Schlumberger

Company: Mack Energy Corporation

Well: Pit SWD #1

Field: Wildcat

County: Eddy State: New Mexico

Cement Bond Log

VDL / HNGS

County: Eddy
Field: Wildcat
Location: 832 FNL & 1980 FWL
Well: Pit SWD #1
Company: Mack Energy Corporation

Location:	832 FNL & 1980 FWL	Elev.:	K.B.	3157.90 ft
			G.L.	3140.90 ft
			D.F.	3156.90 ft
	Permanent Datum:	Ground Level	Elev.:	3140.90 f
	Log Measured From:	Kelly Bushing	17.00 ft	above Perm.Datum
	Drilling Measured From:	Kelly Bushing		

API Serial No.	Section:	Township:	Range:
30-015-20993	4	23S	27E

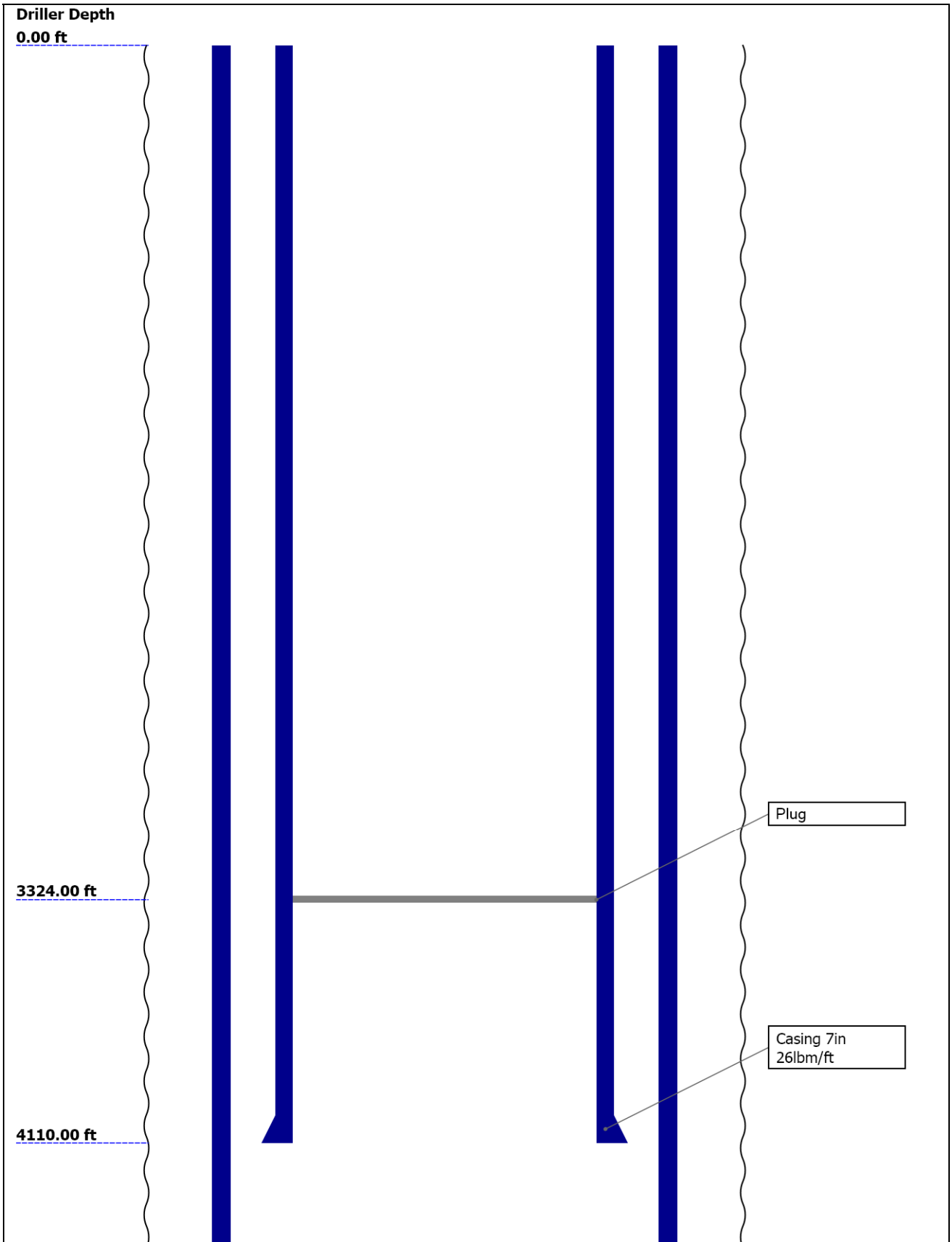
Logging Date		25-Jun-2014			
Run Number		1		Two	
Depth Driller		5397.00 ft			
Schlumberger Depth		5397.00 ft			
Bottom Log Interval		3318.00 ft		4200.00 ft	
Top Log Interval		53.00 ft		2000.00 ft	
Casing Fluid Type		Fresh Water			
Salinity		1 ppm		1 ppm	
Density		8.34 lbm/gal		8.34 lbm/gal	
Fluid Level		8.00 ft		8.00 ft	
BIT/CASING/TUBING STRING					
Bit Size		12.25 in			
From		0.00 ft			
To		5397.00 ft			
Casing/Tubing Size		9.625 in		9.625 in	
Weight		40 lbm/ft		46 lbm/ft	
Grade		L80		N/A	
From		0.00 ft		0.00 ft	
To		5397.00 ft		4200.00 ft	
Max Recorded Temperatures		92.42 degF		115 degF	-999.25 -999.25
Logger on Bottom	Time	25-Jun-2014	11:57:00		
Unit Number	Location:	2323	USRW	2323	USRW
Recorded By		CManoos / Ali Assad		Erik Olson	
Witnessed By		Mr. Michael Gonzales		Michael Gonzales	

Disclaimer

Contents

11.3 Log (Repeat Section Sonic CBL Dual Gate with VDL)
11.4 Parameter Listing
12. Calibration Report
13. Tail

Well Sketch



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	12.25					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	5397					
Bottom Logger (ft)	5397					
Casing						
Size (in)	9.625	7				
Weight (lbm/ft)	40	26				
Inner Diameter (in)	8.835	6.276				
Grade	L80	L80				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	5397	4110				
Bottom Logger (ft)	5397	4110				

Operational Run Summary

Parameter (unit)	1	Imported Run 1				
Date Log Started	25-Jun-2014					
Time Log Started	11:13:00					
Date Log Finished	25-Jun-2014					
Time Log Finished	13:38:03					
Top Log Interval (ft)	53.00					
Bottom Log Interval (ft)	3318.00					
Total Depth (ft)	3318.00					
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	12.250					
Logging Unit Number	2133	2133				
Logging Unit Location	Roswell, NM	Roswell, NM				
Recorded By	CManoos / Ali Assad					
Witnessed By	Mr. Michael					

	Gonzales					
Service Order Number						

Borehole Fluids

Parameter(unit)	1	Imported Run 1				
Fluid Type	Water					
Fluid Name	Fresh Water					
Max Recorded Temperatures (degF)	92.42					
Source of Sample	Active Tank					
Salinity (ppm)	1					
Density (lbm/gal)	8.34					
Funnel Viscosity (s)						
Fluid Loss (cm3)						
PH						
Date/Time Circulation Stopped	NaN					
Date Logger on Bottom	25-Jun-2014					
Time Logger on Bottom	11:57:00					
Source RMF						
RMC	Pressed					
RM @ Meas Temp (ohm.m@degF)	0.2 @ 68					
RMF @ Meas Temp (ohm.m@degF)	0.15 @ 68					
RMC @ Meas Temp (ohm.m@degF)						
RM @ BHT (ohm.m@degF)	0.15 @ 92.42					
RMF @ BHT (ohm.m@degF)	0.11 @ 92.42					
RMC @ BHT (ohm.m@degF)	NaN @ 92.42					
Total Solid (%)						
High Gravity Solids (%)						

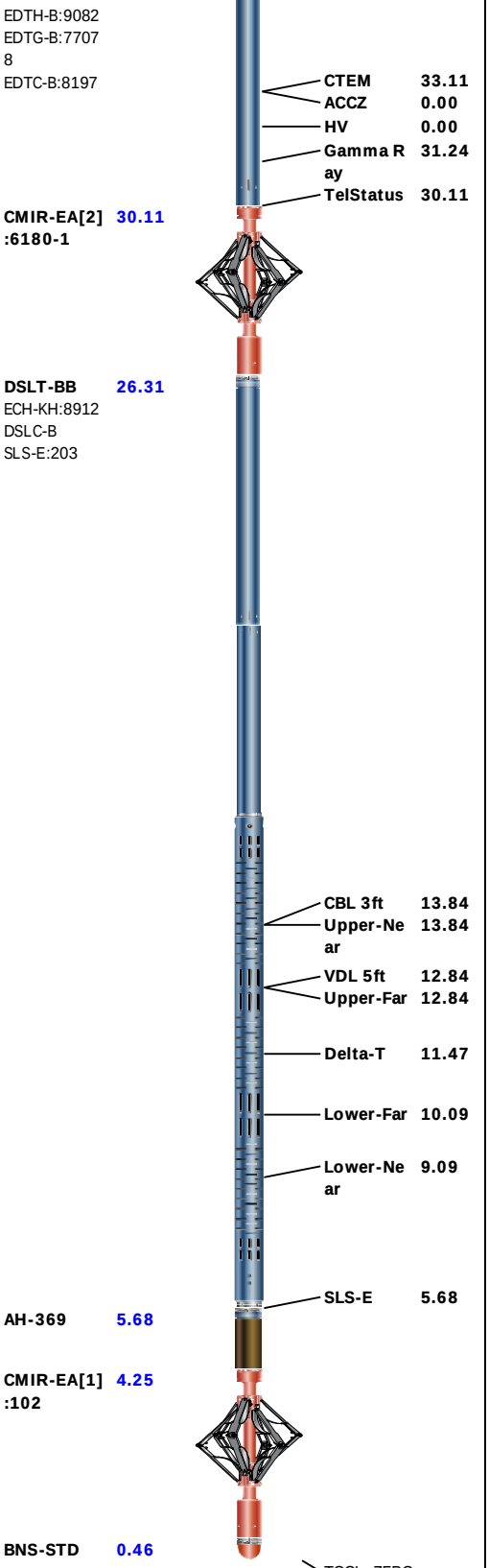
Remarks and Equipment Summary

1: Remarks	Imported Run 1: Remarks
Toolstring run as per tool sketch.	Porosity calculated on a Limestone scale 2.71 g/cc
Inline centralizers used to centralize the tool.	Two 0.125” wear rings ran on HGNS
Job done on a pulling unit.	Work over well, so not all header/well information is known
Repeat pass done with 0 psi.	
Main pass done with 1000 psi.	
Log started 5 ft. above plug depth.	
Schlumberger Crew: H. Carter, C. Lopes	Today’s Crew: R. Richardson, M. Ortega

1: Toolstring

Equip name	Length	MP name	Offset
LEH-QC	42.56		
CAL-YA:987	40.11		
CAL-YA:987		CCL	39.31
EDTC-B:8197	36.61		

Imported Run 1: Toolstring



Lengths are in ft
Maximum Outer Diameter = 3.625 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Merge Composite

5" Main Pass

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Imported Run 1	OpIdealDlisLap	Up	0.00 ft	0.00 ft			ON	0.00 ft	No
1	Log[4]:Up	Up	24.53 ft	3319.01 ft	25-Jun-2014	25-Jun-2014	ON	0.00 ft	No

