

# STEP

**PHASED INDUCTION**  
**SHALLOW FOCUS SP LOG**

## energy services

**Company:** BEREXCO, LLC  
**Well:** HINES UNIT #26X  
**Field:** FAIRPORT  
**Country:** RUSSELL  
**State:** KANSAS  
**Country:** USA  
**API No.:** 15-167-24097-00-00

**File No.:** HAYS-70386  
**Company:** BEREXCO, LLC  
**Well:** HINES UNIT #26X  
**Field:** FAIRPORT  
**Country:** RUSSELL  
**State:** KANSAS  
**Country:** USA  
**API No.:** 15-167-24097-00-00

**Location:**  
 200' FNL & 440' FWL  
 NE NW NW NW

**LSD:**                      **Sect:** 16                      **Twp:** 11S                      **Rge:** 15W

|                                 |                       |                    |    |                  |     |
|---------------------------------|-----------------------|--------------------|----|------------------|-----|
| <b>Permanent Datum:</b>         | GL                    | <b>Elevations:</b> |    | <b>Services:</b> |     |
| <b>Drilling Measured From:</b>  | KB                    | KB 1942.00         | Ft | CNT              | CST |
| <b>Log Measured From:</b>       | KB                    | DF 1941.00         | Ft | LDT              | PIT |
| <b>Above Permanent Datum:</b>   | 6.00 Ft               | GL 1936.00         | Ft | MST              |     |
| <b>Date:</b>                    | 11-20-2019            |                    |    |                  |     |
| <b>Run Number</b>               | 0                     |                    |    |                  |     |
| <b>Depth--Driller</b>           | 3550.0 Ft             |                    |    |                  |     |
| <b>Depth--Logger</b>            | 3550.0 Ft             |                    |    |                  |     |
| <b>First Reading</b>            | 3549.0 Ft             |                    |    |                  |     |
| <b>Last Reading</b>             | 264.0 Ft              |                    |    |                  |     |
| <b>Casing--Driller</b>          | 264.0 Ft              |                    |    |                  |     |
| <b>Casing--Logger</b>           | 264.0 Ft              |                    |    |                  |     |
| <b>Bit Size</b>                 | 7.875 In              |                    |    |                  |     |
| <b>Casing Size</b>              | 8.625 In              |                    |    |                  |     |
| <b>Hole Fluid Type</b>          | CHEMICAL              |                    |    |                  |     |
| <b>Density</b>                  | 9.0                   |                    |    |                  |     |
| <b>Fluid Loss</b>               | 8.0                   |                    |    |                  |     |
| <b>PH/Viscosity</b>             | 9.5                   | 64.0               |    |                  |     |
| <b>Sample Source</b>            | MEASURED              |                    |    |                  |     |
| <b>RM@Measured Temp.</b>        | 1.500                 | @ 60 F             |    |                  |     |
| <b>RMF@Measured Temp</b>        | 1.280                 | @ 60 F             |    |                  |     |
| <b>RMG@Measured Temp.</b>       | 1.730                 | @ 60 F             |    |                  |     |
| <b>Source RMF/RMC</b>           | CALCULATED/CALCULATED |                    |    |                  |     |
| <b>RM@BHT</b>                   | 0.930 @ 101 F         |                    |    |                  |     |
| <b>Time Circulation Stopped</b> | 11-20-2019 14:34      |                    |    |                  |     |
| <b>Max Recorded Temp.</b>       | 101                   | F                  |    |                  |     |
| <b>Equipment/Base</b>           | TRK-137               | HAYS               |    |                  |     |
| <b>Recorded By</b>              | B.BAILEY              |                    |    |                  |     |
| <b>Witnessed By</b>             | J.SMITH               |                    |    |                  |     |

The customer is hereby warned that by providing the log data herein, STEP Energy Services does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. STEP Energy Services does not guarantee or warrant either expressly or impliedly, the accuracy of any interpretation of log data, conversion of log data to physical rock parameters or recommendations which may be given by STEP Energy Services personnel. Any interpretation, conversion or recommendation is not part of the consideration for the agreement between the parties and is not part of any part of the charge by STEP Energy Services for its services. Any user of the log data is warned that said user is not entitled to rely on interpretations, conversions or recommendations as aforesaid.

| Bitsize Intervals |             | Casing Strings |              |             |          |
|-------------------|-------------|----------------|--------------|-------------|----------|
| Size (In)         | Bottom (Ft) | Size (In)      | Weight (Lbs) | Bottom (Ft) | Top (Ft) |
| 7.875             | 3550.00     | 8.625          | 32.00        | 264.00      | 0.00     |
|                   |             |                |              |             |          |
|                   |             |                |              |             |          |
|                   |             |                |              |             |          |
|                   |             |                |              |             |          |

|                            |                  |
|----------------------------|------------------|
| <b>Run Number</b>          | 0                |
| <b>Date</b>                | 11-20-2019       |
| <b>Date/Time On Bottom</b> | 11-20-2019 15:34 |
| <b>Depth to Fluid</b>      | 0.0 Ft           |
| <b>Salinity</b>            | 0.000            |
| <b>RMF@BHT</b>             | 0.790 @ 101 F    |
| <b>RMC@BHT</b>             | 1.070 @ 101 F    |

**Run Number 0**

**Comments**

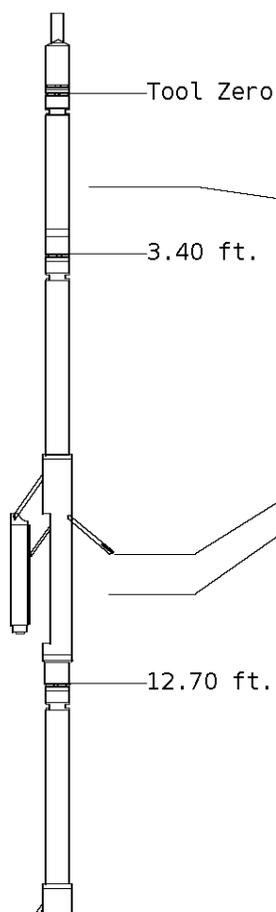
ALL PRESENTATIONS AS PER CUSTOMER REQUEST  
 GRT, CNT, LDT, MLT, CST, AND PIT RUN IN COMBINATION  
 CALIPERS ORIENTED ON X-Y AXIS  
 2.71 G/CC USED TO CALCULATE POROSITY  
 ANNULAR HOLE VOLUME CALCULATED USING 5.50" PRODUCTION CASING  
 PHIN IS CALIPER CORRECTED

GRT: GRP.  
 CNT: PHIN, CLCNIN.  
 LDT: PORL, LCORN, PECLN, LDENN, CLLDIN.  
 CST: PORS, ITT, CDTF, TT1, TT2, TT3, TT4.  
 PIT : ILD,ILM,SPU,SFLAEC,CIRD,RXO/RT

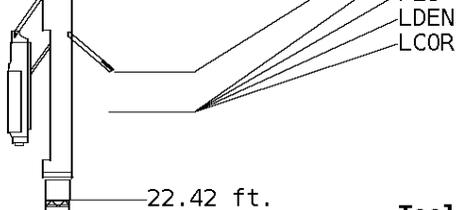
OPERATORS:  
 D.RAGSDALE  
 J.VAUGH  
 D.LEGLEITER

### Tool String Schematic

**Total Tool Length** - 67.37 ft.  
**Maximum Outside diameter** - 6.00 in.  
**Net Weight in Air** - 1171.00 lbs.



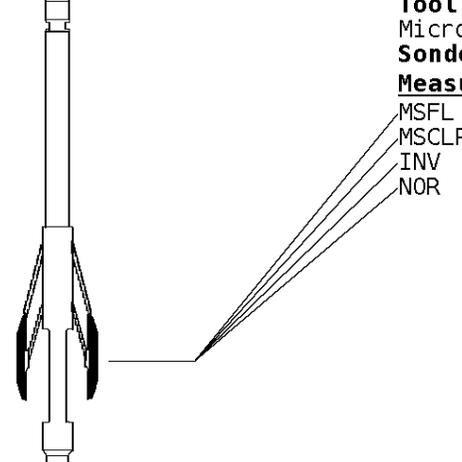
|                                    |                         |                       |                      |
|------------------------------------|-------------------------|-----------------------|----------------------|
| <b>Tool:</b> GRT-B                 | <b>Length:</b> 3.40 ft. | <b>O.D.:</b> 3.60 in. |                      |
| Gamma Ray Controller               |                         |                       |                      |
| <b>Sonde ID</b>                    | :GRT-BC-038             |                       |                      |
| <b>Measure Point</b>               | <b>Tool Offset</b>      | <b>Stack Offset</b>   | <b>Bottom Offset</b> |
| GRP                                | 2.00                    | 2.00                  | 65.37                |
| <b>Tool:</b> CNT-AA                | <b>Length:</b> 9.30 ft. | <b>O.D.:</b> 4.36 in. |                      |
| Compensated Neutron A Pad on NDT-A |                         |                       |                      |
| <b>Sonde ID</b>                    | :NDT-AF-104             |                       |                      |
| <b>Source ID</b>                   | :N-1104                 |                       |                      |
| <b>Pad ID</b>                      | :CNP-AE-41              |                       |                      |
| <b>Measure Point</b>               | <b>Tool Offset</b>      | <b>Stack Offset</b>   | <b>Bottom Offset</b> |
| CLCN                               | 6.00                    | 9.40                  | 57.97                |
| PHIN                               | 6.80                    | 10.20                 | 57.17                |
| <b>Tool:</b> LDT-DF                | <b>Length:</b> 9.72 ft. | <b>O.D.:</b> 4.80 in. |                      |
| Litho Density D Pad on NDT-F       |                         |                       |                      |
| <b>Sonde ID</b>                    | :NDT-FA-404             |                       |                      |
| <b>Source ID</b>                   | :1637GW                 |                       |                      |
| <b>Pad ID</b>                      | :LDP-DA-062             |                       |                      |
| <b>Measure Point</b>               | <b>Tool Offset</b>      | <b>Stack Offset</b>   | <b>Bottom Offset</b> |
| CLLD                               | 6.42                    | 19.12                 | 48.25                |
| PEL                                | 7.42                    | 20.12                 | 47.25                |
| PES                                | 7.82                    | 20.52                 | 46.85                |



7.62      20.32      47.05  
 7.62      20.32      47.05

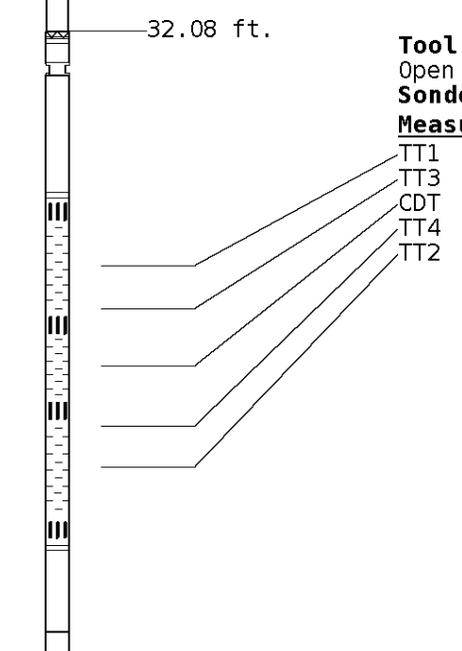
**Tool:** MST-DA      **Length:** 9.66 ft.    **O.D.** 6.00 in.  
 Micro Spherically Focused (IC,D)  
**Sonde ID** :MST-DA-13

| Measure Point | Tool Offset | Stack Offset | Bottom Offset |
|---------------|-------------|--------------|---------------|
| MSFL          | 7.60        | 30.02        | 37.35         |
| MSCLP         | 7.60        | 30.02        | 37.35         |
| INV           | 7.60        | 30.02        | 37.35         |
| NOR           | 7.60        | 30.02        | 37.35         |



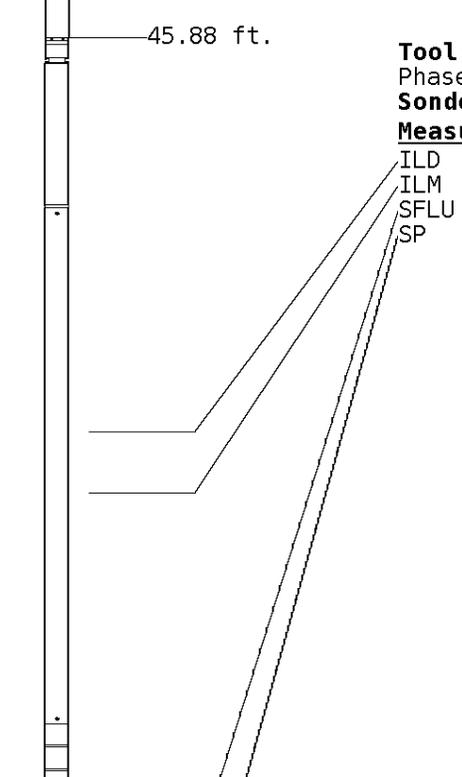
**Tool:** CST-AD      **Length:** 13.80 ft.    **O.D.** 3.60 in.  
 Open Hole Sonic  
**Sonde ID** :CST-AD-043

| Measure Point | Tool Offset | Stack Offset | Bottom Offset |
|---------------|-------------|--------------|---------------|
| TT1           | 4.80        | 36.88        | 30.49         |
| TT3           | 5.80        | 37.88        | 29.49         |
| CDT           | 7.30        | 39.38        | 27.99         |
| TT4           | 8.80        | 40.88        | 26.49         |
| TT2           | 9.80        | 41.88        | 25.49         |



**Tool:** PIT-CA      **Length:** 21.49 ft.    **O.D.** 3.62 in.  
 Phased Dual Induction w/ RM & D  
**Sonde ID** :PIT-AC-043

| Measure Point | Tool Offset | Stack Offset | Bottom Offset |
|---------------|-------------|--------------|---------------|
| ILD           | 8.92        | 54.80        | 12.56         |
| ILM           | 10.10       | 55.98        | 11.39         |
| SFLU          | 17.49       | 63.37        | 4.00          |
| SP            | 20.60       | 66.48        | 0.88          |



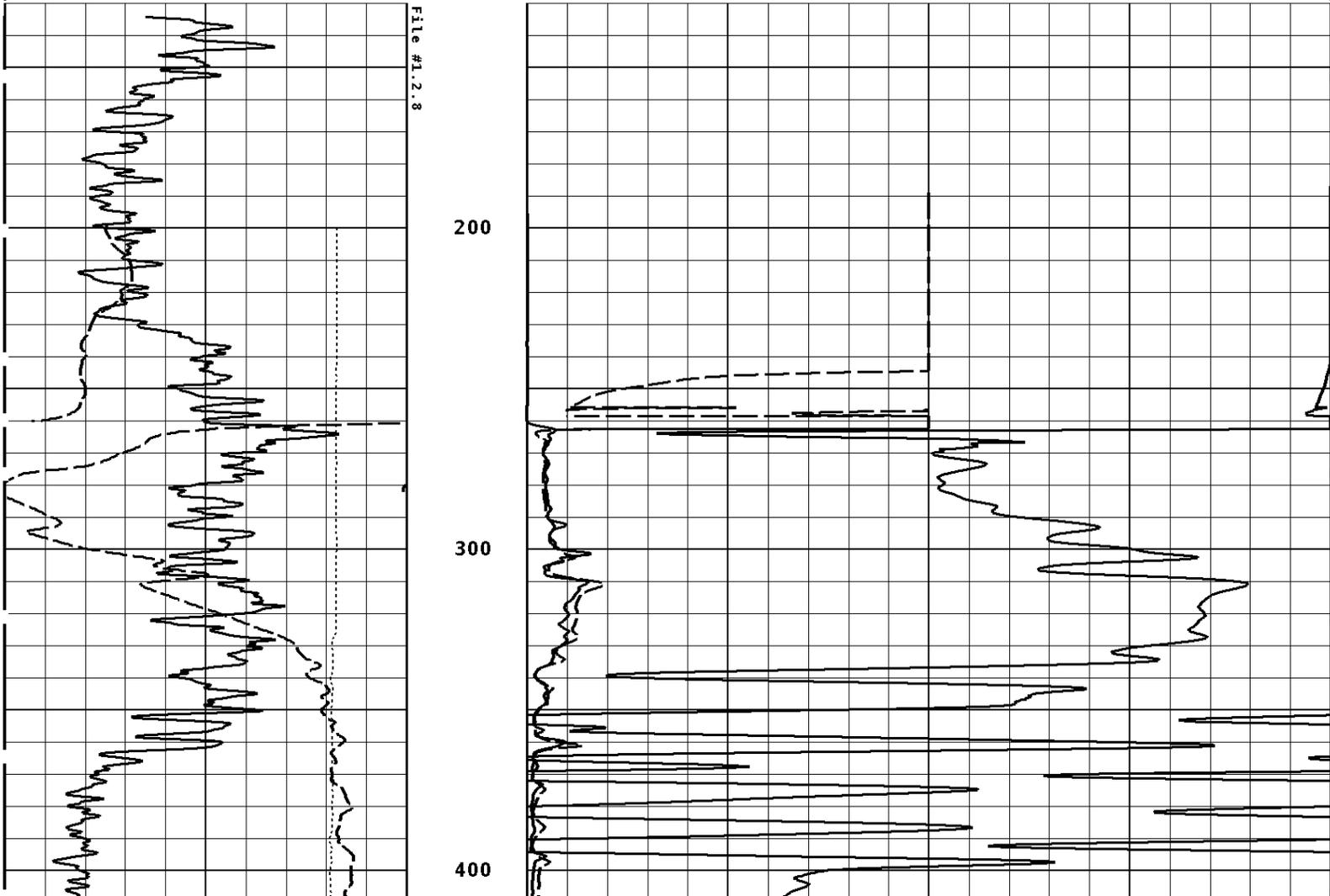
LWT 67.37 ft.

