

Company: St. Croix Operating, Inc.

Well: Jack Creek #1

Field: Wildcat

County: Washington State: Colorado

County: Washington  
Field: Wildcat  
Location: SENE  
Well: Jack Creek #1  
Company: St. Croix Operating, Inc.

Platform Express

Caliper

Cement Volume

SENE		Elev.:		K.B. 4603.00 ft			
2038 FNL 600 FEL		G.L.		4597.00 ft			
Lat/Long: 39.91161/-103.08922		D.F.		4603.00 ft			
Permanent Datum:		Ground Level		Elev.:		4597.00 f	
Log Measured From:		Kelly Bushing		6.00 ft		above Perm.Datum	
Drilling Measured From:		Kelly Bushing					
API Serial No.		Section:		Township:		Range:	
05-121-11078		4		2S		51W	

Logging Date 21-Jul-2018

Run Number 1A

Depth Driller 4273.00 ft

Schlumberger Depth 4270.00 ft

Bottom Log Interval 4270.00 ft

Top Log Interval 0.00 ft

Casing Driller Size @ Depth 8.625 in @ 470.00 ft

Casing Schlumberger 475 ft

Bit Size 7.875 in

Type Fluid In Hole Water

Density 8.8 lbm/gal

Fluid Loss PH 43 s

Source of Sample 8.5

MUD

RM @ Meas Temp Active Tank

RMF @ Meas Temp 0.2 ohm.m @ 68 degF

RMC @ Meas Temp 0.15 ohm.m @ 68 degF

Source RMF RMC

RM @ BHT RMC @ BHT

Max Recorded Temperatures Pressed

Circulation Stopped 133 degF

Logger on Bottom 21-Jul-2018 11:30:00

Unit Number 21-Jul-2018 16:14:00

Recorded By 9108

Witnessed By Evan Grzecki

Thomas

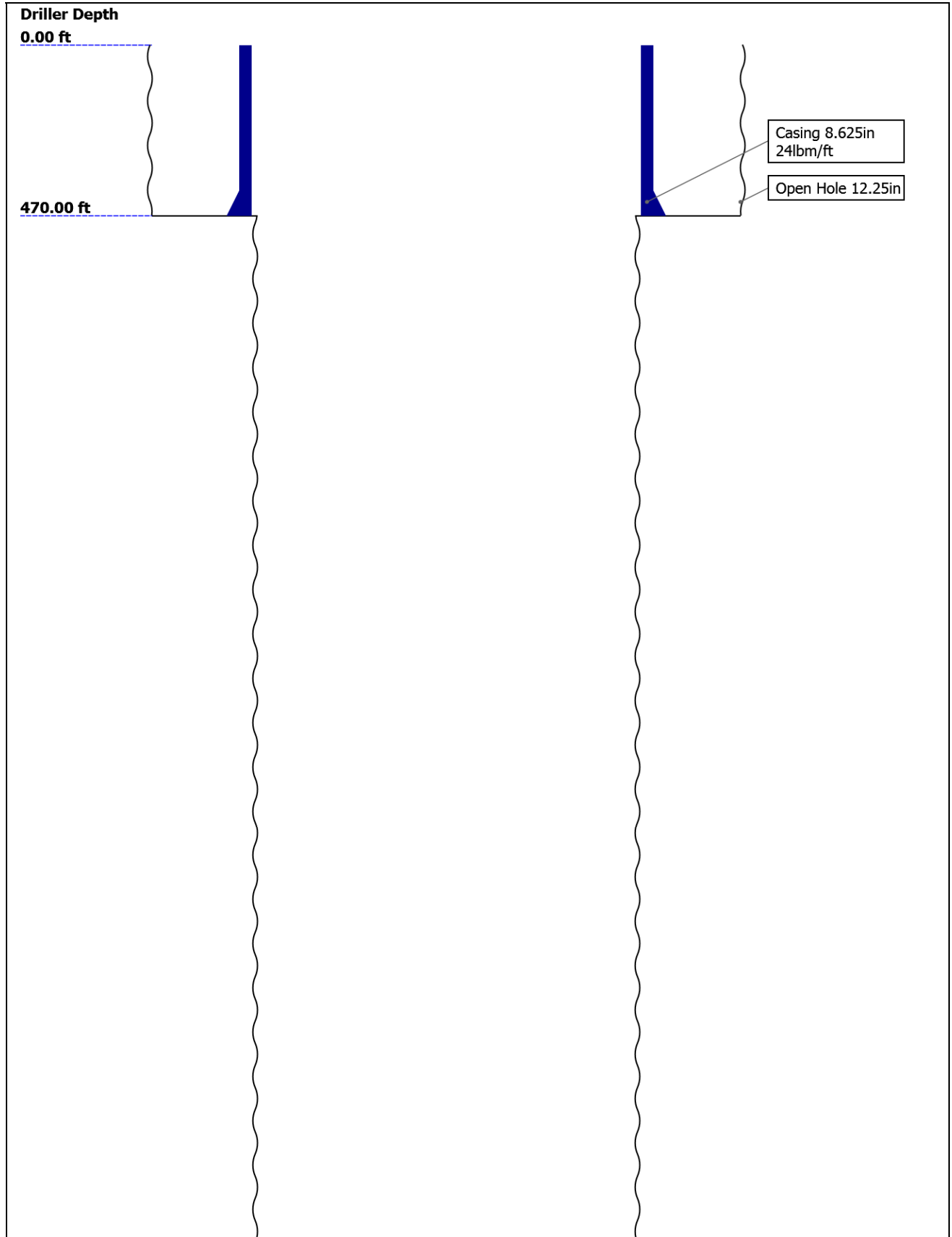
Disclaimer

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## Well Sketch





4273.00 ft

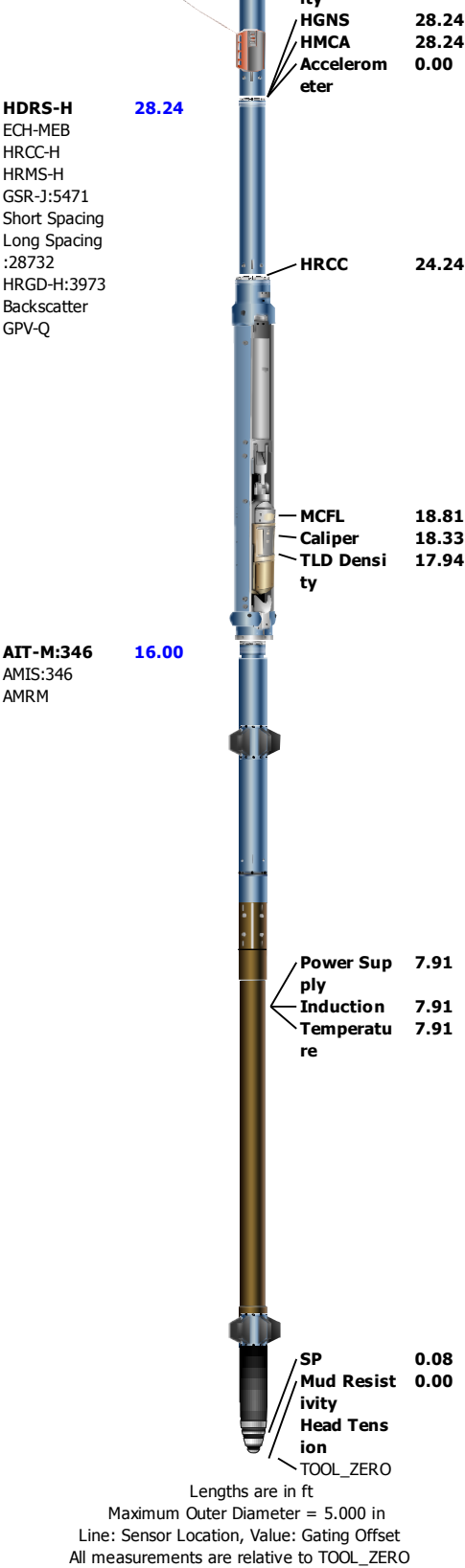
Open Hole 7.875in

## Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	12.25	7.875				
Top Driller ( ft )	0	470				
Top Logger ( ft )	0	475				
Bottom Driller ( ft )	470	4273				
Bottom Logger ( ft )	475	4270				
Casing						
Size ( in )	8.625					
Weight ( lbm/ft )	24					
Inner Diameter ( in )	8.097					
Grade	N/A					
Top Driller ( ft )	0					
Top Logger ( ft )	0					
Bottom Driller ( ft )	470					
Bottom Logger ( ft )	475					

