

Company: ENCANA OIL & GAS (USA) INC

Well: MCU 26-4A (127W)

Field: MAMM CREEK

County: GARFIELD

State: COLORADO

RESERVOIR SATURATION LOG  
SIGMA MODE  
GR-CCL

County: GARFIELD

Field: MAMM CREEK

Location: SHL: 516 FEL & 1967 FSL

Well: MCU 26-4A (127W)

Company: ENCANA OIL & GAS (USA) INC

| LOCATION                |               | Elev.: K.B. 7224.00 ft     |       |
|-------------------------|---------------|----------------------------|-------|
| SHL: 516 FEL & 1967 FSL |               | G.L. 7202.00 ft            |       |
| BHL: 948 FWL & 710 FNL  |               | D.F. 7223.00 ft            |       |
| Permanent Datum:        | GROUND LEVEL  | Elev.: 7202.00 ft          |       |
| Log Measured From:      | KELLY BUSHING | 22.00 ft above Perm. Datum |       |
| Drilling Measured From: | KELLY BUSHING |                            |       |
| API Serial No.          | Section       | Township                   | Range |
| 05-045-21608-0C         | 27            | 7S                         | 93W   |

|                          | Run 1   | Run 2 | Run 3 |
|--------------------------|---------|-------|-------|
| PVT DATA                 |         |       |       |
| Oil Density              |         |       |       |
| Water Salinity           |         |       |       |
| Gas Gravity              |         |       |       |
| Bo                       |         |       |       |
| Bw                       |         |       |       |
| 1/Bg                     |         |       |       |
| Bubble Point Pressure    |         |       |       |
| Bubble Point Temperature |         |       |       |
| Solution GOR             |         |       |       |
| Maximum Deviation        |         |       |       |
| CEMENTING DATA           |         |       |       |
| Primary/Squeeze          | Primary |       |       |
| Casing String No         |         |       |       |
| Lead Cement Type         |         |       |       |
| Volume                   |         |       |       |
| Density                  |         |       |       |
| Water Loss               |         |       |       |
| Additives                |         |       |       |
| Tail Cement Type         |         |       |       |
| Volume                   |         |       |       |
| Density                  |         |       |       |
| Water Loss               |         |       |       |
| Additives                |         |       |       |
| Expected Cement Top      |         |       |       |

|                               |                 |       |  |
|-------------------------------|-----------------|-------|--|
| Logging Date                  | 22-Jan-2013     |       |  |
| Run Number                    | 1               |       |  |
| Depth Driller                 | 10868 ft        |       |  |
| Schlumberger Depth            | 10784 ft        |       |  |
| Bottom Log Interval           | 10750 ft        |       |  |
| Top Log Interval              | 2000 ft         |       |  |
| Casing Fluid Type             | FRESH WATER     |       |  |
| Salinity                      |                 |       |  |
| Density                       | 8.4 lbm/gal     |       |  |
| Fluid Level                   | 60 ft           |       |  |
| BIT/CASING/TUBING STRING      |                 |       |  |
| Bit Size                      | 7.875 in        |       |  |
| From                          | 81.16 ft        |       |  |
| To                            | 10868 ft        |       |  |
| Casing/Tubing Size            | 4.500 in        |       |  |
| Weight                        | 11.6 lbm/ft     |       |  |
| Grade                         | S-80            |       |  |
| From                          | 22 ft           |       |  |
| To                            | 10846 ft        |       |  |
| Maximum Recorded Temperatures | 266 degF        |       |  |
| Logger On Bottom              | 22-Jan-2013     | 23:45 |  |
| Unit Number                   | Location        |       |  |
| 391                           | GRAND JUNCTION  |       |  |
| Recorded By                   | KIRSTIE BUNTING |       |  |
| Witnessed By                  | EUGENE          |       |  |

|                               |          |  |  |
|-------------------------------|----------|--|--|
| Logging Date                  |          |  |  |
| Run Number                    |          |  |  |
| Depth Driller                 |          |  |  |
| Schlumberger Depth            |          |  |  |
| Bottom Log Interval           |          |  |  |
| Top Log Interval              |          |  |  |
| Casing Fluid Type             |          |  |  |
| Salinity                      |          |  |  |
| Density                       |          |  |  |
| Fluid Level                   |          |  |  |
| BIT/CASING/TUBING STRING      |          |  |  |
| Bit Size                      |          |  |  |
| From                          |          |  |  |
| To                            |          |  |  |
| Casing/Tubing Size            |          |  |  |
| Weight                        |          |  |  |
| Grade                         |          |  |  |
| From                          |          |  |  |
| To                            |          |  |  |
| Maximum Recorded Temperatures |          |  |  |
| Logger On Bottom              |          |  |  |
| Unit Number                   | Location |  |  |
|                               |          |  |  |
| Recorded By                   |          |  |  |
| Witnessed By                  |          |  |  |

## DEPTH SUMMARY LISTING

Date Created: 12-DEC-2012 9:29:15

## Depth System Equipment

| Depth Measuring Device    |           | Tension Device                |            | Logging Cable      |          |
|---------------------------|-----------|-------------------------------|------------|--------------------|----------|
| Type:                     | IDW-B     | Type:                         | CMTD-B/A   | Type:              | 1-25ZT   |
| Serial Number:            | 6214      | Serial Number:                | 3421       | Serial Number:     |          |
| Calibration Date:         | 4-24-2012 | Calibration Date:             | 28-11-2012 | Length:            | 19700 FT |
| Calibrator Serial Number: |           | Calibrator Serial Number:     | 174878     |                    |          |
| Calibration Cable Type:   | 1-25ZT    | Number of Calibration Points: | 10         | Conveyance Method: | Wireline |
| Wheel Correction 1:       | -3        | Calibration RMS:              | 6          | Rig Type:          | LAND     |
| Wheel Correction 2:       | -4        | Calibration Peak Error:       | 11         |                    |          |

## Depth Control Parameters

|                             |                       |
|-----------------------------|-----------------------|
| Log Sequence:               | First Log In the Well |
| Rig Up Length At Surface:   | 200.00 FT             |
| Rig Up Length At Bottom:    | 200.00 FT             |
| Rig Up Length Correction:   | 0.00 FT               |
| Stretch Correction:         |                       |
| Tool Zero Check At Surface: |                       |

### Depth Control Remarks

1. ALL SCHLUMBERGER DEPTH CONTROL POLICIES APPLIED
2. IDW USED AS PRIMARY DEPTH REFERENCE
3. SWPT DRUM COUNTER USED AS SECONDARY DEPTH REFERENCE
- 4.
- 5.
- 6.

## DISCLAIMER

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

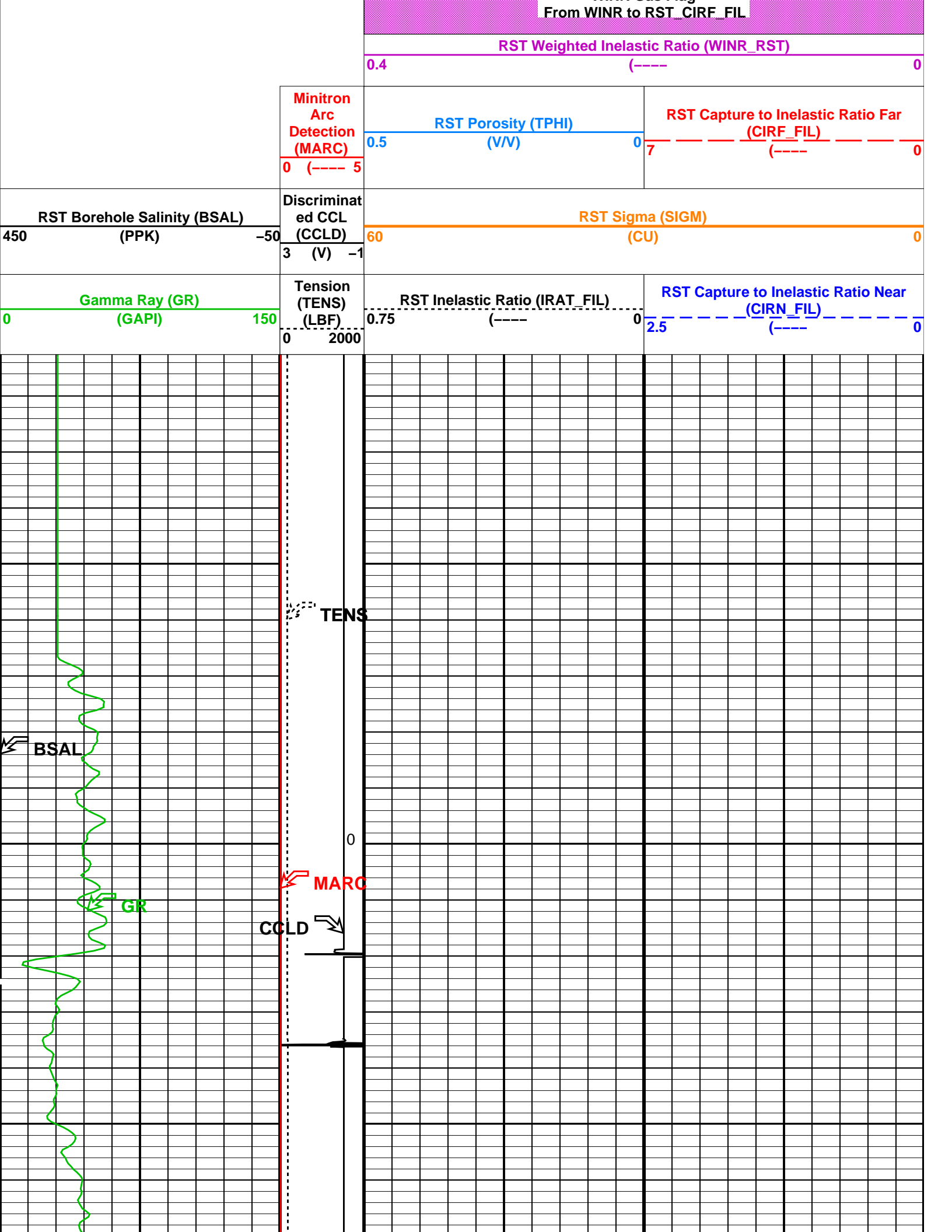
|  |                       |
|--|-----------------------|
| OTHER SERVICES1                          | OTHER SERVICES2       |
| OS1: SLIM CEMENT MAPPING                 | OS1:                  |
| OS2: LOG                                 | OS2:                  |
| OS3: CBL-VDL                             | OS3:                  |
| OS4: GR-CCL                              | OS4:                  |
| OS5:                                     | OS5:                  |
| REMARKS: RUN NUMBER 1                    | REMARKS: RUN NUMBER 2 |
| FIRST RUN IN HOLE CORRELATED TO DOWN LOG |                       |
| TOOL RAN AS PER TOOL SKETCH              |                       |
|  |                       |
| ENTRANCE TIME: 22:45                     |                       |
| TIME AT TD: 23:45                        |                       |
| EXIT TIME: 02:15                         |                       |
|  |                       |

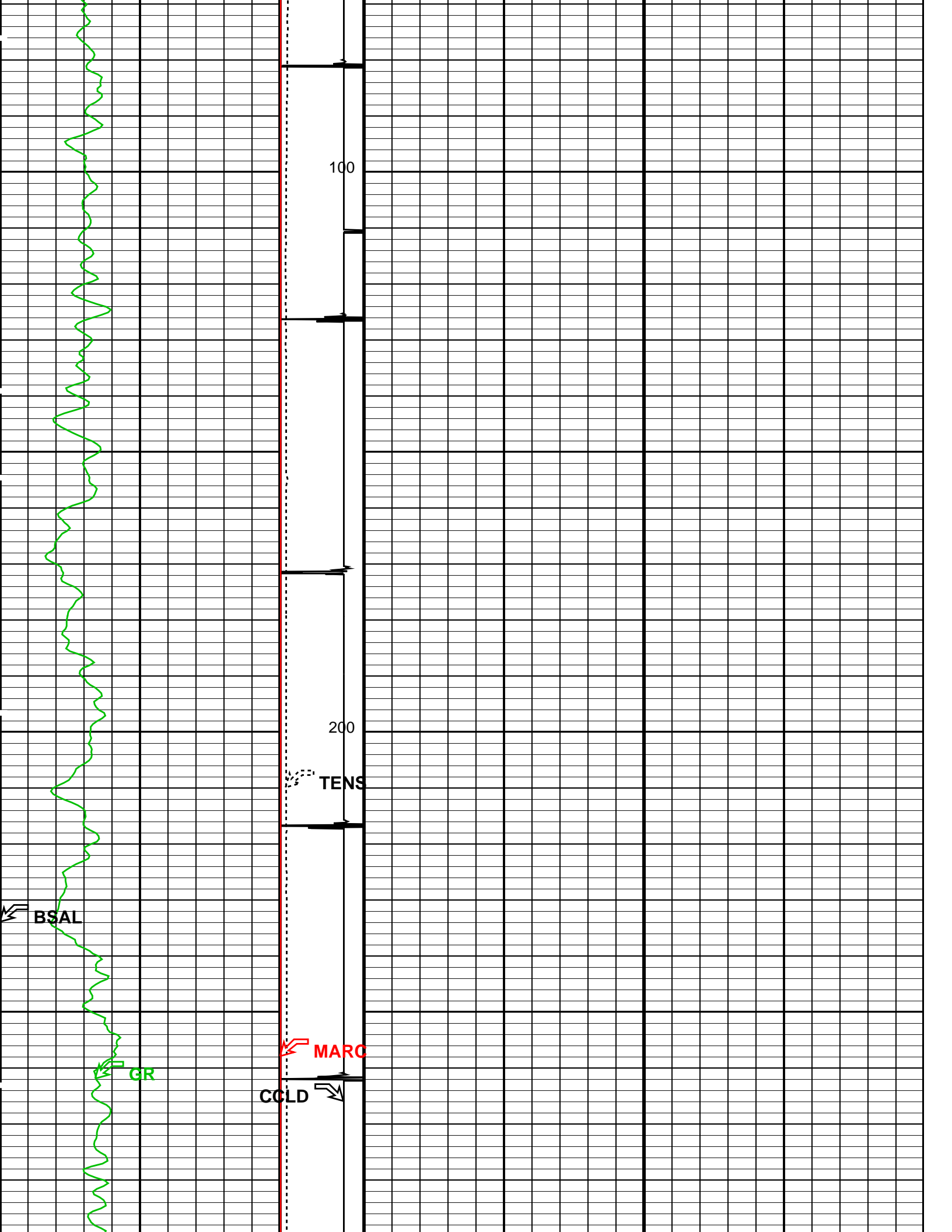
|  |       |      |  |       |      |
|--|-------|------|--|-------|------|
| MAXIMUM RECORDED TEMPERATURE: 266 DEGF   |       |      |  |       |      |
| MAXIMUM RECORDED PRESSURE: 4327 PSIA   |       |      |  |       |      |
|  |       |      |  |       |      |
| SHORT JOINTS: 8478 FT & 7478 FT  |       |      |  |       |      |
|  |       |      |  |       |      |
| SANDSTONE MATRIX USED  |       |      |  |       |      |
|  |       |      |  |       |      |
|  |       |      |  |       |      |
| THANK YOU FOR CHOOSING E&P WIRELINE, A SCHLUMBERGER COMPANY  |       |      |  |       |      |
| CREW: KBUNTING JBARRY WAZIZ BRANSBOTTOM  |       |      |  |       |      |
| <div> <div>RUN 1</div> <div> <div>SERVICE ORDER #:</div> <div>PROGRAM VERSION:</div> <div>FLUID LEVEL:</div> </div> <div> <div>CGF9-00014</div> <div>19C0-187</div> <div>60 ft</div> </div> </div> |       |      | <div> <div>RUN 2</div> <div> <div>SERVICE ORDER #:</div> <div>PROGRAM VERSION:</div> <div>FLUID LEVEL:</div> </div> </div> |       |      |
| LOGGED INTERVAL  | START | STOP | LOGGED INTERVAL  | START | STOP |
|  |       |      |  |       |      |
|  |       |      |  |       |      |
|  |       |      |  |       |      |
|  |       |      |  |       |      |
|  |       |      |  |       |      |

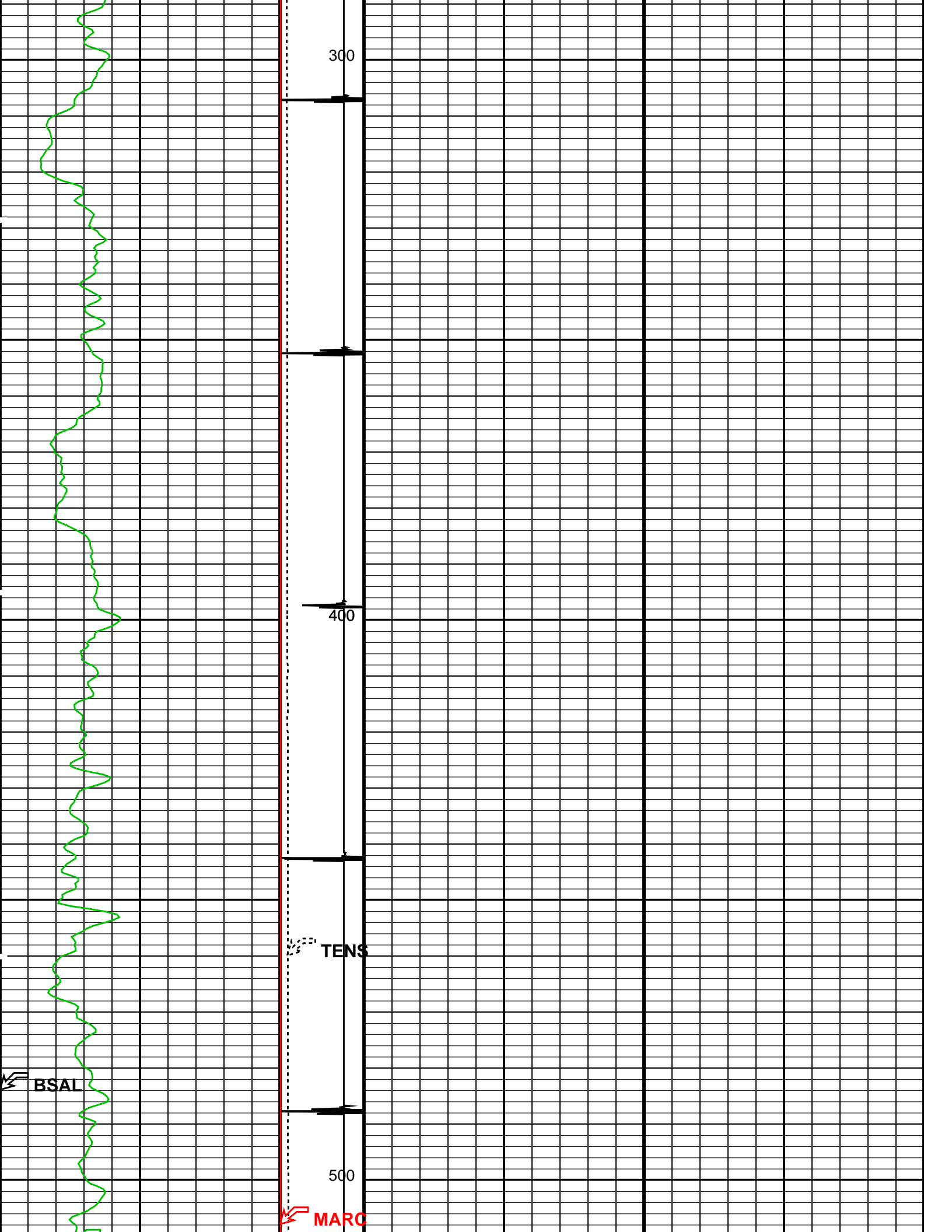
| EQUIPMENT DESCRIPTION  |  |  |       |  |  |
|--|--|--|-------|--|--|
| RUN 1  |  |  | RUN 2 |  |  |
| <div> <div>SURFACE EQUIPMENT</div> <div> <div>WITM-A</div> <div>PSC_16MHZ</div> </div> </div>  |  |  |       |  |  |
| <div> <div>DOWNHOLE EQUIPMENT</div> <div> <div> <div> <div>MH-22</div> <div>MH-22</div> <div> <div> <div>Detail MT</div> <div>TelStatus</div> <div>CTEM</div> </div> <div> <div>51.5</div> <div>51.8</div> <div>51.5</div> </div> </div> </div> <div> <div> <div>PSPT</div> <div>PSC-A</div> <div>PSPT-B 928</div> <div>PSTC-A 928</div> <div>PBMS-B 928</div> <div>CQG_F_Mano</div> <div>RTD_Thermometer</div> <div>GR</div> <div>CCL</div> <div>PBMS 928</div> </div> <div> <div>GR</div> <div>Well_Temp</div> <div>CQG Manom</div> <div>CCL</div> <div>PBMS PSTC</div> </div> <div> <div>47.8</div> <div>44.8</div> <div>44.5</div> <div>44.0</div> <div>43.3</div> </div> </div> </div> <div> <div> <div> <div>RST-C</div> <div>RSCH-A 469</div> <div>RSC-E</div> <div>RSS-A 461</div> <div>RSXH-A 493</div> <div>RSX-E</div> </div> <div> <div>43.3</div> </div> </div> <div> <div> <div> <div>RSC-A Far</div> <div>RSC-A PNG</div> <div>RSC-A Nea</div> <div>RSX-A PNG</div> </div> <div> <div>34.2</div> <div>33.7</div> </div> </div> </div> </div> </div></div> |  |  |       |  |  |

