



**Weatherford**

**ARRAY INDUCTION  
SHALLOW FOCUSED  
ELECTRIC LOG**

COMPANY

**EAST CHEYENNE GAS STORAGE, LLC**

WELL

**LC-M005 ROPER 1**

FIELD

**WEST PEETZ**

PROVINCE/COUNTY LOGAN

COUNTRY/STATE **U.S.A. / COLORADO**

LOCATION **2275' FSL & 1539' FEL**

SEC 13 TWP T11N RGE 53W Other Services

Latitude 40.92628 MPD/MDN

Longitude -103.24224

API Number 05-075-08449

Permanent Datum GL, Elevation 4596 feet

Log Measured From KB, 10.00 feet above Permanent Datum

Drilling Measured From KB

Elevations:  
KB 4606.00 feet  
DF 4606.00  
GL 4596.00

Date 18-NOV-2017

Run Number ONE

Service Order 4052-198174672

Depth Driller 5412.00 feet

Depth Logger 5412.70 feet

First Reading 5409.00 feet

Last Reading 120.00 feet

Casing Driller 120.00 feet

Casing Logger 120.00 feet

Bit Size 7.875 inches

Hole Fluid Type WBM

Density / Viscosity 9.70 g/cc 50.00 CP

PH / Fluid Loss 8.00 6.40 ml/30Min

Sample Source MUD TANK

Rm @ Measured Temp 0.11 @ 85.0 ohm-m

Rmf @ Measured Temp 0.08 @ 85.0 ohm-m

Rmc @ Measured Temp 0.123 @ 85.0 ohm-m

Source Rmf / Rmc CALC CALC

Rm @ BHT 0.06 @ 159.0 ohm-m

Time Since Circulation 6 HRS

Max Recorded Temp 159.00 deg F

Equipment / Base 13057 OKC

Recorded By Z. AL SUDANI

Witnessed By GREG FRANCIS

TERRY STREIT

**BOREHOLE RECORD**

Last Edited: 18-NOV-2017 17:51

Bit Size  
inches

7.875

Depth From  
feet

120.00

Depth To  
feet

5412.00

**CASING RECORD**

Type

Size  
inches

8.625

Depth From  
feet

0.00

Shoe Depth  
feet

120.00

Weight  
pounds/ft

36.00

**REMARKS**

WLS SOFTWARE VERSION: 17.03.9609

TOOLS RAN: SHA-438; MCG-475; MDN-388; MPD-120; MFE-261; MAI-426

HARDWARE: MAI - 0.5 INCH STAND-OFFS AT TOP AND BOTTOM CENTRALIZED BY THE TOOLS ABOVE

MFE - 0.5 INCH STAND-OFF AT TOP

MPD - 8 INCH PROFILE PLATE

MDN - DUAL SPRING DECENTRALIZER ON BODY

LOG IS CORRELATED TO DRESSER ATLAS INDUCTION LOG DATED 3-31-1974

2.65 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY.

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

TOTAL HOLE VOLUME FROM TD TO SURFACE CASING = 2440 CU.FT.

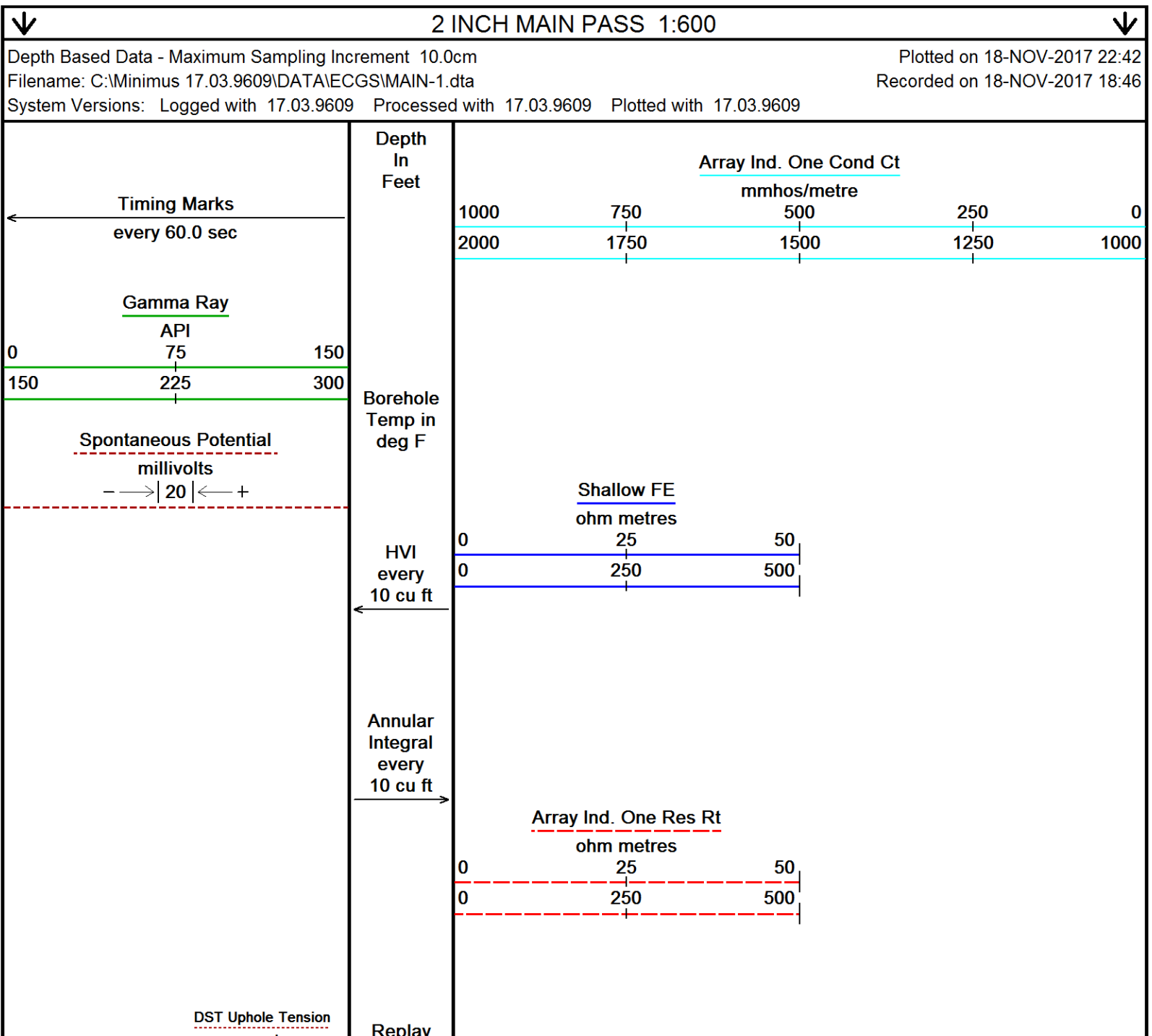
ANNULAR HOLE VOLUME WITH 7 INCH PRODUCTION CASING FROM TD TO SURFACE CASING = 1035 CU.FT.

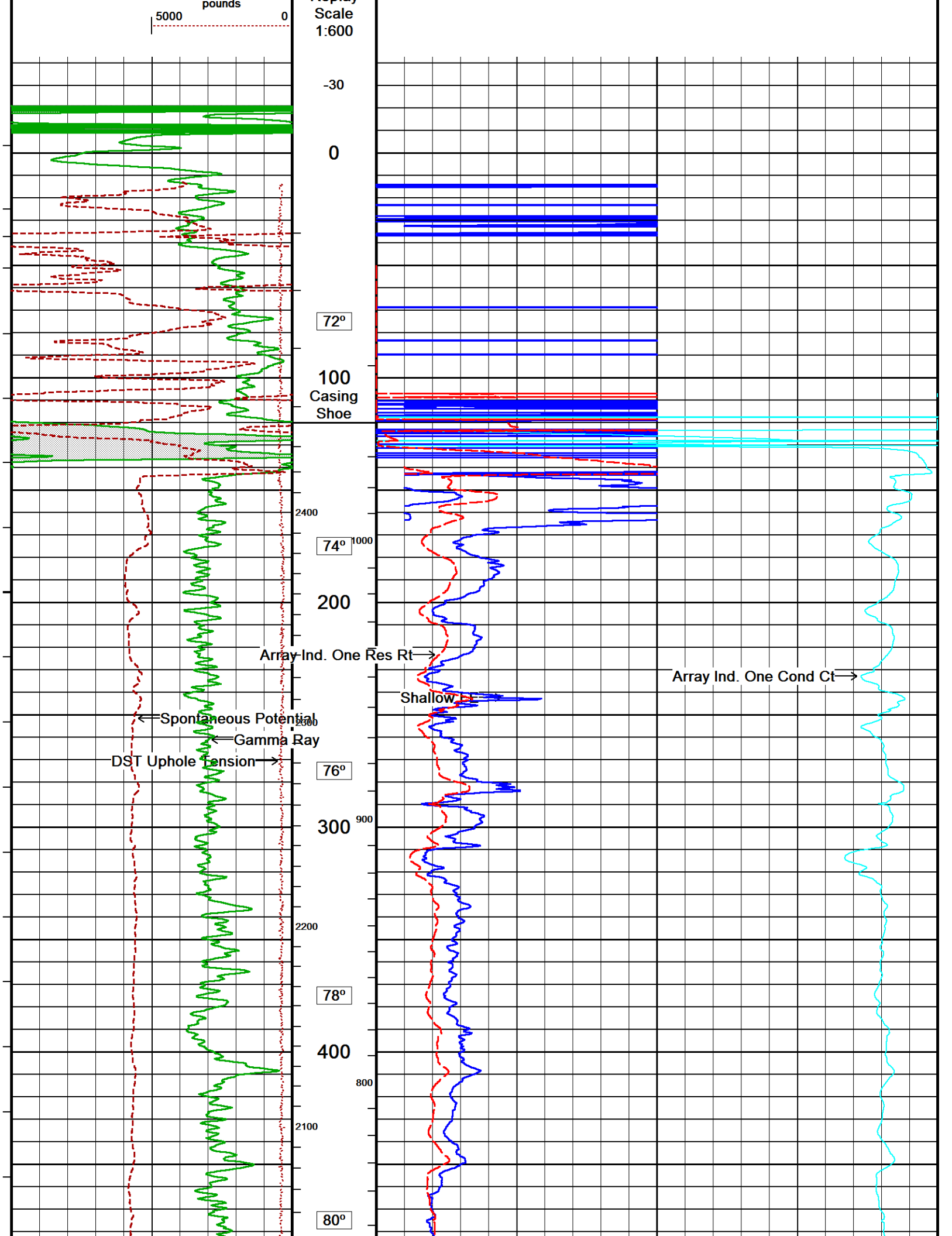
OPERATORS: D GILLISPIE

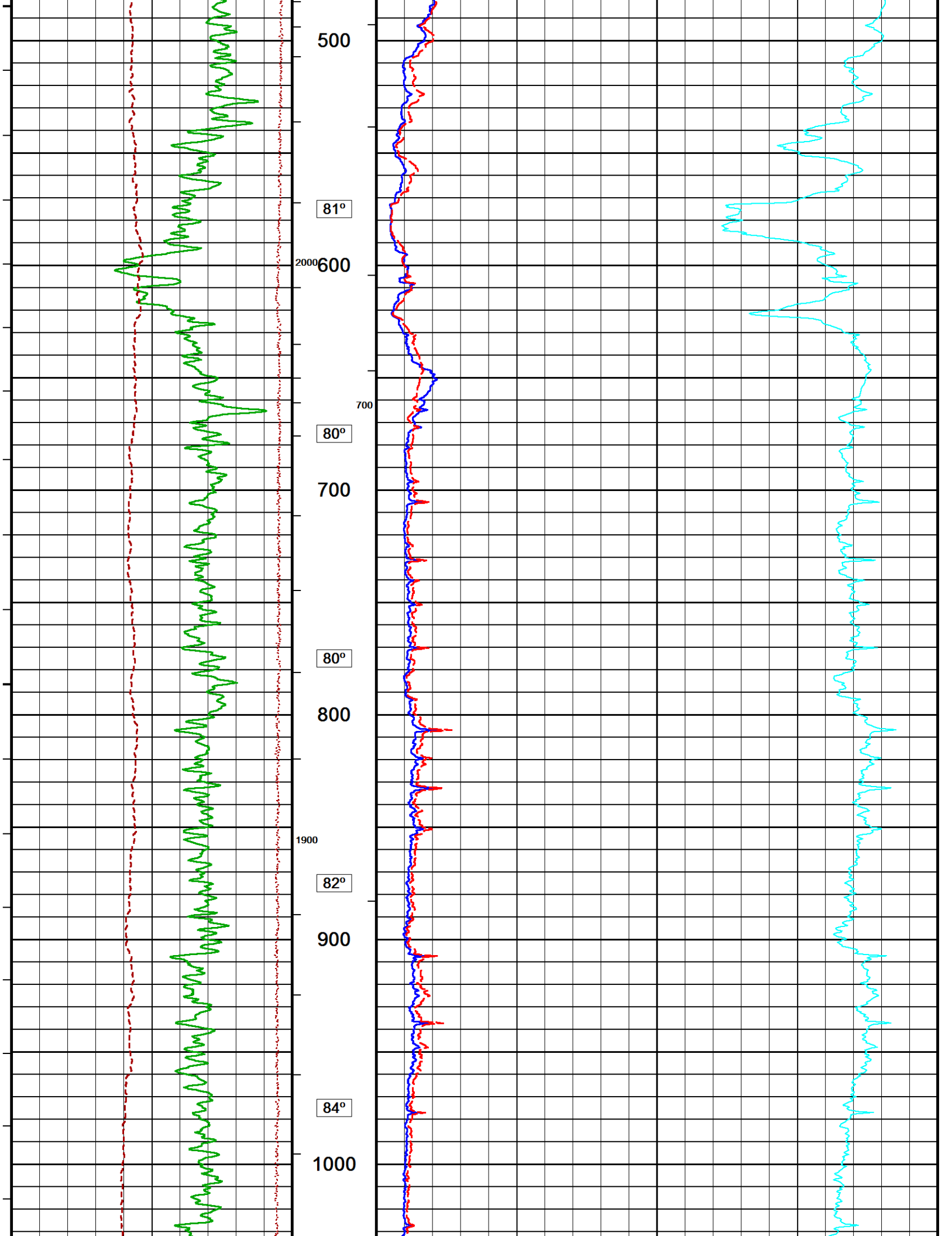
MUD PROPERTIES: CHLORIDES: 1100 PPM  
LCM: NONE

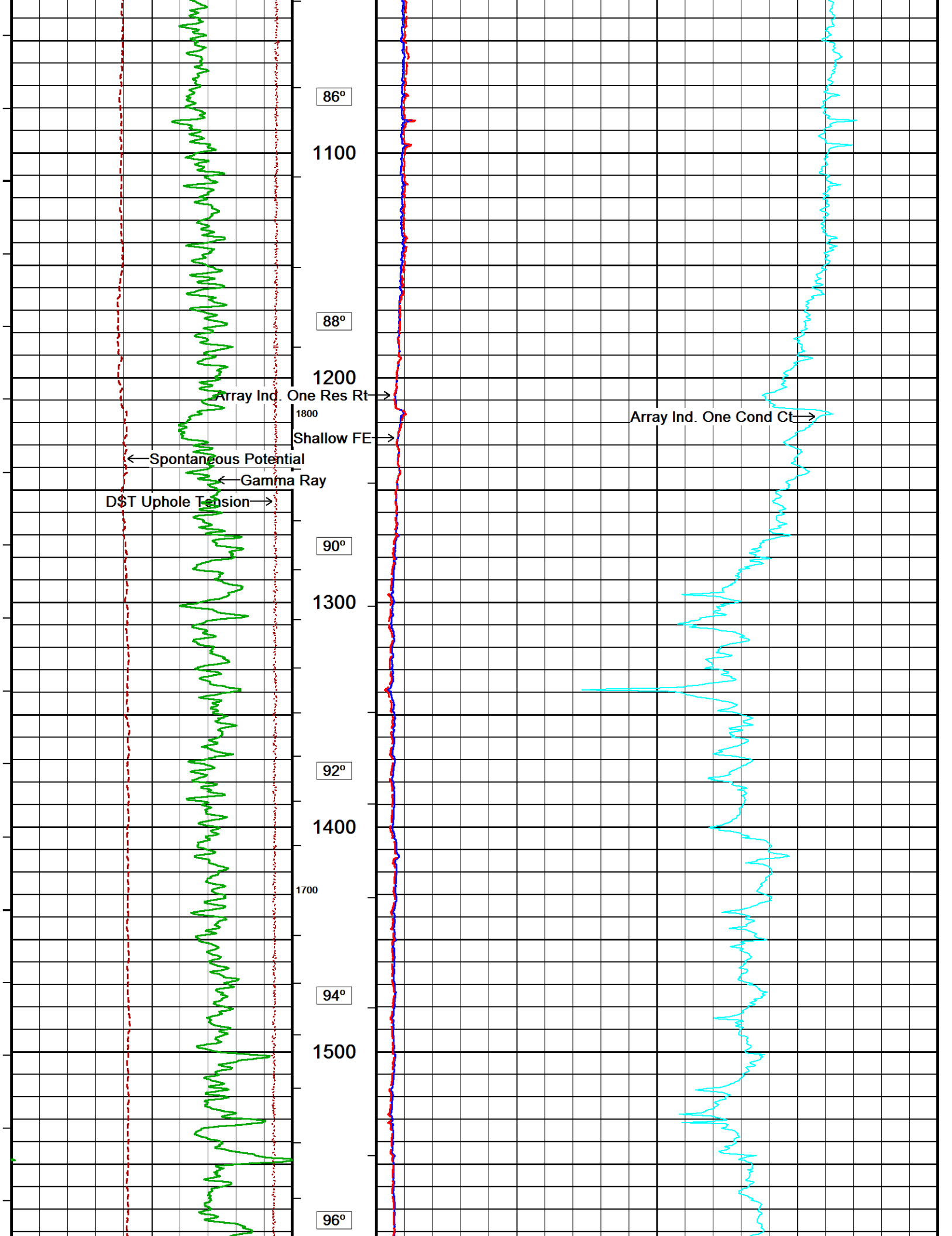
\*\*\*NO REPEAT SECTION LOGGED ON BOTTOM DUE TO HOLE CONDITIONS\*\*\*  
\*\*\*\*LOG RESPONSE EFFECTED BY HOLE RUGOSITY\*\*\*\*

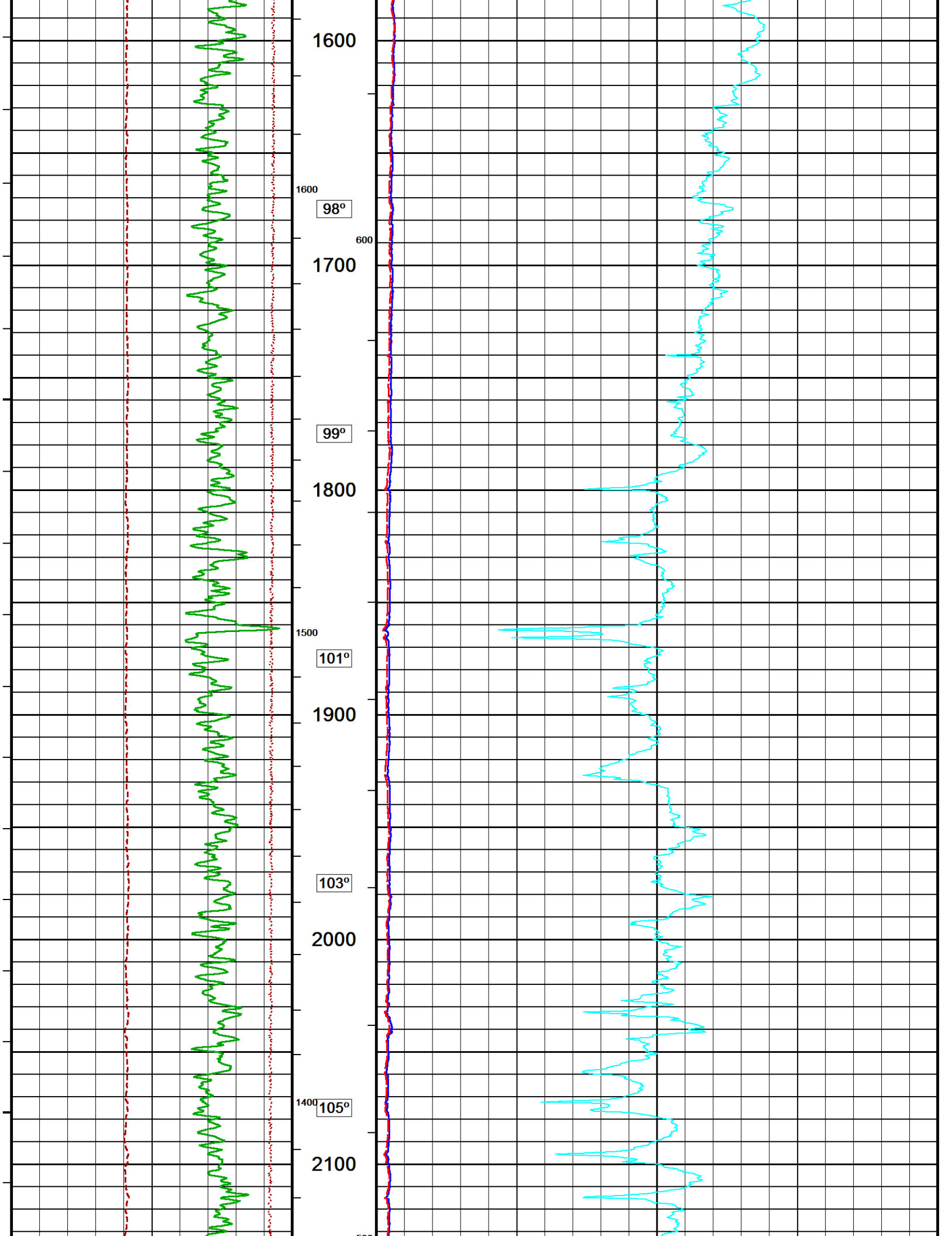
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.

