Schlumberger

Company: **Pronghorn Operating LLC**

Well: **Hanavan 1**
Field: **Smoky Creek**
County: **Cheyenne** State: **Colorado**

Triple Combo (Limestone)
Compensated Neutron
Litho Density

County: Cheyenne
Field: Smoky Creek
Location: NWNW Sec. 21, T13S, R44W
Well: Hanavan 1
Company: Pronghorn Operating LLC

LOCATION

NWNW Sec. 21, T13S, R44W
SHL: 610' FNL X 610' FWL

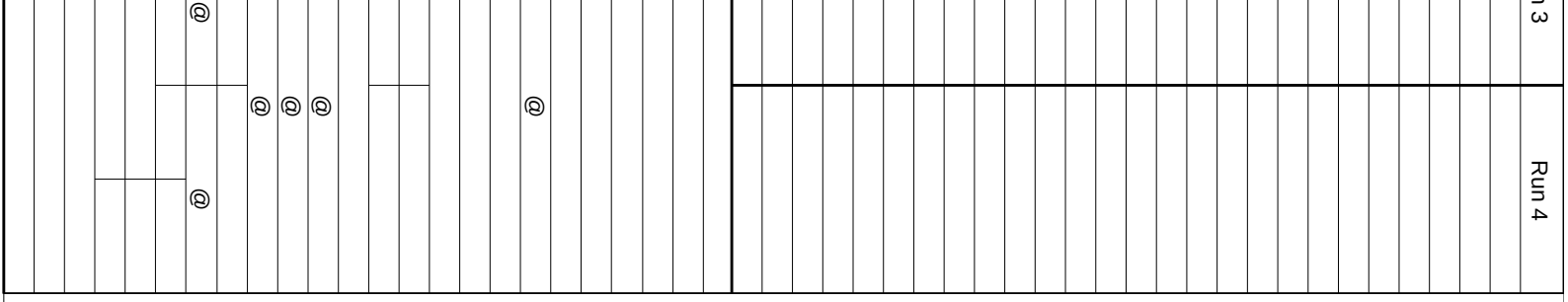
Elev.: K.B. 4274.00 ft
G.L. 4262.00 ft
D.F. 4273.00 ft

Permanent Datum: Ground Level Elev.: 4262.00 ft
Log Measured From: Kelly Bushing 12.00 ft above Perm. Datum
Drilling Measured From: Kelly Bushing

API Serial No.	Section	Township	Range
05-017-07760-0000	21	13S	44W

	Run 1	Run 2	Run
Logging Date	3-Nov-2013		
Run Number	1		
Depth Driller	5504 ft		
Schlumberger Depth	5435 ft		
Bottom Log Interval	5427 ft		
Top Log Interval	471 ft		
Casing Driller Size @ Depth	13.375 in @ 470 ft	@	@
Casing Schlumberger	471 ft		
Bit Size	7.875 in		
Type Fluid In Hole	Water Based Mud		
MUD Density / Viscosity	9 lbm/gal / 63 s		
MUD Fluid Loss / PH	6.6 cm3 / 9		
MUD Source Of Sample	Flowline		
RM @ Measured Temperature	1.500 ohm.m @ 75 degF	@	@
RMF @ Measured Temperature	1.200 ohm.m @ 75 degF	@	@
RMC @ Measured Temperature	1.800 ohm.m @ 75 degF	@	@
Source RMF / RMC	Calculated / Calculated		
RM @ MRT / RMF @ MRT	0.836 @ 140 / 0.669 @ 140	@ / @	@ / @
Maximum Recorded Temperatures	140 degF		
Circulation Stopped / Time	3-Nov-2013 / 11:00		
Logger On Bottom / Time	3-Nov-2013 / 18:15		
Unit Number / Location	3022 / Ft. Morgan, CO		
Recorded By	Tim Hoffman		
Witnessed By	Jim Thorson		

	Run 1	Run 2	Run
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: 3−NOV−2013 19:13:41

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−39P−LXS
Serial Number:	7249	Serial Number:	1109	Serial Number:	
Calibration Date:	12−June−2013	Calibration Date:	18−Oct−2013	Length:	16000 FT
Calibrator Serial Number:		Calibrator Serial Number:	1234		
Calibration Cable Type:	7−39P−LXS	Number of Calibration Points:	10	Conveyance Method:	Wireline
Wheel Correction 1:	−4	Calibration RMS:	6	Rig Type:	LAND
Wheel Correction 2:	−4	Calibration Peak Error:	11		

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	0.00 FT
Rig Up Length At Bottom:	0.00 FT
Rig Up Length Correction:	0.00 FT
Stretch Correction:	4.50 FT
Tool Zero Check At Surface:	

Depth Control Remarks

1. All Schlumberger depth policies followed.
2. IDW used as primary depth reference. Z−Chart used as secondary.
3.
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1: HNGS	OS1:
OS2: BHC	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
This is the first run in hole	
Toolstring run as per tool sketch	
Matrix: Limestone (2.71g/cc)	
Sandstone (2.65g/cc) from 5145' to 5260'	

All tools run from TD to 3800'

AIT and GR run to surface

Bridged and logged out from 5435'

Rig: Excel 3

Crew: Dave Marquez, Cody Bruns, Elizabeth Wilson

RUN 1		
SERVICE ORDER #:	CCN1−00030	
PROGRAM VERSION:	19C2−270	
FLUID LEVEL:	100 ft	
LOGGED INTERVAL	START	STOP

RUN 2		
SERVICE ORDER #:		
PROGRAM VERSION:		
FLUID LEVEL:		
LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

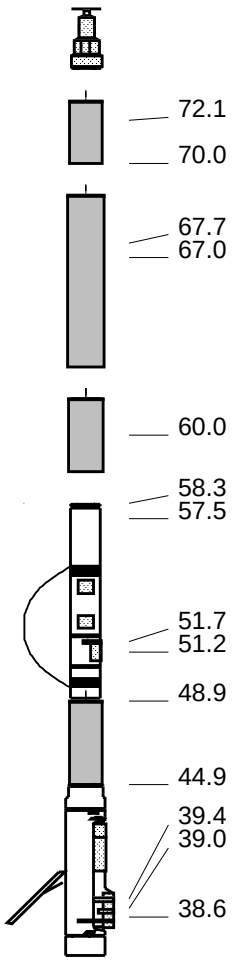
RUN 1 RUN 2

SURFACE EQUIPMENT

GSR−U/Y
NCT−B
CNB−AB
NCS−VB

GSR−U 599
WITM (DTS)−A

DOWNHOLE EQUIPMENT



LEH−QT
LEH−QT
75.9

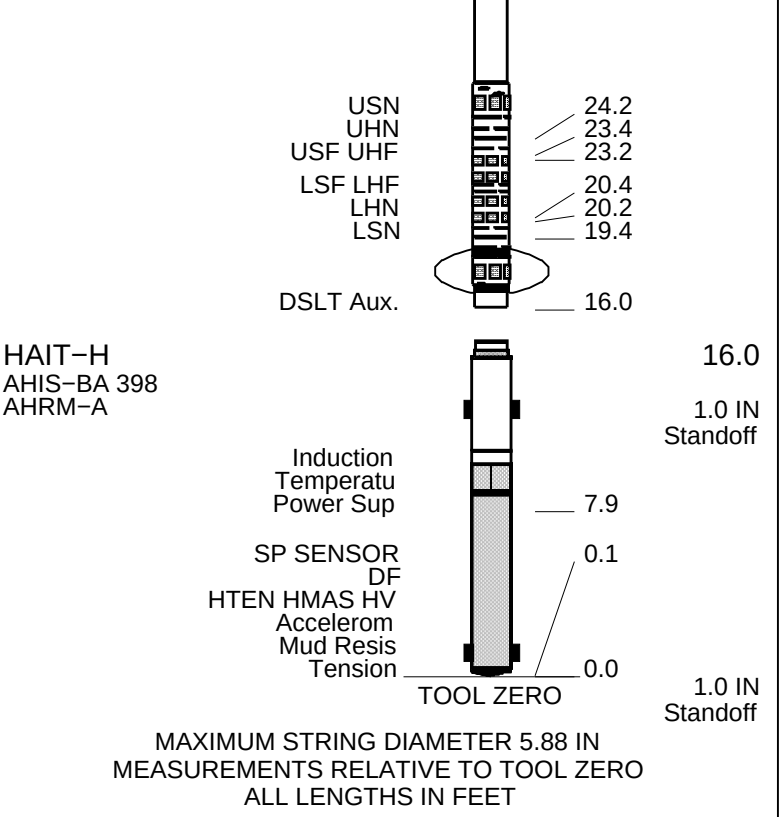
DTC−H
ECH−KC 9562
DTCH0−A
73.0

HNGS−BA
HNGS−BA 152
HNSH−BA 149
70.0

HNGC−B
HNGH−A 87
HNGC−B 250
61.8

HILTB−FTB
HGNSD−B 1927
HMCA
HGNH 3878
NLS−KL
NSR−F 5069
HACCZ 749
HCNT
HGR
HRCC−B 860
HRMS−B 1716
HRGD−B 1748
GLS−VJ 5094
MCFL Device
HILT Nucl. LS
HILT Nucl. SS
HILT Nucl. BS
BOW−SPR
NPV−N
58.3

DSLT−FTB
DSLC−B
ECH−KH
SLS−W
36.6



Schlumberger

MAIN POROSITY 5" = 100’

MAXIS Field Log

Output DLIS Files

DEFAULT	**AIT_SONIC_TLD_MCFL_030LUP**	**FN:28**	**PRODUCER**	**03−Nov−2013 19:21**

OP System Version: 19C2−270

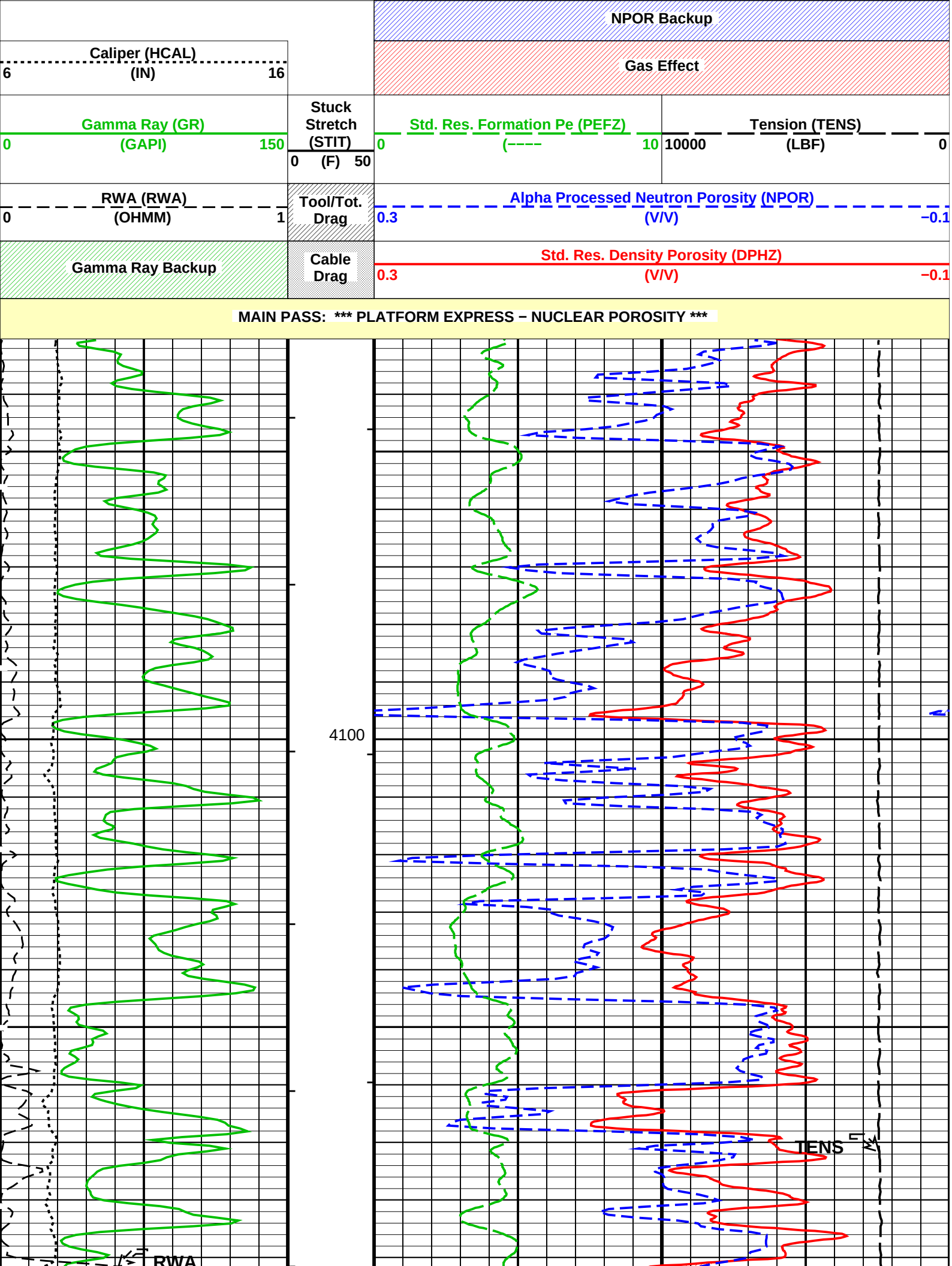
HAIT−H	**19C2−270**	**DSLT−FTB**	**19C2−270**
HILTB−FTB	**19C2−270**	**HNGC−B**	**19C2−270**
HNGS−BA	**19C2−270**	**DTC−H**	**19C2−270**

