Schlumberger

Company: **Lamont Doherty Earth Observatory**

Well: **Expedition 349, Site U1431E**
Field: **South China Sea Tectonics**
Rig: **JOIDES Resolution** Ocean: **South China Sea**

High Resolution Laterolog Array (HRLA)
Log Quality Control

Rig: JOIDES Resolution
Field: South China Sea Tectonics
Location: Latitude: N 15.375633*
Well: Expedition 349, Site U1431E
Company: Lamont Doherty Earth Observatory

LOCATION

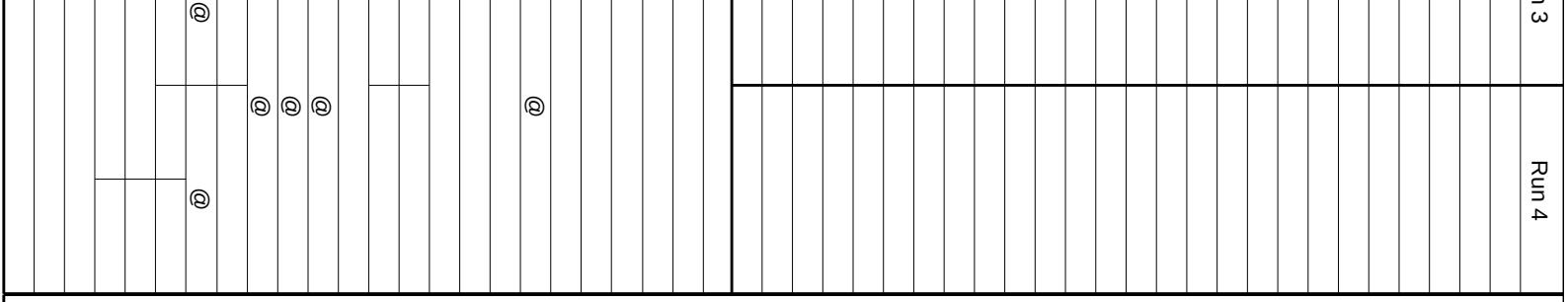
Latitude: N 15.375633*
Longitude: E 116.999838*

Elev.: K.B. −4251.00 m
G.L. 0.00 m
D.F. −4251.00 m

Permanent Datum: Sea Floor — Elev.: 0.00 m
Log Measured From: Sea Floor — 0.00 m above Perm. Datum
Drilling Measured From: Sea Floor

API Serial No.	N 15.375633	E 116.999838	

			Run 1	Run 2	Run
Logging Date	14−Feb−2014				
Run Number	1				
Depth Driller	1008 m				
Schlumberger Depth	471 m				
Bottom Log Interval	471 m				
Top Log Interval	0 m				
Casing Driller Size @ Depth	13.375 in @ 149 m	@		@	
Casing Schlumberger	155 m				
Bit Size	9.875 in				
Type Fluid In Hole	Seawater−Sepiolite				
MUD Density / Viscosity	1.029 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	@ 7	@ 7	@	@	
Maximum Recorded Temperatures	7 degC				
Circulation Stopped / Time	14−Feb−2014	3:00			
Logger On Bottom / Time	14−Feb−2014	18:12			
Unit Number / Location	625003	Houston			
Recorded By	K. Swain				
Witnessed By	T. Williams				



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OTHER SERVICES1	OTHER SERVICES2
OS1: FMS/DSI	OS1:
OS2: MSS	OS2:
OS3: HRLA/HLDS/APS/HNGS	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
Hole drilled with RCB coring bit and bottom hole assembly (BHA). 9 7/8 " BS	
Sea floor depth reference used for this presented log. Original log files	
recorded were taken with depth reference at drill floor.	
Borehole correction utilizing bit size (BS) as requested.	
Original log files acquired for barite 11.5 lb/gal mud but later reprocessed	
for sea water 1.03 g/cc and no barite per client request due to mud absent.	
2 MCD (mechanical Caliper Device) centralizers run with HRLA. 2 knuckle	
joints and 1 thru wired extension separates the centralized HRLA from	
the eccentered HLDS/APS.	
Active Heave Compensator in use for all open hole logs.	
The RCB bit was dropped at the bottom of the hole prior to logging.	
Calibration out of date warning due to Summary Listing created later.	
Heavy mud was pumped into hole but due to hole washouts, logging tools	
never immersed in heavy mud as logging tools bridged out before getting	
into the heavy mud volume.	

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

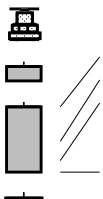
EQUIPMENT DESCRIPTION

RUN 1	RUN 2

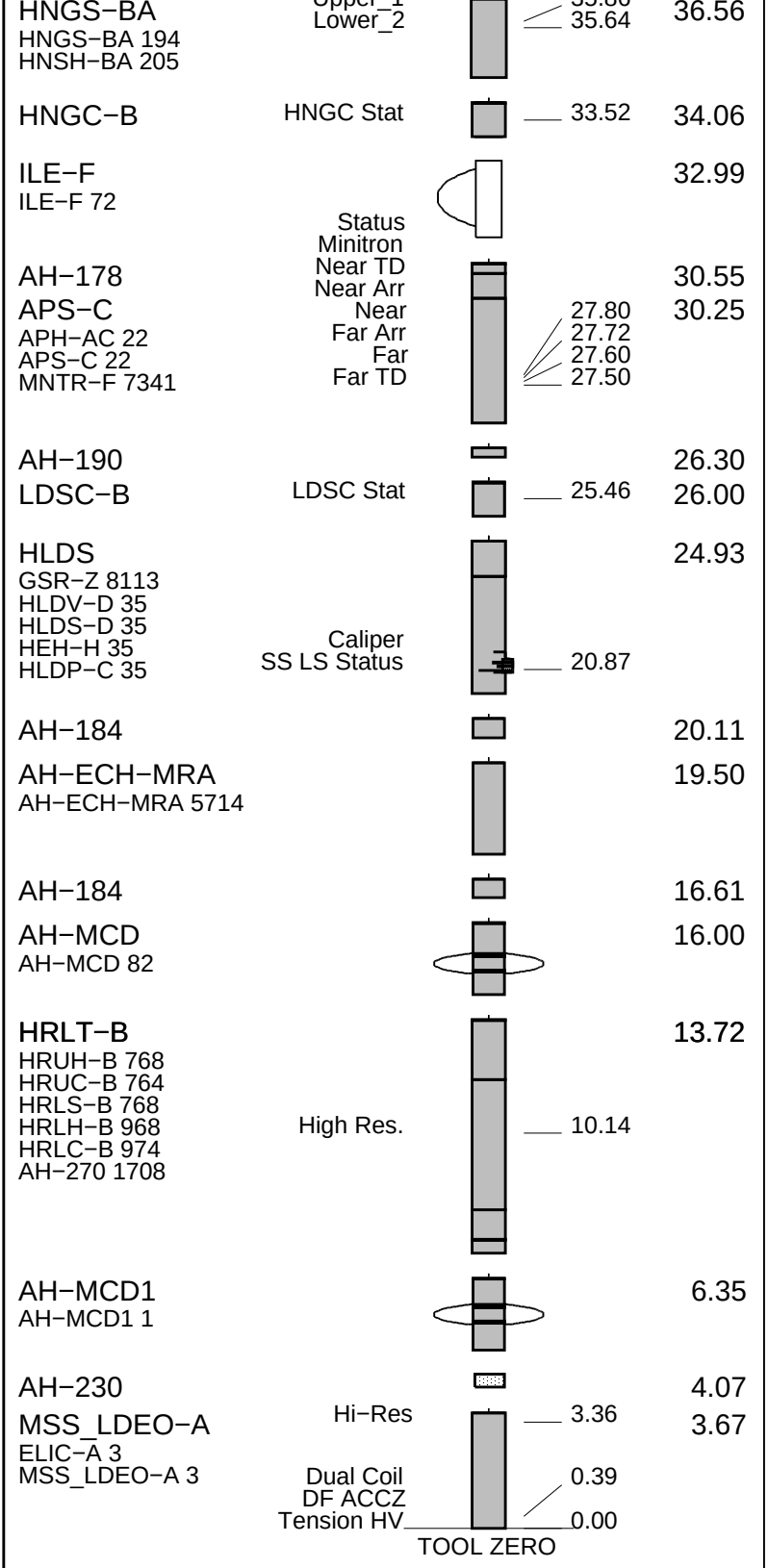
SURFACE EQUIPMENT

SFT−281 1
SFT−178 1
GSR−U 616008
WITM (EDTS)−A

DOWNHOLE EQUIPMENT

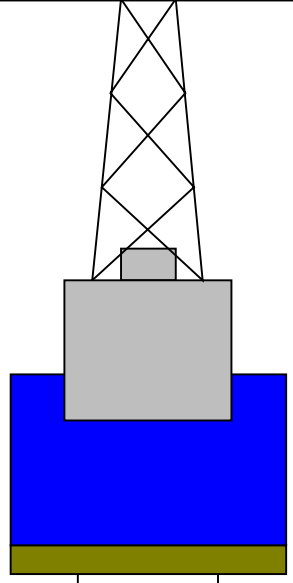


LEH−MT 101	MDSB_EDTC	39.93
	Mud Tempe	
AH−369	CTEM	38.97
	Gamma Ray	
EDTC−B	EFTB DIAG	38.54
EDTH−B 8303	TelStatus	
EDTC−B 8317	EDTCB Ele	
	Upper_1	



MAXIMUM STRING DIAMETER 4.50 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

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



Kelly Bushing Elevation	−425.1			
Derrick Floor Elevation	−425.1			
Mean Sea Level	−424.0			
			4.1	
		0	4.1	Sea Floor
		149.6	9.875	Open Hole
		1008.8		Total Depth

Input DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_028PUP	FN:50	PRODUCER	16−Feb−2014 05:20	4725.2 M	4201.1 M

Output DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_046PUP	FN:66	PRODUCER	01−Mar−2014 12:26	473.2 M	−50.9 M

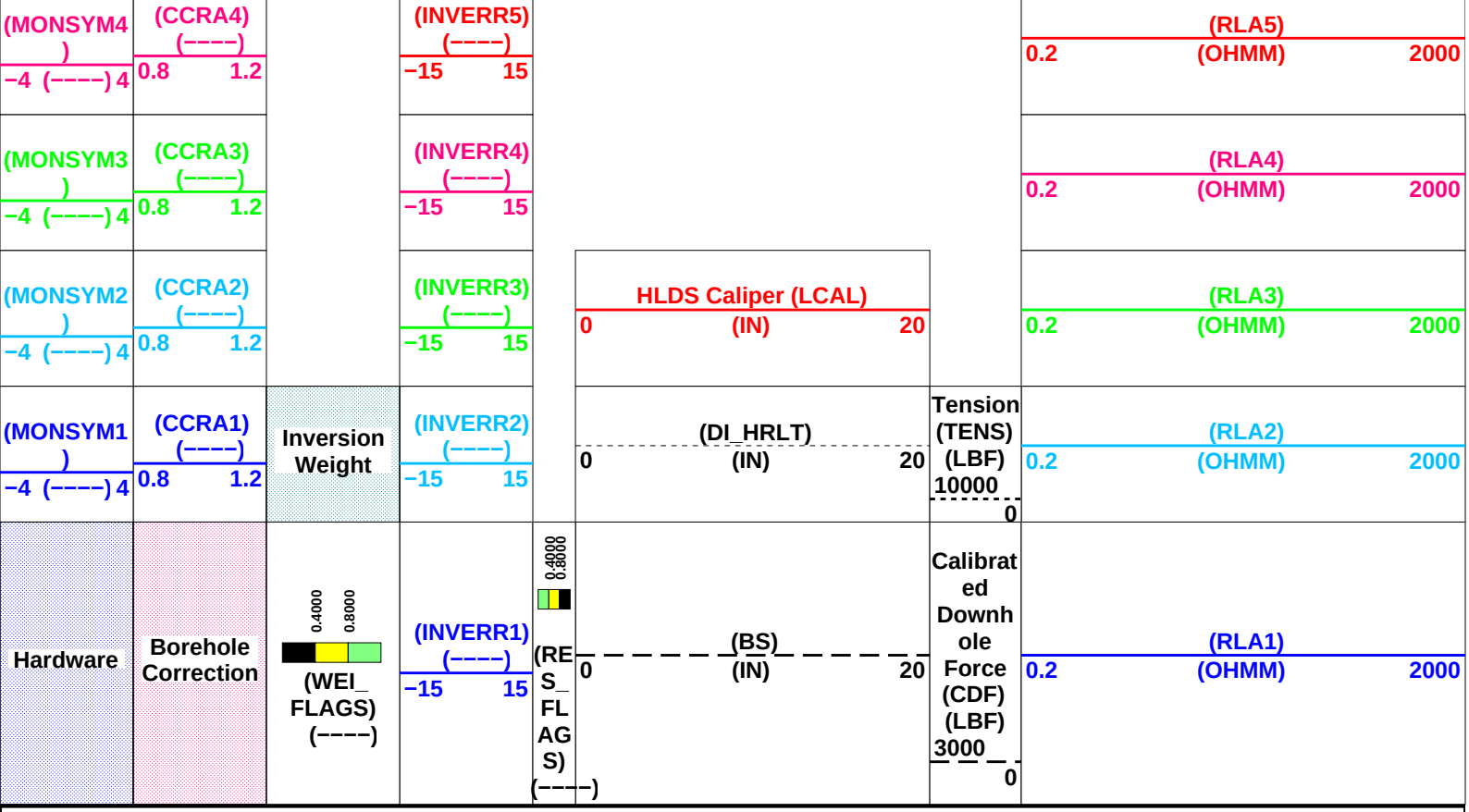
OP System Version: 19C0−187

MSS_LDEO−A	19C0−187	HRLT−B	19C0−187
HLDS	19C0−187	LDSC−B	19C0−187
APS−C	19C0−187	HNGC−B	19C0−187
HNGS−BA	19C0−187	EDTC−B	SKK−5169−EDTCB

PIP SUMMARY

Time Mark Every 60 S

			(RT_HRLT) 0.2 (OHMM) 2000
			(RM_HRLT) 0.02 (OHMM) 200
(MONSYM5) −4 (----) 4	(CCRA5) (----) 0.8 1.2	Inversion	(RXO_HRLT) 0.2 (OHMM) 2000



*** HRLT FLAG TRACKS ***

BLACK areas show that the corresponding error flag is set.

Main Log

Sea Floor Depth Reference

TRACK R3_LQC INVERSION WEIGHT

Contribution from each hrlt channel in Inversion algorythm, and from left to right :

| Wei1 | Wei2 | Wei3 | Wei4 | Wei5 |

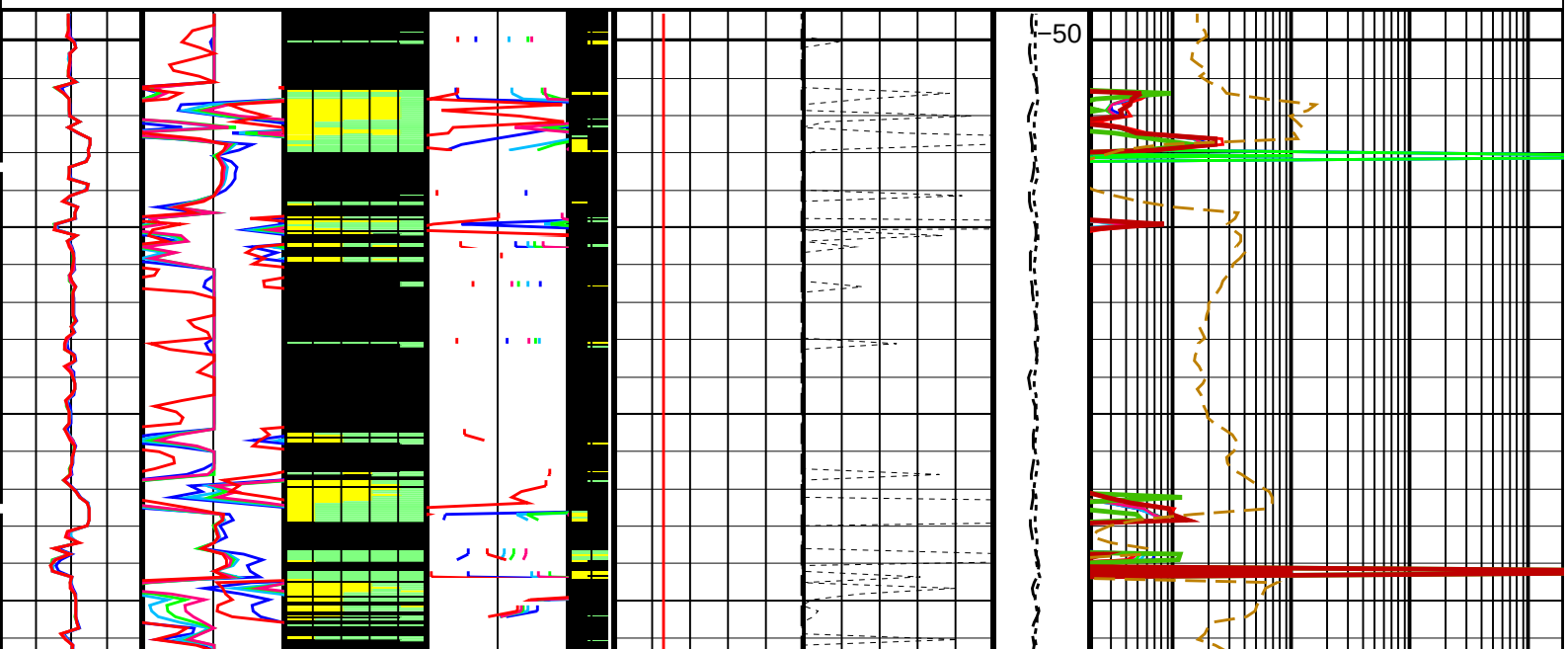
GREEN = OK YELLOW = Contribution QUESTIONABLE BLACK = Contribution UNRELIABLE