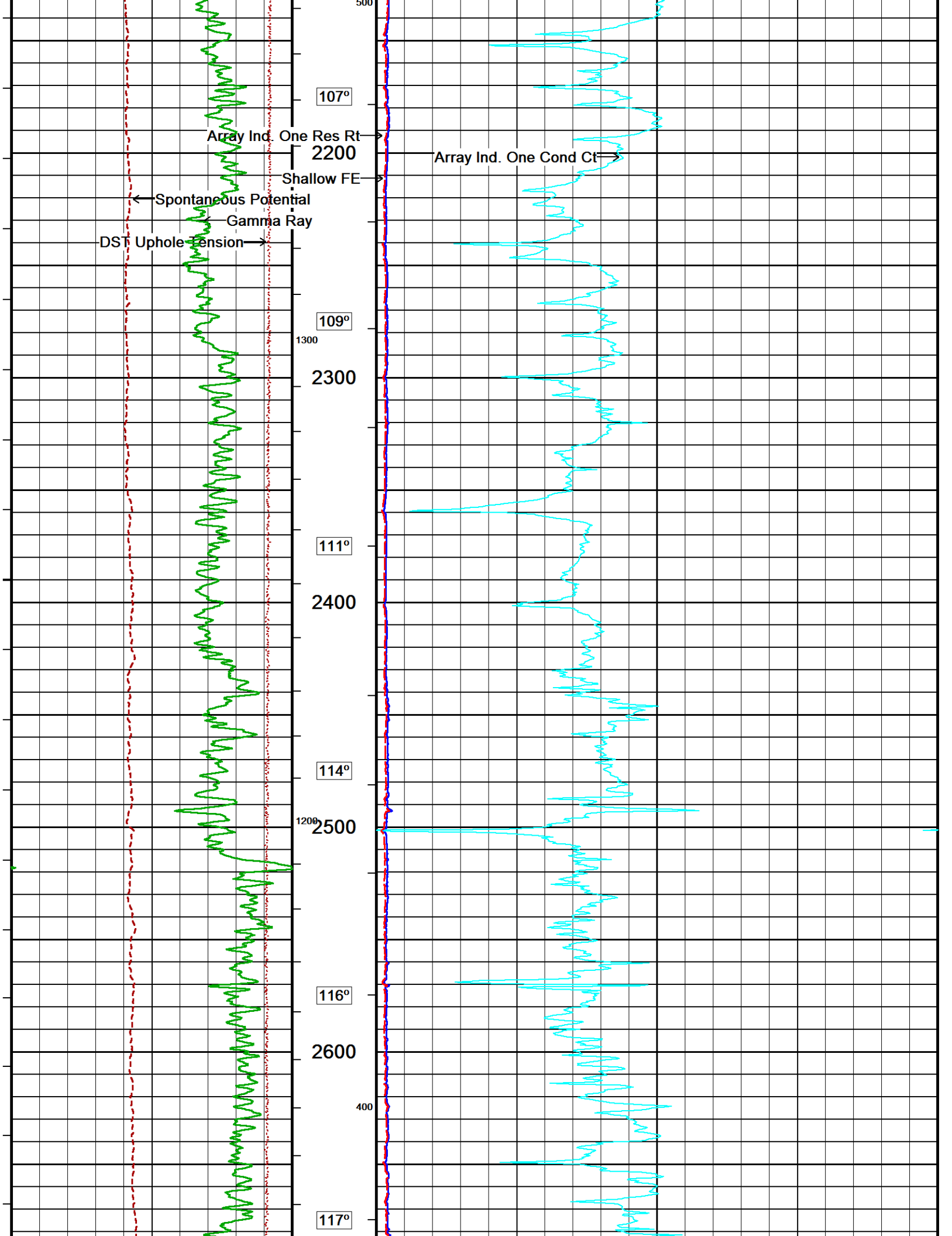


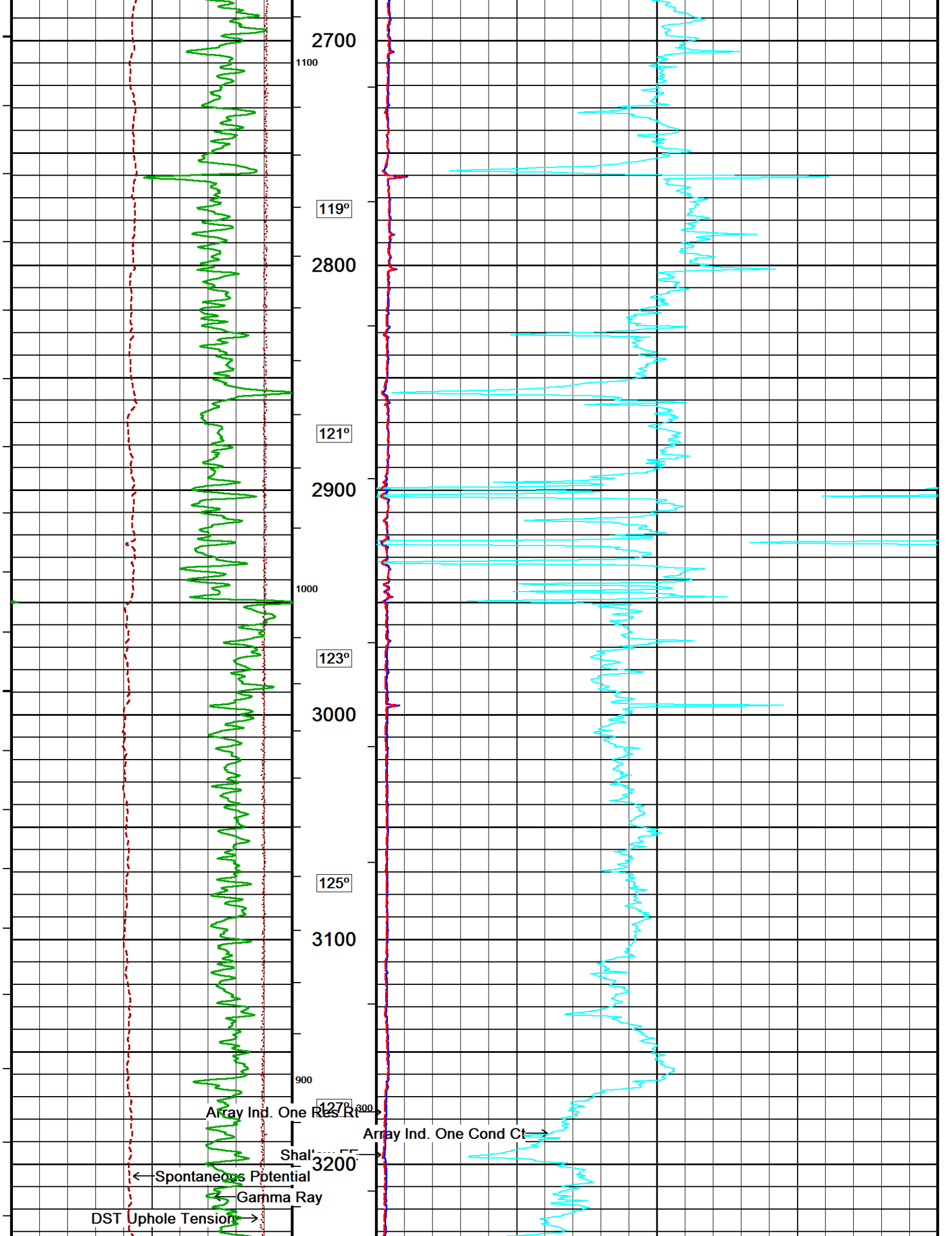




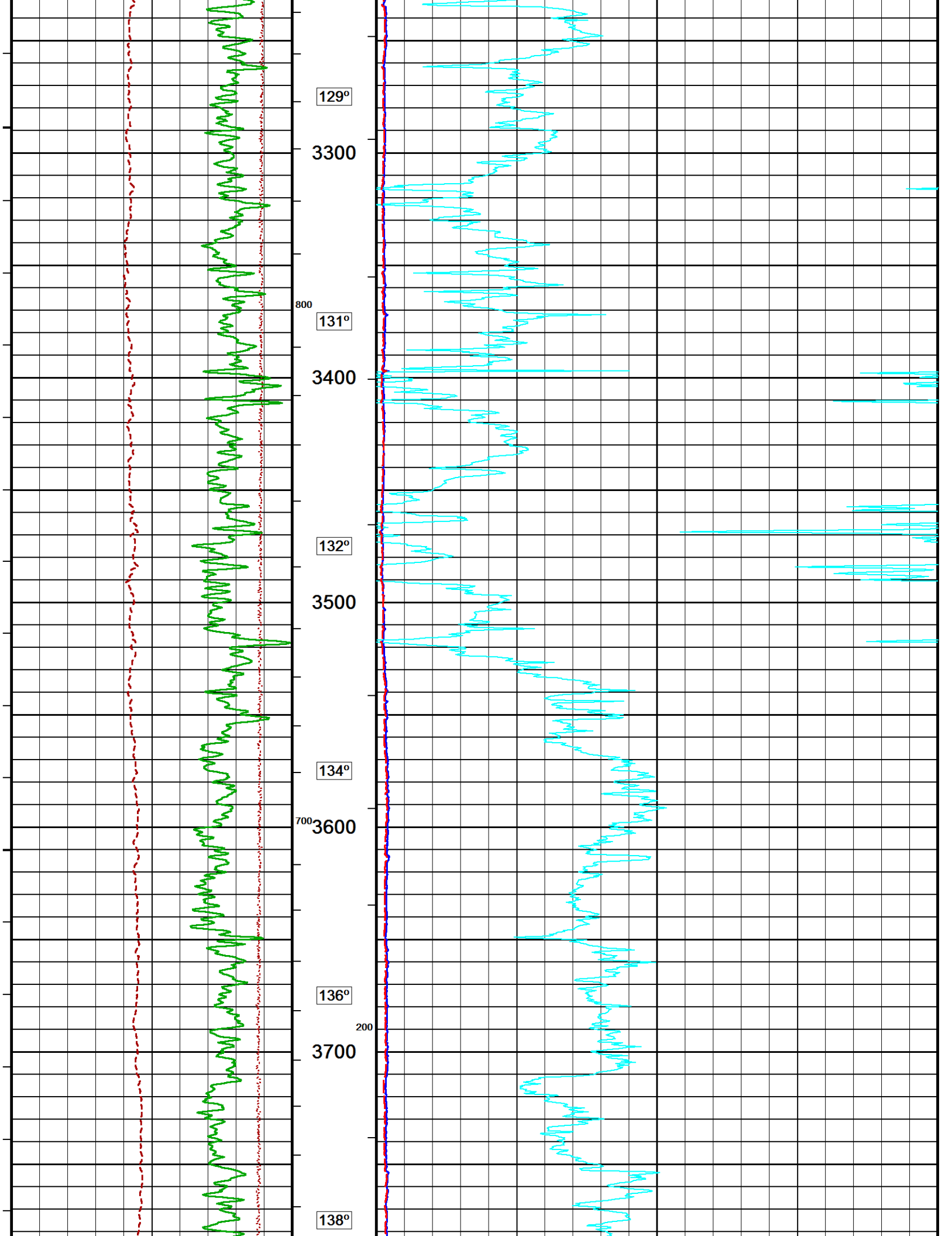


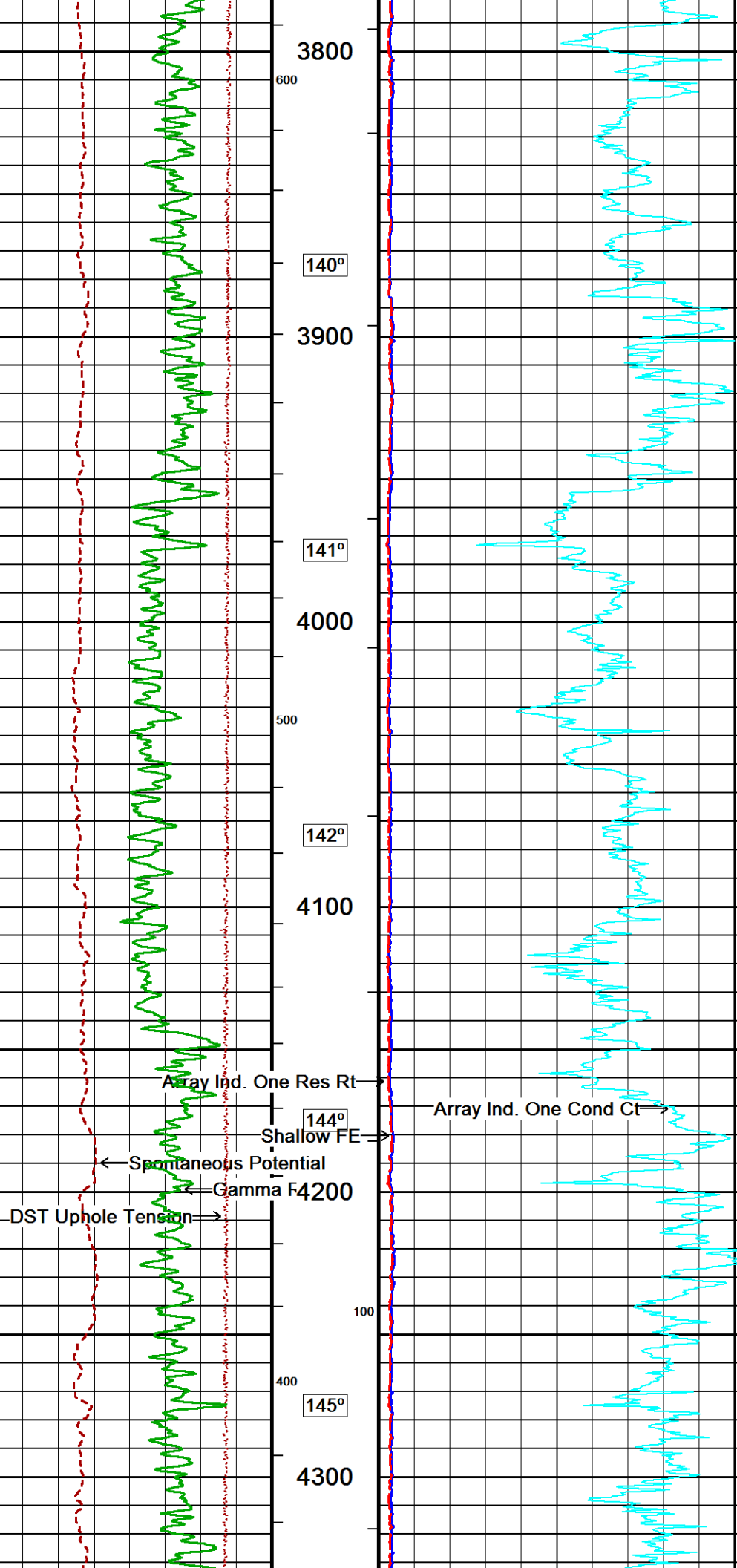


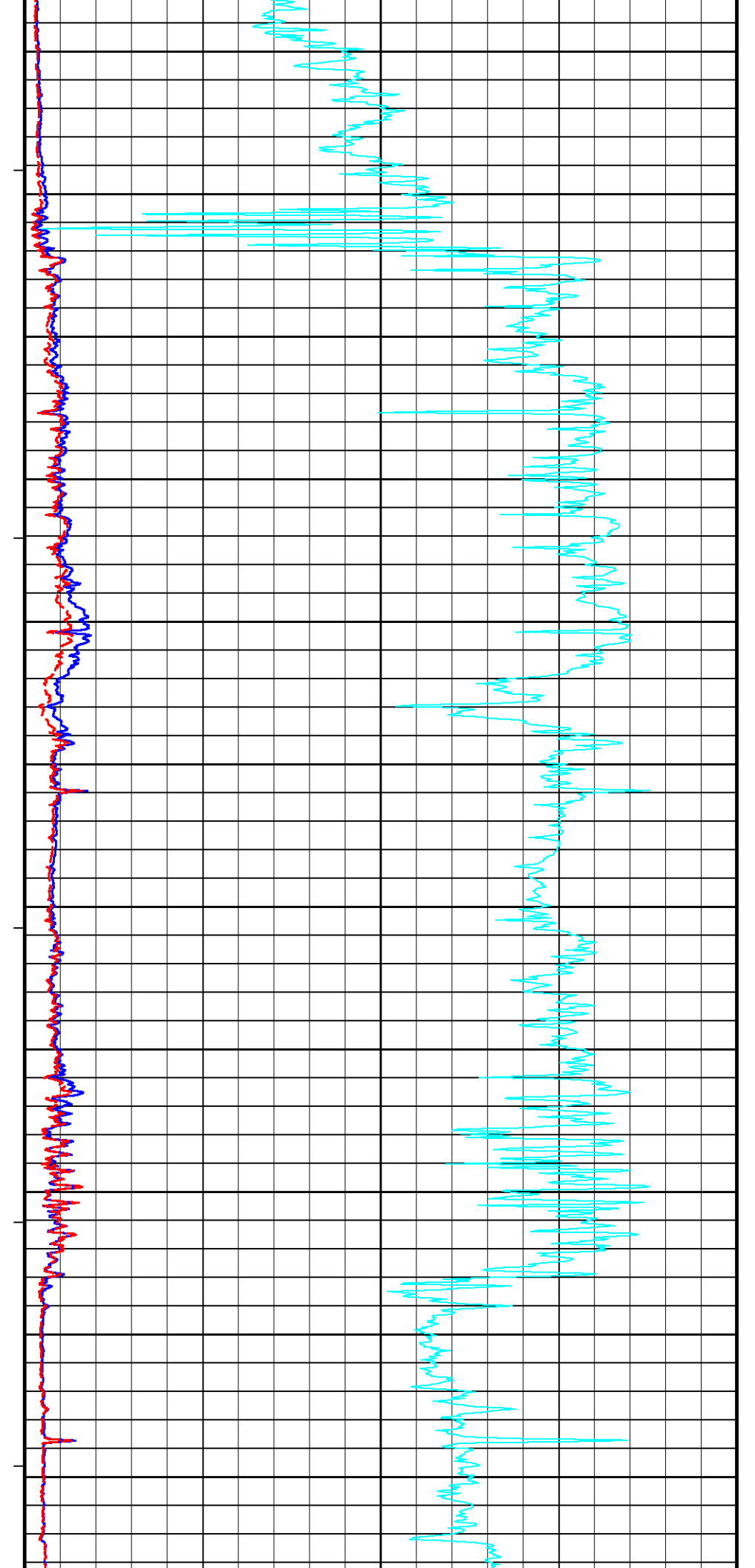
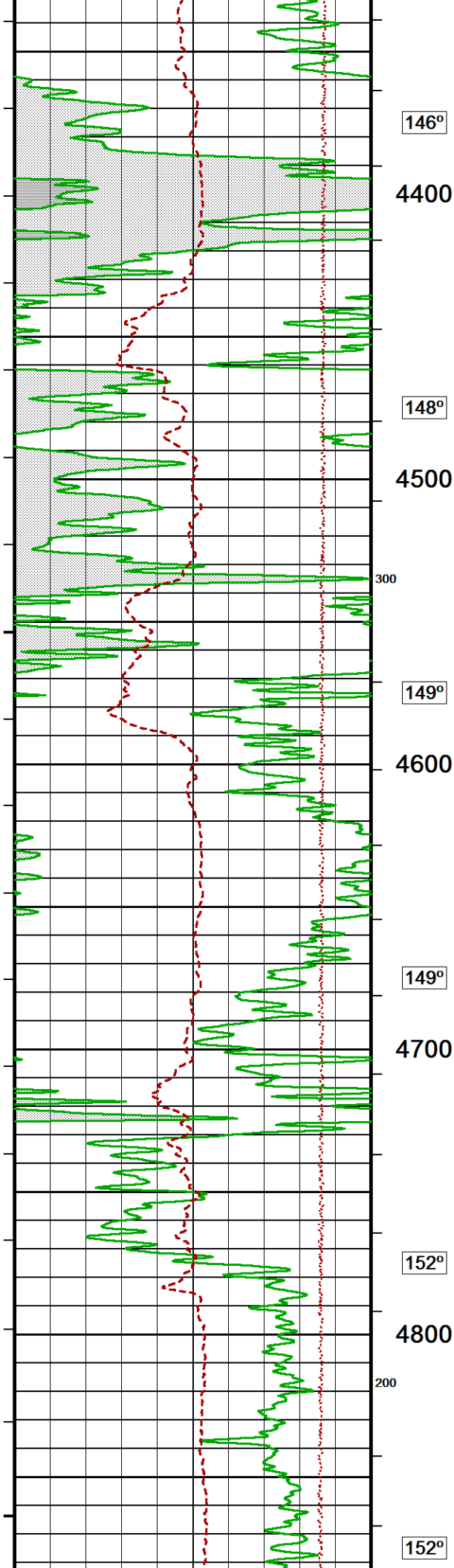


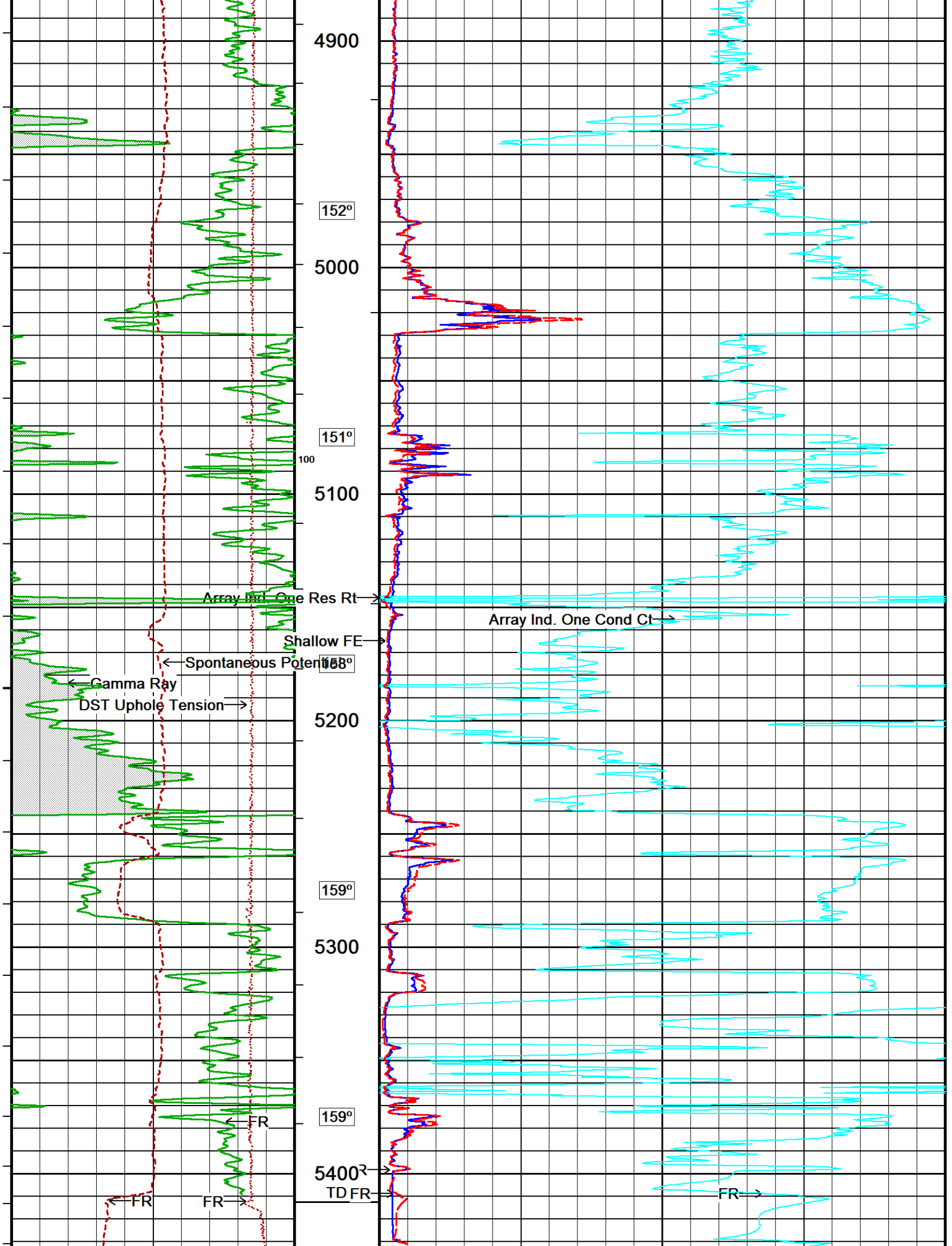


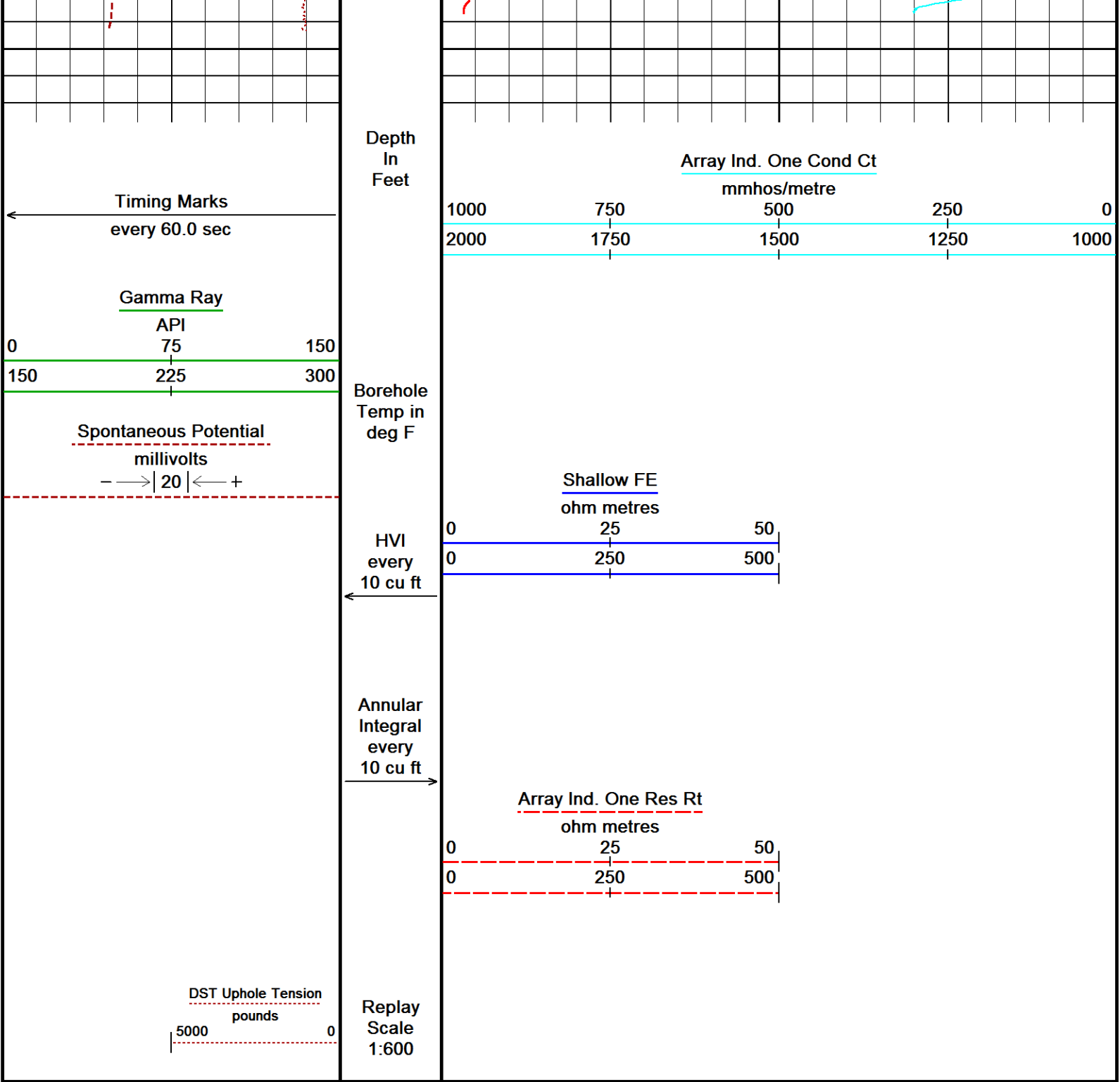












Depth Based Data - Maximum Sampling Increment 10.0cm  
Filename: C:\Minimus 17.03.9609\DATA\ECGS\MAIN-1.dta  
System Versions: Logged with 17.03.9609 Processed with 17.03.9609 Plotted with 17.03.9609

Plotted on 18-NOV-2017 22:42  
Recorded on 18-NOV-2017 18:46

↑

2 INCH MAIN PASS 1:600

↑

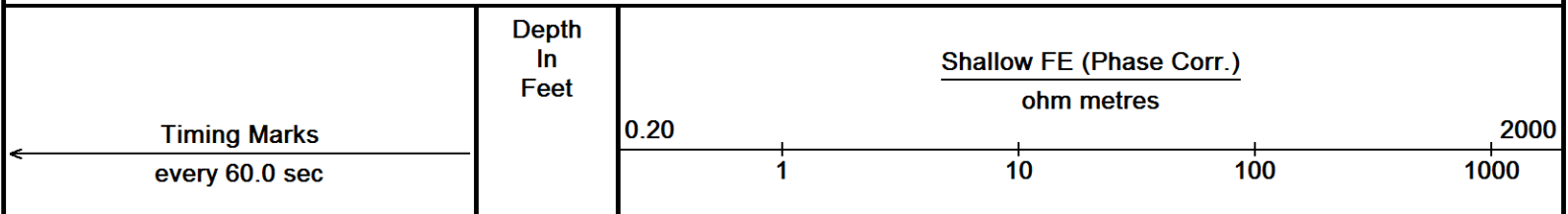
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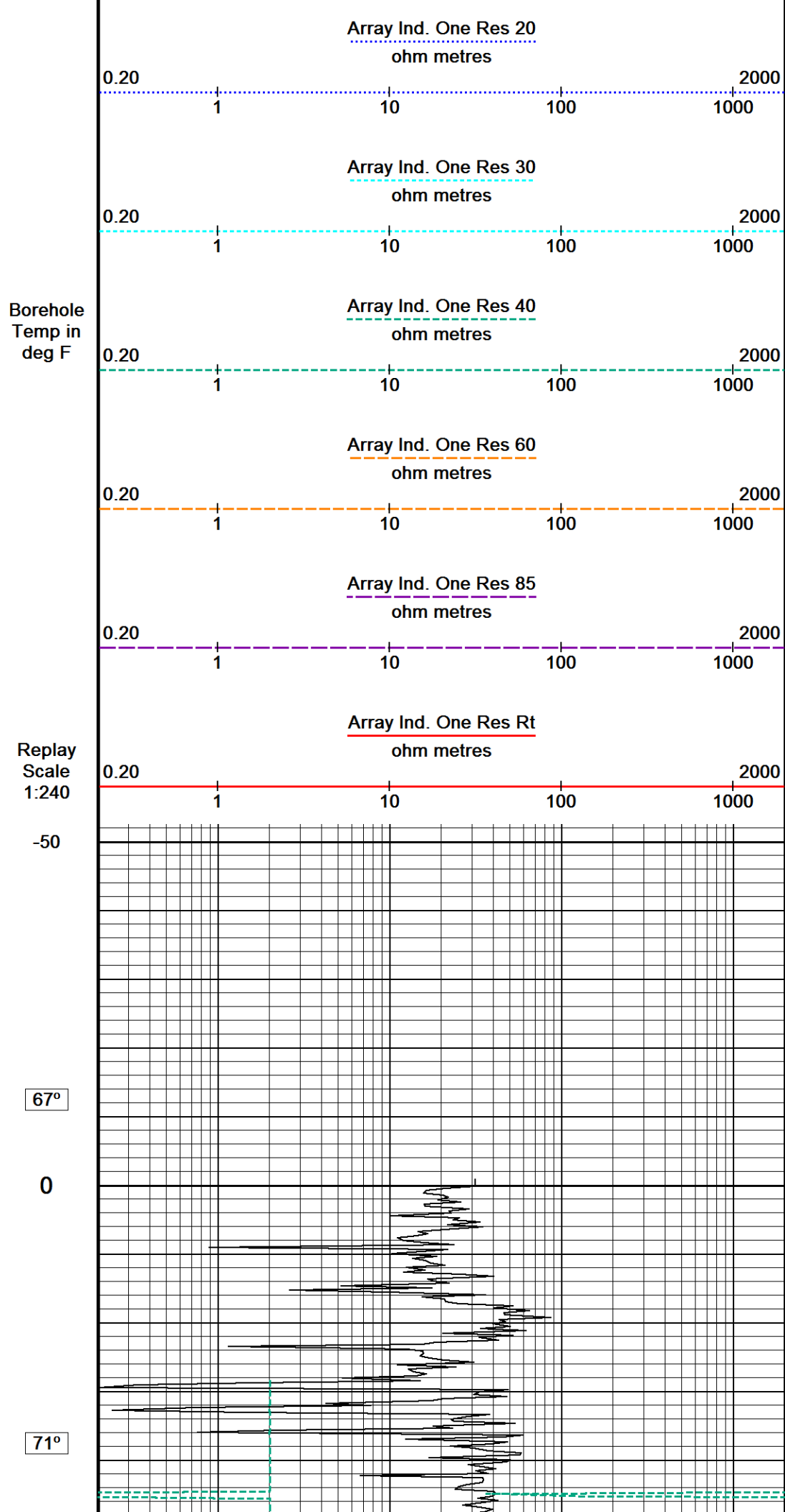
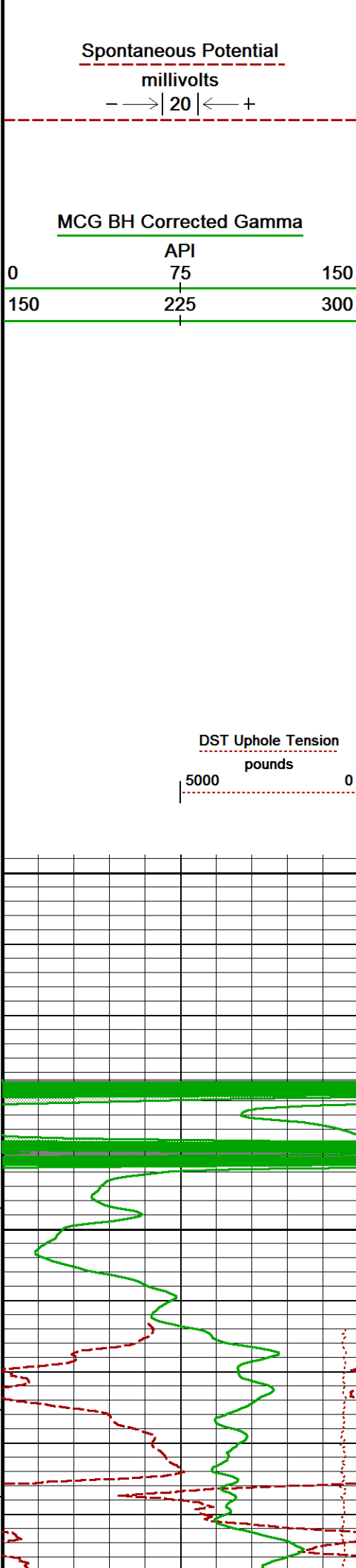
5 INCH MAIN PASS 1:240

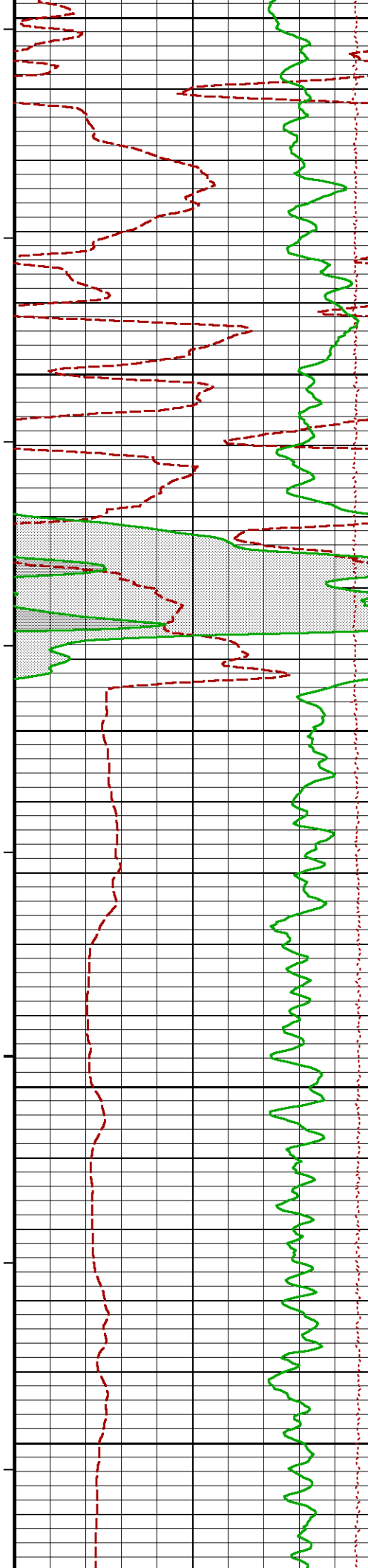
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Depth Based Data - Maximum Sampling Increment 10.0cm  
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System Versions: Logged with 17.03.9609 Processed with 17.03.9609 Plotted with 17.03.9609

