

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Wells Ranch AA11-654

Location SENE 11 6N 63W

State COLORADO

County WELD

Country USA

Rig Number H&P #273

API Number 05-123-41252

AFE # 201003

Region DJ BASIN

Field WATTENBERG

Spud Date 6/11/2015

Drilling Completed 6/18/2015

Surface Coordinates LAT: 40.50291
LONG: -104.3952
2000' FNL
215' FEL

Bottom Hole Coordinates PROJECTED:
2355' FNL
2085' FEL

Ground Elevation 4868'

K.B. Elevation 4892'

Logged Interval 800' To 13956'

Total Depth 13956'

Formation CODELL SANDSTONE

Type of Drilling Fluid H2O, LSND

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

- E EARTHY
- F FENESTRAL
- F FRACTURE
- X INTERCRYSTALLINE
- Q INTEROOLITIC
- MOLDIC

ORGANIC

P PINPOINT

V VUGGY

Engineering

- BIT CHANGE
- CONNECTION (LEFT)
- CONNECTION (RIGHT)
- CONNECTION GAS
- TRIP GAS
- DOWN TIME GAS
- CORE - LOST
- CORE - RECOVERED
- DST INTERVAL

FAULT

FORMATION TOP

GAS SHOW

OIL SHOW

MN DEPTH MN DEPTH

MN DEPTH MN DEPTH (RIGHT)

NORMAL FAULT

OVERTURNED STRATA

REVERSE FAULT

CASING

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE

SURVEY

DST DRILL STEM TEST

WIRELINE TESTED - LEFT

WIRELINE TESTED - RT

Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

Textures

- BOUNDSTONE
- CHALKY
- CRYPTOXLN

E EARTHY

FINELYXLN

GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

MS MUDSTONE

PS PACKSTONE

WS WACKSTONE

Sorting

- M MODERATE
- P POOR
- W WELL

Accessories

Fossils

ALGAE
 AMPHIPORA
 BELEMNITE
 BIOCLASTIC
 BRACHIOPOD
 BRYOZOA
 CEPHALOPOD
 CORAL
 CRINOID
 ECHINOID
 FISH
 FORAMINIFERA
 FOSSIL

GASTROPOD
 INOCERAMUS

OOLITE
 OSTRACOD
 PELECYPOD
 PELLET
 PISOLITE
 PLANT REMAINS
 PLANT SPORES
 SCAPHOPOD
 STROMATOPOROID

Minerals

ANHYDRITIC
 ARGILLACEOUS

ARGILLITE GRAIN
 BENTONITE

BITUMENOUS SUBSTANCE
 BRECCIA FRAGMENTS
 CALCAREOUS
 CARBONACEOUS FLAKES
 CHTDK
 CHTLT
 COAL - THIN BEDS
 DOLOMITIC
 FELDSPAR
 FERRUGINOUS PELLET

FERRUGINOUS
 GLAUCONITE
 GYPSIFEROUS

HEAVY MINERAL
 KAOLIN

MARCASITE
 MARLSTONE
 MICACEOUS
 MINERAL CRYSTALS
 NODULES
 PHOSPHATE PELLETS
 PYRITE
 SALT CAST
 SANDY
 SIDERITE
 SILICEOUS
 SILTY
 TUFFACEOUS

Stringer

ANHYDRITE STRINGER
 BENTONITE STRINGER
 COAL STRINGER
 DOLOMITE STRINGER
 GYPSUM STRINGER
 LIMESTONE STRINGER
 MARLSTONE (CALC) STRG
 MARLSTONE (DOL) STRG
 SANDSTONE STRINGER
 SHALE STRINGER
 SILTSTONE STRINGER

Rock Types

UNKNOWN
 ANHYDRITE
 BENTONITE
 BRECCIA
 CEMENT
 CHALK
 CHERT
 CLAY CHOKE SAND
 CLAYSTONE

COAL
 CONGLOMERATE
 DOLOMITE
 DOLOMITIC LIMESTONE
 GRANITE
 GYPSUM
 IGNEOUS
 LIMESTONE
 SIDERITE or LIMONITE

MARLSTONE
 METAMORPHIC
 NO SAMPLE
 SALT
 SALT- PEPPER SAND
 SANDSTONE
 SHALE
 SHALE COLORED
 SHALE GRAY

SHALY SANDSTONE
 SHALY SILTSTONE
 SILTSTONE
 SILTY SHALE
 TILL
 TUFF
 WELDED TUFF

Operator

Company NOBLE ENERGY, INC.

Address 1625 BROADWAY
 DENVER, CO 80202
 (303) 228-4000

Geologist

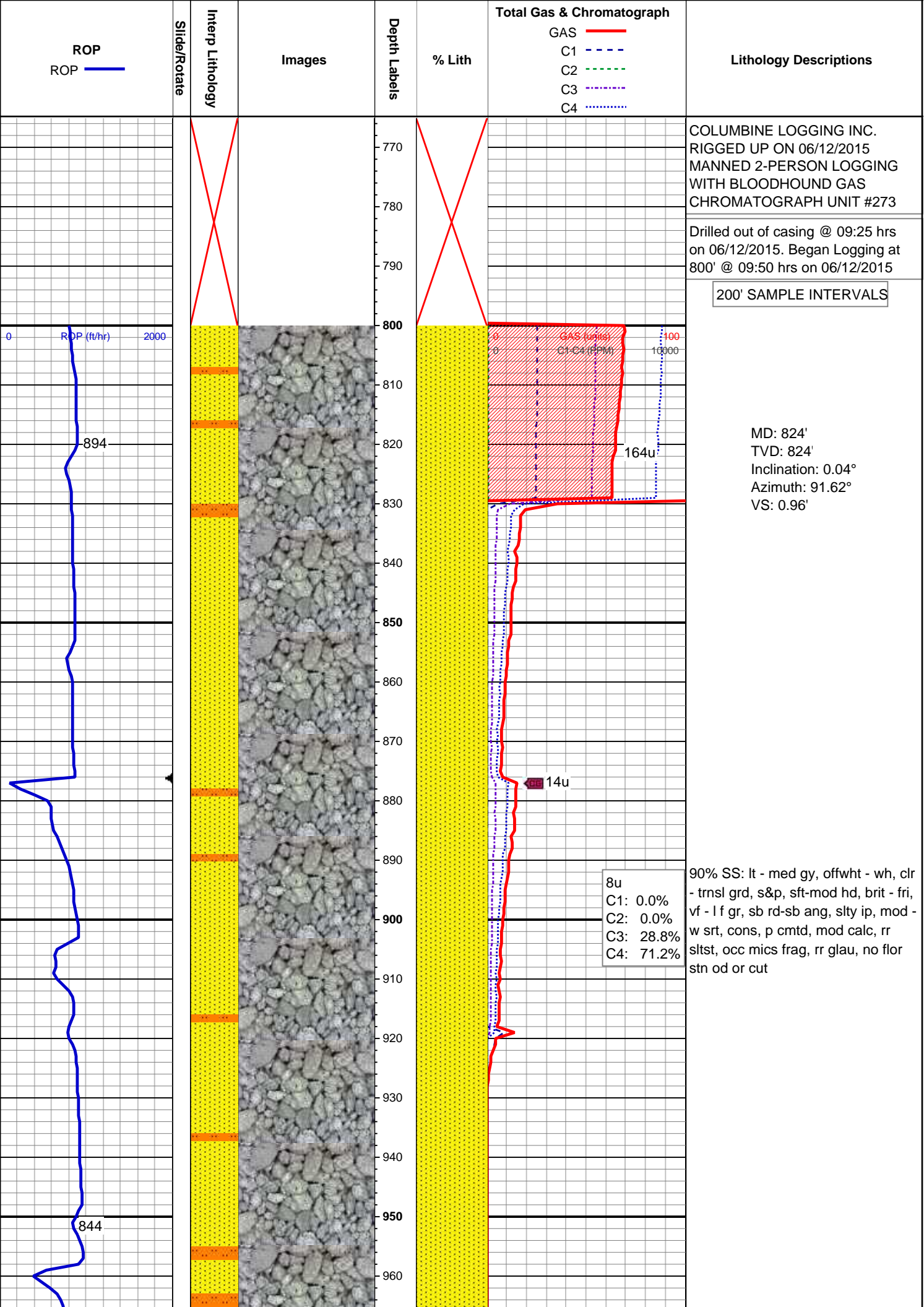
Name MICHAEL ANDERSON, ANDREW MARTENS

Company COLUMBINE LOGGING, INC.

