



SUPERIOR
Hays,
Kansas

**COMPENSATED
DENSITY / NEUTRON
PE LOG**

Company CRAWFORD OIL & GAS CO. LLC.
Well ZIMMERMAN #1-24
Field WILDCAT
County GOVE
State KANSAS

Company CRAWFORD OIL & GAS COMPANY, LLC.
Well ZIMMERMAN #1-24
Field WILDCAT
County GOVE State KANSAS

Location: API # : 15-063-22032-0000
2617' FSL & 622' FEL
SEC 24 TWP 13S RGE 31W
Permanent Datum GROUND LEVEL Elevation 2835
Log Measured From KELLY BUSHING 5' A.G.L.
Drilling Measured From KELLY BUSHING
Other Services
DIL/MEL
SONIC
Elevation
K.B. 2840
D.F. 2838
G.L. 2835

Date	8/18/12		
Run Number	ONE		
Depth Driller	4590		
Depth Logger	4590		
Bottom Logged Interval	4566		
Top Log Interval	3400		
Casing Driller	8 5/8"@218'		
Casing Logger	218		
Bit Size	7 7/8"		
Type Fluid in Hole	CHEMICAL MUD	CHLORIDES 2,000 PPM	
Density / Viscosity	9.460		
pH / Fluid Loss	10.5/7.8		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	2.40@88F		
Rmt @ Meas. Temp	1.80@88F		
Rmc @ Meas. Temp	2.88@88F		
Source of Rmf / Rmc	MEASUREMENT		
Rm @ BHT	1.75@121F		
Time Circulation Stopped	2.5 HOURS		
Time Logger on Bottom	7:00 A.M.		
Maximum Recorded Temperature	121F		
Equipment Number	4010		
Location	HAYS, KANSAS		
Recorded By	JEFF LUEBBERS		
Witnessed By	LARRY FRIEND		

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, 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. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

THANK YOU FOR USING SUPERIOR WELL SERVICE HAYS, KANSAS (785) 628-6395
DIRECTIONS
GRINNELL, KS. & I-70, 10 1/2S. TO "RD. S", 4W. TO "RD. 22", 3 1/2S., W. INTO