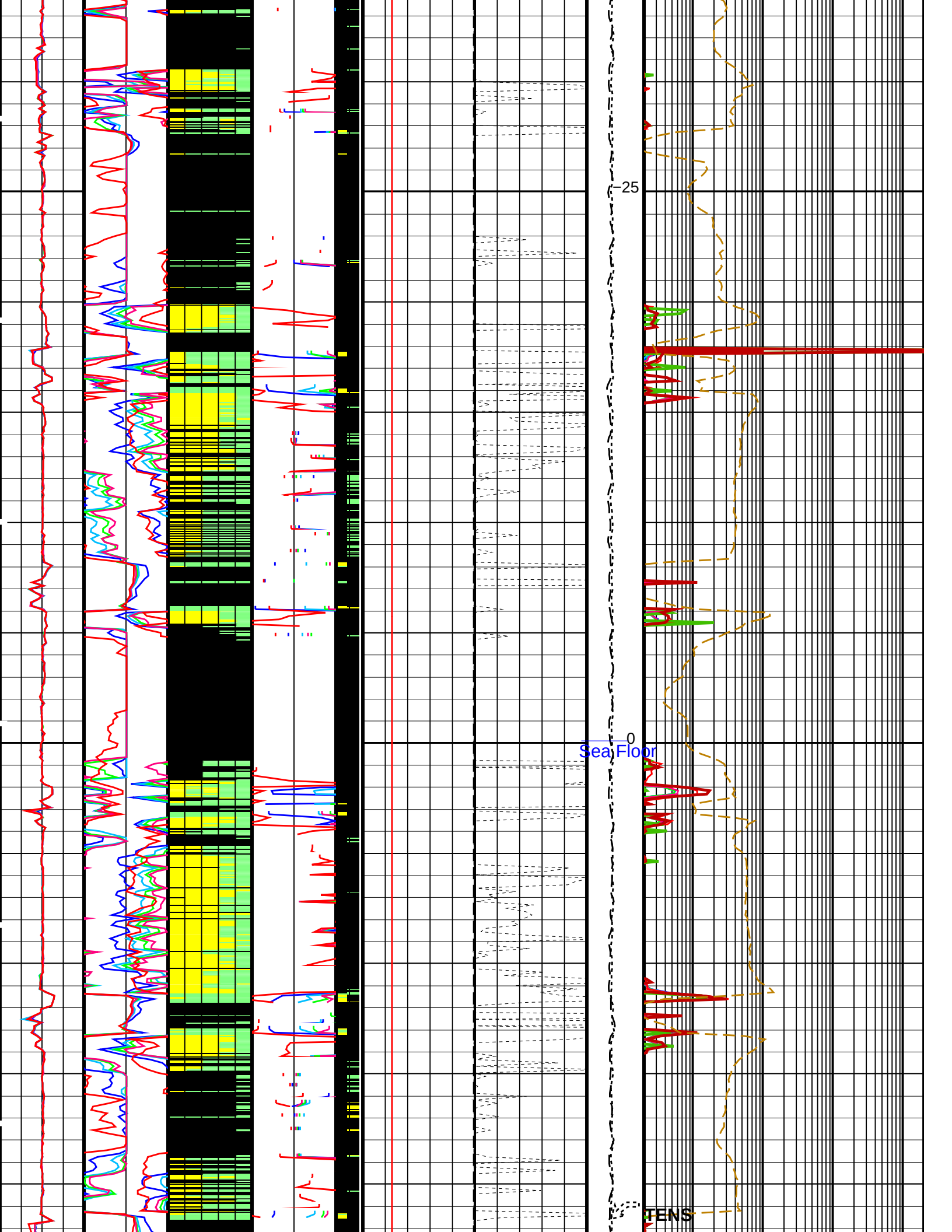
TRACK R5_LQC RESISTIVITY QUALITY INDICATOR

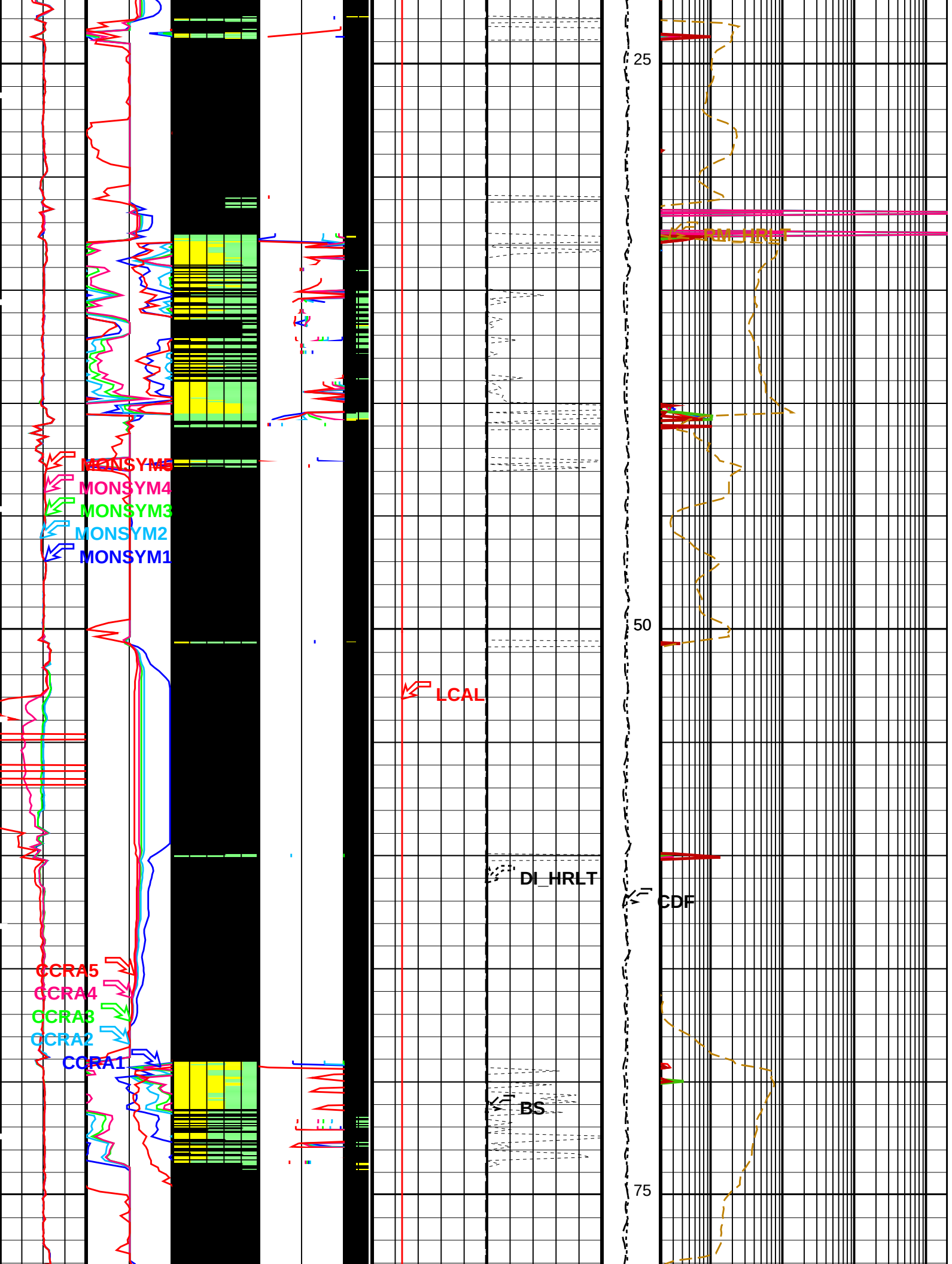
LQC flags on RXO_HRLT & RT_HRLT, and from left to right :

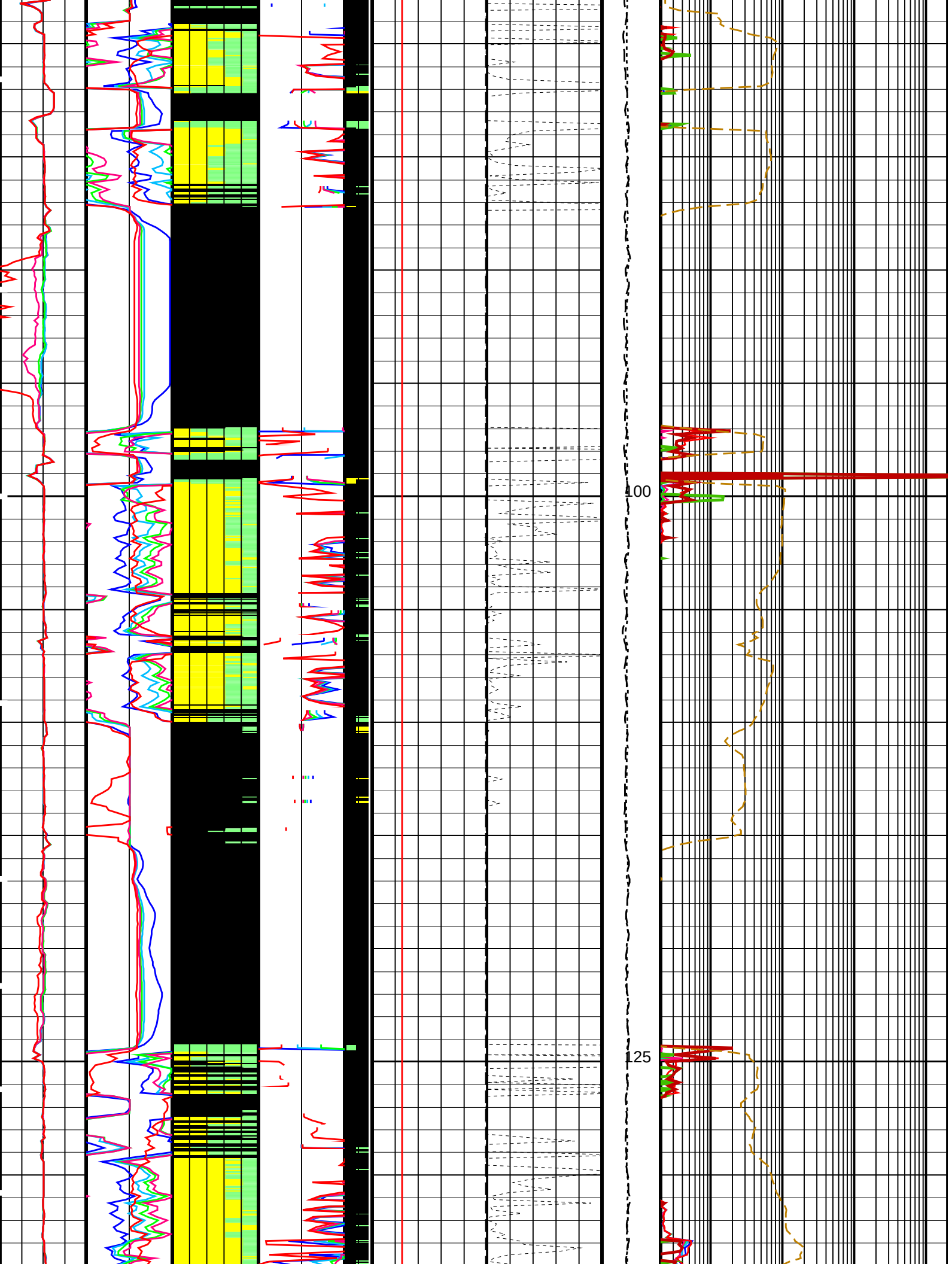
| RxoFlag | RTFlag |

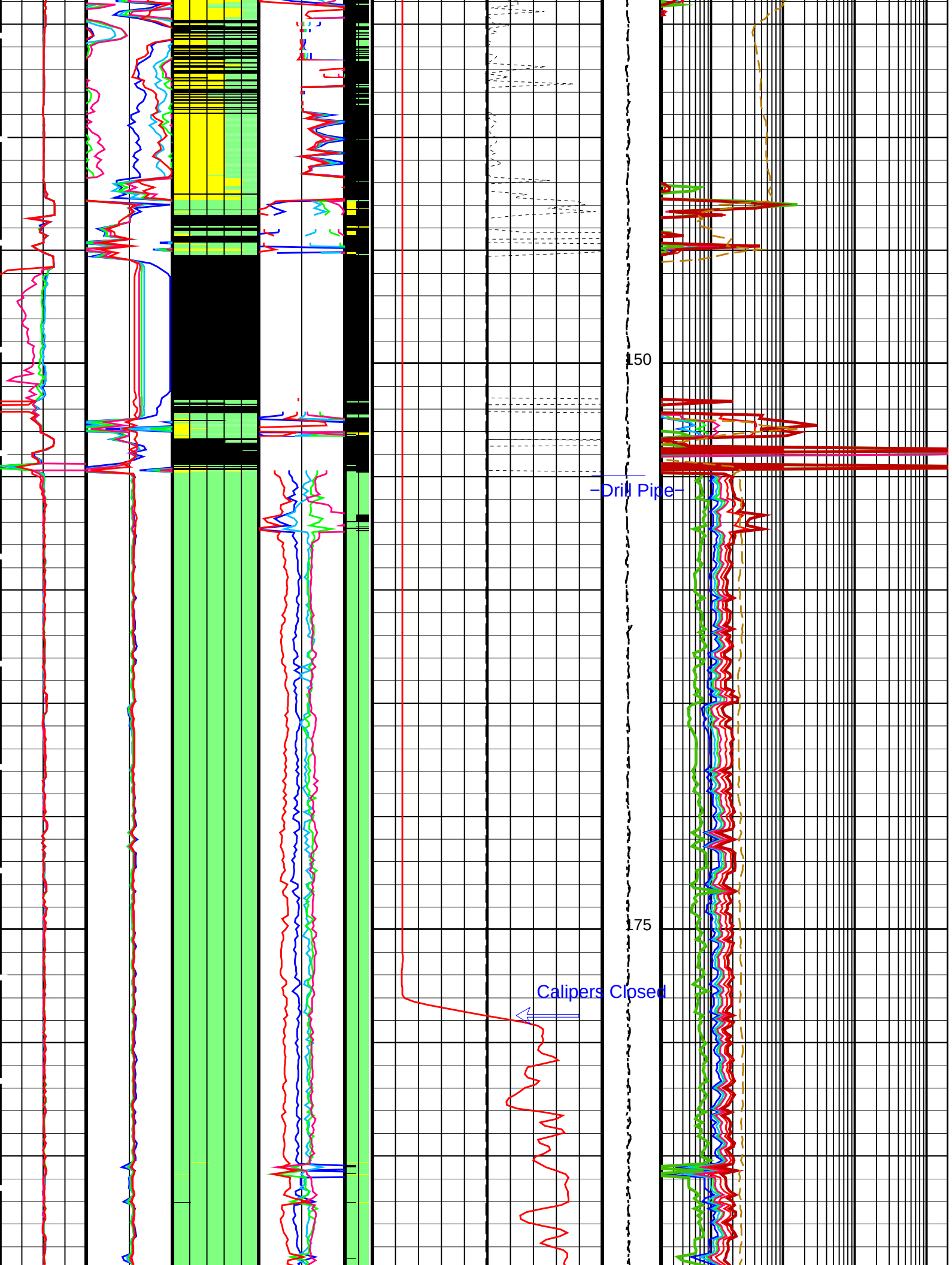
GREEN = OK YELLOW = SHOULDER BED EFFECT BLACK = NOK

