Schlumberger

Company: **QUICKSILVER RESOURCES INC.**

Well: **WEBER 32−4**
Field: **BELL ROCK**
County: **MOFFAT** State: **COLORADO**

County: MOFFAT
Field: BELL ROCK
Location: 2189 FNL 2095 FEL
Well: WEBER 32−4
Company: QUICKSILVER RESOURCES IN

PLATFORM EXPRESS
ARRAY INDUCTION TOOL
BHC

LOCATION

2189 FNL 2095 FEL

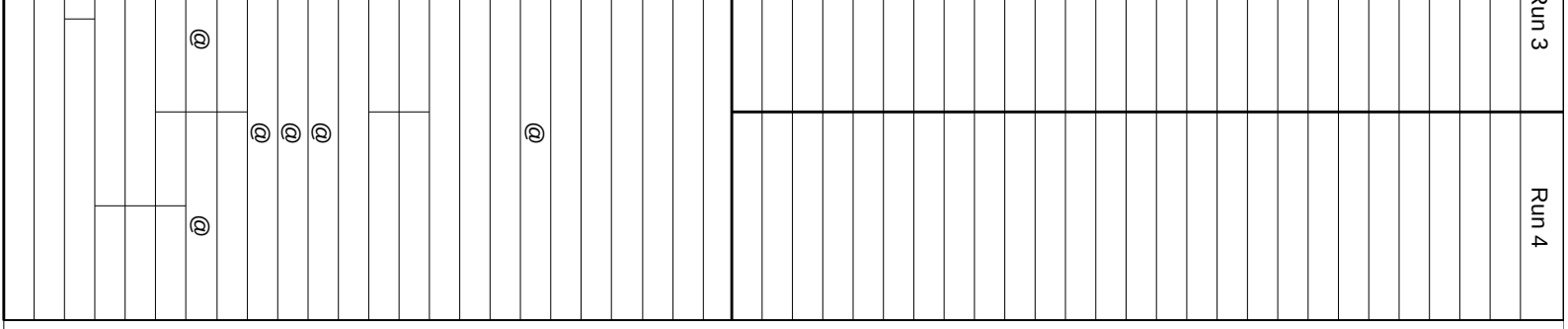
Elev.: K.B. 6686.00 ft
G.L. 6669.00 ft
D.F. 6685.00 ft

Permanent Datum: GROUND LEVEL Elev.: 6669.00 ft
Log Measured From: KELLY BUSHING 17.00 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	Section	Township	Range
50810765400	4	6N	92W

	Run 1	Run 2	Run 3
Logging Date	20−Jun−2011		
Run Number	1		
Depth Driller	6136 ft		
Schlumberger Depth	6136 ft		
Bottom Log Interval	6136 ft		
Top Log Interval	100 ft		
Casing Driller Size @ Depth	9.625 in @ 1218 ft	@	@
Casing Schlumberger	1218 ft		
Bit Size	8.750 in		
Type Fluid In Hole	OBM		
MUD Density / Viscosity	8.4 lbm/gal / 45 s		
MUD Fluid Loss / PH	/		
MUD Source Of Sample	MEASURED		
RM @ Measured Temperature	44.000 ohm.m @ 72 degF	@	@
RMF @ Measured Temperature	@ 75 degF	@	@
RMC @ Measured Temperature	@ 75 degF	@	@
Source RMF / RMC	CALCULATED / CALCULATED		
RM @ MRT / RMF @ MRT	21.583 @ 153 / @ 153	@ / @	@ / @
Maximum Recorded Temperatures	153 degF		
Circulation Stopped Time	20−Jun−2011 16:00		
Logger On Bottom Time	20−Jun−2011 23:41		
Unit Number / Location	2276 VERNAL		
Recorded By	JEAN HERNANDEZ		
Witnessed By	STEVE POTTS		

	Run 1	Run 2	Run 3
Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Driller Size @ Depth	@		
Casing Schlumberger			
Bit Size			
Type Fluid In Hole			
MUD Density / Viscosity	/		
MUD Fluid Loss / PH	/		
MUD Source Of Sample			
RM @ Measured Temperature	@		
RMF @ Measured Temperature	@		
RMC @ Measured Temperature	@		
Source RMF / RMC	/		
RM @ MRT / RMF @ MRT	@ / @		
Maximum Recorded Temperatures			
Circulation Stopped Time			
Logger On Bottom Time			
Unit Number / Location	/		
Recorded By			
Witnessed By			



DEPTH SUMMARY LISTING

Date Created: 20−JUN−2011 22:31:44

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−46A XS
Serial Number:	6214	Serial Number:	2527	Serial Number:	368473
Calibration Date:	20−JAN−2011	Calibration Date:	13−JUN−201	Length:	24000 FT
Calibrator Serial Number:	33	Calibrator Serial Number:	100518		
Calibration Cable Type:	7−46P XS	Number of Calibration Points:	10	Conveyance Method:	Wireline
Wheel Correction 1:	−8	Calibration RMS:	26	Rig Type:	LAND
Wheel Correction 2:	−6	Calibration Peak Error:	42		

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	220.00 FT
Rig Up Length At Bottom:	219.00 FT
Rig Up Length Correction:	1.00 FT
Stretch Correction:	3.00 FT
Tool Zero Check At Surface:	1.00 FT

Depth Control Remarks

1. ALL SCHLUMBERGER DEPTHS POLICIES WERE FOLLOWED
2. IDW USED AS PRIMARY DEPTH CONTROL
3. Z−CHART USED AS SECONDARY DEPTH CONTROl
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1: None	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
Tool ran as per tool skecth	
Tool ran with 2*1.5 inch standoffs	
Density compensated for bit size	
Neutron compensated for hole size and standoff	
Data invalid in regions with tight pull and washout	

RUN 1			RUN 2		
SERVICE ORDER #:			SERVICE ORDER #:		
PROGRAM VERSION:		19C0−187	PROGRAM VERSION:		
FLUID LEVEL:		10 ft	FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

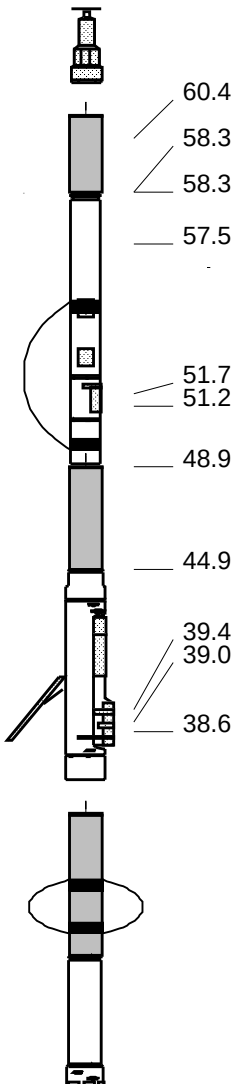
EQUIPMENT DESCRIPTION

RUN 1 RUN 2

SURFACE EQUIPMENT

GSR−U/Y
NCT−B
CNB−AB
NCS−VB
WITM (DTS)−A

DOWNHOLE EQUIPMENT

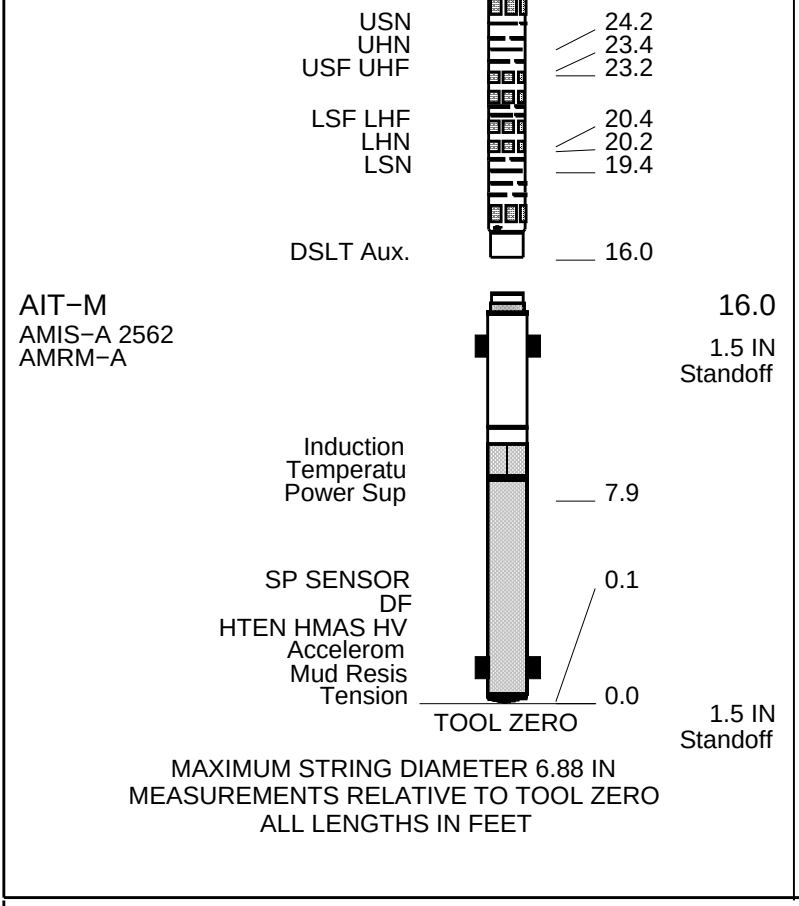


LEH−QT 64.2
LEH−QT

DTC−H 61.3
ECH−KC
DTCH0−A

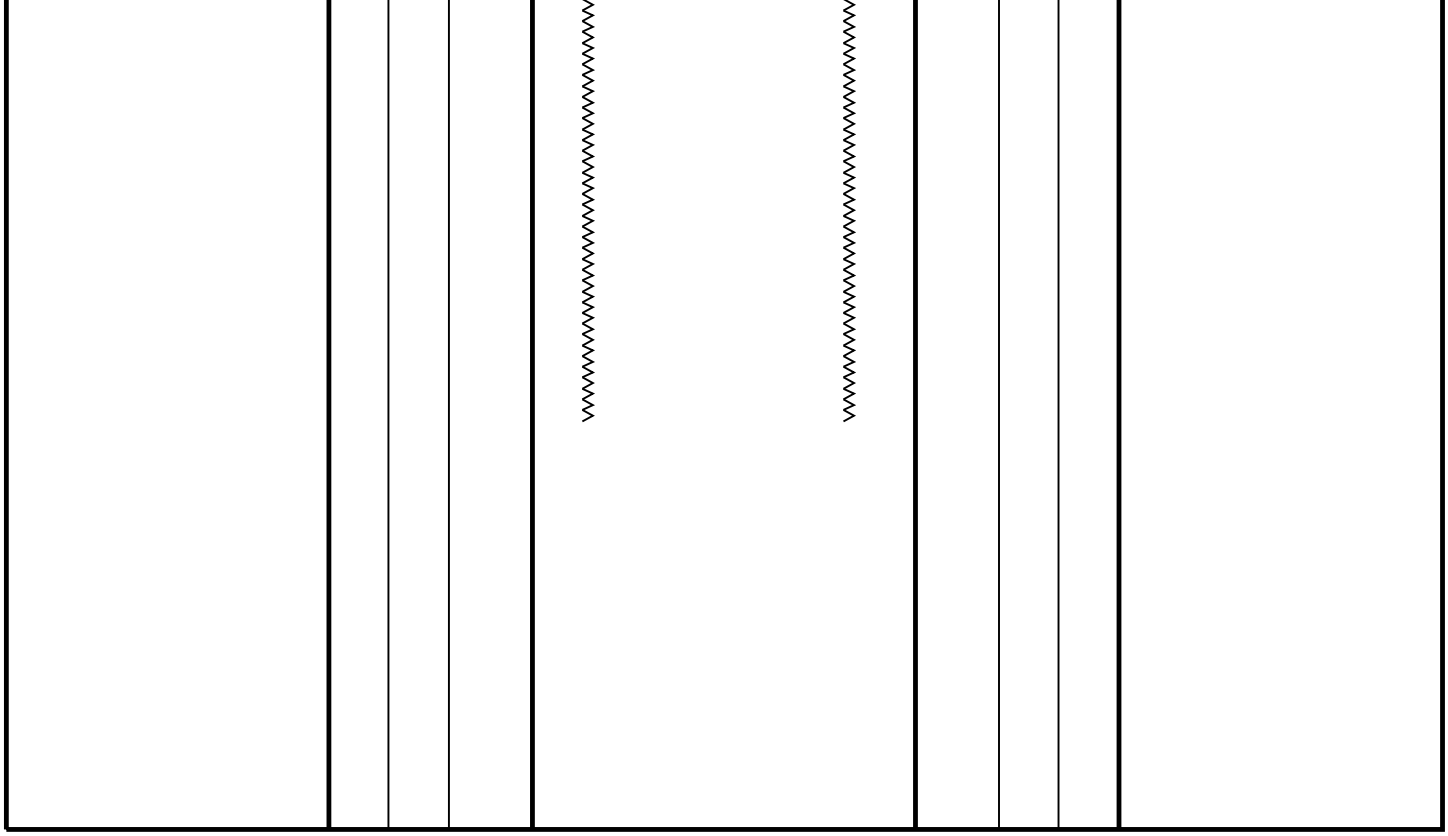
HILTH−FTB 58.3
HGNSD−H 3799
HMCA−H
HGNH
NLS−KL
NSR−F 5138
HACCZ−H 1614
HCNT−H
HGR
HRCC−H 4863
HRMS−H 3964
HRGD−H 3995
GLS−VJ 5234
MCFL Device−H
HILT Nucl. LS−H 28805
HILT Nucl. SS−H 42767
HILT Nucl. BS−H 26447
BOW−SPR
NPV−N

DSLT−FTB 36.6
DSLC−B
ECH−KH
SLS−W



Client: QUICKSILVER RESOURCES INC.
Drawing Date: 6/20/2011
Well: WEBER 32−4
API #: 50810765400
Field: NIOBRARA
Rig Name: DHS # 6
State: COLORADO
Reference Datum: Kelly Bushing
Country: USA
Elevation: 6686.0 ft

Production String	(in) OD	(in) ID	(ft) MD	Well Schematic	(ft) MD	(in) OD	(in) ID	Casing String
					0.0	9.625		Casing String
					1218.0	9.625		Casing Shoe
					1218.0	8.750		Borehole Segment



ALL DEPTHS ARE DRILLER'S DEPTHS

Schlumberger

MAIN PASS

MAXIS Field Log

Company: QUICKSILVER RESOURCES INC. **Well: WEBER 32−04**

Input DLIS Files

	AIT_SONIC_TLD_MCFL_018PUP	FN:25		21−Jun−2011 04:50	6150.0 FT	182.0 FT

Output DLIS Files

DEFAULT	AIT_SONIC_TLD_MCFL_002PUP	FN:1	PRODUCER	21−Jun−2011 08:20	6150.0 FT	182.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 1981.59 F3

Cement Volume = 667.14 F3 (assuming 7.00 IN casing O.D.)

