Schlumberger

Company: Noble Energy Inc

Well: NCLP AA06-62-1AHNC

Field: Wattenberg

County: Weld State: Colorado

Platform Express

Array Induction

with Linear Correlation

County: Weld
Field: Wattenberg
Location: SWSW Sec.4, T6N, R63W
Well: NCLP AA06-62-1AHNC
Company: Noble Energy Inc

Location:				
SWSW Sec.4, T6N, R63W SHL: 713' FSL x 100' FWL		Elev.:	K.B.	4733.00 ft
			G.L.	4709.00 ft
			D.F.	4732.00 ft
Permanent Datum:	Ground Level	Elev.:	4709.00 f	
Log Measured From:	Kelly Bushing	24.00 ft	above Perm.Datum	
Drilling Measured From:	Kelly Bushing			

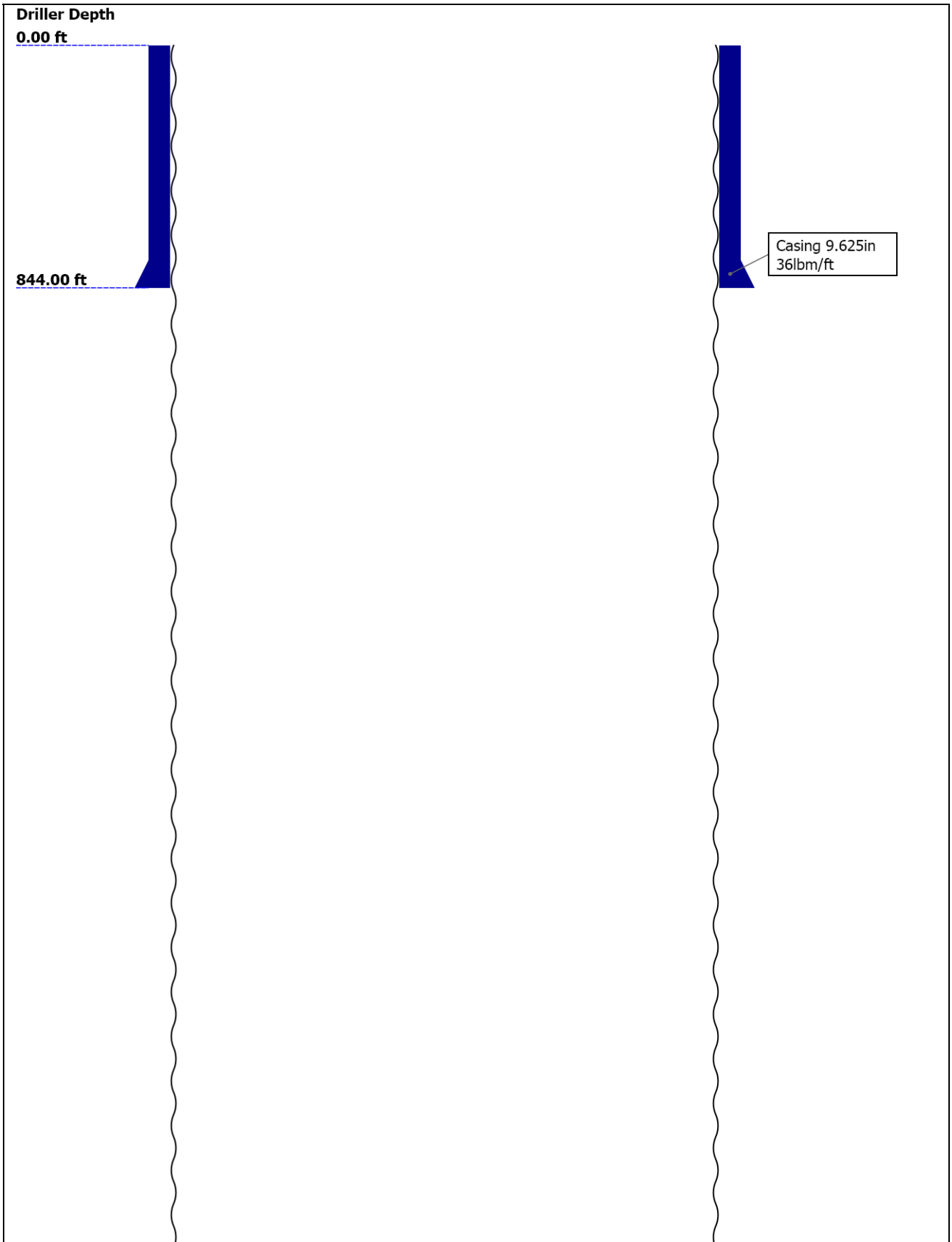
API Serial No.	Section:	Township:	Range:
05-123-39106-00	4	6N	63W

Logging Date			04-Jul-2014				
Run Number			Run 1				
Depth Driller			6086.00 ft				
Schlumberger Depth			6092.00 ft				
Bottom Log Interval			6092.00 ft				
Top Log Interval			848.00 ft				
Casing Driller Size @ Depth			9.625 in	@	844.00 ft		
Casing Schlumberger			848 ft				
Bit Size			8.75 in				
Type Fluid In Hole			LSND WBM				
MUD	Density	Viscosity	9.8 lbm/gal		45 s		
	Fluid Loss	PH	6.4 cm3		9.6		
	Source of Sample		Flowline				
RM @ Meas Temp			0.65 ohm.m	@	86.5 degF		
RMF @ Meas Temp			0.49 ohm.m	@	86.5 degF		
RMC @ Meas Temp			0.81 ohm.m	@	86.5 degF		
Source RMF	RMC		Calculated		Calculated		
RM @ BHT	RMF @ BHT		0.34	@ 171	0.26	@ 171	
Max Recorded Temperatures			171 degF				
Circulation Stopped	Time		04-Jul-2014		07:00:00		
Logger on Bottom	Time						
Unit Number	Location:		2135		Ft. Morgan, CO		
Recorded By			Aleksei Bekhterev				
Witnessed By			Charles Collver				

Disclaimer

Contents

Well Sketch



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	8.75					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	6086					
Bottom Logger (ft)	6092					
Casing						
Size (in)	9.625					
Weight (lbm/ft)	36					
Inner Diameter (in)	8.921					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	844					
Bottom Logger (ft)	848					

Operational Run Summary

Parameter (unit)	Run 1					
Date Log Started	04-Jul-2014					
Time Log Started	10:28:26					
Date Log Finished	04-Jul-2014					
Time Log Finished	12:22:43					
Top Log Interval (ft)	848.00					
Bottom Log Interval (ft)	6092.00					
Total Depth (ft)	6092.00					
Max Hole Deviation (deg)	10.05					
Azimuth of Max Deviation (deg)	218.81					
Bit Size (in)	8.750					
Logging Unit Number	2135					
Logging Unit Location	Ft. Morgan, CO					
Recorded By	Aleksei Bekhterev					
Witnessed By	Charles Collver					

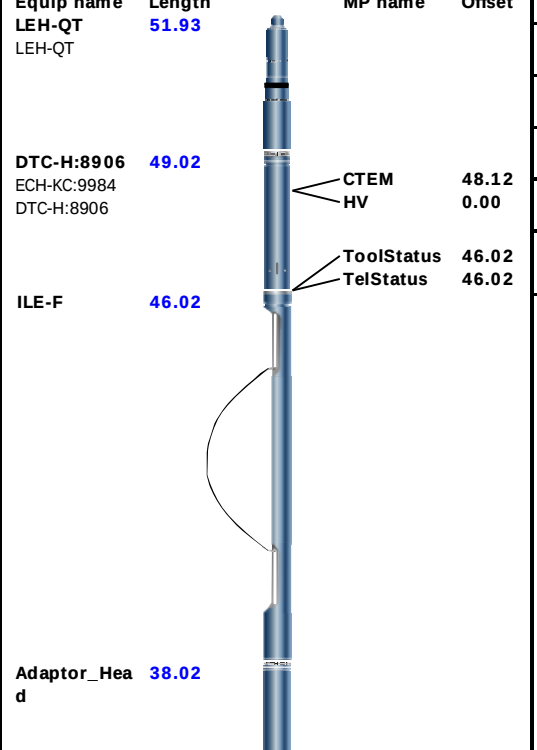
Service Order Number	CY37-00022					

Borehole Fluids

Parameter(unit)	Run 1					
Fluid Type	Water					
Fluid Name	LSND WBM					
Max Recorded Temperatures (degF)	171					
Source of Sample	Flowline					
Salinity (ppm)	2300					
Density (lbm/gal)	9.8					
Funnel Viscosity (s)	45					
Fluid Loss (cm3)	6.4					
PH	9.6					
Date/Time Circulation Stopped	04-Jul-2014 07:00:00					
Date Logger on Bottom	NaN					
Time Logger on Bottom	NaN					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degF)	0.65 @ 86.5					
RMF @ Meas Temp (ohm.m@degF)	0.49 @ 86.5					
RMC @ Meas Temp (ohm.m@degF)	0.81 @ 86.5					
RM @ BHT (ohm.m@degF)	0.34 @ 171					
RMF @ BHT (ohm.m@degF)	0.26 @ 171					
RMC @ BHT (ohm.m@degF)	0.43 @ 171					
Total Solid (%)						
High Gravity Solids (%)						

Remarks and Equipment Summary

Run 1: Toolstring



Run 1: Remarks

- This is subsequent trip in the well
- Toolstring ran as per toolsketch
- ILE-F used as a weight bar without bow-spring
- Survey data provided by client
- Rig: H&P 322
- Crew: Jeff Schossow, Derrick Hunter, Aleksei Bekhterev

SGT-N:10386 **30.02**
SGH-K:3164
SGC-TB:10386
SGD-TAA:21892

GR **29.1**

PPC-B:8437 **24.52**
PPC-B:8437

PPC-B Calipers **23.37**

AH-184 **18.00**

AIT-M:208 **16.00**
AMIS:208
AMRM:208

Power Supply **7.91**
Induction **7.91**
Temperature **7.91**

SP **0.08**
Mud Resistivity **0.00**
Head Tension
TOOL_ZERO

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

	Run 1		
Depth Measuring Device			
Type	IDW-B		

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

Tension Device

Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		

Logging Cable

Type	7-46NT-XS		
Serial Number			
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type	Land Rig		

Run 1:Depth Control Parameters

Log Sequence	First Log In the Well
Rig Up Length At Surface	
Rig Up Length At Bottom	
Rig Up Length Correction	
Stretch Correction	
Tool Zero Check At Surface	

Depth Control Remarks

All Schlumbereger depth policies followed

IDW used as primary depth device

Z-chart used as secondary depth reference

Survey Record

Survey Calculation

Method :	Minimum Radius of Curvature	DLS Method :	Lubinski
North Reference :	True North	Total Correction Formula :	Magnetic Dec

Rig Location

Latitude :	40.510480 degrees	Longitude :	-104.45086 degrees

Tie In Point

Measured Depth:	0.00 ft	Inclination:	0.00 deg	Azimuth:	0.00 deg
True Vertical Depth:	0.00 ft	North Displacement:	0.00 ft	East Displacement:	0.00 ft

Survey Quality Index

9 : Manual

28 : Tie-In Point

Survey Correction Index

0 : No correction

Survey Description Index

0 : Not Flagged Survey

Seq	MD (ft)	Incl (deg)	Azim (deg)	Course (ft)	TVD (ft)	V Sec (ft)	N/ -S (ft)	E/ -W (ft)	Closure (ft)	at Azim (deg)	DLS deg/100ft	Tool Type	QI	CI	DI
1	0.00	0.00	0.00	- - - -	0.00	0.00	0.00	0.00	0.00	90.00	0.00	TIP	28	0	0
2	300.00	0.20	61.67	300.00	300.00	0.25	0.25	0.46	0.52	61.67	0.07	Other	9	0	0
3	600.00	0.30	77.27	300.00	600.00	0.67	0.67	1.69	1.80	68.35	0.04	Other	9	0	0
4	841.00	0.40	312.57	241.00	840.99	1.38	1.38	1.68	2.17	50.70	0.26	Other	9	0	0
5	917.00	0.26	275.03	76.00	916.99	1.57	1.57	1.32	2.07	39.93	0.33	Other	9	0	0
6	1103.00	0.59	257.57	186.00	1102.99	1.40	1.40	-0.04	1.41	358.41	0.19	Other	9	0	0
7	1196.00	0.56	246.10	93.00	1195.98	1.12	1.12	-0.92	1.44	320.44	0.13	Other	9	0	0
8	1289.00	0.59	254.70	93.00	1288.98	0.81	0.81	-1.80	1.97	294.13	0.10	Other	9	0	0
9	1382.00	0.73	259.01	93.00	1381.97	0.57	0.57	-2.84	2.89	281.27	0.16	Other	9	0	0
10	1475.00	0.57	257.43	93.00	1474.97	0.35	0.35	-3.88	3.90	275.20	0.17	Other	9	0	0
11	1569.00	0.46	240.27	94.00	1568.96	0.06	0.06	-4.66	4.66	270.79	0.20	Other	9	0	0
12	1664.00	0.34	260.74	95.00	1663.96	-0.17	-0.17	-5.27	5.28	268.15	0.19	Other	9	0	0
13	1759.00	0.58	263.42	95.00	1758.96	-0.27	-0.27	-6.03	6.04	267.43	0.25	Other	9	0	0

14	1853.00	1.67	281.89	94.00	1852.94	-0.04	-0.04	-7.84	7.84	269.69	1.21	Other	9	0	0
15	1948.00	3.11	252.16	95.00	1947.86	-0.55	-0.55	-11.65	11.65	267.31	1.95	Other	9	0	0
16	2043.00	4.39	241.47	95.00	2042.65	-3.07	-3.07	-17.29	17.55	259.92	1.53	Other	9	0	0
17	2138.00	4.80	232.01	95.00	2137.35	-7.26	-7.26	-23.62	24.70	252.92	0.91	Other	9	0	0
18	2233.00	5.80	222.95	95.00	2231.94	-13.22	-13.22	-30.02	32.81	246.24	1.37	Other	9	0	0
19	2327.00	6.48	218.74	94.00	2325.40	-20.83	-20.83	-36.58	42.09	240.34	0.87	Other	9	0	0
20	2422.00	7.88	220.43	95.00	2419.66	-29.97	-29.97	-44.16	53.38	235.84	1.49	Other	9	0	0
21	2517.00	9.22	218.05	95.00	2513.60	-40.92	-40.92	-53.07	67.03	232.37	1.46	Other	9	0	0
22	2611.00	9.34	219.89	94.00	2606.37	-52.70	-52.70	-62.61	81.82	229.91	0.34	Other	9	0	0
23	2706.00	9.04	219.98	95.00	2700.15	-64.34	-64.34	-72.35	96.82	228.35	0.32	Other	9	0	0
24	2800.00	9.80	220.84	94.00	2792.88	-76.05	-76.05	-82.32	112.07	227.27	0.82	Other	9	0	0
25	2895.00	10.05	218.81	95.00	2886.46	-88.62	-88.62	-92.80	128.31	226.32	0.45	Other	9	0	0
26	2990.00	9.91	218.70	95.00	2980.02	-101.46	-101.46	-103.11	144.65	225.46	0.15	Other	9	0	0
27	3084.00	8.92	220.16	94.00	3072.75	-113.35	-113.35	-112.87	159.97	224.88	1.08	Other	9	0	0
28	3179.00	9.49	220.90	95.00	3166.53	-124.89	-124.89	-122.75	175.10	224.50	0.61	Other	9	0	0
29	3274.00	8.53	221.67	95.00	3260.36	-136.08	-136.08	-132.56	189.96	224.25	1.02	Other	9	0	0
30	3369.00	6.83	227.82	95.00	3354.50	-145.13	-145.13	-141.43	202.66	224.26	1.99	Other	9	0	0
31	3464.00	5.06	220.34	95.00	3448.99	-152.12	-152.12	-148.33	212.47	224.28	2.03	Other	9	0	0
32	3559.00	4.49	213.96	95.00	3543.66	-158.40	-158.40	-153.12	220.31	224.03	0.82	Other	9	0	0
33	3653.00	3.97	217.26	94.00	3637.40	-164.04	-164.04	-157.14	227.17	223.77	0.61	Other	9	0	0
34	3748.00	4.81	216.31	95.00	3732.12	-169.87	-169.87	-161.49	234.38	223.55	0.89	Other	9	0	0
35	3843.00	5.40	214.36	95.00	3826.75	-176.77	-176.77	-166.37	242.75	223.27	0.65	Other	9	0	0
36	3938.00	4.61	209.20	95.00	3921.38	-183.79	-183.79	-170.76	250.89	222.90	0.96	Other	9	0	0
37	4033.00	3.18	196.26	95.00	4016.16	-189.65	-189.65	-173.36	256.96	222.43	1.76	Other	9	0	0
38	4127.00	1.70	176.54	94.00	4110.08	-193.55	-193.55	-174.01	260.27	221.96	1.79	Other	9	0	0
39	4222.00	1.08	109.37	95.00	4205.06	-195.25	-195.25	-173.08	260.93	221.55	1.71	Other	9	0	0
40	4317.00	0.69	108.78	95.00	4300.04	-195.73	-195.73	-171.69	260.37	221.26	0.41	Other	9	0	0
41	4412.00	1.77	129.43	95.00	4395.02	-196.85	-196.85	-170.01	260.10	220.82	1.21	Other	9	0	0
42	4507.00	1.27	132.56	95.00	4489.99	-198.49	-198.49	-168.11	260.10	220.26	0.53	Other	9	0	0
43	4602.00	1.76	93.23	95.00	4584.96	-199.29	-199.29	-165.87	259.28	219.77	1.18	Other	9	0	0
44	4696.00	0.56	45.65	94.00	4678.94	-199.05	-199.05	-164.10	257.97	219.50	1.53	Other	9	0	0
45	4790.00	1.24	81.97	94.00	4772.92	-198.58	-198.58	-162.77	256.76	219.34	0.91	Other	9	0	0
46	4885.00	1.62	84.74	95.00	4867.90	-198.32	-198.32	-160.41	255.09	218.97	0.41	Other	9	0	0
47	4980.00	1.48	32.50	95.00	4962.86	-197.16	-197.16	-158.42	252.92	218.78	1.44	Other	9	0	0
48	5075.00	1.07	29.57	95.00	5057.84	-195.35	-195.35	-157.32	250.82	218.85	0.44	Other	9	0	0
49	5169.00	0.79	334.36	94.00	5151.83	-194.00	-194.00	-157.17	249.67	219.01	0.95	Other	9	0	0
50	5264.00	0.91	327.44	95.00	5246.82	-192.78	-192.78	-157.86	249.15	219.31	0.17	Other	9	0	0
51	5358.00	0.91	309.37	94.00	5340.81	-191.68	-191.68	-158.84	248.95	219.65	0.30	Other	9	0	0
52	5453.00	0.72	301.11	95.00	5435.80	-190.89	-190.89	-159.93	249.02	219.96	0.23	Other	9	0	0
53	5548.00	0.25	86.66	95.00	5530.80	-190.57	-190.57	-160.23	248.98	220.06	0.99	Other	9	0	0
54	5643.00	0.98	116.22	95.00	5625.79	-190.92	-190.92	-159.30	248.65	219.84	0.81	Other	9	0	0
55	5738.00	0.49	138.91	95.00	5720.78	-191.58	-191.58	-158.30	248.52	219.57	0.59	Other	9	0	0
56	5833.00	1.11	141.20	95.00	5815.77	-192.60	-192.60	-157.46	248.79	219.27	0.65	Other	9	0	0
57	5928.00	0.98	151.73	95.00	5910.76	-194.04	-194.04	-156.50	249.28	218.89	0.24	Other	9	0	0
58	6023.00	0.58	173.44	95.00	6005.75	-195.23	-195.23	-156.06	249.93	218.64	0.52	Other	9	0	0

Run 1

2" Induction

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	777.33	ft3

Software Version

Acquisition System	Version
MaxWell	4.0.9163.3000
Application Patch	Patch-SP-10767_18214-4.0.9163.3001
	Patch-Hotfix_Task_Tree_GDI_SP2-20806-4.0.9434.3002

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	4.0.9433.3000

Tool Elements	Description	Software Version	Firmware Version
AMIS	Array Induction Sonde - M	4.0.9427.3000	1
SGC-TB	Scintillation Gamma Cartridge	4.0.9360.3000	

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Run 1	Main[3]:Up	Up	64.12 ft	6095.03 ft	04-Jul-2014 11:18:09 AM	04-Jul-2014 12:20:48 PM	ON	-3.42 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Noble Energy Inc Well:NCLP AA06-62-1AHNC

