

Company: Tug Hill Operating, LLC

Well: Proctor Trust 1 SWD

Field: Wildcat

County: Comanche State: Kansas

County: Comanche  
 Field: Wildcat  
 Location: 265' FSL - 645' FWL  
 Well: Proctor Trust 1 SWD  
 Company: Tug Hill Operating, LLC

PLATFORM EXPRESS  
 ARRAY INDUCTION  
 GAMMA RAY - SP

265' FSL - 645' FWL	Elev.:	K.B.	2142.00 ft
		G.L.	2120.00 ft
		D.F.	2142.00 ft
Permanent Datum:	Ground Level	Elev.:	2120.00 f
Log Measured From:	Kelly Bushing	22.00 ft	above Perm. Datum
Drilling Measured From:	Kelly Bushing		
API Serial No. 15-033-21657	Section: 25	Township: 31S	Range: 19W

Logging Date 27-Sep-2012

Run Number ONE

Depth Driller 6145.00 ft

Schlumberger Depth 6123.00 ft

Bottom Log Interval 6123.00 ft

Top Log Interval 752.00 ft

Casing Driller Size @ Depth 9.625 in @ 752.00 ft

Casing Schlumberger 752 ft

Bit Size 8.75 in

Type Fluid In Hole Water

Density 9.5 lbm/gal

Viscosity 78 s

Fluid Loss PH 4.8 cm3

PH 10.3

Source of Sample Active Tank

RM @ Meas Temp 0.3 ohm.m @ 79 degF

RMF @ Meas Temp 0.26 ohm.m @ 79 degF

RMC @ Meas Temp 0.42 ohm.m @ 79 degF

Source RMF RMC Calculated

RM @ BHT 0.19 @ 130 0.16 @ 130

Max Recorded Temperatures 130 degF 130

Circulation Stopped 27-Sep-2012 16:00:00

Logger on Bottom 28-Sep-2012 00:23:11

Unit Number 3082

Location: Elk City, OK

Recorded By Matt Cramer

Recorded By Buck Davis

## Disclaimer

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

## Contents

1. Header
2. Disclaimer
3. Contents
4. Well Sketch
5. Borehole Size/Casing/Tubing Record
6. Remarks and Equipment Summary
7. Depth Summary
8. ONE Main Pass 2" = 100'
  - 8.1 Integration Summary
  - 8.2 Software Version
  - 8.3 Composite Summary
  - 8.4 Log ( AIT Basic Log Two )
  - 8.5 Parameter Listing
9. ONE Main Pass 5" = 100'
  - 9.1 Integration Summary
  - 9.2 Software Version
  - 9.3 Composite Summary
- 10.5 Parameter Listing
11. ONE Repeat Analysis
  - 11.1 Composite Summary
  - 11.2 Log ( AIT Basic Log Two RA\_1 )
12. Calibration Report
13. ONE Main Pass 1" = 100'
  - 13.1 Integration Summary
  - 13.2 Software Version
  - 13.3 Composite Summary
  - 13.4 Log ( AIT Basic Log Two )
  - 13.5 Parameter Listing
14. Tail

9.4 Log ( AIT 5 )

9.5 Parameter Listing

10. ONE Repeat Pass 5" = 100'

10.1 Integration Summary

10.2 Software Version

10.3 Composite Summary

10.4 Log ( AIT 5 )

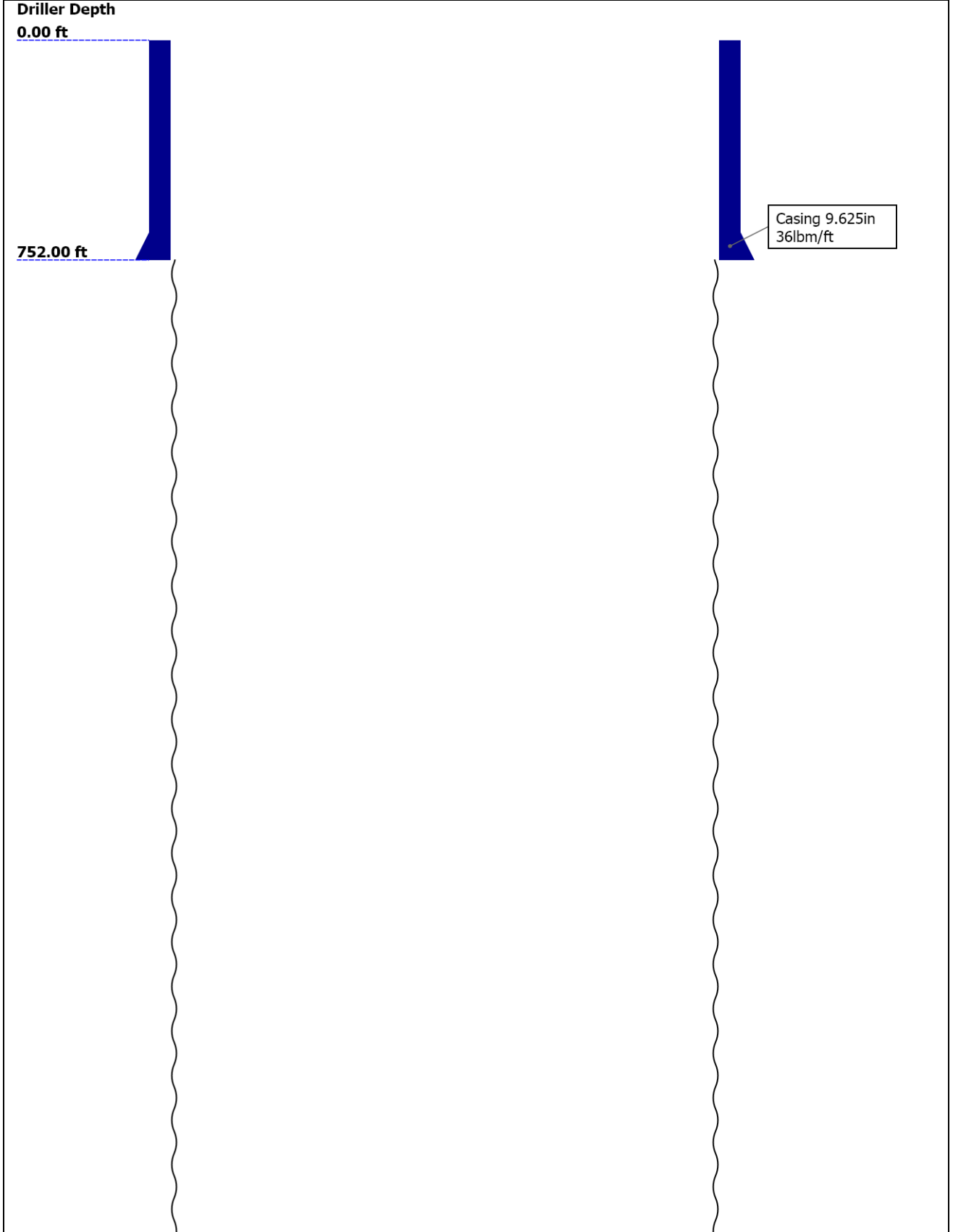
## Well Sketch

**Driller Depth**

**0.00 ft**

**752.00 ft**

Casing 9.625in  
36lbm/ft



6145.00 ft

Open Hole 8.75in

### Borehole Size/Casing/Tubing Record

<b>Bit</b>					
Bit Size ( in )	8.75				
Top Driller ( ft )	752				
Top Logger ( ft )	752				
Bottom Driller ( ft )	6145				
Bottom Logger ( ft )	6123				
<b>Casing</b>					
Size ( in )	9.625				
Weight ( lbm/ft )	36				
Inner Diameter ( in )	8.914				
Top Driller ( ft )	0				
Top Logger ( ft )	0				
Bottom Driller ( ft )	752				
Bottom Logger ( ft )	752				

### Remarks and Equipment Summary

ONE: Toolstring				ONE: Remarks
<b>Equip name</b>	<b>Length</b>	<b>MP name</b>	<b>Offset</b>	Tools ran per tool sketch.
LEH-QT:3077 LEH-QT:3077	65.65			All logs and formats as per client's request.
				Logs computed on Limestone matrix (MDEN = 2,71 g/cc, DTM=47.6 us/ft).
<b>DTC-H:8711</b> ECH-KC:10024 DTC-H:8711	62.73	CTEM HV	61.83 0.00	Main pass recorded from TD to CSG as per client's request.
		TelStatus ToolStatus	59.73 59.73	Repeat Pass pulled from 300 ft from TD as per client's request.
<b>AH-184[2]:47</b> 86	59.73			Maximum recorded temperature as recorded by the HGNS temperature sensor = 130 degF.
				Hole-Cement Volume computed given a future casing size of 7 inches.
<b>AH-184[1]:39</b> 03	57.73			Thank you for choosing Schlumberger Wireline, Elk City, 580-225-4300
				Your crew today: Nicky, Mark and Matt.
<b>GPIT-F:782</b> GPIH-B:1969 DHRU-F:0 GPIC-F:782	55.73	GPIT-F Incl inometer	54.32	
<b>A adaptor_Head</b> :793	51.73	GPIT ECH-MKA	0.00	

MLT-B:24 45.23  
MLT-B:24



Microlog Pad 41.82

Microlog Station 37.65

Temperature 37.62

GR 36.91

CNL Porosity 30.57

HGNS 28.24

HMCA 28.24

Accelerometer 0.00

HRCC 24.24

MCFL 18.81

Caliper 18.33

TLD Density 17.94

HGNS-H:3916 37.65  
HGNH:2965  
NPV-N  
NSR-F:5219  
HMCA-H  
HACCZ-H:3574  
HGNS-H:3916

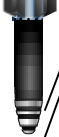
HDRS-H:3966 28.24  
ECH-MEB:2769  
HRC C-H:3821  
HRMS-H:3966  
GSR-J:5398  
HRGD-H:3992  
Short Spacing:0  
GPV-Q  
Long Spacing:28  
539  
Backscatter:2681  
9

AIT-M:34 16.00  
AMIS:34  
AMRM:34

Temperature 7.91

Power Supply 7.91

Induction 7.91



SP 0.08  
 Mud Resistivity 0.00  
 Head Tension  
 TOOL\_ZERO

Lengths are in ft  
 Maximum Outer Diameter = 5.875 in  
 Line: Sensor Location, Value: Gating Offset  
 All measurements are relative to TOOL\_ZERO

## Depth Summary

<b>Depth Control Parameters</b>	<b>ONE</b>		
Conveyance Type	Wireline		
Log Sequence	First trip to wellsite		
Rig Up Length at Surface ( ft )	184.60		
Rig Up Length at Bottom ( ft )	184.30		
Rig Up Length Correction ( ft )	0.30		
Stretch Correction ( ft )	2.34		
Tool Zero Reference Check at Surface ( ft )	0.30		
<b>Depth Remark Parameters</b>	<b>ONE</b>		
Depth Remark 1	All Schlumberger depth control procedures were followed.		
Depth Remark 2	IDW used as primary depth control.		
Depth Remark 3	Z-chart used as secondary depth control measure.		
Depth Remark 4	First trip to wellsite. Main Pass correlated to down log.		
<b>Depth Measuring Device</b>	<b>ONE</b>		
Type	IDW-B		
Serial Number	900		
Calibration Date	01-May-2012		
Calibrator Serial Number	33		
Wheel Correction 1	-3		
Wheel Correction 2	-3		
<b>Tension Device</b>	<b>ONE</b>		
Type	CMTD-B/A		
Serial Number	2549		
Calibration Date	25-Sep-2012		
Calibrator Serial Number	1018		
Calibration Points	10		
Calibration RMS	11		
Calibration Peak Error	22		
<b>Logging Cable</b>	<b>ONE</b>		
Type	7-39P-LXS		
Serial Number	U712016		
Logging Cable Length ( ft )	18020.00		

**ONE**

**Main Pass 2" = 100'**

## Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	1543.34	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	2981.24	ft3

# Software Version

<b>Acquisition System</b>		<b>Version</b>	
MaxWell		3.0.9609.0	
Application Patch		SP-20120409-3.0.9609.1919	
		EXP_APL-OPElevation-3.0.9609.1966	
		EXP_APL-ADT-3.0.9609.1558	
<b>Computation</b>	<b>Description</b>	<b>Version</b>	
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.0.9609.1919	
<b>Tool Elements</b>	<b>Description</b>	<b>Software Version</b>	<b>Firmware Version</b>
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.0.9609.1919	2.0
AMIS	Array Induction Sonde - M	3.0.9609.1919	1

## Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Log[4]:Up	Up	517.13 ft	6137.18 ft	28-Sep-2012 12:35:18 AM	28-Sep-2012 2:13:46 AM	2.34 ft	

All depths are referenced to toolstring zero

## Log

ONE: Log[4]:Up 31C06791-5DD9-42F0-BB46-96BE07B8860F

Description: AIT Basic Log Two Format: Log ( AIT Basic Log Two ) Index Scale: 2 in per 100 ft Index Unit: ft  
 Index Type: Measured Depth Creation Date: 28-Sep-2012 02:40:39

Channel	Source	Sampling
AF20	AIT-M:AMIS:AMIS	3in
AF60	AIT-M:AMIS:AMIS	3in
AFCO60	AIT-M:AMIS:AMIS	3in
GR	HGNS-H:HGNS-H:HGNS-H	6in
ICV	Borehole	6in
IHV	Borehole	6in
SP	AIT-M:AMIS:AMIS	6in
TIME_1900	WLWorkflow	0.1in

- | IHV - Integrated Hole Volume every 10.00 (ft3)
- | TIME\_1900 - Time Marked every 60.00 (s)
- | IHV - Integrated Hole Volume every 100.00 (ft3)
- | ICV - Integrated Cement Volume every 10.00 (ft3)
- | ICV - Integrated Cement Volume every 100.00 (ft3)

**Gamma Ray Backup**

Gamma Ray (GR)  
HGNS-H

---

0 gAPI 150

Spontaneous Potential  
(SP) AIT-M

---

-160 mV 40

Gamma Ray (GR)  
HGNS-H

---

150 gAPI 300

Array Induction Four  
Foot Resistivity A60  
(AF60) AIT-M

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0 ohm.m 50

Array Induction Four  
Foot Resistivity A20  
(AF20) AIT-M

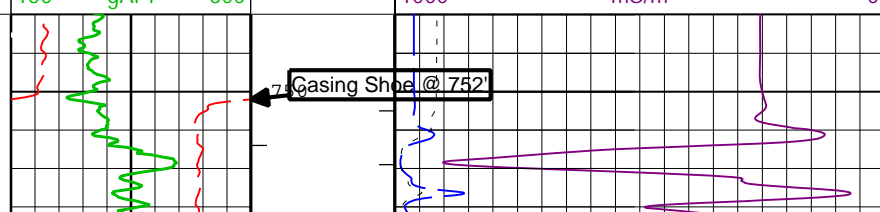
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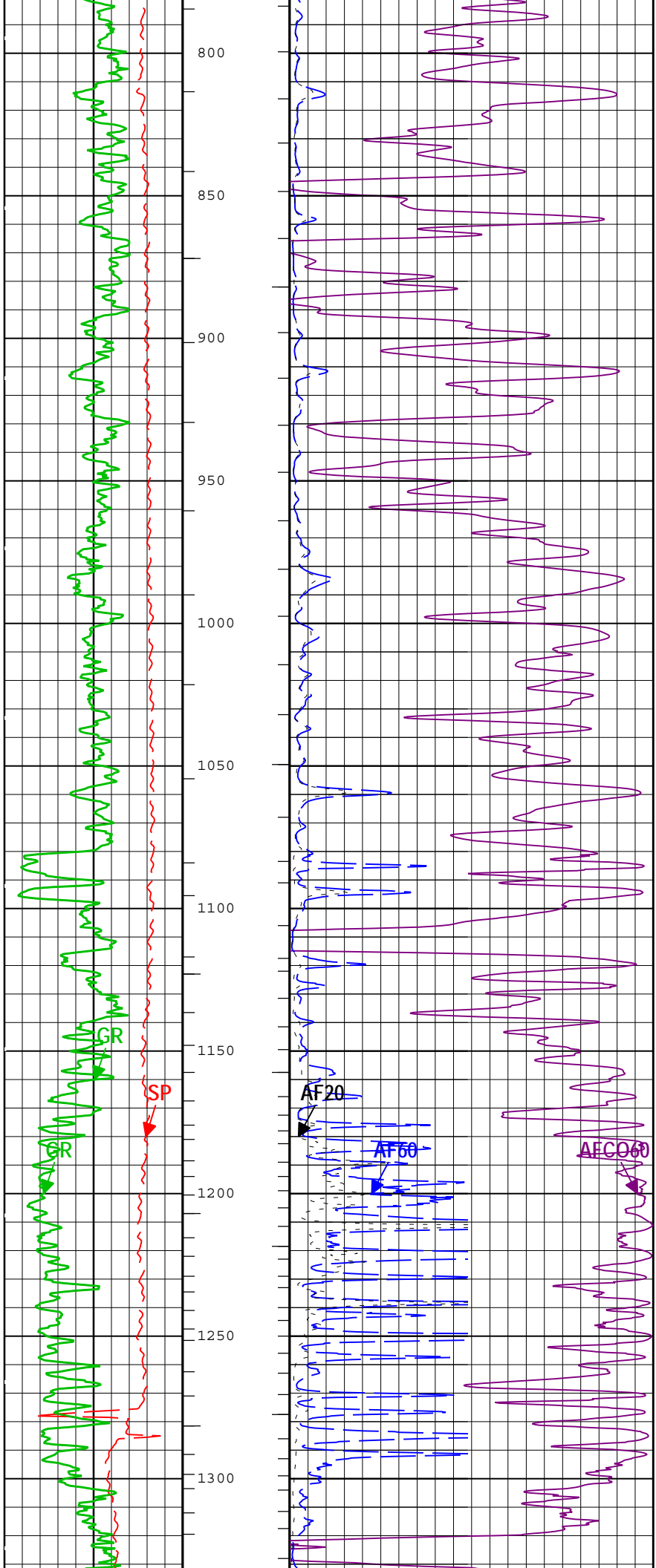
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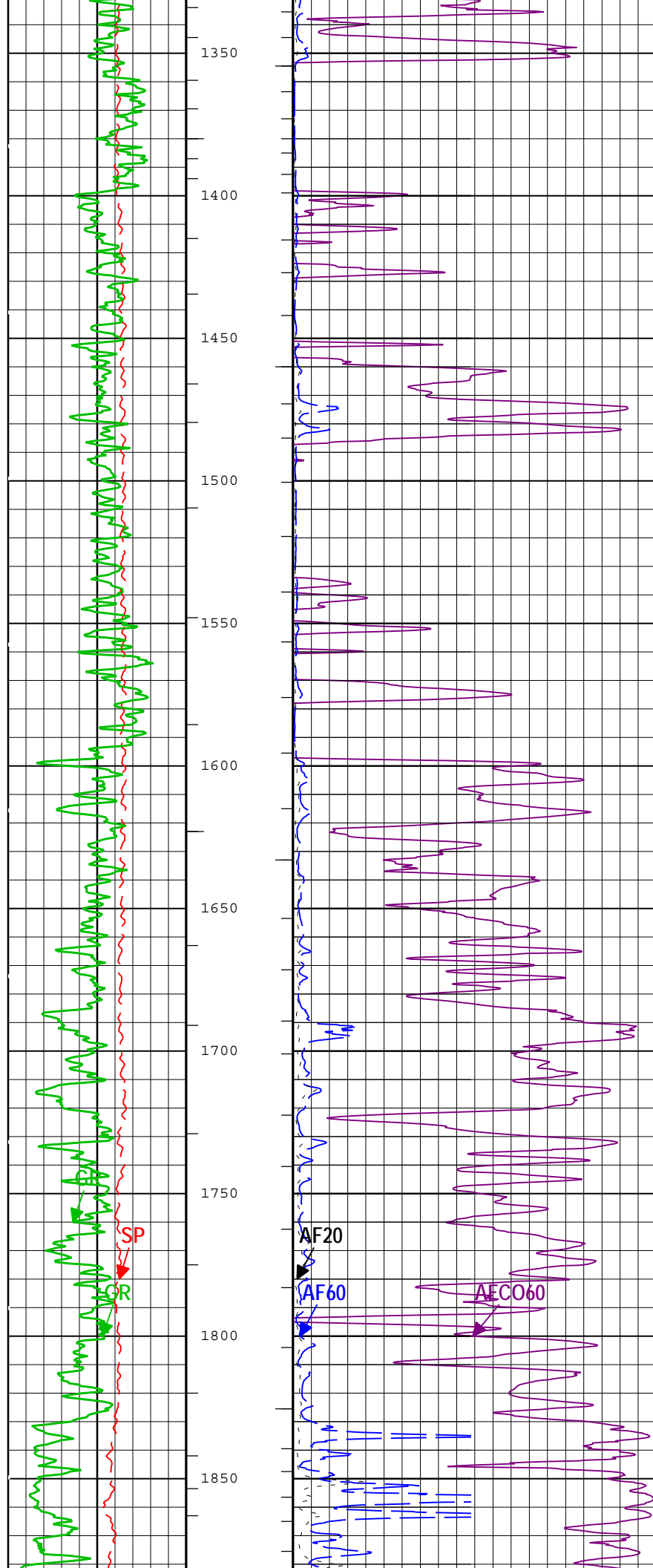
Array Induction Four Foot Conductivity A60  
(AFCO60) AIT-M

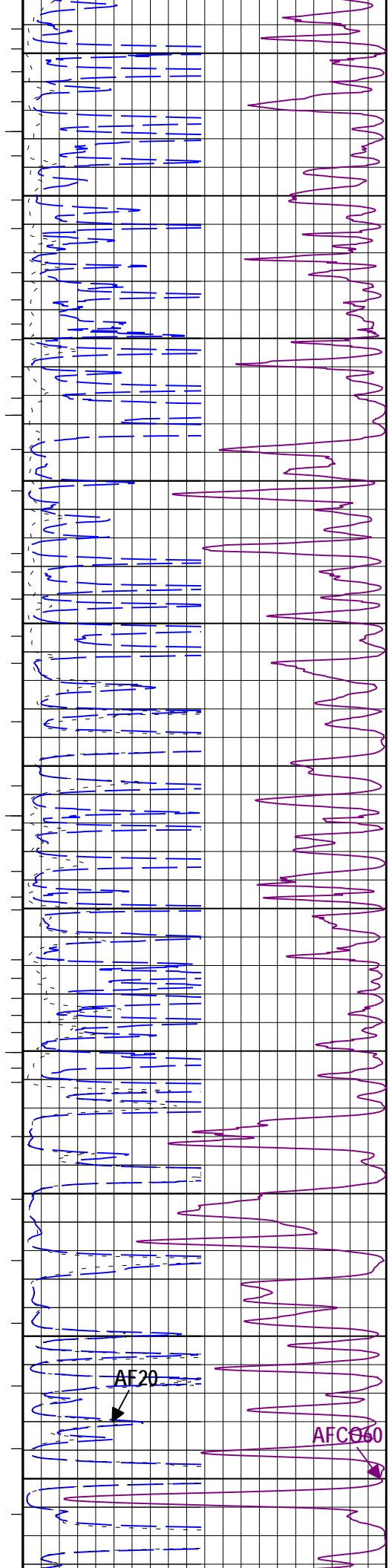
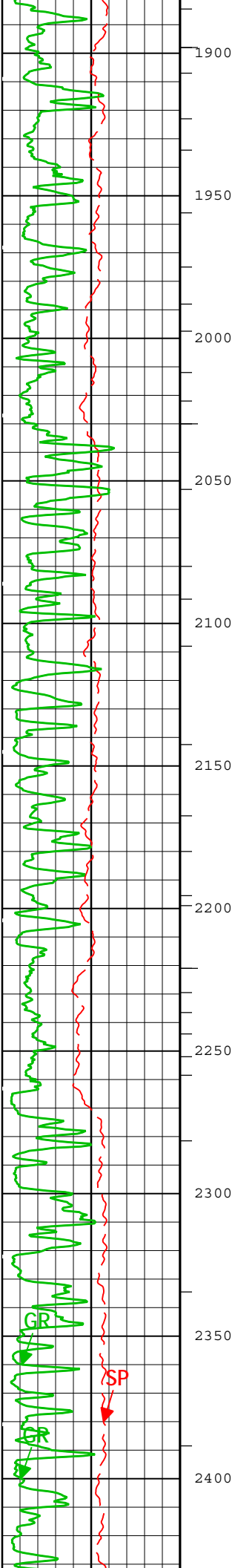
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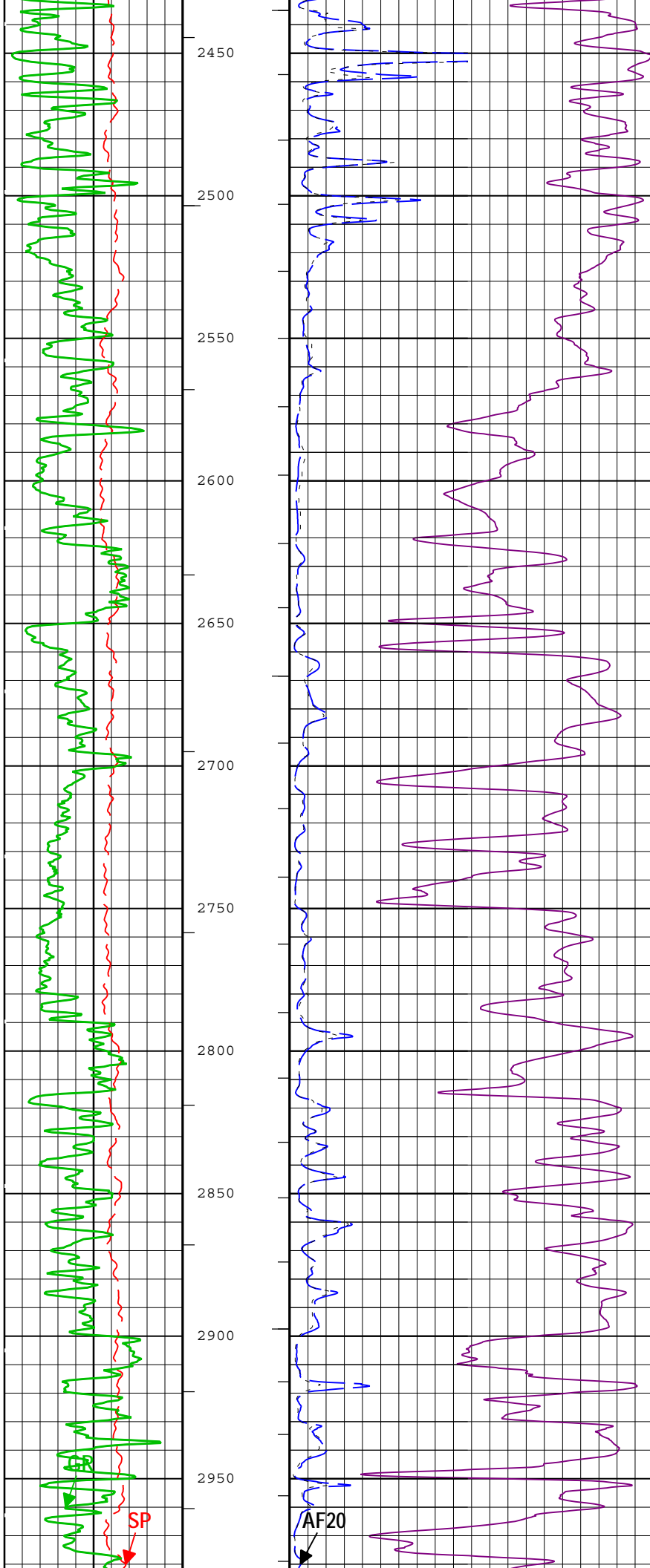
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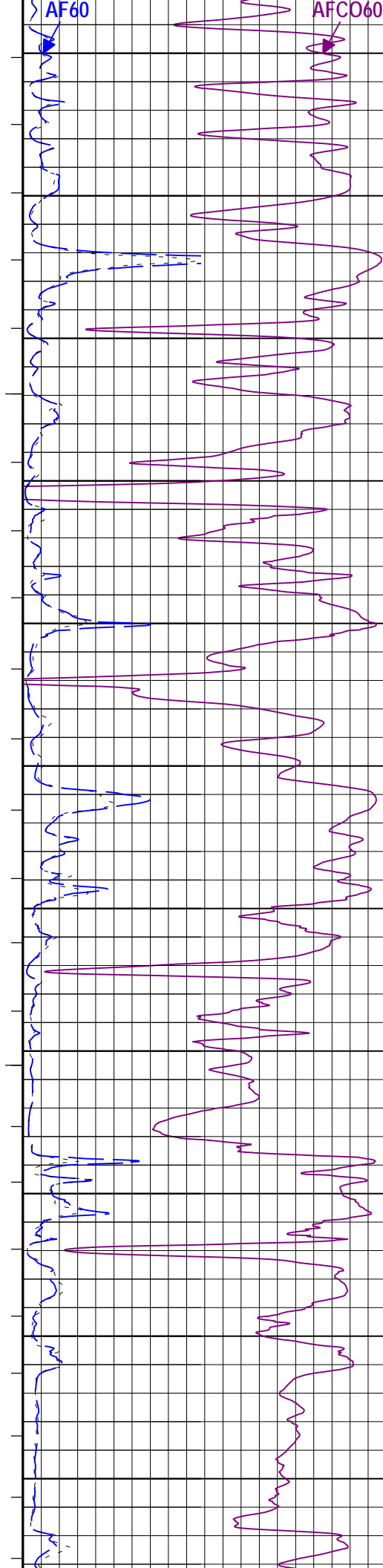
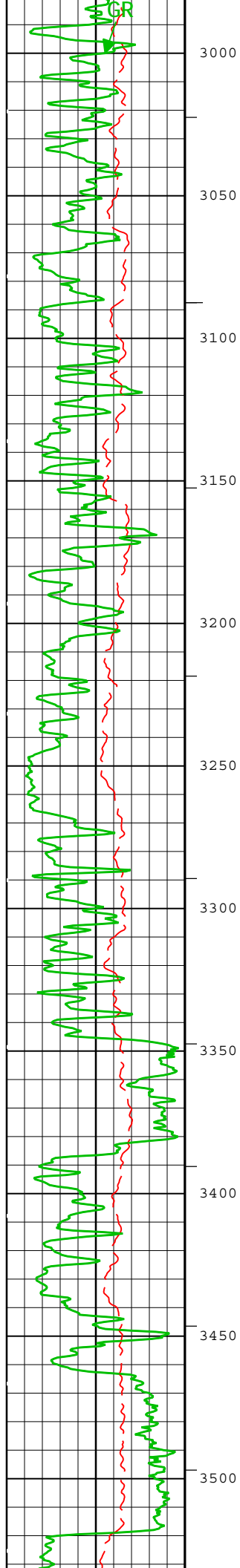