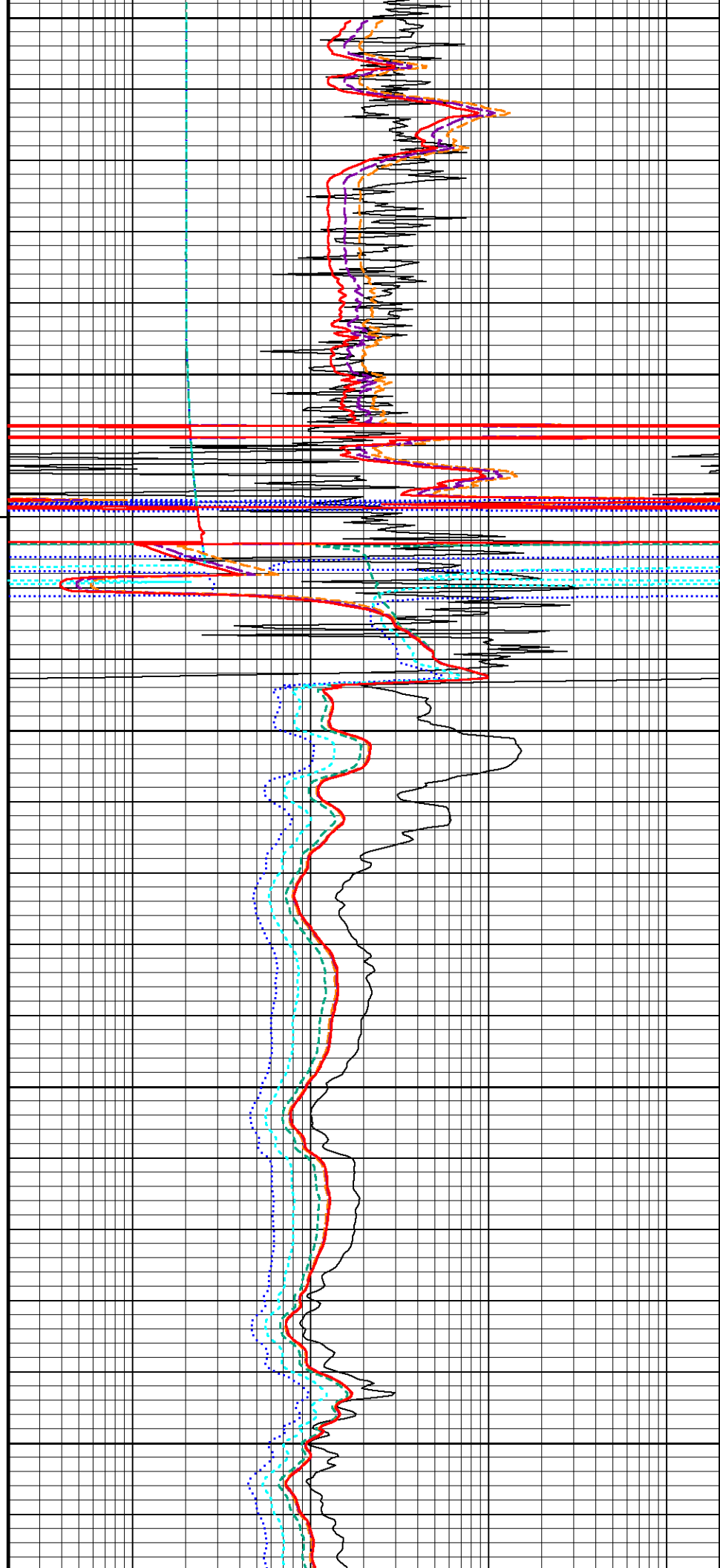
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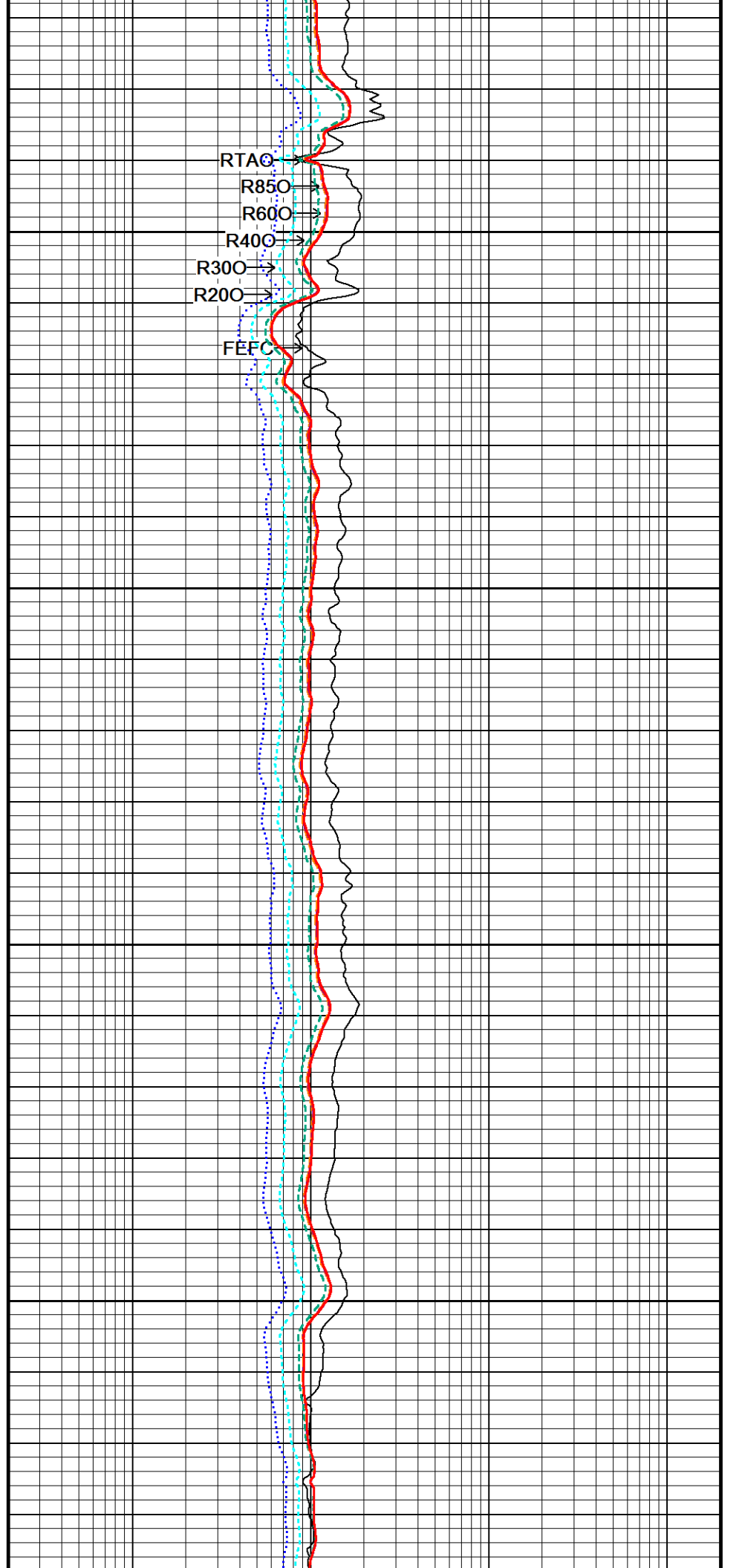
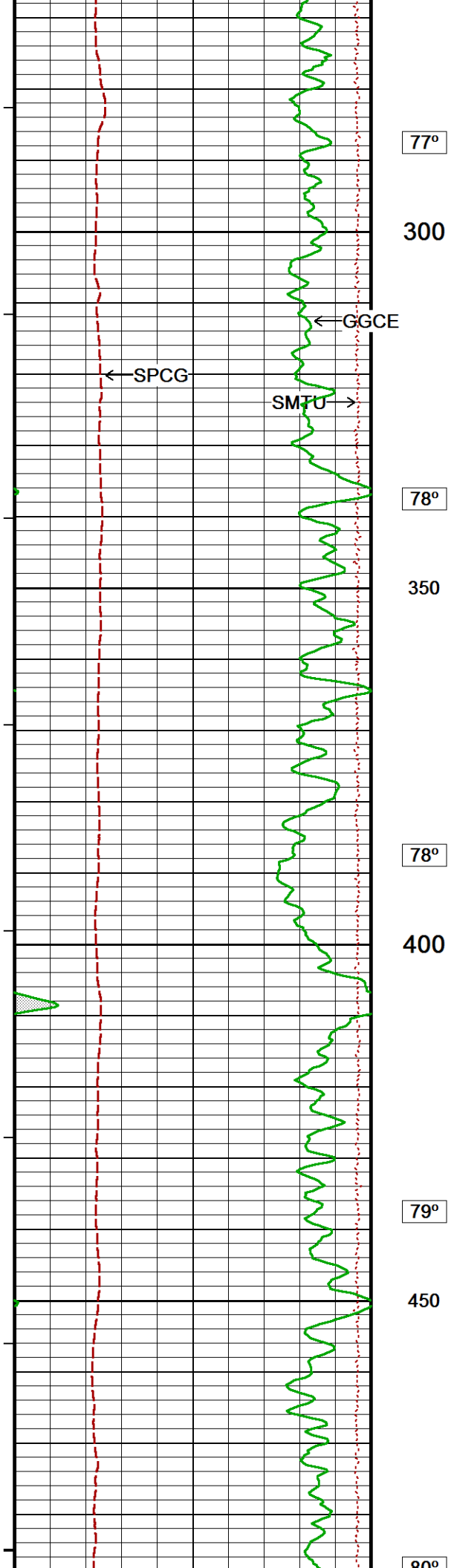




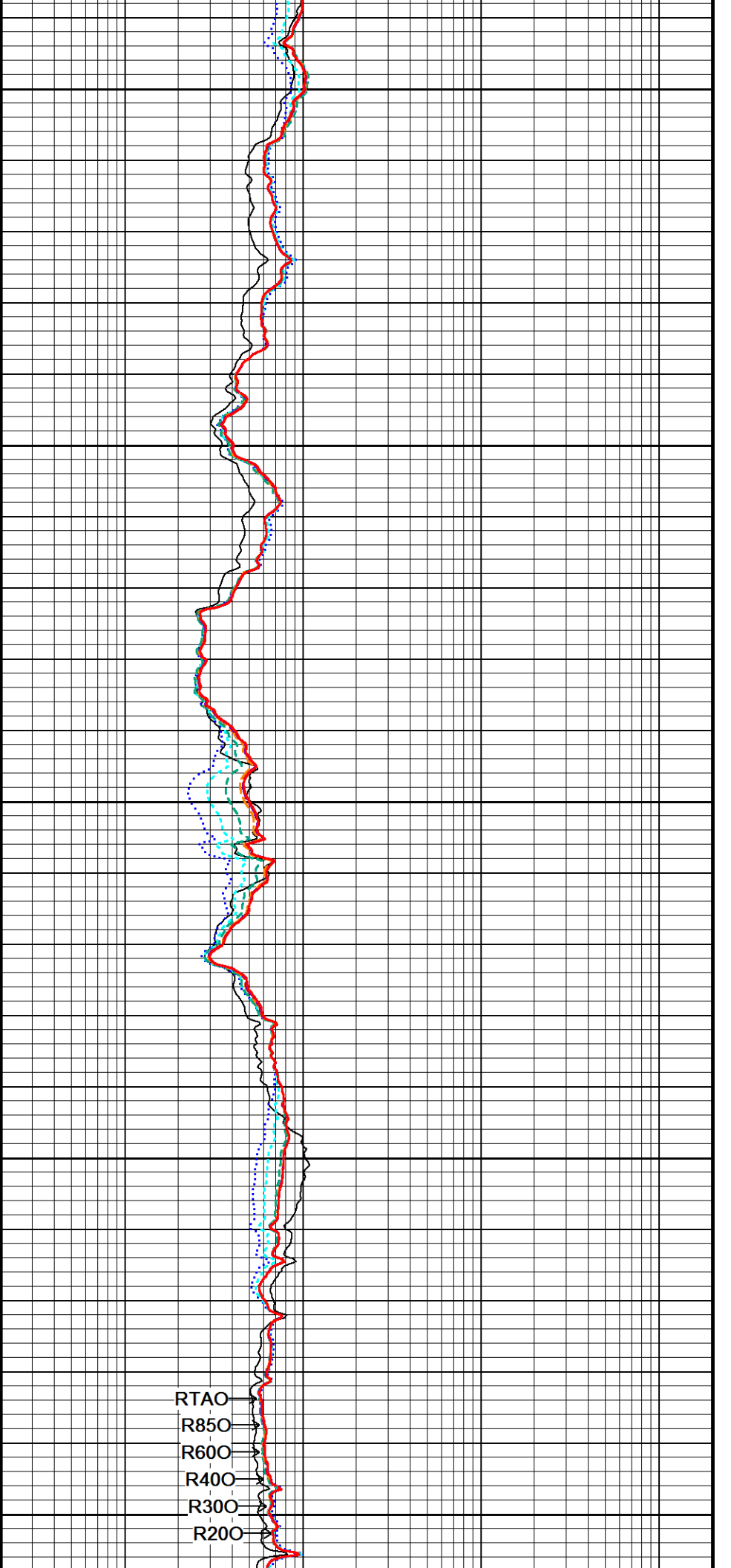
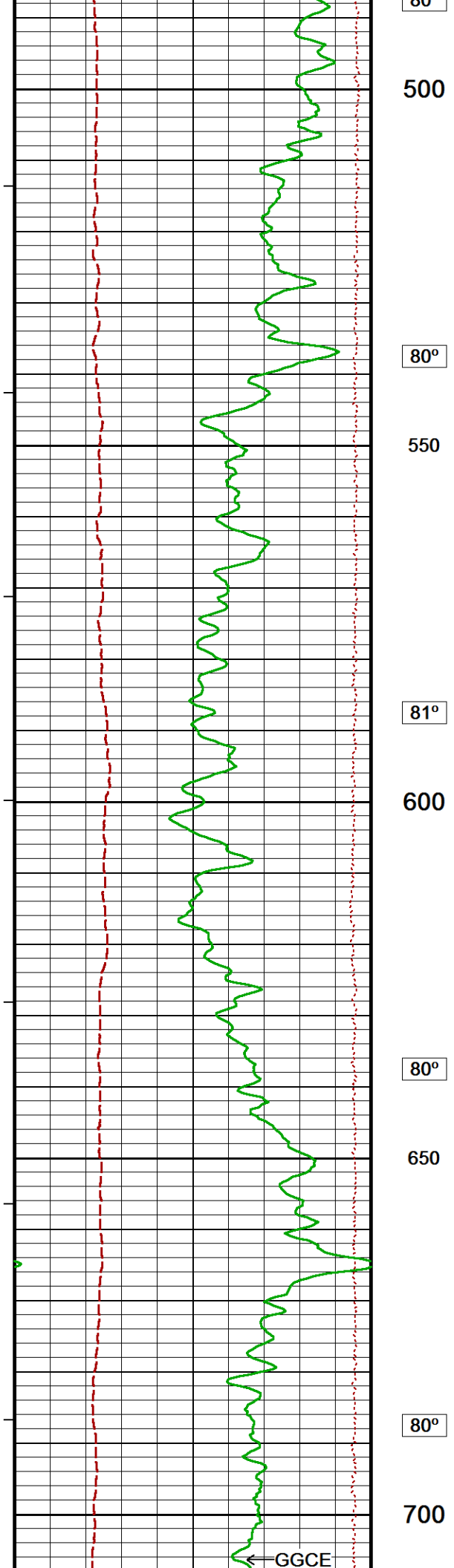


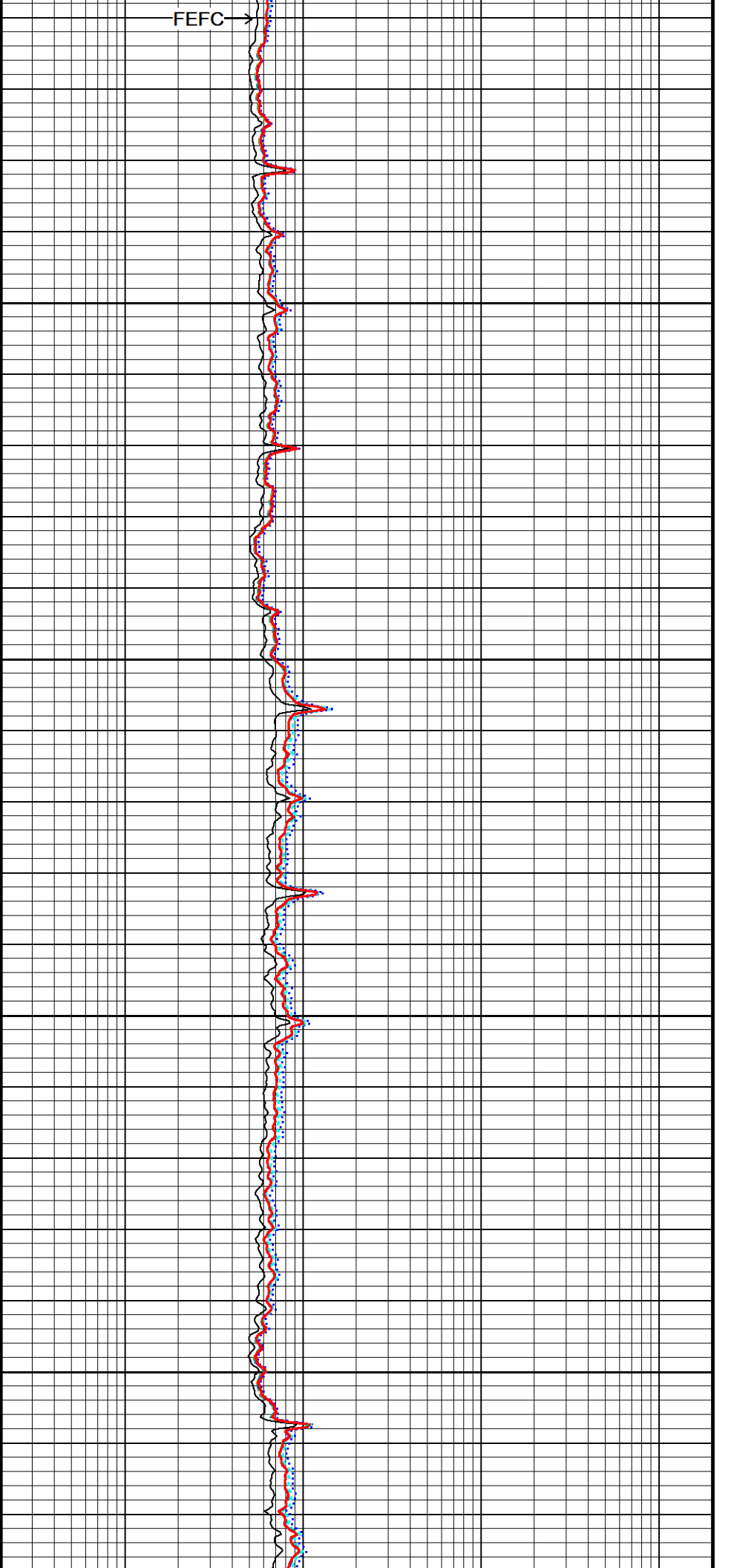
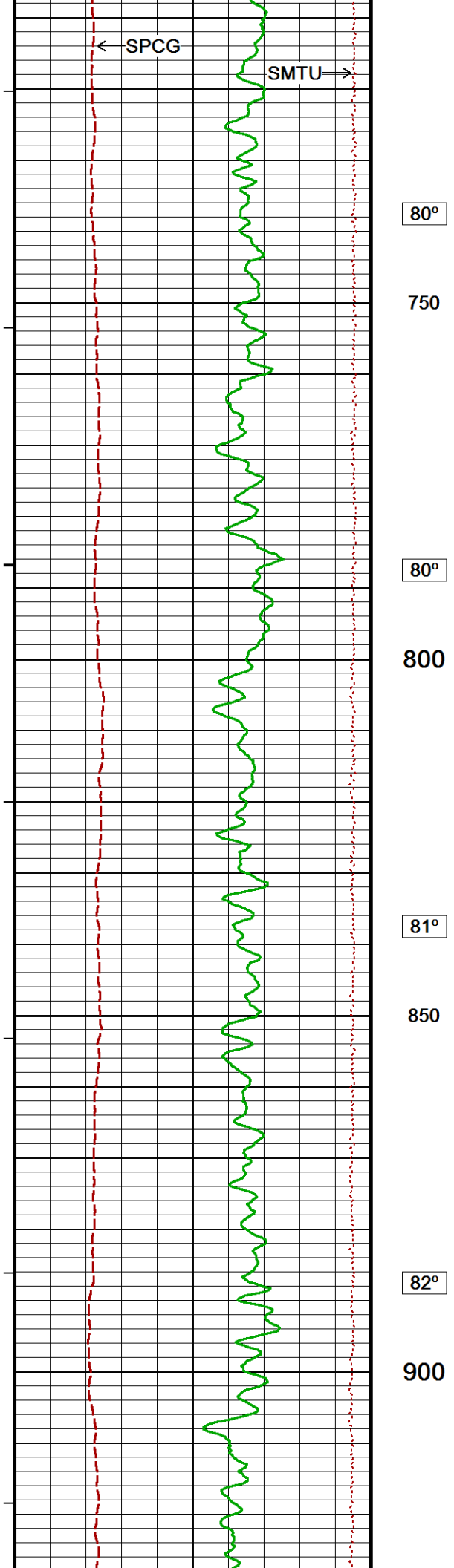
50  
72°  
100  
Casing Shoe  
72°  
150  
74°  
200  
75°  
250

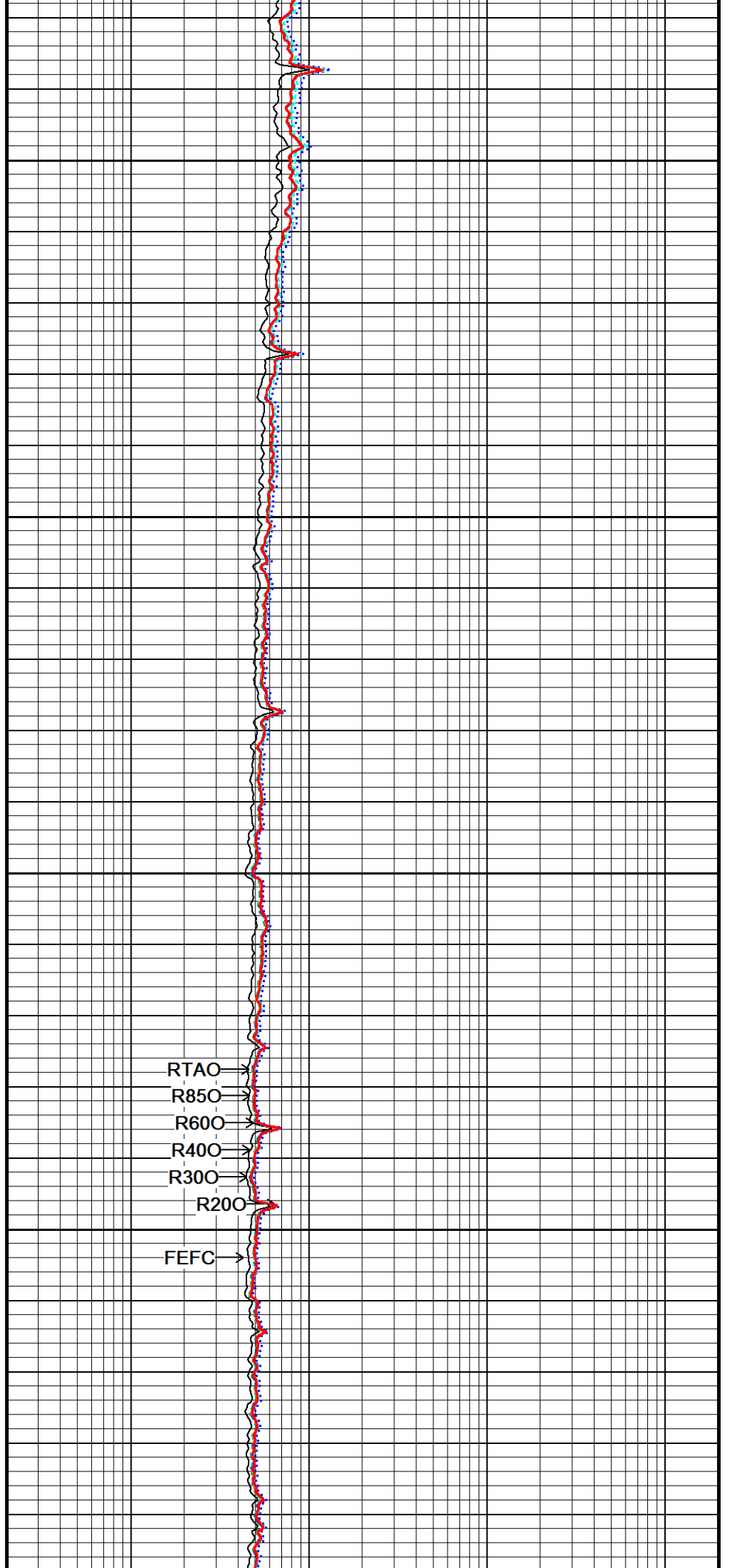
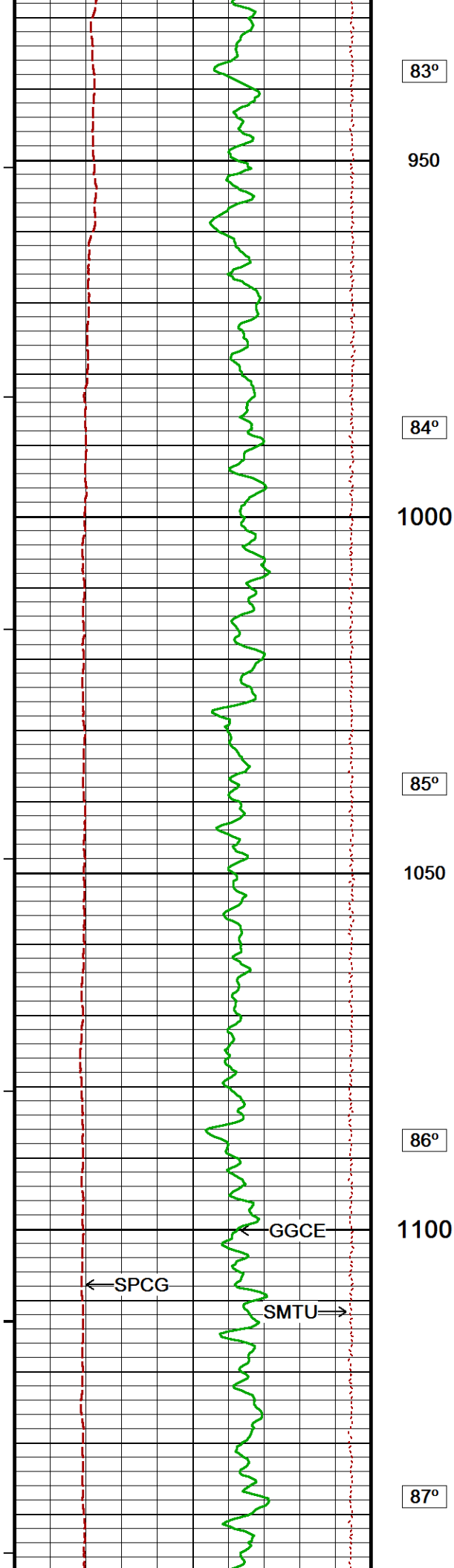