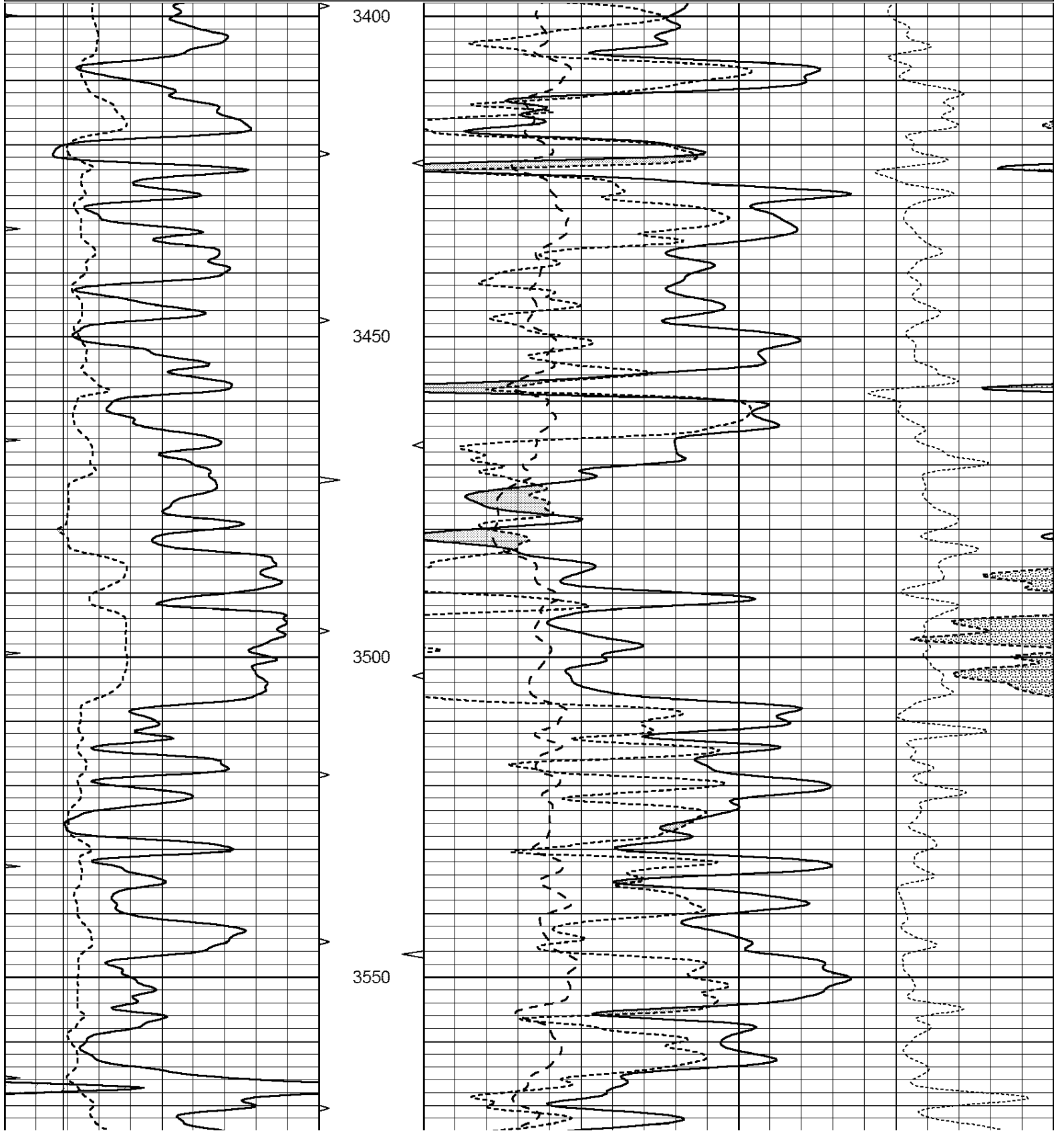


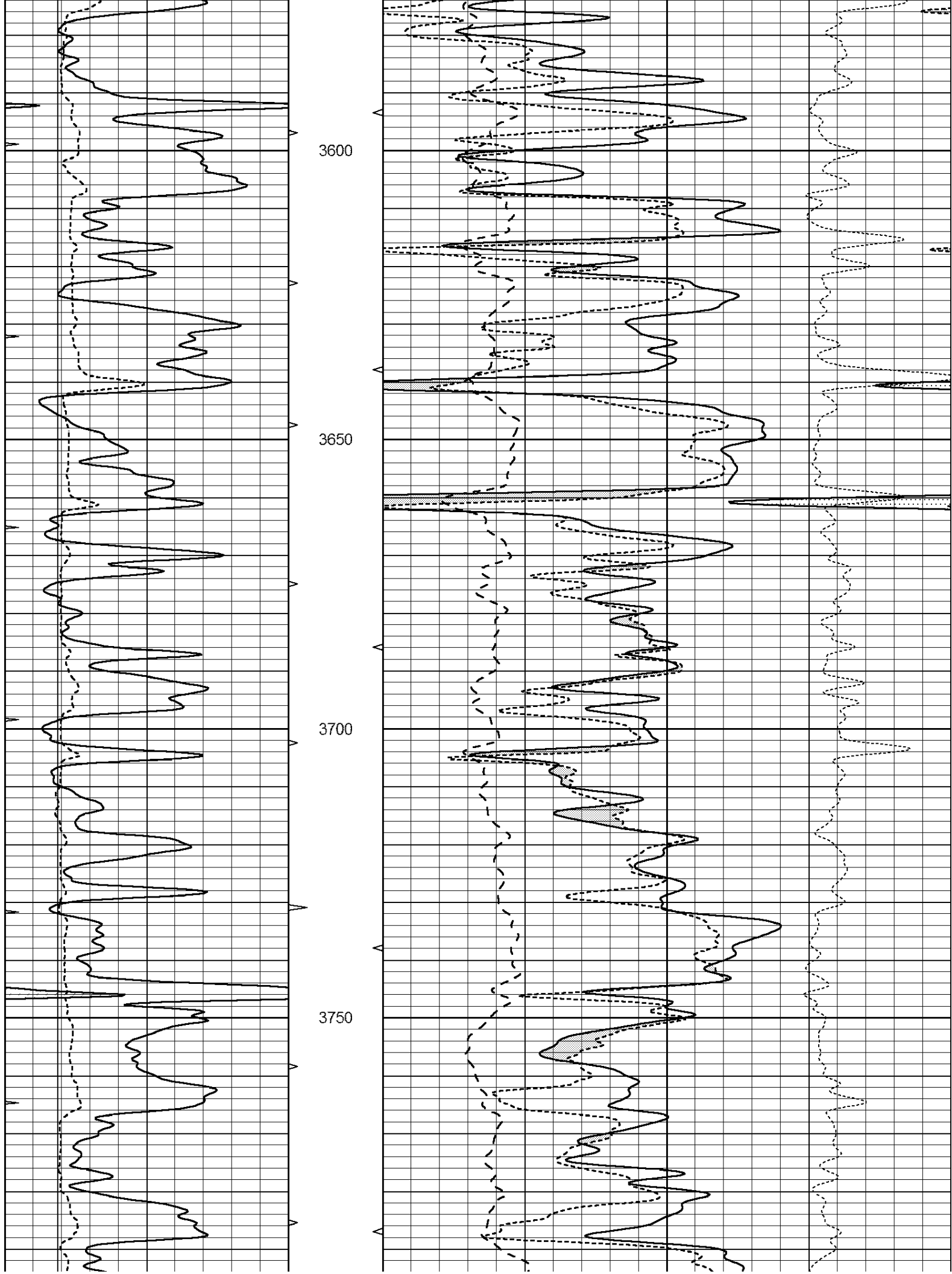