## Remarks and Equipment Summary

1A: Toolstring				1A: Remarks
<b>Equip name</b> <b>LEH-QT</b> LEH-QT	<b>Length</b> <b>47.64</b>	<b>MP name</b>	<b>Offset</b>	Thank you for choosing Schlumberger!
				Logs run for formation evaluation
				Toolstring run slick as per client request
				TD-4050ft -> MATRIX: Sandstone; MDEN: 2.65
				4050ft-3100ft -> MATRIX: Limestone; MDEN: 2.71 g/cc
				Logs correlated to down log
<b>EDTC-B</b> EDTH-B EDTG-A EDTC-B	<b>44.15</b>	<b>CTEM</b> <b>ACCZ</b> <b>HV</b> <b>Gamma Ra</b> <b>y</b> <b>TelStatus</b> <b>Temperatu</b> <b>re</b> <b>GR</b>	<b>40.65</b> <b>0.00</b> <b>0.00</b> <b>38.78</b> <b>37.65</b> <b>37.62</b> <b>36.91</b>	Crew: Gary Lapp, Claude Walz
<b>HGNS-H</b> HGNH NPV-N NSR-F:5070 HMCA-H HACCZ-H:416 8 HGNS-H	<b>37.65</b>	<b>CNL Poros</b> <b>ity</b>	<b>30.57</b>	



## Depth Summary

1A

## Depth Measuring Device

Type	IDW-B
Serial Number	
Calibration Date	
Calibrator Serial Number	
Calibration Cable Type	
Wheel Correction 1	0
Wheel Correction 2	0



ICV	Borehole	6in - RT
IHV	Borehole	6in - RT
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

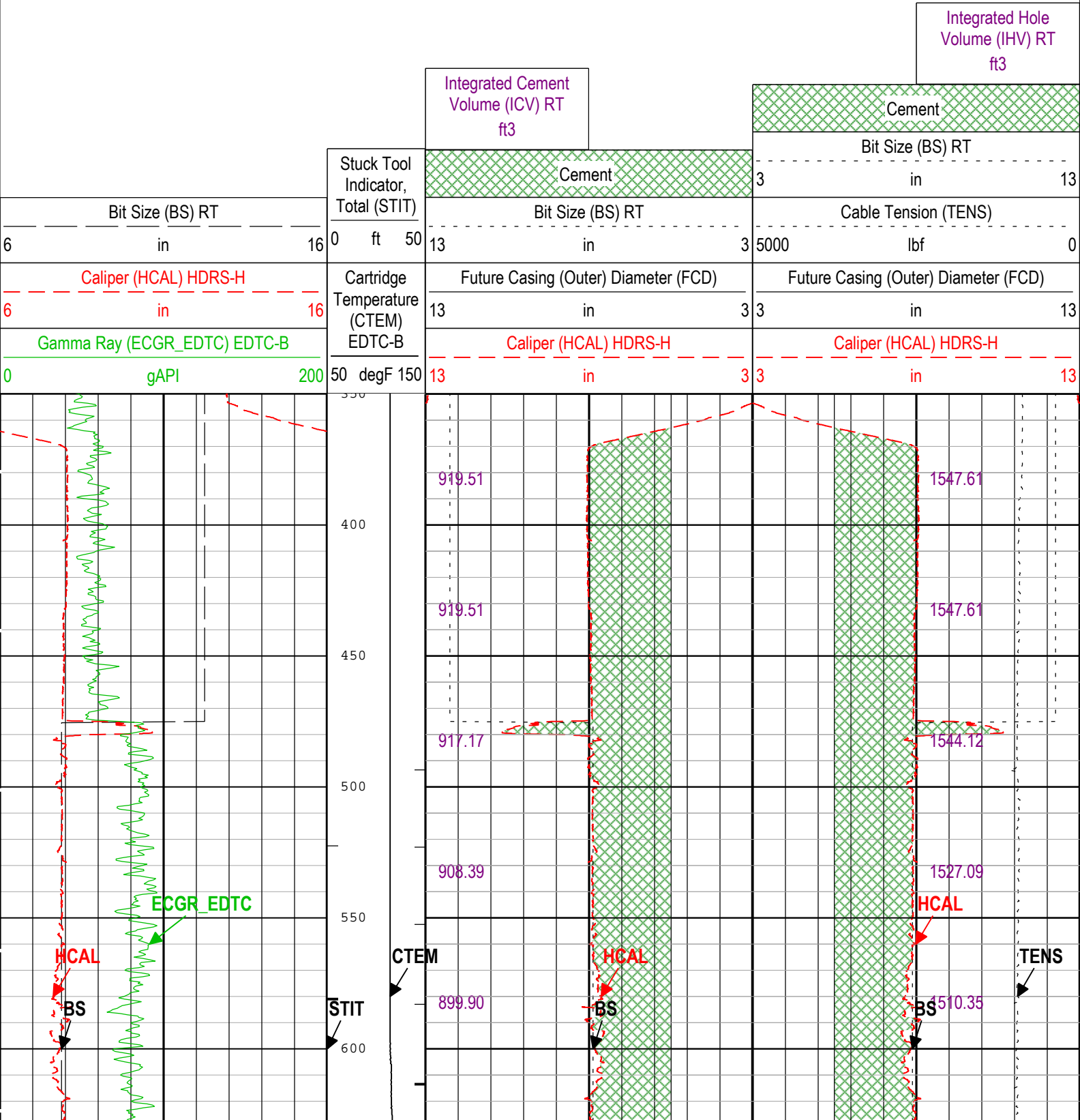
TIME\_1900 - Time Marked every 60.00 (s)