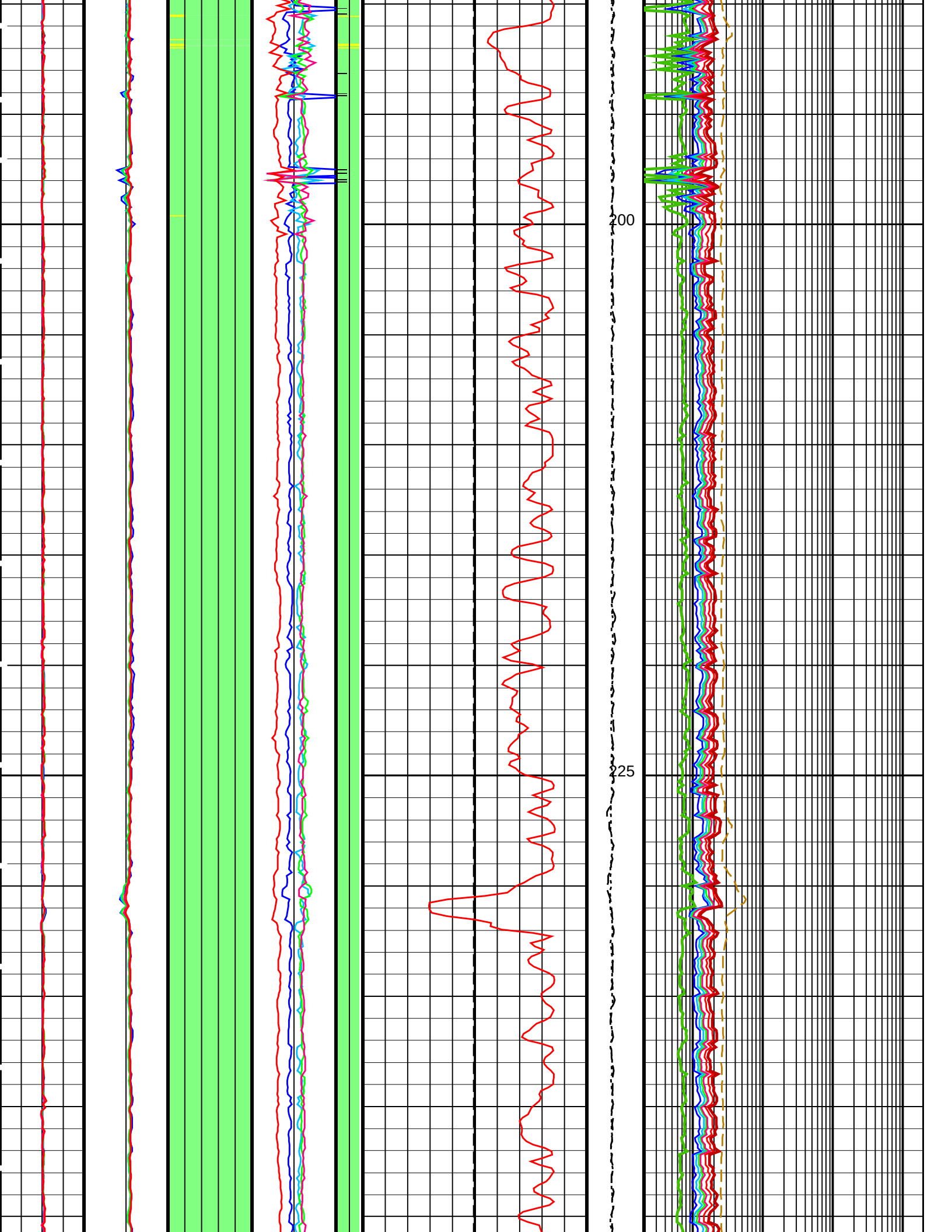


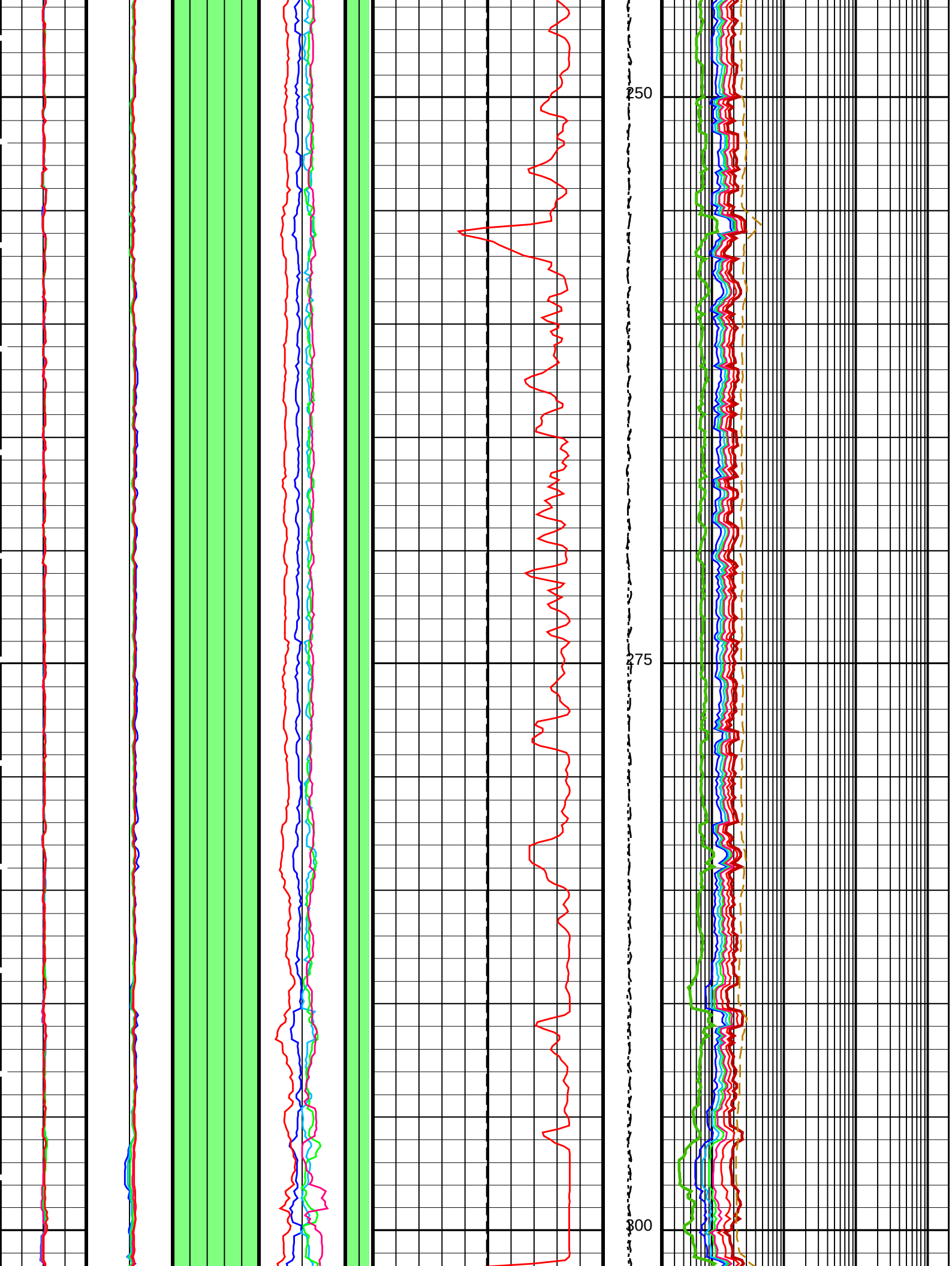

25
0
Sea Floor
TENS

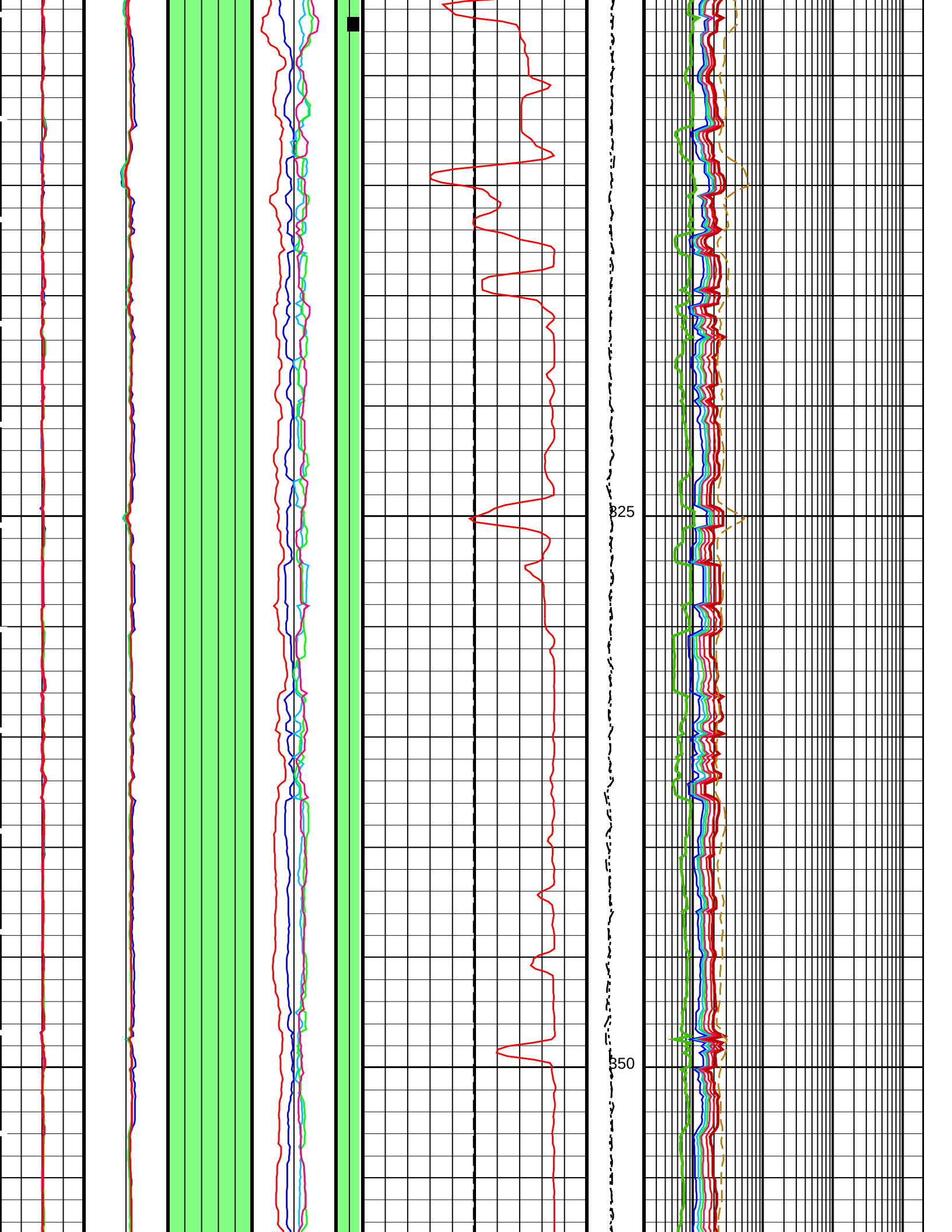

MONSYM5
MONSYM4
MONSYM3
MONSYM2
MONSYM1
CCRA5
CCRA4
CCRA3
CCRA2
CCRA1
LCAL
DI_HRLT
BS
CDF
RM_HRLT
25
50
75

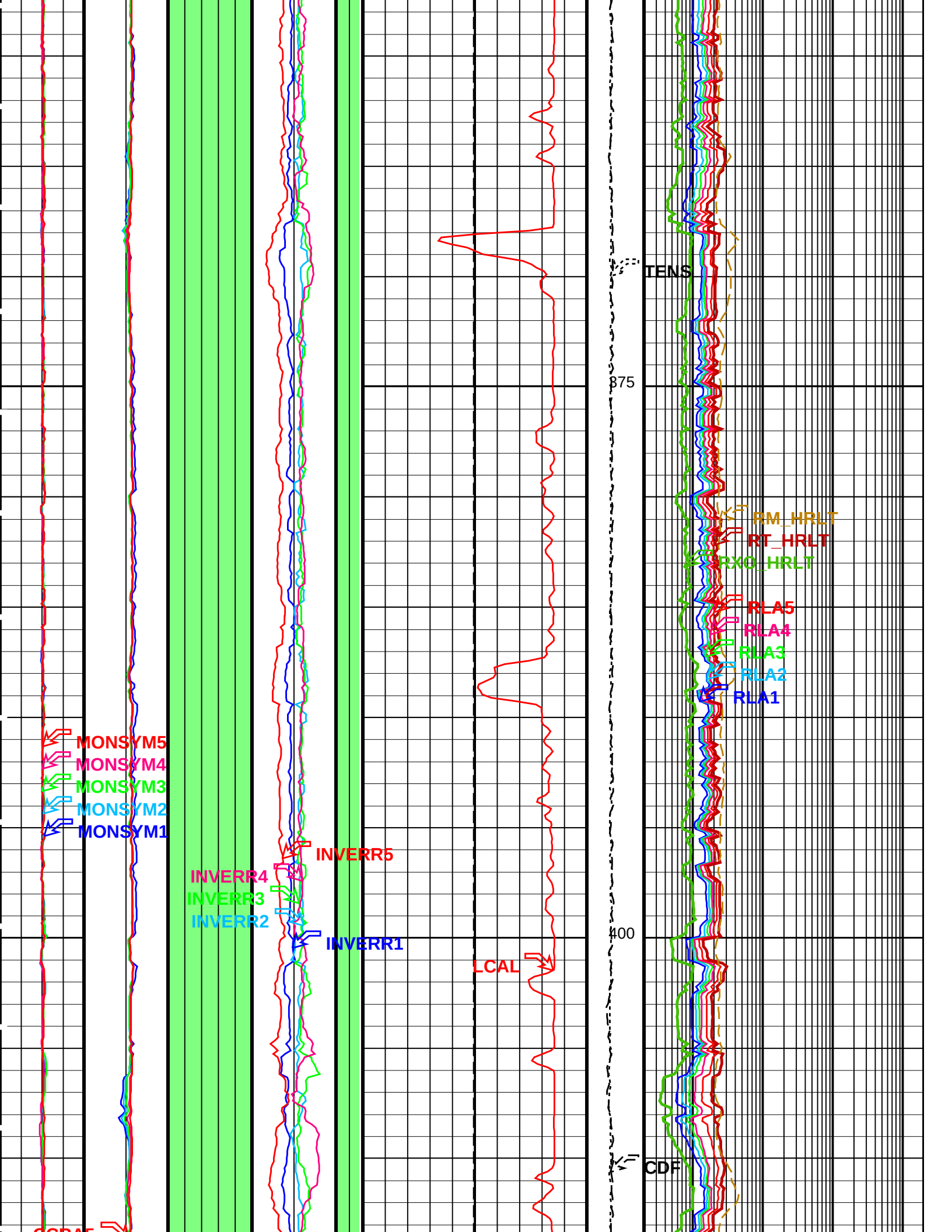

100
125

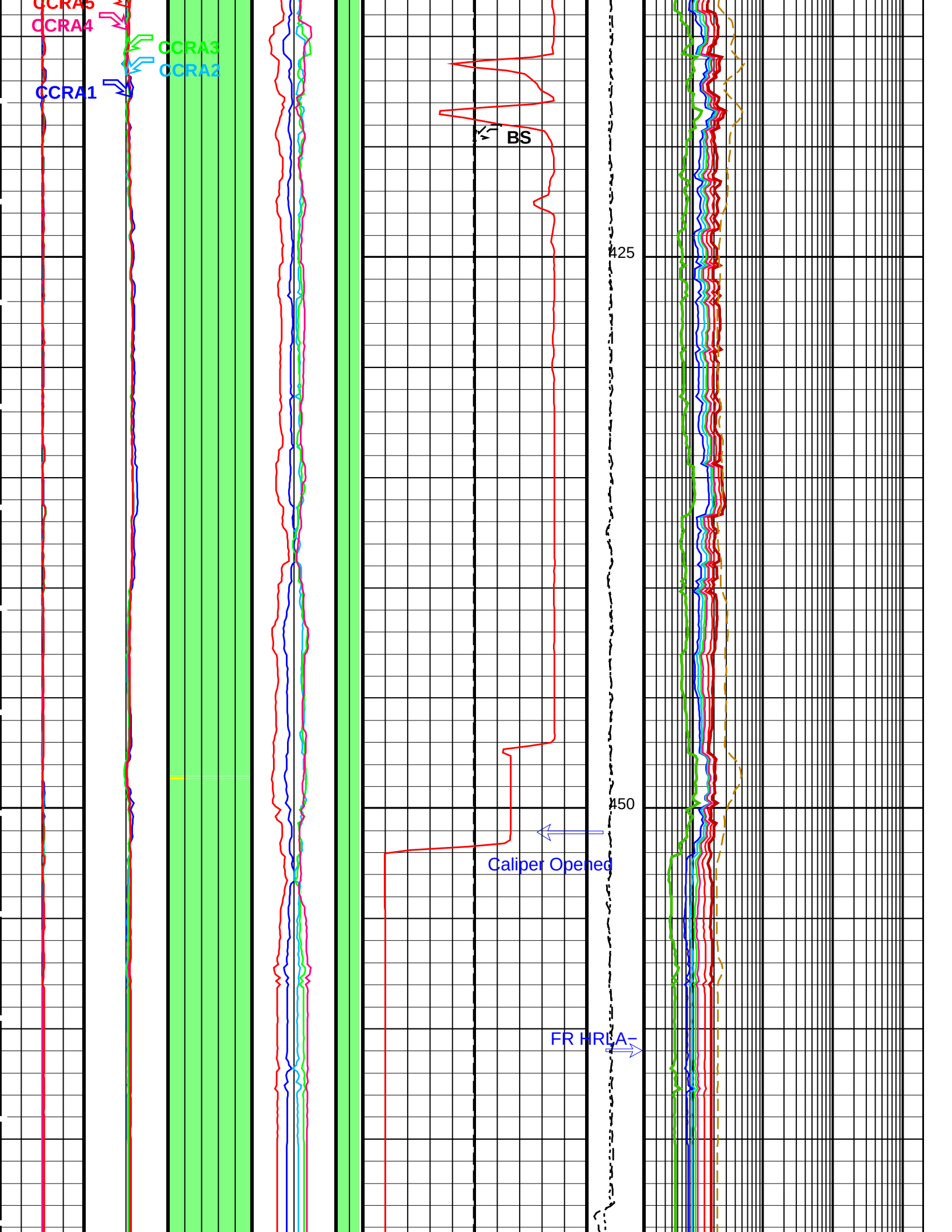

150
Drill Pipe
175
Calipers Closed

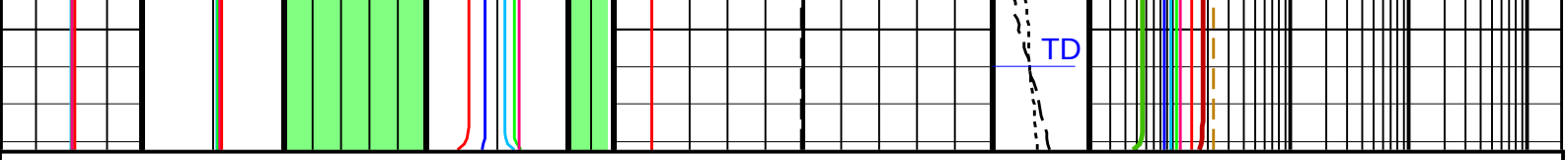

200
225


250
275
300


325
350


TENS
375
RM_HRLT
RT_HRLT
RXO_HRLT
RLA5
RLA4
RLA3
RLA2
RLA1
MONSYM5
MONSYM4
MONSYM3
MONSYM2
MONSYM1
INVERR5
INVERR4
INVERR3
INVERR2
INVERR1
LCAL
400
CDF


CCRA5
CCRA4
CCRA3
CCRA2
CCRA1
BS
425
450
Caliper Opened
FR HRLA-



***** HRLT FLAG TRACKS *****

BLACK areas show that the corresponding error flag is set.

