



ThruBit
A Schlumberger Company

ARRAY INDUCTION GAMMA RAY MEMORY LOG

Company SANDRIDGE ENERGY
Well BRITT 3406 4-20H
Field EASTHAM
County HARPER
State KANSAS

Company SANDRIDGE ENERGY
Well BRITT 3406 4-20H
Field EASTHAM
County HARPER State KANSAS

Location: API 15-077-21927-0100
SHL: 200' FNL & 1600' FWL
SEC 29 TWP 34S RGE 06W
Permanent Datum G.L. Elevation 1294'
Log Measured From K.B. 15' ABOVE PERM DATUM
Drilling Measured From K.B.
Other Services
THRUBIT
PORTAL BIT
Elevation
K.B. 1309'
D.F. 1309'
G.L. 1294'

Date	11 MAY 2019		
Run Number	ONE		
Depth Driller	9458'		
Depth Logger	9402'		
Bottom Logged Interval	9392'		
Top Log Interval	5351'		
Casing Driller	7.00" @ 5365		
Casing Logger	5351'		
Bit Size	6.125		
Type Fluid in Hole	WBM		
Density / Viscosity	8.4 / 27		
pH / Fluid Loss	9.0 / 60		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	1.91 ohms @ 91 degf		
Rmf @ Meas. Temp	1.43 ohms @ 91 degf		
Rmc @ Meas. Temp	2.39 ohms @ 91 degf		
Source of Rmf / Rmc	CALCULATED		
Rm @ BHT	0.88 ohms @ 146 degf		
Time Circulation Stopped	22:30		
Time Logger on Bottom	23:50		
Maximum Recorded Temperature	146 degf		
Equipment Number	T013		
Location	TYLER, TX		
Recorded By	DENGLER		
Witnessed By	ANTONIO LEUA		

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The use of and reliance upon this recorded-data by the herein named company (and any of its affiliates, partners, representatives, agents, consultants and employees) is subject to the terms and conditions agreed upon between ThruBit LLC and the company, including: (a) Restrictions on use of the recorded-data; (b) Disclaimers and waivers of warranties and representations regarding company's use of and reliance upon the recorded-data; and (c) Customer's full and sole responsibility for any inference drawn or decision made in connection with the use of this

Comments

SERVICE: LEVEL 4 HORIZONTAL PUMPDOWN MEMORY LOG FROM BIT DEPTH 9346 ' TO 5351'
ALL SCALES AND PRESENTATIONS PER CLIENT REQUEST
LIMESTONE MATRIX. 2.71g/cc USED FOR POROSITY MEASUREMENTS
TOOLSTRING RAN WITH DECENTRALIZER, SWIVEL AND NO STANDOFFS
TBHV REPRESENTS TOTAL BOREHOLE VOLUME, ft3
ABHV REPRESENTS ANNULAR HOLE VOLUME, CALCULATED FOR 4.5" CSG ft3
DEPTH REFERENCE: MWD LOG
RIGMINDER AND PASON USED TO CREATE DEPTH LOG

RIG: UNIT 310
CREW: J. DENGLER, T. BARCLAY, M. WAHLBERG, D. McNUTT

Service Ticket No. 1898

API No. 15-077-21927-0100

PGM Ver WARRIOR 7.0

The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client

EQUIPMENT DATA

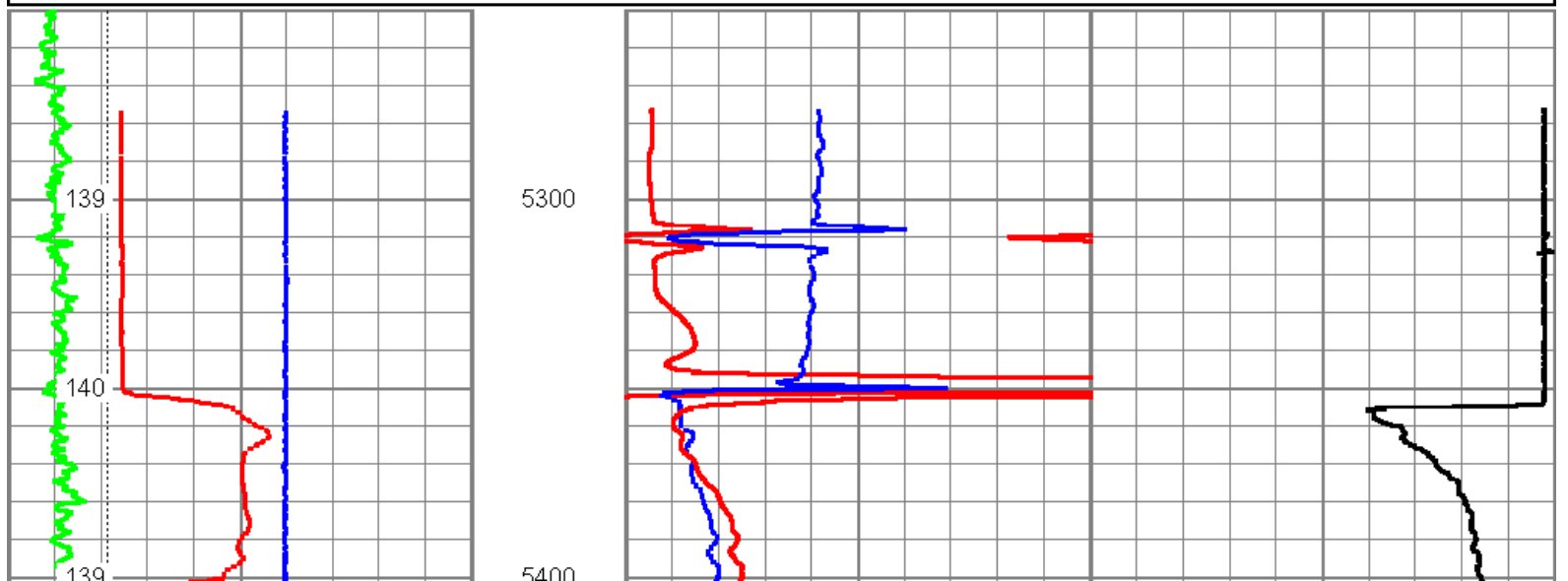
GAMMA RAY		NEUTRON		DENSITY		INDUCTION		
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE	
Serial No.	PS30T	Serial No.	PS1N	Serial No.	PS36D	Serial No.	PS37R	
Model No.	PS	Model No.	PS	Model No.	PS	Model No.	PS	
Diameter	2.125"	Diameter	2.125"	Diameter	2.125"	Diameter	2.125"	
LOGGING DATA								
General Data								
Pass	Depths		Well Head	Speed	Logging Run Comments			
No.	From	To	Pressure	Ft/Min				
ONE	9402'	5351'		30				
	GAMMA RAY		NEUTRON		DENSITY		INDUCTION	
Pass	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	R
ONE	0 API	150 API	30%	-10%	30%	-10%	0.2 OHM-M	2000 OHM-M
DIRECTIONAL INFORMATION								
Maximum Deviation		93.07	deg. @	7999'	KOP	3946'		

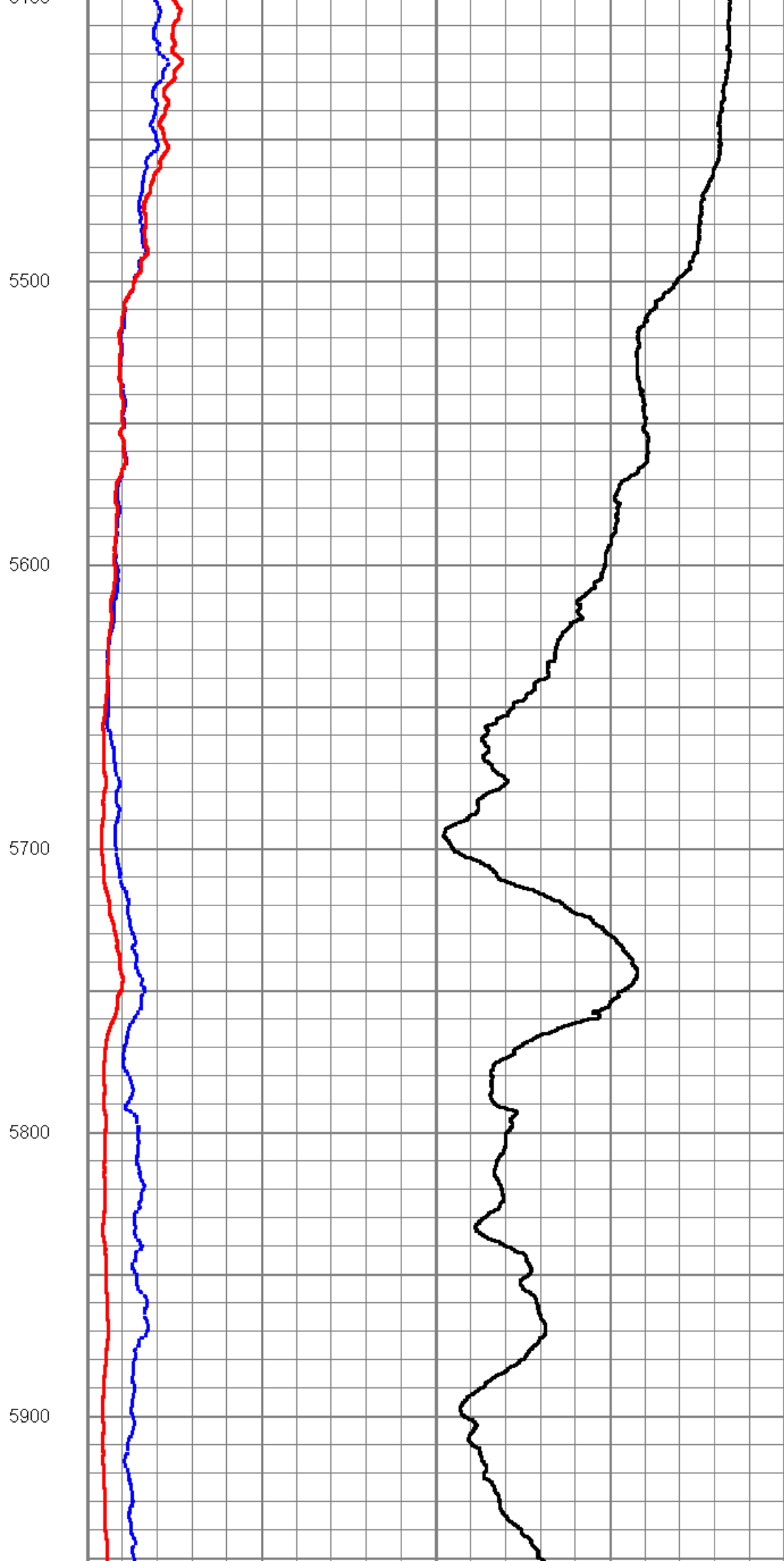
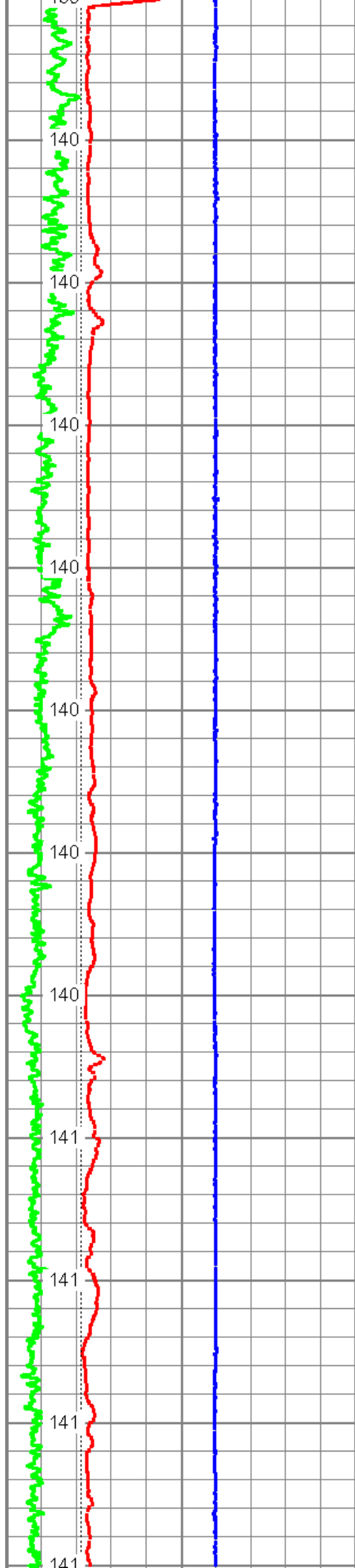


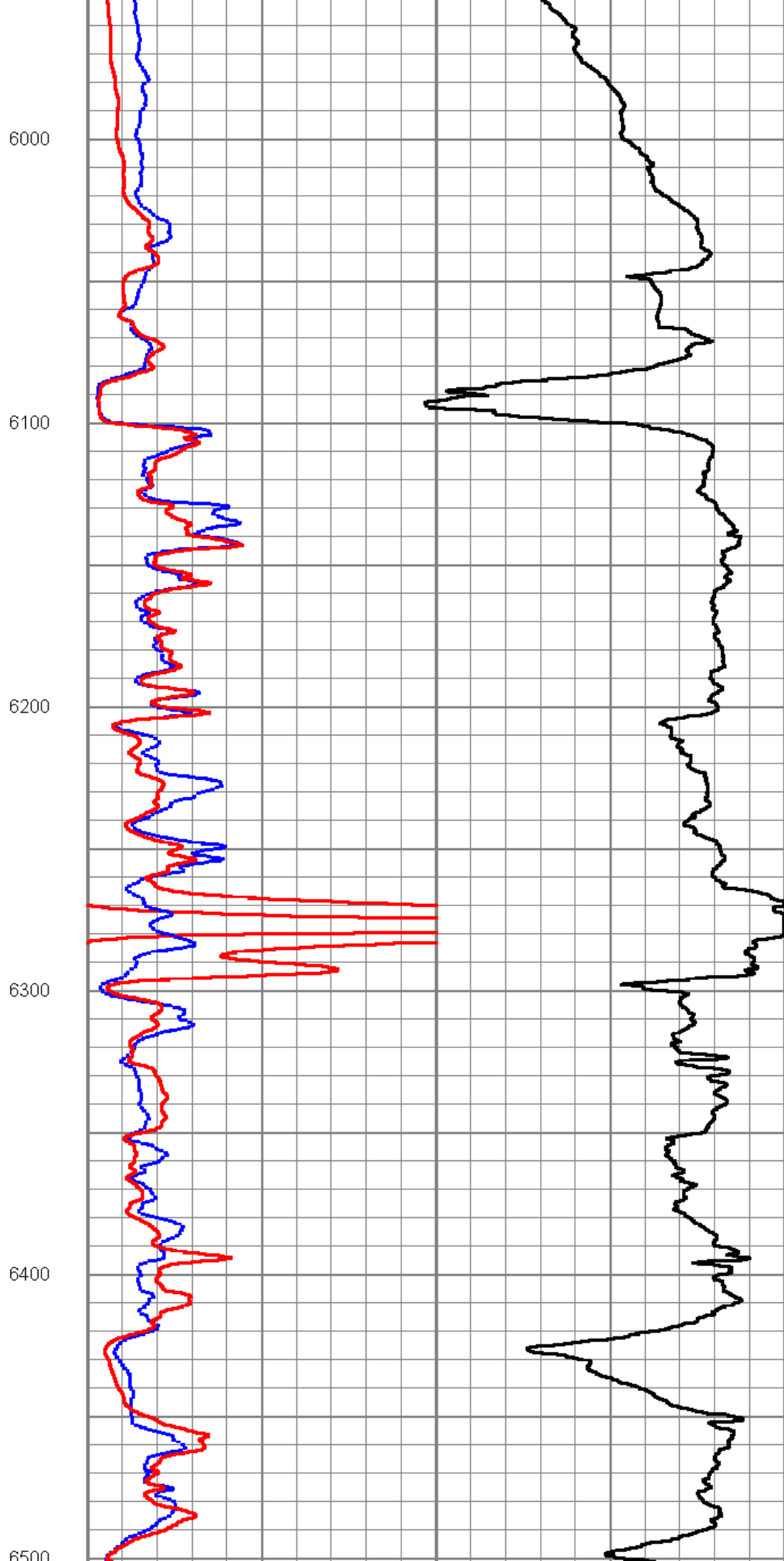
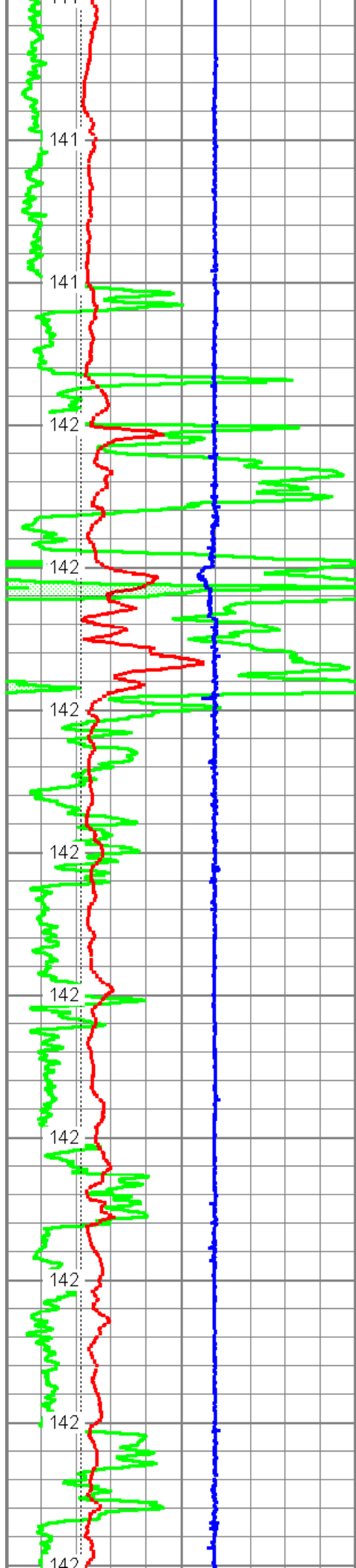
MAIN PASS

