

Company: ExxonMobil Production Corp

Well: PCU 296-5A1

Field: Piceance Creek

County: Rio Blanco

State: Colorado

CORRELATION PRINT

GAMMA RAY

Field: Piceance Creek
Location: Latitude: 39.912053000
Well: PCU 296-5A1
Company: ExxonMobil Production Corp

LOCATION		Latitude: 39.912053000	Elev.: K.B. 7325.50 ft
		Longitude: 108.198567000	G.L. 7295.50 ft
		690' FNL & 561' FWL	D.F. 7324.50 ft
Permanent Datum:	GROUND LEVEL	Elev.: 7295.50 ft	
Log Measured From:	KELLY BUSHING	30.00 ft above Perm. Datum	
Drilling Measured From:	KELLY BUSHING		
API Serial No.	Section	Township	Range
05103124800	5	2S	96W
Logging Date	18-Sep-2010		
Run Number	1		
Depth Driller	14390 ft		
Schlumberger Depth	9866 ft		
Bottom Log Interval	9866 ft		
Top Log Interval	3950 ft		
Casing Fluid Type	WBM		
Salinity			
Density	9.6 lbm/gal		
Fluid Level	40 ft		
BIT/CASING/TUBING STRING	9.875 in		
Bit Size	30 ft		
From	14390 ft		
To	7.000 in		
Casing/Tubing Size	26 lbm/ft		
Weight			
Grade	30 ft		
From	10105 ft		
To	214 degF		
Maximum Recorded Temperatures	18-Sep-2010	6:30	
Logger On Bottom	Time		
Unit Number	Location	Rock Springs	
Recorded By	Yating Wang		
Witnessed By	Ken Holmes		

PVT DATA			
	Run 1	Run 2	Run 3
Oil Density			
Water Salinity			
Gas Gravity			
Bo			
Bw			
1/Bg			
Bubble Point Pressure			
Bubble Point Temperature			
Solution GOR			
Maximum Deviation	24.4 deg		
CEMENTING DATA			
Primary/Squeeze	Primary		
Casing String No			
Lead Cement Type	TUNE LIGHT		
Volume			
Density	11 lbm/gal		
Water Loss			
Additives			
Tail Cement Type	TUNE LIGHT		
Volume			
Density	11 lbm/gal		
Water Loss			
Additives			
Expected Cement Top	4150 ft		
Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Fluid Type			
Salinity			
Density			
Fluid Level			
BIT/CASING/TUBING STRING			
Bit Size			
From			
To			
Casing/Tubing Size			
Weight			
Grade			
From			
To			
Maximum Recorded Temperatures			
Logger On Bottom	Time		
Unit Number	Location		
Recorded By			
Witnessed By			

DEPTH SUMMARY LISTING

Date Created: 18-SEP-2010 8:58:11

Depth System Equipment

Depth Measuring Device	Tension Device	Logging Cable
Type: IDW-B	Type: CMTD-B/A	Type: 7-46P XS
Serial Number: 6435	Serial Number: 2697	Serial Number: 709027
Calibration Date: 4-Aug-2010	Calibration Date: 19-Aug-2010	Length: 24000 FT
Calibrator Serial Number: 33	Calibrator Serial Number: 100518	Conveyance Method: Wireline Rig Type: LAND
Calibration Cable Type: 7-46P XS	Number of Calibration Points: 10	
Wheel Correction 1: -3	Calibration RMS: 5	
Wheel Correction 2: -3	Calibration Peak Error: 10	

Depth Control Parameters

Log Sequence: First Log In the Well
Rig Up Length At Surface: 213.00 FT
Rig Up Length At Bottom: 212.60 FT
Rig Up Length Correction: 0.40 FT
Stretch Correction: 6.00 FT
Tool Zero Check At Surface: 2.10 FT

Depth Control Remarks

1. All Schlumberger depth control policies followed
2. IDW used as primary depth reference, Z-chart used as secondary depth reference
3. Uplot correlated to downlog from 9800 ft to 8000 ft
4.
5.
6.

DISCLAIMER

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OTHER SERVICES1	OTHER SERVICES2
OS1: NONE	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
Tool ran as per tool sketch	
Tool centralized using 2 x In-Line-Centralizers and 1 x Gemco	
Neutron ran for GR only	
UFAO = -22	
Logged at 1800 ft/hr	
Expected casing Thickness: 0.362"	
Expected Casing ID = 6.276"	
IBC resolution set to 5 deg 6 inch	

IBC transducer angles set at 33 deg
 Eccentering high above 5000 ft due to high deviation of the well

Crew: Marvin Smith & Edward Jones

RUN 1
 SERVICE ORDER #: BAK1-00022
 PROGRAM VERSION: 18C0-147
 FLUID LEVEL: 40 ft

RUN 2
 SERVICE ORDER #:
 PROGRAM VERSION:
 FLUID LEVEL:

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

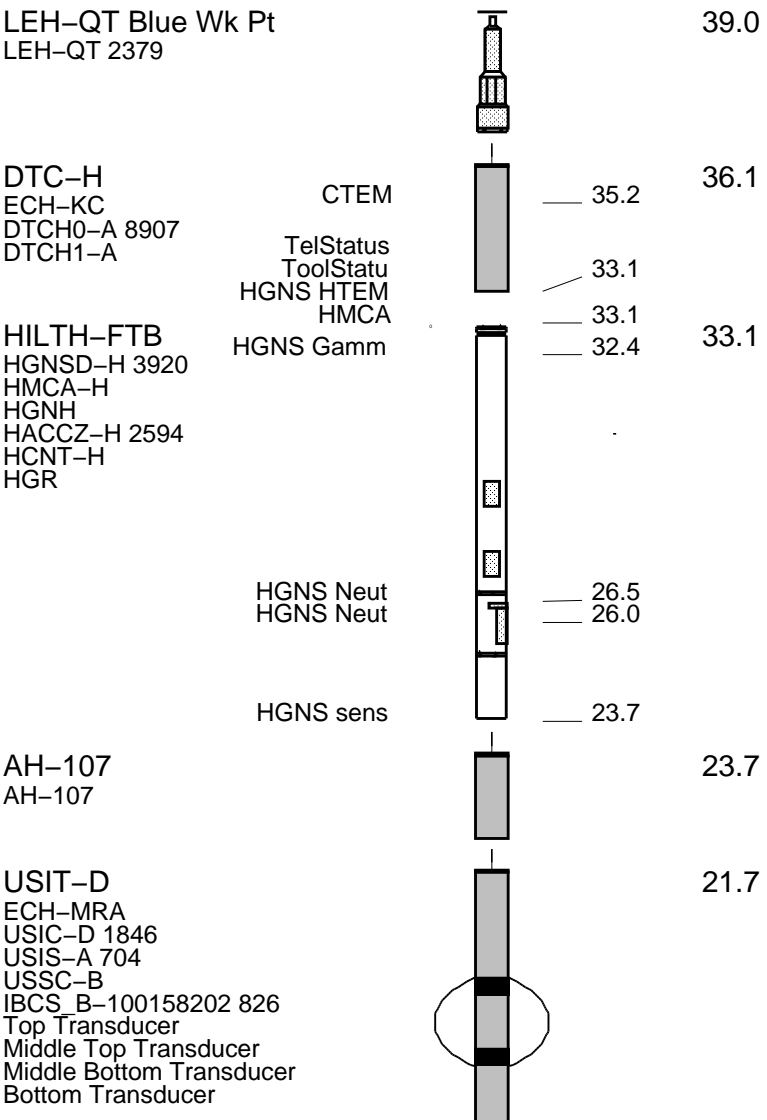
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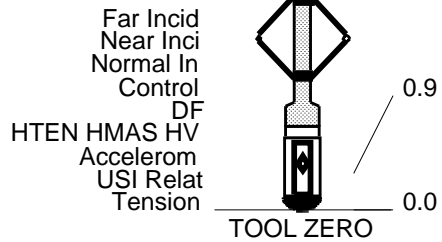
RUN 2

SURFACE EQUIPMENT

GSR-U/Y
 NCT-B
 CNB-AB
 WITM (DTS)-A

DOWNHOLE EQUIPMENT





MAXIMUM STRING DIAMETER 7.50 IN
 MEASUREMENTS RELATIVE TO TOOL ZERO
 ALL LENGTHS IN FEET

Client: ExxonMobil Production Corp

Drawing Date: 9/18/2010

Well: PCU 296-5A1

API #: 51031124800

Field: Piceance Creek

Rig Name: H&P 321

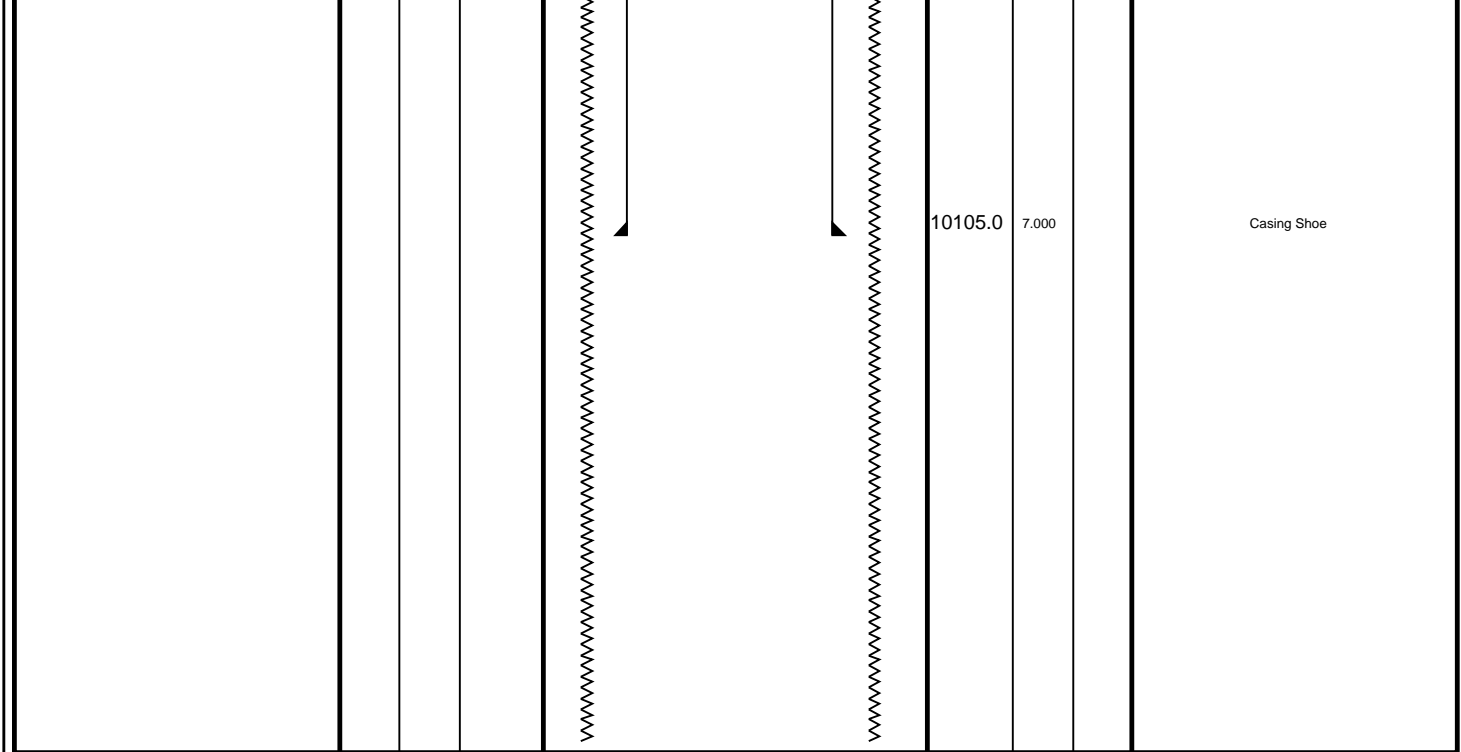
State: Colorado

Reference Datum: Kelly Bushing

Country: USA

Elevation: 7325.5 ft

Production String	(in)		(ft)	Well Schematic		(ft)	(in)		Casing String
	OD	ID	MD			MD	OD	ID	
				~		30.2		7.000	Casing String Borehole Segment
				~		30.2		9.875	



All depths are driller's depth



Correlation

MAXIS Field Log

Company: ExxonMobil Production Corp Well: PCU 296-5A1

Input DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_023LUP	FN:22	PRODUCER	18-Sep-2010 07:07	9866.0 FT	1727.5 FT
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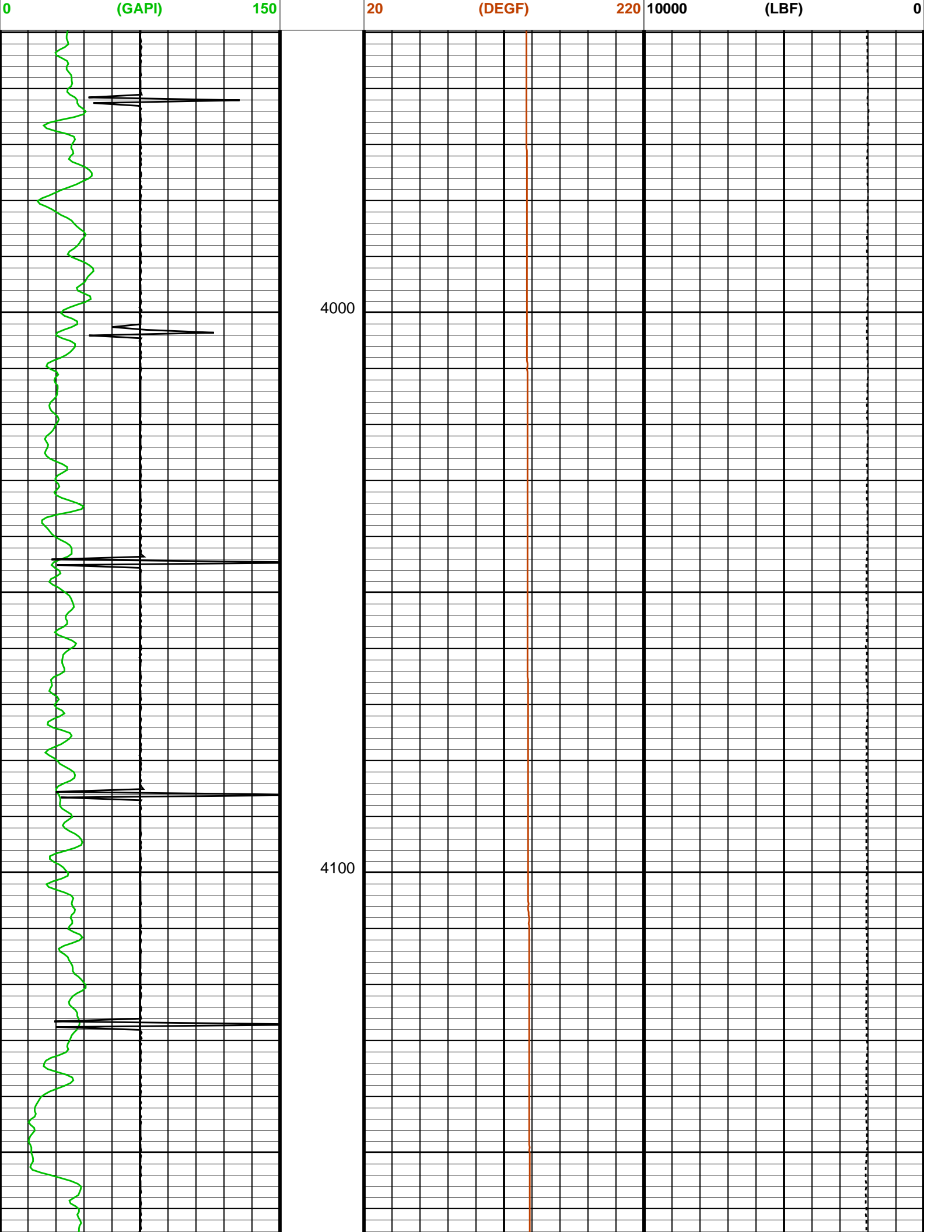
Output DLIS Files

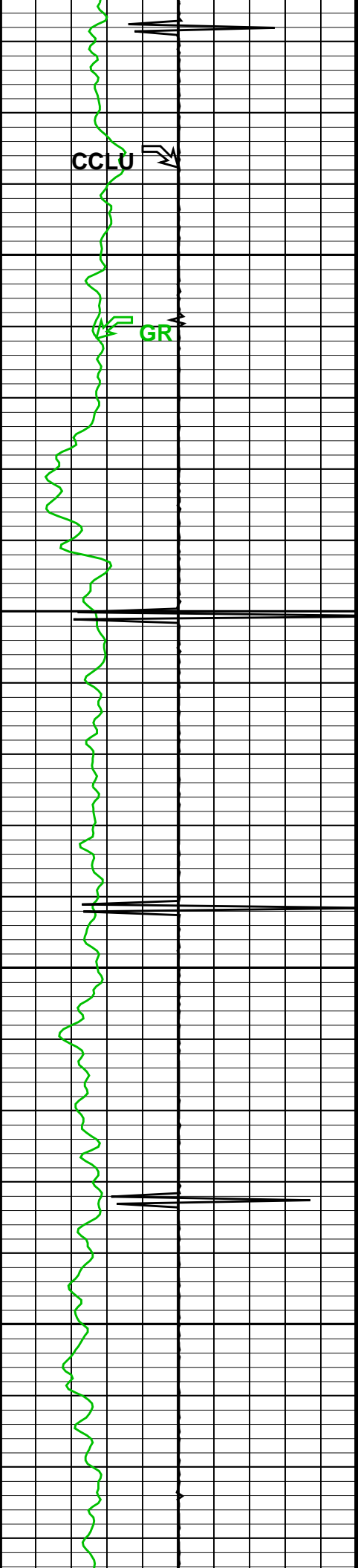
DEFAULT	USI_TLD_MCFL_CNL_025PUP	FN:24	PRODUCER	18-Sep-2010 11:12	9872.0 FT	3949.5 FT
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OP System Version: 18C0-147

