



**SECTOR  
CEMENT BOND LOG**

Company	H&C OPERATING INC.	Country	
Well	ROSALIE K-F UNIT 7-18 SWD		
Field	HURLBUT WEST		
County	GRAHAM		
State	KANSAS		
Location:	SE - SE - NE 2310' FNL & 330' FEL	API #: 15-065-00904-00-01	Other Services MASSP/RL 50X2 STRIP JETS
Permanent Datum	GROUND LEVEL Elevation	2471'	Elevation
Log Measured From	8' AGL K.B.		K.B. 2479'
Drilling Measured From	KELLY BUSHING		D.F. 2478'
			G.L. 2471'

Date	12/5/2019
Run Number	ONE
Depth Driller	2216'
Depth Logger	2149'
Bottom Logged Interval	2148'
Top Log Interval	0'
Open Hole Size	8 5/8"
Type Fluid	WATER
Density / Viscosity	N/A
Max Recorded Temp.	100 deg.
Estimated Cement Top	///
Time Well Ready	8:00 AM
Time Logger on Bottom	8:15 AM
Equipment Number	T-173
Location	HAYS
Recorded By	A DREILING
Witnessed By	MR BOB PLANTE

Borehole Record		Tubing Record					
Run Number	Bit	From	To	Size	Weight	From	To
ONE	8 5/8"	0'	232'	8 5/8"	23#	0'	232'
TWO	7 7/8"	0'	2173'	5.5"	15.5 #	0'	2173'

Casing Record	Size	Wd/FI	Top	Bottom
Surface String				
Prot. String				
Production String				
Liner				

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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**

**LOG NOT CORRELATED**

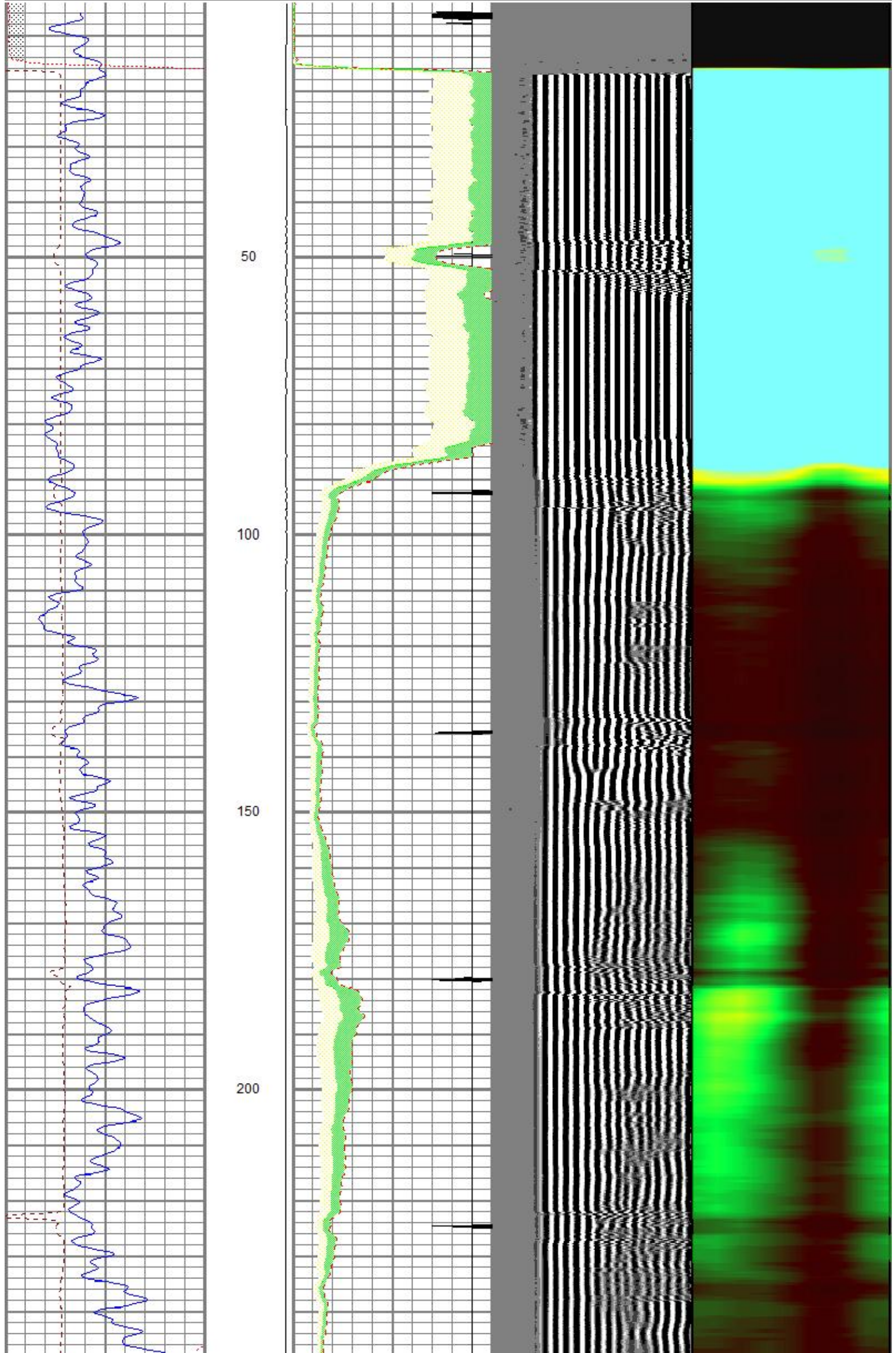
ST. PETER KS.  
N TO H RD (REDLINE),  
E TO 180 TH, 2N, 1/2 W,  
S INTO.