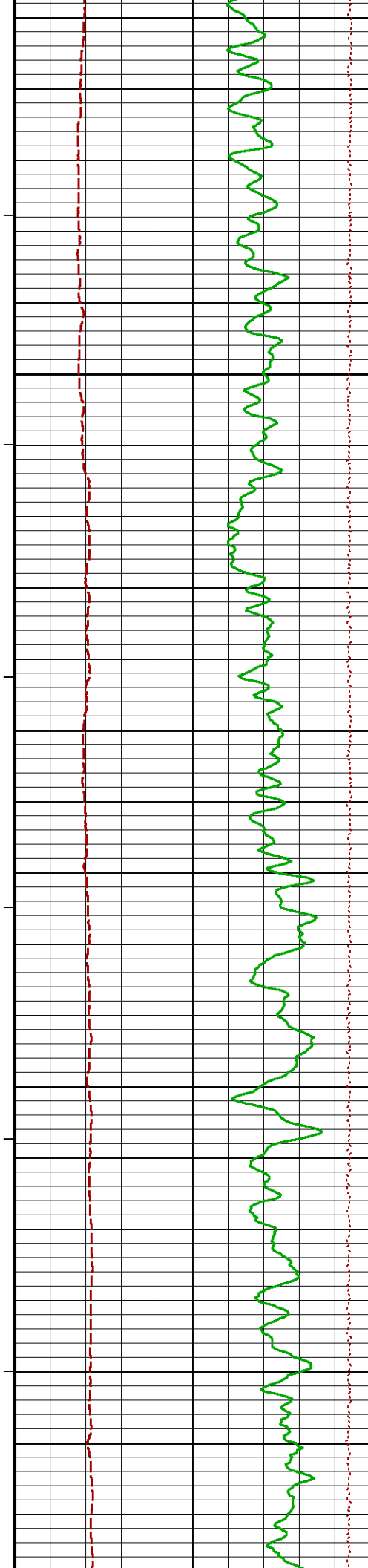












1150

88°

1200

89°

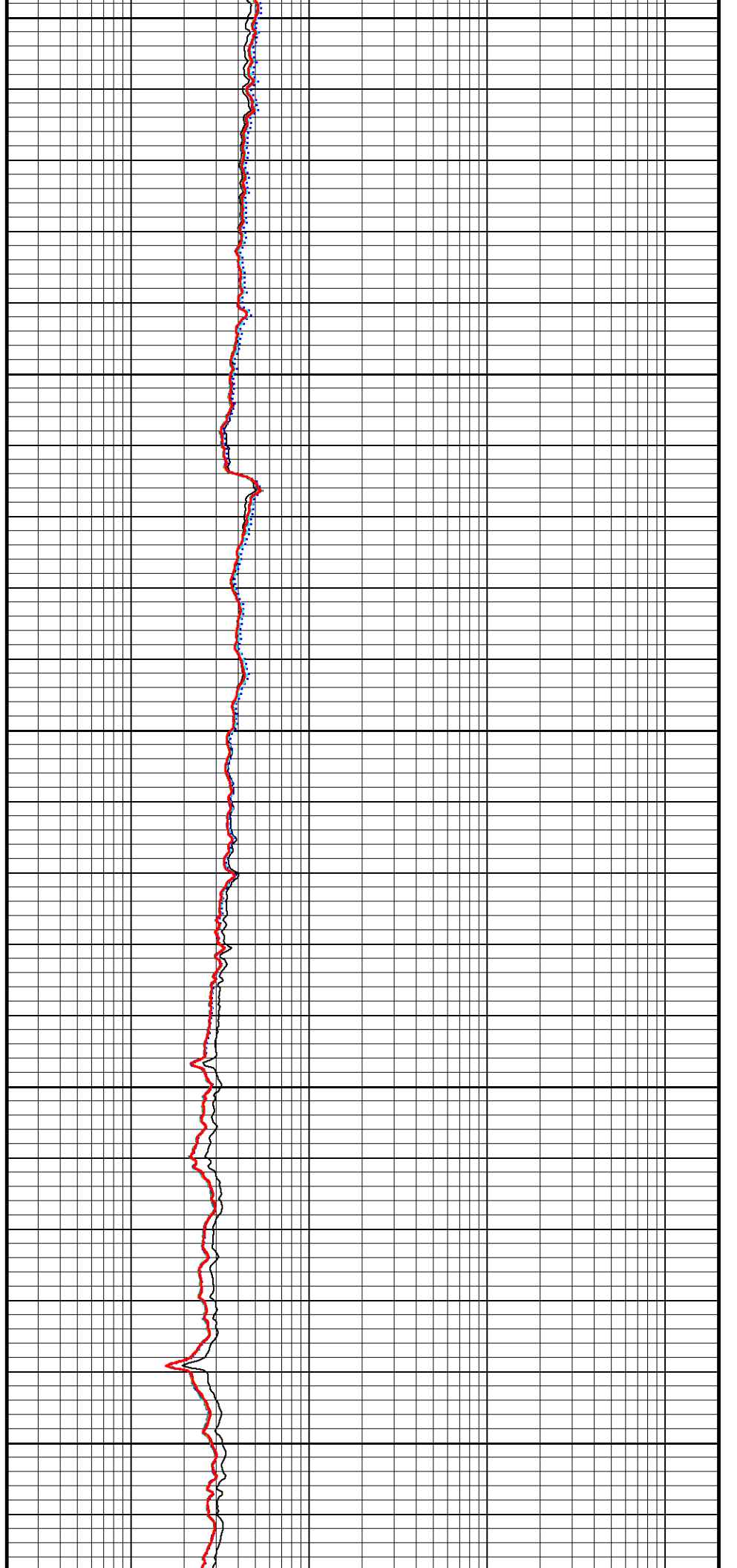
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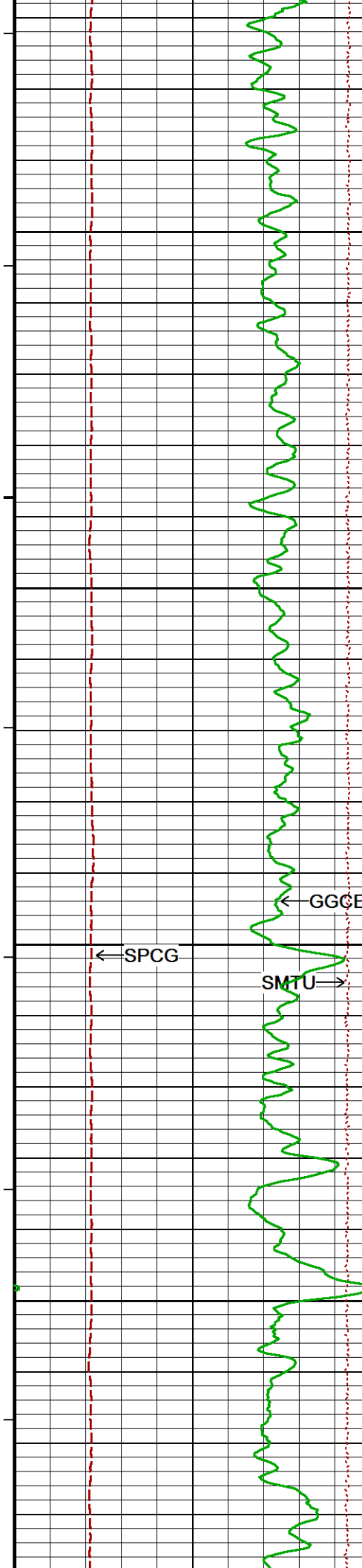
90°

1300

91°

1350





92°

1400

93°

1450

94°

1500

95°

1550

96°

← SPCG

← GGCE

SMTU →

RTAO →

R850 →

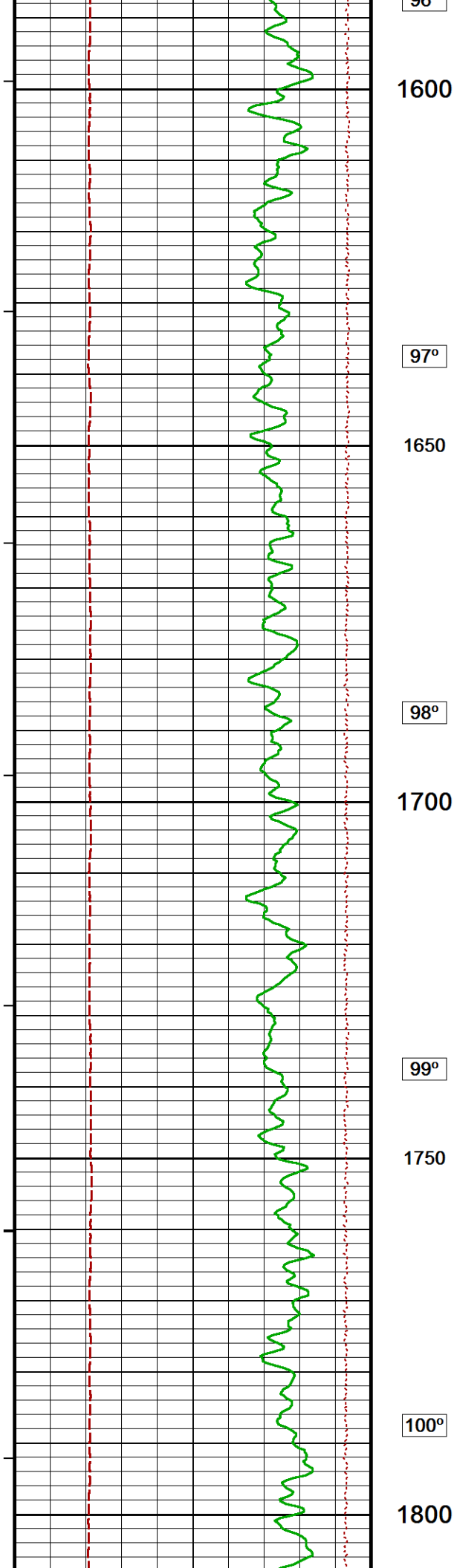
R600 →

R400 →

R300 →

R200 →

FEFC →



96

1600

97°

1650

98°

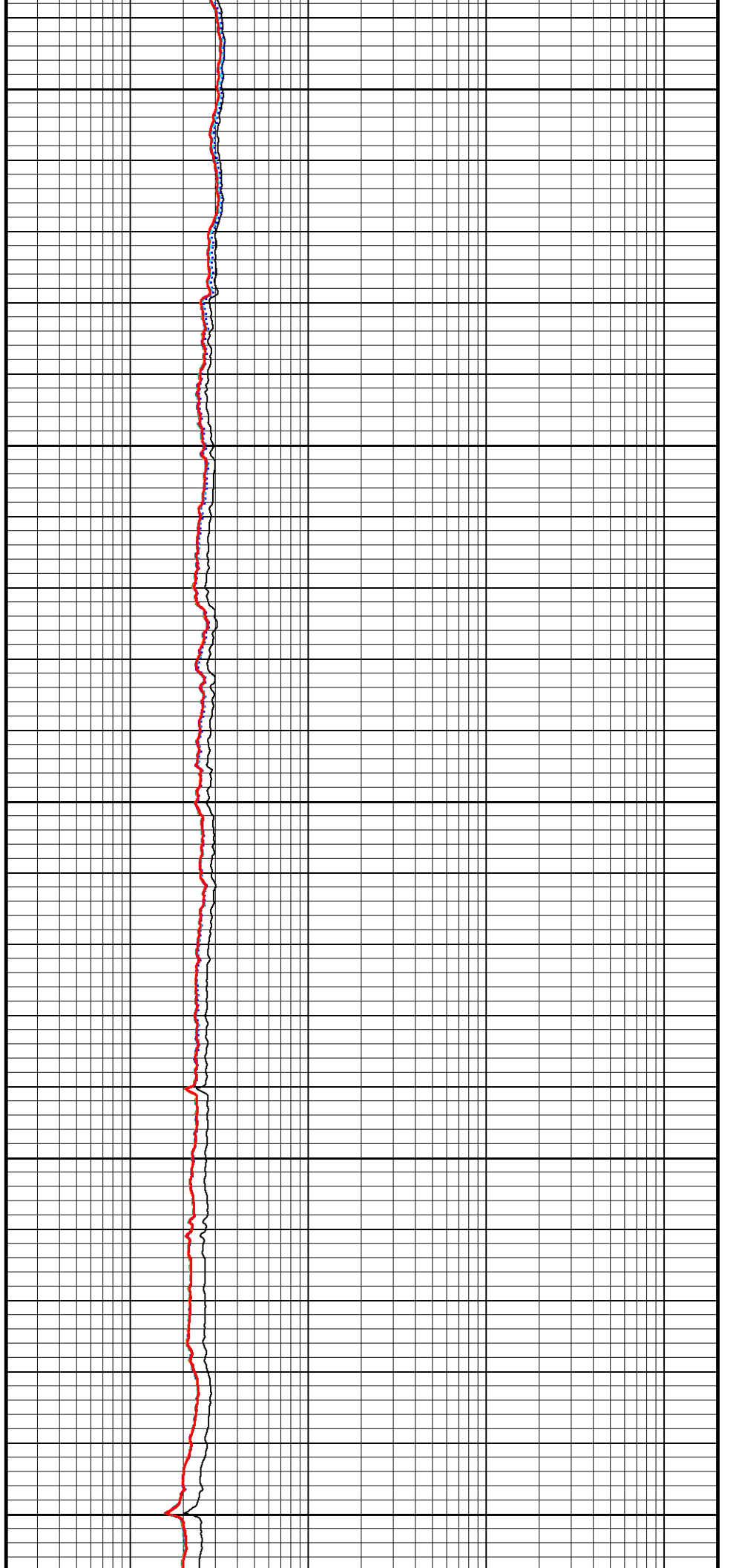
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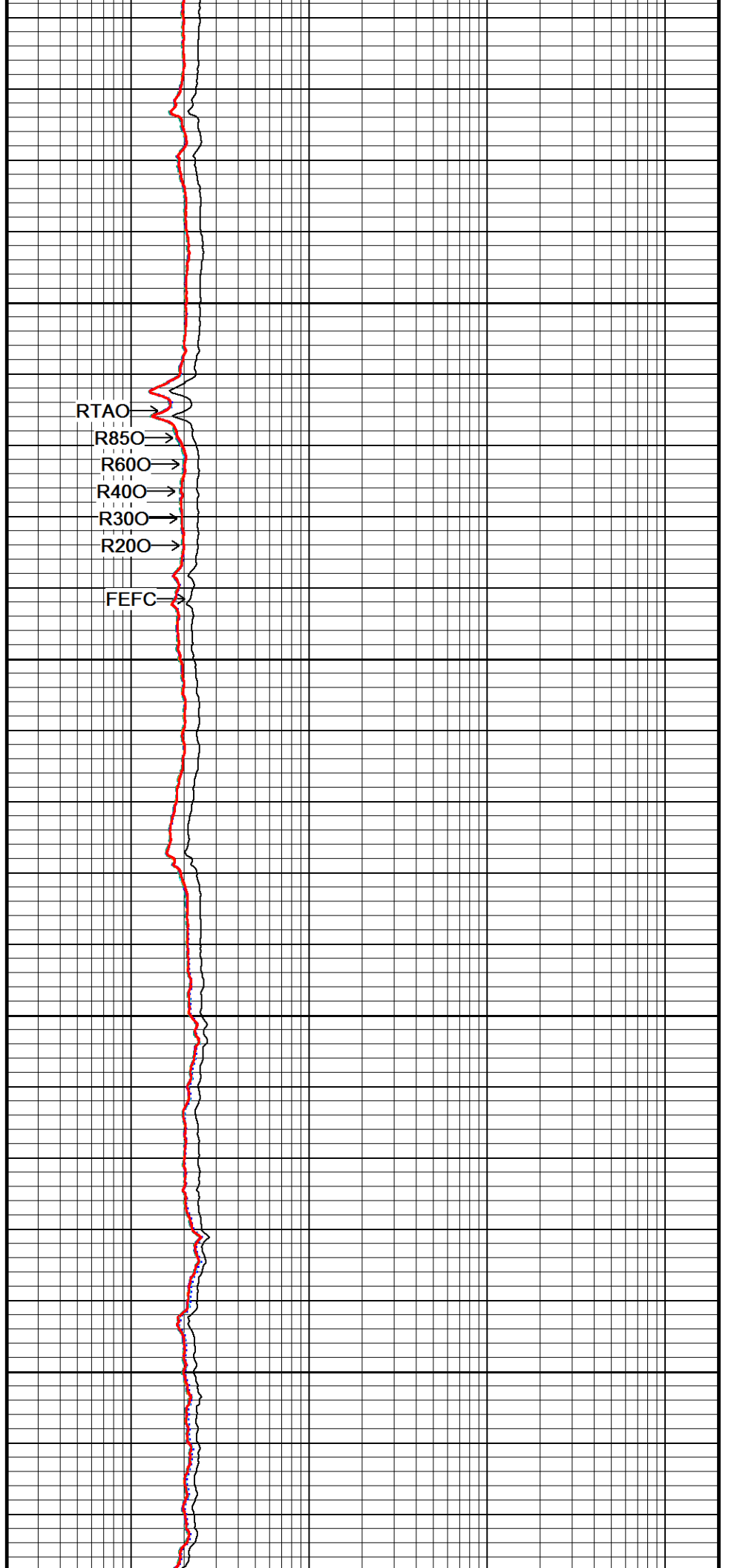
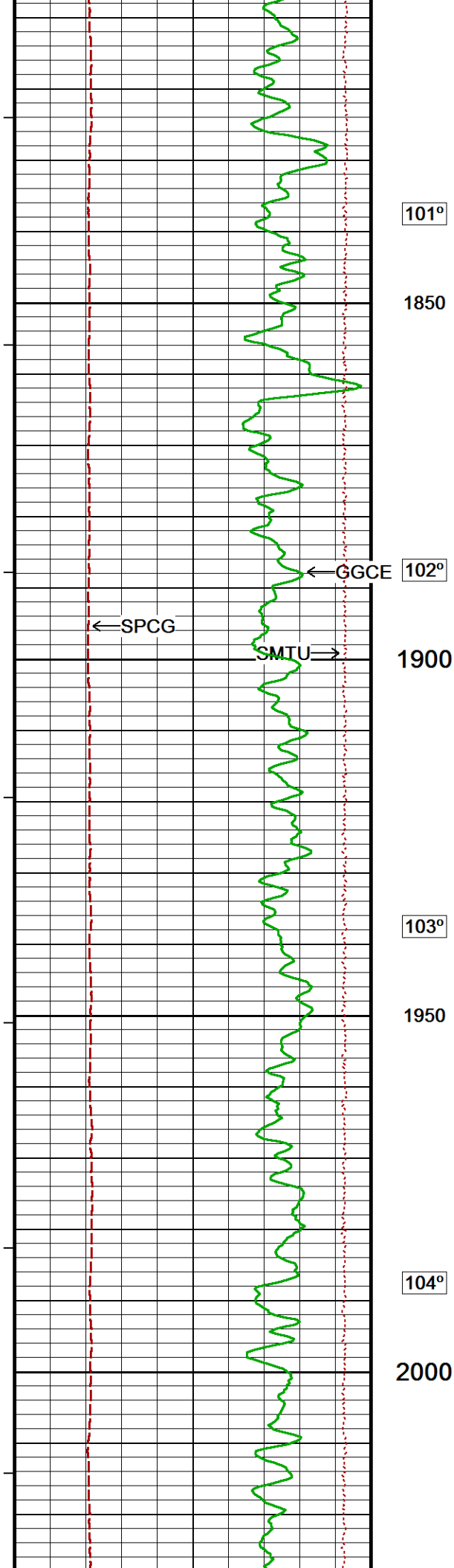
99°

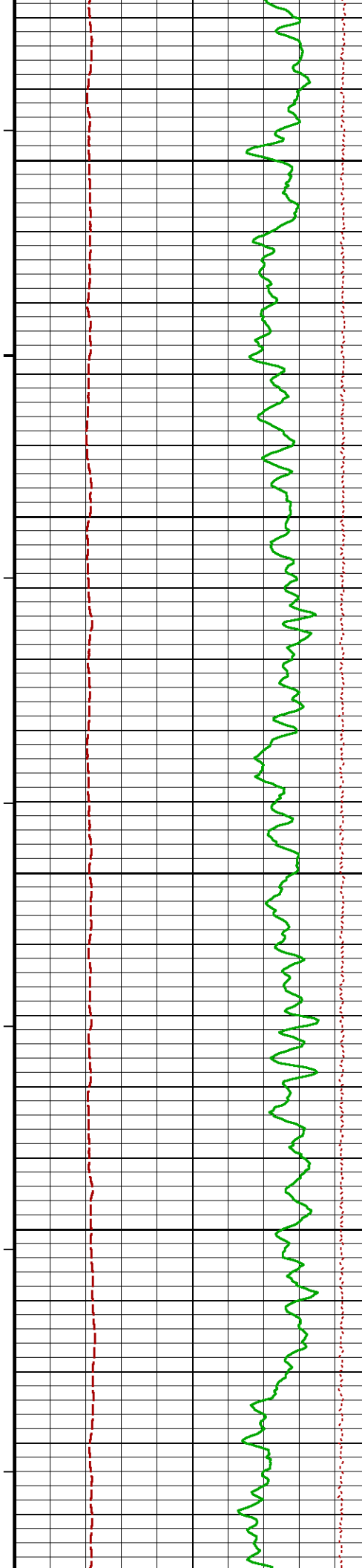
1750

100°

1800







105°

2050

105°

2100

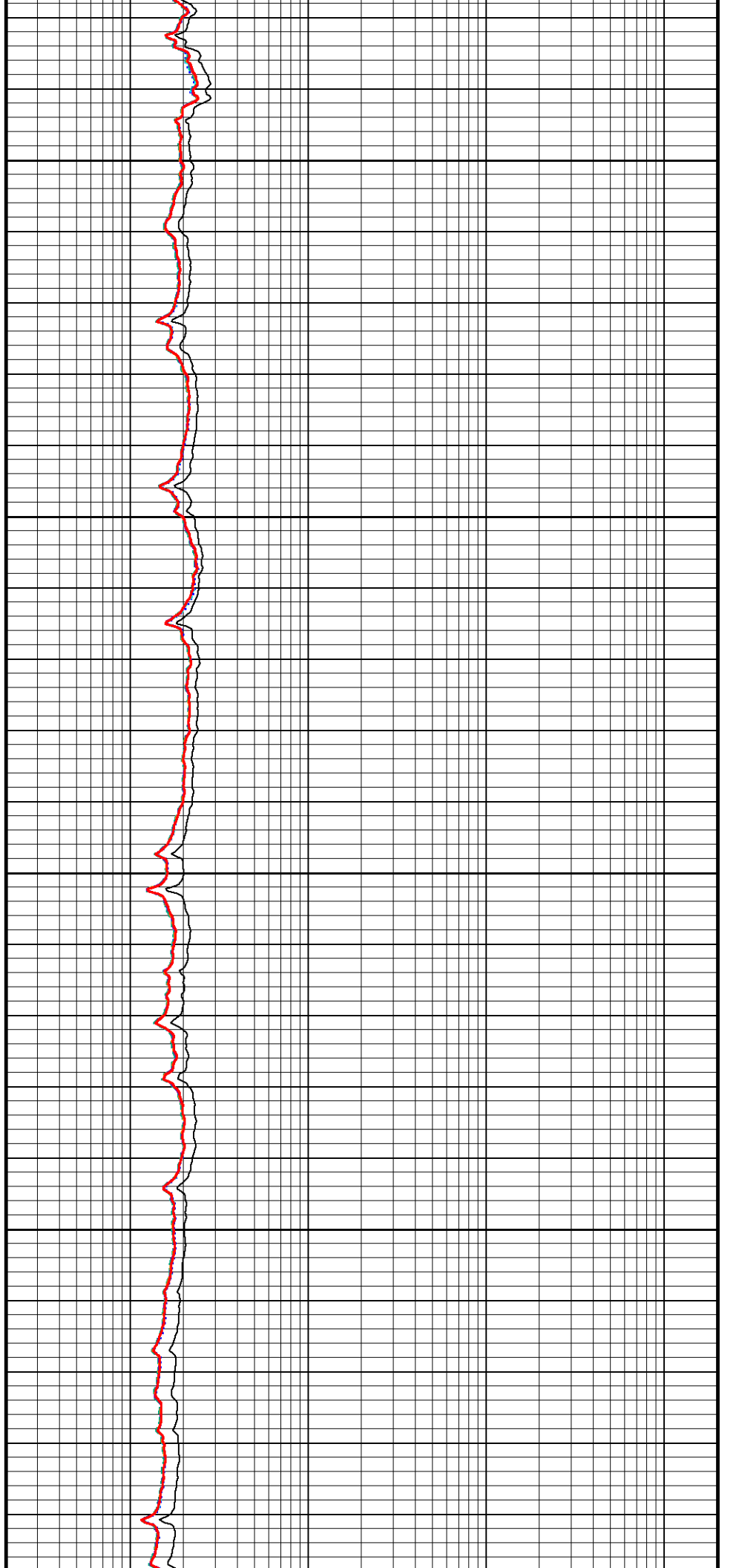
106°

2150

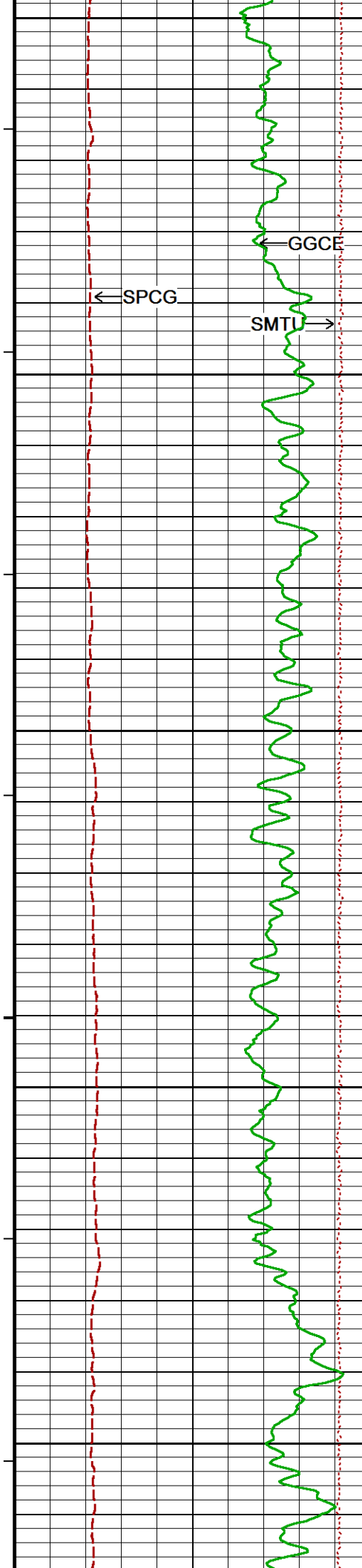
108°

2200

108°







2250

110°

2300

111°

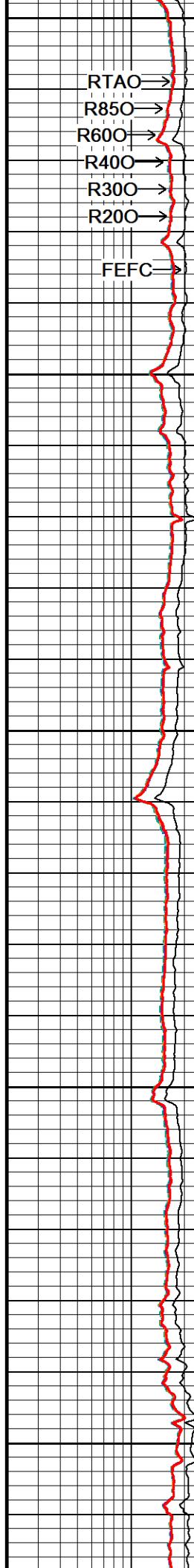
2350

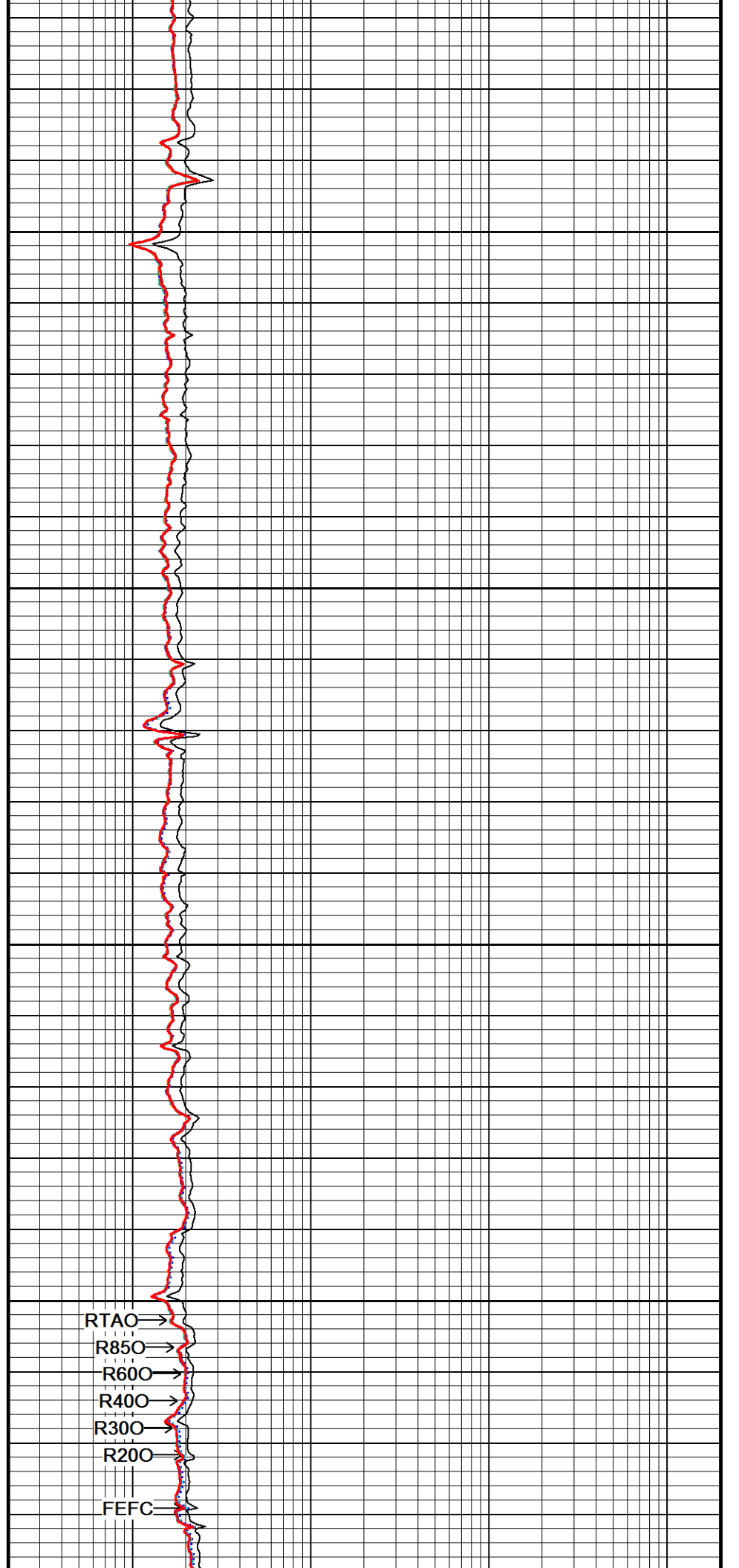
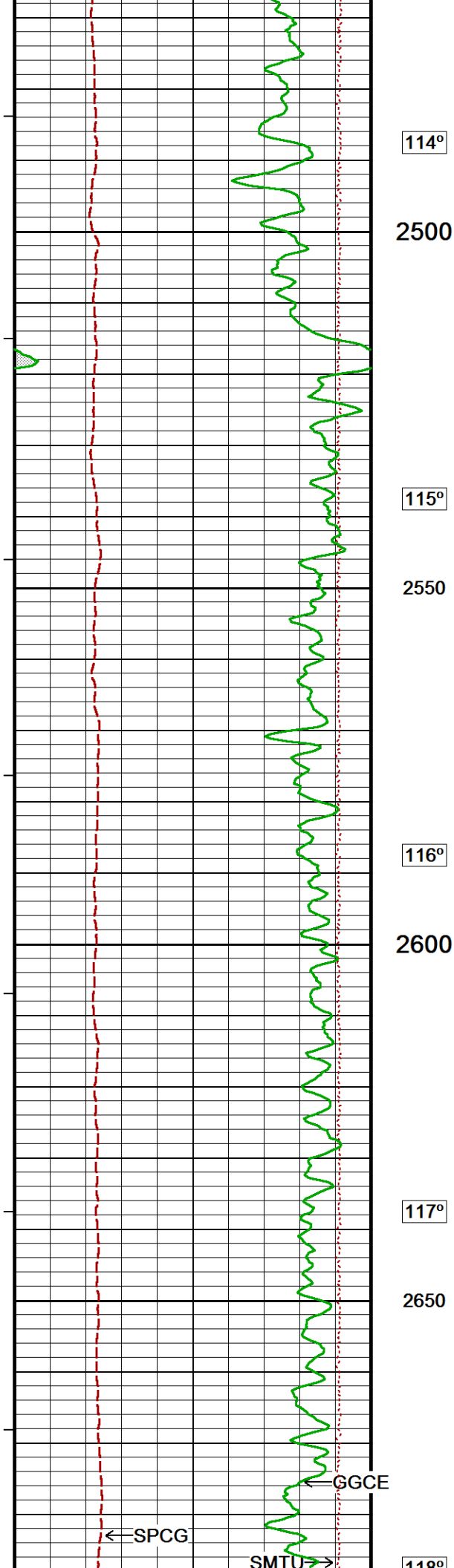
112°

