

Micro Electric Log

Company		O'Brien Energy Resources Corp.	
Well		Keystone #6-4	
Field		Angell Southeast	
County	Meade	State	Kansas

Location:	1320' FSL & 2100' FWL	API #:	15-119-21443	Other Services CNL, LDT, IAT
	W2 E2 E2 SW			
	Lat: 37.202561503, Long: 100.482112615			
	NAD83			
SEC 4	TWP 33S	RGE 29W		
Permanent Datum	G.L.	Elevation	2669 ft.	
Log Measured From	K.B.		12 ft. above perm. datum	
Drilling Measured From	K.B.			

Date	17-May-2020		
Run Number	One		
Depth Driller	6298'		
Depth Logger	6298'		
Bottom Logged Interval	6261'		
Top Log Interval	4000'		
Casing Driller	8.625" @ 1573'	@	@
Casing Logger	1567'		
Bit Size	7.875"	@	@
Type Fluid in Hole	WBM		
Density / Viscosity	9.2 / 60		
pH / Fluid Loss	11 / 6.8		
Source of Sample	Flowline		
Rm @ Meas. Temp	0.74 @ 75°F	@	@
Rmf @ Meas. Temp	0.56 @ 75°F	@	@
Rmc @ Meas. Temp	0.42 @ 75°F	@	@
Source of Rmf / Rmc	Calculated		
Rm @ BHT	0.47 @ 125°F	@	@
Time Circulation Stopped	17-May-2020 @ 18:00		
Time Logger on Bottom	18-May-2020 @ 1:15		
Maximum Recorded Temperature	125°F		
Equipment Number	10002		
Location	OKC		
Recorded By	B. Oetting		
Witnessed By	D. Greathouse		

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Equipment and Log Data															
Service Order: T2_201705															
Gamma			Density			Neutron			Sonic			IAT/DLL			
Run No.		One	Run No.		One	Run No.		One	Run No.		One	Run No.		One	
Serial No.		49	Serial No.		63	Serial No.		71	Serial No.			Serial No.		64	
O.D.		3.375 in.	Source No.		50129B	Source No.		87624G	Centralizers			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/DLL	
			Scales		Scales			Scales			Scales			Scales	
Run	Depths		Left	Right	Left	Right	Matrix	Left	Right	Matrix	Left	Right	Matrix	Left	Right
One	CSG	TD	0	150	0.3	-0.1	2.71 g/cc	0.3	-0.1	Lime				0.2	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 diagram.
Density is presented on a 2.71g/cc Matrix, Neutron is presented on a Limestone Matrix, Chlorides 6300 mg/L.
Annular volume computed using 4.5" Casing.
Washouts and borehole rugosity affect data quality.

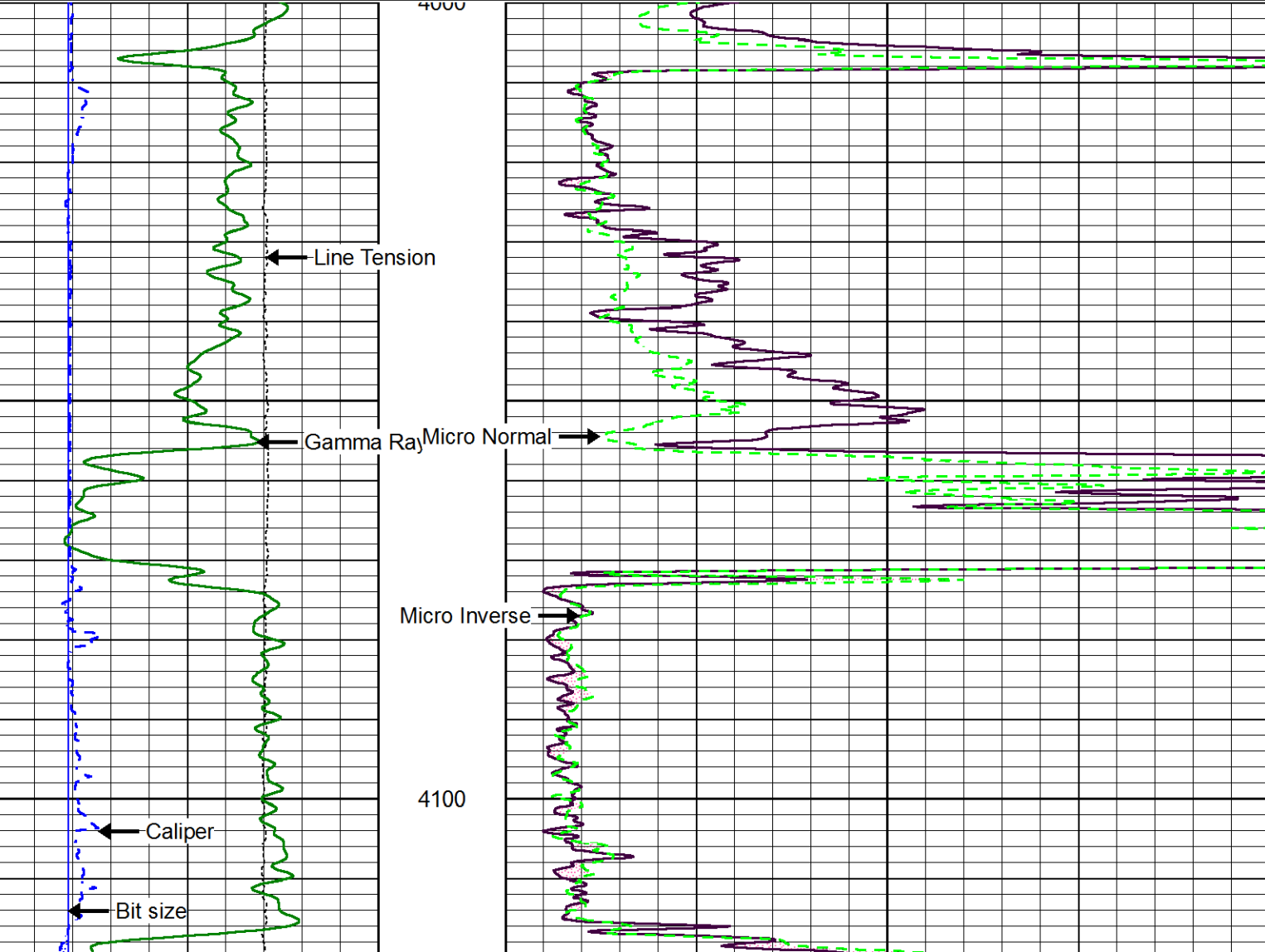
YOUR CREW TODAY: H. Garcia / J. Jones
THANK YOU FOR CHOOSING WIRELINE LOGGING SOLUTIONS. OKLAHOMA CITY. (405) 445-7135.

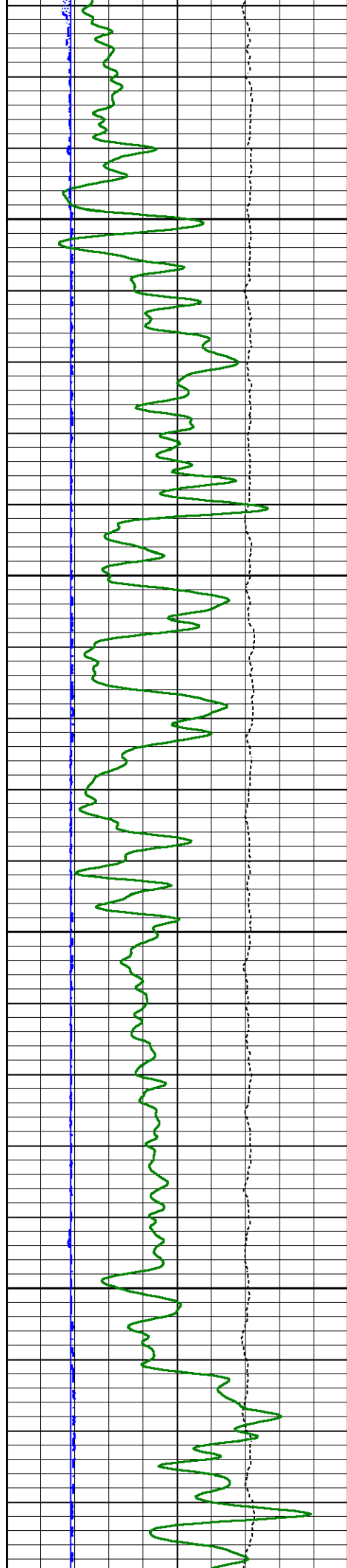


Main Pass

Database File obrien_keystone_6-4.db
Dataset Pathname MainPass
Presentation Format OKC-ME~1
Dataset Creation Mon May 18 03:39:43 2020
Charted by Depth in Feet scaled 1:240

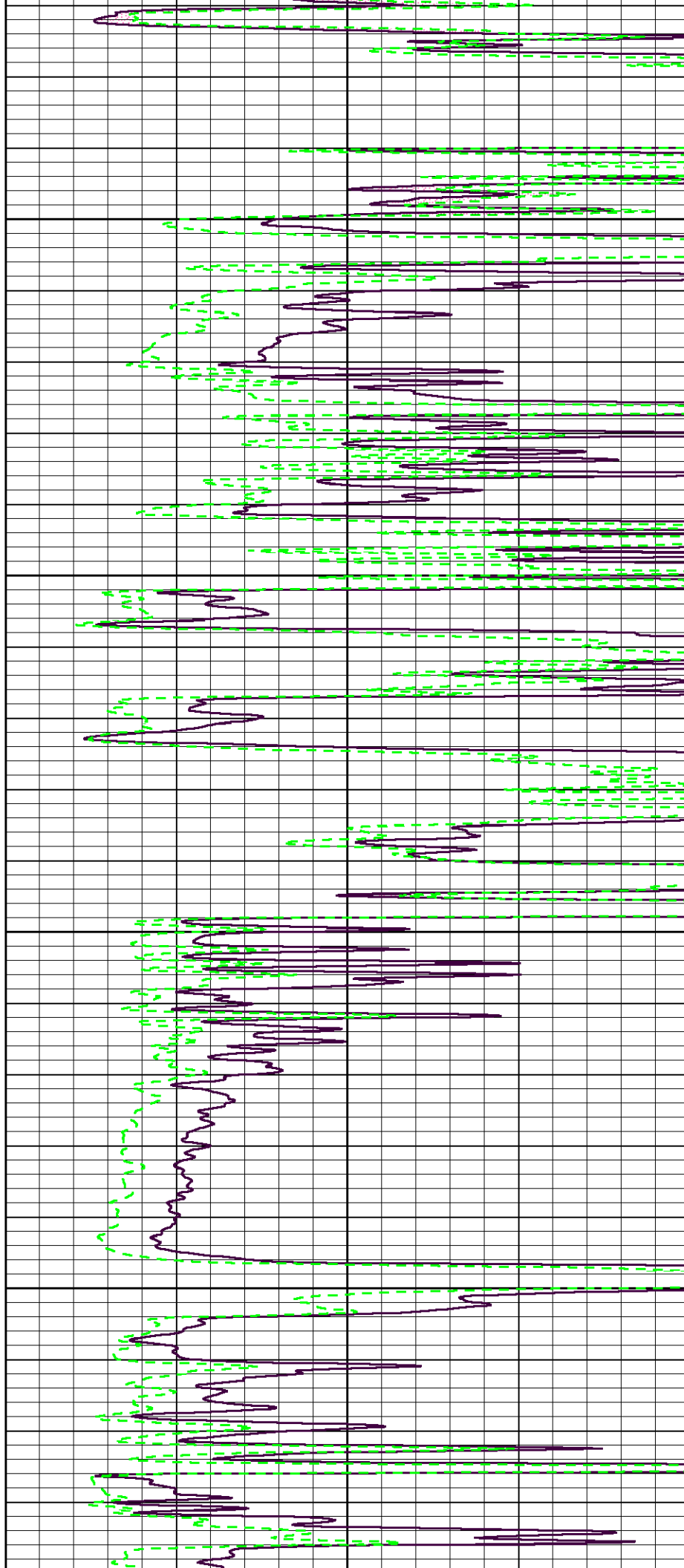
6	Bit size (in)	16	0	Micro Inverse (Ohm-m)	40
10000	Line Tension (lb)	0	0	Micro Normal (Ohm-m)	40
0	Gamma Ray (GAPI)	150			
6	Caliper (in)	16			

