | -0.002       | -0.004       | 0.005        | 0.006        | 0.005        | -0.005       | -0.004       | -0.001       |
|          | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 |
| Coil 5 Q | -0.007       | 0.011        | 0.003        | -0.012       | 0.007        | 0.002        | 0.002        | -0.007       |
|          | -2.000 2.000 | -0.800 0.800 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 |
| Coil 6 R | 0.029        | -0.012       | -0.030       | -0.051       | -0.007       | 0.005        | 0.005        | -0.000       |
|          | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 |
| Coil 6 Q | -0.022       | -0.003       | -0.002       | 0.002        | 0.004        | 0.002        | -0.023       | -0.013       |
|          | -5.000 5.000 | -2.000 2.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 |

|             |               |               |               |               |               |                |                |                 |
|-------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|-----------------|
| ELEC. GAINS | 10 KHz        | 30 KHz        | 50 KHz        | 70 KHz        | 90 KHz        | 110 KHz        | 130 KHz        | 150 KHz         |
| Coil 0 M    | 125.61        | 124.08        | 121.18        | 116.91        | 111.53        | 104.99         | 97.58          | 89.24           |
|             | 100.00 150.00 | 100.00 150.00 | 98.00 150.00  | 96.00 140.00  | 92.00 140.00  | 87.00 130.00   | 82.00 120.00   | 76.00 110.00    |
| Coil 0 P    | 7.751         | 24.407        | 40.769        | 57.096        | 73.308        | 89.605         | 105.754        | 122.050         |
|             | 6.000 9.000   | 19.000 28.000 | 32.000 47.000 | 44.000 66.000 | 57.000 85.000 | 70.000 100.000 | 82.000 120.000 | 95.000 140.000  |
| Coil 1 M    | 217.33        | 214.63        | 209.58        | 202.20        | 192.93        | 181.70         | 168.84         | 154.49          |
|             | 180.00 270.00 | 180.00 270.00 | 170.00 260.00 | 170.00 250.00 | 160.00 250.00 | 160.00 230.00  | 150.00 220.00  | 140.00 200.00   |
| Coil 1 P    | 7.744         | 24.382        | 40.726        | 57.015        | 73.216        | 89.498         | 105.642        | 121.959         |
|             | 6.000 9.000   | 19.000 28.000 | 32.000 48.000 | 45.000 67.000 | 57.000 86.000 | 70.000 110.000 | 83.000 120.000 | 96.000 140.000  |
| Coil 2 M    | 437.01        | 431.51        | 421.57        | 406.91        | 388.65        | 366.21         | 340.77         | 312.02          |
|             | 360.00 540.00 | 360.00 540.00 | 350.00 530.00 | 340.00 510.00 | 330.00 500.00 | 310.00 470.00  | 300.00 440.00  | 270.00 410.00   |
| Coil 2 P    | 7.948         | 24.962        | 41.678        | 58.351        | 74.941        | 91.604         | 108.180        | 124.905         |
|             | 6.000 9.000   | 19.000 29.000 | 32.000 48.000 | 45.000 67.000 | 58.000 87.000 | 71.000 110.000 | 84.000 130.000 | 96.000 140.000  |
| Coil 3 M    | 708.90        | 699.61        | 682.27        | 656.94        | 625.41        | 587.39         | 544.92         | 498.44          |
|             | 590.00 880.00 | 580.00 870.00 | 570.00 850.00 | 550.00 830.00 | 530.00 800.00 | 500.00 760.00  | 470.00 710.00  | 440.00 650.00   |
| Coil 3 P    | 7.915         | 24.907        | 41.555        | 58.143        | 74.551        | 90.940         | 107.103        | 123.313         |
|             | 6.000 10.000  | 20.000 29.000 | 33.000 49.000 | 46.000 69.000 | 59.000 89.000 | 72.000 110.000 | 85.000 130.000 | 98.000 150.000  |
| Coil 4 M    | 1142.3        | 1124.3        | 1091.4        | 1044.9        | 988.6         | 923.3          | 852.5          | 777.4           |
|             | 900.0 1400.0  | 900.0 1300.0  | 900.0 1300.0  | 850.0 1300.0  | 800.0 1200.0  | 800.0 1200.0   | 750.0 1100.0   | 700.0 1000.0    |
| Coil 4 P    | 8.162         | 25.583        | 42.574        | 59.388        | 75.896        | 92.293         | 108.330        | 124.356         |
|             | 6.000 10.000  | 20.000 30.000 | 33.000 50.000 | 46.000 70.000 | 60.000 90.000 | 73.000 110.000 | 86.000 130.000 | 99.000 150.000  |
| Coil 5 M    | 2373.8        | 2341.1        | 2281.3        | 2193.5        | 2085.4        | 1955.1         | 1811.2         | 1653.8          |
|             | 1900.0 2800.0 | 1800.0 2800.0 | 1800.0 2700.0 | 1800.0 2600.0 | 1700.0 2500.0 | 1600.0 2400.0  | 1500.0 2200.0  | 1400.0 2100.0   |
| Coil 5 P    | 8.295         | 25.985        | 43.343        | 60.607        | 77.701        | 94.770         | 111.575        | 128.461         |
|             | 6.000 10.000  | 20.000 31.000 | 34.000 51.000 | 48.000 72.000 | 62.000 93.000 | 76.000 110.000 | 89.000 130.000 | 100.000 150.000 |
| Coil 6 M    | 6012.9        | 5924.4        | 5766.8        | 5539.9        | 5264.0        | 4930.5         | 4558.4         | 4156.7          |
|             | 4700.0 7100.0 | 4700.0 7000.0 | 4600.0 6900.0 | 4400.0 6600.0 | 4200.0 6400.0 | 4000.0 6000.0  | 3700.0 5600.0  | 3400.0 5100.0   |
| Coil 6 P    | 8.296         | 26.185        | 43.667        | 61.060        | 78.248        | 95.420         | 112.382        | 129.391         |
|             | 7.000 10.000  | 22.000 32.000 | 36.000 54.000 | 51.000 76.000 | 65.000 98.000 | 80.000 120.000 | 94.000 140.000 | 110.000 160.000 |