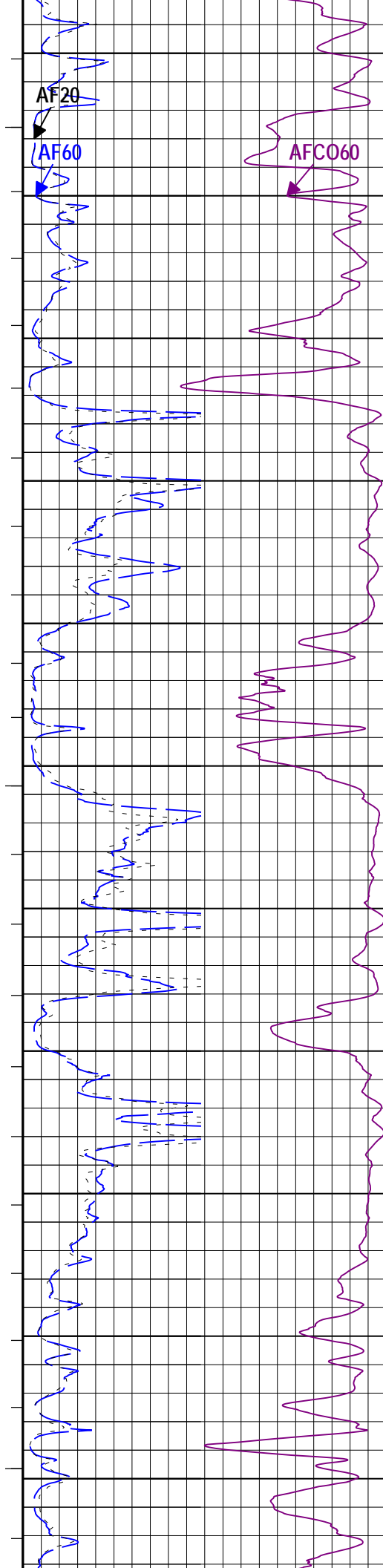
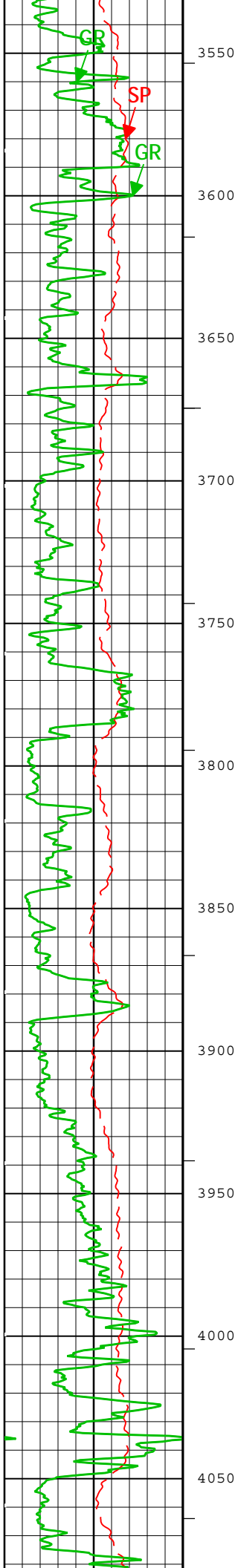


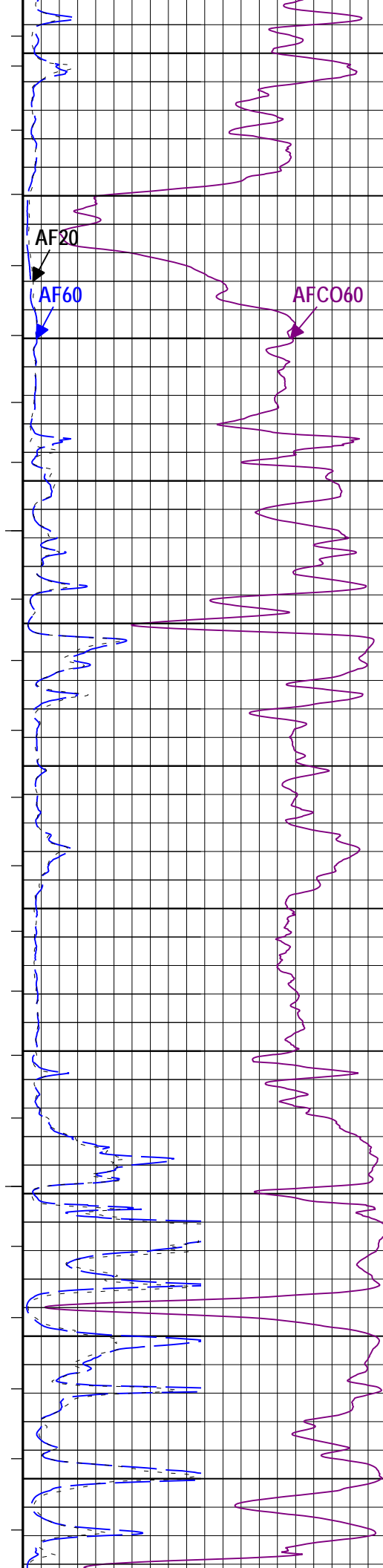
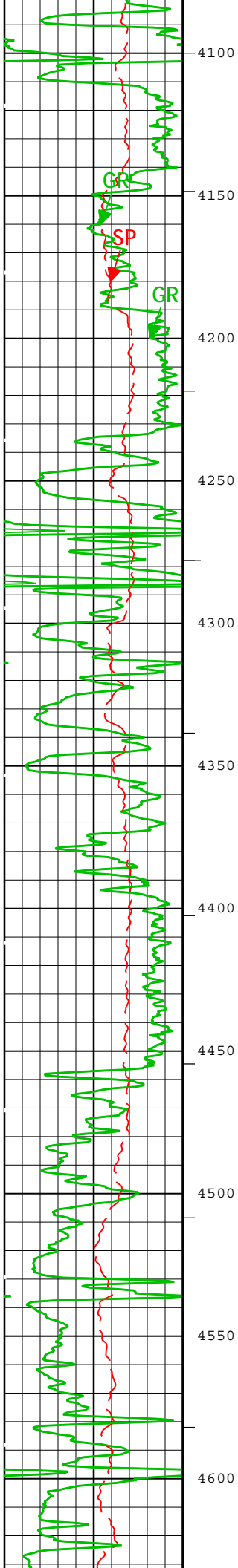


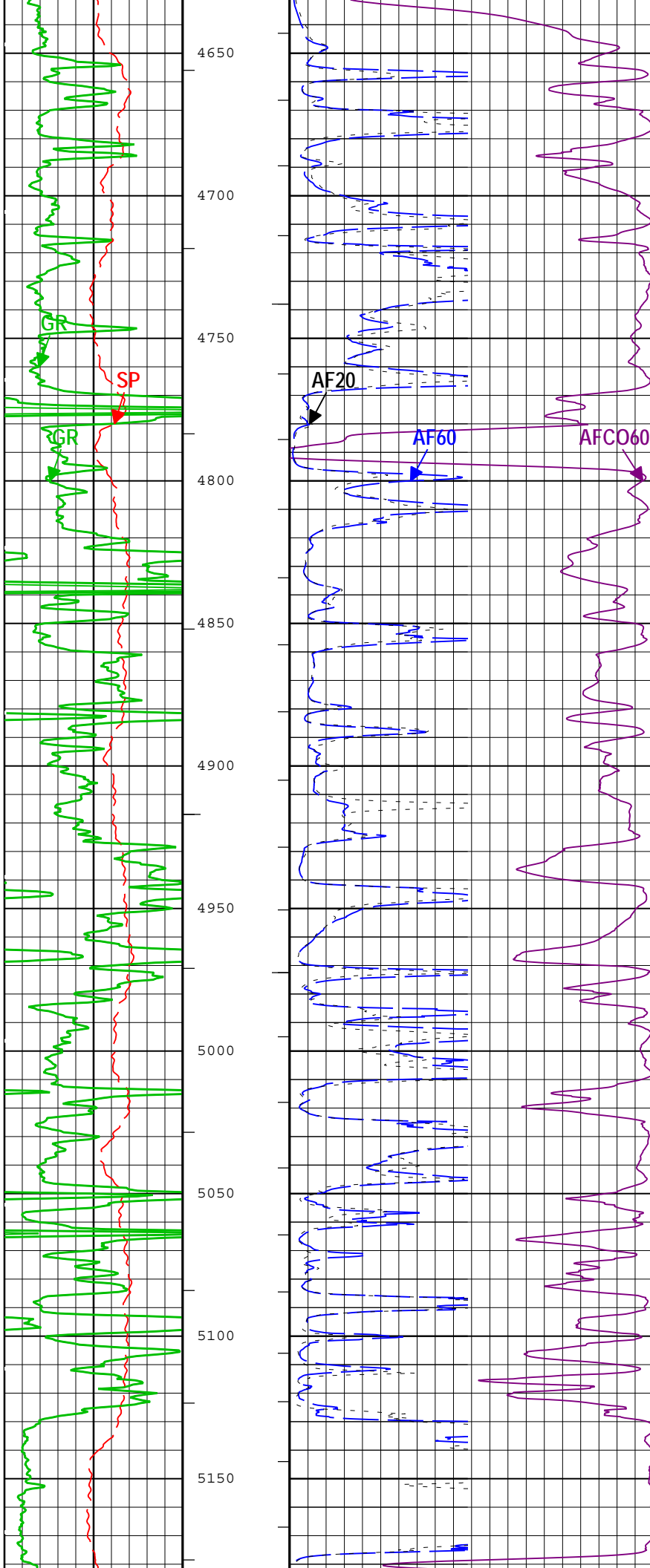


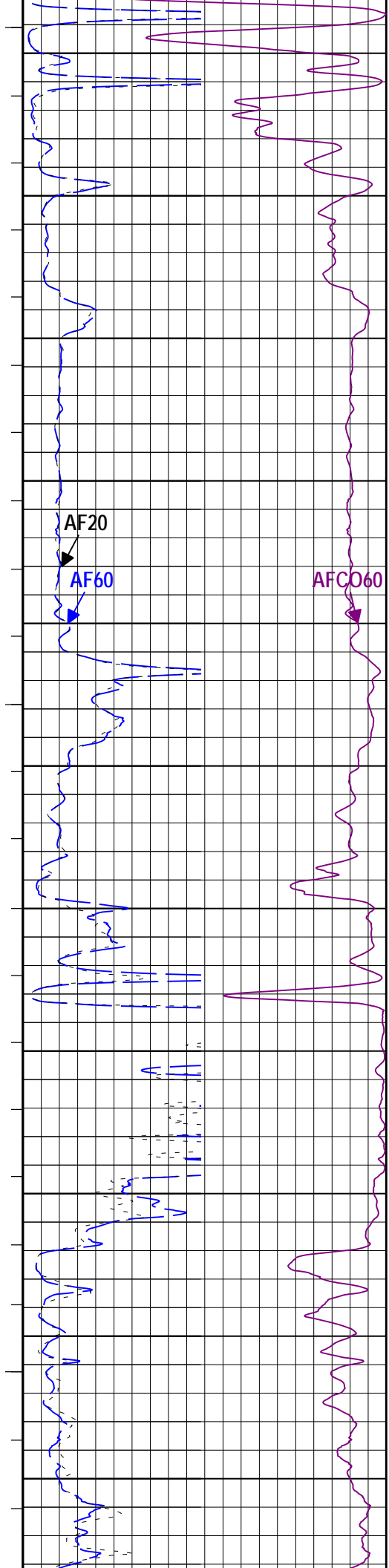
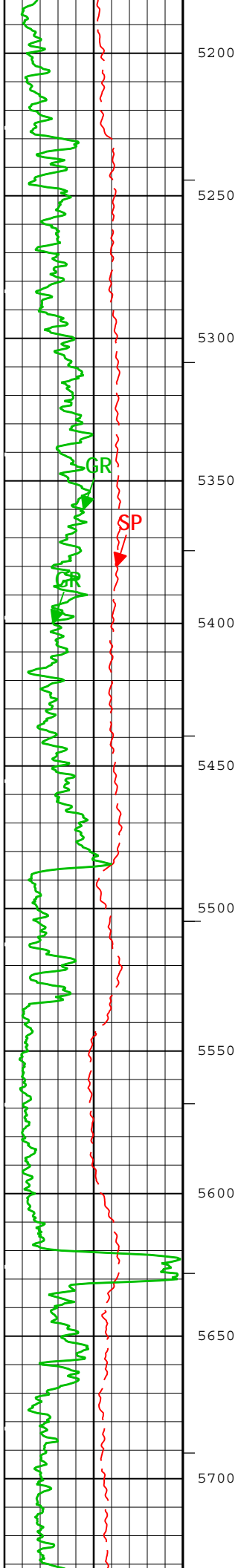


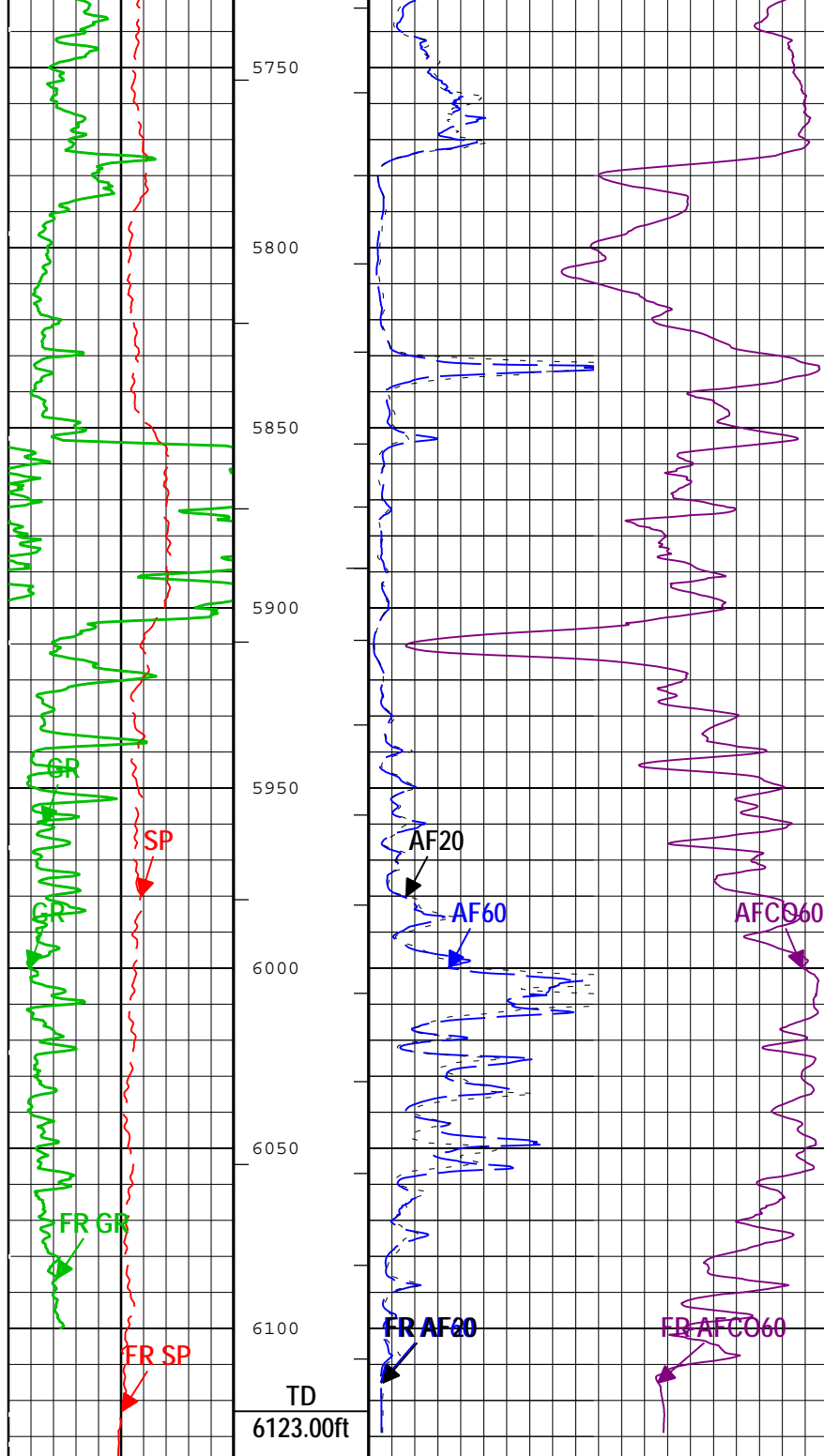












Gamma Ray Backup		
Gamma Ray (GR) HGNS-H		
0	gAPI	150
Spontaneous Potential (SP) AIT-M		
-160	mV	40
Gamma Ray (GR) HGNS-H		
150	gAPI	300

Array Induction Four Foot Conductivity A60 (AFCO60) AIT-M		
1000	mS/m	0
Array Induction Four Foot Resistivity A60 (AF60) AIT-M		
0	ohm.m	50
Array Induction Four Foot Resistivity A20 (AF20) AIT-M		
0	ohm.m	50

— ICV - Integrated Cement Volume every 100.00 (ft3)

— ICV - Integrated Cement Volume every 10.00 (ft3)

—|IHV - Integrated Hole Volume every 100.00 (ft3)

|TIME\_1900 - Time Marked every 60.00 (s)

—|IHV - Integrated Hole Volume every 10.00 (ft3)

Description: AIT Basic Log Two Format: Log ( AIT Basic Log Two ) Index Scale: 2 in per 100 ft Index Unit: ft  
 Index Type: Measured Depth Creation Date: 28-Sep-2012 02:40:39

## Channel Processing Parameters

Parameter	Description	ToolPath	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M:AMIS:AMIS	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M:AMIS:AMIS	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M:AMIS:AMIS	Yes	
ASTA	Array Induction Tool Standoff	AIT-M:AMIS:AMIS	1.625	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	COMPLETION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H:HRCC-H:HRCC-H	0	in
CBLO	Casing Bottom (Logger)	COMPLETION	752	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	COMPLETION	9.625	in
DFD	Drilling Fluid Density	Borehole	9.5	lbm/gal
FCD	Future Casing (Outer) Diameter	COMPLETION	7	in
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	CALI	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SPDR	SP Drift Per Foot	AIT-M:AMIS:AMIS	0	mV/ft

## Depth Zone Parameters

Parameter	Value	Start ( ft )	Stop ( ft )
BS	0	730	752
BS	8.75	752	6137

All depth are actual.

## Tool Control Parameters

ONE

Main Pass 5" = 100'

## Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	1543.34	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	2981.24	ft3

## Software Version

Acquisition System	Version
MaxWell	3.0.9609.0
Application Patch	SP-20120409-3.0.9609.1919 EXP_APL-OPElevation-3.0.9609.1966 EXP_APL-ADT-3.0.9609.1558

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.0.9609.1919

Tool Elements	Description	Software Version	Firmware Version
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HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.0.9609.1919	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.0.9609.1919	2.0
AMIS	Array Induction Sonde - M	3.0.9609.1919	1

## Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Log[4]:Up	Up	517.13 ft	6137.18 ft	28-Sep-2012 12:35:18 AM	28-Sep-2012 2:13:46 AM	2.34 ft	

All depths are referenced to toolstring zero

## Log

ONE: Log[4]:Up 31C06791-5DD9-42F0-BB46-96BE07B8860F

Description: AIT Basic Log One Format: Log (AIT 5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2012 02:40:41

Channel	Source	Sampling
AT10	AIT-M:AMIS:AMIS	3in
AT20	AIT-M:AMIS:AMIS	3in
AT30	AIT-M:AMIS:AMIS	3in
AT60	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
BS	Borehole	6in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
ICV	Borehole	6in
IHV	Borehole	6in
SP	AIT-M:AMIS:AMIS	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

— IHV - Integrated Hole Volume every 10.00 (ft3)

— IHV - Integrated Hole Volume every 100.00 (ft3)

— ICV - Integrated Cement Volume every 10.00 (ft3)

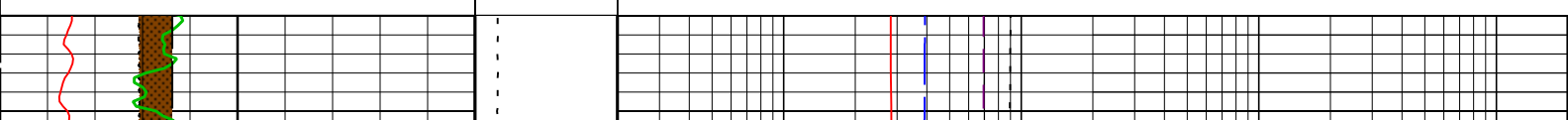
TIME\_1900 - Time Marked every 60.00 (s)

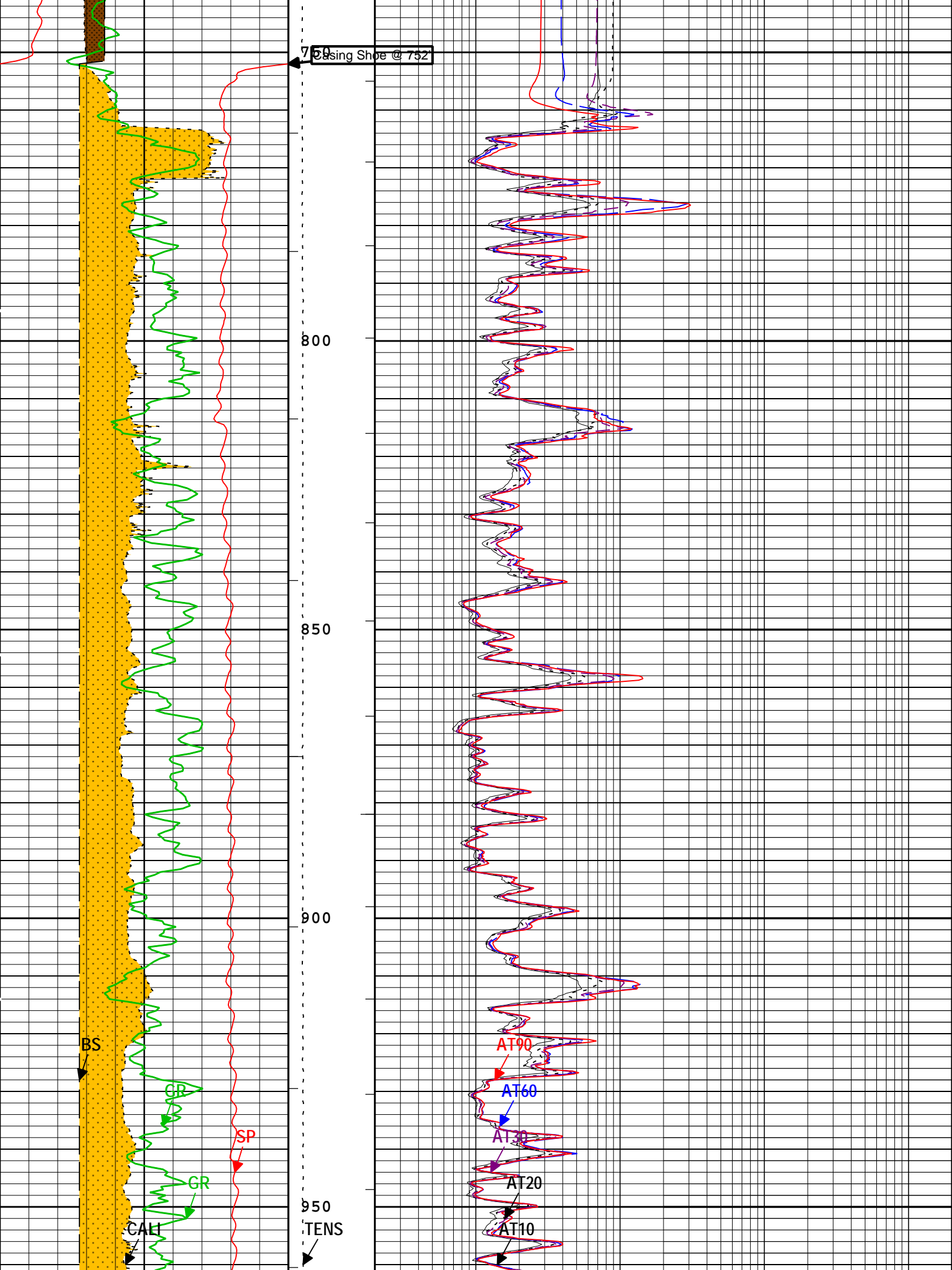
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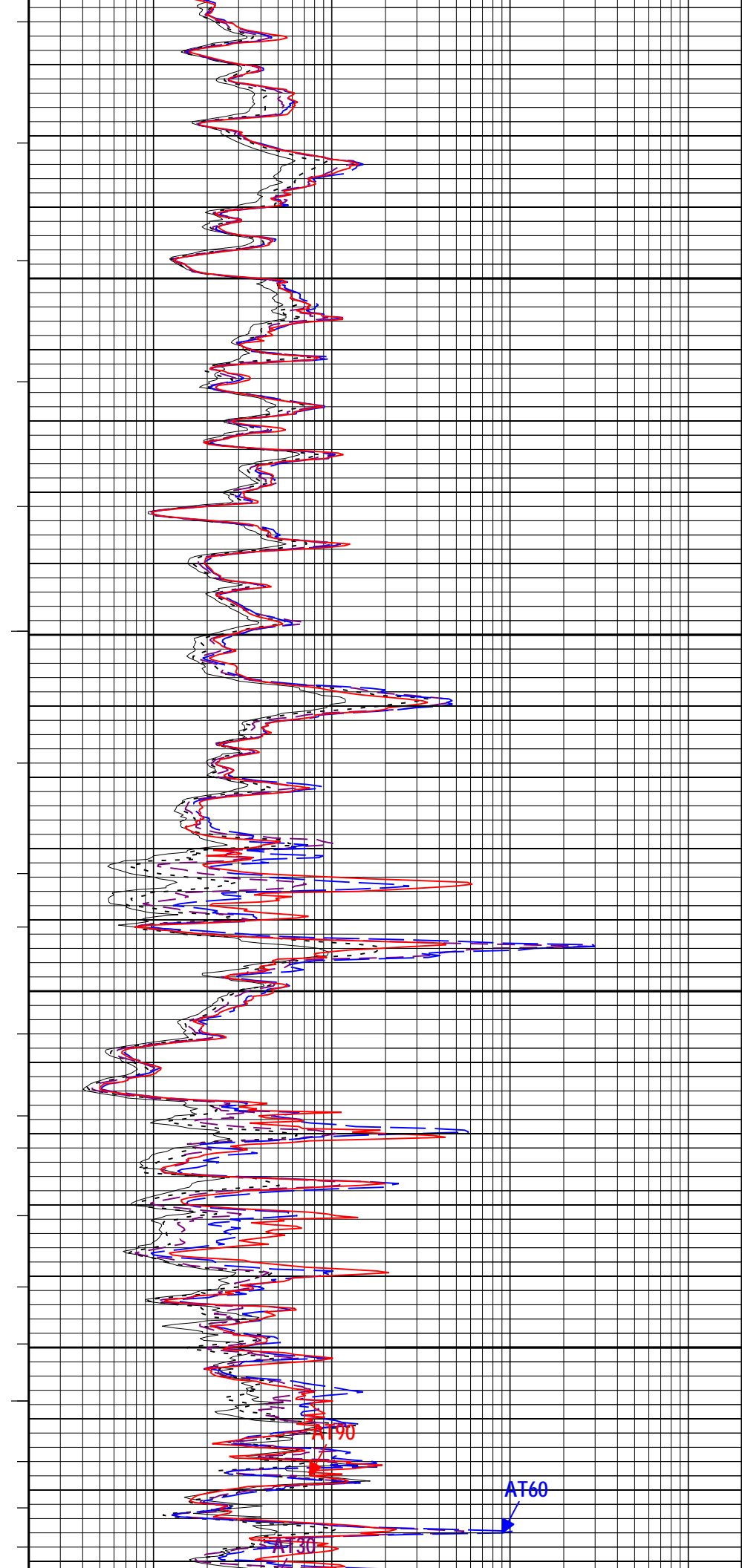
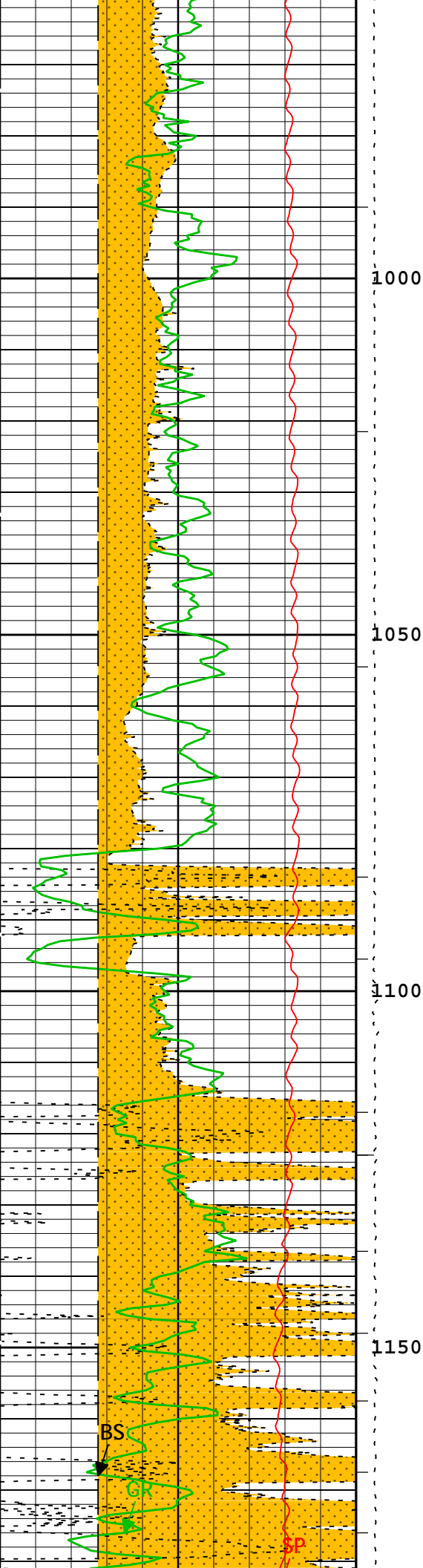
Gamma Ray Backup		
Mud-Cake		
Washout		
Caliper (CALI) HDRS-H		
6	in	16
Gamma Ray (GR) HGNS-H		
0	gAPI	150
Spontaneous Potential (SP) AIT-M		
-160	mV	40
Gamma Ray (GR) HGNS-H		
150	gAPI	300
Bit Size (BS)		
6	in	16