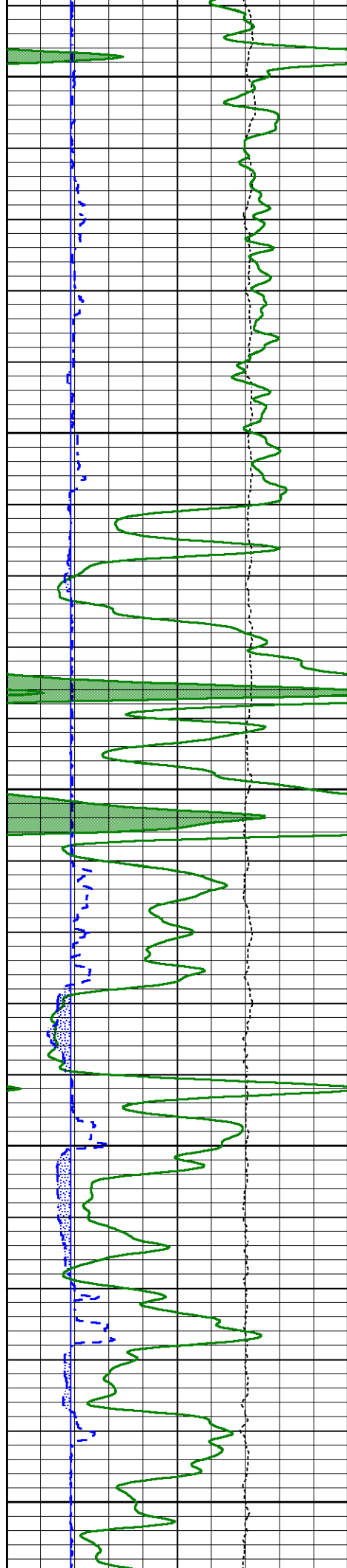




4200

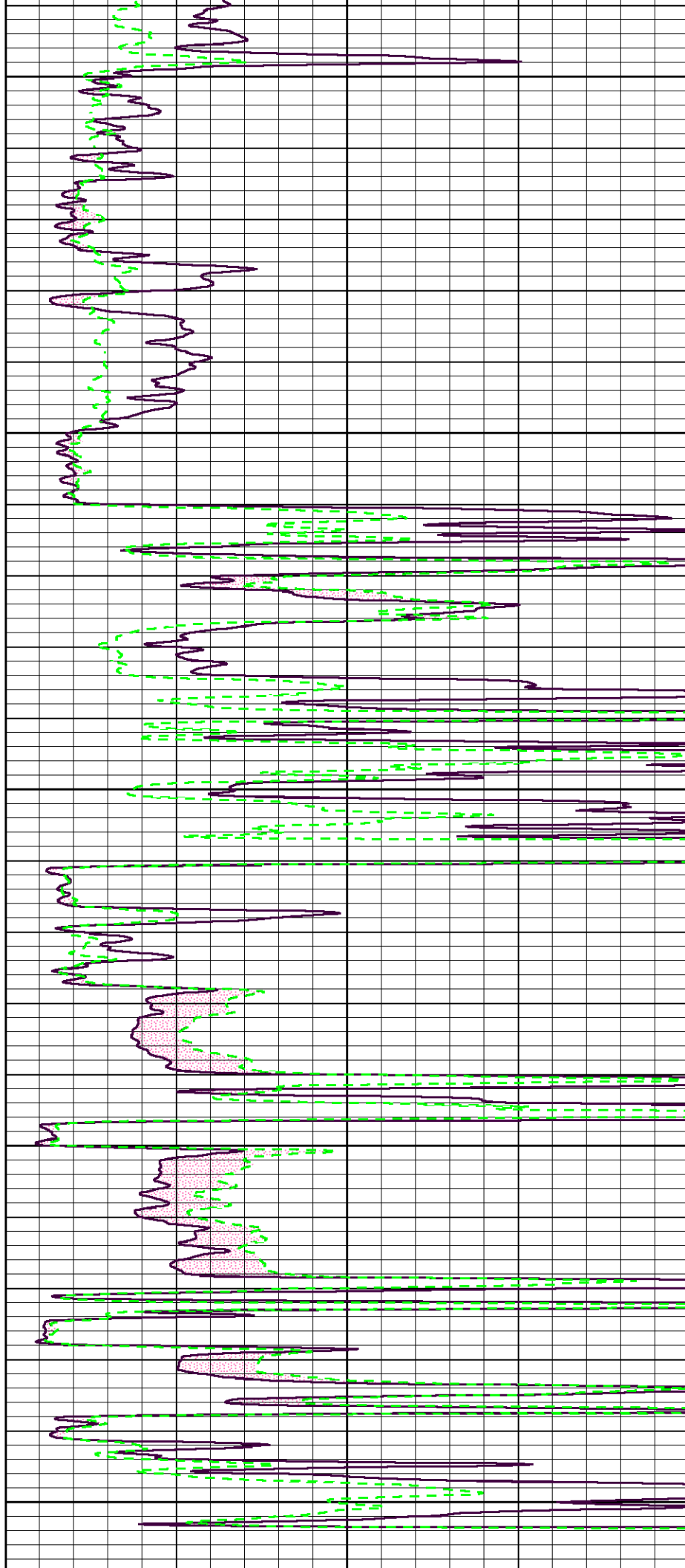
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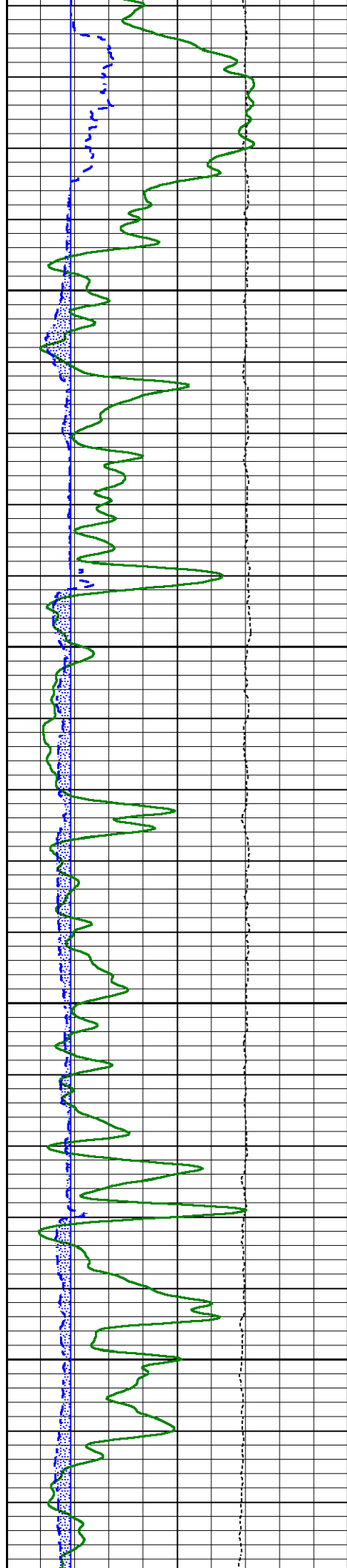




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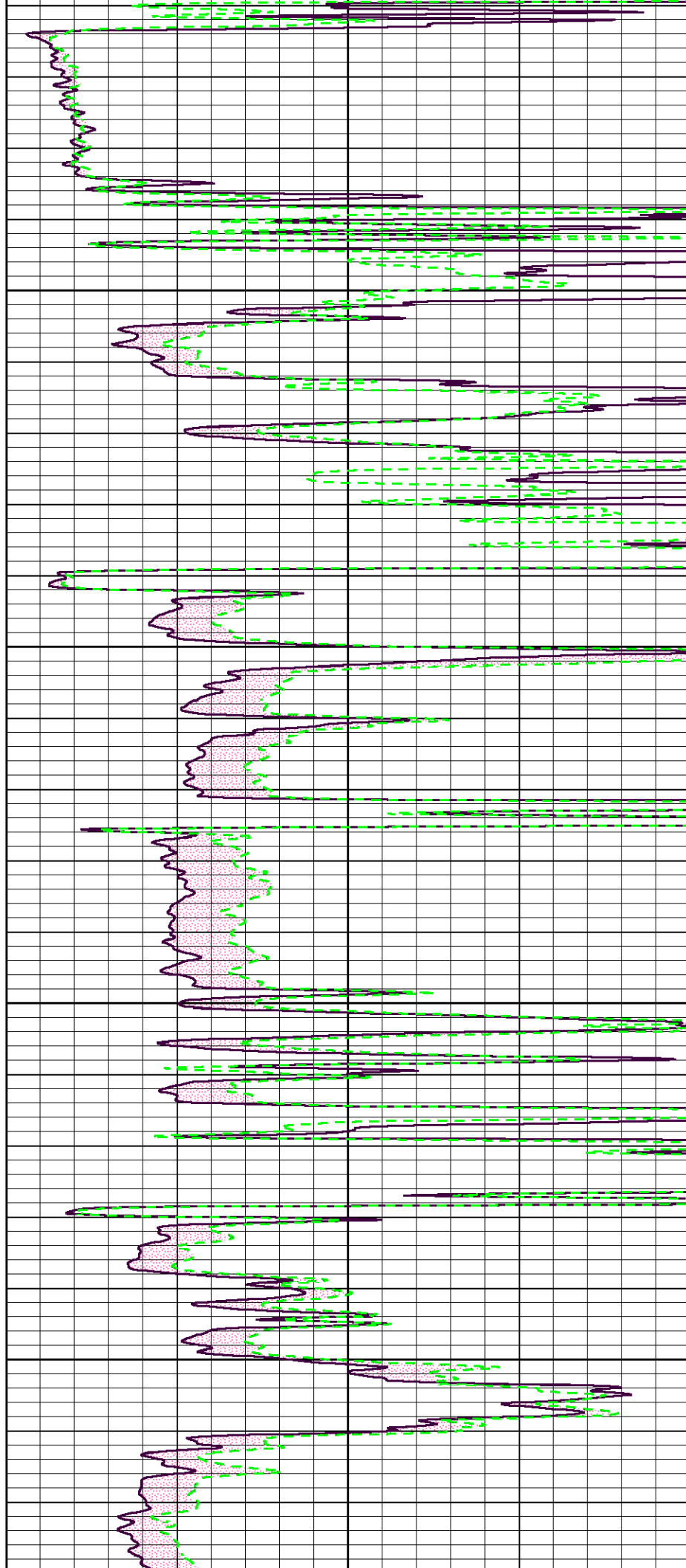
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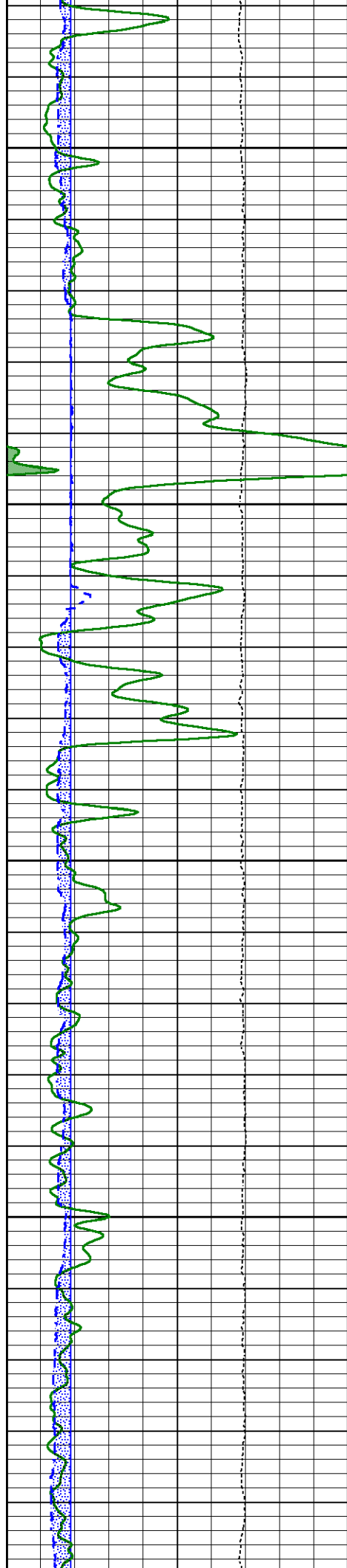




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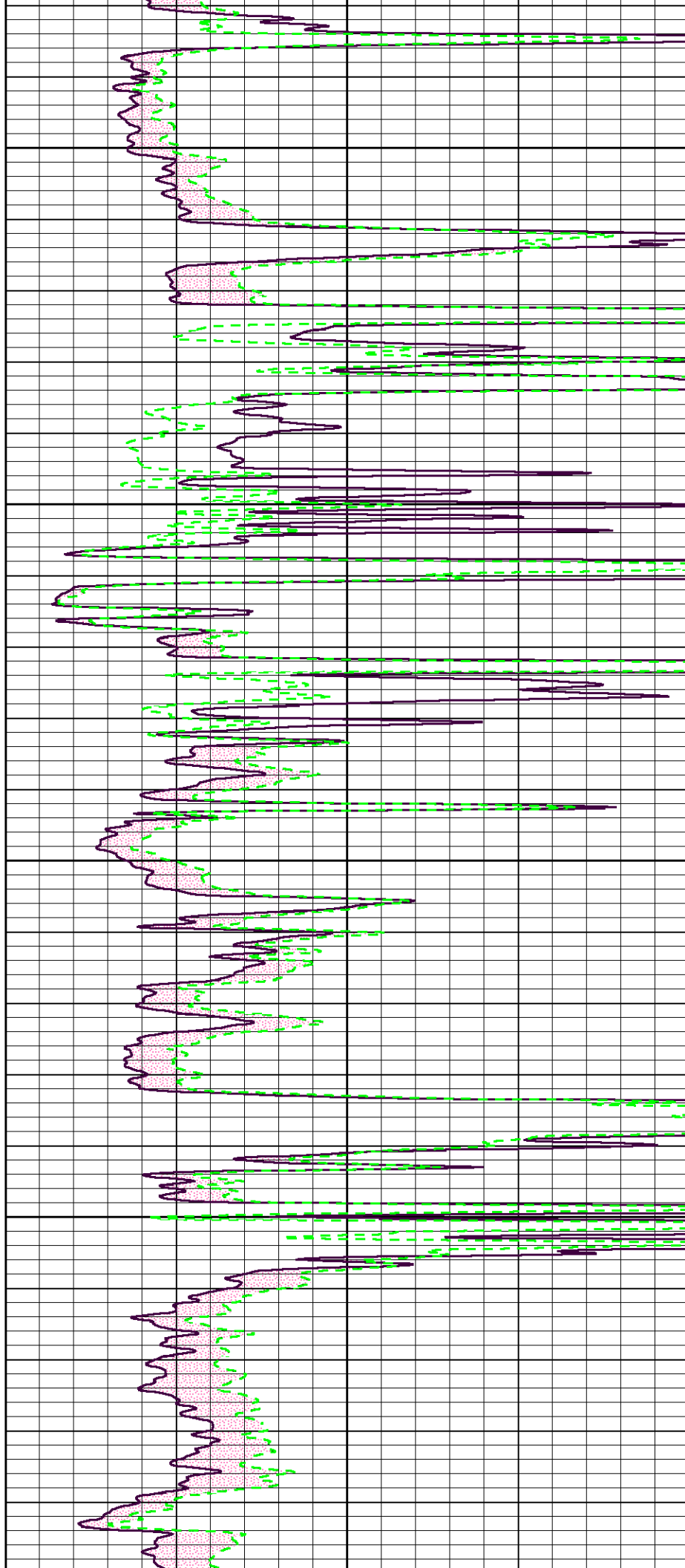


