

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Hester Farms H-36-HC

**Location** SEC 31 T7N R66W

**State** Colorado

**County** Weld

**Country** United States

**Rig Number** Frontier (Utah) 8

**API Number** 05-123-42000

**AFE #** 42000

**Geographic Region** DJ Basin

**Field** Wattenberg

**Spud Date** 11/30/2015

**Drilling Completed** 1/21/2016

**Surface Coordinates** 40.533332/-104.831381  
1694' FNL 202' FWL

**Bottom Hole Coordinates** Sec: 36 Twp: 7N 67W  
1645' FFNLL 470' FFWLL

**Ground Elevation** 4914'

**K.B. Elevation** 4937'

**Logged Interval** 6000' To 12107'

**Total Depth** 12107'

**Formation** CODELL

**Type of Drilling Fluid** WBM

## Operator

**Company** Bayswater Exploration & Production, LLC.

**Address** 730 17th St.  
Denver, CO 80202



## Geologist

**Name** Mark E. Brown

**Company** Bayswater Exploration & Production, LLC.

**Address** 730 17th St.  
Denver, CO 80202

## Other

**Robert Davis** Senior Lead Wellsite Geologist

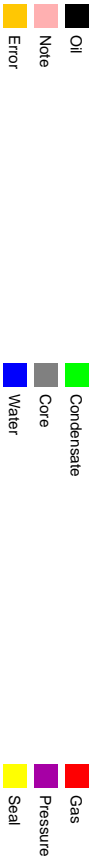
**Andrew Martens** Wellsite Geologist

**Ben Katka** Wellsite Geologist

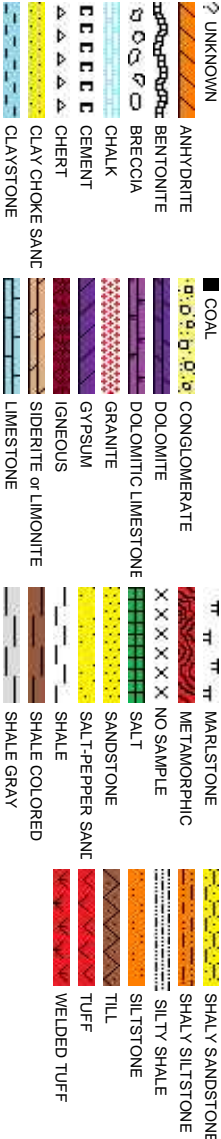
**Columbine Logging Computer** 148

**Bloodhound Unit** 331

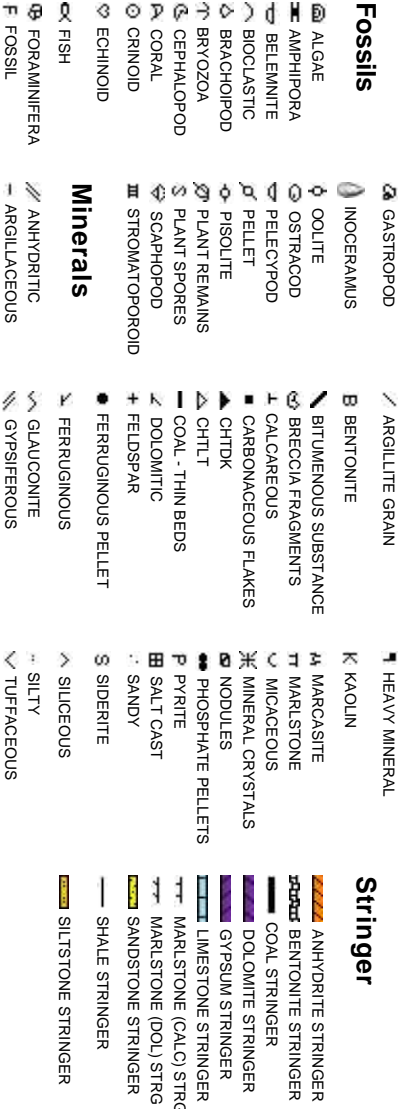
Zone Color Coding



Rock Types



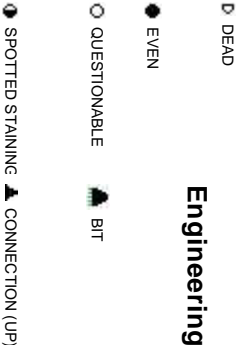
Accessories



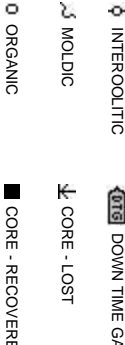
Oil Show



Engineering



Porosity



# Other Symbols

 DST INTERVAL       WIRELINE TESTED - LEFT    **E** EARTHY

 FAULT       WIRELINE TESTED - RT    **FX** FINELYXLN

 FORMATION TOP       DRILL STEM TEST      **GS** GRAINSTONE

 GAS SHOW       **MINDEPTH** MN DEPTH      **L** LITHOGRAPHIC


 OIL SHOW      **MX** MICROXLN


 **MINDEPTH** MN DEPTH UP      **MS** MUDSTONE

## Rounding

 **MINDEPTH** MN DEPTH (DOWN)      **A** ANGULAR      **PS** PACKSTONE

 NORMAL FAULT      **R** ROUNDED      **WS** WACKSTONE

 **(LEFT)** OVERTURNED STRATA      **B** SUBANG


 REVERSE FAULT      **R** SUBRND

## Sorting

 CASING      **M** MODERATE

## Textures

 SIDEWALL CORE (LEFT)      **P** POOR

 **(LEFT)** SIDEWALL CORE (RIGHT)    **BS** BOUNDSTONE      **W** WELL

 SLIDE      **C** CHALKY

 **BS** SURVEY      **CX** CRYPTOXLN

Slide/Rotate

ROP

ROP

COLUMBINE LOGGING RIGGED UP ON  
12/25/2015 MANNED 2-PERSON LOGGING.  
STARTED LOGGING AT 6000' @ 23:26 MDT  
12/25/2015.

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

Depth Labels

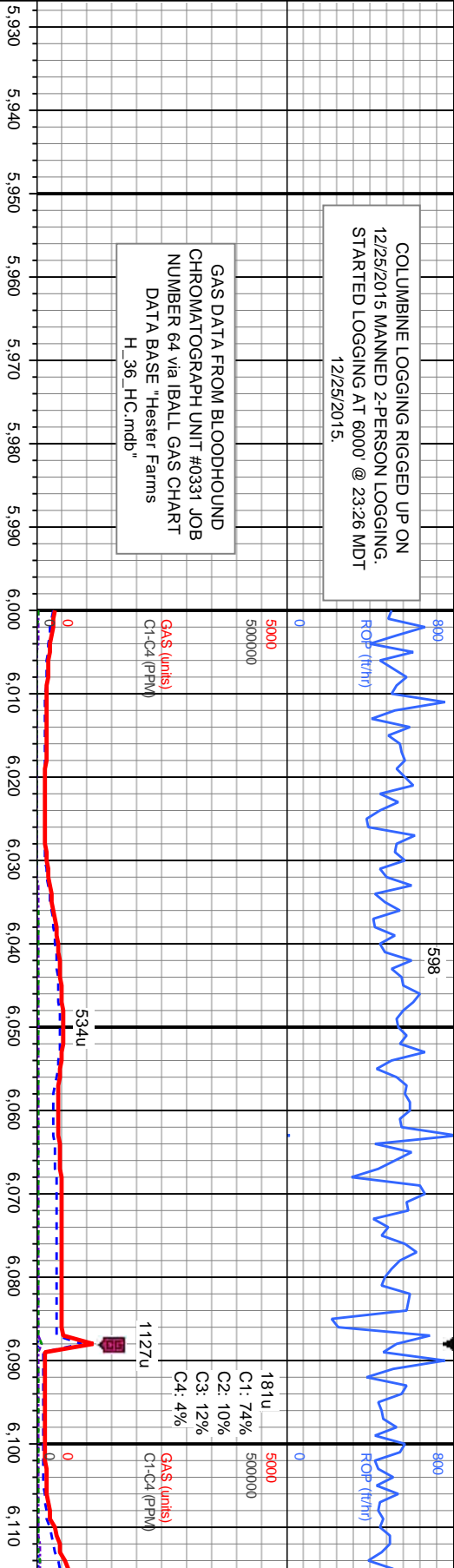
% Lith

Gamma  
GAMMA

Well Bore  
TVD

Oil Show

Images



GAS DATA FROM BLOODHOUND  
CHROMATOGRAPH UNIT #0331 JOB  
NUMBER 64 via IBALL GAS CHART  
DATA BASE "Hester Farms  
H\_36\_HC.mdb"

SURVEY, GAMMA, and ROP DATA  
PROVIDED BY BAKER HUGHES

**Bit Data**  
Bit #: 2  
Type: VAREL VS516HG  
Size: 8.75  
Depth In: 1,548'  
Depth Out: 7,578'  
Hours: 18 hrs  
Avg FV/Hr: 335 /hr  
Jets: 7x14  
S/N: 4008812

MD: 6.02°  
TVD: 6,018.54'  
Inclination: 0.68°  
Azimuth: 0.55°  
VS: -50.7'

MD: 6.11°  
TVD: 6.1'  
Inclination:  
Azimuth:  
VS: -50.8'

SHY SLTST: lt-med gy, silt-vf gr, mod frm-hd, sb ply-sb blk, gt- sily tex, arg cmt, sh incl, non  
calc, SLTY SH, med-dk gy, silt-mic gr, mod frm, sb ply-ply, rthy-sb rthy tex, tr shy ss, slow difse,  
mod sting, bl cut, mod even ring

SHY SLTST: lt-med  
gy, silt-vf gr, mod  
frm-hd, sb ply-sb  
blk, gt- sily tex,  
arg cmt, sh incl,  
non calc, SLTY SH,  
med-dk gy, silt-mic  
gr, mod frm, sb  
ply-ply, rthy-sb  
rthy tex, tr shy ss,  
slow difse, mod  
sting, bl cut, mod  
even ring





503

12/26/2015

MINDEPTH

800

576

800

ROP (ft/m)

ROP (ft/m)

MUD WT IN 9.7/ VIS 39  
OUT 9.7/40

0

5000

500000

300u  
C1: 79%  
C2: 10%  
C3: 9%  
C4: 2%

GAS (units)  
C1-C4 (PPM)

1213u

799u

1088u

6,120 6,130 6,140 6,150 6,160 6,170 6,180 6,190 6,200 6,210 6,220 6,230 6,240 6,250 6,260 6,270 6,280 6,290 6,300 6,310 6,320 6,330

129

117

1556u

6

6

6

MD: 6,209'  
TVD: 6,206.54'  
Inclination: 0.19°  
Azimuth: 316.65°  
VS: -50.79'

TVD (ft)

MD: 6,303'  
TVD: 6,300.54'  
Inclination: 0.23°  
Azimuth: 294.75°  
VS: -50.51'

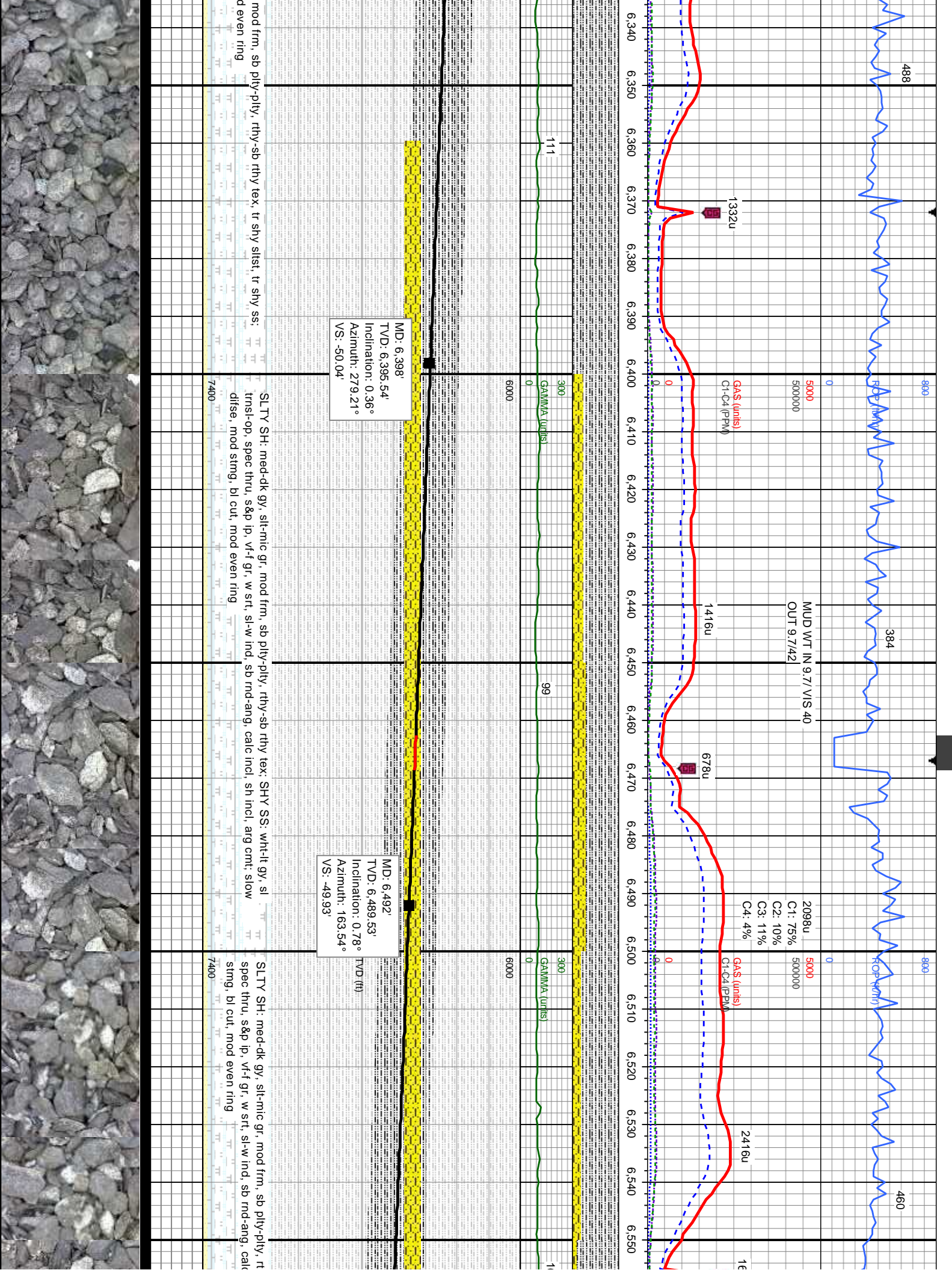
med gy, silt-vf gr, sl frm-hd, sb pily-sb blkly, gt tex, arg cnt, sh incl, non calc; SLTY SH: mic gr, mod frm, sb pily-pily, rthy-sb rthy tex, tr shy ss, slow difse, mod stmg, bl cut,