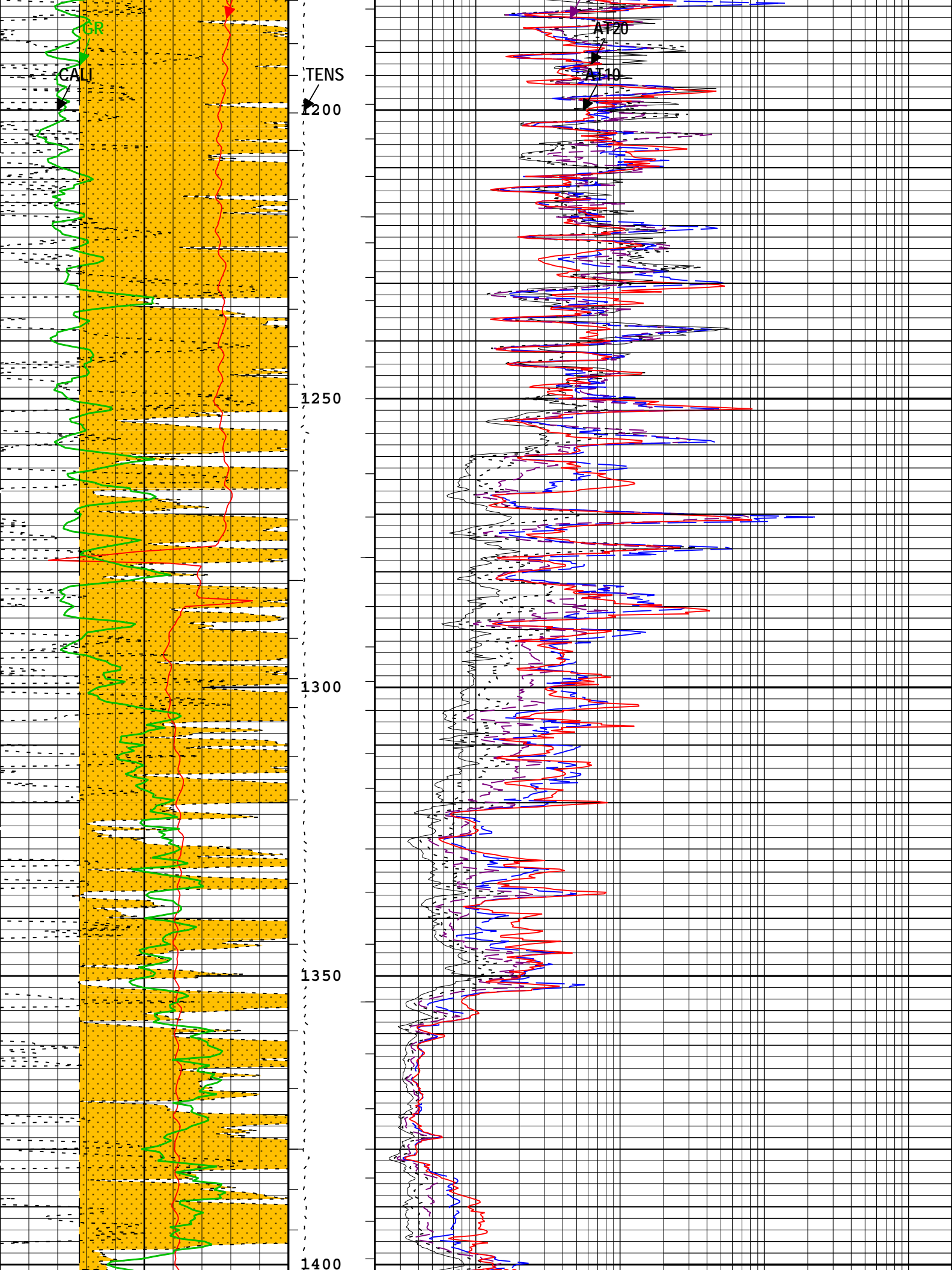
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0 lbf 8000

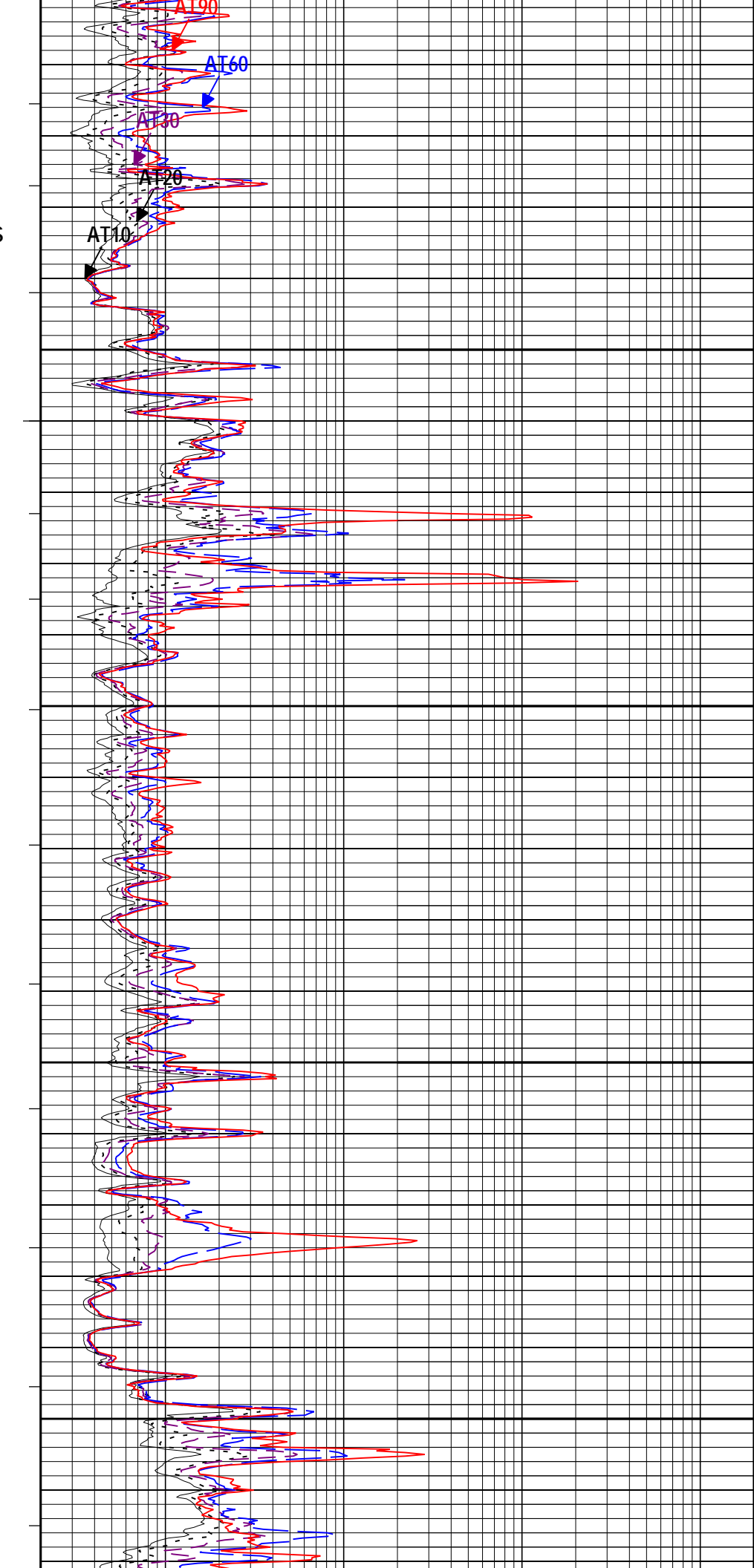
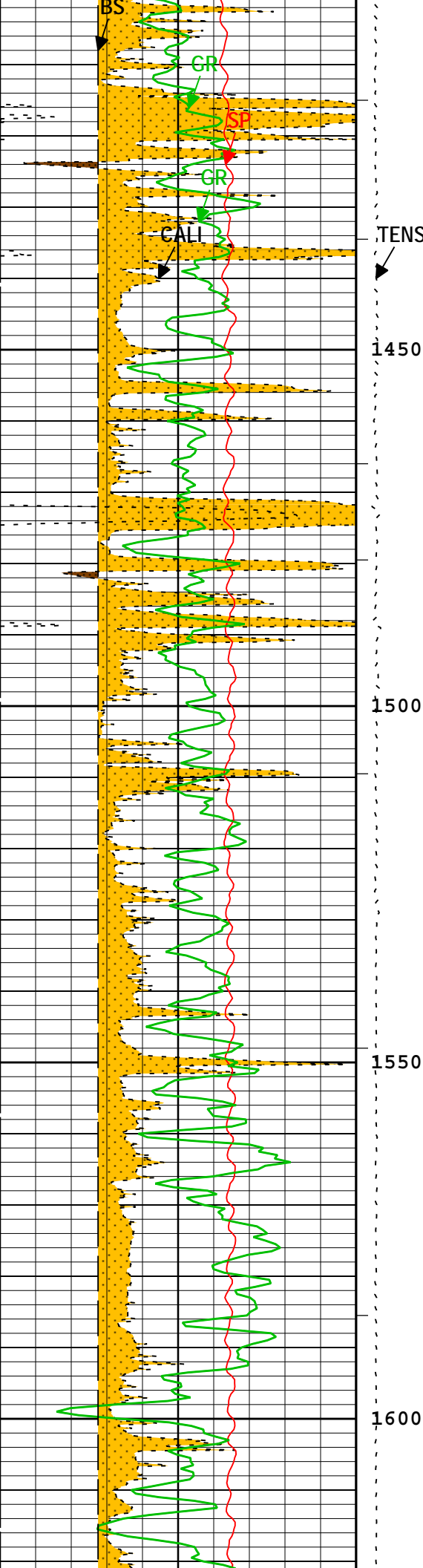
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0.2	ohm.m	2000
Array Induction Two Foot Resistivity A20 (AT20) AIT-M		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A30 (AT30) AIT-M		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A60 (AT60) AIT-M		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A90 (AT90) AIT-M		
0.2	ohm.m	2000

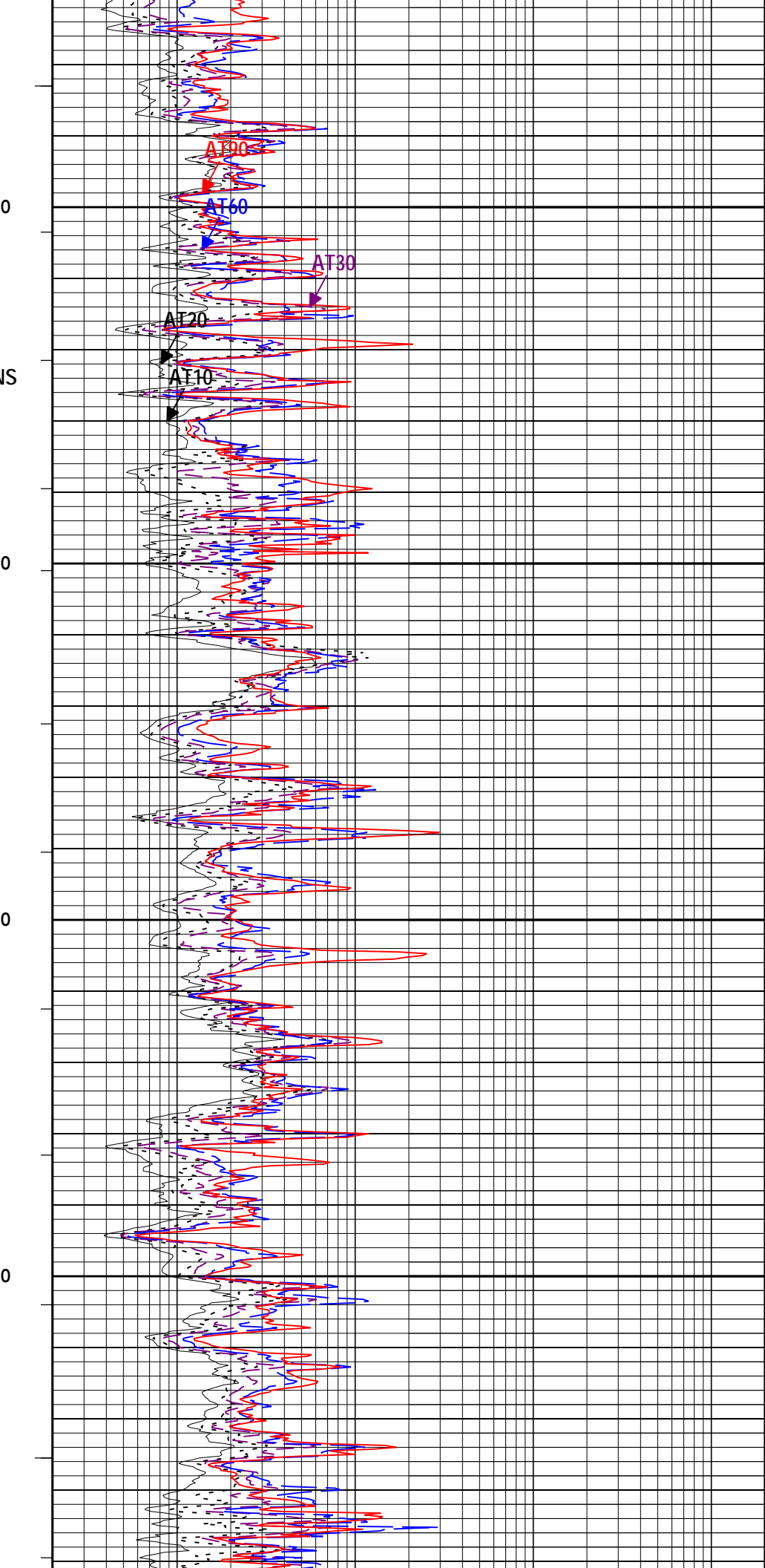
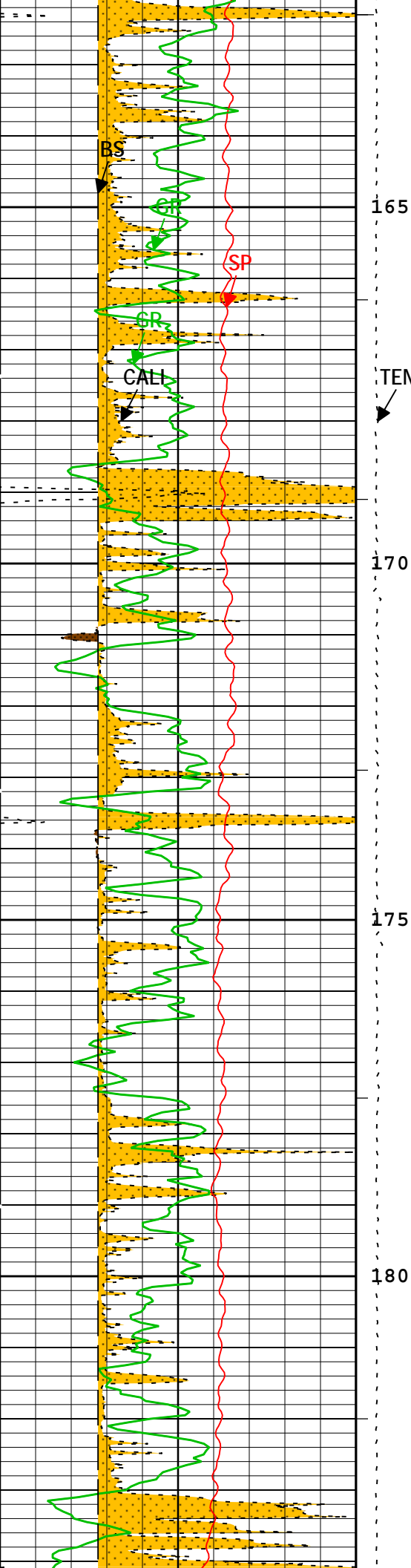


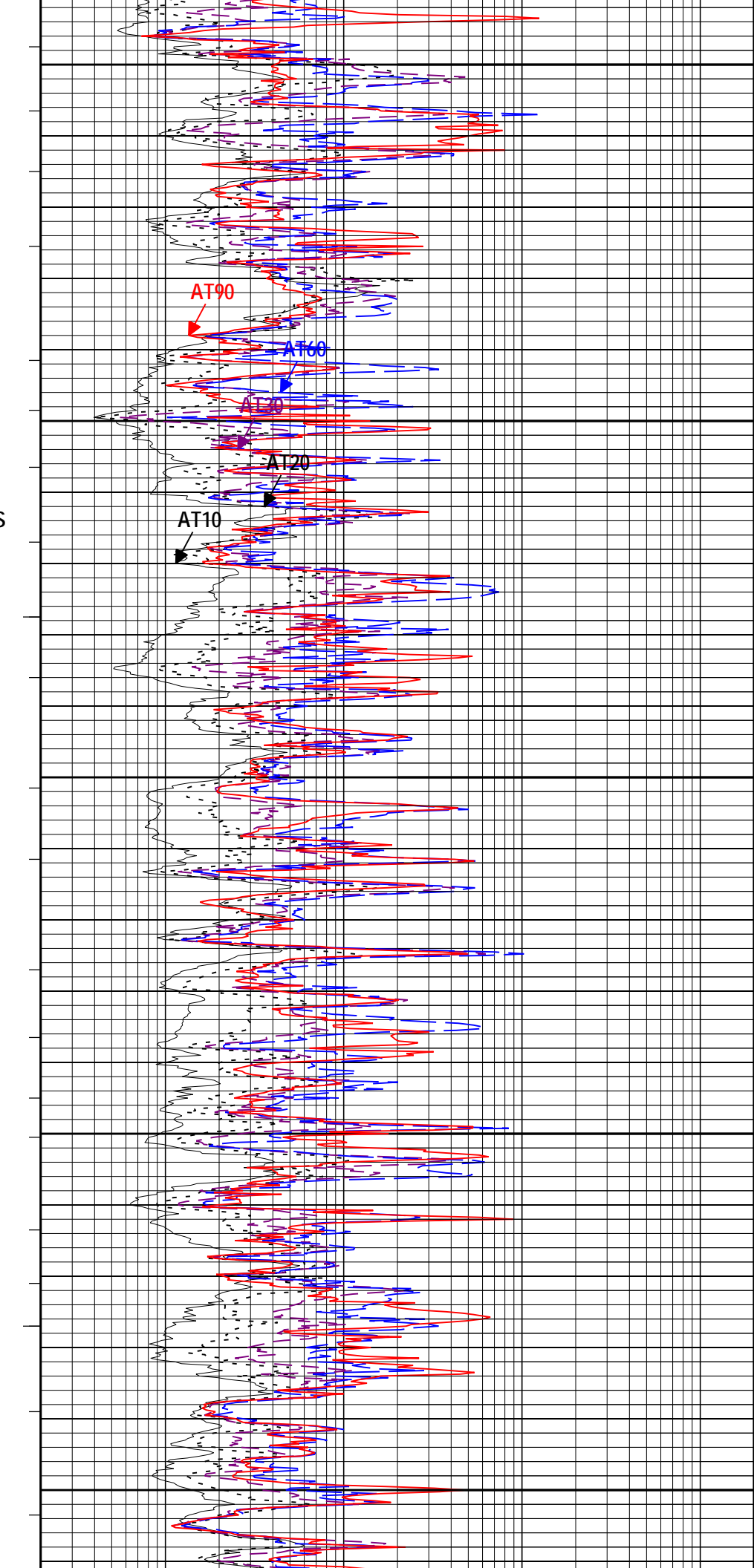
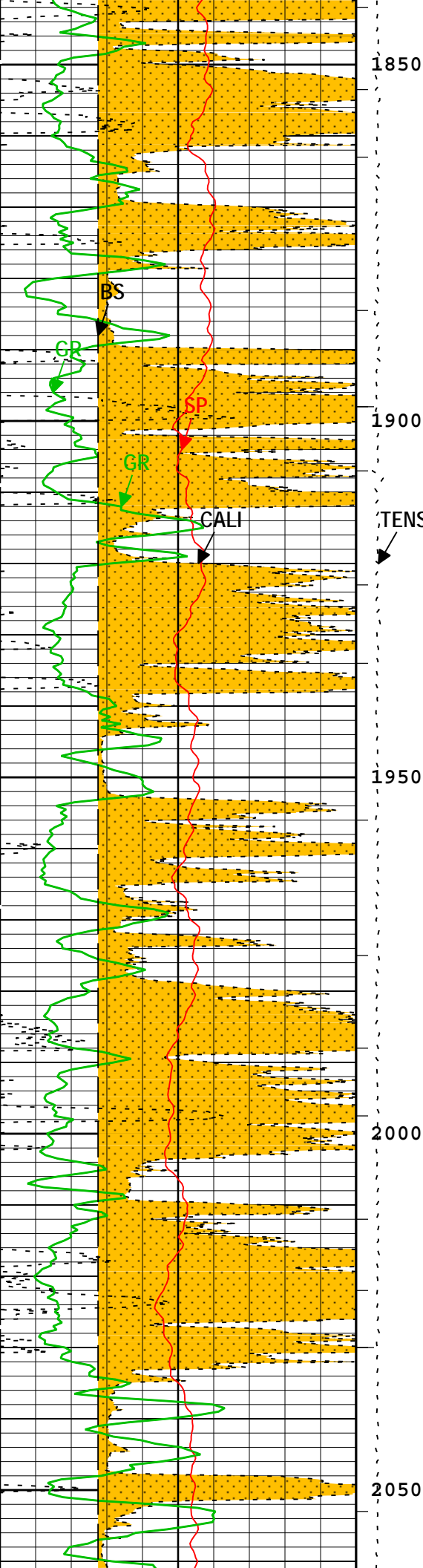


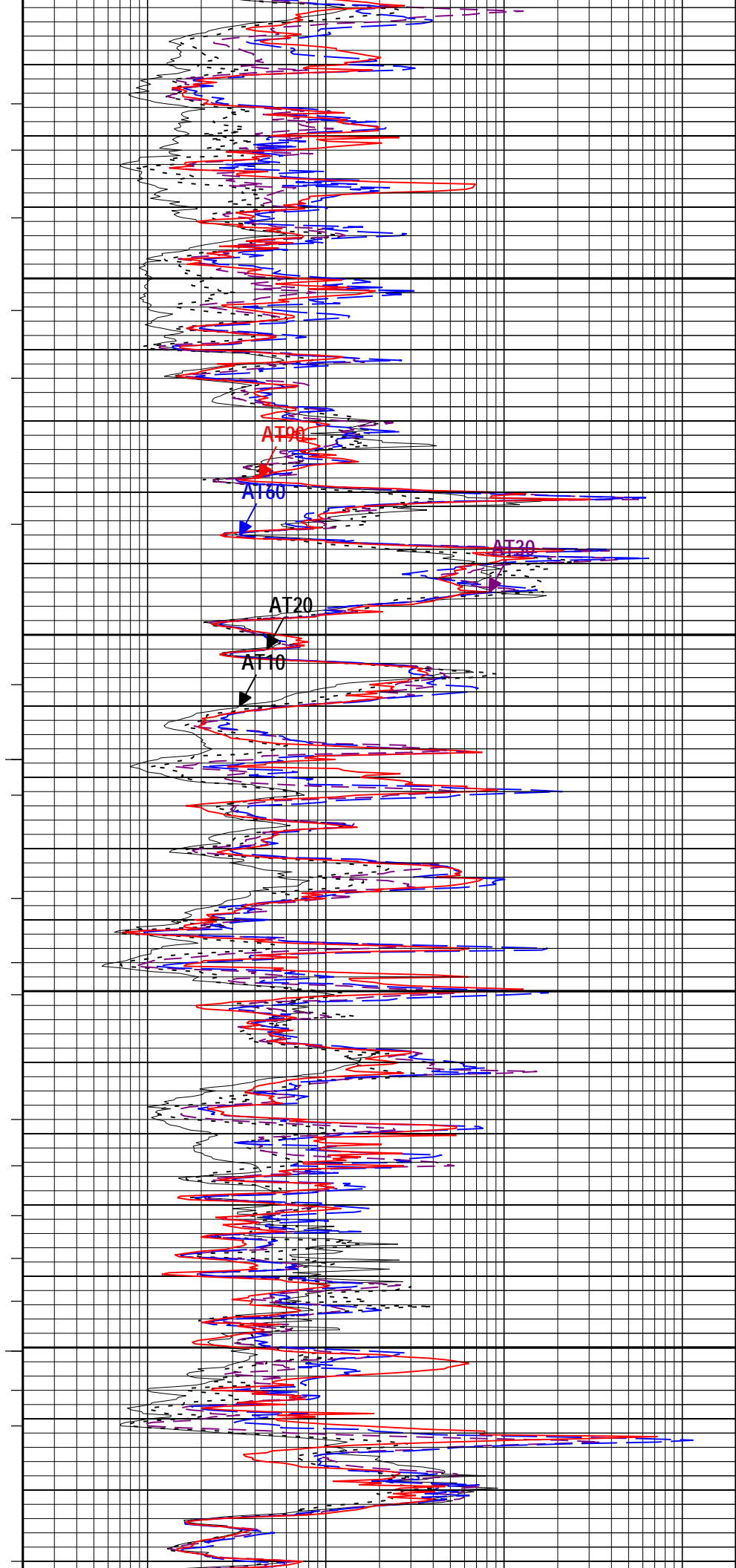
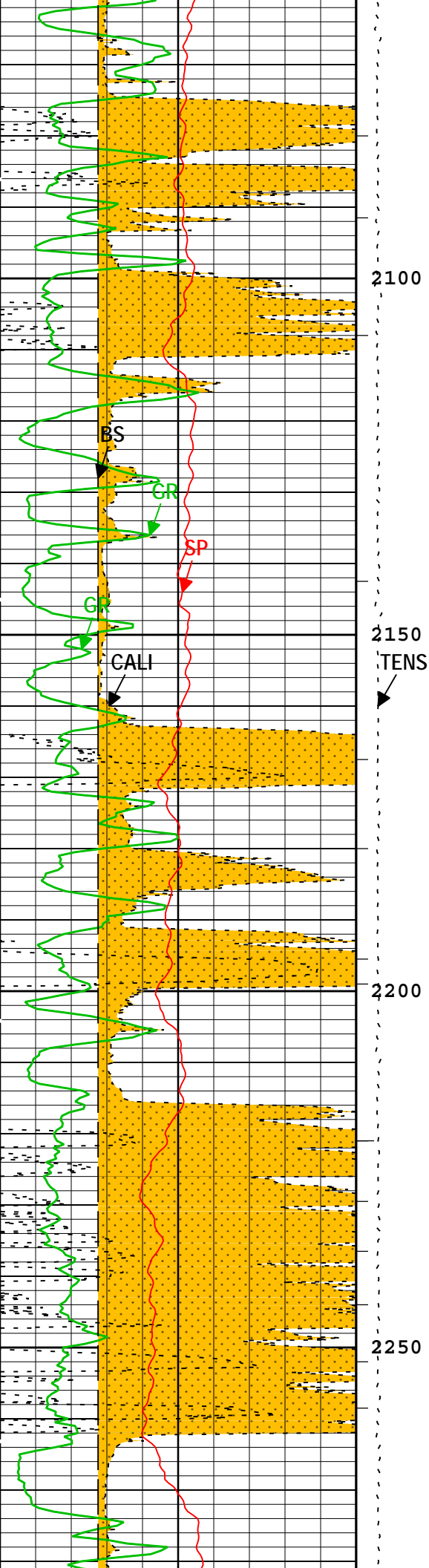


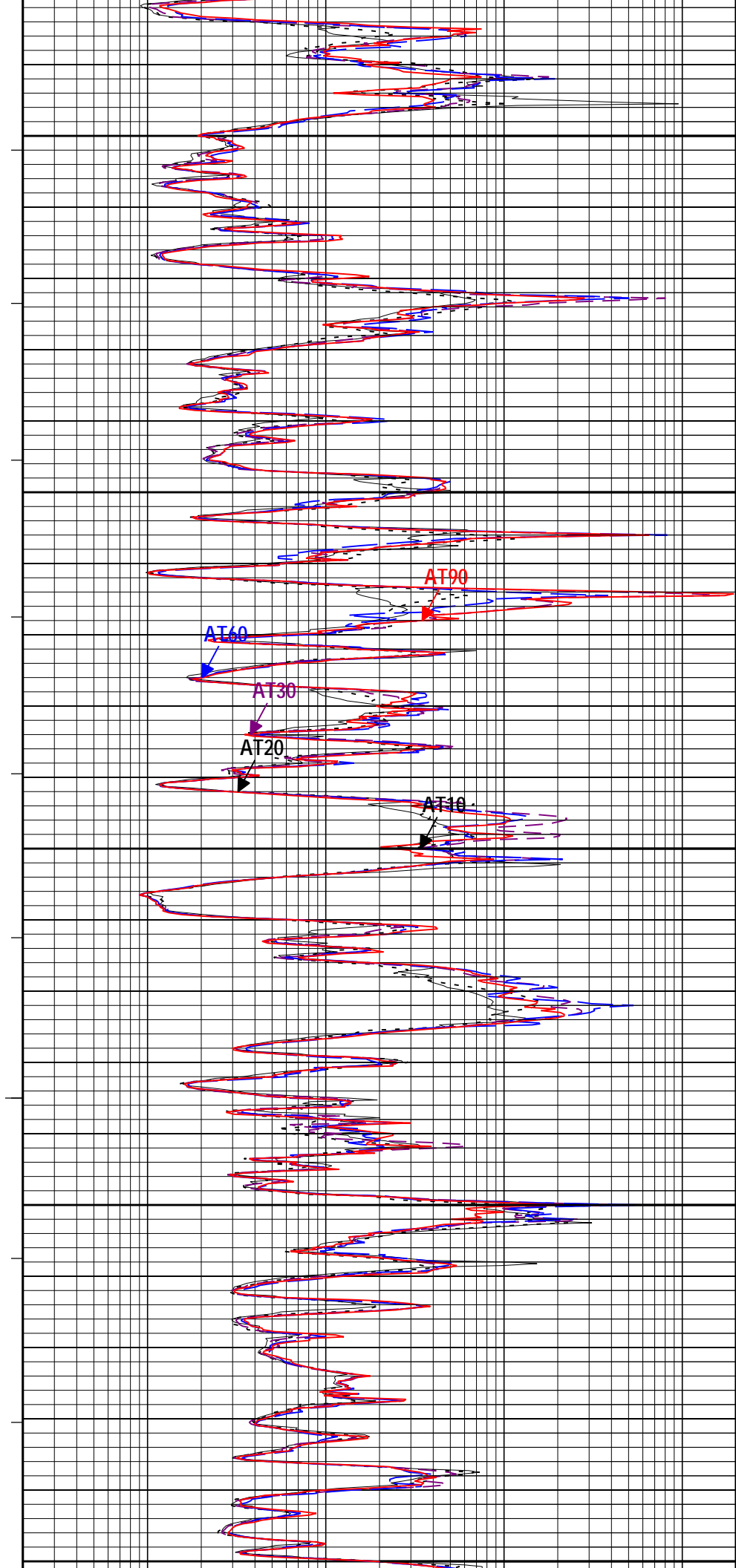
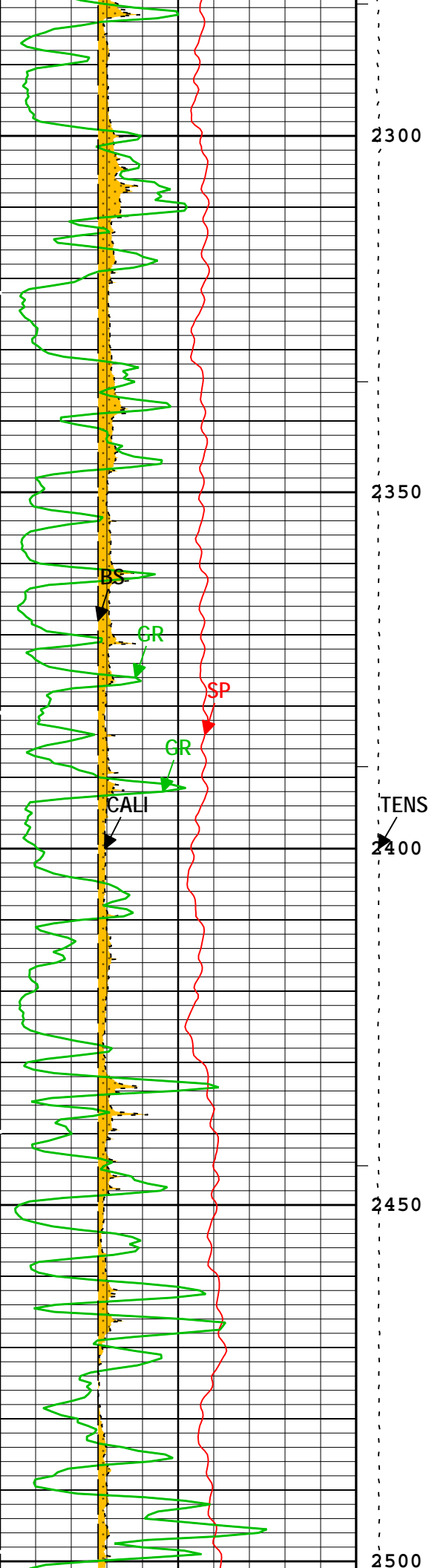