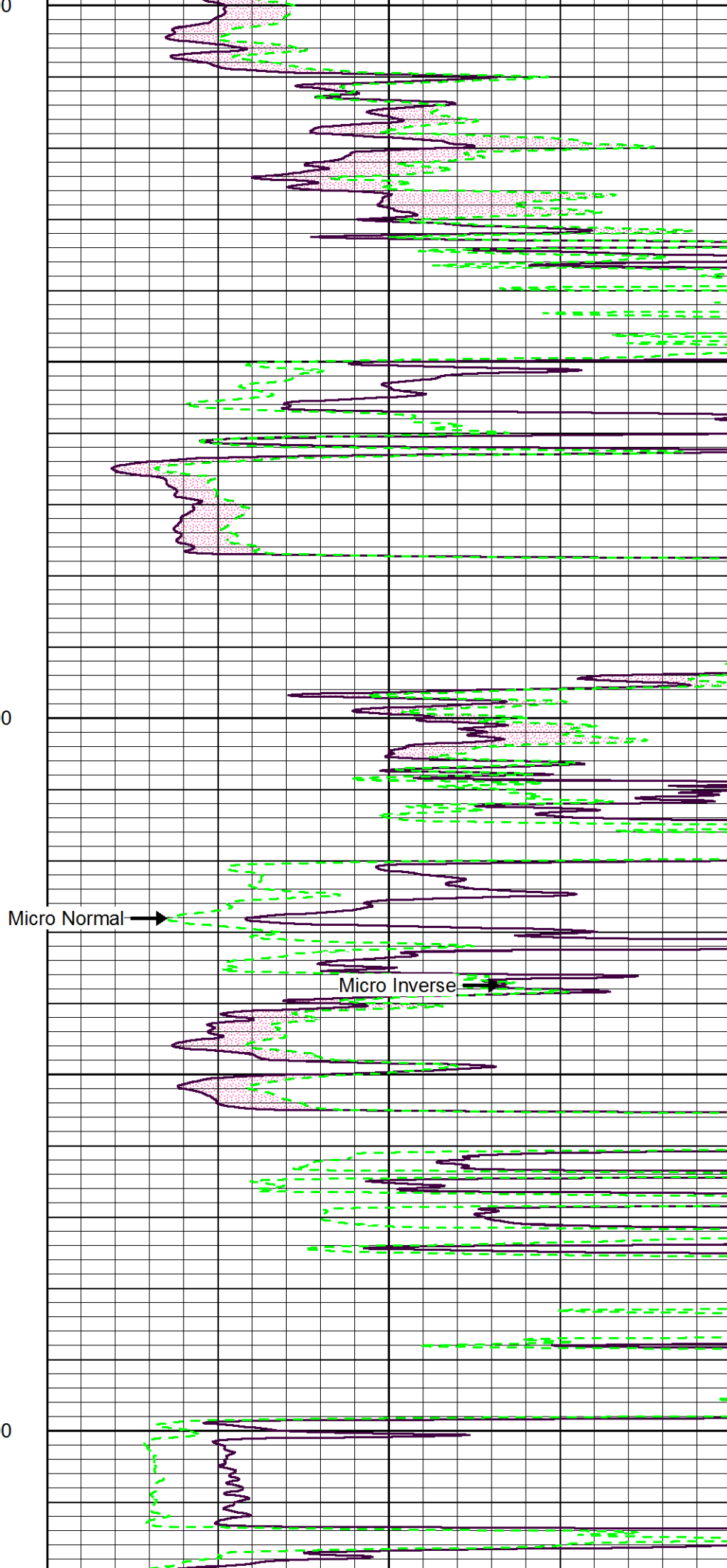
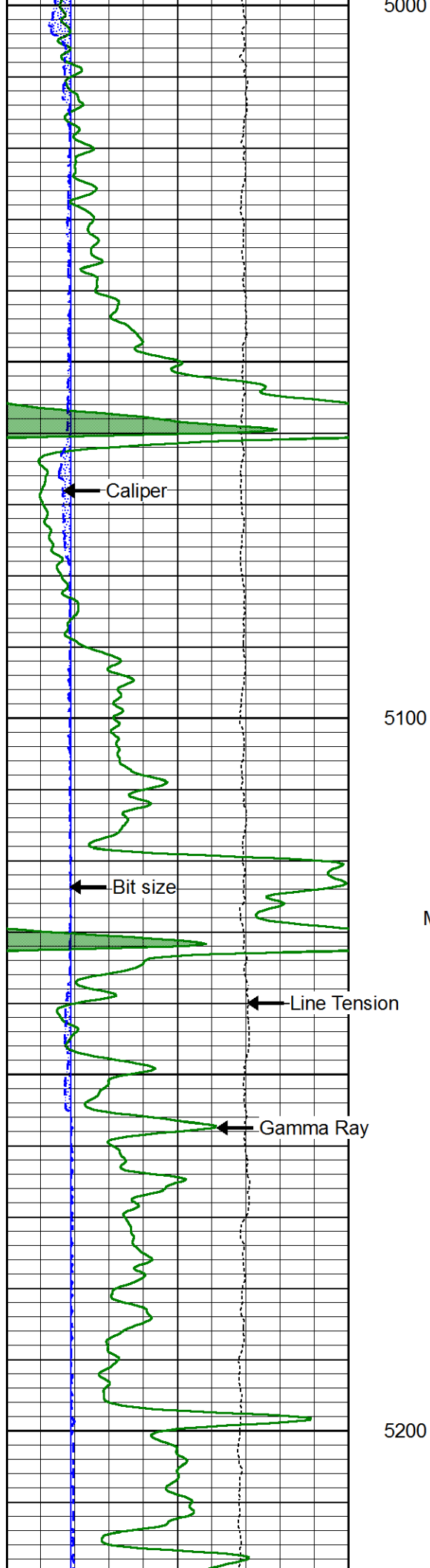


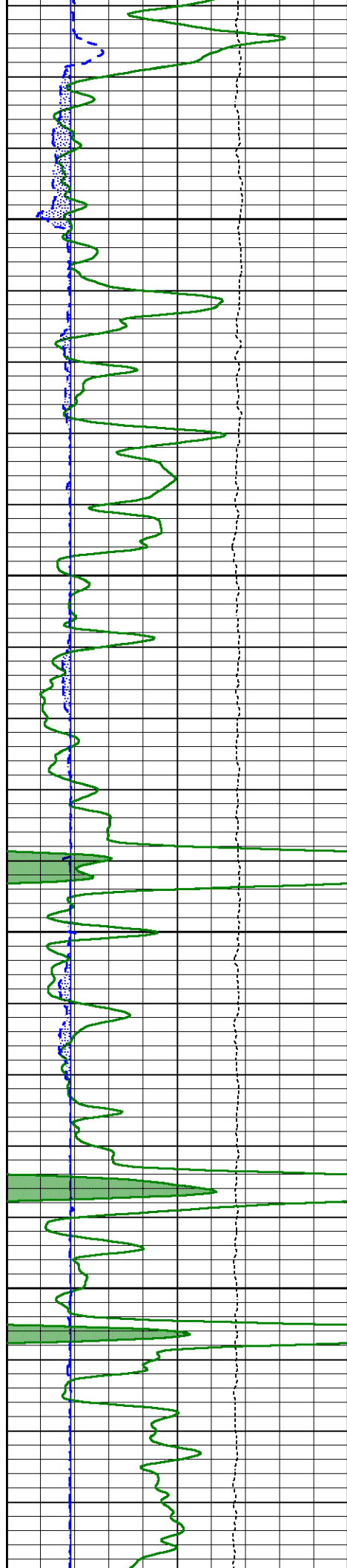
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4900

5000

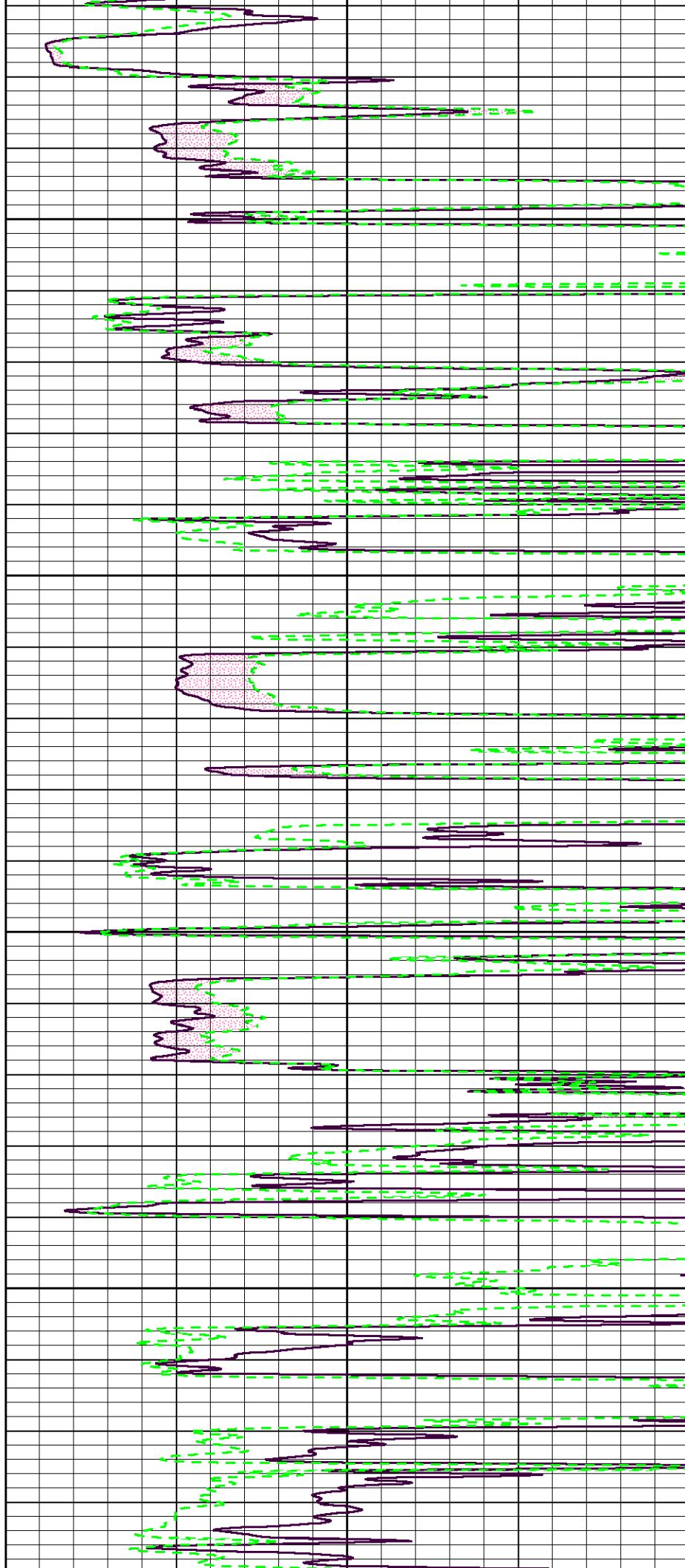


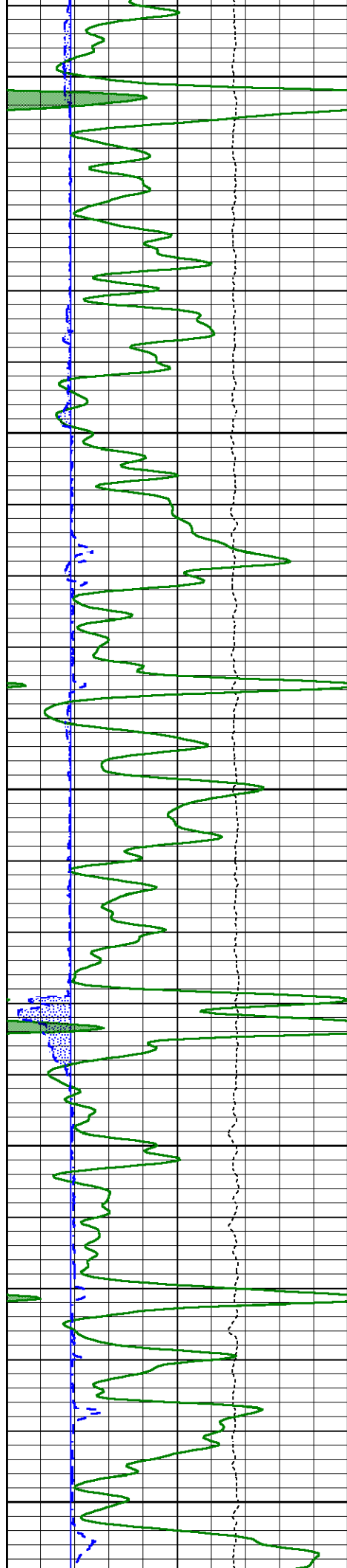




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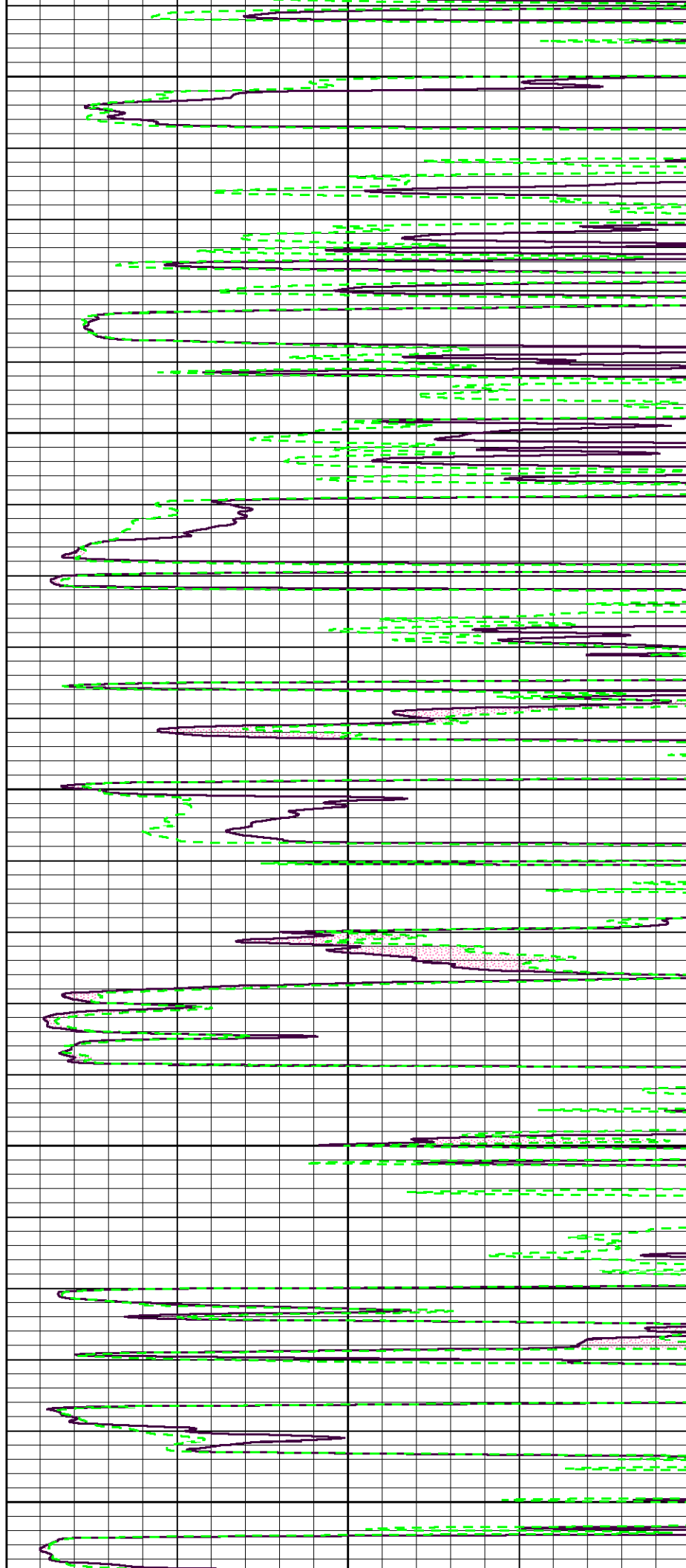
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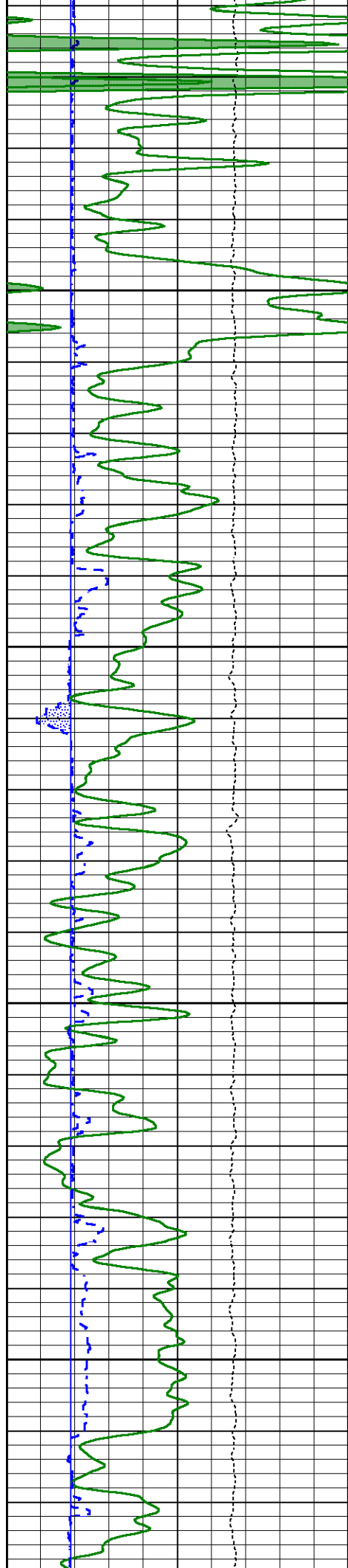




