



DUAL INDUCTION LOG

Pioneer Energy Services

Company **AMERICAN WARRIOR, INC.**
 Well **LN #2-18**
 Field **DEWALD**
 County **NESS** State **KANSAS**

Company **AMERICAN WARRIOR, INC.**
 Well **LN #2-18**
 Field **DEWALD**
 County **NESS**
 State **KANSAS**

Location: **API #: 15-135-25968-00-00**
2140' FNL & 2305' FEL
SEC 18 TWP 19S RGE 21W
 Permanent Datum **GROUND LEVEL Elevation 2263'**
 Log Measured From **KELLY BUSHING**
 Drilling Measured From **KELLY BUSHING**
 Other Services **CNL/CDL**
 Elevation **K.B. 2271'**
D.F. N/A
G.L. 2263'

| | |
|------------------------|---------------|
| Date | 9/13/2017 |
| Run Number | ONE |
| Depth Driller | 4392' |
| Depth Logger | 4393' |
| Bottom Logged Interval | 4392' |
| Top Log Interval | 200' |
| Casing Driller | 8.625" @ 220' |
| Casing Logger | 219' |
| Bit Size | 7.875" |
| Type Fluid in Hole | CHEMICAL |
| Salinity, ppm CL | 6200 |
| Density / Viscosity | 9.4 56 |
| pH / Fluid Loss | 8.5 8.8 |
| Source of Sample | FLOWLINE |
| Rm @ Meas. Temp | 0.50 @ 80 |
| Rmt @ Meas. Temp | 0.38 @ 80 |
| Rmc @ Meas. Temp | 0.68 @ 80 |
| Source of Rmf / Rmc | CHARTS |
| Rm @ BHT | 0.33 @ 120 |
| Operating Rig Time | 2 1/2 HOURS |
| Max Rec. Temp. F | 120 |
| Equipment Number | 91 |
| Location | HAYS |
| Recorded By | D. SCHMIDT |
| Witnessed By | JASON ALM |

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and Pioneer Wireline Services, LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Pioneer Wireline Services, LLC will not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees.

Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

BAZINE,
 3 SOUTH ON AUSTIN RD, 1/2 EAST,
 SOUTH INTO



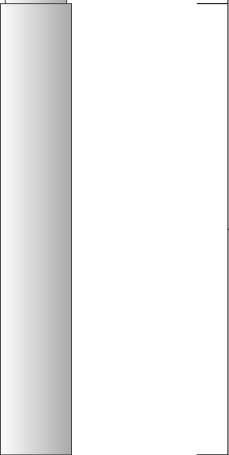

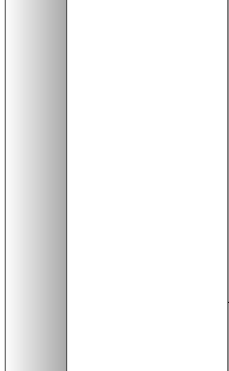
Log Measured From: **KELLY BUSHING** 8 Ft. Above Permanent Datum

THANK YOU FOR USING PIONEER ENERGY SERVICES
www.pioneerenergy.com 785-625-3858

| | |
|--|--|
| Your Pioneer Energy Services Crew Engineer: D. SCHMIDT Operator: Operator: Operator: | This Log Record Was Witnessed By Primary Witness: JASON ALM Secondary Witness: Secondary Witness: Secondary Witness: |
|--|--|

Top - Bottom

| | | | | | | | |
|------------------|-----------------|----------------|--------------|------------------|------------------|-----------------|-------------------|
| M | A | SZCOR | NPORSEL | FLUIDDEN g/cc | MATRXDEN g/cc | SPSHIFT mV | SNDERRM mmho/m |
| 2 | 1 | Off | Limestone | 1 | 2.71 | 243 | 0 |
| SNDERR mmho/m | SRFTEMP degF | CASETHCK in | CASEOD in | PERFS | TDEPTH ft | BOTTEMP degF | BOREID in |
| 0 | 80 | 0 | 5.5 | 0 | 4393 | 120 | 7.875 |

| Sensor | Offset (ft) | Schematic | Description | Length (ft) | O.D. (in) | Weight (lb) |
|--------------------|-------------------------|---|-------------------|-------------|-----------|-------------|
| GR | 33.00 |  | GR-M&W (89) | 3.00 | 3.50 | 50.00 |
| CNLSC CNSSC | 29.90 29.15 |  | CNT-M&W (207-MW) | 5.50 | 3.50 | 100.00 |
| LSD DCAL SSD | 20.85 20.83 20.35 |  | CDL-M&W (90-1031) | 8.50 | 4.00 | 250.00 |
| RLL3F RLL3 | 15.80 15.80 |  | | | | |
| CILD | 8.00 |  | DIL-M&W (PSI 91) | 18.50 | 3.50 | 220.00 |

CILM 4.70

SP 0.20

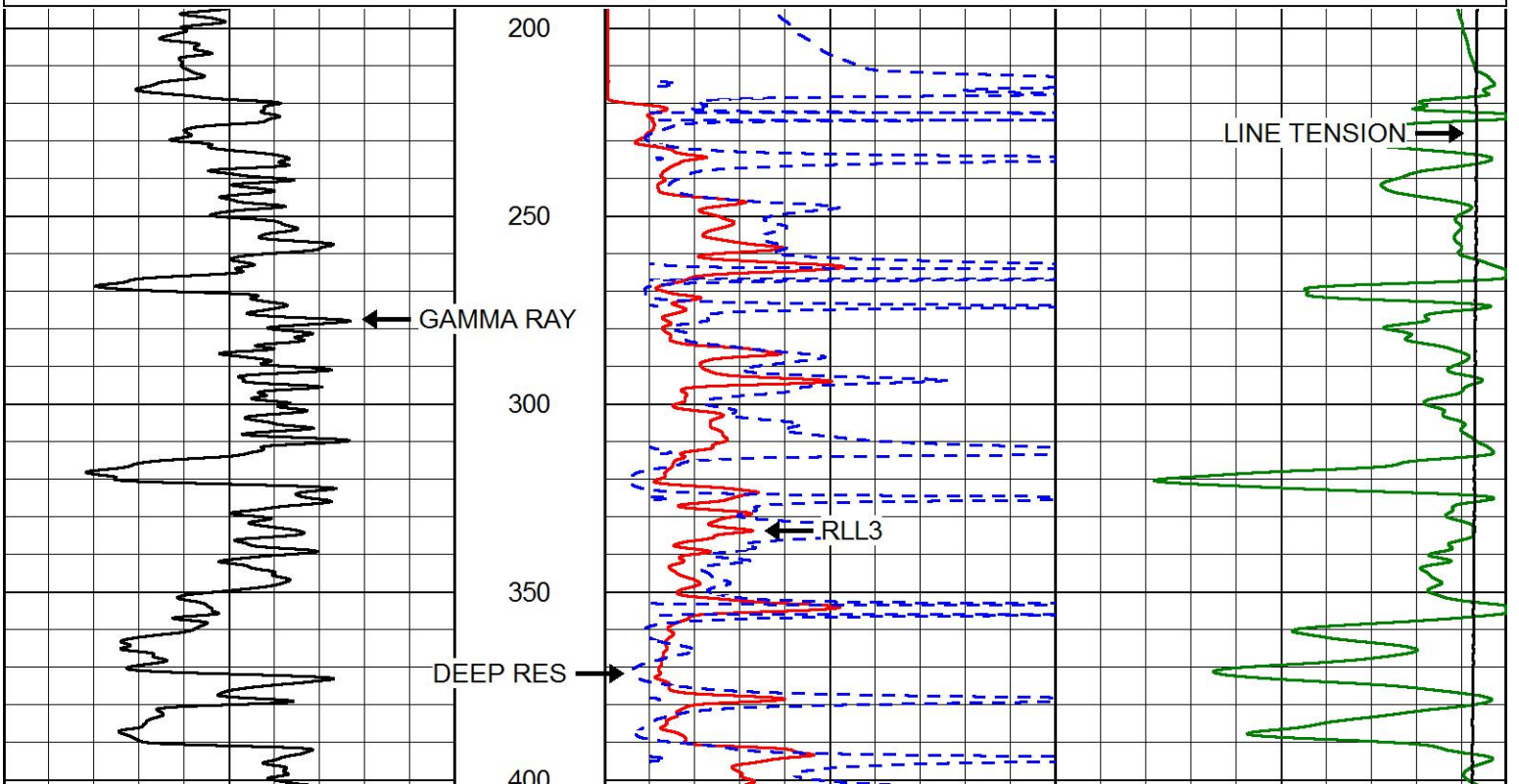
Dataset: american_warrior_In_2-18.db: field/well/STACK/pass2.2
 Total length: 35.50 ft
 Total weight: 620.00 lb
 O.D.: 4.00 in