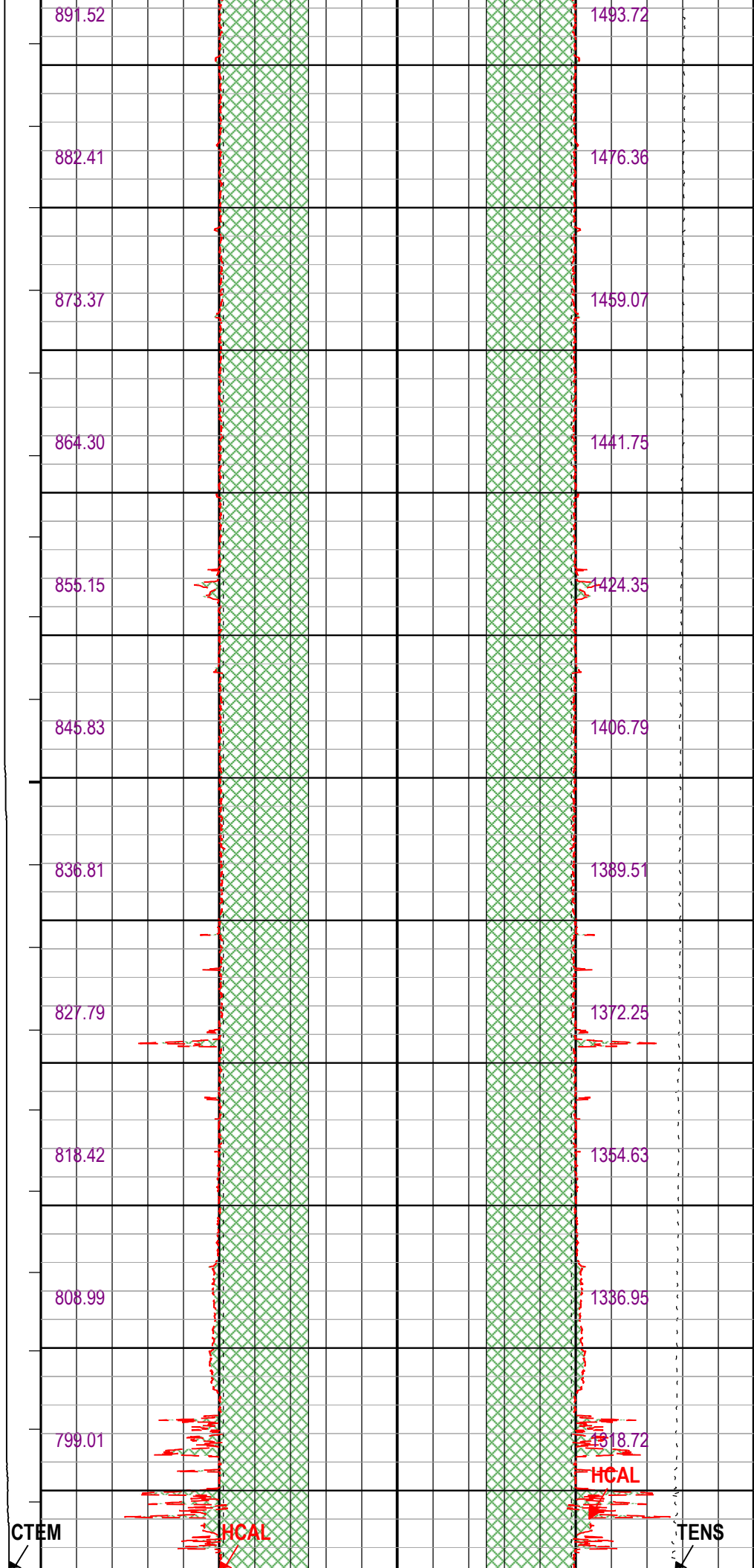
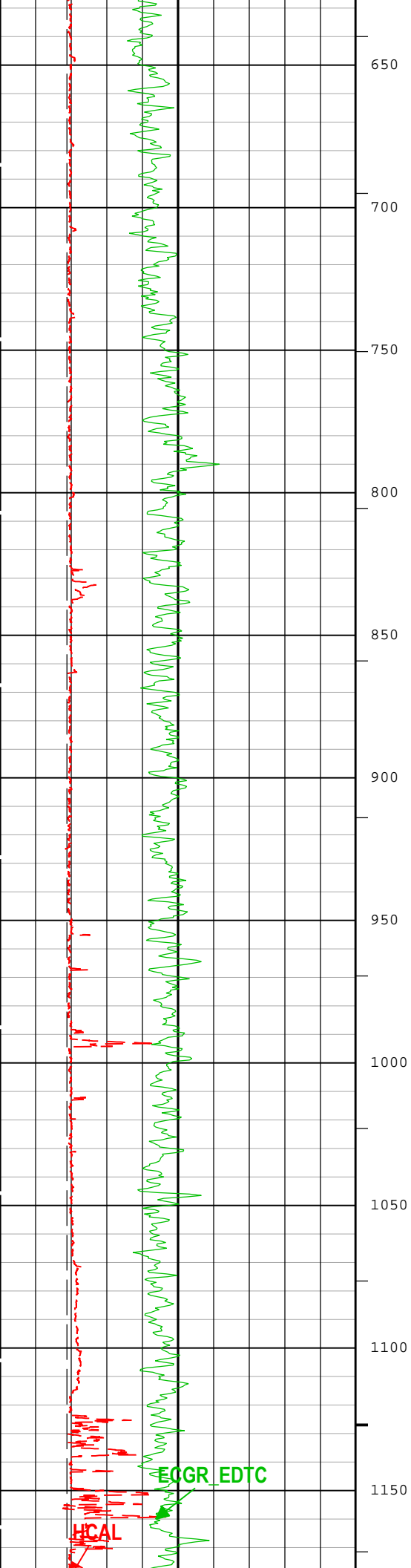
└─IHV - Integrated Hole Volume every 100.00 (ft3)