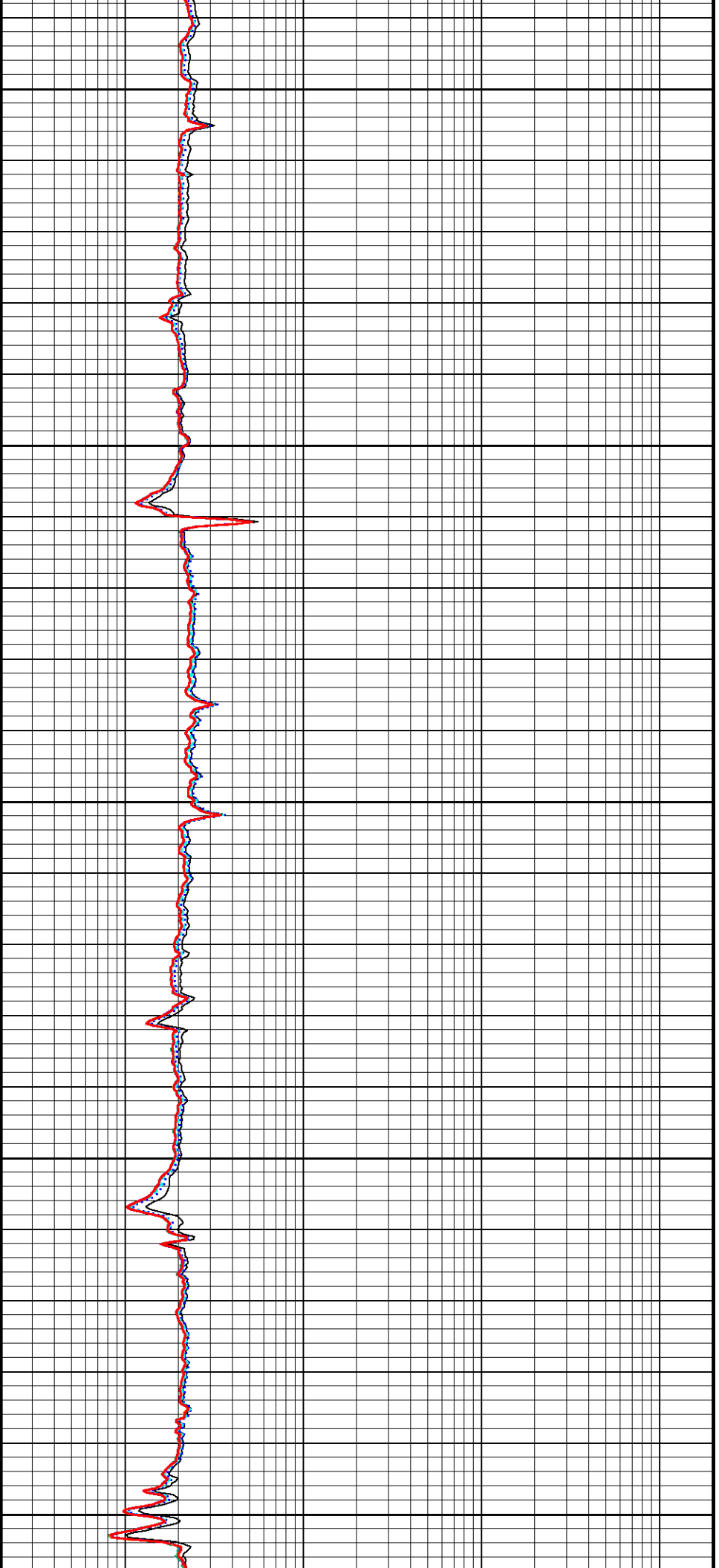
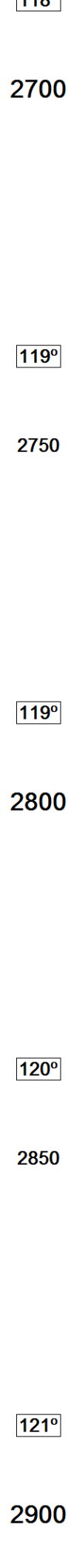
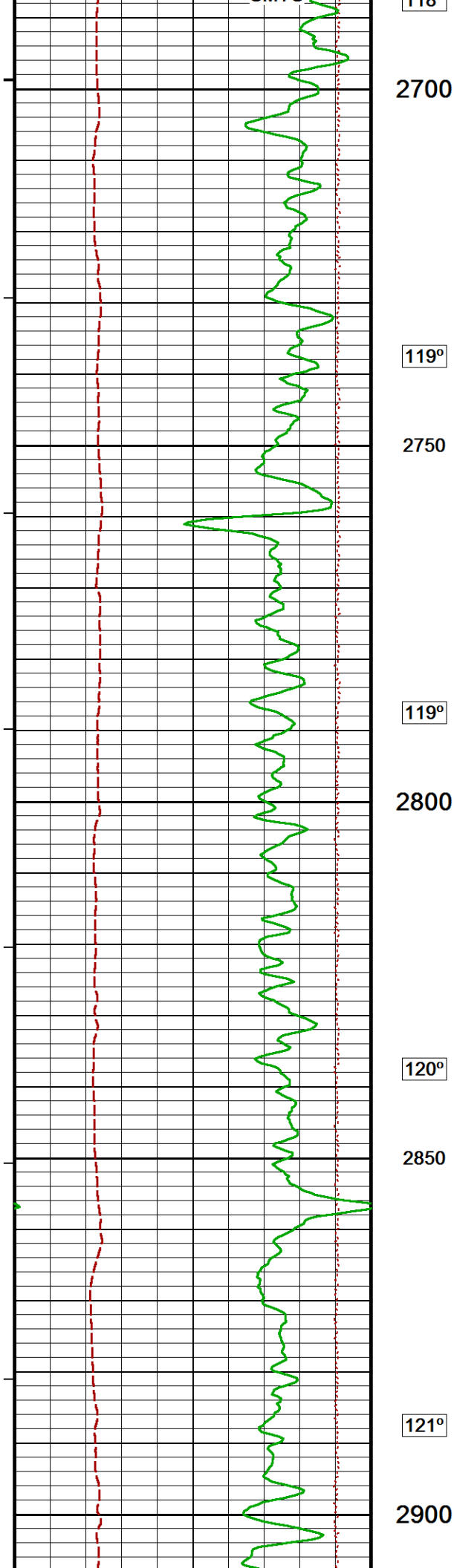
2400

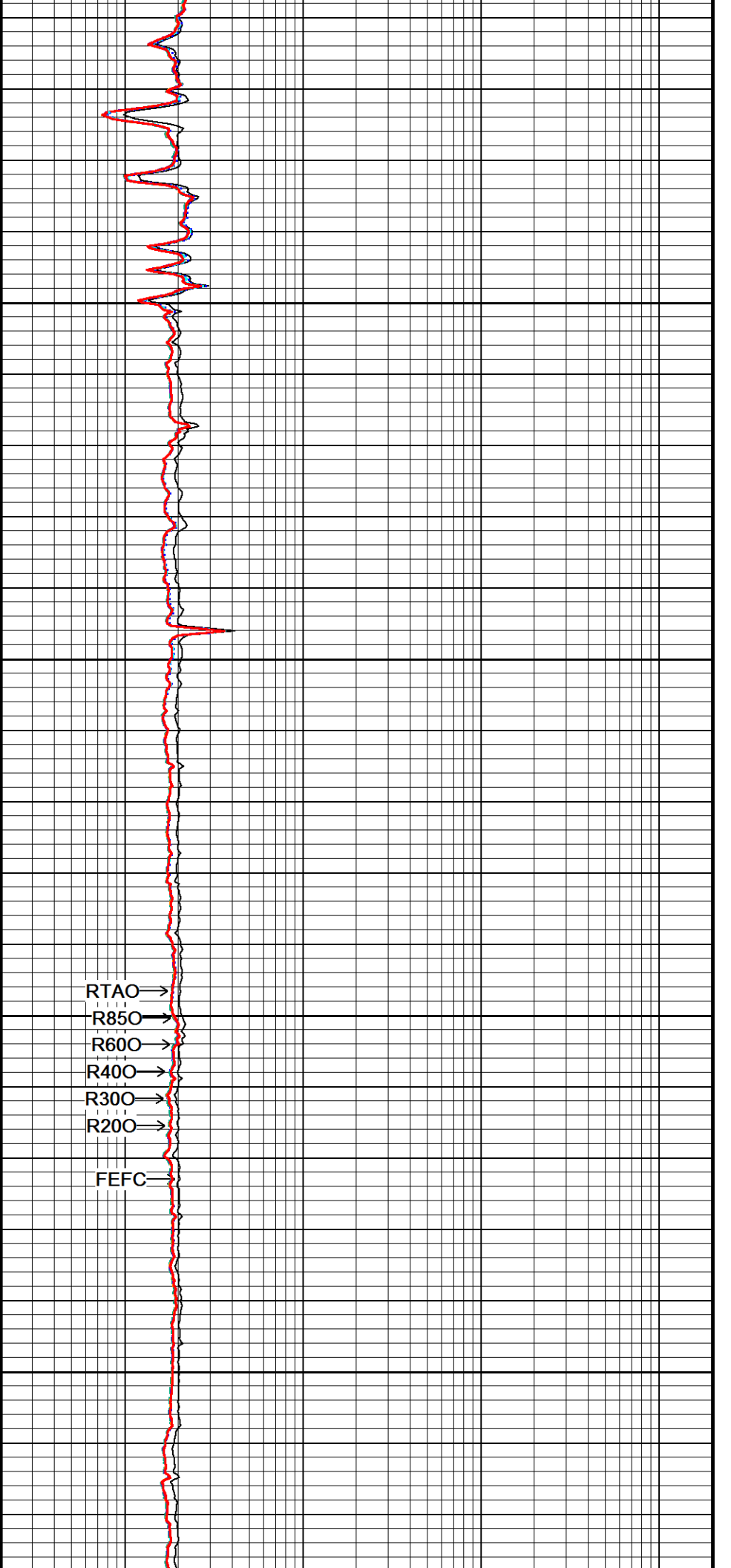
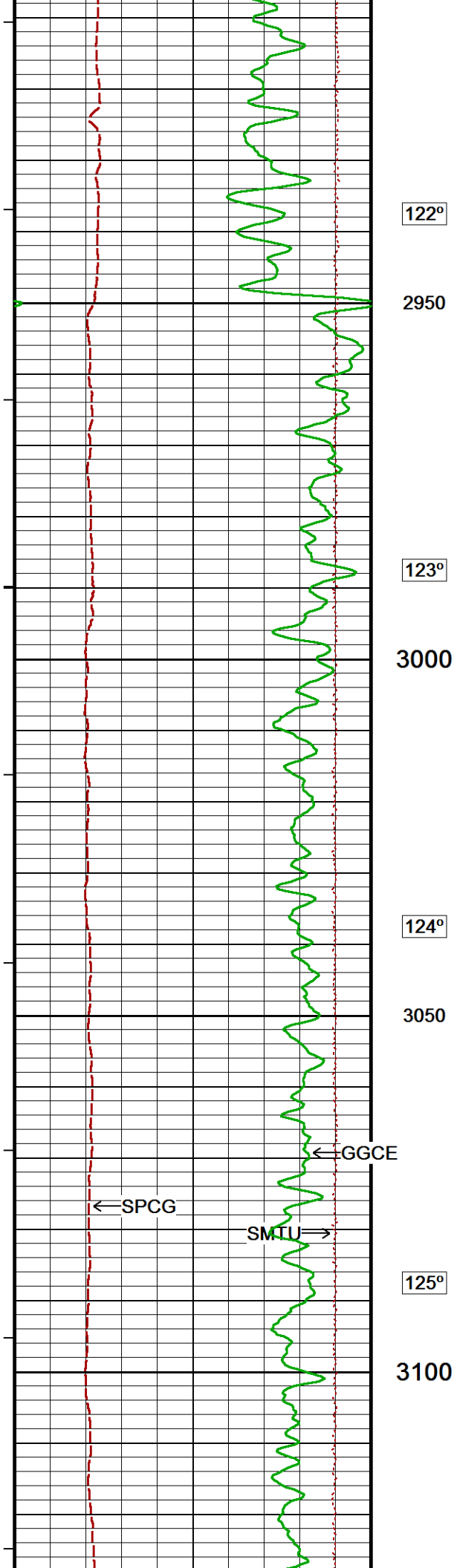
113°

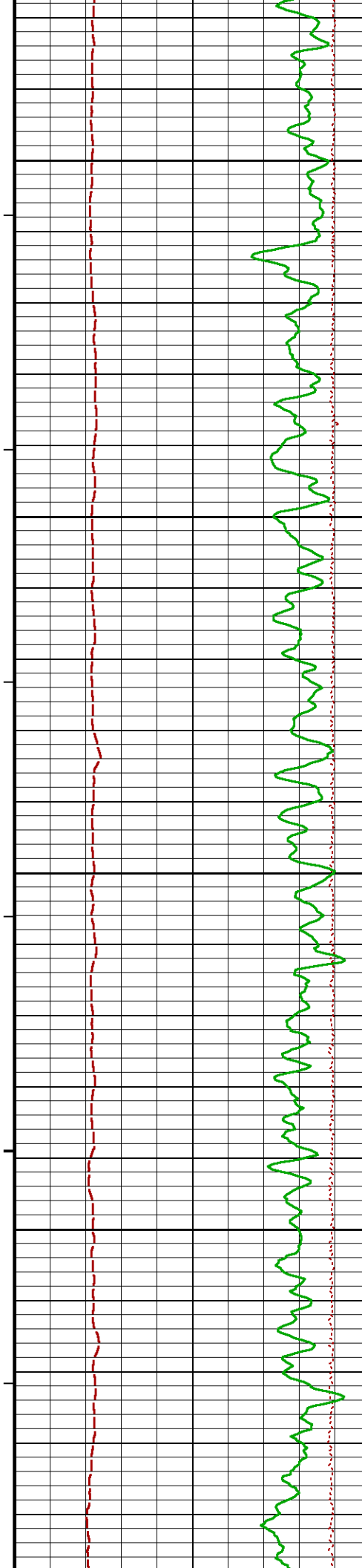
2450











126°

3150

127°

3200

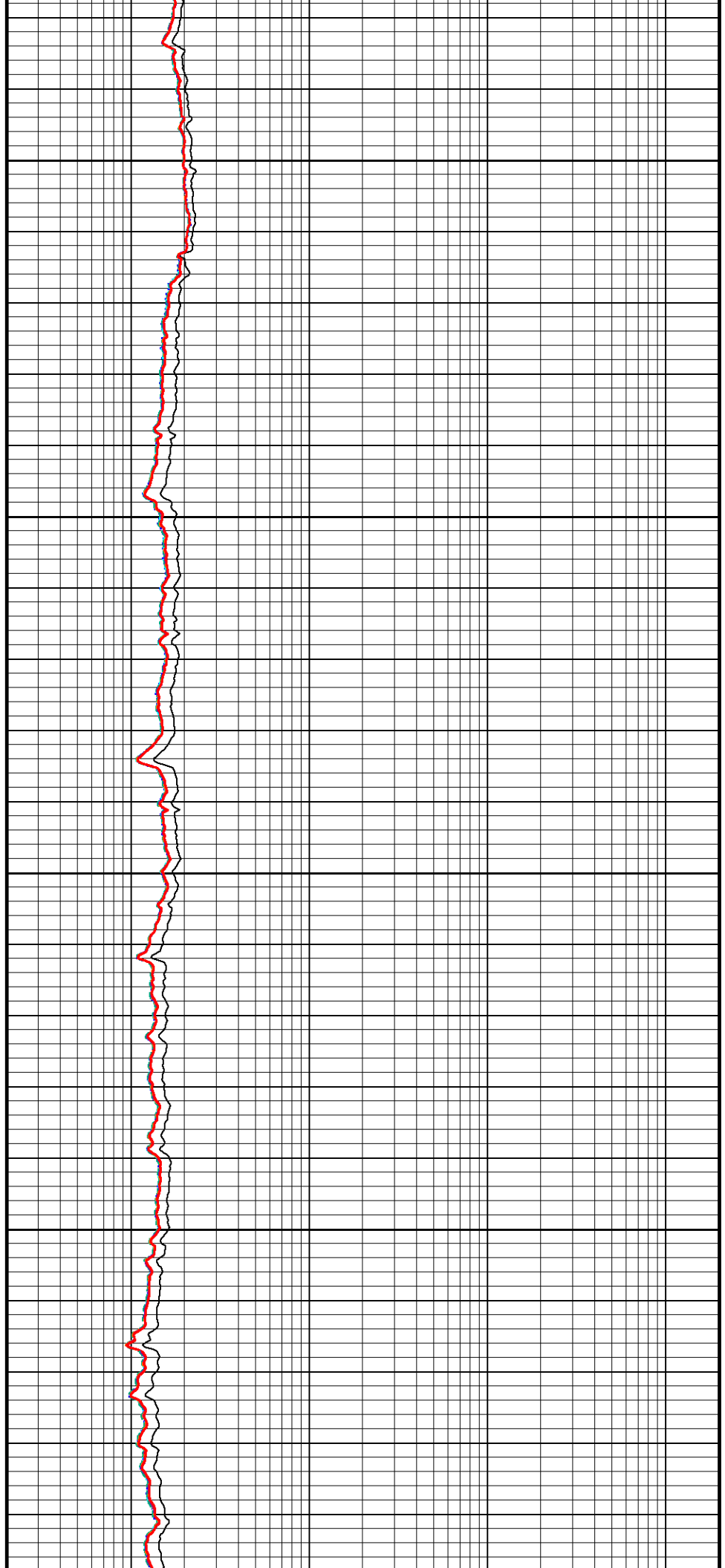
128°

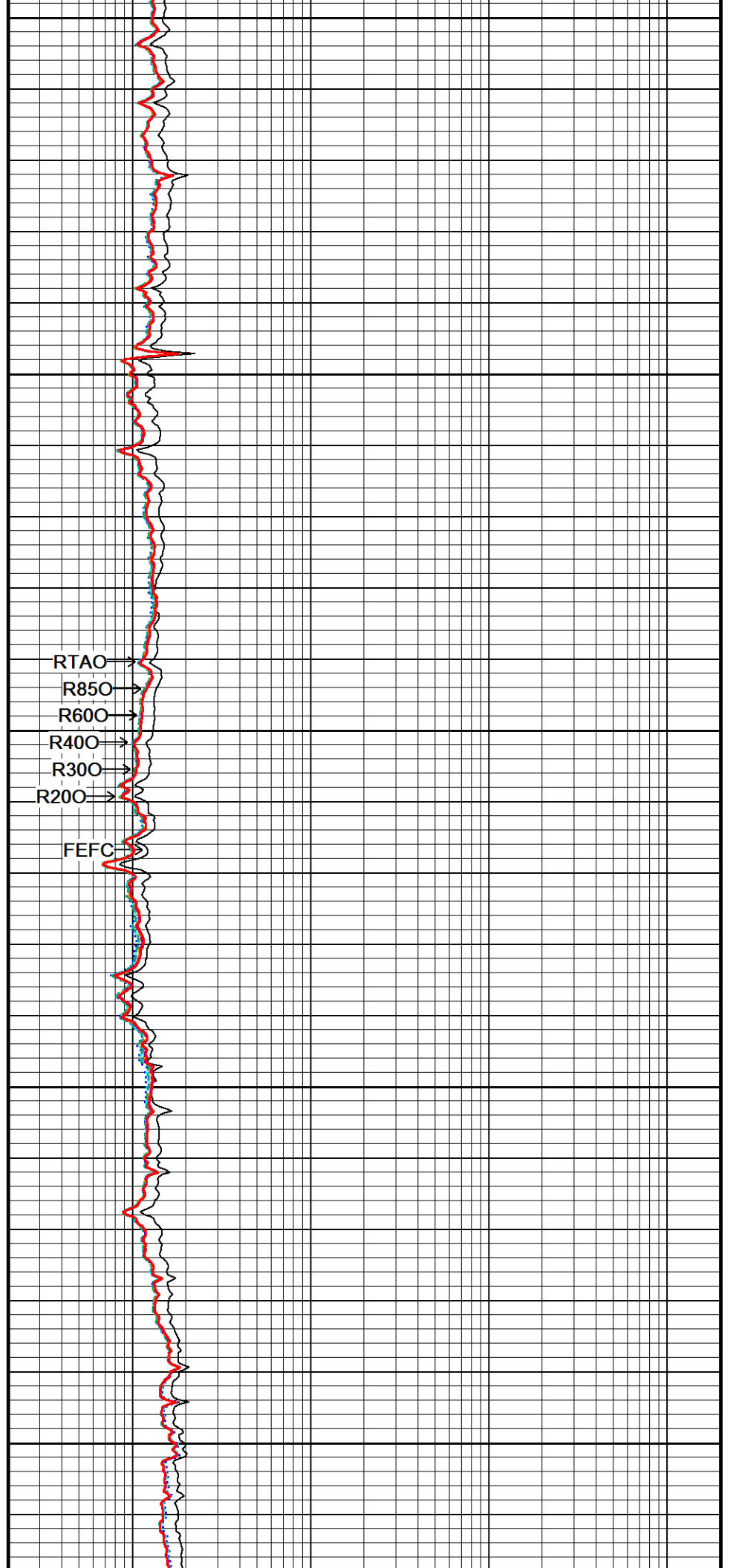
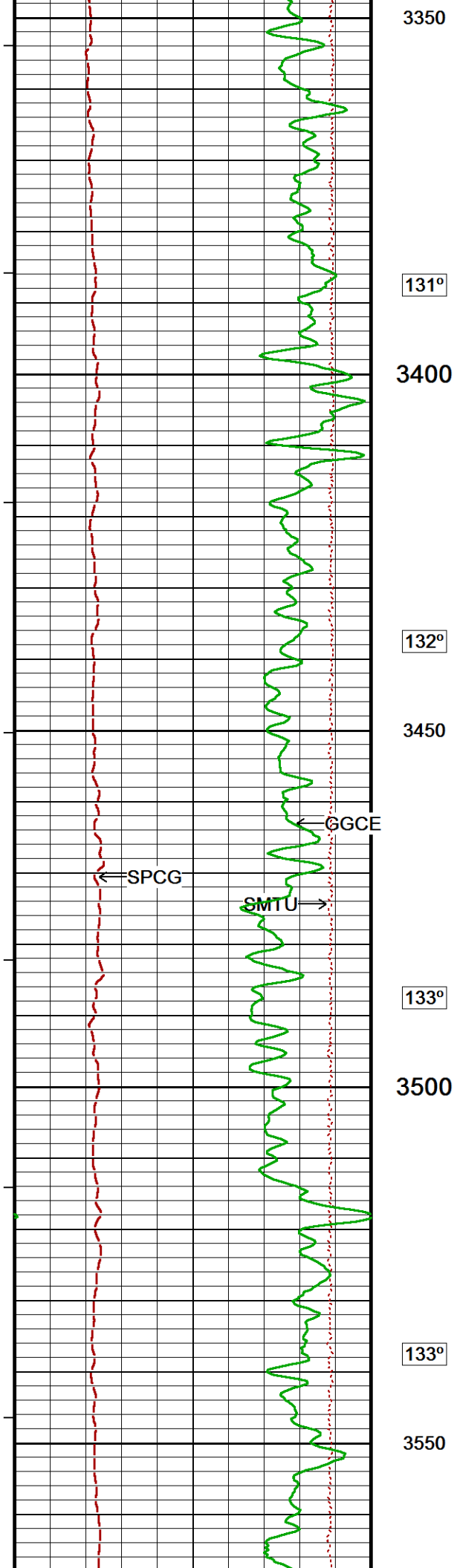
3250

