Schlumberger

Company: **Noble Energy Inc**

Well: **Blach 22−8**
Field: **Republican #73275**
County: **Yuma** State: **Colorado**

Platform Express
Triple Combo

County: Yuma
Field: Republican #73275
Location: Sec. 8, T1N, R46W
Well: Blach 22−8
Company: Noble Energy Inc

LOCATION

Sec. 8, T1N, R46W
SHL: 1790 FNL X 1510 FWL SENW

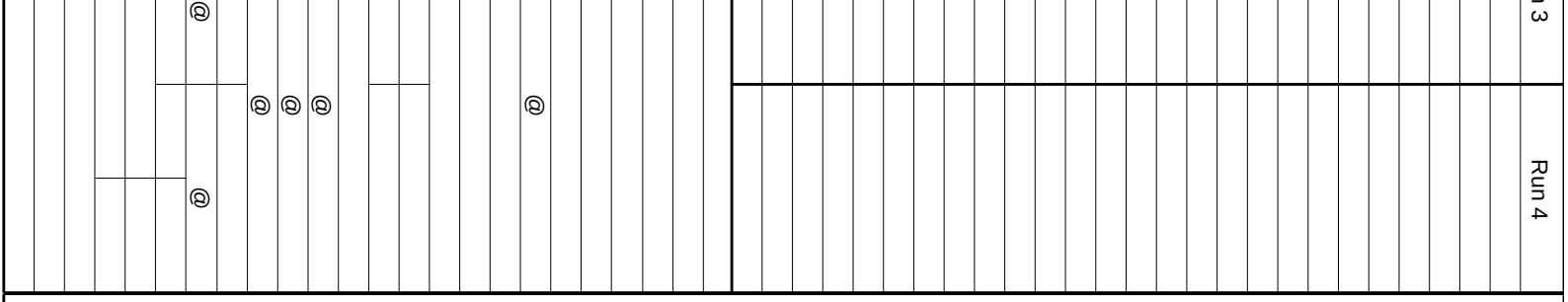
Elev.: K.B. 3993.00 ft
G.L. 3987.00 ft
D.F. 3995.00 ft

Permanent Datum: Ground Level Elev.: 3987.00 ft
Log Measured From: Kelly Bushing 6.00 ft above Perm. Datum
Drilling Measured From: Kelly Bushing

API Serial No.	Section	Township	Range
05−125−12008−0000	8	1N	46W

	Run 1	Run 2	Run
Logging Date	28−Oct−2011		
Run Number	1		
Depth Driller	2793 ft		
Schlumberger Depth	2793 ft		
Bottom Log Interval	2793 ft		
Top Log Interval	502 ft		
Casing Driller Size @ Depth	7.000 in @ 498 ft	@	@
Casing Schlumberger	502 ft		
Bit Size	6.250 in		
Type Fluid In Hole	Water Based Mud		
MUD Density / Viscosity	8.8 lbm/gal / 31 s		
MUD Fluid Loss / PH	/		
MUD Source Of Sample	Flowline		
RM @ Measured Temperature	0.174 ohm.m @ 70 degF	@	@
RMF @ Measured Temperature	0.131 ohm.m @ 70 degF	@	@
RMC @ Measured Temperature	0.261 ohm.m @ 70 degF	@	@
Source RMF / RMC	Calculated / Calculated		
RM @ MRT / RMF @ MRT	0.117 @ 108 / 0.088 @ 108	@ / @	@ / @
Maximum Recorded Temperatures	108 degF		
Circulation Stopped / Time	28−Oct−2011 / 17:00		
Logger On Bottom / Time	28−Oct−2011 / 23:40		
Unit Number / Location	3055 / Fort Morgan, Colorado		
Recorded By	Allison Johnston		
Witnessed By	Tom Hoff		

	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			



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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 the first run in well.	
2) Toolstring run as per tool sketch. Standoffs and bowspring not run as per client request.	
3) Matrix: Limestone, 2.71 g/cc.	
Schlumberger Crew: Jake Jump & Ed Ponce	
Rig: Excell #2	

RUN 1		RUN 2	
SERVICE ORDER #:	BVZK−00009	SERVICE ORDER #:	
PROGRAM VERSION:	18C0−147	PROGRAM VERSION:	
FLUID LEVEL:	100 ft	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1

SURFACE EQUIPMENT

WITM (CTS)−A
GSR−U/Y 5094
NCT−B
CNB−AB
NCS−VB

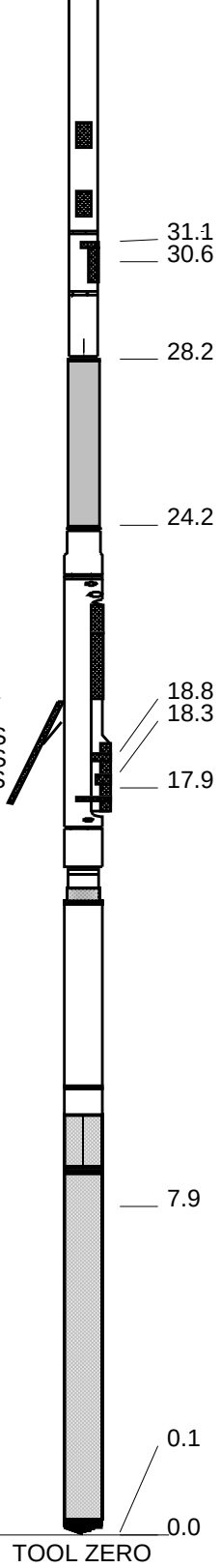
DOWNHOLE EQUIPMENT

LEH−QT
LEH−QT — 40.6

HGNS HTEM
HMCA
TelStatus
CTEM
HILTB−CTS — 37.6
HGNS Gamm — 36.9 — 37.6

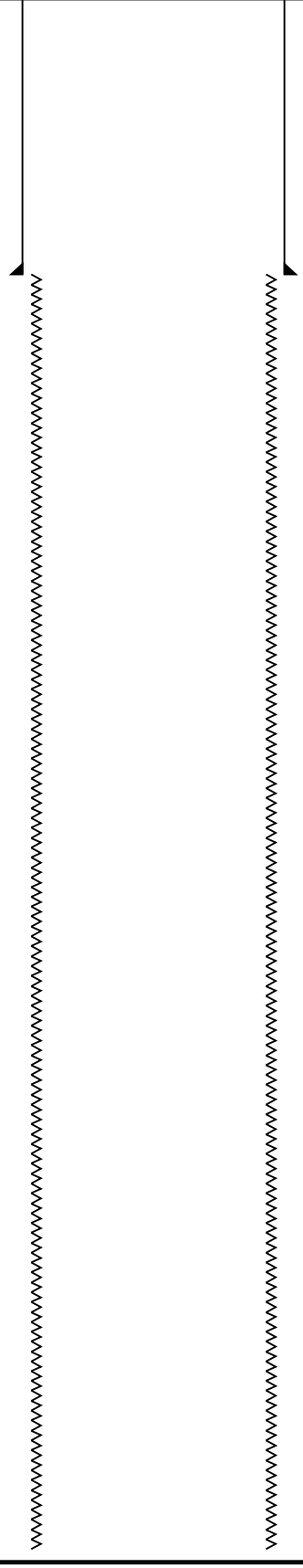
RUN 2

HGNSC−B
HMCA
TCC−B
HGNH 2900
NLS−KL
NSR−F 5068
HACCZ 328
HCNT
HGR
HRCC−B
HRMS−B
HRGD−B
GLS−VJ 5094
MCFL Device
HILT Nucl. LS 42767
HILT Nucl. SS 42767
HILT Nucl. BS 42767
AIT−H
AHIS−BA 111
AHRM−A
NPV−N



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

Production String	(in) OD	(in) ID	(ft) MD	Well Schematic	(ft) MD	(in) OD	(in) ID	Casing String



0.0	7.000		Casing String
498.0	7.000		Casing Shoe
498.0	6.250		Borehole Segment

Schlumberger

MAIN TRIPLE COMBO LOG 2"=100’

MAXIS Field Log

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_011LUP	FN:10	PRODUCER	28−Oct−2011 23:39	2802.0 FT	377.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 513.49 F3

Cement Volume = 260.42 F3 (assuming 4.50 IN casing O.D.)