Address 602 S. LIPAN ST
 DENVER, COLORADO 80223
 (303) 228-7764

Zone Color Coding

Oil
 Note
 Error
 Condensate
 Core
 Water
 Gas
 Pressure
 Seal



MW 8.5 VIS 28

MD: 1,014'
TVD: 1,014'
Inclination: 0.34°
Azimuth: 198.51°
VS: 1.09'

Bloodhound Recalibrated

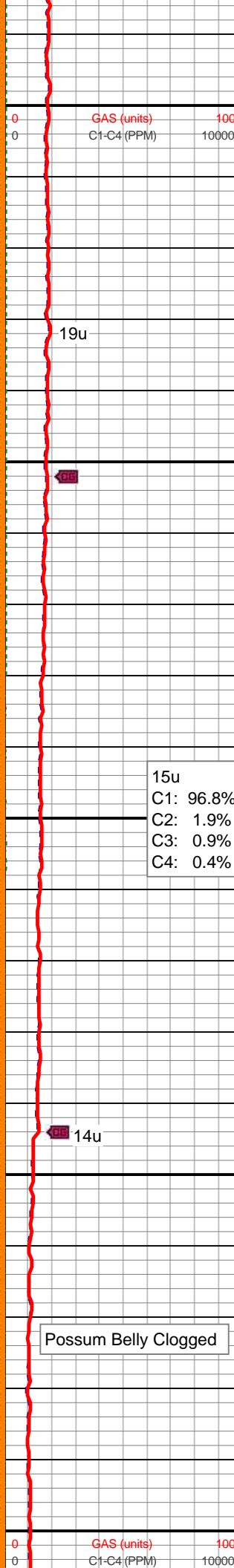
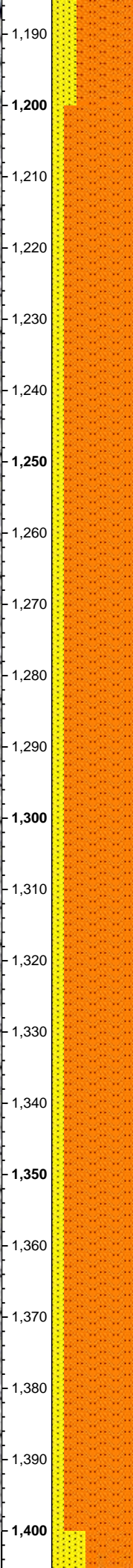
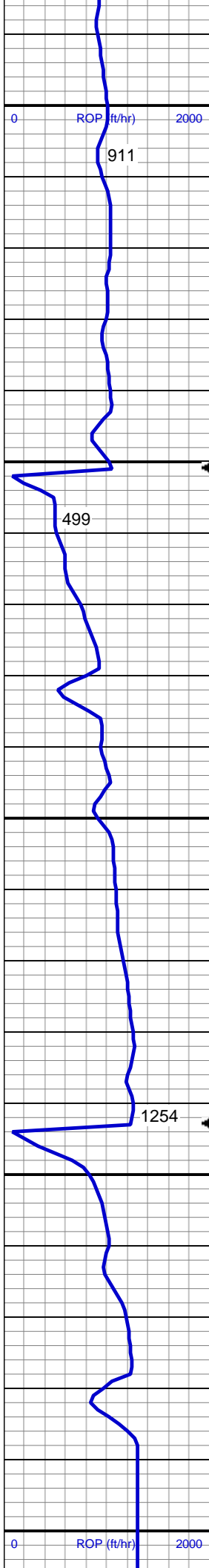
0u
C1: 0.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

70% SLTST: med gy, sdy ip, sft, fri,
sb blk, gt tex, slty - arg mtx, fy
intlam wi 30% SS: lt - med gy,
offwht - wh ip, clr - trnsl grd, s&p,
sft-mod hd, brit - fri, vf gr, sb rd-sb
ang, com slty - v l arg mtx, mod - w
srt, cons, p cmt, v sl calc, tr mics
frag, no flor stn od or cut

MD: 1,108'
TVD: 1,108'
Inclination: 0.18°
Azimuth: 190.15°
VS: 1.22'

18u

18u



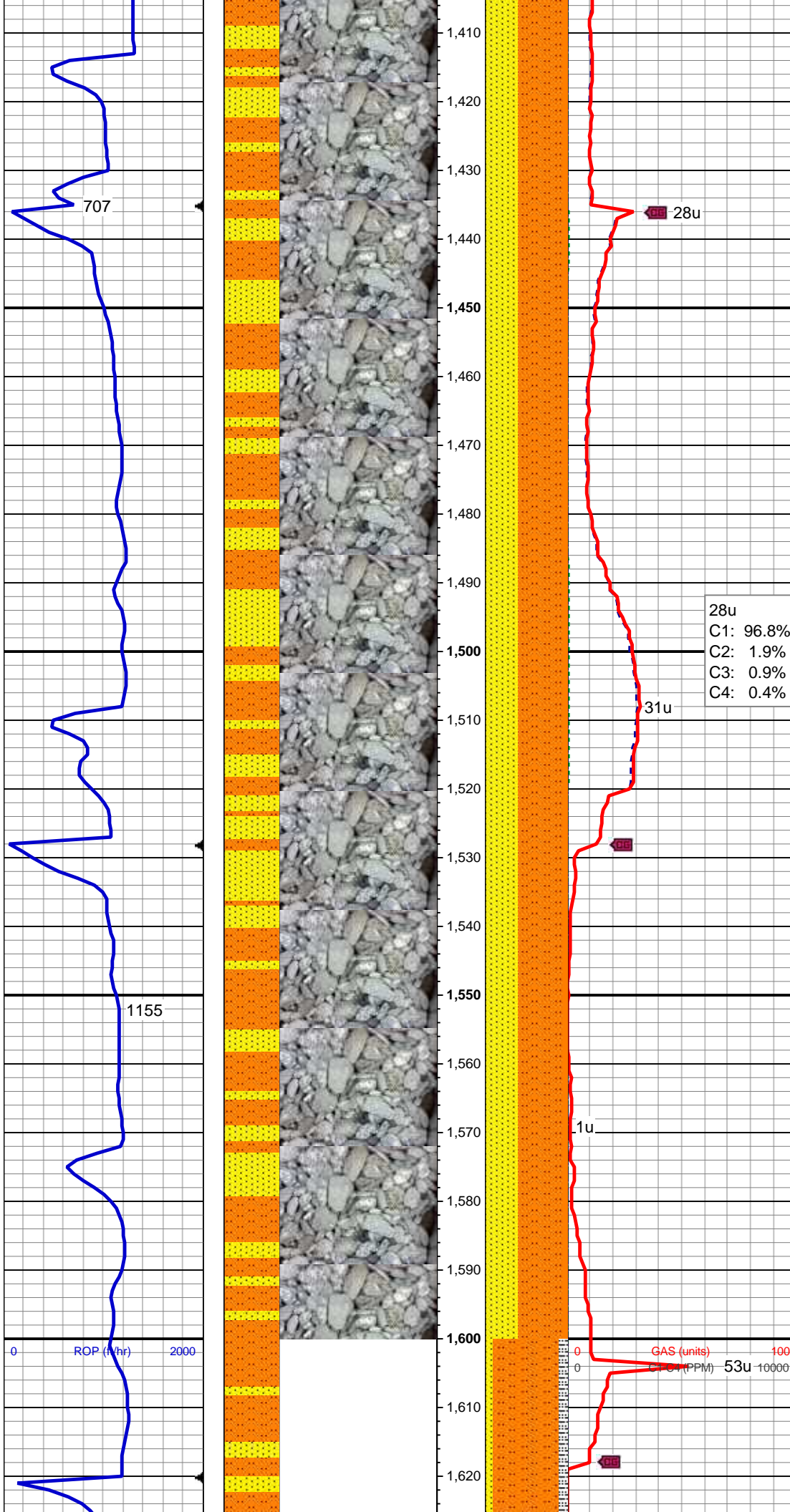
MD: 1,200'
TVD: 1,200'
Inclination: 0.35°
Azimuth: 259°
VS: 1.54'

15u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

85% SLTST: med gy, sdy ip, sft, fri,
sb blk, gt tex, slty - arg mtx, 15%
SS: lt - med gy, offwht, clr - trns grd,
s&p, sft-mod hd, brit - fri, vf gr, sb
rd-sb ang, mod - w srt, cons, p
cmt, v sl calc, rr mics frag, rr glau,
no flor stn od or cut