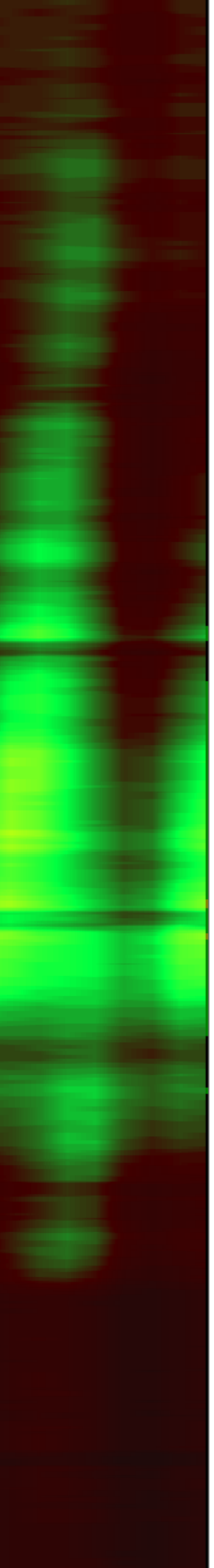
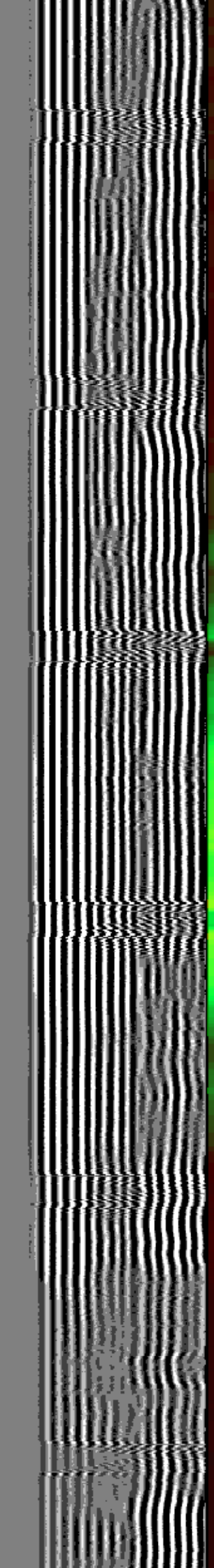
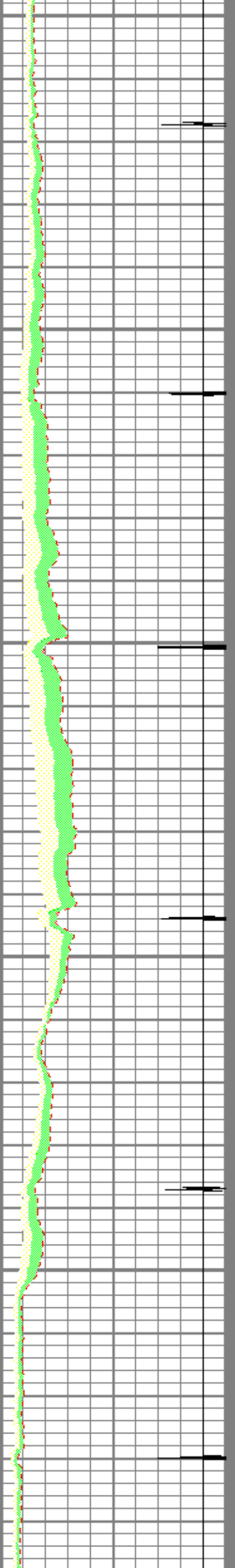
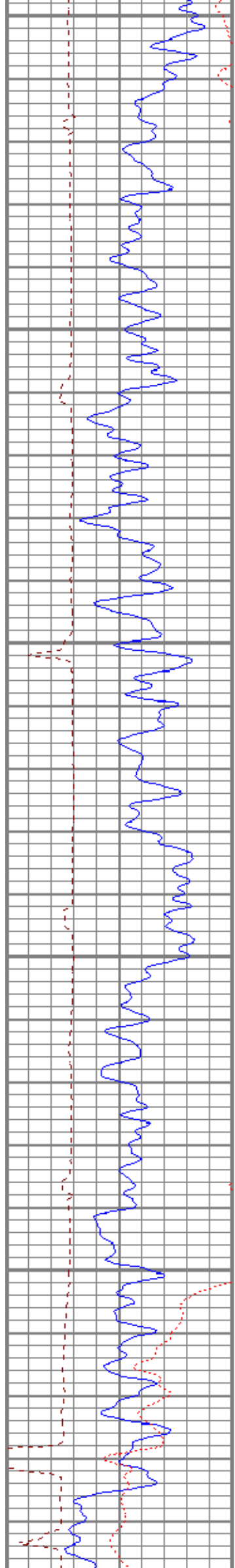


