

Logs

PULSE MWD GR from 1,841'-15,744' MD

Casing

9 5/8" Surface Casing set @ 1,811' MD

5 1/2" Production Casing set @ 15,741' MD

Comments

- 1) Drilling Contractor: Precision Drilling, Rig #462
Toolpusher: Cody Teeter
- 2) Company Man: Steve Wilson, Buddy Davis
Lovell Young, Tony Pershall
- 3) Mud Company : Reliable Drilling Fluid
Engineer: Tim Pattison, Henry Yoes
- 4) Directional Drilling: Baker Hughes Directional
Rotary Steerable BHA
Drillers: Josh Sund, Josh Otero
- 5) Gas Equipment: Pason Gas Analyzer (Spectrometer)
- 6) SRC Geologist: Tony Williams

ROCK TYPES

	Bent		Slst		Slty sh		Arg_ss		Ls
	Mrlst		Carb chalk		Coal		Ss		Slty sh
	Shale		Chalk		Slst		Carb sh		

ACCESSORIES

MINERAL

Anhy
 Arggrn
 Arg
 Bent
 Bit
 Brecfrag
 Calc
 Carb
 Chtdk
 Chtlt
 Dol
 Feldspar
 Ferrpel
 Ferr
 Glau

Gyp
 Hvymin
 Kaol
 Marl
 Minxl
 Nodule
 Phos
 Pyr
 Salt
 Sandy
 Silt
 Sil
 Sulphur
 Tuff

FOSSIL

Algae
 Amph
 Belm
 Bioclst
 Brach
 Bryozoa
 Cephal
 Coral
 Crin
 Echin
 Fish
 Foram
 Fossil
 Gastro
 Oolite

Ostra
 Pelec
 Pellet
 Pisolite
 Plant
 Strom

Mrst
 Sltstrg
 Ssstrg

TEXTURE

Boundst
 Chalky
 Cryxln
 Earthy
 Finexln
 Grainst
 Lithogr
 Microxln
 Mudst
 Packst
 Wackest

STRINGER

Chlkgstg
 Anhy
 Arg
 Bent
 Coal
 Dol
 Gyp
 Ls

OTHER SYMBOLS

POROSITY TYPE

Earthy
 Fenest
 Fracture
 Inter
 Moldic
 Organic
 Pinpoint
 Vuggy

SORTING

Well
 Moderate
 Poor

ROUNDING

Rounded
 Subrnd
 Subang

Angular

OIL SHOWS

Even
 Spotted
 Ques
 Dead
 Vspotty
 near even

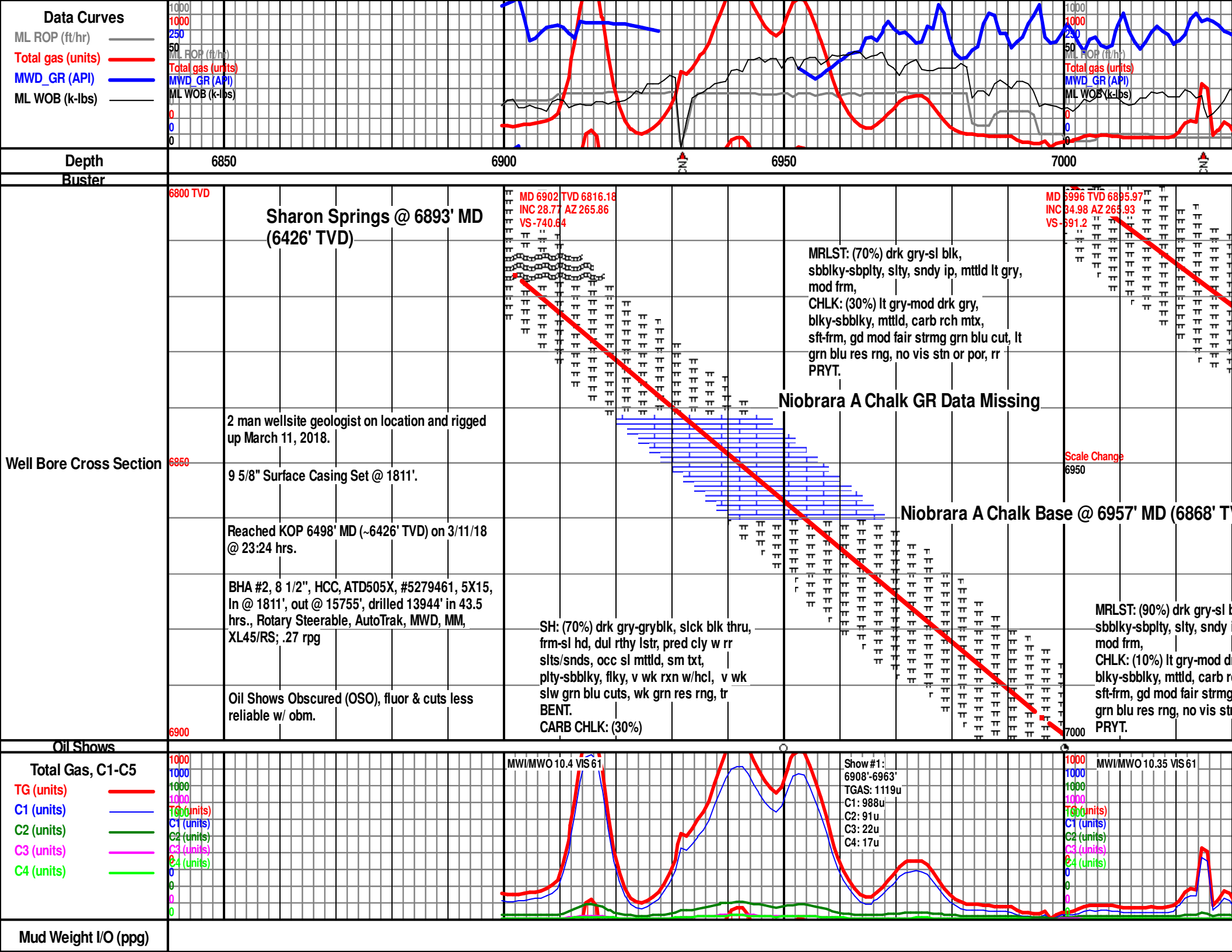
INTERVALS

Core
 Dst

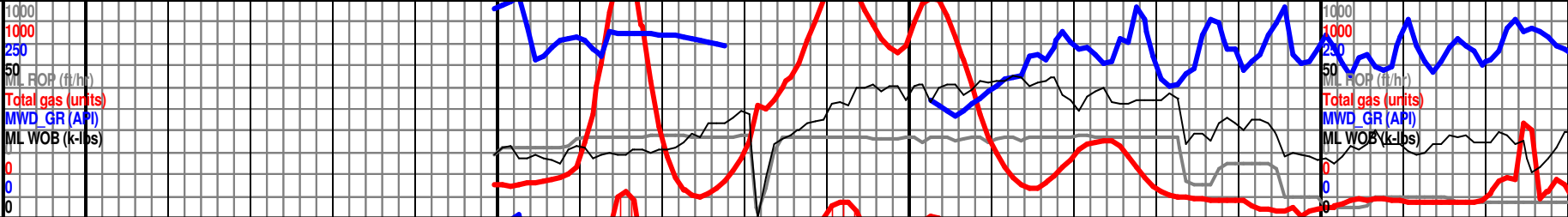
EVENTS

Casing shoe_hzl
 Trip_point_1
 Off bottom
 conn

Survey(mwd)
 Survey(red)
 bit



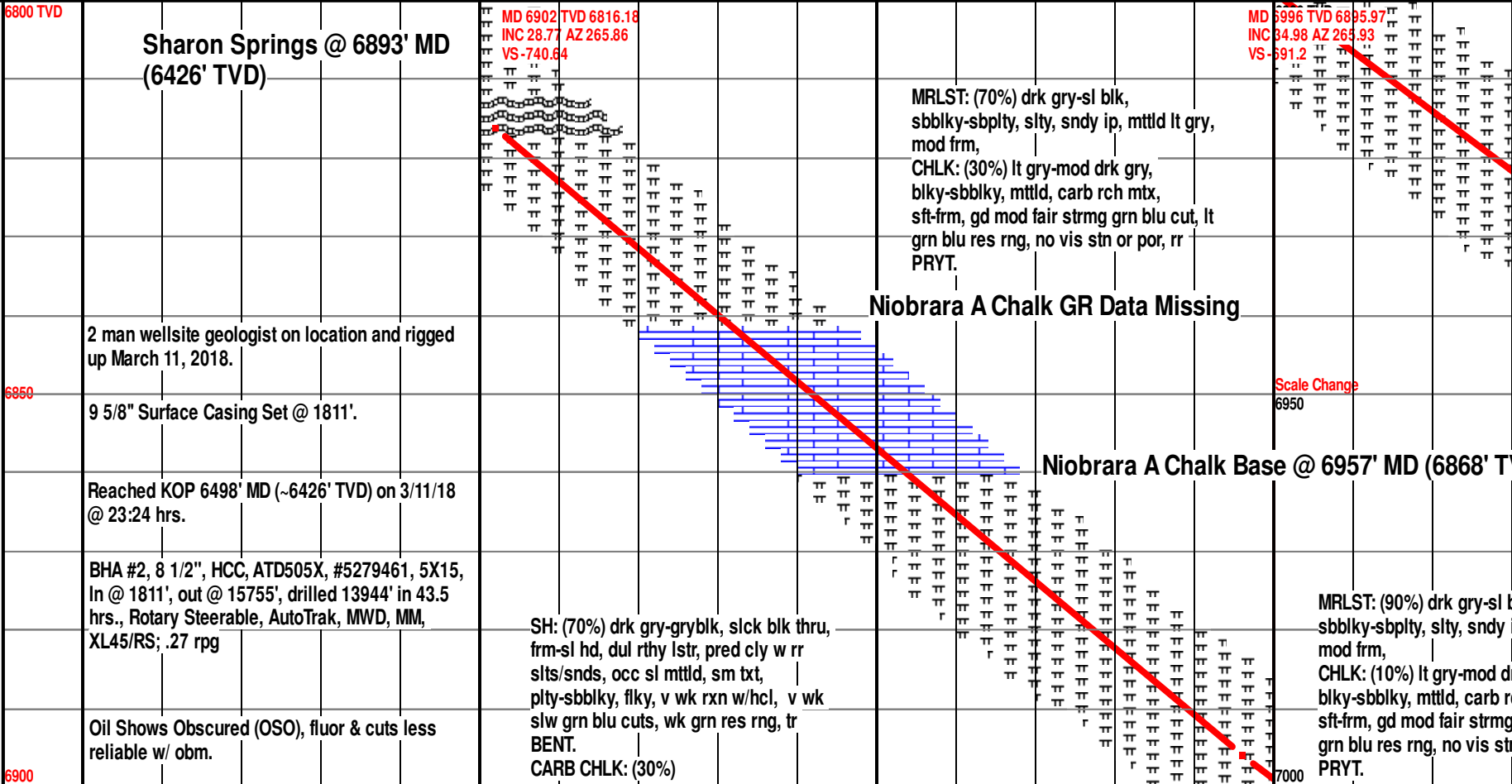
Data Curves
 ML ROP (ft/hr) —
 Total gas (units) —
 MWD_GR (API) —
 ML WOB (k-lbs) —



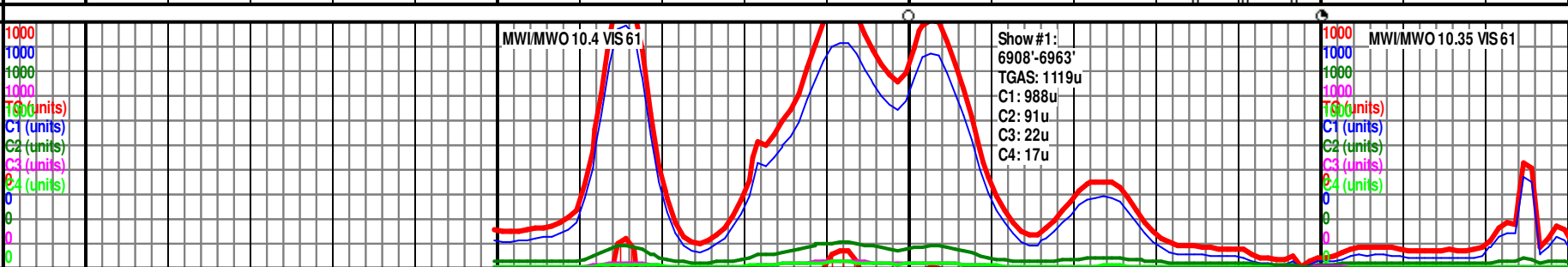
Depth
Buster



Well Bore Cross Section

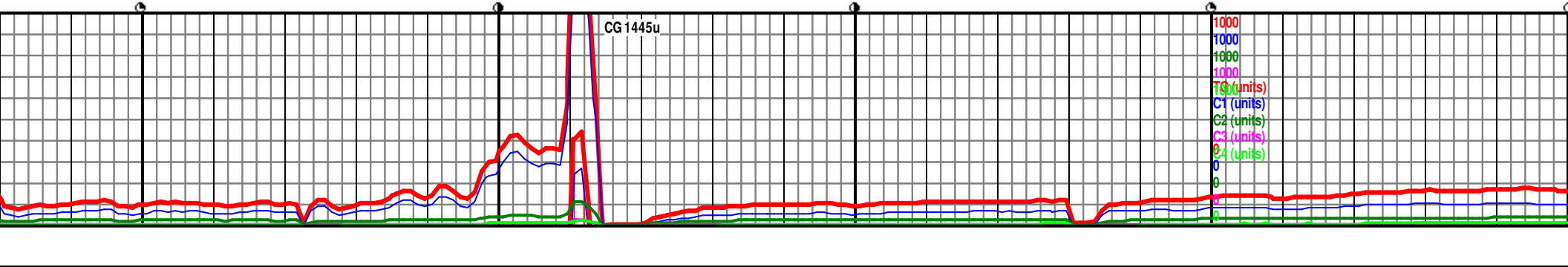
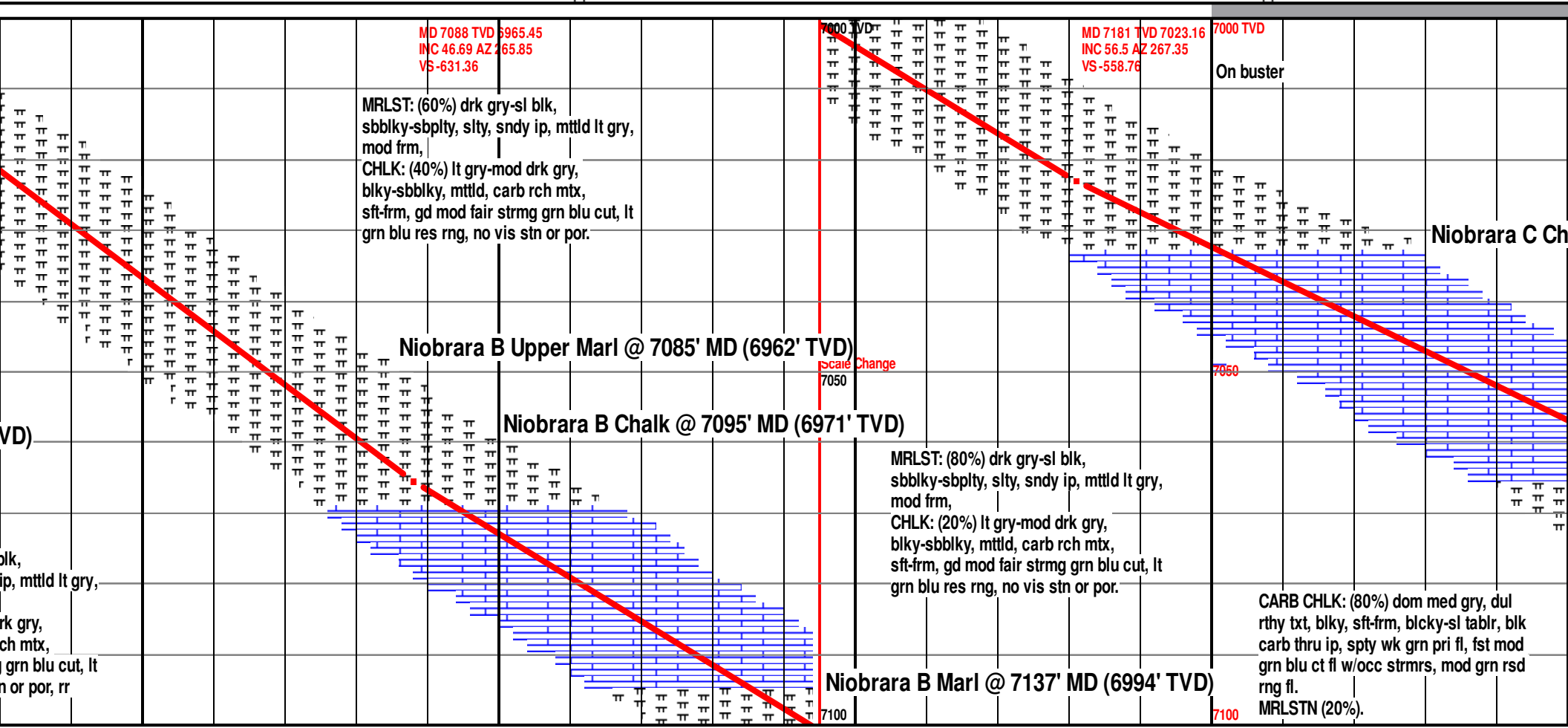
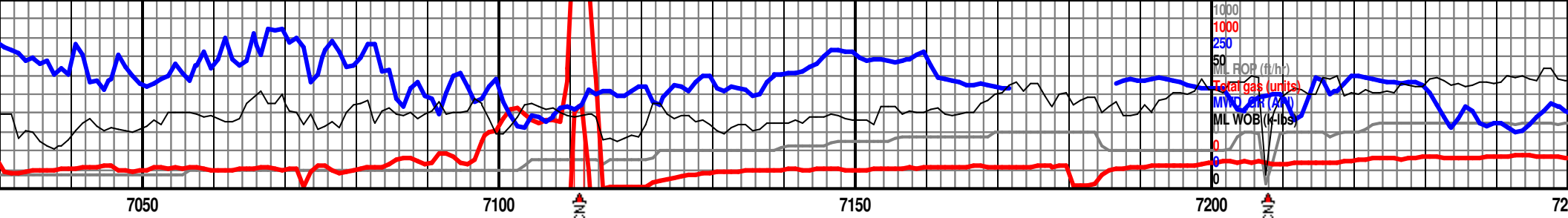


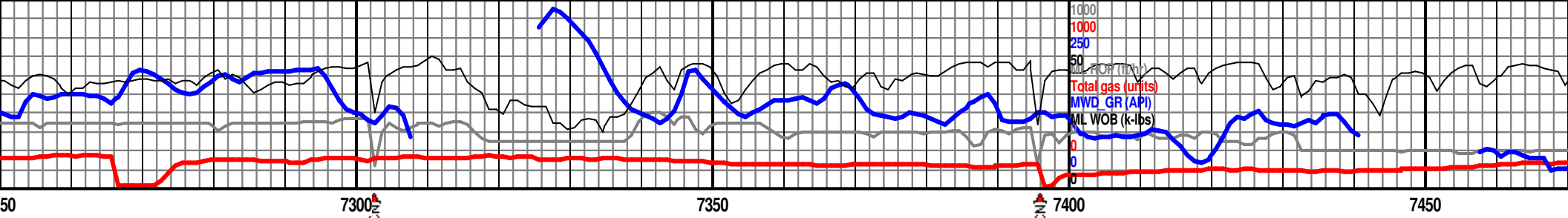
Oil Shows



Mud Weight I/O (ppg)







MD 7273 TVD 7068.09
INC 64.97 AZ 266.21
VS-478.77

MD 7367 TVD 7100.44
INC 74.72 AZ 245.93
VS-390.92

MD 7460 TVD
INC 81.04
VS-300.27

alk @ 7202' MD (7034' TVD)

Ft. Hays LS @ 7442' MD (7117' TVD)

MRLST: (80%) drk gry-sl blk,
sbbkly-sbply, slty, sndy ip, mttld lt gry,
mod frm,
CHLK: (20%) lt gry-mod drk gry,
blky-sbbkly, mttld, carb rch mtx,
sft-frm, gd mod fair strmg grn blu cut, lt
grn blu res rng, no vis stn or por, abnt
BENT.