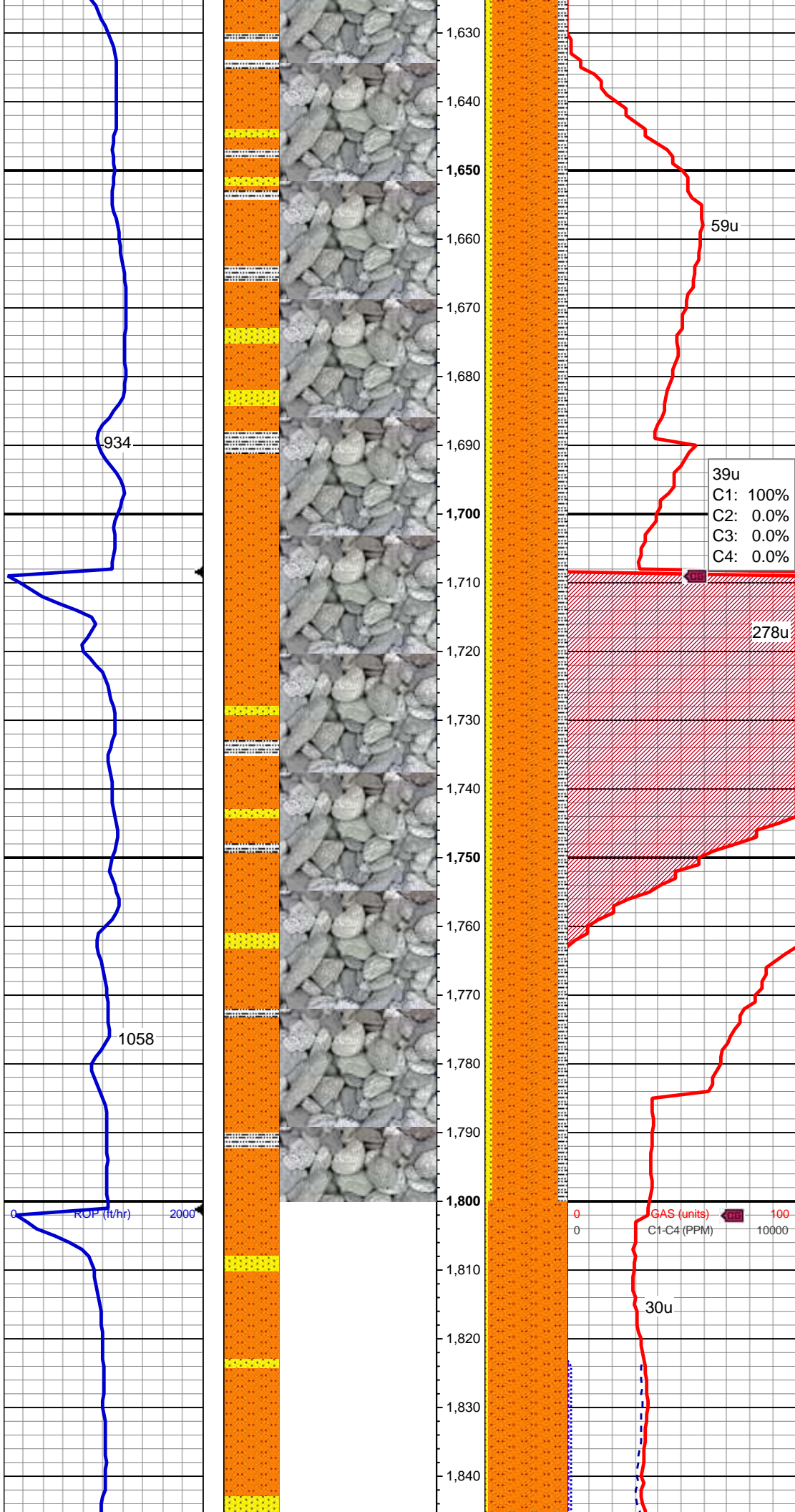
Possum Belly Clogged

MD: 1,383'
TVD: 1,382.99'
Inclination: 0.44°
Azimuth: 199.03°
VS: 2.35'



60% SLTST: med gy, sdy ip, sft, fri,
sb blk, gt tex, slty - arg mtx, 40%
SS: lt - med gy, offwht, clr - trns grd,
s&p, mod - v hd, brit - fri, vf - f gr, sb
rd-sb ang, mod - w srt, cons, mod -
w cmt, v sl calc, rr slty sh, tr mics
frag, occ gn glau, rr diss pyr, no
flor stn od or cut

MD: 1,566'
TVD: 1,565.99'
Inclination: 0.11°
Azimuth: 249.29°
VS: 2.78'



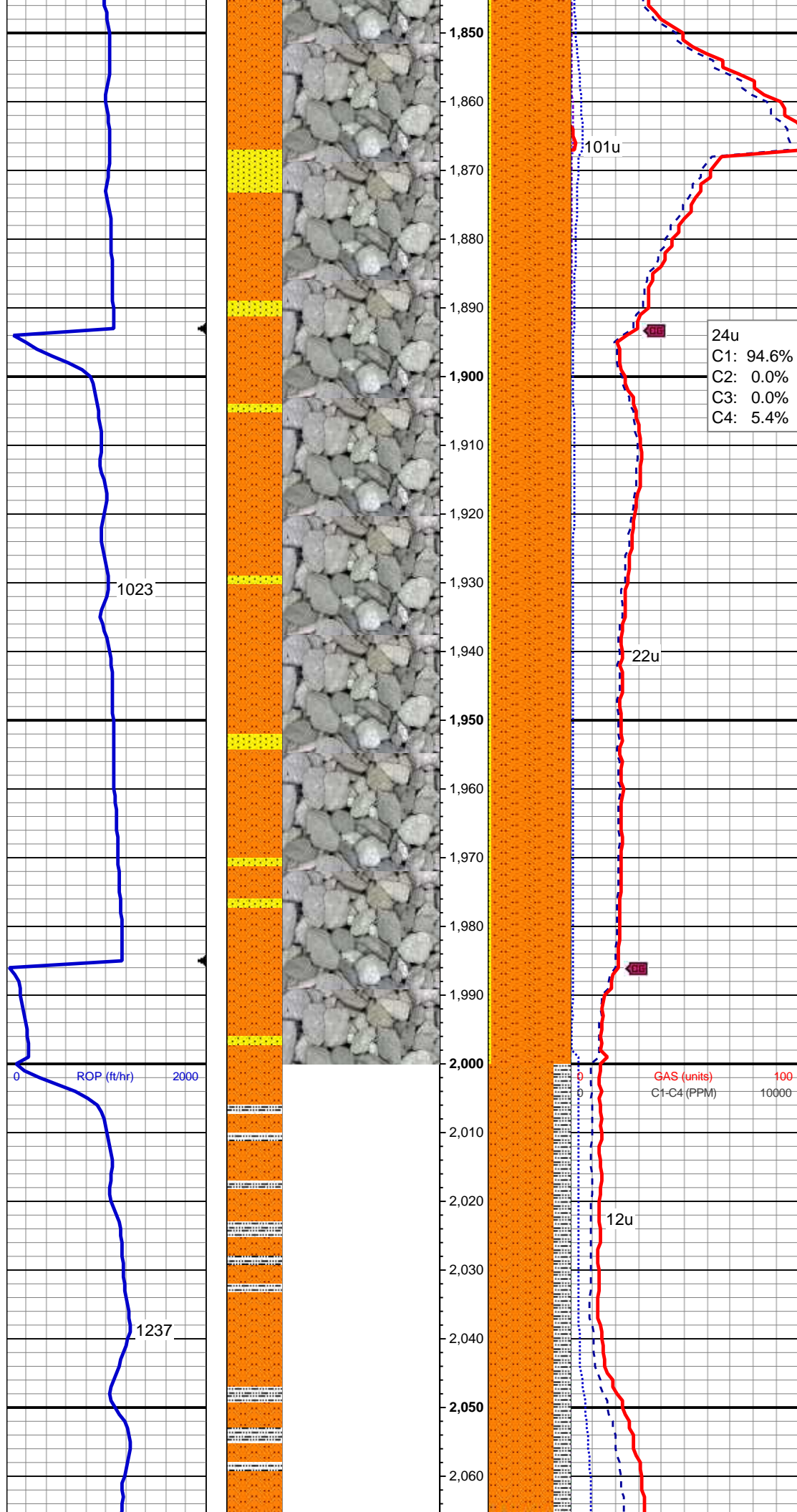
MD: 1,657'
TVD: 1,656.99'
Inclination: 0.42°
Azimuth: 258.06°
VS: 3.19'

80% SLTST: lt - med gy, sdy ip, sft, fri, sb blk, gt tex, slty - arg mtx, v sl calc, occ (10%) ss & (10%) slty sh, rr mics frag, rr glau, rr dissim pyr, no flor stn od or cut

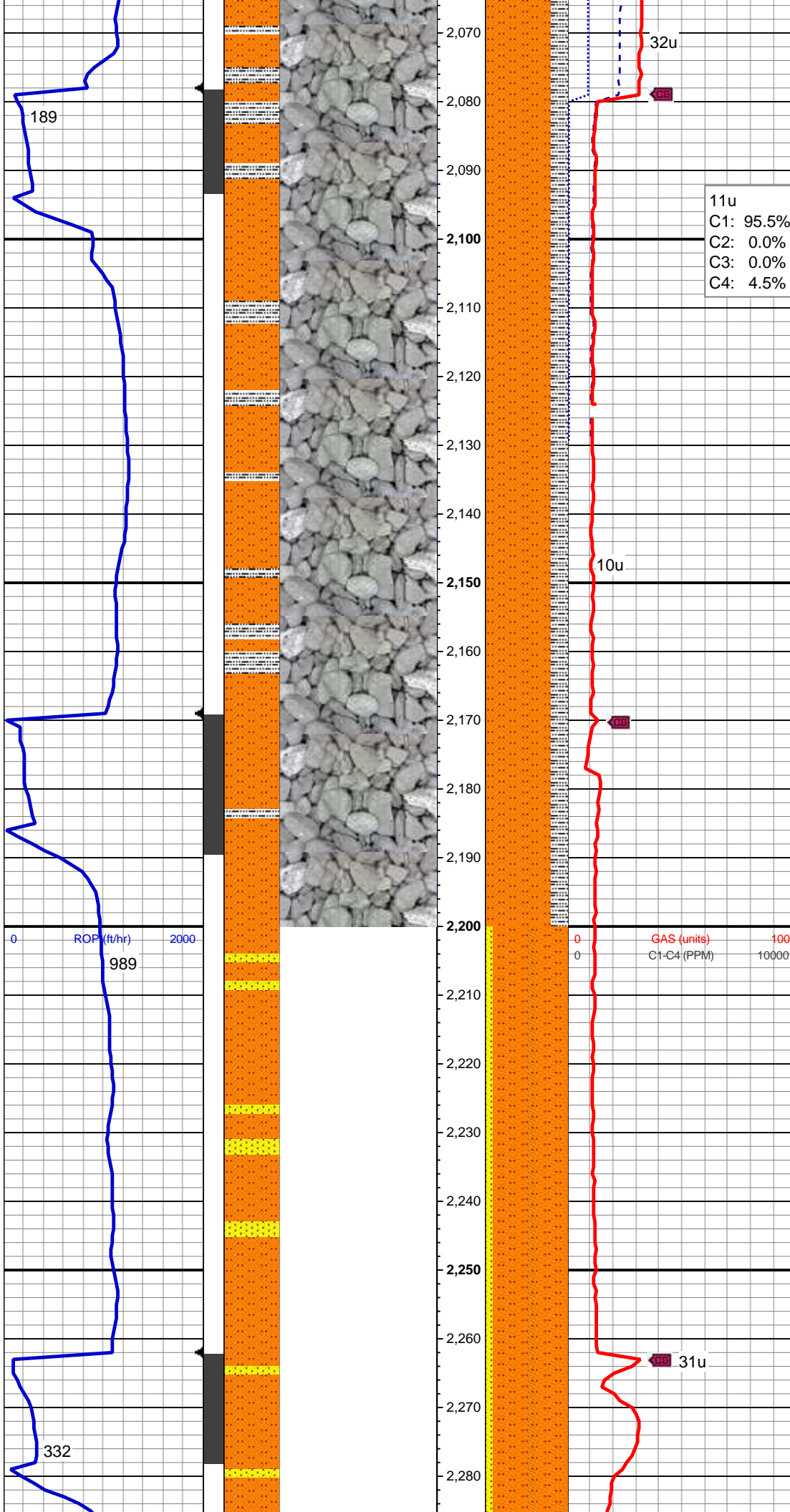
MD: 1,748'
TVD: 1,747.99'
Inclination: 0.22°
Azimuth: 151.92°
VS: 3.45'