SLTY SH: med-dk gy, silt-mic gr, mod frm, sb pily-pily, rthy-sb rthy tex; SHY SLTST: lk-med gy, silt-vf gr, sl frm-hd, sb pily-sb blkly, gt tex, arg cnt, sh incl, non calc, tr shy ss, slow difse, mod stmg, bl cut, mod even ring

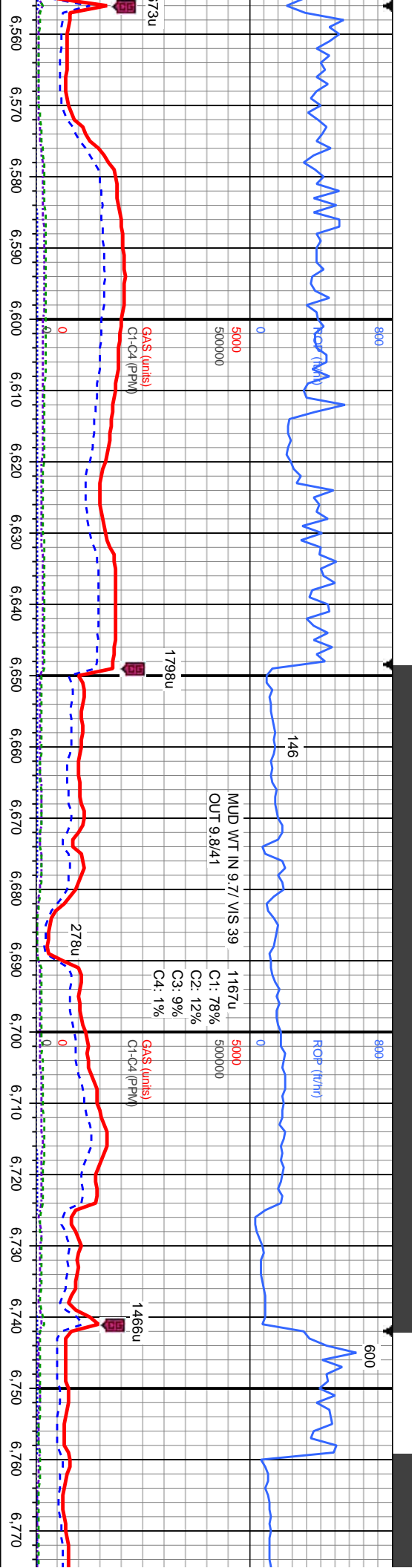
SLTY SH: med-dk gy, silt-mic gr, mod frm, sb pily-pily, rthy-sb rthy tex, arg cnt, sh incl, non calc, tr shy ss, slow difse, mod stmg, bl cut, mo

3.54'  
n: 0.46°  
14.86°









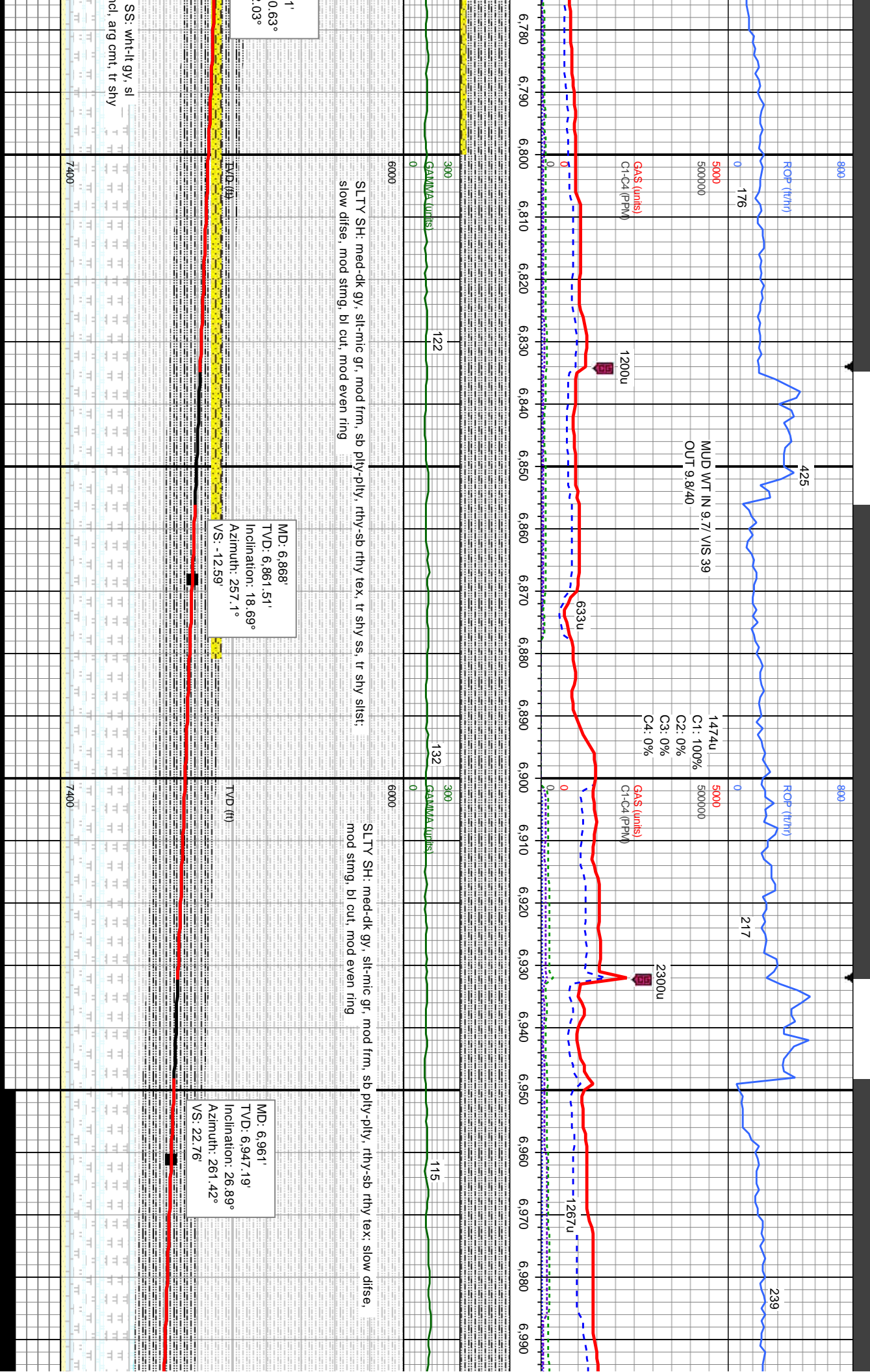
MD: 6.585'  
TVD: 6,582.52'  
Inclination: 0.67°  
Azimuth: 178.06°  
VS: -50.13'

ly-sb rthy tex: SHY SS: wht-lt gy, sl trnsi-op, incl: sh incl, arg cm; slow difse, mod  
SLTY SH: med-dk gy, slt-mic gr, mod frm, sb ply-ply, rthy-sb rthy tex, tr shy ss, tr shy slst; slow difse, mod string, bl cut, mod even ring

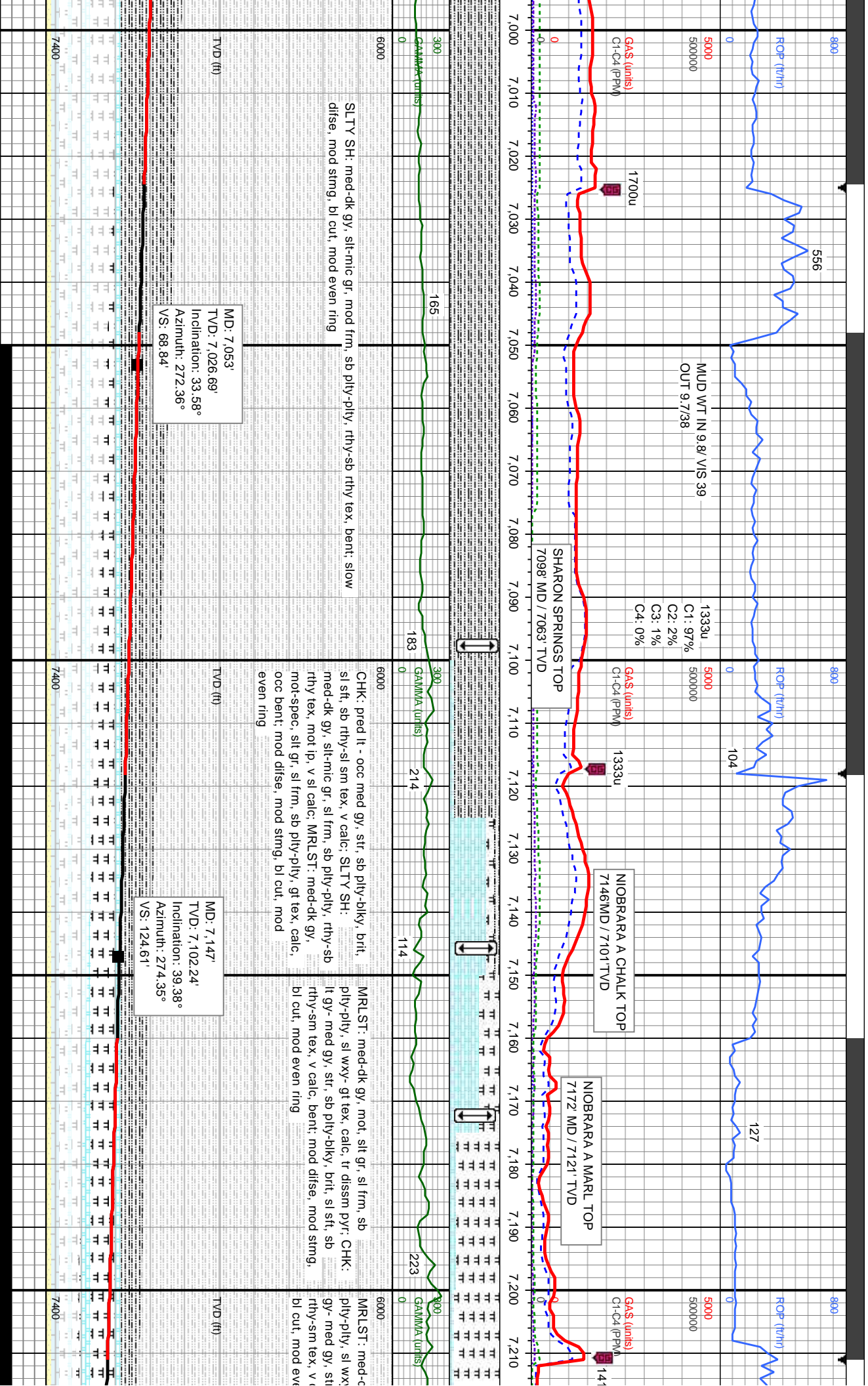
MD: 6.677'  
TVD: 6,674.47'  
Inclination: 3.25°  
Azimuth: 254.03°  
VS: -47.65'

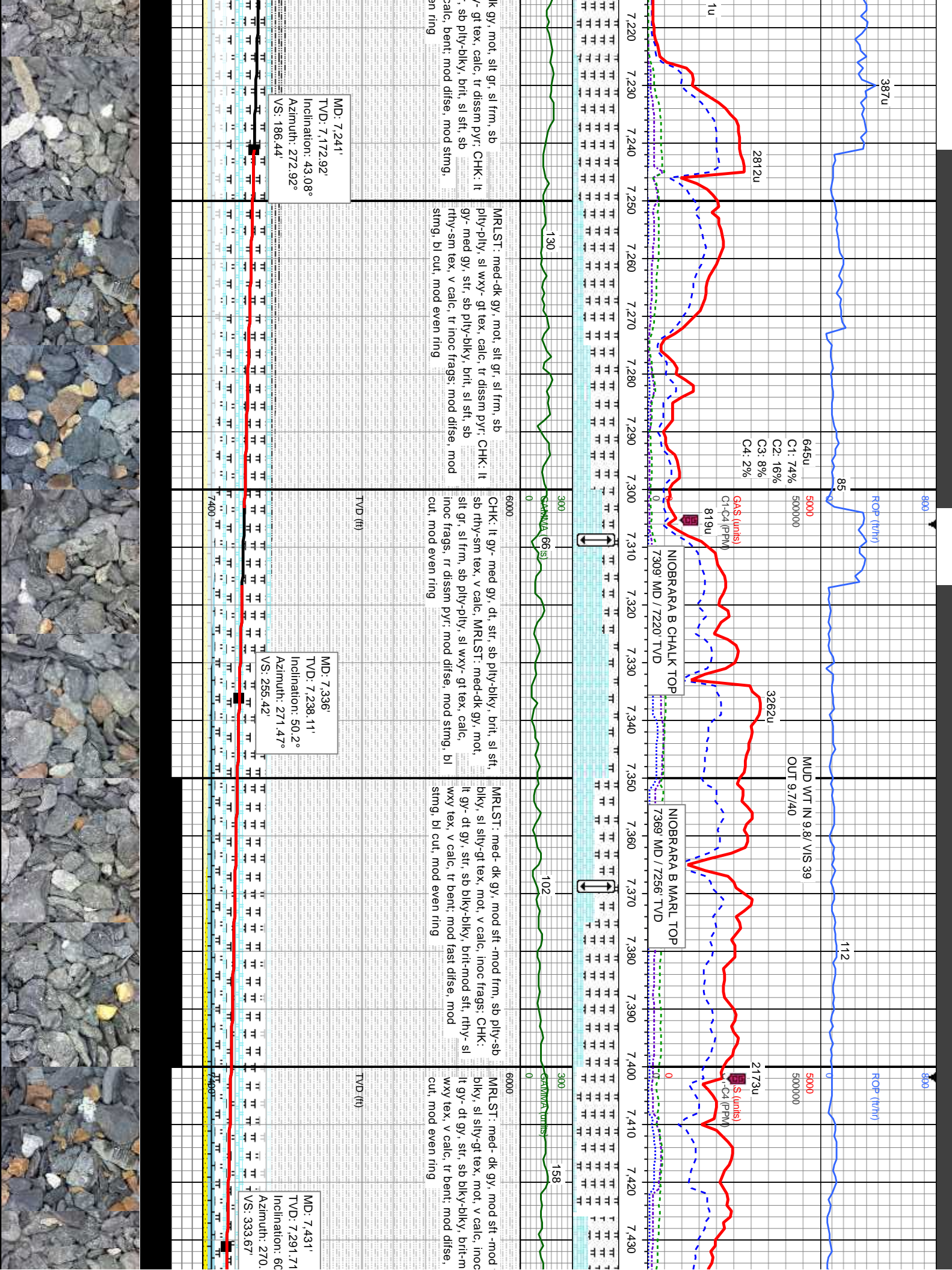
MD: 6.772'  
TVD: 6,768.7  
Inclination: 1  
Azimuth: 262  
VS: -36.37'