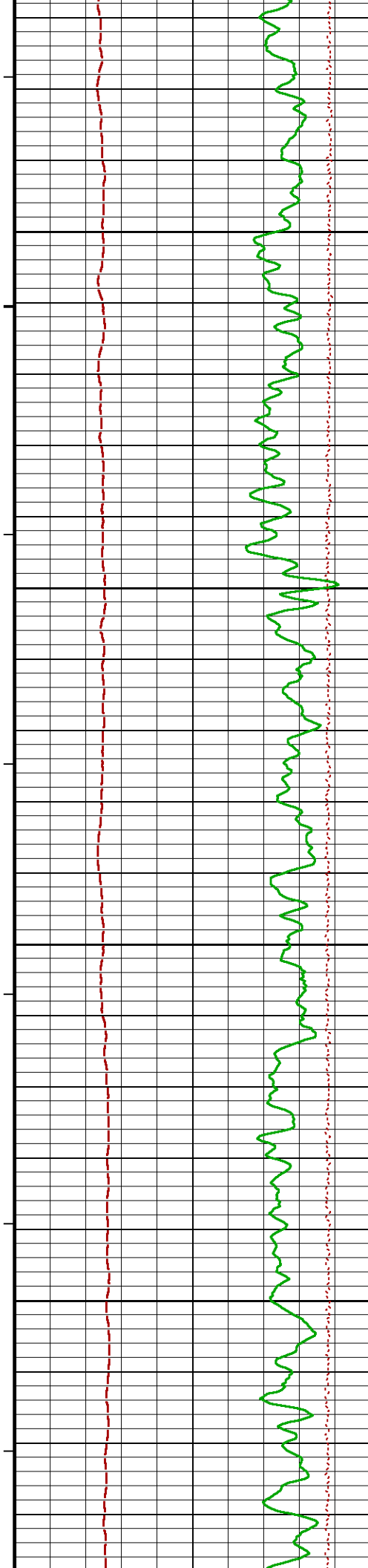
129°

3300

130°







134°

3600

135°

3650

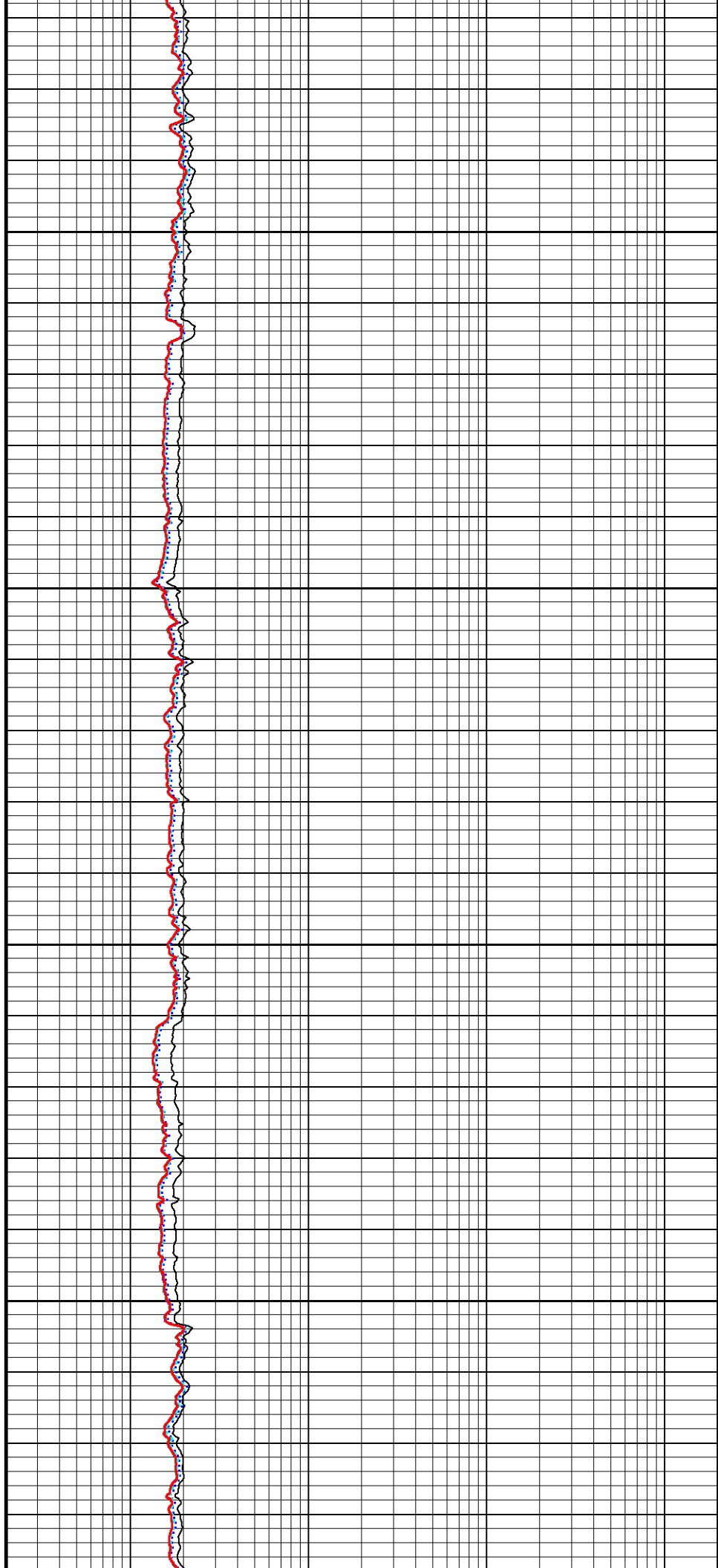
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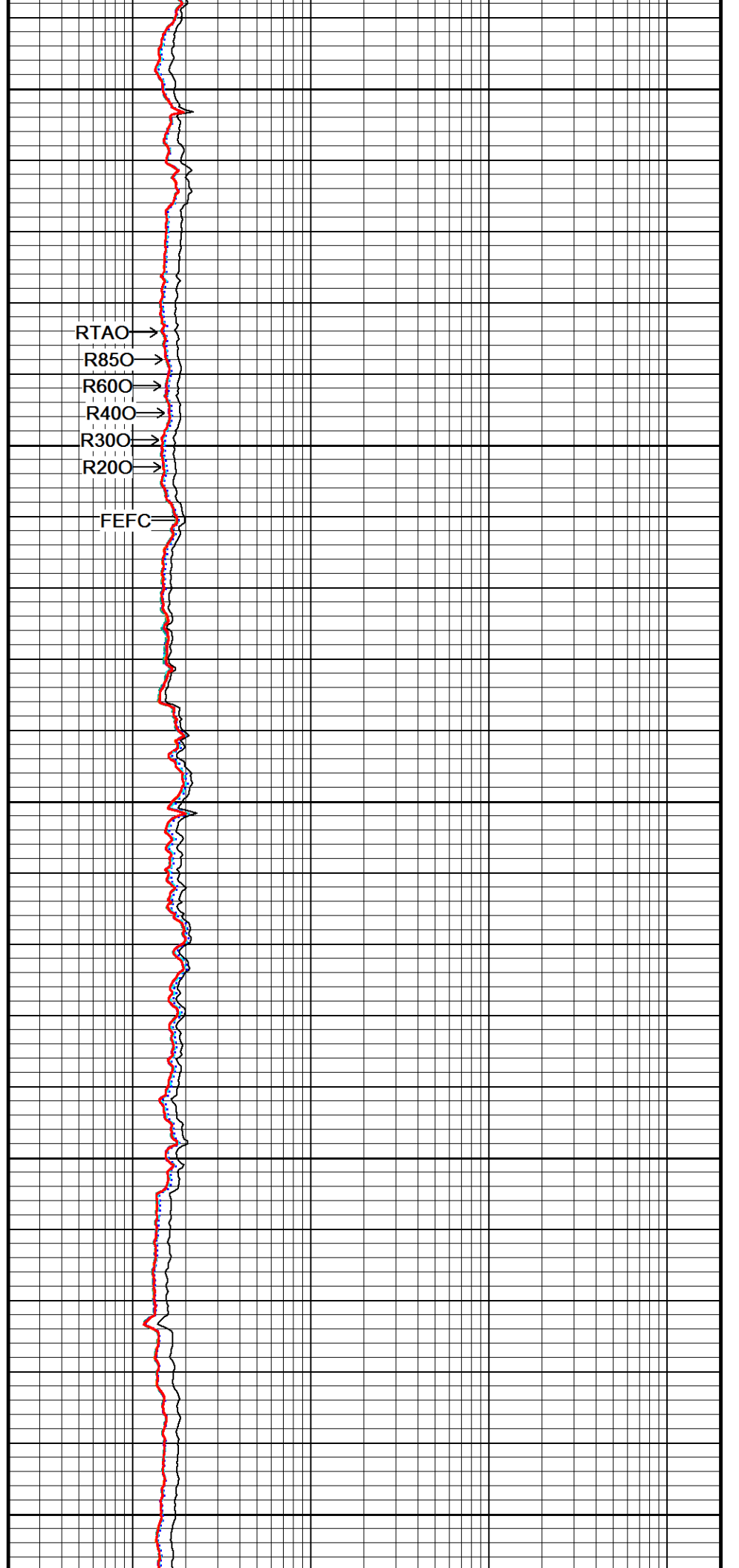
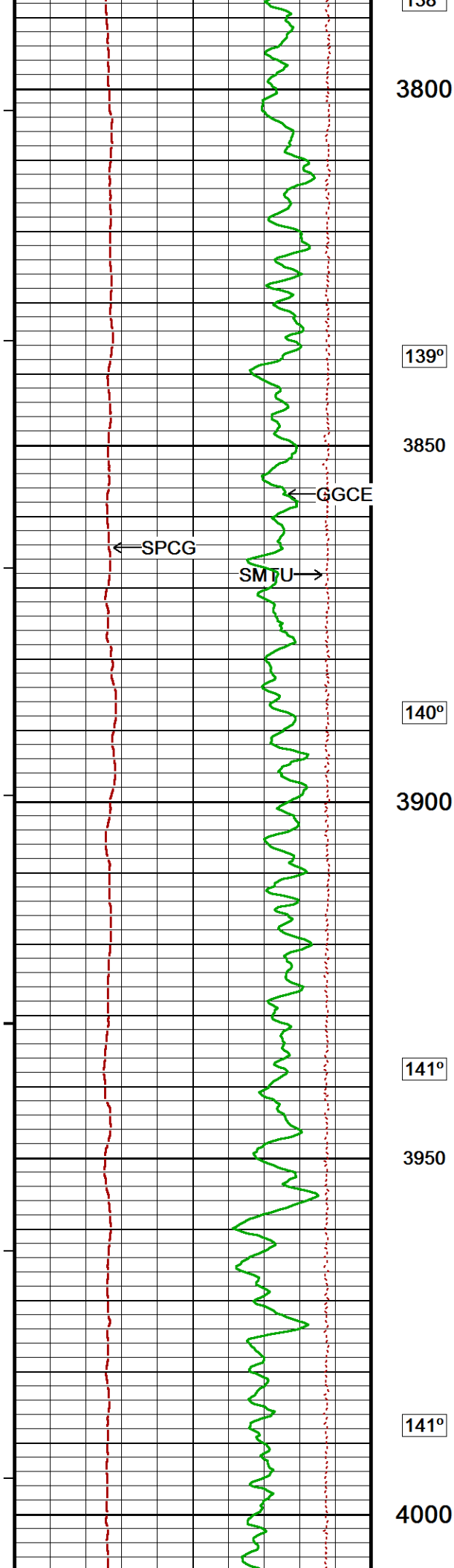
3700

137°

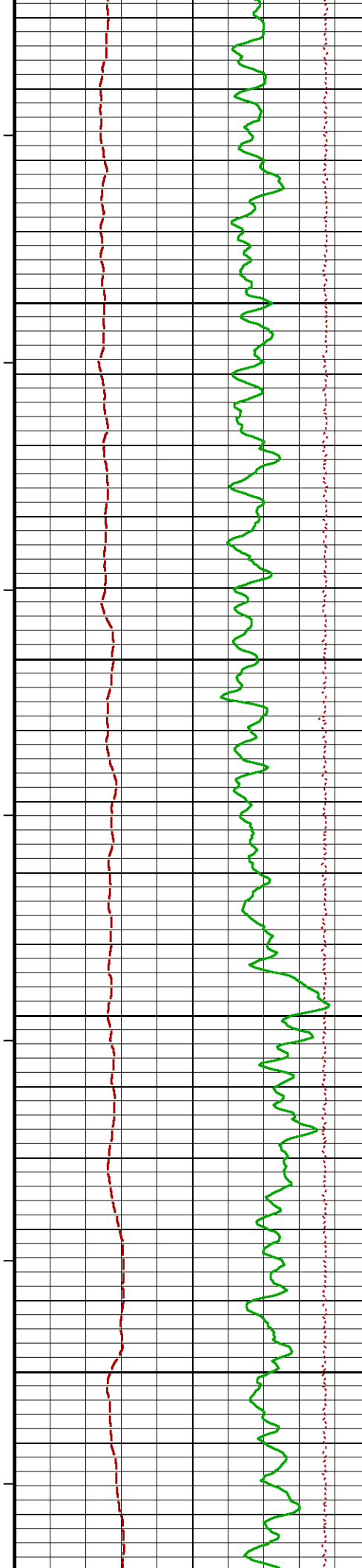
3750

138°









142°

4050

142°

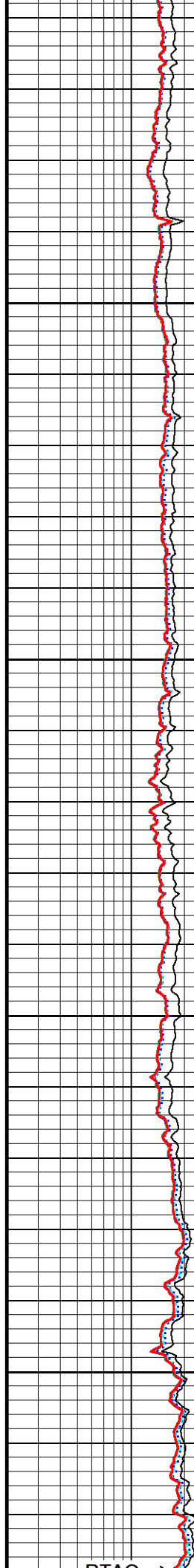
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143°

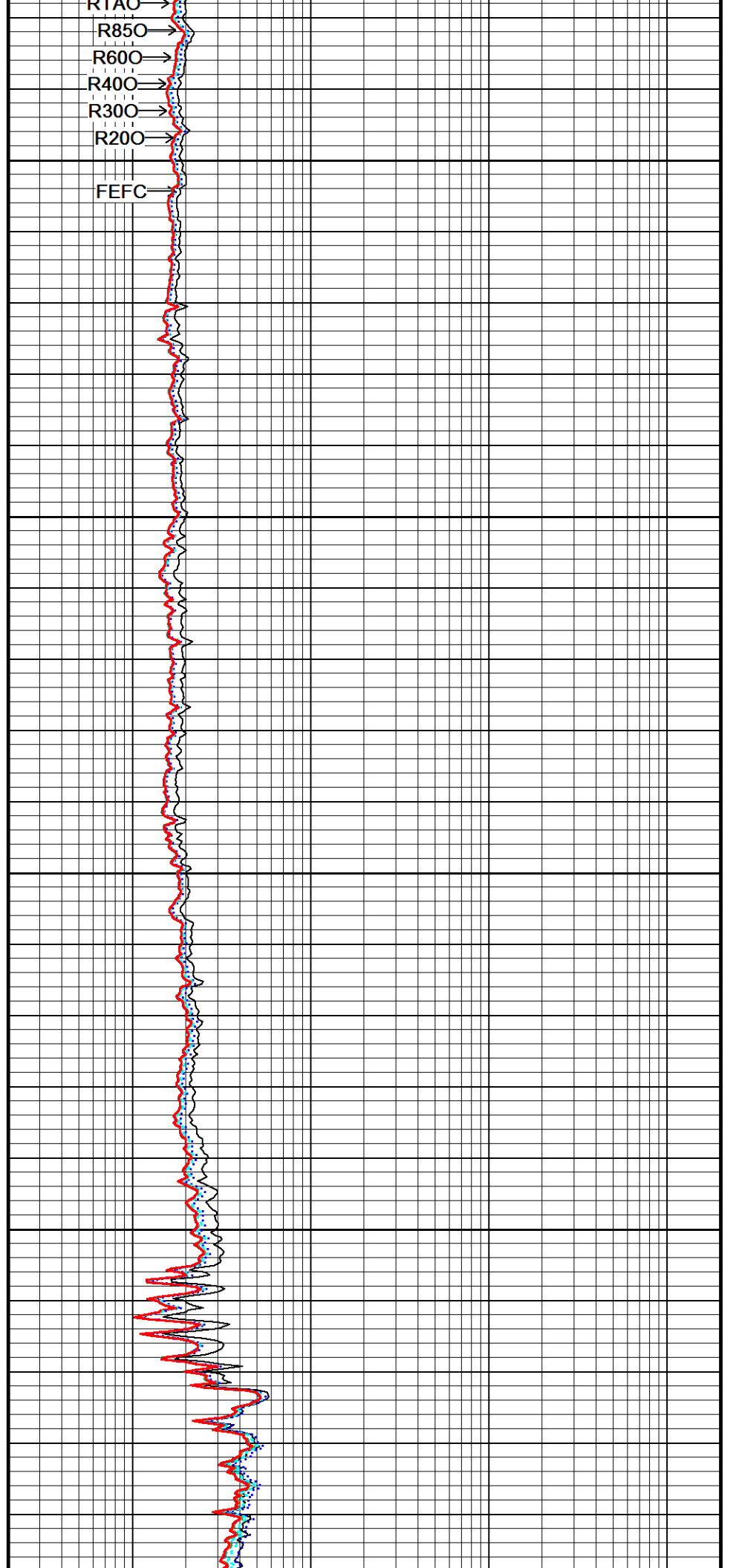
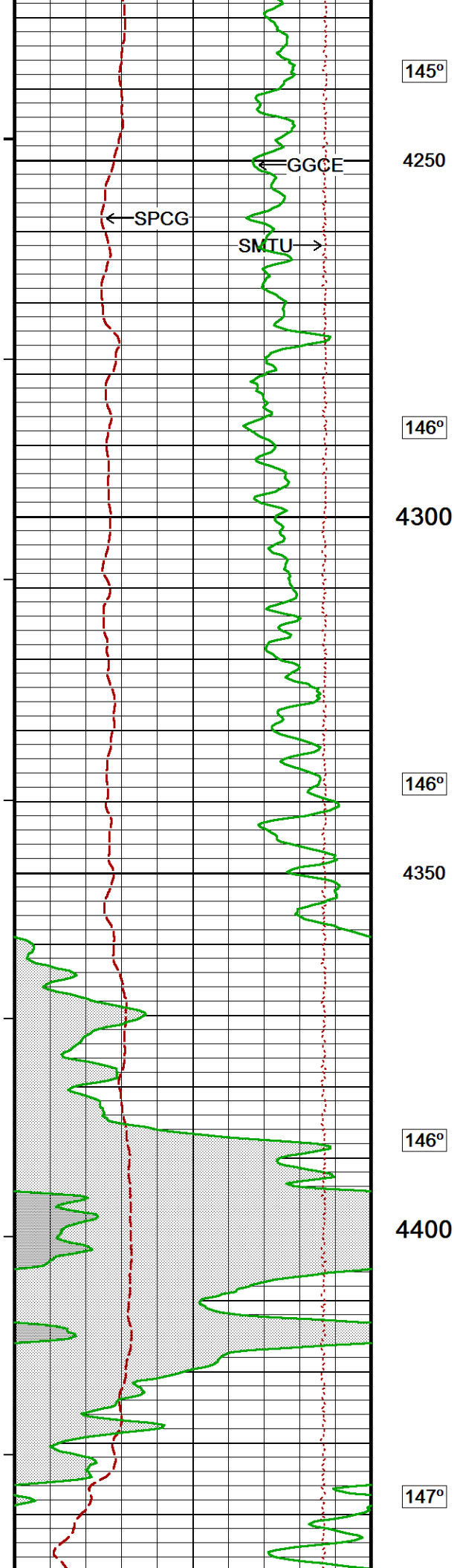
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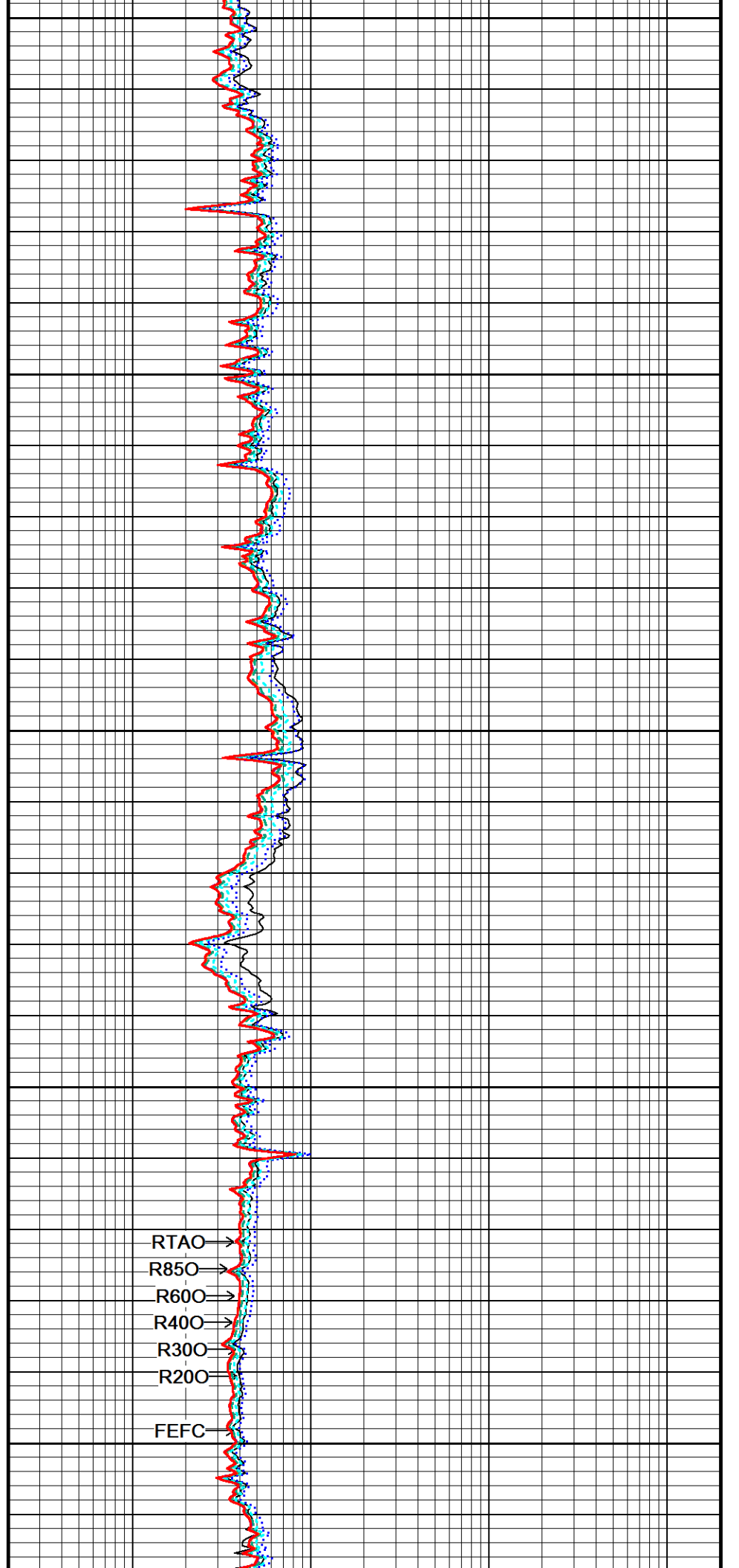
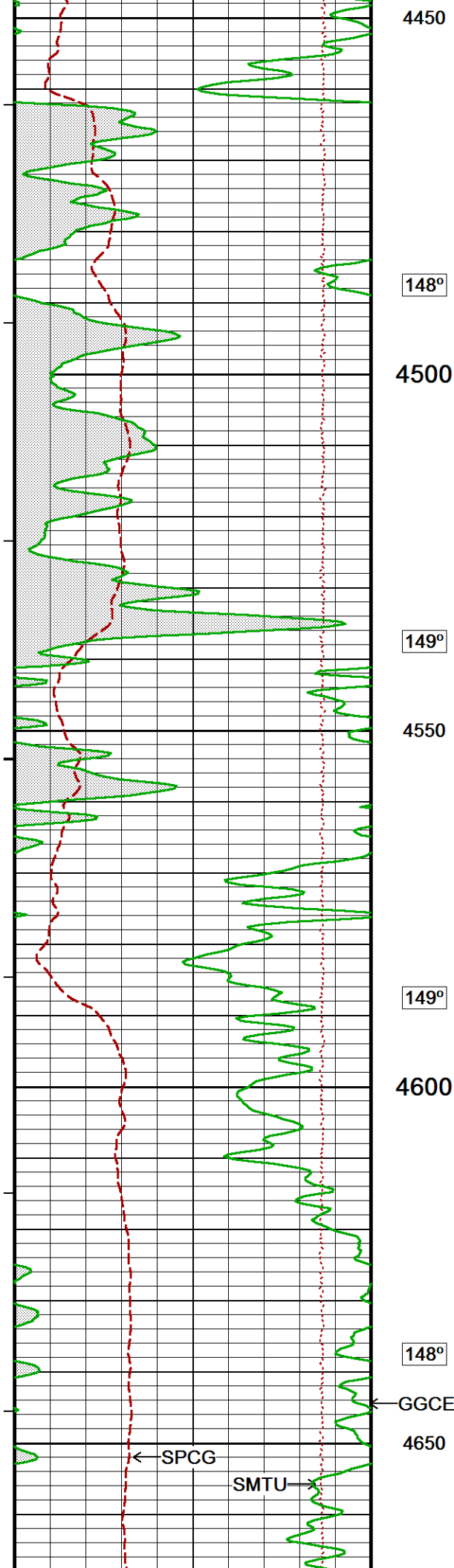
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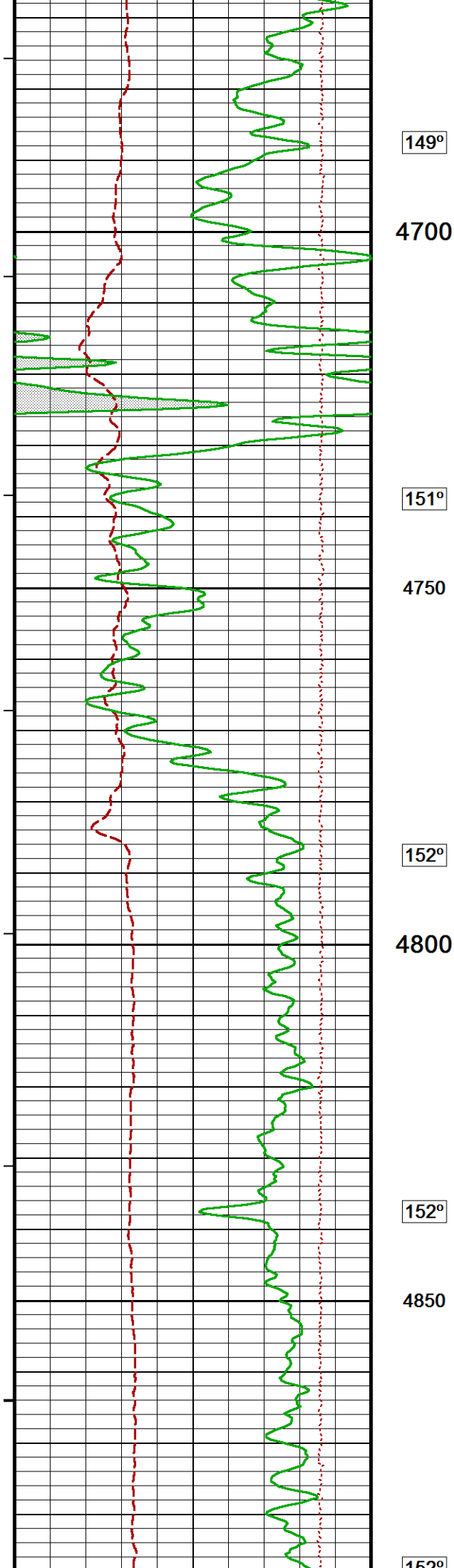
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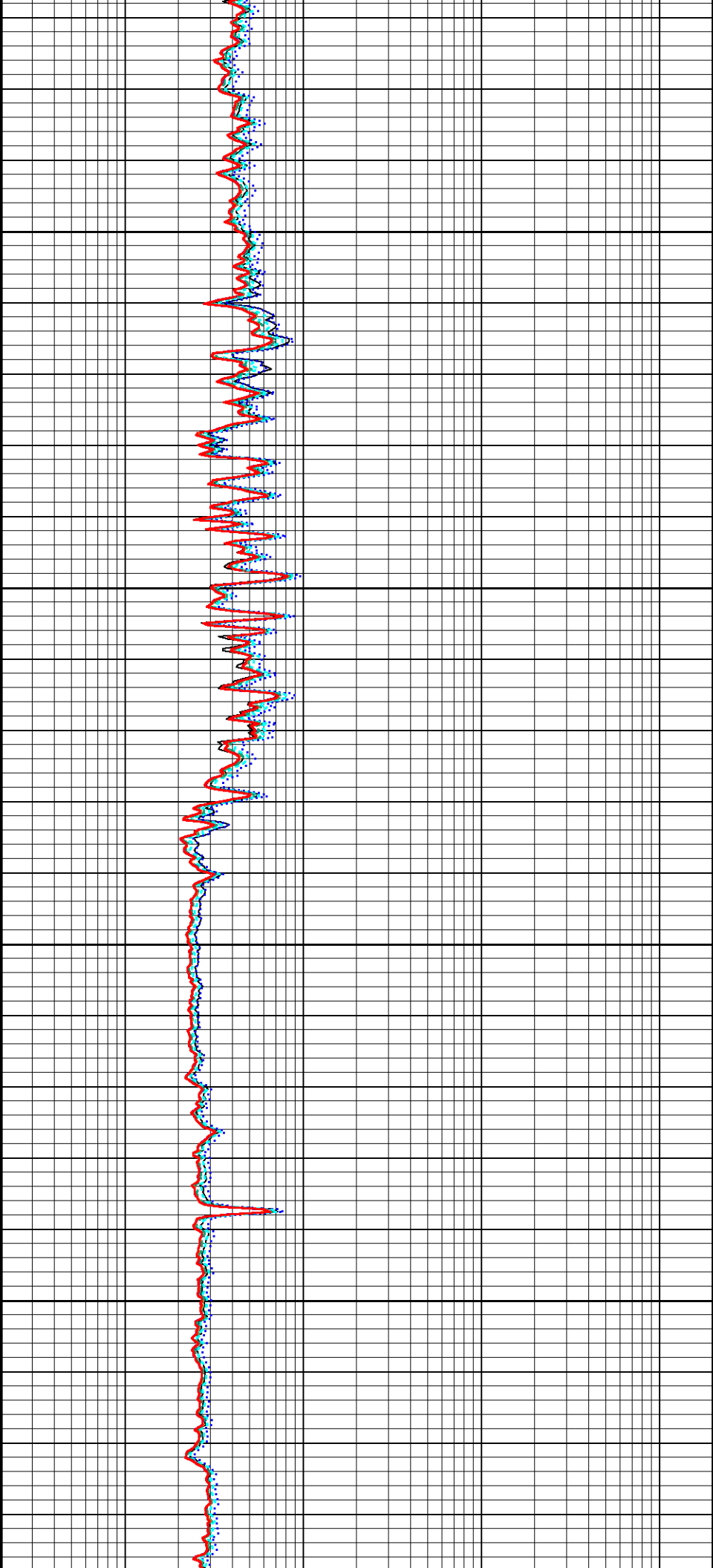
BTAC

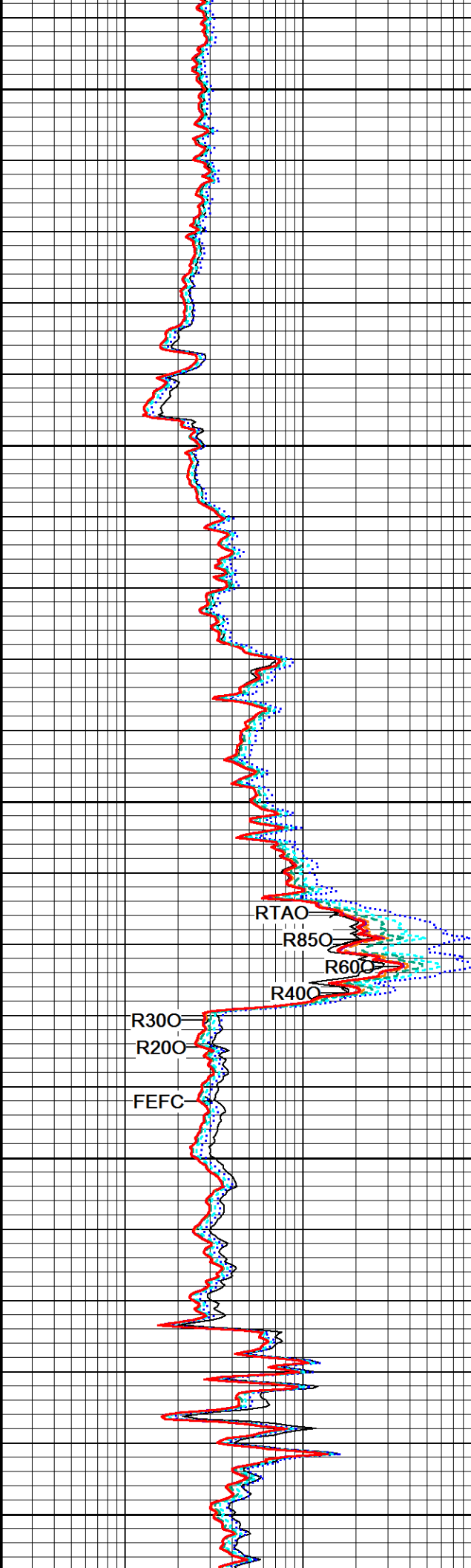
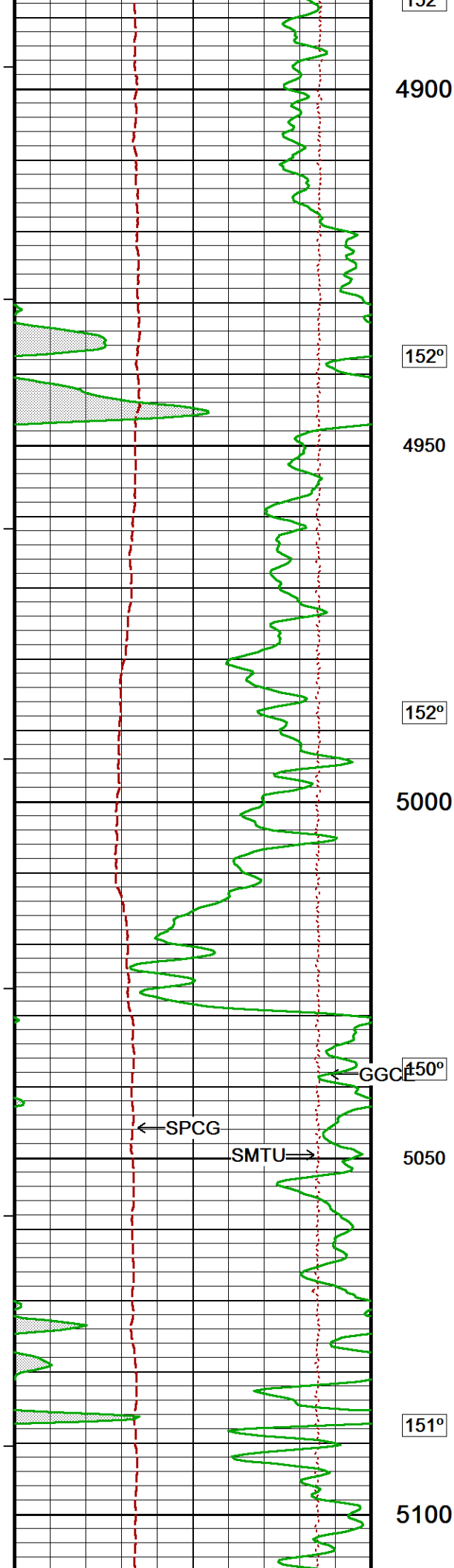