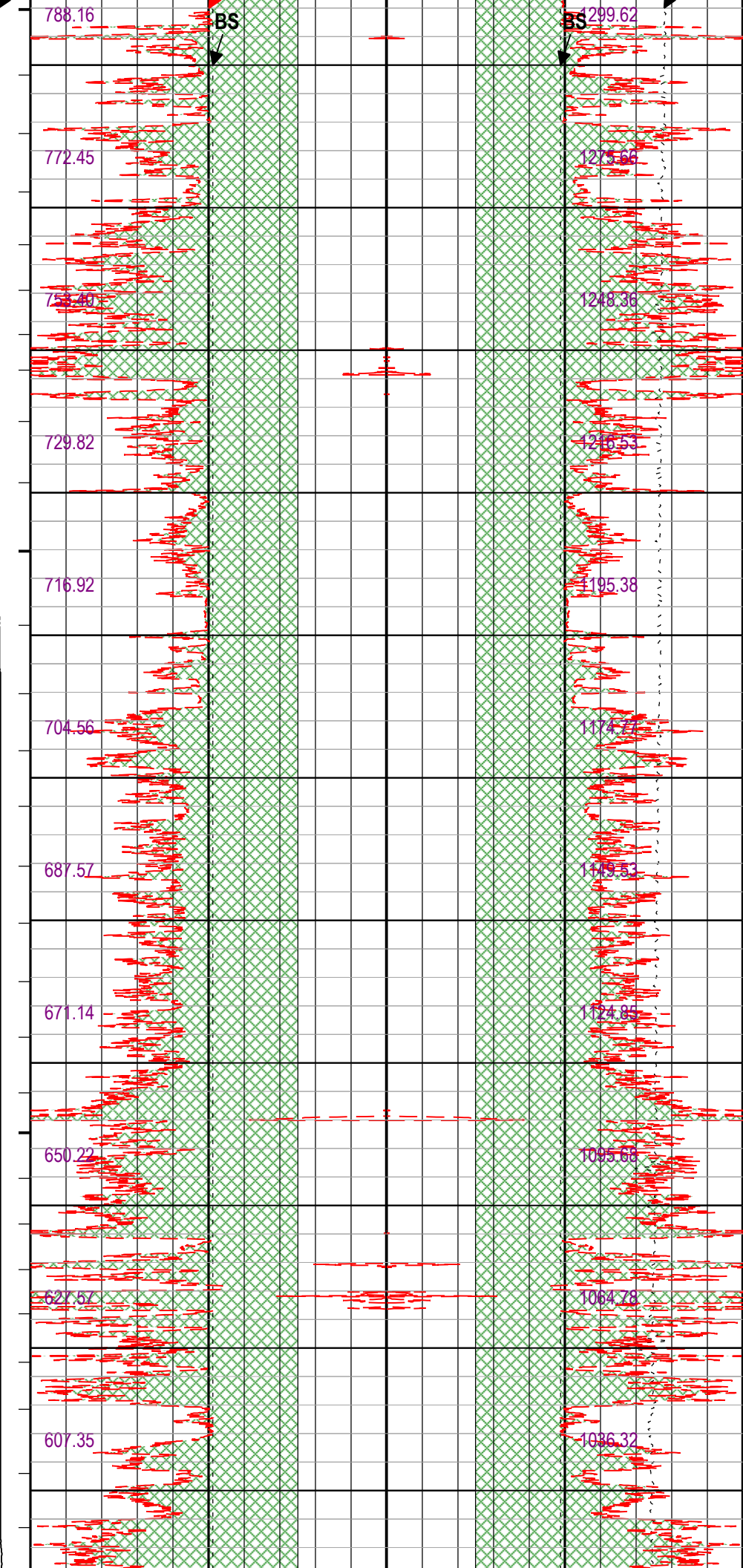
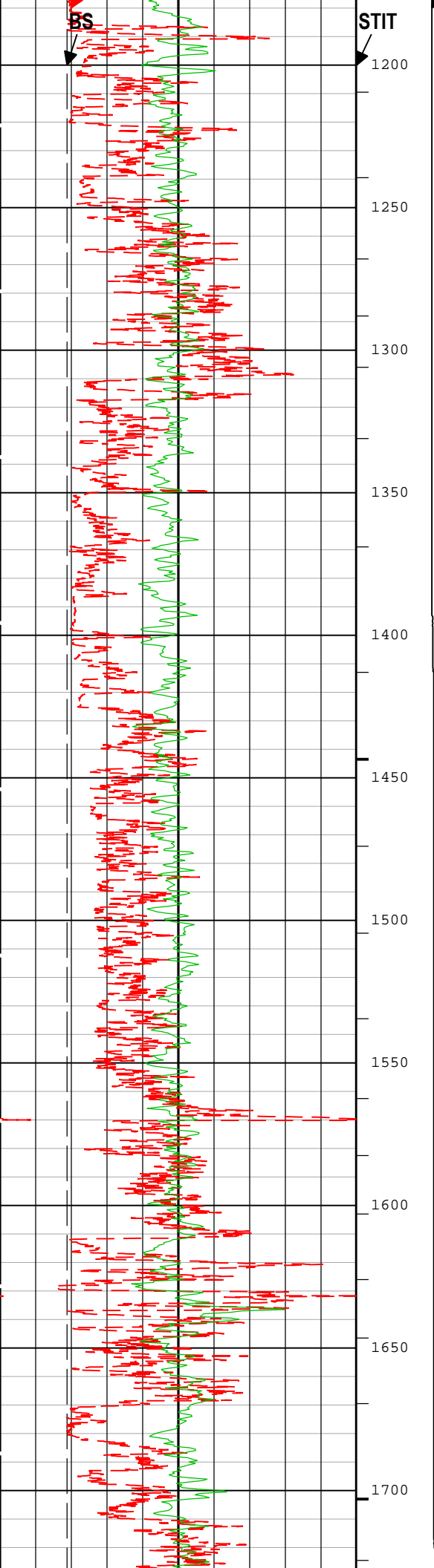
└─ICV - Integrated Cement Volume every 100.00 (ft3)

└─IHV - Integrated Hole Volume every 10.00 (ft3)

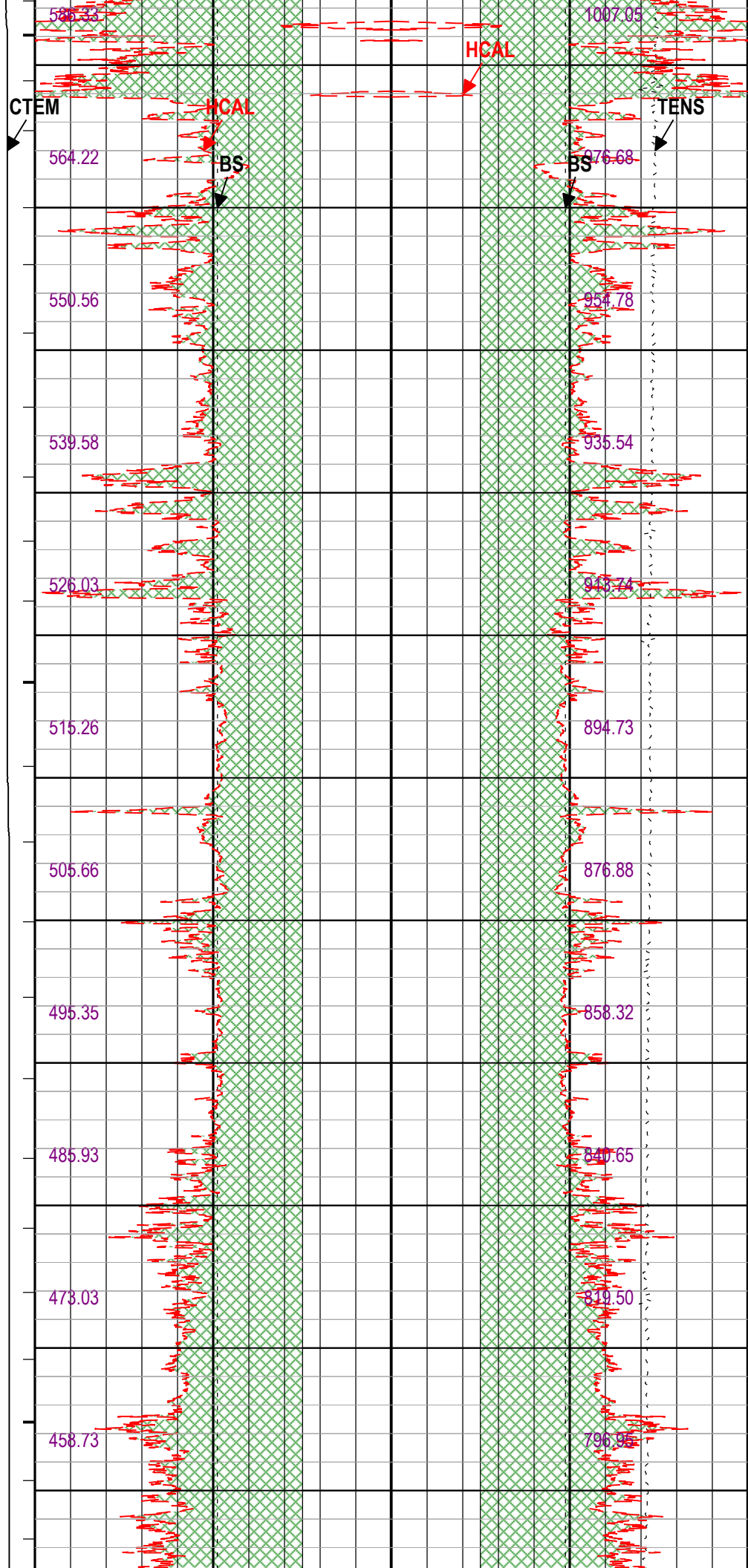
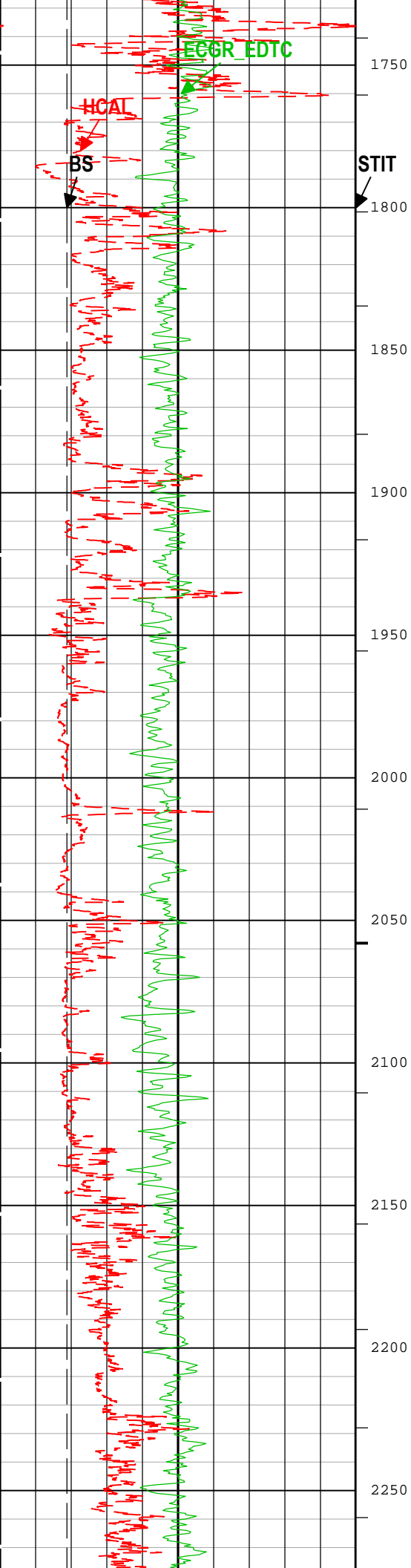
└─ICV - Integrated Cement Volume every 10.00 (ft3)