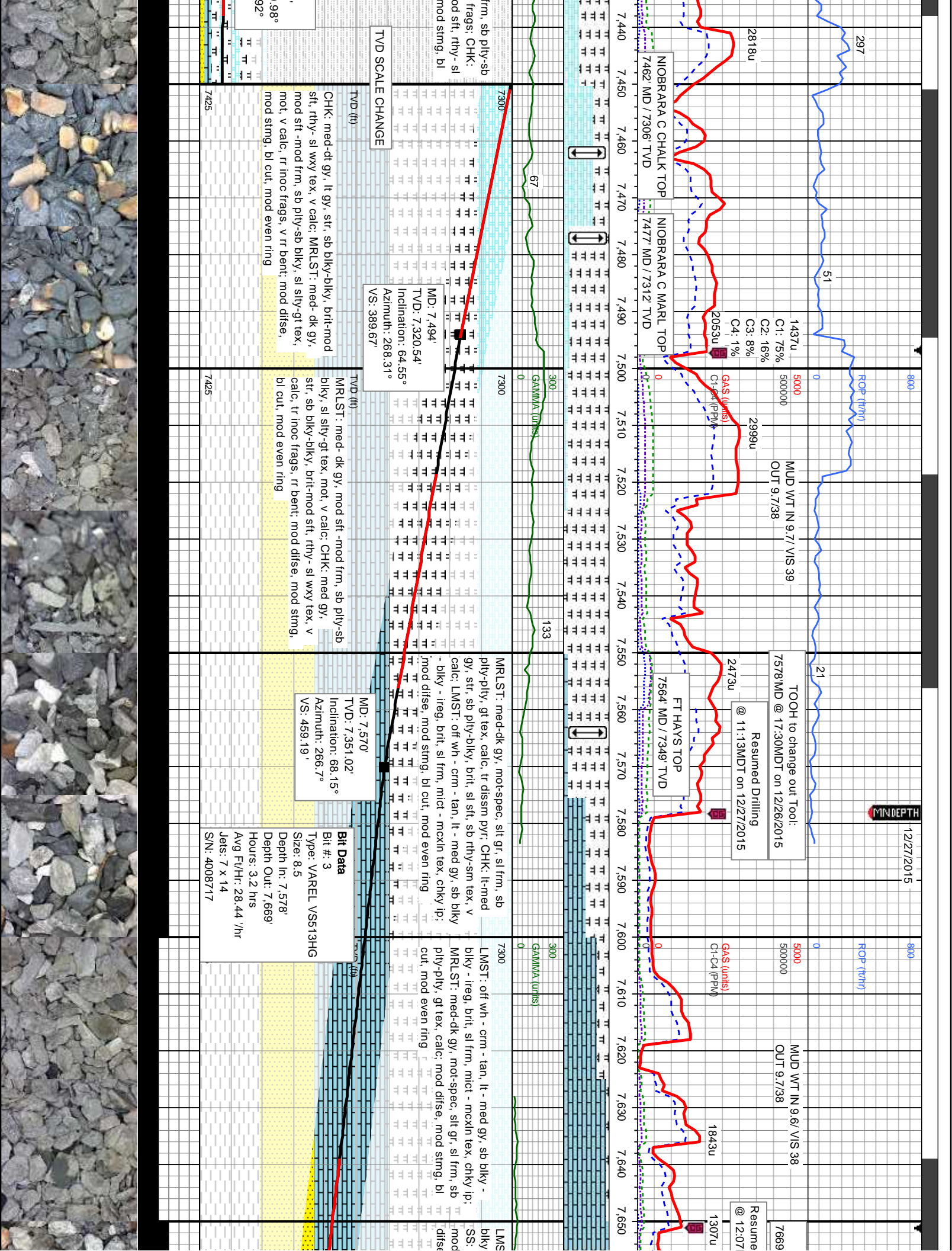












12/27/2015

ROP (ft/hr)

MUD WT IN 9.7 / VIS 39  
OUT 9.7/38

TOOH to change out Tool:  
7578 MD @ 17:30MDT on 12/26/2015

Resume Drilling  
@ 11:13MDT on 12/27/2015

MUD WT IN 9.6 / VIS 38  
OUT 9.7/38

Resume  
@ 12:07

GAS (units)  
C1-C4 (PPM)

GAS (units)  
C1-C4 (PPM)

NIOBRARA C CHALK TOP  
7462 MD / 7306' TVD

NIOBRARA C MARL TOP  
7477 MD / 7312' TVD

FT HAYS TOP  
7564 MD / 7349' TVD

GAMMA (units)

GAMMA (units)

TVD SCALE CHANGE

MD: 7.494'  
TVD: 7.320.54'  
Inclination: 64.55°  
Azimuth: 268.31°  
VS: 389.67

MD: 7.570'  
TVD: 7.351.02'  
Inclination: 68.15°  
Azimuth: 266.7°  
VS: 459.19'

Bit Data  
Bit #: 3  
Type: VAREL VS513HG  
Size: 8.5  
Depth In: 7.578'  
Depth Out: 7.669'  
Hours: 3.2 hrs  
Avg Ft/Hr: 28.44 /hr  
Jets: 7 x 14  
S/N: 4008717

CHK: med-dt gy, lt gy, str, sb blk-y-bkly, brit-mod sft, rthy- sl wxy tex, v calc: MRLST: med- dk gy, mod sft -mod frm, sb ply-sb blkly, sl stly-gt tex, mot, v calc, rr inoc frags, v rr bent, mod difse, mod sting, bl cut, mod even ring

MRLST: med- dk gy, mod sft -mod frm, sb ply-sb blkly, sl stly-gt tex, mot, v calc: CHK: med gy, str, sb blk-y-bkly, brit-mod sft, rthy- sl wxy tex, v calc, tr inoc frags, rr bent, mod difse, mod sting, bl cut, mod even ring

MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb ply-pty, gt tex, calc, tr dissim pyr: CHK: lt-med gy, str, sb ply-bkly, brit, sl sft, sb rthy-sm tex, v calc: LMST: off wh - crm - tan, lt - med gy, sb blkly - blkly - iieg, brit, sl frm, mict - mcnx tex, chky ip; mod difse, mod sting, bl cut, mod even ring

LMST: off wh - crm - tan, lt - med gy, sb blkly - blkly - iieg, brit, sl frm, mict - mcnx tex, chky ip; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb ply-pty, gt tex, calc: mod difse, mod sting, bl cut, mod even ring

LMS  
blkly  
SS:  
mod  
difse

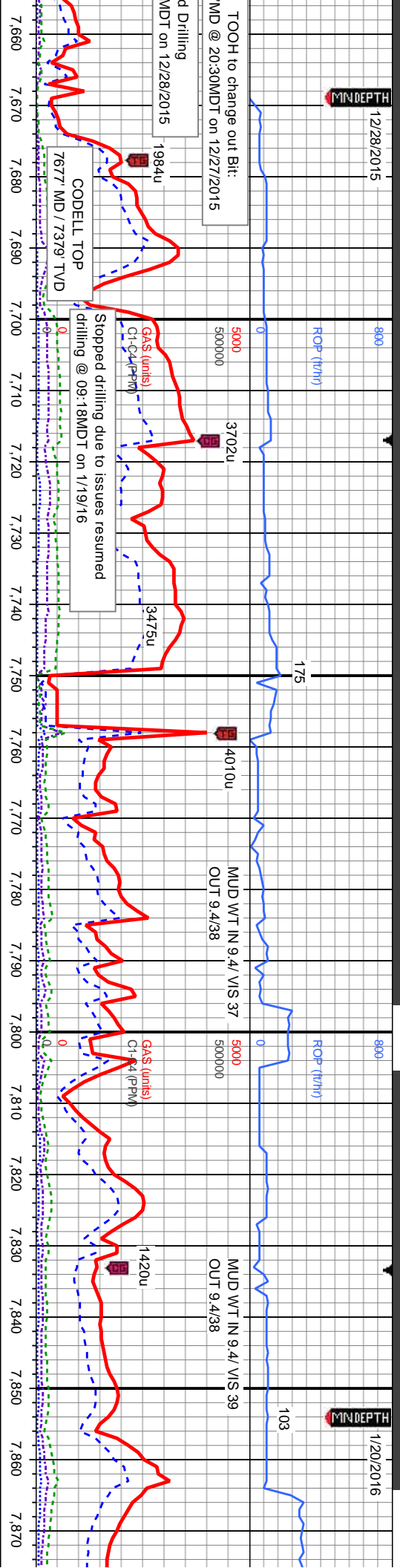


12/28/2015

MINDEPTH

TOOH to change out Bit:  
MD @ 20:30MDT on 12/27/2015

MDT on 12/28/2015

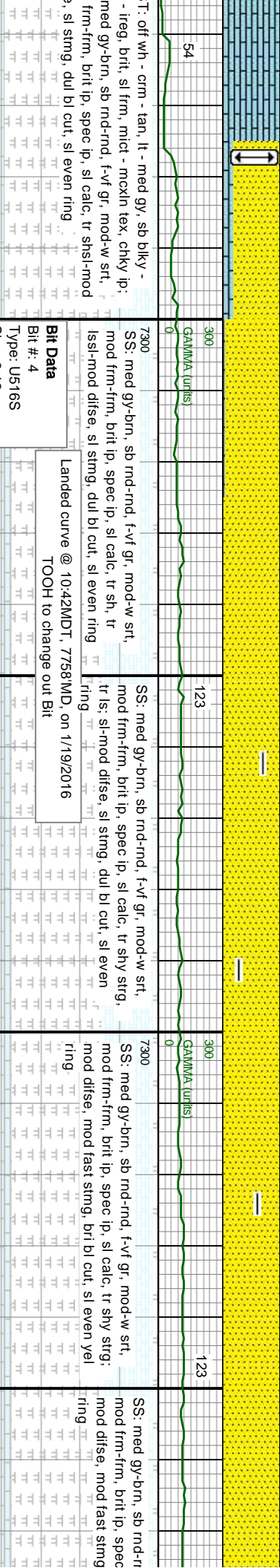


1/20/2016

MINDEPTH

TOOH to change out Bit:  
MD @ 20:30MDT on 12/27/2015

MDT on 12/28/2015



SS: med gy-brn, sb rnd-rnd, f-vf gr, mod-w srt, mod frm-frm, brit ip, spec ip, sl calc, tr sh, tr lssl-mod difse, sl sting, dul bl cut, sl even ring

SS: med gy-brn, sb rnd-rnd, f-vf gr, mod-w srt, mod frm-frm, brit ip, spec ip, sl calc, tr shy strg, tr ls: sl-mod difse, sl sting, dul bl cut, sl even ring

SS: med gy-brn, sb rnd-rnd, f-vf gr, mod-w srt, mod frm-frm, brit ip, spec ip, sl calc, tr shy strg, mod difse, mod fast sting, bri bl cut, sl even yel ring

SS: med gy-brn, sb rnd-rnd, f-vf gr, mod-w srt, mod frm-frm, brit ip, spec ip, sl calc, tr shy strg, mod difse, mod fast sting

**Bit Data**  
Bit #. 4  
Type: U616S  
Size: 6.12  
Depth In: 7.674'  
Depth Out: 7.758'  
S/N: 27822

MD: 7.729'  
TVD: 7.392.43'  
Inclination: 81.6°  
Azimuth: 270.4°  
VS: 612.24'

