Schlumberger

Company: Nemaha Oil and Gas, LLC

Well: Lampson #2A-23-32-9 SWD

Field: Hylton

County: Chautauqua State: Kansas

PLATFORM EXPRESS

ARRAY INDUCTION

GAMMA RAY - SP

County: Chautauqua
Field: Hylton
Location: 135' FNL & 405' FEL
Well: Lampson #2A-23-32-9 SWD
Company: Nemaha Oil and Gas, LLC

Location:	135' FNL & 405' FEL	Elev.	K.B.	1076.00 ft
			G.L.	1060.00 ft
			D.F.	1075.00 ft
	Permanent Datum:	Ground Level	Elev.:	1060.00 f
	Log Measured From:	Kelly Bushing	16.00 ft	above Perm.Datum
	Drilling Measured From:	Kelly Bushing		

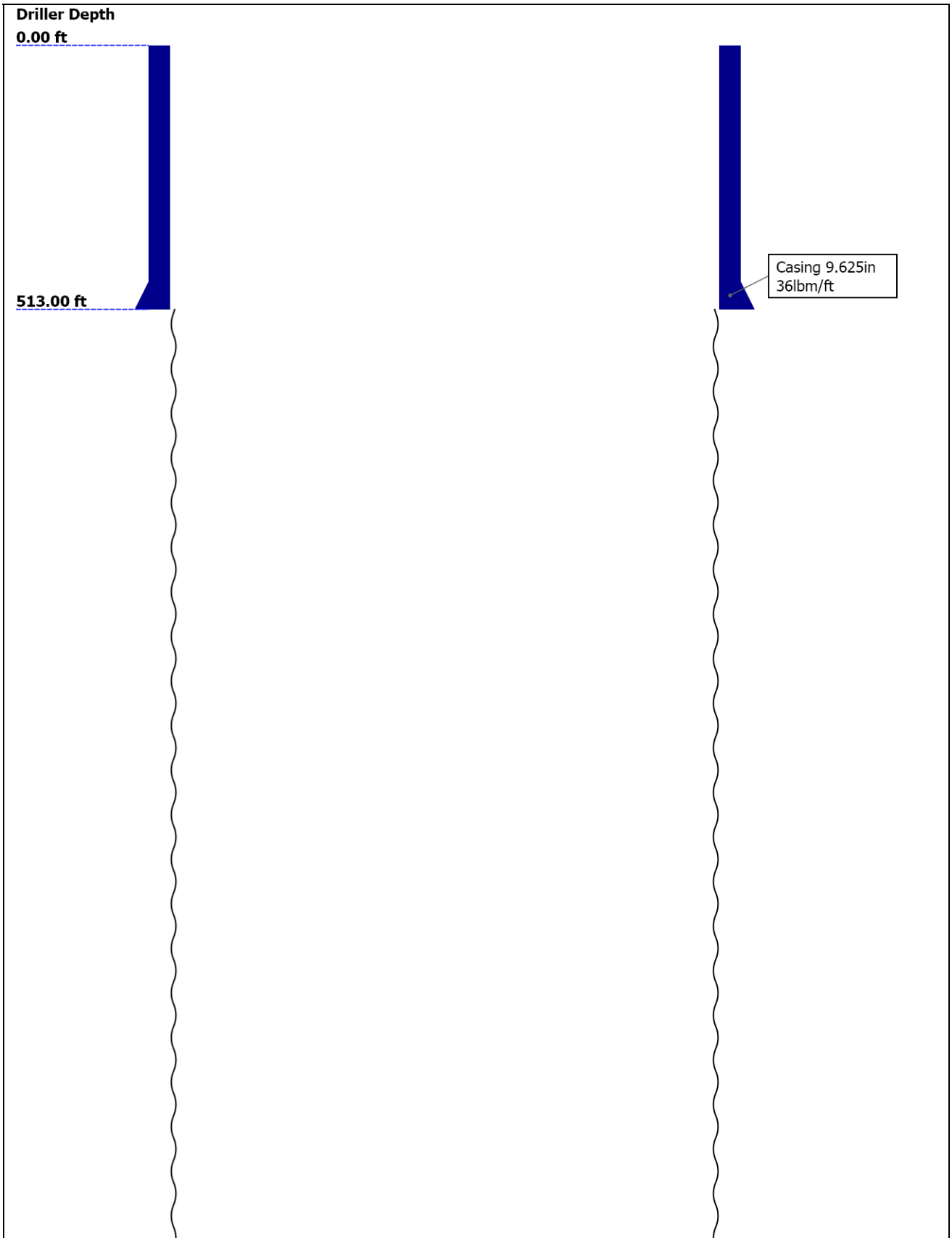
API Serial No.	Section:	Township:	Range:
15-019-27282	23	32	9

Logging Date			28-Feb-2013			
Run Number			One			
Depth Driller			3315.00 ft			
Schlumberger Depth			3278.00 ft			
Bottom Log Interval			3278.00 ft			
Top Log Interval			526.00 ft			
Casing Driller Size @ Depth			9.625 in @ 513.00 ft			
Casing Schlumberger			526 ft			
Bit Size			8.75 in			
Type Fluid In Hole			Water			
MUD	Density	Viscosity	8.7 lbm/gal	32 s		
	Fluid Loss	PH	0 cm3	8		
	Source of Sample		Flowline			
RM @ Meas Temp			1.28 ohm.m @ 46 degF			
RMF @ Meas Temp			1.09 ohm.m @ 46 degF			
RMC @ Meas Temp			1.79 ohm.m @ 46 degF			
Source RMF	RMC		Calculated	Calculated		
RM @ BHT	RMF @ BHT		0.53 @ 120	0.45 @ 120		
Max Recorded Temperatures			120 degF	120	120	
Circulation Stopped	Time		28-Feb-2013	00:00:00		
Logger on Bottom	Time		28-Feb-2013	07:45:00		
Unit Number	Location:		2281	Elk City, OK		
Recorded By			Ahmad Kojo			
Witnessed By			Mr. Don Myers			

Disclaimer

Contents

Well Sketch



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	8.75					
Top Driller (ft)	513					
Top Logger (ft)	526					
Bottom Driller (ft)	3315					
Bottom Logger (ft)	3278					
Casing						
Size (in)	9.625					
Weight (lbm/ft)	36					
Inner Diameter (in)	8.914					
Grade	J55					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	513					
Bottom Logger (ft)	526					

Operational Run Summary

Parameter (unit)	One					
Date Log Started	28-Feb-2013					
Time Log Started	05:51:19					
Date Log Finished	28-Feb-2013					
Time Log Finished	09:35:38					
Top Log Interval (ft)	526.00					
Bottom Log Interval (ft)	3278.00					
Total Depth (ft)	3278.00					
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.750					
Logging Unit Number	2281					
Logging Unit Location	Elk City, OK					
Recorded By	Ahmad Kojo					
Witnessed By	Mr. Don Myers					

Service Order Number	BXTS-00087					

Borehole Fluids

Parameter(unit)	One					
Fluid Type	Water					
Max Recorded Temperatures (degF)	120					
Source of Sample	Flowline					
Salinity (ppm)	6527.74					
Density (lbm/gal)	8.7					
Funnel Viscosity (s)	32					
Fluid Loss (cm3)	0					
PH	8					
Date/Time Circulation Stopped	28-Feb-2013 00:00:00					
Date Logger on Bottom	28-Feb-2013					
Time Logger on Bottom	07:45:00					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degF)	1.28 @ 46					
RMF @ Meas Temp (ohm.m@degF)	1.09 @ 46					
RMC @ Meas Temp (ohm.m@degF)	1.79 @ 46					
RM @ BHT (ohm.m@degF)	0.53 @ 120					
RMF @ BHT (ohm.m@degF)	0.45 @ 120					
RMC @ BHT (ohm.m@degF)	0.75 @ 120					
Total Solid (%)						
High Gravity Solids (%)						

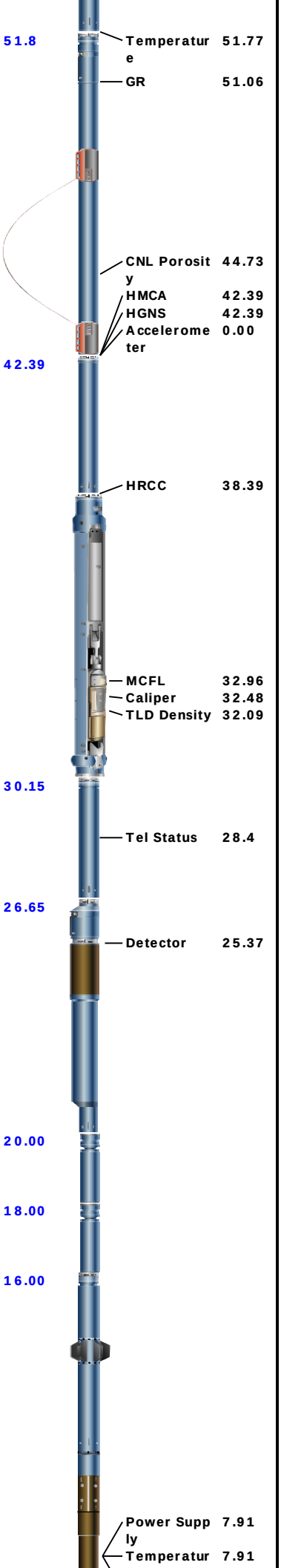
Remarks and Equipment Summary

One: Toolstring

Equip name	Length	MP name	Offset
LEH-QT:2519	**69.41**		
LEH-QT:2519			
DTC-H:8497	**66.49**		
ECH-KC:9614		**CTEM**	**65.59**
DTC-H:8497		**HV**	**0.00**
		ToolStatus	**63.49**
		TelStatus	**63.49**
HNGS-BA:236	**63.49**		
HEH-K:1018			
HNGS-BA:236			
		GR	**60.5**
HNGC-B:46	**55.3**		
HNGH-A:46			
HNGC-B:46		**Tel Status**	**53.55**

One: Remarks

One: Remarks
Thank you for choosing Schlumberger of Elk City, OK 580-225-4300.
Your crew today was: Mike, Andrew, Johnathan and Arona.
Toolstring ran as per tool sketch
All logs and scales are as per client's request
Maximum recorded temperature was 120 degF
All logs are computed on Limestone Matrix (MDEN = 2.71 g/cc and DT = 47.6 us/ft)
Hole-Cement Volume computed using a future casing diameter of 7 inches
Repeat Pass logged from 2500' to 2100' as per client's request
Main Pass logged from TD to CS for PEX. Hi-Res, ECS, and HNGS logged from 2675' to 1675' as per client's request
Thank you for choosing Schlumberger of Elk City, OK -- 580-225-4300
Your crew today was: Marlon, Ryan, and Kojo



HGNS-H:3819 51.8
HGNH:2844
NPV-N:5226
NSR-F:5226
HGNS-H:3819
HACCZ-H:2102
HMCA-H

HDRS-H:4758 42.39
ECH-MEB:776
HRCC-H:4806
HRMS-H:4758
Backscatter:4867
Short Spacing:27
763
GSR-J:5350
Long Spacing
HRGD-H:4867
GPV-Q:5350

LDSC-A:475 30.15
LDSH-A:441
LDSC-A:475

ECS-A:99 26.65
ECSH-A:99
NSR-F:5075
ECSD-A:99
ECS-A:99

AH-184[2] 20.00

AH-184[1] 18.00

AIT-M:229 16.00
AMIS:229
AMRM:229

Temperatur e 51.77
GR 51.06
CNL Porosit y 44.73
HMCA 42.39
HGNS 42.39
Accelerome ter 0.00
HRCC 38.39
MCFL 32.96
Caliper 32.48
TLD Density 32.09
Tel Status 28.4
Detector 25.37
Power Supp ly 7.91
Temperatur 7.91

Lengths are in ft
Maximum Outer Diameter = 5.000 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

Depth Control Parameters	One		
Conveyance Type	Wireline		
Log Sequence	First Trip to Wellsite		
Rig Up Length at Surface (ft)	145.80		
Rig Up Length at Bottom (ft)	145.50		
Rig Up Length Correction (ft)	0.30		
Stretch Correction (ft)	1.00		
Tool Zero Reference Check at Surface (ft)	0.30		
Rig Type	Land		
Depth Remark Parameters	**One**		
Depth Remark 1	All Schlumberger depth control policies and procedures were followed		
Depth Remark 2	IDW used as primary depth control		
Depth Remark 3	Z-Chart used as secondary depth control		
Depth Remark 4	First Trip to Wellsite, Main Pass correlated to Down Log		
Depth Measuring Device	**One**		
Type	IDW-B		
Serial Number	5904		
Calibration Date	13-Nov-2012		
Calibrator Serial Number	NA		
Calibration Cable Type	7-46A XS		
Wheel Correction 1	-8		
Wheel Correction 2	-6		
Tension Device	**One**		
Type	CMTD-B/A		
Serial Number	2576		
Calibration Date	08-Feb-2013		
Calibrator Serial Number	1018		
Calibration Points	10		
Calibration RMS	7		
Calibration Peak Error	1446		
Logging Cable	**One**		
Type	7-46A-XS		

Serial Number	U711103		
Logging Cable Length (ft)	17800.00		

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	612.38	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	1350.25	ft3

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20120723-3.1.9755.1112
	EXP_APL-MAST-3.1.9755.1419
	EXP_APL-NEXTA-3.1.9755.1340

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.0

Tool Elements	Description	Software Version	Firmware Version
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0
AMIS	Array Induction Sonde - M	3.1.9755.1112	1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	468.98 ft	3288.06 ft	28-Feb-2013 7:51:04 AM	28-Feb-2013 9:32:53 AM	0.30 ft	

All depths are referenced to toolstring zero

Log

One: Log[5]:Up

Description: AIT Basic Log Four Format: Log (AIT MP 2 IN) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Feb-2013 10:57:06