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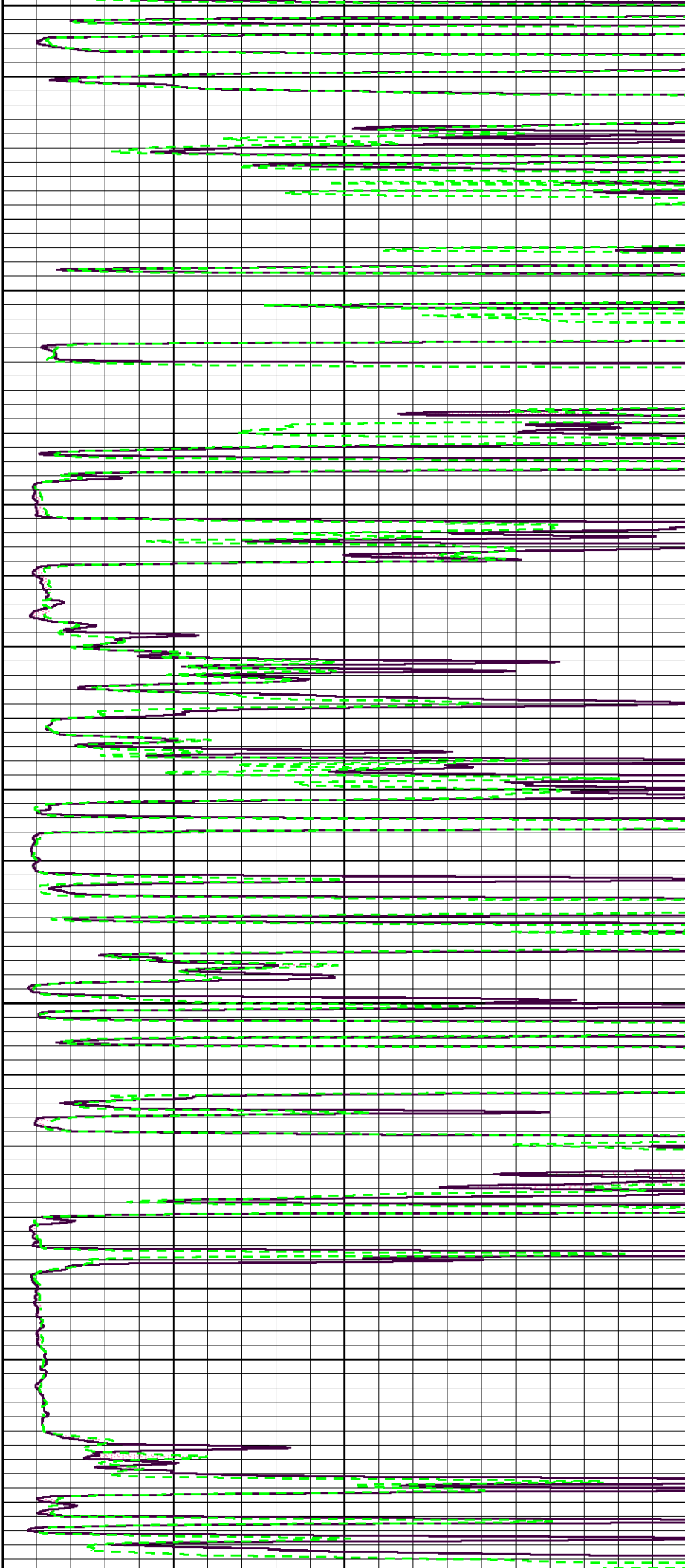
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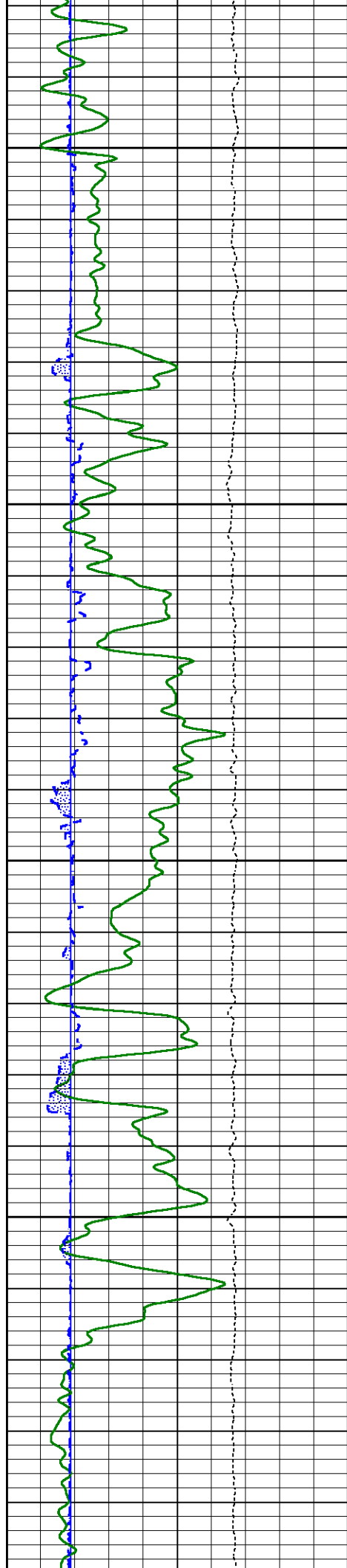




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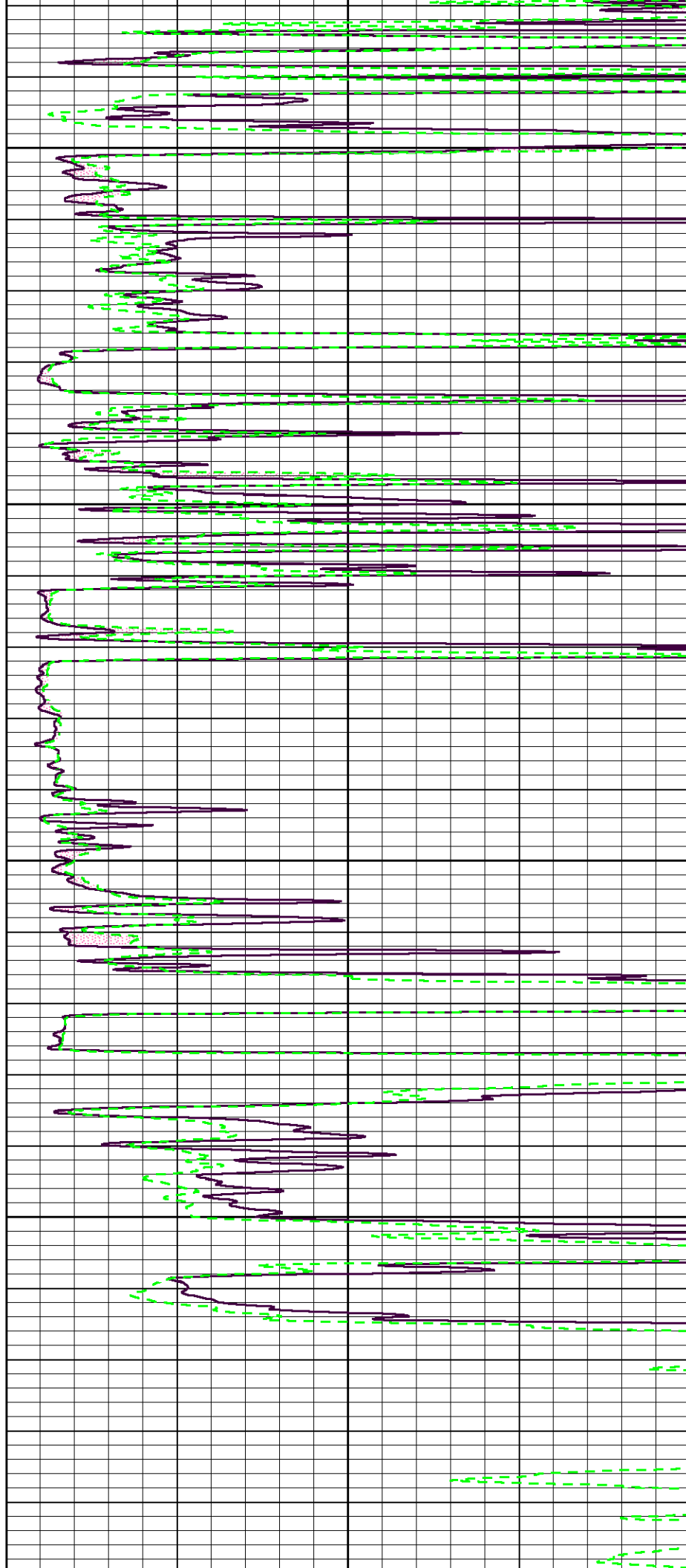