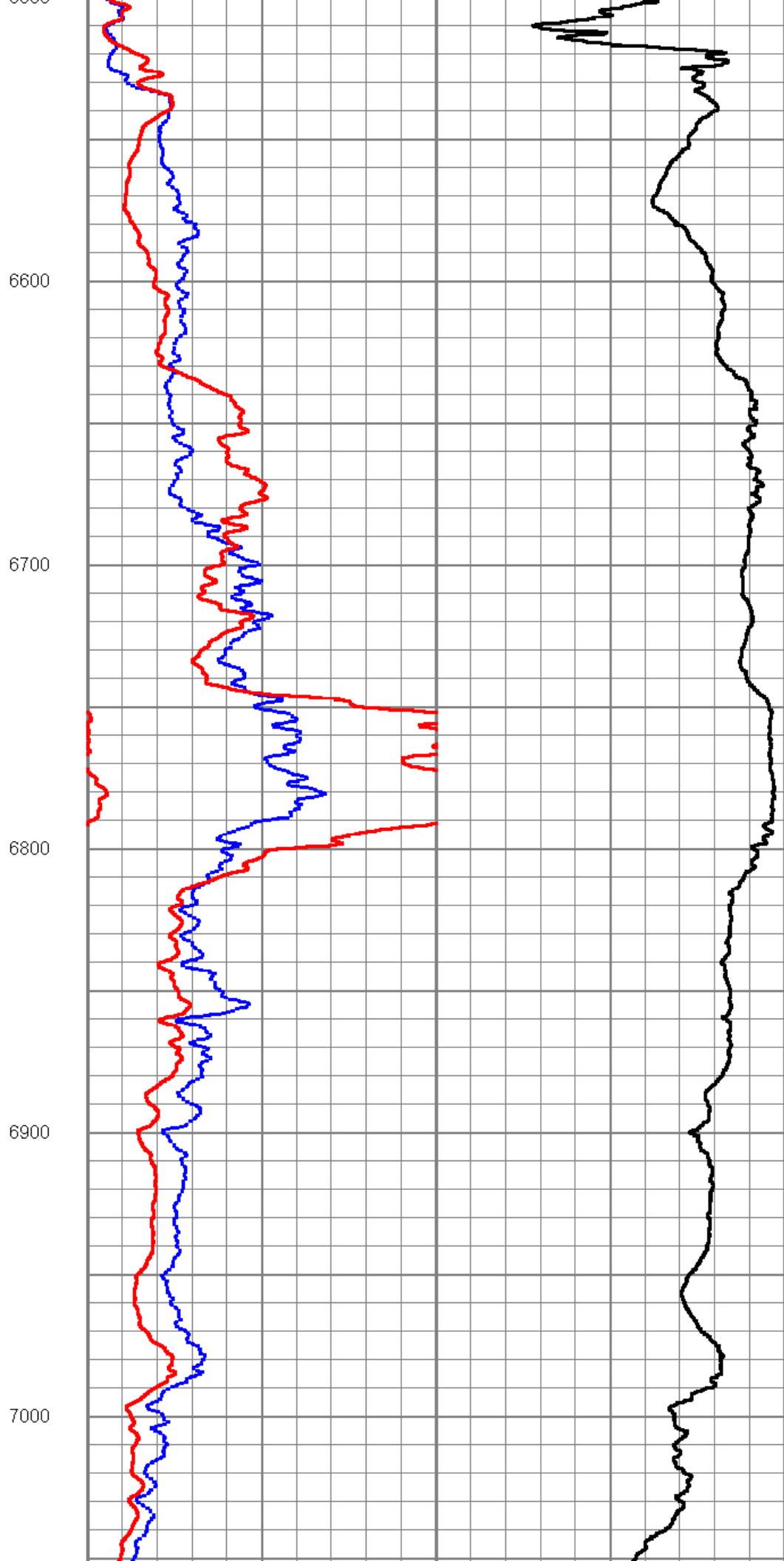
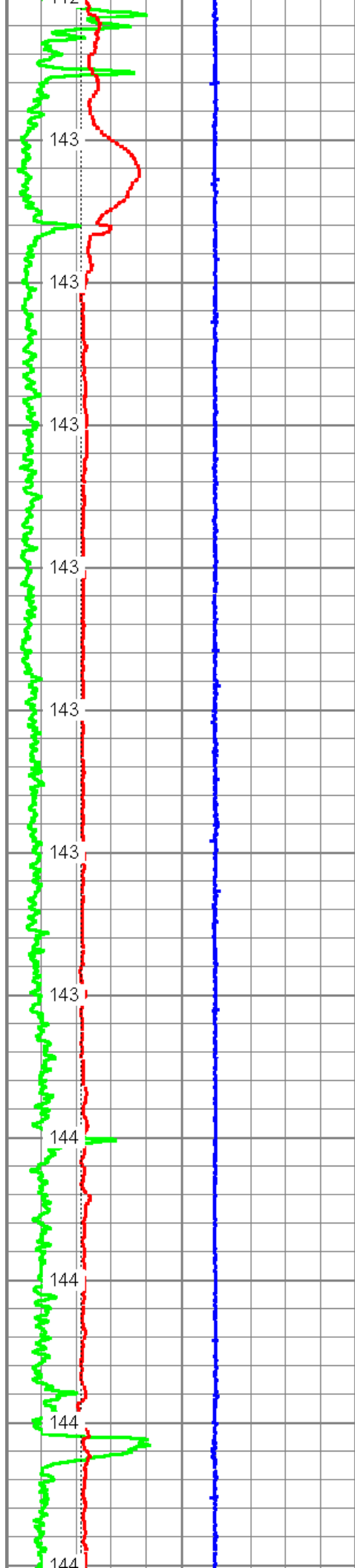
Database File: britt_3406_mem.db
 Dataset Pathname: proc1/pass1.2
 Presentation Format: 6_2r_chk
 Dataset Creation: Sat May 11 09:05:48 2013
 Charted by: Depth in Feet scaled 1:600

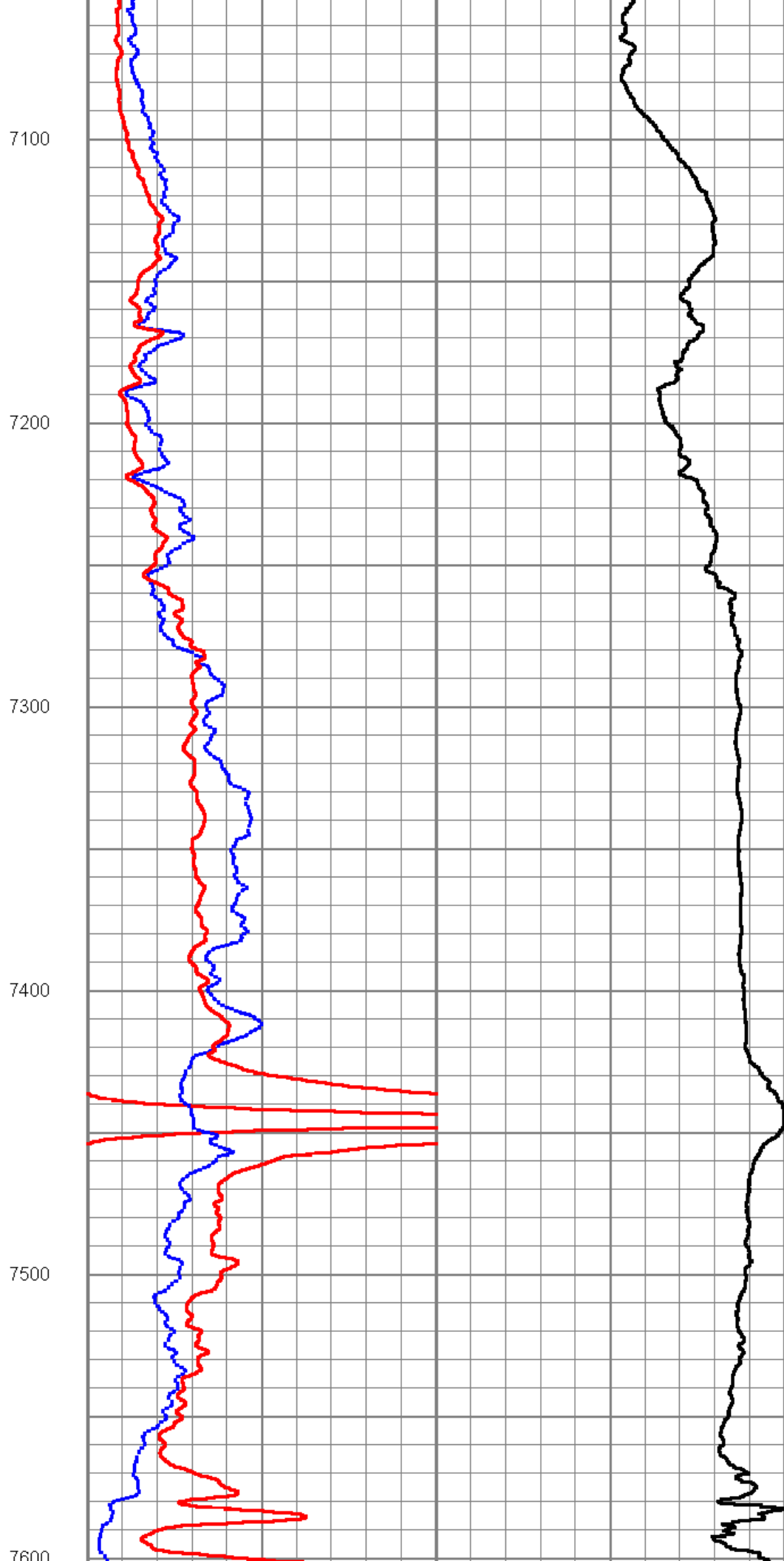
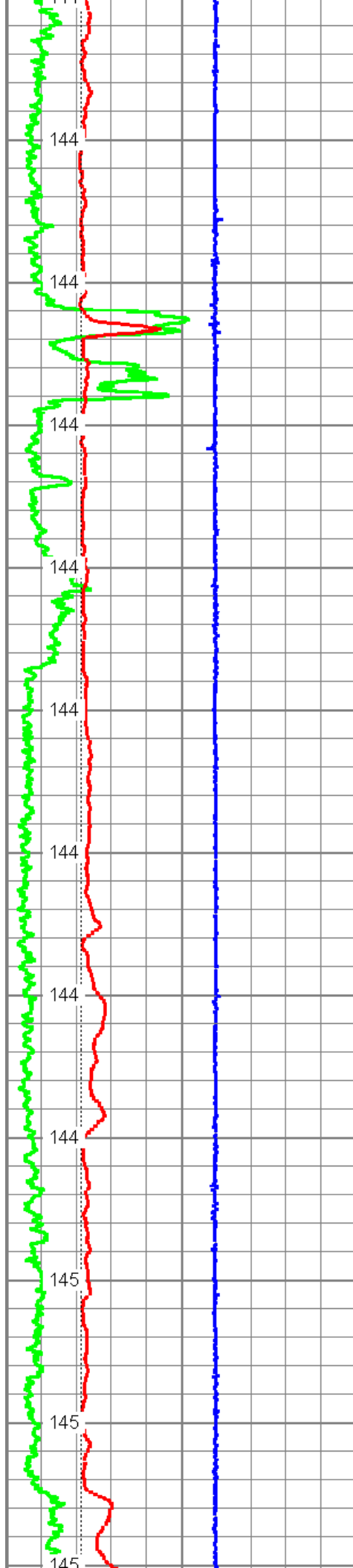
0	GR (GAPI)	150	50	20in 2ft Res (Ohm-m)	500	0
4	DCAL (in)	14	50	90in 2ft Res (Ohm-m)	500	
-5	ACCY	5	1000	DEEP COND (mmho/m)		
4	BOREID (in)	14	0	20in 2ft Res (Ohm-m)	50	
GRTEMP (degF)			0	90in 2ft Res (Ohm-m)	50	

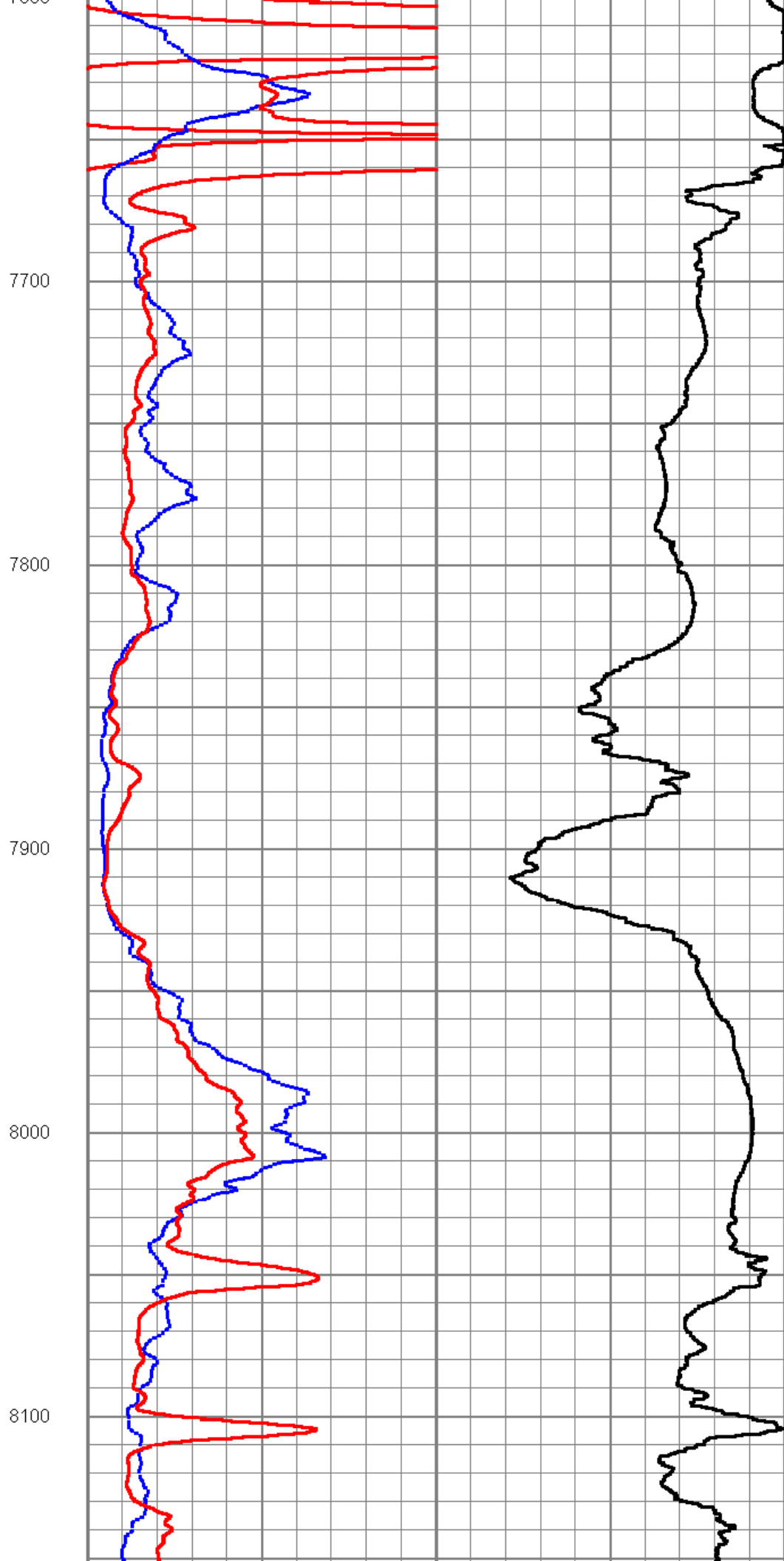
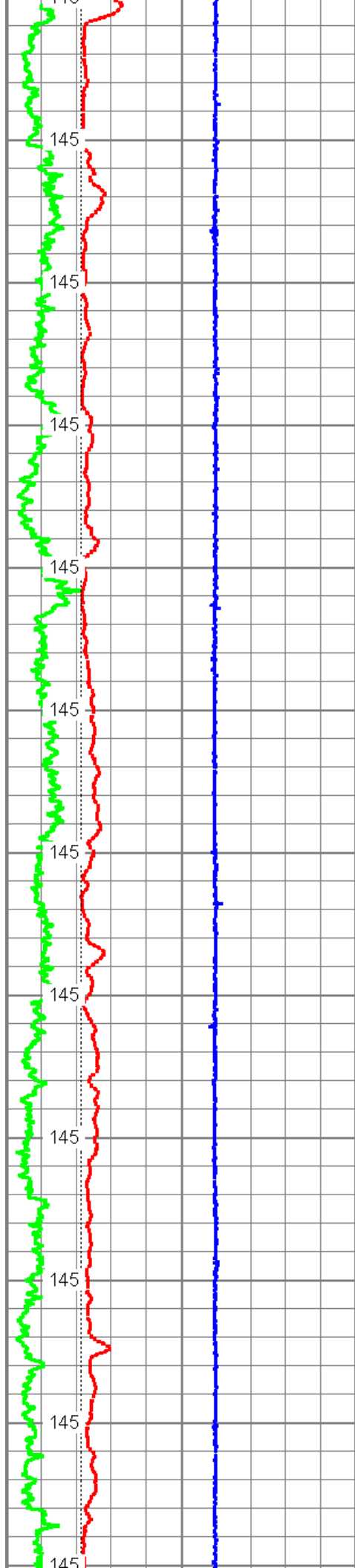


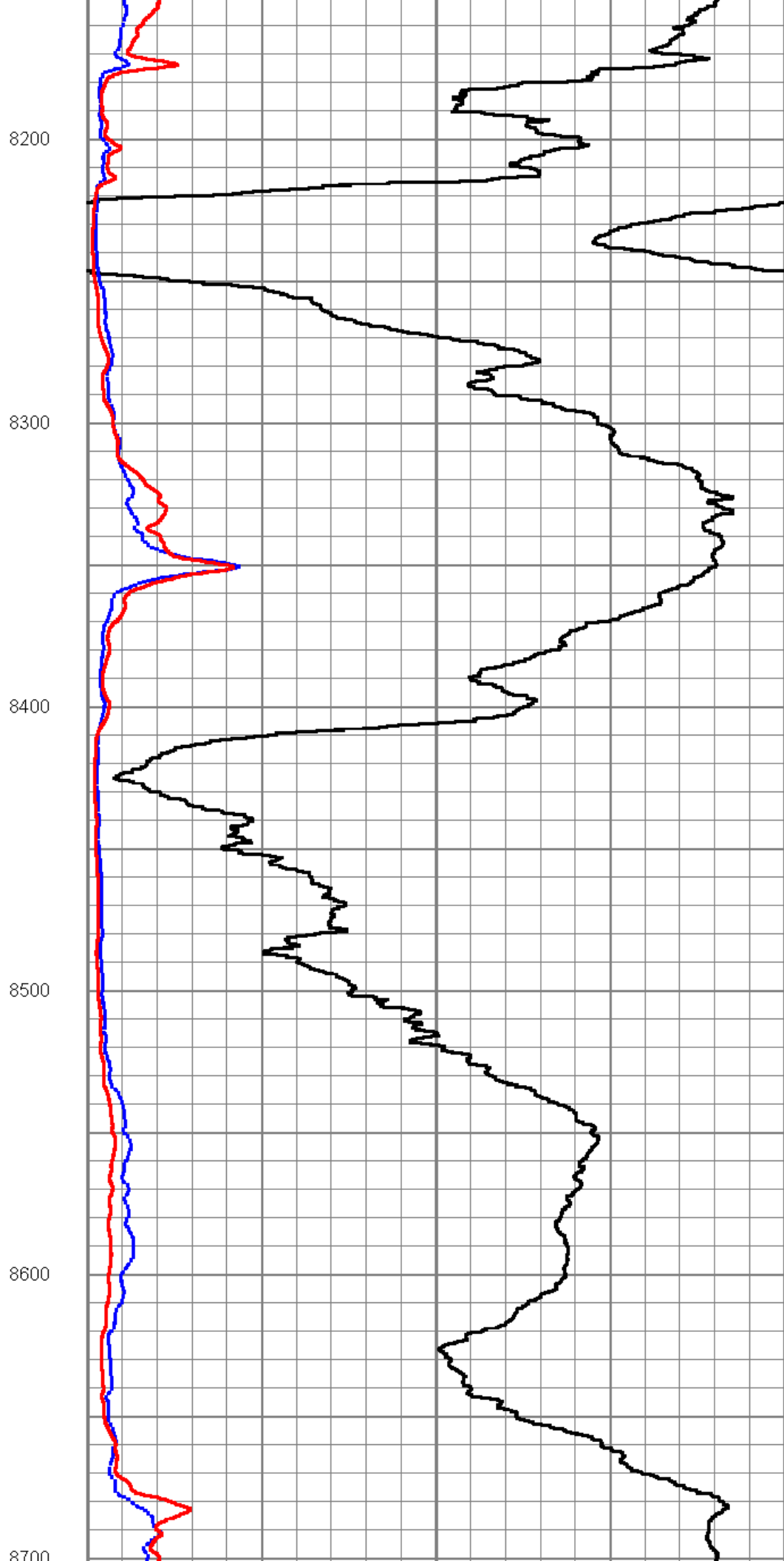
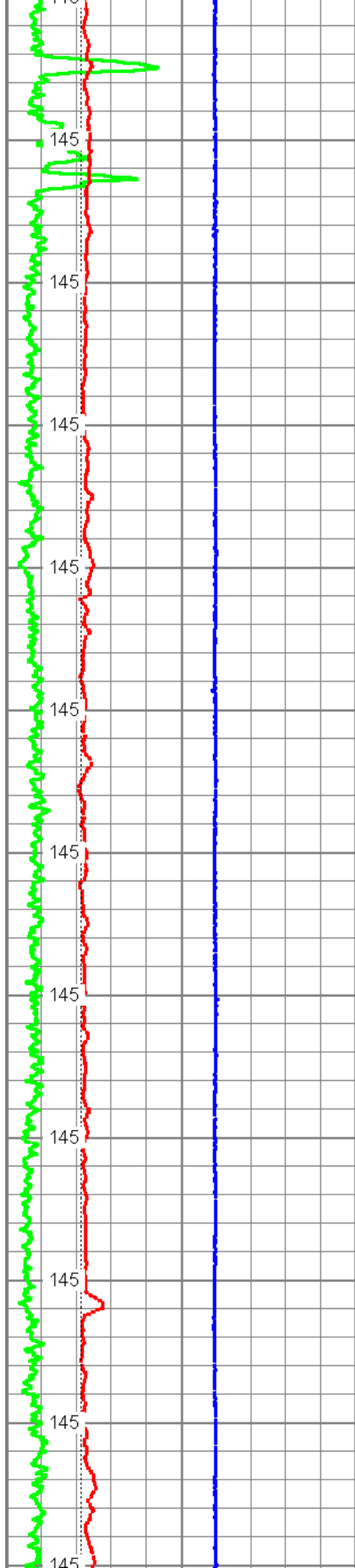