USIT-D	18C0-147	HILTH-FTB	18C0-147
DTC-H	18C0-147		

CCL (CCLU)		
-20	(----)	20





CCLU



GR



4200

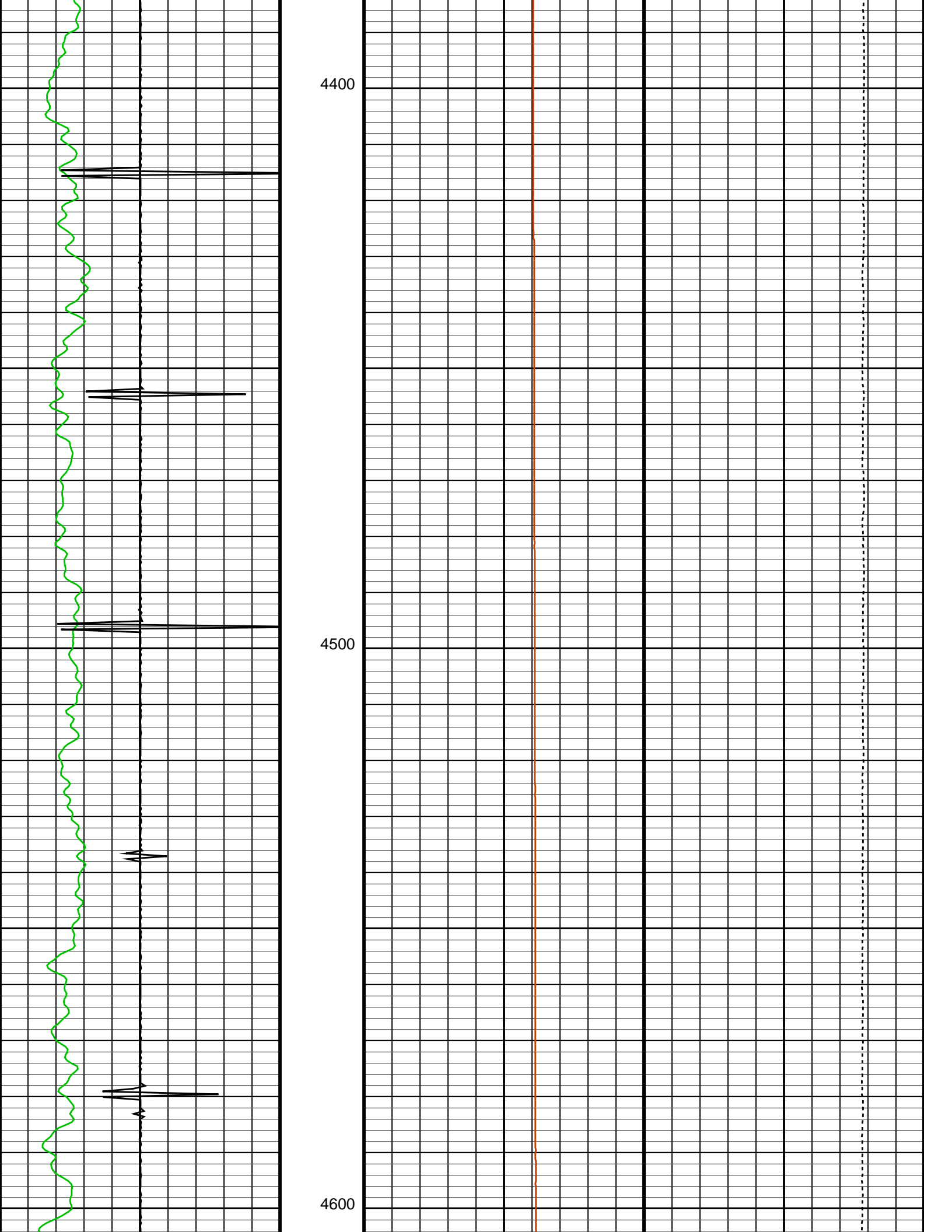
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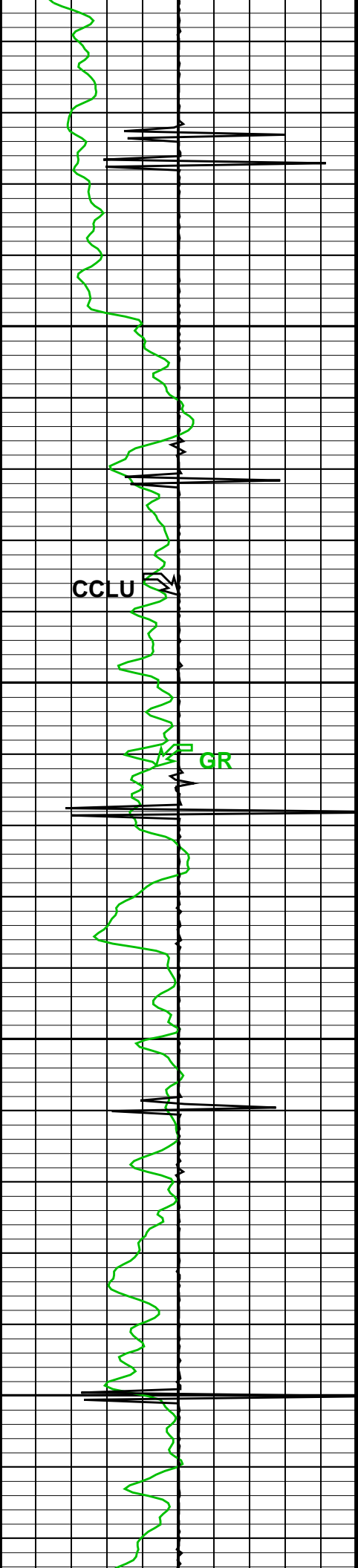
HTEM



TENS

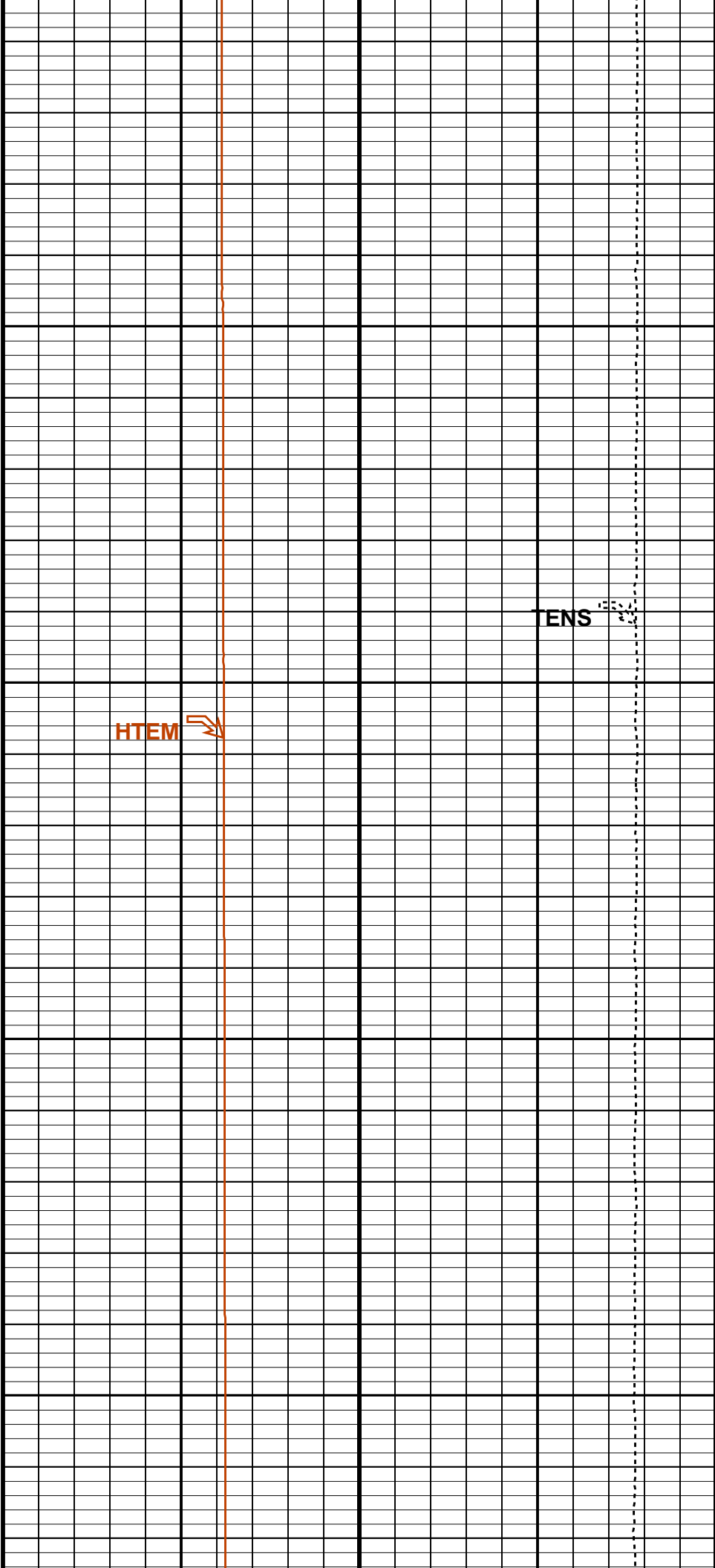






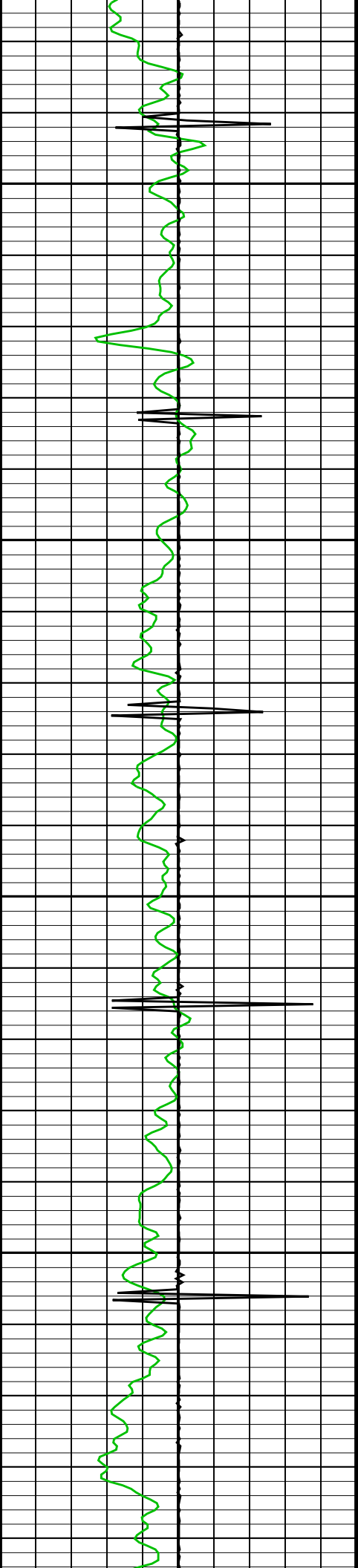
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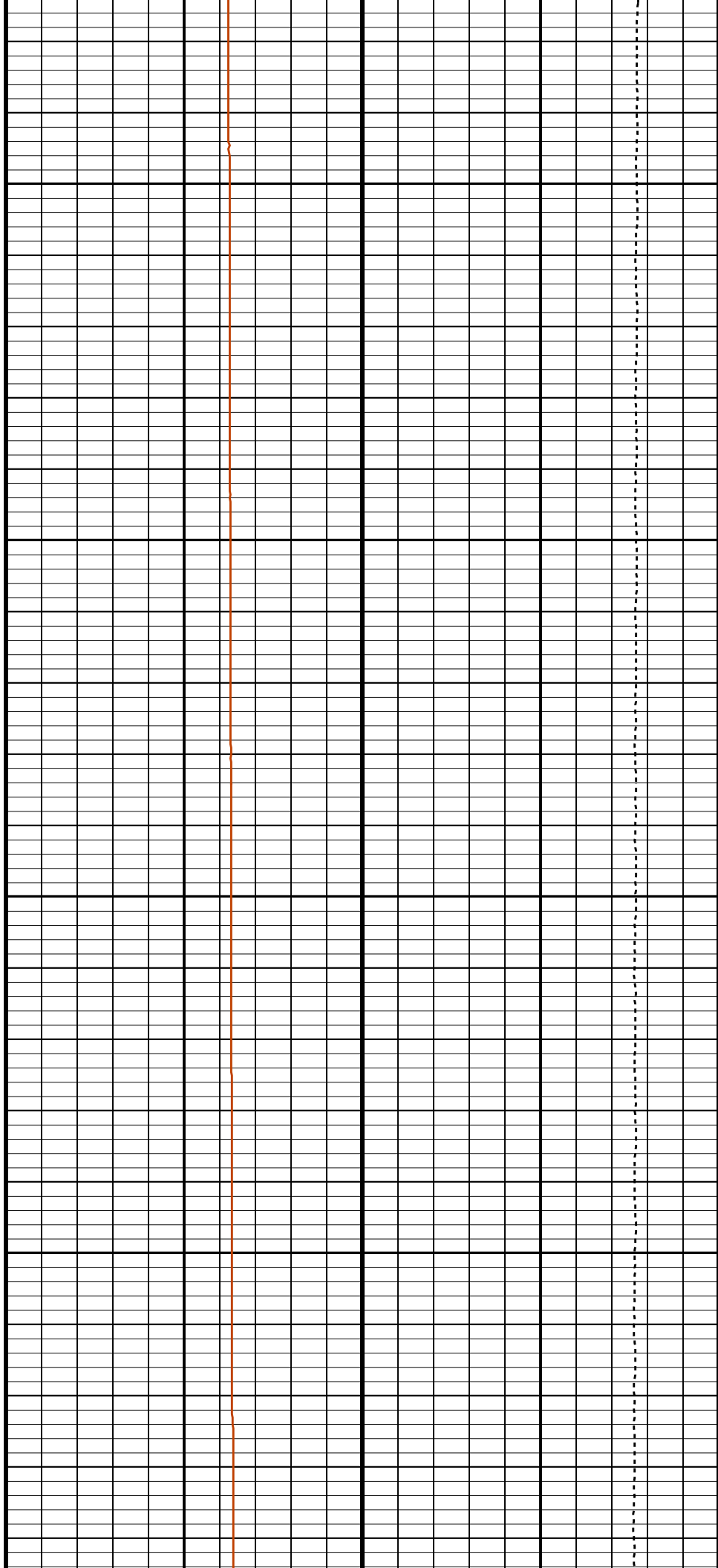
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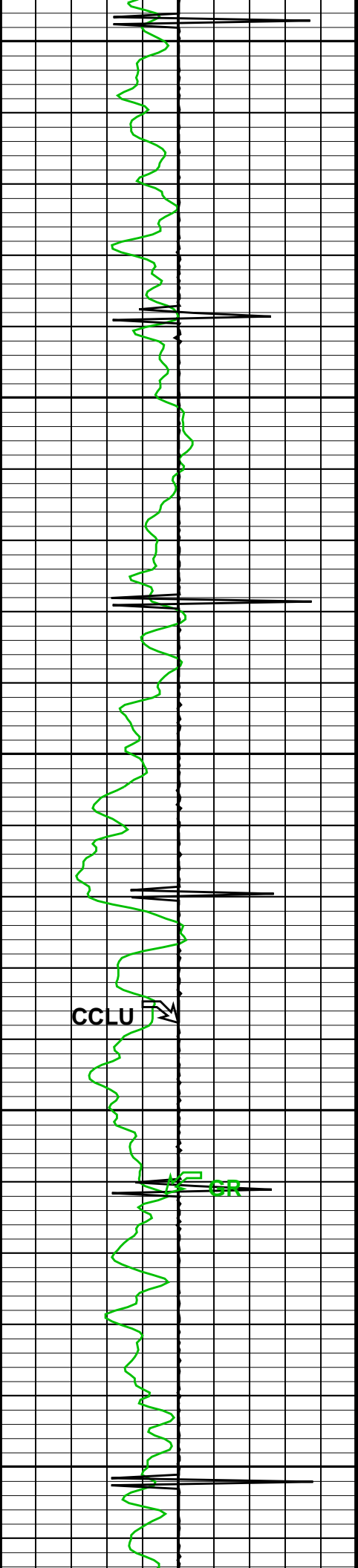
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4900

