



# CALIPER LOG GAMMA RAY LOG

FILE NO: MD11447	COMPANY WELL FIELD COUNTY	PICEANCE ENERGY LLC PICEANCE FEDERAL 28-21E VEGA MESA	STATE COLORADO
API NO: 05-077-10250	LOCATION: SHL: 1981' FSL & 2484' FWL BHL: 113' FSL & 881' FEL SEC 28 T9S R93W		
Ver. 4.01 FINAL PRINT	OTHER SERVICES ZDLCN/GR/HDIL		
PERMANENT DATUM LOG MEASURED FROM DRILL. MEAS. FROM	GL KB	ELEVATION 22 FT ABOVE P.D.	KB DF GL 7701 FT 7700 FT 7679 FT

DATE		14-OCT-2015			
RUN	TRIP	1	1		
SERVICE ORDER		100135			
DEPTH DRILLER		8574 FT			
DEPTH LOGGER		8574 FT			
BOTTOM LOGGED INTERVAL		8545 FT			
TOP LOGGED INTERVAL		1620 FT			
CASING DRILLER		8.625 IN		@ 1658 FT	@
CASING LOGGER		1644 FT			
BIT SIZE		7.875 IN			
TYPE OF FLUID IN HOLE		LSND			
DENSITY	VISCOSITY	10 LBG	65 CP		
PH	FLUID LOSS	8.5	5.2 C3		
SOURCE OF SAMPLE		MUD PIT			
RM AT MEAS. TEMP.		2.25 OHMM		@ 95 DEGF	@
RMF AT MEAS. TEMP.		1.69 OHMM		@ 95 DEGF	@
RMC AT MEAS. TEMP.		2.81 OHMM		@ 95 DEGF	@
SOURCE OF RMF	RMC	CALCULATED	CALCULATED		
RM AT BHT		1.75 OHMM	@ 190 DEGF		@
TIME SINCE CIRCULATION		5 HOURS			
MAX. RECORDED TEMP.		190 DEGF			
EQUIP. NO.	LOCATION	HL6713	ODESSA, TX		
RECORDED BY		B HOAGLAND/S SAEED			
WITNESSED BY		MATT SETTLES			

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE THE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

BOREHOLE RECORD		
BIT SIZE	FROM	TO
11 IN	0 FT	1668 FT
7.875 IN	1668 FT	8574 FT

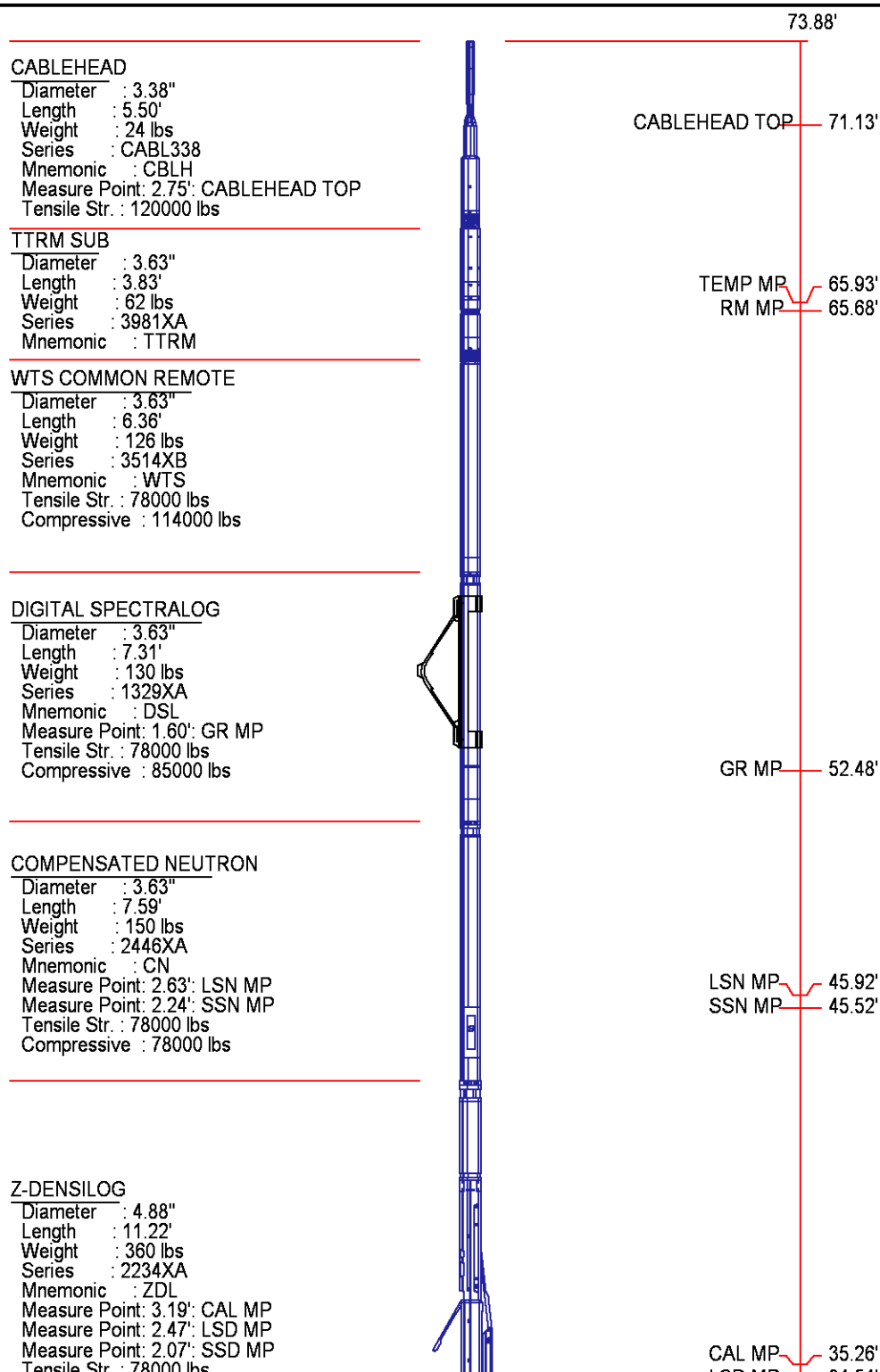
CASING RECORD				
SIZE	WEIGHT	GRADE	FROM	TO
8.625 IN	24 LB/F	J-55	0 FT	1668 FT
4.5 IN			0 FT	8574 FT

REMARKS
RUN 1 TRIP 1: NACL: 1835 PPM CL: 1115 PPM
BOREHOLE & CEMENT VOLUME PRESENTED (TOTAL VOLUME LESS 4.5 CSG) 1 SMALL TICK = 10 CU. FT. 1 MEDIUM TICK = 100 CU. FT. 1 LARGE TICK = 1000 CU. FT.
CREW: J. ORONA, J. BECK RIG: PATTERSON 306

EQUIPMENT DATA			
RUN	TRIP	TOOL	SERIES NO.
			SERIAL NO.
			POSITION

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	TTRM	3981XB	12030561	FREE
1	1	CMRT	3514XB	10213244	FREE
1	1	DSL	1329XA	Z177857	DECENTRALIZED
1	1	CN	2446XA	10103362	DECENTRALIZED
1	1	ZDL	2234XA	10195311	PAD DEVICE
1	1	KNUCKLE	3939XA	12949575	FREE
1	1	HDIL ELEC	1515EA	10208946	CENTRALIZED
1	1	HDIL	1515MA	10326319	CENTRALIZED

## INSTRUMENT CONFIGURATION



Tensile Str. : 70000 lbs  
Compressive : 74500 lbs

LSD MP : 34.54'  
SSD MP : 34.14'

#### KNUCKLE JOINT (DOUBLE)

Diameter : 3.38"  
Length : 4.65'  
Weight : 90 lbs  
Series : 3939XA  
Mnemonic : KNJT  
Tensile Str. : 32000 lbs



#### HIGH DEFINITION INDUCTION TOOL

Diameter : 3.62"  
Length : 27.13'  
Weight : 415 lbs  
Series : 1515XA  
Mnemonic : HDIL  
Measure Point: 13.91': SP MP  
Measure Point: 7.44': XMTR MP  
Tensile Str. : 36000 lbs  
Compressive : 1900 lbs

SP MP : 14.19'

XMTR MP : 7.72'

#### BULL PLUG 3 3/8

TOTAL LENGTH: 73.88'  
TOTAL WEIGHT: 1381 lbs  
MAX DIAMETER: 0'4.88"

0.00'

## CEMENT VOLUME LOG WITH 4.5" CASING

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013  
Updates: 1 Patches: 7

Plotted: Wed Oct 14 21:46:51 2015

### PARAMETER AND FILTER SUMMARY REPORT

File: /dat1a/md11447/n87cb\_kb02.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 106.250 ft BOTTOM DEPTH: 8586.000 ft

## SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CHT	FILTER ( )	medium (1)		TOP	BOTTOM
Y AXIS CALIPER	FILTER ( )	medium (1)		"	"
GR	FILTER ( )	medium (1)		"	"
CALIPER	FILTER ( )	medium (1)		"	"
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"

## BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	4.500	in	TOP	BOTTOM
BIT SIZE	BIT SIZE	7.875	in	"	"

## CURVE DESCRIPTION REPORT

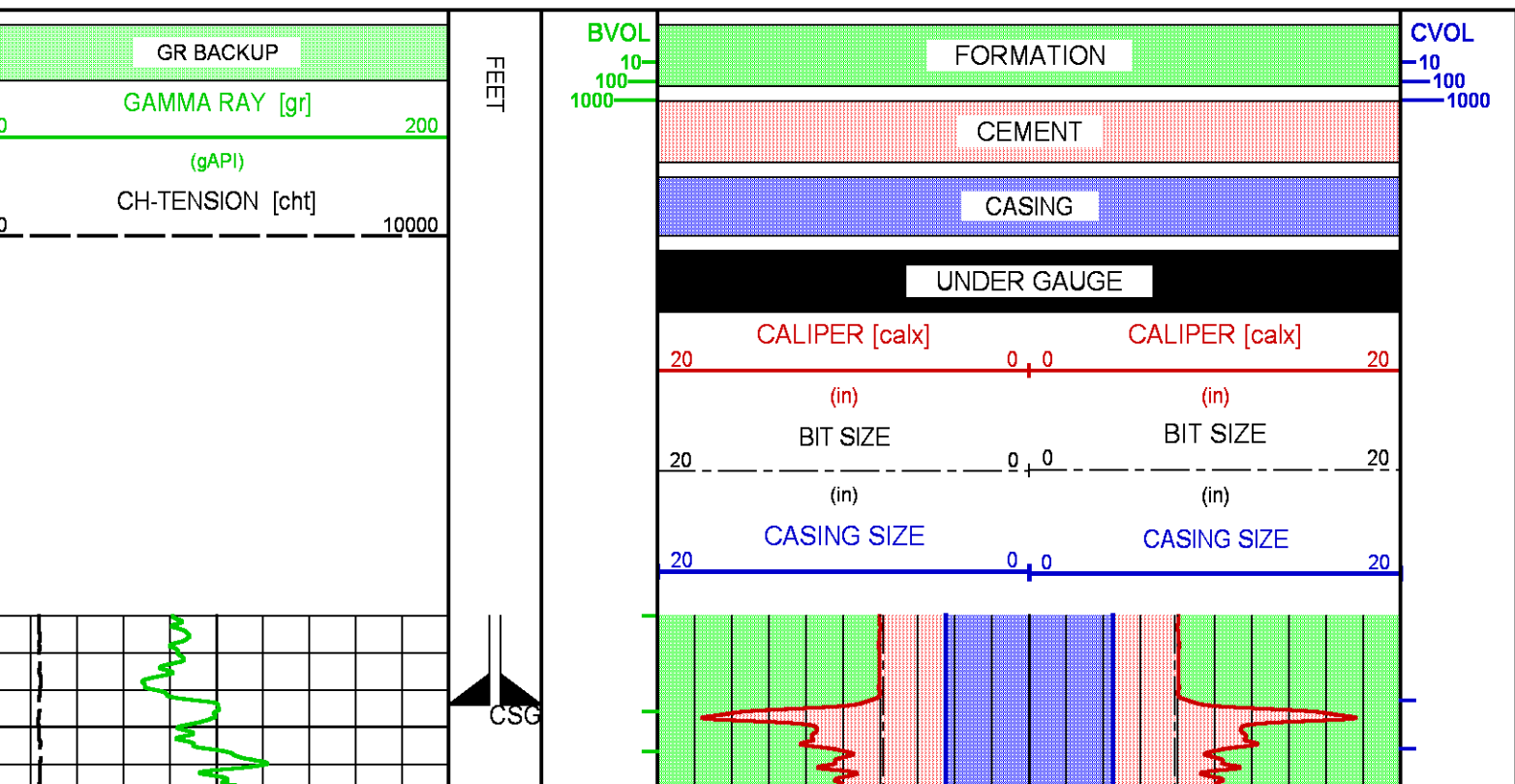
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Oct 14 17:39:42 2015	BIT SIZE
F1:BVOL	Oct 14 17:39:42 2015	BOREHOLE VOLUME
F1:CALX	Oct 14 17:39:42 2015	CALIPER FROM X-AXIS OF XY CALIPER(S)
F1:CHT	Oct 14 17:39:42 2015	CABLE HEAD TENSION
F1:CVOL	Oct 14 17:39:42 2015	CEMENT VOLUME
F1:GR	Oct 14 17:39:42 2015	GAMMA RAY

## CURVE MEASURE POINT OFFSET

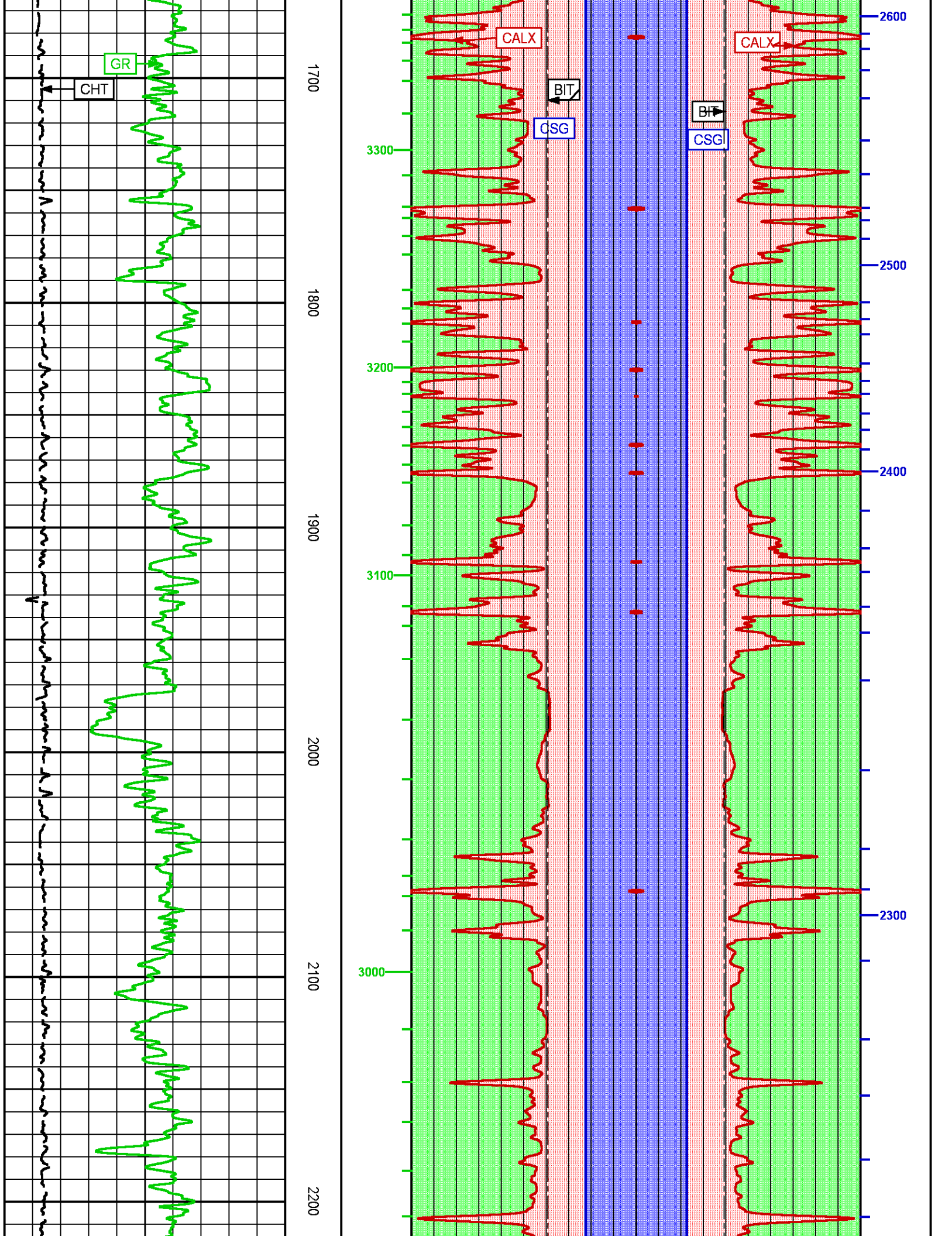
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	CALX	38.00	CHT	0.00	GR	55.00