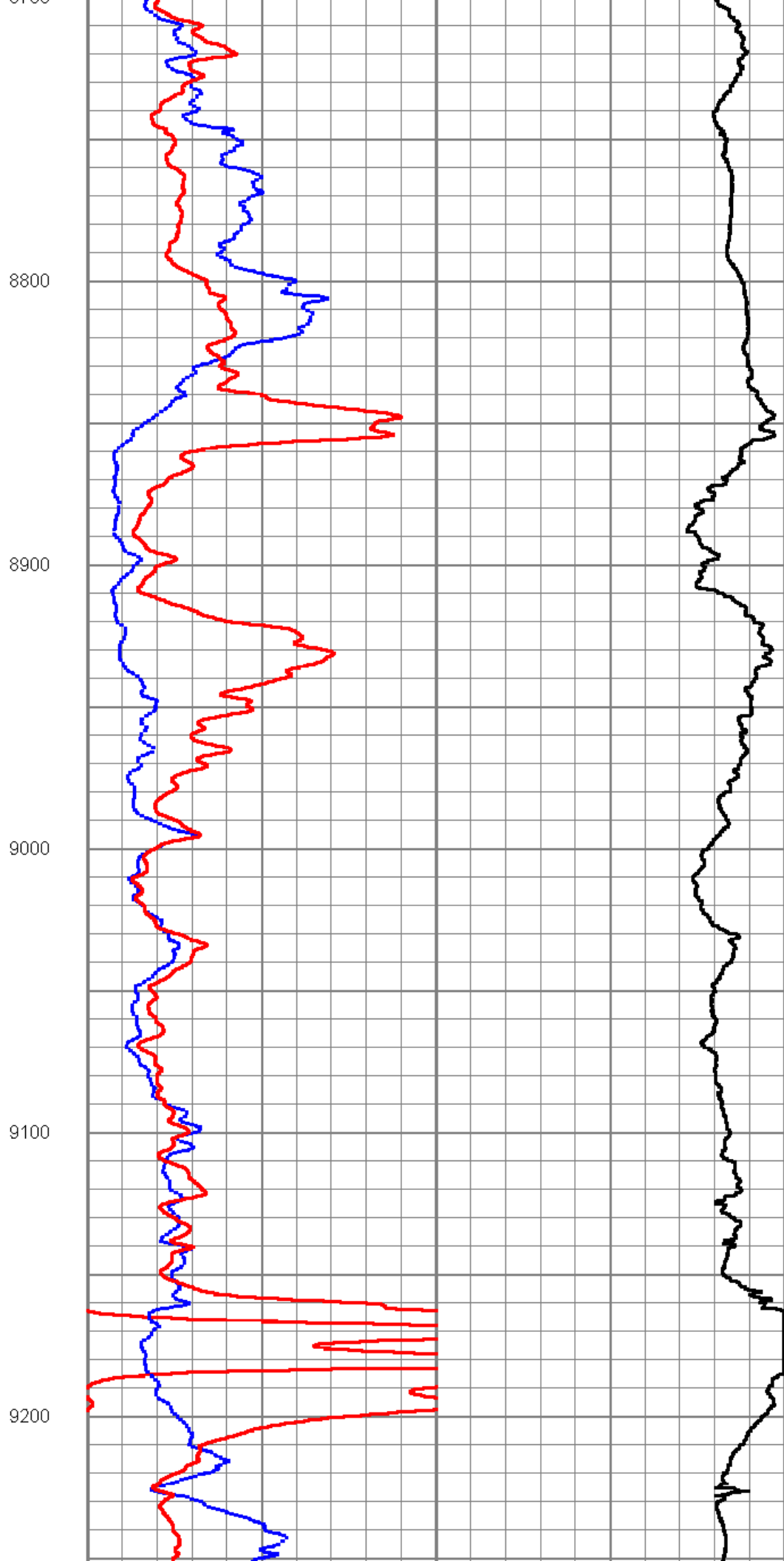
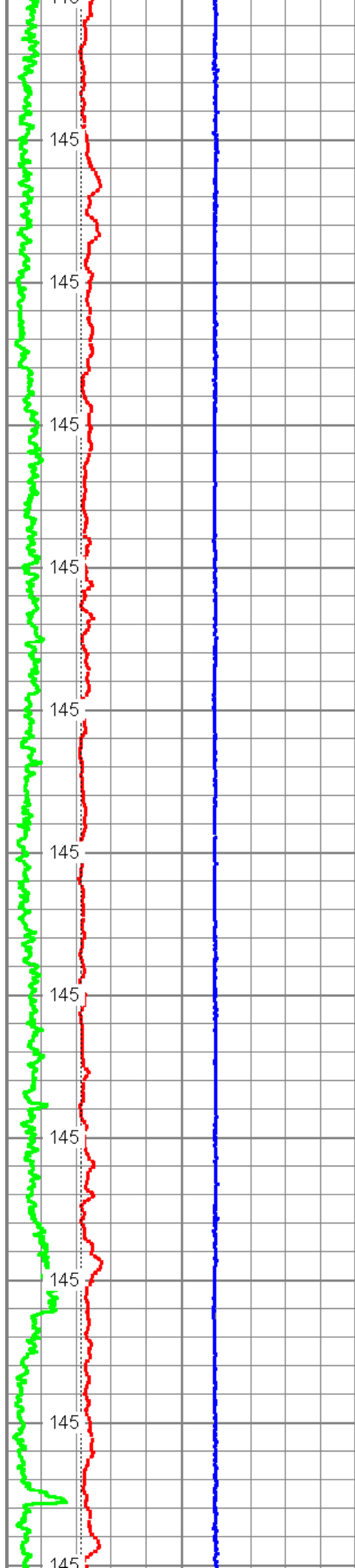


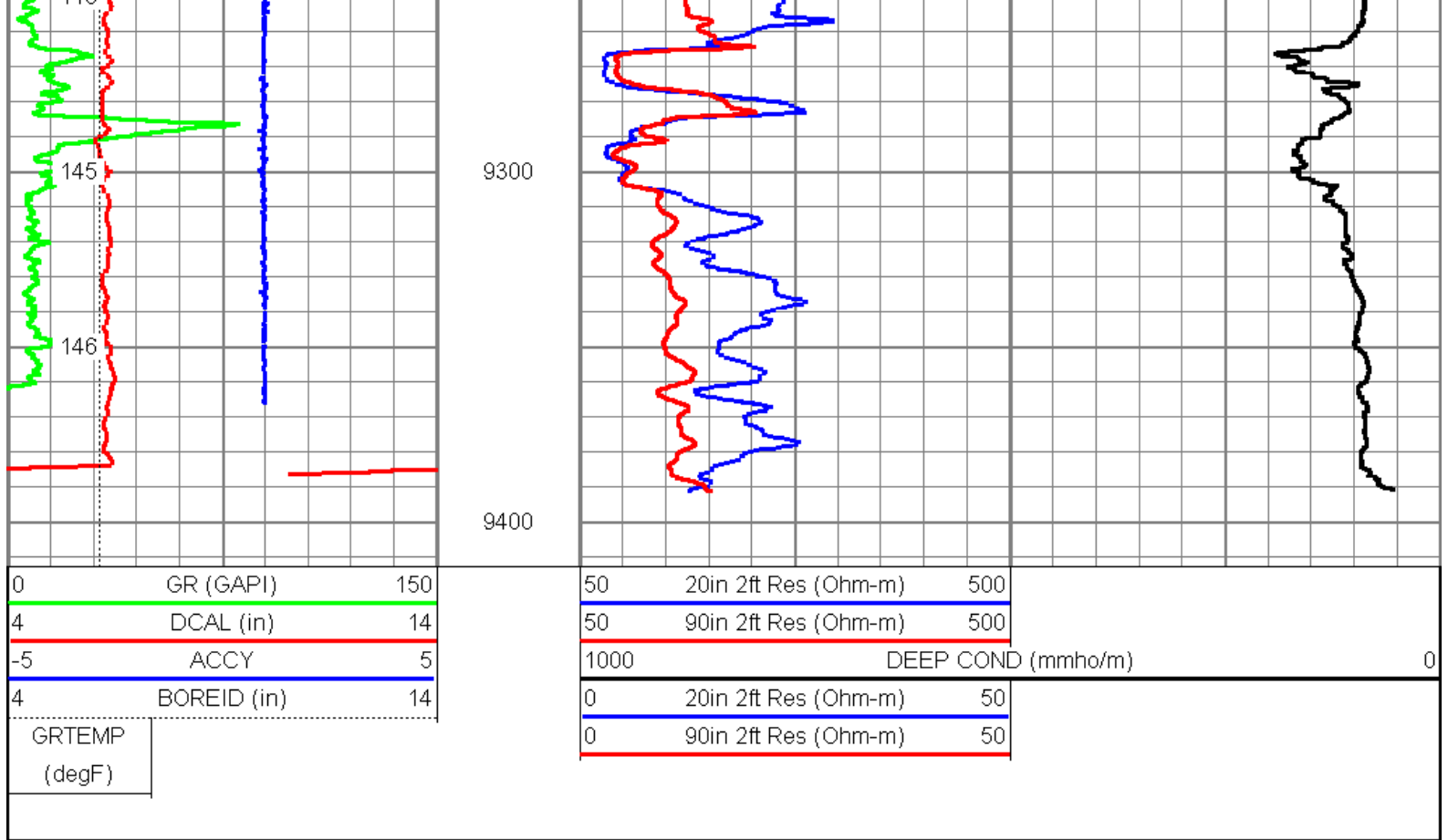






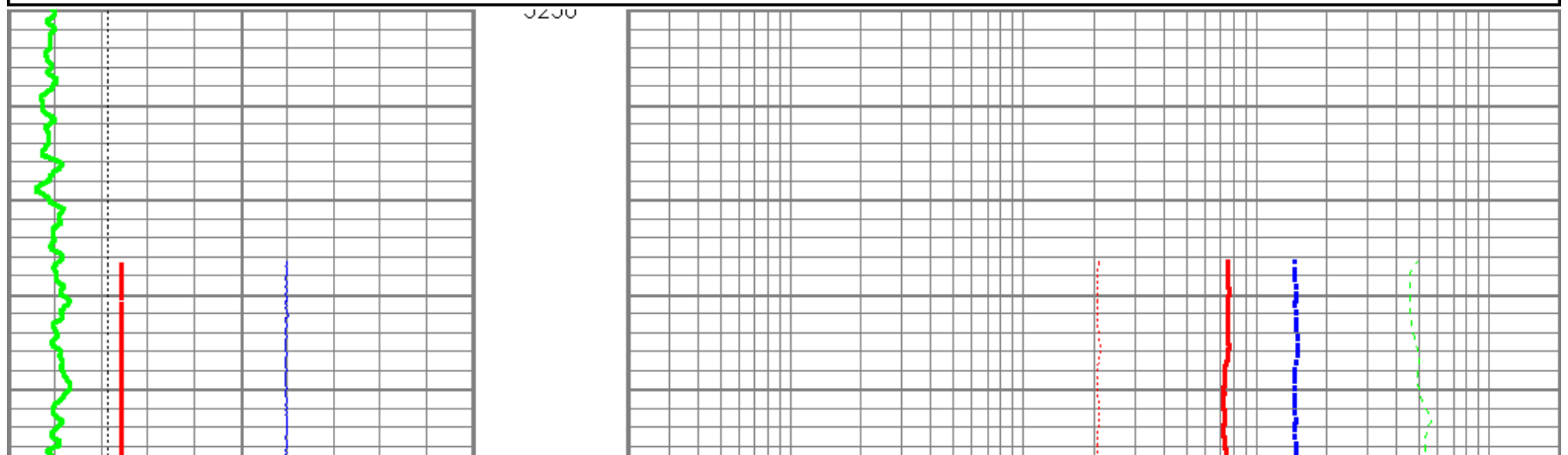
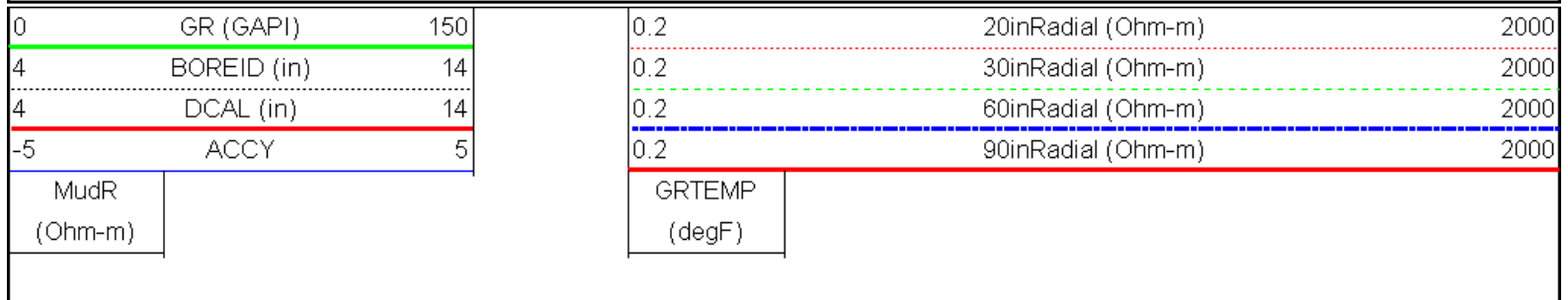


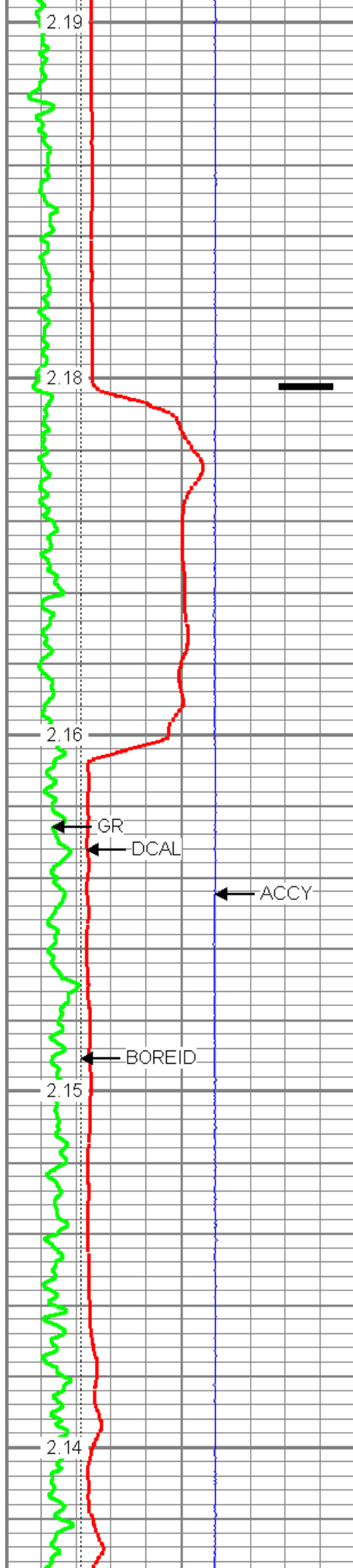




MAIN PASS

Database File: britt_3406_mem.db
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 Presentation Format: 6_5r_chk
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 Charted by: Depth in Feet scaled 1:240



