

# Schlumberger

Company: **Kerr McGee Oil and Gas Onshore, LP**

Well: **Howard 37-29**

Field: **Wattenberg**

County: **Weld**

State: **Colorado**

**Platform Express  
Compensated Neutron  
Litho Density**

County: Weld  
Field: Wattenberg  
Location: SESE Sec. 29 , T 1N , R 67W  
Well: Howard 37-29  
Company: Kerr McGee Oil and Gas Onshore

LOCATION		Elev.:	K.B.	5038.00 ft
SESE Sec. 29 , T 1N , R 67W			G.L.	5023.00 ft
SHL: 1081' FSL / 1278' FEL SESE			D.F.	5037.00 ft
BHL: 64' FSL / 1340' FEL SWSE				
Permanent Datum:	Ground Level	Elev.:	5023.00 ft	
Log Measured From:	Kelly Bushing	15.00 ft	above Perm. Datum	
Drilling Measured From:	Kelly Bushing			
API Serial No.	Section	Township	Range	
05-123-33735-0000	29	1N	67W	

Logging Date	16-Sep-2011			
Run Number	1			
Depth Driller	8471 ft			
Schlumberger Depth	8451 ft			
Bottom Log Interval	8450 ft			
Top Log Interval	1195 ft			
Casing Driller Size @ Depth	8.625 in @ 1207 ft			
Casing Schlumberger	1195 ft			
Bit Size	7.875 in			
Type Fluid In Hole	Water			
Density	8.4 lbm/gal	27 s		
Fluid Loss				
Source Of Sample	Flowline			
RM @ Measured Temperature	2.330 ohm.m @ 58 degF			
RMF @ Measured Temperature	1.747 ohm.m @ 58 degF			
RMC @ Measured Temperature	3.495 ohm.m @ 58 degF			
Source RMF	Calculated	Calculated		
RM @ MRT	0.687 @ 213	0.515 @ 213		
Maximum Recorded Temperatures	213 degF			
Circulation Stopped	15-Sep-2011	21:00		
Logger On Bottom	16-Sep-2011	7:00		
Unit Number	3021	Fort Morgan, CO		
Recorded By	Jared R. Hoskins			
Witnessed By	Keith & Tekabe Gedamu			

Logging Date	16-Sep-2011			
Run Number	1			
Depth Driller	8471 ft			
Schlumberger Depth	8451 ft			
Bottom Log Interval	8450 ft			
Top Log Interval	1195 ft			
Casing Driller Size @ Depth	8.625 in @ 1207 ft			
Casing Schlumberger	1195 ft			
Bit Size	7.875 in			
Type Fluid In Hole	Water			
Density	8.4 lbm/gal	27 s		
Fluid Loss				
Source Of Sample	Flowline			
RM @ Measured Temperature	2.330 ohm.m @ 58 degF			
RMF @ Measured Temperature	1.747 ohm.m @ 58 degF			
RMC @ Measured Temperature	3.495 ohm.m @ 58 degF			
Source RMF	Calculated	Calculated		
RM @ MRT	0.687 @ 213	0.515 @ 213		
Maximum Recorded Temperatures	213 degF			
Circulation Stopped	15-Sep-2011	21:00		
Logger On Bottom	16-Sep-2011	7:00		
Unit Number	3021	Fort Morgan, CO		
Recorded By	Jared R. Hoskins			
Witnessed By	Keith & Tekabe Gedamu			

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				
Density				
Fluid Loss				
Source Of Sample				
RM @ Measured Temperature				
RMF @ Measured Temperature				
RMC @ Measured Temperature				
Source RMF				
RM @ MRT				
Maximum Recorded Temperatures				
Circulation Stopped				
Logger On Bottom				
Unit Number				
Recorded By				
Witnessed By				

Run 1

Run 2

Run

## DEPTH SUMMARY LISTING

Date Created: 16-SEP-2011 7:07:47

### Depth System Equipment

Depth Measuring Device	Tension Device	Logging Cable
Type: IDW-B Serial Number: 6380 Calibration Date: 9-17-2011 Calibrator Serial Number: 33 Calibration Cable Type: 7-46P Wheel Correction 1: -9 Wheel Correction 2: -8	Type: CMTD-B/A Serial Number: 1433 Calibration Date: 26-Aug-2011 Calibrator Serial Number: 100513 Number of Calibration Points: 10 Calibration RMS: 33 Calibration Peak Error: 68	Type: 7-46A XS Serial Number: 2153 Length: 16429 FT <hr/> Conveyance Method: Wireline Rig Type: LAND

### 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: 5.00 FT
Tool Zero Check At Surface: 0.00 FT

### Depth Control Remarks

1. This is the primary depth reference
2. All Schlumberger depth policy procedures applied
3. Rig-up lengths not performed due to open-hole conditions
- 4.
- 5.
- 6.

#### DISCLAIMER

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OTHER SERVICES1	OTHER SERVICES2
OS1: None	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
1. This is the first run in hole.	
2. Tool run as per tool sketch.	
3. Limestone matrix 2.71 g/cc.	
4. Rmf and Rmc calculated using GEN-7	

Rig: X15

Crew: Josh Strand & Todd Draeger

RUN 1		
SERVICE ORDER #:	BSS4-00119	
PROGRAM VERSION:	18C0-147	
FLUID LEVEL:		
LOGGED INTERVAL	START	STOP

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

## EQUIPMENT DESCRIPTION

RUN 1

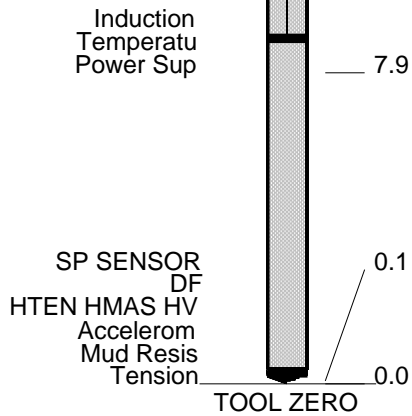
**SURFACE EQUIPMENT**  
WITM (DTS)-A

GSR-U/Y  
NCT-B  
CNB-AB  
NCS-VB

**DOWNHOLE EQUIPMENT**

<p>LEH-QT LEH-QT 2552</p> <p>DTC-H ECH-KC 896 DTCH0-A DTCH1-A</p> <p>HILTB-FTB HGNSD-B 863 HMCA HGNH 863 NLS-KL NSR-F 5068 HACCZ 452 HCNT HGR HRCC-B HRMS-B HRGD-B 1879 GLS-VJ 1827 MCFL Device HILT Nucl. LS 42767 HILT Nucl. SS 42767 HILT Nucl. BS 42767 AIT-H 392 AHIS-BA 392 AHRM-A NPV-N</p>	<p>CTEM</p> <p>TelStatus ToolStatu</p> <p>HGNS HTEM HMCA</p> <p>HGNS Gamm</p> <p>HGNS Neut HGNS Neut</p> <p>HGNS sens</p> <p>HRCC cart</p>	<p>— 39.7</p> <p>— 37.6</p> <p>— 37.6</p> <p>— 36.9</p> <p>— 31.1</p> <p>— 30.6</p> <p>— 28.2</p> <p>— 24.2</p> <p>— 18.8</p> <p>— 18.3</p> <p>— 17.9</p>	<p>43.6</p> <p>40.6</p> <p>37.6</p> <p>37.6</p>
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RUN 2



MAXIMUM STRING DIAMETER 4.63 IN  
 MEASUREMENTS RELATIVE TO TOOL ZERO  
 ALL LENGTHS IN FEET



# UPPER POROSITY LOG 5" = 100'

MAXIS Field Log

## Input DLIS Files

DEFAULT      AIT\_TLD\_MCFL\_CNL\_011LUP      FN:10      PRODUCER      16-Sep-2011 07:05      8454.0 FT      0.0 FT

## OP System Version: 18C0-147

HILTD      18C0-147      DTCH      18C0-147

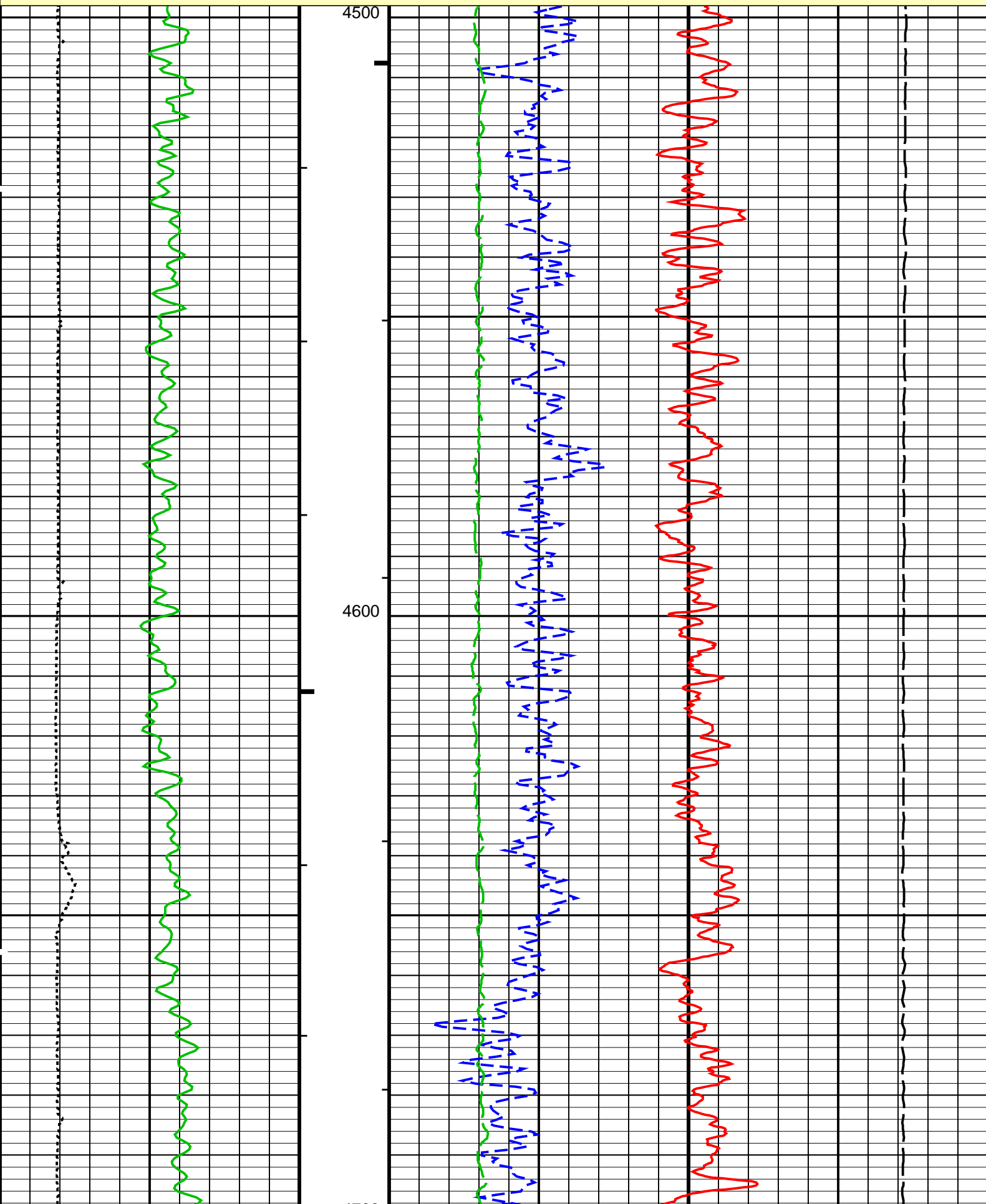
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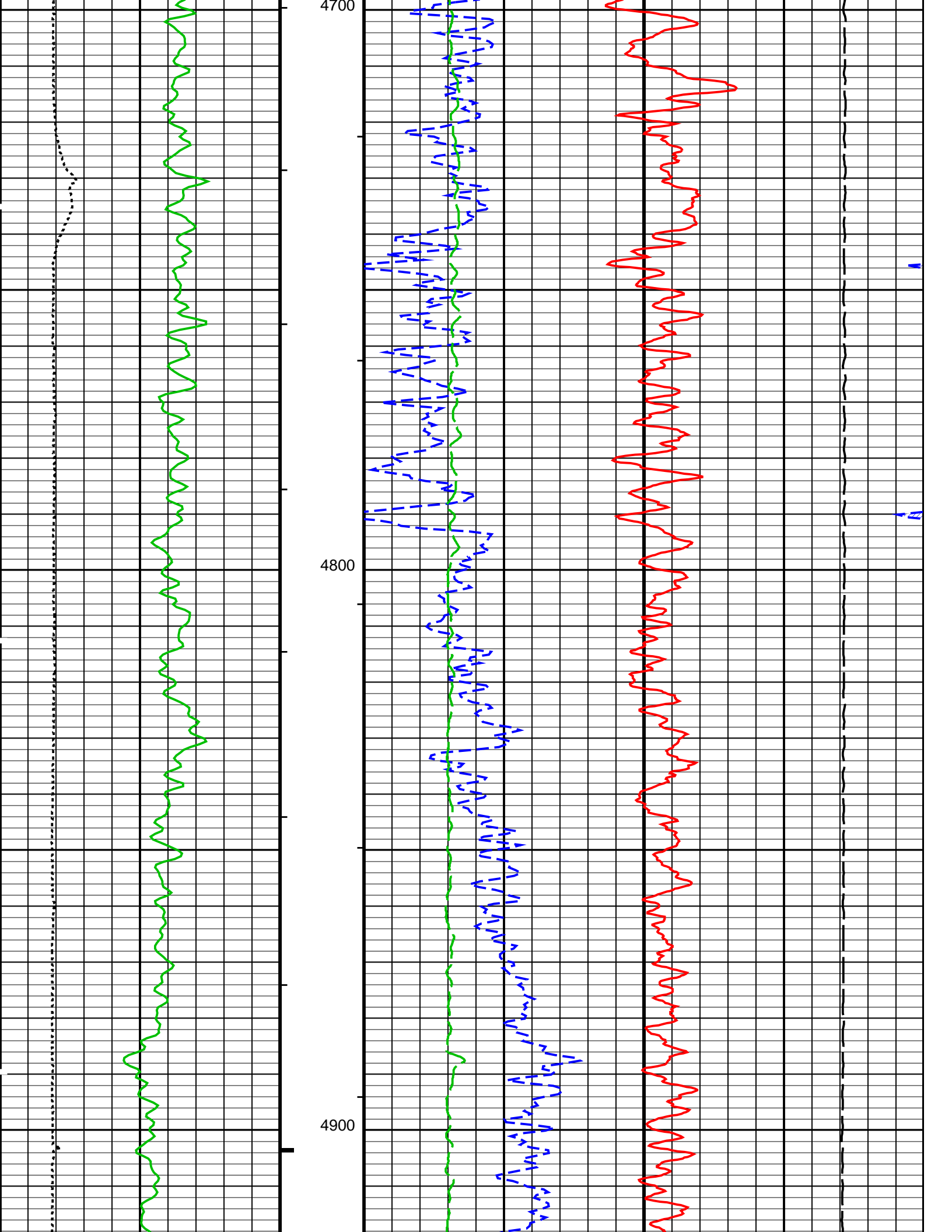
- ┌ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
- ┌ Integrated Cement Volume Minor Pip Every 10 F3
- └ Integrated Cement Volume Major Pip Every 100 F3