					12:19:06 PM	1:37:04 PM			

All depths are referenced to toolstring zero

Log

Company:Mack Energy Corporation Well:Pit SWD #1

Merge Composite:S005

Description: CBL_Dual_Gate Format: Log (5 inch Sonic CBL Dual Gate with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 25-Jun-2014 19:14:15

TIME_1900 - Time Marked every 60.00 (s)

Uranium Indicator

Casing Collar Locator Amplitude (CCL) CAL-YA

-19 1

Transit Time (Sliding Gate) (TTSL) DSLT-BB

400 us 200

Transit Time for CBL (TT) DSLT-BB

400 us 200

Gamma Ray (GR) EDTC-B

0 gAPI 150

Cable Drag

Tool_Tot. Drag

CBL Amplitude (CBL) DSLT-BB

0 mV 10

CBL Amplitude (Sliding Gate) (CBSL) DSLT-BB

0 mV 100

CBL Amplitude (CBL) DSLT-BB

0 mV 100

Good Bond (GOBO)

0 mV 10

GoodBond from CBL to GOBO

Min Amplitude Max

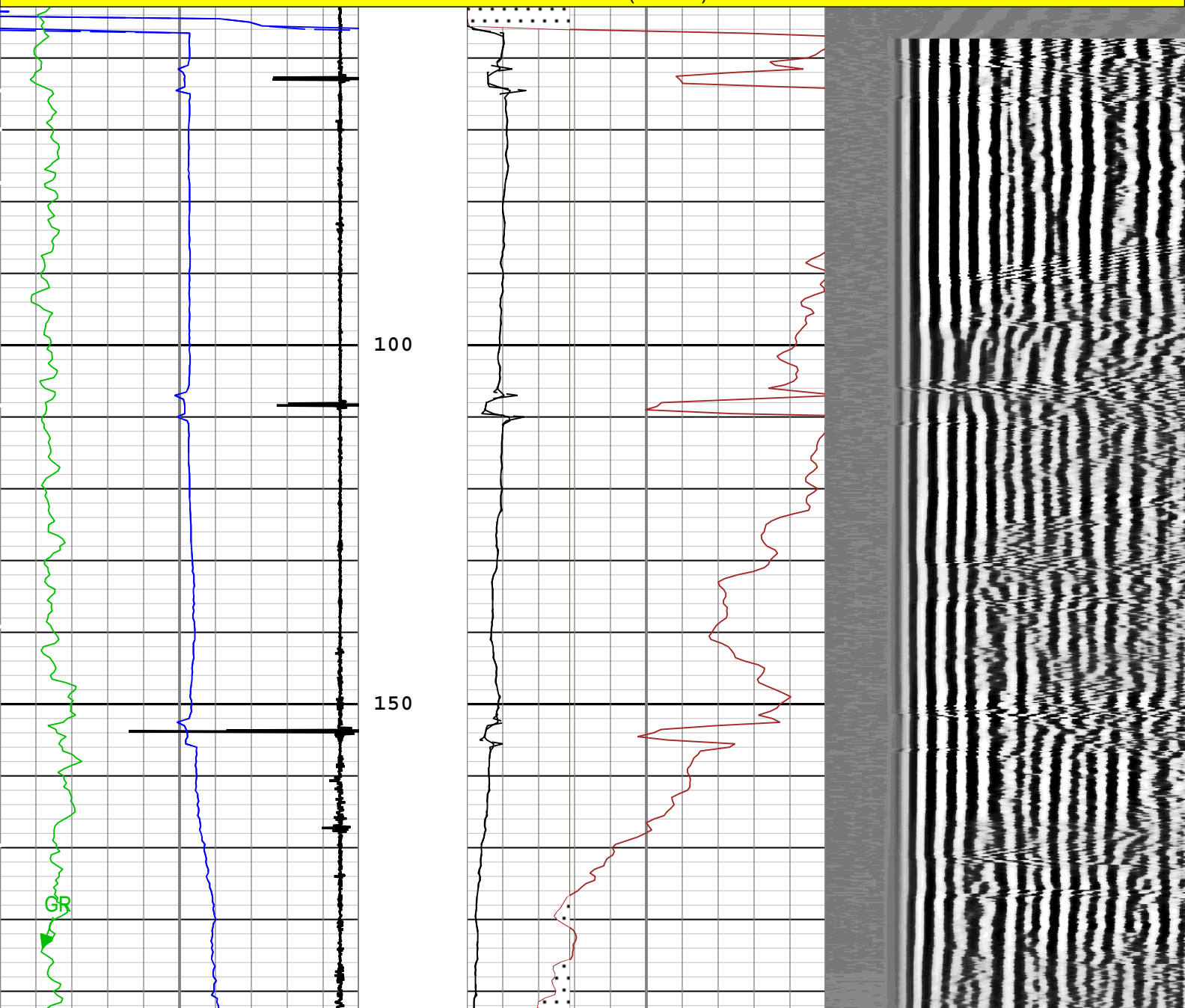
Variable Density Log (VDL) DSLT-BB

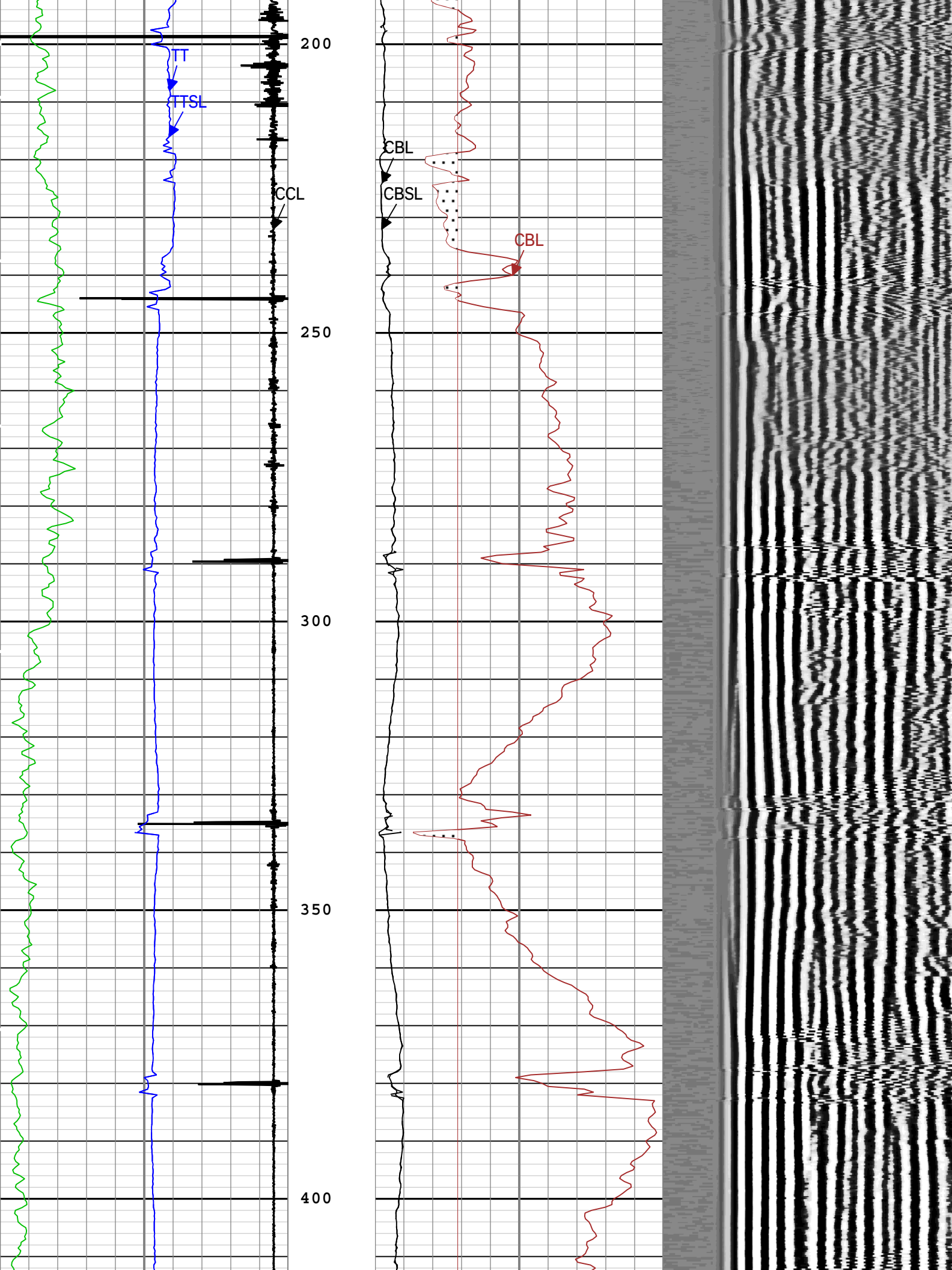
200 us 1200

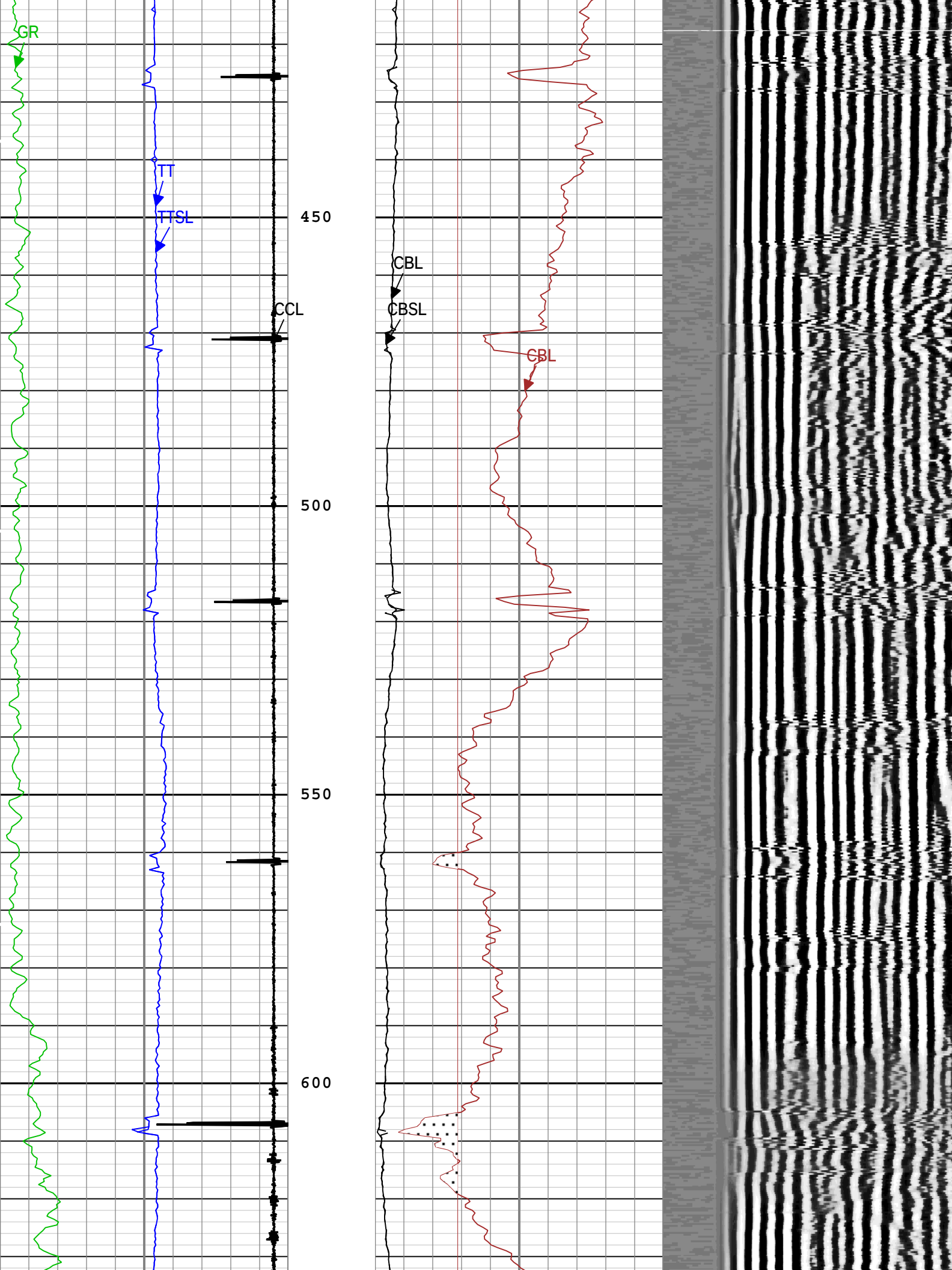
Thermal Neutron Porosity (original Ratio Method) in Selected Lithology (NPHI)