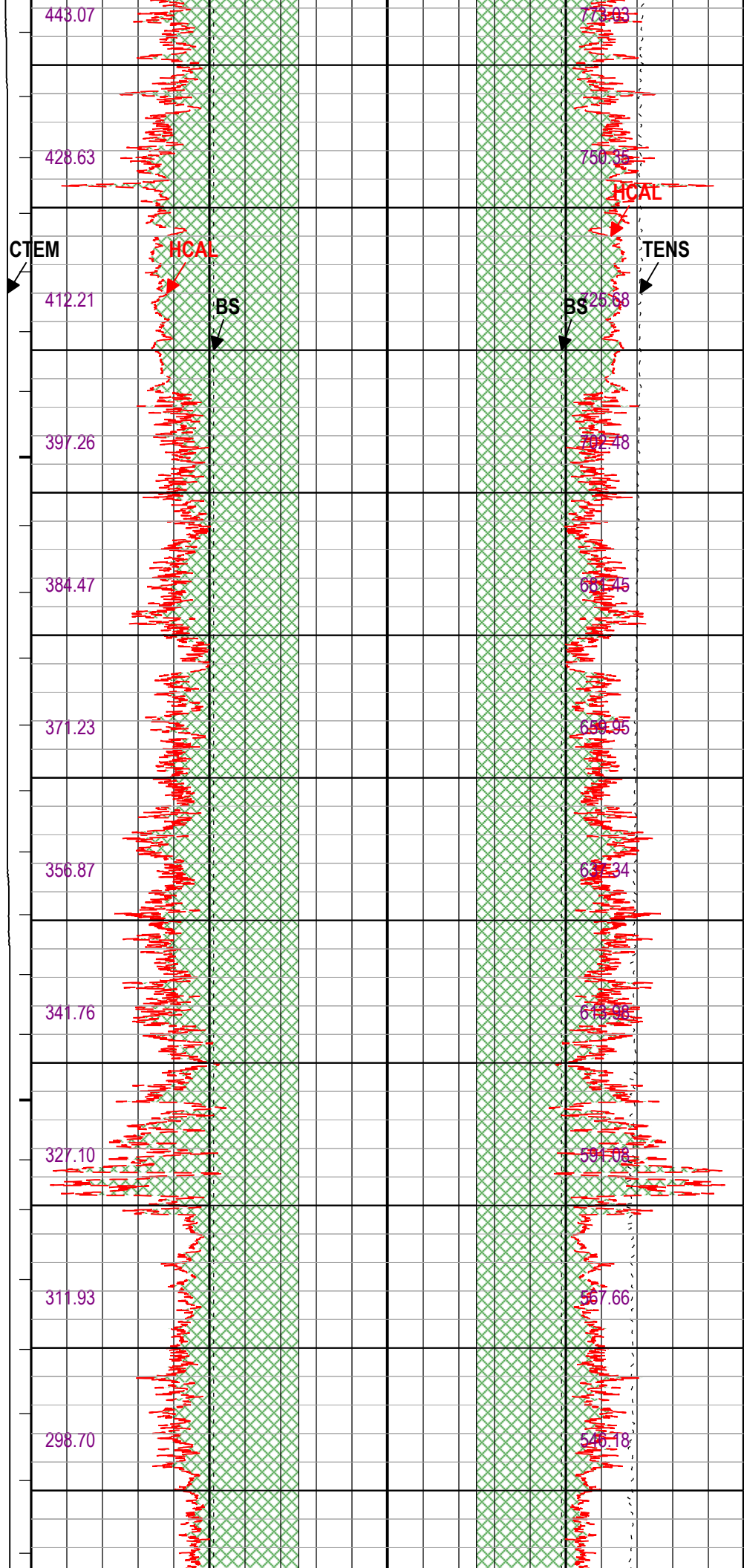
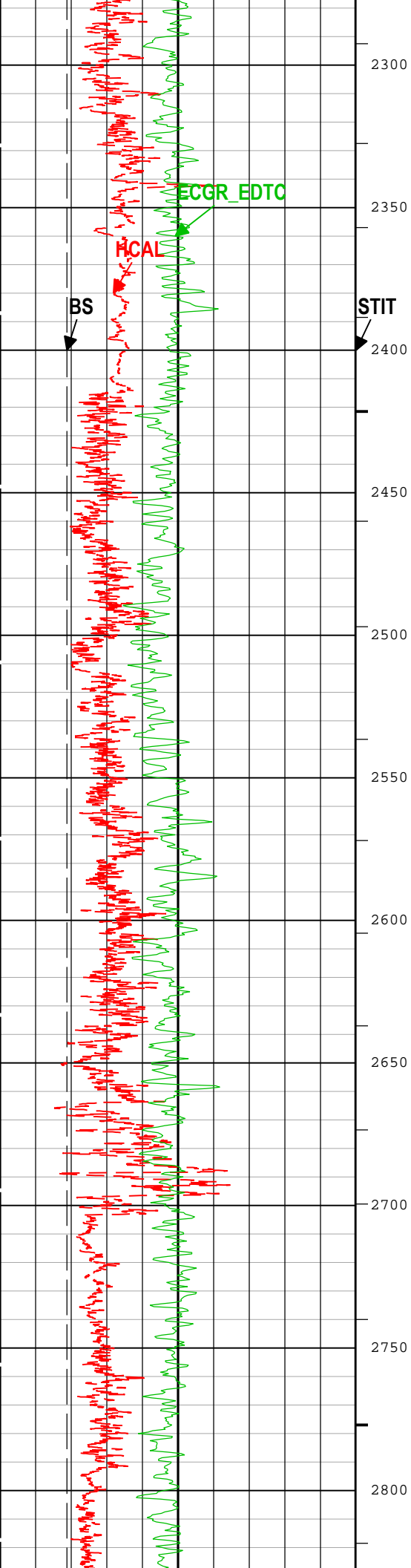