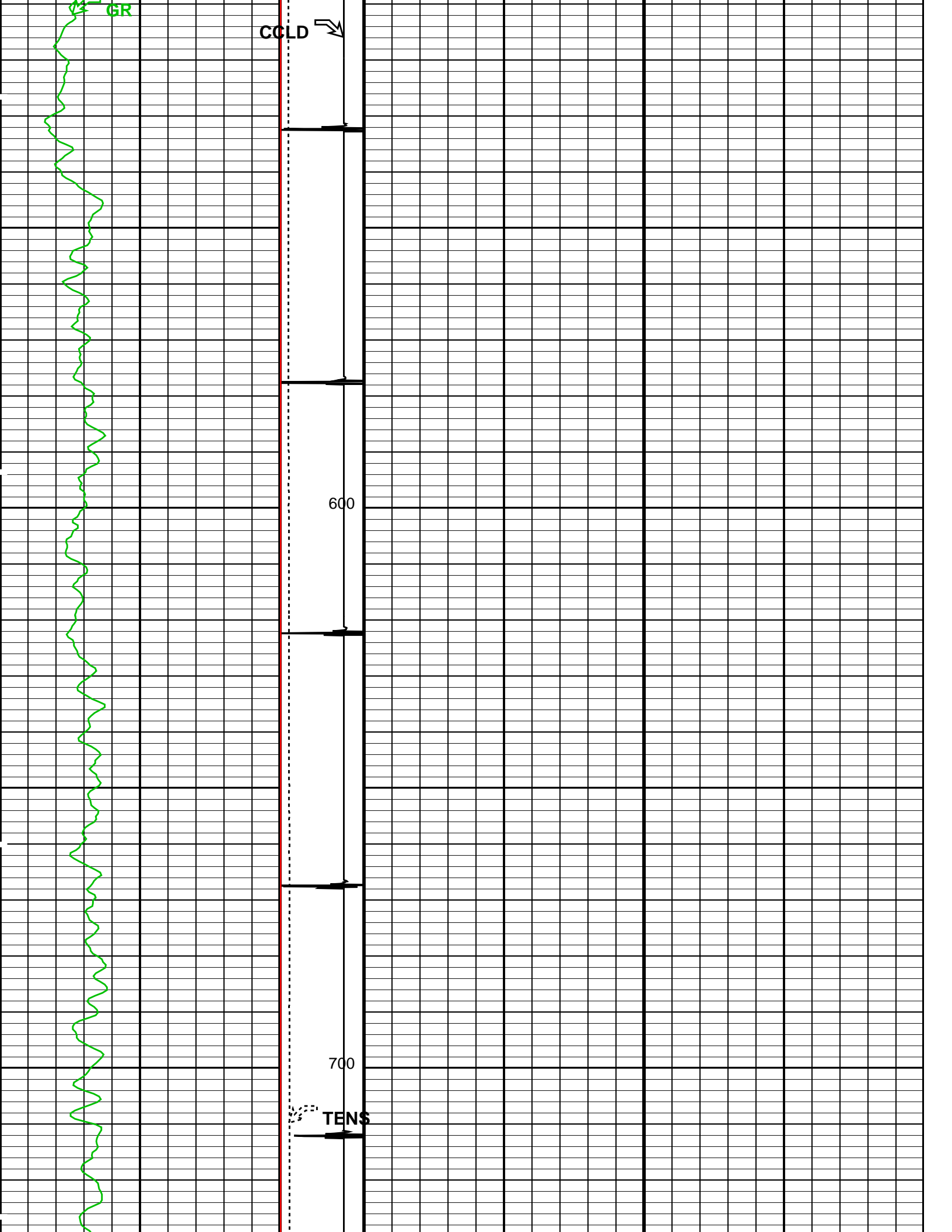


## WINR Gas Flag

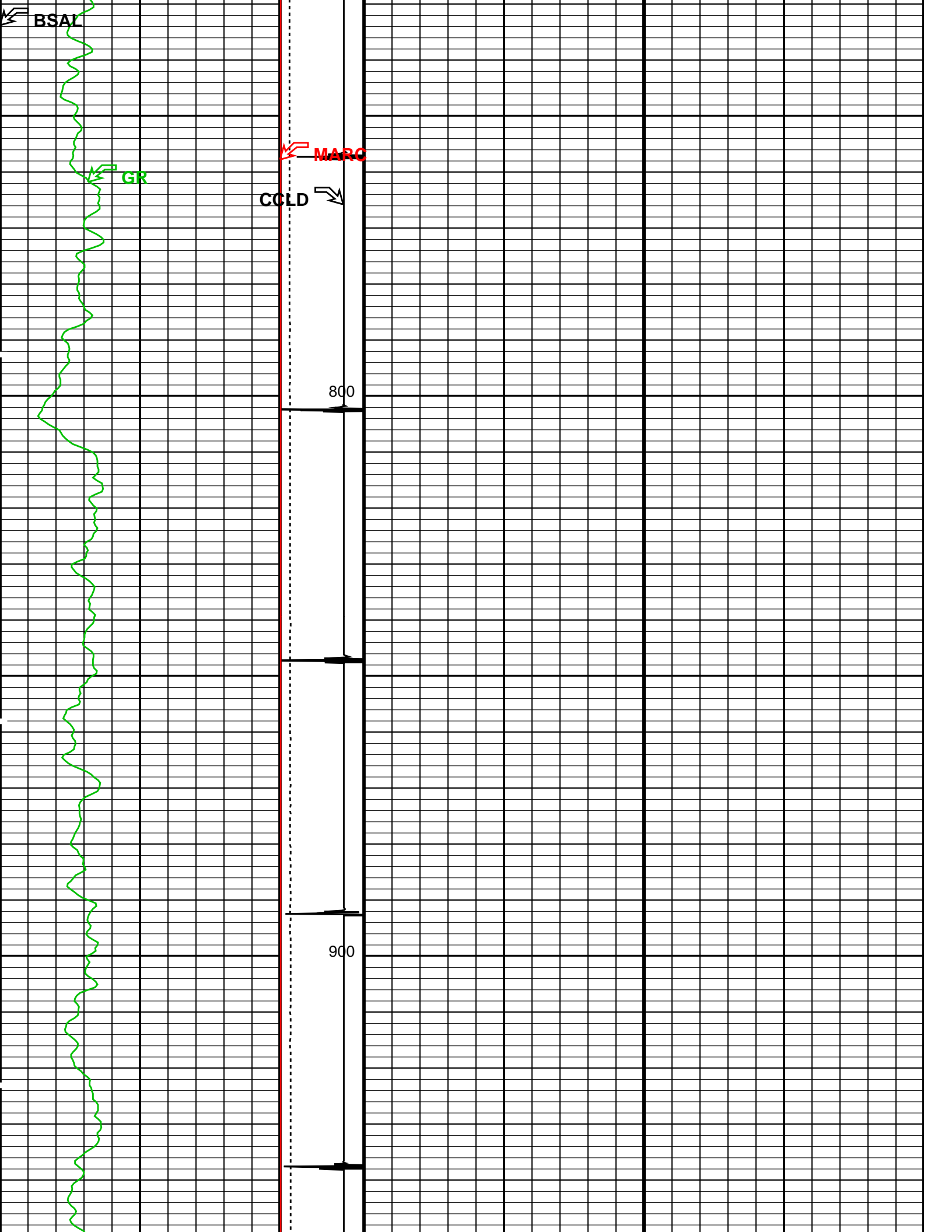


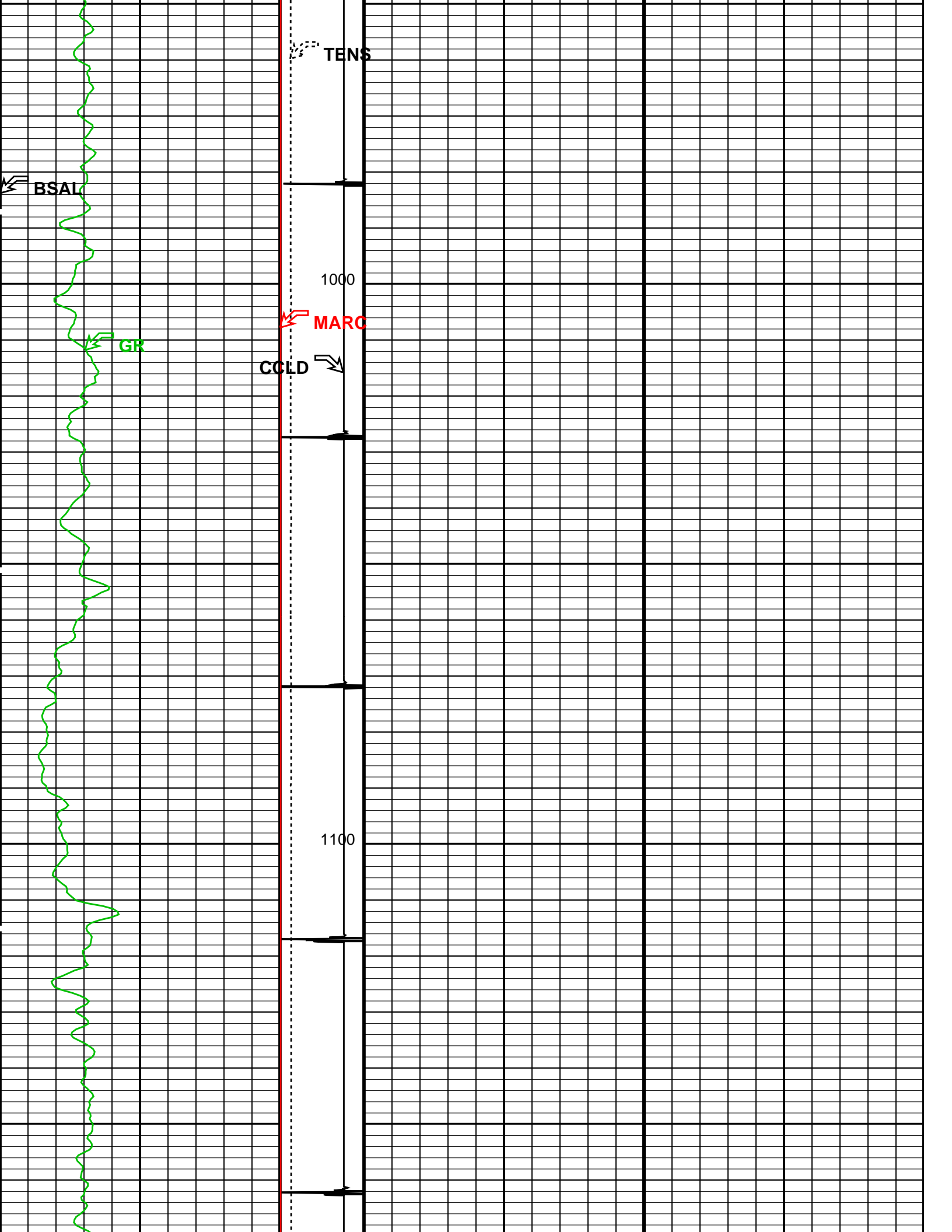


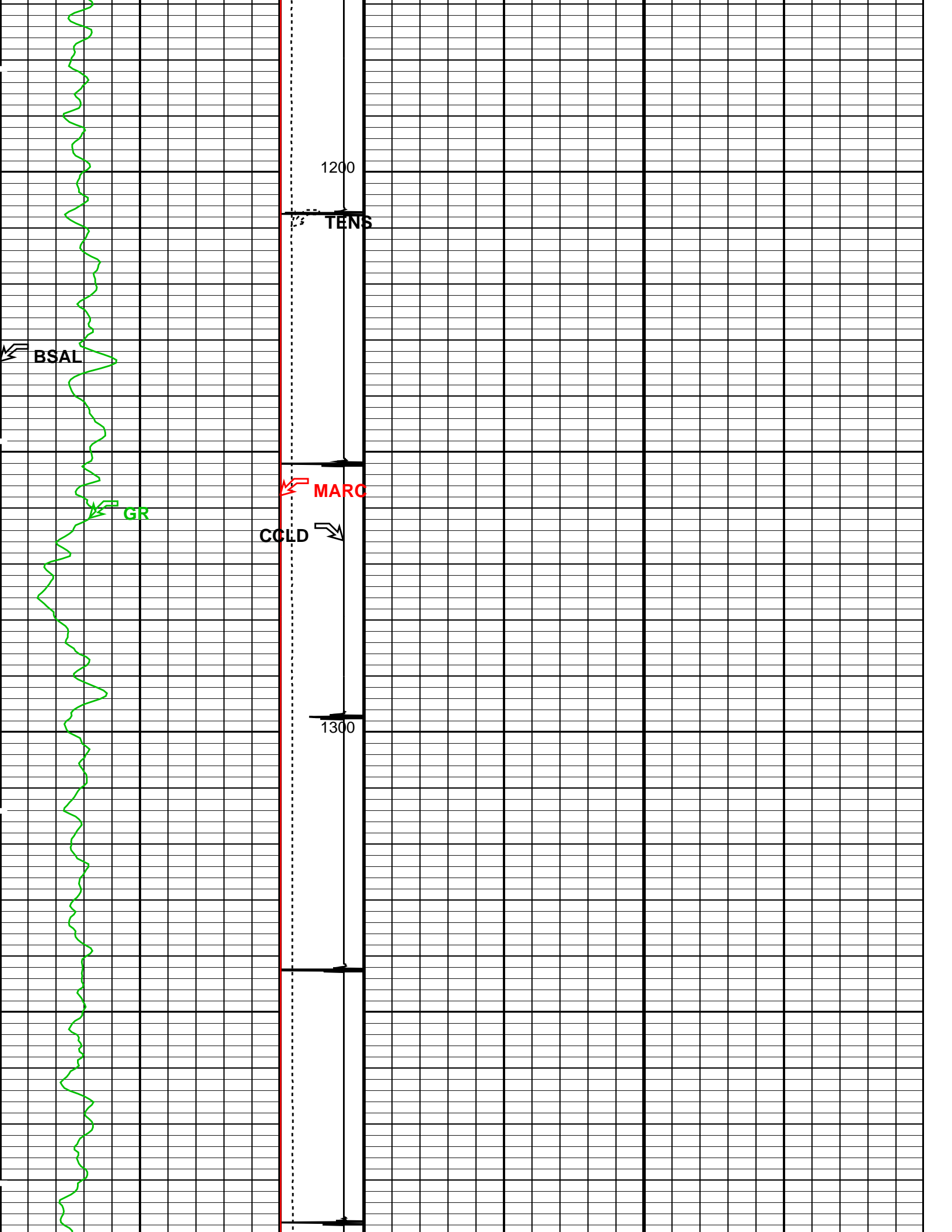


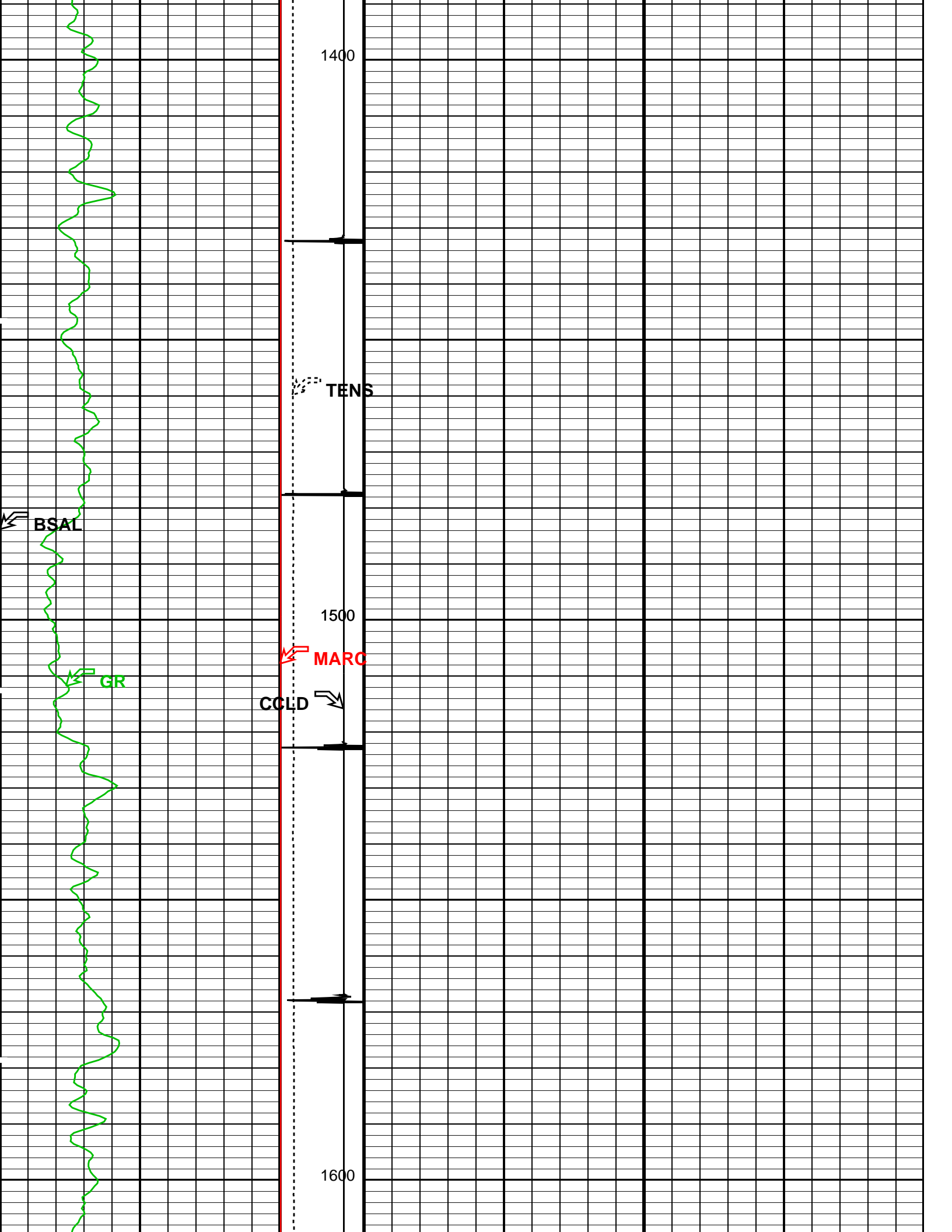


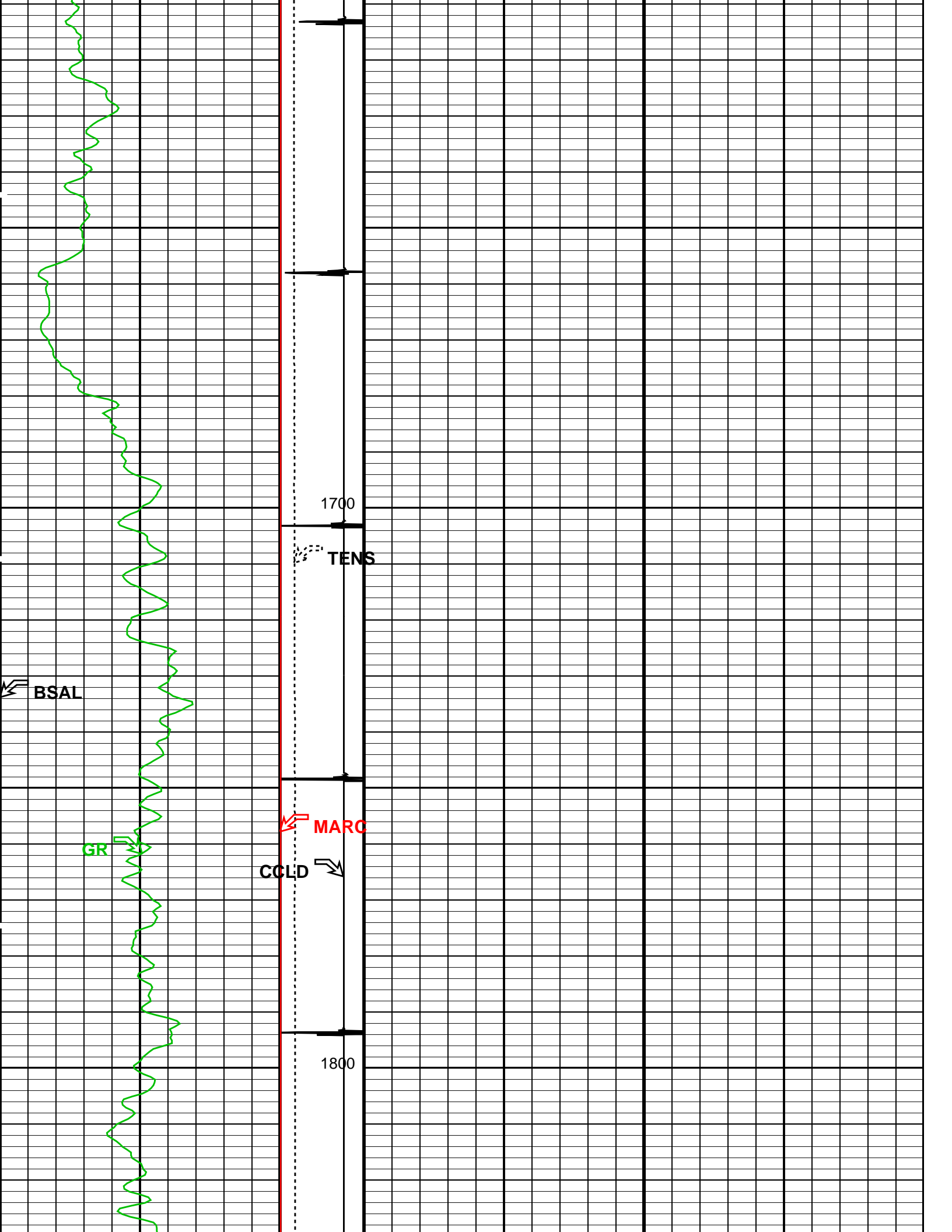


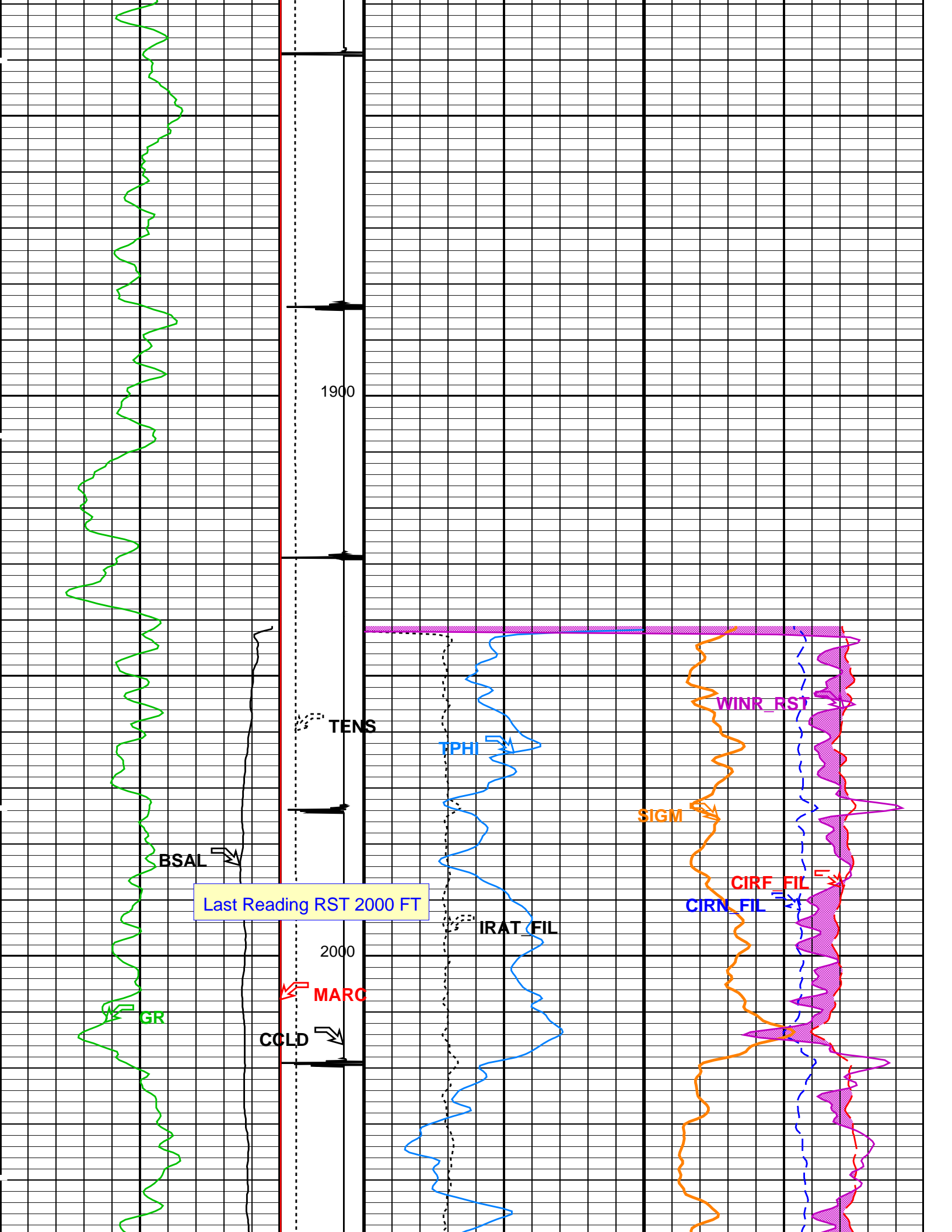


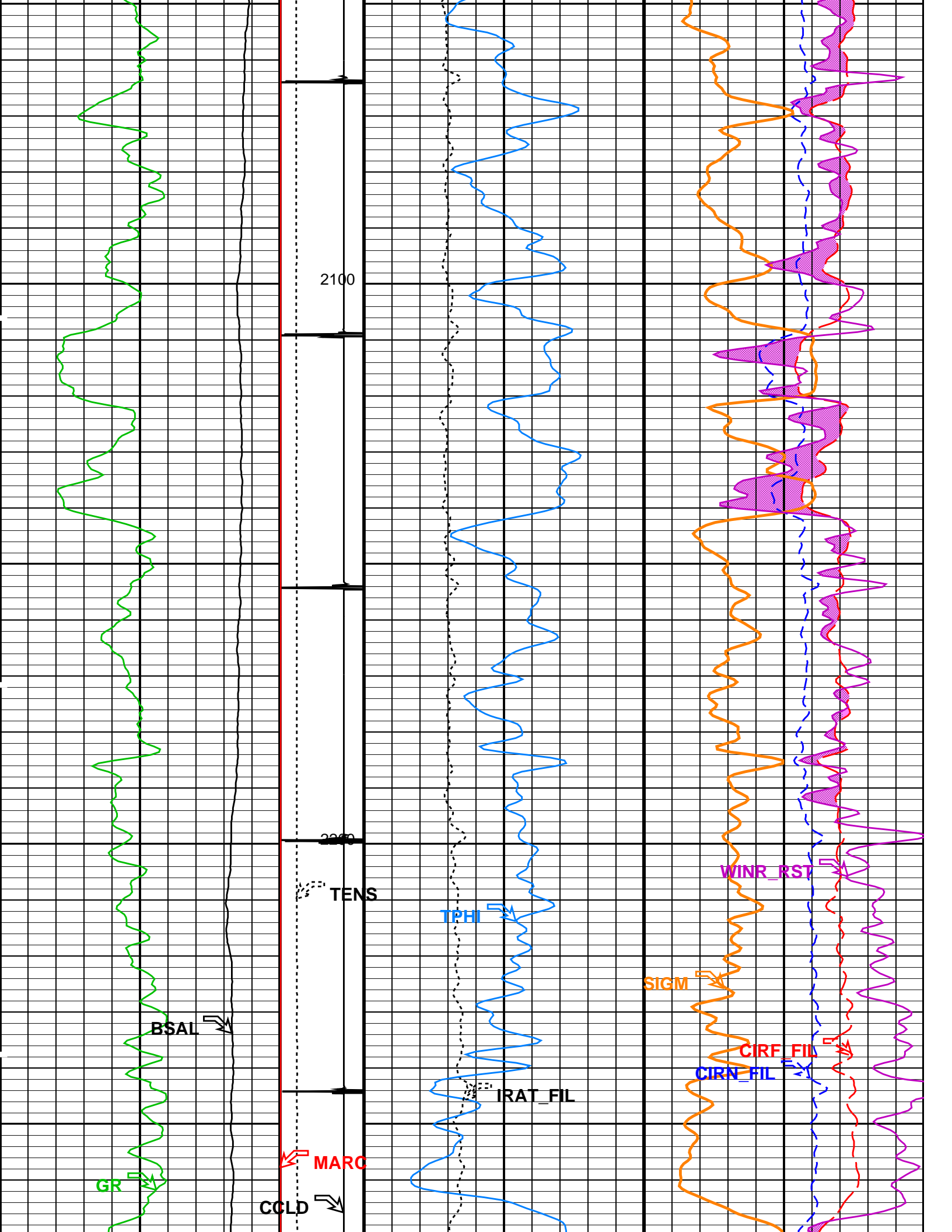


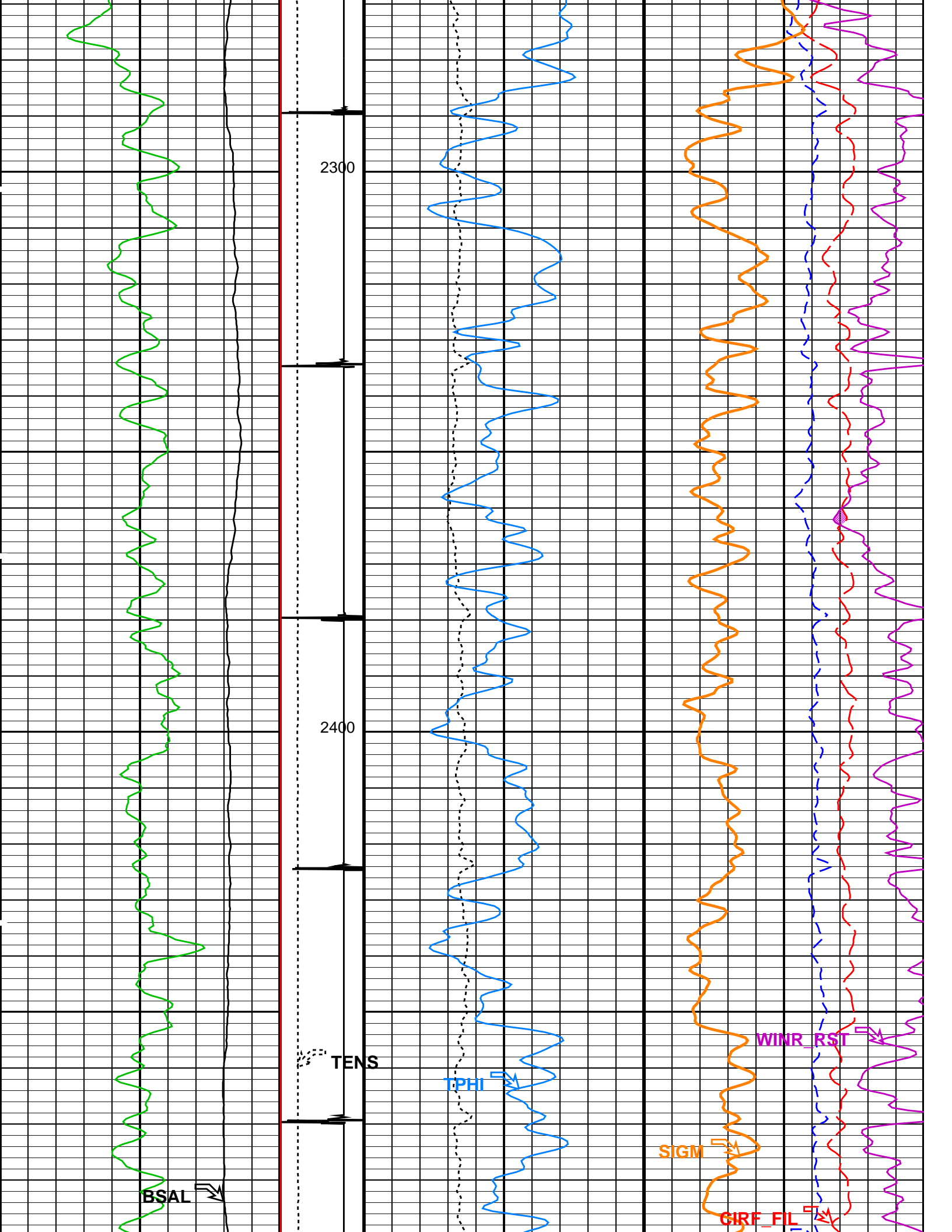




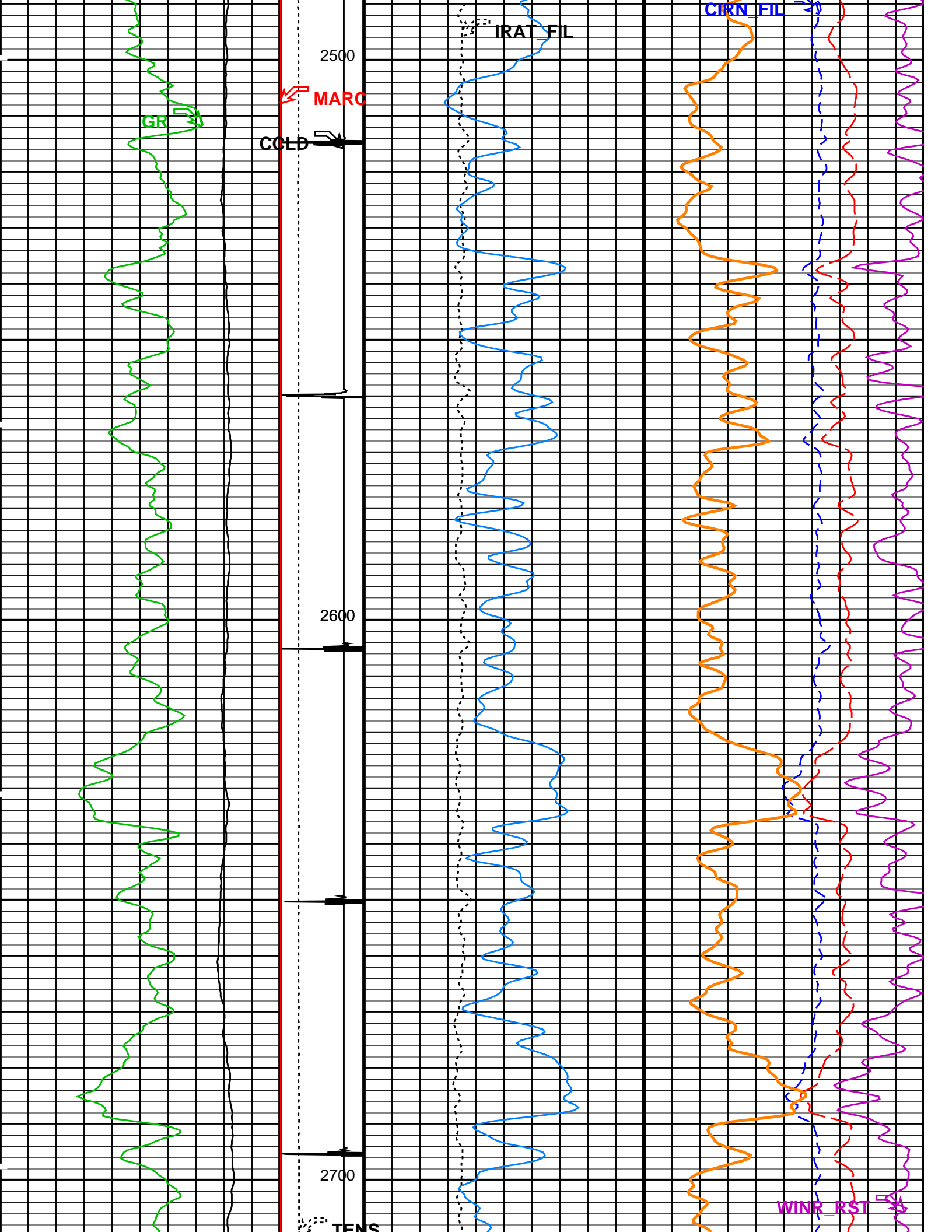


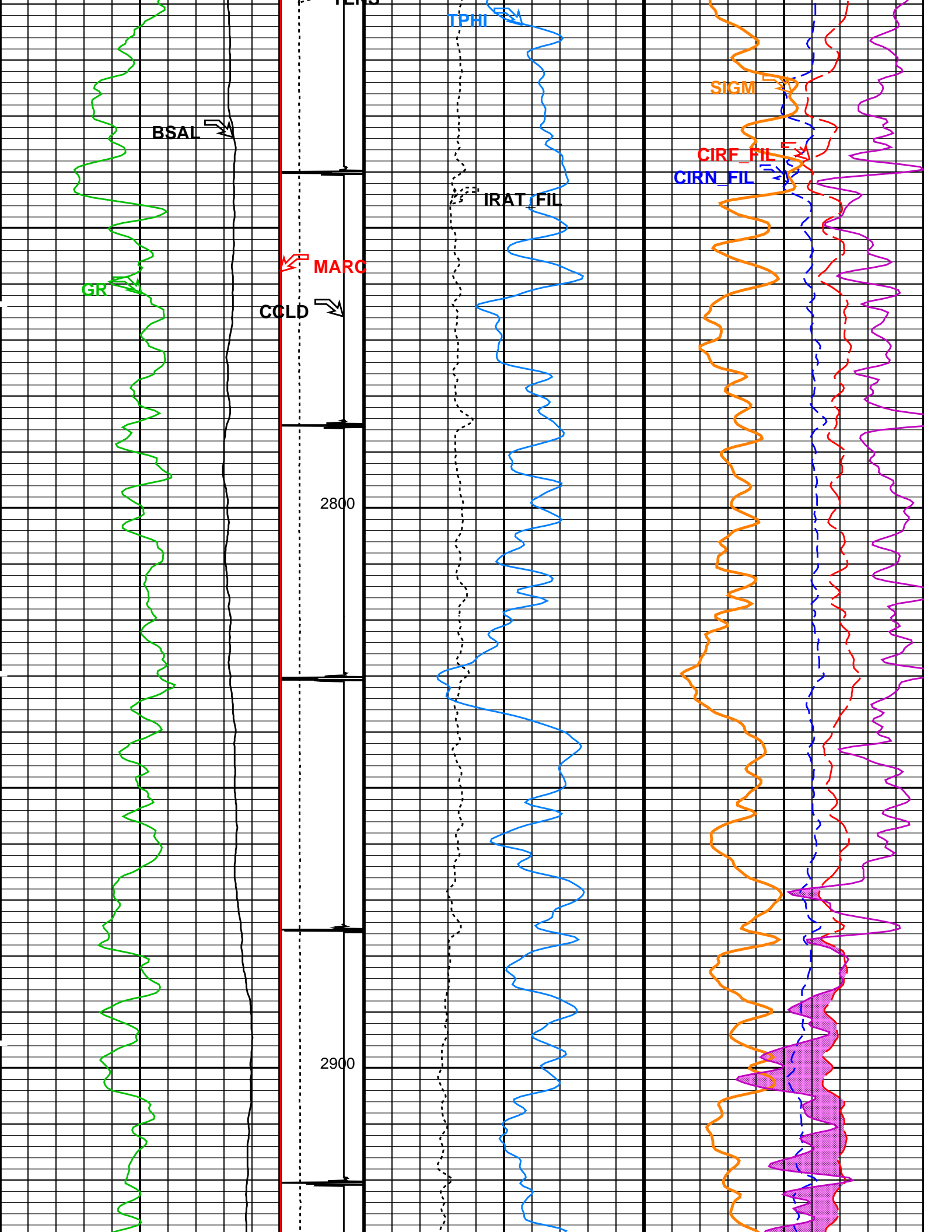


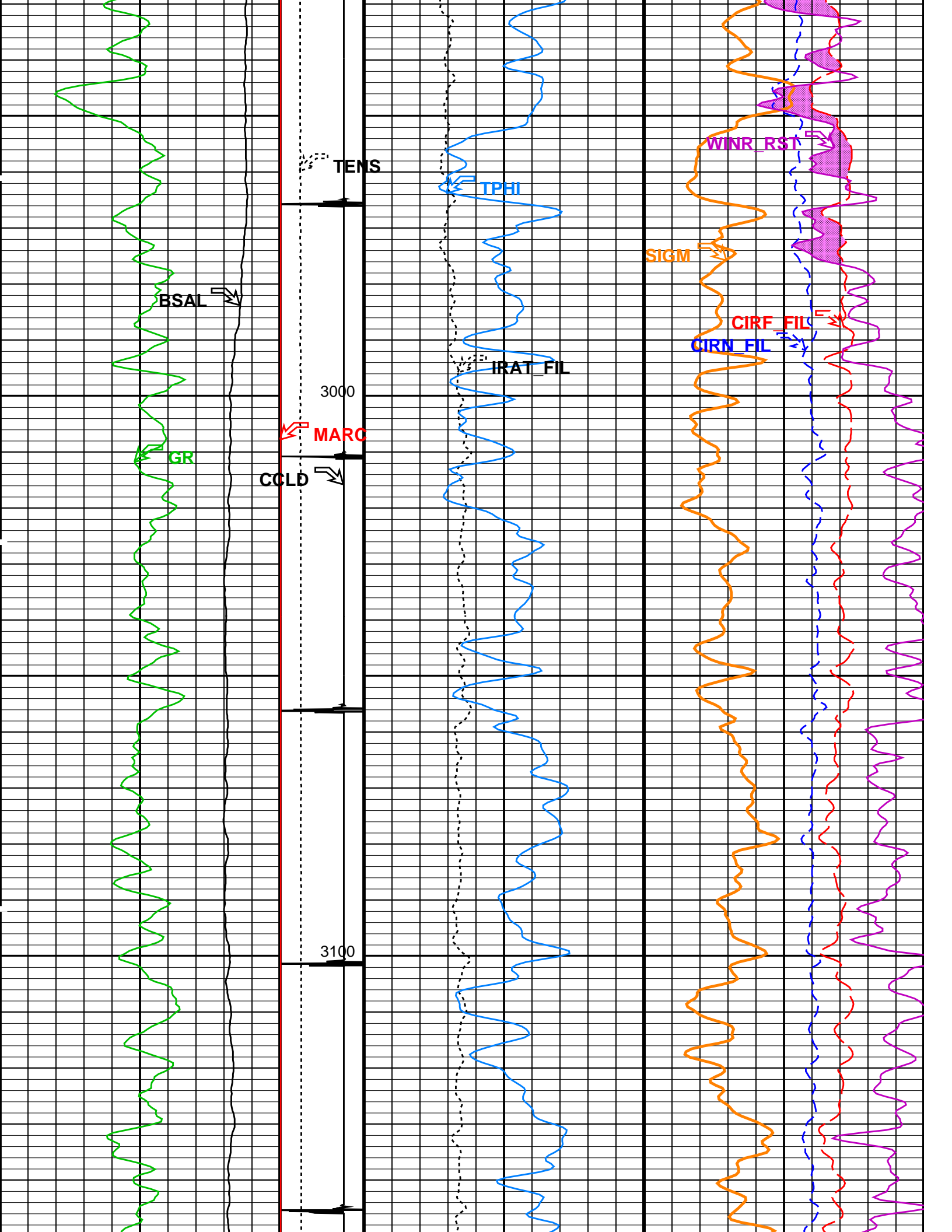


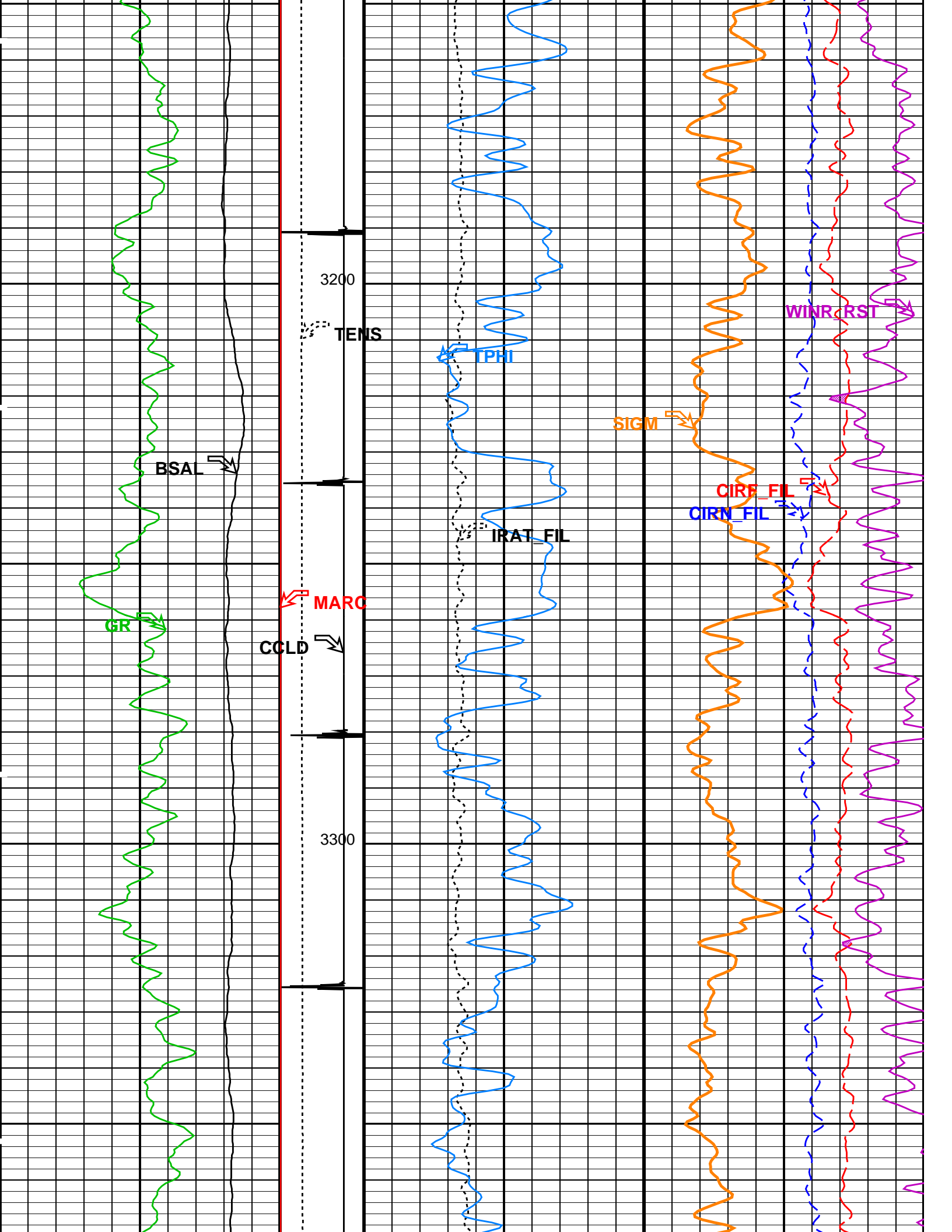


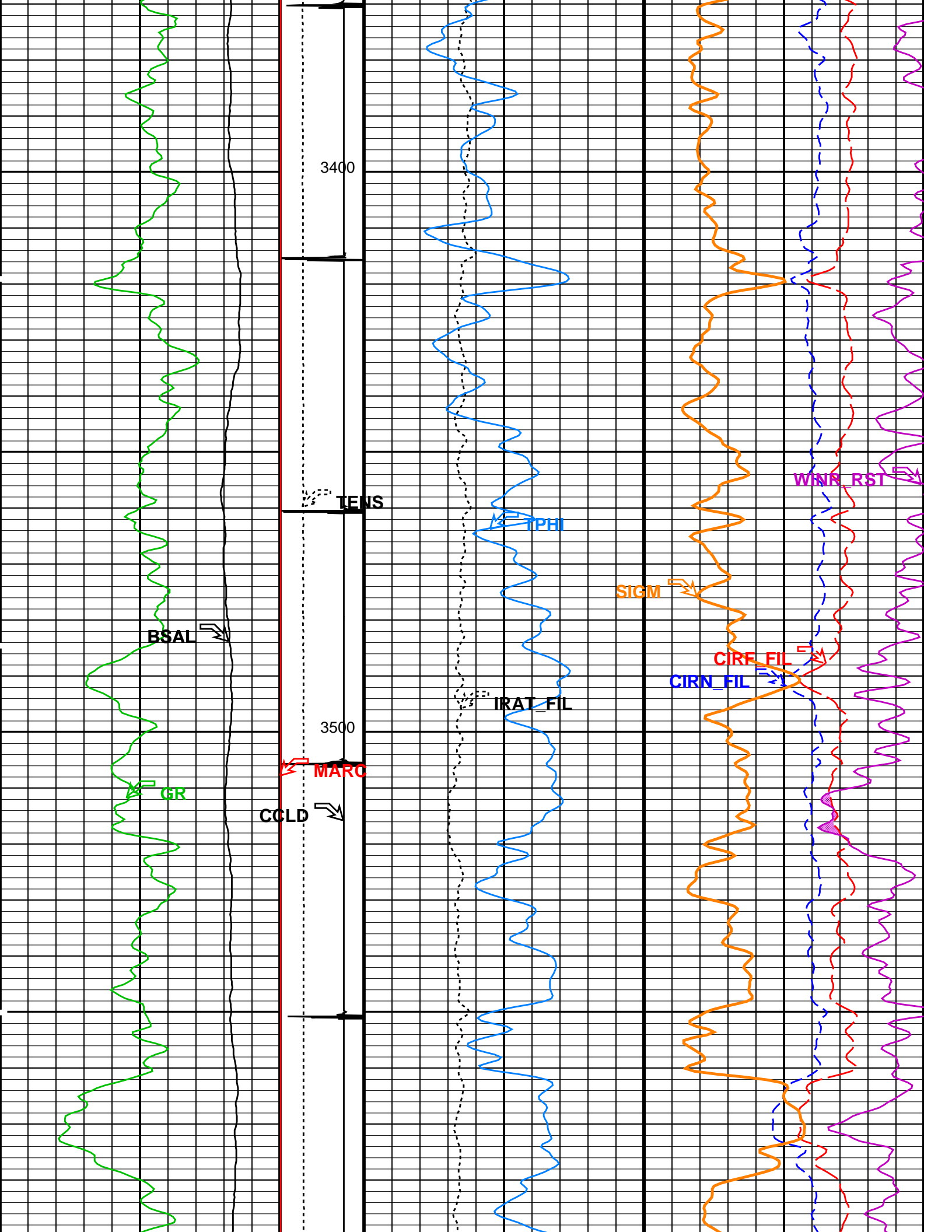


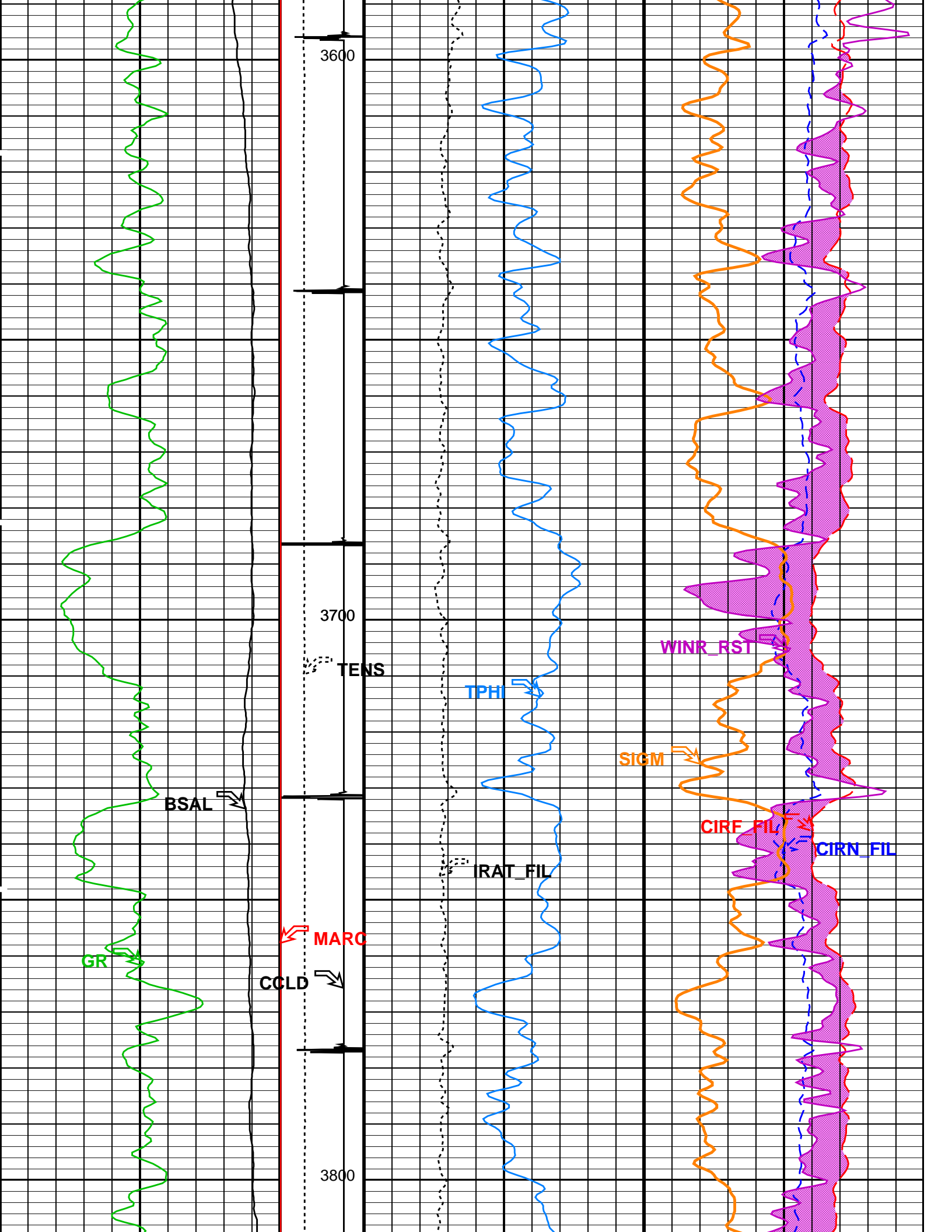


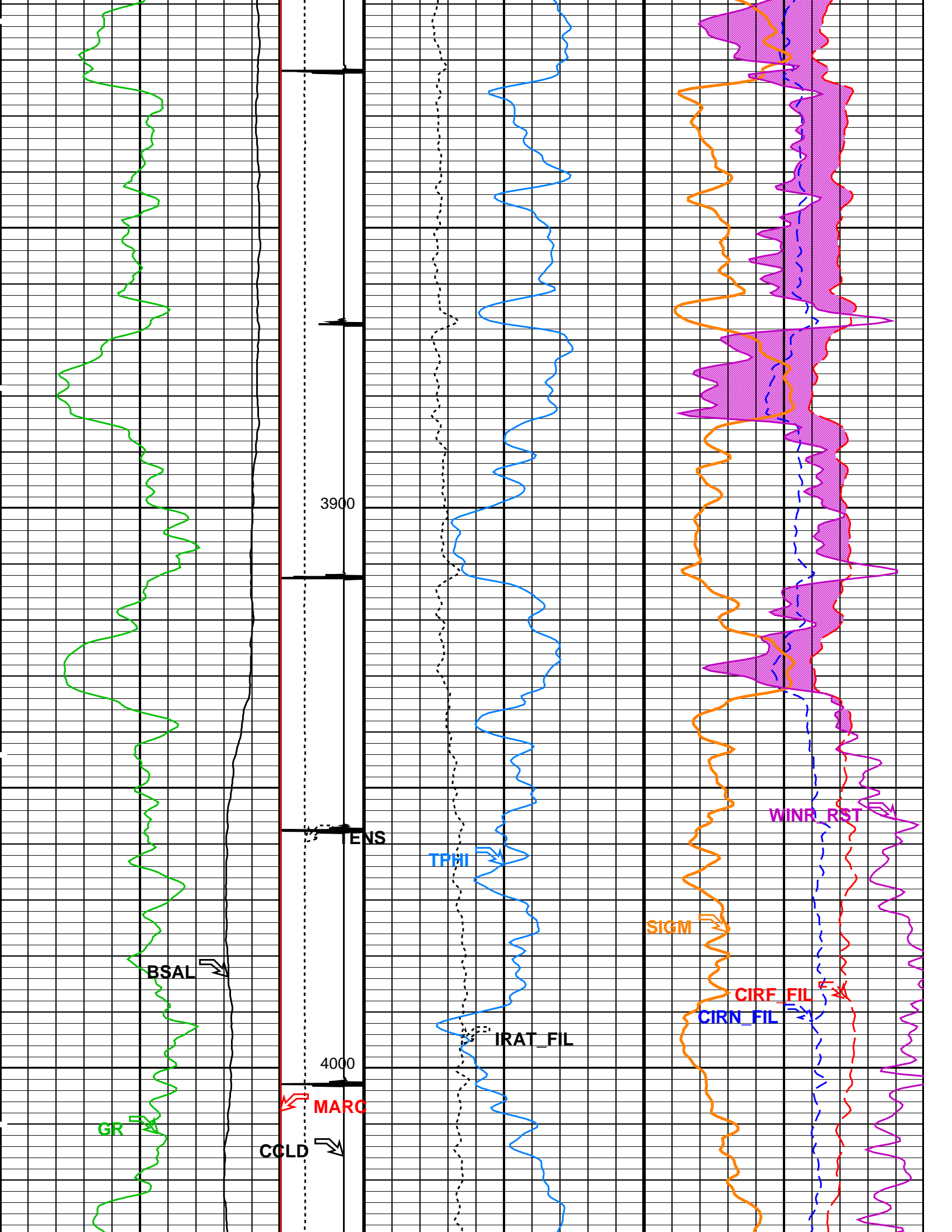


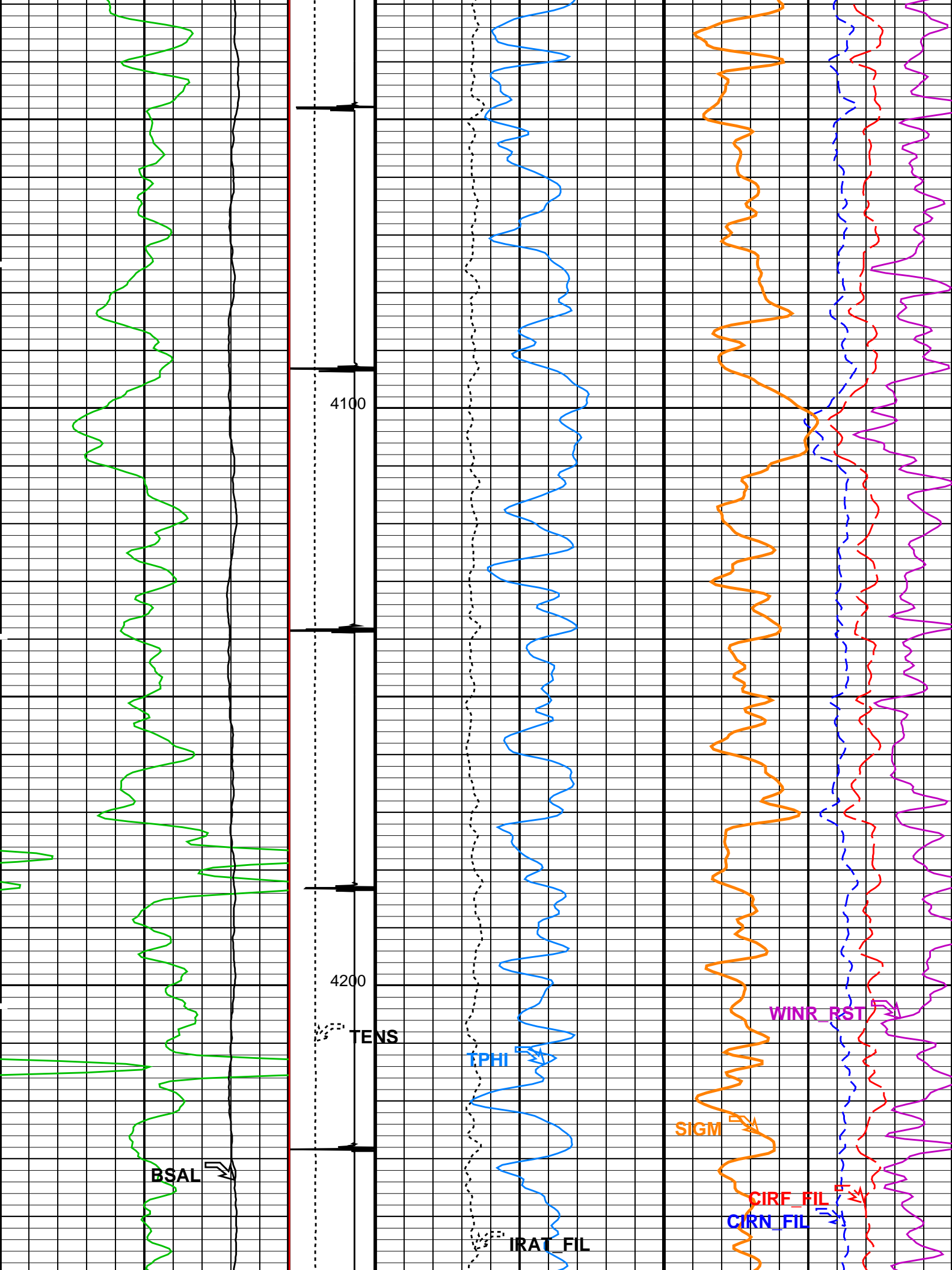




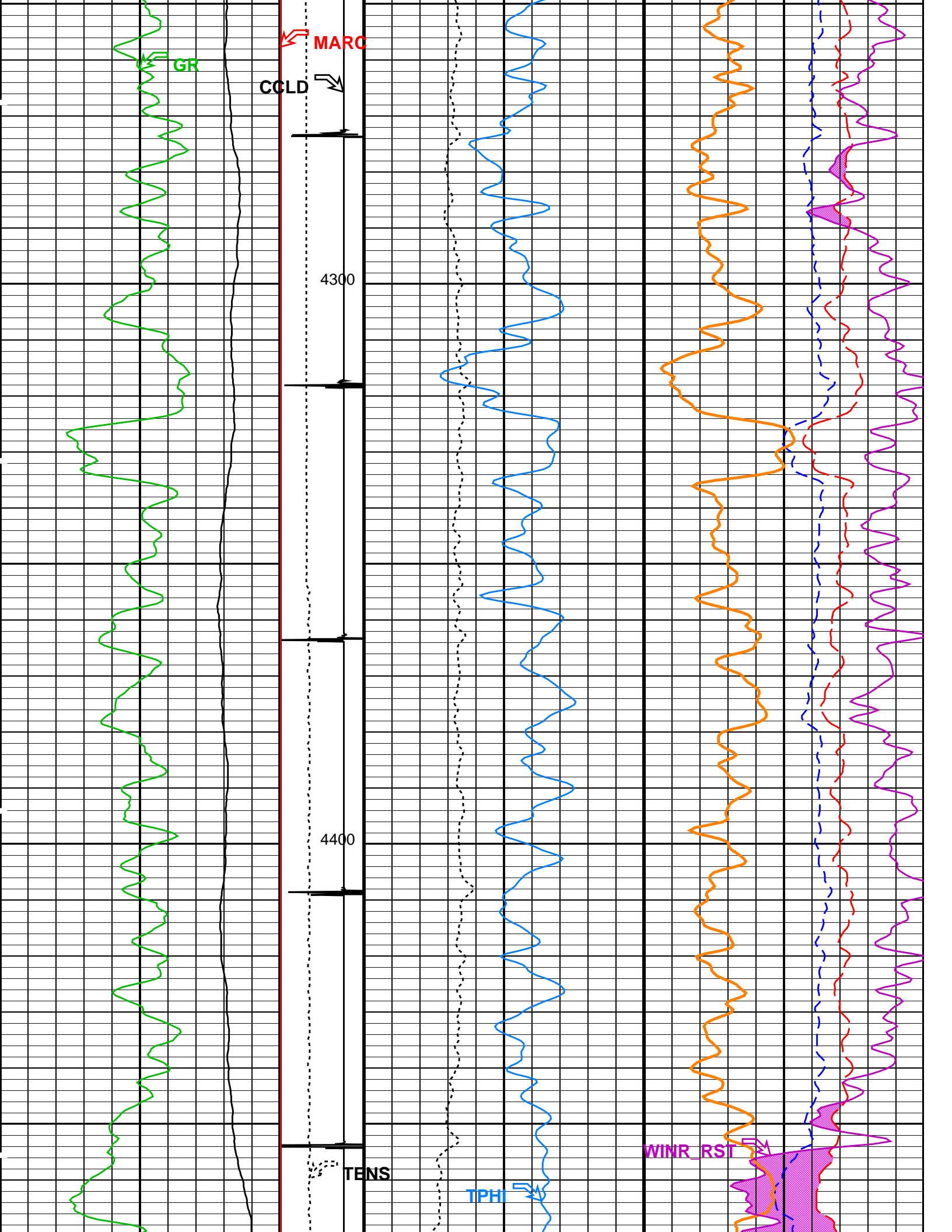


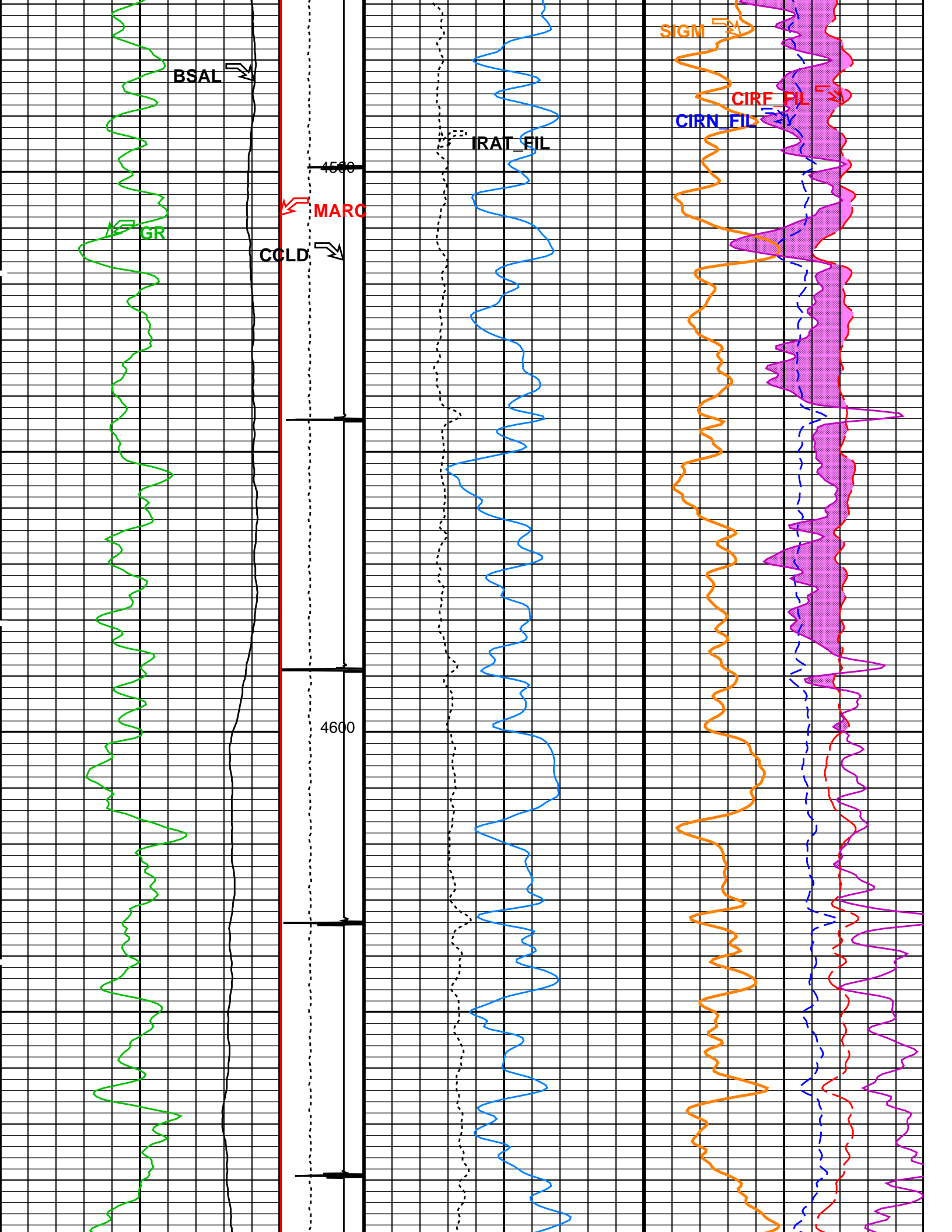


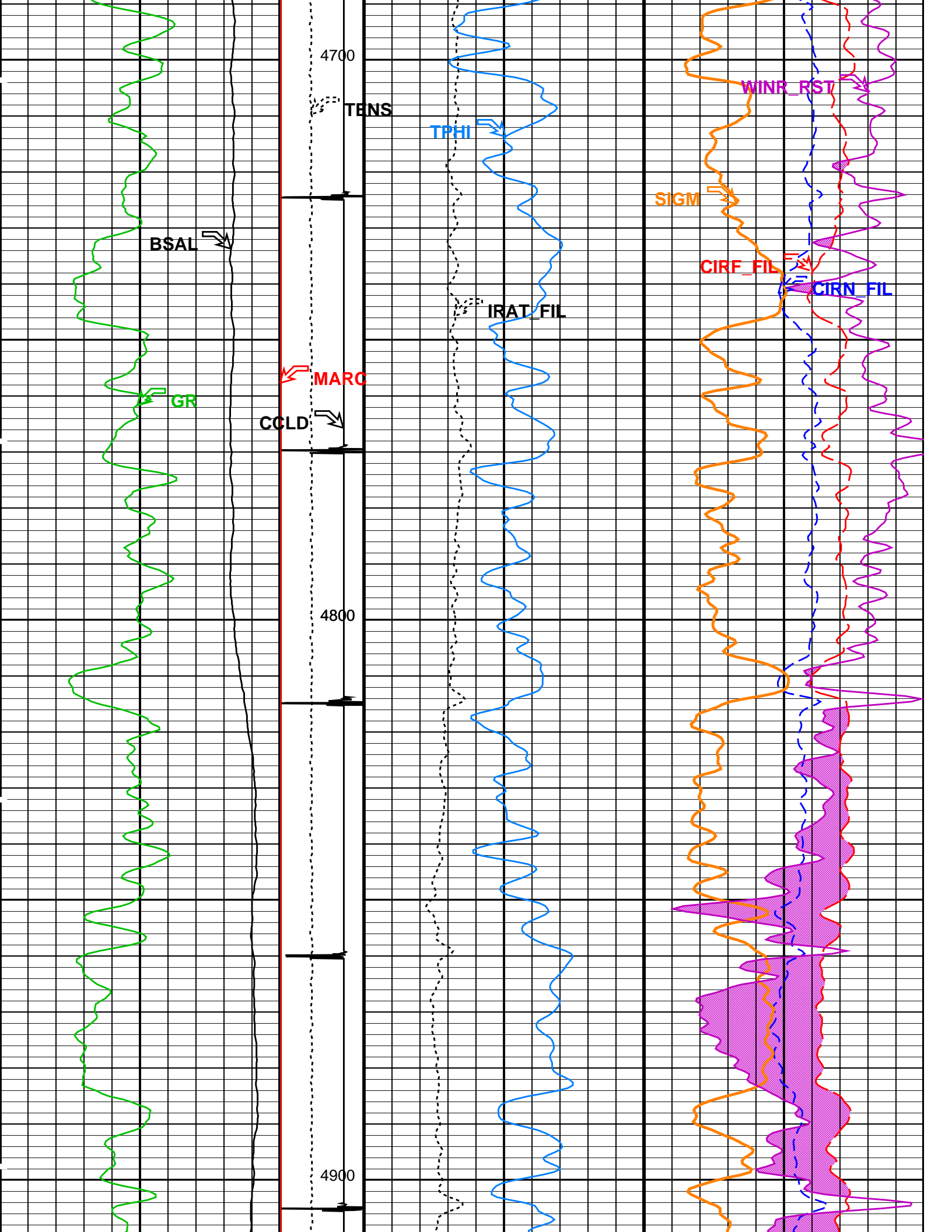


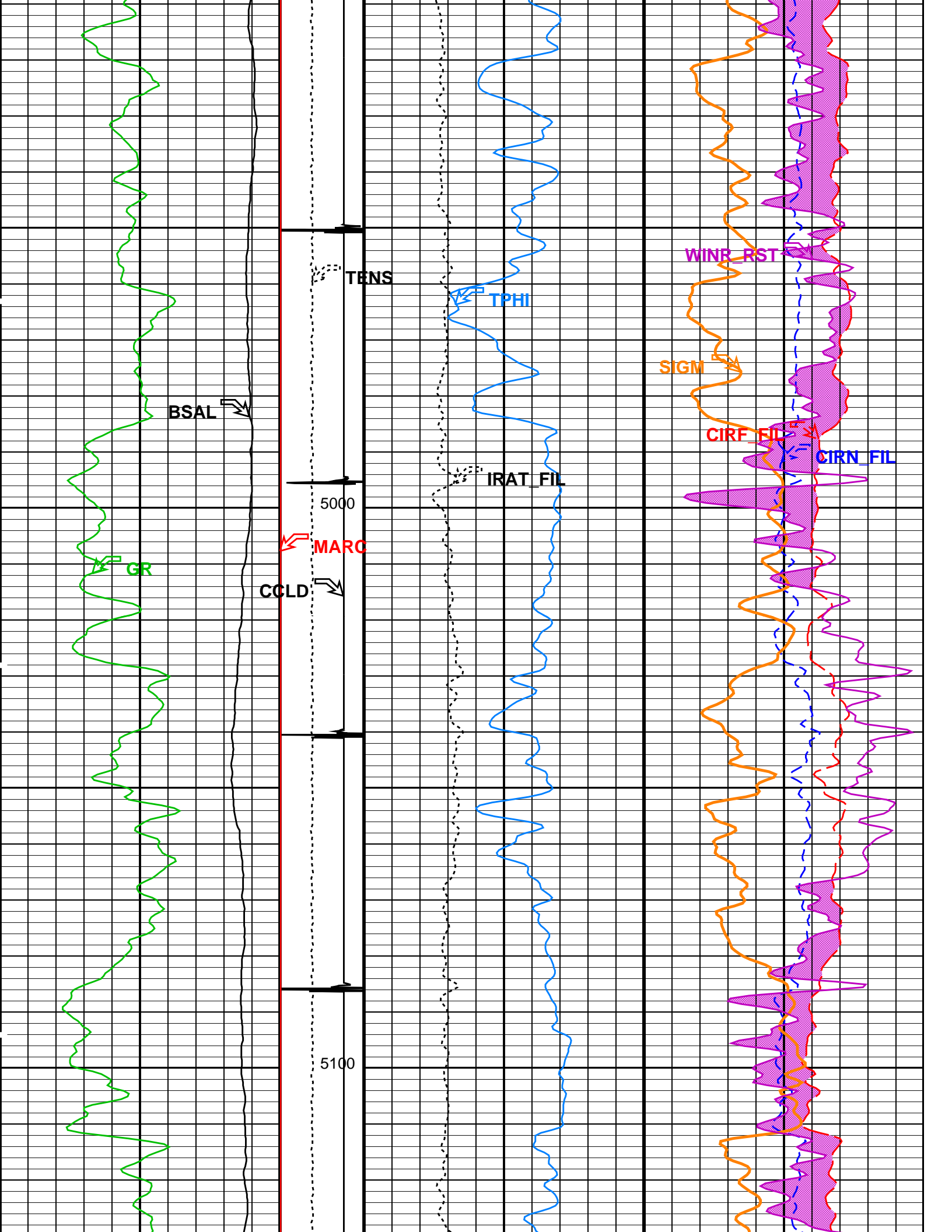


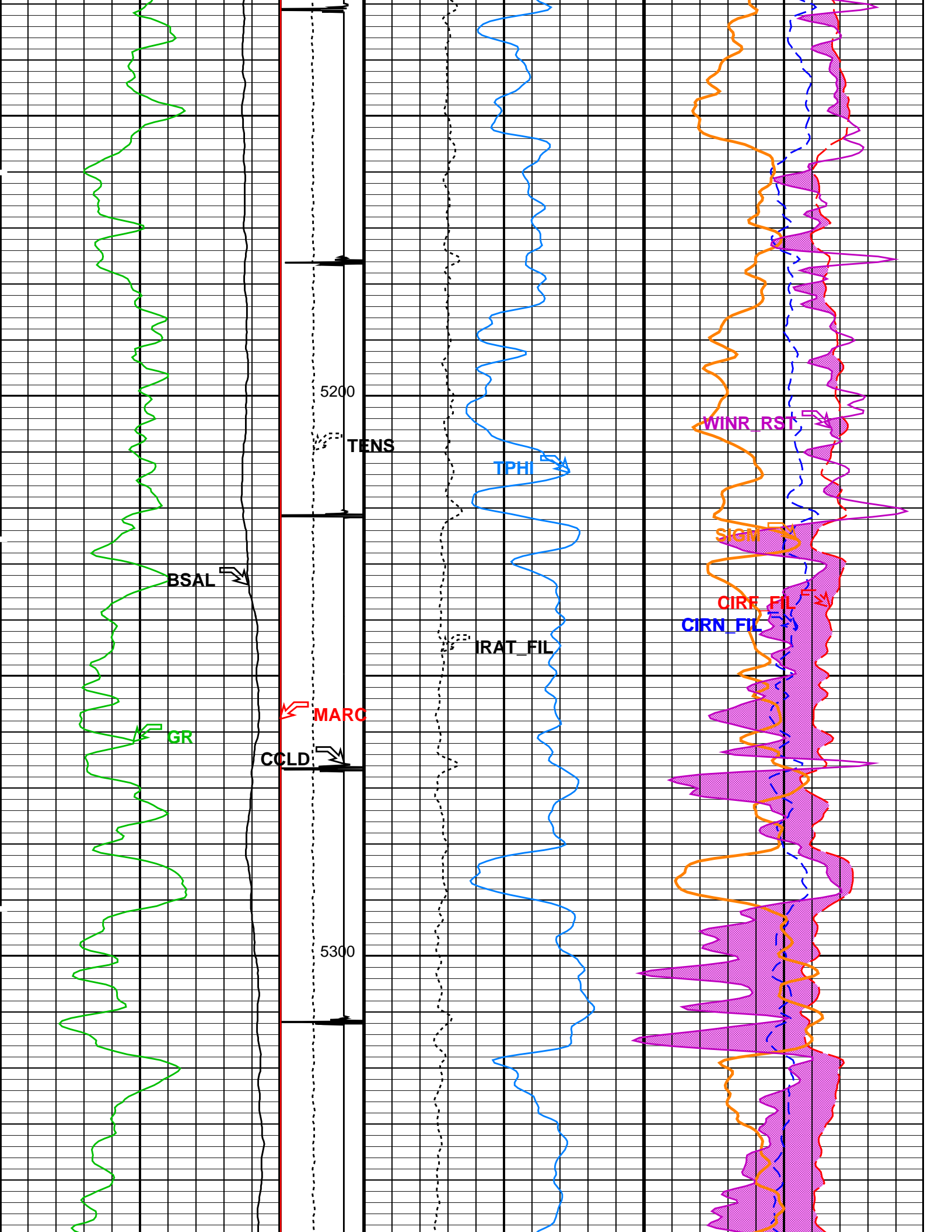


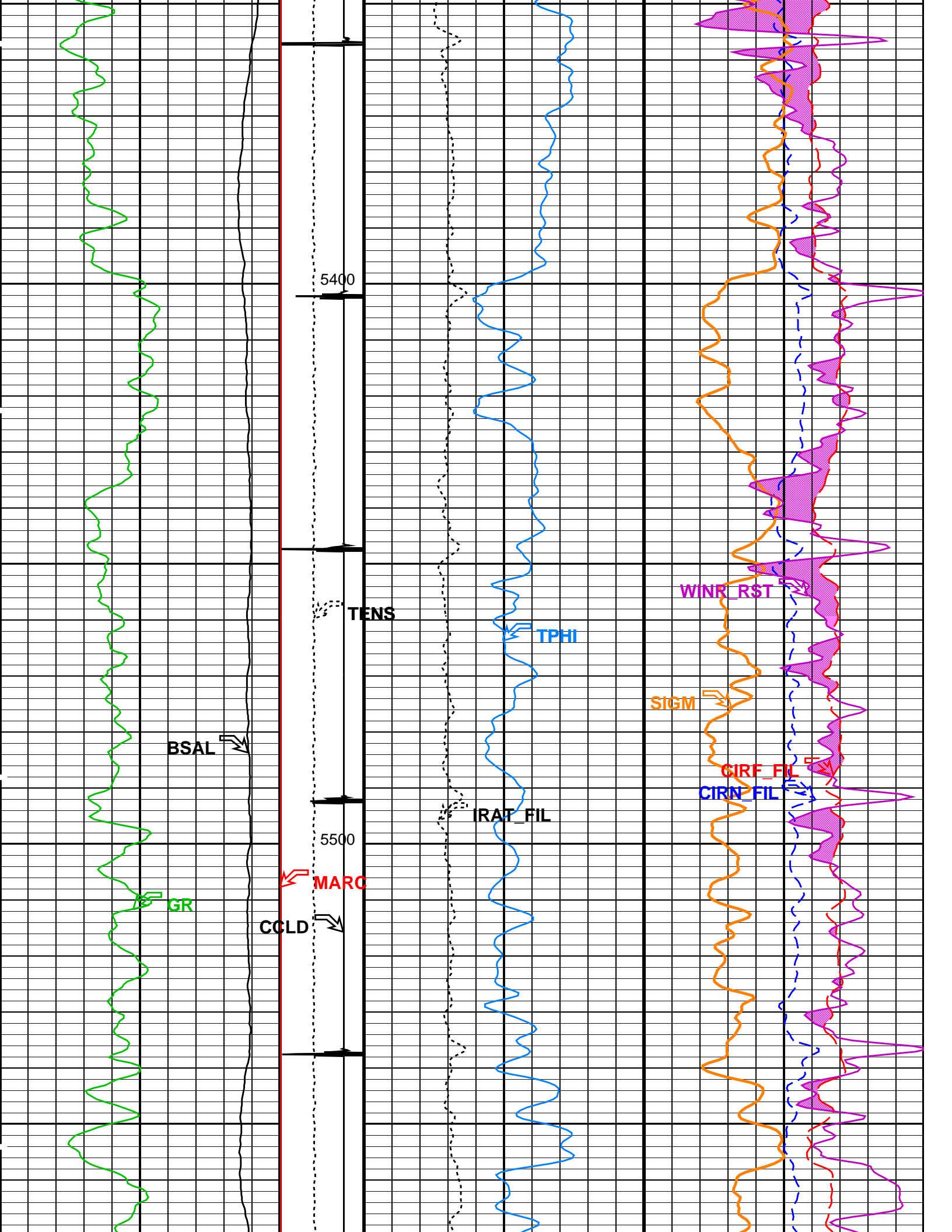


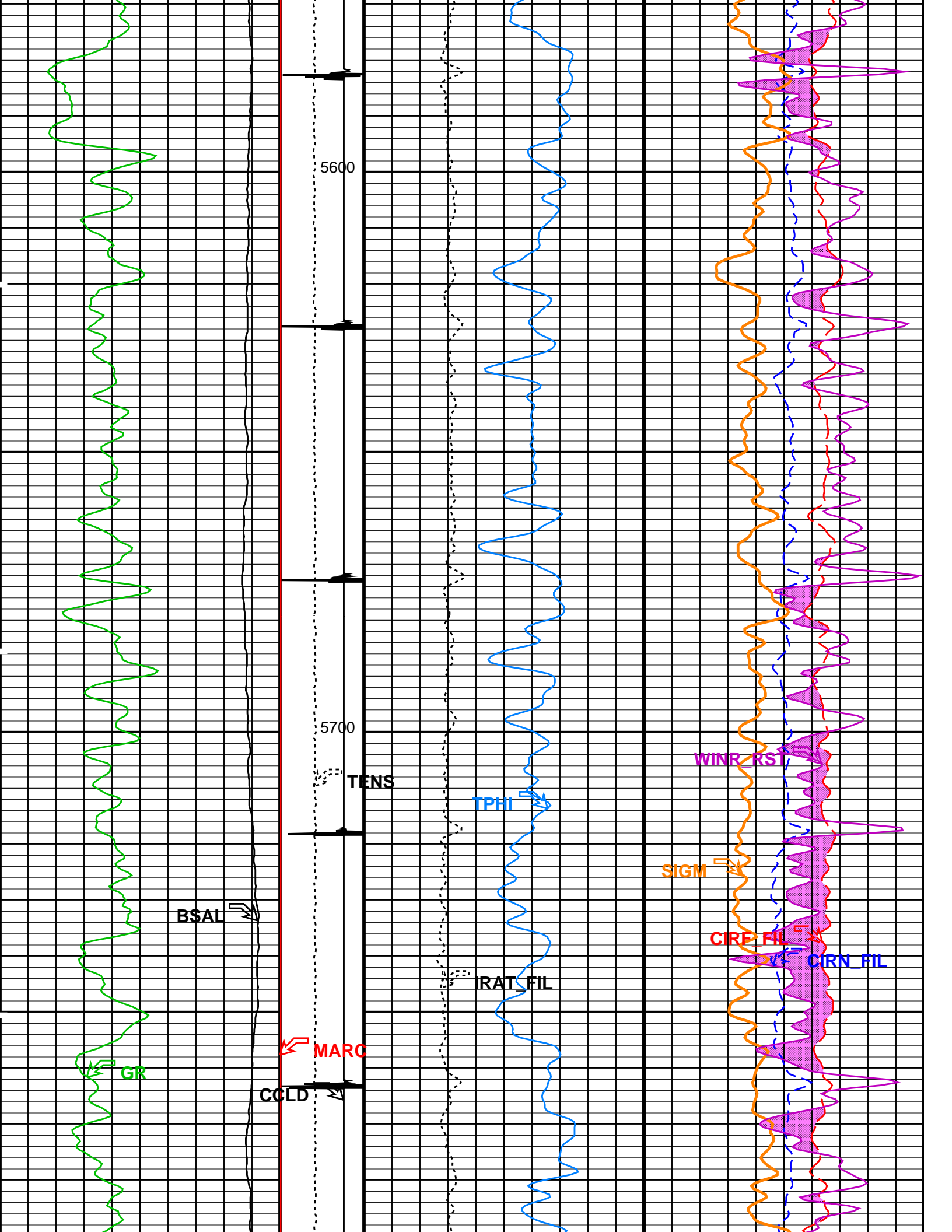




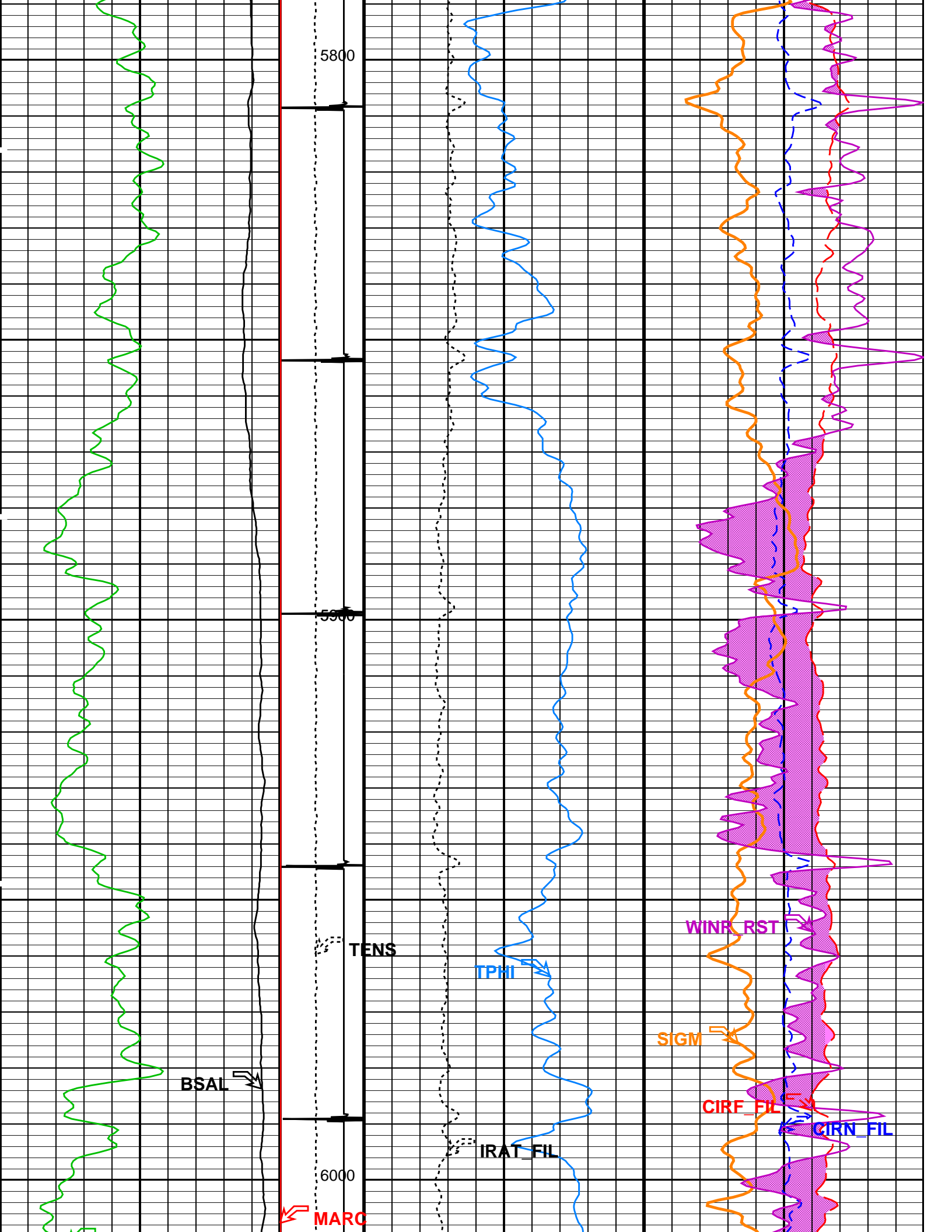




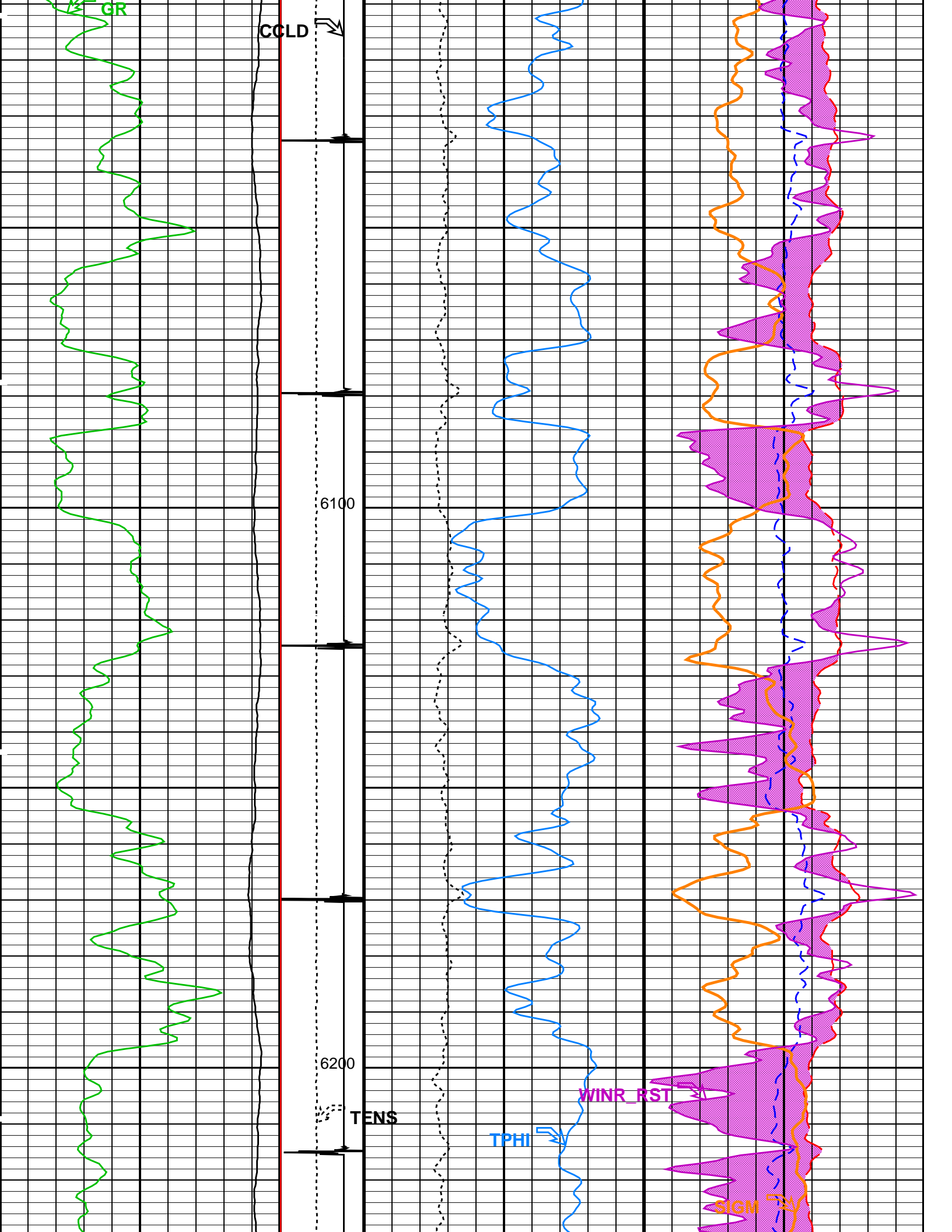


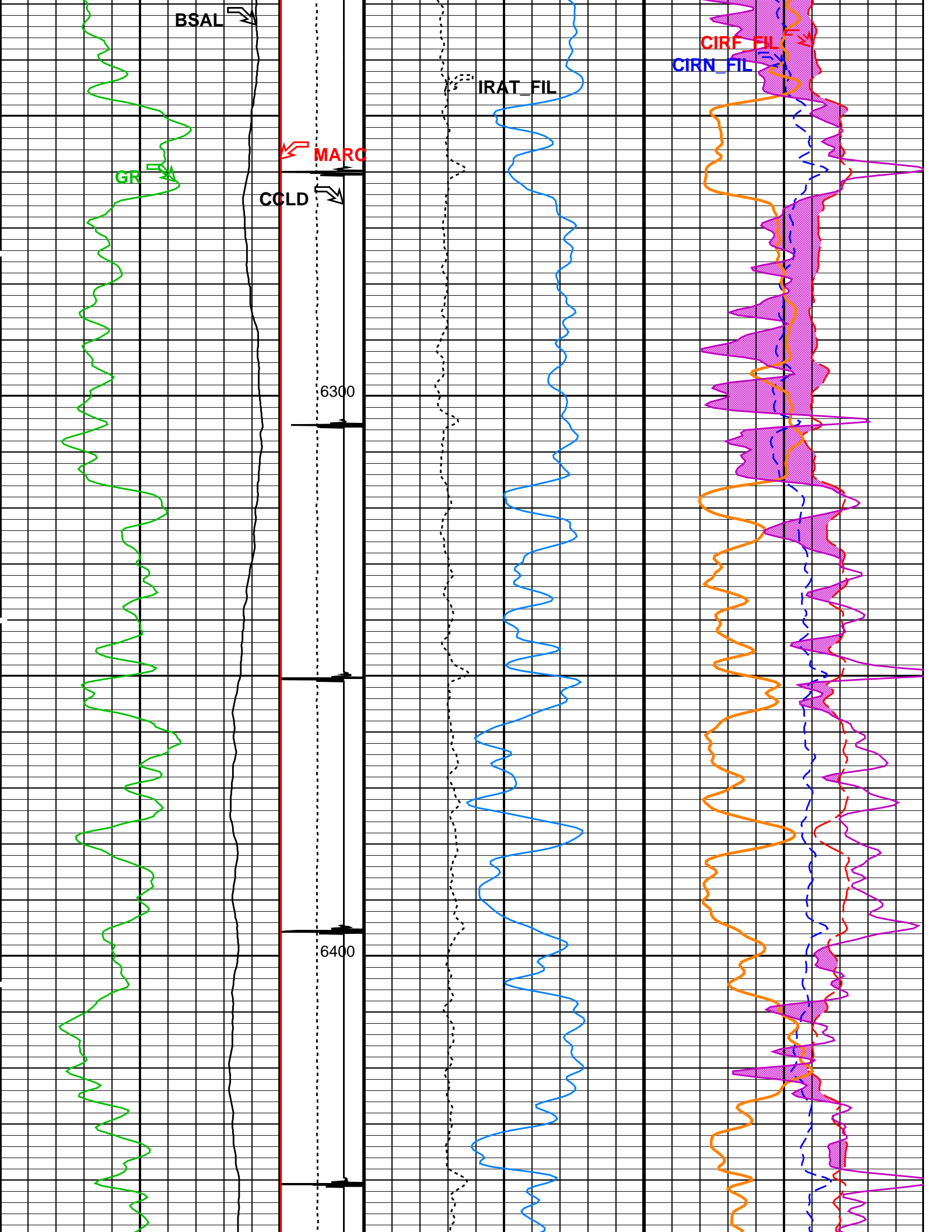


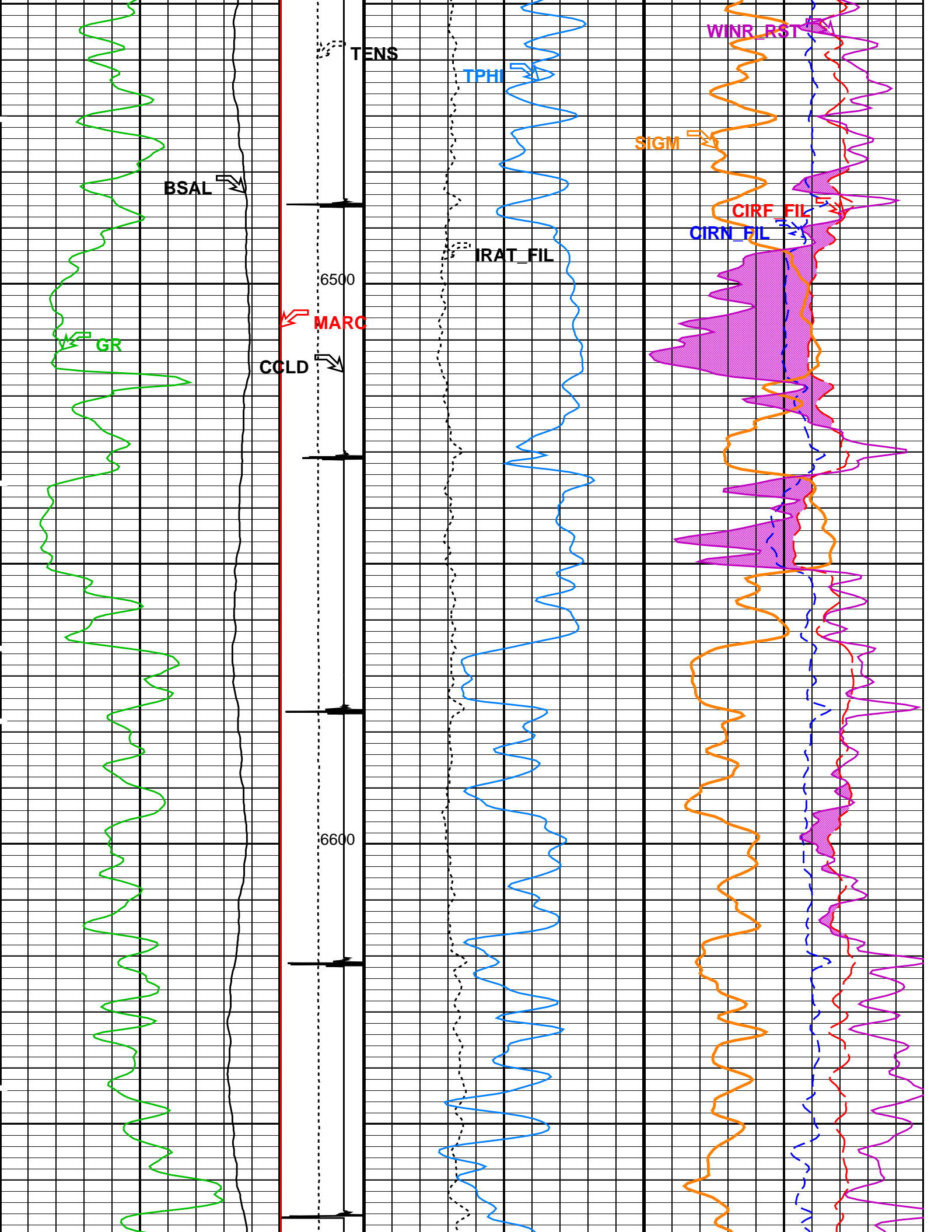


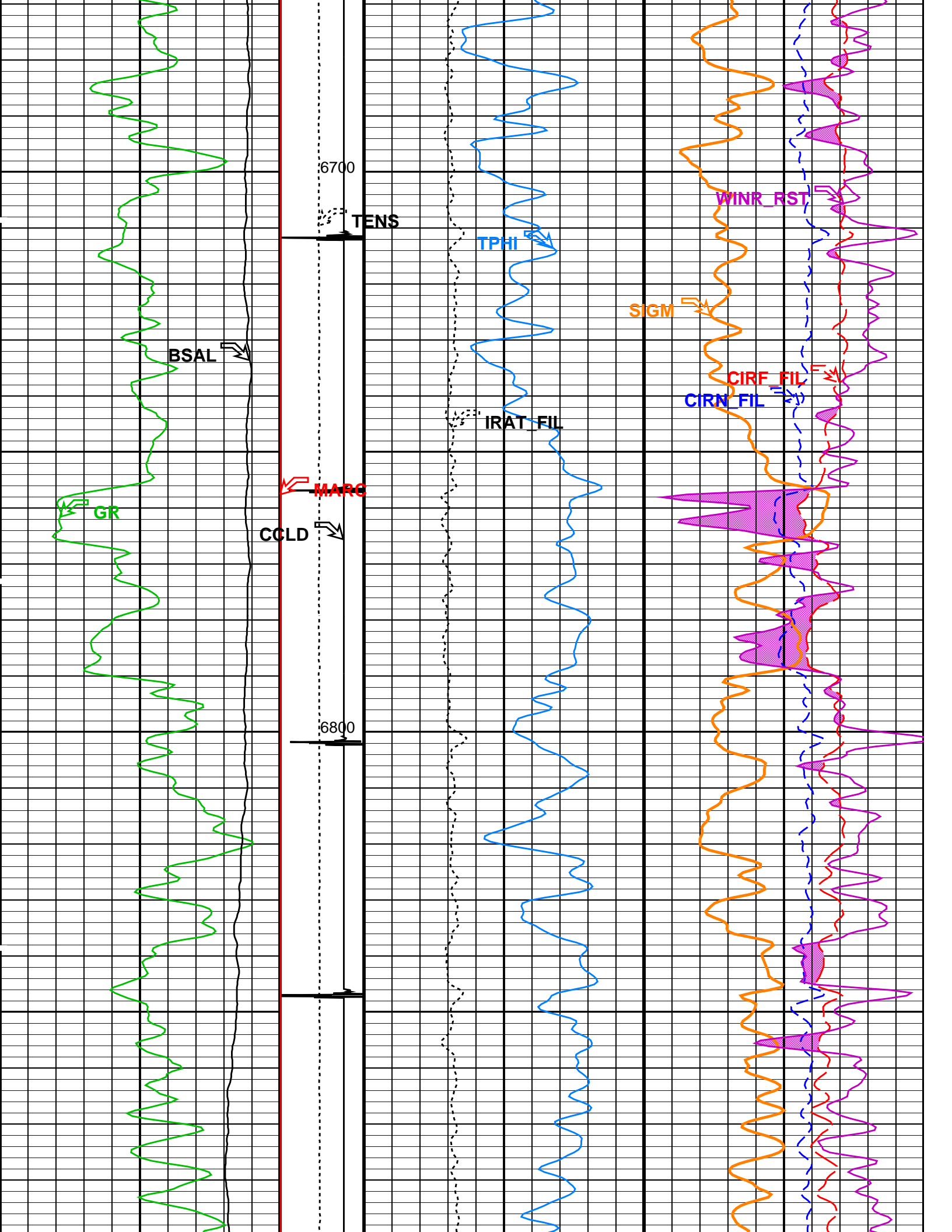


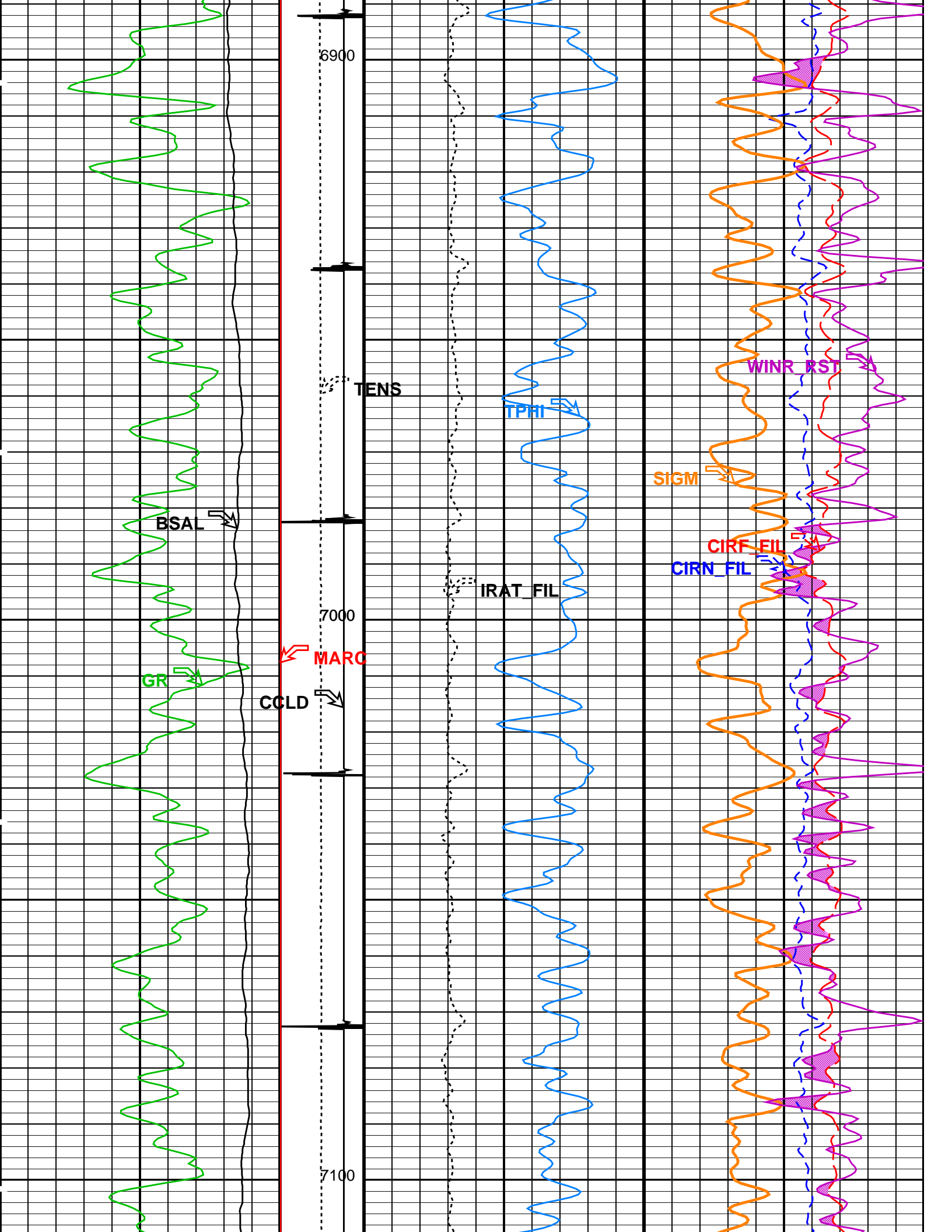


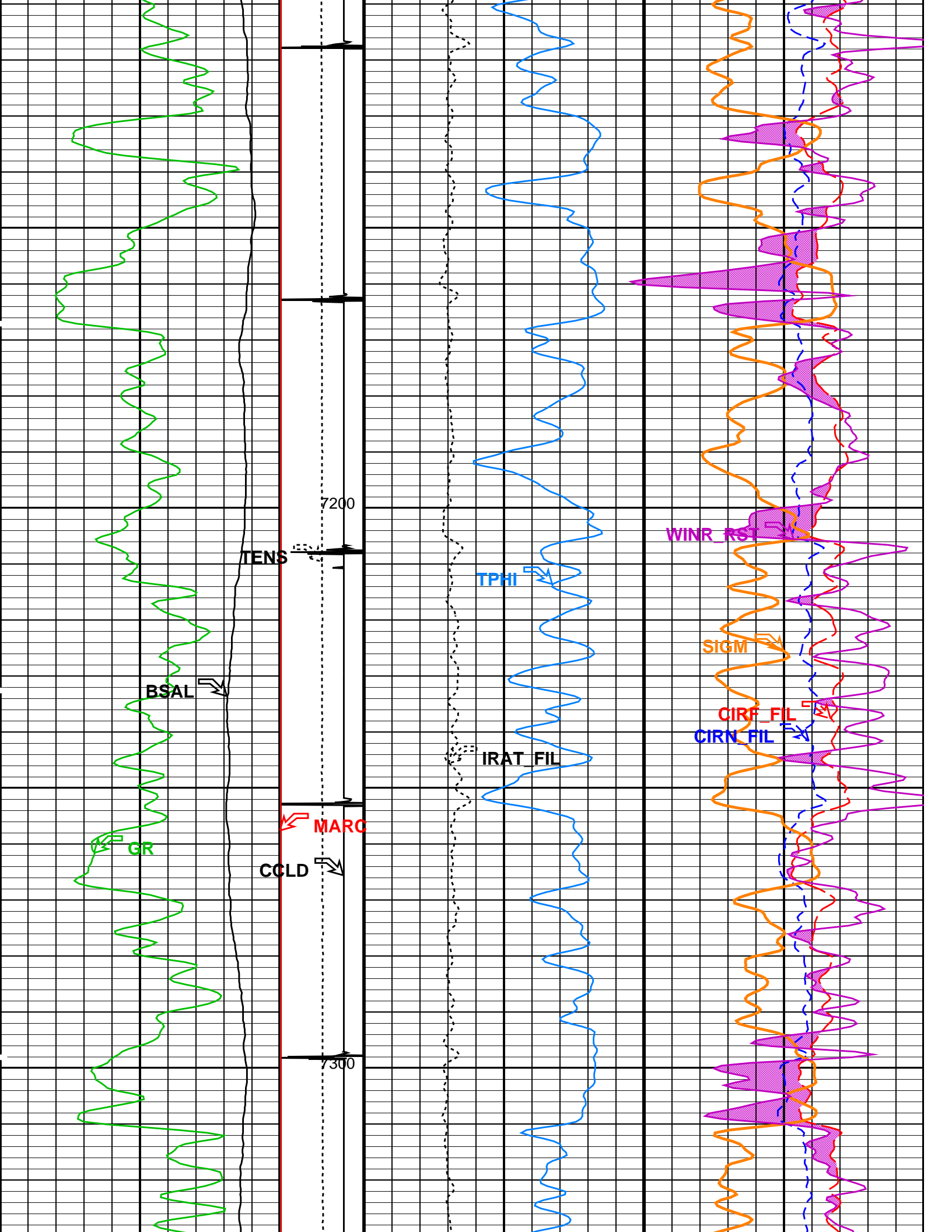


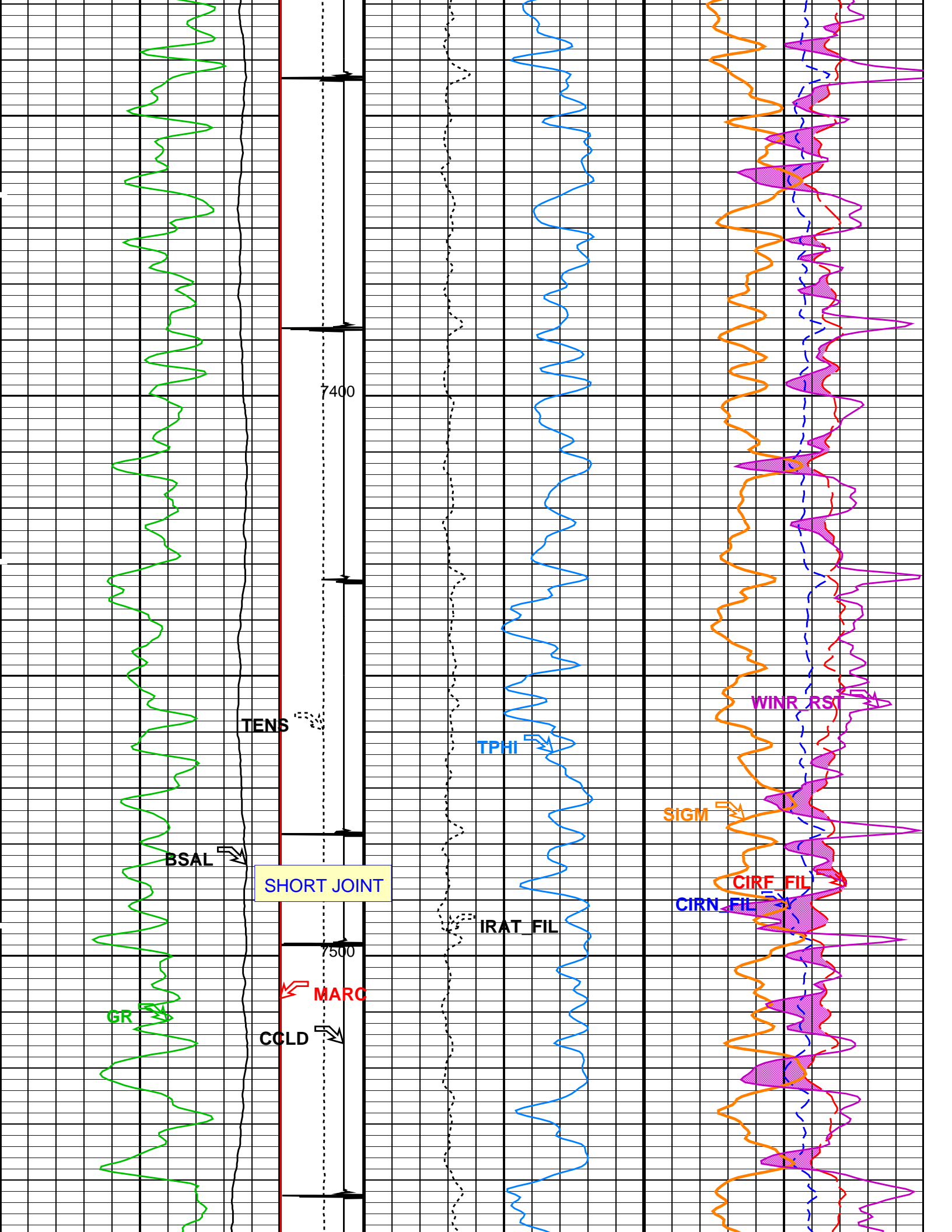




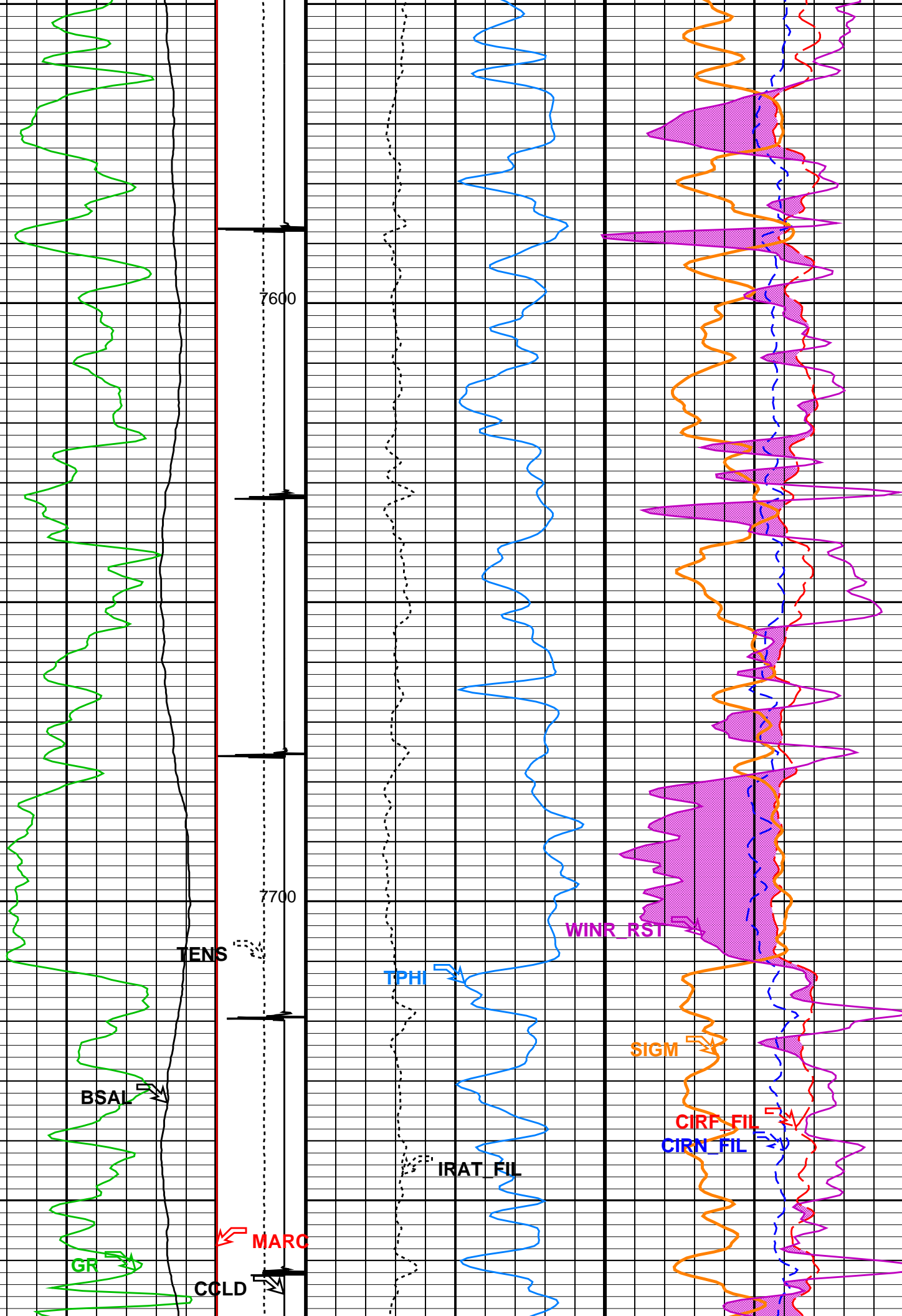




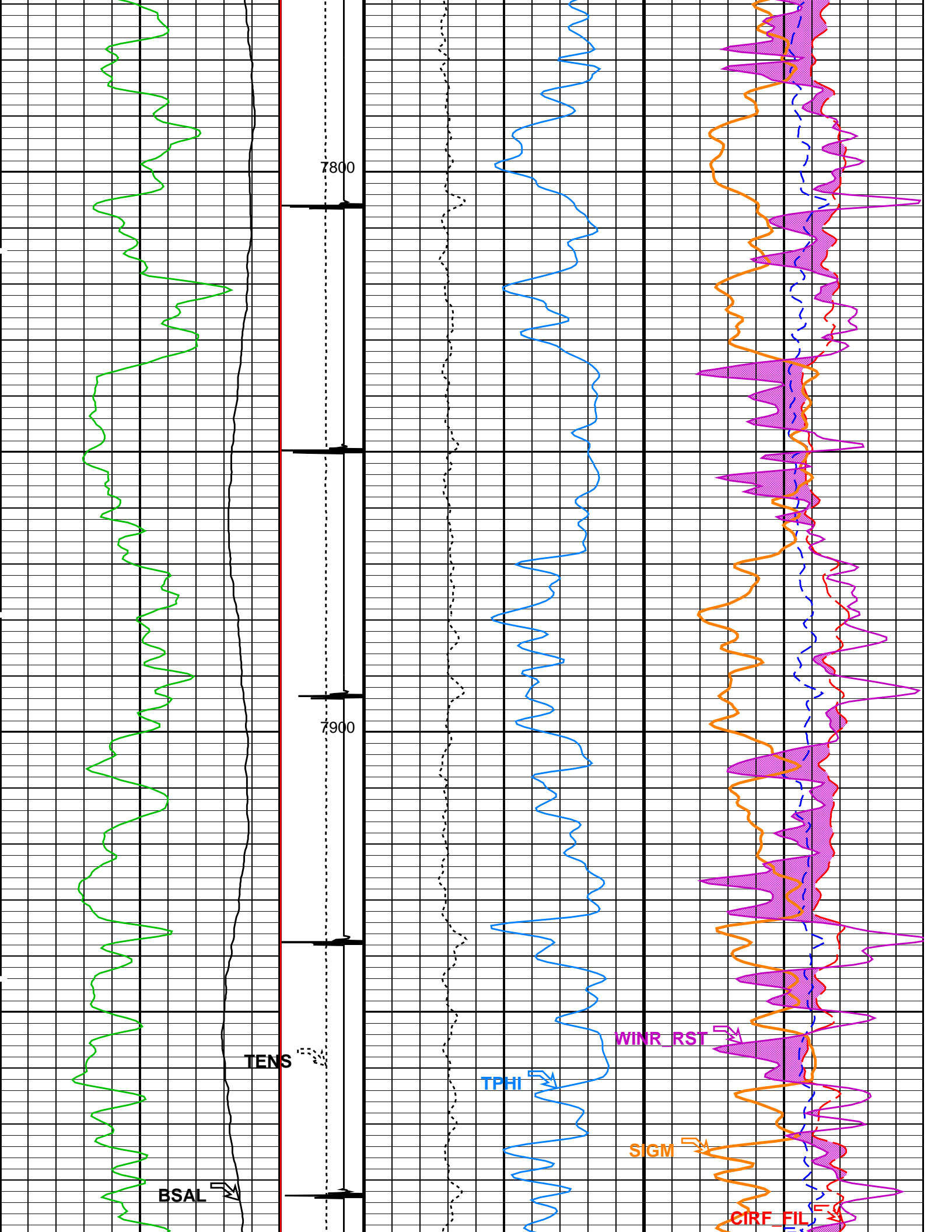


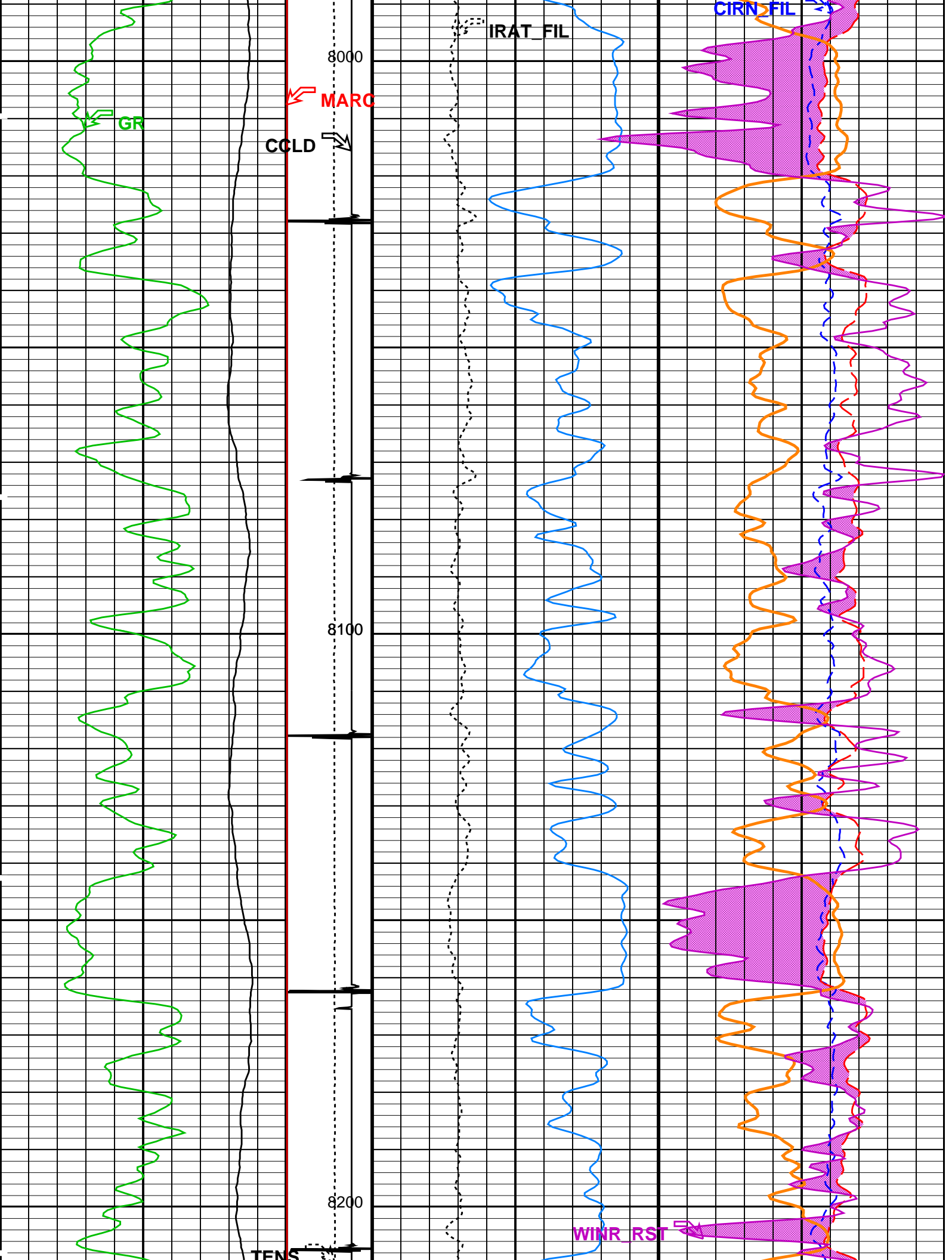


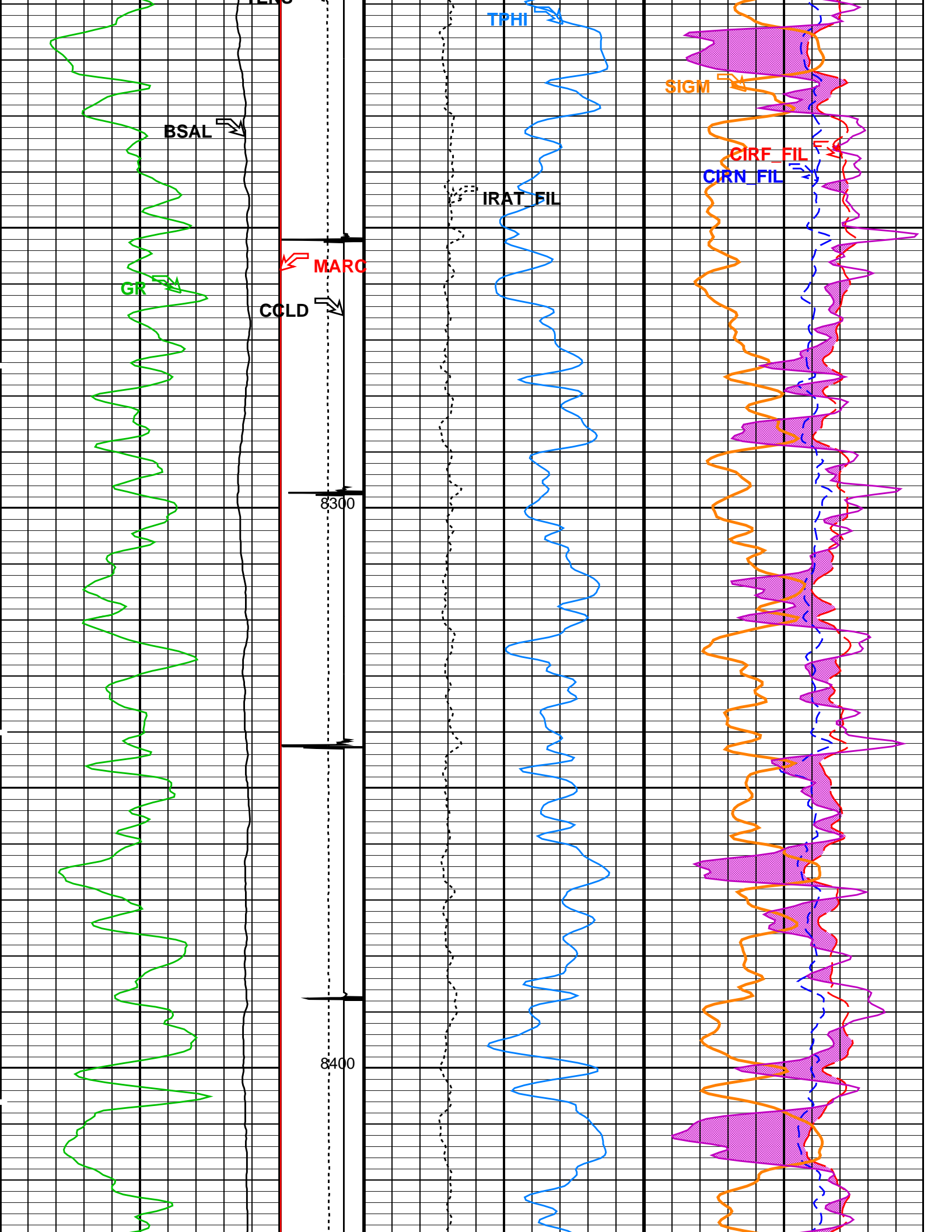


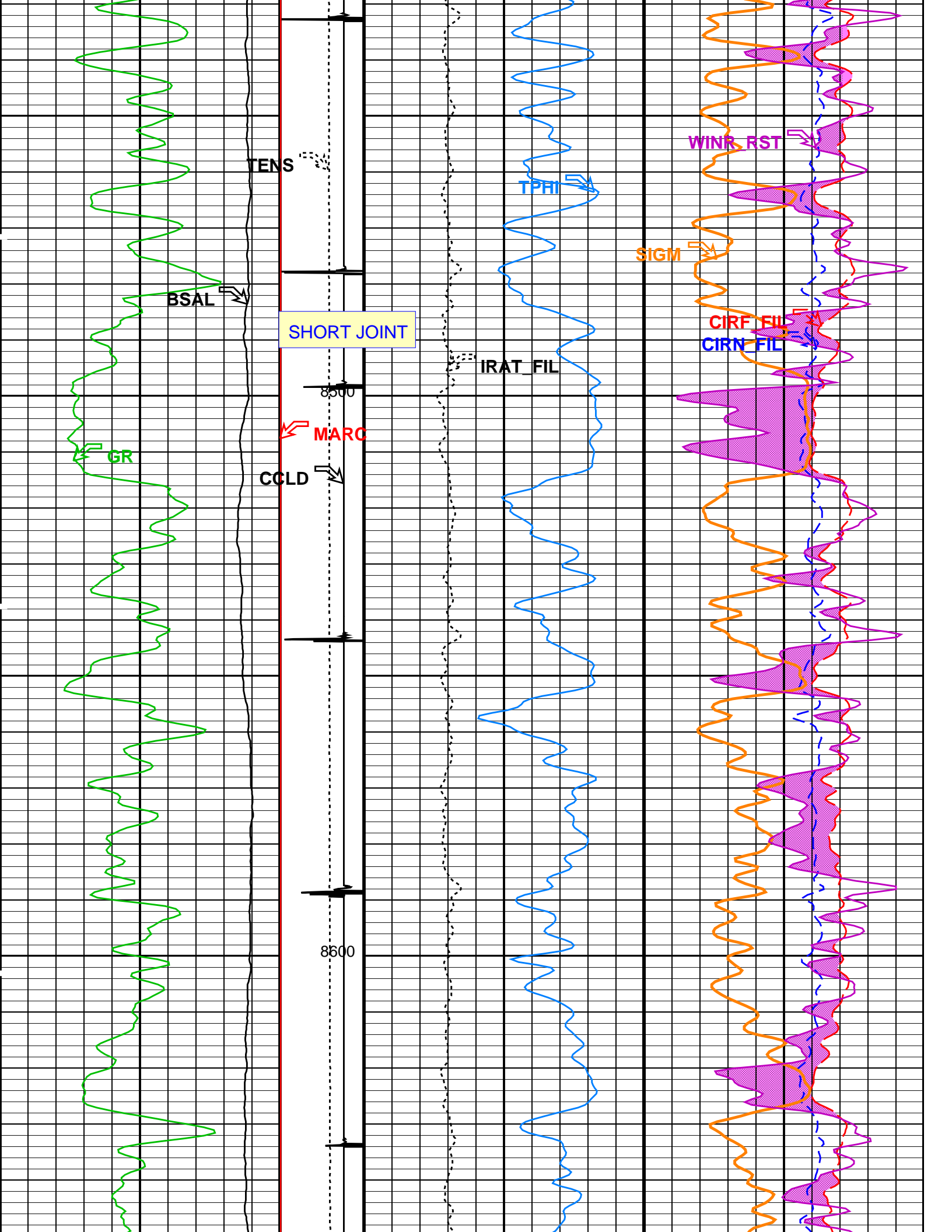


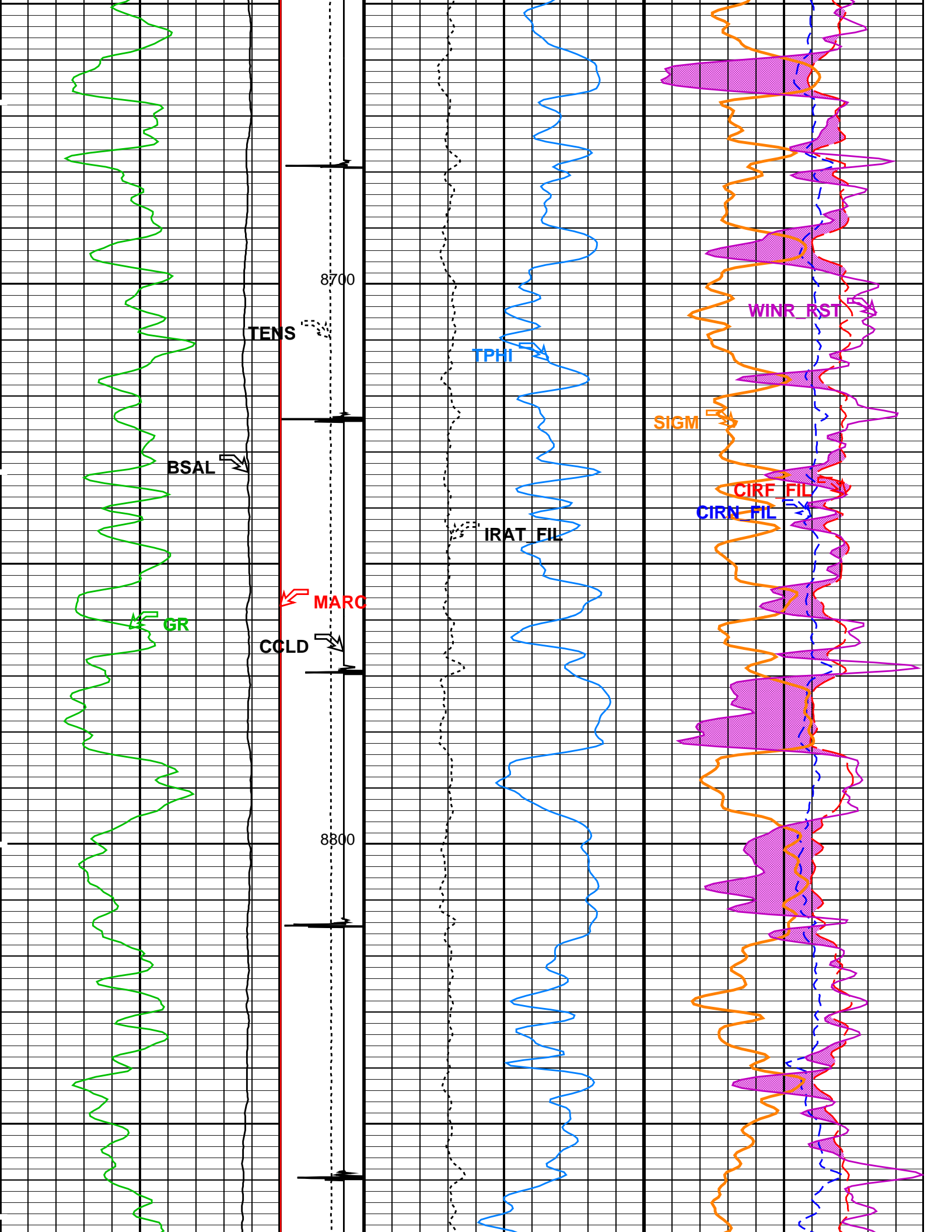


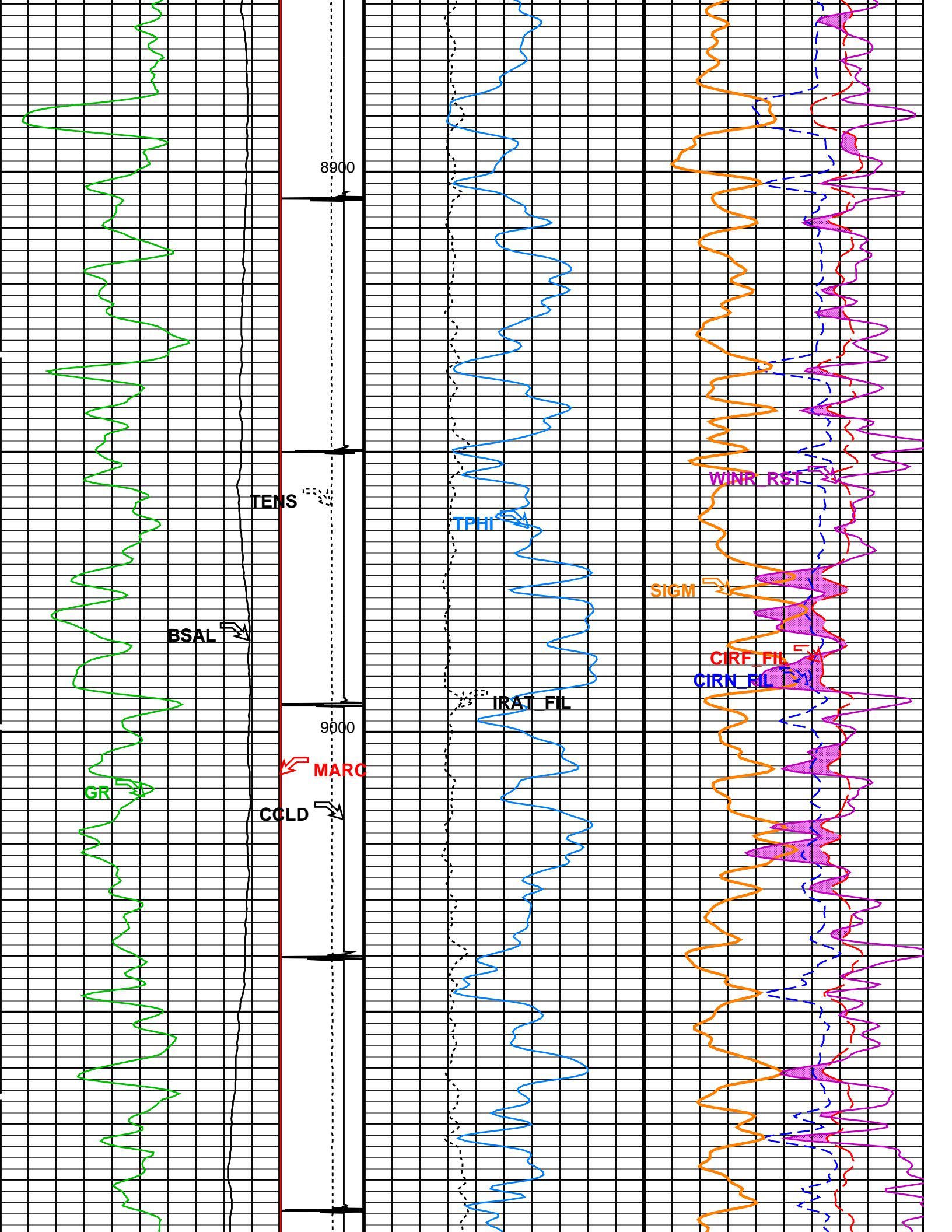


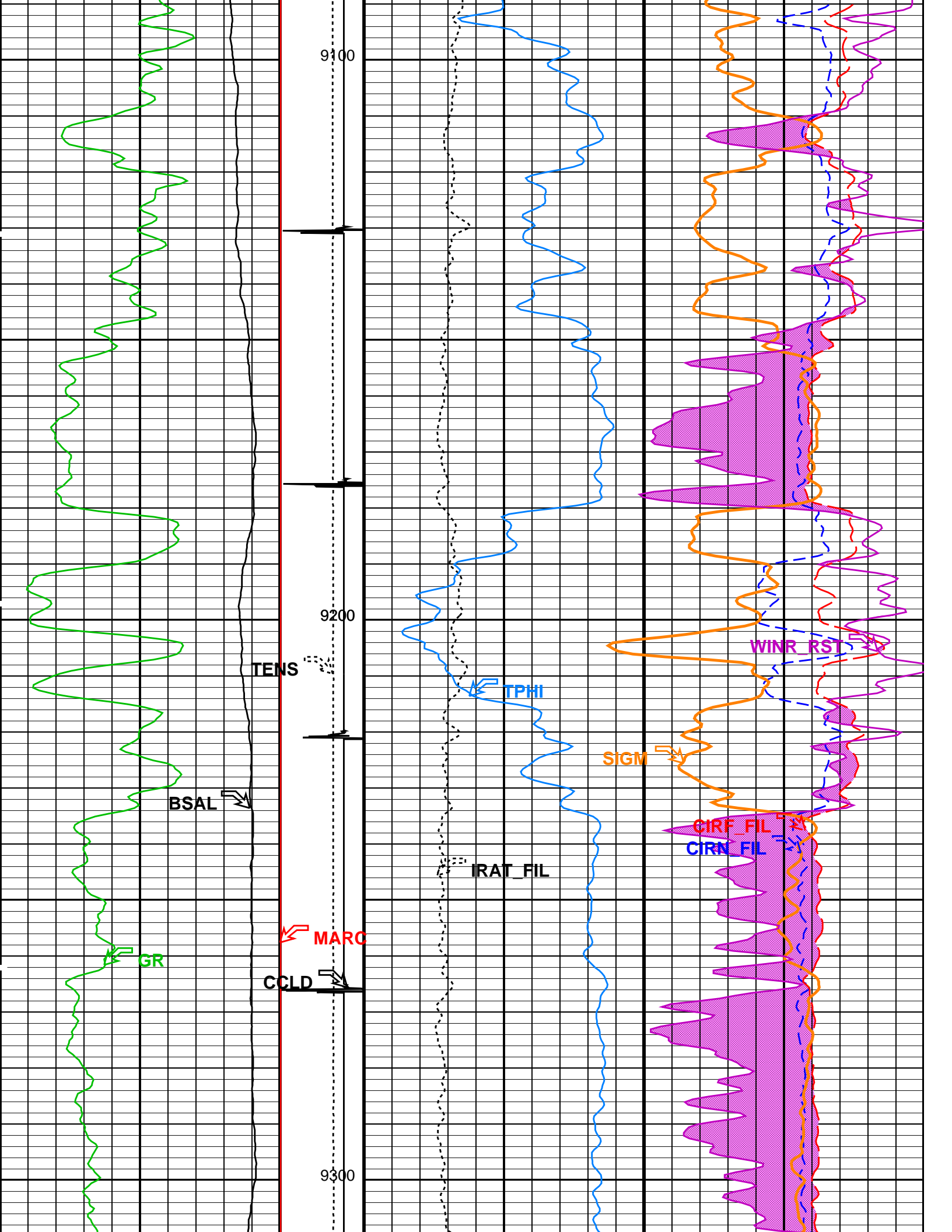




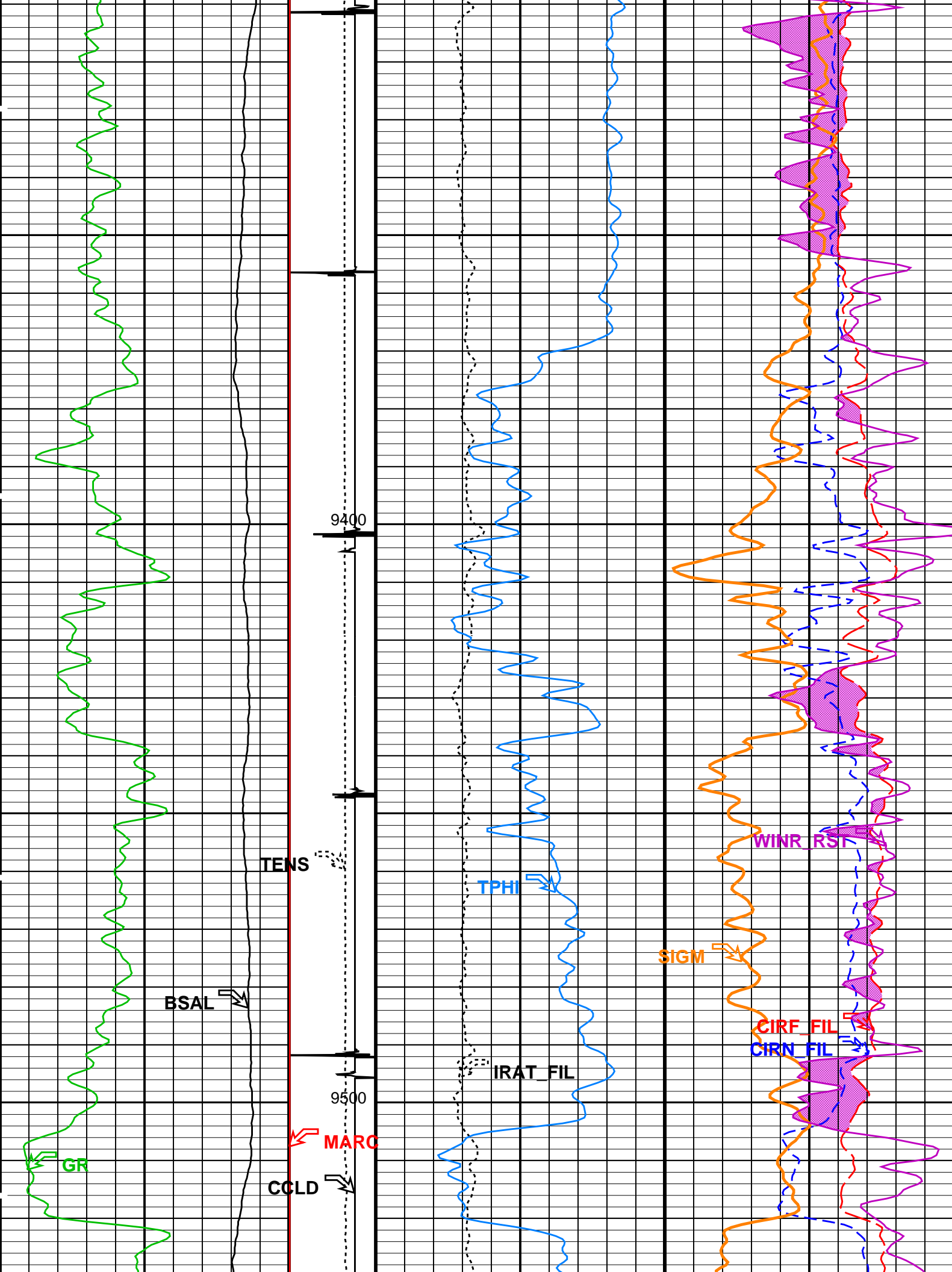




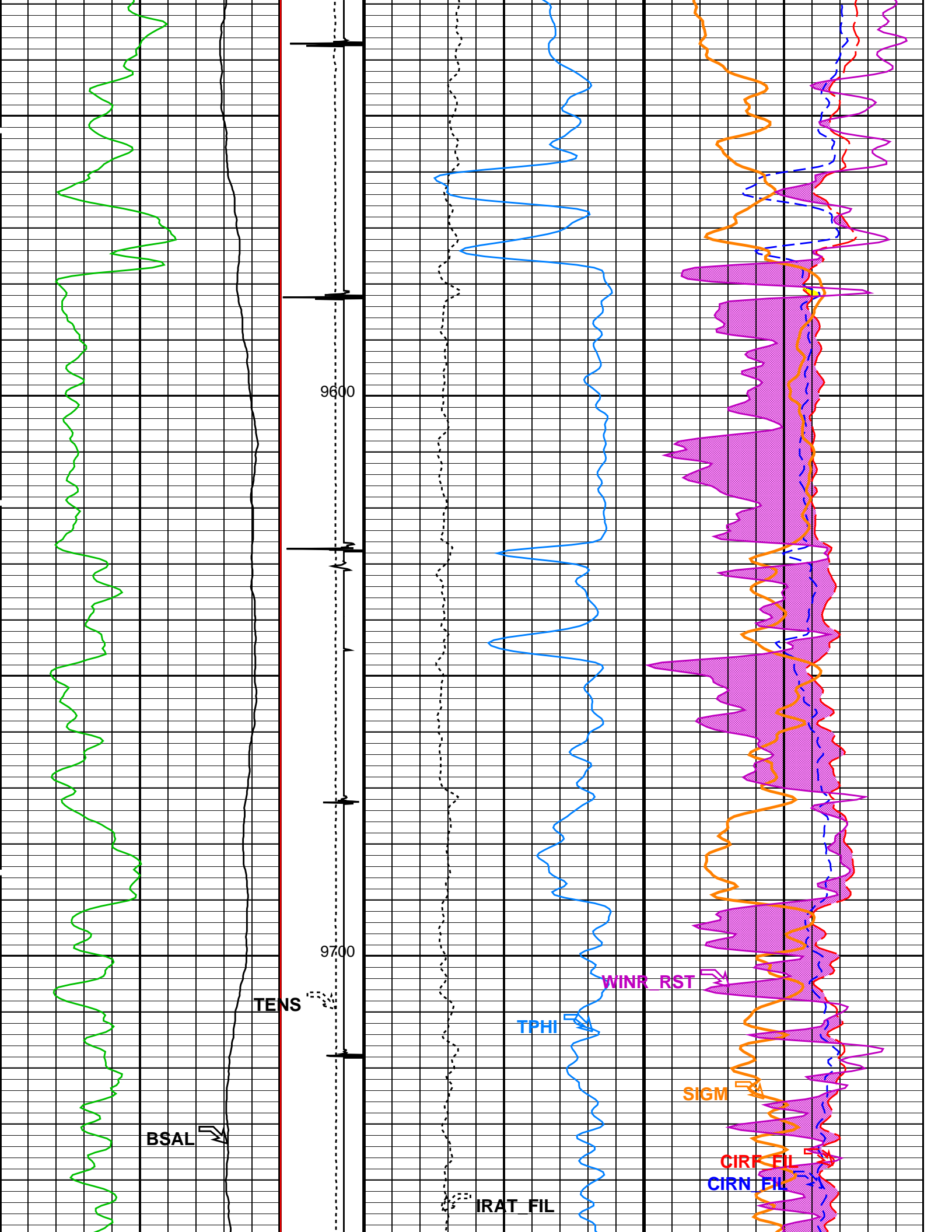


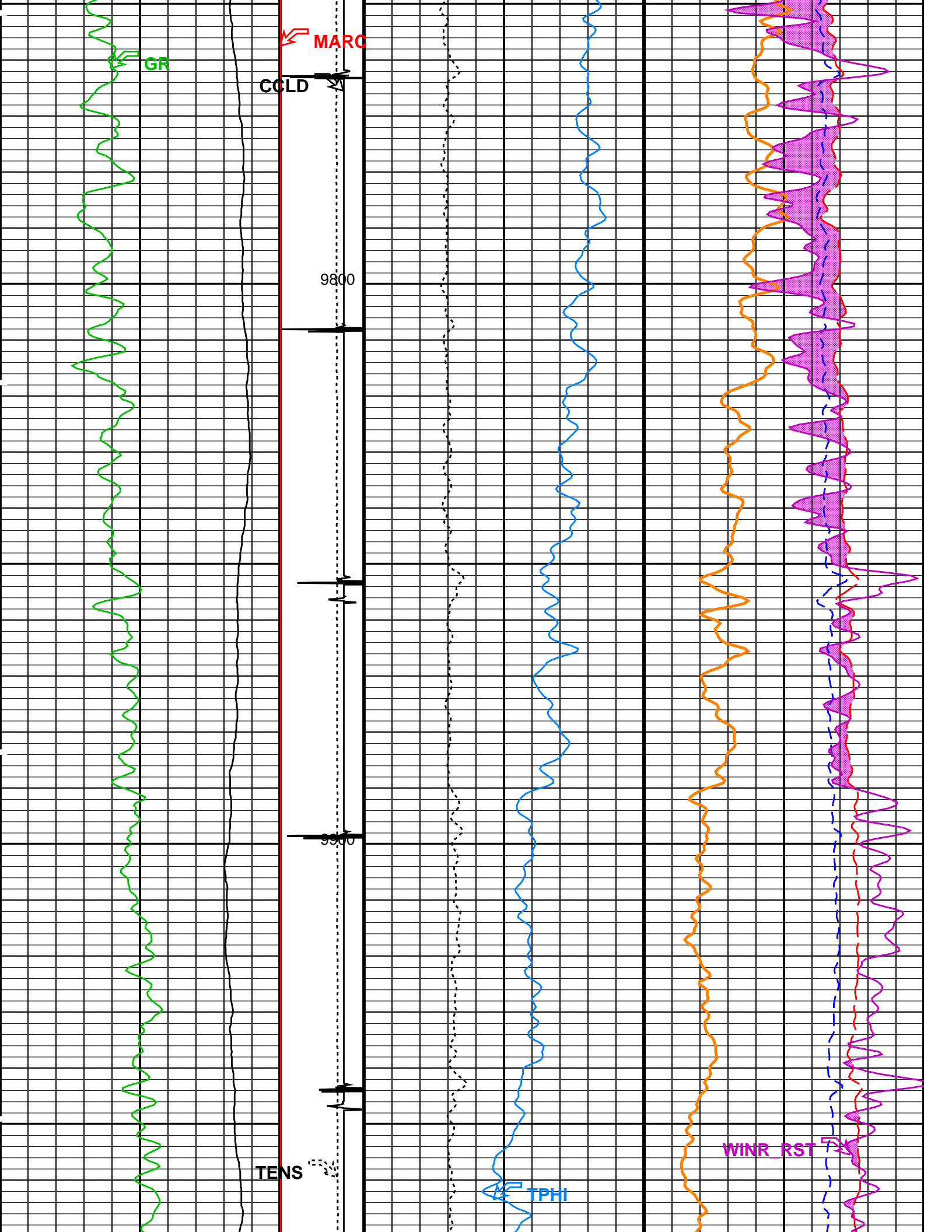


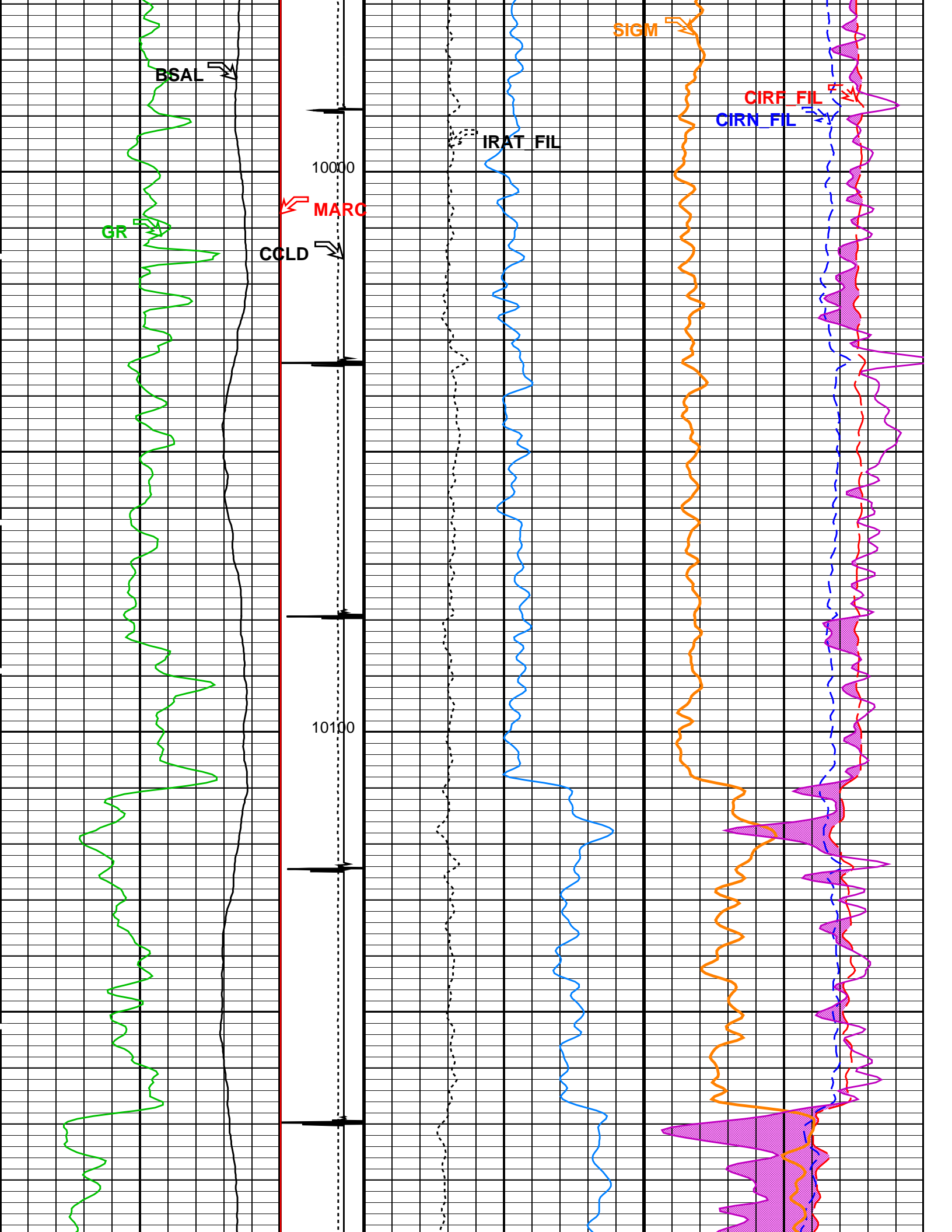


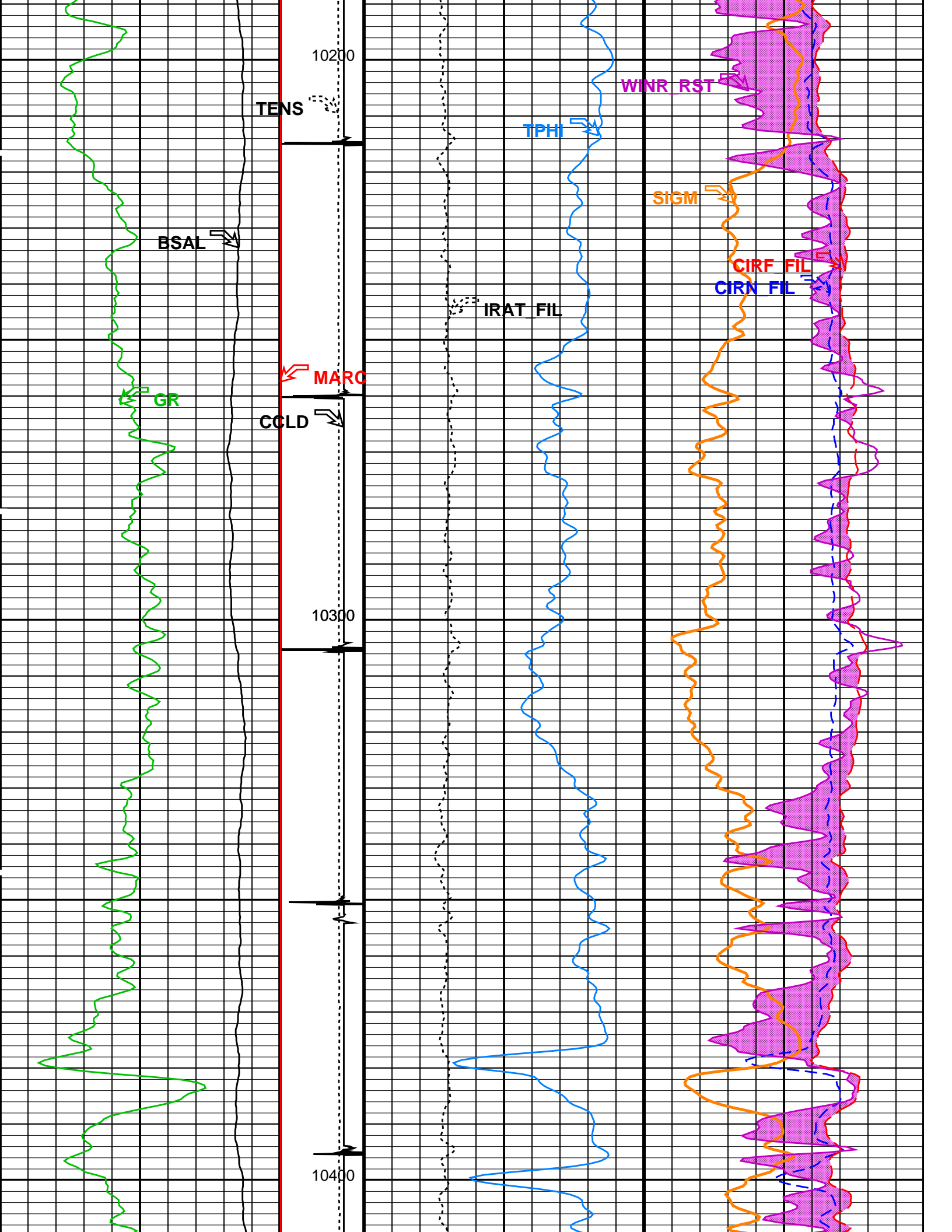


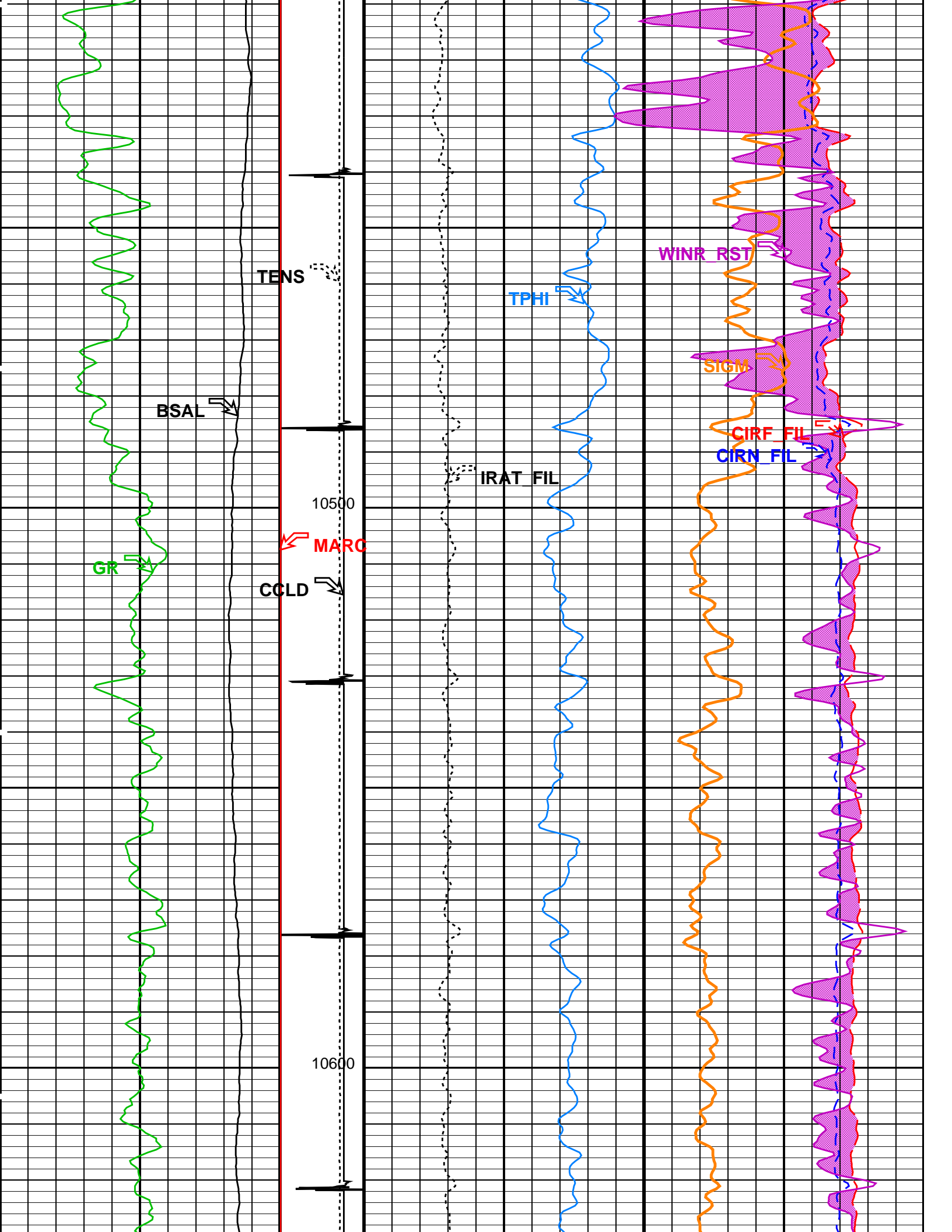


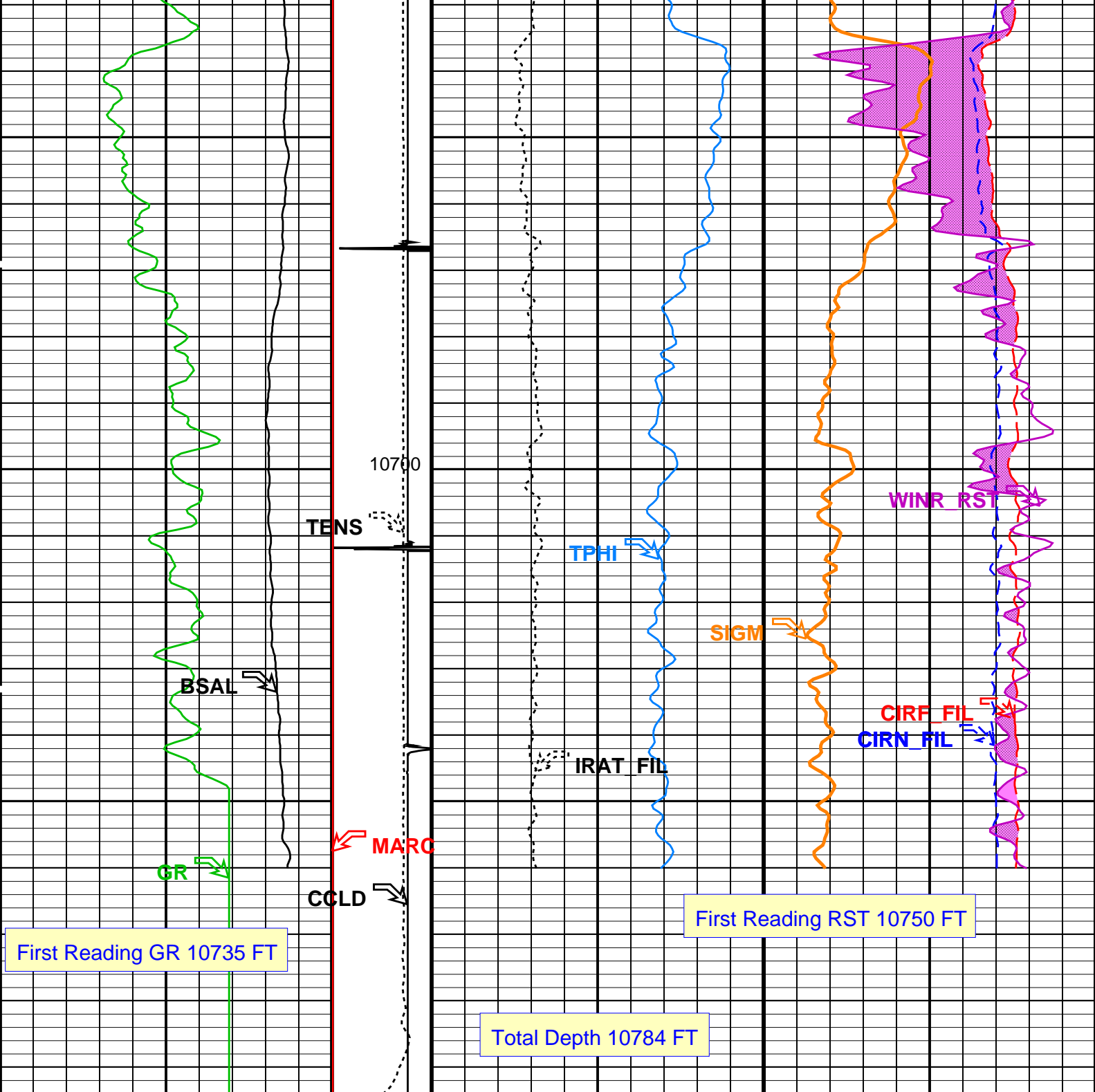












|                                       |  |  |  |   |  |  |  |
|---------------------------------------|--|--|--|---|--|--|--|
