



Compensated Neutron Litho Density Log

Company	Okland Oil Company	Company	Okland Oil Company
Well	Liberty1-8	Well	Liberty1-8
Field	Willowdale NW	Field	Willowdale NW
County	Kingman	County	Kingman
State	Kansas	State	Kansas
Location:	1217' FNL & * 1626' FWL	API # :	15-095-22305
SEC 8	TWP 29S	RGE 9W	
Permanent Datum	G. L.	Elevation	1711 ft.
Log Measured From	K. B.		13 ft. above perm. datum
Drilling Measured From	K. B.		
		Other Services	MEL, MAS, IAT
		Elevation	1724 ft.
		D.F.	1723 ft.
		G.L.	1711 ft.
Date	13-Sept-2016		
Run Number	One		
Depth Driller	4650'		
Depth Logger	4650'		
Bottom Logged Interval	4648'		
Top Log Interval	3250'		
Casing Driller	8.625" @ 223'		@
Casing Logger	225'		
Bit Size	7.875"		@
Type Fluid in Hole	WBM		
Density / Viscosity	9.3 / 64		
pH / Fluid Loss	10.5 / 8		
Source of Sample	Mud Pit		
Rm @ Meas. Temp	0.97 @ 85 °F		@
Rmf @ Meas. Temp	0.73 @ 85 °F		@
Rmc @ Meas. Temp	1.46 @ 85 °F		@
Source of Rmf / Rmc	Calculated		
Rm @ BHT	0.70 @ 117 °F		@
Time Circulation Stopped	15:30		
Time Logger on Bottom	16:30		
Maximum Recorded Temperature	117°F		
Equipment Number	11007		
Location	OKC		
Recorded By	B. Oetting		
Witnessed By	G. Alletag / A. Watson		

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Equipment and Log Data															
Service Order: 23348															
Gamma			Density			Neutron			Sonic			IAT			
Run No.		One	Run No.		One	Run No.		One	Run No.		One	Run No.		One	
Serial No.		47	Serial No.		110	Serial No.		71	Serial No.		38SS	Serial No.		106	
O.D.		3.375 in.	Source No.		50129B	Source No.		50202G	Centralizers		2	Standoffs		2 @ 0.5"	
			O.D.		4.5 in.	O.D.		3.375 in.	O.D.		3.375 in.	O.D		3.875 in.	
Logging Pass Data															
General			Gamma		Density			Neutron			Sonic			IAT	
			Scales		Scales			Scales			Scales			Scales	
Run	Depths		Left	Right	Left	Right	Matrix	Left	Right	Matrix	Left	Right	Matrix	Left	Right
One	TD	CSG	0	150	0.3	-0.1	2.71 g/cc	0.3	-0.1	Lime	0.3	-0.1	47.6 usec/ft	0.12	2000
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

Toolstring ran as per tool sketch,
2.71 g/cc Matrix Density used to calculate LDT porosity
Limestone Matrix used to calculate Neutron porosity
47.6 usec/ft Matrix used to calculate MAS porosity
4.5" production casing used to calculate annular hole volume.

Chlorides: 3900 ppm
LCM 4 #/bbl
LCM can effect LDT and MEL readings

YOUR CREW TODAY: J. Bennett, B. Barton
THANK YOU FOR CHOOSING ALLIED WIRELINE. OKLAHOMA CITY, OK. (405) 445-7135.

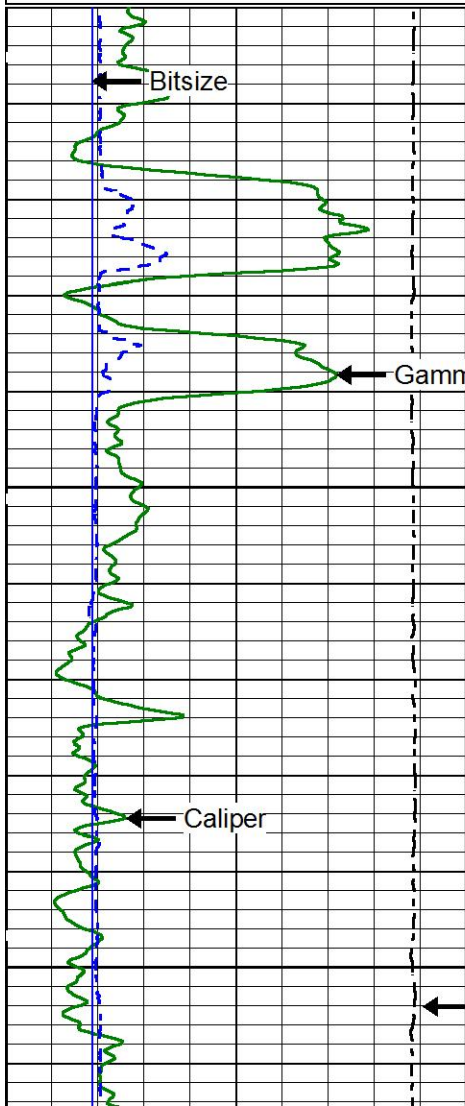


Main Pass

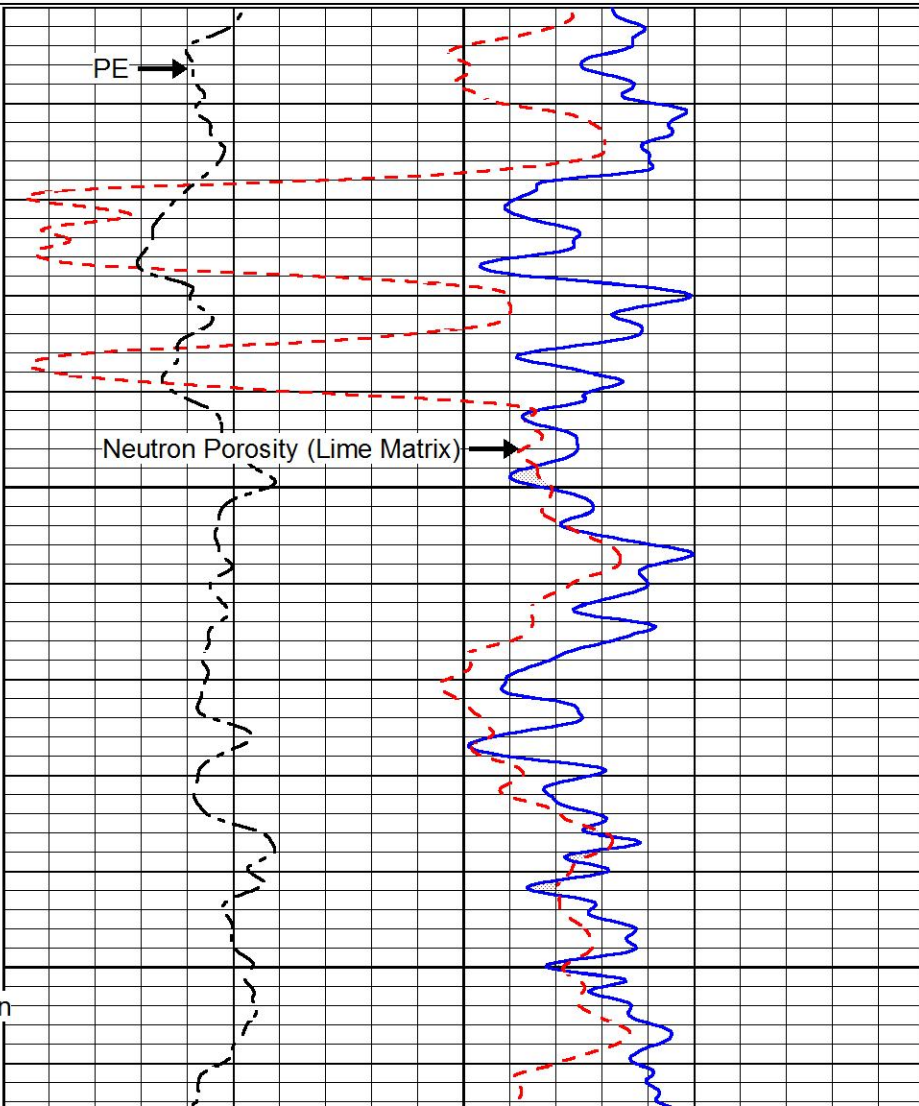
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Dataset Pathname run2/pass8
Presentation Format OKC0C5~1
Dataset Creation Tue Sep 13 22:19:02 2016 by Calc Sondex
Charted by Depth in Feet scaled 1:240

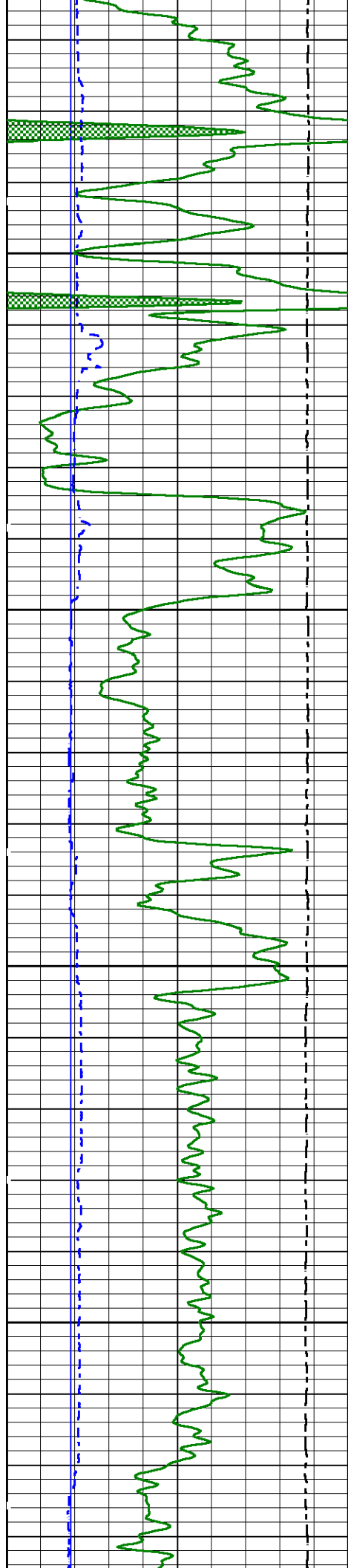
0	Gamma Ray (GAPI)	150
6	Caliper (in)	16
6	Bitsize (in)	16
Line Tension		
10000 (lb)		0

0.3	Density Porosity (2.71 Matrix)	-0.1
0.3	Neutron Porosity (Lime Matrix)	-0.1
0	PE	10



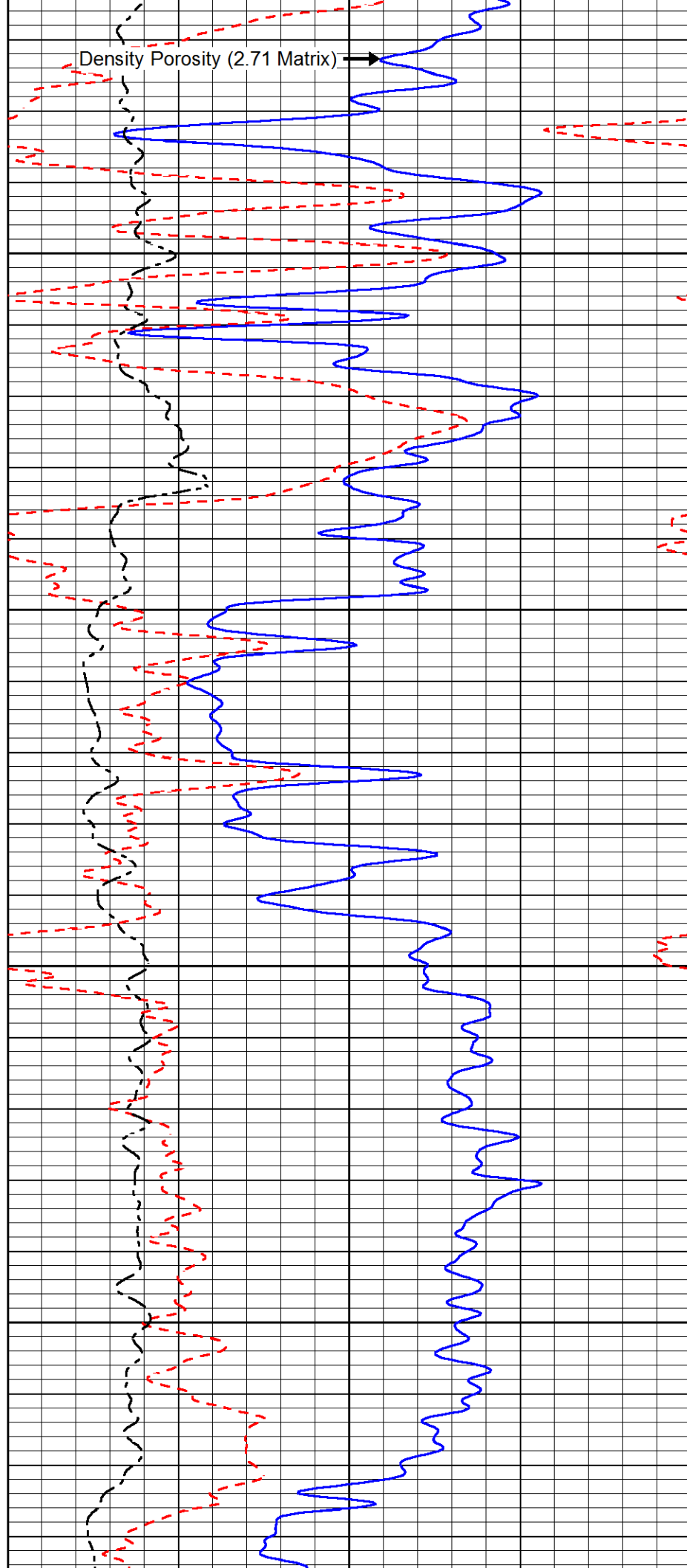
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3400