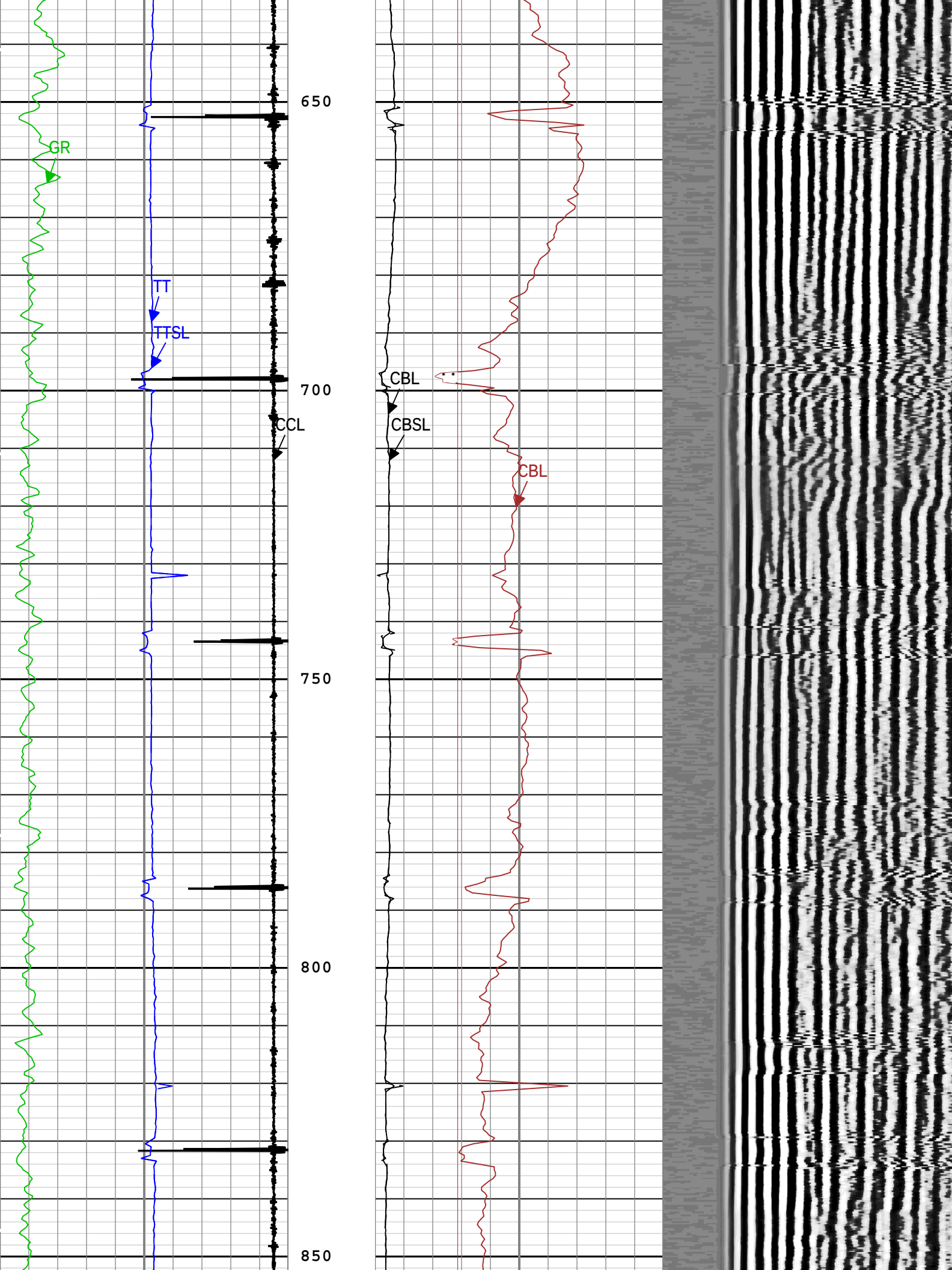
0.6 ft3/ft3 0

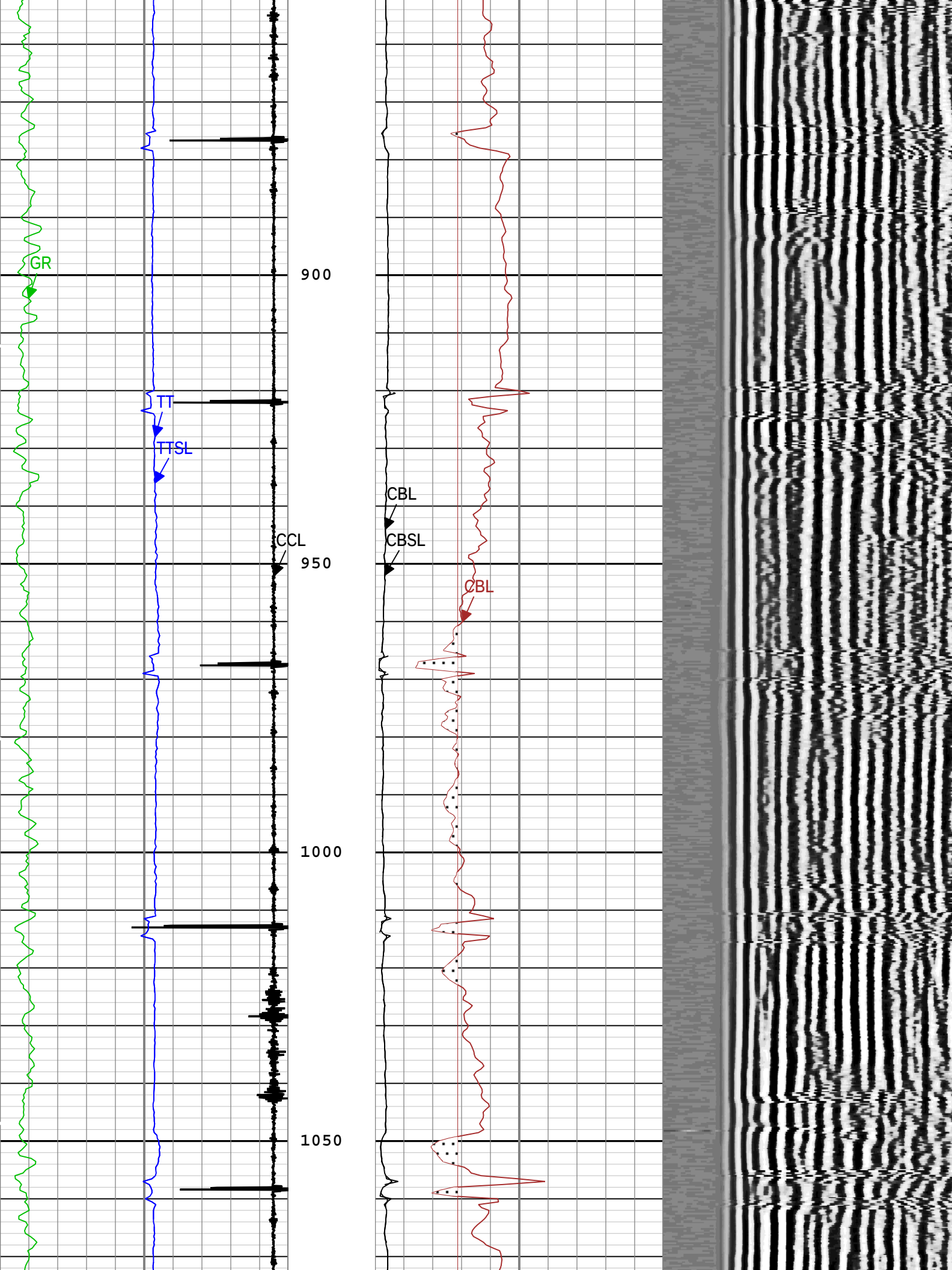
Main Pass 5" = 100' (1000 PSI)