| Gamma Ray (GR)<br>(GAPI)              |  | Tension<br>(TENS)<br>(LBF)                         |  | RST Inelastic Ratio (IRAT_FIL)<br>(-----) |  | RST Capture to Inelastic Ratio Near<br>(CIRN_FIL)<br>(-----) |  |
| 0 150                                 |  | 0 2000   |  | 0.75 (-----) 0                            |  | 2.5 (-----) 0  |  |
| RST Borehole Salinity (BSAL)<br>(PPK) |  | Discriminat<br>ed CCL<br>(CCLD)<br>(V)             |  | RST Sigma (SIGM)<br>(CU)                  |  |  |  |
| 450 -50                               |  | 3 -1   |  | 60 0                                      |  |  |  |
|                                       |  | Minitron<br>Arc<br>Detection<br>(MARC)             |  | RST Porosity (TPHI)<br>(V/V)              |  | RST Capture to Inelastic Ratio Far<br>(CIRF_FIL)<br>(-----)  |  |
|                                       |  | 0 (-----) 5  |  | 0.5 0                                     |  | 7 (-----) 0  |  |
|                                       |  | RST Weighted Inelastic Ratio (WINR_RST)<br>(-----) |  |   |  |  |  |
|                                       |  | 0.4 (-----) 0                                      |  |   |  |  |  |



## PIP SUMMARY

Time Mark Every 60 S

## Parameters

| DLIS Name                                     | Description  | Value                      |      |
|---|--|----------------------------|------|
| SCMT-CB: Slim Cement Mapping Tool, 1-11/16 OD |  |                            |      |
| BILI  | Bond Index Level for Zone Isolation                  | 0.8                        |      |
| BISS  | Bond Index Source Selection for BIQL                 | BI                         |      |
| CB3D  | SCMT CBL 3 ft Peak Detection Mode                    | PEAK                       |      |
| CB3G  | SCMT CBL 3 ft Peak Detection T0_Delay and Noise Gate | 224.559                    | US   |
| CB3T  | SCMT CBL 3 ft Fixed Threshold Level                  | 20                         | MV   |
| CB5D  | SCMT CBL 5 ft Peak Detection Mode                    | PEAK                       |      |
| CB5G  | SCMT CBL 5 ft Peak Detection T0_Delay and Noise Gate | 338.559                    | US   |
| CB5T  | SCMT CBL 5 ft Fixed Threshold Level                  | 20                         | MV   |