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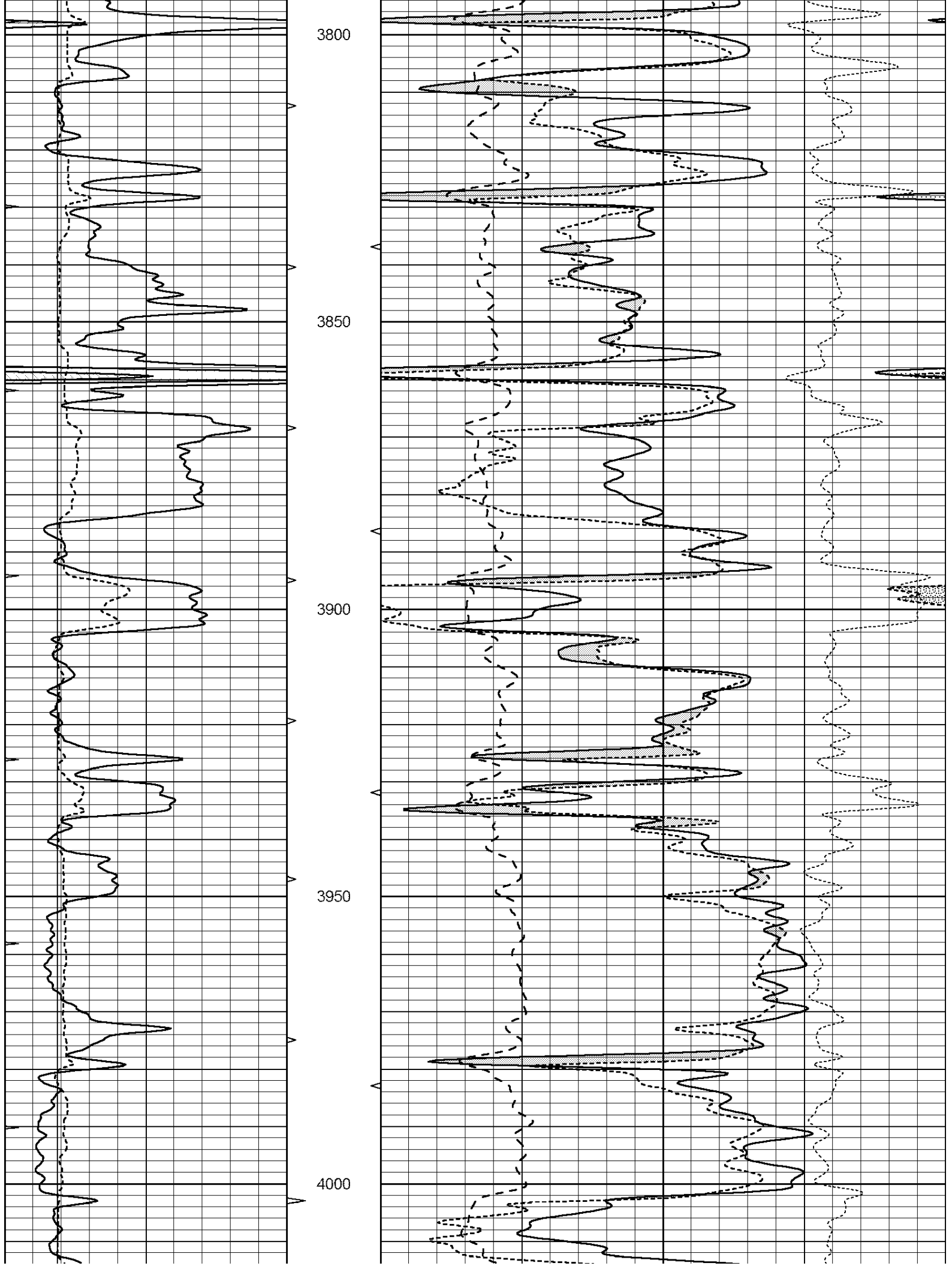
MAIN SECTION