Run 1: Main[3]:Up:S011

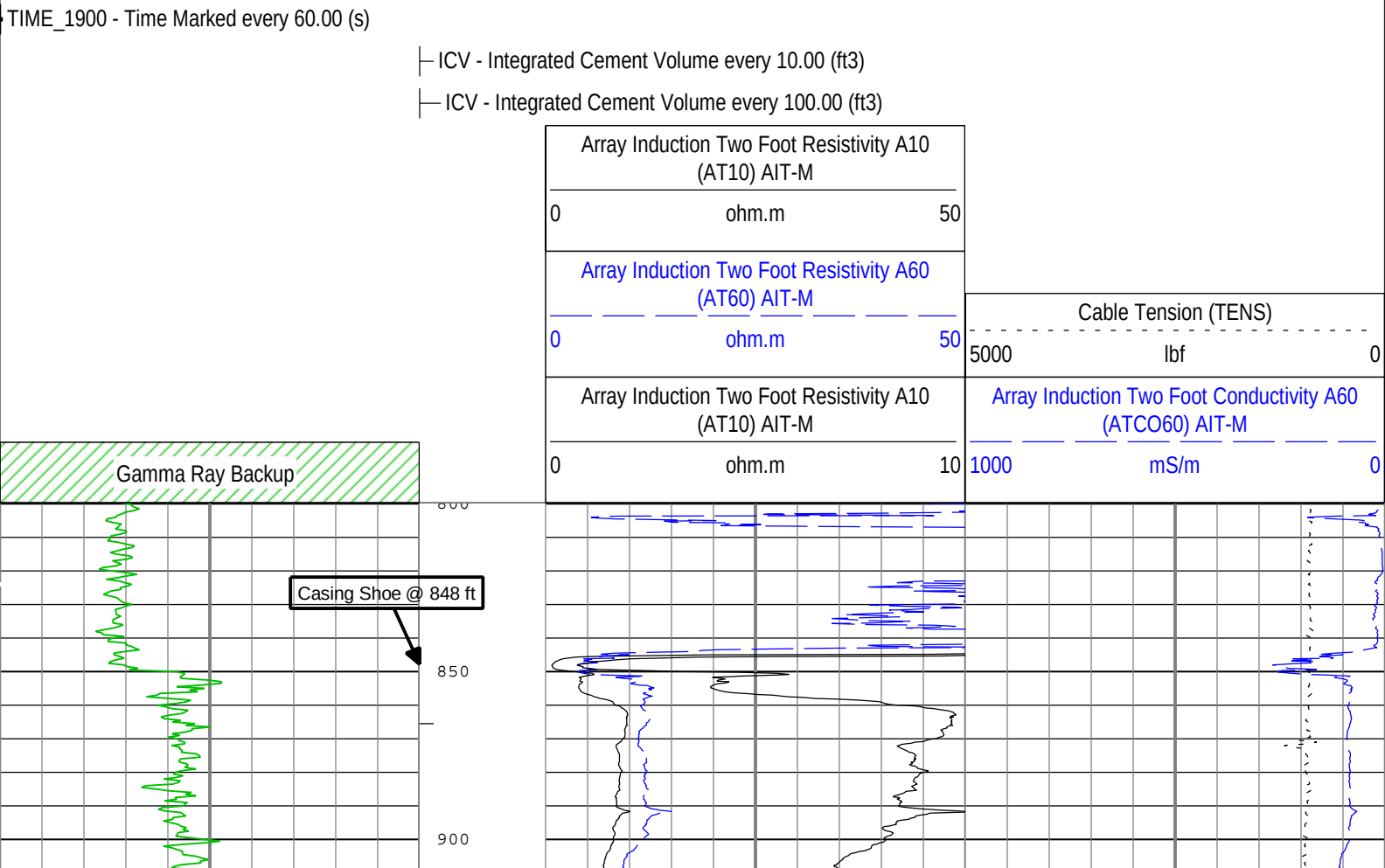
Description: AIT Basic Log Two Format: Log (Import of Kerr McGee 2in Induction) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jul-2014 13:13:37

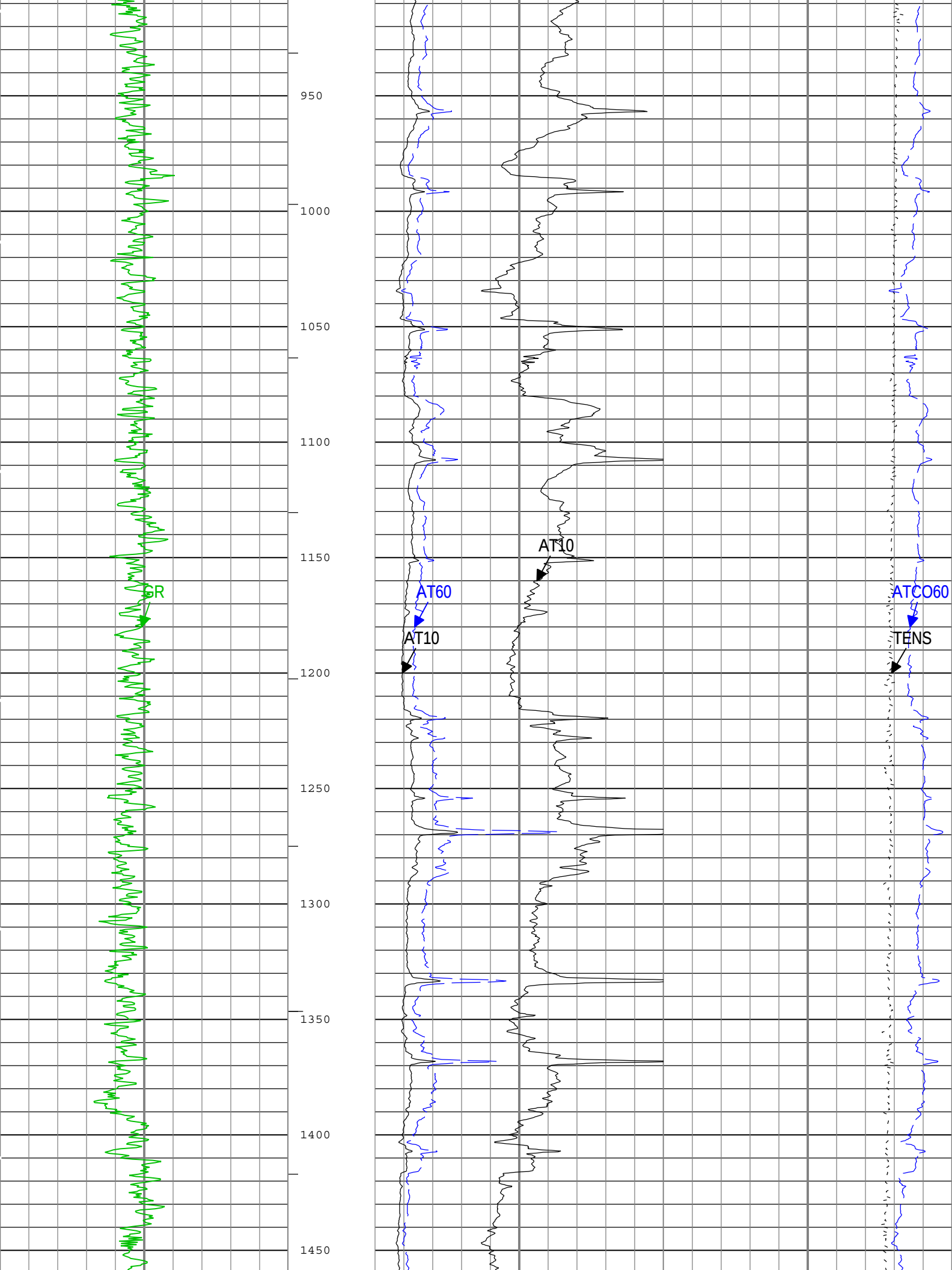
Channel	Source	Sampling
AT10	AIT-M:AMIS:AMIS	3in
AT60	AIT-M:AMIS:AMIS	3in
ATCO60	AIT-M:AMIS:AMIS	3in
GR	SGT-N:SGT-N:SGC-TB	6in
ICV	Borehole	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

TIME_1900 - Time Marked every 60.00 (s)

ICV - Integrated Cement Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

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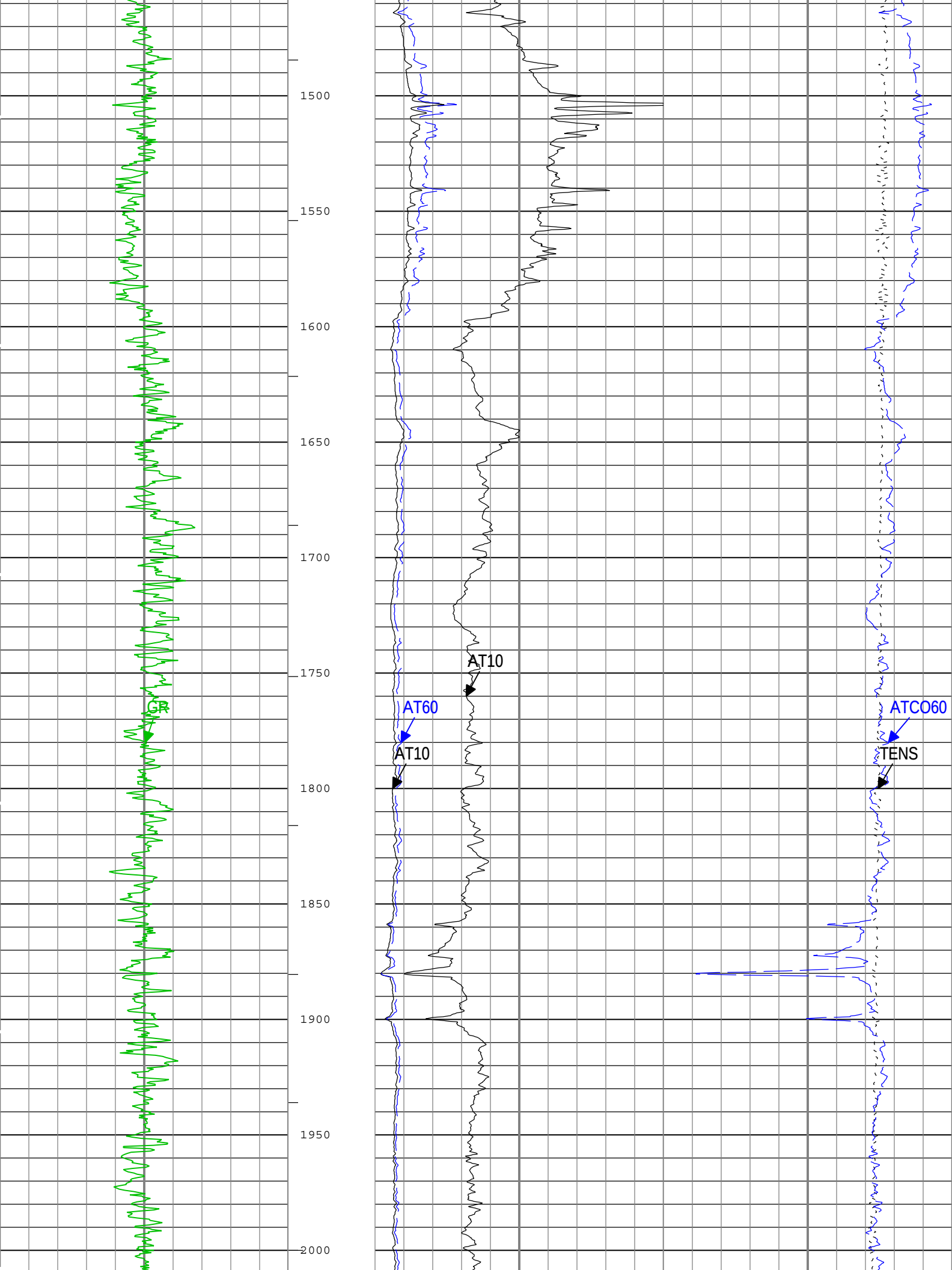
GR
AT60
AT10
AT10
ATCO60
TENS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1900
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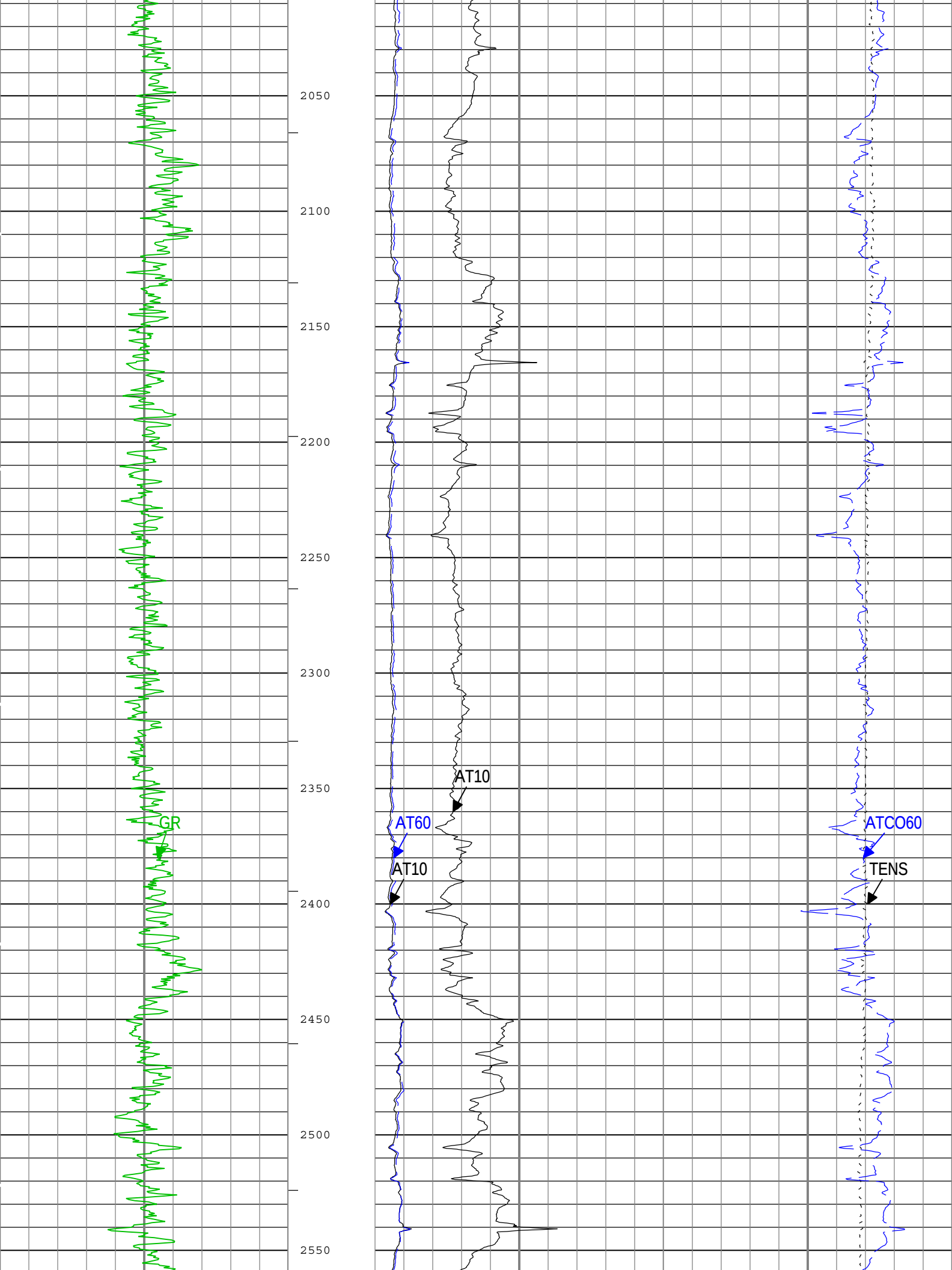
GR
AT10
AT60
AT10
ATCO60
TENS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2300
2350
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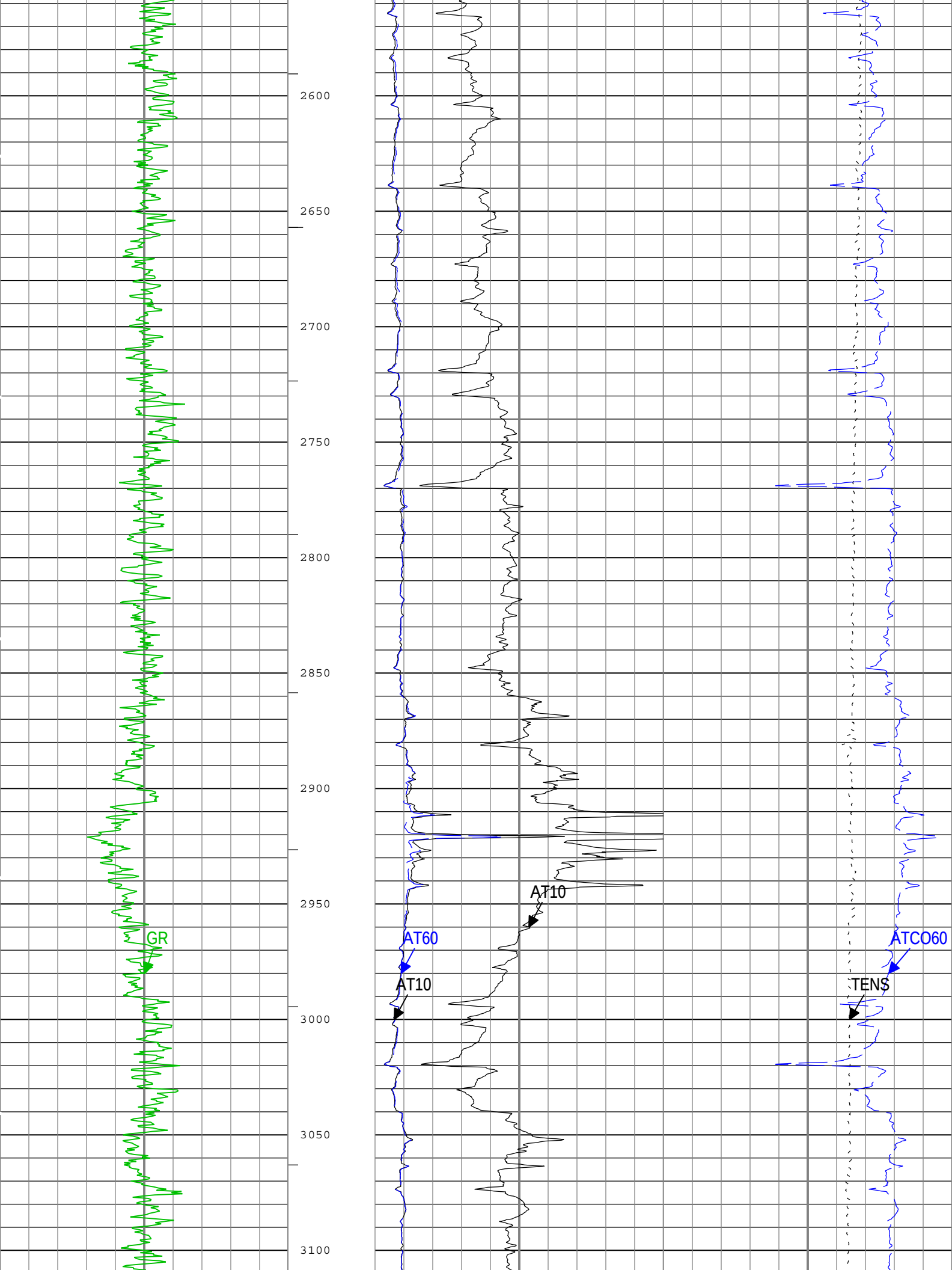
2450
2500
2550
GR
AT10
AT60
AT10
ATCO60
TENS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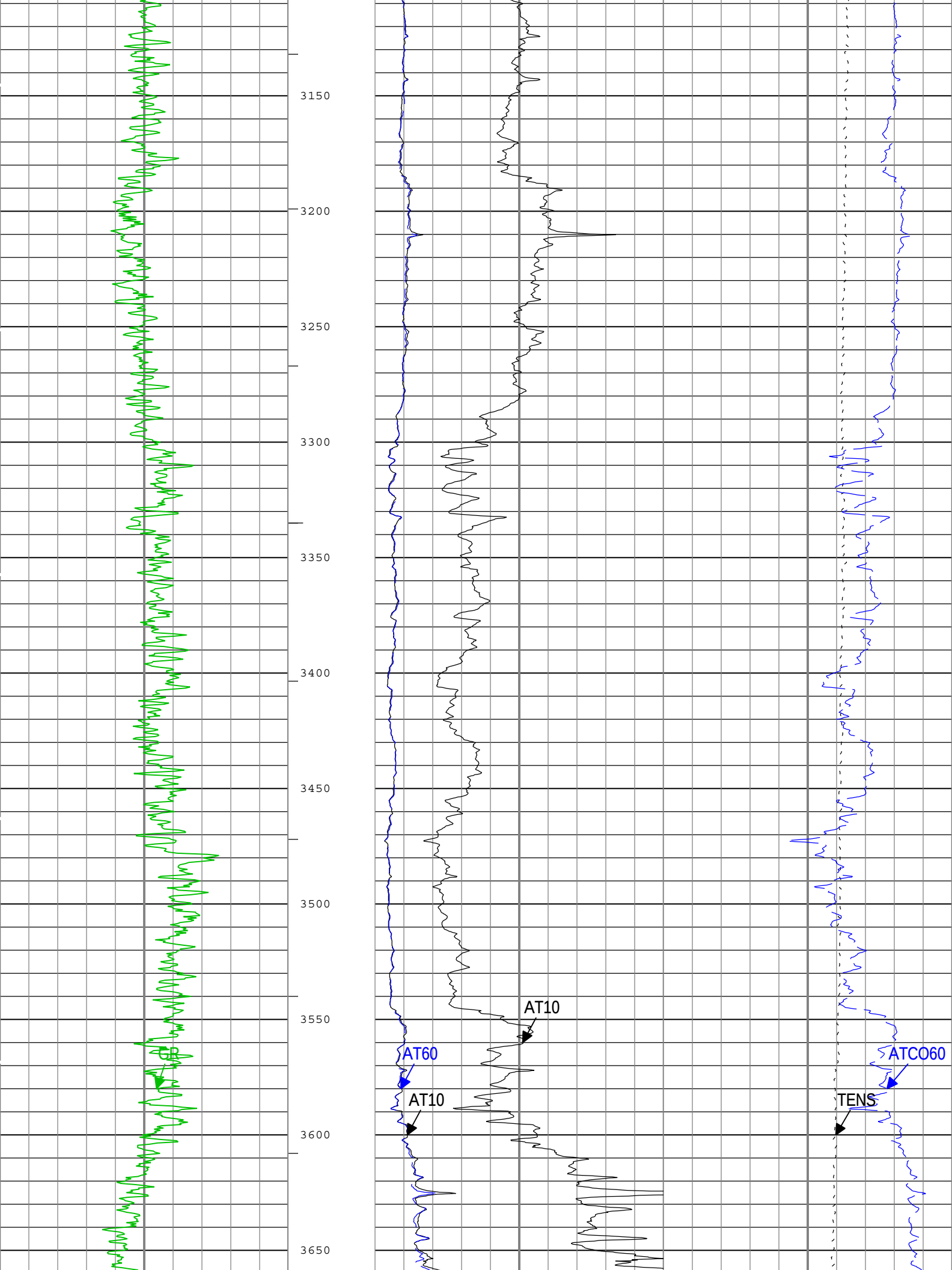
3000
3050
3100
GR
AT60
AT10
AT10
ATCO60
TENS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3250
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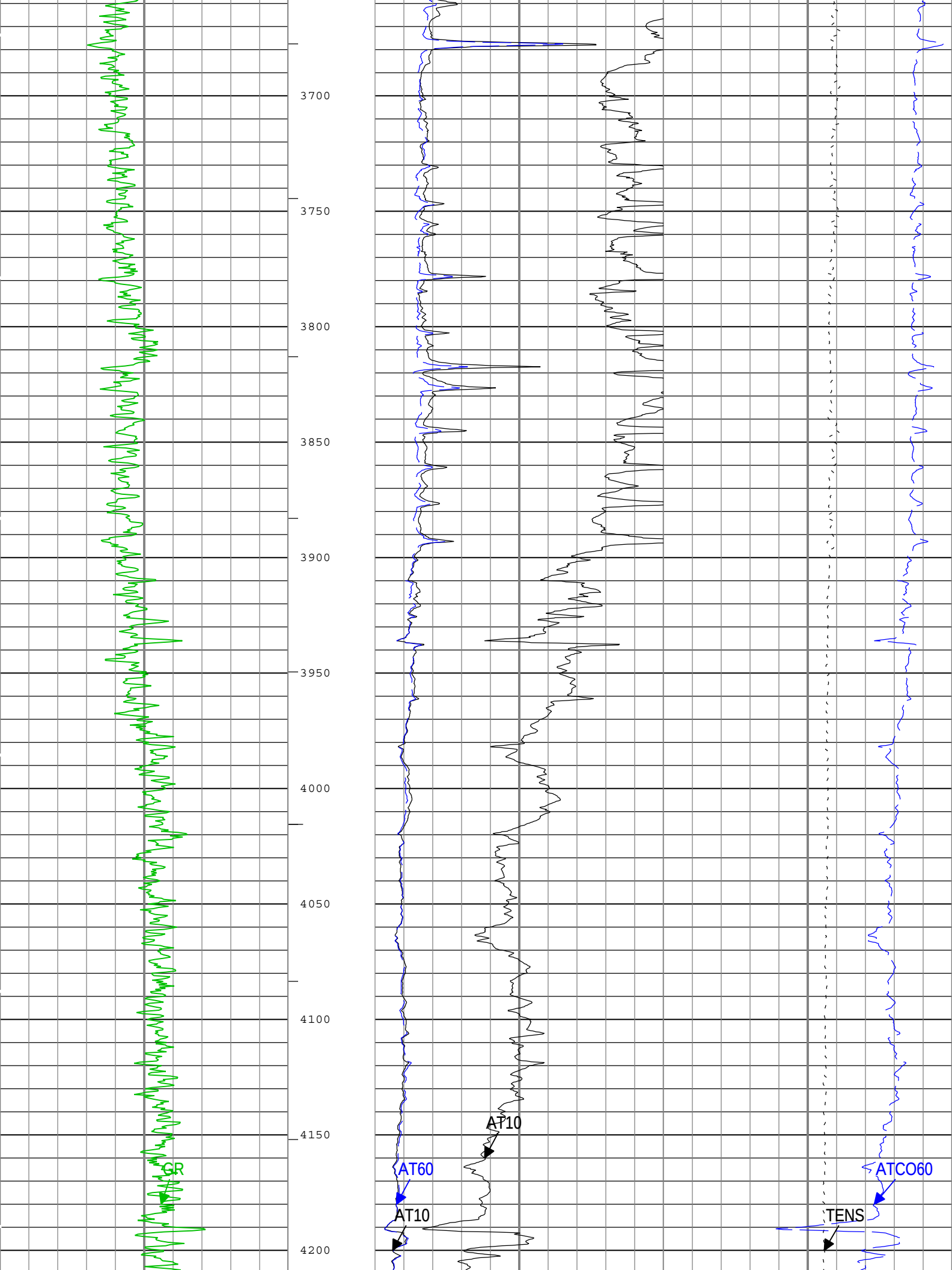
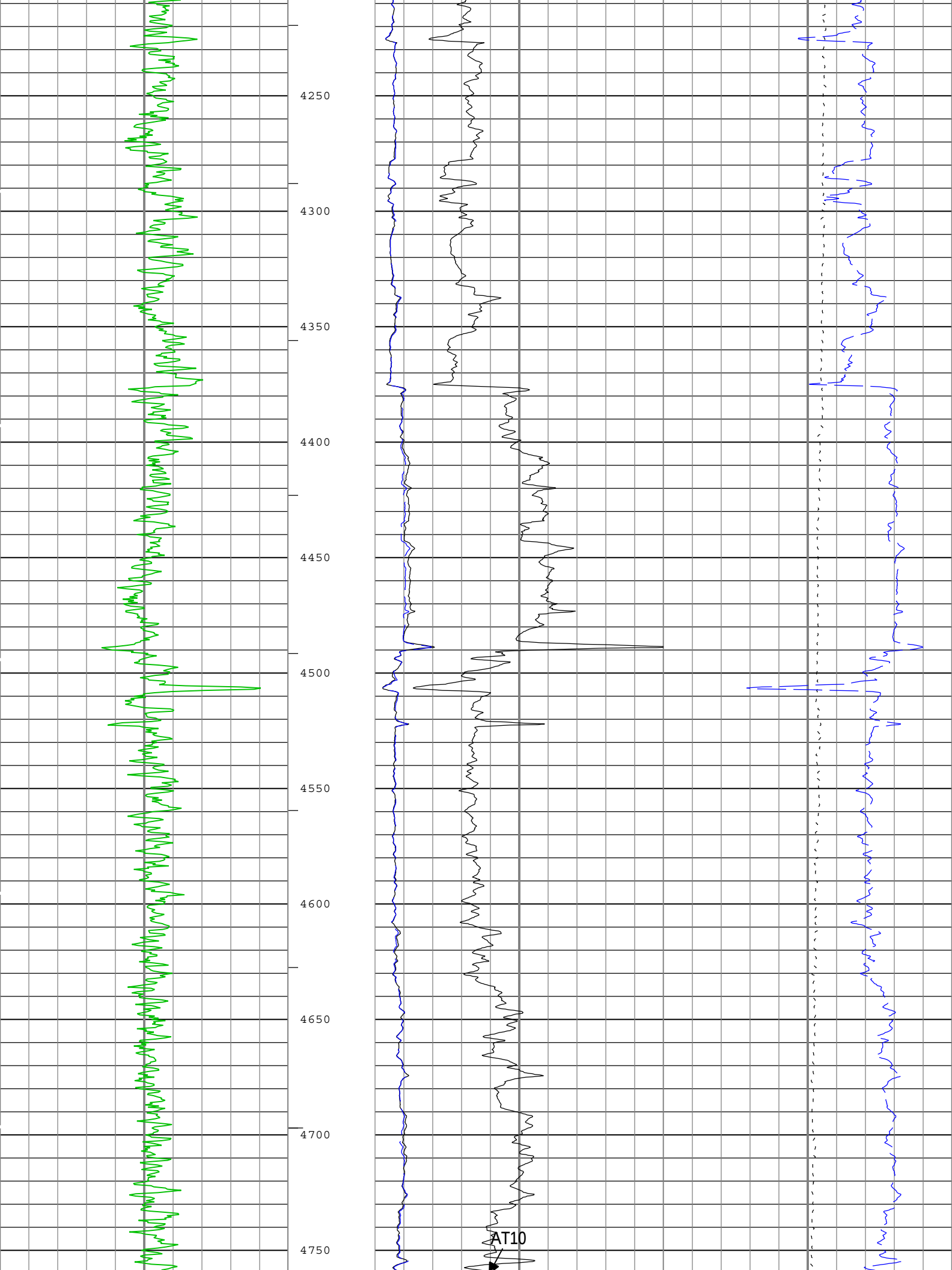
3600
3650
GR
AT10
AT60
AT10
TENS
ATCO60