MD: 1,840'
TVD: 1,839.99'
Inclination: 0.15°
Azimuth: 206.12°

MD: 1,932'
TVD: 1,931.99'
Inclination: 0.59°
Azimuth: 191.18°
VS: 3.6'



MD: 2,023'
TVD: 2,022.95'
Inclination: 2.35°
Azimuth: 144.68°
VS: 2.7'

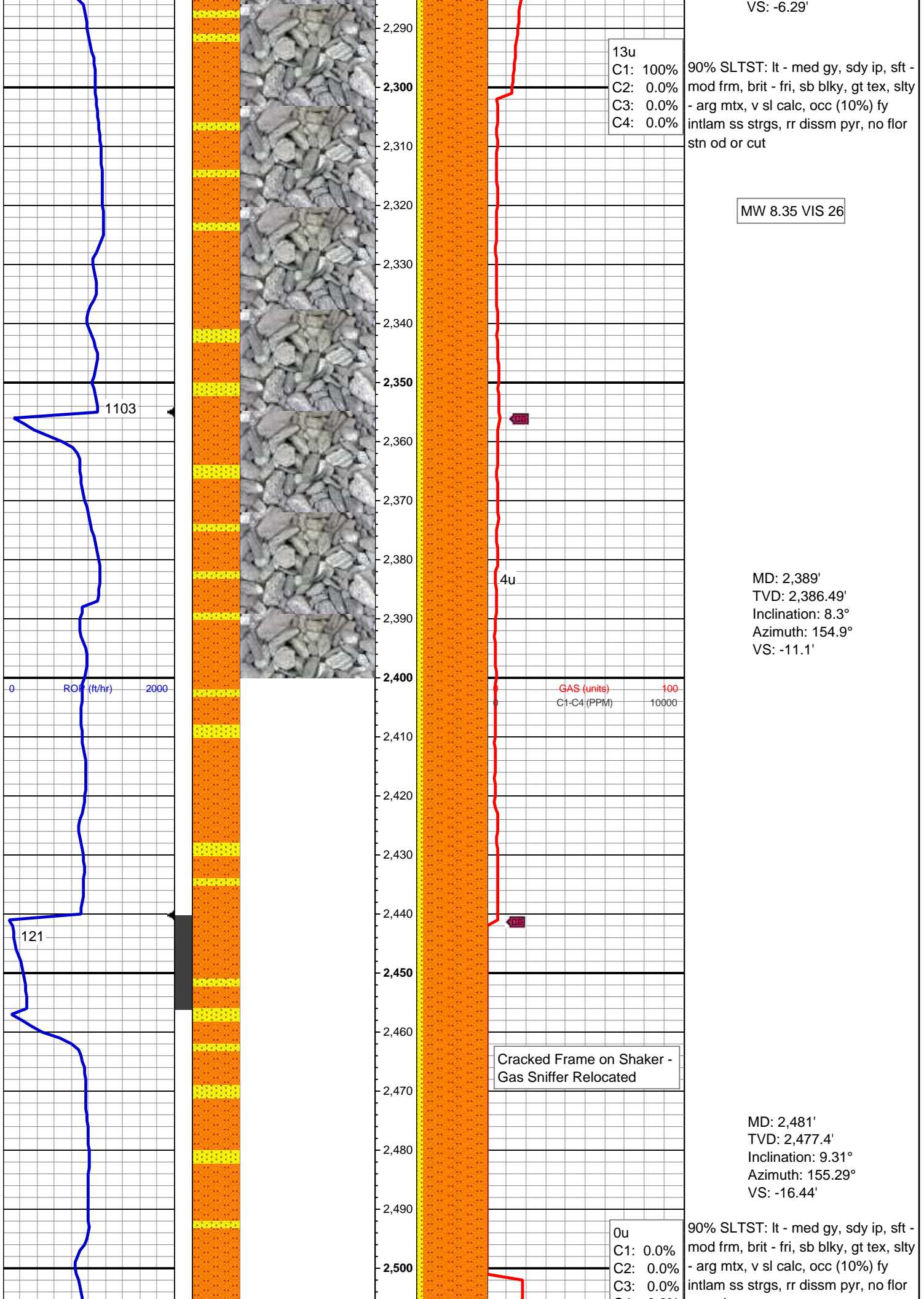


80% SLTST: lt - med gy, sdy ip, sft - mod frm, brit - fri, sb blk, gt tex, slty - arg mtx, 20% SLTY SH: med-dk gy, mod - v frm, brit fri ip, sb plty - sb blk, sm - sb wxy tex, arg - slty mtx, v sl calc, rr mics frag, rr glau, rr diss pyr, no flor stn od or cut

MD: 2,115'
TVD: 2,114.79'
Inclination: 4.41°
Azimuth: 155.12°
VS: 0.35'

MD: 2,206'
TVD: 2,205.38'
Inclination: 6.47°
Azimuth: 159.97°
VS: -2.51'

MD: 2,297'
TVD: 2,295.54'
Inclination: 9.04°
Azimuth: 159.1°



13u
C1: 100%
C2: 0.0%
C3: 0.0%
C4: 0.0%

90% SLTST: lt - med gy, sdy ip, sft - mod frm, brit - fri, sb blkly, gt tex, slty - arg mtx, v sl calc, occ (10%) fy intlam ss strgs, rr dissd pyr, no flor stn od or cut

MW 8.35 VIS 26

MD: 2,389'
TVD: 2,386.49'
Inclination: 8.3°
Azimuth: 154.9°
VS: -11.1'

GAS (units)
C1-C4 (PPM)

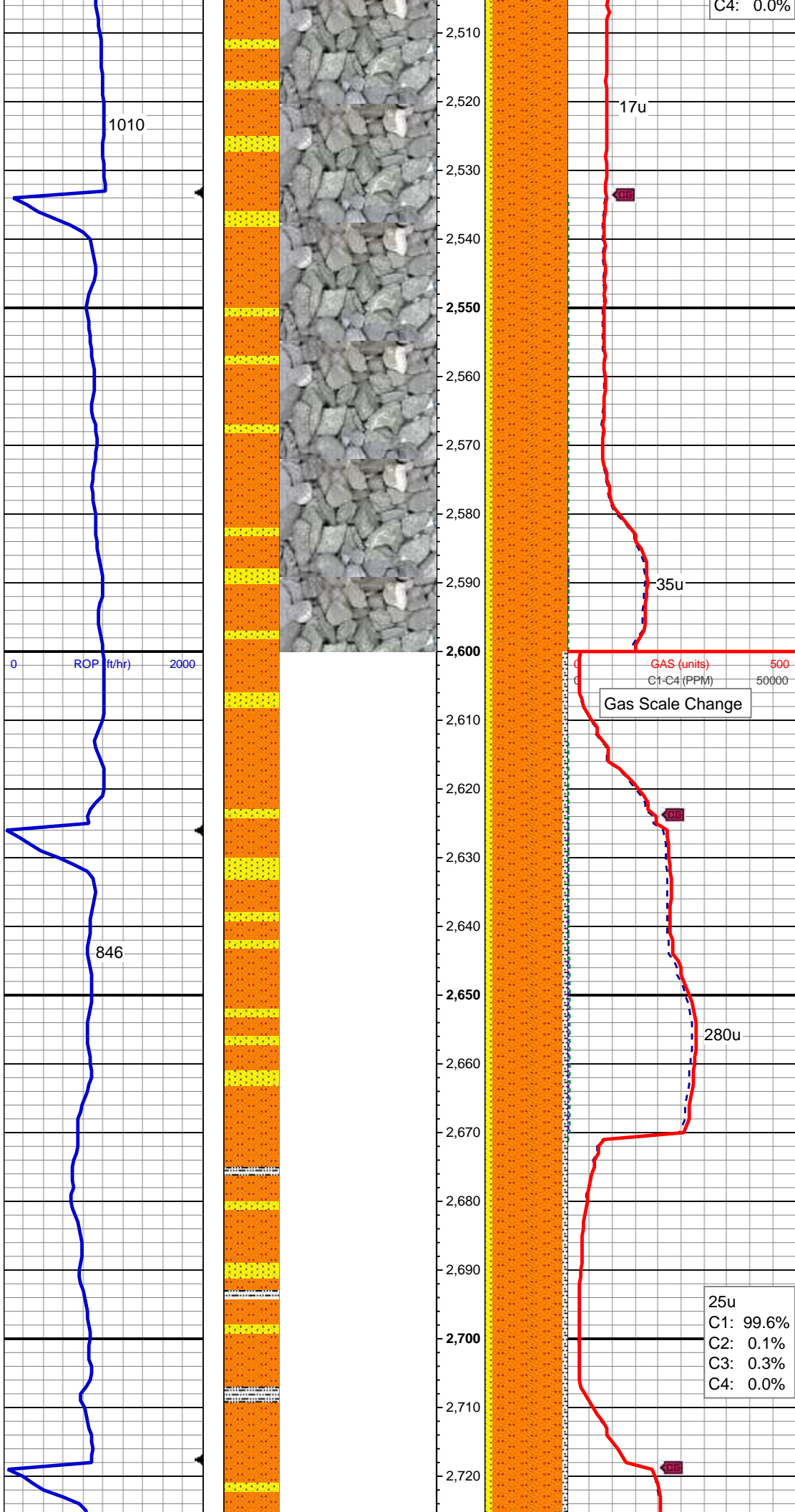
100
10000

Cracked Frame on Shaker -
Gas Sniffer Relocated

MD: 2,481'
TVD: 2,477.4'
Inclination: 9.31°
Azimuth: 155.29°
VS: -16.44'

