

Schlumberger

Company: Lamont Doherty

Well: Expedition 324 Site U1348A

Field: Shatsky Rise

Rig: JOIDES Resolution **Ocean:** Pacific

Hostile Litho Density (HLDS)

Natural Gamma Spectroscopy (HNGS)

Rig: JOIDES Resolution
Field: Shatsky Rise
Location: Latitude: N 34° 24.94'
Well: Expedition 324 Site U1348A
Company: Lamont Doherty

LOCATION

Latitude: N 34° 24.94'	Elev.: K.B. 11.00 m
Longitude: E 159° 22.91'	G.L. -3275.00 m
	D.F. 11.00 m

Permanent Datum:	Mean Sea Level	Elev.: 0.00 m
Log Measured From:	Drill Floor	11.00 m above Perm. Datum
Drilling Measured From:	Drill Floor	

API Serial No.	Max. Hole Devi. 0 deg	Longitude	Latitude
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Run 1

Run 2

Run 3

Logging Date	5-Oct-2009		
Run Number	1		
Depth Driller	3599 m		
Schlumberger Depth	3596 m		
Bottom Log Interval	3596 m		
Top Log Interval	3267 m		
Casing Driller Size @ Depth	4.500 in	@ 3372 m	@
Casing Schlumberger	3368 m		
Bit Size	9.875 in		
Type Fluid In Hole	Seawater Gel		
MUD Density	Viscosity	1.258 g/cm3	
MUD Fluid Loss	PH		
MUD Source Of Sample	N/A		
RM @ Measured Temperature		@	@
RMF @ Measured Temperature		@	@
RMC @ Measured Temperature		@	@
Source RMF	RMC	N/A	N/A
RM @ MRT	RMF @ MRT	@ 4	@ 4
Maximum Recorded Temperatures	4 degC		
Circulation Stopped	Time	5-Oct-2009	18:00
Logger On Bottom	Time	6-Oct-2009	1:00
Unit Number	Location	625003	Houston
Recorded By	K. Swain		
Witnessed By	Gerardo Iturrino, Helen Evans		

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			

DISCLAIMER

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OTHER SERVICES1

OS1: DITE
OS2: HLDS
OS3:
OS4: FMS/DSI
OS5:

OTHER SERVICES2

OS1:
OS2:
OS3:
OS4:
OS5:

REMARKS: RUN NUMBER 1

Logging tools deployed inside drillpipe with wireline.
BHA consisted of RCB Drilling Bit and collars with mechanical bit release.
HLDS caliper calibration used 12 inch and 15.19" diameter rings as reference to improve large hole size accuracy.
Depths referenced from drill floor which is 11m above sea level.

REMARKS: RUN NUMBER 2

RUN 1

SERVICE ORDER #:
PROGRAM VERSION: 17C0-154
FLUID LEVEL:

RUN 2

SERVICE ORDER #:
PROGRAM VERSION:
FLUID LEVEL:

LOGGED INTERVAL	START	STOP

LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION


RUN 1


SURFACE EQUIPMENT

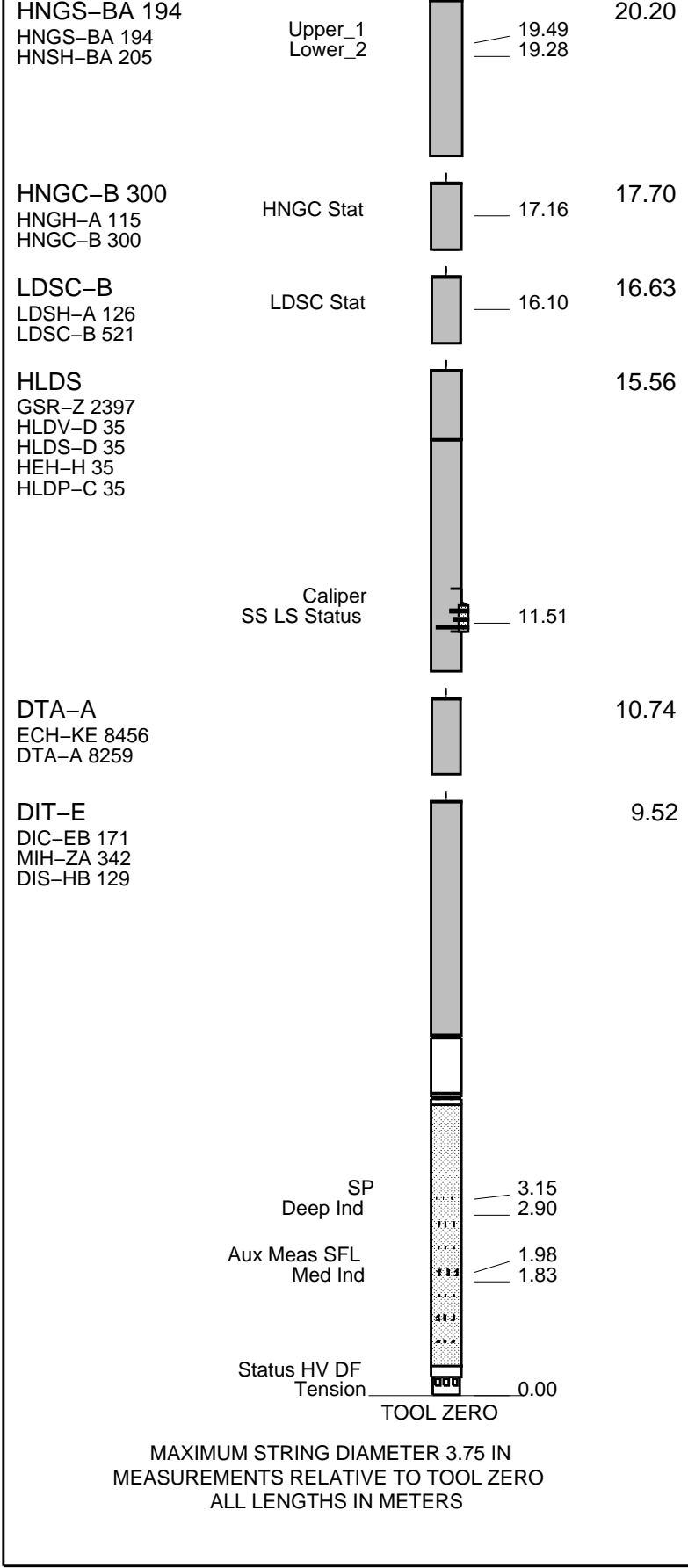
GSR-U 616008
WITM (DTS)-A

RUN 2

DOWNHOLE EQUIPMENT

LEH-QT  22.00
LEH-QT 301

DTC-H  20.83 21.11
ECH-KC 1777 CTEM
DTCH0-A 8798 TelStatus
ToolStatu _____ 20.20



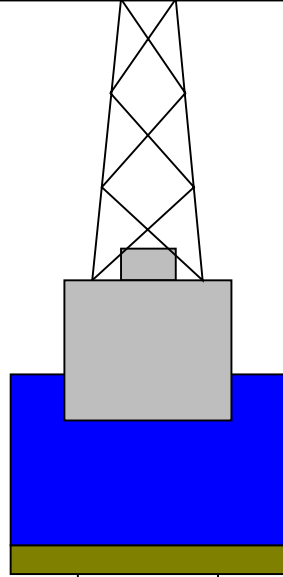
Production String	(in)	(M)	Well Schematic	(M)	(in)	Casing String
	OD	ID		MD	MD	

Kelly Bushing Elevation
Derrick Floor Elevation

11.0
11.0

Mean Sea Level

0.0



3275 4.20

Sea Floor



3275 9.875

3257 3.80

Borehole Segment

Open Hole

3599

Output DLIS Files

DEFAULT	PI_LDL_NGS_007LUP	FN:9	PRODUCER	06-Oct-2009 02:23	3593.6 M	3231.2 M
BACKUPDLISDATA	PI_LDL_NGS_007LUP	FN:10	PRODUCER	05-Oct-2009 17:24	3593.6 M	3231.2 M

OP System Version: 17C0-154

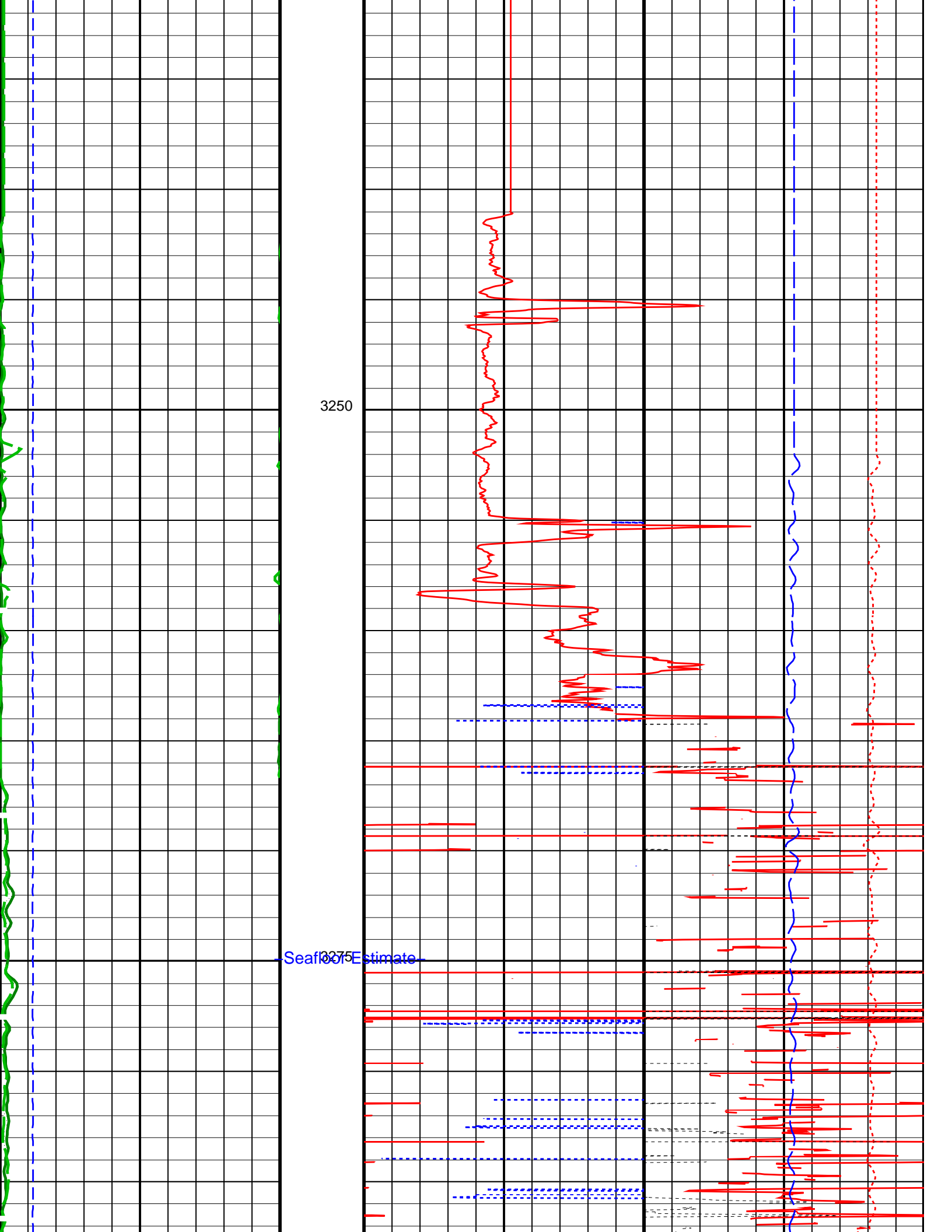
DIT-E	17C0-154	DTA-A	17C0-154
HLDS	17C0-154	LDSC-B	17C0-154
HNGC-B	17C0-154	HNGS-BA	17C0-154
DTC-H	17C0-154		