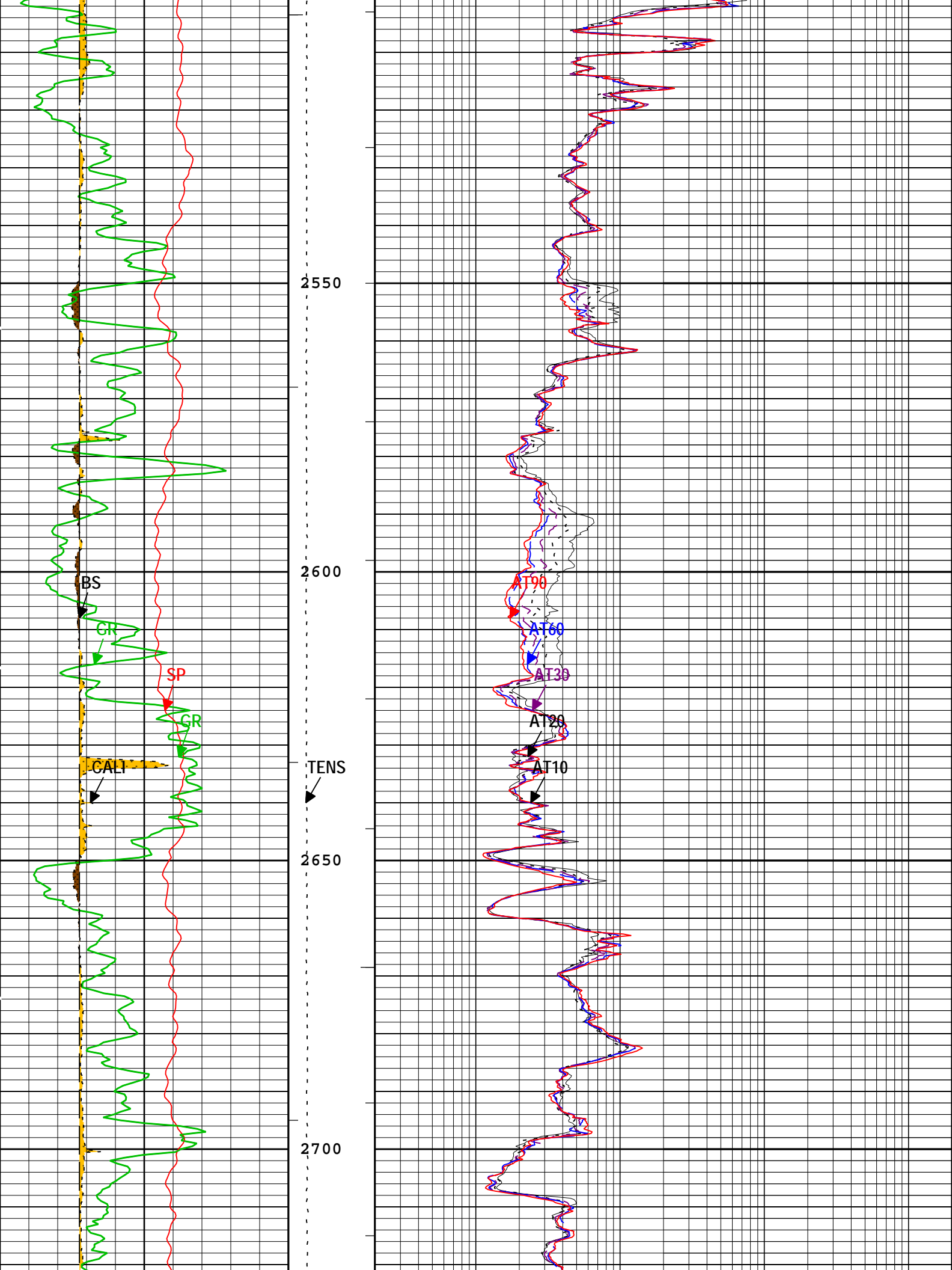




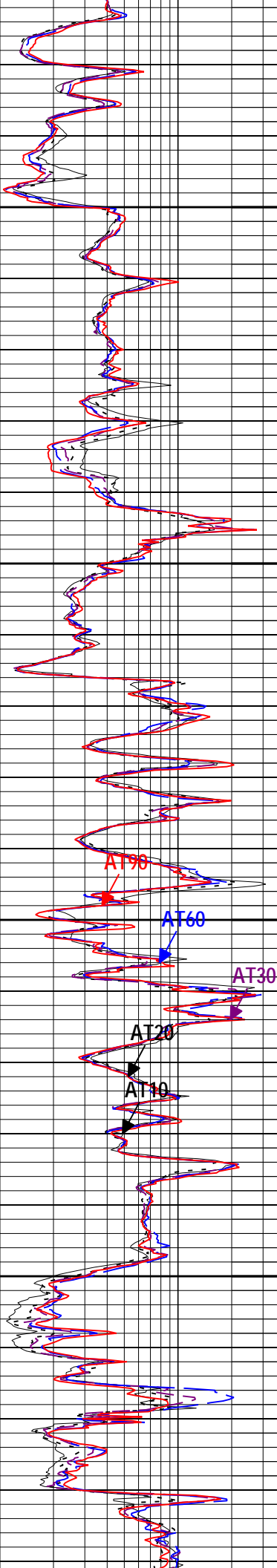
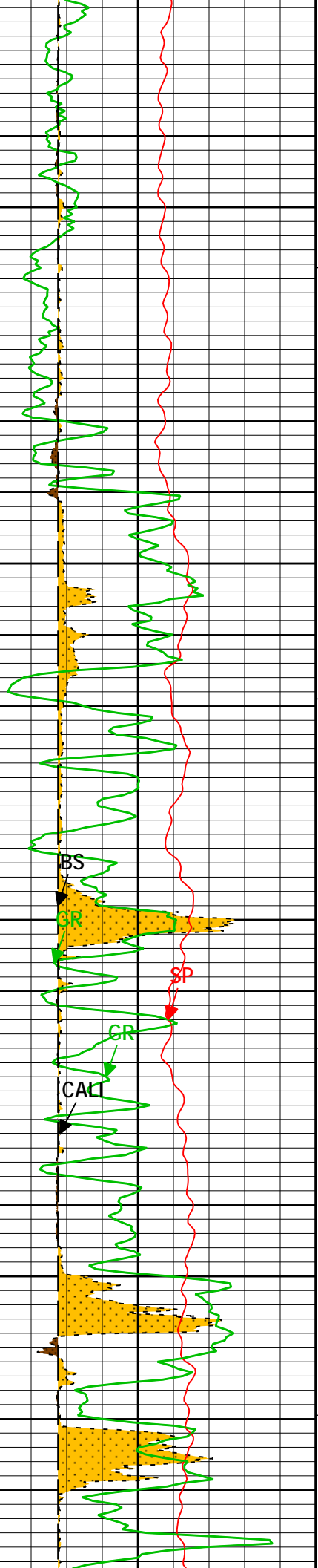


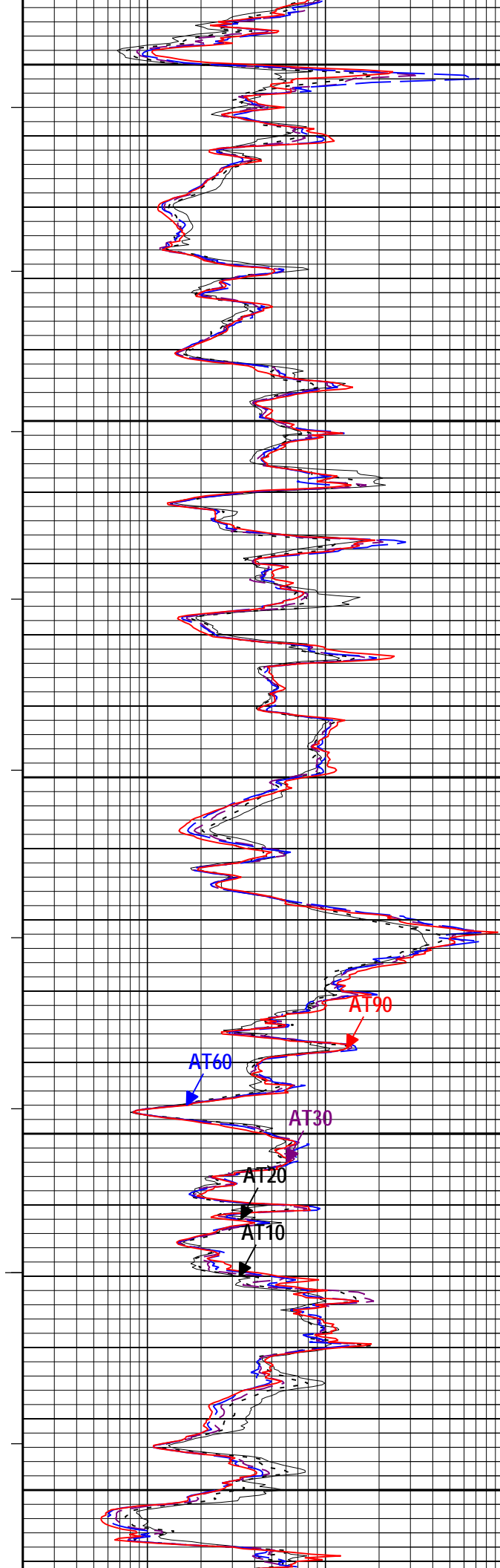
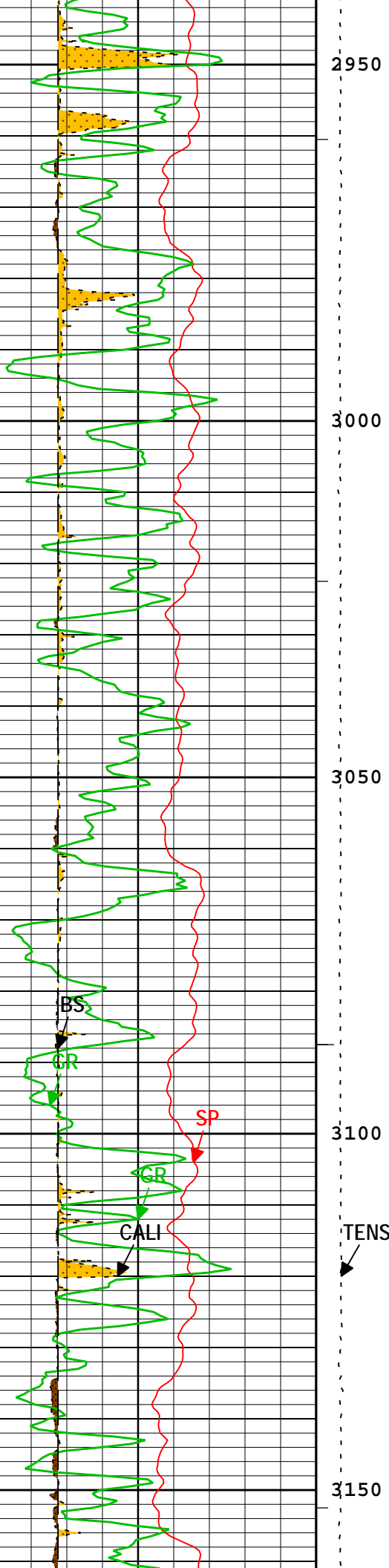






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2800  
2850  
TENS  
2900







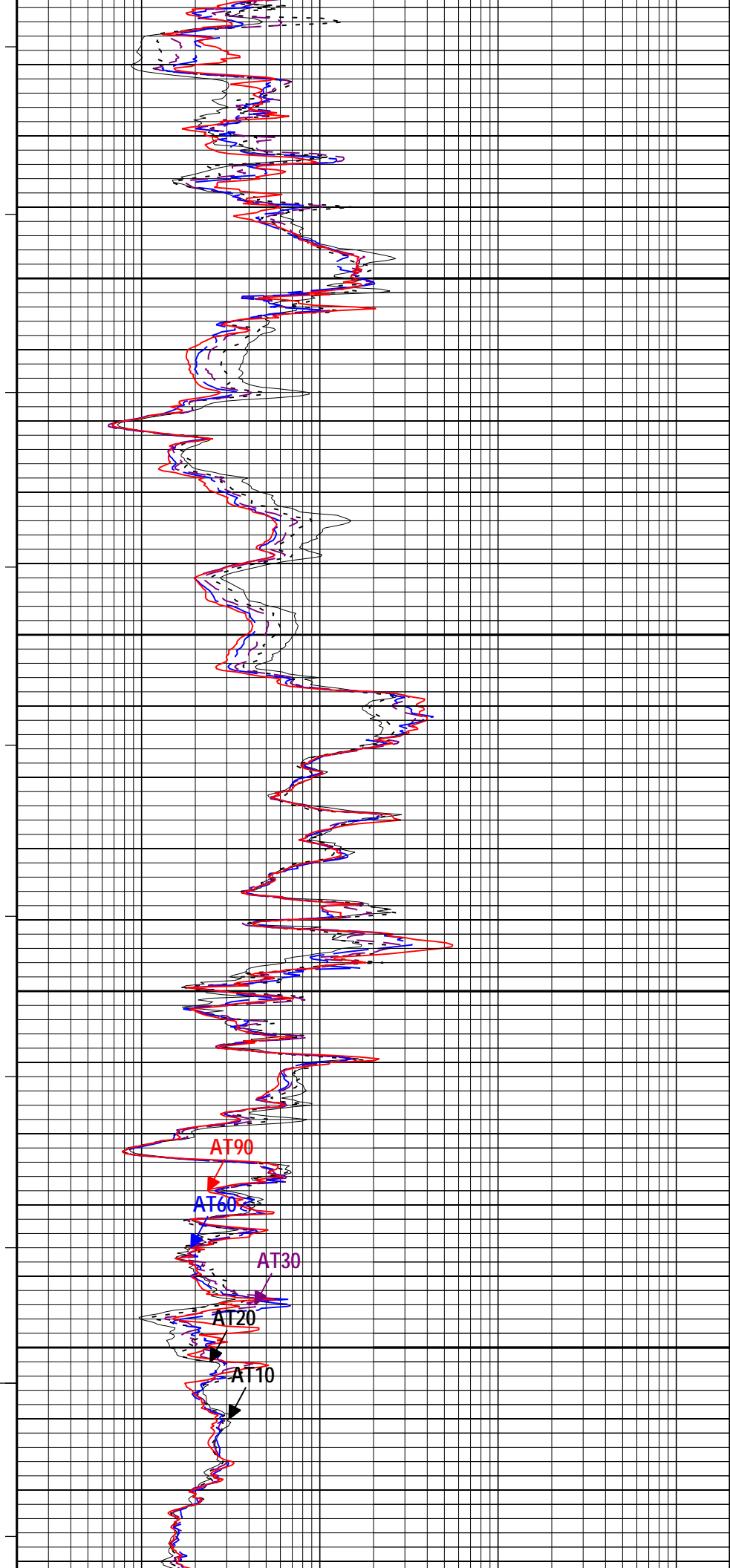
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3250

3300

3350

TENS



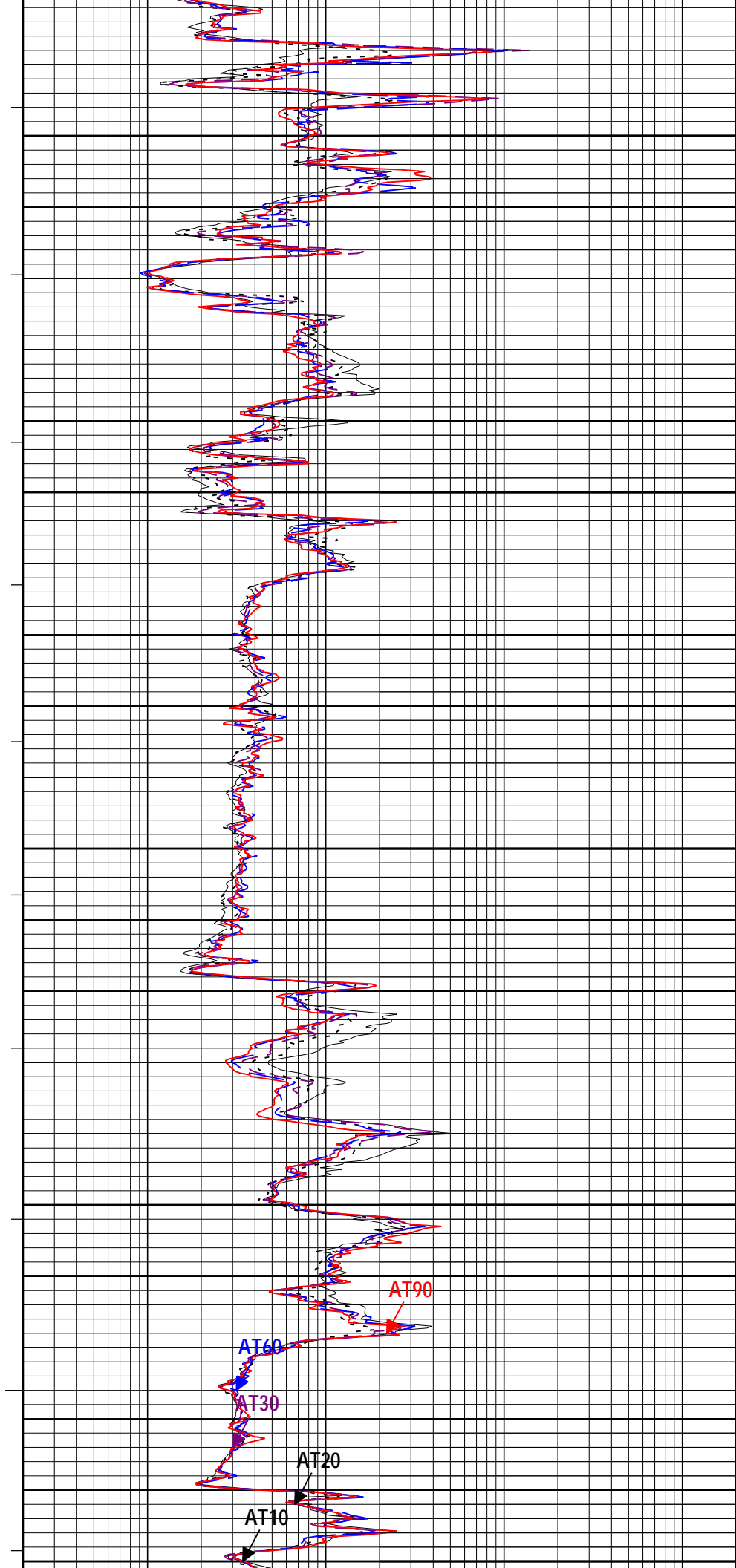
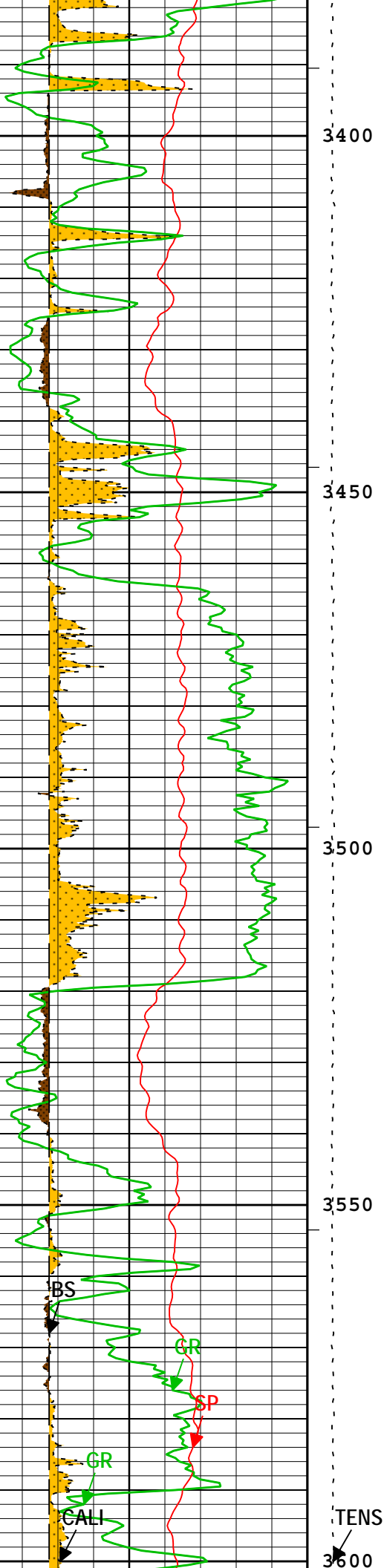
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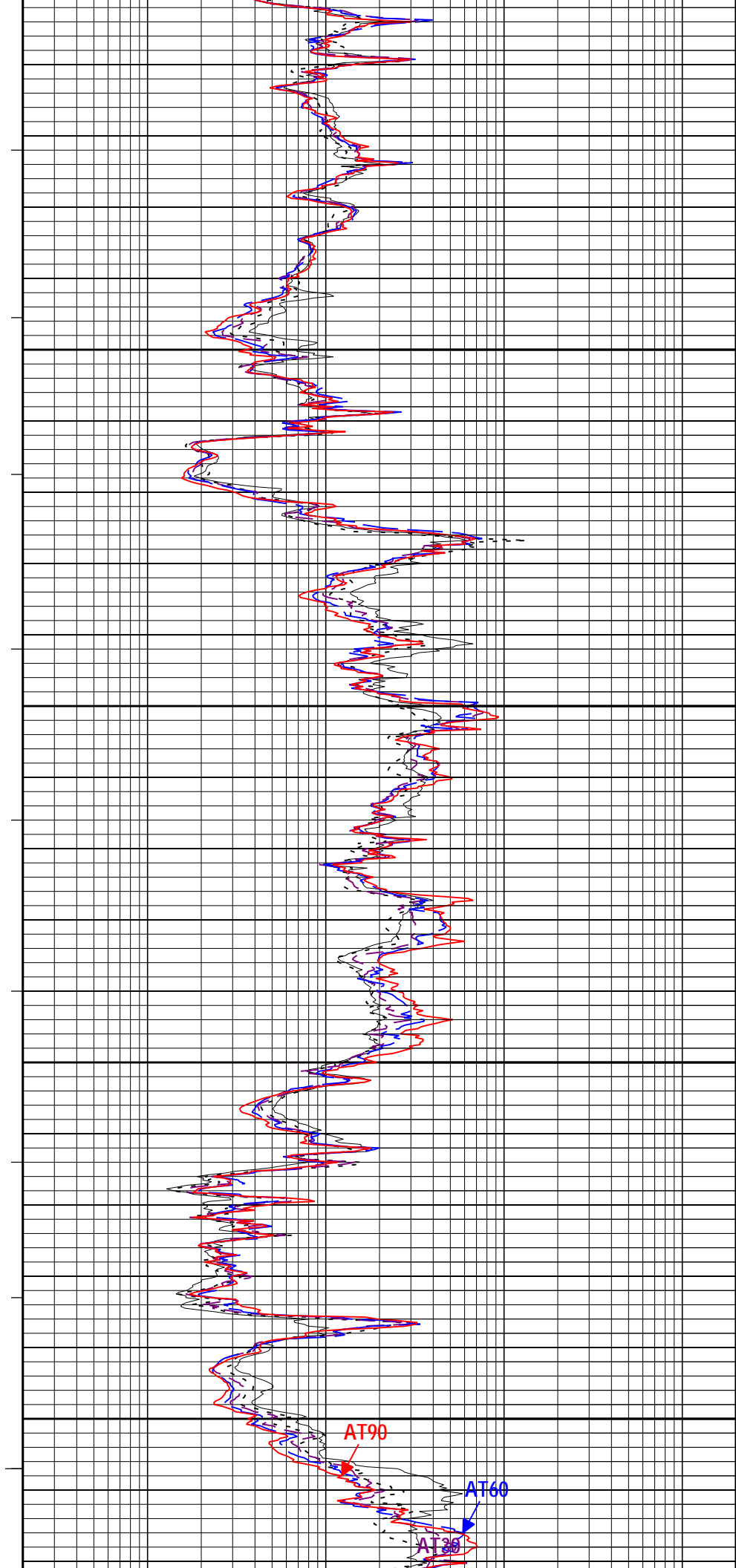
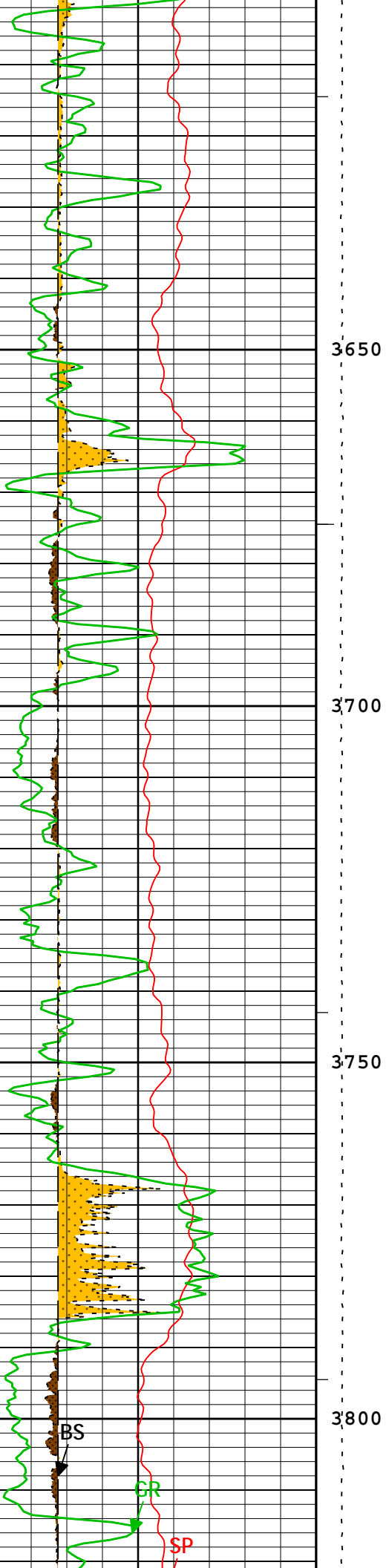
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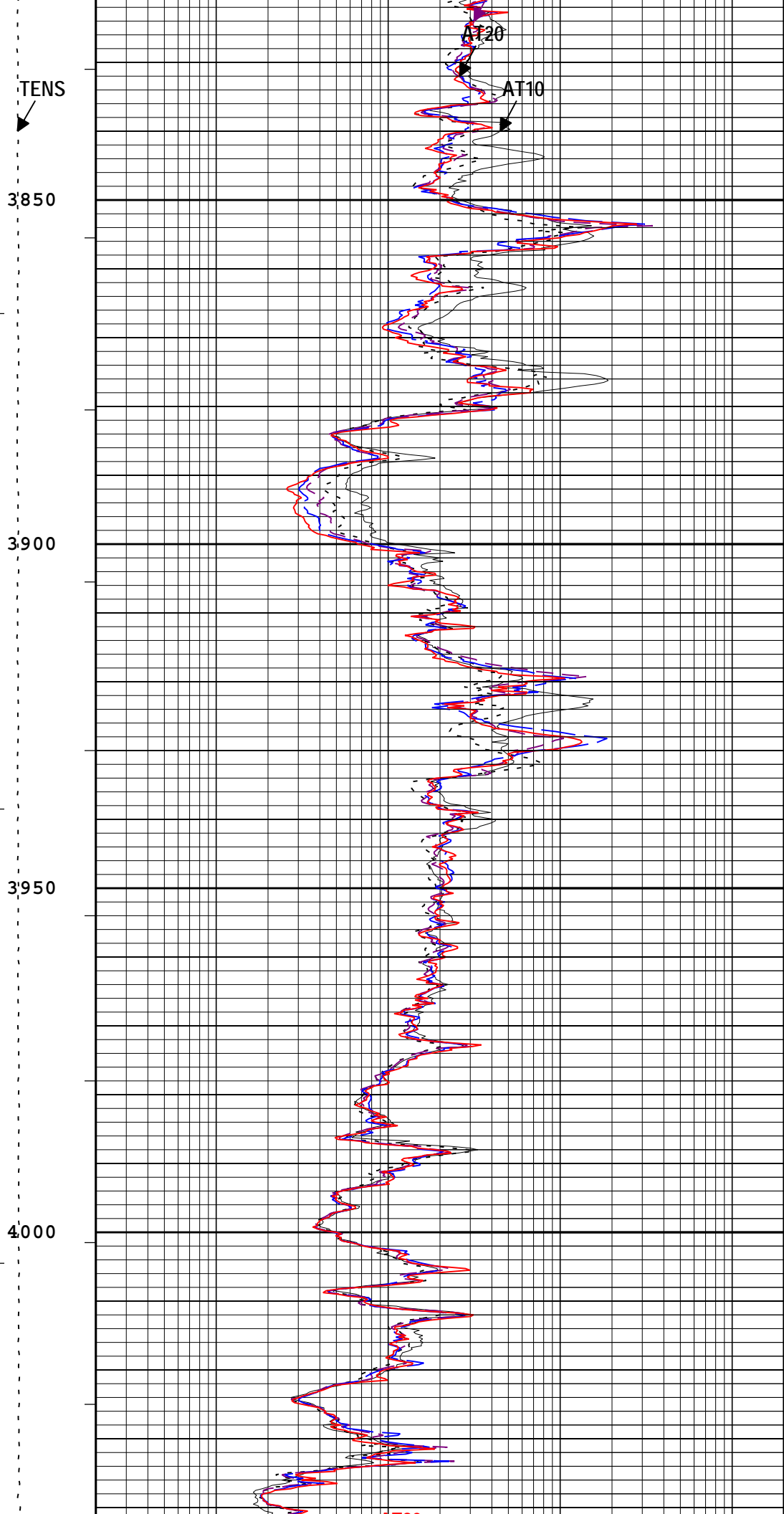
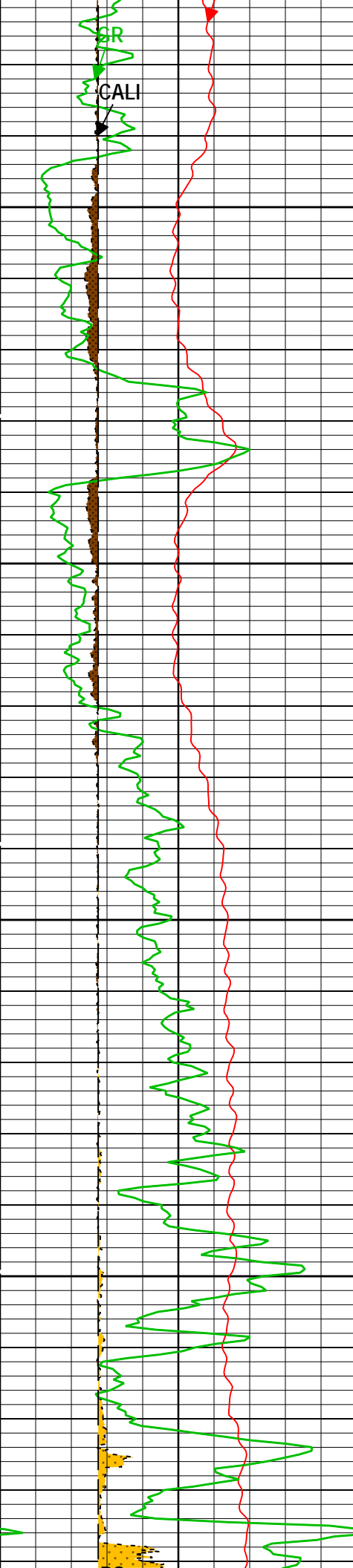
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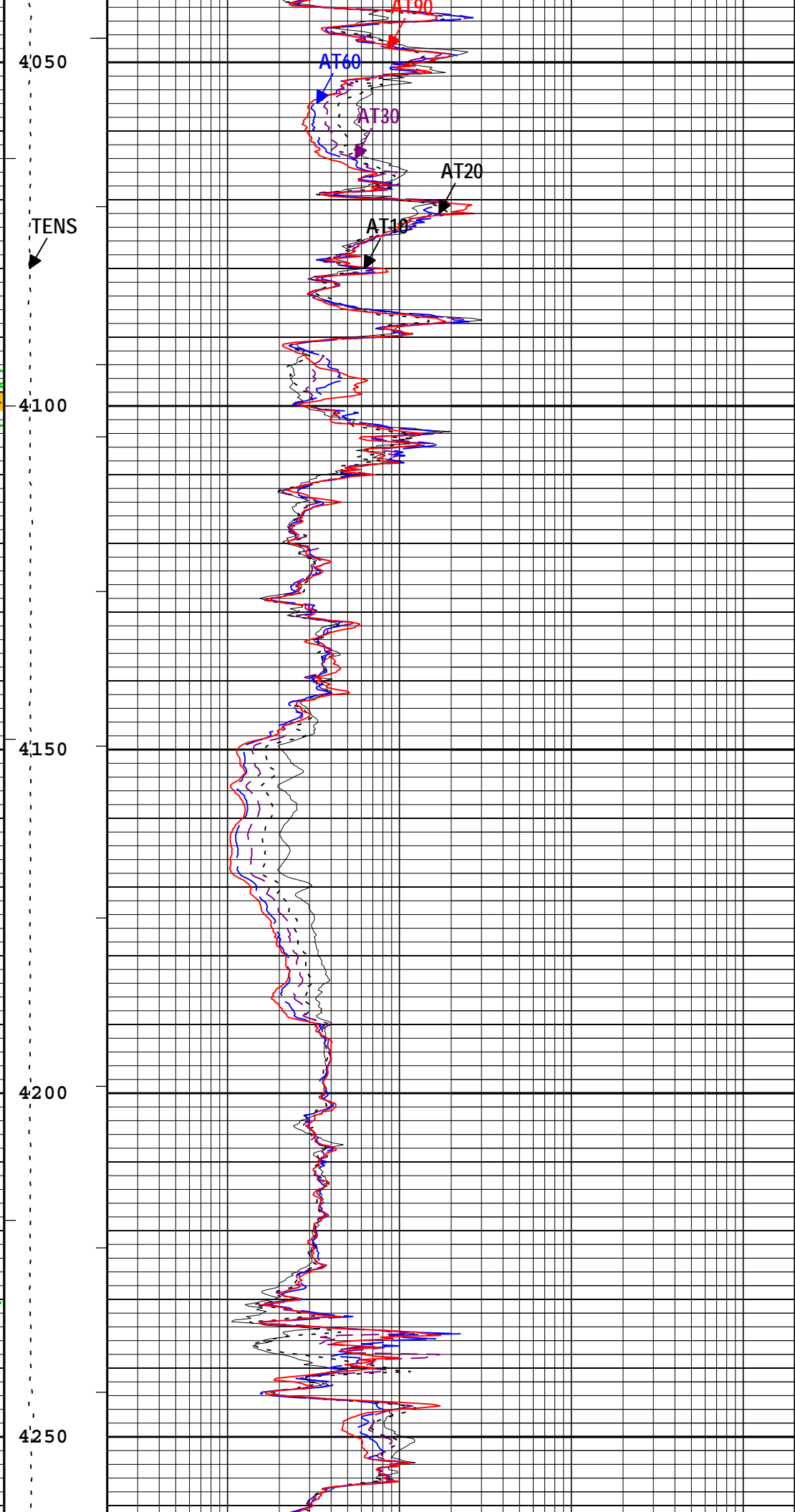
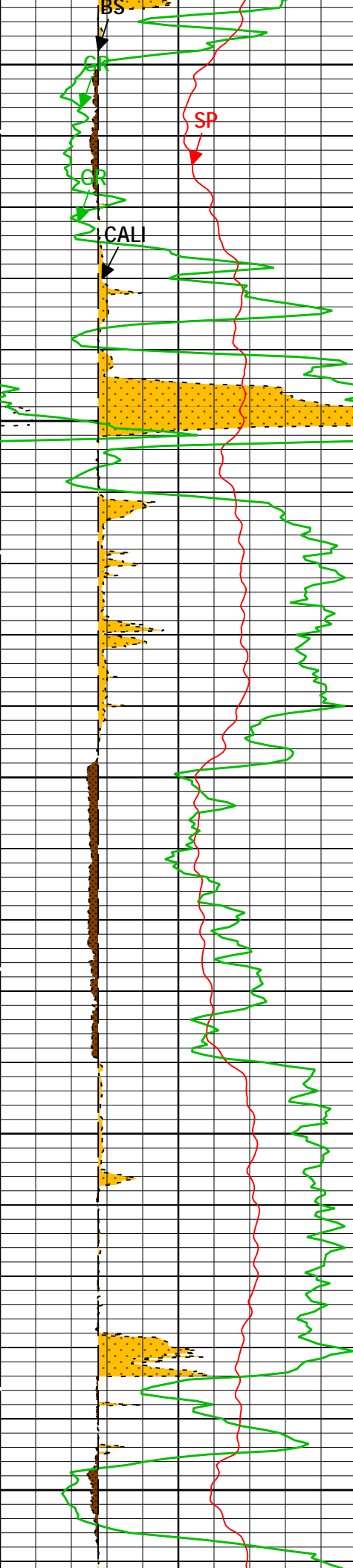
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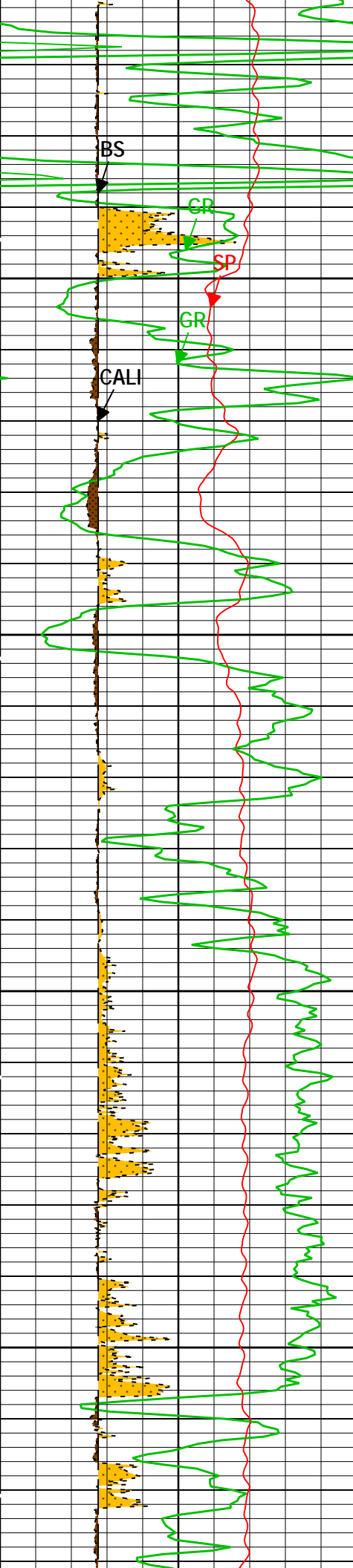
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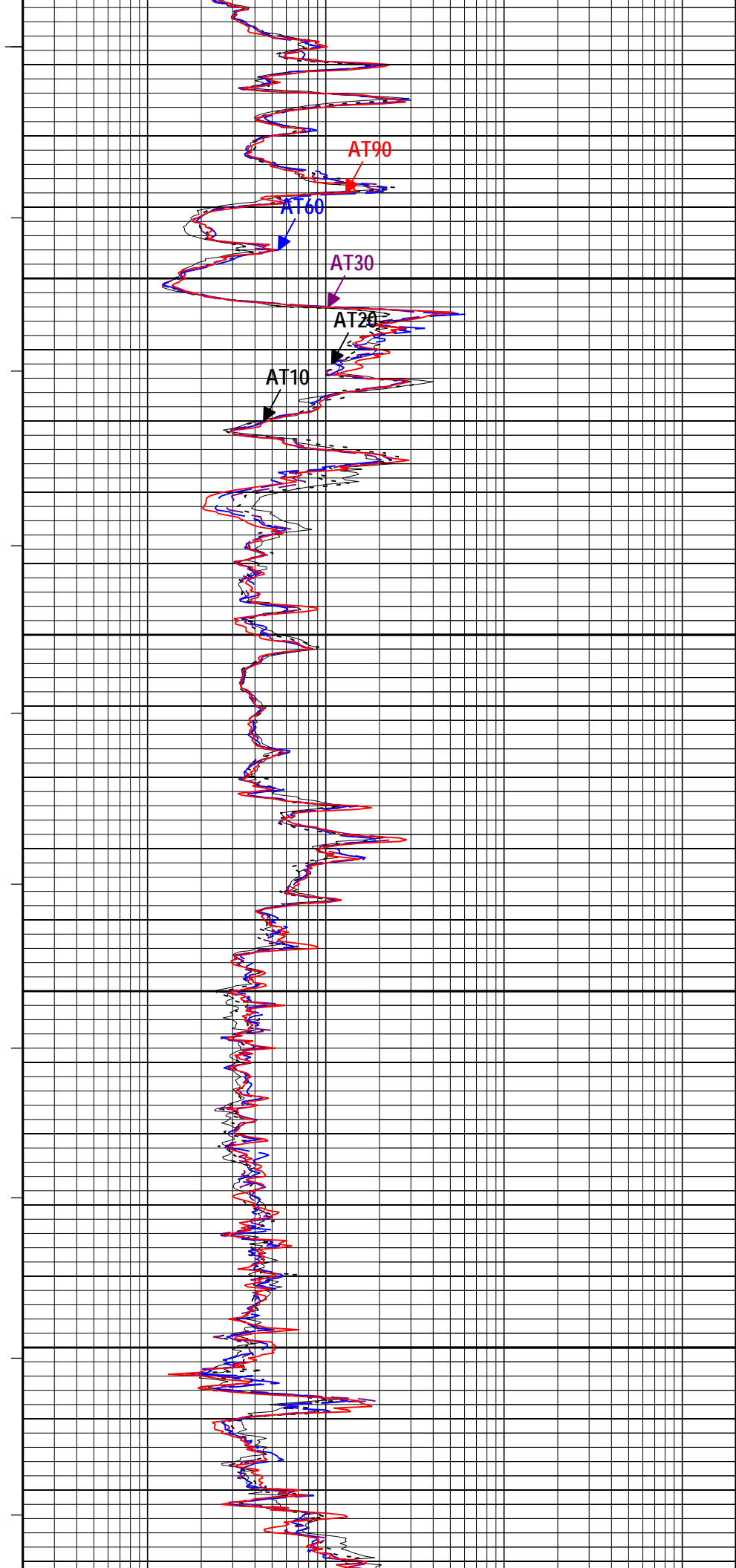