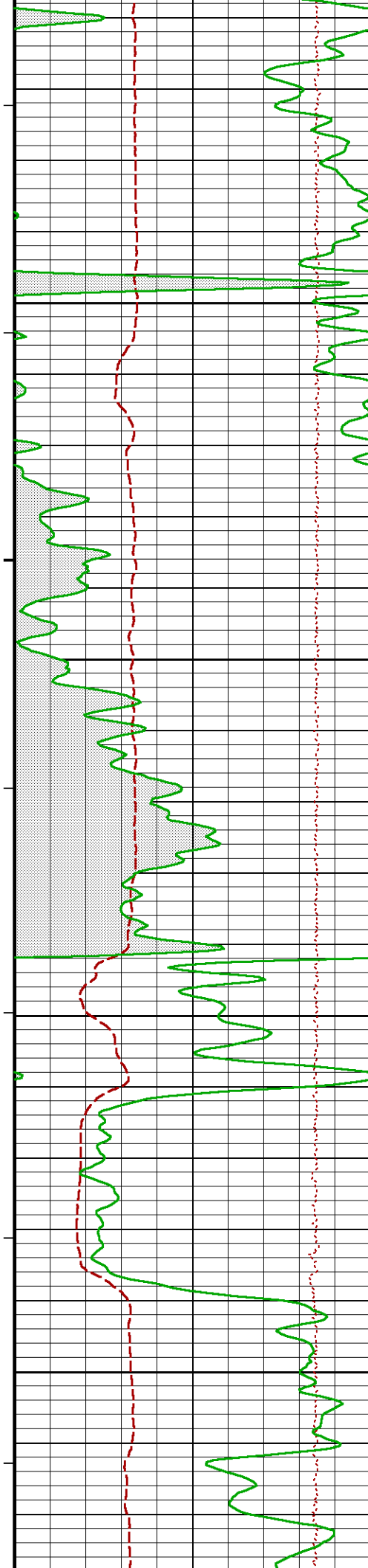




149°  
4700  
151°  
4750  
152°  
4800  
152°  
4850  
152°







156°

5150

159°

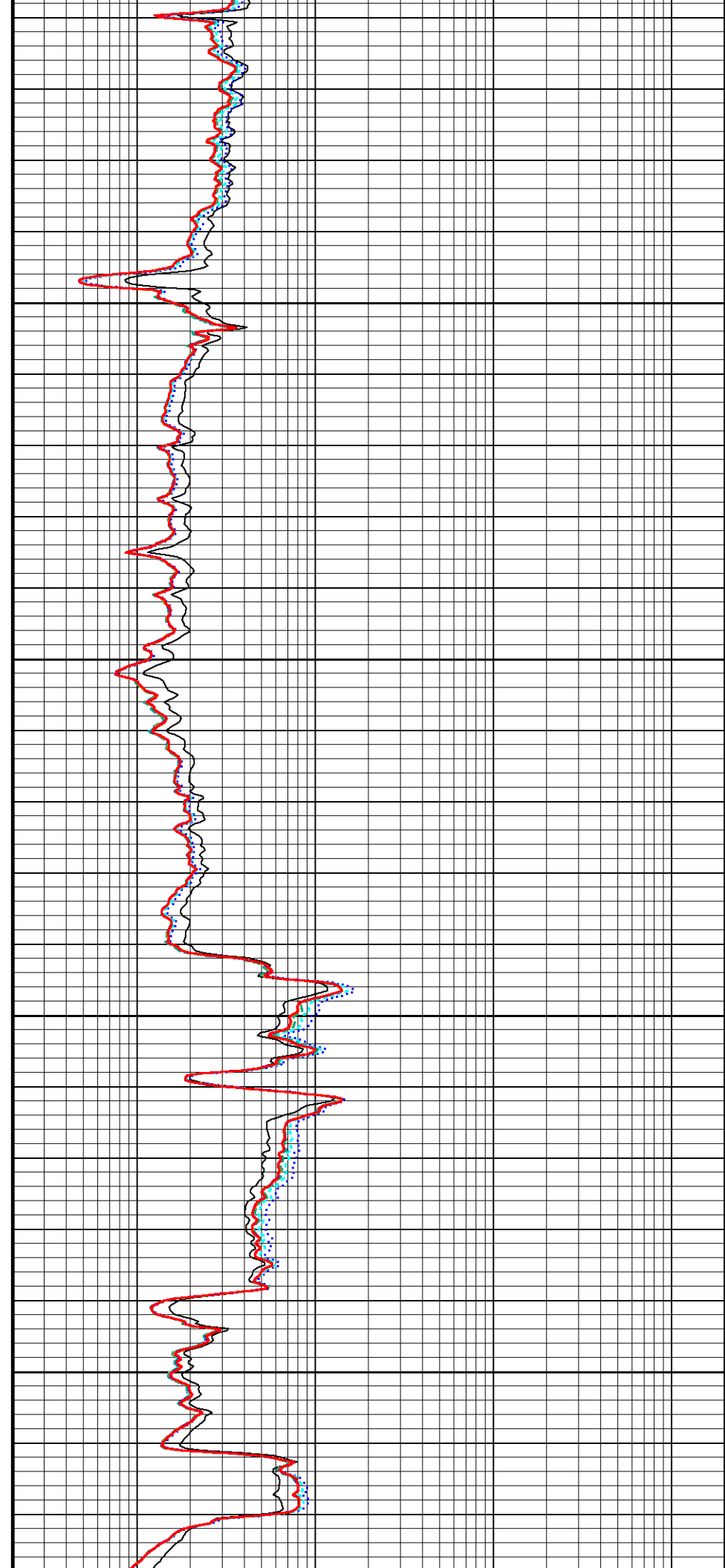
5200

162°

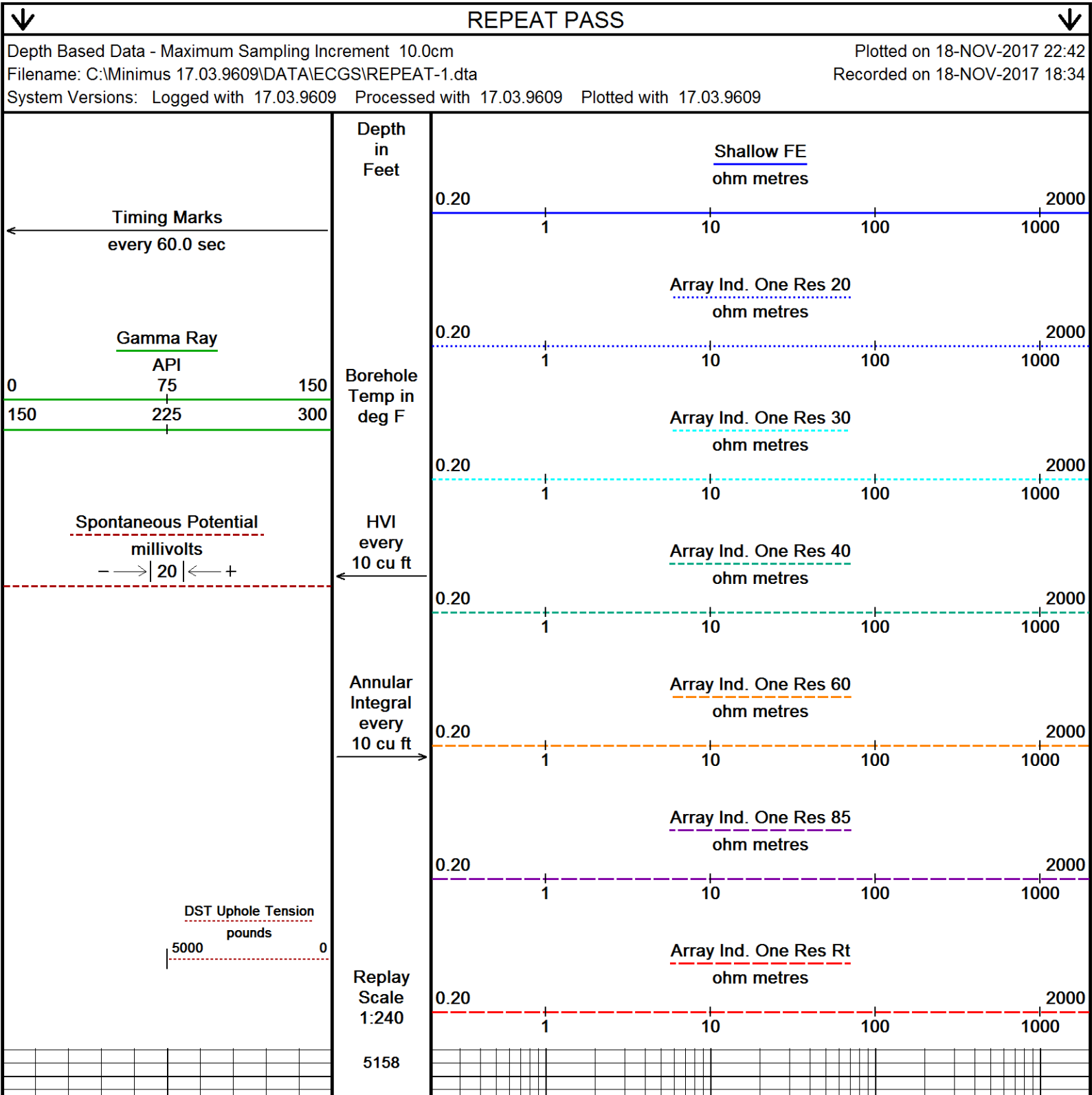
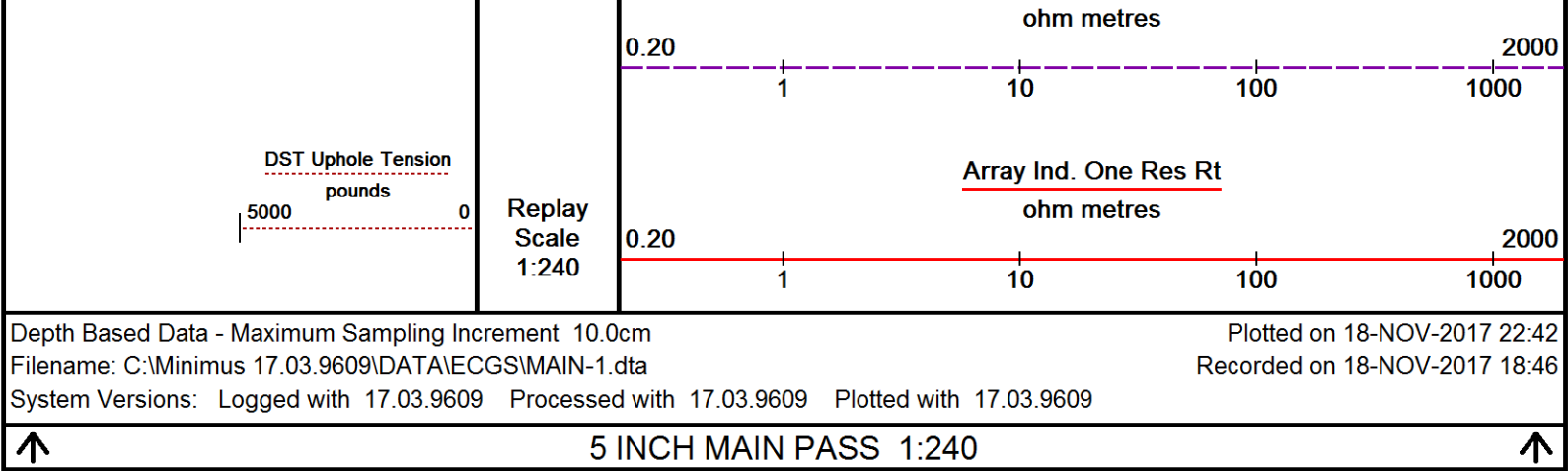
5250

158°

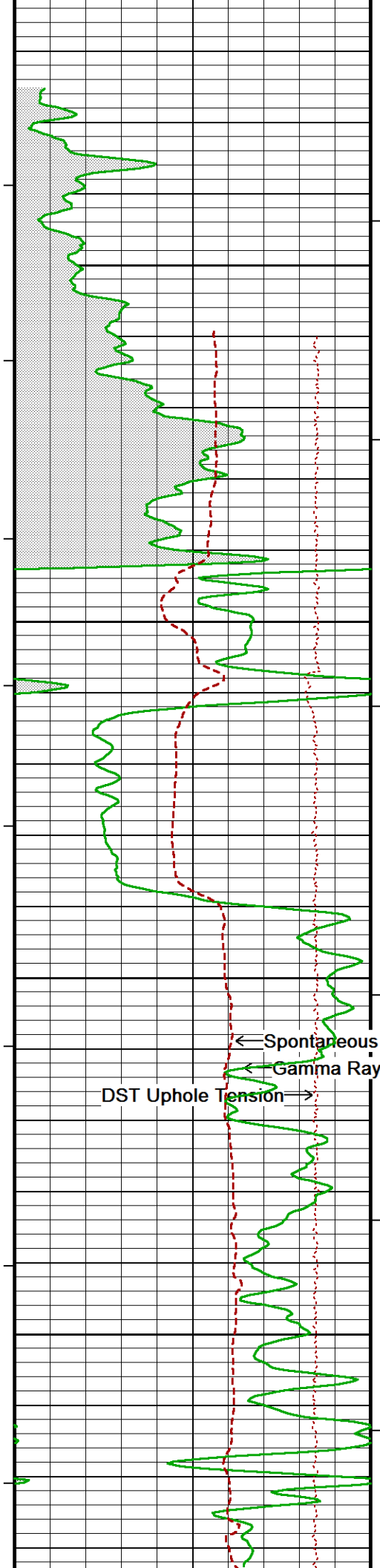
5300



Array Ind. One Res 85







5200

160°

5250

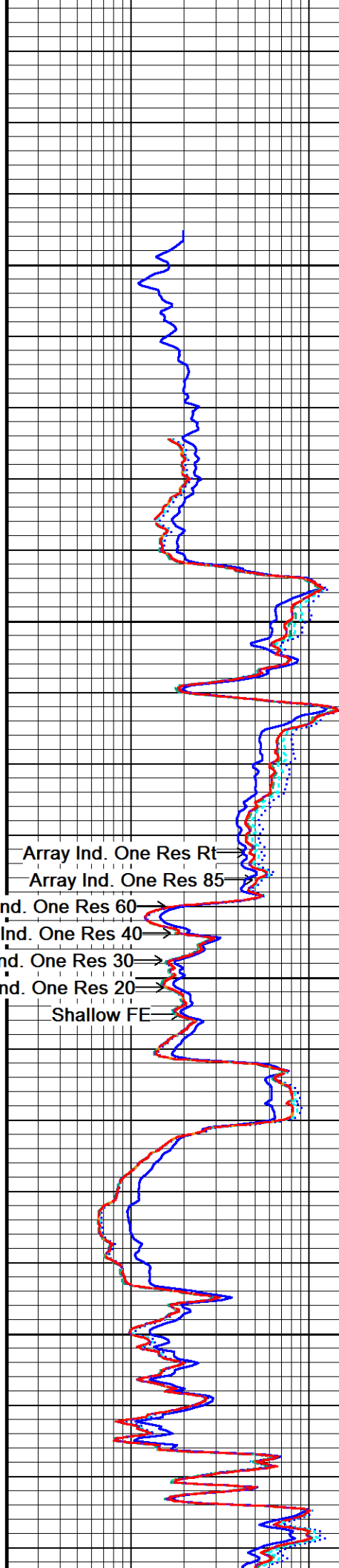
155°

5300

155°

5350

← Spontaneous Potential  
← Gamma Ray  
DST Uphole Tension →



Array Ind. One Res Rt →

Array Ind. One Res 85 →

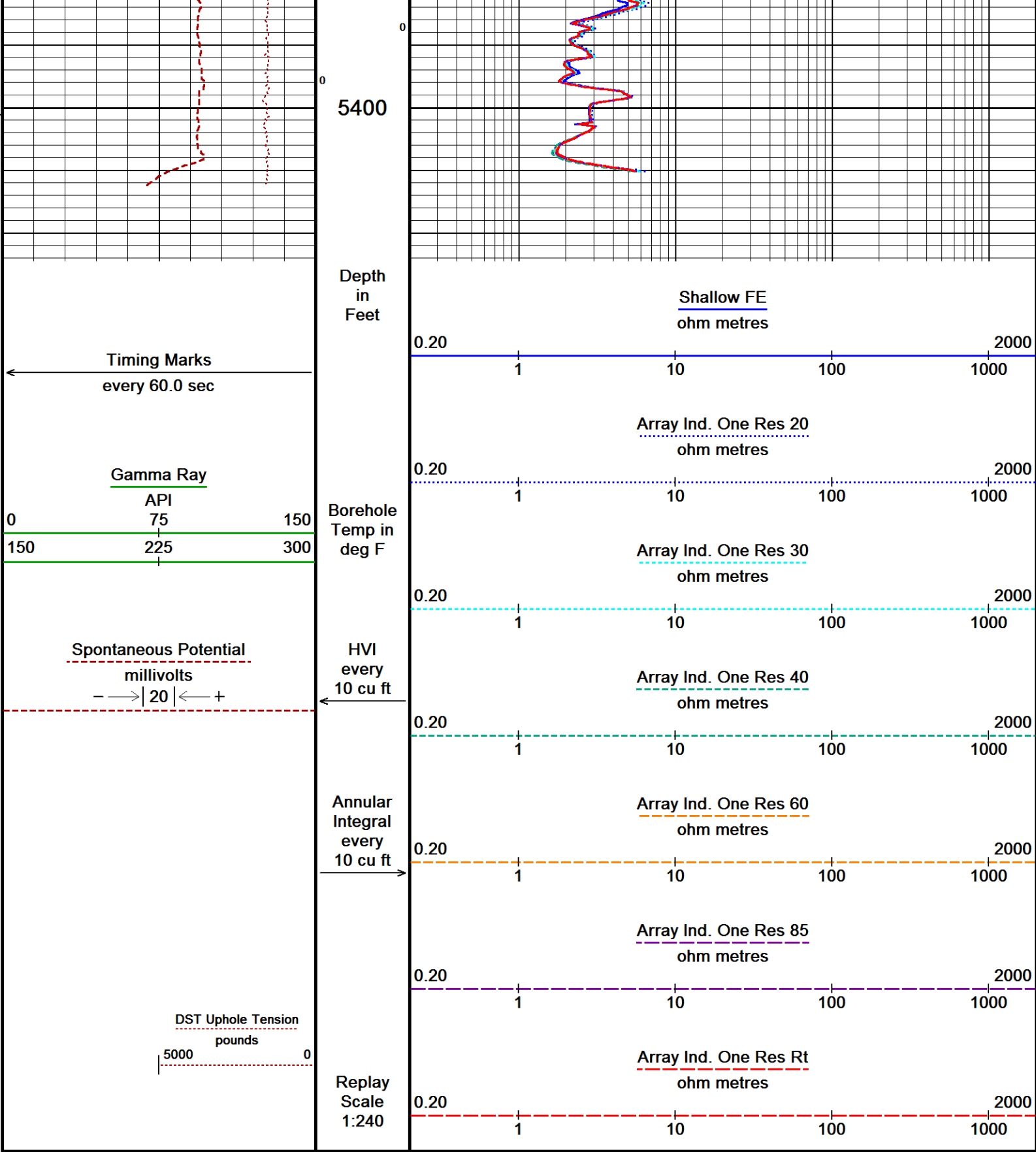
Array Ind. One Res 60 →

Array Ind. One Res 40 →

Array Ind. One Res 30 →

Array Ind. One Res 20 →

Shallow FE →



Depth Based Data - Maximum Sampling Increment 10.0cm  
Filename: C:\Minimus 17.03.9609\DATA\ECGS\REPEAT-1.dta  
System Versions: Logged with 17.03.9609 Processed with 17.03.9609 Plotted with 17.03.9609  
Plotted on 18-NOV-2017 22:42  
Recorded on 18-NOV-2017 18:34

REPEAT PASS

BEFORE SURVEY CALIBRATION  
C:\Minimus 17.03.9609\DATA\ECGS\MAIN-1.dta

General Constants All 000  
Last Edited on 18-NOV-2017,18:17

|                             |          |            |
|-----------------------------|----------|------------|
| General Parameters          |          |            |
| Mud Resistivity             | 0.110    | ohm-metres |
| Mud Resistivity Temperature | 85.000   | degrees F  |
| Water Level                 | 0.000    | feet       |
| Borehole Fluid Processing   | Wet Hole |            |

|   |                 |        |
|---|-----------------|--------|
| Hole/Annular Volume and Differential Caliper Parameters |                 |        |
| HVOL Method   | Single Caliper  |        |
| HVOL Caliper 1  | Density Caliper |        |
| HVOL Caliper 2  | N/A             |        |
| Annular Volume Diameter                                 | 7.000           | inches |
| Caliper for Differential Caliper                        | Density Caliper |        |

|                     |                       |  |
|---------------------|-----------------------|--|
| Rwa Parameters      |                       |  |
| Porosity used       | Crossplot Porosity    |  |
| Resistivity used    | Array Ind. One Res Rt |  |
| RWA Constant A      | 0.620                 |  |
| RWA Constant M      | 2.150                 |  |
| SW/APOR Tool Source | 0.000                 |  |

#### High Resolution Temperature Calibration MCG-D.K 475

Field Calibration on 15-NOV-2017,10:29

|       |          |                   |
|-------|----------|-------------------|
|       | Measured | Calibrated(Deg F) |
| Lower | 50.00    | 50.00             |
| Upper | 200.00   | 200.00            |

#### High Resolution Temperature Constants MCG-D.K 475

Last Edited on 11-MAY-2016 11:23

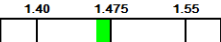
|                   |    |
|-------------------|----|
| Pre-filter Length | 11 |
|-------------------|----|

#### Gamma Calibration MCG-D.K 475

Field Calibration on 15-NOV-2017 10:41

|                    |          |                  |
|--------------------|----------|------------------|
|                    | Measured | Calibrated (API) |
| Background         | 40       | 27               |
| Calibrator (Gross) | 1880     | 1288             |
| Calibrator (Net)   | 1841     | 1261             |

#### Gamma Calibration Tolerances MCG-D.K 475

|       |       |   |            |
|-------|-------|---|------------|
| Ratio | 1.460 |  | Counts/API |
|-------|-------|---|------------|

The bar chart shows a scale from 1.40 to 1.55. The value 1.460 is marked, and the bar is green, indicating it is within the tolerance range.

#### Gamma Constants MCG-D.K 475

Last Edited on 18-NOV-2017,18:13

|                                 |                 |       |
|---------------------------------|-----------------|-------|
| Gamma Calibrator Number         | GRC.C 46        |       |
| GRC-M Calibrator Jig in Use?    | NO              |       |
| Inactive Background Jig in Use? | NO              |       |
| Mud Density                     | 1.10            | gm/cc |
| Caliper Source for Processing   | Density Caliper |       |
| Tool Position                   | Eccentred       |       |
| Potassium Equivalence           | Chloride        |       |
| K Mud Concentration             | 0.00            | %     |

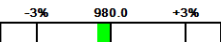
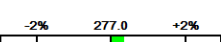
#### FE Calibration MFE-B.A 261

Base Calibration on 30-OCT-2017 13:49

Field Check on 15-NOV-2017 10:20

|                  |                  |                    |
|------------------|------------------|--------------------|
|                  | Resistor 1 (ohm) | Resistor 2 (ohm)   |
|                  | 0.0              | 1000.0             |
| Base Calibration |                  |                    |
|                  | Measured         | Calibrated (ohm-m) |
| Reference 1      | 0.0              | 0.0                |
| Reference 2      | 974.6            | 126.8              |
| Base Check       |                  | 278.1              |
| Field Check      |                  | 278.2              |

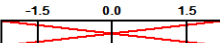
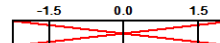
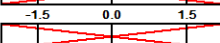
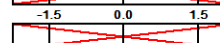
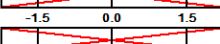
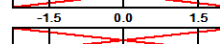
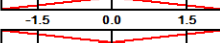
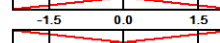
#### FE Calibration Tolerances MFE-B.A 261

|             |       |   |       |
|-------------|-------|---|-------|
| Reference 2 | 974.6 |  | ohm   |
| Base Check  | 278.1 |  | ohm-m |

The bar charts show tolerance ranges. For Reference 2, the range is -3% to +3% around 980.0. For Base Check, the range is -2% to +2% around 277.0. Both values are within the tolerance range.

|                               |  |                                     |                                  |  |  |
|-------------------------------|--|-------------------------------------|----------------------------------|--|--|
| FE Constants MFE-B.A 261      |  |                                     | Last Edited on 15-NOV-2017,10:19 |  |  |
| Running Mode                  |  | No Sleeve                           |                                  |  |  |
| MFE K Factor                  |  | 0.1268                              |                                  |  |  |
| Borehole Correction Constants |  |                                     |                                  |  |  |
| Sonde Position                |  | 0.5                                 | inches                           |  |  |
| Hole Size Source              |  | Density Caliper                     |                                  |  |  |
| Hole Size Constant Value      |  | N/A                                 | inches                           |  |  |
| Rm Source                     |  | Global Value: Temperature Corrected |                                  |  |  |
| Temp. for Rm Corr.            |  | MCG External Temperature            |                                  |  |  |

|                                      |      |                            |       |  |       |             |        |
|--------------------------------------|------|----------------------------|-------|--|-------|-------------|--------|
| Induction Calibration MAI-B.J 426    |      |                            |       | Factory Loop Calibration 15-NOV-2017,10:47 |       |             |        |
| Factory Loop Calibration             |      |                            |       |  |       |             |        |
| Low Conductivity Reference Resistor  |      | 3.3                        | ohm   |  |       |             |        |
| High Conductivity Reference Resistor |      | 333.3                      | ohm   |  |       |             |        |
|                                      |      | Measured Signal (unitless) |       | Reference Conductivity (mmho/m)            |       | Calibration |        |
| Array                                | Low  | High                       |       | Low  | High  | Gain        | Offset |
| 1 (near)                             | 15.9 | 452.0                      |       | 9.3  | 966.2 | 2.2         | -25.7  |
| 2                                    | 5.1  | 359.5                      |       | 7.6  | 821.4 | 2.3         | -4.2   |
| 3                                    | 3.0  | 246.4                      |       | 5.2  | 566.0 | 2.3         | -1.6   |
| 4 (far)                              | 2.1  | 128.2                      |       | 2.6  | 279.2 | 2.2         | -2.0   |
| Array Temperature                    |      | 74.8                       | Deg F |  |       |             |        |
| Tool Checks                          |      |                            |       |  |       |             |        |
|                                      |      | Factory Reference (mmho/m) |       | Before Survey (mmho/m)                     |       |             |        |
| Array                                | Low  | High                       |       | Low  | High  |             |        |
| 1 (near)                             |      |                            |       |  |       |             |        |
| 2                                    |      |                            |       |  |       |             |        |
| 3                                    |      |                            |       |  |       |             |        |
| 4 (far)                              |      |                            |       |  |       |             |        |
| Array Temperature                    |      | 0.0                        |       | 0.0  |       | Deg F       |        |

| Induction Check Tolerances MAI-B.J 426 |     |   |        |              |     |   |        |
|--|-----|---|--------|--------------|-----|---|--------|
| Low Array 1                            | 0.0 |  | mmho/m | High Array 1 | 0.0 |  | mmho/m |
| Low Array 2                            | 0.0 |  | mmho/m | High Array 2 | 0.0 |  | mmho/m |
| Low Array 3                            | 0.0 |  | mmho/m | High Array 3 | 0.0 |  | mmho/m |
| Low Array 4                            | 0.0 |  | mmho/m | High Array 4 | 0.0 |  | mmho/m |

|                                 |        |                                     |                                  |            |  |
|---------------------------------|--------|-------------------------------------|----------------------------------|------------|--|
| Induction Constants MAI-B.J 426 |        |                                     | Last Edited on 15-NOV-2017,10:46 |            |  |
| Induction Model                 |        | RtAP-WBM                            |                                  |            |  |
| Borehole Correction Constants   |        |                                     |                                  |            |  |
| Tool Centred                    |        | No                                  |                                  |            |  |
| Hole Size Source                |        | Density Caliper                     |                                  |            |  |
| Hole Size Constant Value        |        | 2.500                               |                                  | inches     |  |
| Stand-off Type                  |        | Fins                                |                                  |            |  |
| Stand-off                       |        | 0.50                                |                                  | inches     |  |
| Number of Fins on Stand-off     |        | 6.0000                              |                                  |            |  |
| Stand-off Fin Angle             |        | 60.00                               |                                  | degrees    |  |
| Stand-off Fin Width             |        | 0.5000                              |                                  | inches     |  |
| Rm Source                       |        | Global Value: Temperature Corrected |                                  |            |  |
| Temp. for Rm Corr.              |        | MCG External Temperature            |                                  |            |  |
| Borehole Correction Method      |        | Default                             |                                  |            |  |
| Squasher Start                  |        | 0.0020                              |                                  | mhos/metre |  |
| Squasher Offset                 |        | N/A                                 |                                  | mhos/metre |  |
| Borehole Normalisation          |        |                                     |                                  |            |  |
| DRM1                            | 0.0000 | DRC1                                | 0.0000                           |            |  |
| DRM2                            | 0.0000 | DRC2                                | 0.0000                           |            |  |
| MRM1                            | 0.0000 | MRC1                                | 0.0000                           |            |  |

|      |        |      |        |
|------|--------|------|--------|
| MRM2 | 0.0000 | MRC2 | 0.0000 |
| SRM1 | 0.0000 | SRC1 | 0.0000 |
| SRM2 | 0.0000 | SRC2 | 0.0000 |