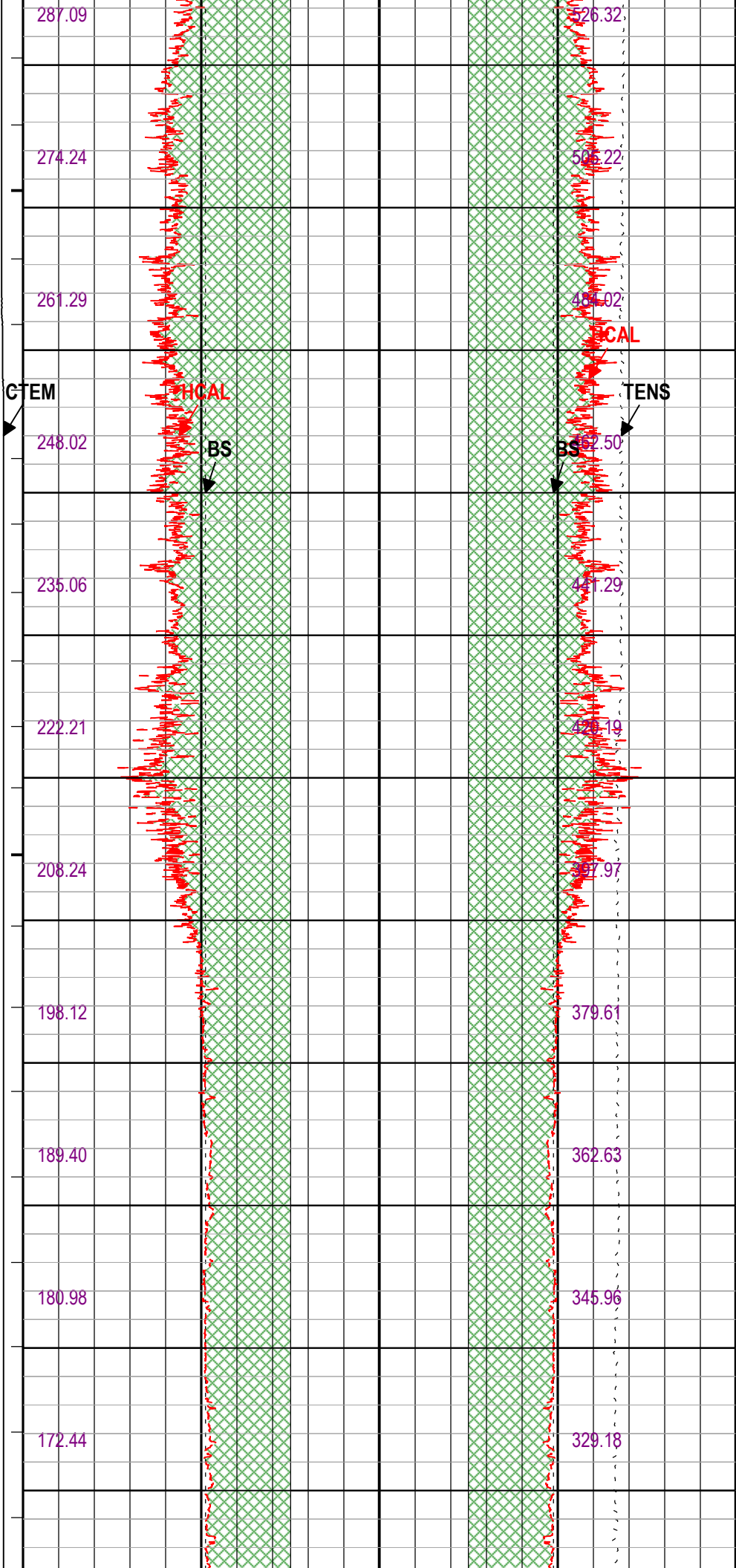
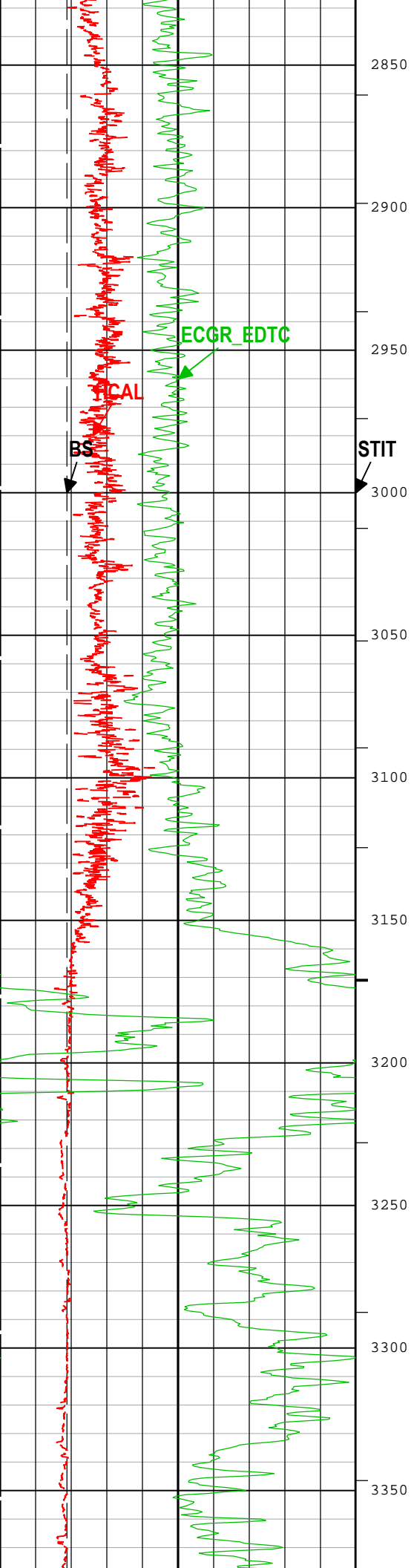