HDIL AFTER LOG VERIFICATION SUMMARY

|         |                 |                      |                          |                 |     |
|---------|-----------------|----------------------|--------------------------|-----------------|-----|
| TOOL #: | 1515MA 10037719 | DATE/TIME PERFORMED: | Wed Aug 27 17:49:15 2014 | DAYS SINCE CAL: | 219 |
| UNIT #: | 3880TA HL6670   |                      |                          |                 |     |

|               |              |              |              |              |              |              |              |              |
|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| ZERO DATA(mv) | 10 KHz       | 30 KHz       | 50 KHz       | 70 KHz       | 90 KHz       | 110 KHz      | 130 KHz      | 150 KHz      |
| Coil 0 R      | 0.002        | 0.003        | 0.002        | 0.000        | -0.003       | -0.000       | 0.000        | -0.001       |
|               | -0.081 0.079 | -0.059 0.061 | -0.029 0.031 | -0.030 0.030 | -0.032 0.028 | -0.029 0.031 | -0.030 0.030 | -0.031 0.029 |
| Coil 0 Q      | 0.007        | 0.010        | 0.003        | 0.003        | 0.002        | 0.000        | -0.000       | -0.000       |
|               | -0.033 0.047 | -0.112 0.128 | -0.028 0.032 | -0.028 0.032 | -0.028 0.032 | -0.029 0.031 | -0.030 0.030 | -0.029 0.031 |
| Coil 1 R      | -0.000       | 0.000        | 0.001        | 0.002        | 0.002        | -0.002       | -0.003       | -0.005       |
|               | -0.081 0.079 | -0.050 0.050 | -0.029 0.031 | -0.027 0.033 | -0.028 0.032 | -0.030 0.030 | -0.033 0.027 | -0.033 0.027 |
| Coil 1 Q      | -0.007       | -0.007       | -0.004       | 0.000        | 0.002        | 0.002        | 0.002        | -0.000       |
|               | -0.407 0.393 | -0.107 0.093 | -0.034 0.026 | -0.030 0.030 | -0.028 0.032 | -0.028 0.032 | -0.027 0.033 | -0.030 0.030 |
| Coil 2 R      | 0.001        | 0.003        | 0.002        | 0.000        | 0.001        | 0.003        | 0.008        | 0.007        |
|               | -0.070 0.070 | -0.030 0.030 | -0.029 0.031 | -0.030 0.030 | -0.030 0.030 | -0.026 0.034 | -0.024 0.036 | -0.023 0.037 |
| Coil 2 Q      | -0.001       | -0.001       | 0.001        | -0.003       | -0.005       | -0.006       | -0.004       | -0.002       |
|               | -0.352 0.348 | -0.099 0.101 | -0.031 0.029 | -0.032 0.028 | -0.034 0.026 | -0.036 0.024 | -0.033 0.027 | -0.032 0.028 |
| Coil 3 R      | 0.003        | 0.002        | 0.003        | -0.000       | 0.002        | 0.002        | -0.001       | 0.001        |
|               | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 |
| Coil 3 Q      | -0.006       | -0.001       | 0.000        | -0.000       | -0.002       | 0.002        | -0.001       | -0.001       |
|               | -0.500 0.500 | -0.200 0.200 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 | -0.100 0.100 |
| Coil 4 R      | -0.007       | -0.002       | 0.000        | -0.005       | -0.003       | -0.003       | 0.004        | 0.002        |
|               | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 |
| Coil 4 Q      | -0.010       | 0.004        | 0.000        | -0.001       | -0.006       | -0.001       | -0.007       | -0.004       |
|               | -1.000 1.000 | -0.400 0.400 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 | -0.200 0.200 |
| Coil 5 R      | -0.002       | -0.004       | 0.005        | 0.006        | 0.005        | -0.005       | -0.004       | -0.001       |
|               | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 |
| Coil 5 Q      | -0.007       | 0.011        | 0.003        | -0.012       | 0.007        | 0.002        | 0.002        | -0.007       |
|               | -2.000 2.000 | -0.800 0.800 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 | -0.400 0.400 |
| Coil 6 R      | 0.029        | -0.012       | -0.030       | -0.051       | -0.007       | 0.005        | 0.005        | -0.000       |
|               | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 |
| Coil 6 Q      | -0.022       | -0.003       | -0.002       | 0.002        | 0.004        | 0.002        | -0.023       | -0.013       |
|               | -5.000 5.000 | -2.000 2.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 | -1.000 1.000 |