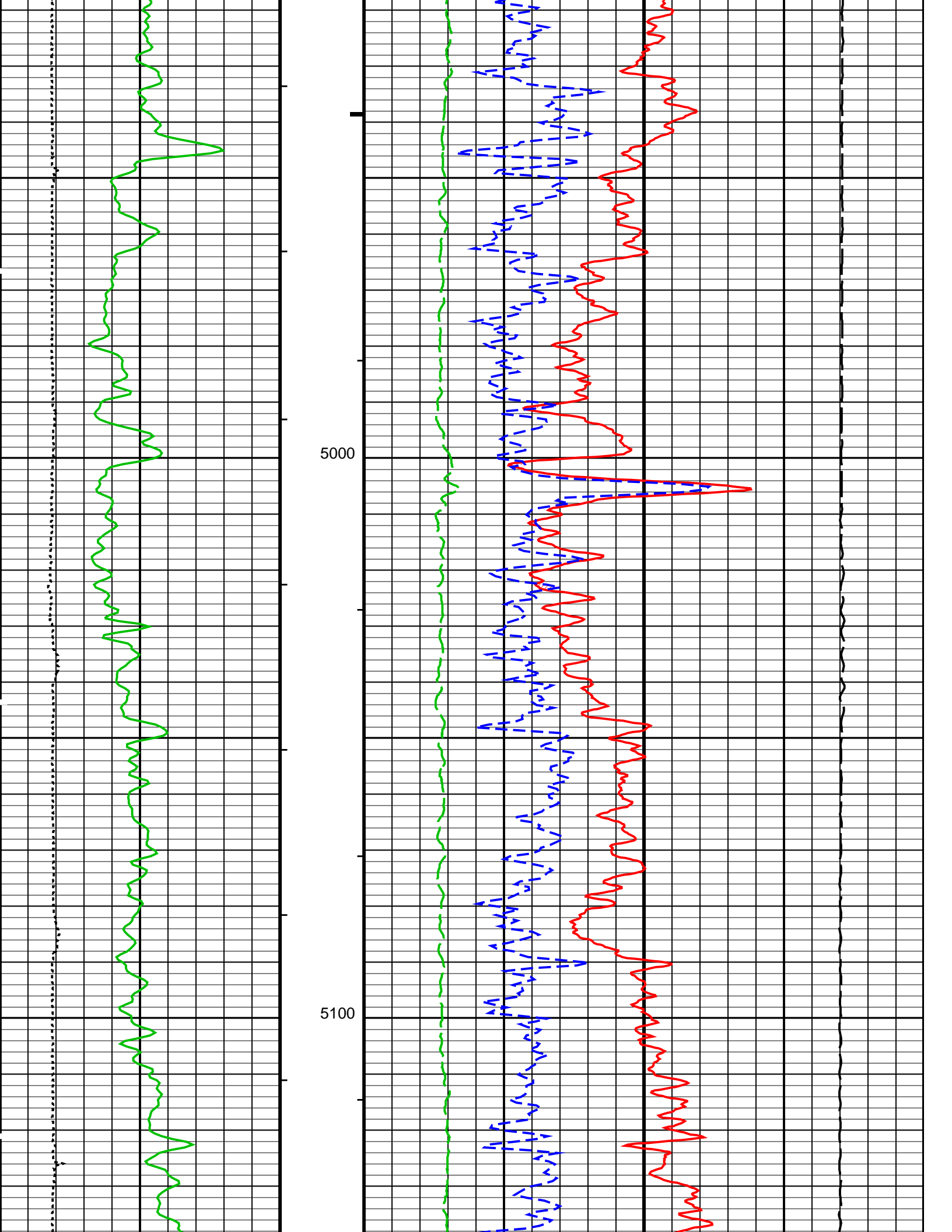
Time Mark Every 60 S

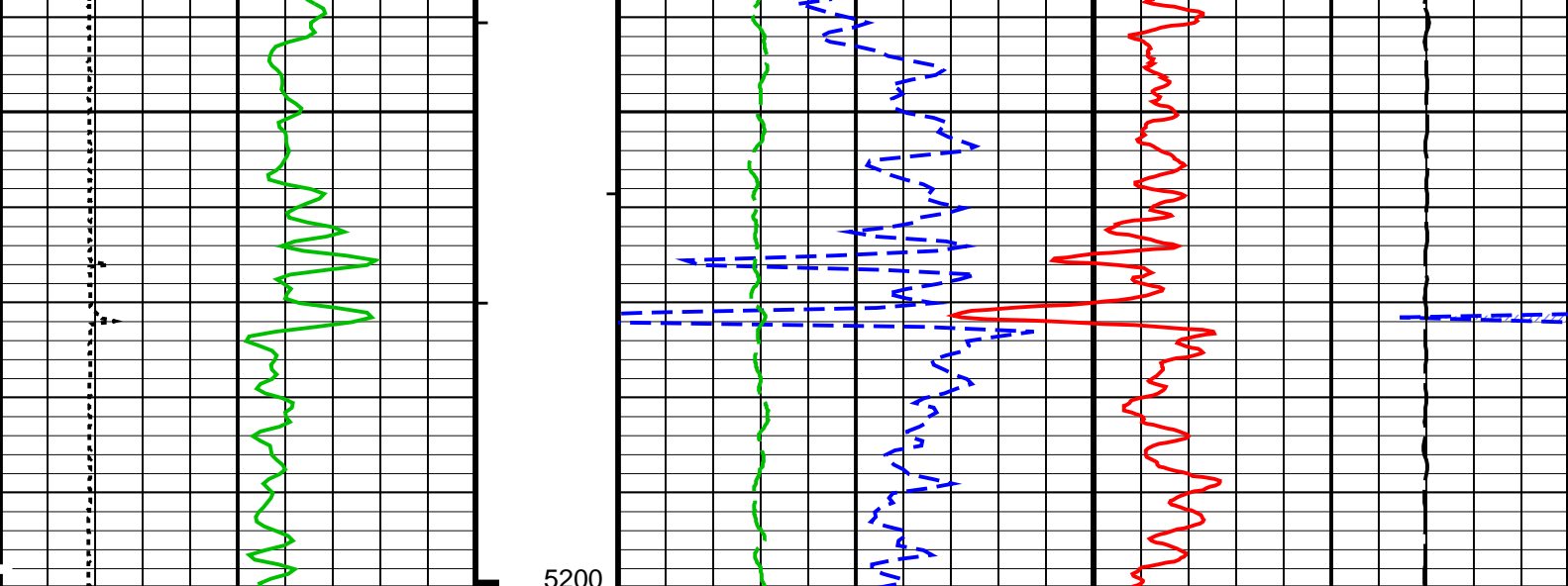
		NPOR Backup	
		Gas Effect	
Caliper (HCAL) (IN)	Stuck Stretch (STIT) (F)	Std. Res. Formation Pe (PEFZ) (-----)	Tension (TENS) (LBF)
6      16	0      50	0      10	10000      0
Gamma Ray (GR) (GAPI)	Tool/Tot. Drag	Alpha Processed Neutron Porosity (NPOR) (VV)	
0      200	0.3	-0.1	

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
Gamma Ray (GR) (GAPI)	Tool/Tot. Drag	Alpha Processed Neutron Porosity (NPOR)	
0 200		0.3	(V/V) -0.1
Caliper (HCAL) (IN)	Stuck Stretch (STIT) (F) 50	Std. Res. Formation Pe (PEFZ)	Tension (TENS) (LBF)
6 16	0	0 (----) 10	10000 0
		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	
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	1.000	g/cm3
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	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	LIME	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.710	g/cm3
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	1.000	in
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68.000	degF

SOCN	Surface Temperature	0.125	in
SOCO	Standoff Correction Option	YES	
<b>HOLEV: Integrated Hole/Cement Volume</b>			
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
MATR	Rock Matrix for Neutron Porosity Corrections	LIME	
SHT	Surface Hole Temperature	68.000	degF
<b>PERT: Preliminary Evaluation – Real Time</b>			
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
MATR	Rock Matrix for Neutron Porosity Corrections	LIME	
SHT	Surface Hole Temperature	68.000	degF
<b>STI: Stuck Tool Indicator</b>			
STKT	STI Stuck Threshold	2.500	ft
TDD	Total Depth – Driller	8471.0	ft
TDL	Total Depth – Logger	8471.0	ft
<b>System and Miscellaneous</b>			
BS	Bit Size	7.875	in
BSAL	Borehole Salinity		
CSIZ	Current Casing Size	8.625	in
CWEI	Casing Weight	24.000	lbm/ft
DFD	Drilling Fluid Density	8.400	lbm/gal
FSAL	Formation Salinity		
MST	Mud Sample Temperature	58.000	degF
RMFS	Resistivity of Mud Filtrate Sample	1.747	ohm.m

Format: LOWER\_PORO Vertical Scale: 5" per 100' Graphics File Created: 16-Sep-2011 07:40

### OP System Version: 18C0-147

HILTD 18C0-147 DTCH 18C0-147

### Input DLIS Files

DEFAULT AIT\_TLD\_MCFL\_CNL\_011LUP FN:10 PRODUCER 16-Sep-2011 07:05 8454.0 FT 0.0 FT



**MAIN POROSITY LOG 5" = 100'**

MAXIS Field Log

### Output DLIS Files

DEFAULT AIT\_TLD\_MCFL\_CNL\_011LUP FN:10 PRODUCER 16-Sep-2011 07:05

### OP System Version: 18C0-147

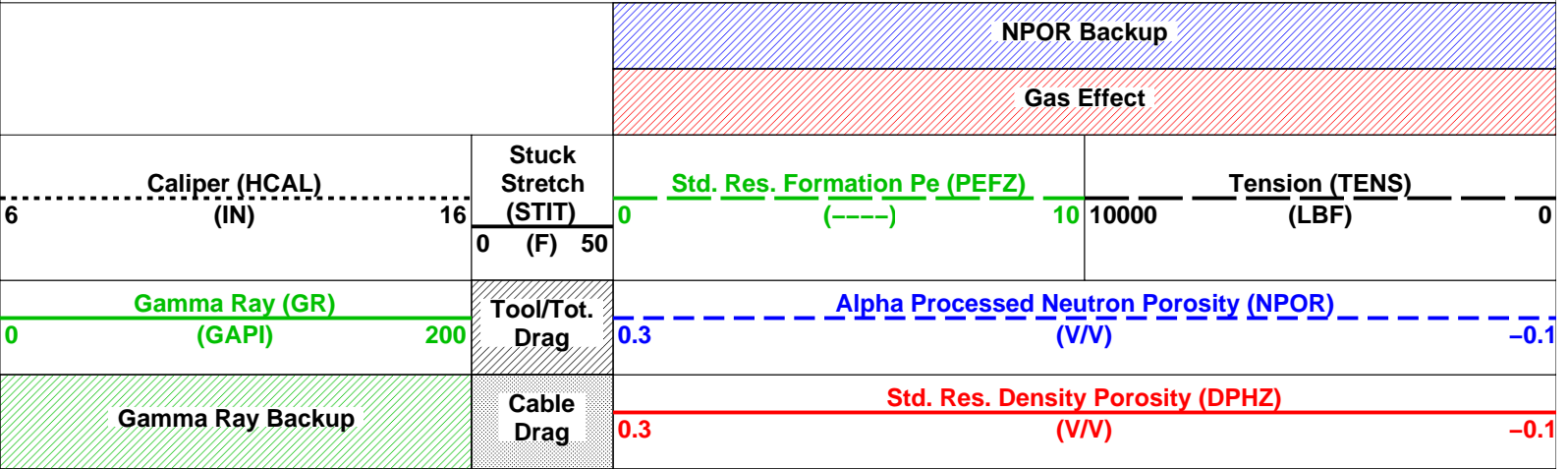
HILTB-FTB 18C0-147 DTC-H 18C0-147

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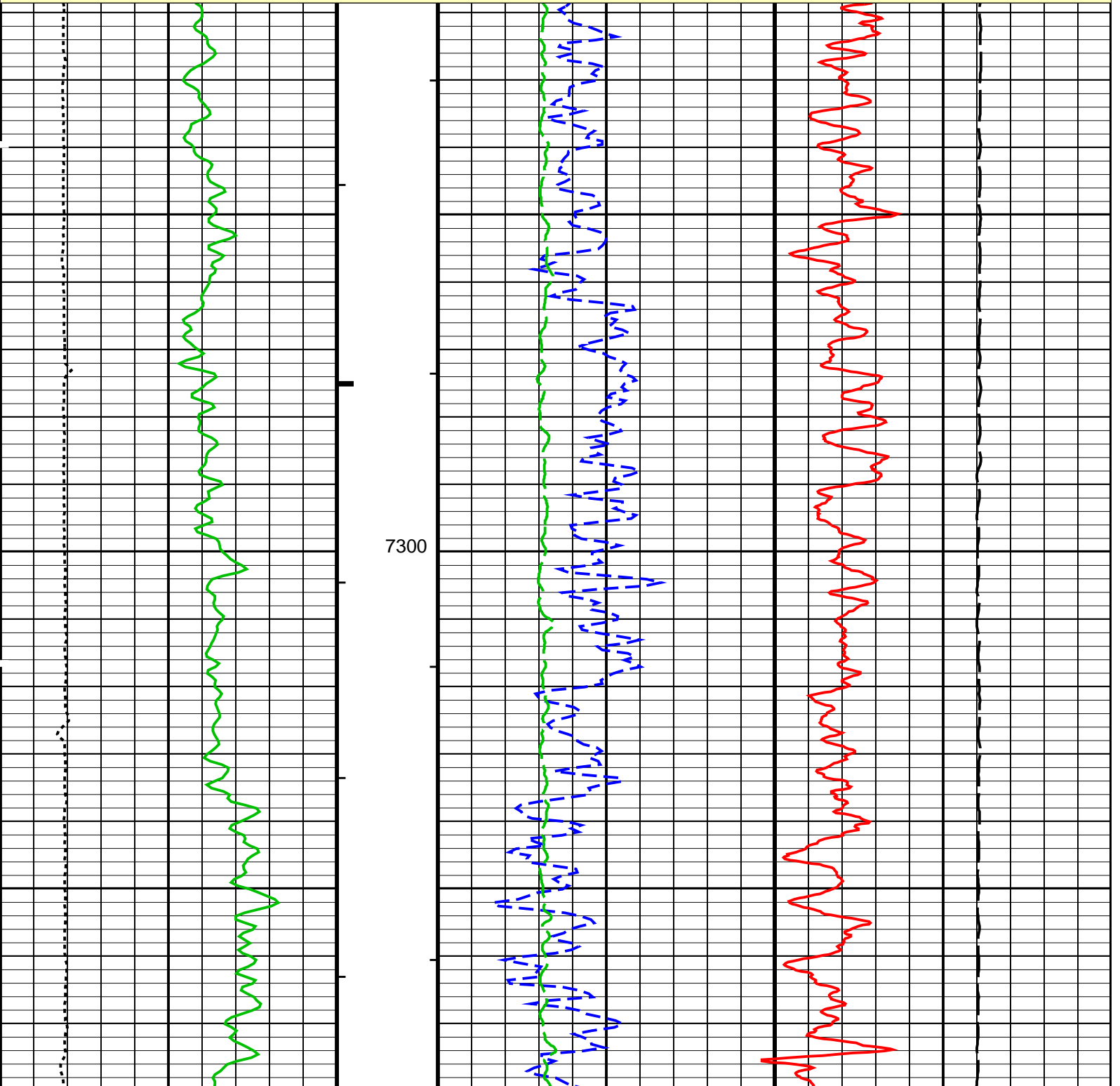
DLIS Name	New Value	Previous Value	Depth & Time
TDL	8451.00 FT	8471.00 FT	8392.3 07:05:49