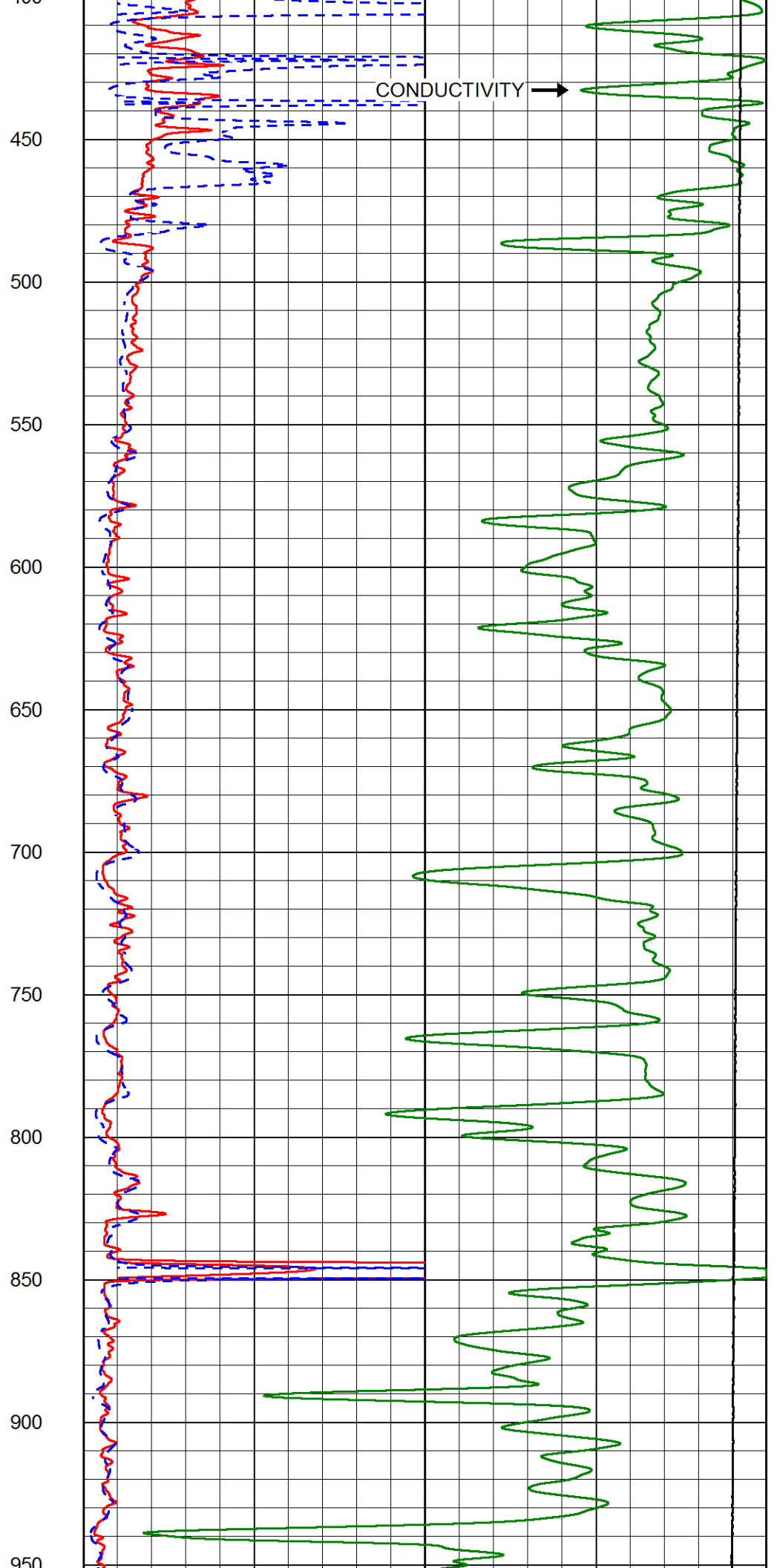
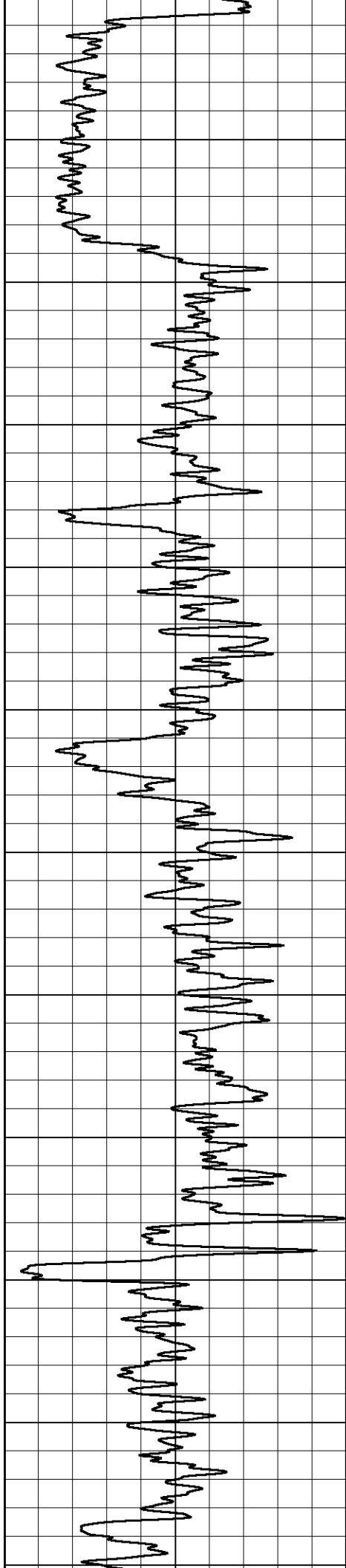


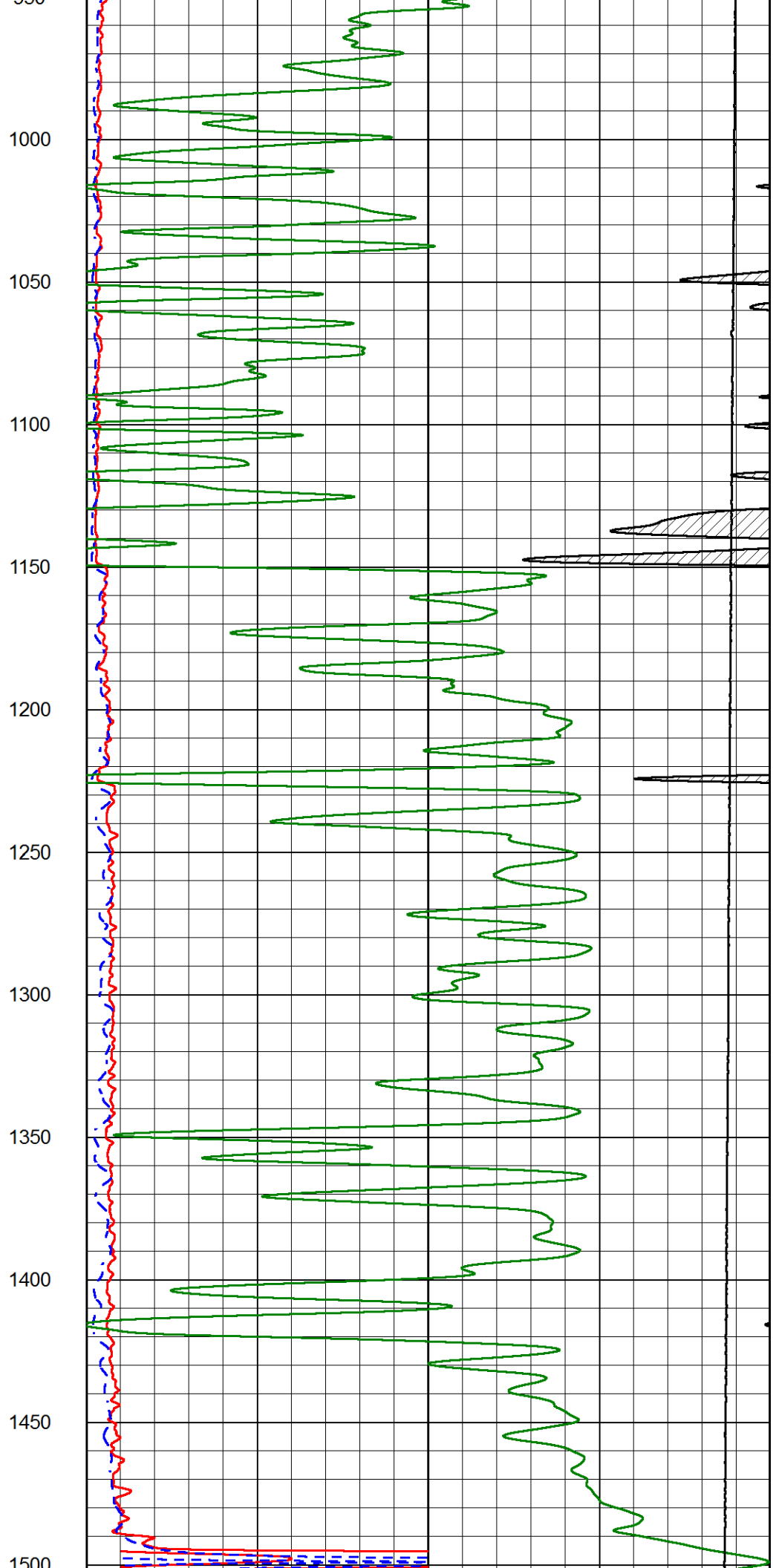
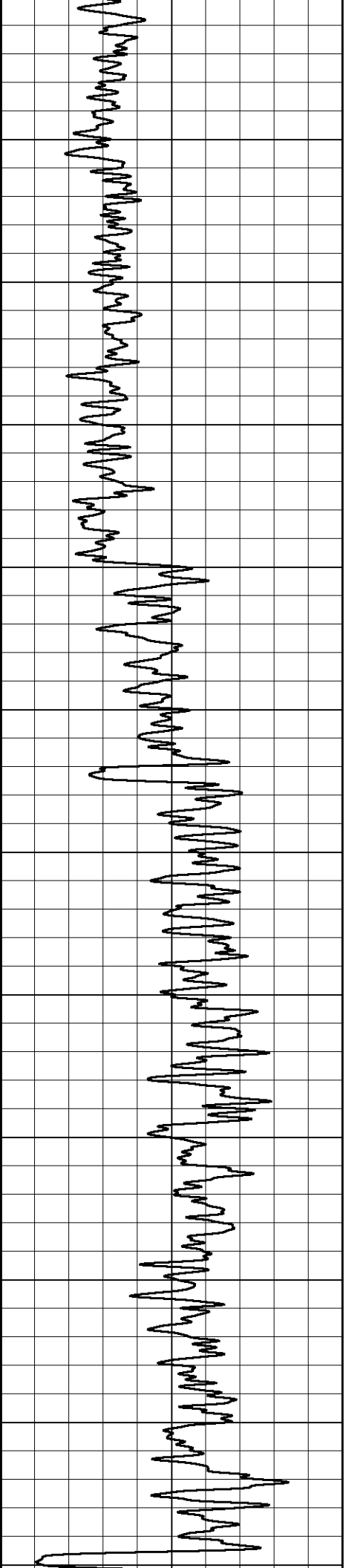
MAIN PASS