Scale Change

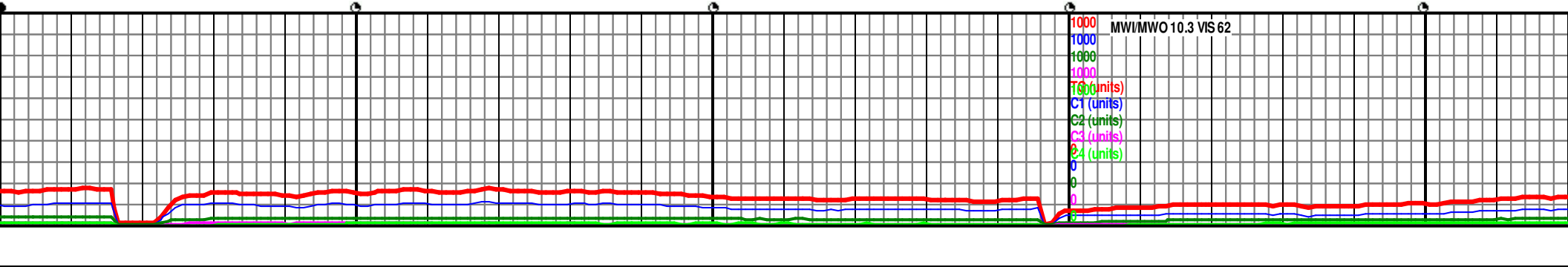
Niobrara C Marl @ 7267' MD (7066' TVD)

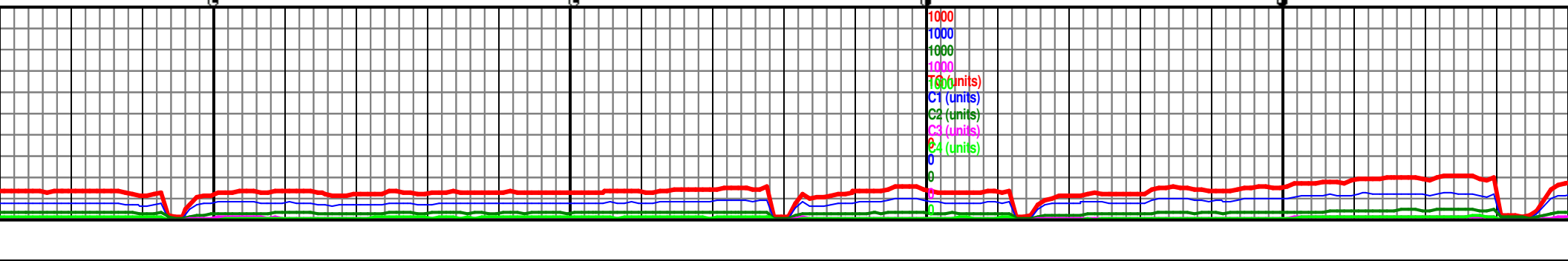
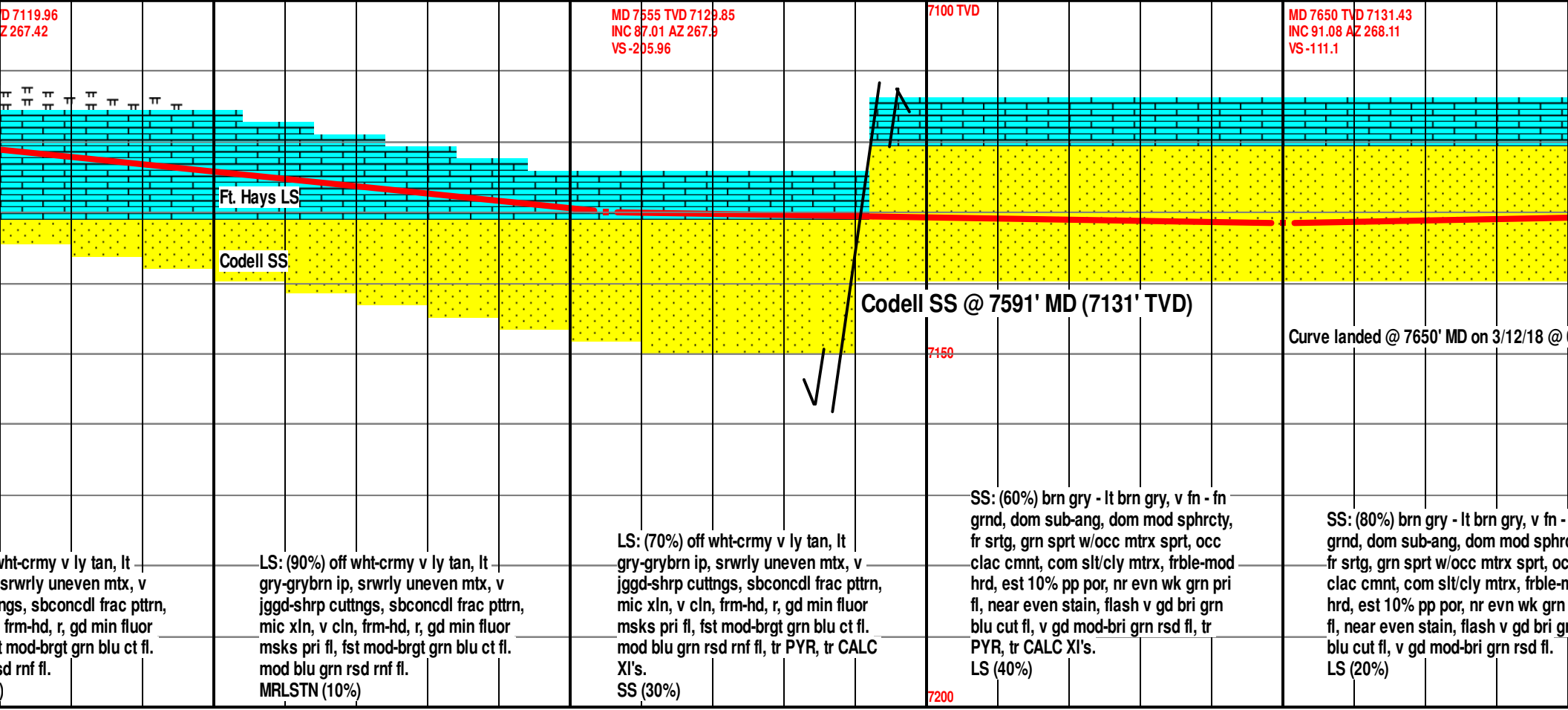
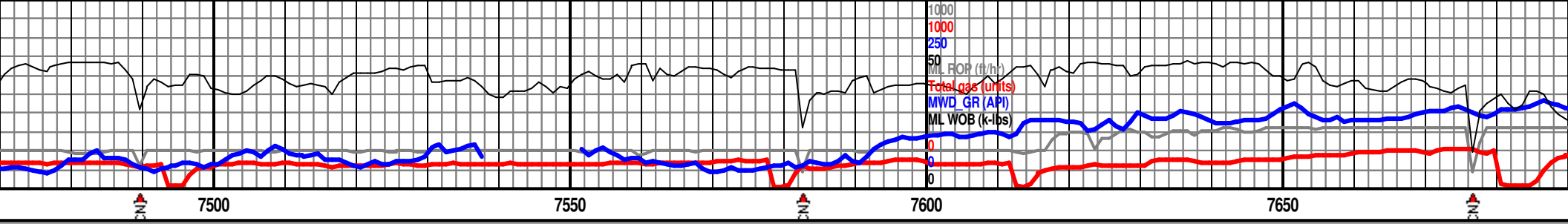
K Marker GR Data Missing

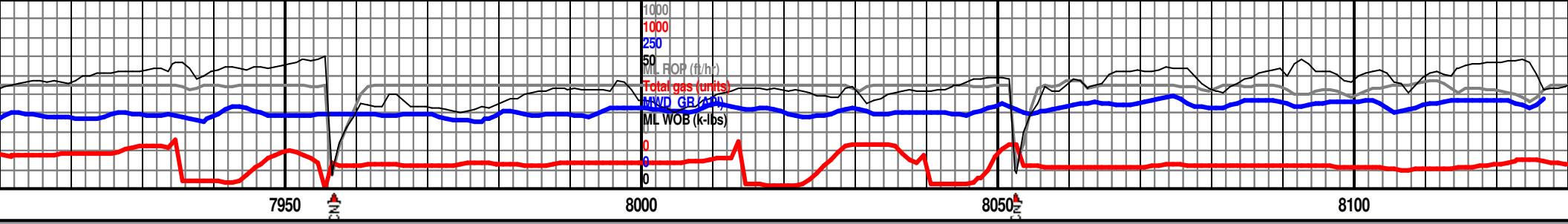
MRLST: (90%) drk gry-sl blk,
sbbkly-sbply, slty, sndy ip, mttld lt gry,
mod frm,
CHLK: (10%) lt gry-mod drk gry,
blky-sbbkly, mttld, carb rch mtx,
sft-frm, gd mod fair strmg grn blu cut, lt
grn blu res rng, no vis stn or por, tr
BENT.

MRLST: (60%) drk gry-sl blk,
sbbkly-sbply, slty, sndy ip, mttld lt gry,
mod frm,
LS: (20%) off wht-crmy v ly tan, lt
gry-grybrn ip, srwrly uneven mtx, v
jggd-shrp cuttngs, sbconcdl frac pptrn,
mic xln, v cln, frm-hd, r, gd min fluor
msks pri fl, fst mod-brgt grn blu ct fl.
mod blu grn rsd rnf fl.

LS: (70%) off w
gry-grybrn ip,
jggd-shrp cuttn
mic xln, v cln,
msks pri fl, fst
mod blu grn rs
MRLSTN (30%)







MD 7930 TVD 7125.98
 INC 91.11 AZ 266.35
 VS 168

7050 TVD

MD 8023 TVD 7124.23
 INC 91.05 AZ 267.88
 VS 260.79

MD 8117 TVD 7124.23
 INC 91.08 AZ 267.88
 VS 354.73

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, occ
 clac cmnt, com slt/cly mtrx, frble-mod
 hrd, est 10% pp por, nr evn wk grn pri
 fl, near even stain, flash v gd bri grn
 blu cut fl, v gd mod-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, occ
 clac cmnt, com slt/cly mtrx, frble-mod
 hrd, est 10% pp por, nr evn wk grn pri
 fl, near even stain, flash v gd bri grn
 blu cut fl, v gd mod-bri grn rsd fl.

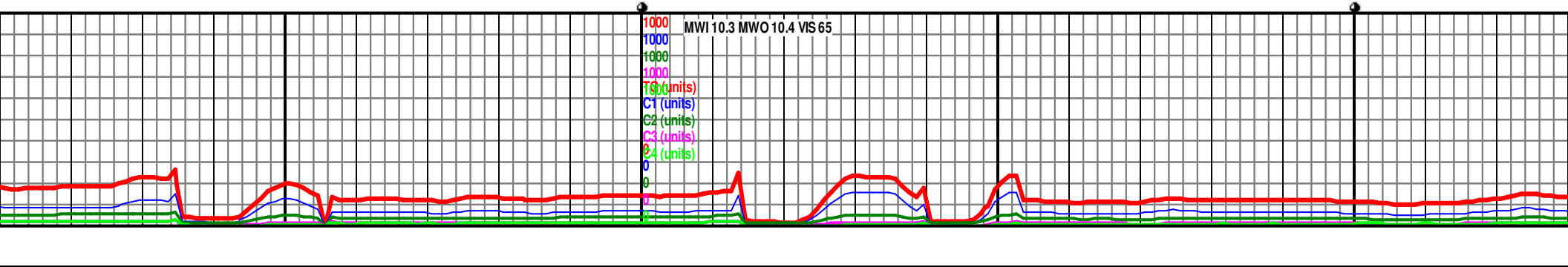
7100

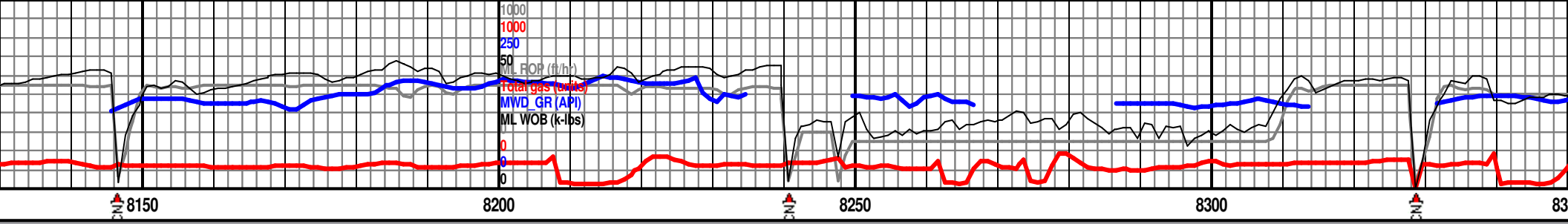
Ft. Hays LS

Codell SS

7150

MWI 10.3 MWO 10.4 VIS 65





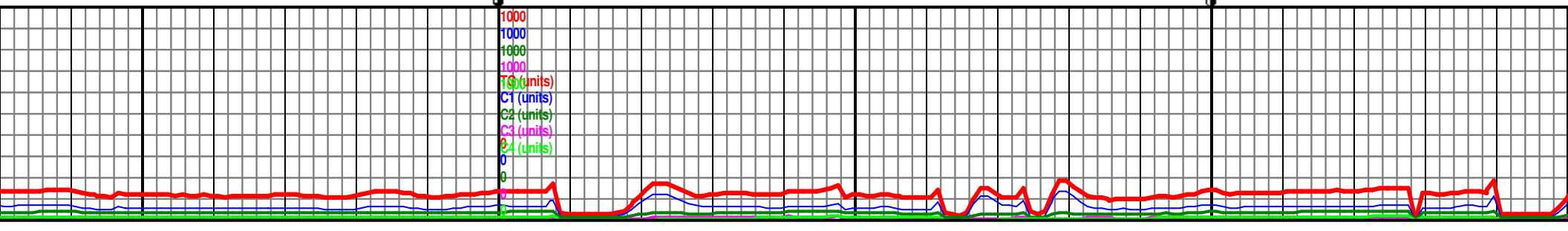
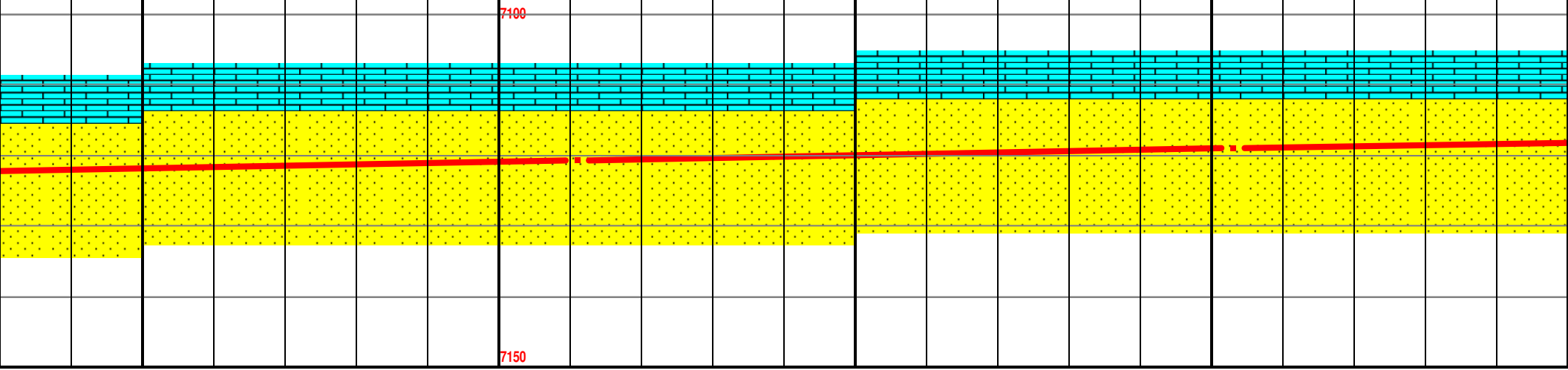
122.48
 0.19

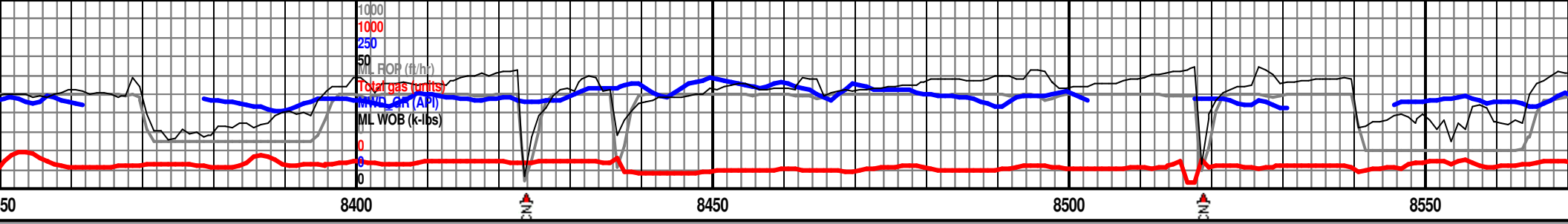
7050 TVD MD 8211 TVD 7120.68
 INC 91.11 AZ 270.87
 VS 448.71

MD 8308 TVD 7118.97
 INC 91.02 AZ 272.81
 VS 540.67

SS: (100%) brn gry - lt brn gry, v fn - fn
 grd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, occ
 clac cmnt, com slt/cly mtrx, frble-mod
 hrd, est 10% pp por, nr evn wk grn pri
 fl, near even stain, flash v gd bri grn
 blu cut fl, v gd mod-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
 grd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, occ
 clac cmnt, com slt/cly mtrx, frble-mod
 hrd, est 8% pp por, nr evn wk grn pri fl,
 spotted stain, fst gd bri grn blu cut fl,
 gd mod-bri grn rsd fl.





MD 8397 TVD 7117.38
INC 90.92 AZ 273.14
VS 634.59

MD 8490 TVD 7115.84
INC 90.98 AZ 273.29
VS 727.49

SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcy,
fr srtg, grn sprt w/occ mtrx sprt, occ
clac cmnt, com slt/cly mtrx, frble-mod
hrd, est 8% pp por, nr evn wk grn pri fl,
spotted stain, fst gd bri grn blu cut fl,
gd mod-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcy,
fr srtg, grn sprt w/occ mtrx sprt, occ
clac cmnt, com slt/cly mtrx, frble-mod
hrd, est 8% pp por, nr evn wk grn pri fl,
spotted stain, fst gd bri grn blu cut fl,
gd mod-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcy,
fr srtg, grn sprt w/occ mtrx sprt, occ
clac cmnt, com slt/cly mtrx, frble-mod
hrd, est 8% pp por, nr evn wk grn pri fl,
spotted stain, fst gd bri grn blu cut fl,
gd mod-bri grn rsd fl.

7100

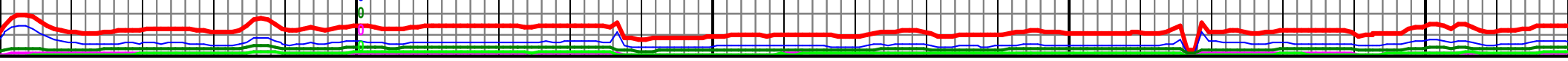
Ft. Hays LS

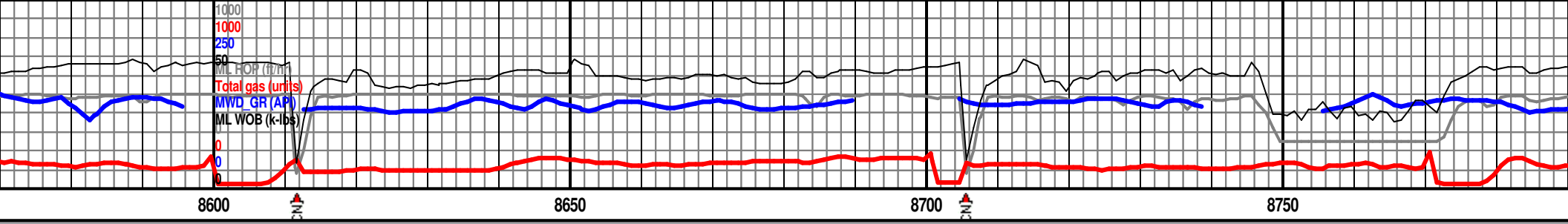
Codell SS

7150

MWI 10.4 MWO 10.5 VIS 66

1000
1000
1000
1000
1000
1000
C1 (units)
C2 (units)
C3 (units)
C4 (units)





MD 8584 TVD 7114.26
 INC 90.95 AZ 271.79
 VS 821.42

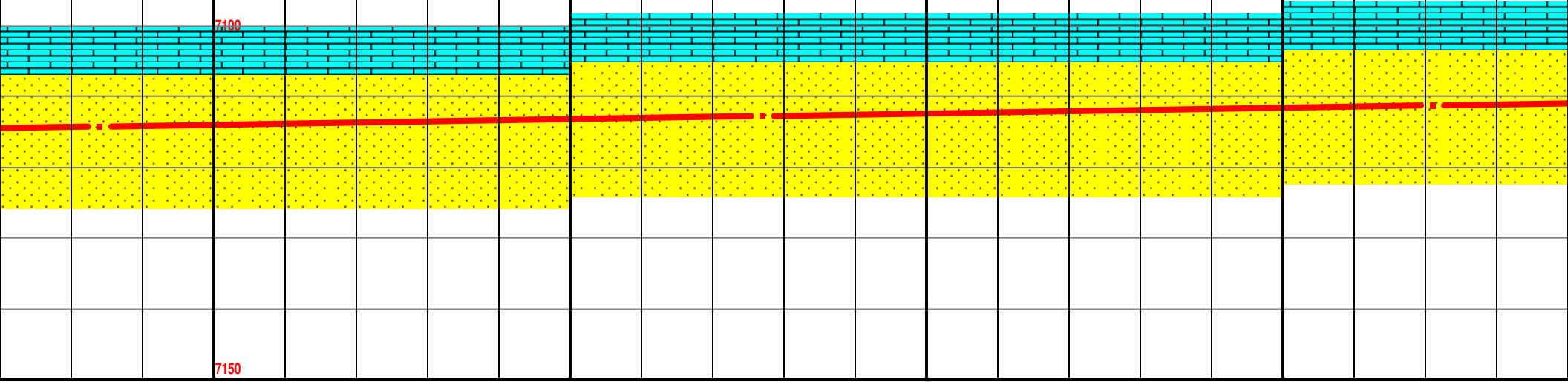
MD 8677 TVD 7112.71
 INC 90.95 AZ 249.19
 VS 914.4

MD 8771 TVD 7111.23
 INC 90.86 AZ 267.06
 VS 1008.29

gry - lt brn gry, v fn - fn
 ang, dom mod sphrcty,
 t w/occ mtrx sprt, occ
 n slt/cly mtrx, frble-mod
 por, nr evn wk grn pri fl,
 fst gd bri grn blu cut fl,
 rsd fl.

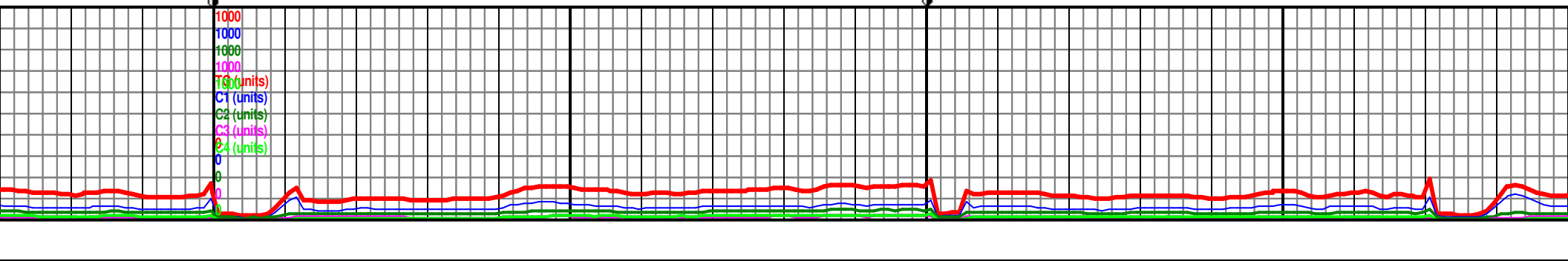
SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, occ
 clac cmnt, com slt/cly mtrx, frble-mod
 hrd, est 8% pp por, nr evn wk grn pri fl,
 spotted stain, fst gd bri grn blu cut fl,
 gd mod-bri grn rsd fl.