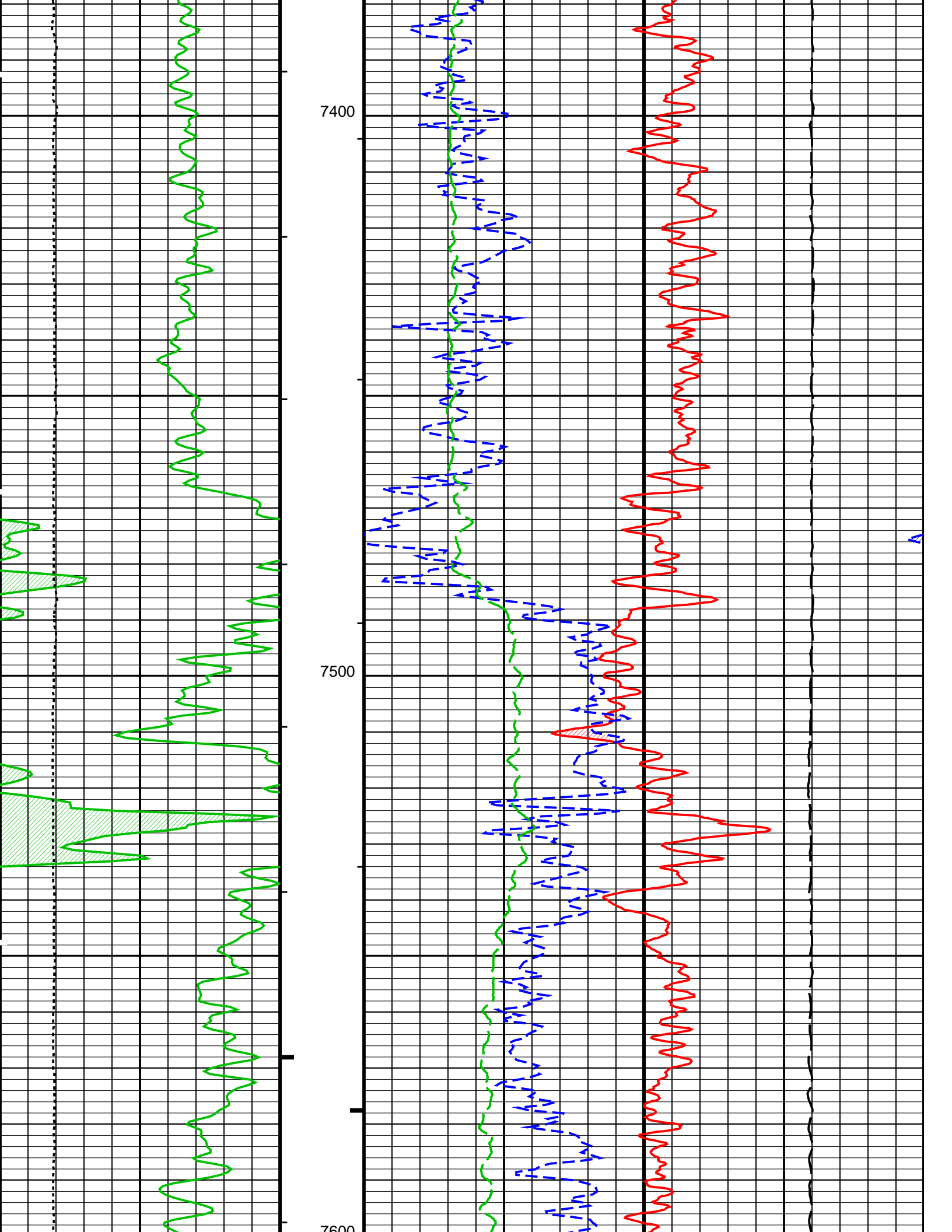
#### PIP SUMMARY

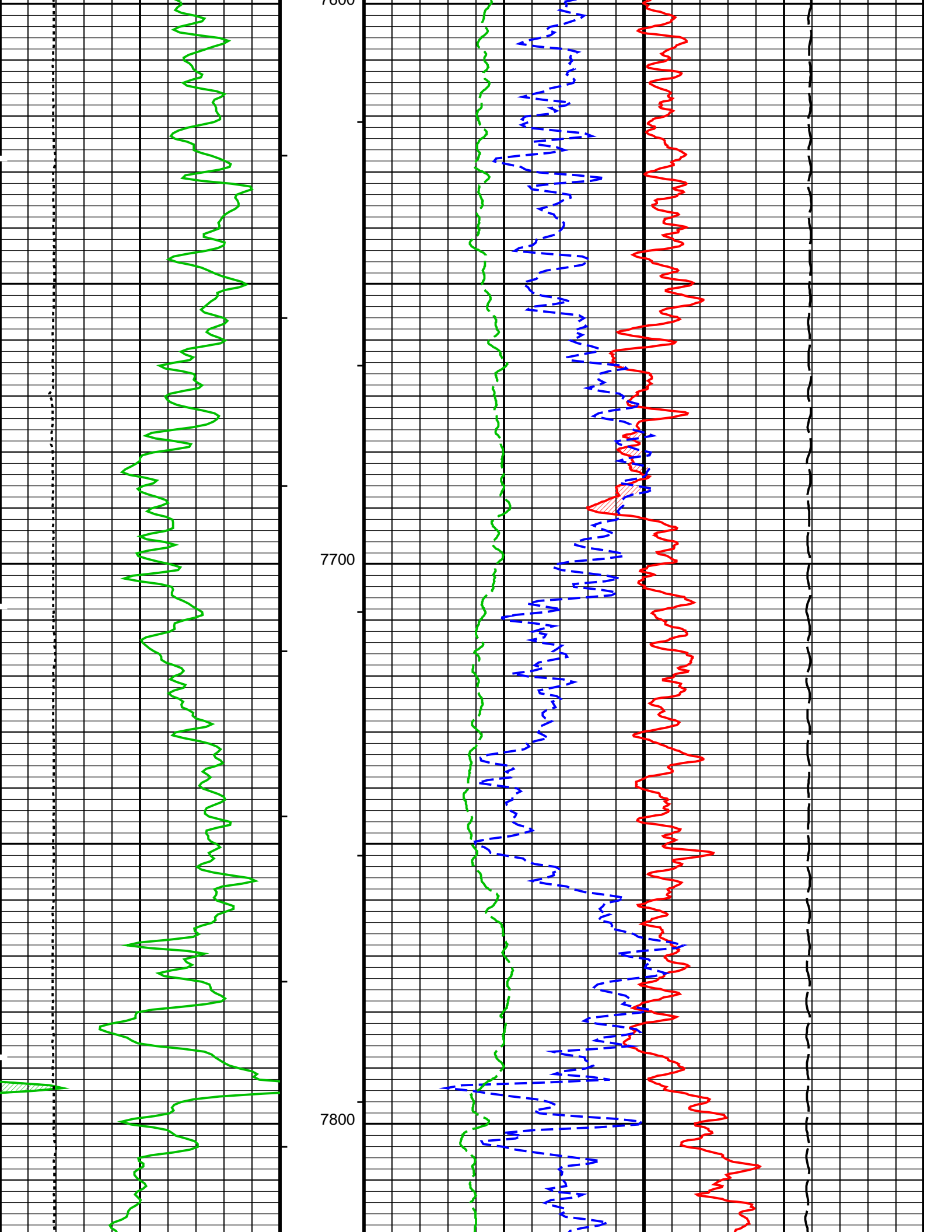
- ┆ Integrated Hole Volume Minor Pip Every 10 F3
- ┆ Integrated Hole Volume Major Pip Every 100 F3
- ┆ Integrated Cement Volume Minor Pip Every 10 F3
- ┆ Integrated Cement Volume Major Pip Every 100 F3

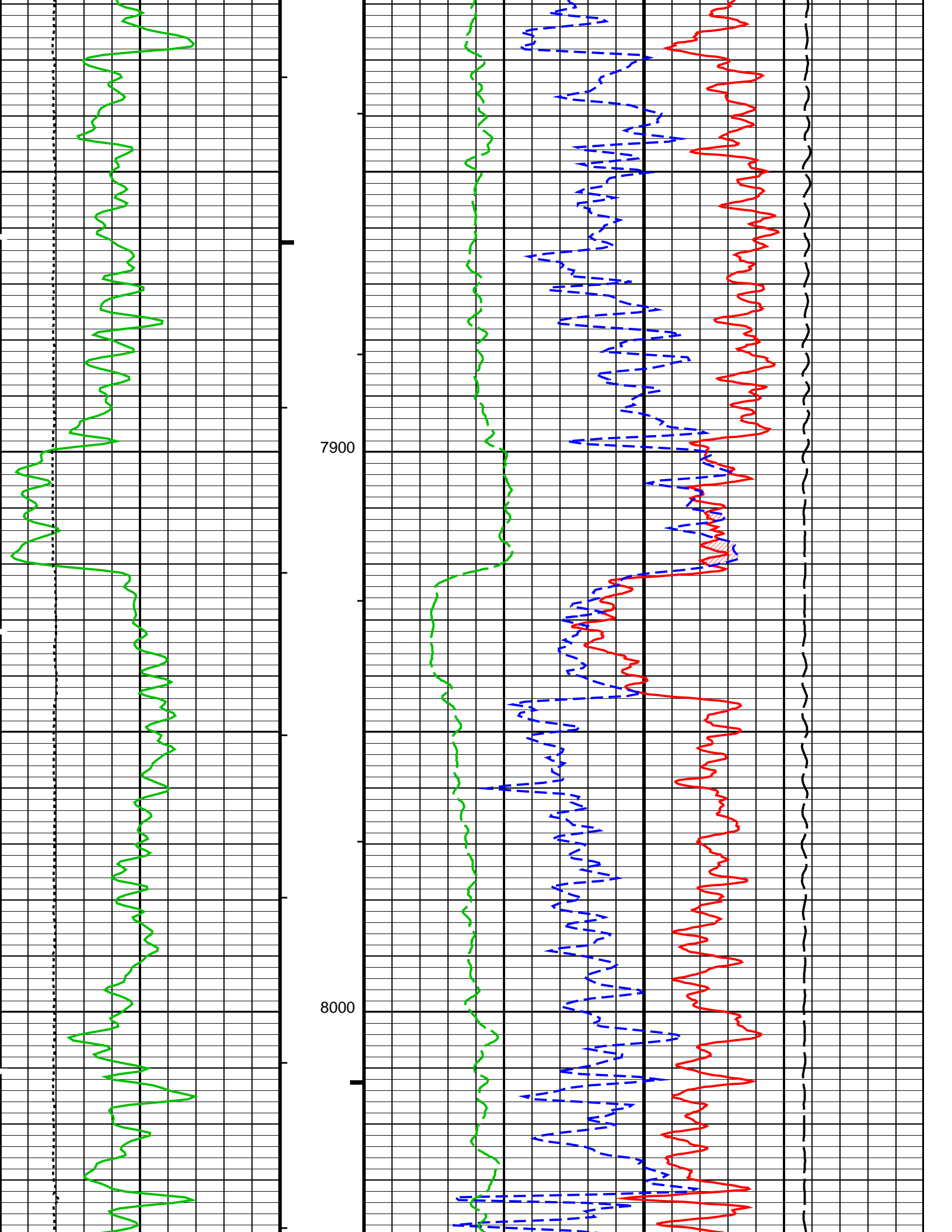


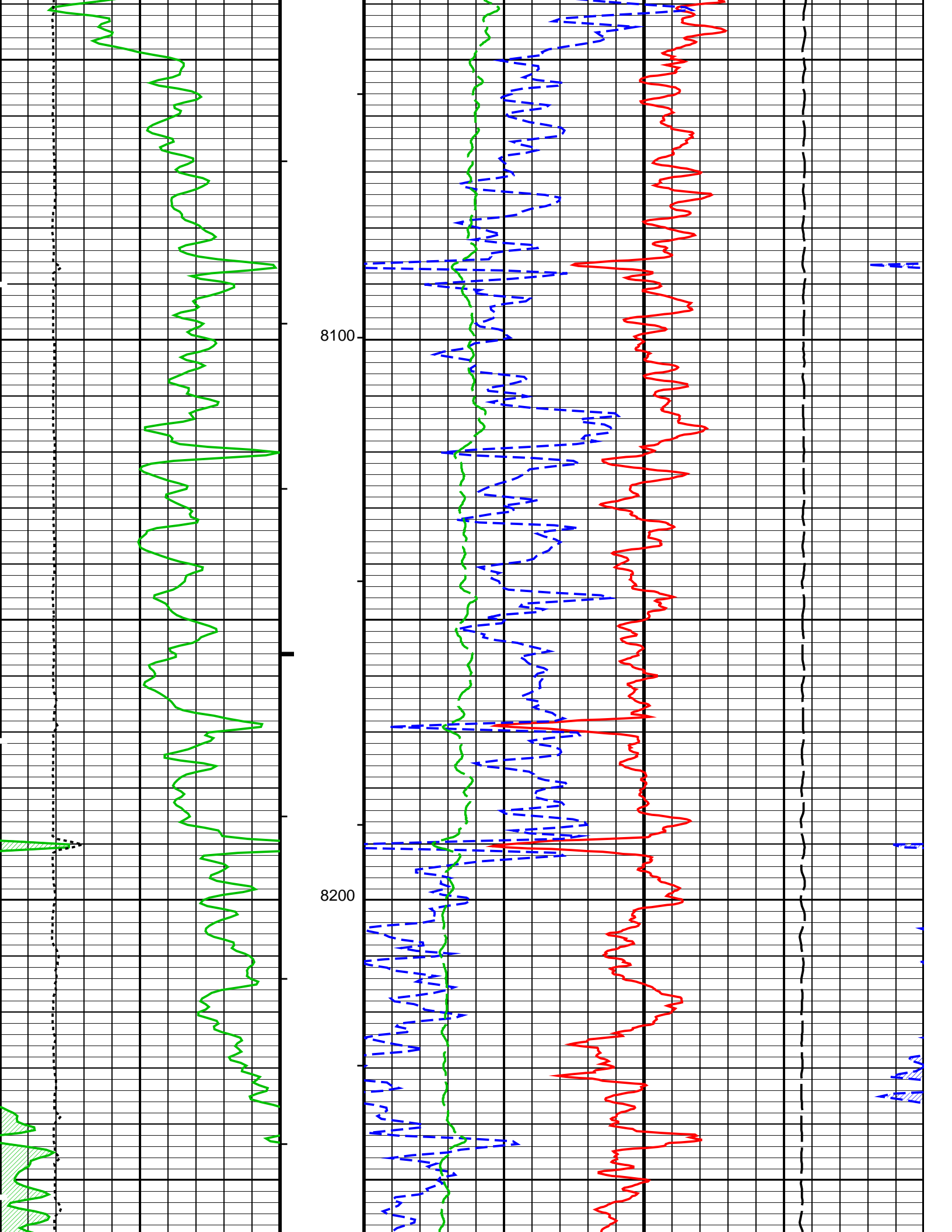
MAIN PASS: \*\*\* PLATFORM EXPRESS - NUCLEAR POROSITY \*\*\*

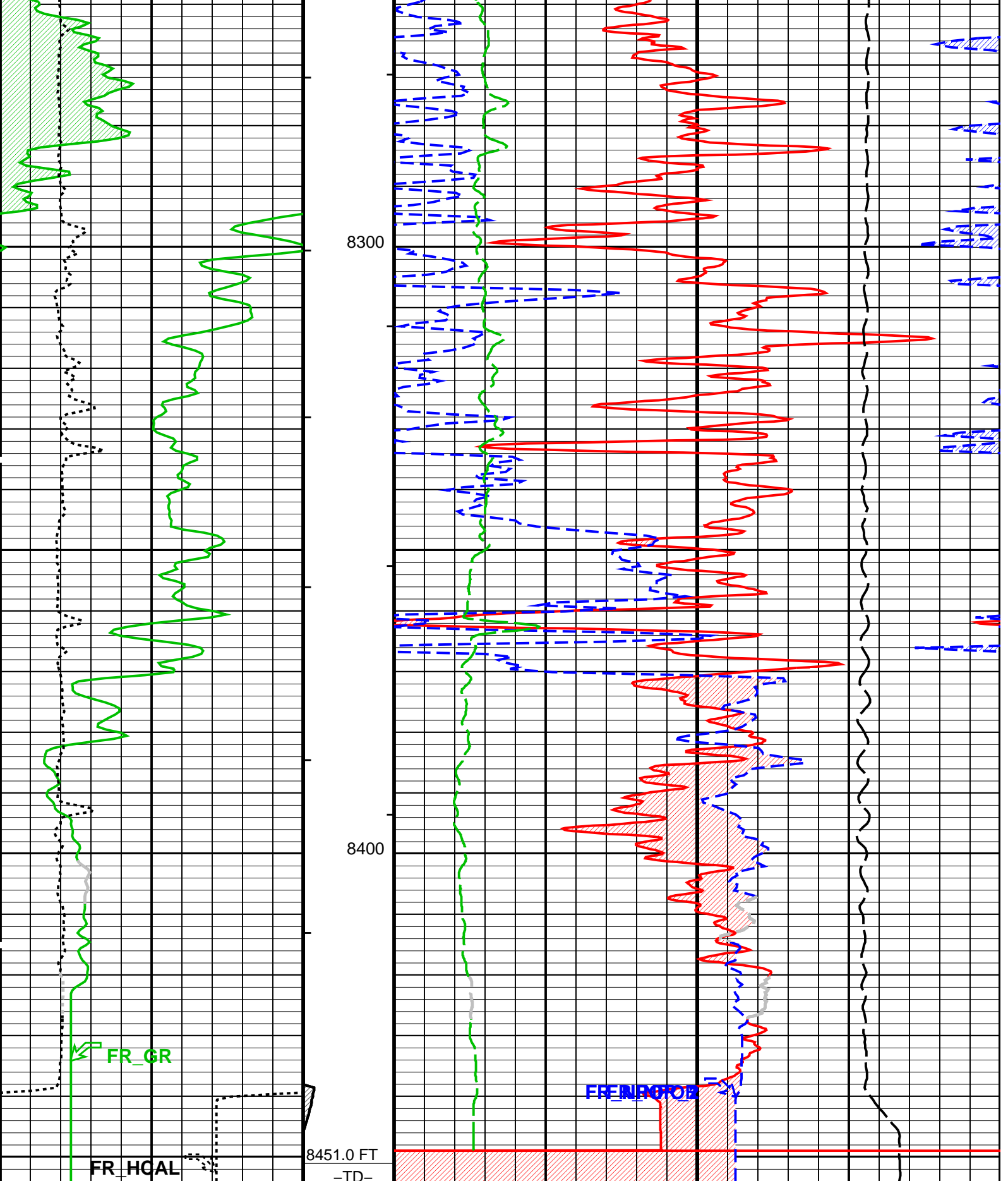






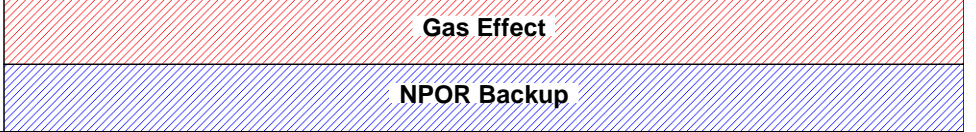
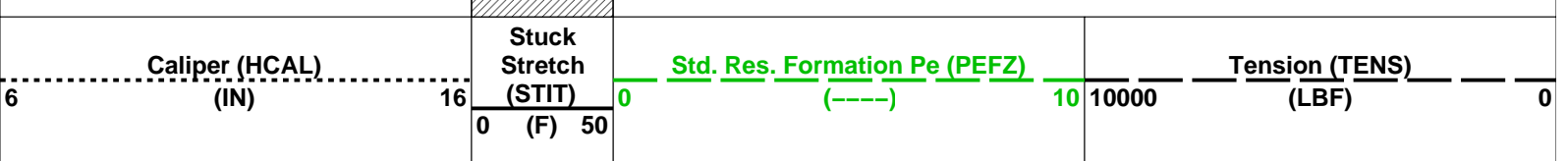