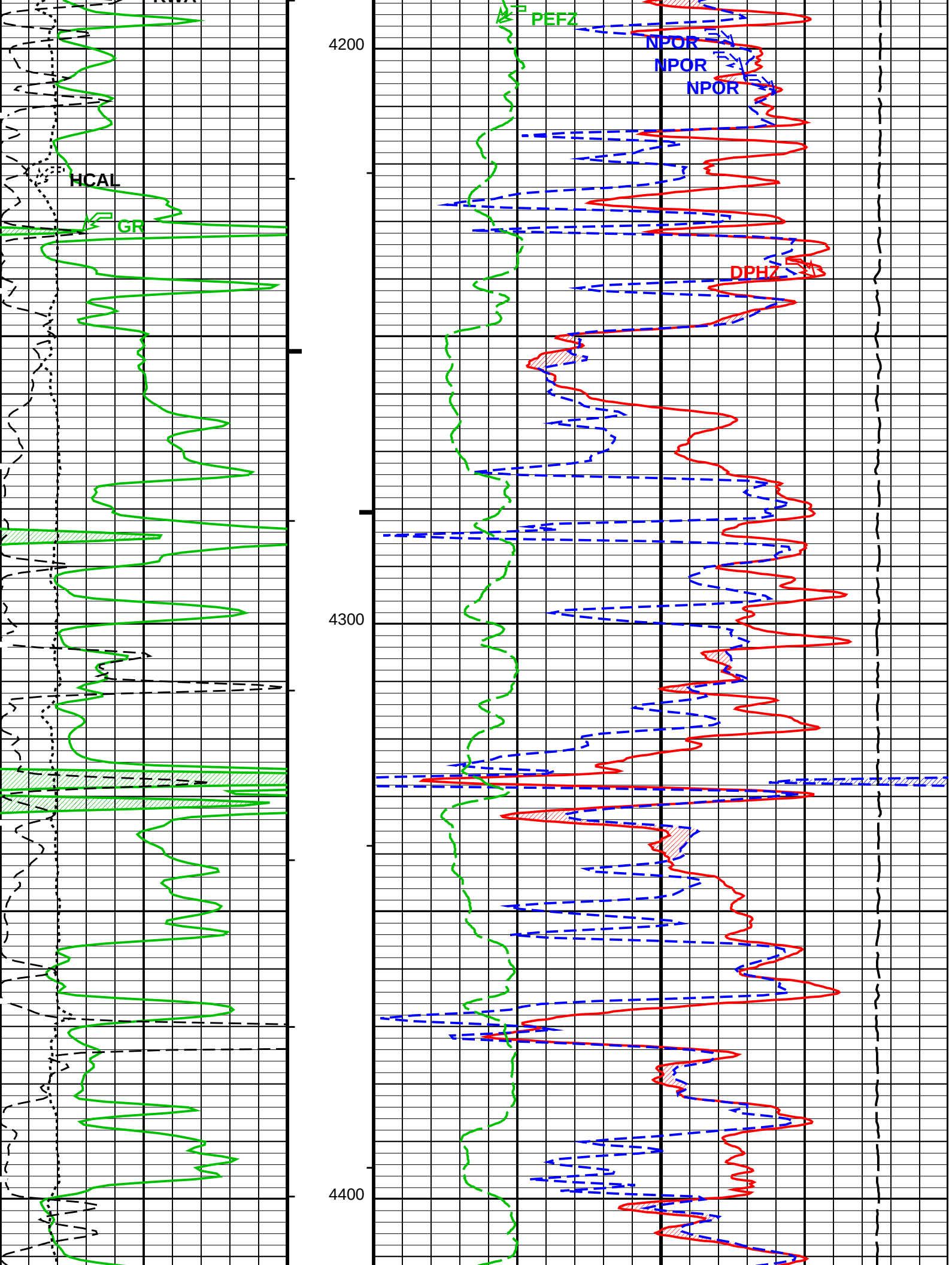
Changed Parameter Summary

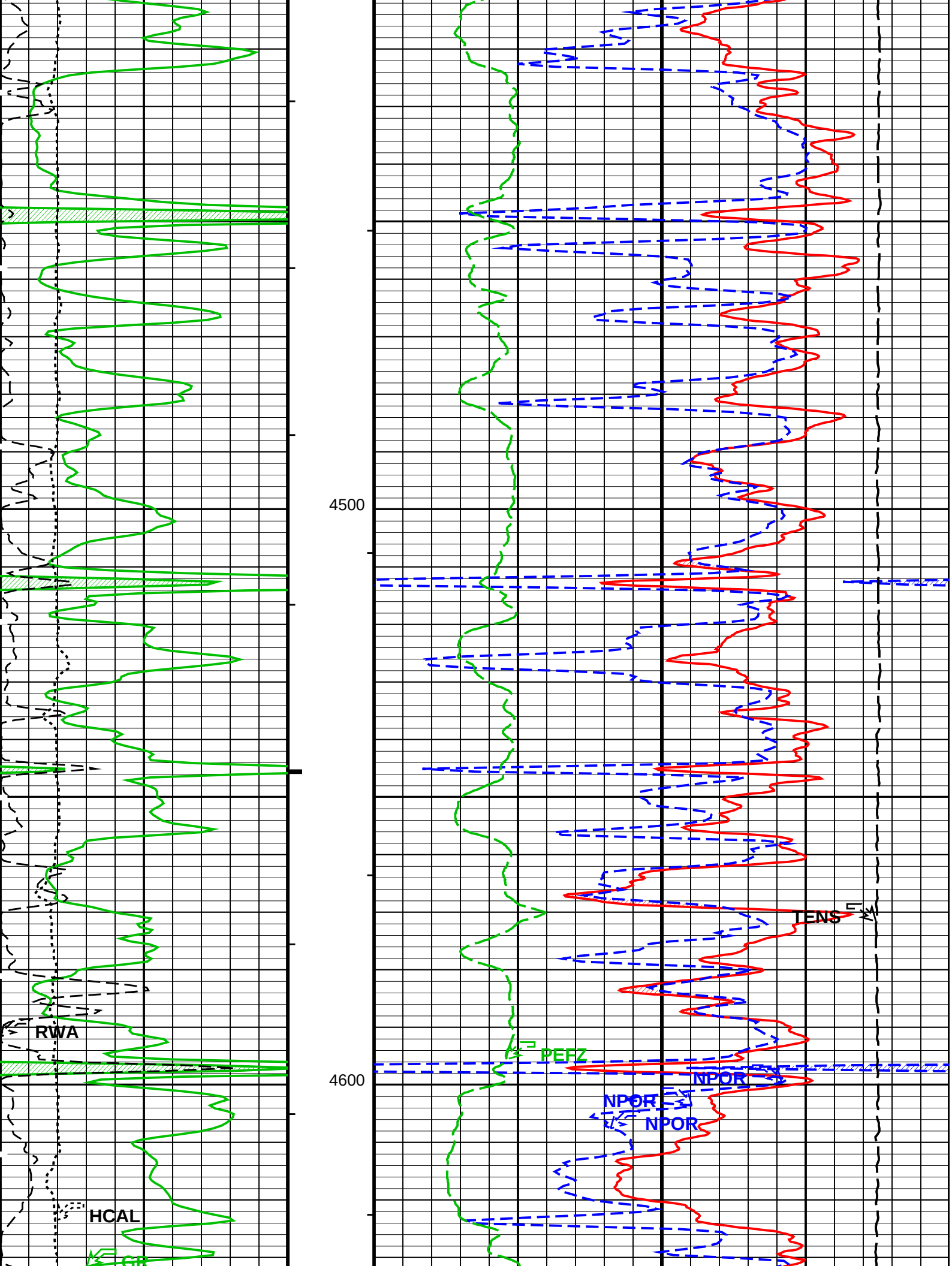
DLIS Name	New Value	Previous Value	Depth & Time
MATR	**LIMESTONE**	**LIMESTONE**	**5445.0 19:22:04**
	SANDSTONE	**LIMESTONE**	**5260.0 19:28:14**
	LIMESTONE	**SANDSTONE**	**5145.0 19:32:06**
MDEN	**2.71 G/C3**	**2.71 G/C3**	**5445.0 19:22:04**
	2.65 G/C3	**2.71 G/C3**	**5260.0 19:28:14**
	2.71 G/C3	**2.65 G/C3**	**5145.0 19:32:06**