**Presentation** : sys1:/dat1a/md11447/BHP.fvpdf [2"/100' Scale]  
**Plot Interval** : 1620 - 8595 Feet

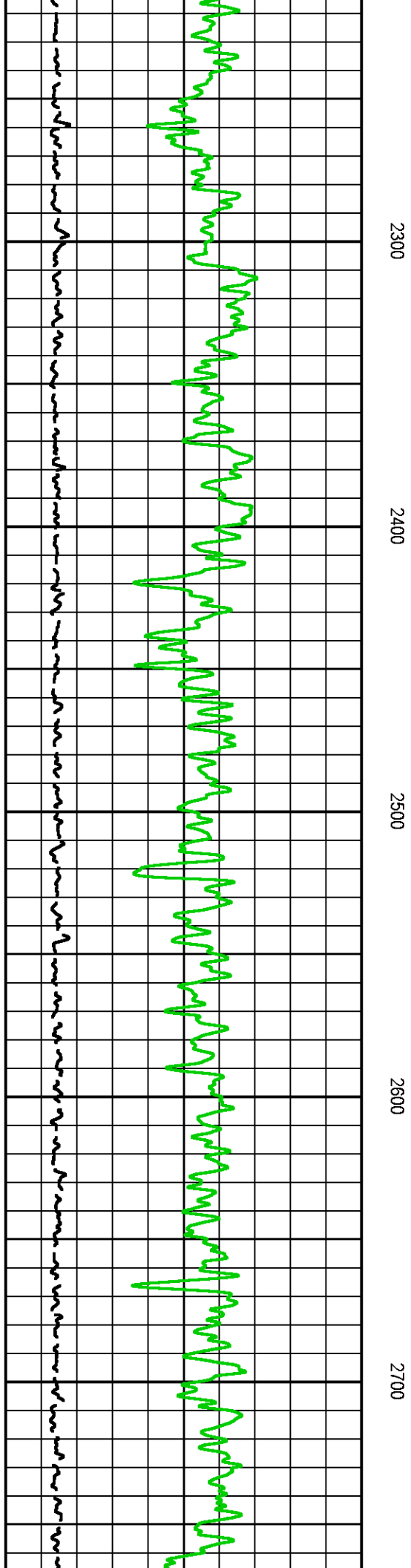
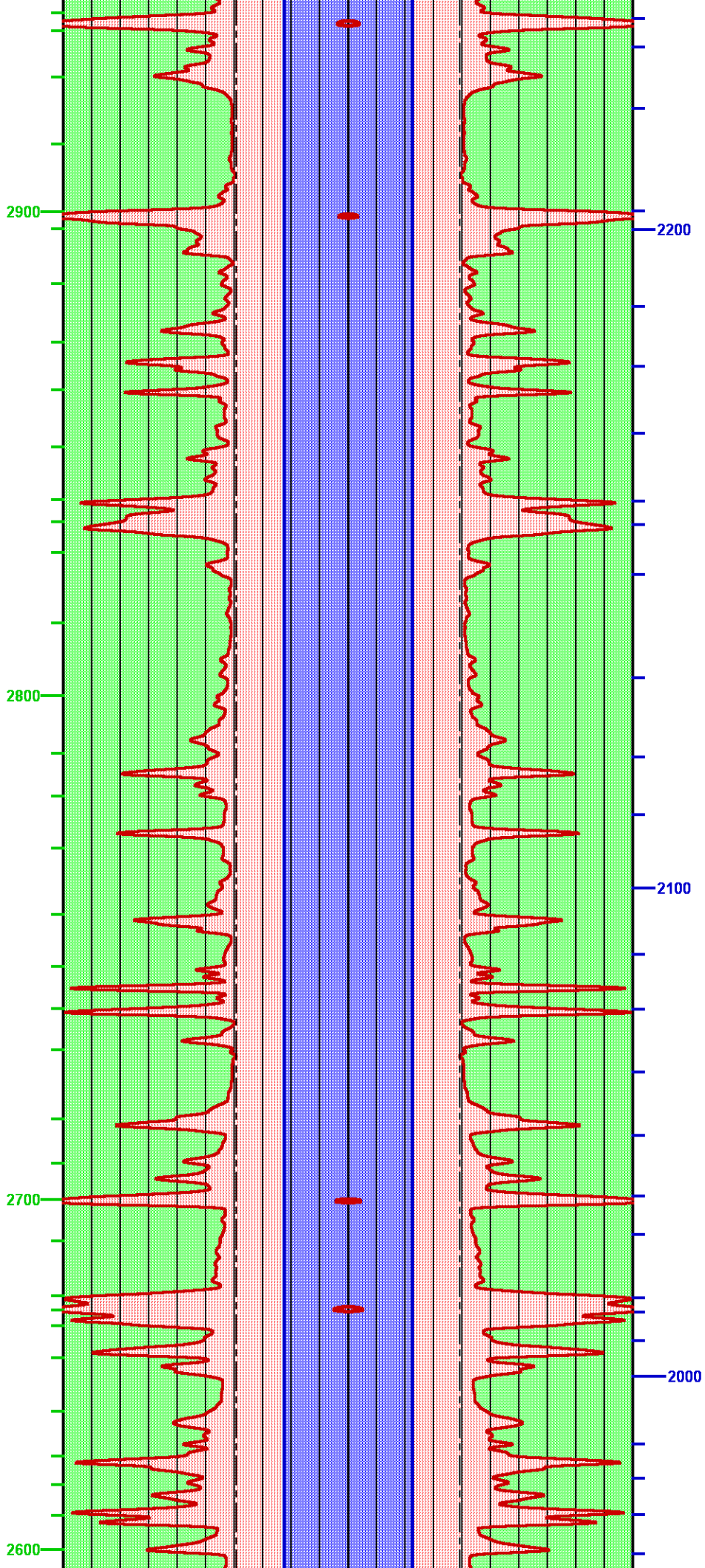
**Data File 1** : F1 : sys1:/dat1a/md11447/MAIN.xtf  
**Created On** : Oct 14 17:39:42 2015  
**Company** : PICEANCE ENERGY LLC  
**Well** : FEDERAL 28-21E  
**Field** : VEGA  
**File Interval** : 1620 - 8595 Feet  
**OCT** : n87cb\_kb



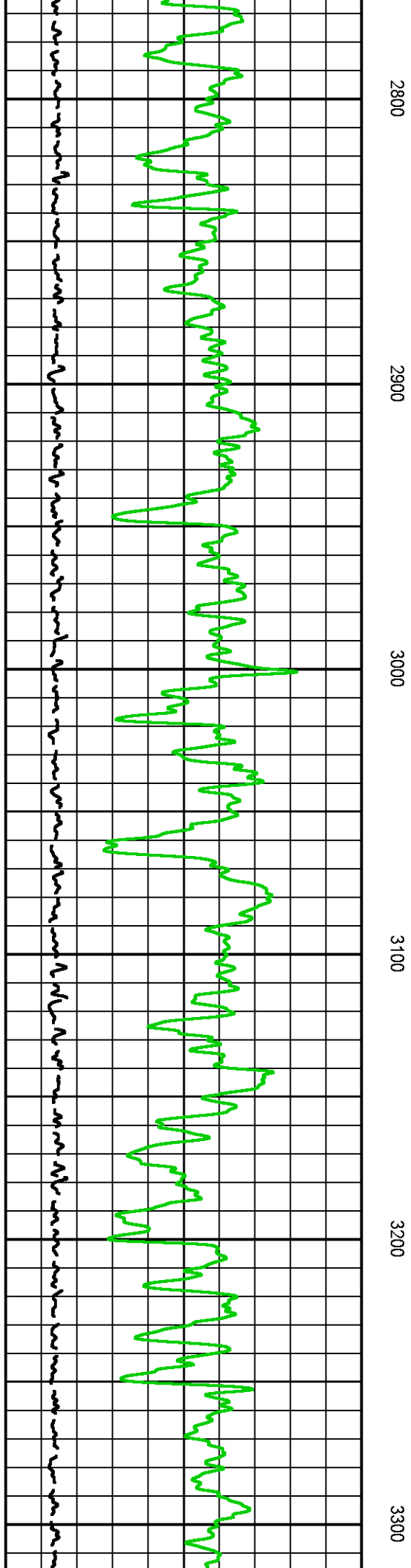
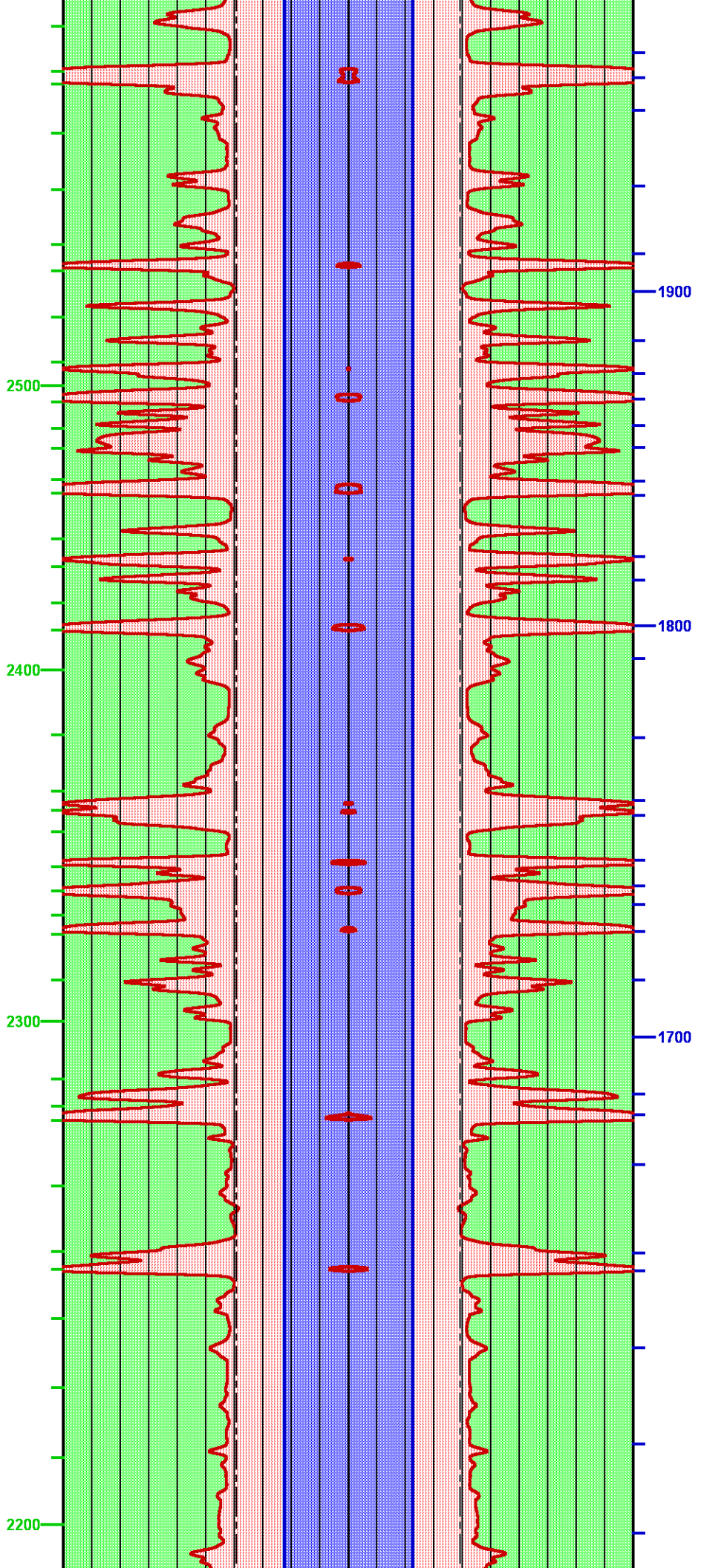