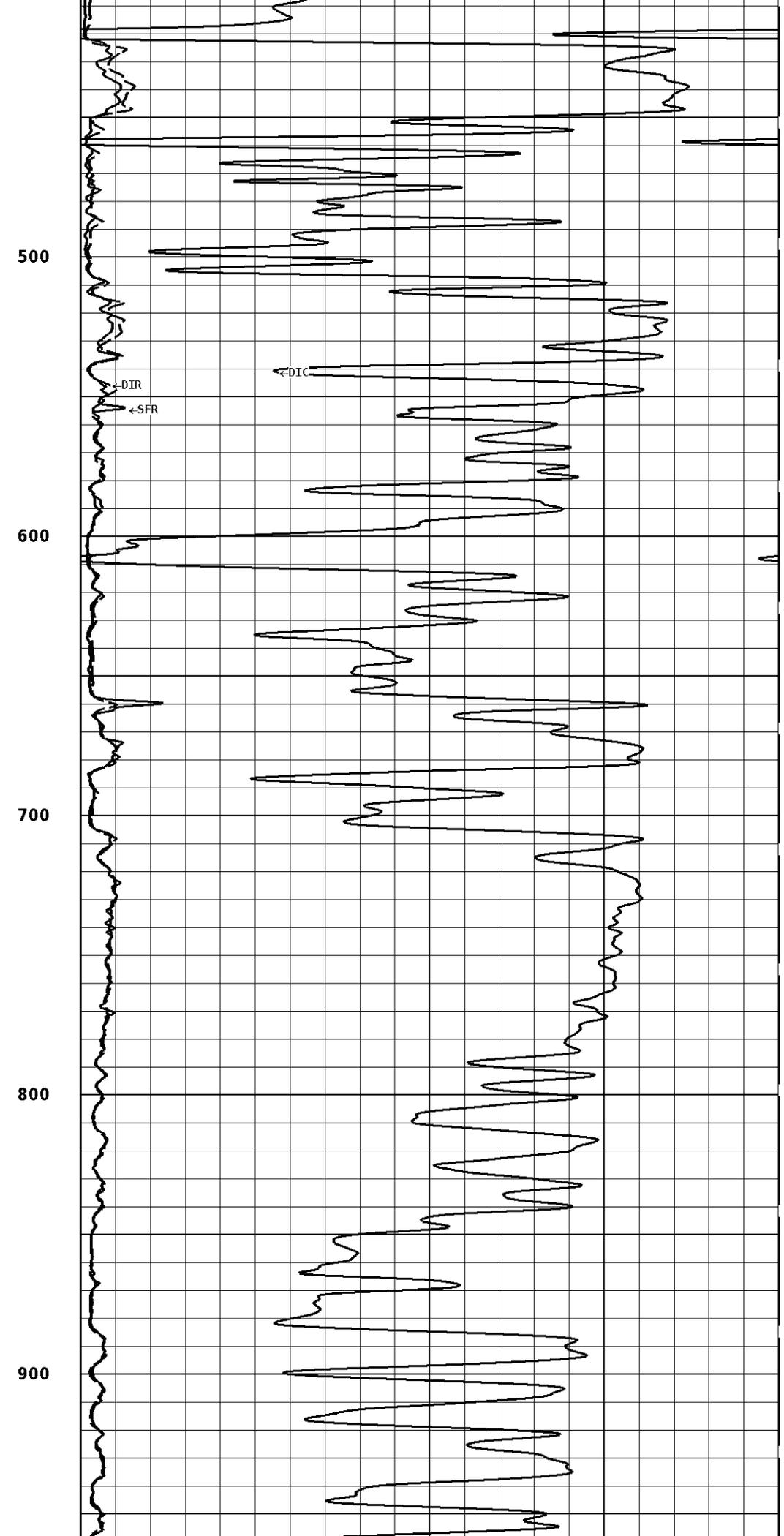
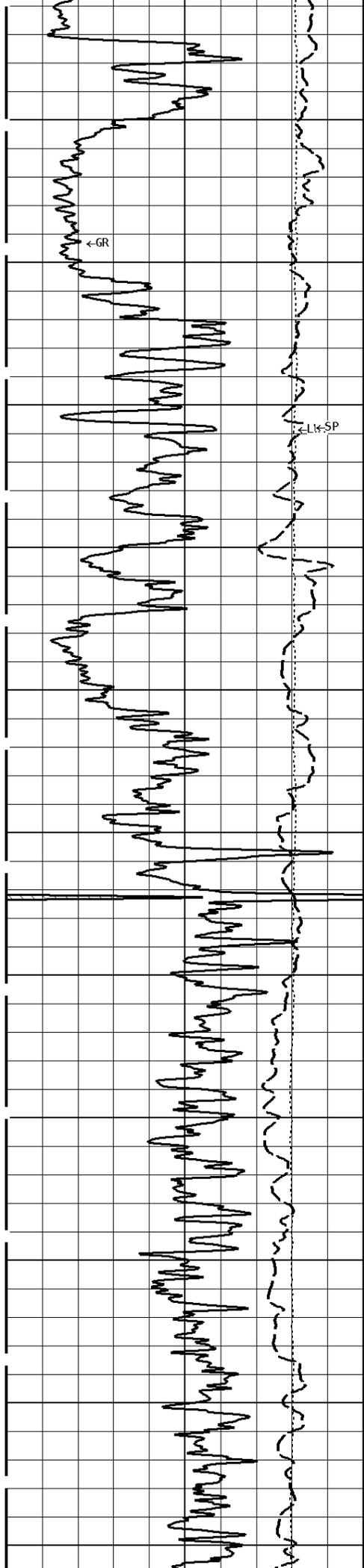
Well File: BEREXCO-HINES-26X\_NOV20-QST  
 Segment: V1.D2.S8 Reprocess MAIN  
 Reference: 0

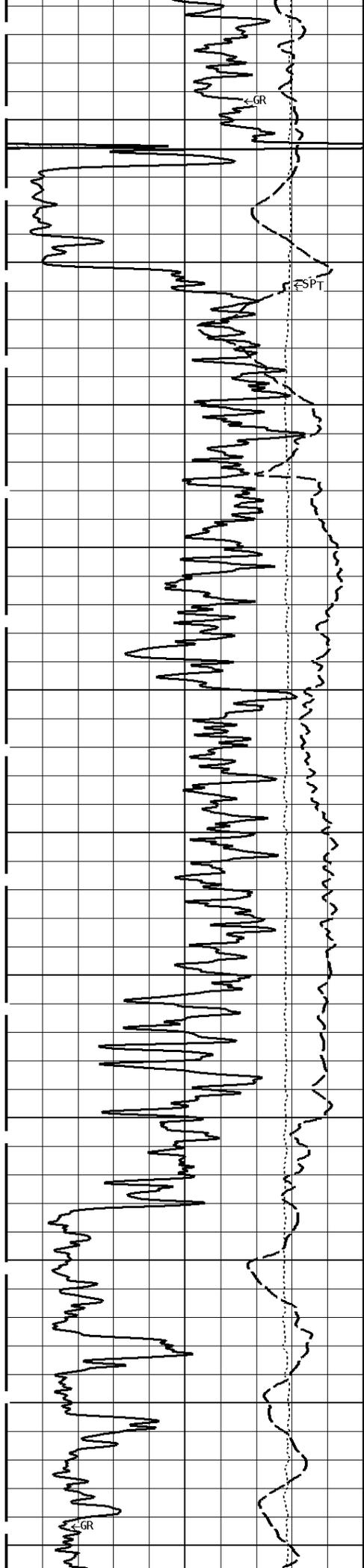
Scale: 1:600 Format: DIL-600  
 Acquired: 2019-11/20 16:48 3.4.1-13972  
 Processed: 2019-11/20 18:43 3.4.1-13972

|  |  |
|--|--|
| <b>TENSION</b><br><b>LBS</b><br>10000 0                  | <b>DEEP INDUCTION</b><br><b>OHMM</b><br>0.0 500.0<br>0.0 50.0              |
| <b>SPONTANEOUS POTENTIAL</b><br><b>mV</b><br>→   ← 20    | <b>SHALLOW FOCUSED RESISTIVITY</b><br><b>OHMM</b><br>0.0 500.0<br>0.0 50.0 |
| <b>GAMMA RAY</b><br><b>API UNITS</b><br>150 300<br>0 150 | <b>DEEP CONDUCTIVITY</b><br><b>MMHO</b><br>2000 1000<br>1000 0             |