5000





5100

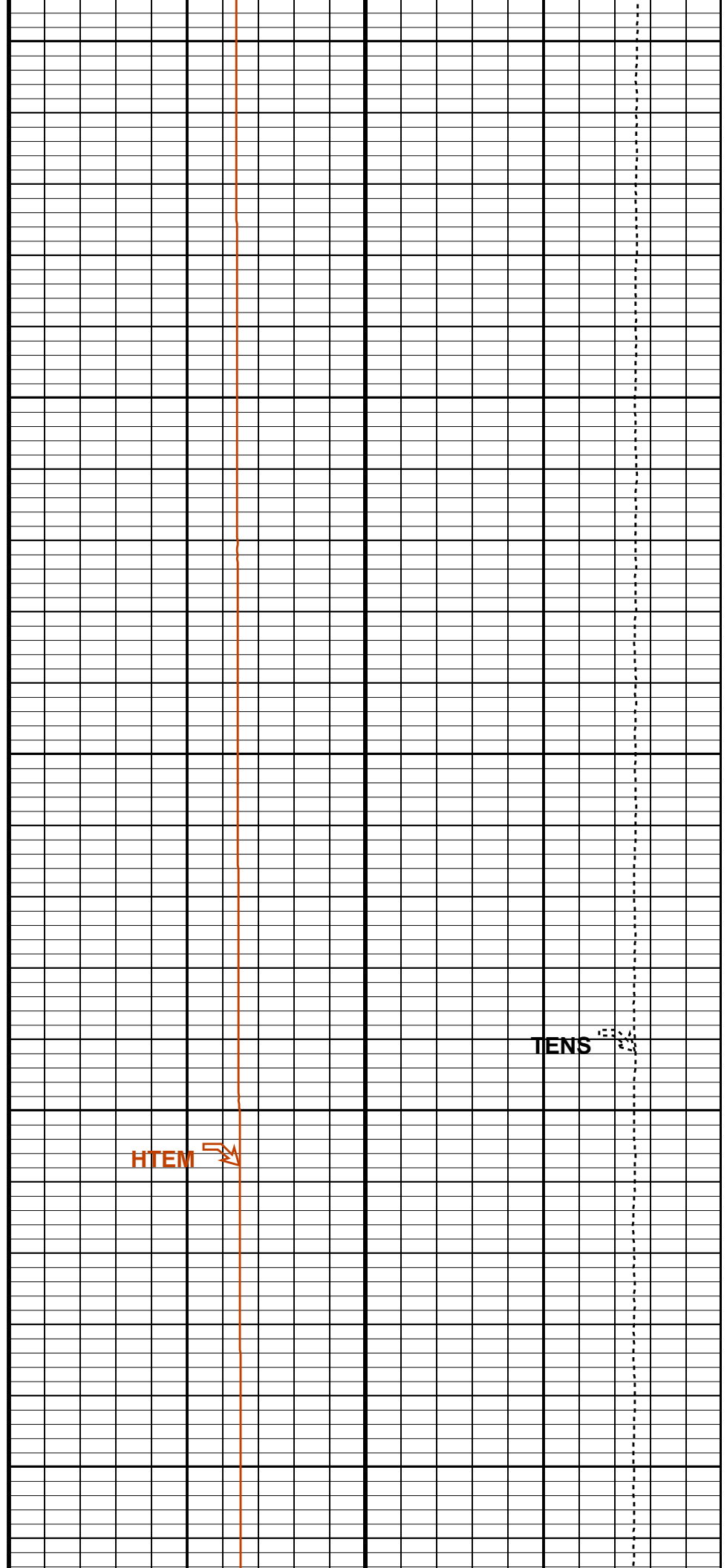
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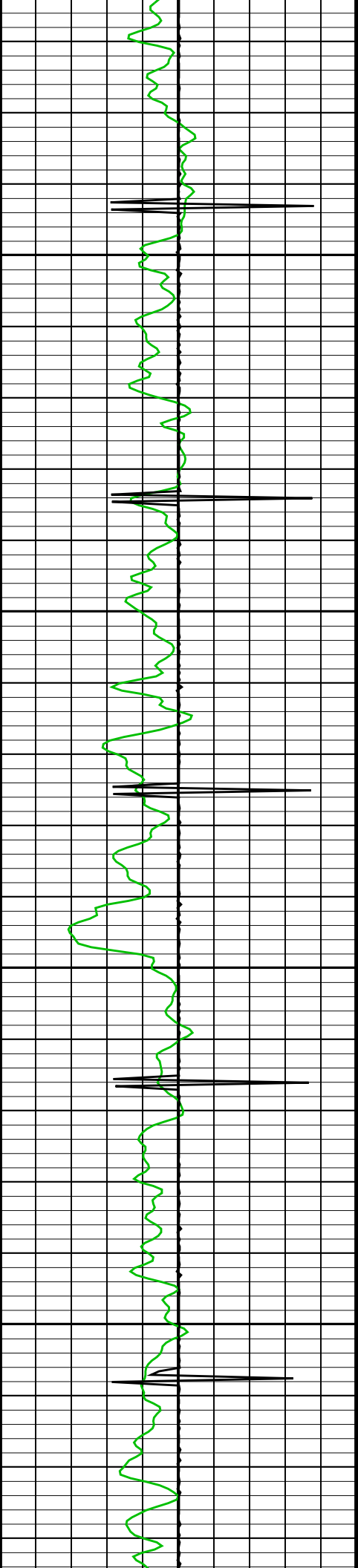
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CR

HTEM

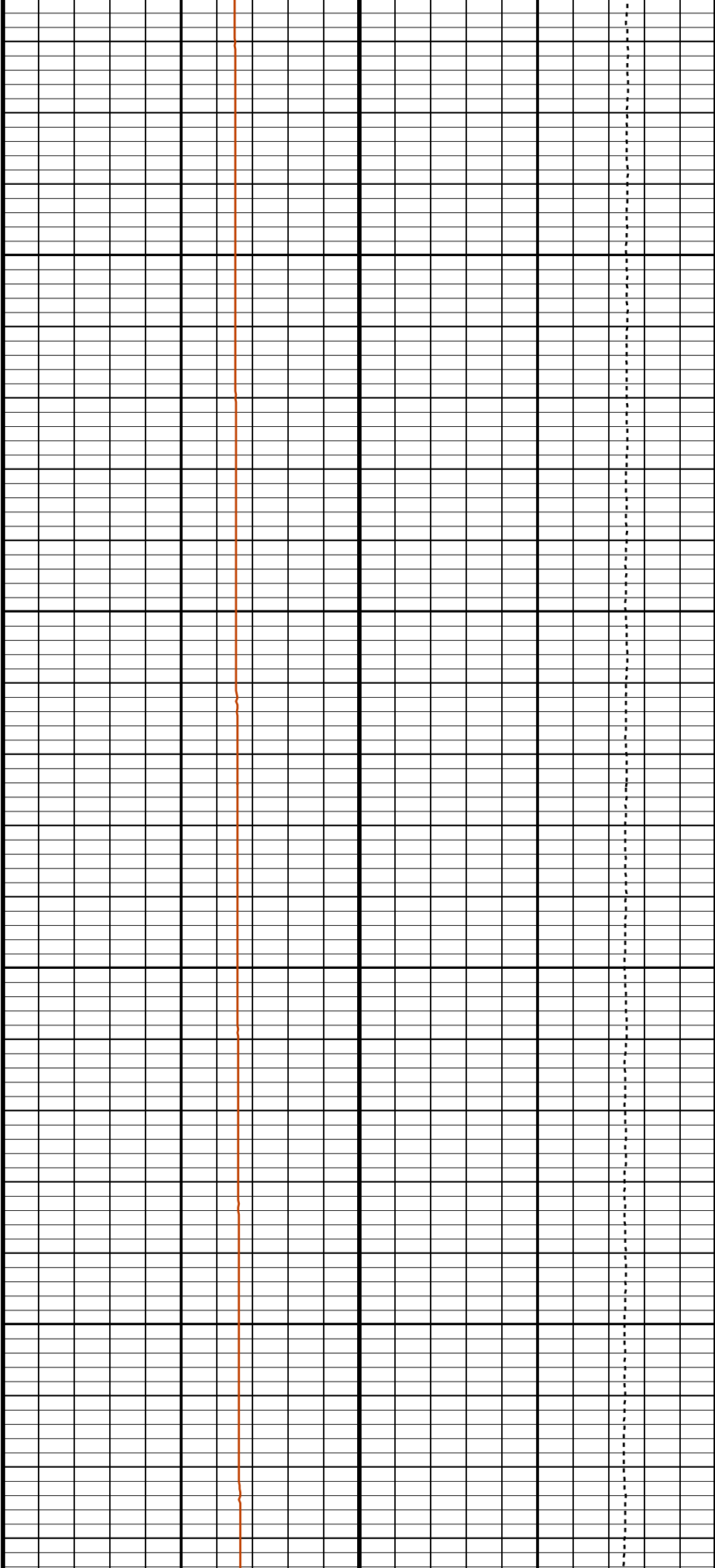
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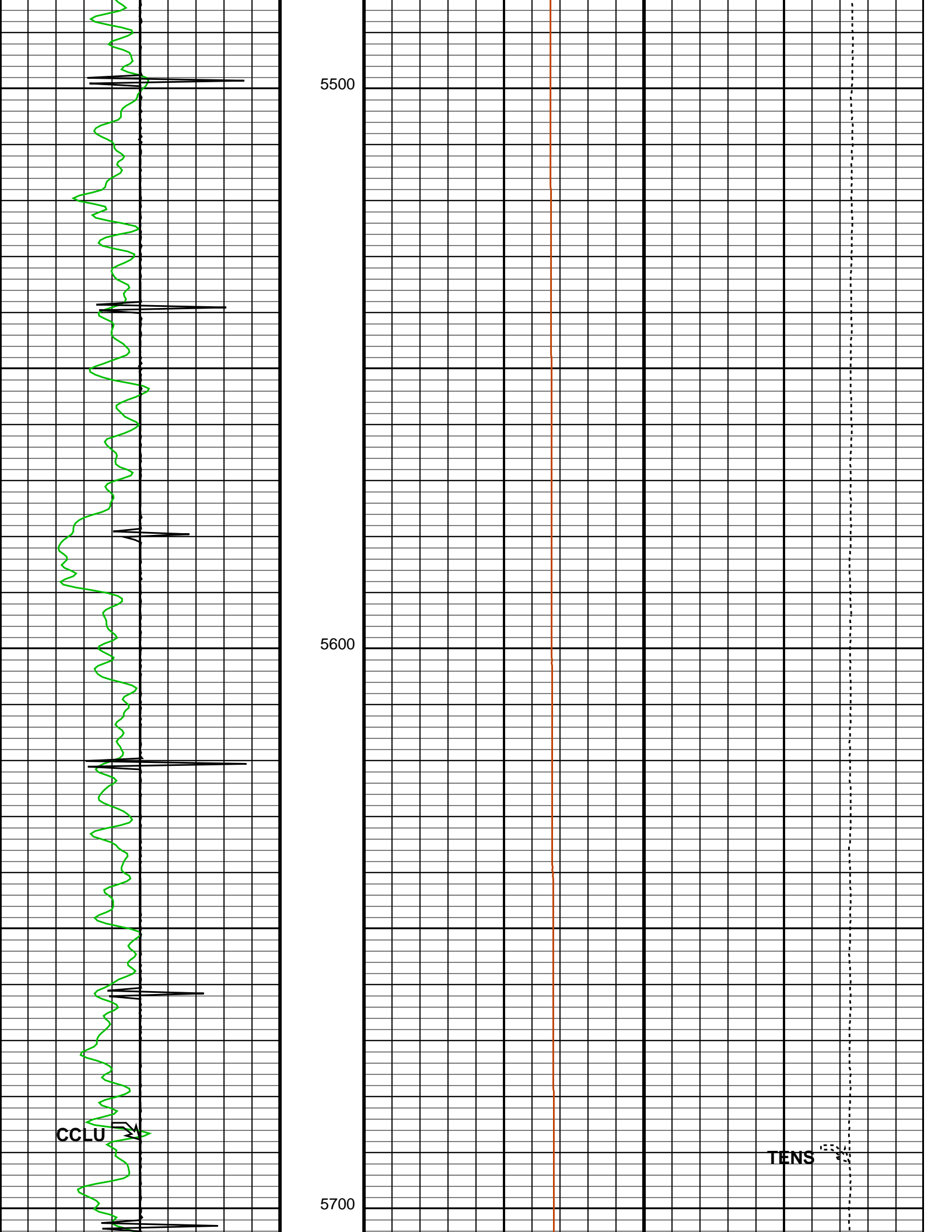




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5400





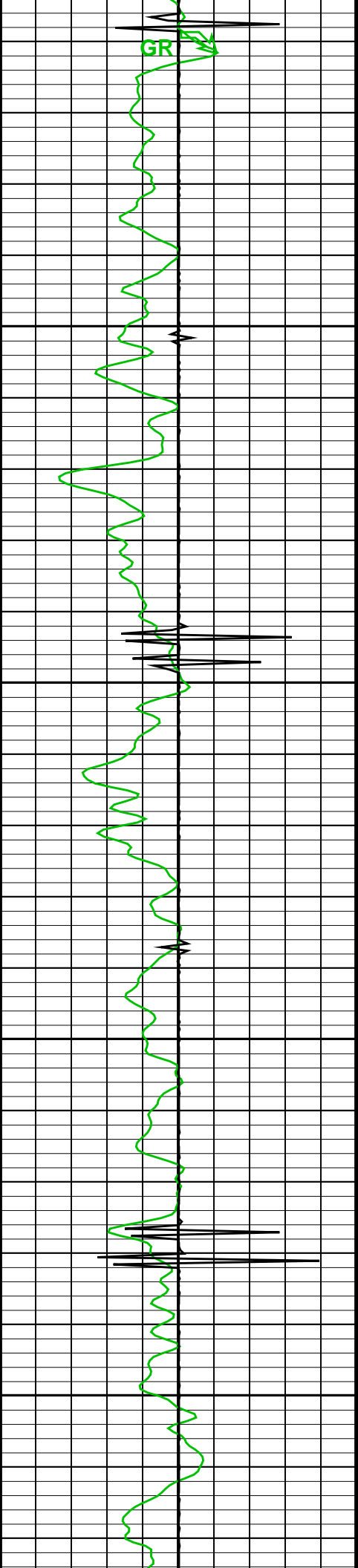
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5600

5700

CCLU

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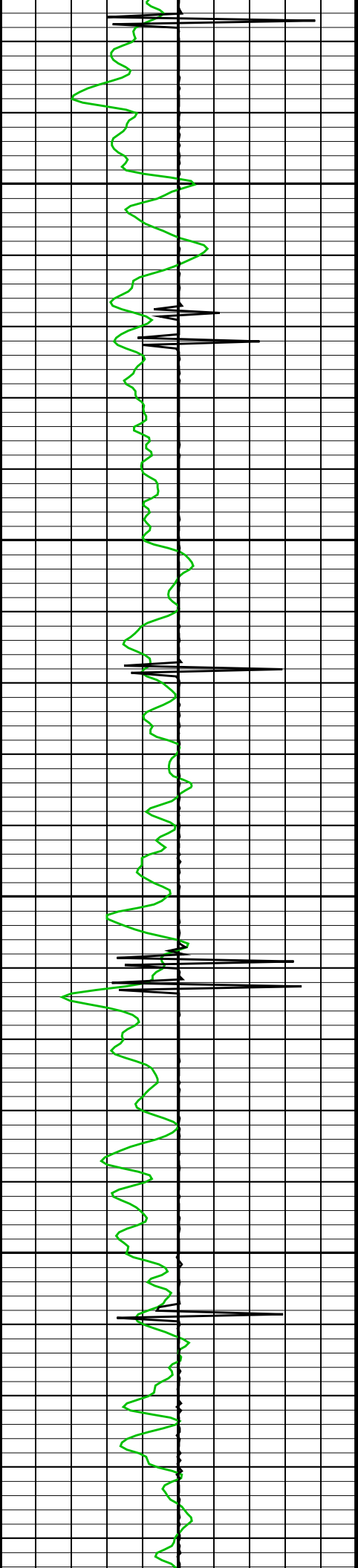


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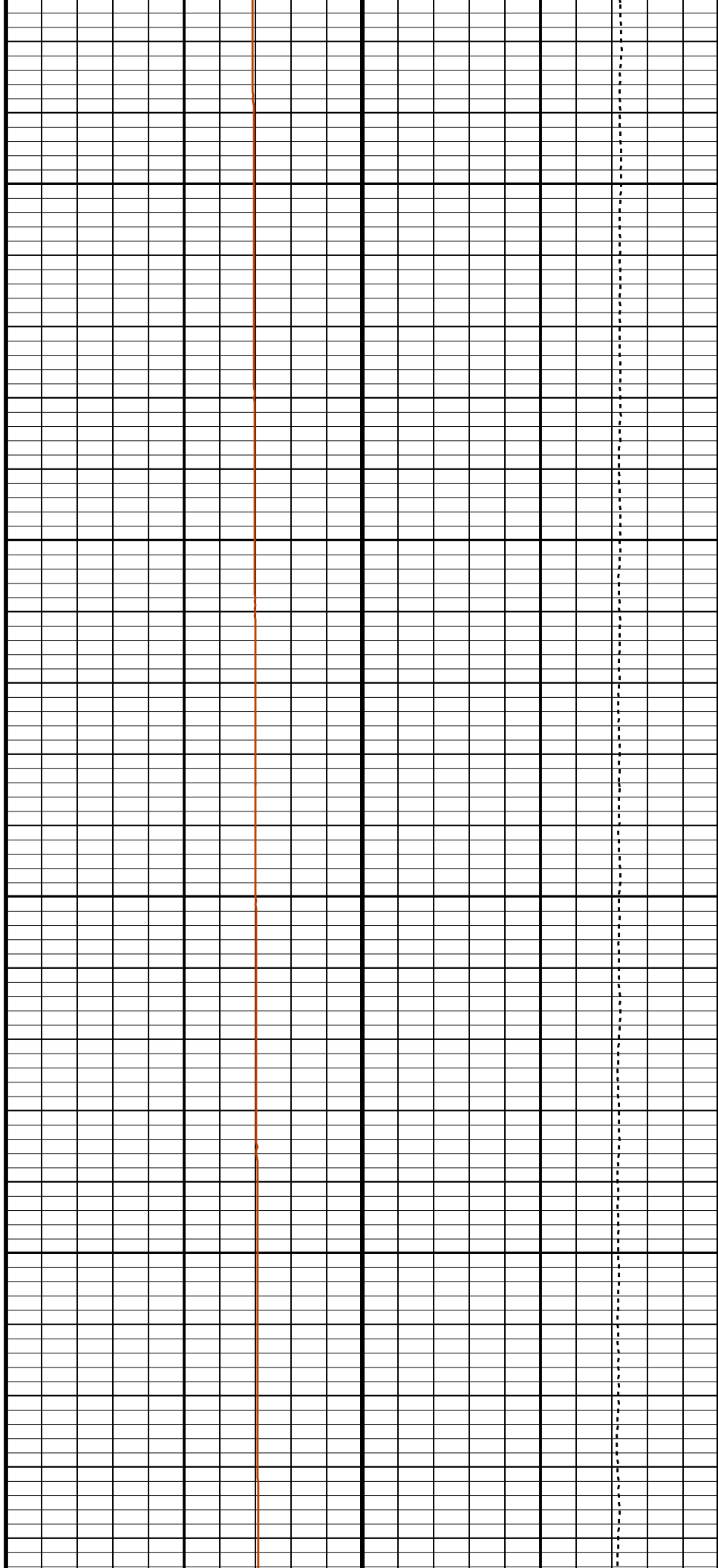
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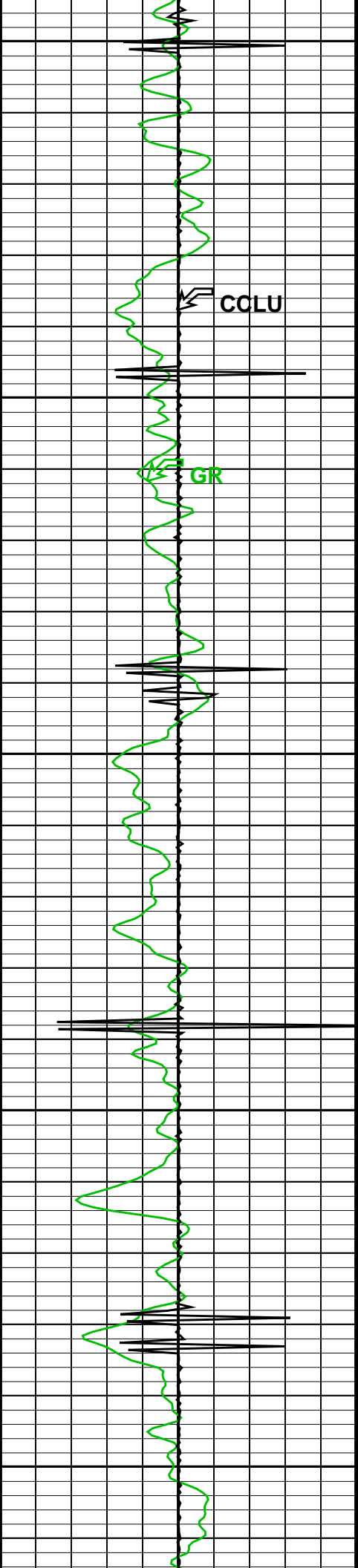
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6000