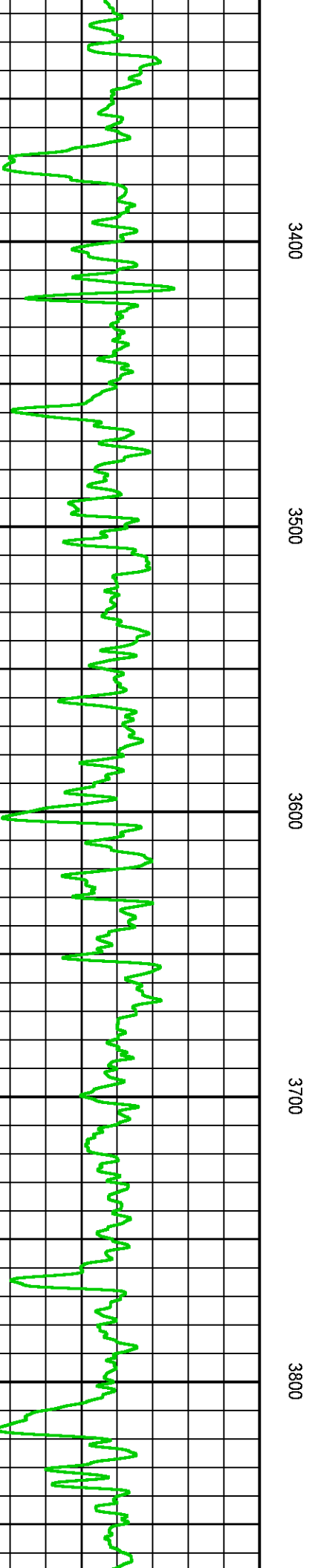
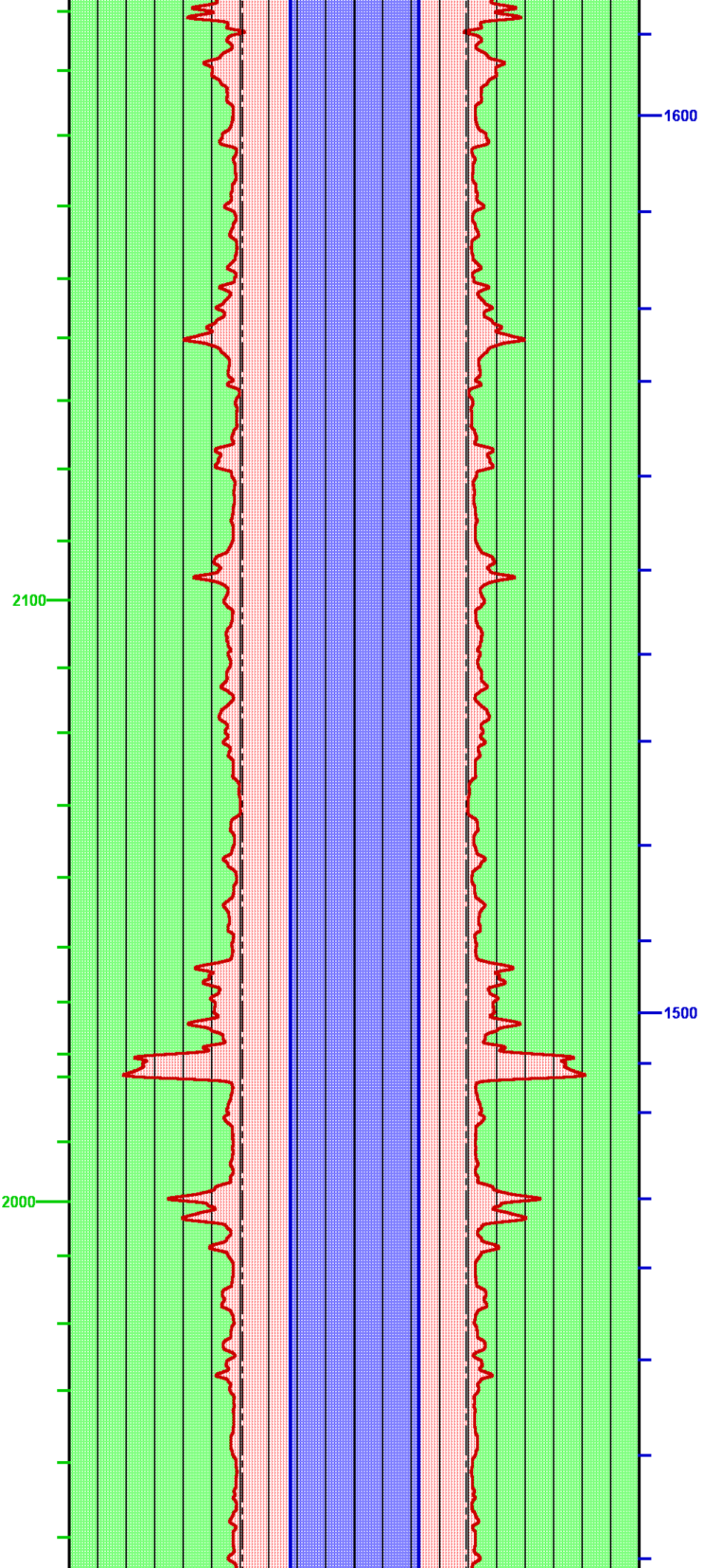






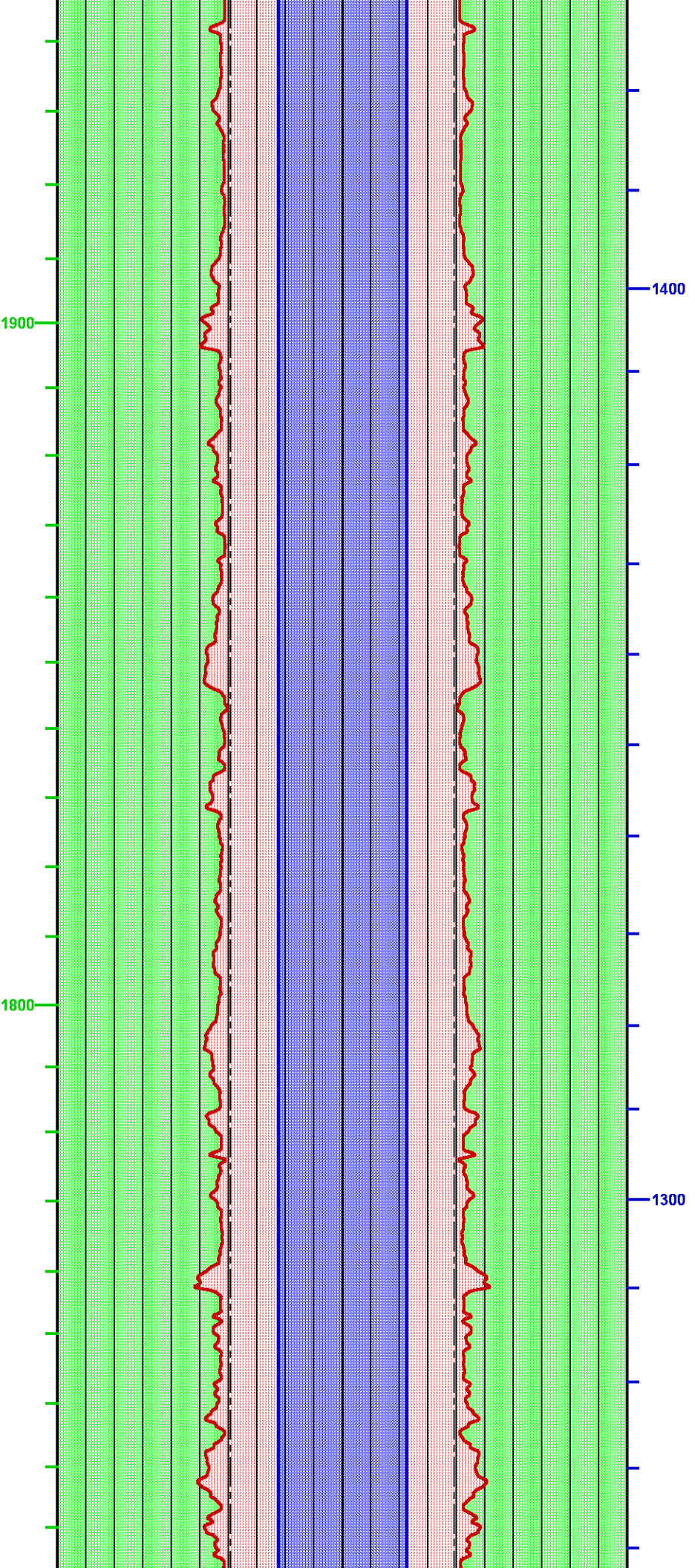




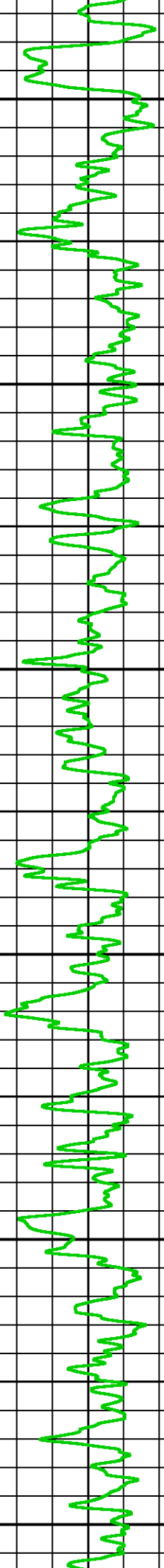


A new record of the 1st of June. The weather was very nice and warm. The wind was from the south and the sea was calm. The sun was shining and the sky was blue. The water was very clear and the fish were jumping out of the water. The birds were singing and the children were playing. The day was very happy and the people were all smiling. The weather was perfect and the day was very nice. The sun was shining and the sky was blue. The water was very clear and the fish were jumping out of the water. The birds were singing and the children were playing. The day was very happy and the people were all smiling.