Computed from 2793.0 FT to 502.0 FT using data channel(s) HCAL

OP System Version: 18C0−147

HILTB−CTS	18C0−147

PIP SUMMARY

⊢ Integrated Hole Volume Minor Pip Every 10 F3

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

SP (SP)
−160 (MV) 40

Gamma Ray (GR)
0 (GAPI) 200

HILT Caliper (HCAL)
4 (IN) 14

GR BACKUP

Stuck Stretch (STIT)
0 (F) 50

AIT−H 90 Inch Investigation (AHT90)
0.2 (OHMM) 20

AIT−H 20 Inch Investigation (AHT20)
0.2 (OHMM) 20

AIT−H 30 Inch Investigation (AHT30)
0.2 (OHMM) 20

AIT−H 60 Inch Investigation (AHT60)
0.2 (OHMM) 20

AIT−H 10 Inch Investigation (AHT10)
0.2 (OHMM) 20

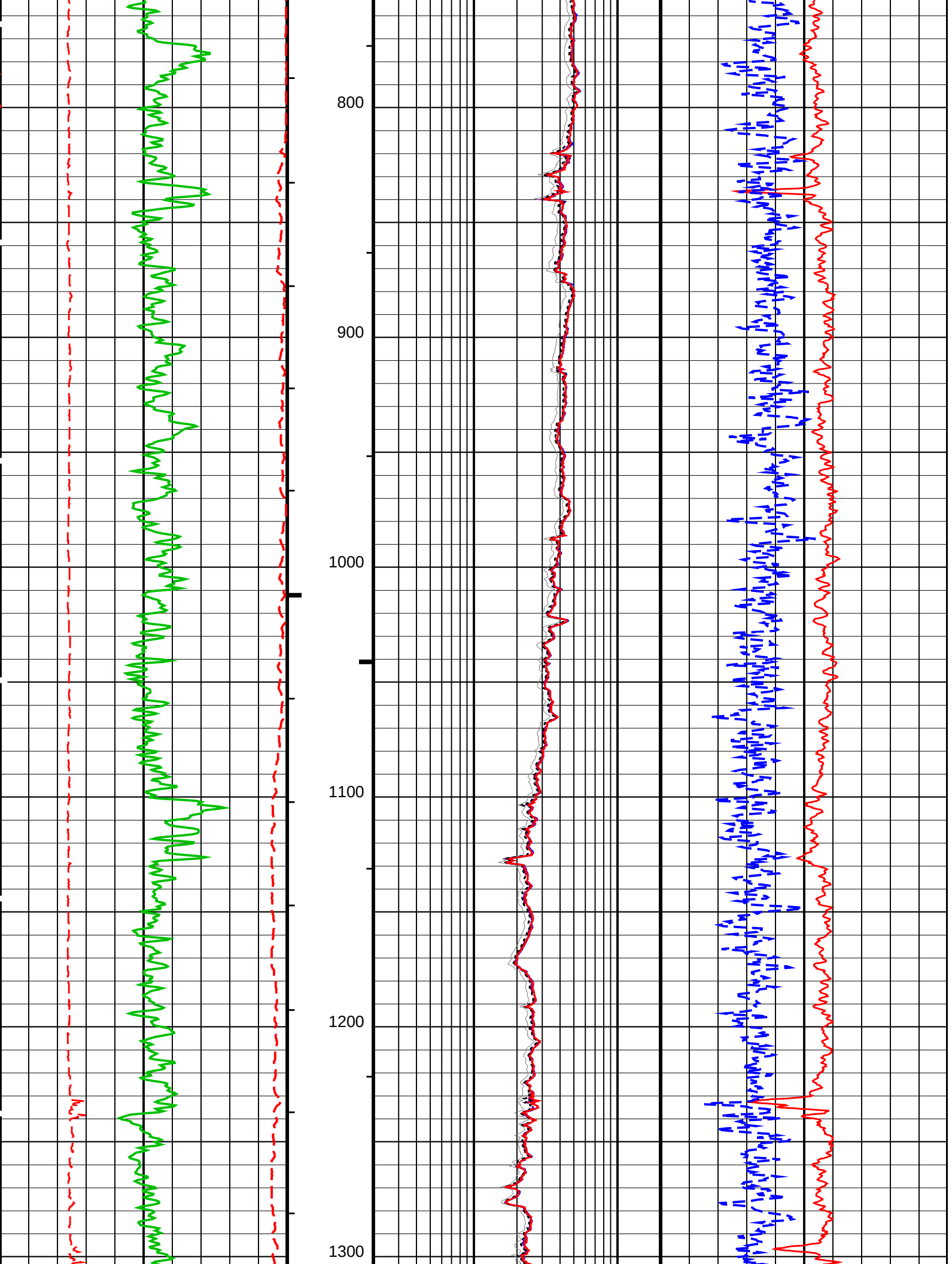
NPOR BACKUP

Gas Effect

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

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

400
500
502.0 F
−−CD−
600
700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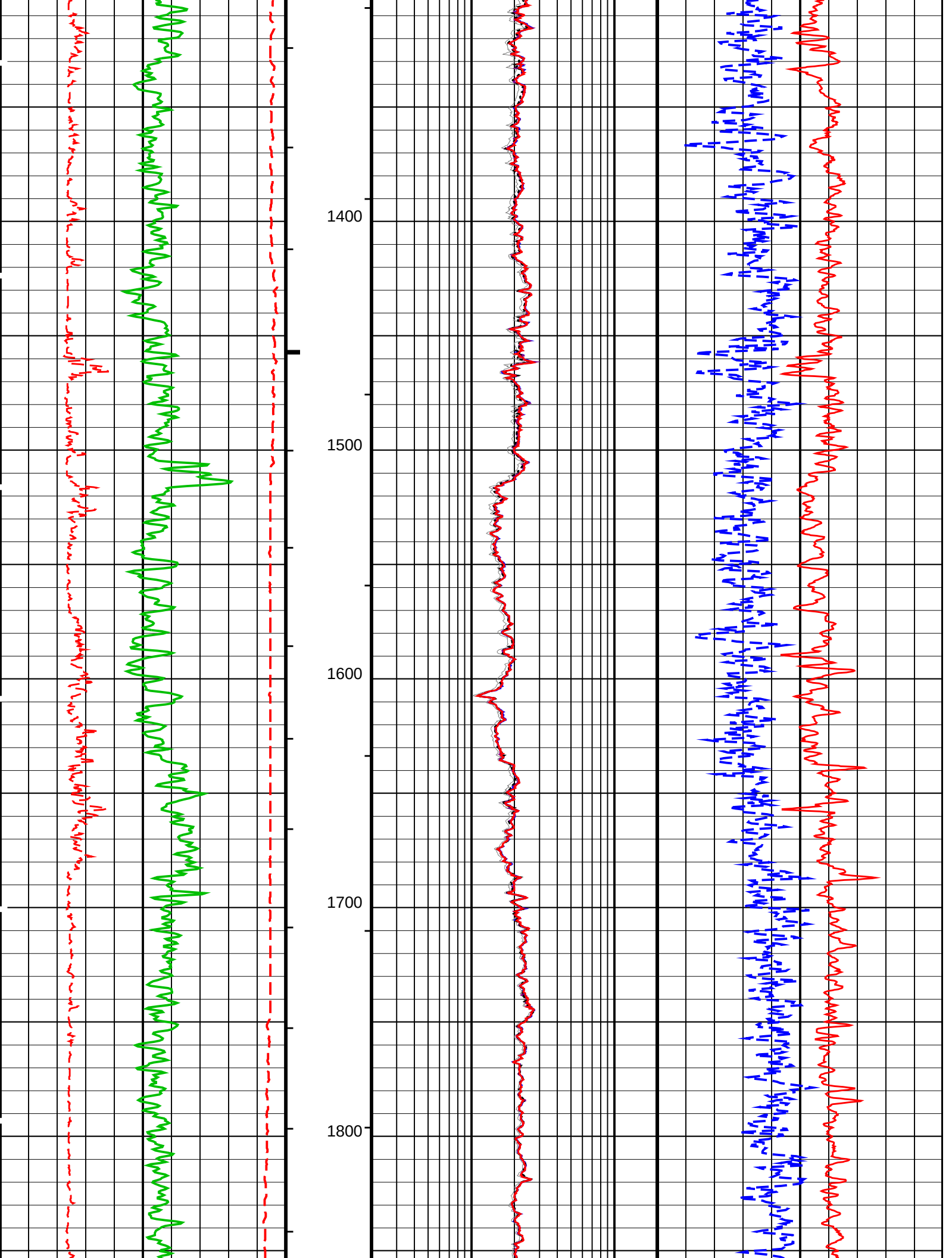
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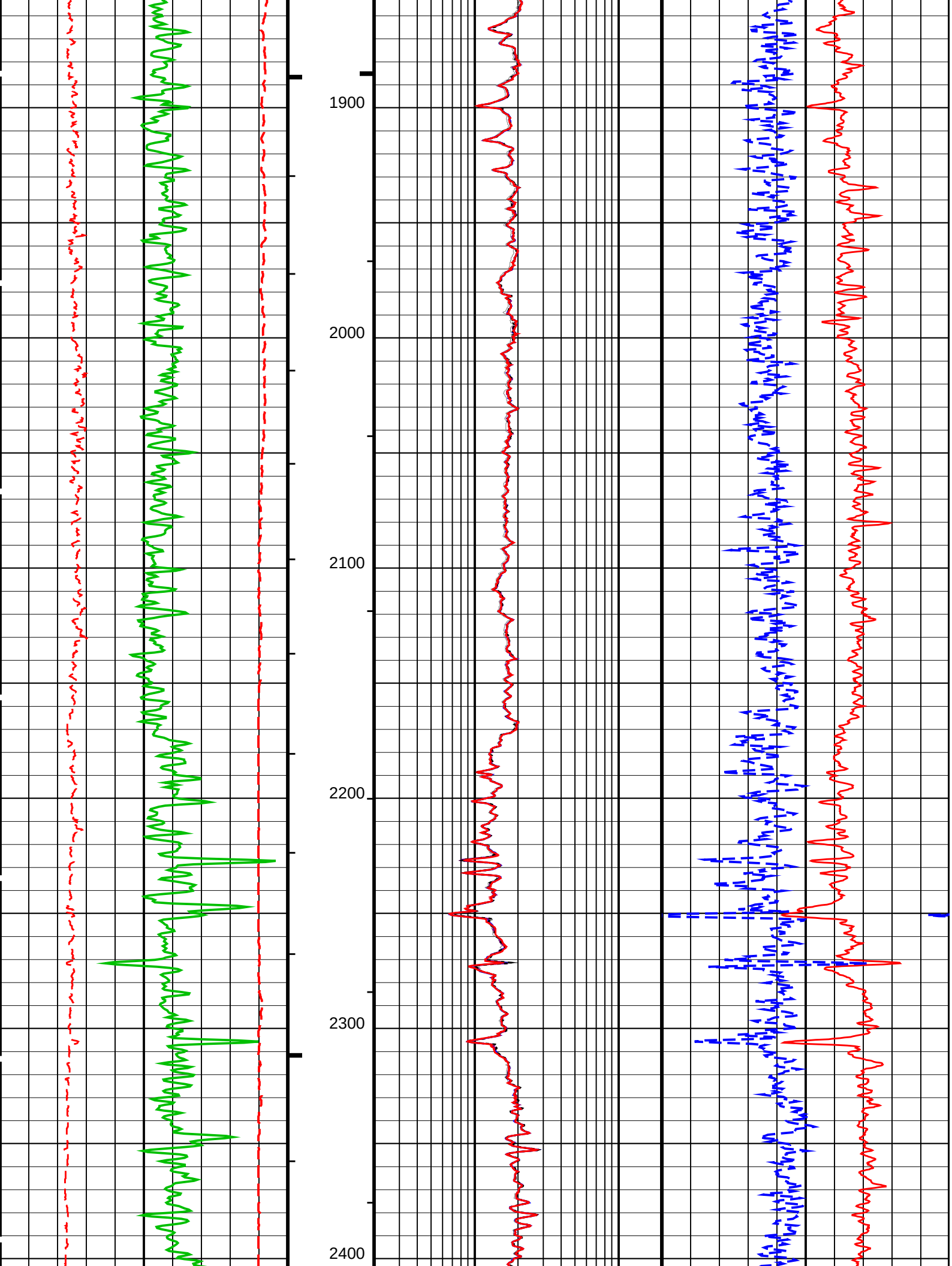
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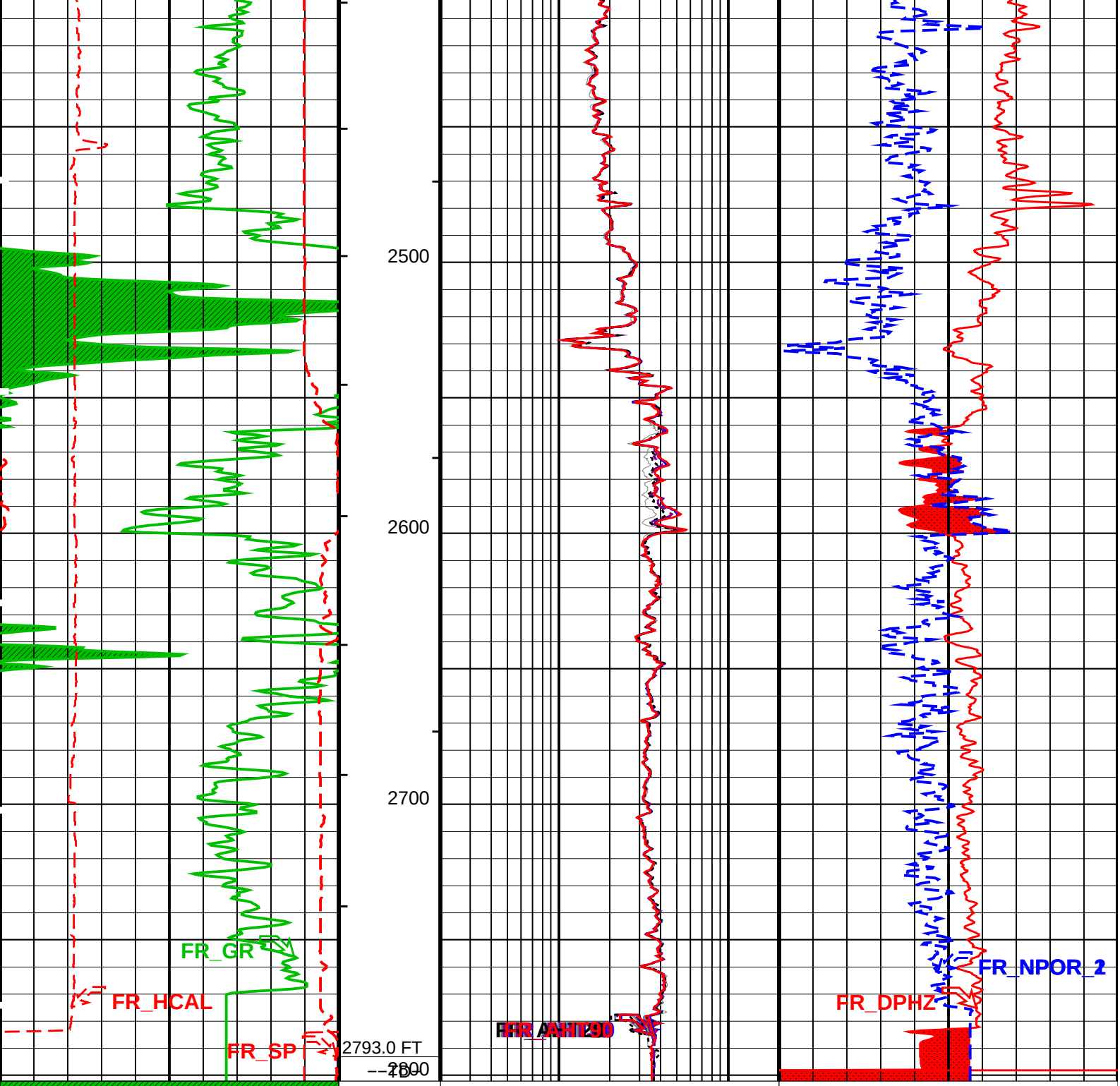


GR BACKUP

HILT Caliper (HCAL)
4 (IN) 14

Gamma Ray (GR)
0 (GAPI) 200

SP (SP)
−160 (MV) 40

Stuck Stretch (STIT)
0 (F) 50

AIT−H 10 Inch Investigation (AHT10)
0.2 (OHMM) 20

AIT−H 60 Inch Investigation (AHT60)
0.2 (OHMM) 20

AIT−H 30 Inch Investigation (AHT30)
0.2 (OHMM) 20

AIT−H 20 Inch Investigation (AHT20)
0.2 (OHMM) 20

AIT−H 90 Inch Investigation (AHT90)
0.2 (OHMM) 20

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

Alpha Processed Neutron Porosity (NPOR)
0.6 (V/V) 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−CTS: High resolution Integrated Logging Tool−CTS		
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	900	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	223	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
AHRFV	Array Induction Radial Profiling Code Version Number	701	
AHRPV	Array Induction Radial Parametrization Code Version Number	232	
AHSTA	Array Induction Tool Standoff	0.125	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
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	
FSAL	Formation Salinity	−50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal−like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
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	IN
SOCO	Standoff Correction Option	YES	
SPNV	SP Next Value	0	MV
	RWA: Apparent Water Resistivity		
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
	DIRPLOT: Enhanced Directional Plots		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
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		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
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
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	

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			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
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	2793.00	FT
TDL	Total Depth − Logger	2793.00	FT
System and Miscellaneous			
BS	Bit Size	6.250	IN
BSAL	Borehole Salinity	−50000.00	PPM
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	20.00	LB/F
DFD	Drilling Fluid Density	8.80	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	100.00	FT
MST	Mud Sample Temperature	70.28	DEGF
RMFS	Resistivity of Mud Filtrate Sample	0.1305	OHMM
TD	Total Depth	2793	FT

Format: COMBO_LOG_S2 Vertical Scale: 2" per 100’ Graphics File Created: 28−Oct−2011 23:39

OP System Version: 18C0−147

HILTB−CTS 18C0−147

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_011LUP FN:10 PRODUCER 28−Oct−2011 23:39

Schlumberger

MAIN TRIPLE COMBO LOG 5"=100’

MAXIS Field Log

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_011LUP FN:10 PRODUCER 28−Oct−2011 23:39 2802.0 FT 377.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 513.49 F3

Cement Volume = 260.42 F3 (assuming 4.50 IN casing O.D.)