4300  
TENS

4350

4400

4450



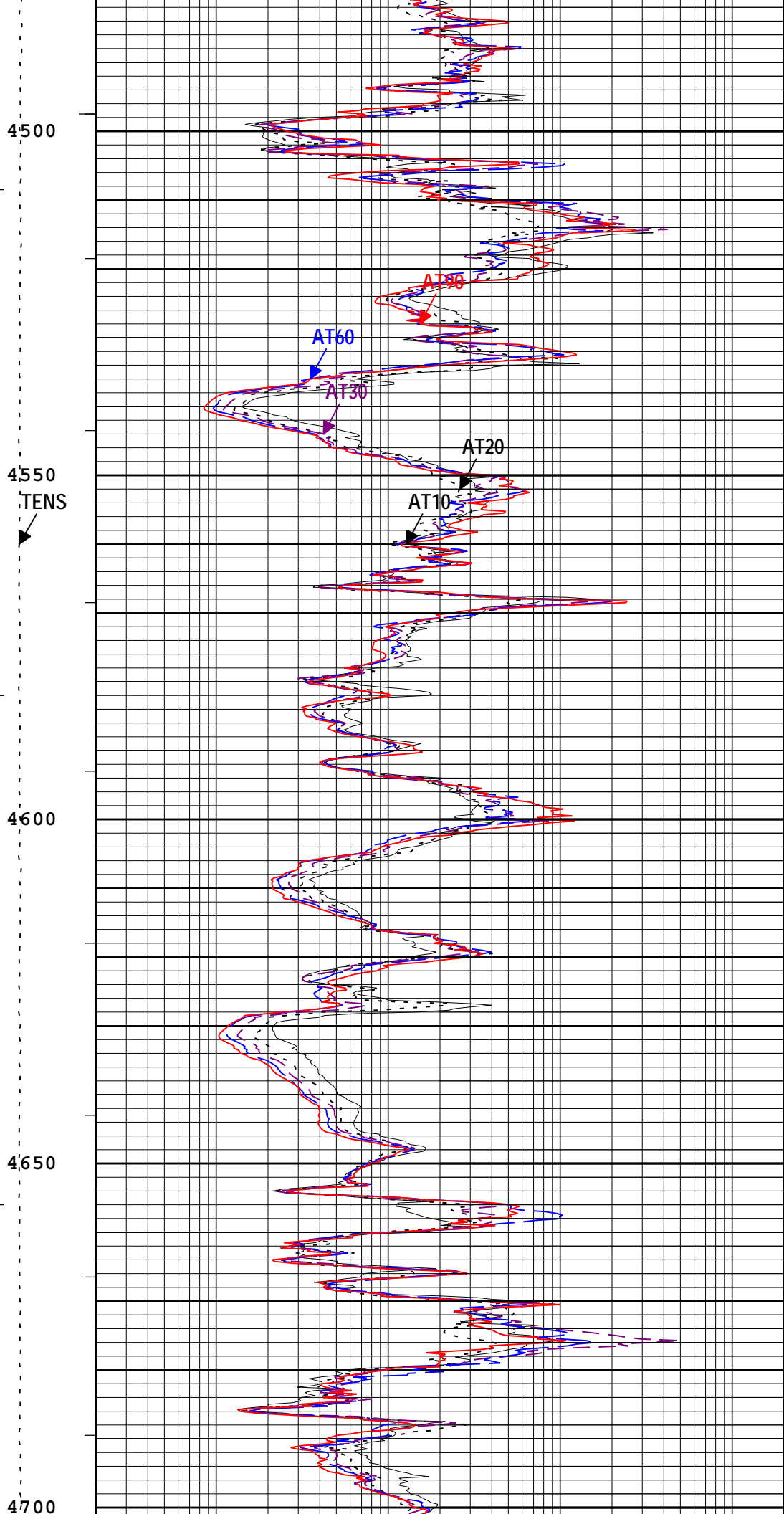
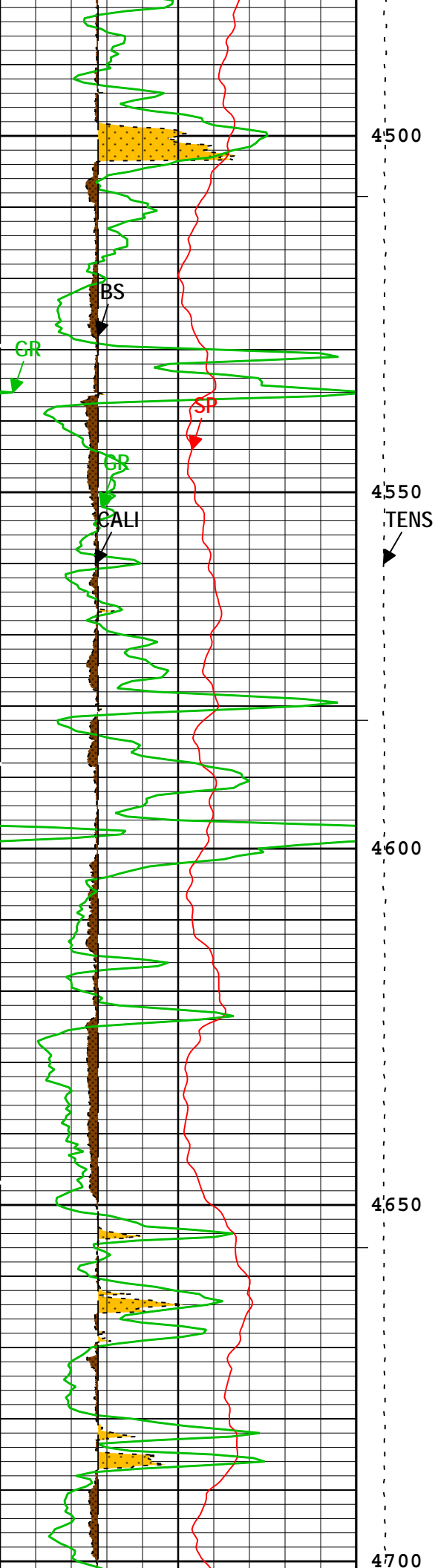
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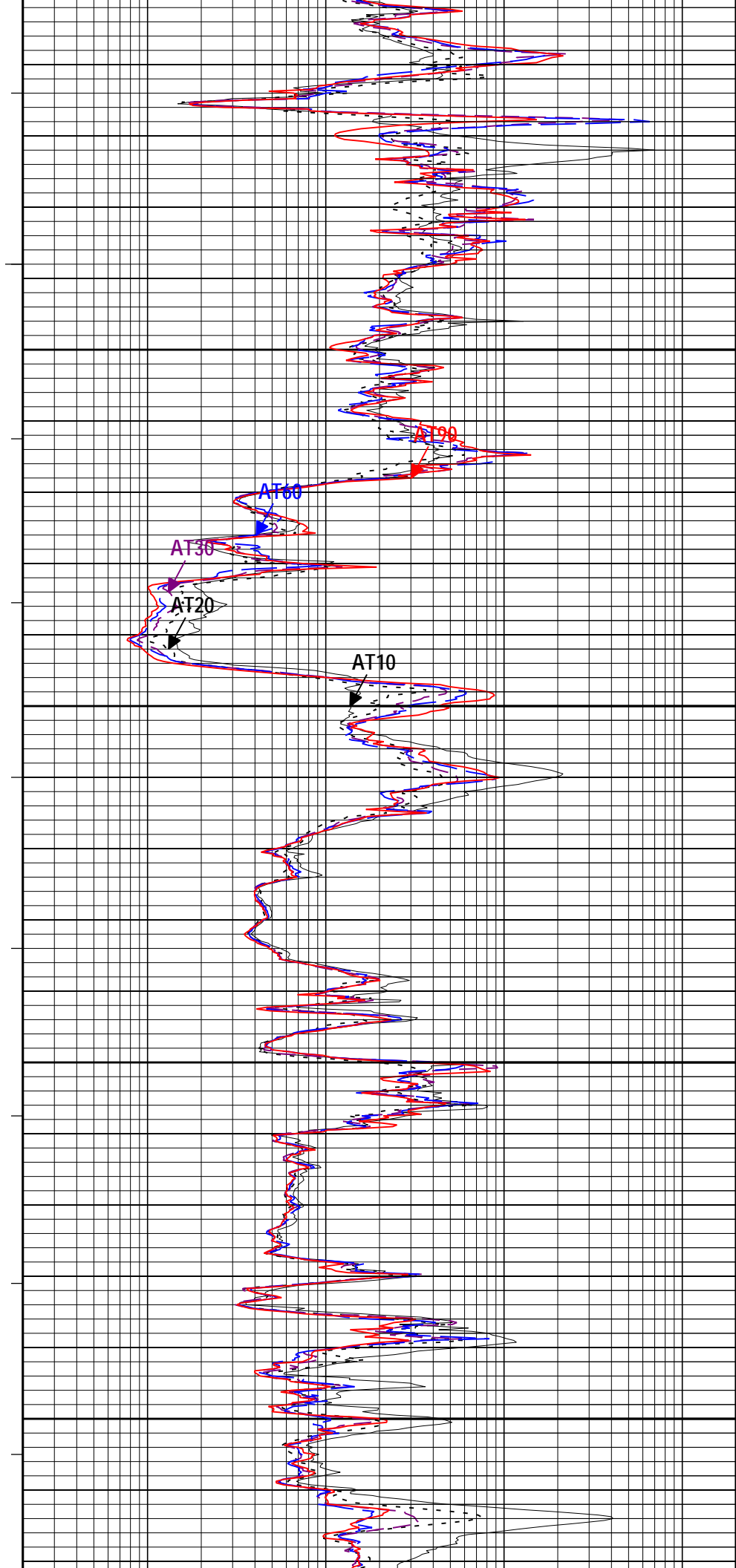
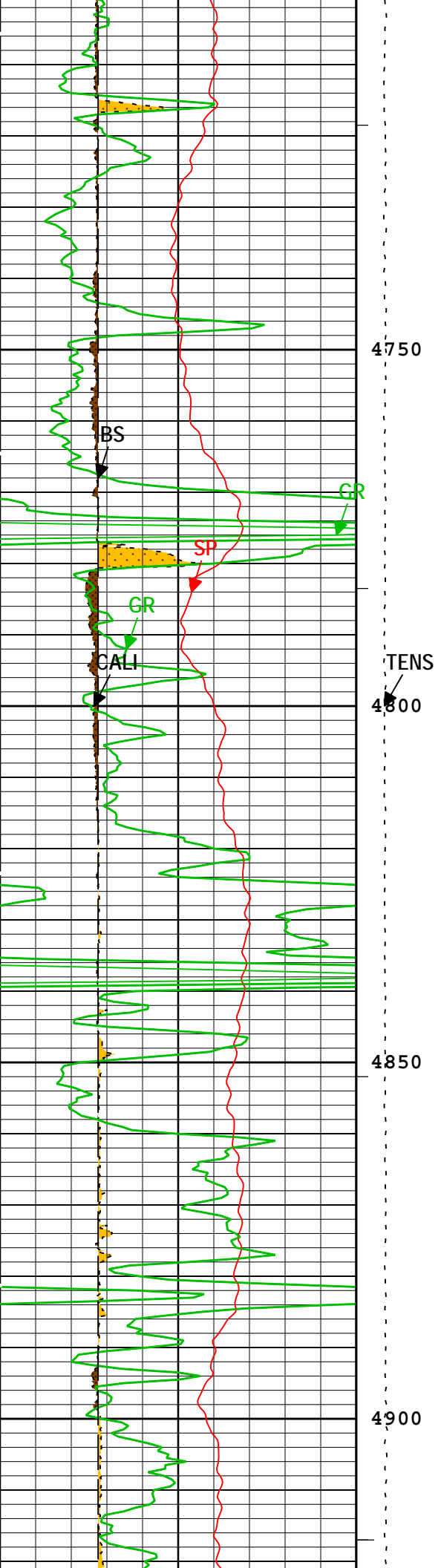
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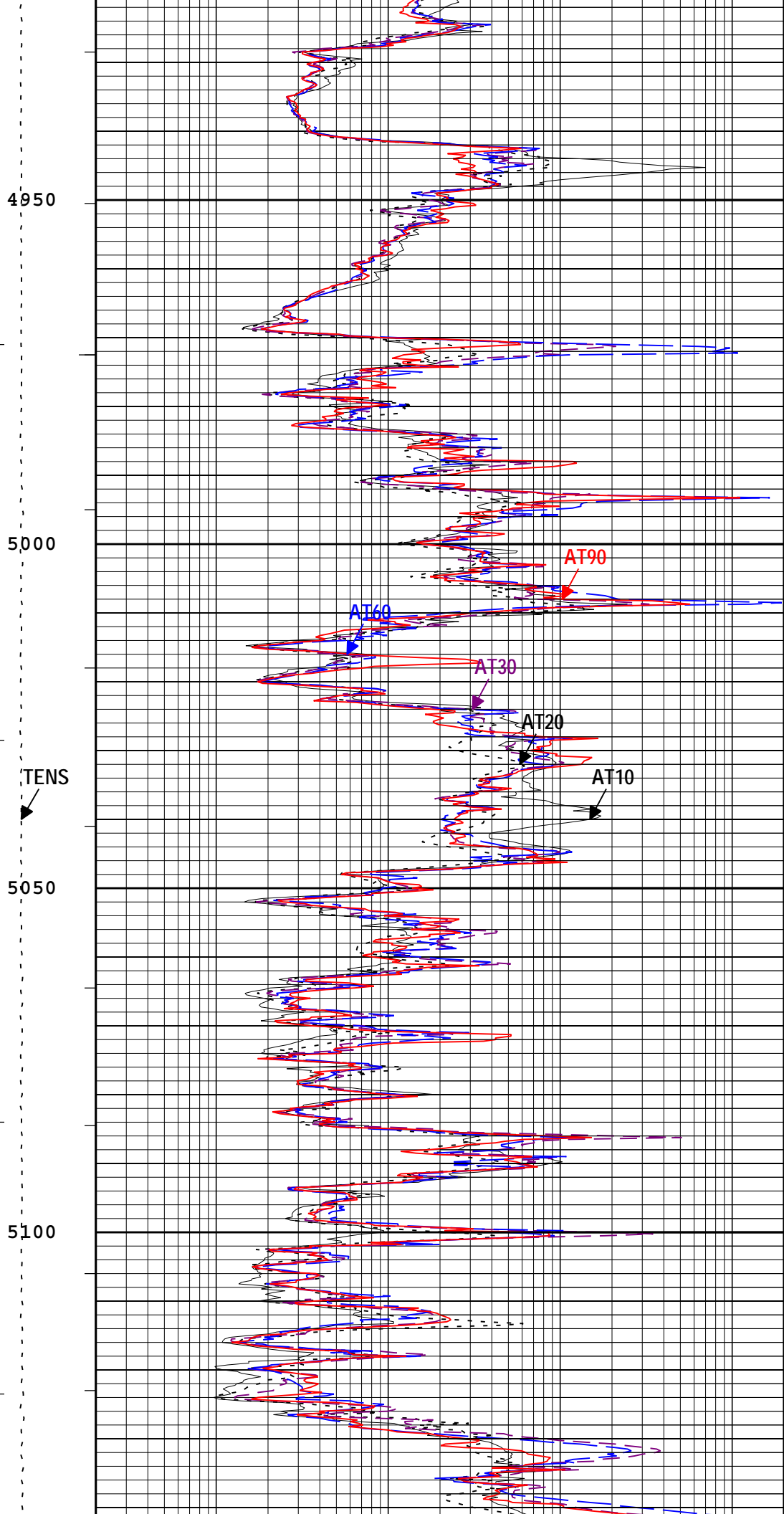
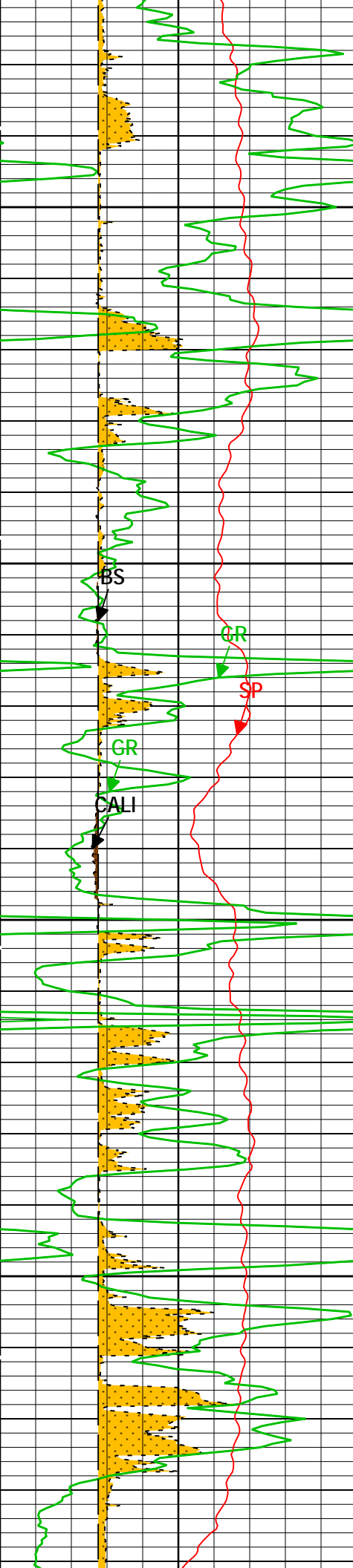
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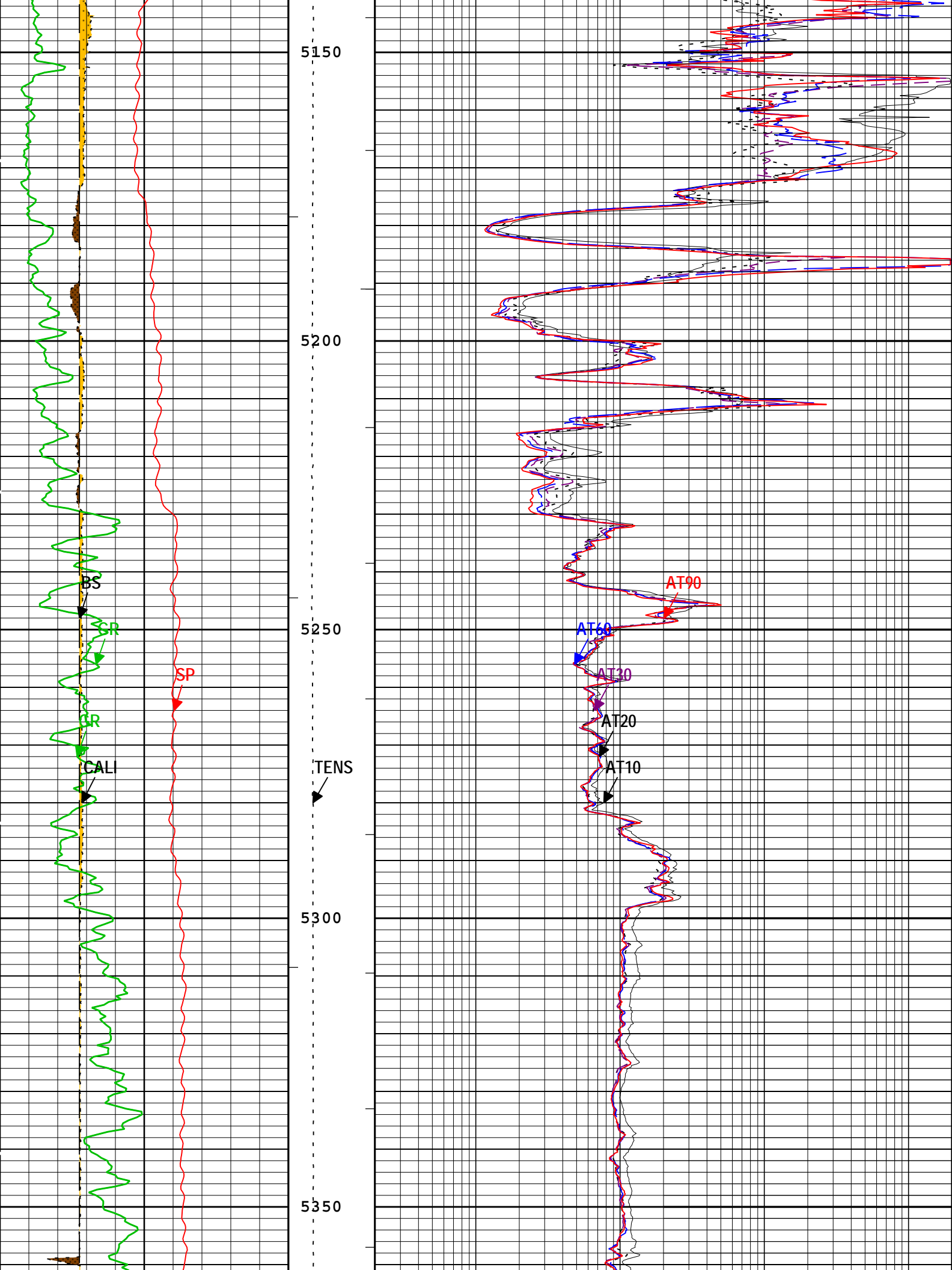
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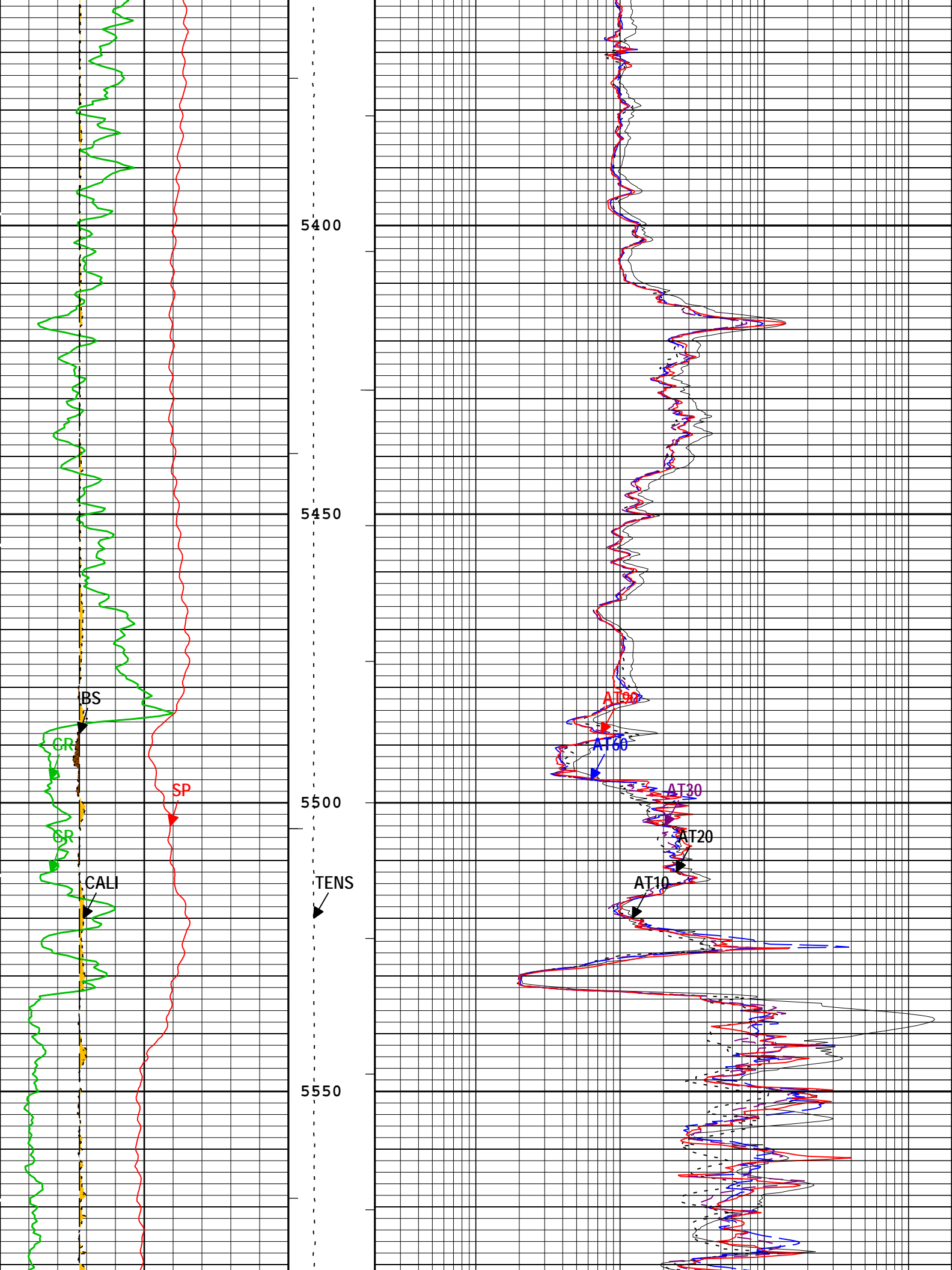
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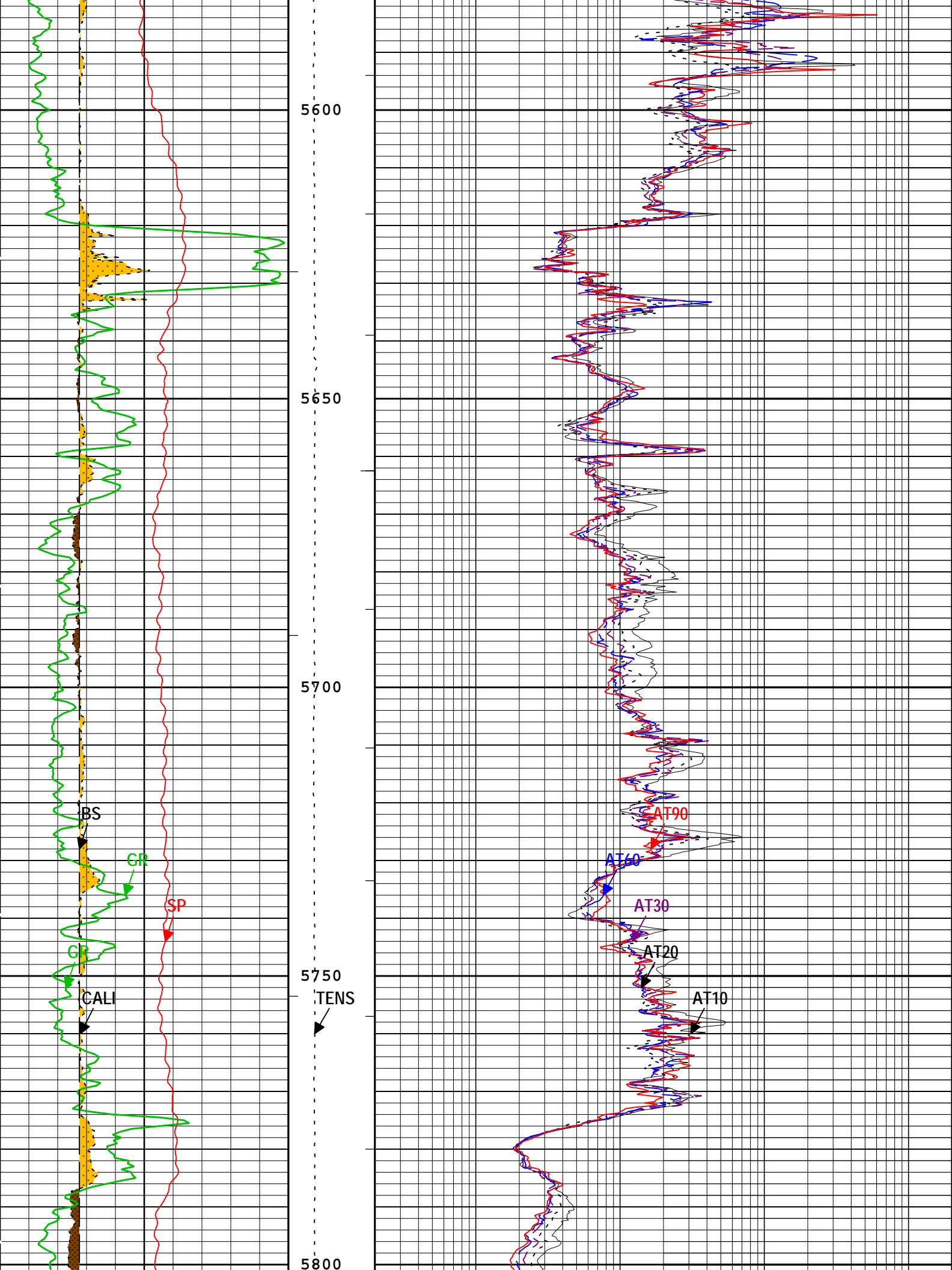


