**Schlumberger**

Company: **International Ocean Discovery Program**

Well: **Expedition 376, Site U1530A**
Field: **Bothers Arc Flux**
Rig: **JOIDES Resolution** Ocean: **Pacific**

Rig: JOIDES Resolution
Field: Bothers Arc Flux
Location: 34.86098 Deg South
Well: Expedition 376, Site U1530A
Company: International Ocean Discovery Pr

Hostile Natural Gamma Spectroscopy −HNGS
Hostile Litho Density Sonde − HLDS
Porosty−APS, Mud Temperature (LEH−MT)

LOCATION

34.86098 Deg South
179.05762 Deg East

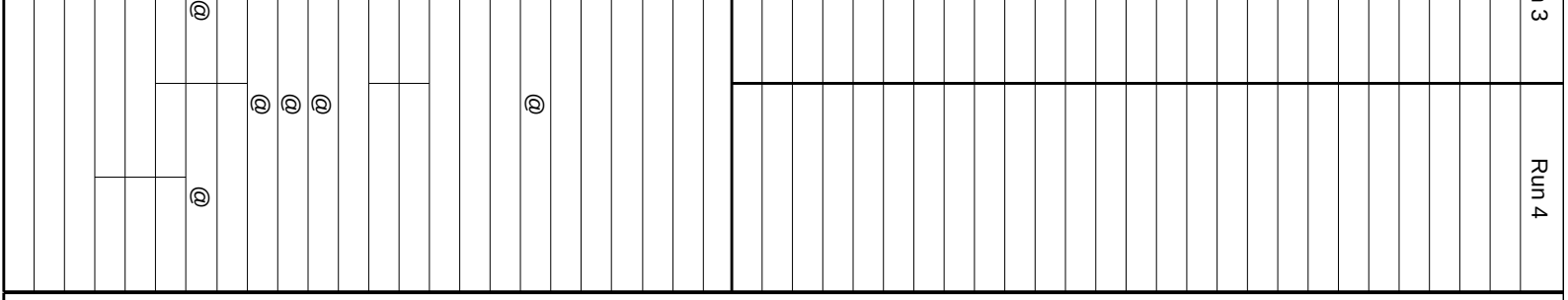
Elev.: K.B. 0.00 m
G.L. −1606.00 m
D.F. 0.00 m

Permanent Datum: Sea Floor — Elev.: −1606.00 m
Log Measured From: Rig Floor — 1606.00 m above Perm. Datum
Drilling Measured From: Rig Floor

| API Serial No. | Max. Hole Devi. 4 deg | Longitude 179.05762 Deg E | Latitude 34.86098 Deg S |
|---|---|---|---|

| | Run 1 | Run 2 | Run |
|---|---|---|---|
| Logging Date | 19−Jun−2018 | | |
| Run Number | 1 | | |
| Depth Driller | 2059.1 m | | |
| Schlumberger Depth | 2046 m | | |
| Bottom Log Interval | 2046 m | | |
| Top Log Interval | 1601 m | | |
| Casing Driller Size @ Depth | 8.500 in @ 1673 m | @ | |
| Casing Schlumberger | 1670 m | | |
| Bit Size | 9.875 in | | |
| Type Fluid In Hole | sea water | | |
| MUD Density / Viscosity | 1.024 g/cm3 | | |
| MUD Fluid Loss / PH | | 7 | |
| MUD Source Of Sample | | | |
| RM @ Measured Temperature | @ | @ | |
| RMF @ Measured Temperature | @ | @ | |
| RMC @ Measured Temperature | @ | @ | |
| Source RMF / RMC | | | |
| RM @ MRT / RMF @ MRT | @ 94 | @ 94 | @ @ |
| Maximum Recorded Temperatures | 94 degC | 94 | |
| Circulation Stopped / Time | 19−Jun−2018 | 13:30 | |
| Logger On Bottom / Time | 19−Jun−2018 | 20:17 | |
| Unit Number / Location | 627314 | Larose, LA | |
| Recorded By | K. Swain | | |
| Witnessed By | C. Massiot, A. Reyes | | |

| | Run 1 | Run 2 | Run |
|---|---|---|---|
| Logging Date | | | |
| Run Number | | | |
| Depth Driller | | | |
| Schlumberger Depth | | | |
| Bottom Log Interval | | | |
| Top Log Interval | | | |
| Casing Driller Size @ Depth | @ | | |
| Casing Schlumberger | | | |
| Bit Size | | | |
| Type Fluid In Hole | | | |
| MUD Density / Viscosity | | | |
| MUD Fluid Loss / PH | | | |
| MUD Source Of Sample | | | |
| RM @ Measured Temperature | @ | | |
| RMF @ Measured Temperature | @ | | |
| RMC @ Measured Temperature | @ | | |
| Source RMF / RMC | | | |
| RM @ MRT / RMF @ MRT | @ | @ | |
| Maximum Recorded Temperatures | | | |
| Circulation Stopped / Time | | | |
| Logger On Bottom / Time | | | |
| Unit Number / Location | | | |
| Recorded By | | | |
| Witnessed By | | | |




DISCLAIMER

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| OTHER SERVICES1 | OTHER SERVICES2 |
|---|---|
| OS1: FMS/DSI/HNGS | OS1: |
| OS2: | OS2: |
| OS3: | OS3: |
| OS4: | OS4: |
| OS5: | OS5: |

| REMARKS: RUN NUMBER 1 | REMARKS: RUN NUMBER 2 |
|---|---|
| Exp 376, U1530A: EDTC and HNGC/LDSC are flasked in case of high temperature. | |
| Tools conveyed on wireline through drill pipe without sub sea riser. | |
| Chemraz and Kalrez seals/o−rings utilized on this toolstring. | |
| Wireline run: 7−46M18XS | |
| Active Heave Compensator utlized until re−entering drillpipe. | |
| GPIH housing is required for HRLA return electrode. | |
| Logging bit used for logging only. | |
| Drilled TD was:2059.1mbrf | |
| Drill pipe set at 1673mbrf | |
| HLDS pad wear does not effect density values. | |
| MT head MTEM maximum 94 deg C. | |
| Maximum reading thermometers not available. | |
| Caliper opened on both uplog passes. | |
| Caliper closed for downlog. | |
| 2nd downlog made only for temperature log. | |
| Kuster fluid sample did not indicate H2S at time of logging so none is expected. | |
| IODP temperature tool prior to logging is 45 deg C. | |

| 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 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

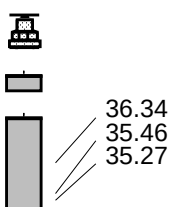
# EQUIPMENT DESCRIPTION

| RUN 1 | RUN 2 |
|---|---|

## SURFACE EQUIPMENT

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

## DOWNHOLE EQUIPMENT




LEH−MT 38.99

AH−369 38.03

EDTC−B 37.60

EDTH−UDFHKL 1091 Paulette 1091

EDTC−B 8317

EDTC−A/B 8305

EDTG−A/B 8305

EDTCB Ele — 34.35

ILE−F — 34.35
ILE−F 72

HNGS−BA — 31.92
HNGS−BA 194
HNSH−BA 204

Upper_1 — 31.22
Lower_2 — 31.00
Status
Minitron
Near TD
Near Arr

APS−C — 29.42
APH−AC 152
APS−C 249
MNTR−F 51002

Near — 26.97
Far Arr — 26.89
Far — 26.77
Far TD — 26.67

HNCC−B — 25.47
UDFH−KLX 1055
HNGC−B 304
LDSC−B 521

HNGC Stat — 24.38
LDSC Stat — 23.31

HLDS — 22.22
GSR−Z 2945
HLDV−D 45
HLDS−D 45
HEH−H 47
HLDP−C 45

Caliper
SS LS Status — 18.16

AH−184−#1737 — 17.40

AH−ECHMRA5714 — 16.79
AH−ECHMRA5714 5714

AH−184−#994 — 13.90

AH−MCD−82 — 13.29
AH−MCD−82 82

HRLT−B — 11.01
HRUH−B 975
HRUC−B 964
HRLS−B 768
HRLH−B 1869
HRLC−B 1897
AH−270 773

High Res. — 7.43

AH−MCD−1663 — 3.64
AH−MCD−1663 1663

AH−GPIH2864 — 1.36
AH−GPIH2864 2864

DF ACCZ
Tension HV — 0.00

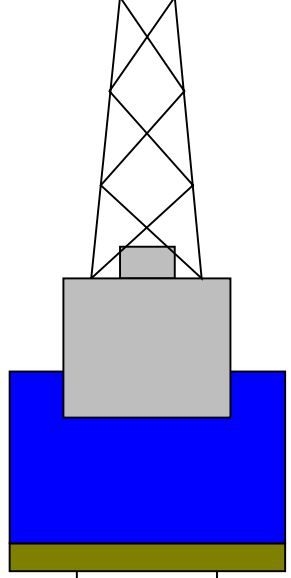
BNS−CCS — 0.14

TOOL ZERO

MAXIMUM STRING DIAMETER 3.75 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 | | 0 | | | |
| Derrick Floor Elevation | | 0 | | | |
| Mean Sea Level | | 11 | | | |
| | | | | 4.1 | |
| | | | 1606 | 4.1 | Sea Floor |
| | | | 1673 | 9.875 | Drill Pipe |
| | | | 2059.1 | | Total Depth Driller |



## Input DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | Flip_HRLA_LDL_APS_028LUP | | PRODUCER | 19−Jun−2018 22:11 | 2040.9 M | 1543.0 M |

## Output DLIS Files

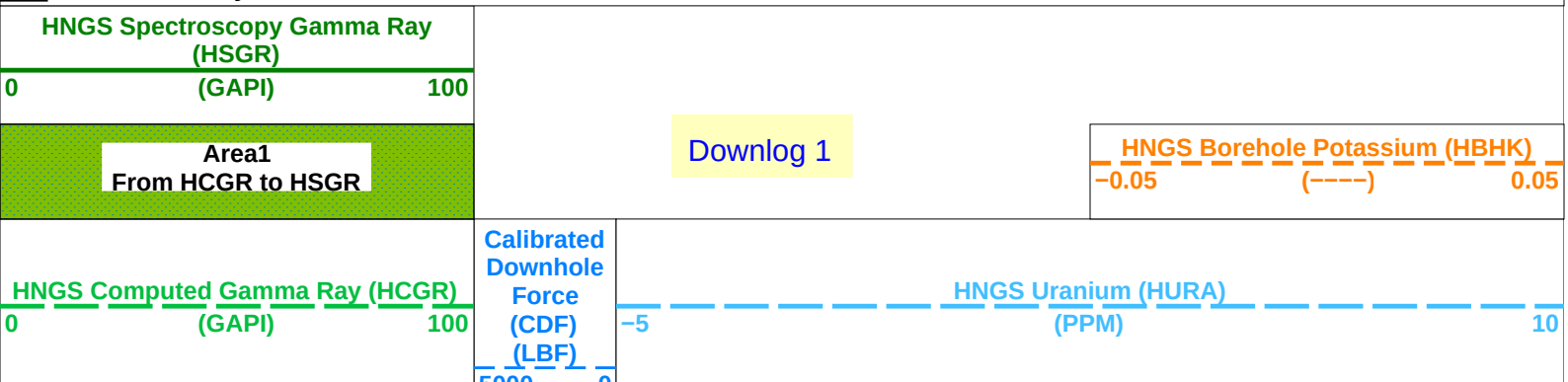
| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_073PUP | FN:93 | PRODUCER | 22−Jun−2018 00:55 | 2040.9 M | 1543.1 M |

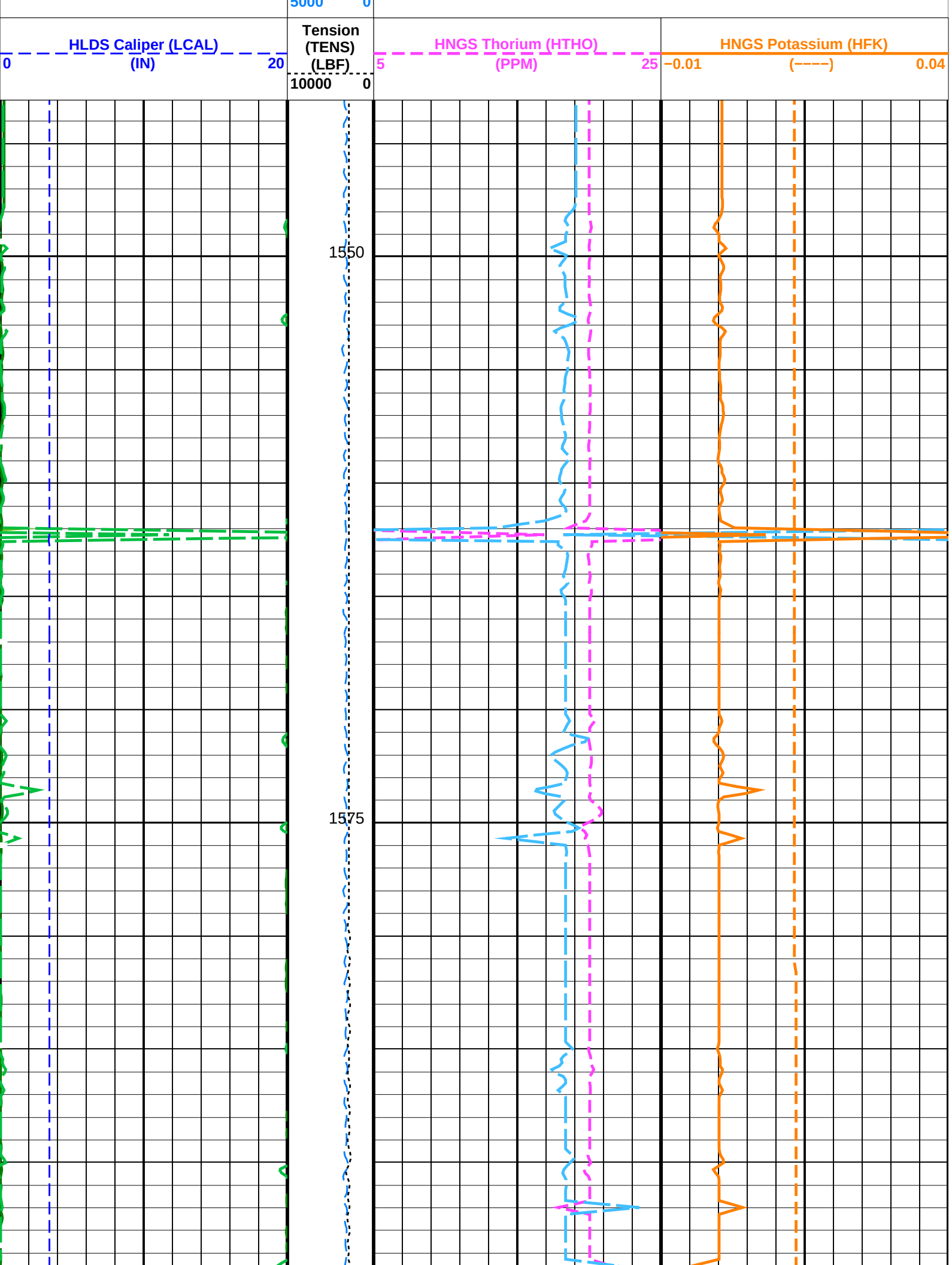
## OP System Version: 19C0−187

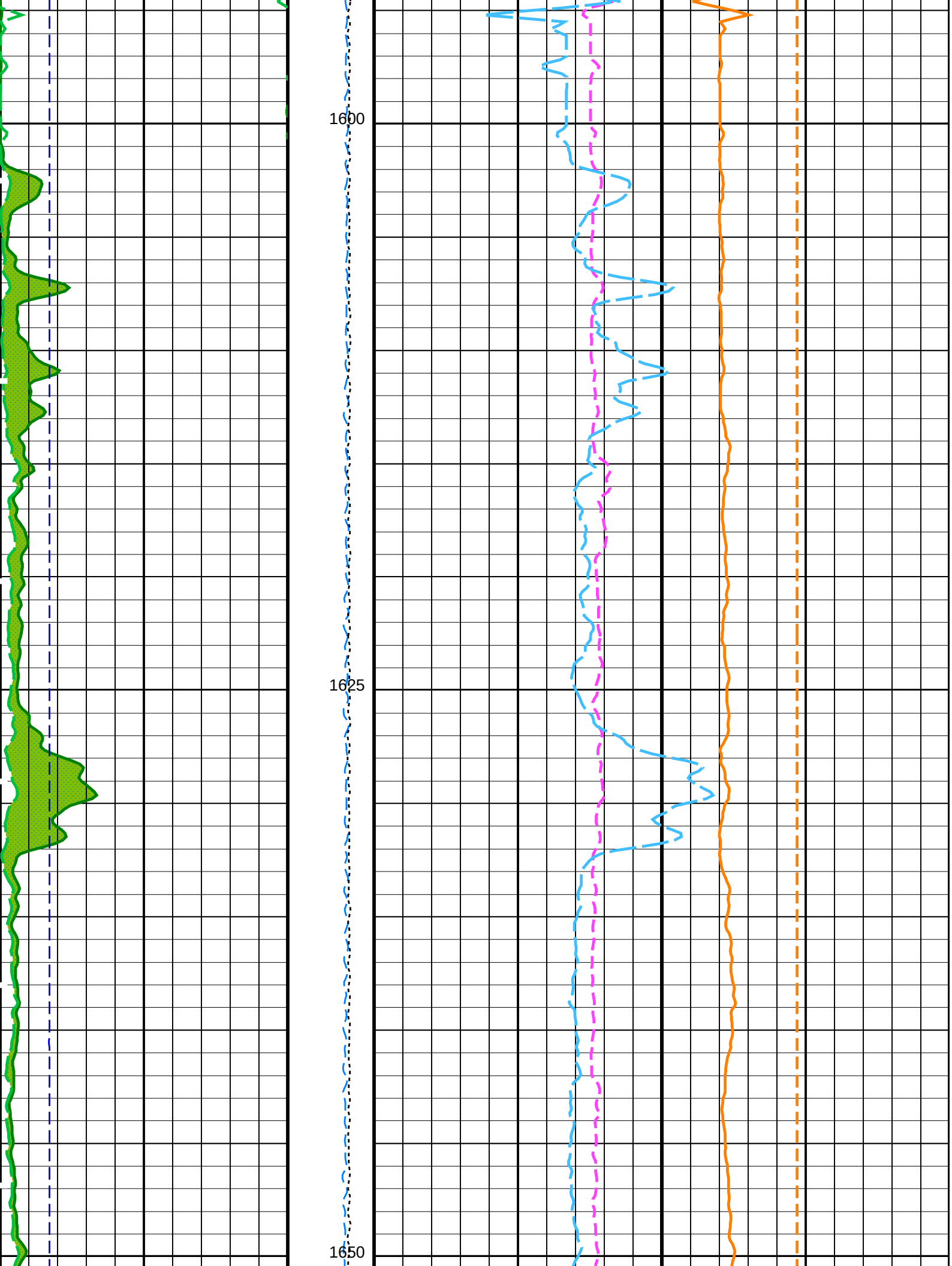
| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

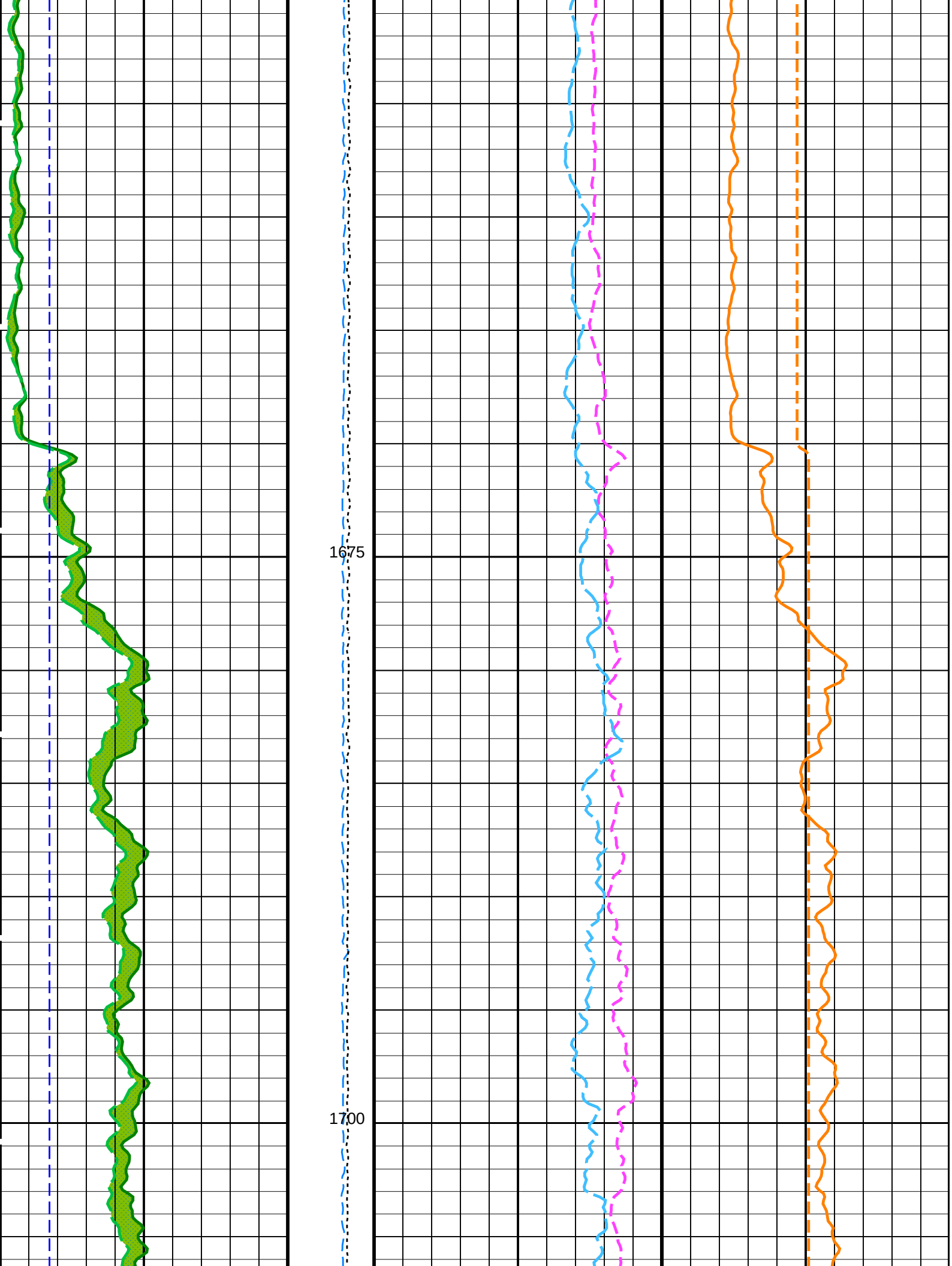
**PIP SUMMARY**

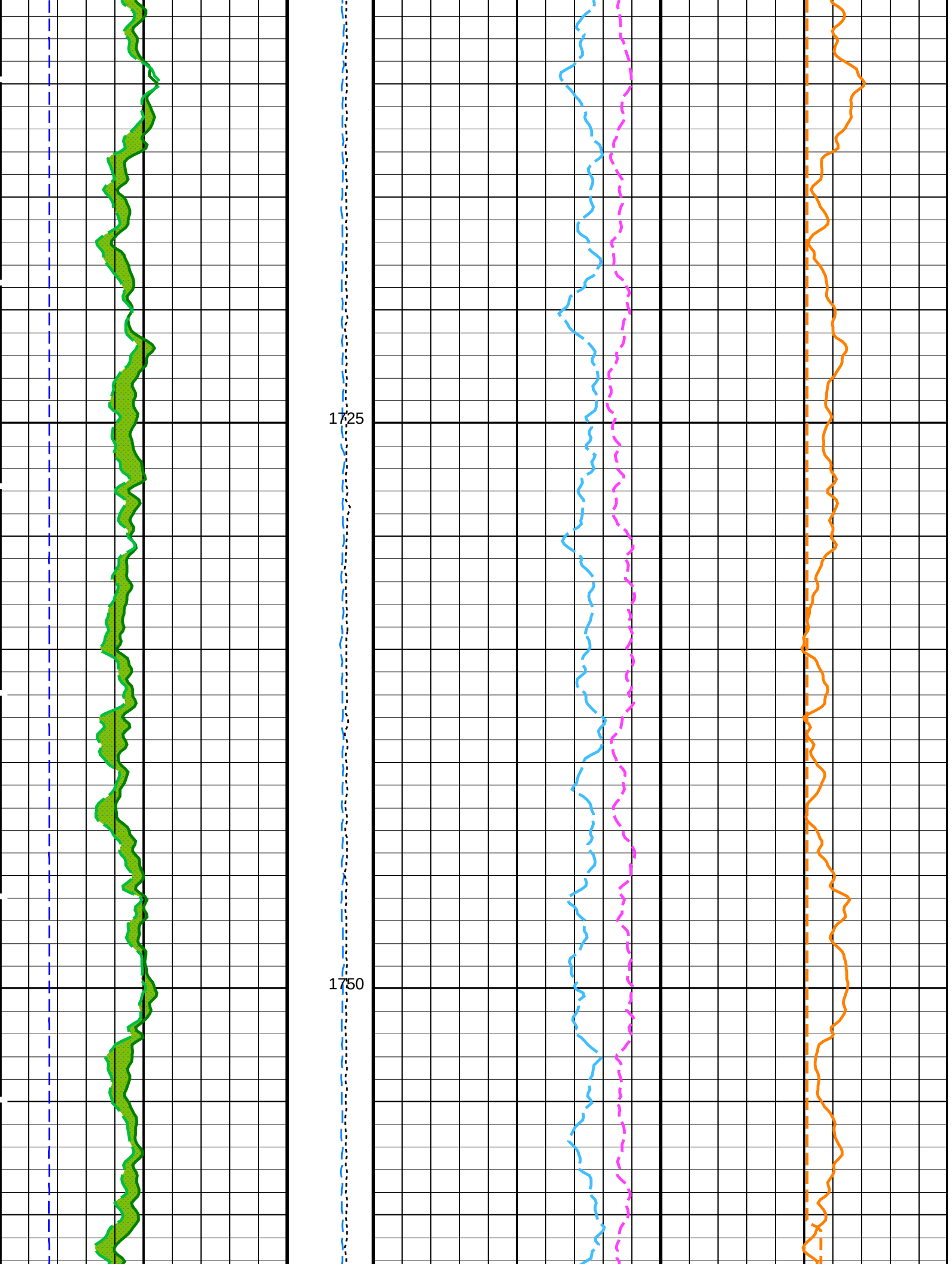
Time Mark Every 60 S

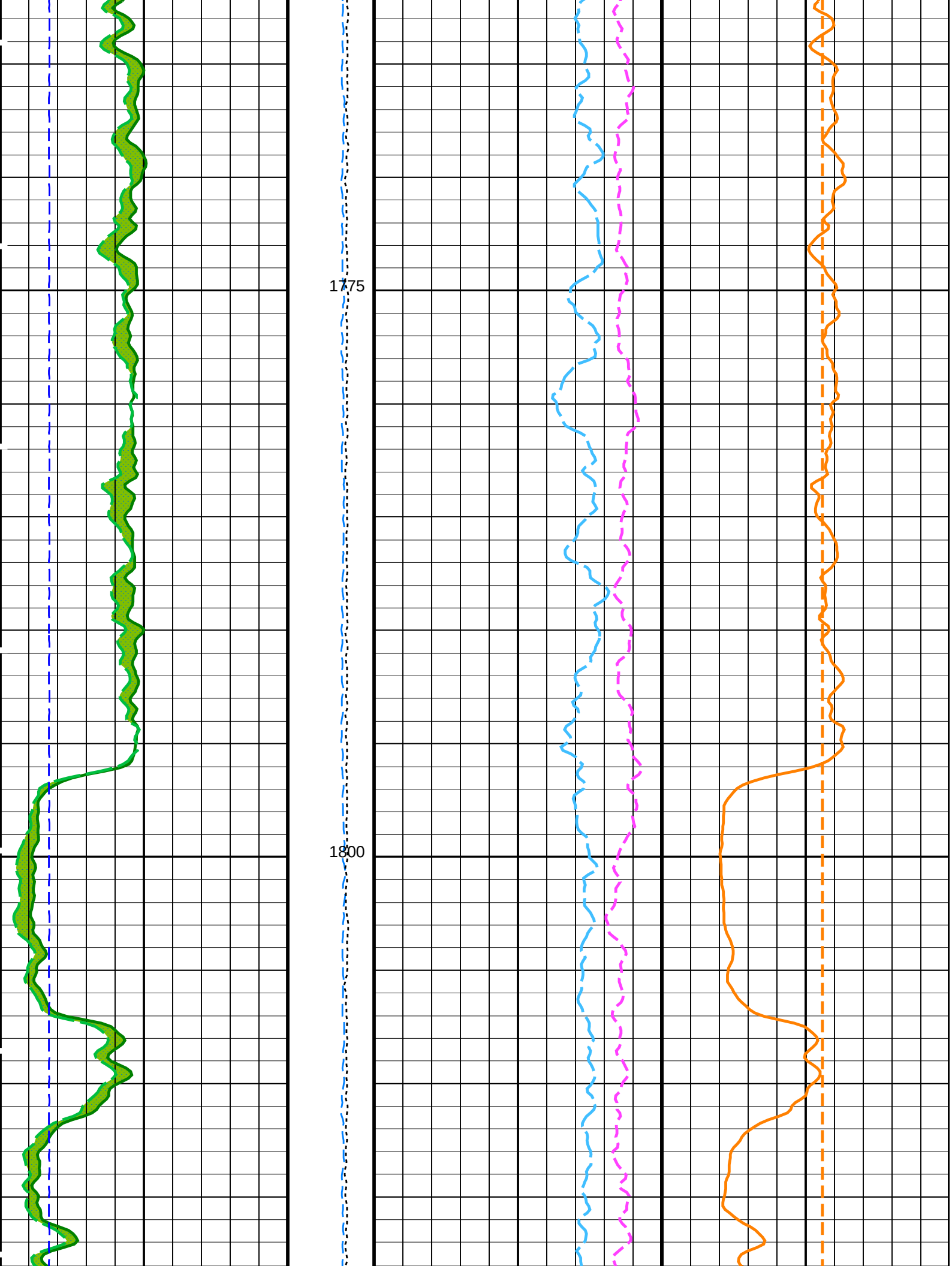


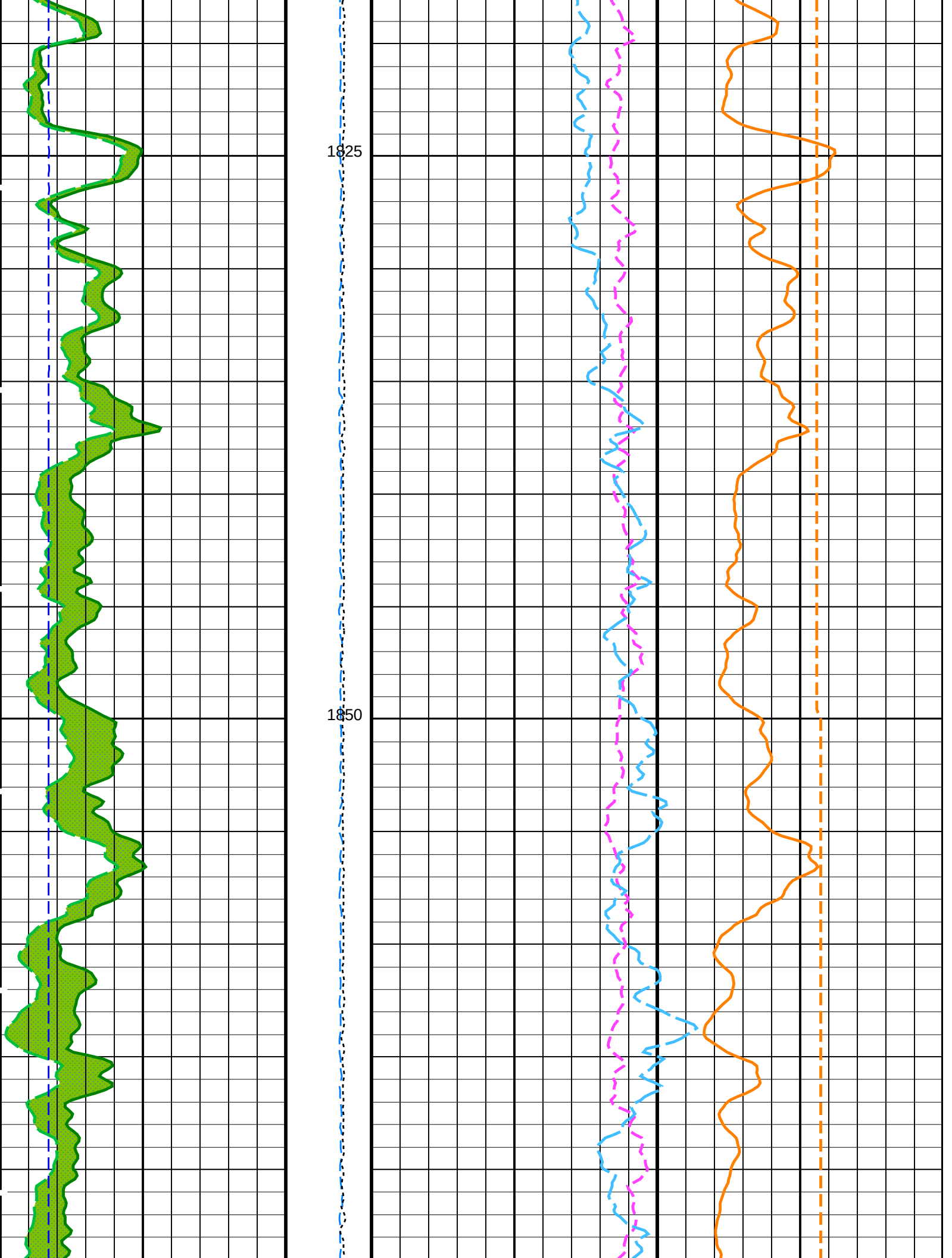

5000 0
HLDS Caliper (LCAL)
0 (IN) 20
Tension (TENS) (LBF)
10000 0
HNGS Thorium (HTHO)
5 (PPM) 25
HNGS Potassium (HFK)
−0.01 (−−−−) 0.04
1550
1575