6100





6200

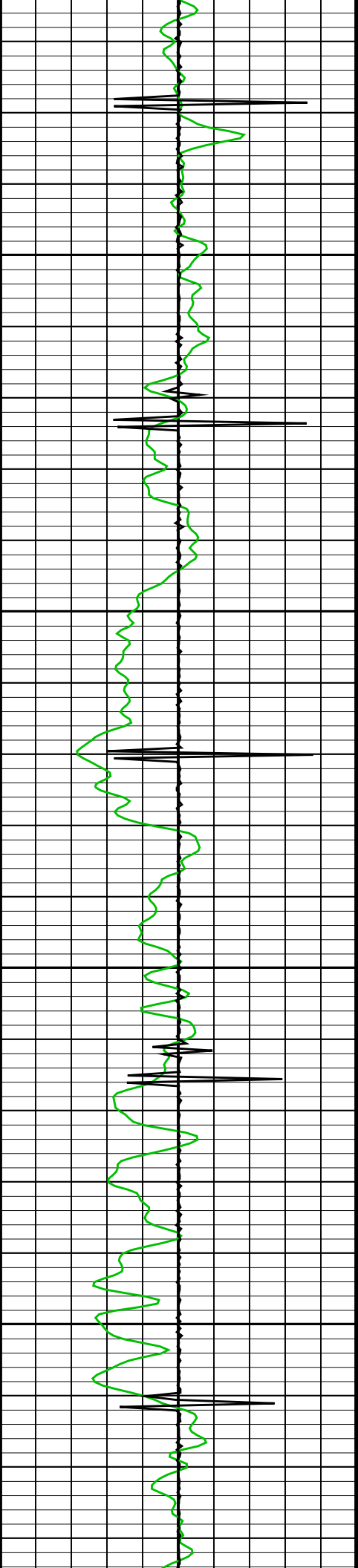
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CCLU

GR

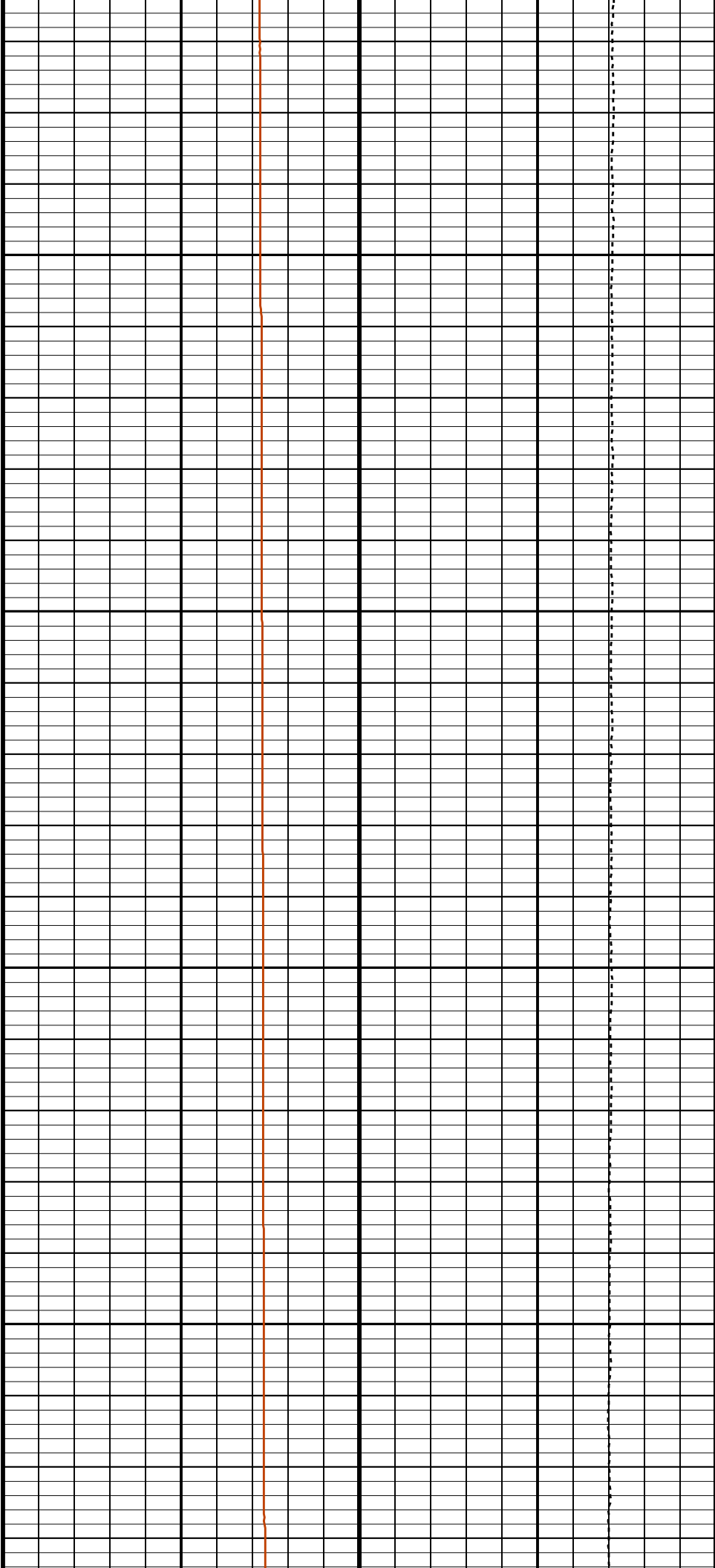
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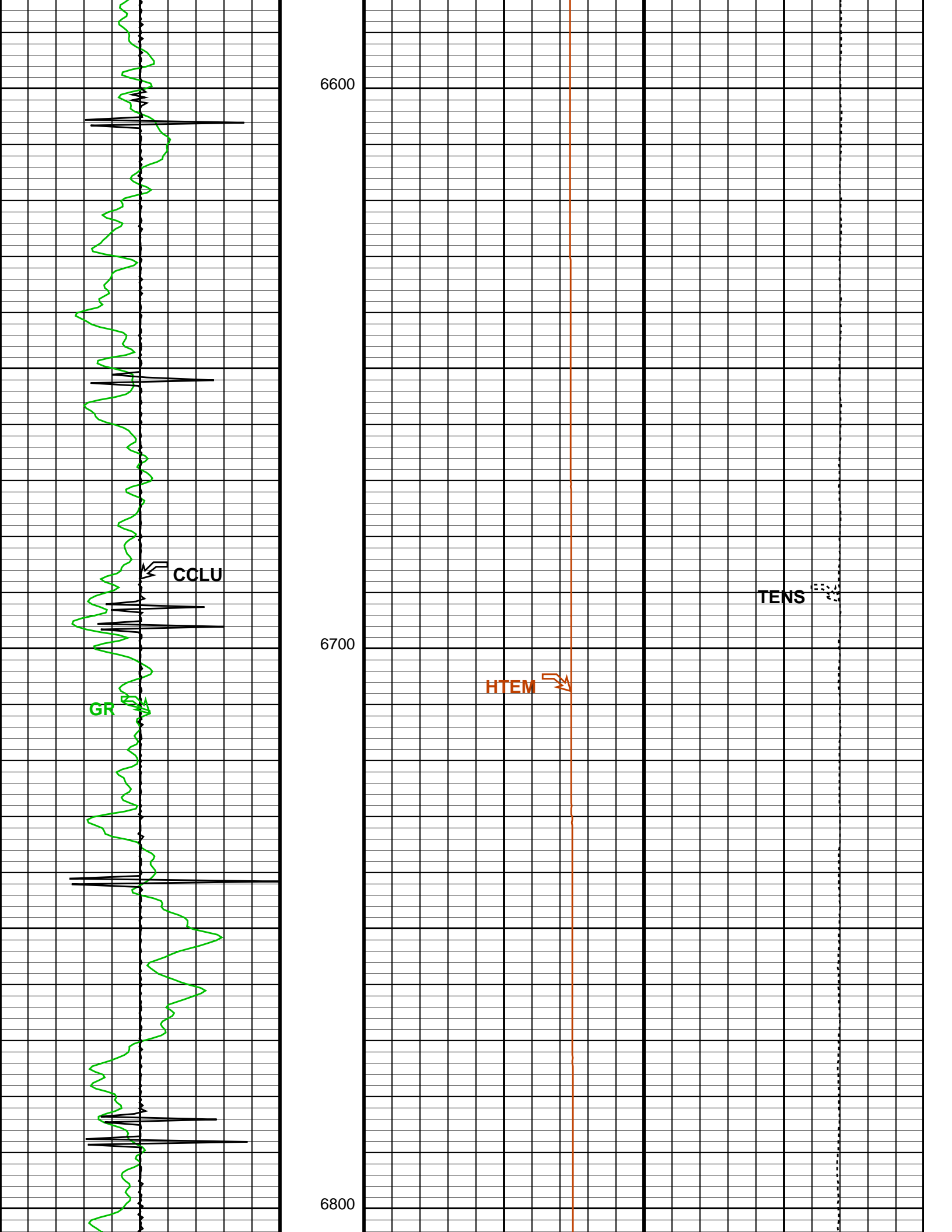
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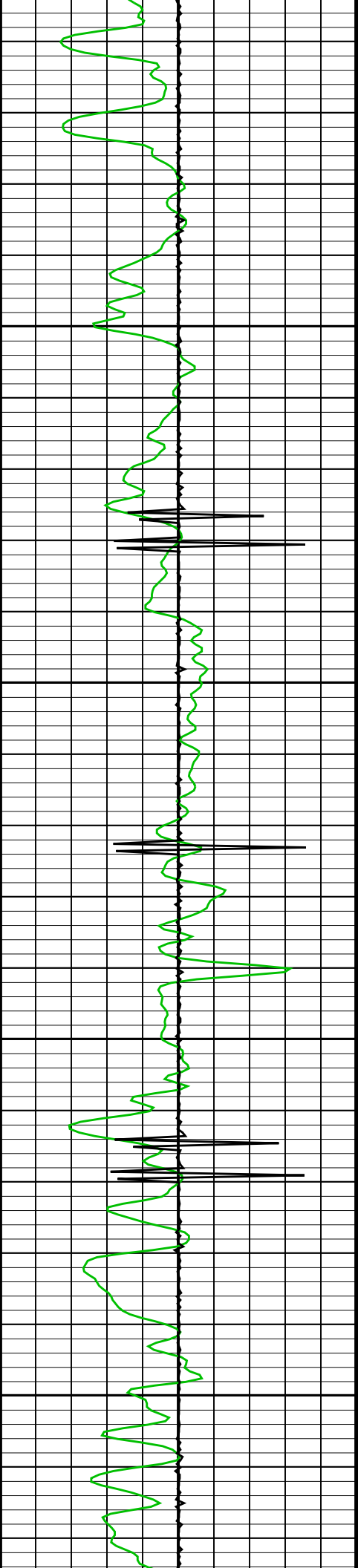


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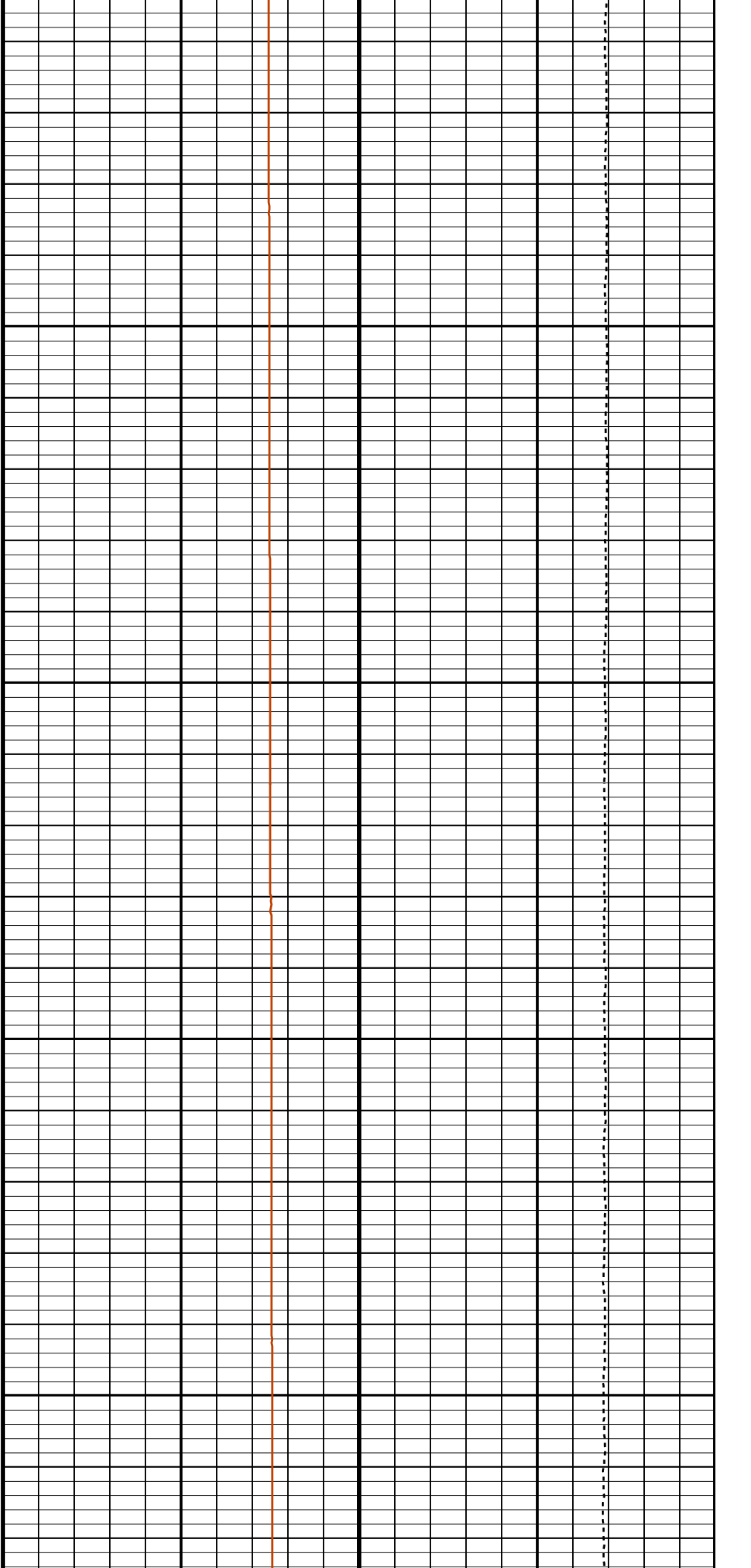


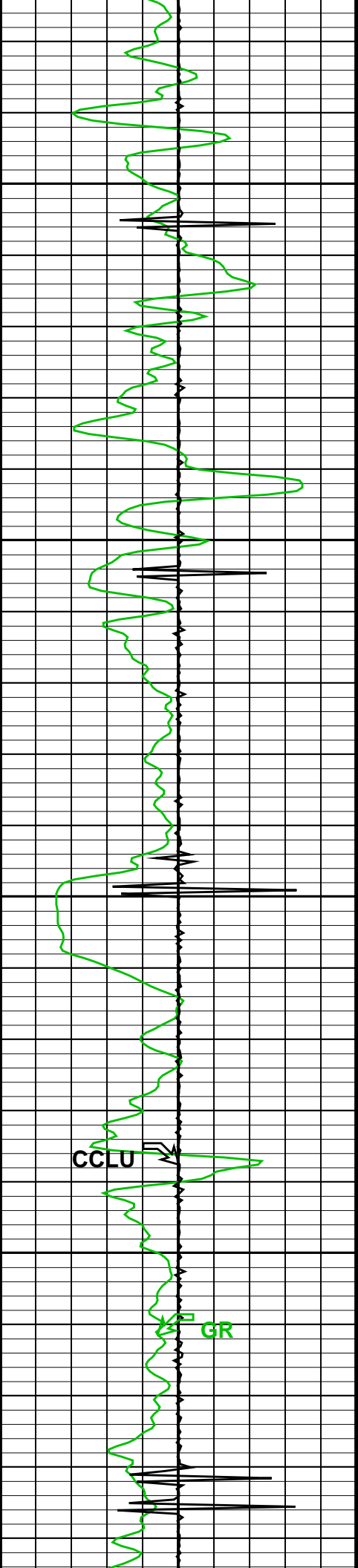




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7000





7100

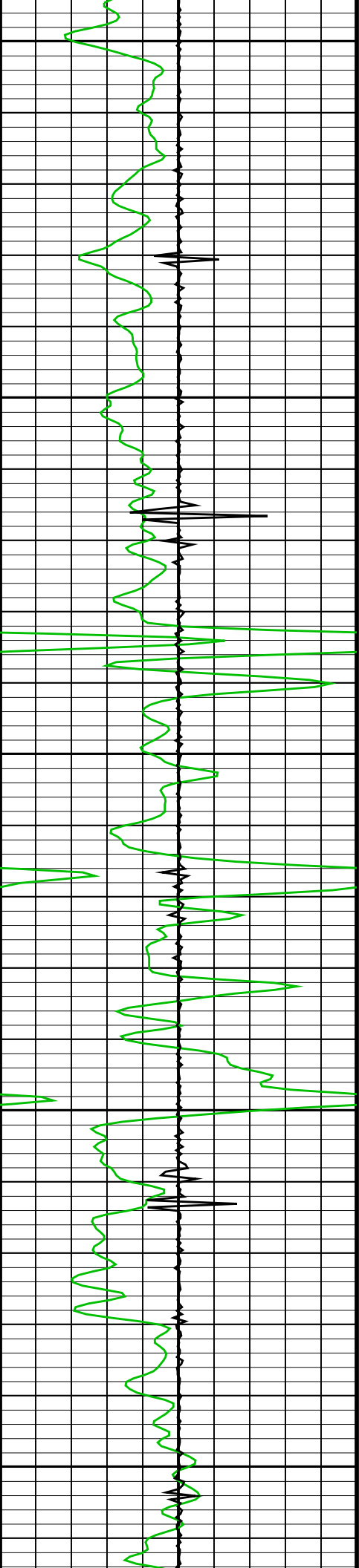
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CCLU