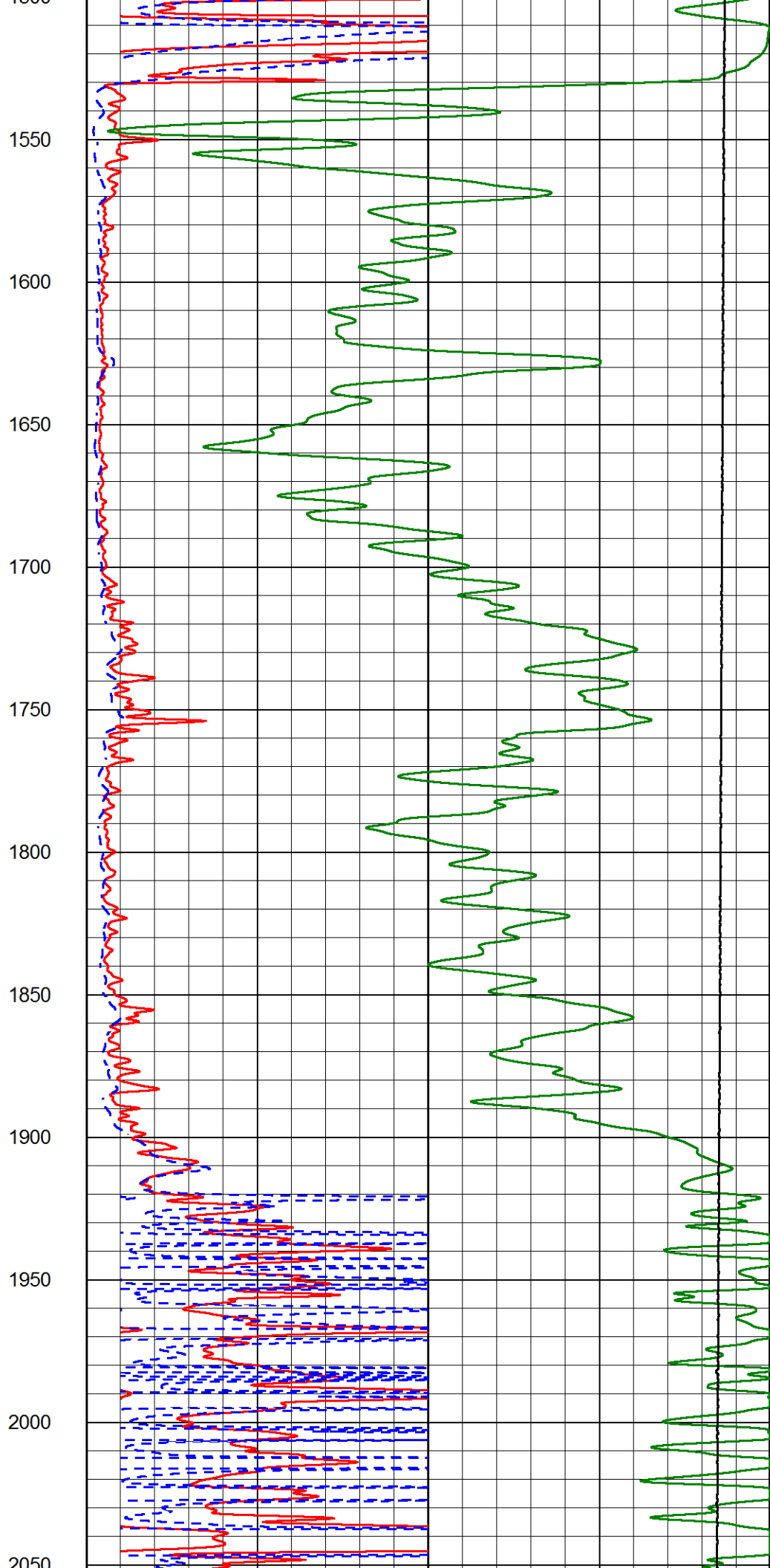
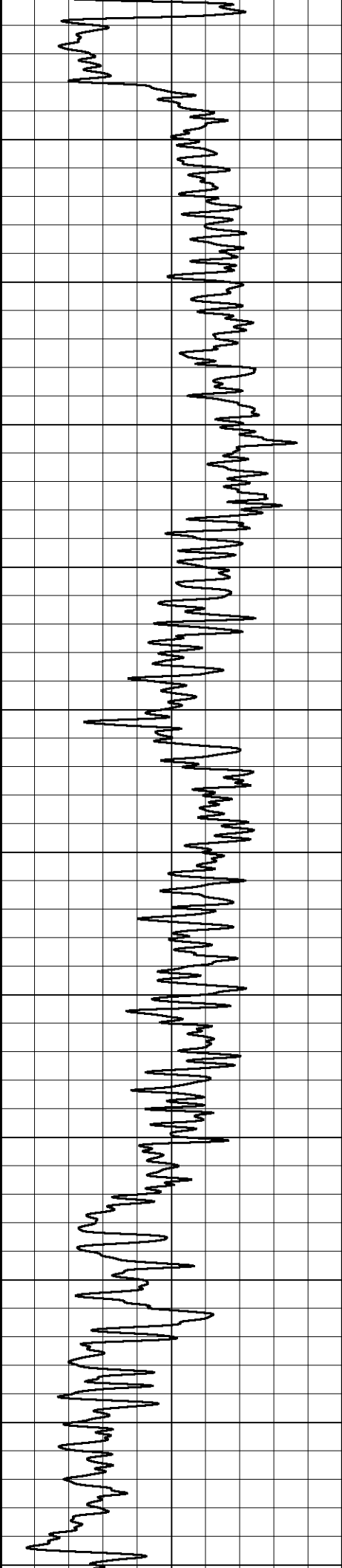
Database File: american_warrior_In_2-18.db
 Dataset Pathname: STACK/pass4.1
 Presentation Format: dil2in
 Dataset Creation: Wed Sep 13 08:45:22 2017
 Charted by: Depth in Feet scaled 1:600

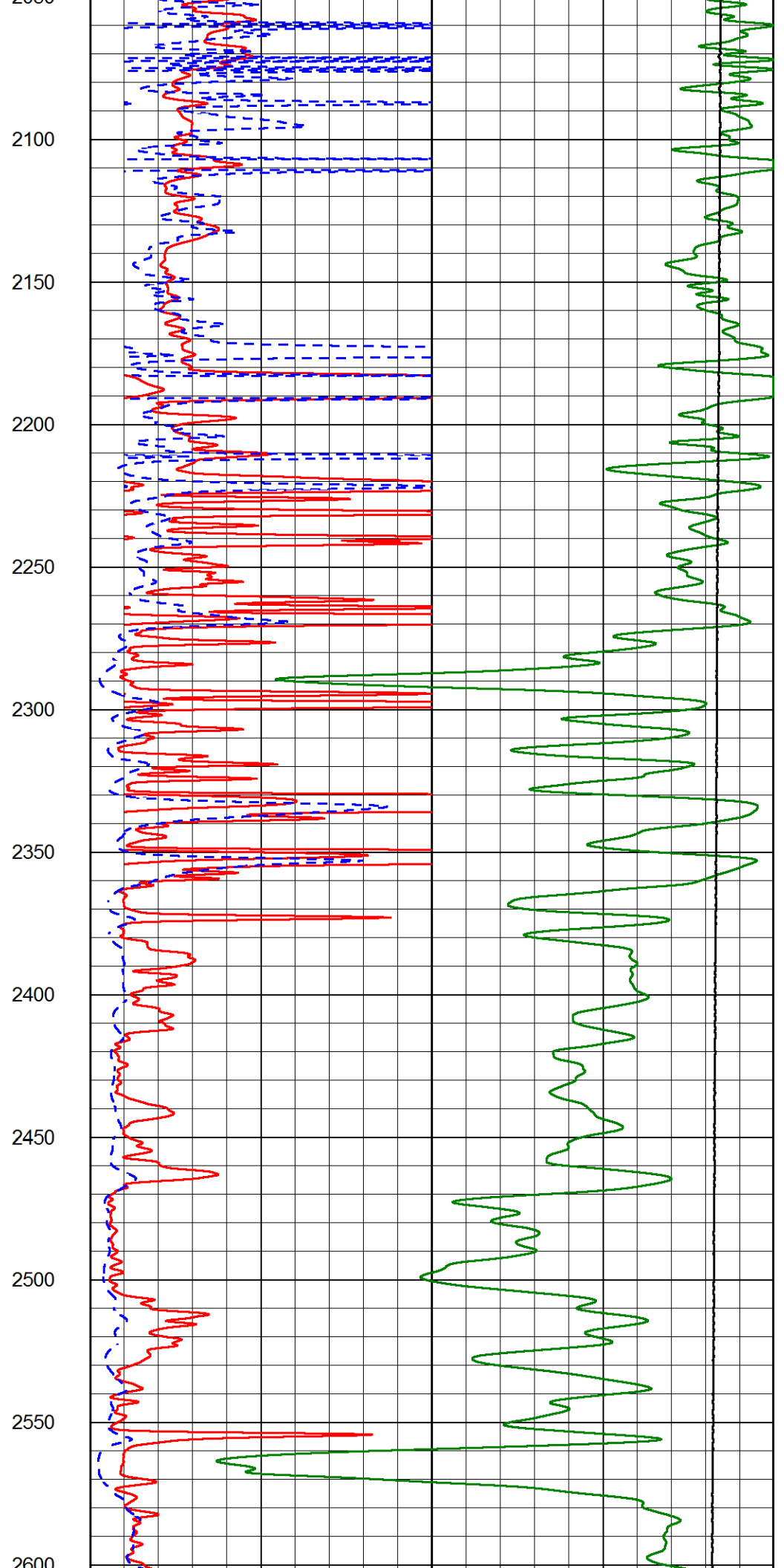
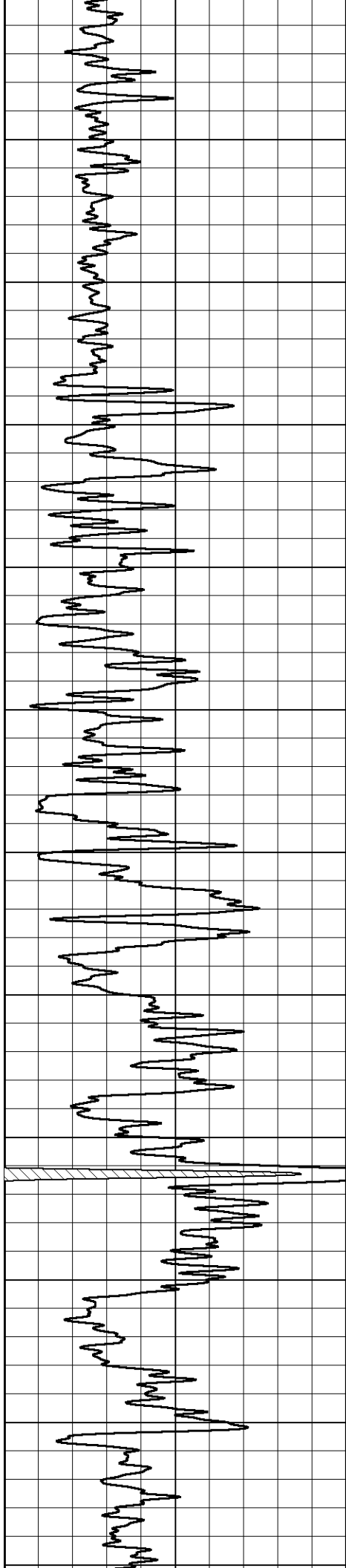
| | | | | | |
|---|------------------|-----|-------|--------------------------|-----|
| 0 | Gamma Ray (GAPI) | 150 | 1000 | Conductivity (mmho/m) | 0 |
| | | | 15000 | Line Tension (lb) | 0 |
| | | | 0 | RLL3 (Ohm-m) | 50 |
| | | | 0 | Deep Resistivity (Ohm-m) | 50 |
| | | | 50 | RLL3 (Ohm-m) | 500 |
| | | | 50 | Deep Resistivity (Ohm-m) | 500 |