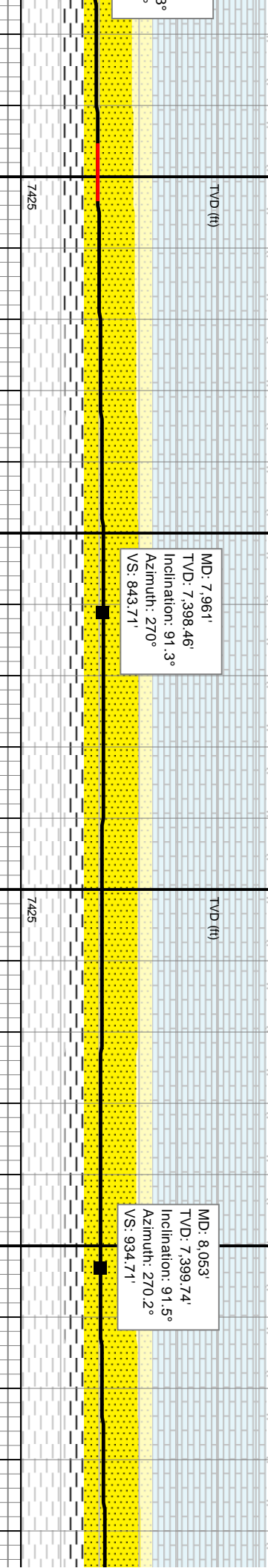
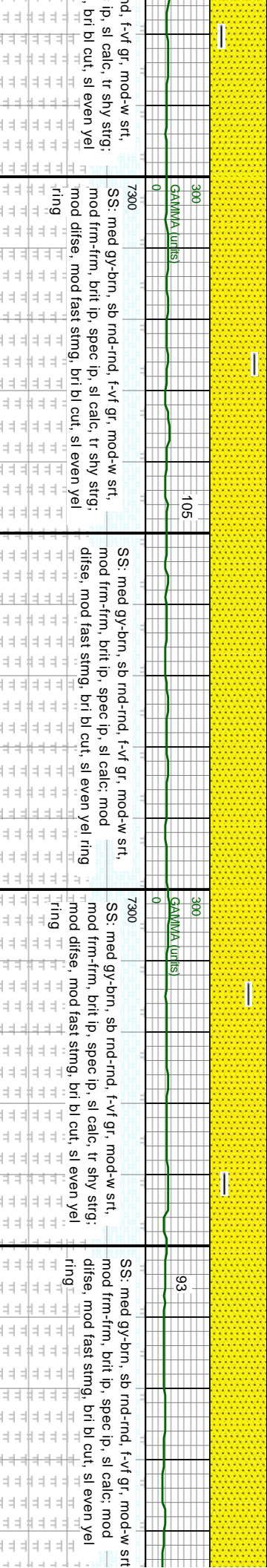
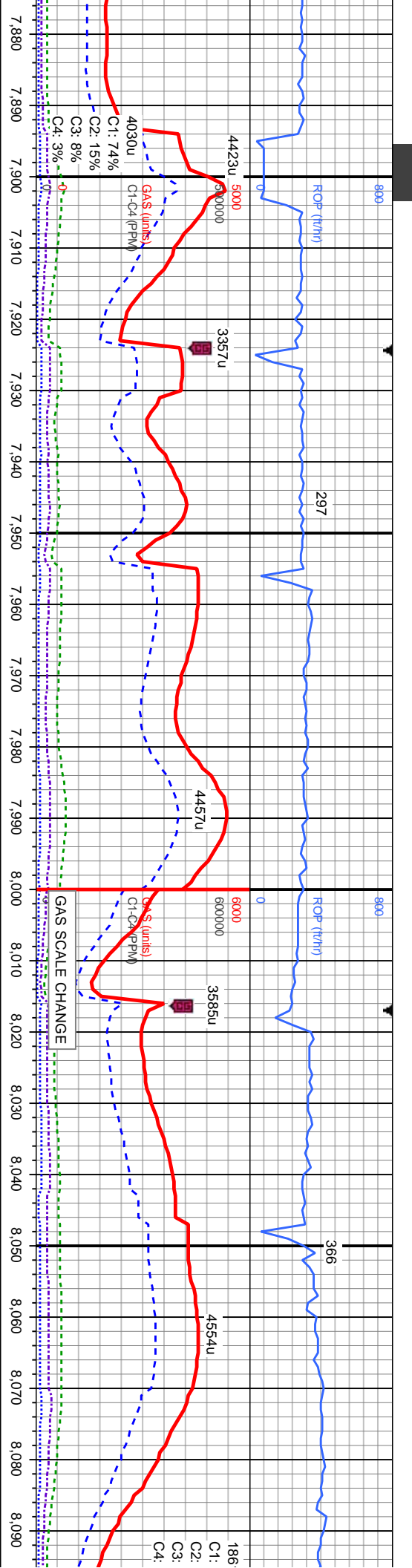
MD: 7.760'  
TVD: 7.396.21'  
Inclination: 84.4°  
Azimuth: 270.4°  
VS: 643.01'

MD: 7.778'  
TVD: 7.398.09'  
Inclination: 83.6°  
Azimuth: 270.6°  
VS: 660.91'

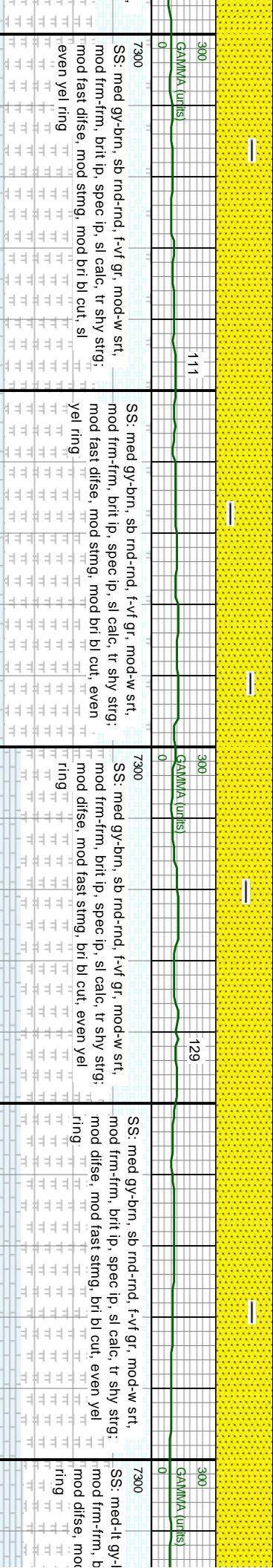
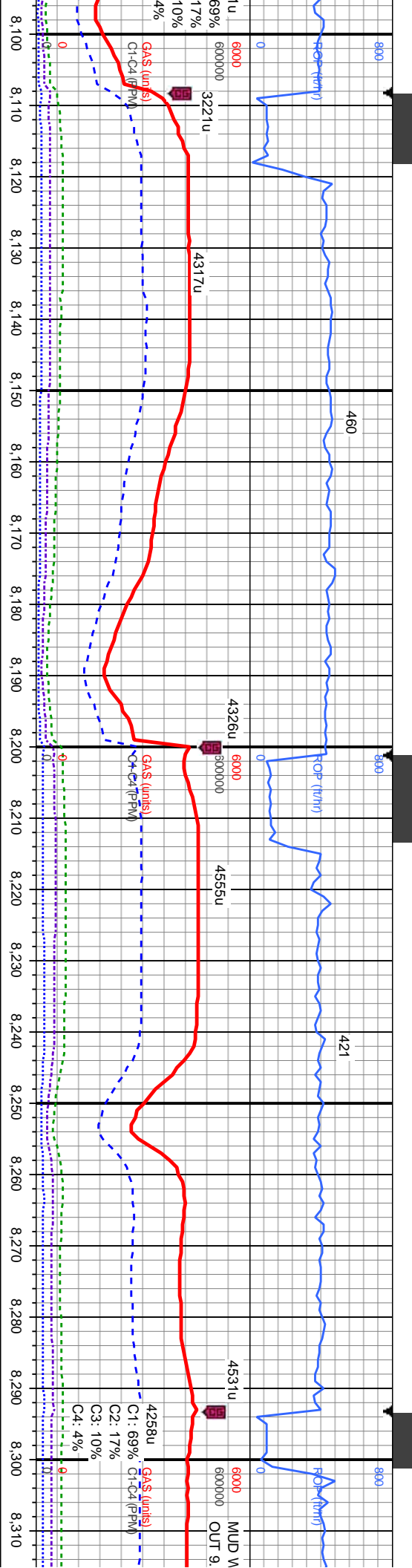
MD: 7.869'  
TVD: 7.401.34'  
Inclination: 92.2°  
Azimuth: 270.2°  
VS: 751.76'

Resumed Drilling of the Lateral @ 21:20 MDT  
on 1/19/2016



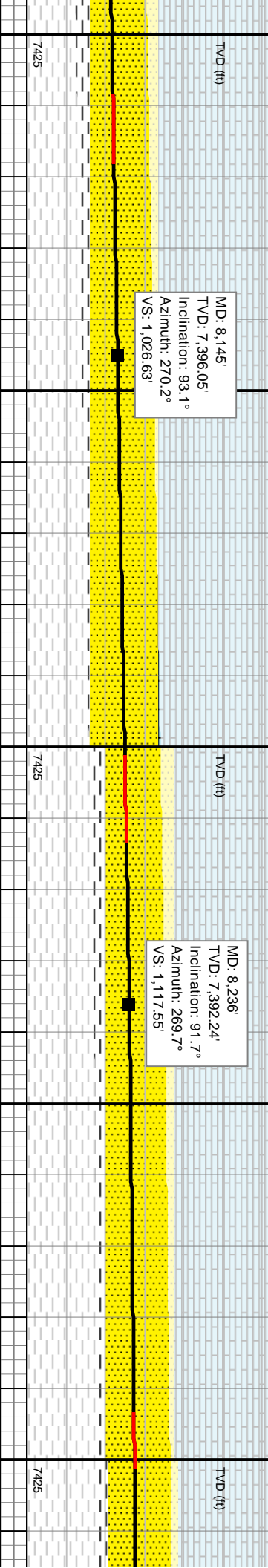




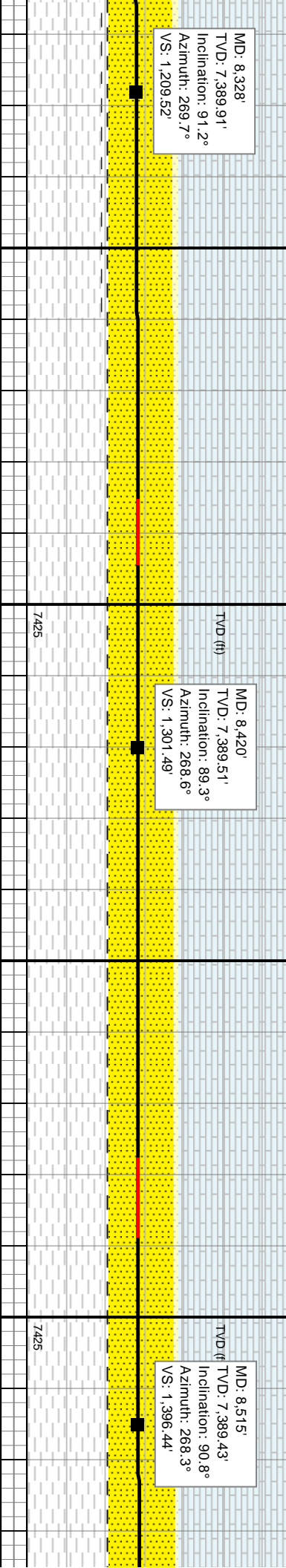
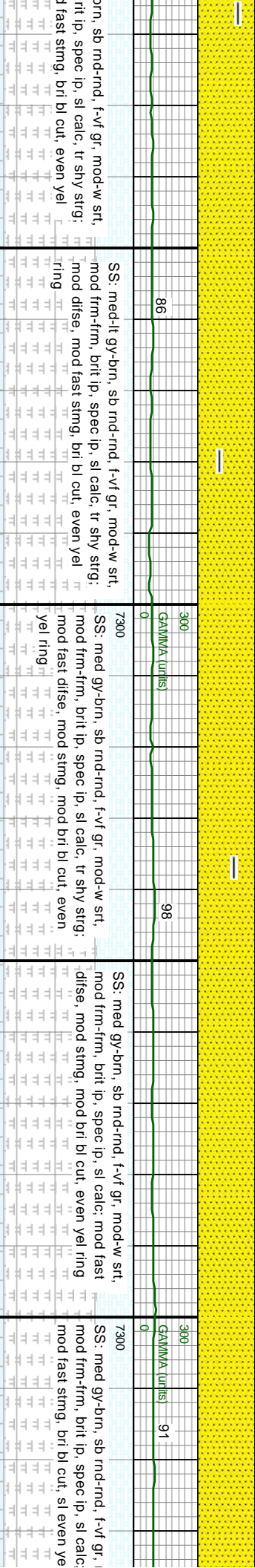
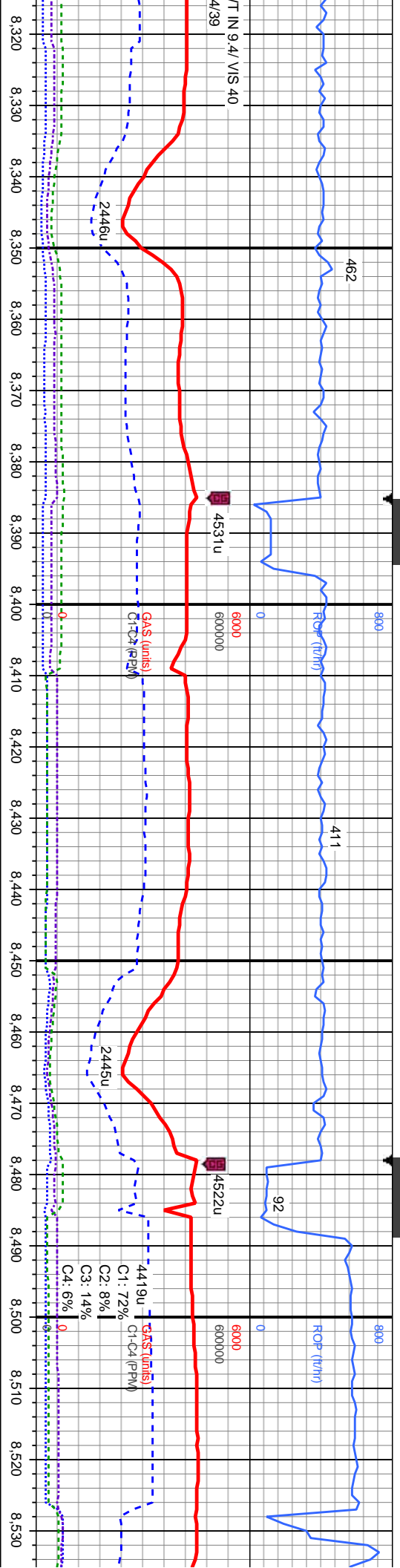