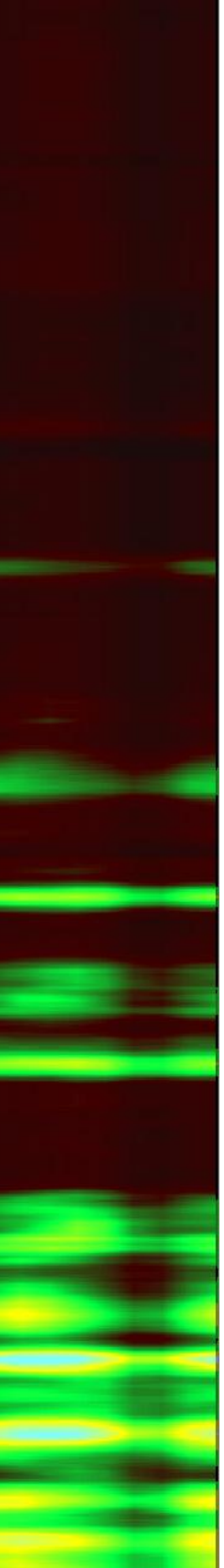
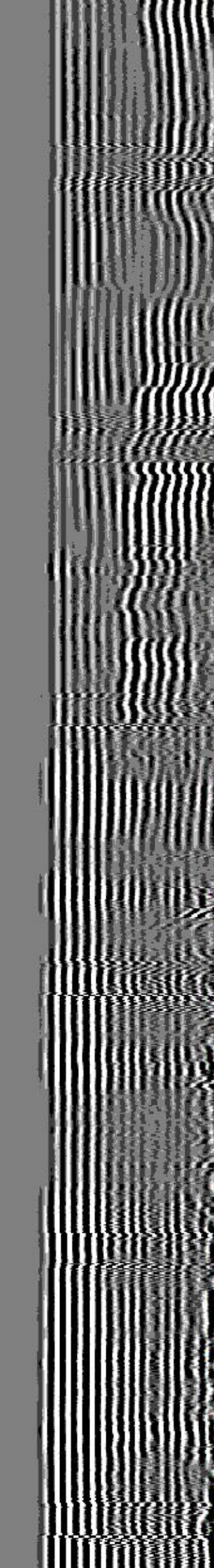
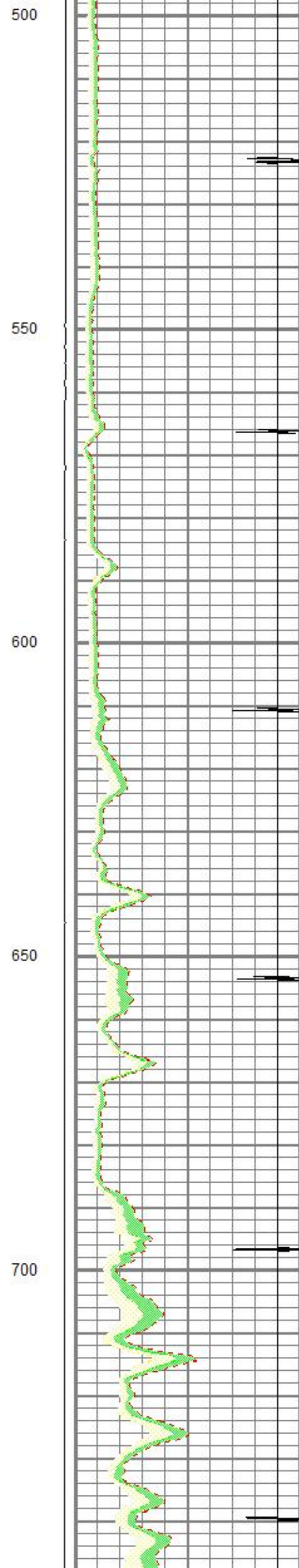
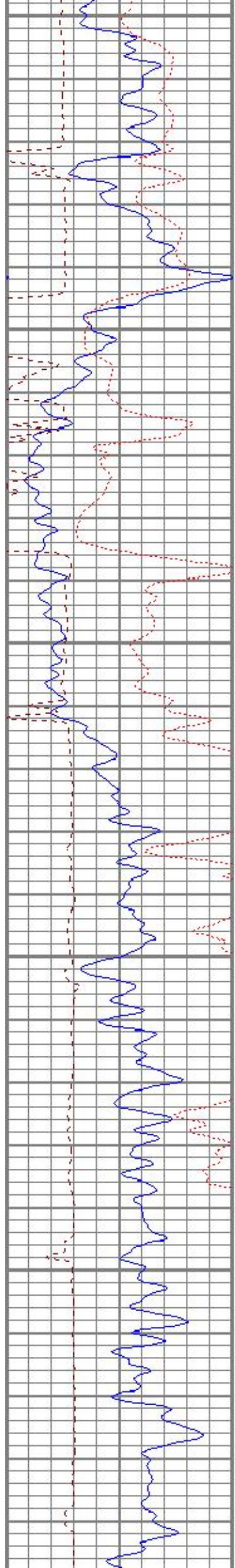
# MAIN PASS

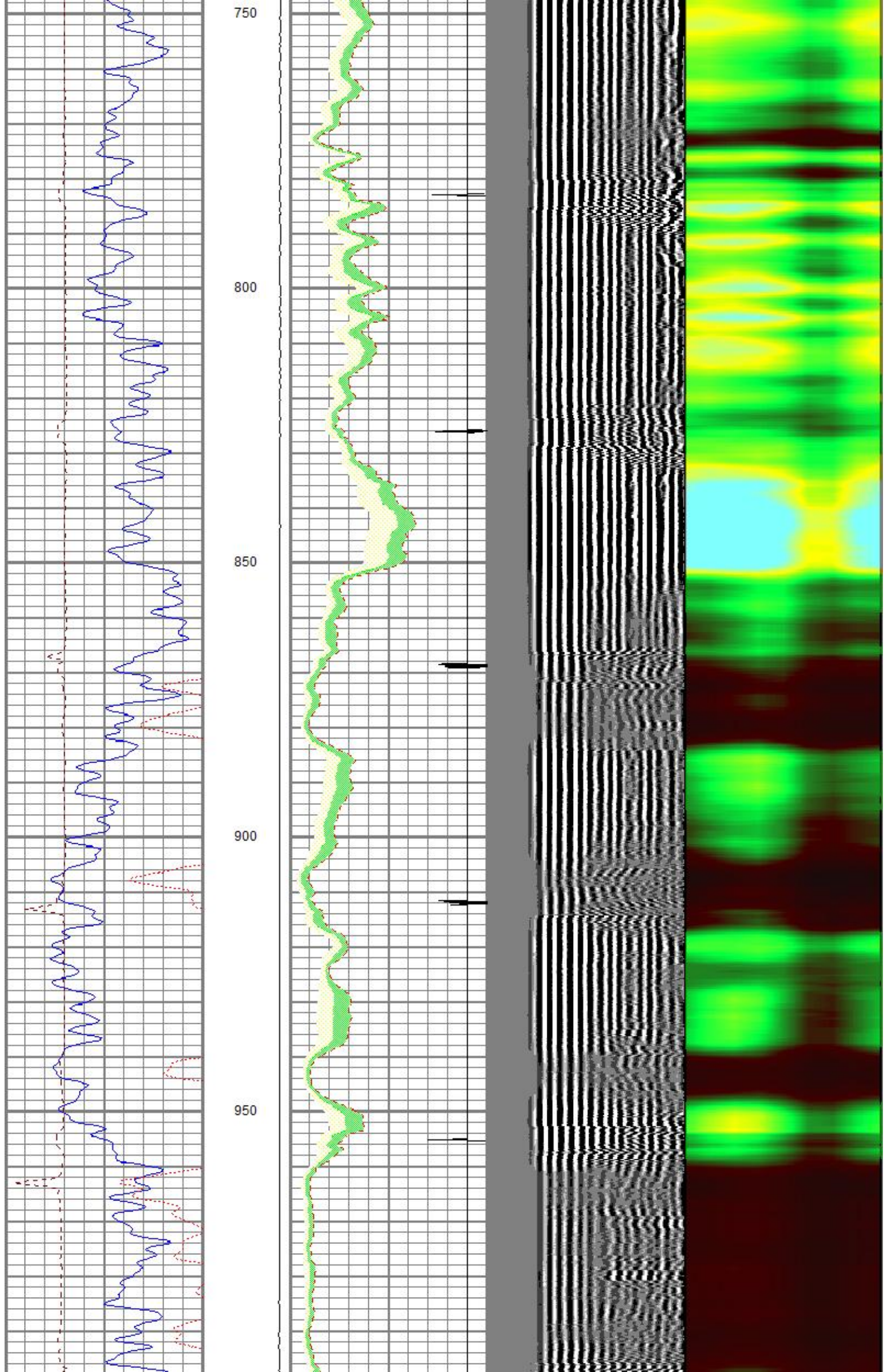
Database File t-173-2019-5\h&clk-f unit 7-18 swd\h&c k-f unit 7-18 swd.db  
 Dataset Pathname k.f.\_unit\_7-18v\_swd\sgrcbl/pass2  
 Presentation Format sectorco  
 Dataset Creation Thu Dec 05 08:43:24 2019  
 Charted by Depth in Feet scaled 1:240