| CBLG  | CBL Gate Width                                       | 45                         | US   |
| CBRA  | CBL LQC Reference Amplitude in Free Pipe             | 80                         | MV   |
| CMCF  | CBL Cement Type Compensation Factor                  | 1                          |      |
| CMTC  | SCMT Slow Channel Multiplexer Mode                   | SCAN                       |      |
| CMTM  | SCMT Operating Mode                                  | LOG                        |      |
| CMTF  | SCMT Tool position on CAN                            | 5                          |      |
| CSCS  | SCMT Slow Channel Index                              | VCC                        |      |
| CTHI  | Casing Thickness                                     | 0.255617                   | IN   |
| DTF   | Delta-T Fluid  | 189                        | US/F |
| FATT  | Acoustic Attenuation due to Fluid                    | 0                          | DB/F |
| FCF   | CBL Fluid Compensation Factor                        | 0.924277                   |      |
| GOBO  | Good Bond  | 1.55185                    | MV   |
| MAPD  | SCMT MAP Peak Detection Mode                         | PEAK                       |      |
| MAPG  | SCMT MAP Peak Detection T0_Delay and Noise Gate      | 167.559                    | US   |
| MAPT  | SCMT MAP Fixed Threshold Level                       | 30                         | MV   |
| MATT  | Maximum Attenuation                                  | 16.5449                    | DB/F |
| MCCF  | MAP Cement Type Compensation Factor                  | 1                          |      |
| MCI   | Minimum Cemented Interval for Isolation              | 1.25                       | FT   |
| MMSA  | MAP Minimum Sonic Amplitude                          | 4.32284                    | MV   |
| MSA   | Minimum Sonic Amplitude                              | 0.579149                   | MV   |
| PEDE  | Peak Detection On/Off Switch in Playback             | OFF                        |      |
| RBC   | Relative Bearing Correction Allow/Disallow           | ALLOW                      |      |
| VDLG  | VDL Manual Gain                                      | 5                          |      |