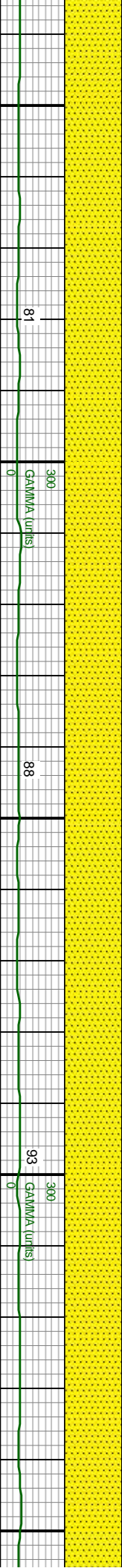
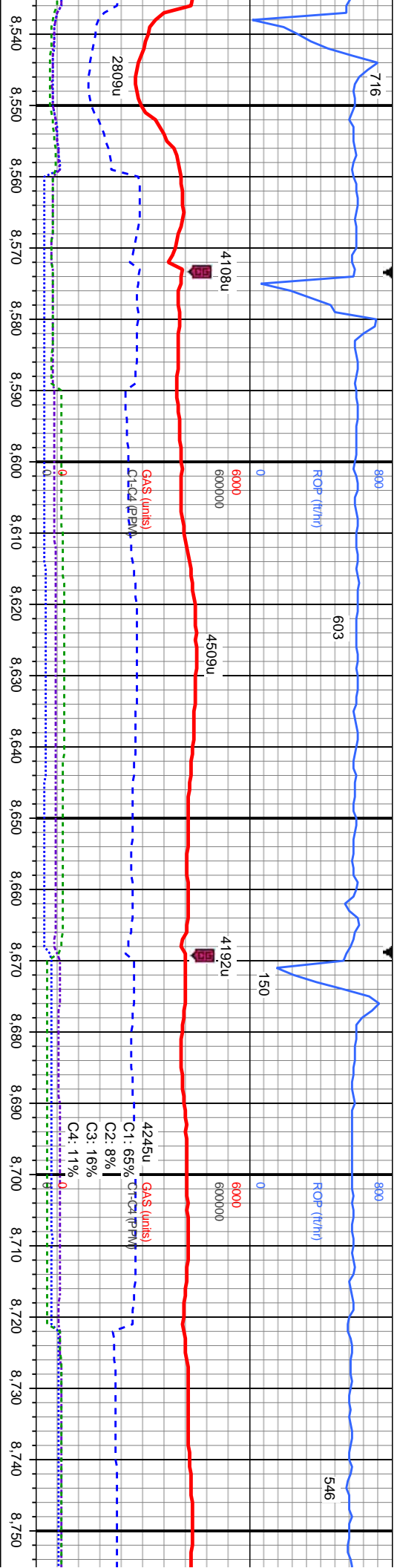
MD: 8,145'  
TVD: 7,396.05'  
Inclination: 93.1°  
Azimuth: 270.2°  
VS: 1,026.63'

MD: 8,236'  
TVD: 7,392.24'  
Inclination: 91.7°  
Azimuth: 269.7°  
VS: 1,117.55'



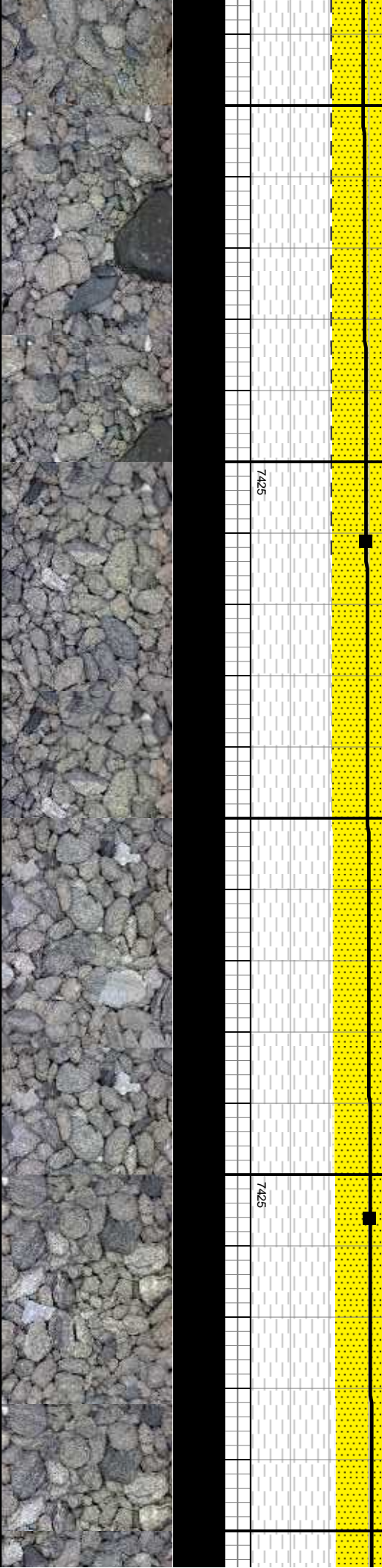




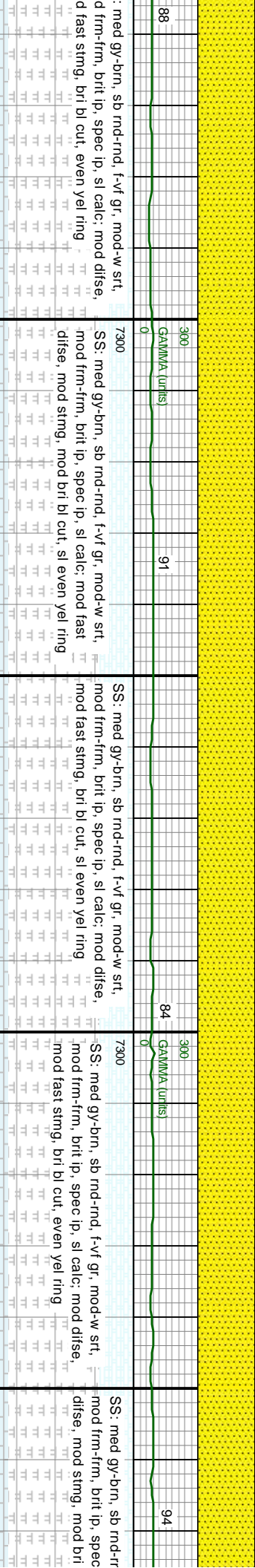
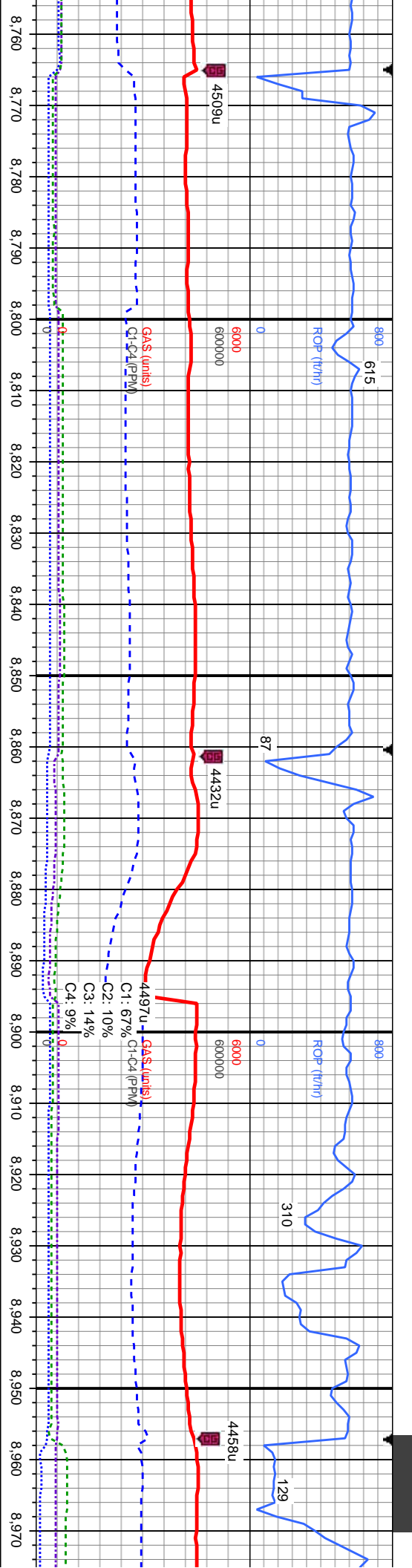
[illegible]

MD: 8,611'  
TVD: 7,388'  
Inclination: 90.9°  
Azimuth: 269°  
VS: 1,492.39'

MD: 8,706'  
TVD: 7,386.84'  
Inclination: 90.5°  
Azimuth: 268.3°  
VS: 1,587.35'

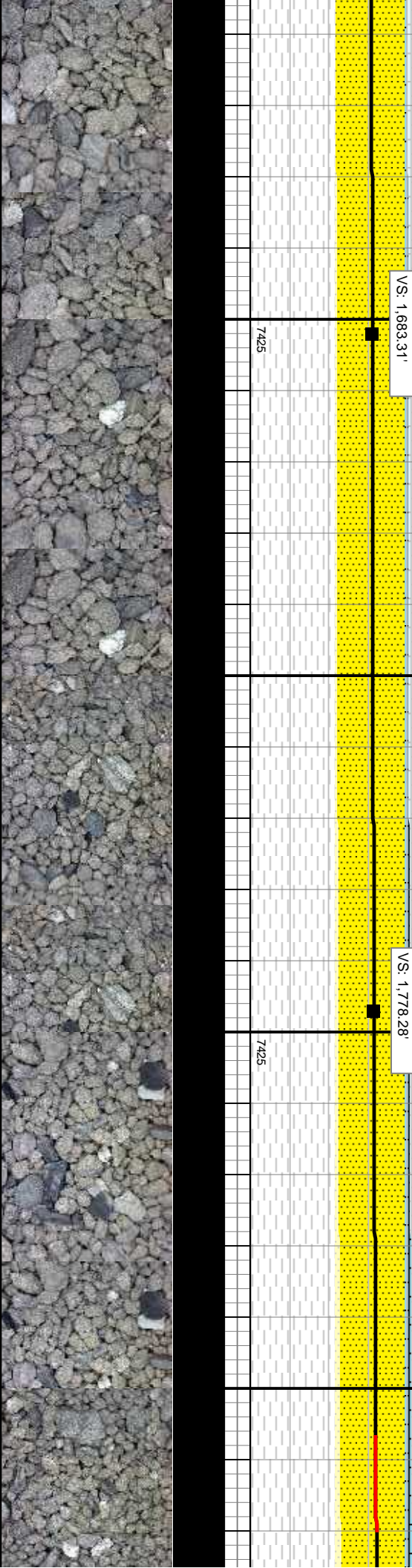




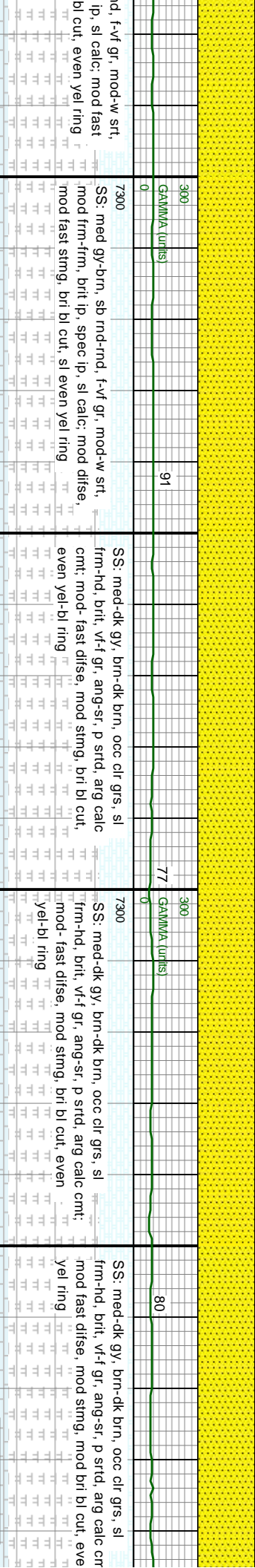
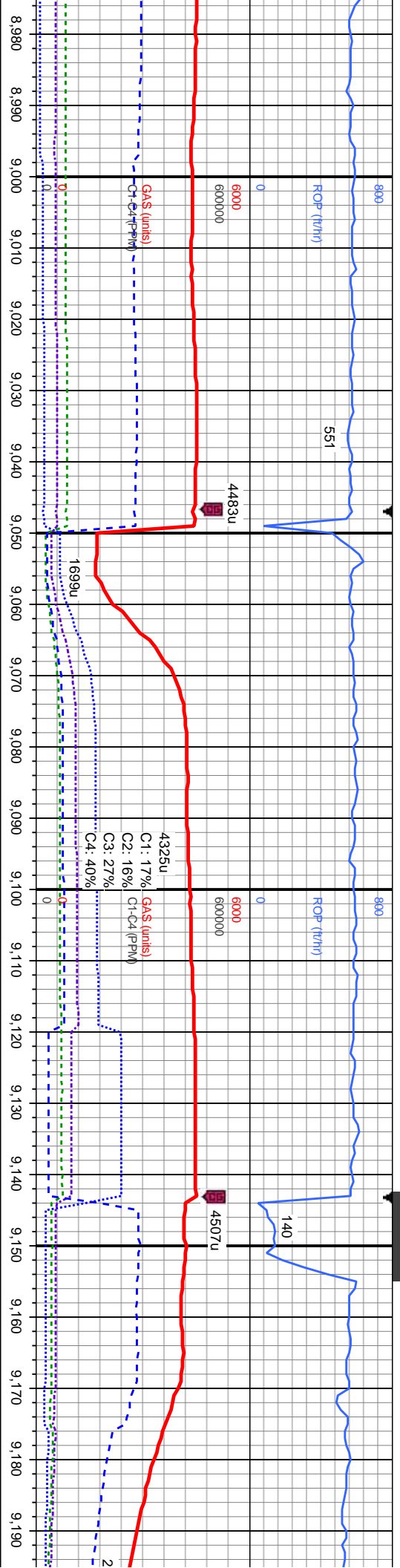