PIP SUMMARY

Time Mark Every 60 S

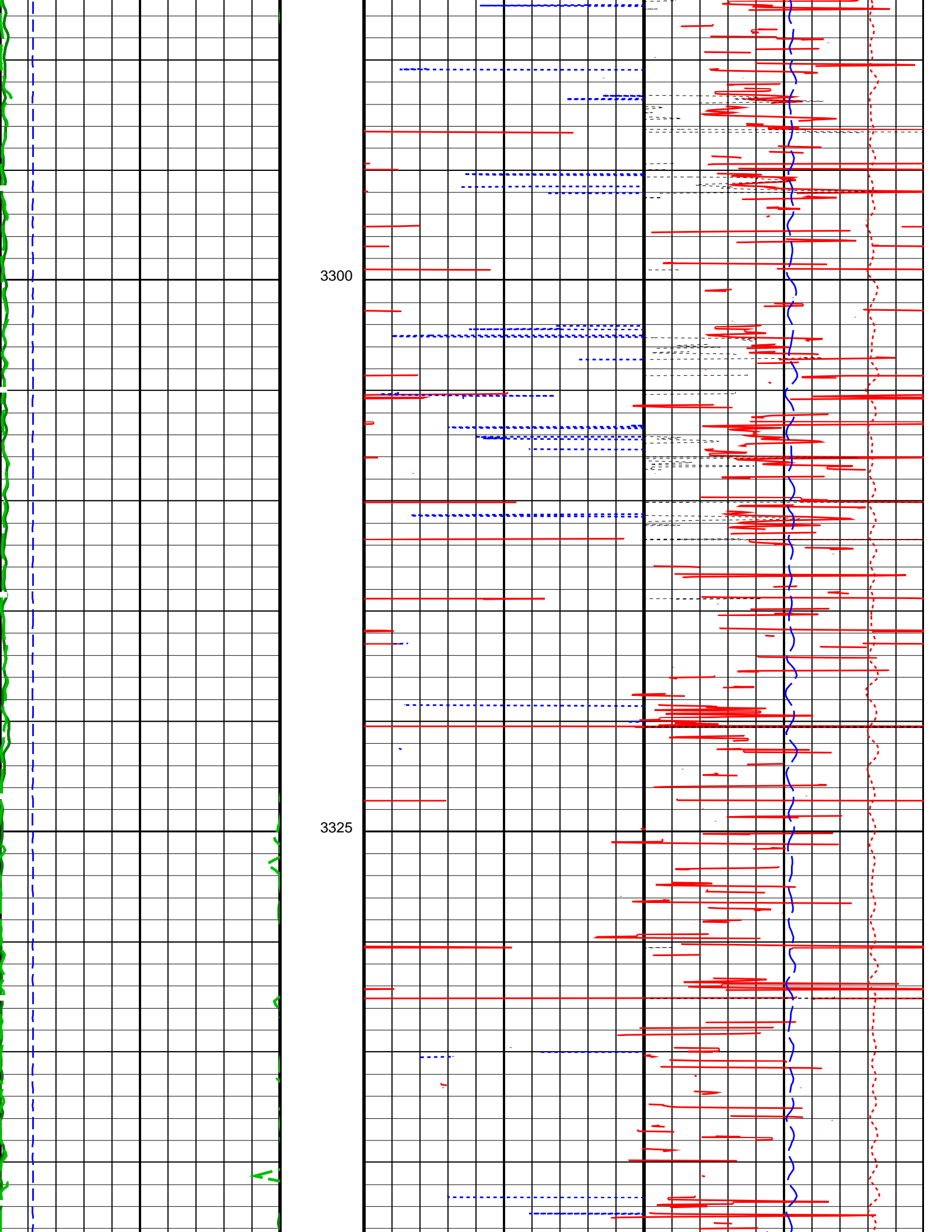
<p style="color: green; text-align: center;">HNGS Spectroscopy Gamma Ray (HSGR)</p> <hr style="border: 1px solid green;"/> <p style="text-align: center;">0 (GAPI) 100</p>	<p style="color: blue; text-align: center;">Tension (TENS)</p> <hr style="border: 1px dashed blue;"/> <p style="text-align: center;">10000 (LBF) 0</p>	
<p style="text-align: center;">Area From HCGR to HSGR</p>	<p style="color: blue; text-align: center;">HLDS HR Bulk Density Correction (HBDC)</p> <hr style="border: 1px dashed blue;"/> <p style="text-align: center;">-0.25 (G/C3) 0.25</p>	<p style="color: red; text-align: center;">Calibrated Downhole Force (CDF)</p> <hr style="border: 1px dashed red;"/> <p style="text-align: center;">5000 (LBF) 0</p>
<p style="color: green; text-align: center;">HNGS Computed Gamma Ray (HCGR)</p> <hr style="border: 1px solid green;"/> <p style="text-align: center;">0 (GAPI) 100</p>	<p style="color: blue; text-align: center;">HLDS HR Long Spaced Photoelectric Effect (HLEF)</p> <hr style="border: 1px dashed blue;"/> <p style="text-align: center;">0 (----) 10</p>	<p style="color: red; text-align: center;">HLDS HR Bulk Density (HROM)</p> <hr style="border: 1px solid red;"/> <p style="text-align: center;">0 (G/C3) 4</p>
<p style="color: blue; text-align: center;">HLDS Caliper (LCAL)</p> <hr style="border: 1px dashed blue;"/> <p style="text-align: center;">0 (IN) 20</p>		