GR

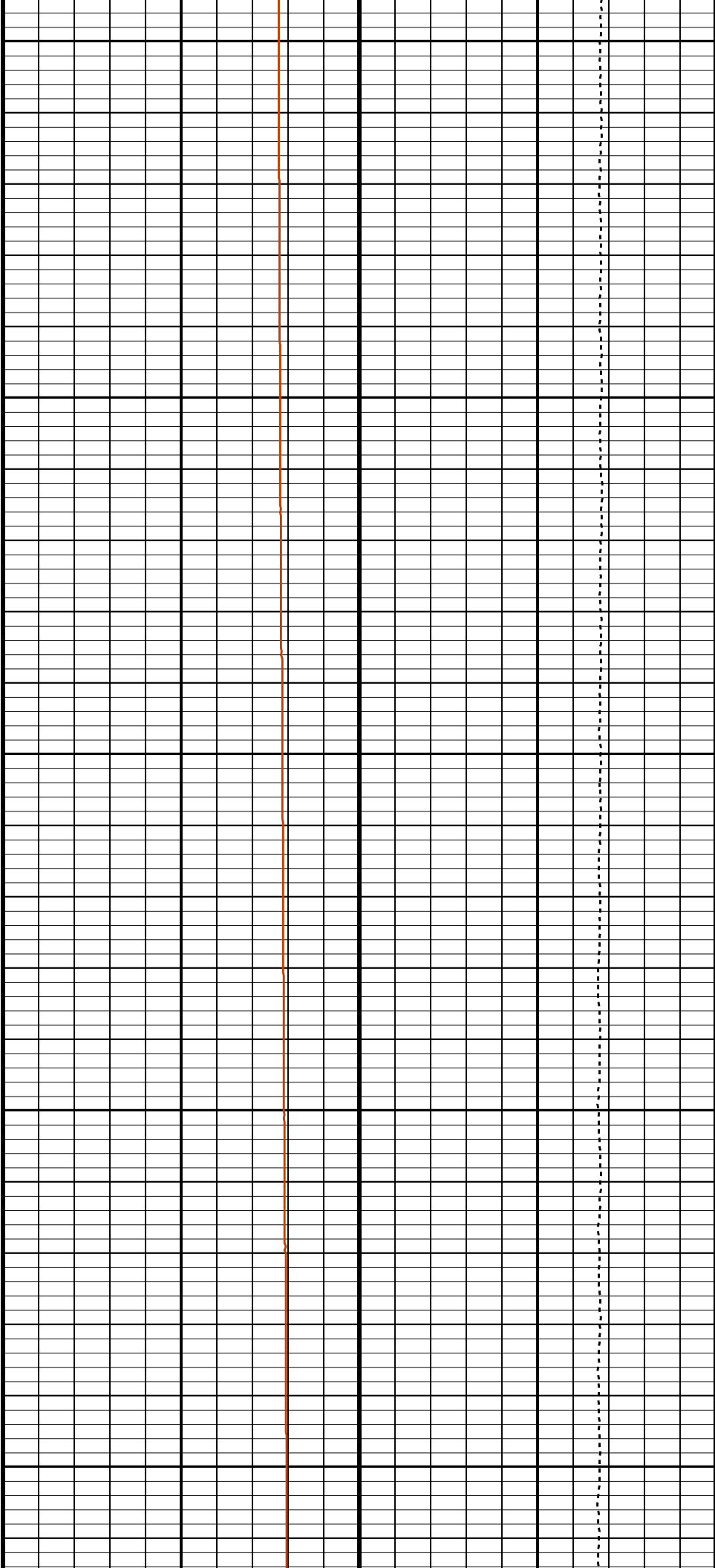
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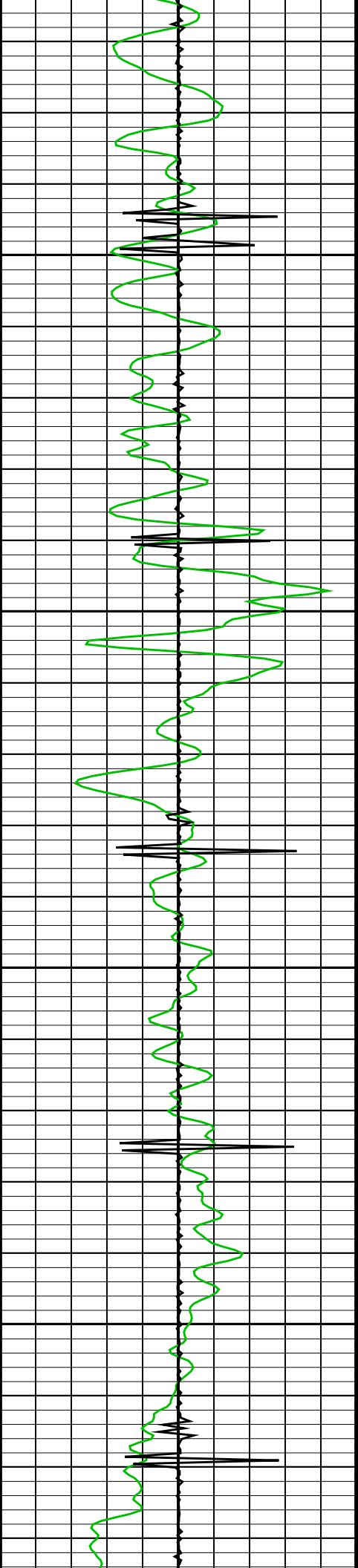
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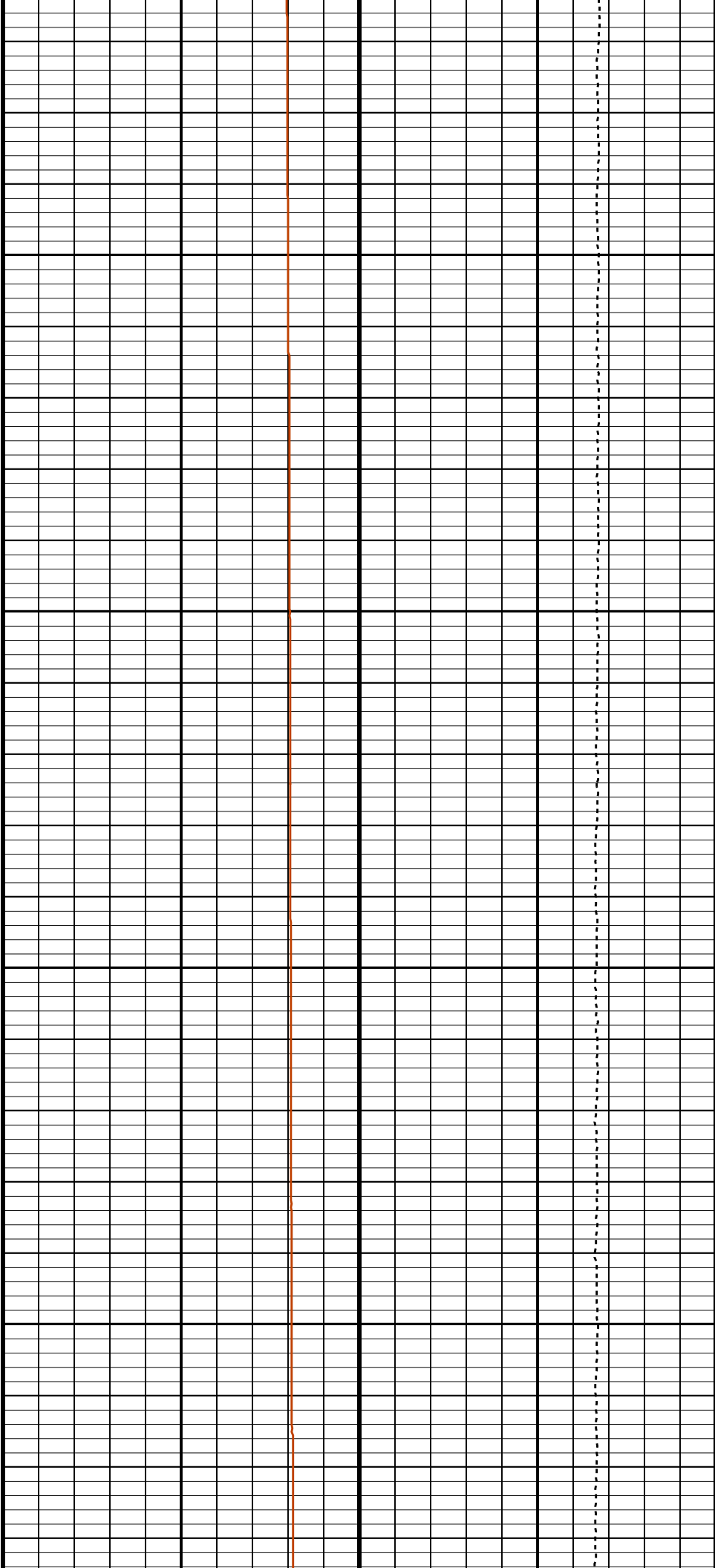
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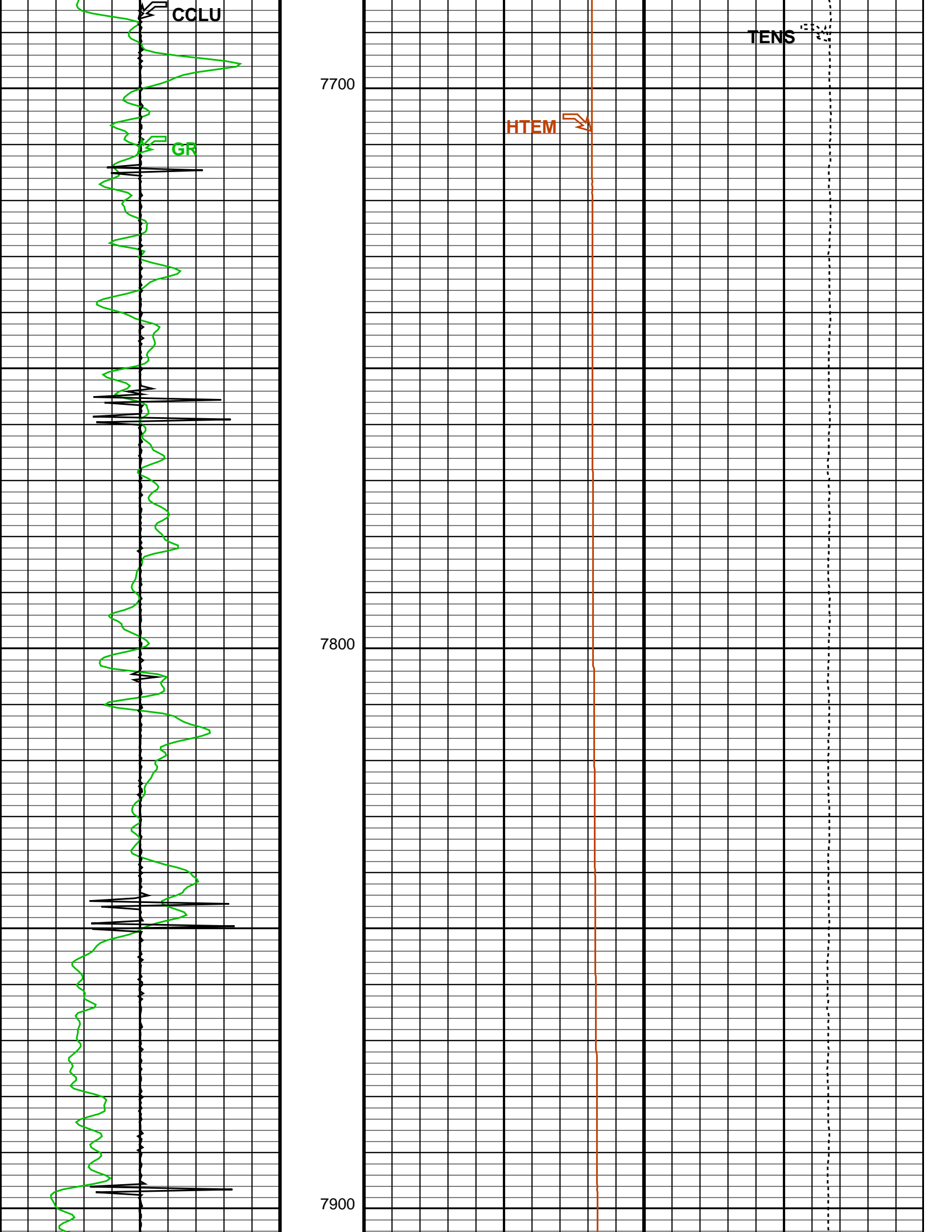


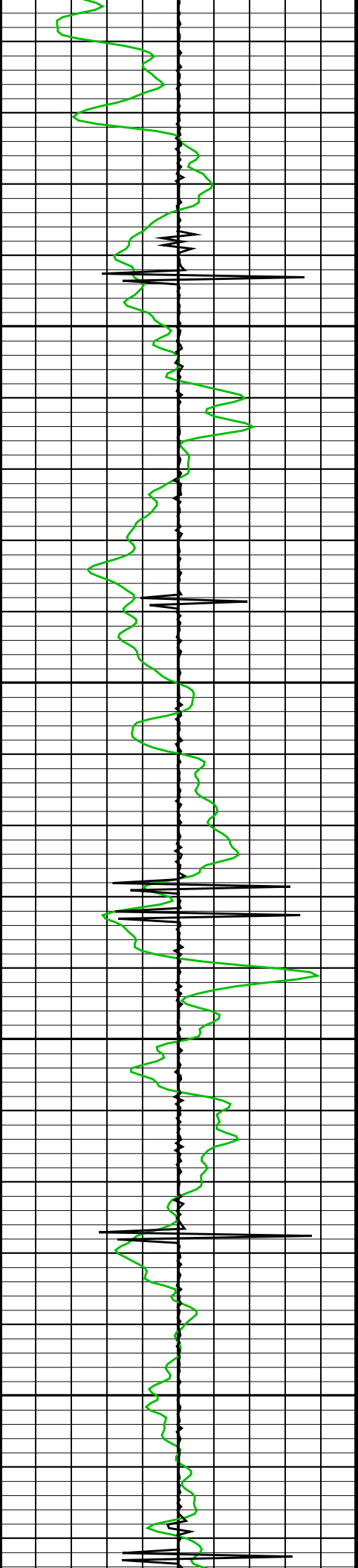


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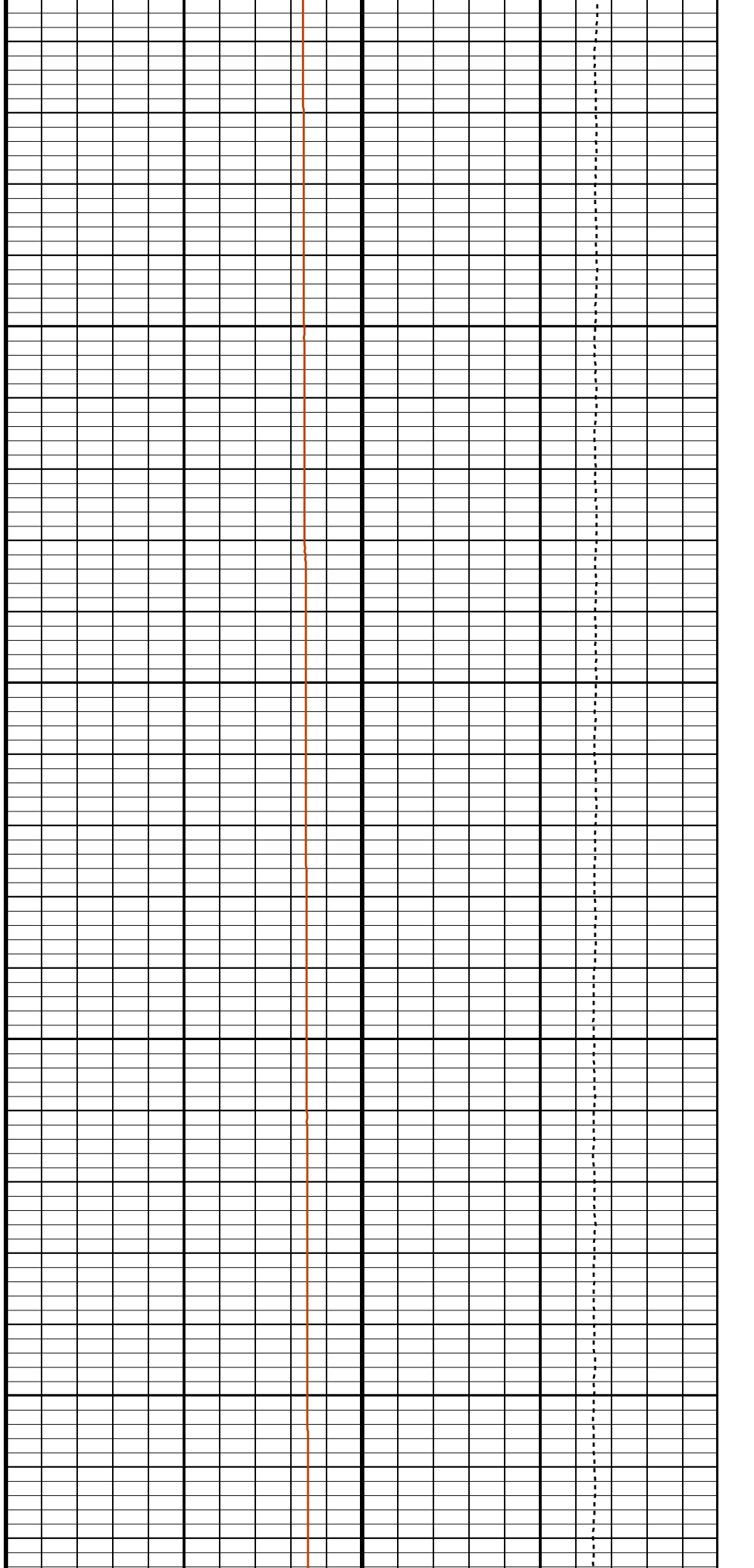