**1:600 MAIN SECTION**







1000

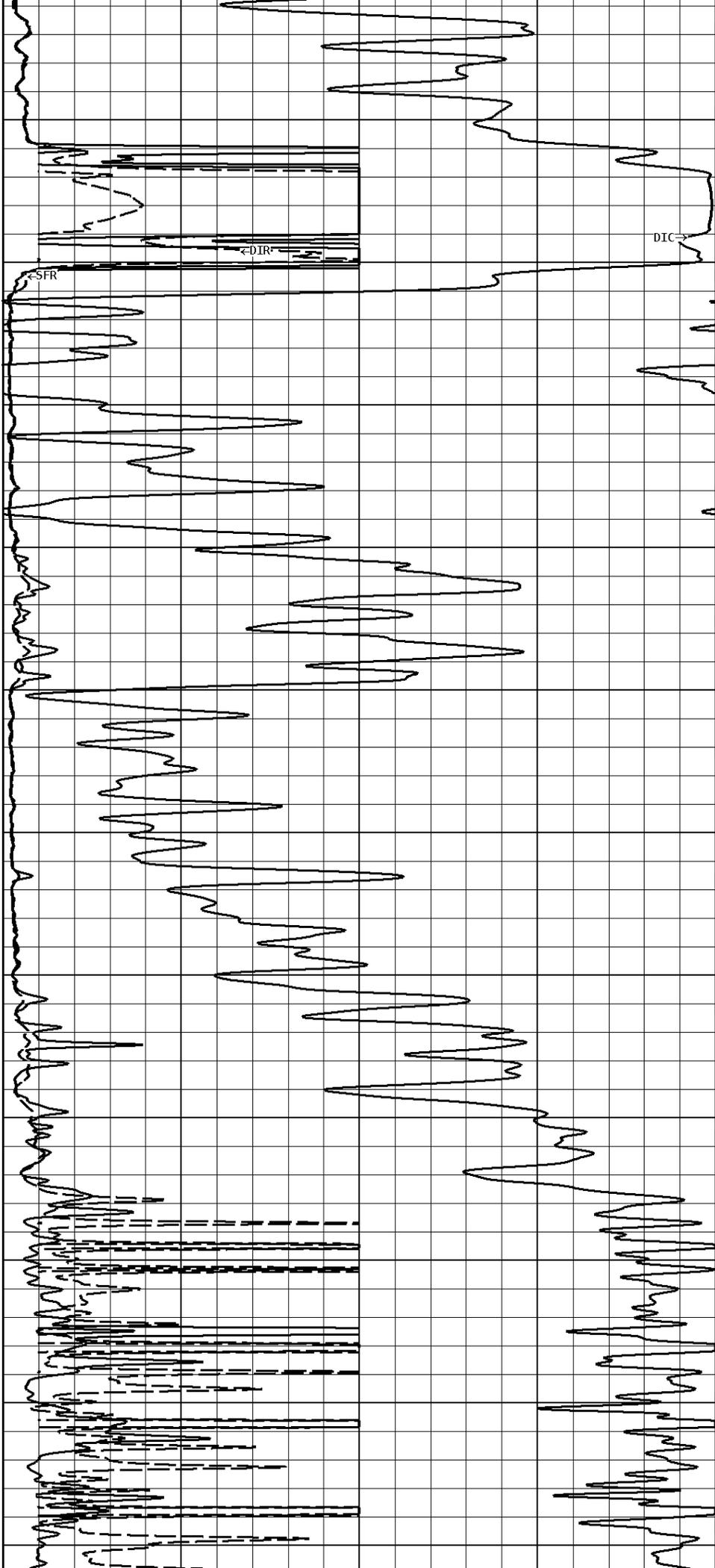
1100

1200

1300

1400

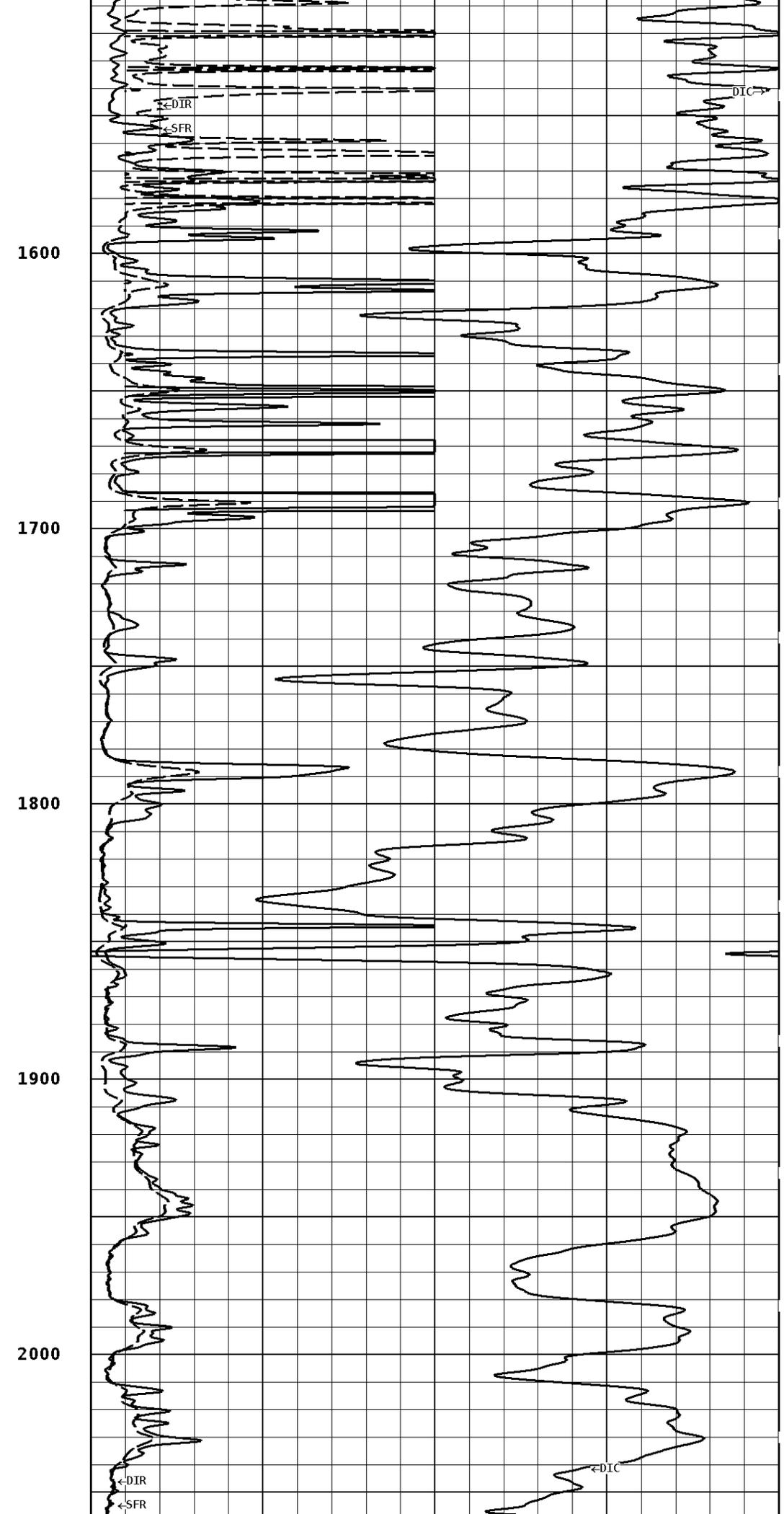
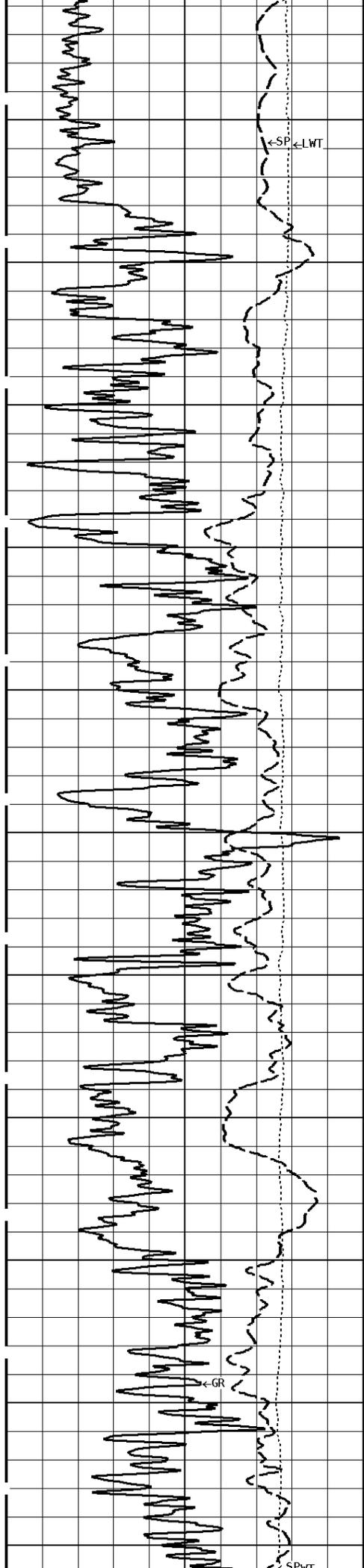
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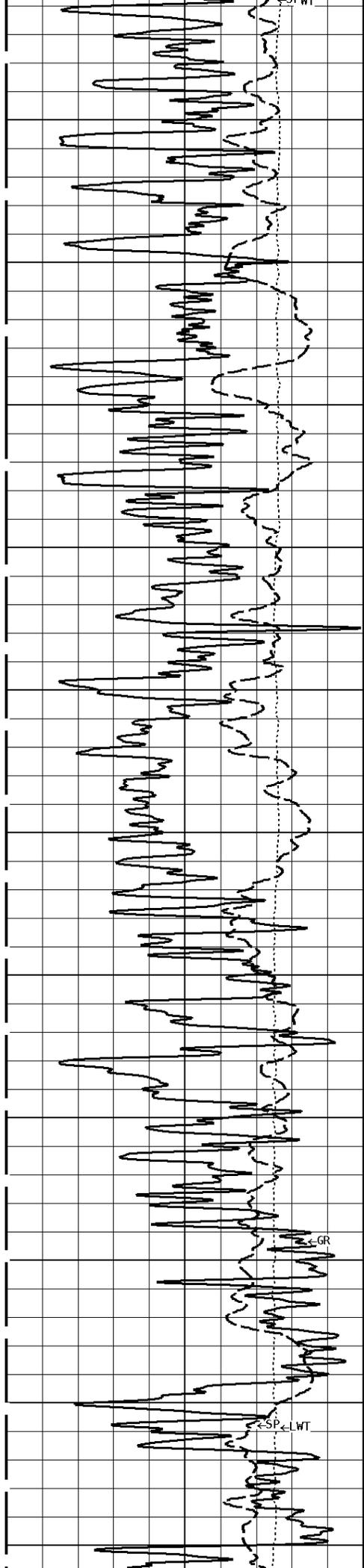


DIC

$\epsilon_{DIR}$

$\epsilon_{SFR}$





2100

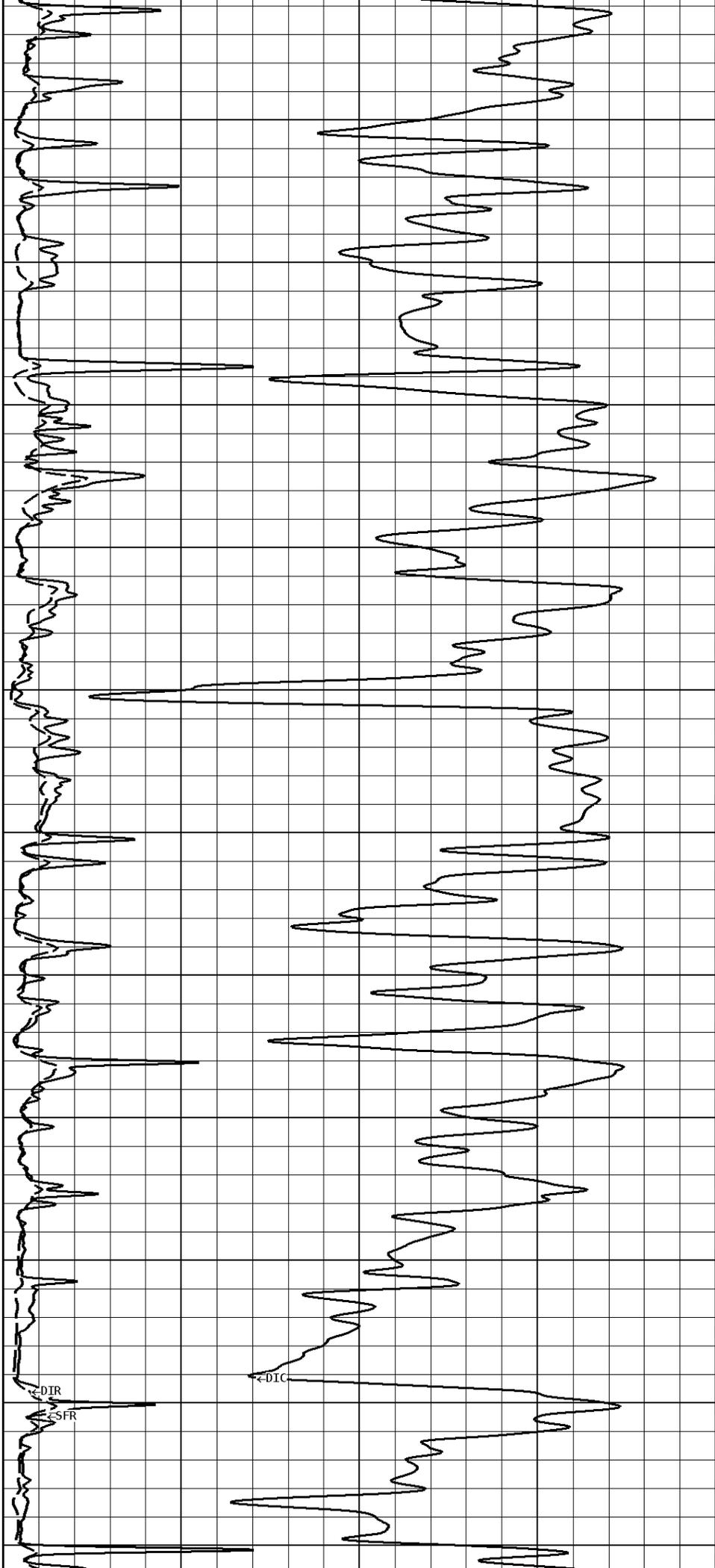
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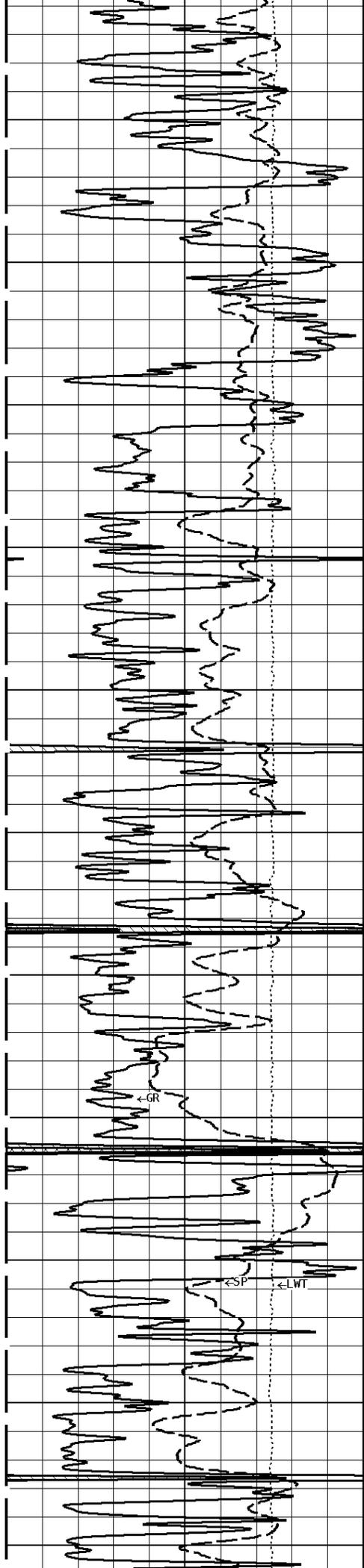
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2400

2500

2600





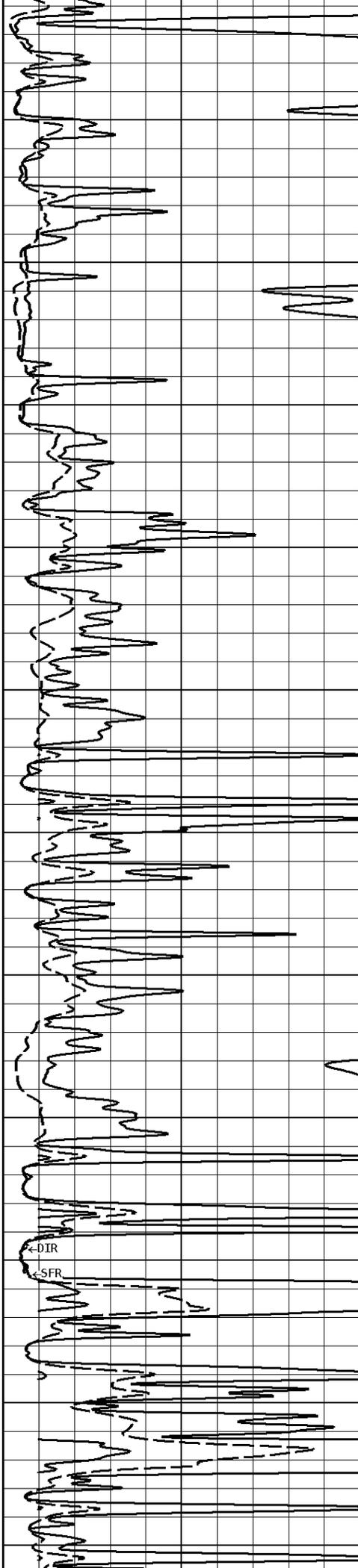
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2800

2900

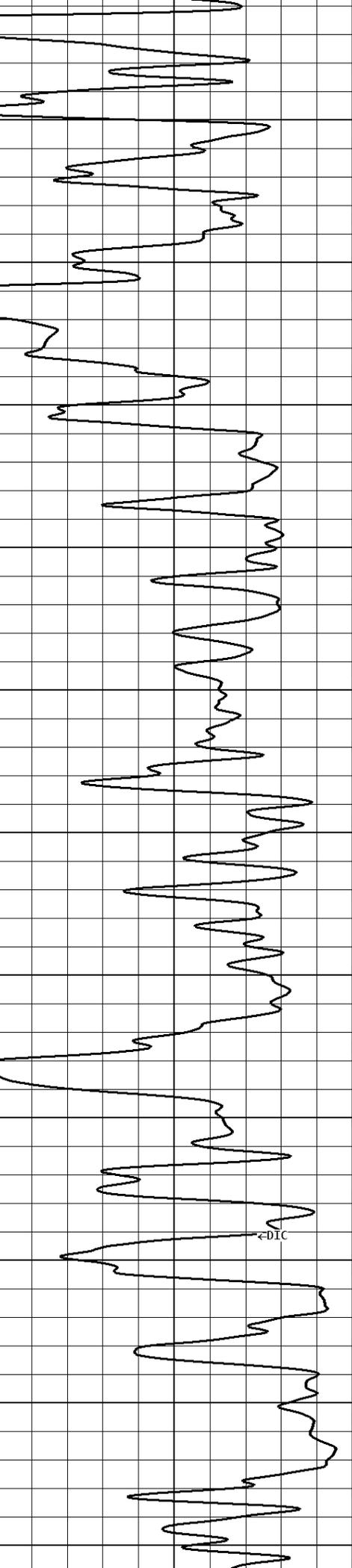
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3100