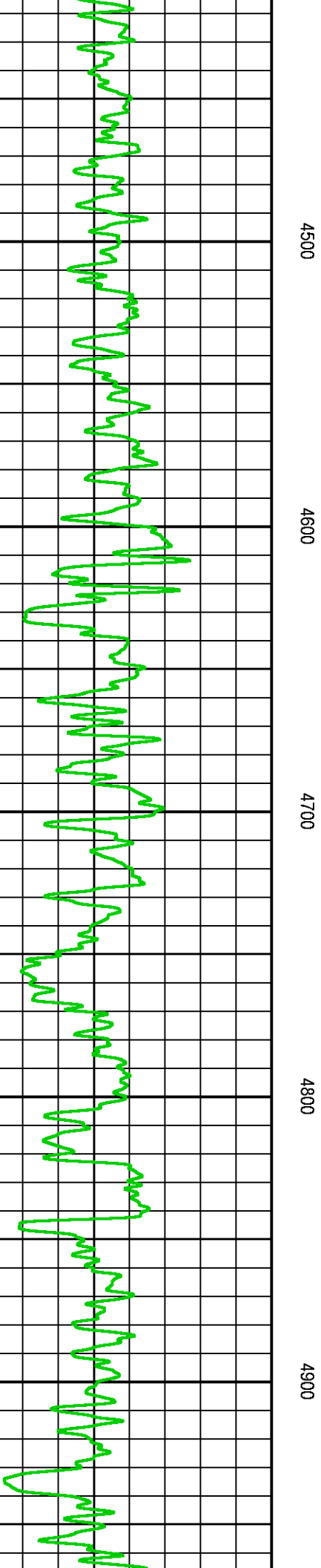
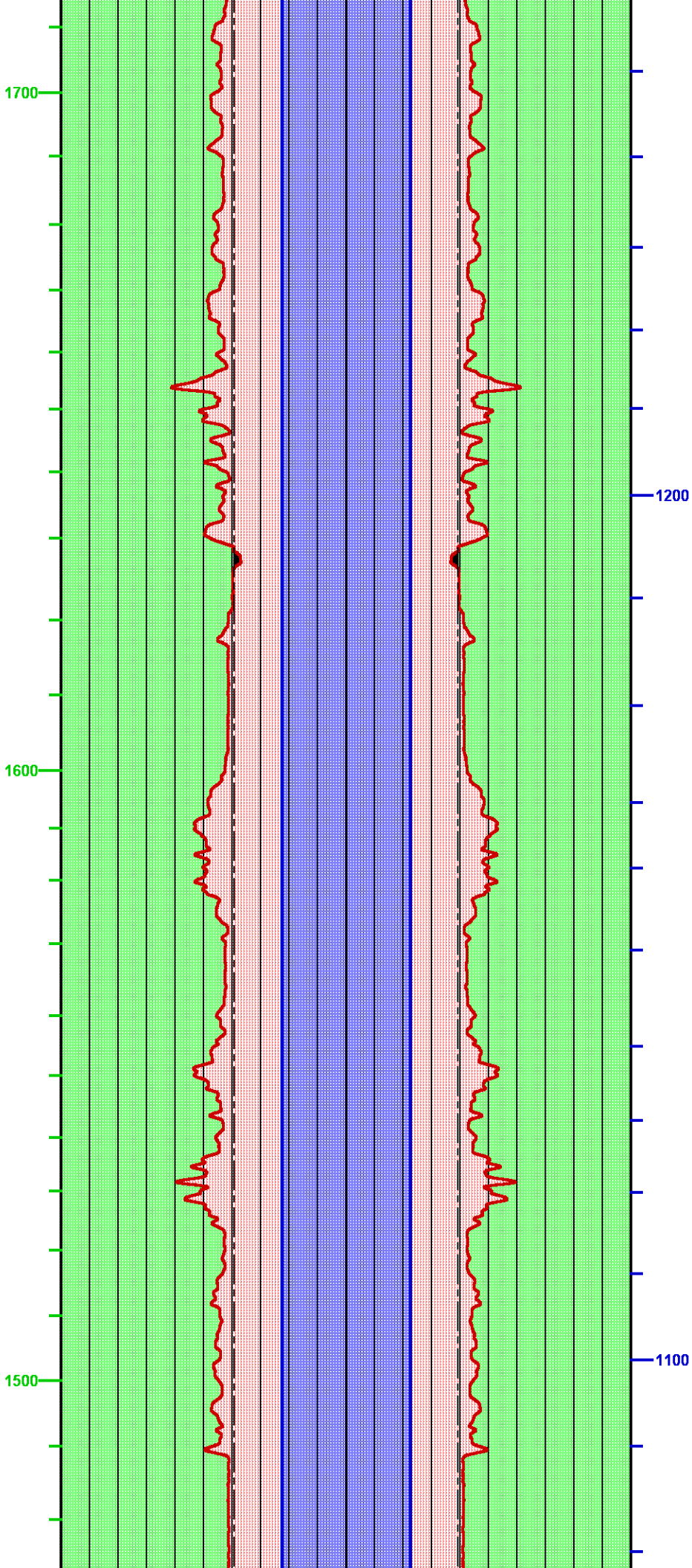


3900 4000 4100 4200 4300 4400

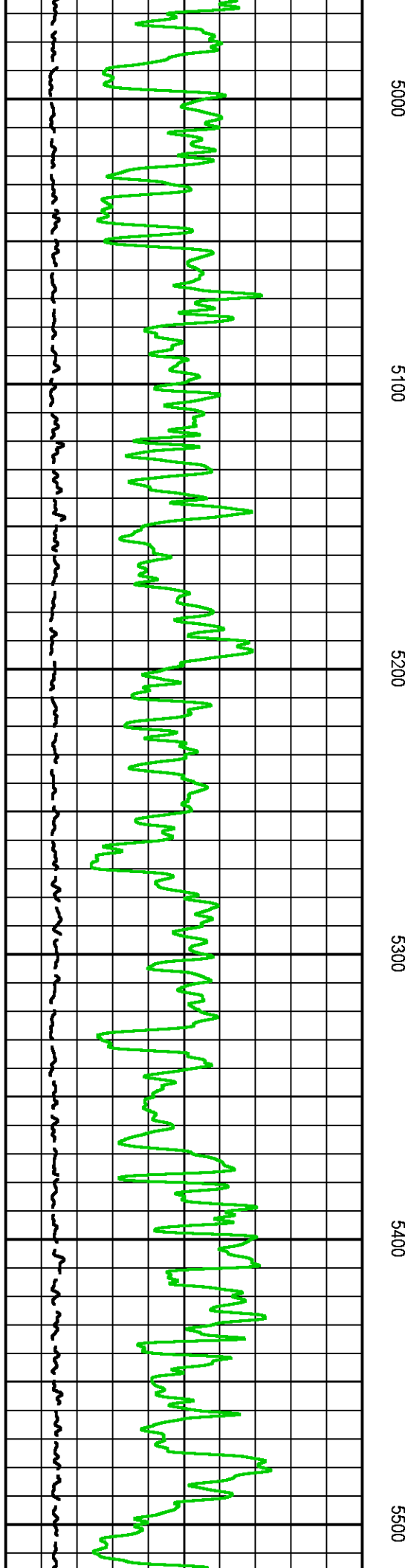
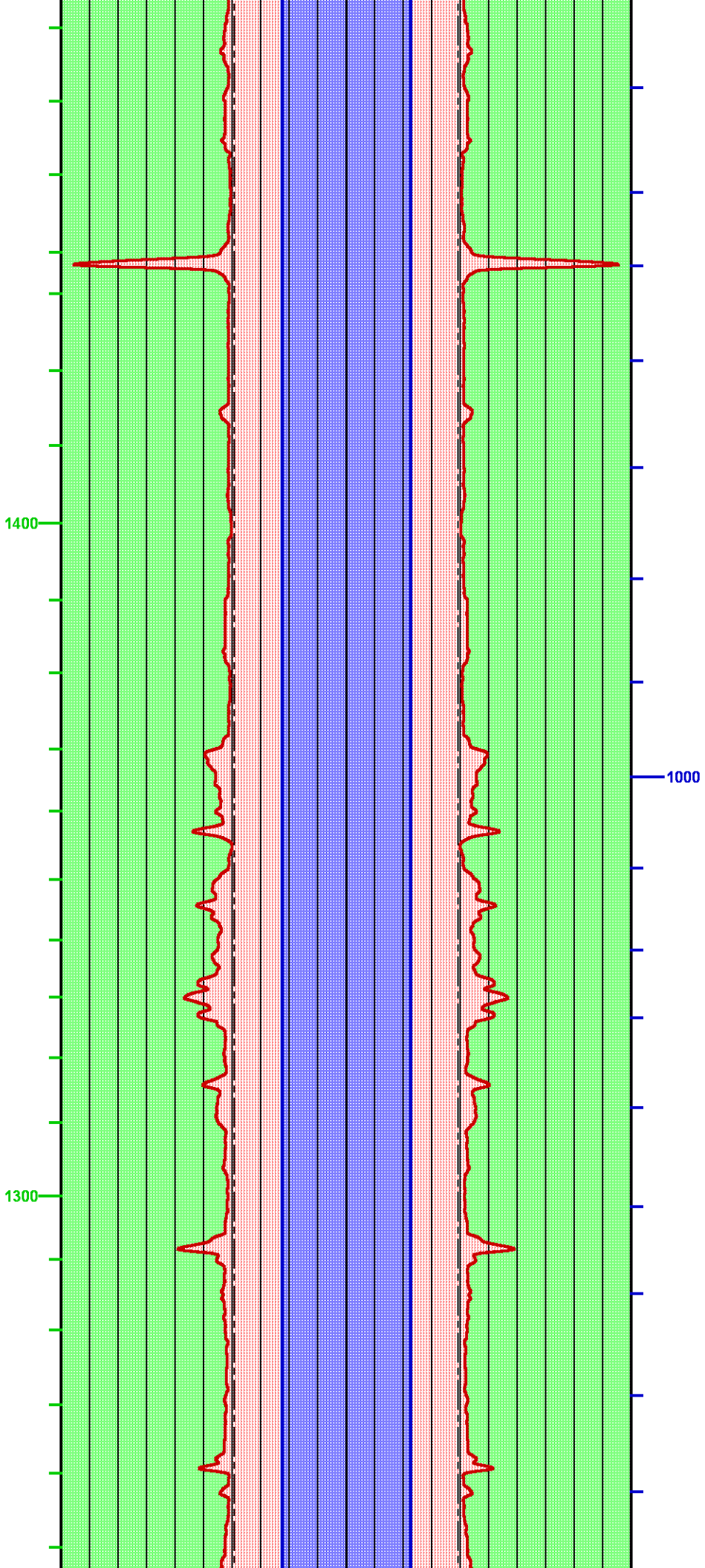