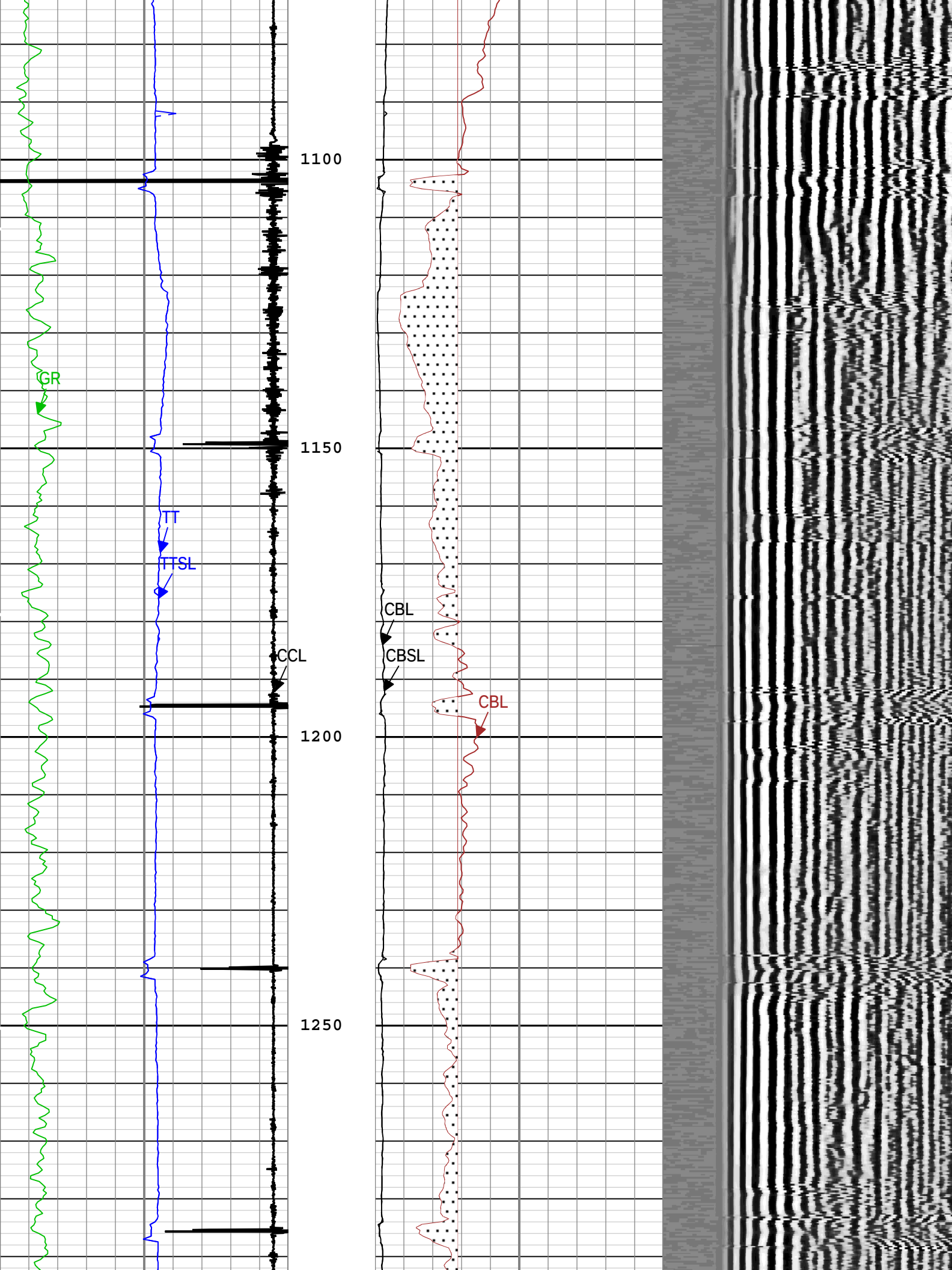


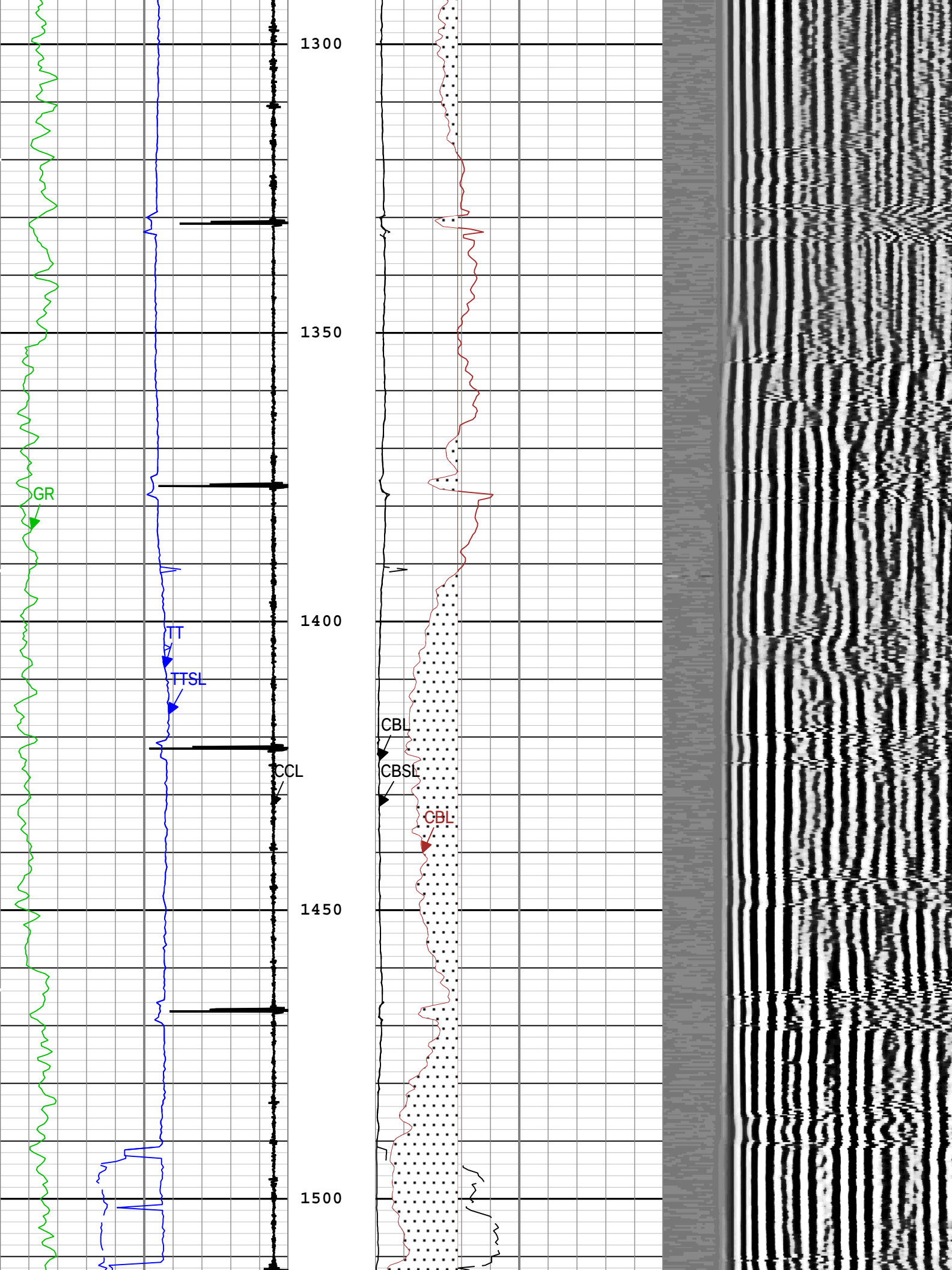

200
250
300
350
400
TT
TTSL
CCL
CBL
CBSL
CBL

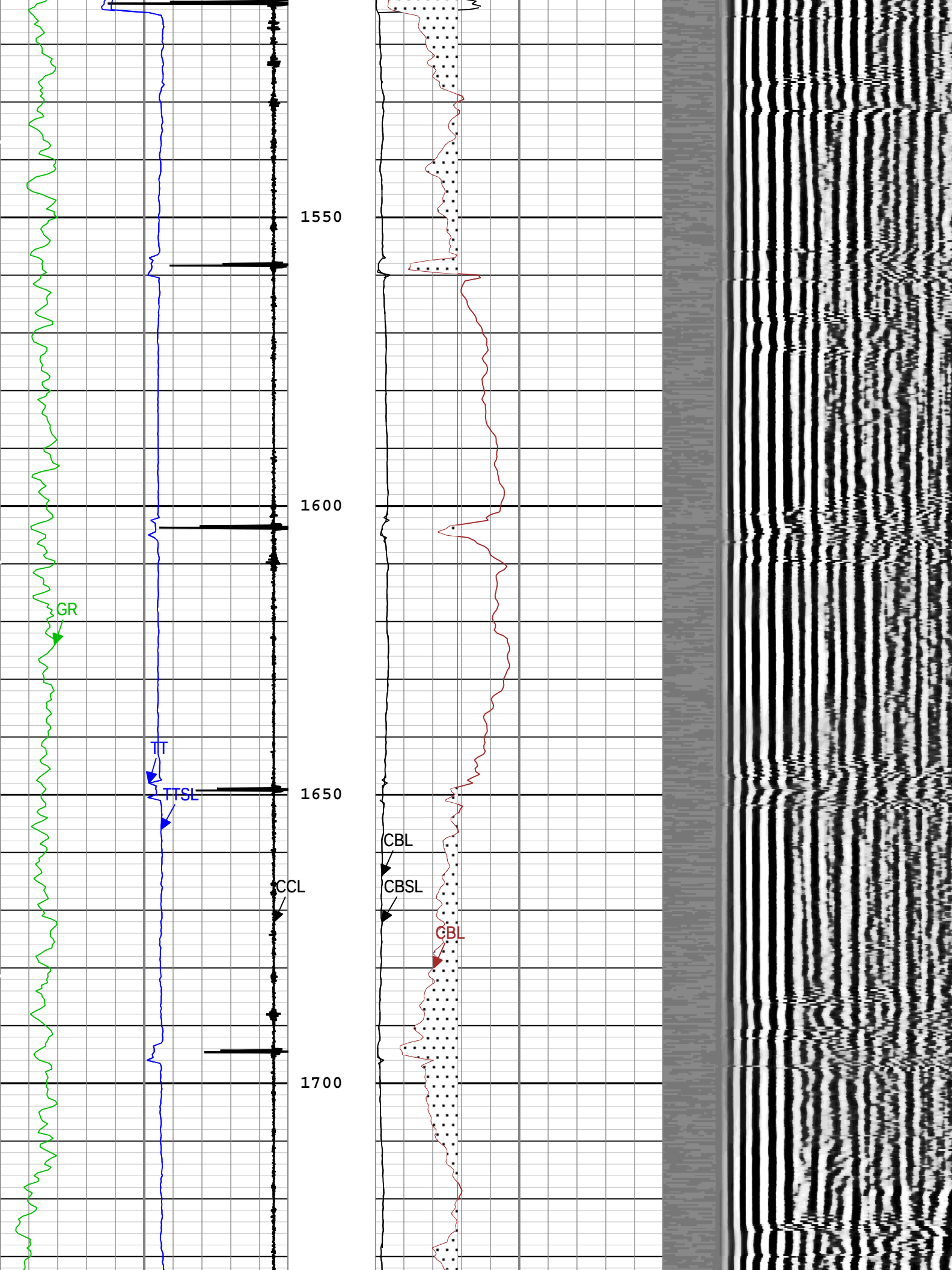

GR
TT
TTSL
450
CBL
CBSL
CCL
CBL
500
550
600

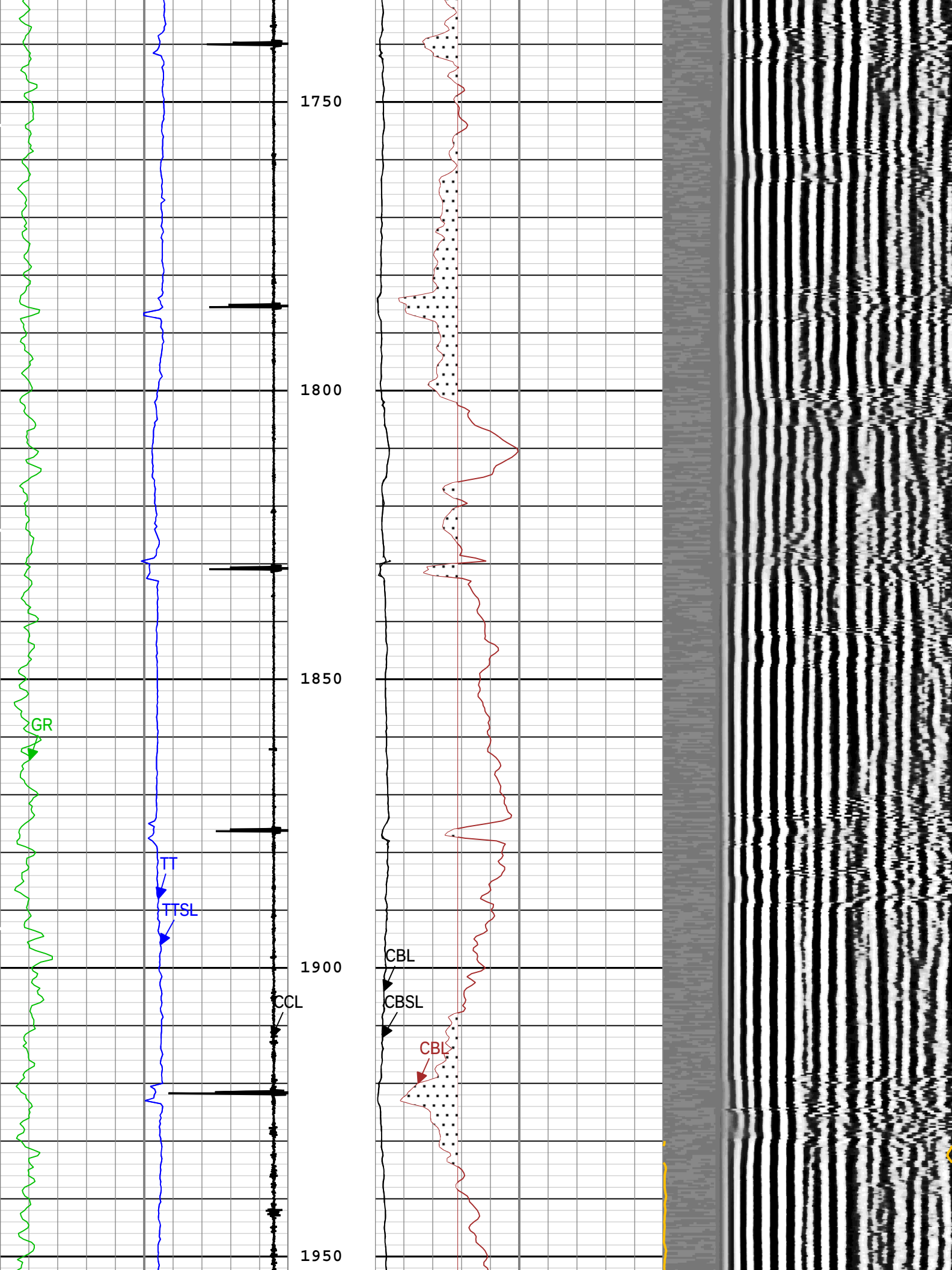

650
700
750
800
850
GR
TT
TTSL
CCL
CBL
CBSL
CBL

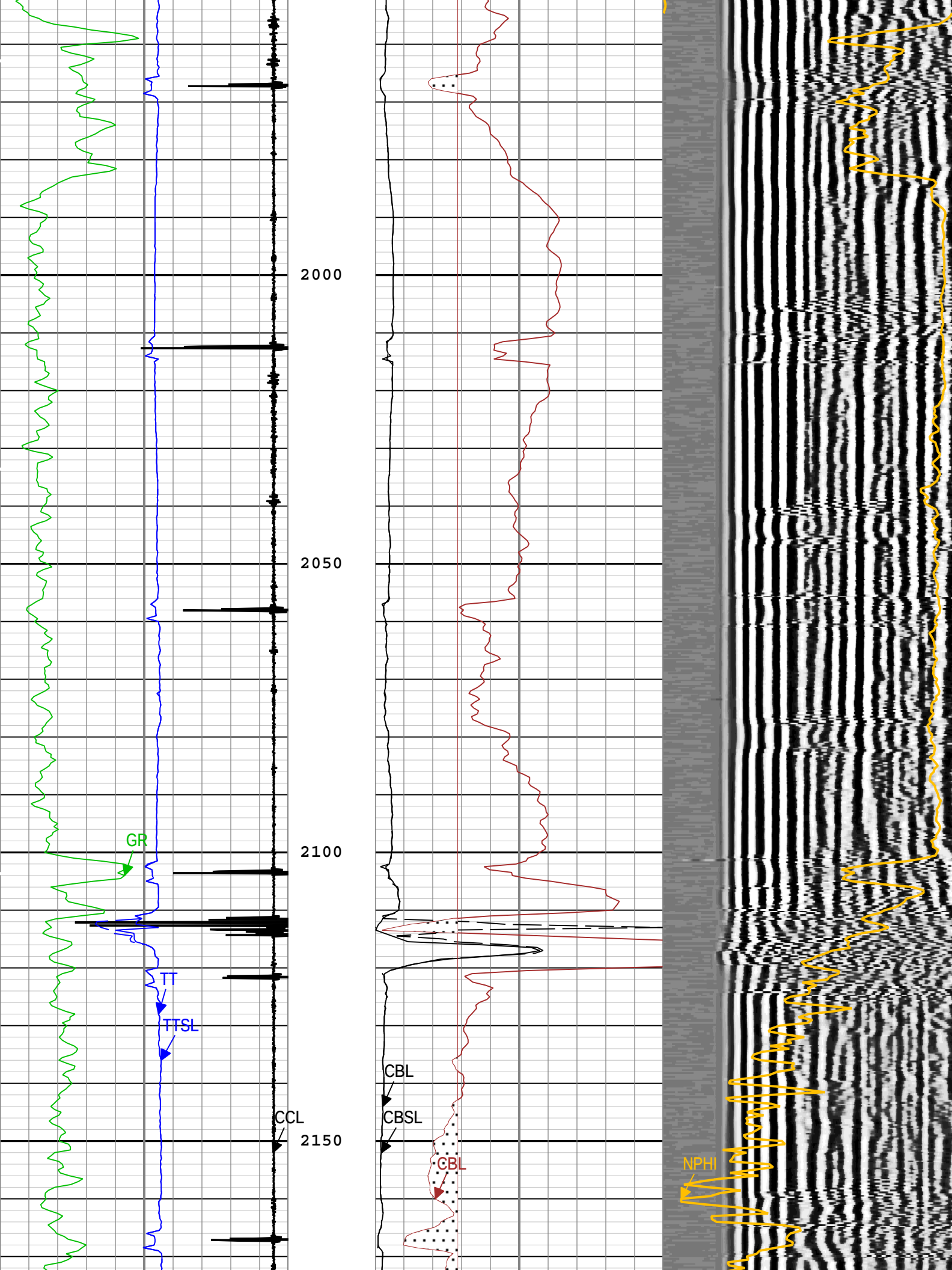

GR
900
TT
TTSL
CBL
CCL
CBSL
950
CBL
1000
1050

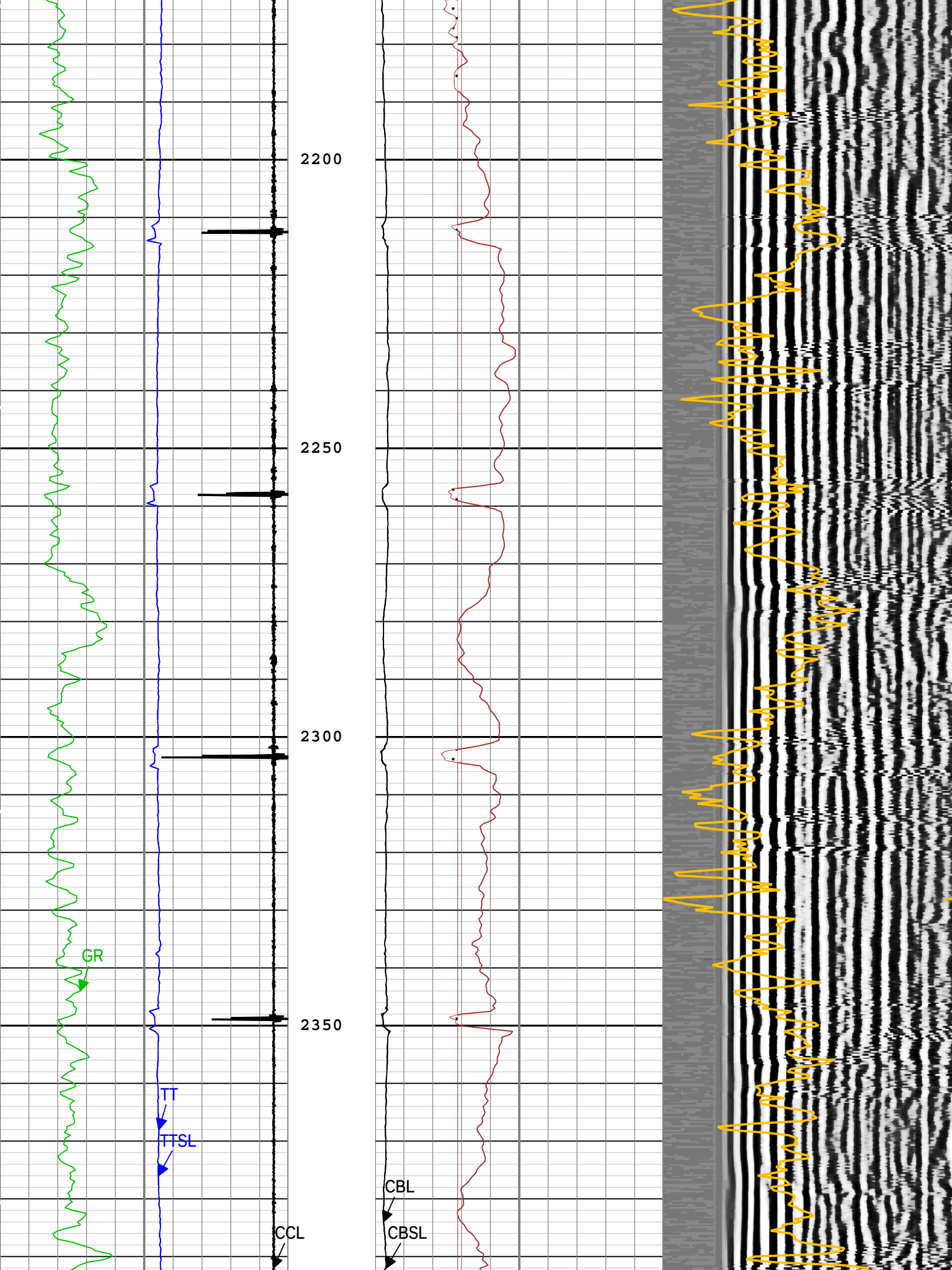

1100
1150
1200
1250
GR
TT
TTSL
CCL
CBL
CBSL
CBL

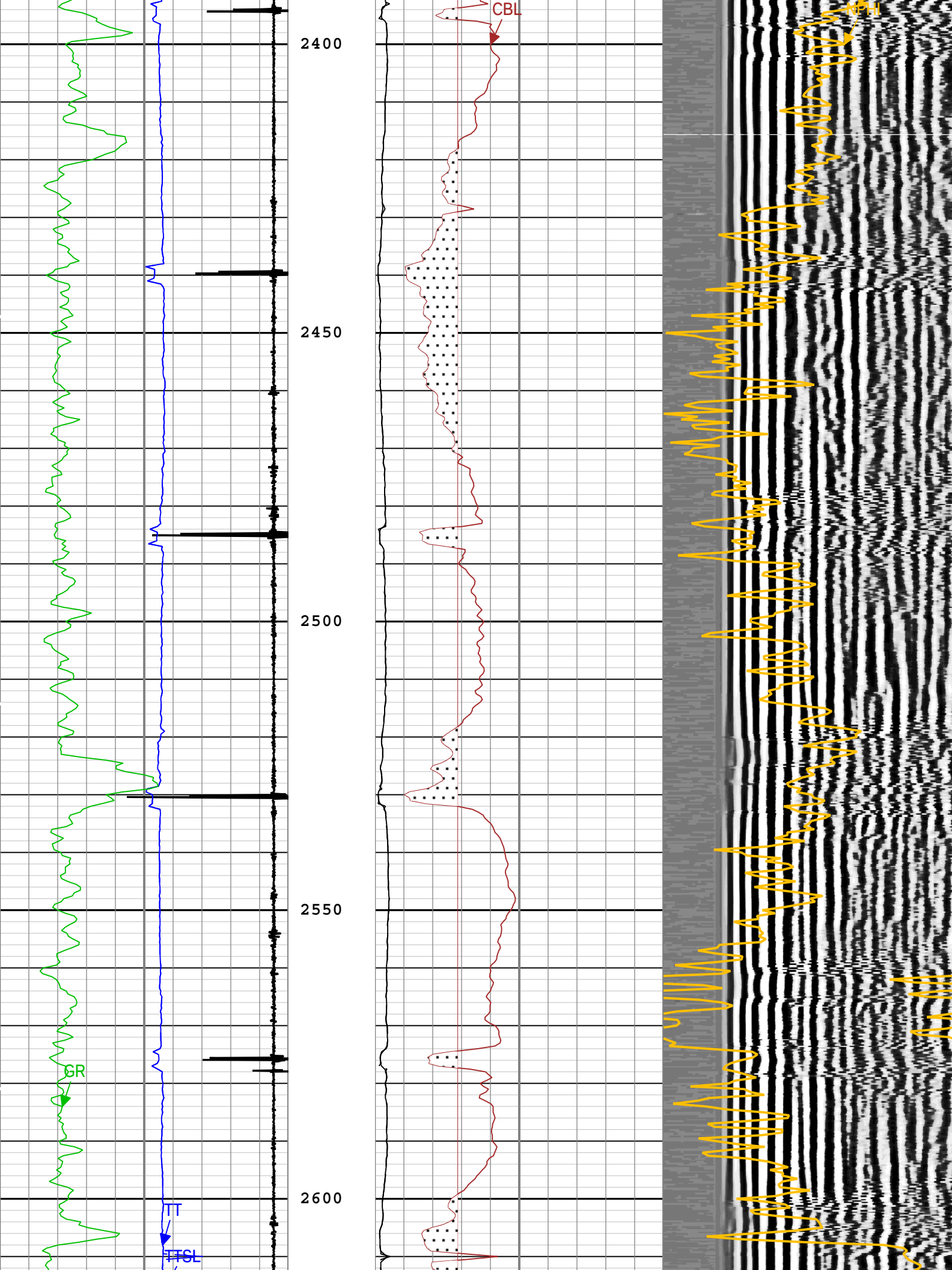

1300
1350
1400
1450
1500
GR
TT
TTSL
CCL
CBL
CBSL
CBL

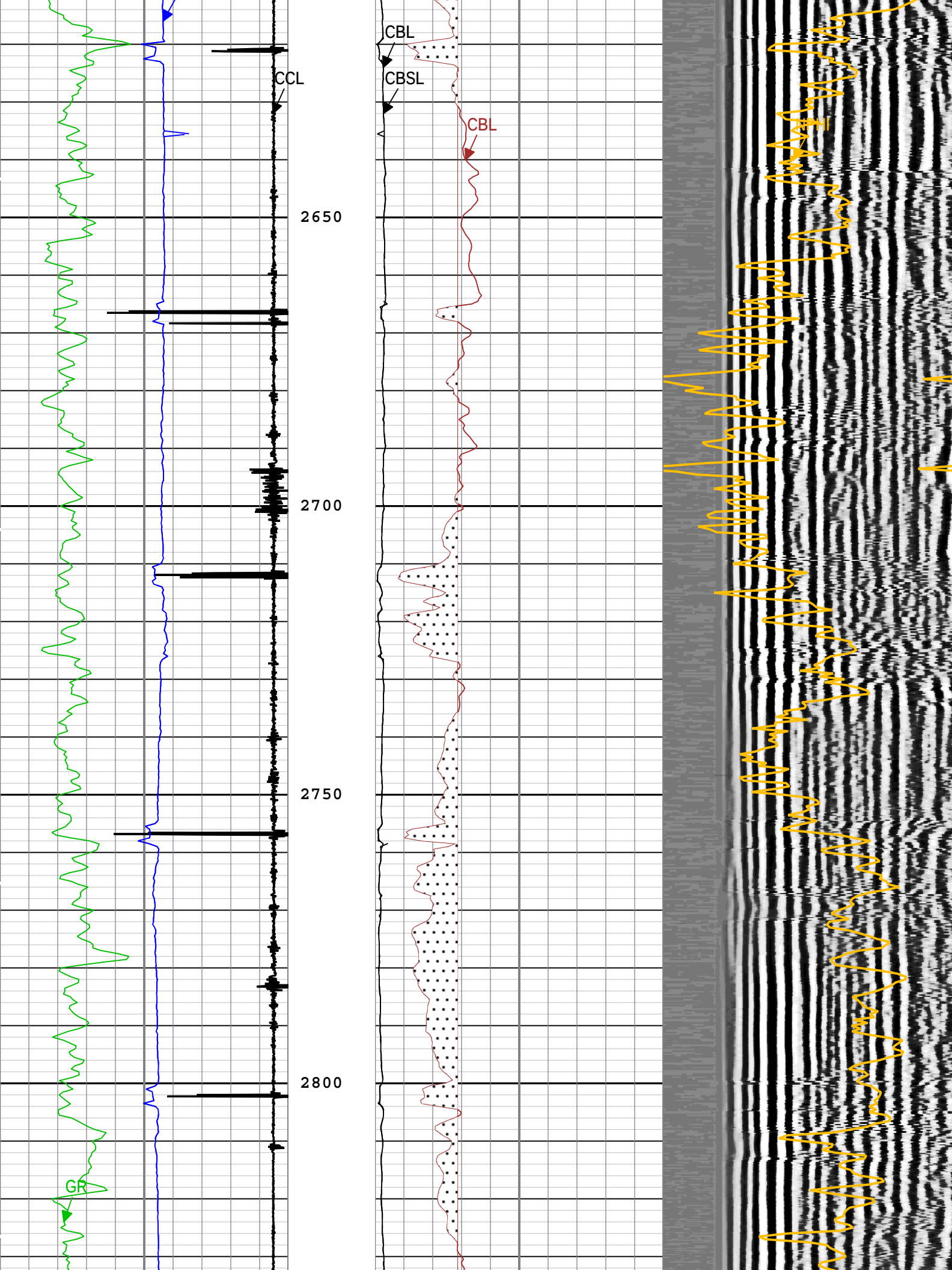

1550
1600
1650
1700
GR
TT
TTSL
CCL
CBL
CBSL
CBL

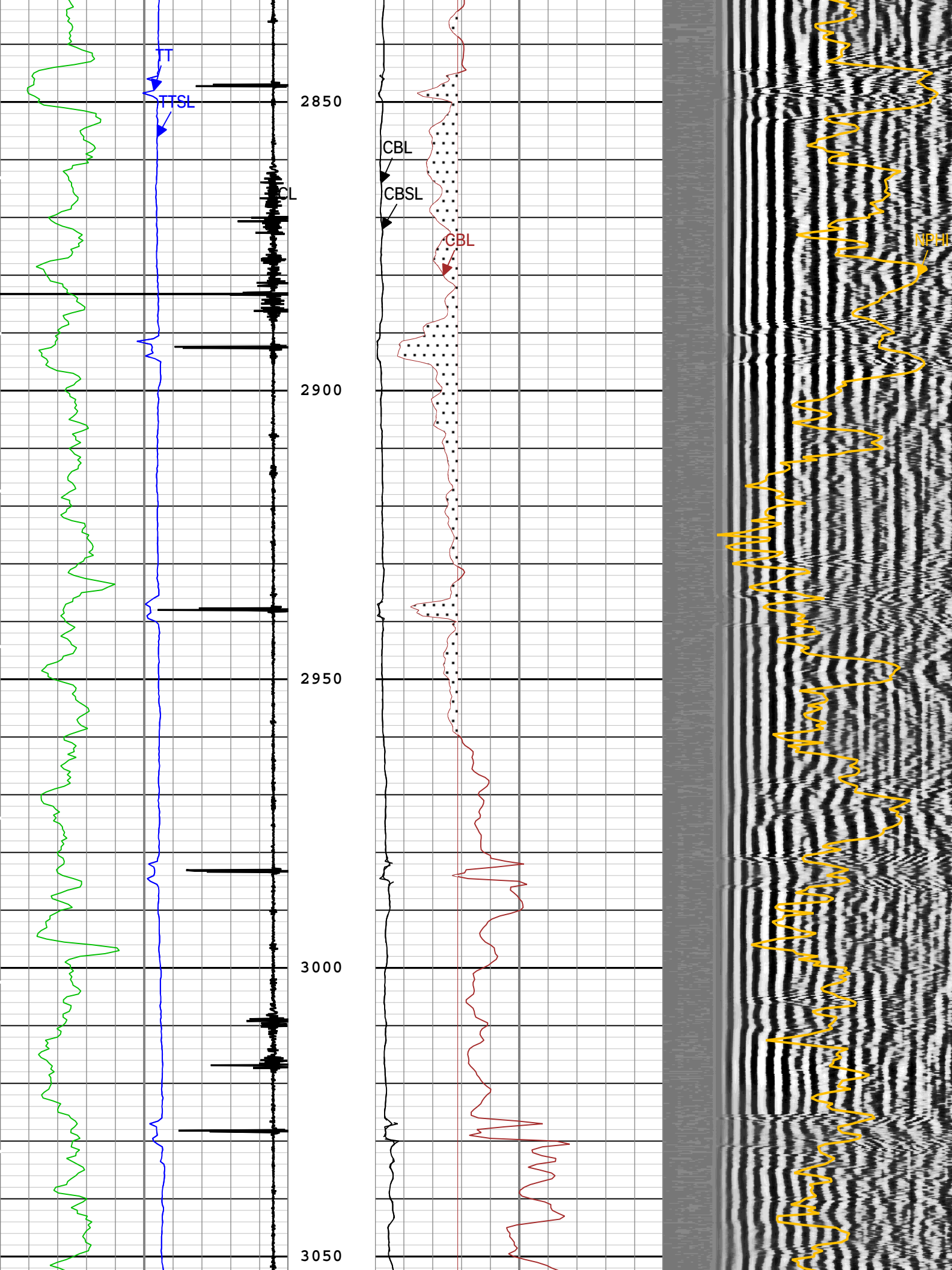

1750
1800
1850
1900
1950
GR
TT
TTSL
CCL
CBL
CBSL
CBL

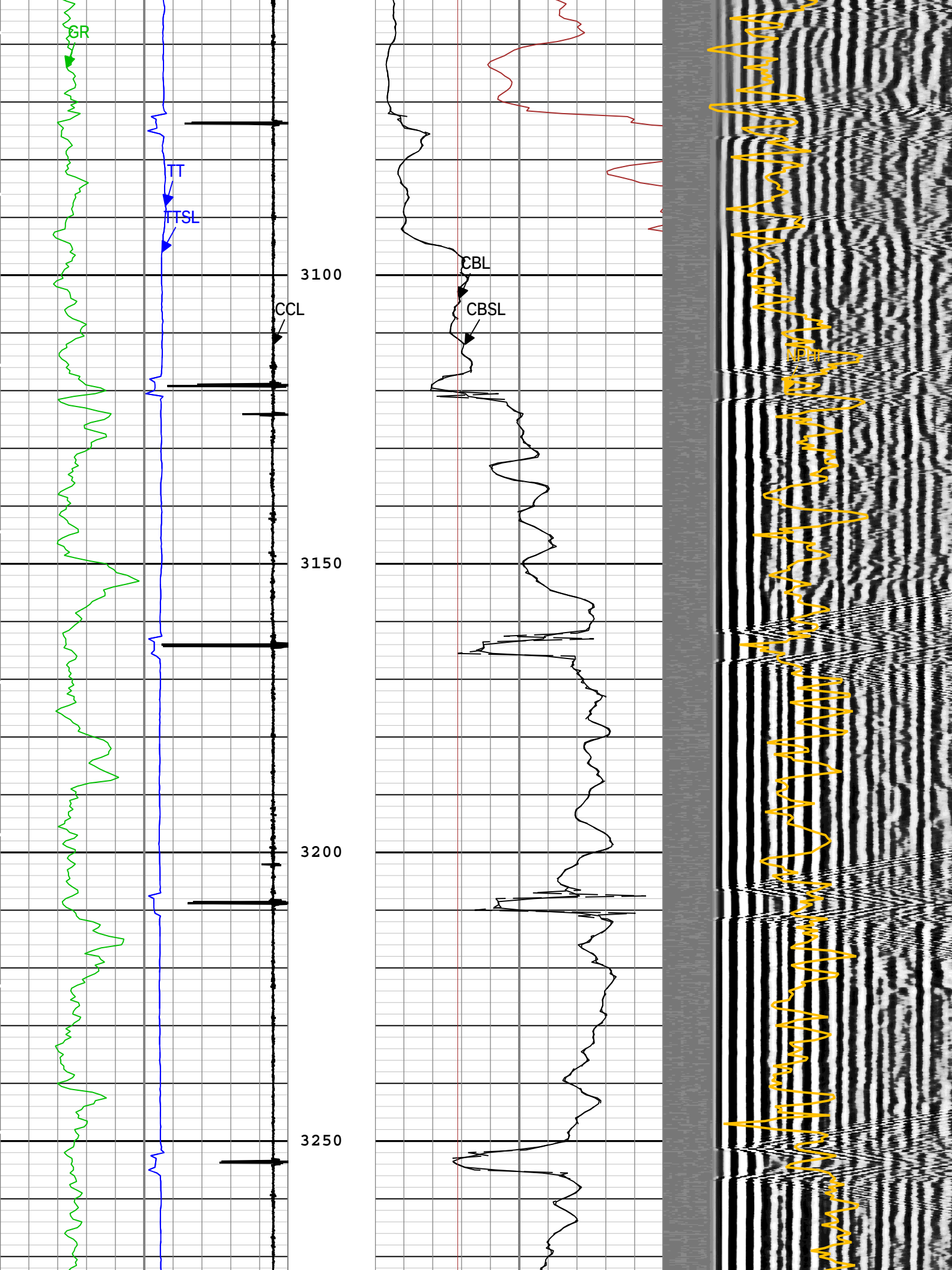

2000
2050
2100
2150
GR
TT
TTSL
CCL
CBL
CBSL
CBL
NPHI

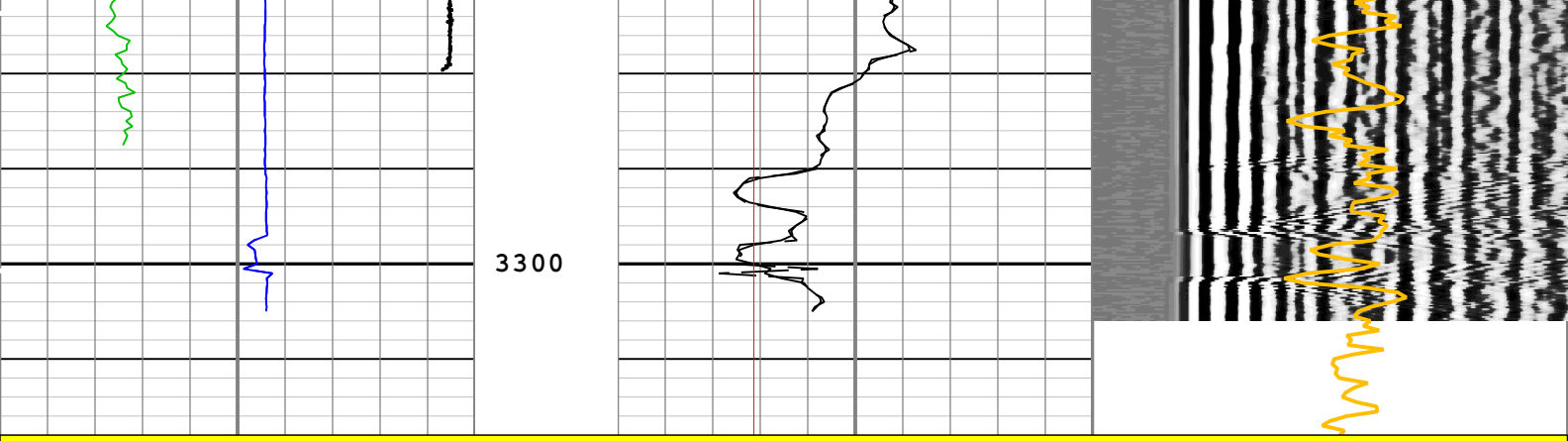

2200
2250
2300
2350
GR
TT
TTSL
CCL
CBL
CBSL


CBL
2400
2450
2500
2550
2600
GR
TT
TTSL


CBL
CBSL
CCL
CBL
2650
2700
2750
2800
GR


TT
TTSL
CL
CBL
CBSL
CBL
NPHI
2850
2900
2950
3000
3050


GR
TT
TTSL
CCL
CBL
CBSL
3100
3150
3200
3250