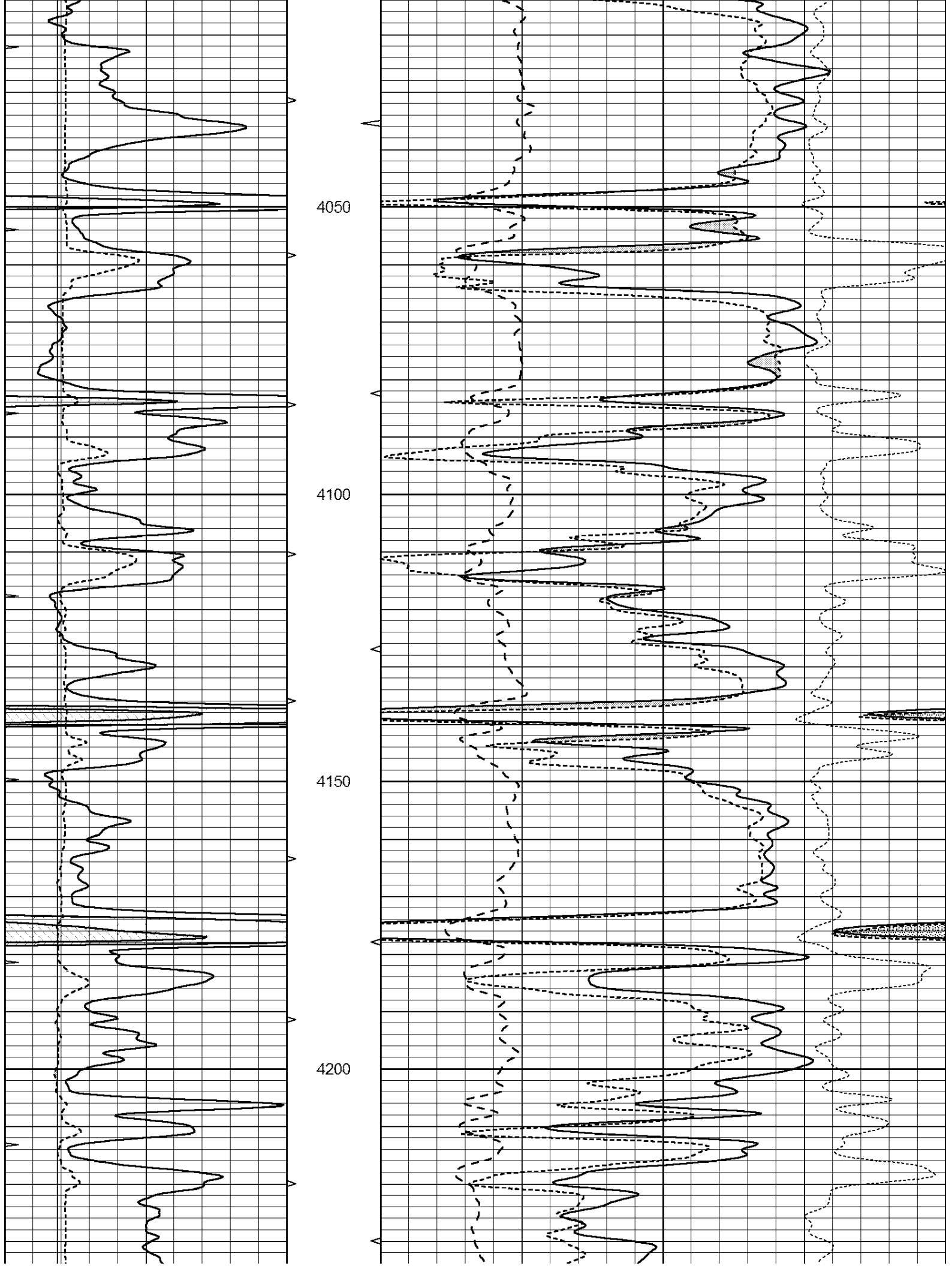
Database File: 409504pe.db
 Dataset Pathname: pass3.8
 Presentation Format: ldt_neu
 Dataset Creation: Sat Aug 18 08:38:50 2012 by Calc Open-Cased 110302
 Charted by: Depth in Feet scaled 1:240