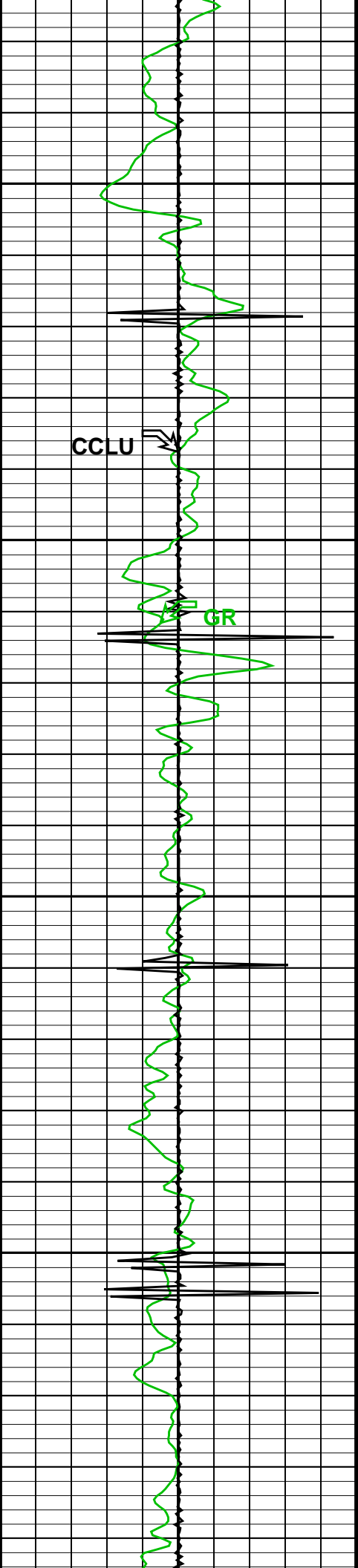




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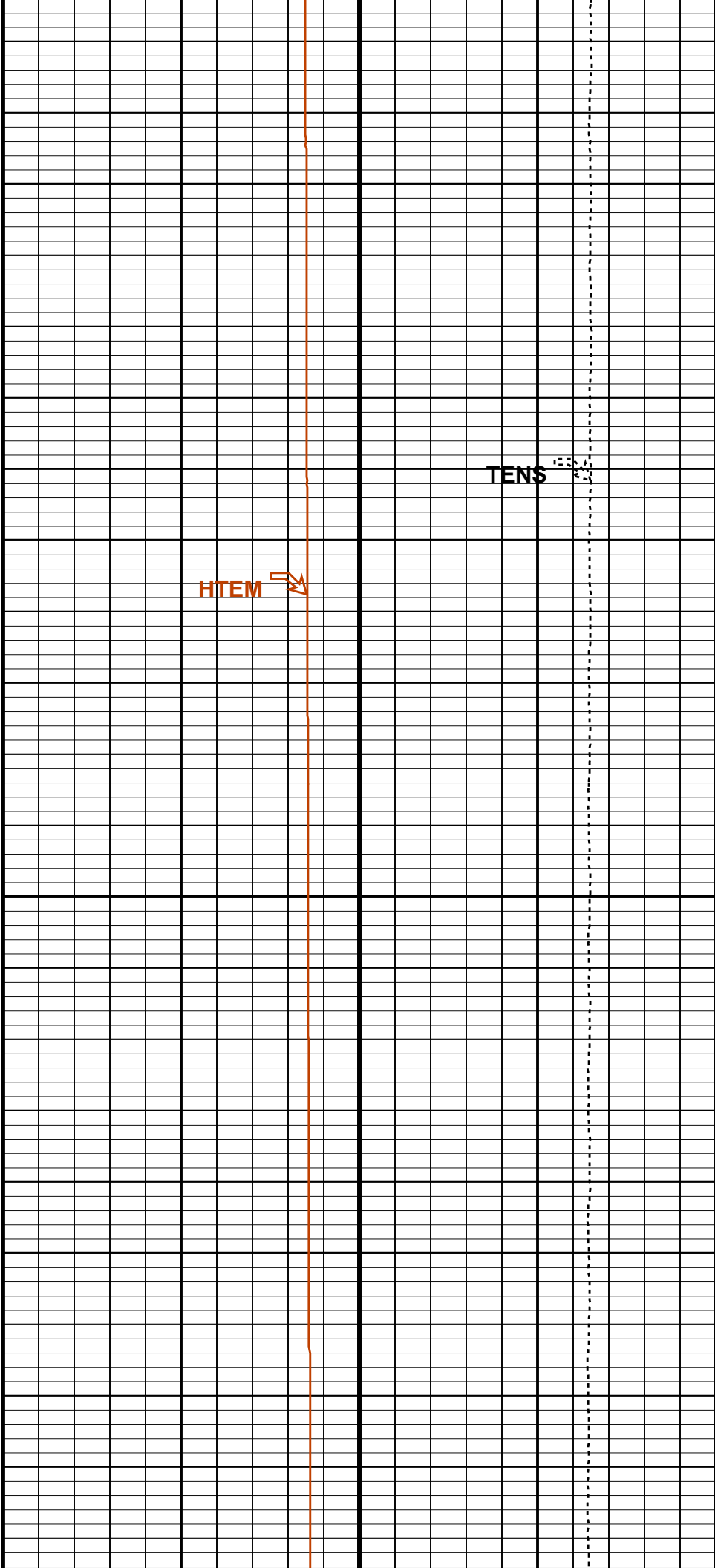


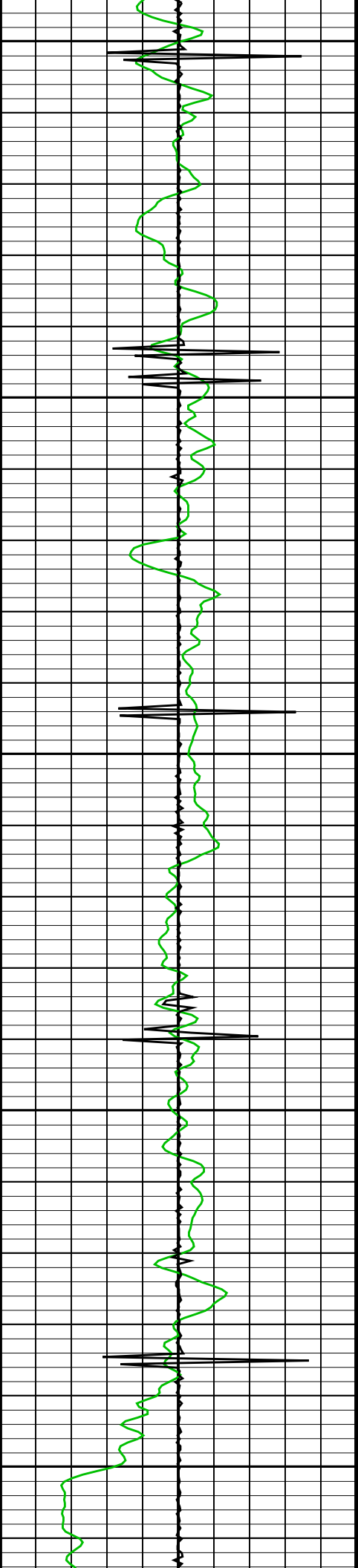
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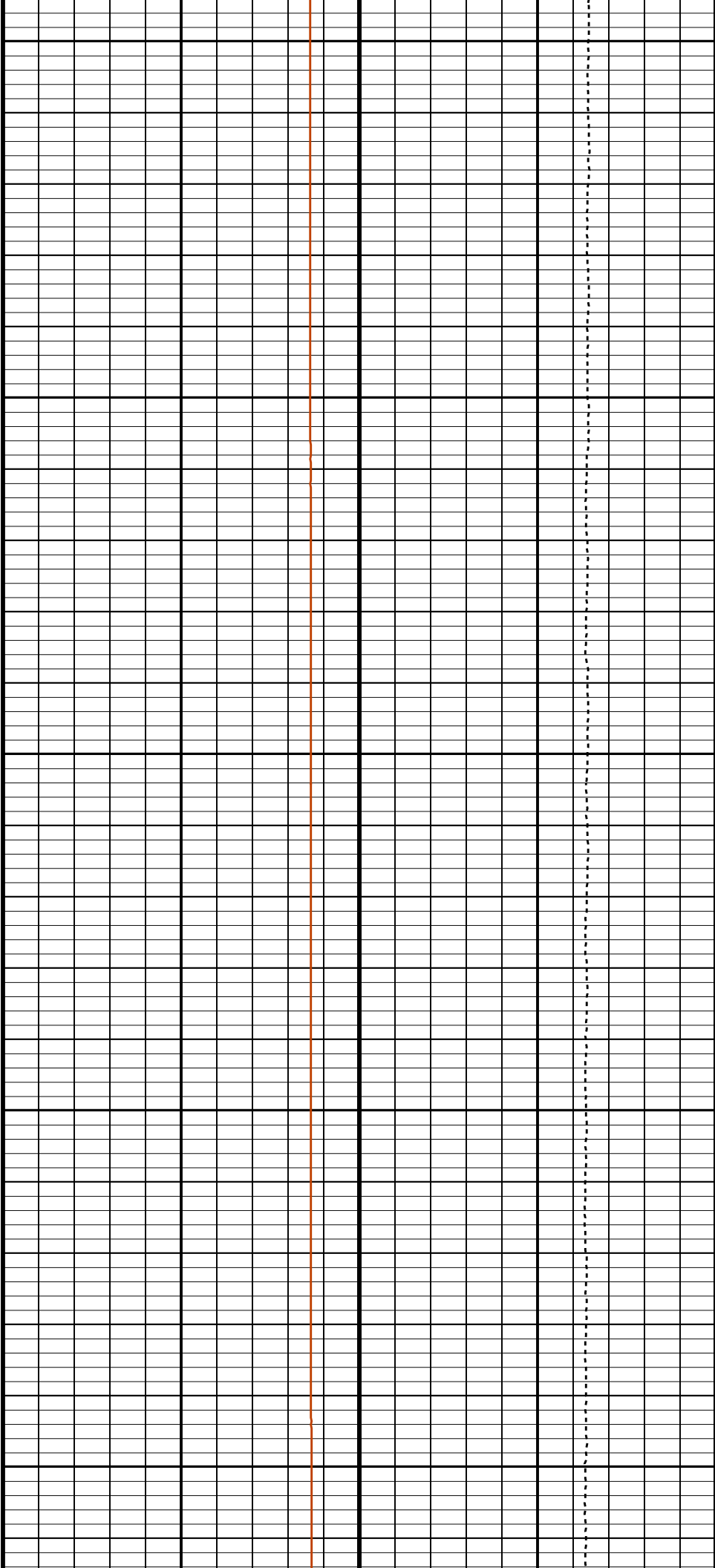
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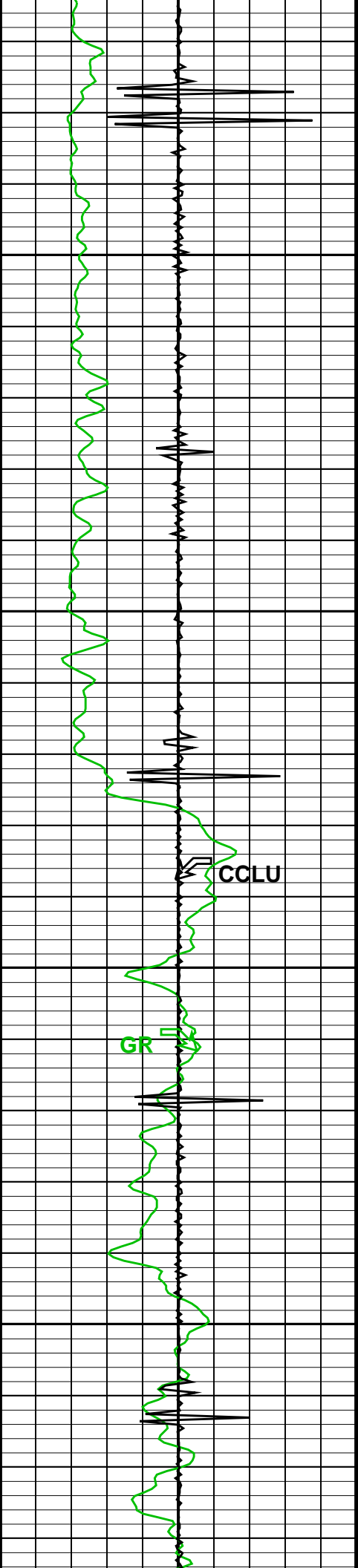




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8500





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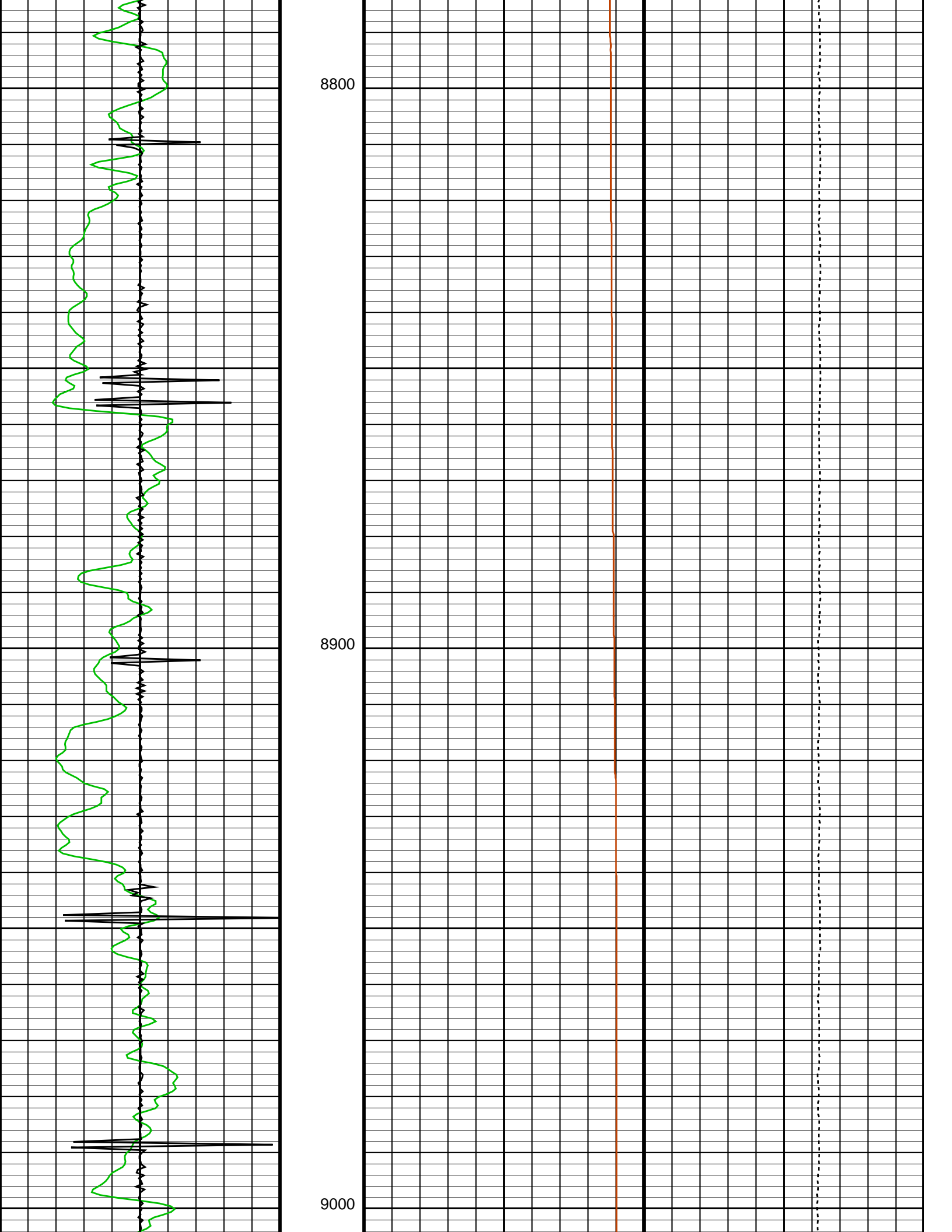
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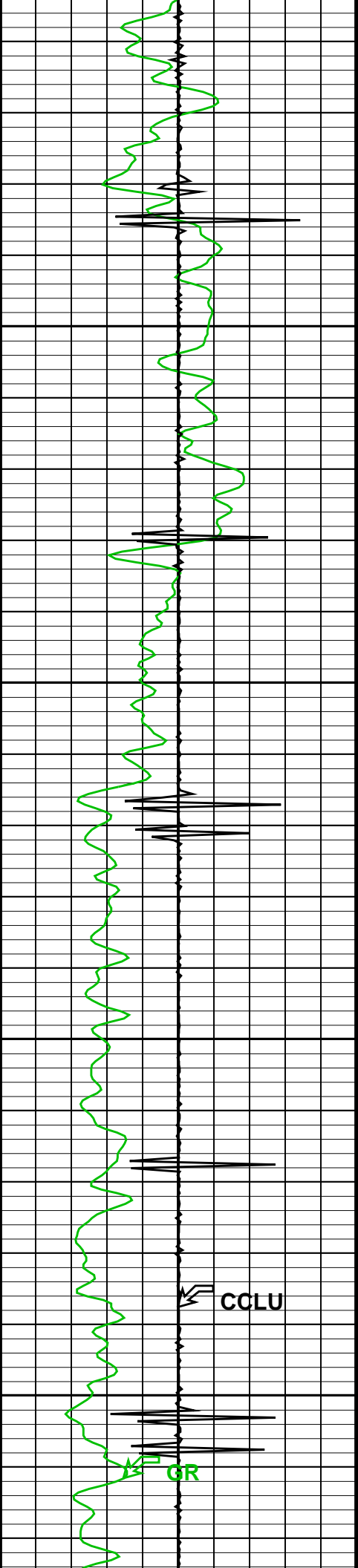
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GR