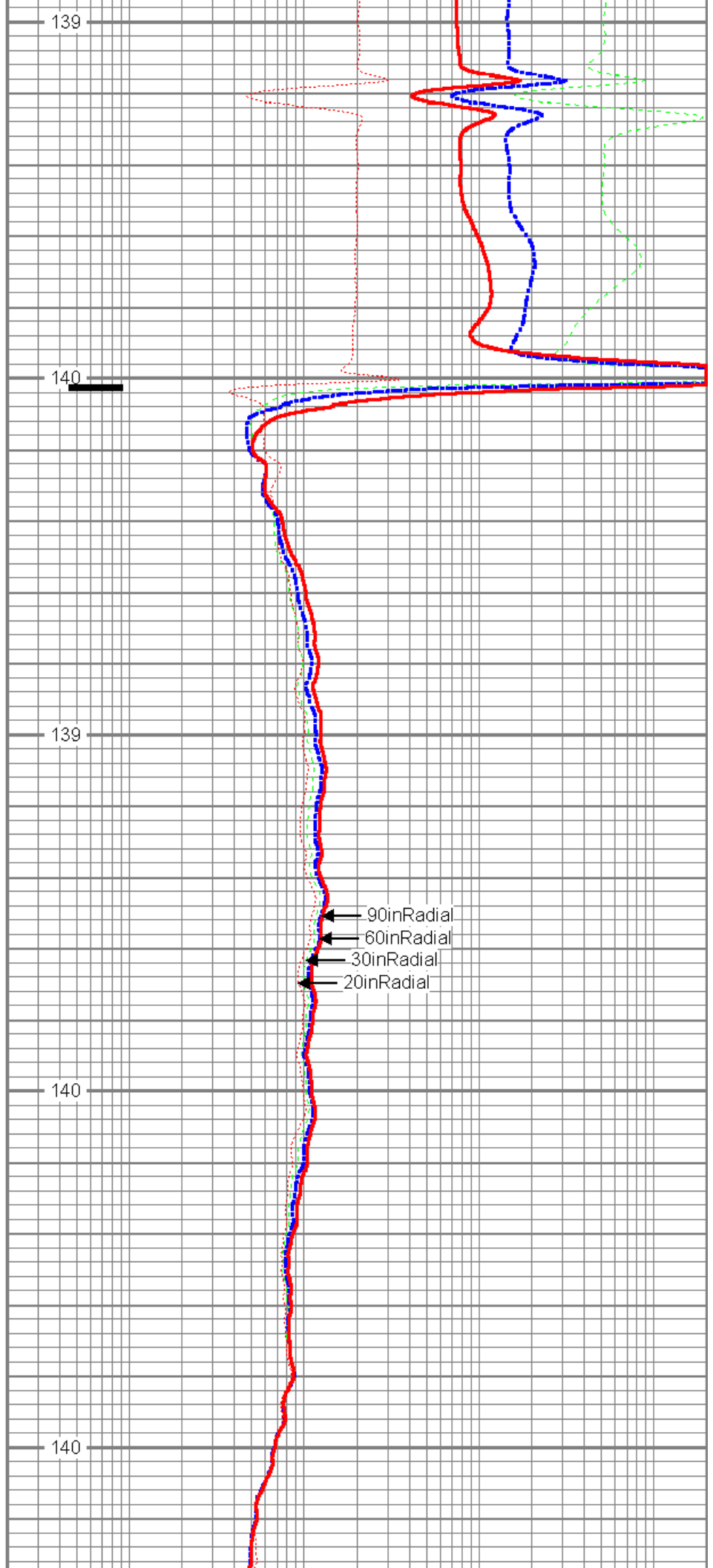


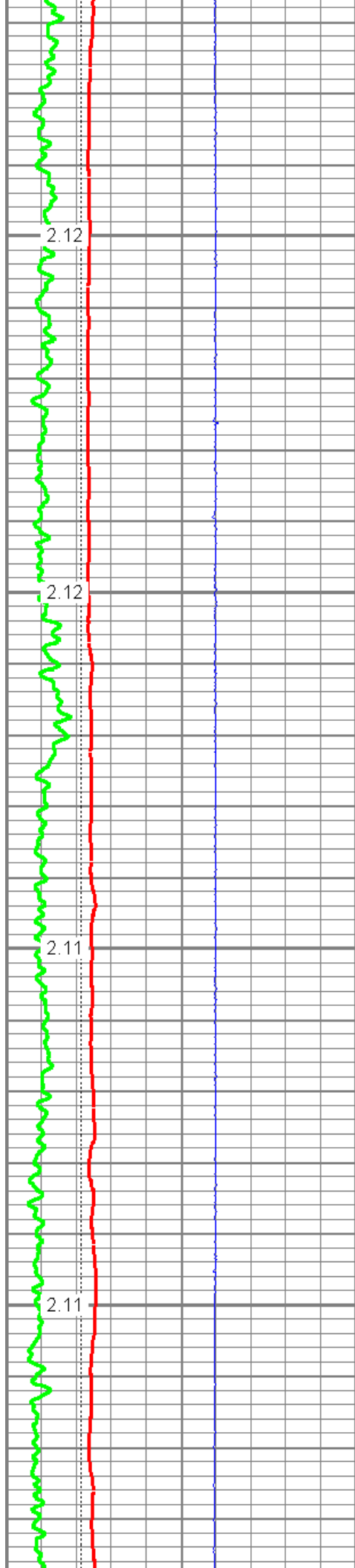
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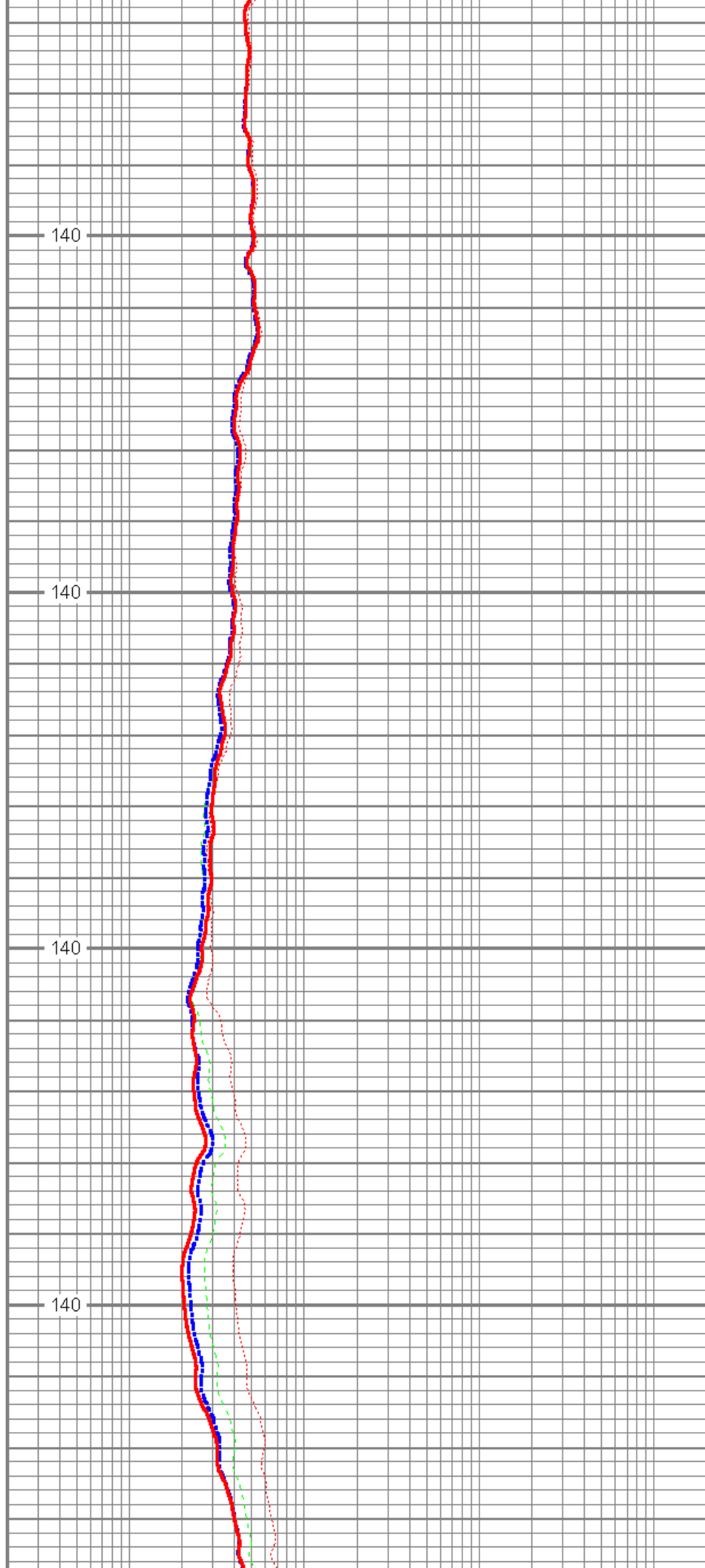
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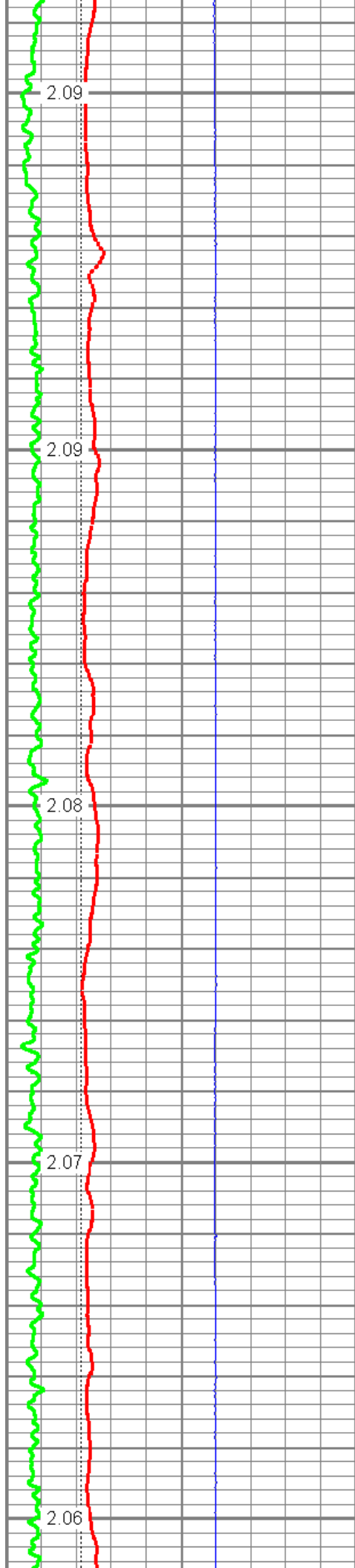
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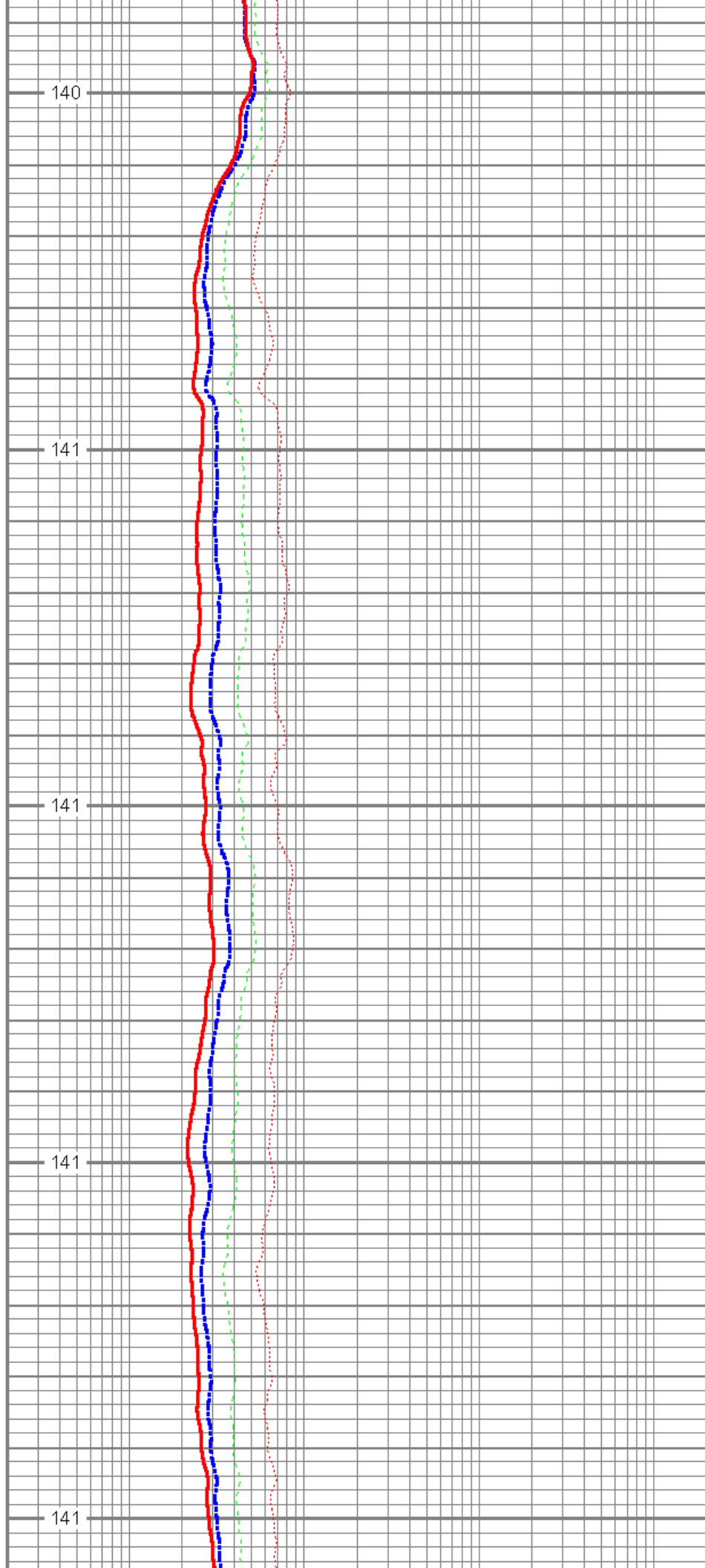
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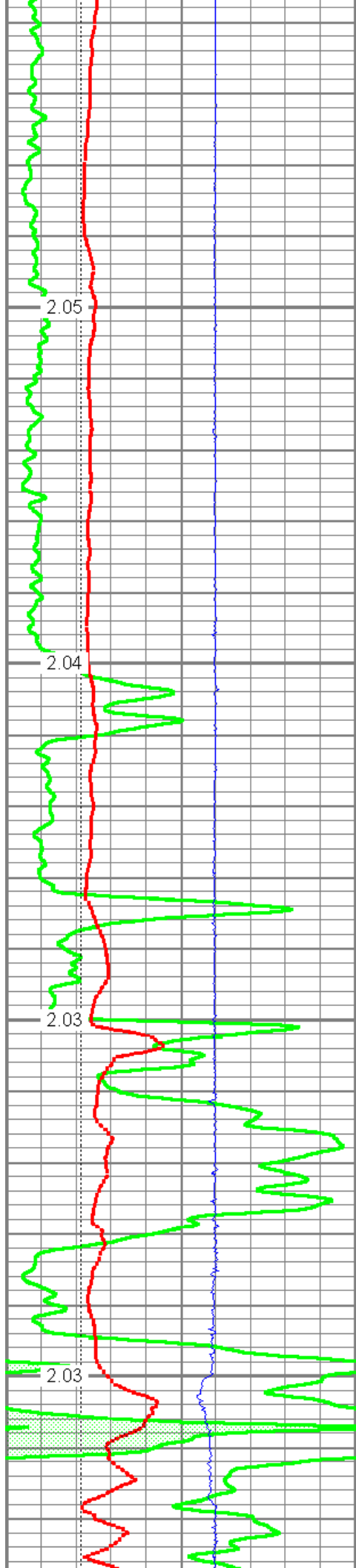
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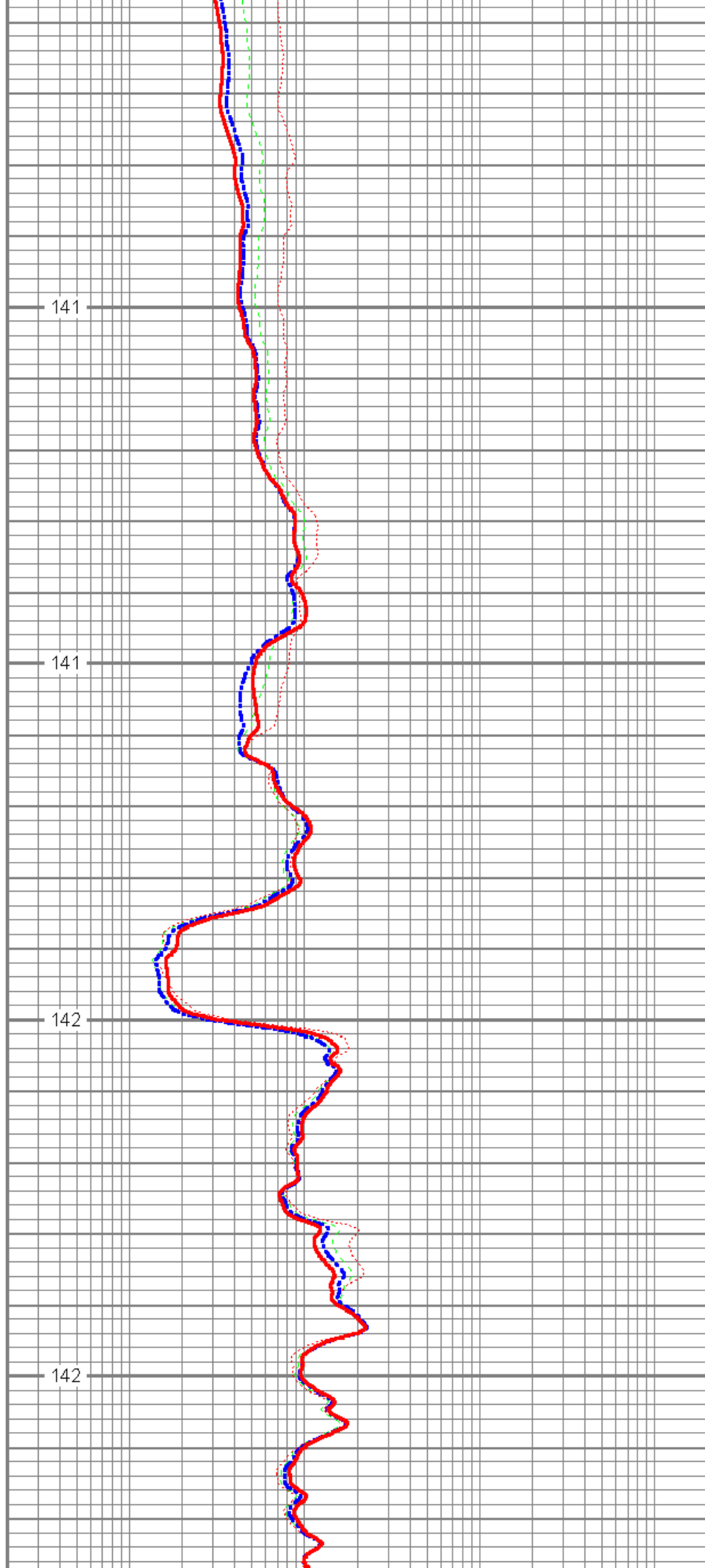
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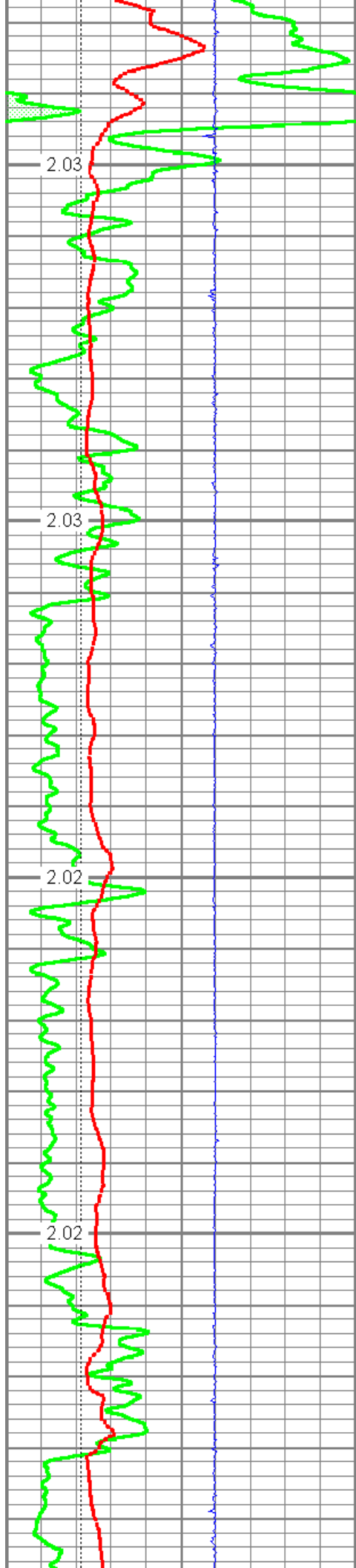