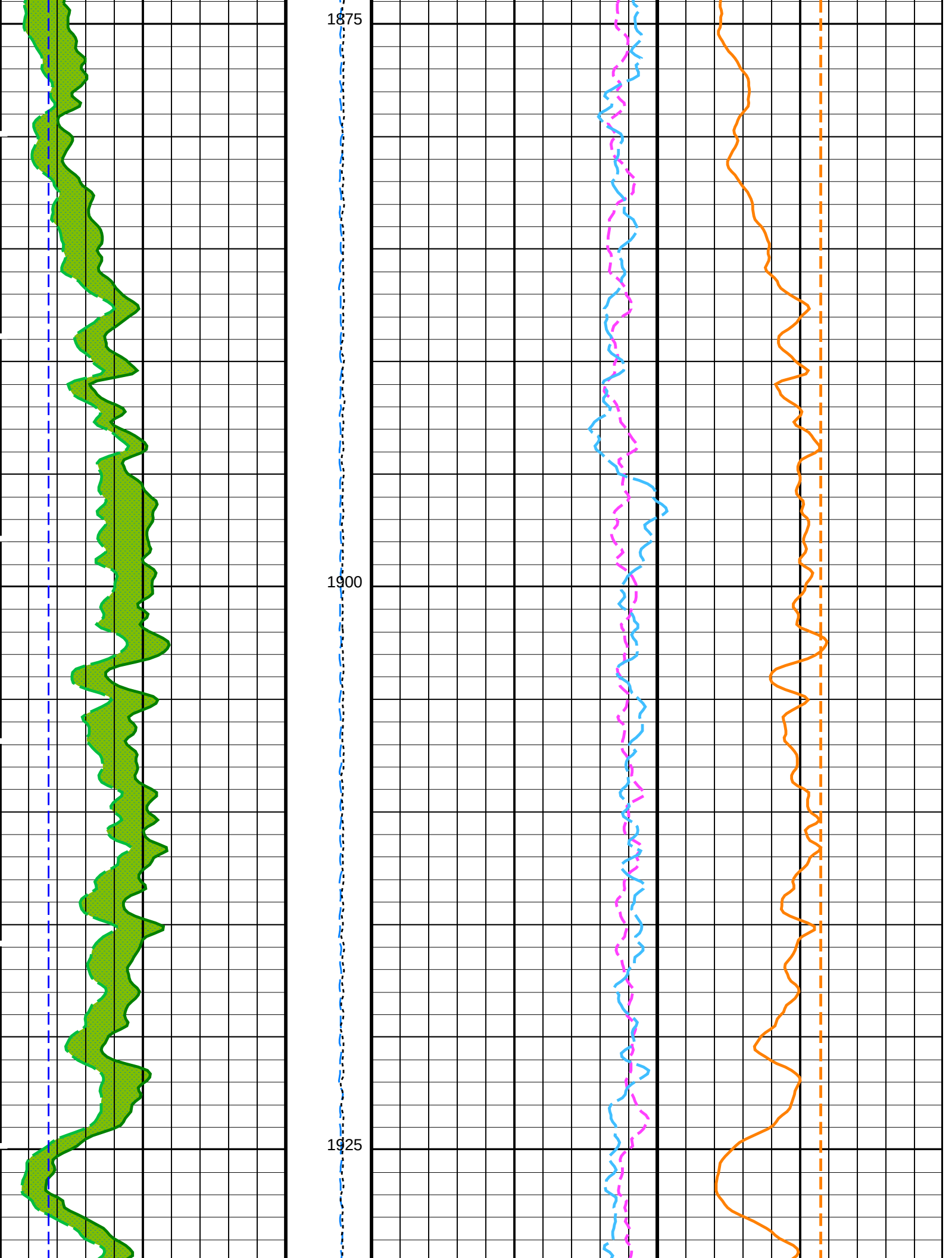

1600
1625
1650

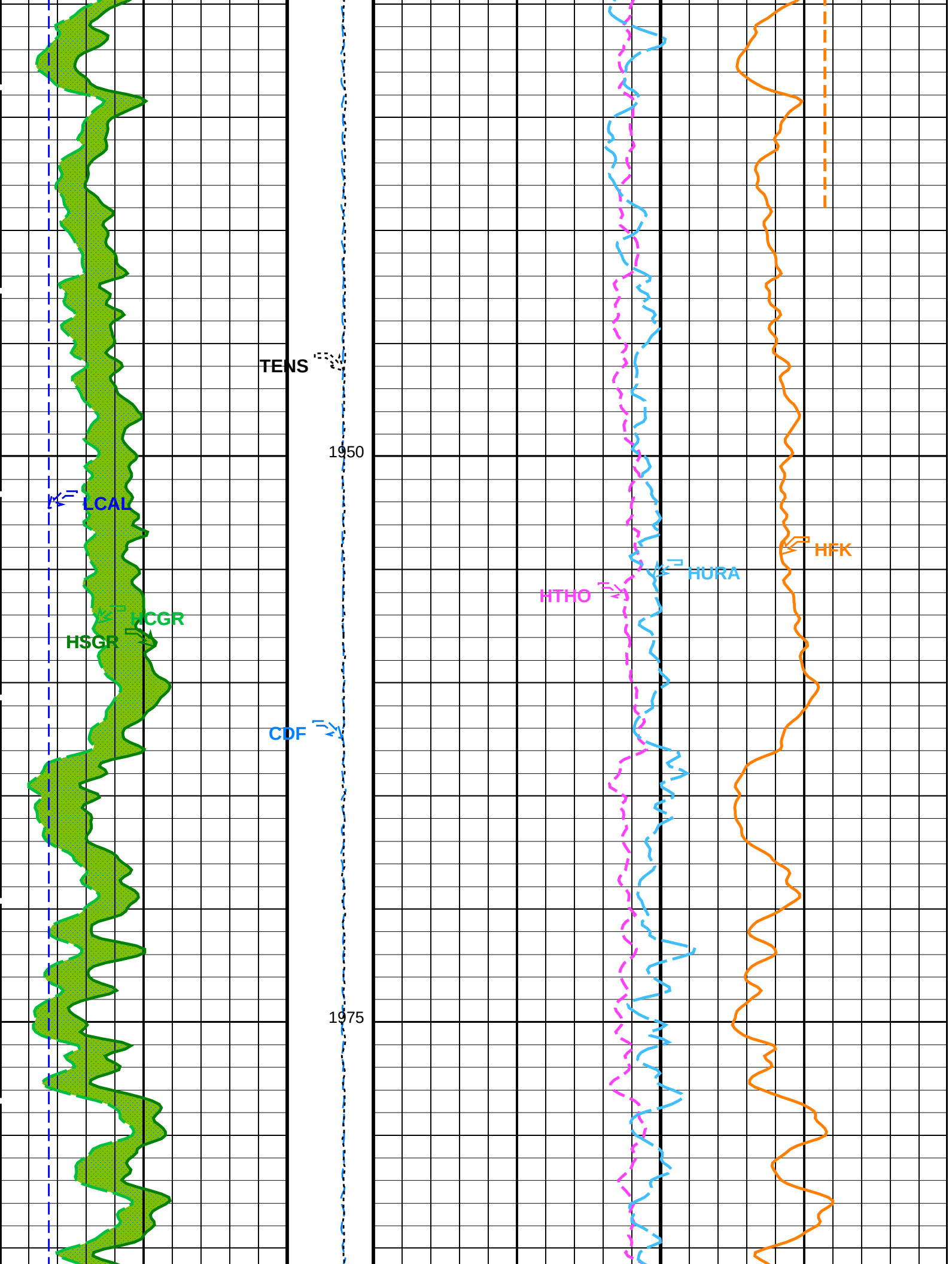

1675
1700

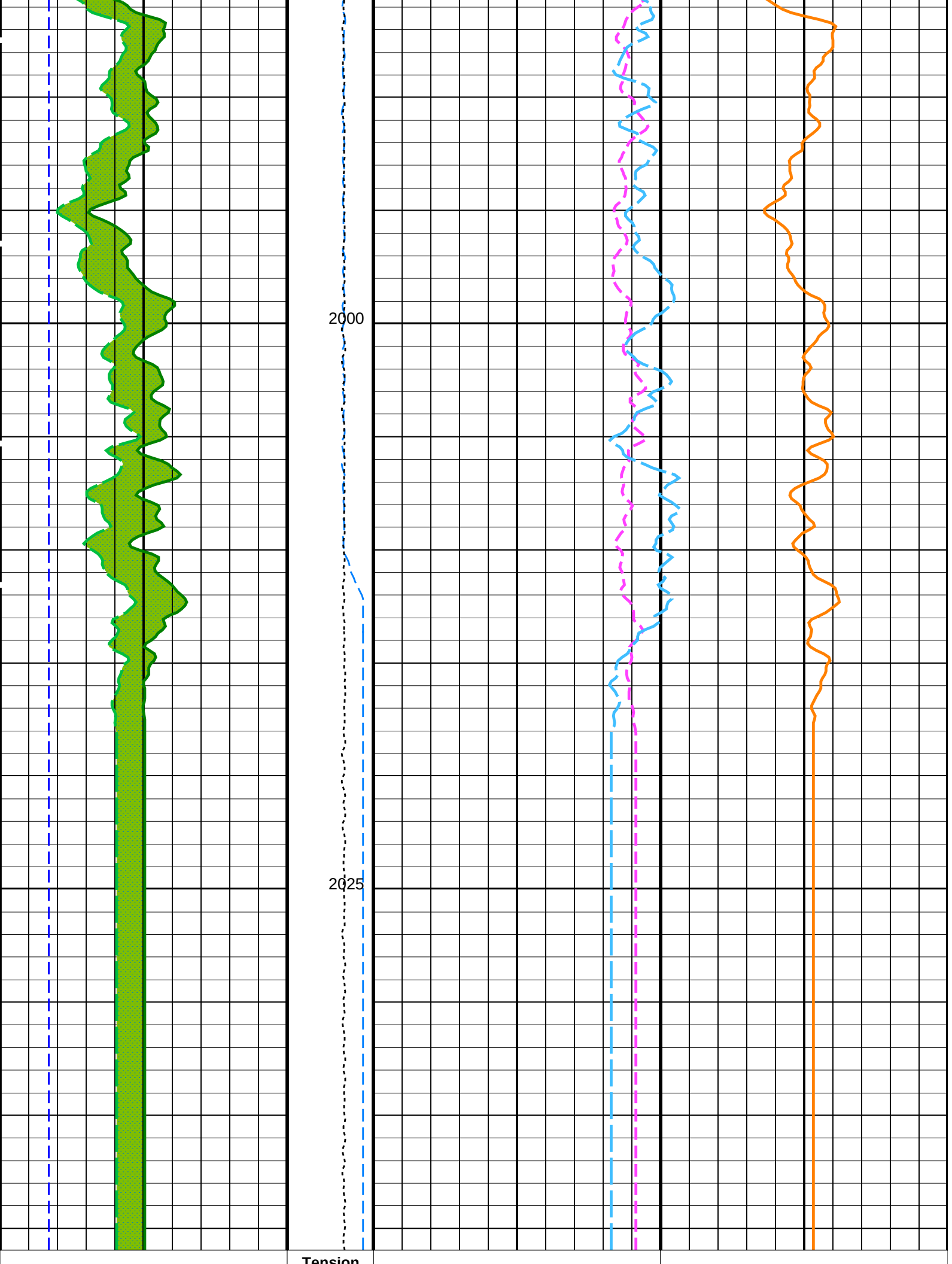

1725
1750

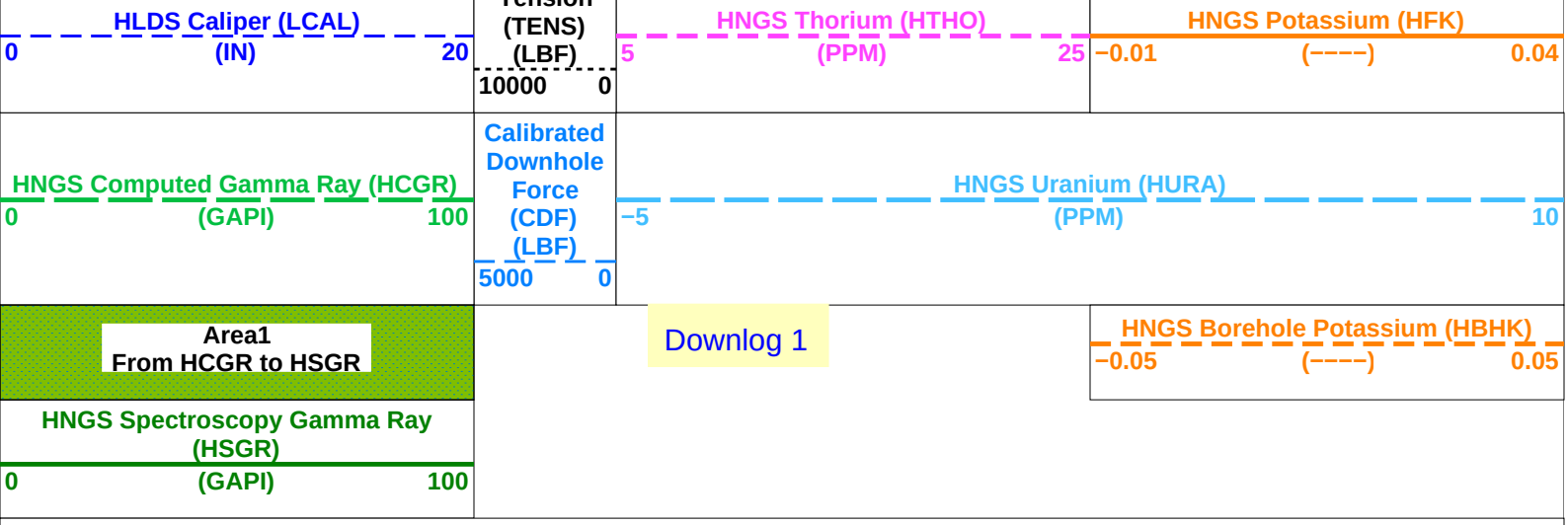

1775
1800


1825
1850


1875
1900
1925


TENS
1950
LCAL
HCGR
HSGR
CDF
HTHO
HURA
HFK
1975


2000
2025
Tension




**PIP SUMMARY**

**Time Mark Every 60 S**

## Parameters

| DLIS Name | Description | Value | |
|---|---|---|---|
| | **HRLT−B: High Resolution Laterolog Array − B** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | BS | |
| | **APS−C: Accelerator−Porosity Tool** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | BS | |
| | **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 | |
| 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 | |
| H1P | HNGS Detector 1 Allow/Disallow In Processing | ALLOW | |
| H2P | HNGS Detector 2 Allow/Disallow In Processing | ALLOW | |
| HABK | HNGS Borehole Potassium Running Average | 0.00127443 | |
| HALF | HNGS Alpha Filter Length | 60 | IN |
| HCRB | HNGS Apply Borehole Potassium Correction | NONE | |
| HMWM | Mud Weighting Material | NATU | |
| HNPE | HNGS Processing Enable | YES | |
| 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 | |
| TPOS | Tool Position | ECCE | |
| VBA1 | HNGS Detector 1 Variable Barite Factor Running Average | 0.961051 | |
| VBA2 | HNGS Detector 2 Variable Barite Factor Running Average | 0.968842 | |
| | **EDTC−B: Enhanced DTS Cartridge** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | BS | |
| | **System and Miscellaneous** | | |
| BS | Bit Size | 9.875 | IN |
| DFD | Drilling Fluid Density | 1.02 | G/C3 |
| DO | Depth Offset for Playback | 0.0 | M |
| PP | Playback Processing | RECOMPUTE | |

**Format: HNGSYields** **Vertical Scale: 1:200** **Graphics File Created: 22−Jun−2018 00:55**

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

## Input DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | Flip_HRLA_LDL_APS_028LUP | PRODUCER | 19−Jun−2018 22:11 | 2040.9 M | 1543.0 M |

## Output DLIS Files

## Output DLIS Files

| | | | | |
|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_073PUP | FN:93 | PRODUCER | 22−Jun−2018 00:55 |

## Input DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | Flip_HRLA_LDL_APS_028LUP | PRODUCER | 19−Jun−2018 22:11 | 2040.9 M | 1543.0 M |

## Output DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_073PUP | FN:93 | PRODUCER | 22−Jun−2018 00:55 | 2040.9 M | 1543.0 M |

## OP System Version: 19C0−187

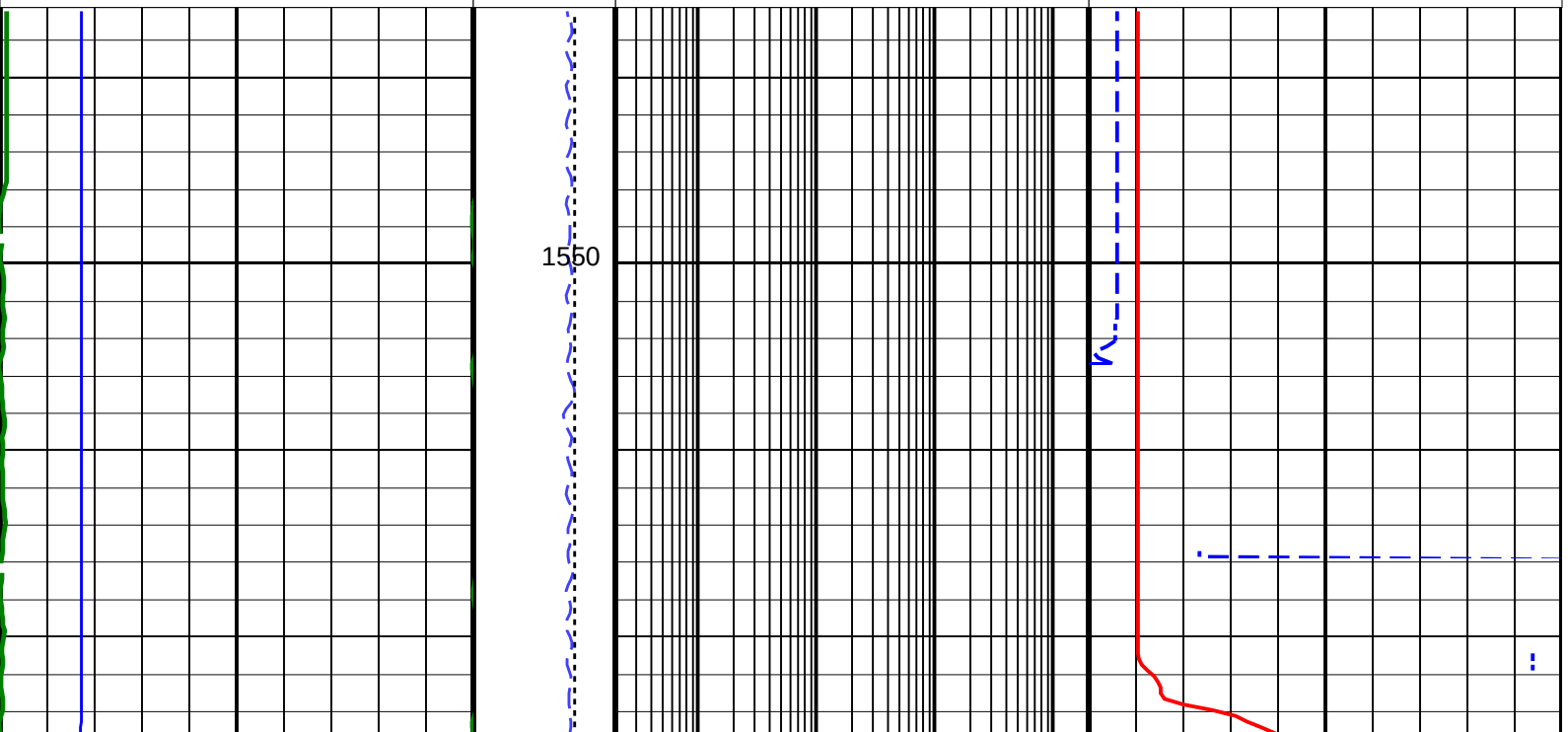
| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

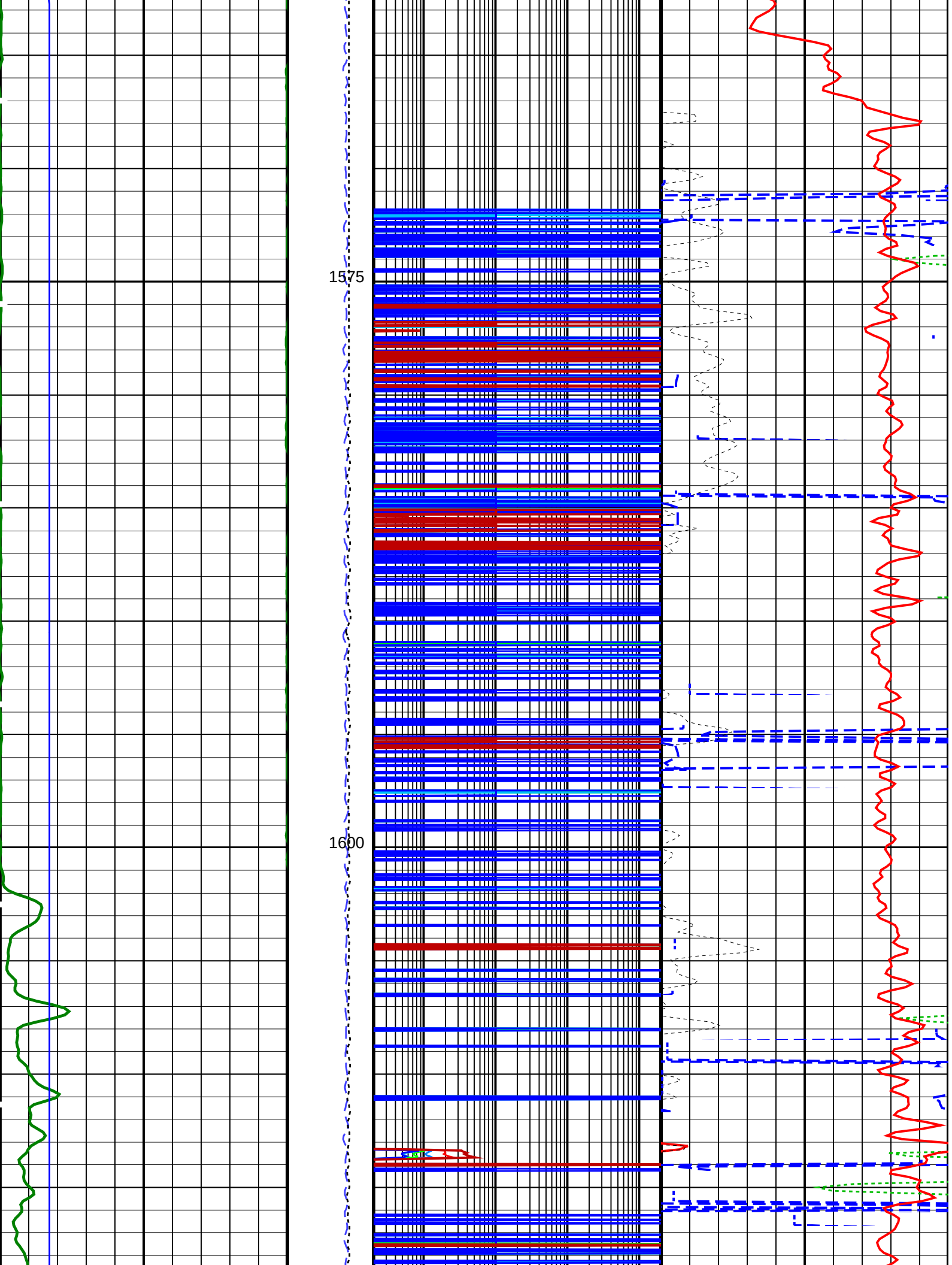
**PIP SUMMARY**

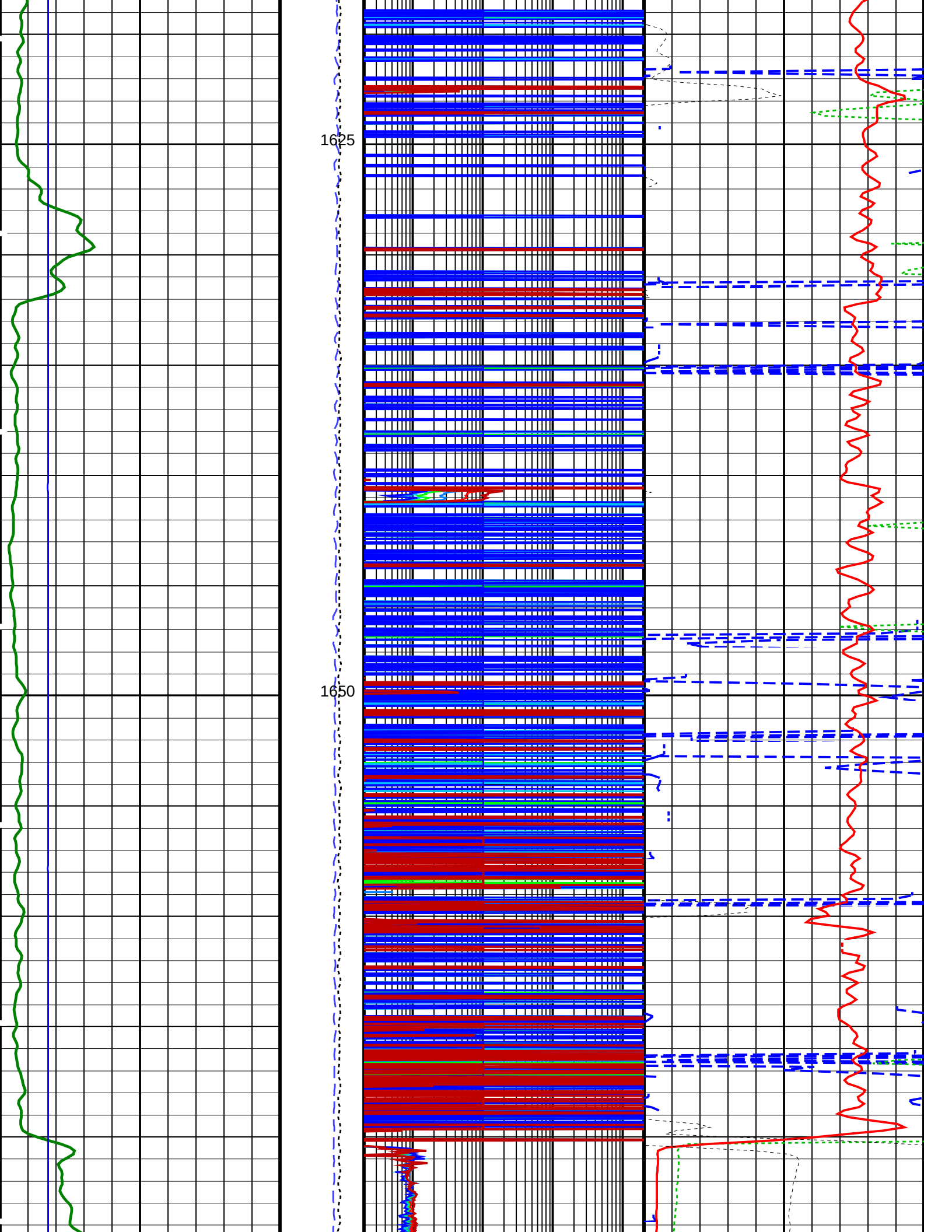
Time Mark Every 60 S

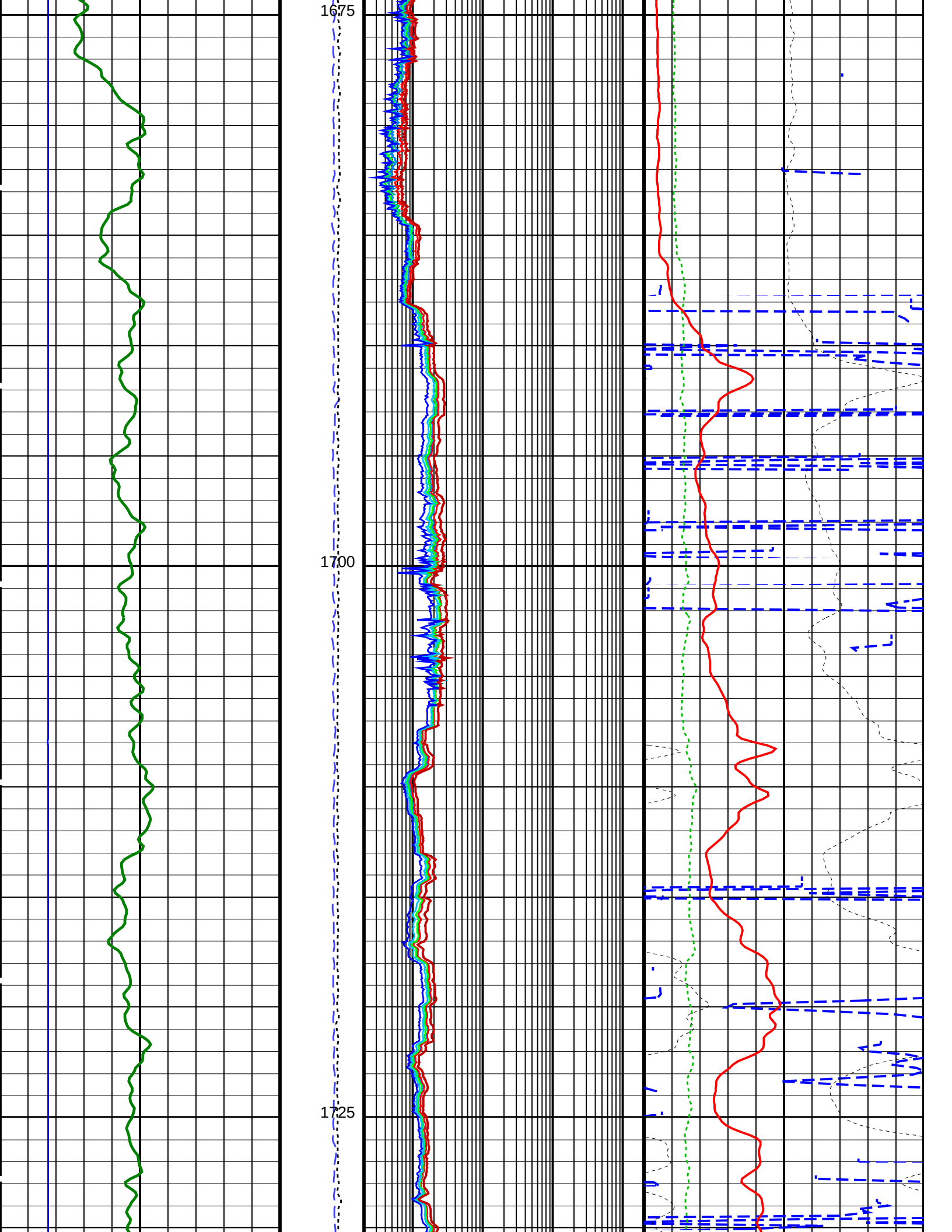
Downlog 1

| | | | |
|---|---|---|---|
| | HRLT True Resistivity (RT_HRLT) 0.2 (OHMM) 2000 | | |
| | HRLT Resistivity 1 (RLA1) 0.2 (OHMM) 2000 | | |
| | HRLT Resistivity 2 (RLA2) 0.2 (OHMM) 2000 | | HLDS Bulk Density Correction (DRH) −0.25 (G/C3) 0.25 |
| | HRLT Resistivity 3 (RLA3) 0.2 (OHMM) 2000 | | HLDS Bulk Density (RHOM) 1 (G/C3) 3 |
| HNGS Spectroscopy Gamma Ray (HSGR) 0 (GAPI) 100 | Calibrated Downhole Force (CDF) (LBF) 5000 0 | HRLT Resistivity 5 (RLA5) 0.2 (OHMM) 2000 | HLDS Long Spaced Photoelectric Effect (PEFL) 0 (−−−−) 10 |
| HLDS Caliper (LCAL) 0 (IN) 20 | Tension (TENS) (LBF) 10000 0 | HRLT Resistivity 4 (RLA4) 0.2 (OHMM) 2000 | APS Near/Array Corrected Limestone Porosity (APLC) 100 (PU) 0 |




1575
1600


1625
1650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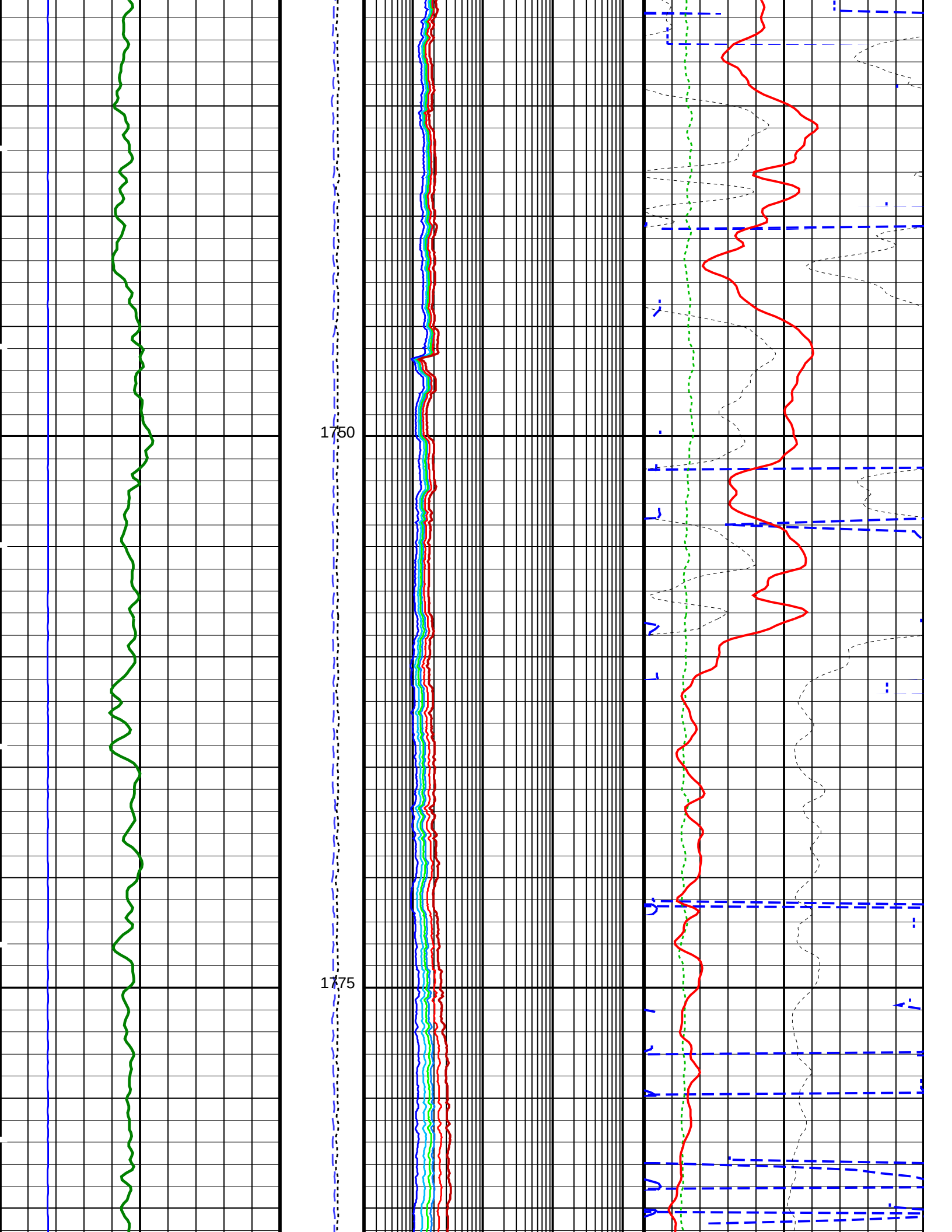
1700
1725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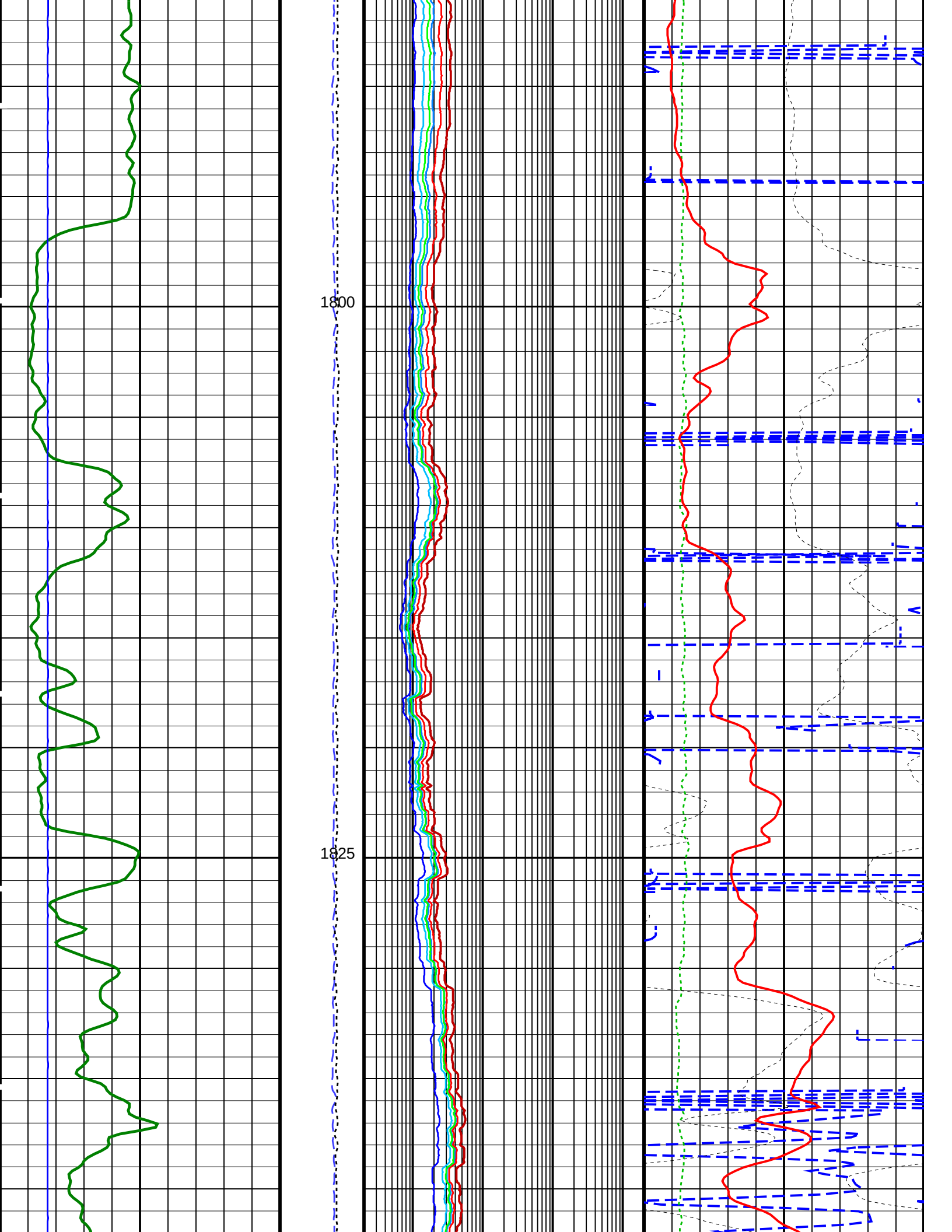
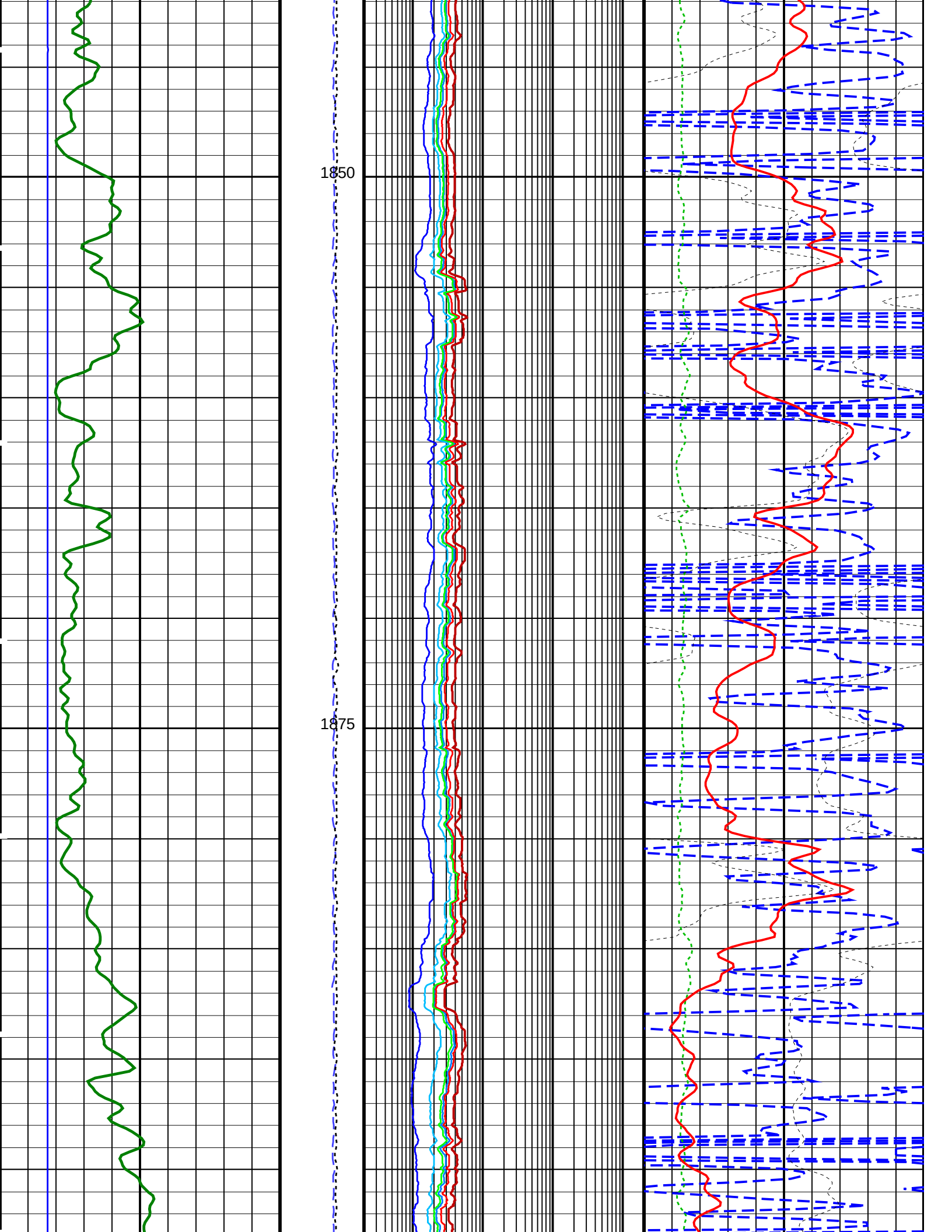
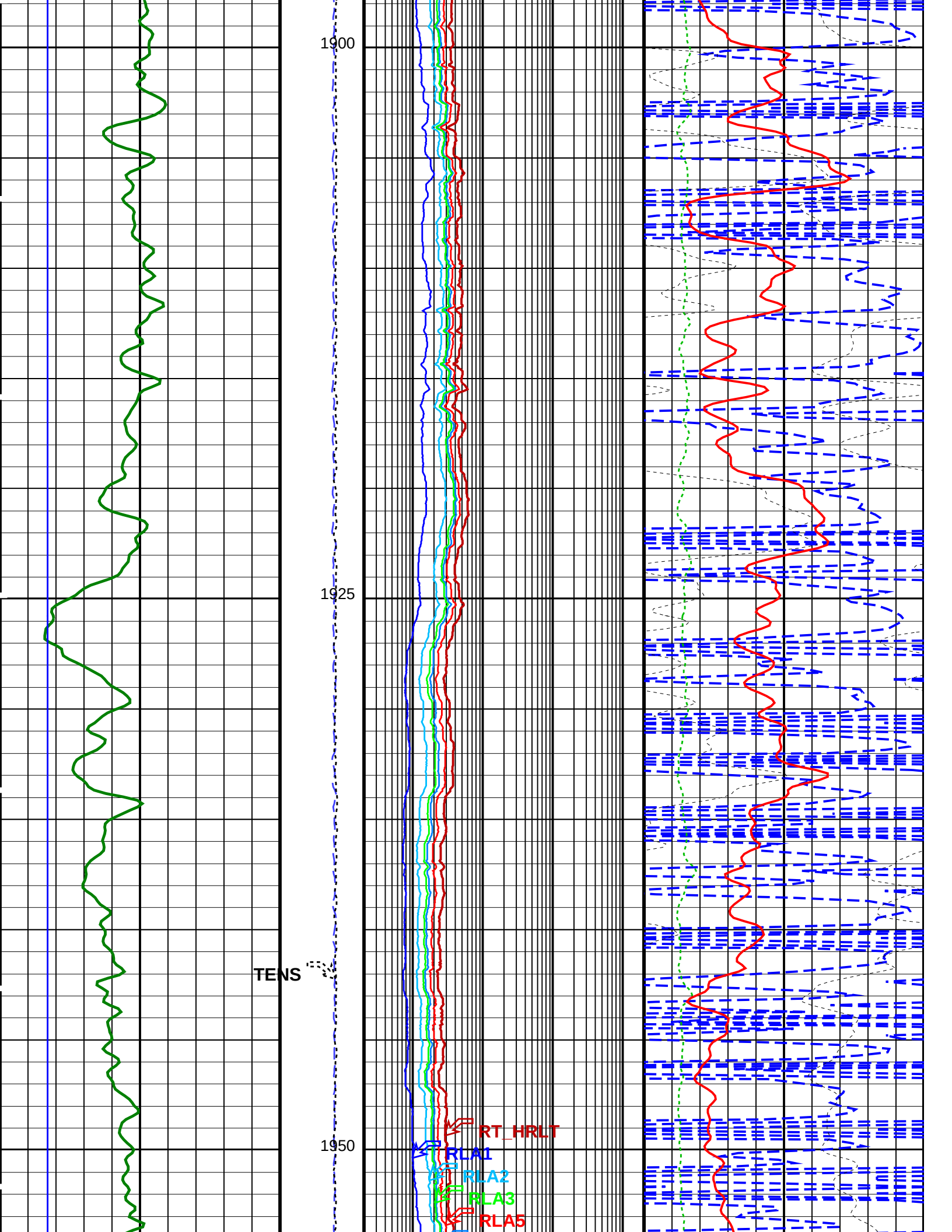
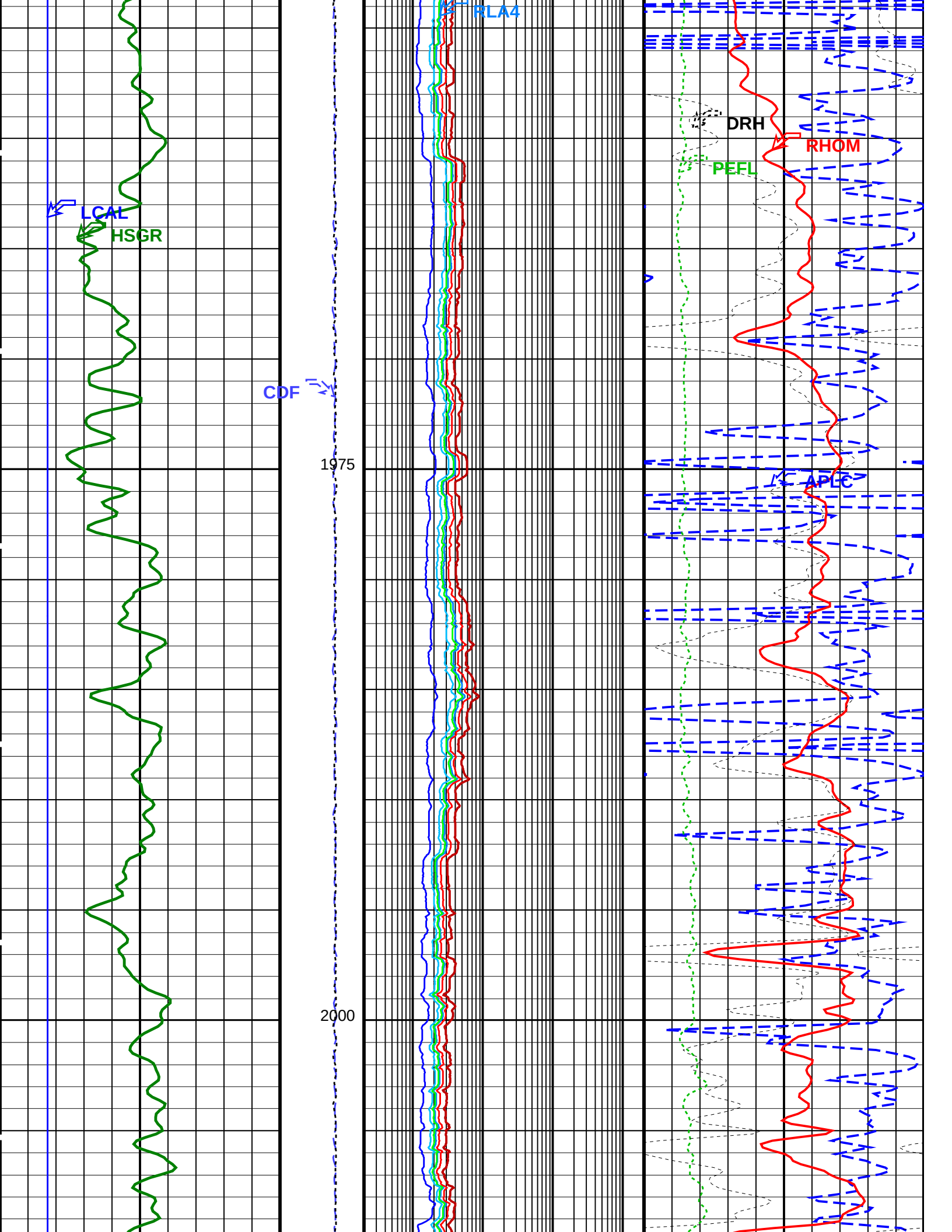
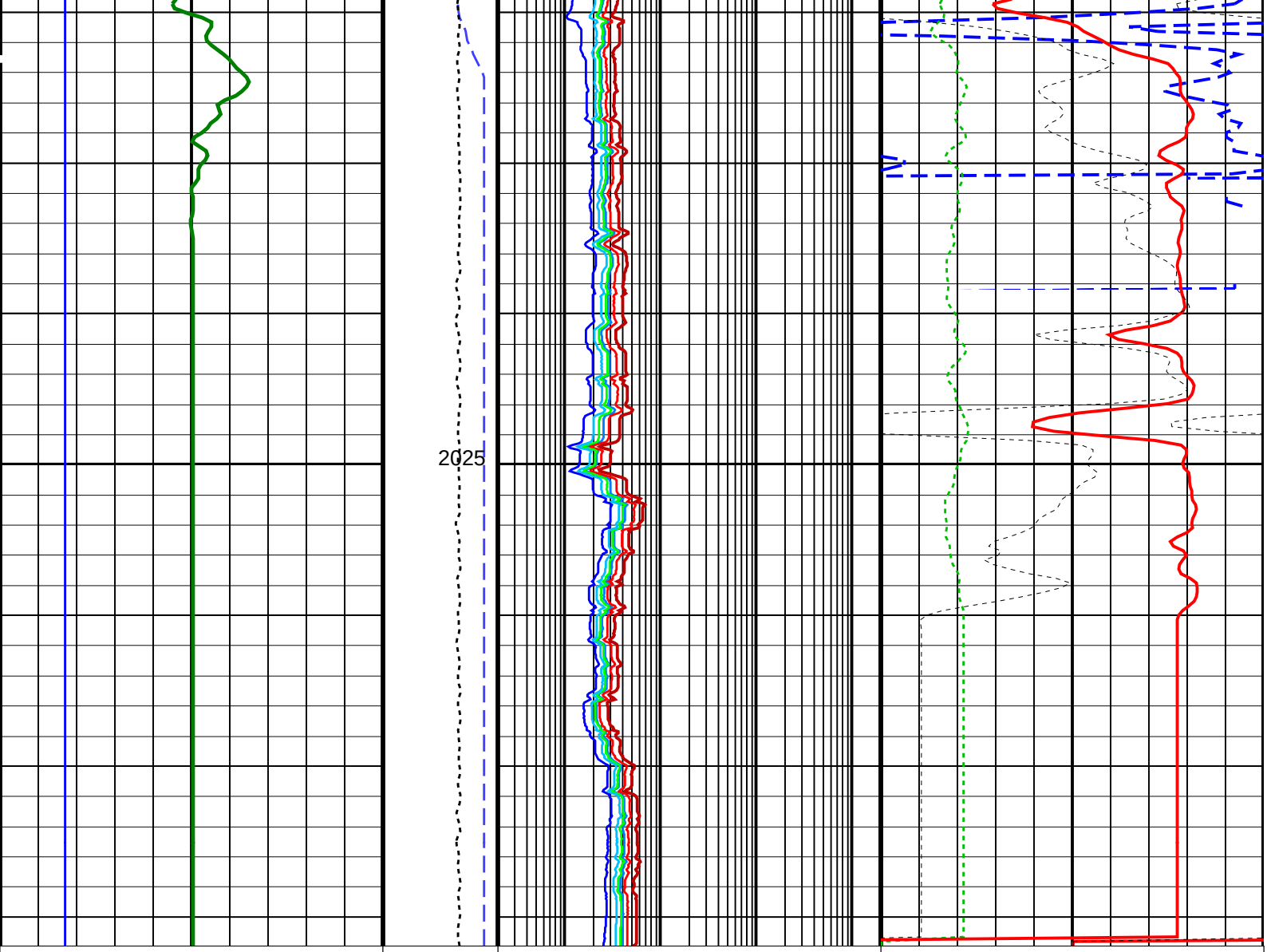
1775