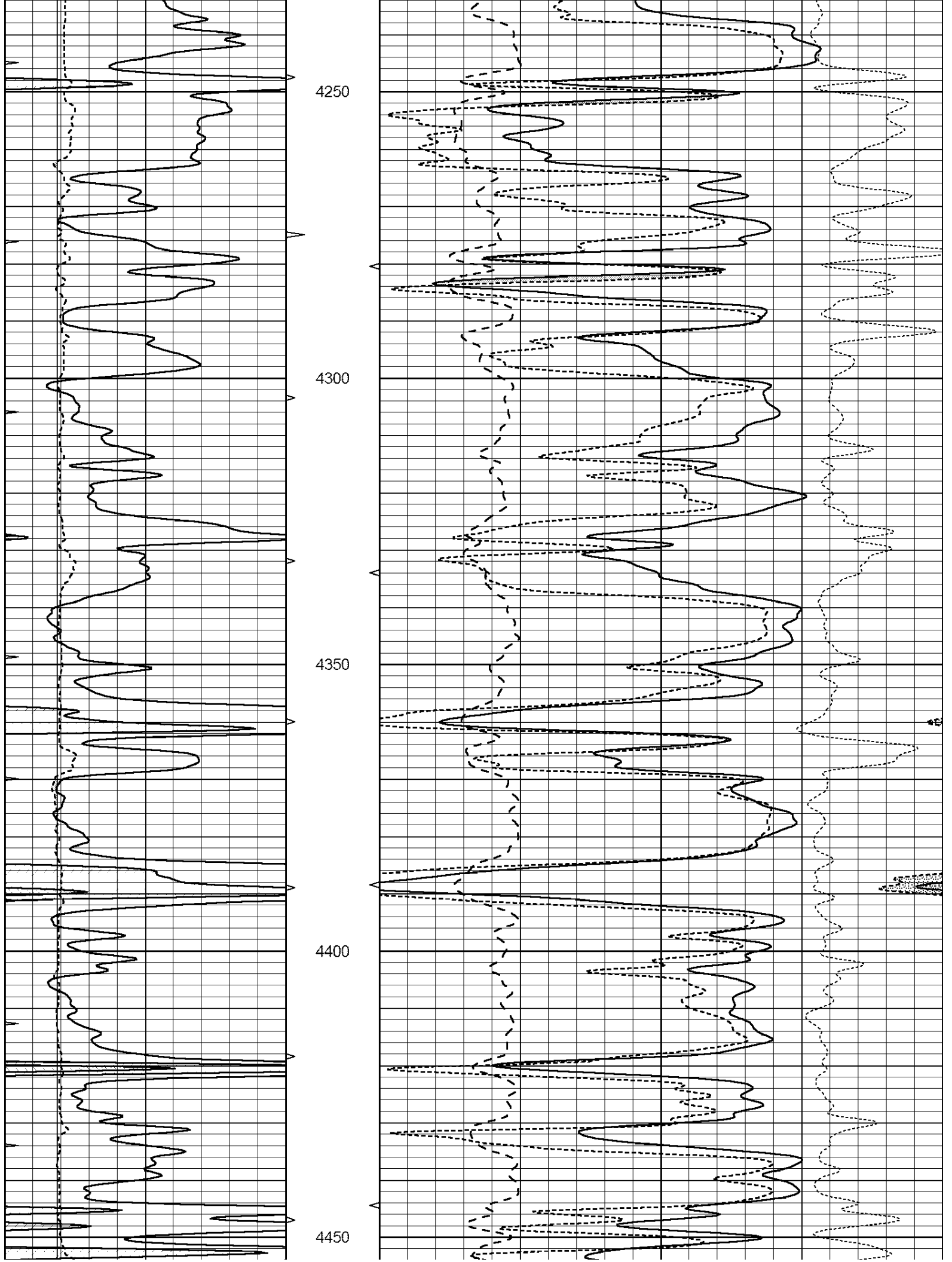
0	GAMMA RAY (GAPI)	150	ABHV	30	COMPENSATED DENSITY (pu)		-10
6	CALIPER (in)	16	10 (ft3)	0	COMPENSATED NEUTRON (pu)		-10
0	MINMK	20	TBHV	0	PE	10	-0.25 CORRECTION (g/cc) 0.25
			0 (ft3)	10			