Main Pass 5" = 100' (1000 PSI)

Uranium Indicator

Cable Drag

Tool_Tot. Drag

Casing Collar Locator Amplitude (CCL) CAL-YA

-19 1

Transit Time (Sliding Gate) (TTSL) DSLT-BB

400 us 200

Transit Time for CBL (TT) DSLT-BB

400 us 200

Gamma Ray (GR) EDTC-B

0 gAPI 150

CBL Amplitude (CBL) DSLT-BB

0 mV 10

CBL Amplitude (Sliding Gate) (CBSL) DSLT-BB

0 mV 100

CBL Amplitude (CBL) DSLT-BB

0 mV 100

Good Bond (GOBO)

0 mV 10

GoodBond from CBL to GOBO

Min Amplitude Max

Variable Density Log (VDL) DSLT-BB

200 us 1200

Thermal Neutron Porosity (original Ratio Method) in Selected Lithology (NPHI)

0.6 ft3/ft3 0

TIME_1900 - Time Marked every 60.00 (s)

Description: CBL_Dual_Gate Format: Log (5 inch Sonic CBL Dual Gate with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 25-Jun-2014 19:14:15

Channel Processing Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSLT-BB	140	us
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BILI	Bond Index Level for Zone Isolation	DSLT-BB	0.8	
BS	Bit Size	WLSESSION	12.25	in
CBLG	CBL Gate Width	DSLT-BB	63	us
CBLO	Casing Bottom (Logger)	WLSESSION	5397	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLT-BB	62	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	25	