1800
1825


1850
1875


1900
1925
TENS
1950
RT_HRLT
RLA1
RLA2
RLA3
RLA5


RLA4
DRH
RHOM
PEFL
LCAL
HSGR
CDF
1975
APLC
2000




| | | | |
|---|---|---|---|
| HLDS Caliper (LCAL)<br>0 (IN) 20 | Tension (TENS) (LBF)<br>10000 0 | HRLT Resistivity 4 (RLA4)<br>0.2 (OHMM) 2000 | APS Near/Array Corrected Limestone Porosity (APLC)<br>100 (PU) 0 |
| HNGS Spectroscopy Gamma Ray (HSGR)<br>0 (GAPI) 100 | Calibrated Downhole Force (CDF) (LBF)<br>5000 0 | HRLT Resistivity 5 (RLA5)<br>0.2 (OHMM) 2000 | HLDS Long Spaced Photoelectric Effect (PEFL)<br>0 (----) 10 |
| Downlog 1 | | HRLT Resistivity 3 (RLA3)<br>0.2 (OHMM) 2000 | HLDS Bulk Density (RHOM)<br>1 (G/C3) 3 |
| | | HRLT Resistivity 2 (RLA2)<br>0.2 (OHMM) 2000 | HLDS Bulk Density Correction (DRH)<br>−0.25 (G/C3) 0.25 |
| | | HRLT Resistivity 1 (RLA1)<br>0.2 (OHMM) 2000 | |
| | | HRLT True Resistivity (RT_HRLT)<br>0.2 (OHMM) 2000 | |

PIP SUMMARY

Time Mark Every 60 S

## Parameters

| DLIS Name | Description | Value |
|---|---|---|
| | HRLT−B: High Resolution Laterolog Array − B | |

| | | | |
|---|---|---|---|
| | 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 | 17.5276 | 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 | 5 | |
| AASD | APS Thermal and Array Detectors High Voltage Setting | 1969.88 | V |
| ADSO | APS Array Detectors Data Source Switch | Both | |
| AFSD | APS Far Detector High Voltage Setting | 2067.34 | V |
| AHCS | APS Holesize Correction Source | GCSE | |
| AHSS | APS Holesize Correction Switch | ON | |
| AMTY | APS Environmental Corrections Mud Type | WaterBaseBarite | |
| ANSD | APS Near Detector High Voltage Setting | 1736.79 | V |
| ASOS | APS Standoff Correction Switch | ON | |
| ATSS | APS Temperature−Pressure−Salinity Correction Switch | ON | |
| 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 | YES | |
| 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 | YES | |
| NARC | APS Near/Array Calibration Ratio | 1.08151 | |

| | | | |
|---|---|---|---|
| NFRC | APS Near/Far Calibration Ratio | 0.940367 | |
| PTCO_APS | APS TNPH Pressure/Temperature Correction Option | YES | |
| 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) | 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 | 0.00127443 | |
| 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 | 0.961051 | |
| VBA2 | HNGS Detector 2 Variable Barite Factor Running Average | 0.968842 | |
| 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 | NATU | |
| 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 | 8.500 | IN |
| CWEI | Casing Weight | 0.00 | LB/F |
| DFD | Drilling Fluid Density | 1.02 | G/C3 |
| DO | Depth Offset for Playback | 0.0 | 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 | RECOMPUTE | |
| RMFS | Resistivity of Mud Filtrate Sample | −50000.0000 | OHMM |
| RW | Resistivity of Connate Water | 1.0000 | OHMM |
| TD | Total Depth | 2059.1 | M |
| TDD | Total Depth − Driller | 2059.10 | M |
| TDL | Total Depth − Logger | 2046.00 | M |
| TWS | Temperature of Connate Water Sample | 37.78 | DEGC |

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

## Input DLIS Files

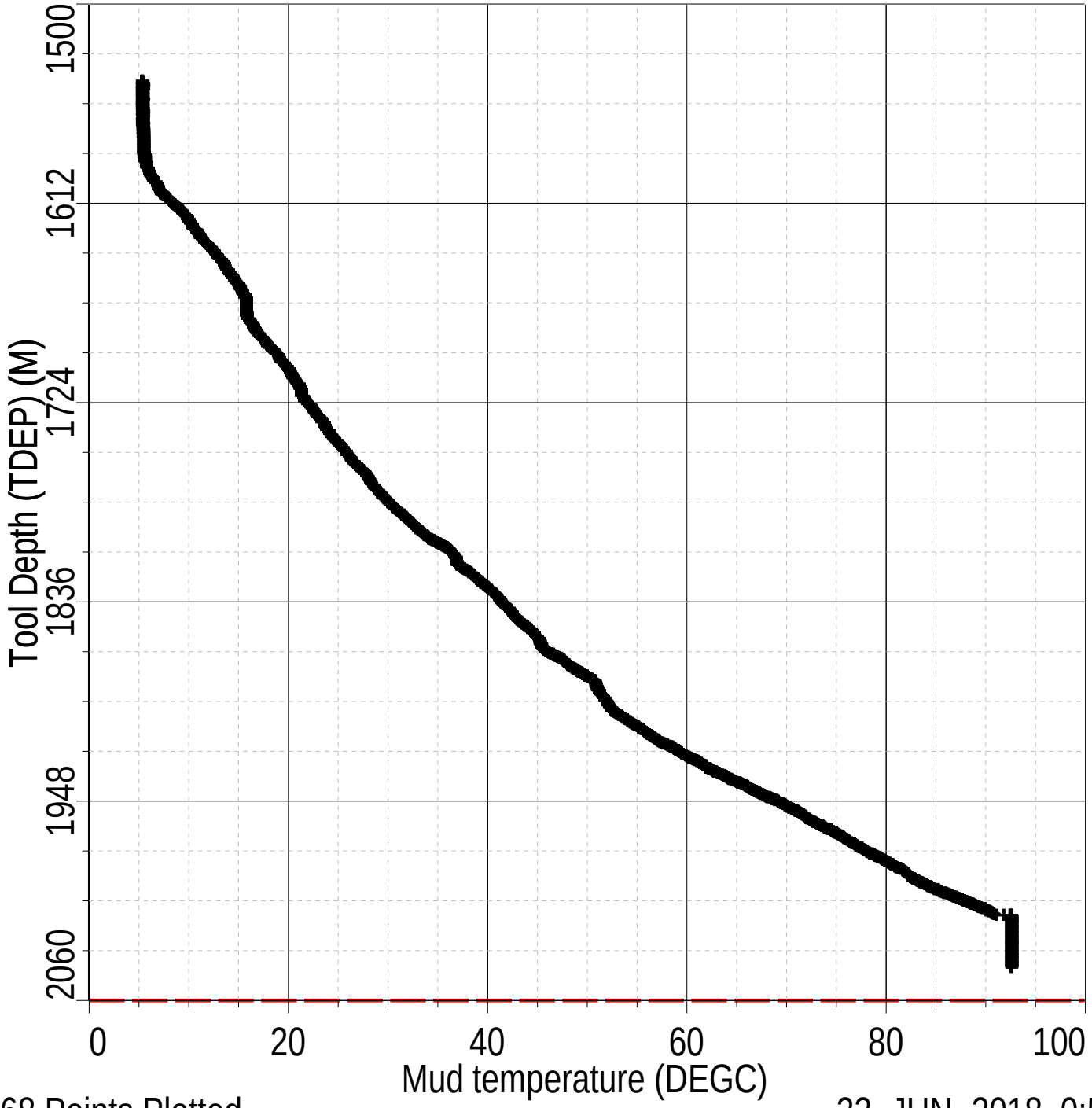
| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | Flip_HRLA_LDL_APS_028LUP | PRODUCER | 19−Jun−2018 22:11 | 2040.9 M | 1543.0 M |

## Output DLIS Files

| | | | | |
|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_073PUP | FN:93 | PRODUCER | 22−Jun−2018 00:55 |

Index: 2040.9 − 1543.0 M

Downlog 1




3268 Points Plotted

22−JUN−2018 0:56

## Input DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | Flip_HRLA_LDL_APS_047PUP | PRODUCER | 20−Jun−2018 09:19 | 2070.0 M | 1831.1 M |

## Output DLIS Files

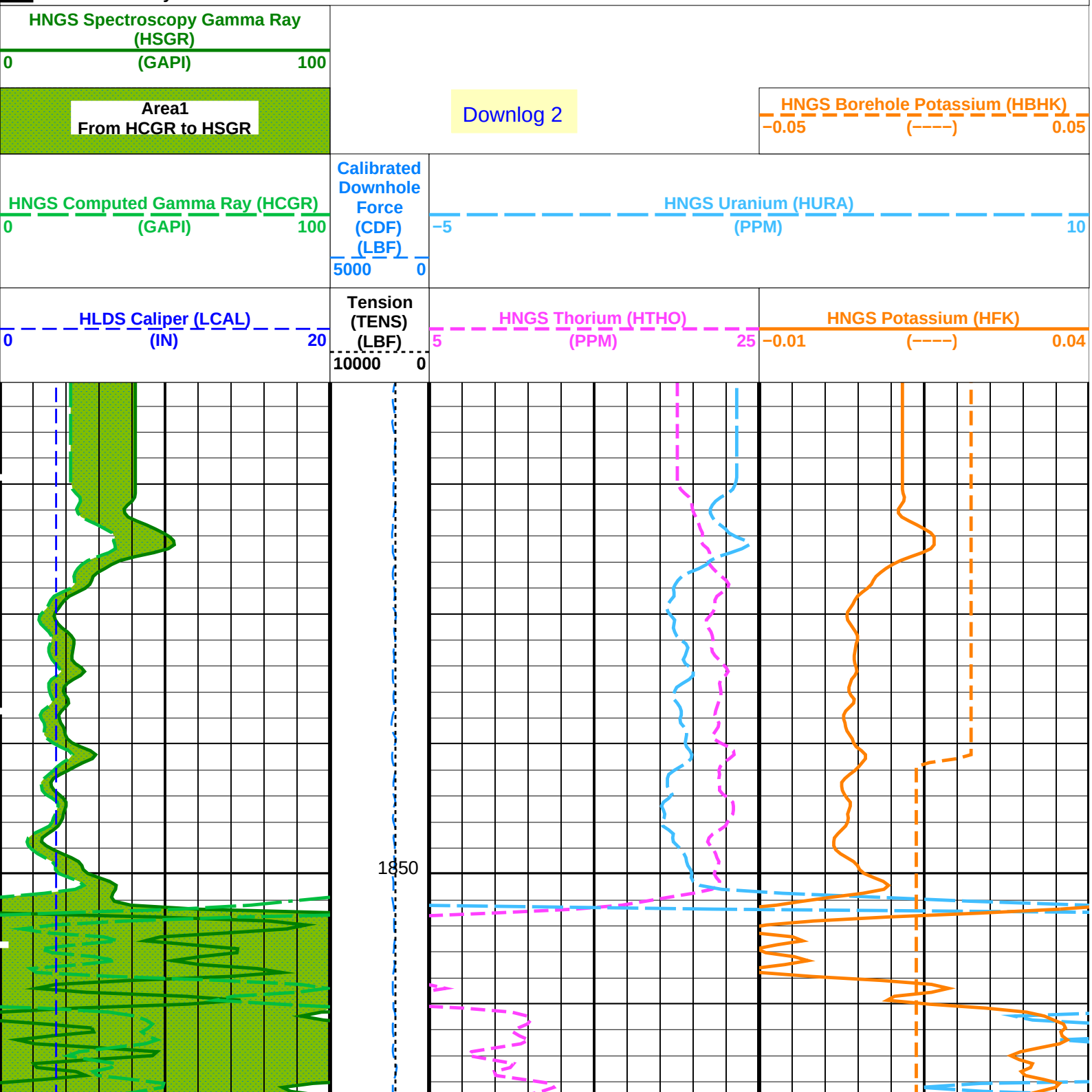
| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_074PUP | FN:94 | PRODUCER | 22−Jun−2018 01:05 | 2070.0 M | 1831.5 M |

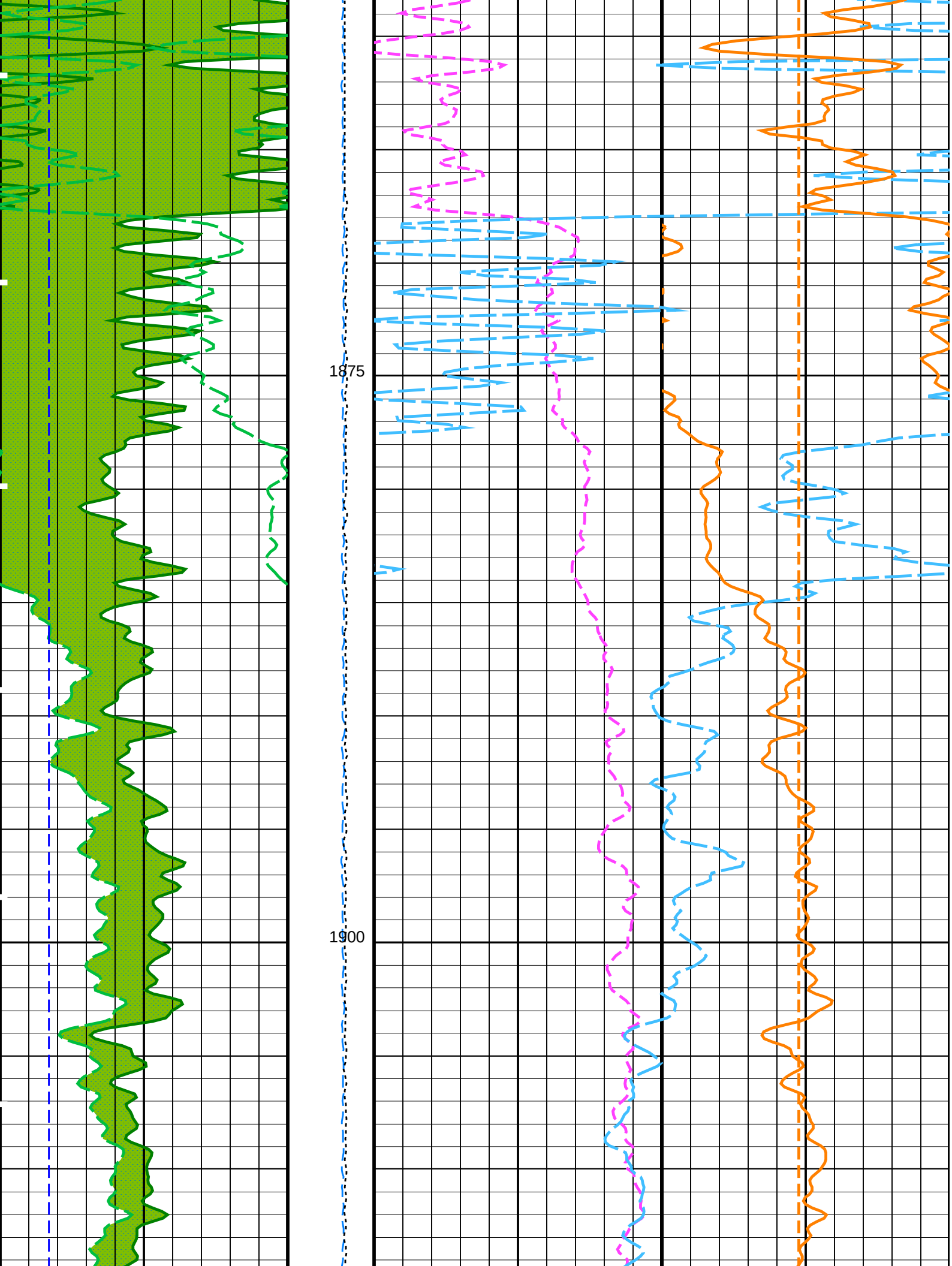
## OP System Version: 19C0−187

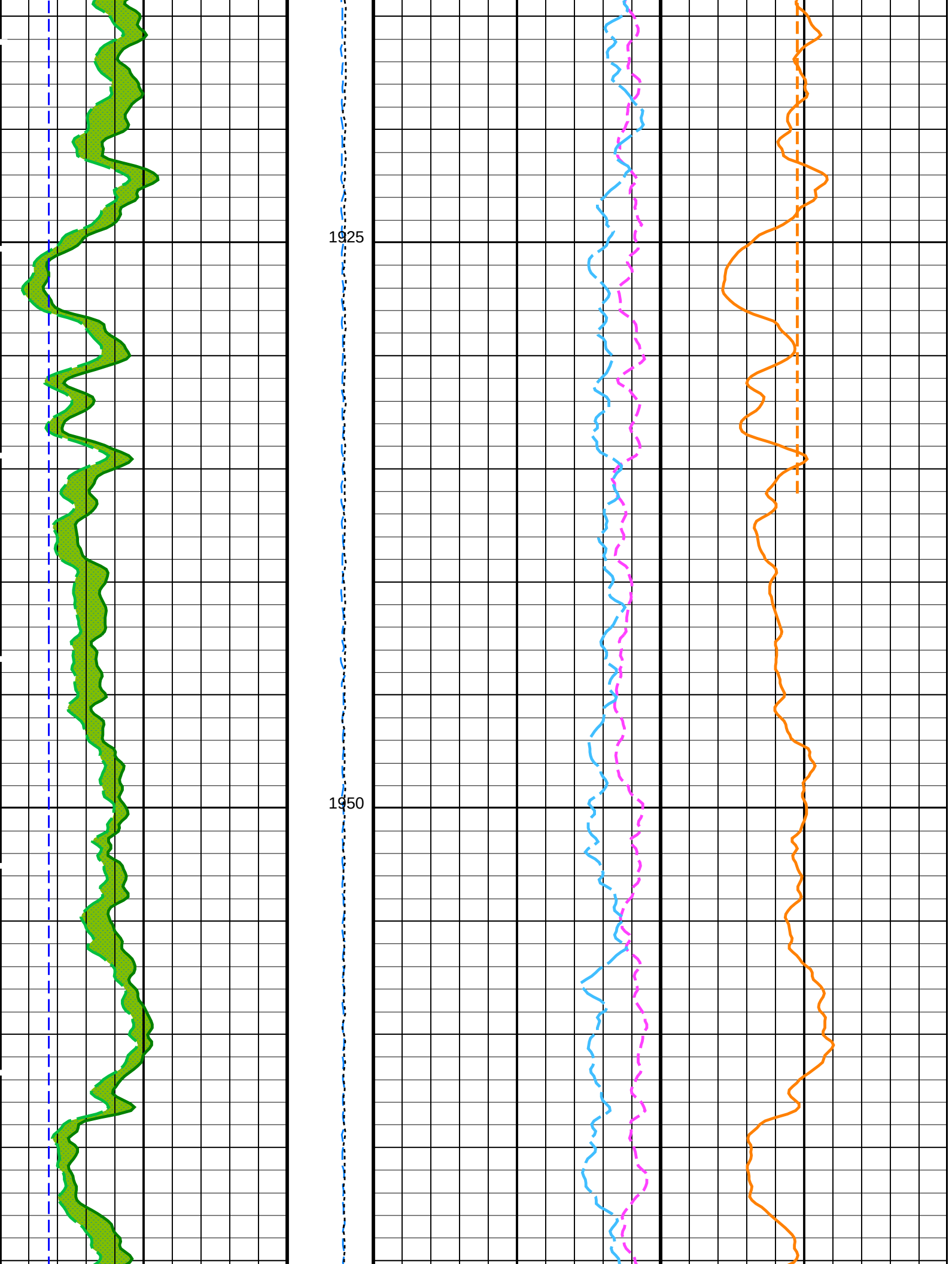
| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

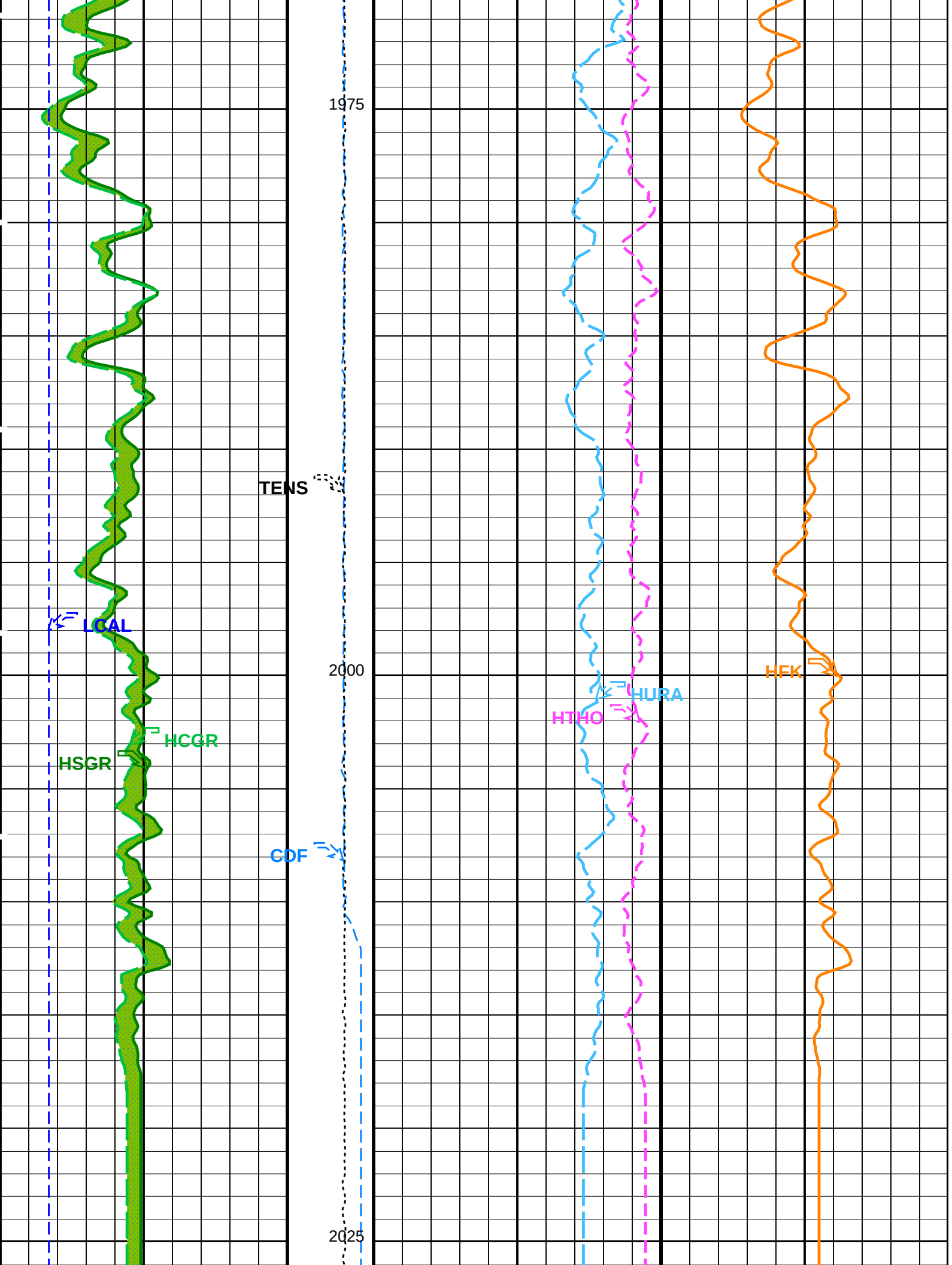
**PIP SUMMARY**

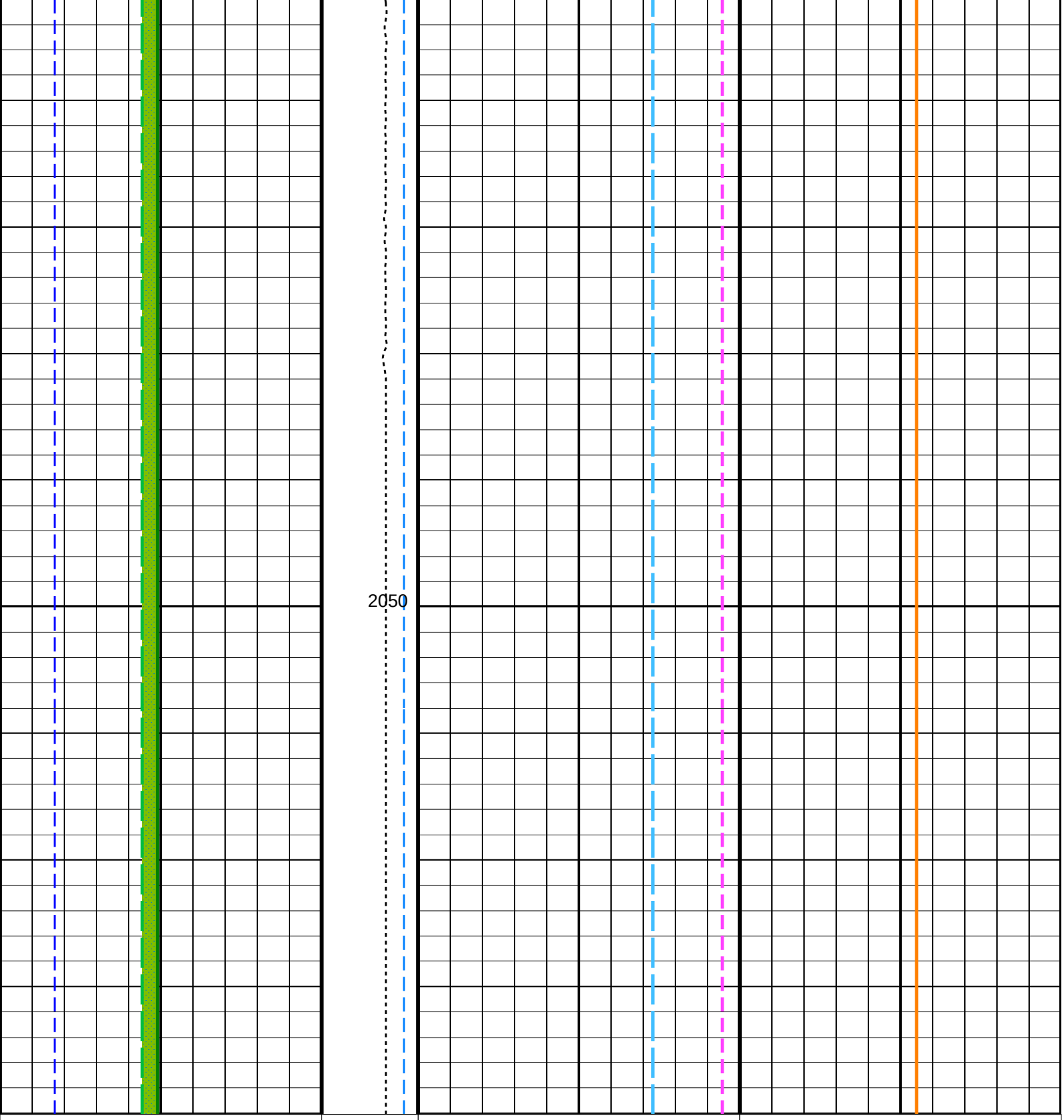
Time Mark Every 60 S




1875
1900


1925
1950


1975
TENS
LCAL
2000
HCGR
HSGR
CDF
HURA
HTHO
HFK
2025




HLDS Caliper (LCAL)
0 (IN) 20

Tension (TENS) (LBF)
10000 0

HNGS Thorium (HTHO)
5 (PPM) 25

HNGS Potassium (HFK)
−0.01 (−−−−) 0.04

HNGS Computed Gamma Ray (HCGR)
0 (GAPI) 100

Calibrated Downhole Force (CDF) (LBF)
5000 0

HNGS Uranium (HURA)
−5 (PPM) 10

Area1
From HCGR to HSGR

Downlog 2

HNGS Borehole Potassium (HBHK)
−0.05 (−−−−) 0.05

HNGS Spectroscopy Gamma Ray

| HNGS Spectroscopy Gamma Ray (HSGR) | | |
|---|---|---|
| 0 | (GAPI) | 100 |

**PIP SUMMARY**

Time Mark Every 60 S

## Parameters

| DLIS Name | Description | Value | |
|---|---|---|---|
| | **HRLT−B: High Resolution Laterolog Array − B** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | BS | |
| | **APS−C: Accelerator−Porosity Tool** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | BS | |
| | **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 | |
| 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 | |
| H1P | HNGS Detector 1 Allow/Disallow In Processing | ALLOW | |
| H2P | HNGS Detector 2 Allow/Disallow In Processing | ALLOW | |
| HABK | HNGS Borehole Potassium Running Average | 0.00127443 | |
| HALF | HNGS Alpha Filter Length | 60 | IN |
| HCRB | HNGS Apply Borehole Potassium Correction | NONE | |
| HMWM | Mud Weighting Material | NATU | |
| HNPE | HNGS Processing Enable | YES | |
| 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 | |
| TPOS | Tool Position | ECCE | |
| VBA1 | HNGS Detector 1 Variable Barite Factor Running Average | 0.961051 | |
| VBA2 | HNGS Detector 2 Variable Barite Factor Running Average | 0.968842 | |
| | **EDTC−B: Enhanced DTS Cartridge** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | BS | |
| | **System and Miscellaneous** | | |
| BS | Bit Size | 9.875 | IN |
| DFD | Drilling Fluid Density | 1.02 | G/C3 |
| DO | Depth Offset for Playback | 0.0 | M |
| PP | Playback Processing | RECOMPUTE | |

Format: HNGSYields Vertical Scale: 1:200 Graphics File Created: 22−Jun−2018 01:06

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

## Input DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | Flip_HRLA_LDL_APS_047PUP | PRODUCER | 20−Jun−2018 09:19 | 2070.0 M | 1831.1 M |

## Output DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_074PUP | FN:94 | PRODUCER | 22−Jun−2018 01:05 | |


## Input DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | Flip_HRLA_LDL_APS_047PUP | PRODUCER | 20−Jun−2018 09:19 | 2070.0 M | 1831.1 M |

## Output DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_074PUP | FN:94 | PRODUCER | 22−Jun−2018 01:05 | 2070.0 M | 1831.1 M |

# OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

## PIP SUMMARY

Time Mark Every 60 S

Downlog 2

HRLT True Resistivity (RT_HRLT)
0.2 (OHMM) 2000

HRLT Resistivity 1 (RLA1)
0.2 (OHMM) 2000

HRLT Resistivity 2 (RLA2)
0.2 (OHMM) 2000

HRLT Resistivity 3 (RLA3)
0.2 (OHMM) 2000

HLDS Bulk Density Correction (DRH)
−0.25 (G/C3) 0.25

HLDS Bulk Density (RHOM)
1 (G/C3) 3

HNGS Spectroscopy Gamma Ray (HSGR)
0 (GAPI) 100

Calibrated Downhole Force (CDF) (LBF)
5000 0

HRLT Resistivity 5 (RLA5)
0.2 (OHMM) 2000

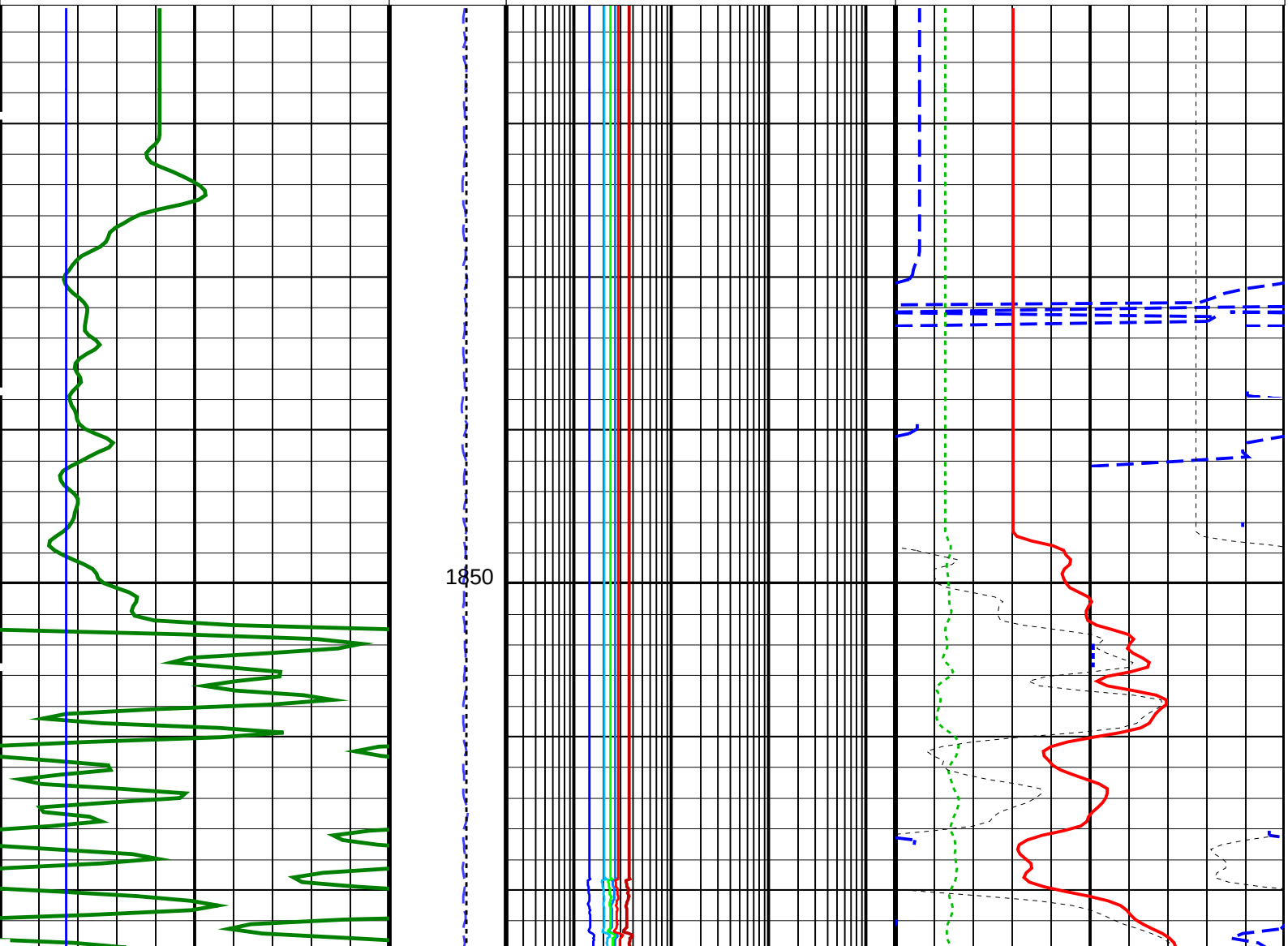
HLDS Long Spaced Photoelectric Effect (PEFL)
0 (−−−−) 10

