NABORS
COMPLETION & PRODUCTION SERVICES CO.

# DUAL INDUCTION LOG

| | |
|---|---|
| Company | RICHLAN DRILLING |
| Well | RAHM #3 |
| Field | SCHABEN WEST |
| County | NESS |
| State | KANSAS |

Company RICHLAN DRILLING
Well RAHM #3
Field SCHABEN WEST
County NESS State KANSAS

Location: API #: 15-135-25699-00-00
1640' FNL & 1170' FEL
NW - NW - SE - NE
SEC 22 TWP 19S RGE 22W

Permanent Datum GROUND LEVEL Elevation 2216
Log Measured From KELLY BUSHING 10' A.G.L.
Drilling Measured From KELLY BUSHING

Other Services: CNL/CDL/PE, MEL/SON

Elevation: K.B. 2226, D.F. 2224, G.L. 2216

| | | | | | | |
|---|---|---|---|---|---|---|
| Date | 11-29-13 | | | | | |
| Run Number | ONE | | | | | |
| Depth Driller | 4483 | | | | | |
| Depth Logger | 4486 | | | | | |
| Bottom Logged Interval | 4484 | | | | | |
| Top Log Interval | 00 | | | | | |
| Casing Driller | 8 5/8"@257' | | | | | |
| Casing Logger | 254' | | | | | |
| Bit Size | 7 7/8" | | | | | |
| Type Fluid in Hole | CHEMICAL MUD | | | CHLORIDES 7,000 PPM | | |
| Density / Viscosity | 9.0/58 | | | | | |
| pH / Fluid Loss | 9.5/8.8 | | | | | |
| Source of Sample | FLOWLINE | | | | | |
| Rm @ Meas. Temp | 0.65@79F | | | | | |
| Rmf @ Meas. Temp | 0.49@71F | | | | | |
| Rmc @ Meas. Temp | 0.78@71F | | | | | |
| Source of Rmf / Rmc | MEASUREMENT | | | | | |
| Rm @ BHT | 0.38@120F | | | | | |
| Time Circulation Stopped | 2 HOURS | | | | | |
| Time Logger on Bottom | | | | | | |
| Maximum Recorded Temperature | 120F | | | | | |
| Equipment Number | 860 | | | | | |
| Location | HAYS, KANSAS | | | | | |
| Recorded By | IAN MABB | | | | | |
| Witnessed By | BOB SCHREIBER | | | | | |