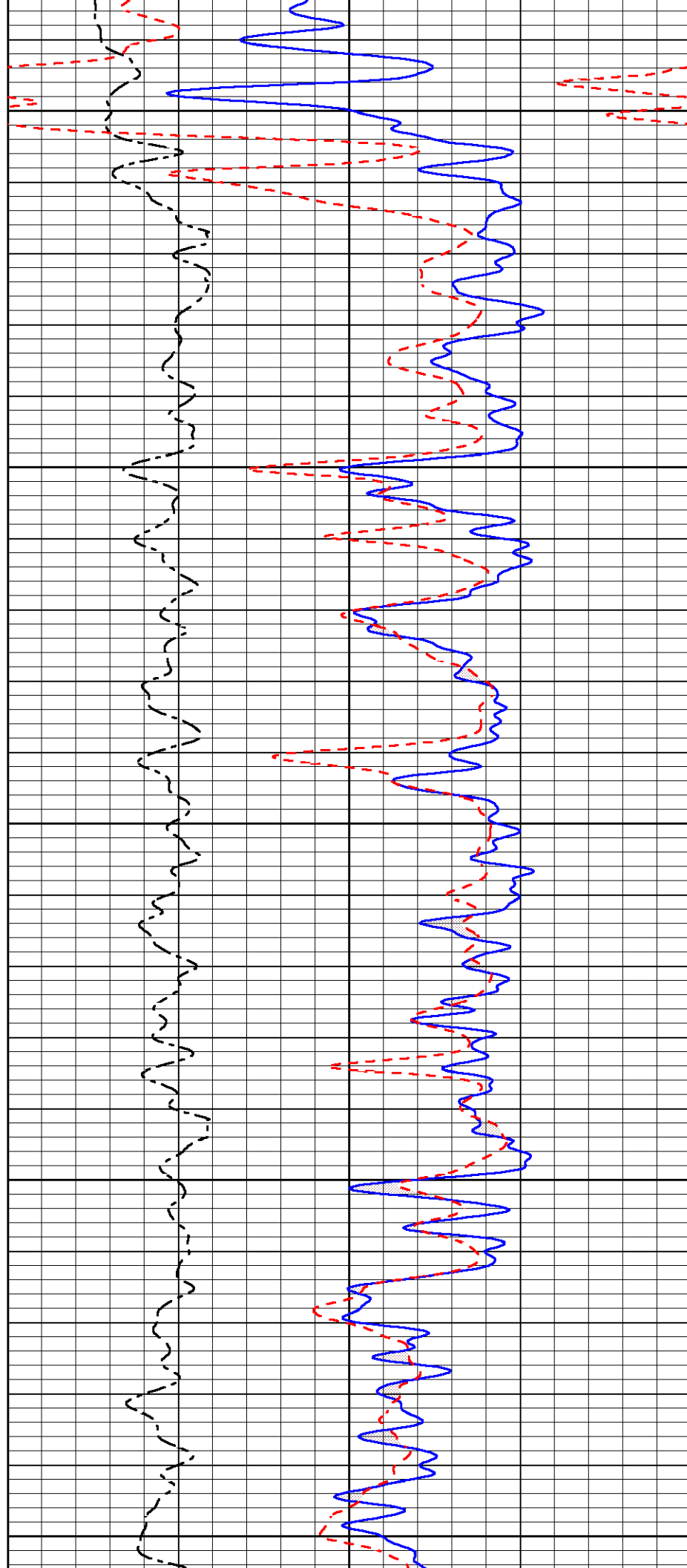
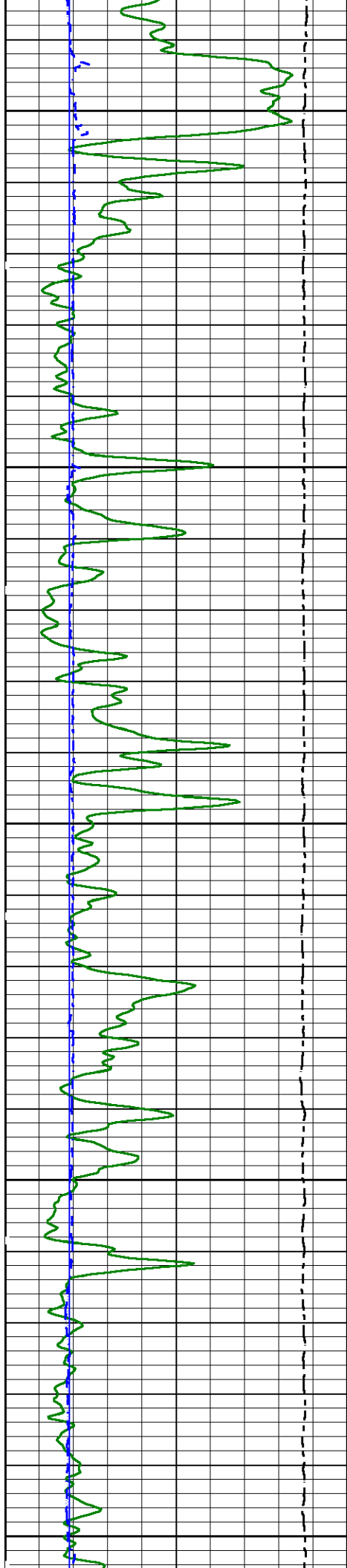
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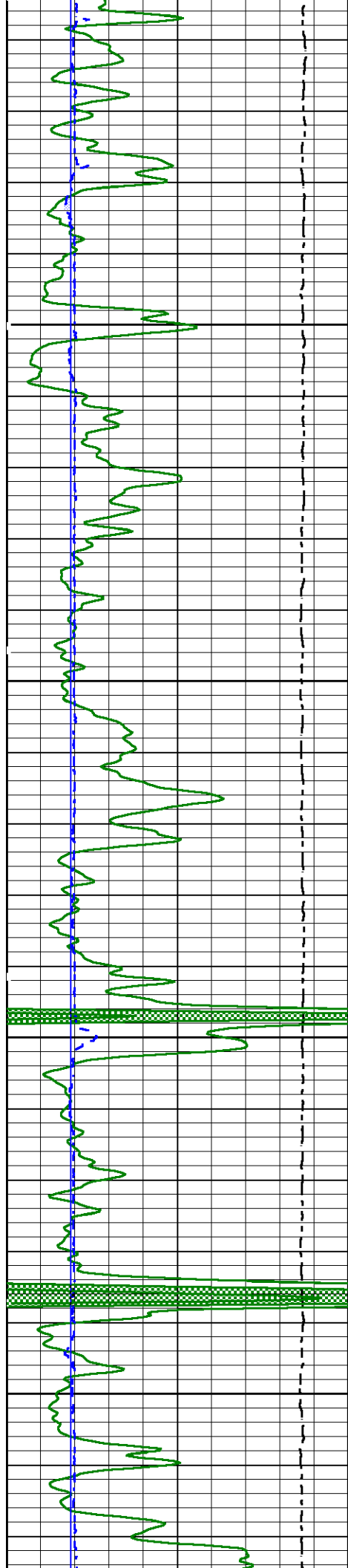


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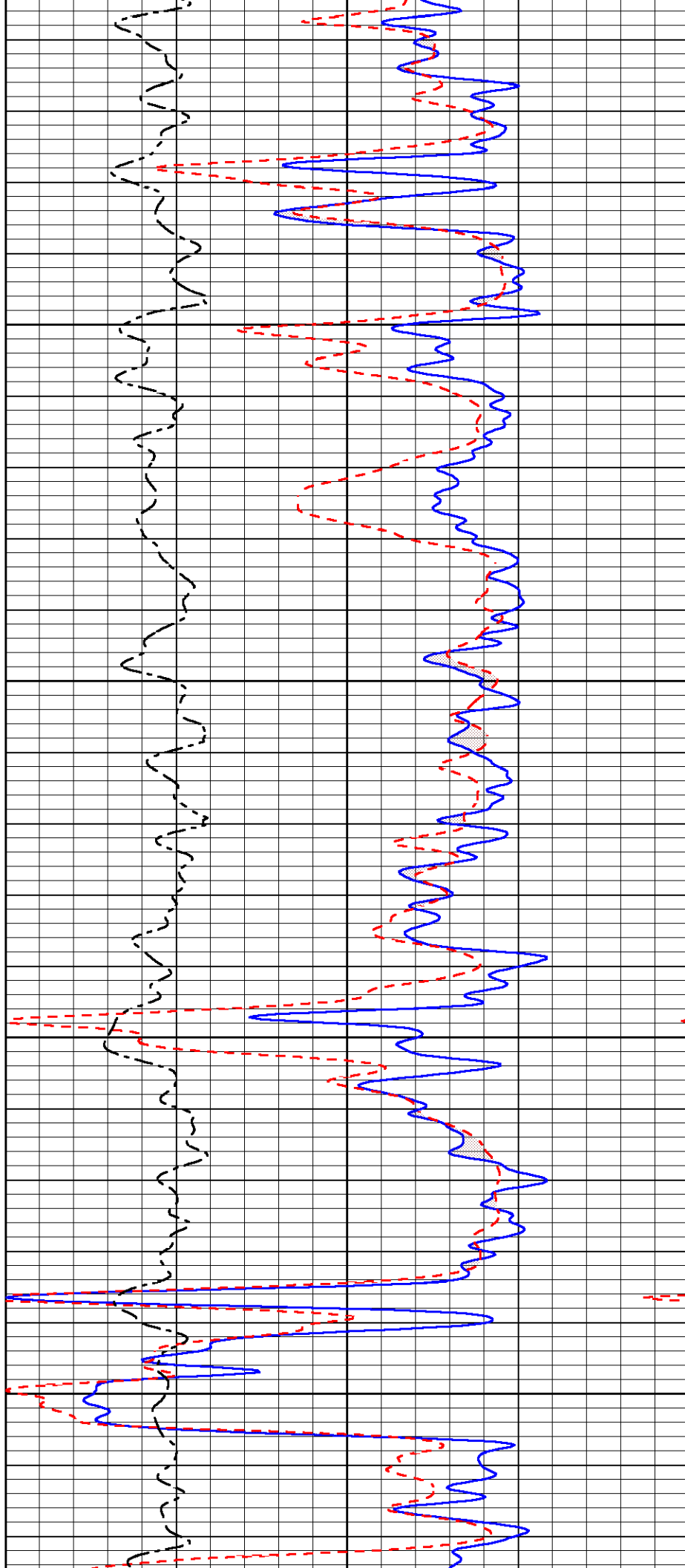
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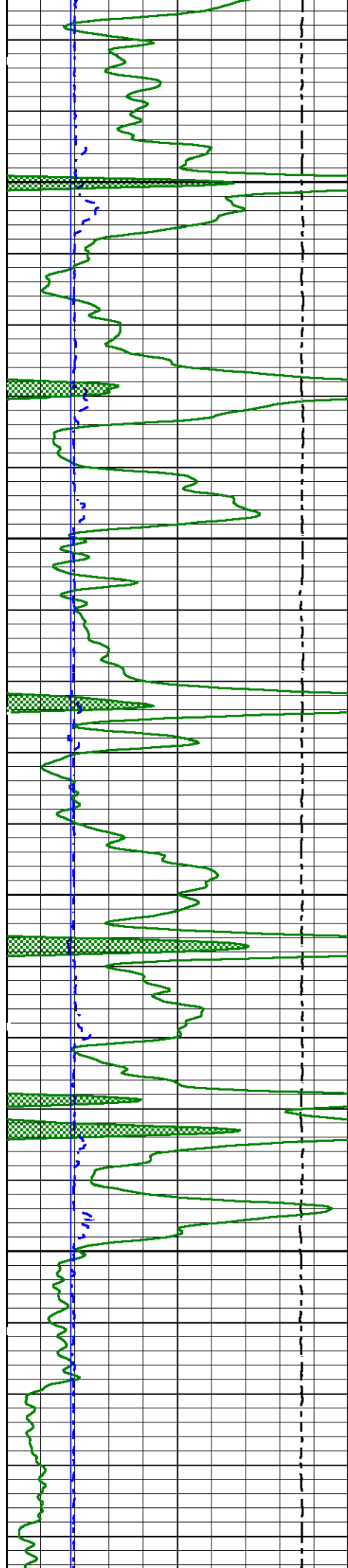