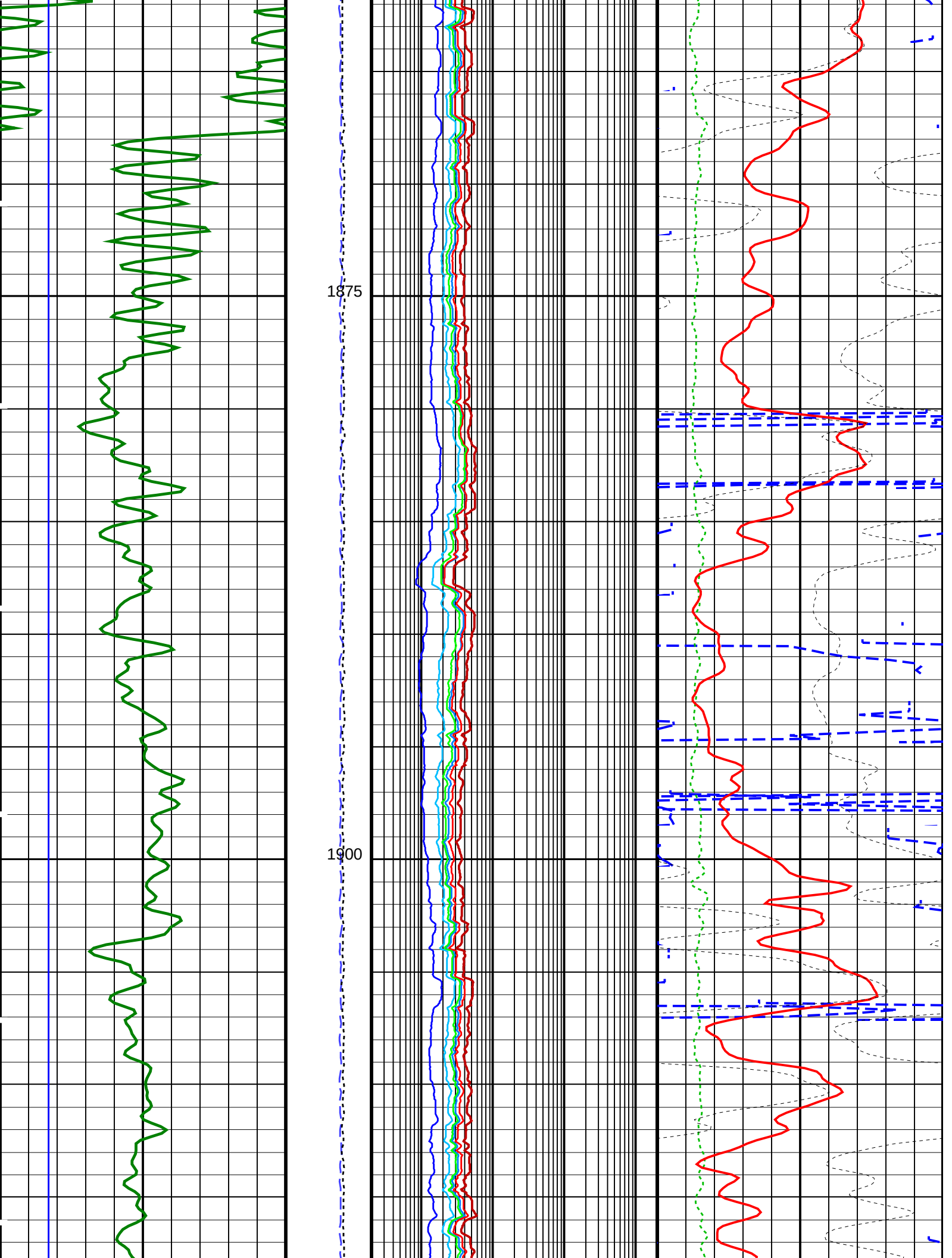
HLDS Caliper (LCAL)
0 (IN) 20

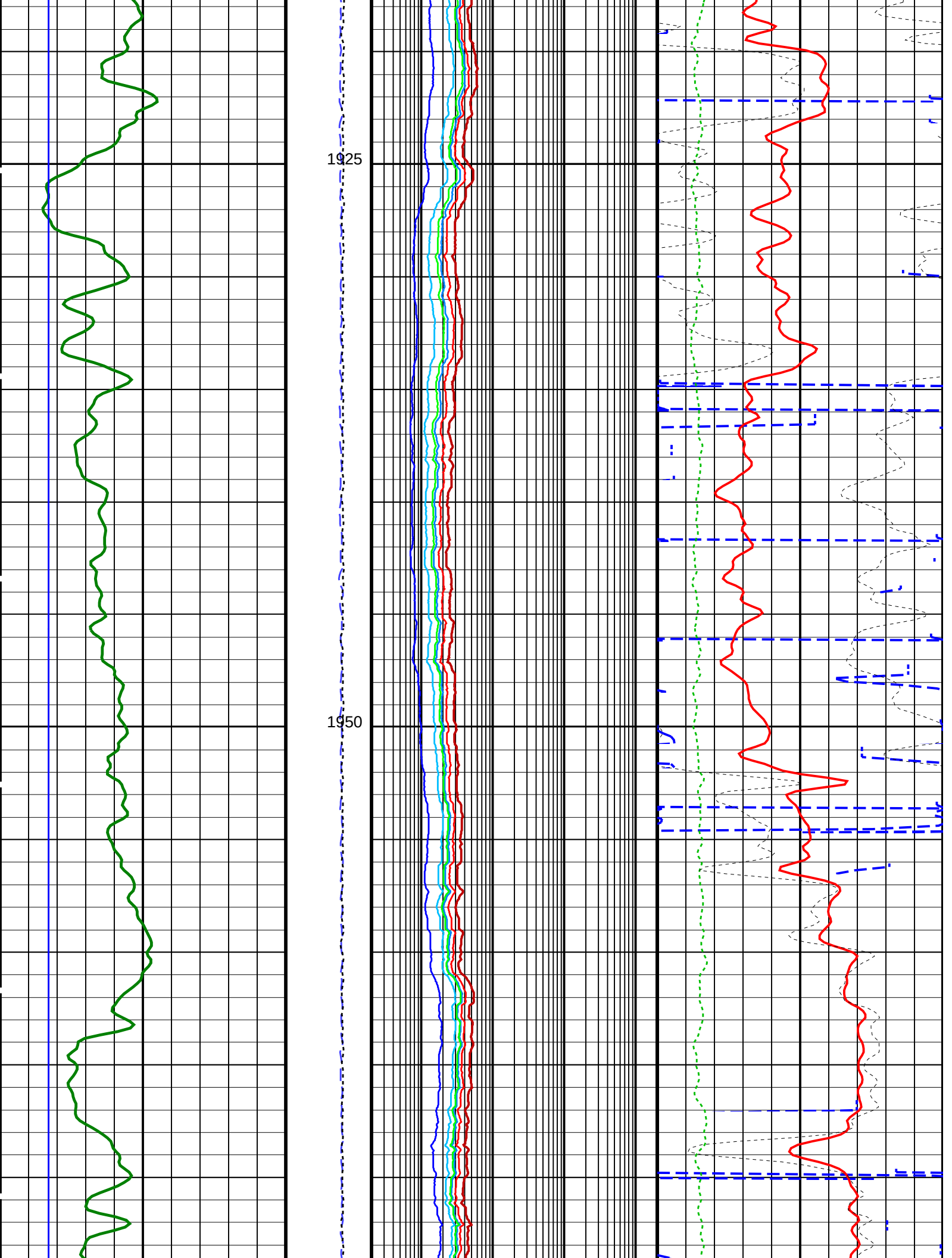
Tension (TENS) (LBF)
10000 0

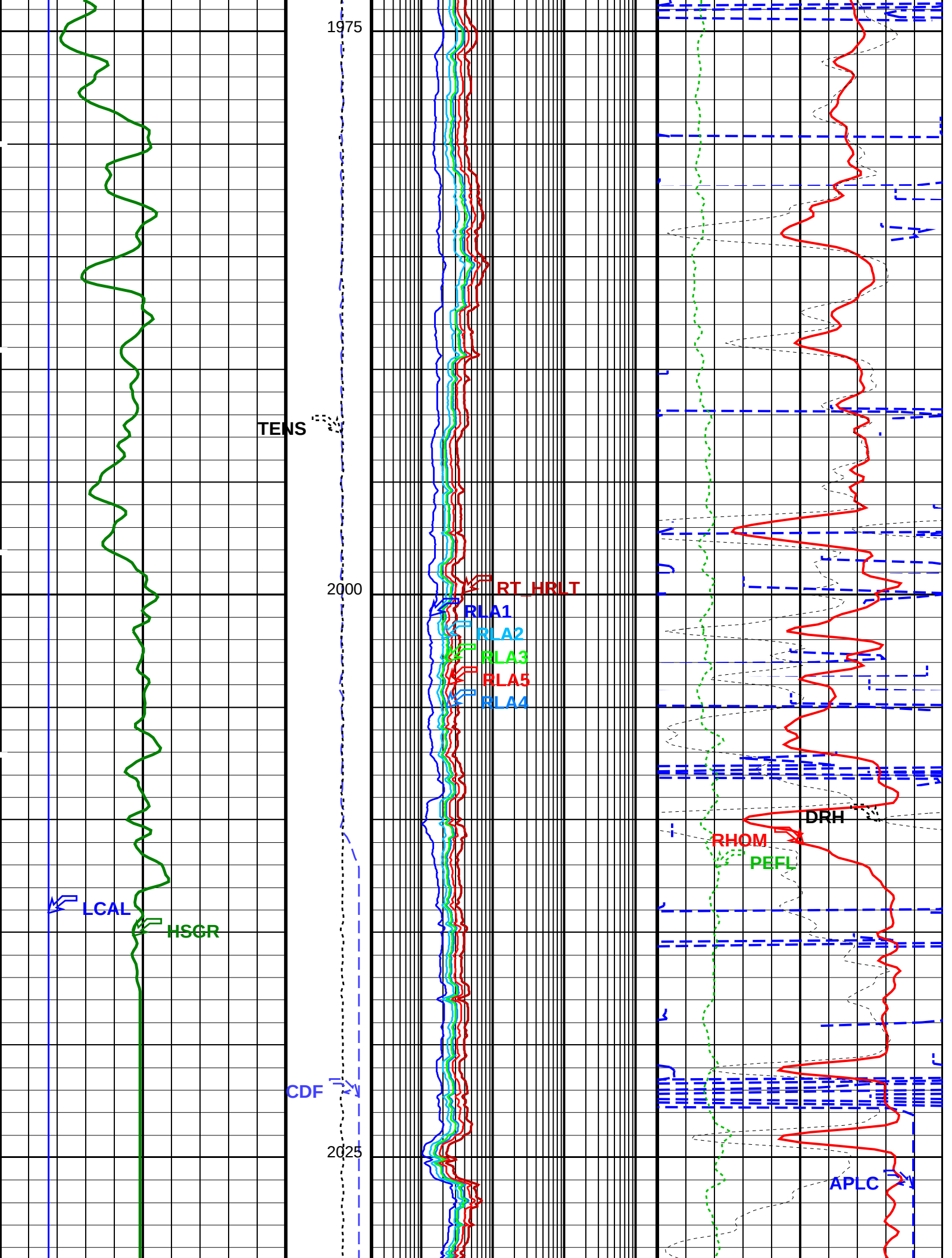
HRLT Resistivity 4 (RLA4)
0.2 (OHMM) 2000

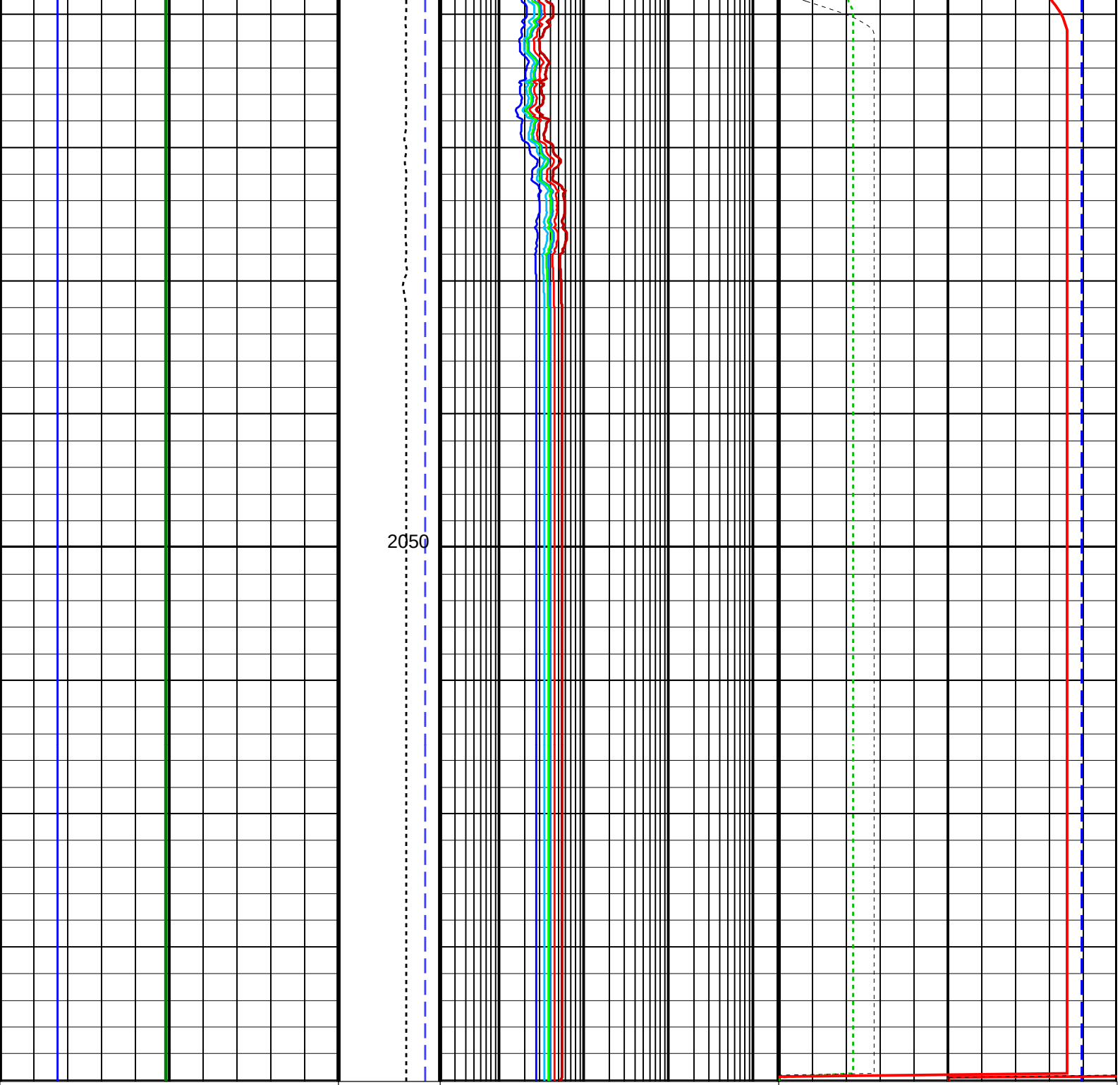
APS Near/Array Corrected Limestone Porosity (APLC)
100 (PU) 0




1875
1900


1925
1950


1975
TENS
2000
RT_HRLT
RLA1
RLA2
RLA3
RLA5
RLA4
DRH
RHOM
PEFL
LCAL
HSGR
CDF
2025
APLC




| | | |
|---|---|---|
| HLDS Caliper (LCAL)<br>0 (IN) 20 | Tension (TENS) (LBF)<br>10000 0 | HRLT Resistivity 4 (RLA4)<br>0.2 (OHMM) 2000 |
| HNGS Spectroscopy Gamma Ray (HSGR)<br>0 (GAPI) 100 | Calibrated Downhole Force (CDF) (LBF)<br>5000 0 | HRLT Resistivity 5 (RLA5)<br>0.2 (OHMM) 2000 |
| | | HRLT Resistivity 3 (RLA3)<br>0.2 (OHMM) 2000 |
| | | HRLT Resistivity 2 (RLA2)<br>0.2 (OHMM) 2000 |
| | | HRLT Resistivity 1 (RLA1)<br>0.2 (OHMM) 2000 |

| |
|---|
| APS Near/Array Corrected Limestone Porosity (APLC)<br>100 (PU) 0 |
| HLDS Long Spaced Photoelectric Effect (PEFL)<br>0 (−−−−) 10 |
| HLDS Bulk Density (RHOM)<br>1 (G/C3) 3 |
| HLDS Bulk Density Correction (DRH)<br>−0.25 (G/C3) 0.25 |

Downlog 2

| HRLT True Resistivity (RT_HRLT) | | |
|---|---|---|
| 0.2 | (OHMM) | 2000 |

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 | 17.5276 | 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 | 5 | |
| AASD | APS Thermal and Array Detectors High Voltage Setting | 1969.88 | V |
| ADSO | APS Array Detectors Data Source Switch | Both | |
| AFSD | APS Far Detector High Voltage Setting | 2067.34 | V |
| AHCS | APS Holesize Correction Source | GCSE | |
| AHSS | APS Holesize Correction Switch | ON | |
| AMTY | APS Environmental Corrections Mud Type | WaterBaseBarite | |
| ANSD | APS Near Detector High Voltage Setting | 1736.79 | V |
| ASOS | APS Standoff Correction Switch | ON | |
| ATSS | APS Temperature−Pressure−Salinity Correction Switch | ON | |
| 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 | YES | |
| 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 | YES | |
| NARC | APS Near/Array Calibration Ratio | 1.08151 | |
| NFRC | APS Near/Far Calibration Ratio | 0.940367 | |
| PTCO_APS | APS TNPH Pressure/Temperature Correction Option | YES | |
| 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) | 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 | 0.00127443 | |
| 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 | 0.961051 | |
| VBA2 | HNGS Detector 2 Variable Barite Factor Running Average | 0.968842 | |
| 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 | NATU | |
| 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 | 8.500 | IN |
| CWEI | Casing Weight | 0.00 | LB/F |

| | | | |
|---|---|---|---|
| DFD | Drilling Fluid Density | 1.02 | G/C3 |
| DO | Depth Offset for Playback | 0.0 | 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 | RECOMPUTE | |
| RMFS | Resistivity of Mud Filtrate Sample | −50000.0000 | OHMM |
| RW | Resistivity of Connate Water | 1.0000 | OHMM |
| TD | Total Depth | 2059.1 | M |
| TDD | Total Depth − Driller | 2059.10 | M |
| TDL | Total Depth − Logger | 2046.00 | M |
| TWS | Temperature of Connate Water Sample | 37.78 | DEGC |

**Format: TripleCombo** **Vertical Scale: 1:200** **Graphics File Created: 22−Jun−2018 01:06**

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

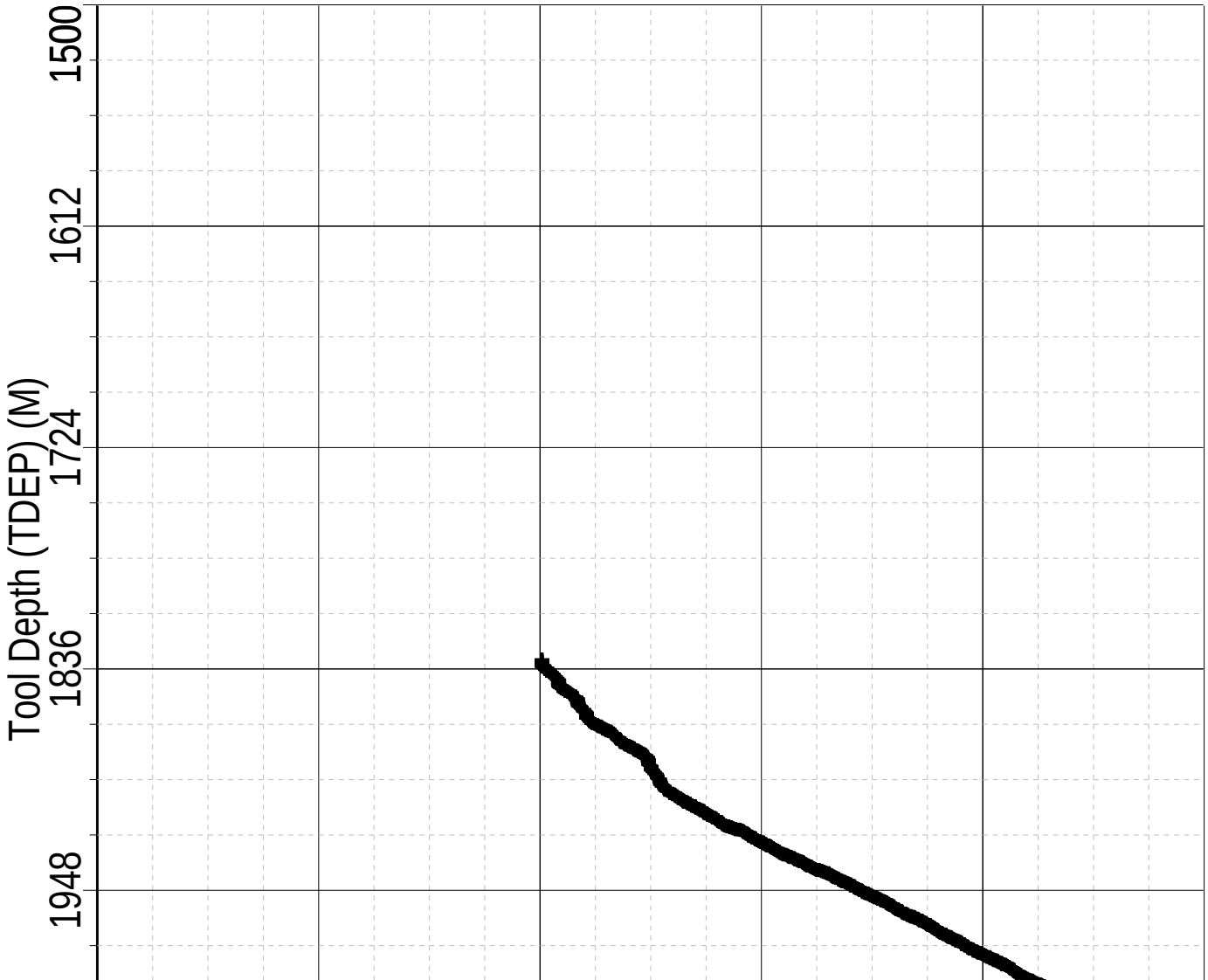
## Input DLIS Files

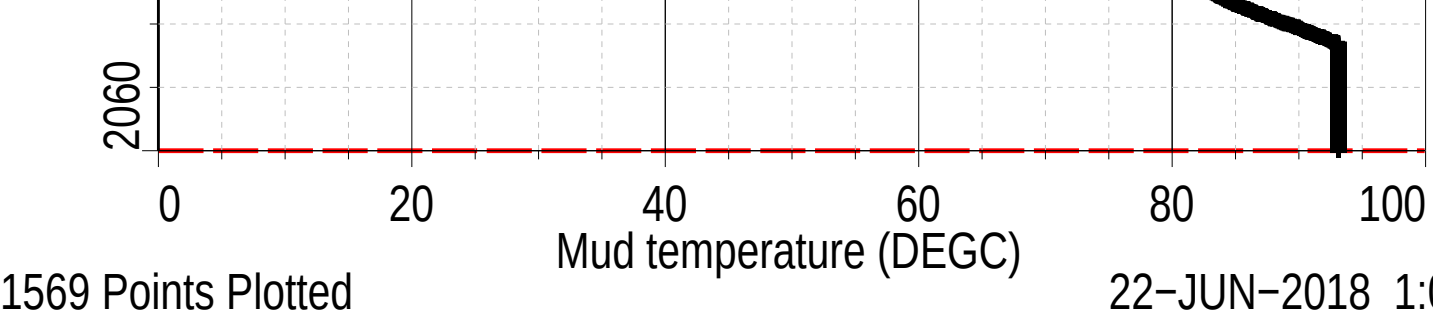
| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | Flip_HRLA_LDL_APS_047PUP | PRODUCER | 20−Jun−2018 09:19 | 2070.0 M | 1831.1 M |

## Output DLIS Files

| | | | | |
|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_074PUP | FN:94 | PRODUCER | 22−Jun−2018 01:05 |

Index: 2070.0 − 1831.1 M Downlog 2






1569 Points Plotted

22−JUN−2018 1:06

## Input DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_023LUP | FN:27 | PRODUCER | 19−Jun−2018 20:17 | 2048.3 M | 1879.4 M |

## Output DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_075PUP | FN:95 | PRODUCER | 22−Jun−2018 01:17 | 2048.3 M | 1879.5 M |

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

**PIP SUMMARY**

Time Mark Every 60 S

HNGS Spectroscopy Gamma Ray (HSGR)
0 (GAPI) 100

Area1
From HCGR to HSGR

REPEAT SECTION

HNGS Borehole Potassium (HBHK)
−0.05 (−−−−) 0.05

HNGS Computed Gamma Ray (HCGR)
0 (GAPI) 100

Calibrated Downhole Force (CDF) (LBF)
5000 0

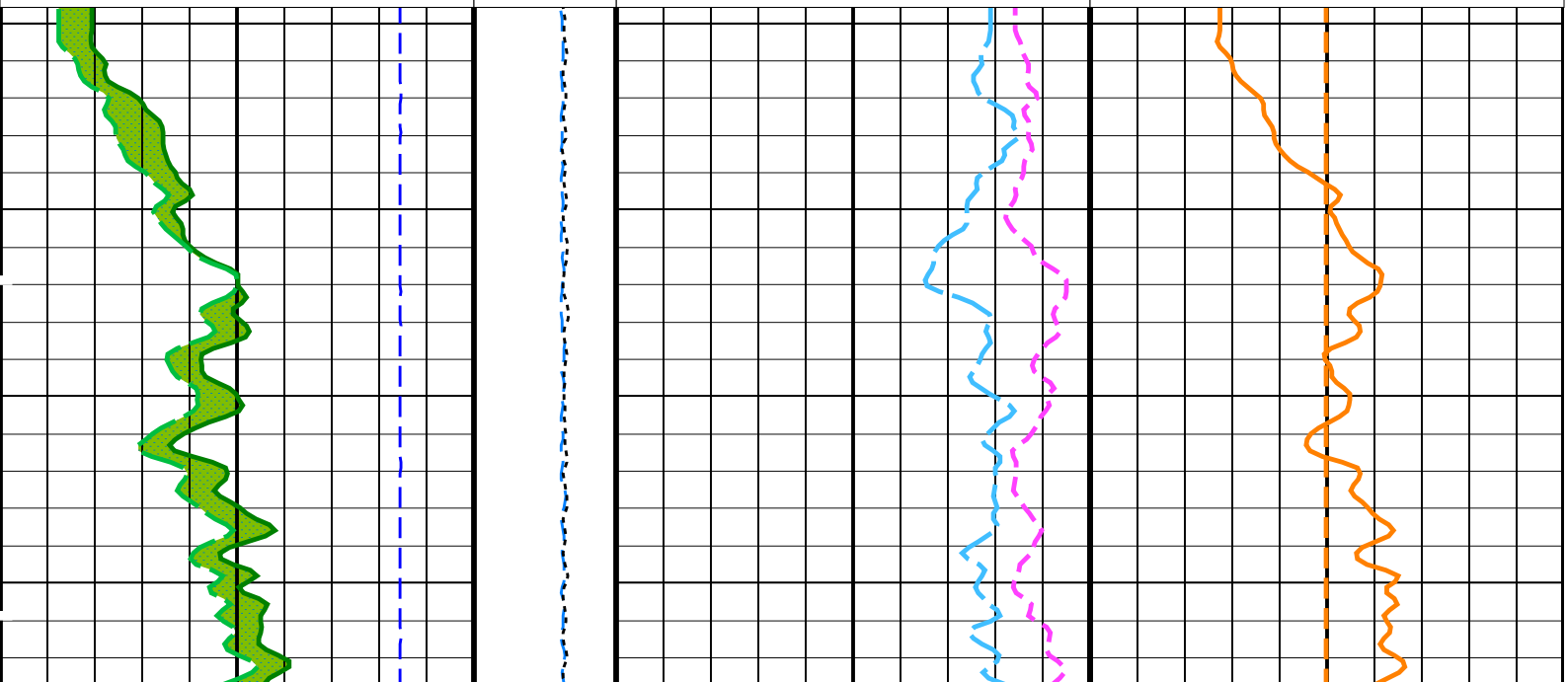
HNGS Uranium (HURA)
−5 (PPM) 10

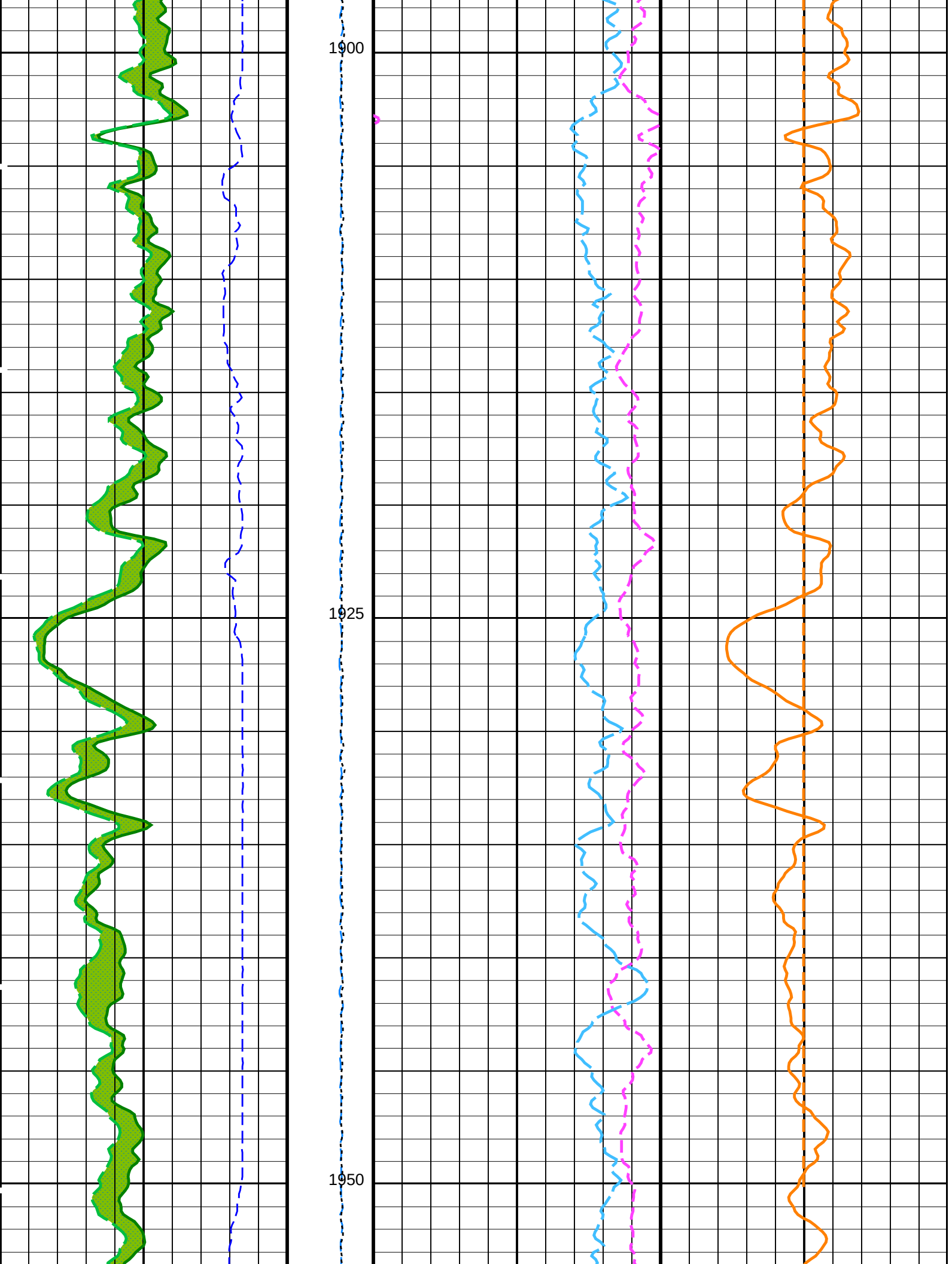
HLDS Caliper (LCAL)
0 (IN) 20

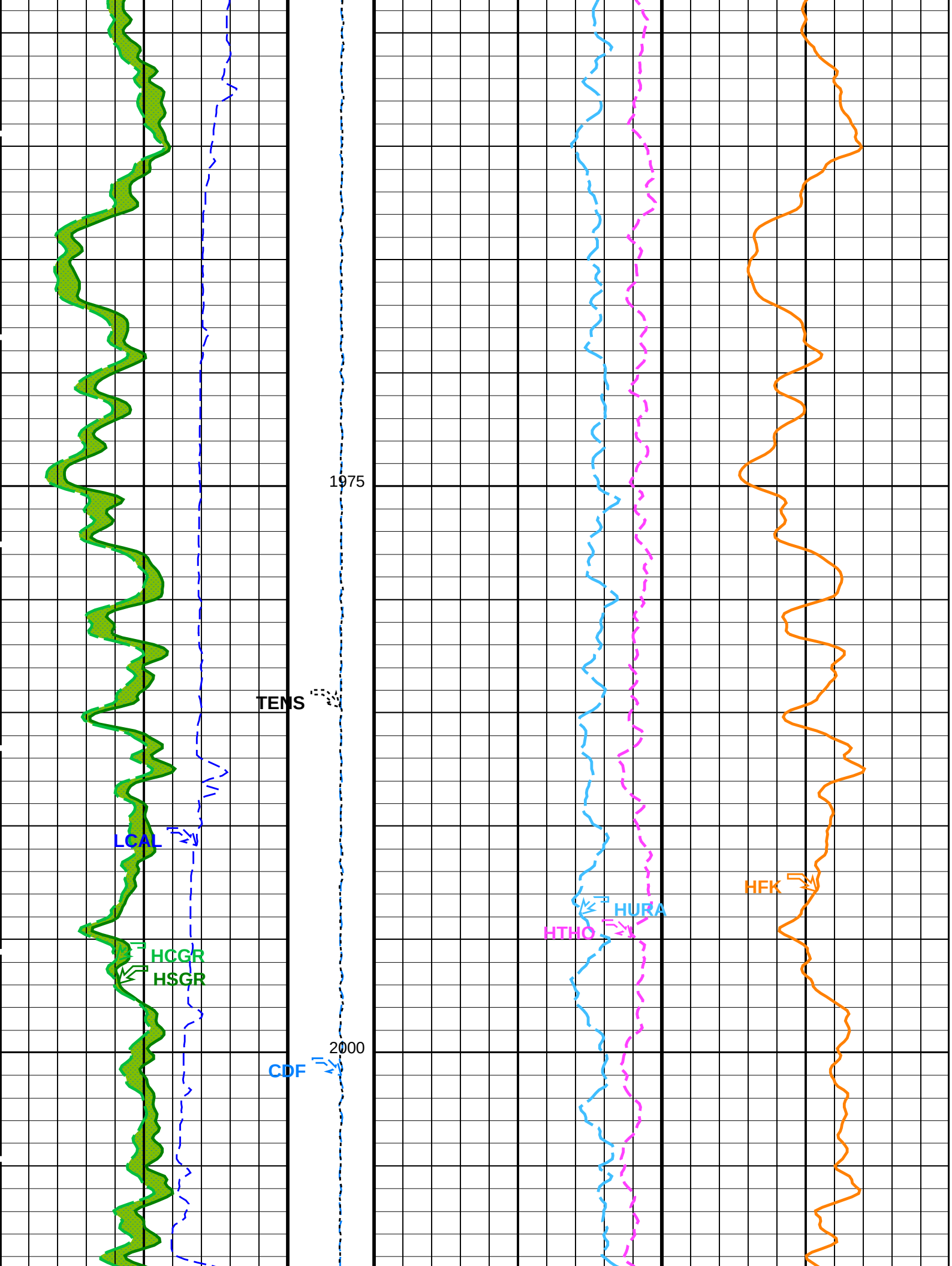
Tension (TENS) (LBF)
10000 0

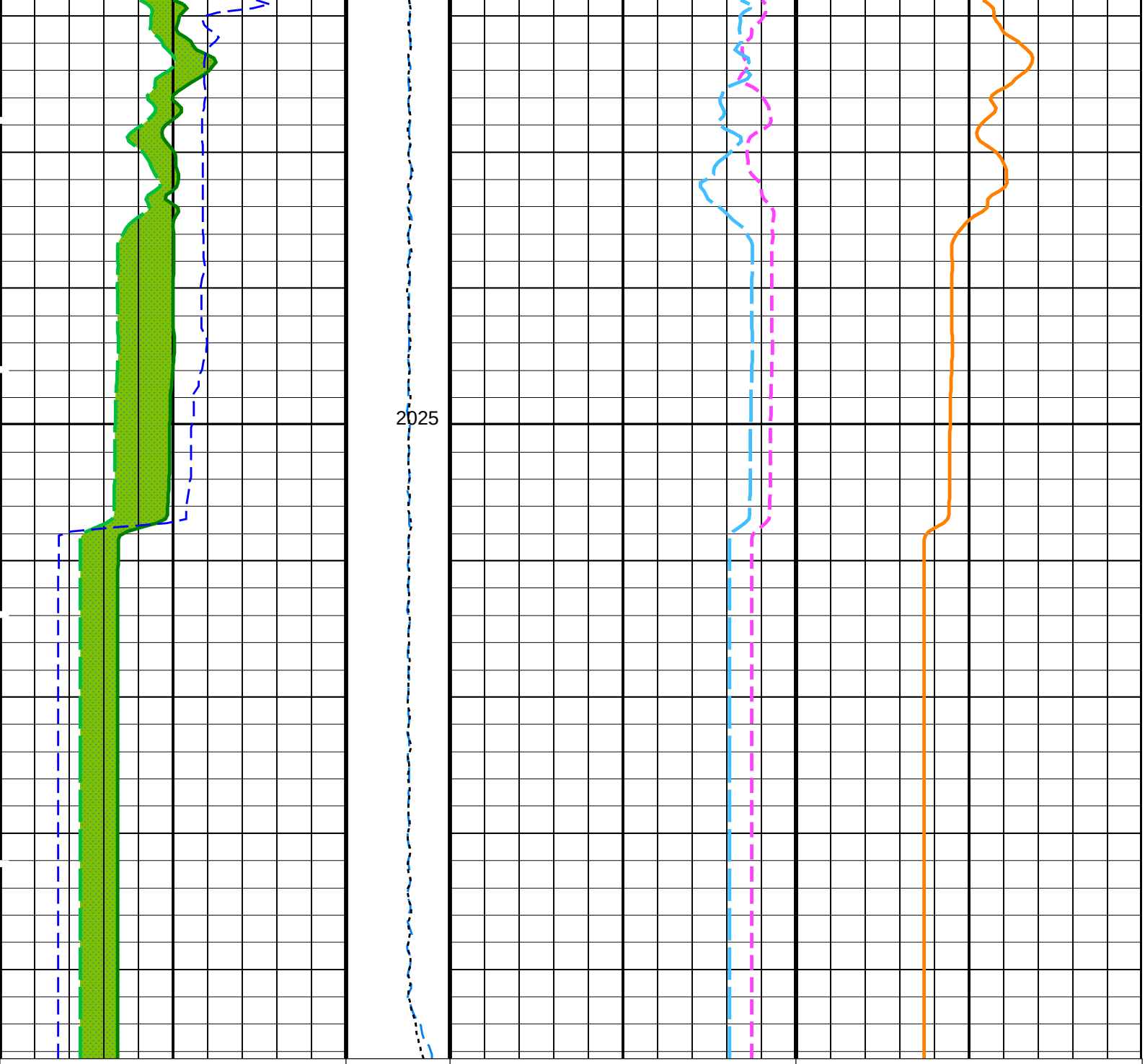
HNGS Thorium (HTHO)
5 (PPM) 25

HNGS Potassium (HFK)
−0.01 (−−−−) 0.04




1900
1925
1950


1975
TENS
LCAL
HCGR
HSGR
2000
CDF
HTHO
HURA
HFK




HLDS Caliper (LCAL)
0 (IN) 20

Tension (TENS) (LBF)
10000 0

HNGS Thorium (HTHO)
5 (PPM) 25

HNGS Potassium (HFK)
−0.01 (−−−−) 0.04

HNGS Computed Gamma Ray (HCGR)
0 (GAPI) 100

Calibrated Downhole Force (CDF) (LBF)
5000 0

HNGS Uranium (HURA)
−5 (PPM) 10

Area1
From HCGR to HSGR

REPEAT SECTION

HNGS Borehole Potassium (HBHK)
−0.05 (−−−−) 0.05

HNGS Spectroscopy Gamma Ray (HSGR)
0 (GAPI) 100

PIP SUMMARY

Time Mark Every 60 S

## Parameters

| DLIS Name | Description | Value | |
|---|---|---|---|
| | **HRLT−B: High Resolution Laterolog Array − B** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | LCAL | |
| | **APS−C: Accelerator−Porosity Tool** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | LCAL | |
| | **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 | |
| 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 | LCAL | |
| H1P | HNGS Detector 1 Allow/Disallow In Processing | ALLOW | |
| H2P | HNGS Detector 2 Allow/Disallow In Processing | ALLOW | |
| HABK | HNGS Borehole Potassium Running Average | 0.00567594 | |
| HALF | HNGS Alpha Filter Length | 60 | IN |
| HCRB | HNGS Apply Borehole Potassium Correction | NONE | |
| HMWM | Mud Weighting Material | NATU | |
| HNPE | HNGS Processing Enable | YES | |
| 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 | |
| TPOS | Tool Position | ECCE | |
| VBA1 | HNGS Detector 1 Variable Barite Factor Running Average | 0.918306 | |
| VBA2 | HNGS Detector 2 Variable Barite Factor Running Average | 0.918898 | |
| | **EDTC−B: Enhanced DTS Cartridge** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | LCAL | |
| | **System and Miscellaneous** | | |
| BS | Bit Size | 9.875 | IN |
| DFD | Drilling Fluid Density | 1.02 | G/C3 |
| DO | Depth Offset for Playback | 0.0 | M |
| PP | Playback Processing | RECOMPUTE | |

**Format: HNGSYields** **Vertical Scale: 1:200** **Graphics File Created: 22−Jun−2018 01:17**

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

## Input DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_023LUP | FN:27 | PRODUCER | 19−Jun−2018 20:17 | 2048.3 M | 1879.4 M |

## Output DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_075PUP | FN:95 | PRODUCER | 22−Jun−2018 01:17 | | |


## Input DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_023LUP | FN:27 | PRODUCER | 19−Jun−2018 20:17 | 2048.3 M | 1879.4 M |


## Output DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_075PUP | FN:95 | PRODUCER | 22−Jun−2018 01:17 | 2048.3 M | 1879.5 M |


## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

PIP SUMMARY

Time Mark Every 60 S

REPEAT SECTION

HRLT True Resistivity (RT_HRLT)
0.2 (OHMM) 2000

HRLT Resistivity 1 (RLA1)
0.2 (OHMM) 2000

HRLT Resistivity 2 (RLA2)
0.2 (OHMM) 2000

HRLT Resistivity 3 (RLA3)
0.2 (OHMM) 2000

HLDS Bulk Density Correction (DRH)
−0.25 (G/C3) 0.25

HLDS Bulk Density (RHOM)
1 (G/C3) 3

HNGS Spectroscopy Gamma Ray (HSGR)
0 (GAPI) 100

Calibrated Downhole Force (CDF) (LBF)
5000 0

HRLT Resistivity 5 (RLA5)
0.2 (OHMM) 2000

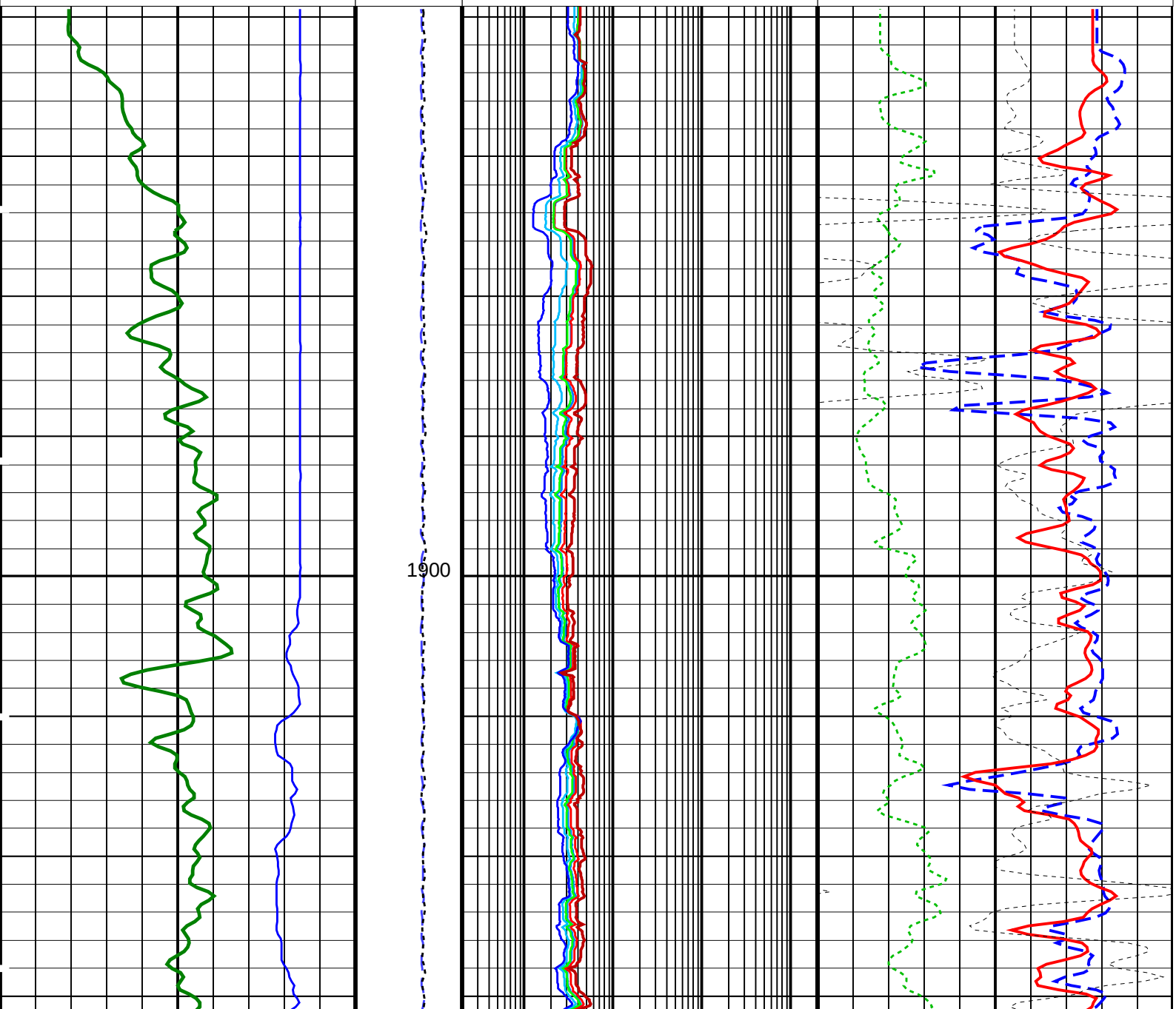
HLDS Long Spaced Photoelectric Effect (PEFL)
0 (−−−−) 10