3700
3750
3800
3850
3900
3950
4000
4050
4100
4150
4200
GR
AT60
AT10
AT10
ATCO60
TENS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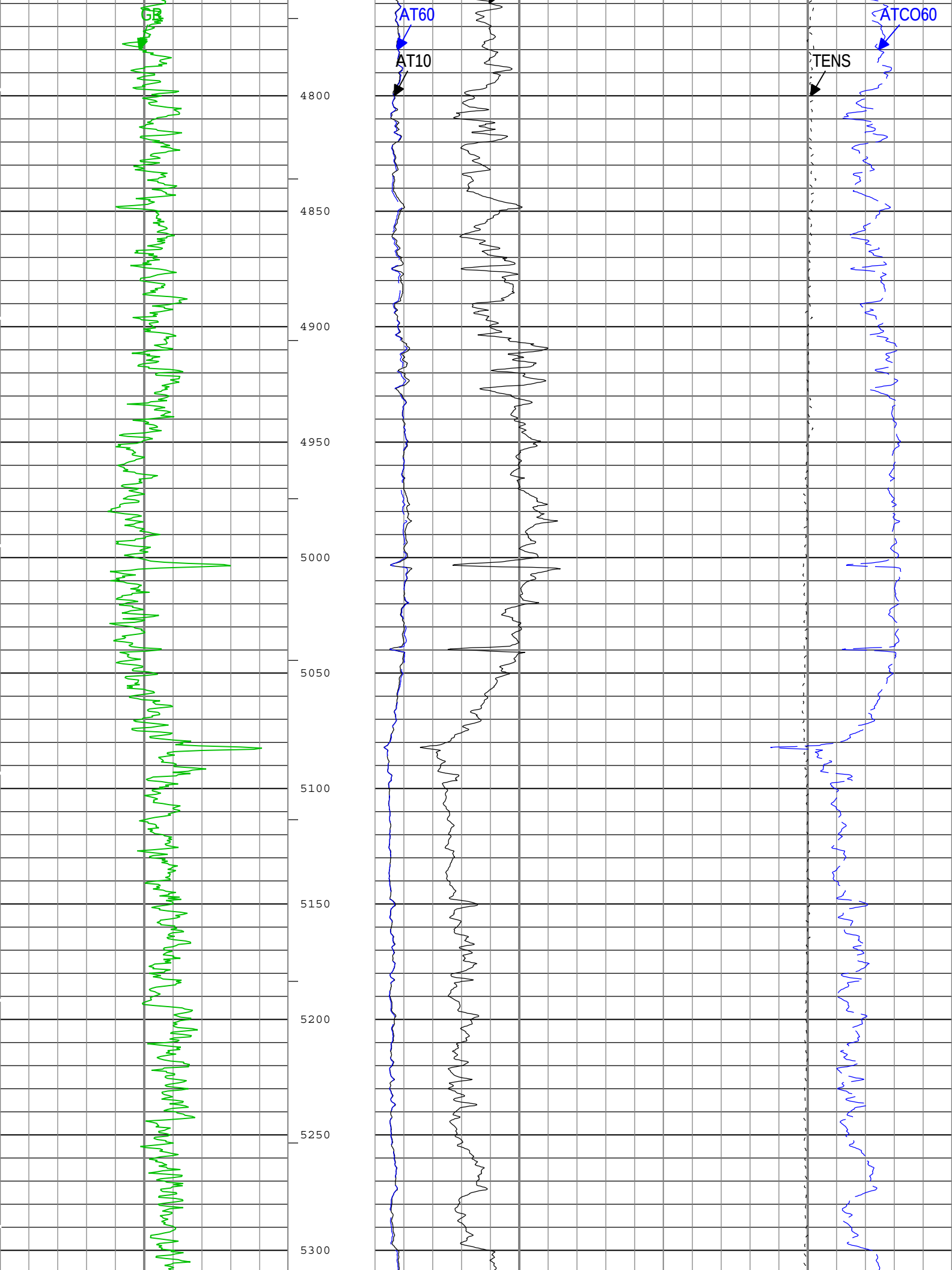
4750
AT10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AT60
AT10
ATCO60
TENS
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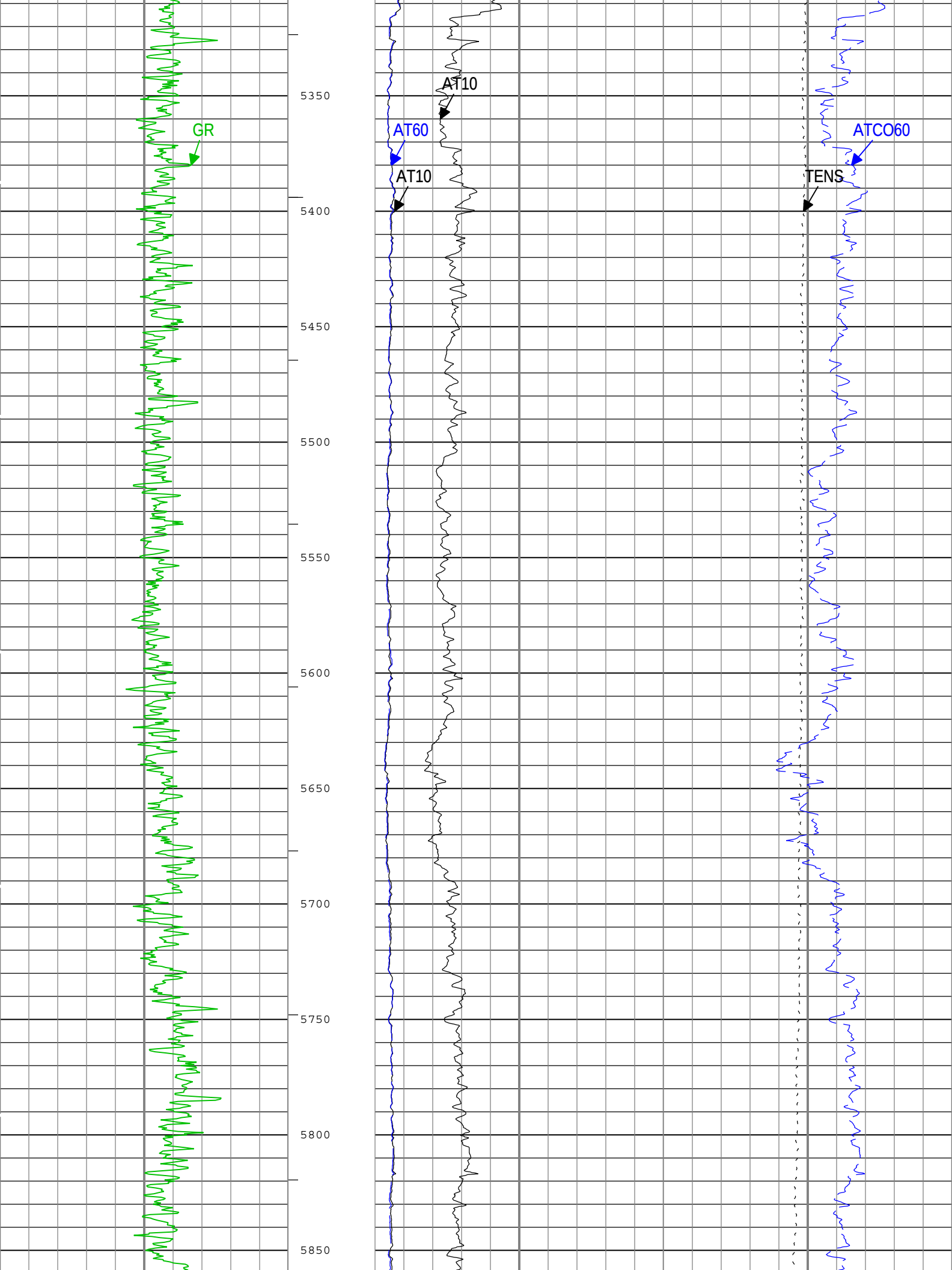
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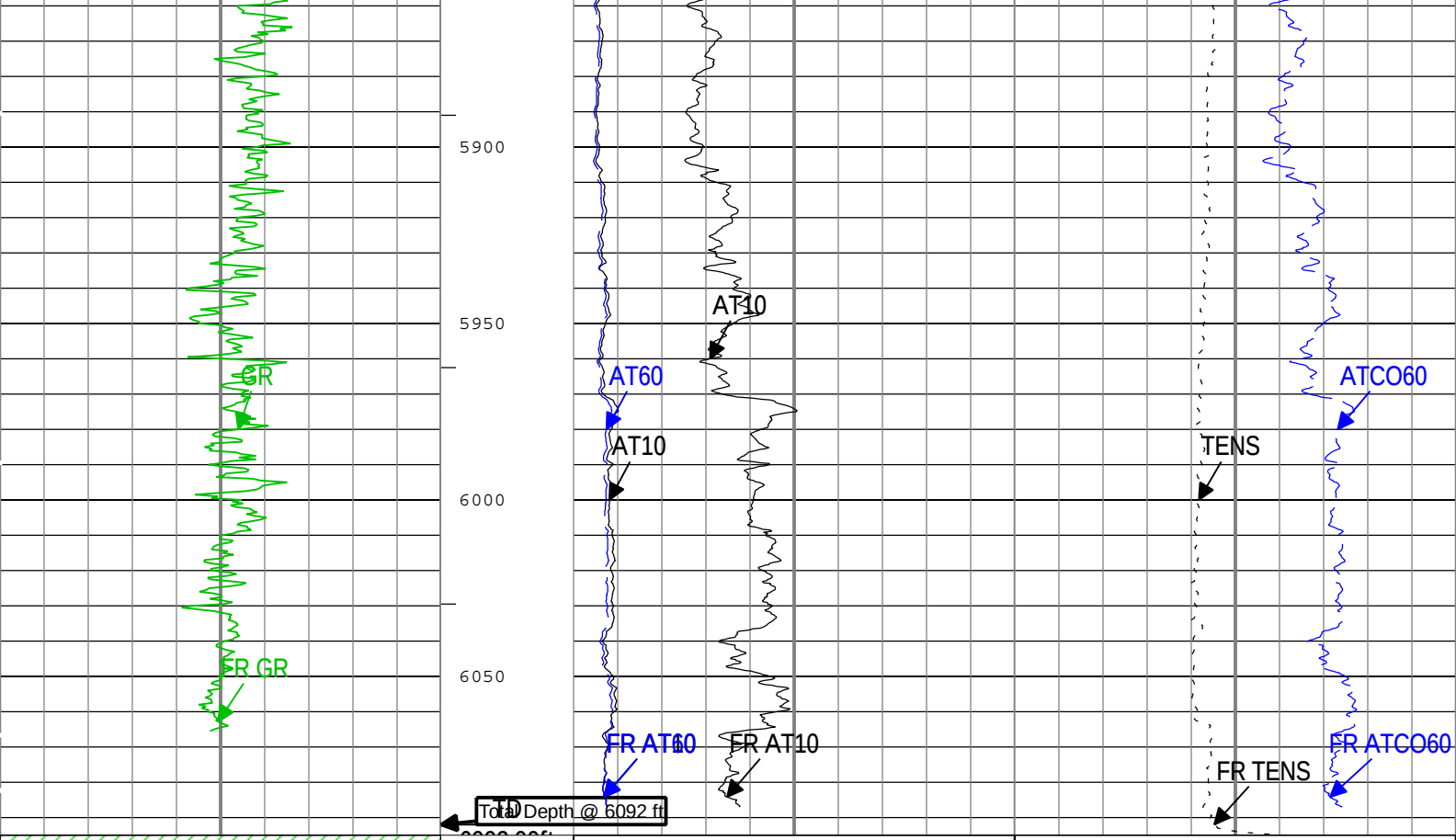


ICV - Integrated Cement Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

Description: AIT Basic Log Two Format: Log (Import of Kerr McGee 2in Induction) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jul-2014 13:13:37

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ACDE	Array Induction Casing Detection Enable	AIT-M	No	
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	8.75	in
CBLO	Casing Bottom (Logger)	WLSESSION	848	ft
CDEN	Cement Density	SGT-N	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DFD	Drilling Fluid Density	Borehole	9.8	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	HD1	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
TPOS	Tool Position: Centered or Eccentered	SGT-N	Centered	

Tool Control Parameters

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

Run 1

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	777.33	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	2179.3	ft3

Software Version

Acquisition System	Version
MaxWell	4.0.9163.3000
Application Patch	Patch-SP-10767_18214-4.0.9163.3001
	Patch-Hotfix_Task_Tree_GDI_SP2-20806-4.0.9434.3002

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	4.0.9433.3000

Tool Elements	Description	Software Version	Firmware Version
AMIS	Array Induction Sonde - M	4.0.9427.3000	1
SGC-TB	Scintillation Gamma Cartridge	4.0.9360.3000	

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Run 1	Main[3]:Up	Up	64.12 ft	6095.03 ft	04-Jul-2014 11:18:09 AM	04-Jul-2014 12:20:48 PM	ON	-3.42 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Noble Energy Inc Well:NCLP AA06-62-1AHNC

Run 1: Main[3]:Up:S011

Description: AIT Basic Log Two Format: Log (KM 5in Induction Upper) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jul-2014 13:13:38

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	SGT-N:SGT-N:SGC-TB	6in
ICV	Borehole	6in
IHV	Borehole	6in
INCL	WLWorkflow	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)

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)

5000 lbf 0

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

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A10 (AT10) 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 A20 (AT20) AIT-M

0.2 ohm.m 2000

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

0.2 ohm.m 2000

Hole inclination (INCL)