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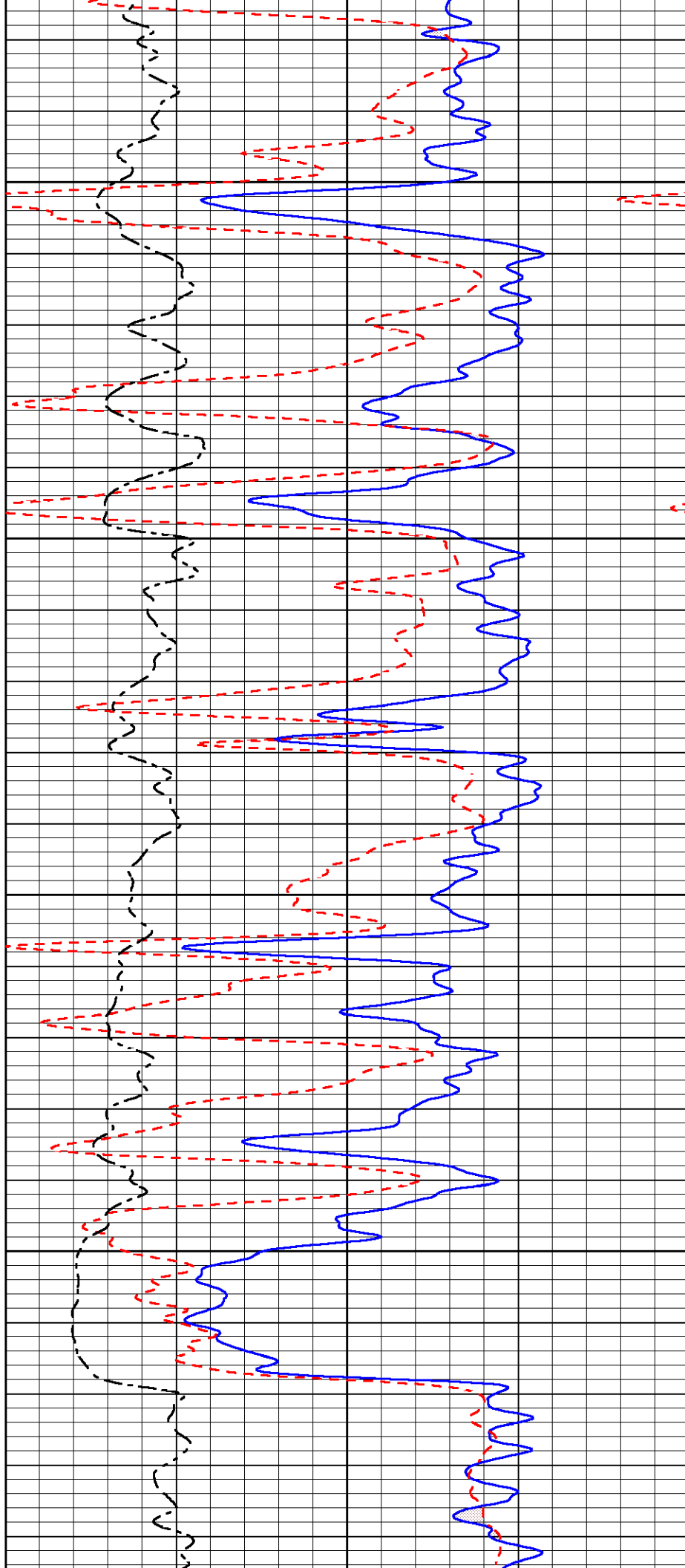
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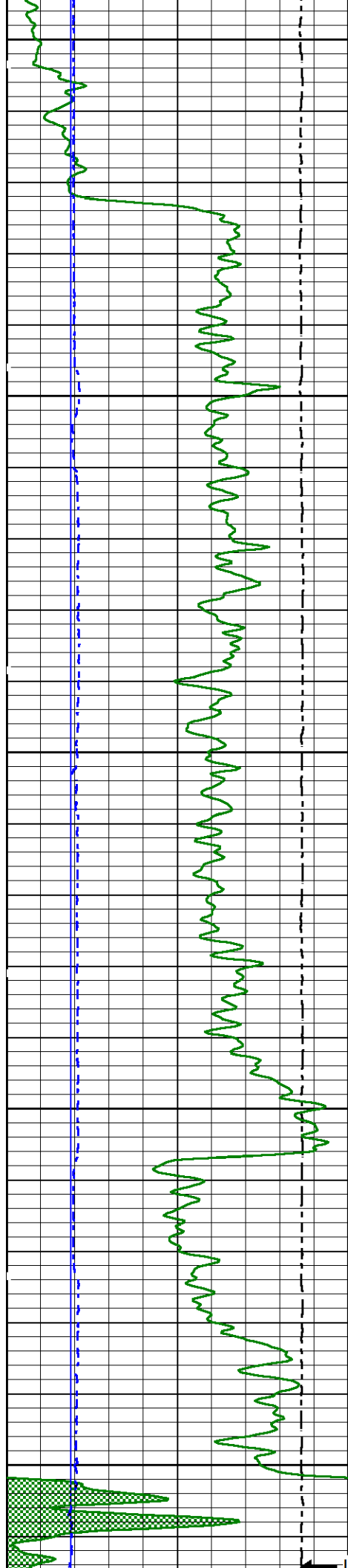