<<< Fold Here >>>

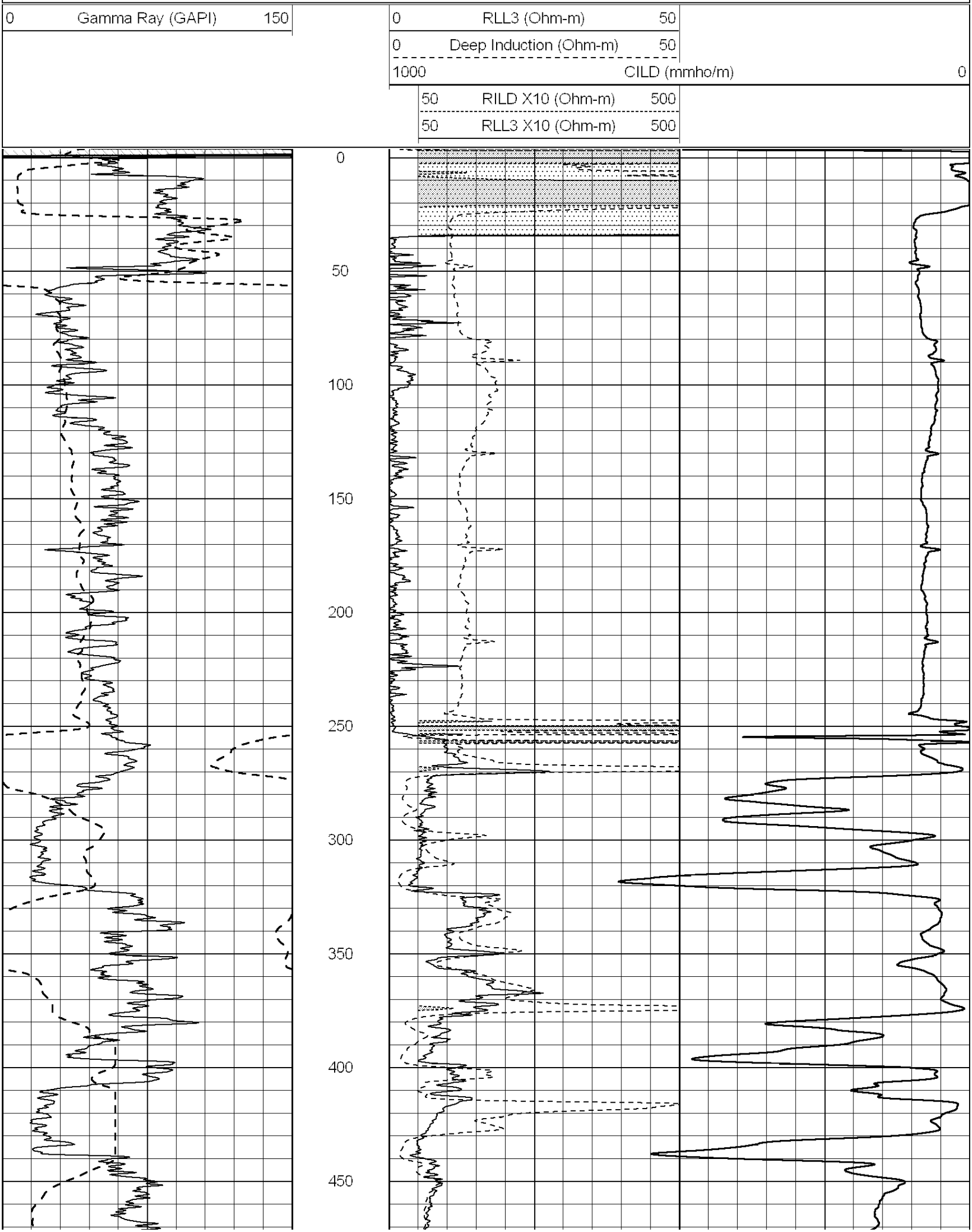


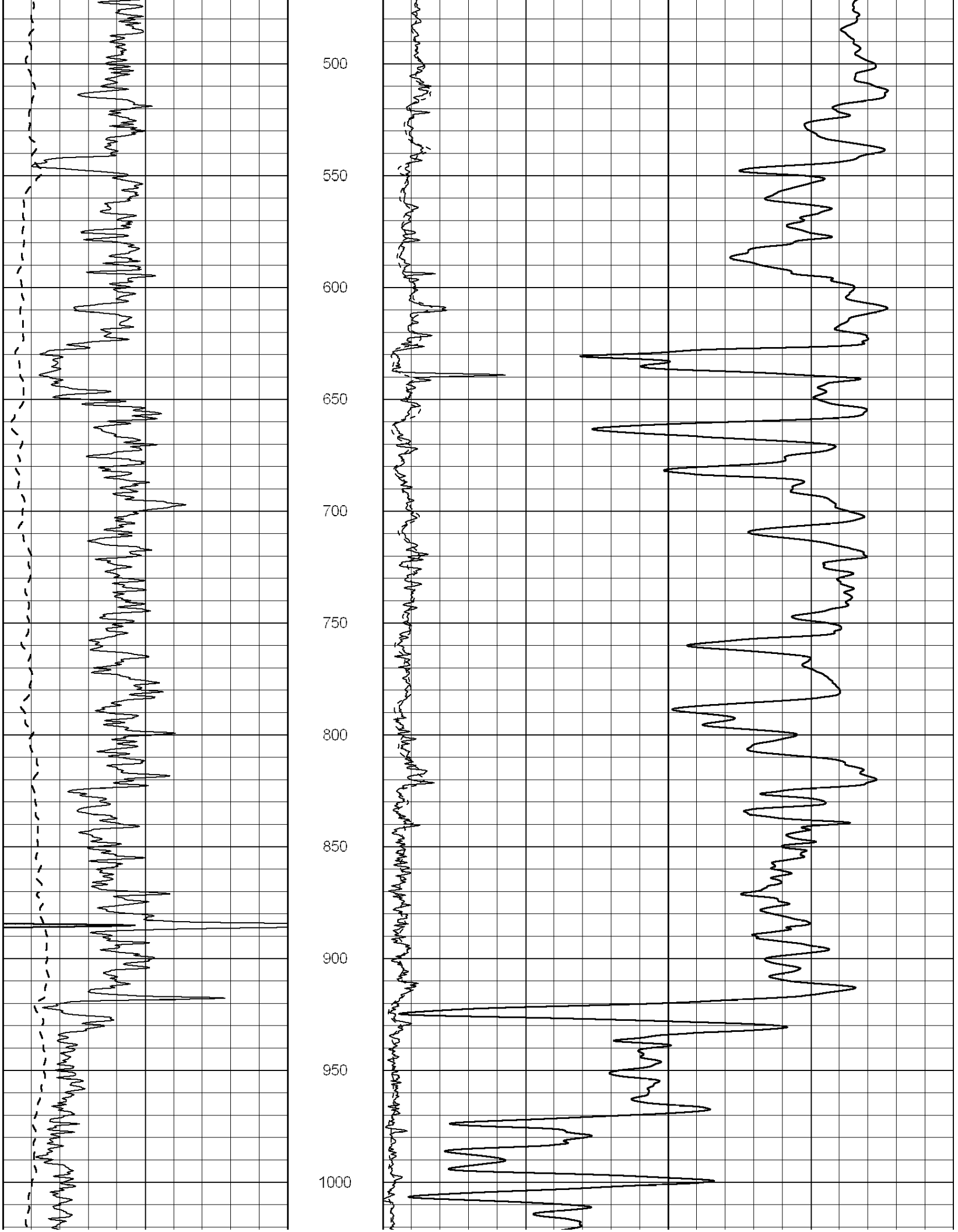
Comments

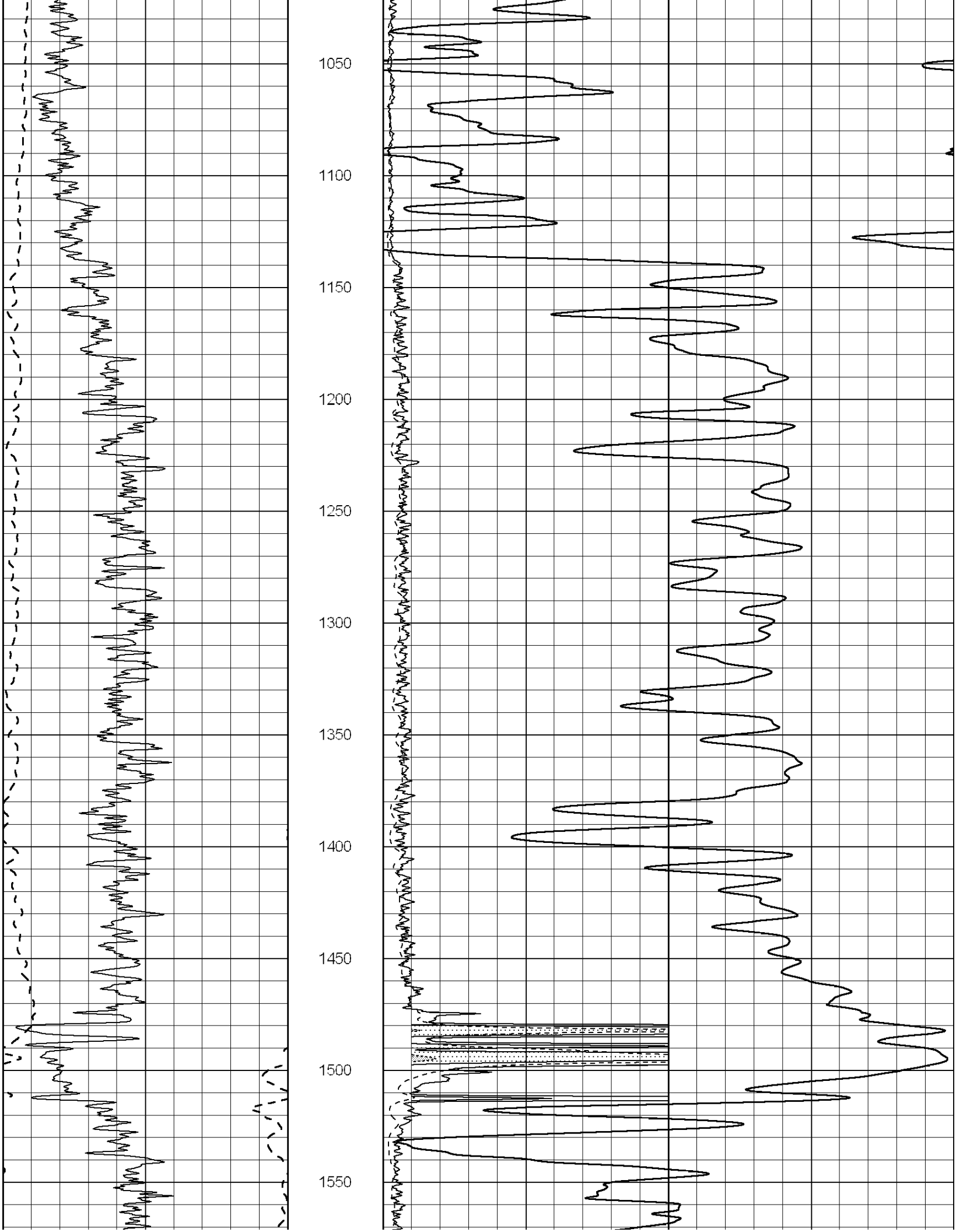
THANK YOU FOR USING "NABORS" HAYS, KANSAS (785) 628-6395
DIRECTIONS
BAZINE, KS. - 2 WEST TO RD BB - SOUTH 4 MILES WEST INTO

