NABORS COMPLETION & PRODUCTION SERVICES CO.

COMPENSATED DENSITY / NEUTRON PE LOG

Company	MULL DRILLING COMPANY, INC.
Well	NWAU #38
Field	ARAPAHOE
County	CHEYENNE
State	COLORADO

Company MULL DRILLING COMPANY, INC.

Well NWAU #38

Field ARAPAHOE

County CHEYENNE State COLORADO

Location: API # : 05-017-07799-00

2070' FSL & 659' FWL

NW/4 - SW/4

SEC 25 TWP 13S RGE 43W

Permanent Datum GROUND LEVEL Elevation 3988

Log Measured From KELLY BUSHING 11' A.G.L.

Drilling Measured From KELLY BUSHING

Other Services: DIL/MEL, SONIC

Elevation: K.B. 3999, D.F. 3997, G.L. 3988

Date	11/3/14		
Run Number	ONE		
Depth Driller	5400		
Depth Logger	5402		
Bottom Logged Interval	5478		
Top Log Interval	4000		
Casing Driller	8 5/8"@518'		
Casing Logger	518		
Bit Size	7 7/8"		
Type Fluid in Hole	CHEMICAL MUD	CHLORIDES 600 PPM	
Density / Viscosity	9.3/62		
pH / Fluid Loss	9.0/7.2		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	2.00@60F		
Rmf @ Meas. Temp	1.50@60F		
Rmc @ Meas. Temp	2.40@60F		
Source of Rmf / Rmc	MEASUREMENT		
Rm @ BHT	.930@129F		
Time Circulation Stopped	3 HOURS		
Time Logger on Bottom	6:00 P.M.		
Maximum Recorded Temperature	129F		
Equipment Number	4854		
Location	HAYS, KANSAS		
Recorded By	JEFF LUEBBERS		
Witnessed By	GREG CONDREN		

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Comments

THANK YOU FOR USING "NABORS" HAYS, KANSAS (785) 628-6395

DIRECTIONS

ARAPAHOE, CO. & OLD 40 HWY, N. ON MICHIGAN AVE. TO DEAD END, 1/2W. TO "RD. 53", 2 1/4N., E. IN

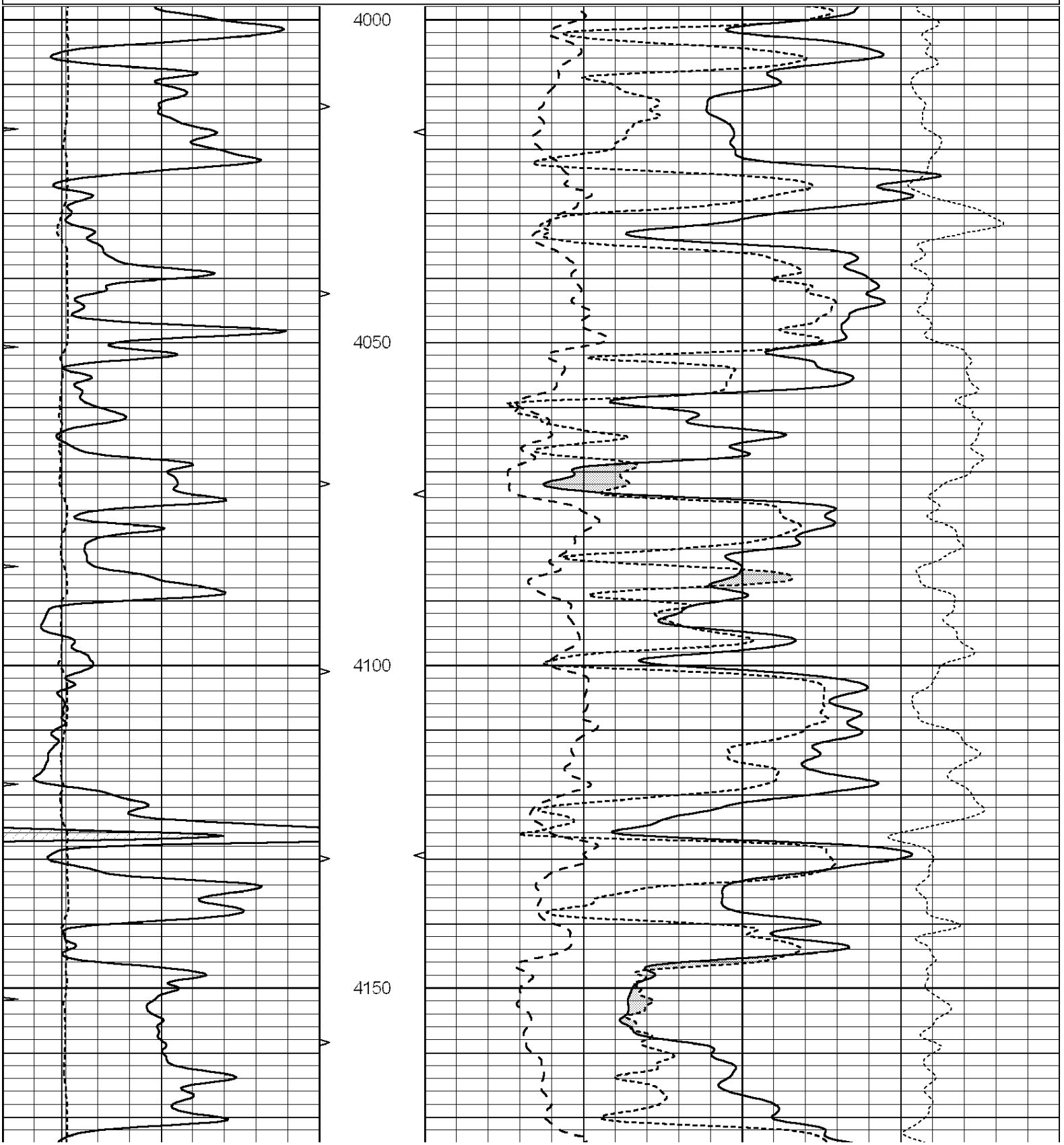
NABORS COMPLETION & PRODUCTION SERVICES CO.