Computed from 6136.0 FT to 1218.0 FT using data channel(s) HCAL

OP System Version: 18C0−147

AIT−M	18C0−147	DSLT−FTB	18C0−147
HILTH−FTB	18C0−147	DTC−H	18C0−147

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3
- Time Mark Every 60 S

Tool/Tot. Drag From STIA to T1

GR Backup From LHT1 to GR_1

Transit Time 4 (TT4) 1200 (US) 200

Transit Time 3 (TT3) 1200 (US) 200

Transit Time 2 (TT2) 1200 (US) 200

Transit Time 1 (TT1) 1200 (US) 200

Sonic Velocity (SVEL) 5000 (FT/S) 25000

HILT Caliper (HCAL) 2 (IN) 12

Gamma Ray (GR) 0 (GAPI) 150

Tension (TENS) 10000 (LBF) 0

Bit Size (BS) 2 (IN) 12

Computed Micro Inverse (HMIN) (OHMM) 0 40

Computed Micro Normal (HMNO) (OHMM) 0 40

Perm From HMIN to HMNO

AIT 90 Inch Investigation (AF90) 0.2 (OHMM) 2000

AIT 60 Inch Investigation (AF60) 0.2 (OHMM) 2000

AIT 30 Inch Investigation (AF30) 0.2 (OHMM) 2000

AIT 20 Inch Investigation (AF20) 0.2 (OHMM) 2000

AIT 10 Inch Investigation (AF10) 0.2 (OHMM) 2000

Std. Res. Formation Pe (PEFZ) 0 (−−−− 10

Density Correction (HDRA) −0.2 (G/C3) 0.05

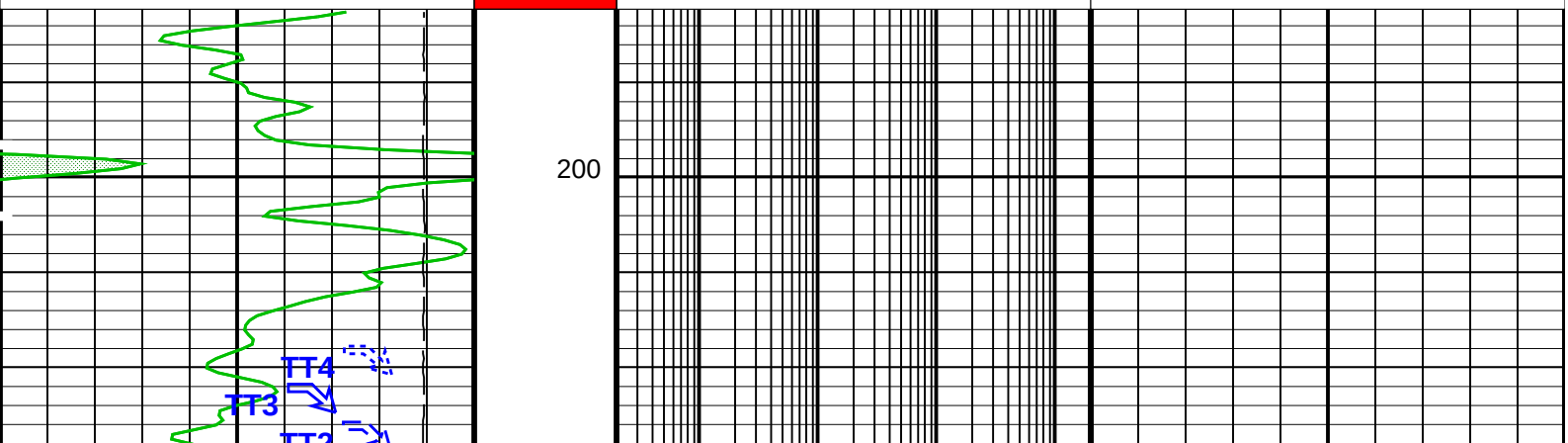
Gas From DPHZ to NPOR

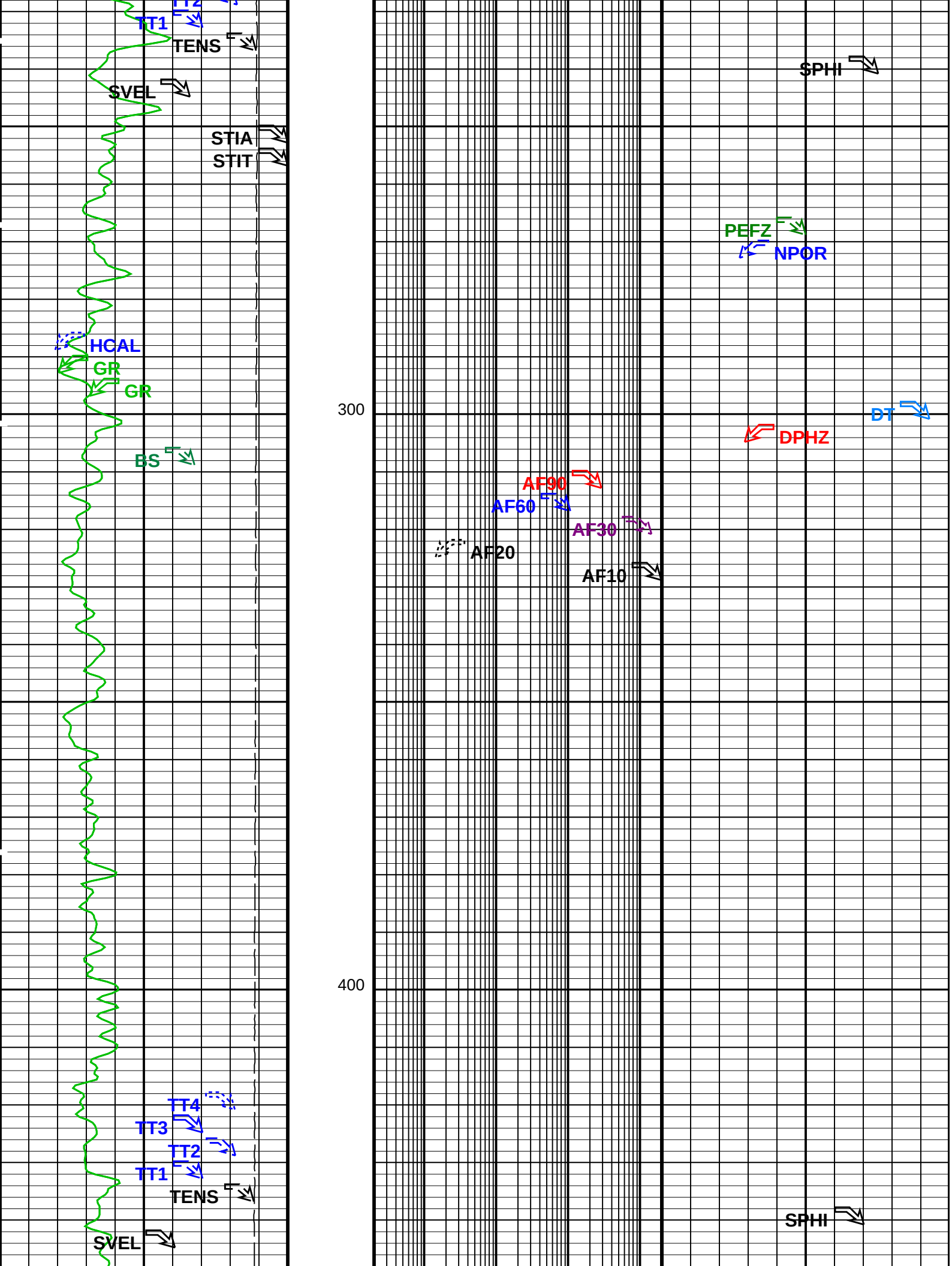
Sonic Porosity (SPHI) 0.45 (V/V) −0.15

Alpha Processed Neutron Porosity (NPOR) 0.6 (V/V) 0

Delta−T (DT) 150 (US/F) 50

Std. Res. Density Porosity (DPHZ) 0.6 (V/V) 0

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SVEL
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HCAL
GR
GR
BS
TT4
TT3
TT2
TT1
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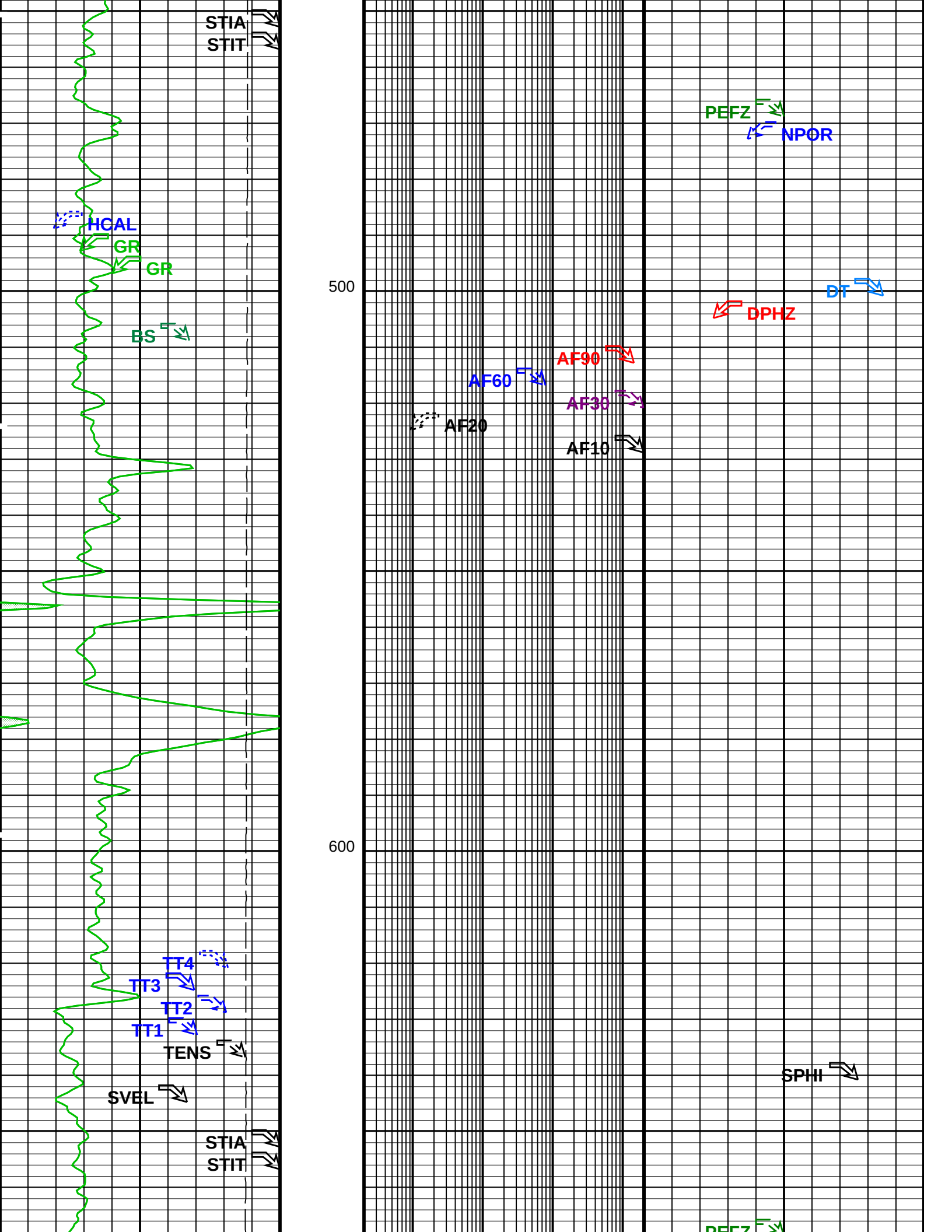
400
SPHI
PEFZ
NPOR
DT
DPHZ
AF90
AF60
AF30
AF20