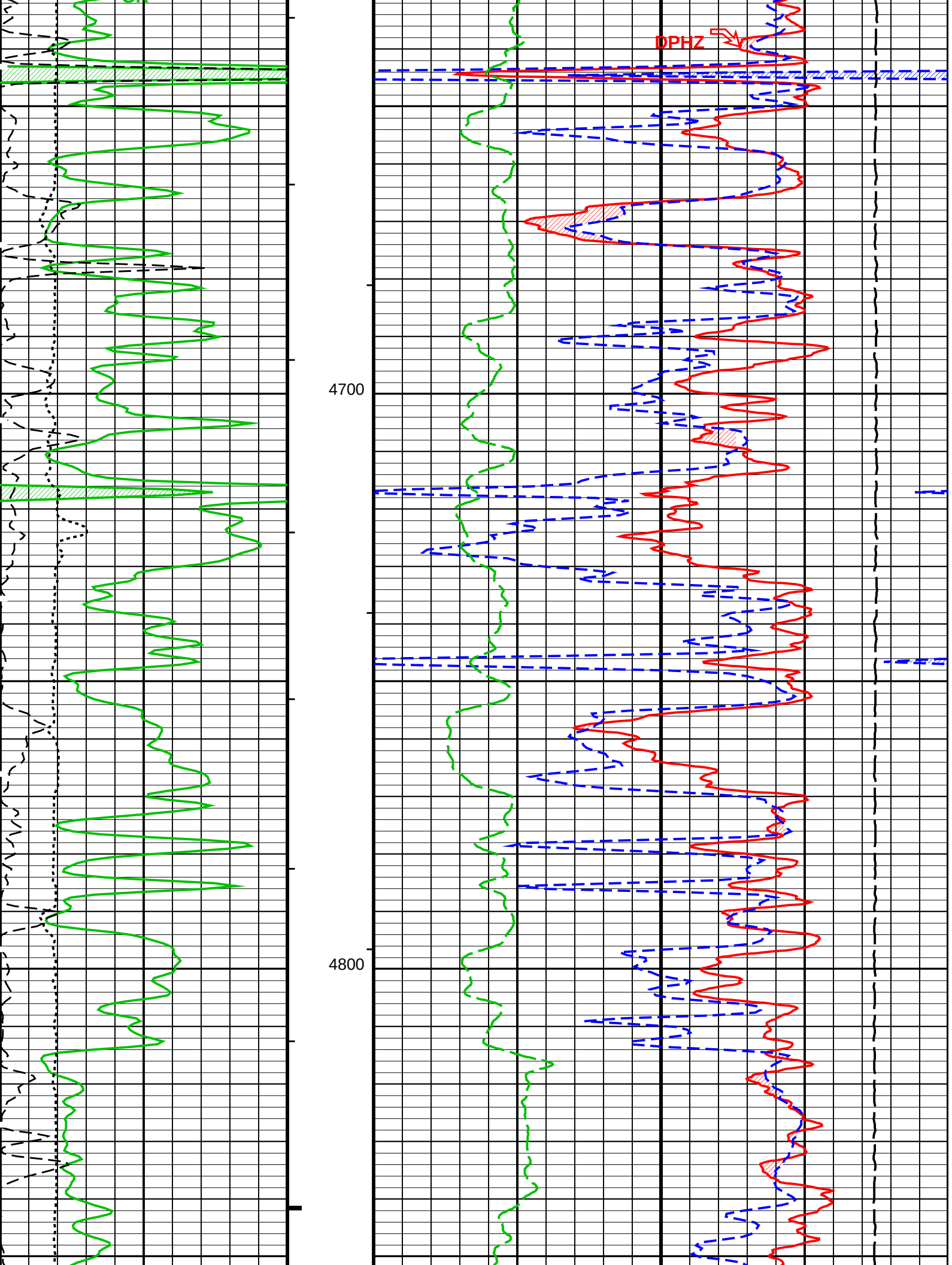
PIP SUMMARY

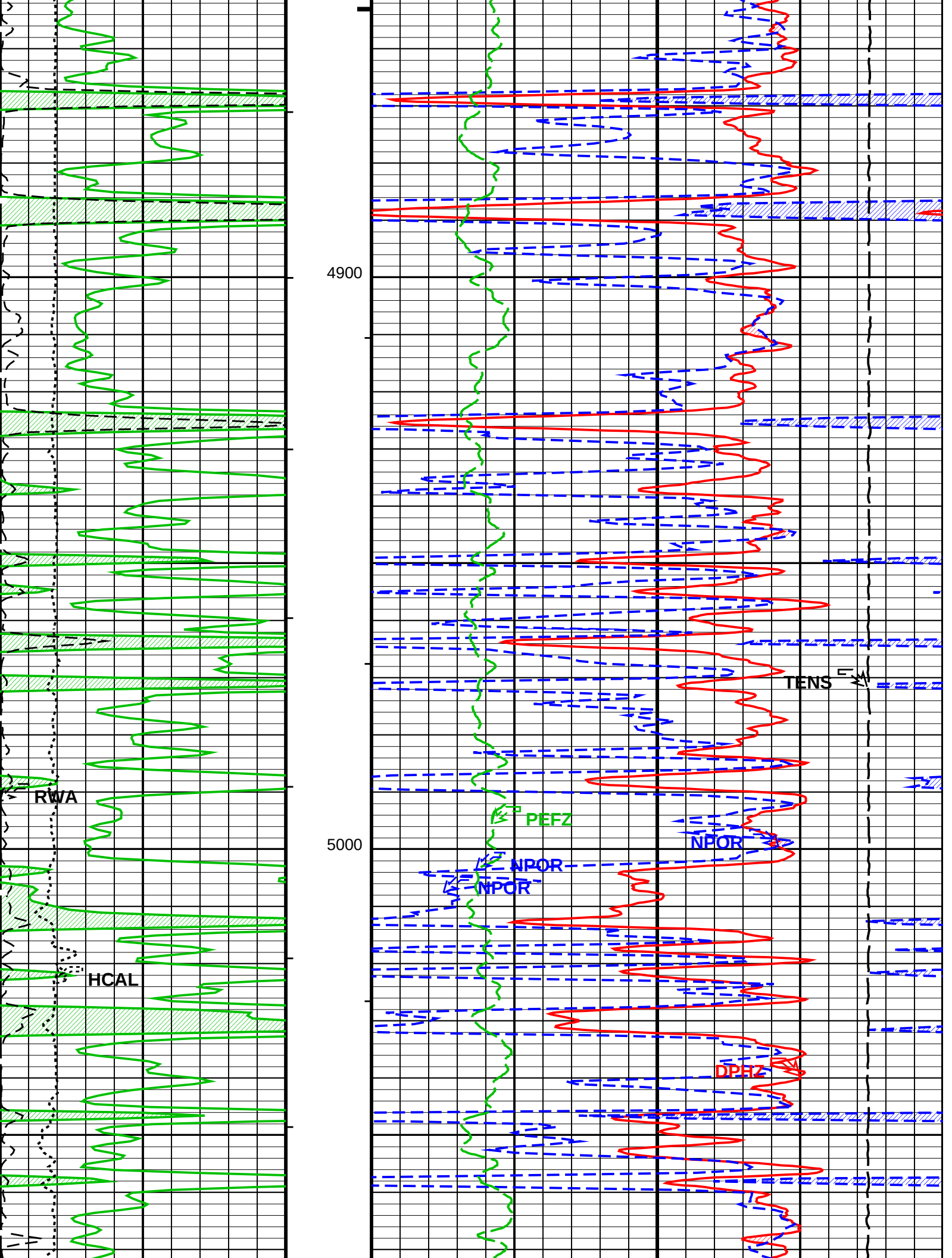
Integrated Hole Volume Minor Pip Every 10 F3
Integrated Hole Volume Major Pip Every 100 F3
Integrated Cement Volume Minor Pip Every 10 F3
Integrated Cement Volume Major Pip Every 100 F3
Time Mark Every 60 S

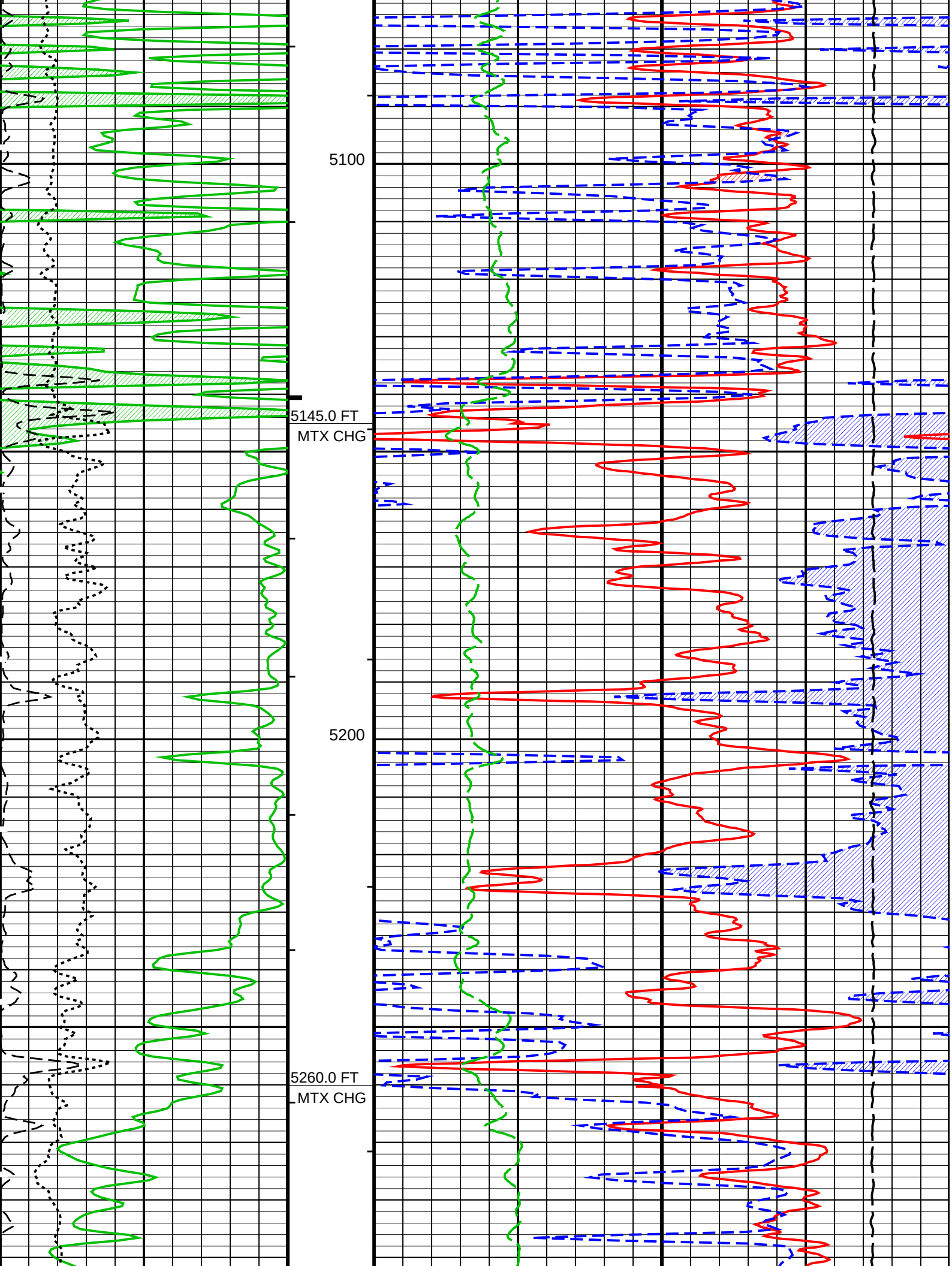

NPOR Backup
Caliper (HCAL)
6 (IN) 16
Gas Effect
Gamma Ray (GR)
0 (GAPI) 150
Stuck Stretch (STIT)
0 (F) 50
Std. Res. Formation Pe (PEFZ)
0 (---- 10
Tension (TENS)
10000 (LBF) 0
RWA (RWA)
0 (OHMM) 1
Tool/Tot. Drag
Alpha Processed Neutron Porosity (NPOR)
0.3 (V/V) -0.1
Gamma Ray Backup
Cable Drag
Std. Res. Density Porosity (DPHZ)
0.3 (V/V) -0.1
MAIN PASS: *** PLATFORM EXPRESS - NUCLEAR POROSITY ***
4100
TENS
RWA

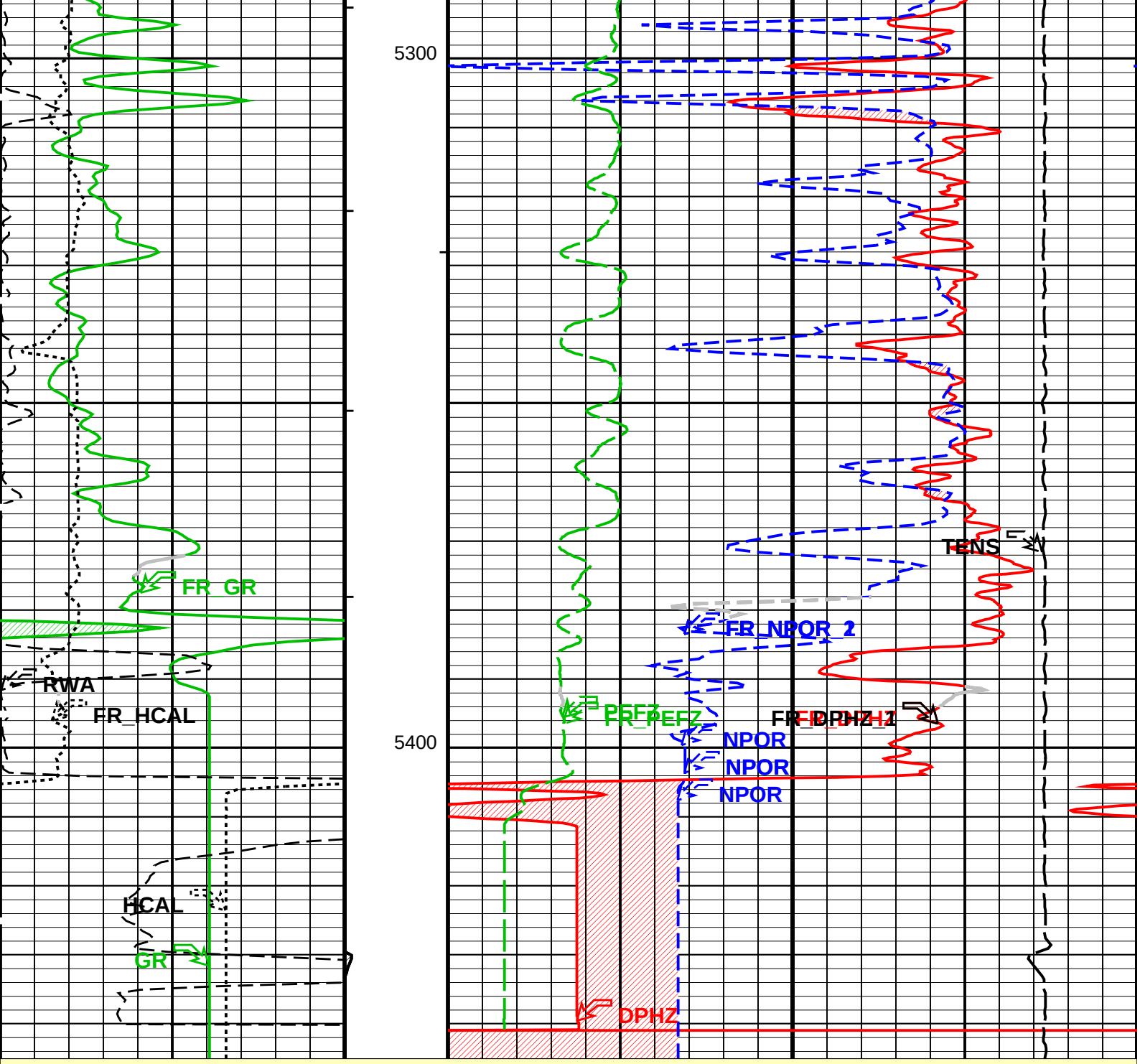

HCAL
GR
PEFZ
NPOR
NPOR
NPOR
DPHZ
4200
4300
4400


4500
4600
RWA
HCAL
GR
TENS
PEFZ
NPOR
NPOR
NPOR


DPHZ
4700
4800


4900
5000
RWA
HCAL
TENS
PEFZ
NPOR
NPOR
NPOR
DPHZ


5100
5145.0 FT
MTX CHG
5200
5260.0 FT
MTX CHG



MAIN PASS: *** PLATFORM EXPRESS − NUCLEAR POROSITY ***

Gamma Ray Backup	Cable Drag	Std. Res. Density Porosity (DPHZ) 0.3 (V/V) −0.1
RWA (RWA) 0 (OHMM) 1	Tool/Tot. Drag	Alpha Processed Neutron Porosity (NPOR) 0.3 (V/V) −0.1
Gamma Ray (GR) 0 (GAPI) 150	Stuck Stretch (STIT) 0 (F) 50	Std. Res. Formation Pe (PEFZ) 0 (~~~~ 10 / Tension (TENS) 10000 (LBF) 0
Caliper (HCAL) 6 (IN) 16		Gas Effect
		NPOR Backup