MD: 8,802'  
TVD: 7,385.92'  
Inclination: 90.6°  
Azimuth: 269°  
VS: 1,683.31'

MD: 8,897'  
TVD: 7,385.59'  
Inclination: 89.8°  
Azimuth: 268.6°  
VS: 1,778.28'



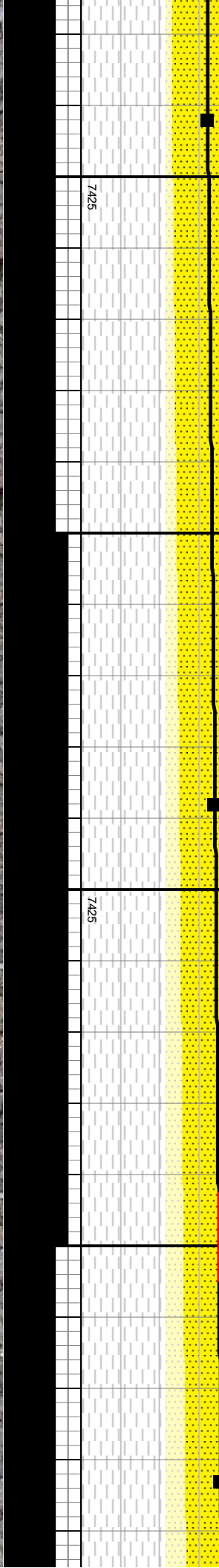


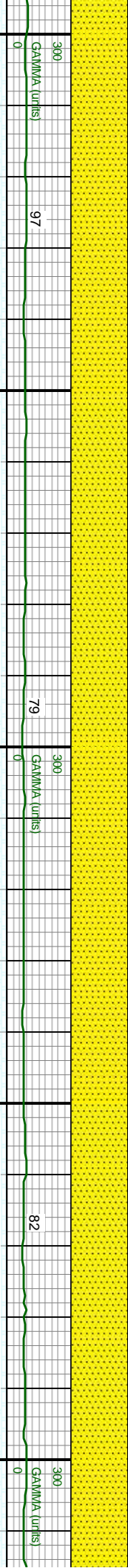
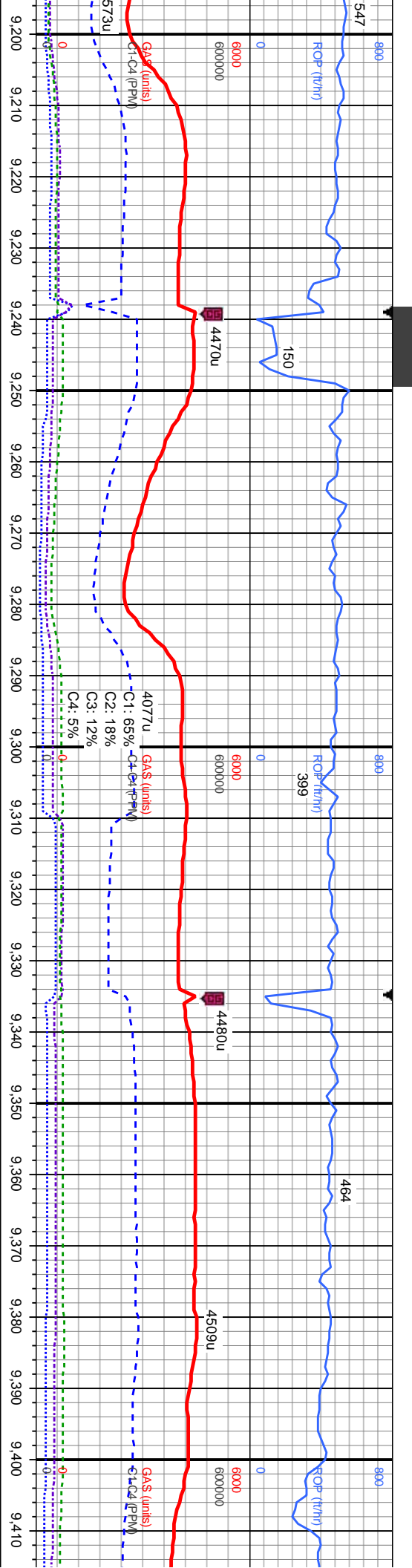


MD: 8.992'  
TVD: 7.384.51'  
Inclination: 91.5°  
Azimuth: 269.2°  
VS: 1.873.24'

MD: 9.088'  
TVD: 7.382.17'  
Inclination: 91.3°  
Azimuth: 269.2°  
VS: 1.969.2'

MD: 9.183'  
TVD: 7.380.34'  
Inclination: 90.9°  
Azimuth: 269.7°  
VS: 2.064.17'





SS: med-dk gy, brn-dk brn, occ clr grs, sl  
frm-hd, brit, vt-f gr, ang-sr, p srd, arg calc cmt:  
cmnt: mod fast difse, mod stmg, mod bri bl cut, sl  
even yel ring

SS: med-dk gy, brn-dk brn, occ clr grs, sl  
frm-hd, brit, vt-f gr, ang-sr, p srd, arg calc cmt:  
cmnt: mod fast difse, mod stmg, mod bri bl cut, F  
even yel ring

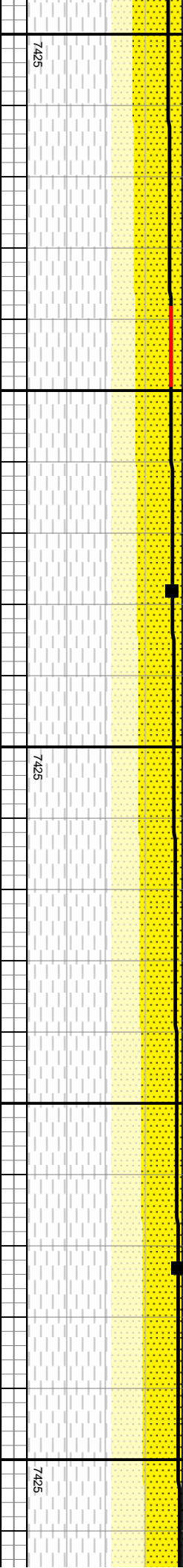
SS: med-dk gy, brn-dk brn, occ clr grs, sl  
frm-hd, brit, vt-f gr, ang-sr, p srd, arg calc cmt:  
cmnt: mod fast difse, mod stmg, mod bri bl cut, even  
yel ring

SS: med-dk gy, brn-dk brn, occ clr grs, sl  
frm-hd, brit, vt-f gr, ang-sr, p srd, arg calc cmt:  
cmnt: mod fast difse, mod stmg, mod bri bl cut,  
even yel ring

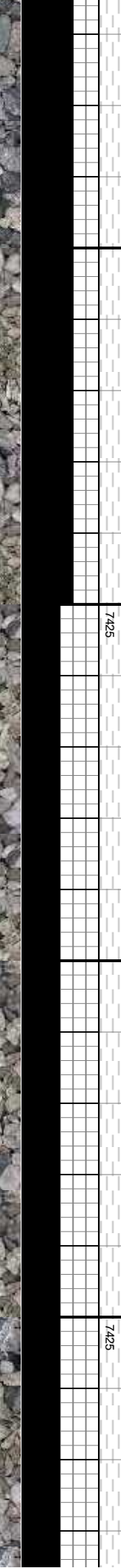
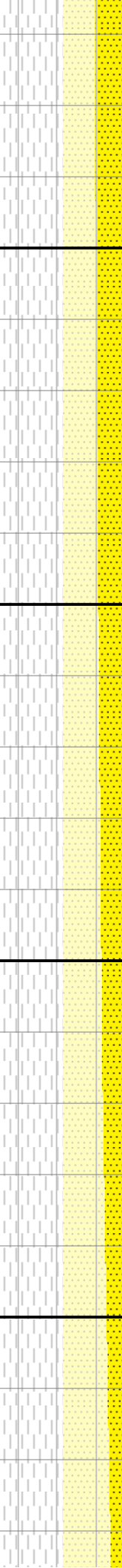
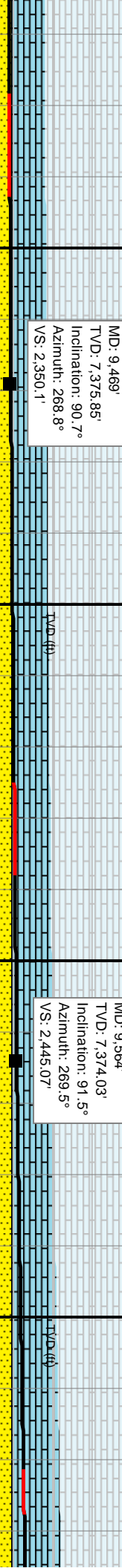
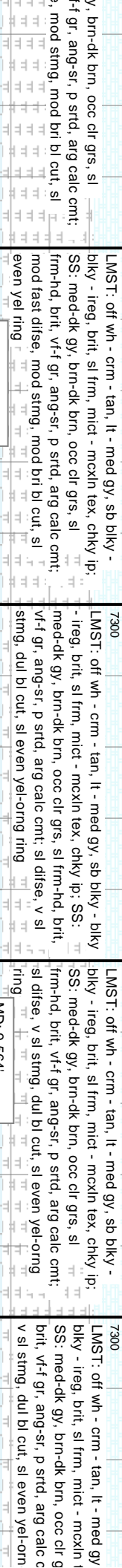
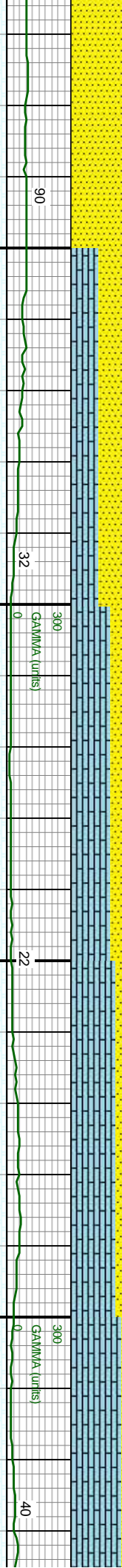
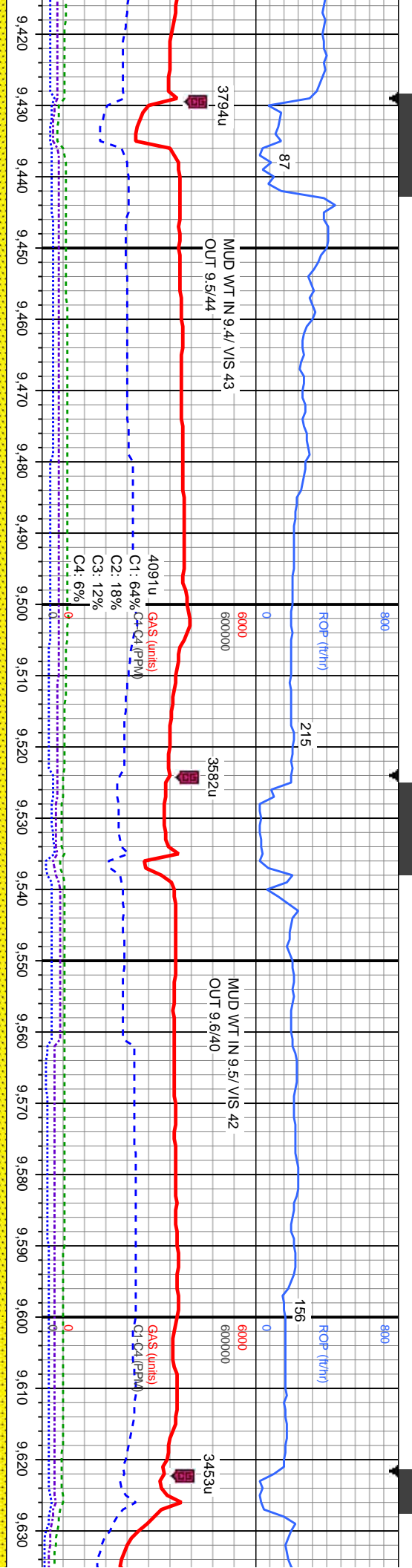
SS: med-dk g  
frm-hd, brit, v  
mod fast difse  
even yel ring

MD: 9,278'  
TVD: 7,378.52'  
Inclination: 91.3°  
Azimuth: 270°  
VS: 2,159.15'

MD: 9,373'  
TVD: 7,376.94'  
Inclination: 90.6°  
Azimuth: 269.5°  
VS: 2,254.13'