4100

4200

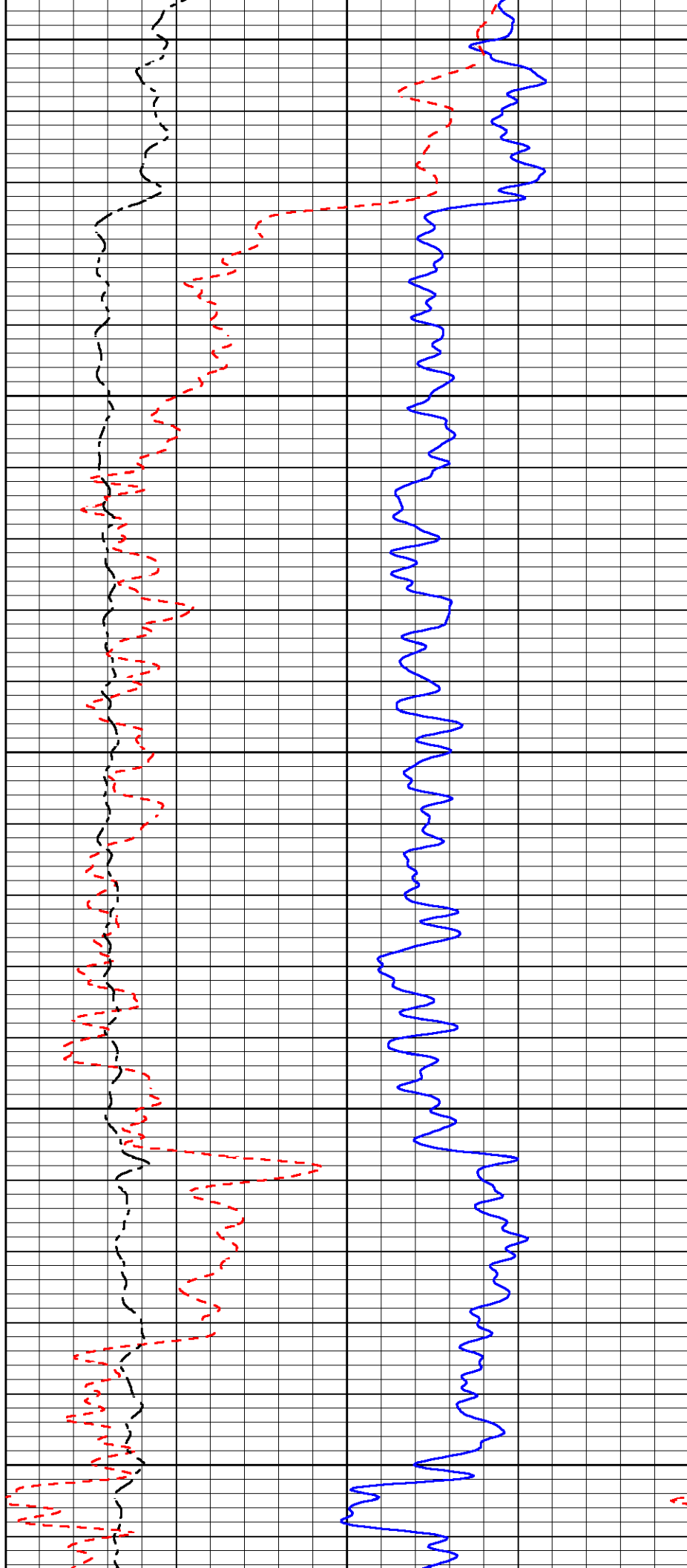


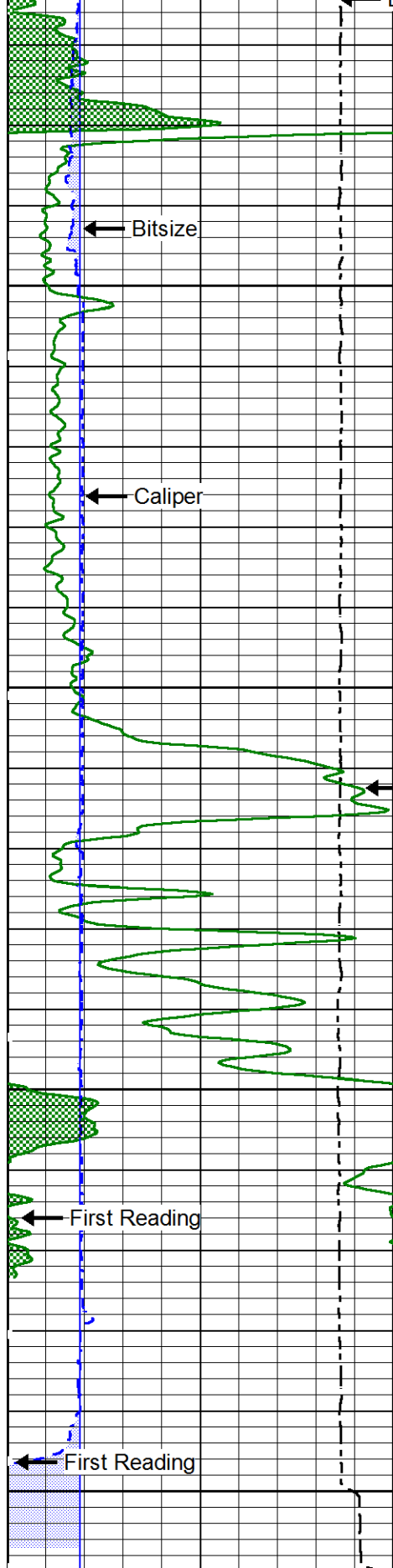


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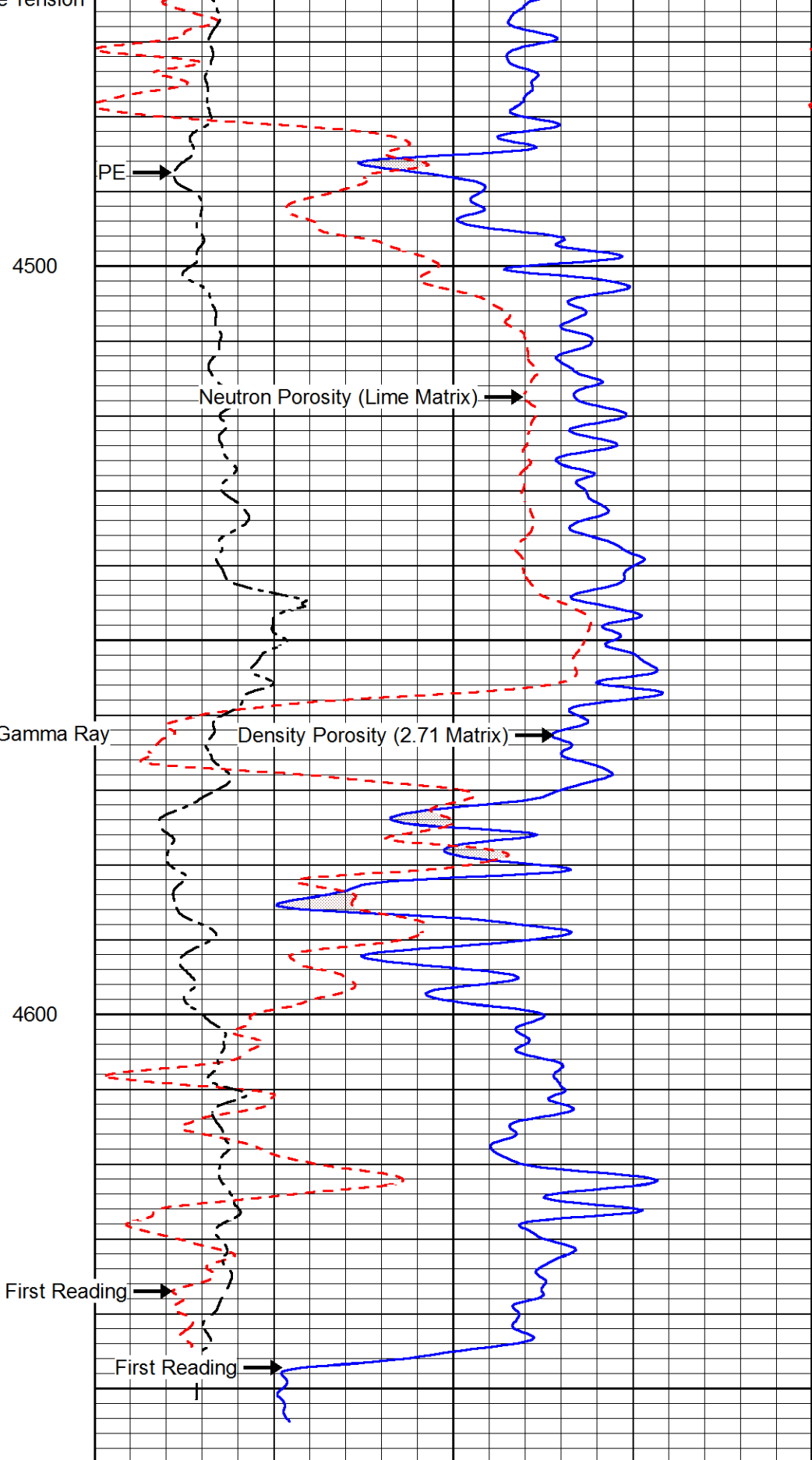
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Line Tension





0	Gamma Ray (GAPI)	150
6	Caliper (in)	16
6	Bitsize (in)	16
Line Tension		
10000	(lb)	0



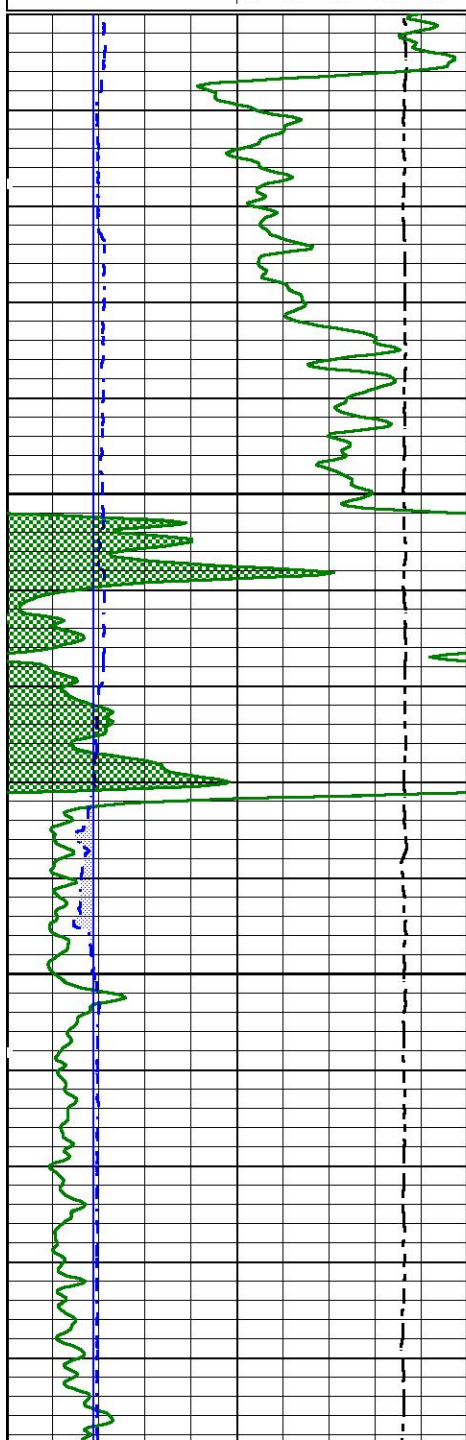
0.3	Density Porosity (2.71 Matrix)	-0.1
0.3	Neutron Porosity (Lime Matrix)	-0.1
0	PE	10

Repeat Pass

Database File okland_liberty_1-8.db
Dataset Pathname run2/pass5
Presentation Format OKC0C5~1
Dataset Creation Tue Sep 13 21:09:08 2016 by Log Sondex
Charted by Depth in Feet scaled 1:240

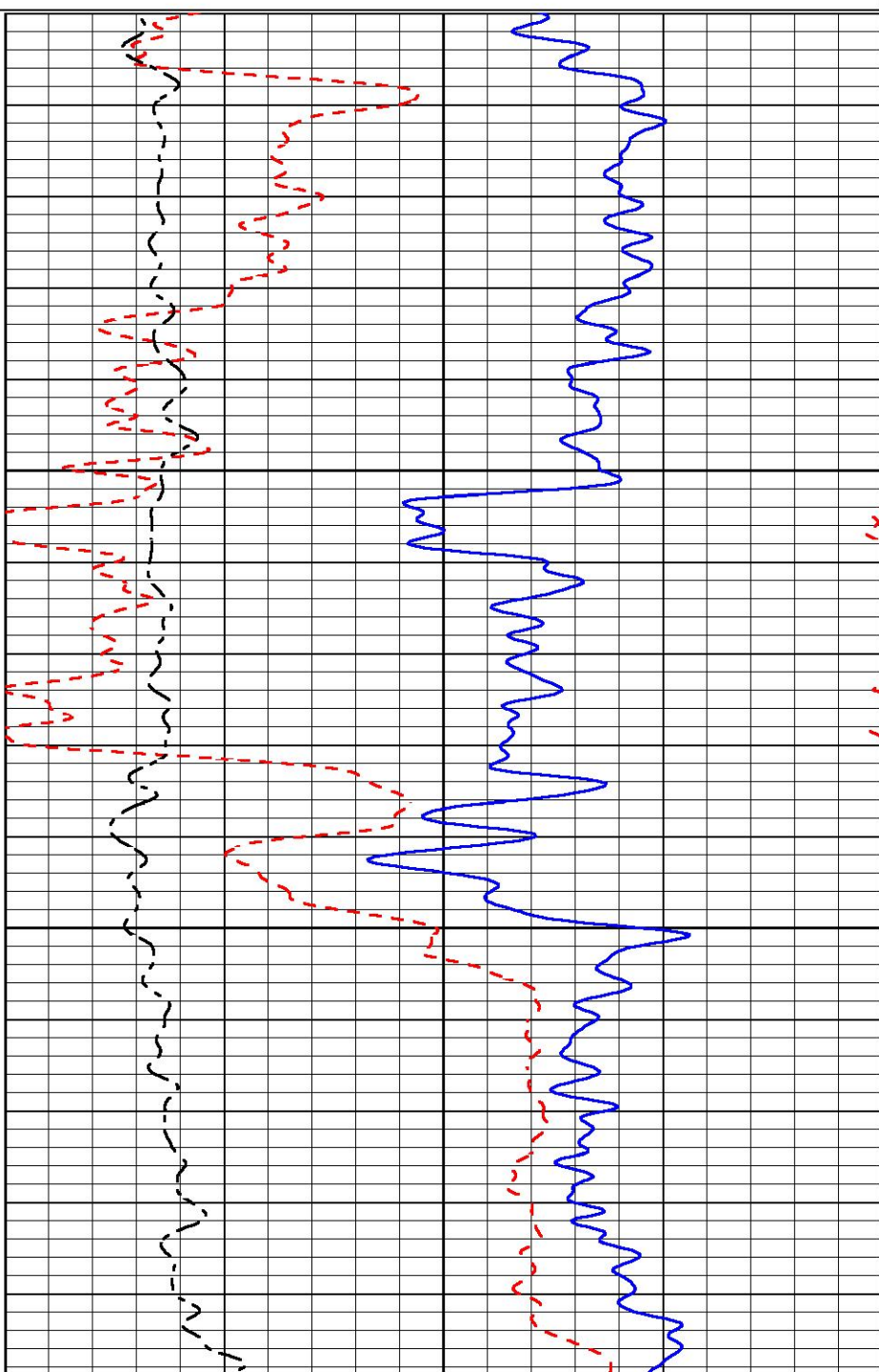
0	Gamma Ray (GAPI)	150
6	Caliper (in)	16
6	Bitsize (in)	16
Line Tension		
10000	(lb)	0

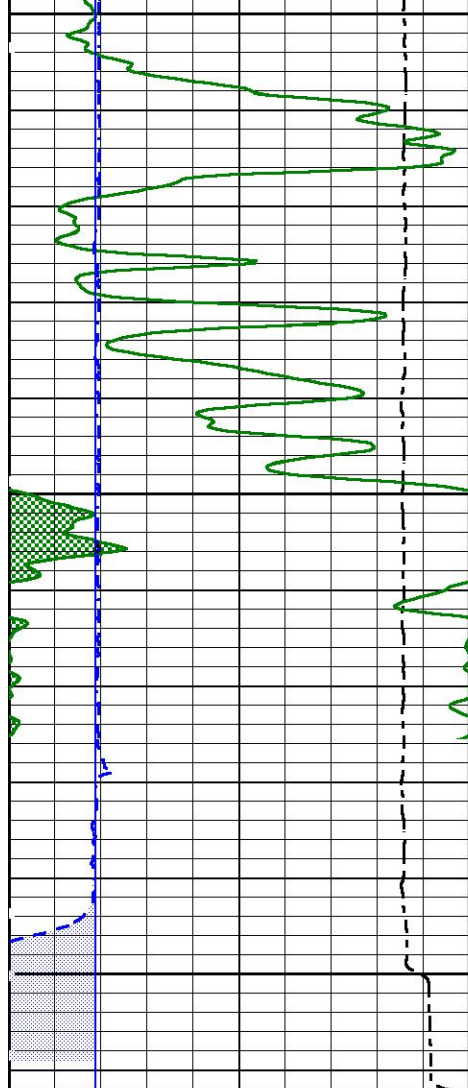
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0.3	Neutron Porosity (Lime Matrix)	-0.1
0	PE	10