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	
	HAIT−H: Array Induction Tool − H		
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
BHS	Borehole Status	OPEN	
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
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
RTCO	RTCO − Rt Invasion Correction	YES	
SHT	Surface Hole Temperature	68	DEGF
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
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
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.71	G/C3
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
	HNGS−BA: Hostile Natural Gamma Ray Sonde		
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	68	DEGF
	RWA: Apparent Water Resistivity		
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
RTCO	RTCO − Rt Invasion Correction	YES	
	FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
	HOLEV: Integrated Hole/Cement Volume		
BHS	Borehole Status	OPEN	
FCD	Future Casing (Outer) Diameter	5.5	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
HVCS	Integrated Hole Volume Caliper Selection	AUTOMATIC	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	68	DEGF
	PERT: Preliminary Evaluation − Real Time		
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
BHS	Borehole Status	OPEN	
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
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
RTCO	RTCO − Rt Invasion Correction	YES	
SHT	Surface Hole Temperature	68	DEGF
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	5504.00	FT
TDL	Total Depth − Logger	5435.00	FT
System and Miscellaneous			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	−50000.00	PPM
DORL	Depth Offset for Repeat Analysis	0.0	FT
MST	Mud Sample Temperature	75.00	DEGF
RMFS	Resistivity of Mud Filtrate Sample	1.2000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	5435	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: PORO Vertical Scale: 5" per 100’ Graphics File Created: 03−Nov−2013 19:21

OP System Version: 19C2−270

HAIT−H	19C2−270	DSLT−FTB	19C2−270
HILTB−FTB	19C2−270	HNGC−B	19C2−270
HNGS−BA	19C2−270	DTC−H	19C2−270

Output DLIS Files

DEFAULT	AIT_SONIC_TLD_MCFL_030LUP	FN:28	PRODUCER	03−Nov−2013 19:21	

Schlumberger

REPEAT PASS

MAXIS Field Log

Input DLIS Files

DEFAULT	AIT_SONIC_TLD_MCFL_028LUP	FN:26	PRODUCER	03−Nov−2013 19:06	5407.5 FT	5084.0 FT

Output DLIS Files

DEFAULT	AIT_SONIC_TLD_MCFL_029PUP	FN:27	PRODUCER	03−Nov−2013 19:19	5412.0 FT	5088.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 105.81 F3

Cement Volume = 52.44 F3 (assuming 5.50 IN casing O.D.)

Computed from 5412.0 FT to 5089.0 FT using data channel(s) HCAL

OP System Version: 19C2−270

HAIT−H	19C2−270	DSLT−FTB	19C2−270
HILTB−FTB	19C2−270	HNGC−B	19C2−270
HNGS−BA	19C2−270	DTC−H	19C2−270

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
MATR	LIMESTONE	LIMESTONE	5412.0 19:19:04
	SANDSTONE	LIMESTONE	5260.0 19:19:09
	LIMESTONE	SANDSTONE	5145.0 19:19:13
MDEN	2.71 G/C3	2.71 G/C3	5412.0 19:19:04
	2.65 G/C3	2.71 G/C3	5260.0 19:19:09
	2.71 G/C3	2.65 G/C3	5145.0 19:19:13

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

NPOR Backup

Caliper (HCAL) 6 (IN) 16

Gas Effect

Gamma Ray (GR) 0 (GAPI) 150

Stuck Stretch (STIT) 0 (F) 50

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

Tension (TENS) 10000 (LBF) 0

RWA (RWA) 0 (OHMM) 1

Tool/Tot. Drag

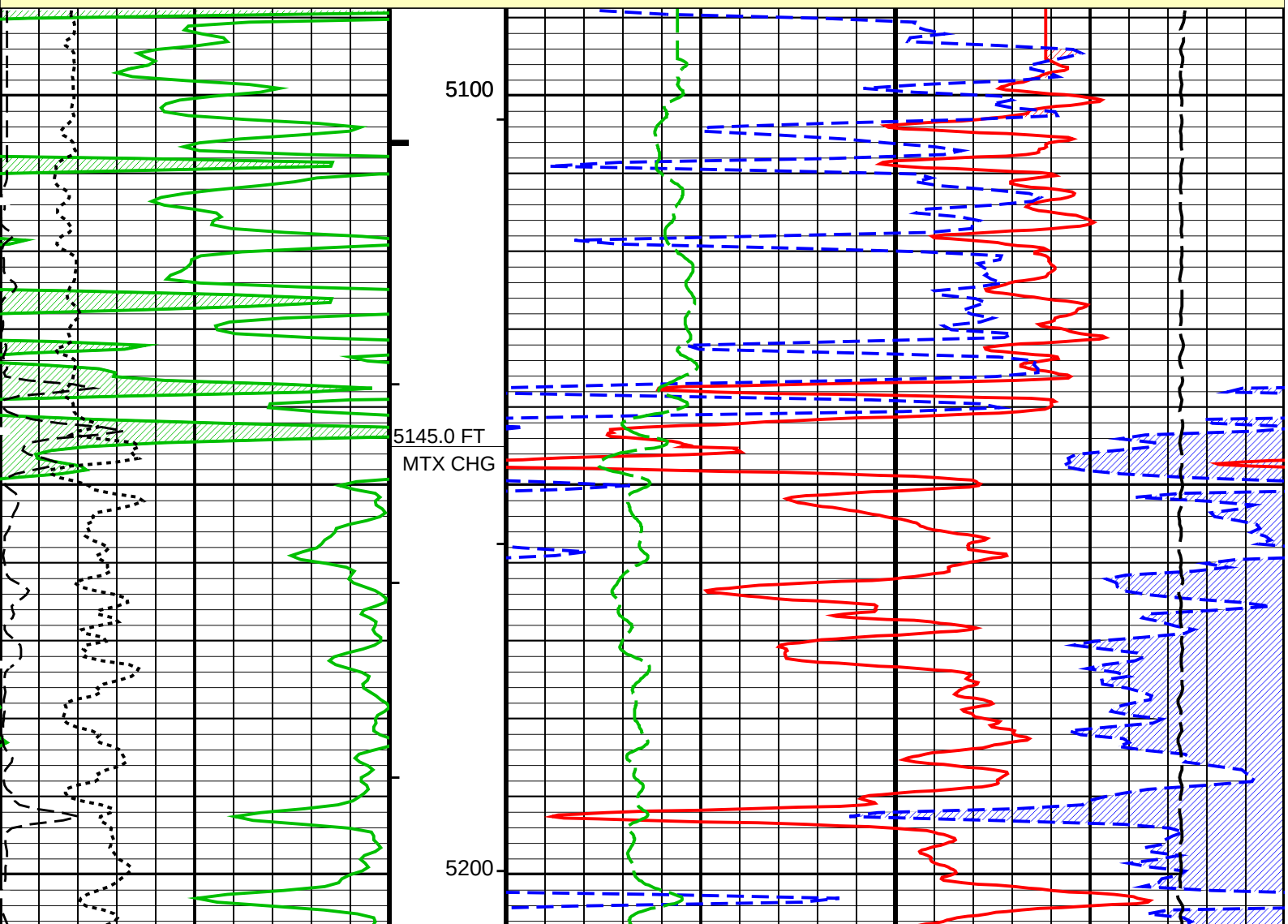
Alpha Processed Neutron Porosity (NPOR) 0.3 (V/V) -0.1

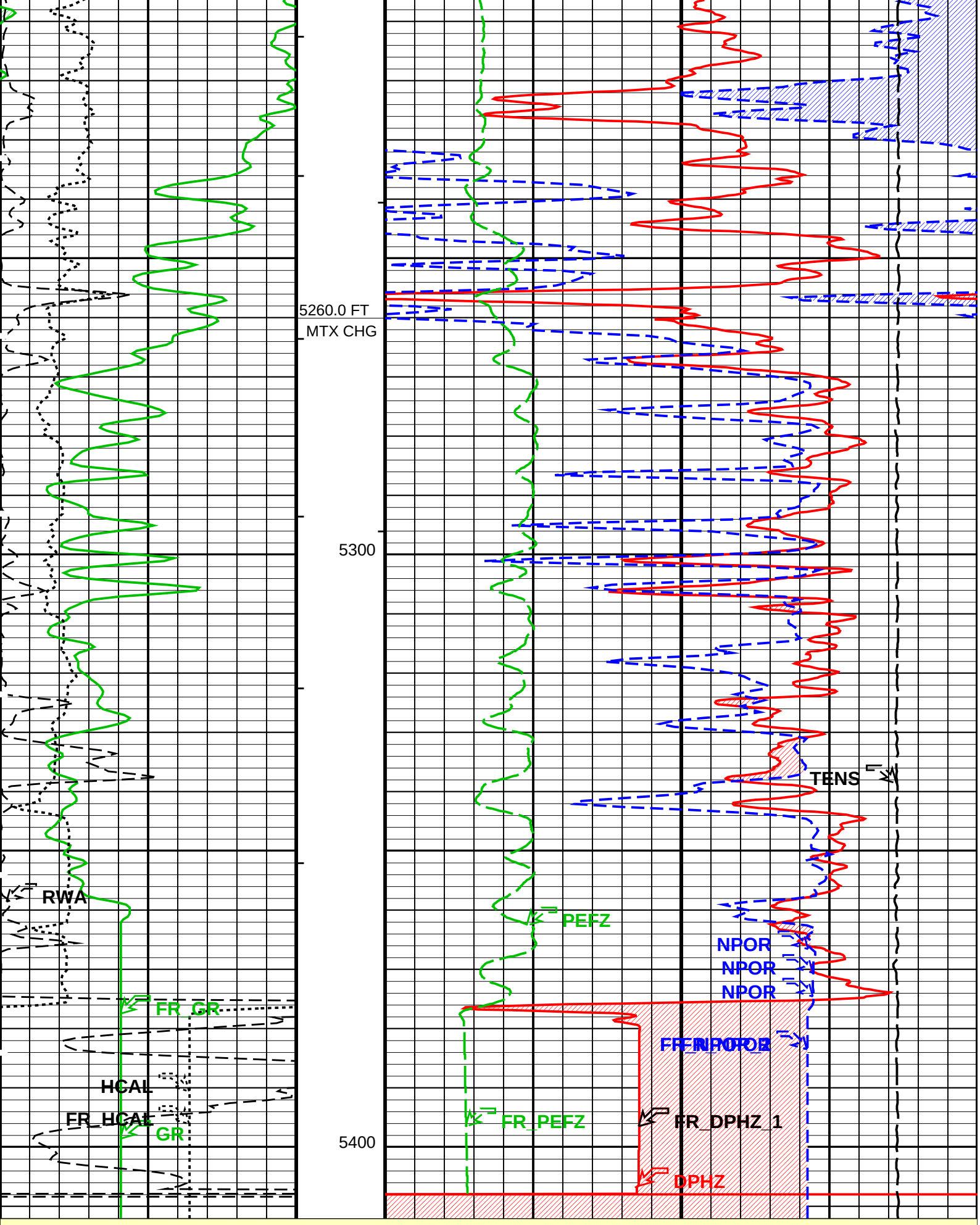
Gamma Ray Backup

Cable Drag

Std. Res. Density Porosity (DPHZ) 0.3 (V/V) -0.1

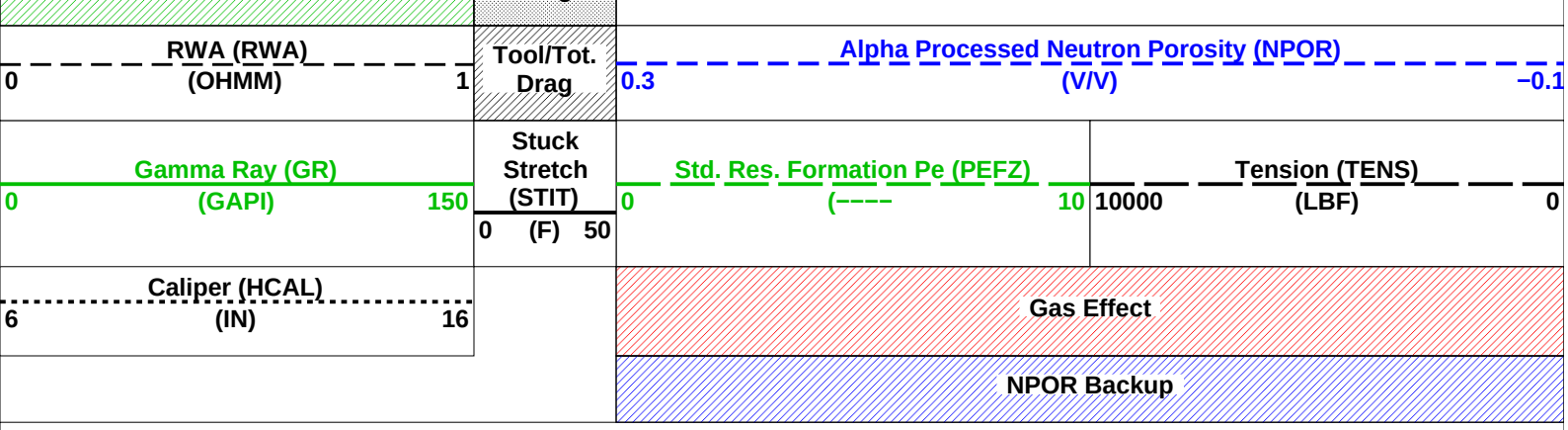
MAIN PASS: * PLATFORM EXPRESS - NUCLEAR POROSITY ***