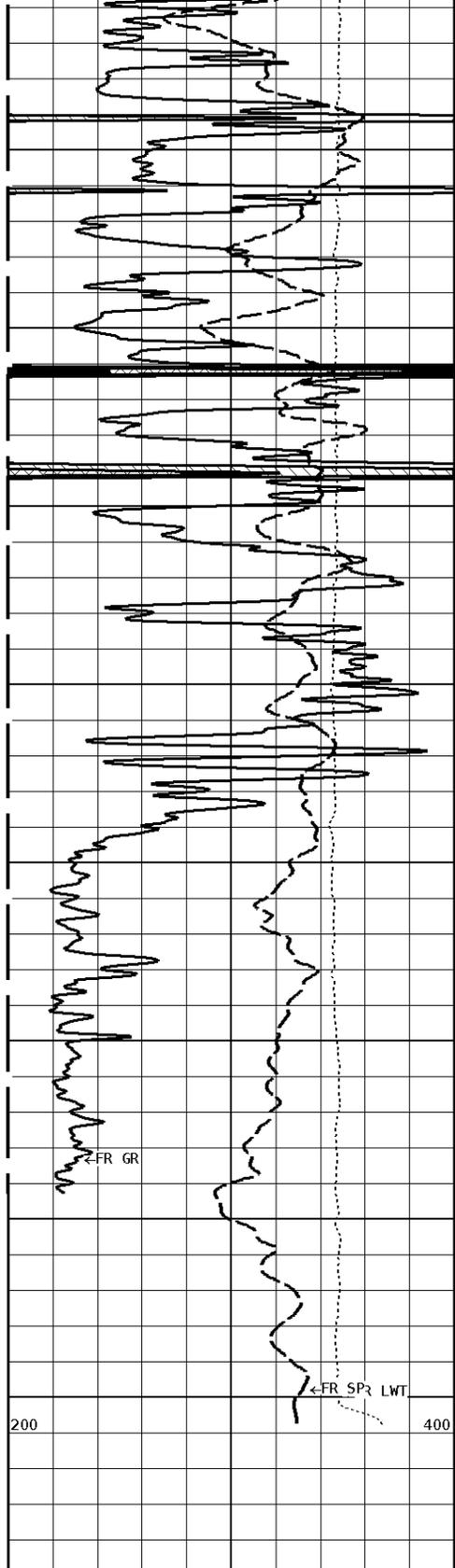


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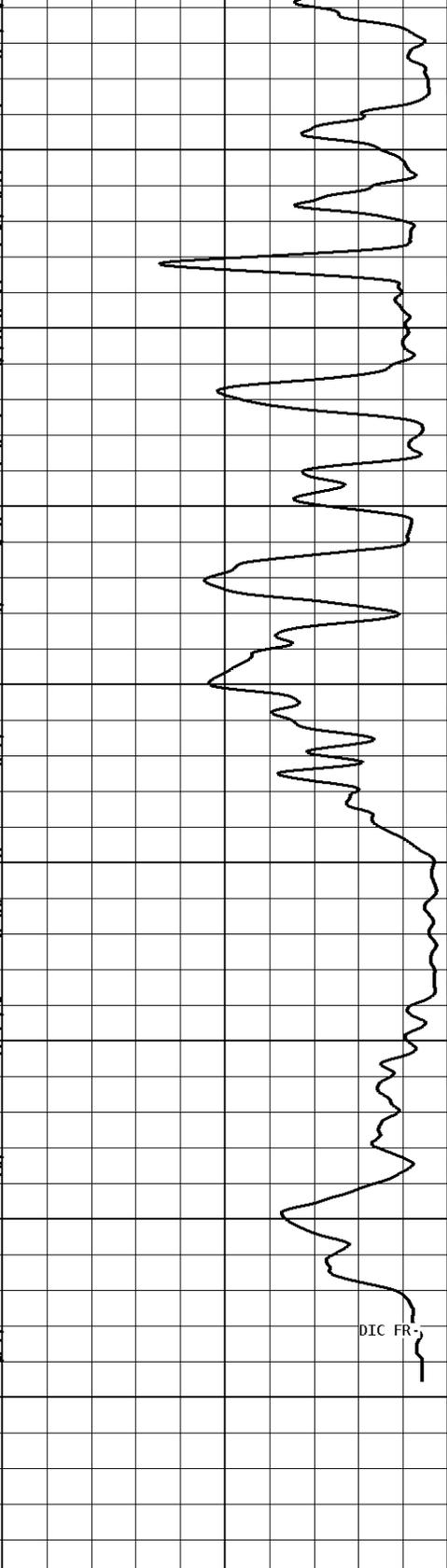
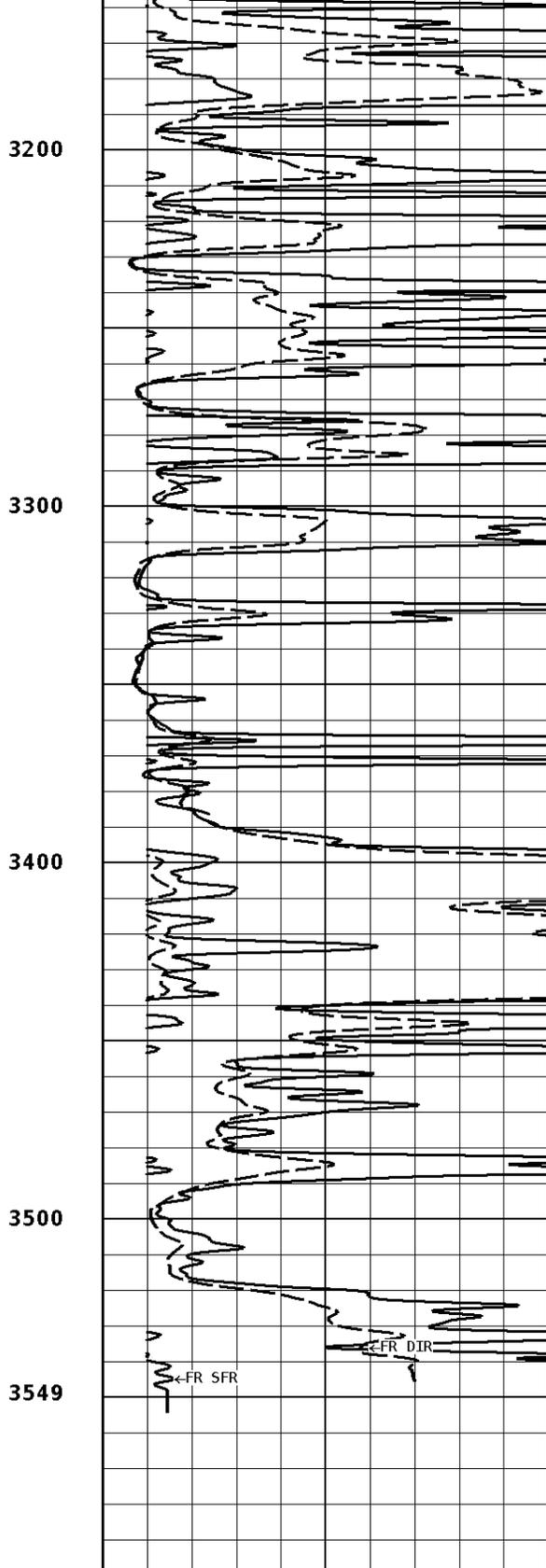
←SFR



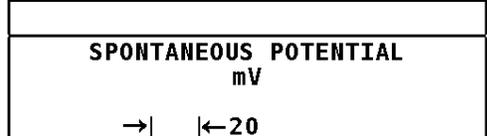
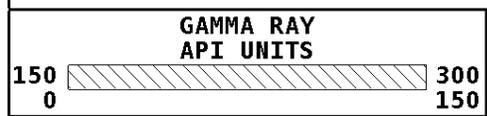
←DIC



File #1.2.8



**1:600 MAIN SECTION**



TENSION  
LBS

10000 0

DEEP INDUCTION  
OHMM

0.0 500.0  
0.0 50.0

Well File: BEREXCO-HINES-26X NOV20-QST Scale: 1:240 Format: DIL-240  
 Segment: V1.D2.S8 Reprocess MAIN Acquired: 2019-11/20 16:48 3.4.1-13972  
 Reference: 0 Processed: 2019-11/20 18:43 3.4.1-13972

SPONTANEOUS POTENTIAL  
mV

→ | ← 20

DEEP INDUCTION  
OHMM

0.2 2000.0

TENSION  
LBS

10000 0

MEDIUM INDUCTION  
OHMM

0.2 2000.0

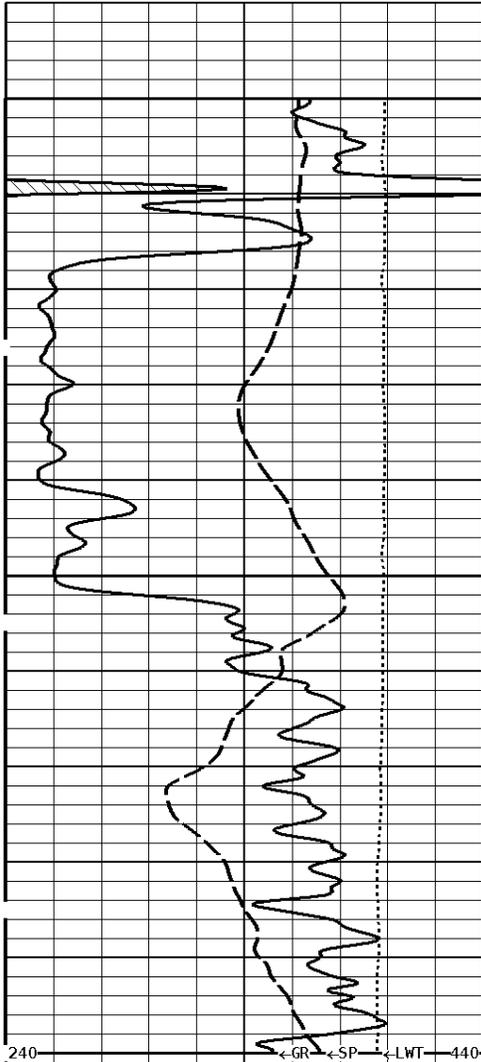
GAMMA RAY  
API UNITS

150 0 300 150

SHALLOW FOCUSED RESISTIVITY  
OHMM

0.2 2000.0

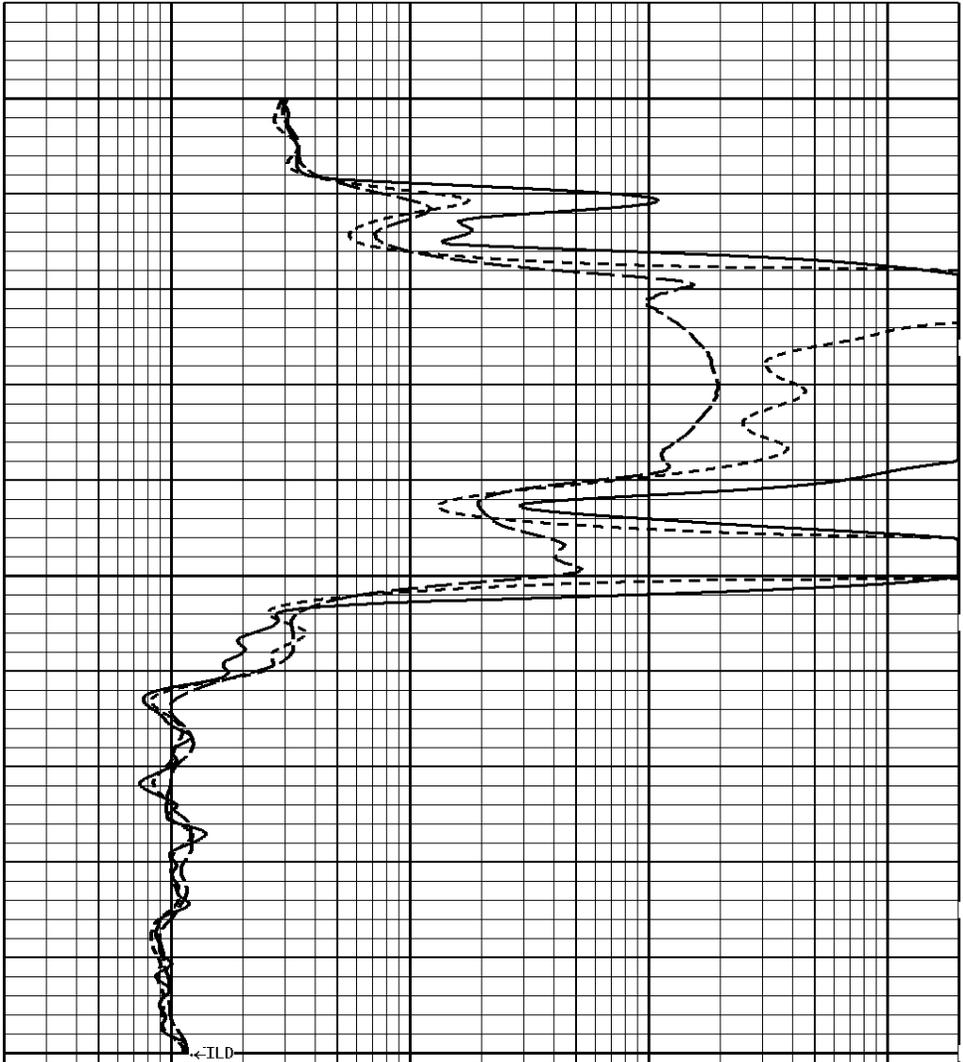
1:240 MAIN SECTION



File #1.2.8

1000

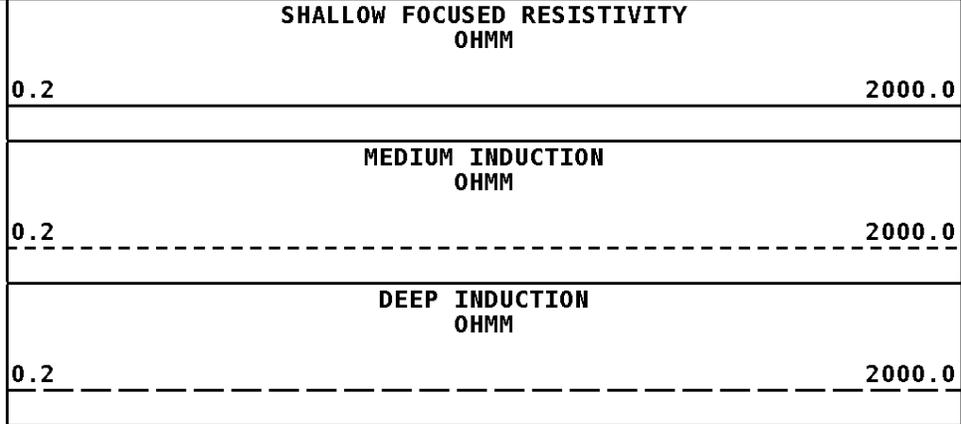
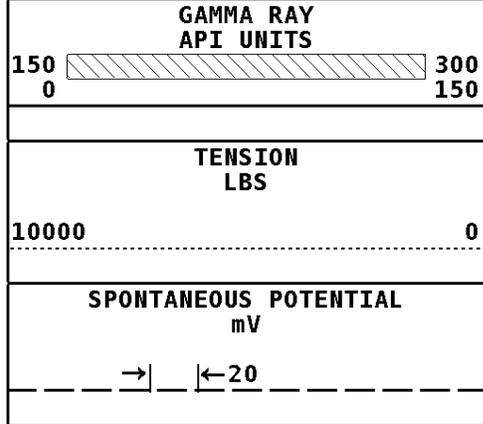
1100



ILD

File #1.2.8

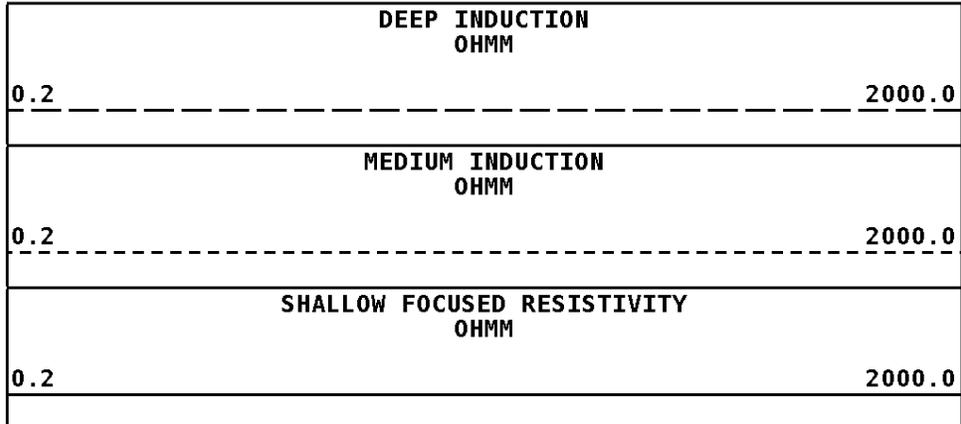
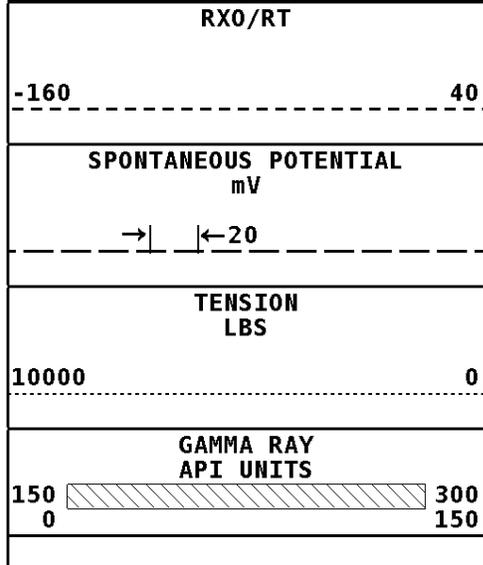
### 1:240 MAIN SECTION



#### \* Borehole Zone Factors \*

| Zone 1 99999.0 to 0.0 Feet     |             |
|--------------------------------|-------------|
| Drill Bit Size                 | 7.875 in    |
| Casing Diameter                | 5.500 in    |
| BHT Depth                      | 3550.000 ft |
| Borehole Temperature           | 95.0 degF   |
| Temperature Gradient           | 1.00 DFHF   |
| Resistivity Of Mud             | 1.500 ohmm  |
| Resistivity Of Mud Temperature | 62.00 degF  |

**Well File:** BEREXCO-HINES-26X NOV20-QST **Scale:** 1:240 **Format:** DIL-240  
**Segment:** V1.D2.S8 Reprocess MAIN **Acquired:** 2019-11/20 16:48 3.4.1-13972  
**Reference:** 0 **Processed:** 2019-11/20 18:43 3.4.1-13972