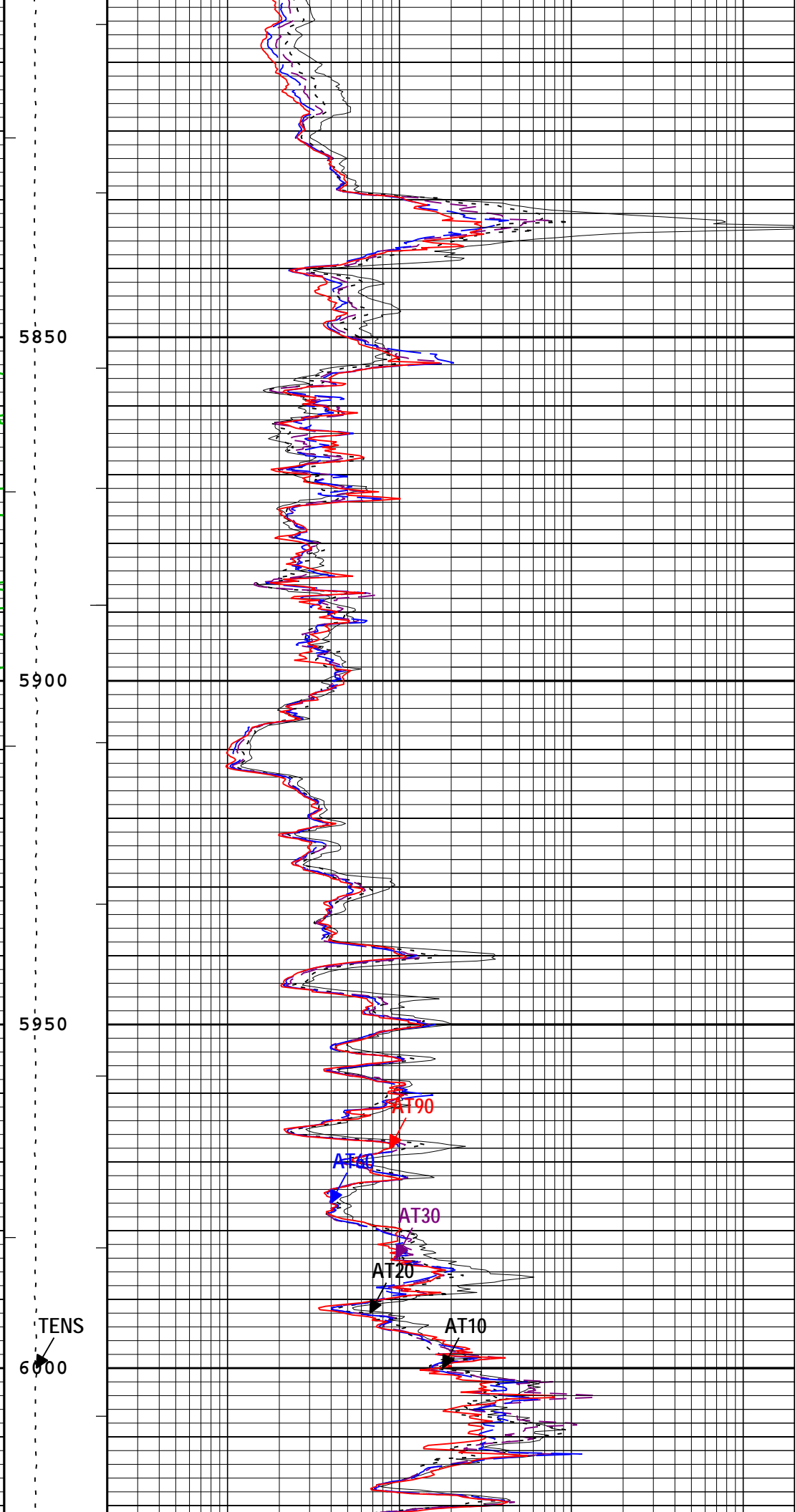
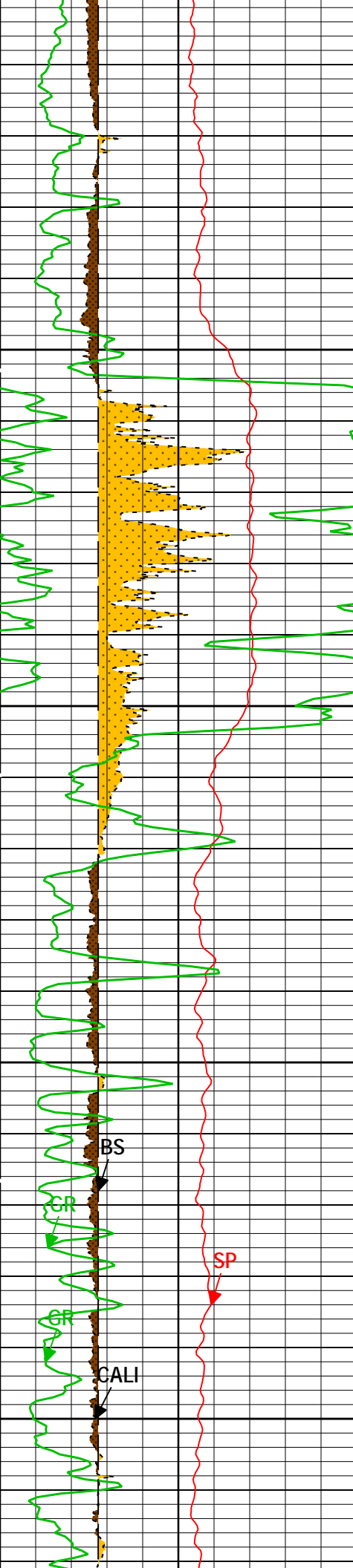


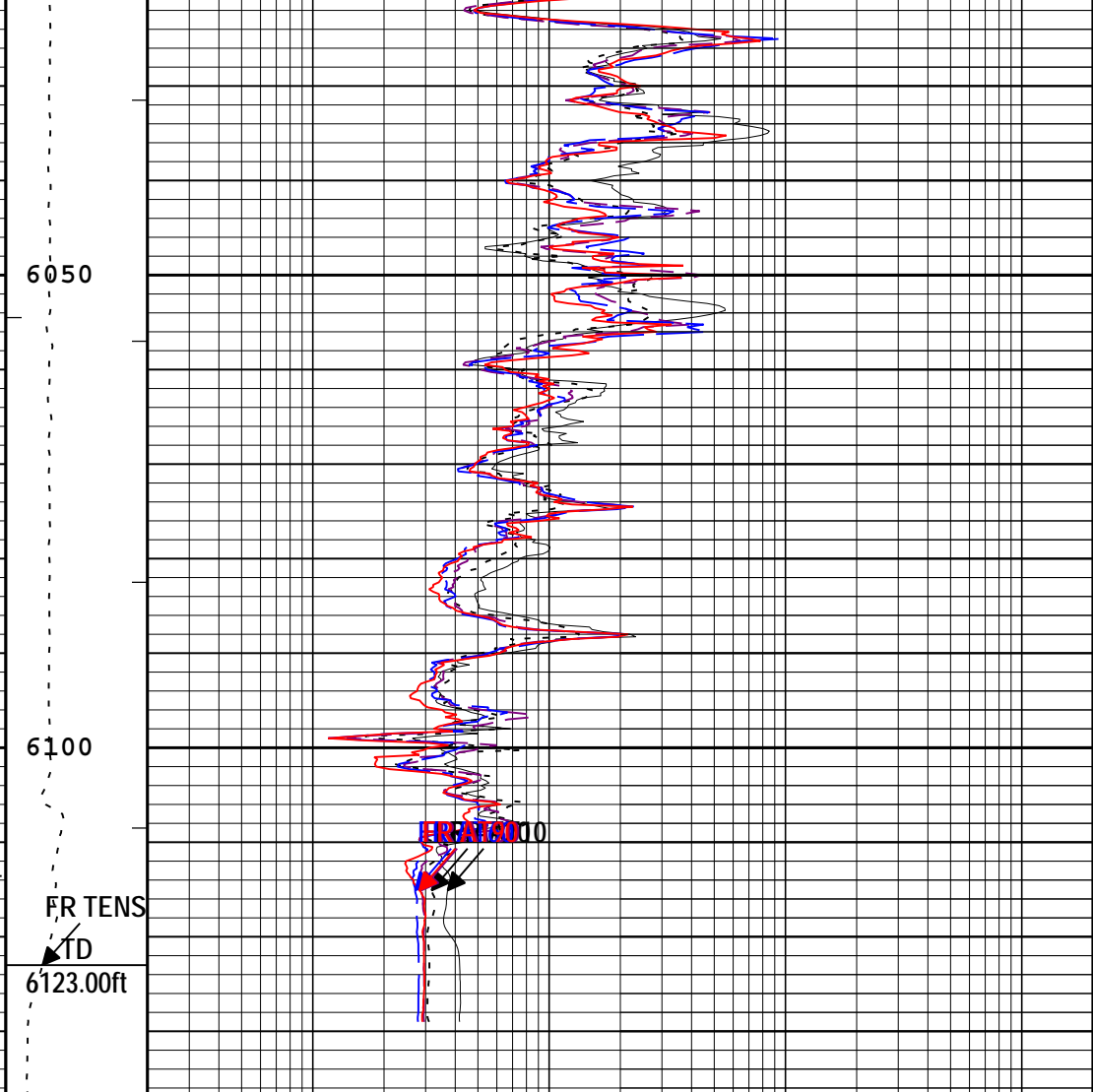
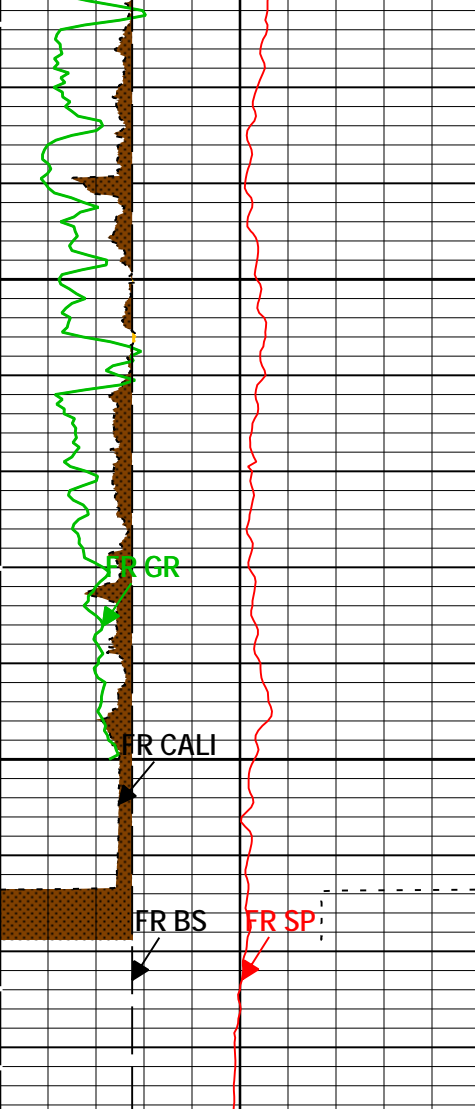












Gamma Ray Backup		
Mud-Cake		
Washout		
Caliper (CALI) HDRS-H		
6	in	16
Gamma Ray (GR) HGNS-H		
0	gAPI	150
Spontaneous Potential (SP) AIT-M		
-160	mV	40
Gamma Ray (GR) HGNS-H		
150	gAPI	300
Bit Size (BS)		
6	in	16

Cable Tension (TENS)	Array Induction Two Foot Resistivity A10 (AT10) AIT-M	
0 lbf 8000	0.2	2000
	ohm.m	
	Array Induction Two Foot Resistivity A20 (AT20) AIT-M	
	0.2	2000
	ohm.m	
	Array Induction Two Foot Resistivity A30 (AT30) AIT-M	
	0.2	2000
	ohm.m	
	Array Induction Two Foot Resistivity A60 (AT60) AIT-M	
	0.2	2000
	ohm.m	
	Array Induction Two Foot Resistivity A90 (AT90) AIT-M	
	0.2	2000
	ohm.m	

— ICV - Integrated Cement Volume every 100.00 (ft3)

— TIME\_1900 - Time Marked every 60.00 (s)

— ICV - Integrated Cement Volume every 10.00 (ft3)

— IHV - Integrated Hole Volume every 100.00 (ft3)

— IHV - Integrated Hole Volume every 10.00 (ft3)

## Channel Processing Parameters

Parameter	Description	ToolPath	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M:AMIS:AMIS	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M:AMIS:AMIS	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M:AMIS:AMIS	Yes	
ASTA	Array Induction Tool Standoff	AIT-M:AMIS:AMIS	1.625	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	COMPLETION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H:HRCC-H:HRCC-H	0	in
CBLO	Casing Bottom (Logger)	COMPLETION	752	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	COMPLETION	9.625	in
DFD	Drilling Fluid Density	Borehole	9.5	lbm/gal
FCD	Future Casing (Outer) Diameter	COMPLETION	7	in
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	CALI	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SPDR	SP Drift Per Foot	AIT-M:AMIS:AMIS	0	mV/ft

## Depth Zone Parameters

Parameter	Value	Start ( ft )	Stop ( ft )
BS	0	730	752
BS	8.75	752	6137

All depth are actual.

## Tool Control Parameters

Parameter	Description	ToolPath	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed		1800	ft/h

**ONE**

**Repeat Pass 5" = 100'**

## Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	51.49	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	141.23	ft3

## Software Version

Acquisition System	Version
MaxWell	3.0.9609.0
Application Patch	SP-20120409-3.0.9609.1919
	EXP_APL-OPElevation-3.0.9609.1966
	EXP_APL-ADT-3.0.9609.1558

Computation	Description	Software Version	Firmware Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels		3.0.9609.1919
Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.0.9609.1919	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.0.9609.1919	2.0
AMIS	Array Induction Sonde - M	3.0.9609.1919	1

# Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Log[2]:Up	Up	5584.50 ft	6137.35 ft	28-Sep-2012 12:17:35 AM	28-Sep-2012 12:29:04 AM	2.34 ft	

All depths are referenced to toolstring zero

## Log

ONE: Log[2]:Up F9C0C94F-7B62-4C63-853E-F96417A3EF84

Description: AIT Basic Log One Format: Log (AIT 5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2012 02:40:45

Channel	Source	Sampling
AT10	AIT-M:AMIS:AMIS	3in
AT20	AIT-M:AMIS:AMIS	3in
AT30	AIT-M:AMIS:AMIS	3in
AT60	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
BS	Borehole	6in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
ICV	Borehole	6in
IHV	Borehole	6in
SP	AIT-M:AMIS:AMIS	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

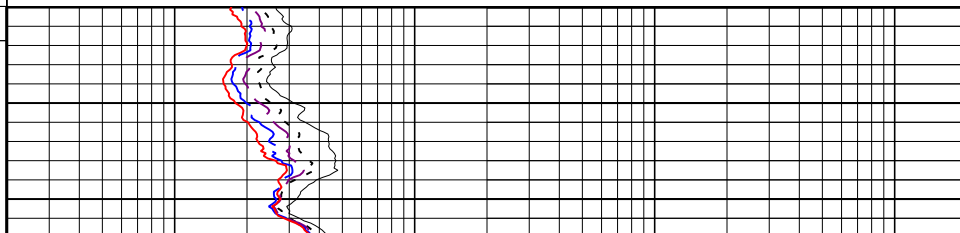
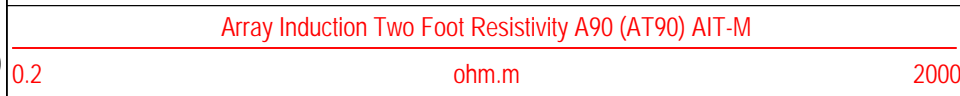
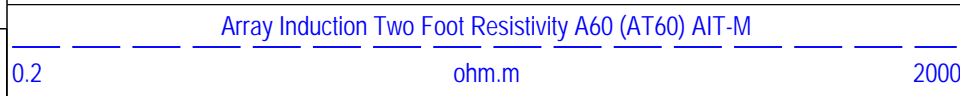
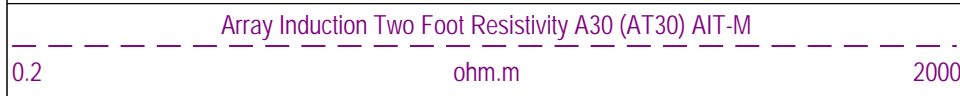
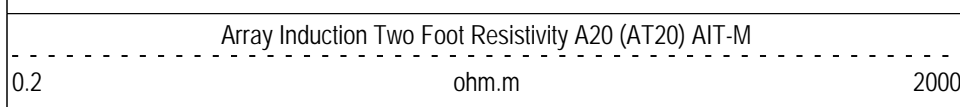
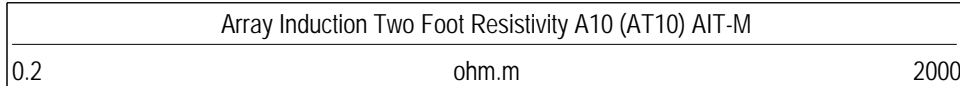
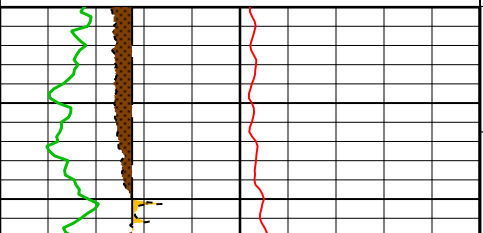
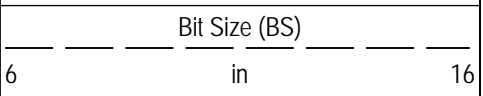
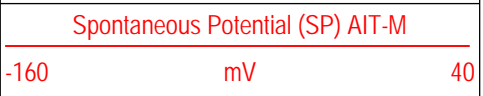
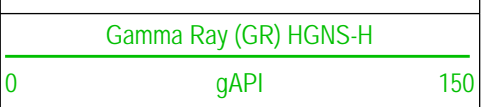
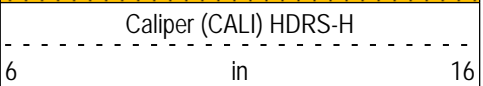
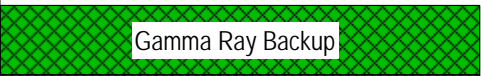
—|IHV - Integrated Hole Volume every 10.00 (ft3)