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

Spontaneous Potential (SP) AIT-M

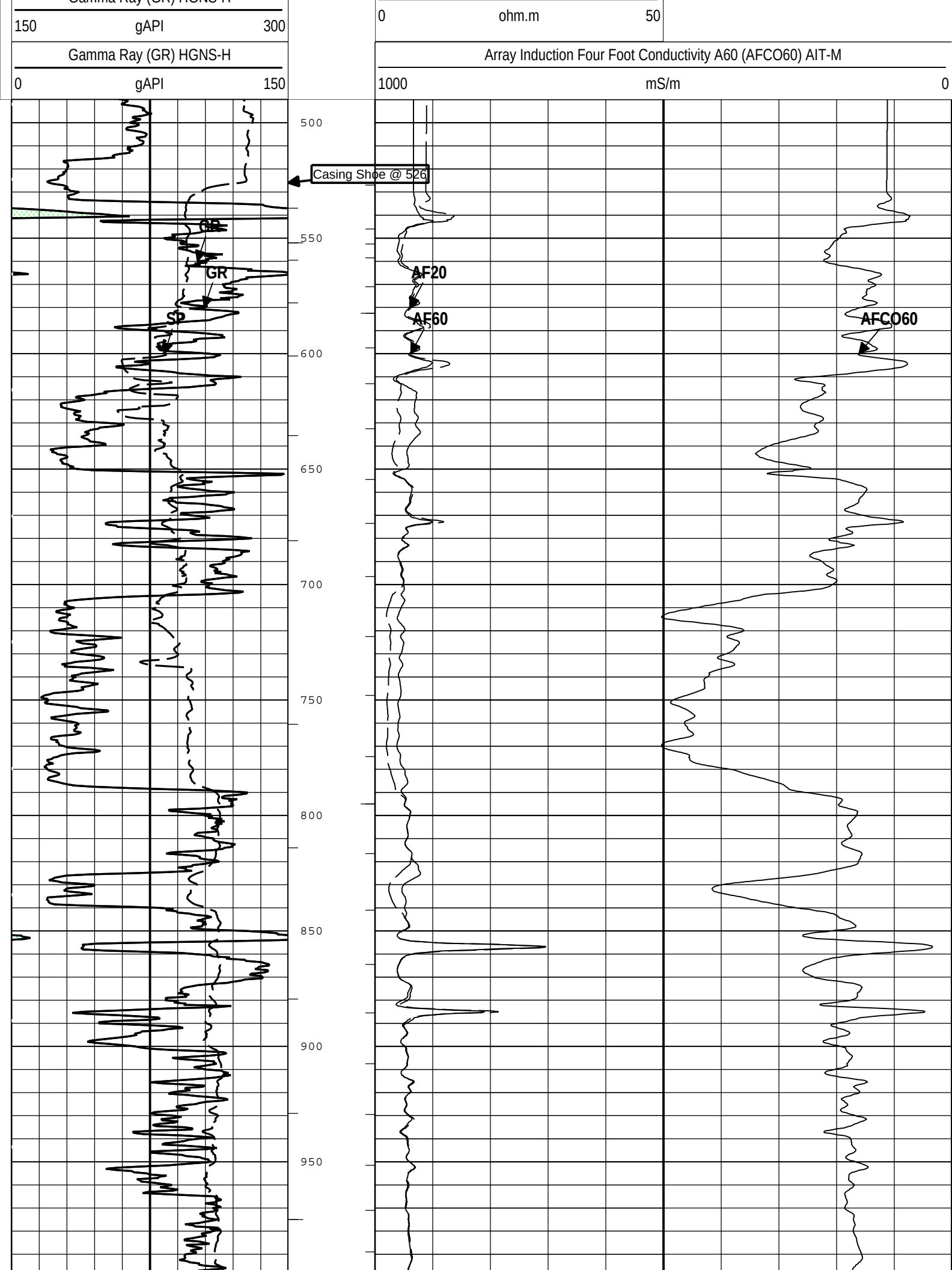
-260 mV 140

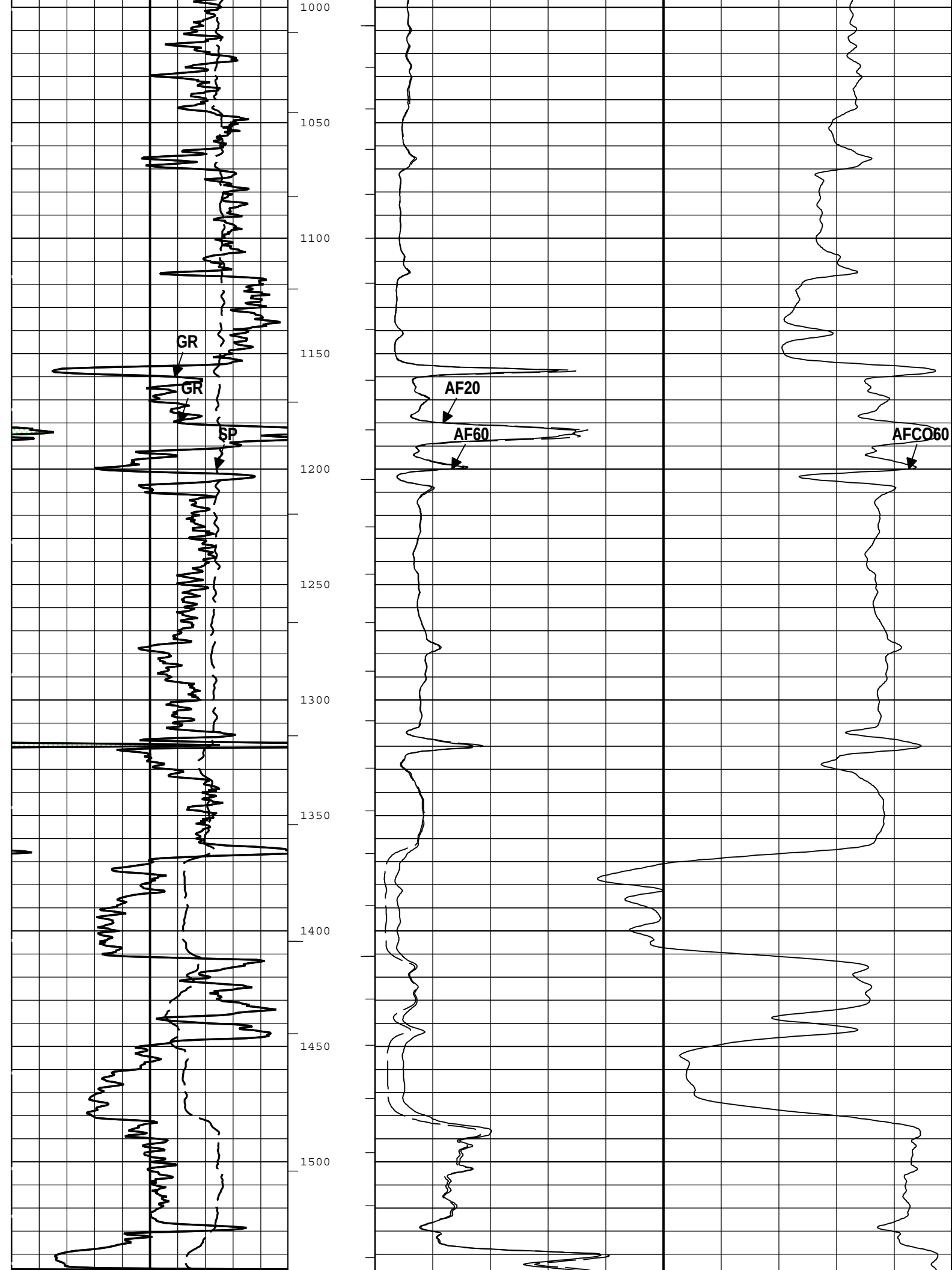
Gamma Ray (GR) HGNS-H

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

0 ohm.m 50

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


Gamma Ray (GR) HGNS-H
150
gAPI
300
0
ohm.m
50
Gamma Ray (GR) HGNS-H
0
gAPI
150
Array Induction Four Foot Conductivity A60 (AFCO60) AIT-M
1000
mS/m
0
500
550
600
650
700
750
800
850
900
950
Casing Shoe @ 526
CAL
GR
SP
AF20
AF60
AFCO60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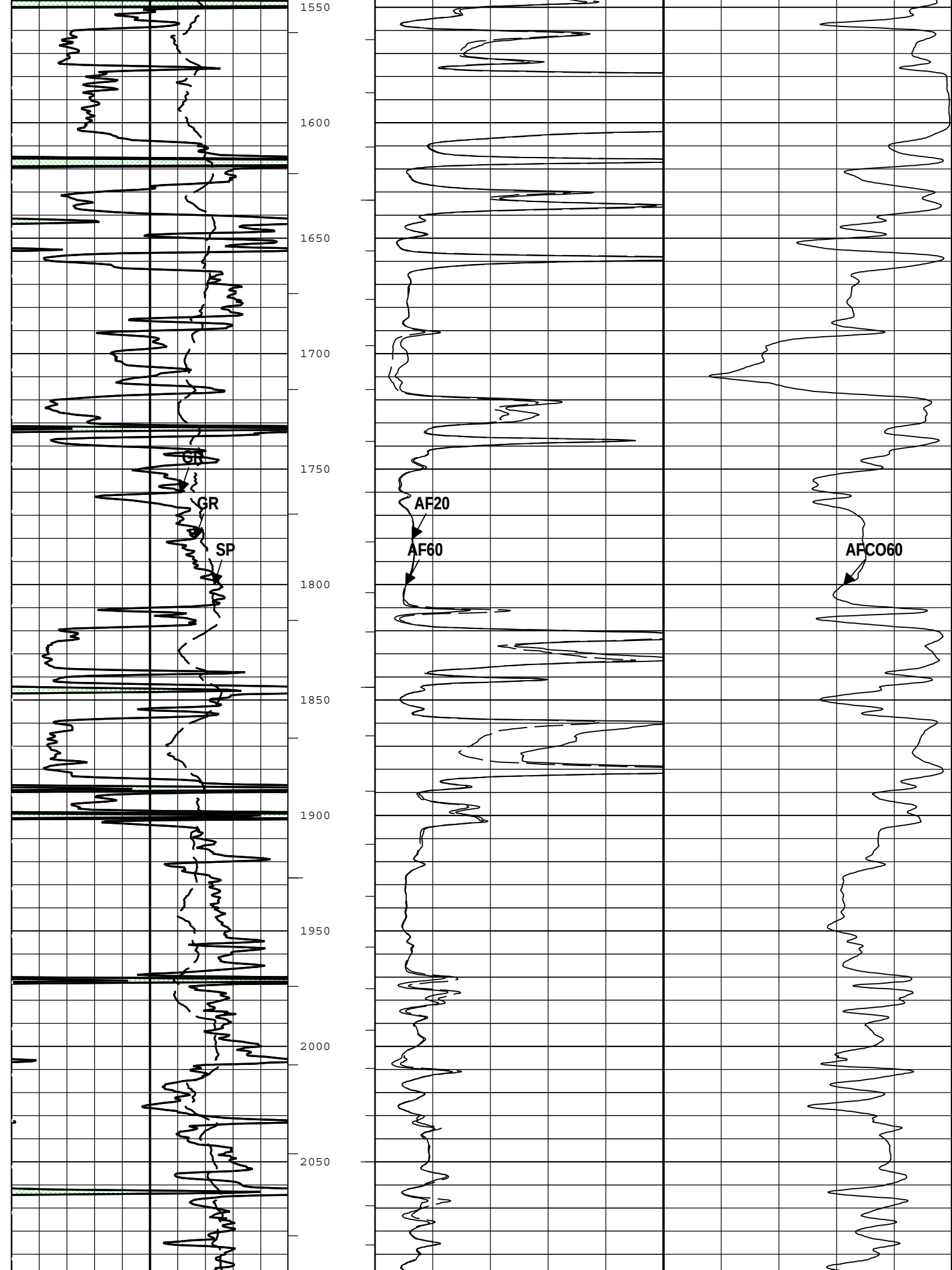
1050
1100
GR
1150
GR
SP
AF20
AF60
AFCO60
1200
1250
1300
1350
1400
1450
1500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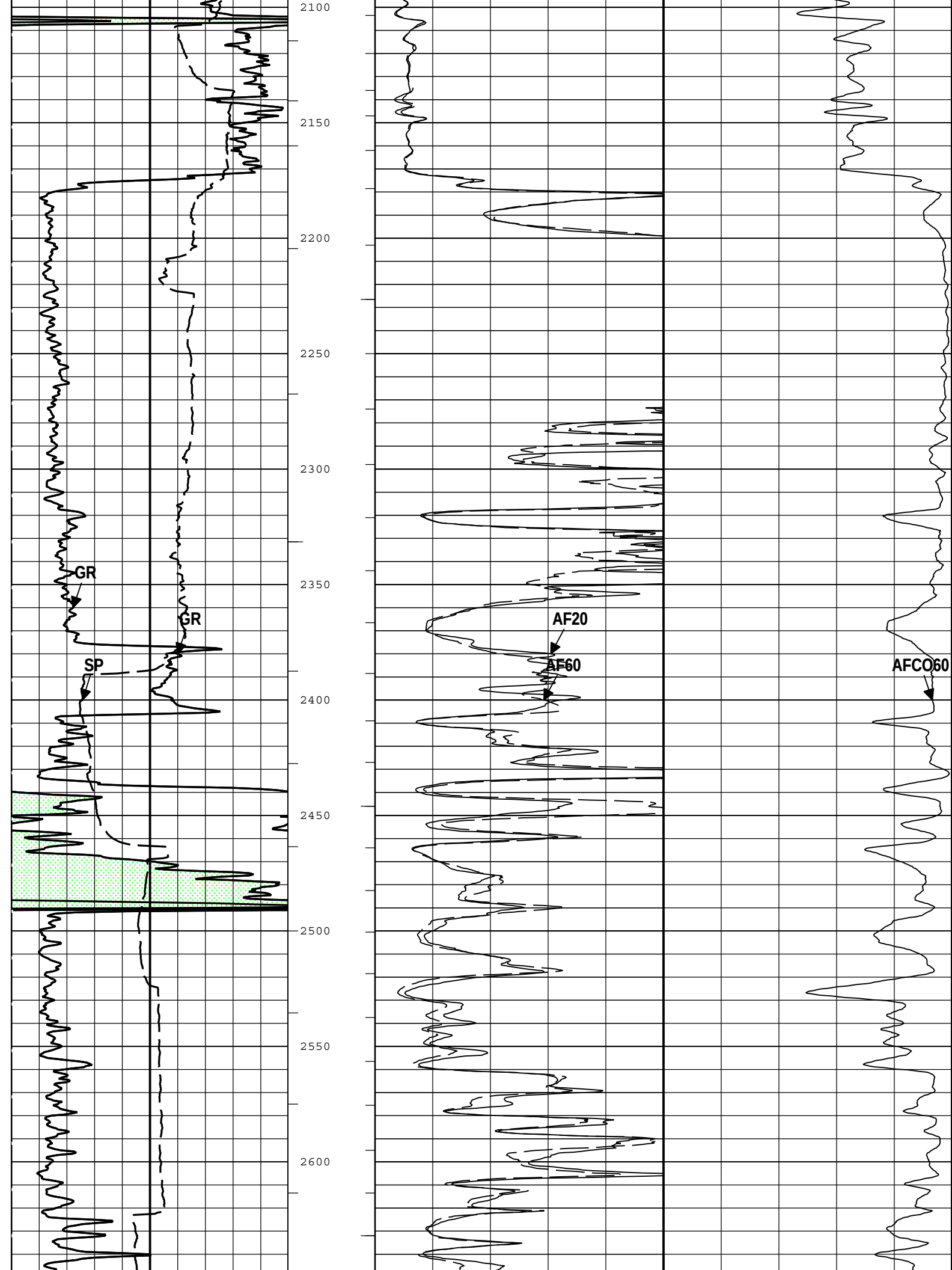
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AF20
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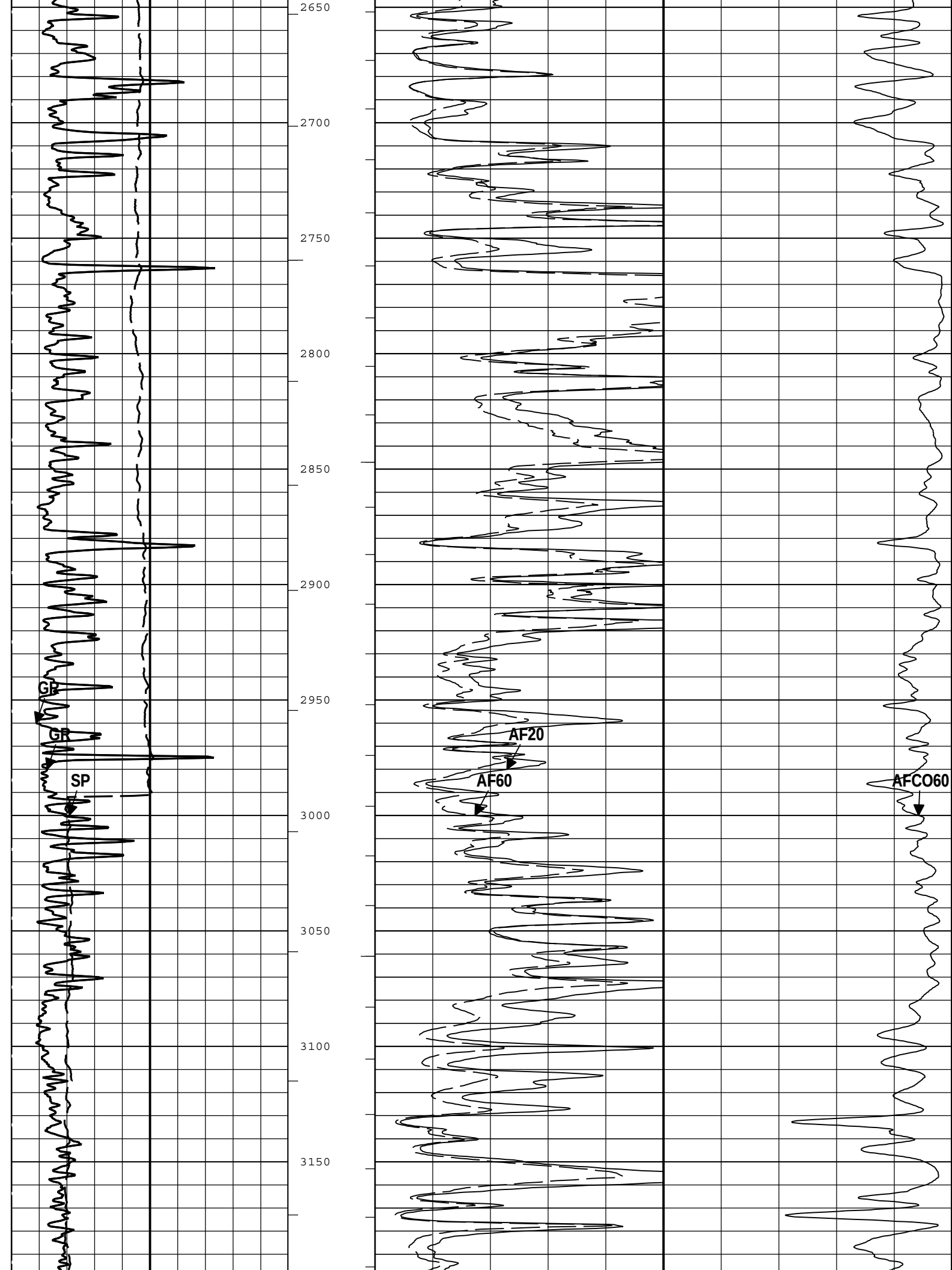
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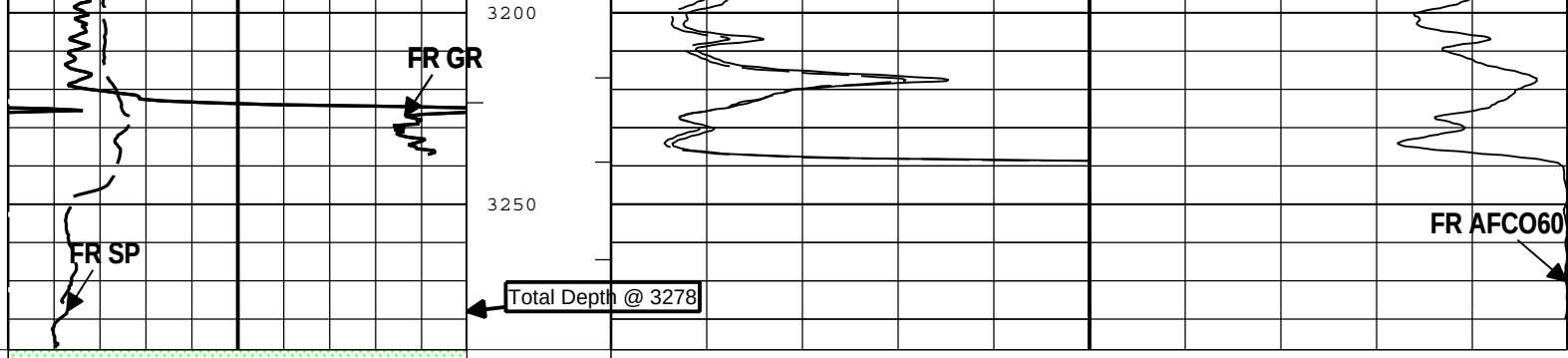
GR
SP
AF20
AF60
AFCO60



Gamma Ray Backup

Spontaneous Potential (SP) AIT-M

-260 mV 140

Gamma Ray (GR) HGNS-H

150 gAPI 300

Gamma Ray (GR) HGNS-H

0 gAPI 150

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)

IHV - Integrated Hole Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

Description: AIT Basic Log Four Format: Log (AIT MP 2 IN) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Feb-2013 10:57:06

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	Yes	
ASTA	Array Induction Tool Standoff	AIT-M	1.625	in
BARI	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	0.05	in
CBLO	Casing Bottom (Logger)	WLSESSION	526	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	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	
SOCO	Standoff Correction Option	HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M	-80	mV
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	0	490	526
BS	8.75	526	3288

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	612.38	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	1350.25	ft3

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20120723-3.1.9755.1112
	EXP_APL-MAST-3.1.9755.1419
	EXP_APL-NEXTA-3.1.9755.1340

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.0

Tool Elements	Description	Software Version	Firmware Version
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0
AMIS	Array Induction Sonde - M	3.1.9755.1112	1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	468.98 ft	3288.06 ft	28-Feb-2013 7:51:04 AM	28-Feb-2013 9:32:53 AM	0.30 ft	

All depths are referenced to toolstring zero

Log

One: Log[5]:Up

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-Feb-2013 10:57:08

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
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)

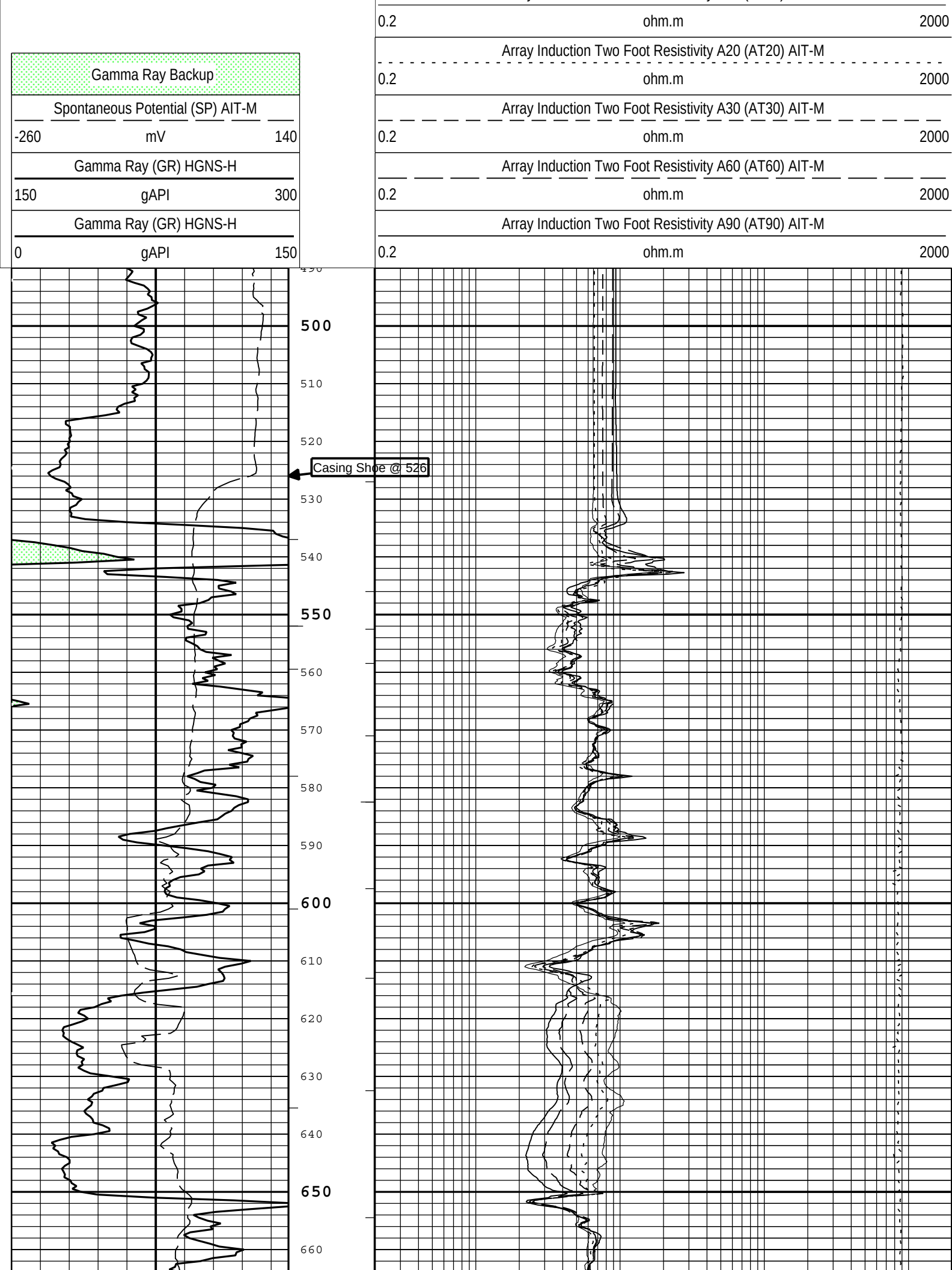
ICV - Integrated Cement Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

Cable Tension (TENS)