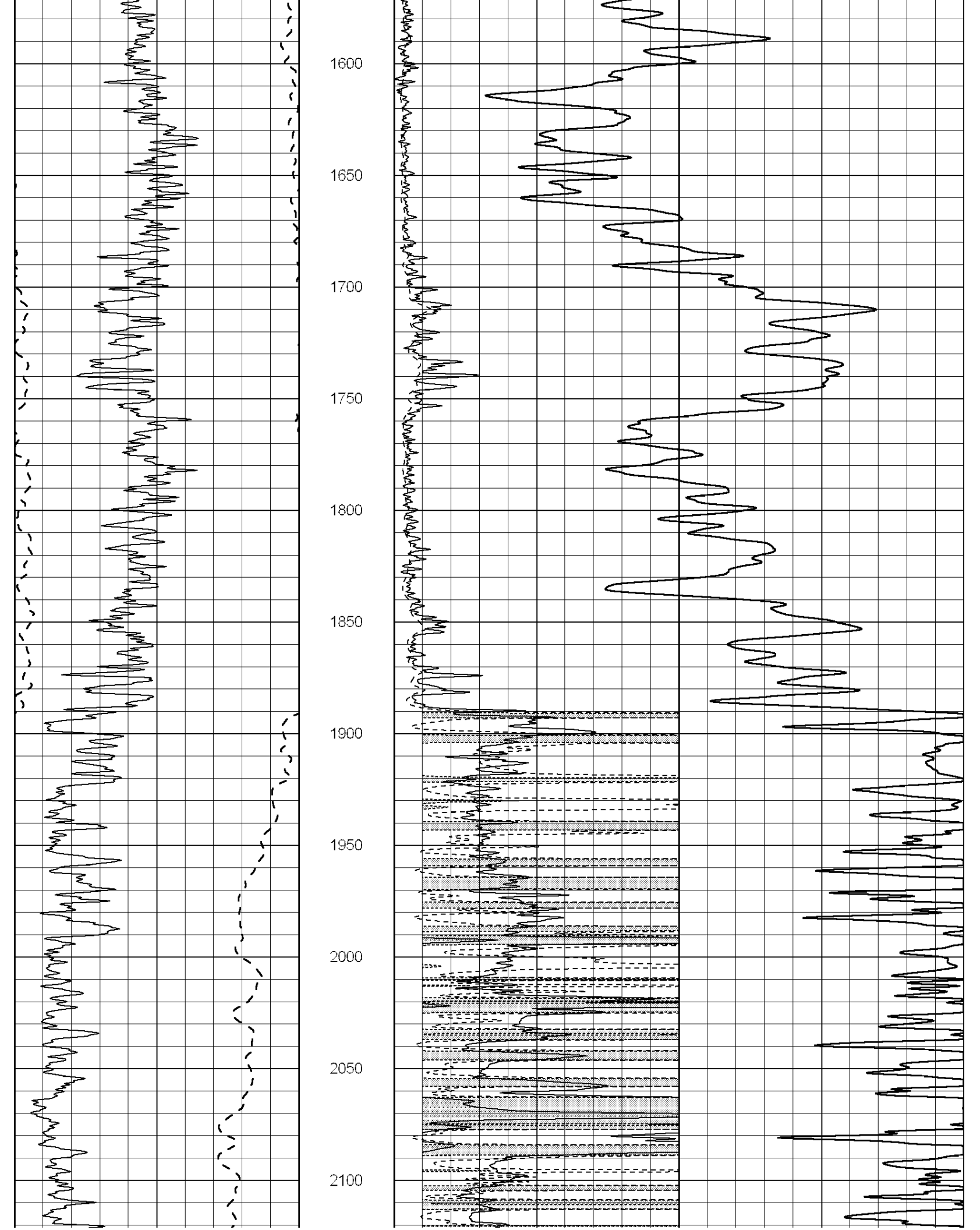
| | |
|---|---|
| Database File: | 012047pe.db |
| Dataset Pathname: | pass3.1.3 |
| Presentation Format: | _dil2 |
| Dataset Creation: | Fri Nov 29 16:15:31 2013 by Calc Open-Cased 090629 |