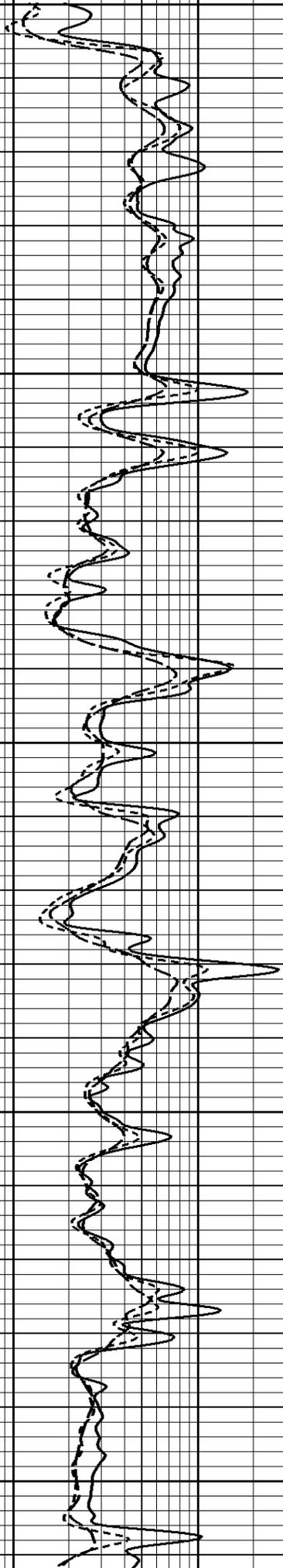
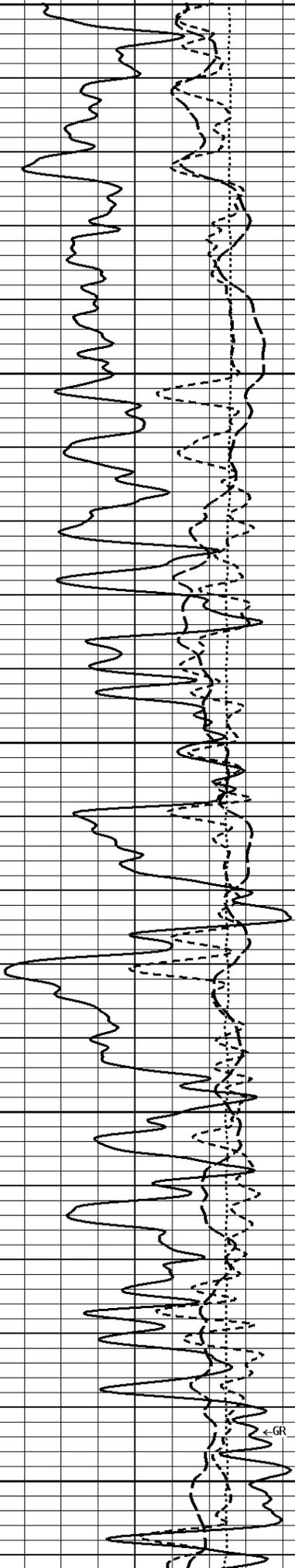


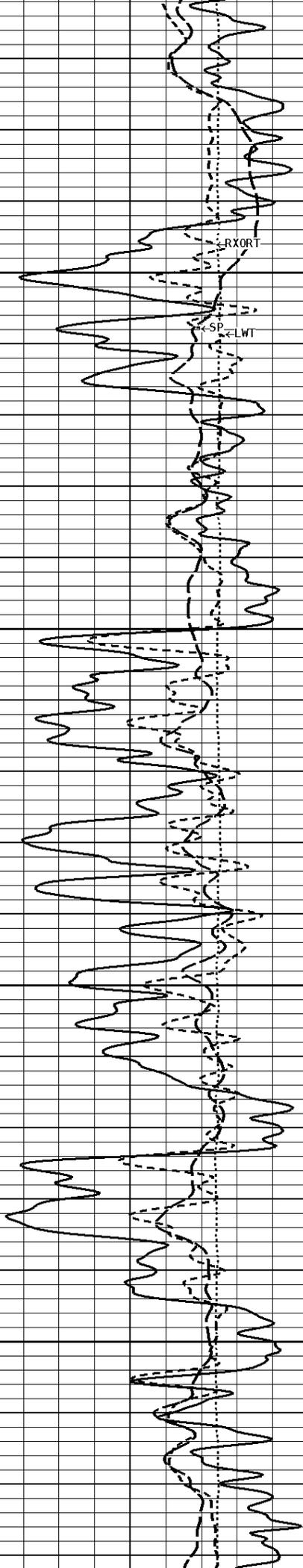
### 1:240 MAIN SECTION

2300

2400

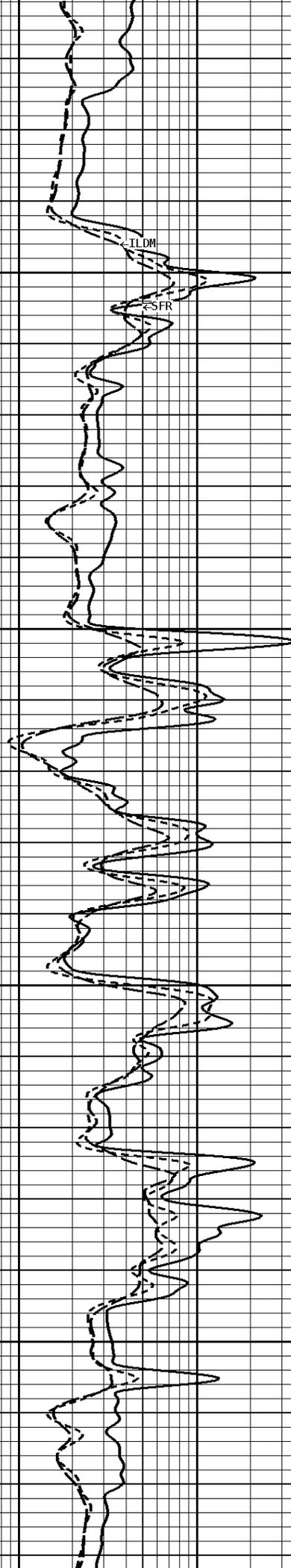
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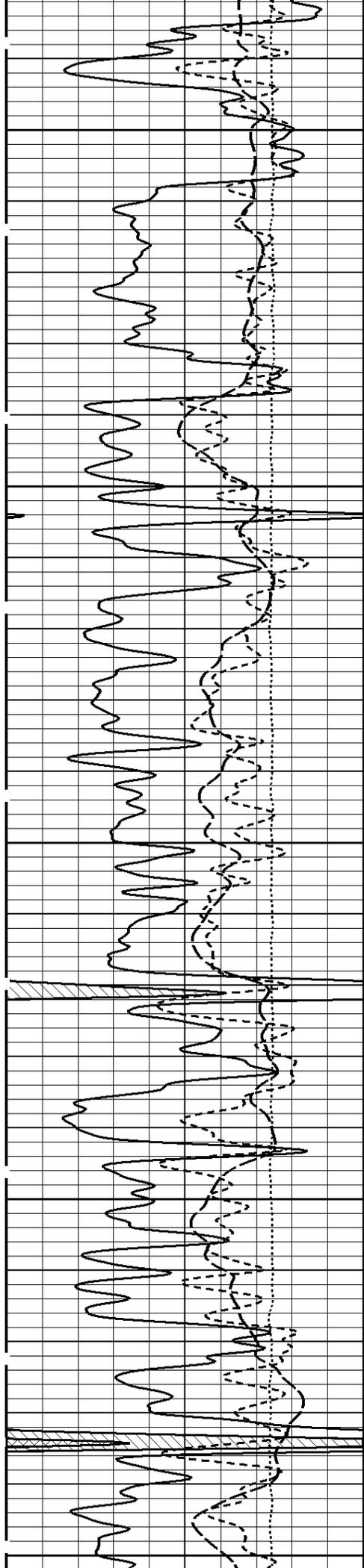




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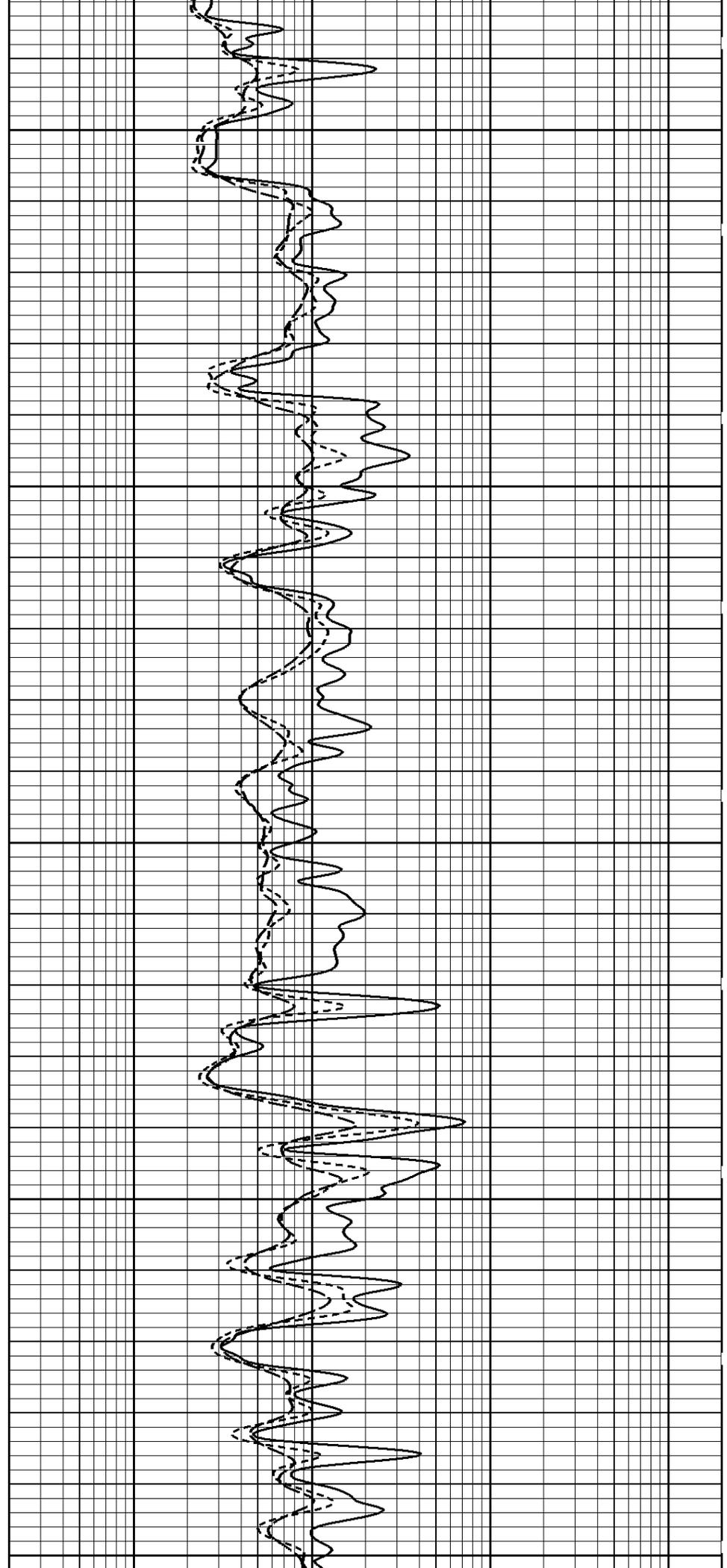
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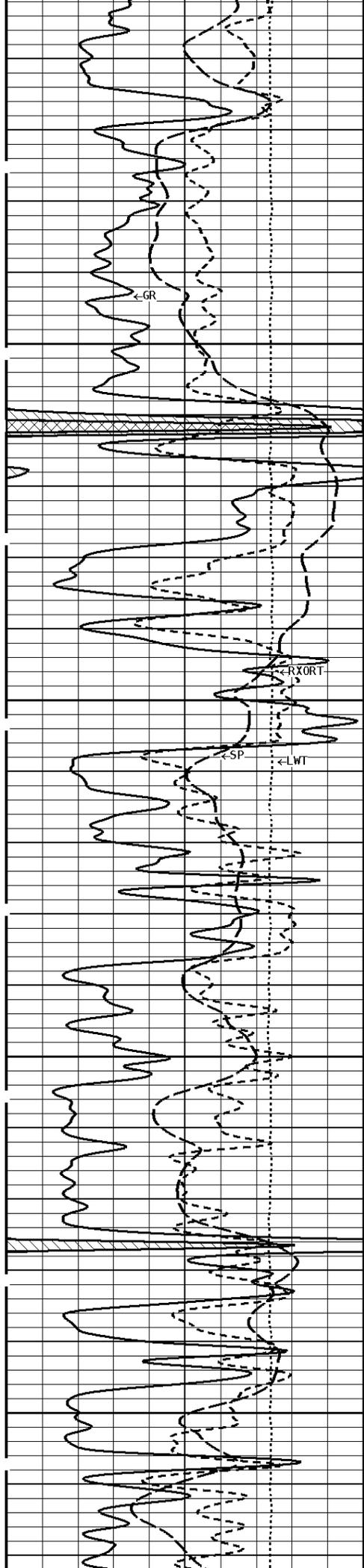




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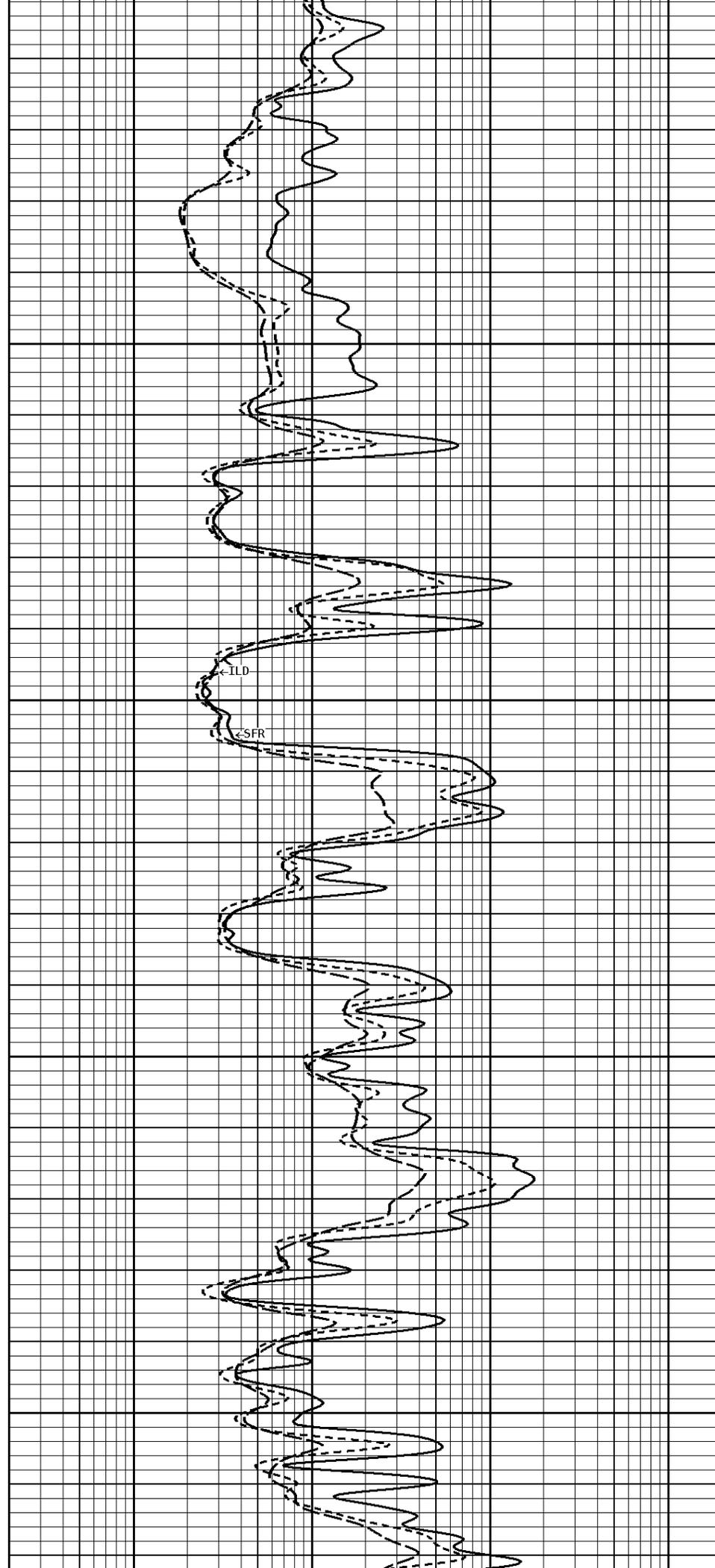
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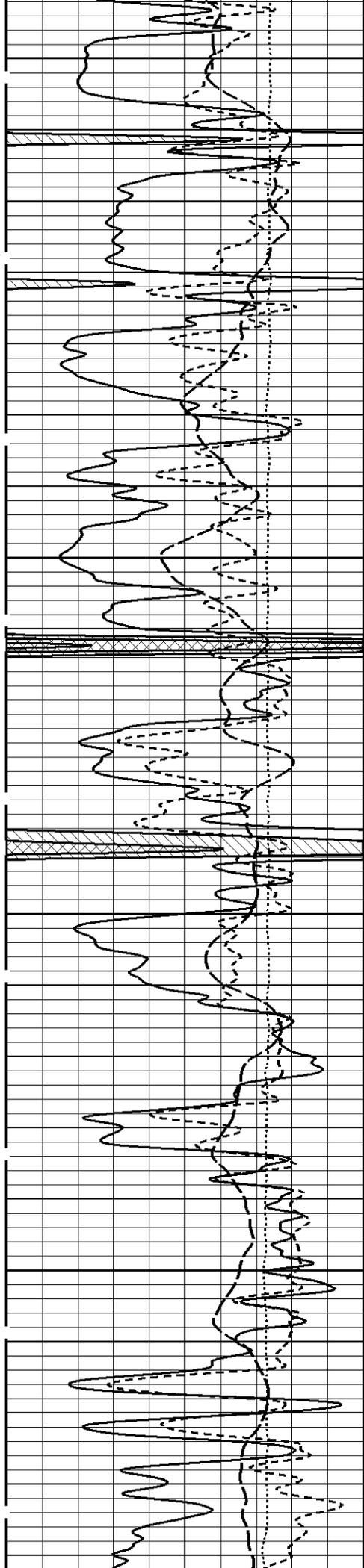