TENS

HTEM





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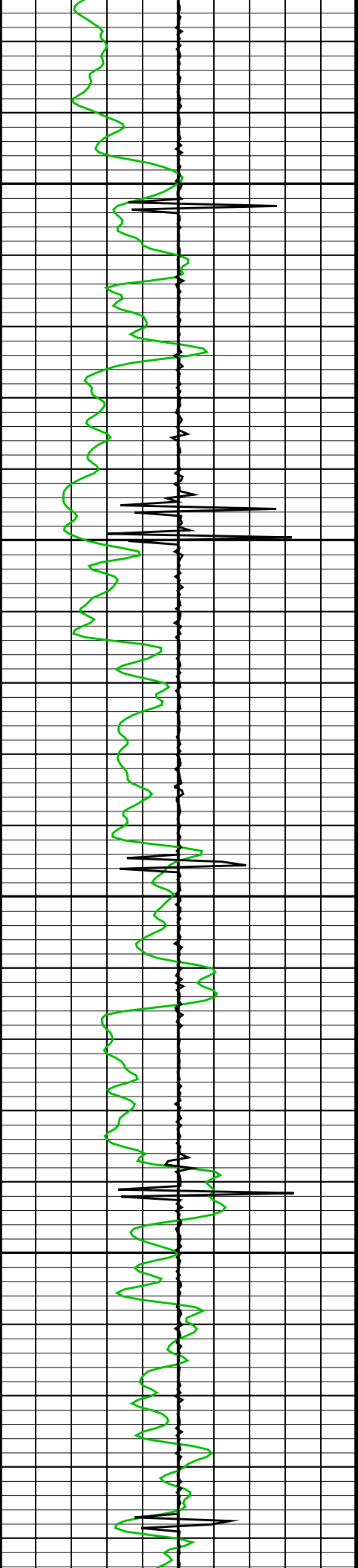
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CCLU

GR

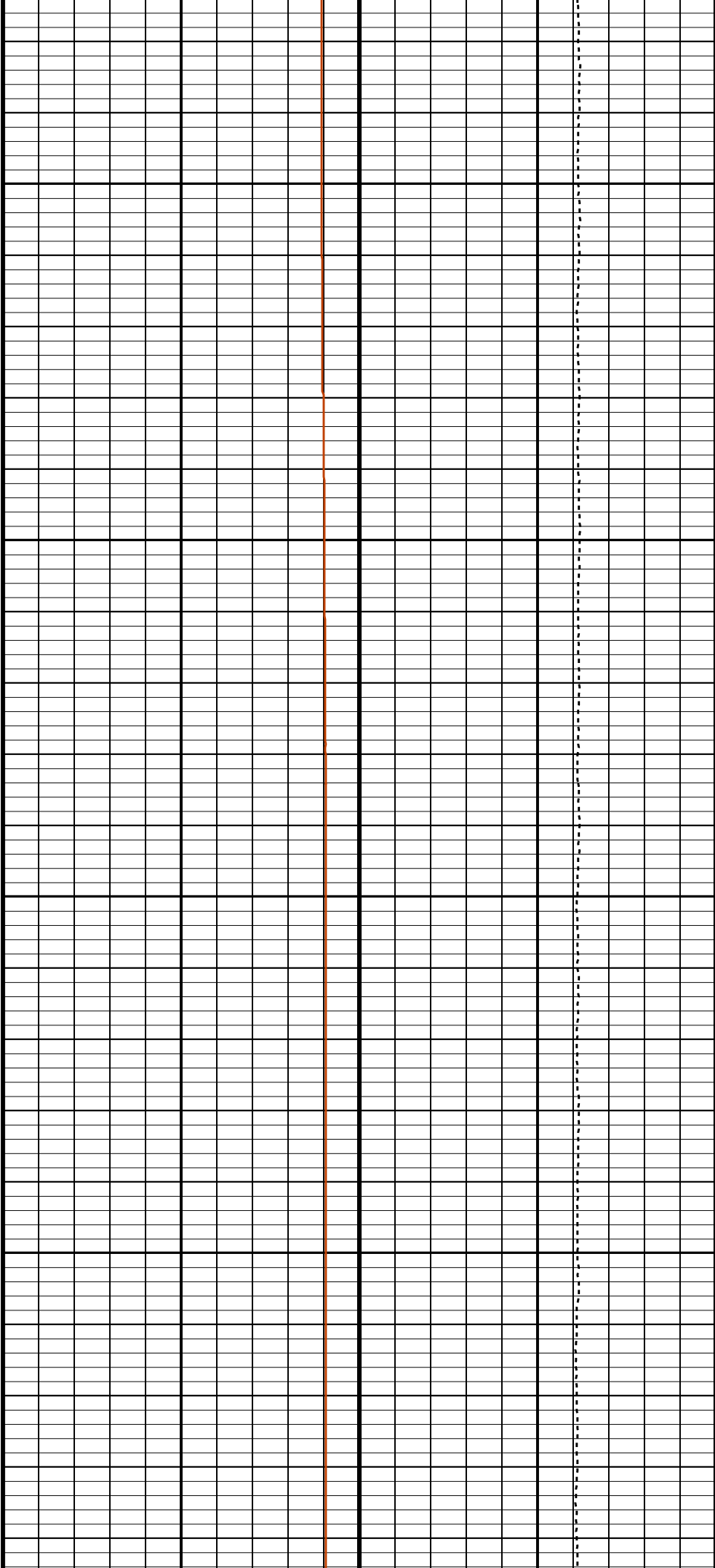
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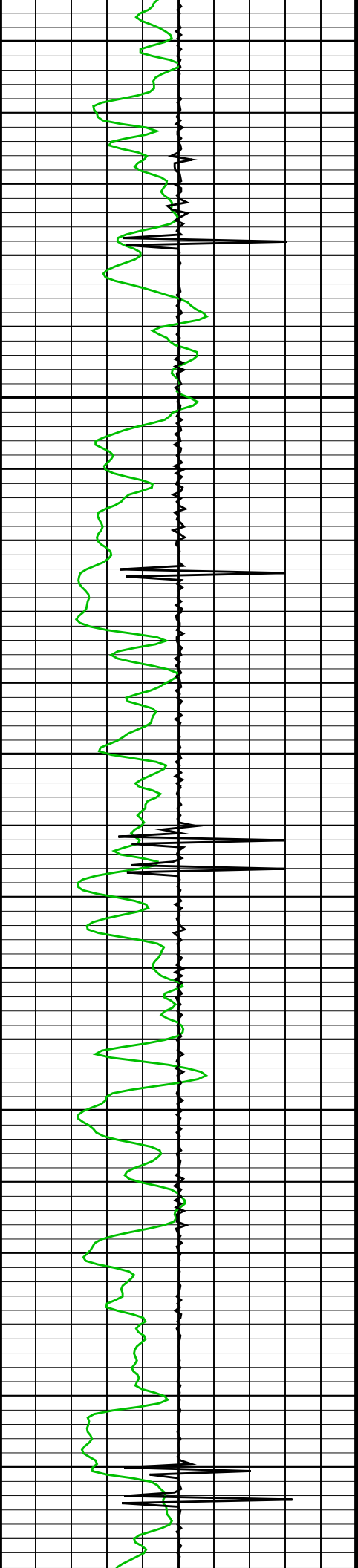
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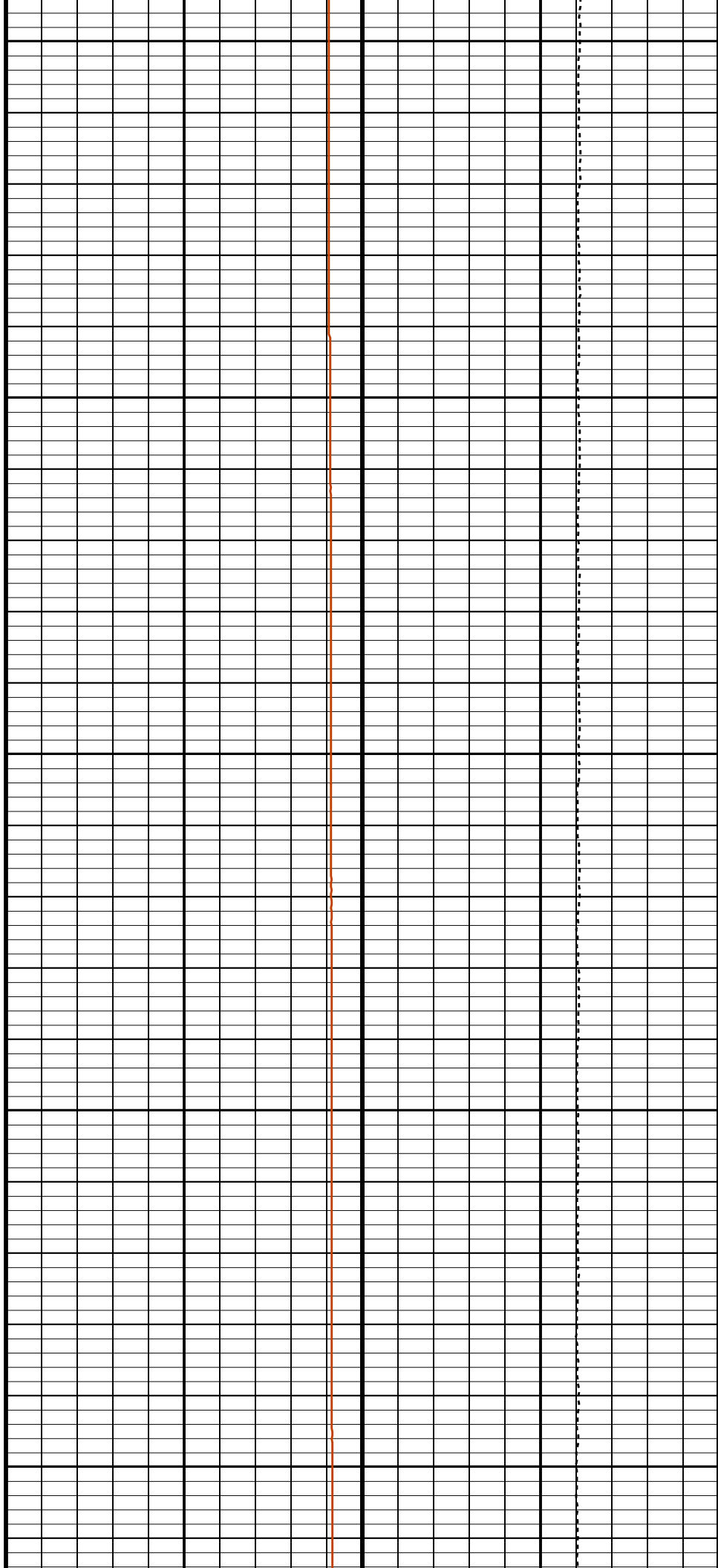
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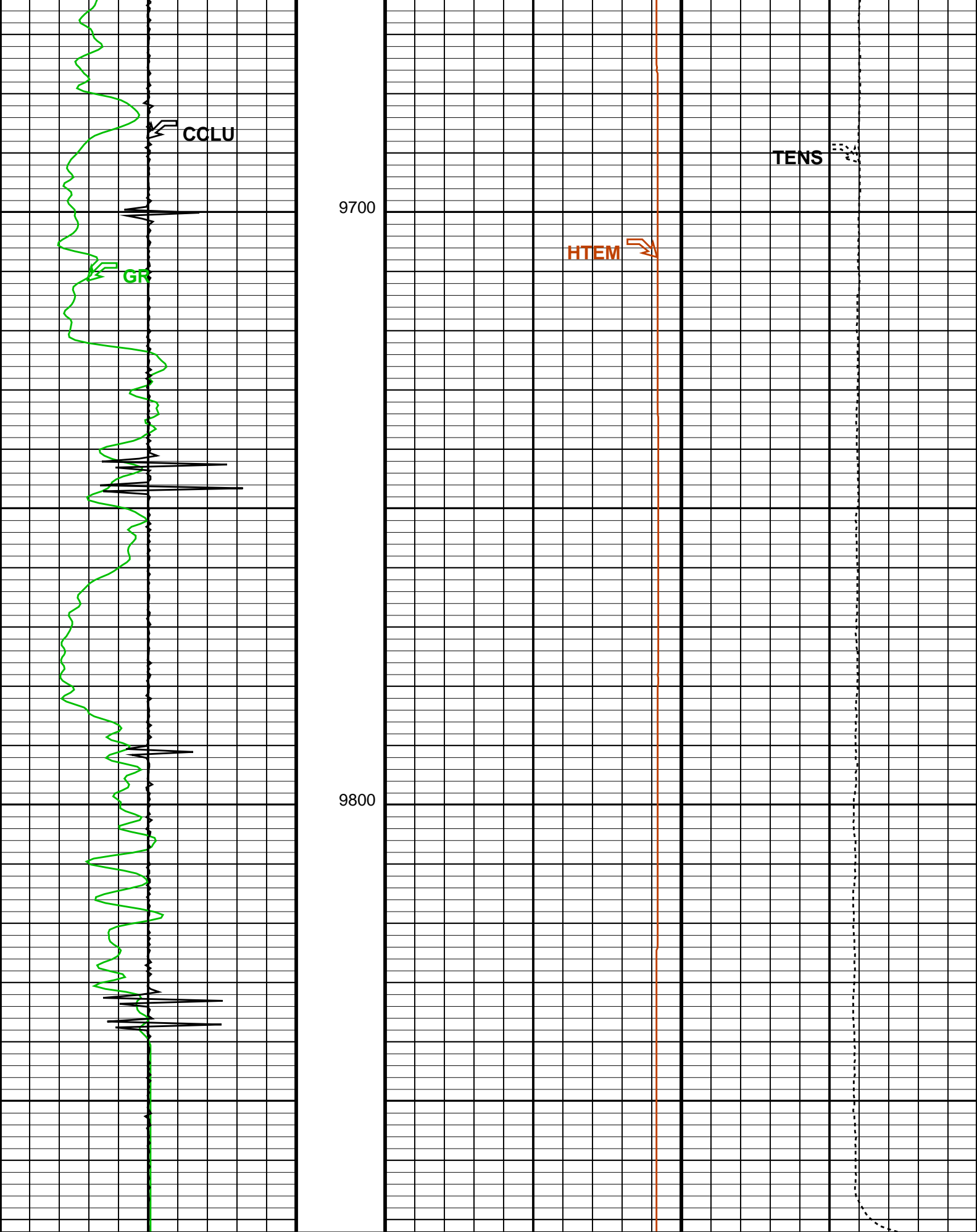




9500

9600





Gamma Ray (GR)
(GAPI) 150

HTC Cartridge Temperature (HTEM)
(DEGF) 220

Tension (TENS)
(LBF) 10000 0

CCL (CCLU)

Parameters

DLIS Name	Description	Value
USIT-D: Ultrasonic Imaging - D		
AGMN	Minimum Gain of Cartridge	-4 DB
AGMX	Maximum Gain of Cartridge	20 DB
BERJ	Bad Echo Rejection	ON
CDIA	Casing Outer Diameter	7 IN
CSDE	Casing Density	486.94 LBCF
CSID	Casing Inner Diameter	6.276 IN
DFVL	Default Fluid Velocity	206 US/F
DOT	Diameter of Transducer Sensor	2.874 IN
EMXV	EMEX Voltage	110 V
MW	Mud Weight	9.6 LB/G
RCOD	Reference Calibrator Outer Diameter	7 IN
RCSO	Reference Calibrator Standoff	1.1811 IN
RCTH	Reference Calibrator Thickness	0.2952 IN
TCUB	T^3 Processing Level	Vax_Loop
THDH	Maximum Search Thickness (percentage of nominal)	130
THDL	Minimum Search Thickness (percentage of nominal)	70
THDP	Thickness Detection Policy	Fundamental
THNO	Nominal Thickness of Casing	0.362 IN
USTO	Ultrasonic Time Offset	-2 US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch
UWKM	Ultrasonic Working Mode	5DEG_6IN_136UNF_LF
VCAS	Ultrasonic Transversal Velocity in Casing	51.4 US/F
WLEN	T^3 Processing Length	21.7078 US
ZCAS	Acoustic Impedance of Casing	46.2537 MRAY
ZINI	Initial Estimate of Cement Impedance	-1 MRAY
ZMUD	Acoustic Impedance of Mud	1.9 MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.6 MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3 MRAY
System and Miscellaneous		
CWEI	Casing Weight	26.00 LB/F
DO	Depth Offset for Playback	6.0 FT
DORL	Depth Offset for Repeat Analysis	0.0 FT
PP	Playback Processing	RECOMPUTE