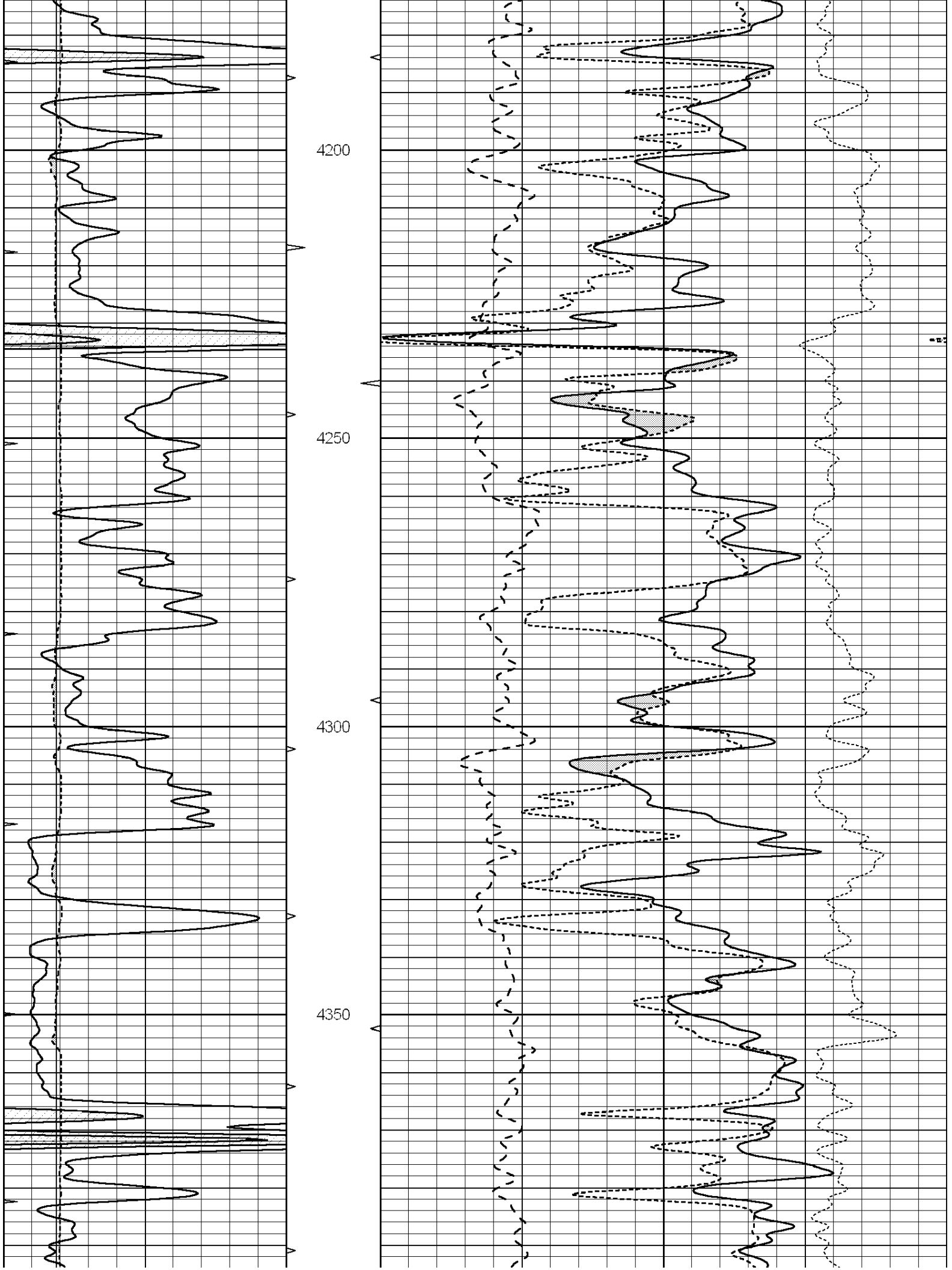
MAIN SECTION

SERVICES CO.