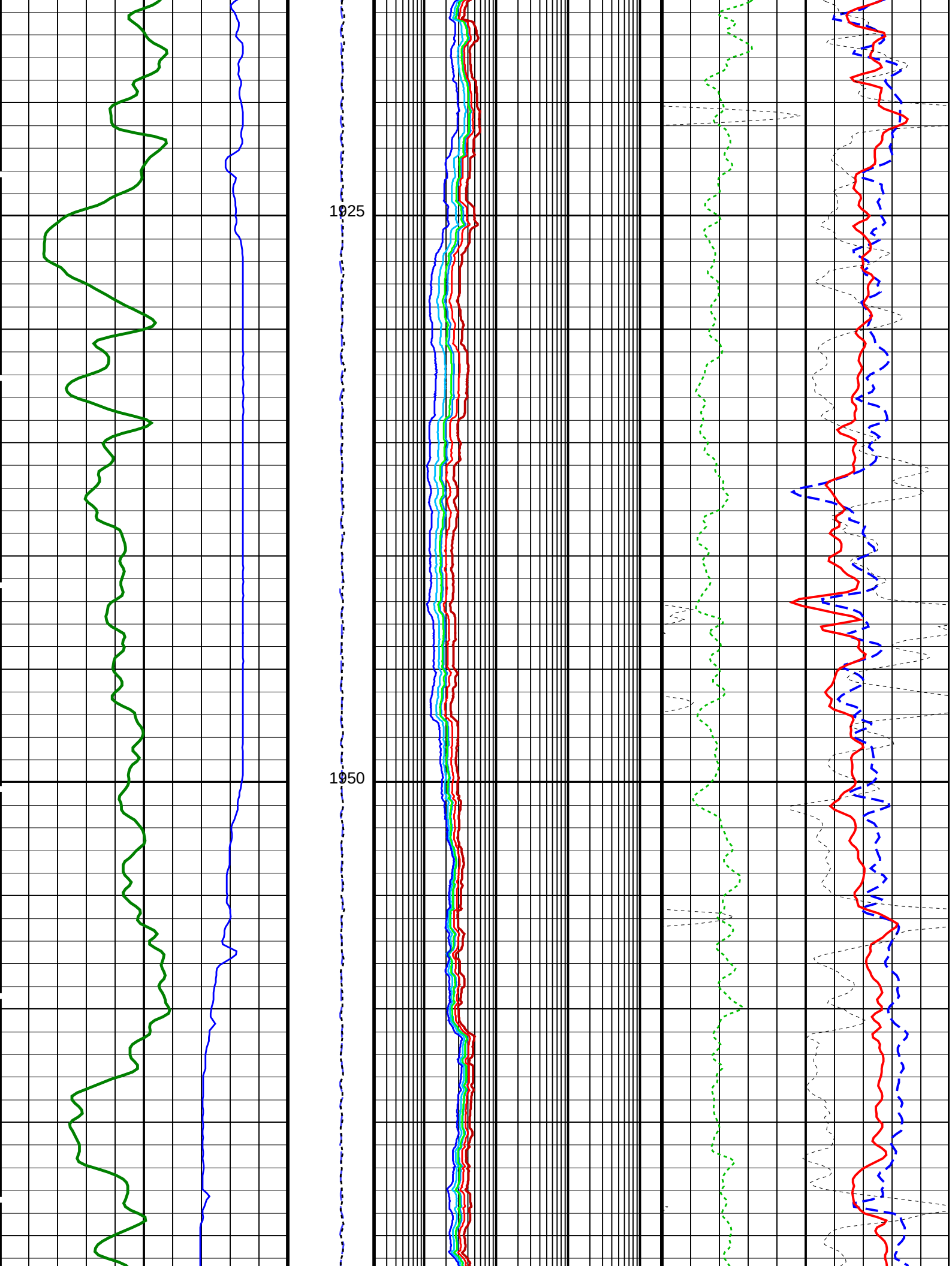
HLDS Caliper (LCAL)
0 (IN) 20

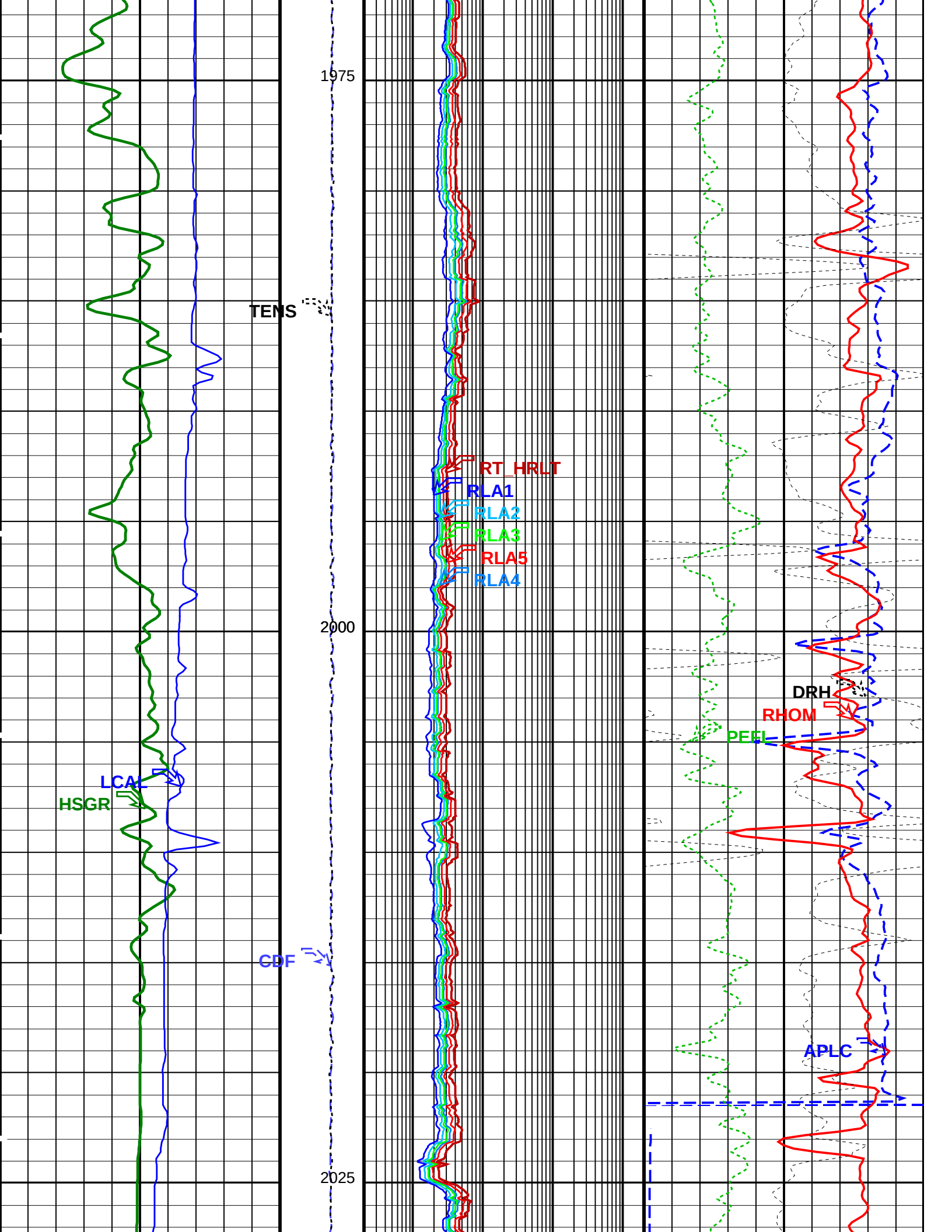
Tension (TENS) (LBF)
10000 0

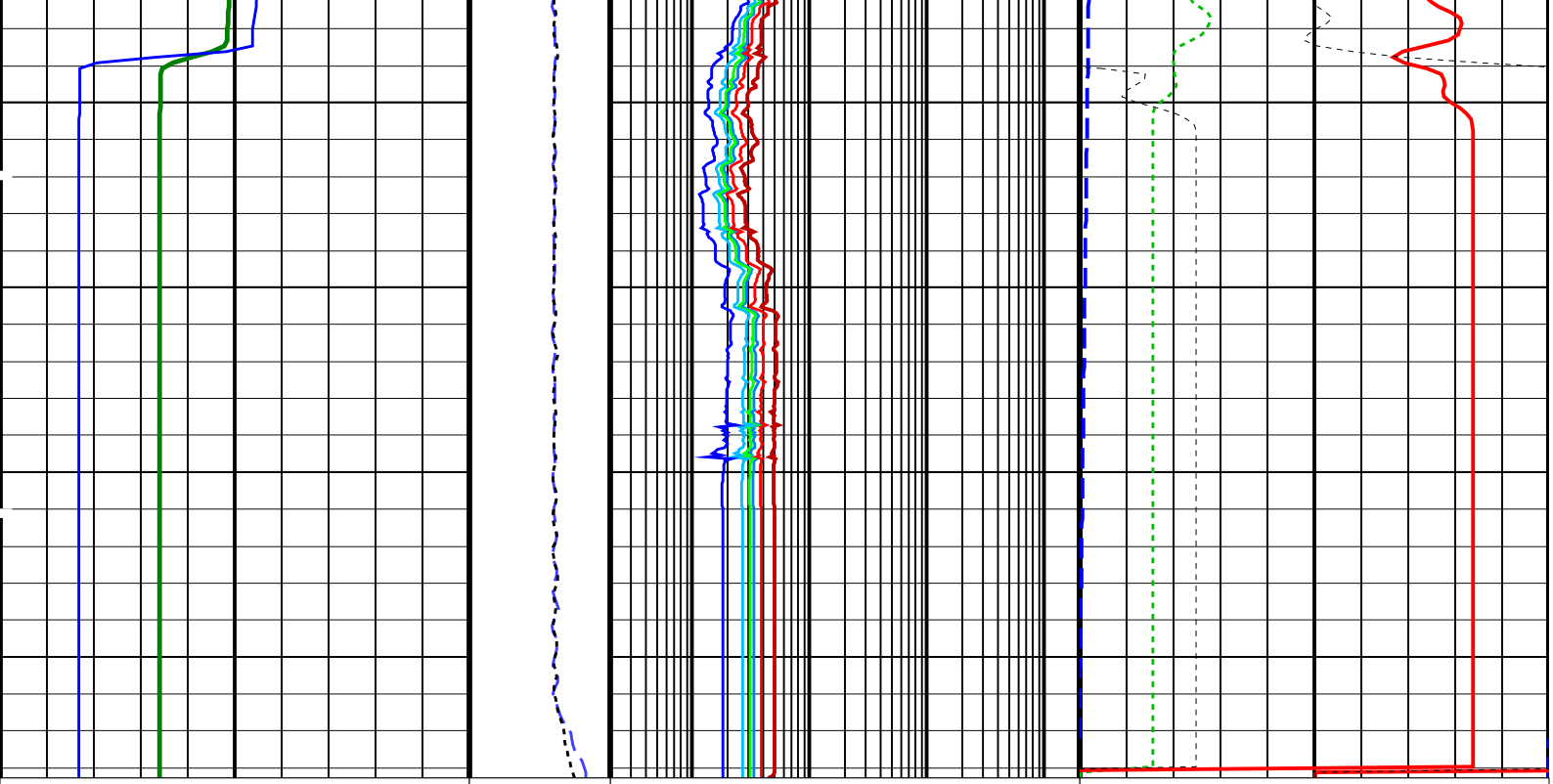
HRLT Resistivity 4 (RLA4)
0.2 (OHMM) 2000

APS Near/Array Corrected Limestone Porosity (APLC)
100 (PU) 0




1925
1950


1975
TENS
RT_HRLT
RLA1
RLA2
RLA3
RLA5
RLA4
2000
DRH
RHOM
PEFL
LCAL
HSGR
CDF
APLC
2025



| HLDS Caliper (LCAL) | Tension (TENS) (LBF) | HRLT Resistivity 4 (RLA4) | APS Near/Array Corrected Limestone Porosity (APLC) |
|---|---|---|---|
| 0 (IN) 20 | 10000 0 | 0.2 (OHMM) 2000 | 100 (PU) 0 |
| **HNGS Spectroscopy Gamma Ray (HSGR)** | **Calibrated Downhole Force (CDF) (LBF)** | **HRLT Resistivity 5 (RLA5)** | **HLDS Long Spaced Photoelectric Effect (PEFL)** |
| 0 (GAPI) 100 | 5000 0 | 0.2 (OHMM) 2000 | 0 (----) 10 |
| REPEAT SECTION | | **HRLT Resistivity 3 (RLA3)** | **HLDS Bulk Density (RHOM)** |
| | | 0.2 (OHMM) 2000 | 1 (G/C3) 3 |
| | | **HRLT Resistivity 2 (RLA2)** | **HLDS Bulk Density Correction (DRH)** |
| | | 0.2 (OHMM) 2000 | −0.25 (G/C3) 0.25 |
| | | **HRLT Resistivity 1 (RLA1)** | |
| | | 0.2 (OHMM) 2000 | |
| | | **HRLT True Resistivity (RT_HRLT)** | |
| | | 0.2 (OHMM) 2000 | |

**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) | 92.5 | DEGC |
| CALSTAT | HRLTB Calibration Status | SHALLOW_DONE | |
| CALTEMP | HRLTB Calibration Temperature | 17.5276 | 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 | LCAL | |
| 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 | 5 | |
| AASD | APS Thermal and Array Detectors High Voltage Setting | 1969.88 | V |
| ADSO | APS Array Detectors Data Source Switch | Both | |
| AFSD | APS Far Detector High Voltage Setting | 2067.34 | V |
| AHCS | APS Holesize Correction Source | GCSE | |
| AHSS | APS Holesize Correction Switch | ON | |
| AMTY | APS Environmental Corrections Mud Type | WaterBaseBarite | |
| ANSD | APS Near Detector High Voltage Setting | 1736.79 | V |
| ASOS | APS Standoff Correction Switch | ON | |
| ATSS | APS Temperature−Pressure−Salinity Correction Switch | ON | |
| BHFL_APS | APS TNPH Borehole Fluid Type | WATER | |
| BHS | Borehole Status | OPEN | |
| BHT | Bottom Hole Temperature (used in calculations) | 92.5 | DEGC |
| BSCO_APS | APS TNPH Borehole Salinity Correction Option | YES | |
| 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 | LCAL | |
| 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 | YES | |
| NARC | APS Near/Array Calibration Ratio | 1.08151 | |
| NFRC | APS Near/Far Calibration Ratio | 0.940367 | |
| PTCO_APS | APS TNPH Pressure/Temperature Correction Option | YES | |
| 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) | 92.5 | 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 | LCAL | |

| | | | |
|---|---|---|---|
| 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 | 0.00567594 | |
| 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 | 0.918306 | |
| VBA2 | HNGS Detector 2 Variable Barite Factor Running Average | 0.918898 | |
| EDTC−B: Enhanced DTS Cartridge | | | |
| BHFL | Borehole Fluid Type | WATER | |
| BHS | Borehole Status | OPEN | |
| BHT | Bottom Hole Temperature (used in calculations) | 92.5 | 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 | LCAL | |
| 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 | NATU | |
| 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 | 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 | 8.500 | IN |
| CWEI | Casing Weight | 0.00 | LB/F |
| DFD | Drilling Fluid Density | 1.02 | G/C3 |
| DO | Depth Offset for Playback | 0.0 | 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 | RECOMPUTE | |
| RMFS | Resistivity of Mud Filtrate Sample | −50000.0000 | OHMM |
| RW | Resistivity of Connate Water | 1.0000 | OHMM |
| TD | Total Depth | 2059.1 | M |
| TDD | Total Depth − Driller | 2059.10 | M |
| TDL | Total Depth − Logger | 2046.00 | M |
| TWS | Temperature of Connate Water Sample | 37.78 | DEGC |

**Format: TripleCombo** **Vertical Scale: 1:200** **Graphics File Created: 22−Jun−2018 01:17**

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

## Input DLIS Files

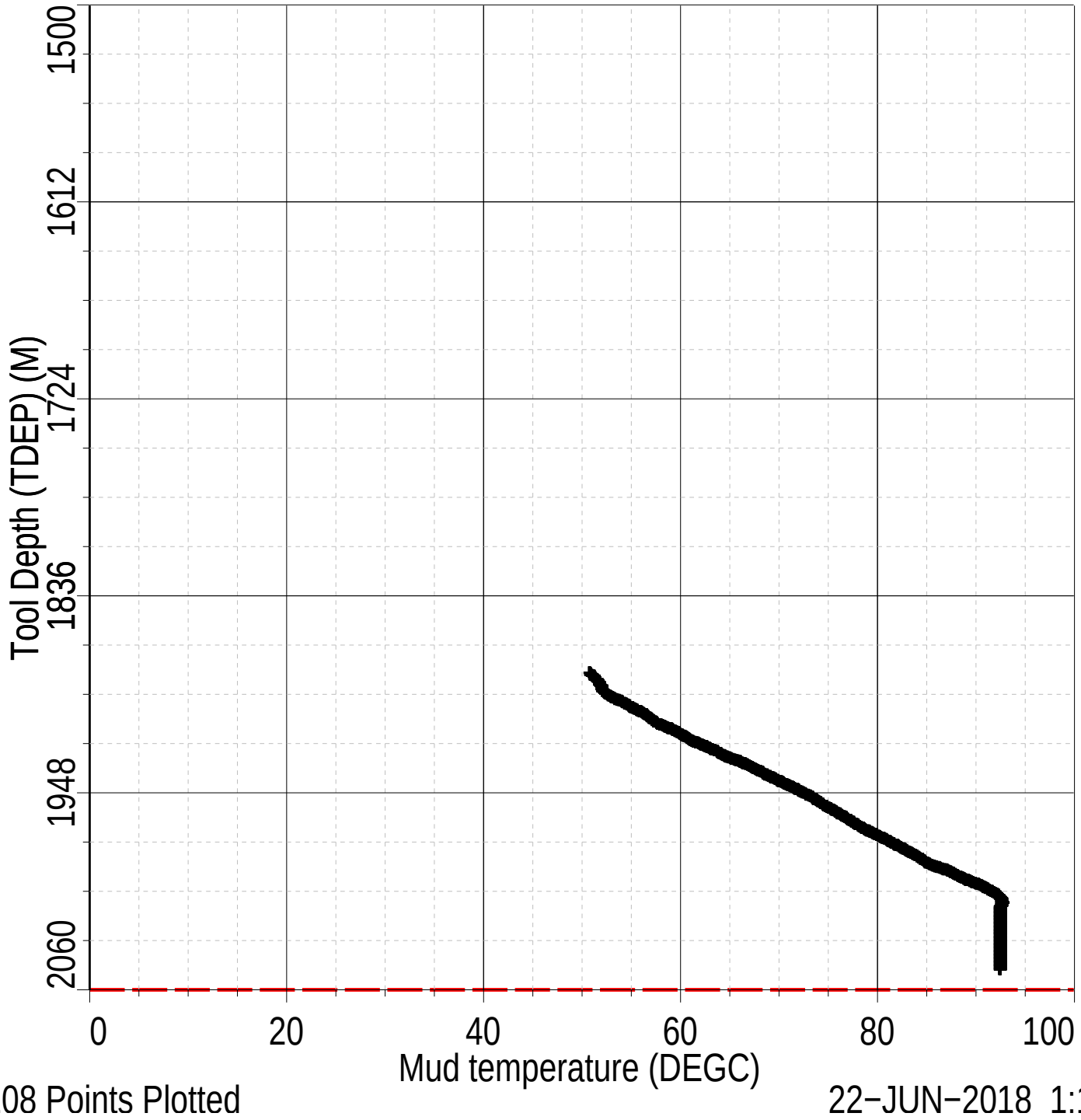
| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_023LUP | FN:27 | PRODUCER | 19−Jun−2018 20:17 | 2048.3 M | 1879.4 M |

## Output DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_075PUP | FN:95 | PRODUCER | 22−Jun−2018 01:17 | | |

Index: 2048.3 − 1879.5 M

Uplog 1 − Repeat Section




1108 Points Plotted

22−JUN−2018 1:18

## Input DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_025LUP | FN:31 | PRODUCER | 19−Jun−2018 21:02 | 2048.3 M | 1494.3 M |

## Output DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_076PUP | FN:96 | PRODUCER | 22−Jun−2018 01:21 | 2048.3 M | 1494.4 M |

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNGG−B | 19C0−187 | APS−C | 19C0−187 |

| | | | |
|---|---|---|---|
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