|          |                        |                        |                        |                        |                        |                        |                        |                        |
|----------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Coil 3 R | -0.000<br>-0.037 0.043 | 0.002<br>-0.038 0.042  | 0.006<br>-0.037 0.043  | 0.005<br>-0.040 0.040  | 0.008<br>-0.038 0.042  | 0.003<br>-0.038 0.042  | 0.004<br>-0.041 0.039  | 0.002<br>-0.039 0.041  |
| Coil 3 Q | -0.006<br>-0.206 0.194 | -0.006<br>-0.081 0.079 | -0.005<br>-0.040 0.040 | -0.001<br>-0.040 0.040 | -0.001<br>-0.042 0.038 | 0.002<br>-0.038 0.042  | 0.003<br>-0.041 0.039  | 0.000<br>-0.041 0.039  |
| Coil 4 R | -0.010<br>-0.067 0.053 | -0.007<br>-0.062 0.058 | -0.003<br>-0.060 0.060 | -0.002<br>-0.065 0.055 | -0.001<br>-0.063 0.057 | -0.002<br>-0.063 0.057 | 0.006<br>-0.056 0.064  | 0.002<br>-0.058 0.062  |
| Coil 4 Q | -0.006<br>-0.310 0.290 | -0.002<br>-0.096 0.104 | -0.006<br>-0.060 0.060 | -0.005<br>-0.061 0.059 | -0.006<br>-0.066 0.054 | -0.005<br>-0.061 0.059 | -0.003<br>-0.067 0.053 | 0.001<br>-0.064 0.056  |
| Coil 5 R | -0.002<br>-0.122 0.118 | 0.004<br>-0.124 0.116  | 0.009<br>-0.115 0.125  | 0.009<br>-0.114 0.126  | 0.008<br>-0.115 0.125  | -0.002<br>-0.125 0.115 | -0.003<br>-0.124 0.116 | -0.005<br>-0.121 0.119 |
| Coil 5 Q | -0.007<br>-0.607 0.593 | -0.010<br>-0.239 0.261 | -0.002<br>-0.117 0.123 | -0.002<br>-0.132 0.108 | 0.008<br>-0.113 0.127  | 0.004<br>-0.118 0.122  | -0.005<br>-0.118 0.122 | -0.001<br>-0.127 0.113 |
| Coil 6 R | 0.009<br>-0.271 0.329  | -0.014<br>-0.312 0.288 | -0.023<br>-0.330 0.270 | -0.001<br>-0.351 0.249 | 0.018<br>-0.307 0.293  | 0.012<br>-0.295 0.305  | -0.000<br>-0.295 0.305 | 0.025<br>-0.300 0.300  |
| Coil 6 Q | -0.011<br>-1.522 1.478 | 0.005<br>-0.603 0.597  | 0.000<br>-0.302 0.298  | -0.036<br>-0.298 0.302 | -0.005<br>-0.296 0.304 | -0.020<br>-0.298 0.302 | -0.014<br>-0.323 0.277 | -0.007<br>-0.313 0.287 |