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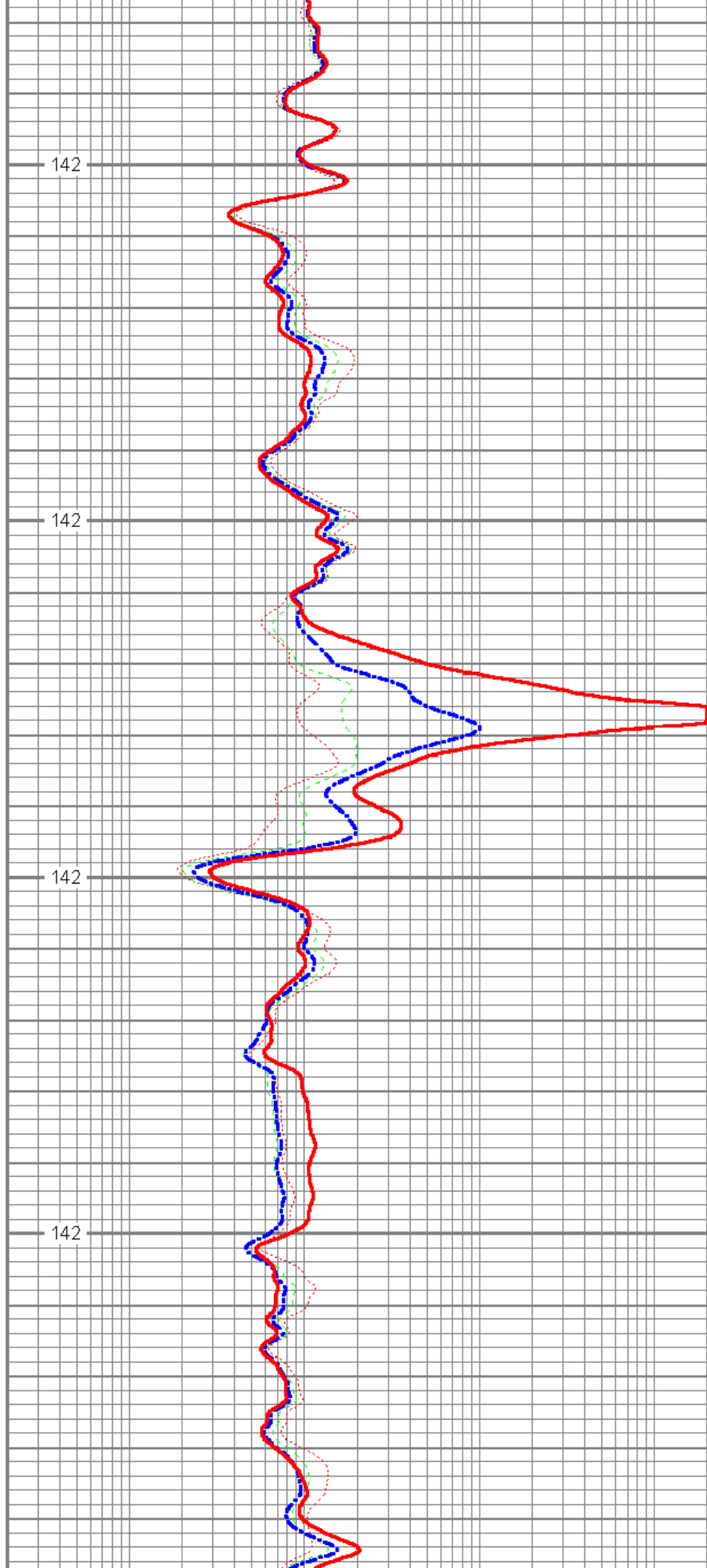
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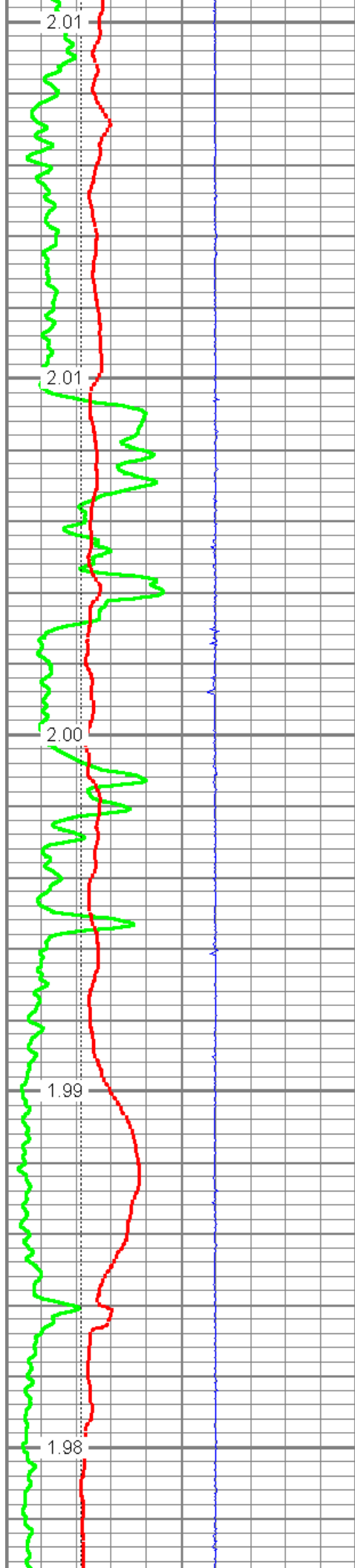
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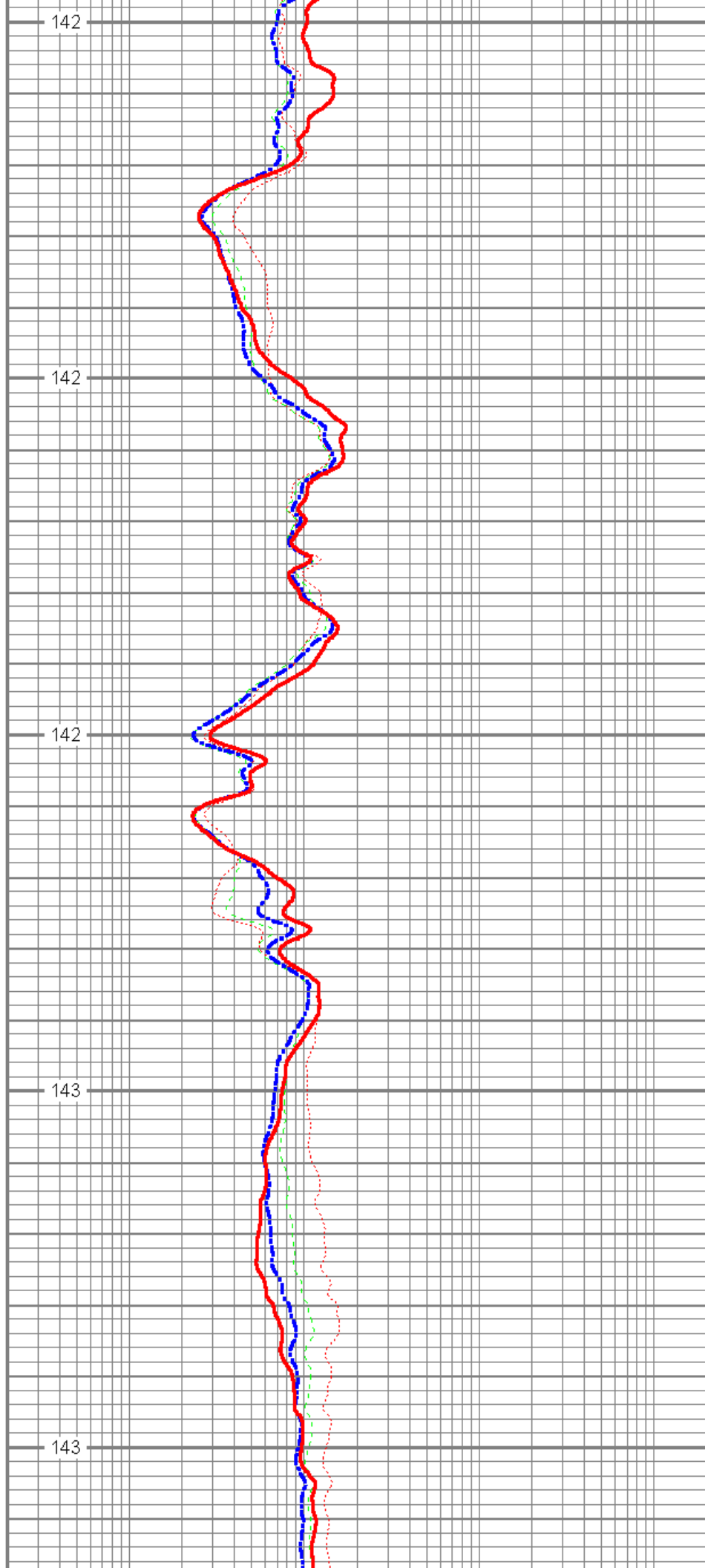
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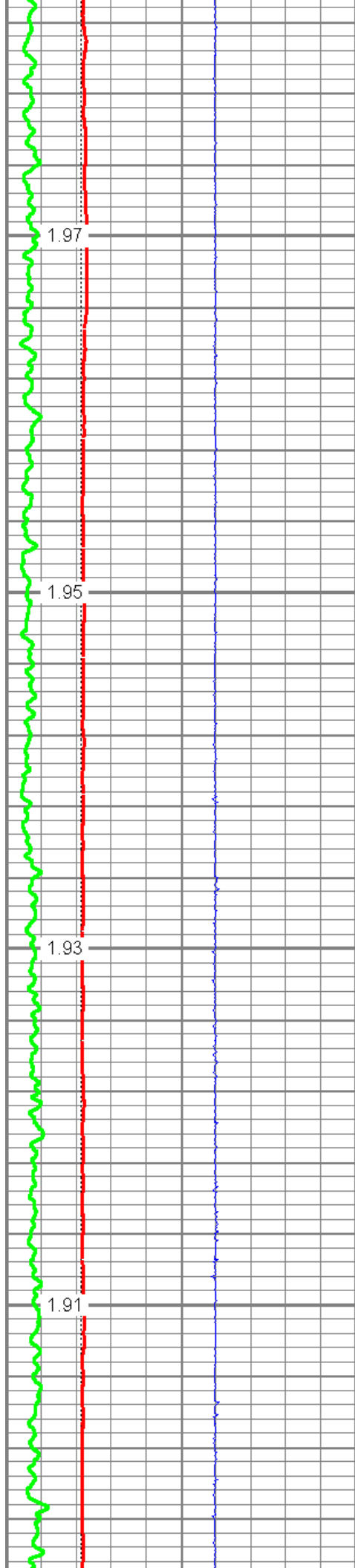
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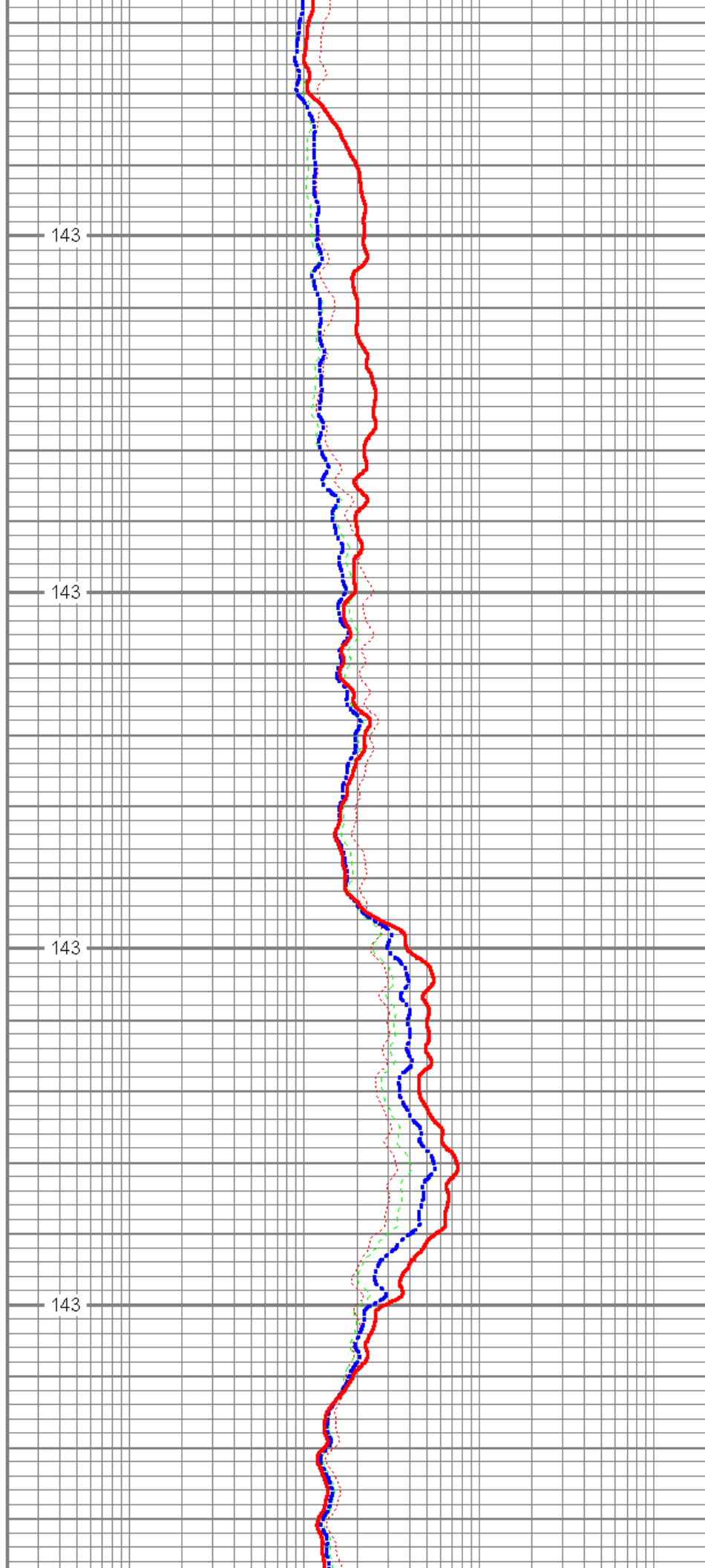
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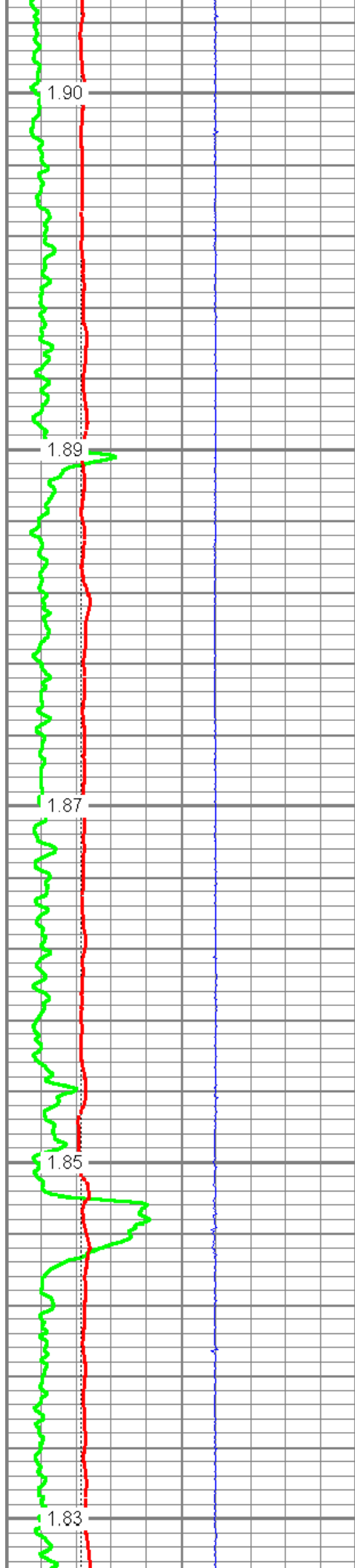
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6950