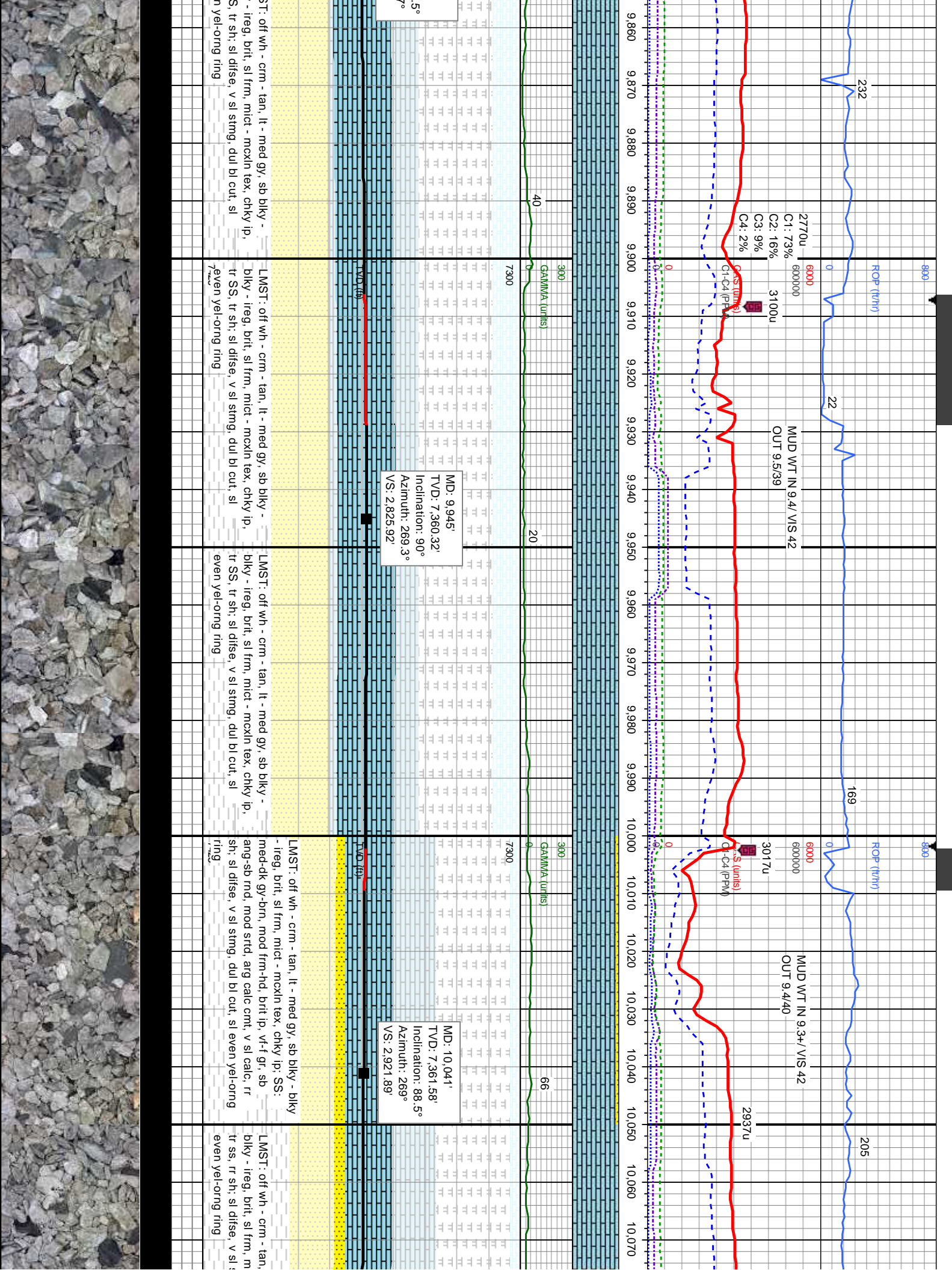


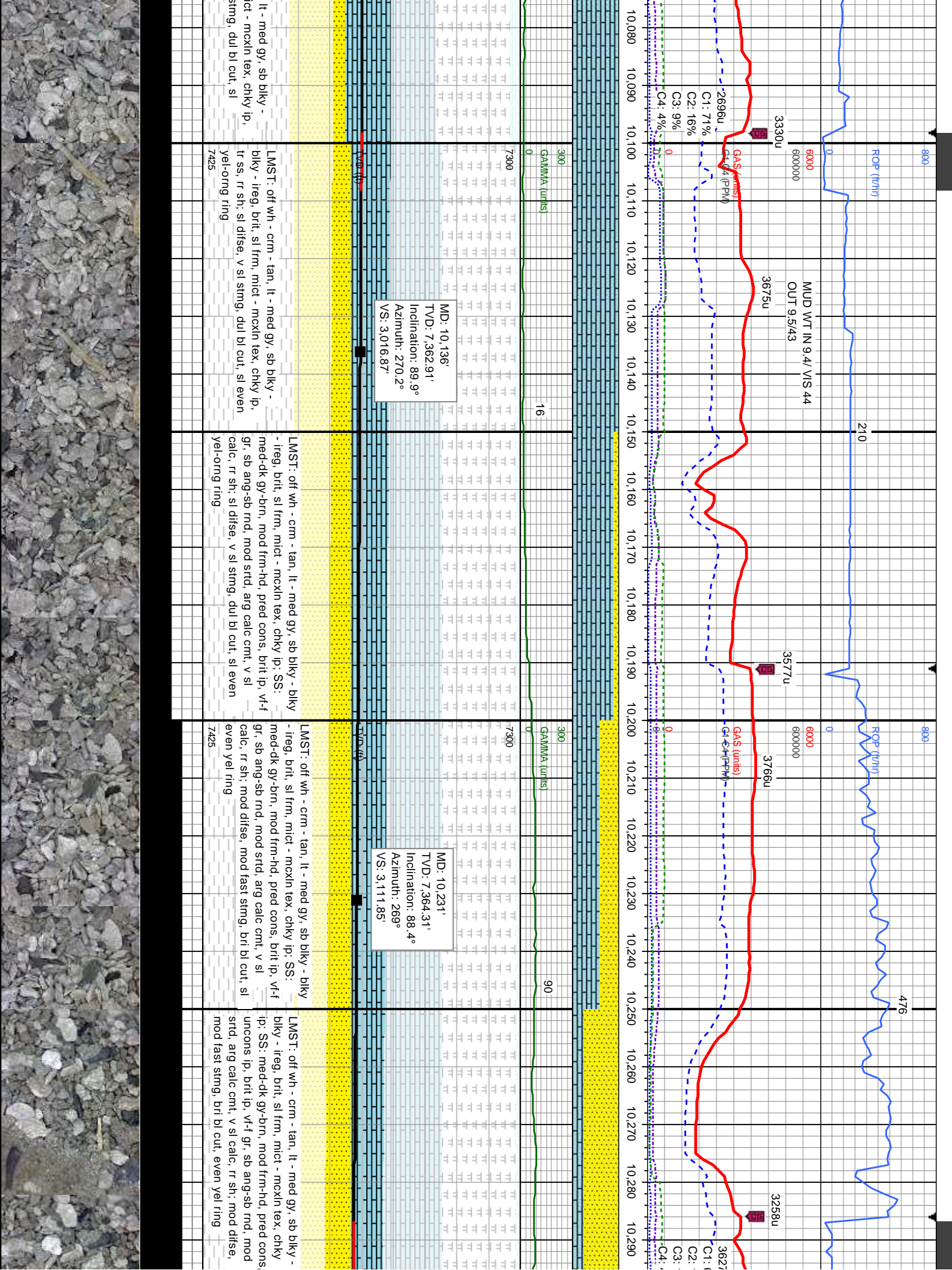




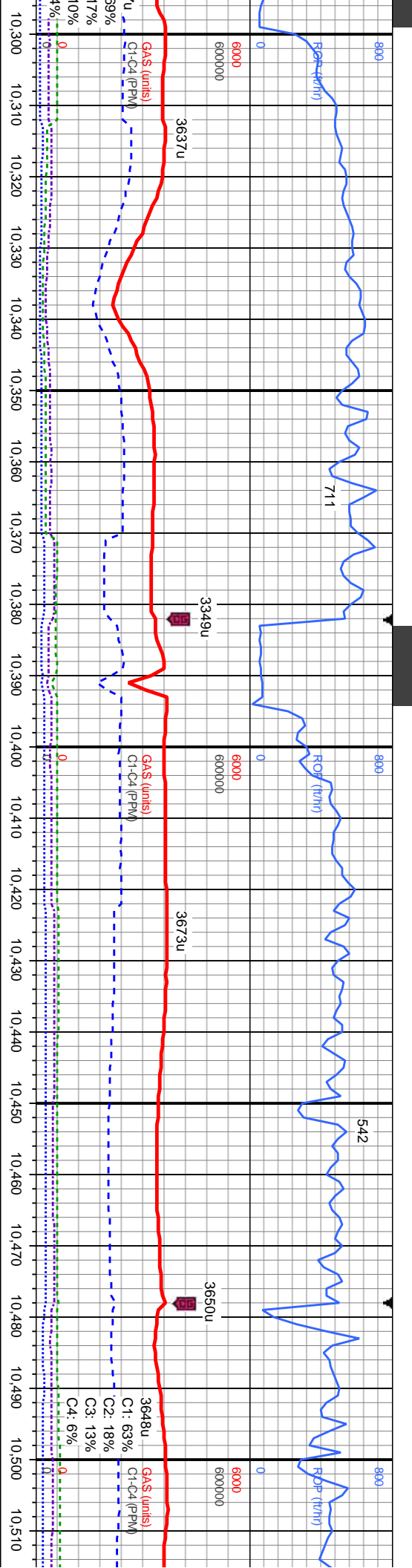












MD: 10.326'  
TVD: 7,366.22'  
Inclination: 89.3°  
Azimuth: 268.1°  
VS: 3,206.79'

MD: 10.421'  
TVD: 7,366.22'  
Inclination: 90.7°  
Azimuth: 269°  
VS: 3,301.74'

MD: 10.421'  
TVD: 7,366.22'  
Inclination: 90.7°  
Azimuth: 269°  
VS: 3,301.74'

SS: med-dk gy-brn, mod frm-hd, pred unconc, brit  
ip, vf-f gr, sb ang-sb rnd, mod strd, arg calc cnt,  
v sl calc, tr ls, rr sh, mod difse, mod fast stmg,  
bri bl cut, even yel ring  
7425

SS: med-dk gy-brn, mod frm-hd, pred unconc, brit  
ip, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd  
qtz, v sl calc; mod difse, mod fast stmg, bri bl  
cut, even yel ring  
7425

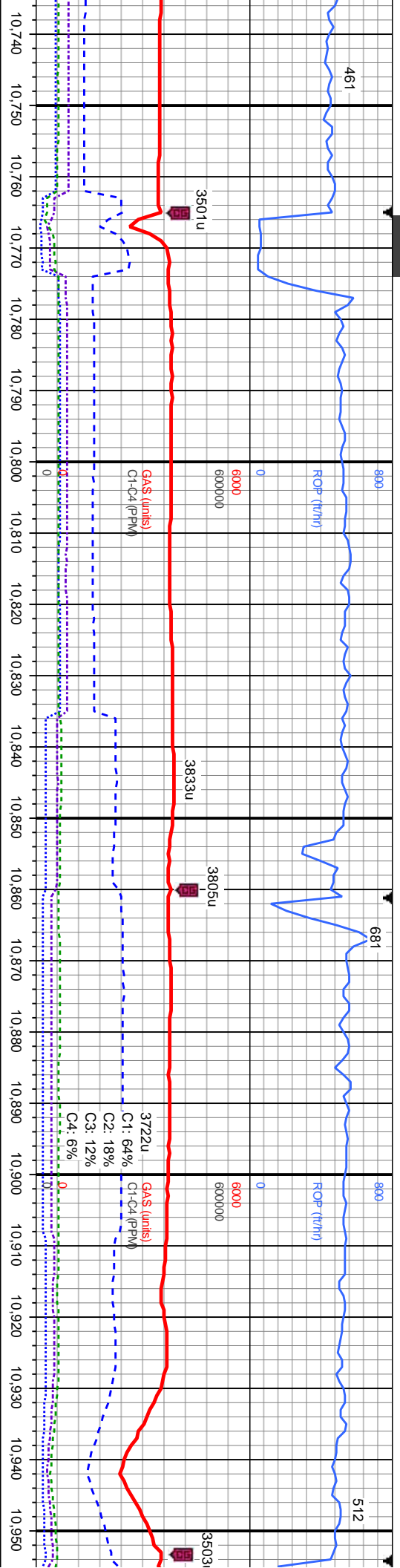
SS: med-dk gy-brn, mod frm-hd, pred unconc,  
brit ip, vf-f gr, sb ang-sb rnd, mod strd, lse sb  
rnd qtz, v sl calc; mod difse, mod fast stmg, bri  
bl cut, sl even yel ring  
7425

SS: med-dk gy-brn, mod frm-hd, pred unconc, brit  
ip, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd  
qtz, v sl calc; mod difse, sl-mod stmg, mod bri bl  
cut, sl even yel ring  
7425

SS: med-dk gy-brn, mod frm-hd, pred unconc, brit  
ip, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd  
qtz, v sl calc; mod difse, sl-mod stmg, mod bri bl  
cut, sl even yel ring  
7425



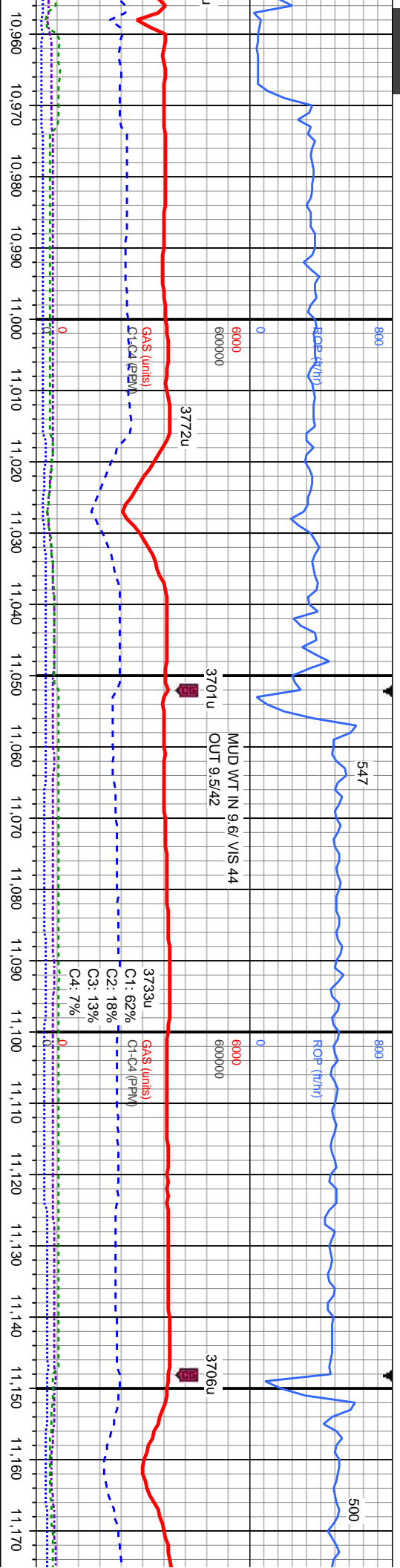




MD: 10.802'  
TVD: 7,366.72'  
Inclination: 89.7°  
Azimuth: 269.7°  
VS: 3,682.65'