8000 lbf 0

Array Induction Two Foot Resistivity A10 (AT10) AIT-M


Gamma Ray Backup
Spontaneous Potential (SP) AIT-M
-260
mV
140
Gamma Ray (GR) HGNS-H
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gAPI
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150
0.2
ohm.m
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Array Induction Two Foot Resistivity A90 (AT90) AIT-M
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Casing Shoe @ 526
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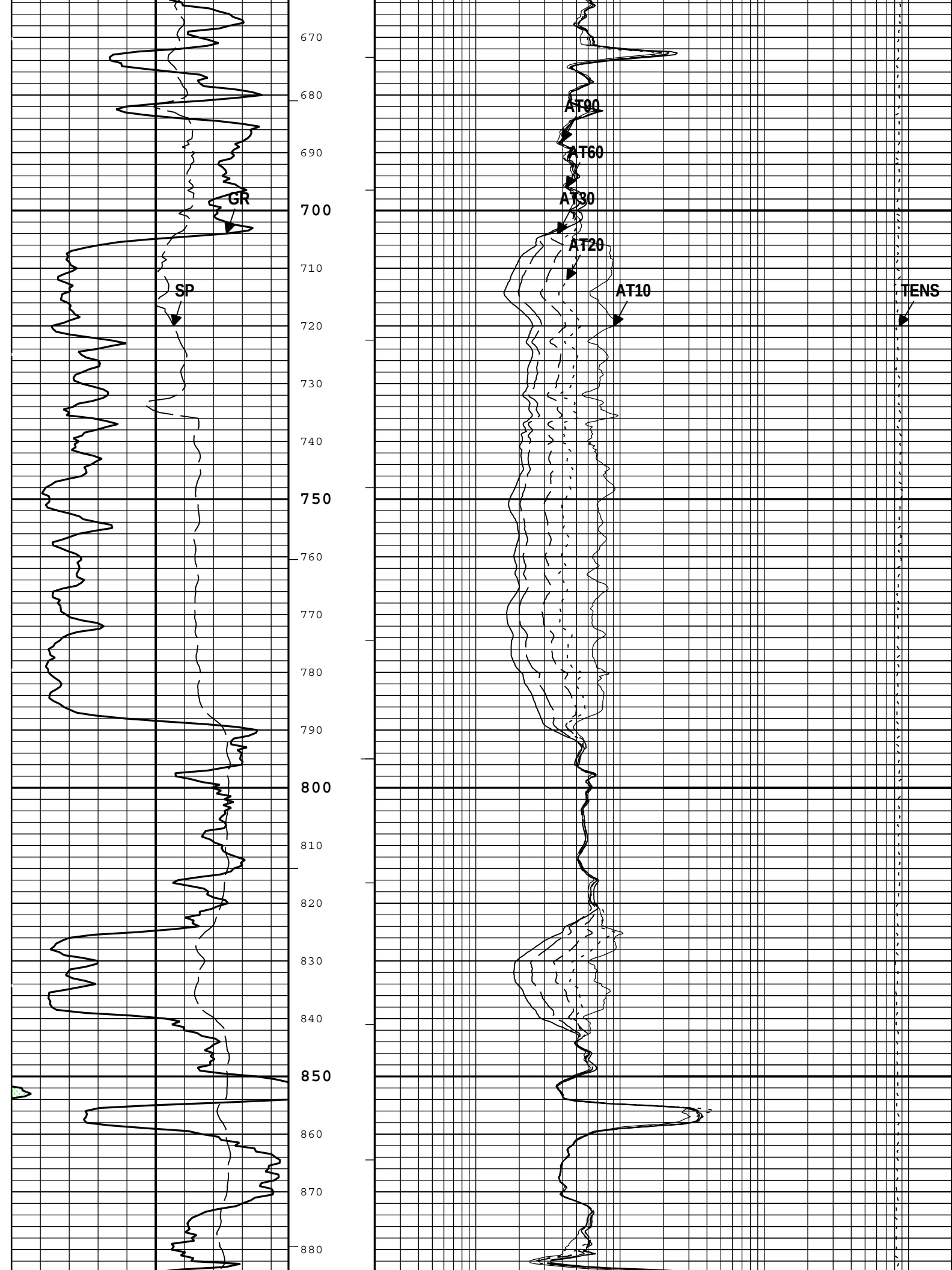
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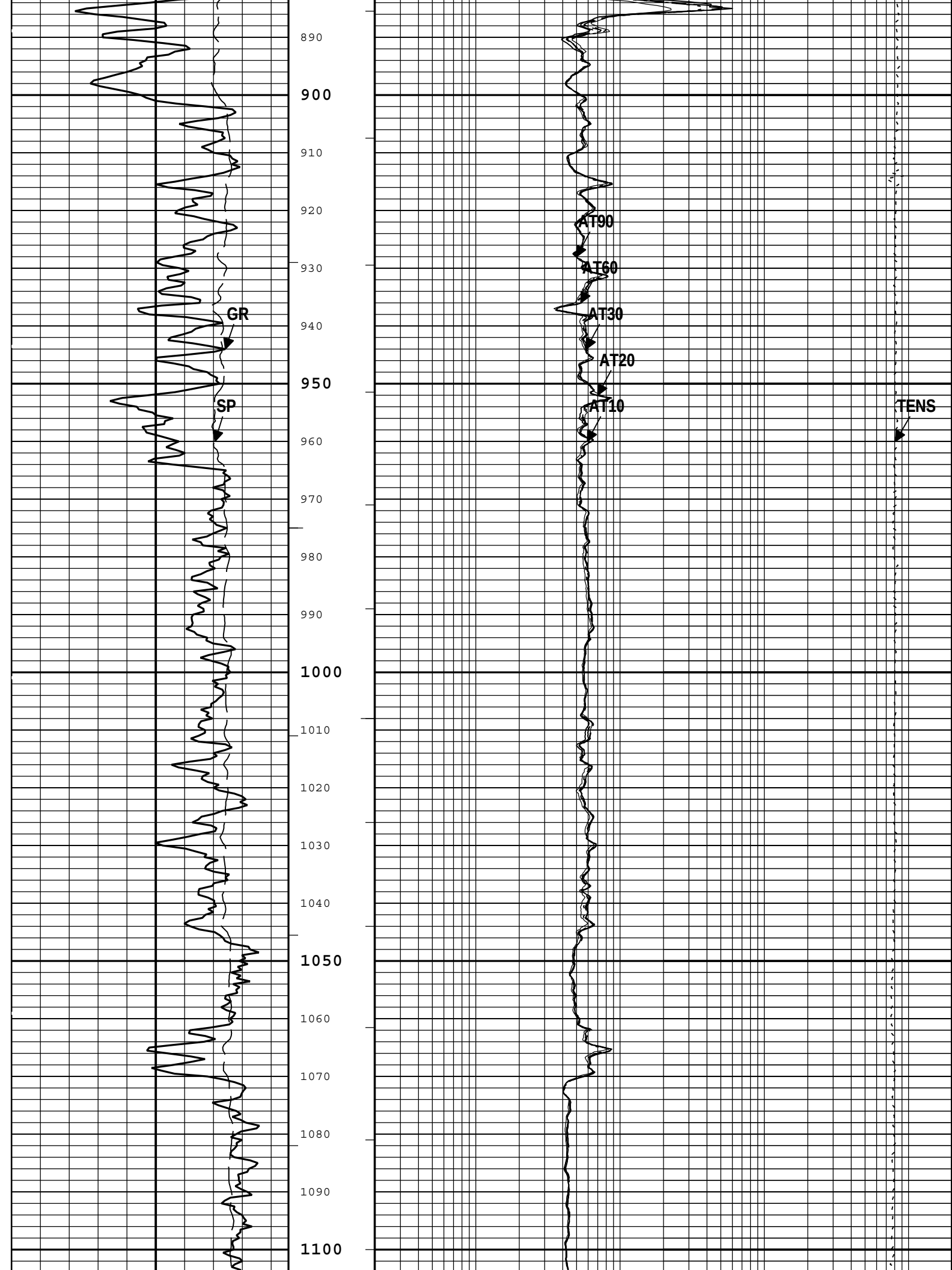
AT10
TENS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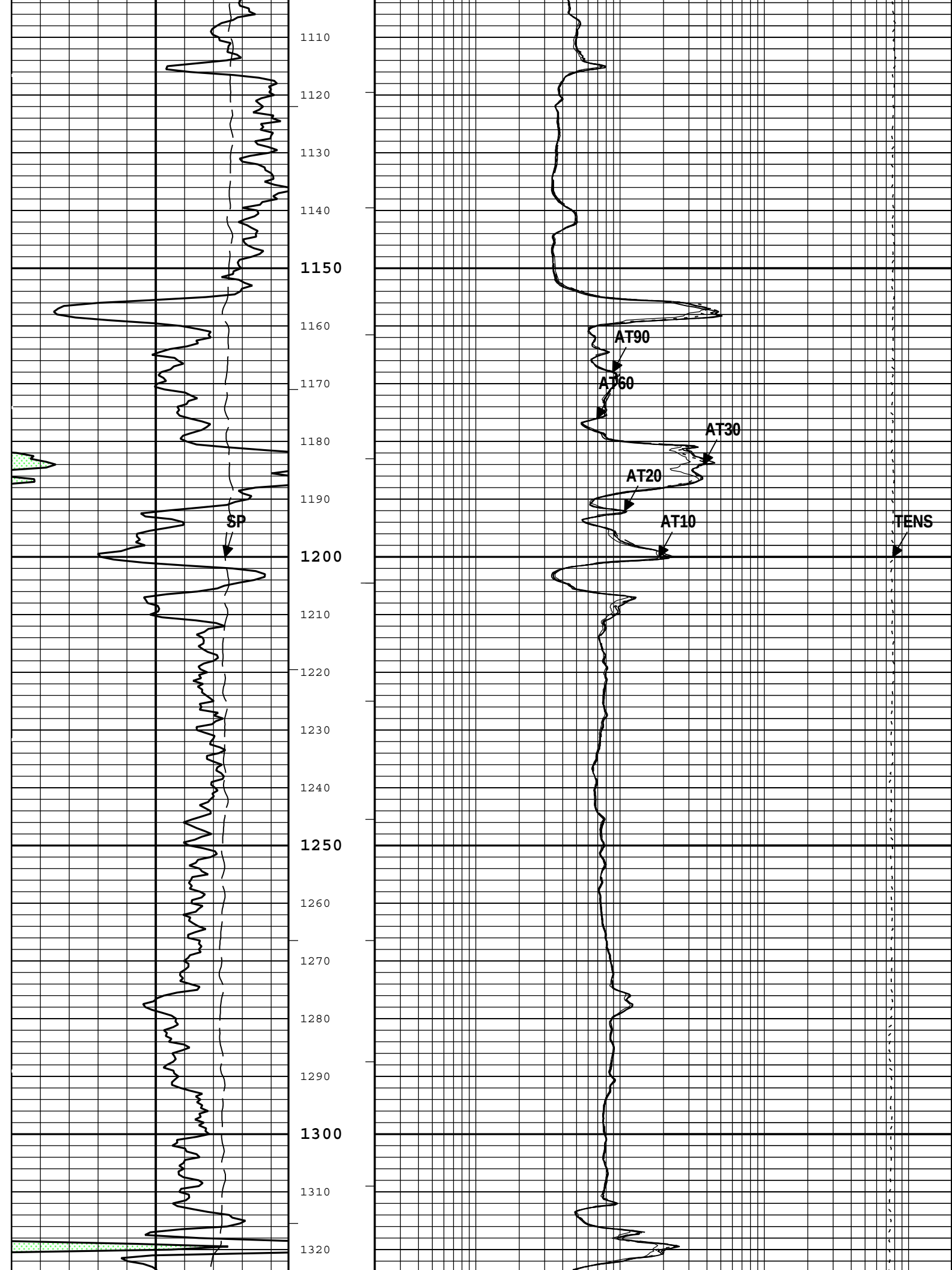
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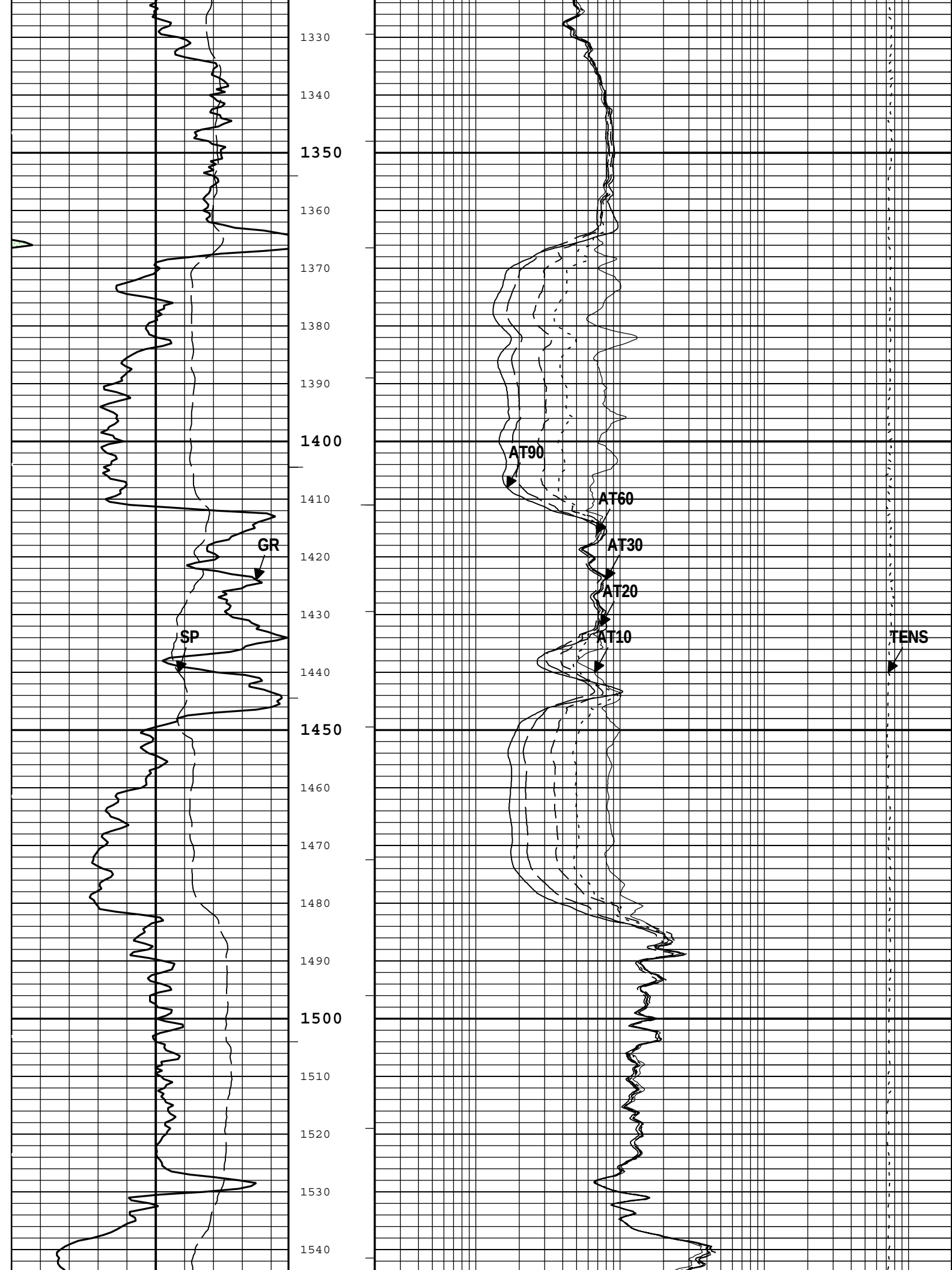
AT10
TENS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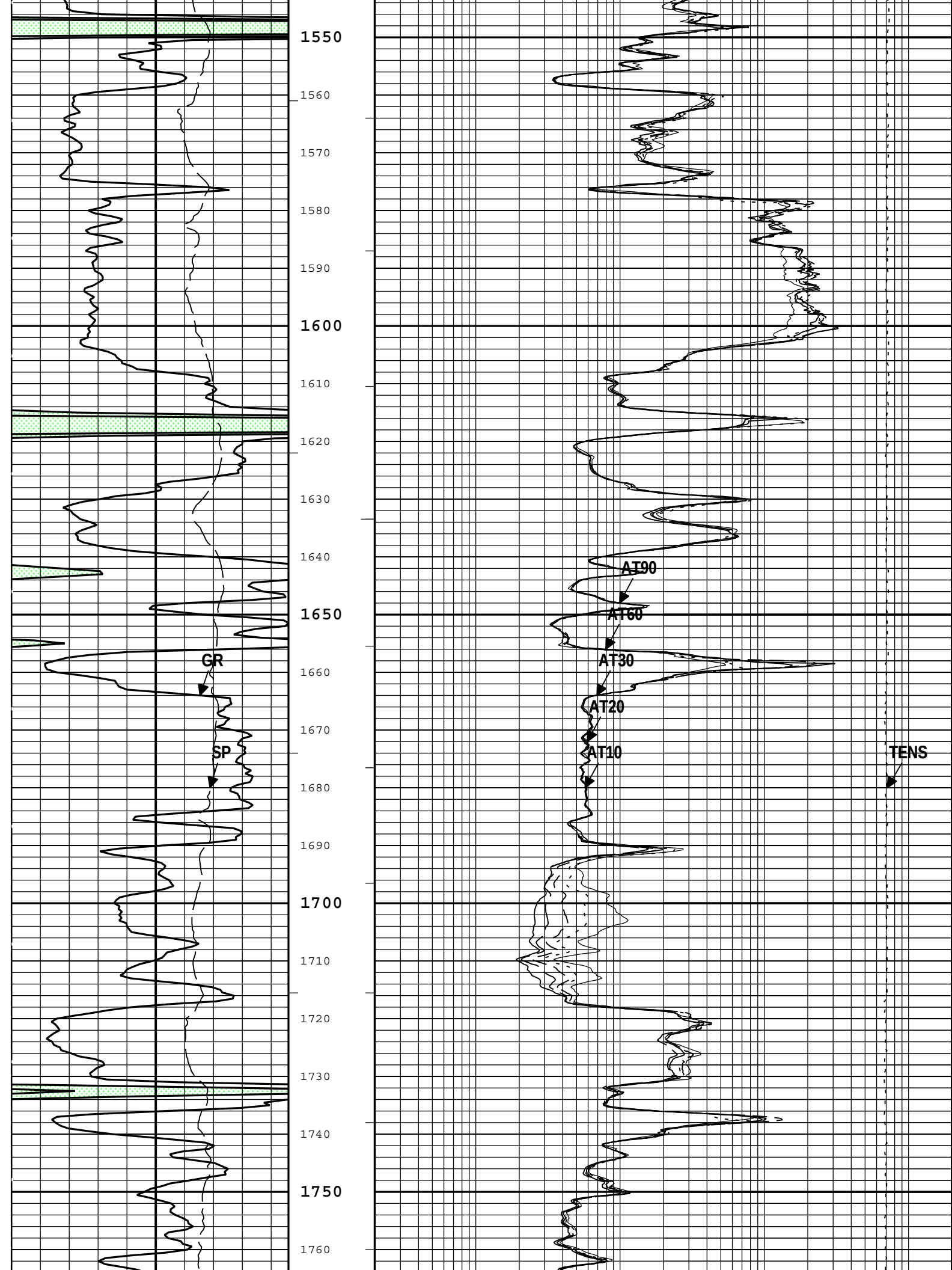
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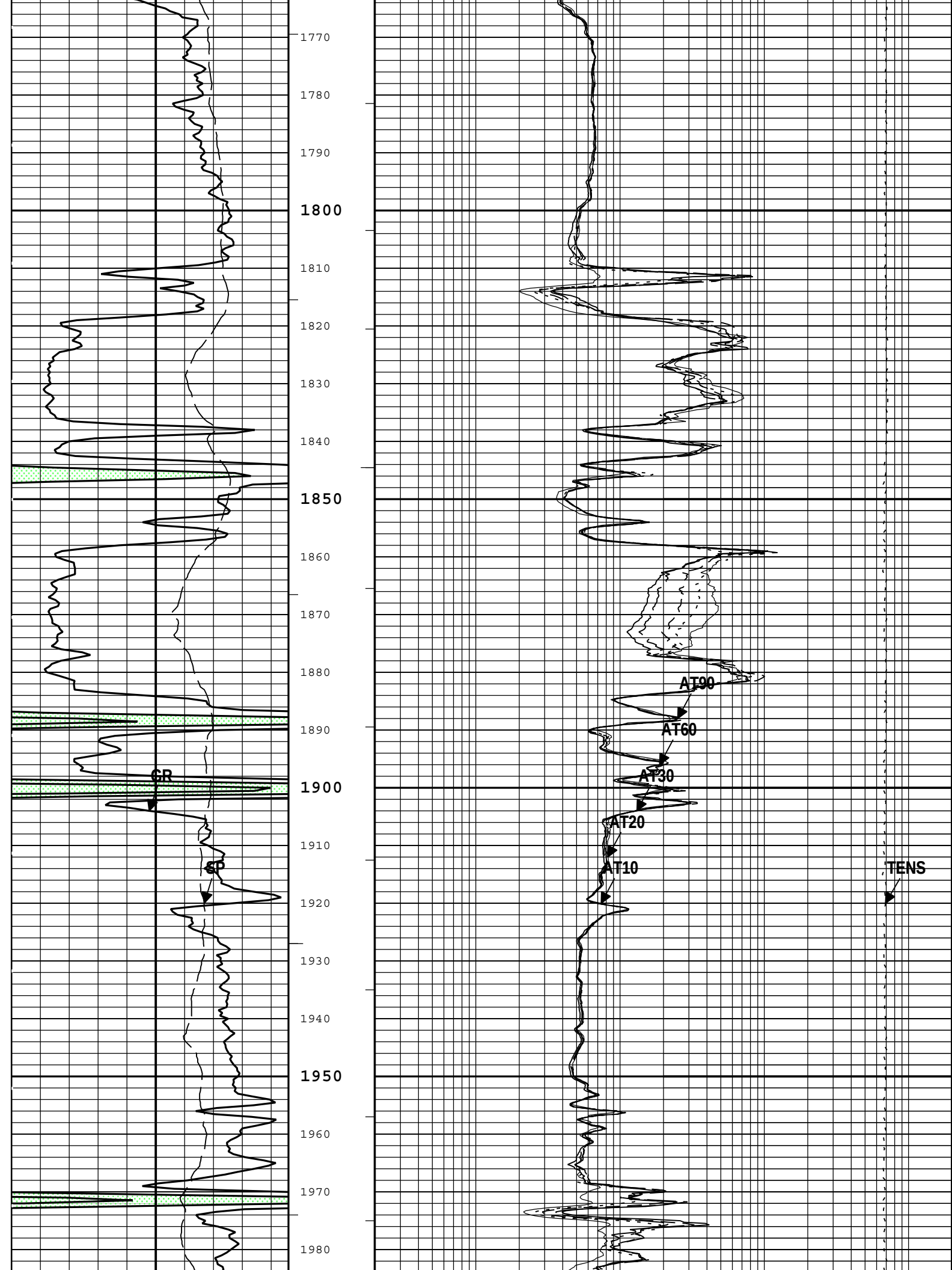
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SP
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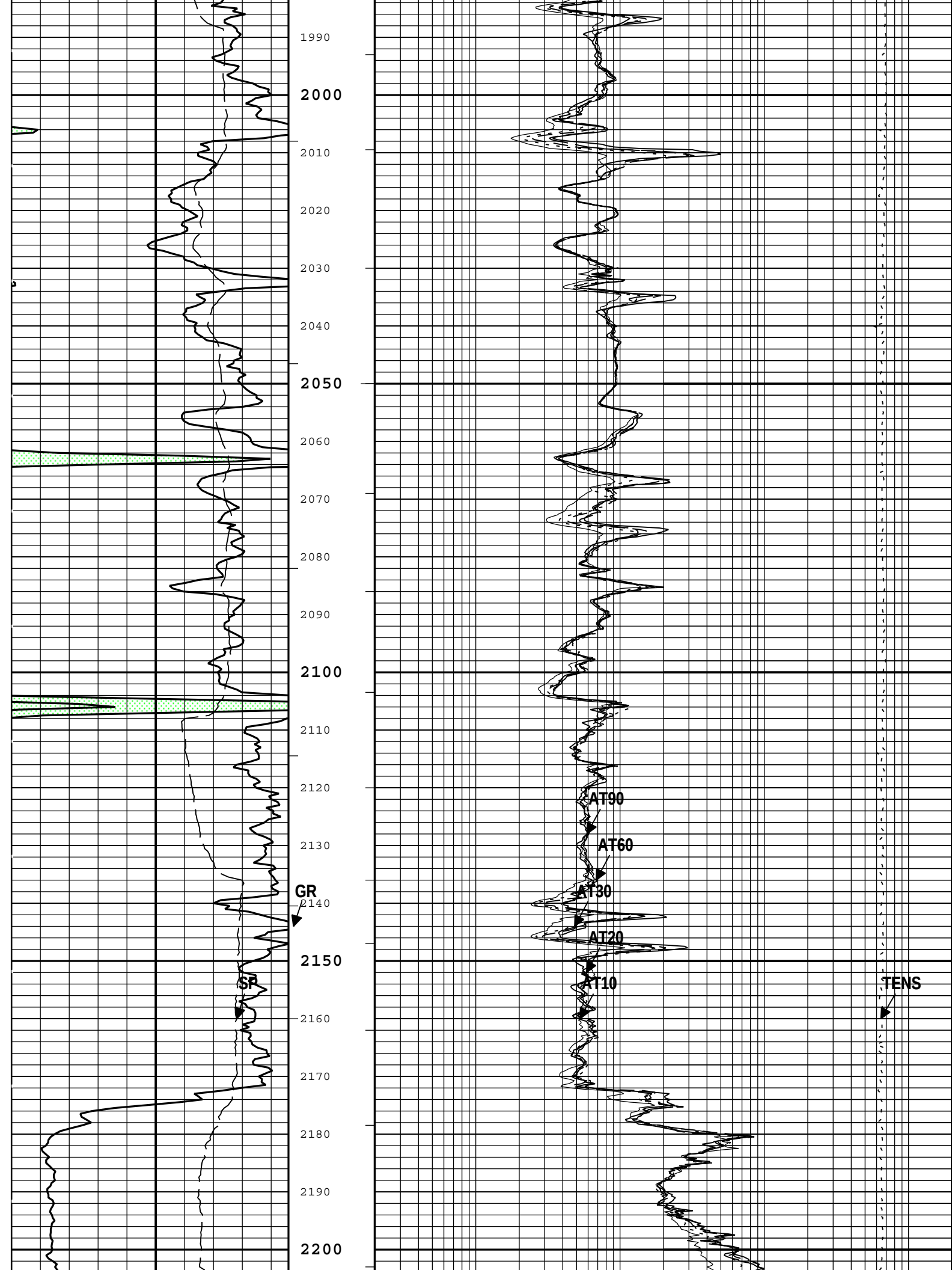
AT60
AT30
AT20
AT10
TENS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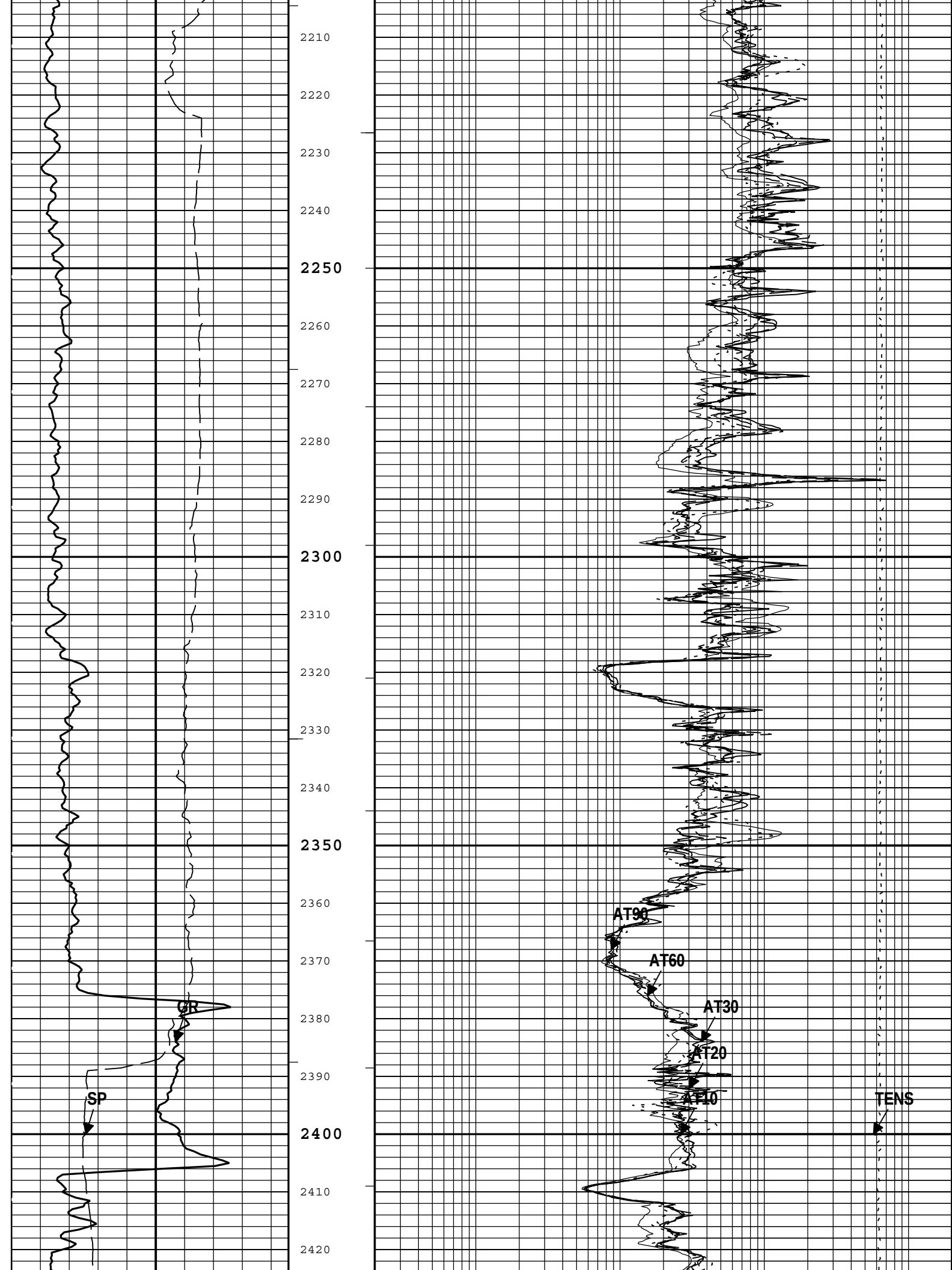
TENS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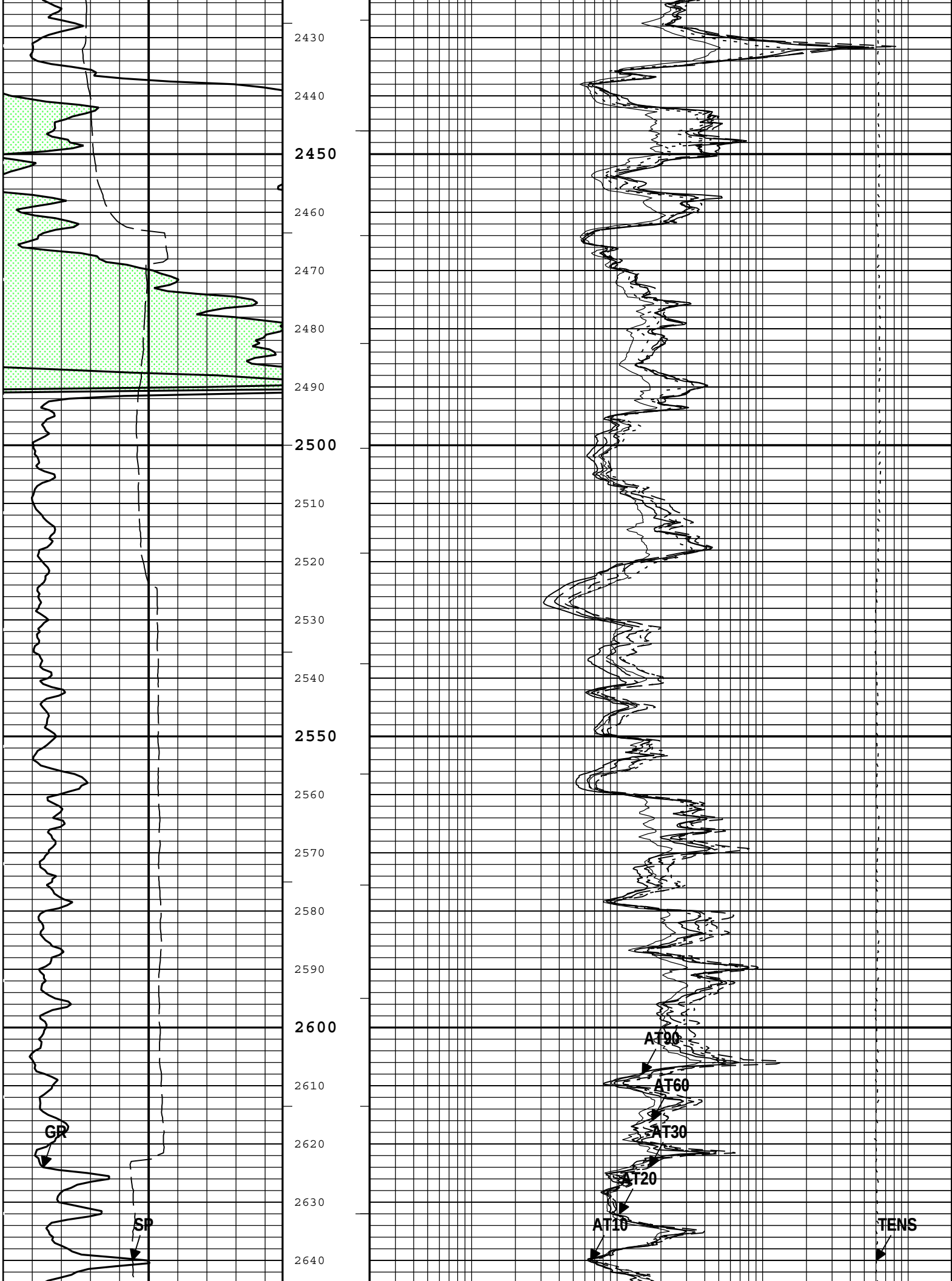
AT20
AT10
TENS
GR
SP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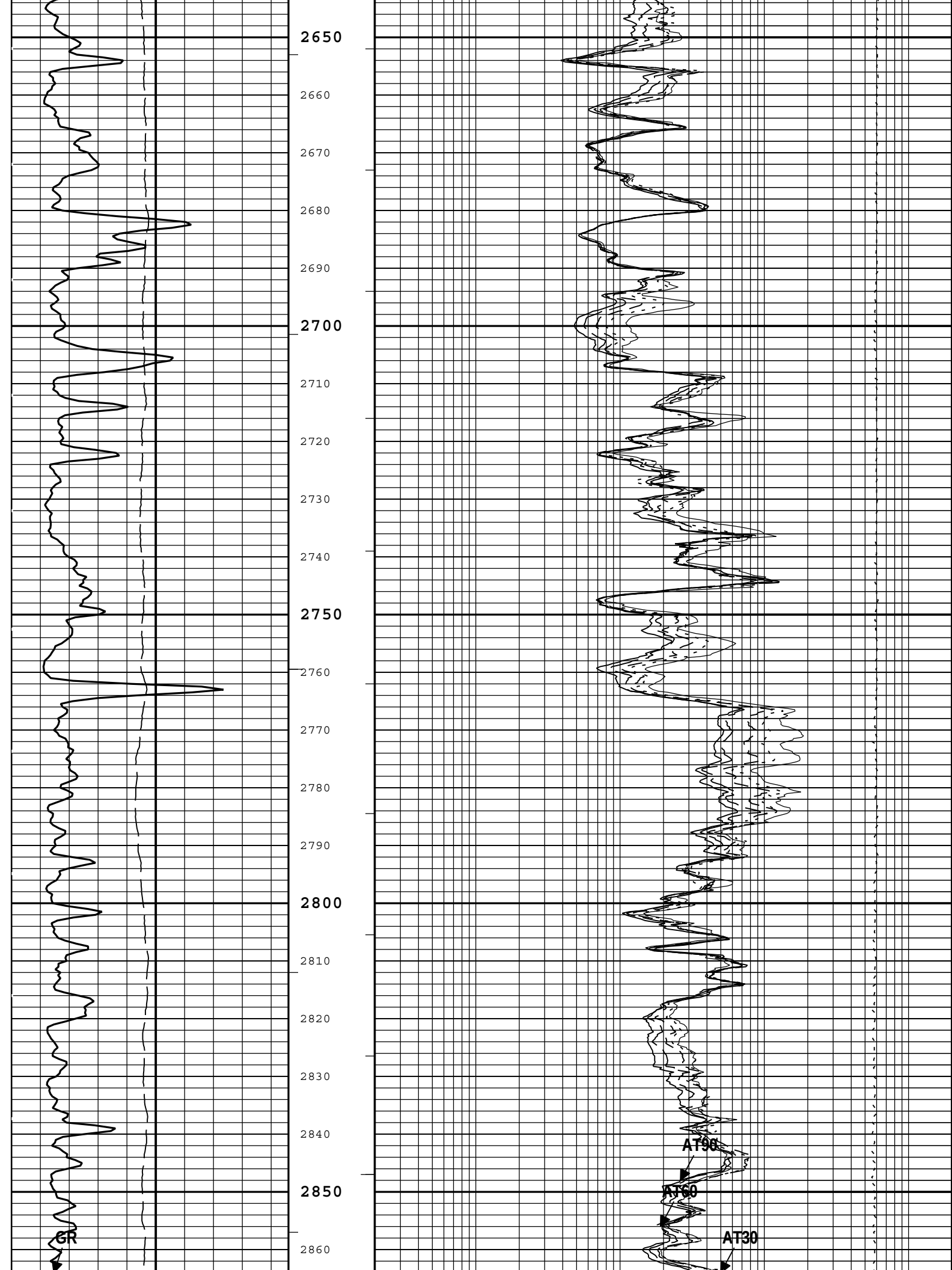
AT20
AT10
TENS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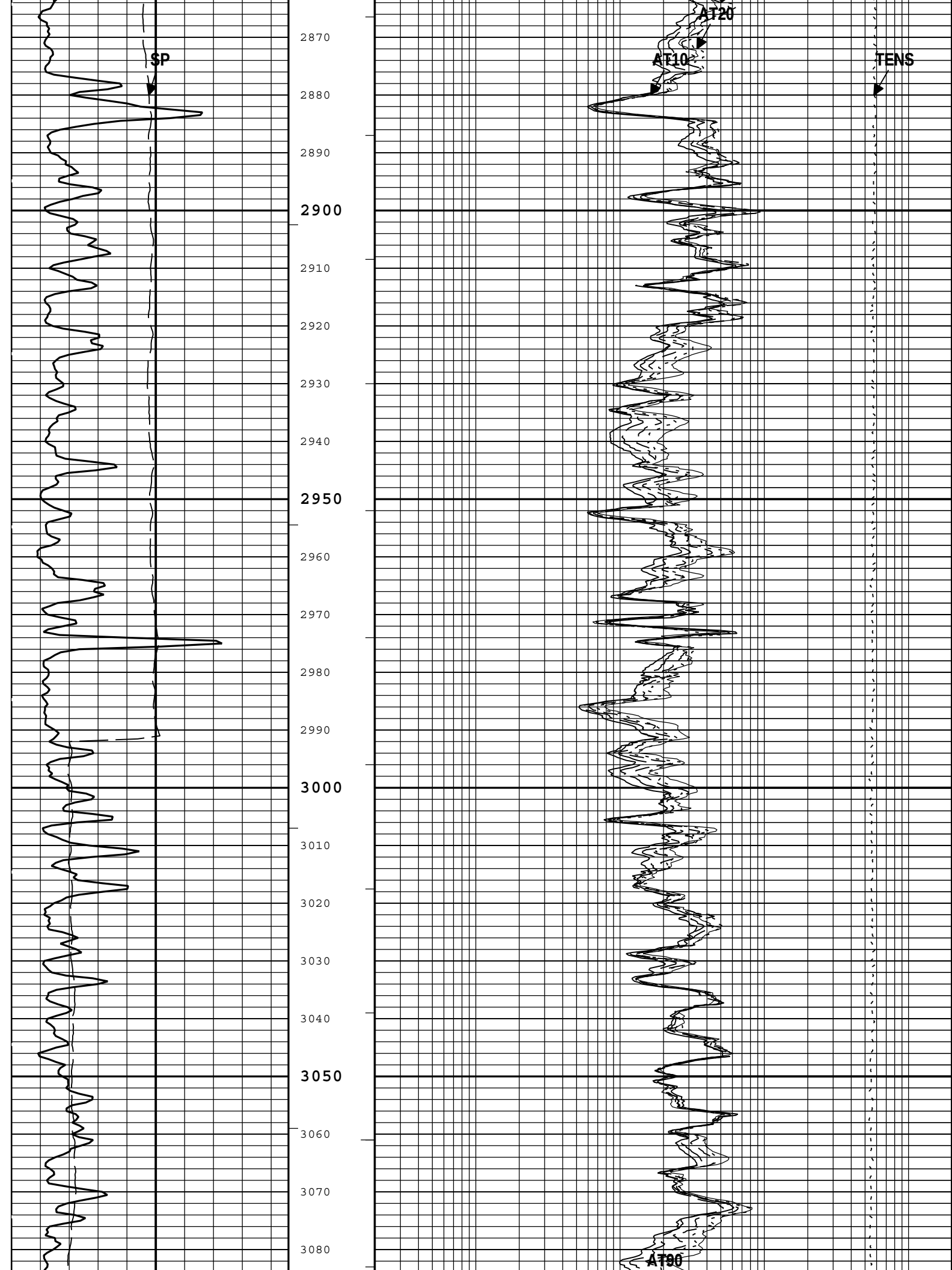
AT90
AT60
AT30
GR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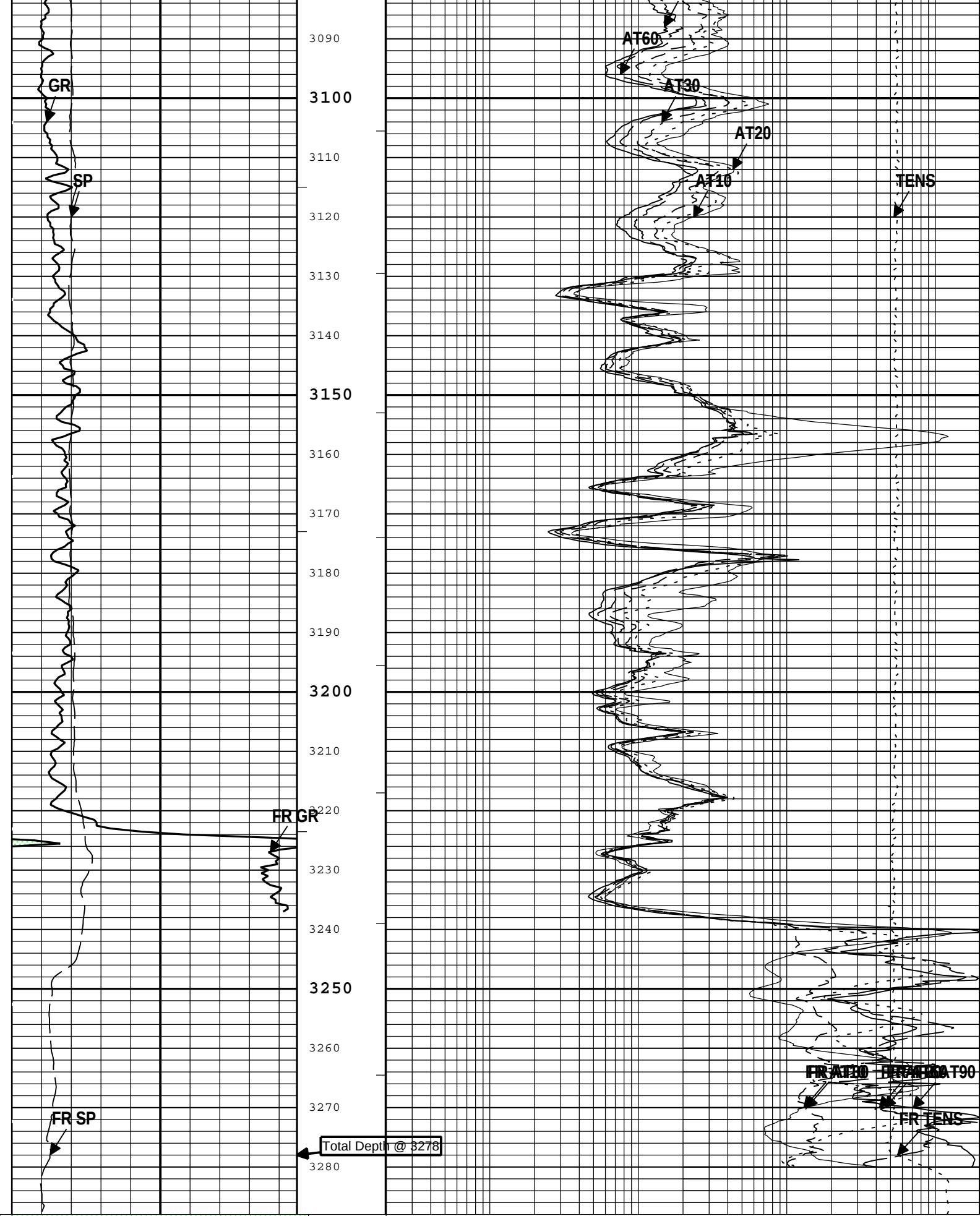