4400

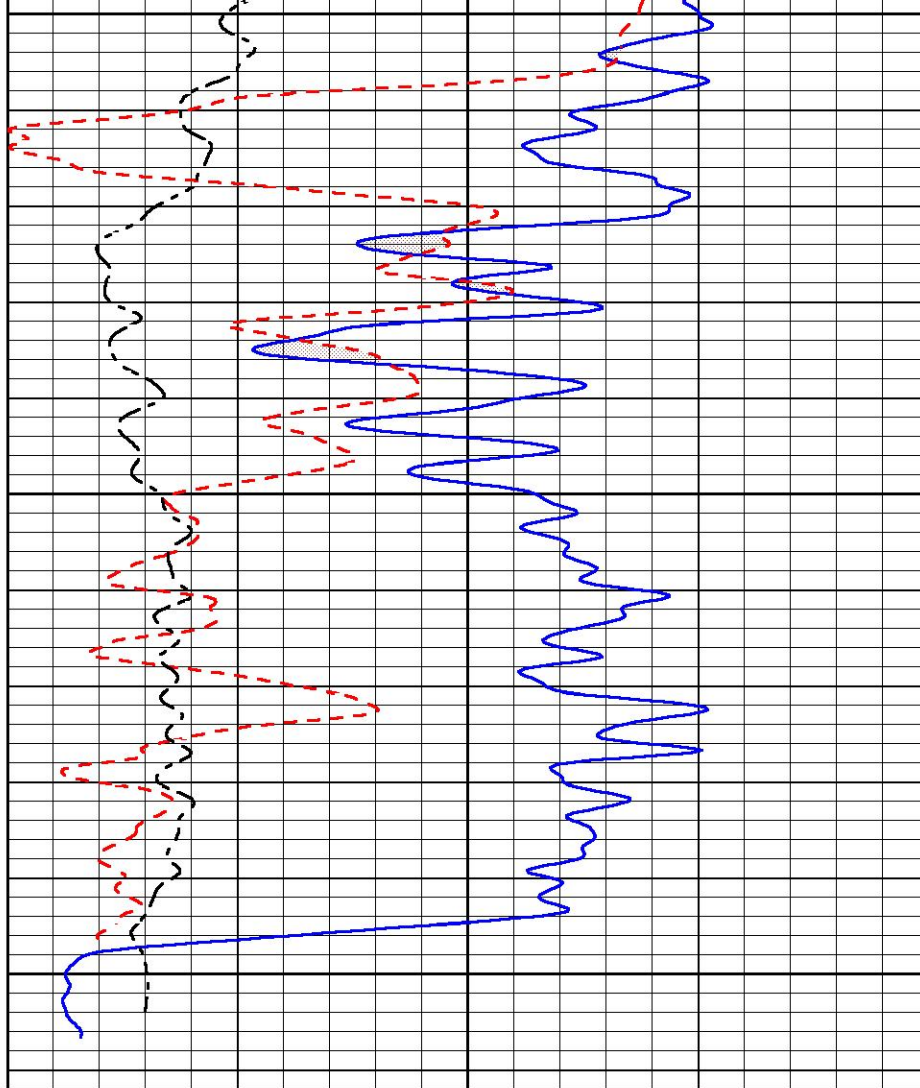
4500





4600

0	Gamma Ray (GAPI)	150
6	Caliper (in)	16
6	Bitsize (in)	16
Line Tension		
10000	(lb)	0



0.3	Density Porosity (2.71 Matrix)	-0.1
0.3	Neutron Porosity (Lime Matrix)	-0.1
0	PE	10

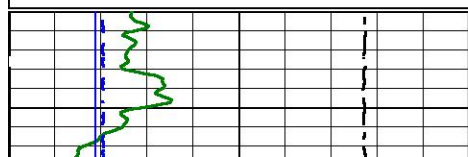


Main Pass

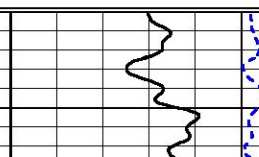
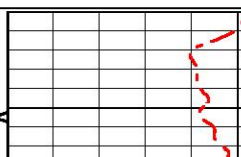
Database File okland_liberty_1-8.db
 Dataset Pathname run2/pass8
 Presentation Format OKC-BU~1
 Dataset Creation Tue Sep 13 22:19:02 2016 by Calc Sondex
 Charted by Depth in Feet scaled 1:240

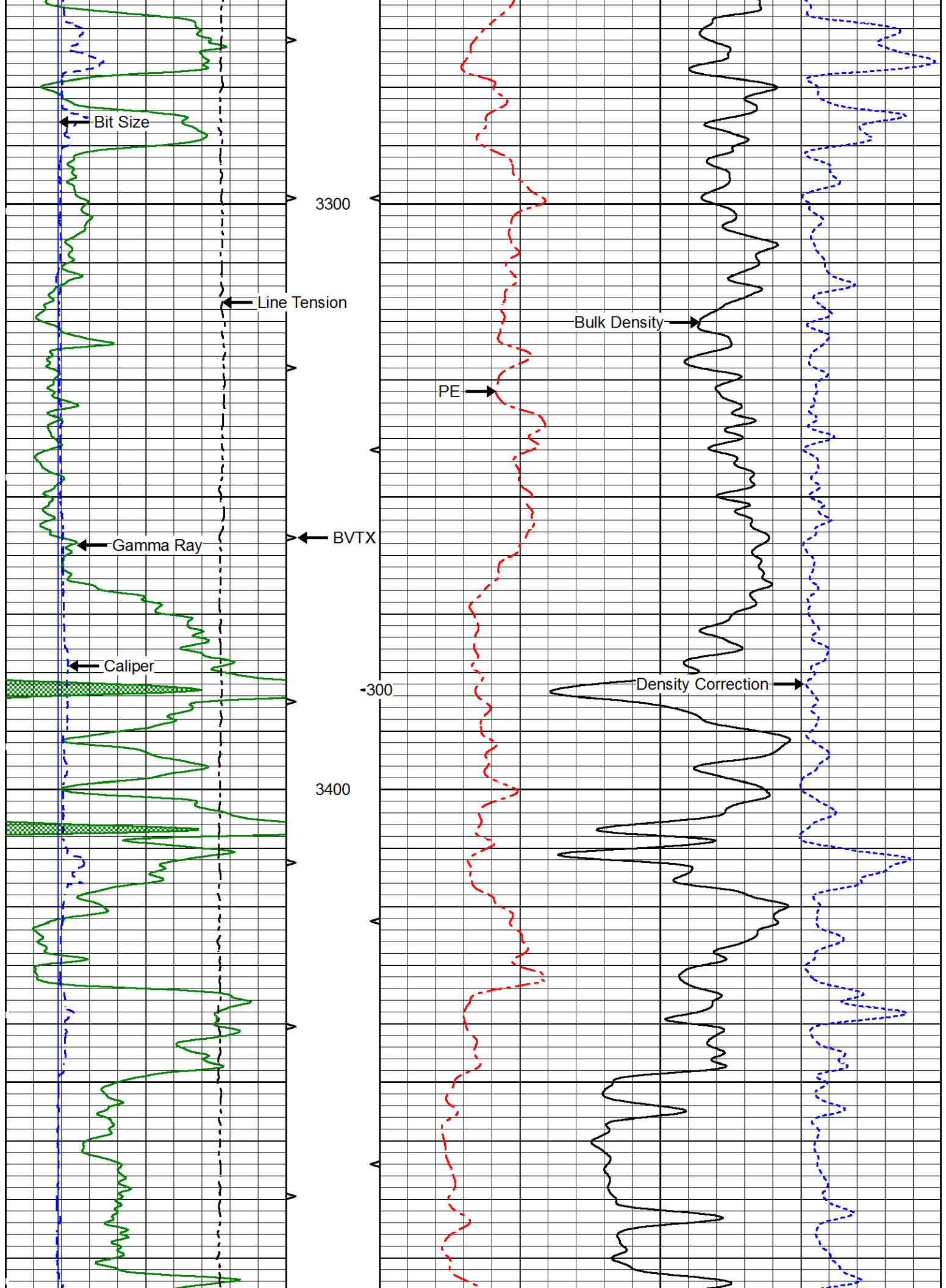
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6	Caliper (in)	16
10000	Line Tension (lb)	0
6	Bit Size (in)	16

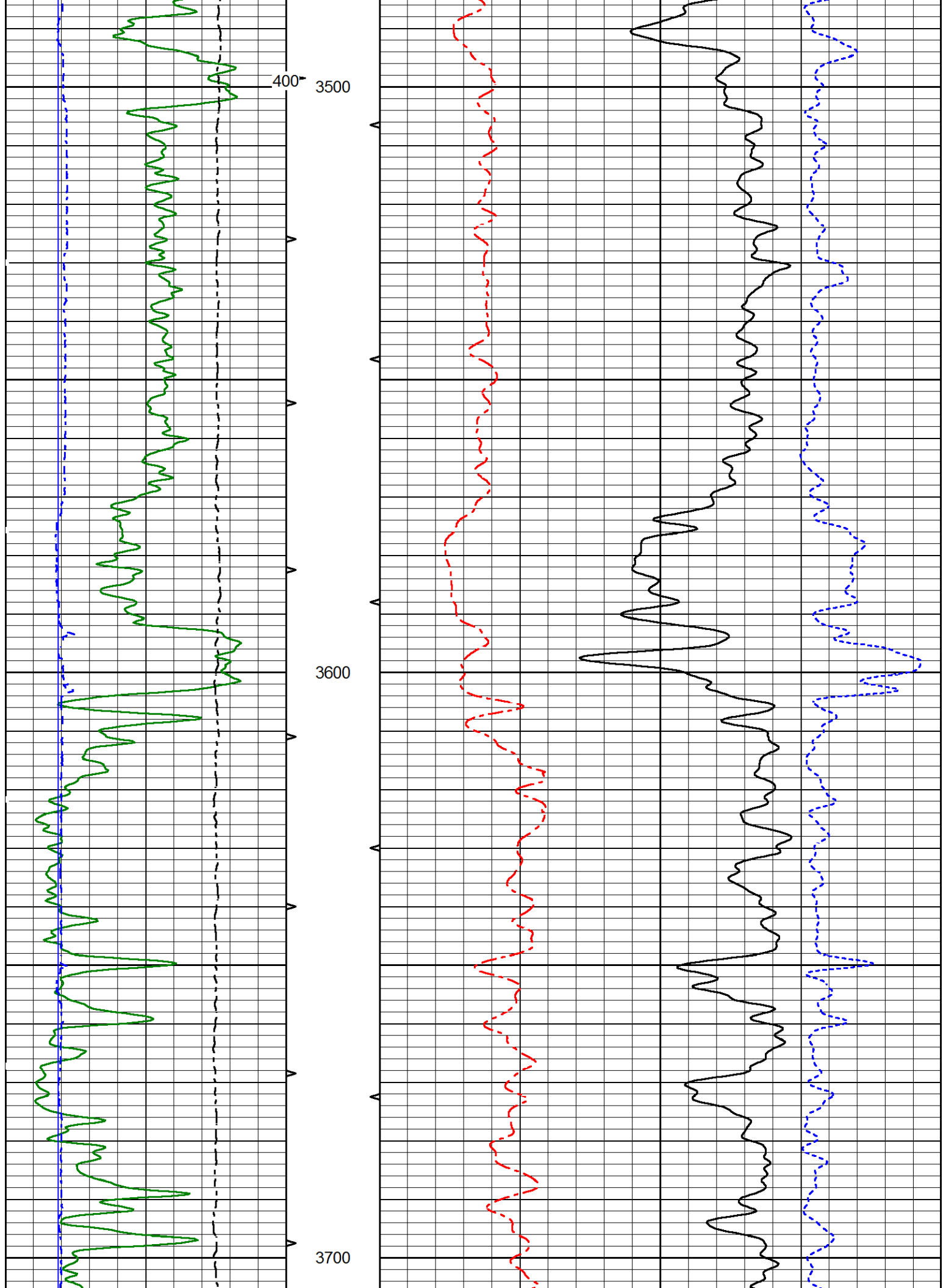
2	Bulk Density (g/cc)	3
0	PE	10
-0.25	Density Correction (g/cc)	0.25