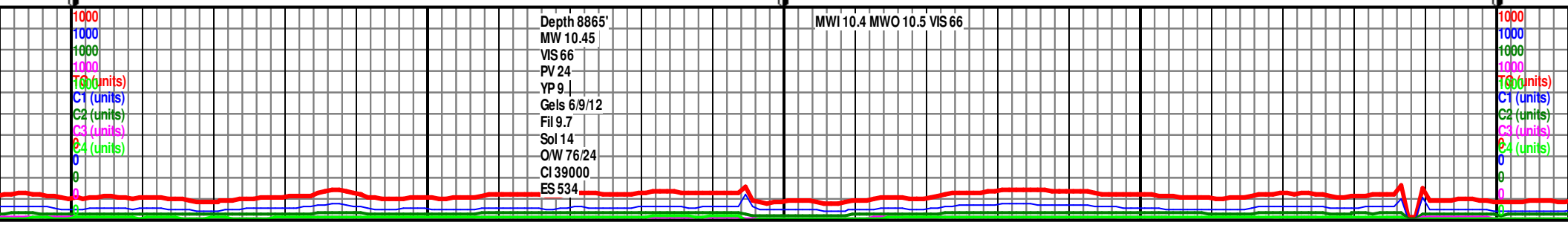
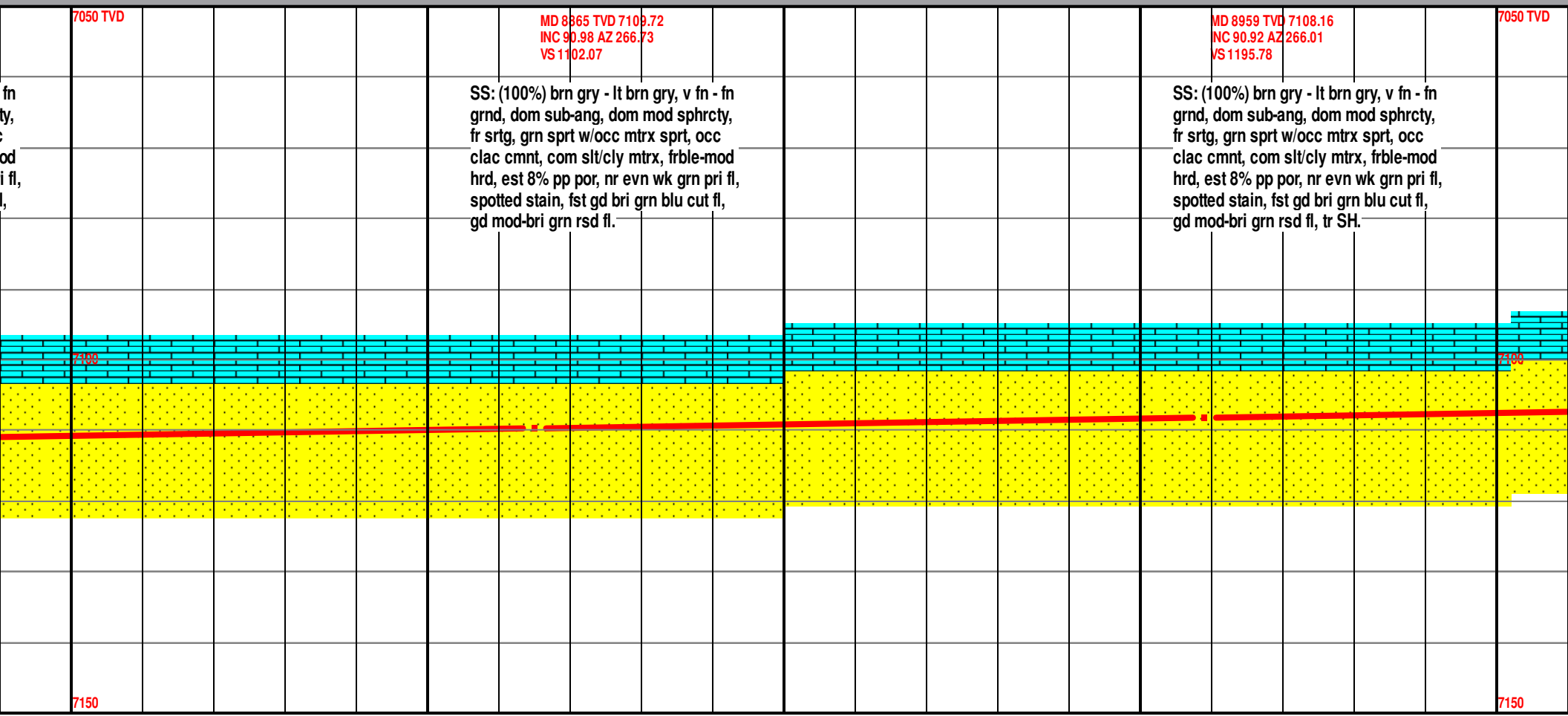
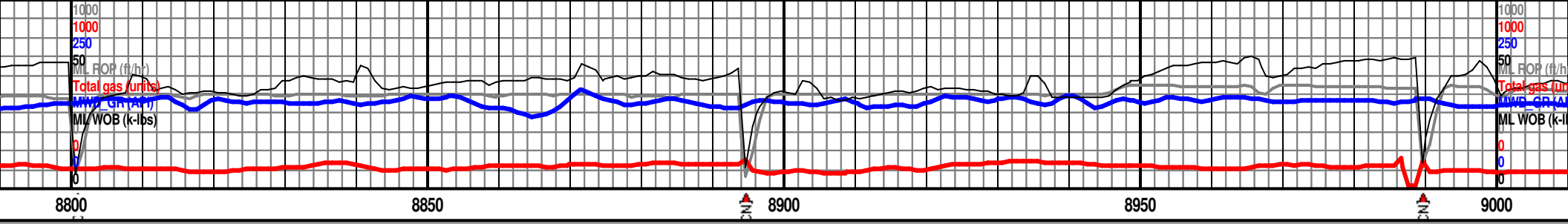
SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, occ
 clac cmnt, com slt/cly mtrx, frble-m
 hrd, est 8% pp por, nr evn wk grn pri
 spotted stain, fst gd bri grn blu cut fl
 gd mod-bri grn rsd fl.

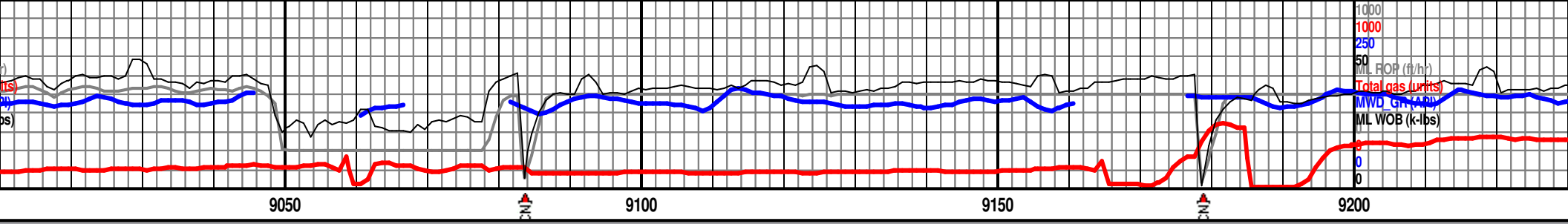


7100

7150







MD 9052 TVD 7106.72
 INC 90.84 AZ 264.97
 VS 1288.39

MD 9147 TVD 7105.13
 INC 91.05 AZ 245.81
 VS 1382.96

7050 TVD

SS: (100%) brn gry - lt brn gry, v fn - fn
 grd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, occ
 clac cmnt, com slt/cly mtrx, frble-mod
 hrd, est 8% pp por, nr evn wk grn pri fl,
 spotted stain, fst gd bri grn blu cut fl,
 gd mod-bri grn rsd fl, tr SH.

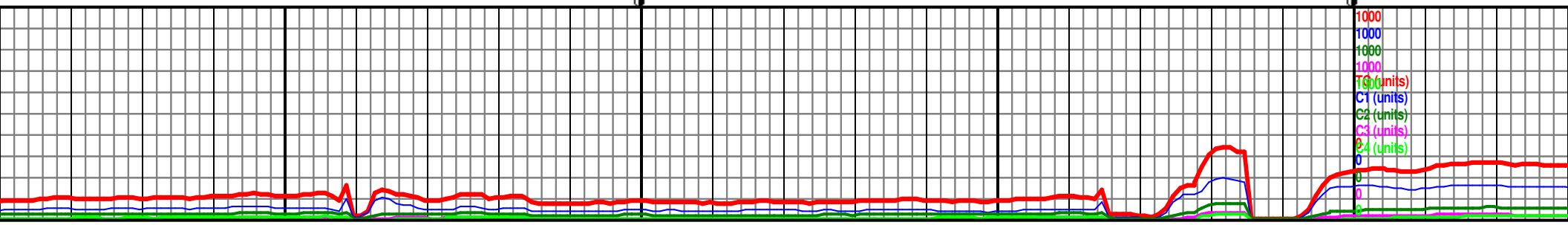
SS: (100%) brn gry - lt brn gry, v fn - fn
 grd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, occ
 clac cmnt, com slt/cly mtrx, frble-mod
 hrd, est 8% pp por, nr evn wk grn pri fl,
 spotted stain, fst gd bri grn blu cut fl,
 gd mod-bri grn rsd fl.

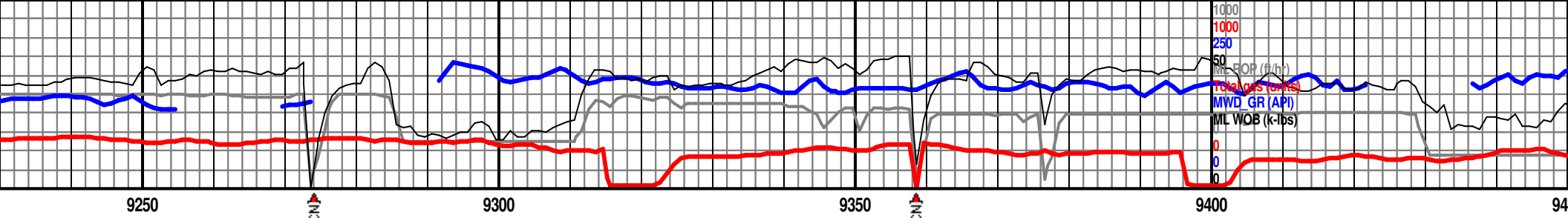
Ft. Hays LS

Codell SS

7180

7150



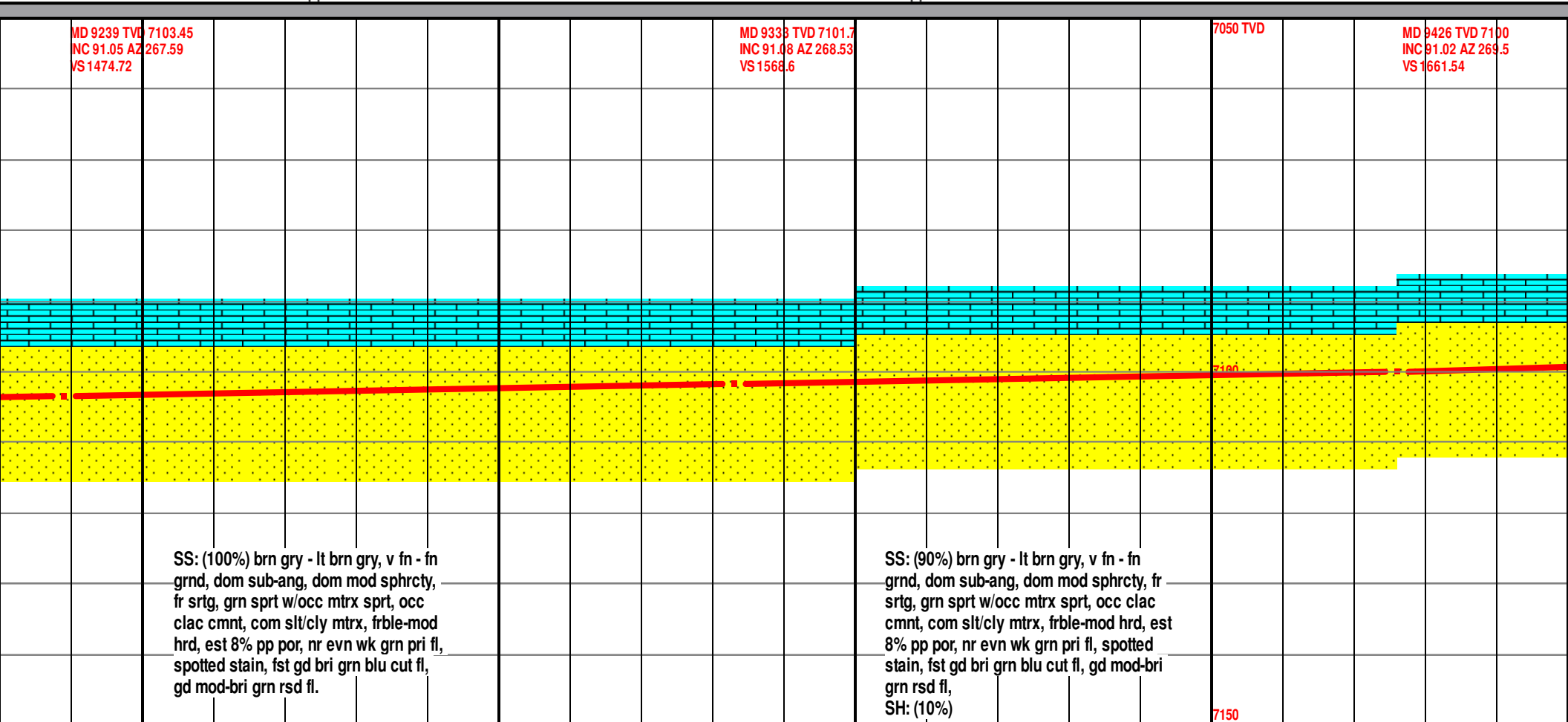


MD 9239 TVD 7103.45
 INC 91.05 AZ 267.59
 VS 1474.72

MD 9333 TVD 7101.7
 INC 91.08 AZ 268.53
 VS 1568.6

7050 TVD

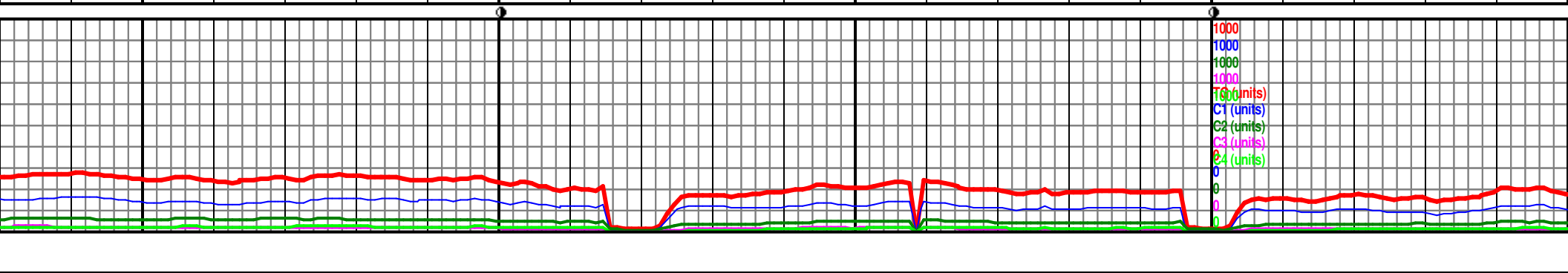
MD 9426 TVD 7100
 INC 91.02 AZ 269.5
 VS 1661.54

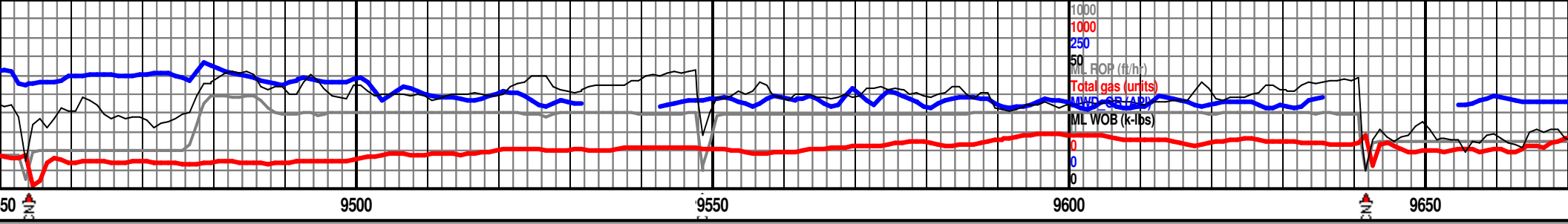


SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, occ
 clac cmnt, com slt/clty mtrx, frble-mod
 hrd, est 8% pp por, nr evn wk grn pri fl,
 spotted stain, fst gd bri grn blu cut fl,
 gd mod-bri grn rsd fl.

SS: (90%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty, fr
 srtg, grn sprt w/occ mtrx sprt, occ clac
 cmnt, com slt/clty mtrx, frble-mod hrd, est
 8% pp por, nr evn wk grn pri fl, spotted
 stain, fst gd bri grn blu cut fl, gd mod-bri
 grn rsd fl,
 SH: (10%)

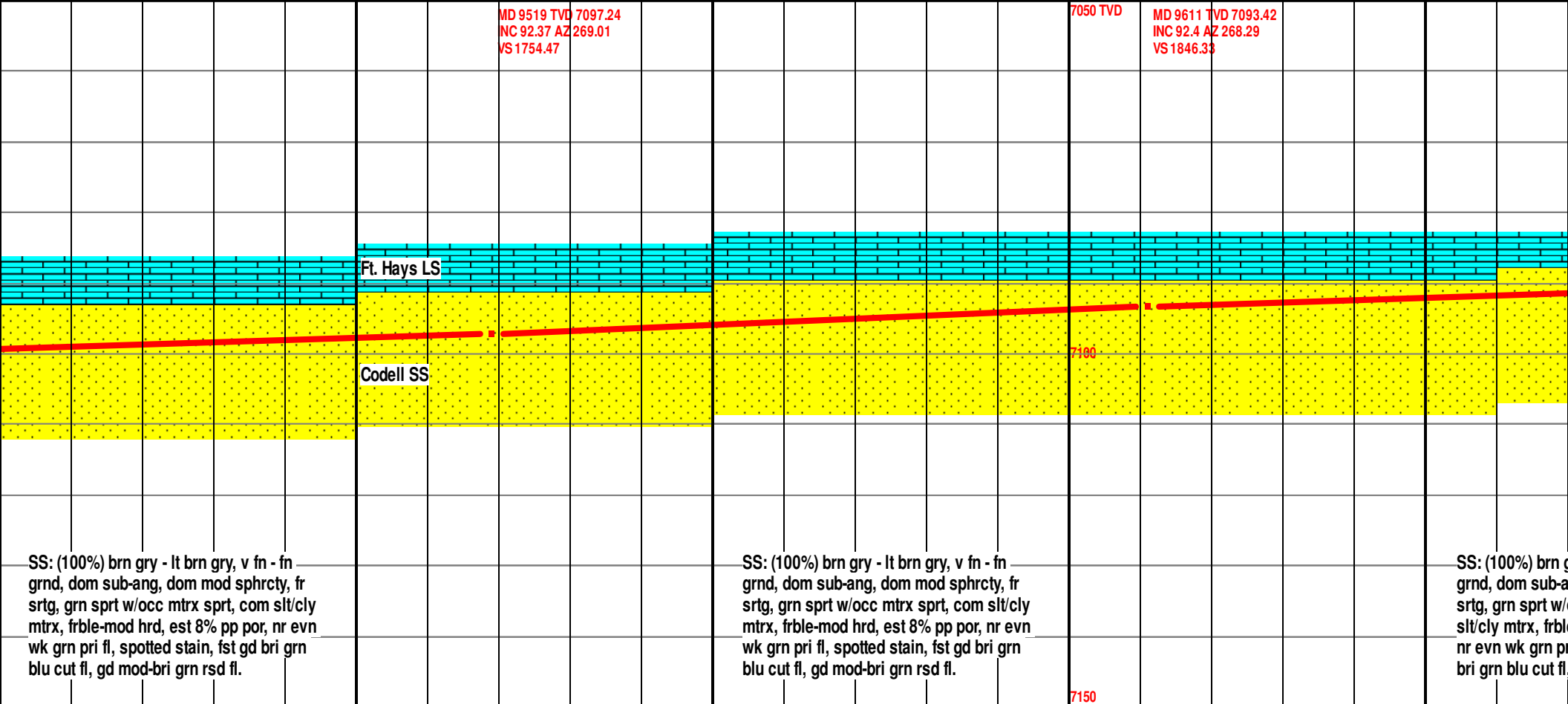
7150



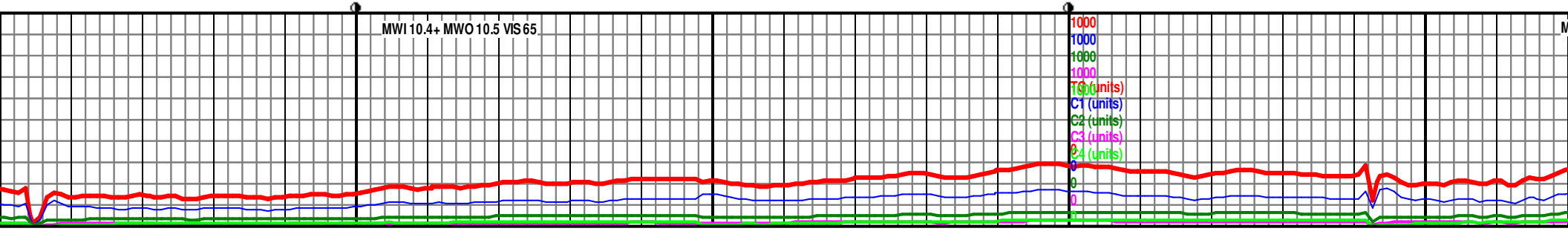


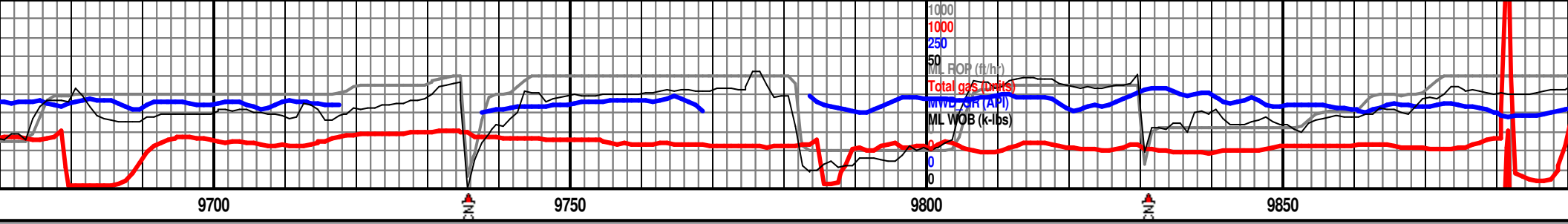
MD 9519 TVD 7097.24
 NC 92.37 AZ 269.01
 VS 1754.47