Computed from 2793.0 FT to 502.0 FT using data channel(s) HCAL

OP System Version: 18C0−147

HILTB−CTS 18C0−147

PIP SUMMARY

Integrated Hole Volume Minor Pip Every 10 F3

Integrated Hole Volume Major Pip Every 100 F3

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

SP (SP)
−160 (MV) 40

Gamma Ray (GR)
0 (GAPI) 200

HILT Caliper (HCAL)
4 (IN) 14

GR BACKUP

Stuck Stretch (STIT)
0 (F) 50

AIT−H 90 Inch Investigation (AHT90)
0.2 (OHMM) 20

AIT−H 20 Inch Investigation (AHT20)
0.2 (OHMM) 20

AIT−H 30 Inch Investigation (AHT30)
0.2 (OHMM) 20

AIT−H 60 Inch Investigation (AHT60)
0.2 (OHMM) 20

AIT−H 10 Inch Investigation (AHT10)
0.2 (OHMM) 20

NPOR BACKUP

Gas Effect

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

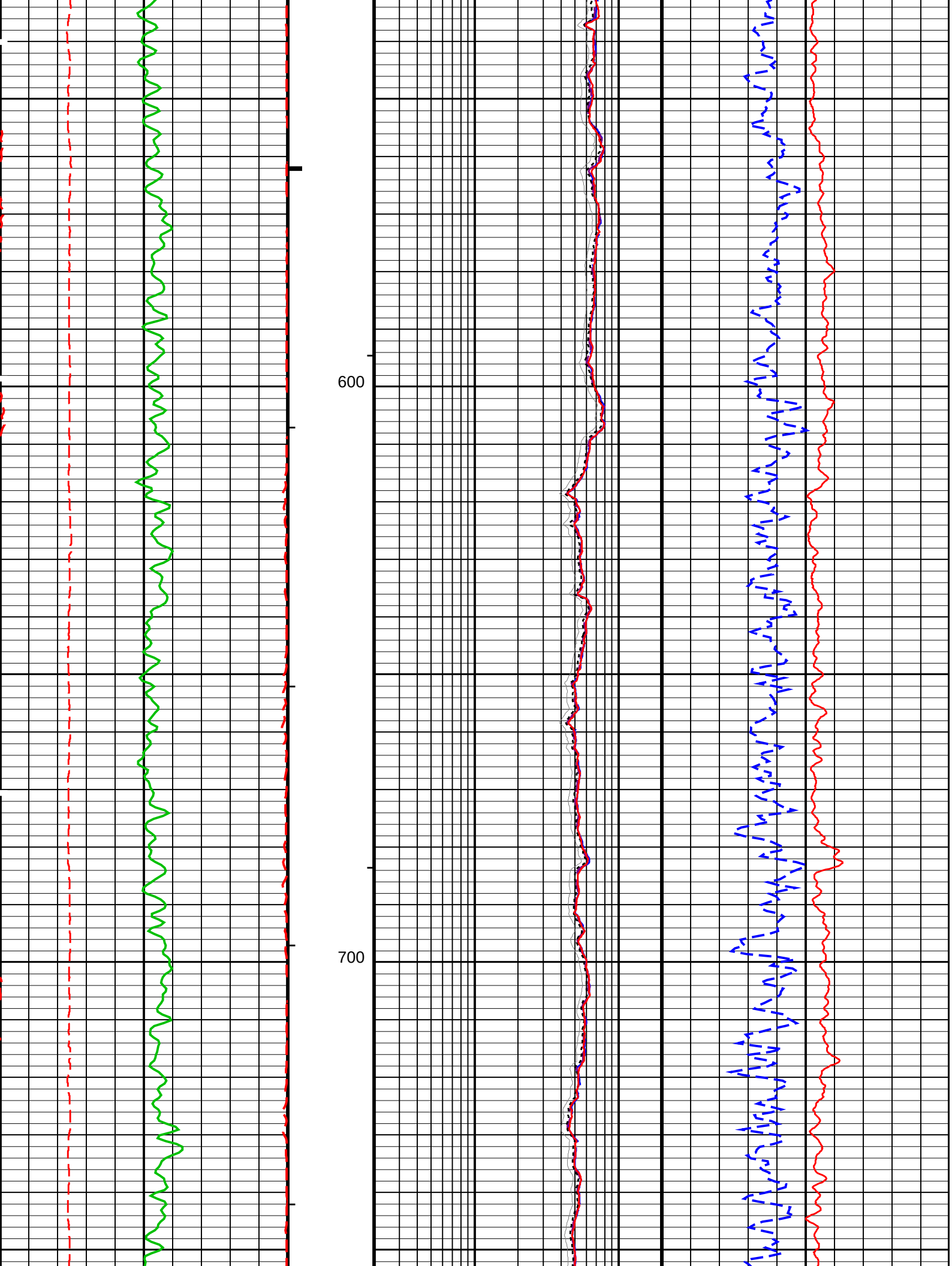
Std. Res. Density Porosity (DPHZ)
0.6 (V/V) 0