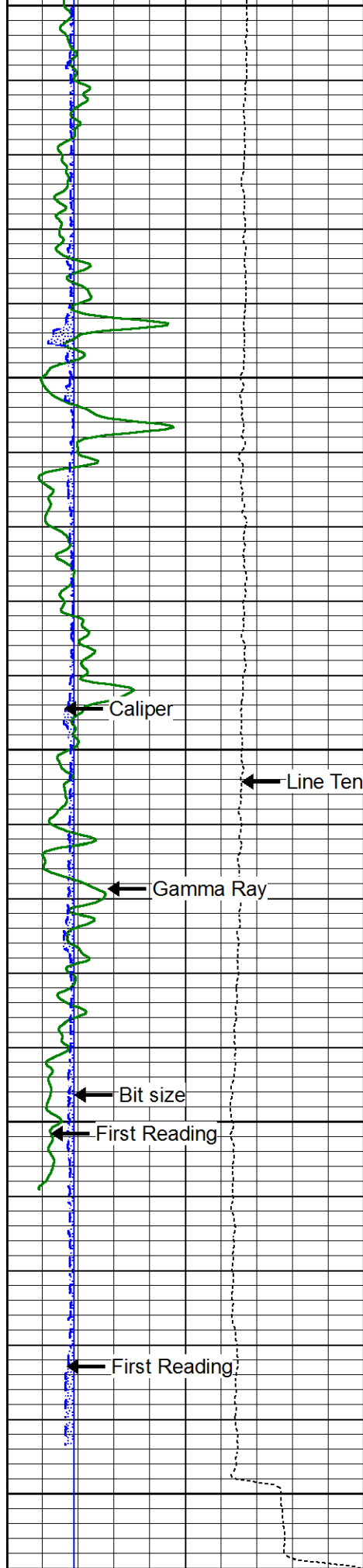


5900

6000

6100

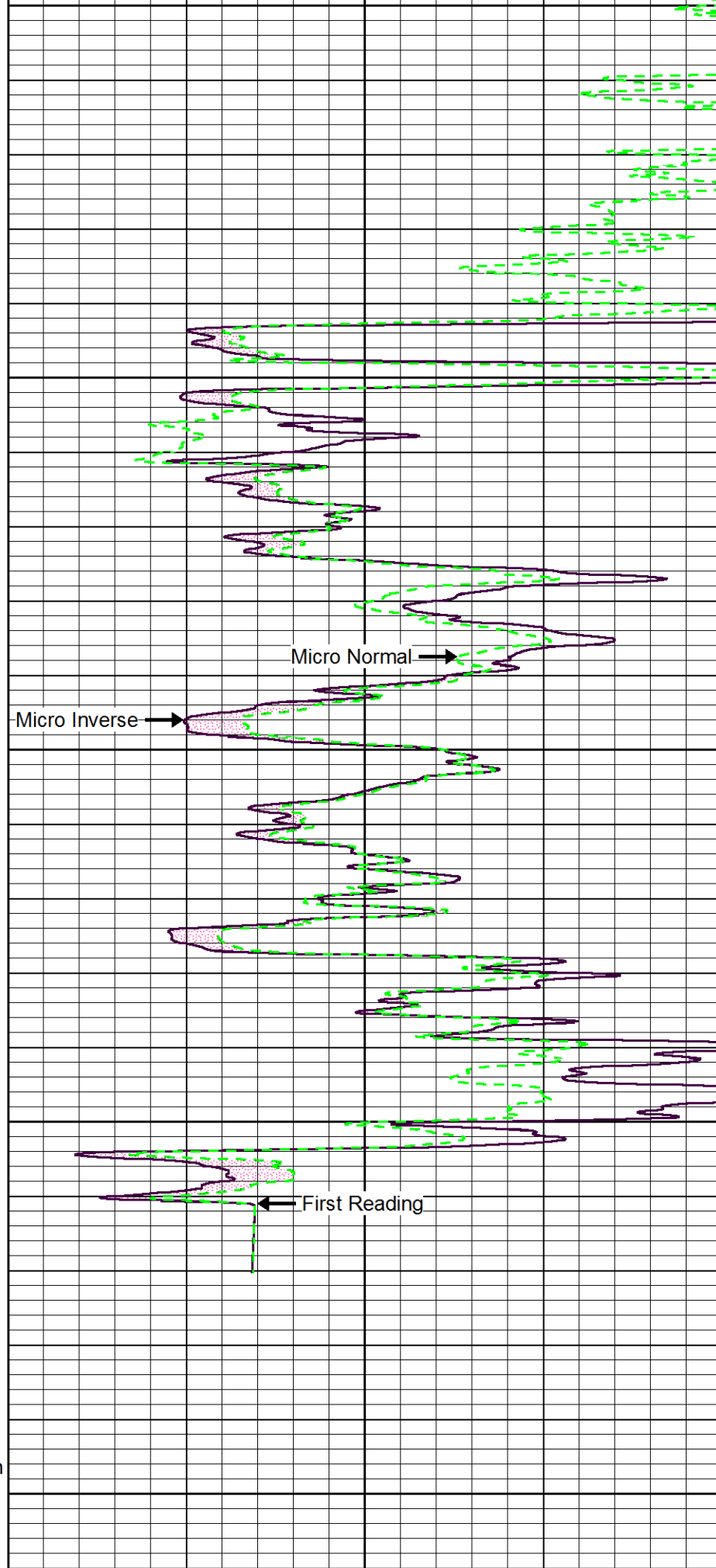




6100

6200

Total Depth 6300



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

0	Micro Inverse (Ohm-m)	40
0	Micro Normal (Ohm-m)	40

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Main Pass

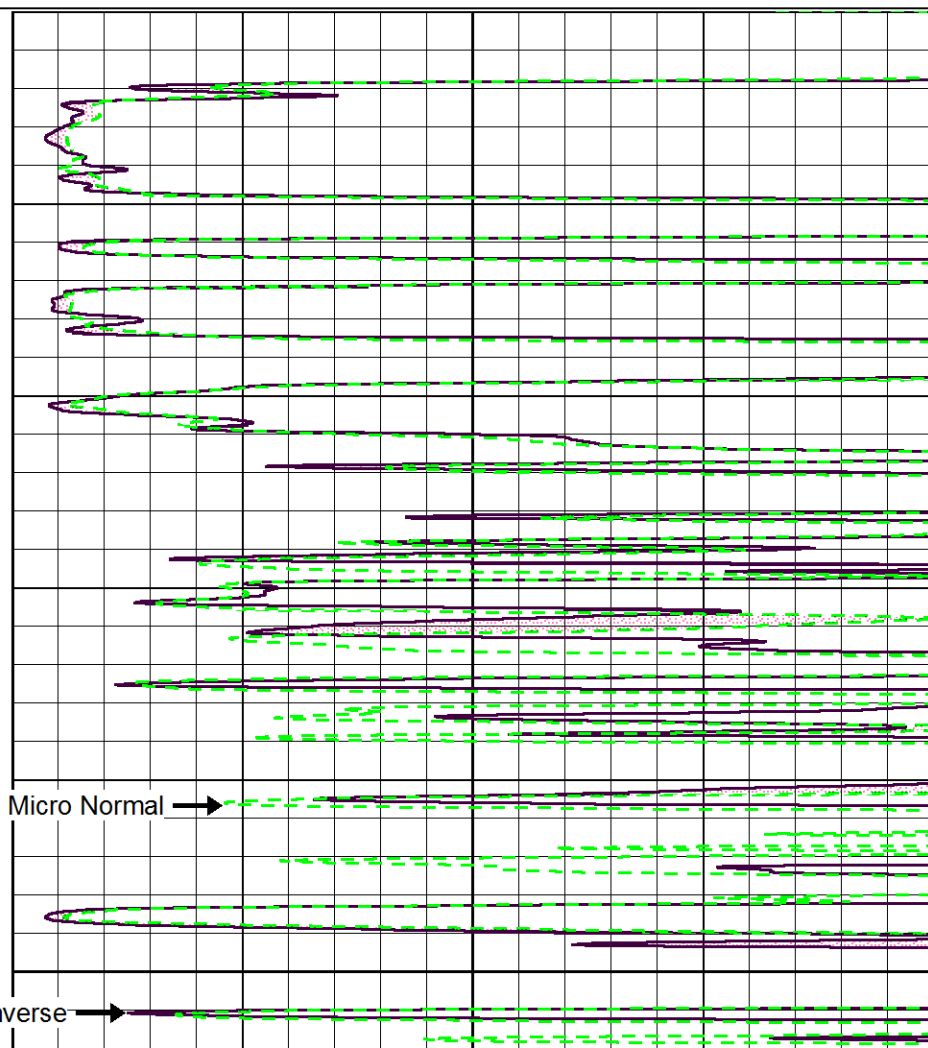
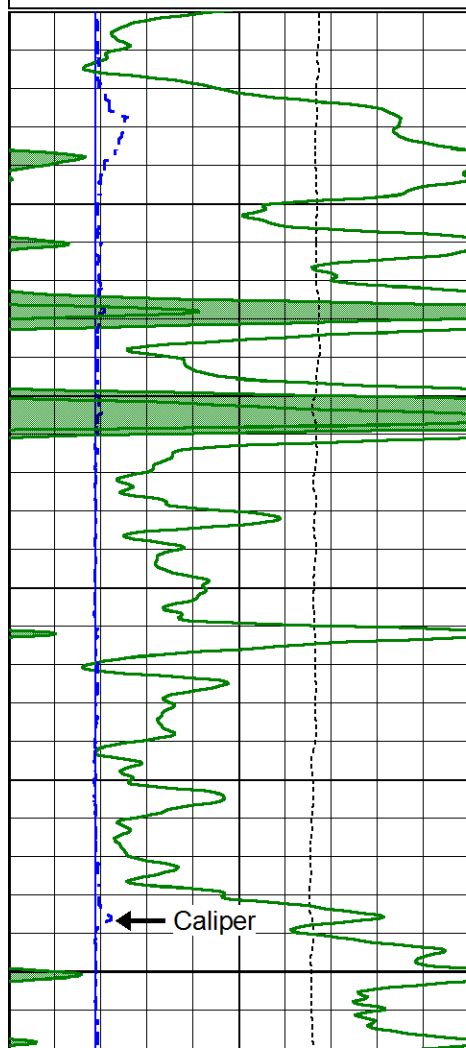
WIRELIN
LOGGING
SOLUTIONS

High Resolution Pass

Database File obrien_keystone_6-4.db
Dataset Pathname HiRes
Presentation Format OKC-ME~1
Dataset Creation Mon May 18 01:52:50 2020 by Calc Sondex
Charted by Depth in Feet scaled 1:120

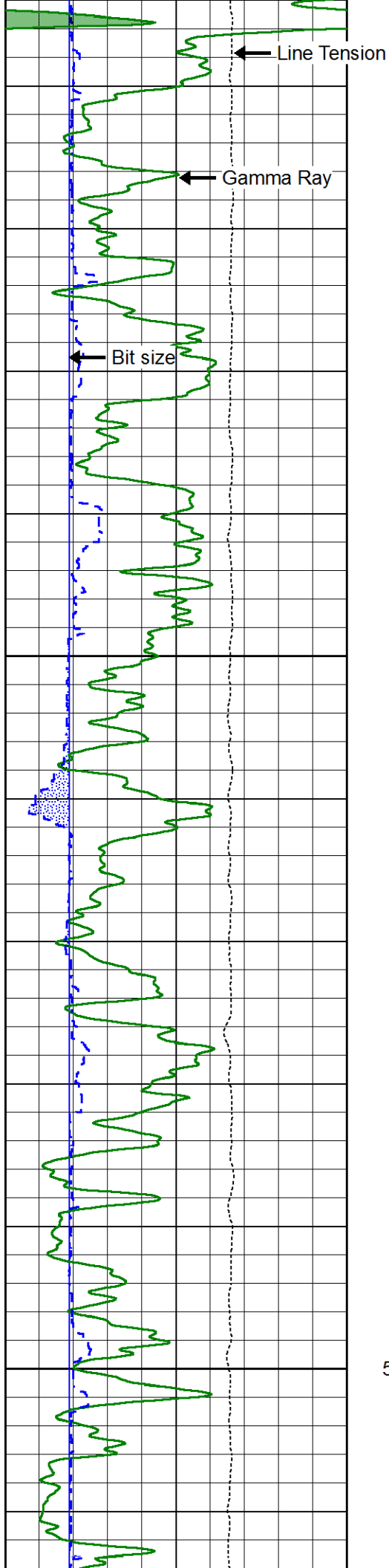
6	Bit size (in)	16
10000	Line Tension (lb)	0
0	Gamma Ray (GAPI)	150
6	Caliper (in)	16

0	Micro Inverse (Ohm-m)	40
0	Micro Normal (Ohm-m)	40

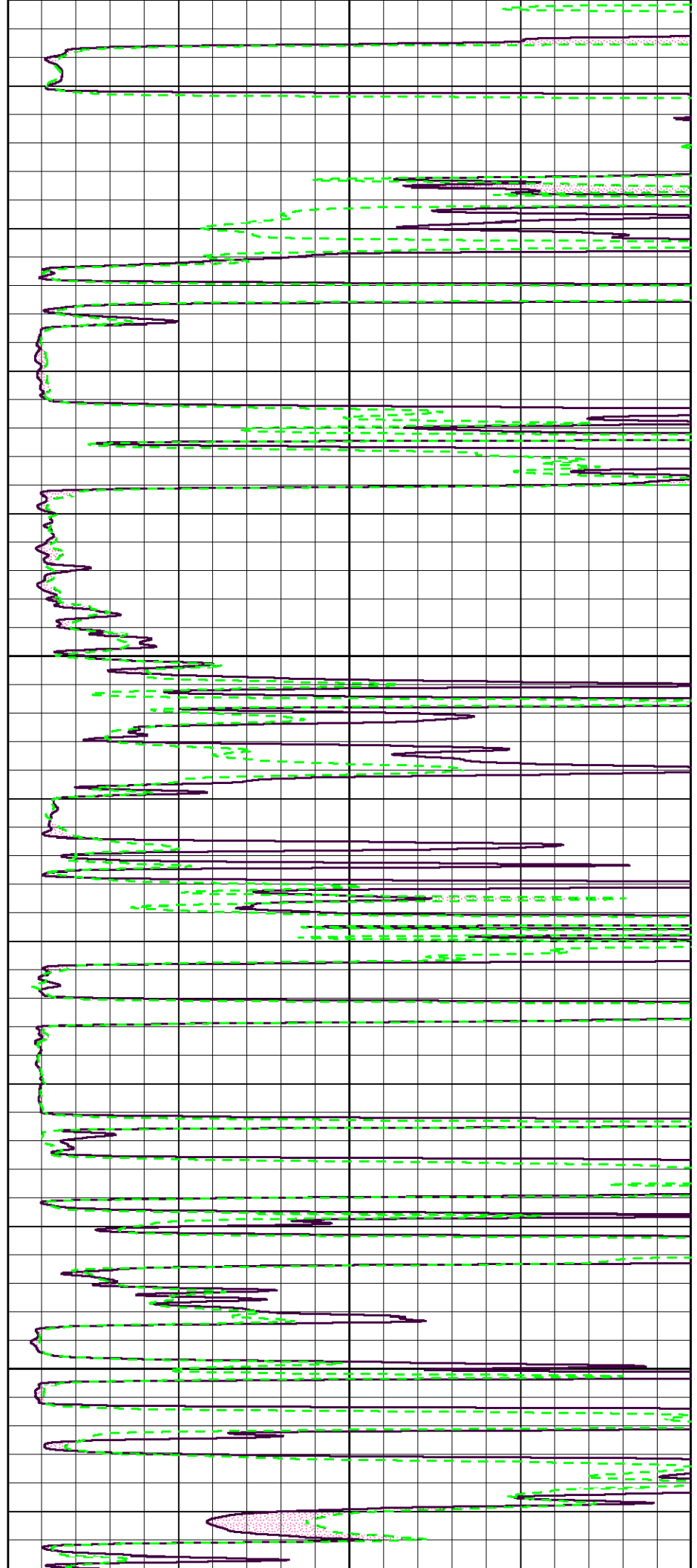


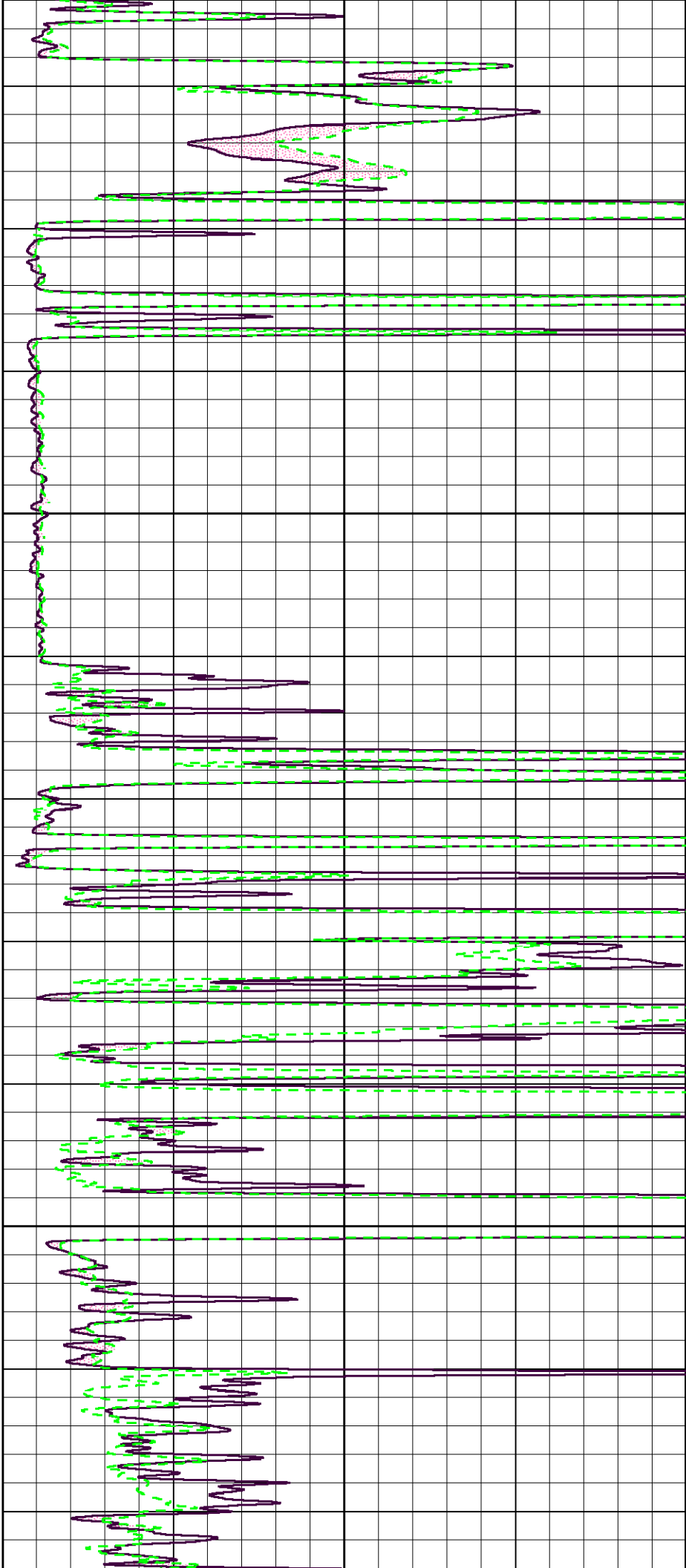
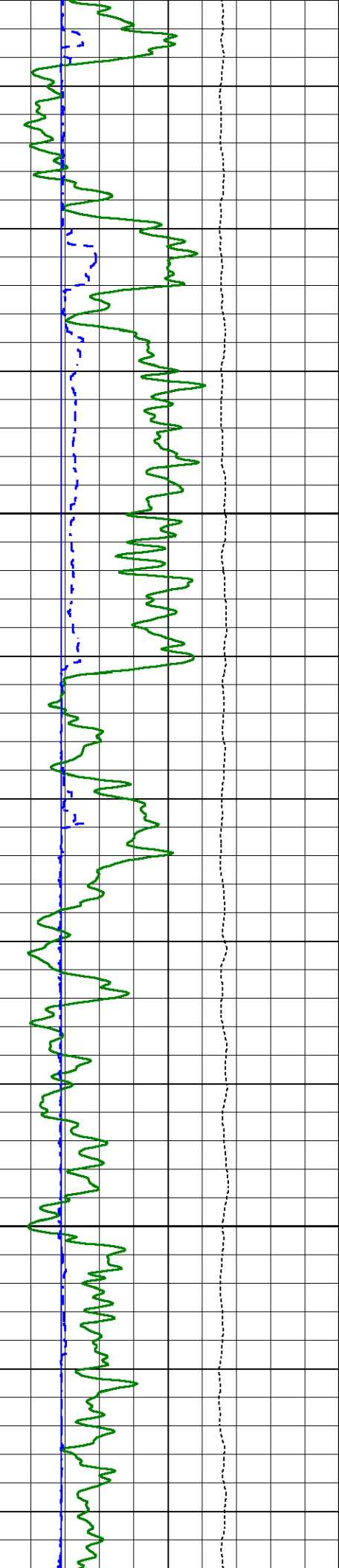
5700