Database File: 25907pe.db
Dataset Pathname: pass3.15
Presentation Format: ldt_neu
Dataset Creation: Mon Nov 03 21:41:05 2014
Charted by: Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI) 150	ABHV	30	COMPENSATED DENSITY (pu)	-10
6	CALIPER (in) 16	10 (ft3) 0	30	COMPENSATED NEUTRON (pu)	-10
0	MINMK 20	TBHV	0	PE 10	-0.25 CORRECTION (g/cc) 0.25
		0 (ft3) 10			

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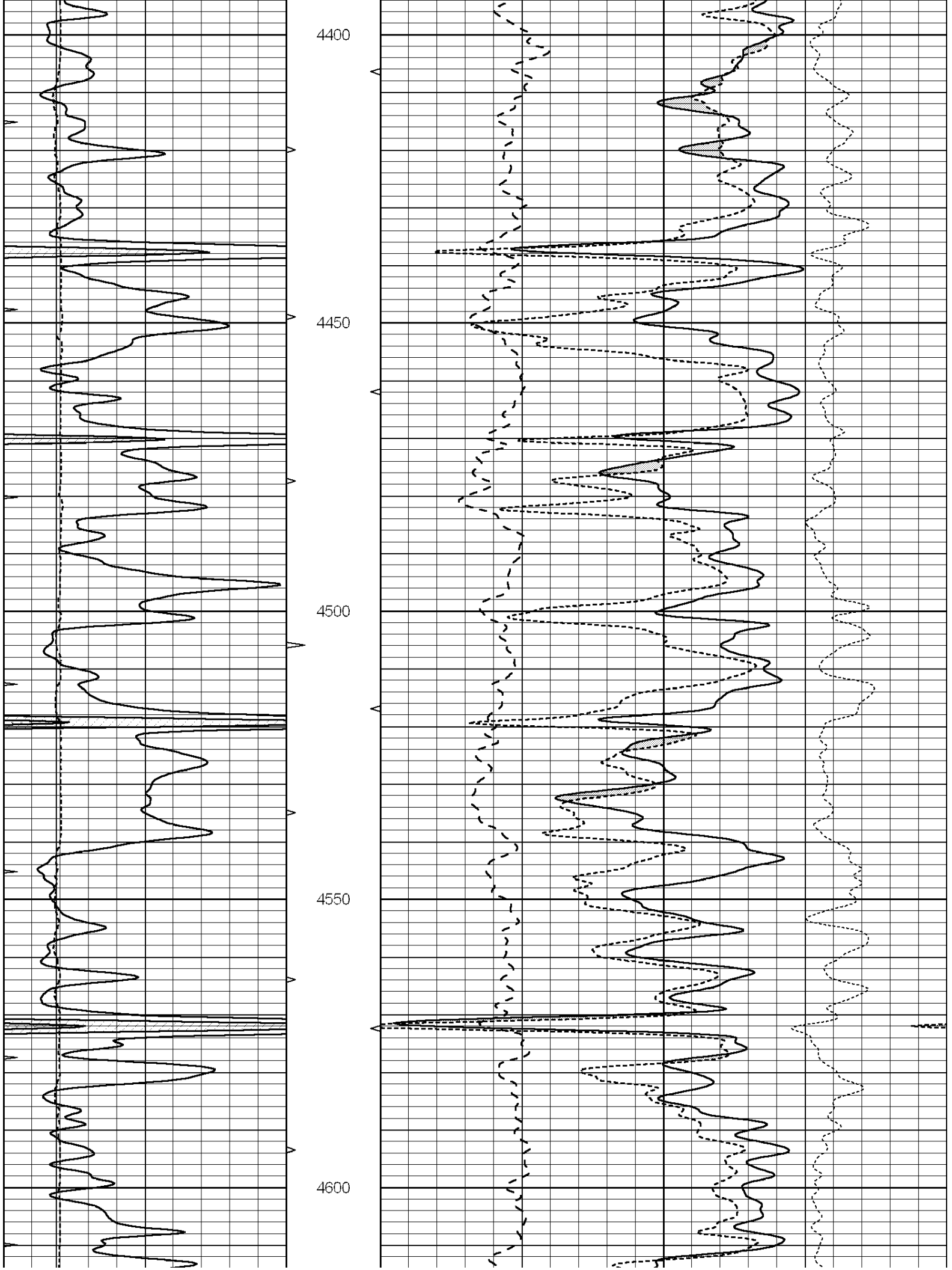
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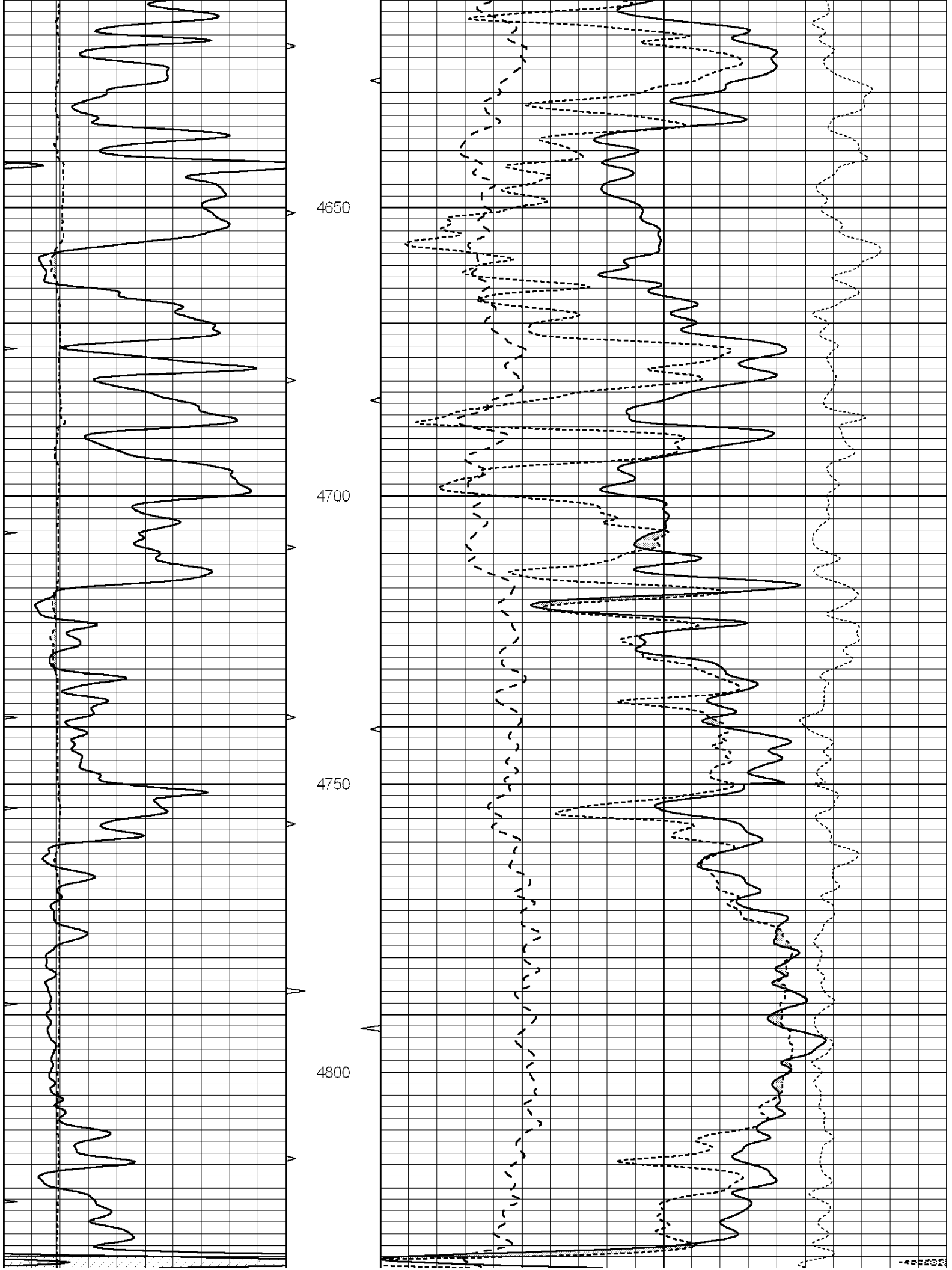
4500
4550
4600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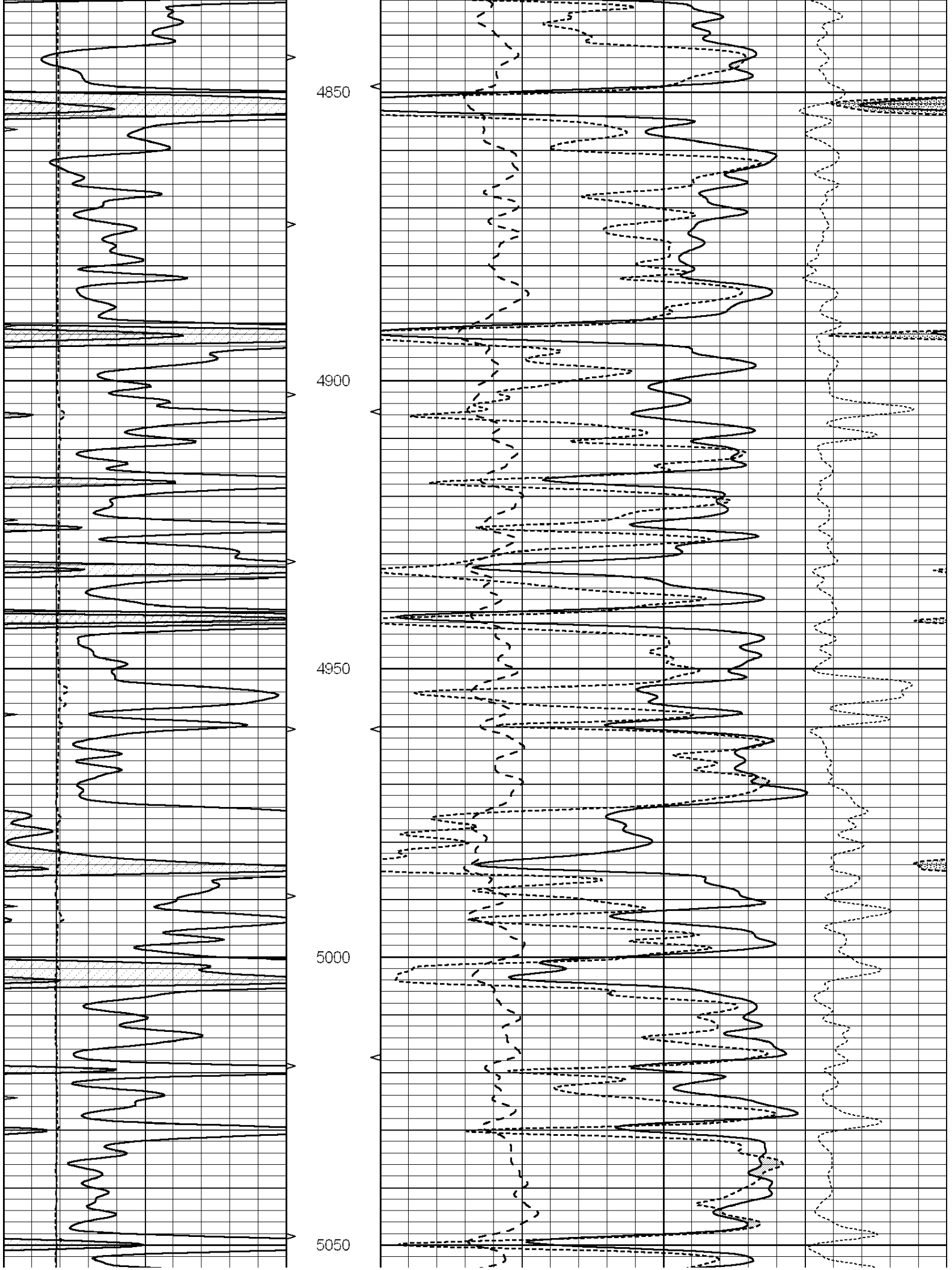