Gamma Ray Backup

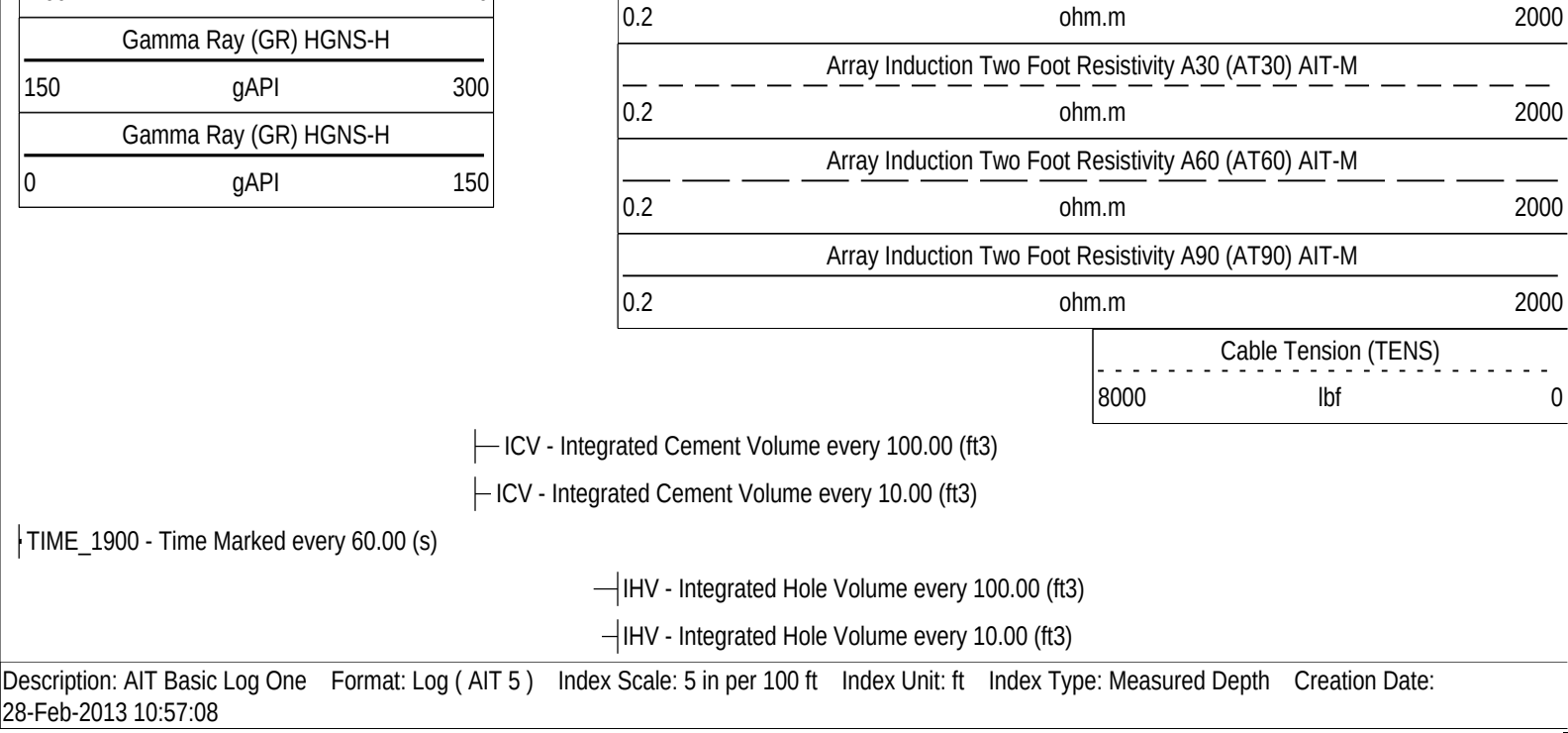
Spontaneous Potential (SP) AIT-M

-260 mV 140

Array Induction Two Foot Resistivity A10 (AT10) AIT-M

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A20 (AT20) AIT-M



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-Feb-2013 10:57:08

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	Yes	
ASTA	Array Induction Tool Standoff	AIT-M	1.625	in
BARI	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	0.05	in
CBLO	Casing Bottom (Logger)	WLSESSION	526	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	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	Yes	
SP_SHIFT	SP Shift	AIT-M	-80	mV
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	0	490	526
BS	8.75	526	3288

All depth are actual.

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	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	88.42	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	189.98	ft3

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20120723-3.1.9755.1112
	EXP_APL-MAST-3.1.9755.1419
	EXP_APL-NEXTA-3.1.9755.1340

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.0

Tool Elements	Description	Software Version	Firmware Version
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0
AMIS	Array Induction Sonde - M	3.1.9755.1112	1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[3]:Up	Up	2016.75 ft	2598.28 ft	28-Feb-2013 6:59:28 AM	28-Feb-2013 7:29:22 AM	0.00 ft	

All depths are referenced to toolstring zero

Log

One: Log[3]:Up

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-Feb-2013 10:57:10

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
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)

ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

Cable Tension (TENS)

8000 lbf 0

Array Induction Two Foot Resistivity A10 (AT10) AIT-M

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A20 (AT20) AIT-M

Gamma Ray Backup

Gamma Ray Backup

Spontaneous Potential (SP) AIT-M

-260 mV 140

Gamma Ray (GR) HGNS-H

150 gAPI 300

Gamma Ray (GR) HGNS-H

0 gAPI 150

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT-M

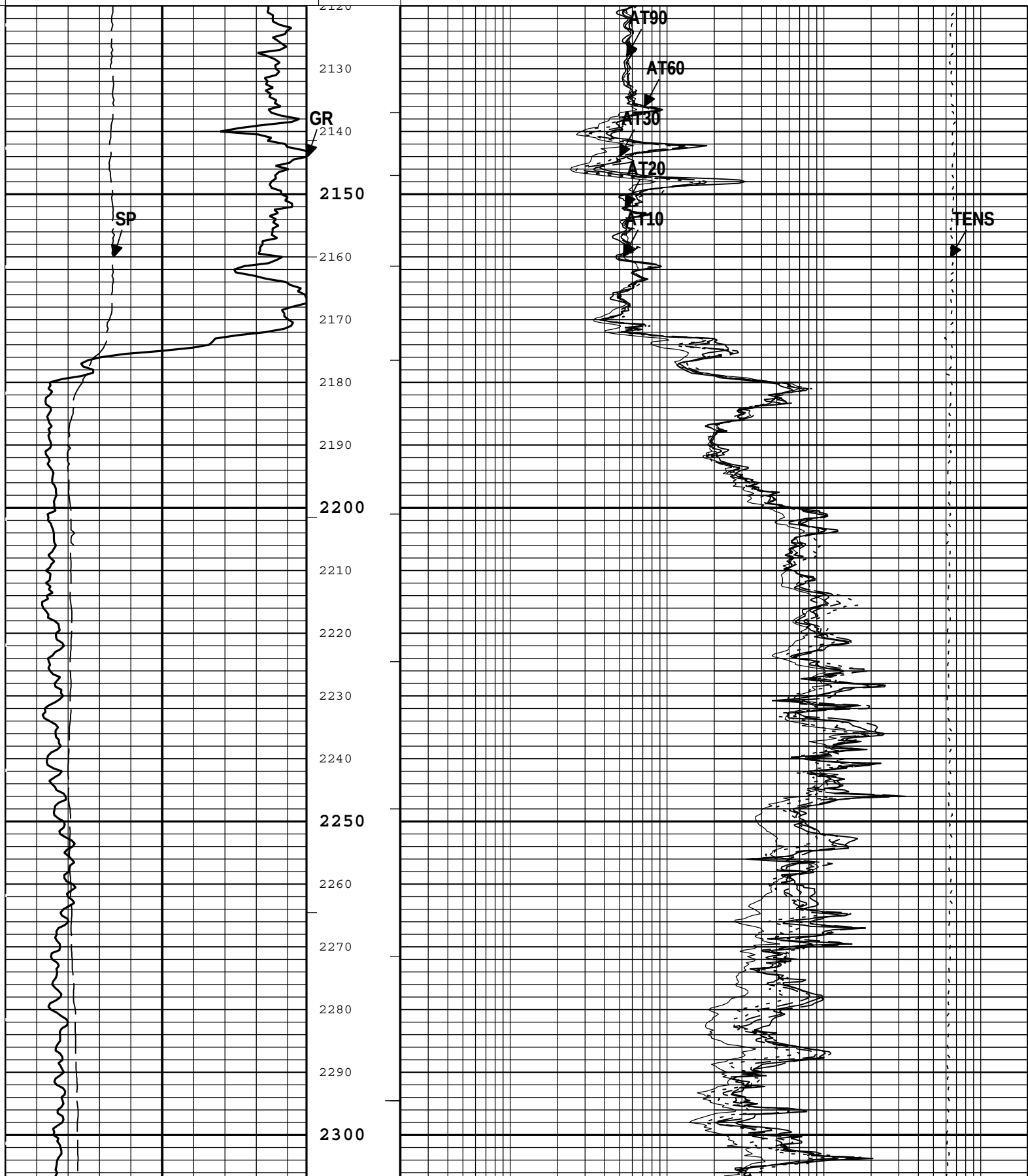
0.2 ohm.m 2000

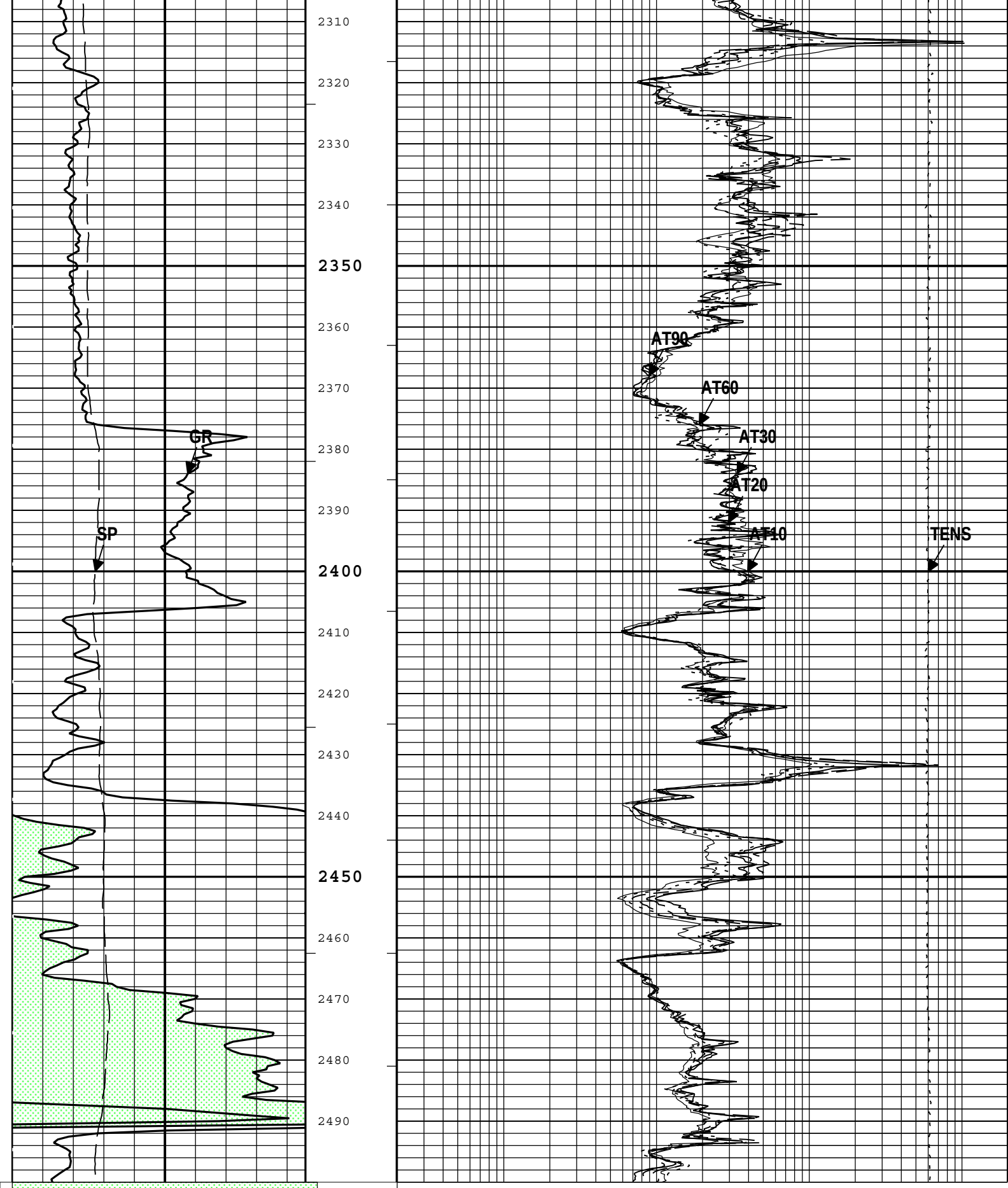
Array Induction Two Foot Resistivity A60 (AT60) AIT-M

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A90 (AT90) AIT-M

0.2 ohm.m 2000





Gamma Ray Backup

Spontaneous Potential (SP) AIT-M

-260 mV 140

Gamma Ray (GR) HGNS-H

150 gAPI 300

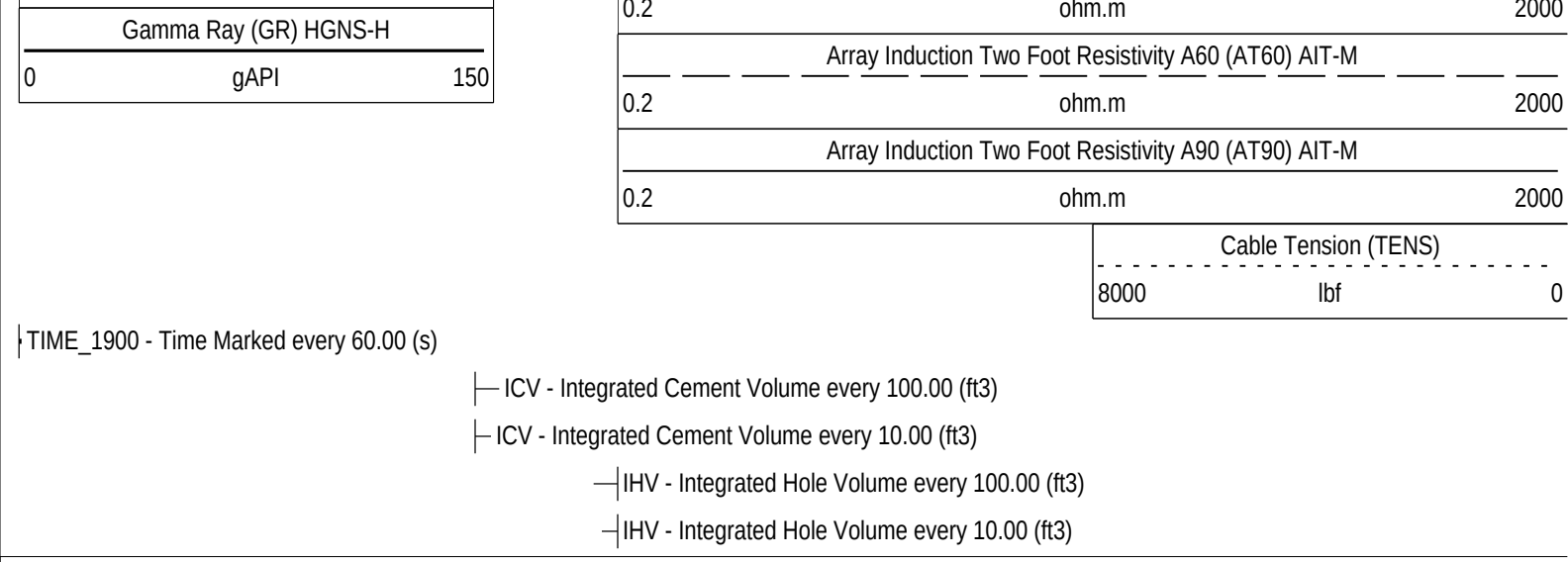
Array Induction Two Foot Resistivity A10 (AT10) AIT-M