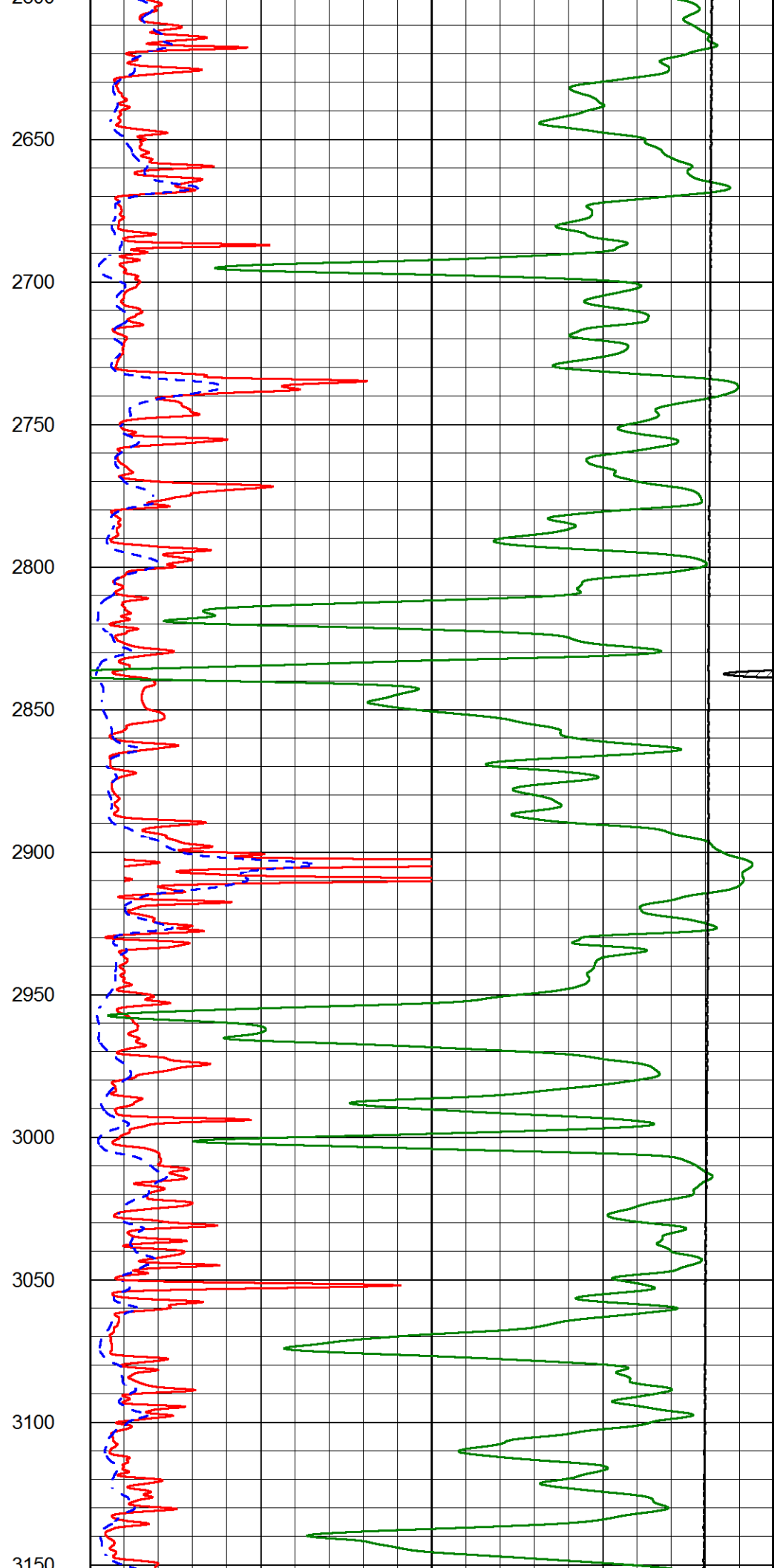
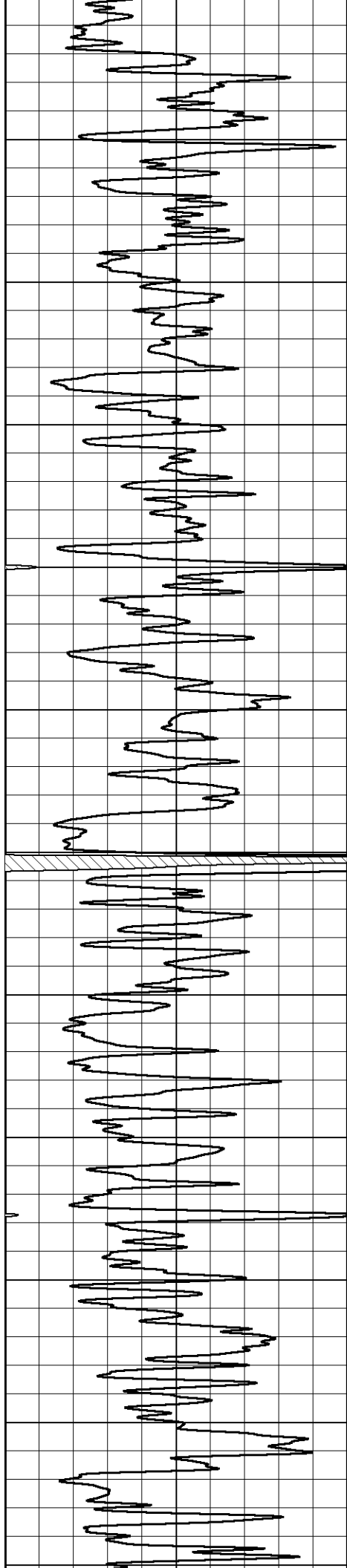


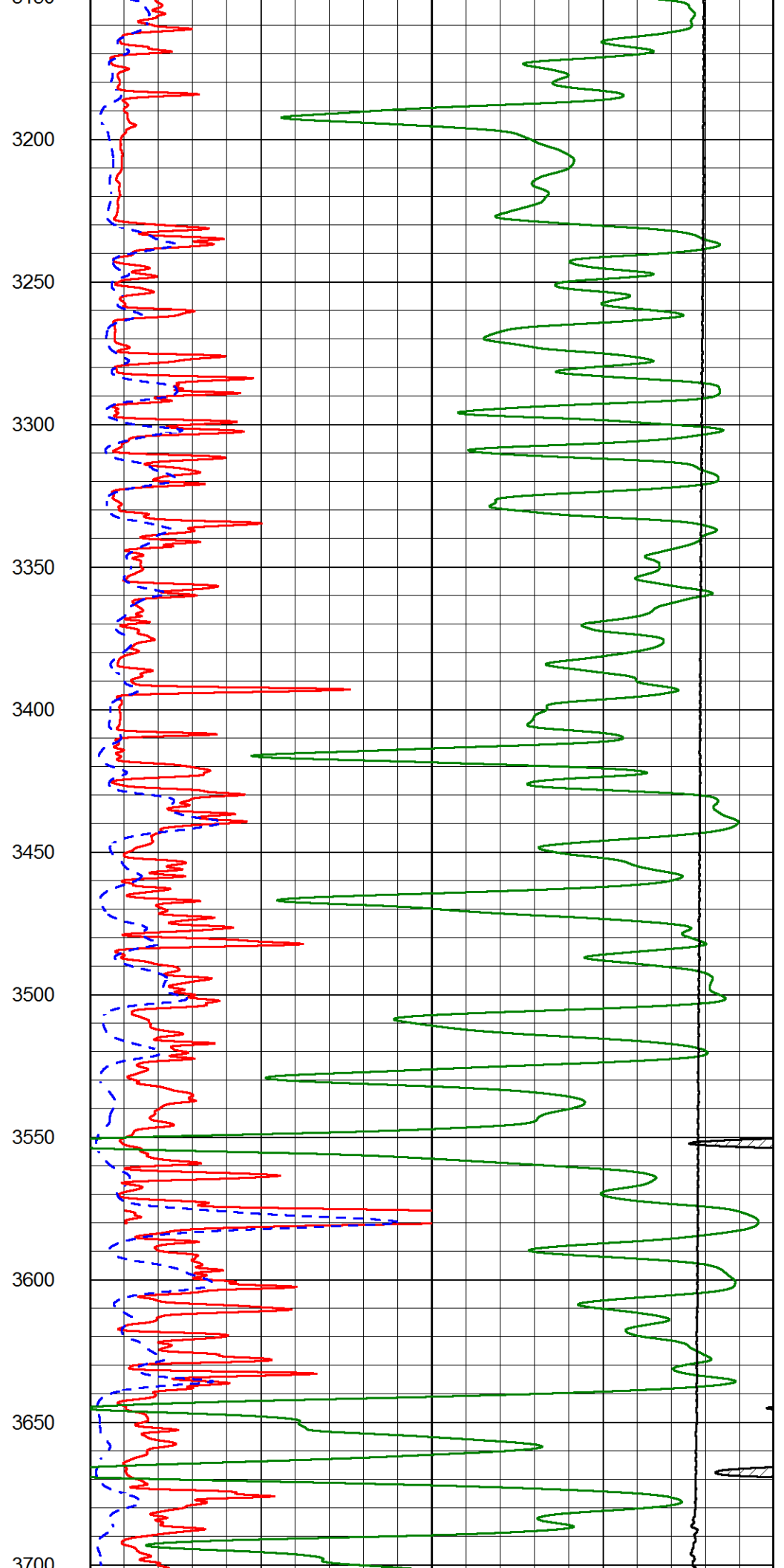
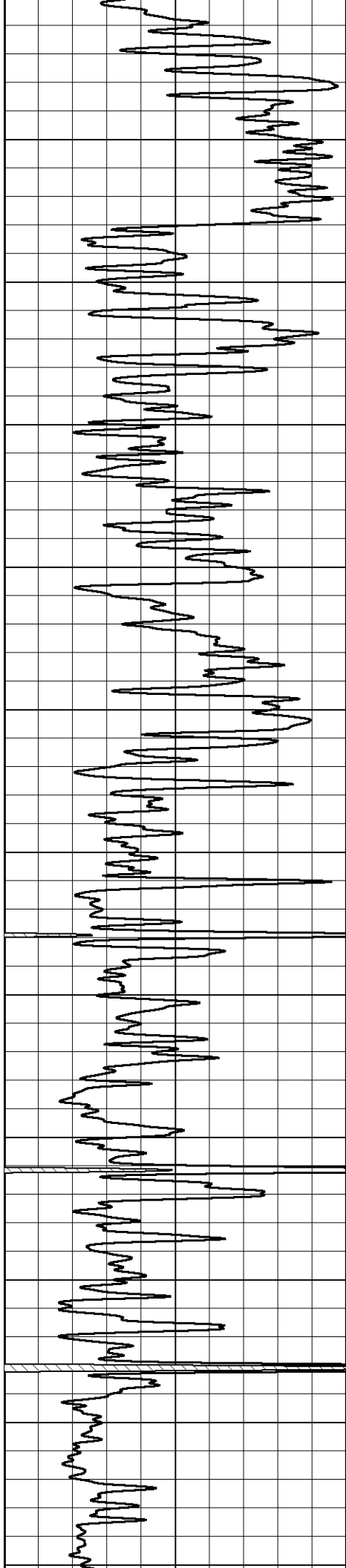