| ZCMT  | Acoustic Impedance of Cement                         | 6.8                        | MRAY |
| RST-C: Reservoir Saturation Pro Tool C        |  |                            |      |
| AIRB  | Tractor Available in Tool String                     | NO                         |      |
| BHS   | RST Air Borehole                                     | No                         |      |
| BHT   | Borehole Status                                      | CASED                      |      |
| BSALOPT                                       | Bottom Hole Temperature (used in calculations)       | 212                        | DEGF |
| BSFL  | RST Borehole Salinity Option                         | Unknown                    |      |
| CSID  | RST Borehole Salinity Filter Length                  | 51                         |      |
| DFPC  | Casing Size I.D.                                     | 3.998                      | IN   |
| DFPC_TDTL                                     | RST Depth Filter Processing Constant                 | One                        |      |
| GCSE  | RST Depth Filter Processing Constant (TDT-like)      | Two                        |      |
| GDEV  | Generalized Caliper Selection                        | BS                         |      |
| GGRD  | Average Angular Deviation of Borehole from Normal    | 0                          | DEG  |
| GRSE  | Geothermal Gradient                                  | 0.01                       | DF/F |
| GTSE  | Generalized Mud Resistivity Selection                | CHART_GEN 9                |      |
| ISSBAR  | Generalized Temperature Selection                    | LINEAR_ESTIMATE            |      |
| MATR  | Barite Mud Switch                                    | NOBARITE                   |      |
| NORM_IRAT_RST                                 | Rock Matrix for Neutron Porosity Corrections         | SANDSTONE                  |      |
| NORM_SIGM_RST                                 | RST Normalized Inelastic Ratio                       | 0.48                       |      |
| PTIER   | RST Normalized Sigma                                 | 30                         | CU   |
| PVL_PSNT_PRST                                 | RST Tiered Presentation Selection                    | 0_Customer                 |      |