CDEN	Cement Density	EDTC-B	2	g/cm3
CMCF	CBL Cement Type Compensation Factor	DSLT-BB	1	
DETE	Delta-T Detection	DSLT-BB	E1	
DFD	Drilling Fluid Density	Borehole	8.34	lbm/gal
FCF	CBL Fluid Compensation Factor	DSLT-BB	1.01	
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
MAHTR	Manual High Threshold Reference for first arrival detection	DSLT-BB	120	
MCI	Minimum Cemented Interval for Isolation	DSLT-BB	14.81	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLT-BB	100	
MSA	Minimum Sonic Amplitude	DSLT-BB	1.33	mV

NMSG	Near Minimum Sliding Gate	DSLT-BB	256	us
NMXG	Near Maximum Sliding Gate	DSLT-BB	950	us
NUMP	Number of Detection Passes	DSLT-BB	2	
SFAF	Sonic Formation Attenuation Factor	DSLT-BB	3.25	dB/ft
SGAD	Sliding Gate Status	DSLT-BB	Off	
SGCL	Sliding Gate Closing Delta-T	DSLT-BB	130	us/ft
SGCW	Sliding Gate Closing Width	DSLT-BB	25	us
SGDT	Sliding Gate Delta-T	DSLT-BB	57	us/ft
SGW	Sliding Gate Width	DSLT-BB	110	us
SLEV	Signal Level for AGC	DSLT-BB	5000	mV
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
TPOS	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