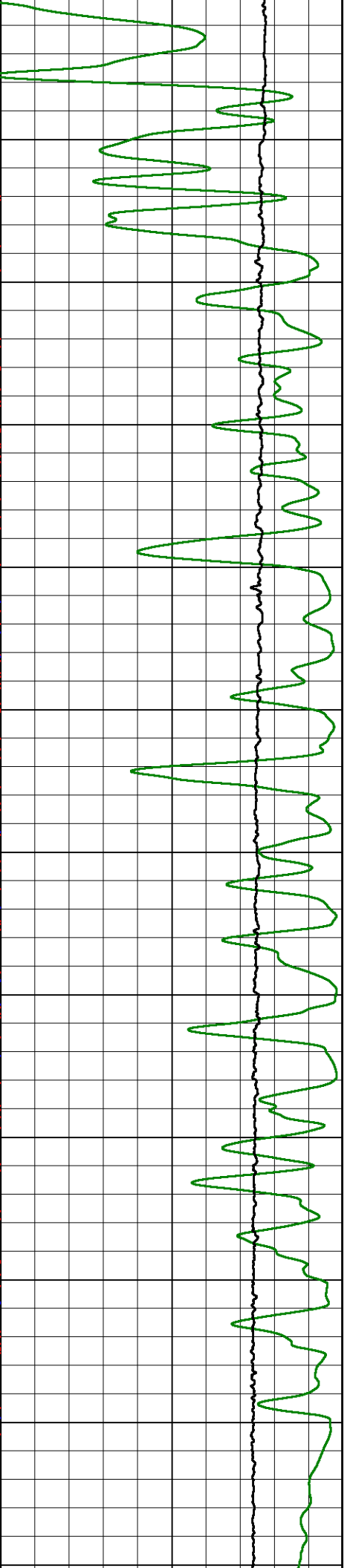
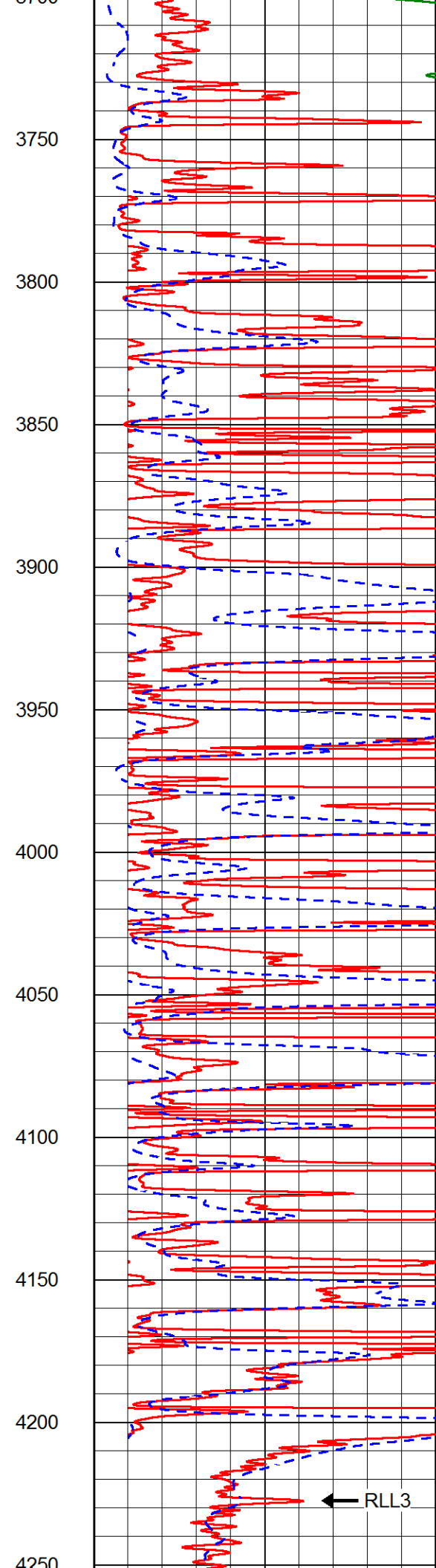
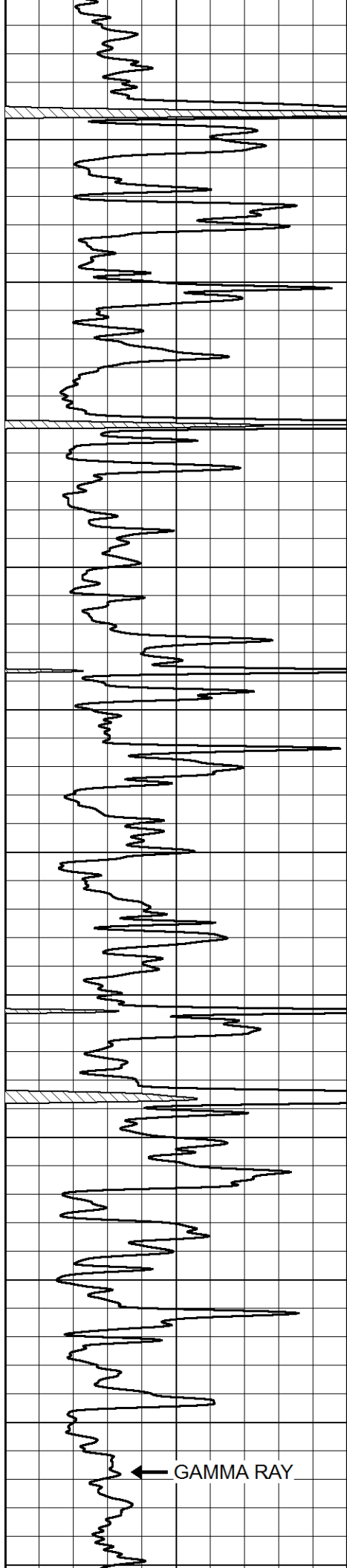


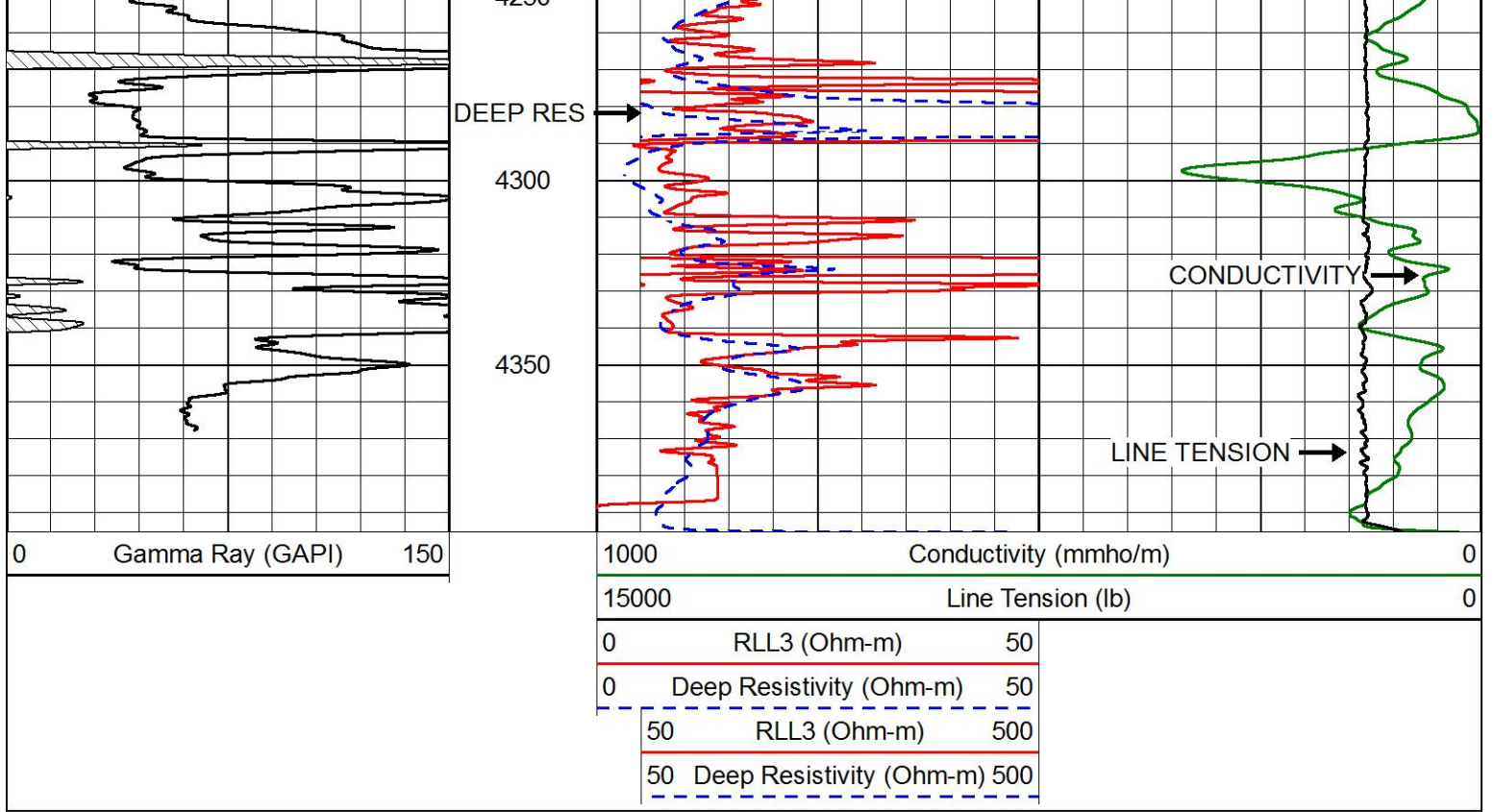






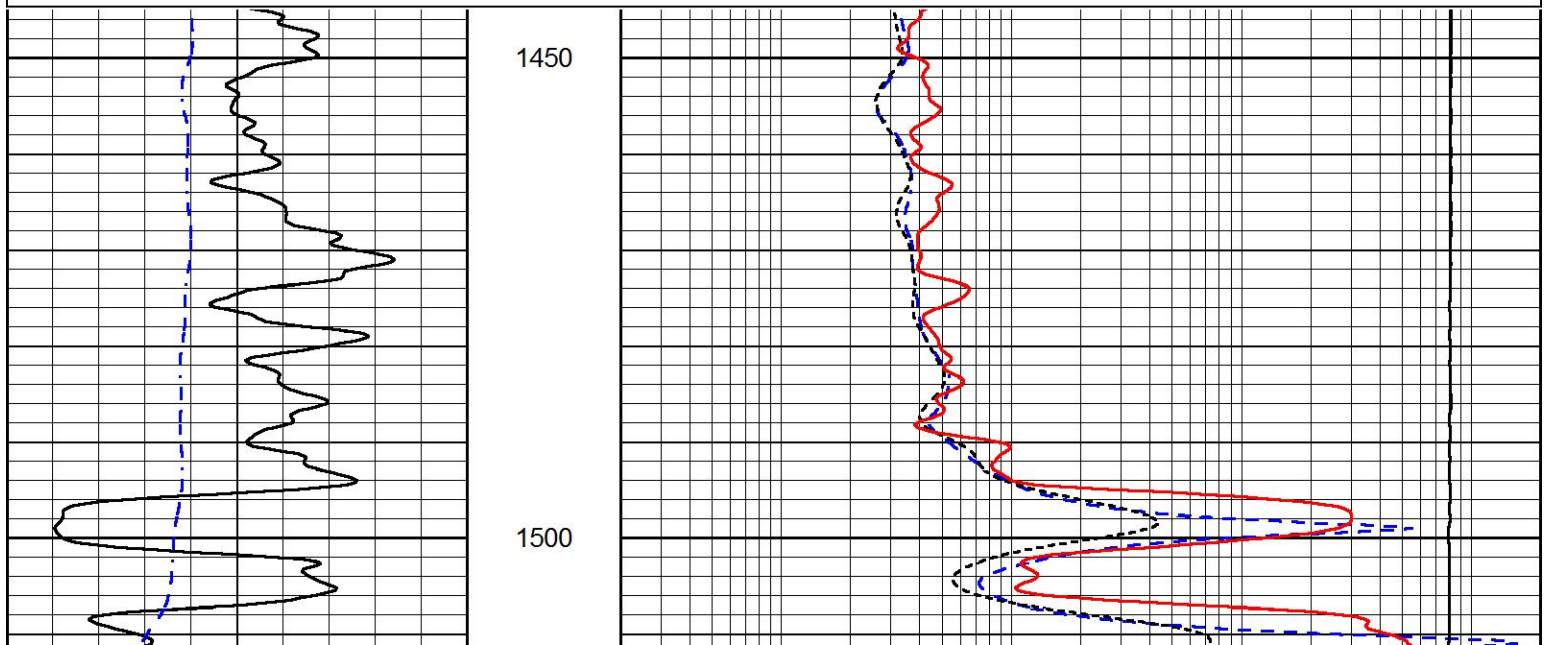
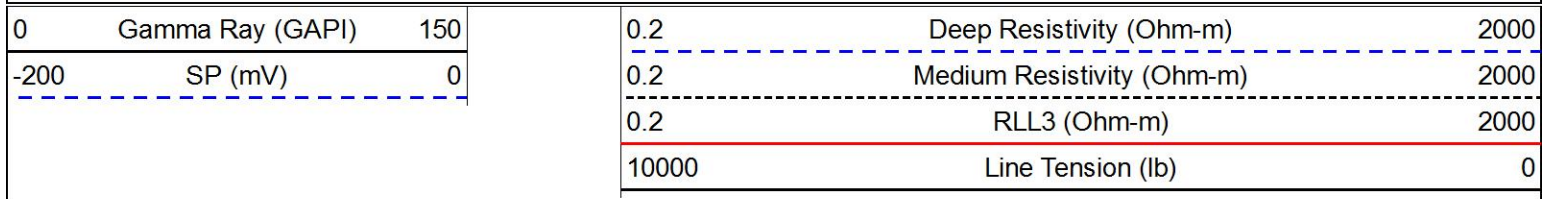