| RGAI  | PVL Peak Signal/Noise Threshold                      | 3                          |      |
| SHT   | Near/Far Gain Calibration Ratio                      | 1                          |      |
| TIER_IC                                       | Surface Hole Temperature                             | 68                         | DEGF |
| TIER_SIGM                                     | RST IC Acquisition Mode                              | 0_CO_Yield_and_Spectrolith |      |
| WOFSL_PRST                                    | RST Sigma Acquisition Mode                           | 0_RST_Sigma                |      |
| WONSL_PRST                                    | RST WFL-Off Subcycle Length                          | 0                          |      |
| WSCOM_PRST                                    | RST WFL-On Subcycle Length                           | 0                          |      |
|   | RST Station Log Comment                              |                            |      |
| PSPT: Production Services Logging Platform    |  |                            |      |
| BHS   | Borehole Status                                      | CASED                      |      |
| BHT   | Bottom Hole Temperature (used in calculations)       | 212                        | DEGF |
| CSID  | Casing Size I.D.                                     | 3.998                      | IN   |
| GCSE  | Generalized Caliper Selection                        | BS                         |      |
| GDEV  | Average Angular Deviation of Borehole from Normal    | 0                          | DEG  |
| GGRD  | Geothermal Gradient                                  | 0.01                       | DF/F |

|                          |  |                     |      |
|--------------------------|--|---------------------|------|
| GGRD                     | Geothermal Gradient                          | 0.01                | DF/F |
| GRSE                     | Generalized Mud Resistivity Selection        | CHART_GEN 9         |      |
| GTSE                     | Generalized Temperature Selection            | LINEAR_ESTIMATE     |      |
| ISSBAR                   | Barite Mud Switch                            | NOBARITE            |      |