Micro Inverse

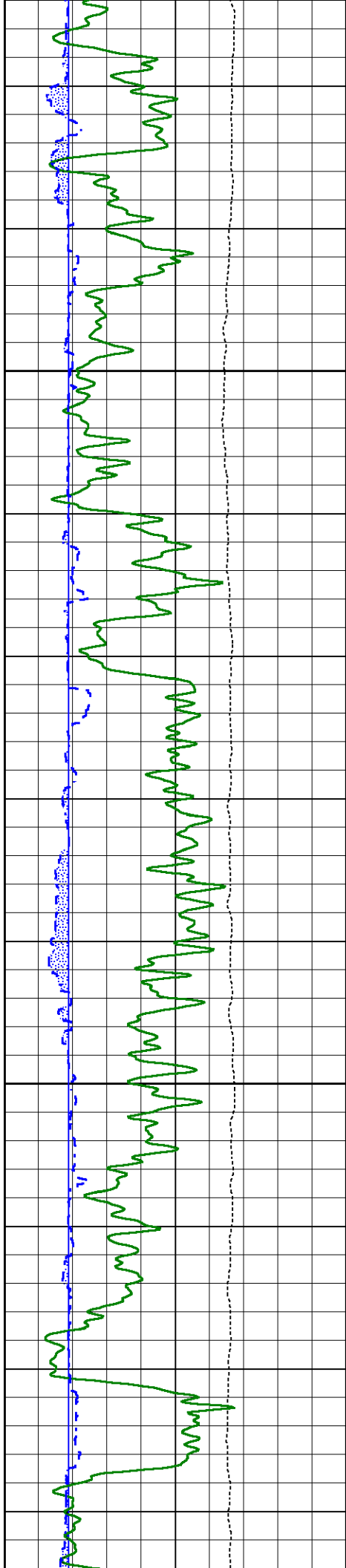


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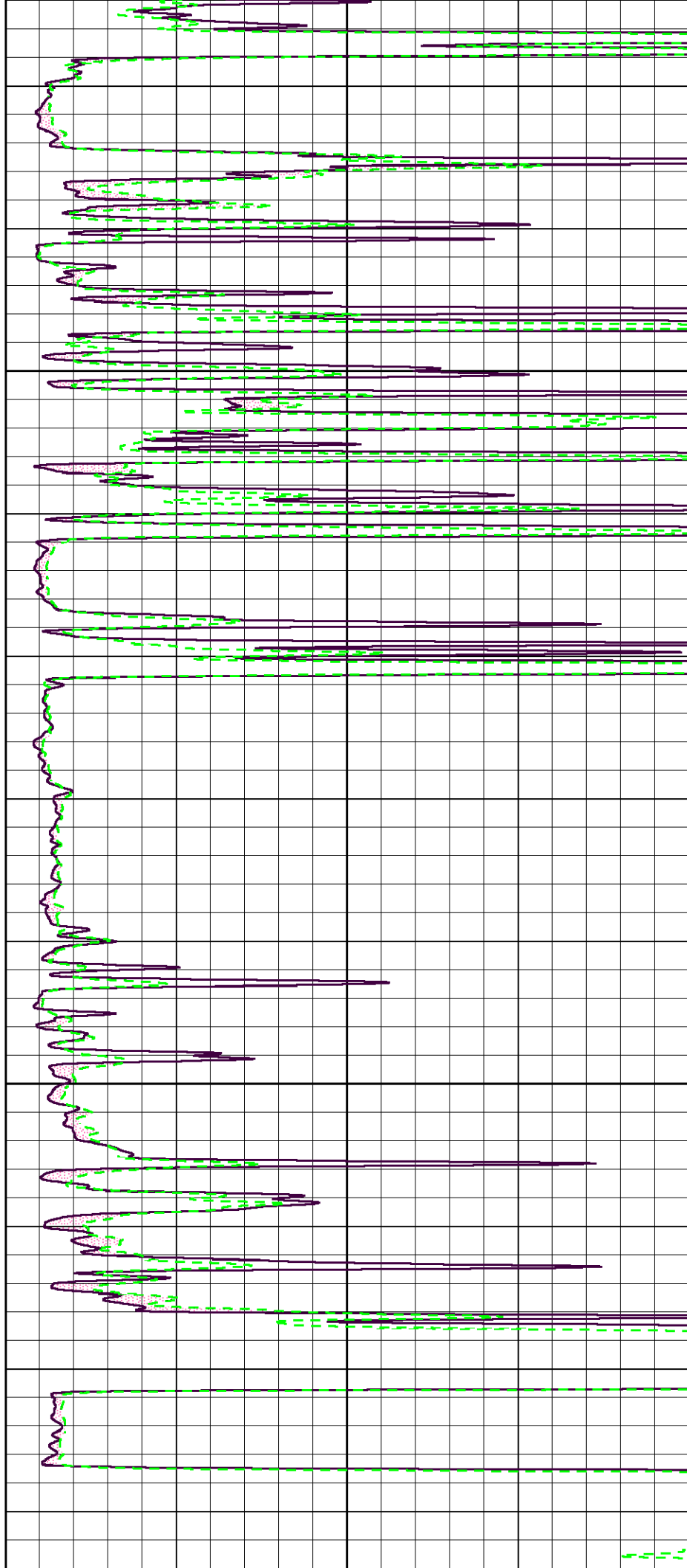


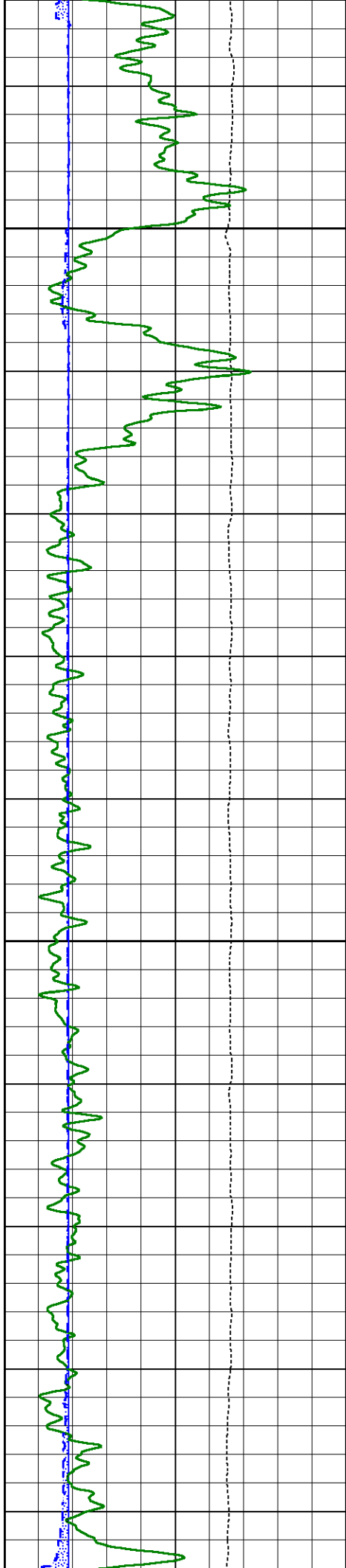


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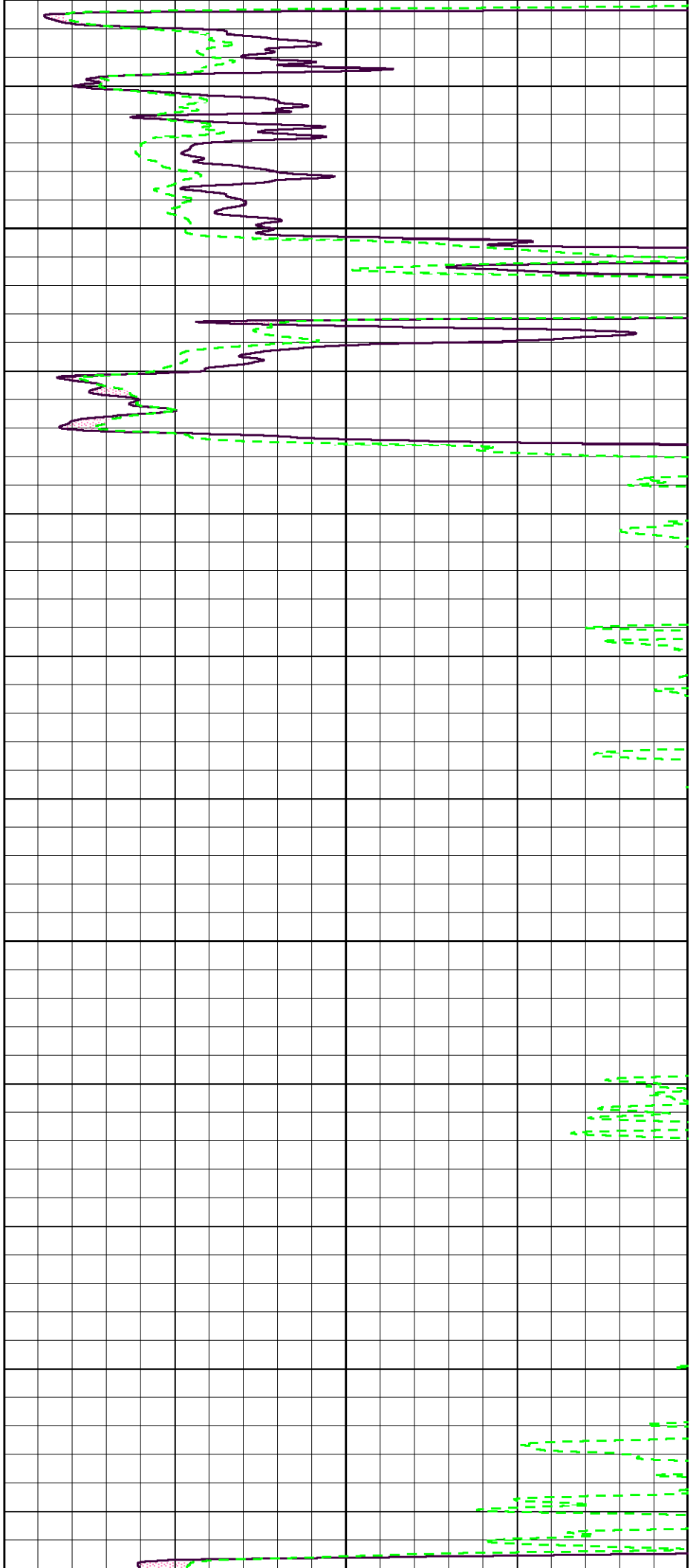


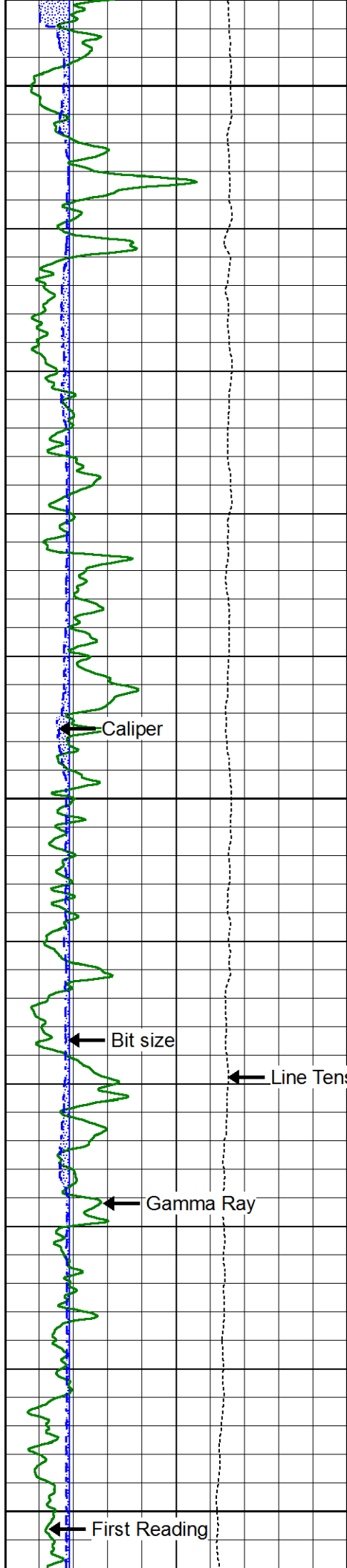
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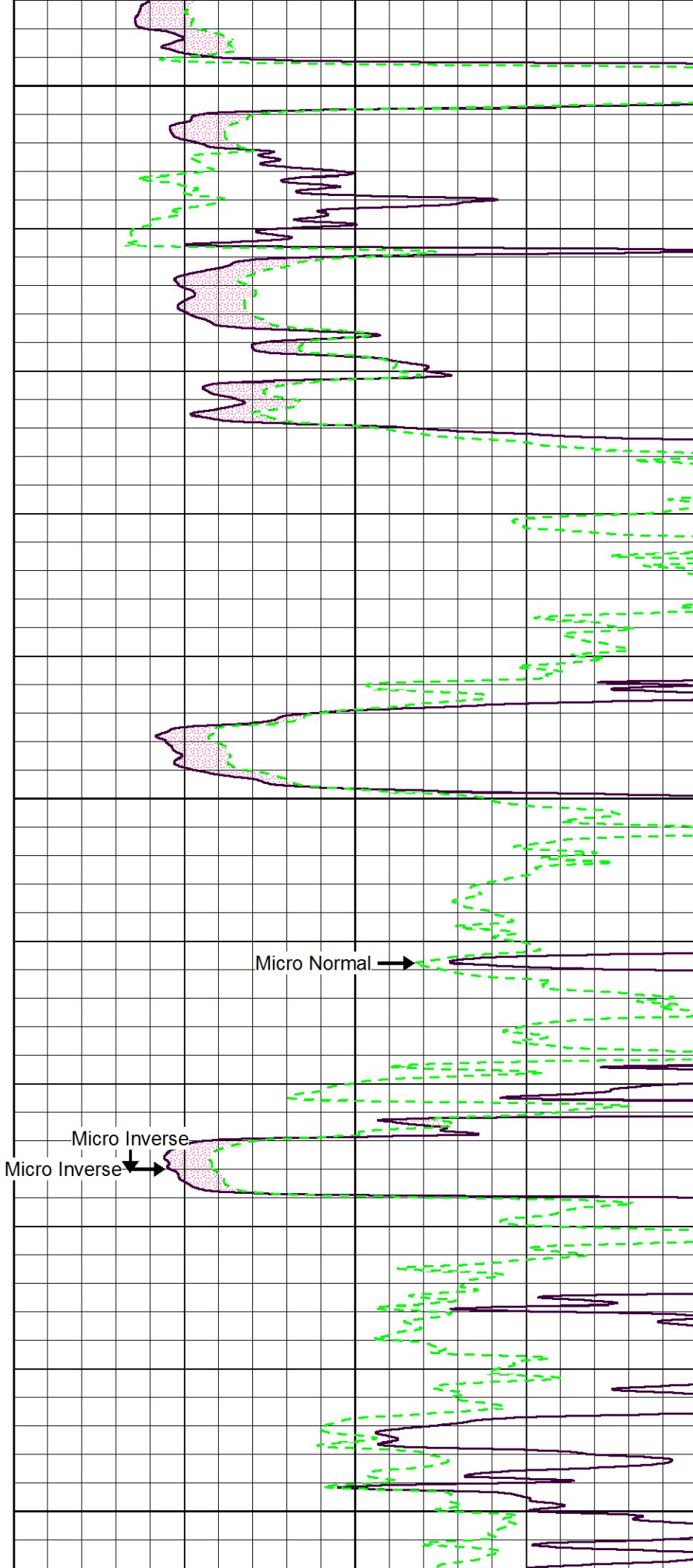