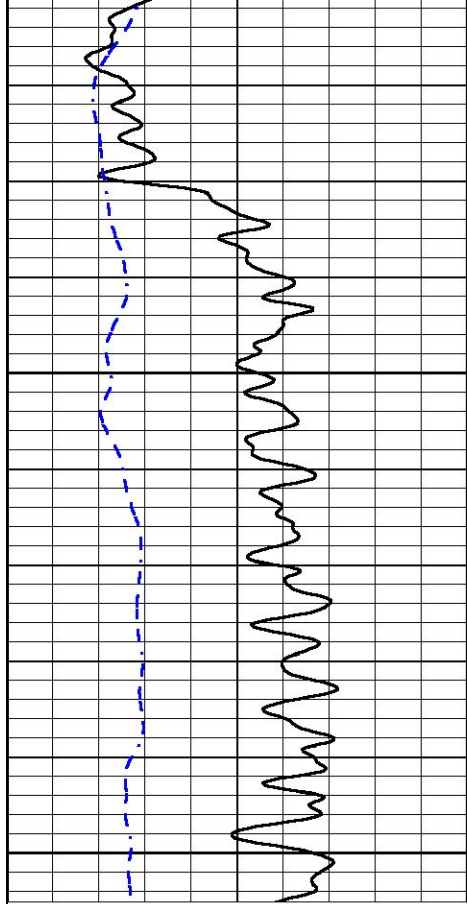




MAIN PASS

Database File american_warrior_In_2-18.db
 Dataset Pathname STACK/pass4.1
 Presentation Format dil
 Dataset Creation Wed Sep 13 08:45:22 2017
 Charted by Depth in Feet scaled 1:240

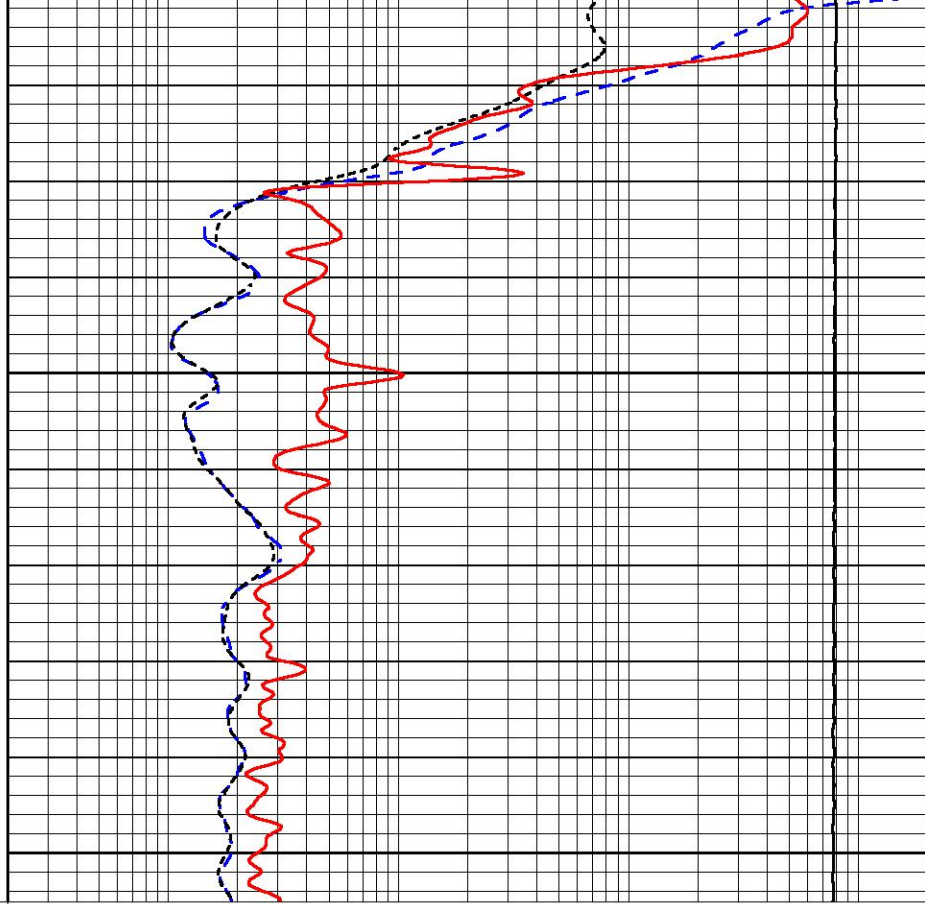




| | | |
|------|------------------|-----|
| 0 | Gamma Ray (GAPI) | 150 |
| -200 | SP (mV) | 0 |

1550

1600



| | | |
|-------|----------------------------|------|
| 0.2 | Deep Resistivity (Ohm-m) | 2000 |
| 0.2 | Medium Resistivity (Ohm-m) | 2000 |
| 0.2 | RLL3 (Ohm-m) | 2000 |
| 10000 | Line Tension (lb) | 0 |

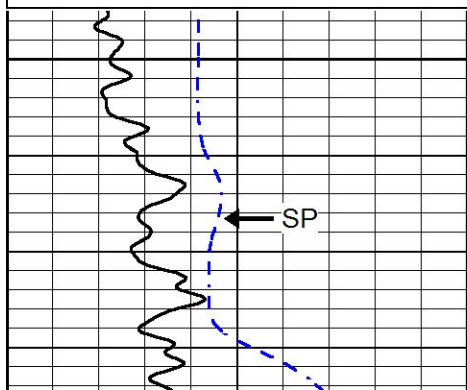


MAIN PASS

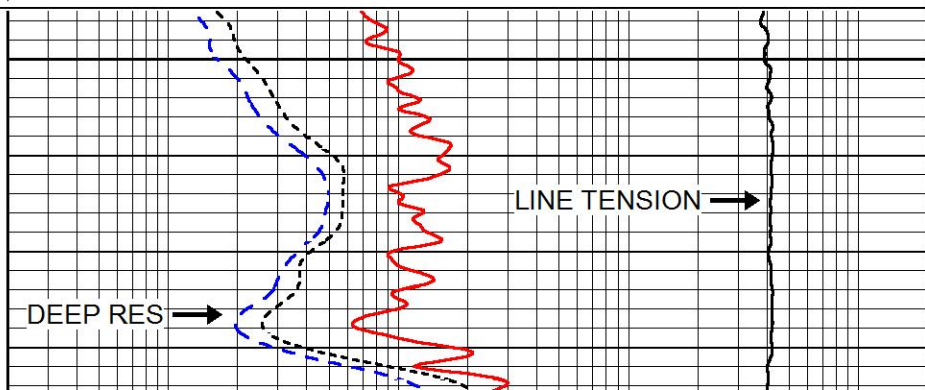
Database File american_warrior_In_2-18.db
 Dataset Pathname STACK/pass3.1
 Presentation Format dil
 Dataset Creation Wed Sep 13 08:10:37 2017
 Charted by Depth in Feet scaled 1:240

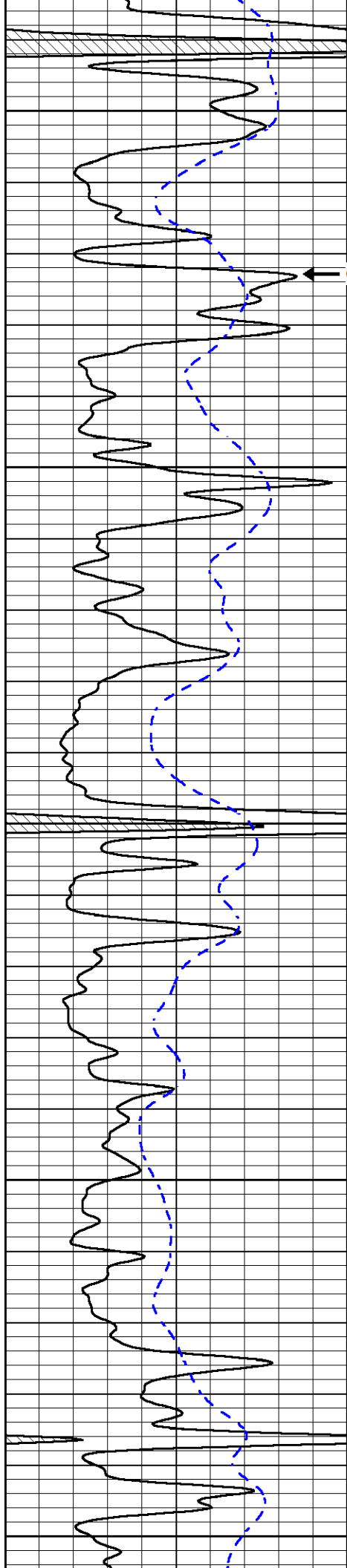
| | | |
|------|------------------|-----|
| 0 | Gamma Ray (GAPI) | 150 |
| -200 | SP (mV) | 0 |

| | | |
|-------|----------------------------|------|
| 0.2 | Deep Resistivity (Ohm-m) | 2000 |
| 0.2 | Medium Resistivity (Ohm-m) | 2000 |
| 0.2 | RLL3 (Ohm-m) | 2000 |
| 10000 | Line Tension (lb) | 0 |