MD: 10.897'  
TVD: 7,367.38'  
Inclination: 89.5°  
Azimuth: 269.7°  
VS: 3,777.64'

d unconcs, brit  
se sb rnd  
g, mod bri bl  
SS: med-dk gy-brn, mod frm-hd, pred unconcs,  
brit ip, vf-f gr, sb ang-sb rnd, mod strd, lse sb  
rnd qtz, v sl calc; mod difse, sl-mod stmg, mod  
brit bl cut, sl even yel ring  
SS: med-dk gy-brn, mod frm-hd, pred unconcs,  
cons ip, occ clus, brit ip, vf-f gr, sb ang-sb rnd,  
mod strd, lse sb rnd qtz, v sl calc; mod difse,  
sl-mod stmg, mod bri bl cut, even yel ring  
SS: med-dk gy-brn, mod frm-hd, pred unconcs,  
cons ip, occ clus, brit ip, vf-f gr, sb ang-sb rnd,  
mod strd, lse sb rnd qtz, v sl calc; mod difse,  
sl-mod stmg, mod bri bl cut, even yel ring  
SS: med-dk gy-brn, mod frm-hd, pred unconcs,  
cor  
rnd  
difse  
ring



MD: 10,993'  
TVD: 7,366.88'  
Inclination: 91.1°  
Azimuth: 270.9°  
VS: 3,873.64'

MD: 11,088'  
TVD: 7,364.81'  
Inclination: 91.4°  
Azimuth: 271.1°  
VS: 3,968.61'

med-dk gy-brn, mod frm-hd, pred unconcs, cons ip, occ clus, brit ip, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd qtz, v sl calc; mod difse, sl-mod stmg, mod bri bl cut, even yel ring

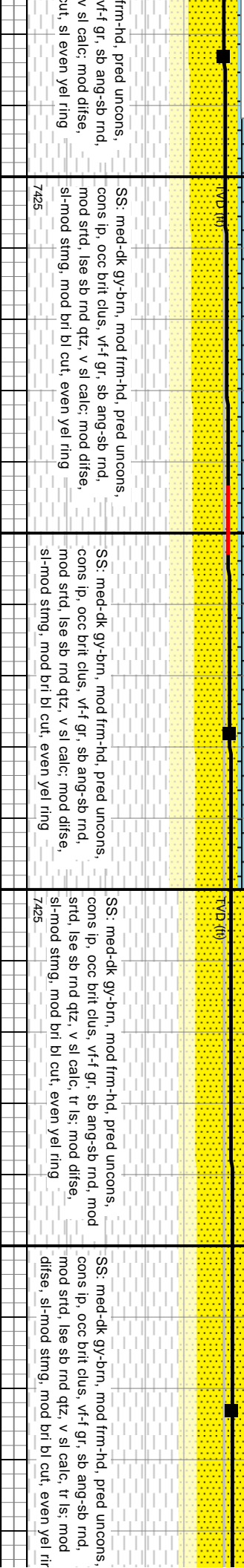
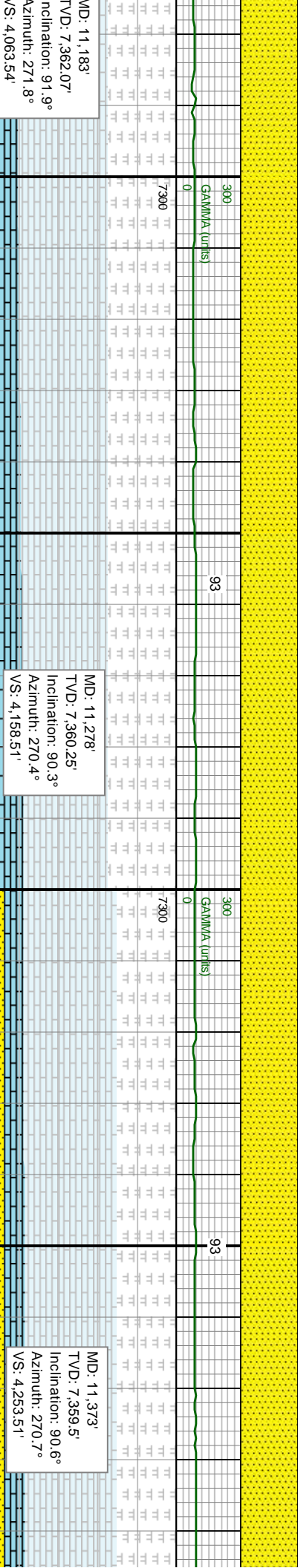
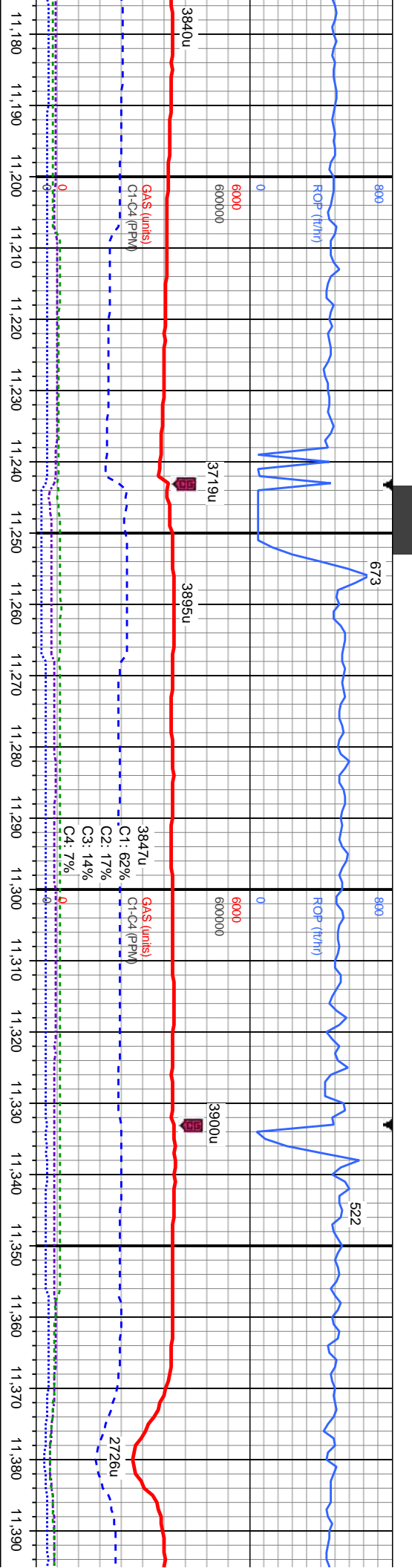
SS: med-dk gy-brn, mod frm-hd, pred unconcs, cons ip, occ clus, brit ip, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd qtz, v sl calc; mod difse, sl-mod stmg, mod bri bl cut, even yel ring

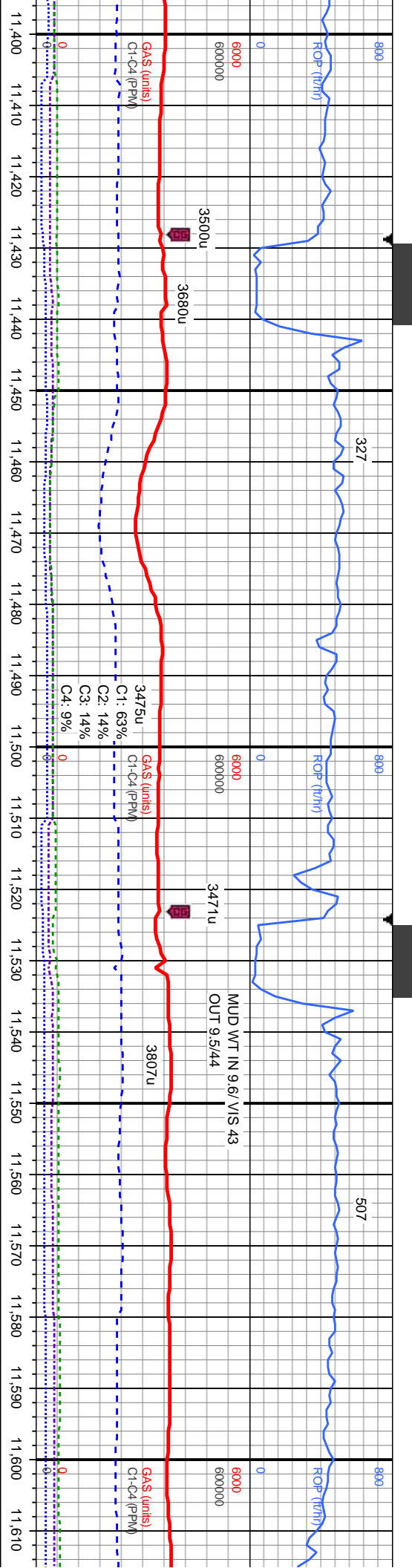
SS: med-dk gy-brn, mod frm-hd, pred unconcs, cons ip, occ clus, brit ip, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd qtz, v sl calc; mod difse, sl-mod stmg, mod bri bl cut, even yel ring

SS: med-dk gy-brn, mod frm-hd, pred unconcs, cons ip, occ clus, brit ip, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd qtz, v sl calc; mod difse, sl-mod stmg, mod bri bl cut, even yel ring









MD: 11,468'  
TVD: 7,359'  
Inclination: 90°  
Azimuth: 271.8°  
VS: 4,348.49'

MD: 11,563'  
TVD: 7,358.59'  
Inclination: 90.5°  
Azimuth: 271.1°  
VS: 4,443.47'

SS: med-dk gy-brn, mod frm-hd, pred unconcs, cons ip, occ brit clus, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd qtz, v sl calc, tr ls, tr shy strg, mod difse, sl-mod stmng, mod bri bl cut, sl even yel ring

SS: med-dk gy-brn, mod frm-hd, pred unconcs, cons ip, occ brit clus, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd qtz, v sl calc, tr ls, tr shy strg, mod difse, sl-mod stmng, mod bri bl cut, sl even yel ring

SS: med-dk gy-brn, mod frm-hd, pred unconcs, cons ip, occ brit clus, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd qtz, v sl calc, tr ls, mod difse, sl-mod stmng, mod bri bl cut, sl even yel ring

SS: med-dk gy-brn, mod frm-hd, pred unconcs, cons ip, occ brit clus, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd qtz, v sl calc, tr ls, mod difse, sl-mod stmng, mod bri bl cut, even yel ring

SS: med-dk gy-brn, mod frm-hd, pred unconcs, cons ip, occ brit clus, vf-f gr, sb ang-sb rnd, mod strd, lse sb rnd qtz, v sl calc, tr ls, mod difse, sl-mod stmng, mod bri bl cut, even yel ring



413

443

800

MINDEPTH

ROP (ft/m)

MOE (ft/m)

3799u

3795u

0

MUD WT IN 9.5' VIS 40  
OUT 9.5/42

6000

3645u

3342u

GAS (units)  
C1-C4 (PPM)

GAS (units)  
C1-C4 (PPM)

C1: 64%

C2: 17%

C3: 12%

C4: 7%

11,620

11,630

11,640

11,650

11,660

11,670

11,680

11,690

11,700

11,710

11,720

11,730

11,740

11,750

11,760

11,770

11,780

11,790

11,800

11,810

11,820

11,830

125

300

GAMMA (units)

86

300

GAMMA (units)

MD: 11,657'  
TVD: 7,358.18'  
Inclination: 90°  
Azimuth: 271.4°  
VS: 4,537.45'

MD: 11,753'  
TVD: 7,358.35'  
Inclination: 89.8°  
Azimuth: 269.2°  
VS: 4,633.44'

TVD (ft)

TVD (ft)

brn, mod frm-hd, pred unconfs,  
clus, vf-f gr, sb ang-sb rnd, mod  
qtz, v sl calc, tr ls, tr shy stng;  
mod stmg, mod bri bl cut, even yel

SS: med-dk gy-brn, mod frm-hd, pred unconfs,  
cons ip, occ brit clus, vf-f gr, sb ang-sb rnd, mod  
strd, lse sb rnd qtz, v sl calc, tr ls, tr shy stng;  
mod difse, sl-mod stmg, mod bri bl cut, even yel  
ring

SS: med-dk gy-brn, mod frm-hd, pred unconfs,  
cons ip, occ brit clus, vf-f gr, sb ang-sb rnd, mod  
strd, lse sb rnd qtz, v sl calc, mod difse, sl-mod  
stmg, mod bri bl cut, sl even yel ring

SS: med-dk gy-brn, mod frm-hd, pred unconfs,  
cons ip, occ brit clus, vf-f gr, sb ang-sb rnd, mod  
strd, lse sb rnd qtz, v sl calc, mod difse, sl-mod  
stmg, mod bri bl cut, even yel ring

SS: med-dk gy-brn, mod frm-hd, pred unconfs,  
cons ip, occ brit clus, vf-f gr, sb ang-sb rnd, mod  
strd, lse sb rnd qtz, v sl calc, mod difse, sl-mod  
stmg, mod bri bl cut, even yel ring