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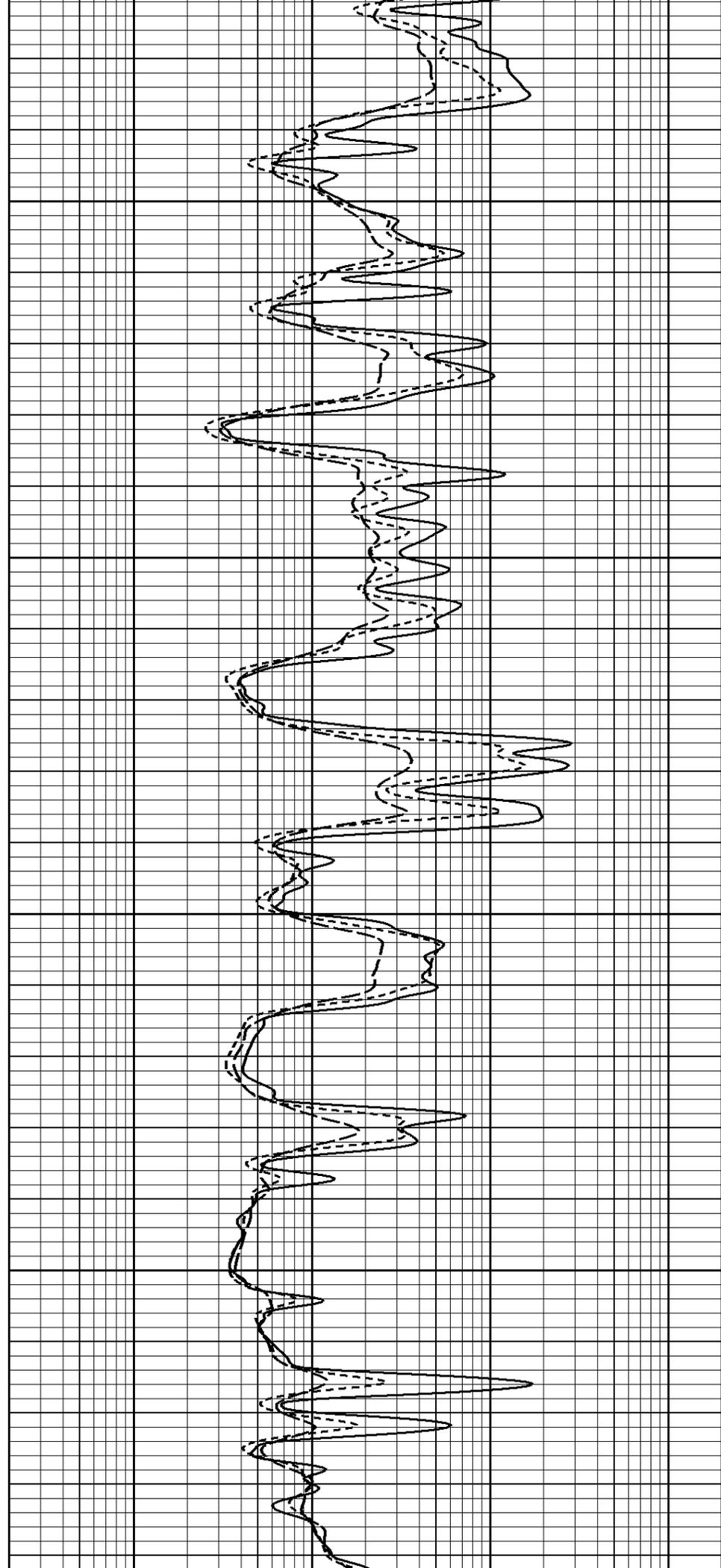
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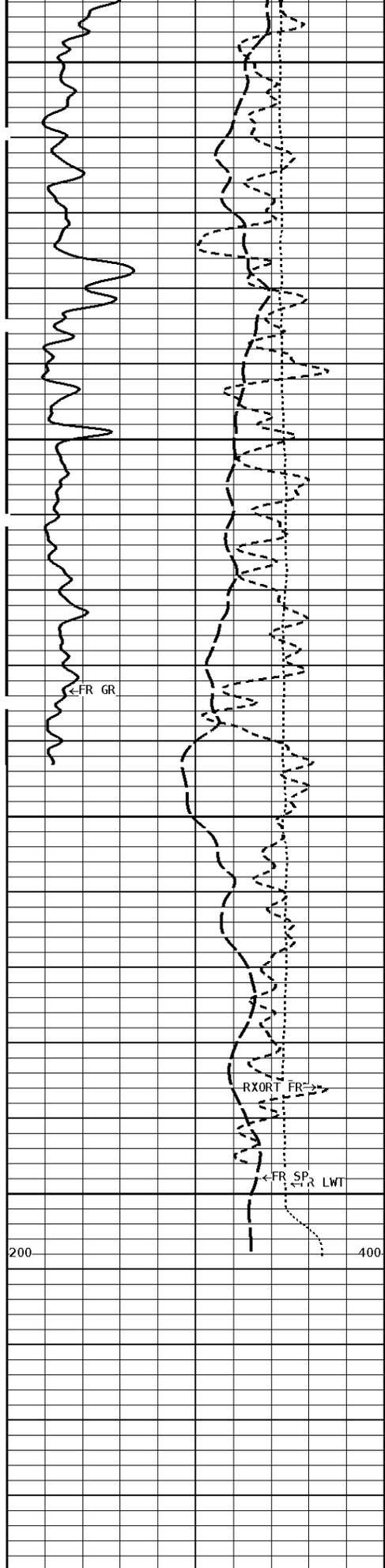




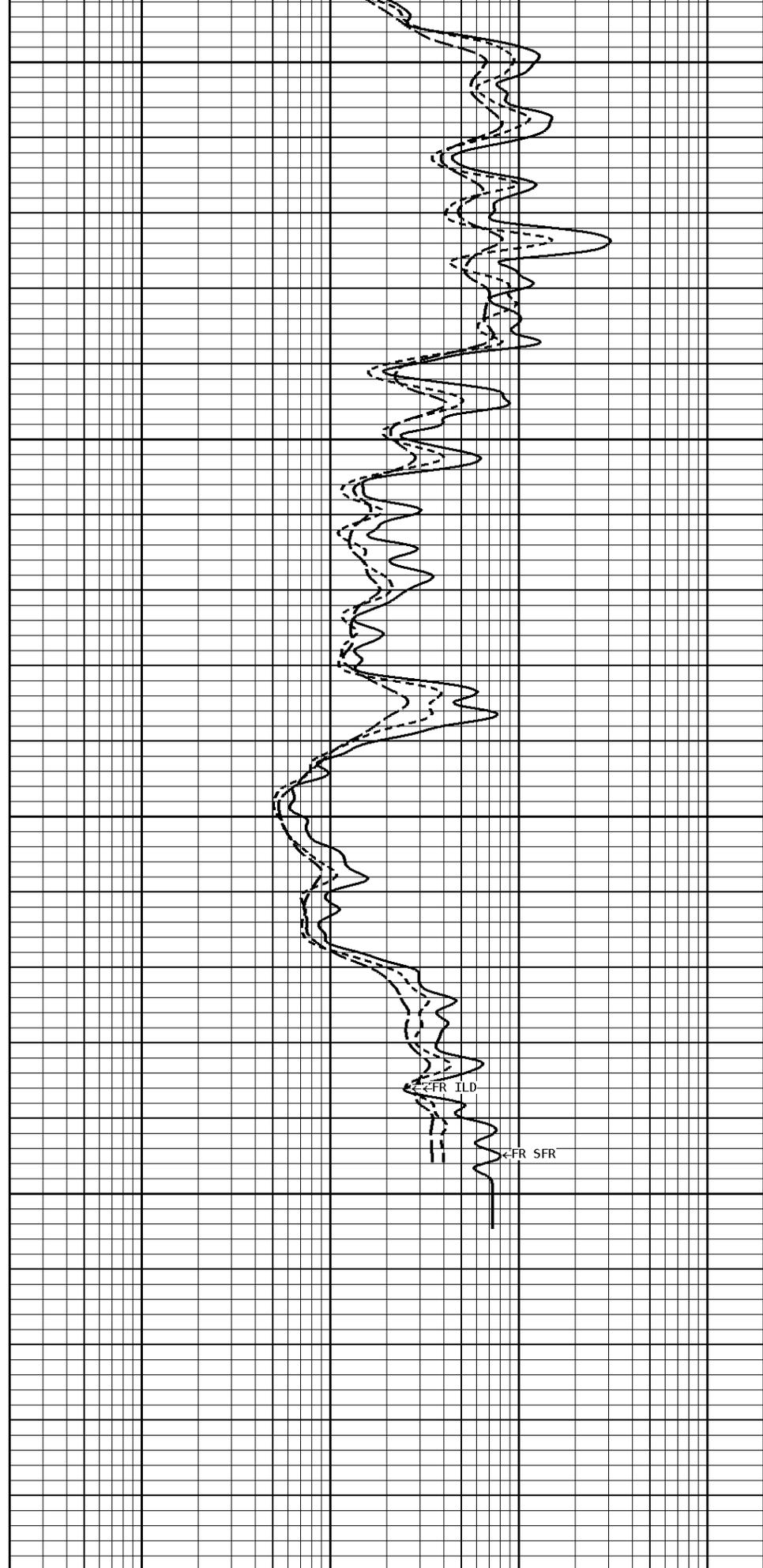
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3300

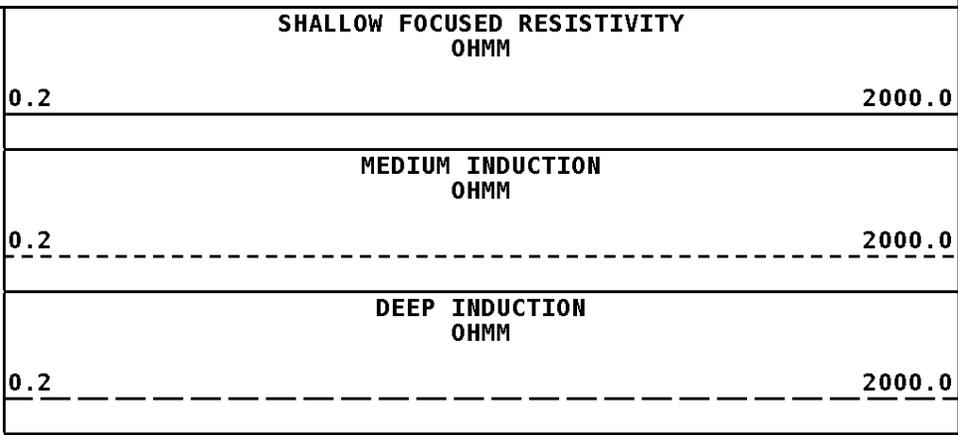
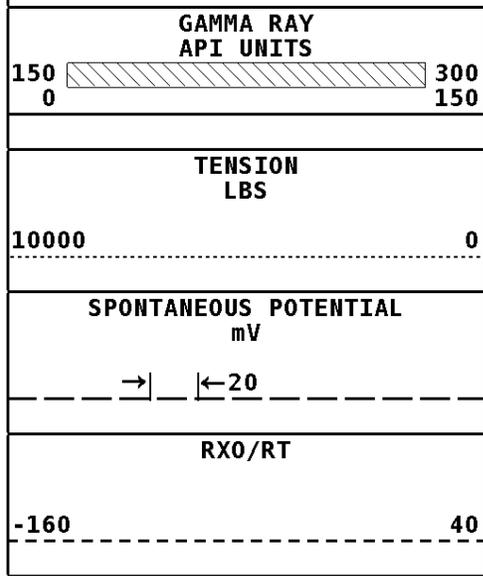




File #1.2.8



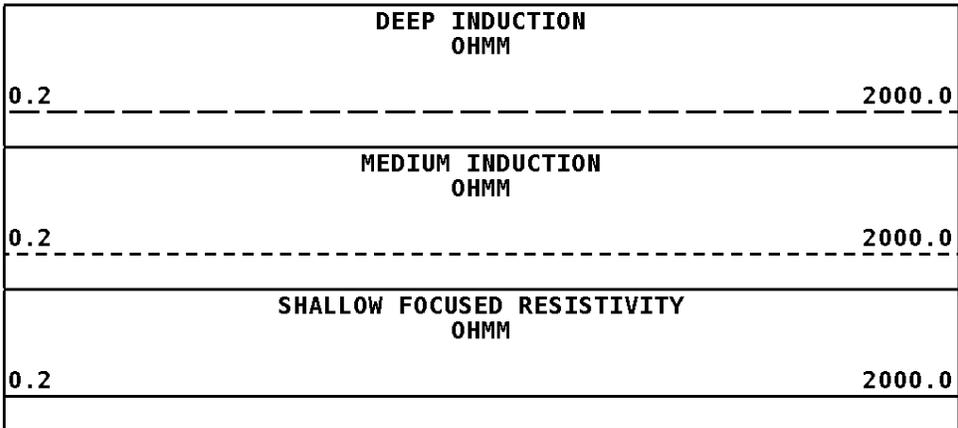
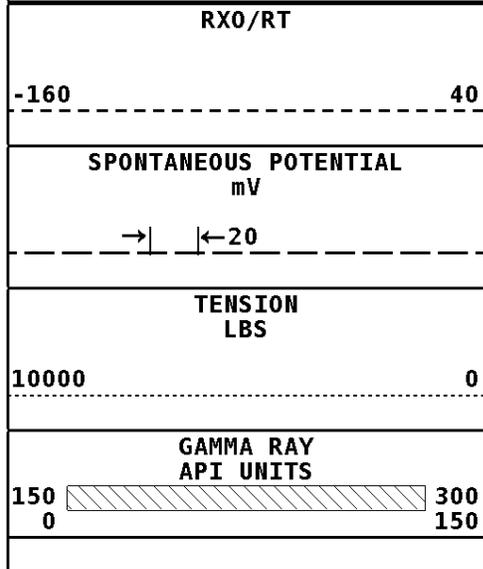
1:240 MAIN SECTION



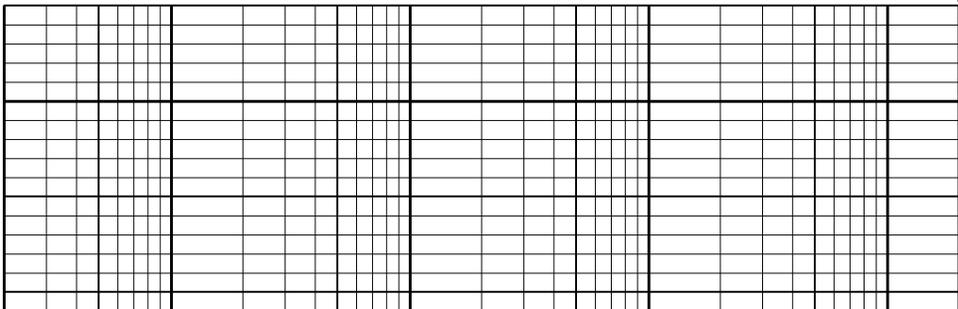
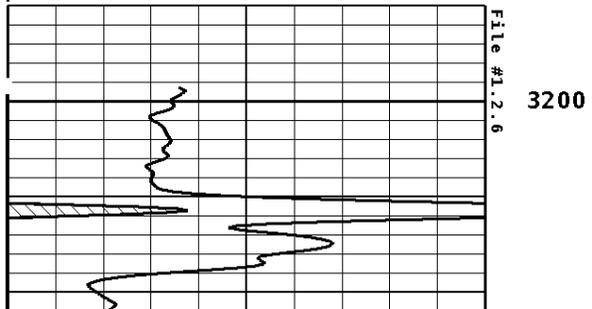
**\* Borehole Zone Factors \***