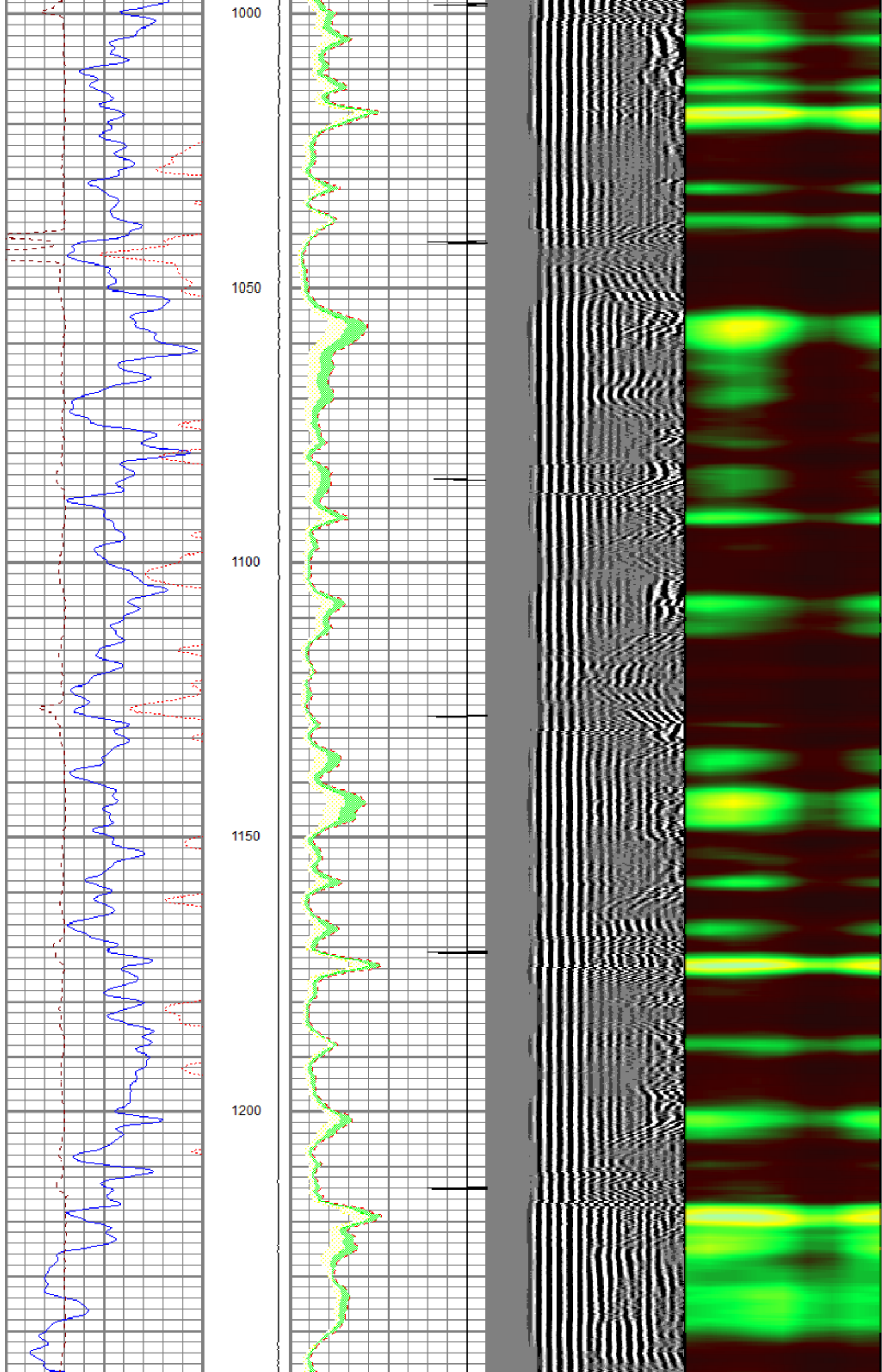
0	GR (GAPI)	150	LTEN	0	AMPMAX	100	200	WVF5FT (usec)	1200	1	Sector Map	8
450	TT3FT (usec)	250	(lb)	0	AMPAVG	100						
0	AMP3FT (mV)	100	3999 -300	0	AMPMIN	100						