MAIN PASS: *** PLATFORM EXPRESS − NUCLEAR POROSITY ***

Gamma Ray Backup	Cable Drag	Std. Res. Density Porosity (DPHZ)	
		0.3 (V/V)	−0.1



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	
	HAIT−H: Array Induction Tool − H		
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
BHS	Borehole Status	OPEN	
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
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
RTCO	RTCO − Rt Invasion Correction	YES	
SHT	Surface Hole Temperature	68	DEGF
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
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
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.71	G/C3
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
	HNGS−BA: Hostile Natural Gamma Ray Sonde		
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	68	DEGF
	RWA: Apparent Water Resistivity		
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
FEXP	Form Factor Exponent	2	

FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
RTCO	RTCO − Rt Invasion Correction	YES	
FEQL: Formation Evaluation Quick Look			
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
FCD	Future Casing (Outer) Diameter	5.5	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
HVCS	Integrated Hole Volume Caliper Selection	AUTOMATIC	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	68	DEGF
PERT: Preliminary Evaluation − Real Time			
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
BHS	Borehole Status	OPEN	
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
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
RTCO	RTCO − Rt Invasion Correction	YES	
SHT	Surface Hole Temperature	68	DEGF
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	5504.00	FT
TDL	Total Depth − Logger	5435.00	FT
System and Miscellaneous			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	−50000.00	PPM
DO	Depth Offset for Playback	4.5	FT
MST	Mud Sample Temperature	75.00	DEGF
PP	Playback Processing	RECOMPUTE	
RMFS	Resistivity of Mud Filtrate Sample	1.2000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	5435	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: PORO Vertical Scale: 5" per 100’ Graphics File Created: 03−Nov−2013 19:19

OP System Version: 19C2−270

HAIT−H	19C2−270	DSLT−FTB	19C2−270
HILTB−FTB	19C2−270	HNGC−B	19C2−270
HNGS−BA	19C2−270	DTC−H	19C2−270

Input DLIS Files

DEFAULT	AIT_SONIC_TLD_MCFL_028LUP	FN:26	PRODUCER	03−Nov−2013 19:06	5407.5 FT	5084.0 FT

Output DLIS Files

DEFAULT	AIT_SONIC_TLD_MCFL_029PUP	FN:27	PRODUCER	03−Nov−2013 19:19

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MAIN DENSITY 5" = 100’

MAXIS Field Log

Output DLIS Files

DEFAULT	AIT_SONIC_TLD_MCFL_030LUP	FN:28	PRODUCER	03−Nov−2013 19:21		

DEFAULT AH_SONIC_TLD_MCPL_030EUP FN:28 PRODUCER 03 NOV 2013 19:21

OP System Version: 19C2−270

HAIT−H	19C2−270	DSLT−FTB	19C2−270
HILTB−FTB	19C2−270	HNGC−B	19C2−270
HNGS−BA	19C2−270	DTC−H	19C2−270

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
MATR	LIMESTONE	LIMESTONE	5445.0 19:22:04
	SANDSTONE	LIMESTONE	5260.0 19:28:14
	LIMESTONE	SANDSTONE	5145.0 19:32:06
POUT	LIMESTONE	LIMESTONE	5445.0 19:22:04
	SANDSTONE	LIMESTONE	5260.0 19:28:14
	LIMESTONE	SANDSTONE	5145.0 19:32:06