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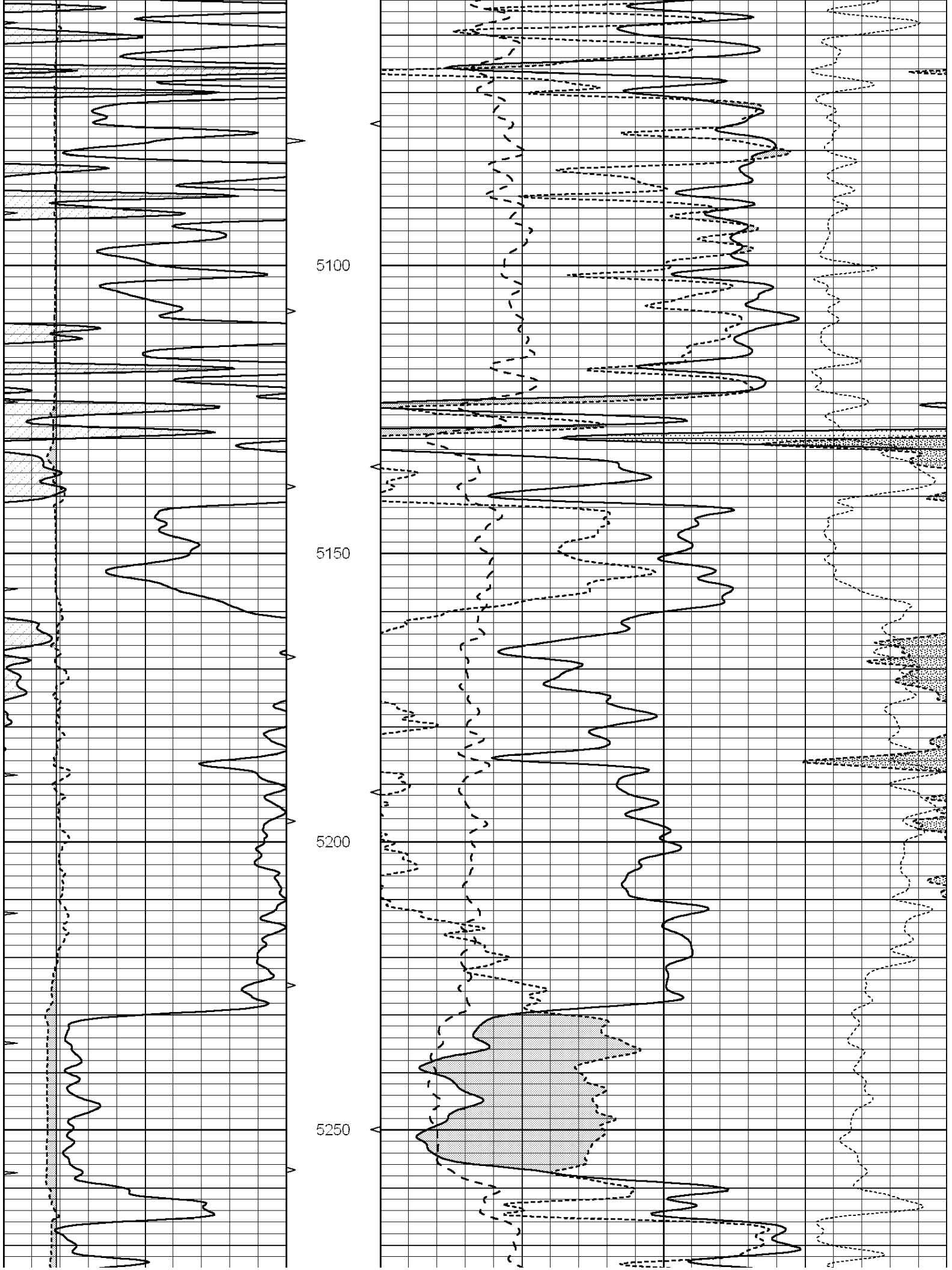
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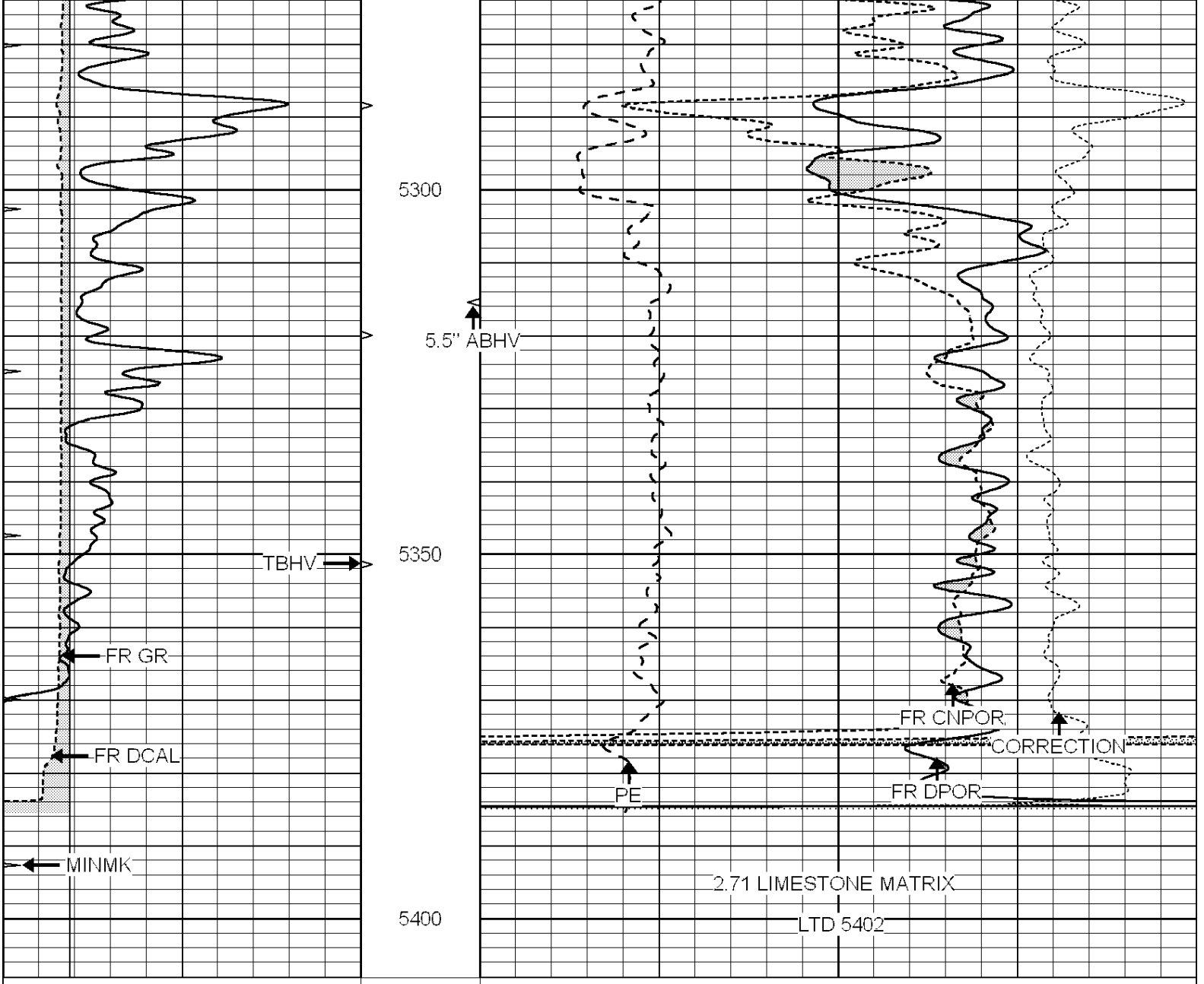