0 deg 10

Gamma Ray (GR) SGT-N

0 gAPI 150

Spontaneous Potential (SP) AIT-M

-80 mV 20

840

850

Casing Shoe @ 848 ft

860

870

880

890

900

910

920

930

940

950

960

970

SP

GR

INCL

AT30

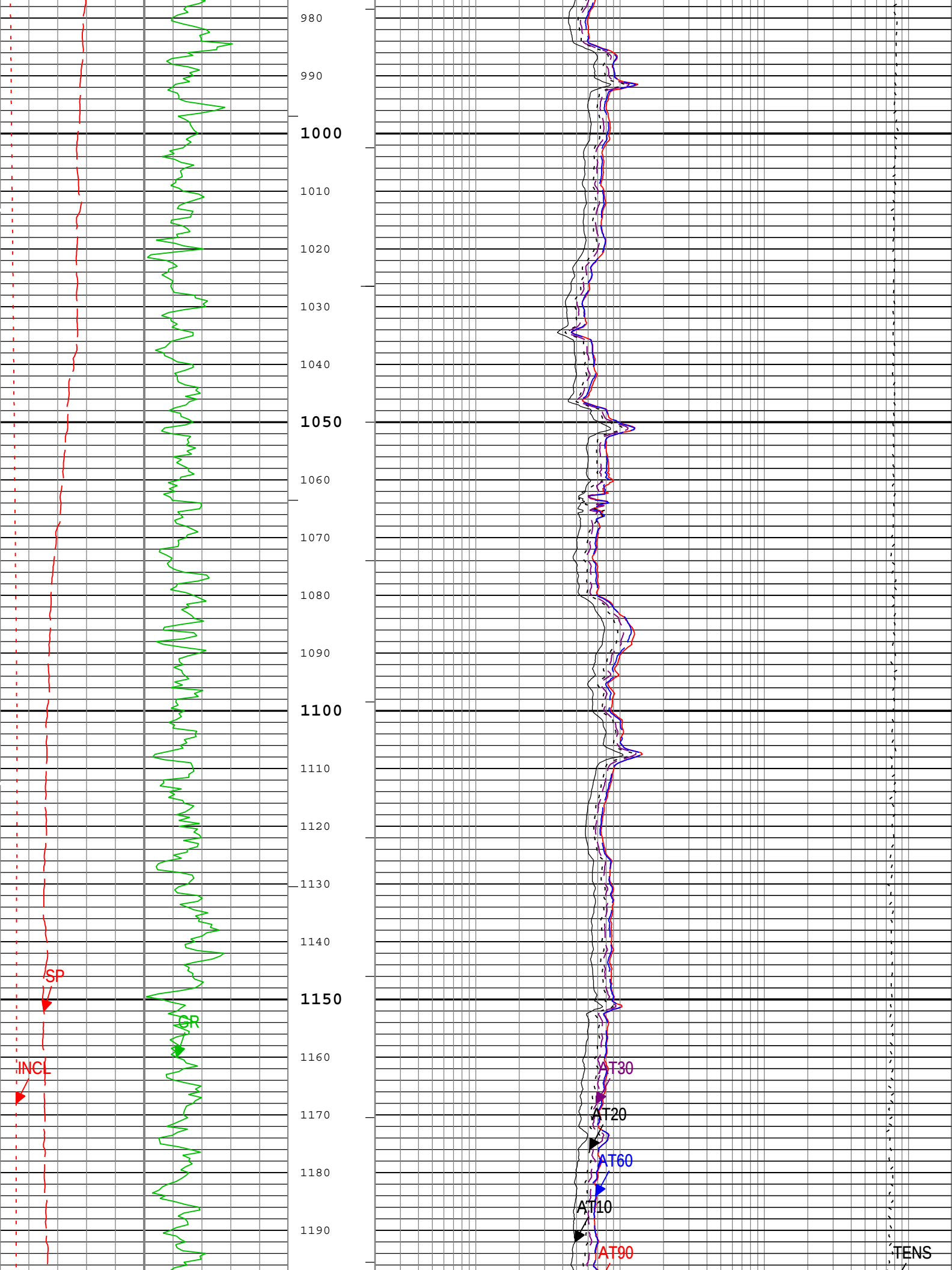
AT20

AT60

AT10

AT90

TENS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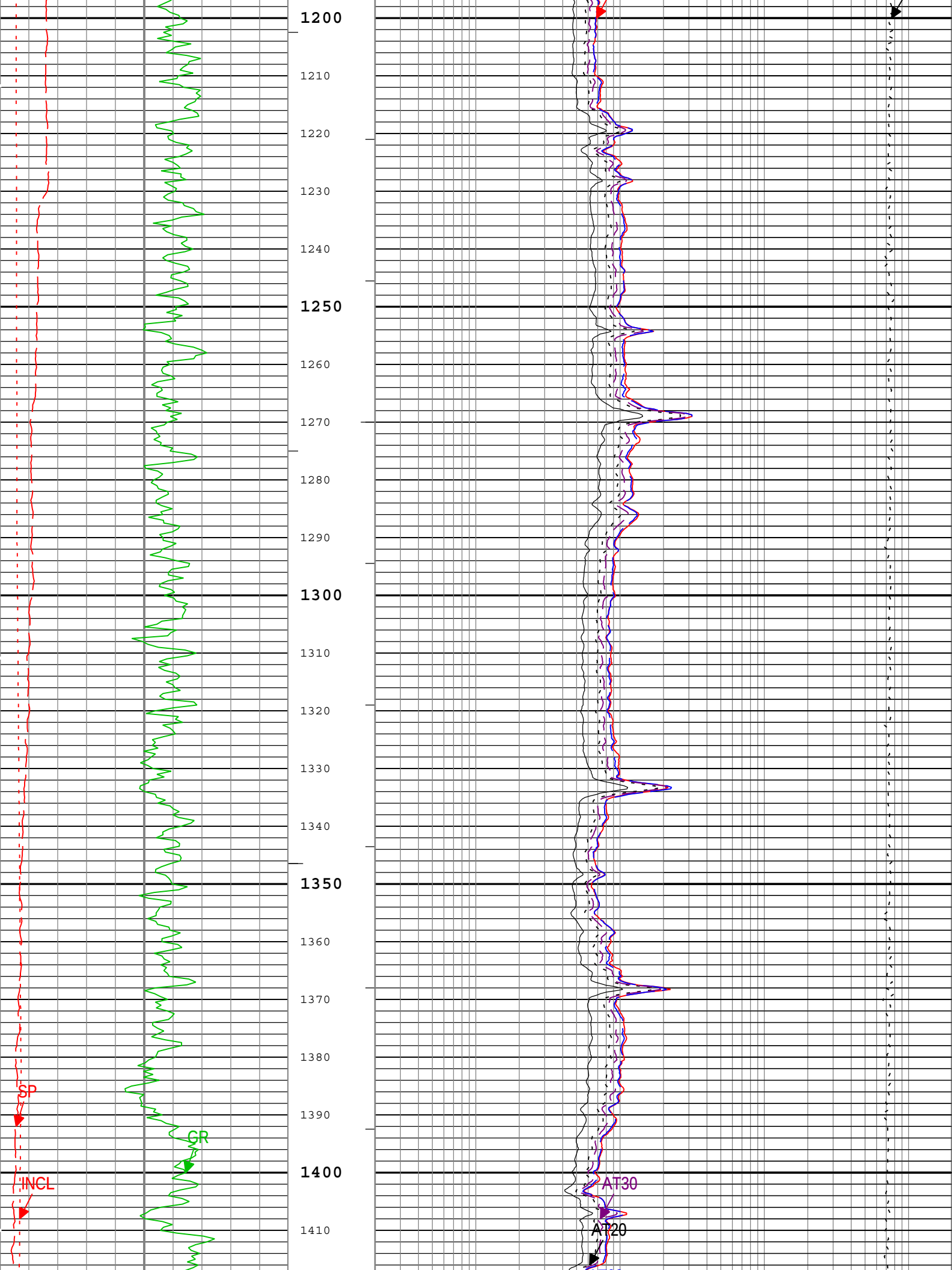
AT30
AT20
AT60
AT10
AT90
TENS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AT30
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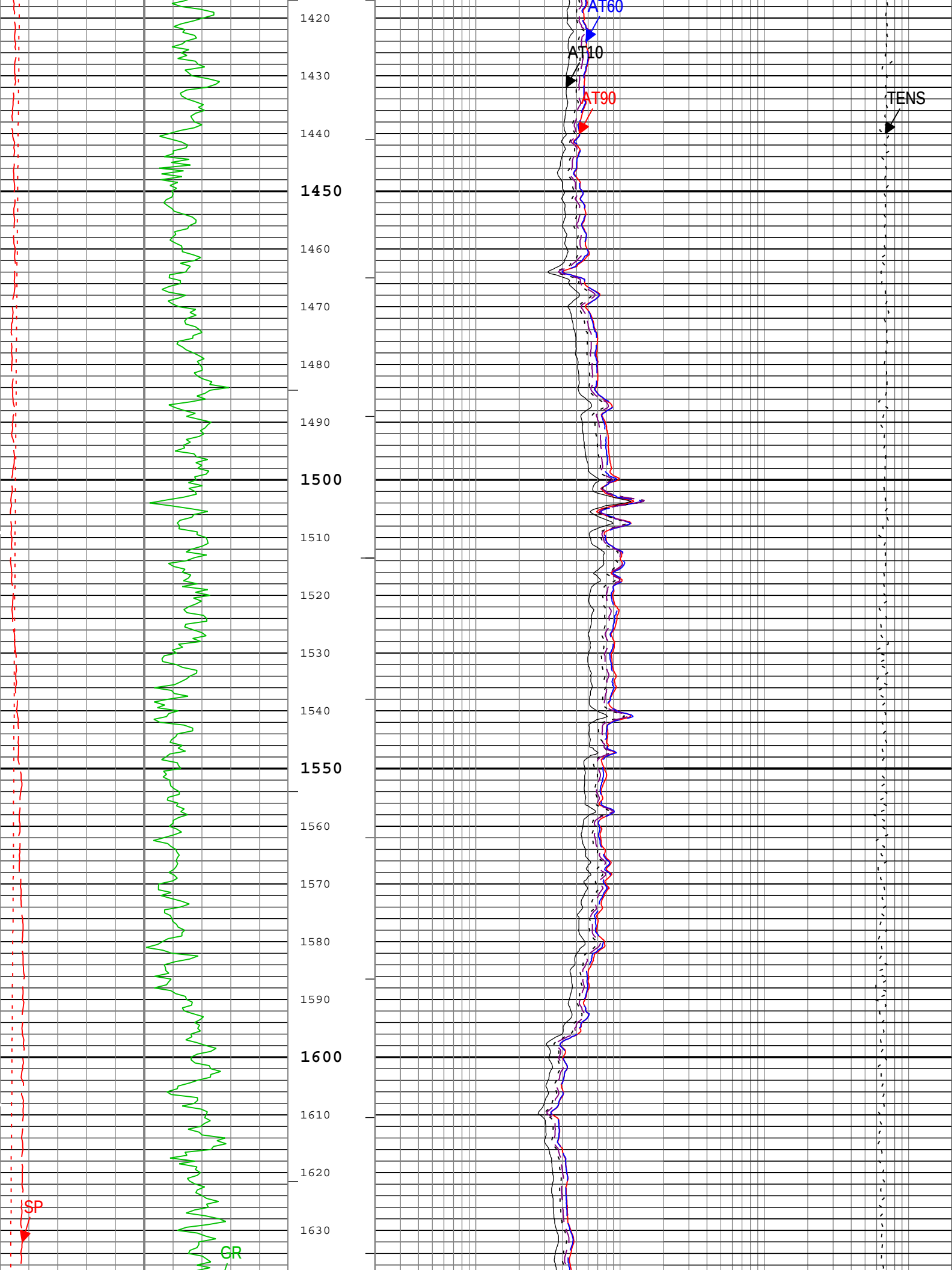
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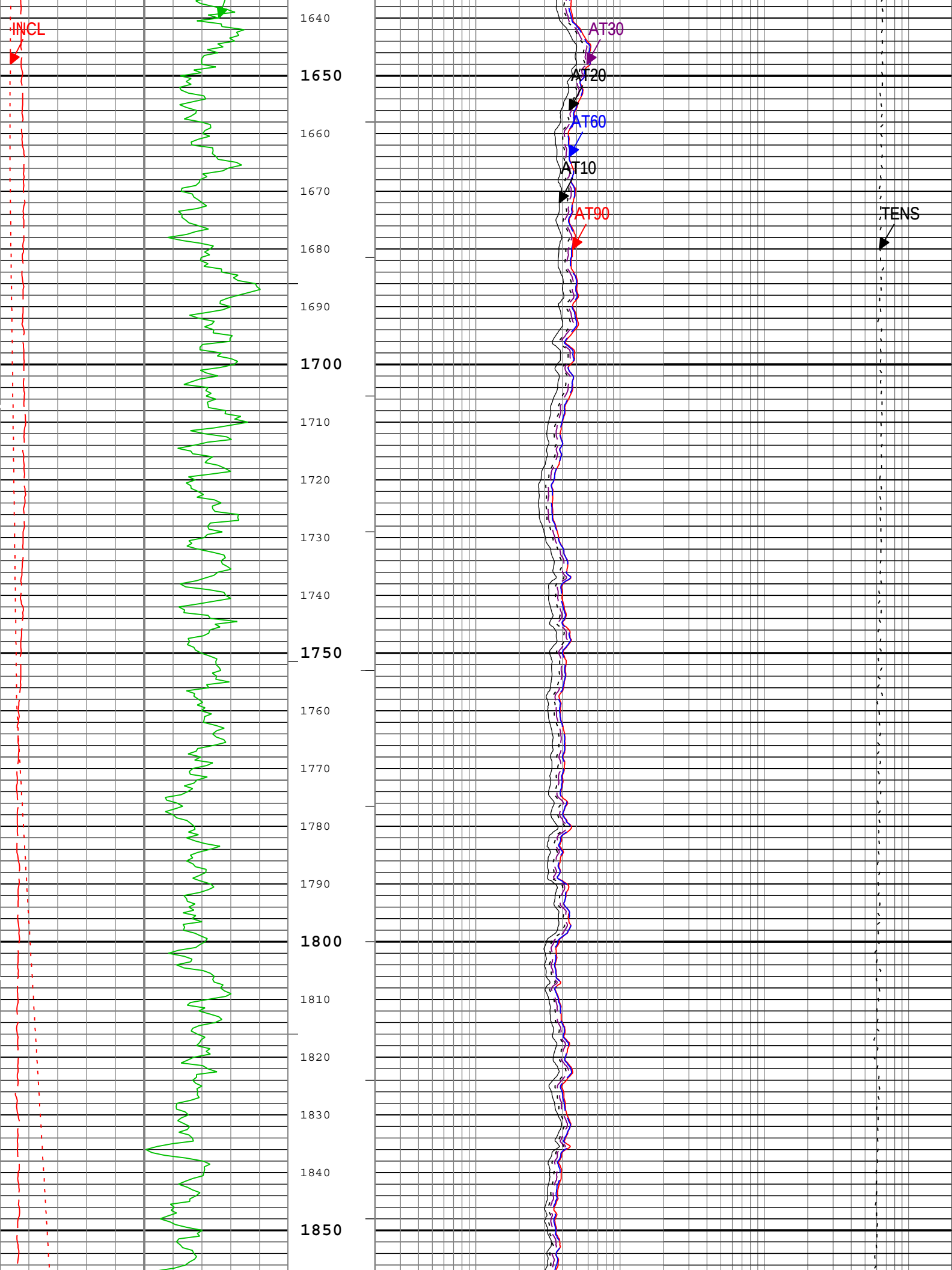