PIP SUMMARY

Time Mark Every 60 S

Caliper (HCAL) 6 (IN) 16

SHALE

Gamma Ray (GR) 0 (GAPI) 150

SAND

Tension (TENS) 10000 (LBF) 0

RWA (RWA) 0 (OHMM) 1

LIME

Std. Res. Formation Density (RHOZ) 2 (G/C3) 3

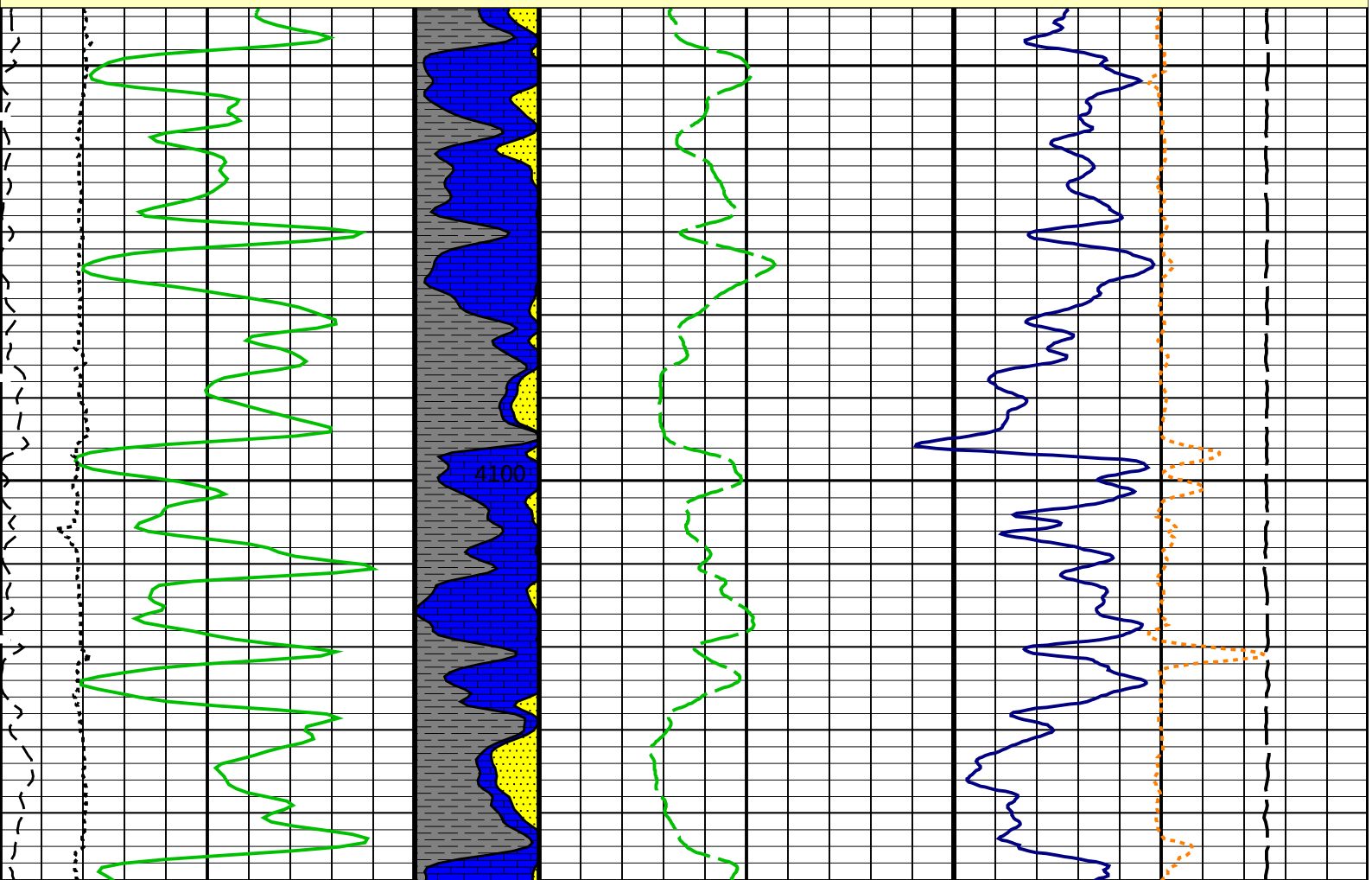
Gamma Ray Backup

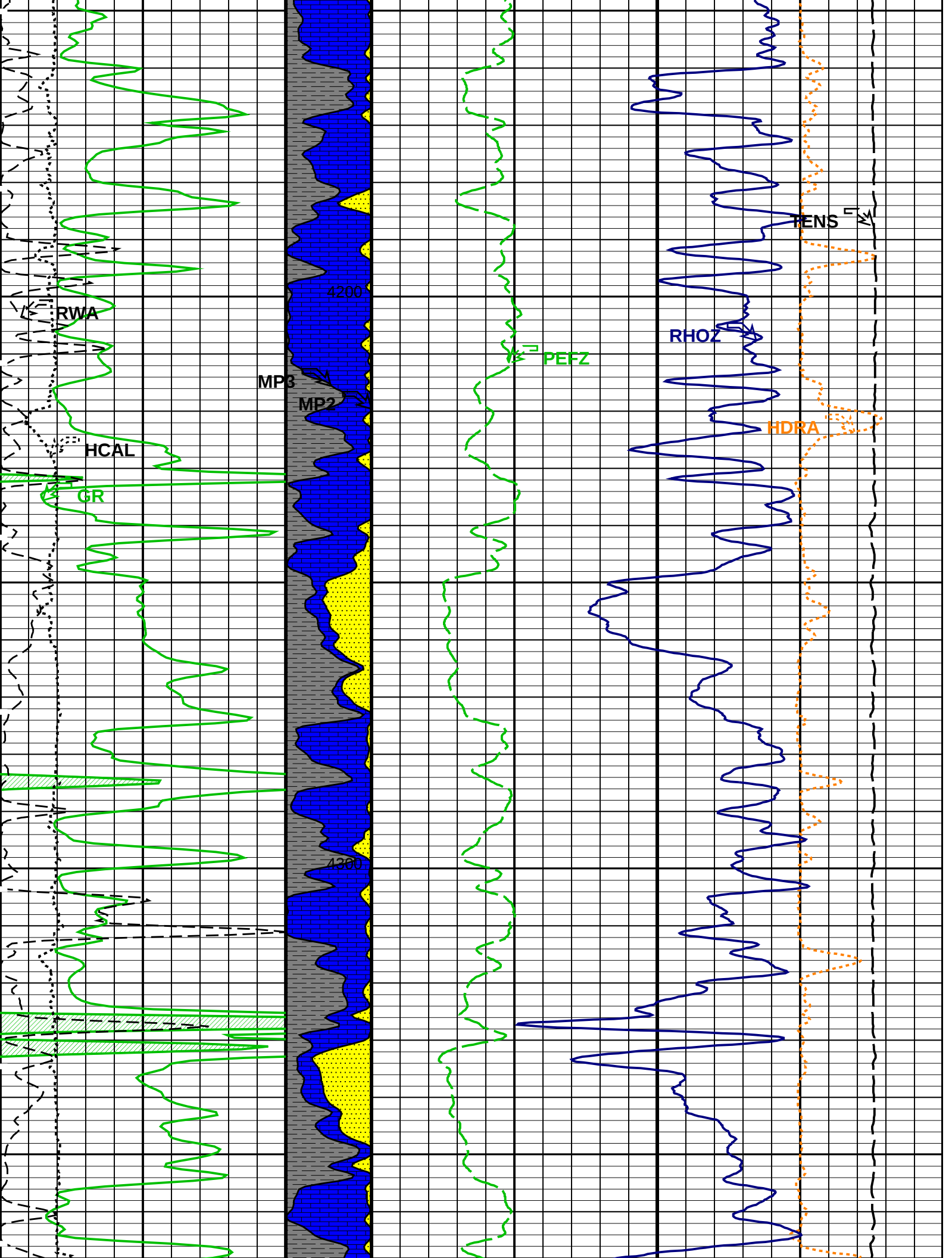
Stuck Stretch (STIT) 0 (F) 50

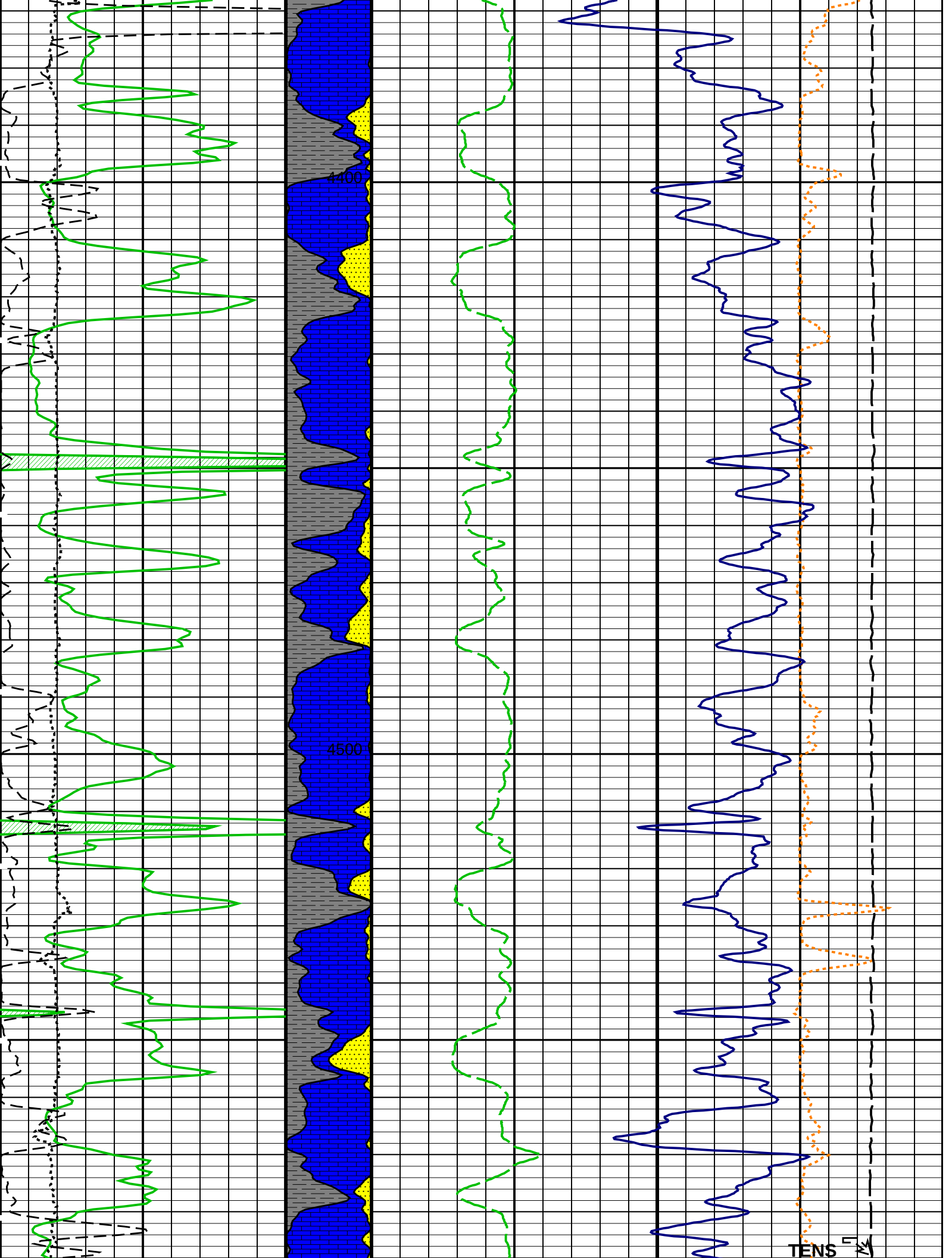
Std. Res. Formation Pe (PEFZ) 0 (−−−− 10

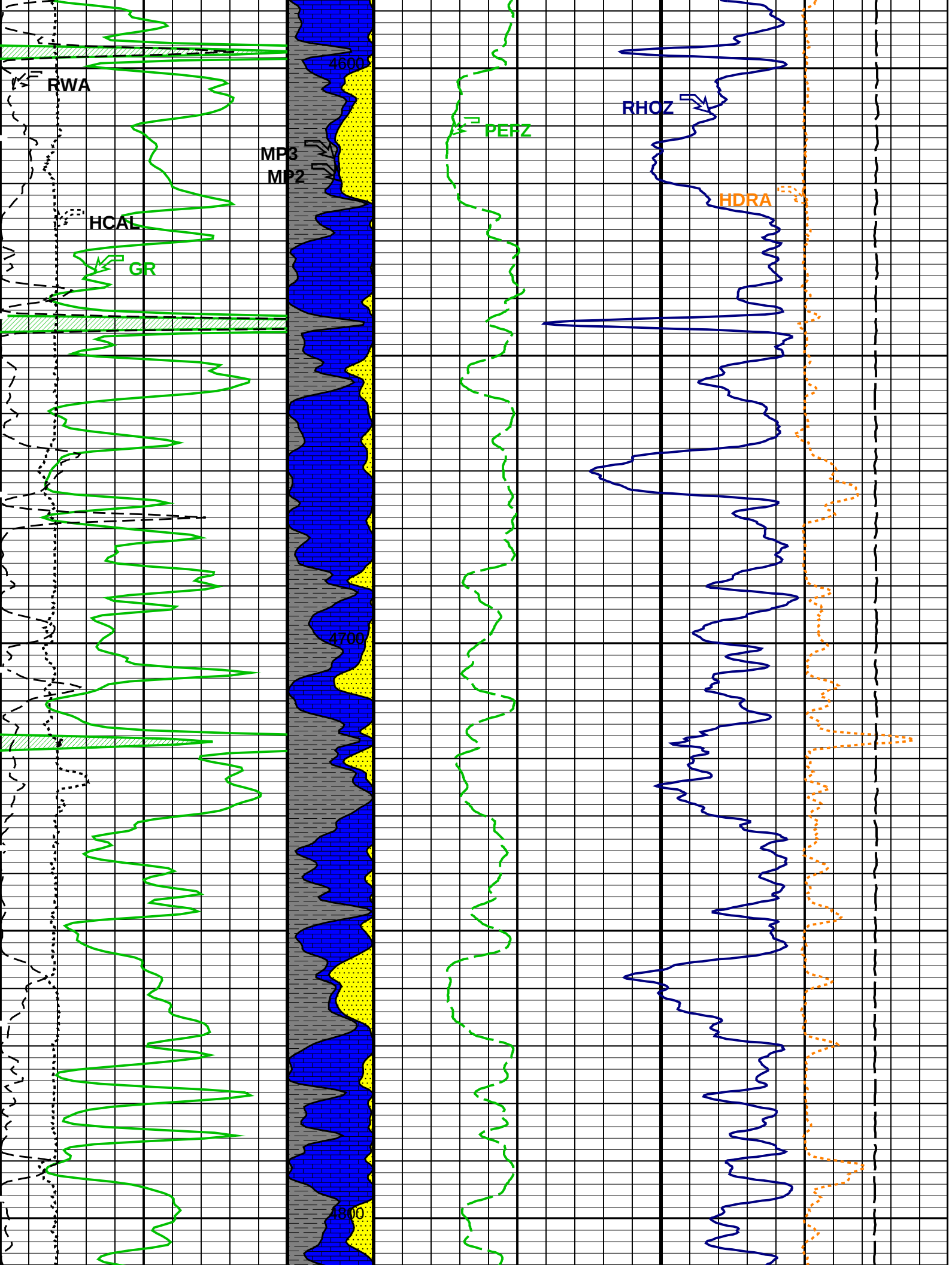
Density Correction (HDRA) −0.25 (G/C3) 0.25

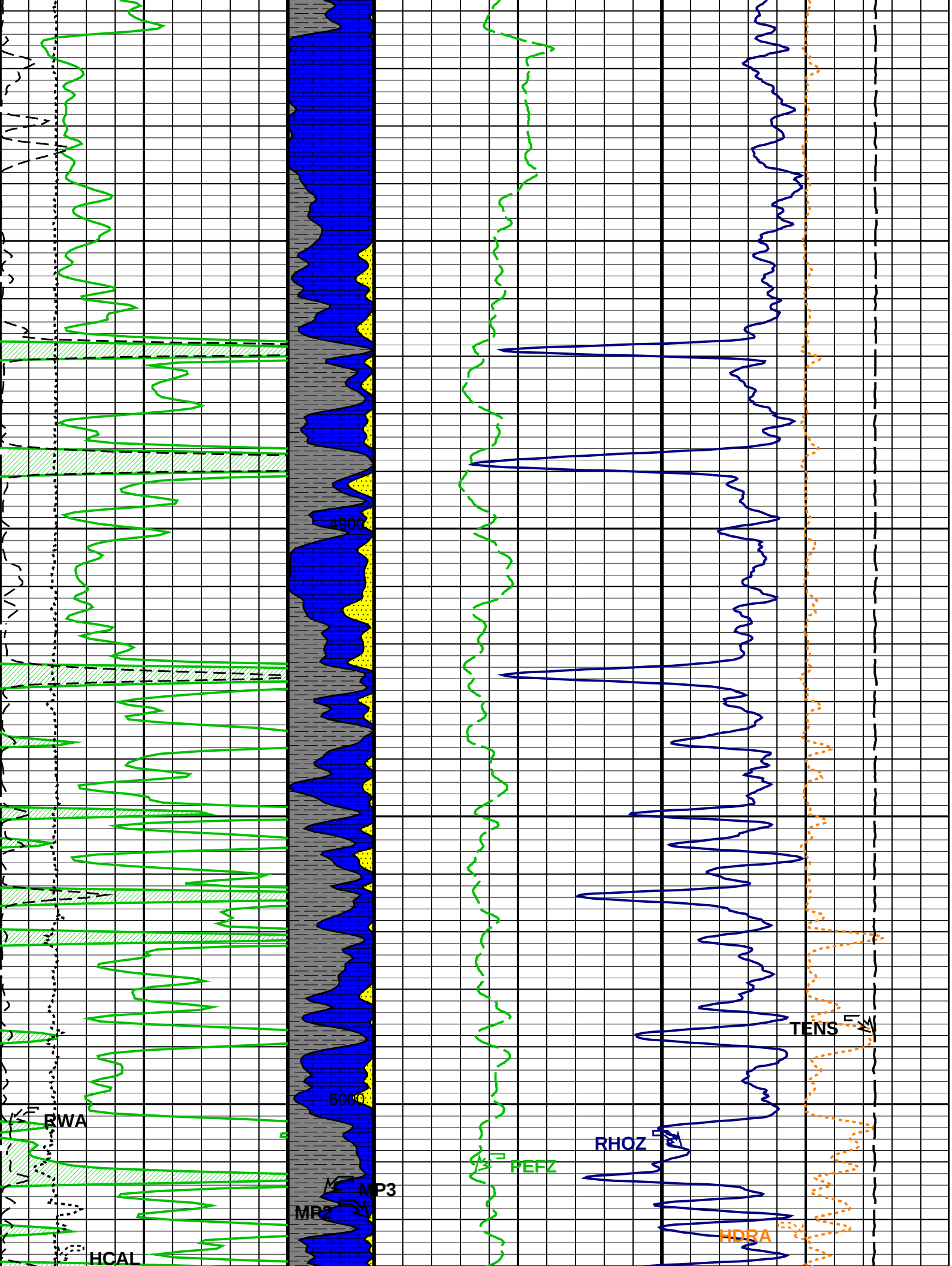
MAIN PASS: *** PLATFORM EXPRESS − LITHOLOGY DENSITY ***