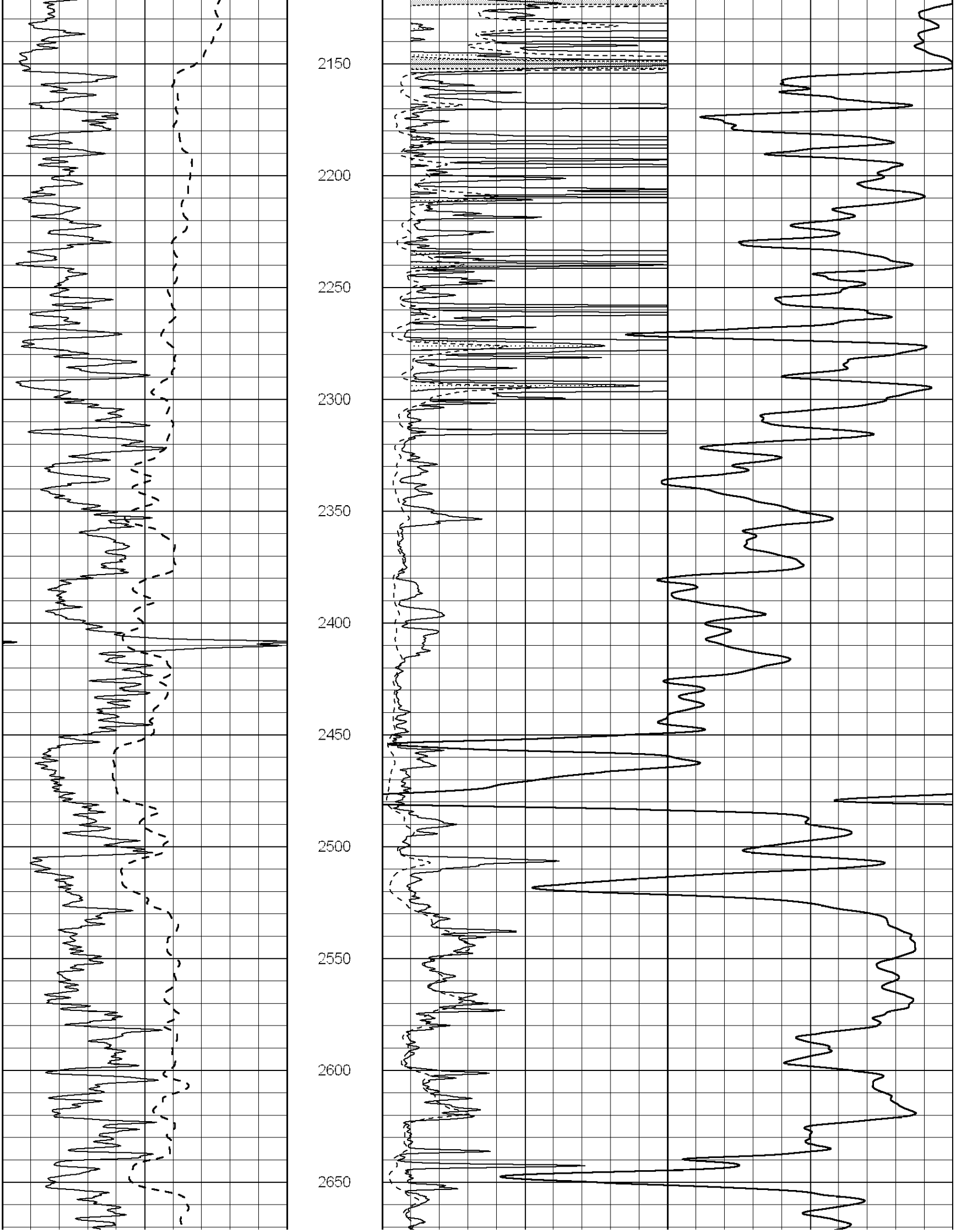
Charted by: Depth in Feet scaled 1:600

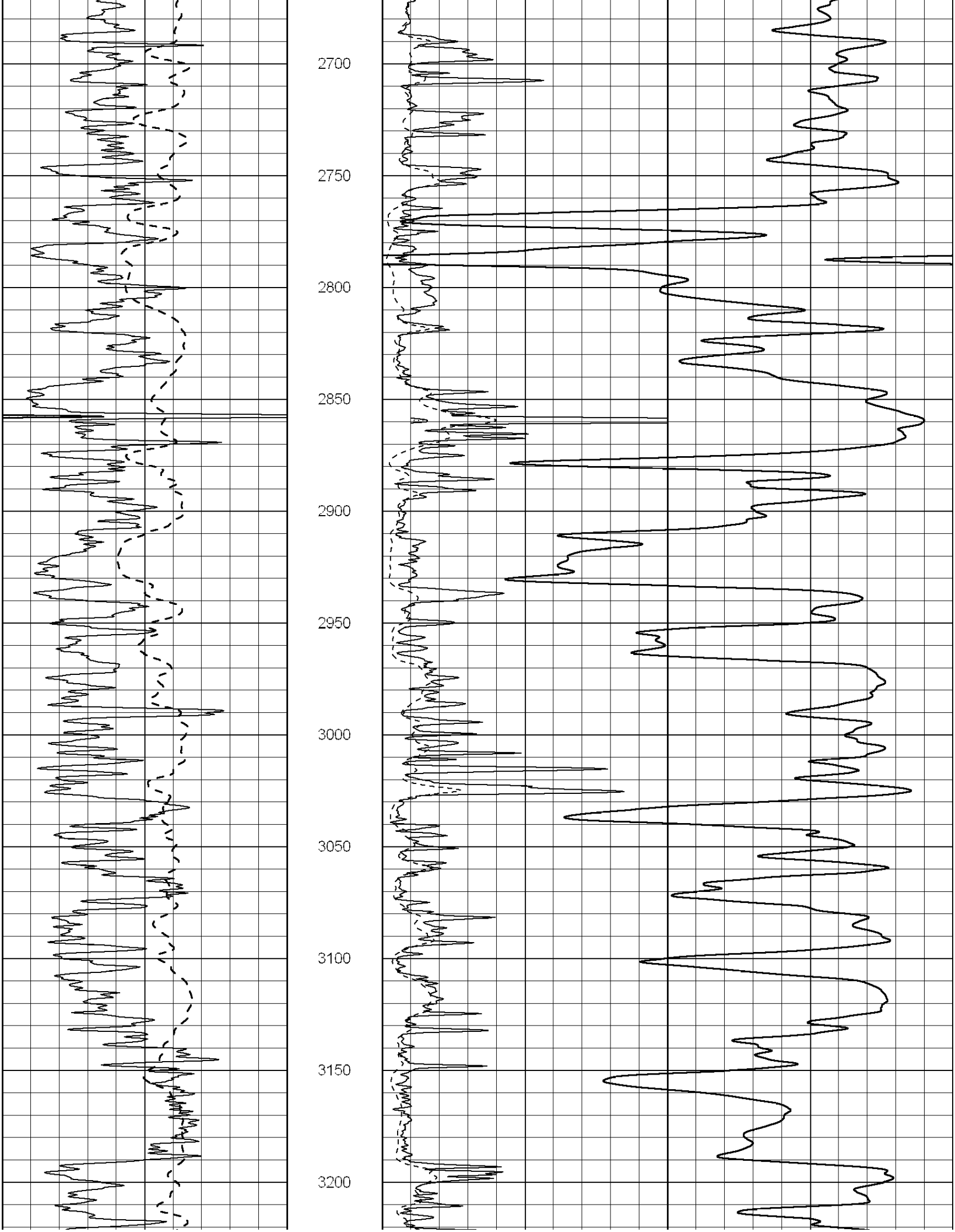


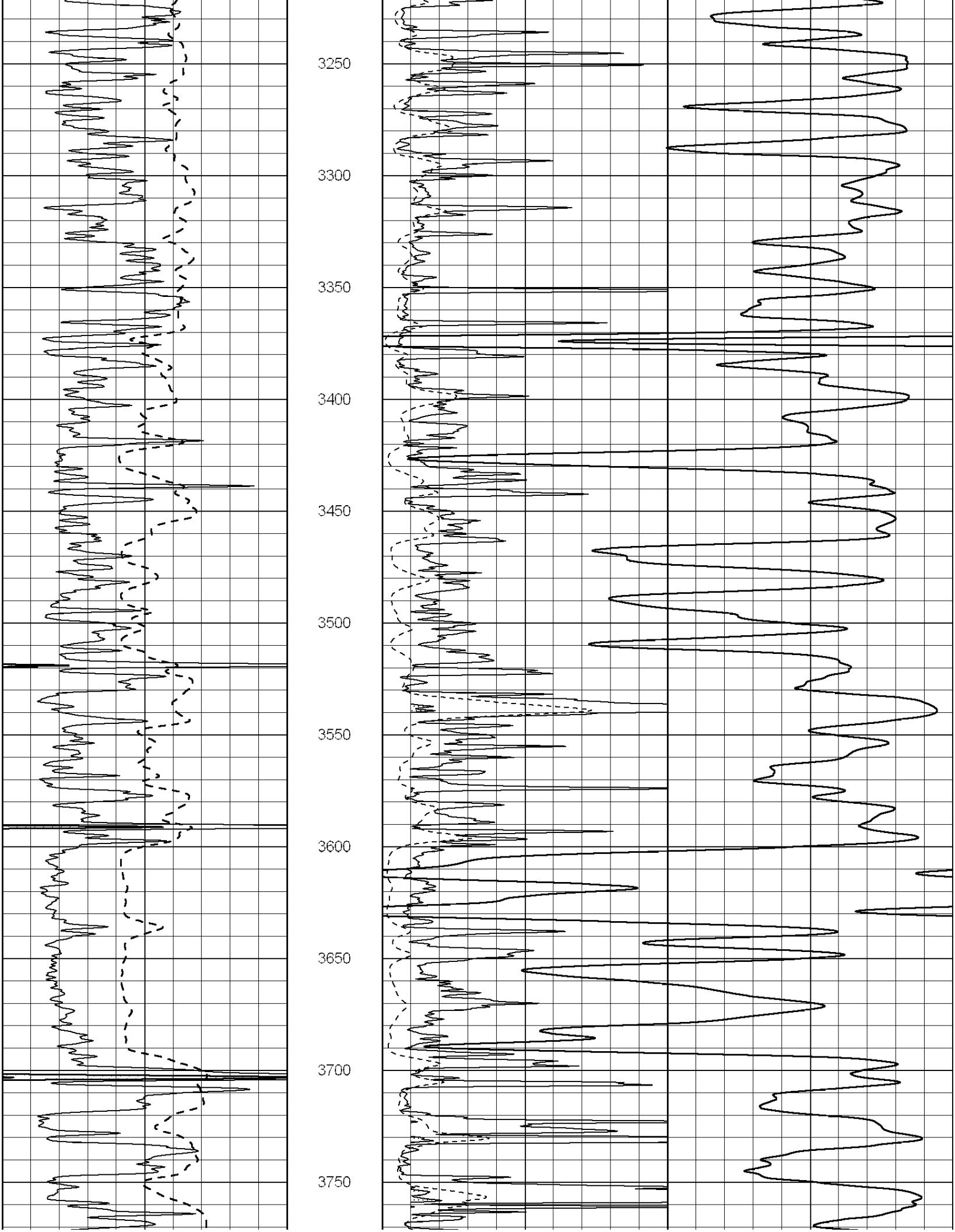

500
550
600
650
700
750
800
850
900
950
1000

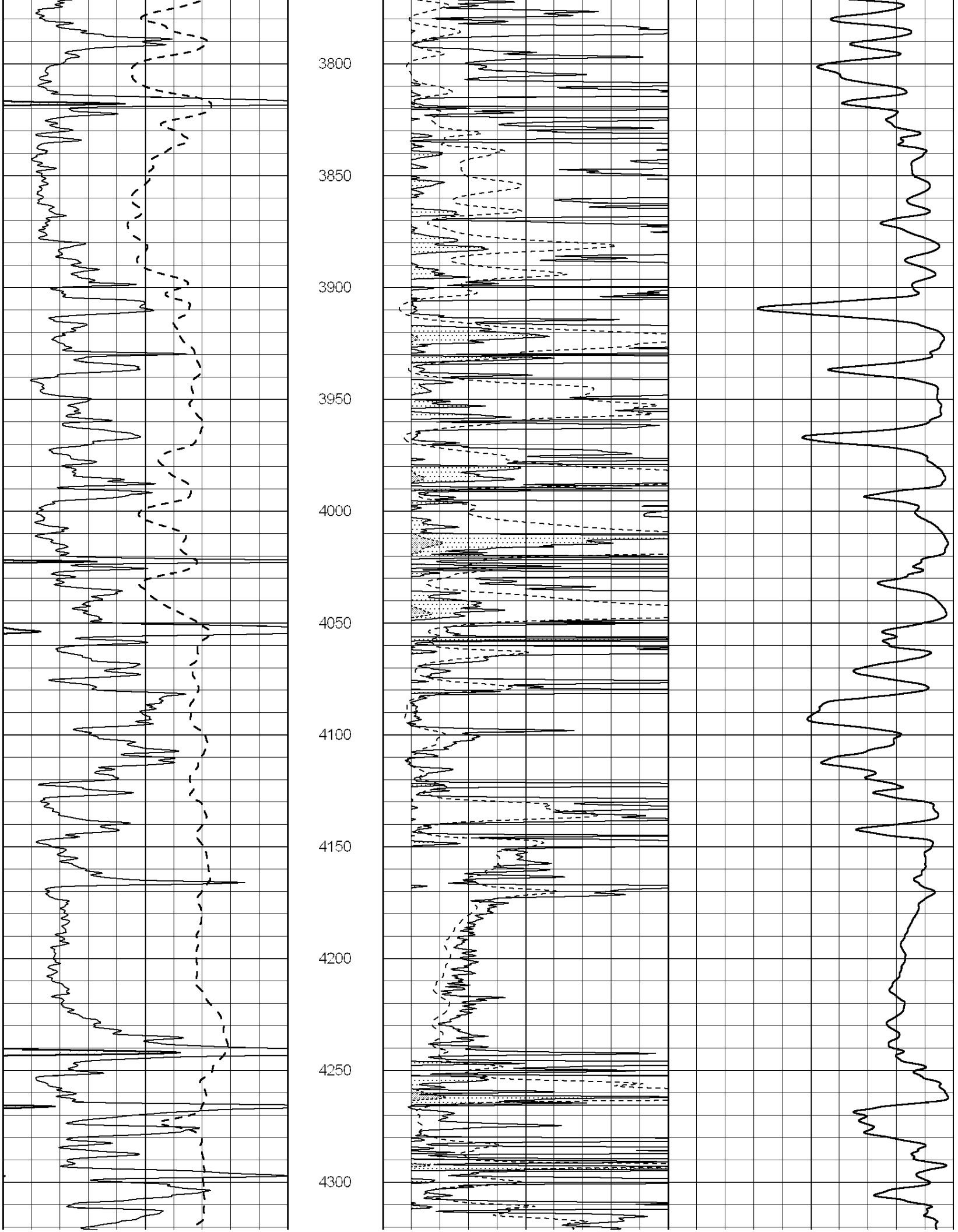

1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550