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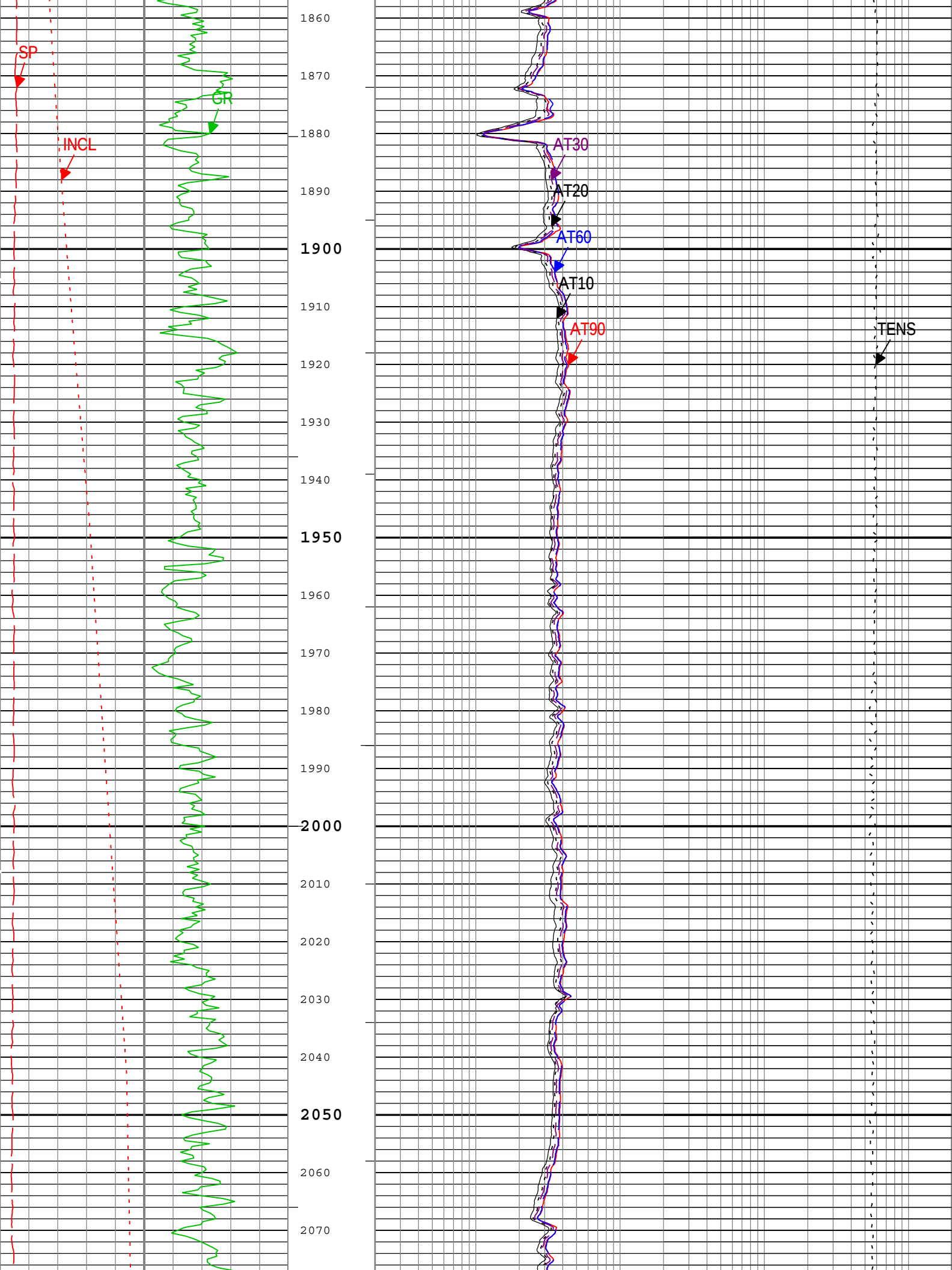
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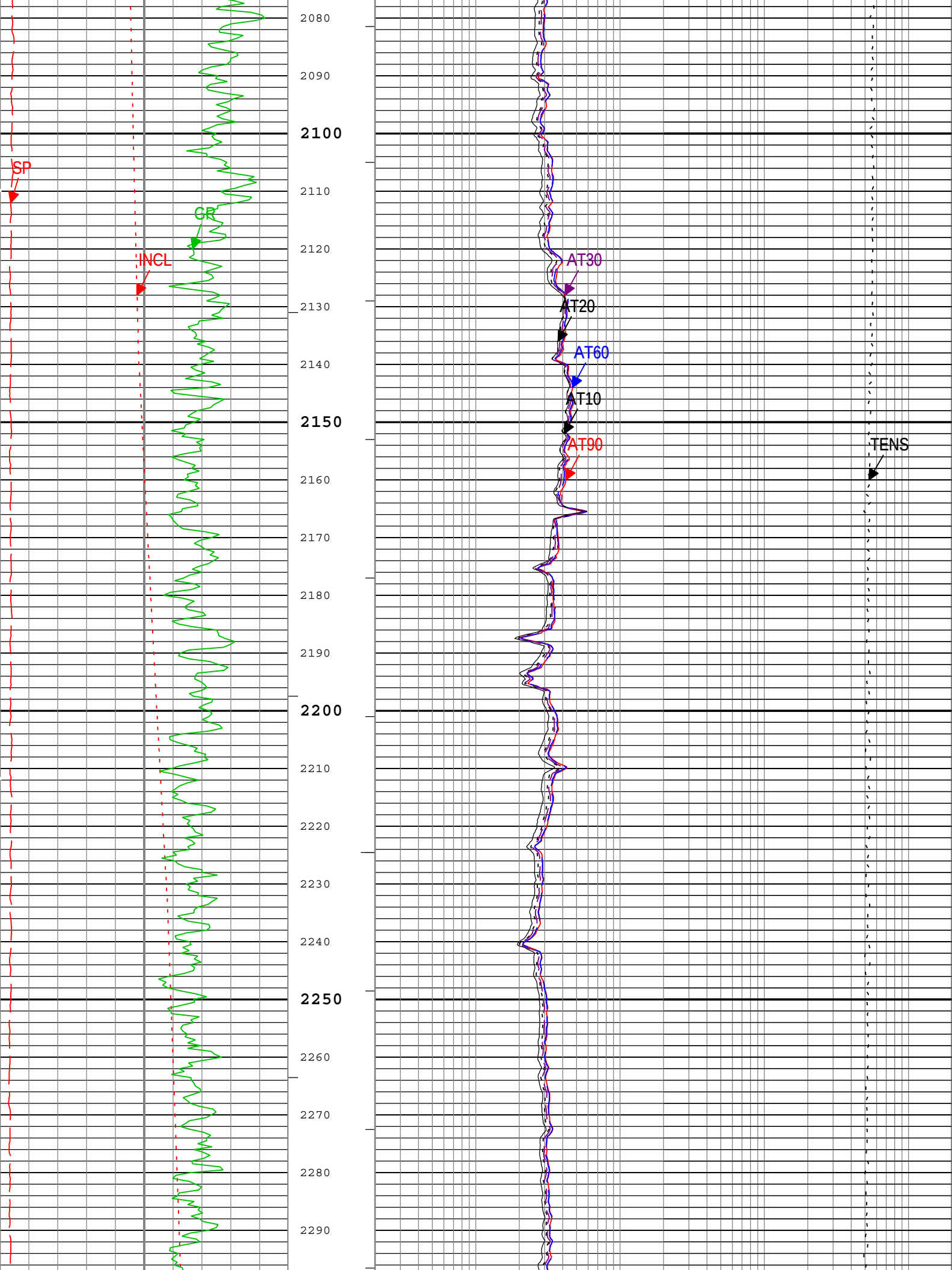
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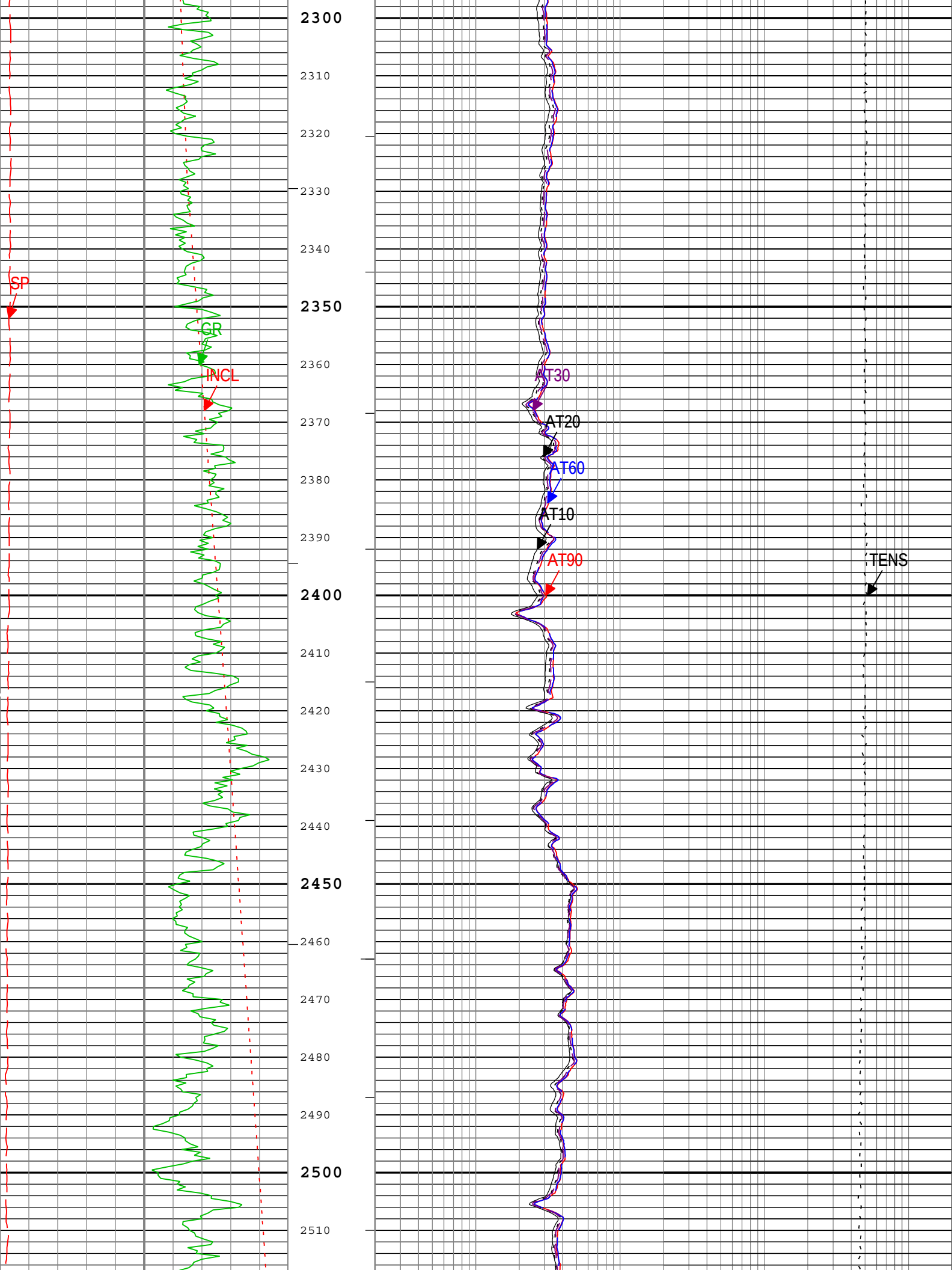
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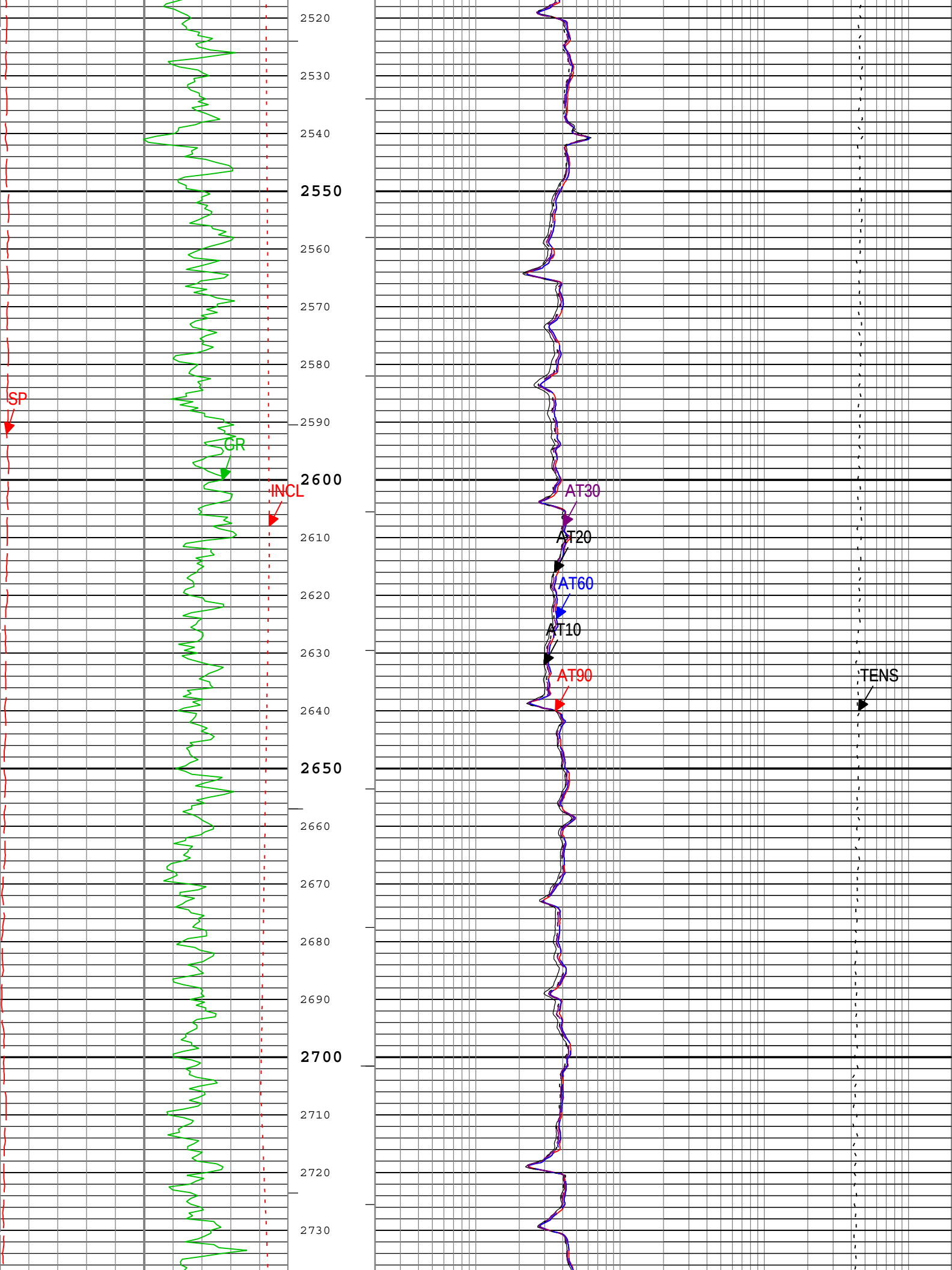
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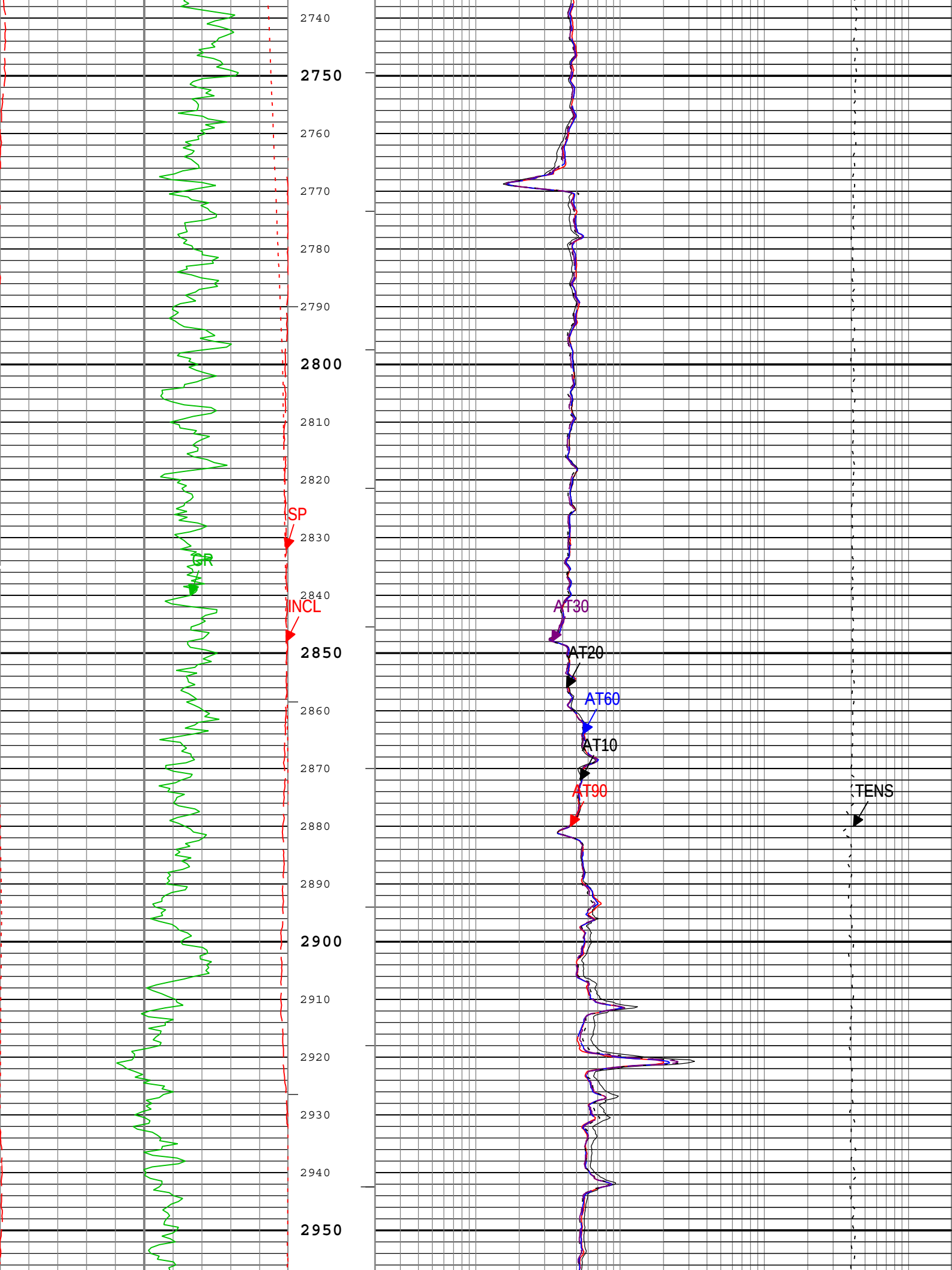
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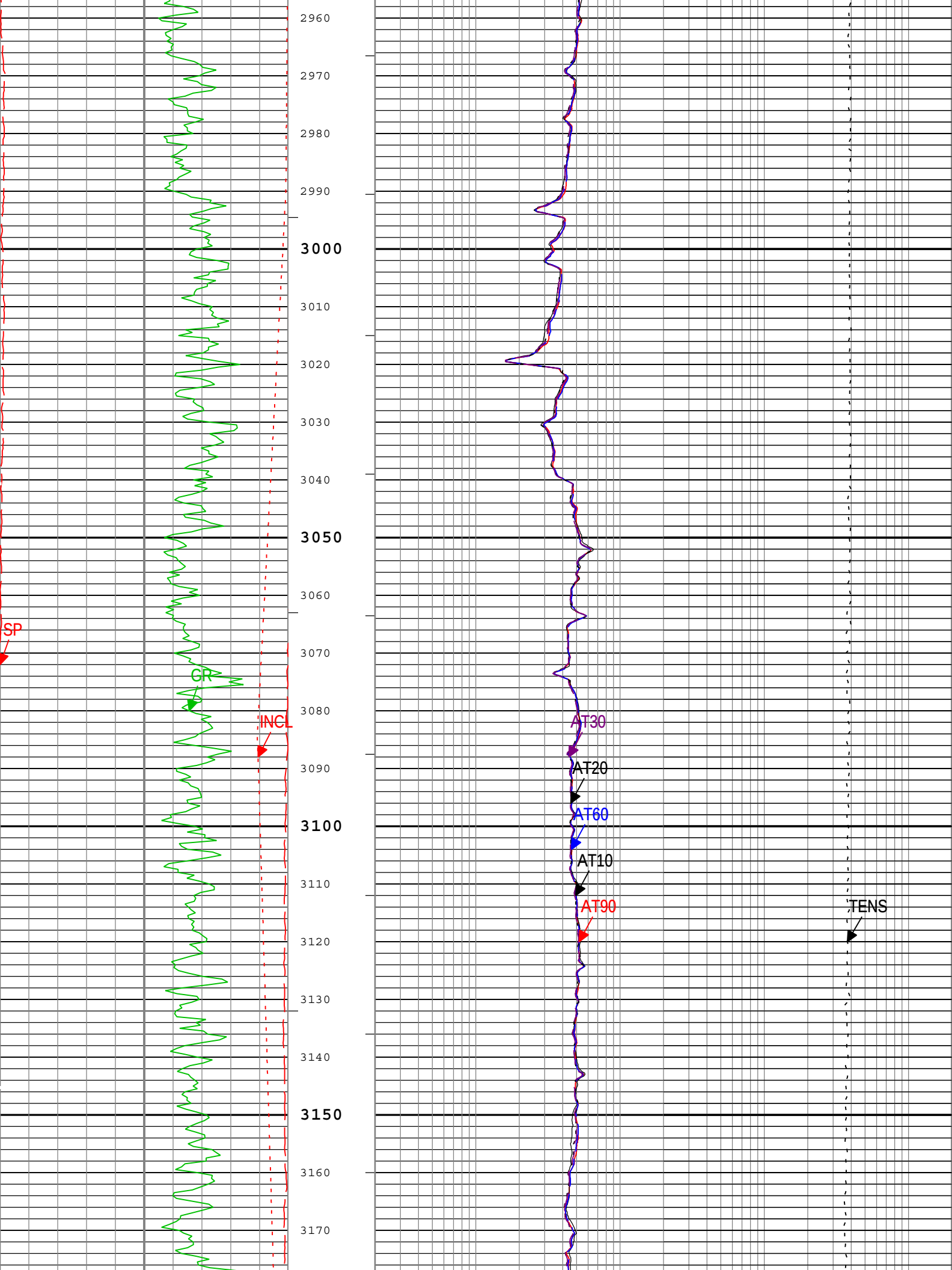
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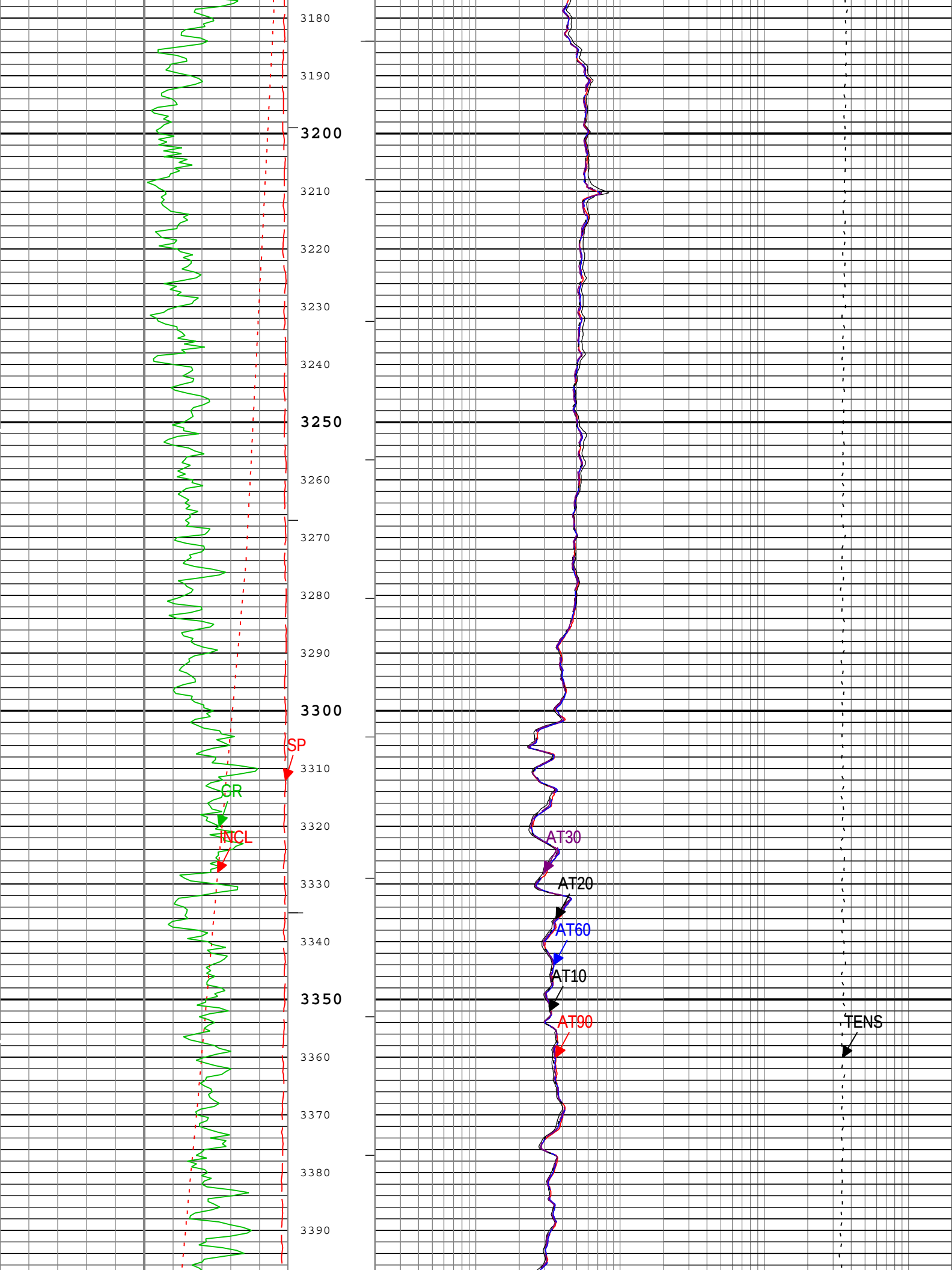