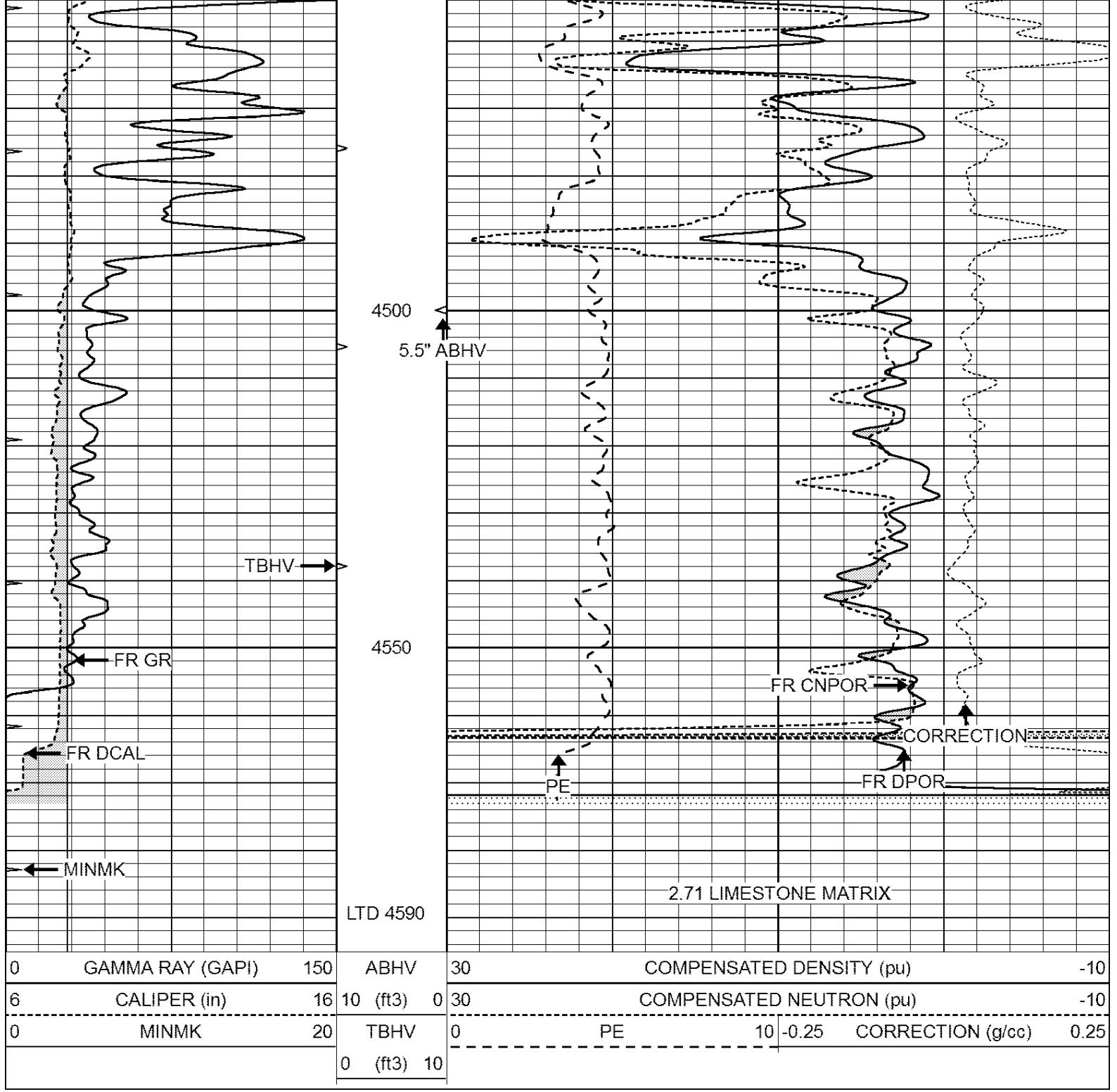












0	GAMMA RAY (GAPI)	150	ABHV	30	COMPENSATED DENSITY (pu)	-10		
6	CALIPER (in)	16	10 (ft3)	0	30	COMPENSATED NEUTRON (pu)	-10	
0	MINMK	20	TBHV	0	10	-0.25	CORRECTION (g/cc)	0.25
			0 (ft3)	10				



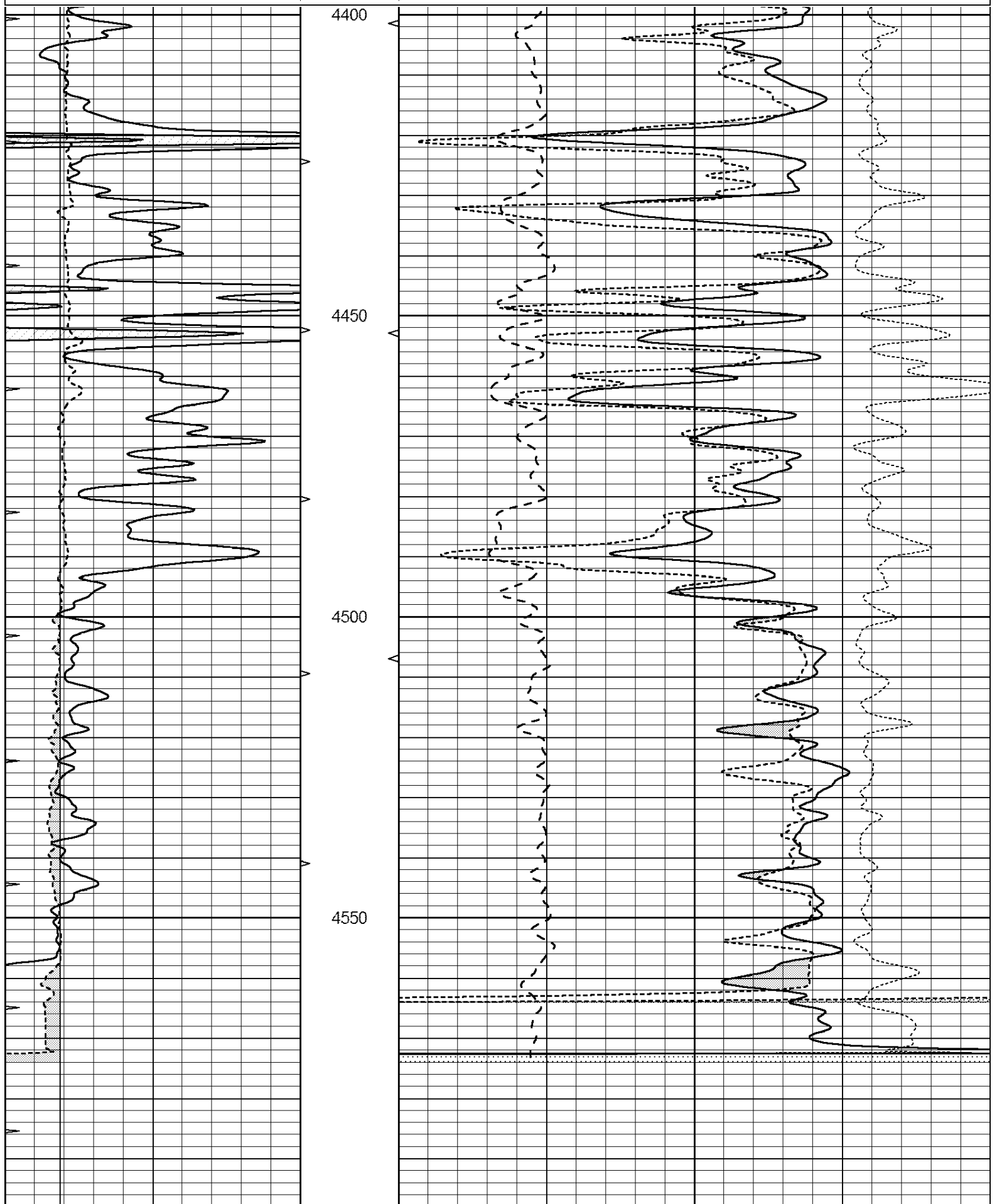
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REPEAT SECTION