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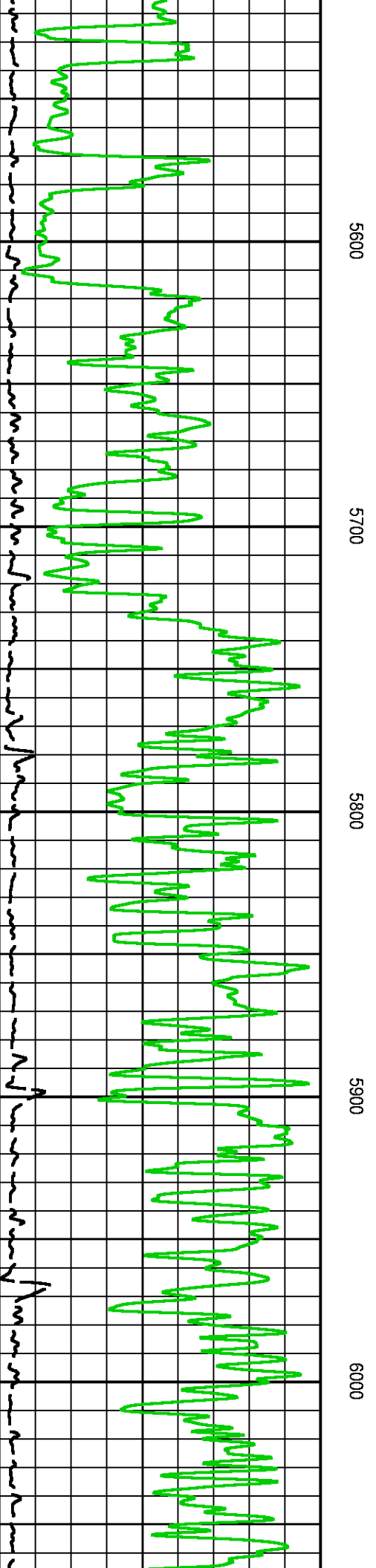
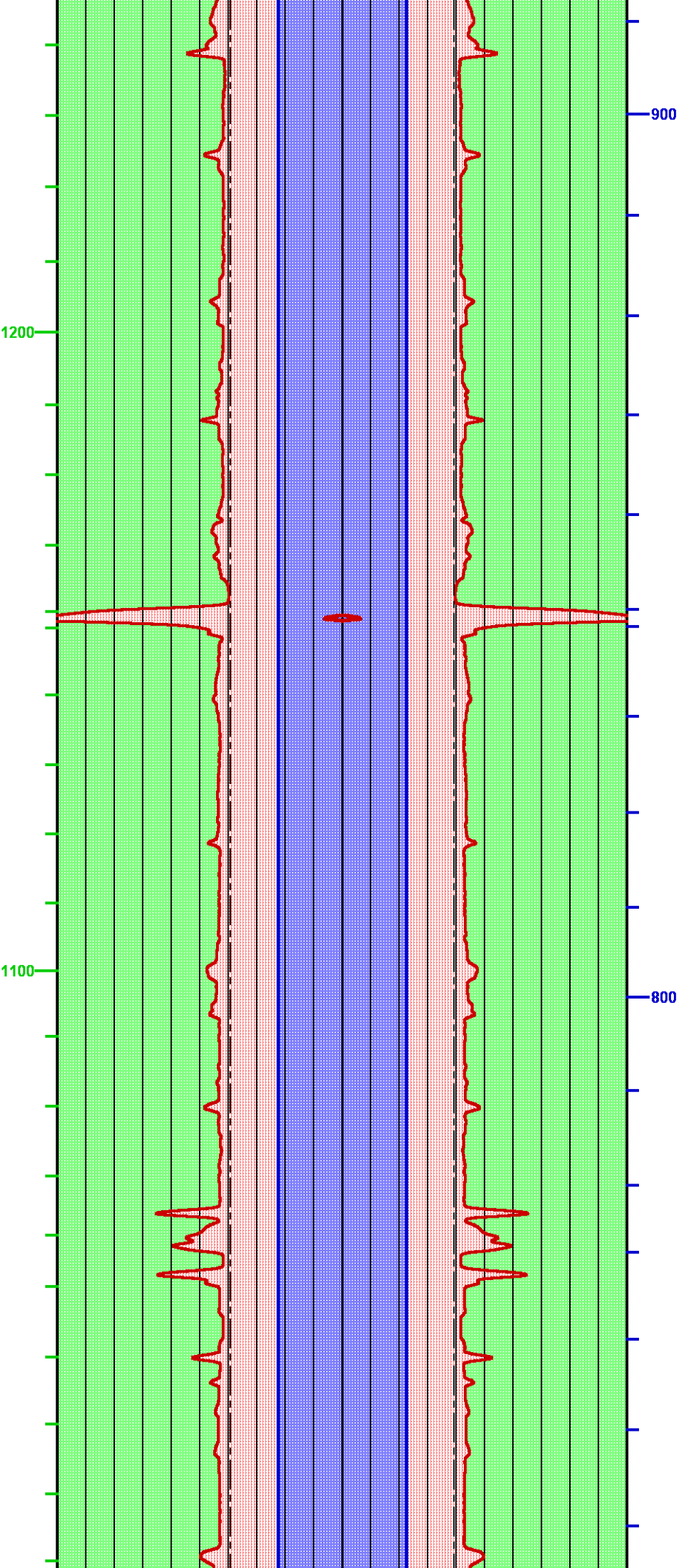