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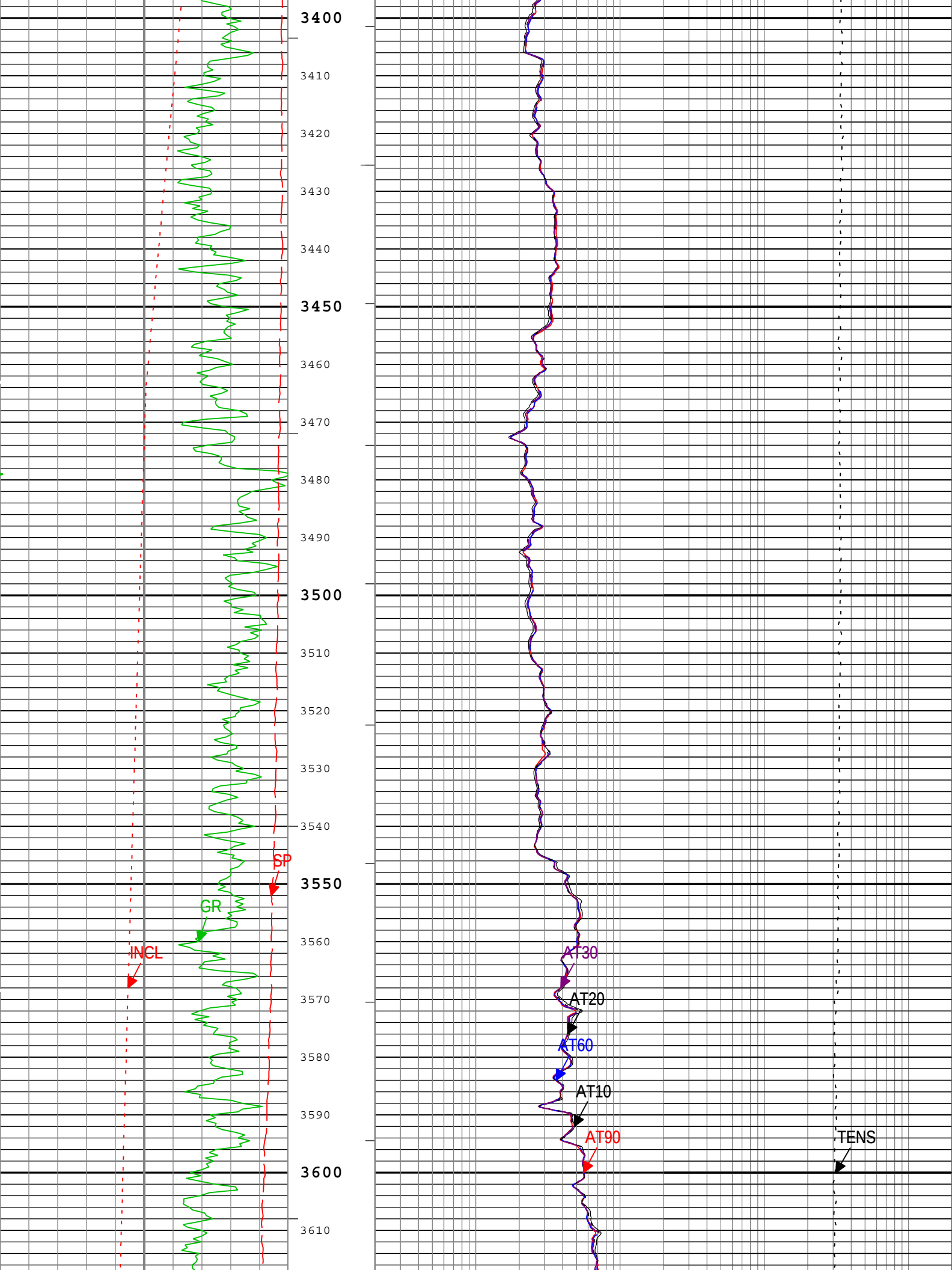
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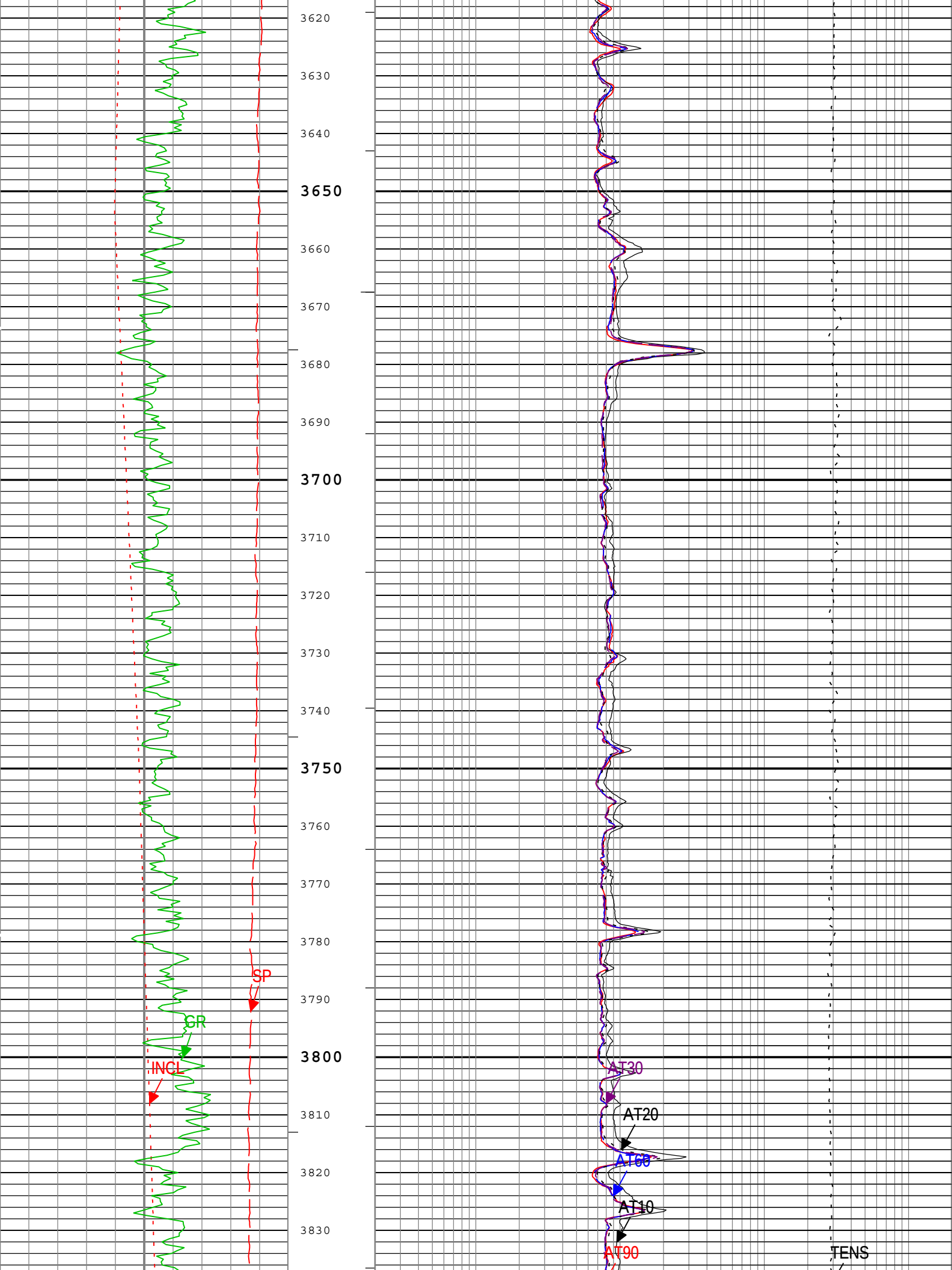
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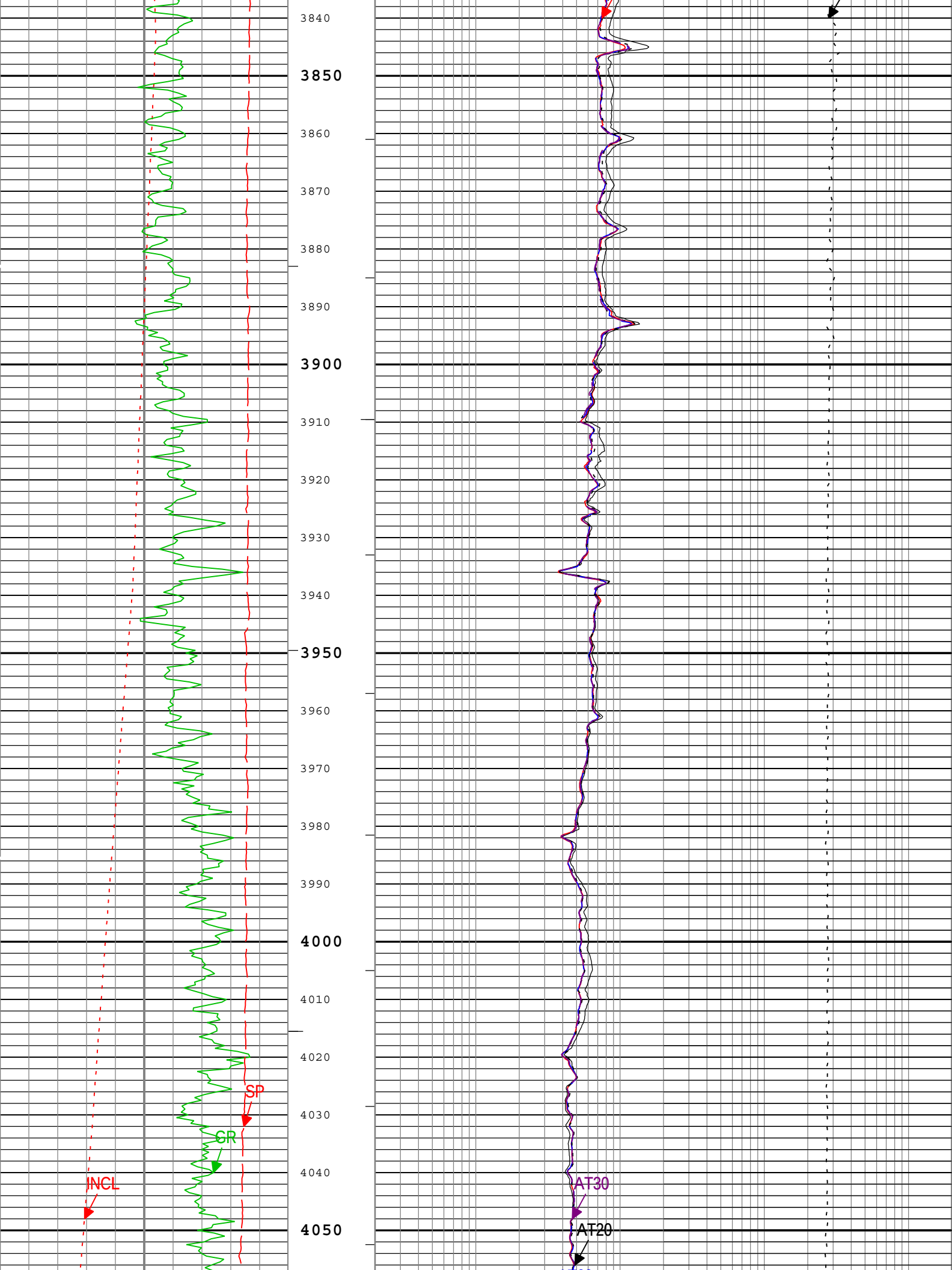
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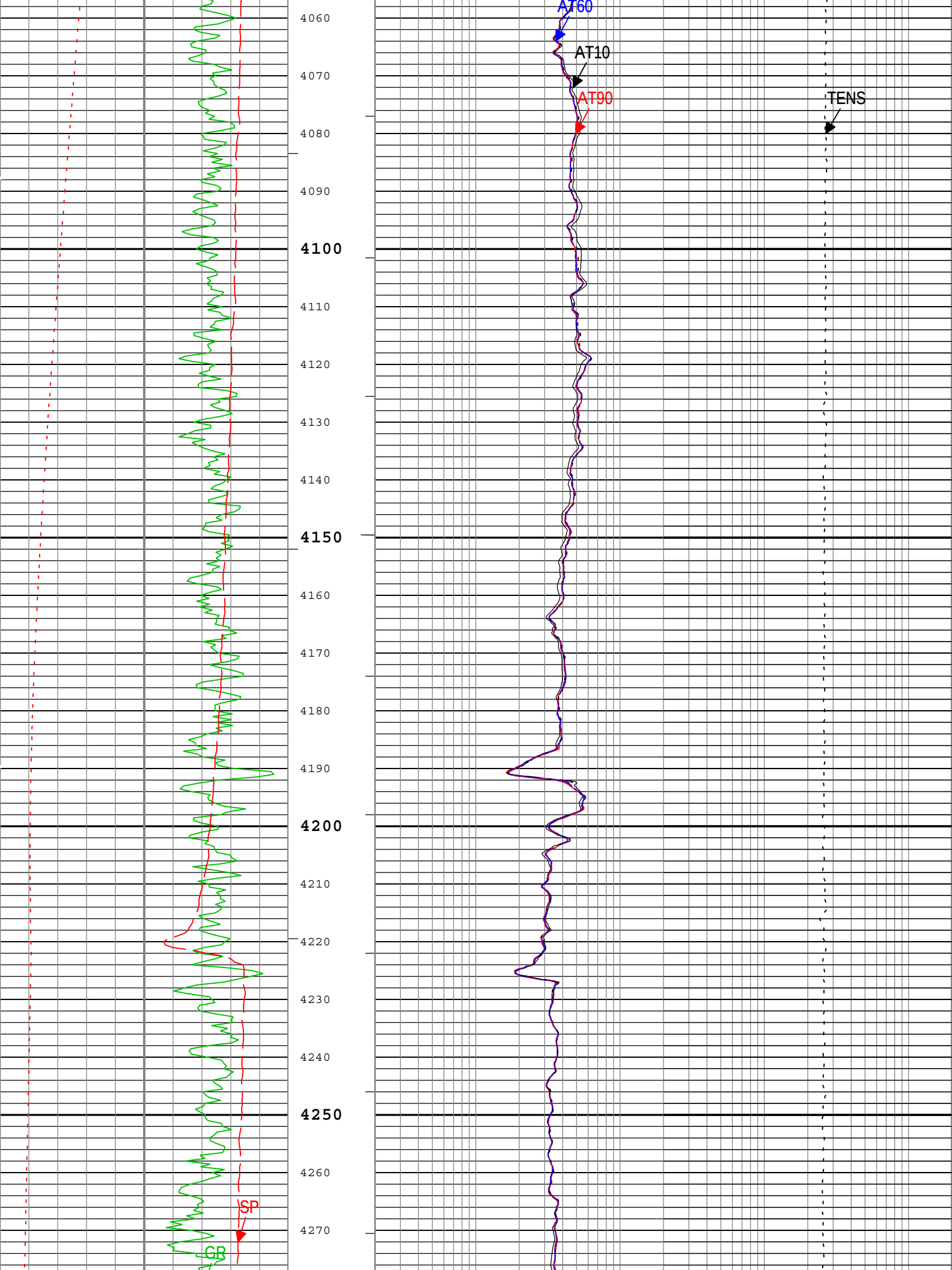
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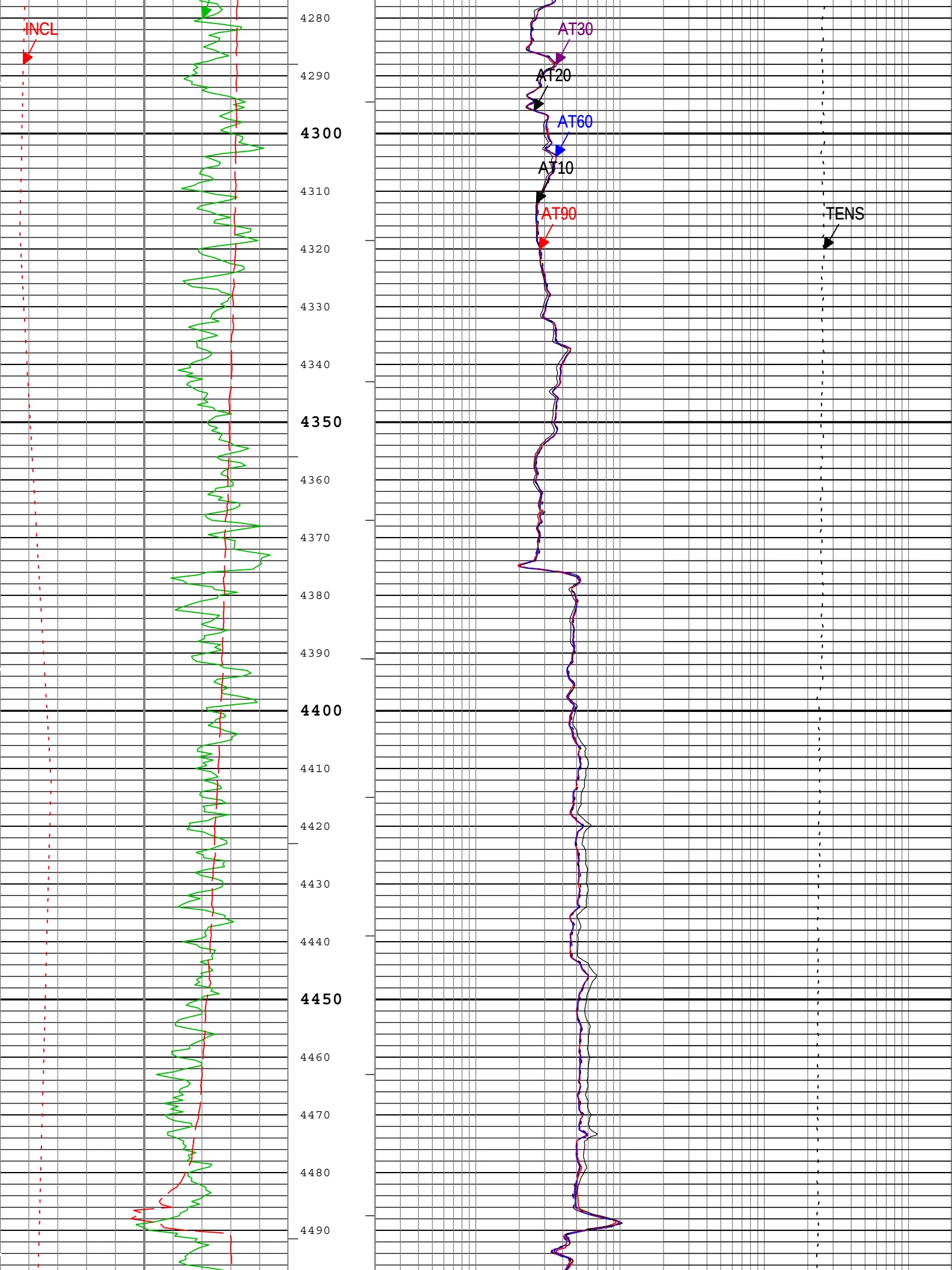
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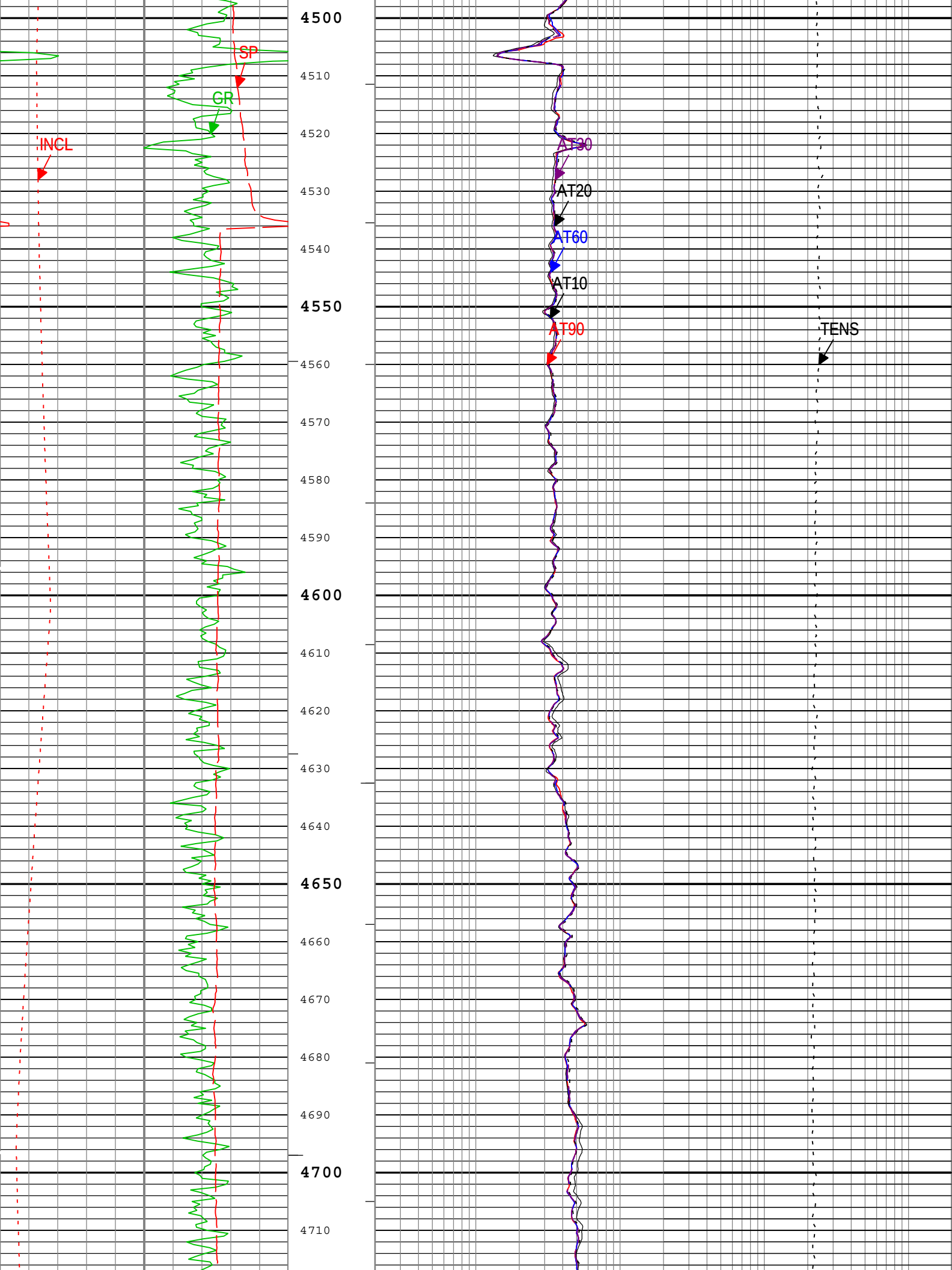