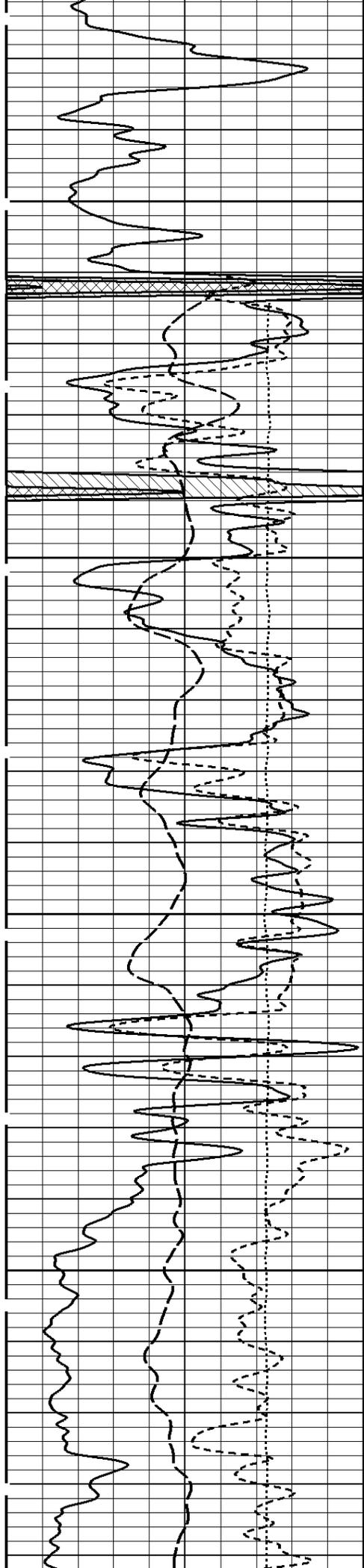
| Zone 1 99999.0 to 0.0 Feet     |             |
|--------------------------------|-------------|
| Drill Bit Size                 | 7.875 in    |
| Casing Diameter                | 5.500 in    |
| BHT Depth                      | 3550.000 ft |
| Borehole Temperature           | 95.0 degF   |
| Temperature Gradient           | 1.00 DFHF   |
| Resistivity Of Mud             | 1.500 ohmm  |
| Resistivity Of Mud Temperature | 62.00 degF  |

**Well File:** BEREXCO-HINES-26X\_NOV20-QST **Scale:** 1:240 **Format:** DIL-240  
**Segment:** V1.D2.S6 Reprocess REPEAT **Acquired:** 2019-11/20 16:30 3.4.1-13972  
**Reference:** 0 **Processed:** 2019-11/20 18:40 3.4.1-13972



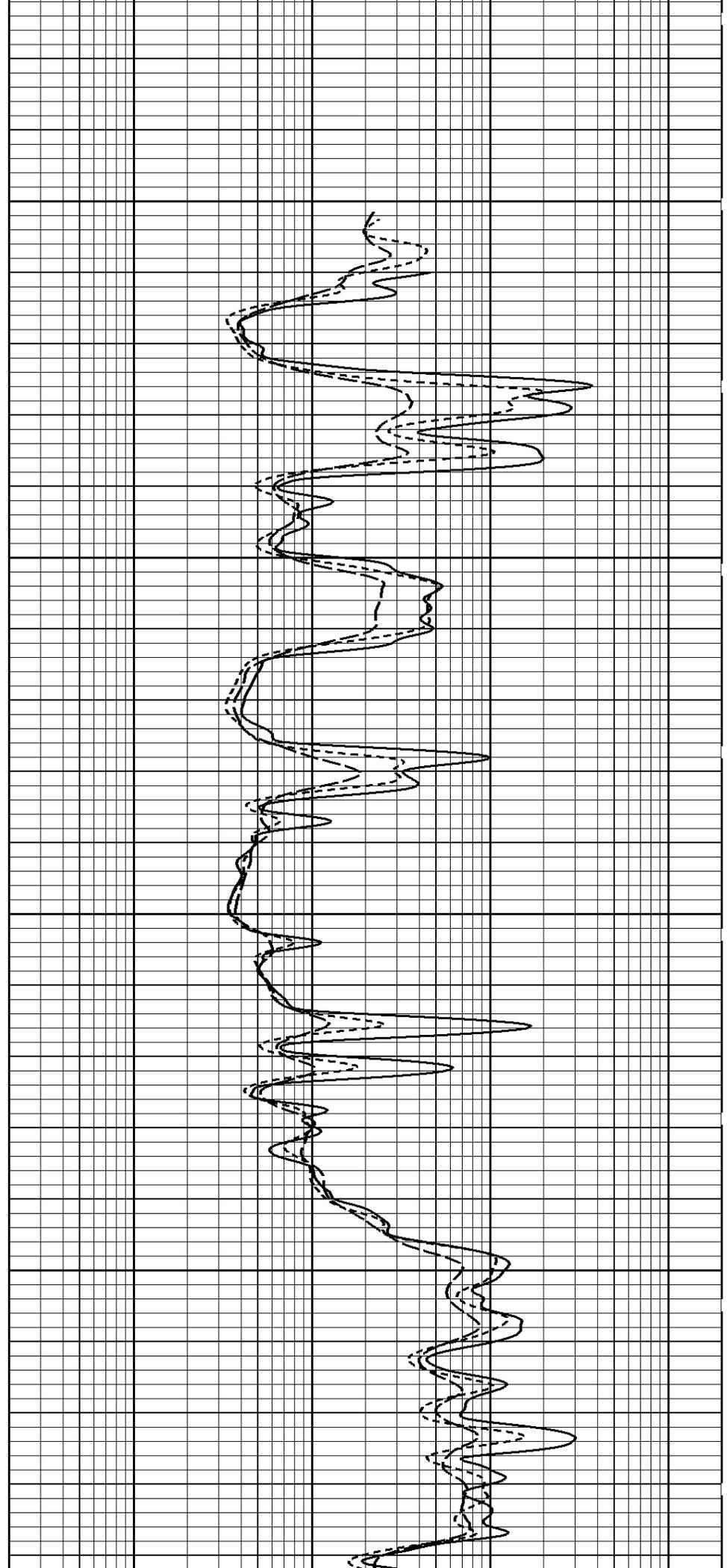
**1:240 REPEAT SECTION**

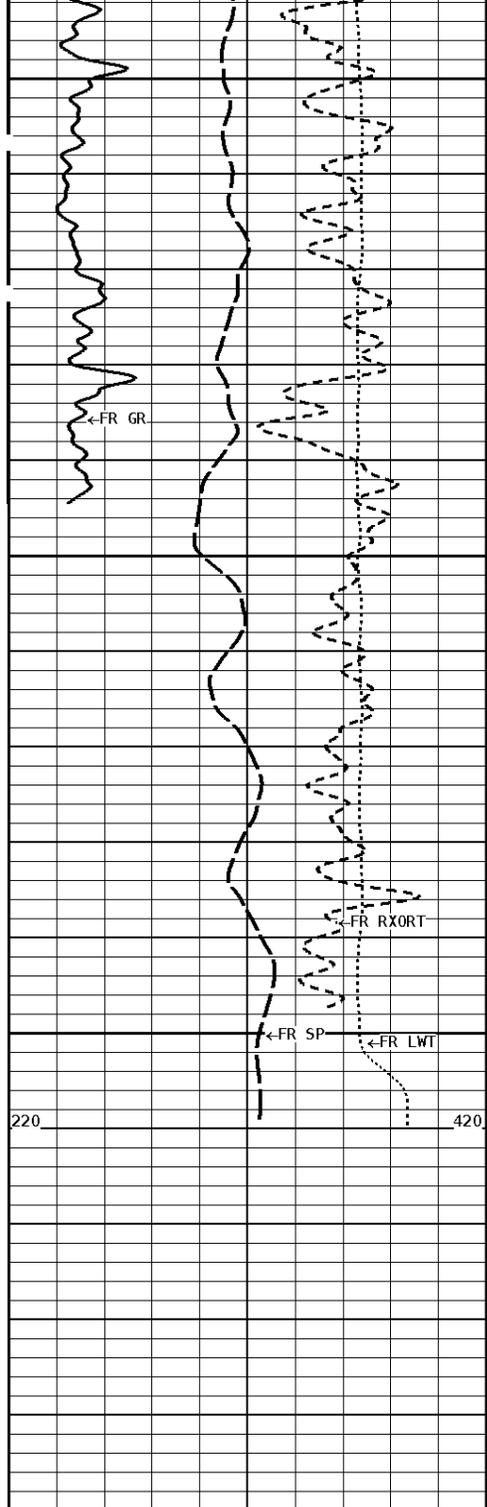




3300

3400

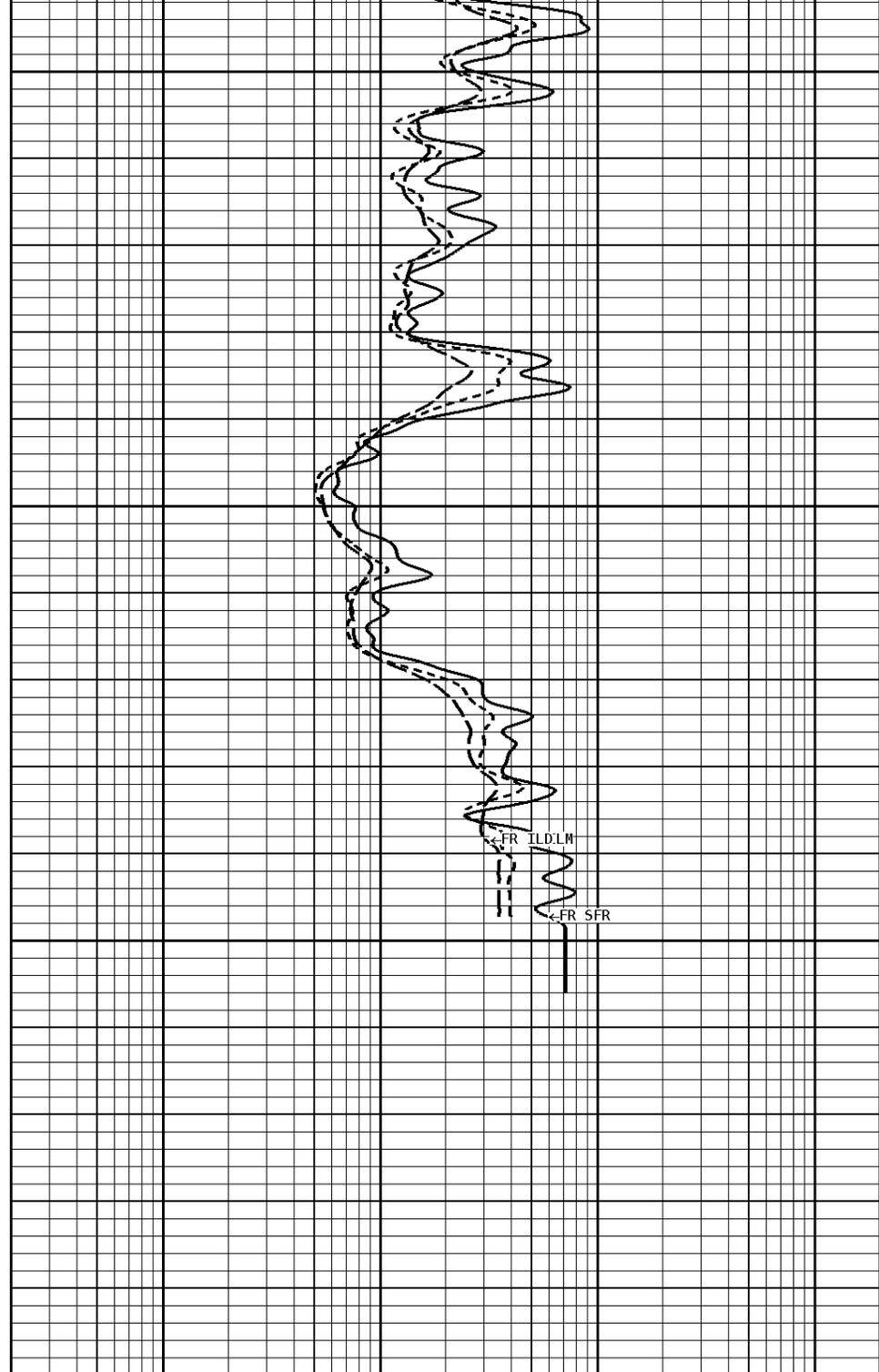




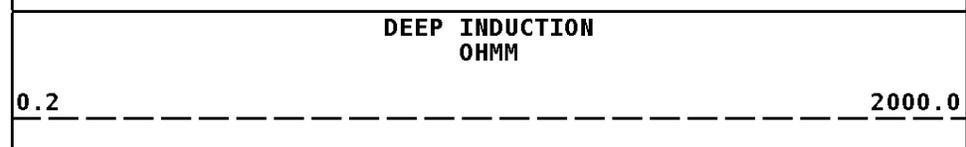
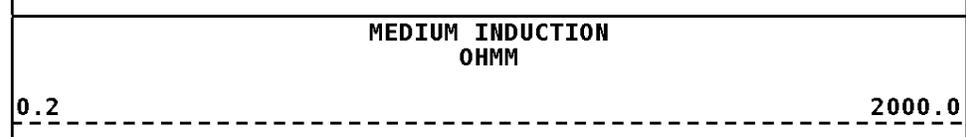
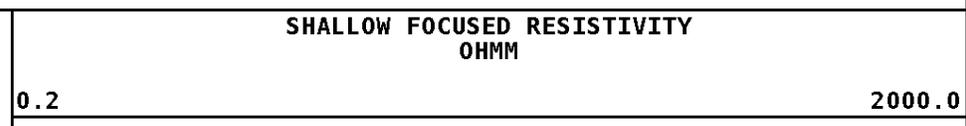
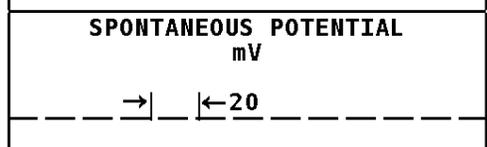
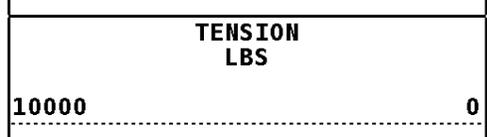
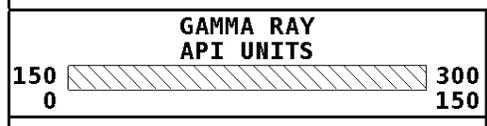
file #1.2.6

3500

3551



**1:240 REPEAT SECTION**



## \* Borehole Zone Factors \*

| Zone 1 99999.0 to 0.0 Feet     |  |             |
|--------------------------------|--|-------------|
| Drill Bit Size                 |  | 7.875 in    |
| Casing Diameter                |  | 5.500 in    |
| BHT Depth                      |  | 3550.000 ft |
| Borehole Temperature           |  | 95.0 degF   |
| Temperature Gradient           |  | 1.00 DFHF   |
| Resistivity Of Mud             |  | 1.500 ohmm  |
| Resistivity Of Mud Temperature |  | 62.00 degF  |