| MATR                     | Rock Matrix for Neutron Porosity Corrections | SANDSTONE           |      |
| PBPO                     | PBMS Tool position on CAN                    | 2                   |      |
| PCCG                     | PBMS CCL Gain                                | DB0                 |      |
| PSTP                     | PSTC Tool Position on CAN Bus                | 1                   |      |
| SHT                      | Surface Hole Temperature                     | 68                  | DEGF |
| System and Miscellaneous |  |                     |      |
| ALTDPCCHAN               | Name of alternate depth channel              | SpeedCorrectedDepth |      |
| BS                       | Bit Size                                     | 8.750               | IN   |
| BSAL                     | Borehole Salinity                            | -50000.00           | PPM  |
| CSIZ                     | Current Casing Size                          | 4.500               | IN   |
| CWEI                     | Casing Weight                                | 11.60               | LB/F |
| DFD                      | Drilling Fluid Density                       | 8.40                | LB/G |
| DO                       | Depth Offset for Playback                    | 4.0                 | FT   |
| FLEV                     | Fluid Level                                  | 60.00               | FT   |
| MST                      | Mud Sample Temperature                       | -50000.00           | DEGF |
| PBVSDAP                  | 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                                  | 10784               | FT   |
| TDD                      | Total Depth - Driller                        | 10868.00            | FT   |
| TDL                      | Total Depth - Logger                         | 10784.00            | FT   |
| TWS                      | Temperature of Connate Water Sample          | 100.00              | DEGF |

Format: RST\_SIGMA\_S5      Vertical Scale: 5" per 100'      Graphics File Created: 23-Jan-2013 03:21

## OP System Version: 19C0-187

SCMT-CB      SRPC-5214-H2-2012-OP1!      RST-C      SRPC-5214-H2-2012-OP1!  
PSPT      SRPC-5214-H2-2012-OP1!