AF10
SPHI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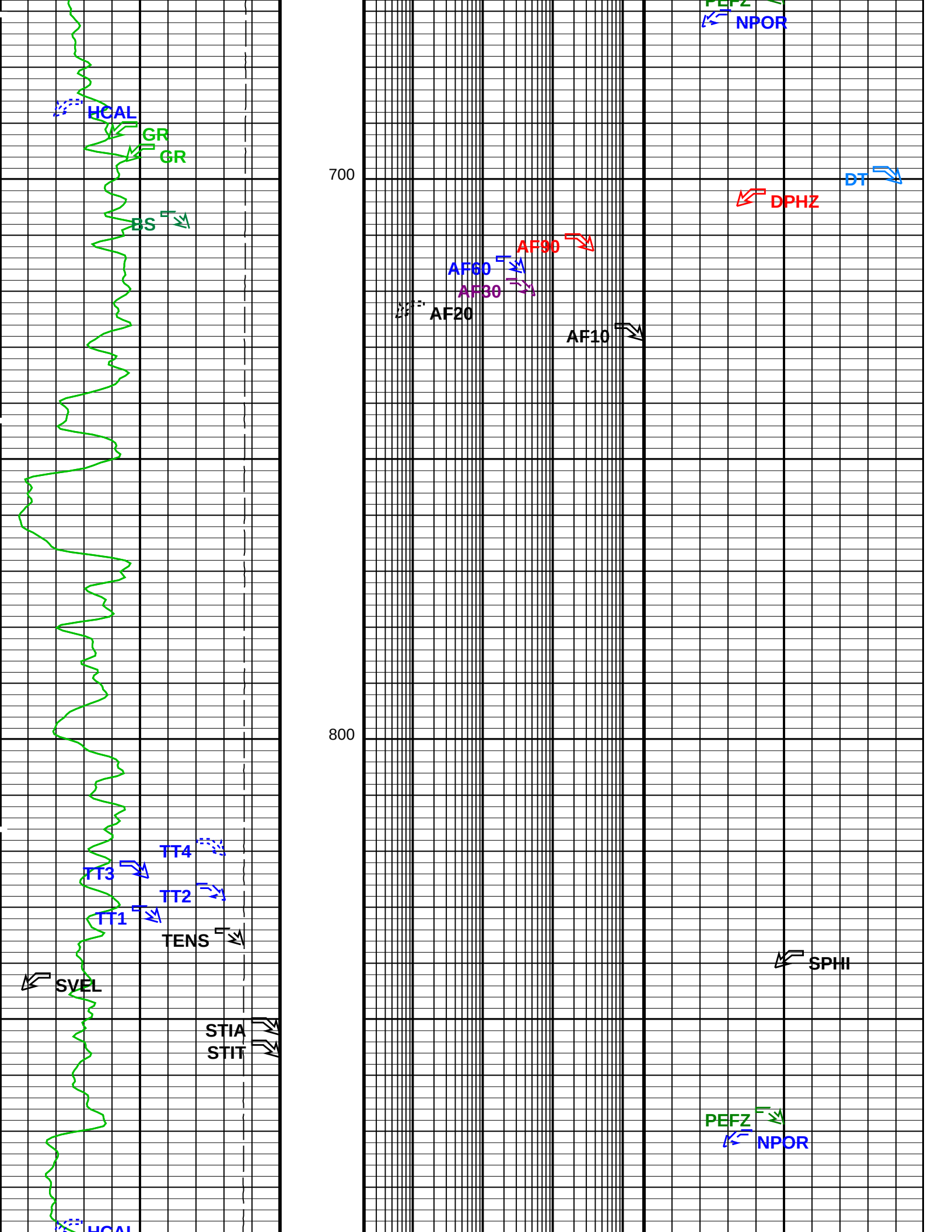
PEFZ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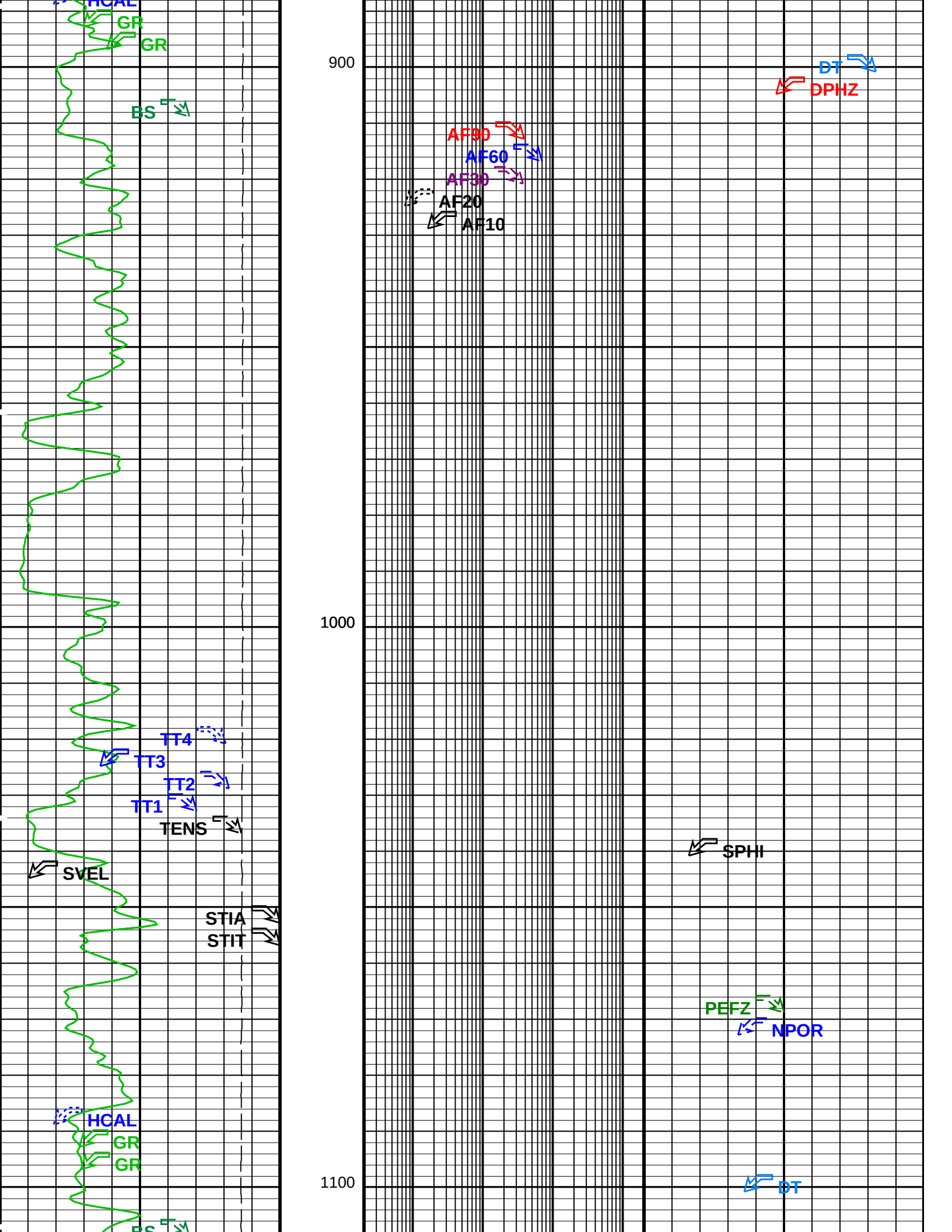
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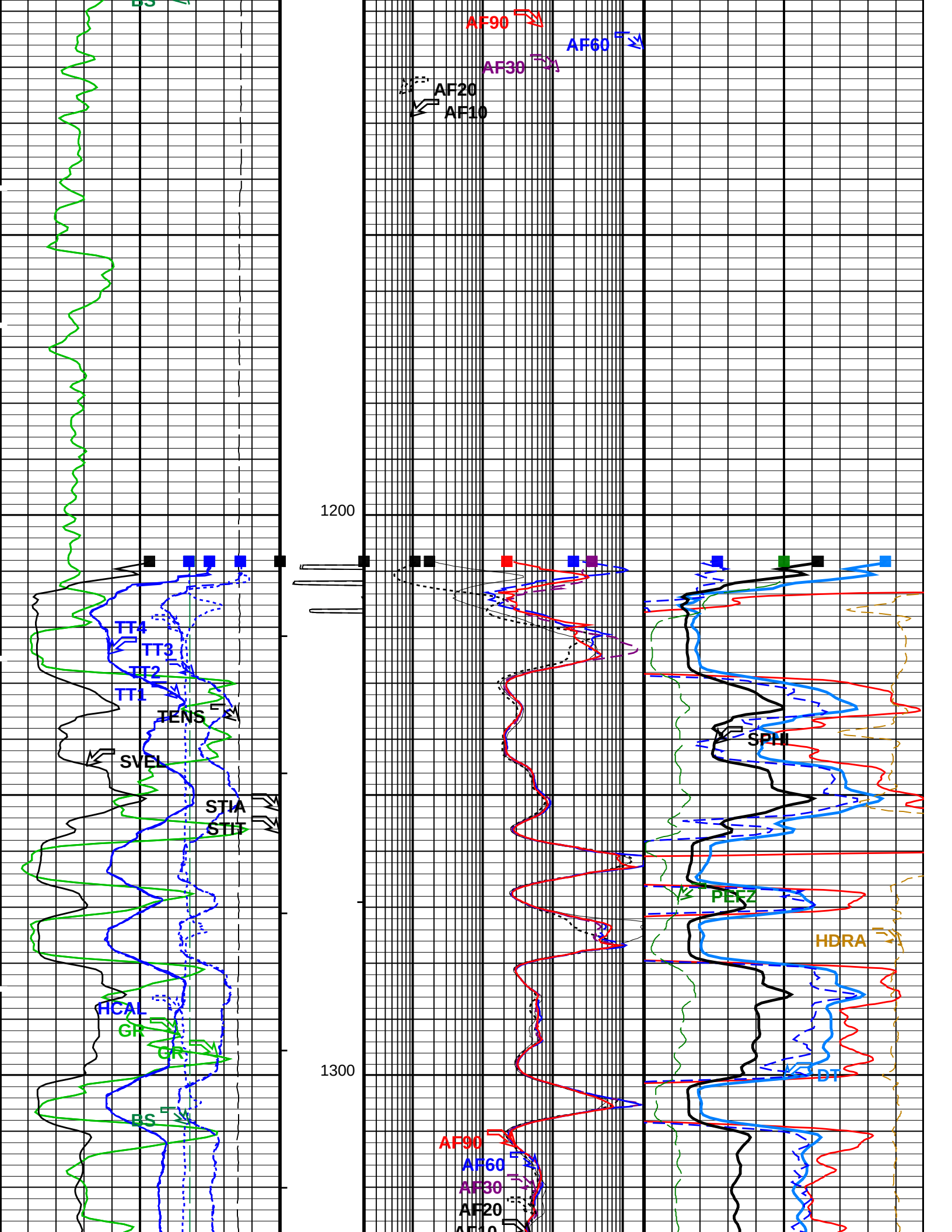
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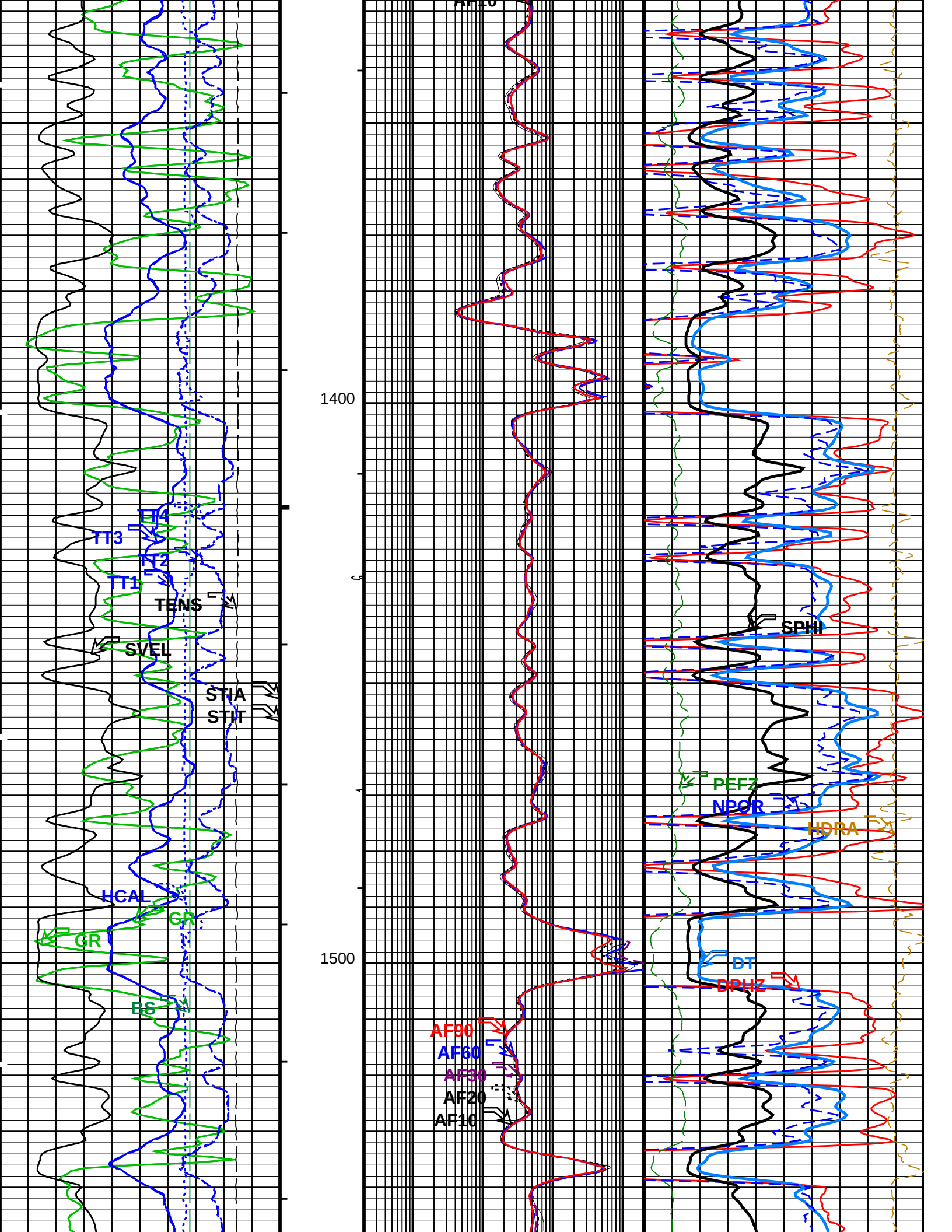
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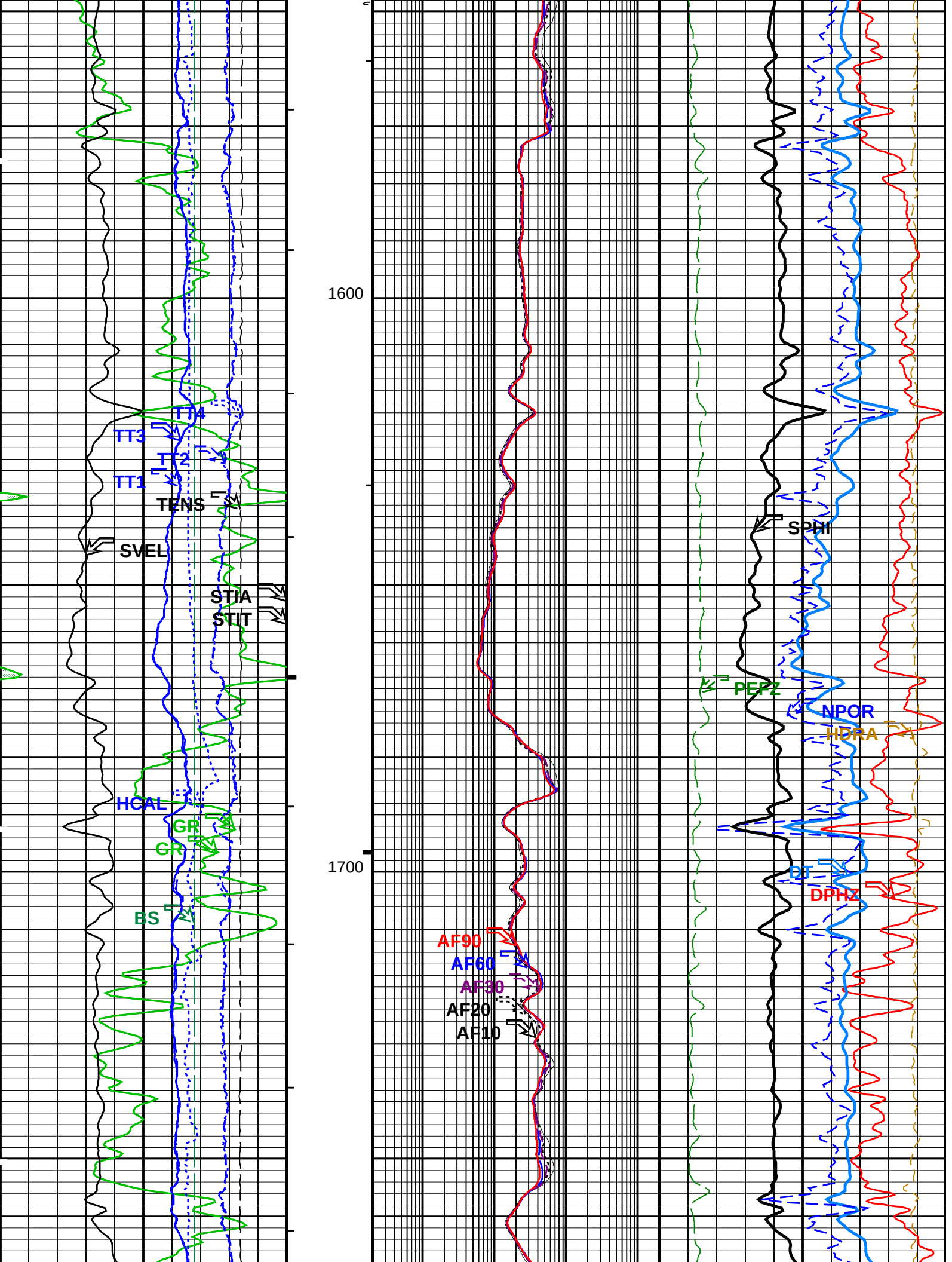
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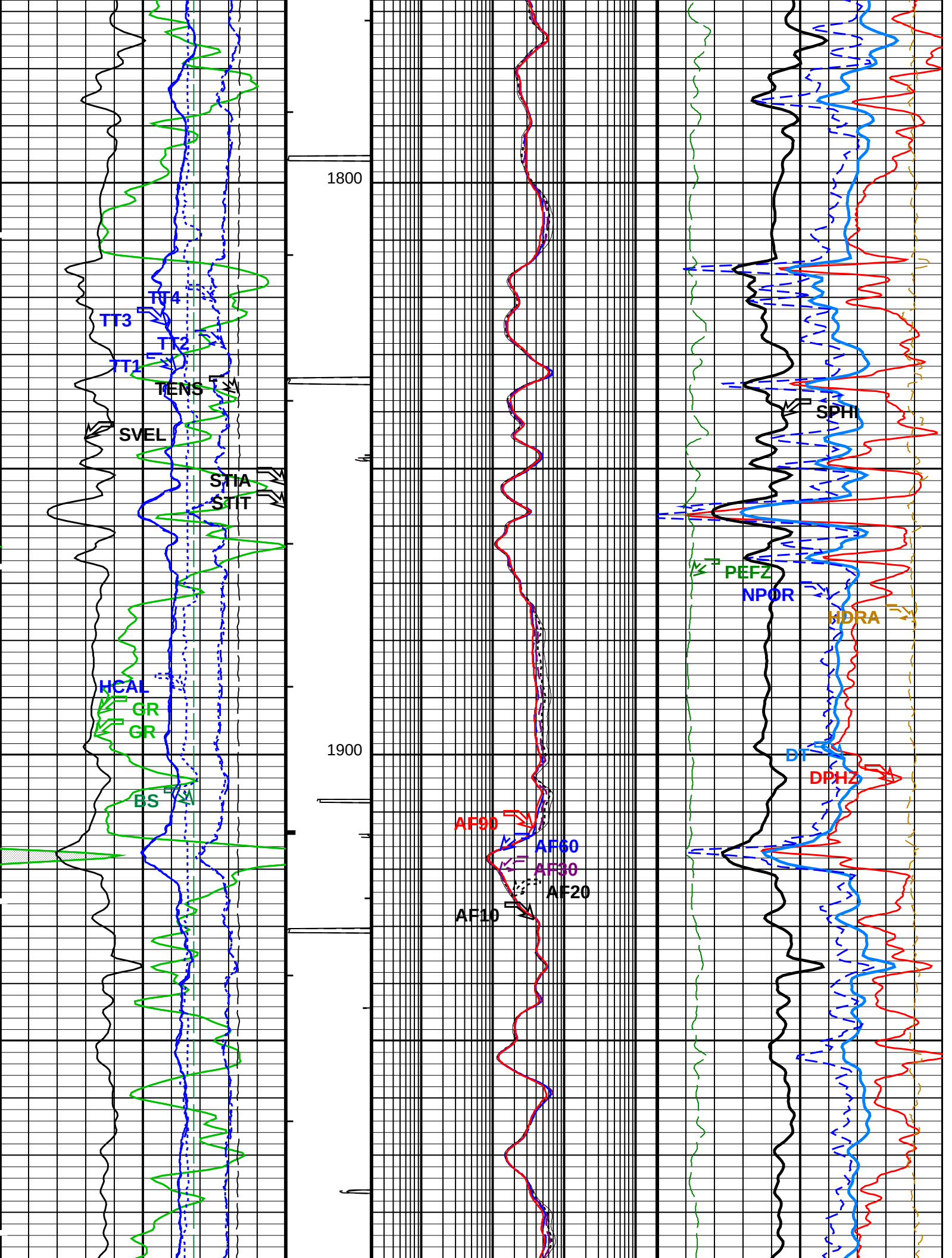
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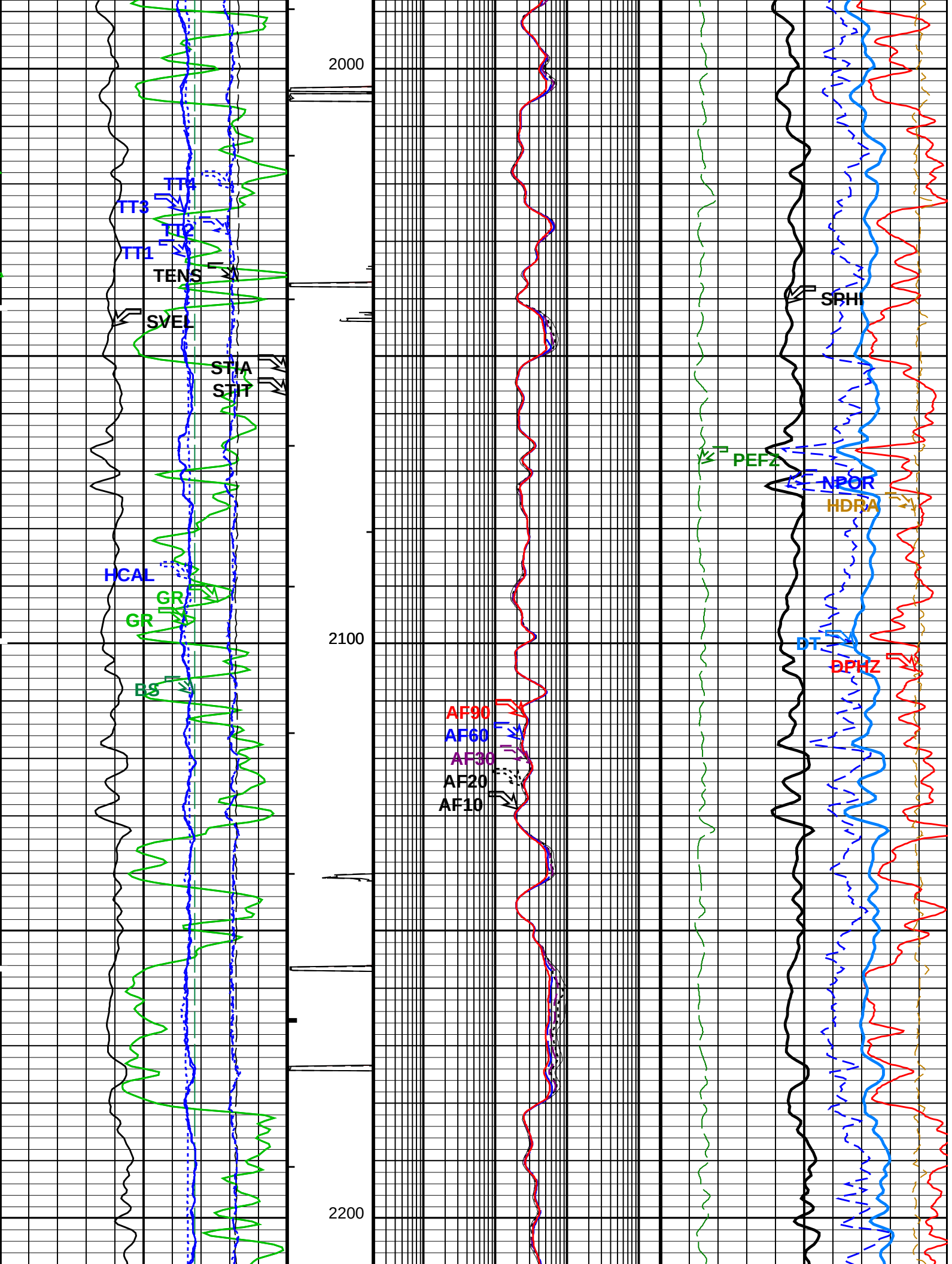
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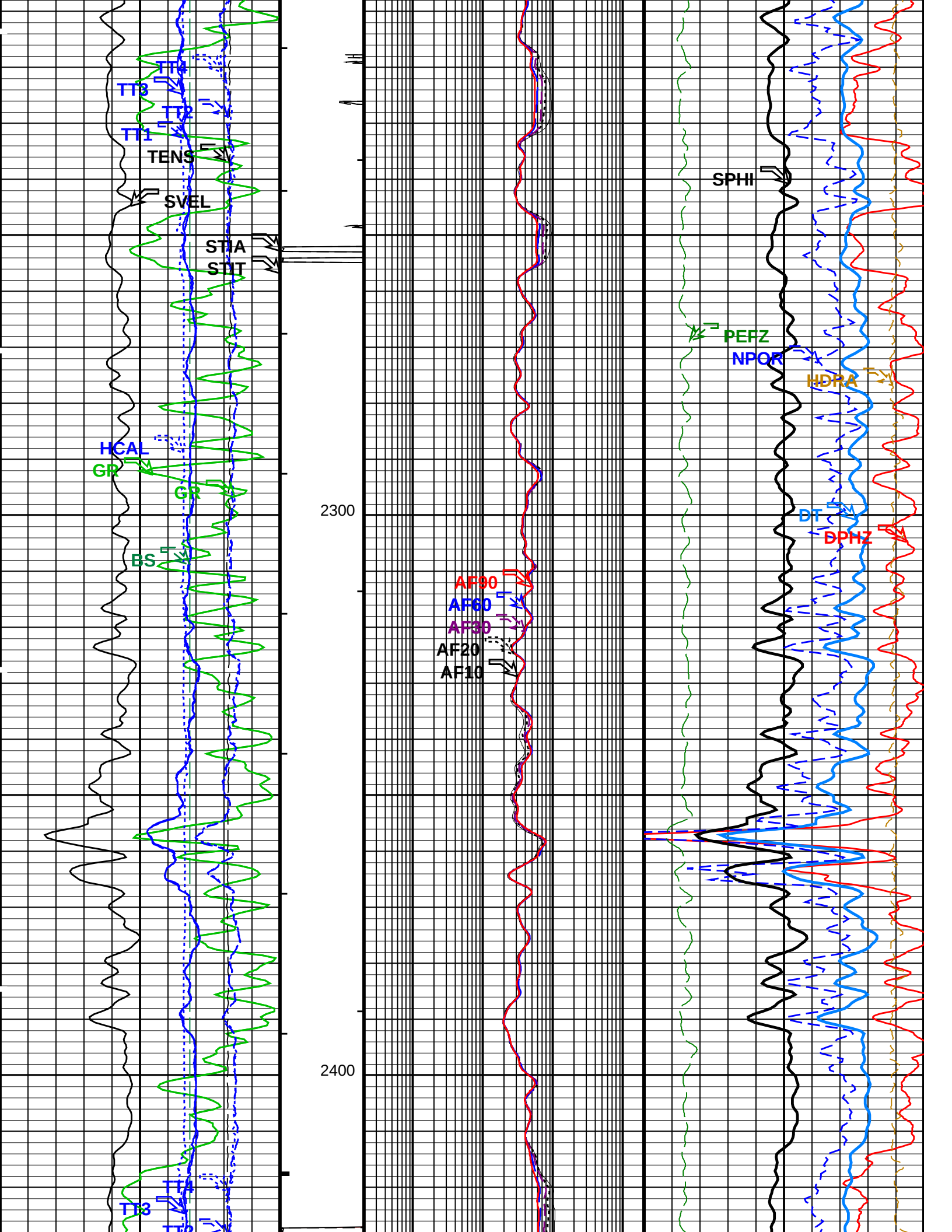