7050 TVD MD 9611 TVD 7093.42
 INC 92.4 AZ 268.29
 VS 1846.33



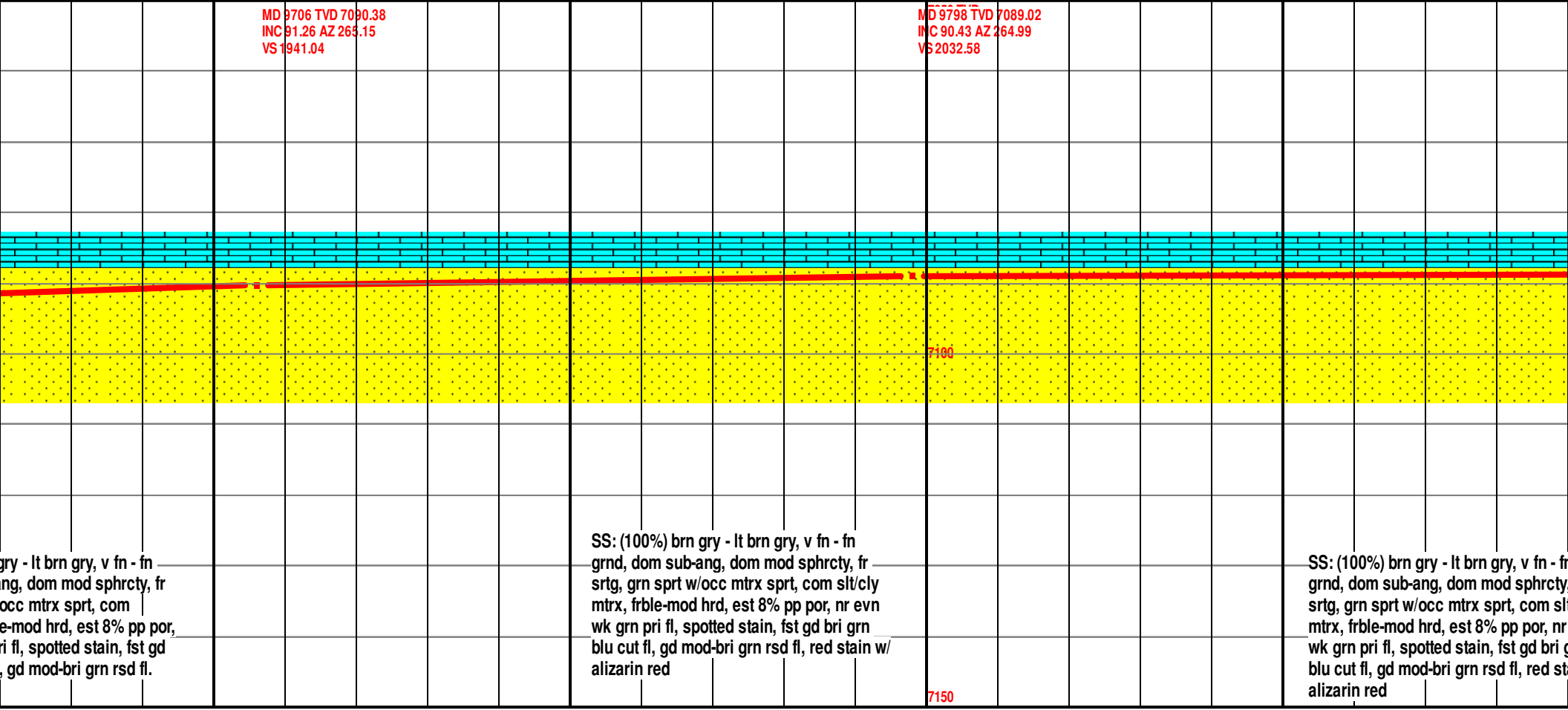
MWI 10.4+ MWO 10.5 VIS 65





MD 9706 TVD 7090.38
 INC 91.26 AZ 263.15
 VS 1941.04

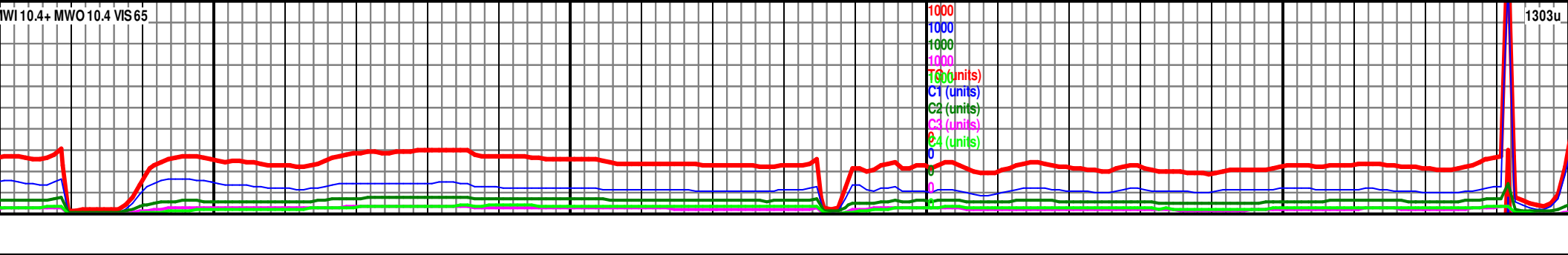
MD 9798 TVD 7089.02
 INC 90.43 AZ 264.99
 VS 2032.58

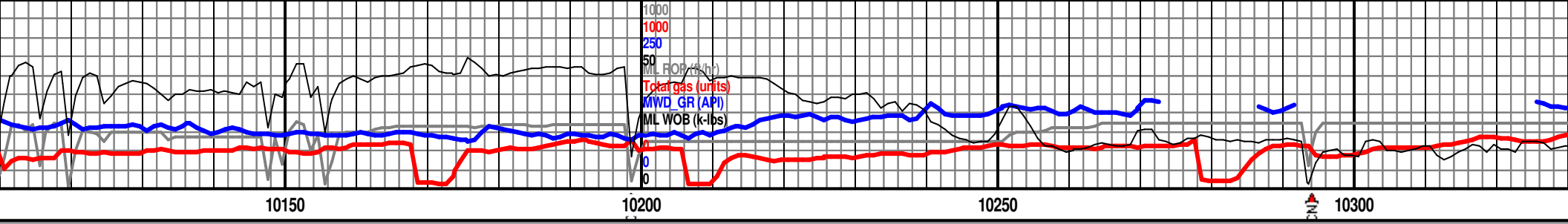


gry - lt brn gry, v fn - fn
 ing, dom mod sphrcty, fr
 occ mtrx sprt, com
 e-mod hrd, est 8% pp por,
 ri fl, spotted stain, fst gd
 gd mod-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty, fr
 srtg, grn sprt w/occ mtrx sprt, com slit/cly
 mtrx, frble-mod hrd, est 8% pp por, nr evn
 wk grn pri fl, spotted stain, fst gd bri grn
 blu cut fl, gd mod-bri grn rsd fl, red stain w/
 alizarin red

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty,
 srtg, grn sprt w/occ mtrx sprt, com slit
 mtrx, frble-mod hrd, est 8% pp por, nr
 wk grn pri fl, spotted stain, fst gd bri g
 blu cut fl, gd mod-bri grn rsd fl, red st
 alizarin red





10150

10200

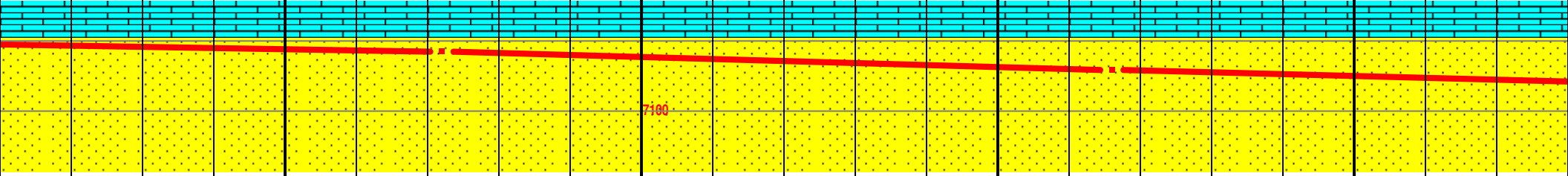
10250

10300

MD 10172 TVD 7091.6
INC 88.68 AZ 263.91
VS 2405.15

7050 TVD

MD 10266 TVD 7094.28
INC 88.06 AZ 267.2
VS 2498.72



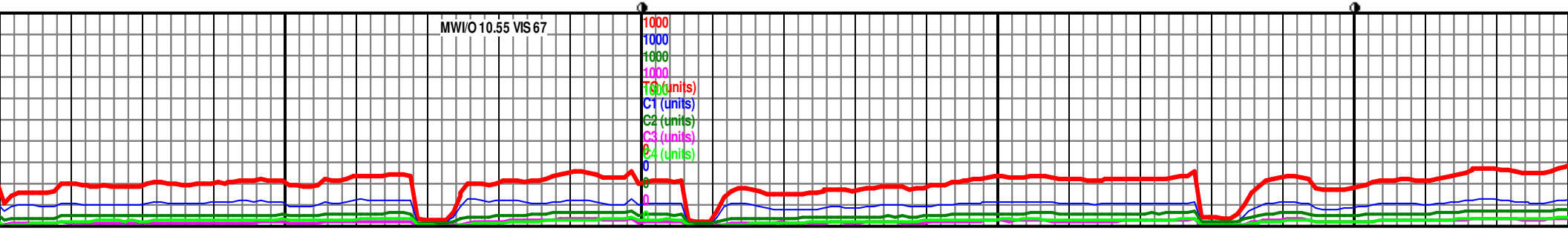
7180

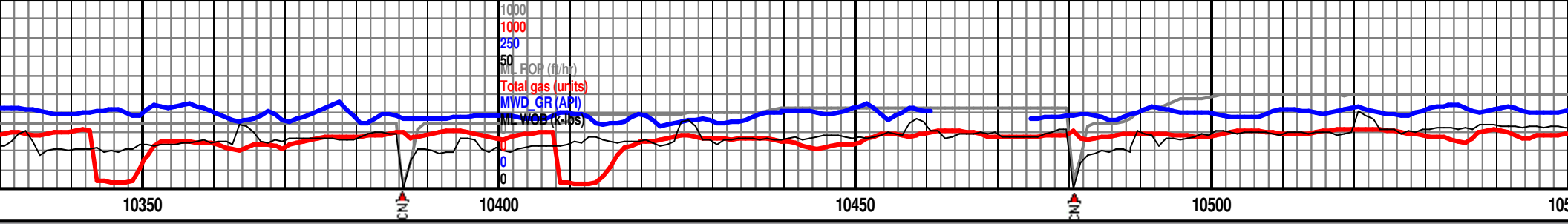
SS: (100%) brn gry - lt brn gry, v fn - fn grnd, dom sub-ang, dom mod sphrcty, fr srtg, grn sprt w/occ mtrx sprt, com slt/cly mtrx, frble-mod hrd, est 8% pp por, nr evn wk grn pri fl, spotted stain, fst gd bri grn blu cut fl, gd mod-bri grn rsd fl, pink stn w/ AR, rr LS

SS: (100%) brn gry - lt brn gry, v fn - fn grnd, dom sub-ang, dom mod sphrcty, fr srtg, grn sprt w/occ mtrx sprt, com slt/cly mtrx, frble-mod hrd, est 8% pp por, nr evn wk grn pri fl, spotted stain, fst gd bri grn blu cut fl, gd mod-bri grn rsd fl.

7150

MW/O 10.55 VIS 67

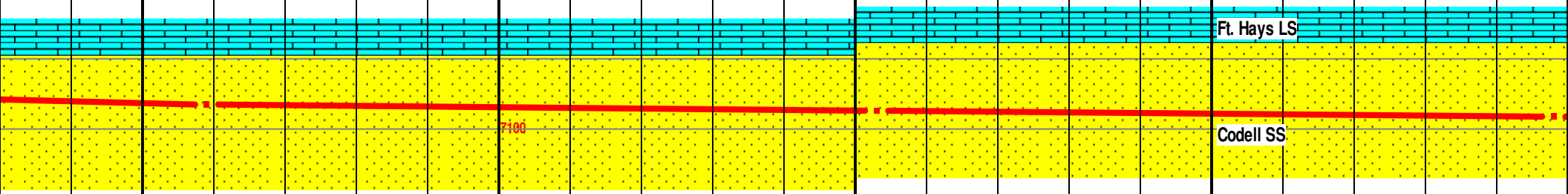




MD 10359 TVD 7096.45
NC 89.26 AZ 269.37
VS 2591.61

7050 TVD

MD 10453 TVD 7097.41
INC 89.47 AZ 269.53
VS 2685.58

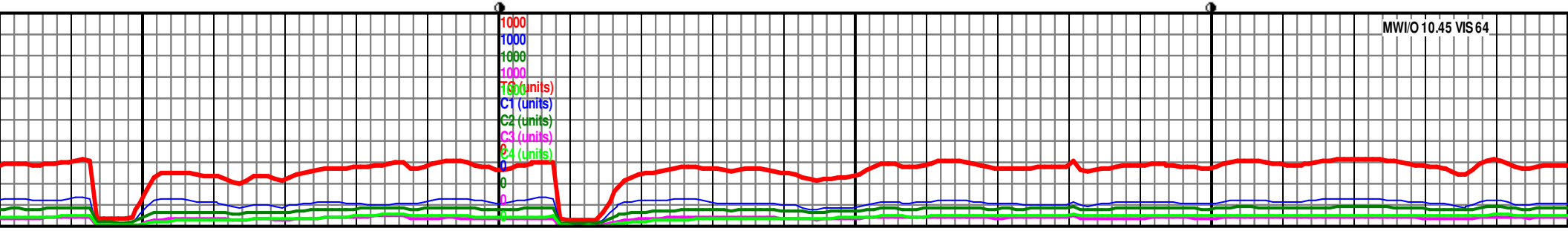


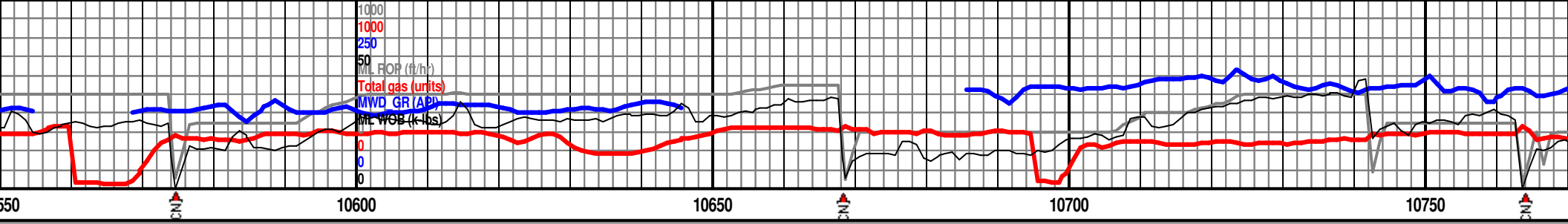
SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcty, fr
srtg, grn sprt w/occ mtrx sprt, com slt/clt
mtrx, frble-mod hrd, est 8% pp por, nr evn
wk grn pri fl, spotted stain, fst gd bri grn
blu cut fl, gd mod-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcty, fr
srtg, grn sprt w/occ mtrx sprt, com slt/clt
mtrx, frble-mod hrd, est 8% pp por, nr evn
wk grn pri fl, spotted stain, fst gd bri grn
blu cut fl, gd mod-bri grn rsd fl.

7150

MW/O 10.45 VIS 64



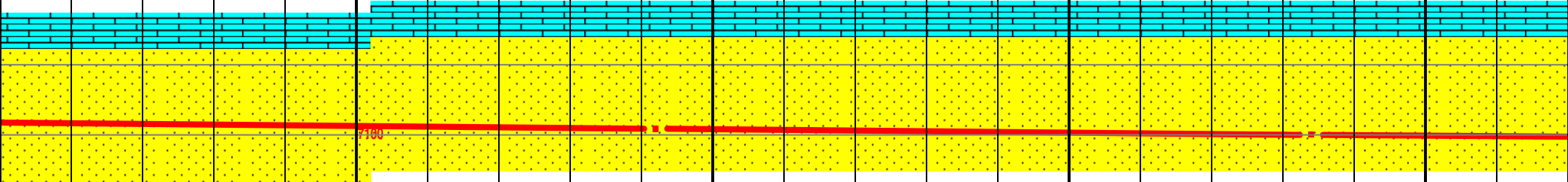


D 10548 TVD 7098.28
 C 89.38 AZ 269.9
 S 2780.56

7050 TVD

MD 10642 TVD 7099.24
 INC 89.43 AZ 270.44
 VS 2874.55

MD 10734 TVD 7099.98
 INC 89.63 AZ 271.65
 VS 2966.54

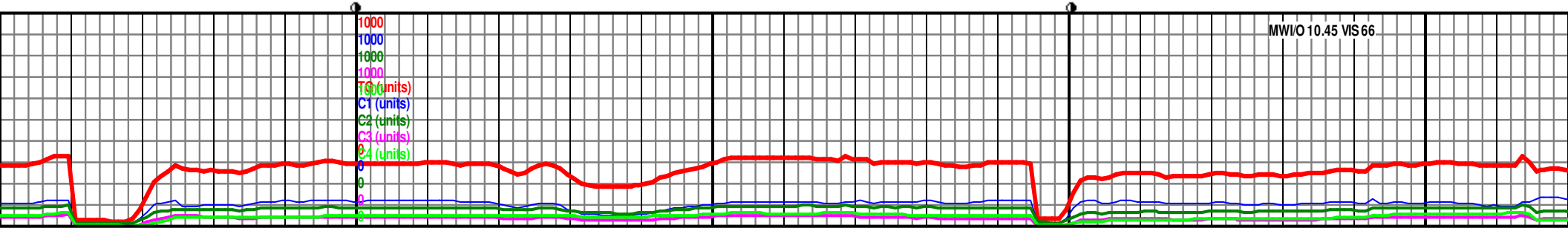


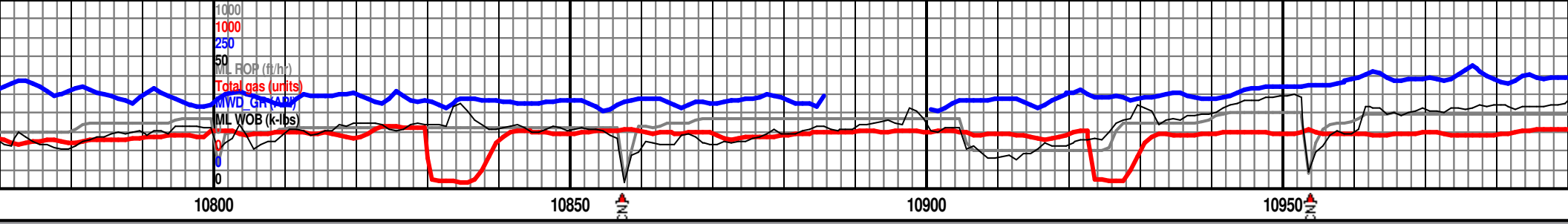
SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty, fr
 srtg, grn sprt w/occ mtrx sprt, com slt/clt
 mtrx, frble-mod hrd, est 8% pp por, nr evn
 wk grn pri fl, spotted stain, fst gd bri grn
 blu cut fl, gd mod-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty, fr
 srtg, grn sprt w/occ mtrx sprt, com slt/clt
 mtrx, frble-mod hrd, est 8% pp por, nr evn
 wk grn pri fl, spotted stain, fst gd bri grn
 blu cut fl, gd mod-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty, fr
 srtg, grn sprt w/occ mtrx sprt, com slt/clt
 mtrx, frble-mod hrd, est 8% pp por, nr evn
 wk grn pri fl, spotted stain, fst gd bri grn
 blu cut fl, gd mod-bri grn rsd fl.