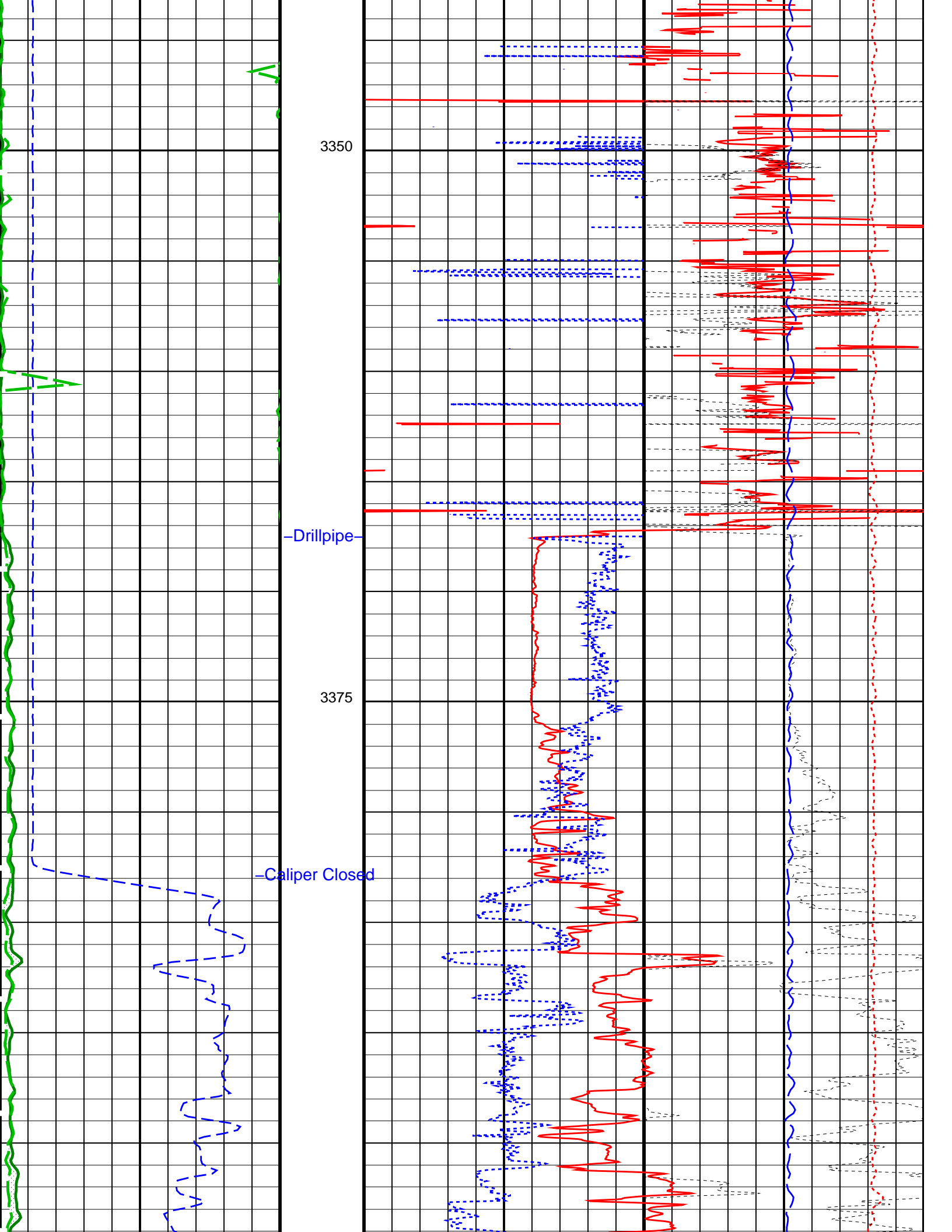
Mainlog2

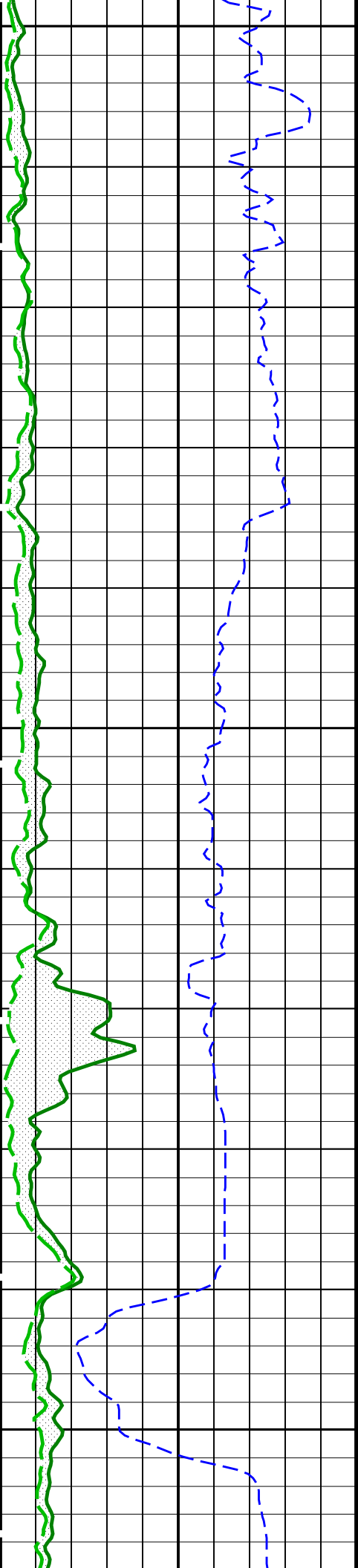


3250

Seafloor Estimate



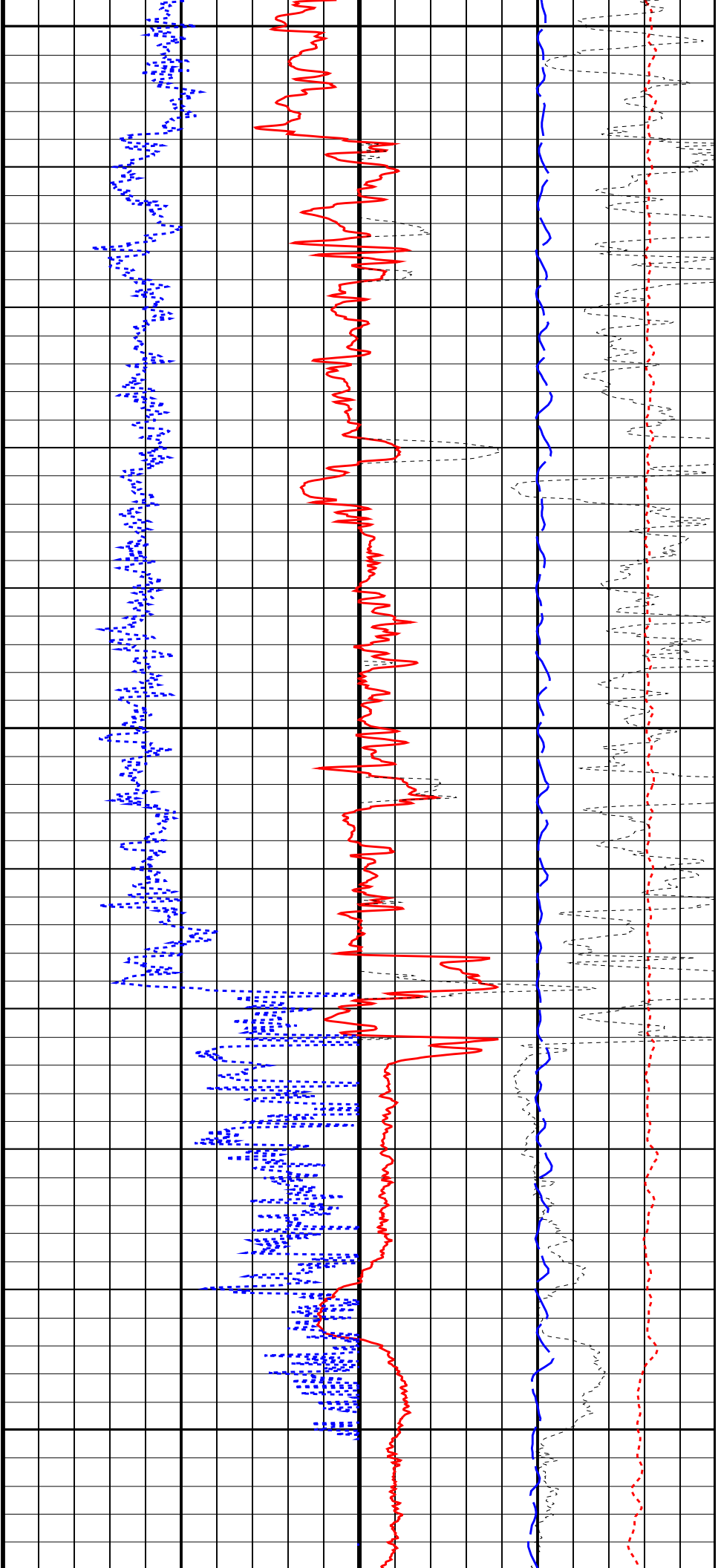


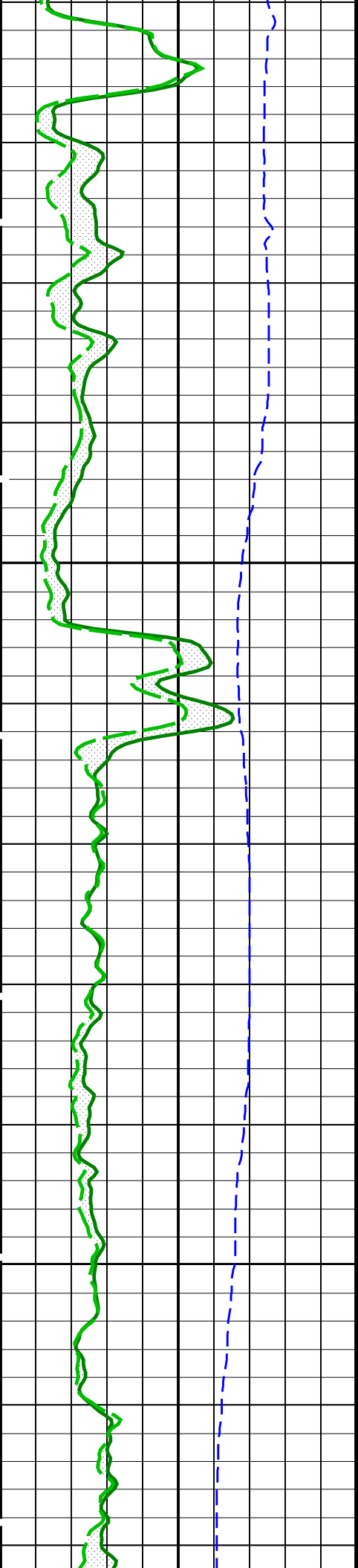


3400

3425

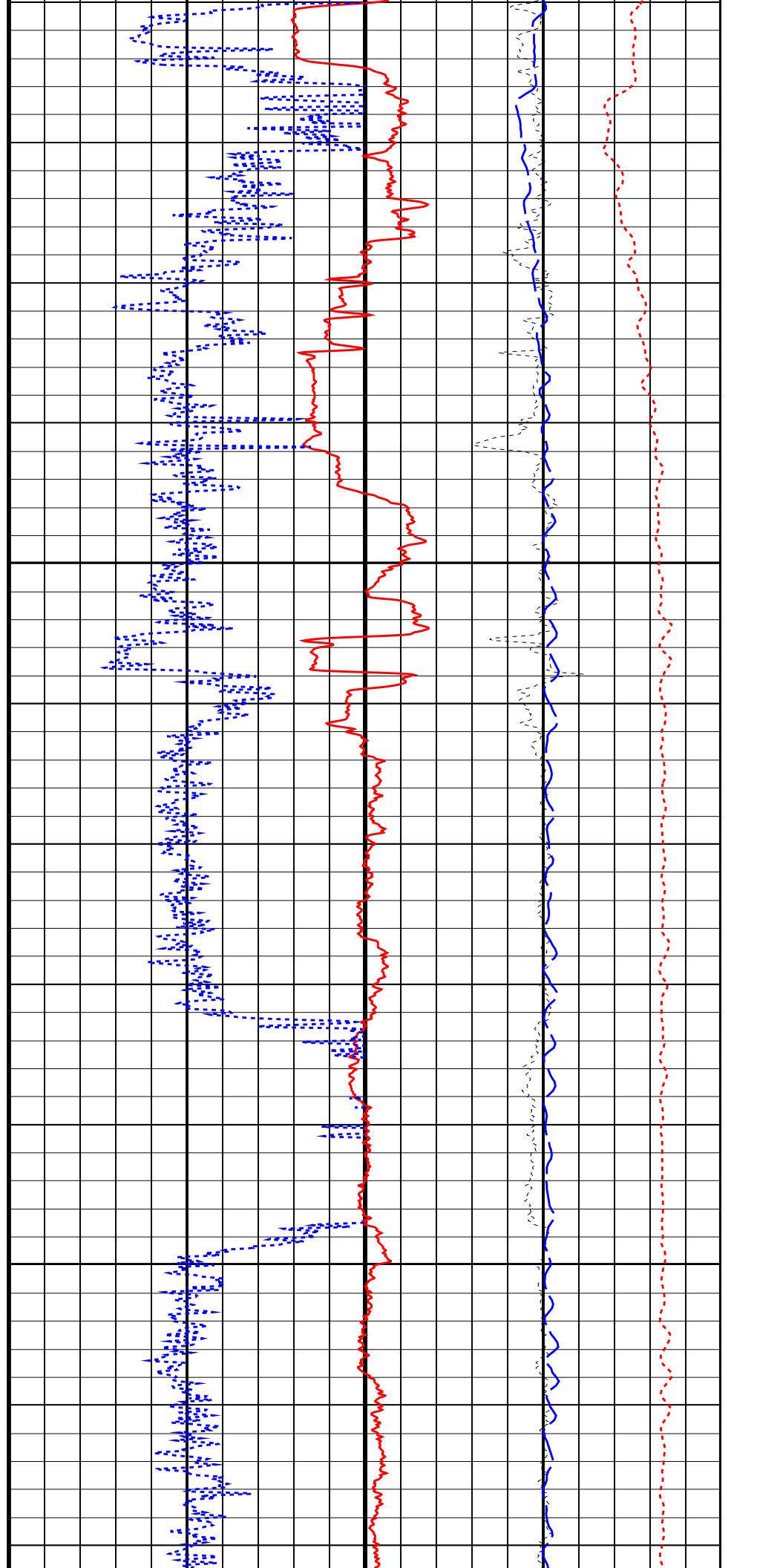
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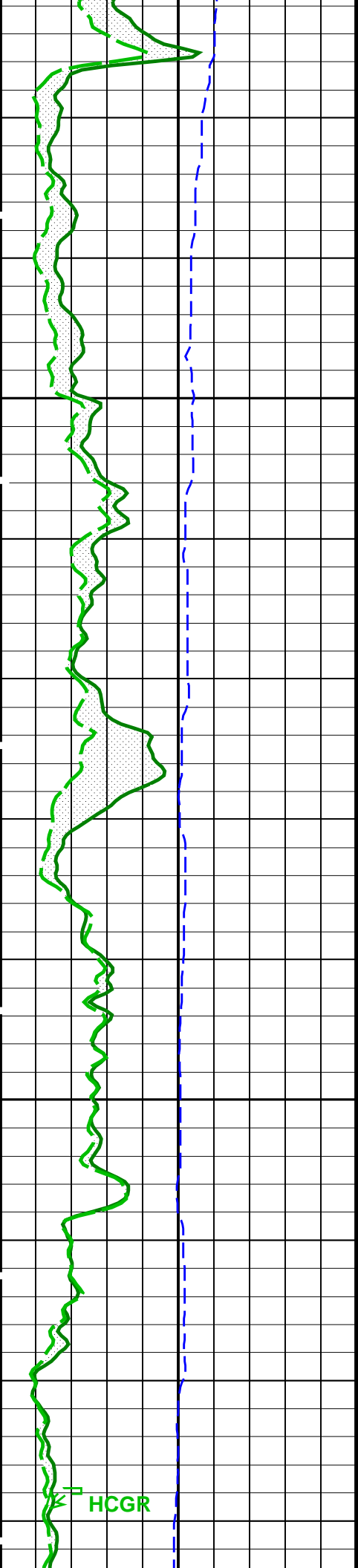




3475

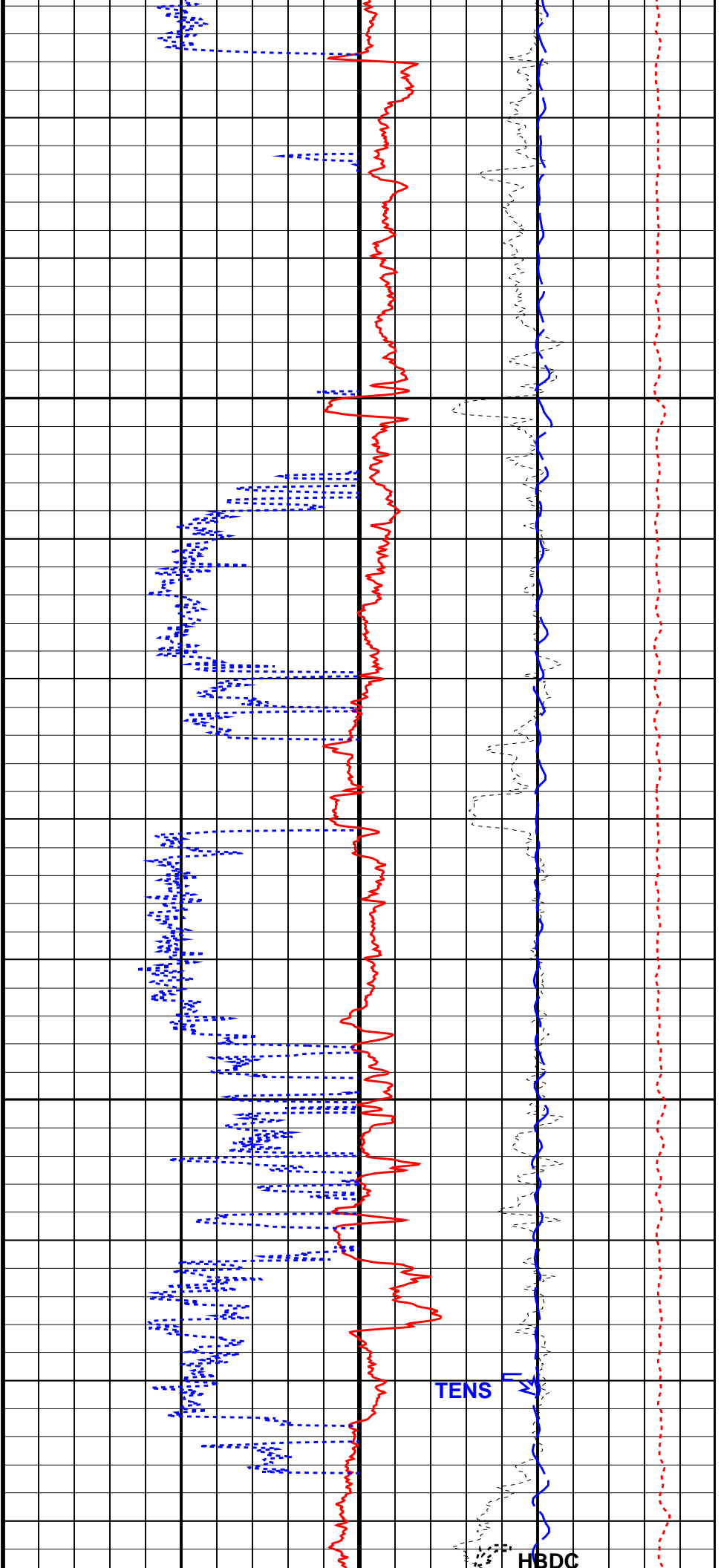
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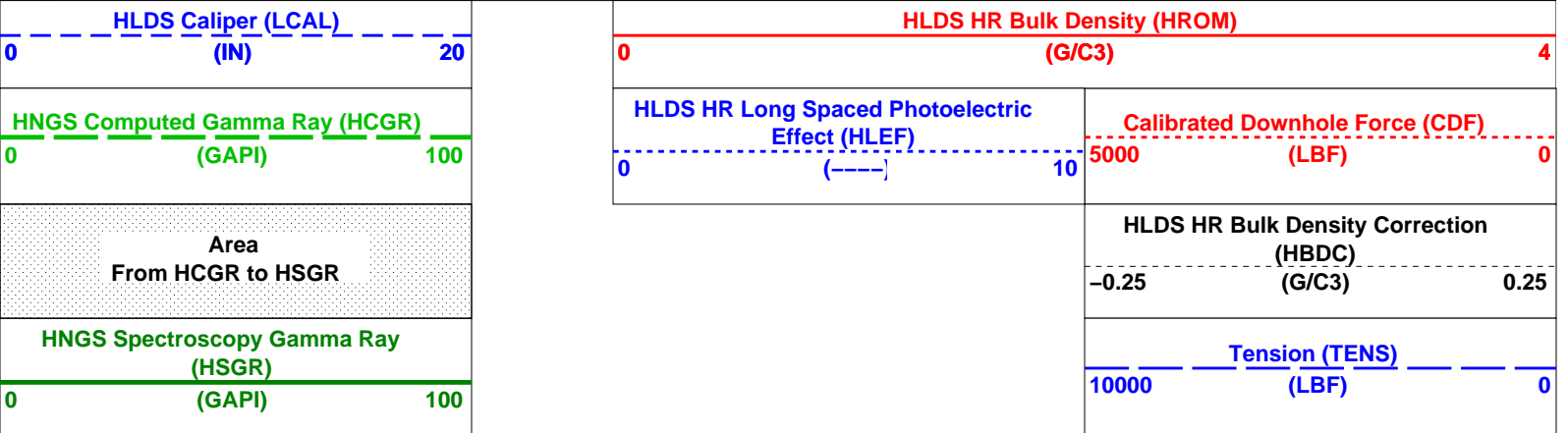
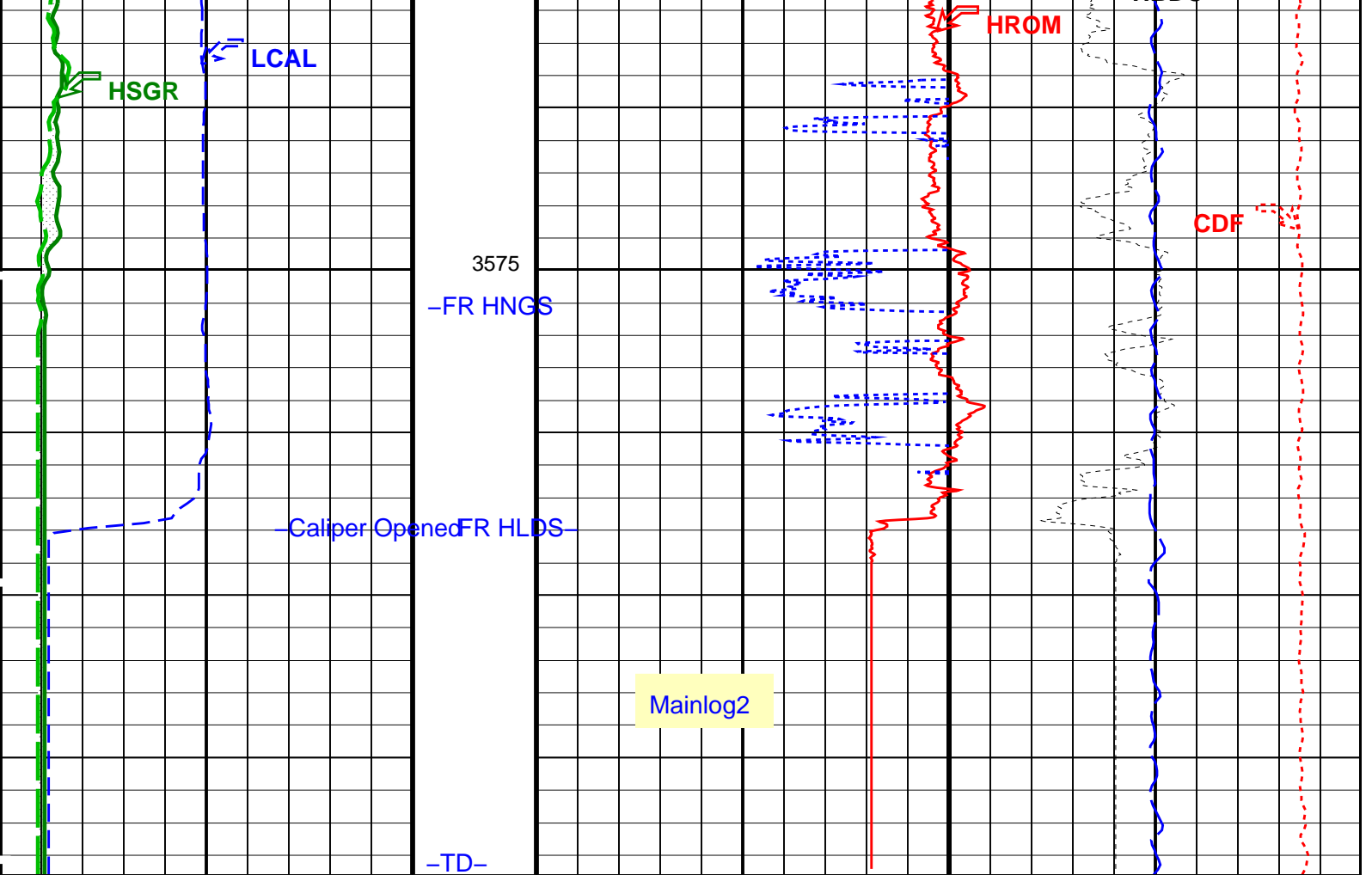