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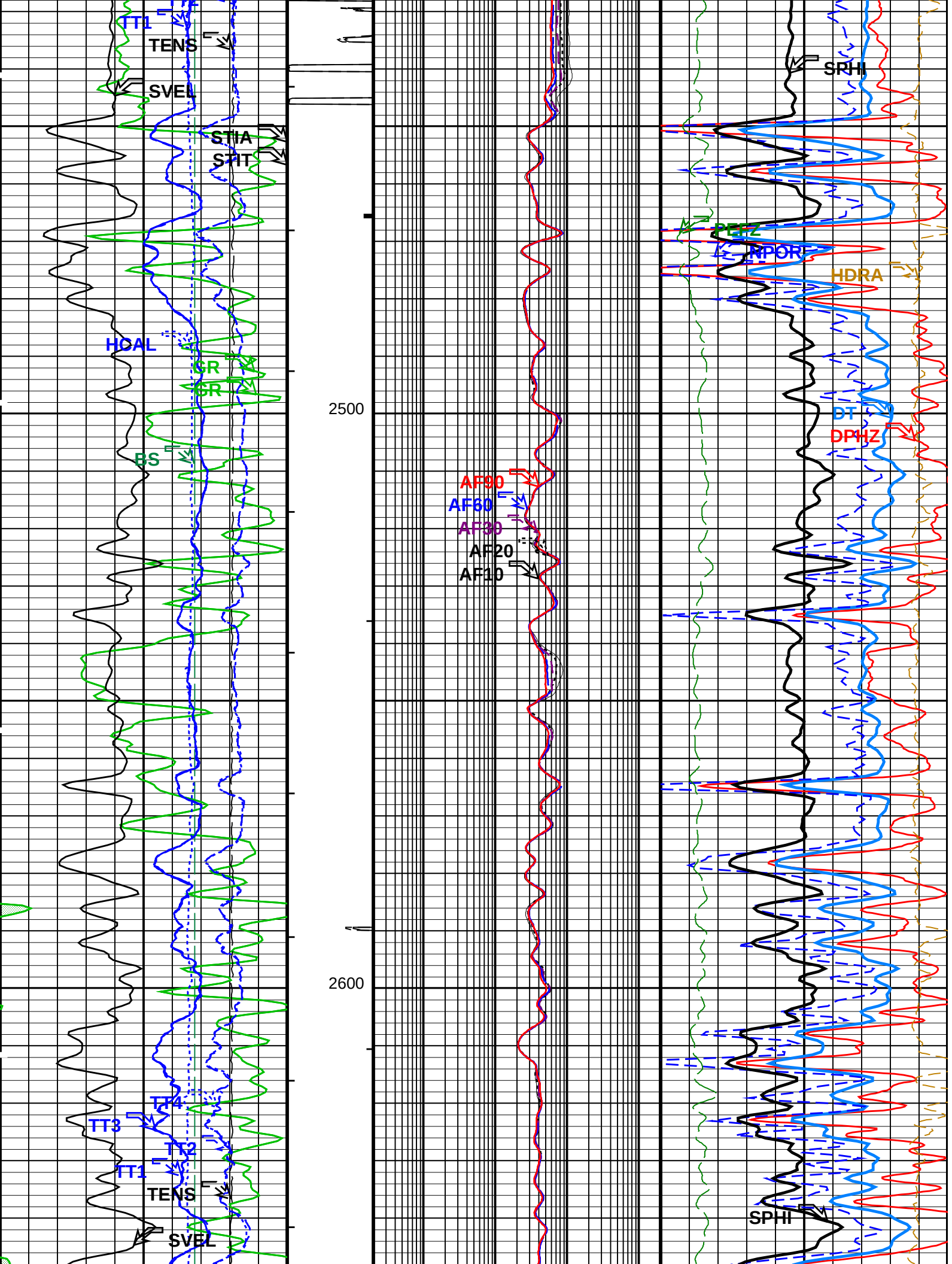
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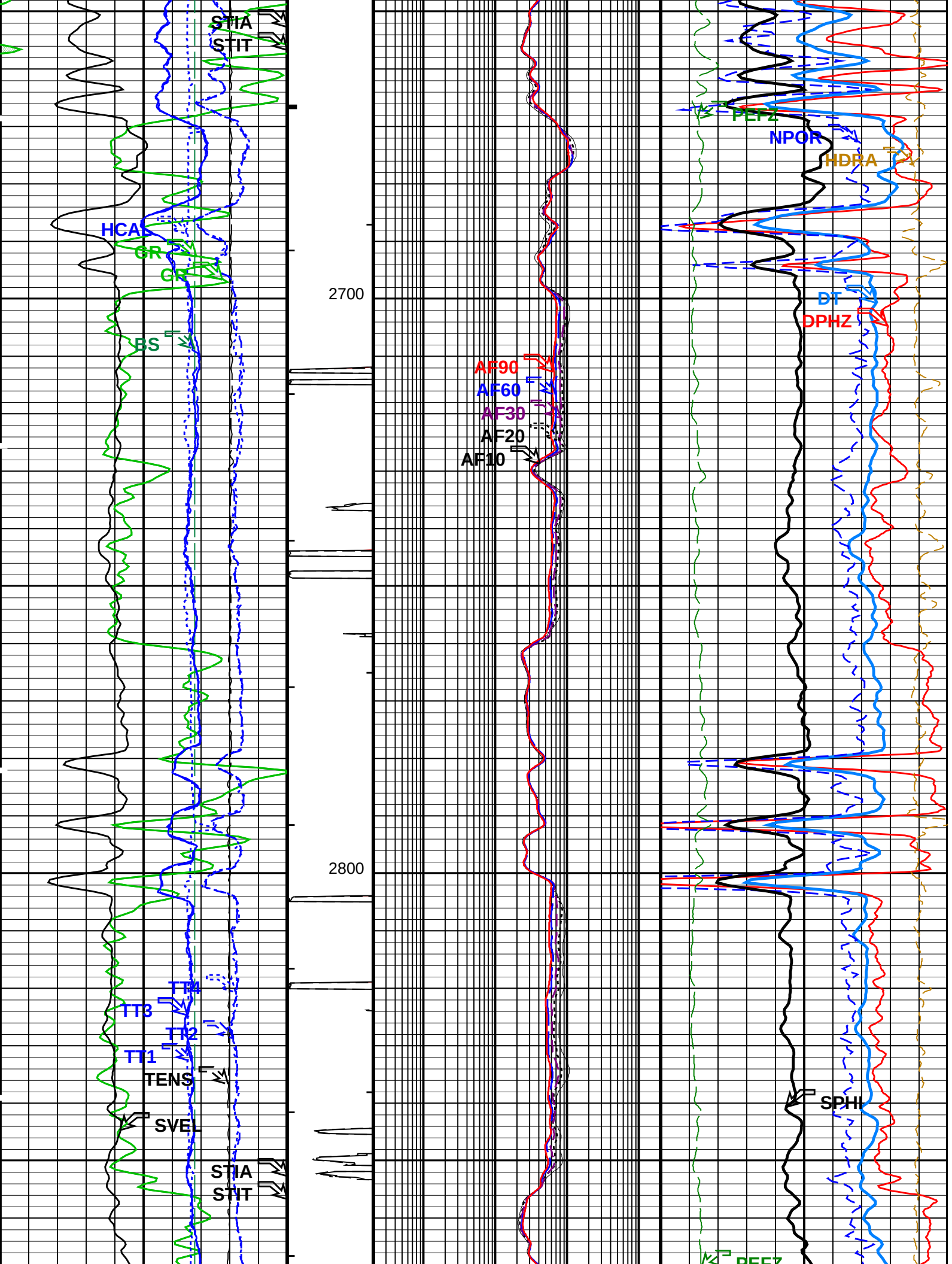
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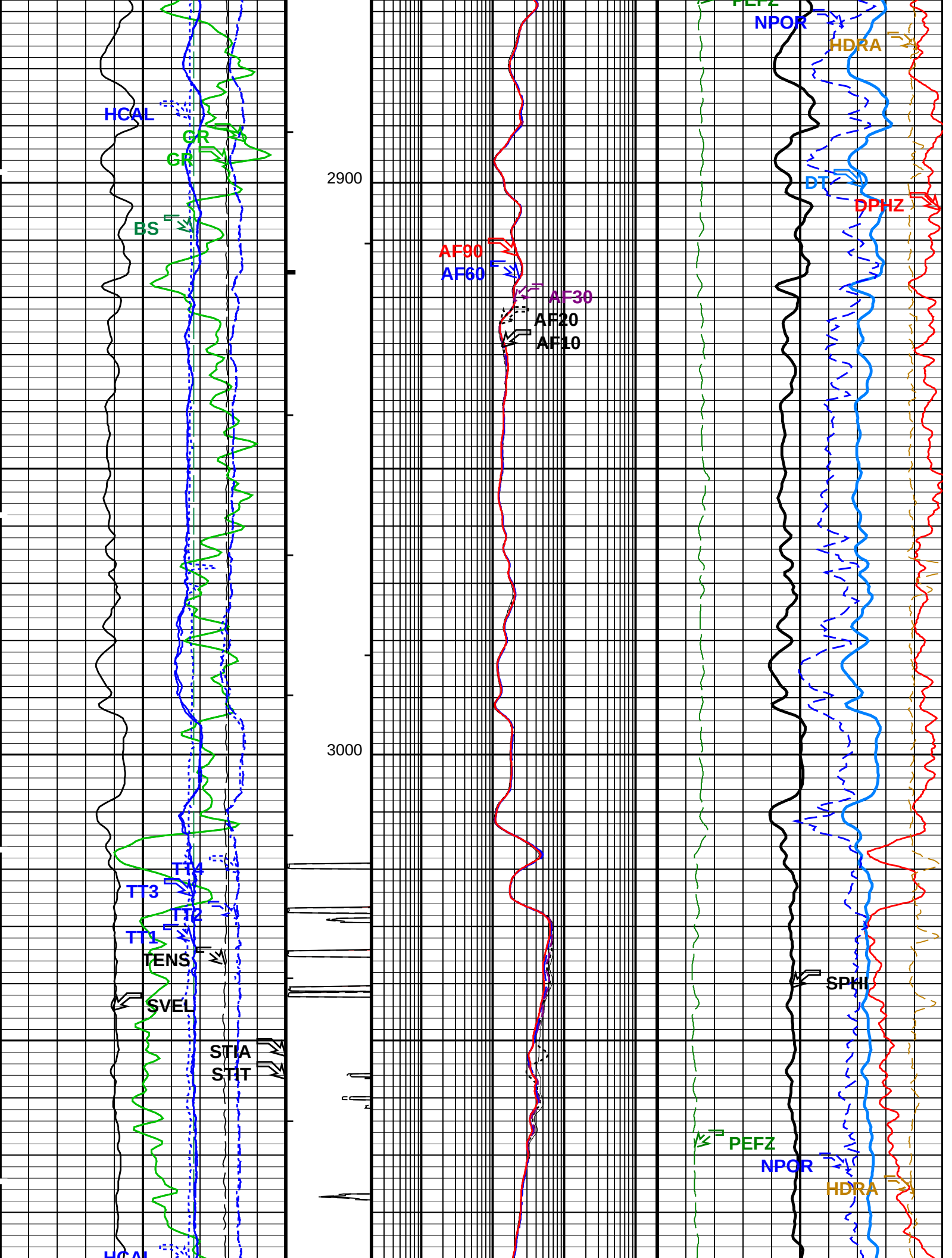
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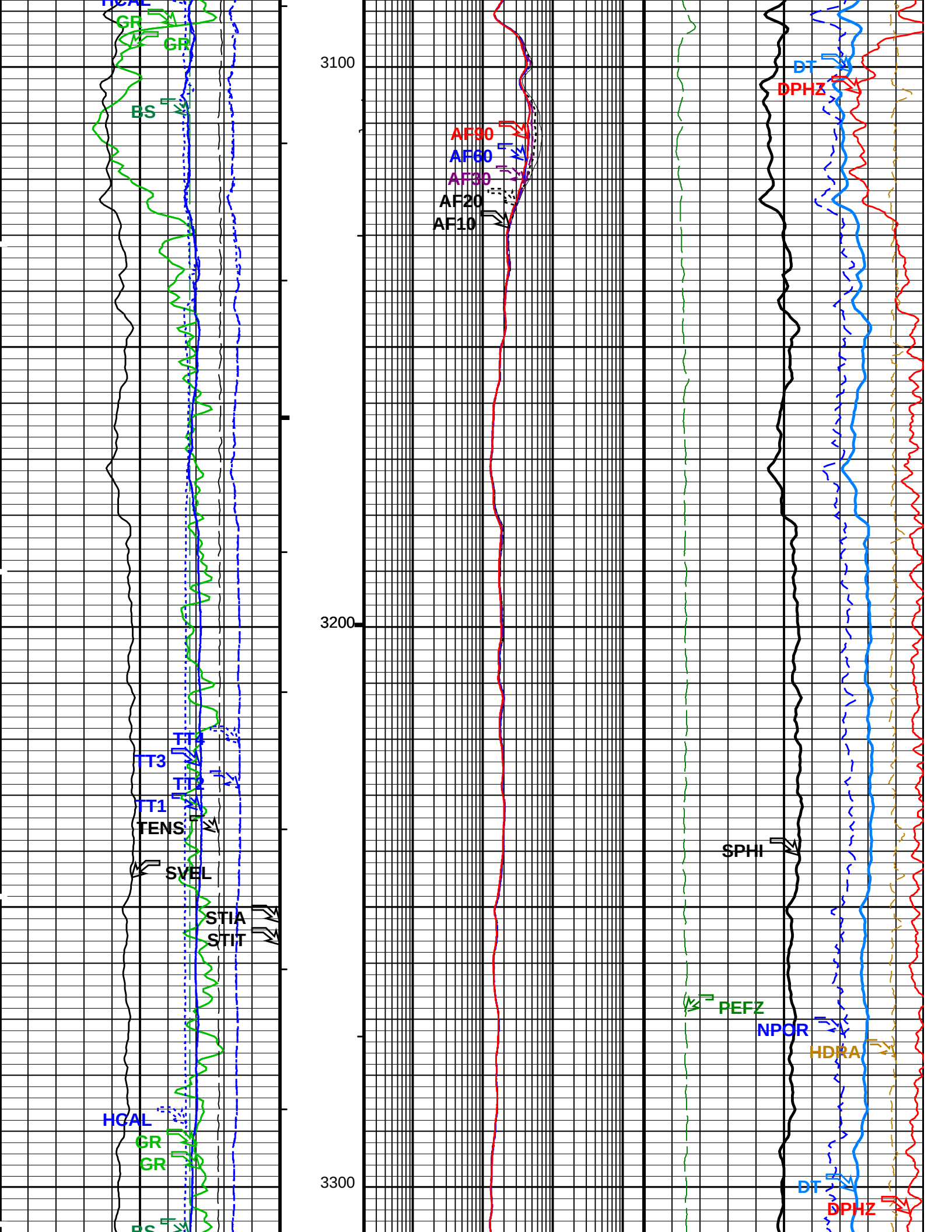
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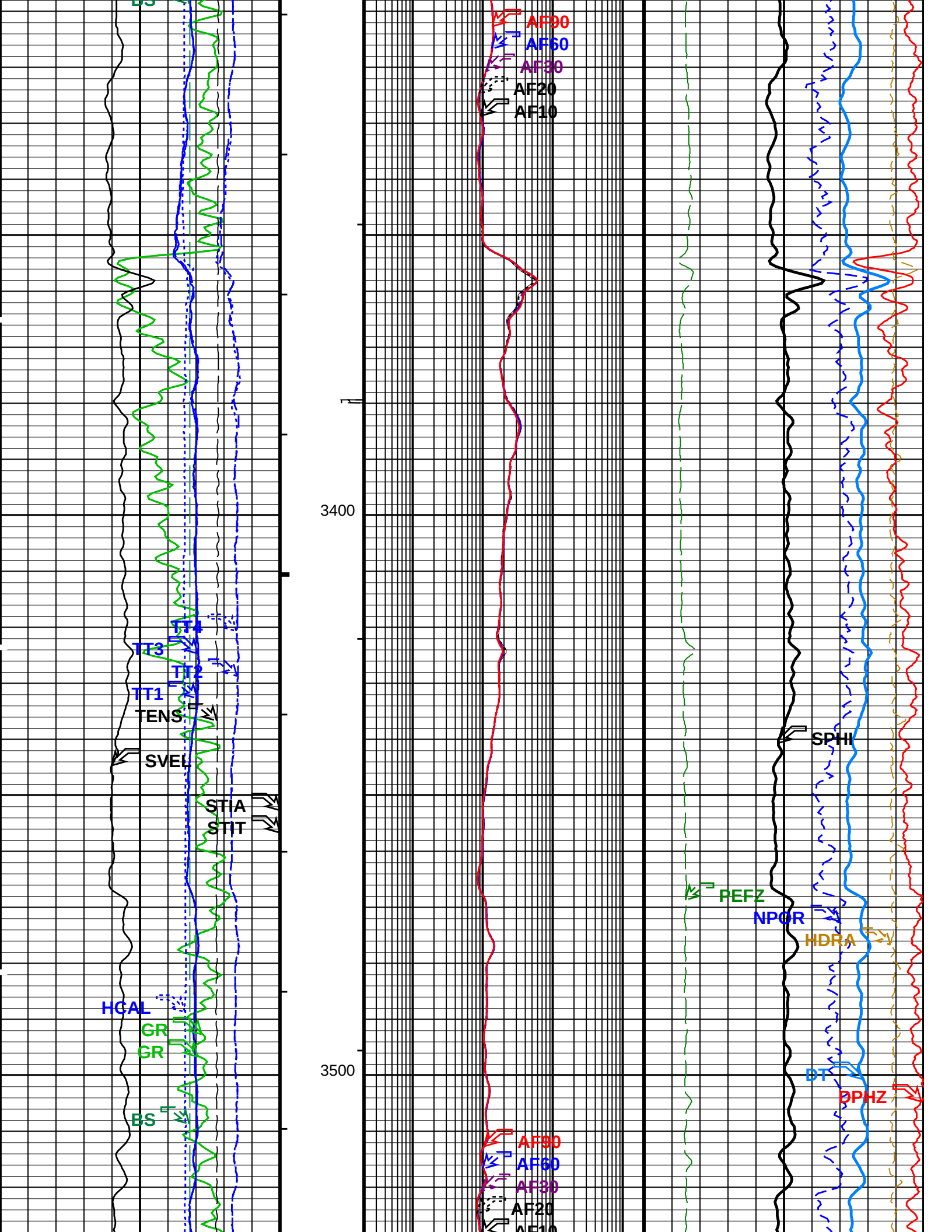
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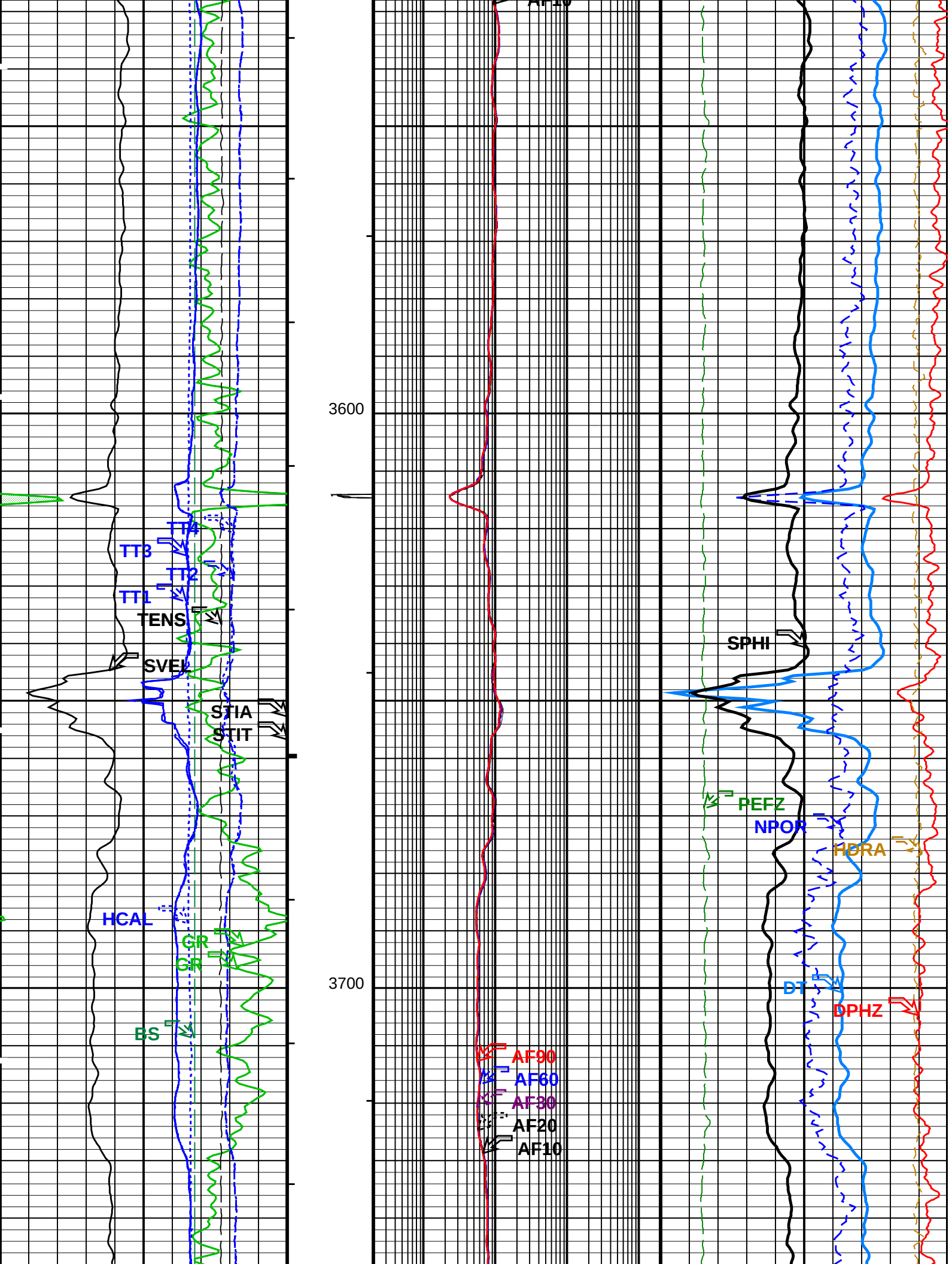
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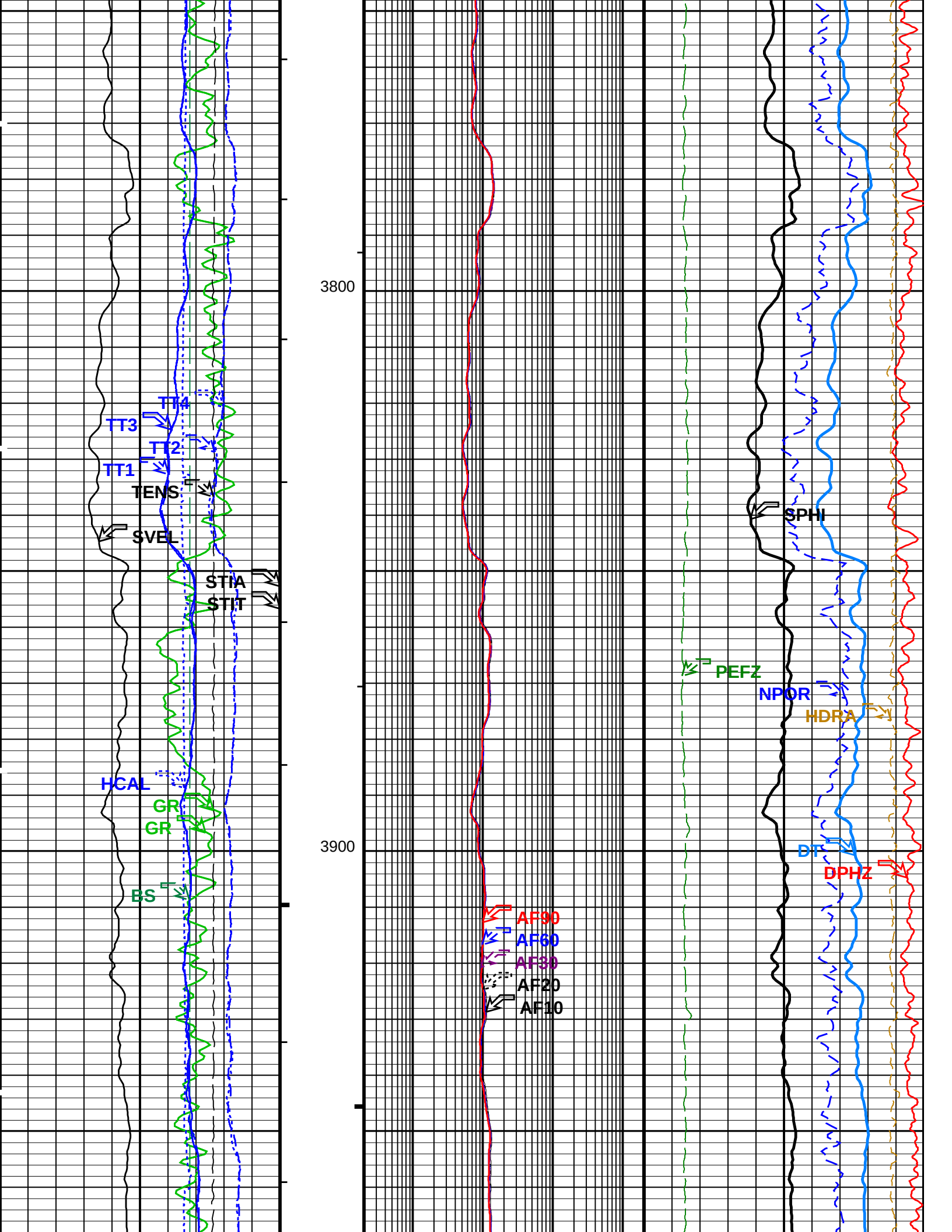
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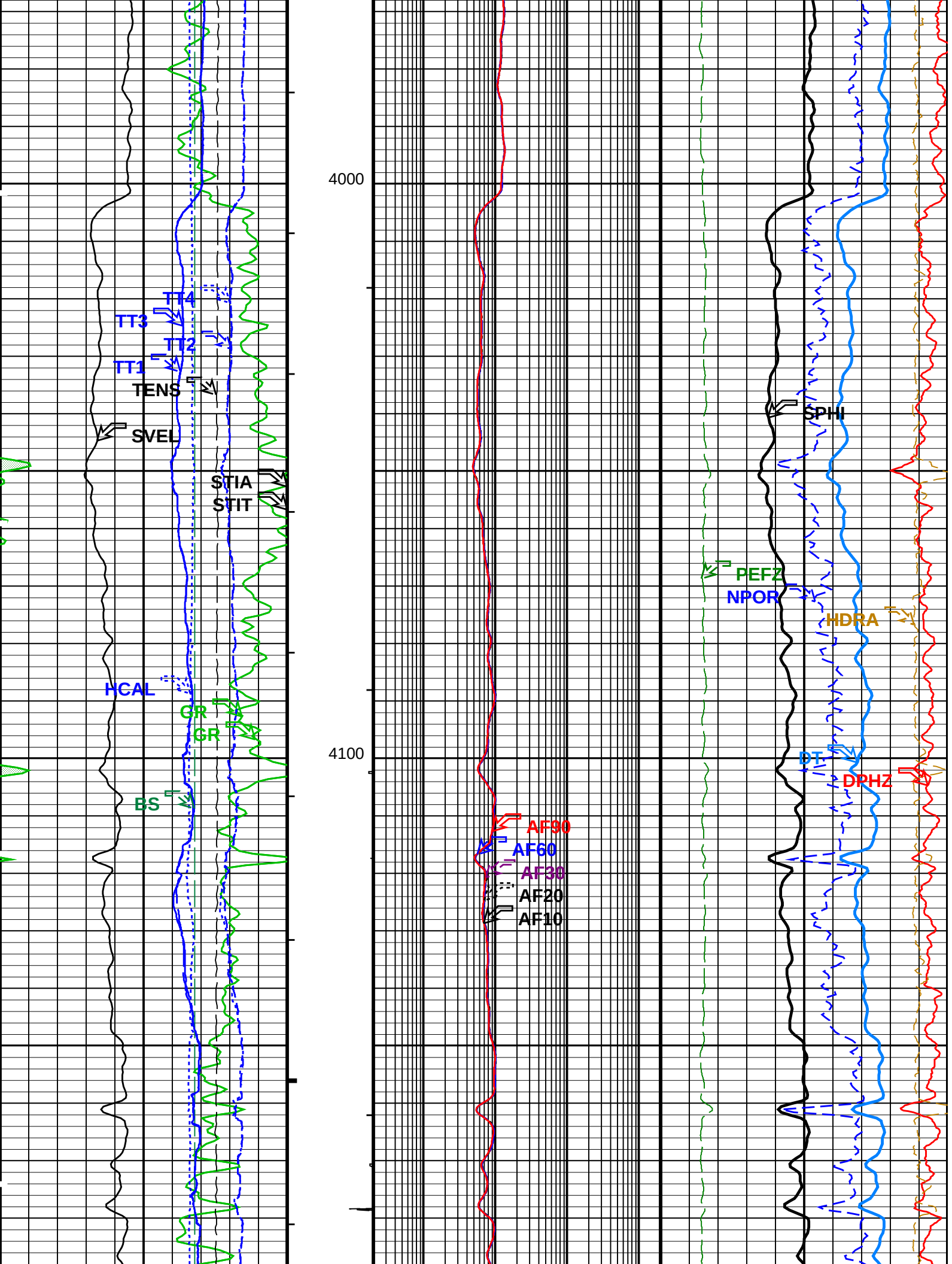
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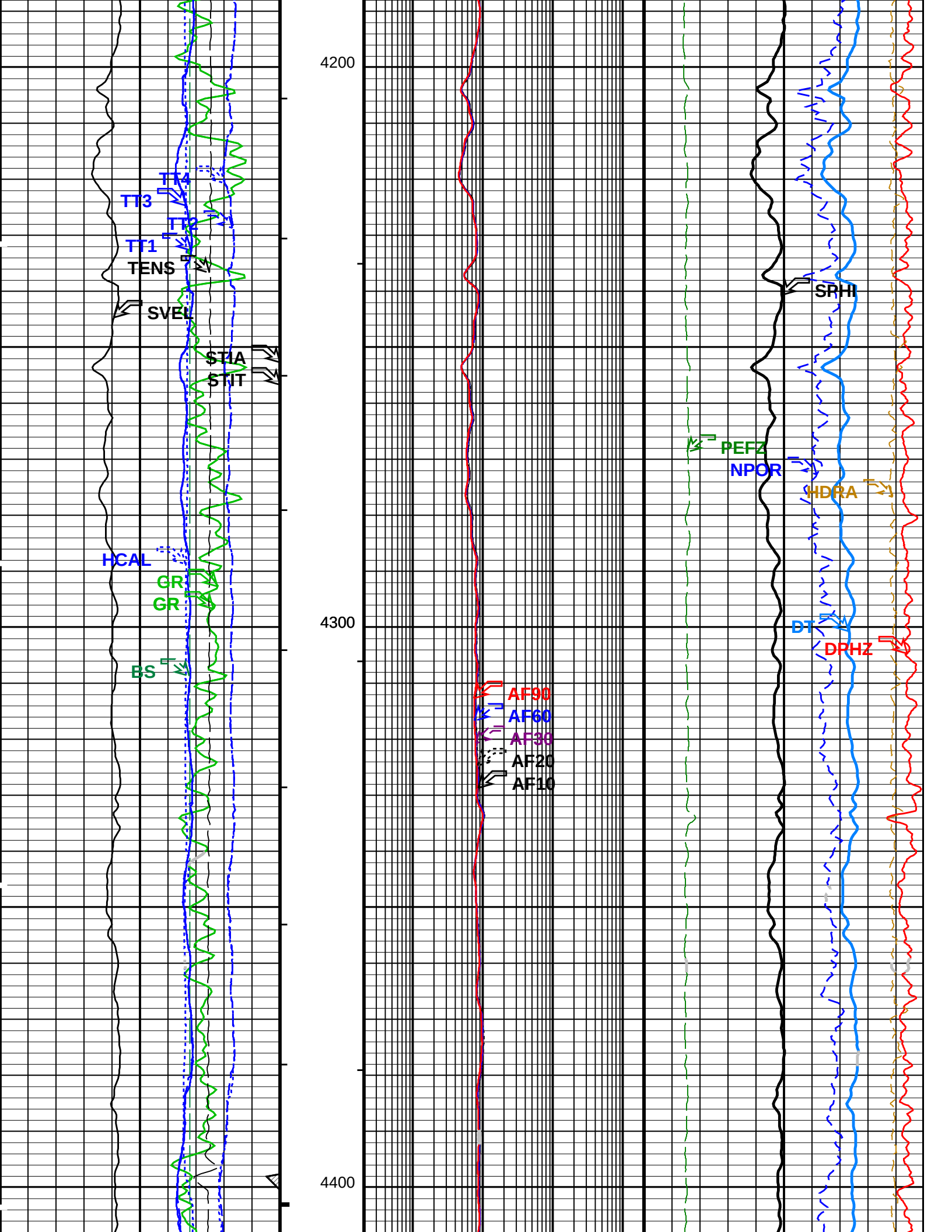