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



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-Feb-2013 10:57:10

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	Yes	
ASTA	Array Induction Tool Standoff	AIT-M	1.625	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	8.75	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.05	in
CBLO	Casing Bottom (Logger)	WLSESSION	526	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	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	Yes	
SP_SHIFT	SP Shift	AIT-M	-80	mV
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft

Tool Control Parameters

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

One

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	238.63	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	511.23	ft3

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0

Application Patch	SP-20120723-3.1.9755.1112
	EXP_APL-MAST-3.1.9755.1419
	EXP_APL-NEXTA-3.1.9755.1340

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.0

Tool Elements	Description	Software Version	Firmware Version
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0
AMIS	Array Induction Sonde - M	3.1.9755.1112	1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	468.98 ft	3288.06 ft	28-Feb-2013 7:51:04 AM	28-Feb-2013 9:32:53 AM	0.30 ft	

All depths are referenced to toolstring zero

Log

One: Log[5]:Up

Description: AIT Basic Log One Format: Log (AIT Basic Log One) Index Scale: 10 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Feb-2013 10:57:12

Channel	Source	Sampling
AO10	AIT-M:AMIS:AMIS	3in
AO20	AIT-M:AMIS:AMIS	3in
AO30	AIT-M:AMIS:AMIS	3in
AO60	AIT-M:AMIS:AMIS	3in
AO90	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
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)

Cable Tension (TENS)

8000 lbf 0

Backup Gamma Ray

Spontaneous Potential (SP) AIT-M

-260 mV 140

Gamma Ray (GR) HGNS-H

0 gAPI 150

Gamma Ray (GR) HGNS-H

150 gAPI 300

Array Induction One Foot Resistivity A10 (AO10) AIT-M

0.2 ohm.m 2000

Array Induction One Foot Resistivity A20 (AO20) AIT-M

0.2 ohm.m 2000

Array Induction One Foot Resistivity A30 (AO30) AIT-M

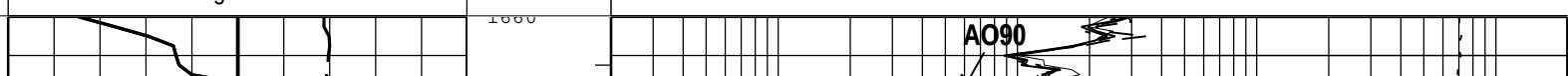
0.2 ohm.m 2000

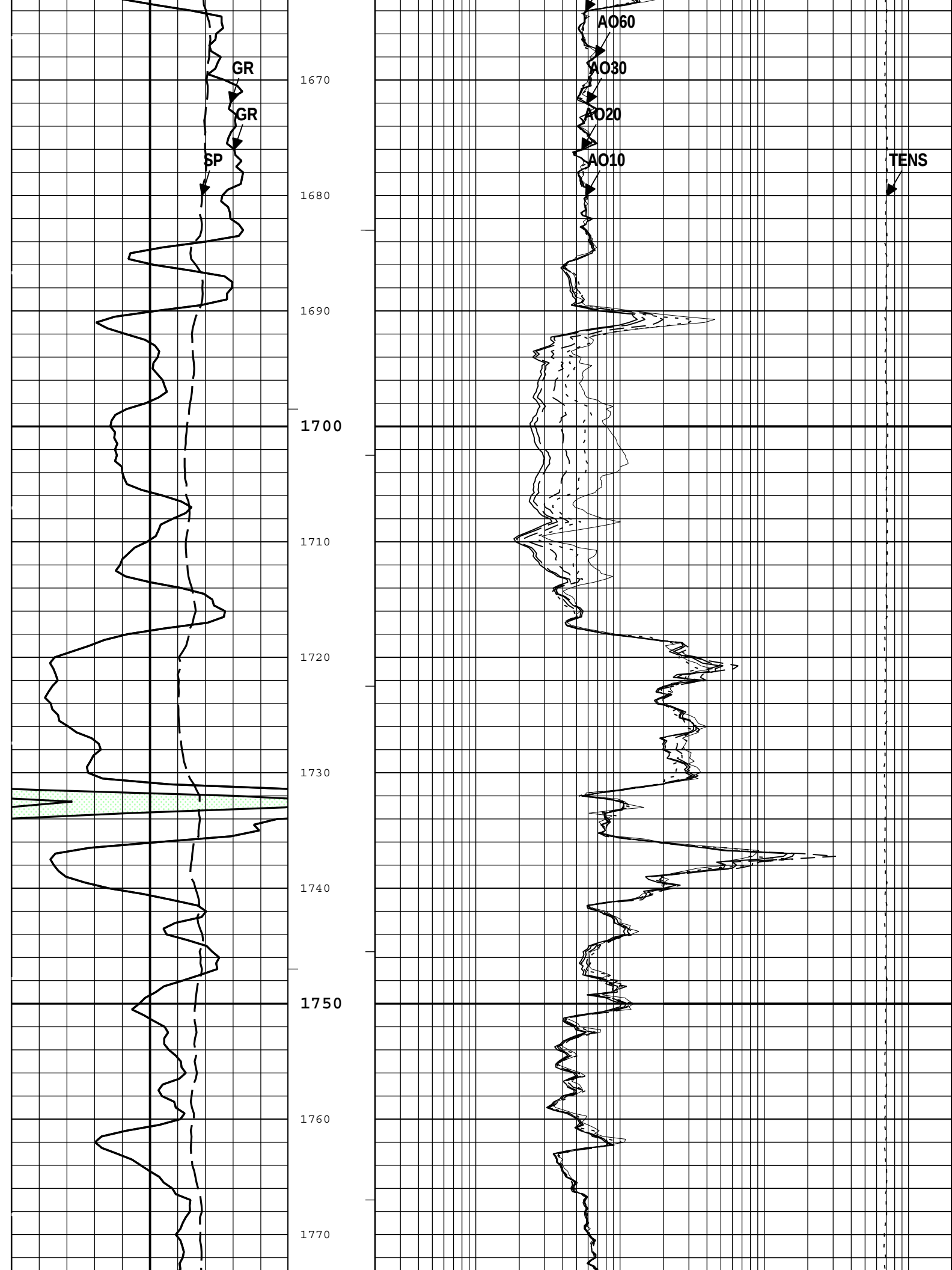
Array Induction One Foot Resistivity A60 (AO60) AIT-M

0.2 ohm.m 2000

Array Induction One Foot Resistivity A90 (AO90) AIT-M

0.2 ohm.m 2000

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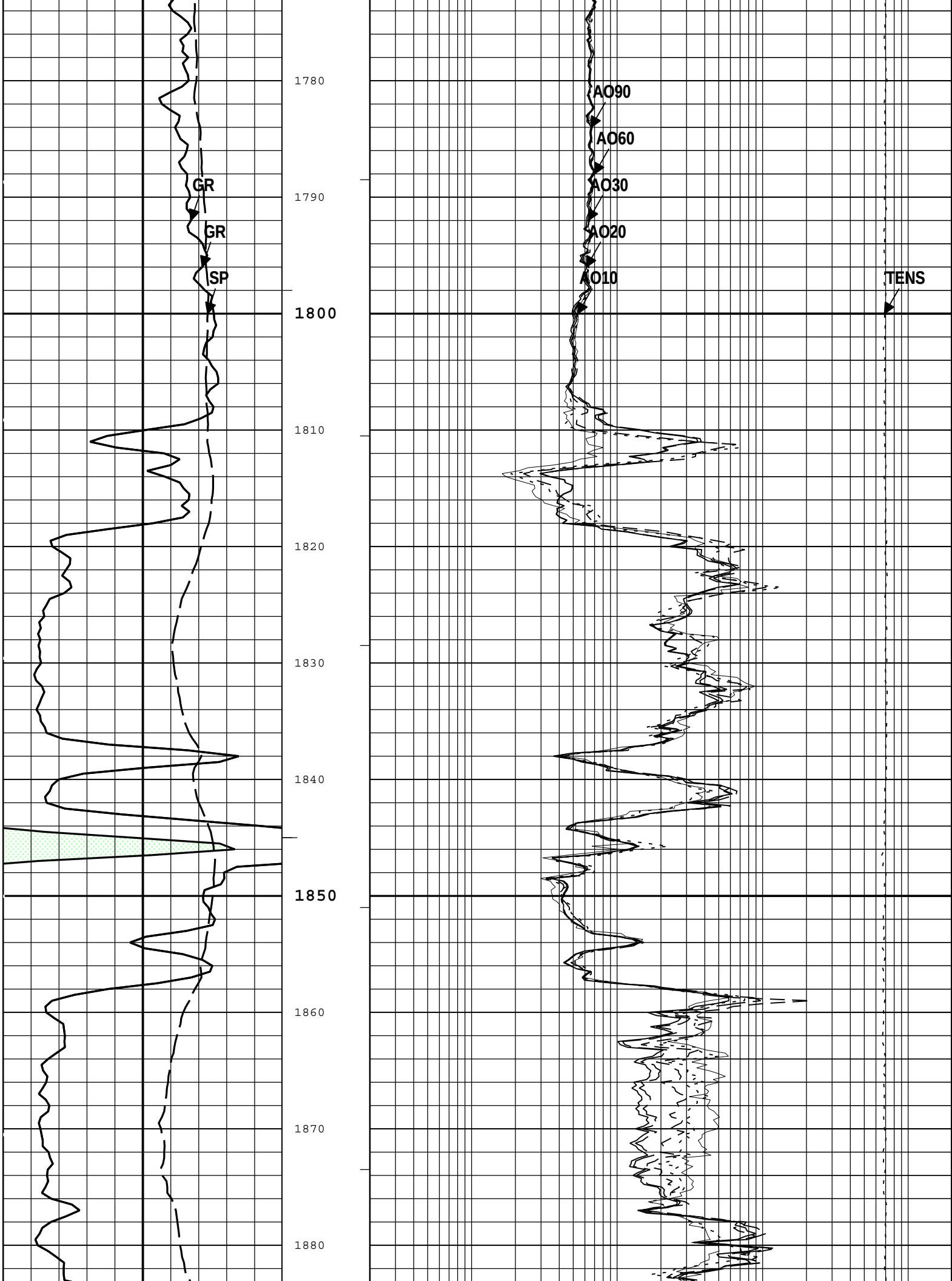
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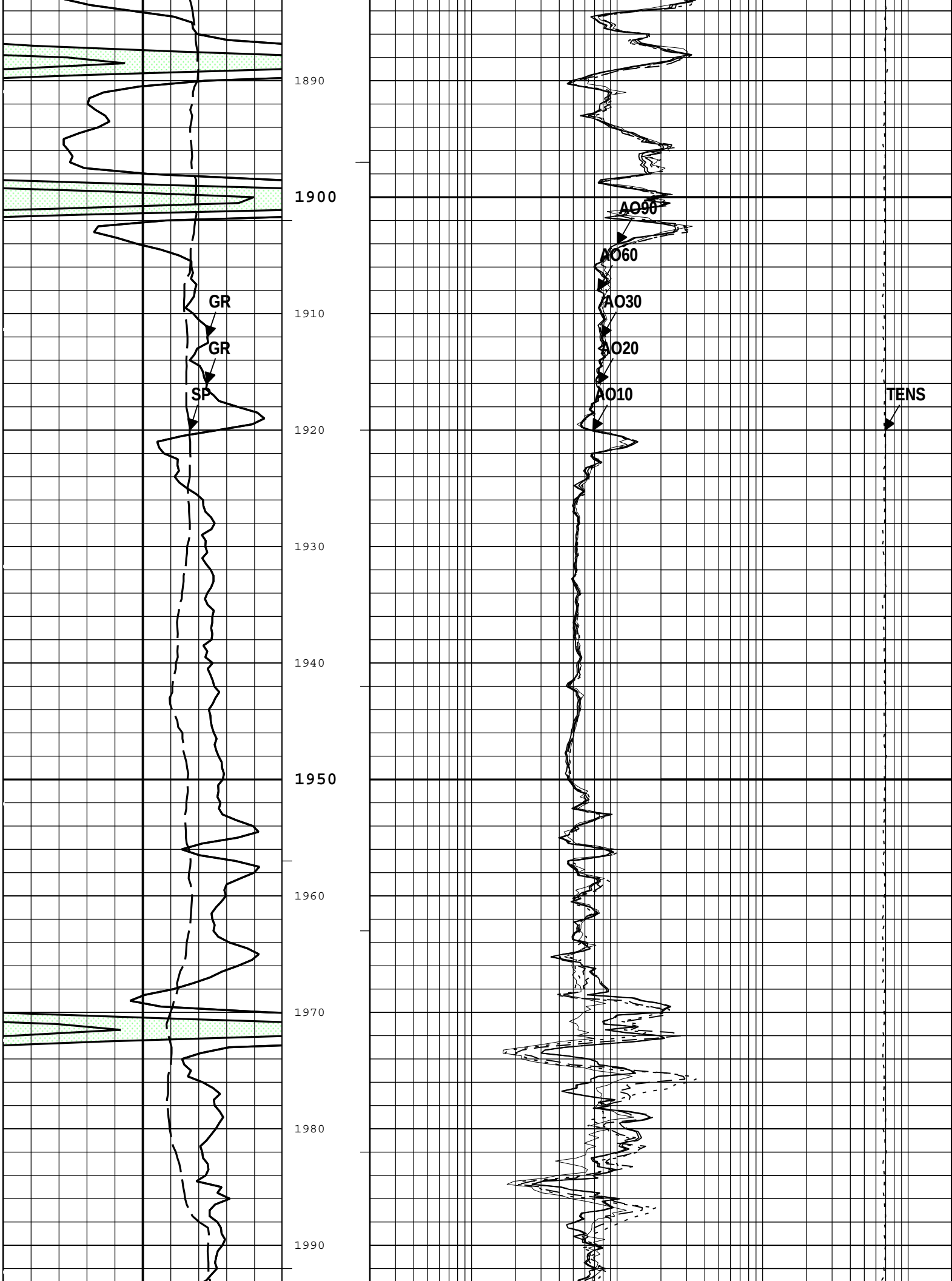
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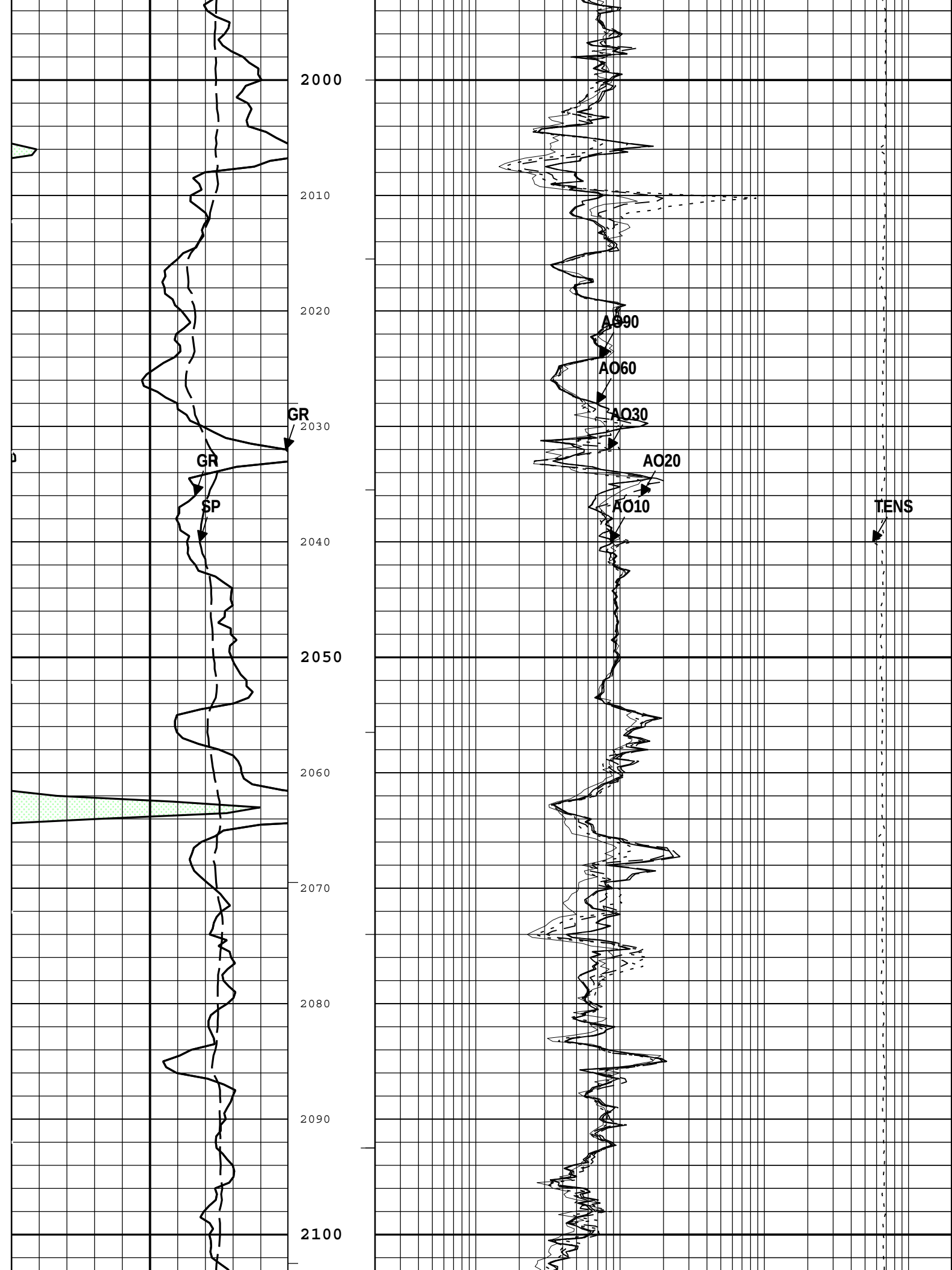
AO10
TENS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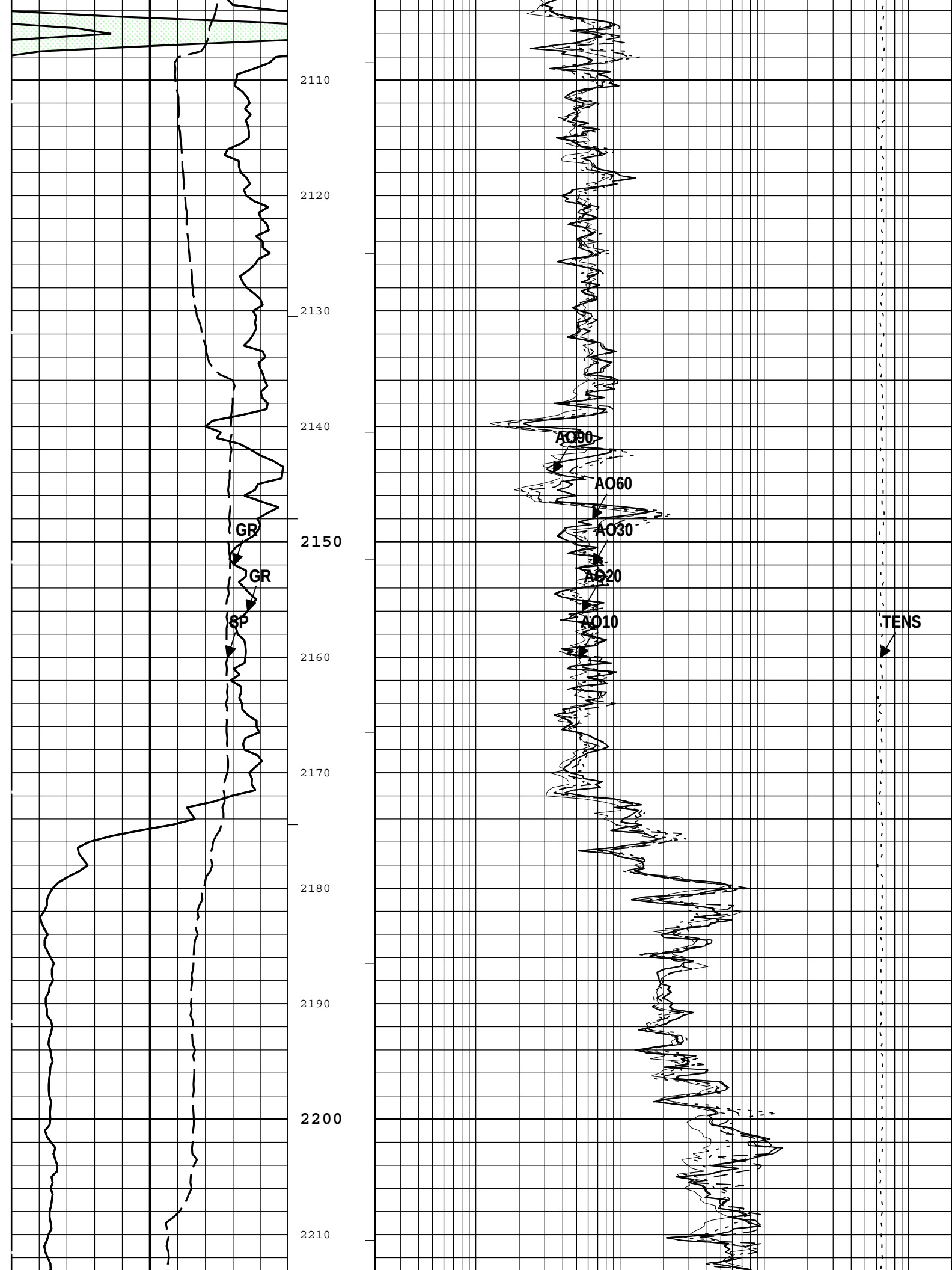
TENS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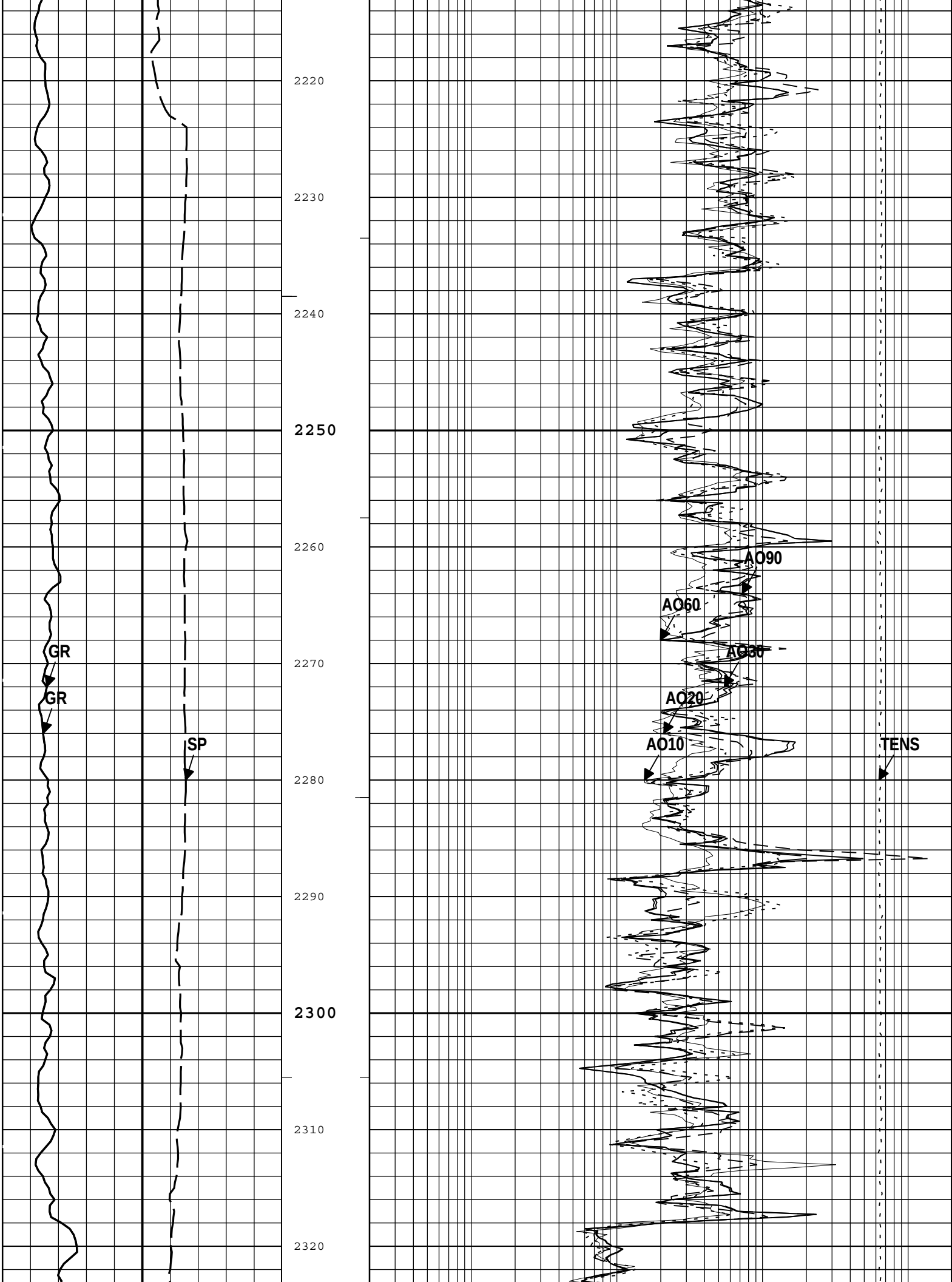
TENS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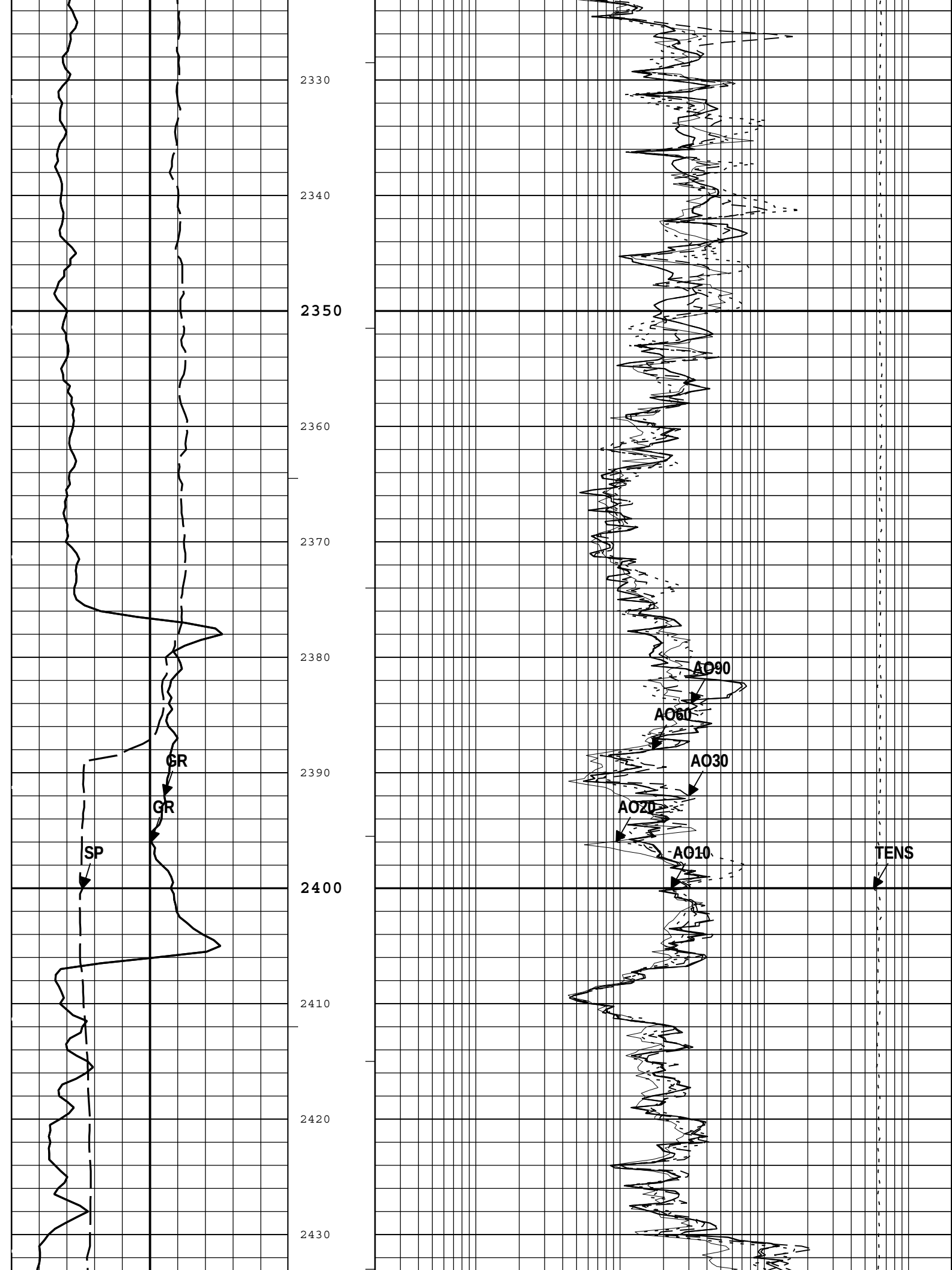
AO10
TENS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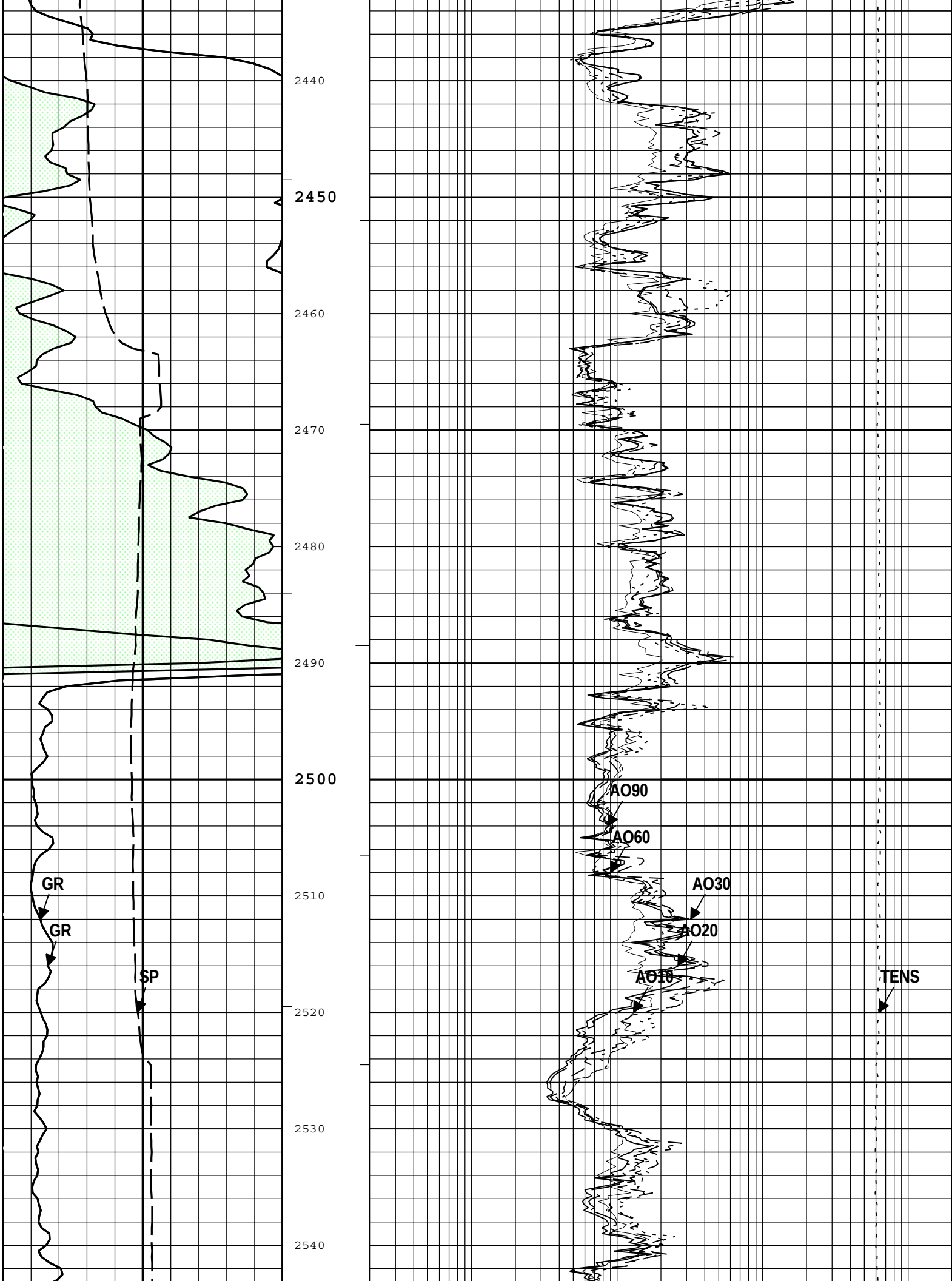
AO20
AO10
TENS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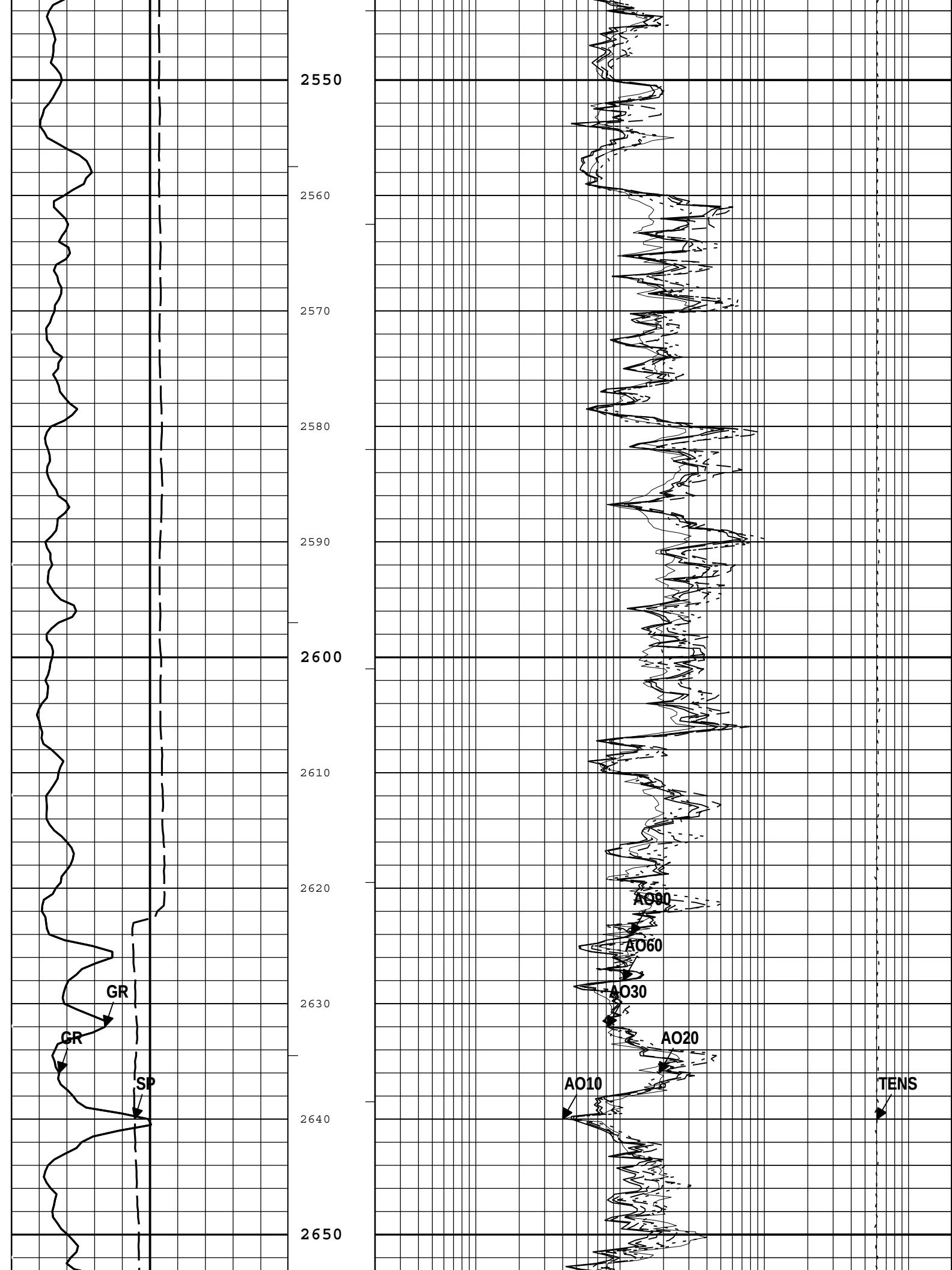
AO10
TENS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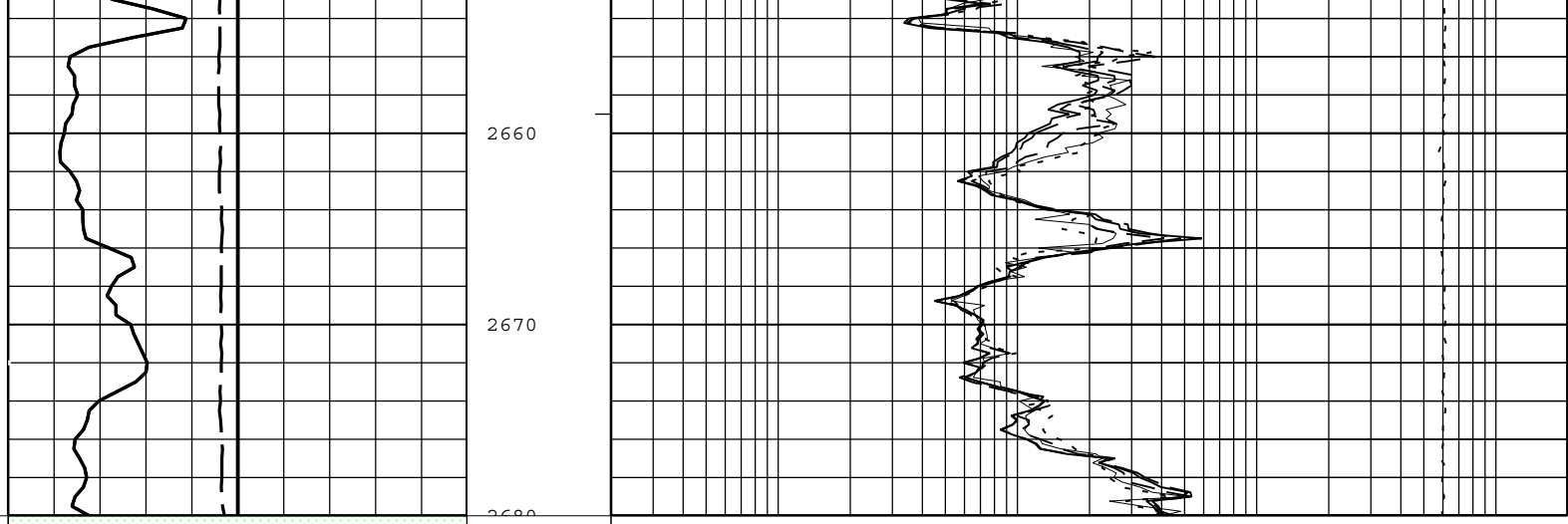
AO10
TENS