3525

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PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
DIT-E: Dual Induction - E		
BHS	Borehole Status	OPEN
BHT	Bottom Hole Temperature (used in calculations)	45 DEGF
DGF2	Deep 20 kHz Gain Factor	0.979119
DPH2	Deep 20 kHz Phase Shift	0.0159963 DEG
DRE2	Deep Real 20 kHz Sonde Error Correction	17.0457 MM/M
DSR2	Deep Sigma Reference (20 kHz)	1843 MM/M
DXE2	Deep Quad 20 kHz Sonde Error Correction	136.154 MM/M
GCSE	Generalized Caliper Selection	BS
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	0.01 DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
IFRS	DIT-E Induction Frequency Selector	20
IPHA	DIT-E Phasor Processing Mode	ALL
IPRO	DIT-E Induction Processing Selector	PHASOR
ISSBAR	Barite Mud Switch	NOBARITE
ISSEN	DIT-E Induction Frequency Selector	ENABLE

ITEN	DIT-E Temperature Enable	ENABLE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MGF2	Medium 20 kHz Gain Factor	0.974788	
MPH2	Medium 20 kHz Phase Shift	-0.199528	DEG
MRE2	Medium Real 20 kHz Sonde Error Correction	11.3259	MM/M
MSR2	Medium Sigma Reference (20 kHz)	3250	MM/M
MXE2	Medium Quad 20 kHz Sonde Error Correction	172.606	MM/M
SBR	Shoulder Bed Resistivity Factor	1	OHMM
SFCR	SFL Channel Ratio	1000	
SFLE	SFL Enable	ENABLE	
SHT	Surface Hole Temperature	68	DEGF
SPAЕ	DIT-E SPARC Processing Enable	ENABLE	
SPNV	SP Next Value	0	MV

HLDS: Hostile Litho-Density Sonde

CLCL	HLDS LS Control Loop Controller Mode	AUTO_DEFAULT	
CLCS	HLDS SS Control Loop Controller Mode	AUTO_DEFAULT	
CLLS	HLDS Mode Loop Long Spacing	AUTO	
CLSS	HLDS Mode Loop Short Spacing	AUTO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
FD	Fluid Density	1	G/C3
LATC	HLDS Activation Correction	ON	
LLDL	HLDS LS Low Level Discriminator DAC	14000	
LLDS	HLDS SS Low Level Discriminator DAC	14000	
LLML	HLDS LS Low Level Discriminator Mode	AUTO	
LLMS	HLDS SS Low Level Discriminator Mode	AUTO	
MDEN	Matrix Density	2.71	G/C3
PHVL	HLDS Long Spacing High Voltage Setting	1000	V
PHVS	HLDS Short Spacing High Voltage Setting	1000	V
PSDL	HLDS LS Pulse Shape Compensation DAC	30000	
PSDS	HLDS SS Pulse Shape Compensation DAC	30000	
PSML	HLDS LS Pulse Shape Compensation Mode	AUTO	
PSMS	HLDS SS Pulse Shape Compensation Mode	AUTO	

HNGS-BA: Hostile Natural Gamma Ray Sonde

BAR1	HNGS Detector 1 Barite Constant	1	
BAR2	HNGS Detector 2 Barite Constant	1	
BHK	HNGS Borehole Potassium Correction Concentration	0	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	45	DEGF
CSD1	Inner Casing Outer Diameter	0	IN
CSD2	Outer Casing Outer Diameter	0	IN
CSW1	Inner Casing Weight	0	LB/F
CSW2	Outer Casing Weight	0	LB/F
DBCC	HNGS Barite Constant Correction Flag	NONE	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	-0.000849183	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	1.3	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	1.3	CPS
SGRC	HNGS Standard Gamma-Ray Correction Flag	YES	
SHT	Surface Hole Temperature	68	DEGF
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	1.01745	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	0.986824	

System and Miscellaneous

ALTDPCCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	0.000	IN
CWEI	Casing Weight	0.00	LB/F
DFD	Drilling Fluid Density	1.26	G/C3
FLEV	Fluid Level	-50000.00	M
MST	Mud Sample Temperature	-50000.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	11811	FT
TDD	Total Depth - Driller	-50000.00	M
TDL	Total Depth - Logger	-50000.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

DIT-E 17C0-154
 HLDS 17C0-154
 HNGC-B 17C0-154
 DTC-H 17C0-154

DTA-A 17C0-154
 LDSC-B 17C0-154
 HNGS-BA 17C0-154

Output DLIS Files

DEFAULT	PI_LDL_NGS_007LUP	FN:9	PRODUCER	06-Oct-2009 02:23
BACKUPDLISDATA	PI_LDL_NGS_007LUP	FN:10	PRODUCER	05-Oct-2009 17:24

Output DLIS Files

DEFAULT	PI_LDL_NGS_006LUP	FN:7	PRODUCER	06-Oct-2009 00:59	3595.9 M	3329.2 M
BACKUPDLISDATA	PI_LDL_NGS_006LUP	FN:8	PRODUCER	05-Oct-2009 16:00	3595.9 M	3329.2 M