ELEC. GAINS      10 KHz      30 KHz      50 KHz      70 KHz      90 KHz      110 KHz      130 KHz      150 KHz

|          |                         |                         |                         |                         |                         |                         |                            |                            |
|----------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|----------------------------|----------------------------|
| Coil 0 M | 125.75<br>123.10 128.13 | 124.26<br>121.60 126.56 | 121.40<br>118.75 123.60 | 116.94<br>114.57 119.25 | 111.53<br>109.30 113.76 | 104.78<br>102.89 107.09 | 97.28<br>95.63 99.53       | 88.72<br>87.45 91.02       |
| Coil 0 P | 7.738<br>4.751 10.751   | 24.388<br>21.407 27.407 | 40.781<br>37.769 43.769 | 57.141<br>54.096 60.096 | 73.353<br>70.308 76.308 | 89.651<br>86.605 92.605 | 105.694<br>102.754 108.754 | 121.978<br>119.050 125.050 |
| Coil 1 M | 217.83<br>212.98 221.67 | 215.22<br>210.34 218.92 | 210.30<br>205.39 213.78 | 202.55<br>198.15 206.24 | 193.24<br>189.08 196.79 | 181.46<br>178.06 185.33 | 168.53<br>165.47 172.22    | 153.77<br>151.41 157.58    |
| Coil 1 P | 7.725<br>4.744 10.744   | 24.364<br>21.382 27.382 | 40.730<br>37.726 43.726 | 57.103<br>54.015 60.015 | 73.267<br>70.216 76.216 | 89.547<br>86.498 92.498 | 105.619<br>102.642 108.642 | 121.890<br>118.959 124.959 |
| Coil 2 M | 437.20<br>428.27 445.75 | 432.01<br>422.88 440.14 | 422.29<br>413.14 430.01 | 407.10<br>398.77 415.05 | 388.60<br>380.88 396.42 | 365.21<br>358.89 373.54 | 339.50<br>333.96 347.59    | 309.56<br>305.78 318.26    |
| Coil 2 P | 7.917<br>4.948 10.948   | 24.922<br>21.962 27.962 | 41.677<br>38.678 44.678 | 58.400<br>55.351 61.351 | 74.992<br>71.941 77.941 | 91.729<br>88.604 94.604 | 108.146<br>105.180 111.180 | 124.844<br>121.905 127.905 |
| Coil 3 M | 709.37<br>694.72 723.08 | 700.12<br>685.62 713.60 | 683.02<br>668.62 695.91 | 656.39<br>643.80 670.08 | 624.40<br>612.90 637.92 | 585.09<br>575.64 599.14 | 542.25<br>534.02 555.82    | 494.62<br>488.48 508.41    |
| Coil 3 P | 7.903<br>4.915 10.915   | 24.901<br>21.907 27.907 | 41.581<br>38.555 44.555 | 58.188<br>55.143 61.143 | 74.548<br>71.551 77.551 | 90.986<br>87.940 93.940 | 107.018<br>104.103 110.103 | 123.206<br>120.313 126.313 |
| Coil 4 M | 1141.5<br>1119.4 1165.1 | 1124.0<br>1101.8 1146.8 | 1092.1<br>1069.6 1113.3 | 1043.8<br>1024.0 1065.8 | 986.8<br>968.9 1008.4   | 919.3<br>904.9 941.8    | 847.9<br>835.4 869.5       | 770.5<br>761.9 793.0       |
| Coil 4 P | 8.133<br>5.162 11.162   | 25.536<br>22.583 28.583 | 42.552<br>39.574 45.574 | 59.418<br>56.388 62.388 | 75.904<br>72.896 78.896 | 92.303<br>89.293 95.293 | 108.234<br>105.330 111.330 | 124.208<br>121.356 127.356 |
| Coil 5 M | 2372.7<br>2326.3 2421.3 | 2341.8<br>2294.3 2387.9 | 2283.6<br>2235.7 2327.0 | 2193.0<br>2149.6 2237.4 | 2083.9<br>2043.7 2127.1 | 1949.6<br>1916.0 1994.2 | 1804.3<br>1775.0 1847.5    | 1642.5<br>1620.7 1686.9    |
| Coil 5 P | 8.249<br>5.295 11.295   | 25.909<br>22.985 28.985 | 43.288<br>40.343 46.343 | 60.578<br>57.607 63.607 | 77.631<br>74.701 80.701 | 94.706<br>91.770 97.770 | 111.416<br>108.575 114.575 | 128.229<br>125.461 131.461 |
| Coil 6 M | 6023.0<br>5892.6 6133.1 | 5942.0<br>5805.9 6042.9 | 5791.2<br>5651.5 5882.1 | 5558.7<br>5429.1 5650.7 | 5280.6<br>5158.7 5369.3 | 4934.4<br>4831.8 5029.1 | 4560.5<br>4467.2 4649.6    | 4143.2<br>4073.6 4239.8    |
| Coil 6 P | 8.214<br>5.296 11.296   | 26.044<br>23.185 29.185 | 43.528<br>40.667 46.667 | 60.930<br>58.060 64.060 | 78.100<br>75.248 81.248 | 95.290<br>92.420 98.420 | 112.124<br>109.382 115.382 | 129.072<br>126.391 132.391 |