Backup Gamma Ray

Spontaneous Potential (SP) AIT-M

-260 mV 140

Gamma Ray (GR) HGNS-H

0 gAPI 150

Gamma Ray (GR) HGNS-H

150 gAPI 300

Array Induction One Foot Resistivity A10 (AO10) AIT-M

0.2 ohm.m 2000

Array Induction One Foot Resistivity A20 (AO20) AIT-M

0.2 ohm.m 2000

Array Induction One Foot Resistivity A30 (AO30) AIT-M

0.2 ohm.m 2000

Array Induction One Foot Resistivity A60 (AO60) AIT-M

0.2 ohm.m 2000

Array Induction One Foot Resistivity A90 (AO90) AIT-M

0.2 ohm.m 2000

Cable Tension (TENS)

8000 lbf 0

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 Basic Log One) Index Scale: 10 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Feb-2013 10:57:12

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	Yes	
ASTA	Array Induction Tool Standoff	AIT-M	1.625	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	8.75	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.05	in
CBLO	Casing Bottom (Logger)	WLSESSION	526	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	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	Borehole	AME	

GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
SOCO	Standoff Correction Option	HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M	-80	mV
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft

Tool Control Parameters

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

One

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[3]:Up	Up	2016.75 ft	2598.28 ft	28-Feb-2013 6:59:28 AM	28-Feb-2013 7:29:22 AM	0.00 ft	
One	Log[5]:Up	Up	468.98 ft	3288.06 ft	28-Feb-2013 7:51:04 AM	28-Feb-2013 9:32:53 AM	0.30 ft	

All depths are referenced to toolstring zero

Log

One: Log[5]:Up

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-Feb-2013 10:57:13

Channel	Source	Sampling
ICV	Borehole	6in
IHV	Borehole	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)

Main To Repeat

Repeat To Main

Cable Tension (TENS)

8000 lbf 0

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A90 (AT90) AIT-M

0.2 ohm.m 2000

Main To Repeat

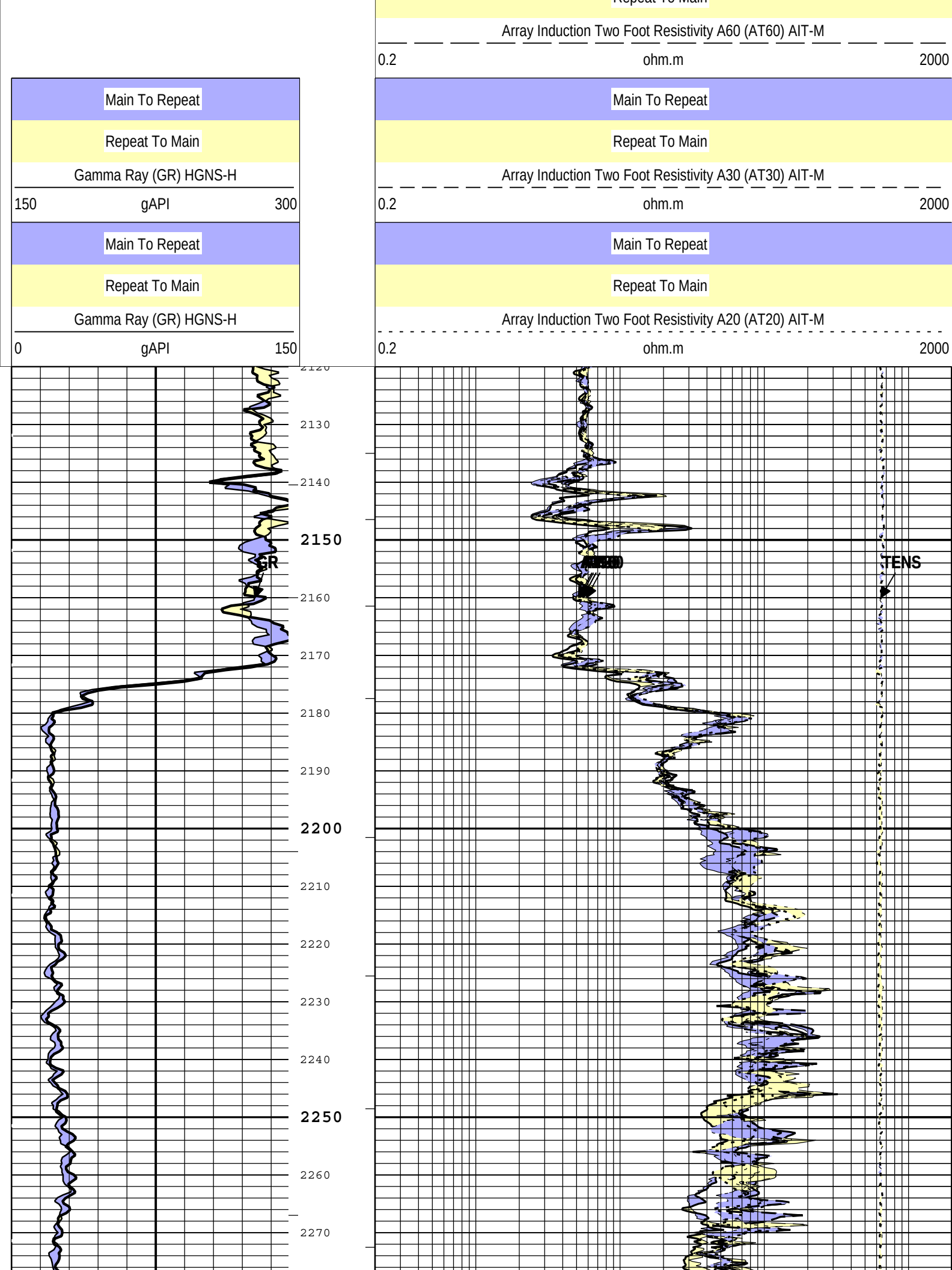
Repeat To Main

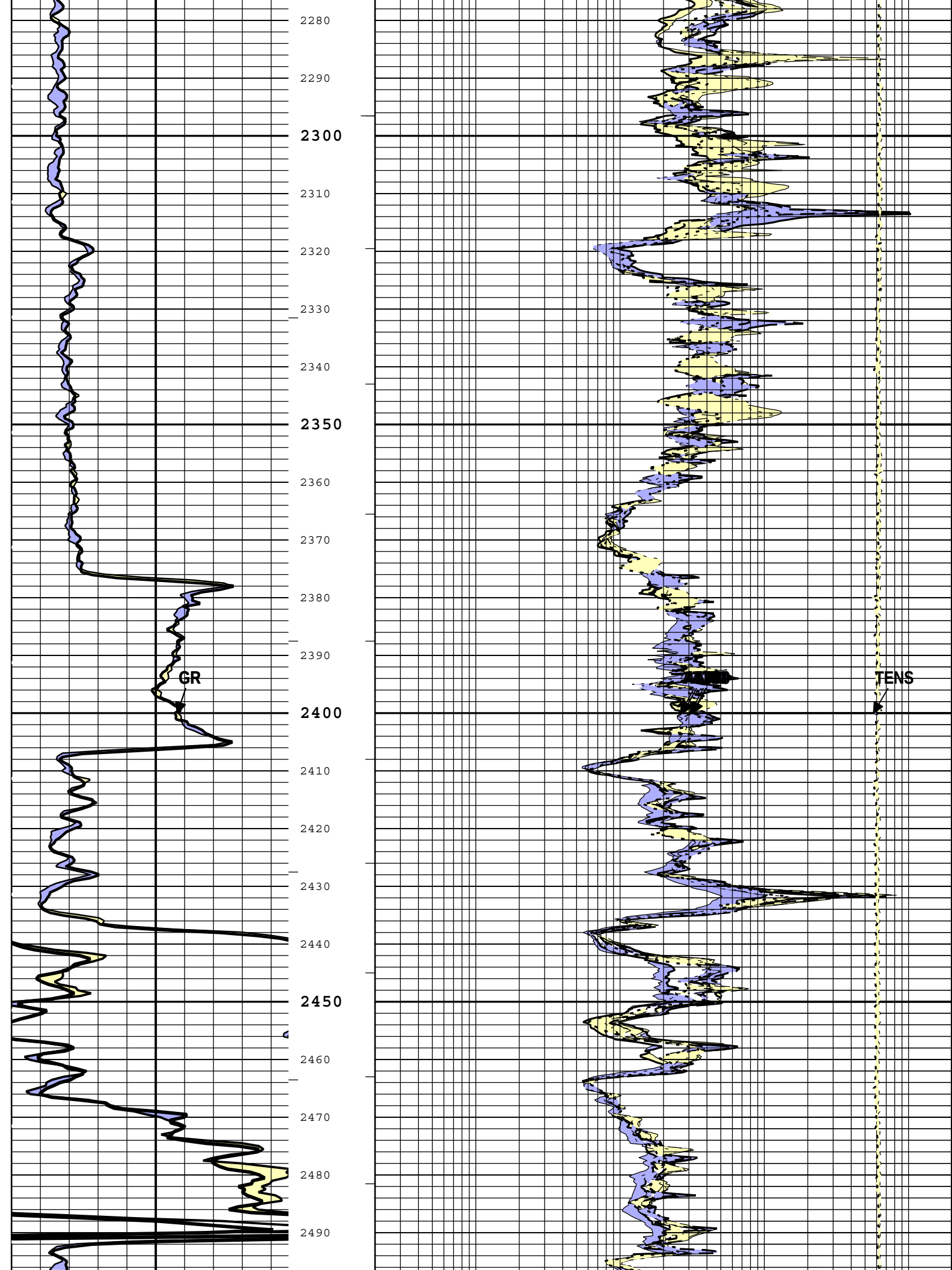
Array Induction Two Foot Resistivity A10 (AT10) AIT-M