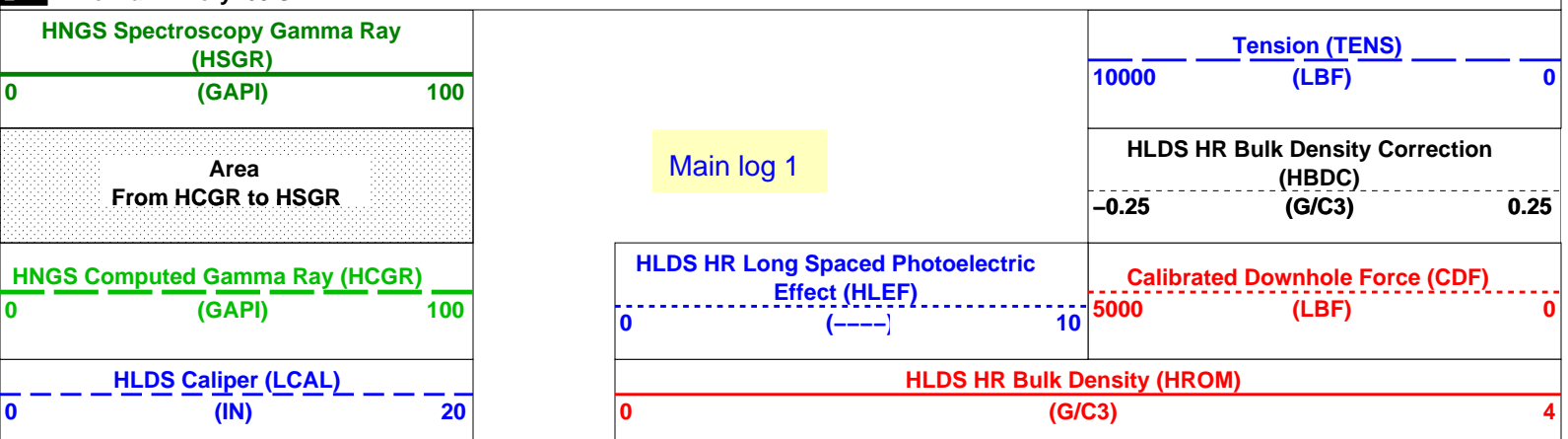
OP System Version: 17C0-154

DIT-E 17C0-154
 HLDS 17C0-154
 HNGC-B 17C0-154
 DTC-H 17C0-154

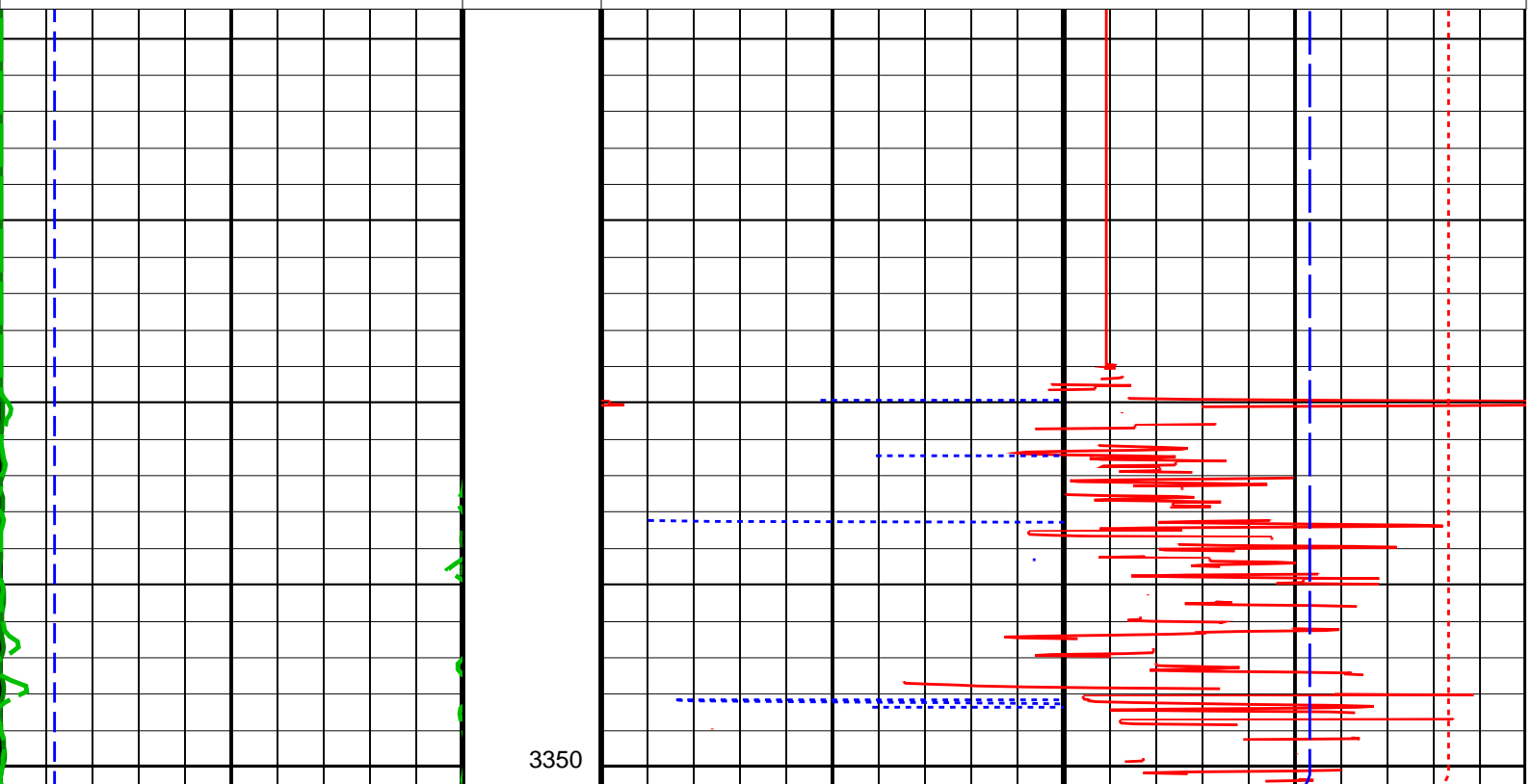
DTA-A 17C0-154
 LDSC-B 17C0-154
 HNGS-BA 17C0-154