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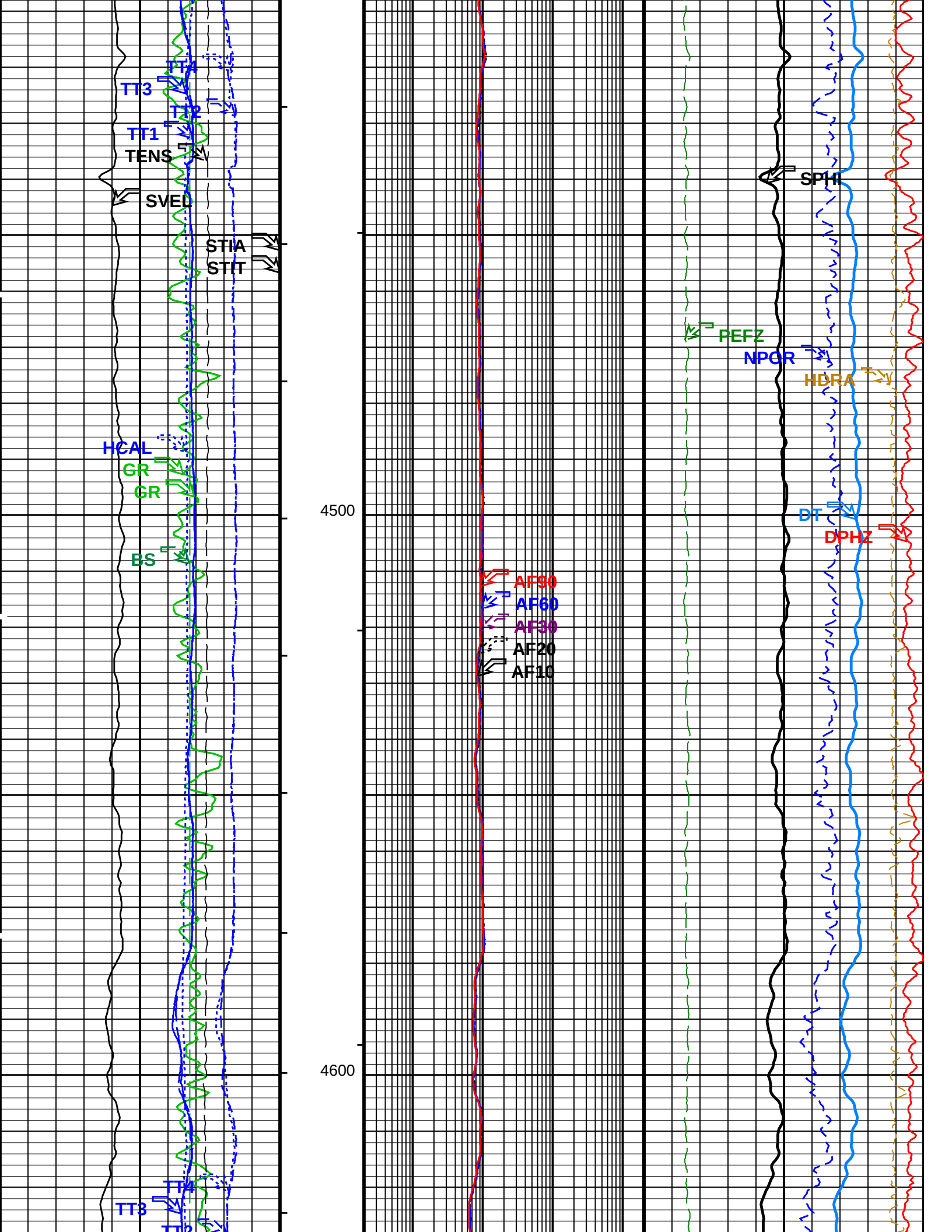
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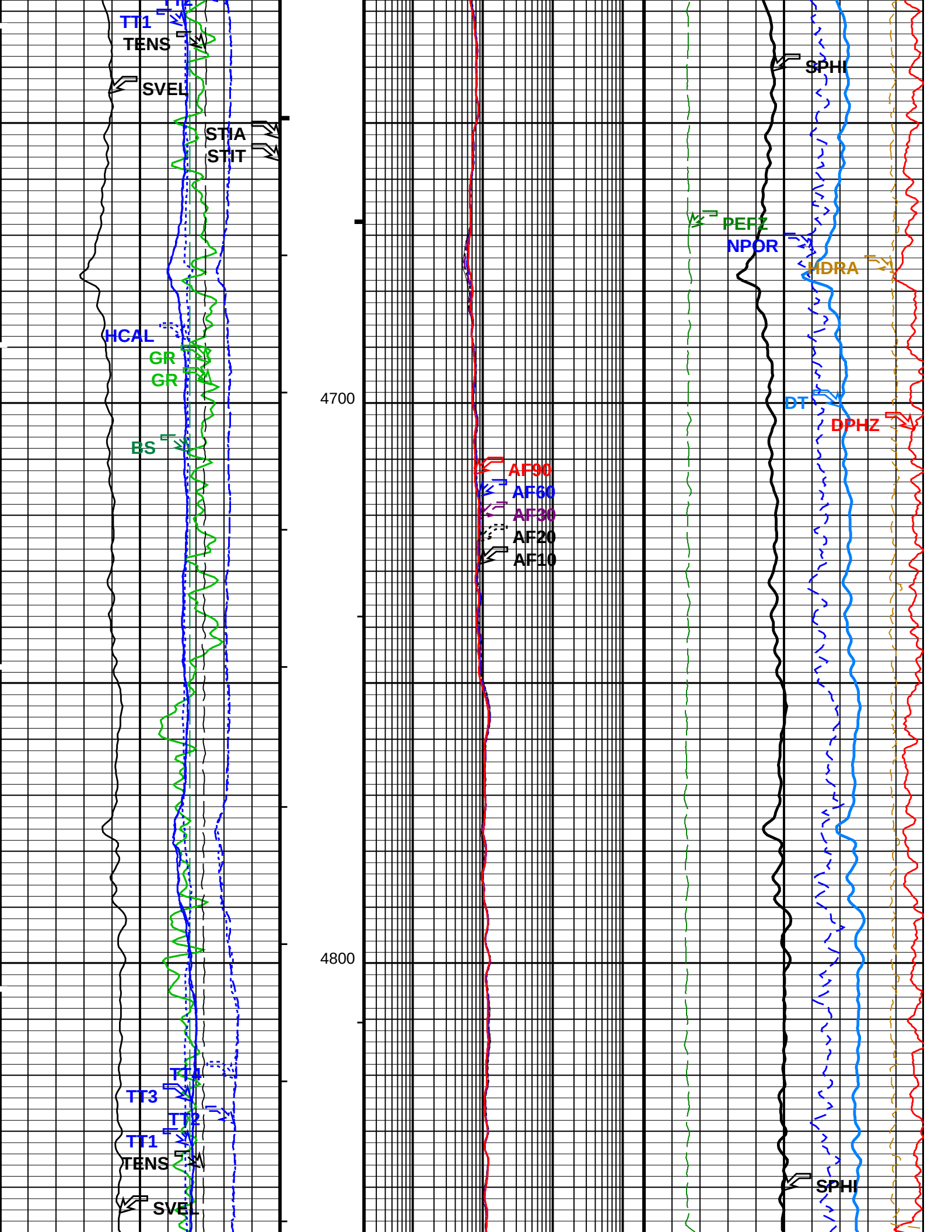
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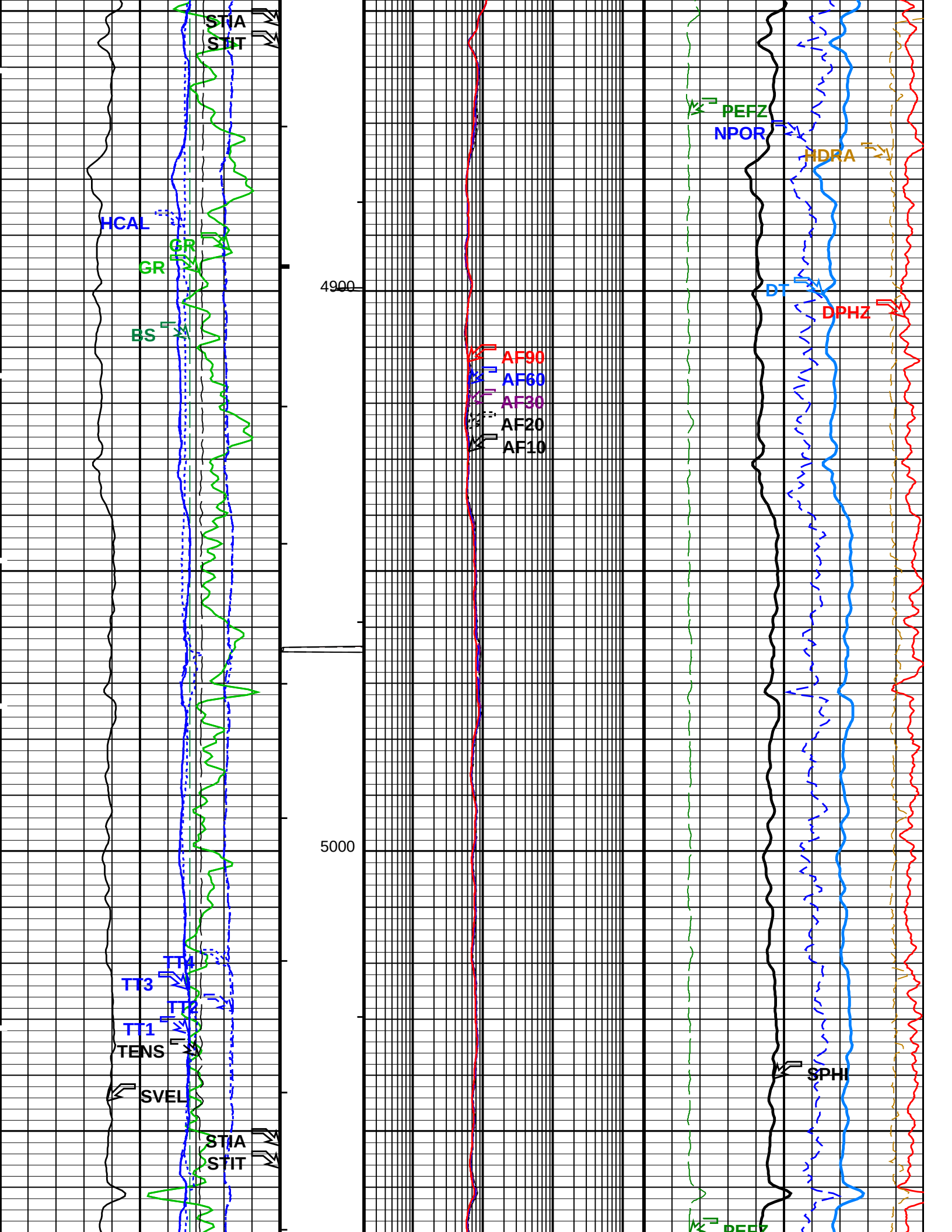
AF60
AF30
AF20
AF10
PEFZ
NPOR
HDRA
SPHI
DT
DPHZ
SPHI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TT3
TT2
TT1
TENS
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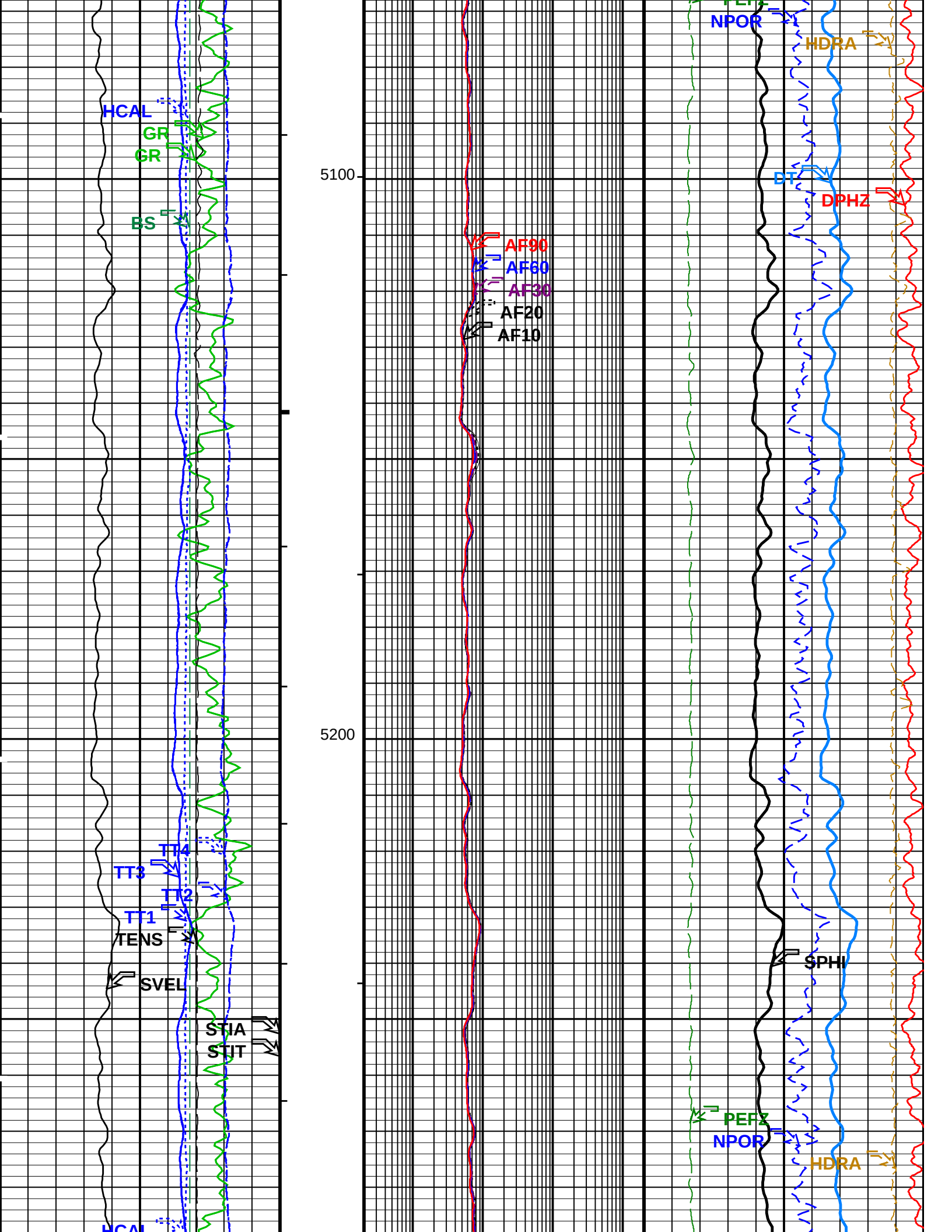
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TT2
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TENS
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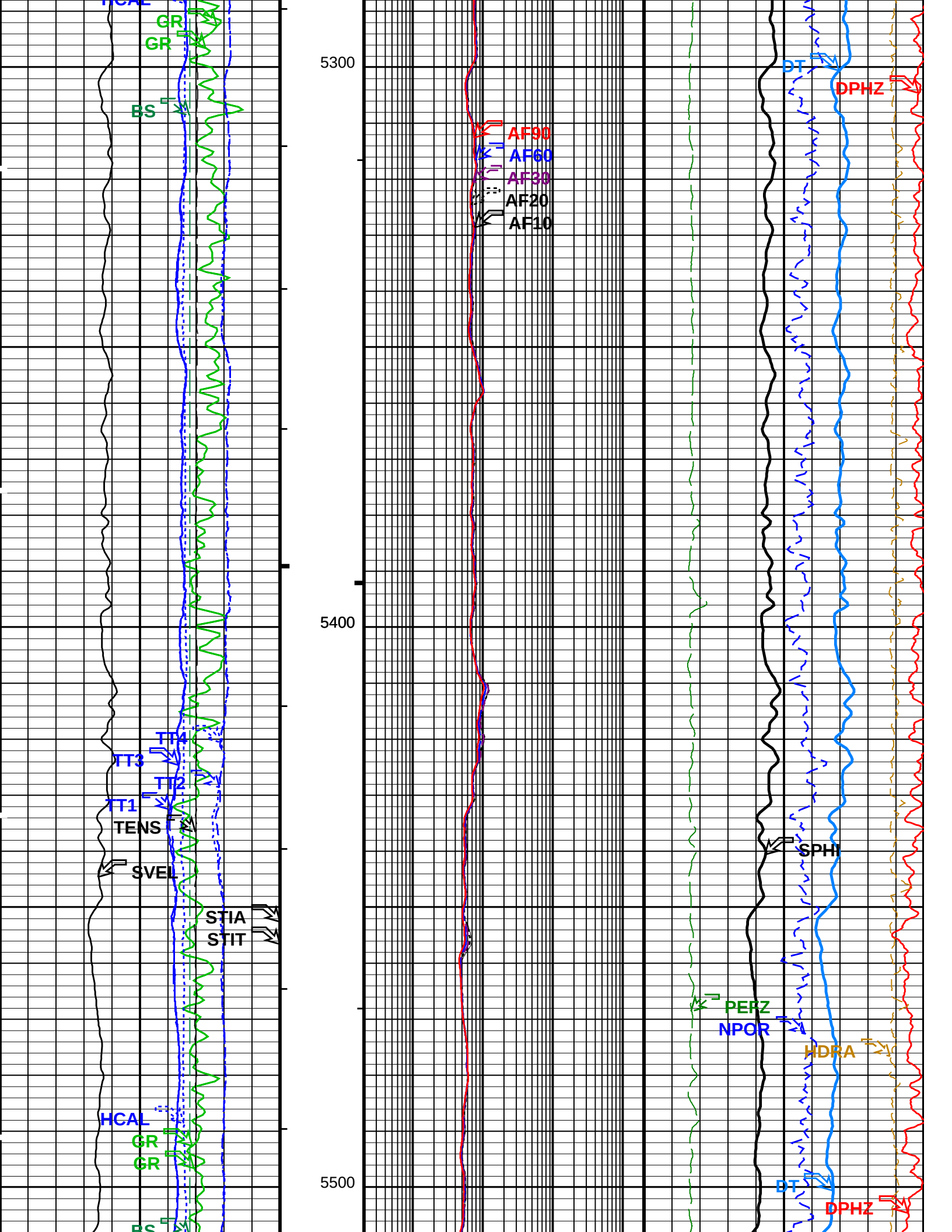
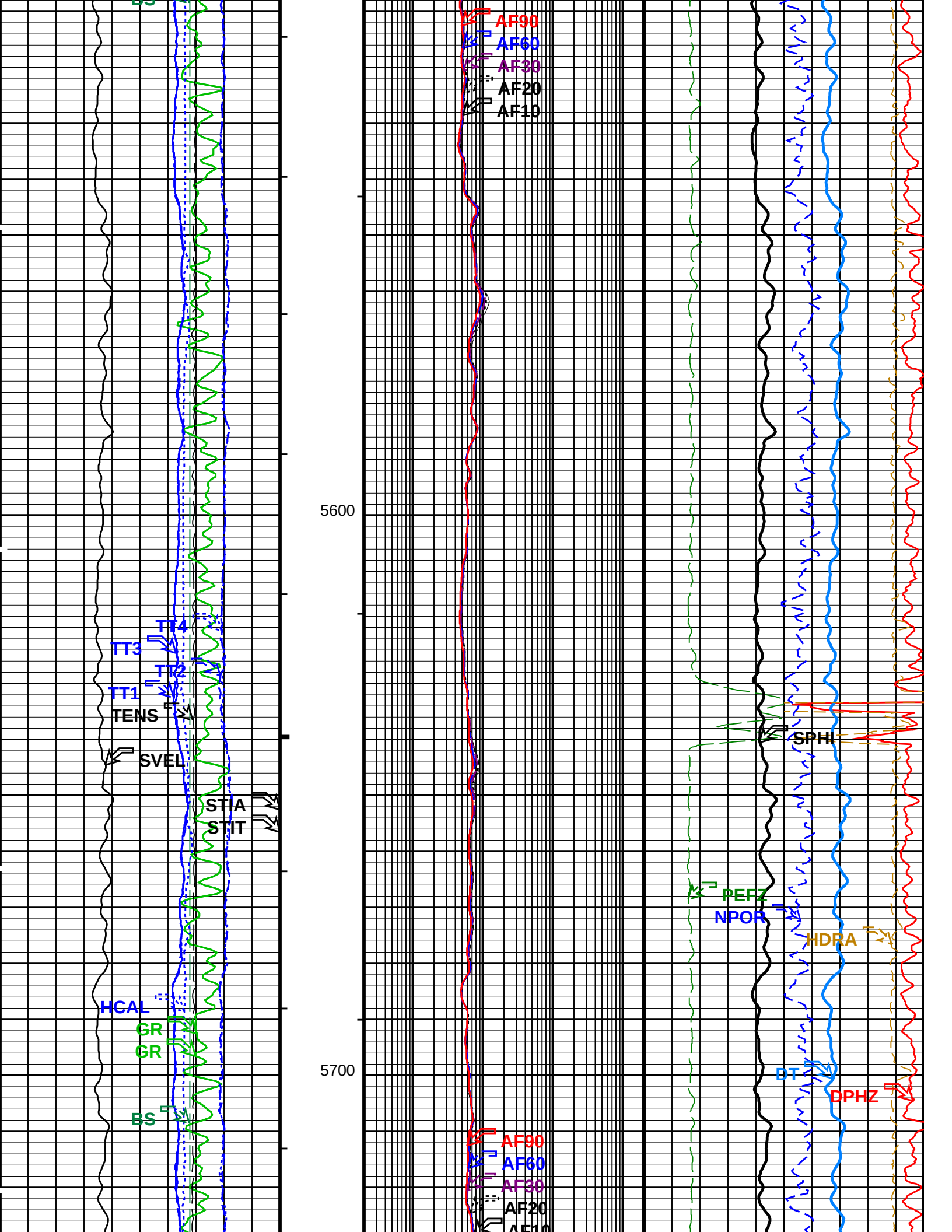
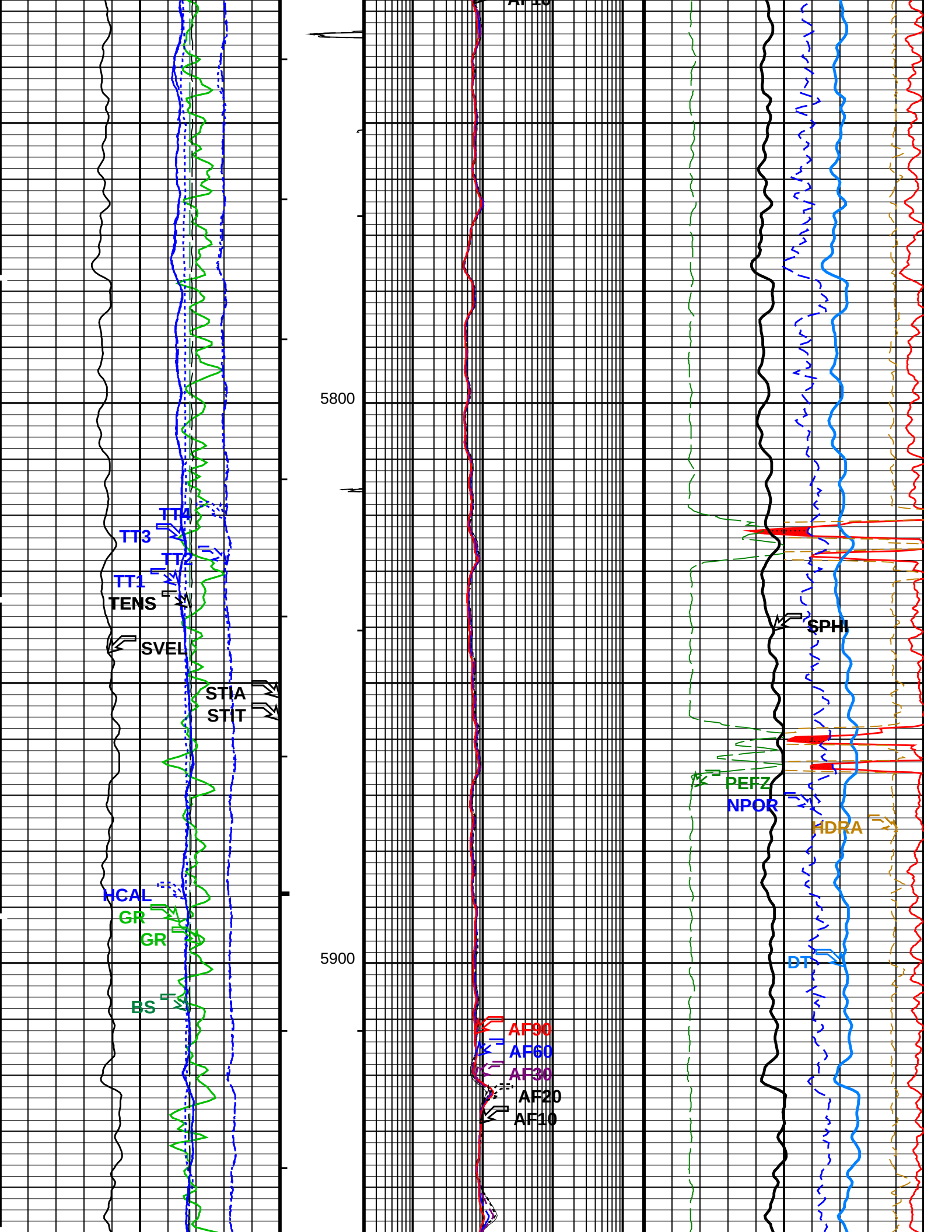
HCAL