Database File: 409504pe.db
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 Presentation Format: ldt_neu
 Dataset Creation: Sat Aug 18 07:39:30 2012 by Calc Open-Cased 110302
 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	10	-0.25	CORRECTION (g/cc)	0.25

0 (ft3) 10



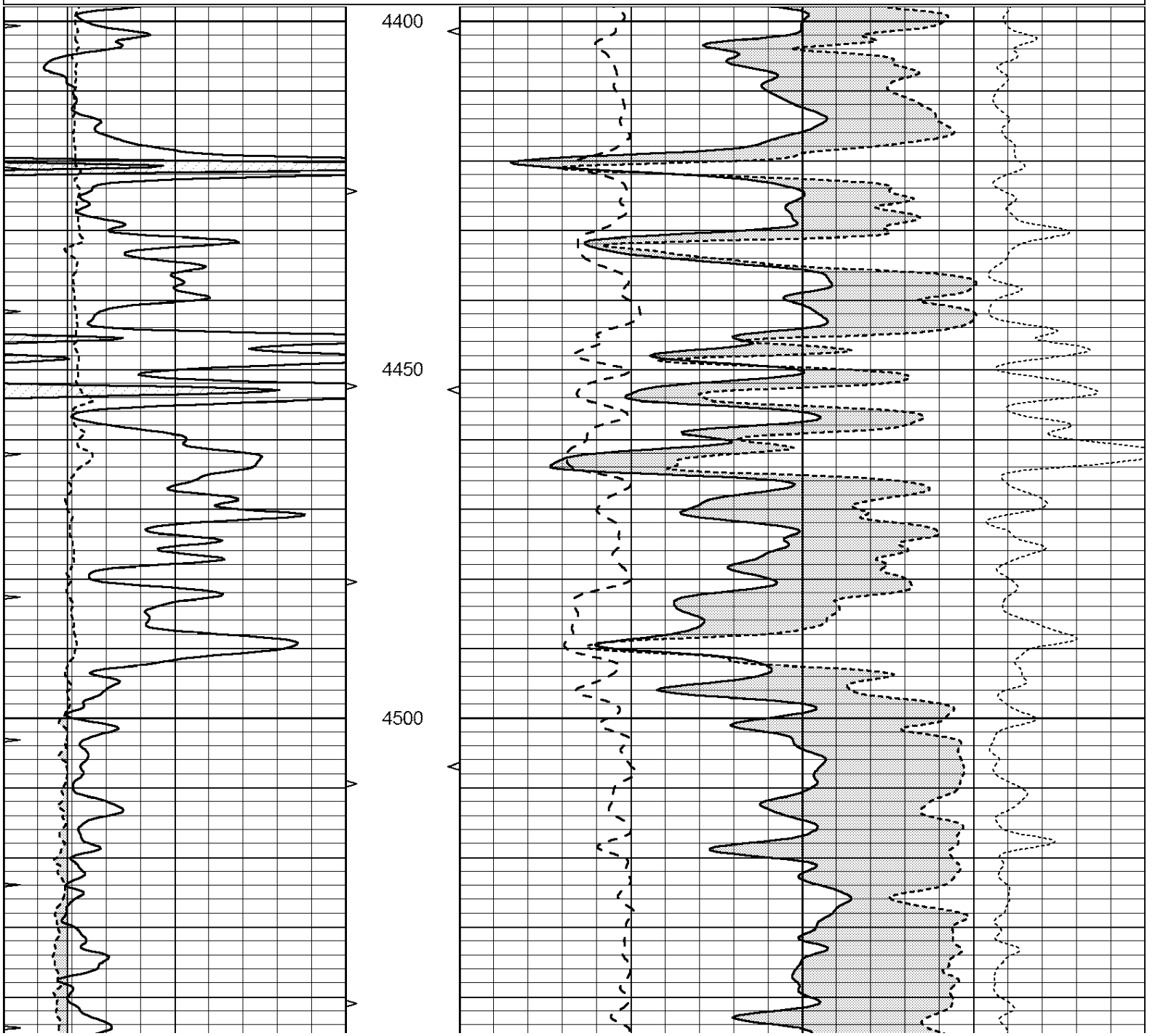


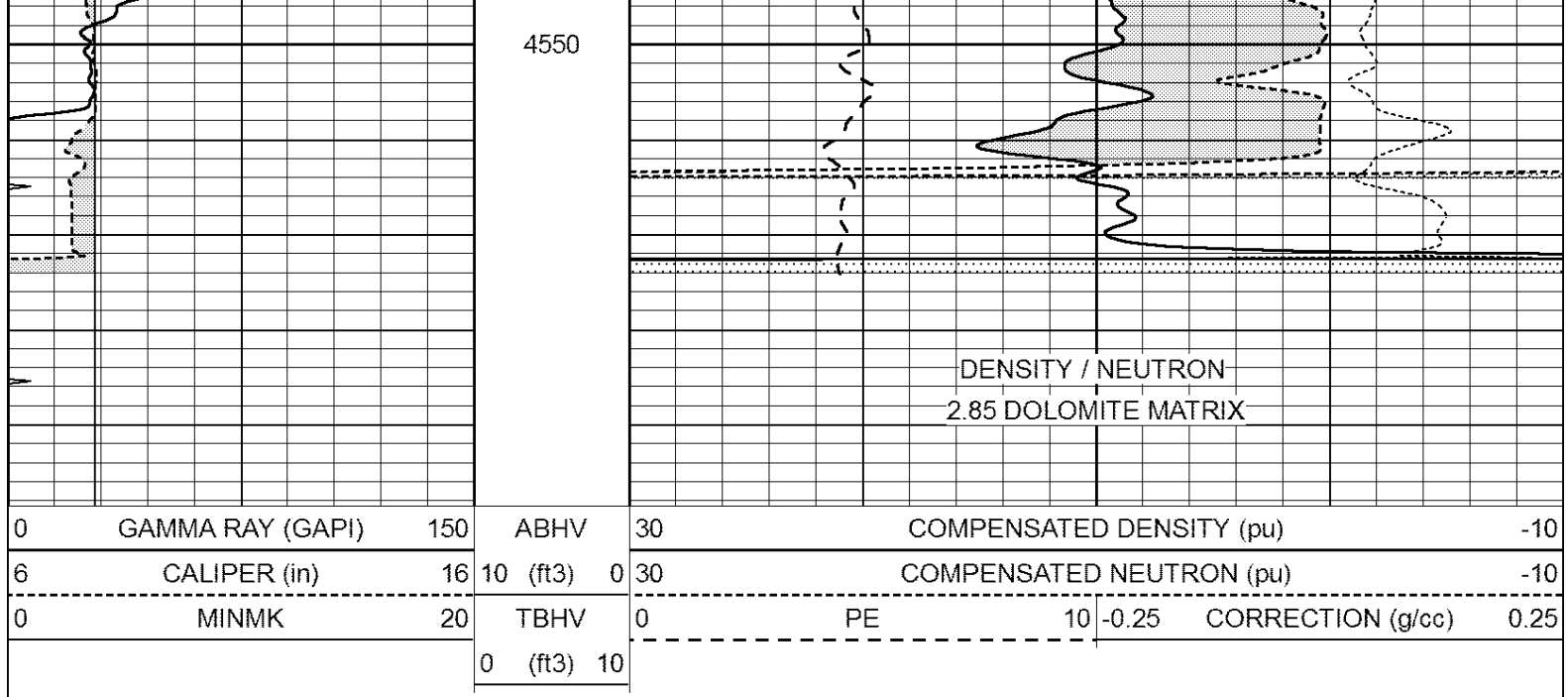
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DOLOMITE MATRIX

Database File: 409504pe.db
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 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	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: 409504pe.db
 Dataset Pathname: pass3.8
 Dataset Creation: Sat Aug 18 08:38:50 2012 by Calc Open-Cased 110302

Dual Induction Calibration Report

Serial-Model: DIL3-GEAR
 Performed: Sat Aug 18 07:19:20 2012

Loop:	Readings				References		Results	
	Air	Loop			Air	Loop	m	b
Deep	0.011	0.656	V	0.000	400.000	mmho/m	640.000	10.000
Medium	0.013	0.740	V	0.000	462.500	mmho/m	700.000	-5.000