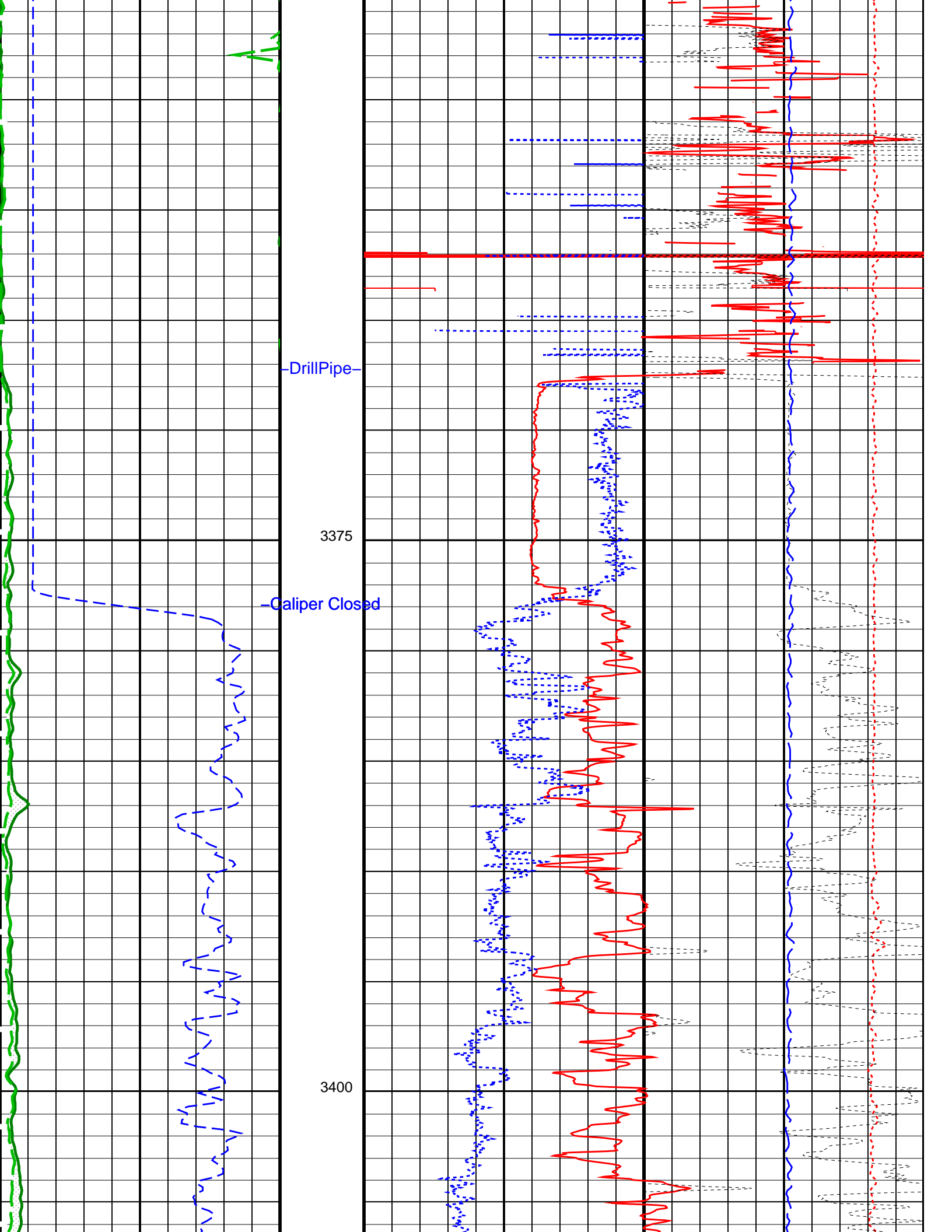
PIP SUMMARY

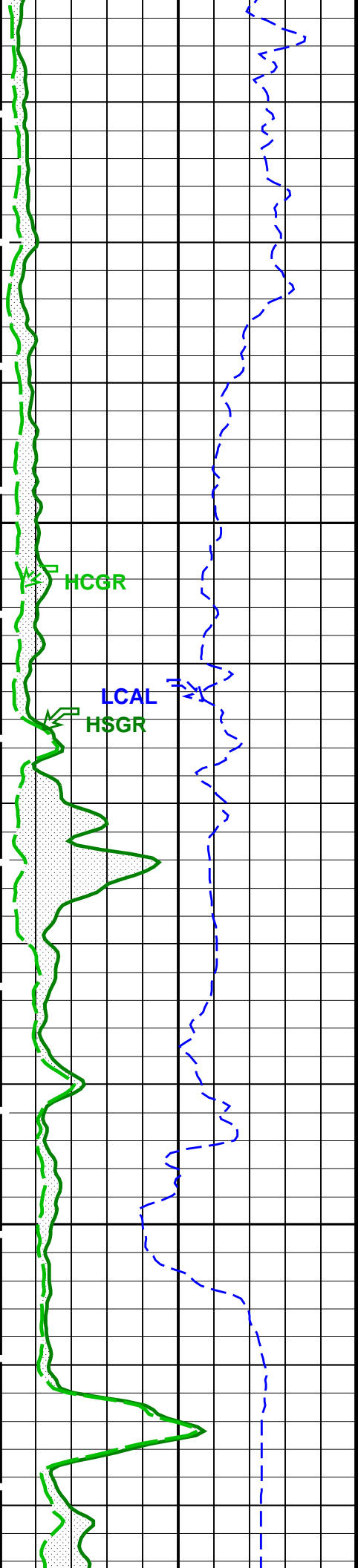
Time Mark Every 60 S



Main log 1

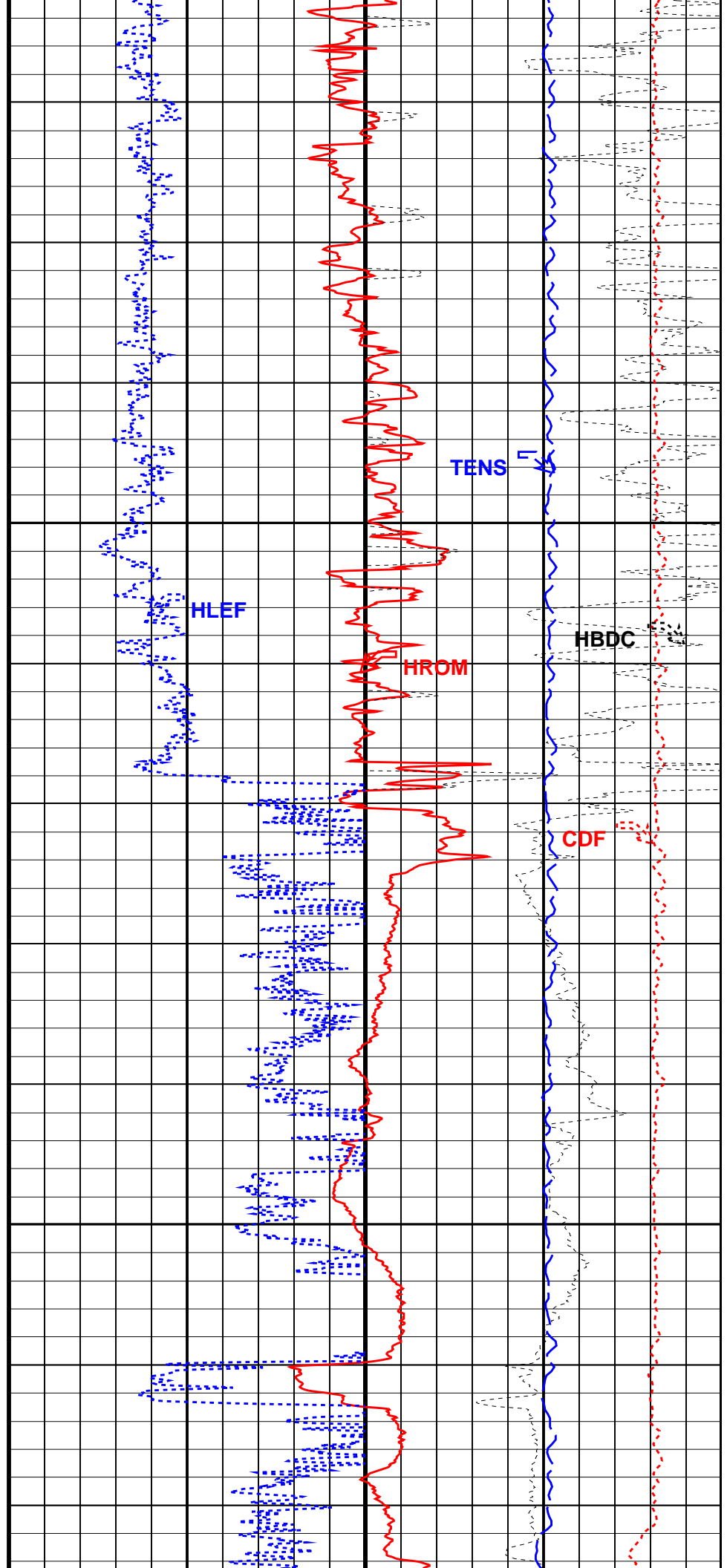


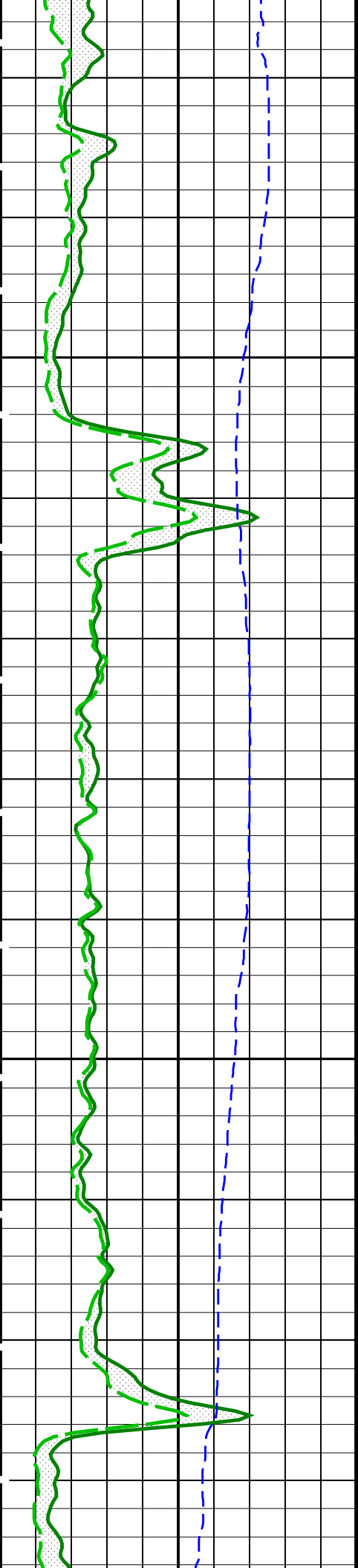




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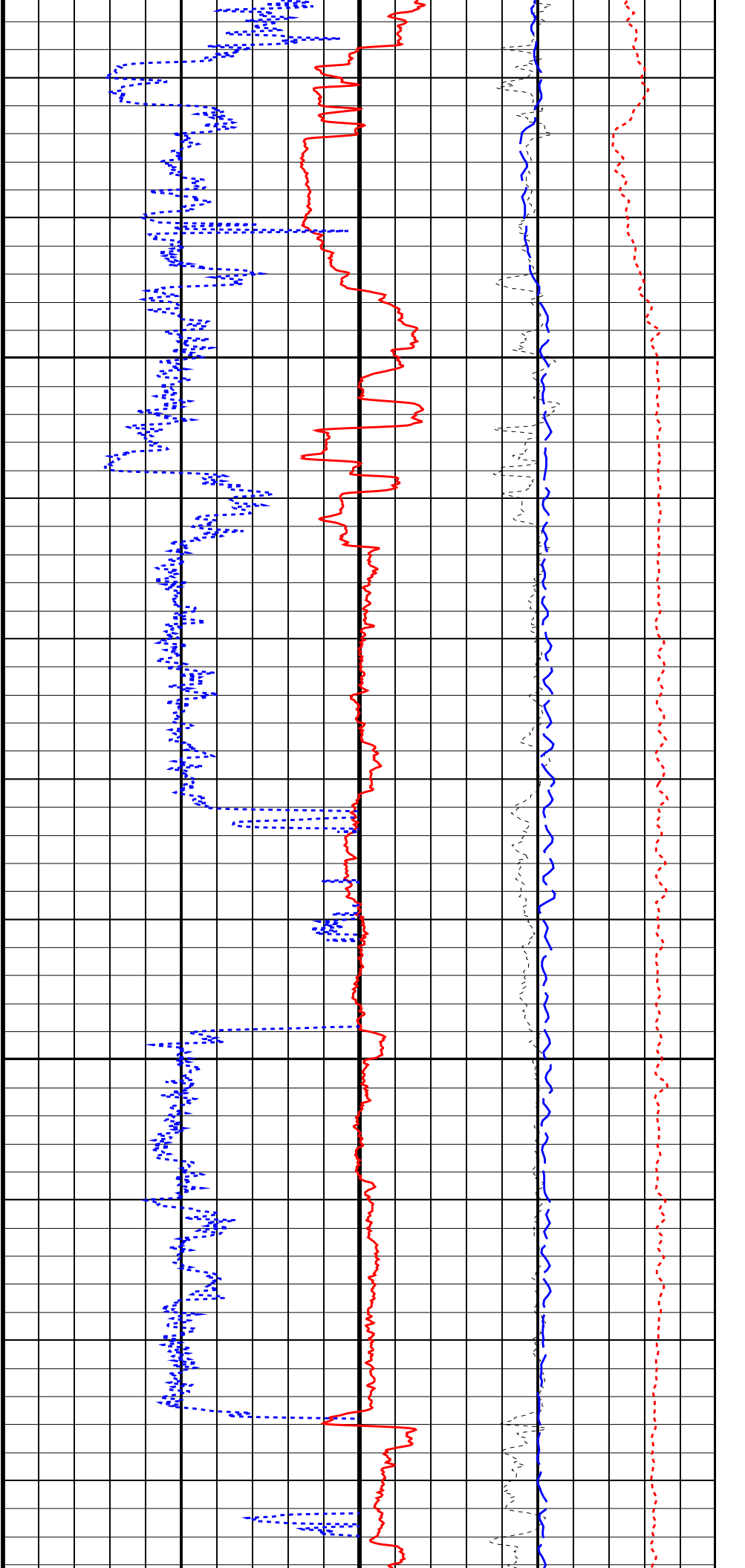
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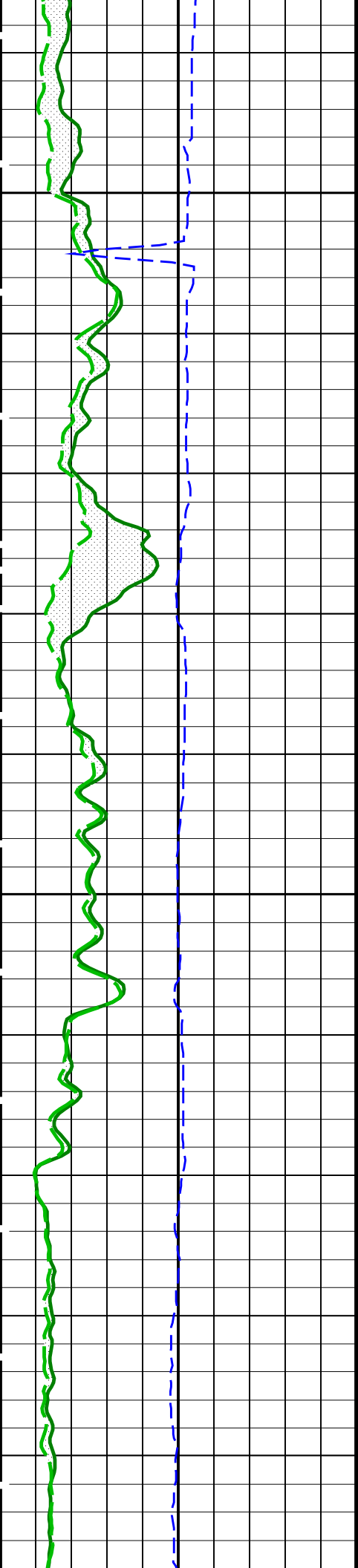




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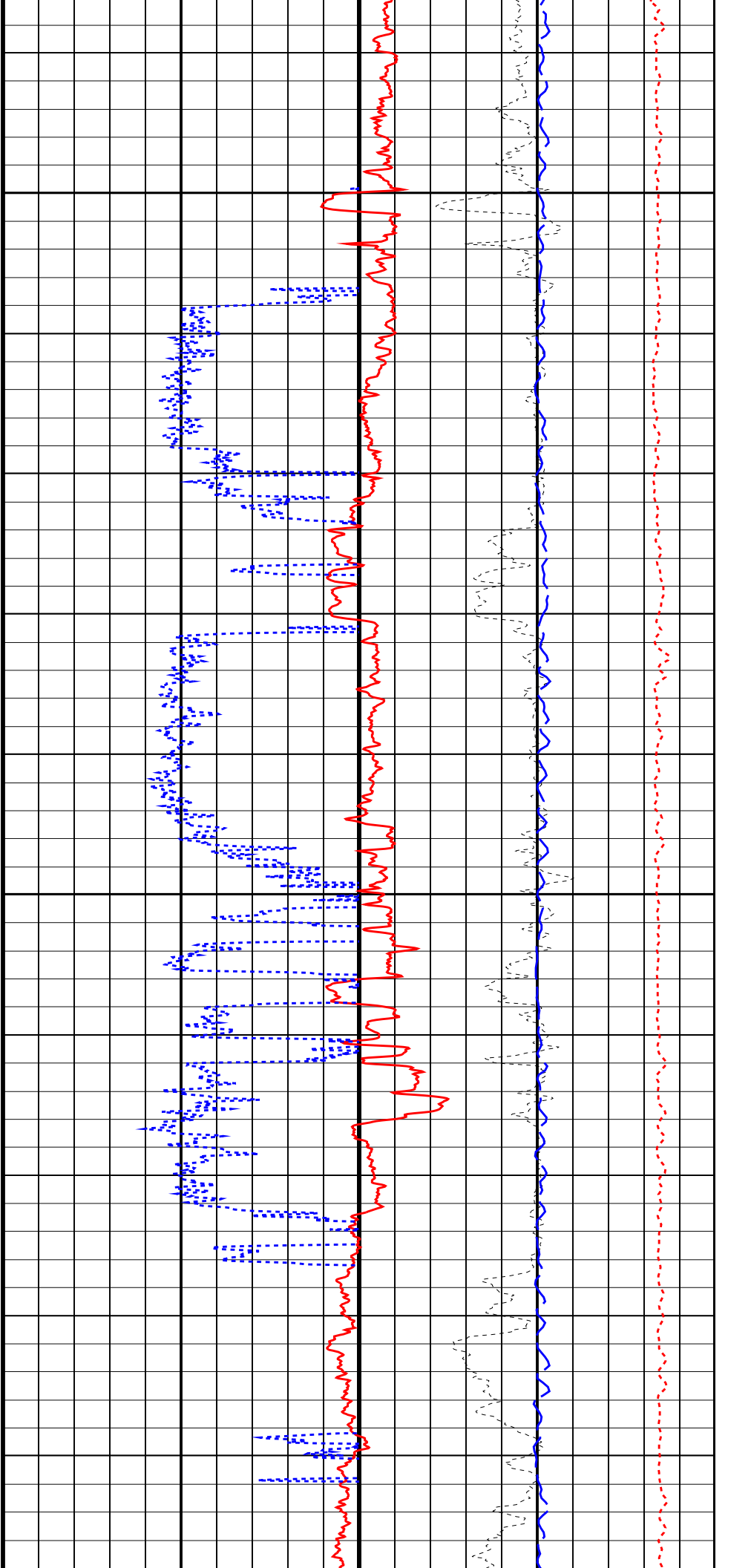
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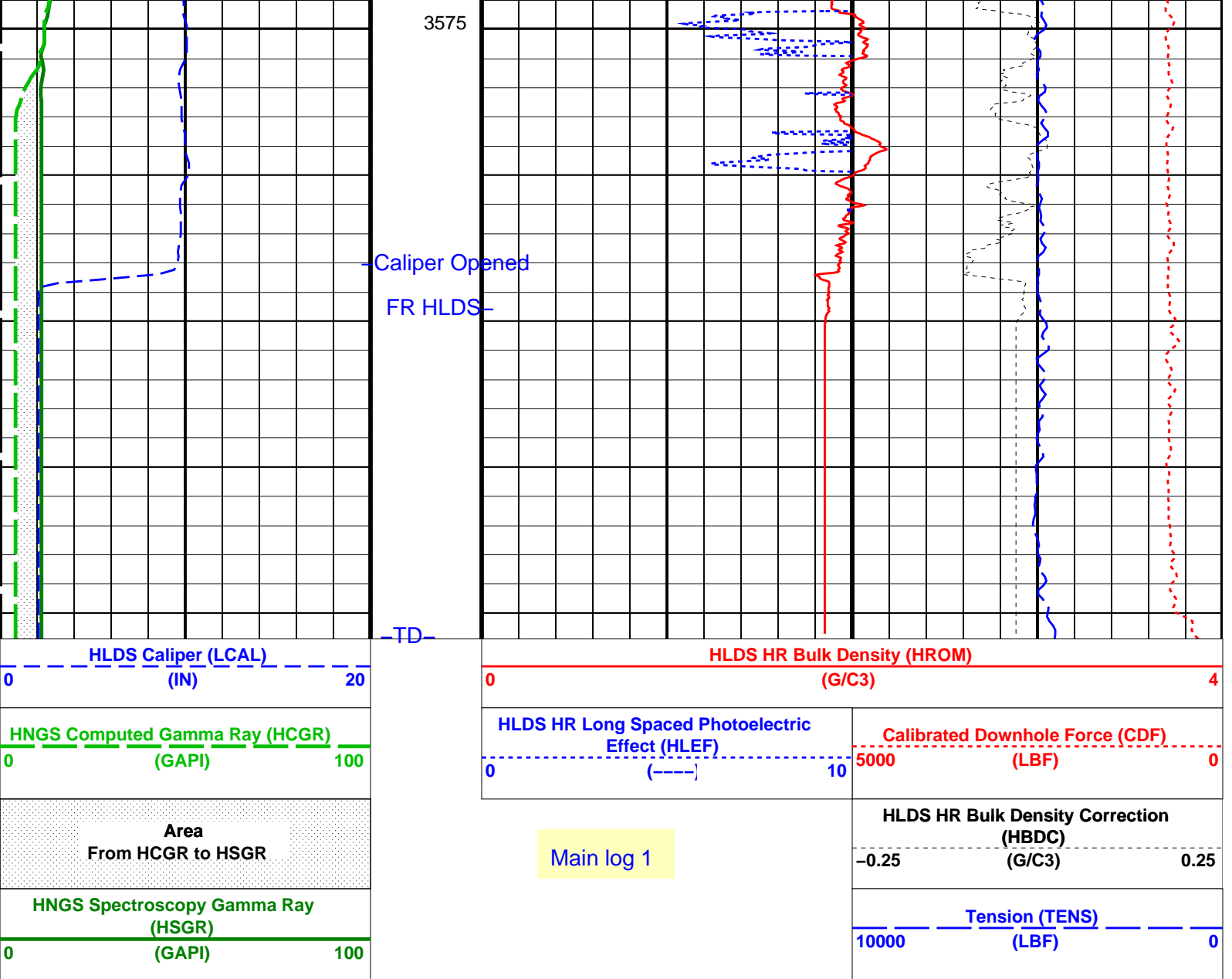