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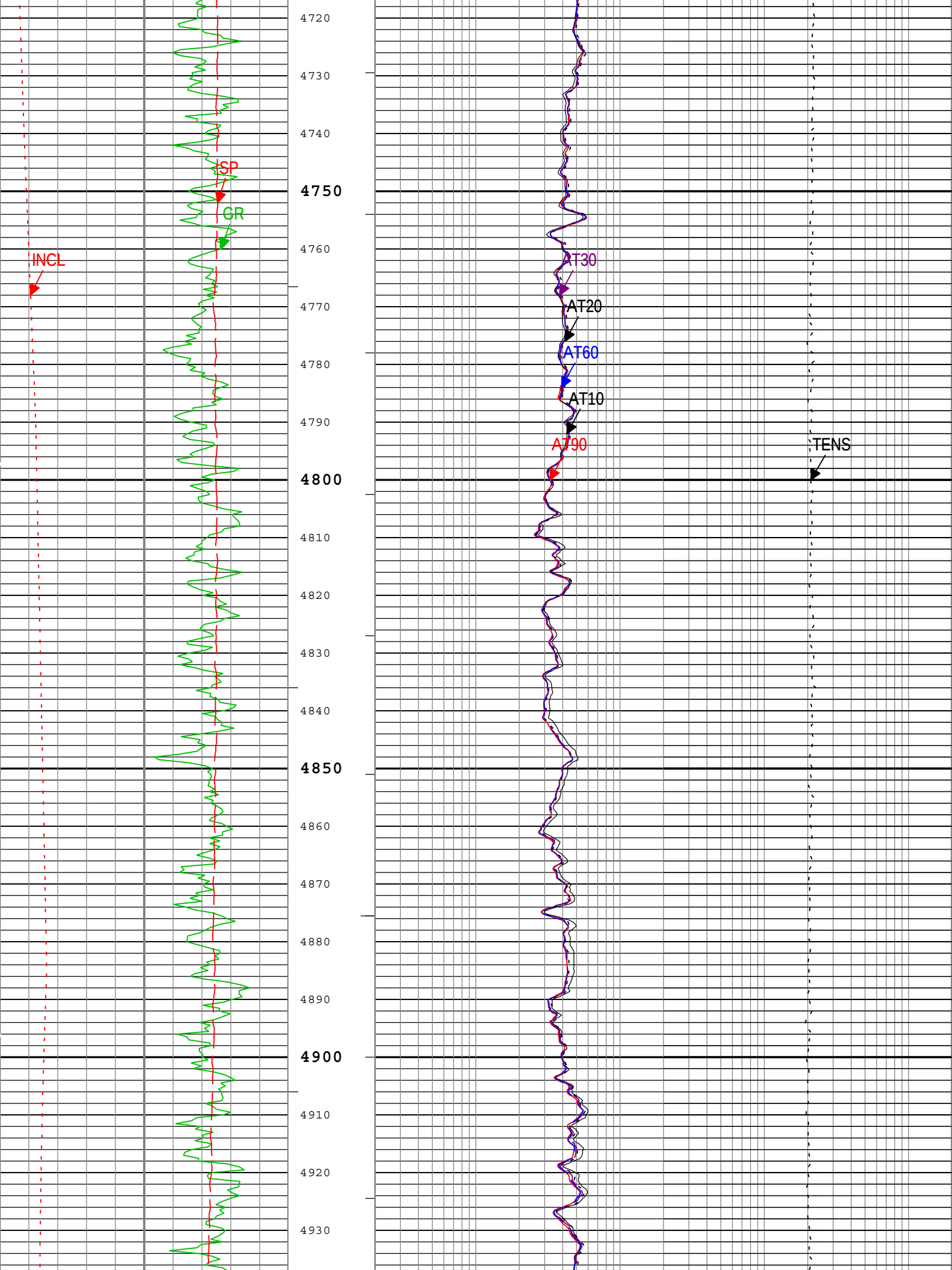
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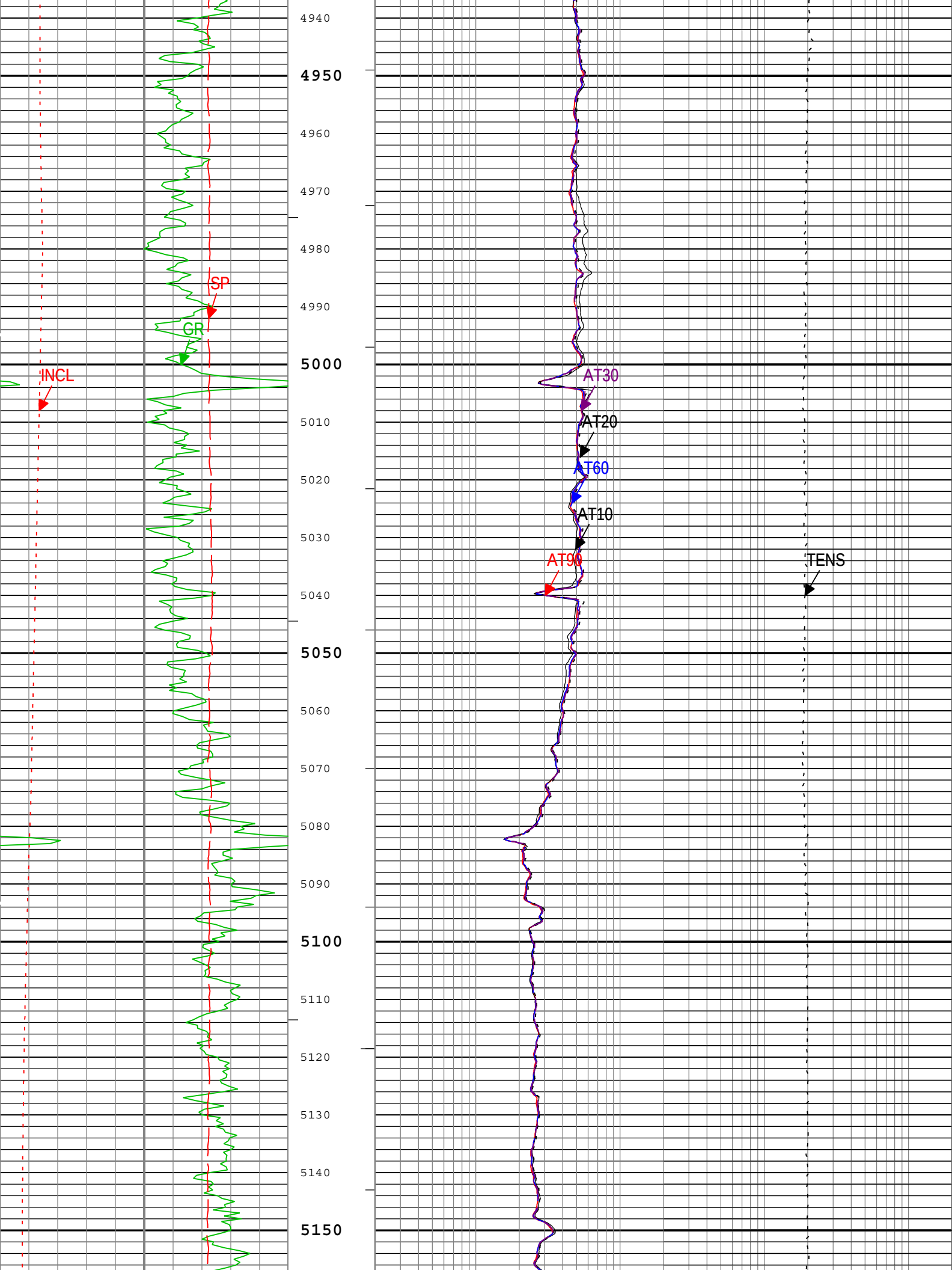
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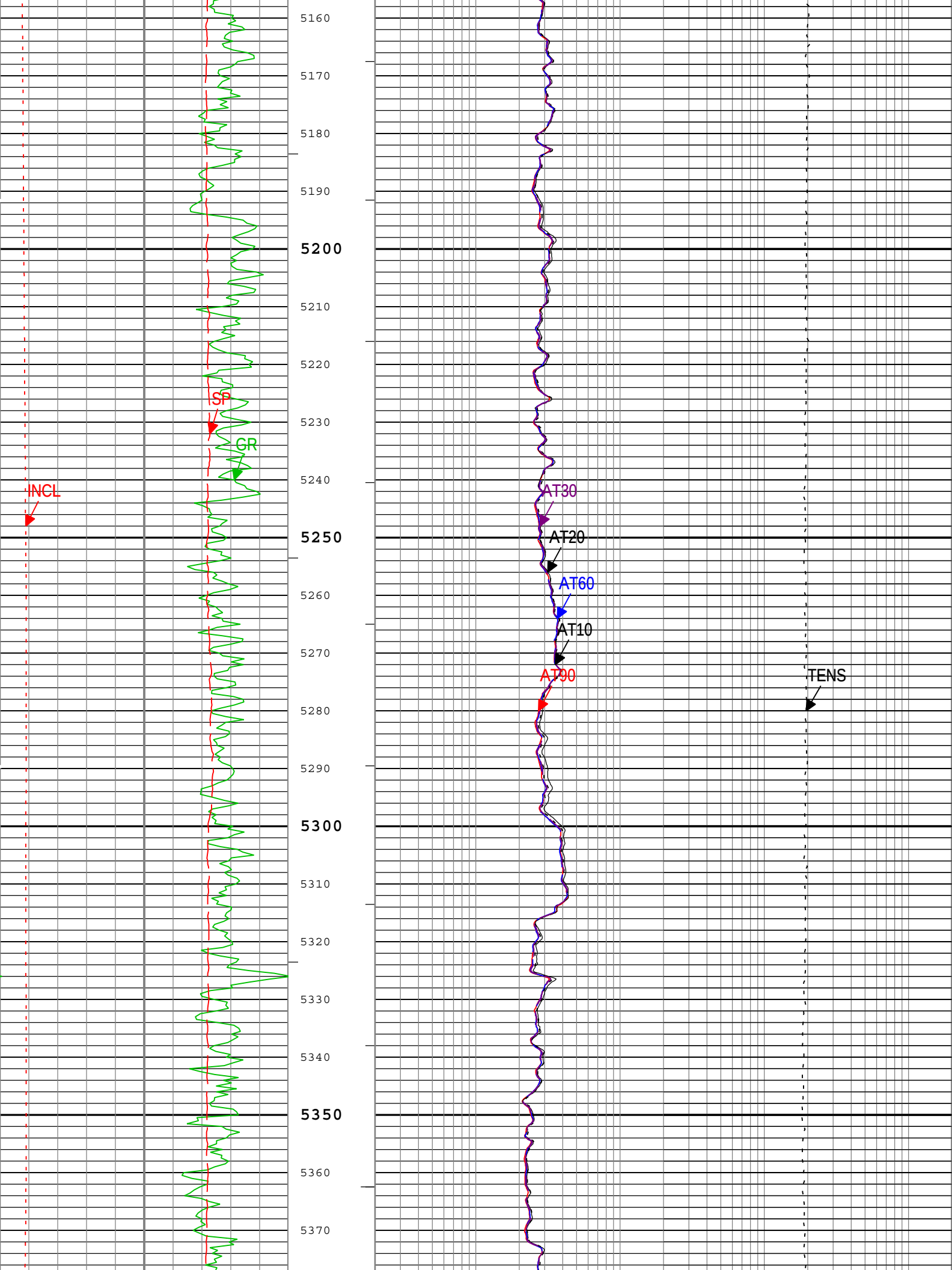
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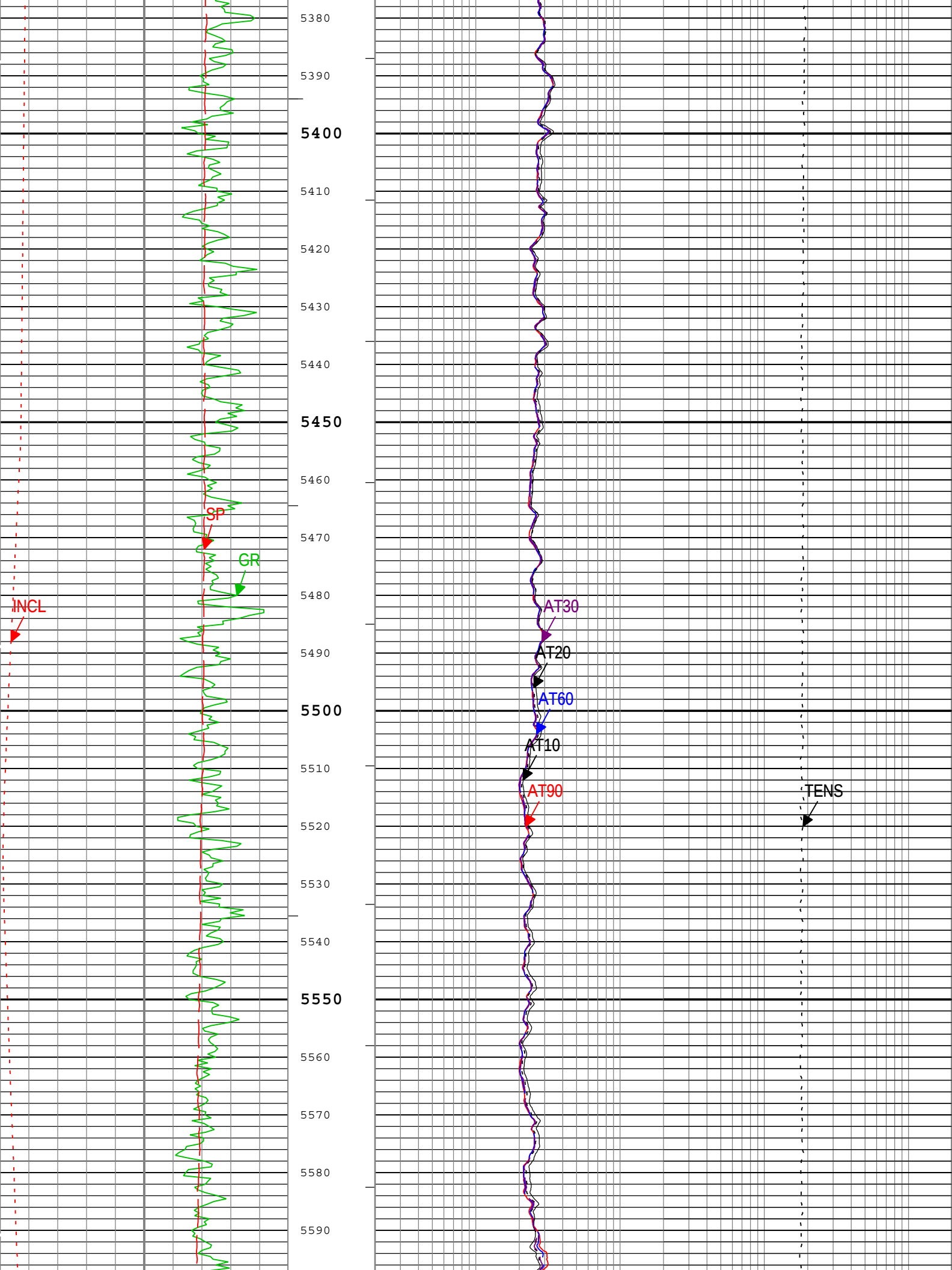
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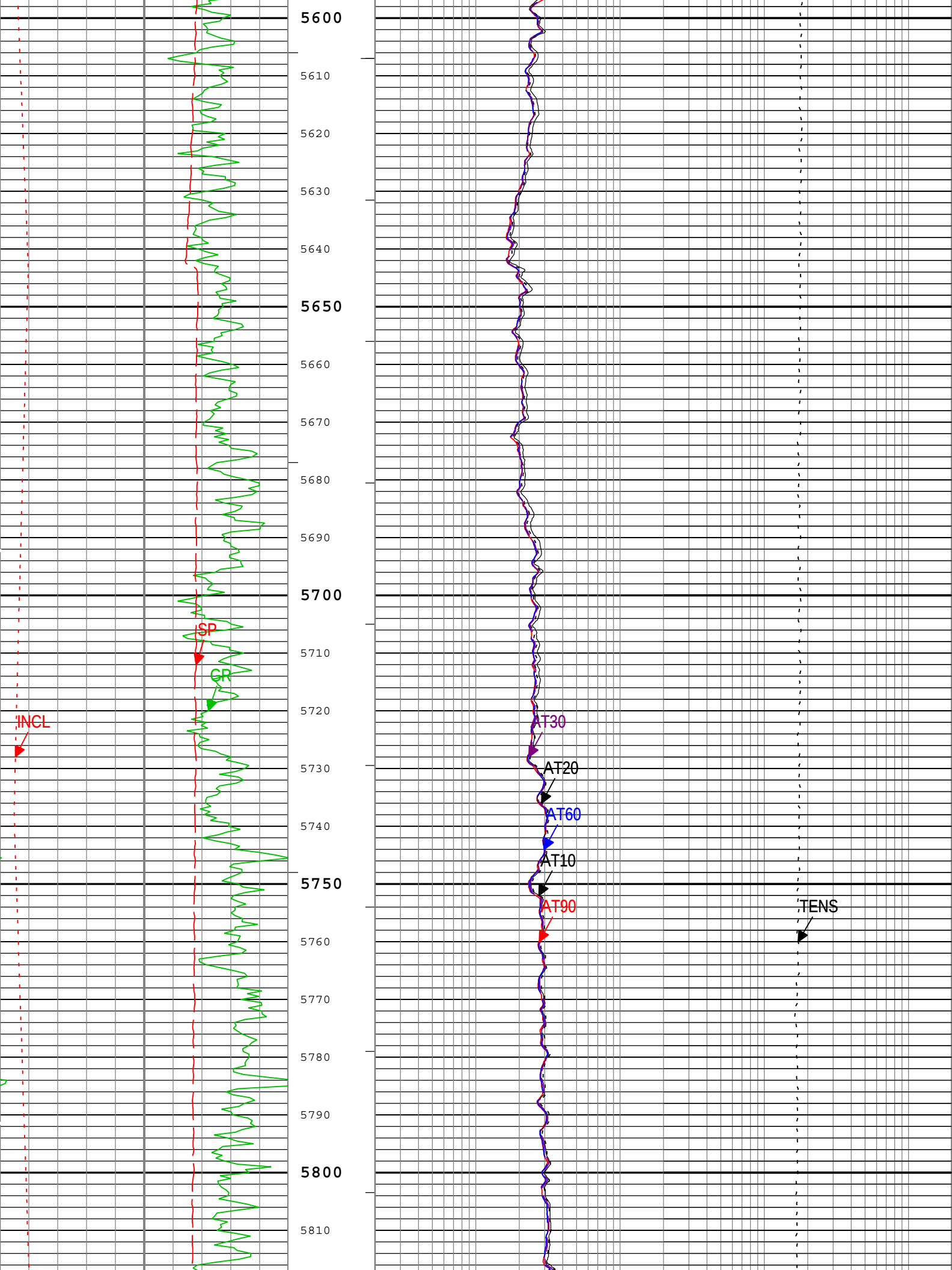
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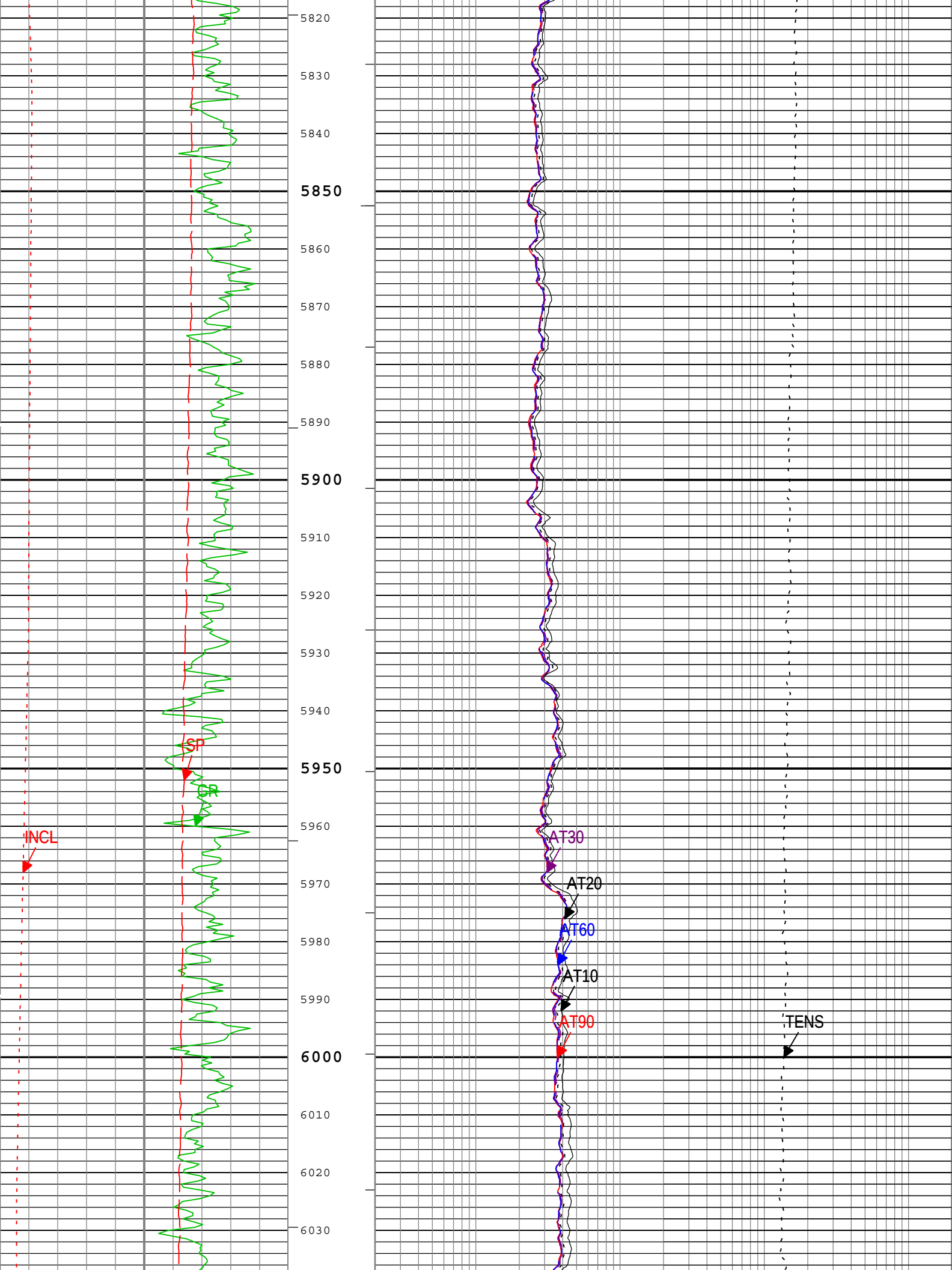
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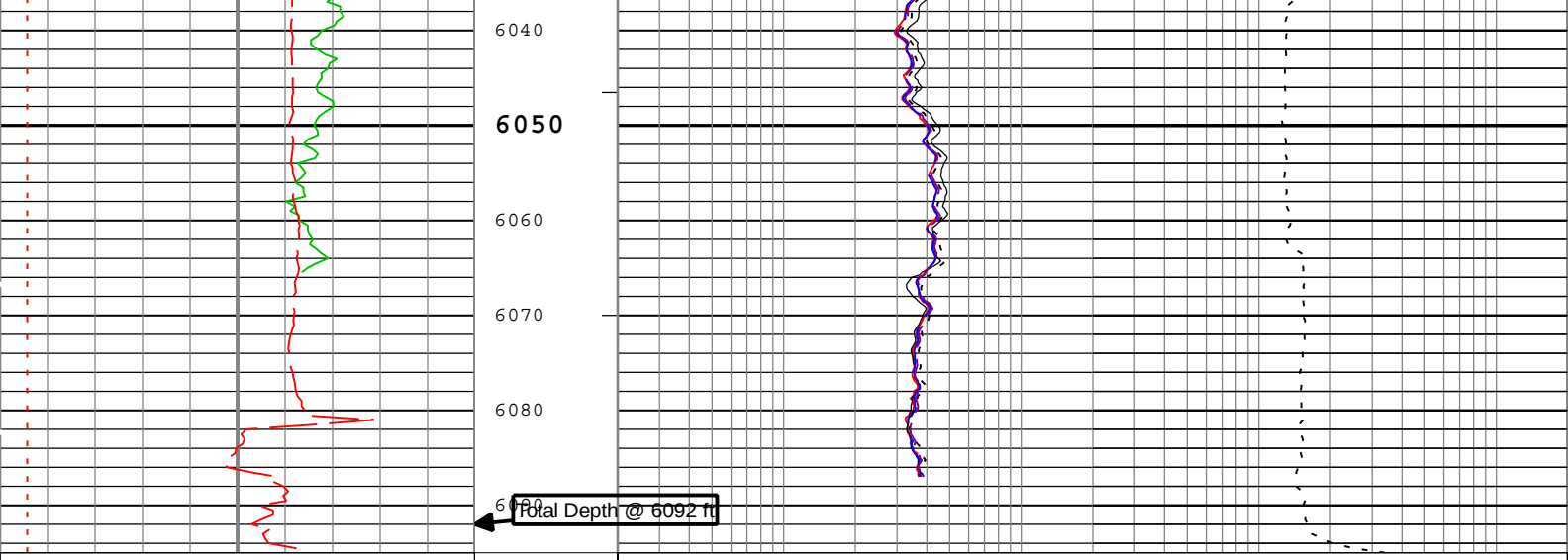