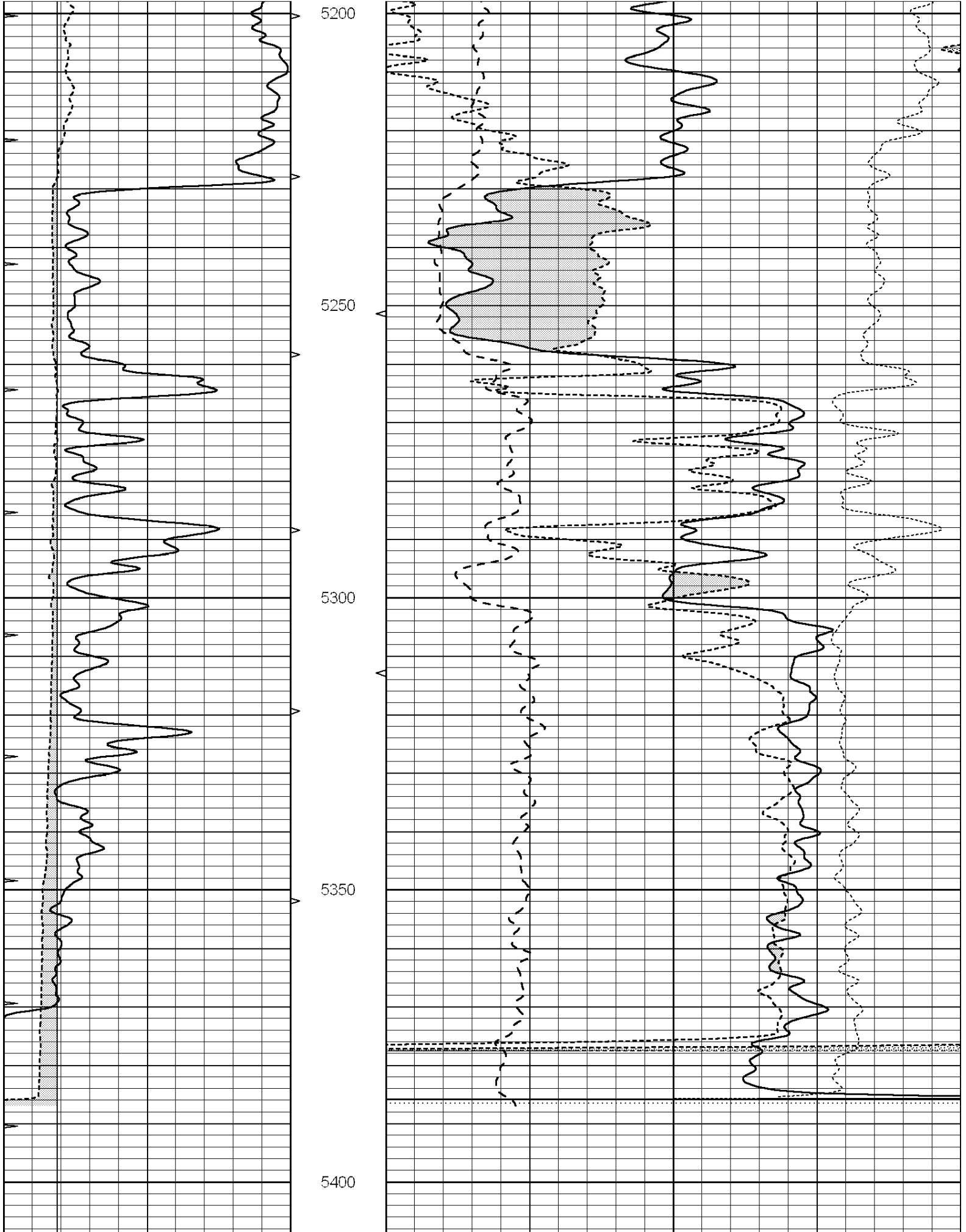
0	GAMMA RAY (GAPI)	150	ABHV	30	COMPENSATED DENSITY (pu)		-10
6	CALIPER (in)	16	10 (ft3) 0	30	COMPENSATED NEUTRON (pu)		-10
0	MINMK	20	TBHV	0	PE 10	-0.25 CORRECTION (g/cc)	0.25
			0 (ft3) 10				