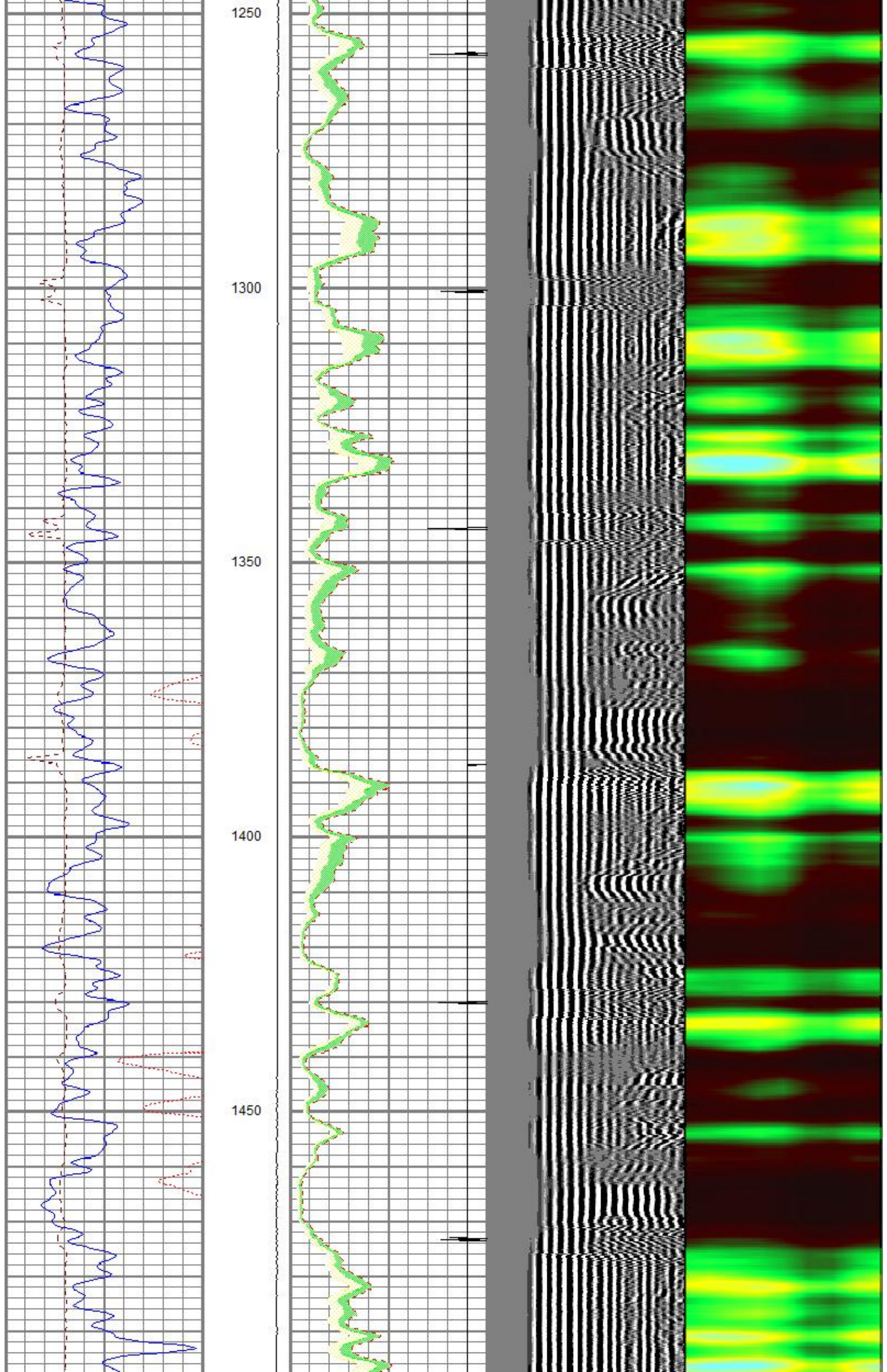


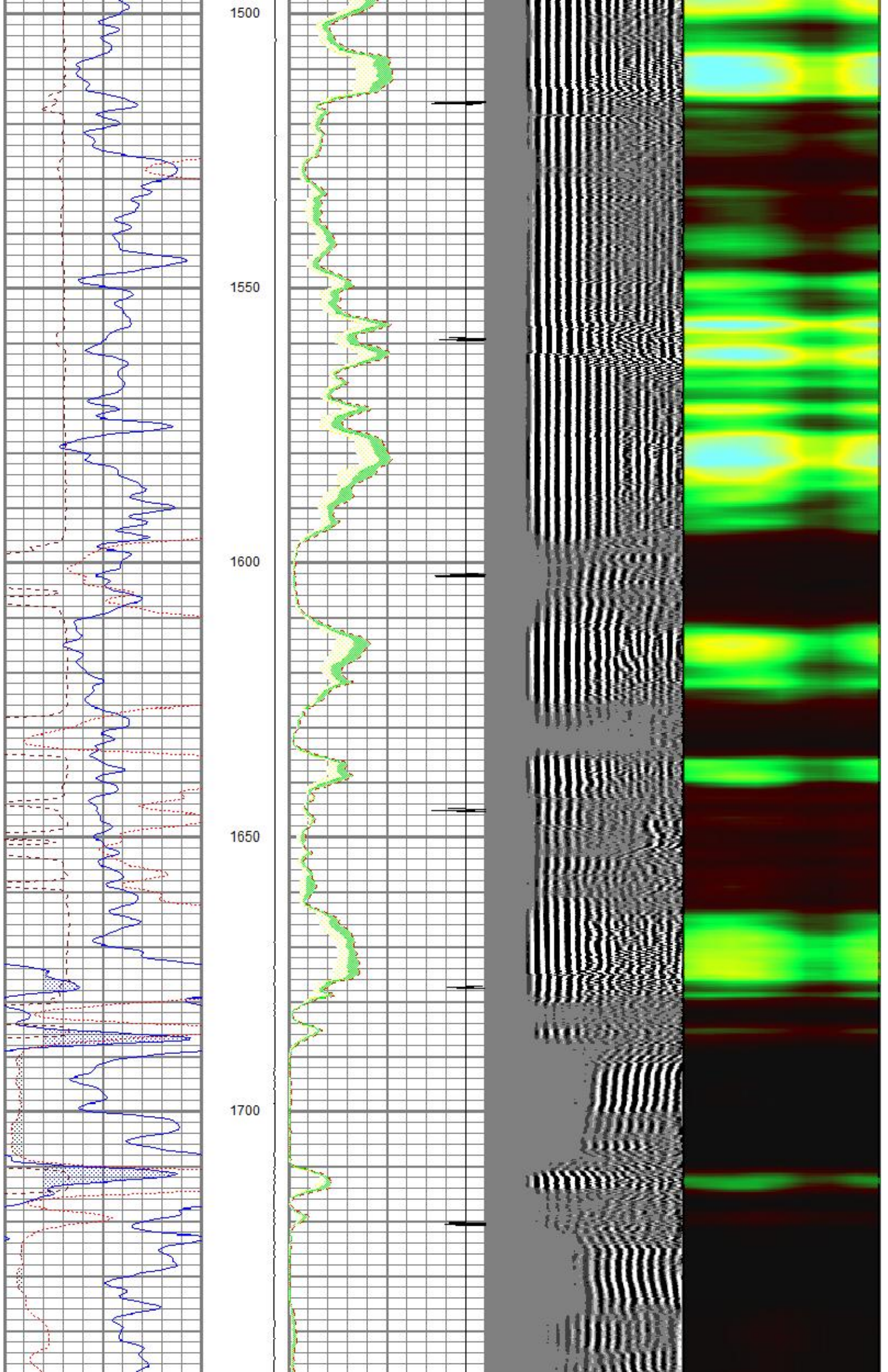


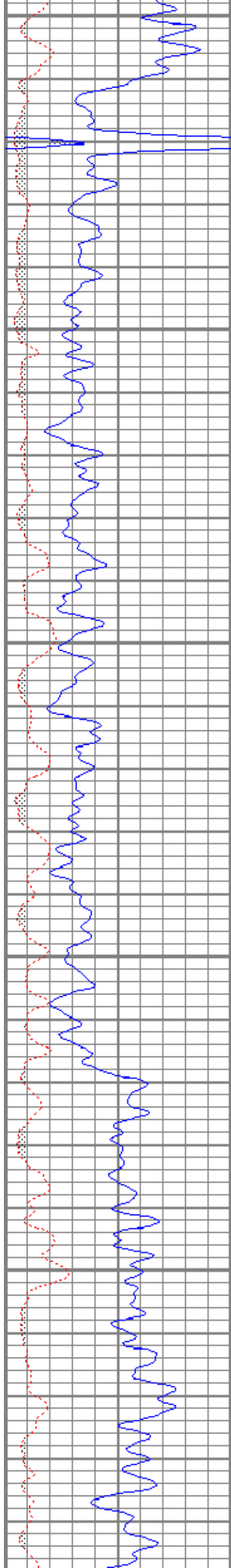