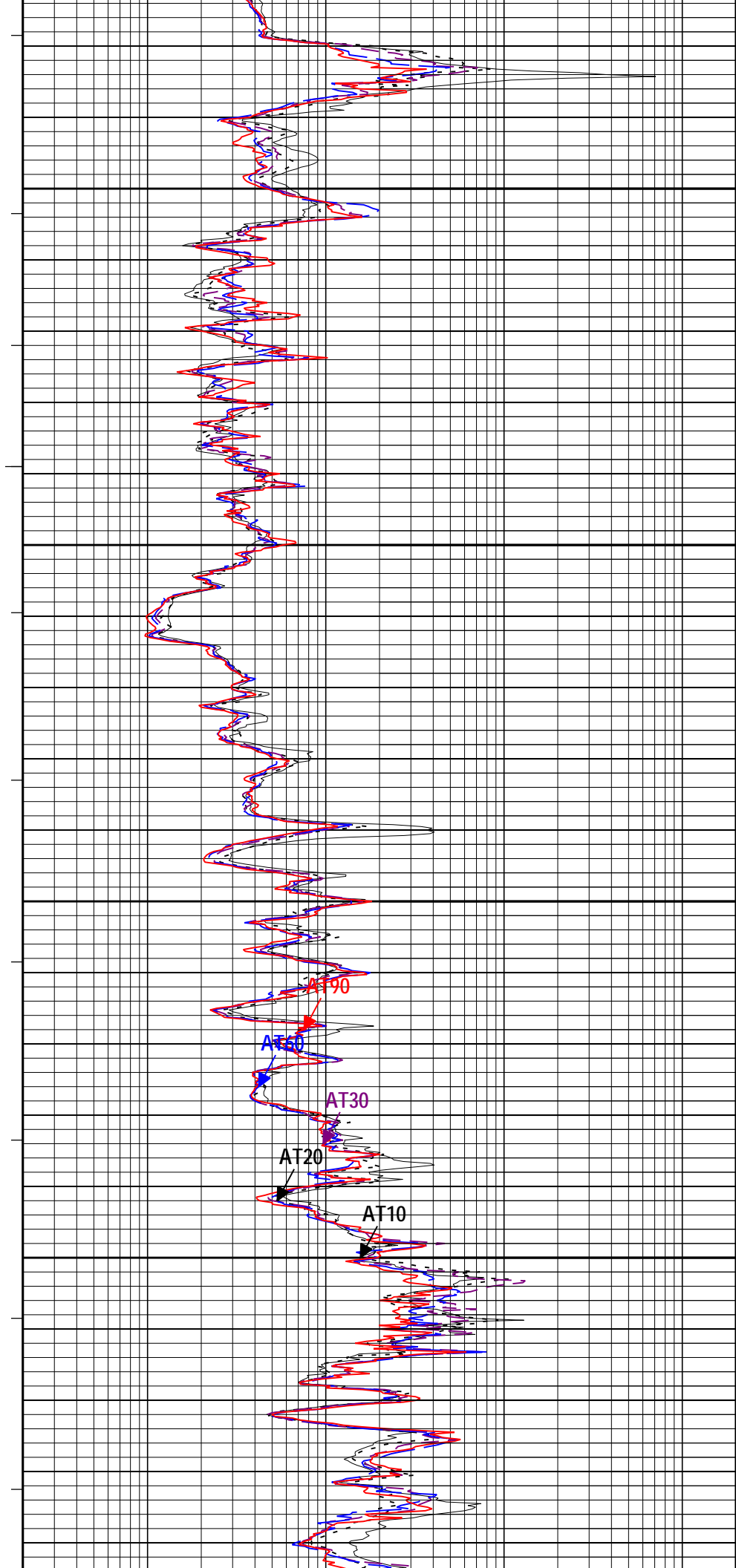
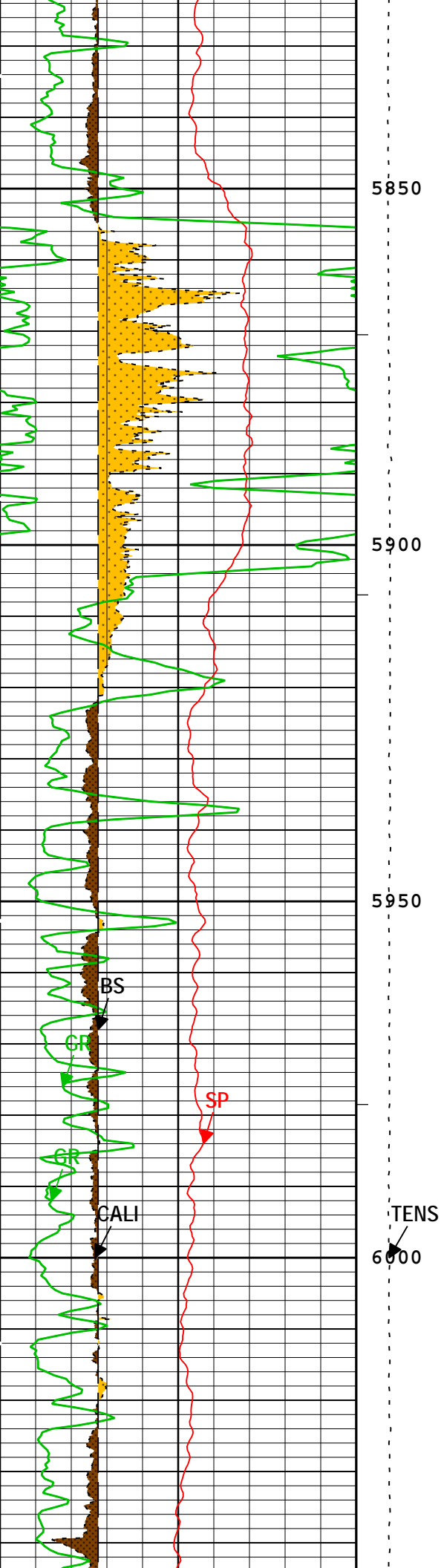
—|IHV - Integrated Hole Volume every 100.00 (ft3)

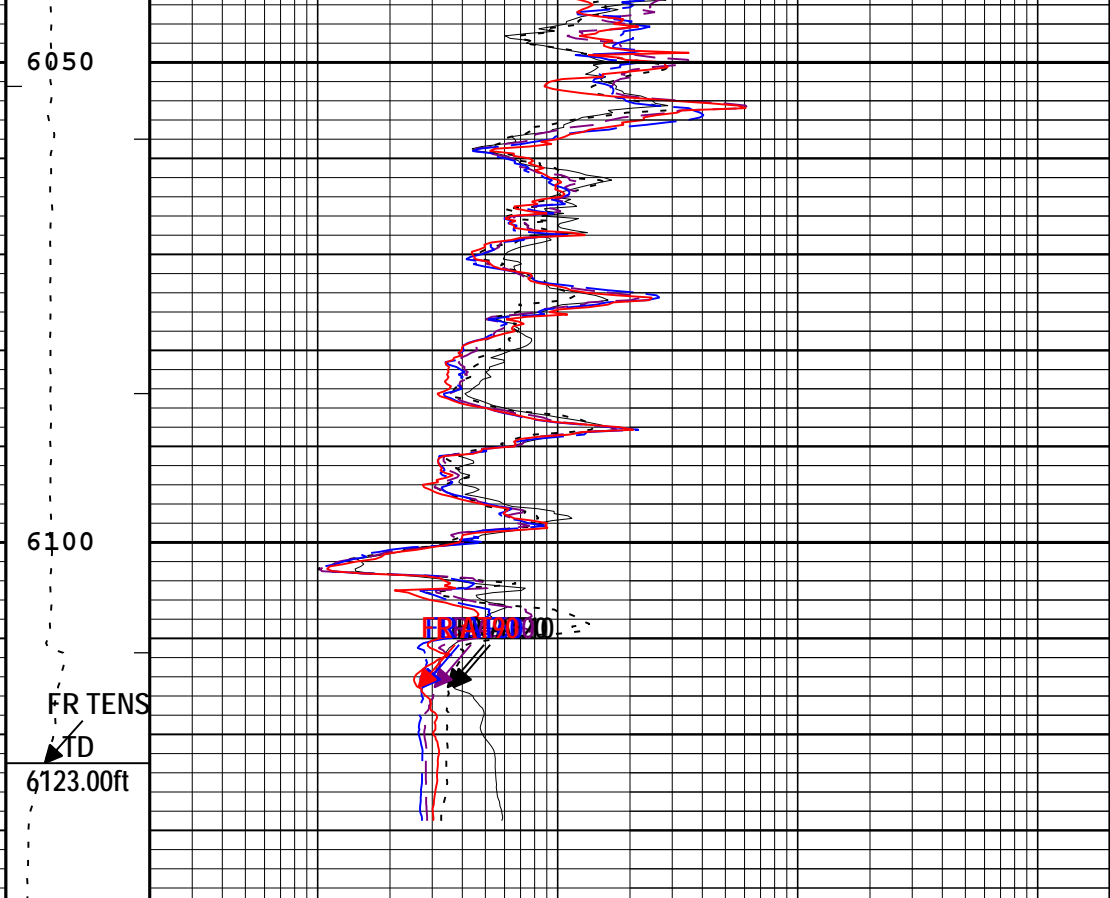
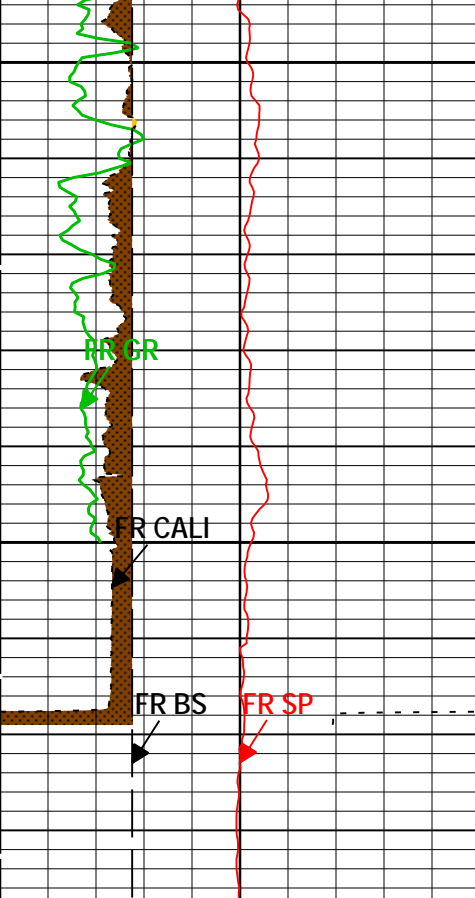
TIME\_1900 - Time Marked every 60.00 (s)

—|ICV - Integrated Cement Volume every 10.00 (ft3)

—|ICV - Integrated Cement Volume every 100.00 (ft3)







Gamma Ray Backup		
Mud-Cake		
Washout		
Caliper (CALI) HDRS-H		
6	in	16
Gamma Ray (GR) HGNS-H		
0	gAPI	150
Spontaneous Potential (SP) AIT-M		
-160	mV	40
Gamma Ray (GR) HGNS-H		
150	gAPI	300
Bit Size (BS)		
6	in	16

Cable Tension (TENS)	Array Induction Two Foot Resistivity A10 (AT10) AIT-M	
0 lbf 8000	0.2	ohm.m 2000
	Array Induction Two Foot Resistivity A20 (AT20) AIT-M	
	0.2	ohm.m 2000
	Array Induction Two Foot Resistivity A30 (AT30) AIT-M	
	0.2	ohm.m 2000
	Array Induction Two Foot Resistivity A60 (AT60) AIT-M	
	0.2	ohm.m 2000
	Array Induction Two Foot Resistivity A90 (AT90) AIT-M	
	0.2	ohm.m 2000

- ICV - Integrated Cement Volume every 100.00 (ft3)
- ICV - Integrated Cement Volume every 10.00 (ft3)
- TIME\_1900 - Time Marked every 60.00 (s)
- IHV - Integrated Hole Volume every 100.00 (ft3)
- IHV - Integrated Hole Volume every 10.00 (ft3)

Description: AIT Basic Log One Format: Log (AIT 5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2012 02:40:45

Channel Processing Parameters				
Parameter	Description	ToolPath	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M:AMIS:AMIS	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M:AMIS:AMIS	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M:AMIS:AMIS	Yes	

ASTA	Array Induction Tool Standoff	AIT-M:AMIS:AMIS	1.625	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	COMPLETION	8.75	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H:HRCC-H:HRCC-H	0	in
CBLO	Casing Bottom (Logger)	COMPLETION	752	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
DFD	Drilling Fluid Density	Borehole	9.5	lbm/gal
FCD	Future Casing (Outer) Diameter	COMPLETION	7	in
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	CALI	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SPDR	SP Drift Per Foot	AIT-M:AMIS:AMIS	0	mV/ft

## Tool Control Parameters

Parameter	Description	ToolPath	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed		1800	ft/h

**ONE**

## Repeat Analysis

## Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Log[2]:Up	Up	5584.50 ft	6137.35 ft	28-Sep-2012 12:17:35 AM	28-Sep-2012 12:29:04 AM	2.34 ft	
ONE	Log[4]:Up	Up	517.13 ft	6137.18 ft	28-Sep-2012 12:35:18 AM	28-Sep-2012 2:13:46 AM	2.34 ft	

All depths are referenced to toolstring zero

## Log

**ONE: Log[4]:Up 31C06791-5DD9-42F0-BB46-96BE07B8860F**

Description: AIT Basic Log Two Format: Log (AIT Basic Log Two RA\_1) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2012 02:40:46

Channel	Source	Sampling
ICV	Borehole	6in
IHV	Borehole	6in
TIME_1900	WLWorkflow	0.1in

—| IHV - Integrated Hole Volume every 10.00 (ft3)

—| IHV - Integrated Hole Volume every 100.00 (ft3)

—| ICV - Integrated Cement Volume every 10.00 (ft3)

—| ICV - Integrated Cement Volume every 100.00 (ft3)

TIME\_1900 - Time Marked every 60.00 (s)

Main To Repeat

Repeat To Main

Cable Tension (TENS)

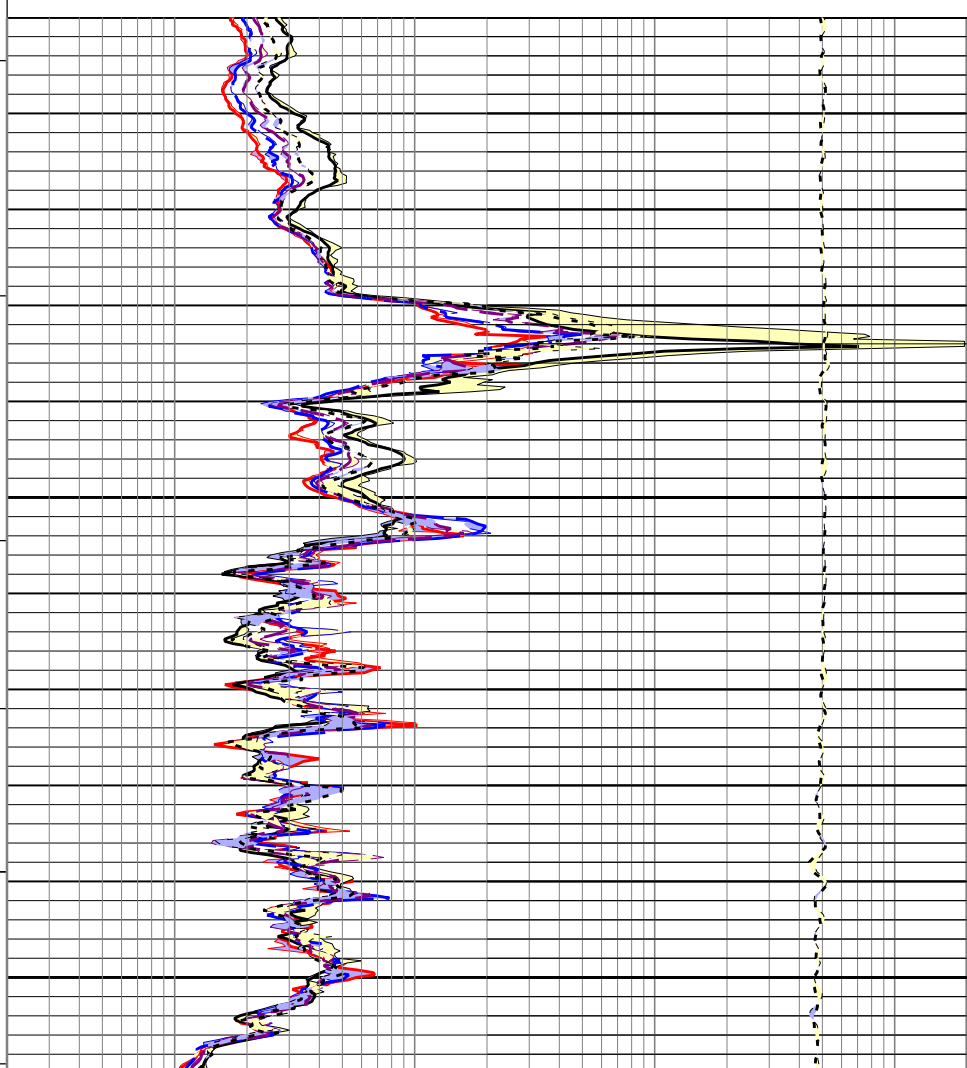
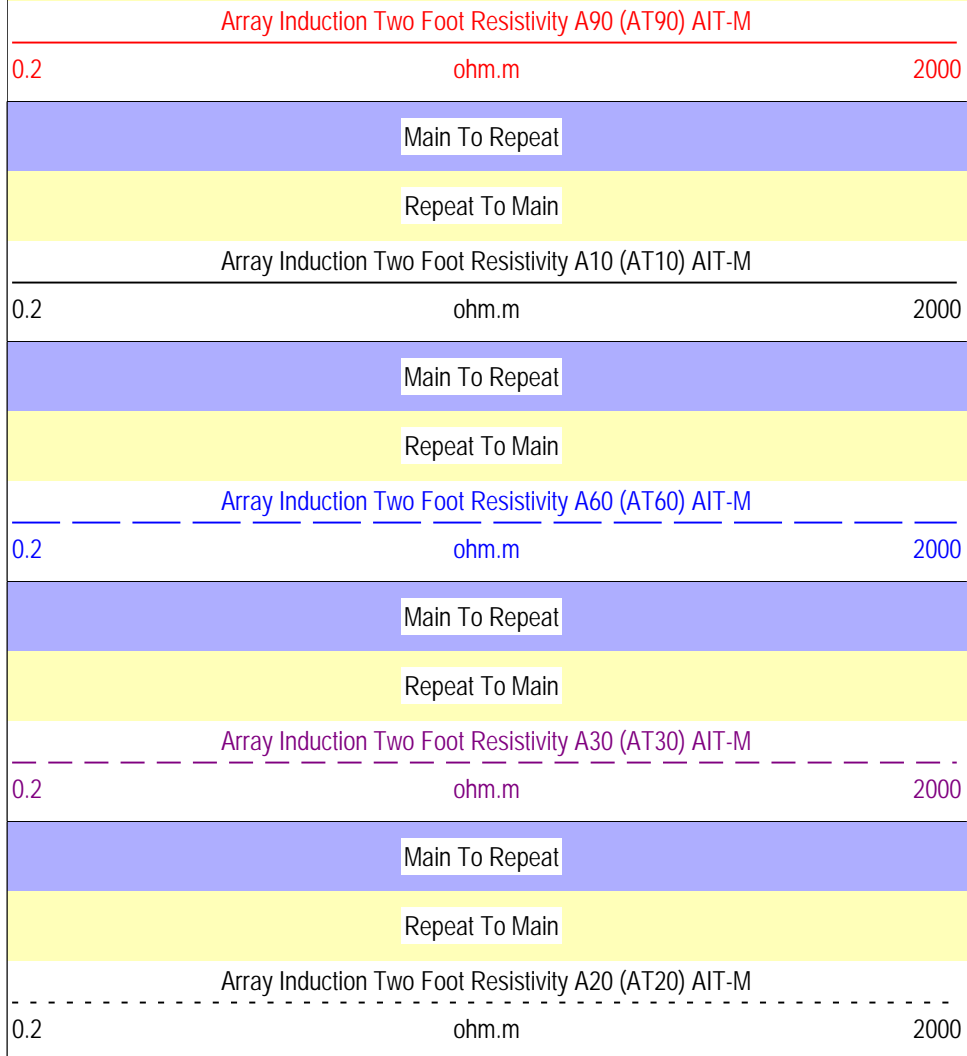
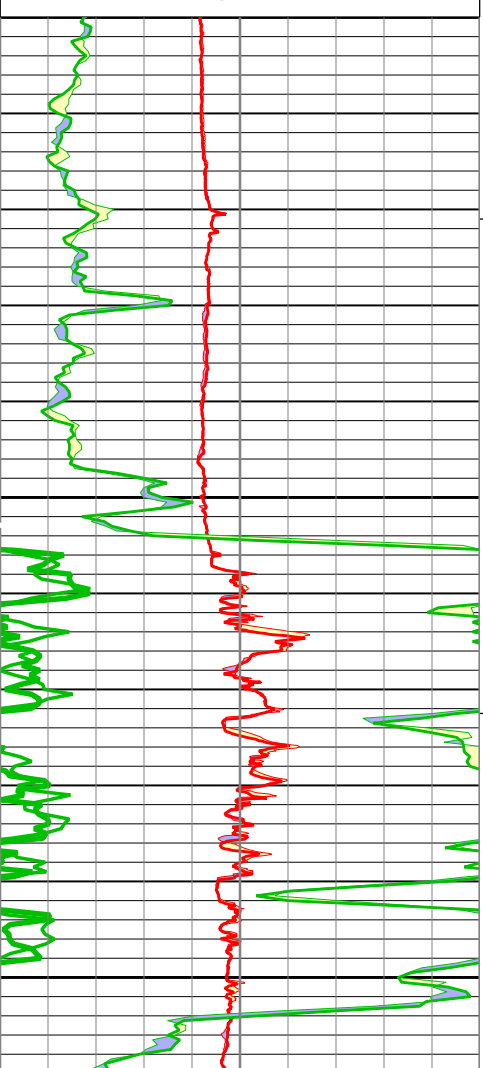
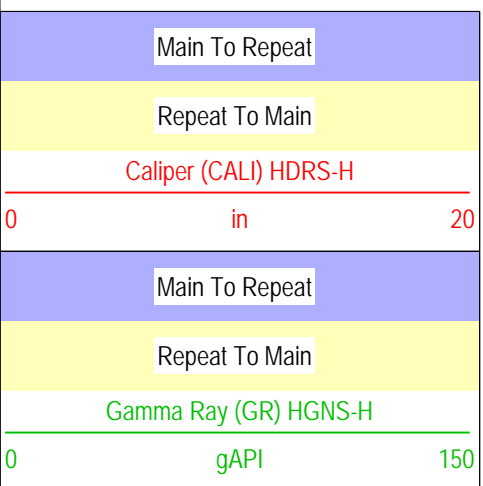
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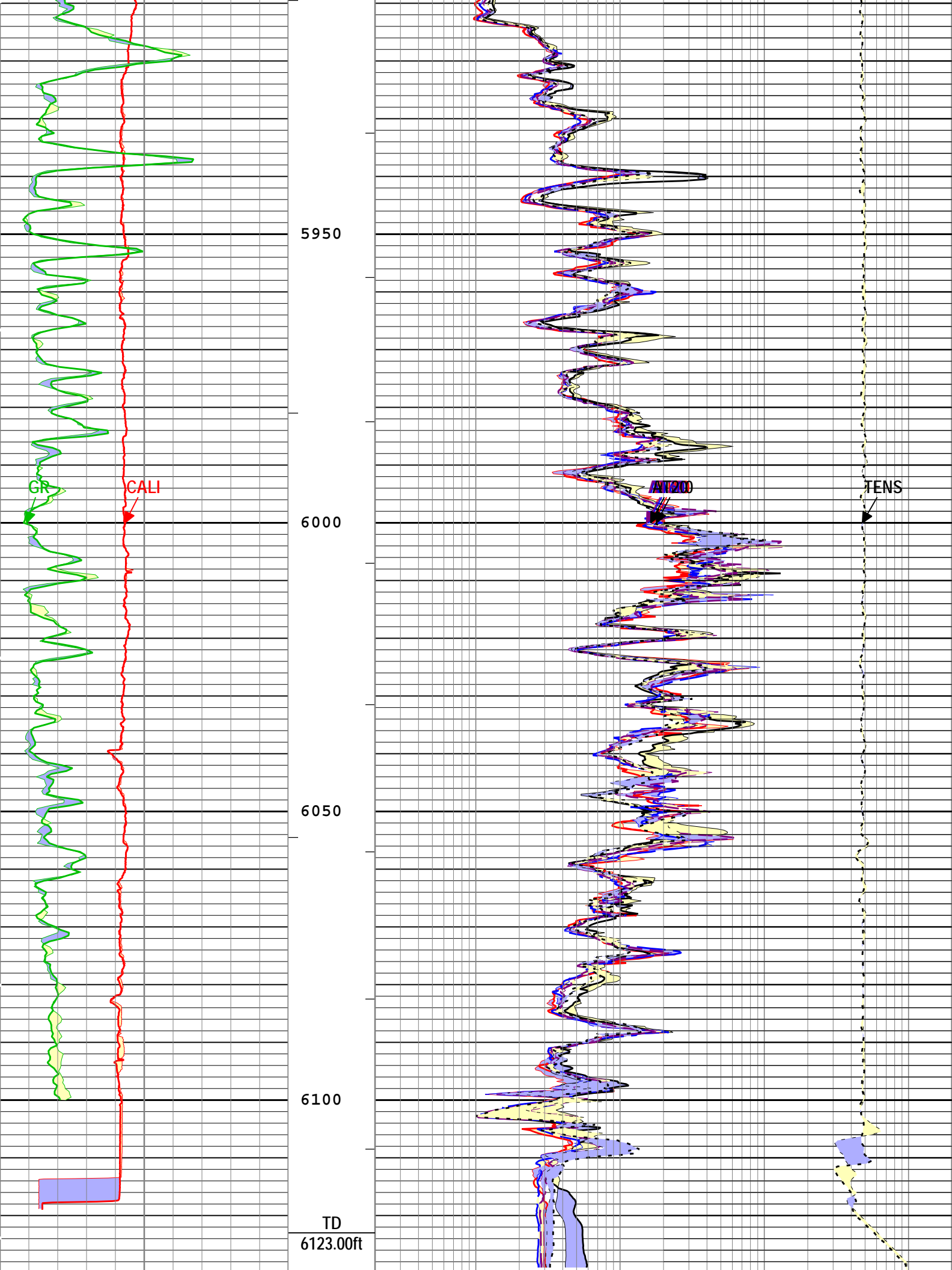
lbf

0

Main To Repeat

Repeat To Main





Main To Repeat		
Repeat To Main		
Caliper (CALI) HDRS-H		
0	in	20
Main To Repeat		
Repeat To Main		
Gamma Ray (GR) HGNS-H		
0	gAPI	150

Main To Repeat		
Repeat To Main		
Array Induction Two Foot Resistivity A90 (AT90) AIT-M		
0.2	ohm.m	2000
Main To Repeat		
Repeat To Main		
Array Induction Two Foot Resistivity A10 (AT10) AIT-M		
0.2	ohm.m	2000
Main To Repeat		
Repeat To Main		
Array Induction Two Foot Resistivity A60 (AT60) AIT-M		
0.2	ohm.m	2000
Main To Repeat		
Repeat To Main		
Array Induction Two Foot Resistivity A30 (AT30) AIT-M		
0.2	ohm.m	2000
Main To Repeat		
Repeat To Main		
Array Induction Two Foot Resistivity A20 (AT20) AIT-M		
0.2	ohm.m	2000

Main To Repeat		
Repeat To Main		
Cable Tension (TENS)		
8000	lbf	0

TIME\_1900 - Time Marked every 60.00 (s)

- ICV - Integrated Cement Volume every 100.00 (ft3)
- ICV - Integrated Cement Volume every 10.00 (ft3)
- IHV - Integrated Hole Volume every 100.00 (ft3)
- IHV - Integrated Hole Volume every 10.00 (ft3)

Description: AIT Basic Log Two Format: Log (AIT Basic Log Two RA\_1) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2012 02:40:46

Calibration Report			
AIT-M (Array Induction Tool - M) Calibration - Run ONE			
Primary Equipment :			
Array Induction Sonde - M	AMIS		34
Auxiliary Equipment :			
AITM Rm/SP Bottom Nose	AMRM		34

## AIT Sonde Calibration - Test Loop Gain

Master (EEPROM):		18:51:21 25-Jul-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Test Loop Gain - 0		Master	1.000	0.950	1.009	1.050	
Test Loop Phase - 0	deg	Master	0	-3.000	1.392	3.000	
Test Loop Gain - 1		Master	1.000	0.950	1.010	1.050	
Test Loop Phase - 1	deg	Master	0	-3.000	0.516	3.000	
Test Loop Gain - 2		Master	1.000	0.950	1.014	1.050	
Test Loop Phase - 2	deg	Master	0	-3.000	0.248	3.000	
Test Loop Gain - 3		Master	1.000	0.950	1.005	1.050	
Test Loop Phase - 3	deg	Master	0	-3.000	0.356	3.000	
Test Loop Gain - 4		Master	1.000	0.950	0.992	1.050	
Test Loop Phase - 4	deg	Master	0	-3.000	0.588	3.000	
Test Loop Gain - 5		Master	1.000	0.950	0.986	1.050	
Test Loop Phase - 5	deg	Master	0	-3.000	-0.857	3.000	
Test Loop Gain - 6		Master	1.000	0.950	0.996	1.050	
Test Loop Phase - 6	deg	Master	0	-3.000	0.130	3.000	
Test Loop Gain - 7		Master	1.000	0.950	1.005	1.050	
Test Loop Phase - 7	deg	Master	0	-3.000	-0.274	3.000	

## AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM):		18:51:21 25-Jul-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Sonde Error Correction Real - 0	mS/m	Master	----	-231.000	-29.757	119.000	
Sonde Error Correction Quad - 0		Master	----	-2250.000	-725.705	2250.000	
Sonde Error Correction Real - 1	mS/m	Master	----	114.000	176.085	204.000	
Sonde Error Correction Quad - 1		Master	----	-625.000	-378.724	625.000	
Sonde Error Correction Real - 2	mS/m	Master	----	66.000	95.324	156.000	
Sonde Error Correction Quad - 2		Master	----	-350.000	-49.546	350.000	
Sonde Error Correction Real - 3	mS/m	Master	----	39.000	58.434	89.000	
Sonde Error Correction Quad - 3		Master	----	-250.000	46.960	250.000	
Sonde Error Correction Real - 4	mS/m	Master	----	15.000	23.573	35.000	
Sonde Error Correction Quad - 4		Master	----	-63.000	-11.946	63.000	
Sonde Error Correction Real - 5	mS/m	Master	----	4.000	11.962	24.000	
Sonde Error Correction Quad - 5		Master	----	-50.000	-17.535	50.000	
Sonde Error Correction Real - 6	mS/m	Master	----	5.000	9.250	15.000	
Sonde Error Correction Quad - 6		Master	----	-30.000	1.649	30.000	
Sonde Error Correction Real - 7	mS/m	Master	----	-5.000	-1.319	5.000	
Sonde Error Correction Quad - 7		Master	----	-30.000	4.019	30.000	

## AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM):		18:51:21 25-Jul-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Coarse Gain		Master	1.000	0.800	1.028	1.200	
Fine Gain		Master	1.000	0.800	1.028	1.200	

## AIT Electronics Check - Thru Calibration Check

Master (EEPROM):		18:51:21 25-Jul-2012		Before (Measured):	15:44:43 26-Sep-2012	After:		
				Expired by 1 days				
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Thru Cal Mag - 0	V	Master	----	0.366	0.585	0.854		
		Before	----	0.366	0.585	0.854		
		After	----	----	----	----		
		Before-Master	----	----	0.000	----		
		After-Before	----	----	----	----		
Thru Cal Phase - 0	deg	Master	----	137.000	-164.743	-103.000		
		Before	----	137.000	-150.362	-103.000		
		After	----	----	----	----		
		Before-Master	----	----	14.381	----		
		After-Before	----	----	----	----		
Thru Cal Mag - 1	V	Master	----	0.762	1.199	1.778		
		Before	----	0.762	1.198	1.778		
		After	----	----	----	----		
		Before-Master	----	----	-0.001	----		
		After-Before	----	----	----	----		
Thru Cal Phase - 1	deg	Master	----	136.000	-165.806	-104.000		
		Before	----	136.000	-151.420	-104.000		