400

500

502.0 FT

−−CD−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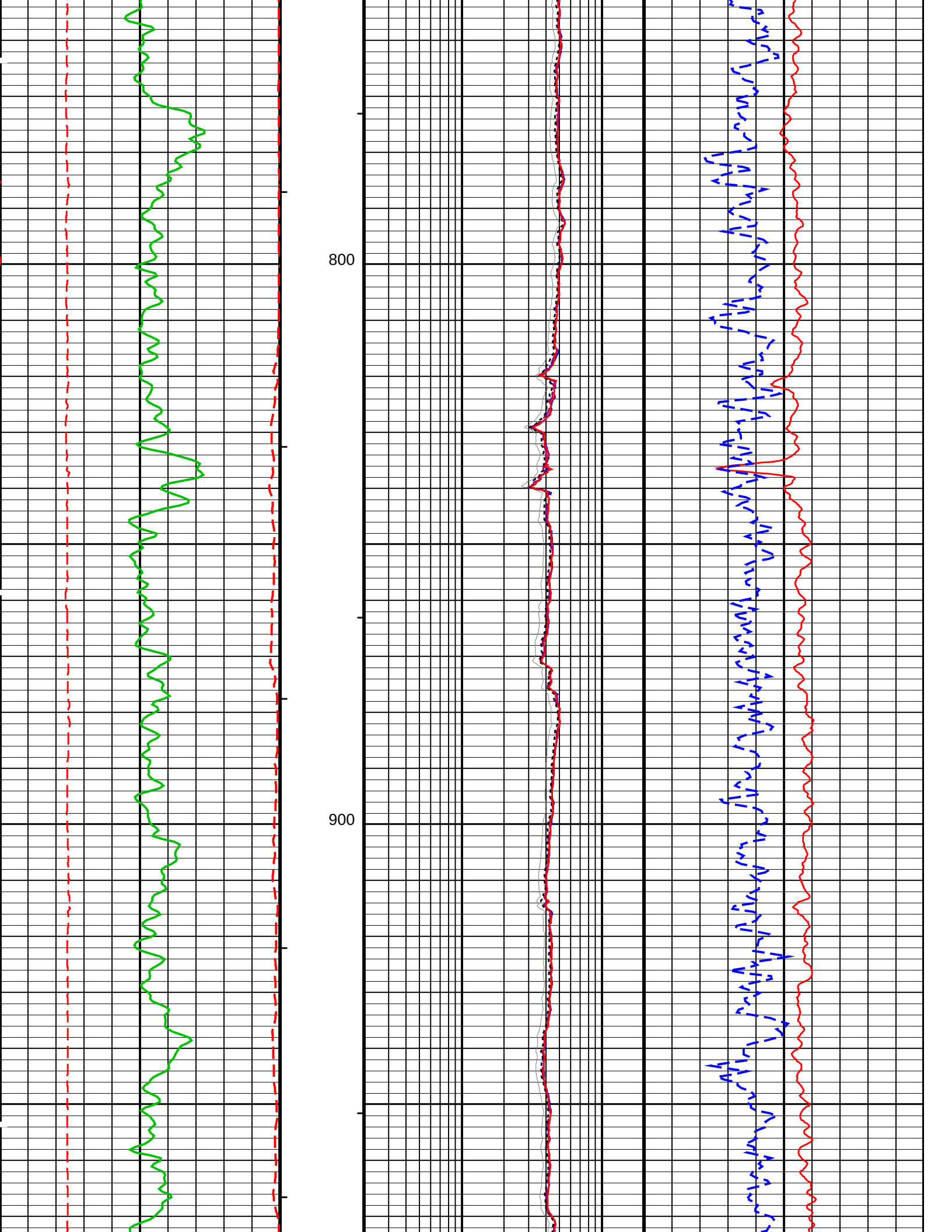
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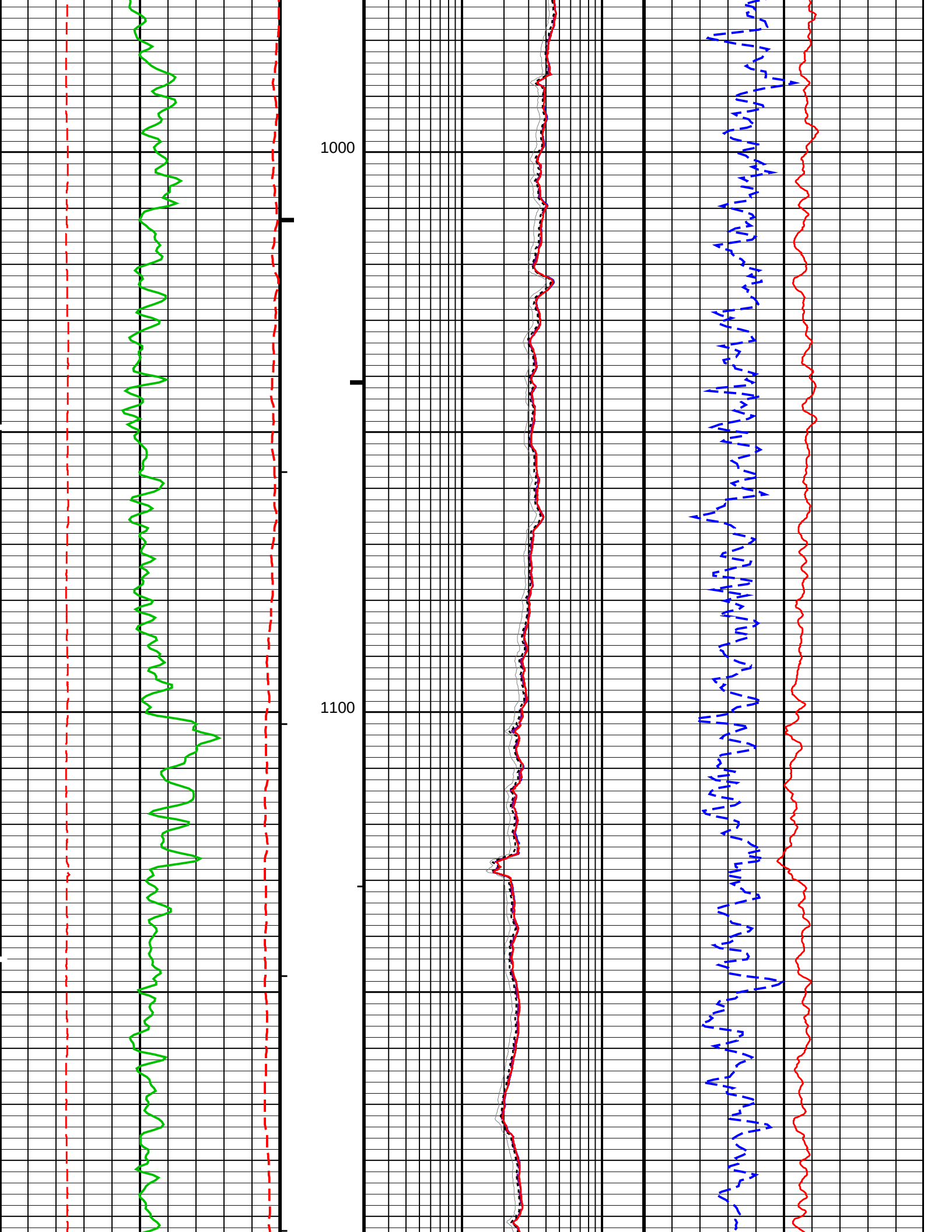
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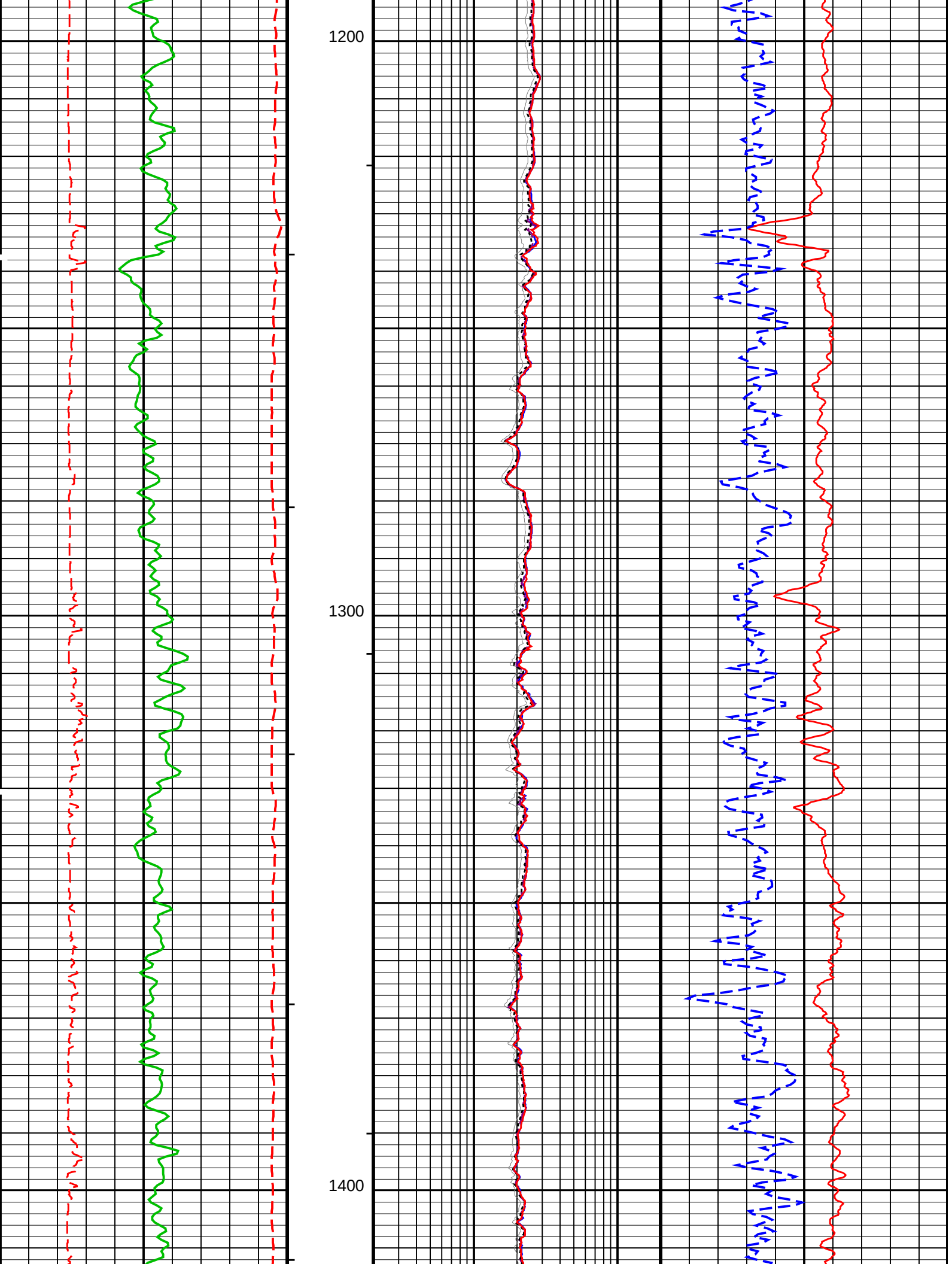
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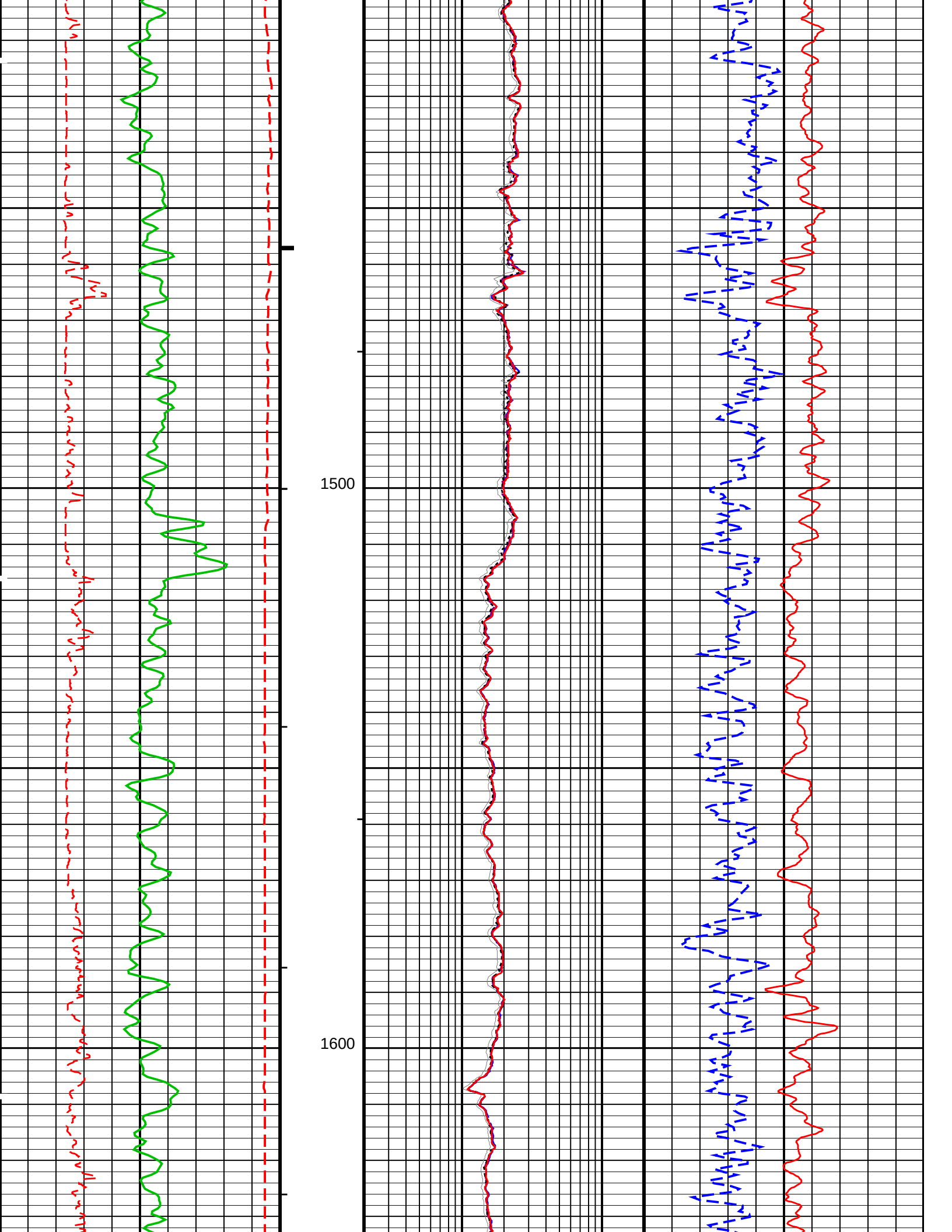
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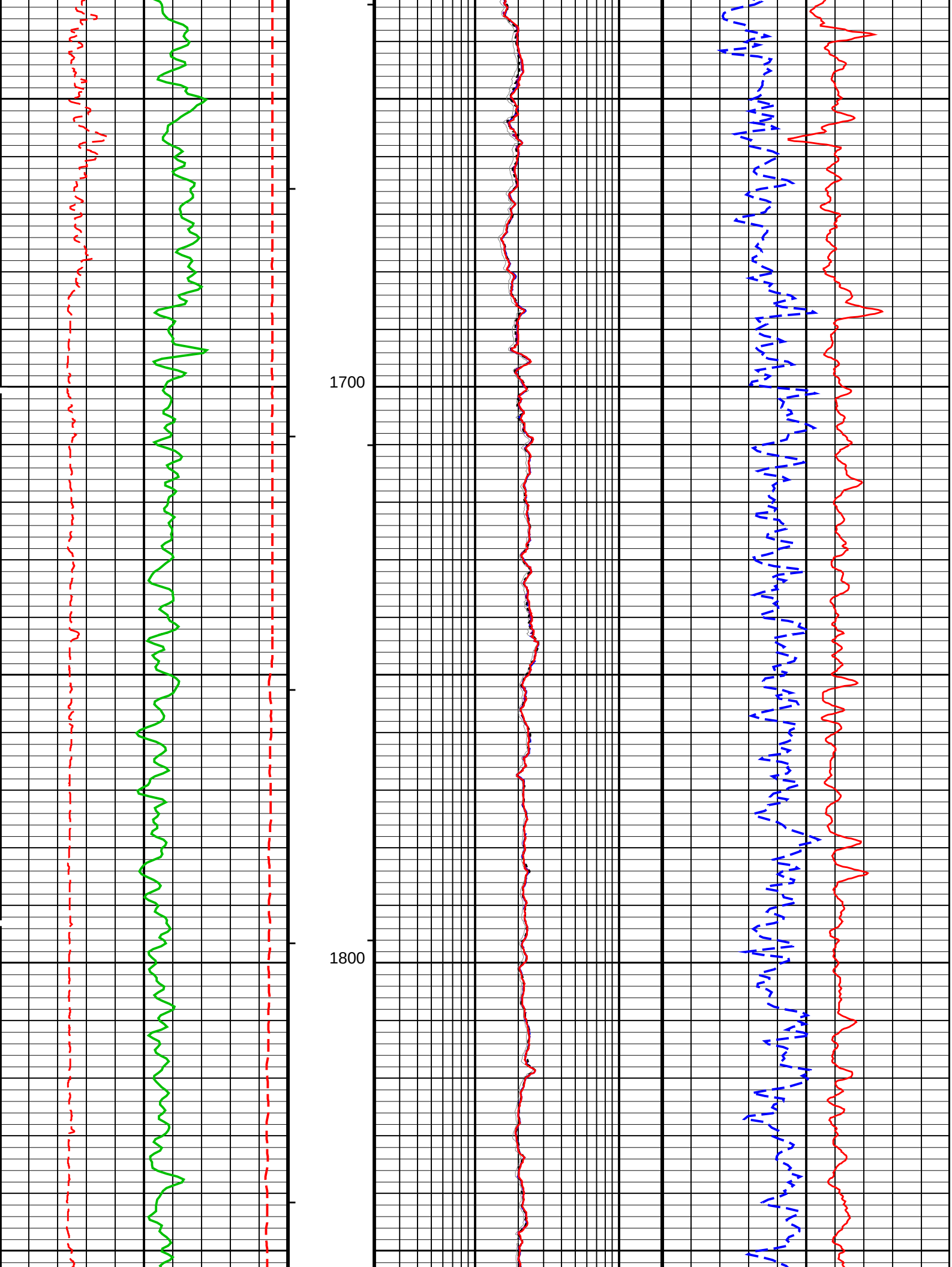