TRACK R3_LQC INVERSION WEIGHT

Contribution from each hrlt channel in Inversion algorythm, and from left to right :

| Wei1 | Wei2 | Wei3 | Wei4 | Wei5 |

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TRACK R5_LQC RESISTIVITY QUALITY INDICATOR

LQC flags on RXO_HRLT & RT_HRLT, and from left to right :

| RxoFlag | RTFlag |

GREEN = OK YELLOW = SHOULDER BED EFFECT BLACK = NOK

Hardware	Borehole Correction	0.4000 0.8000 (WEI_ FLAGS) (----)	(INVERR1) (----) −15 15	0.4000 0.8000 (RES_ FLAGS) (----)	(BS) 0 (IN) 20	Calibrated Downhole Force (CDF) (LBF) 3000 0	(RLA1) 0.2 (OHMM) 2000
(MONSYM1) −4 (----) 4	(CCRA1) (----) 0.8 1.2	Inversion Weight	(INVERR2) (----) −15 15		(DI_HRLT) 0 (IN) 20	Tension (TENS) (LBF) 10000 0	(RLA2) 0.2 (OHMM) 2000
(MONSYM2) −4 (----) 4	(CCRA2) (----) 0.8 1.2		(INVERR3) (----) −15 15		HLDS Caliper (LCAL) 0 (IN) 20		(RLA3) 0.2 (OHMM) 2000
(MONSYM3) −4 (----) 4	(CCRA3) (----) 0.8 1.2		(INVERR4) (----) −15 15				(RLA4) 0.2 (OHMM) 2000
(MONSYM4) −4 (----) 4	(CCRA4) (----) 0.8 1.2		(INVERR5) (----) −15 15				(RLA5) 0.2 (OHMM) 2000
(MONSYM5) −4 (----) 4	(CCRA5) (----) 0.8 1.2		Inversion				(RXO_HRLT) 0.2 (OHMM) 2000
							(RM_HRLT) 0.02 (OHMM) 200
							(RT_HRLT) 0.2 (OHMM) 2000

Main Log

Sea Floor Depth Reference

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	HRLT−B: High Resolution Laterolog Array − B		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	6.5	DEGC
CALSTAT	HRLTB Calibration Status	SHALLOW_DONE	
CALTEMP	HRLTB Calibration Temperature	9.22677	DEGC
FREQ0	HRLT Frequency Index for Mode 0	32	
FREQ1	HRLT Frequency Index for Mode 1	128	
FREQ2	HRLT Frequency Index for Mode 2	104	
FREQ3	HRLT Frequency Index for Mode 3	86	
FREQ4	HRLT Frequency Index for Mode 4	56	
FREQ5	HRLT Frequency Index for Mode 5	44	
FREQ6	HRLT Frequency Index for Mode 6	116	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
ISSBAR	Barite Mud Switch	NOBARITE	
KFAC_HRLT	HRLT K Factor Option	SONDE	
LOOPCOEF_S	HRLT Loop Coefficient for Shallow Modes	LOW	
LOOPMOD0	HRLT Mode 0 Loop Mode	OFF	
LOOPMOD1	HRLT Mode 1 Loop Mode	OFF	
LOOPMOD2	HRLT Mode 2 Loop Mode	OFF	
LOOPMOD3	HRLT Mode 3 Loop Mode	OFF	
LOOPMOD4	HRLT Mode 4 Loop Mode	OFF	
LOOPMOD5	HRLT Mode 5 Loop Mode	OFF	
LOOPMOD6	HRLT Mode 6 Loop Mode	OFF	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
PROCINV	Inversion Selection	ON	
PROCMFL	Inversion Micro−Resistivity Selection	NO_EXTERNAL_RXO	
PROCMSO	Mechanical Standoff Fin Size	0	IN
PROCRM	Processing Mud Resistivity Select	HRLT_Compute	
PROCSPO	Sonde Position	Centered	
SHT	Surface Hole Temperature	20	DEGC
	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	
	APS−C: Accelerator−Porosity Tool		
	APS Software Version	0	
AASD	APS Thermal and Array Detectors High Voltage Setting	1962.57	V
ADSO	APS Array Detectors Data Source Switch	Both	
AFSD	APS Far Detector High Voltage Setting	2079.08	V
AHCS	APS Holesize Correction Source	BS	
AHSS	APS Holesize Correction Switch	ON	
AMTY	APS Environmental Corrections Mud Type	WaterBaseBarite	
ANSD	APS Near Detector High Voltage Setting	1732.09	V
ASOS	APS Standoff Correction Switch	OFF	
ATSS	APS Temperature−Pressure−Salinity Correction Switch	OFF	
BHFL_APS	APS TNPH Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	6.5	DEGC
BSCO_APS	APS TNPH Borehole Salinity Correction Option	NO	
DPPM	Density Porosity Processing Mode	HIRS	
DSCO_APS	APS TNPH Density Source Correction Option	MEASURED	
FSAL	Formation Salinity	−50000	PPM
FSCO_APS	APS TNPH Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO_APS	APS TNPH Hole Size Correction Option	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO_APS	APS TNPH Mud Cake Correction Option	NO	

MCOR_APS	APS TNPH Mud Correction	NATU	
MWCO_APS	APS TNPH Mud Weight Correction Option	NO	
NARC	APS Near/Array Calibration Ratio	1.06588	
NFRC	APS Near/Far Calibration Ratio	0.886605	
PTCO_APS	APS TNPH Pressure/Temperature Correction Option	NO	
SHT	Surface Hole Temperature	20	DEGC
TNCO_APS	APS TNPH Computation Option	YES	
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)	6.5	DEGC
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	0.018227	DC/M
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	−0.00263053	
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	20	DEGC
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	0.248452	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	1.13597	
EDTC−B: Enhanced DTS Cartridge			
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	6.5	DEGC
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DPPM	Density Porosity Processing Mode	HIRS	
FSAL	Formation Salinity	−50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO	Hole Size Correction Option	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
ISSBAR_EDTC	Nuclear Mud Type	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	BARI	
MWCO	Mud Weight Correction Option	YES	
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	20	DEGC
SOCN	Standoff Distance	0.5	IN
SOCO	Standoff Correction Option	NO	
TPOS_EDTC	EDTC Tool Centered/Eccentered	Eccentered	
U−ETELM_EDTS	Telemetry Mode for eWAFE	Standard_EDTS	
U−TELM_EDTS	Telemetry Mode for WAFE	Standard_EDTS	
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	13.375	IN
CWEI	Casing Weight	168.00	LB/F
DFD	Drilling Fluid Density	1.03	G/C3
DO	Depth Offset for Playback	−4252.0	M
FLEV	Fluid Level	−50000.00	M
MST	Mud Sample Temperature	−50000.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
PP	Playback Processing	NORMAL	
RMFS	Resistivity of Mud Filtrate Sample	−50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	471	M
TDD	Total Depth − Driller	1008.00	M

TDL	Total Depth – Logger	471.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: HRLT_LQC Vertical Scale: 1:200 Graphics File Created: 01–Mar–2014 12:26

OP System Version: 19C0–187

MSS_LDEO–A	19C0–187	HRLT–B	19C0–187
HLDS	19C0–187	LDSC–B	19C0–187
APS–C	19C0–187	HNGC–B	19C0–187
HNGS–BA	19C0–187	EDTC–B	SKK–5169–EDTCB

Input DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_028PUP	FN:50	PRODUCER	16–Feb–2014 05:20	4725.2 M	4201.1 M

Output DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_046PUP	FN:66	PRODUCER	01–Mar–2014 12:26		

Input DLIS Files

DEFAULT	Flip_MSS_LDEO_HRLA_040PUP		PRODUCER	25–Feb–2014 15:38	4719.8 M	4185.7 M

Output DLIS Files

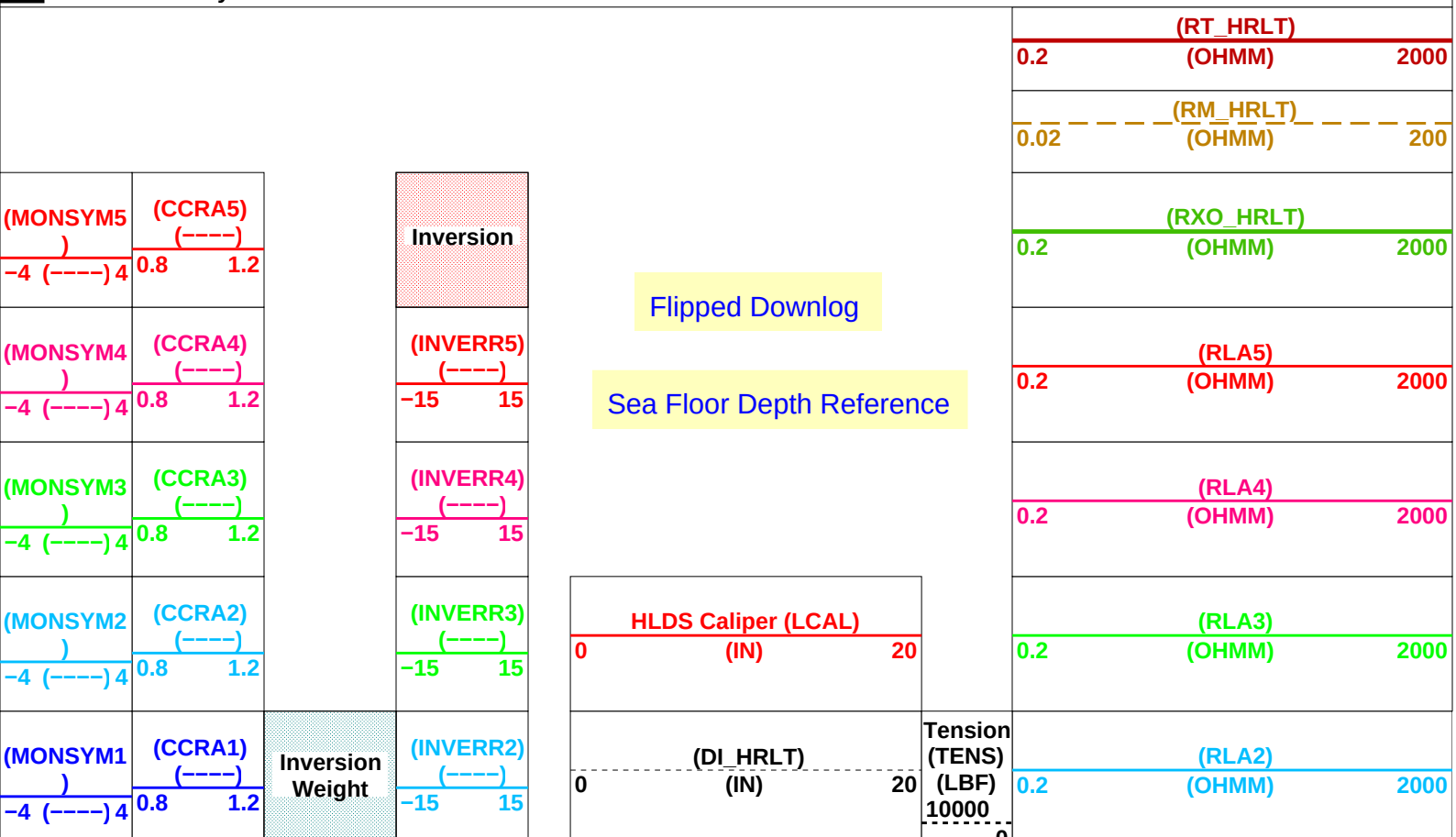
DEFAULT	MSS_LDEO_HRLA_LDL_045PUP	FN:65	PRODUCER	01–Mar–2014 12:23	473.8 M	–60.4 M

OP System Version: 19C0–187

MSS_LDEO–A	19C0–187	HRLT–B	19C0–187
HLDS	19C0–187	LDSC–B	19C0–187
APS–C	19C0–187	HNGC–B	19C0–187
HNGS–BA	19C0–187	EDTC–B	SKK–5169–EDTCB

PIP SUMMARY

Time Mark Every 60 S



Hardware	Borehole Correction	(WEI_FLAGS) (----) 0.4000 0.8000	(INVERR1) (----) −15 15	(RES_FLAGS) (----) 0.4000 0.8000	(BS) (IN) 0 20	Calibrated Downhole Force (CDF) (LBF) 3000 0	(RLA1) (OHMM) 0.2 2000

***** HRLT FLAG TRACKS *****

BLACK areas show that the corresponding error flag is set.

TRACK R3_LQC INVERSION WEIGHT

Contribution from each hrlt channel in Inversion algorythm, and from left to right :

| Wei1 | Wei2 | Wei3 | Wei4 | Wei5 |

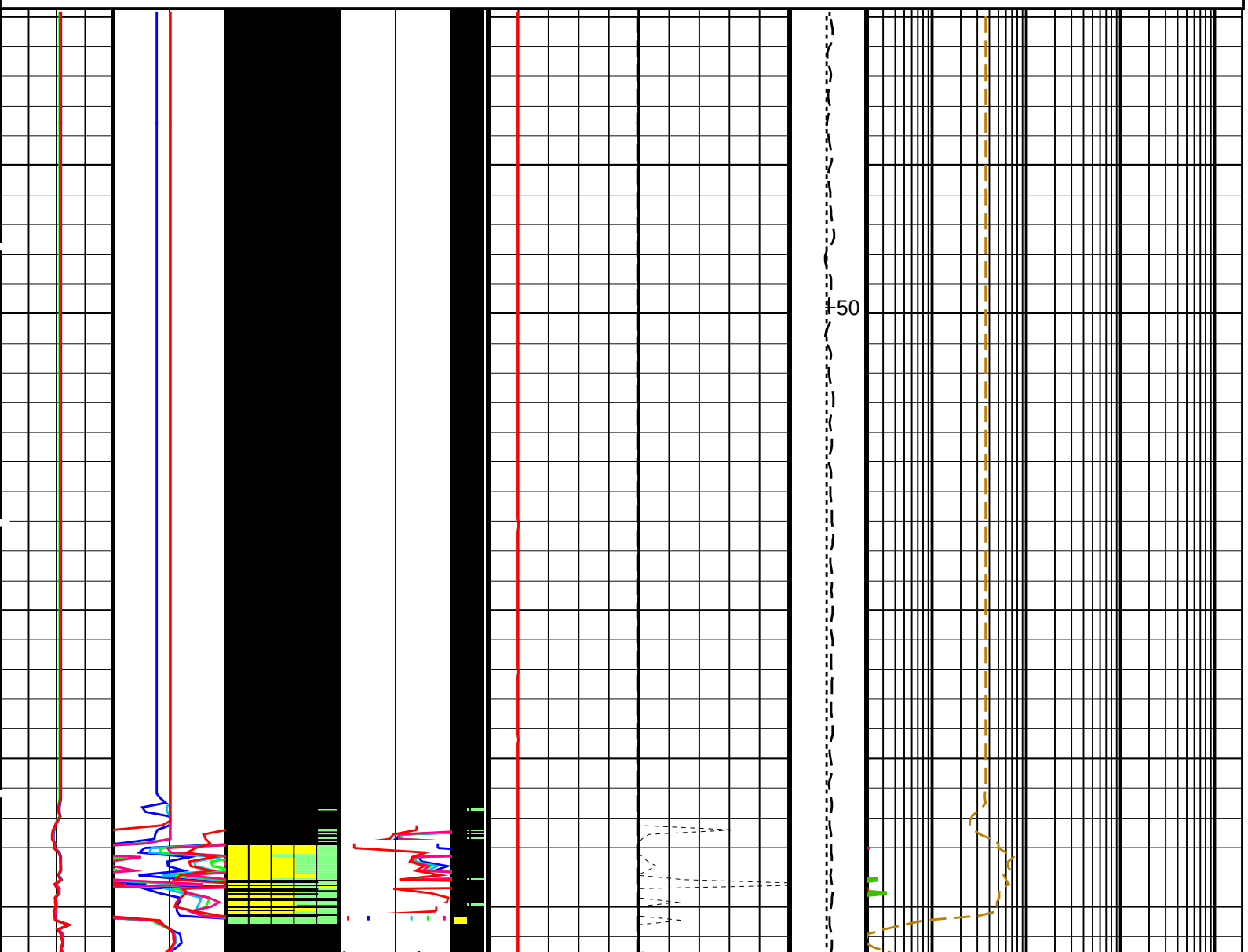
GREEN = OK YELLOW = Contribution QUESTIONABLE BLACK = Contribution UNRELIABLE

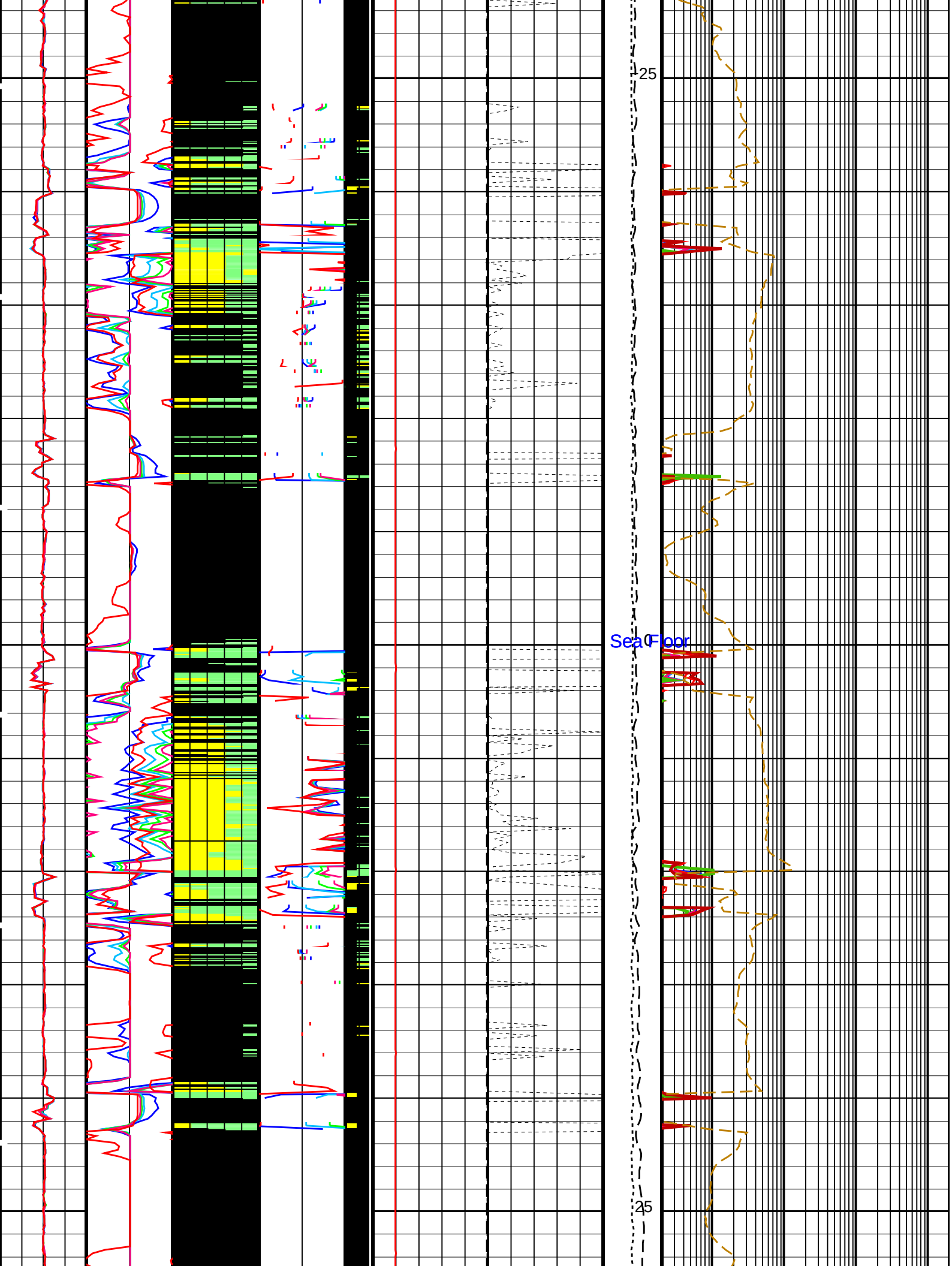
TRACK R5_LQC RESISTIVITY QUALITY INDICATOR