3700





3750

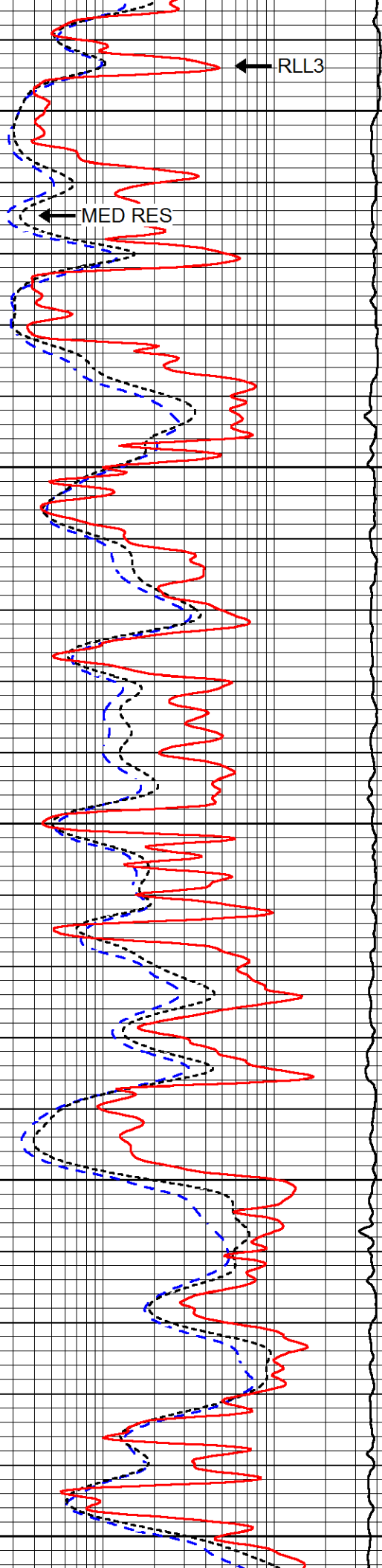
3800

3850

3900

3950

GAMMA RAY



RLL3

MED RES

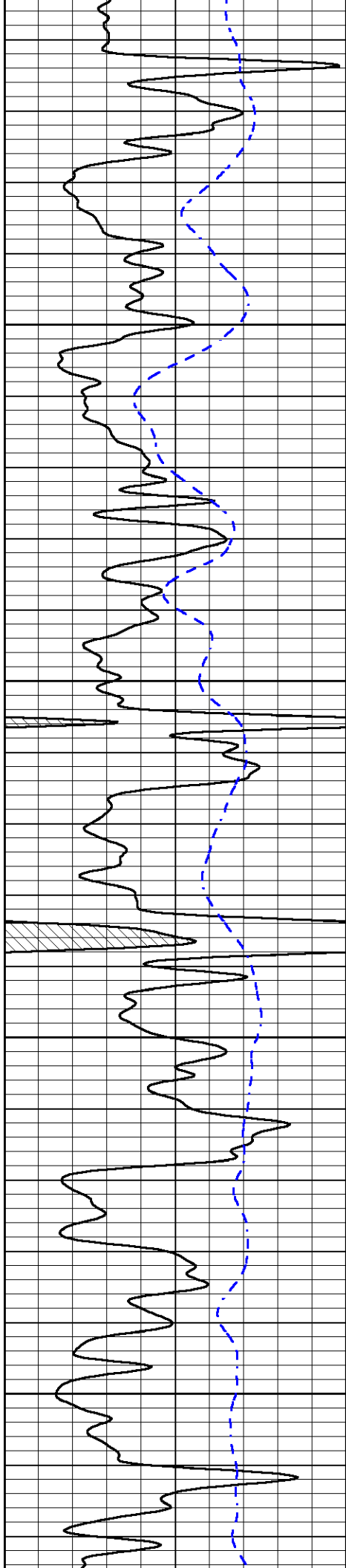
3750

3800

3850

3900

3950

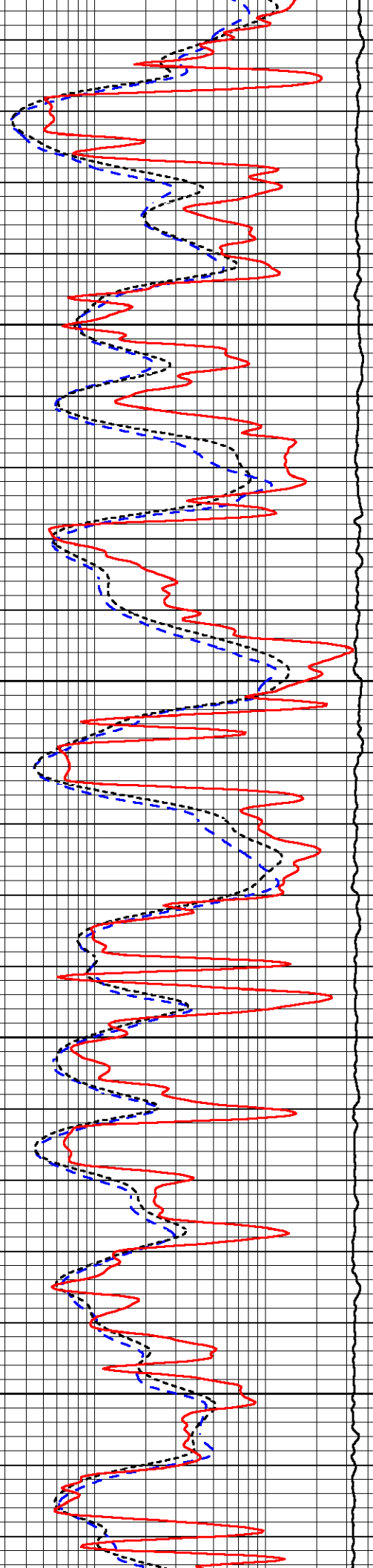


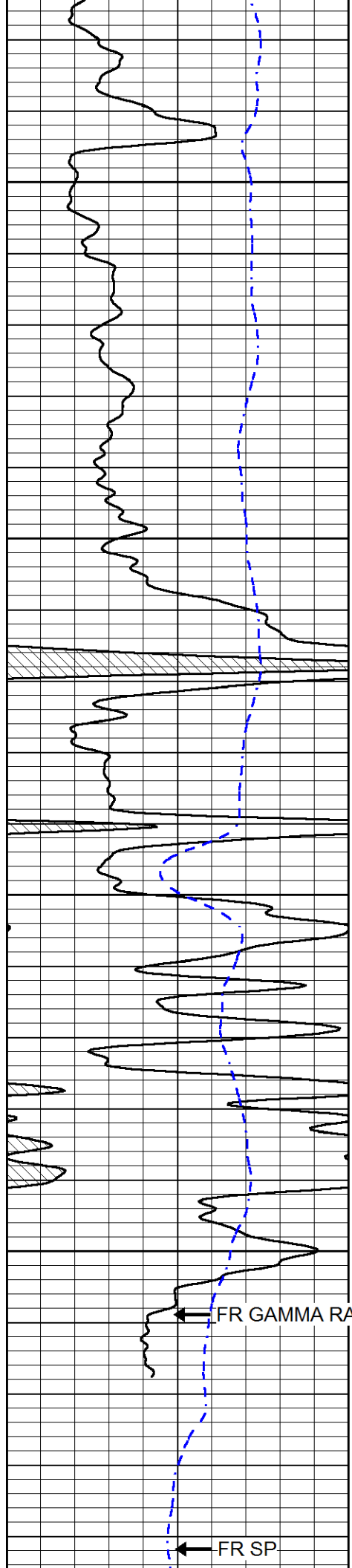
4000

4050

4100

4150





4200

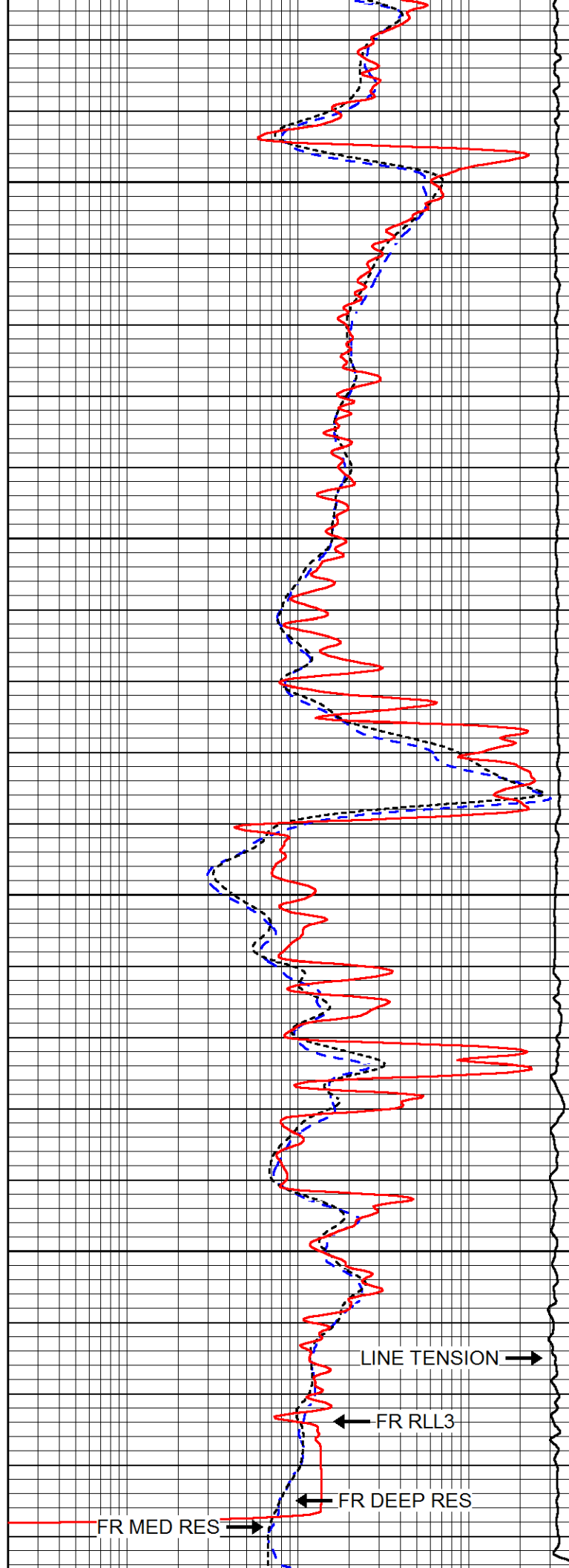
4250

4300

4350

FR GAMMA RAY

FR SP



LINE TENSION

FR RLL3

FR DEEP RES

FR MED RES

| | | |
|------|------------------|-----|
| 0 | Gamma Ray (GAPI) | 150 |
| -200 | SP (mV) | 0 |

| | | |
|-------|----------------------------|------|
| 0.2 | Deep Resistivity (Ohm-m) | 2000 |
| 0.2 | Medium Resistivity (Ohm-m) | 2000 |
| 0.2 | RLL3 (Ohm-m) | 2000 |
| 10000 | Line Tension (lb) | 0 |

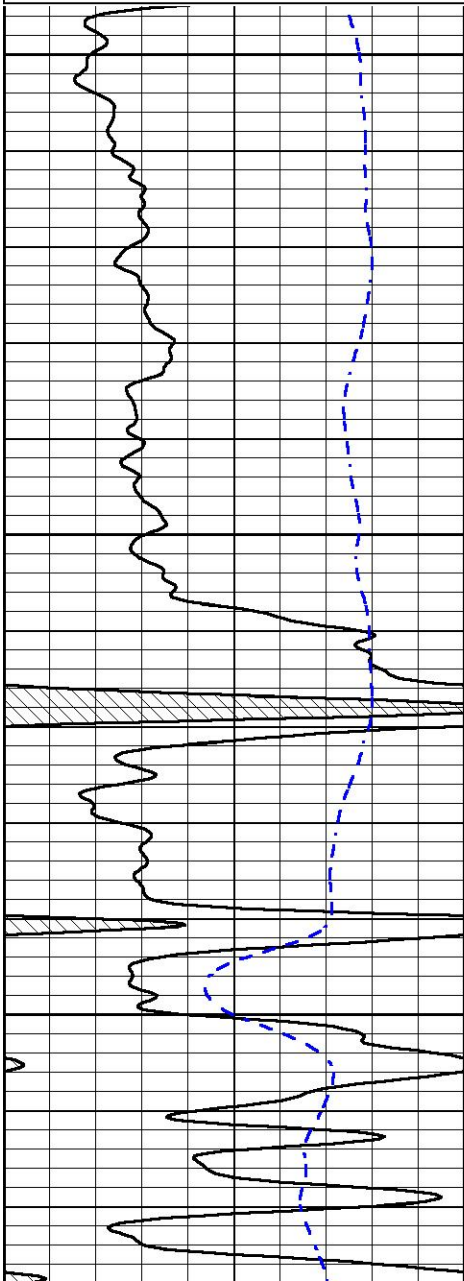


REPEAT SECTION

Database File american_warrior_In_2-18.db
 Dataset Pathname STACK/pass2.1
 Presentation Format dil
 Dataset Creation Wed Sep 13 08:01:23 2017
 Charted by Depth in Feet scaled 1:240

| | | |
|------|------------------|-----|
| 0 | Gamma Ray (GAPI) | 150 |
| -200 | SP (mV) | 0 |