Format: CORRELATION Vertical Scale: 5" per 100' Graphics File Created: 18-Sep-2010 11:12

OP System Version: 18C0-147

USIT-D	18C0-147	HILTH-FTB	18C0-147
DTC-H	18C0-147		

Input DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_023LUP	FN:22	PRODUCER	18-Sep-2010 07:07	9866.0 FT	1727.5 FT
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Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_025PUP	FN:24	PRODUCER	18-Sep-2010 11:12		
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Repeat Analysis

MAXIS Field Log

Input DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_023LUP	FN:22	PRODUCER	18-Sep-2010 07:07	9866.0 FT	1727.5 FT
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Output DLIS Files

OP System Version: 18C0-147

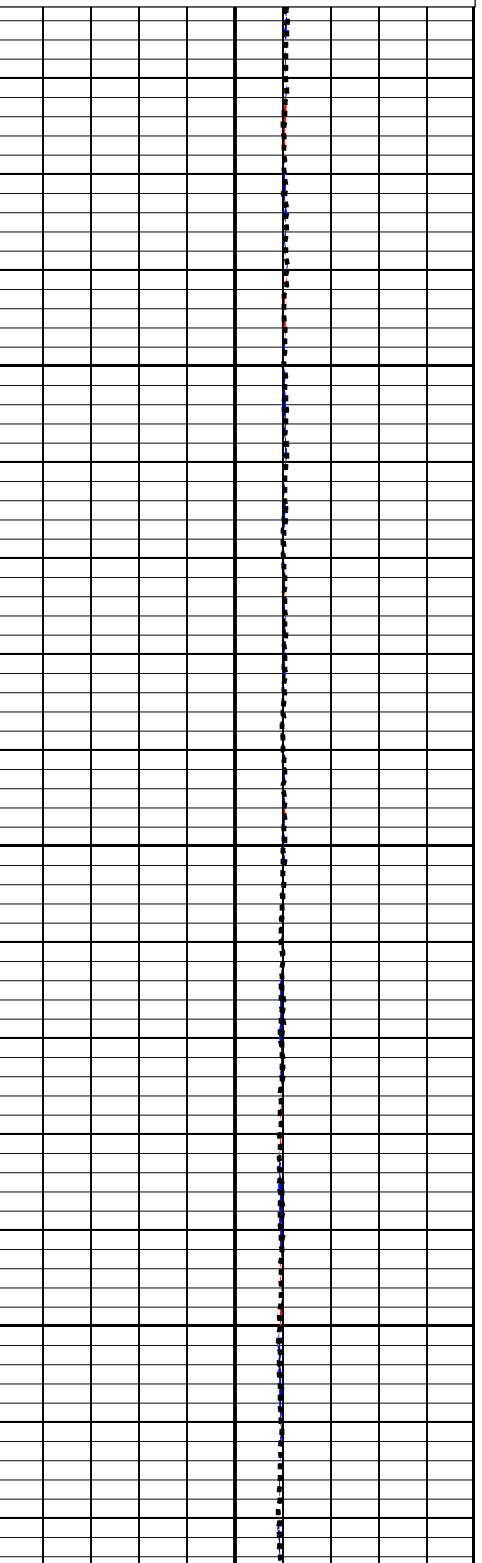
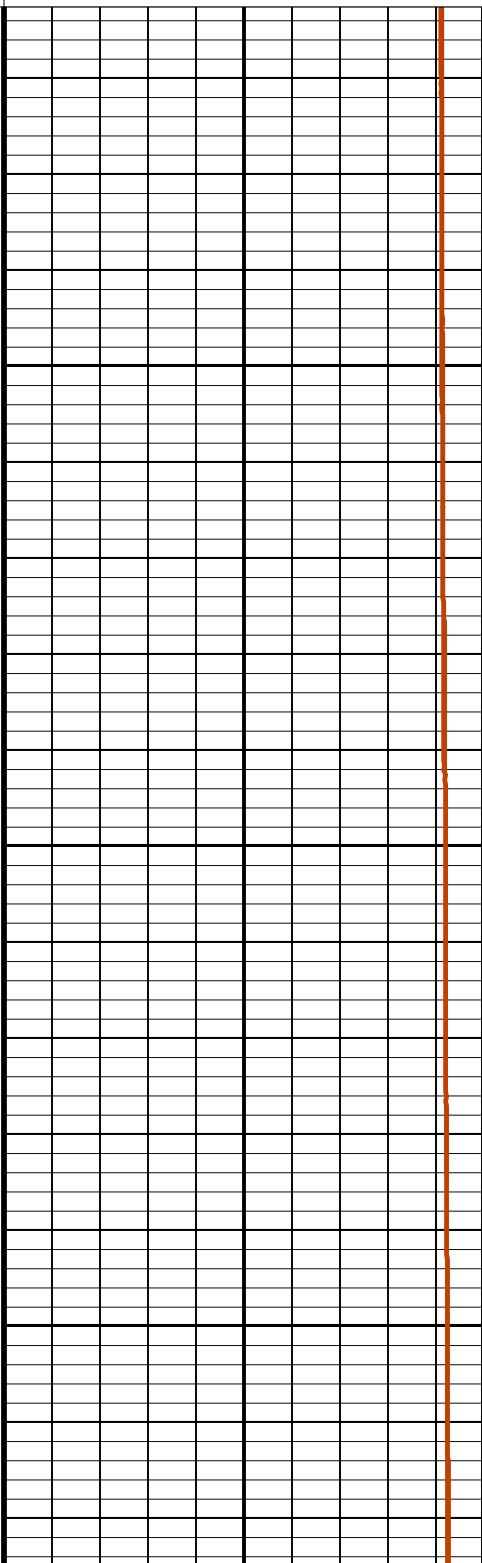
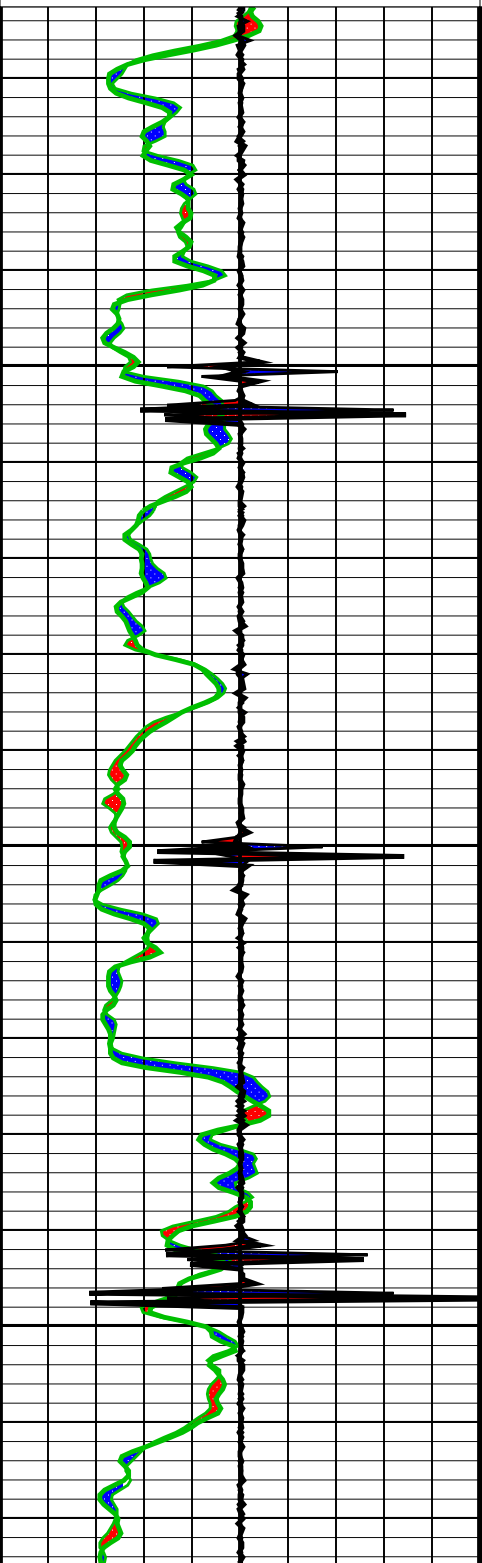
USIT-D 18C0-147 HILTH-FTB 18C0-147
 DTC-H 18C0-147

USIT_CCLU_curve_REP Curve (CCLU_REP)
 -20 (----) 20

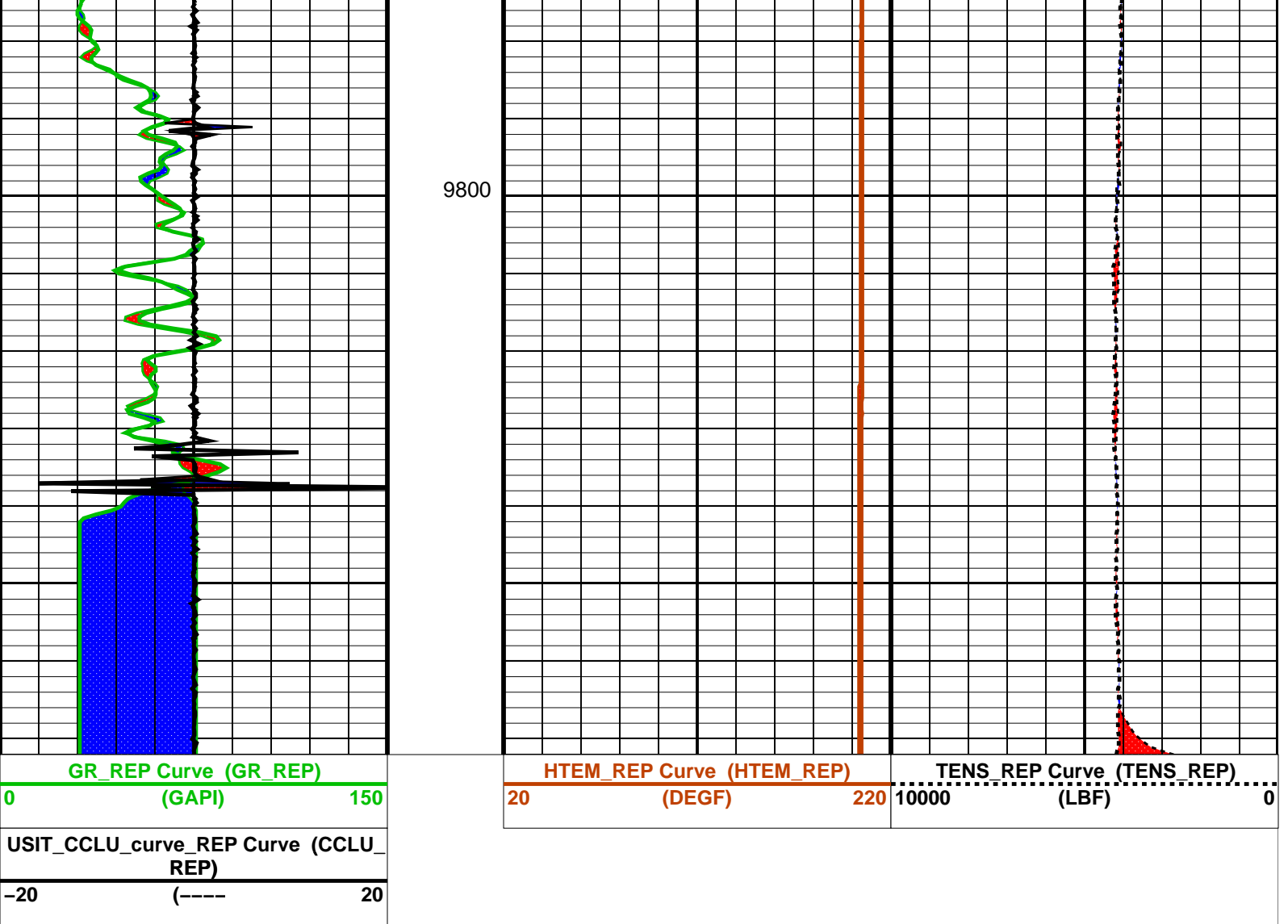
GR_REP Curve (GR_REP)
 0 (GAPI) 150

HTEM_REP Curve (HTEM_REP)
 20 (DEGF) 220

TENS_REP Curve (TENS_REP)
 10000 (LBF) 0



9700



Parameters

DLIS Name	Description	Value	
USIT-D: Ultrasonic Imaging - D			
AGMN	Minimum Gain of Cartridge	-4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	206	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	110	V
MW	Mud Weight	9.6	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN
RCTH	Reference Calibrator Thickness	0.2952	IN
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
THDL	Minimum Search Thickness (percentage of nominal)	70	
THDP	Thickness Detection Policy	Fundamental	
THNO	Nominal Thickness of Casing	0.362	IN
USTO	Ultrasonic Time Offset	-2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	5DEG_6IN_136UNF_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.2537	MRAY
ZINI	Initial Estimate of Cement Impedance	-1	MRAY
ZMUD	Acoustic Impedance of Mud	1.9	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.6	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
System and Miscellaneous			
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	6.0	FT
DORL	Depth Offset for Repeat Analysis	0.0	FT

OP System Version: 18C0-147

USIT-D 18C0-147 HILTH-FTB 18C0-147
 DTC-H 18C0-147

Input DLIS Files

DEFAULT USI_TLD_MCFL_CNL_023LUP FN:22 PRODUCER 18-Sep-2010 07:07 9866.0 FT 1727.5 FT
 DEFAULT USI_TLD_MCFL_CNL_024PUP FN:23 PRODUCER 18-Sep-2010 11:08 9872.5 FT 9612.0 FT

Output DLIS Files

DEFAULT USI_TLD_MCFL_CNL_025PUP FN:24 PRODUCER 18-Sep-2010 11:12



Calibrations

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-DTS Wellsite Calibration - Detector Calibration							
Before: 17-Sep-2010 15:15							
Gamma Ray Background	30.00	N/A	27.41	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkgd)	165.0	N/A	174.9	N/A	N/A	15.00	GAPI
High resolution Integrated Logging Tool-DTS Wellsite Calibration - Zero Measurement							
Master: 7-Sep-2010 12:00 Before: 17-Sep-2010 15:26							
CNTC Background	27.14	27.14	26.98	N/A	N/A	4.071	CPS
CFTC Background	31.05	31.05	27.46	N/A	N/A	4.658	CPS
High resolution Integrated Logging Tool-DTS Wellsite Calibration - Ratio Measurement							
Master: 7-Sep-2010 12:00							
Thermal Near Corr. (Tank)	5800	5661	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2261	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.504	N/A	N/A	N/A	N/A	
High resolution Integrated Logging Tool-DTS Wellsite Calibration - Accelerometer Calibration							
Before: 18-Sep-2010 3:09							
Z-Axis Acceleration	32.19	N/A	32.11	N/A	N/A	N/A	F/S2

The HGNS Neutron Master Calibration was done with the following parameters :

NCT-B Water Temperature 70.0 DEGF.
 Thermal Housing Size 3.375 IN.
 NSR-F serial number 0

High resolution Integrated Logging Tool-DTS / Equipment Identification

Primary Equipment:
 HILT Gamma-Ray Neutron Sonde-DTS HGNS - H 3920
 HGNS Gamma-Ray Device HGR -

HGNS Neutron Detector with Alpha Source
 Z-Axis Accelerometer
 Compensated Neutron Box
 HTBC Communication Assembly DTS Mode

HCNT - H
 HACC - H
 CNB - AB
 HMCA - H

2594

Auxiliary Equipment:
 Neutron Calibration Tank
 Gamma Source Radioactive
 HGNS Housing

NCT - B
 GSR - U/Y
 HGNH -

High resolution Integrated Logging Tool-DTS Wellsite Calibration						
Detector Calibration						
Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkgd) GAPI	Value	
Before		27.41	Before		174.9	
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			157.1 (Minimum) 165.0 (Nominal) 206.3 (Maximum)		
Before: 17-Sep-2010 15:15						

High resolution Integrated Logging Tool-DTS Wellsite Calibration						
Zero Measurement						
Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value	
Master		27.14	Master		31.05	
Before		26.98	Before		27.46	
	5.000 (Minimum) 27.14 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 31.05 (Nominal) 40.00 (Maximum)		
Master: 7-Sep-2010 12:00			Before: 17-Sep-2010 15:26			

High resolution Integrated Logging Tool-DTS Wellsite Calibration									
Ratio Measurement									
Phase	Thermal Near Corr. (Tank) CPS	Value	Phase	Thermal Far Corr. (Tank) CPS	Value	Phase	CNTC/CFTC (Tank)	Value	
Master		5661	Master		2261	Master		2.504	
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)			1900 (Minimum) 2400 (Nominal) 2900 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)		
Master: 7-Sep-2010 12:00									

High resolution Integrated Logging Tool-DTS Wellsite Calibration		
Accelerometer Calibration		
Phase	Z-Axis Acceleration F/S2	Value
Before		32.11
	31.53 (Minimum) 32.19 (Nominal) 32.84 (Maximum)	
Before: 18-Sep-2010 3:09		

High resolution Integrated Logging Tool-DTS Master Calibration						
Zero Measurement						
Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value	
Master		27.14	Master		31.05	
	5.000 (Minimum) 27.14 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 31.05 (Nominal) 40.00 (Maximum)		
Master: 7-Sep-2010 12:00						

High resolution Integrated Logging Tool-DTS Master Calibration									
Tank Measurement									
Phase	Thermal Near Corr. (Tank) CPS	Value	Phase	Thermal Far Corr. (Tank) CPS	Value	Phase	CNTC/CFTC (Tank)	Value	
Master		5661	Master		2261	Master		2.504	
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)			1900 (Minimum) 2400 (Nominal) 2900 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)		
Master: 7-Sep-2010 12:00									

DTS Telemetry Tool / Equipment Identification

Primary Equipment:
 DTC-H Auxiliary Cartridge
 DTC-H Telemetry Cartridge

DTCH - A
 DTCH - A

8907

Company: **ExxonMobil Production Corp**

Schlumberger

Well: **PCU 296-5A1**

Field: **Piceance Creek**

County: **Rio Blanco**

State: **Colorado**

CORRELATION PRINT

GAMMA RAY