MAIN PASS: \*\*\* PLATFORM EXPRESS - NUCLEAR POROSITY \*\*\*

Gamma Ray Backup	Cable Drag	0.3	Std. Res. Density Porosity (DPHZ) (V/V)	-0.1
Gamma Ray (GR) (GAPI)	Tool/Tot. Drag	0.3	Alpha Processed Neutron Porosity (NPOR) (V/V)	-0.1
0	200			



**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
<b>HILTB-FTB: High resolution Integrated Logging Tool-DTS</b>		
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
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
<b>HOLEV: Integrated Hole/Cement Volume</b>		
BHS	Borehole Status	OPEN
FCD	Future Casing (Outer) Diameter	4.5 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
<b>PERT: Preliminary Evaluation - Real Time</b>		
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
<b>STI: Stuck Tool Indicator</b>		
LBFR	Trigger for MAXIS First Reading Label	TDL
STKT	STI Stuck Threshold	2.5 FT
TDD	Total Depth - Driller	8471.00 FT
TDL	Total Depth - Logger	8471.00 FT
<b>System and Miscellaneous</b>		
BS	Bit Size	7.875 IN
BSAL	Borehole Salinity	-50000.00 PPM
CSIZ	Current Casing Size	8.625 IN
CWEI	Casing Weight	24.00 LB/F
DFD	Drilling Fluid Density	8.40 LB/G
DORL	Depth Offset for Repeat Analysis	0.0 FT
MST	Mud Sample Temperature	58.00 DEGF
RMFS	Resistivity of Mud Filtrate Sample	1.7475 OHMM

**OP System Version: 18C0-147**

HILTB-FTB 18C0-147 DTC-H 18C0-147

**Output DLIS Files**

DEFAULT AIT\_TLD\_MCFL\_CNL\_011LUP FN:10 PRODUCER 16-Sep-2011 07:05



**POROSITY REPEAT ANALYSIS**

MAXIS Field Log

**Input DLIS Files**

DEFAULT AIT\_TLD\_MCFL\_CNL\_010PUP FN:9 PRODUCER 16-Sep-2011 07:03 8494.5 FT 8070.5 FT

**Output DLIS Files**

DEFAULT AIT\_TLD\_MCFL\_CNL\_011LUP FN:10 PRODUCER 16-Sep-2011 07:05

**OP System Version: 18C0-147**

HILTB-FTB 18C0-147 DTC-H 18C0-147

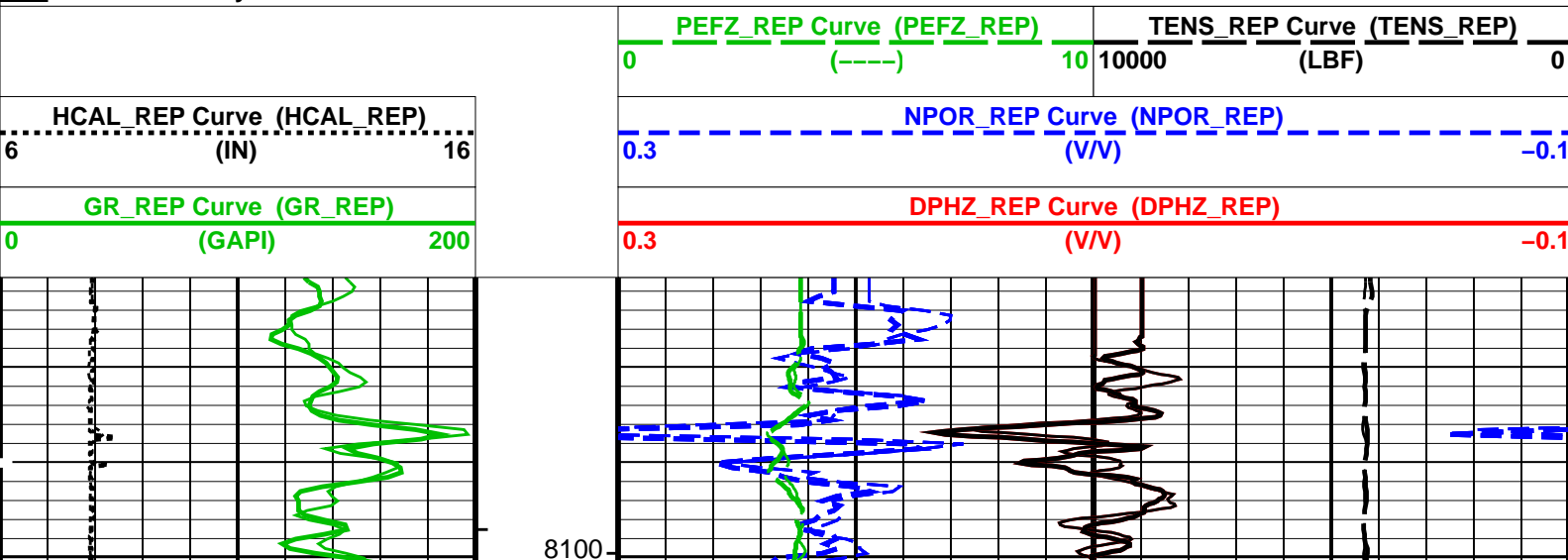
**Changed Parameter Summary**

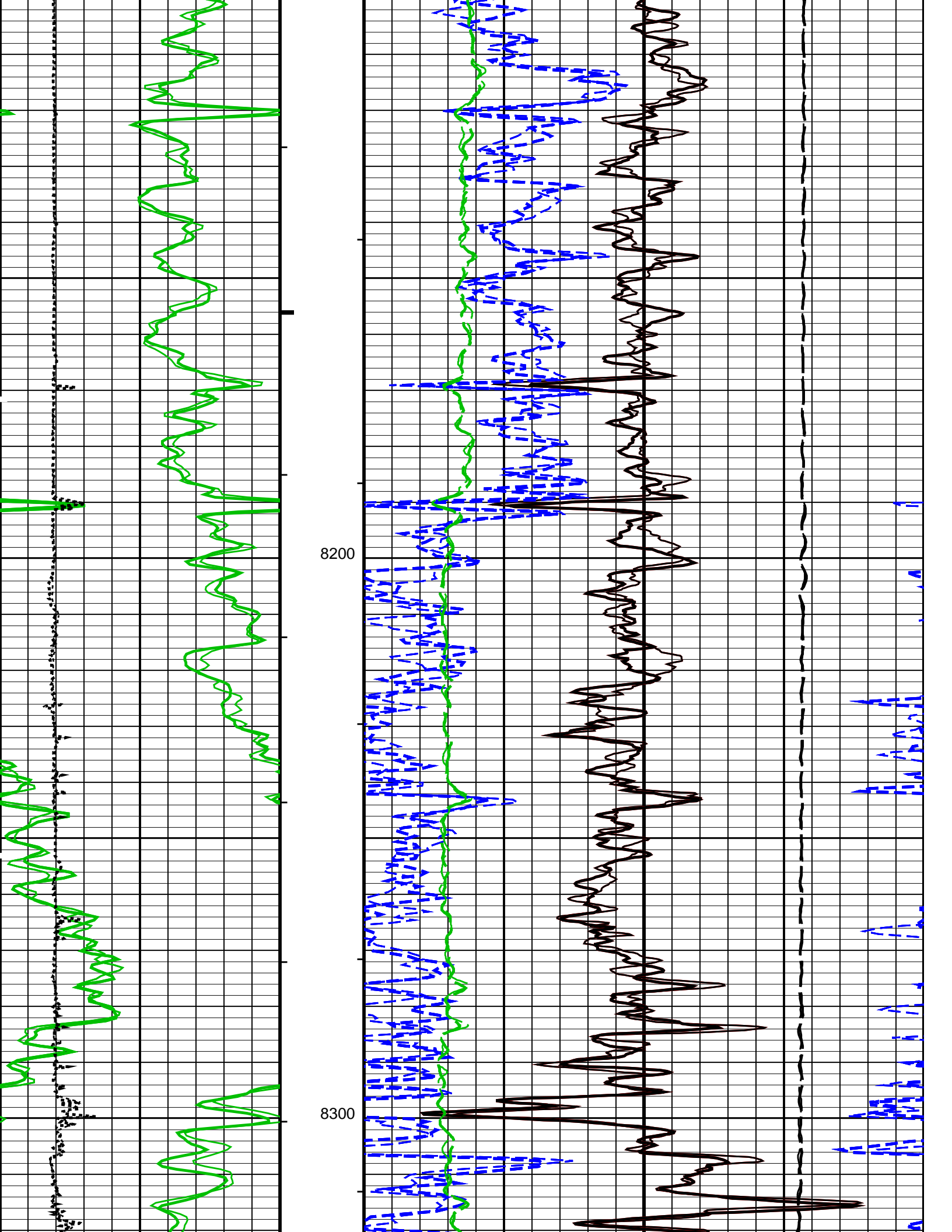
DLIS Name	New Value	Previous Value	Depth & Time
TDL	8451.00 FT	8471.00 FT	8392.3 07:05:49

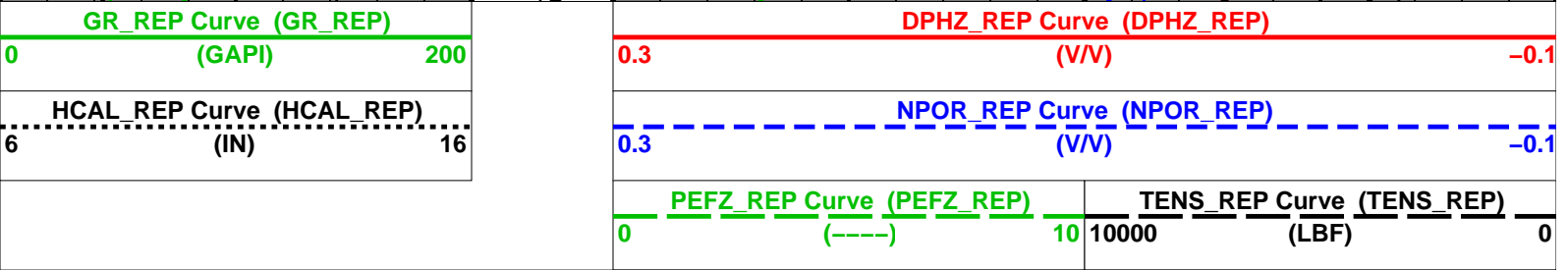
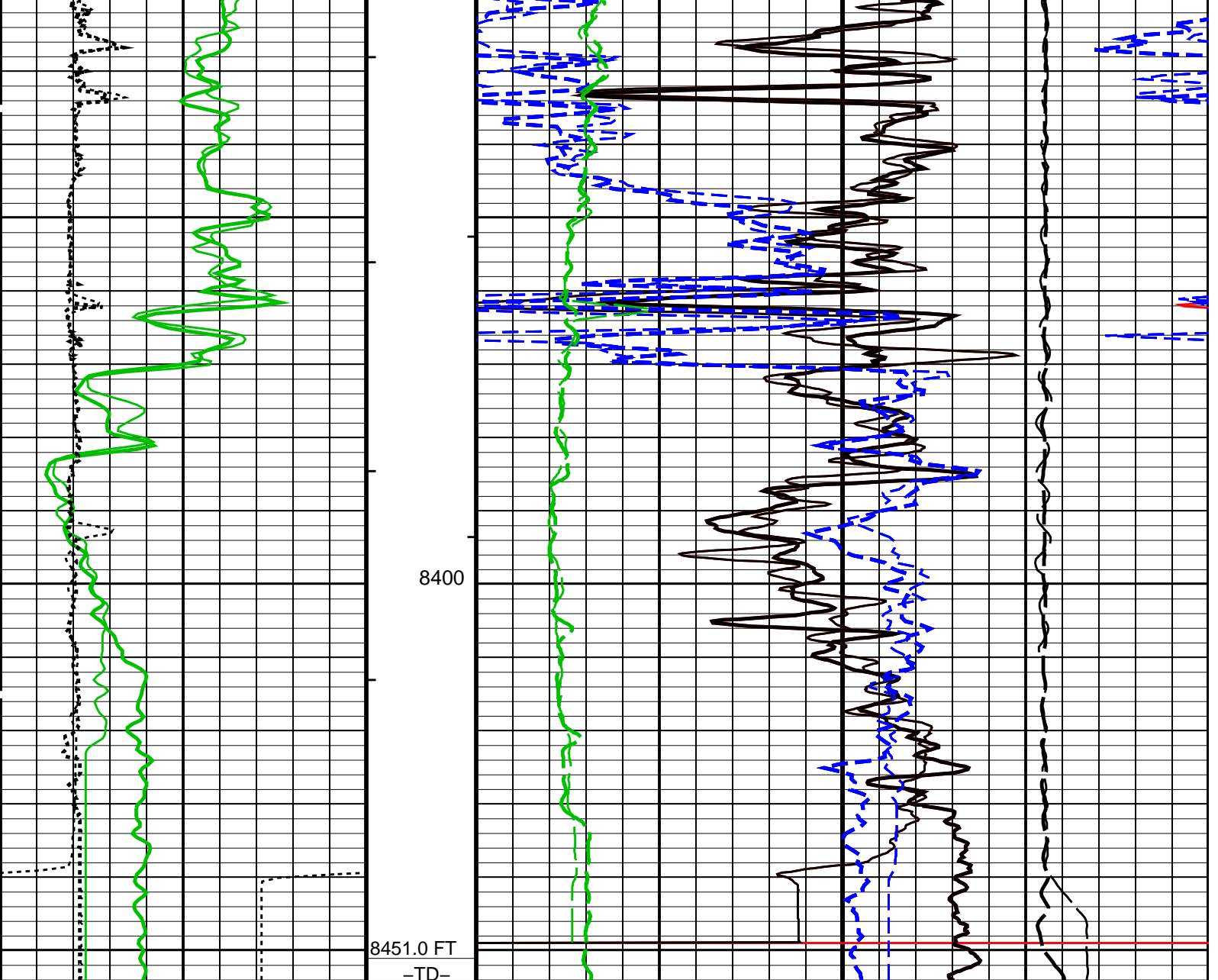
**PIP SUMMARY**