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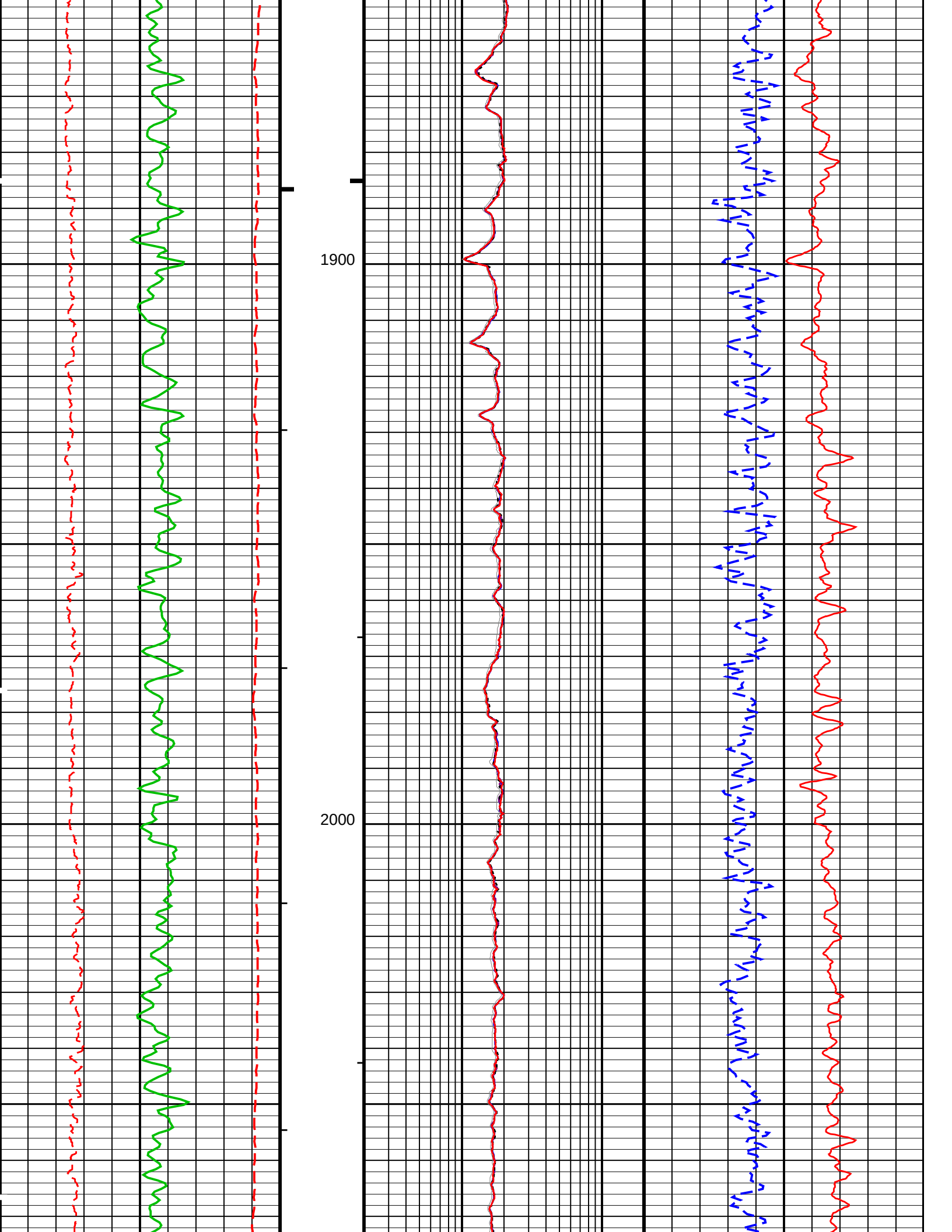
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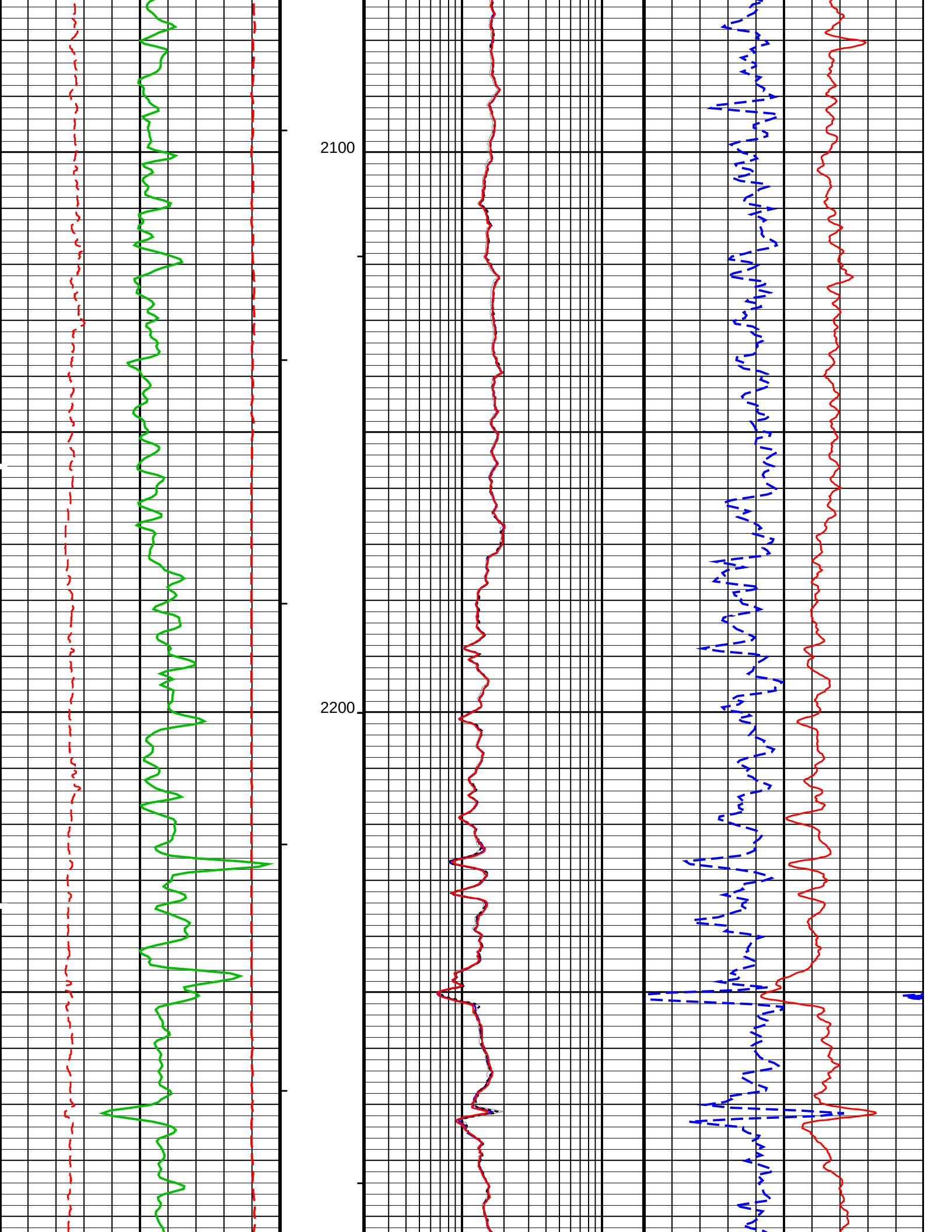
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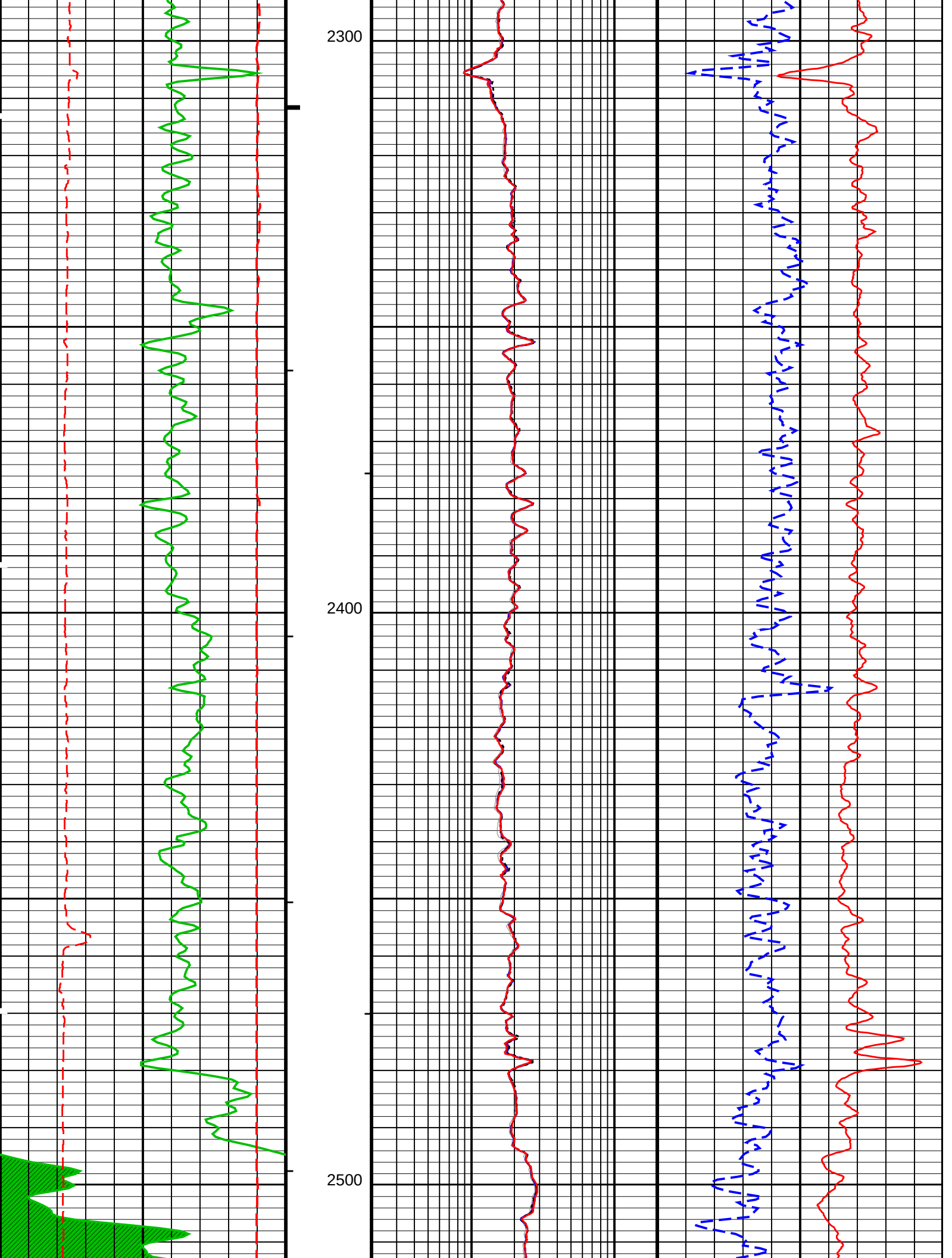
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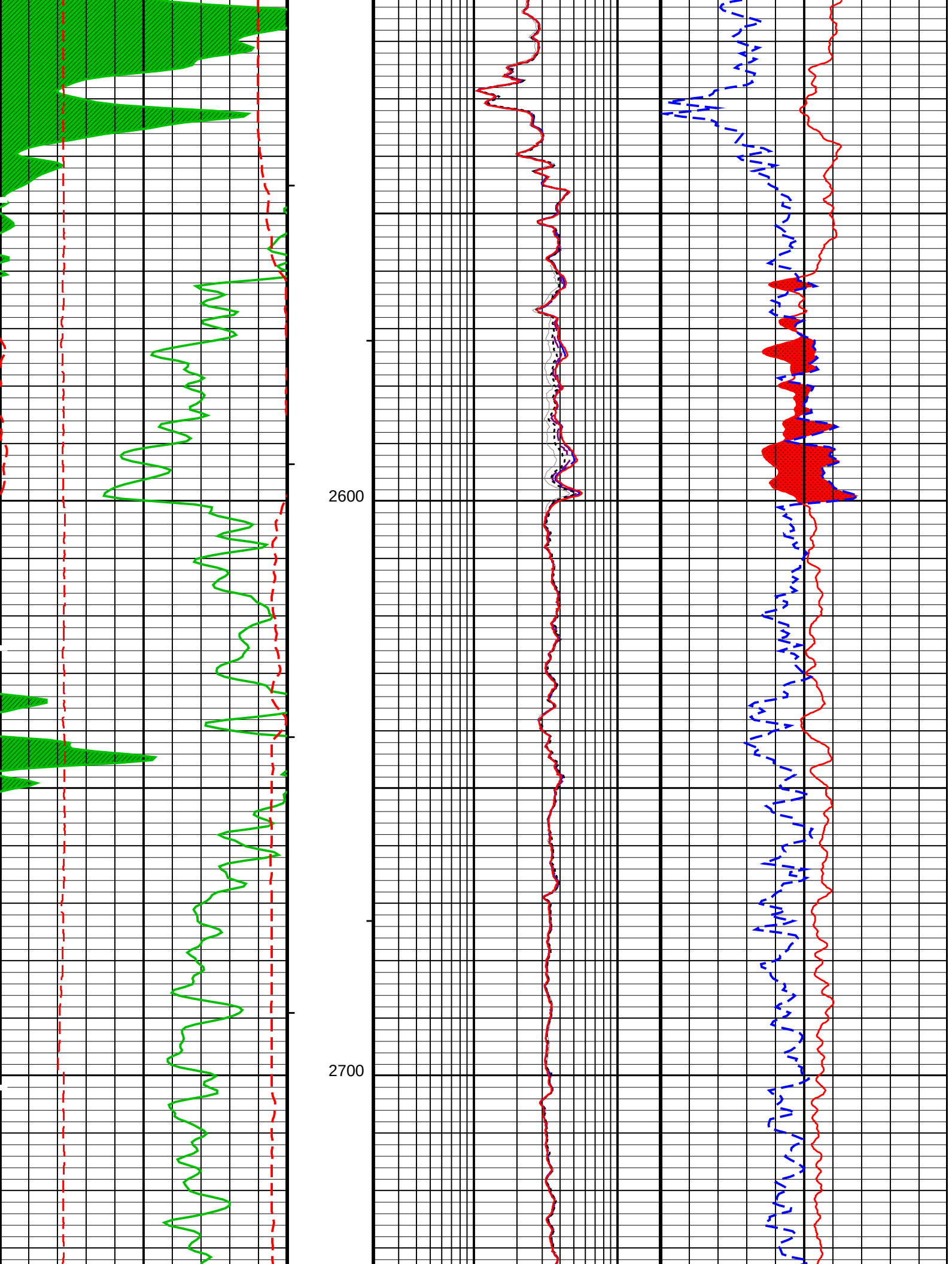
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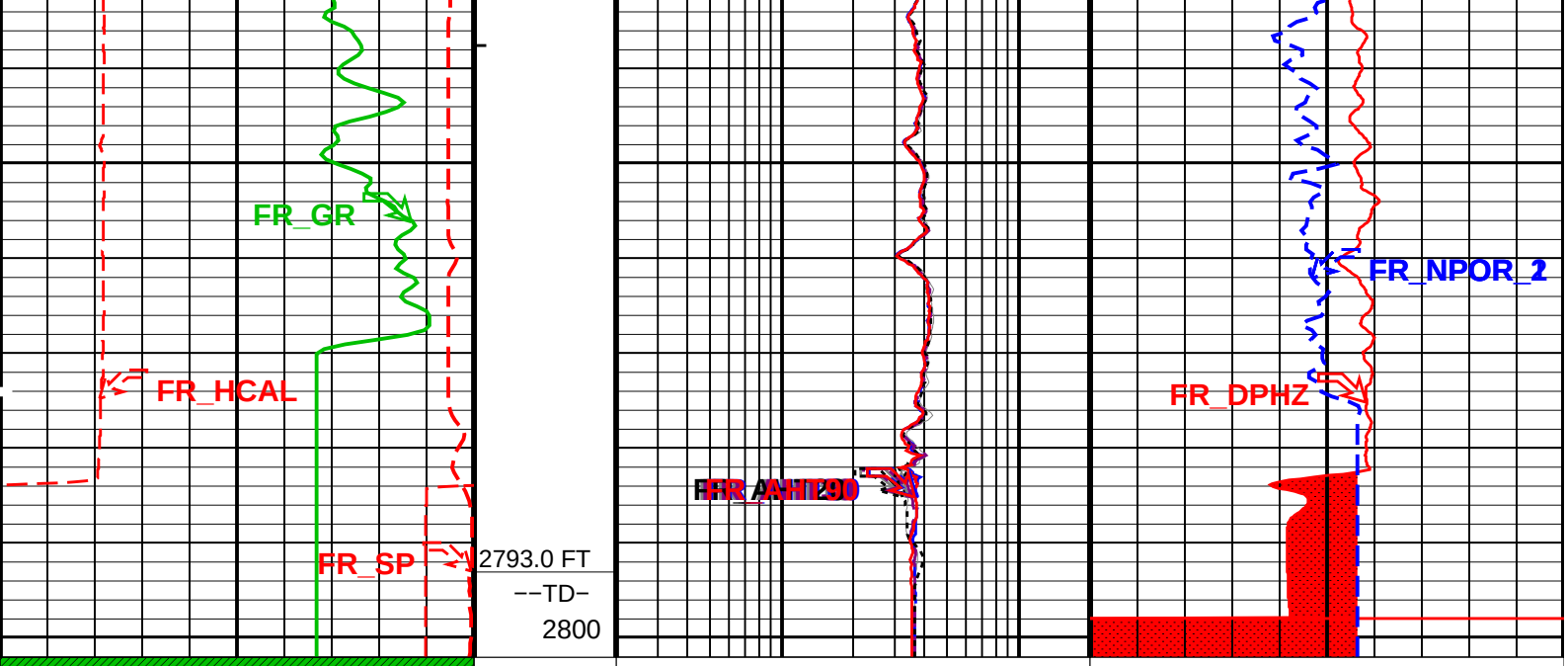