HCAL
GR
GR
BS
5300
AF90
AF60
AF30
AF20
AF10
DT
DPHZ
TT4
TT3
TT2
TT1
TENS
SVEL
SPHI
STIA
STIT
PERZ
NPOR
HDRA
5400
HCAL
GR
GR
BS
5500
DT
DPHZ


BS
AF90
AF60
AF30
AF20
AF10
5600
TT4
TT3
TT2
TT1
TENS
SVEL
STIA
STIT
SPHI
PEFZ
NPOR
HDRA
HCAL
GR
GR
5700
DT
DPHZ
BS
AF90
AF60
AF30
AF20


TT4
TT3
TT2
TT1
TENS
SVEL
STIA
STIT
HCAL
GR
GR
BS
5800
5900
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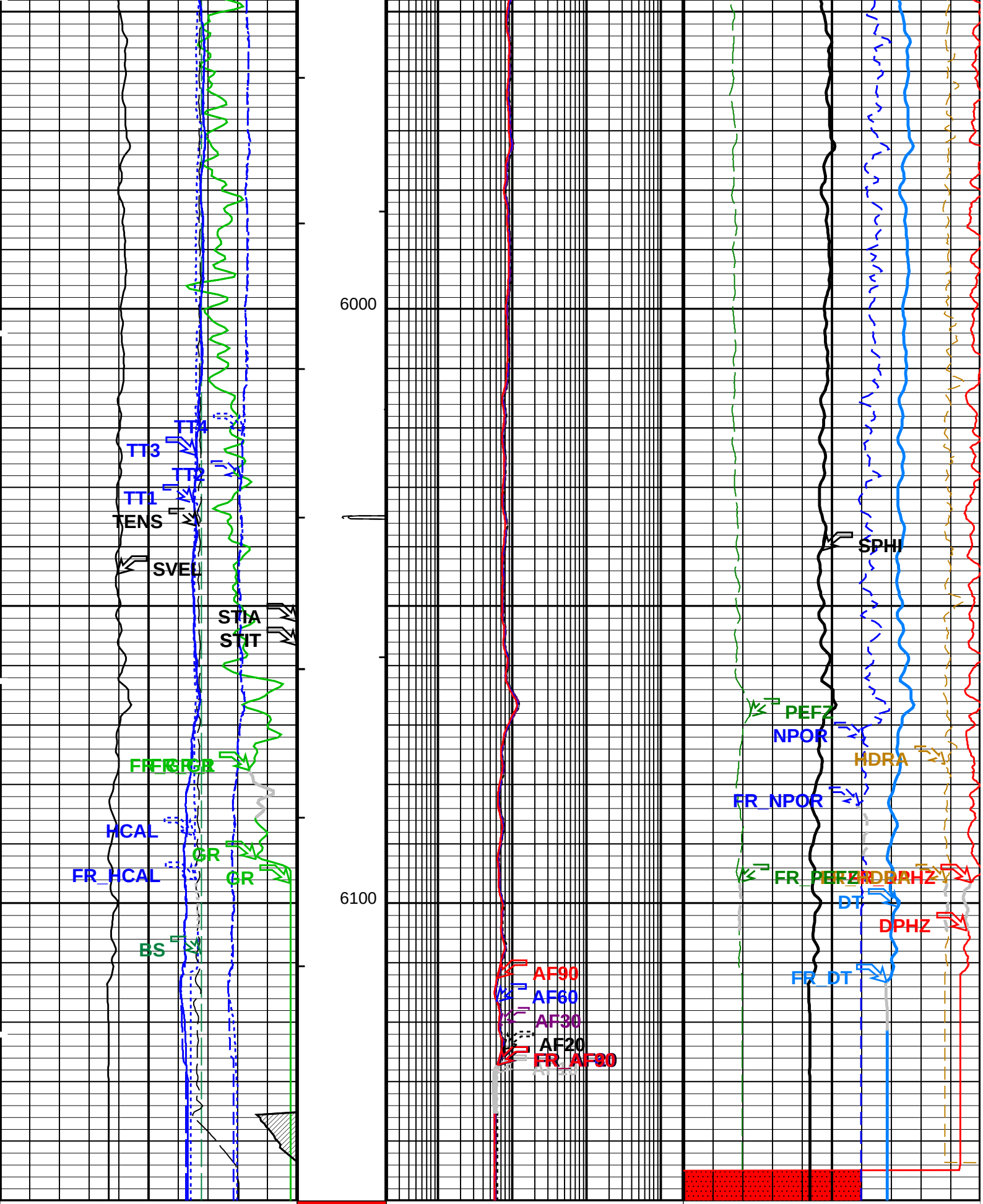
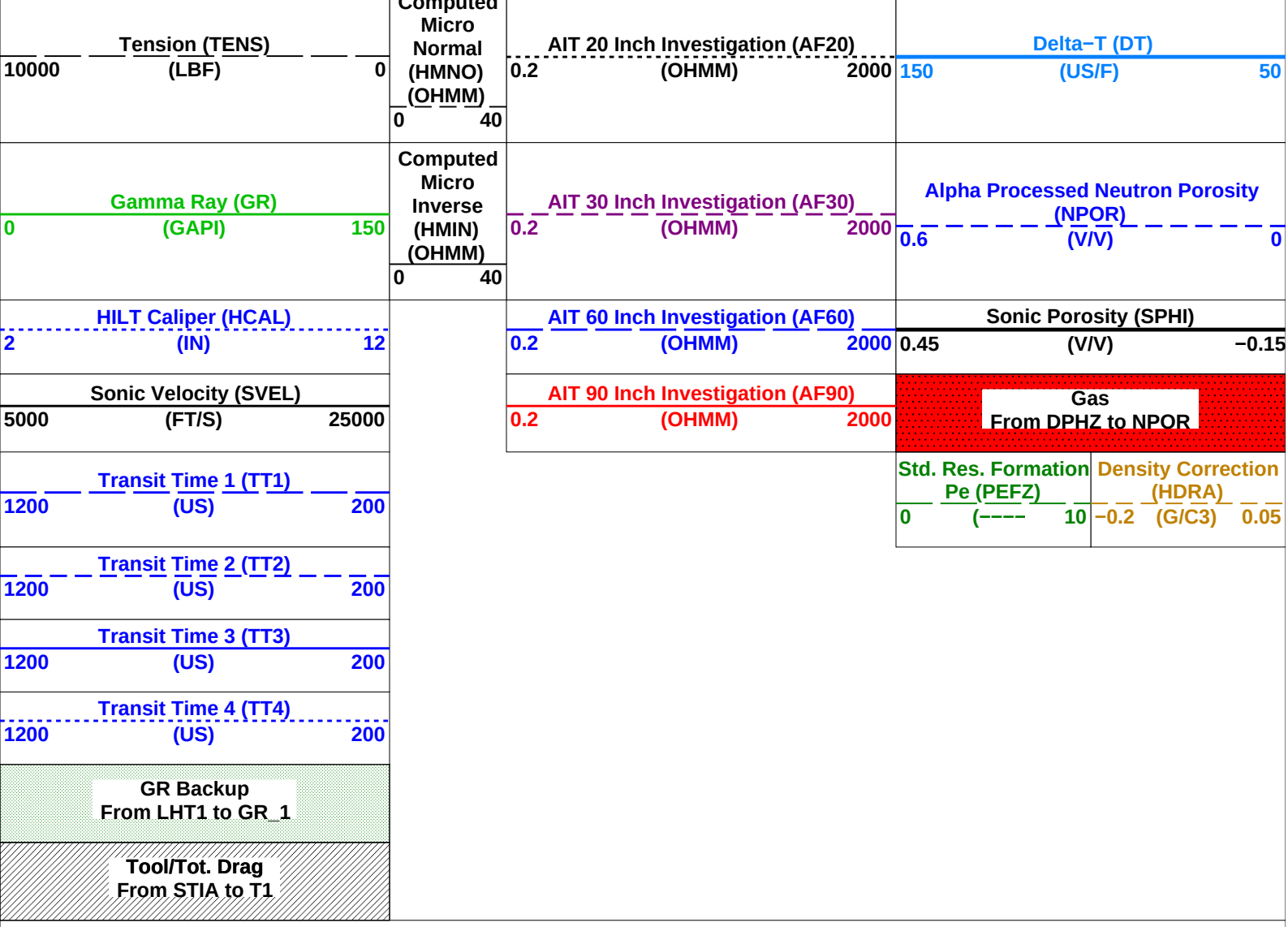
AF20
AF10
SPHI
PEFZ
NPOR
HDRA
DT



Bit Size (BS)			Perm From HMIN to HMNO	AIT 10 Inch Investigation (AF10)			Std. Res. Density Porosity (DPHZ)		
2	(IN)	12		0.2	(OHMM)	2000	0.6	(V/V)	0



PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	AIT−M: Array Induction Tool − M		
AAPL	Array Induction Answer Product Level(Depth Log/View only)	3_BholeCorr_BasicLogs_RadialProcessing	
ABHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
ABHV	Array Induction Borehole Correction Code Version Number	900	
ABLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
ABLV	Array Induction Basic Logs Code Version Number	223	
ACDE	Array Induction Casing Detection Enable	No	
ACEN	Array Induction Tool Centering Flag (in Borehole)	Centered	
ACSED	Array Induction Casing Shoe Estimated Depth	−50000	FT
ADITM	Array Induction Desired Tool Mode	0x00_Log_000	
AEBC	Array Induction Enable Borehole Correction	Yes	
AEBL	Array Induction Enable Basic Logs	Yes	
AERP	Array Induction Enable Radial Processing	Yes	
AETP	Array Induction Enable Sonde Error Temp&Pres Corr	Yes	
AFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AFVN	Array Induction Firmware Code Version Number	0	
AIGS	Array Induction Select Akima Interpolation Gating	On	
ALNV	Array Induction Log Not Valid Flag	Log_Valid−No_Default_Parameters	
AMRD	Array Induction Mud Resistivity Calibration Depth	0	FT
AMRF	Array Induction Mud Resistivity Factor	1	
AORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
ARFV	Array Induction Radial Profiling Code Version Number	701	
ARPM	Array Induction Radial Processing Mode	0_One	
ARPV	Array Induction Radial Parametrization Code Version Number	232	
ARTS	AIT Rt Selection (for ALLRES computation)	AITM_OneResA60	

ASTA	Array Induction Tool Standoff	1.5	IN
ATRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
ATSE	Array Induction Temperature Selection(Sonde Error Correction)	Internal	
ATTY	Array Induction Tool Type (of acquired data)	AITM	
AULV	Array Induction User Level Control	Normal	
AZRSV	Array Induction Response Set Version for Z Resolution	00.10.25.00	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
RTCO	RTCO − Rt Invasion Correction	YES	
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
DSLT−FTB: Digitizing Sonic Logging Tool			
	Telemetry Mode	DSLC_FTB	
	DSLT Firing Mode	BHC	
AGC	Automatic Gain Control Status	ON	
AMSG	Auxiliary Minimum Sliding Gate	140	US
CBAF	CBL Adjustment Factor	1	
CBLG	CBL Gate Width	45	US
CDTS	C−Delta−T Shale	100	US/F
DDEL	Digitizing Delay	0	US
DETE	Delta−T Detection	E2	
DFAD	Digital First Arrival Detection Switch	HOST	
DIVL	DSLT Depth Sampling Interval	20	
DRCS	DSLT DLIS Recording Size	150	
DSIN	Digitizing Sample Interval	10	
DTCM	Delta−T Computation Mode	FULL	
DTF	Delta−T Fluid	220	US/F
DTFS	DSLC Telemetry Frame Size	336	
DTM	Delta−T Matrix	56	US/F
DWCO	Digitizing Word Count	150	
GAI	Manual Gain	40	
HRSP	High Resolution Spacing	5.118	IN
ITTS	Integrated Transit Time Source	DT	
LTUT	Lower to Upper Transmitter Spacing Ratio	1	
MAHTR	Manual High Threshold Reference	120	
MGAI	Maximum Gain	60	
MIGA	Minimum Gain	1	
MNHTR	Minimum High Threshold Reference	100	
MODE	Sonic Firing Mode	BHC	
NMSG	Near Minimum Sliding Gate	140	US
NMXG	Near Maximum Sliding Gate	980	US
NUMP	Number of Detection Passes	2	
RATE	Firing Rate	R15	
RDFA	Reset DFAD	OFF	
SDTH	Switch Down Threshold	20000	
SFAF	Sonic Formation Attenuation Factor	3	DB/F
SGAD	Sliding Gate Status	ON	
SGAI	Selectable Acquisition Gain	AUTO	
SGCL	Sliding Gate Closing Delta−T	140	US/F
SGCW	Sliding Gate Closing Width	25	US
SGDT	Sliding Gate Delta−T	40	US/F
SGW	Sliding Gate Width	110	US
SLEV	Signal Level for AGC	5000	
SPFS	Sonic Porosity Formula	RAYMER_HUNT	
SPSO	Sonic Porosity Source	DT	
SUTH	Switch Up Threshold	1000	
VDLG	VDL Manual Gain	40	
WAGC	Waveform AGC Allow/Disallow	OFF	
WGAI	Waveform Manual Gain	20	
WGDT	Waveform Gain Delta−T	240	US/F
WGIN	Waveform Gain Interval	2540	US
WMOD	Waveform Firing Mode	FULL	
HILTH−FTB: High resolution Integrated Logging Tool−DTS			
BHFL	Borehole Fluid Type	OIL	
BHFL_TLD	HILT Nuclear Mud Base	OIL	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
EXSICL	External Shale Indicator Clean Value	20	
EXSISH	External Shale Indicator Shale Value	150	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	

FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
FSAL	Formation Salinity	−50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal−like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HACPP	Accelerometer PROM Presence	PRESENT_FILE	
HART	Accelerometer Reference Temperature	77	DEGF
HDCOD	HILT Density Coal detection	2	G/C3
HDSAD	HILT Density Salt detection	2.1	G/C3
HILT_GAS_DENSITY	HILT Gas Downhole Density	0	G/C3
HILT_GAS_OPTION	HILT Gas Computation Option	OFF	
HNCOD	HILT Neutron Coal detection	45	PU
HNSAD	HILT Neutron Salt detection	5	PU
HPHIECUT	HILT effective Porosity Cutoff	5	PU
HSCO	Hole Size Correction Option	YES	
HSIS	HILT Shale Indicator Selection	GR	
HSSO	HRDD Nuclear Source Strength Option	NORMAL	
HSWCUT	HILT Water Saturation from AITH cutoff	50	%
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.65	G/C3
MHC0	MCFL B0 Contrast Correction Coefficient	2.2e−005	OHMS
MHC1	MCFL B1 Contrast Correction Coefficient	3.2e−005	OHMS
MHCC	MCFL High Contrast Correction Switch	NO	
MPOF	MCFL Processing Operation Mode	ON	
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	HiRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PEA_FILTER	PEA Filter	NO_FILTER	
PEFC_FILTER	PEFC Filter	NO_FILTER	
PHIMAX	HILT max porosity	35	PU
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SEXP_HILT	HILT Saturation Exponent	2	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	NO	
DIR: Directional Survey Computation			
SPED	East Departure of Starting Point	0	FT
SPND	North Departure of Starting Point	0	FT
SPVD	TVD of Starting Point	0	FT
TAZI	Vertical Section Azimuth	0	DEG
TIED	East Departure of Tie−in Point	0	FT
TIMD	Along−hole depth of Tie−in Point	0	FT
TIND	North Departure of Tie−in Point	0	FT
TIVD	TVD of Tie−in Point	0	FT
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
FCD	Future Casing (Outer) Diameter	7	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	AUTOMATIC	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	STI	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	6136.00	FT
TDL	Total Depth − Logger	6136.00	FT
System and Miscellaneous			
ALTDPCHAN	Name of alternate depth channel	MeasuredDepth	
BS	Bit Size	8.750	IN
BSAL	Borehole Salinity	25.45	PPM
CSIZ	Current Casing Size	9.625	IN
CWEI	Casing Weight	36.00	LB/F
DFD	Drilling Fluid Density	8.40	LB/G
DO	Depth Offset for Playback	0.0	FT
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	10.00	FT
MST	Mud Sample Temperature	71.60	DEGF

PBVSADP	Use alternate depth channel for playback	NO	
PP	Playback Processing	NORMAL	
RMFS	Resistivity of Mud Filtrate Sample	−50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	6136	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: TCOMBO_S5_SONIC **Vertical Scale: 5" per 100'** **Graphics File Created: 21−Jun−2011 08:20**

OP System Version: 18C0−147

AIT−M	18C0−147	DSLT−FTB	18C0−147
HILTH−FTB	18C0−147	DTC−H	18C0−147

Input DLIS Files

AIT_SONIC_TLD_MCFL_018PUP	FN:25	21−Jun−2011 04:50	6150.0 FT	182.0 FT

Output DLIS Files

DEFAULT	AIT_SONIC_TLD_MCFL_002PUP	FN:1	PRODUCER	21−Jun−2011 08:20

Schlumberger

REPEAT ANALYSIS

MAXIS Field Log

Company: QUICKSILVER RESOURCES INC. **Well: WEBER 32−04**

Input DLIS Files

AIT_SONIC_TLD_MCFL_018PUP	FN:25	21−Jun−2011 04:50	6150.0 FT	182.0 FT
AIT_SONIC_TLD_MCFL_013PUP	FN:18	21−Jun−2011 04:50	2002.0 FT	1798.0 FT

Output DLIS Files

DEFAULT	AIT_SONIC_TLD_MCFL_002PUP	FN:1	PRODUCER	21−Jun−2011 08:20

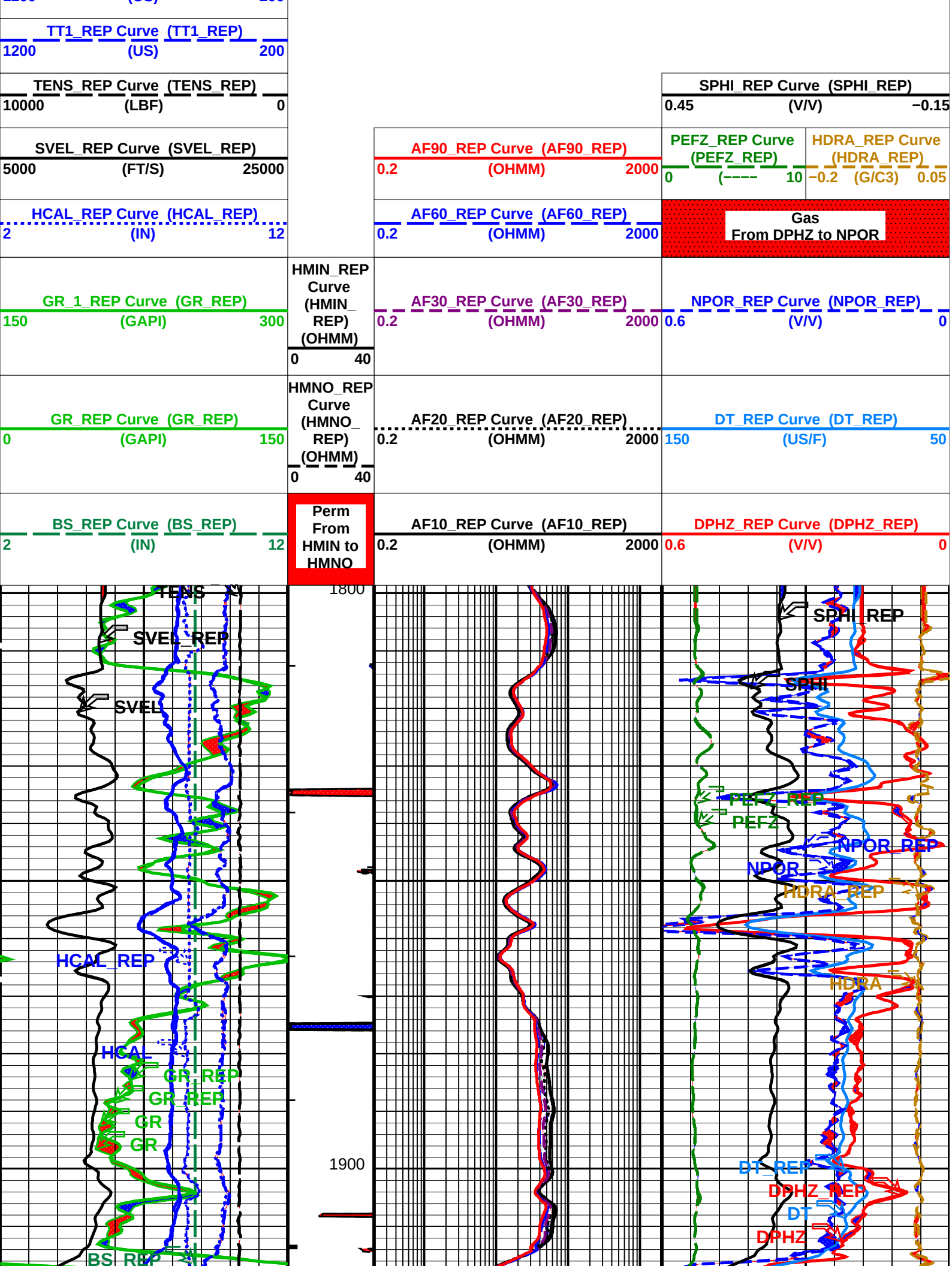
OP System Version: 18C0−147

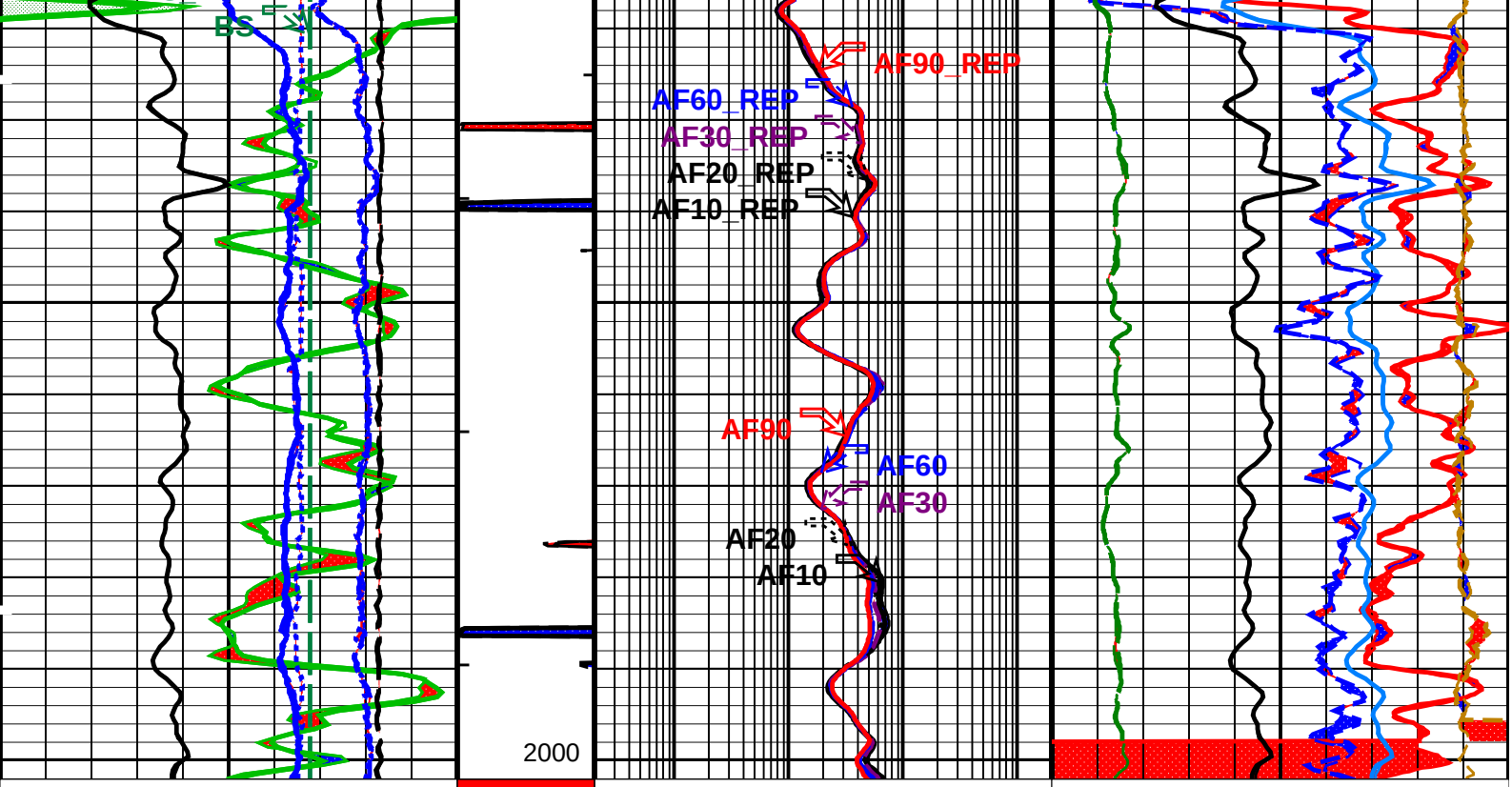
AIT−M	18C0−147	DSLT−FTB	18C0−147
HILTH−FTB	18C0−147	DTC−H	18C0−147