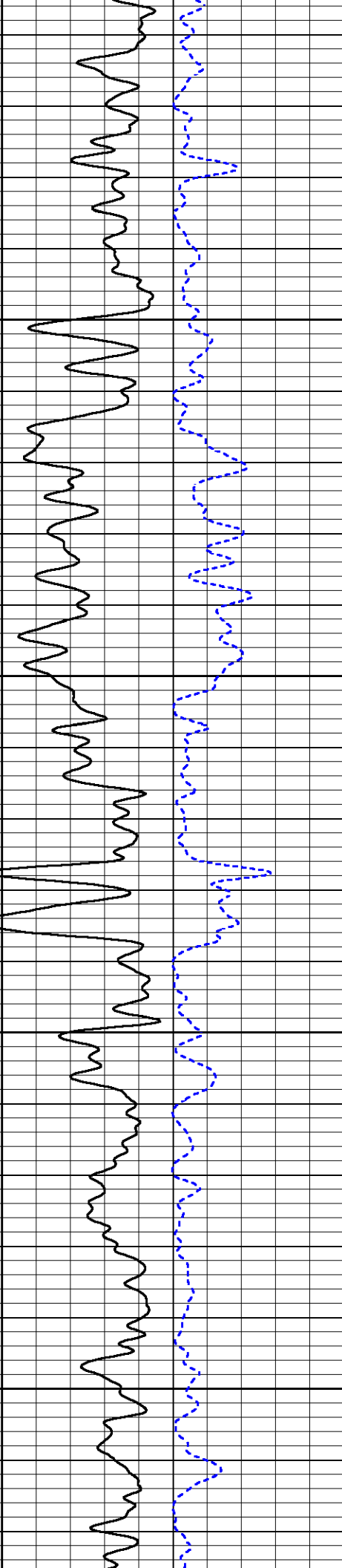
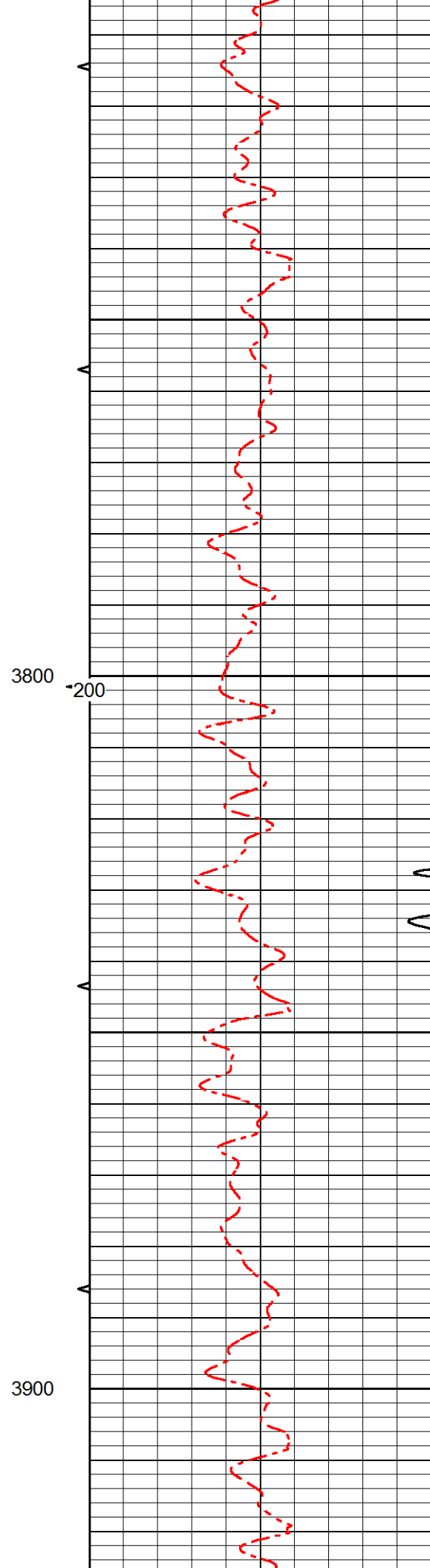
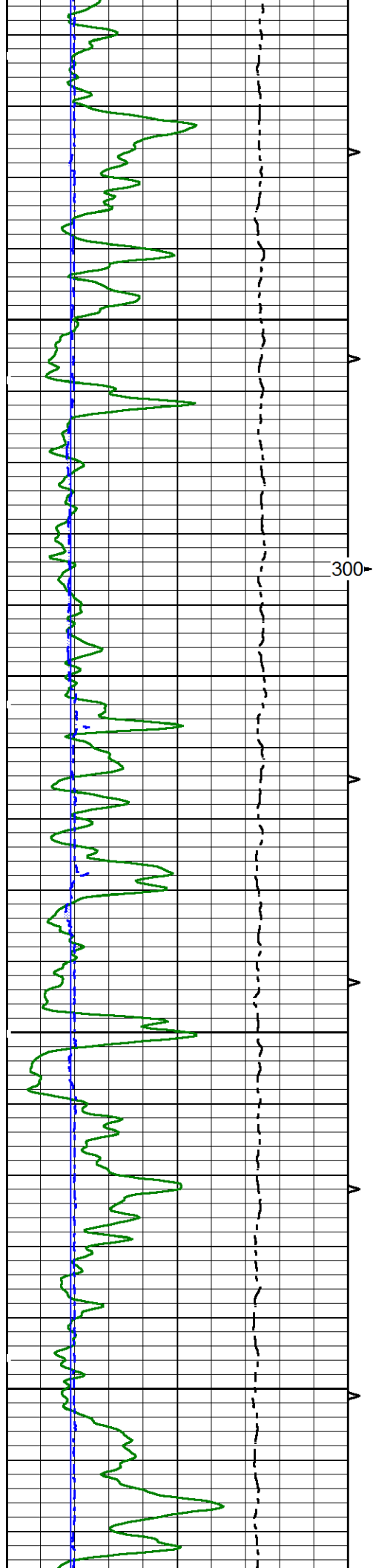


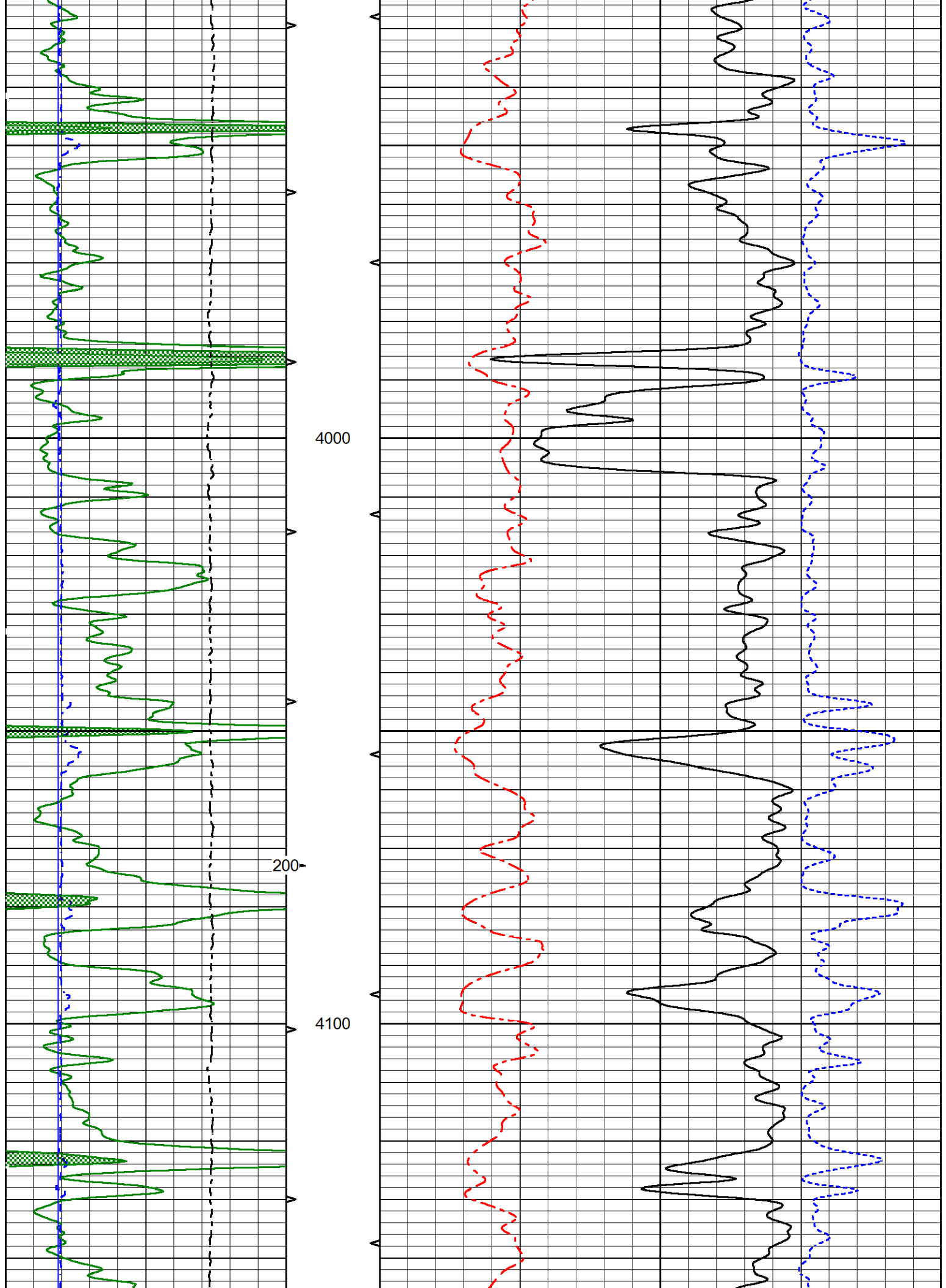
AVTX →

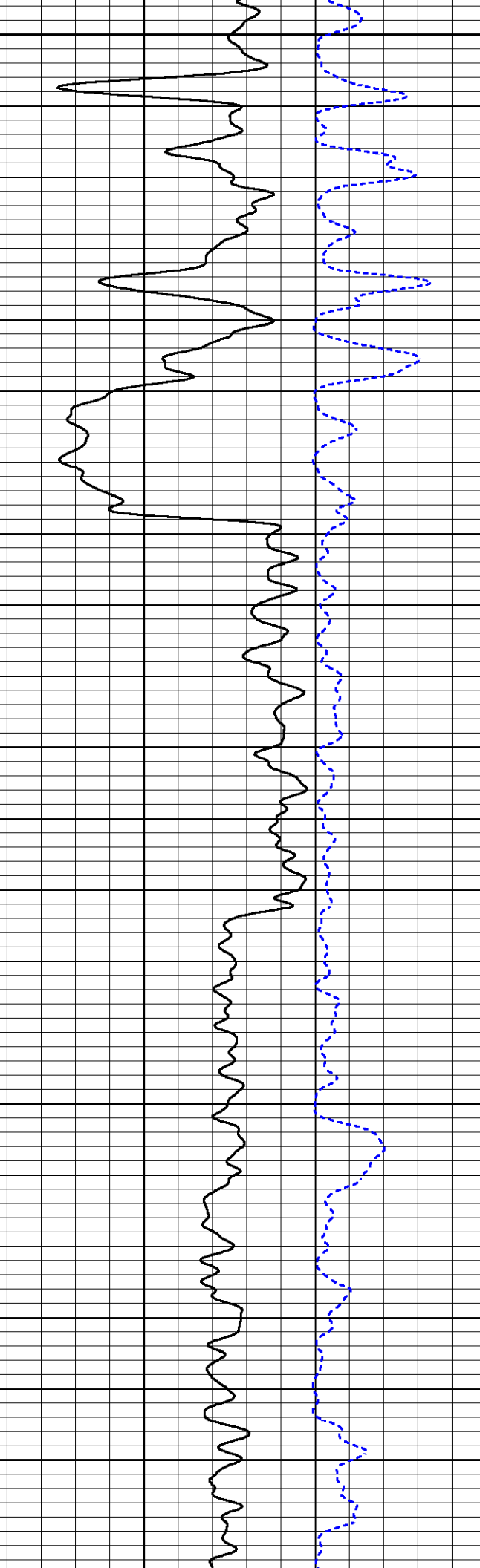
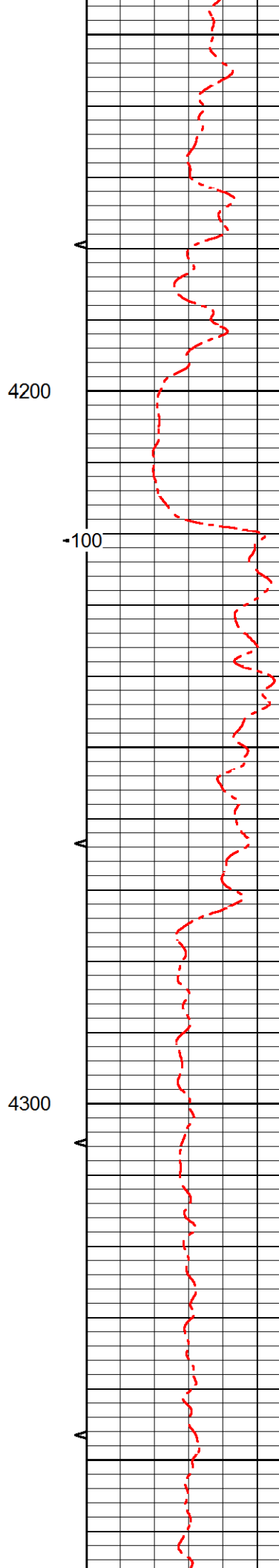
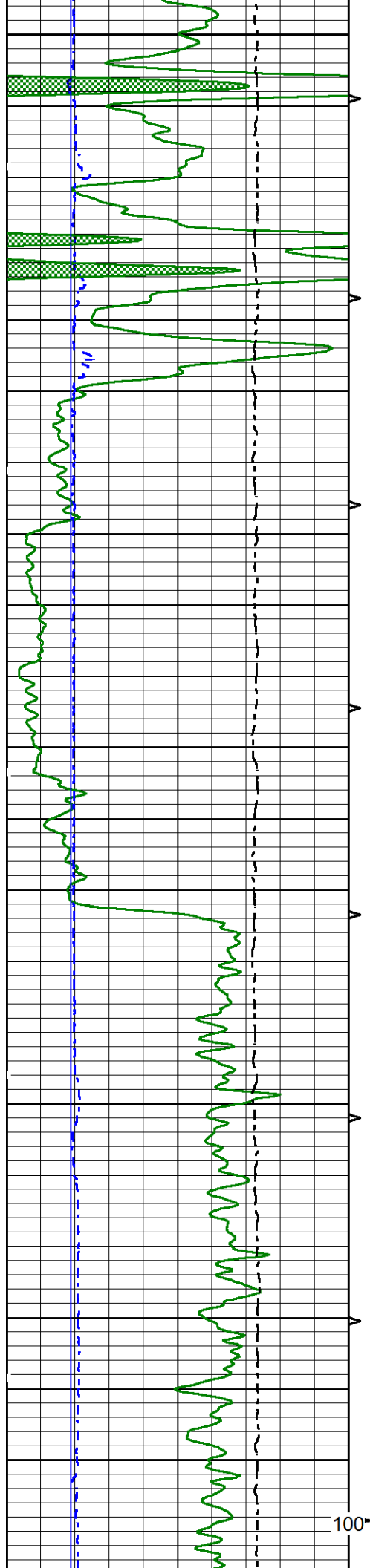