7150

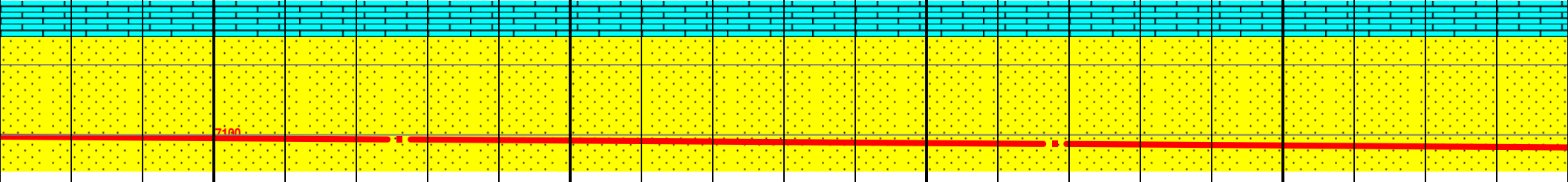




7050 TVD

MD 10826 TVD 7100.65
 INC 89.54 AZ 271.91
 VS 3058.52

MD 10918 TVD 7101.34
 INC 89.6 AZ 271.73
 VS 3150.5

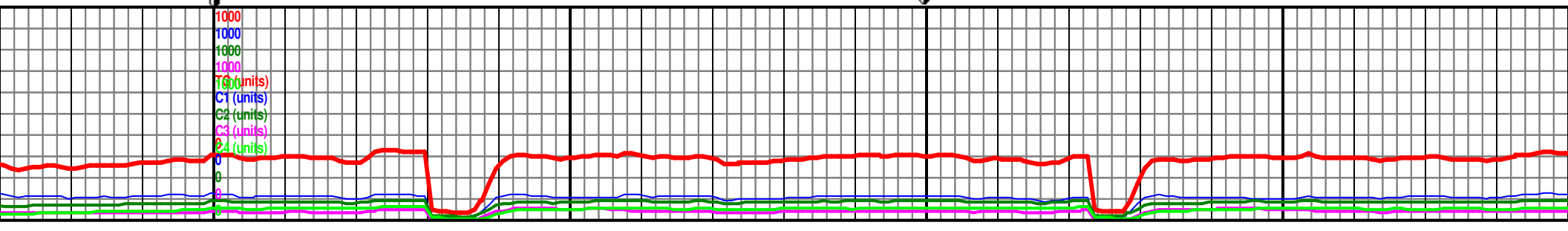


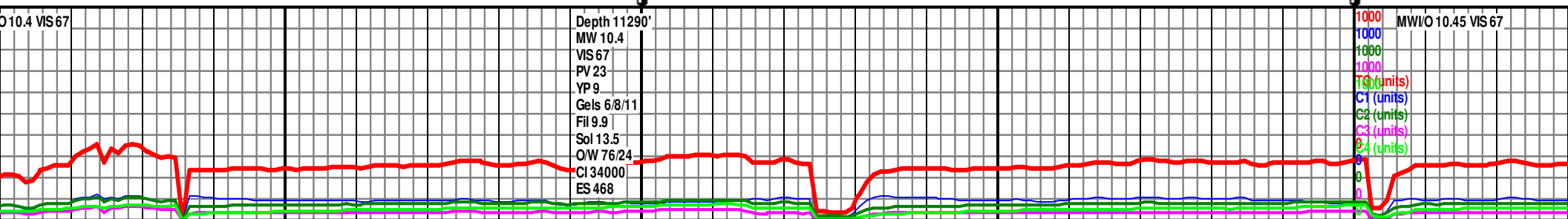
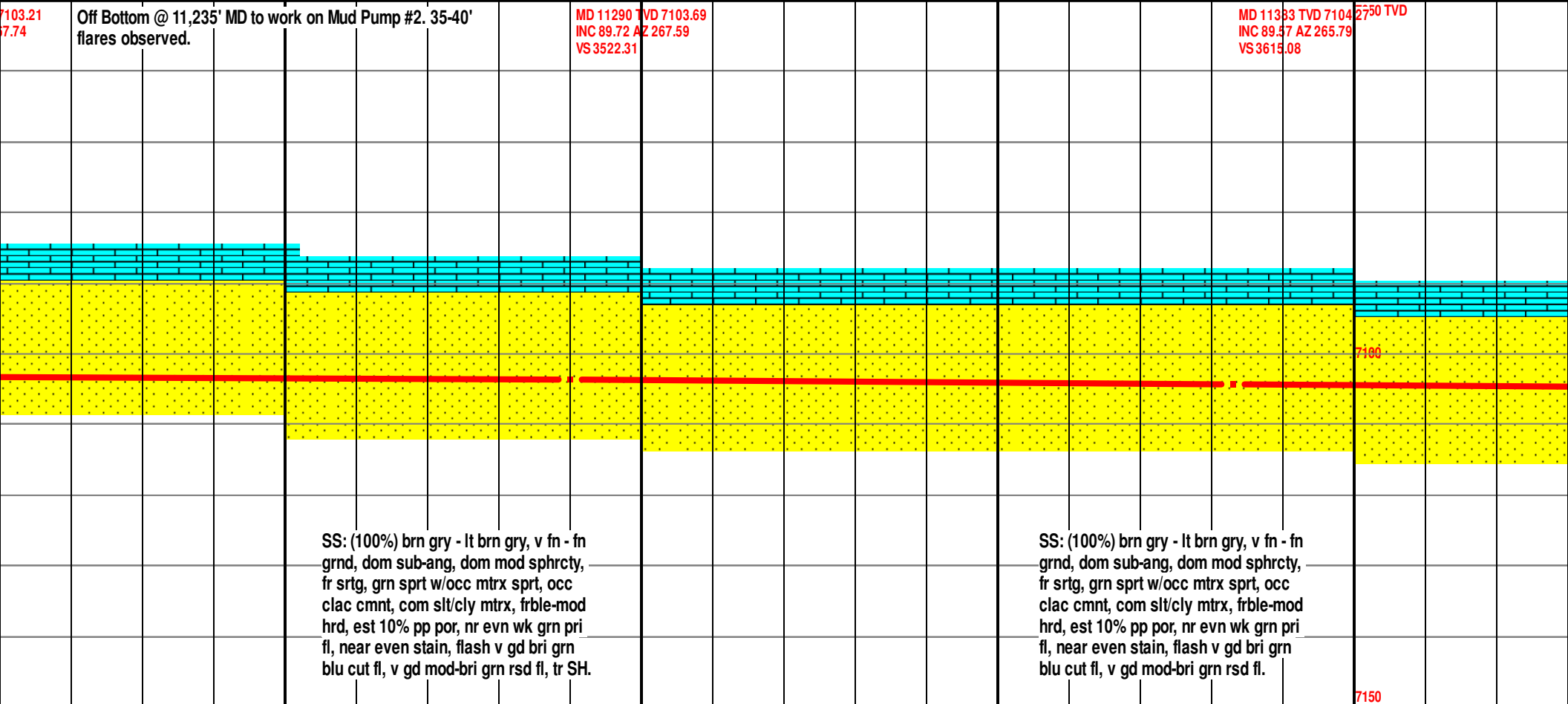
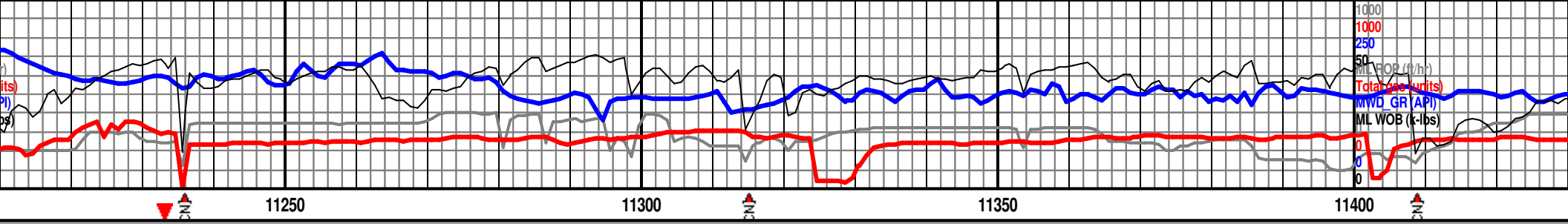
gry - lt brn gry, v fn - fn
 ang, dom mod sphrcy, fr
 occ mtrx sprt, com slt/cly
 hrd, est 8% pp por, nr evn
 spotted stain, fst gd bri grn
 mod-bri grn rsd fl, tr SH

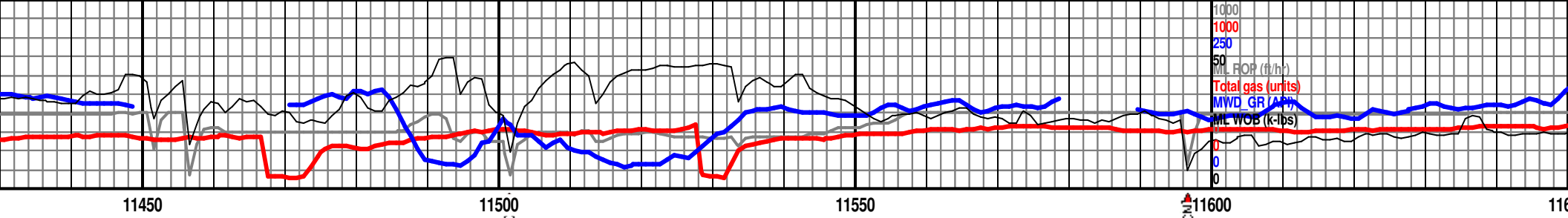
SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcy, fr
 srtg, grn sprt w/occ mtrx sprt, com
 slt/cly mtrx, frble-mod hrd, est 8% pp
 por, nr evn wk grn pri fl, spotted stain,
 fst gd bri grn blu cut fl, gd mod-bri grn
 rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcy,
 srtg, grn sprt w/occ mtrx sprt, com slt
 mtrx, frble-mod hrd, est 8% pp por, nr
 wk grn pri fl, spotted stain, fst gd bri g
 blu cut fl, gd mod-bri grn rsd fl, tr SH.

7150







1000
1000
250
50
ML ROP (ft/h)
Total gas (units)
MWD GR (MPa)
ML WOB (K-lbs)

11450

11500

11550

11600

11650

MD 11476 TVD 7104.99
INC 89.54 AZ 263.32
VS 3707.7

MD 11570 TVD 7105.75
INC 89.54 AZ 265.96
VS 3801.33

7050 TVD

Fault #1 @ 11470' MD (3689' VS)

Ft. Hays LS

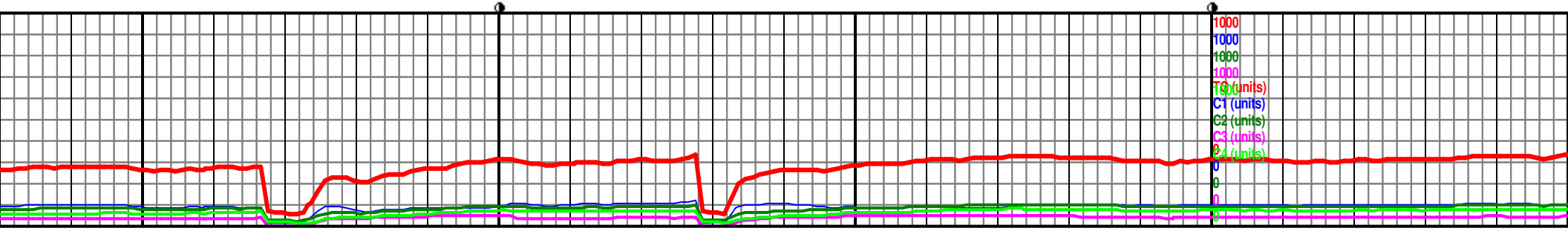
CodeII SS

SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcty,
fr srtg, grn sprt w/occ mtrx sprt, com
slt/clly mtrx, frble-mod hrd, est 8% pp
por, nr evn wk grn pri fl, spotted stain,
fst gd bri grn blu cut fl, gd mod-bri grn
rsd fl, tr CALCITE XL's, tr PYR.

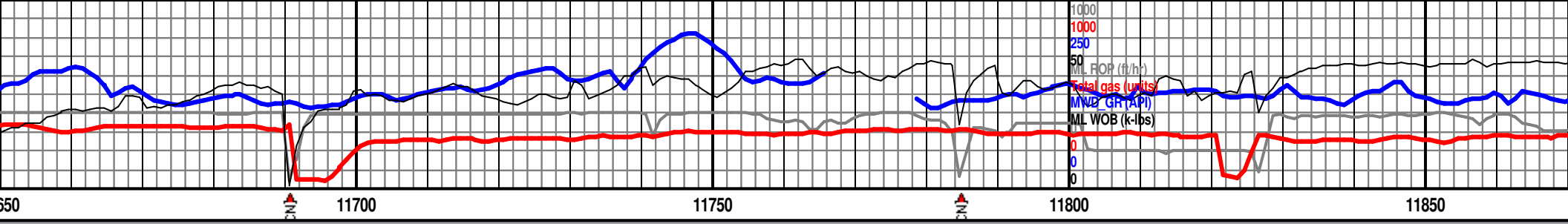
SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcty, fr
srtg, grn sprt w/occ mtrx sprt, com slt/clly
mtrx, frble-mod hrd, est 8% pp por, nr evn
wk grn pri fl, spotted stain, fst gd bri grn
blu cut fl, gd mod-bri grn rsd fl, pink stain
with AR.

7189

7150



1000
1000
1000
1000
1000
C1 (units)
C2 (units)
C3 (units)
C4 (units)

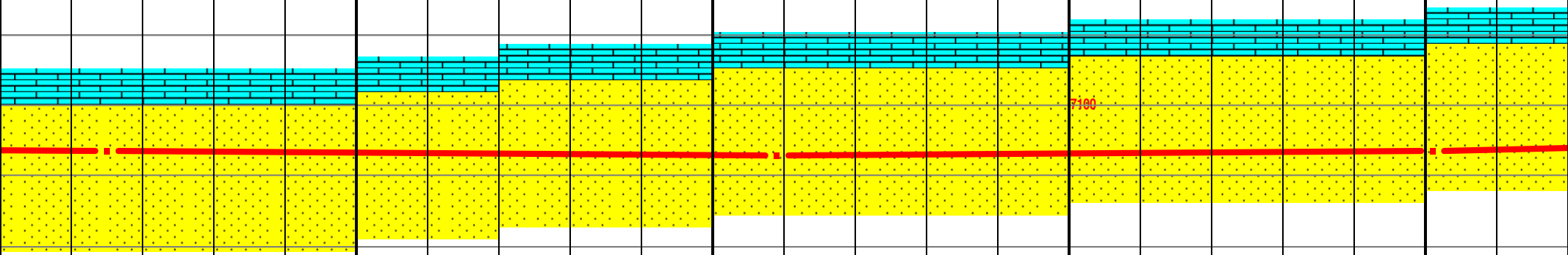


MD 11665 TVD 7106.41
INC 89.66 AZ 266.88
VS 3896.06

MD 11759 TVD 7107.02
INC 89.6 AZ 267.64
VS 3989.89

7050 TVD

MD 11851 TVD 7106.45
INC 91.11 AZ 268.6
VS 4081.79



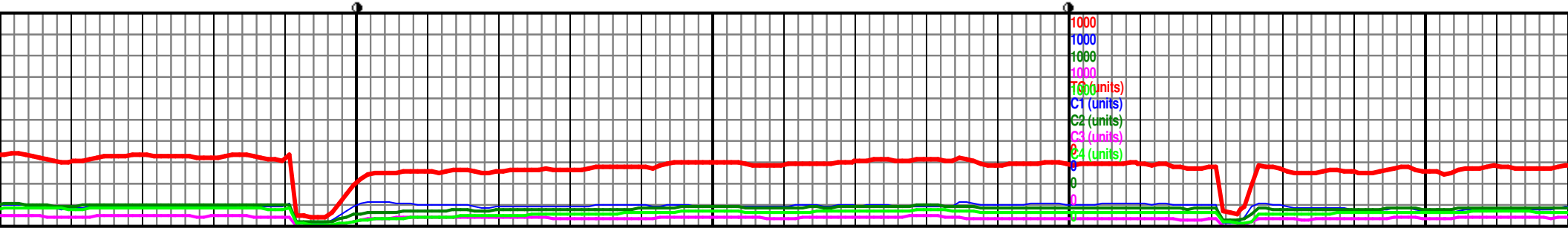
SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcty,
fr srtg, grn sprt w/occ mtrx sprt, com
slt/cly mtrx, frble-mod hrd, est 8% pp
por, nr evn wk grn pri fl, spotted stain,
fst gd bri grn blu cut fl, gd mod-bri grn
rsd fl.

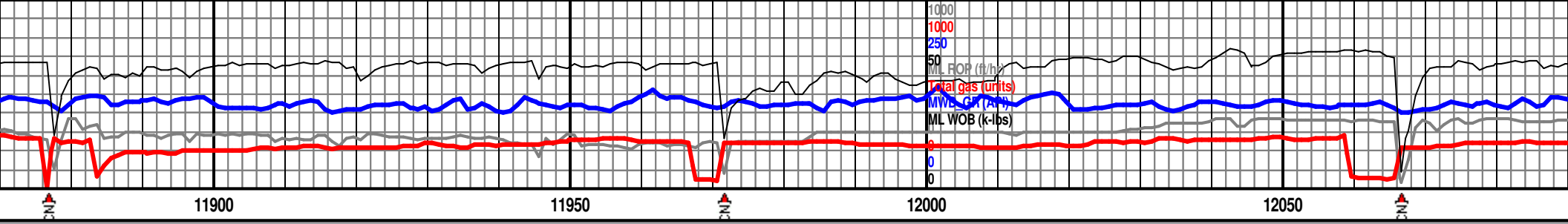
SS: (90%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcty,
fr srtg, grn sprt w/occ mtrx sprt, com
slt/cly mtrx, frble-mod hrd, est 8% pp
por, nr evn wk grn pri fl, spotted stain,
fst gd bri grn blu cut fl, gd mod-bri grn
rsd fl.
SH: (10%)

7180

SS: (80%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcty,
fr srtg, grn sprt w/occ mtrx sprt, com
slt/cly mtrx, frble-mod hrd, est 8% pp
por, nr evn wk grn pri fl, spotted stain,
fst gd bri grn blu cut fl, gd mod-bri grn
rsd fl.
SH: (20%)

7150

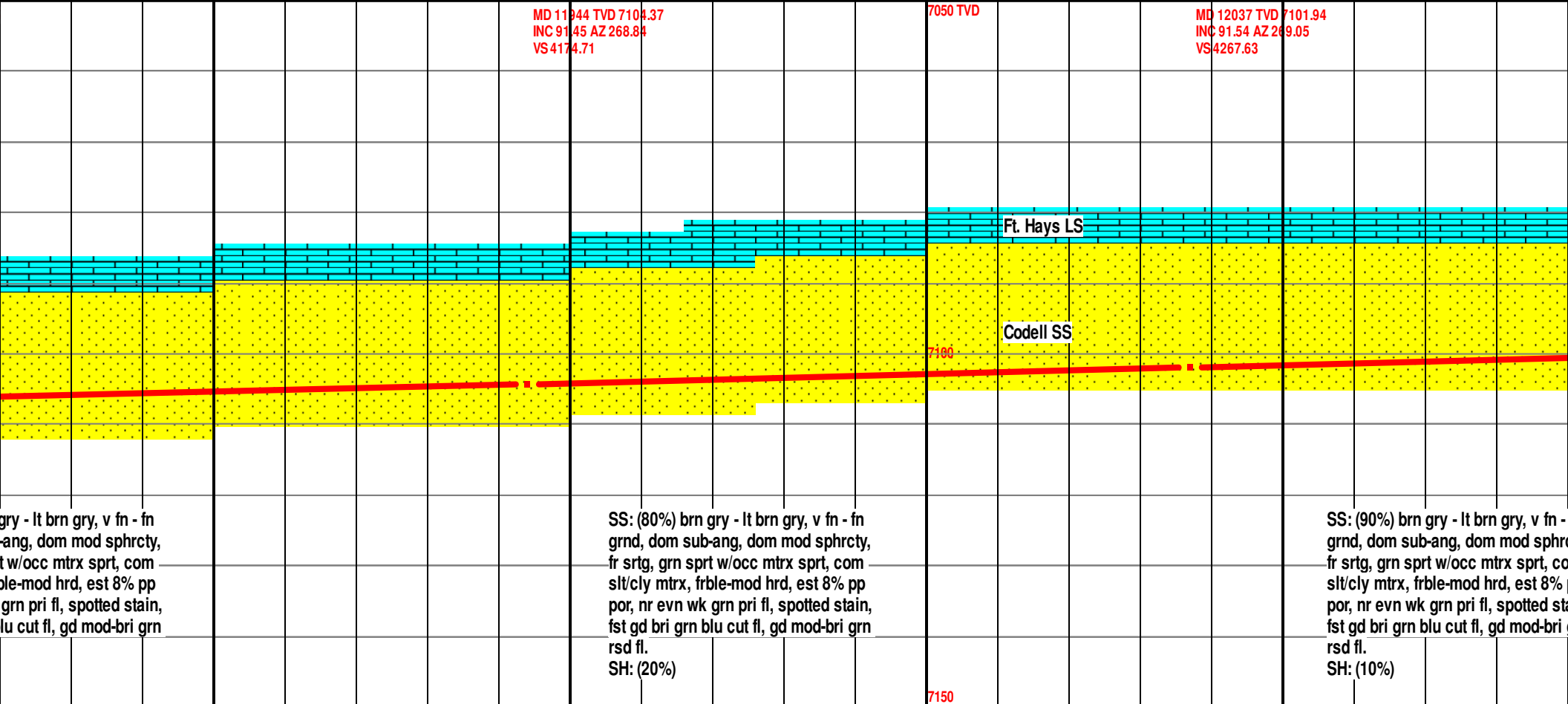




MD 11944 TVD 7104.37
 INC 91.45 AZ 268.84
 VS 4174.71

7050 TVD

MD 12037 TVD 7101.94
 INC 91.54 AZ 269.05
 VS 4267.63



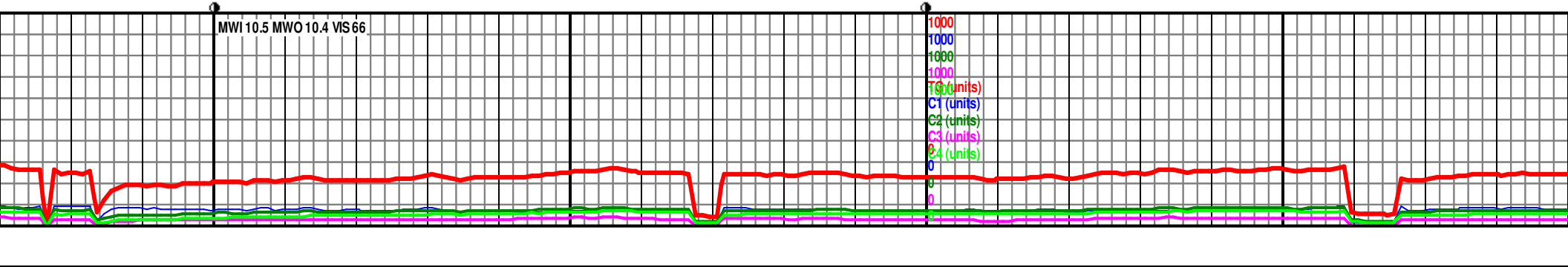
gry - lt brn gry, v fn - fn
 -ang, dom mod sphrcty,
 t w/occ mtrx sprt, com
 ole-mod hrd, est 8% pp
 grn pri fl, spotted stain,
 lu cut fl, gd mod-bri grn