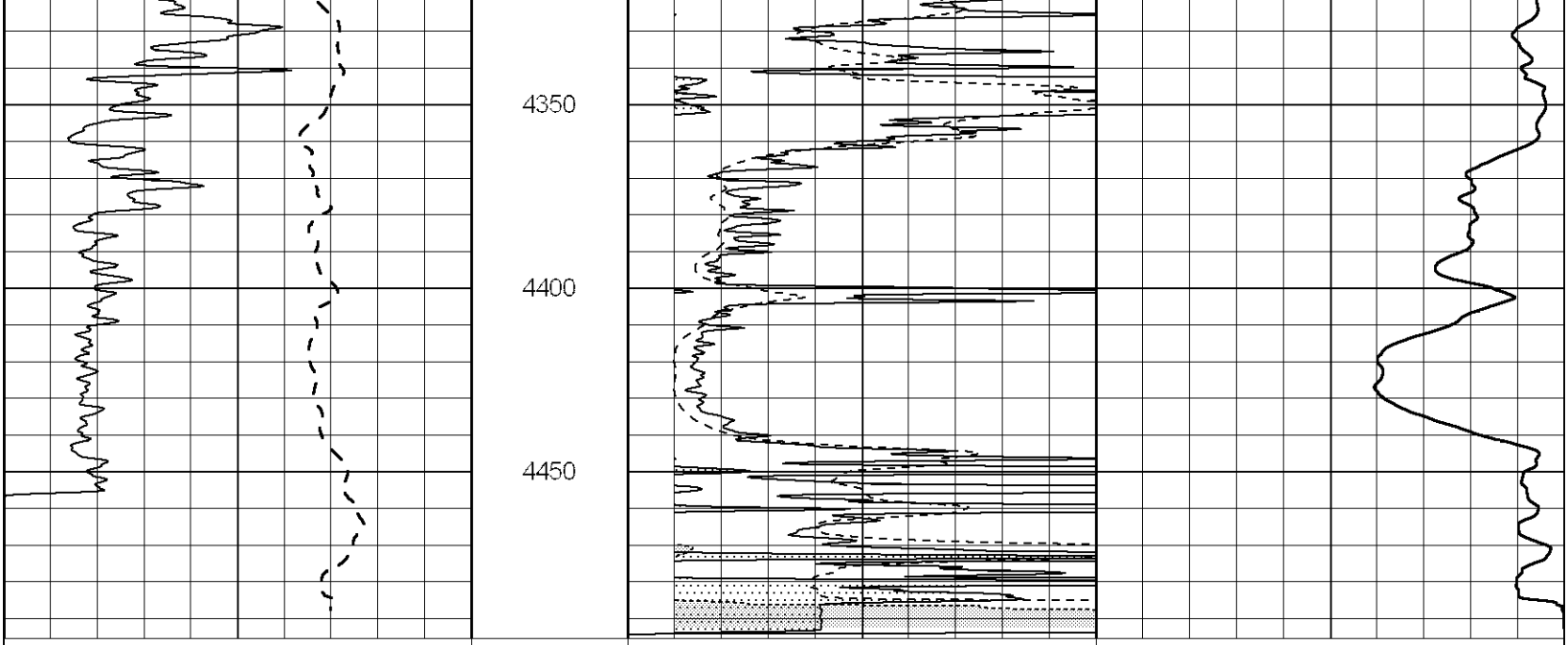

1600
1650
1700
1750
1800
1850
1900
1950
2000
2050
2100


2150
2200
2250
2300
2350
2400
2450
2500
2550
2600
2650

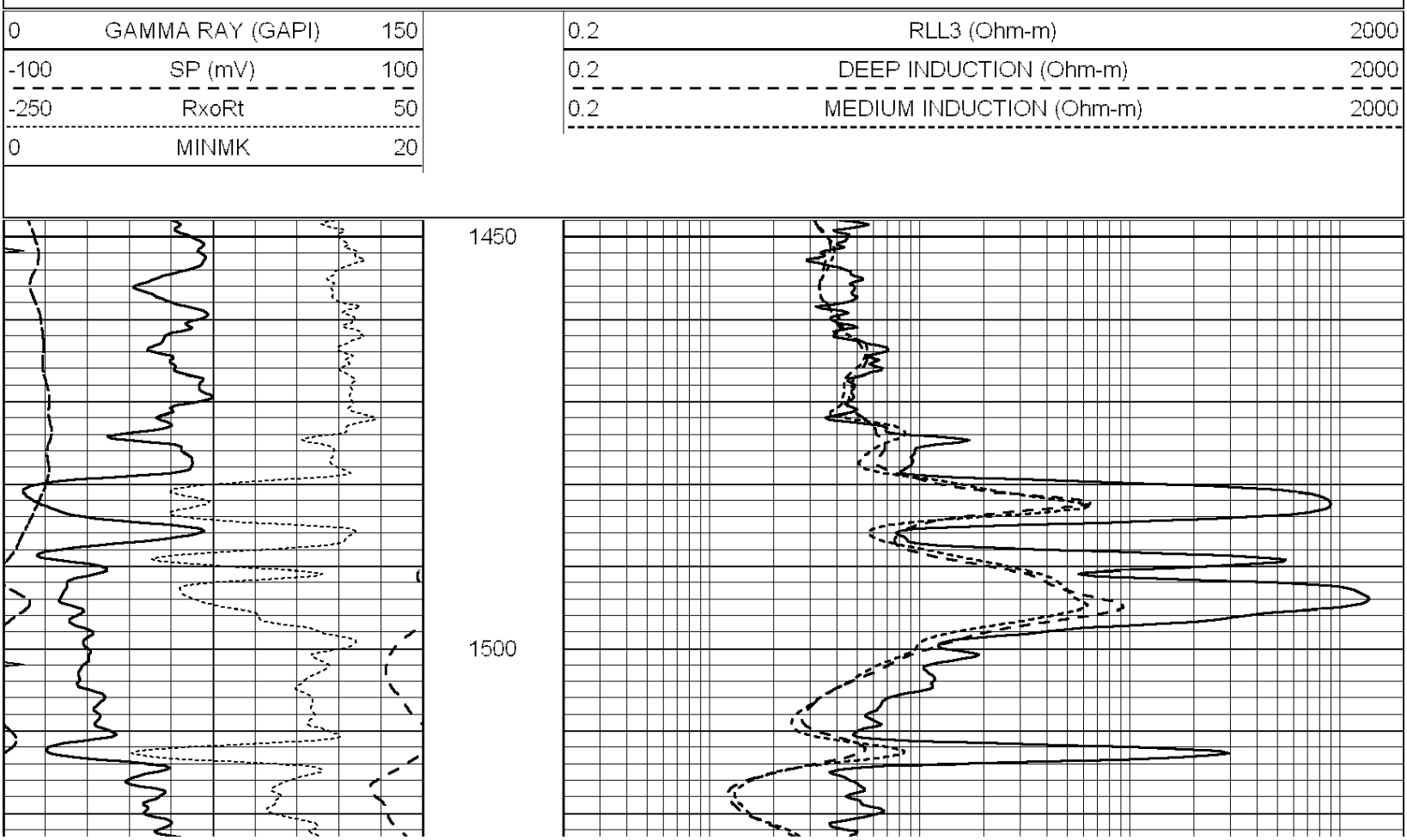

2700
2750
2800
2850
2900
2950
3000
3050
3100
3150
3200

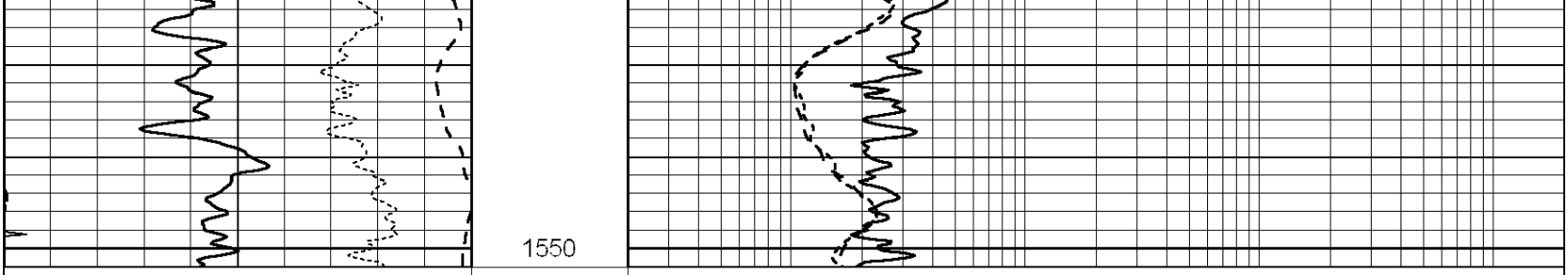

3250
3300
3350
3400
3450
3500
3550
3600
3650
3700
3750