Hole inclination (INCL)
0 deg 10

Gamma Ray (GR) SGT-N
0 gAPI 150

Spontaneous Potential (SP) AIT-M
-80 mV 20

Array Induction Two Foot Resistivity A90 (AT90) AIT-M
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A10 (AT10) 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 A20 (AT20) AIT-M
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT-M
0.2 ohm.m 2000

Cable Tension (TENS)
5000 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 Two Format: Log (KM 5in Induction Upper) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jul-2014 13:13:38

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ACDE	Array Induction Casing Detection Enable	AIT-M	No	
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	8.75	in
CBLO	Casing Bottom (Logger)	WLSESSION	848	ft
CDEN	Cement Density	SGT-N	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.8	lbm/gal
ETIP	Elevation of the TIP above MSL	WLSESSION	4733	ft
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	HD1	

GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	HDT	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft
TPOS	Tool Position: Centered or Eccentered	SGT-N	Centered	

Tool Control Parameters

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

Run 1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Run 1	Repeat[2]:Up	Up	5440.26 ft	6099.99 ft	04-Jul-2014 11:04:06 AM	04-Jul-2014 11:12:27 AM	ON	7.96 ft	Yes
Run 1	Main[3]:Up	Up	64.12 ft	6095.03 ft	04-Jul-2014 11:18:09 AM	04-Jul-2014 12:20:48 PM	ON	-3.42 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Noble Energy Inc Well:NCLP AA06-62-1AHNC

Run 1: Main[3]:Up:S011

Description: AIT Basic Log Two Format: Log (KM 5in Induction Upper RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth

Creation Date: 04-Jul-2014 13:13:40

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)

10000 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 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

Gamma Ray (GR) SGT-N

200 gAPI 400

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

Gamma Ray (GR) SGT-N

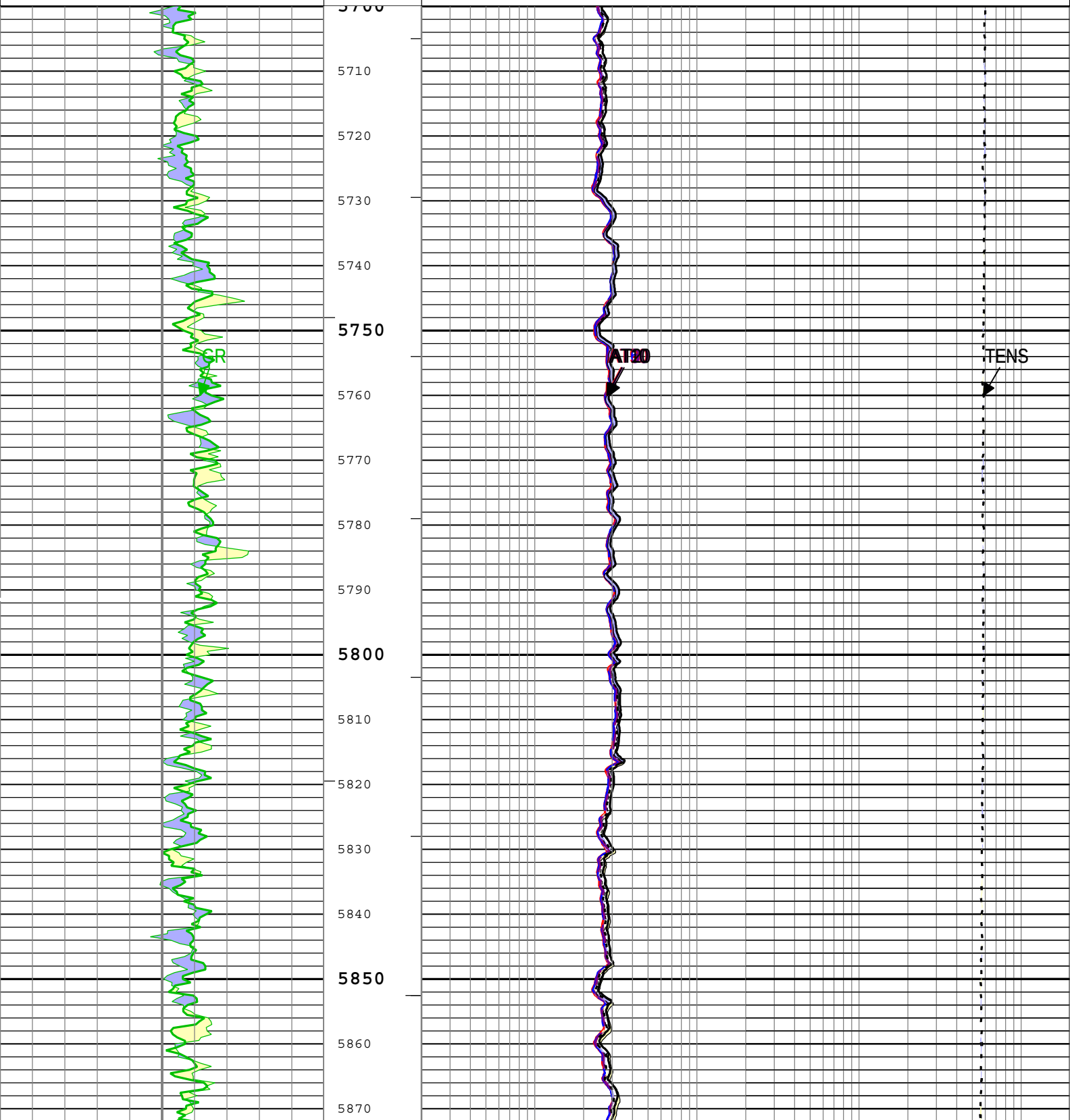
0 gAPI 200

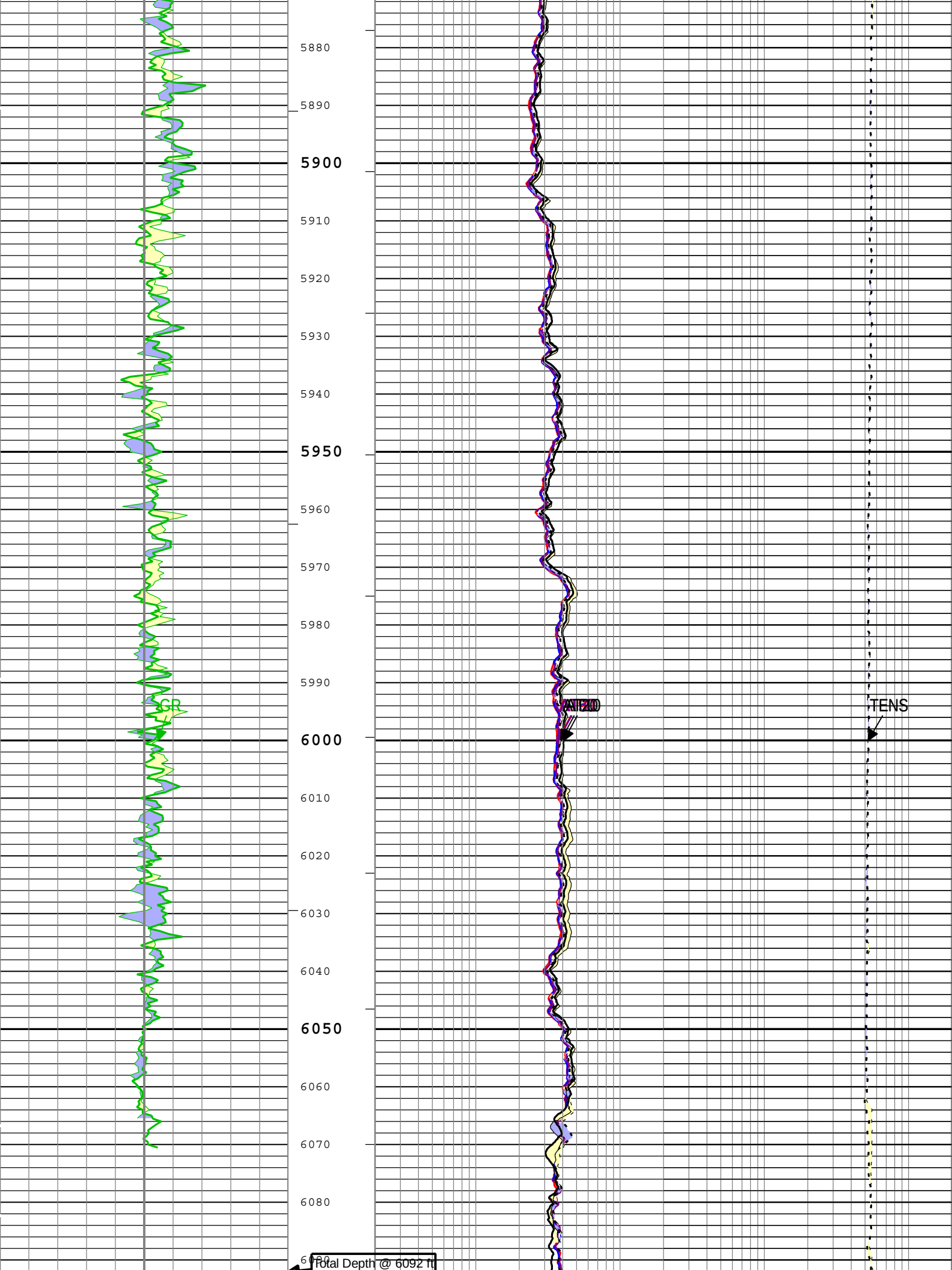
Main To Repeat

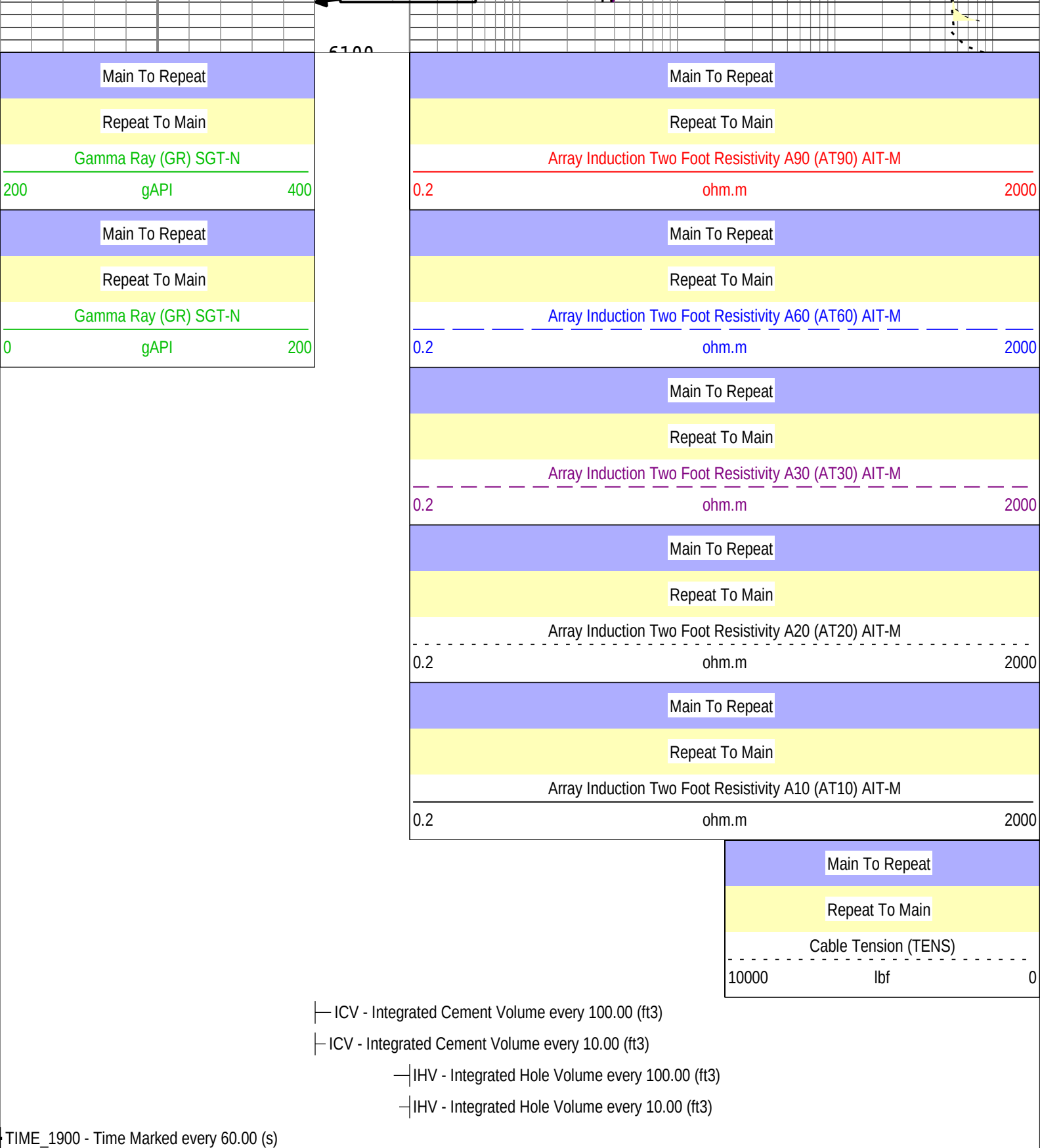
Repeat To Main

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

0.2 ohm.m 2000




5880
5890
5900
5910
5920
5930
5940
5950
5960
5970
5980
5990
6000
6010
6020
6030
6040
6050
6060
6070
6080
6090
GR
ATR20
TENS
Total Depth @ 6092 ft



Description: AIT Basic Log Two Format: Log (KM 5in Induction Upper RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 04-Jul-2014 13:13:40

Calibration Report

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

Primary Equipment :

File code for AIT-MA Sonde Tool Element	AMIS	208

Auxiliary Equipment :

AITM Rm/SP Bottom Nose	AMRM	208

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 11:17:21 06-Jun-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Test Loop Gain - 0		Master	1.000	0.950	1.014	1.050
Test Loop Phase - 0	deg	Master	0	-3.000	0.552	3.000
Test Loop Gain - 1		Master	1.000	0.950	1.016	1.050
Test Loop Phase - 1	deg	Master	0	-3.000	0.570	3.000
Test Loop Gain - 2		Master	1.000	0.950	1.014	1.050
Test Loop Phase - 2	deg	Master	0	-3.000	0.112	3.000
Test Loop Gain - 3		Master	1.000	0.950	1.018	1.050
Test Loop Phase - 3	deg	Master	0	-3.000	0.147	3.000
Test Loop Gain - 4		Master	1.000	0.950	0.997	1.050
Test Loop Phase - 4	deg	Master	0	-3.000	0.104	3.000
Test Loop Gain - 5		Master	1.000	0.950	0.990	1.050
Test Loop Phase - 5	deg	Master	0	-3.000	-0.192	3.000
Test Loop Gain - 6		Master	1.000	0.950	0.996	1.050
Test Loop Phase - 6	deg	Master	0	-3.000	0.106	3.000
Test Loop Gain - 7		Master	1.000	0.950	1.006	1.050
Test Loop Phase - 7	deg	Master	0	-3.000	-0.176	3.000

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 11:17:21 06-Jun-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-60.321	119.000
Sonde Error Correction Quad - 0		Master	-----	-2250.000	-152.099	2250.000
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	157.631	204.000
Sonde Error Correction Quad - 1		Master	-----	-625.000	-188.161	625.000
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	120.726	156.000
Sonde Error Correction Quad - 2		Master	-----	-350.000	-120.538	350.000
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	53.704	89.000
Sonde Error Correction Quad - 3		Master	-----	-250.000	-29.010	250.000
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	27.120	35.000
Sonde Error Correction Quad - 4		Master	-----	-63.000	-3.589	63.000
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	12.843	24.000
Sonde Error Correction Quad - 5		Master	-----	-50.000	-11.841	50.000
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	10.355	15.000
Sonde Error Correction Quad - 6		Master	-----	-30.000	7.536	30.000
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-2.018	5.000
Sonde Error Correction Quad - 7		Master	-----	-30.000	1.586	30.000

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 11:17:21 06-Jun-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Coarse Gain		Master	1.000	0.800	0.801	1.200
Fine Gain		Master	1.000	0.800	0.802	1.200

AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 11:17:21 06-Jun-2014 Before (Measured): 10:32:05 04-Jul-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Thru Cal Mag - 0	V	Master	-----	0.366	0.564	0.854
		Before	-----	0.366	0.564	0.854
		Before-Master	-----	-----	0.000	-----
Thru Cal Phase - 0	deg	Master	-----	137.000	-177.633	-103.000
		Before	-----	137.000	-177.751	-103.000
		Before-Master	-----	-----	-0.118	-----
Thru Cal Mag - 1	V	Master	-----	0.762	1.156	1.778
		Before	-----	0.762	1.156	1.778
		Before-Master	-----	-----	0.000	-----
Thru Cal Phase - 1	deg	Master	-----	136.000	-176.509	-104.000
		Before	-----	136.000	-176.631	-104.000
		Before-Master	-----	-----	-0.122	-----
Thru Cal Mag - 2	V	Master	-----	0.372	0.613	0.868
		Before	-----	0.372	0.613	0.868
		Before-Master	-----	-----	0.000	-----
Thru Cal Phase - 2	deg	Master	-----	132.000	-170.937	-108.000
		Before	-----	132.000	-171.081	-108.000
		Before-Master	-----	-----	-0.144	-----

Thru Cal Mag - 3	V	Master	-----	0.420	0.693	0.980	
		Before	-----	0.420	0.693	0.980	
		Before-Master	-----	-----	0.000	-----	
Thru Cal Phase - 3	deg	Master	-----	131.000	-170.959	-109.000	
		Before	-----	131.000	-171.104	-109.000	
		Before-Master	-----	-----	-0.145	-----	
Thru Cal Mag - 4	V	Master	-----	0.804	1.318	1.876	
		Before	-----	0.804	1.317	1.876	
		Before-Master	-----	-----	-0.001	-----	
Thru Cal Phase - 4	deg	Master	-----	125.000	-171.311	-115.000	
		Before	-----	125.000	-171.453	-115.000	
		Before-Master	-----	-----	-0.142	-----	
Thru Cal Mag - 5	V	Master	-----	1.176	1.931	2.744	
		Before	-----	1.176	1.929	2.744	
		Before-Master	-----	-----	-0.002	-----	
Thru Cal Phase - 5	deg	Master	-----	122.000	-171.794	-118.000	
		Before	-----	122.000	-171.936	-118.000	
		Before-Master	-----	-----	-0.142	-----	
Thru Cal Mag - 6	V	Master	-----	1.176	1.933	2.744	
		Before	-----	1.176	1.932	2.744	
		Before-Master	-----	-----	-0.001	-----	
Thru Cal Phase - 6	deg	Master	-----	121.000	-171.786	-119.000	
		Before	-----	121.000	-171.926	-119.000	
		Before-Master	-----	-----	-0.140	-----	
Thru Cal Mag - 7	V	Master	-----	0.846	1.379	1.974	
		Before	-----	0.846	1.378	1.974	
		Before-Master	-----	-----	-0.001	-----	
Thru Cal Phase - 7	deg	Master	-----	115.000	-173.888	-125.000	
		Before	-----	115.000	-174.025	-125.000	
		Before-Master	-----	-----	-0.137	-----	
SPA Zero	mV	Master		-50.000	-0.044	50.000	
		Before		-50.000	-0.038	50.000	
		Before-Master	-----	-----	0.006	-----	
SPA Plus	mV	Master		941.000	992.523	1040.000	
		Before		941.000	992.514	1040.000	
		Before-Master	-----	-----	-0.009	-----	
Temperature Zero	V	Master		-0.050	0.000	0.050	
		Before		-0.050	0.000	0.050	
		Before-Master	-----	-----	0.000	-----	
Temperature Plus	V	Master		0.870	0.919	0.960	
		Before		0.870	0.919	0.960	
		Before-Master	-----	-----	0.000	-----	

Company: Noble Energy Inc

Schlumberger

Well: NCLP AA06-62-1AHNC

Field: Wattenberg

County: Weld

State: Colorado

Platform Express
Array Induction
with Linear Correlation