**PIP SUMMARY**

Time Mark Every 60 S

HNGS Spectroscopy Gamma Ray (HSGR)
0 (GAPI) 100

Area1
From HCGR to HSGR

Uplog 2 − Main Pass

HNGS Borehole Potassium (HBHK)
−0.05 (−−−−) 0.05

HNGS Computed Gamma Ray (HCGR)
0 (GAPI) 100

Calibrated Downhole Force (CDF) (LBF)
5000 0

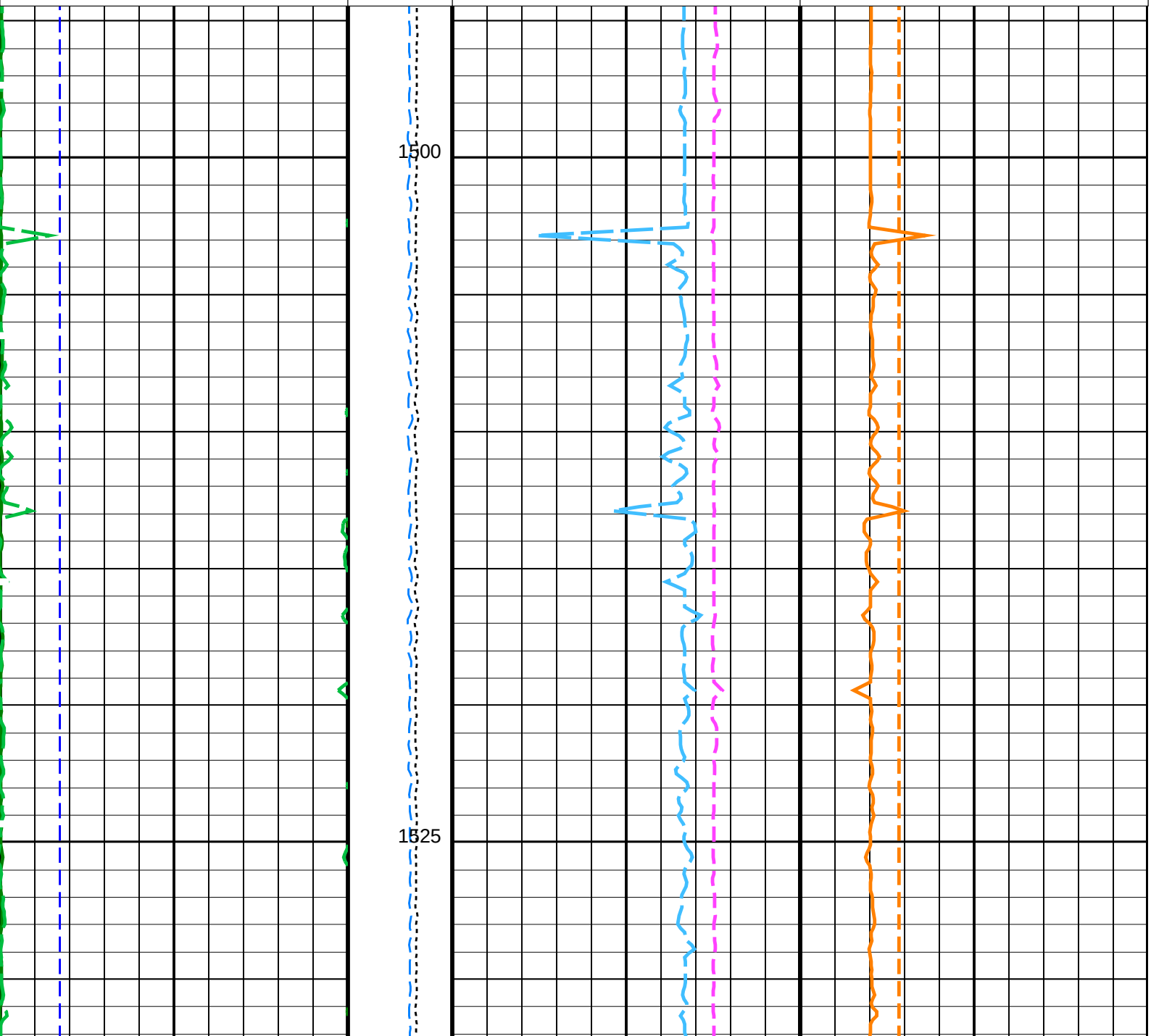
HNGS Uranium (HURA)
−5 (PPM) 10

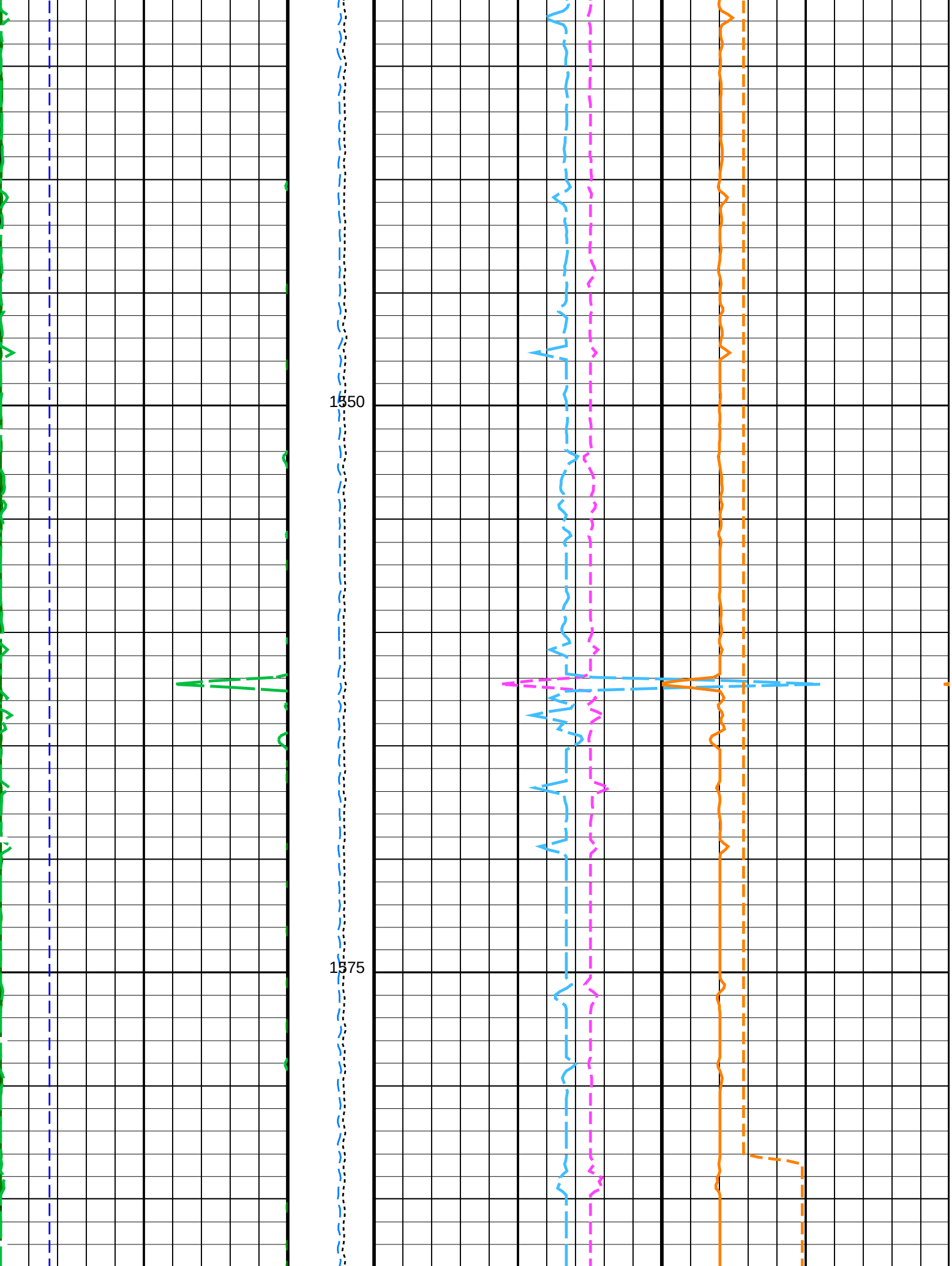
HLDS Caliper (LCAL)
0 (IN) 20

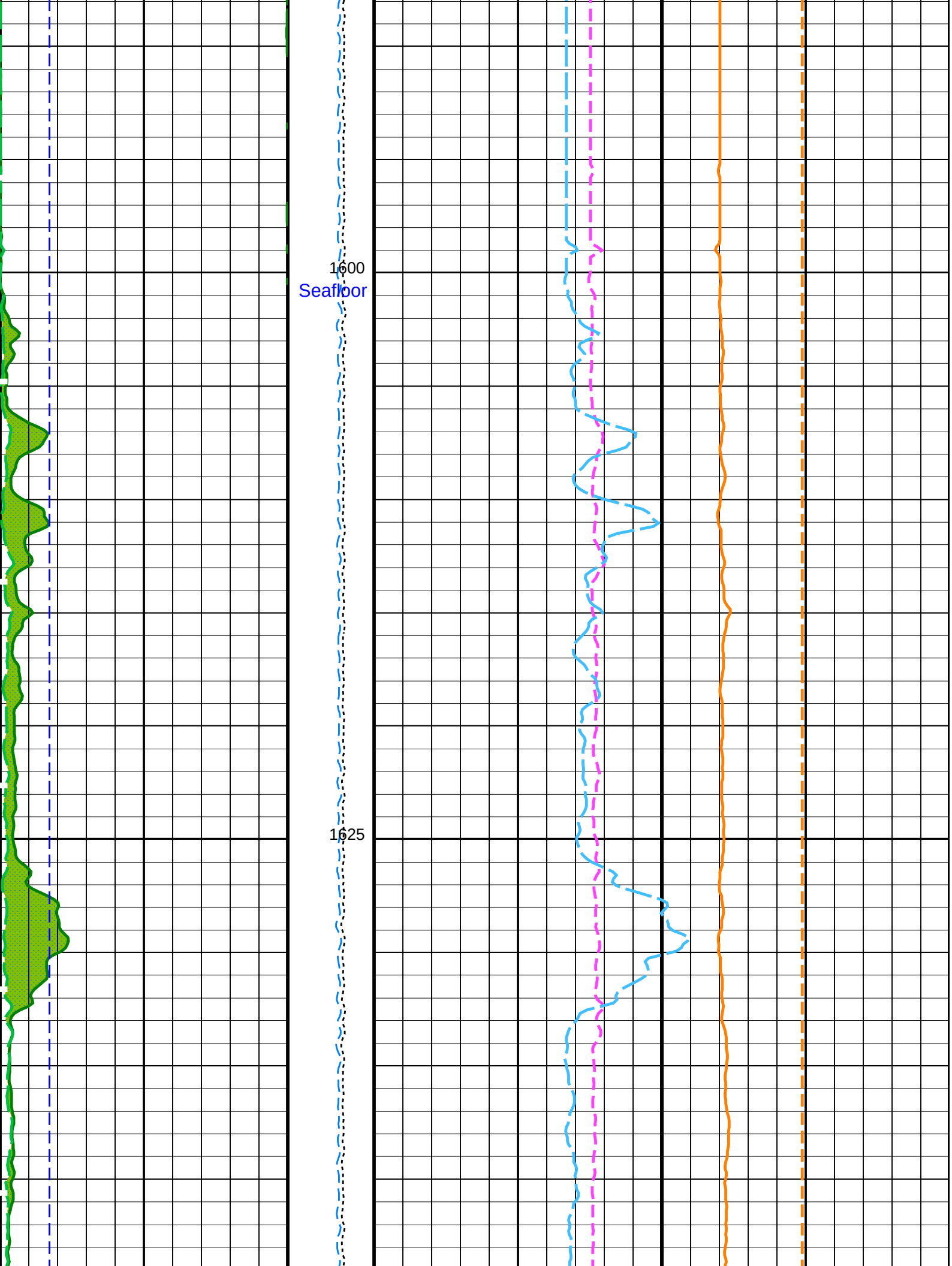
Tension (TENS) (LBF)
10000 0

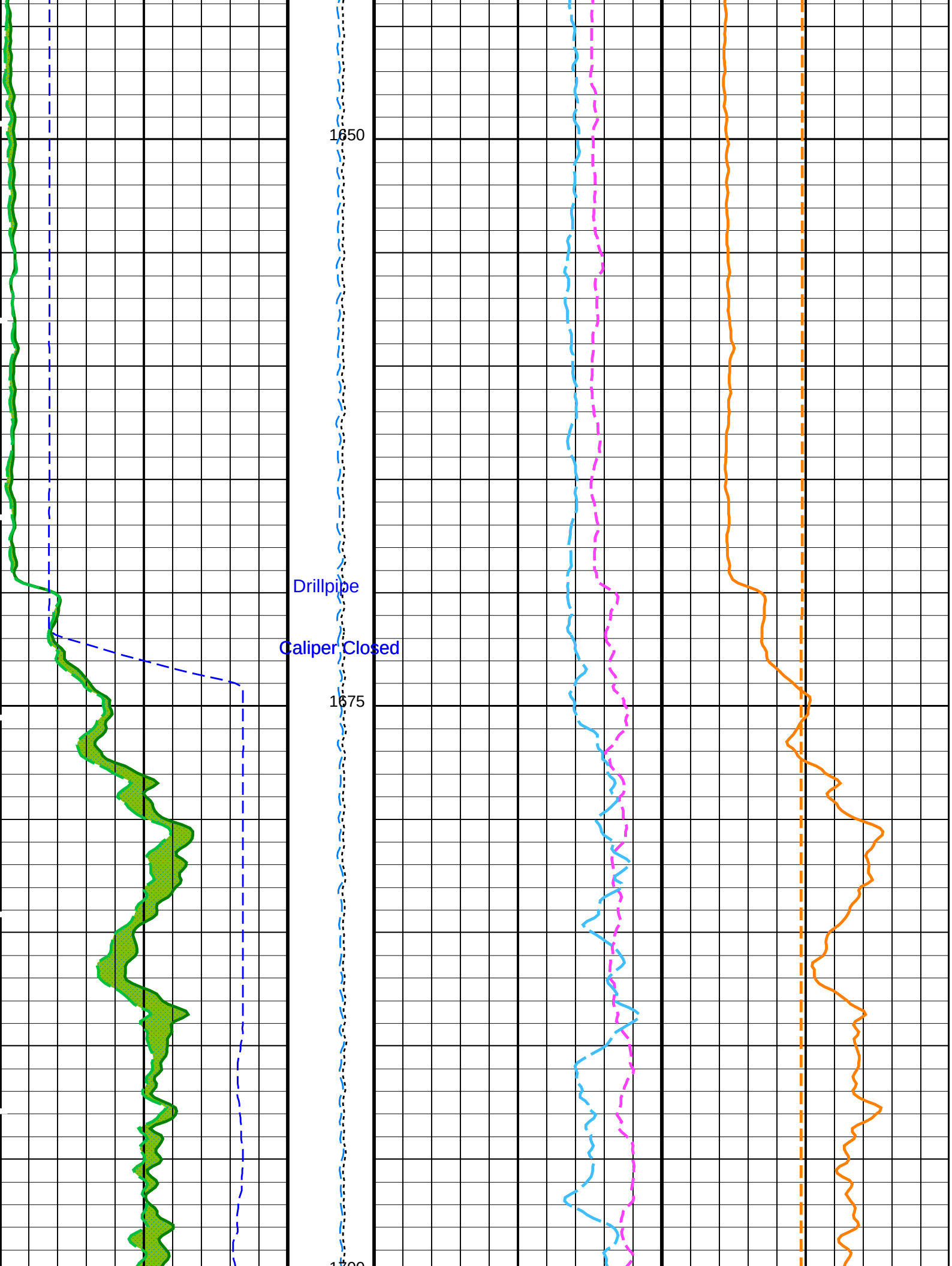
HNGS Thorium (HTHO)
5 (PPM) 25

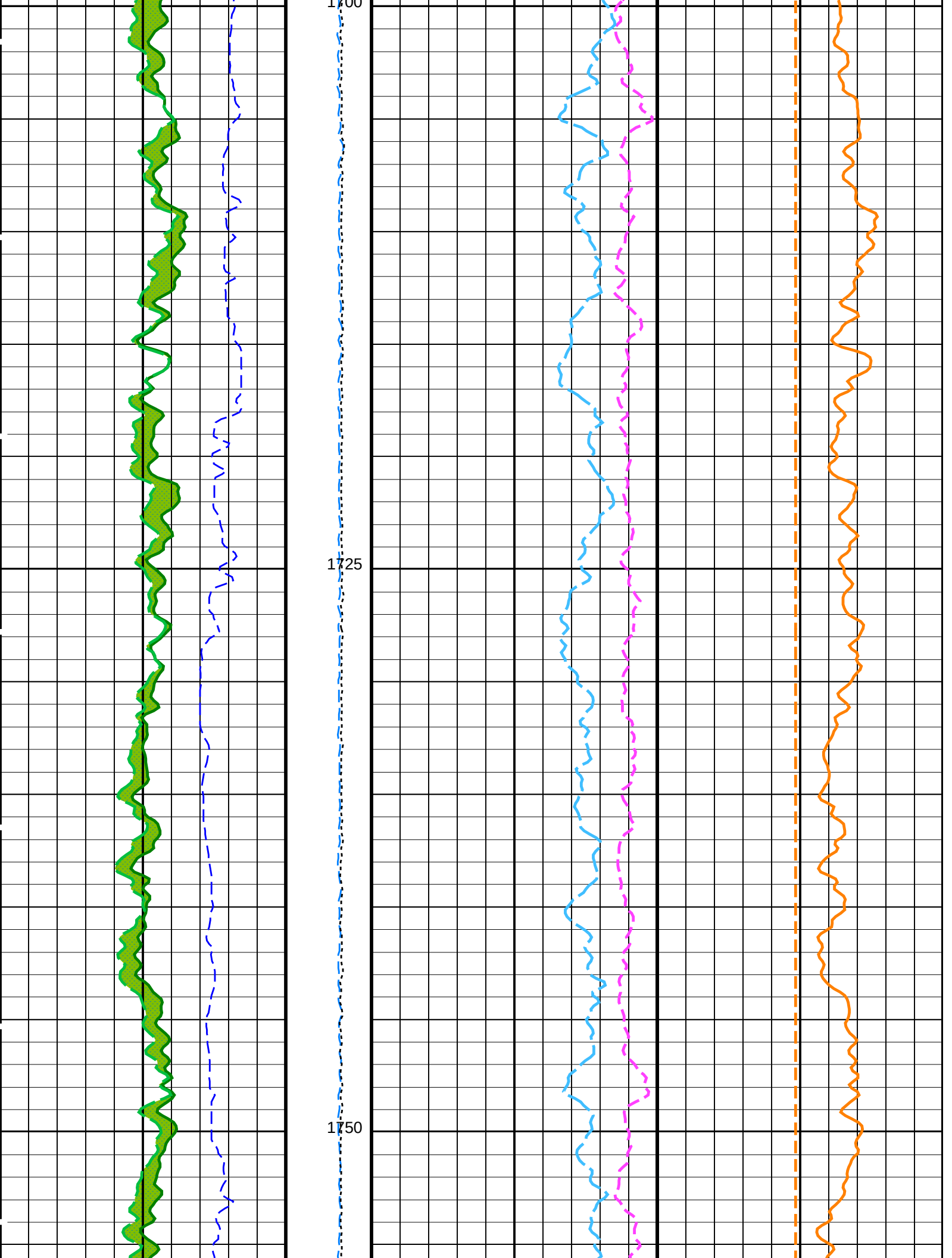
HNGS Potassium (HFK)
−0.01 (−−−−) 0.04




1550
1575


1600
Seafloor
1625


1650
Drillpipe
Caliper Closed
1675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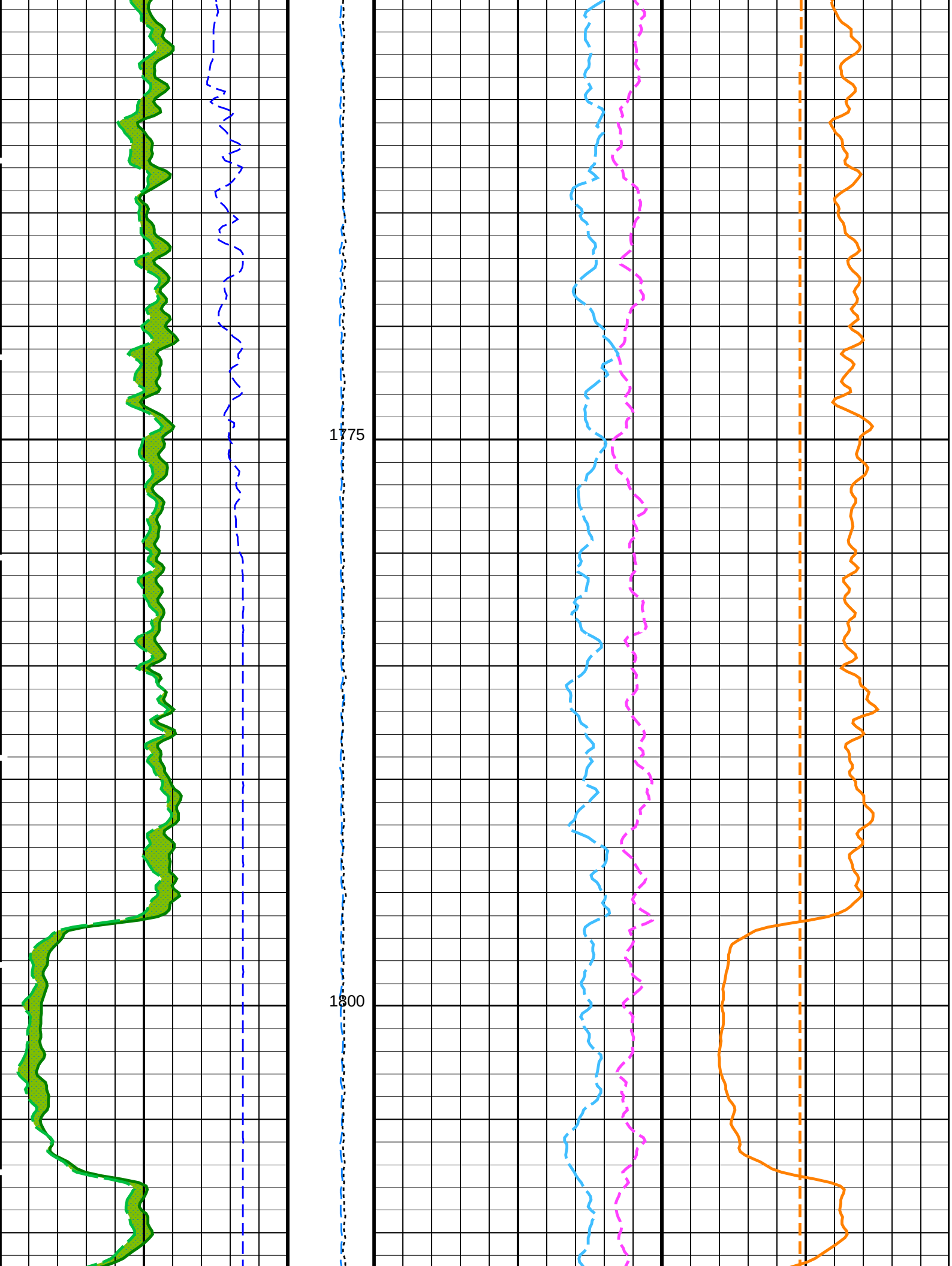
1725
1750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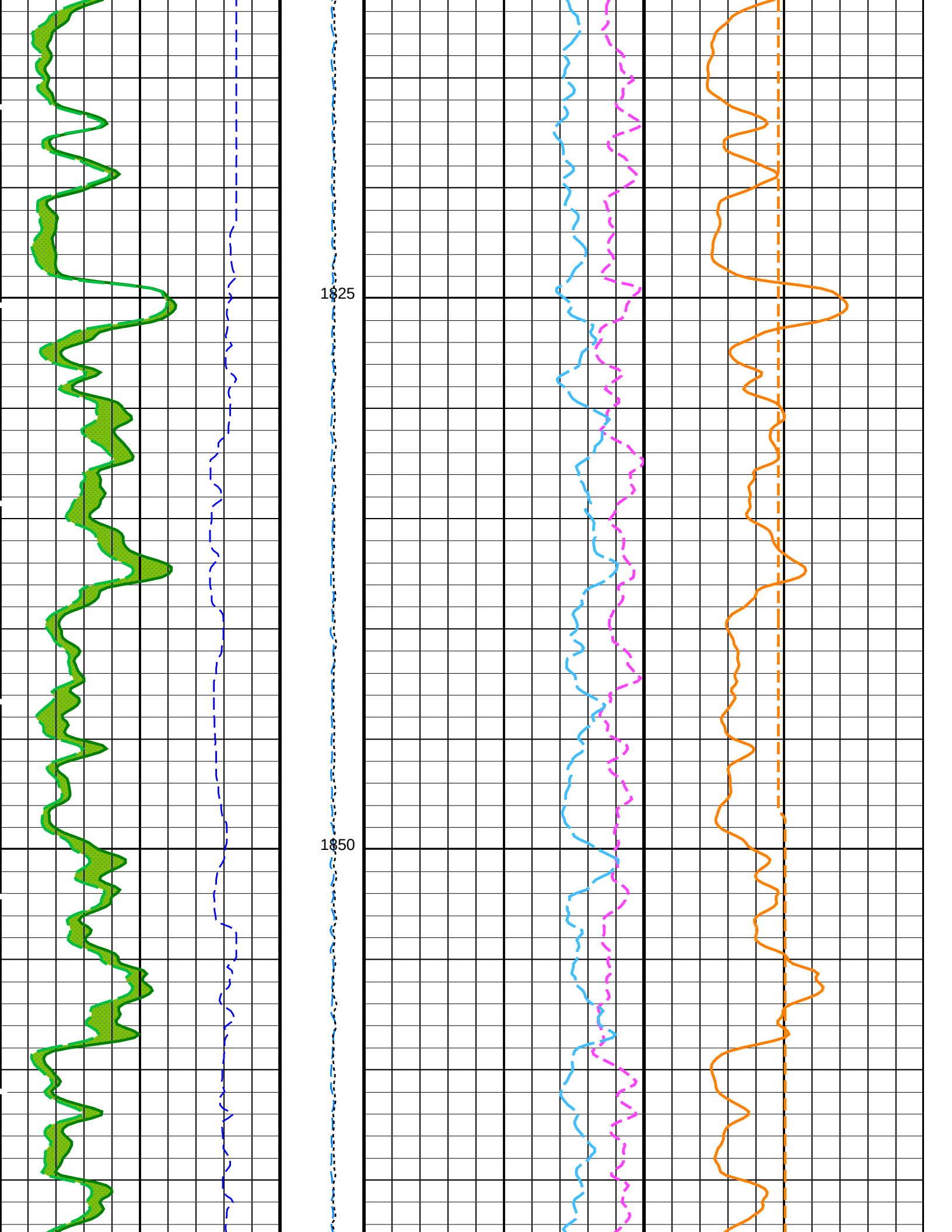
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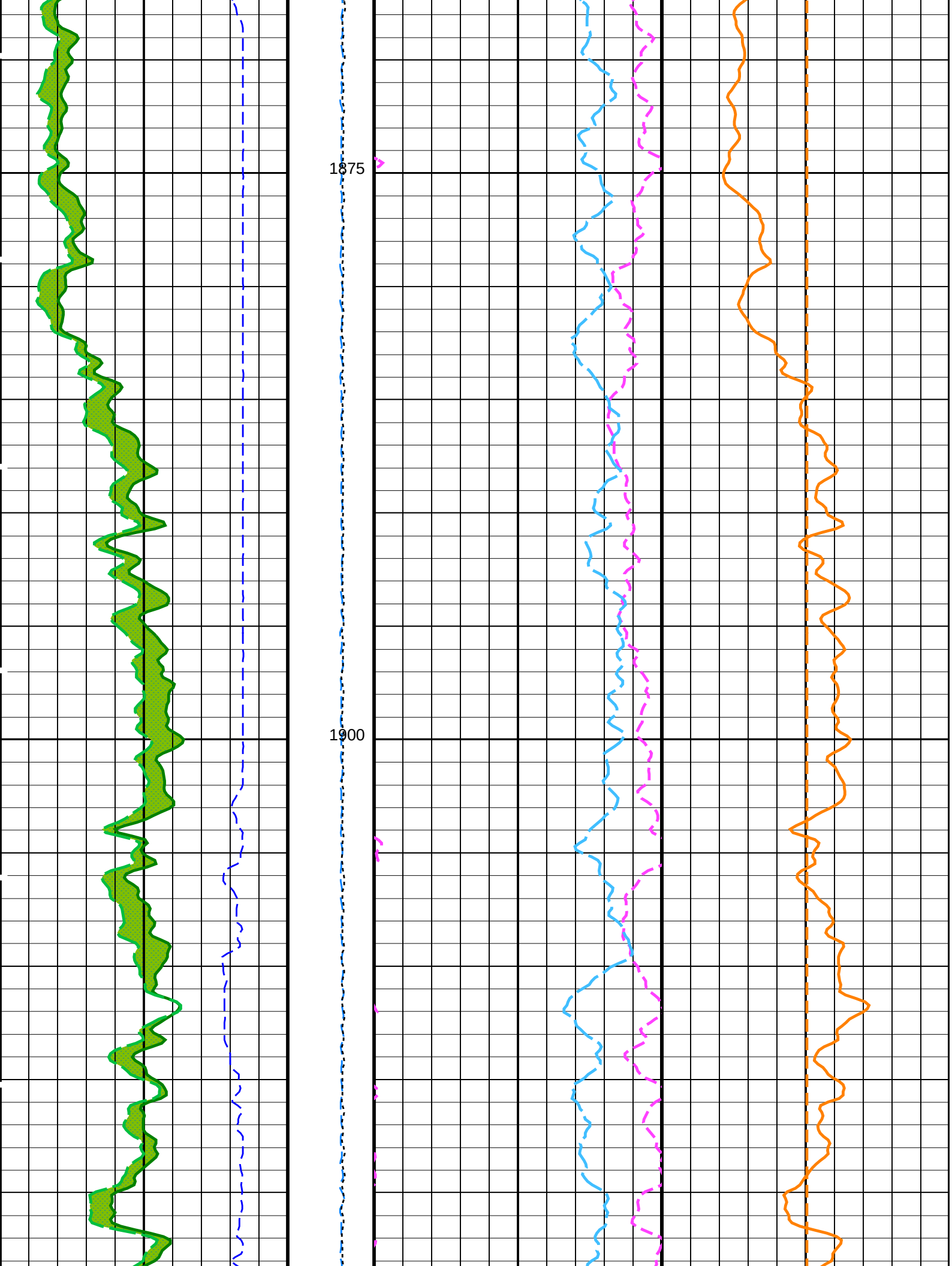
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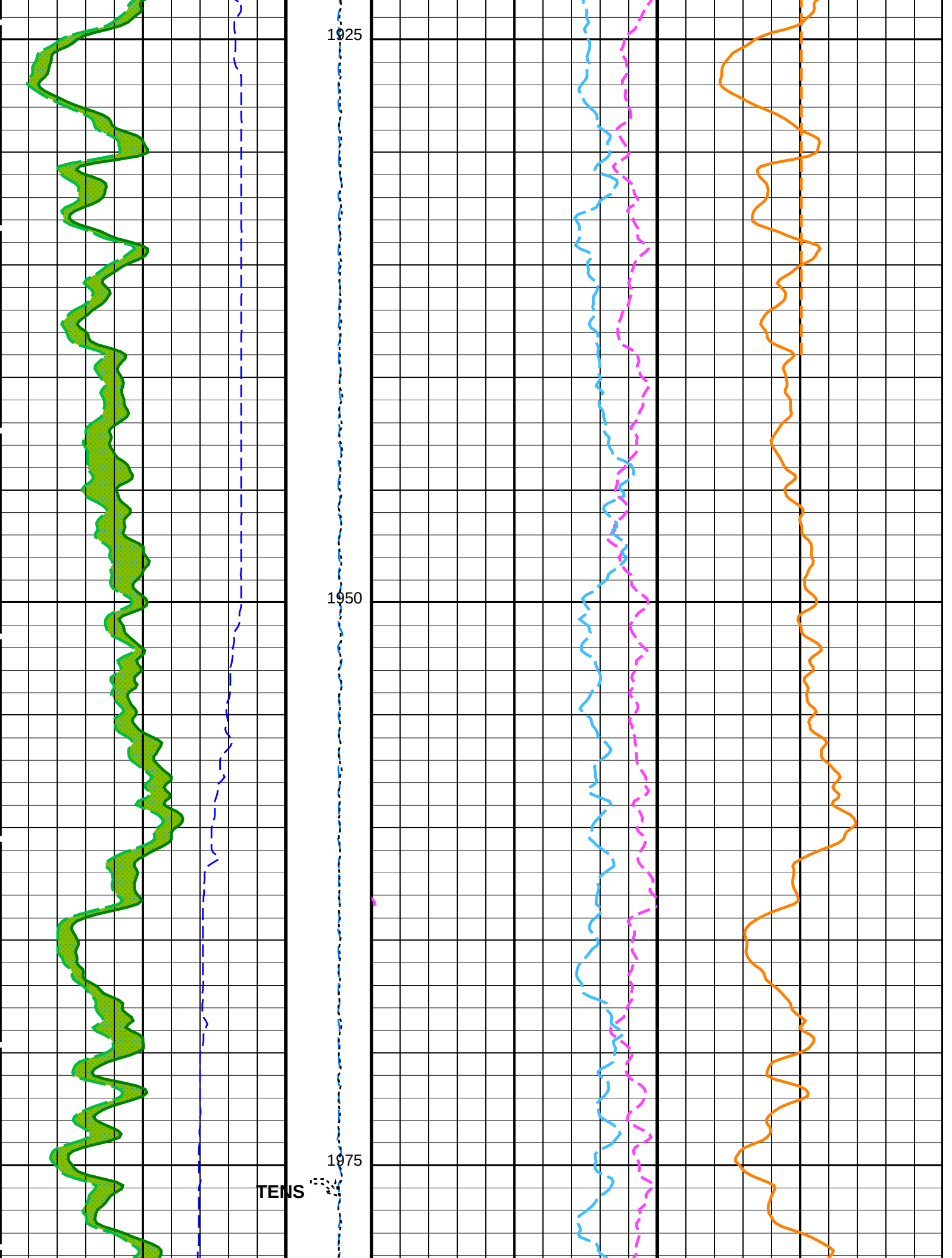
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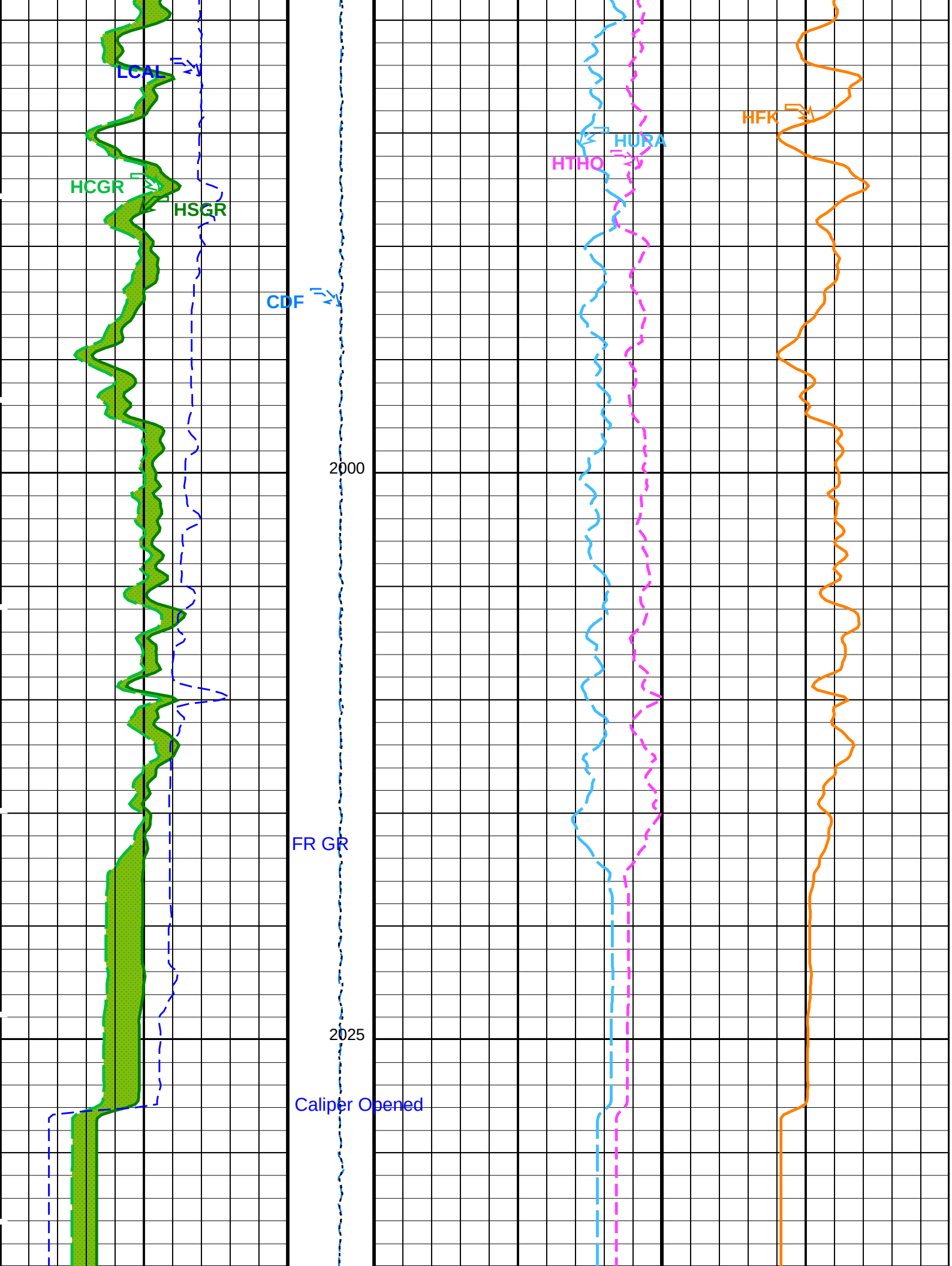
1950
1975
TENS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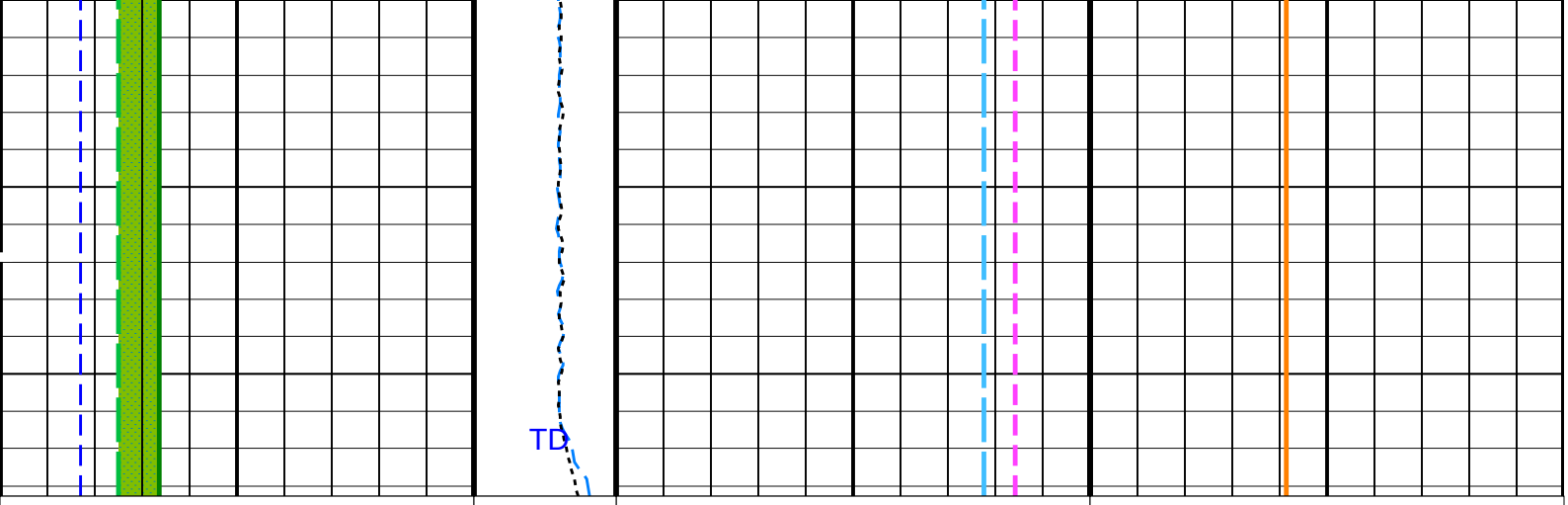
HCGR
HSGR
CDF
HTHO
HURA
HFK
2000
FR GR
2025
Caliper Opened




**PIP SUMMARY**

**Time Mark Every 60 S**

## Parameters

| DLIS Name | Description | Value | |
|---|---|---|---|
| | **HRLT−B: High Resolution Laterolog Array − B** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | LCAL | |
| | **APS−C: Accelerator−Porosity Tool** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | LCAL | |
| | **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 | |
| 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 | LCAL | |
| H1P | HNGS Detector 1 Allow/Disallow In Processing | ALLOW | |
| H2P | HNGS Detector 2 Allow/Disallow In Processing | ALLOW | |
| HABK | HNGS Borehole Potassium Running Average | −0.00036385 | |
| HALF | HNGS Alpha Filter Length | 60 | IN |
| HCRB | HNGS Apply Borehole Potassium Correction | NONE | |
| HMWM | Mud Weighting Material | NATU | |
| HNPE | HNGS Processing Enable | YES | |
| 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 | |
| TPOS | Tool Position | ECCE | |
| VBA1 | HNGS Detector 1 Variable Barite Factor Running Average | 1.00929 | |
| VBA2 | HNGS Detector 2 Variable Barite Factor Running Average | 1.01583 | |
| | **EDTC−B: Enhanced DTS Cartridge** | | |
| BHS | Borehole Status | OPEN | |
| GCSE | Generalized Caliper Selection | LCAL | |
| | **System and Miscellaneous** | | |

| | | | |
|---|---|---|---|
| BS | Bit Size | 9.875 | IN |
| DFD | Drilling Fluid Density | 1.02 | G/C3 |
| DO | Depth Offset for Playback | 0.0 | M |
| PP | Playback Processing | RECOMPUTE | |

Format: HNGSYields  Vertical Scale: 1:200  Graphics File Created: 22−Jun−2018 01:21

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

## Input DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_025LUP | FN:31 | PRODUCER | 19−Jun−2018 21:02 | 2048.3 M | 1494.3 M |

## Output DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_076PUP | FN:96 | PRODUCER | 22−Jun−2018 01:21 | | |


## Input DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_025LUP | FN:31 | PRODUCER | 19−Jun−2018 21:02 | 2048.3 M | 1494.3 M |

## Output DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_076PUP | FN:96 | PRODUCER | 22−Jun−2018 01:21 | 2048.3 M | 1494.4 M |

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |


PIP SUMMARY

Time Mark Every 60 S

Uplog 2 − Main Pass

HRLT True Resistivity (RT_HRLT)
0.2 (OHMM) 2000

HRLT Resistivity 1 (RLA1)
0.2 (OHMM) 2000

HRLT Resistivity 2 (RLA2)
0.2 (OHMM) 2000

HRLT Resistivity 3 (RLA3)
0.2 (OHMM) 2000

HLDS Bulk Density Correction (DRH)
−0.25 (G/C3) 0.25

HLDS Bulk Density (RHOM)
1 (G/C3) 3

HNGS Spectroscopy Gamma Ray (HSGR)
0 (GAPI) 100

Calibrated Downhole Force (CDF) (LBF)
5000 0

HRLT Resistivity 5 (RLA5)
0.2 (OHMM) 2000

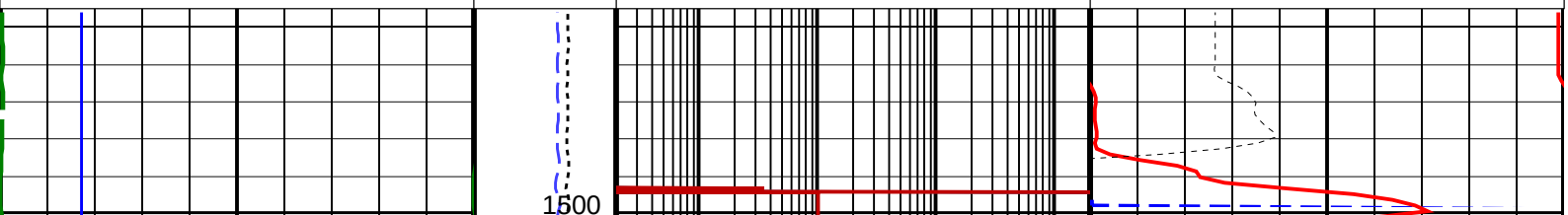
HLDS Long Spaced Photoelectric Effect (PEFL)
0 (−−−−) 10

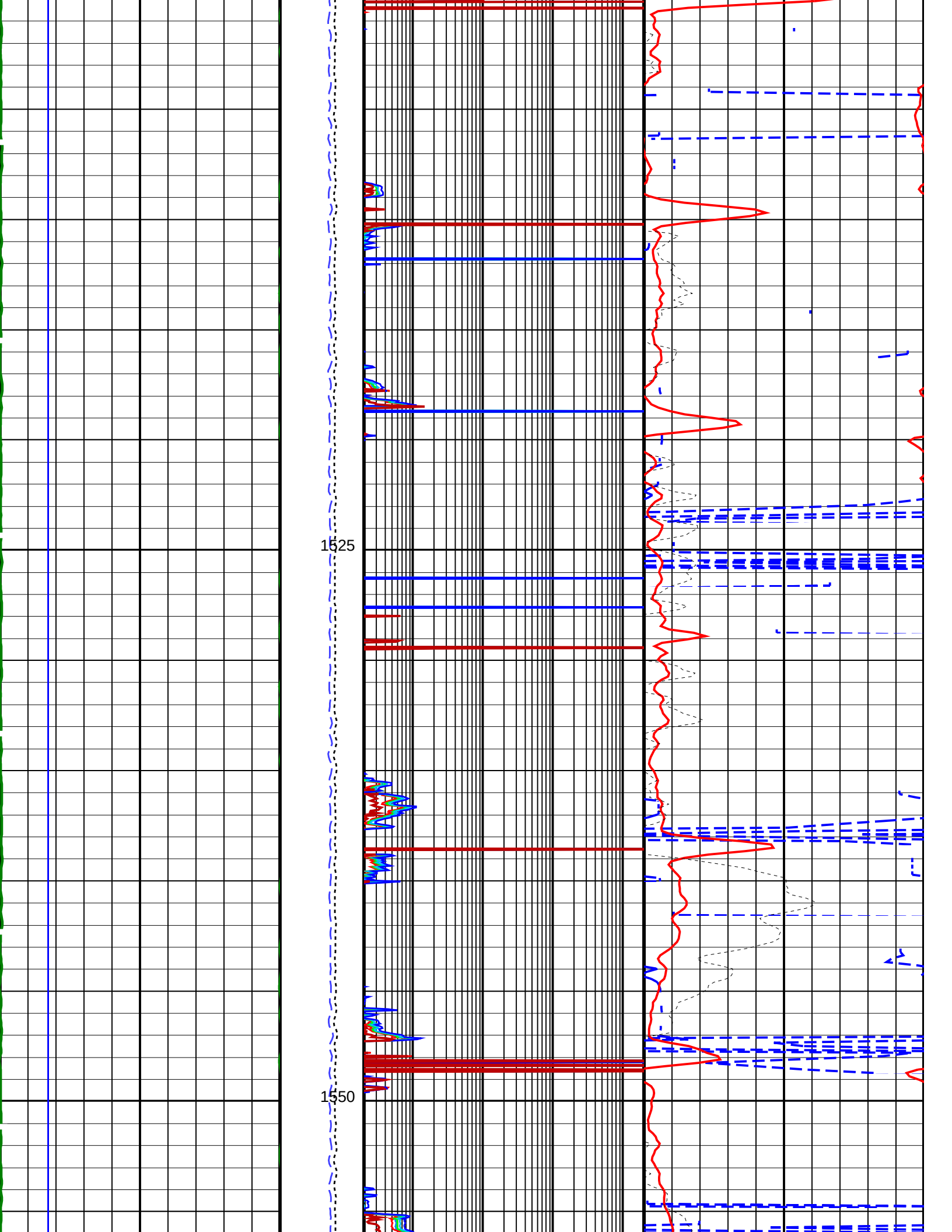
HLDS Caliper (LCAL)
0 (IN) 20

Tension (TENS) (LBF)
10000 0

HRLT Resistivity 4 (RLA4)
0.2 (OHMM) 2000

APS Near/Array Corrected Limestone Porosity (APLC)
100 (PU) 0

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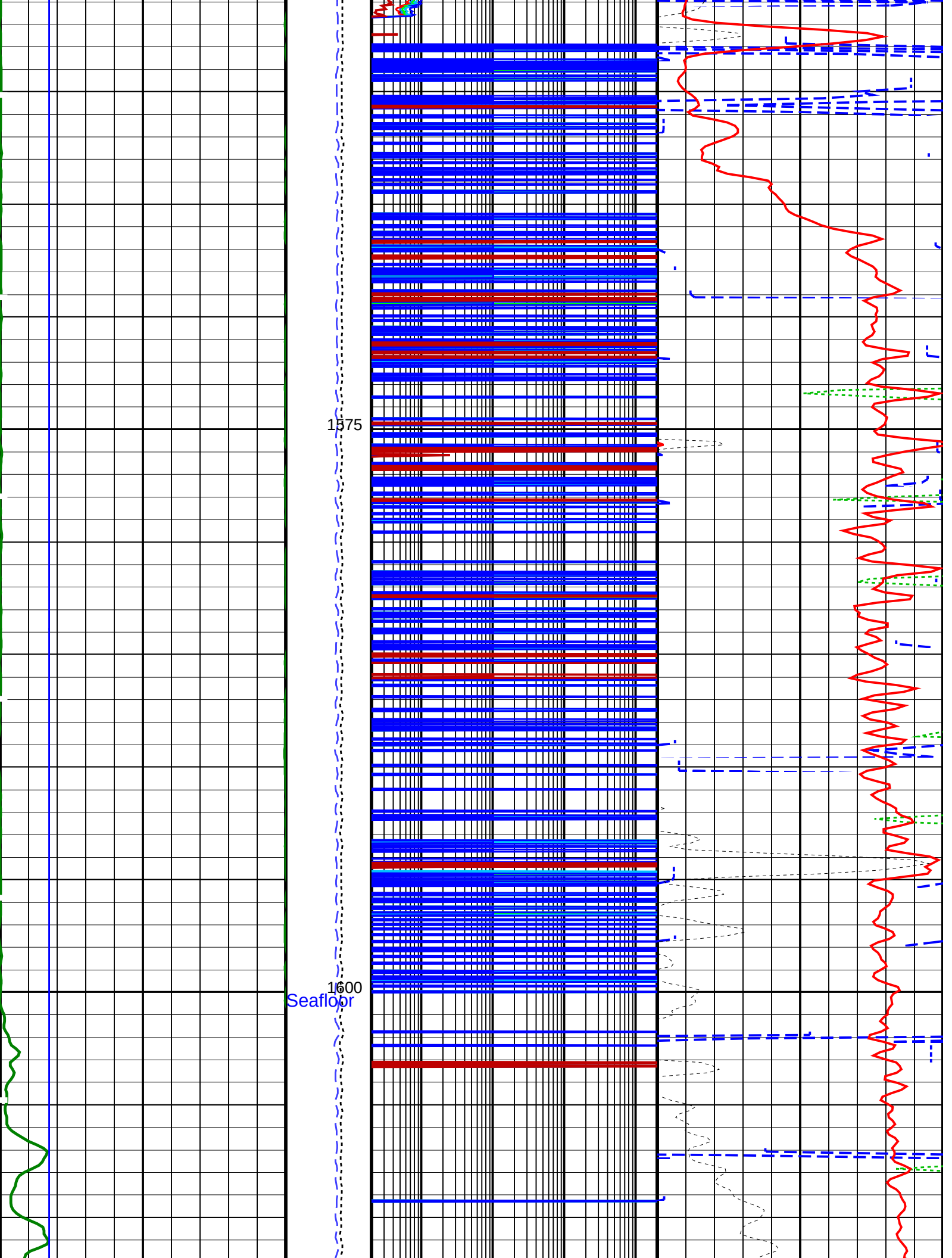
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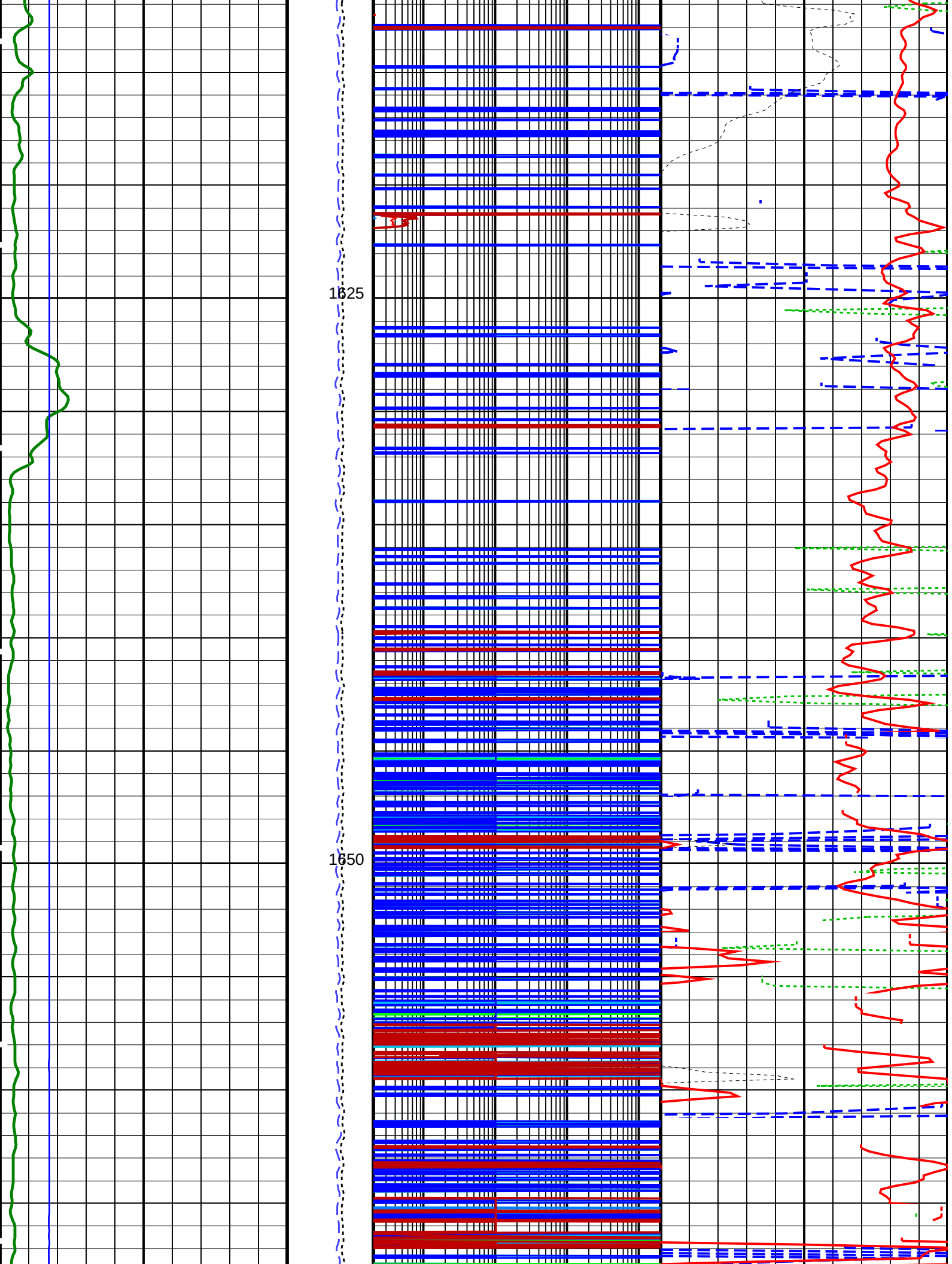
1600
Seafloor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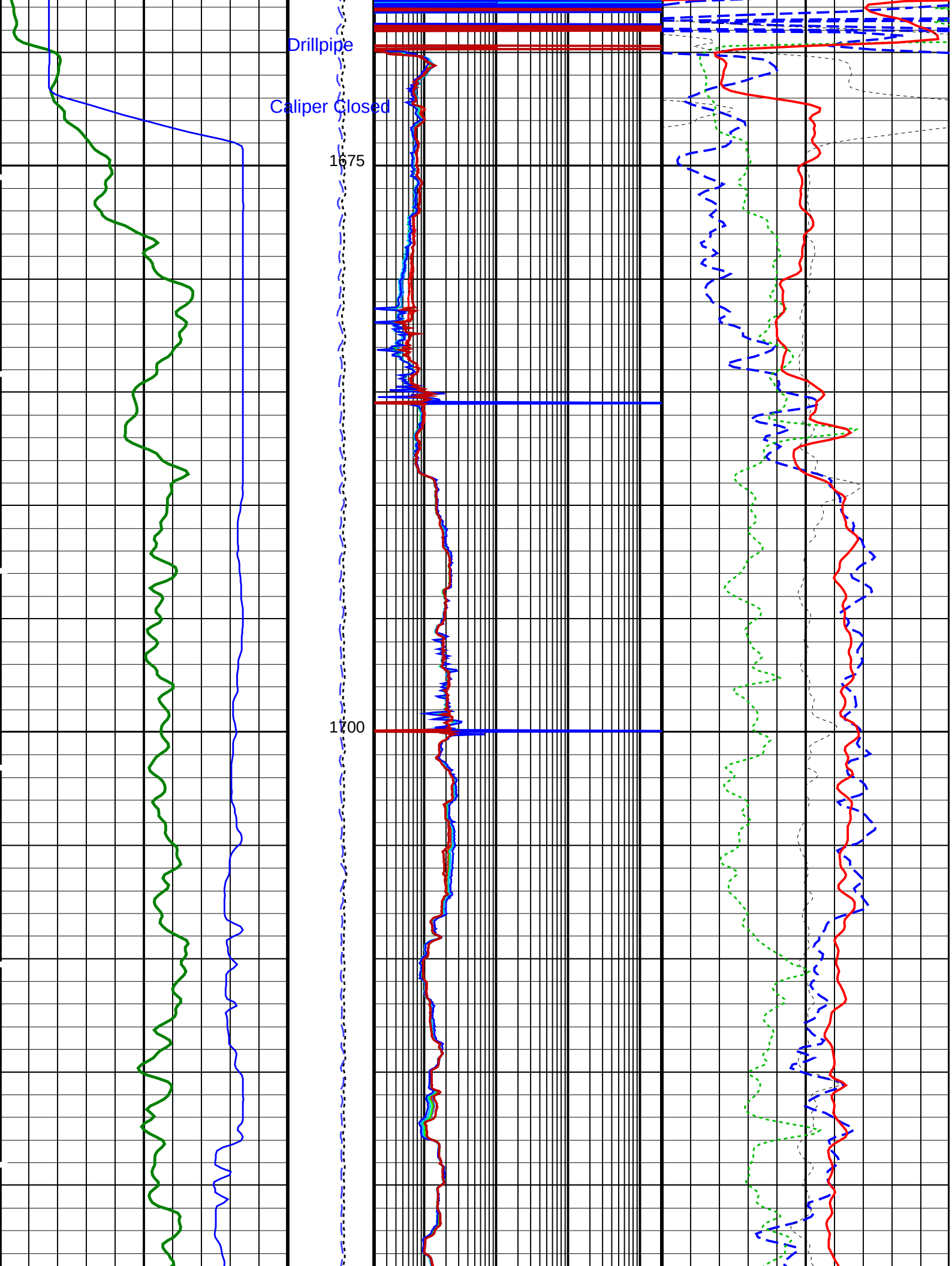
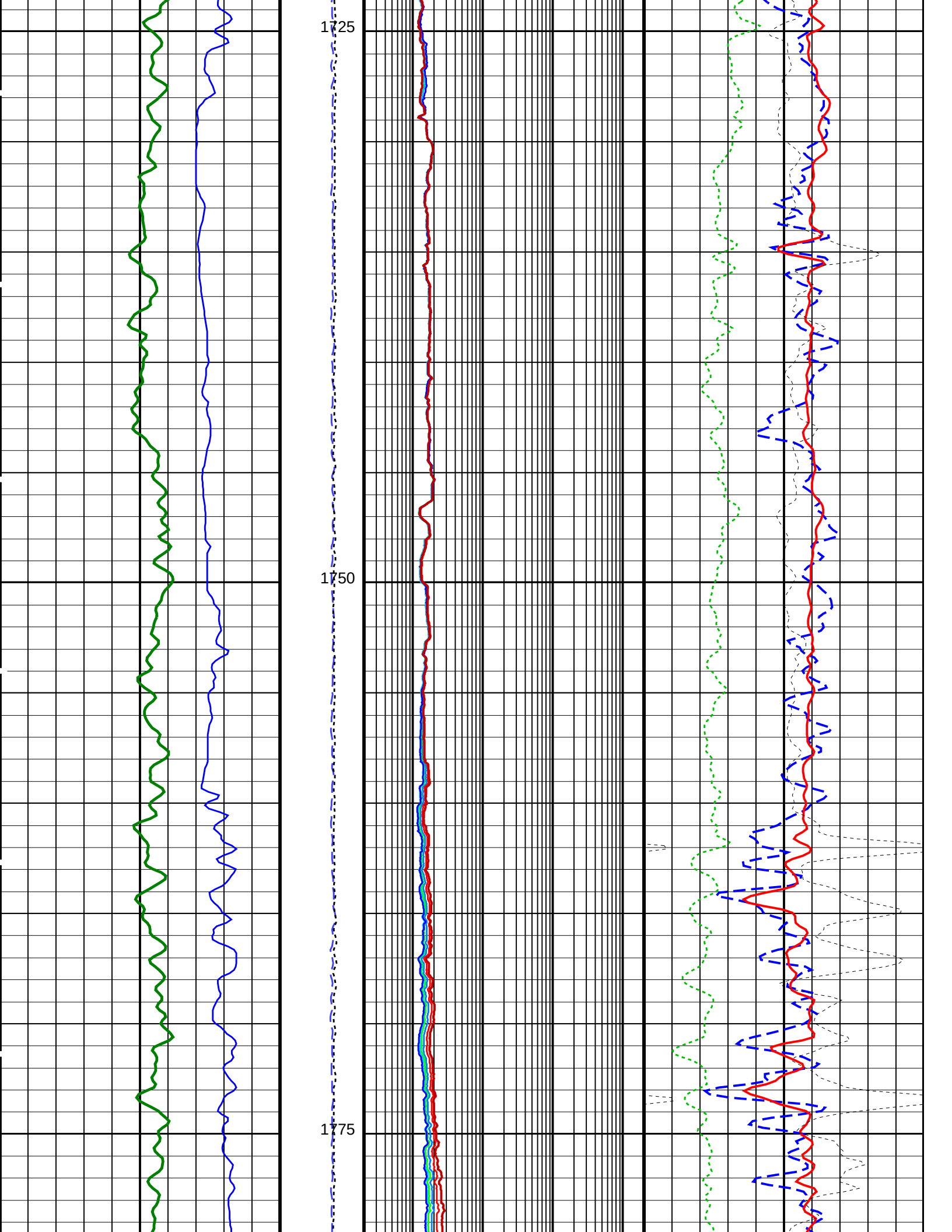