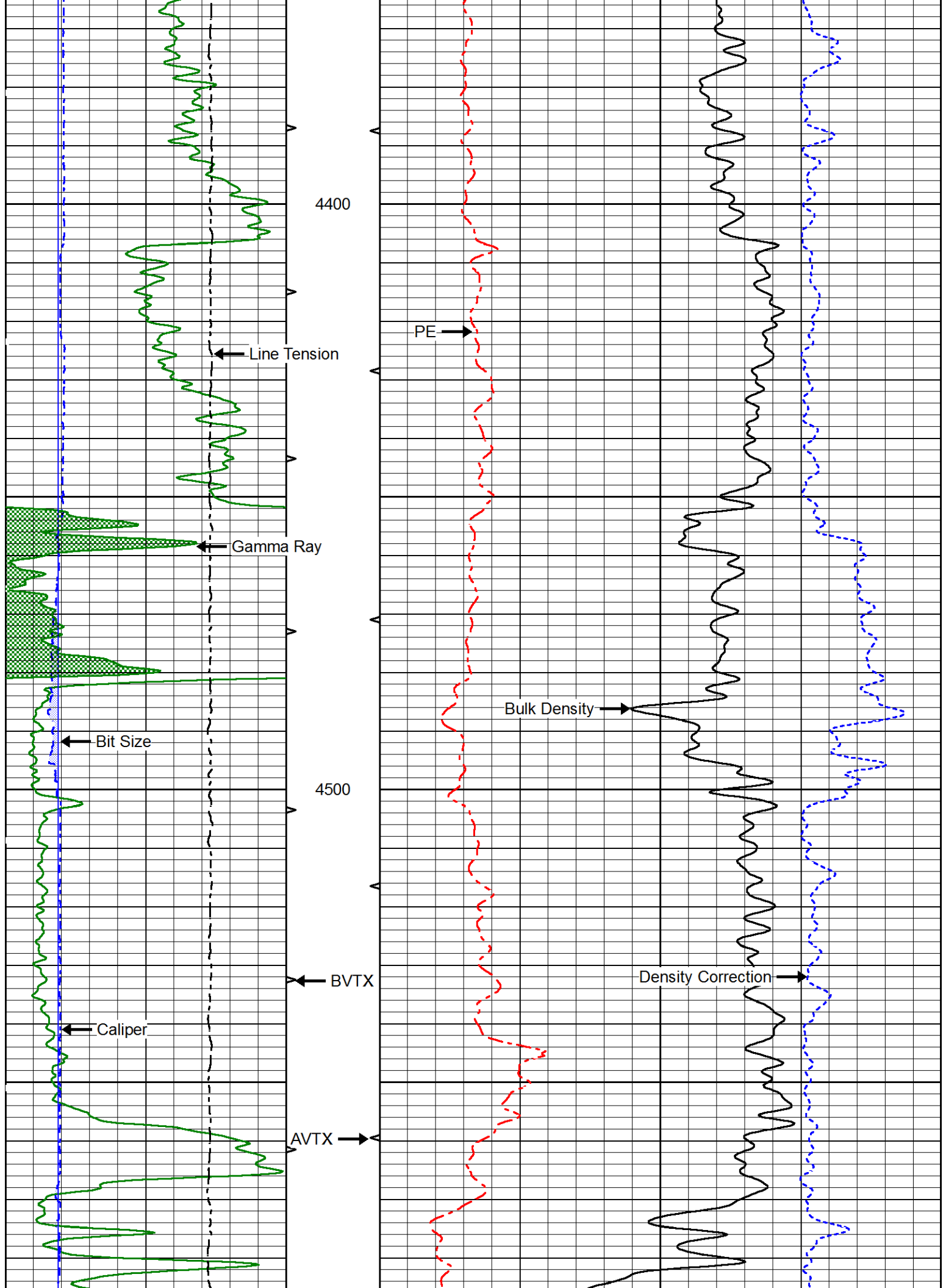


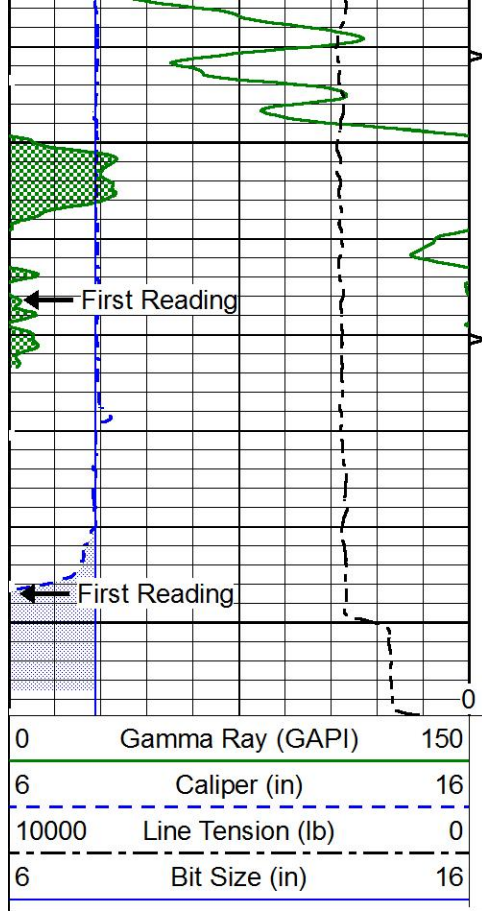




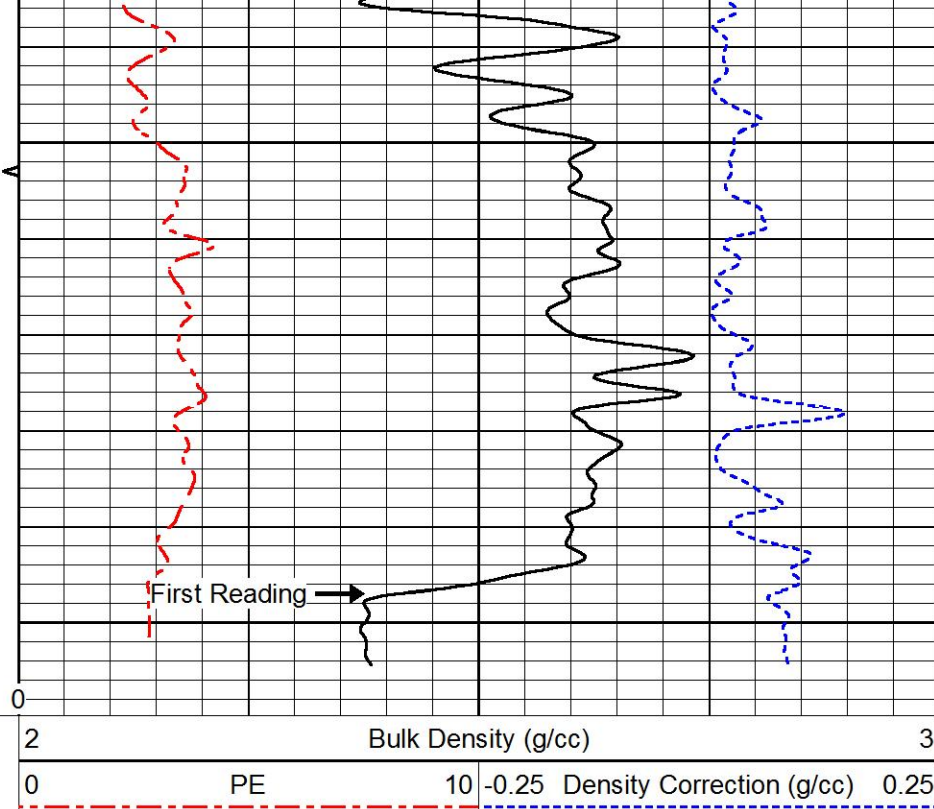






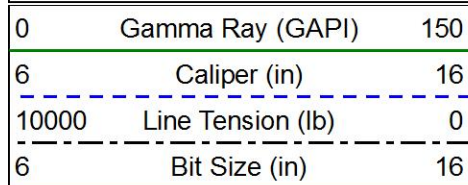


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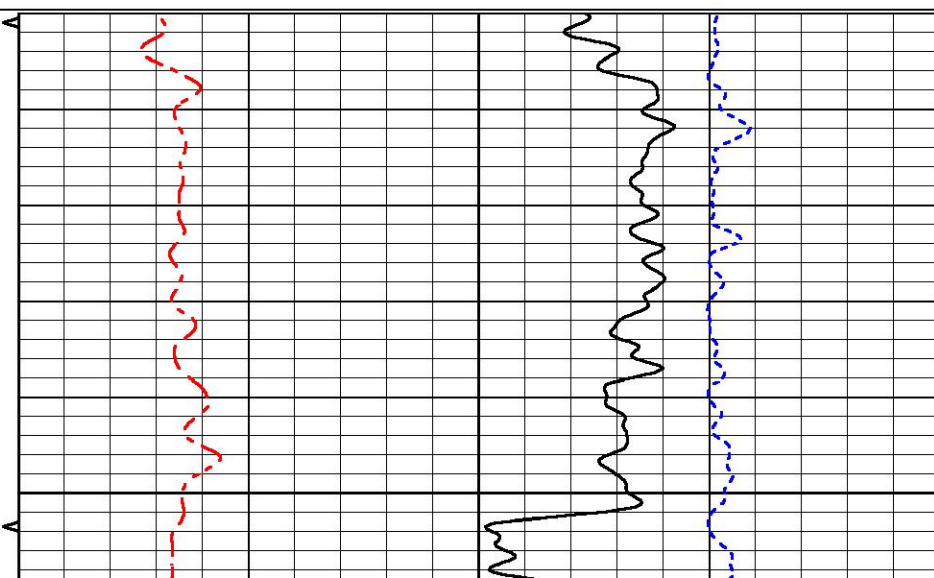
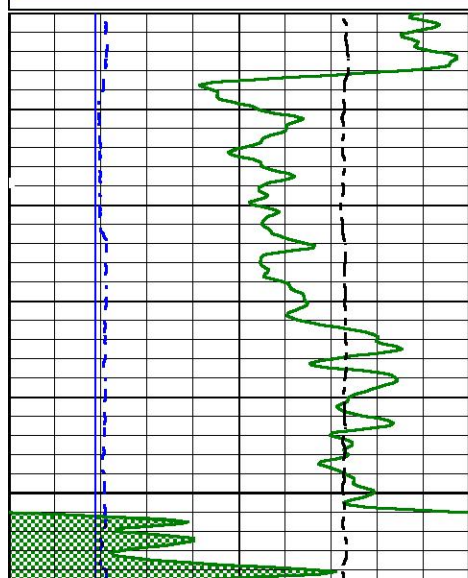
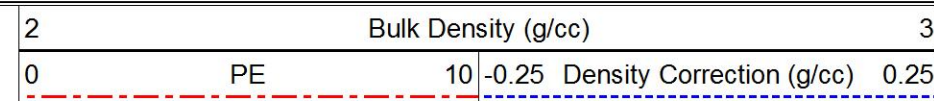