3525

3550





PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
DIT-E: Dual Induction - E		
BHS	Borehole Status	OPEN
BHT	Bottom Hole Temperature (used in calculations)	45 DEG
DGF2	Deep 20 kHz Gain Factor	0.979119
DPH2	Deep 20 kHz Phase Shift	0.0159963 DEG
DRE2	Deep Real 20 kHz Sonde Error Correction	17.0457 MM/M
DSR2	Deep Sigma Reference (20 kHz)	1843 MM/M
DXE2	Deep Quad 20 kHz Sonde Error Correction	136.154 MM/M
GCSE	Generalized Caliper Selection	BS
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	0.01 DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
IFRS	DIT-E Induction Frequency Selector	20
IPHA	DIT-E Phasor Processing Mode	ALL
IPRO	DIT-E Induction Processing Selector	PHASOR
ISSBAR	Barite Mud Switch	NOBARITE
ITEN	DIT-E Temperature Enable	ENABLE
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE
MGF2	Medium 20 kHz Gain Factor	0.974788
MPH2	Medium 20 kHz Phase Shift	-0.199528 DEG
MRE2	Medium Real 20 kHz Sonde Error Correction	11.3259 MM/M
MSR2	Medium Sigma Reference (20 kHz)	3250 MM/M
MXE2	Medium Quad 20 kHz Sonde Error Correction	172.606 MM/M
SBR	Shoulder Bed Resistivity Factor	1 OHMM

SFCR	SFL Channel Ratio	1000	
SFLE	SFL Enable	ENABLE	
SHT	Surface Hole Temperature	68	DEGF
SPAЕ	DIT-E SPARC Processing Enable	ENABLE	
SPNV	SP Next Value	0	MV

HLDS: Hostile Litho-Density Sonde

CLCL	HLDS LS Control Loop Controller Mode	AUTO_DEFAULT	
CLCS	HLDS SS Control Loop Controller Mode	AUTO_DEFAULT	
CLLS	HLDS Mode Loop Long Spacing	AUTO	
CLSS	HLDS Mode Loop Short Spacing	AUTO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
FD	Fluid Density	1	G/C3
LATC	HLDS Activation Correction	ON	
LLDL	HLDS LS Low Level Discriminator DAC	14000	
LLDS	HLDS SS Low Level Discriminator DAC	14000	
LLML	HLDS LS Low Level Discriminator Mode	AUTO	
LLMS	HLDS SS Low Level Discriminator Mode	AUTO	
MDEN	Matrix Density	2.71	G/C3
PHVL	HLDS Long Spacing High Voltage Setting	1000	V
PHVS	HLDS Short Spacing High Voltage Setting	1000	V
PSDL	HLDS LS Pulse Shape Compensation DAC	30000	
PSDS	HLDS SS Pulse Shape Compensation DAC	30000	
PSML	HLDS LS Pulse Shape Compensation Mode	AUTO	
PSMS	HLDS SS Pulse Shape Compensation Mode	AUTO	

HNGS-BA: Hostile Natural Gamma Ray Sonde

BAR1	HNGS Detector 1 Barite Constant	1	
BAR2	HNGS Detector 2 Barite Constant	1	
BHK	HNGS Borehole Potassium Correction Concentration	0	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	45	DEGF
CSD1	Inner Casing Outer Diameter	0	IN
CSD2	Outer Casing Outer Diameter	0	IN
CSW1	Inner Casing Weight	0	LB/F
CSW2	Outer Casing Weight	0	LB/F
DBCC	HNGS Barite Constant Correction Flag	NONE	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GRDR	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	-0.000875068	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	1.3	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	1.3	CPS
SGRC	HNGS Standard Gamma-Ray Correction Flag	YES	
SHT	Surface Hole Temperature	68	DEGF
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	1.27313	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	1.08009	

System and Miscellaneous

ALTDPCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	0.000	IN
CWEI	Casing Weight	0.00	LB/F
DFD	Drilling Fluid Density	1.26	G/C3
FLEV	Fluid Level	-50000.00	M
MST	Mud Sample Temperature	-50000.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	11811	FT
TDD	Total Depth - Driller	-50000.00	M
TDL	Total Depth - Logger	-50000.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: APSLiquidPorosity_1 Vertical Scale: 1:200 Graphics File Created: 06-Oct-2009 00:59

OP System Version: 17C0-154

DIT-E	17C0-154	DTA-A	17C0-154
HLDS	17C0-154	LDSC-B	17C0-154
HNGC-B	17C0-154	HNGS-BA	17C0-154
DTC-H	17C0-154		

Output DLIS Files

DEFAULT	PI_LDL_NGS_006LUP	FN:7	PRODUCER	06-Oct-2009 00:59
BACKUPDLISDATA	PI_LDL_NGS_006LUP	FN:8	PRODUCER	05-Oct-2009 16:00

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Hostile Litho-Density Sonde Wellsite Calibration – Background Measurement							
Master: 18-Sep-2009 2:55 Before: 18-Sep-2009 5:19 After: 6-Oct-2009 5:12							
SS Cs Resolution Bkg	9.000	8.452	8.363	8.426	0.06246	1.800	%
LS Cs Resolution Bkg	9.000	8.580	8.651	8.599	-0.05205	1.800	%
LSW1 Background	100.0	76.04	75.16	74.56	-0.5994	3.000	CPS
LSW2 Background	100.0	69.08	67.85	68.84	0.9836	3.000	CPS
LSW3 Background	200.0	155.5	152.7	154.5	1.819	6.000	CPS
LSW4 Background	250.0	187.6	187.4	187.2	-0.1870	7.500	CPS
LSW5 Background	600.0	426.9	426.3	426.5	0.2204	18.00	CPS
SSW1 Background	100.0	74.38	73.61	74.87	1.256	3.000	CPS
SSW2 Background	200.0	130.0	127.5	128.7	1.249	6.000	CPS
SSW3 Background	500.0	340.0	341.3	343.6	2.380	15.00	CPS
SSW4 Background	270.0	181.2	184.1	184.1	-0.01787	8.100	CPS
SSW5 Background	200.0	132.4	130.8	132.1	1.332	6.000	CPS
Hostile Litho-Density Sonde Wellsite Calibration – Aluminum Measurement							
Master: 18-Sep-2009 4:05							
LSW1 Aluminum	600.0	539.9	N/A	N/A	N/A	N/A	CPS
LSW2 Aluminum	900.0	806.6	N/A	N/A	N/A	N/A	CPS
LSW3 Aluminum	1100	986.0	N/A	N/A	N/A	N/A	CPS
LSW4 Aluminum	580.0	501.1	N/A	N/A	N/A	N/A	CPS
LSW5 Aluminum	570.0	458.2	N/A	N/A	N/A	N/A	CPS
SSW1 Aluminum	2800	2369	N/A	N/A	N/A	N/A	CPS
SSW2 Aluminum	8000	6795	N/A	N/A	N/A	N/A	CPS
SSW3 Aluminum	11600	9808	N/A	N/A	N/A	N/A	CPS
SSW4 Aluminum	5000	4129	N/A	N/A	N/A	N/A	CPS
SSW5 Aluminum	660.0	554.7	N/A	N/A	N/A	N/A	CPS
Hostile Litho-Density Sonde Wellsite Calibration – Lithology Measurement							
Master: 18-Sep-2009 3:57							
LSW1 Iron	400.0	366.5	N/A	N/A	N/A	N/A	CPS
LSW2 Iron	730.0	642.8	N/A	N/A	N/A	N/A	CPS
LSW3 Iron	1000	862.0	N/A	N/A	N/A	N/A	CPS
LSW4 Iron	520.0	447.6	N/A	N/A	N/A	N/A	CPS
LSW5 Iron	470.0	414.9	N/A	N/A	N/A	N/A	CPS
SSW1 Iron	2100	1749	N/A	N/A	N/A	N/A	CPS
SSW2 Iron	6800	5618	N/A	N/A	N/A	N/A	CPS
SSW3 Iron	10800	8869	N/A	N/A	N/A	N/A	CPS
SSW4 Iron	4600	3733	N/A	N/A	N/A	N/A	CPS
SSW5 Iron	580.0	484.8	N/A	N/A	N/A	N/A	CPS
Hostile Litho-Density Sonde Wellsite Calibration – Caliper Calibration							
Before: 18-Sep-2009 5:08							
HLDS Caliper Small Ring	12.00	N/A	14.59	N/A	N/A	N/A	IN
HLDS Caliper Large Ring	15.19	N/A	18.14	N/A	N/A	N/A	IN
Hostile Natural Gamma Ray Sonde Wellsite Calibration – Detector 1 Check							
Master: 5-Sep-2009 7:01 Before: 13-Sep-2009 22:15 After: 6-Oct-2009 5:15							
Na 511 Peak Loc	40.00	39.55	39.60	39.55	-0.04499	1.000	
Na 511 Peak Res	15.50	15.65	16.19	16.19	-0.001600	2.000	%
High Voltage	1150	1146	1180	1180	-0.04395	N/A	V
Na 1785 Peak Loc	142.6	142.8	142.7	141.7	-1.018	7.000	
Na 1785 Peak Res	8.500	7.849	8.372	8.356	-0.01615	2.000	%
Temperature	15.50	14.91	32.53	30.76	-1.774	N/A	DEGC
Na Count Rate	45.00	36.92	35.51	35.28	-0.2280	8.000	CPS
Hostile Natural Gamma Ray Sonde Wellsite Calibration – Detector 2 Check							
Master: 5-Sep-2009 7:01 Before: 13-Sep-2009 22:15 After: 6-Oct-2009 5:15							
Na 511 Peak Loc	40.00	39.62	39.55	39.54	-0.007183	1.000	
Na 511 Peak Res	15.50	15.06	16.55	16.18	-0.3718	2.000	%
High Voltage	1150	1080	1113	1113	-0.2059	N/A	V
Na 1785 Peak Loc	142.6	141.3	142.3	141.9	-0.4169	7.000	
Na 1785 Peak Res	8.500	8.437	9.484	8.502	-0.9824	2.000	%
Temperature	15.50	15.08	32.86	32.67	-0.1886	N/A	DEGC
Na Count Rate	45.00	36.97	36.00	35.45	-0.5474	8.000	CPS

Coincidence Count Rate Ratio	1.000	0.9992	0.9853	0.9952	0.009893	0.05000
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Hostile Natural Gamma Ray Sonde Master Calibration – Detector 1 Calibration

Master: 5-Sep-2009 7:01

Na 511 Peak Set Point	40.00	41.00	---	---	---	---
Th Peak Loc	209.6	210.4	---	---	---	---
Th Peak Res	7.000	6.417	---	---	---	%
Background Count Rate	142.5	18.75	---	---	---	CPS
Gain Ratio	1.000	1.012	---	---	---	---

Hostile Natural Gamma Ray Sonde Master Calibration – Detector 2 Calibration

Master: 5-Sep-2009 7:01

Na 511 Peak Set Point	40.00	41.00	---	---	---	---
Th Peak Loc	209.6	209.5	---	---	---	---
Th Peak Res	7.000	7.001	---	---	---	%
Background Count Rate	142.5	18.87	---	---	---	CPS
Gain Ratio	1.000	1.006	---	---	---	---

Dual Induction – E / Equipment Identification

Primary Equipment:

Dual Induction Sonde	DIS – HB	129
Dual Induction Cartridge	DIC – EB	171

Auxiliary Equipment:

Mass Isolated Housing	MIH – ZA	342
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Hostile Litho–Density Sonde / Equipment Identification

Primary Equipment:

Hostile Litho Density Sonde	HLDS – D	35
Hostile Litho Density High Voltage	HLDV – D	35
Gamma Source Radioactive	GSR – Z	2397

Auxiliary Equipment:

Hostile Litho Density Pad	HLDP – C	35
Hostile Litho Density High Voltage Housi	HEH – H	35

Hostile Litho–Density Sonde Wellsite Calibration

Background Measurement

Phase	SS Cs Resolution Bkg %	Value	Phase	LS Cs Resolution Bkg %	Value	Phase	LSW1 Background CPS	Value	
Master		8.452	Master		8.580	Master		76.04	
Before		8.363	Before		8.651	Before		75.16	
After		8.426	After		8.599	After		74.56	
7.000 (Minimum)		9.000 (Nominal)	7.000 (Minimum)		9.000 (Nominal)	55.00 (Minimum)		100.0 (Nominal)	150.0 (Maximum)
Phase	LSW2 Background CPS	Value	Phase	LSW3 Background CPS	Value	Phase	LSW4 Background CPS	Value	
Master		69.08	Master		155.5	Master		187.6	
Before		67.85	Before		152.7	Before		187.4	
After		68.84	After		154.5	After		187.2	
50.00 (Minimum)		100.0 (Nominal)	110.0 (Minimum)		200.0 (Nominal)	140.0 (Minimum)		250.0 (Nominal)	360.0 (Maximum)
Phase	LSW5 Background CPS	Value	Phase	SSW1 Background CPS	Value	Phase	SSW2 Background CPS	Value	
Master		426.9	Master		74.38	Master		130.0	
Before		426.3	Before		73.61	Before		127.5	
After		426.5	After		74.87	After		128.7	
330.0 (Minimum)		600.0 (Nominal)	55.00 (Minimum)		100.0 (Nominal)	100.0 (Minimum)		200.0 (Nominal)	260.0 (Maximum)
Phase	SSW3 Background CPS	Value	Phase	SSW4 Background CPS	Value	Phase	SSW5 Background CPS	Value	
Master		340.0	Master		181.2	Master		132.4	
Before		341.3	Before		184.1	Before		130.8	