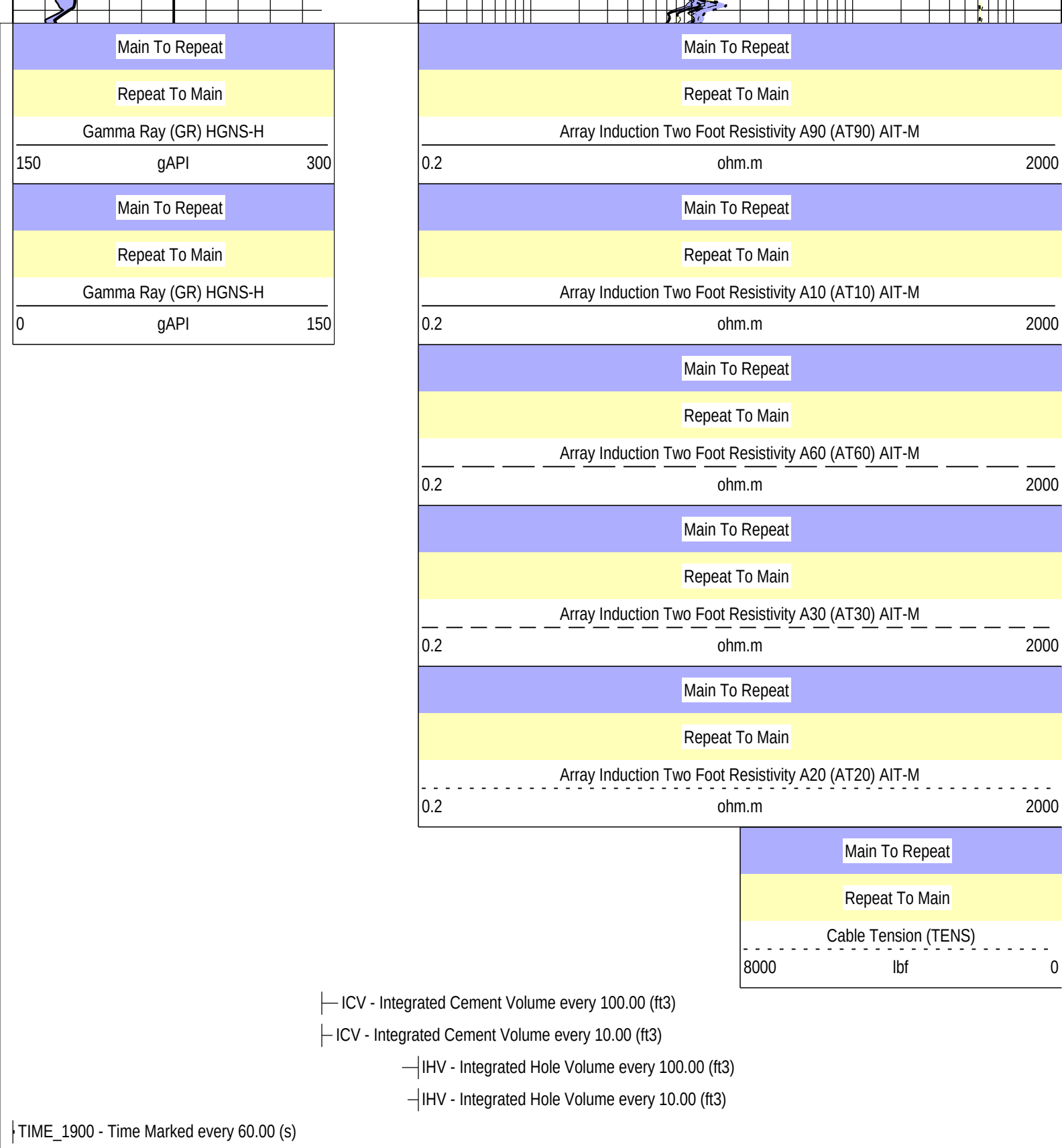
0.2 ohm.m 2000

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
Gamma Ray (GR) HGNS-H
150
gAPI
300
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
Gamma Ray (GR) HGNS-H
0
gAPI
150
Main To Repeat
Repeat To Main
Array Induction Two Foot Resistivity A20 (AT20) AIT-M
0.2
ohm.m
2000
2130
2140
2150
2160
2170
2180
2190
2200
2210
2220
2230
2240
2250
2260
2270
GR
TENS


2280
2290
2300
2310
2320
2330
2340
2350
2360
2370
2380
2390
2400
2410
2420
2430
2440
2450
2460
2470
2480
2490
GR
TENS



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-Feb-2013 10:57:13

Calibration Report

AIT-M (Array Induction Tool - M) Calibration - Run One

Primary Equipment :

Array Induction Sonde - M	AMIS	229

Auxiliary Equipment :

AITM Rm/SP Bottom Nose	AMRM	229

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 17:03:59 28-Jan-2013

Master (EEPROM): 17:03:59 28-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Test Loop Gain - 0		Master	1.000	0.950	1.012	1.050
Test Loop Phase - 0	deg	Master	0	-3.000	0.537	3.000
Test Loop Gain - 1		Master	1.000	0.950	1.014	1.050
Test Loop Phase - 1	deg	Master	0	-3.000	0.814	3.000
Test Loop Gain - 2		Master	1.000	0.950	1.014	1.050
Test Loop Phase - 2	deg	Master	0	-3.000	0.082	3.000
Test Loop Gain - 3		Master	1.000	0.950	1.011	1.050
Test Loop Phase - 3	deg	Master	0	-3.000	0.185	3.000
Test Loop Gain - 4		Master	1.000	0.950	0.993	1.050
Test Loop Phase - 4	deg	Master	0	-3.000	0.502	3.000
Test Loop Gain - 5		Master	1.000	0.950	0.988	1.050
Test Loop Phase - 5	deg	Master	0	-3.000	-0.220	3.000
Test Loop Gain - 6		Master	1.000	0.950	0.995	1.050
Test Loop Phase - 6	deg	Master	0	-3.000	0.445	3.000
Test Loop Gain - 7		Master	1.000	0.950	1.008	1.050
Test Loop Phase - 7	deg	Master	0	-3.000	0.524	3.000

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 17:03:59 28-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-94.661	119.000
Sonde Error Correction Quad - 0		Master	-----	-2250.000	-1104.161	2250.000
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	161.446	204.000
Sonde Error Correction Quad - 1		Master	-----	-625.000	184.156	625.000
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	108.432	156.000
Sonde Error Correction Quad - 2		Master	-----	-350.000	-142.362	350.000
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	49.712	89.000
Sonde Error Correction Quad - 3		Master	-----	-250.000	-19.018	250.000
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	26.930	35.000
Sonde Error Correction Quad - 4		Master	-----	-63.000	0.104	63.000
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	13.238	24.000
Sonde Error Correction Quad - 5		Master	-----	-50.000	-2.098	50.000
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.598	15.000
Sonde Error Correction Quad - 6		Master	-----	-30.000	8.018	30.000
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-0.916	5.000
Sonde Error Correction Quad - 7		Master	-----	-30.000	-2.883	30.000

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 17:03:59 28-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Coarse Gain		Master	1.000	0.800	1.031	1.200
Fine Gain		Master	1.000	0.800	1.026	1.200

AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 17:03:59 28-Jan-2013 Before (Measured): 10:45:34 27-Feb-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Thru Cal Mag - 0	V	Master	-----	0.366	0.613	0.854
		Before	-----	0.366	0.613	0.854
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 0	deg	Master	-----	137.000	-178.174	-103.000
		Before	-----	137.000	-169.310	-103.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	8.864	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 1	V	Master	-----	0.762	1.257	1.778
		Before	-----	0.762	1.257	1.778
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 1	deg	Master	-----	136.000	-179.243	-104.000
		Before	-----	136.000	-170.378	-104.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	8.865	-----

		After-Before	-----	-----	-----	-----
Thru Cal Mag - 2	V	Master	-----	0.372	0.622	0.868
		Before	-----	0.372	0.622	0.868
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 2	deg	Master	-----	132.000	177.201	-108.000
		Before	-----	132.000	-173.933	-108.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-351.134	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 3	V	Master	-----	0.420	0.703	0.980
		Before	-----	0.420	0.703	0.980
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 3	deg	Master	-----	131.000	176.440	-109.000
		Before	-----	131.000	-174.696	-109.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-351.136	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 4	V	Master	-----	0.804	1.315	1.876
		Before	-----	0.804	1.315	1.876
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 4	deg	Master	-----	125.000	170.314	-115.000
		Before	-----	125.000	179.192	-115.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	8.878	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 5	V	Master	-----	1.176	1.916	2.744
		Before	-----	1.176	1.915	2.744
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 5	deg	Master	-----	122.000	168.664	-118.000
		Before	-----	122.000	177.549	-118.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	8.885	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 6	V	Master	-----	1.176	1.913	2.744
		Before	-----	1.176	1.911	2.744
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.002	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 6	deg	Master	-----	121.000	168.703	-119.000
		Before	-----	121.000	177.592	-119.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	8.889	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 7	V	Master	-----	0.846	1.379	1.974
		Before	-----	0.846	1.378	1.974
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 7	deg	Master	-----	115.000	167.865	-125.000
		Before	-----	115.000	176.845	-125.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	8.980	-----
		After-Before	-----	-----	-----	-----
SPA Zero	mV	Master		-50.000	-0.103	50.000
		Before		-50.000	-0.079	50.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.024	-----
		After-Before	-----	-----	-----	-----
SPA Plus	mV	Master		941.000	994.784	1040.000
		Before		941.000	994.836	1040.000

		After	-----	-----	-----	-----	
		Before-Master	-----	-----	0.052	-----	
		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	0.922	0.960	
		Before		0.870	0.922	0.960	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	0.000	-----	
		After-Before	-----	-----	-----	-----	

ECS-A (Elemental Capture Spectroscopy Tool) Calibration - Run One

Primary Equipment :

The ECS sonde is used to measure elemental concentrations.	ECS-A	99

Auxiliary Equipment :

The gamma ray BGO detector is used to detect prompt capture gamma rays for spectroscopy measurement.	ECSD-A	99
Litho-Density Spectroscopy Cartridge	LDSC-A	475
Housing for the LDSC	LDSH-A	441
Housing to contain the ECS Sonde Assembly	ECSH-A	99
The AmBe source provides neutrons for the prompt capture spectroscopy measurement.	NSR-F	5075

ECS Background Measurement Check - ECS Calibration Check

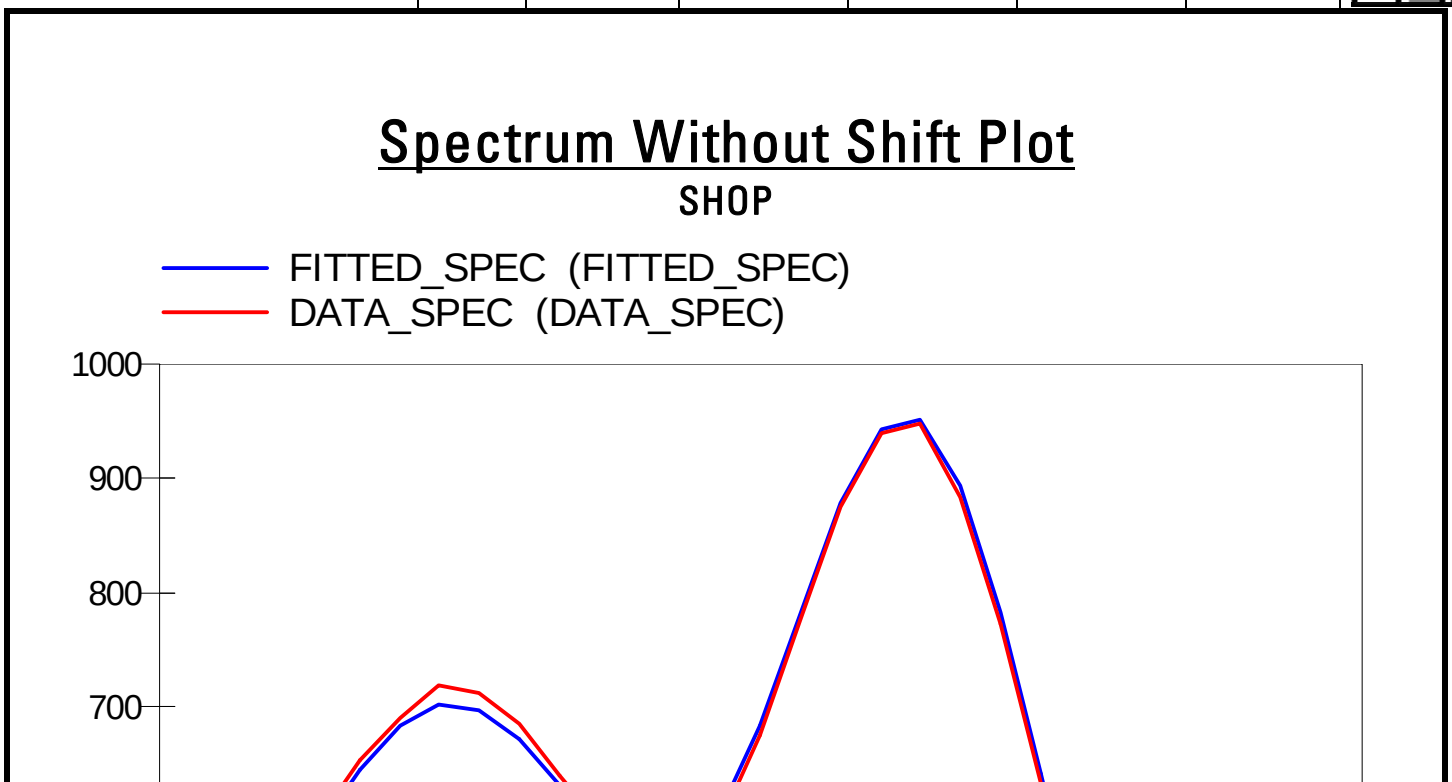
Master (EEPROM): 22:23:09 18-Aug-2011 Before (Measured): 11:07:13 27-Feb-2013 After:
Expired by 194 days

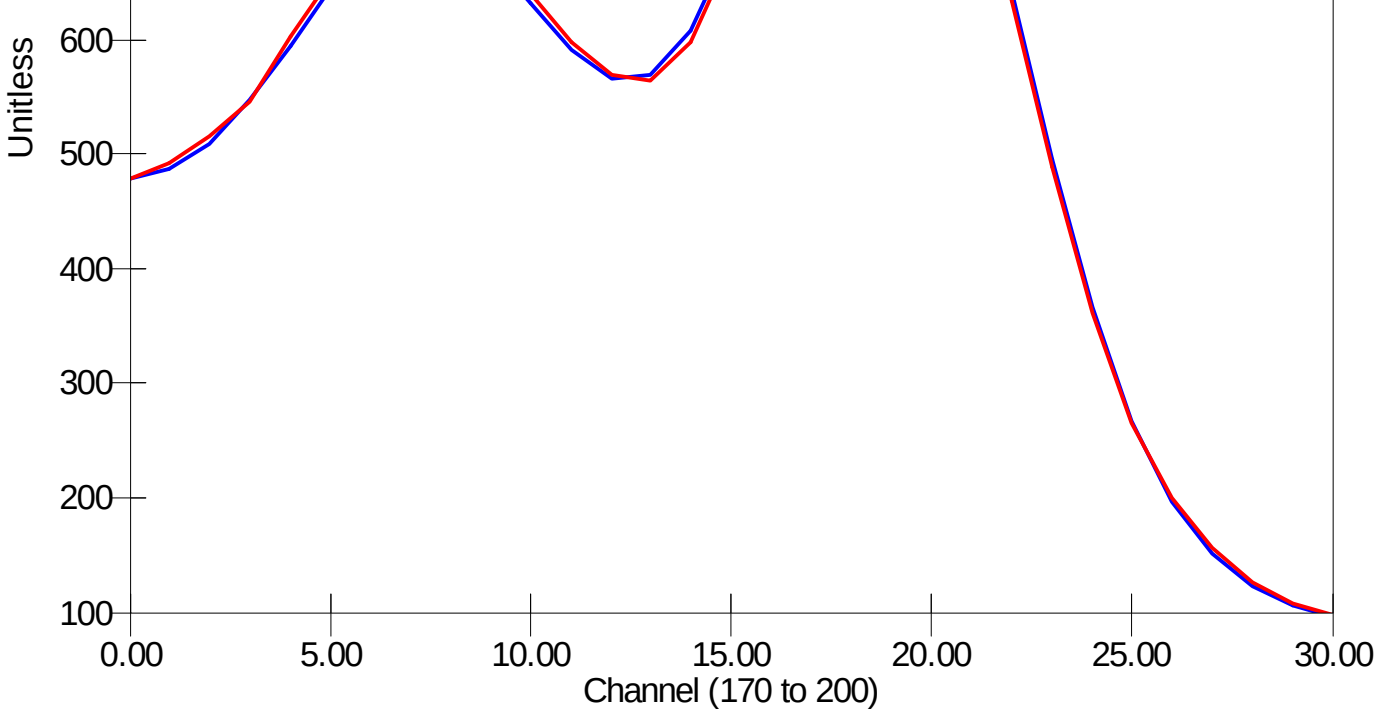
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Detector resolution (20 DegC)	%	Master	-----	-----	-----	-----
		Before	13.000	11.200	11.794	14.000
		After	13.000	11.200	NOT DONE	14.000
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

ECS Spectral Calibration - ECS Spectral Calibration

Master (EEPROM): 06:20:16 28-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Spectral Shift Factor		Master	1.000	-0.500	-0.046	1.500

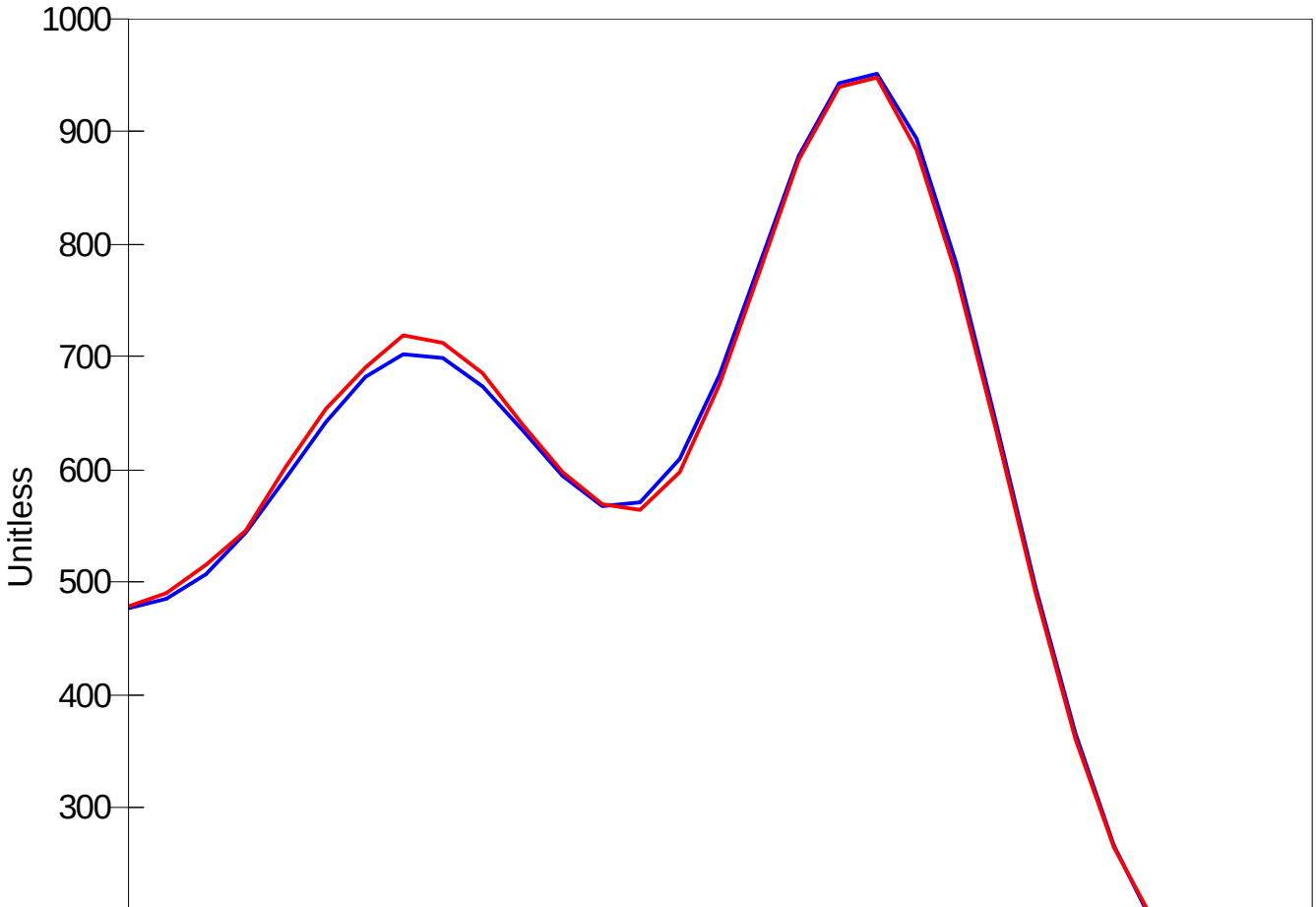


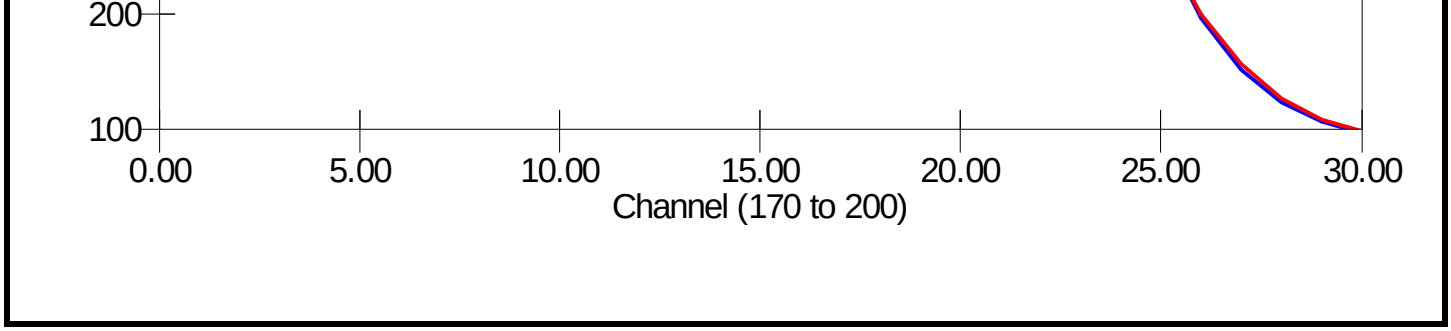


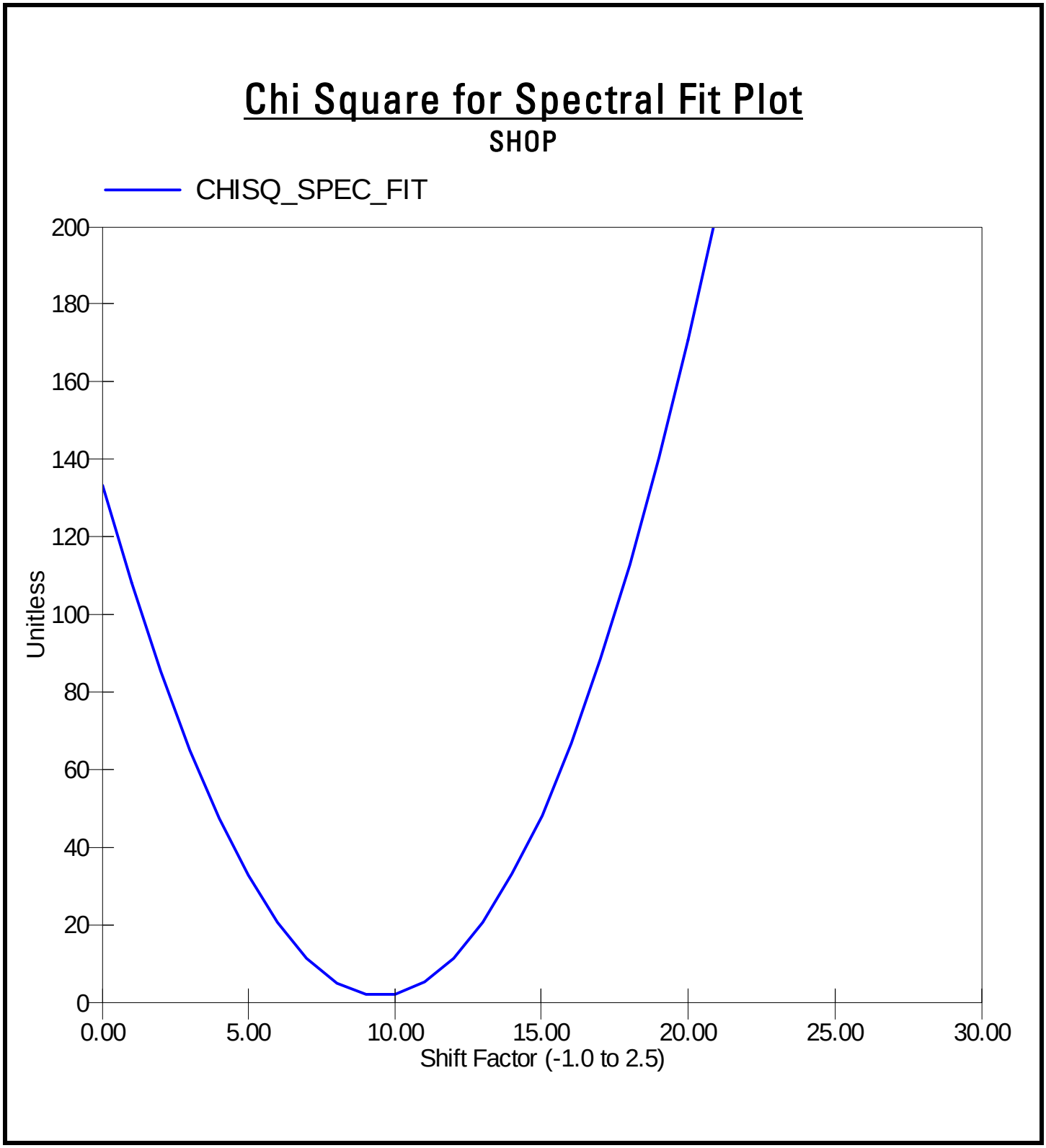
Spectrum With Shift Plot

SHOP

FITTED_SPEC_SF (FITTED_SPEC_SF)
DATA_SPEC_SF (DATA_SPEC_SF)




200
100
0.00
5.00
10.00
15.00
20.00
25.00
30.00
Channel (170 to 200)