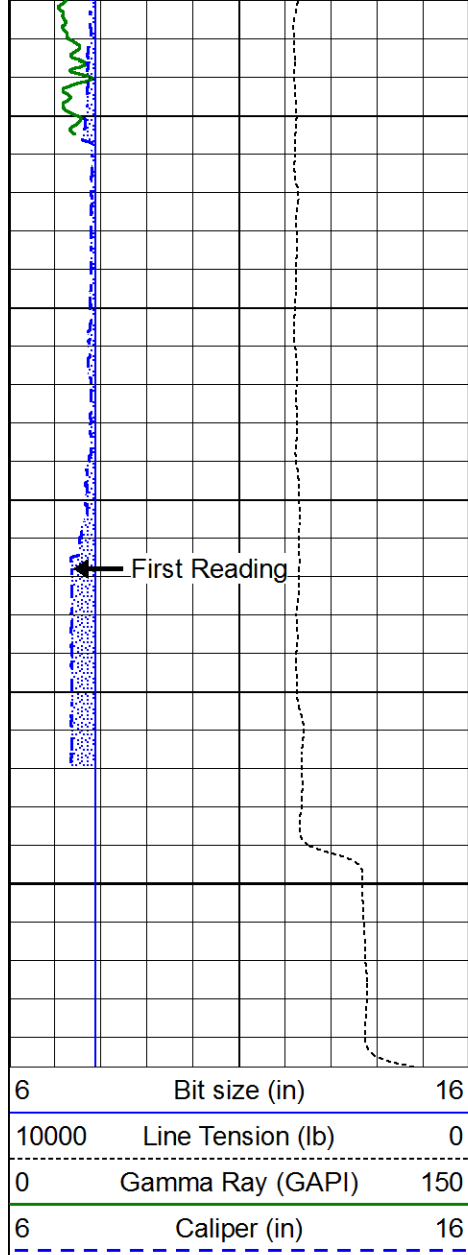
6100





6200





Total Depth
6300



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High Resolution Pass

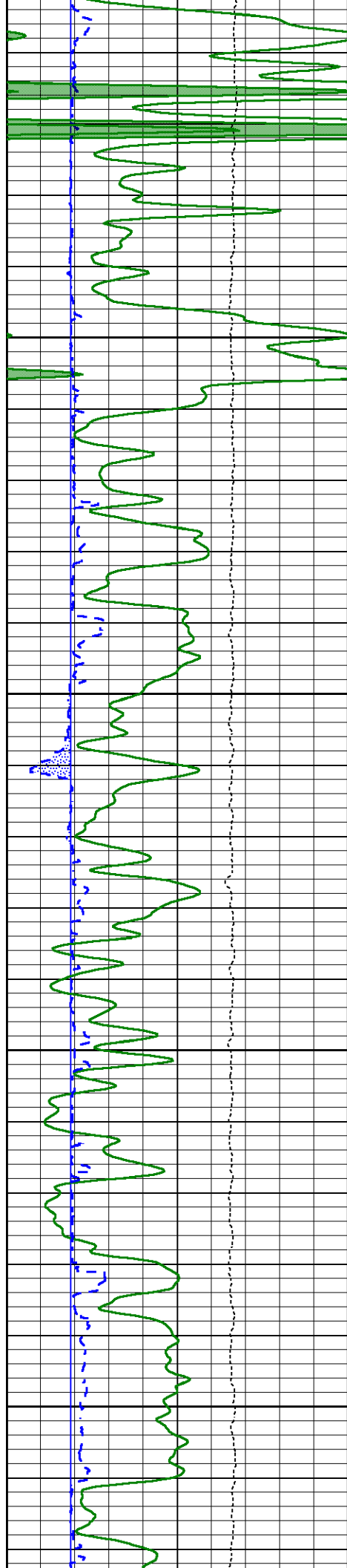
WIRELIN
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Repeat Pass

Database File obrien_keystone_6-4.db
Dataset Pathname RepeatPass
Presentation Format OKC-ME~1
Dataset Creation Mon May 18 01:56:32 2020 by Calc Sondex
Charted by Depth in Feet scaled 1:240

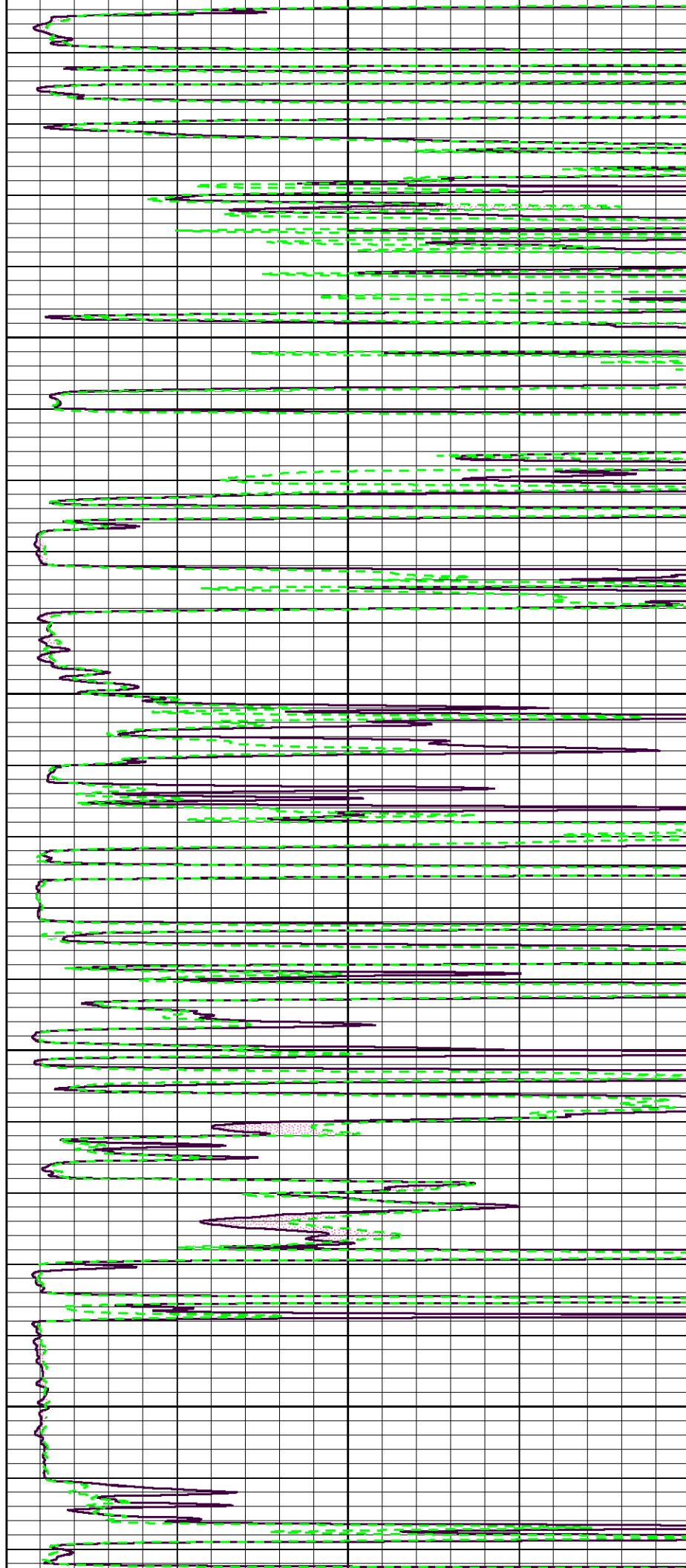
6	Bit size (in)	16
10000	Line Tension (lb)	0
0	Gamma Ray (GAPI)	150
6	Caliper (in)	16

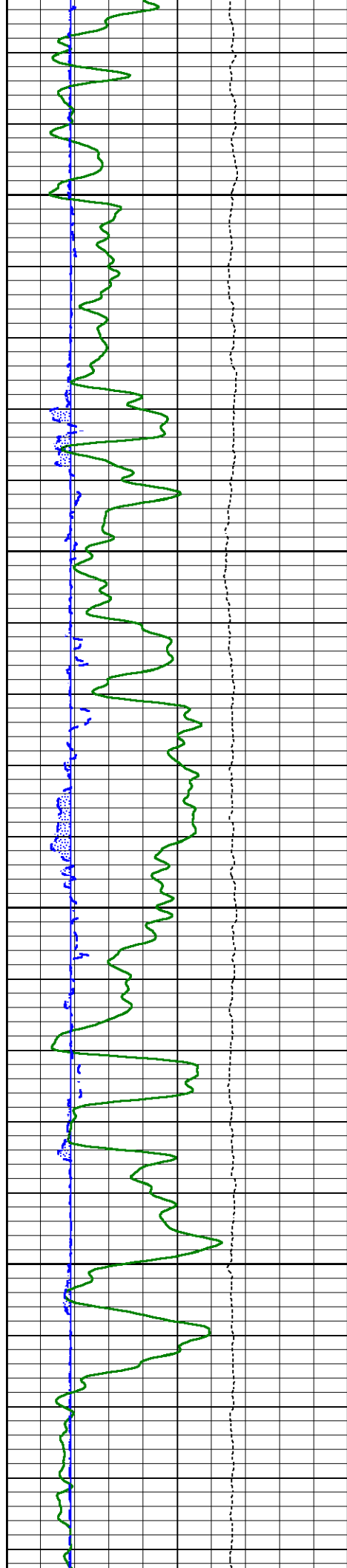
0	Micro Inverse (Ohm-m)	40
0	Micro Normal (Ohm-m)	40



5700

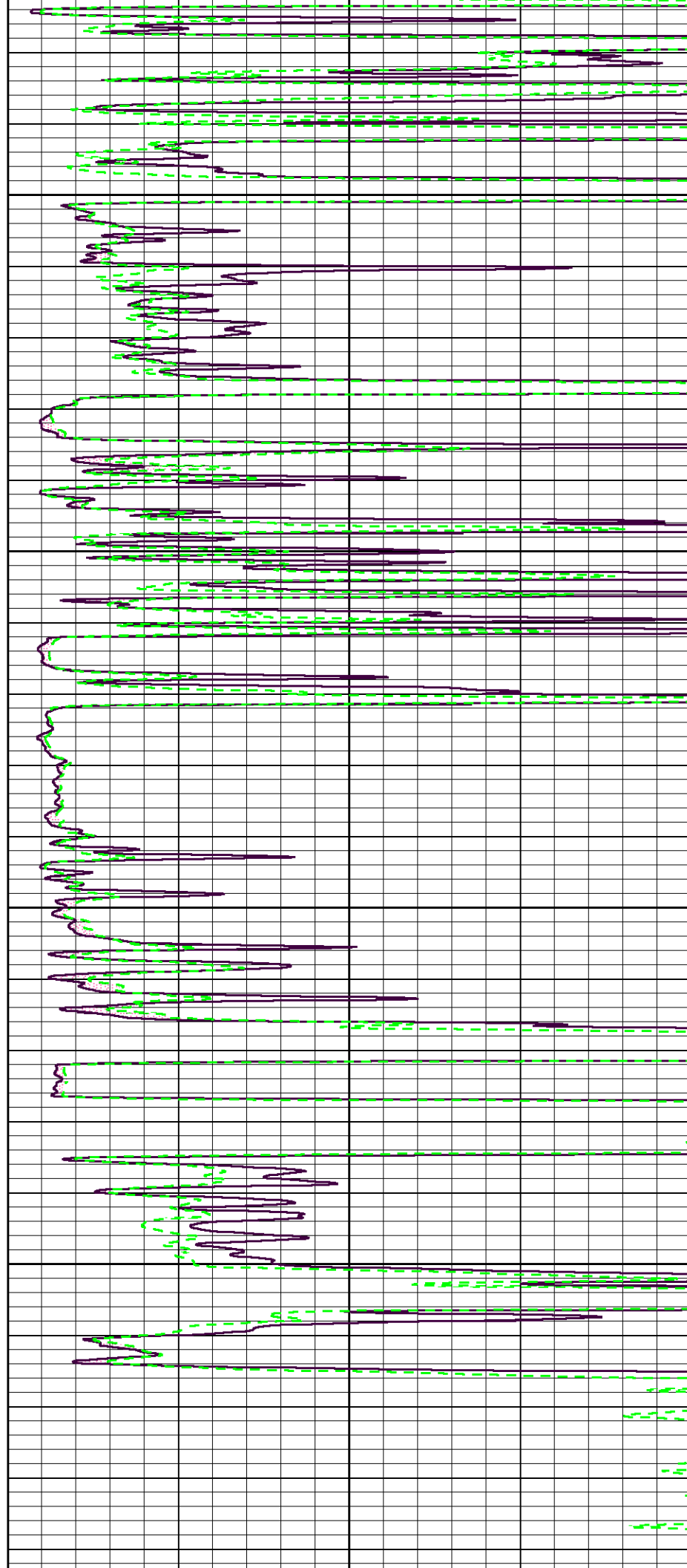
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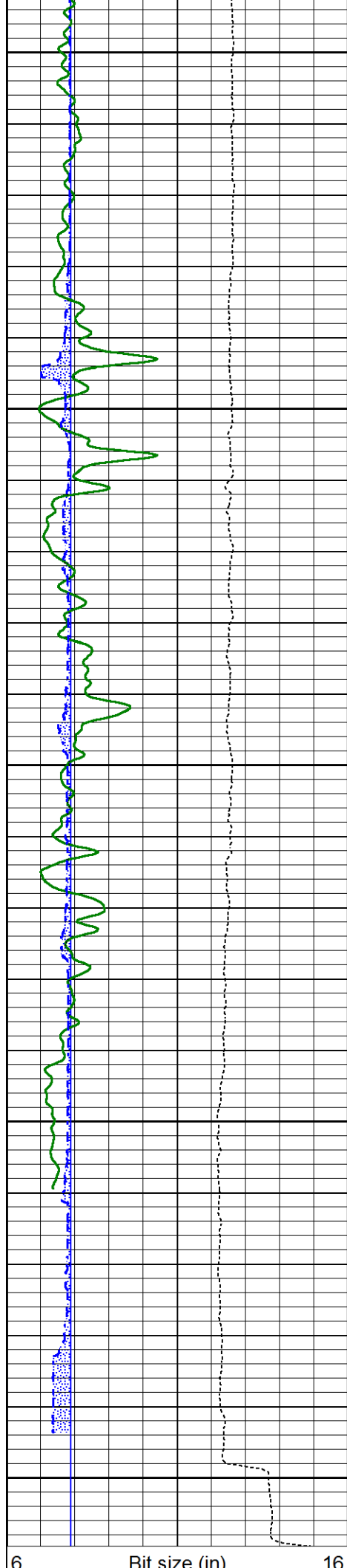