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3
- Time Mark Every 60 S

GR Backup From LHT1 to GR_1		
TT4_REP Curve (TT4_REP)		
1200	(US)	200
TT3_REP Curve (TT3_REP)		
1200	(US)	200
TT2_REP Curve (TT2_REP)		
1200	(US)	200


TT1_REP Curve (TT1_REP)
1200 (US) 200
TENS_REP Curve (TENS_REP)
10000 (LBF) 0
SVEL_REP Curve (SVEL_REP)
5000 (FT/S) 25000
HCAL_REP Curve (HCAL_REP)
2 (IN) 12
GR_1_REP Curve (GR_REP)
150 (GAPI) 300
GR_REP Curve (GR_REP)
0 (GAPI) 150
BS_REP Curve (BS_REP)
2 (IN) 12
HMIN_REP Curve (HMIN_REP) (OHMM)
0 40
HMNO_REP Curve (HMNO_REP) (OHMM)
0 40
Perm From HMIN to HMNO
AF90_REP Curve (AF90_REP)
0.2 (OHMM) 2000
AF60_REP Curve (AF60_REP)
0.2 (OHMM) 2000
AF30_REP Curve (AF30_REP)
0.2 (OHMM) 2000
AF20_REP Curve (AF20_REP)
0.2 (OHMM) 2000
AF10_REP Curve (AF10_REP)
0.2 (OHMM) 2000
SPHI_REP Curve (SPHI_REP)
0.45 (V/V) −0.15
PEFZ_REP Curve (PEFZ_REP)
0 (−−−− 10
HDRA_REP Curve (HDRA_REP)
−0.2 (G/C3) 0.05
Gas From DPHZ to NPOR
NPOR_REP Curve (NPOR_REP)
0.6 (V/V) 0
DT_REP Curve (DT_REP)
150 (US/F) 50
DPHZ_REP Curve (DPHZ_REP)
0.6 (V/V) 0
1800
1900
TENS
SVEL_REP
SVEL
HCAL_REP
HCAL
GR_REP
GR_REP
GR
GR
BS_REP
SPHI_REP
SPHI
PEFZ_REP
PEFZ
NPOR_REP
NPOR
HDRA_REP
HDRA
DT_REP
DPHZ_REP
DT
DPHZ



BS_REP Curve (BS_REP)
2 (IN) 12

GR_REP Curve (GR_REP)
0 (GAPI) 150

GR_1_REP Curve (GR_REP)
150 (GAPI) 300

HCAL_REP Curve (HCAL_REP)
2 (IN) 12

SVEL_REP Curve (SVEL_REP)
5000 (FT/S) 25000

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

TT1_REP Curve (TT1_REP)
1200 (US) 200

TT2_REP Curve (TT2_REP)
1200 (US) 200

TT3_REP Curve (TT3_REP)
1200 (US) 200

TT4_REP Curve (TT4_REP)
1200 (US) 200

GR Backup
From LHT1 to GR_1

Perm
From HMIN to HMNO

HMNO_REP Curve (HMNO_REP) (OHMM)
0 40

HMIN_REP Curve (HMIN_REP) (OHMM)
0 40

AF10_REP Curve (AF10_REP)
0.2 (OHMM) 2000

AF20_REP Curve (AF20_REP)
0.2 (OHMM) 2000

AF30_REP Curve (AF30_REP)
0.2 (OHMM) 2000

AF60_REP Curve (AF60_REP)
0.2 (OHMM) 2000

AF90_REP Curve (AF90_REP)
0.2 (OHMM) 2000

DPHZ_REP Curve (DPHZ_REP)
0.6 (V/V) 0

DT_REP Curve (DT_REP)
150 (US/F) 50

NPOR_REP Curve (NPOR_REP)
0.6 (V/V) 0

Gas
From DPHZ to NPOR

PEFZ_REP Curve (PEFZ_REP)
0 (---- 10

HDRA_REP Curve (HDRA_REP)
−0.2 (G/C3) 0.05

SPHI_REP Curve (SPHI_REP)
0.45 (V/V) −0.15

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3
- Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	AIT−M: Array Induction Tool − M		
AAPL	Array Induction Answer Product Level(Depth Log/View only)	3_BholeCorr_BasicLogs_RadialProcessing	
ABHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
ABHV	Array Induction Borehole Correction Code Version Number	900	
ABLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
ABLV	Array Induction Basic Logs Code Version Number	223	
ACDE	Array Induction Casing Detection Enable	No	
ACEN	Array Induction Tool Centering Flag (in Borehole)	Centered	
ACSED	Array Induction Casing Shoe Estimated Depth	−50000	FT
ADITM	Array Induction Desired Tool Mode	0x00_Log_000	
AEBC	Array Induction Enable Borehole Correction	Yes	
AEBL	Array Induction Enable Basic Logs	Yes	
AERP	Array Induction Enable Radial Processing	Yes	
AETP	Array Induction Enable Sonde Error Temp&Pres Corr	Yes	
AFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AFVN	Array Induction Firmware Code Version Number	0	
AIGS	Array Induction Select Akima Interpolation Gating	On	
ALNV	Array Induction Log Not Valid Flag	Log_Valid−No_Default_Parameters	
AMRD	Array Induction Mud Resistivity Calibration Depth	0	FT
AMRF	Array Induction Mud Resistivity Factor	1	
AORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
ARFV	Array Induction Radial Profiling Code Version Number	701	
ARPM	Array Induction Radial Processing Mode	0_One	
ARPV	Array Induction Radial Parametrization Code Version Number	232	
ARTS	AIT Rt Selection (for ALLRES computation)	AITM_OneResA60	
ASTA	Array Induction Tool Standoff	1.5	IN
ATRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
ATSE	Array Induction Temperature Selection(Sonde Error Correction)	Internal	
ATTY	Array Induction Tool Type (of acquired data)	AITM	
AULV	Array Induction User Level Control	Normal	
AZRSV	Array Induction Response Set Version for Z Resolution	00.10.25.00	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
RTCO	RTCO − Rt Invasion Correction	YES	
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
	DSLT−FTB: Digitizing Sonic Logging Tool		
	Telemetry Mode	DSLC_FTB	
	DSLT Firing Mode	BHC	
AGC	Automatic Gain Control Status	ON	
AMSG	Auxiliary Minimum Sliding Gate	140	US
CBAF	CBL Adjustment Factor	1	
CBLG	CBL Gate Width	45	US
CDTS	C−Delta−T Shale	100	US/F
DDEL	Digitizing Delay	0	US
DETE	Delta−T Detection	E2	
DFAD	Digital First Arrival Detection Switch	HOST	
DIVL	DSLT Depth Sampling Interval	20	
DRCS	DSLT DLIS Recording Size	150	
DSIN	Digitizing Sample Interval	10	
DTCM	Delta−T Computation Mode	FULL	
DTF	Delta−T Fluid	220	US/F
DTFS	DSLC Telemetry Frame Size	336	
DTM	Delta−T Matrix	56	US/F
DWCO	Digitizing Word Count	150	
GAI	Manual Gain	40	
HRSP	High Resolution Spacing	5.118	IN
ITTS	Integrated Transit Time Source	DT	
LTUT	Lower to Upper Transmitter Spacing Ratio	1	
MAHTR	Manual High Threshold Reference	120	

MAHTR	Manual High Threshold Reference	120	
MGAI	Maximum Gain	60	
MIGA	Minimum Gain	1	
MNHTR	Minimum High Threshold Reference	100	
MODE	Sonic Firing Mode	BHC	
NMSG	Near Minimum Sliding Gate	140	US
NMXG	Near Maximum Sliding Gate	980	US
NUMP	Number of Detection Passes	2	
RATE	Firing Rate	R15	
RDFA	Reset DFAD	OFF	
SDTH	Switch Down Threshold	20000	
SFAF	Sonic Formation Attenuation Factor	3	DB/F
SGAD	Sliding Gate Status	ON	
SGAI	Selectable Acquisition Gain	AUTO	
SGCL	Sliding Gate Closing Delta−T	140	US/F
SGCW	Sliding Gate Closing Width	25	US
SGDT	Sliding Gate Delta−T	40	US/F
SGW	Sliding Gate Width	110	US
SLEV	Signal Level for AGC	5000	
SPFS	Sonic Porosity Formula	RAYMER_HUNT	
SPSO	Sonic Porosity Source	DT	
SUTH	Switch Up Threshold	1000	
VDLG	VDL Manual Gain	40	
WAGC	Waveform AGC Allow/Disallow	OFF	
WGAI	Waveform Manual Gain	20	
WGDT	Waveform Gain Delta−T	240	US/F
WGIN	Waveform Gain Interval	2540	US
WMOD	Waveform Firing Mode	FULL	
HILTH−FTB: High resolution Integrated Logging Tool−DTS			
BHFL	Borehole Fluid Type	OIL	
BHFL_TLD	HILT Nuclear Mud Base	OIL	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
EXSICL	External Shale Indicator Clean Value	20	
EXSISH	External Shale Indicator Shale Value	150	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
FSAL	Formation Salinity	−50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal−like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HACPP	Accelerometer PROM Presence	PRESENT_FILE	
HART	Accelerometer Reference Temperature	77	DEGF
HDCOD	HILT Density Coal detection	2	G/C3
HDSAD	HILT Density Salt detection	2.1	G/C3
HILT_GAS_DENSITY	HILT Gas Downhole Density	0	G/C3
HILT_GAS_OPTION	HILT Gas Computation Option	OFF	
HNCOD	HILT Neutron Coal detection	45	PU
HNSAD	HILT Neutron Salt detection	5	PU
HPHIECUT	HILT effective Porosity Cutoff	5	PU
HSCO	Hole Size Correction Option	YES	
HSIS	HILT Shale Indicator Selection	GR	
HSSO	HRDD Nuclear Source Strength Option	NORMAL	
HSWCUT	HILT Water Saturation from AITH cutoff	50	%
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.65	G/C3
MHC0	MCFL B0 Contrast Correction Coefficient	2.2e−005	OHMS
MHC1	MCFL B1 Contrast Correction Coefficient	3.2e−005	OHMS
MHCC	MCFL High Contrast Correction Switch	NO	
MPOF	MCFL Processing Operation Mode	ON	
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	HiRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PEA_FILTER	PEA Filter	NO_FILTER	
PEFC_FILTER	PEFC Filter	NO_FILTER	
PHIMAX	HILT max porosity	35	PU
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SEXP_HILT	HILT Saturation Exponent	2	
SHT	Surface Hole Temperature	68	DEGF

SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	NO	
	DIR: Directional Survey Computation		
SPED	East Departure of Starting Point	0	FT
SPND	North Departure of Starting Point	0	FT
SPVD	TVD of Starting Point	0	FT
TAZI	Vertical Section Azimuth	0	DEG
TIED	East Departure of Tie−in Point	0	FT
TIMD	Along−hole depth of Tie−in Point	0	FT
TIND	North Departure of Tie−in Point	0	FT
TIVD	TVD of Tie−in Point	0	FT
	HOLEV: Integrated Hole/Cement Volume		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
FCD	Future Casing (Outer) Diameter	7	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	AUTOMATIC	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
	STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	STI	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	6136.00	FT
TDL	Total Depth − Logger	6136.00	FT
	System and Miscellaneous		
ALTDPCHAN	Name of alternate depth channel	MeasuredDepth	
BS	Bit Size	8.750	IN
BSAL	Borehole Salinity	25.45	PPM
CSIZ	Current Casing Size	9.625	IN
CWEI	Casing Weight	36.00	LB/F
DFD	Drilling Fluid Density	8.40	LB/G
DO	Depth Offset for Playback	0.0	FT
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	10.00	FT
MST	Mud Sample Temperature	71.60	DEGF
PBVSADP	Use alternate depth channel for playback	NO	
PP	Playback Processing	NORMAL	
RMFS	Resistivity of Mud Filtrate Sample	−50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	6136	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: TCOMBO_S5_SONIC_REP Vertical Scale: 5" per 100' Graphics File Created: 21−Jun−2011 08:20

OP System Version: 18C0−147

AIT−M	18C0−147	DSLT−FTB	18C0−147
HILTH−FTB	18C0−147	DTC−H	18C0−147

Input DLIS Files

	AIT_SONIC_TLD_MCFL_018PUP	FN:25	21−Jun−2011 04:50	6150.0 FT	182.0 FT
	AIT_SONIC_TLD_MCFL_013PUP	FN:18	21−Jun−2011 04:50	2002.0 FT	1798.0 FT

Output DLIS Files

DEFAULT	AIT_SONIC_TLD_MCFL_002PUP	FN:1	PRODUCER	21−Jun−2011 08:20

Schlumberger

CALIBRATIONS

MAXIS Field Log

Array Induction Tool − M / Equipment Identification

Primary Equipment:

Rm/SP Bottom Nose	AMRM − A	
Array Induction Sonde	AMIS − A	2562

Auxiliary Equipment:

Array Induction Tool − M Master Calibration

Electronics Calibration Check − Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Thru Cal Phase DEG	Nominal
0	Master	0.6186		0.6100	176.3		197.0
1	Master	1.268		1.270	175.3		196.0
2	Master	0.6288		0.6200	171.8		192.0
3	Master	0.7111		0.7000	171.0		191.0
4	Master	1.337		1.340	164.9		185.0
5	Master	1.951		1.960	163.3		182.0
6	Master	1.947		1.960	163.3		181.0
7	Master	1.428		1.410	162.4		175.0
		60.00 % (Minimum)	140.0 % (Nominal) (Maximum)		Nom −60.00 (Minimum)	Nom + 60.00 (Nominal) (Maximum)	

Master: 23−Mar−2011 14:31

Array Induction Tool − M Master Calibration

Electronics Calibration Check − Auxiliary

Phase	Array Induction SPA Plus MV	Value	Phase	Array Induction SPA Zero MV	Value
Master		991.3	Master		0.3849
	941.0 (Minimum) 991.0 (Nominal) 1040 (Maximum)			−50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	

Phase	Array Induction Temperature Plus V	Value	Phase	Array Induction Temperature Zero V	Value
Master		0.9181	Master		0.0003880
	0.8710 (Minimum) 0.9170 (Nominal) 0.9630 (Maximum)			−0.05000 (Minimum) 0 (Nominal) 0.05000 (Maximum)	

Master: 23−Mar−2011 14:31

Array Induction Tool − M Master Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Correction Magnitude V	Value	Test Loop Gain Correction Phase DEG
0	1.016		−0.9925	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
1	1.015		0.3154	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
2	1.020		0.1139	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
3	1.012		0.06053	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
4	0.9957		0.02994	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
5	0.9892		−0.01163	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
6	1.002		0.2593	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
7	1.014		−0.1299	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)

		(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)

Master: 23−Mar−2011 14:31

Array Induction Tool − M Master Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
0	−125.1				299.2			
		−231.0 (Minimum)	−56.00 (Nominal)	119.0 (Maximum)		−2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	161.1				−140.0			
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		−625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	103.4				−159.0			
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		−350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	60.12				−9.725			
		39.00 (Minimum)	64.00 (Nominal)	89.30 (Maximum)		−250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	24.27				−14.54			
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		−63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	13.07				15.10			
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		−50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	8.950				7.872			
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	−1.693				5.676			
		−5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: 23−Mar−2011 14:31

Array Induction Tool − M Master Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag			Value	Fine − Mag, Real, Imag		
0	1.085				1.085			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	1.085				1.085			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	1.085				1.085			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

Master: 23−Mar−2011 14:31

High resolution Integrated Logging Tool−DTS / Equipment Identification

Primary Equipment:		
HILT high−Resolution Mechanical Sonde	HRMS − H	3964
HILT Rxo Gamma−ray Device	HRGD − H	3995
HILT Micro Cylindrically Focused Log Dev	MCFL − H	
GR Logging Source	GLS − VJ	5234
HILT High Res. Control Cartridge	HRCC − H	4863
HILT Gamma−Ray Neutron Sonde−DTS	HGNS − H	3799
HGNS Gamma−Ray Device	HGR −	
HGNS Neutron Detector with Alpha Source	HCNT − H	
Auxiliary Equipment:		
Neutron Calibration Tank	NCT − B	
Gamma Source Radioactive	GSR − U/Y	
HGNS Housing	HGNH −	

High resolution Integrated Logging Tool−DTS Master Calibration

Inversion results

Phase	Rho Aluminum G/C3	Value	Phase	Rho Magnesium G/C3	Value

Phase		Value
Master		2.598
	2.586 (Minimum) 2.596 (Nominal) 2.606 (Maximum)	

Phase		Value
Master		1.691
	1.676 (Minimum) 1.686 (Nominal) 1.696 (Maximum)	

Phase	Pe Aluminum	Value
Master		2.524
	2.470 (Minimum) 2.570 (Nominal) 2.670 (Maximum)	

Phase	Pe Magnesium	Value
Master		2.616
	2.550 (Minimum) 2.650 (Nominal) 2.750 (Maximum)	

Master: 10−Jun−2011 14:59

High resolution Integrated Logging Tool−DTS Master Calibration

Deviation Summary

Phase	BS Average Deviation %	Value
Master		0.3564
	−0.6000 (Minimum) 0 (Nominal) 0.6000 (Maximum)	

Phase	SS Average Deviation %	Value
Master		0.3533
	−1.000 (Minimum) 0 (Nominal) 1.000 (Maximum)	

Phase	LS Average Deviation %	Value
Master		0.6841
	−1.500 (Minimum) 0 (Nominal) 1.500 (Maximum)	

Phase	BS Max Deviation %	Value
Master		0.7628
	−1.600 (Minimum) 0 (Nominal) 1.600 (Maximum)	

Phase	SS Max Deviation %	Value
Master		1.240
	−2.500 (Minimum) 0 (Nominal) 2.500 (Maximum)	

Phase	LS Max Deviation %	Value
Master		1.906
	−3.500 (Minimum) 0 (Nominal) 3.500 (Maximum)	

Master: 10−Jun−2011 14:59

High resolution Integrated Logging Tool−DTS Master Calibration

Zero Measurement

Phase	CNTC Background CPS	Value
Master		27.68
	5.000 (Minimum) 27.68 (Nominal) 40.00 (Maximum)	

Phase	CFTC Background CPS	Value
Master		27.33
	5.000 (Minimum) 27.33 (Nominal) 40.00 (Maximum)	

Master: 16−May−2011 15:01

High resolution Integrated Logging Tool−DTS Master Calibration

Tank Measurement

Phase	Thermal Near Corr. (Tank) CPS	Value
Master		5651
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)	

Phase	Thermal Far Corr. (Tank) CPS	Value
Master		2270
	1900 (Minimum) 2400 (Nominal) 2900 (Maximum)	

Phase	CNTC/CFTC (Tank)	Value
Master		2.489
	2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

Master: 16−May−2011 15:01

DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC−H Auxiliary Cartridge	DTCH − A
DTC−H Telemetry Cartridge	DTCH − A

Auxiliary Equipment:

DTCH Telemetry Cartridge Housing	ECH − KC

Company: **QUICKSILVER RESOURCES INC.**

Schlumberger

Well: **WEBER 32−4**
Field: **BELL ROCK**
County: **MOFFAT**
State: **COLORADO**

PLATFORM EXPRESS

ARRAY INDUCTION TOOL
BHC