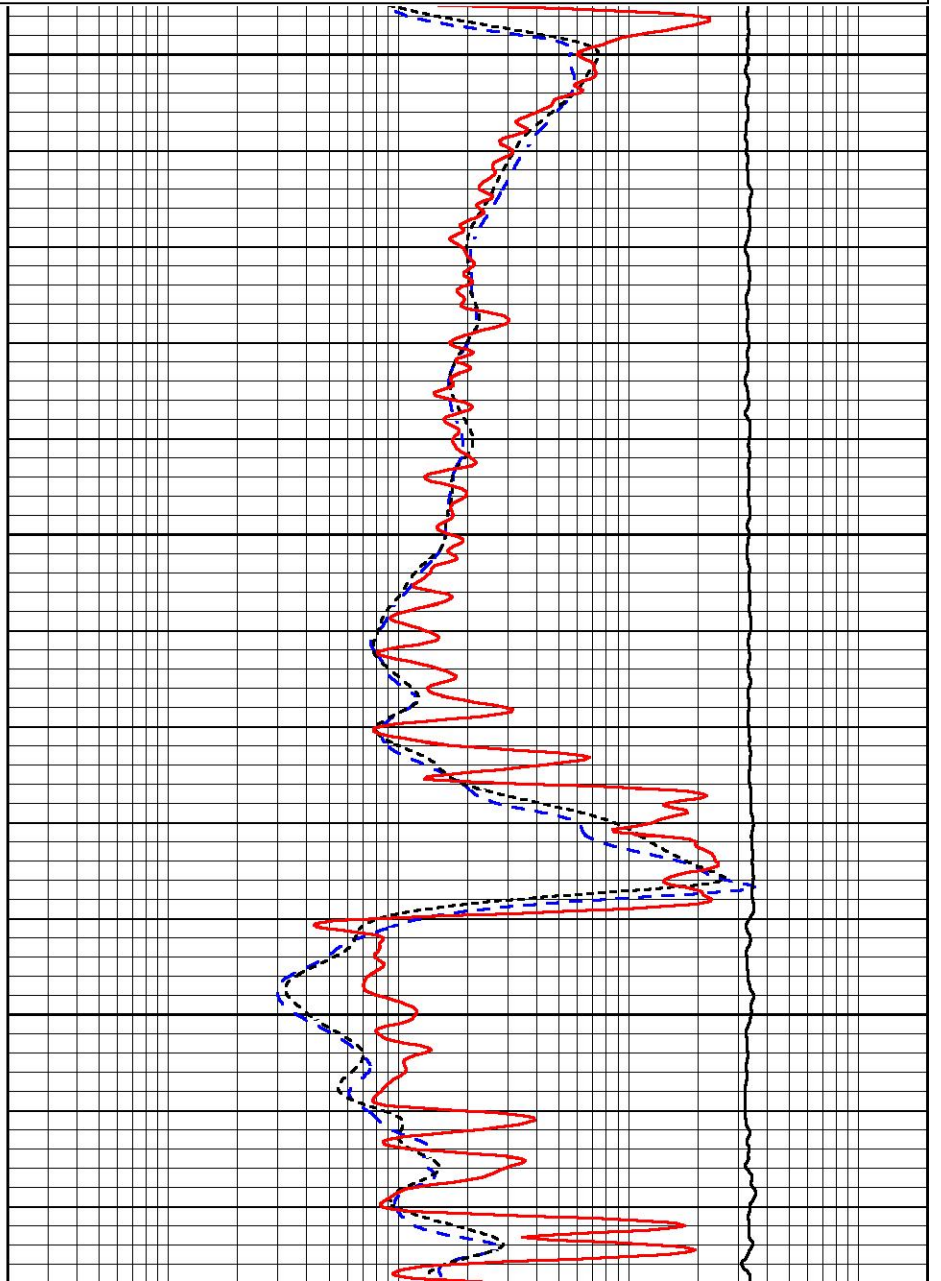
| | | |
|-------|----------------------------|------|
| 0.2 | Deep Resistivity (Ohm-m) | 2000 |
| 0.2 | Medium Resistivity (Ohm-m) | 2000 |
| 0.2 | RLL3 (Ohm-m) | 2000 |
| 10000 | Line Tension (lb) | 0 |

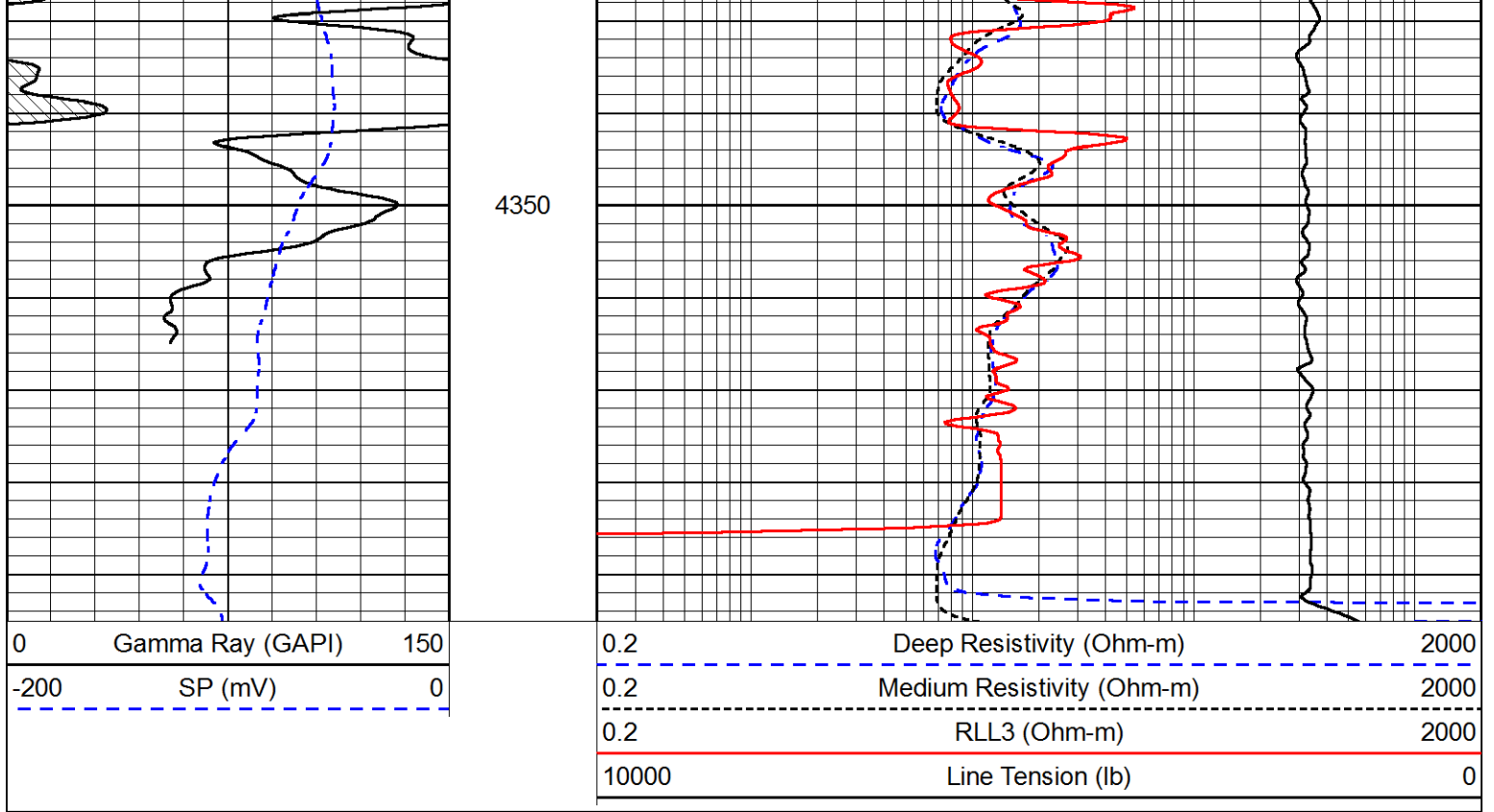


4200

4250

4300





Calibration Report

Database File american_warrior_In_2-18.db
 Dataset Pathname STACK/pass3.1
 Dataset Creation Wed Sep 13 08:10:37 2017

Dual Induction Calibration Report

Serial-Model: PSI 91-M&W
 Calibration Performed: Wed Sep 06 19:50:36 2017

| Loop: | Readings | | References | | | Results | |
|--------|----------|----------|------------|---------|--------|---------|---------|
| | Air | Loop | Air | Loop | | Gain | Offset |
| Deep | 166.796 | 835.089 | 0.000 | 255.800 | mmho/m | 0.430 | -33.500 |
| Medium | 142.009 | 1348.560 | 0.000 | 255.800 | mmho/m | 0.360 | -31.000 |

Compensated Density Calibration Report

Serial-Model: 90-1031-M&W
 Source / Verifier: 16955B / 2ci
 Master Calibration Performed: Wed Sep 06 19:51:03 2017

Master Calibration

| | Density | | Far Detector | Near Detector | |
|-----------|---------|------|--------------|---------------|-----|
| Magnesium | 1.755 | g/cc | 4903.44 | 6153.79 | cps |
| Aluminum | 2.685 | g/cc | 934.50 | 4021.31 | cps |

Spine Angle = 75.61

Density/Spine Ratio = 0.543

| | Size | | Reading |
|------------|------|----|---------|
| Small Ring | 8.00 | in | 1.84 |

Large Ring

22.00

in

1.46

Compensated Neutron Calibration Report

Serial Number: 207-MW
 Tool Model: M&W
 Calibration Performed: WED SEP 6 10:30:30 2017

| Detector | Readings | Target | Normalization |
|-------------|-------------|-------------|---------------|
| Short Space | 6240.00 cps | 1000.00 cps | 1.6025 |
| Long Space | 460.00 cps | 1000.00 cps | 1.9500 |

Gamma Ray Calibration Report

Serial Number: 89
 Tool Model: M&W
 Calibration Performed: Wed Sep 06 19:51:14 2017

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
 Calibrator Reading: 1.0 cps

Sensitivity: 0.6000 GAPI/cps



PIONEER
 Pioneer Energy Services

Company AMERICAN WARRIOR, INC.
 Well LN #2-18
 Field DEWALD
 County NESS
 State KANSAS