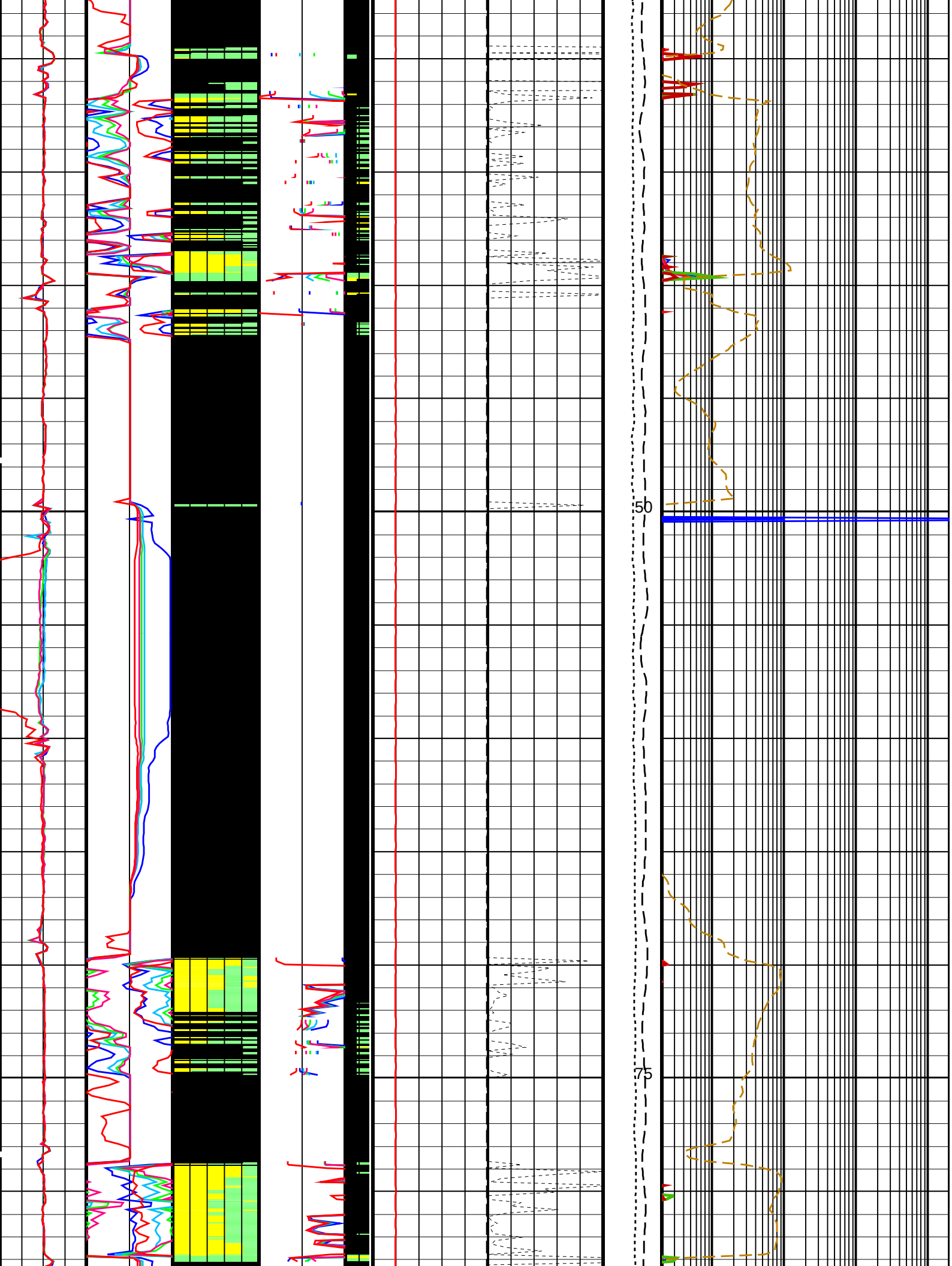
LQC flags on RXO_HRLT & RT_HRLT, and from left to right :

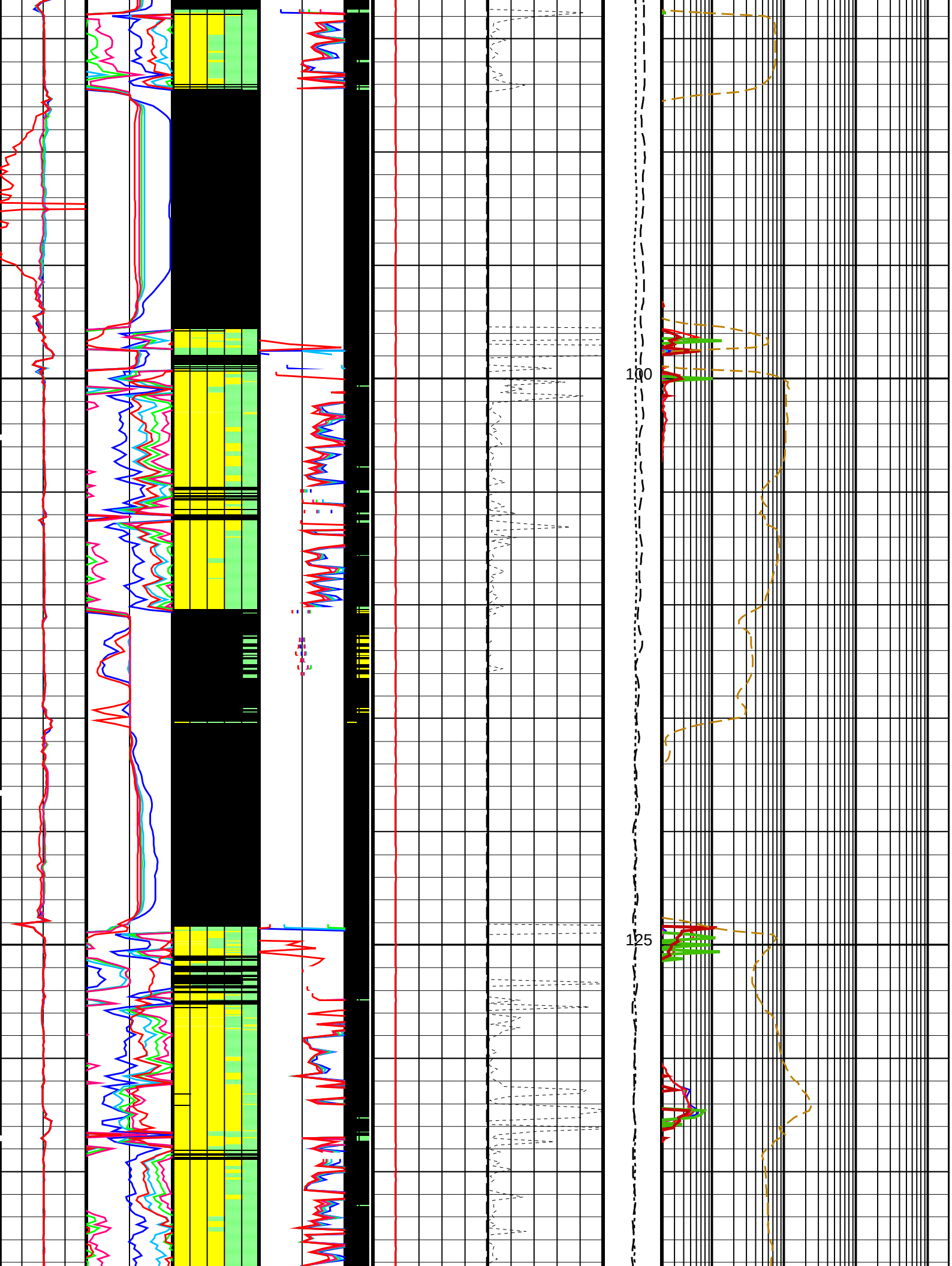
| RxoFlag | RTFlag |

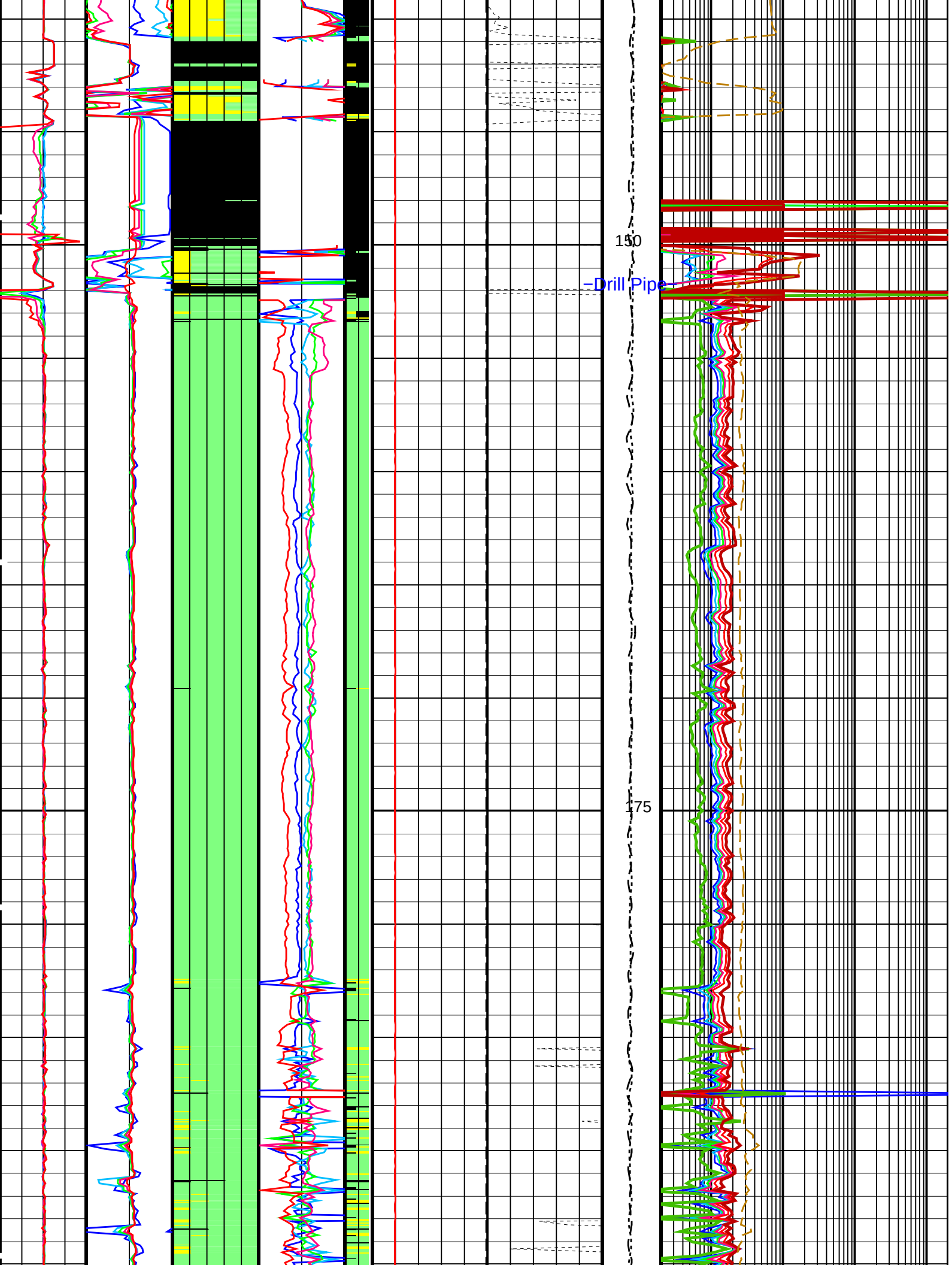
GREEN = OK YELLOW = SHOULDER BED EFFECT BLACK = NOK