#### Calibration Site Corrections

|           |      |             |
|-----------|------|-------------|
| Channel 1 | 0.00 | mmhos/metre |
| Channel 2 | 0.00 | mmhos/metre |
| Channel 3 | 0.00 | mmhos/metre |
| Channel 4 | 0.00 | mmhos/metre |

#### Symmetrised Receiver Gains

|            |      |
|------------|------|
| Receiver 1 | 1.00 |
| Receiver 2 | 1.00 |
| Receiver 3 | 1.00 |
| Receiver 4 | 1.00 |

#### Apparent Porosity and Water Saturation Constants

|                                      |        |         |
|--------------------------------------|--------|---------|
| Archie Constant (A)                  | 1.00   |         |
| Cementation Exponent (M)             | 2.00   |         |
| Saturation Exponent (N)              | 2.00   |         |
| Saturation of Water for Apor         | 100.00 | percent |
| Resistivity of Water for Apor and Sw | 0.05   | ohm-m   |
| Resistivity of Mud Filtrate for Sw   | 0.00   | ohm-m   |
| Source for Rt                        | 0.00   |         |
| Source for Rxo                       | 0.00   |         |

#### Caliper Calibration MPD-B 120

Base Calibration on 19-OCT-2017 14:24  
Field Calibration on 15-NOV-2017 10:22

##### Base Calibration

| Reading No | Measured | Calibrator Size (in) |
|------------|----------|----------------------|
| 1          | 16976    | 4.00                 |
| 2          | 25701    | 5.96                 |
| 3          | 34368    | 7.96                 |
| 4          | 42681    | 9.86                 |
| 5          | 51811    | 11.88                |
| 6          | N/A      | N/A                  |

##### Field Calibration

| Measured Caliper (in) | Actual Caliper (in) |
|-----------------------|---------------------|
| 7.96                  | 7.96                |

#### Caliper Calibration Tolerances MPD-B 120

Short Arm Field Cal. 7.96 

|      |      |      |
|------|------|------|
| 7.76 | 7.96 | 8.16 |
|------|------|------|

 in

## DOWNHOLE EQUIPMENT

C:\Minimus 17.03.9609\DATA\ECGS\MAIN-1.dta

#### 11B Tension Cablehead

MCB-A 1 LG: 2.18 ft WT: 19.8 lb OD: 2.244 in

#### Compact Swivel Head Adaptor

SHA-J.A 438 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

#### Compact Comms Gamma

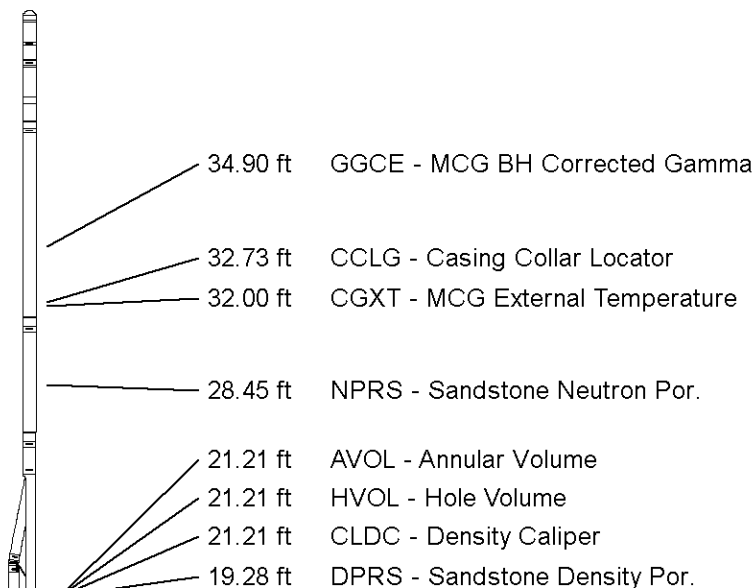
MCG-D.K 475 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

#### Compact Neutron

MDN-B.J 388 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

#### Compact Density/Caliper

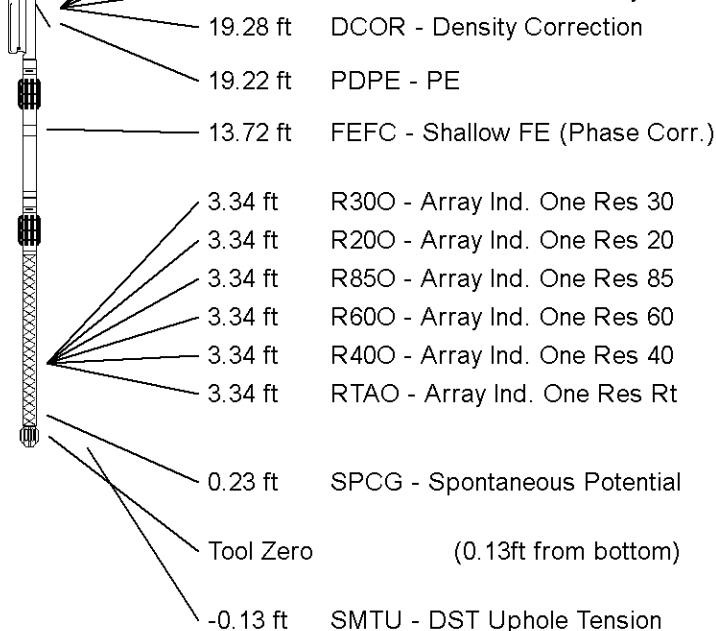
MPD-B 120 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in



Compact Focussed Electric  
MFE-B.A 261 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Induction  
MAI-B.J 426 LG: 10.81 ft WT: 48.5 lb OD: 2.240 in

Total Length: 44.67 ft Weight: 343.9 lb



All measurements relative to tool zero.

COMPANY EAST CHEYENNE GAS STORAGE, LLC  
WELL LC-M005 ROPER 1  
FIELD WEST PEETZ  
PROVINCE/COUNTY LOGAN  
COUNTRY/STATE U.S.A. / COLORADO

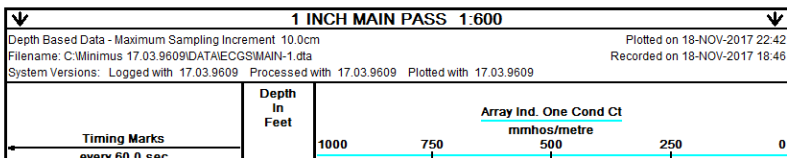
|                         |      |      |               |         |      |
|-------------------------|------|------|---------------|---------|------|
| Elevation Kelly Bushing | 4606 | feet | First Reading | 5409.00 | feet |
| Elevation Drill Floor   | 4606 | feet | Depth Driller | 5412.00 | feet |
| Elevation Ground Level  | 4596 | feet | Depth Logger  | 5412.70 | feet |

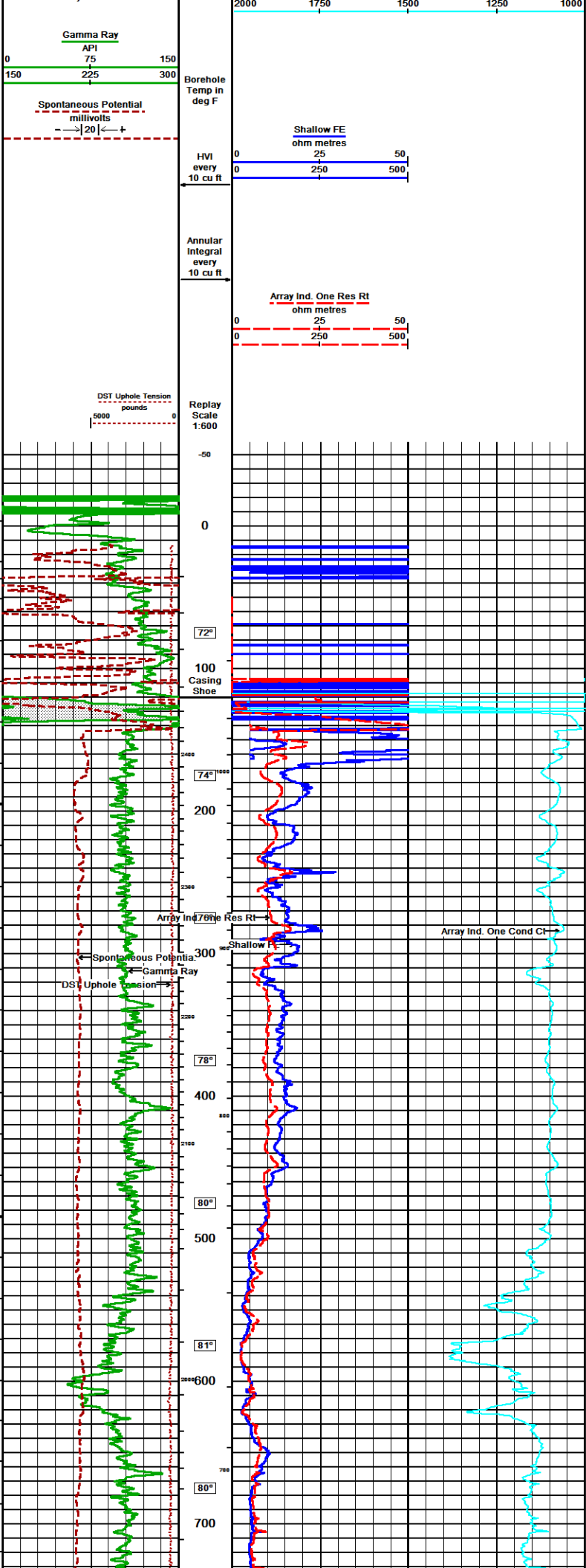


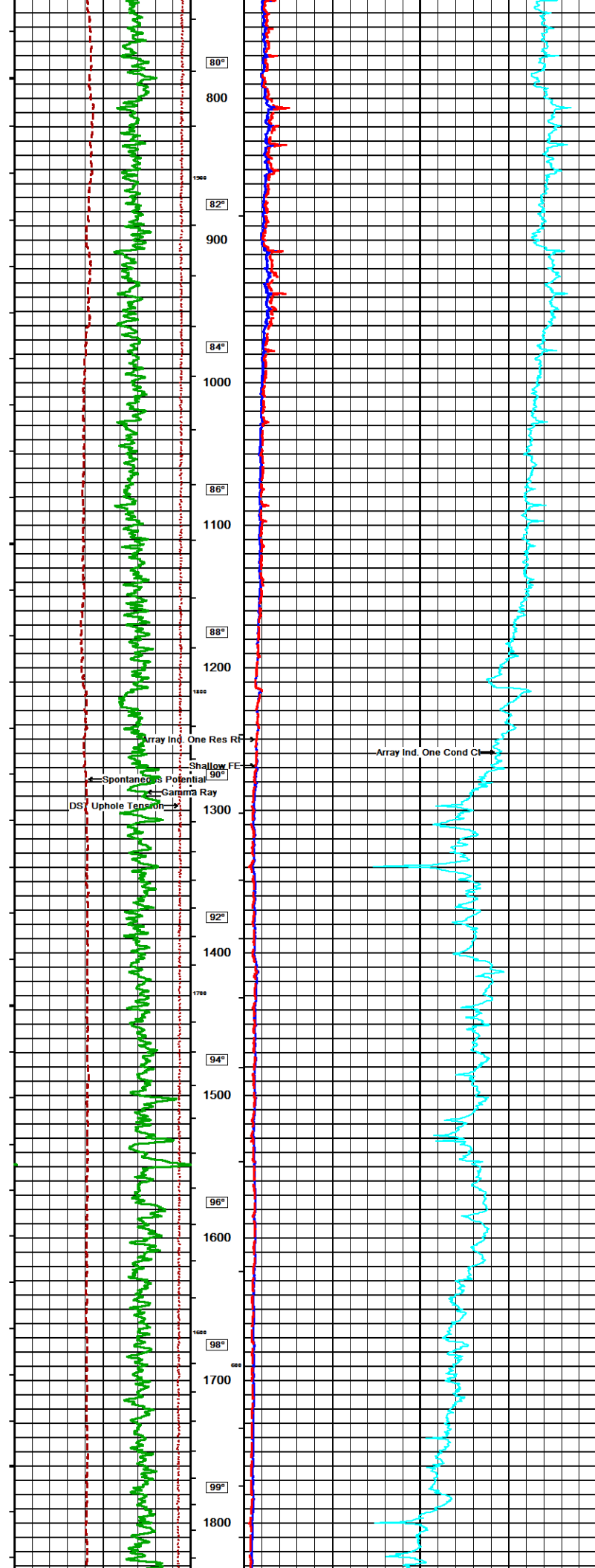
## ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

# Weatherford®

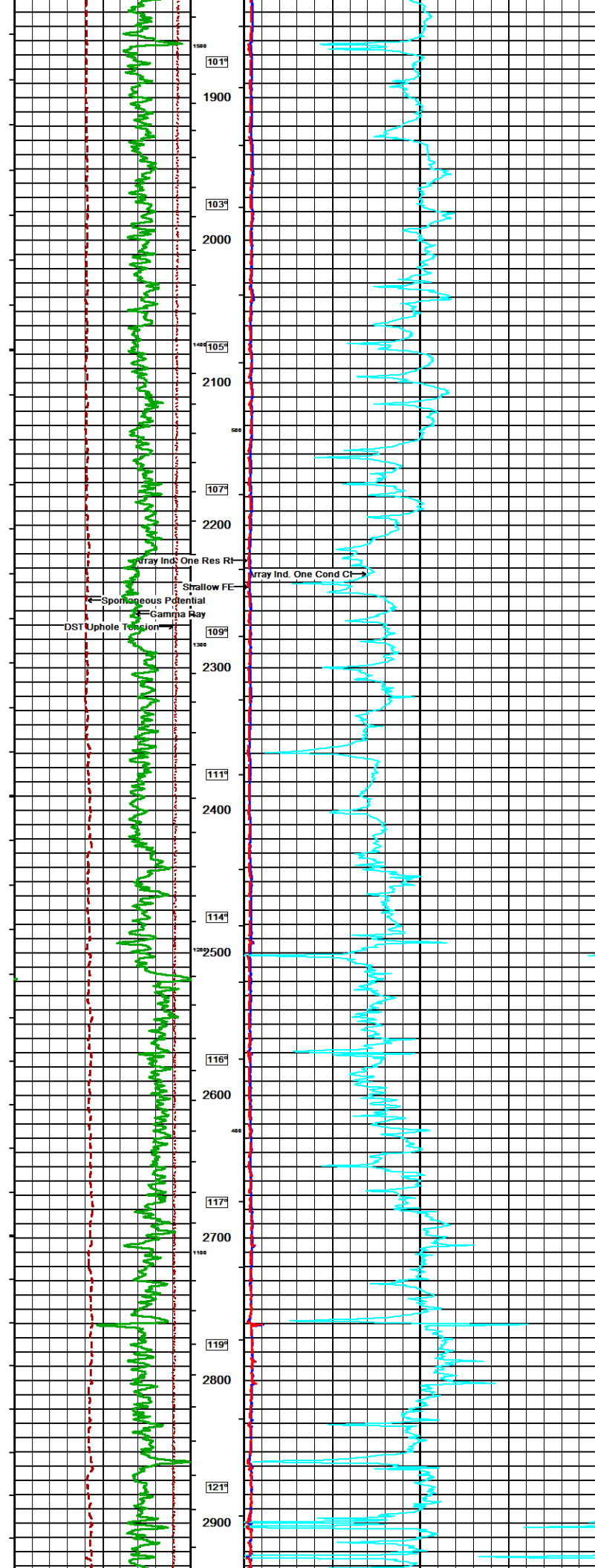
| Weatherford®                 |                                | ARRAY INDUCTION<br>SHALLOW FOCUSED<br>ELECTRIC LOG |                     |
|------------------------------|--------------------------------|--|---------------------|
| COMPANY                      | EAST CHEYENNE GAS STORAGE, LLC | WELL   | LC-M005 ROPER 1     |
| FIELD                        | WEST PEETZ                     | PROVINCE/COUNTY                                    | LOGAN               |
| COUNTRY/STATE                | U.S.A. / COLORADO              | LOCATION   | 2275 FSU & 1539 FEL |
| SEC 13                       | T1N16E33N10E1S                 | LOG MEASURED FROM                                  | KB                  |
| Latitude                     | 40.3228                        | Longitude  | -103.2524           |
| UTM Zone                     | 18Q                            | UTM Easting  | 654000              |
| UTM Northing                 | 4606000                        | UTM Zone   | 18Q                 |
| Permanent Datum GL Elevation | 4596 feet                      | Log Measured From                                  | KB                  |
| Drilling Measured From       | KB                             | Drilling Measured From                             | KB                  |
| Date                         | 18-NOV-2017                    | Run Number   | ONE                 |
| Service Order                | 4052-198774672                 | Depth Driller                                      | 5412.00 feet        |
| Depth Logger                 | 5412.70 feet                   | First Reading                                      | 5409.00 feet        |
| Last Reading                 | 120.00 feet                    | Casing Driller                                     | 120.00 feet         |
| Casing Logger                | 120.00 feet                    | Bit Size   | 7.875 inches        |
| Hole Fluid Type              | WBH                            | Density/Viscosity                                  | 9.70 g/cc           |
| PH/Fluid Loss                | 8.00                           | PH/Fluid Loss                                      | 6.40 m3/min         |
| Sample Source                | MUD TANK                       | Run @ Measured Temp                                | 0.11 @ 85.0 ohm-m   |
| Run @ Measured Temp          | 0.08 @ 85.0 ohm-m              | Run @ Measured Temp                                | 0.123 @ 85.0 ohm-m  |
| Source Rm / Rmc              | CALC                           | Source Rm / Rmc                                    | CALC                |
| Run @ BHT                    | 0.06 @ 150.0 ohm-m             | Time Since Circulation                             | 6 HRS               |
| Max Recorded Temp            | 159.00 deg F                   | Equipment / Base                                   | 13057 OKC           |
| Recorded By                  | Z AL SUDAN                     | Witnessed By                                       | GREG FRANCOIS       |
| Witnessed By                 | TERRY STREET                   |  |                     |

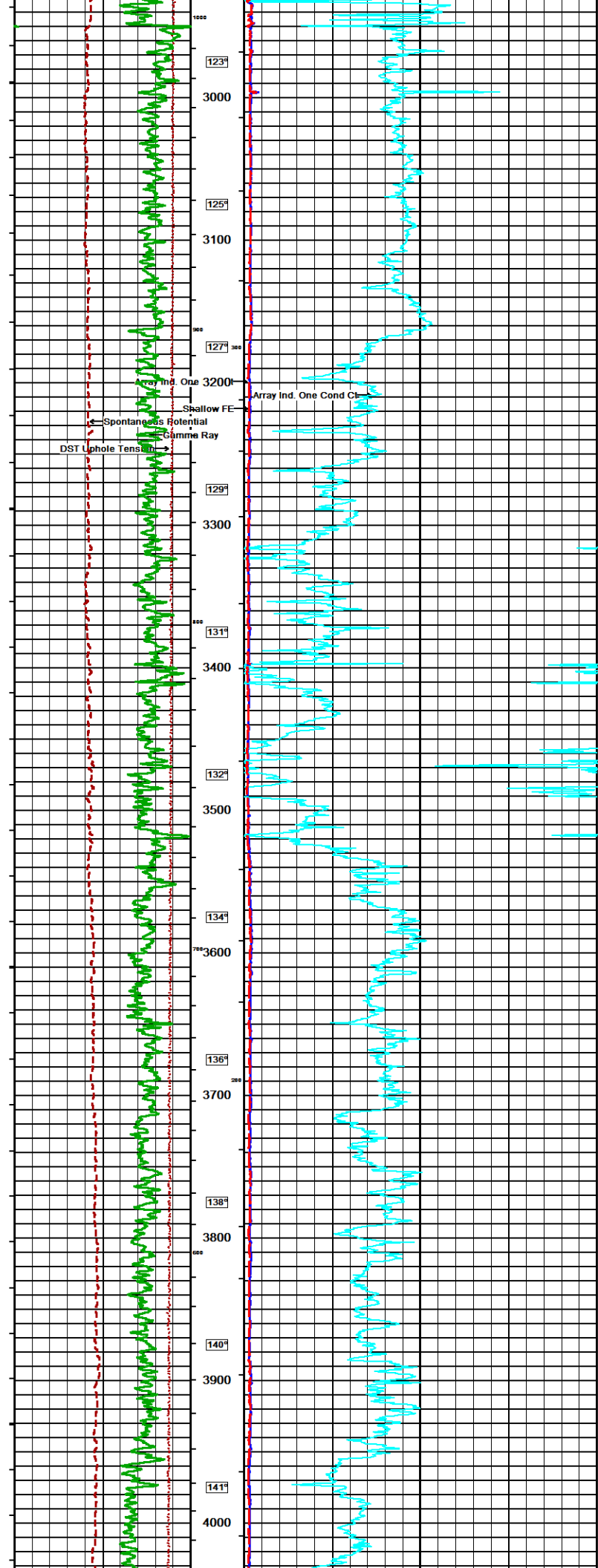


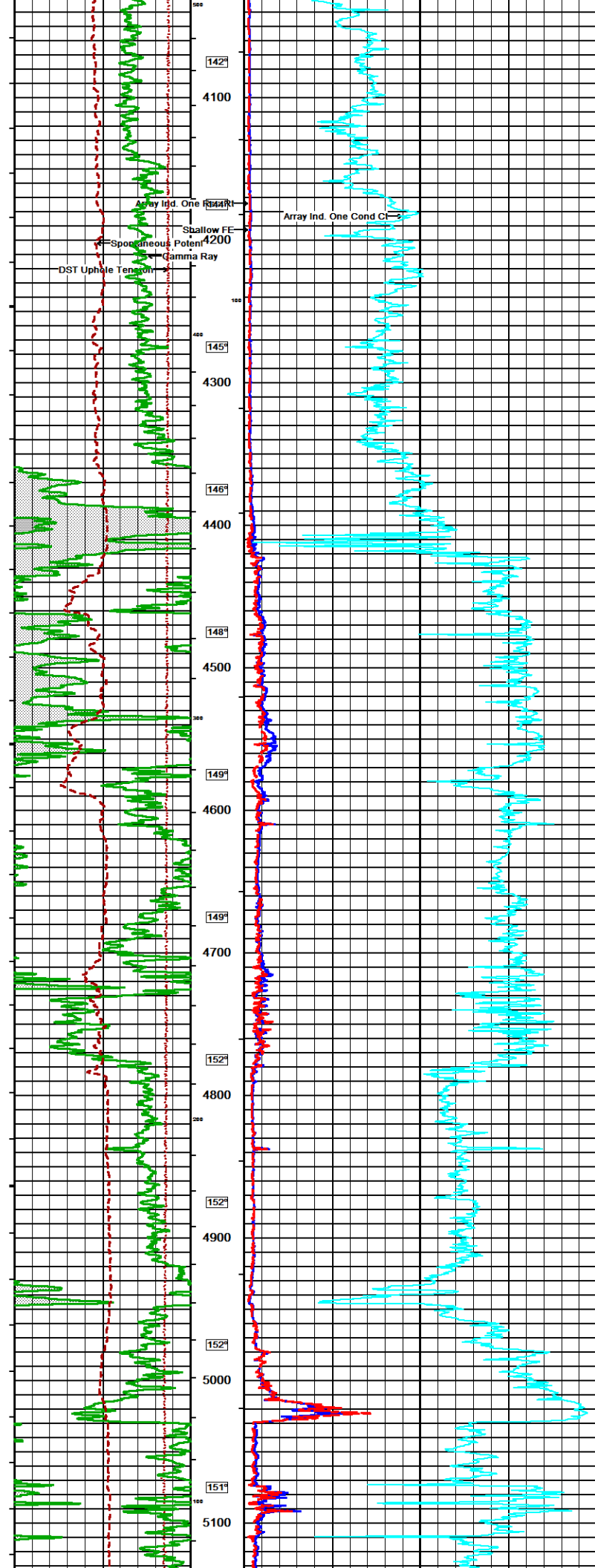


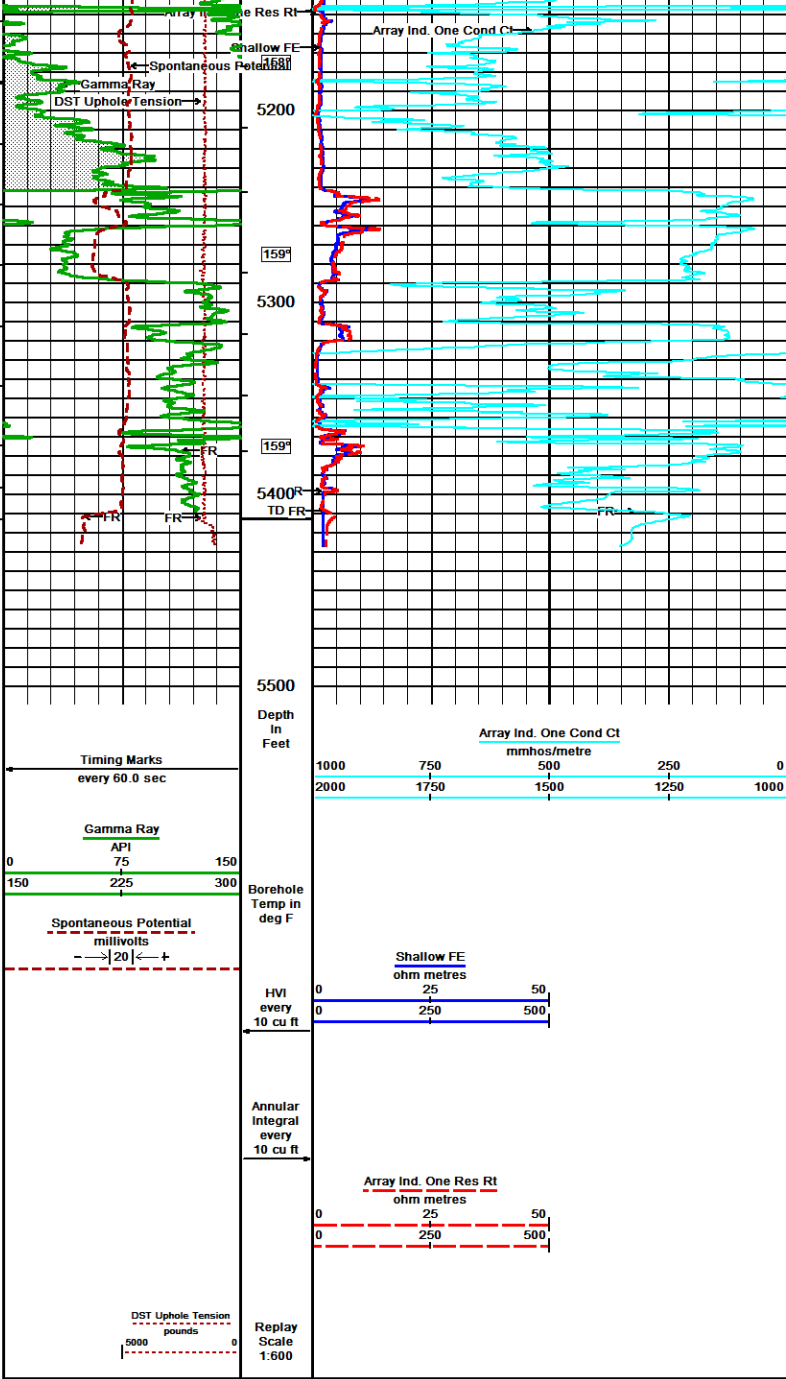













|  |      |                                |                 |         |      |
|--|------|--------------------------------|-----------------|---------|------|
| COMPANY  |      | EAST CHEYENNE GAS STORAGE, LLC |                 |         |      |
| WELL   |      | LC-M005 ROPER 1                |                 |         |      |
| FIELD  |      | WEST PEETZ                     |                 |         |      |
| PROVINCE/COUNTY  |      | LOGAN                          |                 |         |      |
| COUNTRY/STATE  |      | U.S.A. / COLORADO              |                 |         |      |
| Elevation Kelly Bushing  | 4606 | feet                           | First Reading   | 5409.00 | feet |
| Elevation Drill Floor  | 4606 | feet                           | Depth Driller   | 5412.00 | feet |
| Elevation Ground Level   | 4596 | feet                           | Depth Logger    | 5412.70 | feet |
| <br><b>Weatherford</b> <sup>®</sup> |      |                                | ARRAY INDUCTION |         |      |
|  |      |                                | SHALLOW FOCUSED |         |      |
|  |      |                                | ELECTRIC LOG    |         |      |