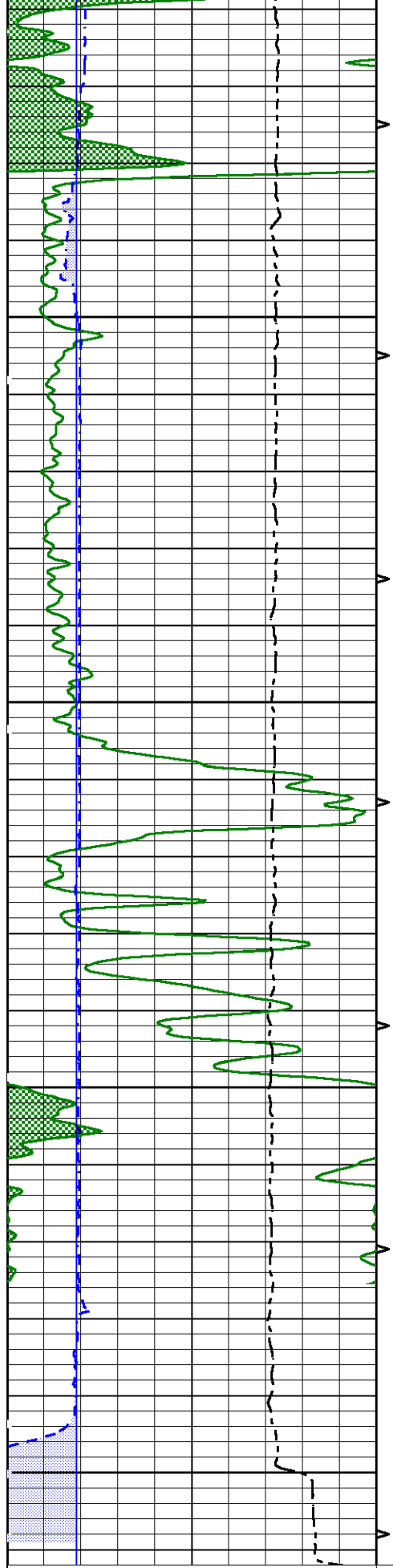
Repeat Pass

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4400

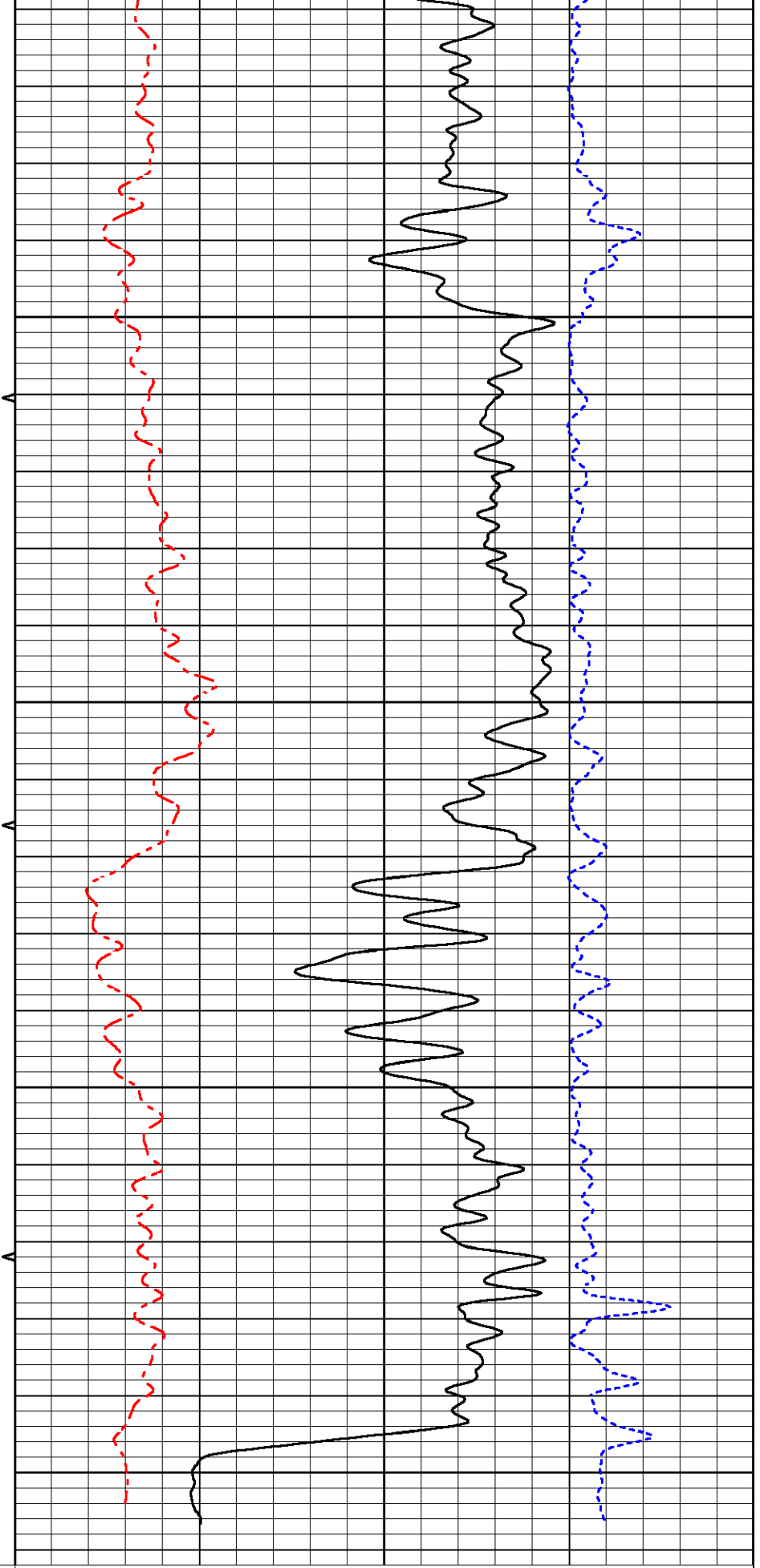




0 Gamma Ray (GAPI) 150
6 Caliper (in) 16
10000 Line Tension (lb) 0
6 Pit Size (in) 16

4500

4600



2 Bulk Density (g/cc) 3
0 PE 10 -0.25 Density Correction (g/cc) 0.25

Log Variables

DatabaseC:\Sondex\Sondex Warrior\Data\okland_liberty_1-8.db
Dataset field/well/run2/pass8/_vars_

Top - 223.00 ft

MAXAMPL mV 0	MINAMPL mV 1	MINATTN db/ft 0.8	COMPACT 1	SVFLUID usec/ft 189	SVMATRIX usec/ft 47.6	FRMSALIN kppm 0	MUDSALIN kppm 0
DEVI deg 0	SRFTEMP degF 68	SO in 0.25	DE-CENT Yes	CASED? Yes	CASEWGHT lb/ft 11.5	NPORSEL Limestone	AIR_HOLE? No
MudWgt lb/gal 9.3	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	CASETHCK in 0	CASEOD in 8.625	PERFS 0	TDEPTH ft 4650
BOTTEMP degF 114	BOREID in 7.875						

223.00 ft - Bottom

MAXAMPL mV 0	MINAMPL mV 1	MINATTN db/ft 0.8	COMPACT 1	SVFLUID usec/ft 189	SVMATRIX usec/ft 47.6	FRMSALIN kppm 0	MUDSALIN kppm 0
DEVI deg 0	SRFTEMP degF 68	SO in 0.25	DE-CENT Yes	CASED? No	CASEWGHT lb/ft 11.5	NPORSEL Limestone	AIR_HOLE? No
MudWgt lb/gal 9.3	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	CASETHCK in 0	CASEOD in 4.5	PERFS 0	TDEPTH ft 4650
BOTTEMP degF 114	BOREID in 7.875						

Calibration Report

Database File okland_liberty_1-8.db
Dataset Pathname run2/pass8
Dataset Creation Tue Sep 13 22:19:02 2016 by Calc Sondex

Litho Density Tool Calibration Report

Serial Number: B10110S50129B
Tool Model: 002

Caliper Calibration Performed: Tue Jul 19 14:03:54 2016

	Diameter		Reading	
Small Ring:	6.000	in	1413.800	cps
Large Ring:	13.000	in	2155.900	cps
Gain:	0.0094			
Offset:	-7.4759			

Master Calibration Performed: Mon Sep 12 12:45:40 2016

Source Number:	50129B
Medium:	Water
Al Block Density:	2.5997 g/cc

	Background	Al Block	Al Block + Fe	
SS1	739.2	4877.7	4698.6	cps
SS2	2049.0	30943.2	29554.8	cps
SSTOTAL	4829.2	49846.1	47125.9	cps
LITH	97.9	567.6	380.1	cps
LL	194.6	878.1	883.2	cps
LU	558.1	1130.0	1149.6	cps
LS	752.7	2008.1	2032.7	cps
LSTOTAL	1420.4	5002.0	4551.7	cps
SSHV	1571.1	1574.7	1575.0	V
LSHV	1506.4	1507.7	1508.7	V
SSFF	0.003	0.007	0.007	
LSFF	0.007	0.001	-0.003	

Before Survey Verification Performed:	Sun Sep 04 17:21:09 2016
After Survey Verification Performed:	Mon Feb 08 13:56:44 2016

	Master Background	Before Survey Background	After Survey Background	
SS1	739.2	745.6	749.7	cps
SS2	2049.0	2057.2	2060.3	cps
SSTOTAL	4829.2	4855.0	4869.9	cps
LITH	97.9	98.2	100.2	cps
LL	194.6	195.6	195.3	cps
LU	558.1	566.6	565.4	cps
LS	752.7	762.2	760.8	cps
LSTOTAL	1420.4	1427.0	1429.8	cps
SSHV	1571.1	1575.0	1573.4	V
LSHV	1506.4	1507.1	1508.9	V
SSFF	0.003	0.001	0.010	
LSFF	0.007	0.014	-0.006	

Tool Module Parameters

Software Version:	8.0.0.3
Borehole Size Source:	CALI
Pad Type:	2

Compensated Neutron Tool Calibration Report

Serial Number:	C10071
Tool Model:	009

Master Calibration Performed:	Mon Sep 05 11:45:48 2016
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Source Number:	50202G
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Short Spacing Counts:	7061.54	cps
Long Spacing Counts:	245.69	cps
High Voltage:	1363.95	V

Target Ratio:	27.2000
Ratio:	28.7420
K-Factor:	0.9464

Before Survey Verification Performed:	Mon Sep 05 11:51:48 2016
After Survey Verification Performed:	

Verifier Values

Master Cal

Before Survey

After Survey

Short Spacing Counts:

305.30

309.62

cps

Long Spacing Counts:

253.02

255.50

cps

High Voltage:

1363.82

1363.82

V

Ratio:

1.2066

1.2118

Tool Module Parameters

Software Version:

8.0.0.5

Borehole Size Source:

BOREID

Clip Crossplot Porosity:

YES

Lithology Identification Parameters:

Calcite

Quartz

Dolomite

Uma:

13.77

4.79

9.03

barns/cc

RHOMA:

2.71

2.65

2.88

g/cc

Micro Electric Log Calibration Report

Serial Number:

10022649

Tool Model:

003

Caliper Calibration Performed:

Wed Jun 01 11:16:39 2016

Pad Arm

Backup Arm

Radius

Reading

Radius

Reading

Small Jig:

4.000

in

1149.900

4.000

in

1273.100

Large Jig:

8.000

in

1990.600

8.000

in

1996.600

Gain:

0.0048

0.0055

Offset:

-1.4712

-3.0386

Pad Calibration

Inverse

Normal

Gain:

1.0000

0.8500

Offset:

0.0000

0.0000

Tool Module Parameters

Software Version:

8.0.0.3

Gamma Ray Calibration Report

Serial Number:

C10047

Tool Model:

001

Performed:

Tue Jul 19 11:02:37 2016

Calibrator Value:

156.0

GAPI

Background Reading:

78.5

cps

Calibrator Reading:

529.3

cps

Sensitivity:

0.3460

GAPI/cps

Borehole Fluid Resistivity Calibration Report

Serial Number:

P004

Tool Model:

002

Master Calibration Performed:

Mon Dec 05 18:05:39 2011

Resistivity Polynomial Equation:

$$0.1429x^3 - 0.4495x^2 + 1.2097x - 0.2854$$

Temperature Calibration:

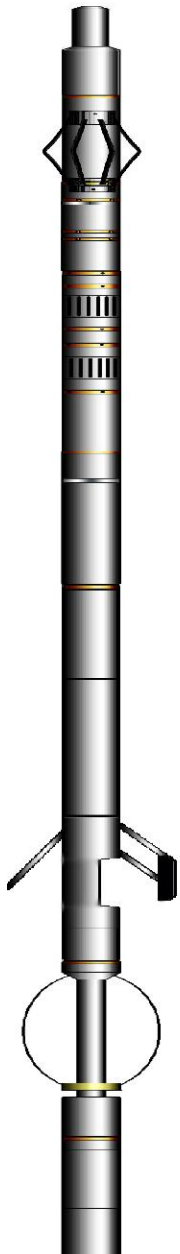
Reference		Reading	
71.60	degF	559.80	bits
167.00	degF	659.50	bits

Head Tension Unit Calibration Report

Serial Number: 00001
Tool Model: 011

Performed: Mon Dec 15 11:20:16 2014

Point #	Reference		Reading	
1	-19894.000	lb	8957.860	cps
2	-15010.000	lb	13965.100	cps
3	-9998.000	lb	19076.100	cps
4	-5007.000	lb	24133.000	cps
5	-1009.000	lb	28232.100	cps
6	1017.000	lb	30185.400	cps
7	5040.000	lb	34439.700	cps
8	9970.000	lb	39346.900	cps
9	14955.000	lb	44466.000	cps
10	19770.000	lb	49397.800	cps

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
HTEN	40.79		CHD-001 (000004) Cable Head	2.19	3.38	35.00
			XTU-008 (C10067) Crossover Ultrawire Toolbus to Ultralink	2.08	3.38	47.00
			Centralizer-Overbody Overbody Centralizer	2.00	6.88	5.00
			HTU-011 (00001) Head Tension Unit	2.18	3.38	55.00
BFR	37.15		BFR-002 (P004) Borehole Fluid Resistivity	4.39	3.38	94.00
GR	34.39		GRT-001 (C10047) Gamma Ray Tool	3.22	3.38	69.00
			MEL-003 (10022649) Micro Electric Log	9.17	3.38	190.00
MEL	24.38		CEN-001 (C10028) Inline OH Springbow Centraliser	4.27	3.38	66.00
			KJT-001 (10002141) Knuckle Joint	2.86	3.38	72.00