0u
C1: 0.0%
C2: 0.0%
C3: 0.0%

90% SLTST: lt - med gy, sdy ip, sft - mod frm, brit - fri, sb blkly, gt tex, slty - arg mtx, v sl calc, occ (10%) fy intlam ss strgs, rr dissd pyr, no flor

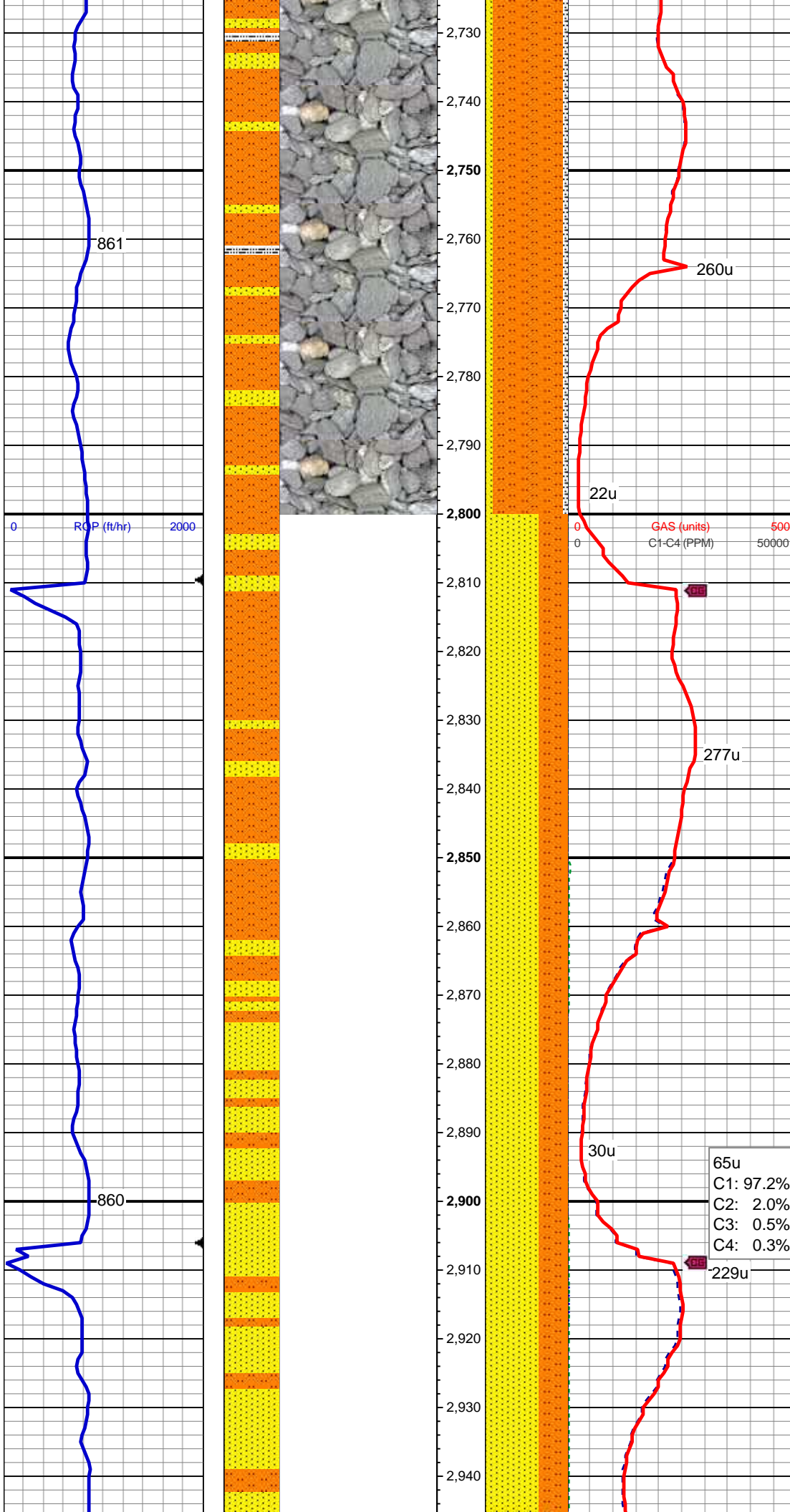


C4: 0.0% stn od or cut

MD: 2,573'
TVD: 2,568.28'
Inclination: 8.6°
Azimuth: 149.08°
VS: -22.5'

MD: 2,665'
TVD: 2,659.17'
Inclination: 9.19°
Azimuth: 146.78°
VS: -29.5'

85% SLTST: lt - med gy, sdy ip, sft - mod frm, brit - fri, sb blk, gt tex, slty - arg mtx, v sl calc, occ (10%) fy intlam ss strgs, tr (5%) slty sh, rr dissim pyr, rr fos frag lnoc, no flr stn od or cut

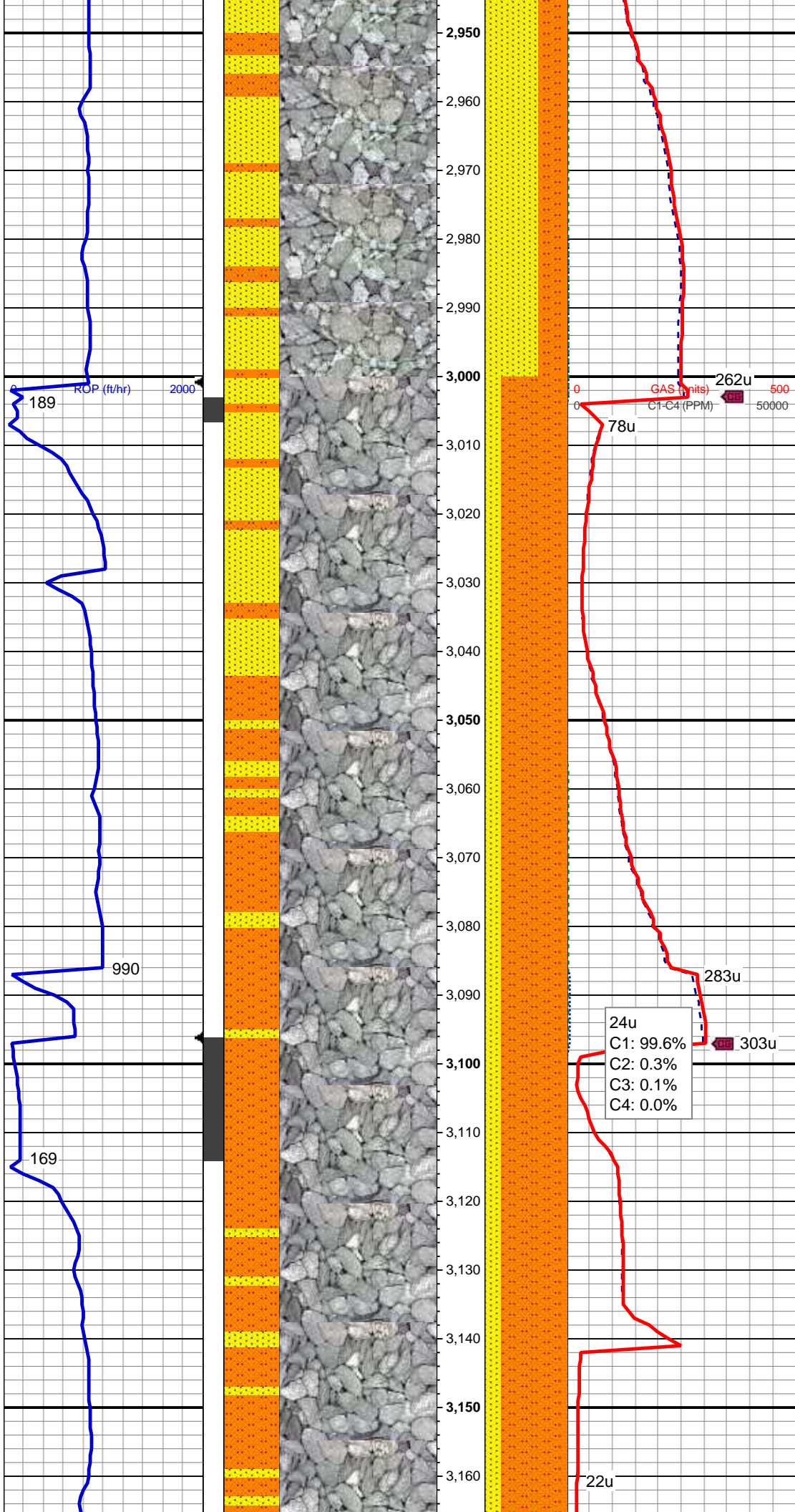


MD: 2,757'
TVD: 2,750.02'
Inclination: 8.97°
Azimuth: 144.28°
VS: -37.16'