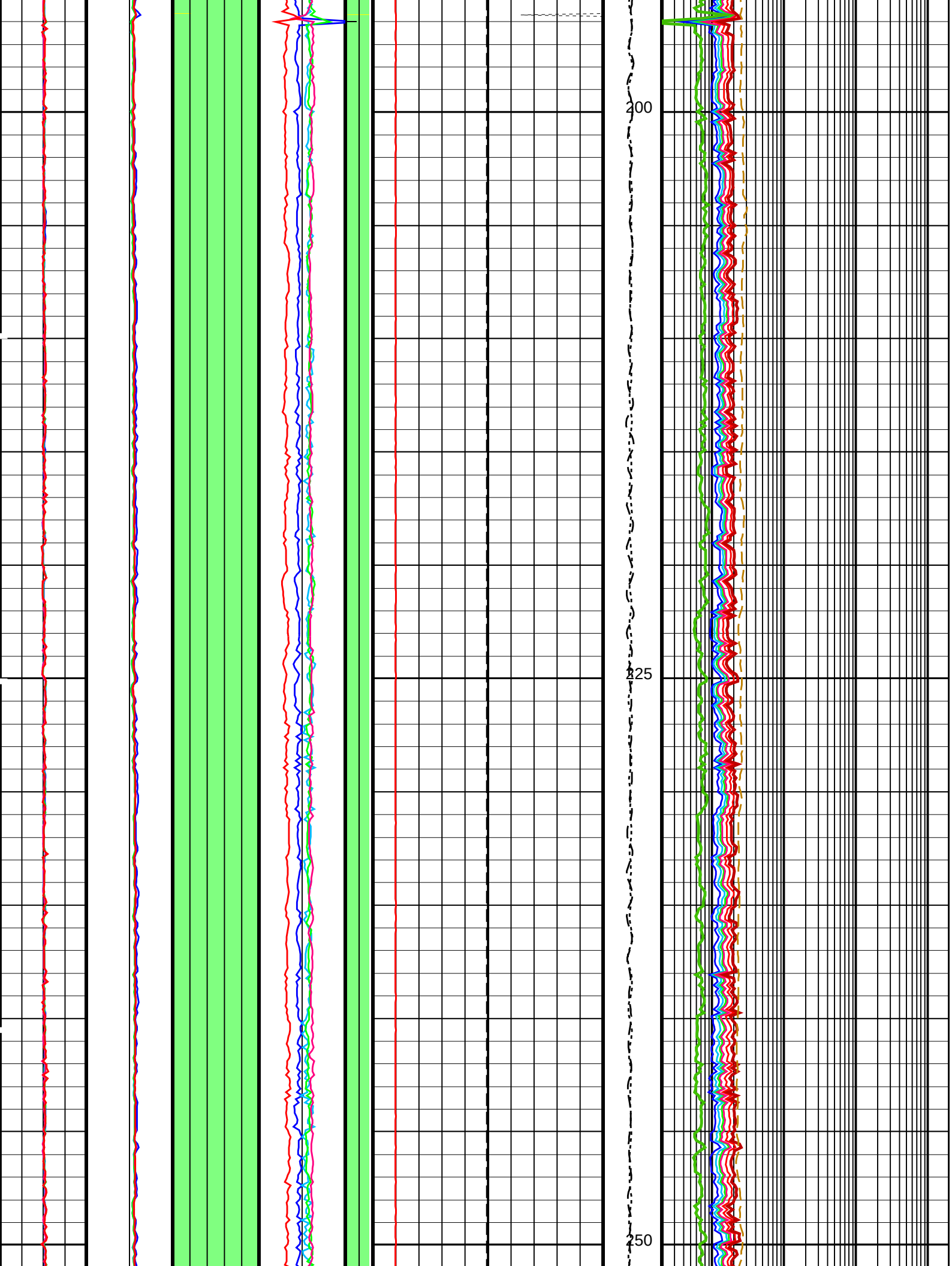


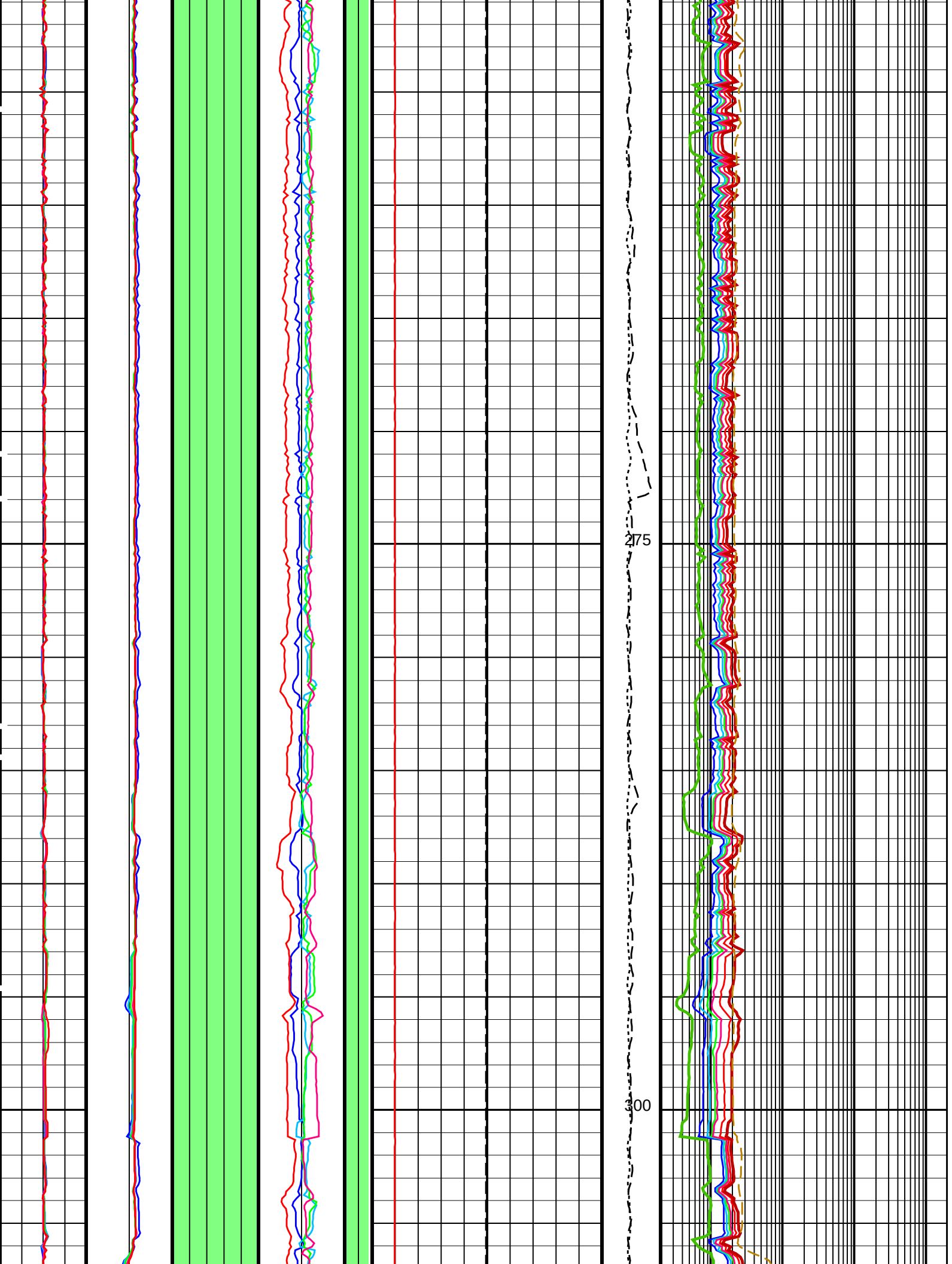

25
Sea Floor
25

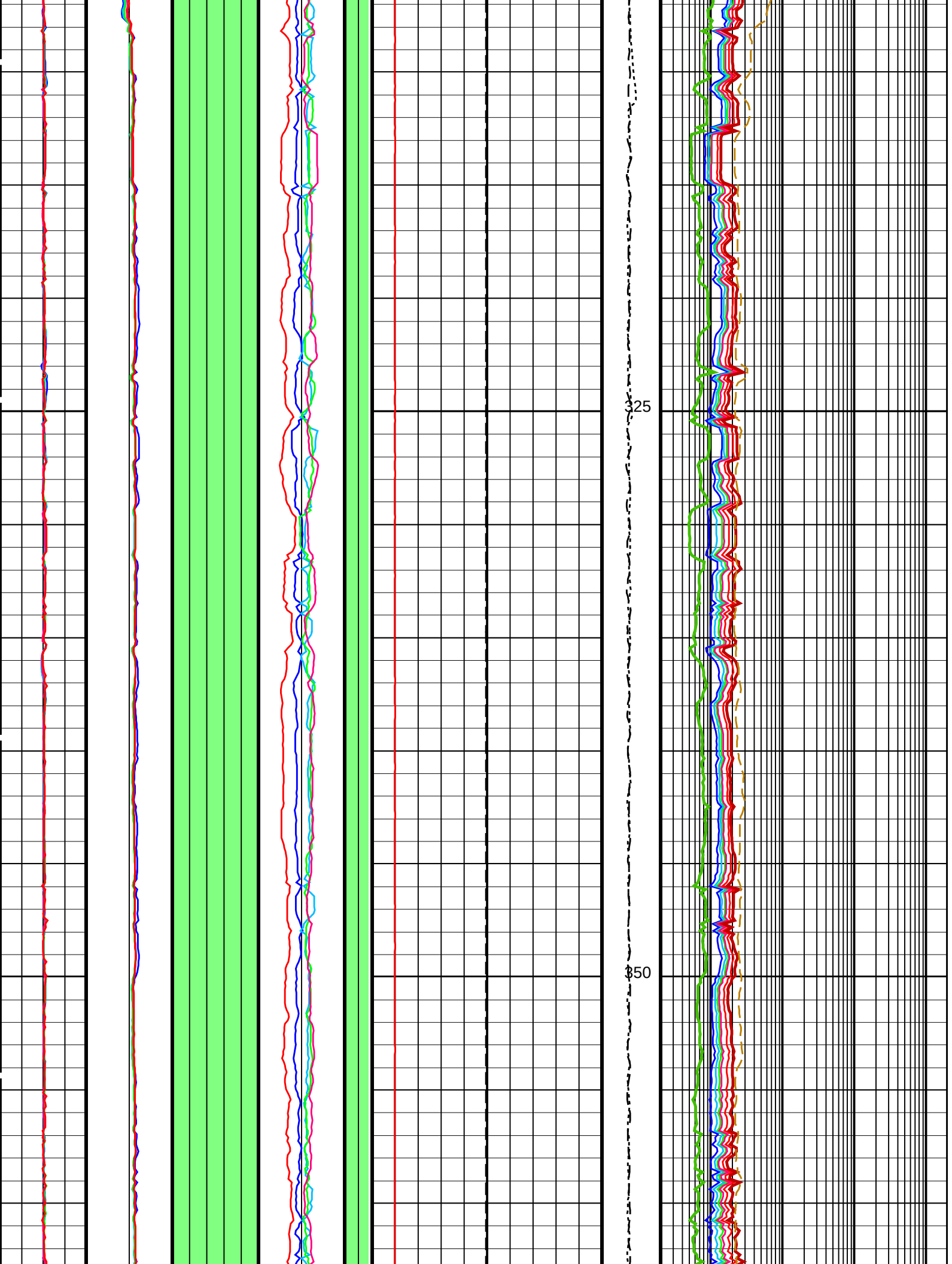

50
75

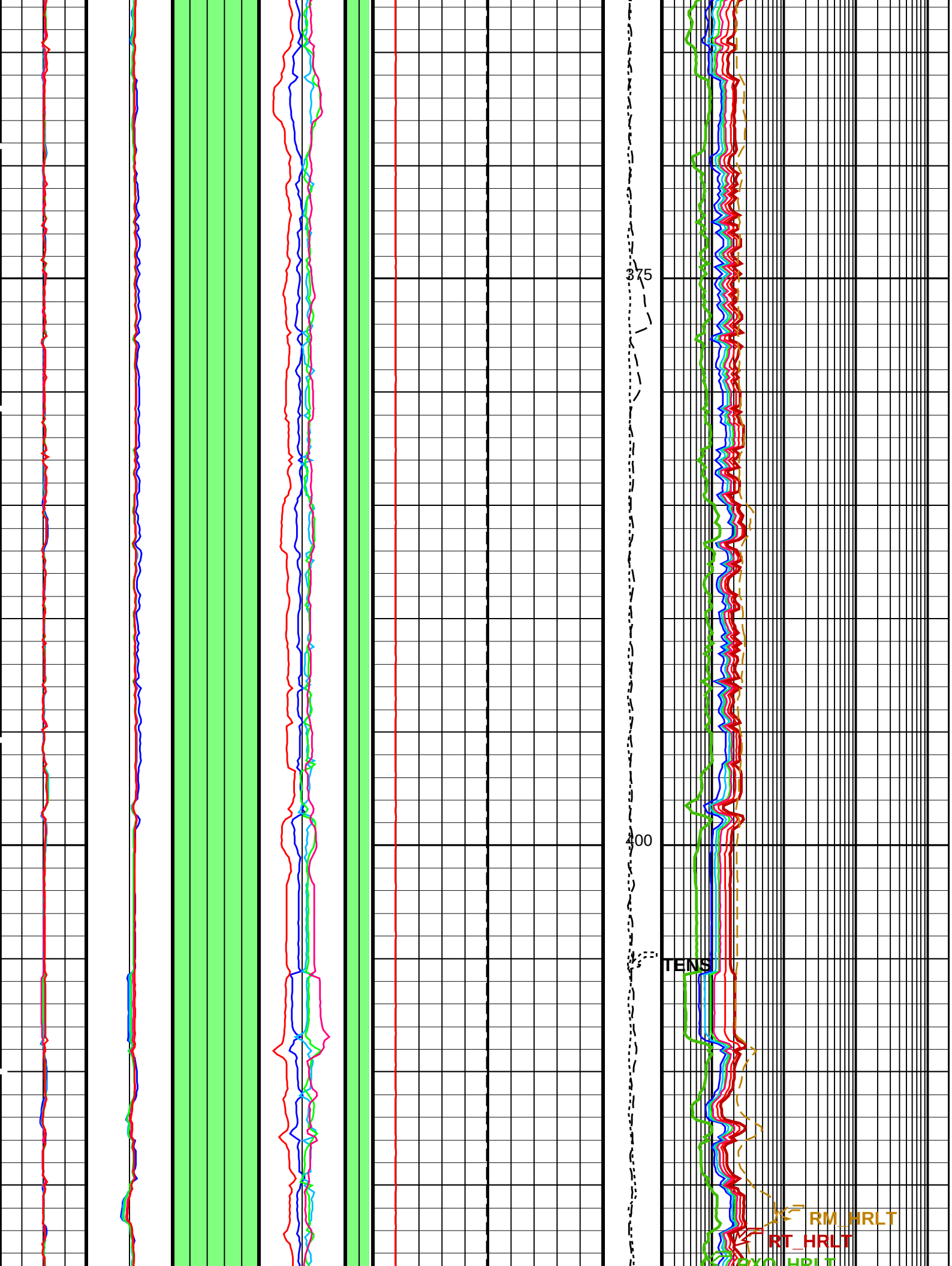

100
125

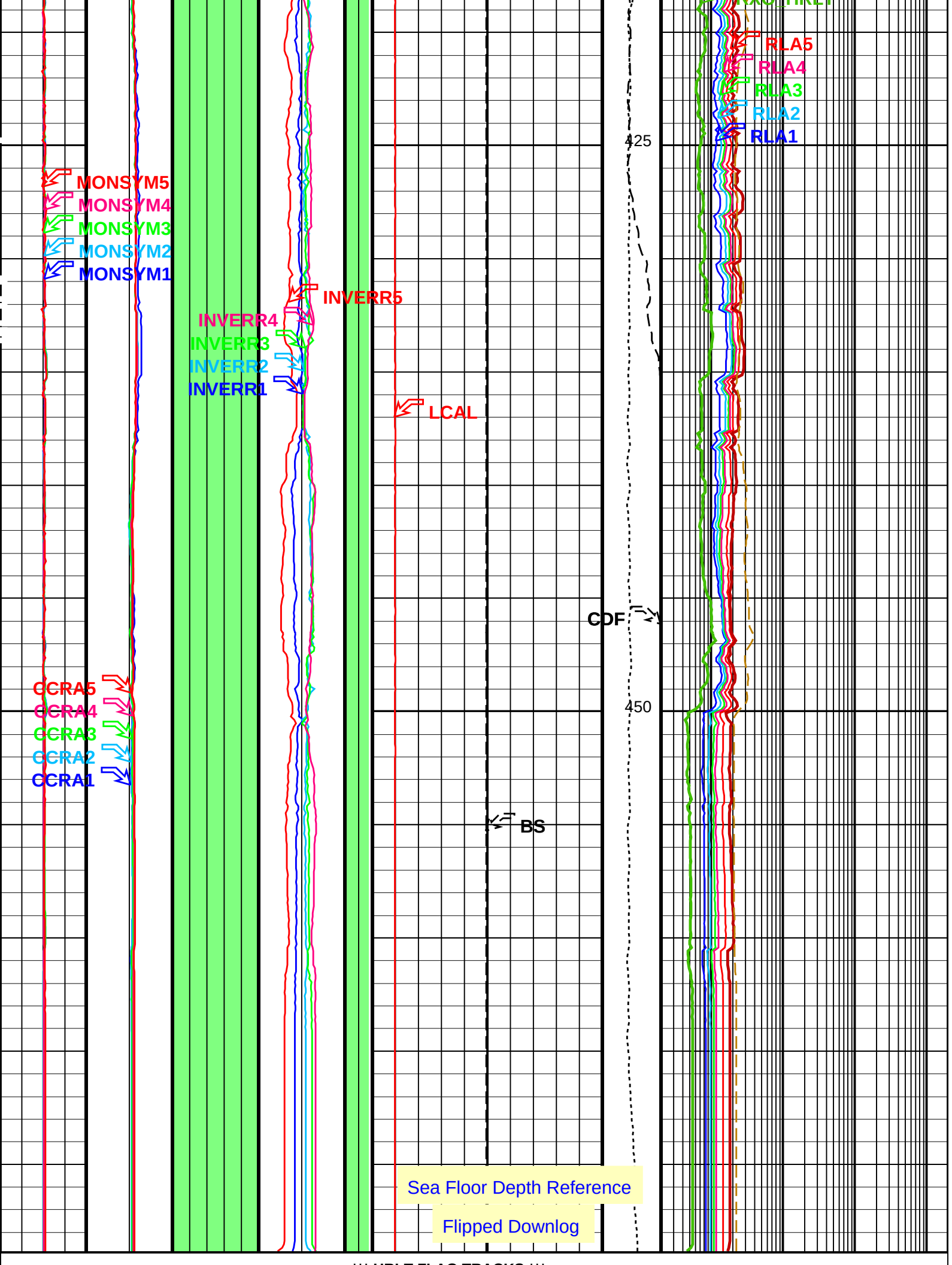

150
Drill Pipe
175


200
225
250


275
300


325
350


375
400
TENS
RM_HRLT
RT_HRLT


RLA5
RLA4
RLA3
RLA2
RLA1
425
MONSYM5
MONSYM4
MONSYM3
MONSYM2
MONSYM1
INVERR5
INVERR4
INVERR3
INVERR2
INVERR1
LCAL
CDF
CCRA5
CCRA4
CCRA3
CCRA2
CCRA1
450
BS
Sea Floor Depth Reference
Flipped Downlog

*** HRLT FLAG TRACKS ***

BLACK areas show that the corresponding error flag is set.

TRACK R3_LQC INVERSION WEIGHT

Contribution from each hrlt channel in Inversion algorythm, and from left to right :

| Wei1 | Wei2 | Wei3 | Wei4 | Wei5 |

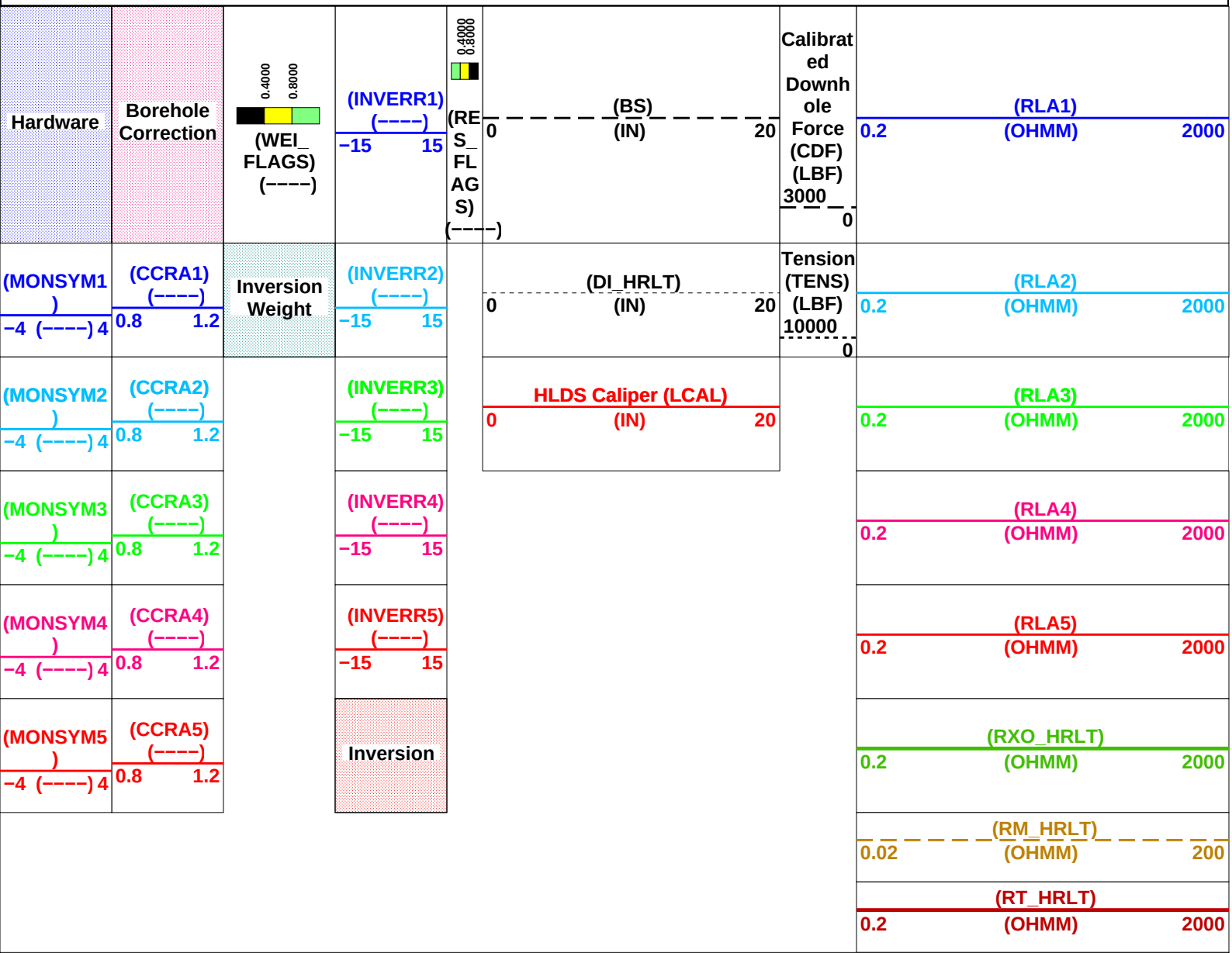
GREEN = OK YELLOW = Contribution QUESTIONABLE BLACK = Contribution UNRELIABLE