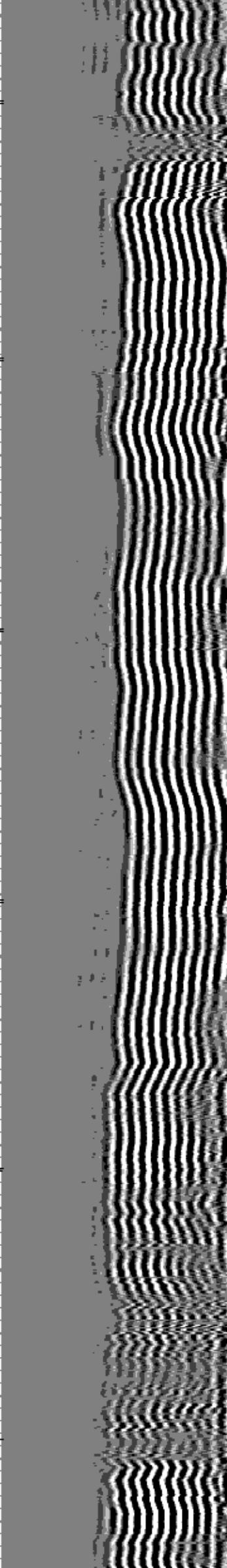
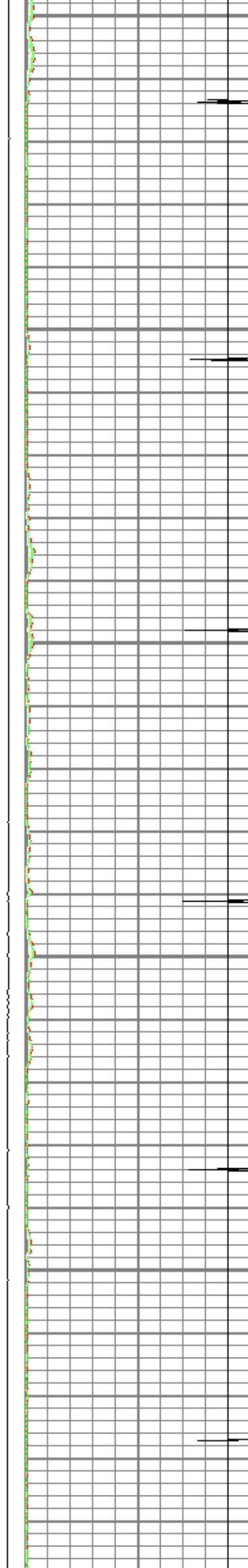