GR BACKUP

Stuck Stretch (STIT)
0 (F) 50

AIT-H 10 Inch Investigation (AHT10)
0.2 (OHMM) 20

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

HILT Caliper (HCAL)
4 (IN) 14

AIT-H 60 Inch Investigation (AHT60)
0.2 (OHMM) 20

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

Gamma Ray (GR)
0 (GAPI) 200

AIT-H 30 Inch Investigation (AHT30)
0.2 (OHMM) 20

Gas Effect

SP (SP)
-160 (MV) 40

AIT-H 20 Inch Investigation (AHT20)
0.2 (OHMM) 20

NPOR BACKUP

AIT-H 90 Inch Investigation (AHT90)
0.2 (OHMM) 20

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-CTS: High resolution Integrated Logging Tool-CTS		
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	900	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	223	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
AHRFV	Array Induction Radial Profiling Code Version Number	701	
AHRPV	Array Induction Radial Parametrization Code Version Number	232	
AHSTA	Array Induction Tool Standoff	0.125	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
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	
FSAL	Formation Salinity	−50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal−like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
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	IN
SOCO	Standoff Correction Option	YES	
SPNV	SP Next Value	0	MV
RWA: Apparent Water Resistivity			
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
DIRPLOT: Enhanced Directional Plots			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
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			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
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
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
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			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
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	2793.00	FT
TDL	Total Depth − Logger	2793.00	FT
System and Miscellaneous			
BS	Bit Size	6.250	IN
BSAL	Borehole Salinity	−50000.00	PPM
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	20.00	LB/F
DFD	Drilling Fluid Density	8.80	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	100.00	FT
MST	Mud Sample Temperature	70.28	DEGF
RMFS	Resistivity of Mud Filtrate Sample	0.1305	OHMM
TD	Total Depth	2793	FT

Format: COMBO_LOG Vertical Scale: 5" per 100' Graphics File Created: 28−Oct−2011 23:39

QP System Version: 18C0−147

HILTB−CTS 18C0−147

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_011LUP FN:10 PRODUCER 28−Oct−2011 23:39

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Repeat Analysis

MAXIS Field Log

Input DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_008LUP FN:7 PRODUCER 28−Oct−2011 23:17 2802.0 FT 2235.2 FT

Output DLIS Files

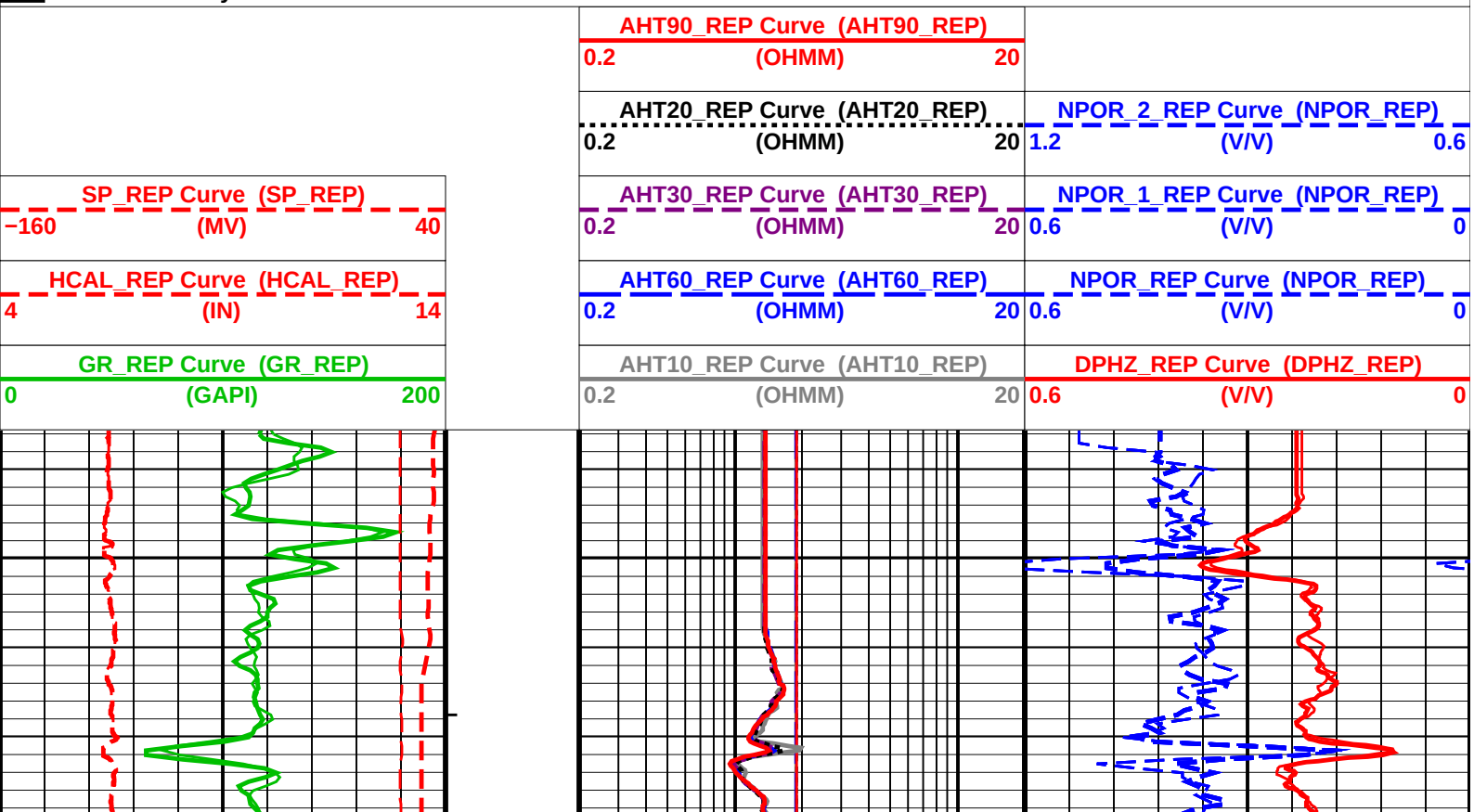
DEFAULT AIT_TLD_MCFL_CNL_011LUP FN:10 PRODUCER 28−Oct−2011 23:39