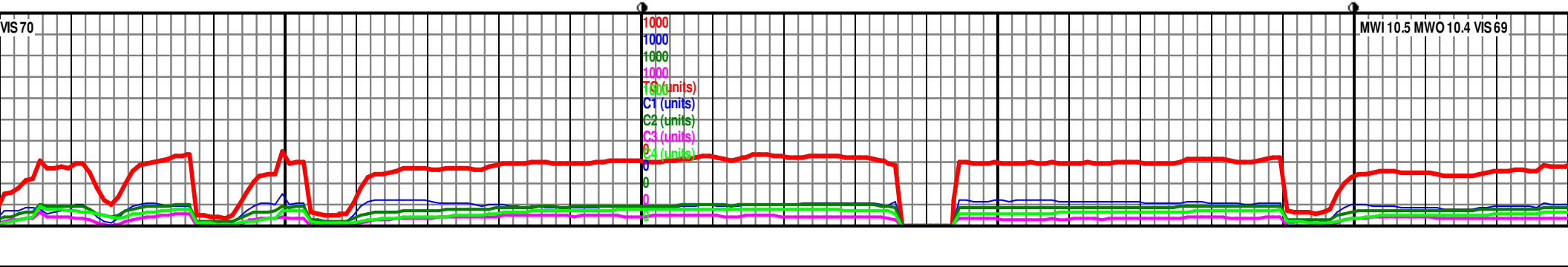
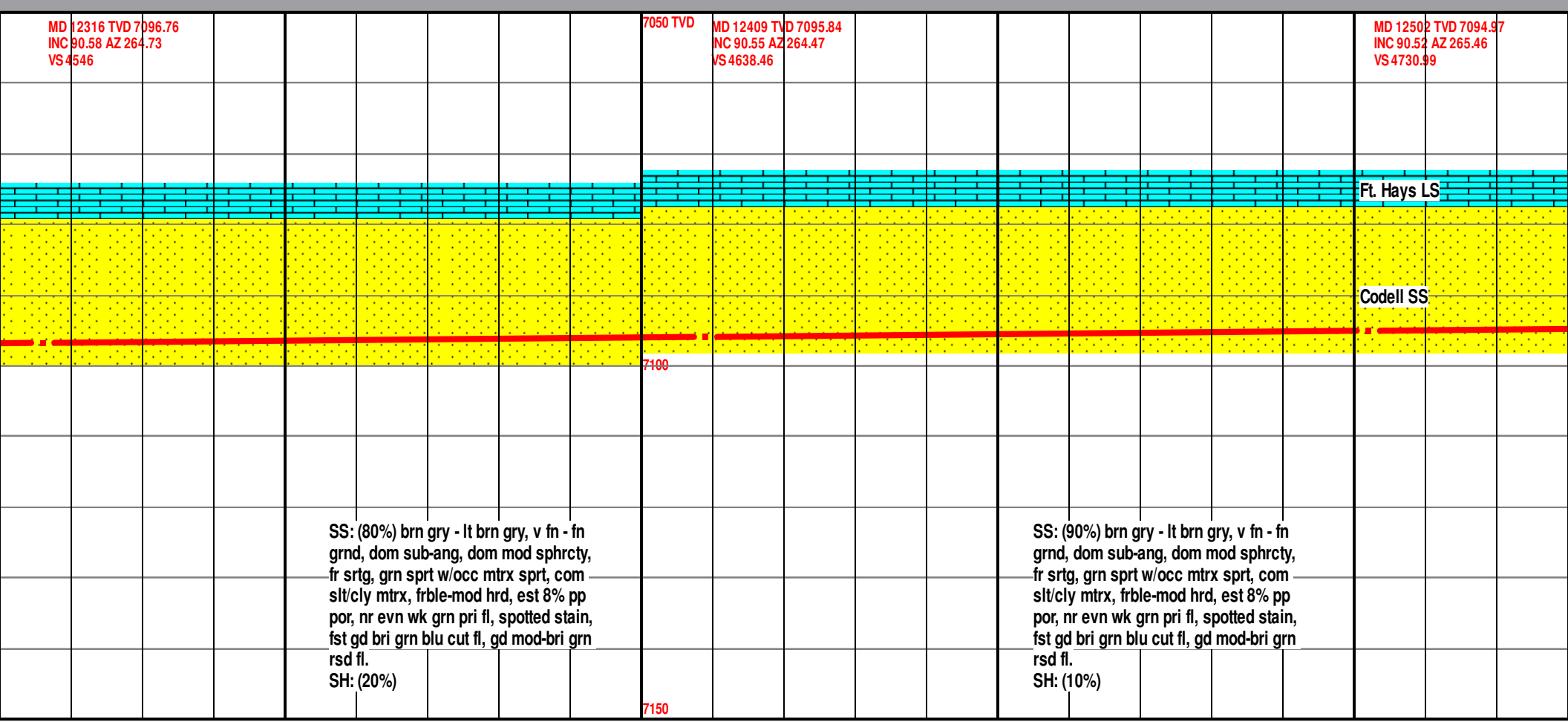
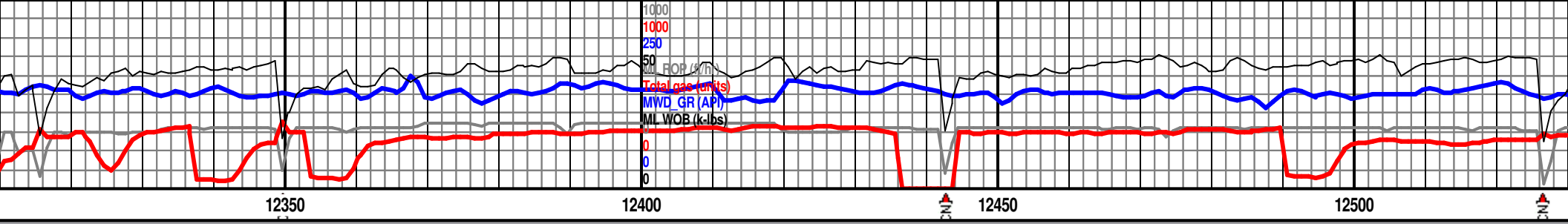
SS: (80%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, com
 slt/cly mtrx, frble-mod hrd, est 8% pp
 por, nr evn wk grn pri fl, spotted stain,
 fst gd bri grn blu cut fl, gd mod-bri grn
 rsd fl.
 SH: (20%)

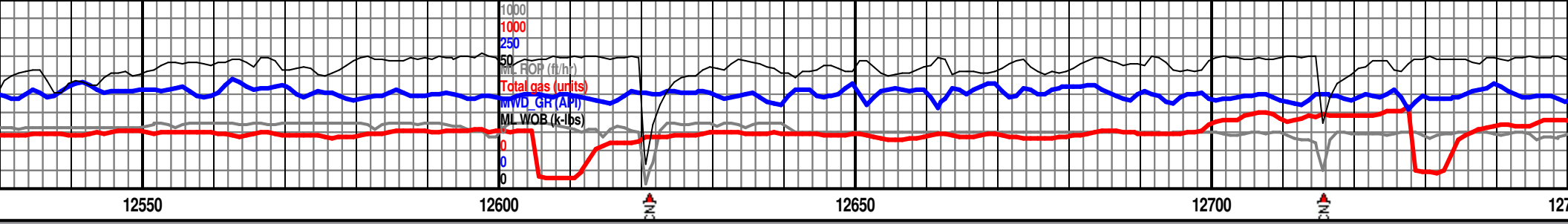
SS: (90%) brn gry - lt brn gry, v fn -
 grnd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, co
 slt/cly mtrx, frble-mod hrd, est 8%
 por, nr evn wk grn pri fl, spotted sta
 fst gd bri grn blu cut fl, gd mod-bri
 rsd fl.
 SH: (10%)

MWI 10.5 MWO 10.4 VIS 66

7150

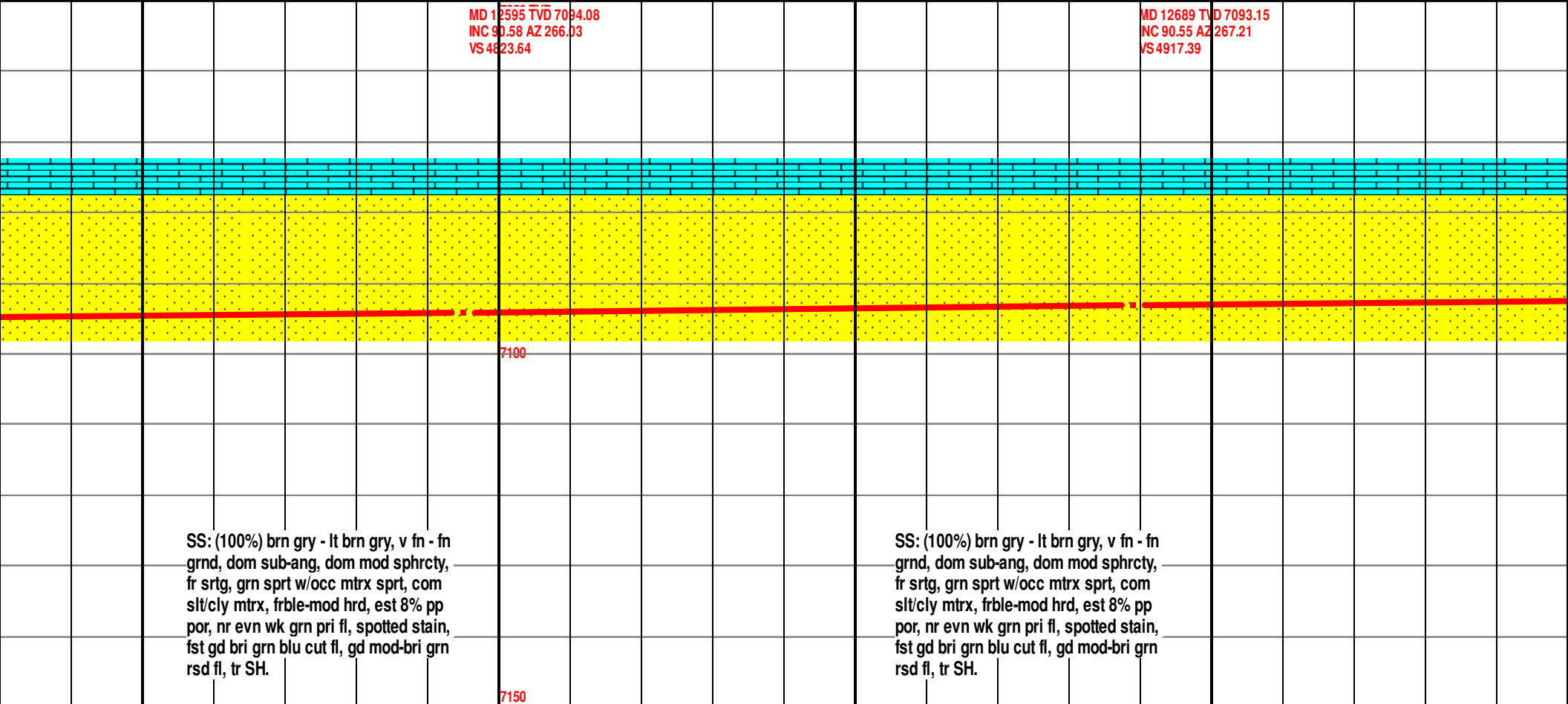






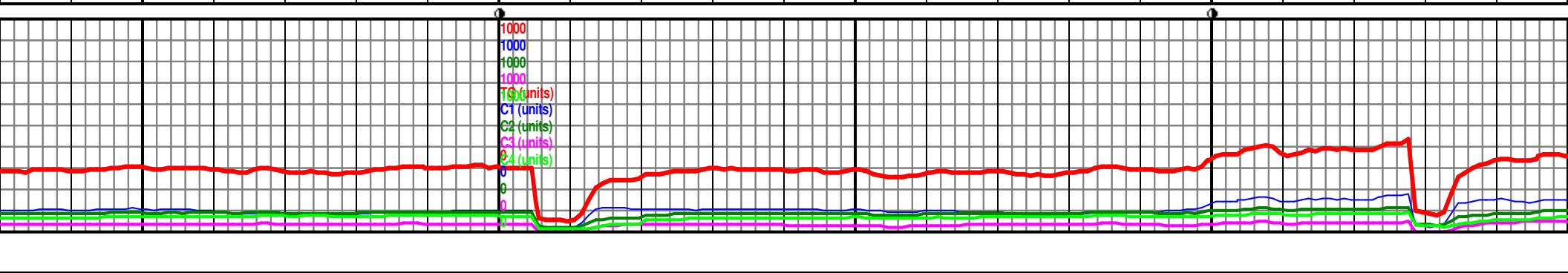
MD 12595 TVD 7094.08
 INC 90.58 AZ 266.03
 VS 4823.64

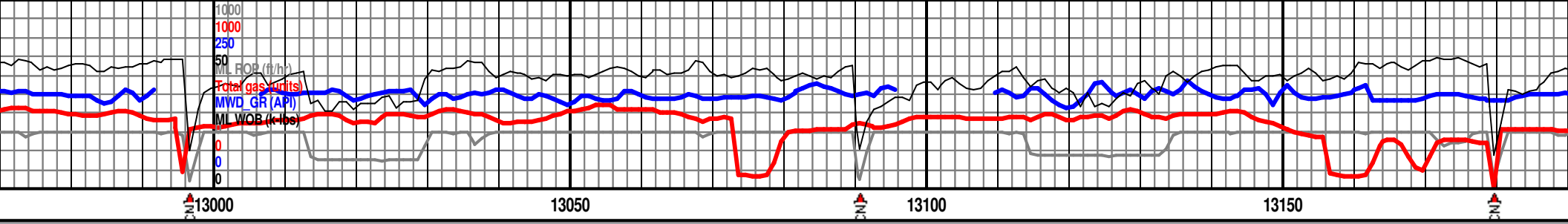
MD 12689 TVD 7093.15
 INC 90.55 AZ 267.21
 VS 4917.39



SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcy,
 fr srtg, grn sprt w/occ mtrx sprt, com
 slt/cly mtrx, frble-mod hrd, est 8% pp
 por, nr evn wk grn pri fl, spotted stain,
 fst gd bri grn blu cut fl, gd mod-bri grn
 rsd fl, tr SH.

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcy,
 fr srtg, grn sprt w/occ mtrx sprt, com
 slt/cly mtrx, frble-mod hrd, est 8% pp
 por, nr evn wk grn pri fl, spotted stain,
 fst gd bri grn blu cut fl, gd mod-bri grn
 rsd fl, tr SH.





MD 12967 TVD 7090.3
 INC 90.58 AZ 271.17
 VS 5195.26

7050 TVD

MD 13059 TVD 7089.41
 INC 90.52 AZ 270.24
 VS 5287.26

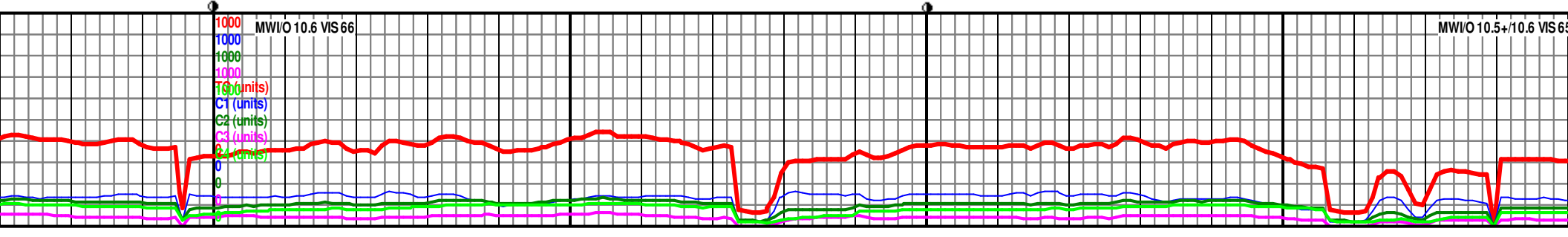
MD 13154 TVD 7088.5
 INC 90.58 AZ 268.38
 VS 5382.22

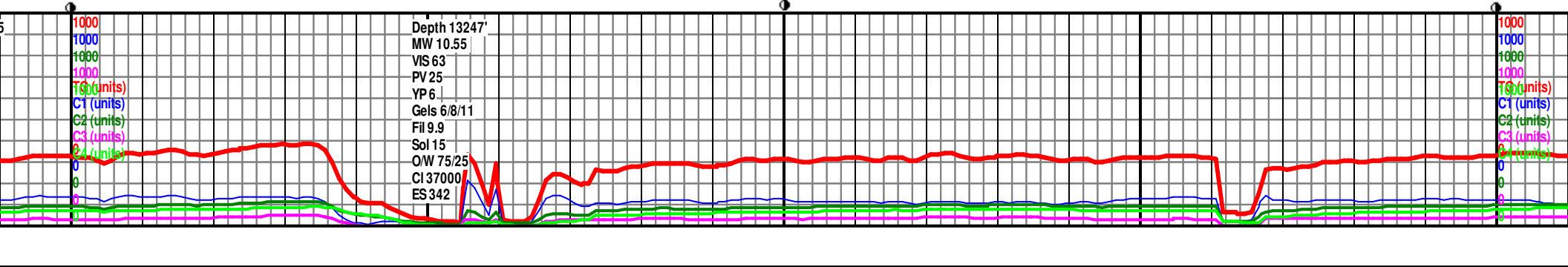
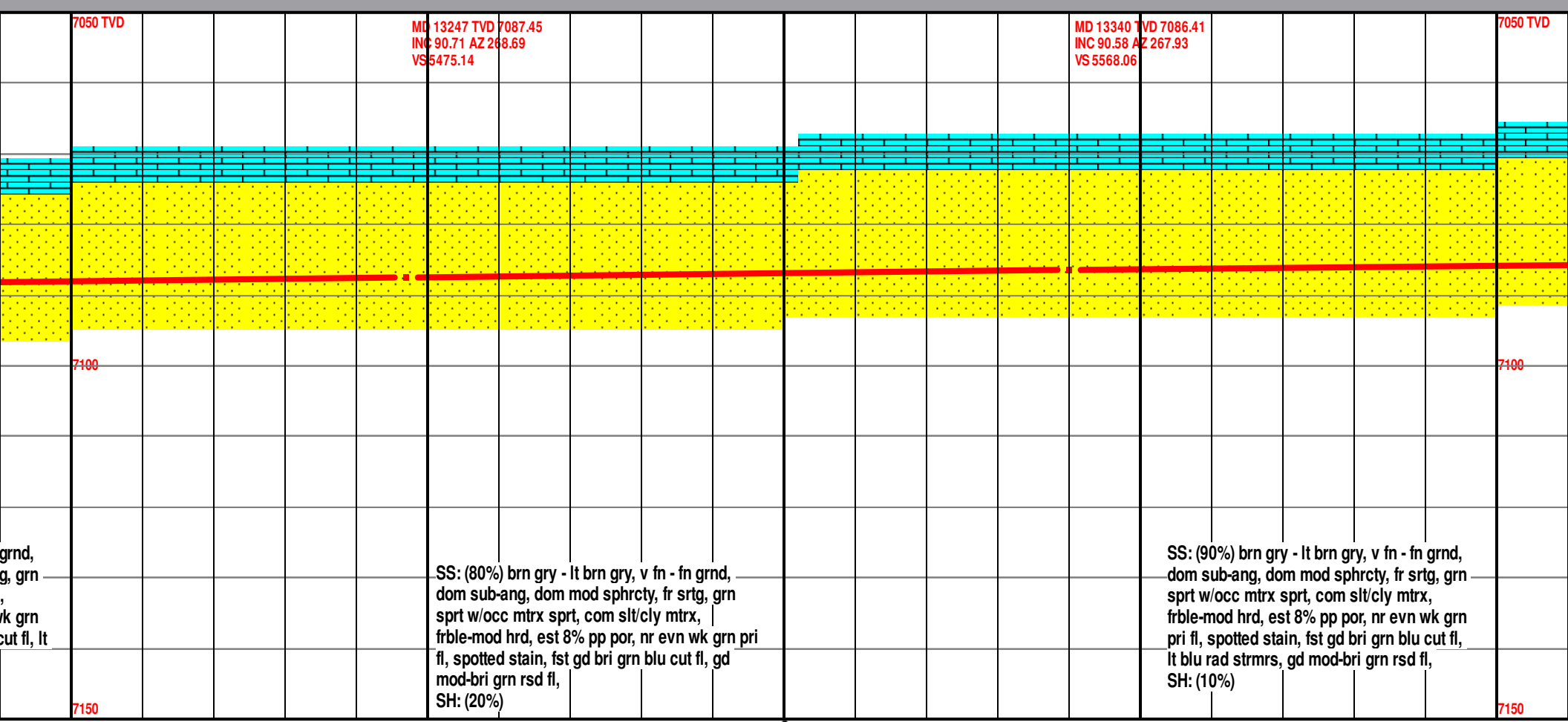
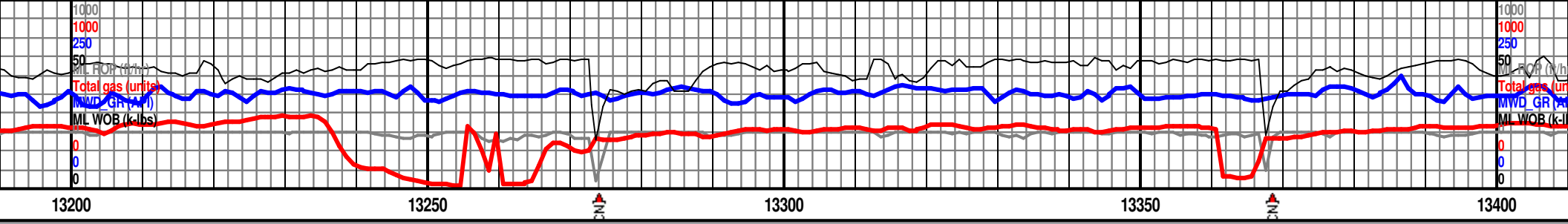


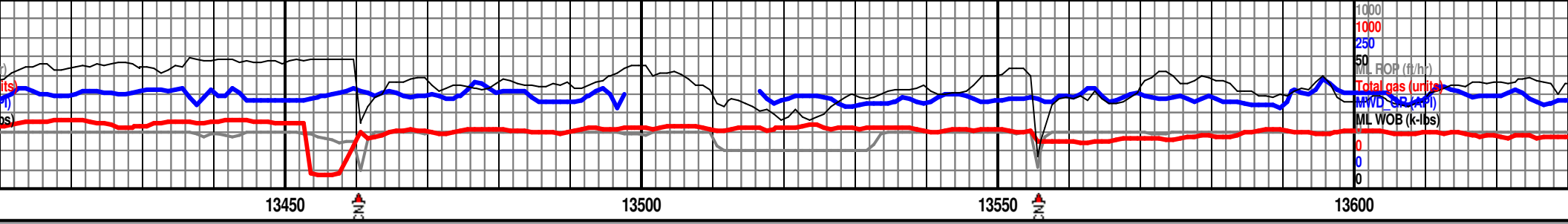
gry - lt brn gry, v fn - fn
 ang, dom mod sphrcty, fr
 /occ mtrx sprt, com slit/clly
 hrd, est 8% pp por, nr evn
 dotted stain, fst gd bri grn
 od-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty, fr
 srtg, grn sprt w/occ mtrx sprt, com slit/clly
 mtrx, frble-mod hrd, est 8% pp por, nr evn
 wk grn pri fl, spotted stain, fst gd bri grn
 blu cut fl, gd mod-bri grn rsd fl.