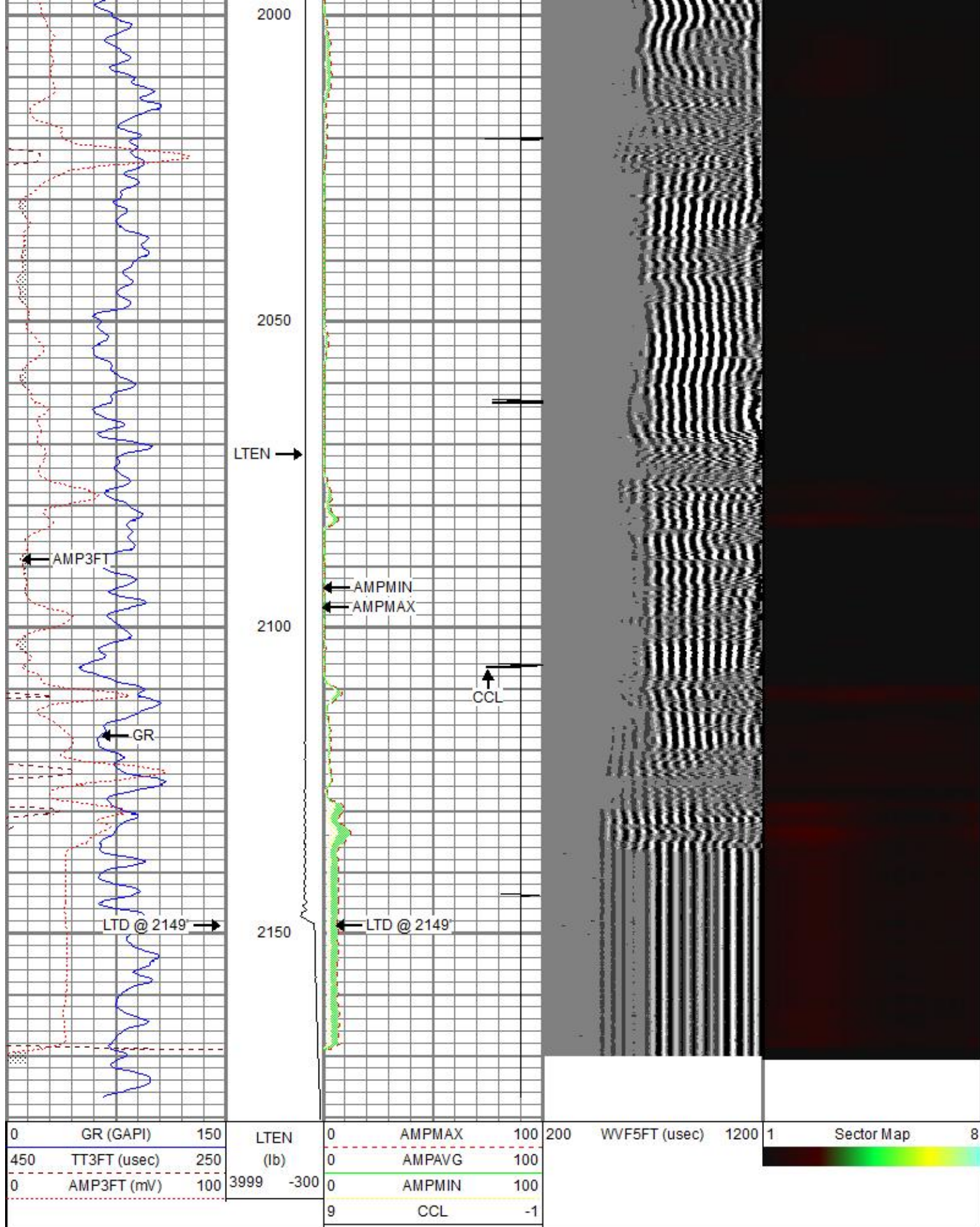






1750  
1800  
1850  
1900  
1950

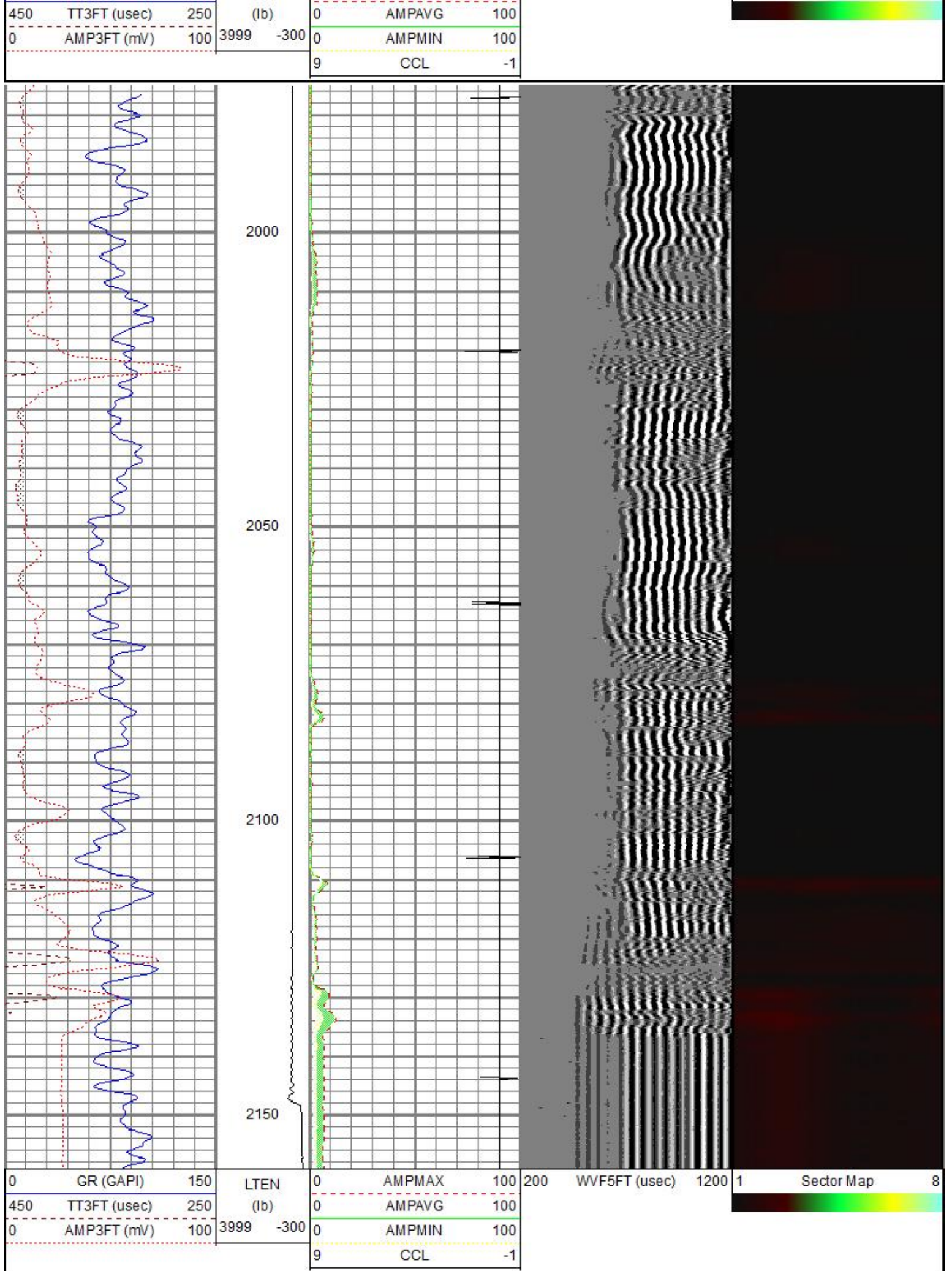




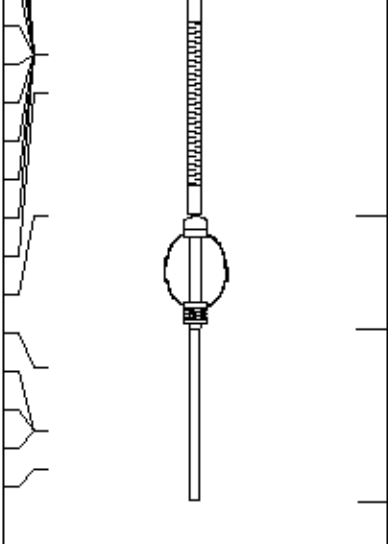
# REPEAT SECTION

Database File t-173-2019-5lh&clk-f unit 7-18 swd\h&c k-f unit 7-18 swd.db  
 Dataset Pathname k.f\_unit\_7-18v\_swd/sgrcbl/pass1.1  
 Presentation Format sectorco  
 Dataset Creation Thu Dec 05 08:56:21 2019  
 Charted by Depth in Feet scaled 1:240

0	GR (GAPI)	150	LTEN	0	AMPMAX	100	200	WVF5FT (usec)	1200	1	Sector Map	8
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Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
WVFS8	11.63		CENT-275 2 3/4" Centralizer	2.94	2.75	10.00
WVFS7	11.63					
WVFS6	11.63					
WVFS5	11.63					

WVFS4	11.63		RBT-Probe (080321) Prototype Probe Radii Bond Tool with Digital Telemetry	8.33	2.75	90.00	
WVFS3	11.63						
WVFS2	11.63						
WVFS1	11.63						
WVFCAL	11.63						
WVF3FT	11.63						
WVF5FT	10.63			CENT-275 2 3/4" Centralizer	2.94	2.75	10.00
HEADVOLT	7.44						
CCL	3.50						
ACCZ	1.83						
ACCY	1.83						
ACCX	1.83		GR-275D_INC (080616) 2-3/4" GR-CCL with Inclination	4.50	2.75		
GR	0.83						

Dataset: H&C k-f unit 7-18 swd.db: field/k.f.\_unit\_7-18v\_swd/sgrcbl/pass2  
Total length: 18.71 ft  
Total weight: 110.00 lb  
O.D.: 2.75 in

## Log Variables

Database: C:\ProgramData\Warrior\Data\T-173-2019-5\H&C\F UNIT 7-18 SWD\H&C k-f unit 7-18 swd.db  
Dataset: field/k.f.\_unit\_7-18v\_swd/sgrcbl/pass2/\_vars\_

### Top - Bottom

BOREID in 7.875	BOTTEMP degF 100	CASEOD in 5.5	CASETHCK in 0	CASEWGHT lb/ft 11.5	MAXAMPL mV 0	MINAMPL mV 1	MINATTN db/ft 0.8	PERFS No
PPT usec 0	SRFTEMP degF 0	TDEPTH ft 0						

### Variable Description

BOREID : Borehole I.D.	CASEWGHT : Casing Weight	PERFS : Perforation Flag
BOTTEMP : Bottom Hole Temperature	MAXAMPL : Maximum Amplitude	PPT : Predicted Pipe Time
CASEOD : Casing O.D.	MINAMPL : Minimum Amplitude	SRFTEMP : Surface Temperature
CASETHCK : Casing Thickness	MINATTN : Minimum Attenuation	TDEPTH : Total Depth