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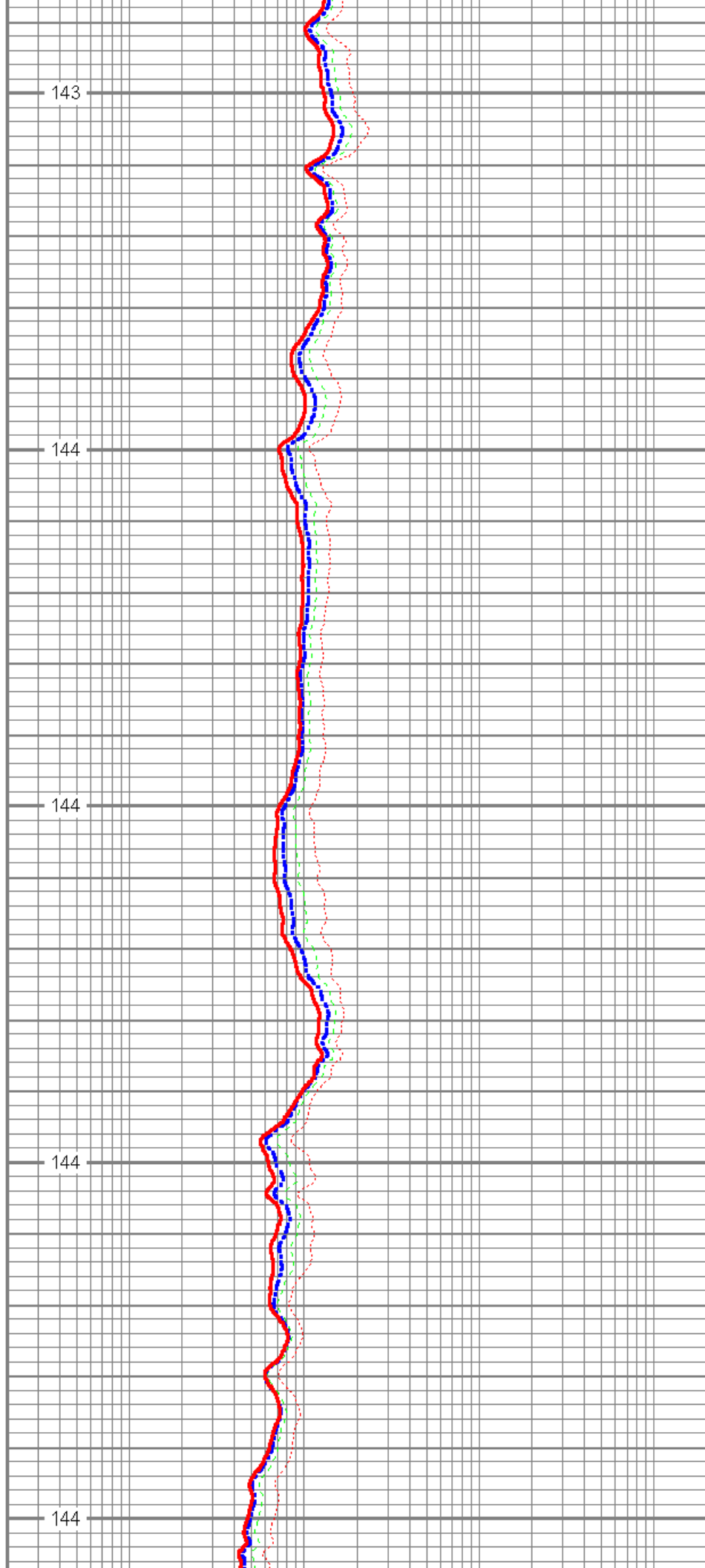
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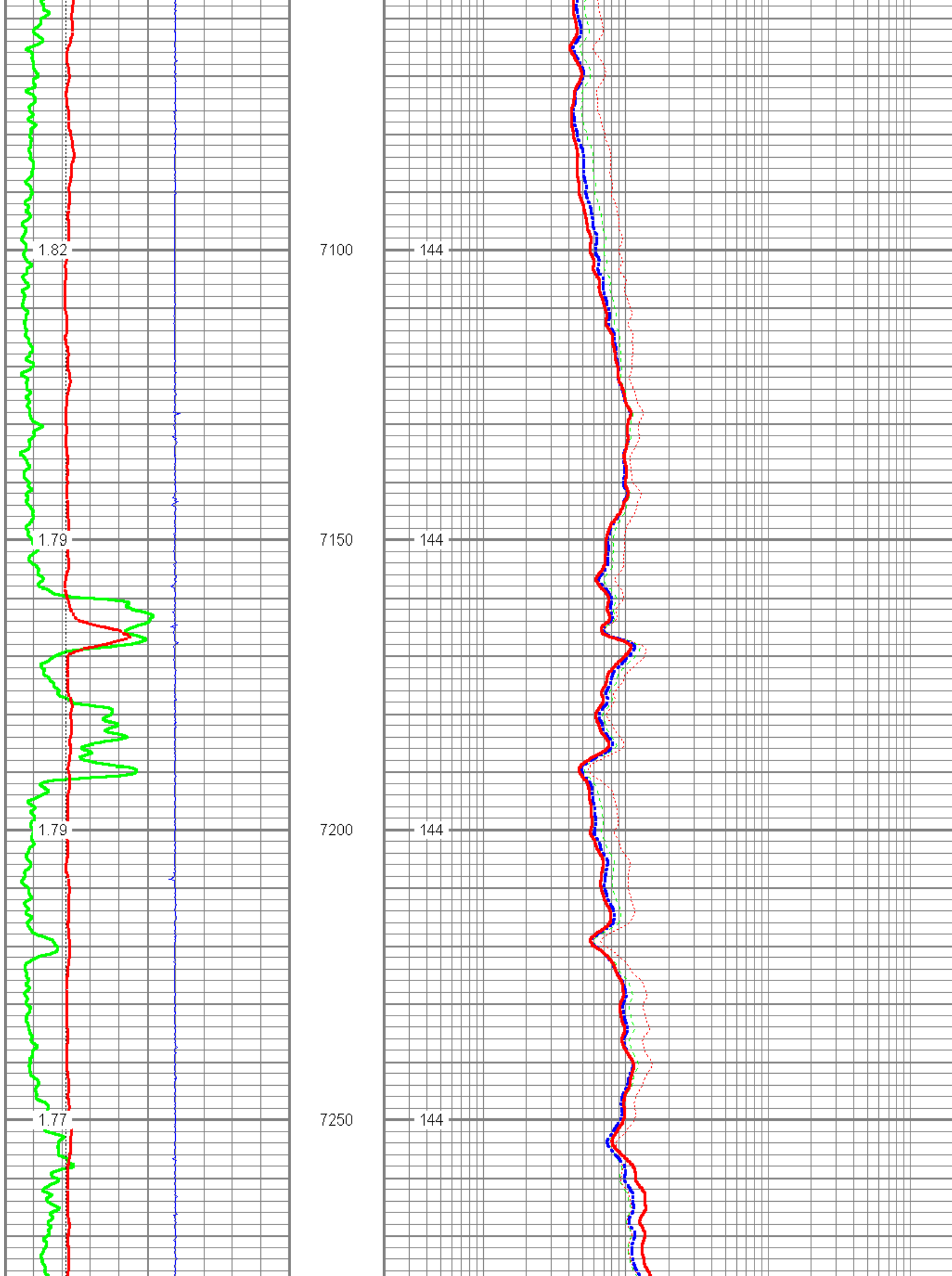
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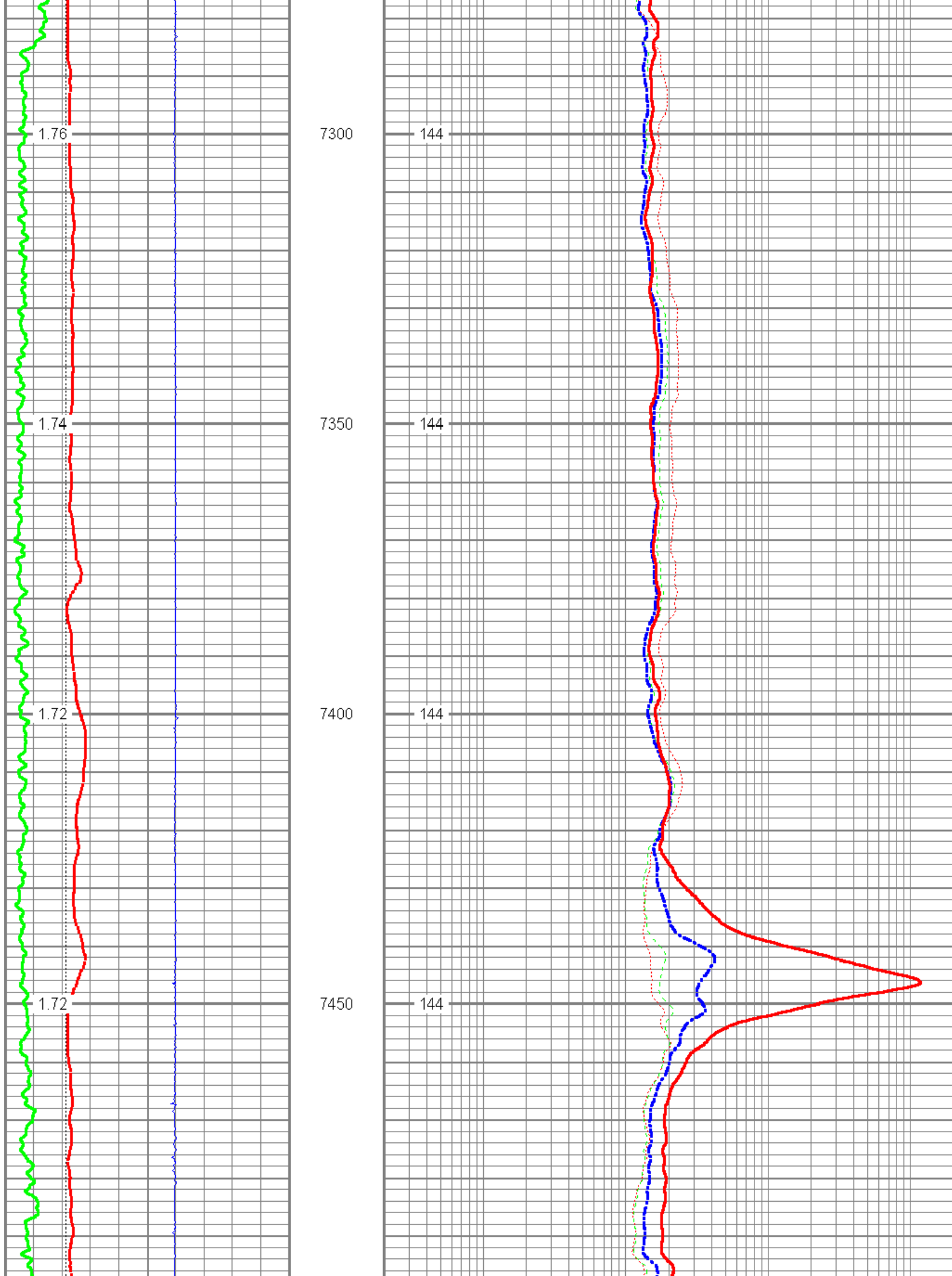
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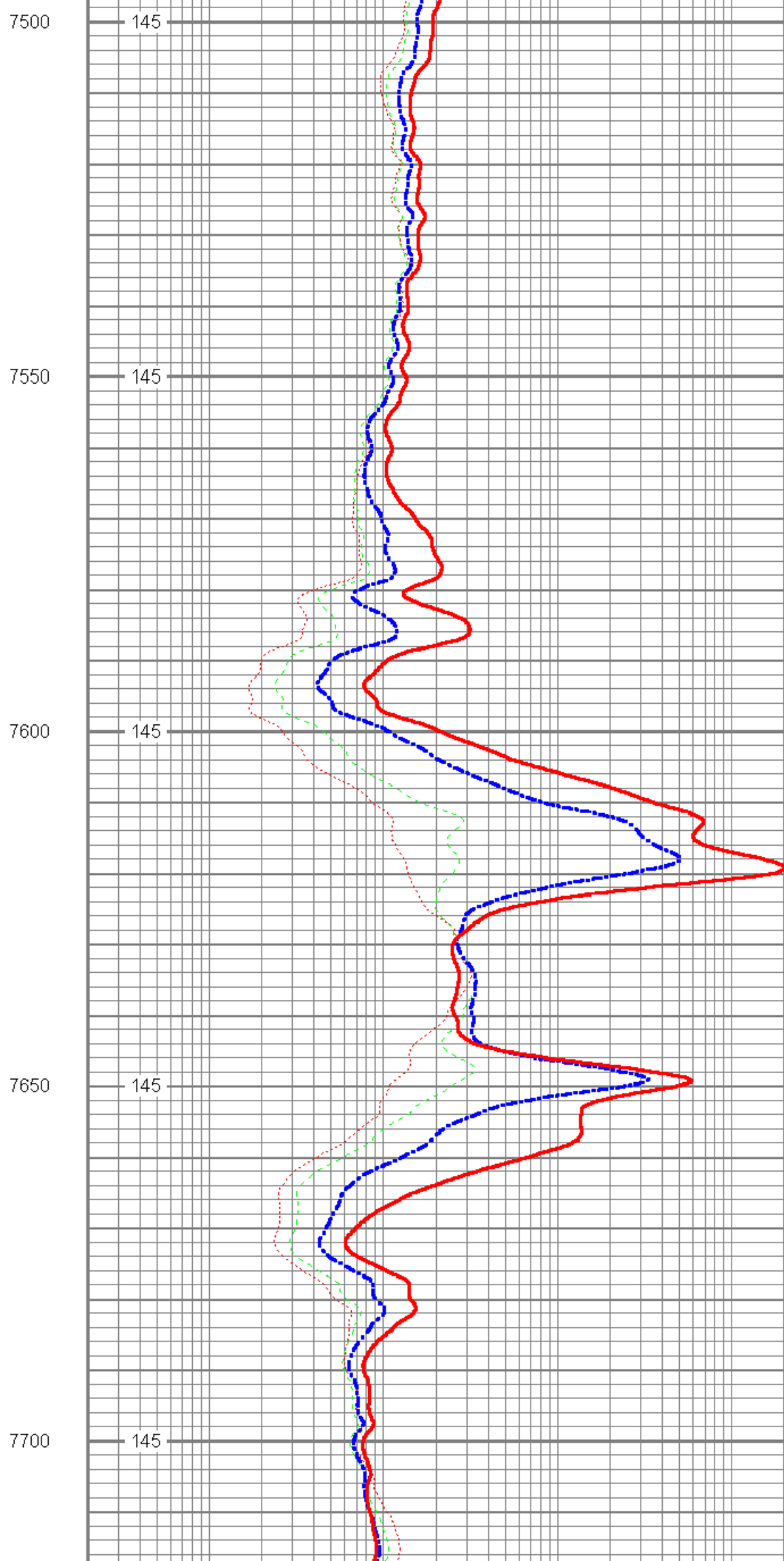
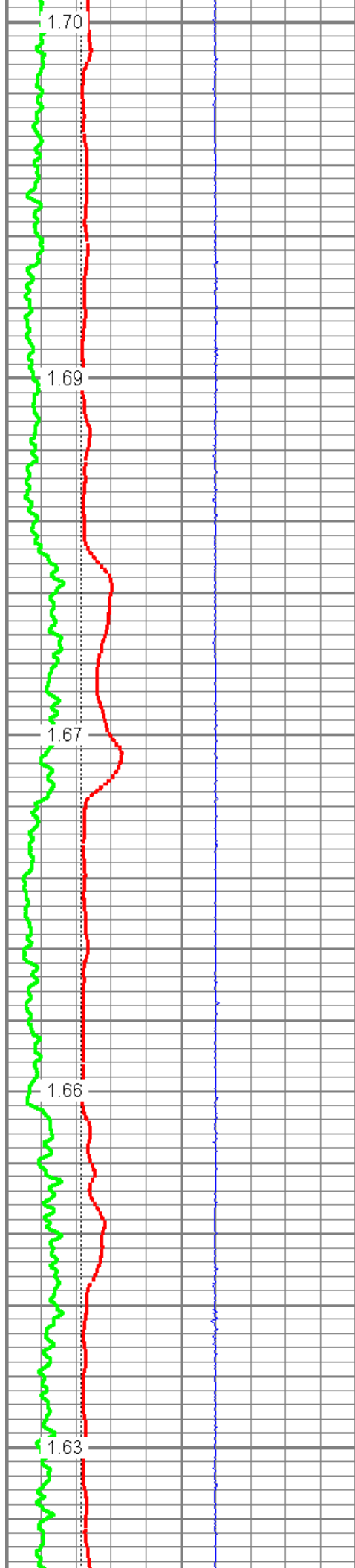
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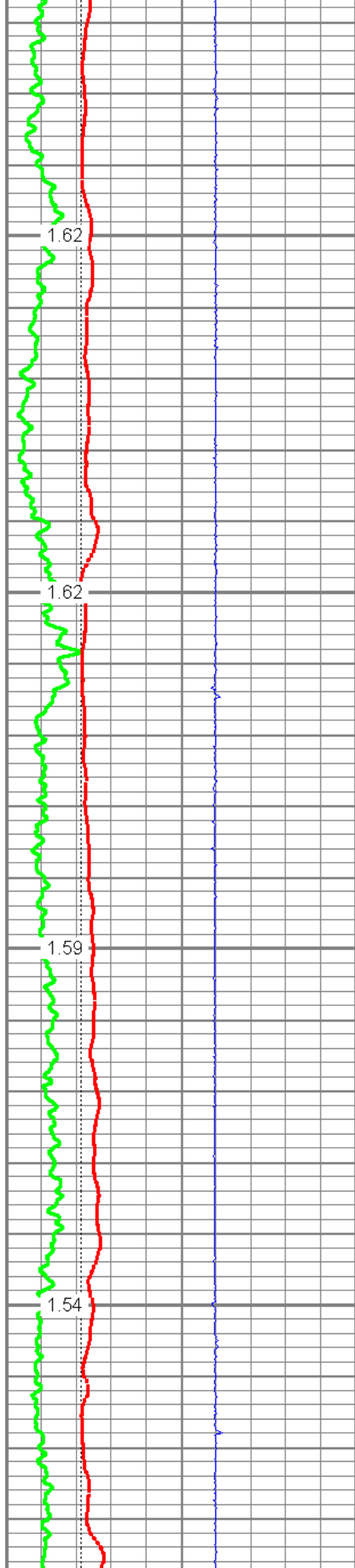
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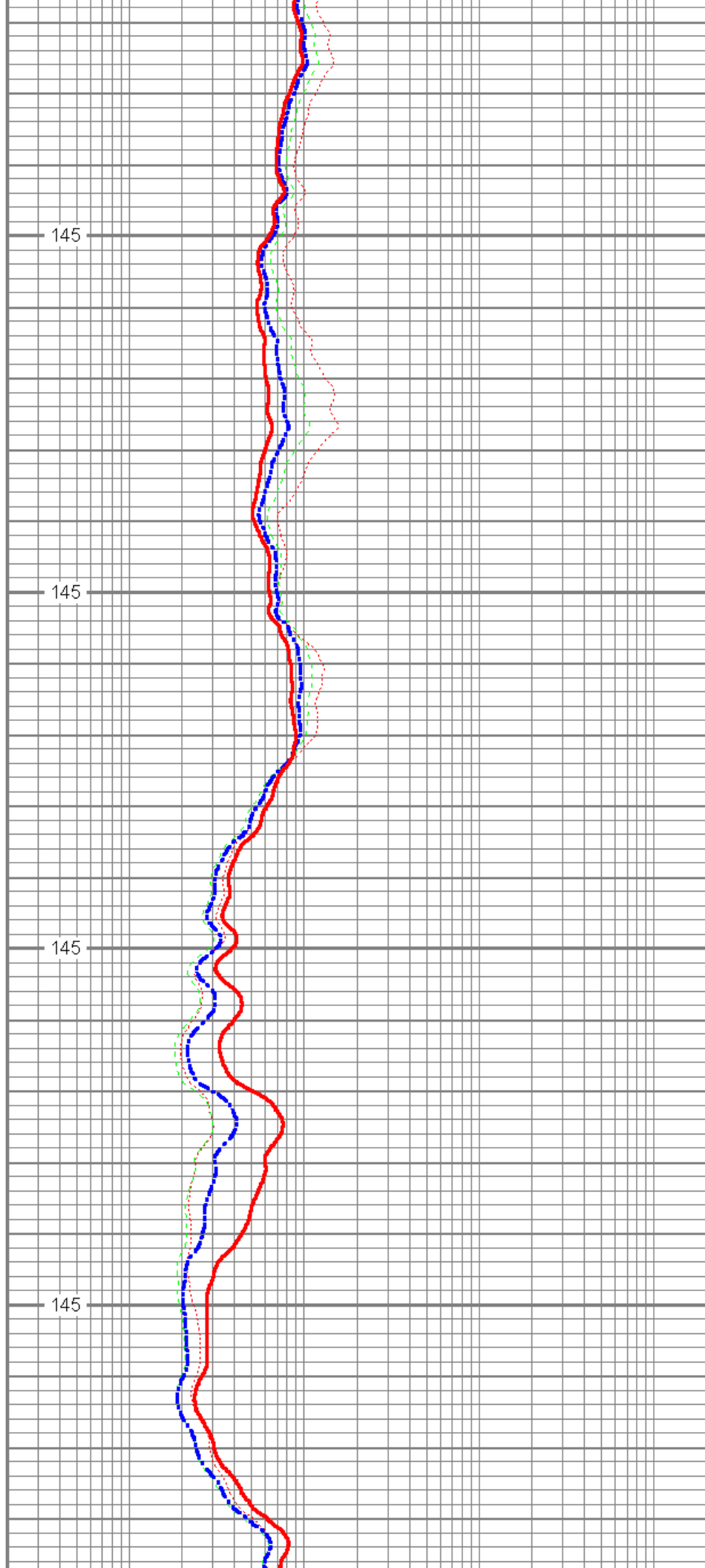
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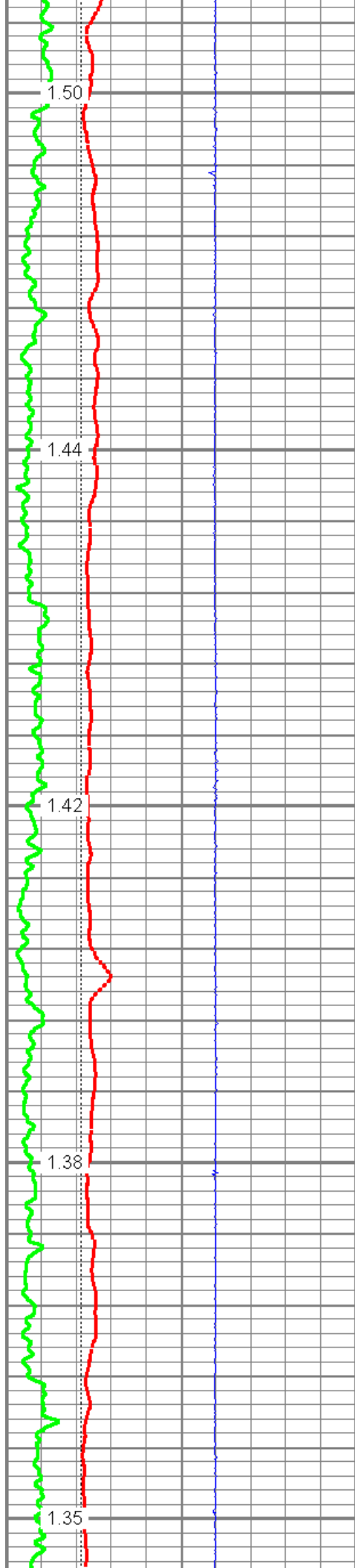
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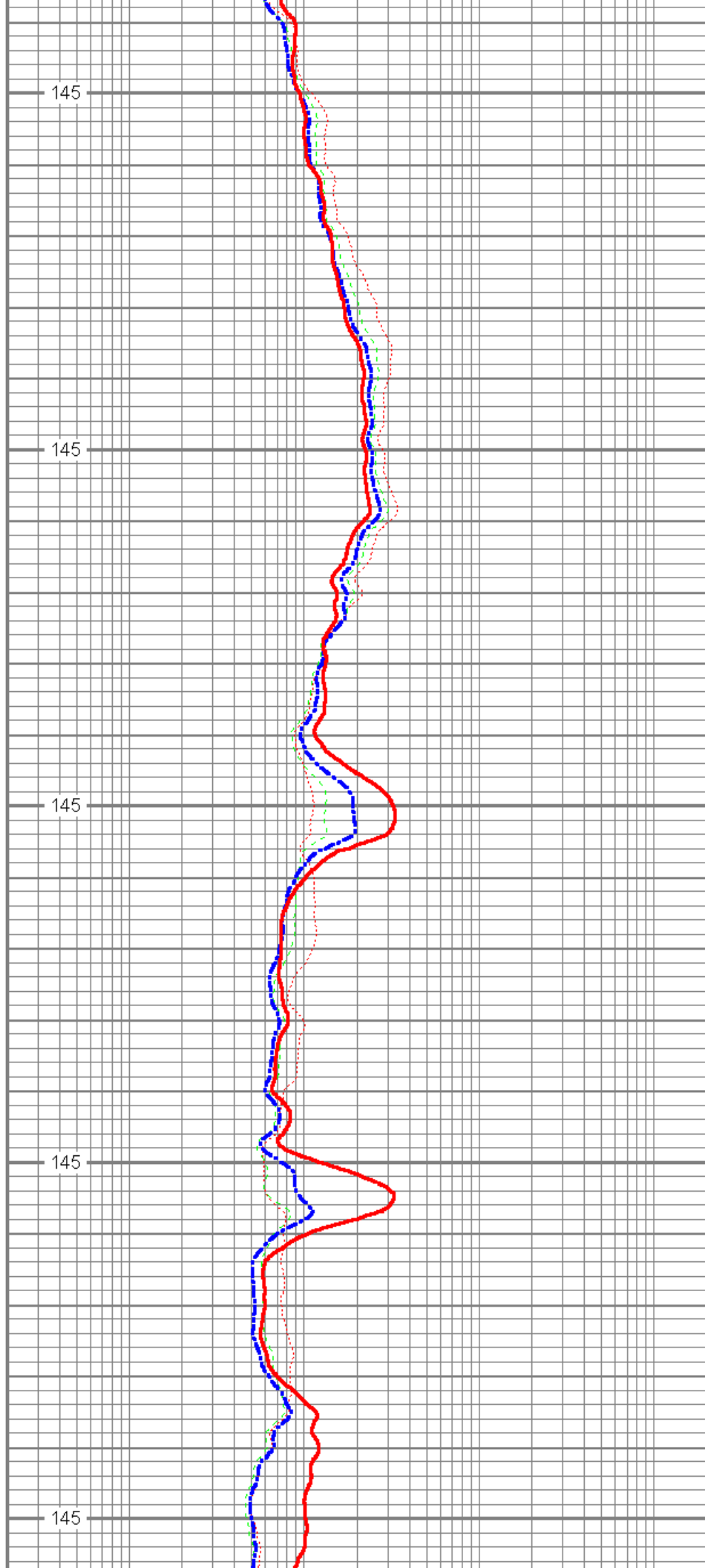
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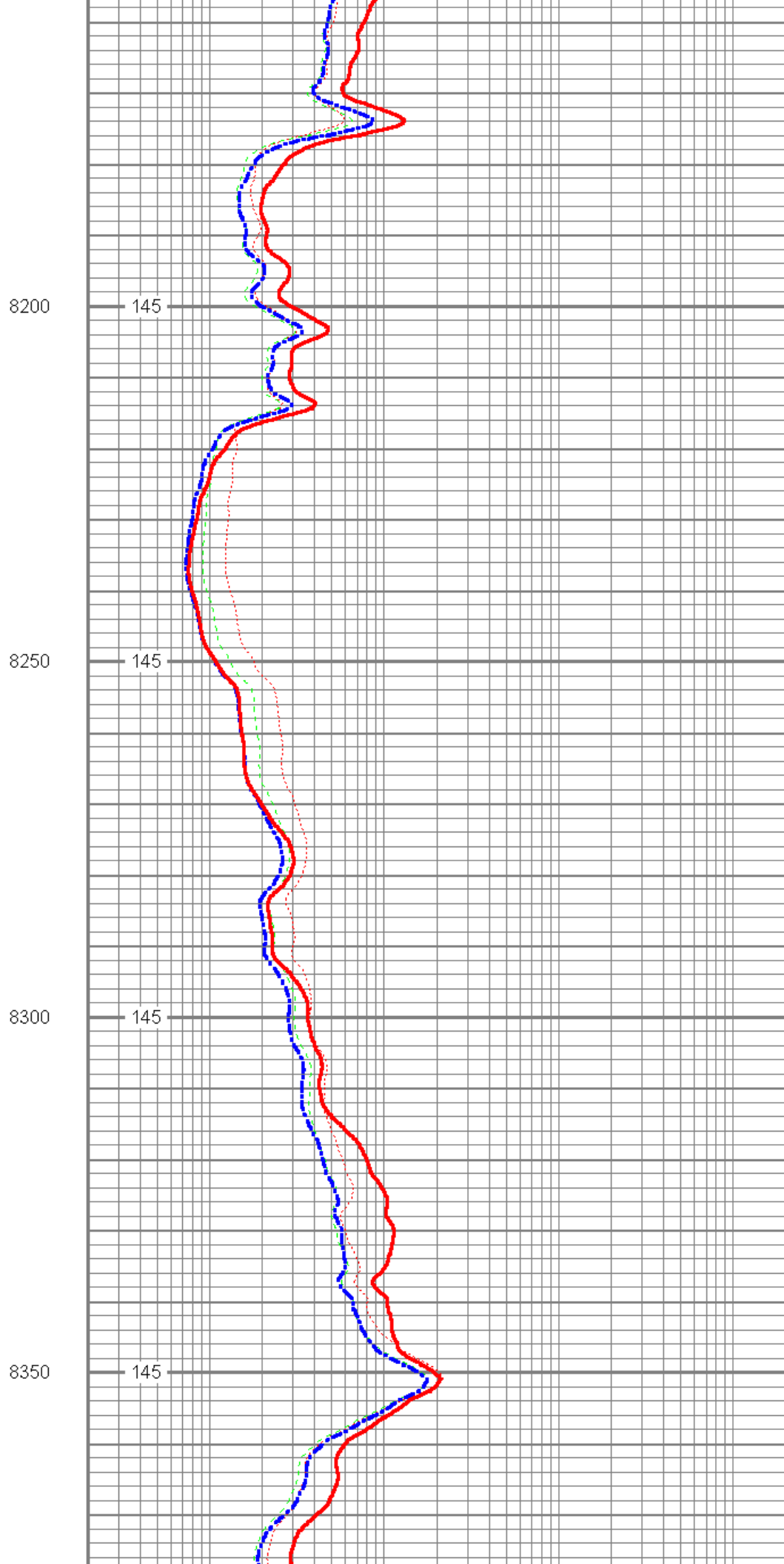
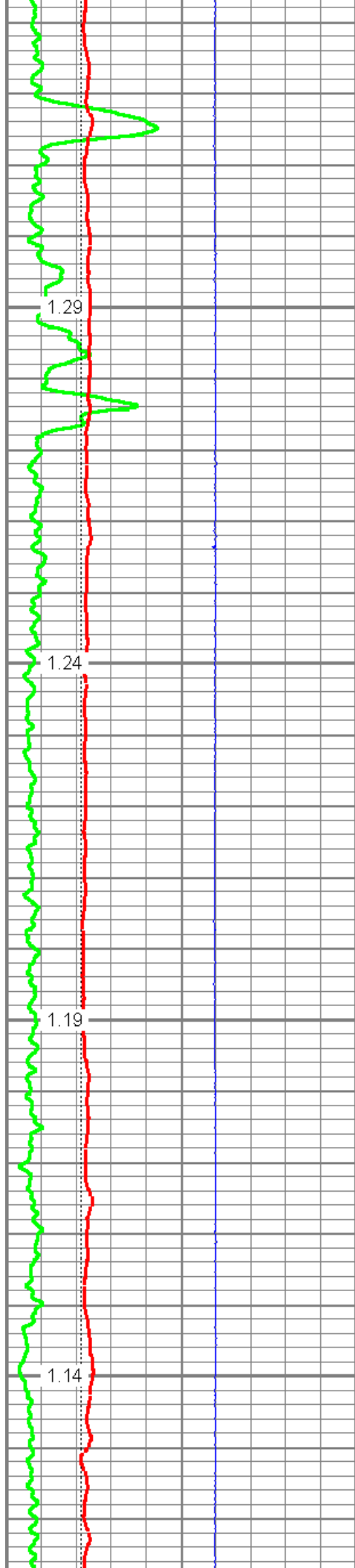
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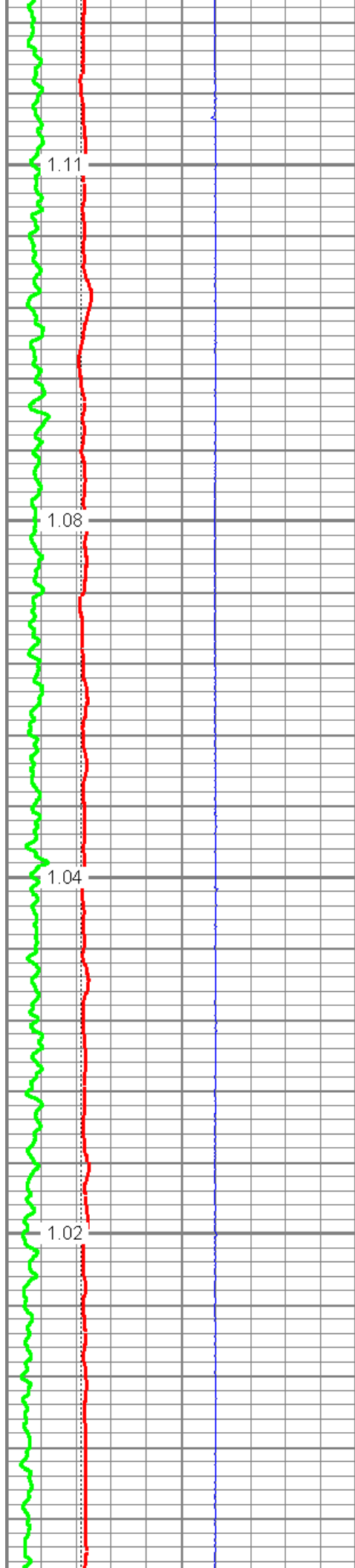
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8400