MD: 2,851'
TVD: 2,842.84'
Inclination: 9.23°
Azimuth: 139.39°
VS: -45.81'

65% SS: offwht - wh, lt gy, clr - trnsl
grd, s&p ip, v hd, brit, vf - l f gr, sb
rd-sb ang, w srt, cons, w cmt, 35%
SLTST: med gy, med gy brn, sdy ip,
mod frm, brit, sb blk, gt tex, slty -
arg mtx, v sl calc, tr mic frags, tr
dissm pyr, com dul yel - orng ss
flor, no stn od or cut

MD: 2,946'
TVD: 2,936.67'



Inclination: 8.76°
Azimuth: 136.16°
VS: -55.26'

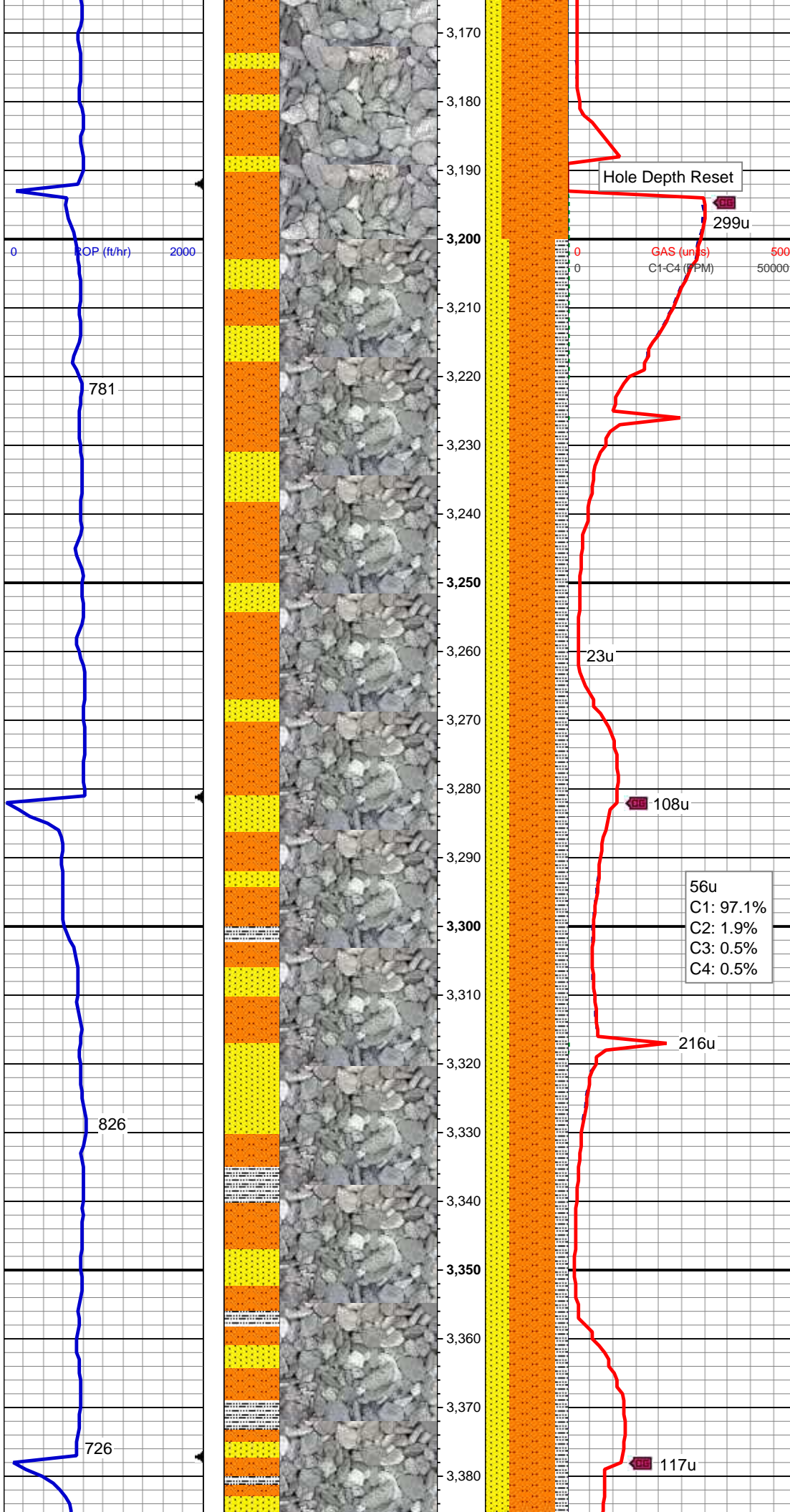
MD: 3,040'
TVD: 3,029.54'
Inclination: 9.06°
Azimuth: 137.24°
VS: -64.75'

MW 8.35 VIS 26

24u
C1: 99.6%
C2: 0.3%
C3: 0.1%
C4: 0.0%

80% SLTST: lt - med gy, mod frm, brit, sb blk, gt tex, slty - arg mtx, fy intlam wi 20% SS: offwht - wh, lt gy, clr - trns gr, s&p ip, mod - v hd, brit, vf gr, sb rd-sb ang, w srt, cons, mod cmt, v sl calc, nfsoc

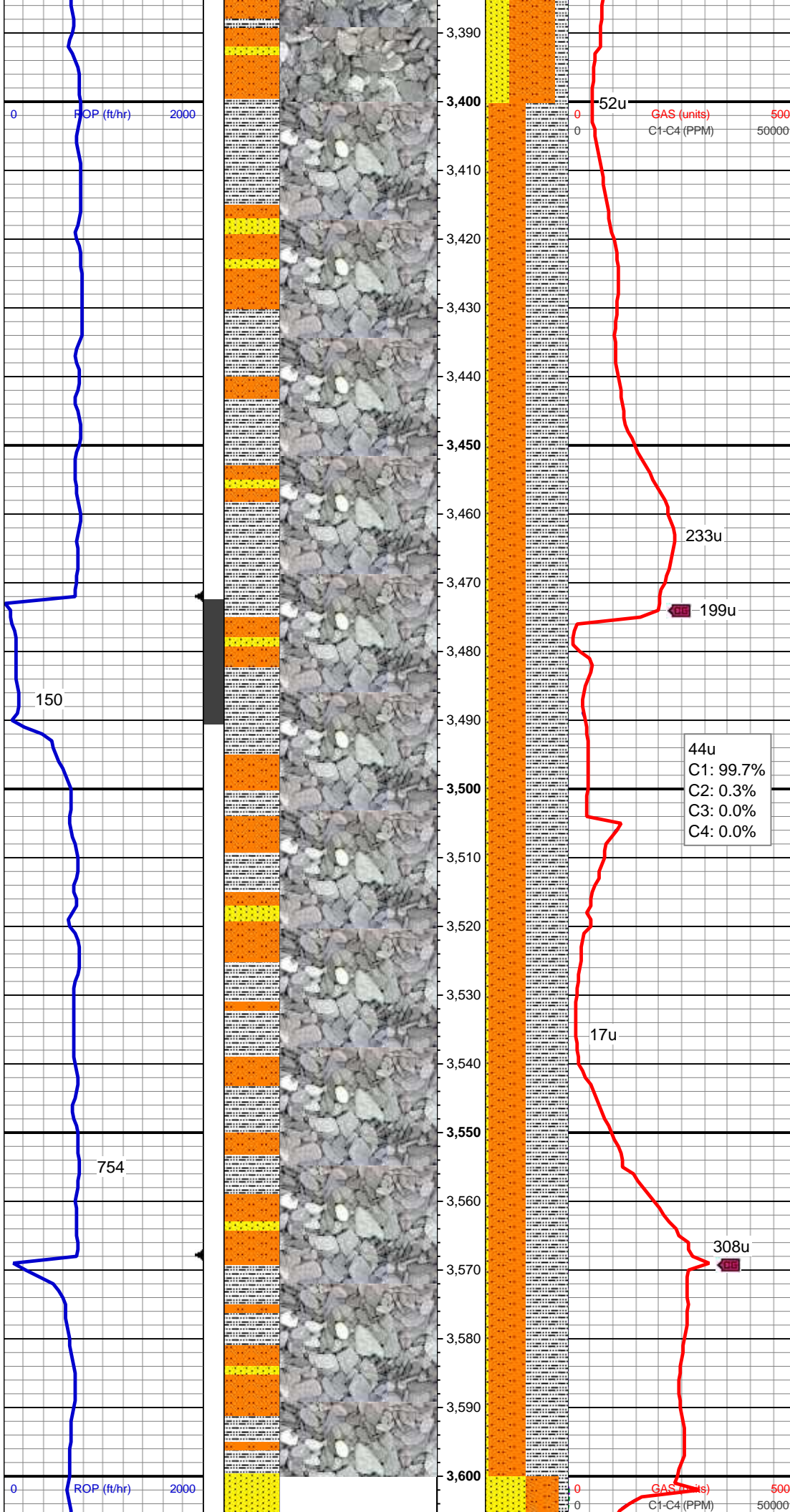
MD: 3,135'
TVD: 3,123.27'
Inclination: 9.75°
Azimuth: 147.54°
VS: -73.58'



MD: 3,230'
TVD: 3,216.95'
Inclination: 9.38°
Azimuth: 144.06°
VS: -81.84'