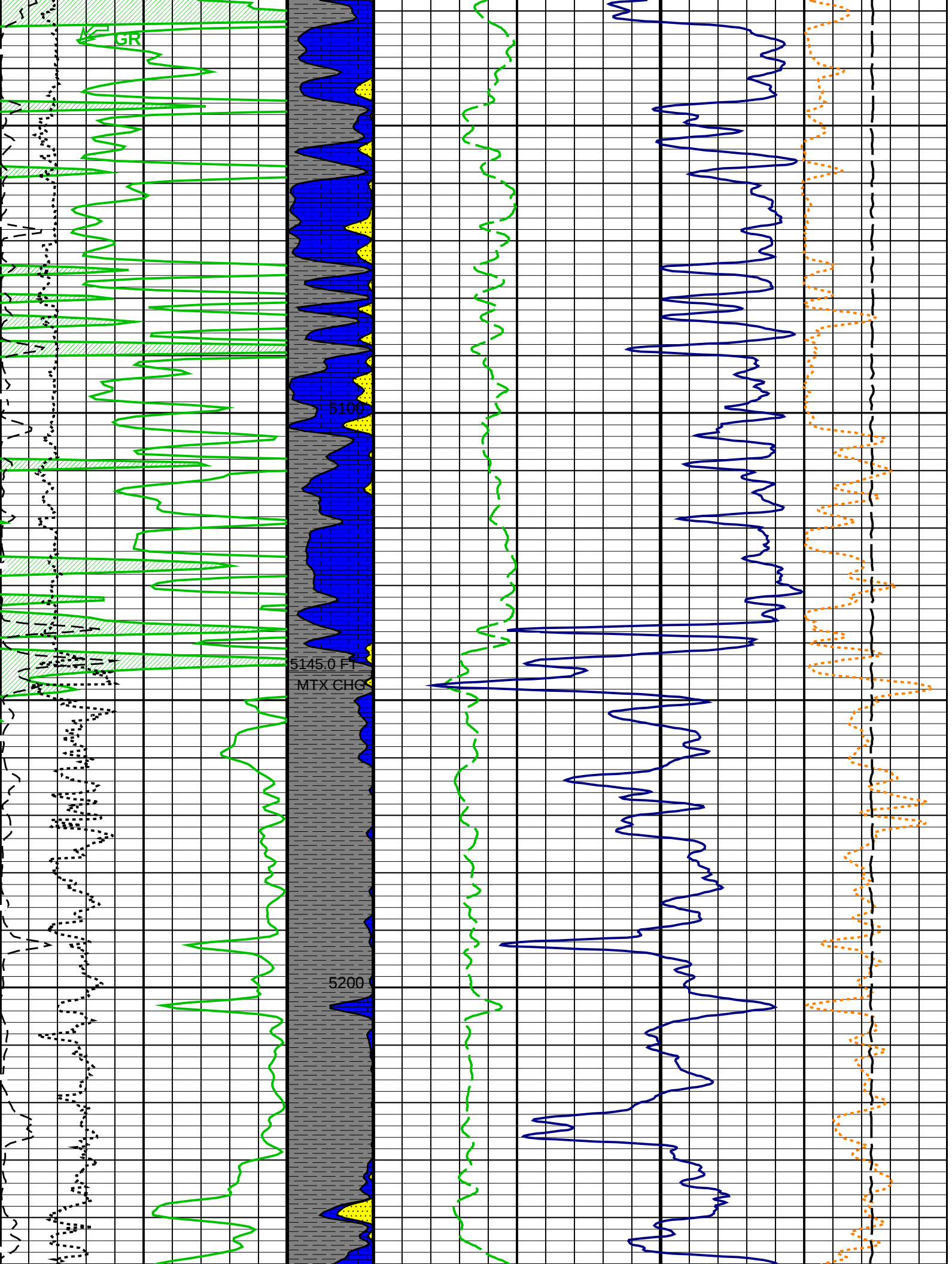


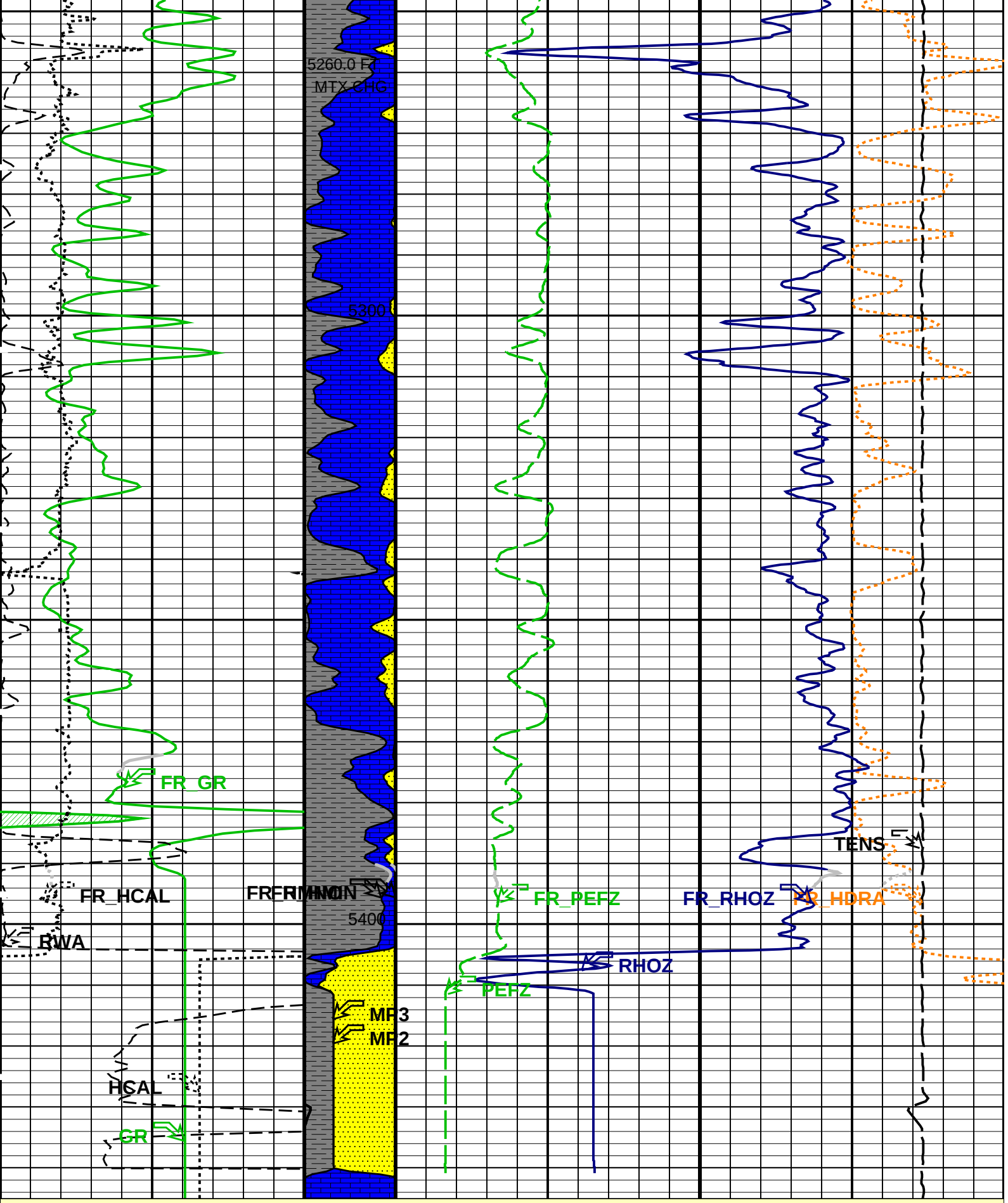

RWA
HCAL
GR
4200
MP3
MP2
4300
PEFZ
RHOZ
HDRA
PENS


4400
4500
TENS


RWA
HCAL
GR
MP3
MP2
4600
4700
4800
PEFZ
RHOZ
HDRA

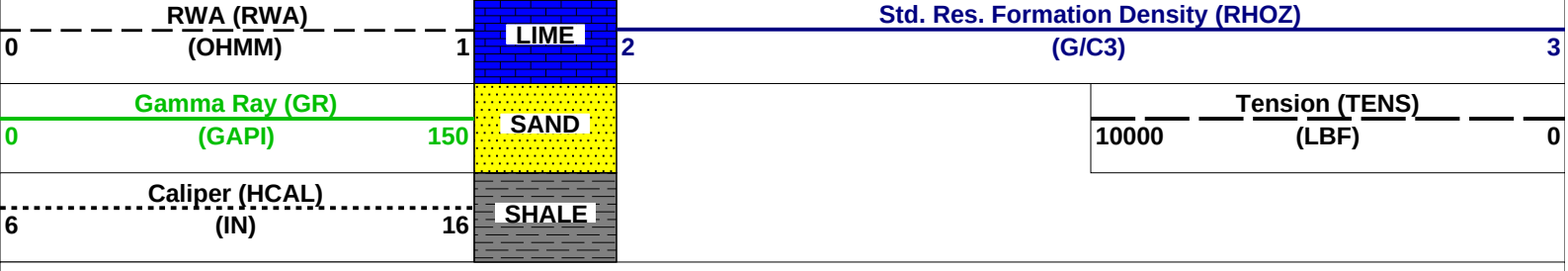

4900
5000
RWA
HCAL
MP3
MR2
PEFZ
RHOZ
TENS
HDRA


GR
5100
5145.0 FT
MTX CHG
5200



MAIN PASS: *** PLATFORM EXPRESS − LITHOLOGY DENSITY ***

Gamma Ray Backup	Stuck Stretch (STIT)	Std. Res. Formation Pe (PEFZ)	Density Correction (HDRA)
	0 (F) 50	0 (−−−− 10	−0.25 (G/C3) 0.25



PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	HAIT−H: Array Induction Tool − H		
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
BHT	Bottom Hole Temperature (used in calculations)	140	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
RTCO	RTCO − Rt Invasion Correction	YES	
SHT	Surface Hole Temperature	68	DEGF
	DSLT−FTB: Digitizing Sonic Logging Tool		
CDTS	C−Delta−T Shale	100	US/F
DTF	Delta−T Fluid	189	US/F
SPFS	Sonic Porosity Formula	RAYMER_HUNT	
SPSO	Sonic Porosity Source	DT	
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHT	Bottom Hole Temperature (used in calculations)	140	DEGF
DHC	Density Hole Correction	BS	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
GCLF	Germany Coal−like Formation Option	NO	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
SHT	Surface Hole Temperature	68	DEGF
	HNGS−BA: Hostile Natural Gamma Ray Sonde		
BHT	Bottom Hole Temperature (used in calculations)	140	DEGF
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	68	DEGF
	RWA: Apparent Water Resistivity		
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
RTCO	RTCO − Rt Invasion Correction	YES	
	FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
	HOLEV: Integrated Hole/Cement Volume		
BHT	Bottom Hole Temperature (used in calculations)	140	DEGF
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	68	DEGF
	PERT: Preliminary Evaluation − Real Time		
ARTS	AIT Rt Selection (for ALLRES computation)	AITH_TwoResA90	
BDPS	Bulk Density Processing Selector	Standard	
BHT	Bottom Hole Temperature (used in calculations)	140	DEGF
CLIM	Caliper Limit for Bad Hole	999	IN
CNPS	Corrected Neutron Porosity Selector	NPHI	
DRUL	DRHO Upper Limit	999	G/C3
FCAL	Caliper Presence Flag	PRESENT	
FCGR	CGR Presence Flag	PRESENT	
FEXP	Form Factor Exponent	2	

FLDT		Bulk Density Presence Flag	PRESENT	
FNUM		Form Factor Numerator	1	
FPHI		Form Factor Porosity Source	DPHZ	
FSON		Sonic Presence Flag	ABSENT	
GGRD		Geothermal Gradient	0.01	DF/F
GTSE		Generalized Temperature Selection	HSTS_HTEM	
MATR		Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
PMAX		PHI Maximum	0.5	CFCF
POUT		Porosity Output Lithology	LIMESTONE	
RG21		RHO Grain (2−Mineral Model, Min−1)	2.71	G/C3
RG22		RHO Grain (2−Mineral Model, Min−2)	2.644	G/C3
RG23		RHO Grain (2−Mineral Model, Min−3)	2.877	G/C3
RG31		RHO Grain (3−Mineral Model, Min−1)	2.71	G/C3
RG32		RHO Grain (3−Mineral Model, Min−2)	2.644	G/C3
RG33		RHO Grain (3−Mineral Model, Min−3)	2.877	G/C3
RTCO		RTCO − Rt Invasion Correction	YES	
RTLF		RT Limit Flag	NO_LIMIT	
RWF		Resistivity of Free Water	0.02	OHMM
SHT		Surface Hole Temperature	68	DEGF
UF		U Fluid	0.398	
UM21		U Matrix (2−Mineral Model, Min−1)	13.77	
UM22		U Matrix (2−Mineral Model, Min−2)	4.779	
UM23		U Matrix (2−Mineral Model, Min−3)	8.997	
UM31		U Matrix (3−Mineral Model, Min−1)	13.77	
UM32		U Matrix (3−Mineral Model, Min−2)	4.779	
UM33		U Matrix (3−Mineral Model, Min−3)	8.997	
	STI: Stuck Tool Indicator			
LBFR		Trigger for MAXIS First Reading Label	TDL	
STKT		STI Stuck Threshold	2.5	FT
TDD		Total Depth − Driller	5504.00	FT
TDL		Total Depth − Logger	5435.00	FT
	System and Miscellaneous			
BS		Bit Size	7.875	IN
DORL		Depth Offset for Repeat Analysis	0.0	FT
MST		Mud Sample Temperature	75.00	DEGF
RMFS		Resistivity of Mud Filtrate Sample	1.2000	OHMM
RW		Resistivity of Connate Water	1.0000	OHMM
TD		Total Depth	5435	FT
TWS		Temperature of Connate Water Sample	100.00	DEGF

Format: DENS **Vertical Scale: 5" per 100'** **Graphics File Created: 03−Nov−2013 19:21**

OP System Version: 19C2−270

HAIT−H	19C2−270	DSLT−FTB	19C2−270
HILTB−FTB	19C2−270	HNGC−B	19C2−270
HNGS−BA	19C2−270	DTC−H	19C2−270

Output DLIS Files

DEFAULT **AIT_SONIC_TLD_MCFL_030LUP** **FN:28** **PRODUCER** **03−Nov−2013 19:21**

Schlumberger

Before Calibrations

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Array Induction Tool − H Wellsite Calibration − Electronics Calibration Check − Thru Cal Mag. & Phase							
Master: 23−Aug−2013 12:43 Before: 2−Nov−2013 14:00							
Thru Cal Magnitude − 0	0	0.6250	0.6271	N/A	N/A	N/A	V
Thru Cal Magnitude − 1	0	1.281	1.285	N/A	N/A	N/A	V
Thru Cal Magnitude − 2	0	0.6354	0.6370	N/A	N/A	N/A	V

Thru Cal Magnitude − 3	0	0.7208	0.7233	N/A	N/A	N/A	V
Thru Cal Magnitude − 4	0	1.343	1.348	N/A	N/A	N/A	V
Thru Cal Magnitude − 5	0	1.940	1.948	N/A	N/A	N/A	V
Thru Cal Magnitude − 6	0	1.936	1.943	N/A	N/A	N/A	V
Thru Cal Magnitude − 7	0	1.370	1.381	N/A	N/A	N/A	V
Phase − 0	0	73.52	74.53	N/A	N/A	N/A	DEG
Phase − 1	0	72.48	73.51	N/A	N/A	N/A	DEG
Phase − 2	0	68.24	69.32	N/A	N/A	N/A	DEG
Phase − 3	0	67.33	68.42	N/A	N/A	N/A	DEG
Phase − 4	0	60.29	61.45	N/A	N/A	N/A	DEG
Phase − 5	0	58.02	59.28	N/A	N/A	N/A	DEG
Phase − 6	0	58.09	59.34	N/A	N/A	N/A	DEG
Phase − 7	0	51.87	53.72	N/A	N/A	N/A	DEG

Array Induction Tool − H Wellsite Calibration − Electronics Calibration Check − Auxilliary
Master: 23−Aug−2013 12:43 Before: 2−Nov−2013 14:00