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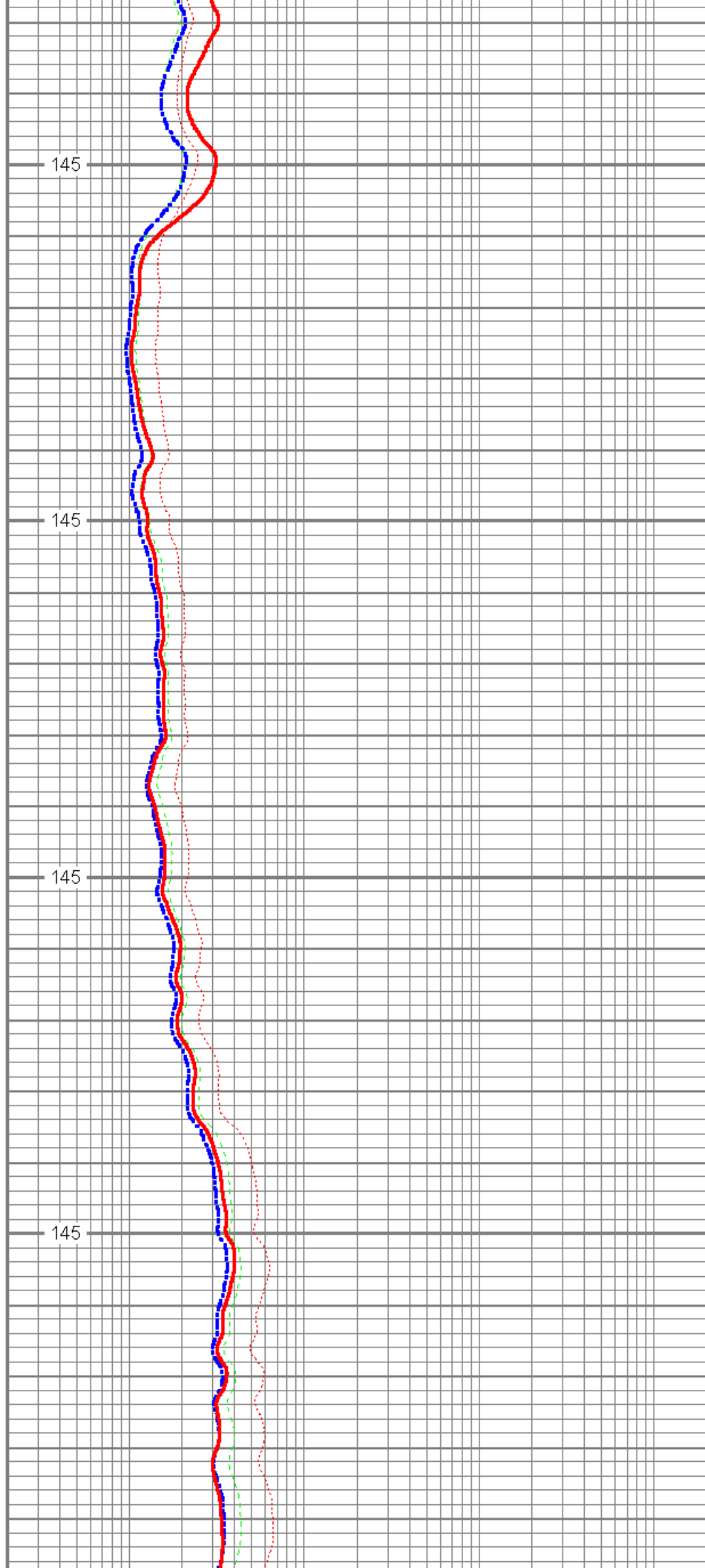
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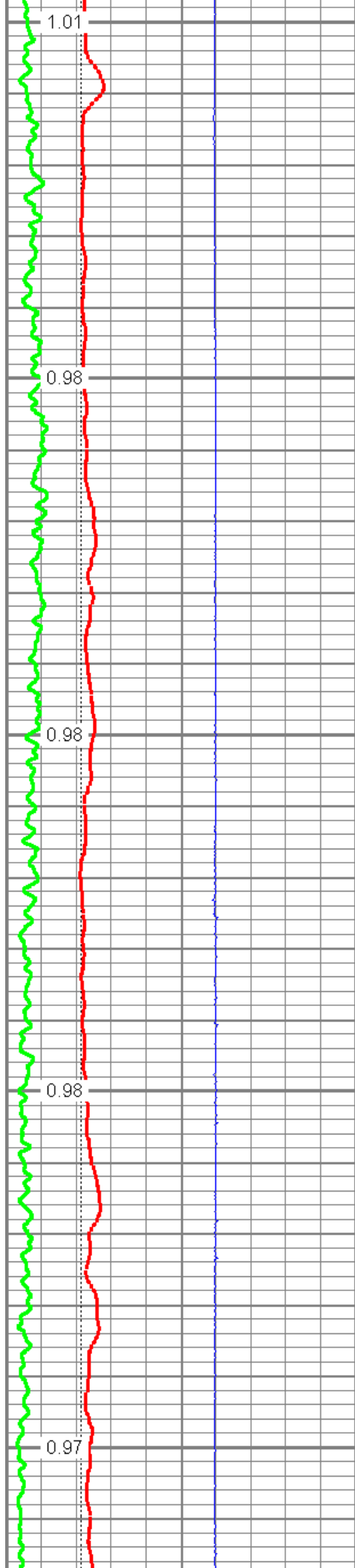
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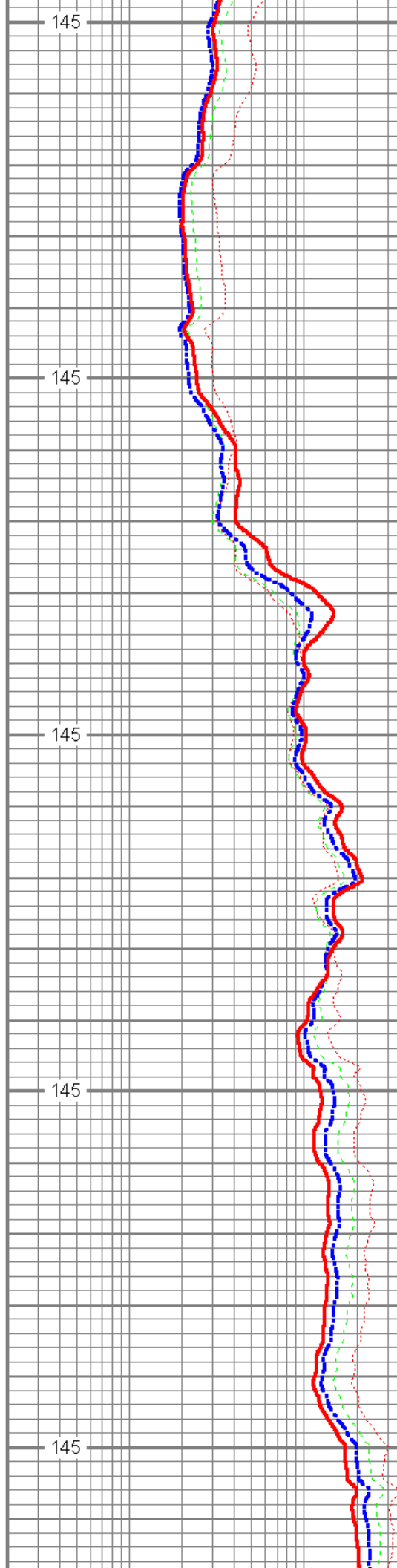
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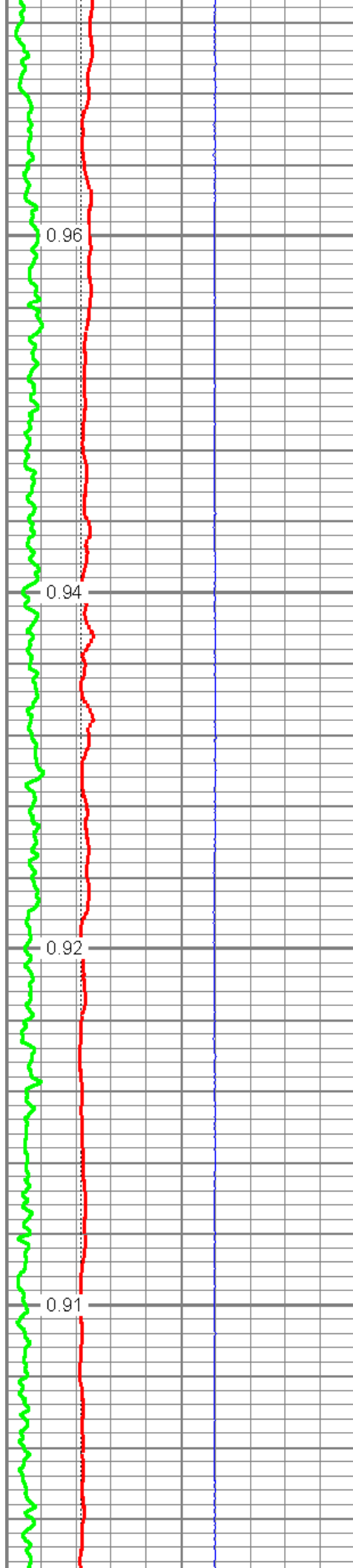
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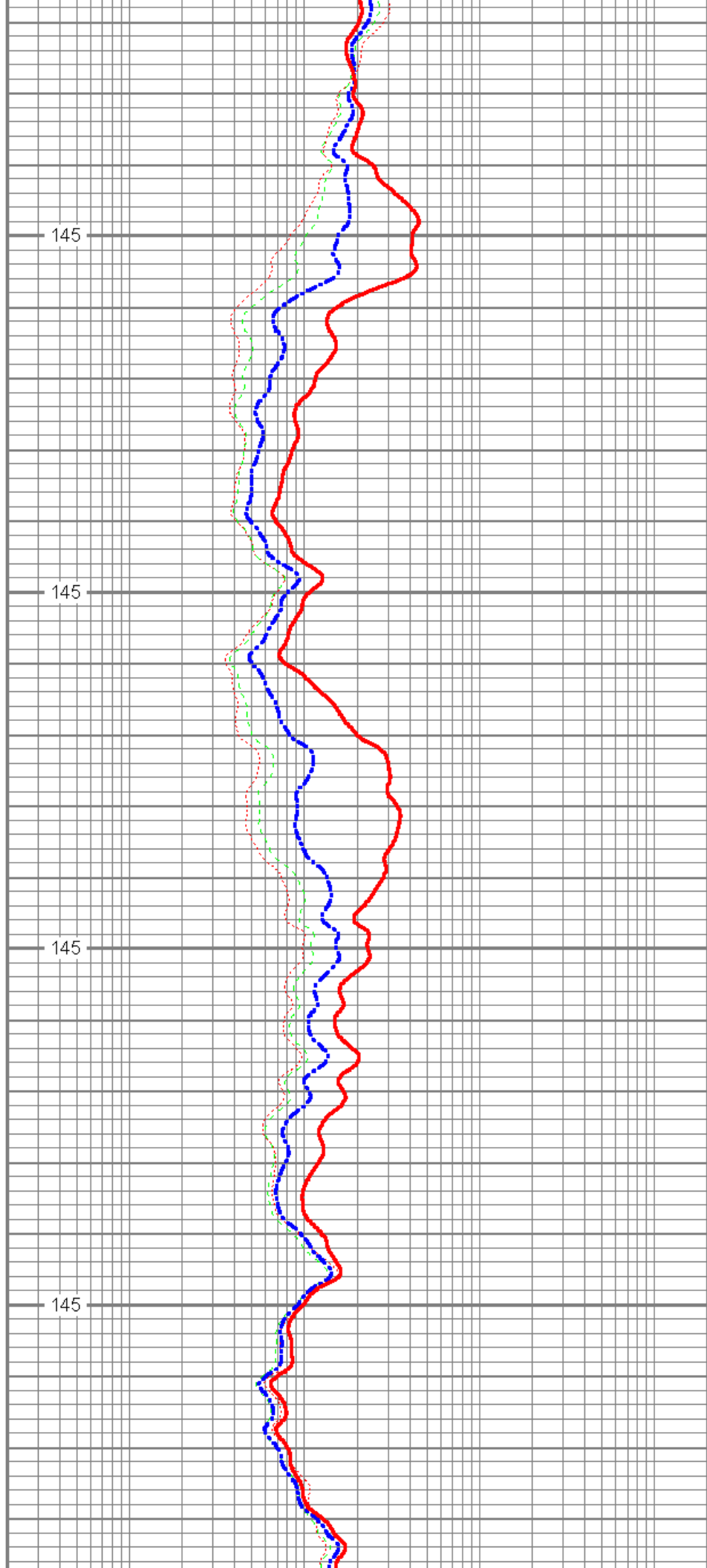
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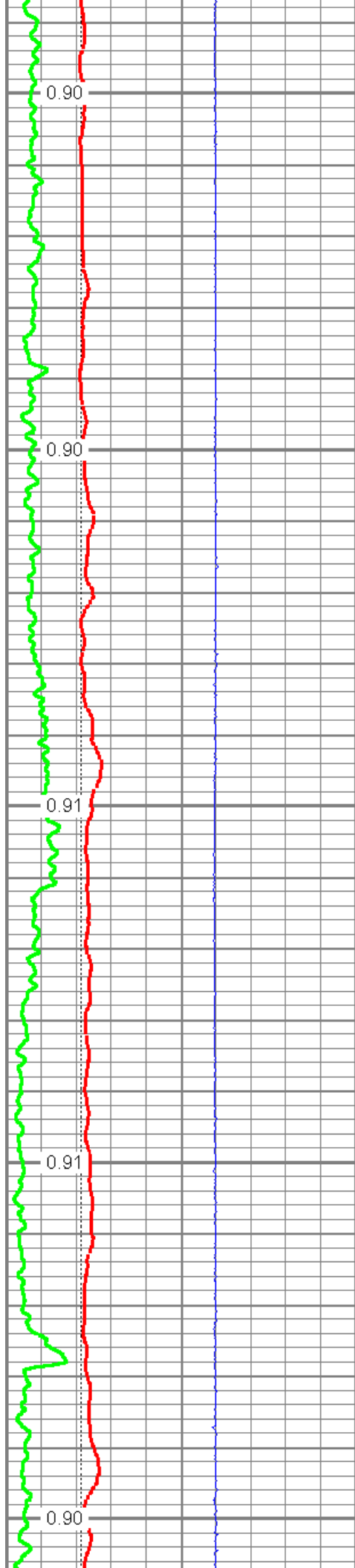
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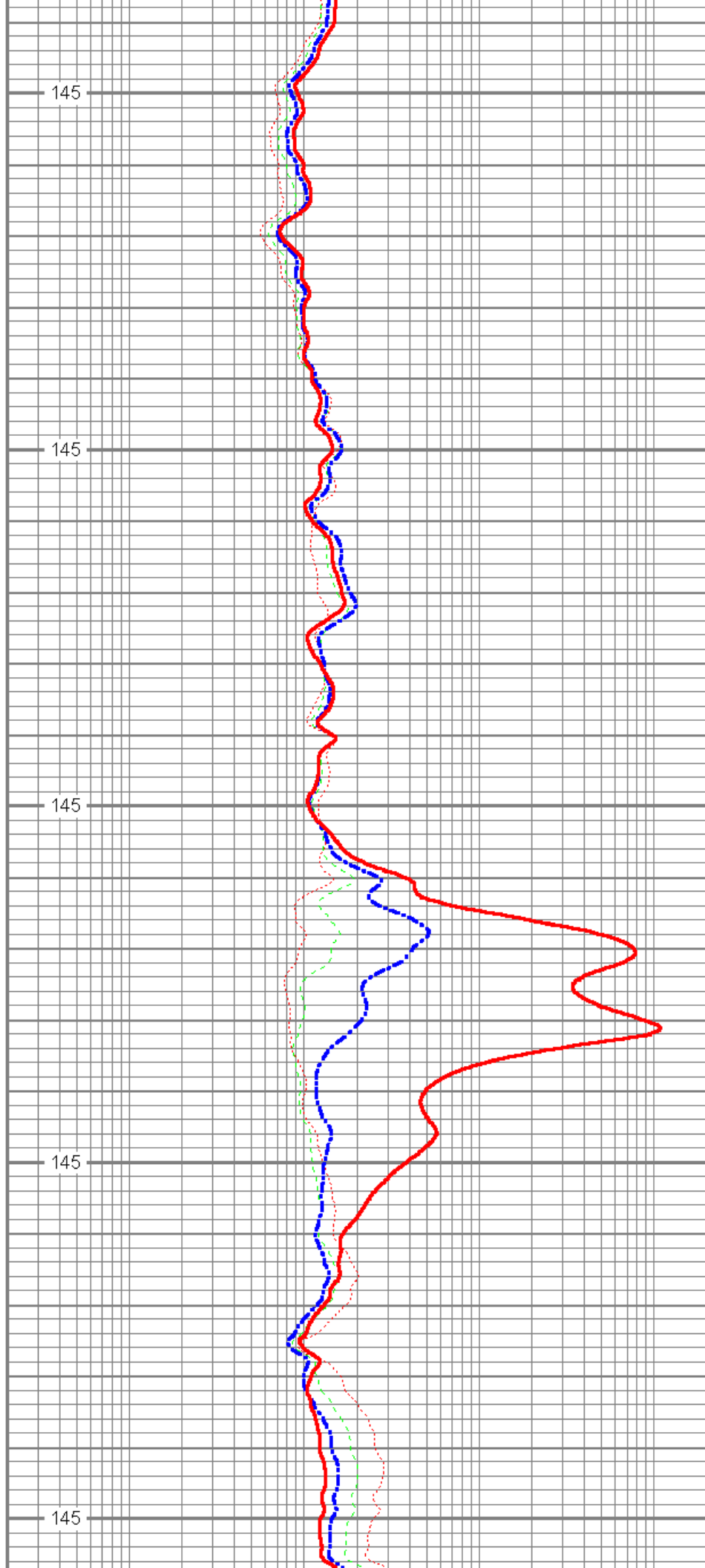
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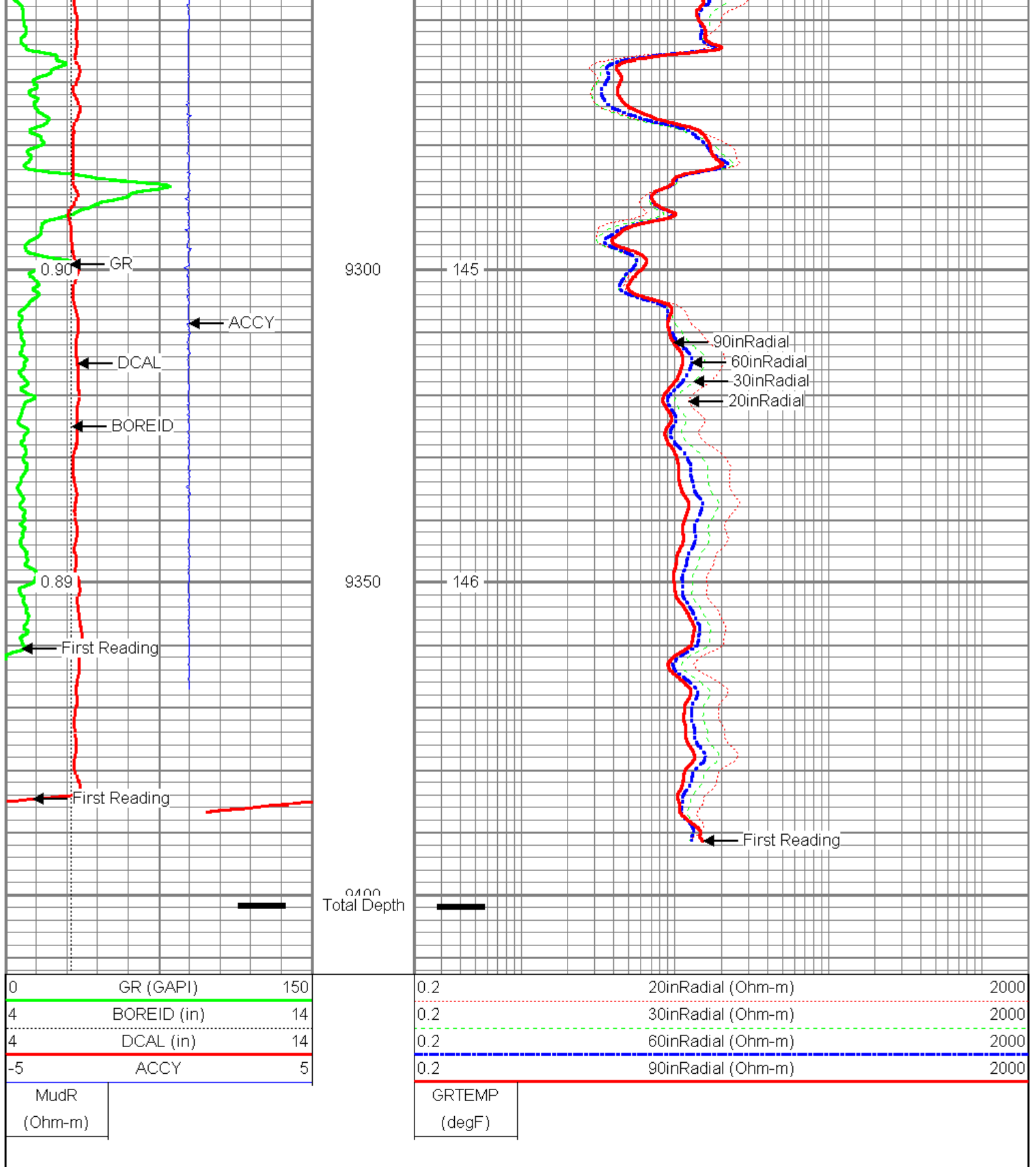
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Log Variables