## \* Calibration Summary \*

| Shop Calibration        |            |           |                 |           |       |  |
|-------------------------|------------|-----------|-----------------|-----------|-------|--|
| GRT-B                   |            |           |                 |           |       |  |
| Performed : 24-JUN-2019 |            |           | Time : 12:20    |           |       |  |
| Sensor Suite : GR-GR5   |            |           | ID : GRT-BC-038 |           |       |  |
|                         | Measured   | Units     | Calibrated      | Units     |       |  |
| GR                      | Background | Jig       | Jig             | GRAPI     |       |  |
|                         | 36         | 266       | 160             |           |       |  |
| Shop Calibration        |            |           |                 |           |       |  |
| PIT-CA                  |            |           |                 |           |       |  |
| Performed : 10-MAY-2019 |            |           | Time : 11:27    |           |       |  |
| Sensor Suite : P-IND-T  |            |           | ID : PIT-AC-043 |           |       |  |
|                         | Measured   |           | Calibrated      |           | Units |  |
|                         | R          | X         | R               | X         |       |  |
| Air                     | 131492     | 129685    | 0.0             | 0.0       | MMHOS |  |
| Zero                    | 131066     | 131062    | -18.1           | 59.6      | MMHOS |  |
| Reference               | 244915     | 244454    | 4981.9          | 5059.6    | MMHOS |  |
| Loop                    | 130404     | 210498    | 3515.7          | 3611.2    | MMHOS |  |
| Sonde Error             |            |           | -0.5            | -1.7      | MMHOS |  |
| Cond                    |            |           | 4981.9          | 5059.6    | MMHOS |  |
|                         | Measured   |           | Calibrated      |           | Units |  |
|                         | R          | X         | R               | X         |       |  |
| Air                     | 131939     | 129230    | 0.0             | -0.0      | MMHOS |  |
| Zero                    | 131079     | 131067    | -15.6           | 35.3      | MMHOS |  |
| Reference               | 220620     | 224092    | 1984.4          | 2035.3    | MMHOS |  |
| Loop                    | 129308     | 206166    | 1595.4          | 1712.8    | MMHOS |  |
| Sonde Error             |            |           | -0.6            | -7.8      | MMHOS |  |
| Cond                    |            |           | 1984.4          | 2035.3    | MMHOS |  |
|                         | Measured   |           | Calibrated      |           | Units |  |
|                         | Low        | High      | Low             | High      |       |  |
|                         | 16980.0    | 56920.0   | 70.0            | 350.0     | DEGF  |  |
| Performed : 10-May-2019 |            |           | Time : 14:03    |           |       |  |
| Sensor Suite : SFL      |            |           | ID : PIT-AC-043 |           |       |  |
|                         | Measured   |           | Calibrated      |           | Units |  |
|                         | Zero       | Reference | Zero            | Reference |       |  |
| Im                      | 32732.6    | 48929.1   | 0.0             | 7028.0    | uA    |  |
| Ib                      | 32768.6    | 49680.1   | 0.0             | 1750.0    | mA    |  |
| MOM1                    | 32722.0    | 56290.6   | 0.0             | 175.0     | mV    |  |
| Equivalent SFL          |            |           |                 | 43.97     | OHMM  |  |
| Performed : 10-MAY-2019 |            |           | Time : 11:16    |           |       |  |
| Sensor Suite : P-SP     |            |           | ID : PIT-AC-043 |           |       |  |
|                         | Measured   |           | Calibrated      |           | Units |  |
|                         | Zero       | Reference | Zero            | Reference |       |  |
|                         | 32774.5    | 58935.9   | 0.0             | 1000.0    | mV    |  |

| TENSION<br>LBS |   |
|----------------|---|
| 10000          | 0 |

| DEEP INDUCTION<br>OHMM |       |
|------------------------|-------|
| 0.0                    | 500.0 |
| 0.0                    | 50.0  |

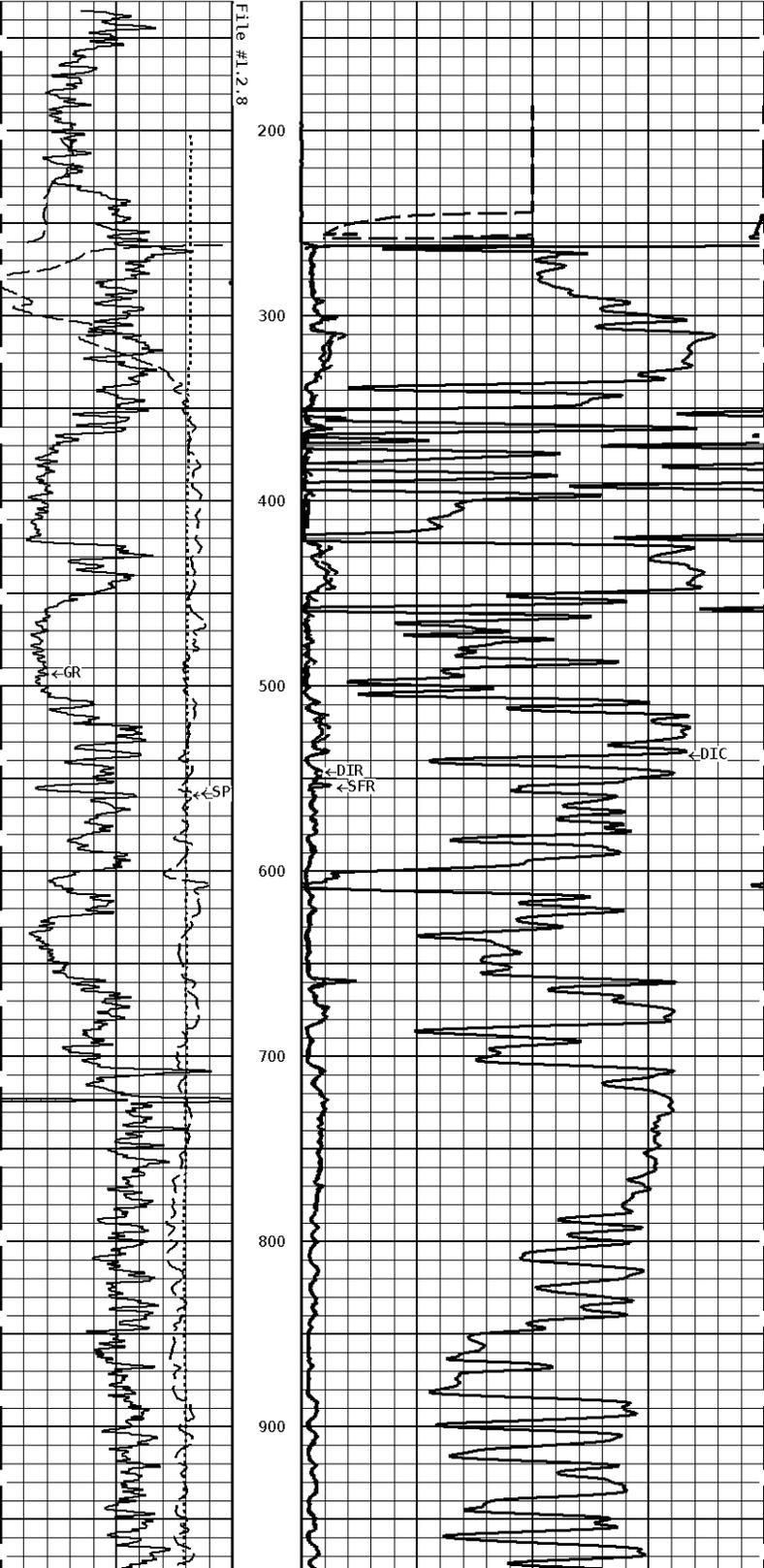
| SPONTANEOUS POTENTIAL<br>mV |      |
|-----------------------------|------|
| →                           | ← 20 |

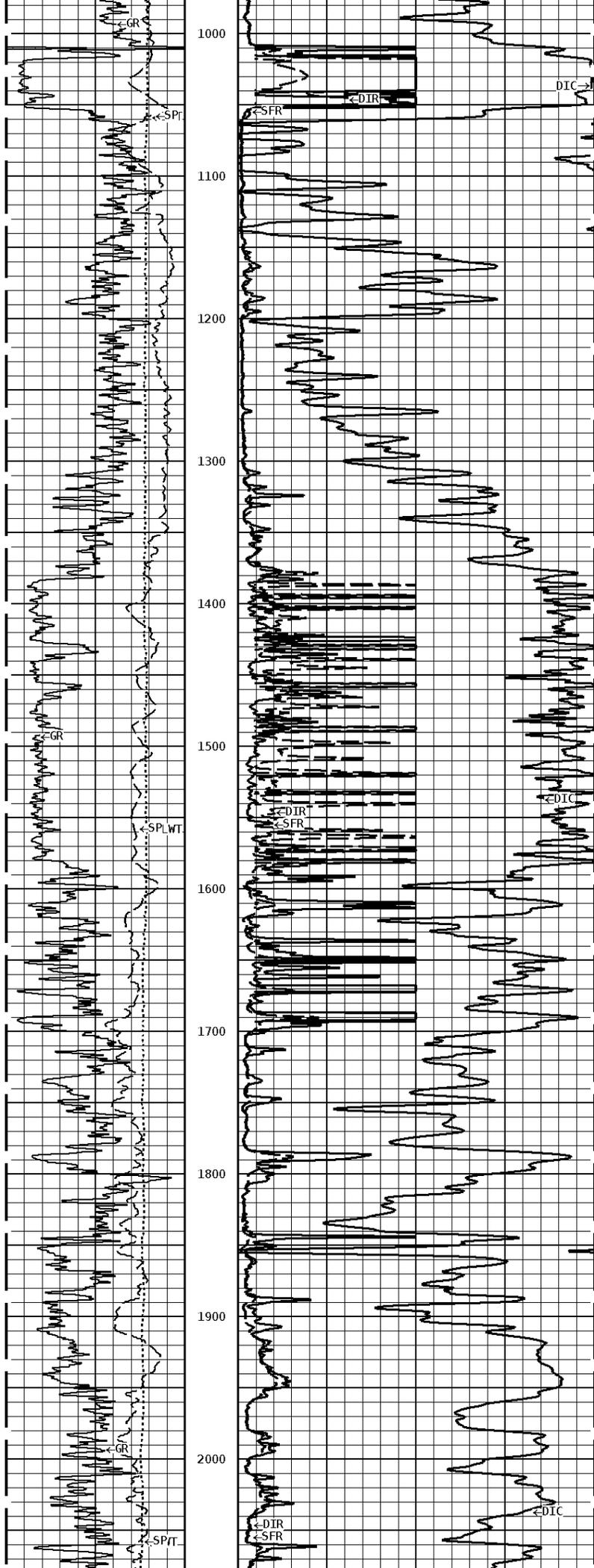
| SHALLOW FOCUSED<br>OHMM |       |
|-------------------------|-------|
| 0.0                     | 500.0 |
| 0.0                     | 50.0  |

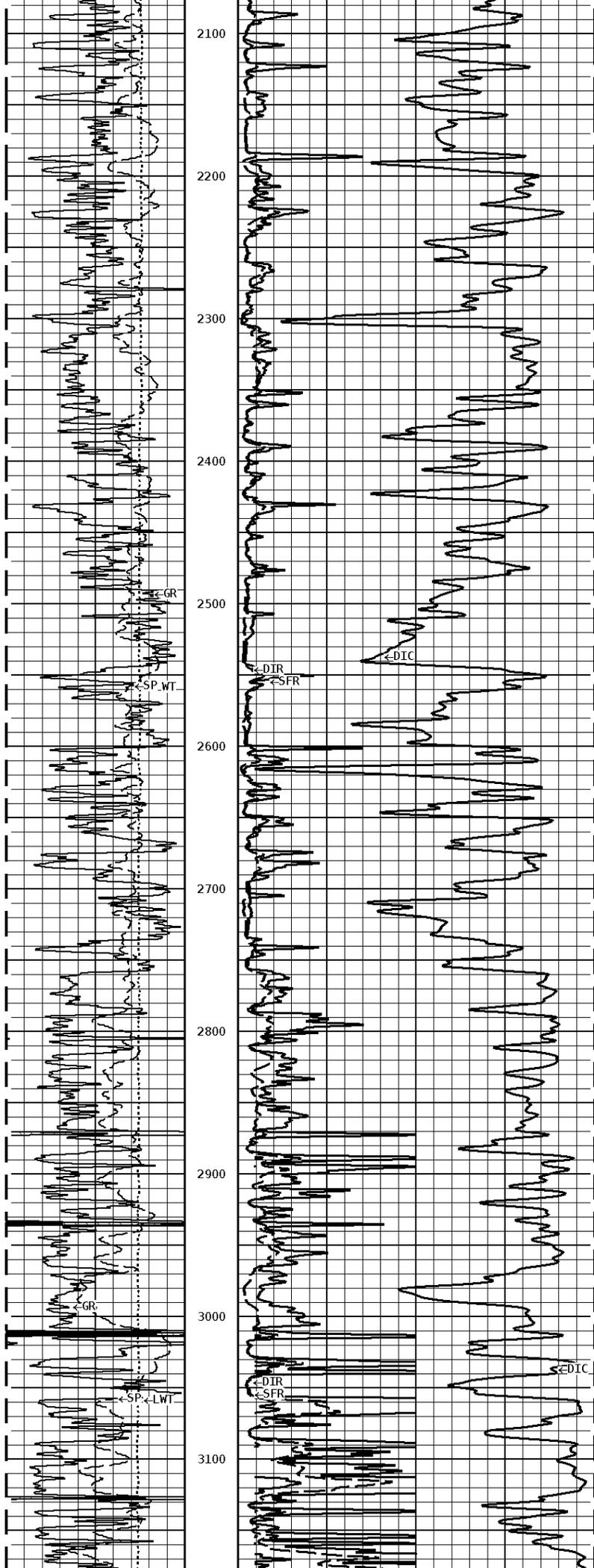
| GAMMA RAY<br>API UNITS |     |
|------------------------|-----|
| 150                    | 300 |
| 0                      | 150 |

| DEEP CONDUCTIVITY<br>MHMO |  |      |
|---------------------------|--|------|
| 2000                      |  | 1000 |
| 1000                      |  | 0    |

1:1200 MAIN SECTION







2100

2200

2300

2400

2500

2600

2700

2800

2900

3000

3100

GR

SP.WT.

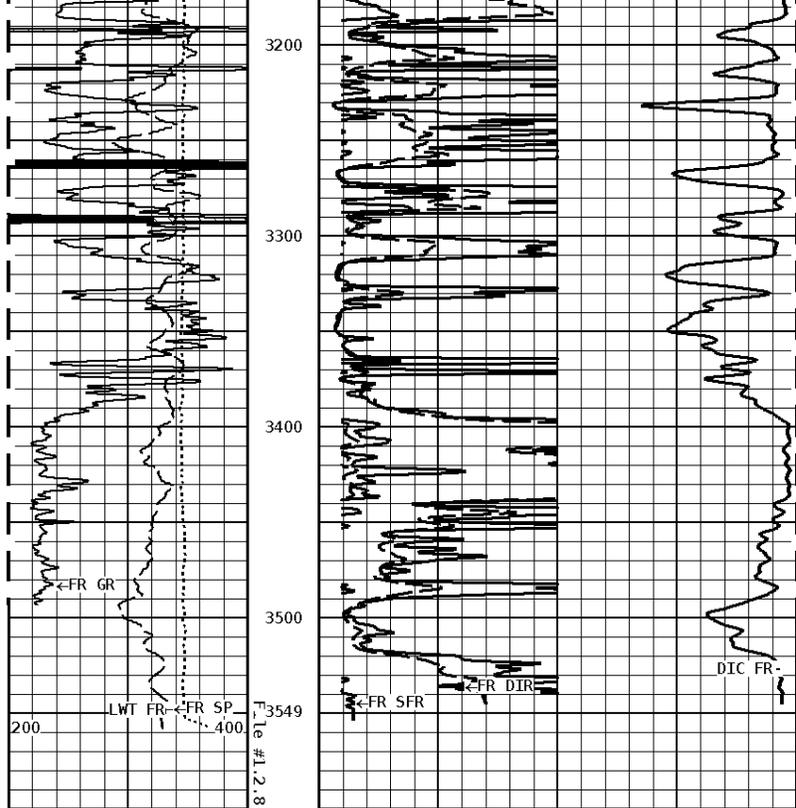
DIR

SFR

DIR

DIR

SFR



1:1200 MAIN SECTION

|   |  |
|---|--|
| <b>GAMMA RAY</b><br><b>API UNITS</b><br>150 0 300 150 | <b>DEEP CONDUCTIVITY</b><br><b>MHMO</b><br>2000 1000 1000 0    |
| <b>SPONTANEOUS POTENTIAL</b><br><b>mV</b><br>→   ← 20 | <b>SHALLOW FOCUSED</b><br><b>OHMM</b><br>0.0 500.0<br>0.0 50.0 |
| <b>TENSION</b><br><b>LBS</b><br>10000 0               | <b>DEEP INDUCTION</b><br><b>OHMM</b><br>0.0 500.0<br>0.0 50.0  |



Company: BEREXCO, LLC  
 Well: HINES UNIT #26X  
 Location: 200' FNL & 440' FWL  
 Logged: 11-20-2019  
 K.B. Elev: 1942.0 Ft