TRACK R5_LQC RESISTIVITY QUALITY INDICATOR

LQC flags on RXO_HRLT & RT_HRLT, and from left to right :

| RxoFlag | RTFlag |

GREEN = OK YELLOW = SHOULDER BED EFFECT BLACK = NOK



PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	HRLT−B: High Resolution Laterolog Array − B		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	100	DEGC
CALSTAT	HRLTB Calibration Status	SHALLOW_DONE	

CALTEMP	HRLTB Calibration Temperature	9.22677	DEGC
FREQ0	HRLT Frequency Index for Mode 0	32	
FREQ1	HRLT Frequency Index for Mode 1	128	
FREQ2	HRLT Frequency Index for Mode 2	104	
FREQ3	HRLT Frequency Index for Mode 3	86	
FREQ4	HRLT Frequency Index for Mode 4	56	
FREQ5	HRLT Frequency Index for Mode 5	44	
FREQ6	HRLT Frequency Index for Mode 6	116	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
ISSBAR	Barite Mud Switch	NOBARITE	
KFAC_HRLT	HRLT K Factor Option	SONDE	
LOOPCOEF_S	HRLT Loop Coefficient for Shallow Modes	LOW	
LOOPMOD0	HRLT Mode 0 Loop Mode	OFF	
LOOPMOD1	HRLT Mode 1 Loop Mode	OFF	
LOOPMOD2	HRLT Mode 2 Loop Mode	OFF	
LOOPMOD3	HRLT Mode 3 Loop Mode	OFF	
LOOPMOD4	HRLT Mode 4 Loop Mode	OFF	
LOOPMOD5	HRLT Mode 5 Loop Mode	OFF	
LOOPMOD6	HRLT Mode 6 Loop Mode	OFF	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
PROCINV	Inversion Selection	ON	
PROCMFL	Inversion Micro−Resistivity Selection	NO_EXTERNAL_RXO	
PROCMSO	Mechanical Standoff Fin Size	0	IN
PROCRM	Processing Mud Resistivity Select	HRLT_Compute	
PROCSPO	Sonde Position	Centered	
SHT	Surface Hole Temperature	20	DEGC
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	
APS−C: Accelerator−Porosity Tool			
	APS Software Version	0	
AASD	APS Thermal and Array Detectors High Voltage Setting	1962.57	V
ADSO	APS Array Detectors Data Source Switch	Both	
AFSD	APS Far Detector High Voltage Setting	2079.08	V
AHCS	APS Holesize Correction Source	BS	
AHSS	APS Holesize Correction Switch	ON	
AMTY	APS Environmental Corrections Mud Type	WaterBaseBarite	
ANSD	APS Near Detector High Voltage Setting	1732.09	V
ASOS	APS Standoff Correction Switch	OFF	
ATSS	APS Temperature−Pressure−Salinity Correction Switch	OFF	
BHFL_APS	APS TNPH Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	100	DEGC
BSCO_APS	APS TNPH Borehole Salinity Correction Option	NO	
DPPM	Density Porosity Processing Mode	HIRS	
DSCO_APS	APS TNPH Density Source Correction Option	MEASURED	
FSAL	Formation Salinity	−50000	PPM
FSCO_APS	APS TNPH Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO_APS	APS TNPH Hole Size Correction Option	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO_APS	APS TNPH Mud Cake Correction Option	NO	
MCOR_APS	APS TNPH Mud Correction	NATU	
MWCO_APS	APS TNPH Mud Weight Correction Option	NO	
NARC	APS Near/Array Calibration Ratio	1.06588	
NFRC	APS Near/Far Calibration Ratio	0.886605	
PTCO_APS	APS TNPH Pressure/Temperature Correction Option	NO	
SHT	Surface Hole Temperature	20	DEGC
TNCO_APS	APS TNPH Computation Option	YES	

HNGS_APS	APS TNPH Computation Option	YES	
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)	100	DEGC
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	0.018227	DC/M
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	−0.00263053	
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	20	DEGC
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	0.248452	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	1.13597	
EDTC−B: Enhanced DTS Cartridge			
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	100	DEGC
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DPPM	Density Porosity Processing Mode	HIRS	
FSAL	Formation Salinity	−50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO	Hole Size Correction Option	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
ISSBAR_EDTC	Nuclear Mud Type	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	BARI	
MWCO	Mud Weight Correction Option	YES	
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	20	DEGC
SOCN	Standoff Distance	0.5	IN
SOCO	Standoff Correction Option	NO	
TPOS_EDTC	EDTC Tool Centered/Eccentered	Eccentered	
U−ETELM_EDTS	Telemetry Mode for eWAFE	Standard_EDTS	
U−TELM_EDTS	Telemetry Mode for WAFE	Standard_EDTS	
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	13.375	IN
CWEI	Casing Weight	168.00	LB/F
DFD	Drilling Fluid Density	1.03	G/C3
DO	Depth Offset for Playback	−4246.0	M
FLEV	Fluid Level	−50000.00	M
MST	Mud Sample Temperature	−50000.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
PP	Playback Processing	NORMAL	
RMFS	Resistivity of Mud Filtrate Sample	−50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	471	M
TDD	Total Depth − Driller	1008.00	M
TDL	Total Depth − Logger	471.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

MSS_LDEO−A	**19C0−187**	**HRLT−B**	**19C0−187**
HLDS	**19C0−187**	**LDSC−B**	**19C0−187**
APS−C	**19C0−187**	**HNGC−B**	**19C0−187**
HNGS−BA	**19C0−187**	**EDTC−B**	**SKK−5169−EDTCB**

Input DLIS Files

DEFAULT	**Flip_MSS_LDEO_HRLA_040PUP**	**PRODUCER**	**25−Feb−2014 15:38**	**4719.8 M**	**4185.7 M**

Output DLIS Files

DEFAULT	**MSS_LDEO_HRLA_LDL_045PUP**	**FN:65**	**PRODUCER**	**01−Mar−2014 12:23**

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High Resolution Laterolog Array − B Wellsite Calibration − HRLT M01							
Before: 14−Feb−2014 12:26 After: 14−Feb−2014 20:10							
HRLT M0−M1 Voltage Plus − 0	0	N/A	−318.6	−319.2	−0.5269	9.681	UV
HRLT M0−M1 Voltage Plus − 1	0	N/A	−327.5	−336.3	−8.893	9.681	UV
HRLT M0−M1 Voltage Plus − 2	0	N/A	−330.1	−335.8	−5.768	9.681	UV
HRLT M0−M1 Voltage Plus − 3	0	N/A	−334.9	−339.5	−4.607	9.681	UV
HRLT M0−M1 Voltage Plus − 4	0	N/A	−325.0	−326.9	−1.961	9.681	UV
HRLT M0−M1 Voltage Plus − 5	0	N/A	−321.6	−322.9	−1.310	9.681	UV
HRLT M0−M1 Voltage Plus − 6	0	N/A	319.5	326.9	7.431	9.681	UV
HRLT M0−M1 Voltage Plus − 7	0	N/A	−322.7	−322.7	0	9.681	UV
High Resolution Laterolog Array − B Wellsite Calibration − HRLT M12							
Before: 14−Feb−2014 12:26 After: 14−Feb−2014 20:10							
HRLT M1−M2 Voltage Plus − 0	0	N/A	1753	1754	0.7512	53.42	UV
HRLT M1−M2 Voltage Plus − 1	0	N/A	1806	1850	44.73	53.42	UV
HRLT M1−M2 Voltage Plus − 2	0	N/A	1814	1841	27.63	53.42	UV
HRLT M1−M2 Voltage Plus − 3	0	N/A	1839	1860	21.30	53.42	UV
HRLT M1−M2 Voltage Plus − 4	0	N/A	1783	1791	7.933	53.42	UV
HRLT M1−M2 Voltage Plus − 5	0	N/A	1765	1769	4.068	53.42	UV
HRLT M1−M2 Voltage Plus − 6	0	N/A	−1770	−1808	−37.45	53.42	UV
HRLT M1−M2 Voltage Plus − 7	0	N/A	1781	1781	0	53.42	UV
High Resolution Laterolog Array − B Wellsite Calibration − HRLT M23							
Before: 14−Feb−2014 12:26 After: 14−Feb−2014 20:10							
HRLT M2−M3 Voltage Plus − 0	0	N/A	1740	1740	−0.02576	53.42	UV
HRLT M2−M3 Voltage Plus − 1	0	N/A	1805	1848	43.30	53.42	UV
HRLT M2−M3 Voltage Plus − 2	0	N/A	1814	1840	26.23	53.42	UV
HRLT M2−M3 Voltage Plus − 3	0	N/A	1842	1862	20.19	53.42	UV
HRLT M2−M3 Voltage Plus − 4	0	N/A	1780	1787	6.274	53.42	UV
HRLT M2−M3 Voltage Plus − 5	0	N/A	1763	1766	3.078	53.42	UV
HRLT M2−M3 Voltage Plus − 6	0	N/A	−1758	−1794	−35.80	53.42	UV
HRLT M2−M3 Voltage Plus − 7	0	N/A	1781	1781	0	53.42	UV
High Resolution Laterolog Array − B Wellsite Calibration − HRLT V34							
Before: 14−Feb−2014 12:26 After: 14−Feb−2014 20:10							
HRLT A3−A4 Voltage Plus − 0	0	N/A	68350	68440	85.94	2100	UV
HRLT A3−A4 Voltage Plus − 1	0	N/A	70690	72470	1782	2100	UV
HRLT A3−A4 Voltage Plus − 2	0	N/A	71310	72460	1157	2100	UV
HRLT A3−A4 Voltage Plus − 3	0	N/A	72720	73610	885.8	2100	UV
HRLT A3−A4 Voltage Plus − 4	0	N/A	70240	70600	355.0	2100	UV
HRLT A3−A4 Voltage Plus − 5	0	N/A	69570	69800	233.0	2100	UV
HRLT A3−A4 Voltage Plus − 6	0	N/A	−67880	−69350	−1475	2100	UV
HRLT A3−A4 Voltage Plus − 7	0	N/A	70000	70000	0	2100	UV
High Resolution Laterolog Array − B Wellsite Calibration − HRLT V45							
Before: 14−Feb−2014 12:26 After: 14−Feb−2014 20:10							
HRLT A4−A5 Voltage Plus − 0	0	N/A	68620	68720	93.47	2100	UV
HRLT A4−A5 Voltage Plus − 1	0	N/A	71060	72860	1807	2100	UV
HRLT A4−A5 Voltage Plus − 2	0	N/A	71660	72830	1172	2100	UV
HRLT A4−A5 Voltage Plus − 3	0	N/A	73050	73950	903.2	2100	UV
HRLT A4−A5 Voltage Plus − 4	0	N/A	70530	70900	366.4	2100	UV
HRLT A4−A5 Voltage Plus − 5	0	N/A	69850	70080	228.5	2100	UV
HRLT A4−A5 Voltage Plus − 6	0	N/A	−68260	−69730	−1475	2100	UV
HRLT A4−A5 Voltage Plus − 7	0	N/A	70000	70000	0	2100	UV
High Resolution Laterolog Array − B Wellsite Calibration − HRLT V56							

Before: 14−Feb−2014 12:26 After: 14−Feb−2014 20:10

HRLT A5−A6 Voltage Plus − 0	0	N/A	68510	68620	110.4	2100	UV
HRLT A5−A6 Voltage Plus − 1	0	N/A	70790	72570	1788	2100	UV
HRLT A5−A6 Voltage Plus − 2	0	N/A	71420	72590	1165	2100	UV
HRLT A5−A6 Voltage Plus − 3	0	N/A	72850	73770	914.6	2100	UV
HRLT A5−A6 Voltage Plus − 4	0	N/A	70390	70750	356.3	2100	UV
HRLT A5−A6 Voltage Plus − 5	0	N/A	69750	69950	204.5	2100	UV
HRLT A5−A6 Voltage Plus − 6	0	N/A	−67990	−69470	−1475	2100	UV
HRLT A5−A6 Voltage Plus − 7	0	N/A	70000	70000	0	2100	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT VTP

Before: 14−Feb−2014 12:26 After: 14−Feb−2014 20:10

HRLT Torpedo−M0 Voltage − 0	0	N/A	−68200	−68290	−92.25	2100	UV
HRLT Torpedo−M0 Voltage − 1	0	N/A	−71100	−72930	−1832	2100	UV
HRLT Torpedo−M0 Voltage − 2	0	N/A	−71730	−72890	−1166	2100	UV
HRLT Torpedo−M0 Voltage − 3	0	N/A	−73140	−74060	−917.2	2100	UV
HRLT Torpedo−M0 Voltage − 4	0	N/A	−70590	−70950	−362.6	2100	UV
HRLT Torpedo−M0 Voltage − 5	0	N/A	−69890	−70120	−226.3	2100	UV
HRLT Torpedo−M0 Voltage − 6	0	N/A	68240	69740	1502	2100	UV
HRLT Torpedo−M0 Voltage − 7	0	N/A	−70000	−70000	0	2100	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT VBD

Before: 14−Feb−2014 12:26 After: 14−Feb−2014 20:10

HRLT Bridle#9−M0 Voltage − 0	0	N/A	−68220	−68290	−65.30	2100	UV
HRLT Bridle#9−M0 Voltage − 1	0	N/A	−71110	−72900	−1786	2100	UV
HRLT Bridle#9−M0 Voltage − 2	0	N/A	−71750	−72870	−1120	2100	UV
HRLT Bridle#9−M0 Voltage − 3	0	N/A	−73170	−74040	−868.0	2100	UV
HRLT Bridle#9−M0 Voltage − 4	0	N/A	−70620	−70950	−332.6	2100	UV
HRLT Bridle#9−M0 Voltage − 5	0	N/A	−69920	−70110	−192.3	2100	UV
HRLT Bridle#9−M0 Voltage − 6	0	N/A	68260	69720	1461	2100	UV
HRLT Bridle#9−M0 Voltage − 7	0	N/A	−70000	−70000	0	2100	UV

High Resolution Laterolog Array − B Wellsite Calibration − HRLT ISO

Before: 14−Feb−2014 12:26 After: 14−Feb−2014 20:10

HRLT Source Current Plus − 0	0	N/A	284.4	284.7	0.2940	8.520	UA
HRLT Source Current Plus − 1	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 2	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 3	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 4	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 5	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 6	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus − 7	**0**	**N/A**	**281.1**	**281.1**	**0**	**8.520**	**UA**

High Resolution Laterolog Array − B Wellsite Calibration − HRLT MV

Before: 14−Feb−2014 12:26 After: 14−Feb−2014 20:10

HRLT Vertical Voltage Pl − 0	0	N/A	−321.1	−321.5	−0.4245	9.681	UV
HRLT Vertical Voltage Pl − 1	0	N/A	−322.7	−331.0	−8.301	9.681	UV
HRLT Vertical Voltage Pl − 2	0	N/A	−324.2	−329.3	−5.105	9.681	UV
HRLT Vertical Voltage Pl − 3	0	N/A	−327.0	−331.1	−4.052	9.681	UV
HRLT Vertical Voltage Pl − 4	0	N/A	−314.2	−315.8	−1.598	9.681	UV
HRLT Vertical Voltage Pl − 5	0	N/A	−325.9	−326.9	−1.033	9.681	UV
HRLT Vertical Voltage Pl − 6	0	N/A	327.6	334.8	7.194	9.681	UV
HRLT Vertical Voltage Pl − 7	0	N/A	−322.7	−322.7	0	9.681	UV

Hostile Litho−Density Sonde Wellsite Calibration − Background Measurement

Master: 18−Jan−2014 7:12 Before: 7−Feb−2014 4:38 After: 14−Feb−2014 22:48

SS Cs Resolution Bkg	9.000	7.743	7.765	7.784	0.01945	1.800	%
LS Cs Resolution Bkg	9.000	8.077	8.064	7.987	−0.07712	1.800	%
LSW1 Background	100.0	83.87	83.87	83.39	−0.4825	0.03000	CPS
LSW2 Background	100.0	76.15	75.58	75.59	0.01392	0.03000	CPS
LSW3 Background	200.0	173.7	172.8	171.4	−1.385	0.03000	CPS
LSW4 Background	250.0	211.2	209.8	211.2	1.347	0.03000	CPS
LSW5 Background	600.0	497.9	497.1	495.6	−1.479	0.03000	CPS
SSW1 Background	100.0	80.53	80.61	81.41	0.8050	0.03000	CPS
SSW2 Background	200.0	138.8	140.3	139.5	−0.7699	0.03000	CPS
SSW3 Background	500.0	394.3	393.6	391.1	−2.484	0.03000	CPS
SSW4 Background	270.0	209.8	210.8	209.5	−1.301	0.03000	CPS
SSW5 Background	200.0	149.8	150.6	149.0	−1.583	0.03000	CPS

Hostile Litho−Density Sonde Wellsite Calibration − Aluminum Measurement

Master: 18−Jan−2014 8:04

LSW1 Aluminum	600.0	441.7	N/A	N/A	N/A	N/A	CPS
LSW2 Aluminum	900.0	643.8	N/A	N/A	N/A	N/A	CPS
LSW3 Aluminum	1100	765.2	N/A	N/A	N/A	N/A	CPS
LSW4 Aluminum	580.0	389.9	N/A	N/A	N/A	N/A	CPS
LSW5 Aluminum	570.0	349.1	N/A	N/A	N/A	N/A	CPS
SSW1 Aluminum	2800	2085	N/A	N/A	N/A	N/A	CPS
SSW2 Aluminum	8000	5782	N/A	N/A	N/A	N/A	CPS
SSW3 Aluminum	11600	8168	N/A	N/A	N/A	N/A	CPS
SSW4 Aluminum	5000	3220	N/A	N/A	N/A	N/A	CPS
SSW5 Aluminum	660.0	353.1	N/A	N/A	N/A	N/A	CPS