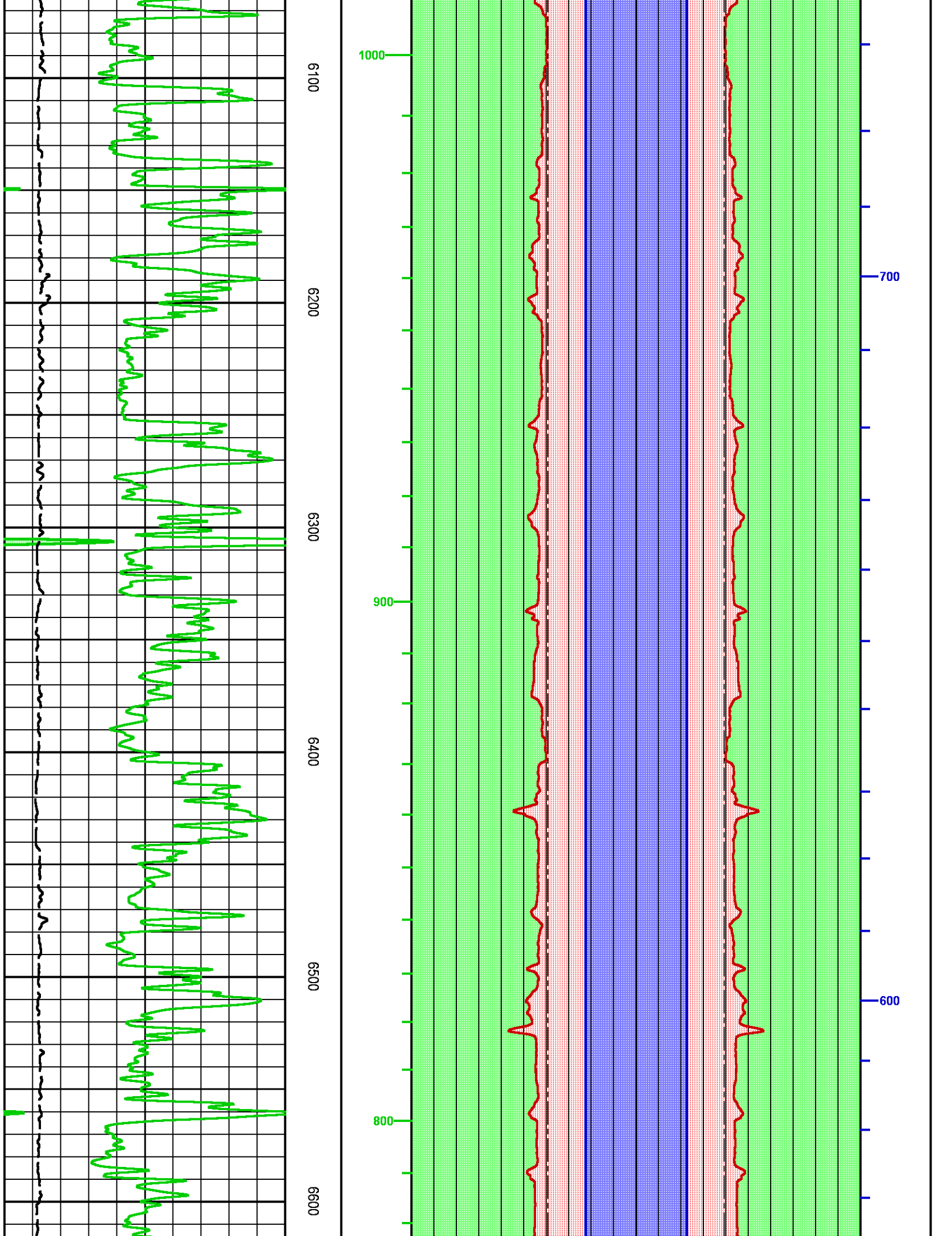




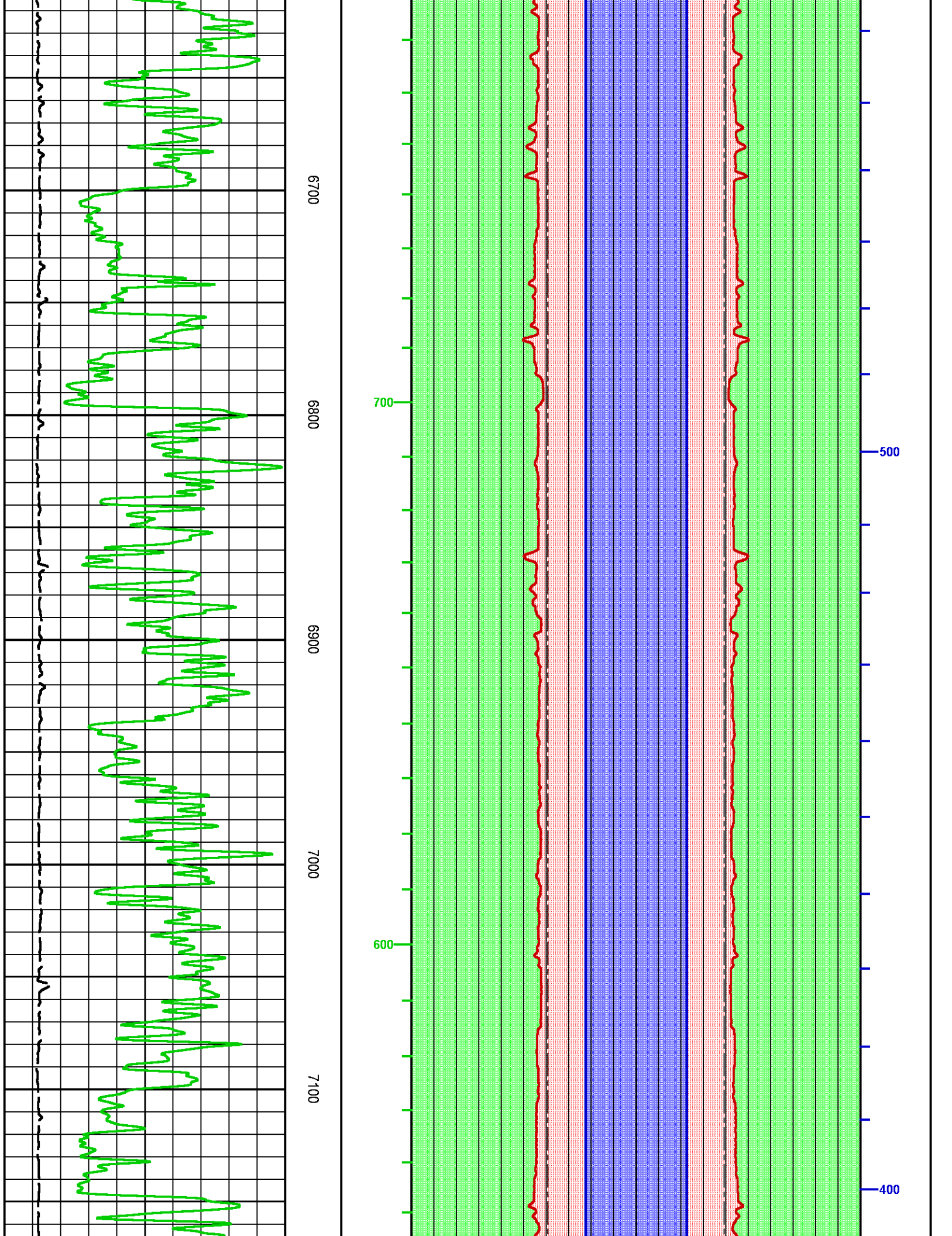




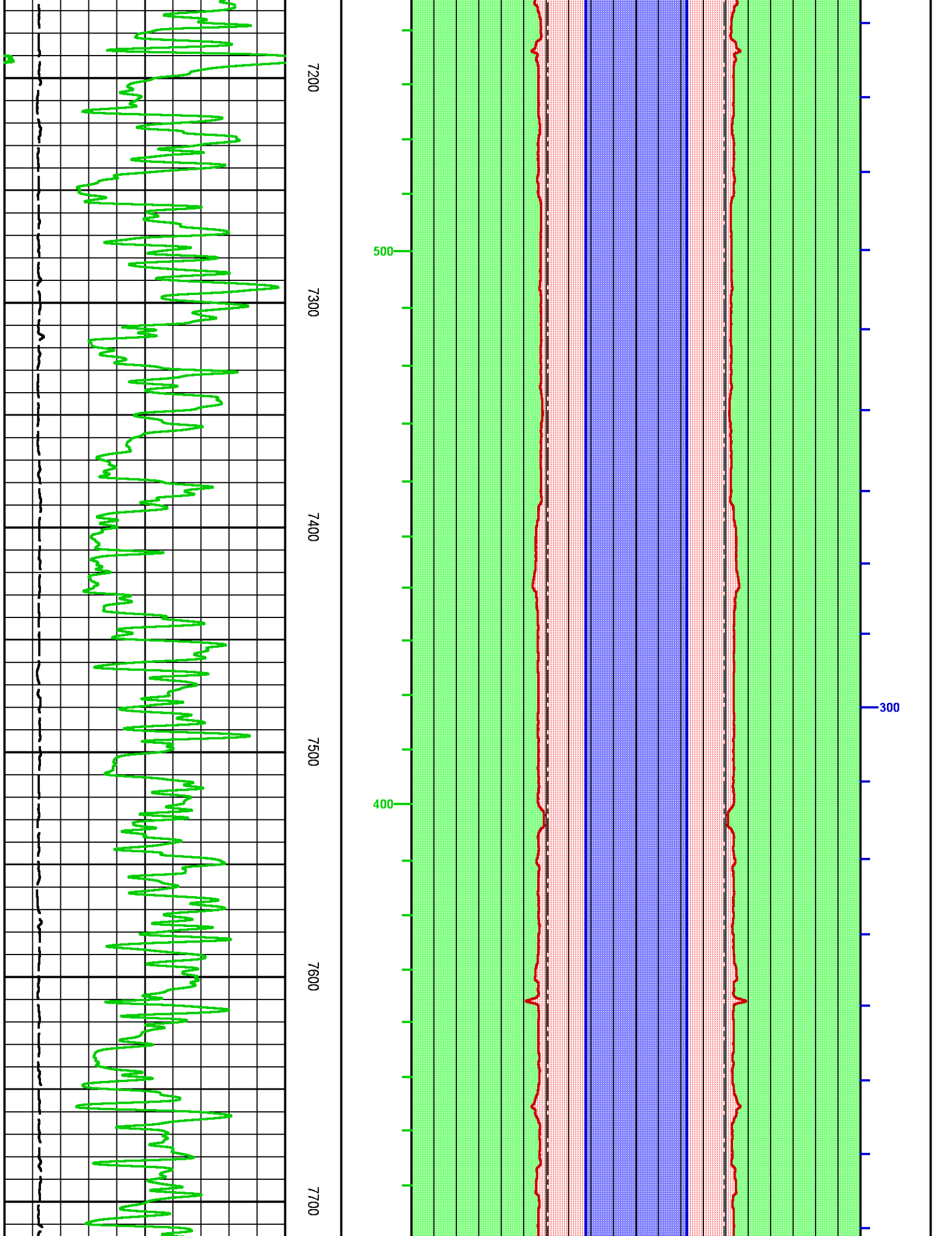




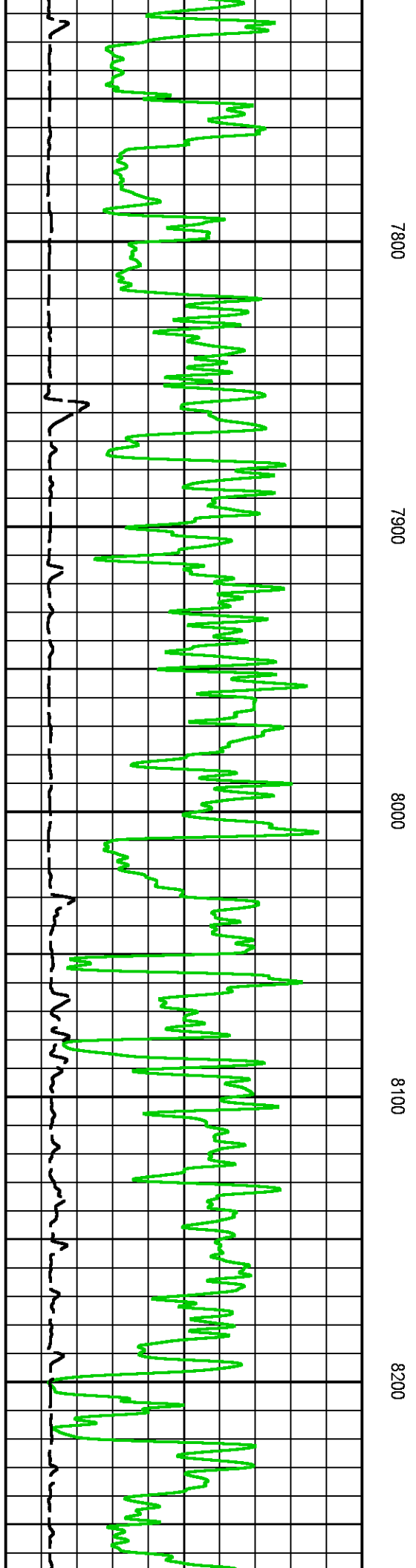
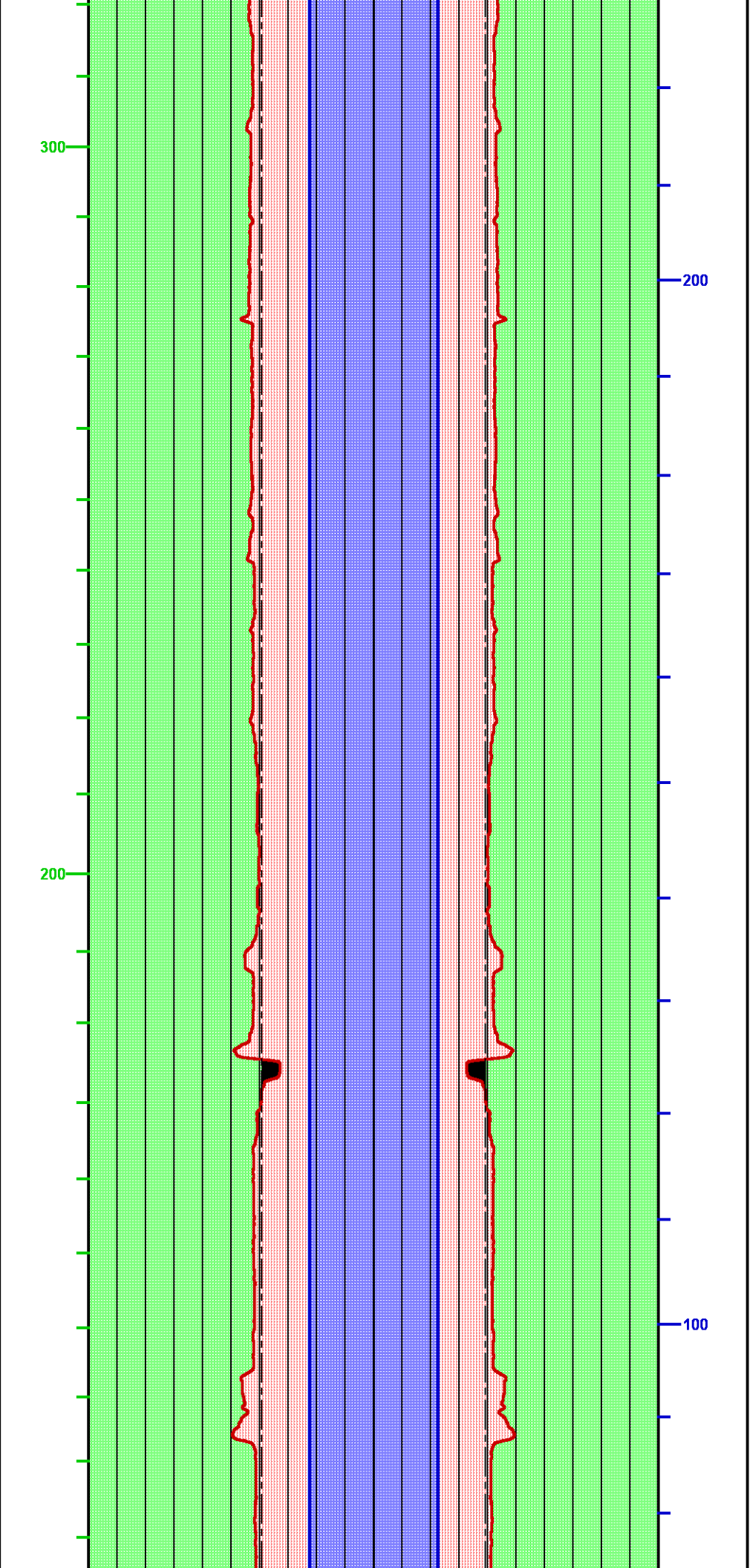




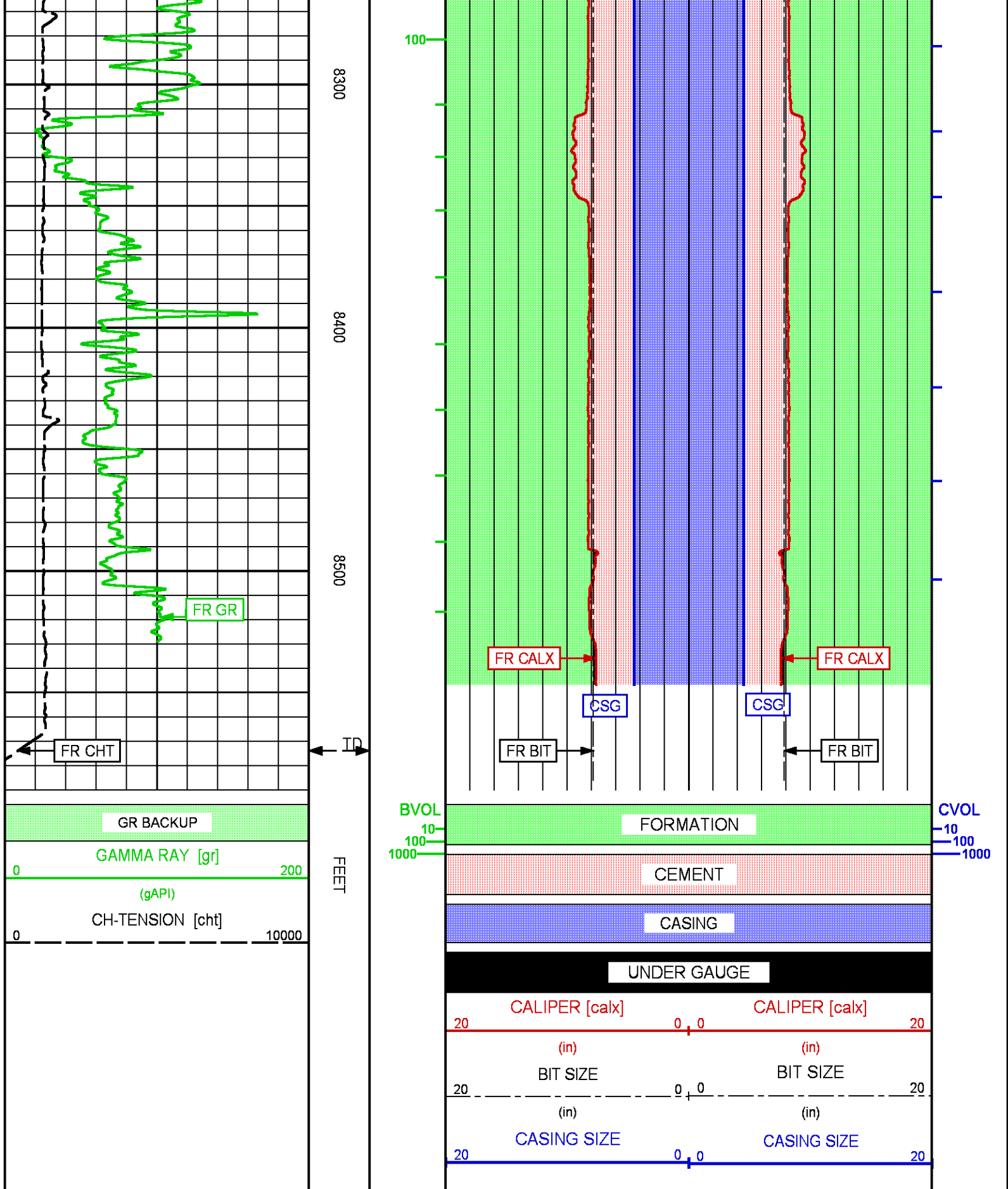












## CALIBRATION / VERIFICATION SUMMARY



## GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 177857

DATE/TIME PERFORMED: Tue Oct 6 13:03:19 2015

UNIT #: 3882TD HL6713

CALB JIG #: 4702NK DA-434

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	171.33	1101.93	930.6 830.0 960.0	0.161	27.62	177.62	150

## GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 177857

DATE/TIME PERFORMED: Tue Oct 6 13:09:27 2015

UNIT #: 3882TD HL6713

VERI JIG #: 4702NK DA-434

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	167.20	1110.89	0.161	26.95	179.06	152.11 140.00 160.00

## GR BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1329XA 177857

DATE/TIME PERFORMED: Wed Oct 14 14:05:24 2015

DAYS SINCE CAL: 8

UNIT #: 3882TD HL6713

VERI JIG #: 4702NK DA-434

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	280.02	1218.71	0.161	45.14	196.44	151.30 142.11 162.11

## GR AFTER LOG VERIFICATION SUMMARY

TOOL #: 1329XA 177857

DATE/TIME PERFORMED: Wed Oct 14 21:36:44 2015

DAYS SINCE CAL: 8