SS: (90%) brn gry - lt brn gry, v fn - fn
 dom sub-ang, dom mod sphrcty, fr srtg
 sprt w/occ mtrx sprt, com slit/clly mtrx
 frble-mod hrd, est 8% pp por, nr evn w
 pri fl, spotted stain, fst gd bri grn blu
 blu rad strms, gd mod-bri grn rsd fl,
 SH: (10%)







MD 13432 TVD 7085.5
INC 90.53 AZ 267.22
VS 5659.91

MD 13524 TVD 7084.83
INC 90.28 AZ 267.2
VS 5751.74

MD 13617 TVD
INC 90.46 AZ 267.2
VS 5844.58

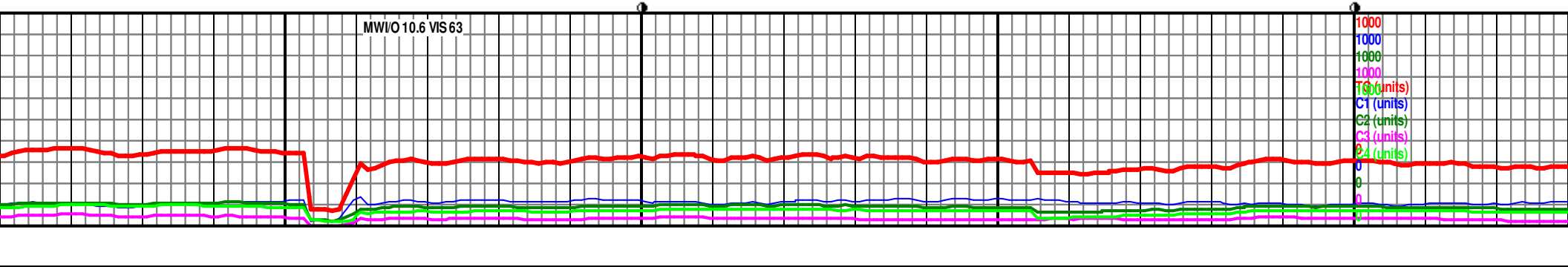
Ft. Hays LS

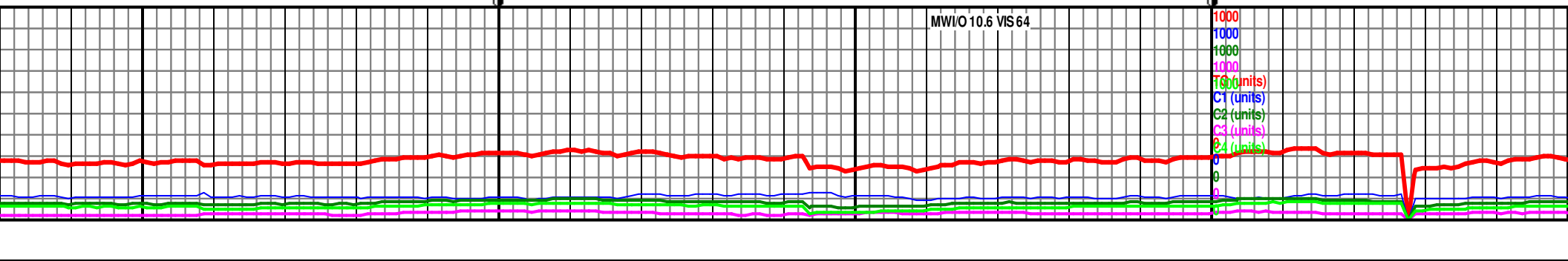
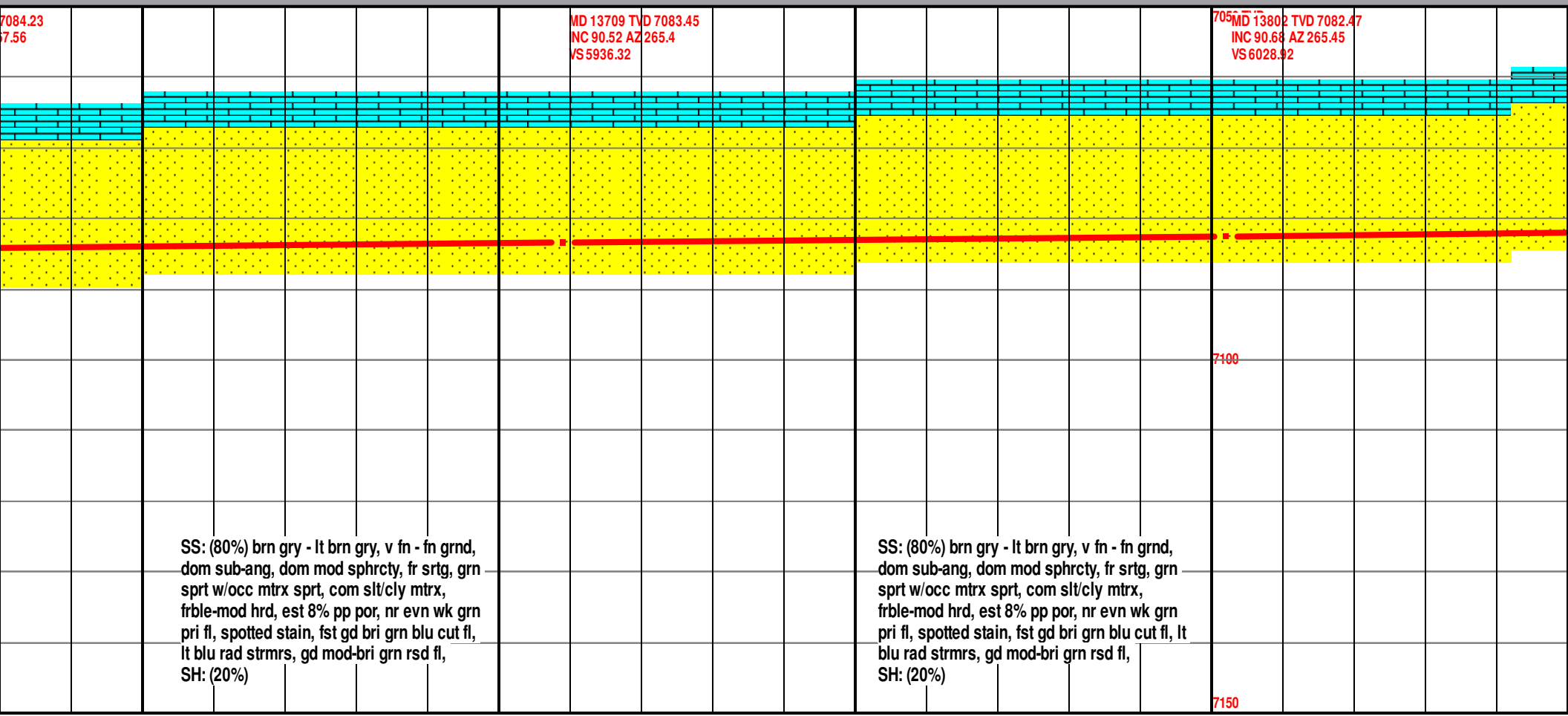
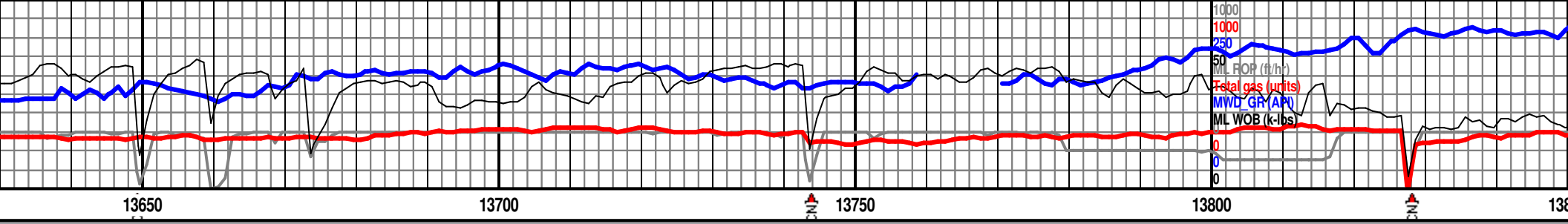
CodeII SS

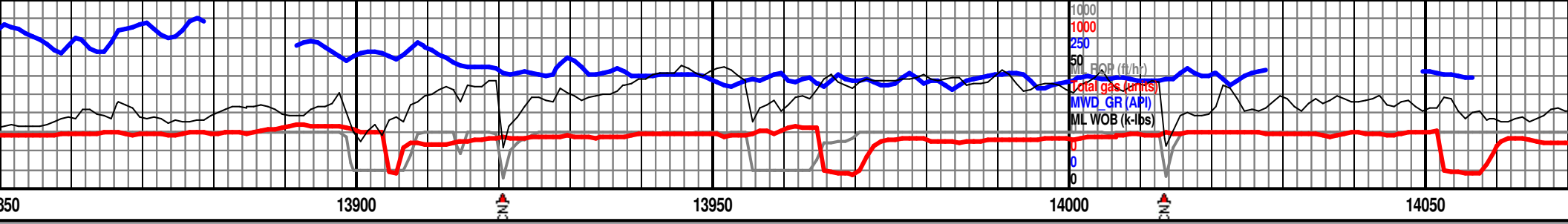
SS: (90%) brn gry - lt brn gry, v fn - fn grnd, dom sub-ang, dom mod sphrcty, fr srtg, grn sprt w/occ mtrx sprt, com slt/cly mtrx, frble-mod hrd, est 8% pp por, nr evn wk grn pri fl, spotted stain, fst gd bri grn blu cut fl, lt blu rad strms, gd mod-bri grn rsd fl, SH: (10%)

SS: (90%) brn gry - lt brn gry, v fn - fn grnd, dom sub-ang, dom mod sphrcty, fr srtg, grn sprt w/occ mtrx sprt, com slt/cly mtrx, frble-mod hrd, est 8% pp por, nr evn wk grn pri fl, spotted stain, fst gd bri grn blu cut fl, lt blu rad strms, gd mod-bri grn rsd fl, SH: (10%)

MW/O 10.6 VIS 63

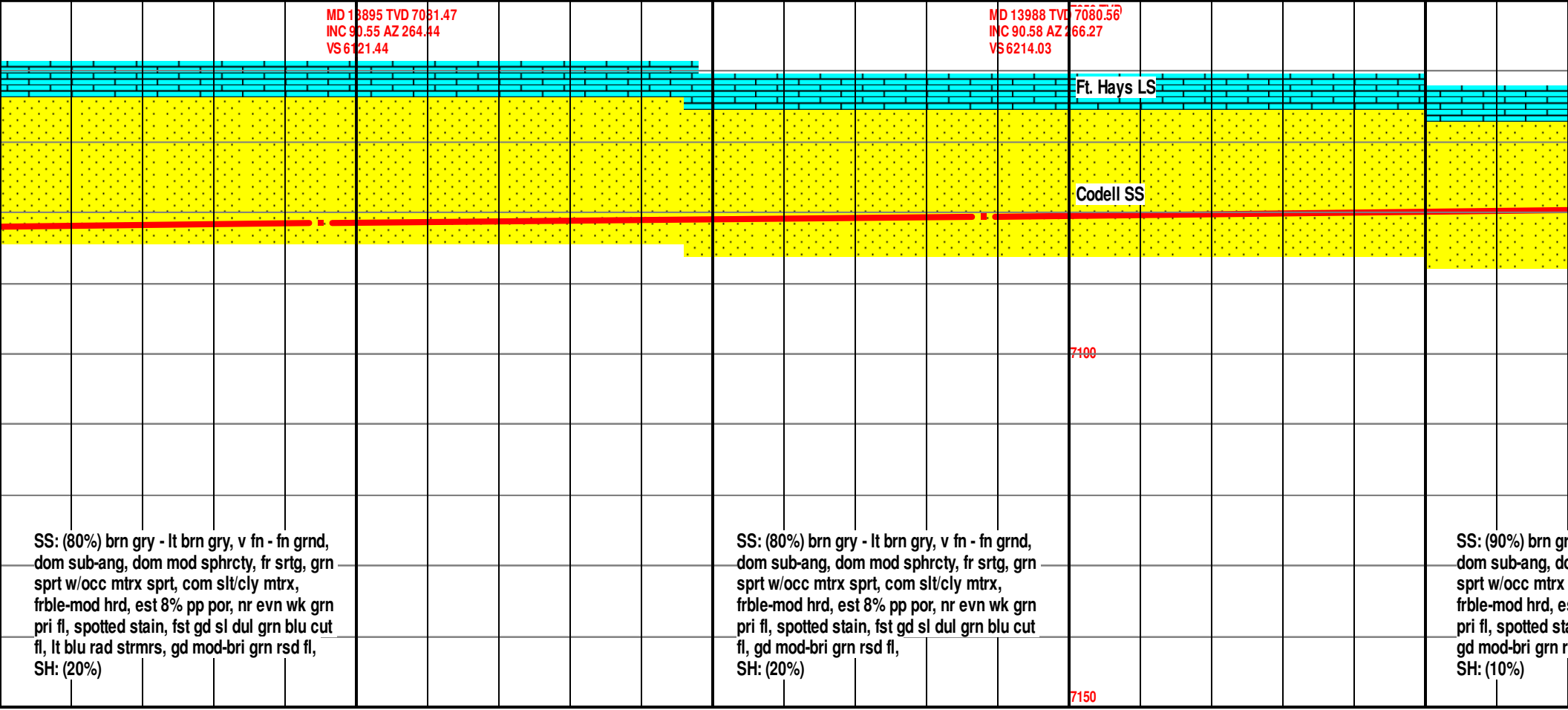






MD 13895 TVD 7081.47
 INC 90.55 AZ 264.84
 VS 621.44

MD 13988 TVD 7080.56
 INC 90.58 AZ 266.27
 VS 6214.03

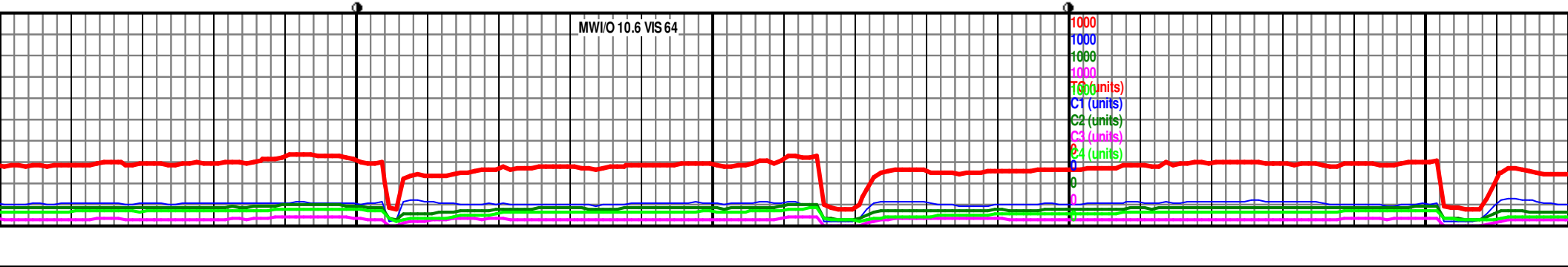


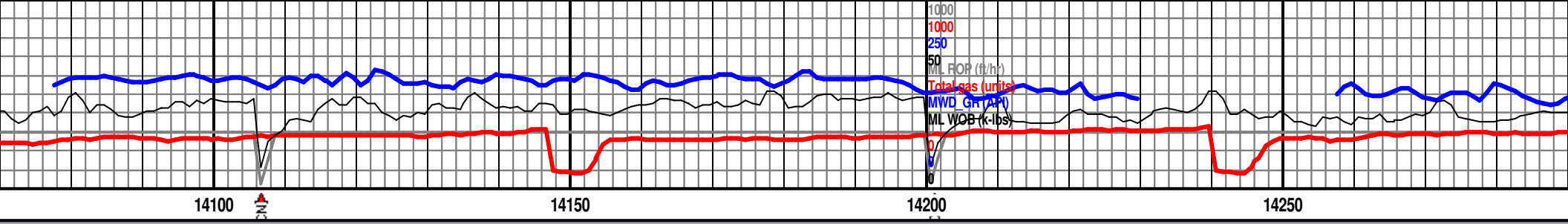
SS: (80%) brn gry - lt brn gry, v fn - fn grnd, dom sub-ang, dom mod sphrcty, fr srtg, grn sprt w/occ mtrx sprt, com slt/cly mtrx, frble-mod hrd, est 8% pp por, nr evn wk grn pri fl, spotted stain, fst gd sl dul grn blu cut fl, lt blu rad strms, gd mod-bri grn rsd fl, SH: (20%)

SS: (80%) brn gry - lt brn gry, v fn - fn grnd, dom sub-ang, dom mod sphrcty, fr srtg, grn sprt w/occ mtrx sprt, com slt/cly mtrx, frble-mod hrd, est 8% pp por, nr evn wk grn pri fl, spotted stain, fst gd sl dul grn blu cut fl, gd mod-bri grn rsd fl, SH: (20%)

SS: (90%) brn gry - lt brn gry, v fn - fn grnd, dom sub-ang, dom mod sphrcty, fr srtg, grn sprt w/occ mtrx sprt, com slt/cly mtrx, frble-mod hrd, est 8% pp por, nr evn wk grn pri fl, spotted stain, fst gd sl dul grn blu cut fl, gd mod-bri grn rsd fl, SH: (10%)

MW/O 10.6 VIS 64





1000
1000
250
50
ML ROP (ft/h)
Total gas (units)
MWL GR (API)
ML WOB (k-lbs)

14100

14150

14200

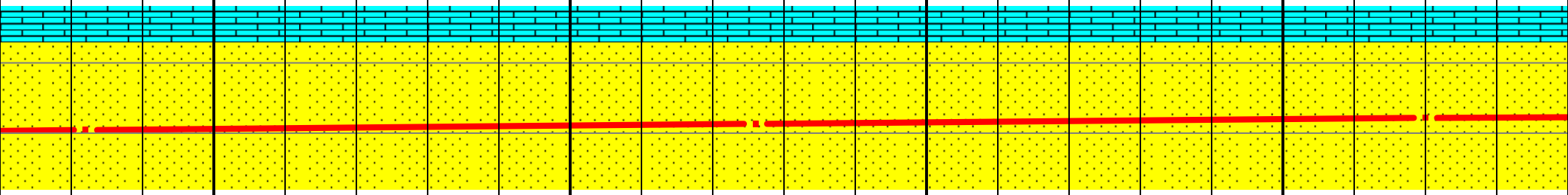
14250

MD 14082 TVD 7079.58
INC 90.61 AZ 273.07
VS 6307.95

MD 14176 TVD 7078.63
INC 90.55 AZ 271.99
VS 6401.9

7050 TVD

MD 14270 TVD 7077.8
INC 90.46 AZ 270.9
VS 6495.89



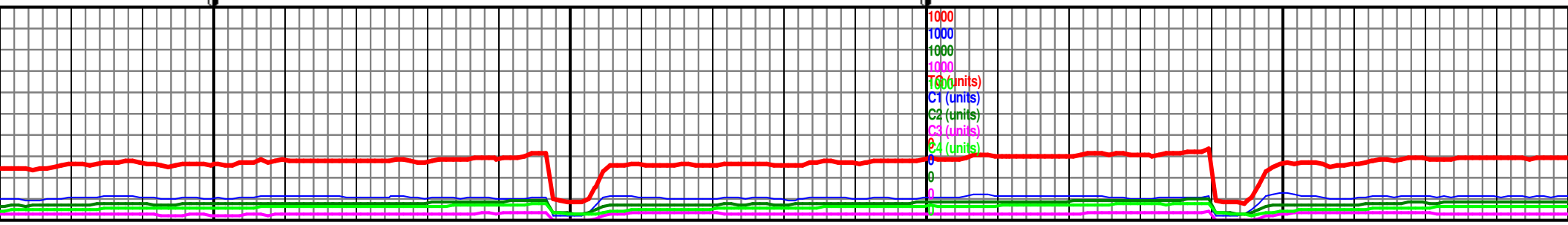
ly - lt brn gry, v fn - fn grnd,
om mod sphrcty, fr srtg, grn
sprt, com slt/cly mtrx,
st 8% pp por, nr evn wk grn
ain, fst gd bri grn blu cut fl,
sd fl,

SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcty, fr
srtg, grn sprt w/occ mtrx sprt, com slt/cly
mtrx, frble-mod hrd, est 8% pp por, nr evn
wk grn pri fl, spotted stain, fst gd bri grn
blu cut fl, gd mod-bri grn rsd fl, com SH.