3800
3850
3900
3950
4000
4050
4100
4150
4200
4250
4300

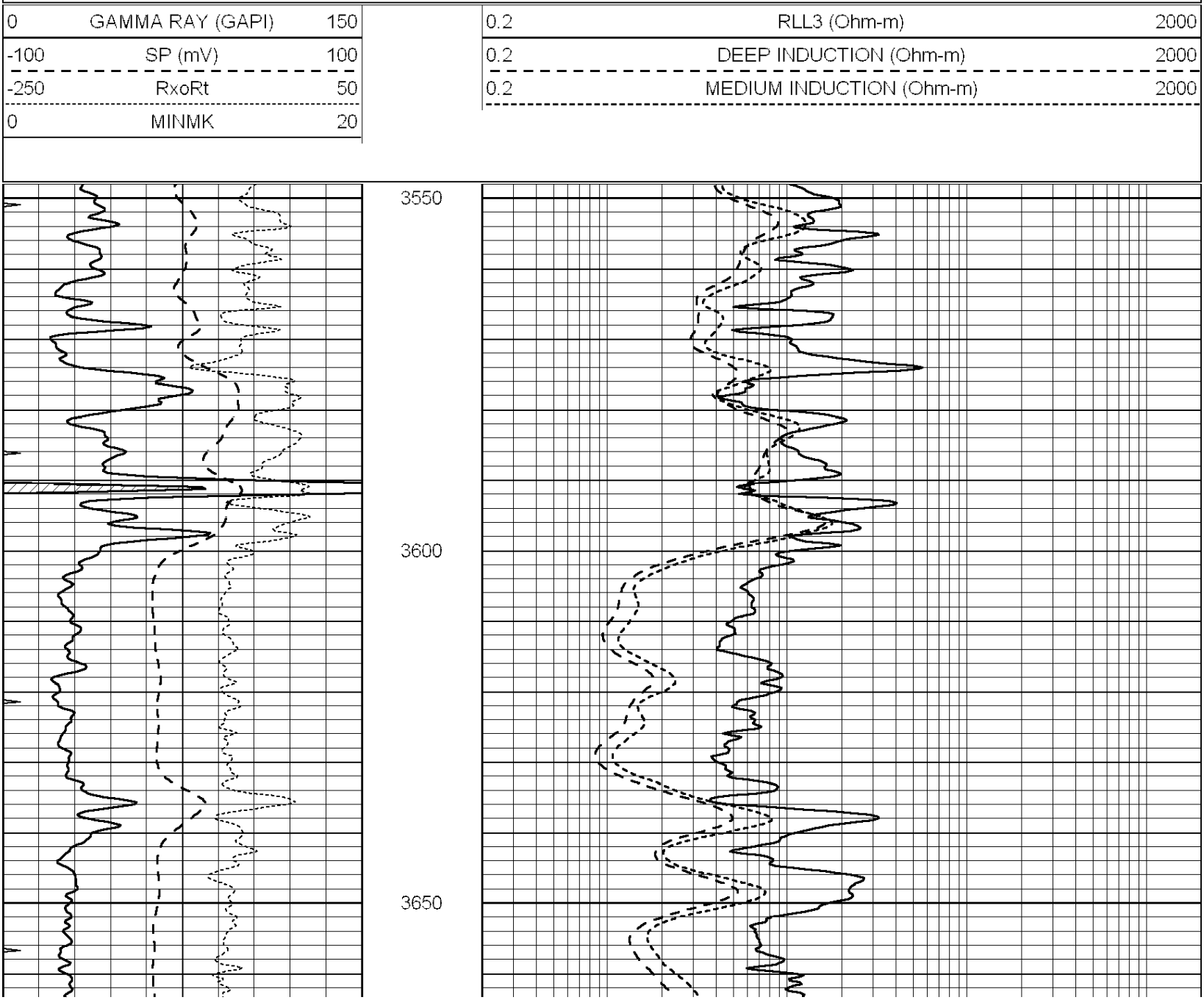


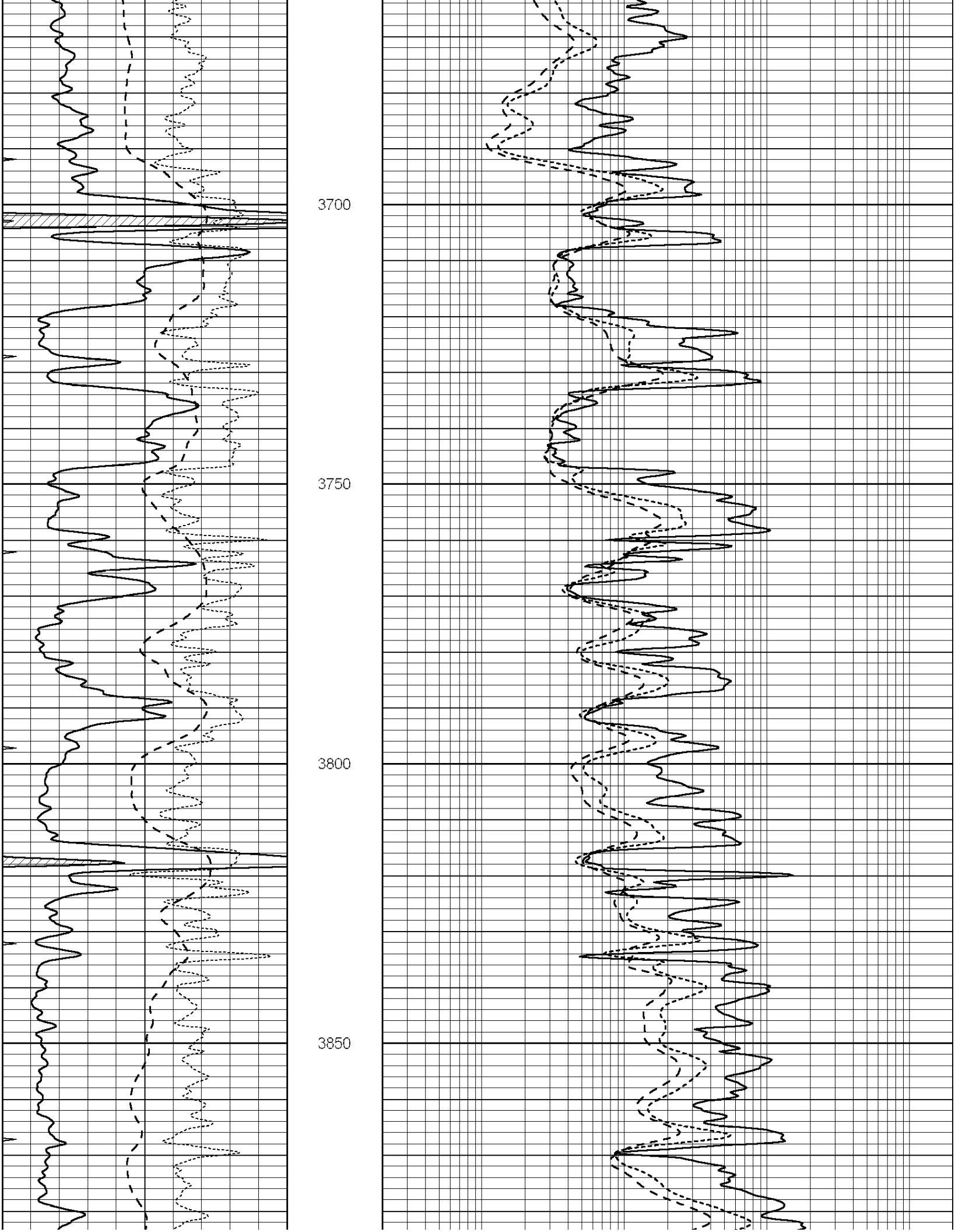

Database File: 012047pe.db
Dataset Pathname: pass3.1.3
Presentation Format: _dil
Dataset Creation: Fri Nov 29 16:15:31 2013 by Calc Open-Cased 090629
Charted by: Depth in Feet scaled 1:240