- ┆ 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







**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
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
FSAL	Formation Salinity	-50000
		G/C3 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	
<b>HOLEV: Integrated Hole/Cement Volume</b>			
BHS	Borehole Status	OPEN	
FCD	Future Casing (Outer) Diameter	4.5	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
<b>PERT: Preliminary Evaluation – Real Time</b>			
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
<b>STI: Stuck Tool Indicator</b>			
TDL	Total Depth – Logger	8471.00	FT
<b>System and Miscellaneous</b>			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	8.625	IN
CWEI	Casing Weight	24.00	LB/F
DFD	Drilling Fluid Density	8.40	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
MST	Mud Sample Temperature	58.00	DEGF
RMFS	Resistivity of Mud Filtrate Sample	1.7475	OHMM
TD	Total Depth	-50000	FT

Format: PORO\_REP    Vertical Scale: 5" per 100'    Graphics File Created: 16-Sep-2011 07:05

### OP System Version: 18C0-147

HILTB-FTB    18C0-147    DTC-H    18C0-147

#### Input DLIS Files

DEFAULT    AIT\_TLD\_MCFL\_CNL\_010PUP    FN:9    PRODUCER    16-Sep-2011 07:03    8494.5 FT    8070.5 FT

#### Output DLIS Files

DEFAULT    AIT\_TLD\_MCFL\_CNL\_011LUP    FN:10    PRODUCER    16-Sep-2011 07:05



**UPPER DENSITY LOG 5" = 100'**

# Input DLIS Files

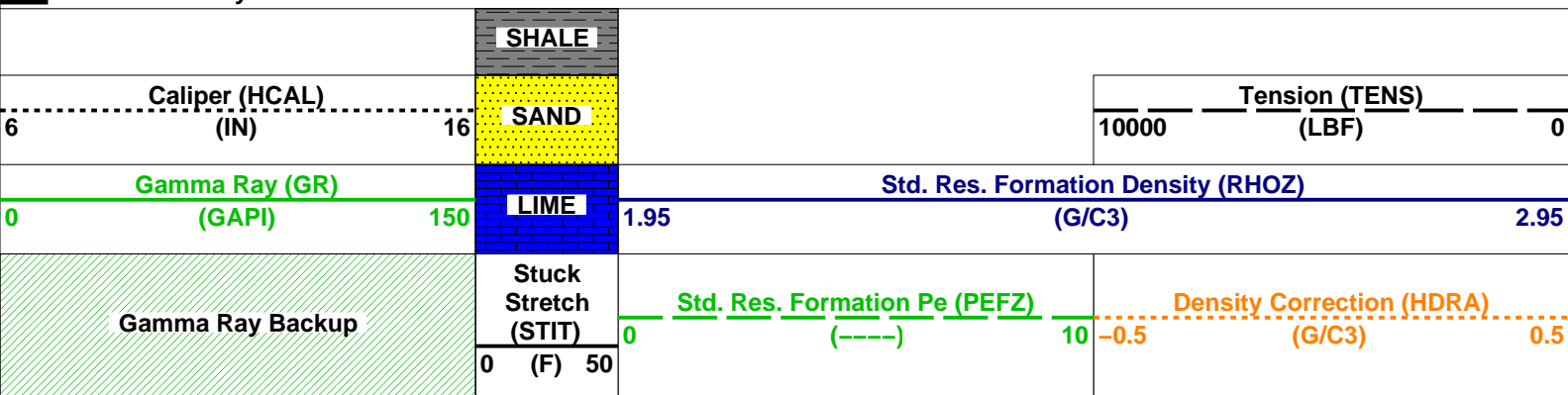
DEFAULT      AIT\_TLD\_MCFL\_CNL\_011LUP      FN:10      PRODUCER      16-Sep-2011 07:05      8454.0 FT      0.0 FT

## OP System Version: 18C0-147

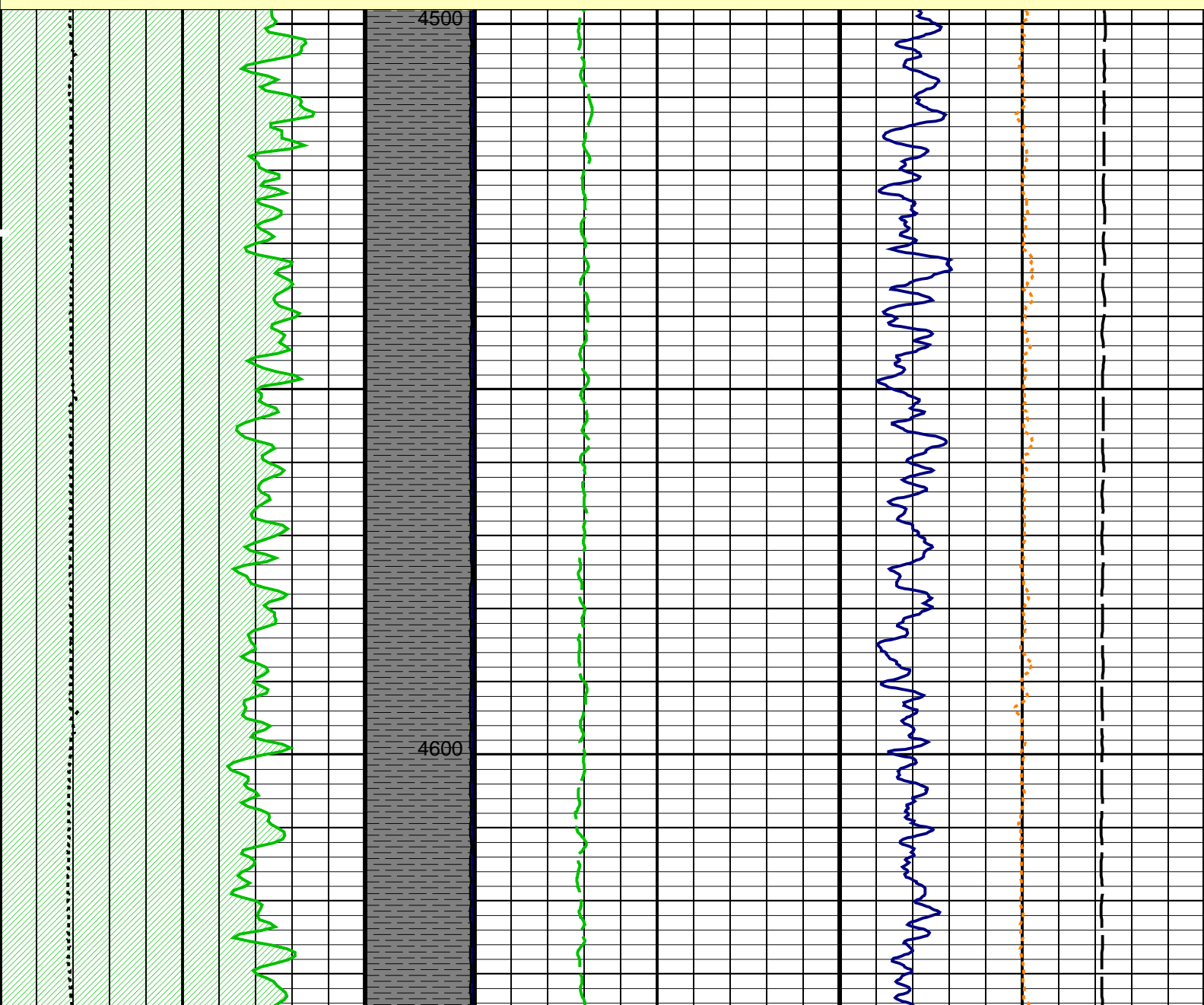
HILTD      18C0-147      DTCH      18C0-147