5900

6000



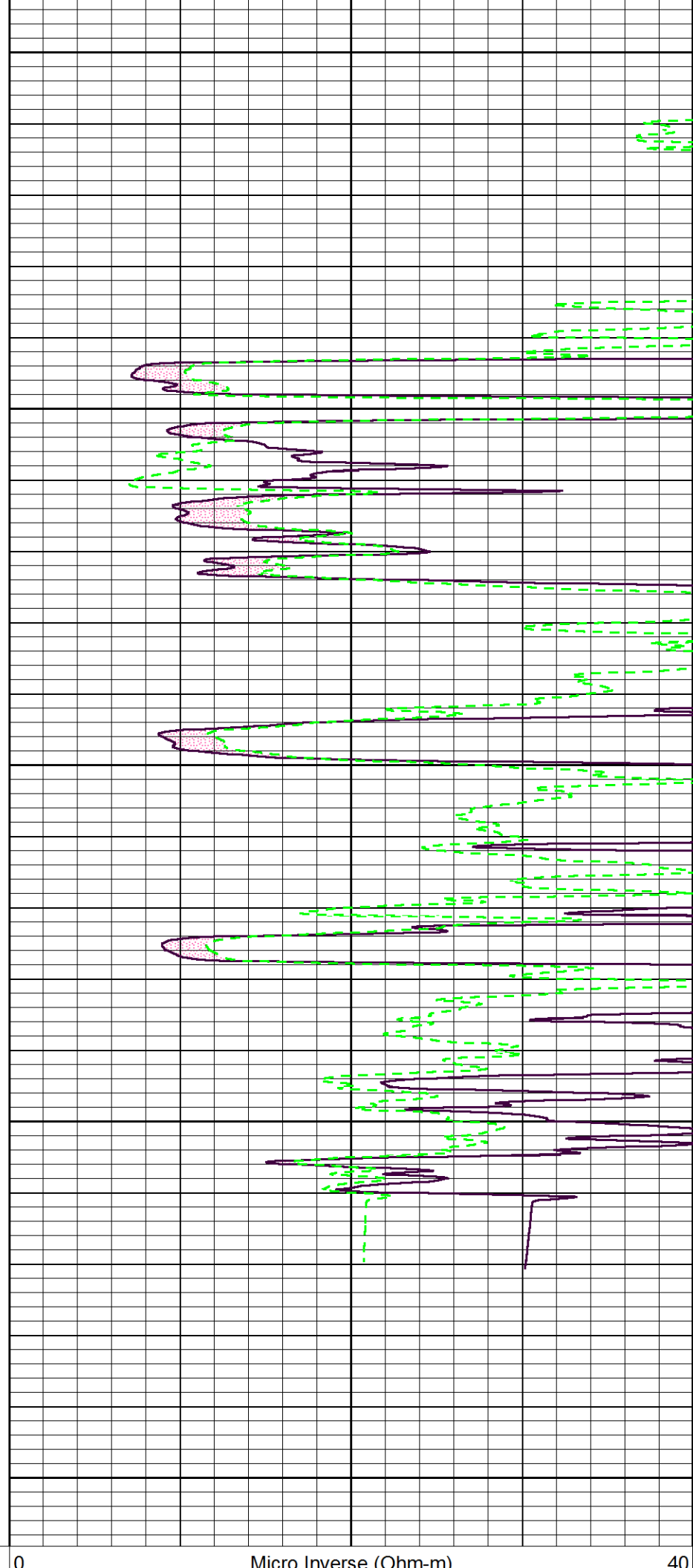


6100

6200

6300

Bit size (in)



Micro Inverse (Ohm-m)

10000	Line Tension (lb)	0	0	Micro Normal (Ohm-m)	40
0	Gamma Ray (GAPI)	150			
6	Caliper (in)	16			



Repeat Pass

Log Variables Database: C:\Sondex\Sondex Warrior\Data\obrien_keystone_6-4.db
Dataset: field/well/run1/HiRes/_vars_

Top - 1573.00 ft							
FRMSALIN kppm 0	MUDSALIN kppm 0	DEVI deg 0	SRFTEMP degF 68	SO in 0.25	DE-CENT Yes	CASED? Yes	CASEWGHT lb/ft 24
NPORSEL Limestone	AIR_HOLE? No	MudWgt lb/gal 9.2	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	CASETHCK in 0	CASEOD in 8.625
PERFS 0	TDEPTH ft 6298	BOTTEMP degF 130	BOREID in 12.25				

1573.00 ft - Bottom							
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 9.2	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	CASETHCK in 0	CASEOD in 4.5
PERFS 0	TDEPTH ft 6298	BOTTEMP degF 130	BOREID in 7.875				

Calibration Report

Database File: obrien_keystone_6-4.db
Dataset Pathname: HiRes
Dataset Creation: Mon May 18 01:52:50 2020 by Calc Sondex

Induction Array Tool Calibration Report

Serial Number: B12164
Tool Model: 002

Master Calibration Performed: Fri Mar 08 11:08:02 2019
Temperature: 62.3 degF

Sonde Error:

Array	1	2	3	4	5	6	7	
Real	209.1	-13.0	-59.4	-11.7	-2.8	1.0	4.3	mmho/m
Imaginary	-50.9	5.8	0.9	4.1	7.1	-13.1	-0.1	mmho/m

Loop Gain:

Array	1	2	3	4	5	6	7	
Loop (real)	537.7	678.5	1295.3	1394.1	1144.8	712.8	404.8	mmho/m
Loop (imaginary)	73.3	92.5	389.8	419.5	344.5	214.5	121.8	mmho/m
Real	825.1	793.4	1253.6	1409.7	1181.6	755.7	430.9	mmho/m
Imaginary	27.1	111.6	391.7	430.4	358.8	213.6	128.4	mmho/m
Gain (real)	0.873	0.841	0.987	0.981	0.967	0.945	0.949	
Gain (imaginary)	0.939	0.874	0.998	0.984	0.979	0.946	0.948	
Before Survey Verification Performed: Sonde 1 Temperature:degF Sonde 2 Temperature:degF Array 1 Temperature:degF Array1234567 TxIRTxIXTx Magnitude Gain RxCR RxCXRxC Magnitude								
Tool Module Parameters								
Software Version:				8.0.0.4				
Borehole Size Source:				CALI				
Mud Resistivity Source:				MUDRES				
Mud Resistivity At Surface:				N/A				
Mud Resistivity Surface Temperature:				N/A				
Borehole Corrections:				Automatic				
Minimum Standoff:				0.4 in				
Litho Density Tool Calibration Report								
Serial Number:				B0063S50129B				
Tool Model:				B10063				
Caliper Calibration Performed:				Fri May 15 11:18:11 2020				
	Diameter			Reading				
Small Ring:	9.000	in		1891.800	cps			
Large Ring:	13.000	in		2244.100	cps			
Gain:	0.0114							
Offset:	-12.4794							
Master Calibration Performed:				Fri May 15 10:52:09 2020				
Source Number:				50129B				
Medium:				Water				
Al Block Density:				2.6014 g/cc				
	Background		Al Block	Al Block + Fe				
SS1	662.1		3915.5	3603.1	cps			
SS2	1866.7		26468.7	24190.6	cps			
SSTOTAL	4364.1		42048.0	38112.2	cps			
LITH	73.2		438.7	283.6	cps			
LL	144.4		725.5	691.6	cps			
LU	411.6		901.7	880.6	cps			
LS	556.0		1627.2	1572.2	cps			
LSTOTAL	1047.9		4025.8	3505.5	cps			
SSHV	1462.5		1464.4	1465.3	V			
LSHV	1468.7		1467.1	1468.2	V			
SSEE	0.006		0.009	0.004				

SSFF	0.000	0.009	0.004
LSFF	0.007	0.005	0.005
Before Survey Verification Performed:		Mon Feb 24 10:39:31 2020	
After Survey Verification Performed:		Mon Feb 24 10:45:14 2020	
	Master Background	Before Survey Background	After Survey Background
SS1	662.1	662.3	666.4 cps
SS2	1866.7	1872.6	1878.1 cps
SSTOTAL	4364.1	4372.7	4388.1 cps
LITH	73.2	74.5	73.9 cps
LL	144.4	144.8	142.6 cps
LU	411.6	410.2	414.9 cps
LS	556.0	555.0	557.5 cps
LSTOTAL	1047.9	1049.2	1050.2 cps
SSHV	1462.5	1467.0	1467.2 V
LSHV	1468.7	1471.5	1471.5 V
SSFF	0.006	0.003	0.009
LSFF	0.007	0.006	0.004
Tool Module Parameters			
Software Version:		8.0.0.6	
Borehole Size Source:		BOREID	
Pad Type:		2	
Compensated Neutron Tool Calibration Report			
Serial Number:		C10071	
Tool Model:		009	
Master Calibration Performed:		Fri May 15 08:32:16 2020	
Source Number:		87624G	
Short Spacing Counts:		4685.07	cps
Long Spacing Counts:		170.48	cps
High Voltage:		1364.05	V
Target Ratio:		27.2000	
Ratio:		27.4816	
K-Factor:		0.9898	
Before Survey Verification Performed:		Fri May 15 08:39:23 2020	
After Survey Verification Performed:		Fri May 15 08:40:36 2020	
Verifier Number:		6489	
Verifier Values	Master Cal	Before Survey	After Survey
Short Spacing Counts:	264.29	267.98	268.28 cps
Long Spacing Counts:	260.11	261.87	263.74 cps
High Voltage:	1364.02	1364.01	1364.01 V
Ratio:	1.0161	1.0233	1.0172
Tool Module Parameters			
Software Version:		8.0.0.5	
Borehole Size Source:		CALI	
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:				10021240			
Tool Model:				003			
Caliper Calibration Performed:				Mon Nov 13 12:40:50 2017			
		Pad Arm				Backup Arm	
	Radius		Reading		Radius		Reading
Small Jig:	9.000	in	1847.200		9.000	in	1677.000
Large Jig:	13.000	in	2371.600		13.000	in	2315.300
Gain:			0.0076	Gain:			0.0063
Offset:			-5.0900	Offset:			-1.5092
Pad Calibration							
			Inverse				Normal
Gain:			1.0000	Gain:			1.0000
Offset:			0.0000	Offset:			0.0000
Tool Module Parameters							
Software Version:				8.0.0.4			

Gamma Ray Calibration Report

Serial Number:	C10049	
Tool Model:	001	
Performed:	Thu Apr 16 17:15:15 2020	
Calibrator Value:	156.0	GAPI
Background Reading:	63.7	cps
Calibrator Reading:	494.2	cps
Sensitivity:	0.3624	GAPI/cps

Borehole Fluid Resistivity Calibration Report

Serial Number:		P004	
Tool Model:		002	
Master Calibration Performed:		Wed May 25 15:17:37 2016	
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 Mar 04 10:52:43 2013	
Point #	Reference		Reading	
1	-19894.000	lb	8957.860	cps
2	-15010.000	lb	13965.100	cps
3	-9998.000	lb	19079.100	cps
4	-5007.000	lb	24133.000	cps
5	1009.000	lb	28232.100	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	55.67		CHD-WFT (WFT01) Weatherford Cable Head	2.67	2.25	15.00	
			X-Over-WFT (0001) Weatherford X-Over	1.13	3.38	5.00	
			XTU-008 (C10067) Crossover Ultrawire Toolbus to Ultralink	2.08	3.38	47.00	
			HTU-011 (00001) Head Tension Unit	2.18	3.38	55.00	
CCL	53.15		CCL-028 (252350) Casing Collar Locator	1.61	3.13	36.00	
BFR	50.41		BFR-002 (P004) Borehole Fluid Resistivity Tool	4.39	3.38	94.00	
GR	47.64		GRT-001 (C10049) Gamma Ray Tool	3.22	3.38	69.00	
			Overbody-Over-cen Overbody Centralizer	3.00	3.38	10.00	
MEL	37.67		MEL-003 (10021240) Micro Electric Log	9.27	3.38	209.00	
			CEN-001 (000028) Inline OH Springbow Centraliser	4.27	3.38	66.00	
			KJT-001 (10010514) Knuckle Joint	2.86	3.38	72.00	
CNLSC	25.59		CNL-009 (C10071) Compensated Neutron Logging Tool	5.28	3.38	100.00	
CNSSC	25.09						
LDT	15.44		LDT-B10063 (B0063S50129B) Litho Density Tool	9.75	4.50	310.00	
			Overbody-Standoff Standoff (Rubber)	1.00	4.50	4.00	
IAT	8.44		IAT-002 (B12164) Induction Array Tool	13.22	3.88	196.00	

SP	0.43			Shorty-Short Short Hole Finder	0.38	3.88	6.00
Dataset: obrien_keystone_6-4.db: field/well/run1/HiRes Total length: 62.30 ft Total weight: 1294.00 lb O.D.: 4.50 in							

WIRELINE LOGGING SOLUTIONS	Company	O'Brien Energy Resources Corp.
	Well	Keystone #6-4
	Field	Angell Southeast
	County	Meade
	State	Kansas