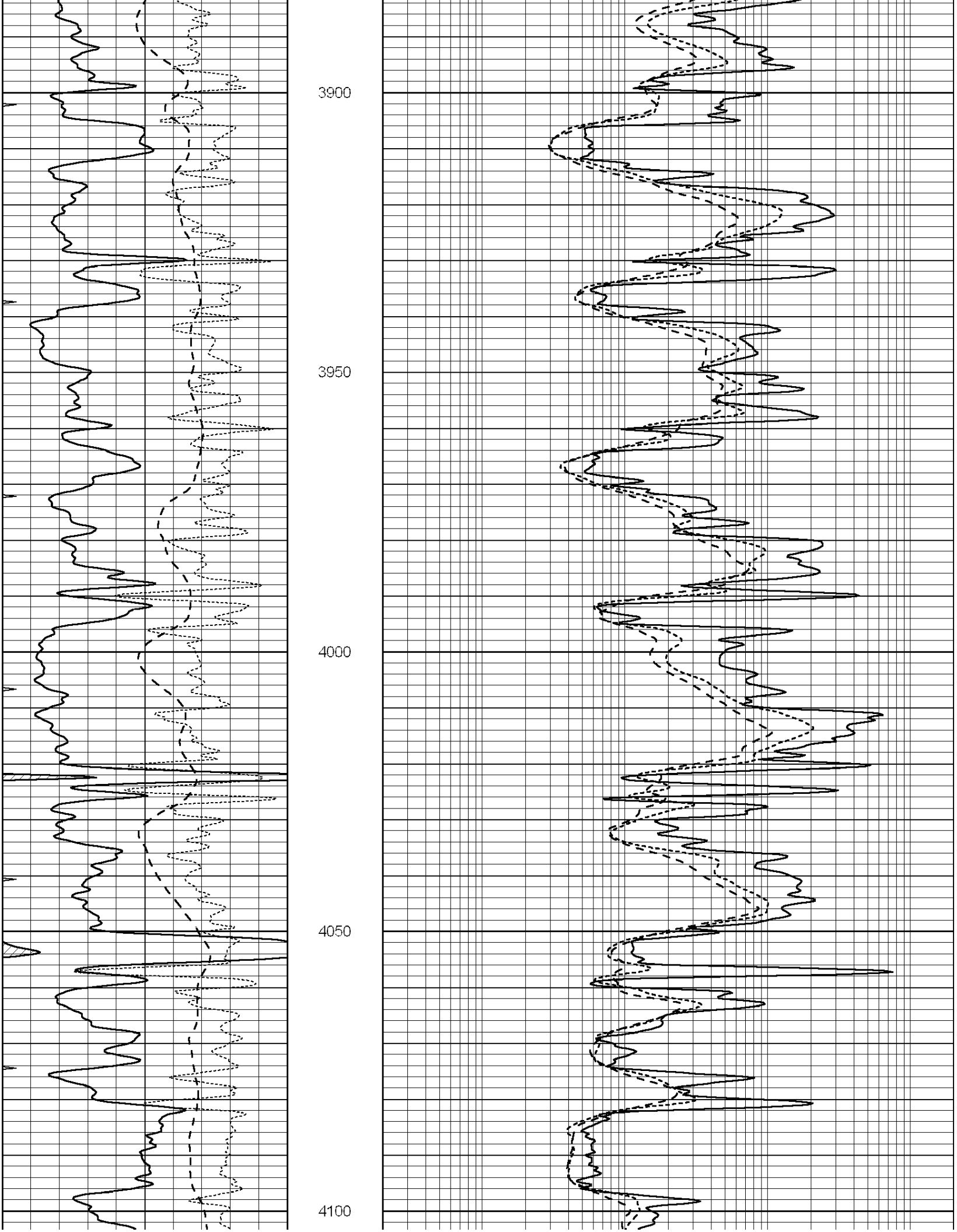


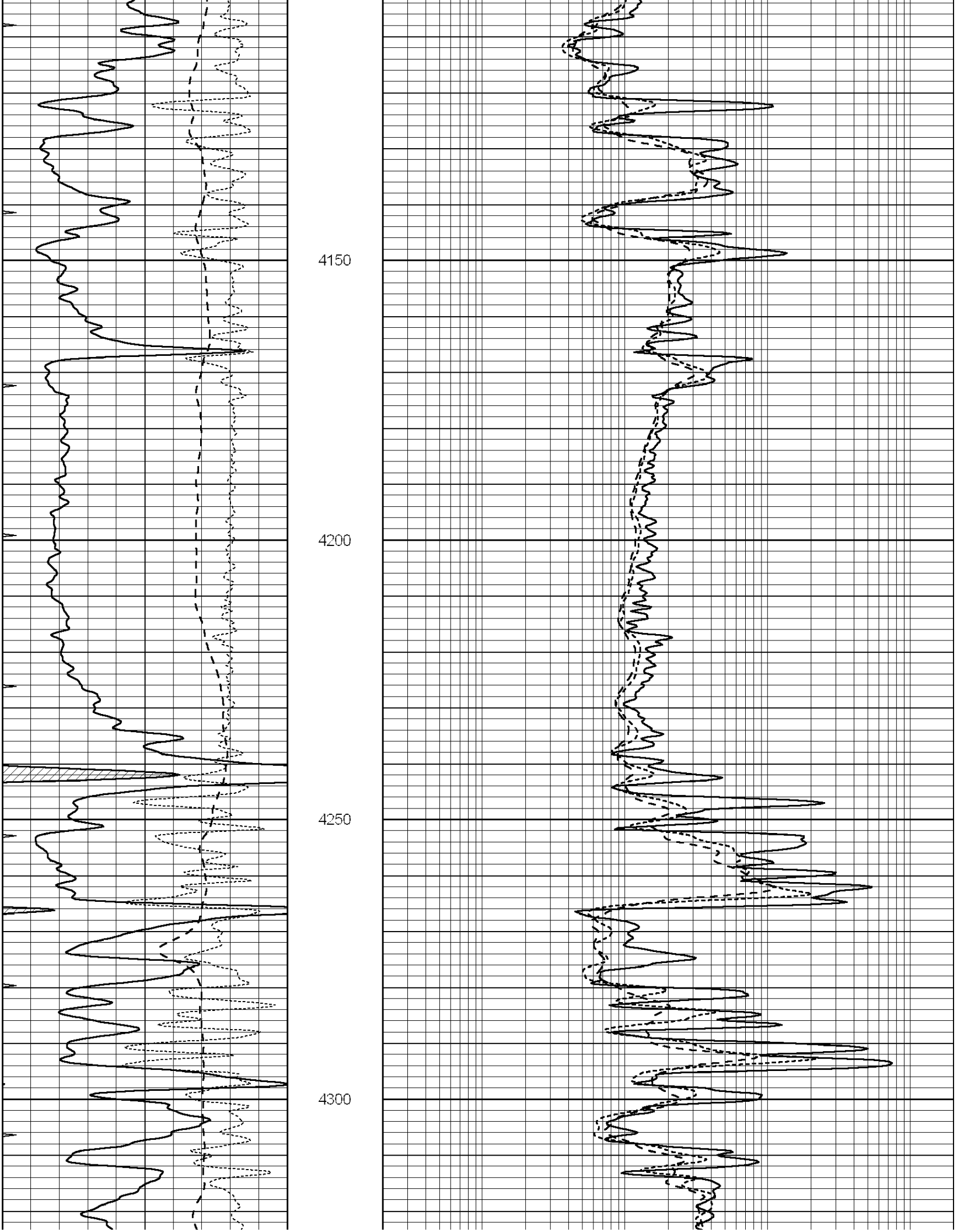


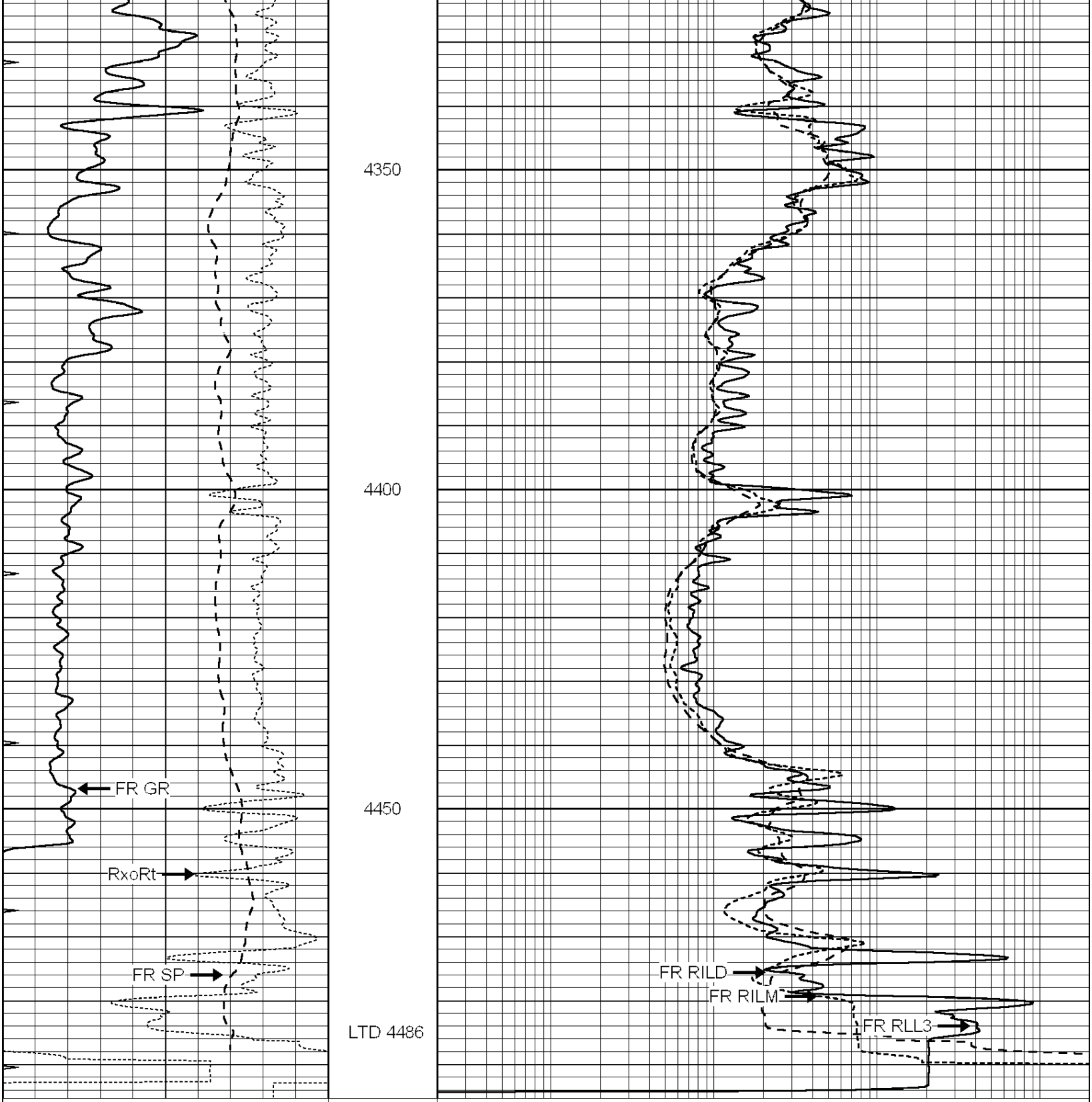

Database File: 012047pe.db
Dataset Pathname: pass3.1.2
Presentation Format: _dil
Dataset Creation: Fri Nov 29 15:44:30 2013 by Calc Open-Cased 090629
Charted by: Depth in Feet scaled 1:240