UNIT #: 3882TD HL6713

VERI JIG #: 4702NK DA-434

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	168.80	1103.04	0.161	27.21	177.80	150.59 141.30 161.30



# CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2234XA 10195311

DATE/TIME PERFORMED: Tue Oct 6 11:58:10 2015

UNIT #: 3882TD HL6713

	SMALL RING	LARGE RING	MULT	ADD	SMALL RING (in)	LARGE RING (in)
CALIPER	1500.0	2396.8	0.00794	-4.04237	7.875	15.000

## CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2234XA 10195311

DATE/TIME PERFORMED: Wed Oct 14 14:36:27 2015

DAYS SINCE CAL: 8

UNIT #: 3882TD HL6713

	I.D.	MULT	ADD	I.D. (in)
CALIPER	1500.8	0.00794	-4.04873	7.875

## CAL AFTER LOG VERIFICATION SUMMARY


TOOL #: 2234XA 10195311

DATE/TIME PERFORMED: Wed Oct 14 21:10:19 2015

DAYS SINCE CAL: 8

UNIT #: 3882TD HL6713

	I.D.	MULT	ADD	I.D. (in)
CALIPER	1540.8	0.00794	-4.04873	8.193
				7.375 8.375

	<b>COMPANY</b> <u>PICEANCE ENERGY LLC</u> <b>WELL</b> <u>PICEANCE FEDERAL 28-21E</u> <b>FIELD</b> <u>VEGA</u> <b>COUNTY</b> <u>MESA</u> <b>STATE</b> <u>COLORADO</u>	<b>FILE NO:</b> <u>MD11447</u> <b>API NO:</b> <u>05-077-10250</u>	
	<b>LOCATION:</b> SHL: 1981' FSL & 2484' FWL BHL: 113' FSL & 881' FEL SEC 28 T9S R93W	<b>ELEVATIONS:</b> KB 7701 FT DF 7700 FT GL 7679 FT	<b>FINAL PRINT</b>
	<b>DATE</b> 14-OCT-2015		