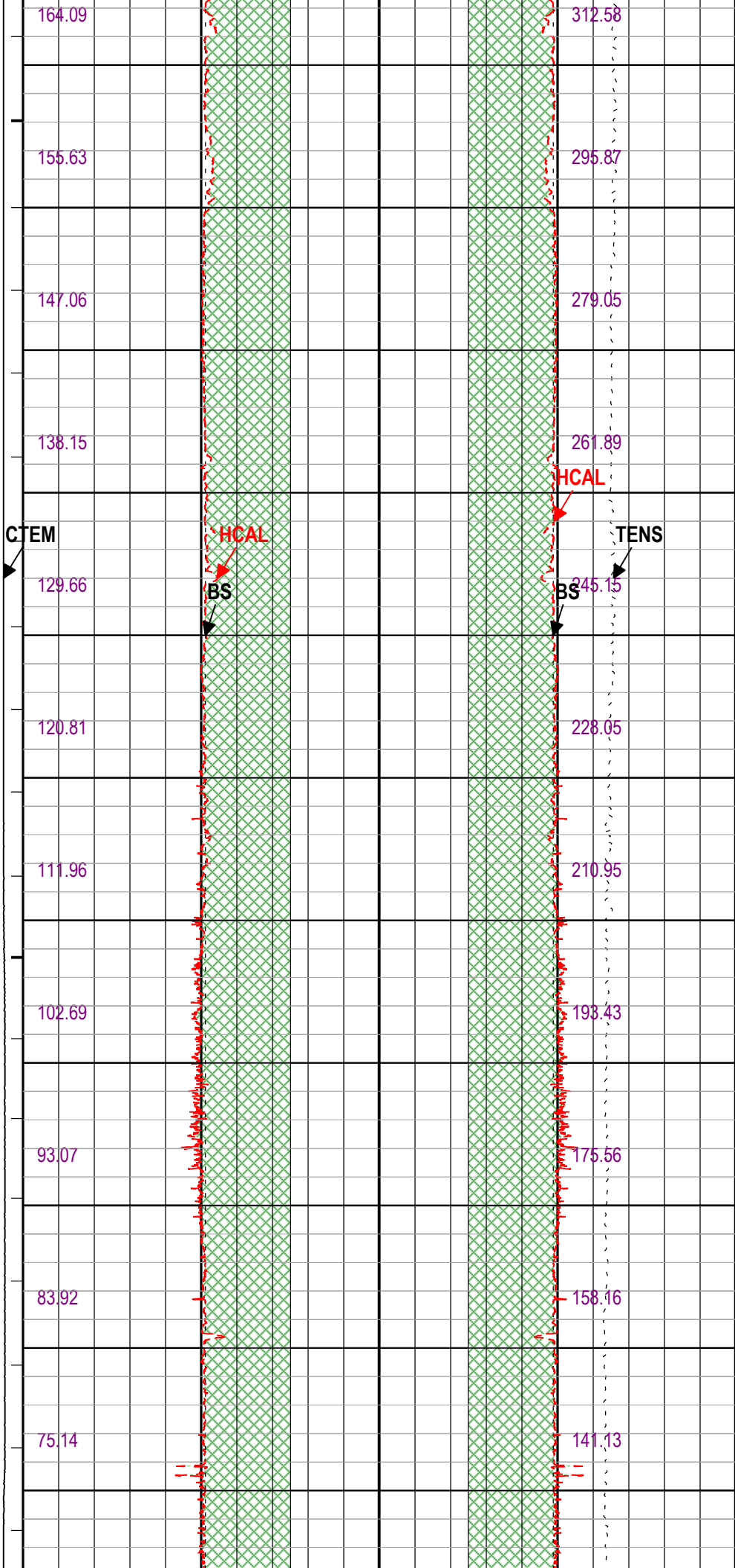
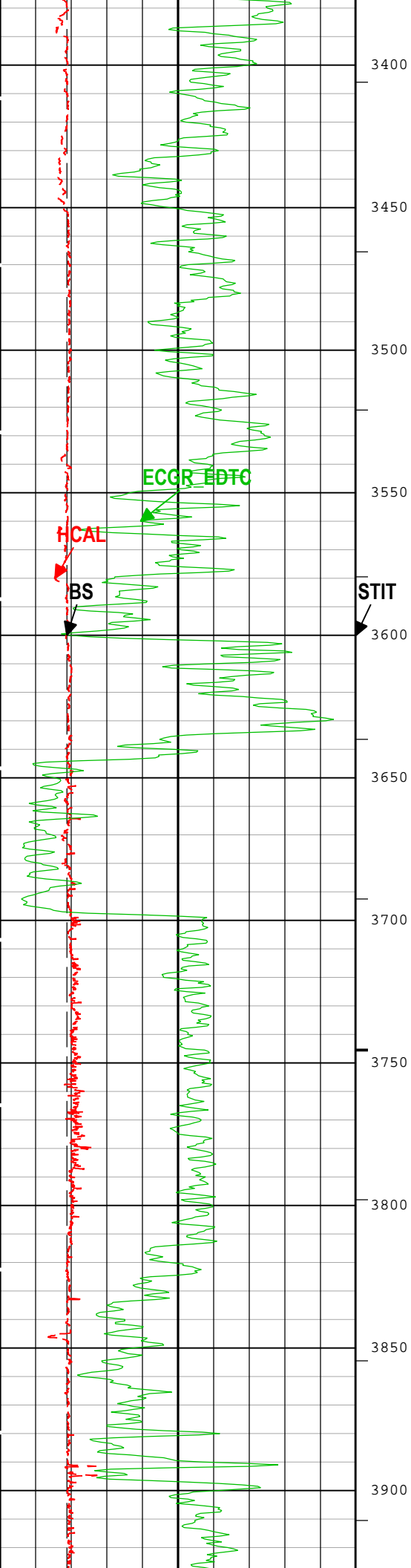


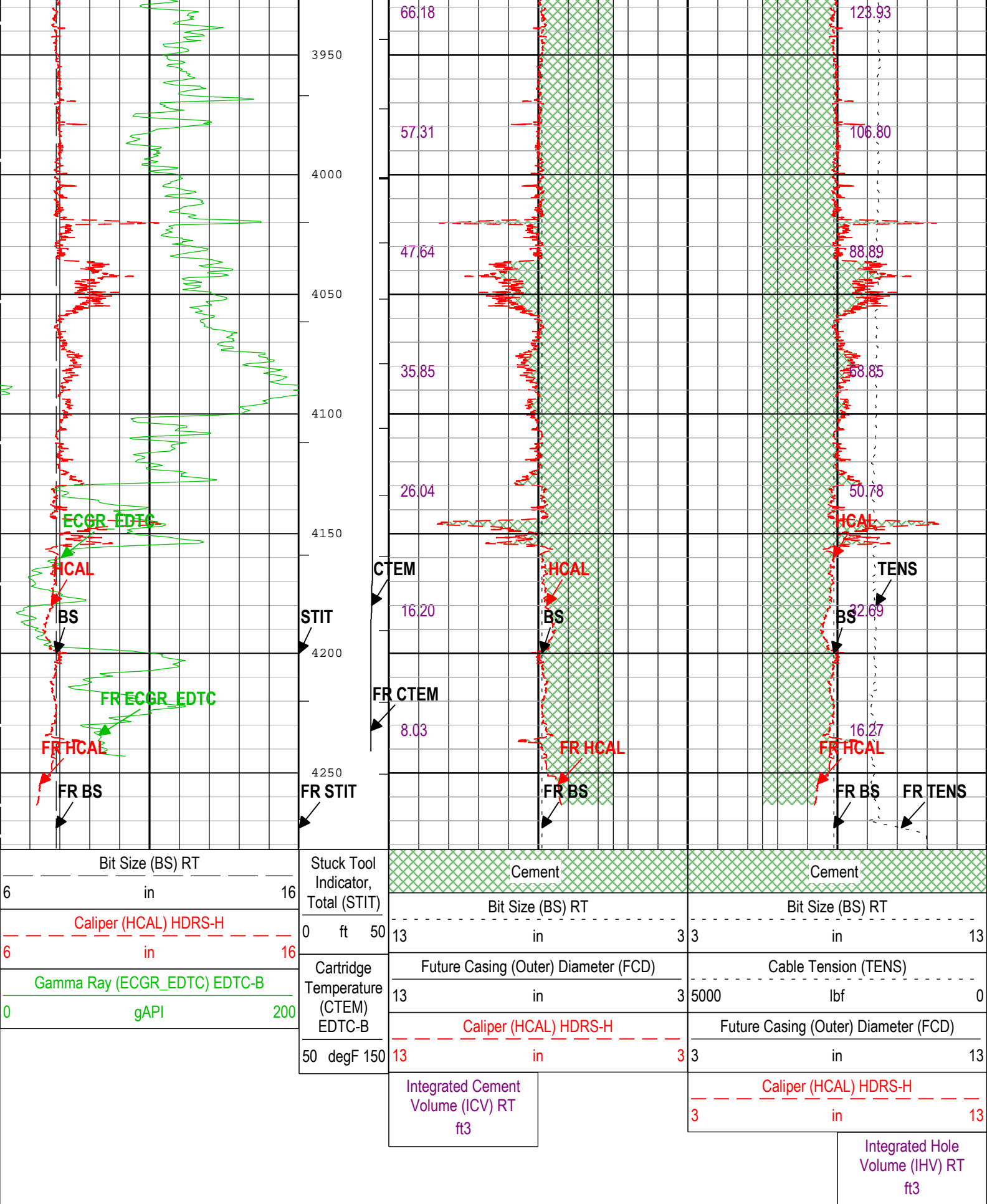












— ICV - Integrated Cement Volume every 10.00 (ft3)