Chi Square for Spectral Fit Plot
SHOP
CHISQ_SPEC_FIT
200
180
160
140
120
100
80
60
40
20
0
Unitless
0.00
5.00
10.00
15.00
20.00
25.00
30.00
Shift Factor (-1.0 to 2.5)

Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4806
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	4867

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	4867
HRDD Short Spacing Detector	Short Spacing	27763
Cesium 137 Gamma-Ray Logging Source	GSR-J	5350
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4806
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	4758

Calibration Parameter :

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): 10:52:03 27-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Small Ring	in	Before	8.00	6.00	7.69	10.00
Large Ring	in	Before	12.00	9.00	12.00	15.00

HDRS Density Calibration - Inversion Results

Master (EEPROM): 15:12:48 29-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Rho Aluminum	g/cm3	Master	2.596	2.586	2.598	2.606
Rho Magnesium	g/cm3	Master	1.686	1.676	1.687	1.696
Pe Aluminum		Master	2.570	2.470	2.551	2.670
Pe Magnesium		Master	2.650	2.550	2.643	2.750

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 15:12:48 29-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Average Deviation	%	Master	0	-0.6000	0.2328	0.6000
BS Max Deviation	%	Master	0	-1.6000	0.5312	1.6000
SS Average Deviation	%	Master	0	-1.0000	0.3689	1.0000
SS Max Deviation	%	Master	0	-2.5000	0.7307	2.5000
LS Average Deviation	%	Master	0	-1.5000	0.5328	1.5000
LS Max Deviation	%	Master	0	-3.5000	1.2546	3.5000

HDRS Density Calibration - Background Summary

Master (EEPROM): 15:12:48 29-Jan-2013 Before (Measured): 11:07:29 27-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Window Ratio		Master	1.0000		0.7433	
		Before	0.7433	0.7062	0.7442	0.7805
		Before-Master	-----	-----	0.0009	-----
BS Window Sum	1/s	Master	1		29581	
		Before	29581	28102	29486	31061
		Before-Master	-----	-----	-95	-----
SS Window Ratio		Master	1.0000		0.4835	
		Before	0.4835	0.4593	0.4815	0.5077
		Before-Master	-----	-----	-0.0020	-----
SS Window Sum	1/s	Master	1		12309	
		Before	12309	11693	12258	12924
		Before-Master	-----	-----	-51	-----
LS Window Ratio		Master	1.0000		0.2964	
		Before	0.2964	0.2816	0.3007	0.3112
		Before-Master	-----	-----	0.0043	-----
LS Window Sum	1/s	Master	1		1341	
		Before	1341	1274	1327	1408
		Before-Master	-----	-----	-14	-----

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 15:12:48 29-Jan-2013 Before (Measured): 11:07:29 27-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS PM High Voltage	V	Master		1000	1564	2400
		Before		1000	1554	2400
		Before-Master	-----	-100	-10	100

SS PM High Voltage	V	Master		1000	1588	2400
		Before		1000	1608	2400
		Before-Master	-----	-100	20	100
LS PM High Voltage	V	Master		1000	1562	2400
		Before		1000	1570	2400
		Before-Master	-----	-100	8	100

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 15:12:48 29-Jan-2013 Before (Measured): 11:07:29 27-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Crystal Resolution	%	Master		5.00	11.67	25.00
		Before		5.00	11.35	25.00
		Before-Master	-----	-1.00	-0.32	1.00
SS Crystal Resolution	%	Master		5.00	9.39	20.00
		Before		5.00	9.80	20.00
		Before-Master	-----	-1.00	0.41	1.00
LS Crystal Resolution	%	Master		5.00	8.48	20.00
		Before		5.00	8.51	20.00
		Before-Master	-----	-1.00	0.03	1.00

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 10:45:07 27-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Main Resistivity	ohm.m	Before	3875	3565	3925	4185
Deep Resistivity	ohm.m	Before	3830	3524	3834	4136
Shallow Resistivity	ohm.m	Before	3830	3524	3827	4136

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

Primary Equipment :

HILT Gamma-Ray and Neutron Sonde, 150 degC	HGNS-H	3819

Auxiliary Equipment :

HGNS Accelerometer, 150 degC	HACCZ-H	2102
AmBe Neutron Logging Source	NSR-F	5226

Calibration Parameter :

Water Temperature	
Housing Size	
JIG-BKG (Jig minus background reference)	160

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 05:52:20 28-Feb-2013

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

Master (EEPROM): 00:00:00 15-Feb-2003

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Accelerometer Manufacturer		Master			QAT_160	
Accelerometer Reference Temperature	degF	Master		30.2	77.0	122.0
Accelerometer Coefficients - 0		Master	-----	-----	-2847.000	-----
Accelerometer Coefficients - 1		Master	-----	-----	13.547	-----
Accelerometer Coefficients - 2		Master	-----	-----	-0.002	-----
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 4		Master	-----	-----	2.752	-----
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 8		Master	-----	-----	299.200	-----
Accelerometer Coefficients - 9		Master	-----	-----	1.004	-----

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 13:09:40 11-Feb-2013 Before (Measured): 11:05:42 27-Feb-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Near Zero Measurement	1/s	Master	0	5.0	26.1	40.0

		Before	0	5.0	27.5	40.0	
		After	-----	-----	-----	-----	
		Before-Master	-----	-3.9	1.4	3.9	
		After-Before	-----	-----	-----	-----	
Far Zero Measurement	1/s	Master	0	5.0	28.6	40.0	
		Before	0	5.0	27.0	40.0	
		After	-----	-----	-----	-----	
		Before-Master	-----	-4.3	-1.6	4.3	
		After-Before	-----	-----	-----	-----	
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	5040.0	6900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2061.0	2900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	5112.0	6900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2095.0	2900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 11:13:18 27-Feb-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
RGR Zero Measurement	gAPI	Before	30.0	0	21.2	120.0
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
RGR Plus Measurement	gAPI	Before	179.8	152.4	179.1	200.0
		After			NOT DONE	
		After-Before	-----	-----	-----	-----
GR Calibration Gain		Before	0.89	0.80	0.89	1.05
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

HNGS-BA (Hostile-environment Natural Gamma-ray Sonde) Calibration - Run One

Primary Equipment :

HNGS Sonde Element	HNGS-BA	236

Auxiliary Equipment :

HNGS Housing Element	HEH-K	1018
		114
Hostile Natural Gamma Ray Cartridge	HNGC-B	46
Housing for the HNGC	HNGH-A	46

HNGS Background and Na22 Set Point Determination - Detector 1 Check

Master (EEPROM): 11:28:21 08-Feb-2013 Before (Measured): 11:06:58 27-Feb-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Na 511 Peak Location		Master			37.628	
		Before	40.000	37.500	37.578	42.500
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.050	-----
		After-Before	-----	-----	-----	-----
Na 511 Peak Resolution	%	Master			15.331	
		Before	15.500	12.000	15.616	19.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.285	-----
		After-Before	-----	-----	-----	-----

High Voltage DAC Value	V	Master			1191.324		
		Before	1150.000	850.000	1165.384	1600.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-25.940	-----	
		After-Before	-----	-----	-----	-----	
Na 1785 Peak Location		Master			136.685		
		Before	142.650	135.000	137.053	150.300	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	0.368	-----	
		After-Before	-----	-----	-----	-----	
Na 1785 Peak Resolution	%	Master			8.782		
		Before	8.500	7.000	7.648	11.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-1.134	-----	
		After-Before	-----	-----	-----	-----	
Temperature	degF	Master	-----	-----	-----	-----	
		Before	59.900	-20.002	51.081	140.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Na Count Rate	CPS	Master	45.000	10.000	16.724	100.000	
		Before	45.000	10.000	15.865	100.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-0.859	-----	
		After-Before	-----	-----	-----	-----	

HNGS Background and Na22 Set Point Determination - Detector 2 Check

Master (EEPROM): 11:28:21 08-Feb-2013 Before (Measured): 11:06:58 27-Feb-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Location		Master			38.648		
		Before	40.000	37.500	38.634	42.500	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-0.014	-----	
		After-Before	-----	-----	-----	-----	
Na 511 Peak Resolution	%	Master			15.034		
		Before	15.500	12.000	15.242	19.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	0.208	-----	
		After-Before	-----	-----	-----	-----	
High Voltage DAC Value	V	Master			1174.987		
		Before	1150.000	850.000	1152.076	1600.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-22.911	-----	
		After-Before	-----	-----	-----	-----	
Na 1785 Peak Location		Master			138.685		
		Before	142.650	135.000	138.245	150.300	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-0.440	-----	
		After-Before	-----	-----	-----	-----	
Na 1785 Peak Resolution	%	Master			9.167		
		Before	8.500	7.000	8.632	11.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-0.535	-----	
		After-Before	-----	-----	-----	-----	
Temperature	degF	Master	-----	-----	-----	-----	
		Before	59.900	-20.002	51.008	140.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Na Count Rate	CPS	Master	45.000	10.000	16.678	100.000	
		Before	45.000	10.000	15.831	100.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-0.847	-----	
		After-Before	-----	-----	-----	-----	

HNGS Background and Na22 Set Point Determination - Ratio of Detector 1 to Detector 2

Master (EEPROM): 11:28:21 08-Feb-2013 Before (Measured): 11:06:58 27-Feb-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	

Coincidence Count Rate Ratio		Master			1.001	
		Before	1.000	0.950	1.003	1.050
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.002	-----
		After-Before	-----	-----	-----	-----

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (EEPROM): 11:28:21 08-Feb-2013 Before (Measured): 11:06:58 27-Feb-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Th Peak Location - 0		Master	209.630	201.000	206.961	218.250
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Th Peak Resolution - 0	%	Master	7.000	5.000	7.420	9.000
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Background Count Rate	CPS	Master			86.921	
		Before	142.500	10.000	69.360	265.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-17.561	-----
		After-Before	-----	-----	-----	-----
Gain Ratio - 0		Master	1.000	0.940	1.046	1.060
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (EEPROM): 11:28:21 08-Feb-2013 Before (Measured): 11:06:58 27-Feb-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Th Peak Location - 0		Master	209.630	201.000	210.150	218.250
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Th Peak Resolution - 0	%	Master	7.000	5.000	7.291	9.000
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Background Count Rate	CPS	Master			83.340	
		Before	142.500	10.000	68.231	265.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-15.109	-----
		After-Before	-----	-----	-----	-----
Gain Ratio - 0		Master	1.000	0.940	1.034	1.060
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (EEPROM): 11:28:21 08-Feb-2013 Before (Measured): 11:06:58 27-Feb-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Na 511 Peak Set Point - 0		Master	40.000	38.000	39.000	43.500
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (EEPROM): 11:28:21 08-Feb-2013 Before (Measured): 11:06:58 27-Feb-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Na 511 Peak Set Point - 0		Master	40.000	38.000	40.000	43.500
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----

Before-Master	-----	-----	-----	-----
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	612.38	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	1350.25	ft3

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20120723-3.1.9755.1112
	EXP_APL-MAST-3.1.9755.1419
	EXP_APL-NEXTA-3.1.9755.1340

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.0

Tool Elements	Description	Software Version	Firmware Version
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0
AMIS	Array Induction Sonde - M	3.1.9755.1112	1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	468.98 ft	3288.06 ft	28-Feb-2013 7:51:04 AM	28-Feb-2013 9:32:53 AM	0.30 ft	

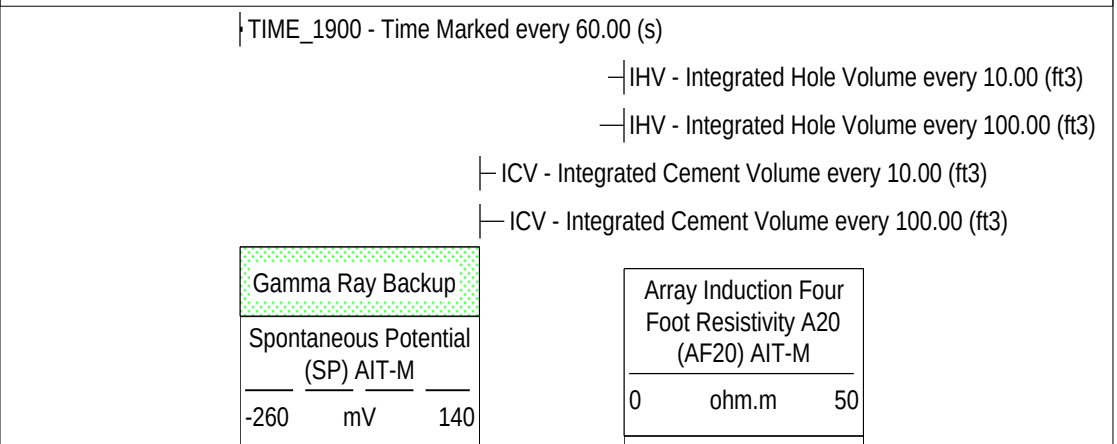
All depths are referenced to toolstring zero

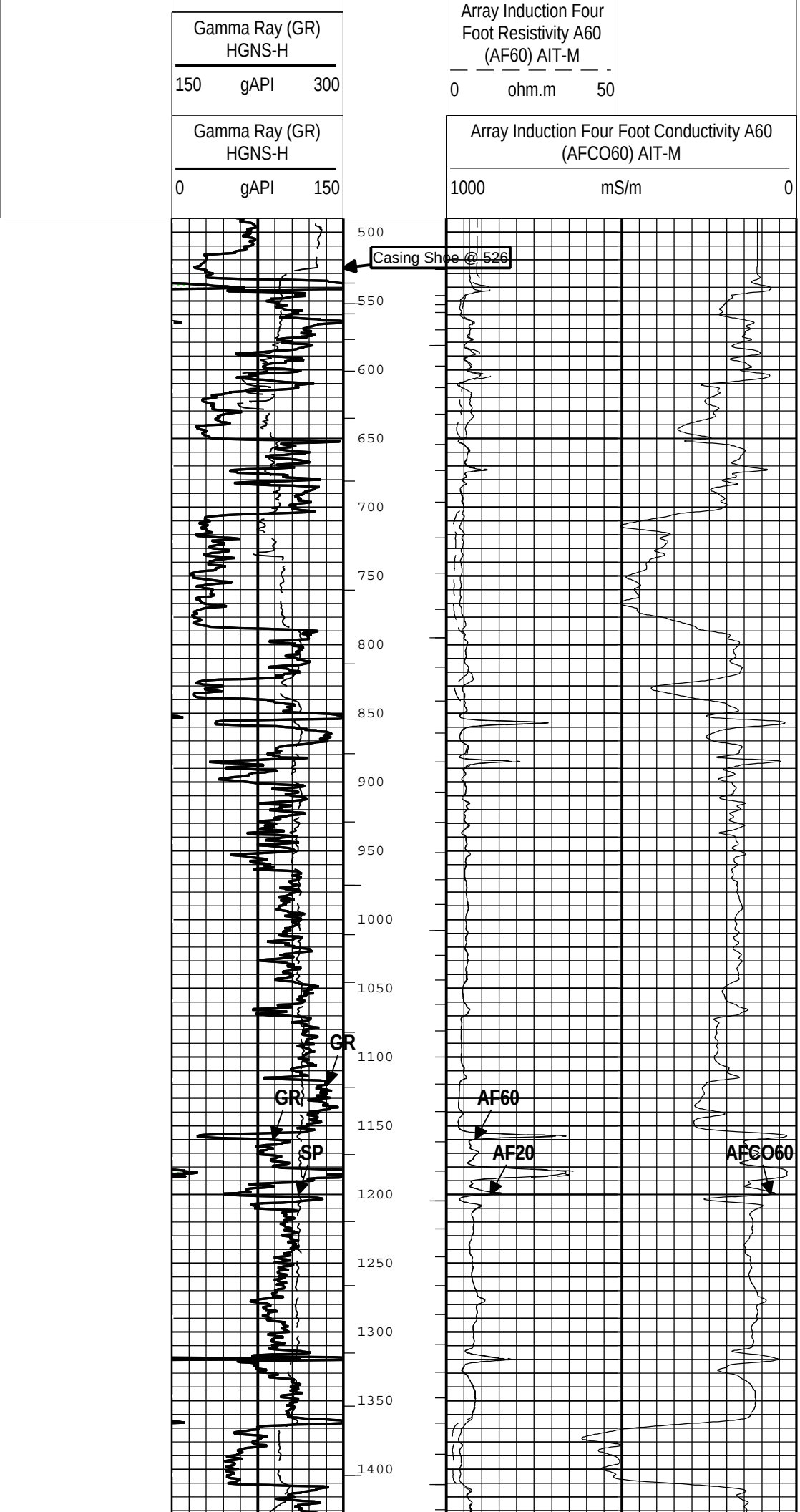
Log

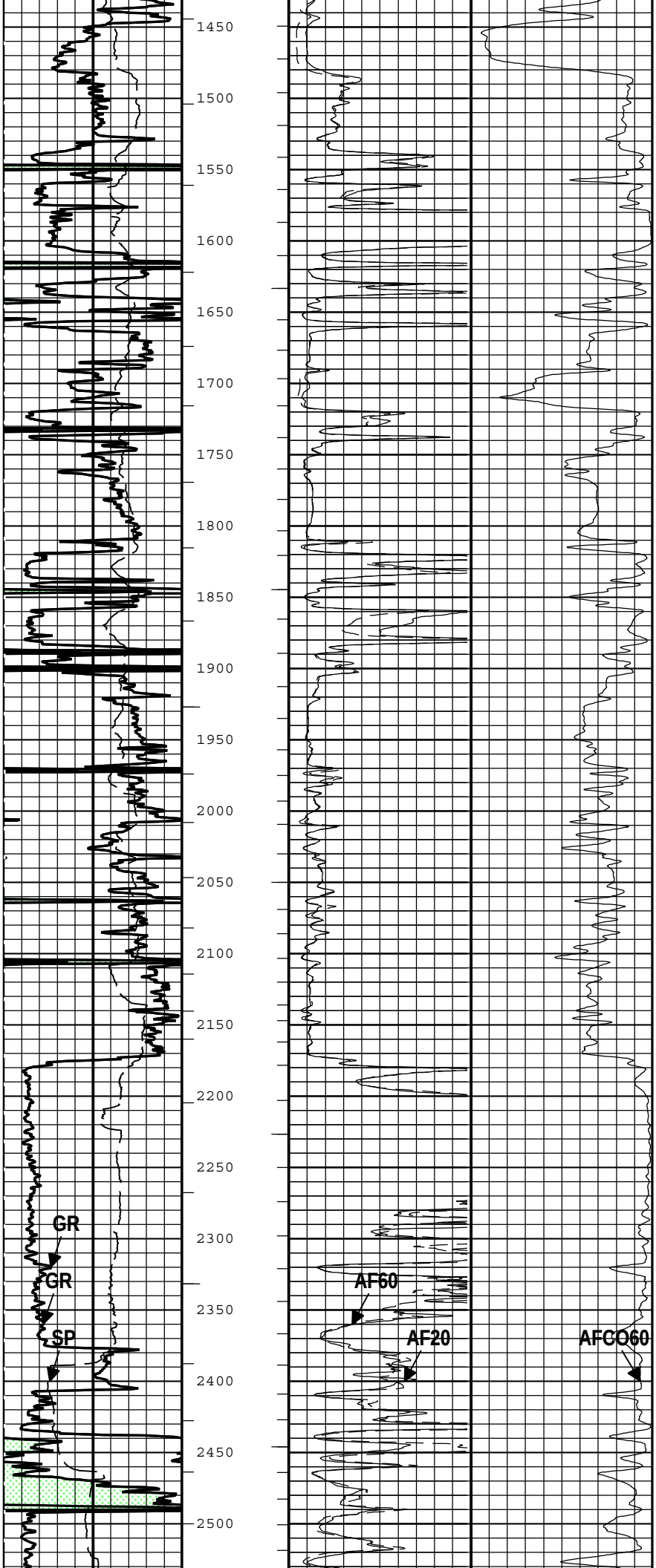
One: Log[5]:Up

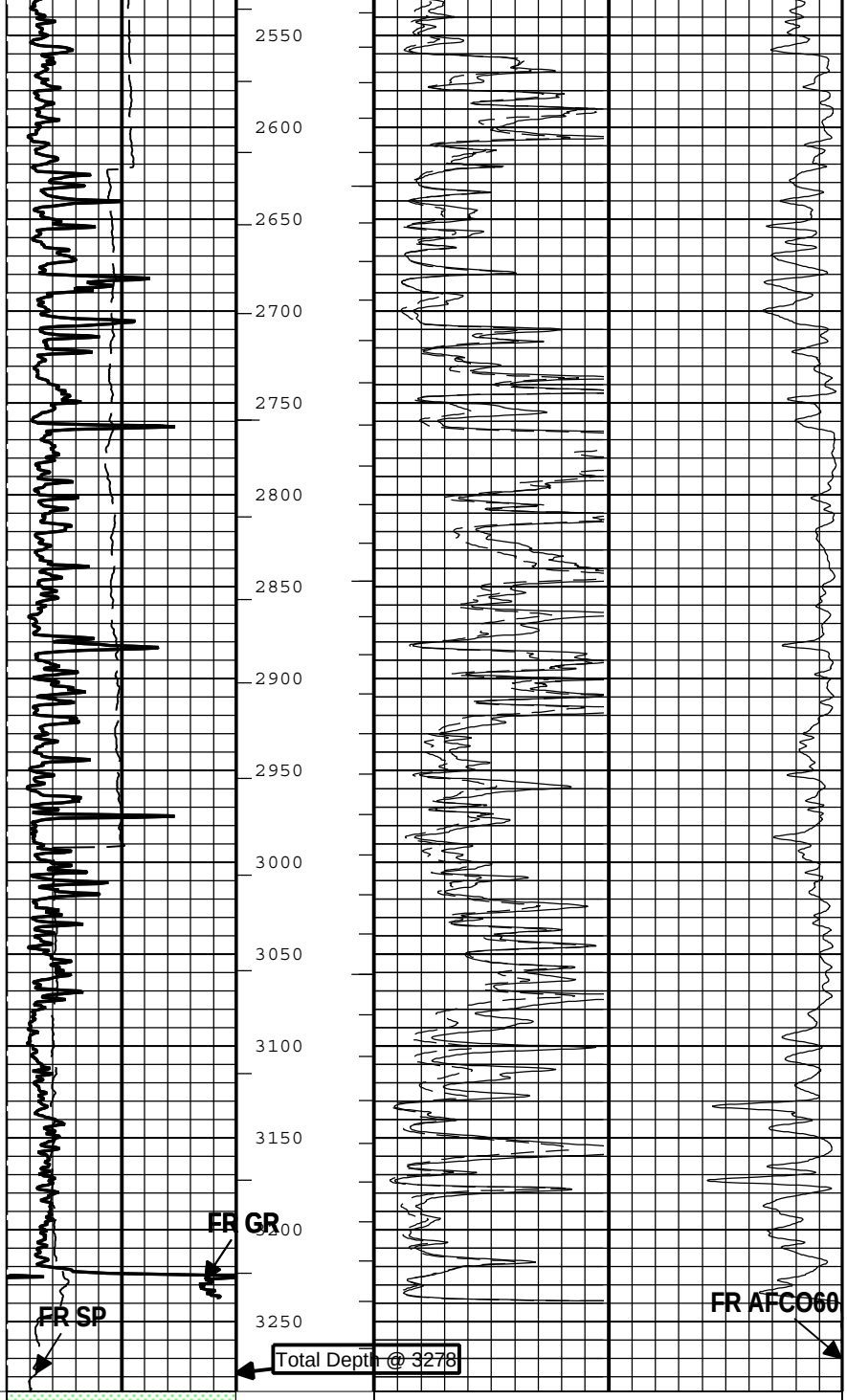
Description: AIT Basic Log Two Format: Log (AIT Basic Log Two) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Feb-2013 10:57:33

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




Gamma Ray (GR) HGNS-H
150 gAPI 300
Gamma Ray (GR) HGNS-H
0 gAPI 150
Array Induction Four Foot Resistivity A60 (AF60) AIT-M
0 ohm.m 50
Array Induction Four Foot Conductivity A60 (AFCO60) AIT-M
1000 mS/m 0
Casing Shoe @ 526'
500
550
600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
1250
1300
1350
1400
GR
GR
SP
AF60
AF20
AFCO60


1450
1500
1550
1600
1650
1700
1750
1800
1850
1900
1950
2000
2050
2100
2150
2200
2250
2300
2350
2400
2450
2500
GR
GR
SP
AF60
AF20
AFCO60



Gamma Ray Backup

Spontaneous Potential (SP) AIT-M

-260 mV 140

Gamma Ray (GR) HGNS-H

150 gAPI 300

Gamma Ray (GR) HGNS-H

0 gAPI 150

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

1000 mS/m 0

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

0 ohm.m 50

Array Induction Four Foot Resistivity A60 (AF60) 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-Feb-2013 10:57:34

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	Yes	
ASTA	Array Induction Tool Standoff	AIT-M	1.625	in
BARI	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	0.05	in
CBLO	Casing Bottom (Logger)	WLSESSION	526	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	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	
SOCO	Standoff Correction Option	HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M	-80	mV
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	0	490	526
BS	8.75	526	3288

All depth are actual.

Tool Control Parameters

Company: Nemaha Oil and Gas, LLC

Schlumberger

Well: Lampson #2A-23-32-9 SWD

Field: Hylton

County: Chautauqua

State: Kansas

PLATFORM EXPRESS

ARRAY INDUCTION

GAMMA RAY - SP