Drillpipe
Caliper Closed
1675
1700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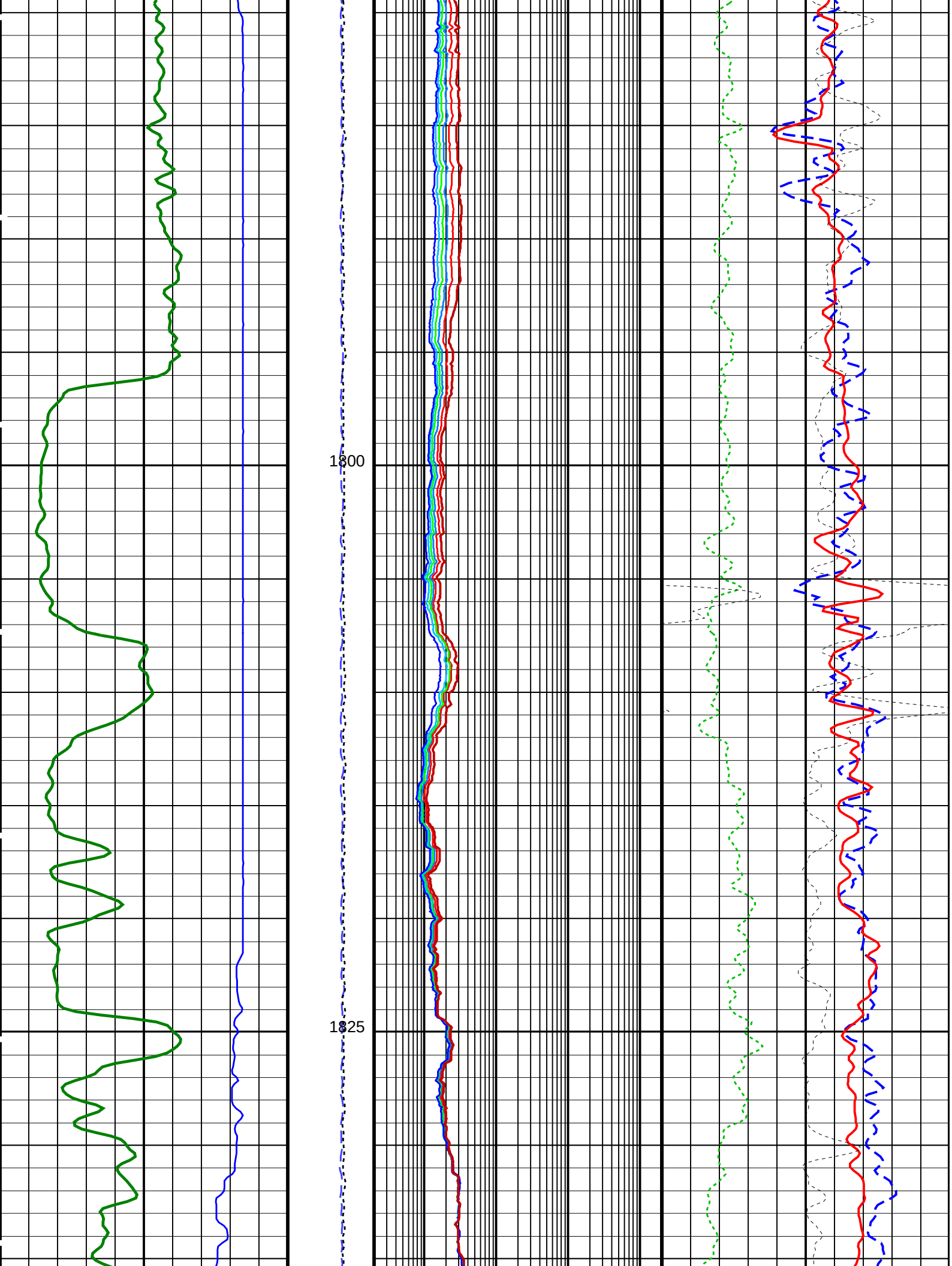
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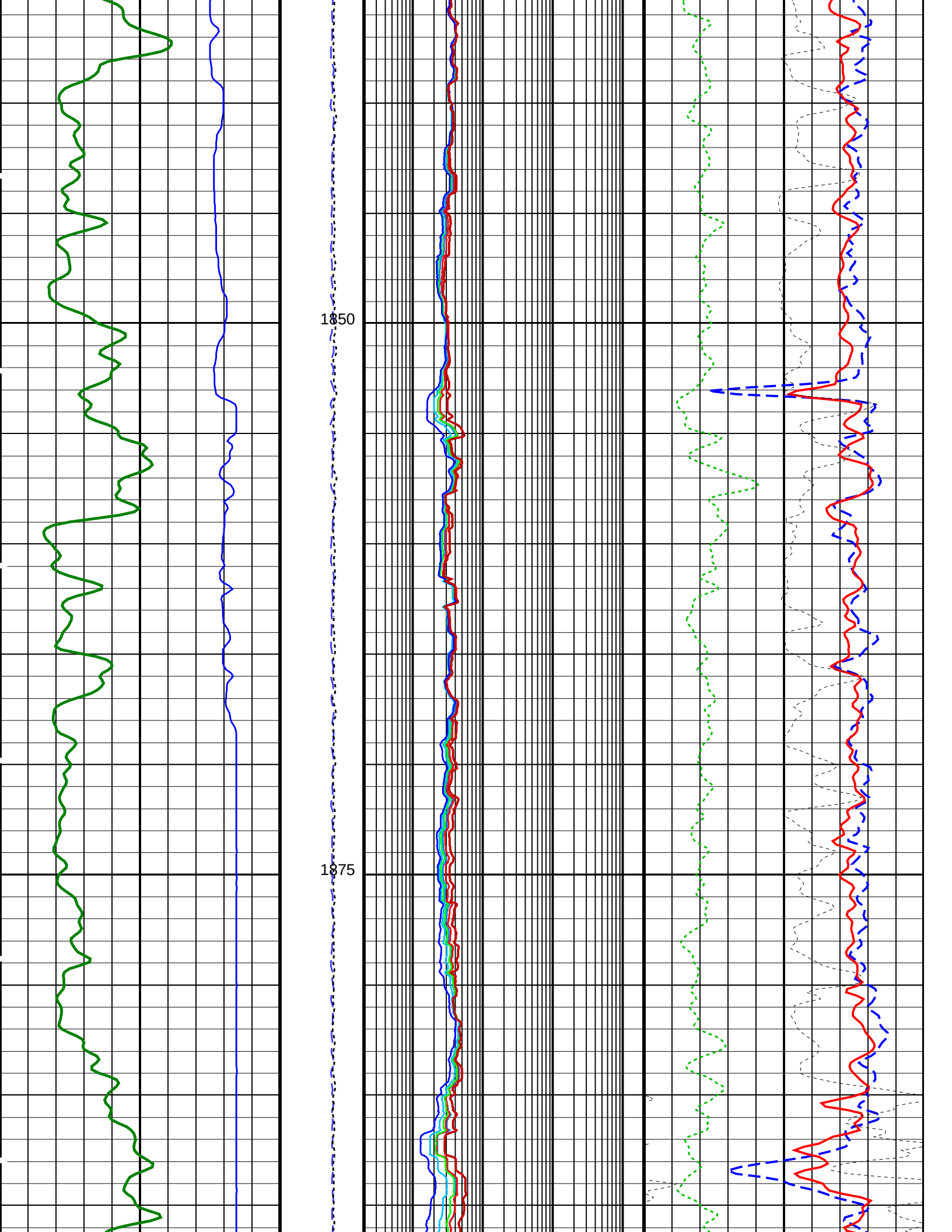
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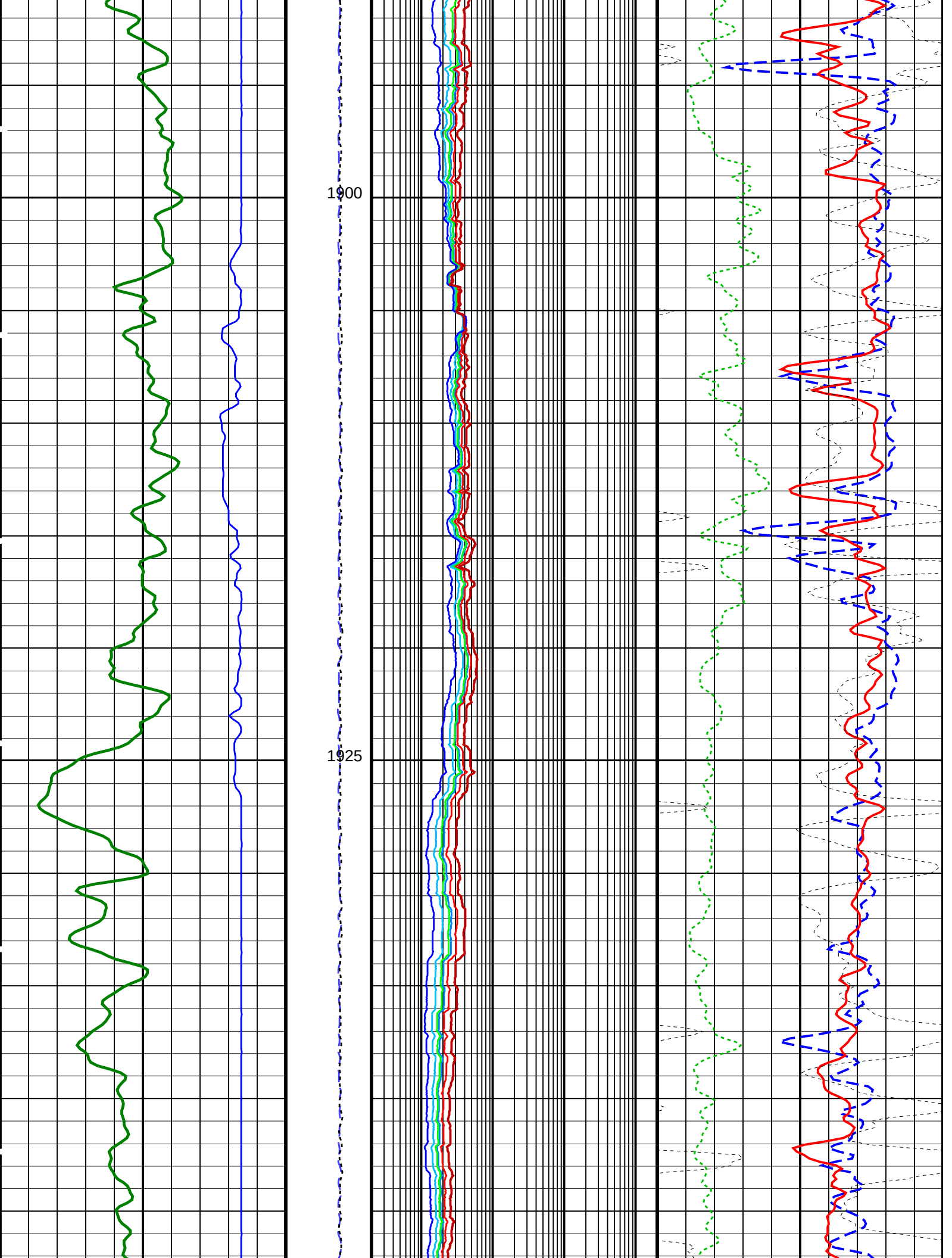
1875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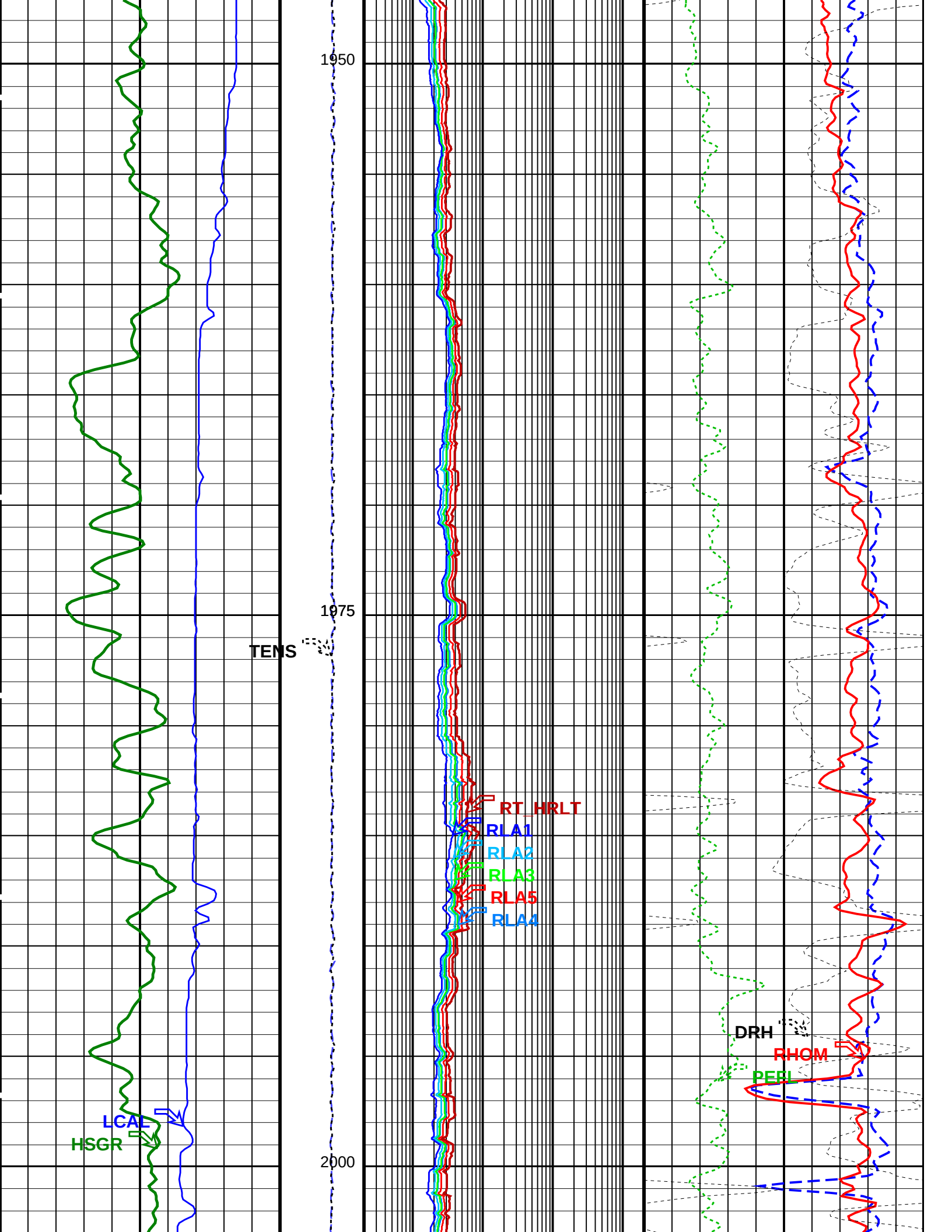
1950
1975
2000
TENS
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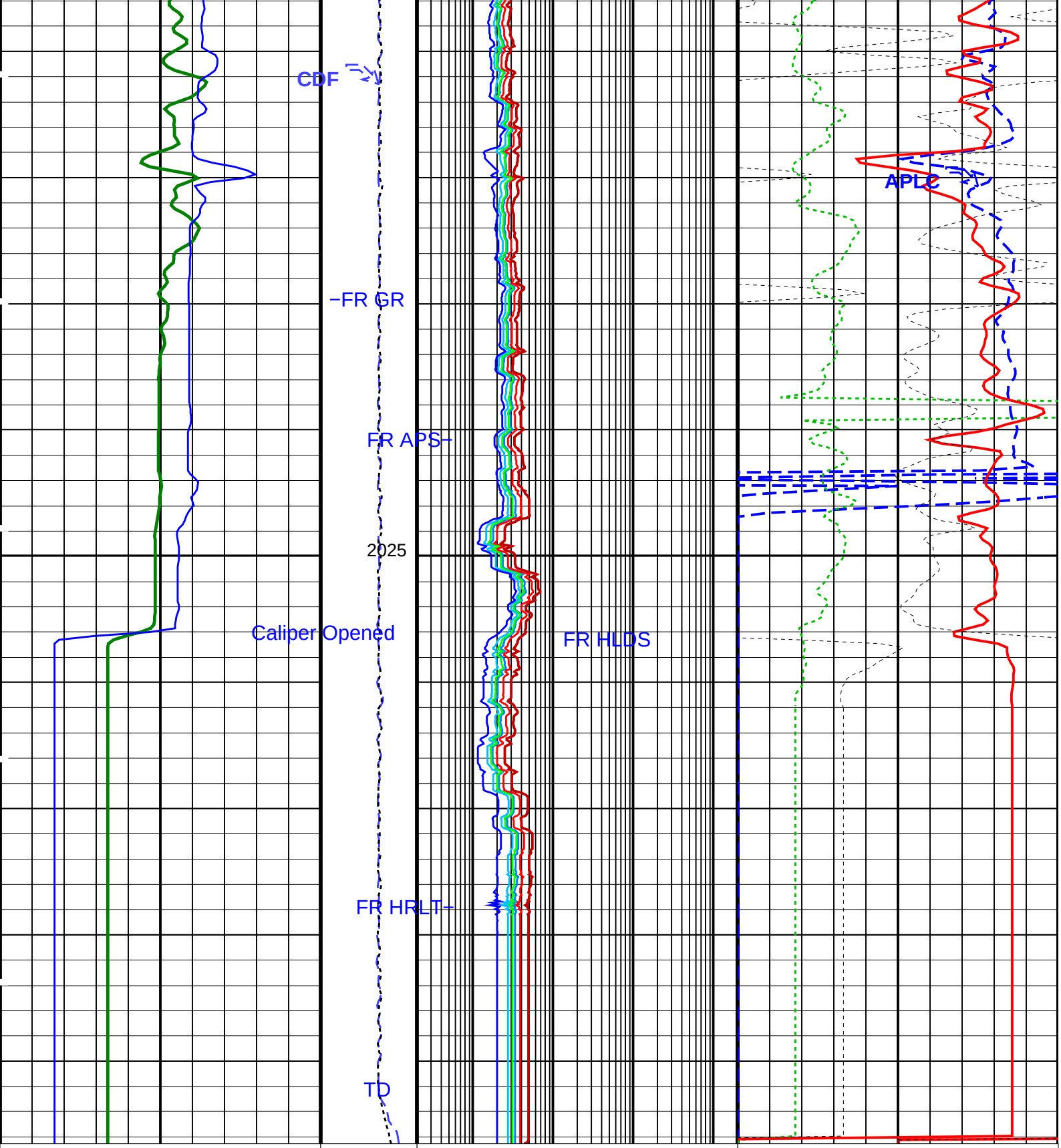
RLA1
RLA2
RLA3
RLA5
RLA4
DRH
RHOM
PEFL
LCAL
HSGR




| | | |
|---|---|---|
| HLDS Caliper (LCAL)<br>0 (IN) 20 | Tension (TENS) (LBF)<br>10000 0 | HRLT Resistivity 4 (RLA4)<br>0.2 (OHMM) 2000 |
| HNGS Spectroscopy Gamma Ray (HSGR)<br>0 (GAPI) 100 | Calibrated Downhole Force (CDF) (LBF)<br>5000 0 | HRLT Resistivity 5 (RLA5)<br>0.2 (OHMM) 2000 |
| | | HRLT Resistivity 3 (RLA3)<br>0.2 (OHMM) 2000 |

| |
|---|
| APS Near/Array Corrected Limestone Porosity (APLC)<br>100 (PU) 0 |
| HLDS Long Spaced Photoelectric Effect (PEFL)<br>0 (----) 10 |
| HLDS Bulk Density (RHOM)<br>1 (G/C3) 3 |

Uplog 2 − Main Pass

| HRLT Resistivity 2 (RLA2) | | | HLDS Bulk Density Correction (DRH) | | |
|---|---|---|---|---|---|
| 0.2 | (OHMM) | 2000 | −0.25 | (G/C3) | 0.25 |
| HRLT Resistivity 1 (RLA1) | | | | | |
| 0.2 | (OHMM) | 2000 | | | |
| HRLT True Resistivity (RT_HRLT) | | | | | |
| 0.2 | (OHMM) | 2000 | | | |

**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) | 92.5 | DEGC |
| CALSTAT | HRLTB Calibration Status | SHALLOW_DONE | |
| CALTEMP | HRLTB Calibration Temperature | 17.5276 | 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 | LCAL | |
| 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 | 5 | |
| AASD | APS Thermal and Array Detectors High Voltage Setting | 1969.88 | V |
| ADSO | APS Array Detectors Data Source Switch | Both | |
| AFSD | APS Far Detector High Voltage Setting | 2067.34 | V |
| AHCS | APS Holesize Correction Source | GCSE | |
| AHSS | APS Holesize Correction Switch | ON | |
| AMTY | APS Environmental Corrections Mud Type | WaterBaseBarite | |
| ANSD | APS Near Detector High Voltage Setting | 1736.79 | V |
| ASOS | APS Standoff Correction Switch | ON | |

| | | | |
|---|---|---|---|
| ATSS | APS Temperature−Pressure−Salinity Correction Switch | ON | |
| BHFL_APS | APS TNPH Borehole Fluid Type | WATER | |
| BHS | Borehole Status | OPEN | |
| BHT | Bottom Hole Temperature (used in calculations) | 92.5 | DEGC |
| BSCO_APS | APS TNPH Borehole Salinity Correction Option | YES | |
| 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 | LCAL | |
| 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 | YES | |
| NARC | APS Near/Array Calibration Ratio | 1.08151 | |
| NFRC | APS Near/Far Calibration Ratio | 0.940367 | |
| PTCO_APS | APS TNPH Pressure/Temperature Correction Option | YES | |
| 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) | 92.5 | 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 | LCAL | |
| 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 | −0.00036385 | |
| 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 | 1.00929 | |
| VBA2 | HNGS Detector 2 Variable Barite Factor Running Average | 1.01583 | |
| EDTC−B: Enhanced DTS Cartridge | | | |
| BHFL | Borehole Fluid Type | WATER | |
| BHS | Borehole Status | OPEN | |
| BHT | Bottom Hole Temperature (used in calculations) | 92.5 | 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 | LCAL | |
| 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 | NATU | |
| 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 | 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 | 8.500 | IN |
| CWEI | Casing Weight | 0.00 | LB/F |
| DFD | Drilling Fluid Density | 1.02 | G/C3 |
| DO | Depth Offset for Playback | 0.0 | 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 | RECOMPUTE | |
| RMFS | Resistivity of Mud Filtrate Sample | −50000.0000 | OHMM |
| RW | Resistivity of Connate Water | 1.0000 | OHMM |
| TD | Total Depth | 2059.1 | M |
| TDD | Total Depth − Driller | 2059.10 | M |
| TDL | Total Depth − Logger | 2046.00 | M |
| TWS | Temperature of Connate Water Sample | 37.78 | DEGC |

**Format: TripleCombo** **Vertical Scale: 1:200** **Graphics File Created: 22−Jun−2018 01:21**

## OP System Version: 19C0−187

| | | | |
|---|---|---|---|
| HRLT−B | 19C0−187 | HLDS | 19C0−187 |
| HNCC−B | 19C0−187 | APS−C | 19C0−187 |
| HNGS−BA | 19C0−187 | EDTC−B | SKK−5169−EDTCB |

## Input DLIS Files

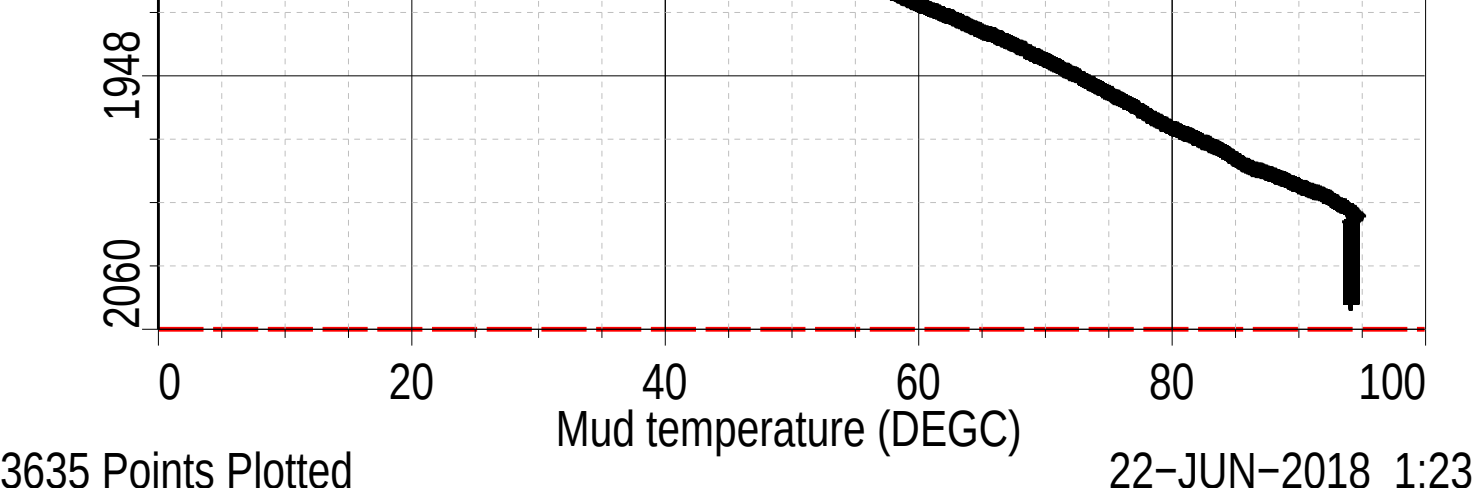
| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_025LUP | FN:31 | PRODUCER | 19−Jun−2018 21:02 | 2048.3 M | 1494.3 M |

## Output DLIS Files

| | | | | |
|---|---|---|---|---|
| DEFAULT | HRLA_LDL_APS_NGS_076PUP | FN:96 | PRODUCER | 22−Jun−2018 01:21 |

Index: 2048.3 − 1494.4 M

Uplog 2 − Main Log




Calibration and Check Summary

| Measurement | Nominal | Master | Before | After | Change | Limit | Units |
|---|---|---|---|---|---|---|---|
| High Resolution Laterolog Array − B Wellsite Calibration − HRLT M01 | | | | | | | |
| Before: 19−Jun−2018 17:48 After: 19−Jun−2018 23:10 | | | | | | | |
| HRLT M0−M1 Voltage Plus − 0 | 0 | N/A | −318.9 | −318.3 | 0.5627 | 9.681 | UV |
| HRLT M0−M1 Voltage Plus − 1 | 0 | N/A | −331.5 | −329.1 | 2.458 | 9.681 | UV |
| HRLT M0−M1 Voltage Plus − 2 | 0 | N/A | −339.0 | −337.1 | 1.971 | 9.681 | UV |
| HRLT M0−M1 Voltage Plus − 3 | 0 | N/A | −329.3 | −328.0 | 1.303 | 9.681 | UV |
| HRLT M0−M1 Voltage Plus − 4 | 0 | N/A | −320.1 | −319.2 | 0.8621 | 9.681 | UV |
| HRLT M0−M1 Voltage Plus − 5 | 0 | N/A | −321.9 | −321.3 | 0.5831 | 9.681 | UV |
| HRLT M0−M1 Voltage Plus − 6 | 0 | N/A | 321.6 | 320.2 | −1.389 | 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: 19−Jun−2018 17:48 After: 19−Jun−2018 23:10 | | | | | | | |
| HRLT M1−M2 Voltage Plus − 0 | 0 | N/A | 1742 | 1738 | −3.486 | 53.42 | UV |
| HRLT M1−M2 Voltage Plus − 1 | 0 | N/A | 1818 | 1804 | −13.79 | 53.42 | UV |
| HRLT M1−M2 Voltage Plus − 2 | 0 | N/A | 1852 | 1840 | −11.27 | 53.42 | UV |
| HRLT M1−M2 Voltage Plus − 3 | 0 | N/A | 1797 | 1790 | −7.371 | 53.42 | UV |
| HRLT M1−M2 Voltage Plus − 4 | 0 | N/A | 1745 | 1741 | −4.644 | 53.42 | UV |
| HRLT M1−M2 Voltage Plus − 5 | 0 | N/A | 1756 | 1753 | −3.162 | 53.42 | UV |
| HRLT M1−M2 Voltage Plus − 6 | 0 | N/A | −1771 | −1764 | 7.957 | 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: 19−Jun−2018 17:48 After: 19−Jun−2018 23:10 | | | | | | | |
| HRLT M2−M3 Voltage Plus − 0 | 0 | N/A | 1734 | 1730 | −3.963 | 53.42 | UV |
| HRLT M2−M3 Voltage Plus − 1 | 0 | N/A | 1820 | 1806 | −13.89 | 53.42 | UV |
| HRLT M2−M3 Voltage Plus − 2 | 0 | N/A | 1856 | 1844 | −11.28 | 53.42 | UV |
| HRLT M2−M3 Voltage Plus − 3 | 0 | N/A | 1806 | 1797 | −8.754 | 53.42 | UV |
| HRLT M2−M3 Voltage Plus − 4 | 0 | N/A | 1748 | 1742 | −5.876 | 53.42 | UV |
| HRLT M2−M3 Voltage Plus − 5 | 0 | N/A | 1759 | 1755 | −3.476 | 53.42 | UV |
| HRLT M2−M3 Voltage Plus − 6 | 0 | N/A | −1763 | −1754 | 8.897 | 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: 19−Jun−2018 17:48 After: 19−Jun−2018 23:10 | | | | | | | |
| HRLT A3−A4 Voltage Plus − 0 | 0 | N/A | 68680 | 68570 | −109.8 | 2100 | UV |
| HRLT A3−A4 Voltage Plus − 1 | 0 | N/A | 71940 | 71410 | −528.5 | 2100 | UV |
| HRLT A3−A4 Voltage Plus − 2 | 0 | N/A | 73660 | 73220 | −434.6 | 2100 | UV |
| HRLT A3−A4 Voltage Plus − 3 | 0 | N/A | 71900 | 71620 | −280.8 | 2100 | UV |
| HRLT A3−A4 Voltage Plus − 4 | 0 | N/A | 69550 | 69380 | −167.1 | 2100 | UV |
| HRLT A3−A4 Voltage Plus − 5 | 0 | N/A | 70040 | 69920 | −124.3 | 2100 | UV |
| HRLT A3−A4 Voltage Plus − 6 | 0 | N/A | −68680 | −68380 | 305.1 | 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: 19−Jun−2018 17:48 After: 19−Jun−2018 23:10 | | | | | | | |
| HRLT A4−A5 Voltage Plus − 0 | 0 | N/A | 68780 | 68640 | −138.0 | 2100 | UV |
| HRLT A4−A5 Voltage Plus − 1 | 0 | N/A | 72150 | 71610 | −531.2 | 2100 | UV |
| HRLT A4−A5 Voltage Plus − 2 | 0 | N/A | 73840 | 73400 | −443.6 | 2100 | UV |
| HRLT A4−A5 Voltage Plus − 3 | 0 | N/A | 72040 | 71760 | −280.8 | 2100 | UV |
| HRLT A4−A5 Voltage Plus − 4 | 0 | N/A | 69670 | 69490 | −183.8 | 2100 | UV |
| HRLT A4−A5 Voltage Plus − 5 | 0 | N/A | 70140 | 70000 | −135.3 | 2100 | UV |
| HRLT A4−A5 Voltage Plus − 6 | 0 | N/A | −68890 | −68580 | 306.8 | 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: 19−Jun−2018 17:48 After: 19−Jun−2018 23:10

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| HRLT A5−A6 Voltage Plus − 0 | 0 | N/A | 68630 | 68490 | −140.5 | 2100 | UV |
| HRLT A5−A6 Voltage Plus − 1 | 0 | N/A | 72000 | 71450 | −551.4 | 2100 | UV |
| HRLT A5−A6 Voltage Plus − 2 | 0 | N/A | 73700 | 73260 | −438.7 | 2100 | UV |
| HRLT A5−A6 Voltage Plus − 3 | 0 | N/A | 71900 | 71620 | −278.6 | 2100 | UV |
| HRLT A5−A6 Voltage Plus − 4 | 0 | N/A | 69540 | 69350 | −186.5 | 2100 | UV |
| HRLT A5−A6 Voltage Plus − 5 | 0 | N/A | 70000 | 69890 | −104.2 | 2100 | UV |
| HRLT A5−A6 Voltage Plus − 6 | 0 | N/A | −68730 | −68430 | 299.9 | 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: 19−Jun−2018 17:48 After: 19−Jun−2018 23:10

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HRLT Torpedo−M0 Voltage − 0 | 0 | N/A | −68140 | −68010 | 128.8 | 2100 | UV |
| HRLT Torpedo−M0 Voltage − 1 | 0 | N/A | −71790 | −71250 | 534.6 | 2100 | UV |
| HRLT Torpedo−M0 Voltage − 2 | 0 | N/A | −73520 | −73090 | 434.8 | 2100 | UV |
| HRLT Torpedo−M0 Voltage − 3 | 0 | N/A | −71790 | −71520 | 272.7 | 2100 | UV |
| HRLT Torpedo−M0 Voltage − 4 | 0 | N/A | −69480 | −69290 | 184.5 | 2100 | UV |
| HRLT Torpedo−M0 Voltage − 5 | 0 | N/A | −69950 | −69830 | 120.5 | 2100 | UV |
| HRLT Torpedo−M0 Voltage − 6 | 0 | N/A | 68480 | 68190 | −283.7 | 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: 19−Jun−2018 17:48 After: 19−Jun−2018 23:10

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HRLT Bridle#9−M0 Voltage − 0 | 0 | N/A | −68190 | −68060 | 132.4 | 2100 | UV |
| HRLT Bridle#9−M0 Voltage − 1 | 0 | N/A | −71890 | −71360 | 534.6 | 2100 | UV |
| HRLT Bridle#9−M0 Voltage − 2 | 0 | N/A | −73620 | −73200 | 422.3 | 2100 | UV |
| HRLT Bridle#9−M0 Voltage − 3 | 0 | N/A | −71880 | −71600 | 281.4 | 2100 | UV |
| HRLT Bridle#9−M0 Voltage − 4 | 0 | N/A | −69530 | −69350 | 175.5 | 2100 | UV |
| HRLT Bridle#9−M0 Voltage − 5 | 0 | N/A | −69990 | −69870 | 118.1 | 2100 | UV |
| HRLT Bridle#9−M0 Voltage − 6 | 0 | N/A | 68570 | 68290 | −277.9 | 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: 19−Jun−2018 17:48 After: 19−Jun−2018 23:10

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HRLT Source Current Plus − 0 | 0 | N/A | 284.4 | 284.0 | −0.4357 | 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: 19−Jun−2018 17:48 After: 19−Jun−2018 23:10

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HRLT Vertical Voltage Pl − 0 | 0 | N/A | −320.5 | −320.0 | 0.4918 | 9.681 | UV |
| HRLT Vertical Voltage Pl − 1 | 0 | N/A | −326.1 | −323.6 | 2.454 | 9.681 | UV |
| HRLT Vertical Voltage Pl − 2 | 0 | N/A | −332.1 | −330.3 | 1.829 | 9.681 | UV |
| HRLT Vertical Voltage Pl − 3 | 0 | N/A | −320.9 | −319.7 | 1.209 | 9.681 | UV |
| HRLT Vertical Voltage Pl − 4 | 0 | N/A | −309.0 | −308.2 | 0.7769 | 9.681 | UV |
| HRLT Vertical Voltage Pl − 5 | 0 | N/A | −325.7 | −325.1 | 0.5093 | 9.681 | UV |
| HRLT Vertical Voltage Pl − 6 | 0 | N/A | 329.1 | 327.6 | −1.501 | 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: 16−Jun−2018 1:58 Before: 16−Jun−2018 2:48 After: 16−Jun−2018 4:12

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SS Cs Resolution Bkg | 9.000 | 7.650 | 7.686 | 7.644 | −0.04242 | 1.800 | % |
| LS Cs Resolution Bkg | 9.000 | 8.039 | 7.968 | 7.994 | 0.02644 | 1.800 | % |
| LSW1 Background | 100.0 | 76.57 | 75.11 | 75.81 | 0.7026 | 3.000 | CPS |
| LSW2 Background | 100.0 | 69.87 | 68.78 | 67.74 | −1.044 | 3.000 | CPS |
| LSW3 Background | 200.0 | 155.2 | 157.1 | 155.9 | −1.279 | 6.000 | CPS |
| LSW4 Background | 250.0 | 193.9 | 193.4 | 191.7 | −1.709 | 7.500 | CPS |
| LSW5 Background | 600.0 | 454.5 | 451.7 | 452.2 | 0.5784 | 18.00 | CPS |
| SSW1 Background | 100.0 | 73.68 | 73.20 | 73.26 | 0.06467 | 3.000 | CPS |
| SSW2 Background | 200.0 | 126.9 | 126.4 | 126.6 | 0.1933 | 6.000 | CPS |
| SSW3 Background | 500.0 | 358.2 | 353.1 | 355.7 | 2.641 | 15.00 | CPS |
| SSW4 Background | 270.0 | 189.8 | 187.9 | 190.0 | 2.049 | 8.100 | CPS |
| SSW5 Background | 200.0 | 136.5 | 137.4 | 136.0 | −1.316 | 6.000 | CPS |

Hostile Litho−Density Sonde Wellsite Calibration − Aluminum Measurement
Master: 16−Jun−2018 2:27

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| LSW1 Aluminum | 600.0 | 490.2 | N/A | N/A | N/A | N/A | CPS |
| LSW2 Aluminum | 900.0 | 717.2 | N/A | N/A | N/A | N/A | CPS |
| LSW3 Aluminum | 1100 | 877.4 | N/A | N/A | N/A | N/A | CPS |
| LSW4 Aluminum | 580.0 | 442.3 | N/A | N/A | N/A | N/A | CPS |
| LSW5 Aluminum | 570.0 | 406.1 | N/A | N/A | N/A | N/A | CPS |
| SSW1 Aluminum | 2800 | 2380 | N/A | N/A | N/A | N/A | CPS |
| SSW2 Aluminum | 8000 | 6487 | N/A | N/A | N/A | N/A | CPS |
| SSW3 Aluminum | 11600 | 9004 | N/A | N/A | N/A | N/A | CPS |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SSW4 Aluminum | 5000 | 3681 | N/A | N/A | N/A | N/A | CPS |
| SSW5 Aluminum | 660.0 | 444.4 | N/A | N/A | N/A | N/A | CPS |

Hostile Litho−Density Sonde Wellsite Calibration − Lithology Measurement
Master: 16−Jun−2018 2:20

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| LSW1 Iron | 400.0 | 334.7 | N/A | N/A | N/A | N/A | CPS |
| LSW2 Iron | 730.0 | 579.2 | N/A | N/A | N/A | N/A | CPS |
| LSW3 Iron | 1000 | 776.3 | N/A | N/A | N/A | N/A | CPS |
| LSW4 Iron | 520.0 | 403.5 | N/A | N/A | N/A | N/A | CPS |
| LSW5 Iron | 470.0 | 368.2 | N/A | N/A | N/A | N/A | CPS |
| SSW1 Iron | 2100 | 1725 | N/A | N/A | N/A | N/A | CPS |
| SSW2 Iron | 6800 | 5387 | N/A | N/A | N/A | N/A | CPS |
| SSW3 Iron | 10800 | 8188 | N/A | N/A | N/A | N/A | CPS |
| SSW4 Iron | 4600 | 3360 | N/A | N/A | N/A | N/A | CPS |
| SSW5 Iron | 580.0 | 387.1 | N/A | N/A | N/A | N/A | CPS |

Hostile Litho−Density Sonde Wellsite Calibration − Caliper Calibration
Before: 16−Jun−2018 3:15

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HLDS Caliper Small Ring | 12.00 | N/A | 16.20 | N/A | N/A | N/A | IN |
| HLDS Caliper Large Ring | 15.19 | N/A | 20.33 | N/A | N/A | N/A | IN |

Accelerator−Porosity Tool Wellsite Calibration − Detector Background
Master: 3−May−2018 11:30 Before: 19−Jun−2018 17:52 After: 19−Jun−2018 23:14

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Near Det Bkg Cntrate | 30.00 | 24.28 | 26.50 | 25.26 | −1.246 | N/A | CPS |
| Far Det Bkg Cntrate | 30.00 | 24.56 | 25.92 | 24.01 | −1.911 | N/A | CPS |
| Array−1 Det Bkg Cntrate | 30.00 | 24.71 | 24.13 | 24.06 | −0.06644 | N/A | CPS |
| Array−2 Det Bkg Cntrate | 30.00 | 23.58 | 23.91 | 24.94 | 1.030 | N/A | CPS |
| Array Therm Det Bkg Cntrate | 30.00 | 25.43 | 25.82 | 24.75 | −1.064 | N/A | CPS |