## INSTRUMENT CONFIGURATION

Source File: /dat1a/OH089777/MS-tdg

### CABLEHEAD

Diameter : 3.38"  
 Length : 5.50'  
 Weight : 24 lbs  
 Series : CABL338  
 Mnemonic : CBLH  
 Measure Point: 2.75': CABLEHEAD TOP



73.88'

CABLEHEAD TOP — 71.13'

#### TTRM SUB

Diameter : 3.63"  
Length : 3.83'  
Weight : 62 lbs  
Series : 3981XA  
Mnemonic : TTRM  
Measure Point: 1.38': TEMP MP  
Measure Point: 1.13': RM MP

TEMP MP — 65.93'  
RM MP — 65.68'

#### WTS COMMON REMOTE

Diameter : 3.63"  
Length : 6.36'  
Weight : 126 lbs  
Series : 3514XB  
Mnemonic : WTS

#### DIGITAL SPECTRALOG

Diameter : 3.63"  
Length : 7.31'  
Weight : 130 lbs  
Series : 1329XA  
Mnemonic : DSL  
Measure Point: 1.60': GR MP

GR MP — 52.48'

#### COMPENSATED NEUTRON

Diameter : 3.63"  
Length : 7.59'  
Weight : 150 lbs  
Series : 2446XA  
Mnemonic : CN  
Measure Point: 2.63': LSN MP  
Measure Point: 2.24': SSN MP

LSN MP — 45.92'  
SSN MP — 45.52'

Z-DENSILOG

Diameter : 4.88"  
Length : 11.22'  
Weight : 360 lbs  
Series : 2234XA  
Mnemonic : ZDL  
Measure Point: 3.19': CAL MP  
Measure Point: 2.47': LSD MP  
Measure Point: 2.07': SSD MP

CAL MP — 35.26'

LSD MP — 34.54'

SSD MP — 34.14'

KNUCKLE JOINT (DOUBLE)

Diameter : 3.38"  
Length : 4.65'  
Weight : 90 lbs  
Series : 3939XA  
Mnemonic : KNJT

HIGH DEFINITION INDUCTION TOOL

Diameter : 3.62"  
Length : 27.13'  
Weight : 415 lbs  
Series : 1E1EYA

SP MP — 14.19'

Series : 1515XA  
Mnemonic : HDIL  
Measure Point: 13.91': SP MP  
Measure Point: 7.44': XMTR MP

BULL PLUG 3 3/8

TOTAL LENGTH: 73.88'  
TOTAL WEIGHT: 1378 lbs  
MAX DIAMETER: 0'4.88"

XMTR MP 7.72'

0.00'





|           |  |       |             |  |     |      |             |
|-----------|--|-------|-------------|--|-----|------|-------------|
| COMPANY   | WPX ENERGY ROCKY MTN LLC   |       | FILE NO:    |  |     |      |             |
| WELL      | FEDERAL NER 24-32  |       |             | US089777                               |     |      |             |
| FIELD     | RULISON  |       | API NO:     |  |     |      |             |
| COUNTY    | GARFIELD   | STATE | CO          | 05045217970000                         |     |      |             |
| LOCATION: | SHL: 120' FNL & 2573' FWL(5 7S 93W)<br>BHL: 1465' FSL & 1799' FWL(32 6S 93W) |       | ELEVATIONS: | 32 6S 93W<br>RU 23-5 PAD<br>NABORS 576 |     |      |             |
| SEC       | 32   | TWP   | 6S          | RGE                                    | 93W | DATE | 27-Aug-2014 |