### Input DLIS Files

DEFAULT      Splice\_SCMT\_RST\_PSP\_072CUP      FN:1      PRODUCER      23-Jan-2013 03:19      10790.0 FT      -40.0 FT

### Output DLIS Files

DEFAULT      SCMT\_RST\_PSP\_073PUP      FN:71      PRODUCER      23-Jan-2013 03:21

**Schlumberger**

**REPEAT ANALYSIS RST SIGMA**

MAXIS Field Log

### Input DLIS Files

DEFAULT      SCMT\_RST\_PSP\_065LUP      FN:64      PRODUCER      22-Jan-2013 23:01      7631.5 FT      7308.0 FT  
DEFAULT      SCMT\_RST\_PSP\_073PUP      FN:71      PRODUCER      23-Jan-2013 03:21      10794.0 FT      -88.0 FT

### Output DLIS Files

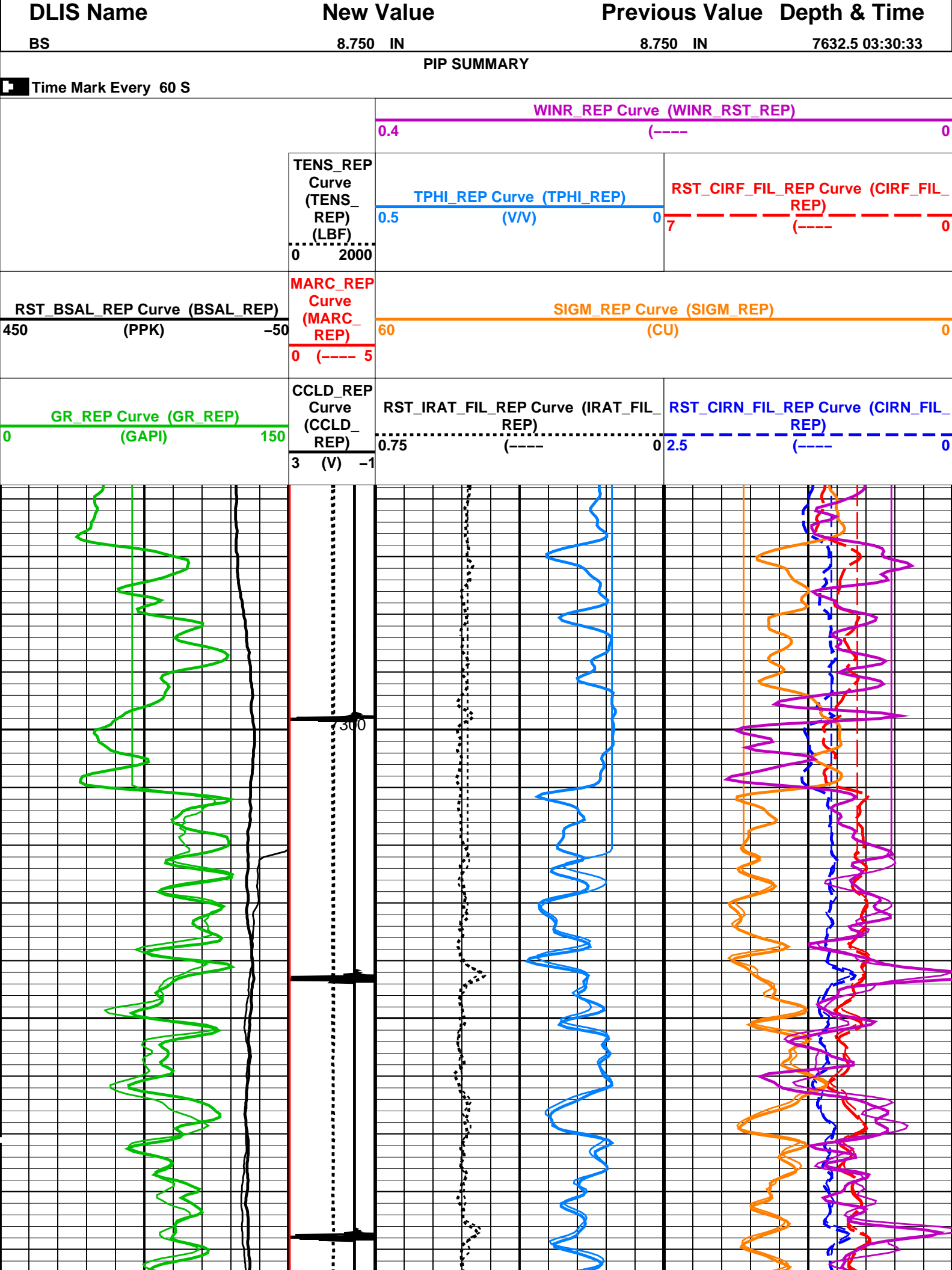
DEFAULT      SCMT\_RST\_PSP\_074PUP      FN:72      PRODUCER      23-Jan-2013 03:30      7632.5 FT      7257.0 FT

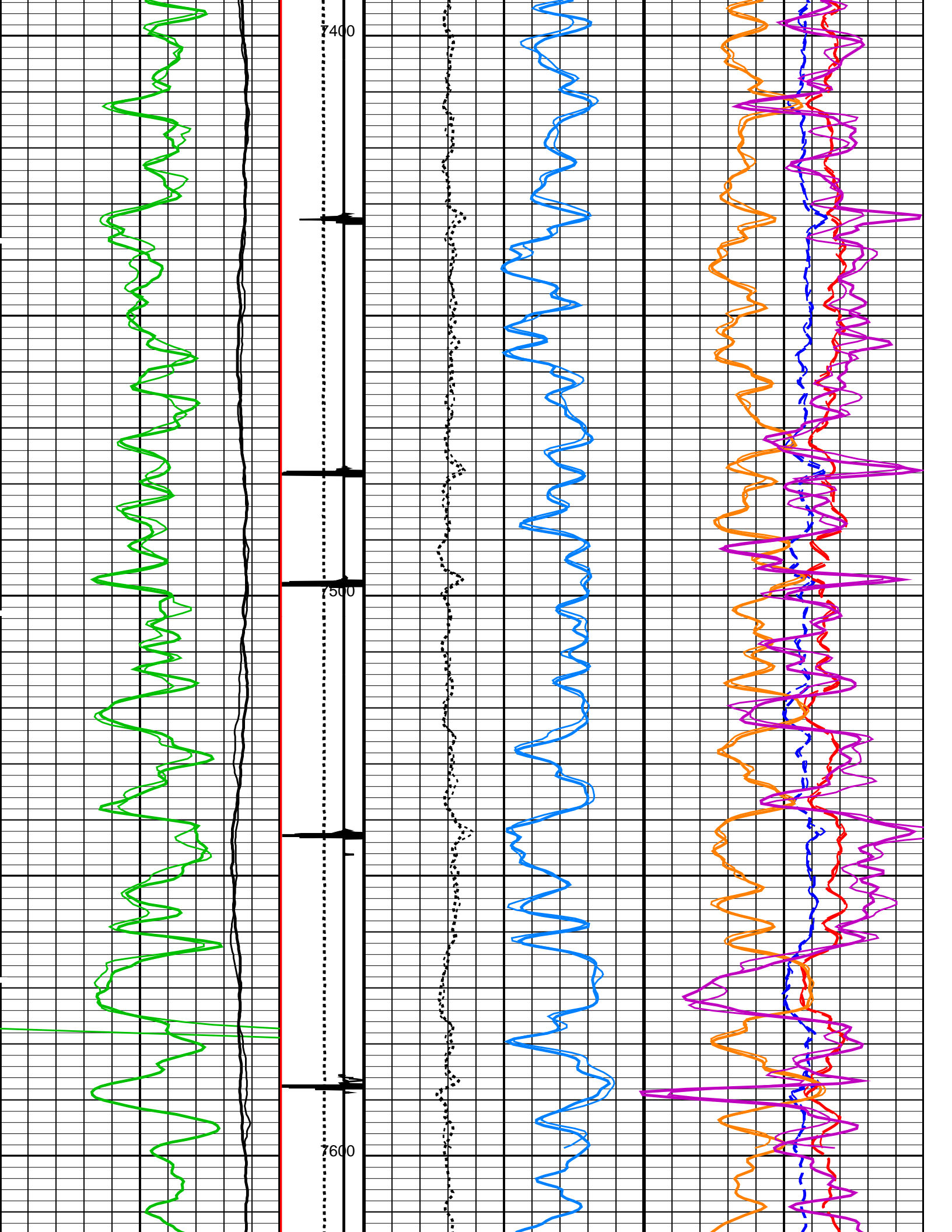
## OP System Version: 19C0-187

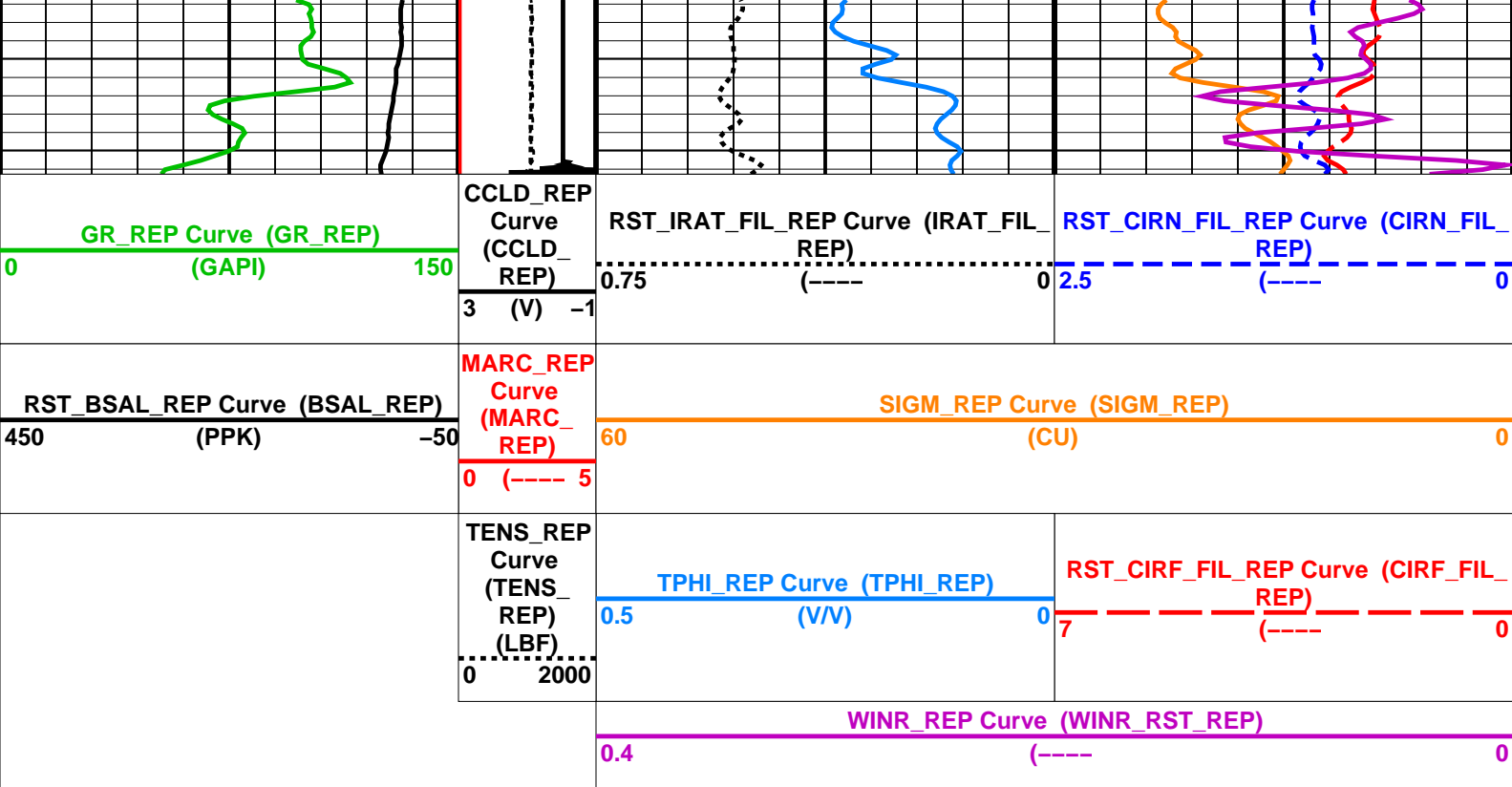
SCMT-CB      SRPC-5214-H2-2012-OP1!      RST-C      SRPC-5214-H2-2012-OP1!  
PSPT      SRPC-5214-H2-2012-OP1!

## Changed Parameter Summary









### PIP SUMMARY

Time Mark Every 60 S

## Parameters

| DLIS Name                                     | Description  | Value    |      |
|---|--|----------|------|
| SCMT-CB: Slim Cement Mapping Tool, 1-11/16 OD |  |          |      |
| BILI  | Bond Index Level for Zone Isolation                  | 0.8      |      |
| BISS  | Bond Index Source Selection for BIQL                 | BI       |      |
| CB3D  | SCMT CBL 3 ft Peak Detection Mode                    | PEAK     |      |
| CB3G  | SCMT CBL 3 ft Peak Detection T0_Delay and Noise Gate | 224.559  | US   |
| CB3T  | SCMT CBL 3 ft Fixed Threshold Level                  | 20       | MV   |
| CB5D  | SCMT CBL 5 ft Peak Detection Mode                    | PEAK     |      |
| CB5G  | SCMT CBL 5 ft Peak Detection T0_Delay and Noise Gate | 338.559  | US   |
| CB5T  | SCMT CBL 5 ft Fixed Threshold Level                  | 20       | MV   |
| CBLG  | CBL Gate Width                                       | 45       | US   |
| CBRA  | CBL LQC Reference Amplitude in Free Pipe             | 80       | MV   |
| CMCF  | CBL Cement Type Compensation Factor                  | 1        |      |
| CMTC  | SCMT Slow Channel Multiplexer Mode                   | SCAN     |      |
| CMTM  | SCMT Operating Mode                                  | LOG      |      |
| CMTF  | SCMT Tool position on CAN                            | 5        |      |
| CSCS  | SCMT Slow Channel Index                              | VCC      |      |
| CTHI  | Casing Thickness                                     | 0.255617 | IN   |
| DTF   | Delta-T Fluid  | 189      | US/F |
| FATT  | Acoustic Attenuation due to Fluid                    | 0        | DB/F |
| FCF   | CBL Fluid Compensation Factor                        | 0.924277 |      |
| GOBO  | Good Bond  | 1.55185  | MV   |
| MAPD  | SCMT MAP Peak Detection Mode                         | PEAK     |      |
| MAPG  | SCMT MAP Peak Detection T0_Delay and Noise Gate      | 167.559  | US   |
| MAPT  | SCMT MAP Fixed Threshold Level                       | 30       | MV   |
| MATT  | Maximum Attenuation                                  | 16.5449  | DB/F |
| MCCF  | MAP Cement Type Compensation Factor                  | 1        |      |
| MCI   | Minimum Cemented Interval for Isolation              | 1.25     | FT   |
| MMSA  | MAP Minimum Sonic Amplitude                          | 4.32284  | MV   |
| MSA   | Minimum Sonic Amplitude                              | 0.579149 | MV   |
| PEDE  | Peak Detection On/Off Switch in Playback             | OFF      |      |
| RBC   | Relative Bearing Correction Allow/Disallow           | ALLOW    |      |
| VDLG  | VDL Manual Gain                                      | 5        |      |
| ZCMT  | Acoustic Impedance of Cement                         | 6.8      | MRAY |
| RST-C: Reservoir Saturation Pro Tool C        |  |          |      |
| AIRB  | Tractor Available in Tool String                     | NO       |      |
| BHS   | RST Air Borehole                                     | No       |      |
| BHT   | Borehole Status                                      | CASED    |      |
| BSALOPT                                       | Bottom Hole Temperature (used in calculations)       | 212      | DEGF |
| BSFL  | RST Borehole Salinity Option                         | Unknown  |      |
| CSID  | RST Borehole Salinity Filter Length                  | 51       |      |
| DFPC  | Casing Size I.D.                                     | 3.998    | IN   |
| DEPC  | RST Depth Filter Processing Constant                 | One      |      |
| TDTL  | RST Depth Filter Processing Constant (TDT-like)      | Two      |      |

|  |   |                            |      |
|--|---|----------------------------|------|
| GCSE                                       | Generalized Caliper Selection                     | BS                         |      |
| GDEV                                       | Average Angular Deviation of Borehole from Normal | 0                          | DEG  |
| GGRD                                       | Geothermal Gradient                               | 0.01                       | DF/F |
| GRSE                                       | Generalized Mud Resistivity Selection             | CHART_GEN_9                |      |
| GTSE                                       | Generalized Temperature Selection                 | LINEAR_ESTIMATE            |      |
| ISSBAR                                     | Barite Mud Switch                                 | NOBARITE                   |      |
| MATR                                       | Rock Matrix for Neutron Porosity Corrections      | SANDSTONE                  |      |
| NORM_IRAT_RST                              | RST Normalized Inelastic Ratio                    | 0.48                       |      |
| NORM_SIGM_RST                              | RST Normalized Sigma                              | 30                         | CU   |
| PTIER                                      | RST Tiered Presentation Selection                 | 0_Customer                 |      |
| PVL_PSNT_PRST                              | PVL Peak Signal/Noise Threshold                   | 3                          |      |
| RGAI                                       | Near/Far Gain Calibration Ratio                   | 1                          |      |
| SHT  | Surface Hole Temperature                          | 68                         | DEGF |
| TIER_IC                                    | RST IC Acquisition Mode                           | 0_CO_Yield_and_Spectrolith |      |
| TIER_SIGM                                  | RST Sigma Acquisition Mode                        | 0_RST_Sigma                |      |
| WOFSL_PRST                                 | RST WFL-Off Subcycle Length                       | 0                          |      |
| WONSL_PRST                                 | RST WFL-On Subcycle Length                        | 0                          |      |
| WSCOM_PRST                                 | RST Station Log Comment                           |                            |      |
| PSPT: Production Services Logging Platform |   |                            |      |
| BHS  | Borehole Status                                   | CASED                      |      |
| BHT  | Bottom Hole Temperature (used in calculations)    | 212                        | DEGF |
| CSID                                       | Casing Size I.D.                                  | 3.998                      | IN   |
| GCSE                                       | Generalized Caliper Selection                     | BS                         |      |
| GDEV                                       | Average Angular Deviation of Borehole from Normal | 0                          | DEG  |
| GGRD                                       | Geothermal Gradient                               | 0.01                       | DF/F |
| GRSE                                       | Generalized Mud Resistivity Selection             | CHART_GEN_9                |      |
| GTSE                                       | Generalized Temperature Selection                 | LINEAR_ESTIMATE            |      |
| ISSBAR                                     | Barite Mud Switch                                 | NOBARITE                   |      |
| MATR                                       | Rock Matrix for Neutron Porosity Corrections      | SANDSTONE                  |      |
| PBPO                                       | PBMS Tool position on CAN                         | 2                          |      |
| PCCG                                       | PBMS CCL Gain                                     | DB0                        |      |
| PSTP                                       | PSTC Tool Position on CAN Bus                     | 1                          |      |
| SHT  | Surface Hole Temperature                          | 68                         | DEGF |
| System and Miscellaneous                   |   |                            |      |
| ALTDPCCHAN                                 | Name of alternate depth channel                   | SpeedCorrectedDepth        |      |
| BS   | Bit Size  | 8.750                      | IN   |
| BSAL                                       | Borehole Salinity                                 | -50000.00                  | PPM  |
| CSIZ                                       | Current Casing Size                               | 4.500                      | IN   |
| CWEI                                       | Casing Weight                                     | 11.60                      | LB/F |
| DFD  | Drilling Fluid Density                            | 8.40                       | LB/G |
| DO   | Depth Offset for Playback                         | 1.0                        | FT   |
| DORL                                       | Depth Offset for Repeat Analysis                  | 0.0                        | FT   |
| FLEV                                       | Fluid Level                                       | 60.00                      | FT   |
| MST  | Mud Sample Temperature                            | -50000.00                  | DEGF |
| 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                                       | 10784                      | FT   |
| TDD  | Total Depth - Driller                             | 10868.00                   | FT   |
| TDL  | Total Depth - Logger                              | 10784.00                   | FT   |
| TWS  | Temperature of Connate Water Sample               | 100.00                     | DEGF |

Format: RST\_SIGMA\_S5\_REP      Vertical Scale: 5" per 100'      Graphics File Created: 23-Jan-2013 03:30

## OP System Version: 19C0-187

|         |                        |       |                        |
|---------|------------------------|-------|------------------------|
| SCMT-CB | SRPC-5214-H2-2012-OP1: | RST-C | SRPC-5214-H2-2012-OP1: |
| PSPT    | SRPC-5214-H2-2012-OP1: |       |                        |

### Input DLIS Files

|         |                     |       |          |                   |            |           |
|---------|---------------------|-------|----------|-------------------|------------|-----------|
| DEFAULT | SCMT_RST_PSP_065LUP | FN:64 | PRODUCER | 22-Jan-2013 23:01 | 7631.5 FT  | 7308.0 FT |
| DEFAULT | SCMT_RST_PSP_073PUP | FN:71 | PRODUCER | 23-Jan-2013 03:21 | 10794.0 FT | -88.0 FT  |

### Output DLIS Files

|         |                     |       |          |                   |
|---------|---------------------|-------|----------|-------------------|
| DEFAULT | SCMT_RST_PSP_074PUP | FN:72 | PRODUCER | 23-Jan-2013 03:30 |
|---------|---------------------|-------|----------|-------------------|

**Schlumberger**

**PBMS COEFFICIENTS**

Client: ENCANA OIL & GAS (USA) INC  
Field: MAMM CREEK  
Well: MCU 26-4A (I27W)  
Run date: 22-Jan-2013

Tool: PSP  
Sub Type: PBMS  
Sensor: GR

**PBMS Gamma Ray**

Sonde Serial NB RESISTORS FOR GR SENSOR N.33223, TOOL PBMS-BA0928. SENSOR S/N:  
Sensor Serial NB 33223  
Calib Date ddmmyy 090800  
Matrix Size 12  
Coeff CRC CFE2

**GR HV Rt****Rt\*\*0****Rt\*\*1****Rt\*\*0**

+.182000000000e+04

+.332000000000e+04

Client: ENCANA OIL & GAS (USA) INC  
Field: MAMM CREEK  
Well: MCU 26-4A (I27W)  
Run date: 22-Jan-2013

Tool: PSP  
Sub Type: PBMS  
Sensor: WellTemp RTD

**PBMS RTD Well Thermometer**

Sonde Serial NB COEFFICIENTS FOR RTD THERMOMETER PBMS-B.928 S/N:  
Sensor Serial NB 928  
Calib Date ddmmyy 280612  
Matrix Size 16  
Coeff CRC A24E

**WTemp Coeff****Tt\*\*0****Tt\*\*1****Tt\*\*2****Tt\*\*0**

-.391987973189E+03

+.191346892512E+03

-.440920753451E+02

Tt\*\*3

Tt\*\*4

Tt\*\*5

Tt\*\*0

+.957191300908E+01

−.711421725686E+00

0.0

Client: ENCANA OIL & GAS (USA) INC  
Field: MAMM CREEK  
Well: MCU 26−4A (I27W)  
Run date: 22−Jan−2013

Tool: PSP  
Sub Type: PBMS  
Sensor: CQG

PBMS Quartz Gauge type F

Sonde Serial NB

COEFFICIENTS FOR CQG PBMS−B.928 S/N:

Sensor Serial NB

928

Calib Date ddmmyy

280612

Matrix Size

66

Coeff CRC

9DC3

Pres Coeff

Fb\*\*0

Fb\*\*1

Fb\*\*2

Fc\*\*0

+.714463802232E+04

+.183434658655E−01

−.156620073569E−06

Fc\*\*1

−.100638308957E+01

−.119899563644E−04

−.912155899025E−10

Fc\*\*2

+.936268101283E−06

+.423898071451E−10

+.958076371919E−15

Fc\*\*3

+.185123362373E−11

+.203107925433E−15

0.0

Fc\*\*4

0.0

0.0

0.0

Fc\*\*5

0.0

0.0

0.0

Fb\*\*3

Fb\*\*4

Fb\*\*5

Fc\*\*0

−.746577997611E−10

−.588773826860E−15

−.622250441458E−19

Fc\*\*1

−.120636521092E−15

+.400325894750E−19

0.0

Fc\*\*2

0.0

0.0

0.0

Fc\*\*3

0.0

0.0

0.0

Fc\*\*4

0.0

0.0

0.0

Fc\*\*5

0.0

0.0

0.0

PBMS Quartz Gauge type F

Sonde Serial NB :  
Sensor Serial NB 928  
Calib Date ddmmyy 280612  
Matrix Size 66  
Coeff CRC 283B

Temp Coeff

|       | Fc**0              | Fc**1              | Fc**2              |
|-------|--------------------|--------------------|--------------------|
| Fb**0 | +.117016867873E+03 | -.284359629614E-03 | +.604391180345E-08 |
| Fb**1 | -.598309140812E-02 | +.182731130848E-07 | +.160166486172E-12 |
| Fb**2 | -.307621454576E-07 | +.300601550309E-12 | +.311233548560E-17 |
| Fb**3 | -.419658736767E-12 | +.117473708647E-16 | 0.0                |
| Fb**4 | 0.0                | 0.0                | 0.0                |
| Fb**5 | 0.0                | 0.0                | 0.0                |
|       | Fc**3              | Fc**4              | Fc**5              |
| Fb**0 | +.114322792679E-12 | +.153807711176E-17 | -.736714260866E-21 |
| Fb**1 | -.528037875456E-18 | -.220337637519E-21 | 0.0                |
| Fb**2 | 0.0                | 0.0                | 0.0                |
| Fb**3 | 0.0                | 0.0                | 0.0                |
| Fb**4 | 0.0                | 0.0                | 0.0                |
| Fb**5 | 0.0                | 0.0                | 0.0                |

PBMS Quartz Gauge type F

Sonde Serial NB :  
Sensor Serial NB 928  
Calib Date ddmmyy 280612  
Matrix Size 16  
Coeff CRC 093F

Clock Freq Coeff

|              | (Fb'-Fc')**0       | (Fb'-Fc')**1       | (Fb'-Fc')**2       |
|--------------|--------------------|--------------------|--------------------|
| (Fb'-Fc')**0 | +.310874009898E+05 | +.288920923041E-02 | +.697940727038E-06 |
|              | (Fb'-Fc')**3       | (Fb'-Fc')**4       | (Fb'-Fc')**5       |
| (Fb'-Fc')**0 | -.657432344763E-10 | -.412920638782E-15 | +.213369826099E-20 |

PBMS Quartz Gauge type F

Sonde Serial NB :  
Sensor Serial NB 928  
Calib Date ddmmyy 280612  
Matrix Size 16

Coeff CRC 8419

Clock Temp Coeff

|              | (Fb'–Fc')**0       | (Fb'–Fc')**1       | (Fb'–Fc')**2       |
|--------------|--------------------|--------------------|--------------------|
| (Fb'–Fc')**0 | +1.15369519827E+03 | –.565338877075E–02 | –.333717531829E–07 |
|              | (Fb'–Fc')**3       | (Fb'–Fc')**4       | (Fb'–Fc')**5       |
| (Fb'–Fc')**0 | –.124387135327E–12 | +7.13102327208E–16 | –.316084316842E–20 |

Company: ENCANA OIL & GAS (USA) INC

Schlumberger

Well: MCU 26–4A (I27W)  
Field: MAMM CREEK  
County: GARFIELD  
State: COLORADO

RESERVOIR SATURATION LOG  
SIGMA MODE  
GR–CCL