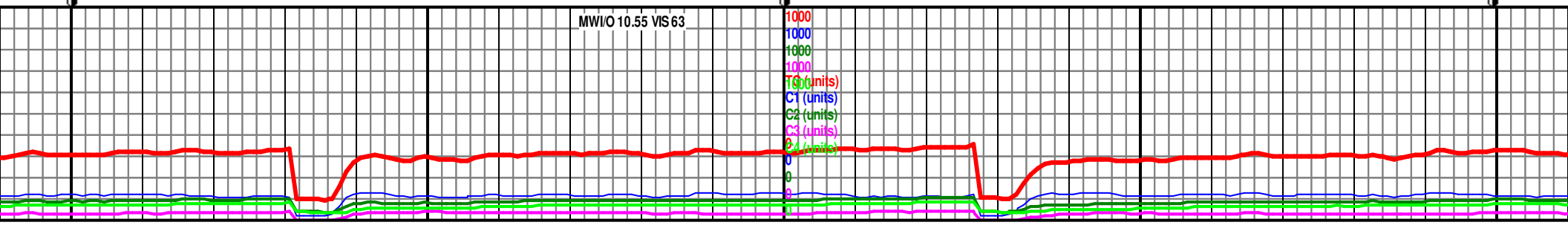
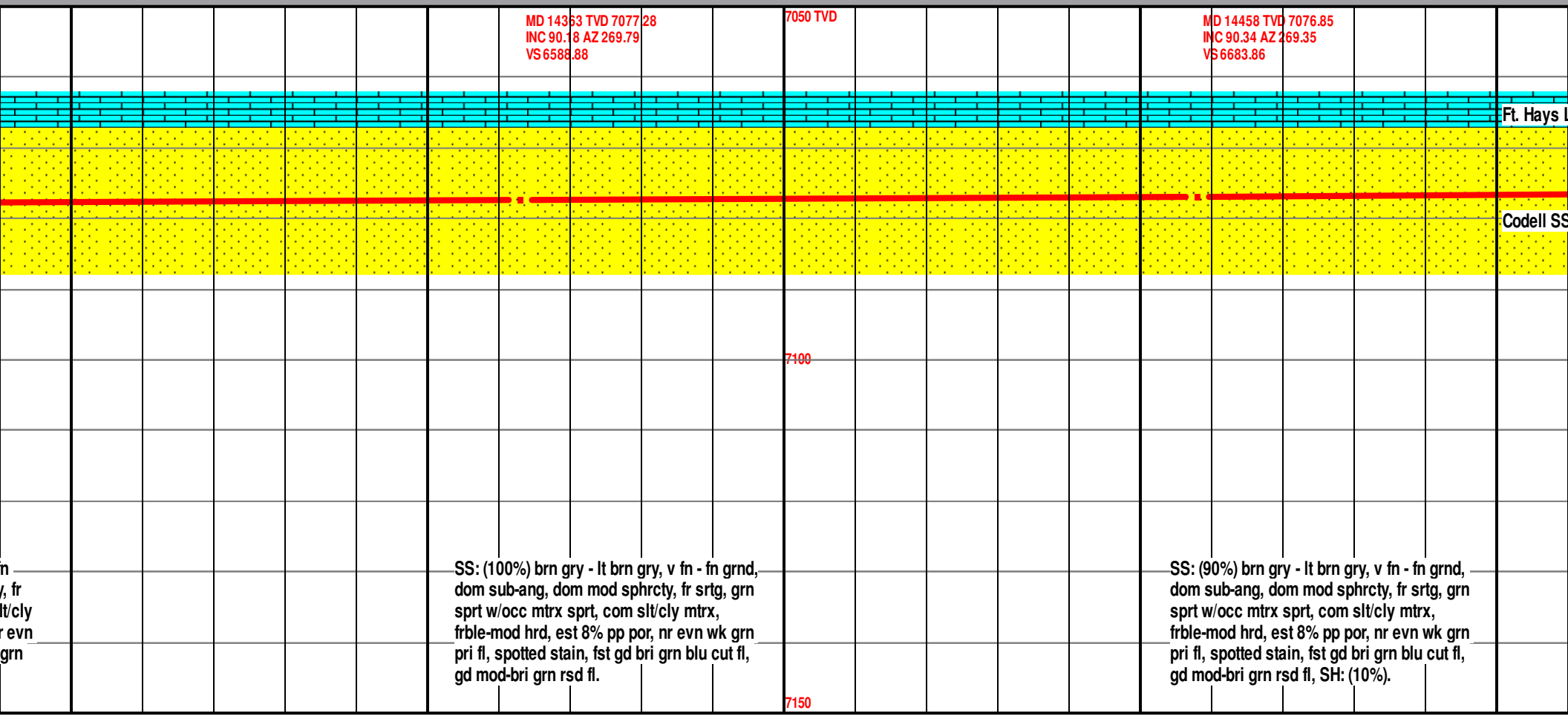
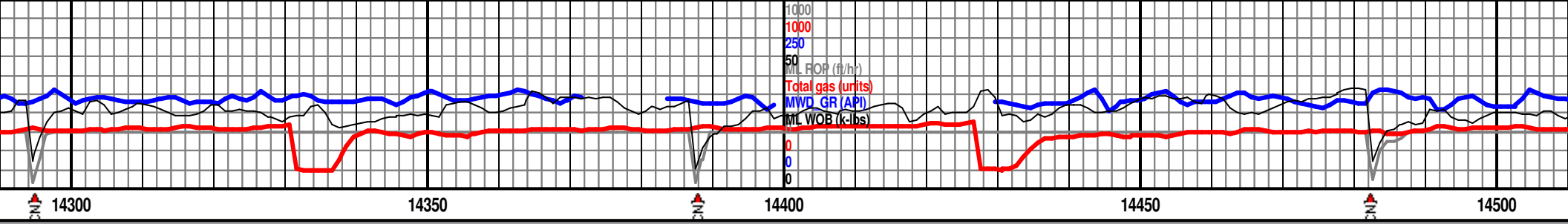
SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcty
srtg, grn sprt w/occ mtrx sprt, com s
mtrx, frble-mod hrd, est 8% pp por, nr
wk grn pri fl, spotted stain, fst gd bri
blu cut fl, gd mod-bri grn rsd fl.

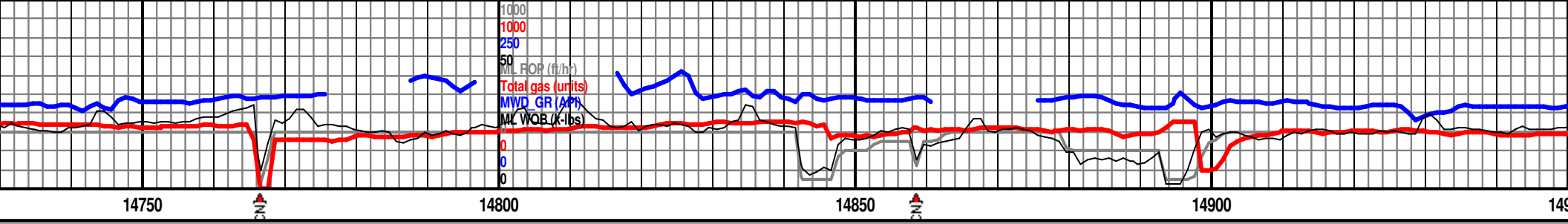
7100

7150



1000
1000
1000
1000
1000
C1 (units)
C2 (units)
C3 (units)
C4 (units)



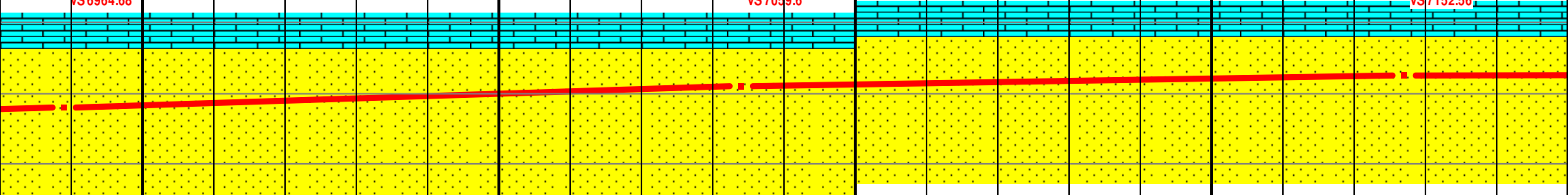


MD 14739 TVD 7071.99
 INC 91.78 AZ 268.62
 VS 6964.68

7050 TVD

MD 14834 TVD 7068.98
 INC 91.85 AZ 269.47
 VS 7059.6

MD 14927 TVD 7067.39
 INC 90.12 AZ 249.57
 VS 7152.56

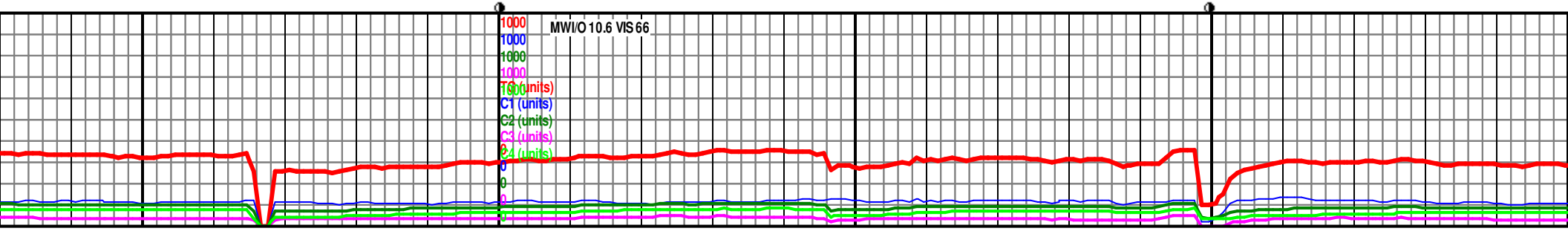


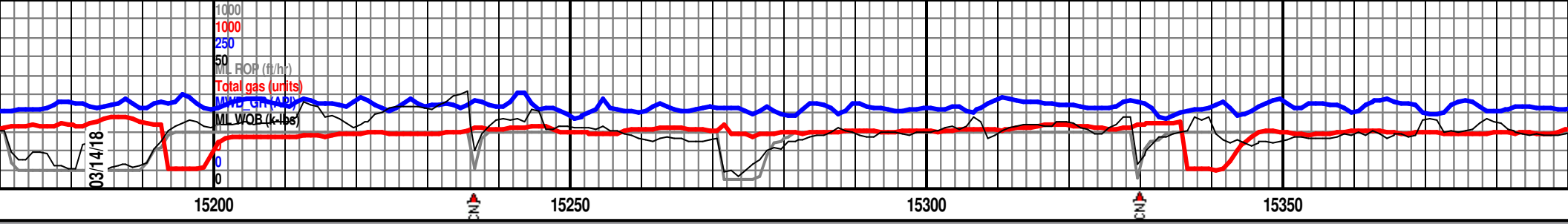
SS: (100%) brn gry - lt brn gry, v fn - fn grnd, dom sub-ang, dom mod sphrcty, fr srtg, grn sprt w/occ mtrx sprt, com slt/cly mtrx, frble-mod hrd, est 8% pp por, nr evn wk grn pri fl, spotted stain, fst gd bri grn blu cut fl, gd mod-bri grn rsd fl, tr SH, rr pyr xls.

SS: (100%) brn gry - lt brn gry, v fn - fn grnd, dom sub-ang, dom mod sphrcty, fr srtg, grn sprt w/occ mtrx sprt, com slt/cly mtrx, frble-mod hrd, est 8% pp por, nr evn wk grn pri fl, spotted stain, fst gd bri grn blu cut fl, gd mod-bri grn rsd fl, tr SH.

7100

7150





7000 TVD MD 15209 TVD 7066.89
NC 90.06 AZ 265.02
VS 7434.11

MD 15302 TVD 7066.64
INC 90.23 AZ 264.33
VS 7526.6

gry - lt brn gry, v fn - fn
-ang, dom mod sphrcy,
t w/occ mtrx sprt, com
ole-mod hrd, est 8% pp
grn pri fl, spotted stain,
lu cut fl, lt blu rad
d-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcy,
fr srtg, grn sprt w/occ mtrx sprt, com
slt/cly mtrx, frble-mod hrd, est 8% pp
por, nr evn wk grn pri fl, spotted stain,
fst gd bri grn blu cut fl, lt blu rad
strmrs, gd mod-bri grn rsd fl.

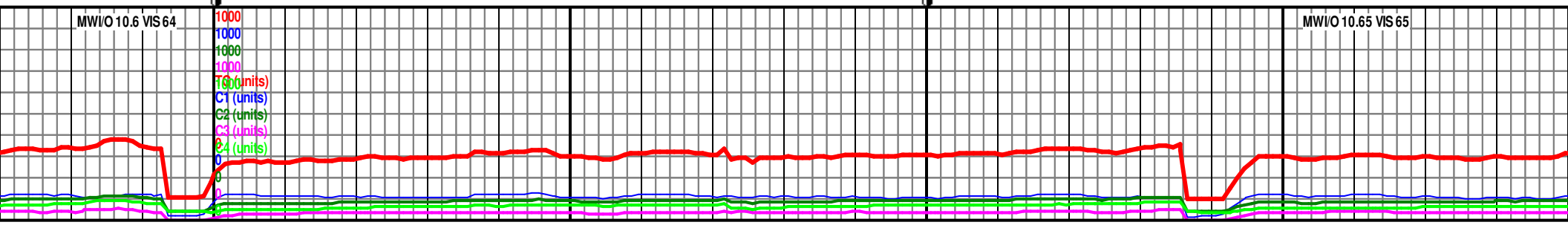
SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcy,
fr srtg, grn sprt w/occ mtrx sprt, co
slt/cly mtrx, frble-mod hrd, est 8% p
por, nr evn wk grn pri fl, spotted sta
fst gd bri grn blu cut fl, lt blu rad
strmrs, gd mod-bri grn rsd fl.

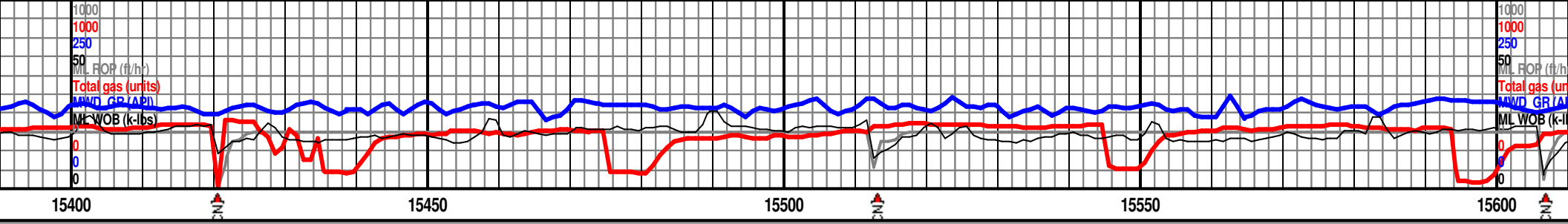
7050

7100

MW/O 10.6 VIS 64

MW/O 10.65 VIS 65





MD 15395 TVD 7066.19
 INC 90.31 AZ 265.84
 VS 7619.14

MD 15488 TVD 7065.68
 INC 90.31 AZ 268.32
 VS 7711.95

MD 15582 TVD 7065.25
 INC 90.23 AZ 270.87
 VS 7805.92

- fn
 cty,
 m
 pp
 ain,

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, com
 slt/cly mtrx, frble-mod hrd, est 8% pp
 por, nr evn wk grn pri fl, spotted stain,
 fst gd bri grn blu cut fl, lt blu rad
 strms, gd mod-bri grn rsd fl.

SS: (100%) brn gry - lt brn gry, v fn - fn
 grnd, dom sub-ang, dom mod sphrcty,
 fr srtg, grn sprt w/occ mtrx sprt, com
 slt/cly mtrx, frble-mod hrd, est 8% pp
 por, nr evn wk grn pri fl, spotted stain,
 fst gd bri grn blu cut fl, lt blu rad
 strms, gd mod-bri grn rsd fl.

7050

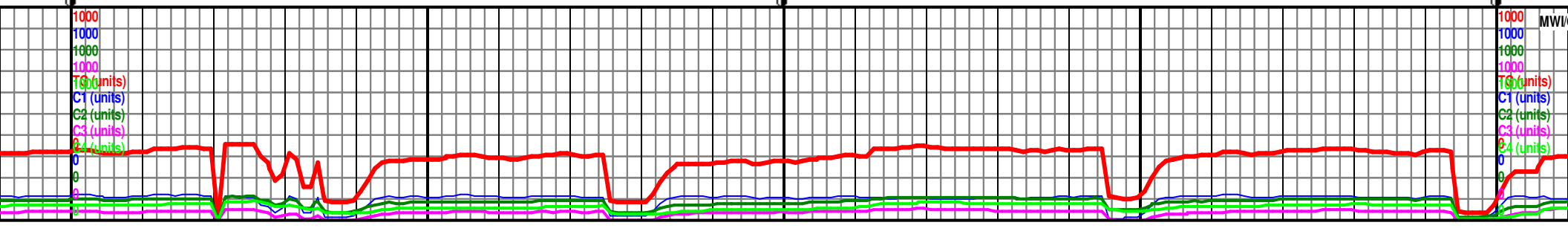
7050

Ft. Hays LS

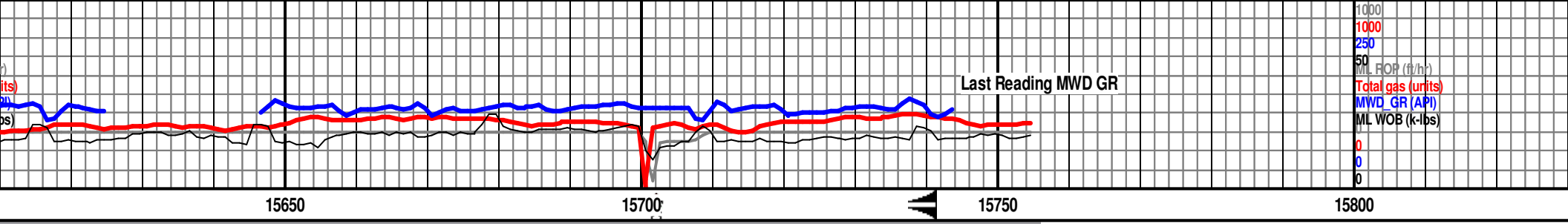
Codell SS

7100

7100



MWOB
 C1 (units)
 C2 (units)
 C3 (units)
 C4 (units)



1000
1000
250
50
ML ROP (ft/h)
Total gas (units)
MWD GR (API)
ML WOB (k-lbs)
0
0
0

15650

15700

15750

15800

MD 15675 TVD 7064.77
INC 90.31 AZ 271.79
VS 7898.91

MD 15729 TVD 7064.49
INC 90.28 AZ 270.47
VS 7952.91

MD 15755 TVD 7064.36
INC 90.28 AZ 270.47
VS 7978.91

7000 TVD

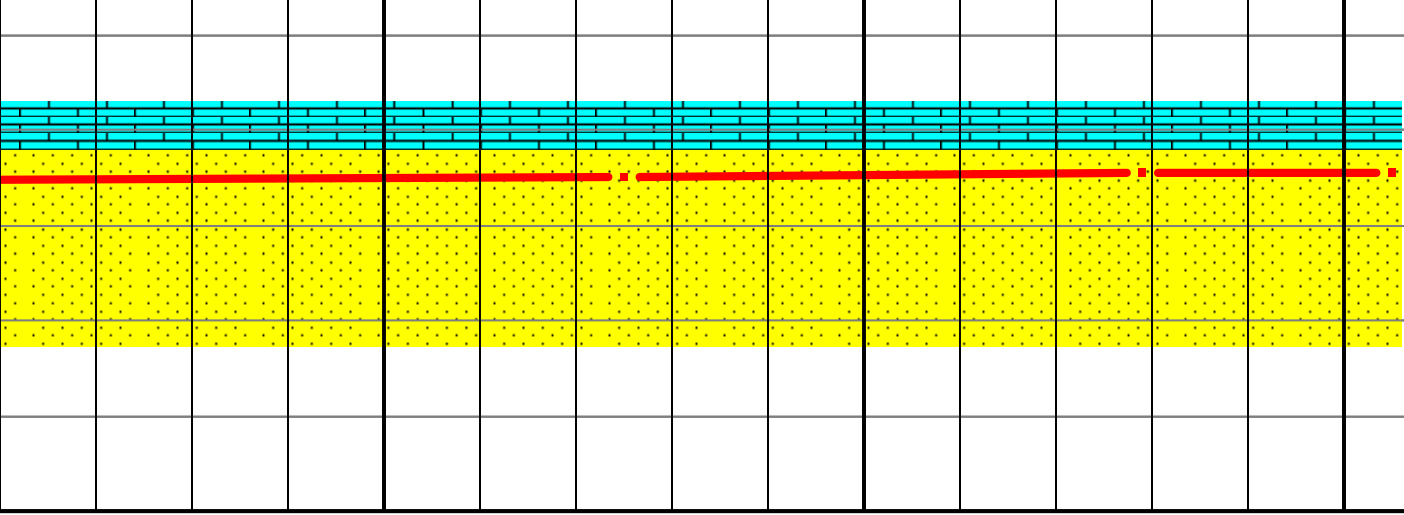
Reached DMTD of 15,755' MD
03/14/2018

Production casing shoe set @

SS: (100%) brn gry - lt brn gry, v fn - fn
grnd, dom sub-ang, dom mod sphrcty,
fr srtg, grn sprt w/occ mtrx sprt, com
slt/cly mtrx, frble-mod hrd, est 8% pp
por, nr evn wk grn pri fl, spotted stain,
fst gd bri grn blu cut fl, lt blu rad
strmrs, gd mod-bri grn rsd fl.

BHA #2, 8 1/2", HCC, ATD505X,
#5279461, 5X15, In @ 1811', out @
15755', drilled 13944' in 43.5 hrs.,
Rotary Steerable, AutoTrak, MWD, MM,
XL45/RS; .27 rpg

Formation tops picked by Ryan
Brian Spitzmiller (GBA).



Formation	MD
Sharon Springs	6893'
"A" Chalk	N/A
"A" Chalk Base	6957'
"B" Upper Marl	7085'
"B" Chalk	7095'
"B" Marl	7137'
"C" Chalk	7202'
"C" Marl	7267'
K Marker	N/A
Ft. Hays	7442'
Codell	7591'
DMTD	15755'

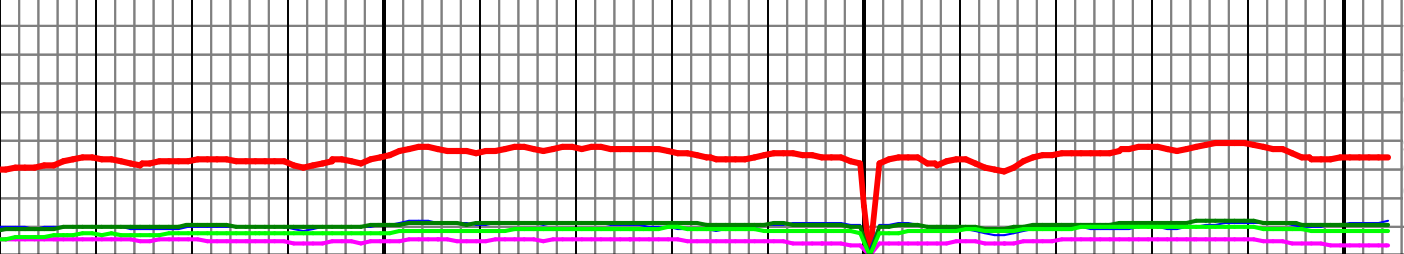
Thank you for choosing Gools
Associates, Inc.

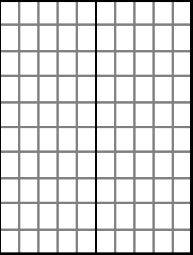
O10.55 VIS 64

MW/O 10.6 VIS 65

Depth 15755'
MW 10.6
VIS 65
PV 26
YP 7
Gels 5/8/12
Fil 9.9
Sol 15
O/W 75/25
CI 36000
ES 312

1000
1000
1000
1000
1000 (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0





@ 03:04 hrs on	
15741' MD	
n Scribner and	
TVD	SSD
6808'	-2019'
N/A	N/A
6868'	-2079'
6962'	-2173'
6971'	-2182'
6994'	-2205'
7034'	-2245'
7066'	-2277'
N/A	N/A
7117'	-2328'
7131'	-2342'
7064'	-2275'
by Brothers and	