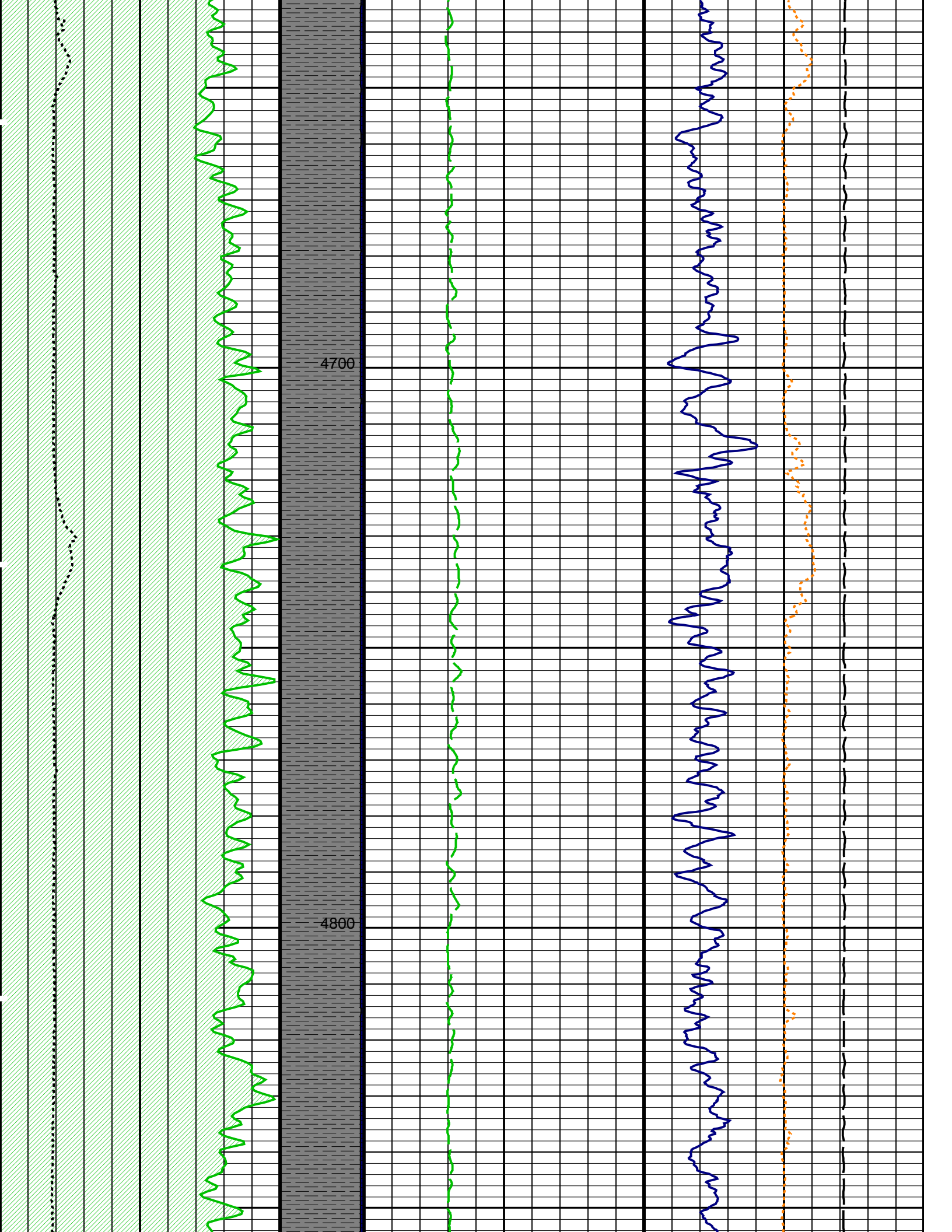
### PIP SUMMARY

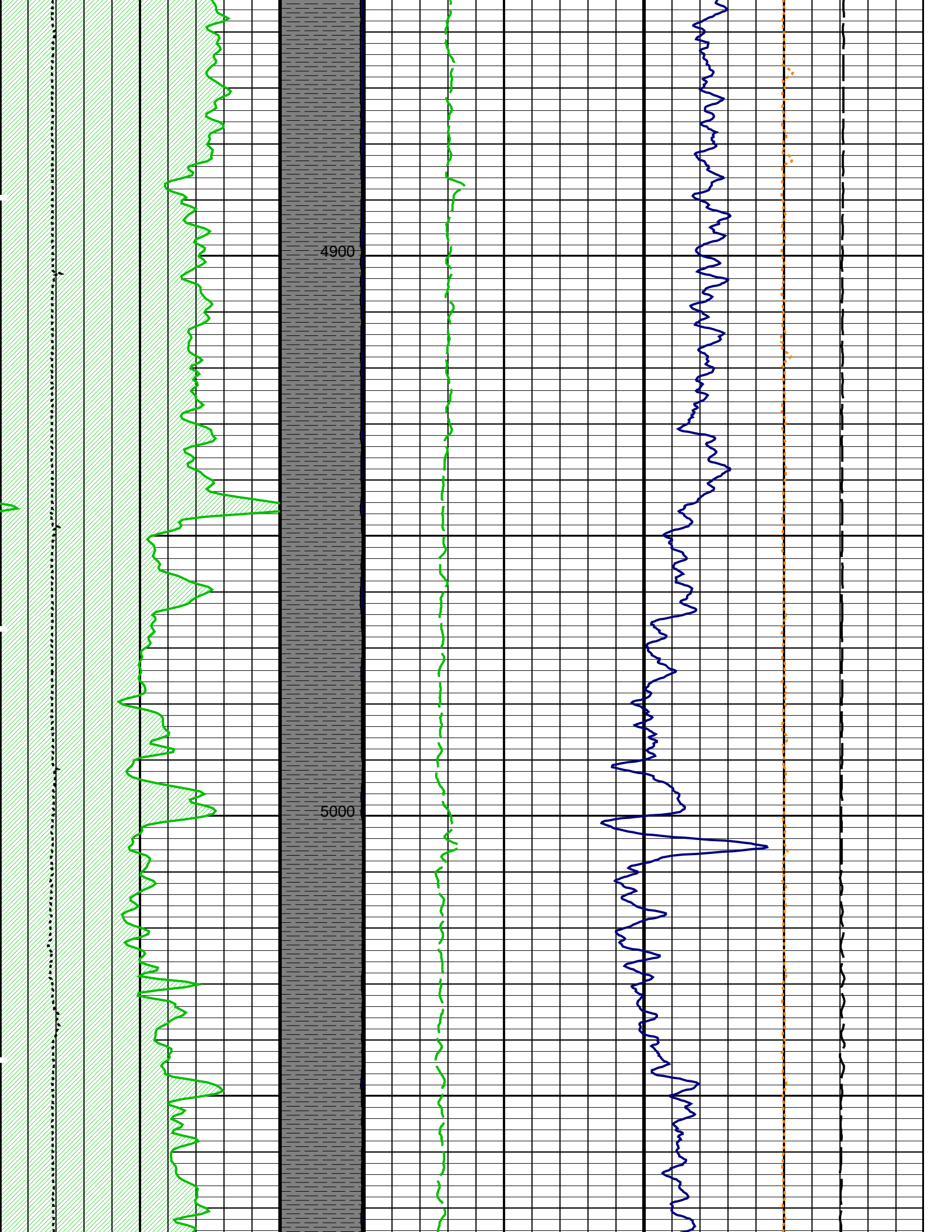
Time Mark Every 60 S

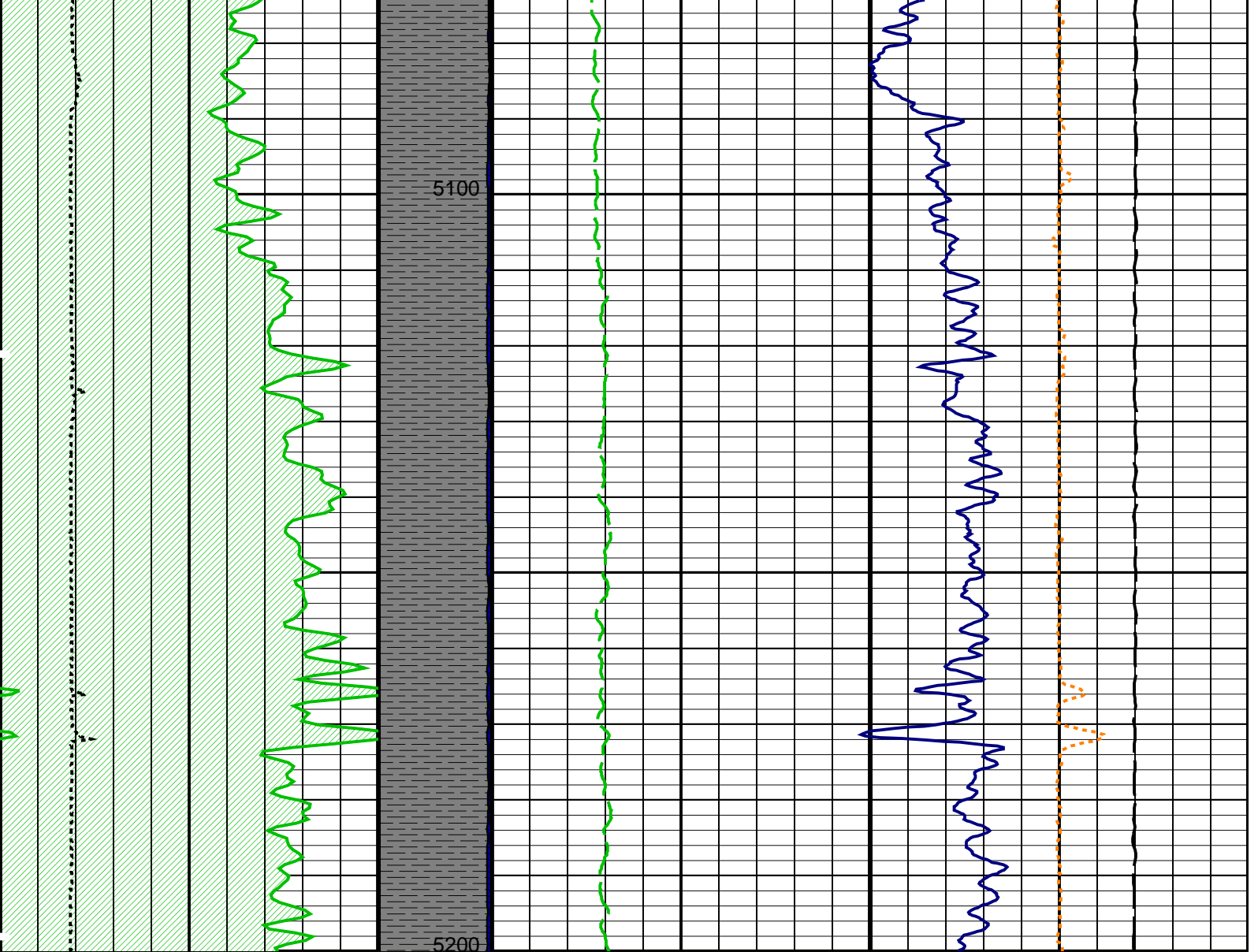


### MAIN PASS: \*\*\* PLATFORM EXPRESS - LITHOLOGY DENSITY \*\*\*

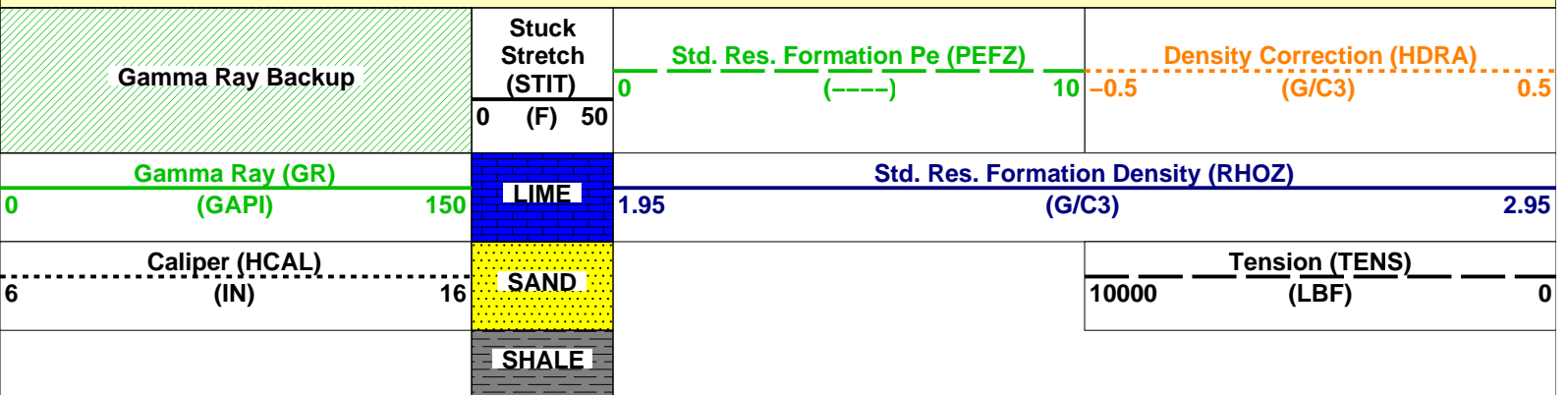








**MAIN PASS: \*\*\* PLATFORM EXPRESS - LITHOLOGY DENSITY \*\*\***



**PIP SUMMARY**

Time Mark Every 60 S

**Parameters**

DLIS Name	Description	Value
HILTB-FTB	High resolution Integrated Logging Tool-DTS	
BHFL_TLD	HILT Nuclear Mud Base	WATER
DHC	Density Hole Correction	BS
GCLF	Germany Coal-like Formation Option	NO
NAAC	HRDD APS Activation Correction	OFF
NMT	HILT Nuclear Mud Type	NOBARITE
NPRM	HRDD Processing Mode	STDRES
NSAR	HRDD Depth Sampling Rate	1.000 in
STI	Stuck Tool Indicator	

STKT	STI Stuck Threshold	2.500	ft
TDD	Total Depth - Driller	8471.0	ft
TDL	Total Depth - Logger	8471.0	ft
BS	System and Miscellaneous Bit Size	7.875	in
DFD	Drilling Fluid Density	8.400	lbm/gal

Format: LOWER\_DENS    Vertical Scale: 5" per 100'    Graphics File Created: 16-Sep-2011 07:40

## OP System Version: 18C0-147

HILTD                      18C0-147                                      DTCH                                      18C0-147

### Input DLIS Files

DEFAULT                      AIT\_TLD\_MCFL\_CNL\_011LUP                      FN:10    PRODUCER    16-Sep-2011 07:05    8454.0 FT                      0.0 FT



## MAIN DENSITY LOG 5" = 100'

MAXIS Field Log

### Output DLIS Files

DEFAULT                      AIT\_TLD\_MCFL\_CNL\_011LUP                      FN:10    PRODUCER    16-Sep-2011 07:05

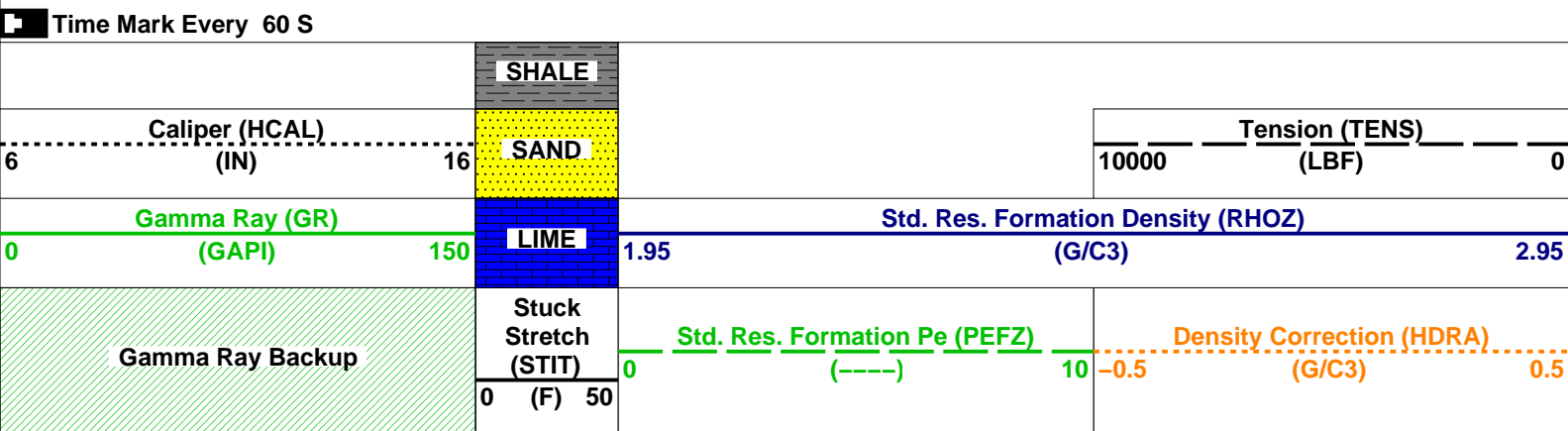
## OP System Version: 18C0-147

HILTB-FTB                      18C0-147                                      DTC-H                                      18C0-147

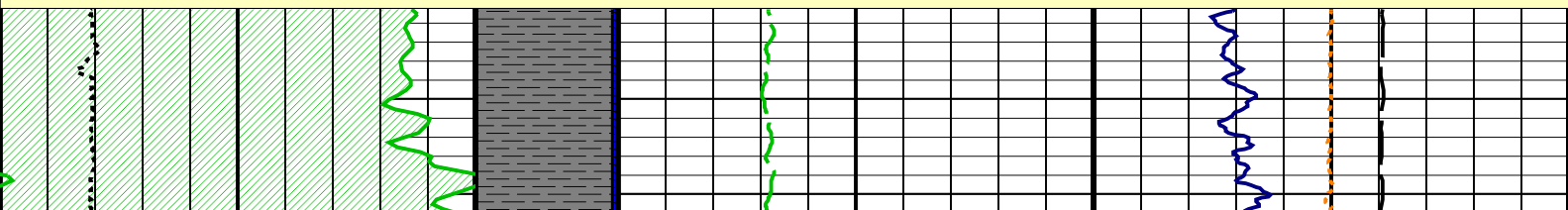
### Changed Parameter Summary

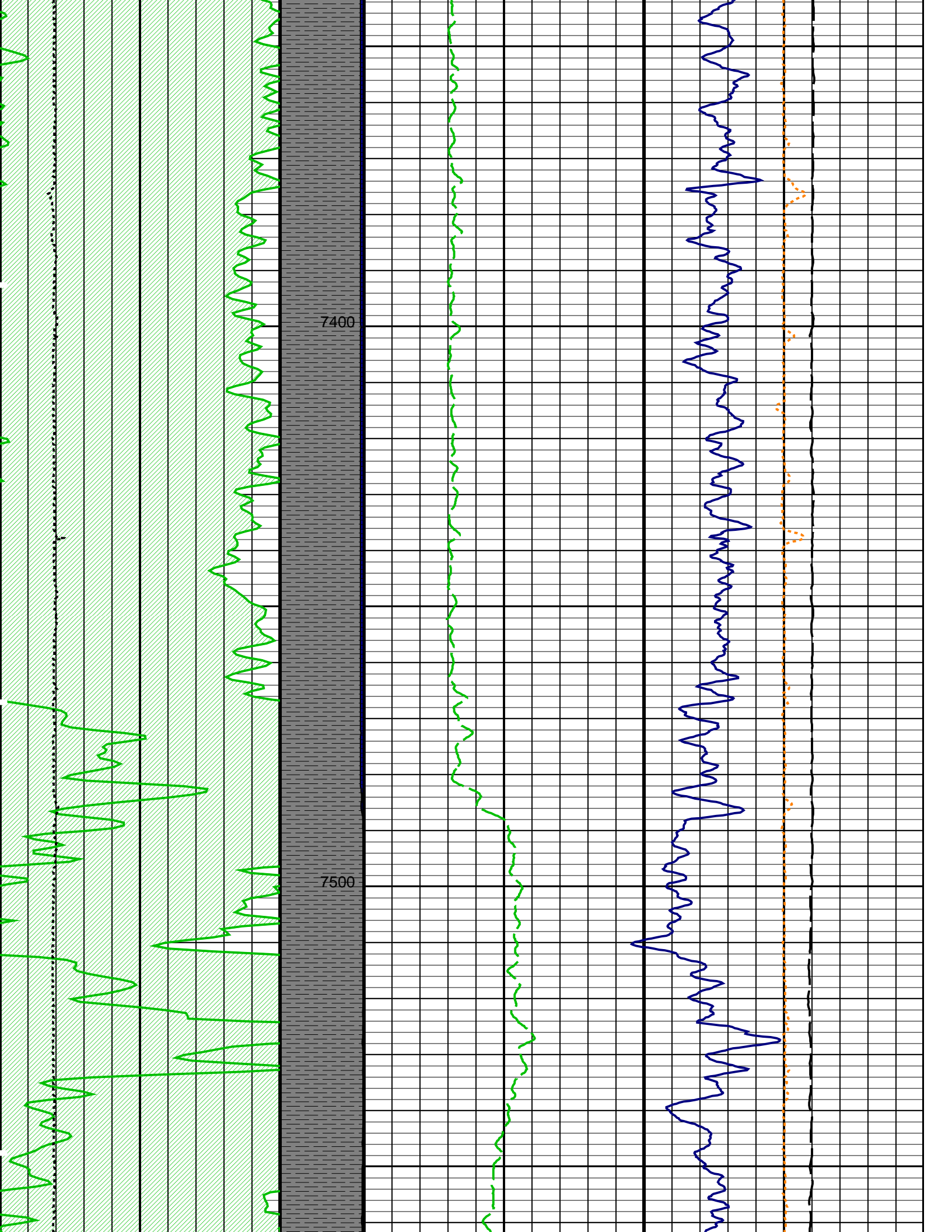
DLIS Name	New Value	Previous Value	Depth & Time
TDL	8451.00 FT	8471.00 FT	8392.3 07:05:49