After		343.6	After		184.1	After		132.1	
	280.0 (Minimum)	500.0 (Nominal)	700.0 (Maximum)	150.0 (Minimum)	270.0 (Nominal)	380.0 (Maximum)	110.0 (Minimum)	200.0 (Nominal)	270.0 (Maximum)

Master: 18-Sep-2009 2:55 Before: 18-Sep-2009 5:19 After: 6-Oct-2009 5:12

Hostile Litho-Density Sonde Master Calibration														
Detector Background Measurement														
Phase	LSW1 Background CPS			Value	Phase	LSW2 Background CPS			Value	Phase	LSW3 Background CPS			Value
Master				76.04	Master				69.08	Master				155.5
	55.00 (Minimum)	100.0 (Nominal)	150.0 (Maximum)		50.00 (Minimum)	100.0 (Nominal)	140.0 (Maximum)		110.0 (Minimum)	200.0 (Nominal)	290.0 (Maximum)			
Phase	LSW4 Background CPS			Value	Phase	LSW5 Background CPS			Value	Phase	LS Cs Resolution Bkg %			Value
Master				187.6	Master				426.9	Master				8.580
	140.0 (Minimum)	250.0 (Nominal)	360.0 (Maximum)		330.0 (Minimum)	600.0 (Nominal)	830.0 (Maximum)		7.000 (Minimum)	9.000 (Nominal)	11.00 (Maximum)			
Phase	SSW1 Background CPS			Value	Phase	SSW2 Background CPS			Value	Phase	SSW3 Background CPS			Value
Master				74.38	Master				130.0	Master				340.0
	55.00 (Minimum)	100.0 (Nominal)	150.0 (Maximum)		100.0 (Minimum)	200.0 (Nominal)	260.0 (Maximum)		280.0 (Minimum)	500.0 (Nominal)	700.0 (Maximum)			
Phase	SSW4 Background CPS			Value	Phase	SSW5 Background CPS			Value	Phase	SS Cs Resolution Bkg %			Value
Master				181.2	Master				132.4	Master				8.452
	150.0 (Minimum)	270.0 (Nominal)	380.0 (Maximum)		110.0 (Minimum)	200.0 (Nominal)	270.0 (Maximum)		7.000 (Minimum)	9.000 (Nominal)	11.00 (Maximum)			

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Hostile Litho-Density Sonde Master Calibration														
Detector Aluminum Measurement (bkgd-subtracted)														
Phase	LSW1 Aluminum CPS			Value	Phase	LSW2 Aluminum CPS			Value	Phase	LSW3 Aluminum CPS			Value
Master				539.9	Master				806.6	Master				986.0
	420.0 (Minimum)	600.0 (Nominal)	770.0 (Maximum)		650.0 (Minimum)	900.0 (Nominal)	1150 (Maximum)		800.0 (Minimum)	1100 (Nominal)	1450 (Maximum)			
Phase	LSW4 Aluminum CPS			Value	Phase	LSW5 Aluminum CPS			Value	Phase	SSW1 Aluminum CPS			Value
Master				501.1	Master				458.2	Master				2369
	410.0 (Minimum)	580.0 (Nominal)	740.0 (Maximum)		410.0 (Minimum)	570.0 (Nominal)	740.0 (Maximum)		2000 (Minimum)	2800 (Nominal)	3200 (Maximum)			
Phase	SSW2 Aluminum CPS			Value	Phase	SSW3 Aluminum CPS			Value	Phase	SSW4 Aluminum CPS			Value
Master				6795	Master				9808	Master				4129
	5800 (Minimum)	8000 (Nominal)	9300 (Maximum)		8300 (Minimum)	11600 (Nominal)	13500 (Maximum)		3500 (Minimum)	5000 (Nominal)	5800 (Maximum)			
Phase	SSW5 Aluminum CPS			Value										
Master				554.7										
	470.0 (Minimum)	660.0 (Nominal)	770.0 (Maximum)											

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Hostile Litho-Density Sonde Master Calibration														
Detector Litholog Measurement (bkgd-subtracted)														
Phase	LSW1 Iron CPS			Value	Phase	LSW2 Iron CPS			Value	Phase	LSW3 Iron CPS			Value
Master				366.5	Master				642.8	Master				862.0
	290.0 (Minimum)	400.0 (Nominal)	560.0 (Maximum)		520.0 (Minimum)	730.0 (Nominal)	950.0 (Maximum)		720.0 (Minimum)	1000 (Nominal)	1350 (Maximum)			
Phase	LSW4 Iron CPS			Value	Phase	LSW5 Iron CPS			Value	Phase	SSW1 Iron CPS			Value
Master				447.6	Master				414.9	Master				1749
	370.0 (Minimum)	520.0 (Nominal)	700.0 (Maximum)		340.0 (Minimum)	470.0 (Nominal)	750.0 (Maximum)		1500 (Minimum)	2100 (Nominal)	2400 (Maximum)			
Phase	SSW2 Iron CPS			Value	Phase	SSW3 Iron CPS			Value	Phase	SSW4 Iron CPS			Value
Master				5618	Master				8869	Master				3733
	4900 (Minimum)	6800 (Nominal)	7900 (Maximum)		7800 (Minimum)	10800 (Nominal)	12600 (Maximum)		3300 (Minimum)	4600 (Nominal)	5400 (Maximum)			
Phase	SSW5 Iron CPS			Value										
Master				484.8										
	420.0 (Minimum)	580.0 (Nominal)	680.0 (Maximum)											

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Hostile Litho-Density Sonde Master Calibration

Quality Ratios

Phase	AL CALIBRATION RATIO 1	Value	Phase	AL CALIBRATION RATIO 2	Value	Phase	AL CALIBRATION RATIO 3	Value
Master		1.028	Master		2.094	Master		0.5628
	0.9000 (Minimum) 1.000 (Nominal) 1.100 (Maximum)			1.900 (Minimum) 2.100 (Nominal) 2.300 (Maximum)			0.4500 (Minimum) 0.5500 (Nominal) 0.6500 (Maximum)	
Phase	AL CALIBRATION RATIO 4	Value	Phase	Pad-Wear SS Ratio	Value	Phase	Pad-Wear LS Ratio	Value
Master		0.5058	Master		0.9917	Master		0.9948
	0.4000 (Minimum) 0.5500 (Nominal) 0.6500 (Maximum)			0.9800 (Minimum) 0.9880 (Nominal) 0.9960 (Maximum)			0.9800 (Minimum) 0.9880 (Nominal) 0.9960 (Maximum)	
Phase	Pad-Position SS Ratio	Value	Phase	Pad-Position LS Ratio	Value			
Master		1.002	Master		0.9855			
	0.9900 (Minimum) 0.9940 (Nominal) 1.015 (Maximum)			0.9850 (Minimum) 0.9940 (Nominal) 1.010 (Maximum)				

Master: 18-Sep-2009 4:05

Litho-Density Spectroscopy Cartridge - B / Equipment Identification

Primary Equipment: LDSC Cartridge	LDSC - B	521
Auxiliary Equipment: LDSC Housing	LDSH - A	126

Hostile Natural Gamma Ray Cartridge - B / Equipment Identification

Primary Equipment: HNGC Cartridge	HNGC - B	300
Auxiliary Equipment: HNGC Housing	HNGH - A	115

Hostile Natural Gamma Ray Sonde / Equipment Identification

Primary Equipment: HNGS Sonde	HNGS - BA	194
Auxiliary Equipment: HNGS Sonde Housing Gamma Source Radioactive	HNSH - BA GSR - U	205 616008

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Detector 1 Check

Phase	Na 511 Peak Loc	Value	Phase	Na 511 Peak Res %	Value	Phase	High Voltage V	Value
Master		39.55	Master		15.65	Master		1146
Before		39.60	Before		16.19	Before		1180
After		39.55	After		16.19	After		1180
	37.50 (Minimum) 40.00 (Nominal) 43.50 (Maximum)			12.00 (Minimum) 15.50 (Nominal) 19.00 (Maximum)			900.0 (Minimum) 1150 (Nominal) 1600 (Maximum)	
Phase	Na 1785 Peak Loc	Value	Phase	Na 1785 Peak Res %	Value	Phase	Temperature DEGC	Value
Master		142.8	Master		7.849	Master		14.91
Before		142.7	Before		8.372	Before		32.53
After		141.7	After		8.356	After		30.76
	135.0 (Minimum) 142.6 (Nominal) 150.3 (Maximum)			7.000 (Minimum) 8.500 (Nominal) 11.00 (Maximum)			-28.89 (Minimum) 15.50 (Nominal) 60.00 (Maximum)	

Phase	Na Count Rate CPS	Value
Master		36.92
Before		35.51
After		35.28

Hostile Natural Gamma Ray Sonde Wellsite Calibration																				
Detector 2 Check																				
Phase	Na 511 Peak Loc		Value	Phase	Na 511 Peak Res %		Value	Phase	High Voltage V		Value									
Master			39.62	Master			15.06	Master			1080									
Before			39.55	Before			16.55	Before			1113									
After			39.54	After			16.18	After			1113									
37.50 (Minimum)			40.00 (Nominal)	43.50 (Maximum)			12.00 (Minimum)			15.50 (Nominal)	19.00 (Maximum)			900.0 (Minimum)			1150 (Nominal)	1600 (Maximum)		
Phase	Na 1785 Peak Loc		Value	Phase	Na 1785 Peak Res %		Value	Phase	Temperature DEGC		Value									
Master			141.3	Master			8.437	Master			15.08									
Before			142.3	Before			9.484	Before			32.86									
After			141.9	After			8.502	After			32.67									
135.0 (Minimum)			142.6 (Nominal)	150.3 (Maximum)			7.000 (Minimum)			8.500 (Nominal)	11.00 (Maximum)			-28.89 (Minimum)			15.50 (Nominal)	60.00 (Maximum)		
Phase	Na Count Rate CPS		Value																	
Master			36.97																	
Before			36.00																	
After			35.45																	
10.00 (Minimum)			45.00 (Nominal)	100.0 (Maximum)																

Hostile Natural Gamma Ray Sonde Wellsite Calibration						
Ratio Of Detector 1 To Detector 2						
Phase	Coincidence Count Rate Ratio	Value				
Master		0.9992				
Before		0.9853				
After		0.9952				
0.9500 (Minimum)			1.000 (Nominal)	1.050 (Maximum)		

Hostile Natural Gamma Ray Sonde Master Calibration																				
Detector 1 Calibration																				
Phase	Na 511 Peak Set Point		Value	Phase	Th Peak Loc		Value	Phase	Th Peak Res %		Value									
Master			41.00	Master			210.4	Master			6.417									
38.00 (Minimum)			40.00 (Nominal)	43.00 (Maximum)			201.0 (Minimum)			209.6 (Nominal)	218.3 (Maximum)			5.000 (Minimum)			7.000 (Nominal)	9.000 (Maximum)		
Phase	Background Count Rate CPS		Value	Phase	Gain Ratio		Value													
Master			18.75	Master			1.012													
10.00 (Minimum)			142.5 (Nominal)	265.0 (Maximum)			0.9400 (Minimum)			1.000 (Nominal)	1.060 (Maximum)									

Hostile Natural Gamma Ray Sonde Master Calibration																				
Detector 2 Calibration																				
Phase	Na 511 Peak Set Point		Value	Phase	Th Peak Loc		Value	Phase	Th Peak Res %		Value									
Master			41.00	Master			209.5	Master			7.001									
38.00 (Minimum)			40.00 (Nominal)	43.00 (Maximum)			201.0 (Minimum)			209.6 (Nominal)	218.3 (Maximum)			5.000 (Minimum)			7.000 (Nominal)	9.000 (Maximum)		
Phase	Background Count Rate CPS		Value	Phase	Gain Ratio		Value													
Master			18.87	Master			1.006													
10.00 (Minimum)			142.5 (Nominal)	265.0 (Maximum)			0.9400 (Minimum)			1.000 (Nominal)	1.060 (Maximum)									

DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC-H Auxiliary Cartridge
DTC-H Telemetry Cartridge

DTCH - A 8798
DTCH - A 8798

Auxiliary Equipment:

DTCH Telemetry Cartridge Housing

ECH - KC 1777

Company: **Lamont Doherty**

Schlumberger

Well: **Expedition 324 Site U1348A**

Field: **Shatsky Rise**

Rig: **JOIDES Resolution**

Ocean: **Pacific**

Hostile Litho Density (HLDS)

Natural Gamma Spectroscopy (HNCS)