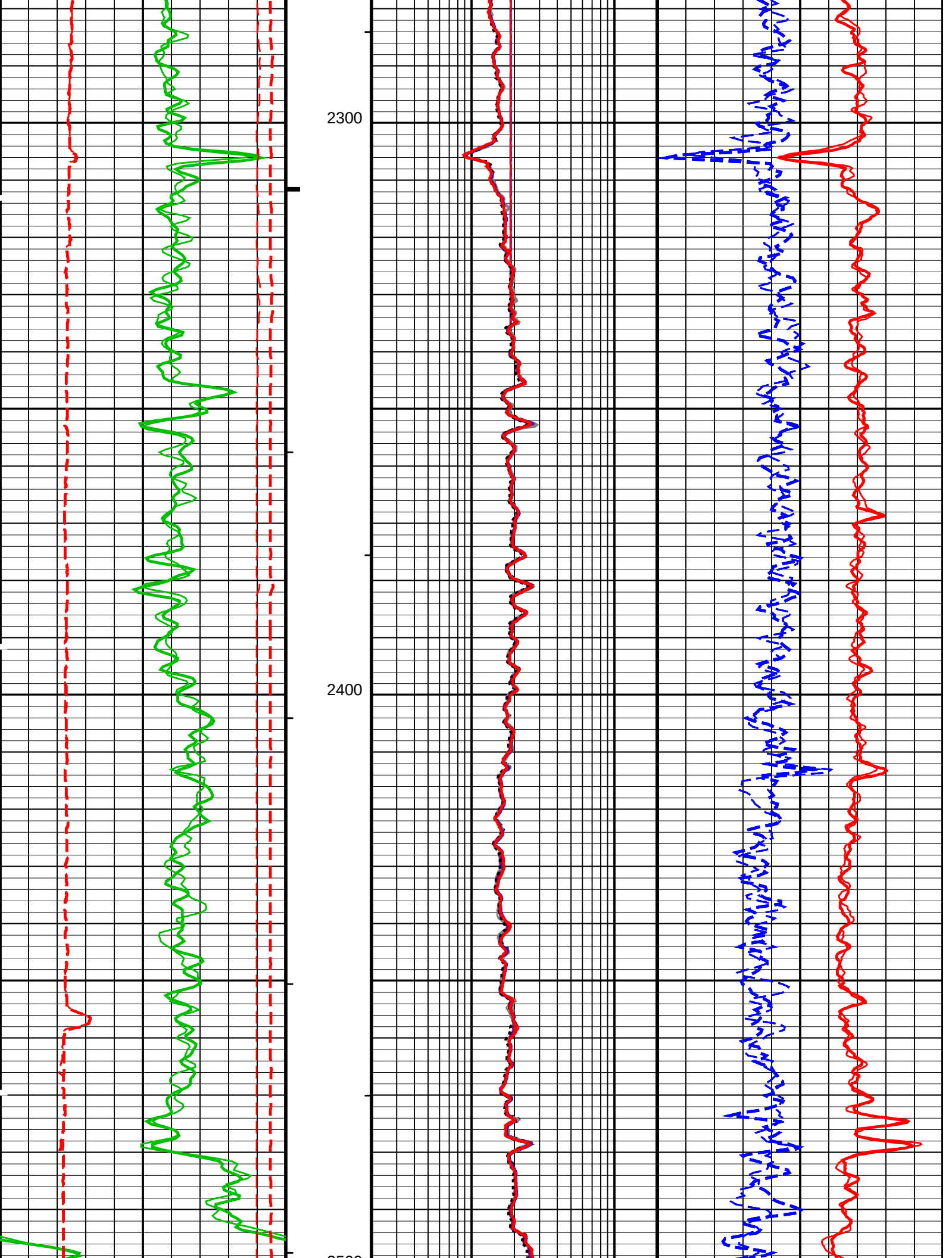
OP System Version: 18C0−147

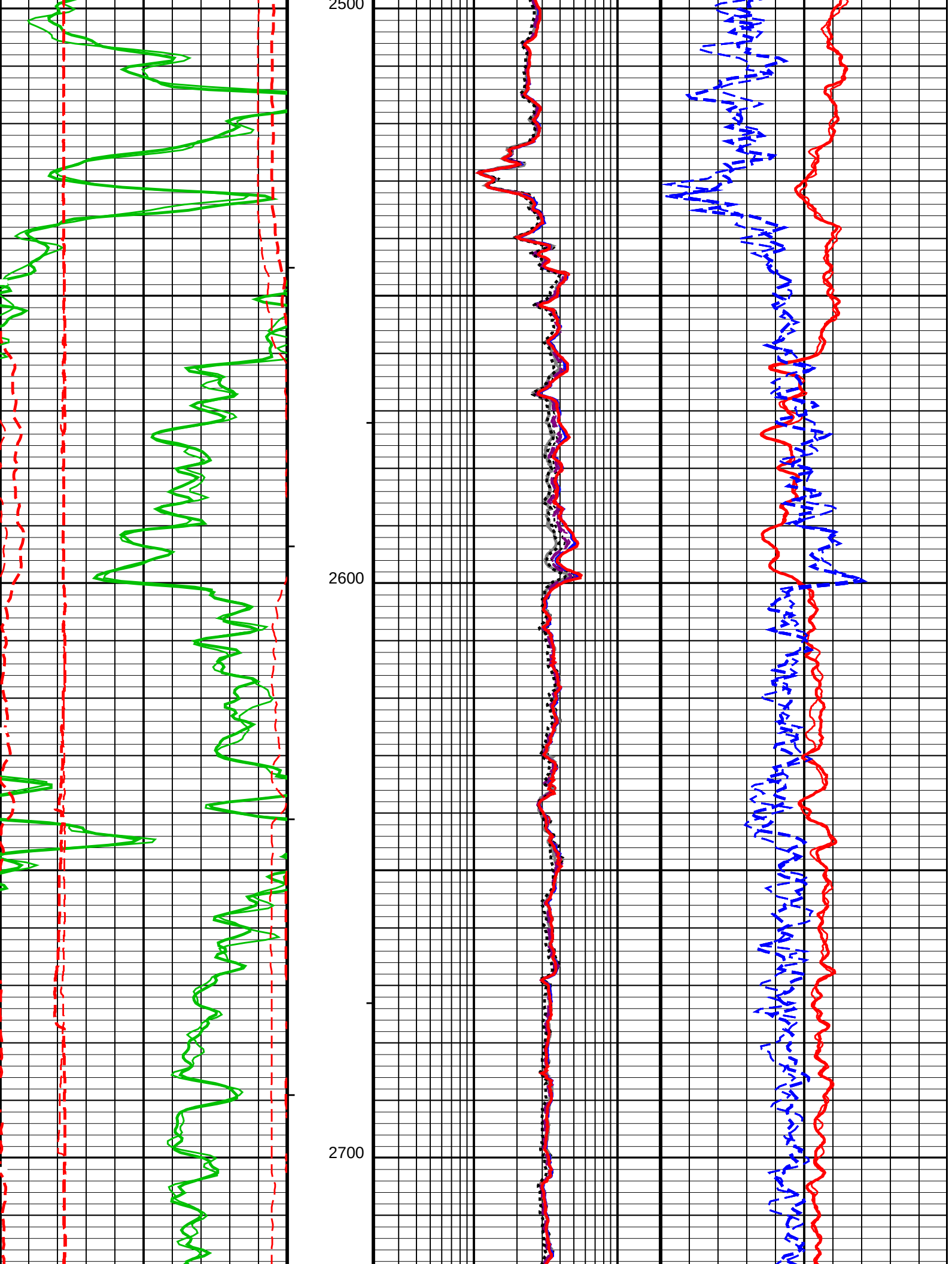
HILTB−CTS 18C0−147

PIP SUMMARY

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




2300
2400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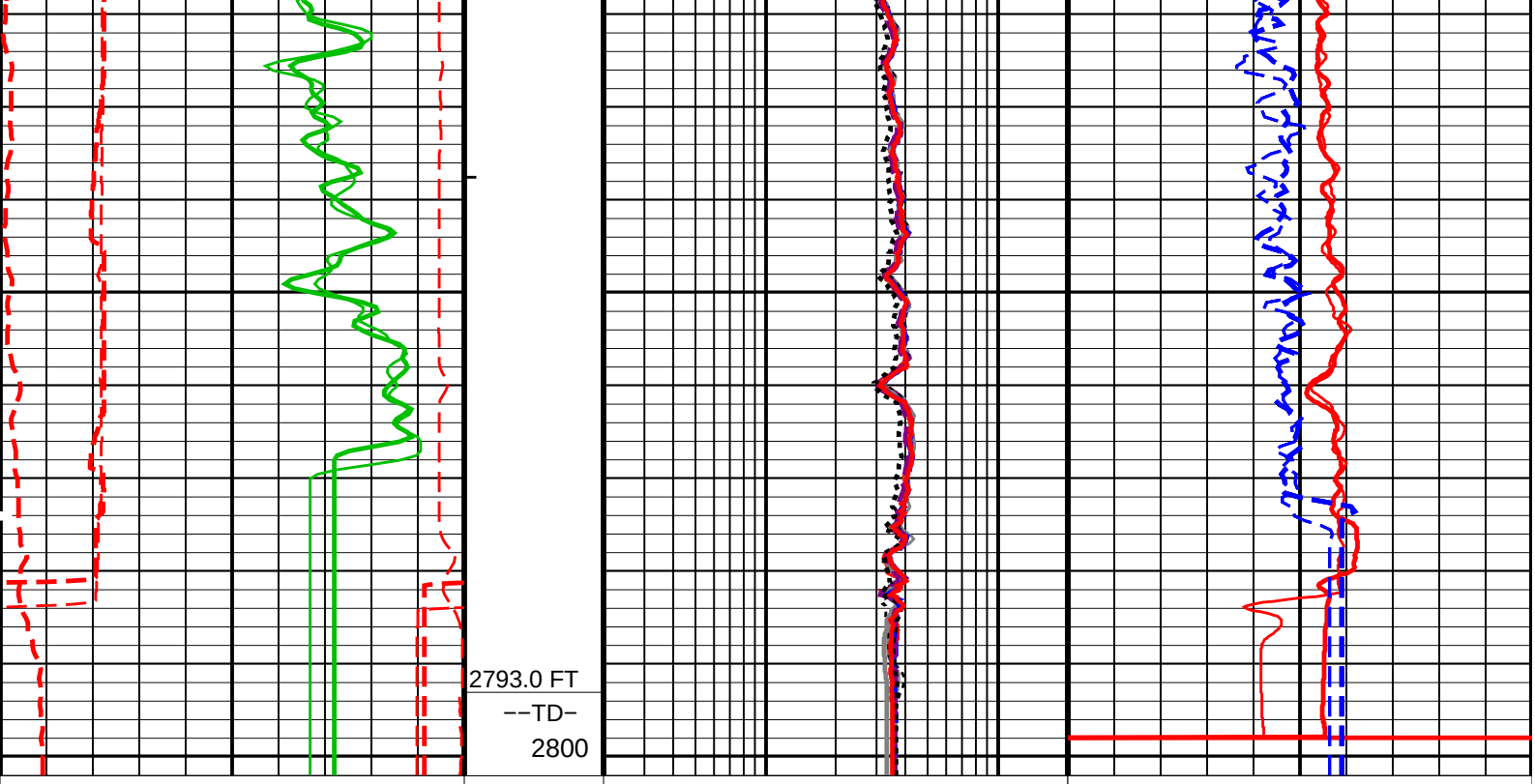
2600
2700



GR_REP Curve (GR_REP)
0 (GAPI) 200

HCAL_REP Curve (HCAL_REP)
4 (IN) 14

SP_REP Curve (SP_REP)
-160 (MV) 40

AHT10_REP Curve (AHT10_REP)
0.2 (OHMM) 20

AHT60_REP Curve (AHT60_REP)
0.2 (OHMM) 20

AHT30_REP Curve (AHT30_REP)
0.2 (OHMM) 20

AHT20_REP Curve (AHT20_REP)
0.2 (OHMM) 20

AHT90_REP Curve (AHT90_REP)
0.2 (OHMM) 20

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

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

NPOR_1_REP Curve (NPOR_REP)
0.6 (V/V) 0

NPOR_2_REP Curve (NPOR_REP)
1.2 (V/V) 0.6

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-CTS: High resolution Integrated Logging Tool-CTS		
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	900	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	223	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
AHRFV	Array Induction Radial Profiling Code Version Number	701	
AHRPV	Array Induction Radial Parametrization Code Version Number	232	
AHSTA	Array Induction Tool Standoff	0.125	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
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	
FSAL	Formation Salinity	−50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal−like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
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	IN
SOCO	Standoff Correction Option	YES	
SPNV	SP Next Value	0	MV
RWA: Apparent Water Resistivity			
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
DIRPLOT: Enhanced Directional Plots			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
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			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
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
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
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			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	107.6	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	68	DEGF
STI: Stuck Tool Indicator			
TDL	Total Depth − Logger	2793.00	FT
System and Miscellaneous			
BS	Bit Size	6.250	IN
BSAL	Borehole Salinity	−50000.00	PPM
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	20.00	LB/F
DFD	Drilling Fluid Density	8.80	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	100.00	FT
MST	Mud Sample Temperature	70.28	DEGF
RMFS	Resistivity of Mud Filtrate Sample	0.1305	OHMM
TD	Total Depth	2793	FT