NABORS
COMPLETION & PRODUCTION SERVICES CO.

REPEAT SECTION

Database File: 25907pe.db
Dataset Pathname: pass2.9
Presentation Format: ldt_neu
Dataset Creation: Mon Nov 03 20:02:21 2014 by Calc SOC 120430
Charted by: Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150	ABHV	30	COMPENSATED DENSITY (pu)		-10
6	CALIPER (in)	16	10 (ft3) 0	30	COMPENSATED NEUTRON (pu)		-10
0	MINMK	20	TBHV	0	PE 10	-0.25 CORRECTION (g/cc)	0.25
			0 (ft3) 10				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5250
5300
5350
5400
0
GAMMA RAY (GAPI)
150
ABHV
30
COMPENSATED DENSITY (pu)
-10
6
CALIPER (in)
16
10
(ft3)
0
30
COMPENSATED NEUTRON (pu)
-10

0	MINMK	20	TBHV	0	PE	10	-0.25	CORRECTION (g/cc)	0.25
			0 (ft3) 10						

Calibration Report

Database File: 25907pe.db
Dataset Pathname: pass3.15
Dataset Creation: Mon Nov 03 21:41:05 2014

Dual Induction Calibration Report

Serial-Model:	PROBE9-DILG
Surface Cal Performed:	Fri Oct 31 04:37:09 2014
Downhole Cal Performed:	Mon Jul 28 12:02:56 2008
After Survey Verification Performed:	Mon Jul 28 12:02:56 2008

Surface Calibration

	Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	-0.014	0.629	V	0.000	400.000	mmho/m	670.000	-7.000
Medium	0.039	0.728	V	0.000	464.000	mmho/m	670.000	-20.500
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.011	0.610	V	0.000	400.000	mmho/m	667.135	-7.256
Medium	0.005	0.712	V	0.000	464.000	mmho/m	655.677	-3.102

Downhole Calibration

	Readings			References			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	14.508	388.384	mmho/m	1.000	0.000
Medium	0.000	0.000	mmho/m	166.367	504.400	mmho/m	1.000	0.000
LL3		7.500	V		1400.000	Ohm-m		
		0.000	V		20.000	Ohm-m		
		-7.200	V		4000.000	mmho-m		

After Survey Verification

	Readings			Targets			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	0.000	0.000	mmho/m	0.000	0.000
Medium	0.000	0.000	mmho/m	0.000	0.000	mmho/m	0.000	0.000
LL3		1.000	Ohm-m		1.000	Ohm-m		
		0.000	Ohm-m		0.000	Ohm-m		
		1.000	mmho-m		1.000	mmho-m		

Litho Density Calibration Report

Serial: 004N Model: PRB

Master Calibration

Performed Fri May 30 11:01:00 2014

	Background	Magnesium	Aluminum	Sandstone	
Window 1	1378.8	10804.6	3492.0	12453.4	cps
Window 2	1262.4	9313.5	3076.7	10594.7	cps
Window 3	1077.6	5668.7	2076.0	6314.8	cps
Window 4	306.4	313.0	306.4	315.6	cps
Long Space	0.0	8051.0	1814.3	9332.3	cps
Short Space	1.9	1706.1	1146.0	1707.6	cps
Rho		1.7100	2.5900	1.3800	g/cc
Pe		0.0000	2.5700	1.5500	

Rib Angle : 45.0 Rib Slope : 1.002 Density/Spine Ratio : 0.571

Rib Angle	: 45.0	Rib Slope	: 1.062	Density/Spine Ratio	: 0.371
Spine Angle	: 75.0	Spine Slope	: 3.745	Spine Intercept	: -18.9

Before Survey Verification — Performed Wed Dec 31 18:00:00 1969

Window 1	0.0	0.0	0.0	0.0	cps
Window 2	0.0	0.0	0.0	0.0	cps
Window 3	0.0	0.0	0.0	0.0	cps
Window 4	0.0	0.0	0.0	0.0	cps
Long Space	0.0	0.0	0.0	0.0	cps
Short Space	0.0	0.0	0.0	0.0	cps
Measured Rho		0.0000	0.0000	0.0000	g/cc
Measured Correction		0.0000	0.0000	0.0000	g/cc
Measured Pe			0.0000	0.0000	

After Survey Verification — Performed Wed Dec 31 18:00:00 1969

Window 1	0.0	0.0	0.0	0.0	cps
Window 2	0.0	0.0	0.0	0.0	cps
Window 3	0.0	0.0	0.0	0.0	cps
Window 4	0.0	0.0	0.0	0.0	cps
Long Space	0.0	0.0	0.0	0.0	cps
Short Space	0.0	0.0	0.0	0.0	cps
Measured Rho		0.0000	0.0000	0.0000	g/cc
Measured Correction		0.0000	0.0000	0.0000	g/cc
Measured Pe			0.0000	0.0000	

Compensated Neutron Calibration Report

Serial Number: 070808
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: 070558
Tool Model: OPEN_GR
Performed: Mon Jun 30 21:53:39 2014

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
Calibrator Reading: 1.0 cps

Sensitivity: 0.2800 GAPI/cps