3700
3750
3800
3850


3900
3950
4000
4050
4100


4150
4200
4250
4300




NABORS

COMPLETION & PRODUCTION SERVICES

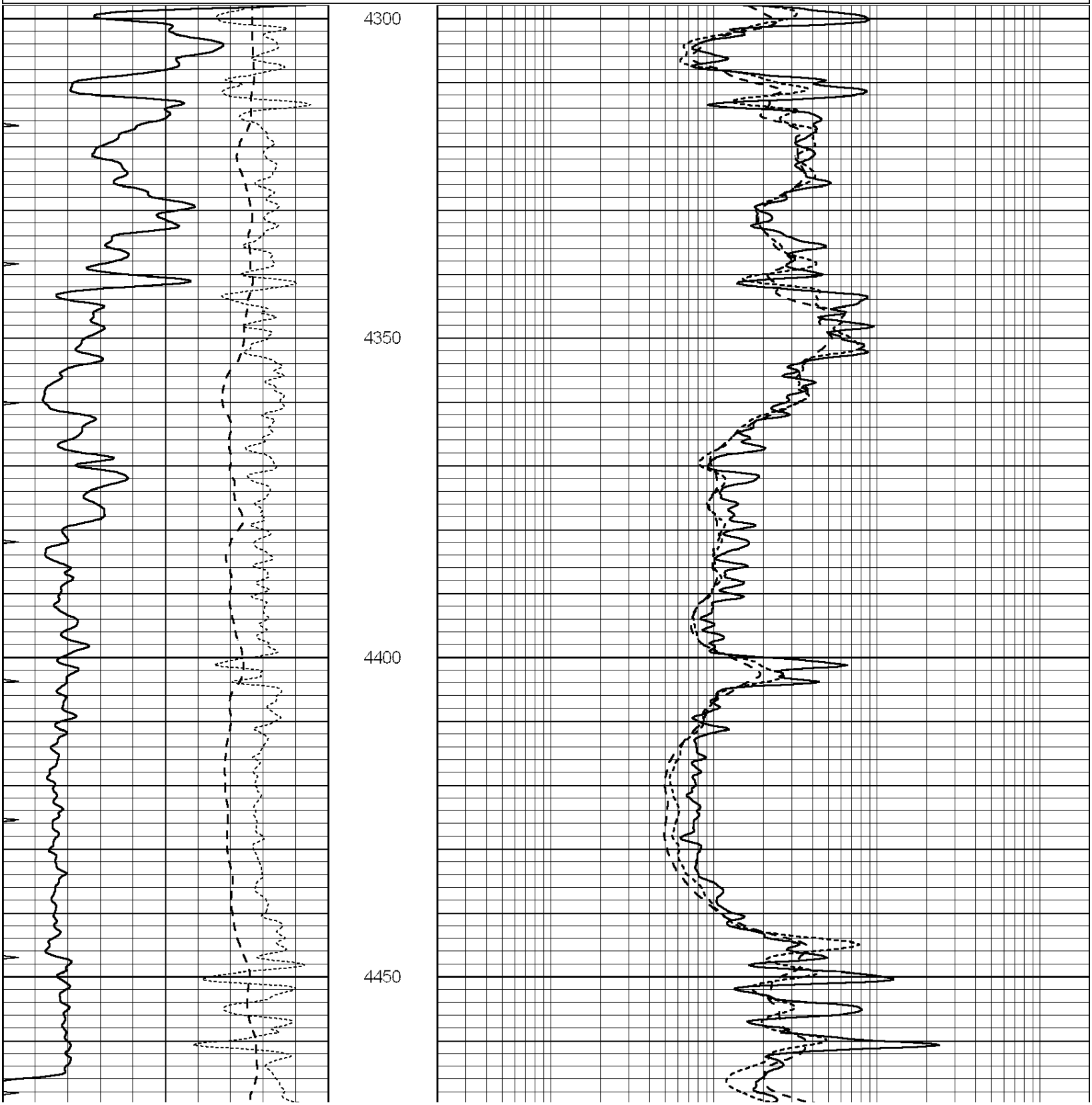
# REPEAT SECTION

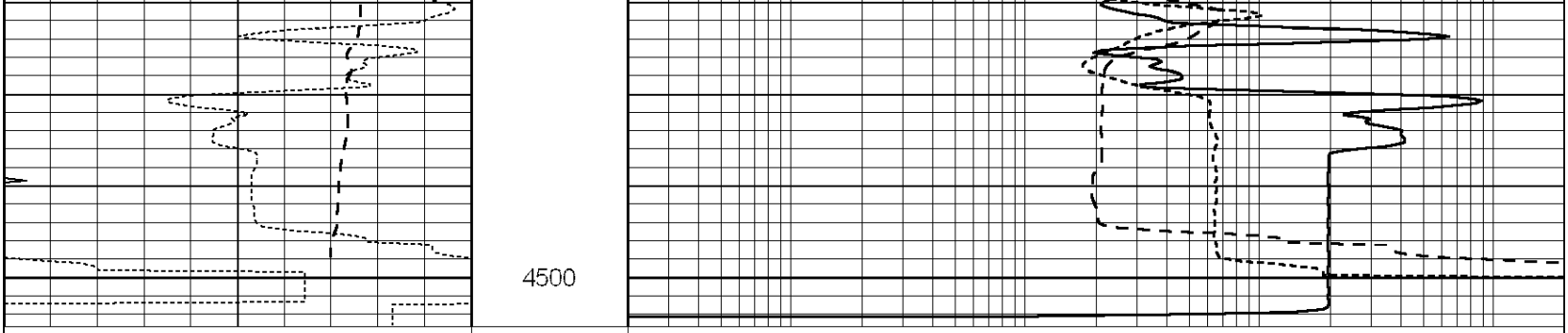
SERVICES CO.

Database File: 012047pe.db
Dataset Pathname: pass2.1.4
Presentation Format: _dil
Dataset Creation: Fri Nov 29 15:10:17 2013 by Calc Open-Cased 090629
Charted by: Depth in Feet scaled 1:240

| | | |
|---|---|---|
| 0 | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV) | 100 |
| -250 | RxoRt | 50 |
| 0 | MINMK | 20 |

| | | |
|---|---|---|
| 0.2 | RLL3 (Ohm-m) | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m) | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |






| | | |
|---|---|---|
| 0 | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV) | 100 |
| -250 | RxoRt | 50 |
| 0 | MINMK | 20 |

| | | |
|---|---|---|
| 0.2 | RLL3 (Ohm-m) | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m) | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |

## Calibration Report

Database File: 012047pe.db
Dataset Pathname: pass3.1.3
Dataset Creation: Fri Nov 29 16:15:31 2013 by Calc Open-Cased 090629

## Dual Induction Calibration Report

Serial-Model: DIL3-GEAR
Performed: Sun Nov 24 23:25:37 2013

| | Readings | | | References | | | Results | |
|---|---|---|---|---|---|---|---|---|
| Loop: | Air | Loop | | Air | Loop | | m | b |
| Deep | 0.011 | 0.656 | V | 0.000 | 400.000 | mmho/m | 500.000 | 5.000 |
| Medium | 0.013 | 0.740 | V | 0.000 | 462.500 | mmho/m | 580.000 | 5.000 |
| Internal: | Zero | Cal | | Zero | Cal | | m | b |
| Deep | 0.002 | 0.645 | V | 0.000 | 400.000 | mmho/m | 560.000 | -1.071 |
| Medium | 0.007 | 0.740 | V | 0.000 | 462.500 | mmho/m | 540.000 | -4.000 |

## Litho Density Calibration Report

Serial: 001 Model: PRB
Performed Tue Jul 03 11:37:32 2007

### Litho Density Calibration

| | Background | Magnesium | Aluminum | Sandstone | |
|---|---|---|---|---|---|
| Window 1 | 2170.6 | 9915.1 | 3855.3 | 11241.6 | cps |
| Window 2 | 2029.2 | 8716.5 | 3483.5 | 9750.8 | cps |
| Window 3 | 1665.0 | 4929.7 | 2356.8 | 5332.0 | cps |
| Window 4 | 493.3 | 492.1 | 490.0 | 486.8 | cps |
| Long Space | 0.0 | 6687.3 | 1454.3 | 7721.6 | cps |
| Short Space | 1.9 | 2149.3 | 1403.9 | 2354.5 | cps |
| Rho | | 1.7100 | 2.5900 | 1.3800 | g/cc |
| Pe | | | 2.5700 | 1.5500 | |

| | | | | | |
|---|---|---|---|---|---|
| Rib Angle | : 44.4 | Rib Slope | : 0.979 | Density/Spine Ratio | : 0.556 |
| Spine Angle | : 74.4 | Spine Slope | : 3.583 | Spine Intercept | : -18.7 |

### Caliper

| | Readings | Reference | |
|---|---|---|---|
| Low Ref | 3.5 | 8.3 | |
| High Ref | 5.4 | 14.0 | |
| | Gain: 2.9 | | Offset: -1.2 |

## Compensated Neutron Calibration Report

Serial Number: 080620
Tool Model: Probe

PRE-SURVEY VERIFICATION

| Detector | Readings | Measured | Target |
|---|---|---|---|
| Short Space | cps | | |
| Long Space | cps | pu | pu |

POST-SURVEY VERIFICATION

| Detector | Readings | Measured | Target |
|---|---|---|---|
| Short Space | cps | | |
| Long Space | cps | pu | pu |

## Gamma Ray Calibration Report

| | | |
|---|---|---|
| Serial Number: | 7 | |
| Tool Model: | Probe1 | |
| Performed: | Tue Apr 16 01:45:59 2013 | |
| Calibrator Value: | 1.0 | GAPI |
| Background Reading: | 0.0 | cps |
| Calibrator Reading: | 1.0 | cps |
| Sensitivity: | 0.4000 | GAPI/cps |