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.002	0.645	V	0.000	400.000	mmho/m	622.059	-1.071
Medium	0.007	0.740	V	0.000	462.500	mmho/m	631.393	-4.555

Litho Density Calibration Report

Serial: 006 Model: PRB
 Performed Sun Aug 15 09:48:41 2010

Litho Density Calibration

	Background	Magnesium	Aluminum	Sandstone	
Window 1	1686.6	11612.8	3932.0	12718.8	cps
Window 2	1531.4	9204.7	3267.8	9851.9	cps
Window 3	1198.3	4733.6	1952.5	4920.6	cps
Window 4	317.3	321.2	325.9	303.6	cps
Long Space	0.0	7673.3	1736.4	8320.4	cps
Short Space	1.7	2548.5	1657.2	2628.8	cps
Rho		1.7100	2.5900	1.3800	g/cc
Pe			2.5700	1.5500	
Rib Angle	: 43.8	Rib Slope	: 0.961	Density/Spine Ratio	: 0.569
Spine Angle	: 73.8	Spine Slope	: 3.453	Spine Intercept	: -18.1

Caliper

	Readings	Reference	
Low Ref	3.5	7.6	
High Ref	5.5	15.0	
	Gain: 3.8		Offset: -5.9

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:	070559	
Tool Model:	OPEN_GR	
Performed:	Thu Jul 26 17:34:29 2012	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	0.3000	GAPI/cps