— IHV - Integrated Hole Volume every 10.00 (ft3)

— ICV - Integrated Cement Volume every 100.00 (ft3)

— IHV - Integrated Hole Volume every 100.00 (ft3)

Channel Processing Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	475	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	8.625	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.8	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	5.5	in
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
TD	Total Measured Depth	Borehole	4273	ft

Depth Zone Parameters

Parameter	Value	Start ( ft )	Stop ( ft )
BS	12.25	350	475
BS	7.875	475	4270

All depth are actual.

Tool Control Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

Calibration Report

AIT-M (Array Induction Tool - M) Calibration - Run 1A

Primary Equipment :			
File code for AIT-MA Sonde Tool Element		AMIS	346

AIT Electronics Check - Thru Calibration Check

Before (Measured):	04:18:35 21-Jul-2018
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Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Thru Cal Mag - 0	V	Before	-----	0.366	0.623	0.854	
Thru Cal Phase - 0	deg	Before	-----	137.000	-164.307	-103.000	
Thru Cal Mag - 1	V	Before	-----	0.762	1.276	1.778	
Thru Cal Phase - 1	deg	Before	-----	136.000	-165.384	-104.000	
Thru Cal Mag - 2	V	Before	-----	0.372	0.633	0.868	
Thru Cal Phase - 2	deg	Before	-----	132.000	-168.919	-108.000	
Thru Cal Mag - 3	V	Before	-----	0.420	0.714	0.980	
Thru Cal Phase - 3	deg	Before	-----	131.000	-169.675	-109.000	
Thru Cal Mag - 4	V	Before	-----	0.804	1.338	1.876	
Thru Cal Phase - 4	deg	Before	-----	125.000	-175.775	-115.000	
Thru Cal Mag - 5	V	Before	-----	1.176	1.951	2.744	
Thru Cal Phase - 5	deg	Before	-----	122.000	-177.433	-118.000	
Thru Cal Mag - 6	V	Before	-----	1.176	1.950	2.744	
Thru Cal Phase - 6	deg	Before	-----	121.000	-177.407	-119.000	
Thru Cal Mag - 7	V	Before	-----	0.846	1.403	1.974	

Thru Cal Phase - 7	deg	Before	-----	115.000	-178.208	-125.000	<div><div></div><div></div><div></div><div></div><div></div></div>
SPA Zero	mV	Before		-50.000	0.095	50.000	<div><div></div><div></div><div></div><div></div><div></div></div>
SPA Plus	mV	Before		941.000	990.903	1040.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature Zero	V	Before		-0.050	0.000	0.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature Plus	V	Before		0.870	0.918	0.960	<div><div></div><div></div><div></div><div></div><div></div></div>

## HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run 1A

### Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	3973

### Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	28732
HRDD Short Spacing Detector	Short Spacing	
Cesium 137 Gamma-Ray Logging Source	GSR-J	5471
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	

### Calibration Parameter :

- Small Ring Size
- Large Ring Size

## HDRS Density Calibration - Inversion Results

Master (EEPROM): 17:27:48 15-Jul-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Rho Aluminum	g/cm3	Master	2.596	2.586	2.604	2.606	<div><div></div><div></div><div></div><div></div><div></div></div>
Rho Magnesium	g/cm3	Master	1.686	1.676	1.687	1.696	<div><div></div><div></div><div></div><div></div><div></div></div>
Pe Aluminum		Master	2.570	2.470	2.591	2.670	<div><div></div><div></div><div></div><div></div><div></div></div>
Pe Magnesium		Master	2.650	2.550	2.564	2.750	<div><div></div><div></div><div></div><div></div><div></div></div>

## HDRS Density Calibration - Deviation Summary

Master (EEPROM): 17:27:48 15-Jul-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Average Deviation	%	Master	0	-0.6000	0.4799	0.6000	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Max Deviation	%	Master	0	-1.6000	1.3212	1.6000	<div><div></div><div></div><div></div><div></div><div></div></div>
SS Average Deviation	%	Master	0	-1.0000	0.8929	1.0000	<div><div></div><div></div><div></div><div></div><div></div></div>
SS Max Deviation	%	Master	0	-2.5000	1.8617	2.5000	<div><div></div><div></div><div></div><div></div><div></div></div>
LS Average Deviation	%	Master	0	-1.5000	1.3096	1.5000	<div><div></div><div></div><div></div><div></div><div></div></div>
LS Max Deviation	%	Master	0	-3.5000	2.7904	3.5000	<div><div></div><div></div><div></div><div></div><div></div></div>

## HDRS Density Calibration - Background Summary

Master (EEPROM): 17:27:48 15-Jul-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Window Ratio		Master	1.0000		0.7378		<div><div></div><div></div><div></div><div></div><div></div></div>
BS Window Sum	1/s	Master	1		22130		<div><div></div><div></div><div></div><div></div><div></div></div>
SS Window Ratio		Master	1.0000		0.4838		<div><div></div><div></div><div></div><div></div><div></div></div>
SS Window Sum	1/s	Master	1		9630		<div><div></div><div></div><div></div><div></div><div></div></div>
LS Window Ratio		Master	1.0000		0.3074		<div><div></div><div></div><div></div><div></div><div></div></div>
LS Window Sum	1/s	Master	1		1080		<div><div></div><div></div><div></div><div></div><div></div></div>

## HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 17:27:48 15-Jul-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS PM High Voltage	V	Master		1000	1460	2400	<div><div></div><div></div><div></div><div></div><div></div></div>
SS PM High Voltage	V	Master		1000	1718	2400	<div><div></div><div></div><div></div><div></div><div></div></div>
LS PM High Voltage	V	Master		1000	1207	2400	<div><div></div><div></div><div></div><div></div><div></div></div>

## HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 17:27:48 15-Jul-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
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Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	25.3	40.0	
Far Zero Measurement	1/s	Master	0	5.0	28.3	40.0	
Near Plus Measurement	1/s	Master	6031.0	4700.0	5016.0	6900.0	
Far Plus Measurement	1/s	Master	2793.0	1900.0	2126.0	2900.0	
Near Corrected Plus Measurement	1/s	Master		4700.0	5016.0	6900.0	
Far Corrected Plus Measurement	1/s	Master		1900.0	2114.0	2900.0	



Company:	St. Croix Operating, Inc.	Schlumberger
Well:	Jack Creek #1	
Field:	Wildcat	
County:	Washington	
State:	Colorado	
Platform Express		
Caliper		