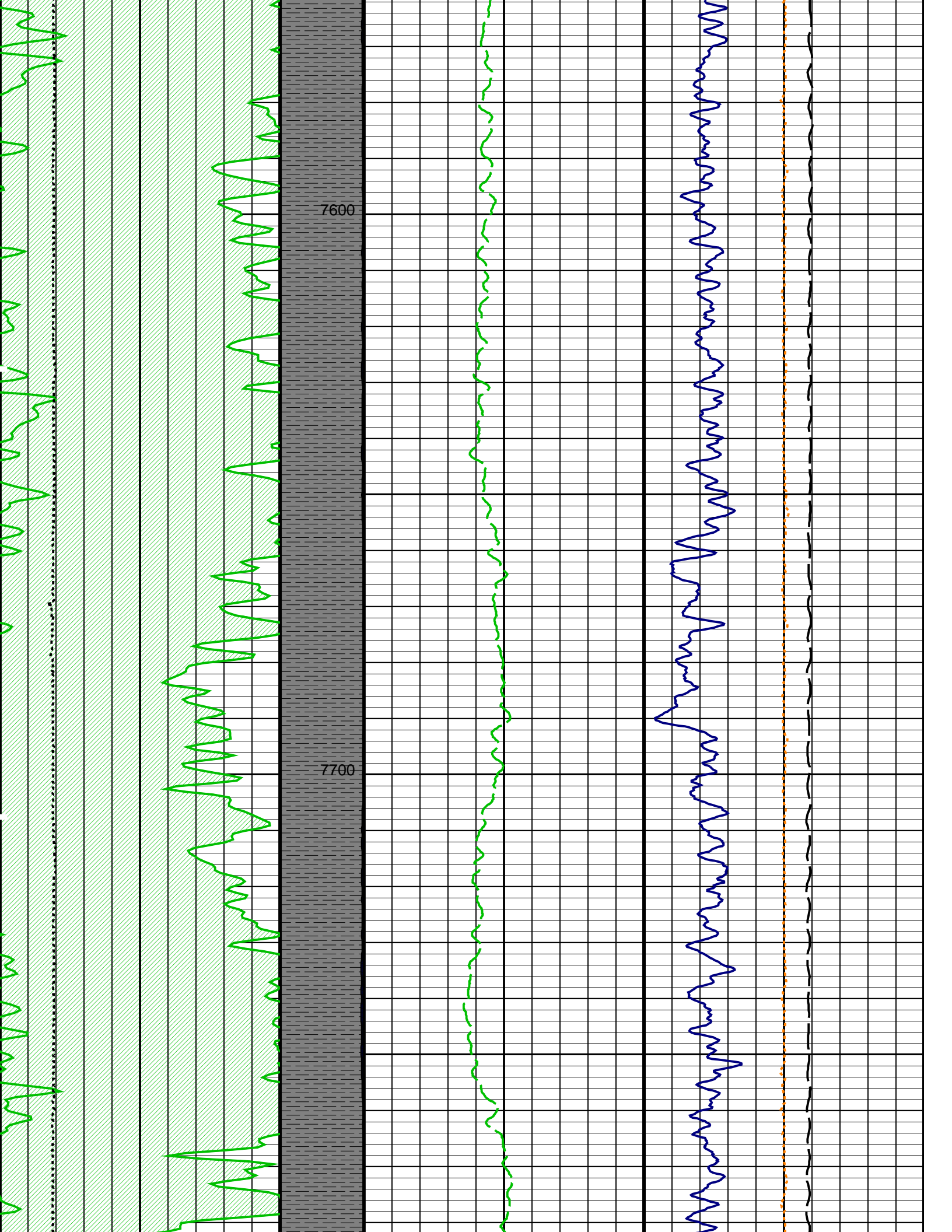
#### PIP SUMMARY

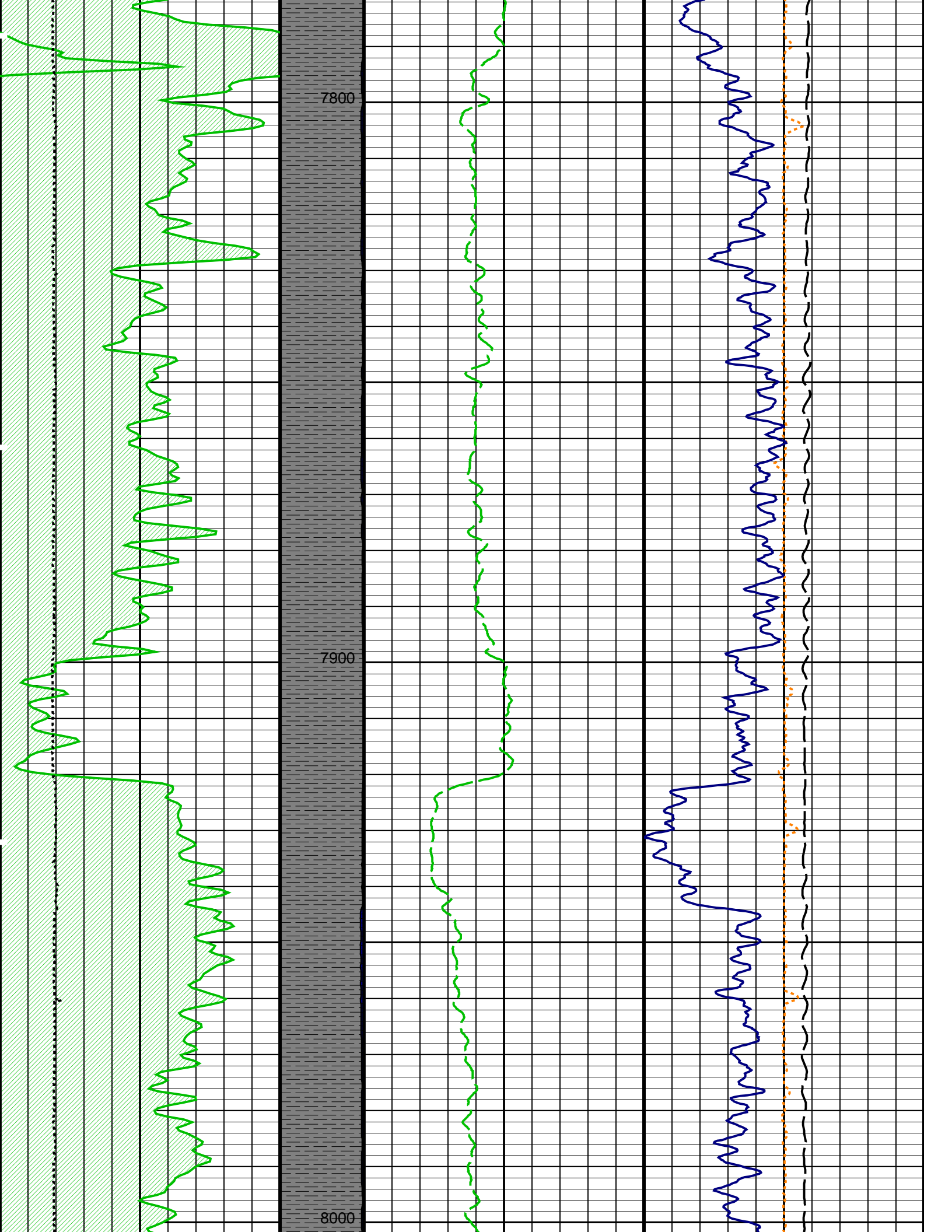


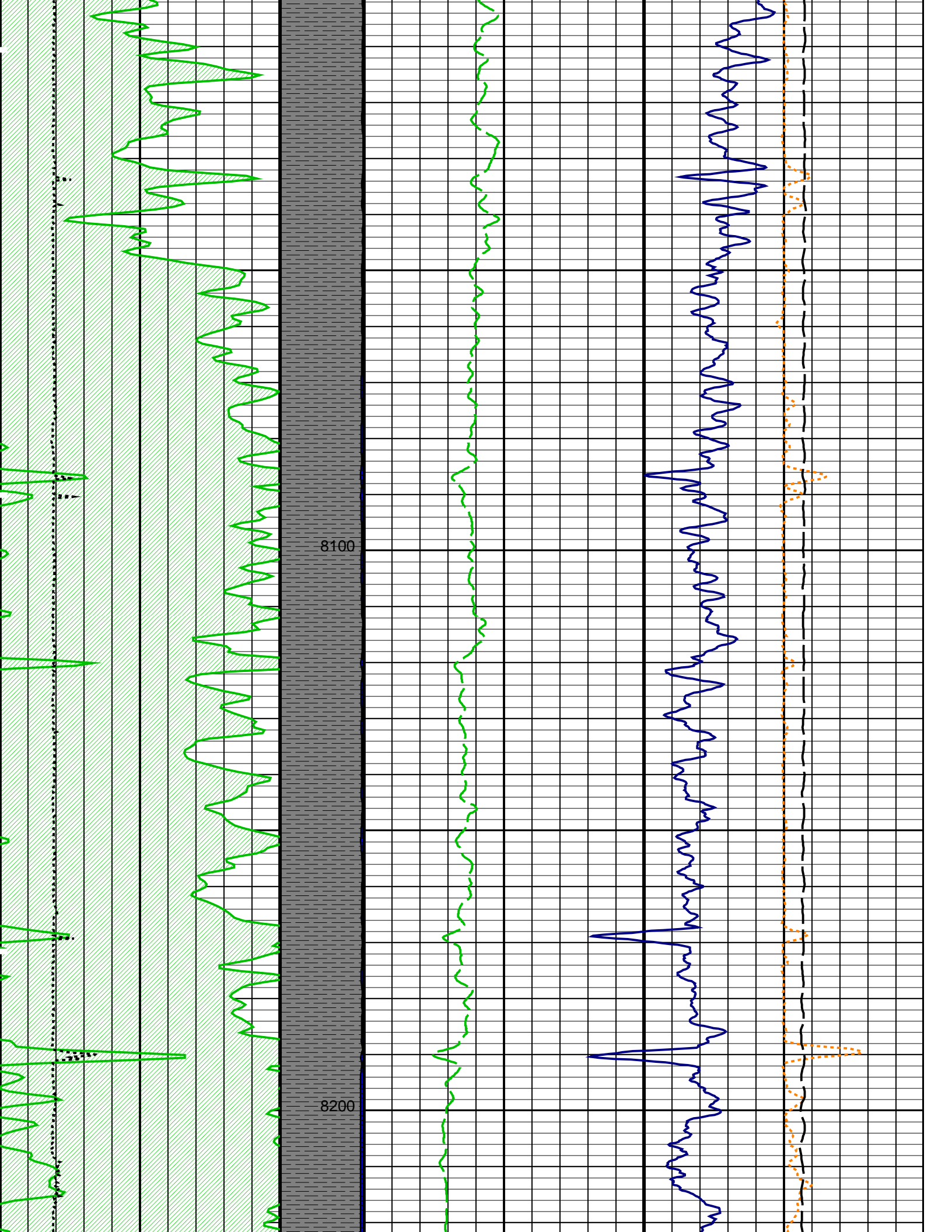
MAIN PASS: \*\*\* PLATFORM EXPRESS - LITHOLOGY DENSITY \*\*\*

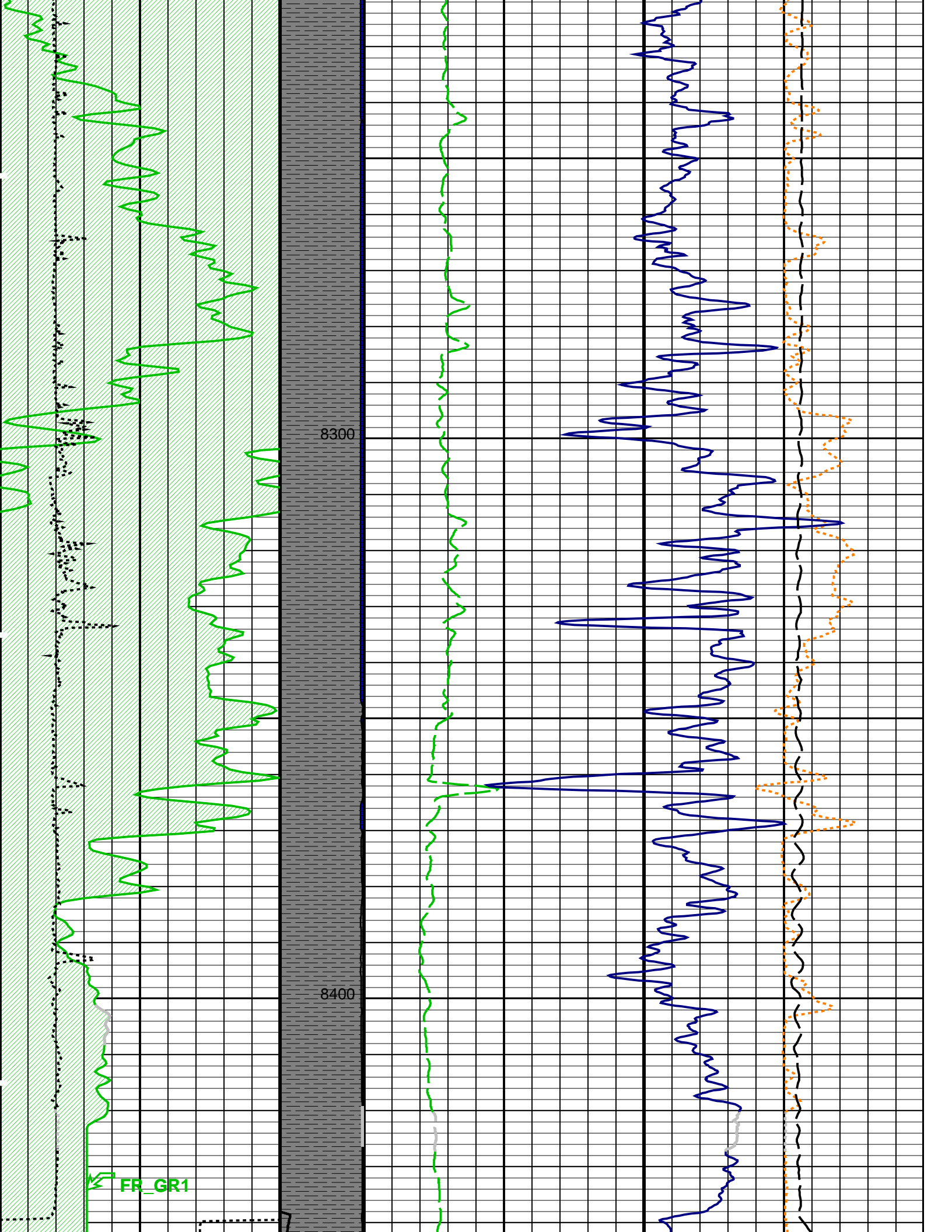








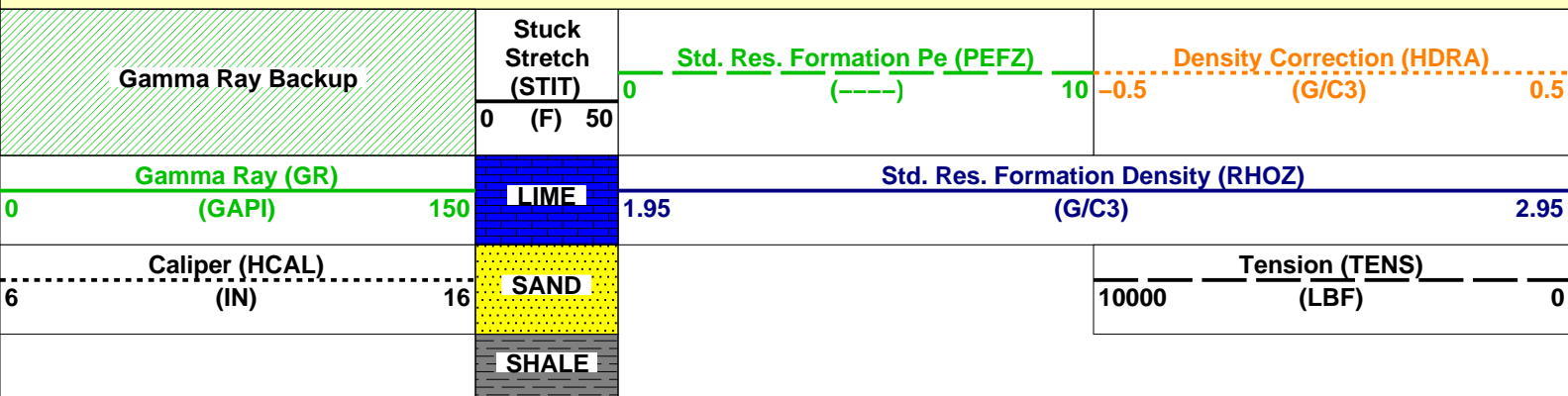




FR\_HCAL

FR\_HDRA

## MAIN PASS: \*\*\* PLATFORM EXPRESS - LITHOLOGY DENSITY \*\*\*



## PIP SUMMARY

Time Mark Every 60 S

## Parameters

DLIS Name	Description	Value	
HILTB-FTB: High resolution Integrated Logging Tool-DTS			
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
DHC	Density Hole Correction	BS	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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
FEQL: Formation Evaluation Quick Look			
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
HOLEV: Integrated Hole/Cement Volume			
BHT	Bottom Hole Temperature (used in calculations)	212	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			
BDPS	Bulk Density Processing Selector	Standard	
BHT	Bottom Hole Temperature (used in calculations)	212	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	
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
RTLFL	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	

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	
<b>STI: Stuck Tool Indicator</b>			
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth - Driller	8471.00	FT
TDL	Total Depth - Logger	8471.00	FT
<b>System and Miscellaneous</b>			
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	8.40	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
RMFS	Resistivity of Mud Filtrate Sample	1.7475	OHMM
TD	Total Depth	-50000	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: LOWER\_DENS    Vertical Scale: 5" per 100'    Graphics File Created: 16-Sep-2011 07:05