Hostile Litho−Density Sonde Wellsite Calibration − Lithology Measurement
Master: 18−Jan−2014 7:59

LSW1 Iron	400.0	327.2	N/A	N/A	N/A	N/A	CPS
LSW2 Iron	730.0	553.4	N/A	N/A	N/A	N/A	CPS
LSW3 Iron	1000	724.2	N/A	N/A	N/A	N/A	CPS
LSW4 Iron	520.0	374.0	N/A	N/A	N/A	N/A	CPS
LSW5 Iron	470.0	335.9	N/A	N/A	N/A	N/A	CPS
SSW1 Iron	2100	1575	N/A	N/A	N/A	N/A	CPS
SSW2 Iron	6800	4944	N/A	N/A	N/A	N/A	CPS
SSW3 Iron	10800	7631	N/A	N/A	N/A	N/A	CPS
SSW4 Iron	4600	3018	N/A	N/A	N/A	N/A	CPS
SSW5 Iron	580.0	325.4	N/A	N/A	N/A	N/A	CPS

Hostile Litho−Density Sonde Wellsite Calibration − Caliper Calibration
Before: 7−Feb−2014 4:54

HLDS Caliper Small Ring	12.00	N/A	14.61	N/A	N/A	N/A	IN
HLDS Caliper Large Ring	15.19	N/A	18.22	N/A	N/A	N/A	IN

Accelerator−Porosity Tool Wellsite Calibration − Detector Background
Master: 19−Jan−2014 0:36 Before: 14−Feb−2014 13:57 After: 14−Feb−2014 22:45

Near Det Bkg Cntrate	30.00	33.30	31.43	32.82	1.388	N/A	CPS
Far Det Bkg Cntrate	30.00	33.16	32.67	31.94	−0.7348	N/A	CPS
Array−1 Det Bkg Cntrate	30.00	28.53	28.48	28.98	0.5045	N/A	CPS
Array−2 Det Bkg Cntrate	30.00	28.93	29.76	30.94	1.180	N/A	CPS
Array Therm Det Bkg Cntrate	30.00	31.86	34.98	32.30	−2.686	N/A	CPS

Accelerator−Porosity Tool Wellsite Calibration − Calibration Ratios
Master: 19−Jan−2014 1:16

Near/Far Calibration Ratio	0.9250	0.8866	N/A	N/A	N/A	N/A	
Near/Array Calibration Ratio	1.030	1.066	N/A	N/A	N/A	N/A	
Near/Array Cal Ratio Up/Down	1.000	1.019	N/A	N/A	N/A	N/A	

Accelerator−Porosity Tool Wellsite Calibration − Tank Check
Master: 19−Jan−2014 1:06

Array−1 Standoff Porosity	11.75	10.18	N/A	N/A	N/A	N/A	PU
Array−2 Standoff Porosity	11.75	10.27	N/A	N/A	N/A	N/A	PU
Average Slowing Down Time	6.000	6.107	N/A	N/A	N/A	N/A	US
Array−1 SDT Ratio Up/Down	1.000	0.9696	N/A	N/A	N/A	N/A	
Array−2 SDT Ratio Up/Down	1.000	0.9801	N/A	N/A	N/A	N/A	
Sigma Formation	27.50	34.45	N/A	N/A	N/A	N/A	CU

Accelerator−Porosity Tool Wellsite Calibration − CCR7 signal boxes
Master: 18−Jan−2014 23:55

Near Detector Plateau Setting	1650	1732	N/A	N/A	N/A	N/A	V
Far Detector Plateau Setting	2000	2079	N/A	N/A	N/A	N/A	V
Array Detector Plateau Setting	2000	1963	N/A	N/A	N/A	N/A	V

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Detector 1 Check
Master: 4−Feb−2014 23:51 Before: 5−Feb−2014 0:02 After: 14−Feb−2014 22:49

Na 511 Peak Loc	40.00	39.52	39.48	39.40	−0.08661	1.000	
Na 511 Peak Res	15.50	15.96	16.77	17.49	0.7250	2.000	%
High Voltage	1150	1194	1193	1178	−14.73	N/A	V
Na 1785 Peak Loc	142.6	142.1	141.8	143.3	1.589	7.000	
Na 1785 Peak Res	8.500	9.703	8.709	9.053	0.3436	2.000	%
Temperature	15.50	35.74	35.71	29.22	−6.490	N/A	DEGC
Na Count Rate	45.00	11.77	12.16	12.00	−0.1618	8.000	CPS

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Detector 2 Check
Master: 4−Feb−2014 23:51 Before: 5−Feb−2014 0:02 After: 14−Feb−2014 22:49

Na 511 Peak Loc	40.00	39.56	39.51	39.31	−0.1972	1.000	
Na 511 Peak Res	15.50	16.07	16.56	18.46	1.905	2.000	%
High Voltage	1150	1126	1128	1111	−16.18	N/A	V
Na 1785 Peak Loc	142.6	142.3	143.1	141.7	−1.305	7.000	
Na 1785 Peak Res	8.500	8.959	9.953	9.256	−0.6973	2.000	%
Temperature	15.50	36.60	36.88	30.79	−6.093	N/A	DEGC
Na Count Rate	45.00	12.28	12.68	12.14	−0.5404	8.000	CPS

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Ratio Of Detector 1 To Detector 2
Master: 4−Feb−2014 23:51 Before: 5−Feb−2014 0:02 After: 14−Feb−2014 22:49

Coincidence Count Rate Ratio	1.000	0.9624	0.9606	0.9838	0.02323	0.05000	

Enhanced DTS Cartridge Wellsite Calibration − EDTC Accelerometer Calibration
Before: Calibration out of date 14−Feb−2014 12:25

EDTC Z−Axis Acceleration	9.810	N/A	9.727	N/A	N/A	N/A	M/S2

Enhanced DTS Cartridge Wellsite Calibration − Detector Calibration
Before: Calibration out of date 4−Feb−2014 5:11 After: Calibration out of date 5−Feb−2014 0:10

Gamma Ray (Jig − Bkg)	158.1	N/A	158.1	159.9	1.758	0.09091	GAPI
Gamma Ray (Calibrated)	164.0	N/A	164.0	165.8	1.823	15.00	GAPI

Accelerator−Porosity Tool − Detector Plateau Settings :

Near Detector Plateau Setting 1732 V
Far Detector Plateau Setting 2079 V
Array Detector Plateau Setting 1963 V

High Resolution Laterolog Array − B / Equipment Identification

Primary Equipment:		
HRLT Sonde	HRLS − B	768
Auxiliary Equipment:		
HRLT lower Housing	HRLH − B	968
HRLT Lower Cartridge	HRLC − B	974
HRLT upper Housing	HRUH − B	768
HRLT Upper Cartridge	HRUC − B	764

High Resolution Laterolog Array − B Wellsite Calibration

HRLT M01

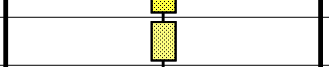
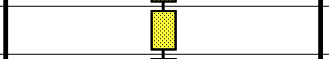
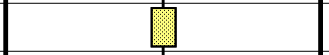
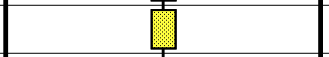
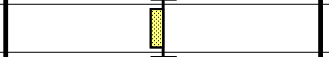
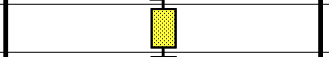
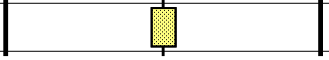
Idx	Phase	HRLT M0−M1 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−318.6	−322.7	−280.7	−379.7
	After		−319.2			
1	Before		−327.5	−322.7	−280.7	−379.7
	After		−336.3			
2	Before		−330.1	−322.7	−280.7	−379.7
	After		−335.8			
3	Before		−334.9	−322.7	−280.7	−379.7
	After		−339.5			
4	Before		−325.0	−322.7	−280.7	−379.7
	After		−326.9			
5	Before		−321.6	−322.7	−280.7	−379.7
	After		−322.9			
6	Before		319.5	322.7	379.7	280.7
	After		326.9			
7	Before		−322.7	−322.7	−280.7	−379.7
	After		−322.7			
		(Minimum) (Nominal) (Maximum)				

Before: 14−Feb−2014 12:26
After: 14−Feb−2014 20:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT M12

Idx	Phase	HRLT M1−M2 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		1753	1781	2095	1549
	After		1754			
1	Before		1806	1781	2095	1549
	After		1850			
2	Before		1814	1781	2095	1549
	After		1841			
3	Before		1839	1781	2095	1549
	After		1860			
	Before		1783			

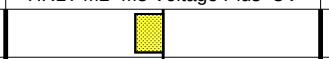
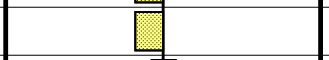
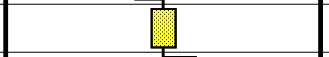
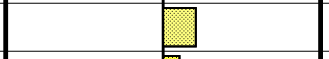
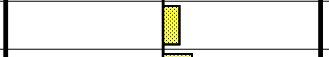
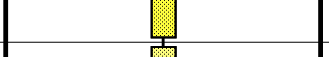
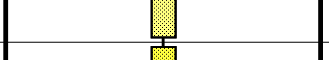
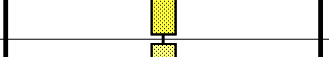
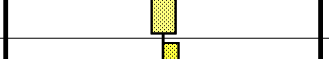
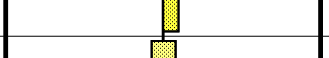
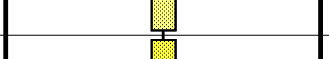
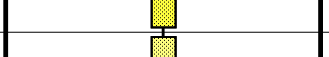
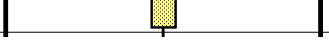
4	After		1791	1781	2095	1549
5	Before		1765	1781	2095	1549
	After		1769			
6	Before		−1770	−1781	−1549	−2095
	After		−1808			
7	Before		1781	1781	2095	1549
	After		1781			
	(Minimum) (Nominal) (Maximum)					

Before: 14−Feb−2014 12:26

After: 14−Feb−2014 20:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT M23

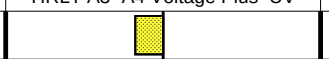
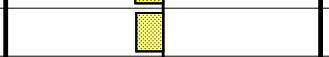
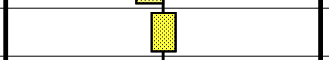
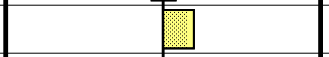
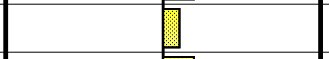
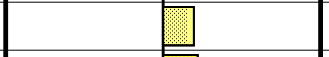
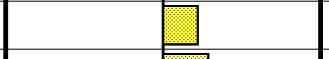
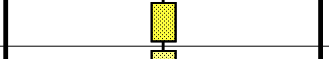
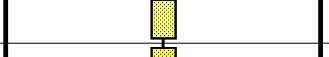
Idx	Phase	HRLT M2−M3 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		1740	1781	2095	1549
	After		1740			
1	Before		1805	1781	2095	1549
	After		1848			
2	Before		1814	1781	2095	1549
	After		1840			
3	Before		1842	1781	2095	1549
	After		1862			
4	Before		1780	1781	2095	1549
	After		1787			
5	Before		1763	1781	2095	1549
	After		1766			
6	Before		−1758	−1781	−1549	−2095
	After		−1794			
7	Before		1781	1781	2095	1549
	After		1781			
	(Minimum) (Nominal) (Maximum)					

Before: 14−Feb−2014 12:26

After: 14−Feb−2014 20:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT V34

Idx	Phase	HRLT A3−A4 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		68350	70000	82360	60900
	After		68440			
1	Before		70690	70000	82360	60900
	After		72470			
2	Before		71310	70000	82360	60900
	After		72460			
3	Before		72720	70000	82360	60900
	After		73610			
4	Before		70240	70000	82360	60900
	After		70600			
	Before		69570			

Idx	Phase	HRLT A4−A5 Voltage Plus UV	Value	Nominal	Maximum	Minimum
5	Before		69570	70000	82360	60900
	After		69800			
6	Before		−67880	−70000	−60900	−82360
	After		−69350			
7	Before		70000	70000	82360	60900
	After		70000			
		(Minimum) (Nominal) (Maximum)				

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High Resolution Laterolog Array − B Wellsite Calibration

HRLT V45

Idx	Phase	HRLT A4−A5 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		68620	70000	82360	60900
	After		68720			
1	Before		71060	70000	82360	60900
	After		72860			
2	Before		71660	70000	82360	60900
	After		72830			
3	Before		73050	70000	82360	60900
	After		73950			
4	Before		70530	70000	82360	60900
	After		70900			
5	Before		69850	70000	82360	60900
	After		70080			
6	Before		−68260	−70000	−60900	−82360
	After		−69730			
7	Before		70000	70000	82360	60900
	After		70000			
		(Minimum) (Nominal) (Maximum)				

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High Resolution Laterolog Array − B Wellsite Calibration

HRLT V56

Idx	Phase	HRLT A5−A6 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		68510	70000	82360	60900
	After		68620			
1	Before		70790	70000	82360	60900
	After		72570			
2	Before		71420	70000	82360	60900
	After		72590			
3	Before		72850	70000	82360	60900
	After		73770			
4	Before		70390	70000	82360	60900
	After		70750			
5	Before		69750	70000	82360	60900
	After		69950			
	Before		67090			

6	Before	−67990	−70000	−60900	−82360
	After	−69470			
7	Before	70000	70000	82360	60900
	After	70000			
	(Minimum) (Nominal) (Maximum)				

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High Resolution Laterolog Array − B Wellsite Calibration

HRLT VTP

Idx	Phase	HRLT Torpedo−M0 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−68200	−70000	−60900	−82360
	After		−68290			
1	Before		−71100	−70000	−60900	−82360
	After		−72930			
2	Before		−71730	−70000	−60900	−82360
	After		−72890			
3	Before		−73140	−70000	−60900	−82360
	After		−74060			
4	Before		−70590	−70000	−60900	−82360
	After		−70950			
5	Before		−69890	−70000	−60900	−82360
	After		−70120			
6	Before		68240	70000	82360	60900
	After		69740			
7	Before		−70000	−70000	−60900	−82360
	After		−70000			
	(Minimum) (Nominal) (Maximum)					

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High Resolution Laterolog Array − B Wellsite Calibration

HRLT VBD

Idx	Phase	HRLT Bridle#9−M0 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−68220	−70000	−60900	−82360
	After		−68290			
1	Before		−71110	−70000	−60900	−82360
	After		−72900			
2	Before		−71750	−70000	−60900	−82360
	After		−72870			
3	Before		−73170	−70000	−60900	−82360
	After		−74040			
4	Before		−70620	−70000	−60900	−82360
	After		−70950			
5	Before		−69920	−70000	−60900	−82360
	After		−70110			
6	Before		68260	70000	82360	60900
	After		69720			
7	Before		−70000	−70000	−60900	−82360

	Before		−70000			
7	After		−70000	−70000	−60900	−82360
	(Minimum)	(Nominal) (Maximum)				

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High Resolution Laterolog Array − B Wellsite Calibration

HRLT ISO

Idx	Phase	HRLT Source Current Plus UA	Value	Nominal	Maximum	Minimum
0	Before		284.4	284.0	334.1	247.0
	After		284.7			
1	Before		281.1	281.1	330.7	244.4
	After		281.1			
2	Before		281.1	281.1	330.7	244.4
	After		281.1			
3	Before		281.1	281.1	330.7	244.4
	After		281.1			
4	Before		281.1	281.1	330.7	244.4
	After		281.1			
5	Before		281.1	281.1	330.7	244.4
	After		281.1			
6	Before		281.1	281.1	330.7	244.4
	After		281.1			
7	Before		281.1	281.1	330.7	244.4
	After		281.1			
	(Minimum)	(Nominal) (Maximum)				

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High Resolution Laterolog Array − B Wellsite Calibration

HRLT MV

Idx	Phase	HRLT Vertical Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−321.1	−322.7	−280.7	−379.7
	After		−321.5			
1	Before		−322.7	−322.7	−280.7	−379.7
	After		−331.0			
2	Before		−324.2	−322.7	−280.7	−379.7
	After		−329.3			
3	Before		−327.0	−322.7	−280.7	−379.7
	After		−331.1			
4	Before		−314.2	−322.7	−280.7	−379.7
	After		−315.8			
5	Before		−325.9	−322.7	−280.7	−379.7
	After		−326.9			
6	Before		327.6	322.7	379.7	280.7
	After		334.8			
7	Before		−322.7	−322.7	−280.7	−379.7
	After		−322.7			

	(Minimum)	(Nominal)	(Maximum)		

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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	8113
Auxiliary Equipment:		
Hostile Litho Density Pad	HLDP − C	35
Hostile Litho Density High Voltage Housi	HEH − H	35

Litho−Density Spectroscopy Cartridge − B / Equipment Identification

Primary Equipment:		
LDSC Cartridge	LDSC − B	326
Auxiliary Equipment:		
LDSC Housing	LDSH − A	303

Accelerator−Porosity Tool / Equipment Identification

Primary Equipment:		
Accelerator−Porosity Sonde	APS − C	22
APS Minitron	MNTR − F	7341
Auxiliary Equipment:		
Accelerator−Porosity Housing	APH − AC	22
APS Calibration Water Tank	SFT − 178	1
APS Aluminum Calibrator Sleeve	SFT − 281	1

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	HNSH − BA	205
Gamma Source Radioactive	GSR − U	616008

Enhanced DTS Cartridge / Equipment Identification

Primary Equipment:		
EDTC Gamma Ray Detector	EDTG − A/B	8305
Enhanced DTS Cartridge	EDTC − B	8317
Auxiliary Equipment:		
EDTC Housing	EDTH − B	8303

Company:	**Lamont Doherty Earth Observatory**
Well:	**Expedition 349, Site U1431E**
Field:	**South China Sea Tectonics**
Rig:	**JOIDES Resolution**
Ocean:	**South China Sea**

Schlumberger

High Resolution Laterolog Array (HRLA)
Log Quality Control