Array Induction SPA Plus	990.5	991.5	992.9	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	−0.01210	−0.03388	N/A	N/A	N/A	MV
Array Induction Temperature Pl	0.9150	0.9185	0.9198	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	−0.00002541	−0.00003630	N/A	N/A	N/A	V

Array Induction Tool − H Wellsite Calibration − Test Loop Gain Correction
Master: 23−Aug−2013 12:43

Test Loop Gain Magnitude − 0	0	1.017	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 1	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 2	0	1.018	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 3	0	1.017	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 4	0	0.9993	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 5	0	0.9919	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 6	0	0.9994	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 7	0	1.013	N/A	N/A	N/A	N/A	V
Phase − 0	0	0.3811	N/A	N/A	N/A	N/A	DEG
Phase − 1	0	0.5097	N/A	N/A	N/A	N/A	DEG
Phase − 2	0	−0.05324	N/A	N/A	N/A	N/A	DEG
Phase − 3	0	−0.07552	N/A	N/A	N/A	N/A	DEG
Phase − 4	0	−0.08022	N/A	N/A	N/A	N/A	DEG
Phase − 5	0	−0.2470	N/A	N/A	N/A	N/A	DEG
Phase − 6	0	0.1174	N/A	N/A	N/A	N/A	DEG
Phase − 7	0	−0.2478	N/A	N/A	N/A	N/A	DEG

Array Induction Tool − H Wellsite Calibration − Sonde Error Correction
Master: 23−Aug−2013 12:43

R Sonde Error Correction − 0	0	−88.79	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 1	0	166.9	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 2	0	111.5	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 3	0	58.50	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 4	0	22.96	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 5	0	13.80	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 6	0	9.406	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 7	0	−0.5903	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 0	0	110.6	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 1	0	155.8	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 2	0	20.31	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 3	0	44.99	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 4	0	−12.67	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 5	0	2.384	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 6	0	4.958	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 7	0	2.526	N/A	N/A	N/A	N/A	MM/M

Array Induction Tool − H Wellsite Calibration − Mud Gain Correction
Master: 23−Aug−2013 12:43

Coarse − Mag, Real, Imag − 0	0	0.8059	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 1	0	0.8059	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 2	0	0.8059	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 0	0	0.8124	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 1	0	0.8125	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 2	0	0.8125	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Stab Measurement Summary
Before: 2−Nov−2013 14:03

BS Window Ratio	0.7333	N/A	0.7296	N/A	N/A	N/A	
BS Window Sum	9110	N/A	9099	N/A	N/A	N/A	CPS
SS Window Ratio	0.4778	N/A	0.4802	N/A	N/A	N/A	
SS Window Sum	8997	N/A	9003	N/A	N/A	N/A	CPS
LS Window Ratio	0.2950	N/A	0.2906	N/A	N/A	N/A	
LS Window Sum	991.1	N/A	991.0	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Photo−multiplier High Voltages Calibrations
Before: 2−Nov−2013 14:03

BS PM High Voltage (Command)	1672	N/A	1669	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1466	N/A	1462	N/A	N/A	N/A	V

LS PM High Voltage (Command)	1546	N/A	1549	N/A	N/A	N/A	V

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Crystal Quality Resolutions Calibration
Before: 2−Nov−2013 14:03

BS Crystal Resolution	11.51	N/A	11.47	N/A	N/A	N/A	%
SS Crystal Resolution	10.29	N/A	10.42	N/A	N/A	N/A	%
LS Crystal Resolution	8.796	N/A	8.976	N/A	N/A	N/A	%

High resolution Integrated Logging Tool−DTS Wellsite Calibration − MCFL Calibration
Before: 2−Nov−2013 14:03

Raw B0 Resistivity	3875	N/A	3867	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3805	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3803	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HILT Caliper Calibration
Before: 2−Nov−2013 14:00

HILT Caliper Zero Measurement	8.000	N/A	9.575	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	13.75	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Detector Calibration
Before: 2−Nov−2013 14:00

Gamma Ray Background	30.00	N/A	79.02	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkgd)	165.0	N/A	175.8	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Zero Measurement
Master: 10−Oct−2013 15:24 Before: 2−Nov−2013 14:01

CNTC Background	26.26	26.26	26.41	N/A	N/A	3.939	CPS
CFTC Background	27.90	27.90	27.94	N/A	N/A	4.185	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Ratio Measurement
Master: 10−Oct−2013 15:24

Thermal Near Corr. (Tank)	5800	4952	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2048	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.418	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Accelerometer Calibration
Before: 3−Nov−2013 18:22

Z−Axis Acceleration	32.19	N/A	32.22	N/A	N/A	N/A	F/S2

The GLS−VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT−B Water Temperature 65.0 DEGF.
Thermal Housing Size 3.375 IN.
NSR−F serial number 5069

Array Induction Tool − H / Equipment Identification

Primary Equipment:

Rm/SP Bottom Nose	AHRM − A	
Array Induction Sonde	AHIS − BA	398

Auxiliary Equipment:

Array Induction Tool − H Wellsite Calibration
Electronics Calibration Check − Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6250		0.6050	73.52		71.00
	Before	0.6271			74.53		
1	Master	1.281		1.270	72.48		70.00
	Before	1.285			73.51		
2	Master	0.6354		0.6230	68.24		66.00
	Before	0.6370			69.32		
3	Master	0.7208		0.7040	67.33		65.00
	Before	0.7233			68.42		

	Before					
4	Master	1.343	1.337	60.29	59.00	
	Before	1.348		61.45		
5	Master	1.940	1.955	58.02	57.00	
	Before	1.948		59.28		
6	Master	1.936	1.955	58.09	57.00	
	Before	1.943		59.34		
7	Master	1.370	1.415	51.87	53.00	
	Before	1.381		53.72		
		60.00 % (Minimum) (Nominal) 140.0 % (Maximum)		Nom −60.00 (Minimum) (Nominal) Nom + 60.00 (Maximum)		

Master: 23−Aug−2013 12:43 Before: 2−Nov−2013 14:00

Array Induction Tool − H Wellsite Calibration

Electronics Calibration Check − Auxilliary

Phase	Array Induction SPA Plus MV	Value
Master		991.5
Before		992.9
	941.0 (Minimum) 990.5 (Nominal) 1040 (Maximum)	

Phase	Array Induction SPA Zero MV	Value
Master		−0.01210
Before		−0.03388
	−50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	

Phase	Array Induction Temperature Plus V	Value
Master		0.9185
Before		0.9198
	0.8700 (Minimum) 0.9150 (Nominal) 0.9600 (Maximum)	

Phase	Array Induction Temperature Zero V	Value
Master		−2.541E−00
Before		−3.630E−00
	−0.05000 (Minimum) 0 (Nominal) 0.05000 (Maximum)	

Master: 23−Aug−2013 12:43 Before: 2−Nov−2013 14:00

Array Induction Tool − H Wellsite Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG
0	1.017		0.3811	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
1	1.015		0.5097	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
2	1.018		−0.05324	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
3	1.017		−0.07552	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
4	0.9993		−0.08022	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
5	0.9919		−0.2470	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
6	0.9994		0.1174	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
7	1.013		−0.2478	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)

Master: 23−Aug−2013 12:43

Array Induction Tool − H Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M
0	−88.79		110.6	
		−231.0 −56.00 119.0		−2250 0 2250

		(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)
1	166.9	114.0	159.0	204.0	155.8	−625.0	0	625.0
2	111.5	66.00	111.0	156.0	20.31	−350.0	0	350.0
3	58.50	39.00	64.00	89.00	44.99	−250.0	0	250.0
4	22.96	15.00	25.00	35.00	−12.67	−63.00	0	63.00
5	13.80	4.000	14.00	24.00	2.384	−50.00	0	50.00
6	9.406	5.000	10.00	15.00	4.958	−30.00	0	30.00
7	−0.5903	−5.000	0	5.000	2.526	−30.00	0	30.00

Master: 23−Aug−2013 12:43

Array Induction Tool − H Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag (Minimum)	(Nominal)	(Maximum)	Value	Fine − Mag, Real, Imag (Minimum)	(Nominal)	(Maximum)
0	0.8059	0.8000	1.000	1.200	0.8124	0.8000	1.000	1.200
1	0.8059	0.8000	1.000	1.200	0.8125	0.8000	1.000	1.200
2	0.8059	0.8000	1.000	1.200	0.8125	0.8000	1.000	1.200

Master: 23−Aug−2013 12:43

Digitizing Sonic Logging Tool / Equipment Identification

Primary Equipment:	
BHC Sonde	SLS − W
Digitizing Sonic Logging Cartridge	DSLC − B
Auxiliary Equipment:	
Electronics Cartridge Housing	ECH − KH

High resolution Integrated Logging Tool−DTS / Equipment Identification

Primary Equipment:		
HILT high−Resolution Mechanical Sonde	HRMS − B	1716
HILT Rxo Gamma−ray Device	HRGD − B	1748
HILT Micro Cylindrically Focused Log Dev	MCFL −	
GR Logging Source	GLS − VJ	5094
HILT High Res. Control Cartridge	HRCC − B	860
HILT Gamma−Ray Neutron Sonde−DTS	HGNS − B	1927
HGNS Gamma−Ray Device	HGR −	
HGNS Neutron Detector with Alpha Source	HCNT −	
Auxiliary Equipment:		
Neutron Calibration Tank	NCT − B	
Gamma Source Radioactive	GSR − U/Y	
HGNS Housing	HGNH −	3878

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Stab Measurement Summary

Phase	BS Window Ratio	Value	Phase	SS Window Ratio	Value	Phase	LS Window Ratio	Value
Before		0.7296	Before		0.4802	Before		0.2906
0.6967 (Minimum)	0.7333 (Nominal)	0.7700 (Maximum)	0.4539 (Minimum)	0.4778 (Nominal)	0.5017 (Maximum)	0.2802 (Minimum)	0.2950 (Nominal)	0.3097 (Maximum)
Phase	BS Window Sum CPS	Value	Phase	SS Window Sum CPS	Value	Phase	LS Window Sum CPS	Value
Before		9099	Before		9003	Before		991.0
8655 (Minimum)	9110 (Nominal)	9566 (Maximum)	8547 (Minimum)	8997 (Nominal)	9446 (Maximum)	941.5 (Minimum)	991.1 (Nominal)	1041 (Maximum)

Before: 2−Nov−2013 14:03

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Photo−multiplier High Voltages Calibrations

Phase	BS PM High Voltage (Command) V	Value	Phase	SS PM High Voltage (Command) V	Value	Phase	LS PM High Voltage (Command) V	Value
Before		1669	Before		1462	Before		1549
1572 (Minimum)	1672 (Nominal)	1772 (Maximum)	1366 (Minimum)	1466 (Nominal)	1566 (Maximum)	1446 (Minimum)	1546 (Nominal)	1646 (Maximum)

Before: 2−Nov−2013 14:03

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %	Value	Phase	SS Crystal Resolution %	Value	Phase	LS Crystal Resolution %	Value
Before		11.47	Before		10.42	Before		8.976
10.51 (Minimum)	11.51 (Nominal)	12.51 (Maximum)	9.289 (Minimum)	10.29 (Nominal)	11.29 (Maximum)	7.796 (Minimum)	8.796 (Nominal)	9.796 (Maximum)

Before: 2−Nov−2013 14:03

High resolution Integrated Logging Tool−DTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value
Before		3867	Before		3805	Before		3803
3565 (Minimum)	3875 (Nominal)	4185 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)

Before: 2−Nov−2013 14:03

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement IN	Value
Before		9.575	Before		13.75
6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)	9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)

Before: 2−Nov−2013 14:00

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig − Bkgd) GAPI	Value
Before		79.02	Before		175.8
0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	157.1 (Minimum)	165.0 (Nominal)	206.3 (Maximum)

Before: 2−Nov−2013 14:00

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		26.26	Master		27.90
Before		26.41	Before		27.94
5.000 (Minimum)	26.26 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	27.90 (Nominal)	40.00 (Maximum)

Master: 10−Oct−2013 15:24 Before: 2−Nov−2013 14:01

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Ratio Measurement

Phase	Thermal Near Corr. (Tank) CPS	Value	Phase	Thermal Far Corr. (Tank) CPS	Value	Phase	CNTC/CFTC (Tank)	Value
Master		4952	Master		2048	Master		2.418
4700 (Minimum)	5800 (Nominal)	6900 (Maximum)	1900 (Minimum)	2400 (Nominal)	2900 (Maximum)	2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)

Master: 10−Oct−2013 15:24

High resolution Integrated Logging Tool−DTS
Wellsite Calibration
Accelerometer Calibration

Phase	Z−Axis Acceleration F/S2	Value
Before		32.22

31.53 (Minimum) 32.19 (Nominal) 32.84 (Maximum)

Before: 3−Nov−2013 18:22

Hostile Natural Gamma Ray Cartridge − B / Equipment Identification

Primary Equipment:		
HNGC Cartridge	HNGC − B	250
Auxiliary Equipment:		
HNGC Housing	HNGH − A	87

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	9562

Company: **Pronghorn Operating LLC**

Schlumberger

Well: **Hanavan 1**
Field: **Smoky Creek**
County: **Cheyenne**
State: **Colorado**

Triple Combo (Limestone)
Compensated Neutron
Litho Density