Database: C:\Warrior\Data\britt_3406_mem.db
Dataset: field/well/proc1/pass1.2

Top - Bottom

A	BHCOR	BHFL_TYPE	BHFLRES Ohm-m	BHFLRESSRC	BHIDSRC	BOREID in
1	On	WBM	1	MUDCELL	CURVE	6.125

BOTTEMP degF 146	CASED? No	CASEOD in 4.5	CASETHCK in 0	CEMWATERSA kppm 0	CMNTTHCK in 0	DNBHC? NO
DPORSEL RHOB	FLUIDDEN g/cc 1	FRMSALIN kppm 0	LATNOR Off	M 2	MATRXDEN g/cc 2.71	MUDSALIN kppm 0.7
MudWgt lb/gal 8.4	NPORSEL Limestone	PEBHC? YES	PERFS 0	RESTMPSRC INTERNAL	SO in 0.5	SRFTEMP degF 65
SZCOR On	TDEPTH ft 9854	TMPCOR On	TOOLPOS Ec-centered			

Calibration Report				
Database File:	britt_3406_mem.db			
Dataset Pathname:	proc1/pass1.2			
Dataset Creation:	Sat May 11 09:05:48 2013			
ThruBit Induction Calibration Report				
Tool Model-Serial Number:		PS-PS37R		
Shop Calibration Performed:		Sat Feb 23 12:25:05 2013		
BASELINE				
	R	Expected	X	Expected
Freq 1				
A1	-478.2170	[-500.00, -400.00]	53.1167	[-500.00, 500.00]
A2	-140.7820	[-180.00, -100.00]	263.3160	[-500.00, 500.00]
A3	-25.2355	[-50.00, -10.00]	3.3103	[-500.00, 500.00]
A4	-16.0787	[-30.00, -10.00]	240.7340	[-500.00, 500.00]
A5	-14.0904	[-30.00, -10.00]	104.5580	[-500.00, 500.00]
Freq 2				
A1	-253.2780	[-280.00, -180.00]	8.1059	[-500.00, 500.00]
A2	-92.0251	[-130.00, -50.00]	144.8910	[-500.00, 500.00]
A3	-19.0677	[-50.00, -10.00]	-47.9515	[-500.00, 500.00]
A4	-19.3550	[-30.00, -10.00]	72.6618	[-500.00, 500.00]
A5	-19.0670	[-30.00, -10.00]	-27.1174	[-500.00, 500.00]
Freq 3				
A1	-162.6440	[-180.00, -80.00]	-61.6214	[-500.00, 500.00]
A2	-70.7103	[-130.00, -30.00]	66.5266	[-500.00, 500.00]
A3	-16.1486	[-50.00, -10.00]	-91.5960	[-500.00, 500.00]
A4	-21.1889	[-30.00, -10.00]	-39.3850	[-500.00, 500.00]
A5	-21.8800	[-30.00, -10.00]	-125.6060	[-500.00, 500.00]
Freq 4				
A1	-89.7805	[-120.00, -40.00]	-191.1890	[-500.00, 500.00]
A2	-51.8709	[-110.00, -10.00]	-40.1440	[-500.00, 500.00]
A3	-13.1275	[-50.00, -10.00]	-165.4590	[-500.00, 500.00]
A4	-24.6670	[-30.00, -10.00]	-205.4510	[-500.00, 500.00]
A5	-27.9730	[-30.00, -10.00]	-293.1350	[-500.00, 500.00]

CALIBRATION COEFFICIENTS				
	R	Expected	X	Expected

Freq 1				
A1	0.9990	[0.95, 1.05]	0.0023	[-0.05, 0.05]
A2	0.9942	[0.95, 1.05]	0.0025	[-0.05, 0.05]
A3	1.0032	[0.95, 1.05]	-0.0051	[-0.05, 0.05]
A4	0.9917	[0.95, 1.05]	0.0050	[-0.05, 0.05]
A5	0.9990	[0.95, 1.05]	0.0011	[-0.05, 0.05]
Freq 2				
A1	0.9934	[0.95, 1.05]	-0.0070	[-0.05, 0.05]
A2	0.9883	[0.95, 1.05]	-0.0062	[-0.05, 0.05]
A3	0.9911	[0.95, 1.05]	-0.0066	[-0.05, 0.05]
A4	0.9858	[0.95, 1.05]	-0.0035	[-0.05, 0.05]
A5	0.9928	[0.95, 1.05]	-0.0083	[-0.05, 0.05]
Freq 3				
A1	1.0024	[0.95, 1.05]	-0.0036	[-0.05, 0.05]
A2	0.9976	[0.95, 1.05]	-0.0028	[-0.05, 0.05]
A3	1.0007	[0.95, 1.05]	-0.0036	[-0.05, 0.05]
A4	0.9930	[0.95, 1.05]	-0.0001	[-0.05, 0.05]
A5	1.0065	[0.95, 1.05]	-0.0053	[-0.05, 0.05]
Freq 4				
A1	0.9939	[0.95, 1.05]	0.0150	[-0.05, 0.05]
A2	0.9882	[0.95, 1.05]	0.0160	[-0.05, 0.05]
A3	0.9941	[0.95, 1.05]	0.0131	[-0.05, 0.05]
A4	0.9809	[0.95, 1.05]	0.0190	[-0.05, 0.05]
A5	1.0082	[0.95, 1.05]	0.0106	[-0.05, 0.05]
Temperature	35.0032 degC			

ThruBit Density Calibration Report			
Tool Model-Serial Number:		PS-PS36D	
Source Number:			
Shop Calibration Performed:		Mon Apr 22 12:49:09 2013	
REFERENCE			
	Density	Units	
Aluminium	2.607	g/cc	
Magnesium	1.752	g/cc	
READINGS			
Outputs	Counts	Units	Expected
SS1 Background	131.35	cps	[130.00, 170.00]
LS1 Background	130.18	cps	[130.00, 170.00]
LS4 Background	28.18	cps	[27.00, 35.00]
SS1 Aluminium	4710.41	cps	[4500.00, 5500.00]
LS1 Aluminium	789.06	cps	[750.00, 950.00]
LS4 Aluminium	926.00	cps	[843.00, 1068.00]
SS1 Magnesium	7842.95	cps	[7000.00, 9000.00]
LS1 Magnesium	5297.41	cps	[5250.00, 6250.00]
LS1 Al + Fe	648.43	cps	[650.00, 800.00]
LS4 Al + Fe	401.80	cps	[382.00, 471.00]
RESULTS			
SS Slope	1.64		[1.52, 1.77]
LS Slope	0.42		[0.38, 0.45]
PEF K Factor	5.148		[3.510, 6.170]
PEF B Factor	-0.579		[-0.700, -0.410]

Caliper Shop Calibration performed:

Mon Apr 22 12:49:09 2013

RESULTS

Reference	Reading	Units
12.00	1861.49	in
9.00	2021.15	in
6.00	2189.87	in

DENSITY PRE-SURVEY CHECK Performed:

Mon Apr 29 09:24:45 2013

Outputs	Counts	Units	Expected
SS1 Background	132.71	cps	[127.41, 135.29]
LS1 Background	128.81	cps	[126.28, 134.09]
LS4 Background	26.57	cps	[26.49, 29.87]

CALIPER PRE-SURVEY CHECK Performed:

Mon Apr 29 09:22:26 2013

Reference	Readings	Units	Expected
6.00	6.05	in	[5.80, 6.20]

Compensated Neutron Calibration Report

Tool Model-Serial Number:
Source Number:

PS-PS01N

Calibration Tank Temperature:
Shop Calibration Performed:68.9 degF
Wed Apr 10 16:24:15 2013

BACKGROUND MEASUREMENT

Outputs	Measured	Units	Expected
SS Counts	0.0	cps	<10
LS Counts	0.0	cps	<4

WATER TANK REFERENCE

Outputs	Measured	Units	Expected
SS Counts	3909.6	cps	
LS Counts	129.6	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	30.1708	SS/LS	
Tank Ratio Gain	1.0261		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE

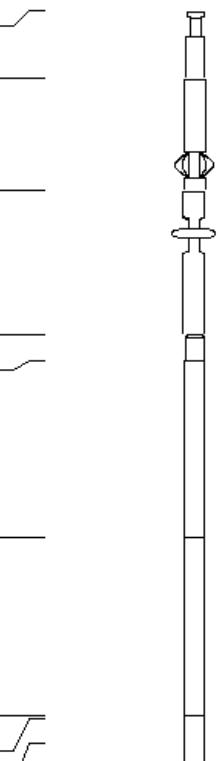
Outputs	Measured	Units	Expected
SS Counts	45408.1	cps	
LS Counts	4225.6	cps	
Al Ratio Ref	10.797	SS/LS	
Al Ratio	11.026	SS/LS	
Al Ratio Gain	0.08		[0.00, 1.10]

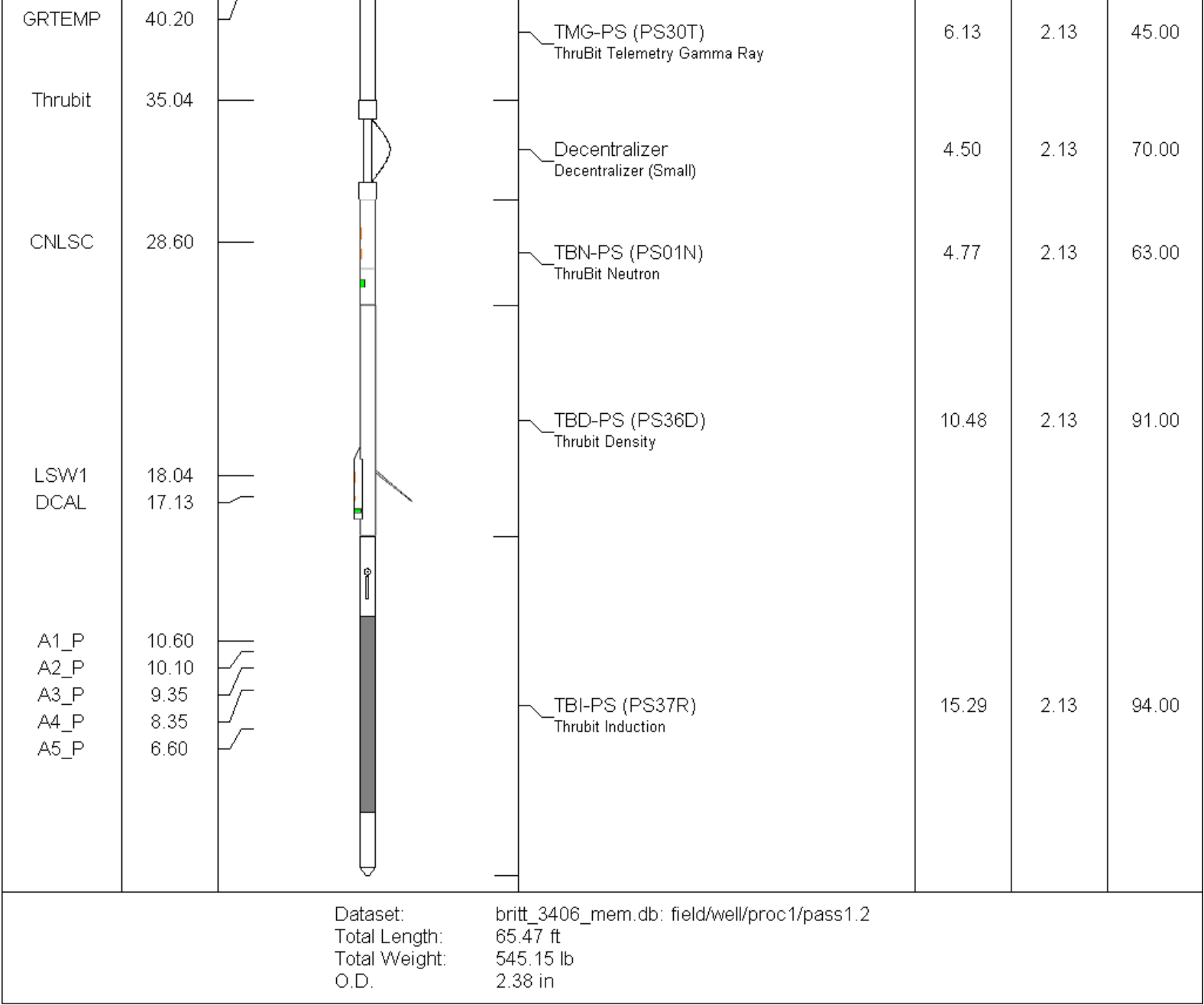
Al Ratio Gain	0.90	[0.90, 1.10]
Sleeve Porosity	14.46	pu

PRE-SURVEY BACKGROUND CHECK Performed: Mon Apr 29 09:29:12 2013			
Outputs	Measured	Units	Expected
SS Counts	0.0	cps	<10
LS Counts	0.1	cps	<4

Gamma Ray Calibration Report			
Tool Model-Serial Number:	PS-PS30T		
Performed:	Tue Apr 16 11:51:38 2013		
Calibrator Value:	1.0	GAPI	
Background Reading:	0.0	cps	
Calibrator Reading:	1.0	cps	
Sensitivity:	0.3750	GAPI/cps	

Inclinometer Calibration Report					
Performed:	Sun Jun 13 14:33:21 1993				
	Low Read.	High Read.	Low Ref.	High Ref.	
X Accelerometer	0.00	1.00	0.00	1.00	gee
Y Accelerometer	0.00	1.00	0.00	1.00	gee
Z Accelerometer	0.00	1.00	0.00	1.00	gee

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
Thrubit	65.47		Cablehead-S	2.31	2.13	5.00
Thrubit	63.16		Solid Weakpoint			
			PSBDOT	3.87	2.25	35.00
Thrubit	59.29		HangOff_Tool	5.00	2.38	60.00
Thrubit	54.29		10-1	0.88	2.13	3.95
TBBAT	53.42		TBBAT-A (PS37B) Thrubit Battery	6.13	2.13	38.20
TBBAT2	47.29		TBBAT2-A (PS36B) Thrubit Battery	6.13	2.13	40.00
TMG	41.16					
GR	41.04					





ThruBit
A Schlumberger Company

Company	SANDRIDGE ENERGY
Well	BRITT 3406 4-20H
Field	EASTHAM
County	HARPER
State	KANSAS



MAIN PASS

Database File:	britt_3406_mem.db
Dataset Pathname:	proc1/pass1.2
Presentation Format:	6_2r_chk
Dataset Creation:	Sat May 11 09:05:48 2013
Charted by:	Depth in Feet scaled 1:1200

0	GR (GAPI)	150	20in 2ft Res	
4	DCAL (in)	14	50 (Ohm-m)	500
-5	ACCY	5	90in 2ft Res	
4	BOREID (in)	14	50 (Ohm-m)	500
GRTEMP			1000 DEEP COND (mmho/m)	0

(degF)

0 20in 2ft Res (Ohm-m) 50

0 90in 2ft Res (Ohm-m) 50