70% SLTST: lt - med gy, mod frm, brit, sb blkly, gt tex, slty - arg mtx, fy intlam; 30% SS: offwht - wh, lt gy, clr - trnsl grd, s&p ip, mod - v hd, brit, vf gr, sb rd-sb ang, w srt, cons, mod cmt, sl calc, 15% SLTY SH: med-dk gy, mod - v frm, brit fri ip, plty - sb plty, sm - sb wxy tex, arg - slty mtx, sl calc, nfsoc

MD: 3,325'
TVD: 3,310.67'
Inclination: 9.47°
Azimuth: 139.7°
VS: -90.86'



MD: 3,420'
TVD: 3,404.42'
Inclination: 9.15°
Azimuth: 135.16°
VS: -100.72'

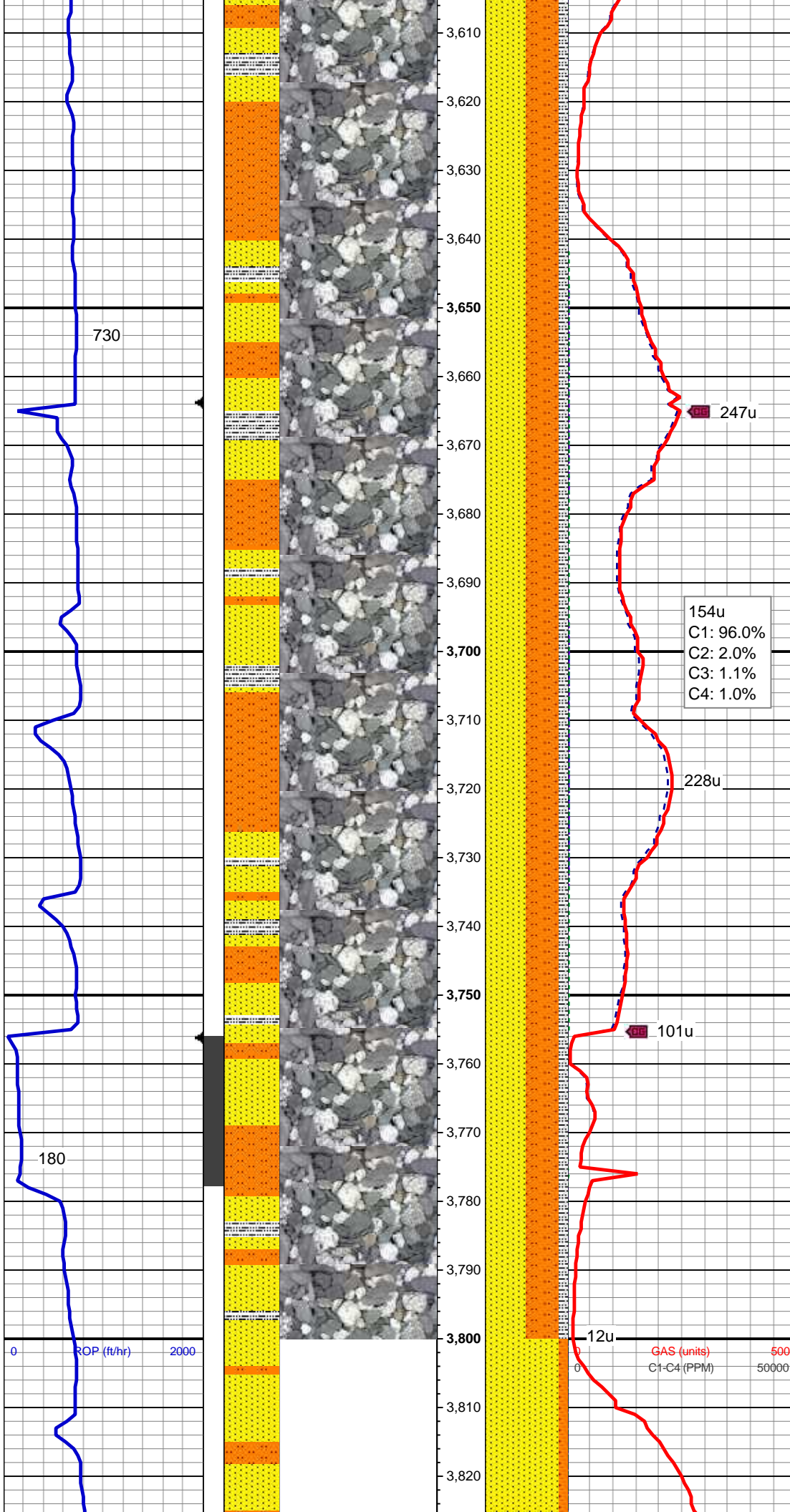
MW 8.35 VIS 26

50% SLTY SH: med-dk gy, mod - v
frm, brit fri ip, plty - sb plty, sm - sb
wxy tex, arg - slty mtx, v sl calc; 45%
SLTST: lt - med gy, occ dk gy, mod
frm, brit, sb plty - sb blkly, gt tex, slty
- arg mtx; 5% SS: offwht - wh, lt gy,
clr - trnsl grd, s&p ip, mod - v hd,
brit, vf gr, sb rd-sb ang, w srt, cons,
mod cmted, fy intlamm ss strgs, tr
dissm pyr, rr fos frag lnoc, nfsoc

MD: 3,515'
TVD: 3,498.36'
Inclination: 7.95°
Azimuth: 145°
VS: -109.31'

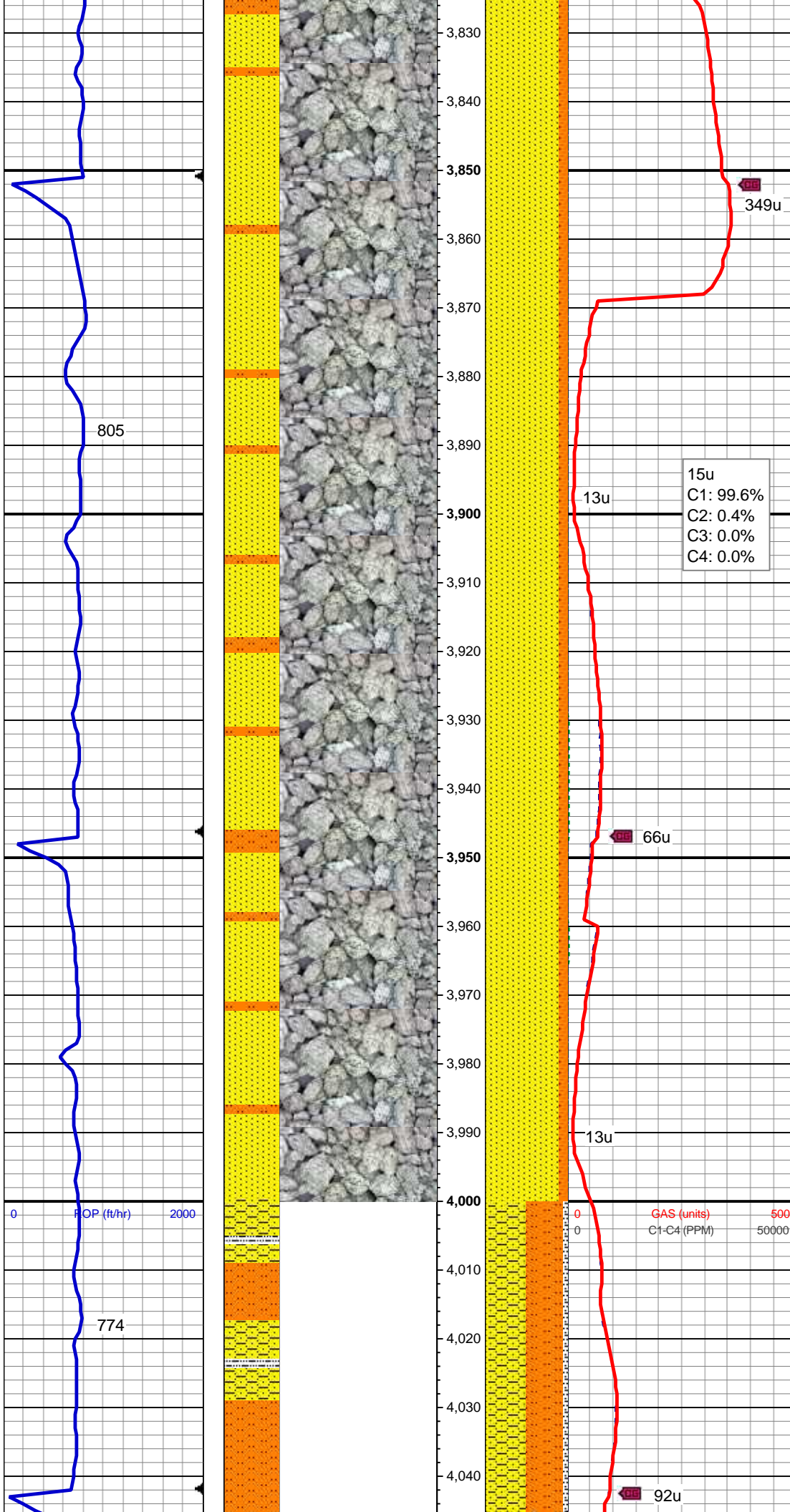
MD: 3,609'
TVD: 3,501.40'

TVD: 3,391.49'
Inclination: 7.73°
Azimuth: 136.4°
VS: -116.95'



MD: 3,704'
TVD: 3,685.57'
Inclination: 8.23°
Azimuth: 137.22°
VS: -125.53'