OP System Version: 18C0−147

HILTB−CTS **18C0−147**

Input DLIS Files

DEFAULT	**AIT_TLD_MCFL_CNL_008LUP**	**FN:7**	**PRODUCER**	**28−Oct−2011 23:17**	**2802.0 FT**	**2235.2 FT**

Output DLIS Files

DEFAULT	**AIT_TLD_MCFL_CNL_011LUP**	**FN:10**	**PRODUCER**	**28−Oct−2011 23:39**

Schlumberger

Calibrations

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool−CTS Wellsite Calibration − Electronics Calibration Check − Thru Cal Mag. & Phase							
Master: 23−Sep−2011 17:00 Before: 26−Oct−2011 9:43							
Thru Cal Magnitude − 0	0	0.6028	0.6038	N/A	N/A	N/A	V
Thru Cal Magnitude − 1	0	1.237	1.239	N/A	N/A	N/A	V
Thru Cal Magnitude − 2	0	0.6132	0.6139	N/A	N/A	N/A	V
Thru Cal Magnitude − 3	0	0.6932	0.6946	N/A	N/A	N/A	V
Thru Cal Magnitude − 4	0	1.304	1.306	N/A	N/A	N/A	V
Thru Cal Magnitude − 5	0	1.888	1.891	N/A	N/A	N/A	V
Thru Cal Magnitude − 6	0	1.893	1.897	N/A	N/A	N/A	V
Thru Cal Magnitude − 7	0	1.359	1.367	N/A	N/A	N/A	V
Phase − 0	0	73.33	73.63	N/A	N/A	N/A	DEG
Phase − 1	0	72.20	72.51	N/A	N/A	N/A	DEG
Phase − 2	0	68.31	68.66	N/A	N/A	N/A	DEG
Phase − 3	0	67.51	67.87	N/A	N/A	N/A	DEG
Phase − 4	0	61.00	61.42	N/A	N/A	N/A	DEG
Phase − 5	0	59.07	59.54	N/A	N/A	N/A	DEG
Phase − 6	0	59.04	59.52	N/A	N/A	N/A	DEG
Phase − 7	0	55.05	55.97	N/A	N/A	N/A	DEG
High resolution Integrated Logging Tool−CTS Wellsite Calibration − Electronics Calibration Check − Auxilliary							
Master: 23−Sep−2011 17:00 Before: 26−Oct−2011 9:43							
Array Induction SPA Plus	990.5	992.8	993.9	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	−0.05566	−0.06111	N/A	N/A	N/A	MV
Array Induction Temperature Pl	0.9150	0.9197	0.9206	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	−0.00005566	−0.00006353	N/A	N/A	N/A	V
High resolution Integrated Logging Tool−CTS Wellsite Calibration − Test Loop Gain Correction							
Master: 23−Sep−2011 17:00							
Test Loop Gain Magnitude − 0	0	1.019	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 1	0	1.020	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 2	0	1.024	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 3	0	1.022	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 4	0	1.006	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 5	0	0.9987	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 6	0	1.011	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 7	0	1.021	N/A	N/A	N/A	N/A	V
Phase − 0	0	0.4021	N/A	N/A	N/A	N/A	DEG
Phase − 1	0	0.4716	N/A	N/A	N/A	N/A	DEG
Phase − 2	0	−0.02196	N/A	N/A	N/A	N/A	DEG
Phase − 3	0	0.1146	N/A	N/A	N/A	N/A	DEG
Phase − 4	0	0.002086	N/A	N/A	N/A	N/A	DEG
Phase − 5	0	−0.1889	N/A	N/A	N/A	N/A	DEG
Phase − 6	0	0.2086	N/A	N/A	N/A	N/A	DEG
Phase − 7	0	−0.08480	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool−CTS Wellsite Calibration − Sonde Error Correction

Master: 23−Sep−2011 17:00							
R Sonde Error Correction − 0	0	−94.93	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 1	0	157.4	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 2	0	116.2	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 3	0	63.97	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 4	0	23.17	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 5	0	11.40	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 6	0	9.688	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 7	0	−1.236	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 0	0	−662.8	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 1	0	184.0	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 2	0	−4.052	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 3	0	46.68	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 4	0	−1.445	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 5	0	−3.729	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 6	0	4.379	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 7	0	5.219	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool−CTS Wellsite Calibration − Mud Gain Correction

Master: 23−Sep−2011 17:00							
Coarse − Mag, Real, Imag − 0	0	0.8691	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 1	0	0.8691	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 2	0	0.8691	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 0	0	0.8415	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 1	0	0.8416	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 2	0	0.8416	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−CTS Wellsite Calibration − Stab Measurement Summary

Before: 26−Oct−2011 9:47							
BS Window Ratio	0.7308	N/A	0.7283	N/A	N/A	N/A	
BS Window Sum	9525	N/A	9538	N/A	N/A	N/A	CPS
SS Window Ratio	0.4782	N/A	0.4787	N/A	N/A	N/A	
SS Window Sum	9444	N/A	9413	N/A	N/A	N/A	CPS
LS Window Ratio	0.2932	N/A	0.2911	N/A	N/A	N/A	
LS Window Sum	1043	N/A	1034	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool−CTS Wellsite Calibration − Photo−multiplier High Voltages Calibrations

Before: 26−Oct−2011 9:47							
BS PM High Voltage (Command)	1659	N/A	1648	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1451	N/A	1459	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1547	N/A	1547	N/A	N/A	N/A	V

High resolution Integrated Logging Tool−CTS Wellsite Calibration − Crystal Quality Resolutions Calibration

Before: 26−Oct−2011 9:47							
BS Crystal Resolution	11.77	N/A	11.28	N/A	N/A	N/A	%
SS Crystal Resolution	10.27	N/A	10.36	N/A	N/A	N/A	%
LS Crystal Resolution	8.785	N/A	8.716	N/A	N/A	N/A	%

High resolution Integrated Logging Tool−CTS Wellsite Calibration − MCFL Calibration

Before: 26−Oct−2011 9:54							
Raw B0 Resistivity	3875	N/A	3866	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3806	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3806	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool−CTS Wellsite Calibration − HILT Caliper Calibration

Before: 26−Oct−2011 9:49							
HILT Caliper Zero Measurement	8.000	N/A	8.670	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.87	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool−CTS Wellsite Calibration − Detector Calibration

Before: 26−Oct−2011 9:44							
Gamma Ray Background	30.00	N/A	106.4	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkgd)	165.0	N/A	172.9	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool−CTS Wellsite Calibration − Zero Measurement

Master: Calibration out of date 26−Jul−2011 8:44	Before: 26−Oct−2011 9:45						
CNTC Background	28.13	28.13	27.47	N/A	N/A	4.220	CPS
CFTC Background	25.95	25.95	26.02	N/A	N/A	3.893	CPS

High resolution Integrated Logging Tool−CTS Wellsite Calibration − Ratio Measurement

Master: Calibration out of date 26−Jul−2011 8:44							
Thermal Near Corr. (Tank)	5800	4840	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2064	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.345	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−CTS Wellsite Calibration − Accelerometer Calibration

Before: 28−Oct−2011 22:57							
Z−Axis Acceleration	32.19	N/A	32.07	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 70.0 DEGF.
Thermal Housing Size 3.372 IN.
NSR−F serial number 5068

High resolution Integrated Logging Tool−CTS / Equipment Identification

Primary Equipment:

Array Induction Tool − H	AIT − H	
Rm/SP Bottom Nose	AHRM − A	
Array Induction Sonde	AHIS − BA	111
HILT high−Resolution Mechanical Sonde	HRMS − B	
HILT Rxo Gamma−ray Device	HRGD − B	
HILT Micro Cylindrically Focused Log Dev	MCFL −	
GR Logging Source	GLS − VJ	5094
HILT High Res. Control Cartridge	HRCC − B	

Auxiliary Equipment:

High resolution Integrated Logging Tool−CTS Wellsite Calibration

Electronics Calibration Check − Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6028		0.6050	73.33		71.00
	Before	0.6038			73.63		
1	Master	1.237		1.270	72.20		70.00
	Before	1.239			72.51		
2	Master	0.6132		0.6230	68.31		66.00
	Before	0.6139			68.66		
3	Master	0.6932		0.7040	67.51		65.00
	Before	0.6946			67.87		
4	Master	1.304		1.337	61.00		59.00
	Before	1.306			61.42		
5	Master	1.888		1.955	59.07		57.00
	Before	1.891			59.54		
6	Master	1.893		1.955	59.04		57.00
	Before	1.897			59.52		
7	Master	1.359		1.415	55.05		53.00
	Before	1.367			55.97		
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom −60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)

Master: 23−Sep−2011 17:00 Before: 26−Oct−2011 9:43

High resolution Integrated Logging Tool−CTS Wellsite Calibration

Electronics Calibration Check − Auxilliary

Phase	Array Induction SPA Plus MV	Value
Master		992.8
Before		993.9
	941.0 (Minimum) 990.5 (Nominal) 1040 (Maximum)	

Phase	Array Induction SPA Zero MV	Value
Master		−0.05566
Before		−0.06111
	−50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	

Phase	Array Induction Temperature Plus V	Value
Master		0.9197
Before		0.9206

Phase	Array Induction Temperature Zero V	Value
Master		−5.566E−00
Before		−6.353E−00

Before				Before		
0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)		−0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)

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High resolution Integrated Logging Tool−CTS Wellsite Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG		
0	1.019				0.4021			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.020				0.4716			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.024				−0.02196			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.022				0.1146			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	1.006				0.002086			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9987				−0.1889			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	1.011				0.2086			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.021				−0.08480			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

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High resolution Integrated Logging Tool−CTS Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
0	−94.93				−662.8			
		−231.0 (Minimum)	−56.00 (Nominal)	119.0 (Maximum)		−2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	157.4				184.0			
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		−625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	116.2				−4.052			
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		−350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	63.97				46.68			
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)		−250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	23.17				−1.445			
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		−63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	11.40				−3.729			
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		−50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.688				4.379			
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	−1.236				5.219			
		−5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

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High resolution Integrated Logging Tool−CTS Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag			Value	Fine − Mag, Real, Imag		

0	0.8691			0.8415			
	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	
1	0.8691			0.8416			
	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	
2	0.8691			0.8416			
	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	

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High resolution Integrated Logging Tool−CTS Wellsite Calibration

Stab Measurement Summary

Phase	BS Window Ratio			Value	Phase	SS Window Ratio			Value	Phase	LS Window Ratio			Value
Before				0.7283	Before				0.4787	Before				0.2911
	0.6943 (Minimum)	0.7308 (Nominal)	0.7673 (Maximum)			0.4543 (Minimum)	0.4782 (Nominal)	0.5021 (Maximum)			0.2785 (Minimum)	0.2932 (Nominal)	0.3078 (Maximum)	
Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value	Phase	LS Window Sum CPS			Value
Before				9538	Before				9413	Before				1034
	9049 (Minimum)	9525 (Nominal)	10000 (Maximum)			8972 (Minimum)	9444 (Nominal)	9916 (Maximum)			990.6 (Minimum)	1043 (Nominal)	1095 (Maximum)	

Before: 26−Oct−2011 9:47

High resolution Integrated Logging Tool−CTS 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				1648	Before				1459	Before				1547
	1559 (Minimum)	1659 (Nominal)	1759 (Maximum)			1351 (Minimum)	1451 (Nominal)	1551 (Maximum)			1447 (Minimum)	1547 (Nominal)	1647 (Maximum)	

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High resolution Integrated Logging Tool−CTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %			Value	Phase	SS Crystal Resolution %			Value	Phase	LS Crystal Resolution %			Value
Before				11.28	Before				10.36	Before				8.716
	10.77 (Minimum)	11.77 (Nominal)	12.77 (Maximum)			9.267 (Minimum)	10.27 (Nominal)	11.27 (Maximum)			7.785 (Minimum)	8.785 (Nominal)	9.785 (Maximum)	

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High resolution Integrated Logging Tool−CTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM			Value	Phase	Raw B1 Resistivity OHMM			Value	Phase	Raw B2 Resistivity OHMM			Value
Before				3866	Before				3806	Before				3806
	3565 (Minimum)	3875 (Nominal)	4185 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	

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High resolution Integrated Logging Tool−CTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement IN			Value	Phase	HILT Caliper Plus Measurement IN			Value
Before				8.670	Before				12.87
	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)			9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)	

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High resolution Integrated Logging Tool−CTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI			Value	Phase	Gamma Ray (Jig − Bkgd) GAPI			Value
Before				106.4	Before				172.9
	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)			157.1 (Minimum)	165.0 (Nominal)	206.3 (Maximum)	

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High resolution Integrated Logging Tool−CTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS			Value	Phase	CFTC Background CPS			Value

Master			28.13	Master			25.95	
Before			27.47	Before			26.02	
5.000 (Minimum)	28.13 (Nominal)	40.00 (Maximum)		5.000 (Minimum)	25.95 (Nominal)	40.00 (Maximum)		

Master: Calibration out of date 26−Jul−2011 8:44 Before: 26−Oct−2011 9:45

High resolution Integrated Logging Tool−CTS Wellsite Calibration

Ratio Measurement

Phase	Thermal Near Corr. (Tank) CPS			Value	Phase	Thermal Far Corr. (Tank) CPS			Value	Phase	CNTC/CFTC (Tank)			Value
Master				4840	Master				2064	Master				2.345
4700 (Minimum)	5800 (Nominal)	6900 (Maximum)			1900 (Minimum)	2400 (Nominal)	2900 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)		

Master: Calibration out of date 26−Jul−2011 8:44

High resolution Integrated Logging Tool−CTS

Wellsite Calibration

Accelerometer Calibration

Phase	Z−Axis Acceleration F/S2			Value
Before				32.07
31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)		

Before: 28−Oct−2011 22:57

Company: **Noble Energy Inc**

Schlumberger

Well: **Blach 22−8**
Field: **Republican #73275**
County: **Yuma**
State: **Colorado**

Platform Express
Triple Combo