VDLG	VDL Manual Gain	DSLT-BB	5	
ZCMT	Acoustic Impedance of Cement	DSLT-BB	6.8	Mrayl

Tool Control Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
DDEL	Digitizing Delay	DSLT-BB	0	us
DSLT_MODE	DSLT Acquisition Mode	DSLT-BB	CBL	
DSLT_RATE	DSLT Firing Rate	DSLT-BB	7.5 Hz	
DTFS	DSLT Telemetry Frame Size	DSLT-BB	536	
DWCO	Digitizer Word Count	DSLT-BB	250	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	4500	ft/h
SDTH	Switch Down Threshold	DSLT-BB	20000	
SGAI	Selectable Acquisition Gain	DSLT-BB	x1	
SUTH	Switch Up Threshold	DSLT-BB	1000	
WMOD	Waveform Firing Mode	DSLT-BB	Full	

Merge Composite

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Imported Run 1	OpIdealDlisLap	Up	0.00 ft	0.00 ft			ON	0.00 ft	No
1	Log[4]:Up	Up	24.53 ft	3319.01 ft	25-Jun-2014 12:19:06 PM	25-Jun-2014 1:37:04 PM	ON	0.00 ft	No

All depths are referenced to toolstring zero

Log

Company:Mack Energy Corporation Well:Pit SWD #1

Merge Composite:S005

Description: CBL_Dual_Gate Format: Log (Repeat Section Sonic CBL Dual Gate with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 25-Jun-2014 19:14:19

TIME_1900 - Time Marked every 60.00 (s)