### Calibration Report

Database File: C:\ProgramData\Warrior\Data\T-173-2019-5\H&C\F UNIT 7-18 SWD\H&C k-f unit 7-18 swd.db  
Dataset Pathname: k.f.\_unit\_7-18v\_swd/sgrcbl/pass1  
Dataset Creation: Thu Dec 05 08:33:09 2019

### Gamma Ray Calibration Report

Serial Number: 080616  
Tool Model: 275D\_INC  
Performed: Wed Jul 31 09:17:14 2019

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
Calibrator Reading: 1.0 cps

Sensitivity: 1.6000 GAPI/cps

### Inclinometer Calibration Report

Performed: Thu Nov 29 16:04:48 2018

	Low Read.	High Read.	Low Ref.	High Ref.	
X Accelerometer	-3588.00	3622.00	-1.00	1.00	gee
Y Accelerometer	-3696.00	3614.00	-1.00	1.00	gee
Z Accelerometer	20.00	3582.40	0.00	1.00	gee

## Segmented Cement Bond Log Calibration Report

Serial Number: 080321  
 Tool Model: Probe  
 Calibration Casing Diameter: 5.500 in  
 Calibration Depth: 779.775 ft

Master Calibration, performed Thu Sep 05 15:19:08 2019:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.055	0.971	1.000	71.921	77.492	-3.294
CAL	0.056	1.581				
5'	0.056	0.734	1.000	71.921	104.678	-4.901
SUM						
S1	0.057	1.049	0.000	72.000	72.581	-4.126
S2	0.056	0.966	0.000	72.000	79.172	-4.447
S3	0.056	0.901	0.000	72.000	85.185	-4.784
S4	0.056	0.882	0.000	72.000	87.135	-4.894
S5	0.056	0.969	0.000	72.000	78.857	-4.428
S6	0.056	1.229	0.000	72.000	61.401	-3.449
S7	0.056	1.293	0.000	72.000	58.201	-3.268
S8	0.056	1.107	0.000	72.000	68.496	-3.846

Internal Reference Calibration, performed Thu Sep 05 15:17:53 2019:

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.056	1.581	1.000	0.000

Air Zero Calibration, performed Thu Sep 05 15:19:35 2019:

	Raw (v)		Calibrated (v)		Results	
	Zero		Zero			Offset
3'	0.056		0.000			-0.001
5'	0.056		0.000			0.000
SUM						
S1	0.056		0.000			0.001
S2	0.056		0.000			0.000
S3	0.056		0.000			0.000
S4	0.056		0.000			0.000
S5	0.056		0.000			0.000
S6	0.056		0.000			0.000
S7	0.056		0.000			0.001
S8	0.057		0.000			-0.001

Company H&C OPERATING INC.  
 Well ROSALIE K-F UNIT 7-18 SWD  
 Field HURLBUT WEST  
 County GRAHAM State KANSAS

SECTOR  
 CEMENT BOND LOG