Accelerator−Porosity Tool Wellsite Calibration − Calibration Ratios
Master: 3−May−2018 11:30

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Near/Far Calibration Ratio | 0.9250 | 0.9404 | N/A | N/A | N/A | N/A | |
| Near/Array Calibration Ratio | 1.030 | 1.082 | N/A | N/A | N/A | N/A | |
| Near/Array Cal Ratio Up/Down | 1.000 | 1.013 | N/A | N/A | N/A | N/A | |

Accelerator−Porosity Tool Wellsite Calibration − Tank Check
Master: 3−May−2018 11:30

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Array−1 Standoff Porosity | 11.75 | 10.71 | N/A | N/A | N/A | N/A | PU |
| Array−2 Standoff Porosity | 11.75 | 10.36 | N/A | N/A | N/A | N/A | PU |
| Average Slowing Down Time | 6.000 | 6.017 | N/A | N/A | N/A | N/A | US |
| Array−1 SDT Ratio Up/Down | 1.000 | 0.9690 | N/A | N/A | N/A | N/A | |
| Array−2 SDT Ratio Up/Down | 1.000 | 0.9668 | N/A | N/A | N/A | N/A | |
| Sigma Formation | 27.50 | 31.98 | N/A | N/A | N/A | N/A | CU |

Accelerator−Porosity Tool Wellsite Calibration − CCR7 signal boxes
Master: 3−May−2018 10:49

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Near Detector Plateau Setting | 1650 | 1737 | N/A | N/A | N/A | N/A | V |
| Far Detector Plateau Setting | 2000 | 2067 | N/A | N/A | N/A | N/A | V |
| Array Detector Plateau Setting | 2000 | 1970 | N/A | N/A | N/A | N/A | V |

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Detector 1 Check
Master: 16−Jun−2018 3:35 Before: 16−Jun−2018 3:44 After: 16−Jun−2018 4:13

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Na 511 Peak Loc | 40.00 | 39.71 | 39.58 | 39.57 | −0.01346 | 1.000 | |
| Na 511 Peak Res | 15.50 | 14.71 | 16.29 | 14.71 | −1.576 | 2.000 | % |
| High Voltage | 1150 | 1177 | 1176 | 1176 | 0.03149 | N/A | V |
| Na 1785 Peak Loc | 142.6 | 142.5 | 142.1 | 141.9 | −0.1169 | 7.000 | |
| Na 1785 Peak Res | 8.500 | 7.989 | 8.568 | 9.084 | 0.5160 | 2.000 | % |
| Temperature | 15.50 | 21.47 | 21.42 | 21.42 | −0.004868 | N/A | DEGC |
| Na Count Rate | 45.00 | 22.99 | 22.87 | 23.36 | 0.4863 | 8.000 | CPS |

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Detector 2 Check
Master: 16−Jun−2018 3:35 Before: 16−Jun−2018 3:44 After: 16−Jun−2018 4:13

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Na 511 Peak Loc | 40.00 | 39.62 | 39.50 | 39.66 | 0.1618 | 1.000 | |
| Na 511 Peak Res | 15.50 | 16.34 | 15.67 | 16.73 | 1.060 | 2.000 | % |
| High Voltage | 1150 | 1096 | 1096 | 1095 | −0.4420 | N/A | V |
| Na 1785 Peak Loc | 142.6 | 142.2 | 141.1 | 141.6 | 0.4193 | 7.000 | |
| Na 1785 Peak Res | 8.500 | 8.174 | 8.852 | 9.429 | 0.5773 | 2.000 | % |
| Temperature | 15.50 | 22.01 | 22.09 | 22.22 | 0.1314 | N/A | DEGC |
| Na Count Rate | 45.00 | 22.76 | 22.74 | 23.10 | 0.3623 | 8.000 | CPS |

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Ratio Of Detector 1 To Detector 2
Master: 16−Jun−2018 3:35 Before: 16−Jun−2018 3:44 After: 16−Jun−2018 4:13

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Coincidence Count Rate Ratio | 1.000 | 1.012 | 1.007 | 1.014 | 0.006844 | 0.05000 | |

Hostile Natural Gamma Ray Sonde Master Calibration − Detector 1 Calibration
Master: 16−Jun−2018 3:30

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Na 511 Peak Set Point | 40.00 | 41.00 | −− | −− | −− | −− | |
| Th Peak Loc | 209.6 | 210.6 | −− | −− | −− | −− | |
| Th Peak Res | 7.000 | 6.860 | −− | −− | −− | −− | % |
| Background Count Rate | 142.5 | 25.30 | −− | −− | −− | −− | CPS |
| Gain Ratio | 1.000 | 1.009 | −− | −− | −− | −− | |

Hostile Natural Gamma Ray Sonde Master Calibration − Detector 2 Calibration
Master: 16−Jun−2018 3:30

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Na 511 Peak Set Point | 40.00 | 41.00 | −− | −− | −− | −− | |
| Th Peak Loc | 209.6 | 208.0 | −− | −− | −− | −− | |
| Th Peak Res | 7.000 | 7.211 | −− | −− | −− | −− | % |
| Background Count Rate | 142.5 | 23.21 | −− | −− | −− | −− | CPS |
| Gain Ratio | 1.000 | 0.9988 | −− | −− | −− | −− | |

Enhanced DTS Cartridge Wellsite Calibration − EDTC Accelerometer Calibration
Before: 19−Jun−2018 17:47

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EDTC Z−Axis Acceleration | 9.810 | N/A | 9.766 | N/A | N/A | N/A | M/S2 |

Enhanced DTS Cartridge Wellsite Calibration − Detector Calibration
Before: 16−Jun−2018 3:59

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Gamma Ray (Jig − Bkg) | 128.5 | N/A | 128.5 | N/A | N/A | 11.68 | GAPI |
| Gamma Ray (Calibrated) | 164.0 | N/A | 164.0 | N/A | N/A | 15.00 | GAPI |

Accelerator−Porosity Tool − Detector Plateau Settings :

Near Detector Plateau Setting 1737 V
Far Detector Plateau Setting 2067 V
Array Detector Plateau Setting 1970 V

High Resolution Laterolog Array − B / Equipment Identification

| | | |
|---|---|---|
| Primary Equipment: | | |
| HRLT Sonde | HRLS − B | 768 |
| Auxiliary Equipment: | | |
| HRLT lower Housing | HRLH − B | 1869 |
| HRLT Lower Cartridge | HRLC − B | 1897 |
| HRLT upper Housing | HRUH − B | 975 |
| HRLT Upper Cartridge | HRUC − B | 964 |

High Resolution Laterolog Array − B Wellsite Calibration
HRLT M01

| Idx | Phase | HRLT M0−M1 Voltage Plus UV | Value | Nominal | Maximum | Minimum |
|---|---|---|---|---|---|---|
| 0 | Before | | −318.9 | −322.7 | −280.7 | −379.7 |
| | After | | −318.3 | | | |
| 1 | Before | | −331.5 | −322.7 | −280.7 | −379.7 |
| | After | | −329.1 | | | |
| 2 | Before | | −339.0 | −322.7 | −280.7 | −379.7 |
| | After | | −337.1 | | | |
| 3 | Before | | −329.3 | −322.7 | −280.7 | −379.7 |
| | After | | −328.0 | | | |
| 4 | Before | | −320.1 | −322.7 | −280.7 | −379.7 |
| | After | | −319.2 | | | |
| 5 | Before | | −321.9 | −322.7 | −280.7 | −379.7 |
| | After | | −321.3 | | | |
| 6 | Before | | 321.6 | 322.7 | 379.7 | 280.7 |
| | After | | 320.2 | | | |
| 7 | Before | | −322.7 | −322.7 | −280.7 | −379.7 |
| | After | | −322.7 | | | |
| | | (Minimum) (Nominal) (Maximum) | | | | |

Before: 19−Jun−2018 17:48
After: 19−Jun−2018 23:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT M12

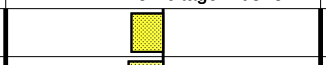
| Idx | Phase | HRLT M1−M2 Voltage Plus UV | Value | Nominal | Maximum | Minimum |
|---|---|---|---|---|---|---|
| 0 | Before |  | 1742 | 1781 | 2095 | 1549 |
| | After | | 1738 | | | |
| 1 | Before | | 1818 | 1781 | 2095 | 1549 |
| | After | | 1804 | | | |
| 2 | Before | | 1852 | 1781 | 2095 | 1549 |
| | After | | 1840 | | | |
| 3 | Before | | 1797 | 1781 | 2095 | 1549 |
| | After | | 1790 | | | |
| 4 | Before | | 1745 | 1781 | 2095 | 1549 |
| | After | | 1741 | | | |
| 5 | Before | | 1756 | 1781 | 2095 | 1549 |
| | After | | 1753 | | | |
| 6 | Before | | −1771 | −1781 | −1549 | −2095 |
| | After | | −1764 | | | |
| 7 | Before | | 1781 | 1781 | 2095 | 1549 |
| | After | | 1781 | | | |
| | | (Minimum) (Nominal) (Maximum) | | | | |

Before: 19−Jun−2018 17:48

After: 19−Jun−2018 23:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT M23

| Idx | Phase | HRLT M2−M3 Voltage Plus UV | Value | Nominal | Maximum | Minimum |
|---|---|---|---|---|---|---|
| 0 | Before |  | 1734 | 1781 | 2095 | 1549 |
| | After | | 1730 | | | |
| 1 | Before | | 1820 | 1781 | 2095 | 1549 |
| | After | | 1806 | | | |
| 2 | Before | | 1856 | 1781 | 2095 | 1549 |
| | After | | 1844 | | | |
| 3 | Before | | 1806 | 1781 | 2095 | 1549 |
| | After | | 1797 | | | |
| 4 | Before | | 1748 | 1781 | 2095 | 1549 |
| | After | | 1742 | | | |
| 5 | Before | | 1759 | 1781 | 2095 | 1549 |
| | After | | 1755 | | | |
| 6 | Before | | −1763 | −1781 | −1549 | −2095 |
| | After | | −1754 | | | |
| 7 | Before | | 1781 | 1781 | 2095 | 1549 |
| | After | | 1781 | | | |
| | | (Minimum) (Nominal) (Maximum) | | | | |

Before: 19−Jun−2018 17:48

After: 19−Jun−2018 23:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT V34

| Idx | Phase | HRLT A3−A4 Voltage Plus UV | Value | Nominal | Maximum | Minimum |
|---|---|---|---|---|---|---|
| | Before |  | 68680 | | | |

| | | | | | |
|---|---|---|---|---|---|
| 0 | After | 68570 | 70000 | 82360 | 60900 |
| 1 | Before | 71940 | 70000 | 82360 | 60900 |
| | After | 71410 | | | |
| 2 | Before | 73660 | 70000 | 82360 | 60900 |
| | After | 73220 | | | |
| 3 | Before | 71900 | 70000 | 82360 | 60900 |
| | After | 71620 | | | |
| 4 | Before | 69550 | 70000 | 82360 | 60900 |
| | After | 69380 | | | |
| 5 | Before | 70040 | 70000 | 82360 | 60900 |
| | After | 69920 | | | |
| 6 | Before | −68680 | −70000 | −60900 | −82360 |
| | After | −68380 | | | |
| 7 | Before | 70000 | 70000 | 82360 | 60900 |
| | After | 70000 | | | |
| | (Minimum) (Nominal) (Maximum) | | | | |

Before: 19−Jun−2018 17:48

After: 19−Jun−2018 23:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT V45

| Idx | Phase | HRLT A4−A5 Voltage Plus UV | Value | Nominal | Maximum | Minimum |
|---|---|---|---|---|---|---|
| 0 | Before | | 68780 | 70000 | 82360 | 60900 |
| | After | | 68640 | | | |
| 1 | Before | | 72150 | 70000 | 82360 | 60900 |
| | After | | 71610 | | | |
| 2 | Before | | 73840 | 70000 | 82360 | 60900 |
| | After | | 73400 | | | |
| 3 | Before | | 72040 | 70000 | 82360 | 60900 |
| | After | | 71760 | | | |
| 4 | Before | | 69670 | 70000 | 82360 | 60900 |
| | After | | 69490 | | | |
| 5 | Before | | 70140 | 70000 | 82360 | 60900 |
| | After | | 70000 | | | |
| 6 | Before | | −68890 | −70000 | −60900 | −82360 |
| | After | | −68580 | | | |
| 7 | Before | | 70000 | 70000 | 82360 | 60900 |
| | After | | 70000 | | | |
| | (Minimum) (Nominal) (Maximum) | | | | | |

Before: 19−Jun−2018 17:48

After: 19−Jun−2018 23:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT V56

| Idx | Phase | HRLT A5−A6 Voltage Plus UV | Value | Nominal | Maximum | Minimum |
|---|---|---|---|---|---|---|
| 0 | Before | | 68630 | 70000 | 82360 | 60900 |
| | After | | 68490 | | | |
| | Before | | 72000 | | | |

| | | | | | |
|---|---|---|---|---|---|
| 1 | After | 71450 | 70000 | 82360 | 60900 |
| 2 | Before | 73700 | 70000 | 82360 | 60900 |
| | After | 73260 | | | |
| 3 | Before | 71900 | 70000 | 82360 | 60900 |
| | After | 71620 | | | |
| 4 | Before | 69540 | 70000 | 82360 | 60900 |
| | After | 69350 | | | |
| 5 | Before | 70000 | 70000 | 82360 | 60900 |
| | After | 69890 | | | |
| 6 | Before | −68730 | −70000 | −60900 | −82360 |
| | After | −68430 | | | |
| 7 | Before | 70000 | 70000 | 82360 | 60900 |
| | After | 70000 | | | |
| | (Minimum) (Nominal) (Maximum) | | | | |

Before: 19−Jun−2018 17:48

After: 19−Jun−2018 23:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT VTP

| Idx | Phase | HRLT Torpedo−M0 Voltage Plus UV | Value | Nominal | Maximum | Minimum |
|---|---|---|---|---|---|---|
| 0 | Before | | −68140 | −70000 | −60900 | −82360 |
| | After | | −68010 | | | |
| 1 | Before | | −71790 | −70000 | −60900 | −82360 |
| | After | | −71250 | | | |
| 2 | Before | | −73520 | −70000 | −60900 | −82360 |
| | After | | −73090 | | | |
| 3 | Before | | −71790 | −70000 | −60900 | −82360 |
| | After | | −71520 | | | |
| 4 | Before | | −69480 | −70000 | −60900 | −82360 |
| | After | | −69290 | | | |
| 5 | Before | | −69950 | −70000 | −60900 | −82360 |
| | After | | −69830 | | | |
| 6 | Before | | 68480 | 70000 | 82360 | 60900 |
| | After | | 68190 | | | |
| 7 | Before | | −70000 | −70000 | −60900 | −82360 |
| | After | | −70000 | | | |
| | (Minimum) (Nominal) (Maximum) | | | | | |

Before: 19−Jun−2018 17:48

After: 19−Jun−2018 23:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT VBD

| Idx | Phase | HRLT Bridle#9−M0 Voltage Plus UV | Value | Nominal | Maximum | Minimum |
|---|---|---|---|---|---|---|
| 0 | Before | | −68190 | −70000 | −60900 | −82360 |
| | After | | −68060 | | | |
| 1 | Before | | −71890 | −70000 | −60900 | −82360 |
| | After | | −71360 | | | |
| | Before | | −73620 | | | |

| | | | | | |
|---|---|---|---|---|---|
| 2 | After | −73200 | −70000 | −60900 | −82360 |
| 3 | Before | −71880 | −70000 | −60900 | −82360 |
| | After | −71600 | | | |
| 4 | Before | −69530 | −70000 | −60900 | −82360 |
| | After | −69350 | | | |
| 5 | Before | −69990 | −70000 | −60900 | −82360 |
| | After | −69870 | | | |
| 6 | Before | 68570 | 70000 | 82360 | 60900 |
| | After | 68290 | | | |
| 7 | Before | −70000 | −70000 | −60900 | −82360 |
| | After | −70000 | | | |
| | (Minimum) (Nominal) (Maximum) | | | | |

Before: 19−Jun−2018 17:48

After: 19−Jun−2018 23:10

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 | | 284.0 | | | |
| 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) | | | | | |

Before: 19−Jun−2018 17:48

After: 19−Jun−2018 23:10

High Resolution Laterolog Array − B Wellsite Calibration

HRLT MV

| Idx | Phase | HRLT Vertical Voltage Plus UV | Value | Nominal | Maximum | Minimum |
|---|---|---|---|---|---|---|
| 0 | Before | | −320.5 | −322.7 | −280.7 | −379.7 |
| | After | | −320.0 | | | |
| 1 | Before | | −326.1 | −322.7 | −280.7 | −379.7 |
| | After | | −323.6 | | | |
| 2 | Before | | −332.1 | −322.7 | −280.7 | −379.7 |
| | After | | −330.3 | | | |
| | Before | | −320.9 | | | |

| | | | | | |
|---|---|---|---|---|---|
| 3 | Before | −319.7 | −322.7 | −280.7 | −379.7 |
| | After | −319.7 | | | |
| 4 | Before | −309.0 | −322.7 | −280.7 | −379.7 |
| | After | −308.2 | | | |
| 5 | Before | −325.7 | −322.7 | −280.7 | −379.7 |
| | After | −325.1 | | | |
| 6 | Before | 329.1 | 322.7 | 379.7 | 280.7 |
| | After | 327.6 | | | |
| 7 | Before | −322.7 | −322.7 | −280.7 | −379.7 |
| | After | −322.7 | | | |
| | (Minimum) (Nominal) (Maximum) | | | | |

Before: 19−Jun−2018 17:48

After: 19−Jun−2018 23:10

## Hostile Litho−Density Sonde / Equipment Identification

| | | |
|---|---|---|
| Primary Equipment: | | |
| Hostile Litho Density Sonde | HLDS − D | 45 |
| Hostile Litho Density High Voltage | HLDV − D | 45 |
| Gamma Source Radioactive | GSR − Z | 2945 |
| Auxiliary Equipment: | | |
| Hostile Litho Density Pad | HLDP − C | 45 |
| Hostile Litho Density High Voltage Housi | HEH − H | 47 |

## Hostile Litho−Density Sonde Wellsite Calibration

### Background Measurement

| Phase | SS Cs Resolution Bkg % | Value |
|---|---|---|
| Master | | 7.650 |
| Before | | 7.686 |
| After | | 7.644 |
| | 7.000 (Minimum) 9.000 (Nominal) 11.00 (Maximum) | |

| Phase | LS Cs Resolution Bkg % | Value |
|---|---|---|
| Master | | 8.039 |
| Before | | 7.968 |
| After | | 7.994 |
| | 7.000 (Minimum) 9.000 (Nominal) 11.00 (Maximum) | |

| Phase | LSW1 Background CPS | Value |
|---|---|---|
| Master | | 76.57 |
| Before | | 75.11 |
| After | | 75.81 |
| | 55.00 (Minimum) 100.0 (Nominal) 150.0 (Maximum) | |

| Phase | LSW2 Background CPS | Value |
|---|---|---|
| Master | | 69.87 |
| Before | | 68.78 |
| After | | 67.74 |
| | 50.00 (Minimum) 100.0 (Nominal) 140.0 (Maximum) | |

| Phase | LSW3 Background CPS | Value |
|---|---|---|
| Master | | 155.2 |
| Before | | 157.1 |
| After | | 155.9 |
| | 110.0 (Minimum) 200.0 (Nominal) 290.0 (Maximum) | |

| Phase | LSW4 Background CPS | Value |
|---|---|---|
| Master | | 193.9 |
| Before | | 193.4 |
| After | | 191.7 |
| | 140.0 (Minimum) 250.0 (Nominal) 360.0 (Maximum) | |

| Phase | LSW5 Background CPS | Value |
|---|---|---|
| Master | | 454.5 |
| Before | | 451.7 |
| After | | 452.2 |
| | 330.0 (Minimum) 600.0 (Nominal) 830.0 (Maximum) | |

| Phase | SSW1 Background CPS | Value |
|---|---|---|
| Master | | 73.68 |
| Before | | 73.20 |
| After | | 73.26 |
| | 55.00 (Minimum) 100.0 (Nominal) 150.0 (Maximum) | |

| Phase | SSW2 Background CPS | Value |
|---|---|---|
| Master | | 126.9 |
| Before | | 126.4 |
| After | | 126.6 |
| | 100.0 (Minimum) 200.0 (Nominal) 260.0 (Maximum) | |

| Phase | SSW3 Background CPS | Value |
|---|---|---|
| Master | | 358.2 |
| Before | | 353.1 |
| After | | 355.7 |
| | 280.0 (Minimum) 500.0 (Nominal) 700.0 (Maximum) | |

| Phase | SSW4 Background CPS | Value |
|---|---|---|
| Master | | 189.8 |
| Before | | 187.9 |
| After | | 190.0 |
| | 150.0 (Minimum) 270.0 (Nominal) 380.0 (Maximum) | |

| Phase | SSW5 Background CPS | Value |
|---|---|---|
| Master | | 136.5 |
| Before | | 137.4 |
| After | | 136.0 |
| | 110.0 (Minimum) 200.0 (Nominal) 270.0 (Maximum) | |

Master: 16−Jun−2018 1:58 Before: 16−Jun−2018 2:48 After: 16−Jun−2018 4:12

## Hostile Litho−Density Sonde Master Calibration

### Detector Background Measurement

| Phase | LSW1 Background CPS | Value |
|---|---|---|

| Phase | LSW2 Background CPS | Value |
|---|---|---|

| Phase | LSW3 Background CPS | Value |
|---|---|---|

| Phase | | Value |
|---|---|---|
| Master | | 76.57 |
| 55.00 (Minimum) | 100.0 (Nominal) | 150.0 (Maximum) |

| Phase | | Value |
|---|---|---|
| Master | | 69.87 |
| 50.00 (Minimum) | 100.0 (Nominal) | 140.0 (Maximum) |

| Phase | | Value |
|---|---|---|
| Master | | 155.2 |
| 110.0 (Minimum) | 200.0 (Nominal) | 290.0 (Maximum) |

| Phase | LSW4 Background CPS | Value |
|---|---|---|
| Master | | 193.9 |
| 140.0 (Minimum) | 250.0 (Nominal) | 360.0 (Maximum) |

| Phase | LSW5 Background CPS | Value |
|---|---|---|
| Master | | 454.5 |
| 330.0 (Minimum) | 600.0 (Nominal) | 830.0 (Maximum) |

| Phase | LS Cs Resolution Bkg % | Value |
|---|---|---|
| Master | | 8.039 |
| 7.000 (Minimum) | 9.000 (Nominal) | 11.00 (Maximum) |

| Phase | SSW1 Background CPS | Value |
|---|---|---|
| Master | | 73.68 |
| 55.00 (Minimum) | 100.0 (Nominal) | 150.0 (Maximum) |

| Phase | SSW2 Background CPS | Value |
|---|---|---|
| Master | | 126.9 |
| 100.0 (Minimum) | 200.0 (Nominal) | 260.0 (Maximum) |

| Phase | SSW3 Background CPS | Value |
|---|---|---|
| Master | | 358.2 |
| 280.0 (Minimum) | 500.0 (Nominal) | 700.0 (Maximum) |

| Phase | SSW4 Background CPS | Value |
|---|---|---|
| Master | | 189.8 |
| 150.0 (Minimum) | 270.0 (Nominal) | 380.0 (Maximum) |

| Phase | SSW5 Background CPS | Value |
|---|---|---|
| Master | | 136.5 |
| 110.0 (Minimum) | 200.0 (Nominal) | 270.0 (Maximum) |

| Phase | SS Cs Resolution Bkg % | Value |
|---|---|---|
| Master | | 7.650 |
| 7.000 (Minimum) | 9.000 (Nominal) | 11.00 (Maximum) |

Master: 16−Jun−2018 1:58

Hostile Litho−Density Sonde Master Calibration

Detector Aluminum Measurement (bkgd−subtracted)

| Phase | LSW1 Aluminum CPS | Value |
|---|---|---|
| Master | | 490.2 |
| 420.0 (Minimum) | 600.0 (Nominal) | 770.0 (Maximum) |

| Phase | LSW2 Aluminum CPS | Value |
|---|---|---|
| Master | | 717.2 |
| 650.0 (Minimum) | 900.0 (Nominal) | 1150 (Maximum) |

| Phase | LSW3 Aluminum CPS | Value |
|---|---|---|
| Master | | 877.4 |
| 800.0 (Minimum) | 1100 (Nominal) | 1450 (Maximum) |

| Phase | LSW4 Aluminum CPS | Value |
|---|---|---|
| Master | | 442.3 |
| 410.0 (Minimum) | 580.0 (Nominal) | 740.0 (Maximum) |

| Phase | LSW5 Aluminum CPS | Value |
|---|---|---|
| Master | EXCEEDS LIMIT | 406.1 |
| 410.0 (Minimum) | 570.0 (Nominal) | 740.0 (Maximum) |

| Phase | SSW1 Aluminum CPS | Value |
|---|---|---|
| Master | | 2380 |
| 2000 (Minimum) | 2800 (Nominal) | 3200 (Maximum) |

| Phase | SSW2 Aluminum CPS | Value |
|---|---|---|
| Master | | 6487 |
| 5800 (Minimum) | 8000 (Nominal) | 9300 (Maximum) |

| Phase | SSW3 Aluminum CPS | Value |
|---|---|---|
| Master | | 9004 |
| 8300 (Minimum) | 11600 (Nominal) | 13500 (Maximum) |

| Phase | SSW4 Aluminum CPS | Value |
|---|---|---|
| Master | | 3681 |
| 3500 (Minimum) | 5000 (Nominal) | 5800 (Maximum) |

| Phase | SSW5 Aluminum CPS | Value |
|---|---|---|
| Master | | 444.4 |
| 430.0 (Minimum) | 660.0 (Nominal) | 770.0 (Maximum) |

Weak source but does not effect density at low mud weight

Master: 16−Jun−2018 2:27

Hostile Litho−Density Sonde Master Calibration

Detector Litholog Measurement (bkgd−subtracted)

| Phase | LSW1 Iron CPS | Value |
|---|---|---|
| Master | | 334.7 |
| 290.0 (Minimum) | 400.0 (Nominal) | 560.0 (Maximum) |

| Phase | LSW2 Iron CPS | Value |
|---|---|---|
| Master | | 579.2 |
| 520.0 (Minimum) | 730.0 (Nominal) | 950.0 (Maximum) |

| Phase | LSW3 Iron CPS | Value |
|---|---|---|
| Master | | 776.3 |
| 720.0 (Minimum) | 1000 (Nominal) | 1350 (Maximum) |

| Phase | LSW4 Iron CPS | Value |
|---|---|---|
| Master | | 403.5 |
| 370.0 (Minimum) | 520.0 (Nominal) | 700.0 (Maximum) |

| Phase | LSW5 Iron CPS | Value |
|---|---|---|
| Master | | 368.2 |
| 340.0 (Minimum) | 470.0 (Nominal) | 750.0 (Maximum) |

| Phase | SSW1 Iron CPS | Value |
|---|---|---|
| Master | | 1725 |
| 1500 (Minimum) | 2100 (Nominal) | 2400 (Maximum) |

| Phase | SSW2 Iron CPS | Value |
|---|---|---|
| Master | | 5387 |
| 4900 (Minimum) | 6800 (Nominal) | 7900 (Maximum) |

| Phase | SSW3 Iron CPS | Value |
|---|---|---|
| Master | | 8188 |
| 7800 (Minimum) | 10800 (Nominal) | 12600 (Maximum) |

| Phase | SSW4 Iron CPS | Value |
|---|---|---|
| Master | | 3360 |
| 3300 (Minimum) | 4600 (Nominal) | 5400 (Maximum) |

| Phase | SSW5 Iron CPS | Value |
|---|---|---|
| Master | EXCEEDS LIMIT | 387.1 |
| 420.0 (Minimum) | 580.0 (Nominal) | 680.0 (Maximum) |

Weak source but does not effect density at low mud weight

Master: 16−Jun−2018 2:20

Hostile Litho−Density Sonde Master Calibration

Quality Ratios

| Phase | AL CALIBRATION RATIO 1 | Value |
|---|---|---|
| Master | | 1.034 |
| 0.9000 (Minimum) | 1.000 (Nominal) | 1.100 (Maximum) |

| Phase | AL CALIBRATION RATIO 2 | Value |
|---|---|---|
| Master | | 2.183 |
| 1.900 (Minimum) | 2.100 (Nominal) | 2.300 (Maximum) |

| Phase | AL CALIBRATION RATIO 3 | Value |
|---|---|---|
| Master | | 0.5778 |
| 0.4500 (Minimum) | 0.5500 (Nominal) | 0.6500 (Maximum) |

| Phase | AL CALIBRATION RATIO 4 | Value |
|---|---|---|
| Master | | 0.5769 |

| Phase | Pad−Wear SS Ratio | Value |
|---|---|---|
| Master | EXCEEDS LIMIT | 0.9784 |

| Phase | Pad−Wear LS Ratio | Value |
|---|---|---|
| Master | EXCEEDS LIMIT | 0.9729 |

| 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 |
|---|---|---|
| Master | | 1.009 |

| 0.9900 (Minimum) | 0.9940 (Nominal) | 1.015 (Maximum) |
|---|---|---|

| Phase | Pad−Position LS Ratio | Value |
|---|---|---|
| Master | | 0.9993 |

| 0.9850 (Minimum) | 0.9940 (Nominal) | 1.010 (Maximum) |
|---|---|---|

Master: 16−Jun−2018 2:10

## Hostile Nuclear Combined Cartridge − B / Equipment Identification

| | | |
|---|---|---|
| Primary Equipment: | | |
| LDSC Cartridge | LDSC − B | 521 |
| HNGC Cartridge | HNGC − B | 304 |
| Auxiliary Equipment: | | |
| UDFH Housing | UDFH − KLX | 1055 |

## Accelerator−Porosity Tool / Equipment Identification

| | | |
|---|---|---|
| Primary Equipment: | | |
| Accelerator−Porosity Sonde | APS − C | 249 |
| APS Minitron | MNTR − F | 51002 |
| Auxiliary Equipment: | | |
| Accelerator−Porosity Housing | APH − AC | 152 |
| APS Calibration Water Tank | SFT − 178 | 1 |
| APS Aluminum Calibrator Sleeve | SFT − 281 | 1 |

### Accelerator−Porosity Tool Wellsite Calibration

#### Detector Background

| Phase | Near Det Bkg Cntrate CPS | Value |
|---|---|---|
| Master | | 24.28 |
| Before | | 26.50 |
| After | | 25.26 |

| 1.000 (Minimum) | 30.00 (Nominal) | 50.00 (Maximum) |
|---|---|---|

| Phase | Far Det Bkg Cntrate CPS | Value |
|---|---|---|
| Master | | 24.56 |
| Before | | 25.92 |
| After | | 24.01 |

| 1.000 (Minimum) | 30.00 (Nominal) | 50.00 (Maximum) |
|---|---|---|

| Phase | Array−1 Det Bkg Cntrate CPS | Value |
|---|---|---|
| Master | | 24.71 |
| Before | | 24.13 |
| After | | 24.06 |

| 1.000 (Minimum) | 30.00 (Nominal) | 50.00 (Maximum) |
|---|---|---|

| Phase | Array−2 Det Bkg Cntrate CPS | Value |
|---|---|---|
| Master | | 23.58 |
| Before | | 23.91 |
| After | | 24.94 |

| 1.000 (Minimum) | 30.00 (Nominal) | 50.00 (Maximum) |
|---|---|---|

| Phase | Array Therm Det Bkg Cntrate CPS | Value |
|---|---|---|
| Master | | 25.43 |
| Before | | 25.82 |
| After | | 24.75 |

| 1.000 (Minimum) | 30.00 (Nominal) | 50.00 (Maximum) |
|---|---|---|

Master: 3−May−2018 11:30 Before: 19−Jun−2018 17:52 After: 19−Jun−2018 23:14

### Accelerator−Porosity Tool Wellsite Calibration

#### Calibration Ratios

| Phase | Near/Far Calibration Ratio | Value |
|---|---|---|
| Master | | 0.9404 |

| 0.8000 (Minimum) | 0.9250 (Nominal) | 1.050 (Maximum) |
|---|---|---|

| Phase | Near/Array Calibration Ratio | Value |
|---|---|---|
| Master | | 1.082 |

| 0.9000 (Minimum) | 1.030 (Nominal) | 1.170 (Maximum) |
|---|---|---|

| Phase | Near/Array Cal Ratio Up/Down | Value |
|---|---|---|
| Master | | 1.013 |

| 0.9700 (Minimum) | 1.000 (Nominal) | 1.030 (Maximum) |
|---|---|---|

Master: 3−May−2018 11:30

### Accelerator−Porosity Tool Wellsite Calibration

#### Tank Check

| Phase | Array−1 Standoff Porosity PU | Value |
|---|---|---|
| Master | | 10.71 |

| 9.900 (Minimum) | 11.75 (Nominal) | 13.60 (Maximum) |
|---|---|---|

| Phase | Array−2 Standoff Porosity PU | Value |
|---|---|---|
| Master | | 10.36 |

| 9.900 (Minimum) | 11.75 (Nominal) | 13.60 (Maximum) |
|---|---|---|

| Phase | Average Slowing Down Time US | Value |
|---|---|---|
| Master | | 6.017 |

| 5.500 (Minimum) | 6.000 (Nominal) | 6.250 (Maximum) |
|---|---|---|

| Phase | Array−1 SDT Ratio Up/Down | Value |
|---|---|---|
| Master | | 0.9690 |

| 0.9500 (Minimum) | 1.000 (Nominal) | 1.050 (Maximum) |
|---|---|---|

| Phase | Array−2 SDT Ratio Up/Down | Value |
|---|---|---|
| Master | | 0.9668 |

| 0.9500 (Minimum) | 1.000 (Nominal) | 1.050 (Maximum) |
|---|---|---|

| Phase | Sigma Formation CU | Value |
|---|---|---|
| Master | | 31.98 |

| 20.00 (Minimum) | 27.50 (Nominal) | 35.00 (Maximum) |
|---|---|---|

Master: 3−May−2018 11:30

Master: 3−May−2018 11:30

## Accelerator−Porosity Tool Master Calibration

### Detector Calibration

| Phase | Near/Far Calibration Ratio | Value | Phase | Near/Array Calibration Ratio | Value | Phase | Near/Array Cal Ratio Up/Down | Value |
|---|---|---|---|---|---|---|---|---|
| Master | | 0.9404 | Master | | 1.082 | Master | | 1.013 |
| | 0.8000 (Minimum) 0.9250 (Nominal) 1.050 (Maximum) | | | 0.9000 (Minimum) 1.030 (Nominal) 1.170 (Maximum) | | | 0.9700 (Minimum) 1.000 (Nominal) 1.030 (Maximum) | |

Master: 3−May−2018 11:30

## Accelerator−Porosity Tool Master Calibration

### Tank Check

| Phase | Array−1 Standoff Porosity PU | Value | Phase | Array−2 Standoff Porosity PU | Value | Phase | Average Slowing Down Time US | Value |
|---|---|---|---|---|---|---|---|---|
| Master | | 10.71 | Master | | 10.36 | Master | | 6.017 |
| | 9.900 (Minimum) 11.75 (Nominal) 13.60 (Maximum) | | | 9.900 (Minimum) 11.75 (Nominal) 13.60 (Maximum) | | | 5.500 (Minimum) 6.000 (Nominal) 6.250 (Maximum) | |

| Phase | Array−1 SDT Ratio Up/Down | Value | Phase | Array−2 SDT Ratio Up/Down | Value | Phase | Sigma Formation CU | Value |
|---|---|---|---|---|---|---|---|---|
| Master | | 0.9690 | Master | | 0.9668 | Master | | 31.98 |
| | 0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum) | | | 0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum) | | | 20.00 (Minimum) 27.50 (Nominal) 35.00 (Maximum) | |

Master: 3−May−2018 11:30

## Hostile Natural Gamma Ray Sonde / Equipment Identification

| | | |
|---|---|---|
| Primary Equipment: | | |
| HNGS Sonde | HNGS − BA | 194 |
| Auxiliary Equipment: | | |
| HNGS Sonde Housing | HNSH − BA | 204 |
| Gamma Source Radioactive | GSR − U | 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 | | 39.71 | Master | | 14.71 | Master | | 1177 |
| Before | | 39.58 | Before | | 16.29 | Before | | 1176 |
| After | | 39.57 | After | | 14.71 | After | | 1176 |
| | 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 | | 142.5 | Master | | 7.989 | Master | | 21.47 |
| Before | | 142.1 | Before | | 8.568 | Before | | 21.42 |
| After | | 141.9 | After | | 9.084 | After | | 21.42 |
| | 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 | | 22.99 |
| Before | | 22.87 |
| After | | 23.36 |
| | 10.00 (Minimum) 45.00 (Nominal) 100.0 (Maximum) | |

Master: 16−Jun−2018 3:35 Before: 16−Jun−2018 3:44 After: 16−Jun−2018 4:13

## 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 | | 16.34 | Master | | 1096 |
| Before | | 39.50 | Before | | 15.67 | Before | | 1096 |
| After | | 39.66 | After | | 16.73 | After | | 1095 |
| | 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 |
|---|---|---|
| Master | | 142.2 |
| Before | | 141.1 |
| After | | 141.6 |
| 135.0 (Minimum) | 142.6 (Nominal) | 150.3 (Maximum) |

| Phase | Na 1785 Peak Res % | Value |
|---|---|---|
| Master | | 8.174 |
| Before | | 8.852 |
| After | | 9.429 |
| 7.000 (Minimum) | 8.500 (Nominal) | 11.00 (Maximum) |

| Phase | Temperature DEGC | Value |
|---|---|---|
| Master | | 22.01 |
| Before | | 22.09 |
| After | | 22.22 |
| −28.89 (Minimum) | 15.50 (Nominal) | 60.00 (Maximum) |

| Phase | Na Count Rate CPS | Value |
|---|---|---|
| Master | | 22.76 |
| Before | | 22.74 |
| After | | 23.10 |
| 10.00 (Minimum) | 45.00 (Nominal) | 100.0 (Maximum) |

Master: 16−Jun−2018 3:35 Before: 16−Jun−2018 3:44 After: 16−Jun−2018 4:13

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Ratio Of Detector 1 To Detector 2

| Phase | Coincidence Count Rate Ratio | Value |
|---|---|---|
| Master | | 1.012 |
| Before | | 1.007 |
| After | | 1.014 |
| 0.9500 (Minimum) | 1.000 (Nominal) | 1.050 (Maximum) |

Master: 16−Jun−2018 3:35
Before: 16−Jun−2018 3:44
After: 16−Jun−2018 4:13

Hostile Natural Gamma Ray Sonde Master Calibration

Detector 1 Calibration

| Phase | Na 511 Peak Set Point | Value |
|---|---|---|
| Master | | 41.00 |
| 38.00 (Minimum) | 40.00 (Nominal) | 43.00 (Maximum) |

| Phase | Th Peak Loc | Value |
|---|---|---|
| Master | | 210.6 |
| 201.0 (Minimum) | 209.6 (Nominal) | 218.3 (Maximum) |

| Phase | Th Peak Res % | Value |
|---|---|---|
| Master | | 6.860 |
| 5.000 (Minimum) | 7.000 (Nominal) | 9.000 (Maximum) |

| Phase | Background Count Rate CPS | Value |
|---|---|---|
| Master | | 25.30 |
| 10.00 (Minimum) | 142.5 (Nominal) | 265.0 (Maximum) |

| Phase | Gain Ratio | Value |
|---|---|---|
| Master | | 1.009 |
| 0.9400 (Minimum) | 1.000 (Nominal) | 1.060 (Maximum) |

Master: 16−Jun−2018 3:30

Hostile Natural Gamma Ray Sonde Master Calibration

Detector 2 Calibration

| Phase | Na 511 Peak Set Point | Value |
|---|---|---|
| Master | | 41.00 |
| 38.00 (Minimum) | 40.00 (Nominal) | 43.00 (Maximum) |

| Phase | Th Peak Loc | Value |
|---|---|---|
| Master | | 208.0 |
| 201.0 (Minimum) | 209.6 (Nominal) | 218.3 (Maximum) |

| Phase | Th Peak Res % | Value |
|---|---|---|
| Master | | 7.211 |
| 5.000 (Minimum) | 7.000 (Nominal) | 9.000 (Maximum) |

| Phase | Background Count Rate CPS | Value |
|---|---|---|
| Master | | 23.21 |
| 10.00 (Minimum) | 142.5 (Nominal) | 265.0 (Maximum) |

| Phase | Gain Ratio | Value |
|---|---|---|
| Master | | 0.9988 |
| 0.9400 (Minimum) | 1.000 (Nominal) | 1.060 (Maximum) |

Master: 16−Jun−2018 3:30

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 − UDF | 1091 |

Enhanced DTS Cartridge Wellsite Calibration

EDTC Accelerometer Calibration

| Phase | EDTC Z−Axis Acceleration M/S2 | Value |
|---|---|---|

| Phase | EDTC Z−Axis Acceleration M/S2 | Value |
|---|---|---|
| Before | | 9.766 |
| 9.610 (Minimum) | 9.810 (Nominal) | 10.01 (Maximum) |

Before: 19−Jun−2018 17:47

Enhanced DTS Cartridge Wellsite Calibration

Detector Calibration

| Phase | Gamma Ray Background GAPI | Value | Phase | Gamma Ray (Jig − Bkg) GAPI | Value | Phase | Gamma Ray (Calibrated) GAPI | Value |
|---|---|---|---|---|---|---|---|---|
| Before | | 7.790 | Before | | 128.5 | Before | | 164.0 |
| 0 (Minimum) | 30.00 (Nominal) | 120.0 (Maximum) | 116.8 (Minimum) | 128.5 (Nominal) | 140.2 (Maximum) | 149.0 (Minimum) | 164.0 (Nominal) | 179.0 (Maximum) |

Before: 16−Jun−2018 3:59

Company: **International Ocean Discovery Program**

Schlumberger

Well: **Expedition 376, Site U1530A**
Field: **Bothers Arc Flux**
Rig: **JOIDES Resolution**
Ocean: **Pacific**

Hostile Natural Gamma Spectroscopy −HNGS
Hostile Litho Density Sonde − HLDS
Porosty−APS, Mud Temperature (LEH−MT)