Uranium Indicator

Casing Collar Locator Amplitude (CCL) CAL-YA

-19 1

Transit Time (Sliding Gate) (TTSL) DSLT-BB

400 us 200

CBL Amplitude (CBL) DSLT-BB

0 mV 10

CBL Amplitude (Sliding Gate) (CBSL) DSLT-BB

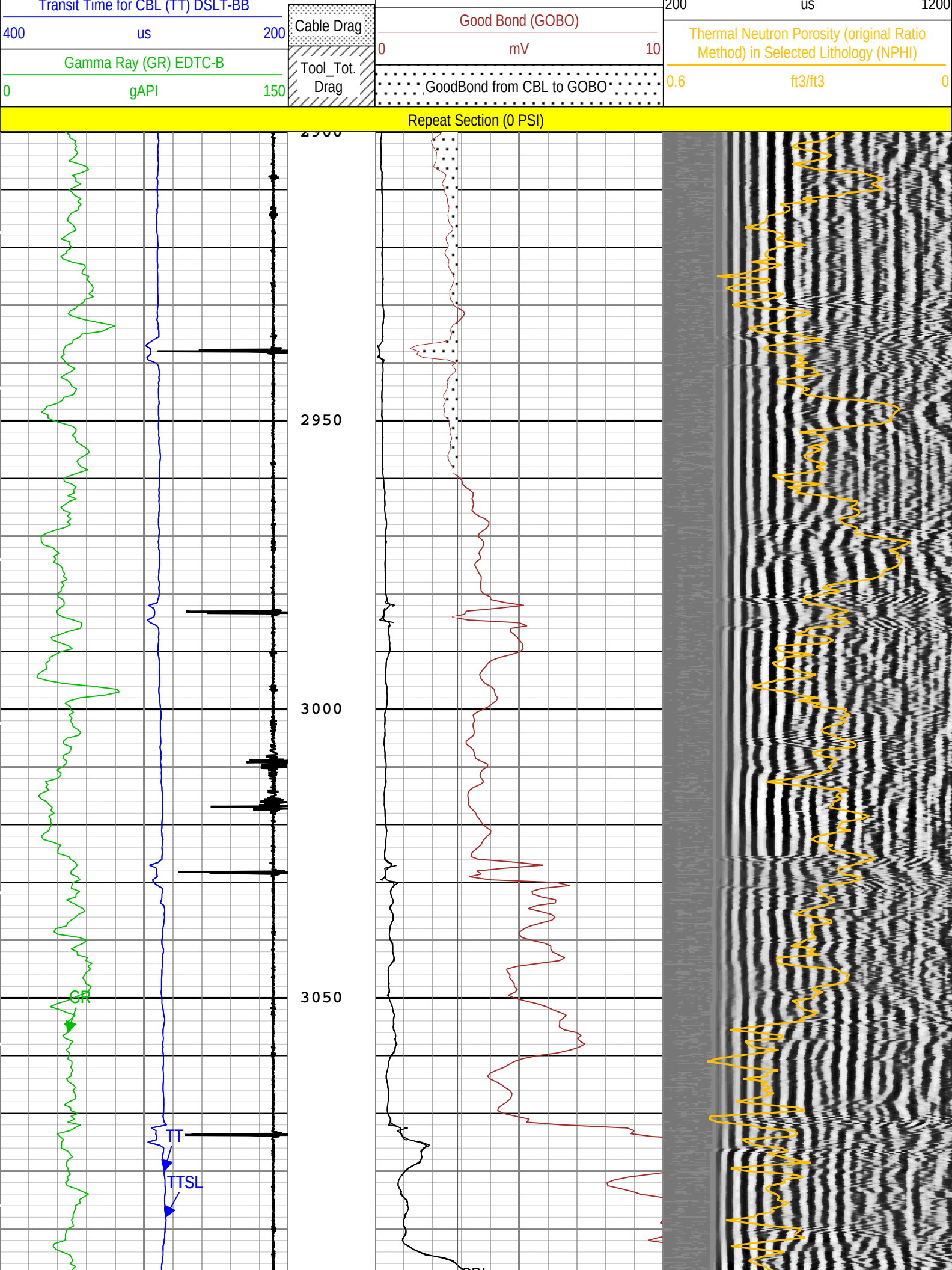
0 mV 100

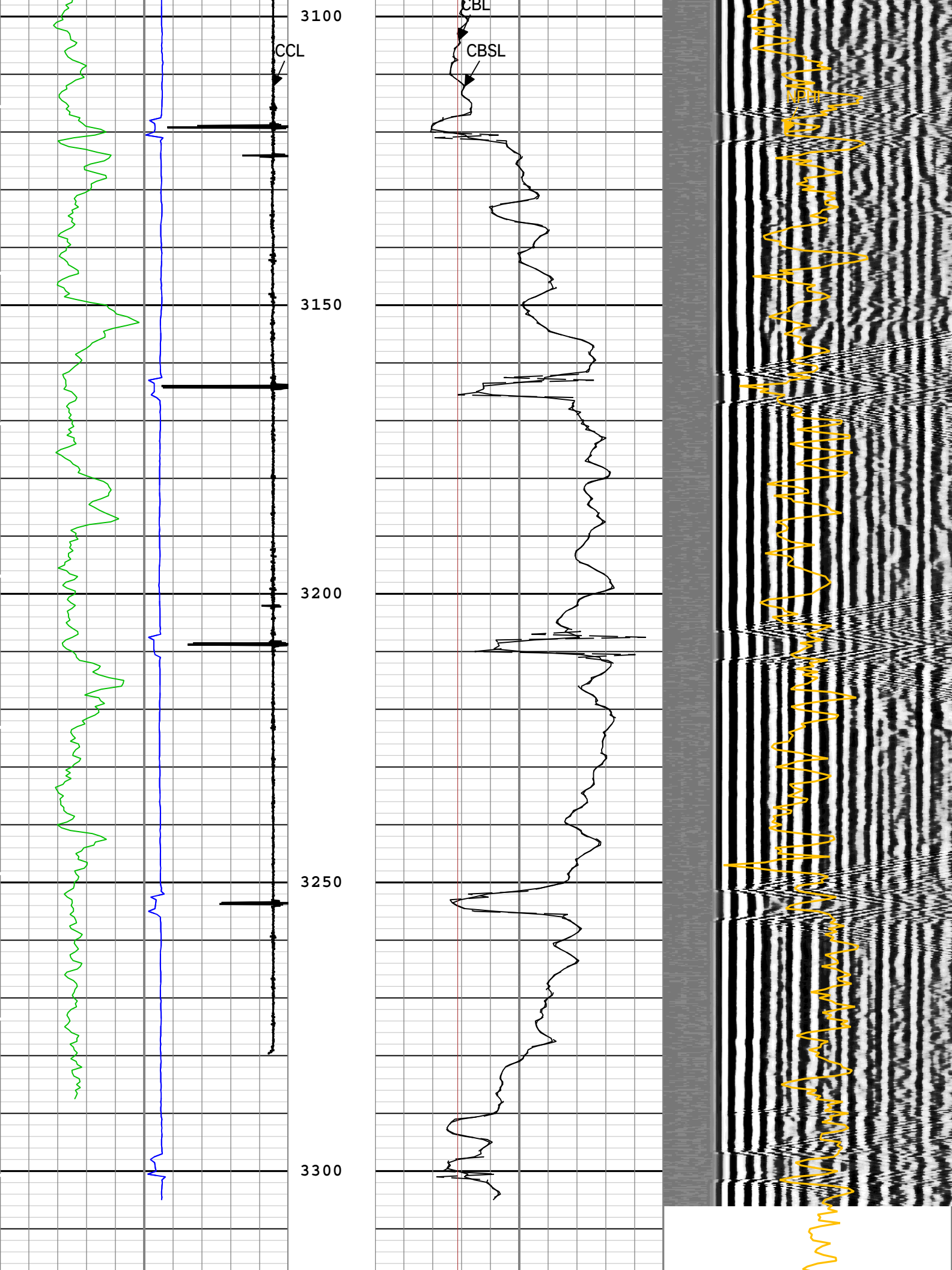
CBL Amplitude (CBL) DSLT-BB

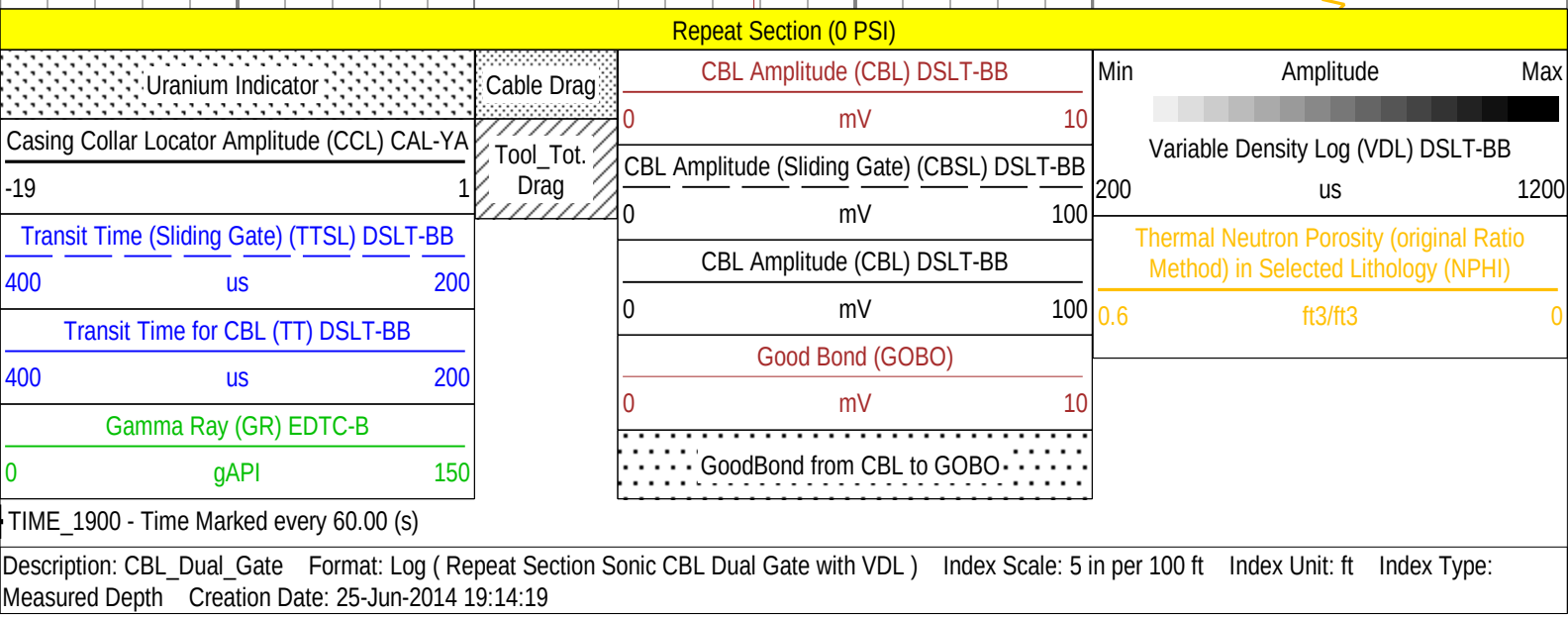
0 mV 100

Min Amplitude Max

Variable Density Log (VDL) DSLT-BB


Transit Time for CBL (TT) DSLT-BB
400
us
200
Gamma Ray (GR) EDTC-B
0
gAPI
150
Cable Drag
Tool_Tot. Drag
Good Bond (GOBO)
0
mV
10
GoodBond from CBL to GOBO
200
us
1200
Thermal Neutron Porosity (original Ratio Method) in Selected Lithology (NPHI)
0.6
ft3/ft3
0
Repeat Section (0 PSI)
2950
3000
3050
GR
TT
TTSL


3100
CCL
CBL
CBSL
3150
3200
3250
3300



Description: CBL_Dual_Gate Format: Log (Repeat Section Sonic CBL Dual Gate with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 25-Jun-2014 19:14:19

Channel Processing Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	12.25	in
CBLG	CBL Gate Width	DSLT-BB	63	us
CBLO	Casing Bottom (Logger)	WLSESSION	5397	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLT-BB	62	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	25	
CDEN	Cement Density	EDTC-B	2	g/cm3
DETE	Delta-T Detection	DSLT-BB	E1	
DFD	Drilling Fluid Density	Borehole	8.34	lbm/gal
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS	
MAHTR	Manual High Threshold Reference for first arrival detection	DSLT-BB	120	
MCI	Minimum Cemented Interval for Isolation	DSLT-BB	14.81	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLT-BB	100	
MSA	Minimum Sonic Amplitude	DSLT-BB	1.33	mV
NMSG	Near Minimum Sliding Gate	DSLT-BB	256	us
SGAD	Sliding Gate Status	DSLT-BB	Off	

Tool Control Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
DSLT_MODE	DSLT Acquisition Mode	DSLT-BB	CBL	
DSLT_RATE	DSLT Firing Rate	DSLT-BB	7.5 Hz	
DTFS	DSLT Telemetry Frame Size	DSLT-BB	536	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	4500	ft/h

Calibration Report

EDTC-B (Enhanced Digital Telemetry Cartridge - Version B) Calibration - Run 1

Primary Equipment :

EDTC-B	EDTC-B	8197

Calibration Parameter :

Plus Reference (lig minus background reference)	165

Plus Reference (Sig minus background reference) 165

EDTC-B Accelerometer Calibration - EDTC-B Accelerometer Calibration

Before (Measured): 11:14:33 25-Jun-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
AZ Vertical Measurement	ft/s2	Before	32.19	31.53	32.02	32.84

EDTC-B Memory Data - EDTC-B Memory Data

Master (EEPROM): 12:18:39 25-Jun-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Initial PMT HV	V	Master			1386.000	
Accelerometer Serial Number		Master			240	
Accelerometer Coefficients - 0		Master	-----	-----	2.971	-----
Accelerometer Coefficients - 1		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 2		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 4		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 7		Master	-----	-----	-0.001	-----
Accelerometer Coefficients - 8		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 9		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 10		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 11		Master	-----	-----	0.000	-----
Gamma-Ray Detector Serial Number		Master			7078	

EDTC-B Gamma-Ray Calibration - Gamma Ray Coefficients

Before (Measured): 17:58:26 24-Jun-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Gamma Ray Gain		Before	1.000	0.900	1.096	1.100

EDTC-B Gamma-Ray Calibration - Gamma Ray Accumulations

Before (Measured): 17:58:26 24-Jun-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
RGR Zero Measurement	gAPI	Before		0	49.327	120.000
RGR Plus Measurement	gAPI	Before	165.000	150.000	150.490	180.000

State: New Mexico

Cement Bond Log

VDL / HNGS