		After	----	----	----	----	
		Before-Master	----	----	14.386	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 2	V	Master	----	0.372	0.594	0.868	
		Before	----	0.372	0.594	0.868	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 2	deg	Master	----	132.000	-169.270	-108.000	
		Before	----	132.000	-154.885	-108.000	
		After	----	----	----	----	
		Before-Master	----	----	14.385	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 3	V	Master	----	0.420	0.672	0.980	
		Before	----	0.420	0.672	0.980	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 3	deg	Master	----	131.000	-170.014	-109.000	
		Before	----	131.000	-155.628	-109.000	
		After	----	----	----	----	
		Before-Master	----	----	14.386	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 4	V	Master	----	0.804	1.261	1.876	
		Before	----	0.804	1.261	1.876	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 4	deg	Master	----	125.000	-176.056	-115.000	
		Before	----	125.000	-161.666	-115.000	
		After	----	----	----	----	
		Before-Master	----	----	14.390	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 5	V	Master	----	1.176	1.834	2.744	
		Before	----	1.176	1.834	2.744	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 5	deg	Master	----	122.000	-177.641	-118.000	
		Before	----	122.000	-163.248	-118.000	
		After	----	----	----	----	
		Before-Master	----	----	14.393	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 6	V	Master	----	1.176	1.835	2.744	
		Before	----	1.176	1.835	2.744	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 6	deg	Master	----	121.000	-177.629	-119.000	
		Before	----	121.000	-163.230	-119.000	
		After	----	----	----	----	
		Before-Master	----	----	14.399	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 7	V	Master	----	0.846	1.332	1.974	
		Before	----	0.846	1.332	1.974	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 7	deg	Master	----	115.000	-178.431	-125.000	
		Before	----	115.000	-164.001	-125.000	
		After	----	----	----	----	
		Before-Master	----	----	14.430	----	
		After-Before	----	----	----	----	
SPA Zero	mV	Master	----	-50.000	0.115	50.000	
		Before	----	-50.000	0.115	50.000	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	

SPA Plus	mV	Master	----	941.000	990.055	1040.000	
		Before	----	941.000	990.008	1040.000	
		After	----	----	----	----	
		Before-Master	----	----	-0.047	----	
		After-Before	----	----	----	----	
Temperature Zero	V	Master	----	-0.050	0.000	0.050	
		Before	----	-0.050	0.000	0.050	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Temperature Plus	V	Master	----	0.870	0.917	0.960	
		Before	----	0.870	0.917	0.960	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	

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

<b>Primary Equipment :</b>			
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H		3821
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H		3992
<b>Auxiliary Equipment :</b>			
HRDD Backscatter Detector	Backscatter		26819
HRDD Long Spacing Detector	Long Spacing		28539
HRDD Short Spacing Detector	Short Spacing		0
Cesium 137 Gamma-Ray Logging Source	GSR-J		5398
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H		3821
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H		3966
<b>Calibration Parameter :</b>			
Small Ring Size (Caliper Calibration Small Ring)		8.00	
Large Ring Size (Caliper Calibration Large Ring)		12.00	

## HDRS Caliper Calibration - Caliper Accumulations

Before (Measured):	15:51:52 26-Sep-2012 Expired by 1 days					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Small Ring	in	Before	8.00	6.00	8.57	10.00
Large Ring	in	Before	12.00	9.00	12.46	15.00

## HDRS Density Calibration - Inversion Results

Master (EEPROM):	15:54:40 19-Sep-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Rho Aluminum	g/cm3	Master	2.596	2.586	2.600	2.606
Rho Magnesium	g/cm3	Master	1.686	1.676	1.686	1.696
Pe Aluminum		Master	2.570	2.470	2.561	2.670
Pe Magnesium		Master	2.650	2.550	2.640	2.750

## HDRS Density Calibration - Deviation Summary

Master (EEPROM):	15:54:40 19-Sep-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Average Deviation	%	Master	0	-0.6000	0.3383	0.6000
BS Max Deviation	%	Master	0	-1.6000	0.7125	1.6000
SS Average Deviation	%	Master	0	-1.0000	0.2933	1.0000
SS Max Deviation	%	Master	0	-2.5000	1.0392	2.5000
LS Average Deviation	%	Master	0	-1.5000	0.4590	1.5000
LS Max Deviation	%	Master	0	-3.5000	1.3766	3.5000

## HDRS Density Calibration - Background Summary

Master (EEPROM):	15:54:40 19-Sep-2012		Before (Measured):	15:53:54 26-Sep-2012 Expired by 1 days		
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Window Ratio		Master	1.0000	----	0.7558	----
		Before	0.7558	0.7180	0.7545	0.7936
		Before-Master	----	----	-0.0013	----
BS Window Sum	1/s	Master	1	----	28181	----
		Before	28181	26772	28177	29590

SS Window Ratio		Before-Master	-----	-----	-4	-----	
		Master	1.0000	-----	0.4855	-----	
		Before	0.4855	0.4612	0.4835	0.5097	
SS Window Sum	1/s	Before-Master	-----	-----	-0.0020	-----	
		Master	1	-----	11566	-----	
		Before	11566	10988	11575	12145	
LS Window Ratio		Before-Master	-----	-----	9	-----	
		Master	1.0000	-----	0.3044	-----	
		Before	0.3044	0.2892	0.3046	0.3196	
LS Window Sum	1/s	Before-Master	-----	-----	0.0002	-----	
		Master	1	-----	1319	-----	
		Before	1319	1253	1307	1385	
Before-Master	-----	-----	-12	-----	-----		

### HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM):		15:54:40 19-Sep-2012		Before (Measured):		15:53:54 26-Sep-2012 Expired by 1 days	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS PM High Voltage	V	Master	-----	1000	1452	2400	
		Before	-----	1000	1462	2400	
		Before-Master	-----	-100	10	100	
SS PM High Voltage	V	Master	-----	1000	1554	2400	
		Before	-----	1000	1554	2400	
		Before-Master	-----	-100	0	100	
LS PM High Voltage	V	Master	-----	1000	1515	2400	
		Before	-----	1000	1520	2400	
		Before-Master	-----	-100	5	100	

### HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM):		15:54:40 19-Sep-2012		Before (Measured):		15:53:54 26-Sep-2012 Expired by 1 days	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Crystal Resolution	%	Master	-----	5.00	10.42	25.00	
		Before	-----	5.00	10.42	25.00	
		Before-Master	-----	-1.00	0.00	1.00	
SS Crystal Resolution	%	Master	-----	5.00	10.49	20.00	
		Before	-----	5.00	10.36	20.00	
		Before-Master	-----	-1.00	-0.13	1.00	
LS Crystal Resolution	%	Master	-----	5.00	9.13	20.00	
		Before	-----	5.00	9.07	20.00	
		Before-Master	-----	-1.00	-0.06	1.00	

### HDRS MCFL Calibration - MCFL Accumulations

Before (Measured):		15:45:26 26-Sep-2012 Expired by 1 days					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Main Resistivity	ohm.m	Before	3875	3565	3854	4185	
Deep Resistivity	ohm.m	Before	3830	3524	3808	4136	
Shallow Resistivity	ohm.m	Before	3830	3524	3822	4136	

### HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run ONE

<b>Primary Equipment :</b>			
HILT Gamma-Ray and Neutron Sonde, 150 degC		HGNS-H	3916
<b>Auxiliary Equipment :</b>			
HGNS Accelerometer, 150 degC		HACCZ-H	3574
AmBe Neutron Logging Source		NSR-F	5219
<b>Calibration Parameter :</b>			
Water Temperature			
Housing Size			
JIG-BKG (Jig minus background reference)		165	

### HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured):		23:24:31 27-Sep-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.2	32.8	

### HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Master (EEPROM): 00:00:00 15-Feb-2005							
Accelerometer Manufacturer		Master	----	----	QAT_160	----	
Accelerometer Reference Temperature	degF	Master	----	30.2	77.0	122.0	
Accelerometer Coefficients - 0		Master	----	----	5116.000	----	
Accelerometer Coefficients - 1		Master	----	----	14.873	----	
Accelerometer Coefficients - 2		Master	----	----	0.003	----	
Accelerometer Coefficients - 3		Master	----	----	0.000	----	
Accelerometer Coefficients - 4		Master	----	----	2.729	----	
Accelerometer Coefficients - 5		Master	----	----	0.000	----	
Accelerometer Coefficients - 6		Master	----	----	0.000	----	
Accelerometer Coefficients - 7		Master	----	----	0.000	----	
Accelerometer Coefficients - 8		Master	----	----	298.500	----	
Accelerometer Coefficients - 9		Master	----	----	1.005	----	

### HGNS Neutron Calibration - HGNS Neutron Accumulations

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Master (EEPROM): 15:04:08 11-Sep-2012 Before (Measured): 15:44:15 26-Sep-2012 Expired by 1 days After:							
Near Zero Measurement	1/s	Master	0	5.0	28.1	40.0	
		Before	0	5.0	27.9	40.0	
		After	----	----	----	----	
		Before-Master	----	-4.2	-0.2	4.2	
		After-Before	----	----	----	----	
Far Zero Measurement	1/s	Master	0	5.0	27.5	40.0	
		Before	0	5.0	27.6	40.0	
		After	----	----	----	----	
		Before-Master	----	-4.1	0.1	4.1	
		After-Before	----	----	----	----	
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	4883.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	1982.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Near Corrected Plus Measurement - 0	1/s	Master	----	4700.0	4880.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Corrected Plus Measurement - 0	1/s	Master	----	1900.0	1970.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

### HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Before (Measured): 15:51:22 26-Sep-2012 Expired by 1 days After:							
RGR Zero Measurement	gAPI	Before	30.0	0	24.7	120.0	
		After	----	----	----	----	
		After-Before	----	----	----	----	
RGR Plus Measurement	gAPI	Before	185.4	157.1	177.6	206.3	
		After	----	----	NOT DONE	----	
		After-Before	----	----	----	----	
GR Calibration Gain		Before	0.89	0.80	0.93	1.05	
		After	----	----	----	----	
		After-Before	----	----	----	----	

**ONE**

**Main Pass 1" = 100'**

## Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	1543.34	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	2981.24	ft3

## Software Version

Acquisition System	Version		
MaxWell	3.0.9609.0		
Application Patch	SP-20120409-3.0.9609.1919 EXP_APL-OPElevation-3.0.9609.1966 EXP_APL-ADT-3.0.9609.1558		
Computation	Description	Version	
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.0.9609.1919	
Tool Elements	Description	Software Version	Firmware Version
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.0.9609.1919	2.0
AMIS	Array Induction Sonde - M	3.0.9609.1919	1

## Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Log[4]:Up	Up	517.13 ft	6137.18 ft	28-Sep-2012 12:35:18 AM	28-Sep-2012 2:13:46 AM	2.34 ft	

All depths are referenced to toolstring zero

## Log

ONE: Log[4]:Up 31C06791-5DD9-42F0-BB46-96BE07B8860F

Description: AIT Basic Log Two Format: Log (AIT Basic Log Two) Index Scale: 1 in per 100 ft Index Unit: ft  
Index Type: Measured Depth Creation Date: 28-Sep-2012 02:40:56

Channel	Source	Sampling
AF20	AIT-M:AMIS:AMIS	3in
AF60	AIT-M:AMIS:AMIS	3in
AFCO60	AIT-M:AMIS:AMIS	3in
GR	HGNS-H:HGNS-H:HGNS-H	6in
ICV	Borehole	6in
IHV	Borehole	6in
SP	AIT-M:AMIS:AMIS	6in
TIME_1900	WLWorkflow	0.1in

| TIME\_1900 - Time Marked every 60.00 (s)

—| IHV - Integrated Hole Volume every 10.00 (ft3)

—| IHV - Integrated Hole Volume every 100.00 (ft3)

—| ICV - Integrated Cement Volume every 10.00 (ft3)

—| ICV - Integrated Cement Volume every 100.00 (ft3)

### Gamma Ray Backup

Gamma Ray (GR)  
HGNS-H

0 gAPI 150

Spontaneous Potential  
(SP) AIT-M

-160 mV 40

Gamma Ray (GR)  
HGNS-H

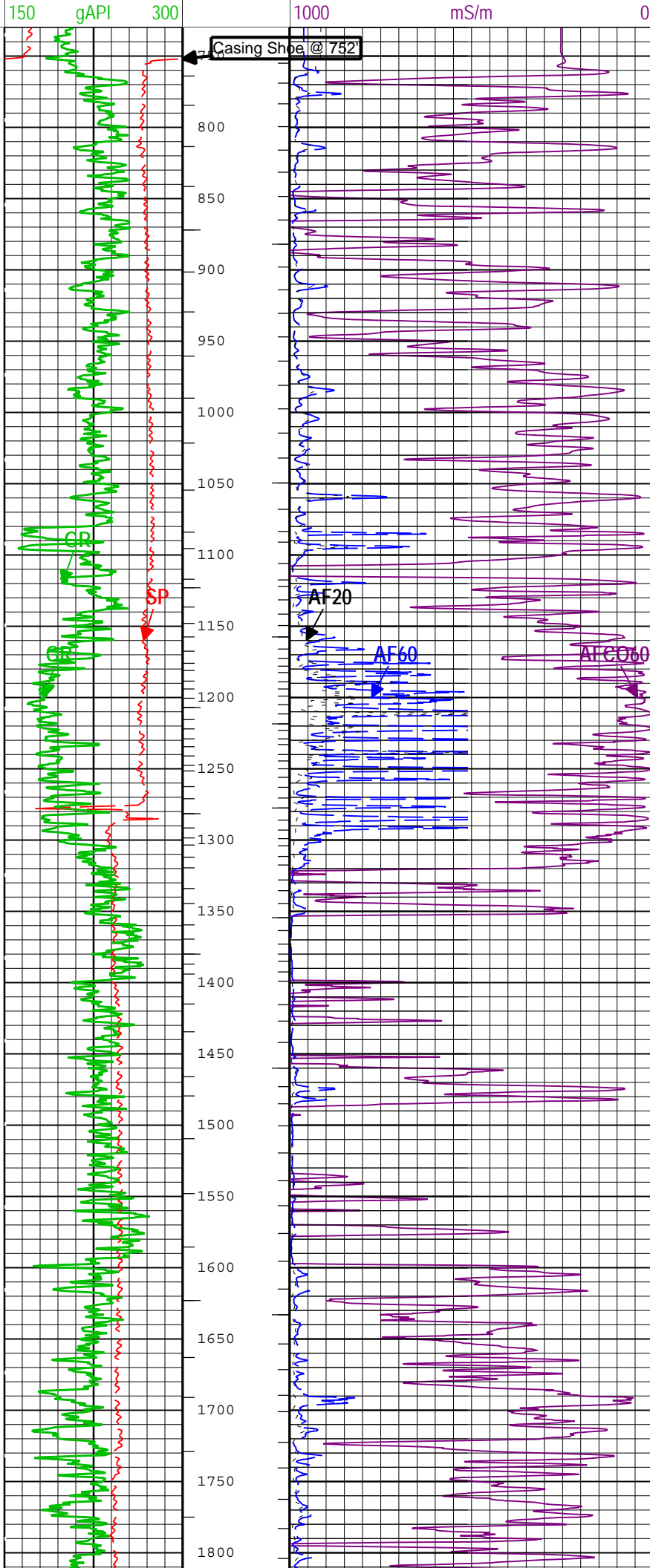
Array Induction Four  
Foot Resistivity A60  
(AF60) AIT-M

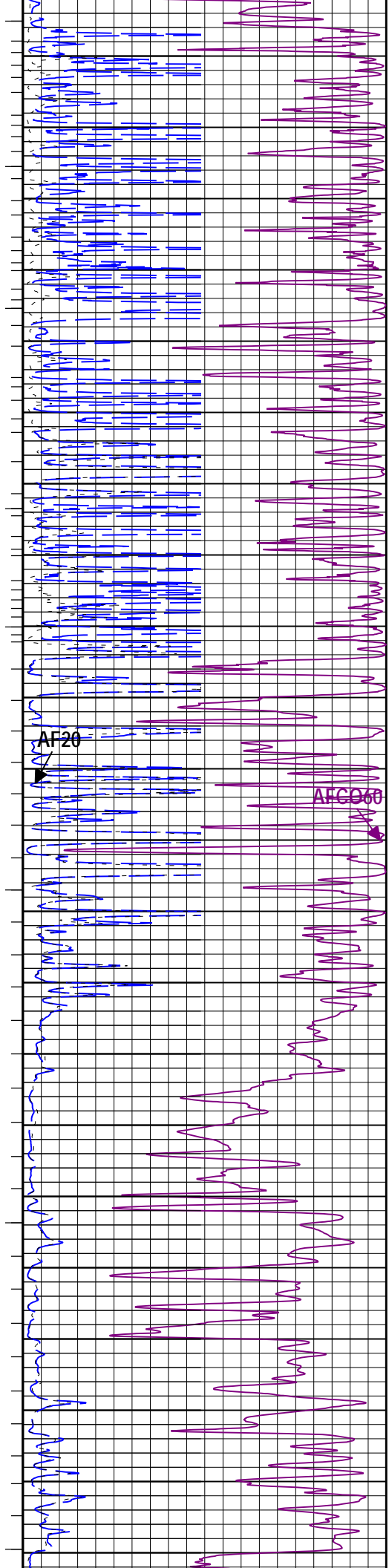
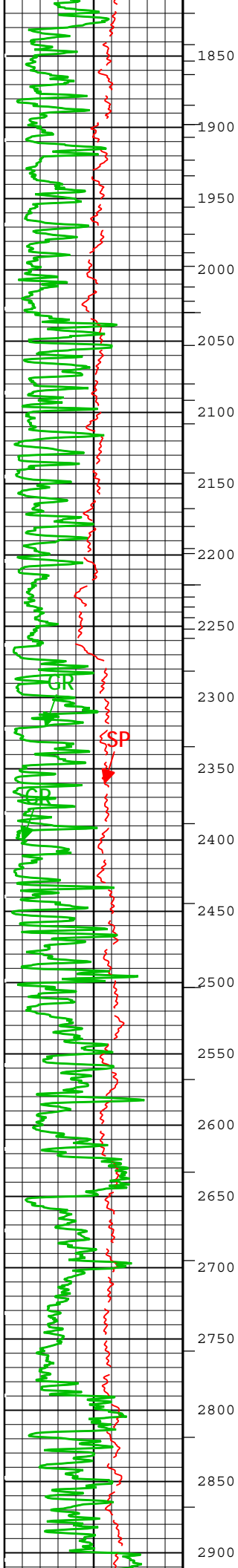
0 ohm.m 50

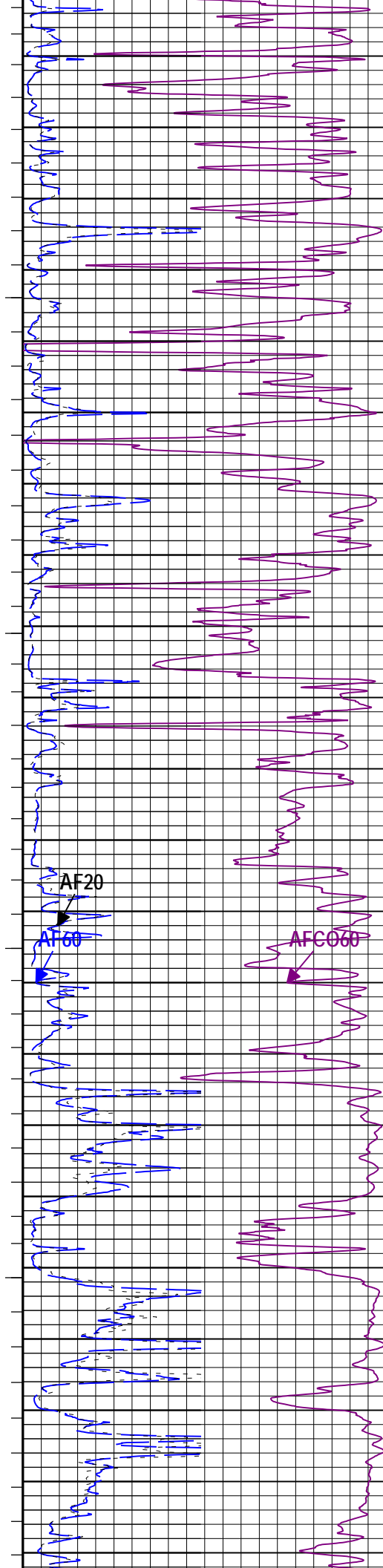
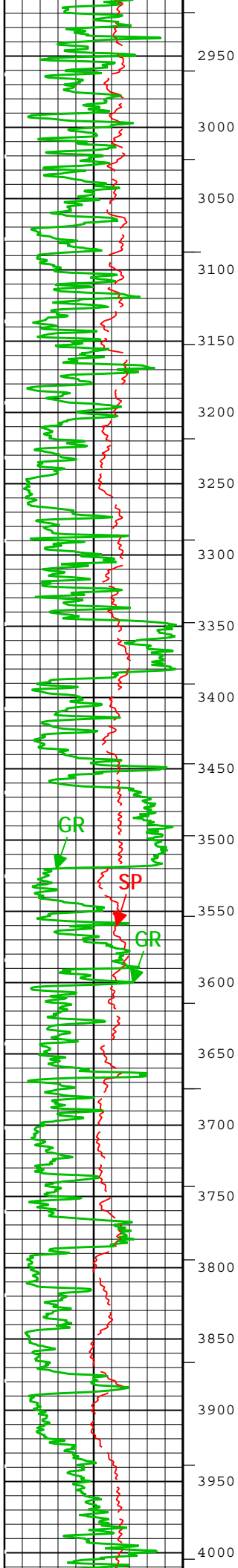
Array Induction Four  
Foot Resistivity A20  
(AF20) AIT-M

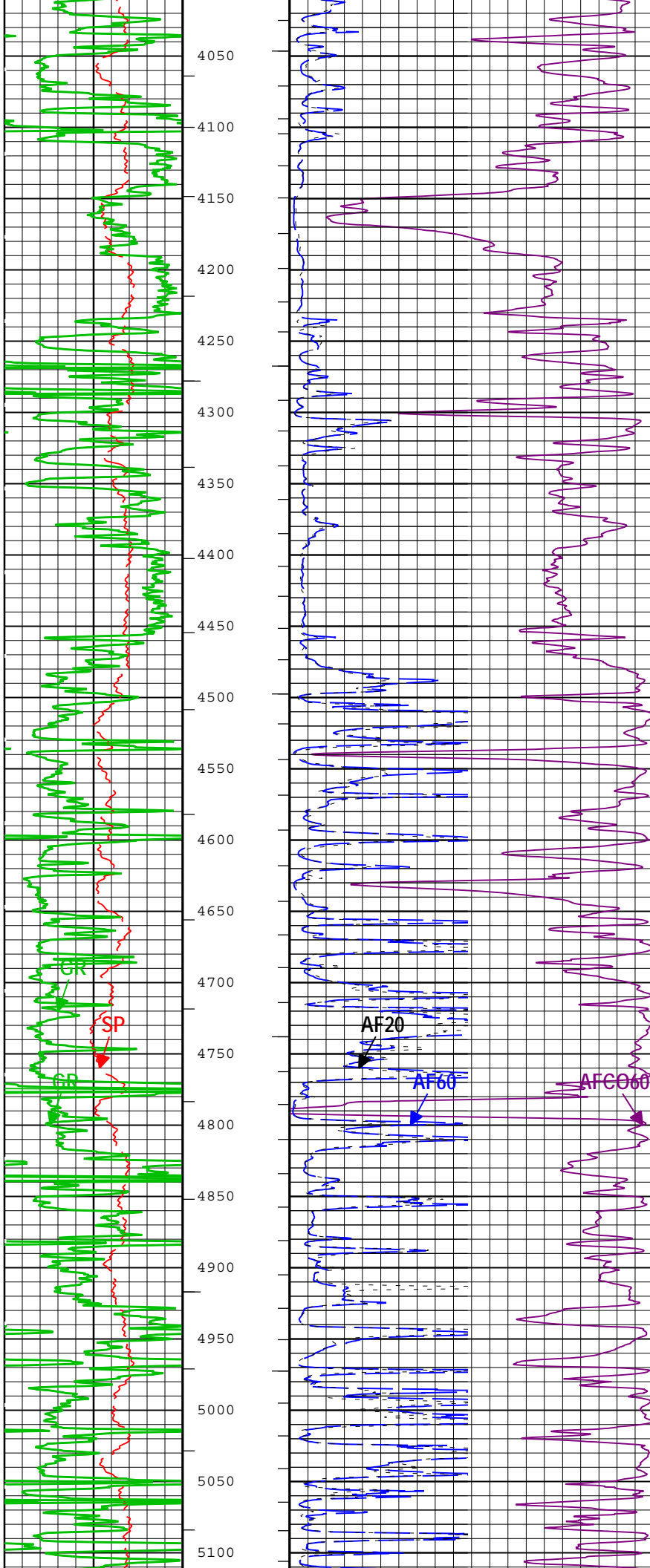
0 ohm.m 50

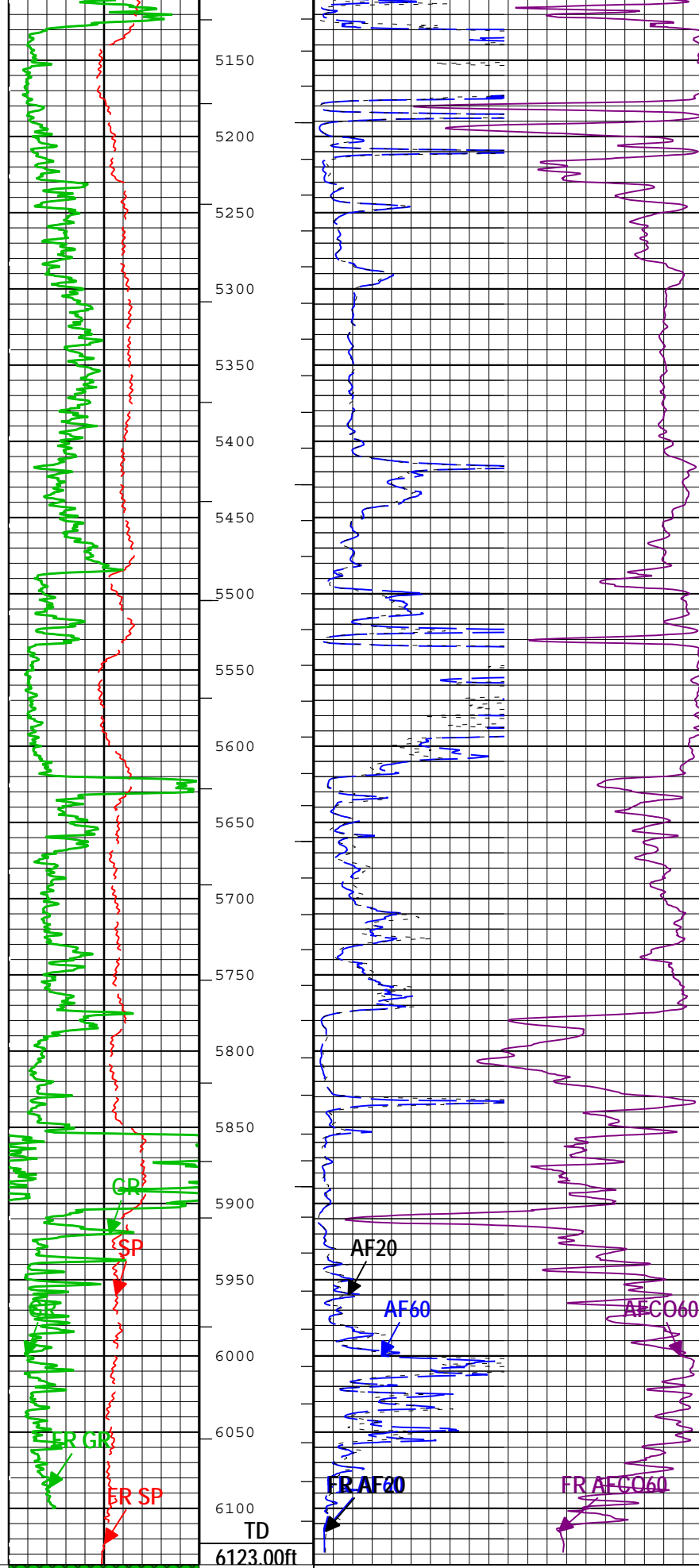
Array Induction Four Foot Conductivity A60  
(AFCO60) AIT-M











Gamma Ray Backup

Gamma Ray (GR)  
HGNS-H

Array Induction Four Foot Conductivity A60  
(AFCO60) AIT-M

1000 mS/m 0

Array Induction Four

0	gAPI	150
Spontaneous Potential (SP) AIT-M		
-160	mV	40
Gamma Ray (GR) HGNS-H		
150	gAPI	300

Array Induction Four Foot Resistivity A60 (AF60) AIT-M		
0	ohm.m	50
Array Induction Four Foot Resistivity A20 (AF20) AIT-M		
0	ohm.m	50

- | ICV - Integrated Cement Volume every 100.00 (ft3)
- | ICV - Integrated Cement Volume every 10.00 (ft3)
- | IHV - Integrated Hole Volume every 100.00 (ft3)
- | IHV - Integrated Hole Volume every 10.00 (ft3)
- | TIME\_1900 - Time Marked every 60.00 (s)

Description: AIT Basic Log Two Format: Log ( AIT Basic Log Two ) Index Scale: 1 in per 100 ft Index Unit: ft  
 Index Type: Measured Depth Creation Date: 28-Sep-2012 02:40:56

## Channel Processing Parameters

Parameter	Description	ToolPath	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M:AMIS:AMIS	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M:AMIS:AMIS	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M:AMIS:AMIS	Yes	
ASTA	Array Induction Tool Standoff	AIT-M:AMIS:AMIS	1.625	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	COMPLETION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H:HRCC-H:HRCC-H	0	in
CBLO	Casing Bottom (Logger)	COMPLETION	752	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	COMPLETION	9.625	in
DFD	Drilling Fluid Density	Borehole	9.5	lbm/gal
FCD	Future Casing (Outer) Diameter	COMPLETION	7	in
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	CALI	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SPDR	SP Drift Per Foot	AIT-M:AMIS:AMIS	0	mV/ft

## Depth Zone Parameters

Parameter	Value	Start ( ft )	Stop ( ft )
BS	0	730	752
BS	8.75	752	6137

All depth are actual.

## Tool Control Parameters

Company: Tug Hill Operating, LLC

**Schlumberger**

Well: Proctor Trust 1 SWD

Field: Wildcat

County: Comanche

County: Comanche

State: Kansas

PLATFORM EXPRESS

ARRAY INDUCTION

GAMMA RAY - SP