## OP System Version: 18C0-147

HILTB-FTB    18C0-147    DTC-H    18C0-147

### Output DLIS Files

DEFAULT    AIT\_TLD\_MCFL\_CNL\_011LUP    FN:10    PRODUCER    16-Sep-2011 07:05



## BEFORE CALIBRATIONS

### MAXIS Field Log

#### Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-DTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase							
Master: 19-Jul-2011 10:13    Before: 16-Sep-2011 2:02							
Thru Cal Magnitude - 0	0	0.6160	0.6163	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.259	1.260	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6284	0.6286	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.7102	0.7108	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.323	1.324	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.928	1.929	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.926	1.928	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.373	1.378	N/A	N/A	N/A	V
Phase - 0	0	72.92	72.93	N/A	N/A	N/A	DEG
Phase - 1	0	71.80	71.83	N/A	N/A	N/A	DEG
Phase - 2	0	68.05	68.10	N/A	N/A	N/A	DEG
Phase - 3	0	67.26	67.31	N/A	N/A	N/A	DEG
Phase - 4	0	60.95	61.05	N/A	N/A	N/A	DEG
Phase - 5	0	59.03	59.16	N/A	N/A	N/A	DEG
Phase - 6	0	59.04	59.17	N/A	N/A	N/A	DEG
Phase - 7	0	55.31	55.73	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Electronics Calibration Check - Auxilliary							
Master: 19-Jul-2011 10:13    Before: 16-Sep-2011 2:02							
Array Induction SPA Plus	990.5	992.9	993.8	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.06050	0.05687	N/A	N/A	N/A	MV
Array Induction Temperature PI	0.9150	0.9197	0.9205	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.00007260	0.00005022	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Test Loop Gain Correction

Master: 19-Jul-2011 10:13

Master: 19-Jul-2011 10:13

Test Loop Gain Magnitude - 0	0	1.016	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.017	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	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9978	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	0.9906	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	0.9977	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	0.9981	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.7501	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	0.07848	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.1335	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	0.03423	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	-0.02399	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.2467	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.1205	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	-0.4226	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Sonde Error Correction

Master: 19-Jul-2011 10:13

R Sonde Error Correction - 0	0	-72.68	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 1	0	191.9	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 2	0	108.4	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 3	0	66.62	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 4	0	25.79	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 5	0	14.04	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 6	0	9.981	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 7	0	-0.1971	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 0	0	-592.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 1	0	-69.72	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 2	0	-129.5	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 3	0	118.6	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 4	0	-36.24	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 5	0	6.216	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 6	0	-9.419	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 7	0	-5.815	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Mud Gain Correction

Master: 19-Jul-2011 10:13

Coarse - Mag, Real, Imag - 0	0	1.088	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 1	0	1.088	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 2	0	1.088	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 0	0	1.087	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 1	0	1.087	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 2	0	1.087	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Stab Measurement Summary

Before: 16-Sep-2011 2:13

BS Window Ratio	0.7411	N/A	0.7422	N/A	N/A	N/A	
BS Window Sum	9918	N/A	9908	N/A	N/A	N/A	CPS
SS Window Ratio	0.4778	N/A	0.4776	N/A	N/A	N/A	
SS Window Sum	10120	N/A	10100	N/A	N/A	N/A	CPS
LS Window Ratio	0.2971	N/A	0.2936	N/A	N/A	N/A	
LS Window Sum	1086	N/A	1082	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations

Before: 16-Sep-2011 2:13

BS PM High Voltage (Command)	1540	N/A	1536	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1668	N/A	1676	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1552	N/A	1562	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Crystal Quality Resolutions Calibration

Before: 16-Sep-2011 2:13

BS Crystal Resolution	11.44	N/A	11.46	N/A	N/A	N/A	%
SS Crystal Resolution	10.34	N/A	10.55	N/A	N/A	N/A	%
LS Crystal Resolution	9.608	N/A	9.388	N/A	N/A	N/A	%

High resolution Integrated Logging Tool-DTS Wellsite Calibration - MCFL Calibration

Before: 16-Sep-2011 2:03

Raw B0 Resistivity	3875	N/A	3833	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3792	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3798	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HILT Caliper Calibration

Before: 16-Sep-2011 2:01

HILT Caliper Zero Measurement	8.000	N/A	8.056	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.20	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Detector Calibration

Before: 16-Sep-2011 2:01

Gamma Ray Background	30.00	N/A	82.29	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkgd)	165.0	N/A	173.9	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Zero Measurement

Master: 10–Aug–2011 15:32 Before: 16–Sep–2011 2:02

CNTC Background	28.58	28.58	28.61	N/A	N/A	4.287	CPS
CFTC Background	30.22	30.22	31.63	N/A	N/A	4.533	CPS

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Ratio Measurement

Master: 10–Aug–2011 15:32

Thermal Near Corr. (Tank)	5800	5577	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2408	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.316	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Accelerometer Calibration

Before: 16–Sep–2011 6:30

Z–Axis Acceleration	32.19	N/A	31.79	N/A	N/A	N/A	F/S2
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High resolution Integrated Logging Tool–DTS Master Calibration – Inversion results

Master: 8–Sep–2011 17:55

Rho Aluminum	2.596	2.594	--	--	--	--	G/C3
Rho Magnesium	1.686	1.688	--	--	--	--	G/C3
Pe Aluminum	2.570	2.574	--	--	--	--	
Pe Magnesium	2.650	2.609	--	--	--	--	

High resolution Integrated Logging Tool–DTS Master Calibration – Deviation Summary

Master: 8–Sep–2011 17:55

BS Average Deviation	0	0.3621	--	--	--	--	%
BS Max Deviation	0	0.9377	--	--	--	--	%
SS Average Deviation	0	0.3858	--	--	--	--	%
SS Max Deviation	0	1.229	--	--	--	--	%
LS Average Deviation	0	0.9041	--	--	--	--	%
LS Max Deviation	0	1.990	--	--	--	--	%

The GLS–VJ source activity is acceptable.

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

NCT–B Water Temperature 77.3 DEGF.  
 Thermal Housing Size 3.371 IN.  
 NSR–F serial number 5068

High resolution Integrated Logging Tool–DTS / Equipment Identification

Primary Equipment:

Array Induction Tool – H	AIT – H	392
Rm/SP Bottom Nose	AHRM – A	
Array Induction Sonde	AHIS – BA	392
HILT high–Resolution Mechanical Sonde	HRMS – B	
HILT Rxo Gamma–ray Device	HRGD – B	1879
HILT Micro Cylindrically Focused Log Dev	MCFL –	
GR Logging Source	GLS – VJ	1827
HILT High Res. Control Cartridge	HRCC – B	

Auxiliary Equipment:

High resolution Integrated Logging Tool–DTS Wellsite Calibration

Electronics Calibration Check – Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6160		0.6050	72.92		71.00
	Before	0.6163			72.93		
1	Master	1.259		1.270	71.80		70.00
	Before	1.260			71.83		
2	Master	0.6284		0.6230	68.05		66.00
	Before	0.6286			68.10		
3	Master	0.7102		0.7040	67.26		65.00
	Before	0.7108			67.31		

4	Master	1.323		1.337	60.95		59.00
	Before	1.324			61.05		
5	Master	1.928		1.955	59.03		57.00
	Before	1.929			59.16		
6	Master	1.926		1.955	59.04		57.00
	Before	1.928			59.17		
7	Master	1.373		1.415	55.31		53.00
	Before	1.378			55.73		
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
Master: 19-Jul-2011 10:13				Before: 16-Sep-2011 2:02			

High resolution Integrated Logging Tool-DTS Wellsite Calibration						
Electronics Calibration Check - Auxilliary						
Phase	Array Induction SPA Plus MV	Value	Phase	Array Induction SPA Zero MV	Value	
Master		992.9	Master		0.06050	
Before		993.8	Before		0.05687	
		941.0 (Minimum)		-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
Phase	Array Induction Temperature Plus V	Value	Phase	Array Induction Temperature Zero V	Value	
Master		0.9197	Master		7.260E-00	
Before		0.9205	Before		5.022E-00	
		0.8700 (Minimum)		-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)
Master: 19-Jul-2011 10:13			Before: 16-Sep-2011 2:02			

High resolution Integrated Logging Tool-DTS Wellsite Calibration						
Test Loop Gain Correction						
Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG		
0	1.016		0.7501			
		0.9500 (Minimum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.017		0.07848			
		0.9500 (Minimum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.018		-0.1335			
		0.9500 (Minimum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.012		0.03423			
		0.9500 (Minimum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	0.9978		-0.02399			
		0.9500 (Minimum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9906		-0.2467			
		0.9500 (Minimum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	0.9977		0.1205			
		0.9500 (Minimum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	0.9981		-0.4226			
		0.9500 (Minimum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
Master: 19-Jul-2011 10:13						

High resolution Integrated Logging Tool-DTS Wellsite Calibration						
Sonde Error Correction						
Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M		
0	-72.68		-592.4			
		-231.0 (Minimum)		-2250 (Minimum)	0 (Nominal)	2250 (Maximum)

1	191.9		-69.72			
	114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)	-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	108.4		-129.5			
	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)	-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	66.62		118.6			
	39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	25.79		-36.24			
	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)	-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	14.04		6.216			
	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.981		-9.419			
	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-0.1971		-5.815			
	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: 19-Jul-2011 10:13

High resolution Integrated Logging Tool-DTS Wellsite Calibration								
Mud Gain Correction								
Idx	Value	Coarse - Mag, Real, Imag			Value	Fine - Mag, Real, Imag		
0	1.088				1.087			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	1.088				1.087			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	1.088				1.087			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

Master: 19-Jul-2011 10:13

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				0.7422	Before				0.4776	Before				0.2936
	0.7040 (Minimum)	0.7411 (Nominal)	0.7781 (Maximum)			0.4539 (Minimum)	0.4778 (Nominal)	0.5017 (Maximum)			0.2822 (Minimum)	0.2971 (Nominal)	0.3119 (Maximum)	
Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value	Phase	LS Window Sum CPS			Value
Before				9908	Before				10100	Before				1082
	9422 (Minimum)	9918 (Nominal)	10410 (Maximum)			9613 (Minimum)	10120 (Nominal)	10630 (Maximum)			1032 (Minimum)	1086 (Nominal)	1140 (Maximum)	

Before: 16-Sep-2011 2:13

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				1536	Before				1676	Before				1562
	1440 (Minimum)	1540 (Nominal)	1640 (Maximum)			1568 (Minimum)	1668 (Nominal)	1768 (Maximum)			1452 (Minimum)	1552 (Nominal)	1652 (Maximum)	

Before: 16-Sep-2011 2:13

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				11.46	Before				10.55	Before				9.388
	10.44 (Minimum)	11.44 (Nominal)	12.44 (Maximum)			9.336 (Minimum)	10.34 (Nominal)	11.34 (Maximum)			8.608 (Minimum)	9.608 (Nominal)	10.61 (Maximum)	

Before: 16-Sep-2011 2:13

High resolution Integrated Logging Tool-DTS Wellsite Calibration

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				3833	Before				3792	Before				3798
	3565 (Minimum)	3875 (Nominal)	4185 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	

Before: 16-Sep-2011 2:03

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				8.056	Before				12.20
	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)			9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)	

Before: 16-Sep-2011 2:01

High resolution Integrated Logging Tool-DTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI			Value	Phase	Gamma Ray (Jig - Bkgd) GAPI			Value
Before				82.29	Before				173.9
	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)			157.1 (Minimum)	165.0 (Nominal)	206.3 (Maximum)	

Before: 16-Sep-2011 2:01

High resolution Integrated Logging Tool-DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS			Value	Phase	CFTC Background CPS			Value
Master				28.58	Master				30.22
Before				28.61	Before				31.63
	5.000 (Minimum)	28.58 (Nominal)	40.00 (Maximum)			5.000 (Minimum)	30.22 (Nominal)	40.00 (Maximum)	

Master: 10-Aug-2011 15:32

Before: 16-Sep-2011 2:02

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				5577	Master				2408	Master				2.316
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)			1900 (Minimum)	2400 (Nominal)	2900 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)	

Master: 10-Aug-2011 15:32

High resolution Integrated Logging Tool-DTS

Wellsite Calibration

Accelerometer Calibration

Phase	Z-Axis Acceleration F/S2			Value
Before				31.79
	31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)	

Before: 16-Sep-2011 6:30

High resolution Integrated Logging Tool-DTS Master Calibration

Electronics Calibration Check - Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6160		0.6050	72.92		71.00
1	Master	1.259		1.270	71.80		70.00
2	Master	0.6284		0.6230	68.05		66.00
3	Master	0.7102		0.7040	67.26		65.00
4	Master	1.323		1.337	60.95		59.00
5	Master	1.928		1.955	59.03		57.00
6	Master	1.926		1.955	59.04		57.00
7	Master	1.373		1.415	55.31		53.00

High resolution Integrated Logging Tool-DTS Master Calibration						
Electronics Calibration Check - Auxiliary						
Phase	Array Induction SPA Plus MV	Value	Phase	Array Induction SPA Zero MV	Value	
Master		992.9	Master		0.06050	
	941.0 (Minimum)	990.5 (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		0.9197	Master		7.260E-00	
	0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)	-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)

High resolution Integrated Logging Tool-DTS Master Calibration							
Test Loop Gain Correction							
Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG	
0	1.016				0.7501		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.017				0.07848		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.018				-0.1335		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.012				0.03423		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	0.9978				-0.02399		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9906				-0.2467		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	0.9977				0.1205		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	0.9981				-0.4226		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

High resolution Integrated Logging Tool-DTS Master Calibration							
Sonde Error Correction							
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M	
0	-72.68				-592.4		
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)	-2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	191.9				-69.72		
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)	-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	108.4				-129.5		
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)	-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	66.62				118.6		
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	25.79				-36.24		
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)	-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	14.04				6.216		
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)

6	9.981	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)	-9.419	0 (Nominal)	30.00 (Maximum)
7	-0.1971	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)	-5.815	0 (Nominal)	30.00 (Maximum)

Master: 19-Jul-2011 10:13

High resolution Integrated Logging Tool-DTS Master Calibration								
Mud Gain Correction								
Idx	Value	Coarse - Mag, Real, Imag			Value	Fine - Mag, Real, Imag		
0	1.088	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	1.087	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	1.088	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	1.087	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	1.088	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	1.087	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

Master: 19-Jul-2011 10:13

High resolution Integrated Logging Tool-DTS Master Calibration									
Inversion results									
Phase	Rho Aluminum G/C3		Value	Phase	Rho Magnesium G/C3		Value		
Master	2.586 (Minimum)	2.596 (Nominal)	2.606 (Maximum)	2.594	Master	1.676 (Minimum)	1.686 (Nominal)	1.696 (Maximum)	1.688
Master	2.470 (Minimum)	2.570 (Nominal)	2.670 (Maximum)	2.574	Master	2.550 (Minimum)	2.650 (Nominal)	2.750 (Maximum)	2.609

Master: 8-Sep-2011 17:55

High resolution Integrated Logging Tool-DTS Master Calibration														
Deviation Summary														
Phase	BS Average Deviation %		Value	Phase	SS Average Deviation %		Value	Phase	LS Average Deviation %		Value			
Master	-0.6000 (Minimum)	0 (Nominal)	0.6000 (Maximum)	0.3621	Master	-1.000 (Minimum)	0 (Nominal)	1.000 (Maximum)	0.3858	Master	-1.500 (Minimum)	0 (Nominal)	1.500 (Maximum)	0.9041
Master	-1.600 (Minimum)	0 (Nominal)	1.600 (Maximum)	0.9377	Master	-2.500 (Minimum)	0 (Nominal)	2.500 (Maximum)	1.229	Master	-3.500 (Minimum)	0 (Nominal)	3.500 (Maximum)	1.990

Master: 8-Sep-2011 17:55

High resolution Integrated Logging Tool-DTS Master Calibration									
Zero Measurement									
Phase	CNTC Background CPS		Value	Phase	CFTC Background CPS		Value		
Master	5.000 (Minimum)	28.58 (Nominal)	40.00 (Maximum)	28.58	Master	5.000 (Minimum)	30.22 (Nominal)	40.00 (Maximum)	30.22

Master: 10-Aug-2011 15:32

High resolution Integrated Logging Tool-DTS Master Calibration														
Tank Measurement														
Phase	Thermal Near Corr. (Tank) CPS		Value	Phase	Thermal Far Corr. (Tank) CPS		Value	Phase	CNTC/CFTC (Tank)		Value			
Master	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)	5577	Master	1900 (Minimum)	2400 (Nominal)	2900 (Maximum)	2408	Master	2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)	2.316

Master: 10-Aug-2011 15:32

### DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC-H Auxiliary Cartridge  
DTC-H Telemetry Cartridge

DTCH - A  
DTCH - A

Auxiliary Equipment:

DTCH Telemetry Cartridge Housing

ECH - KC

896

Company: **Kerr McGee Oil and Gas Onshore, LP**

**Schlumberger**

Well: **Howard 37-29**

Field: **Wattenberg**

County: **Weld**

State: **Colorado**

Platform Express  
Compensated Neutron  
Litho Density