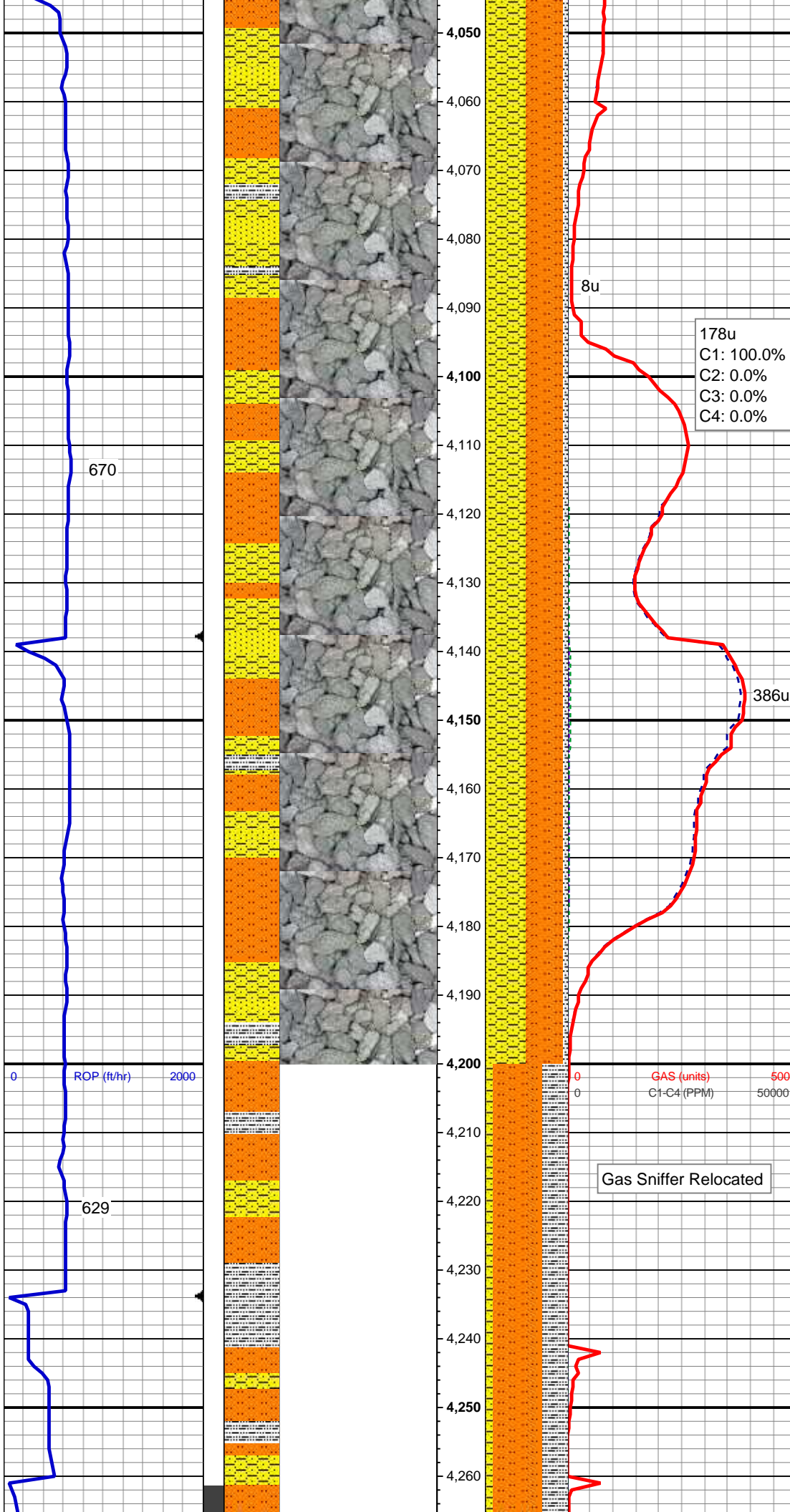
50% SLTST: lt - med gy, mod frm, brit, sb blkly, gt tex, slty - arg mtx, fy intlam; 40% SS: offwht - wh, lt gy, clr - trnsl grd, s&p ip, mod - v hd, brit, vf gr, sb rd-sb ang, w srt, cons, mod cmted, sl calc; 10% SLTY SH: med-dk gy, mod - v frm, brit fri ip, plty - sb plty, sm - sb wxy tex, arg - slty mtx, v sl calc; nfsoc



MD: 3,894'
TVD: 3,873.45'
Inclination: 8.99°
Azimuth: 153.1°
VS: -140.41'

90% SS: offwhit - wh, lt gy, clr - trnsd
grd, s&p, mod - v hd, brit, vf gr, sb
rd-sb ang, w srt, cons, mod cmtd,
sl calc; 10% SLTST: lt - med gy,
mod frm, brit, sb blkly, gt tex, slty -
arg mtx, fy intlam; nfsoc

MD: 3,988'
TVD: 3,966.23'
Inclination: 9.52°
Azimuth: 151.47°
VS: -146.83'



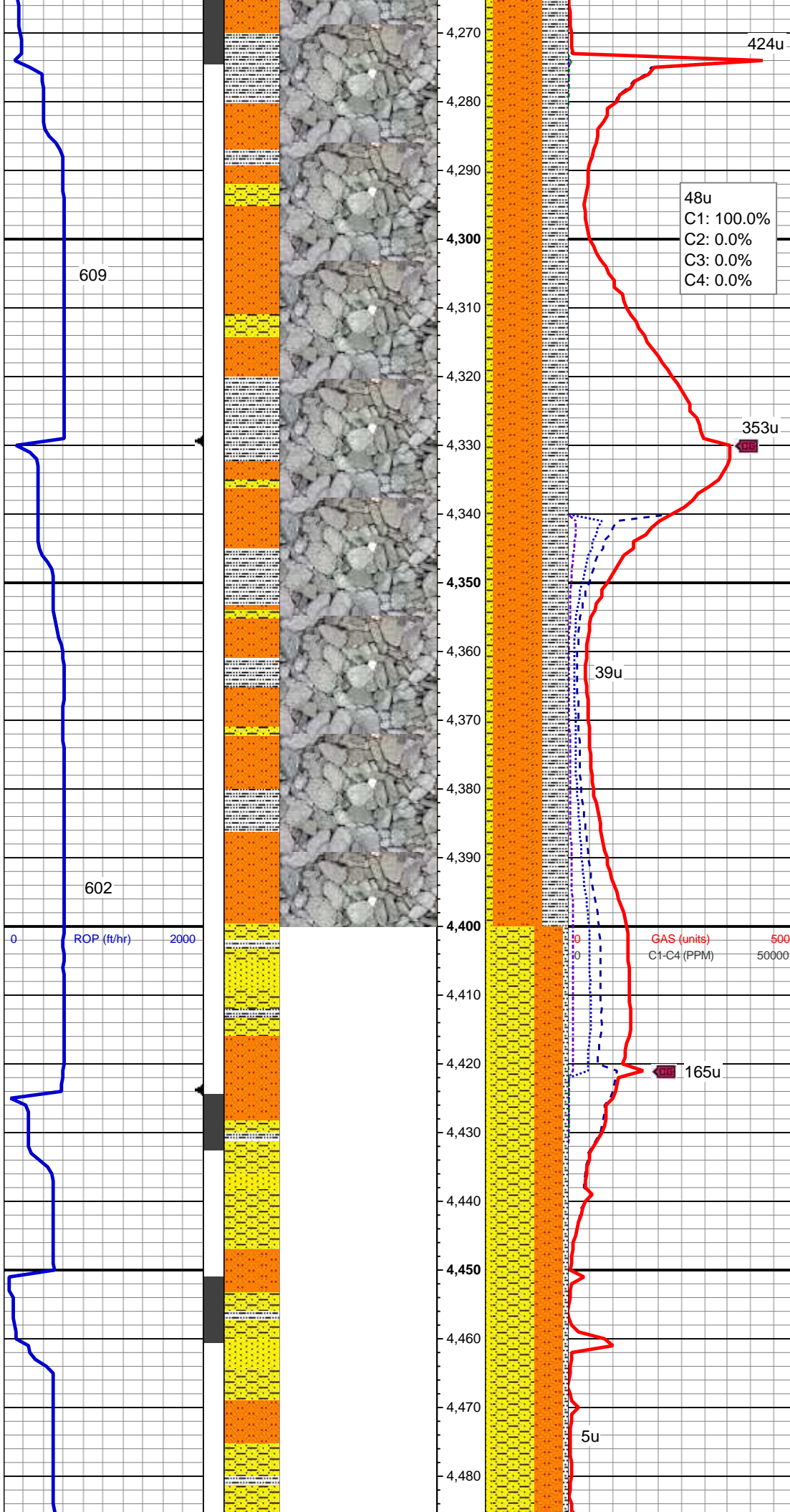
MD: 4,083'
TVD: 4,059.92'
Inclination: 9.51°
Azimuth: 149.99°
VS: -153.88'

45% SLTST: lt - med gy, occ dk gy, mod frm, brit, sb plty - sb blk, gt tex, slty - arg mtx, 45% SHY SS: lt - med gy, occ dk gy, f - vf gr, mod frm, brit, sb rnd - sb ang, shy - arg mtx, cons, 5% SS: lt - med gy, s&p, f - vf gr, mod frm, sb rnd - sb ang, mod srt, cons, glauc ip, 5% SLTY SH: med-dk gy, mod - v frm, brit fri ip, plty - sb plty, sm - sb wxy tex, arg - slty mtx, sl calc, nfsoc

MD: 4,178'
TVD: 4,153.54'
Inclination: 10.03°
Azimuth: 150.83°
VS: -161.19'

Gas Sniffer Relocated

MW 8.3 VIS 27



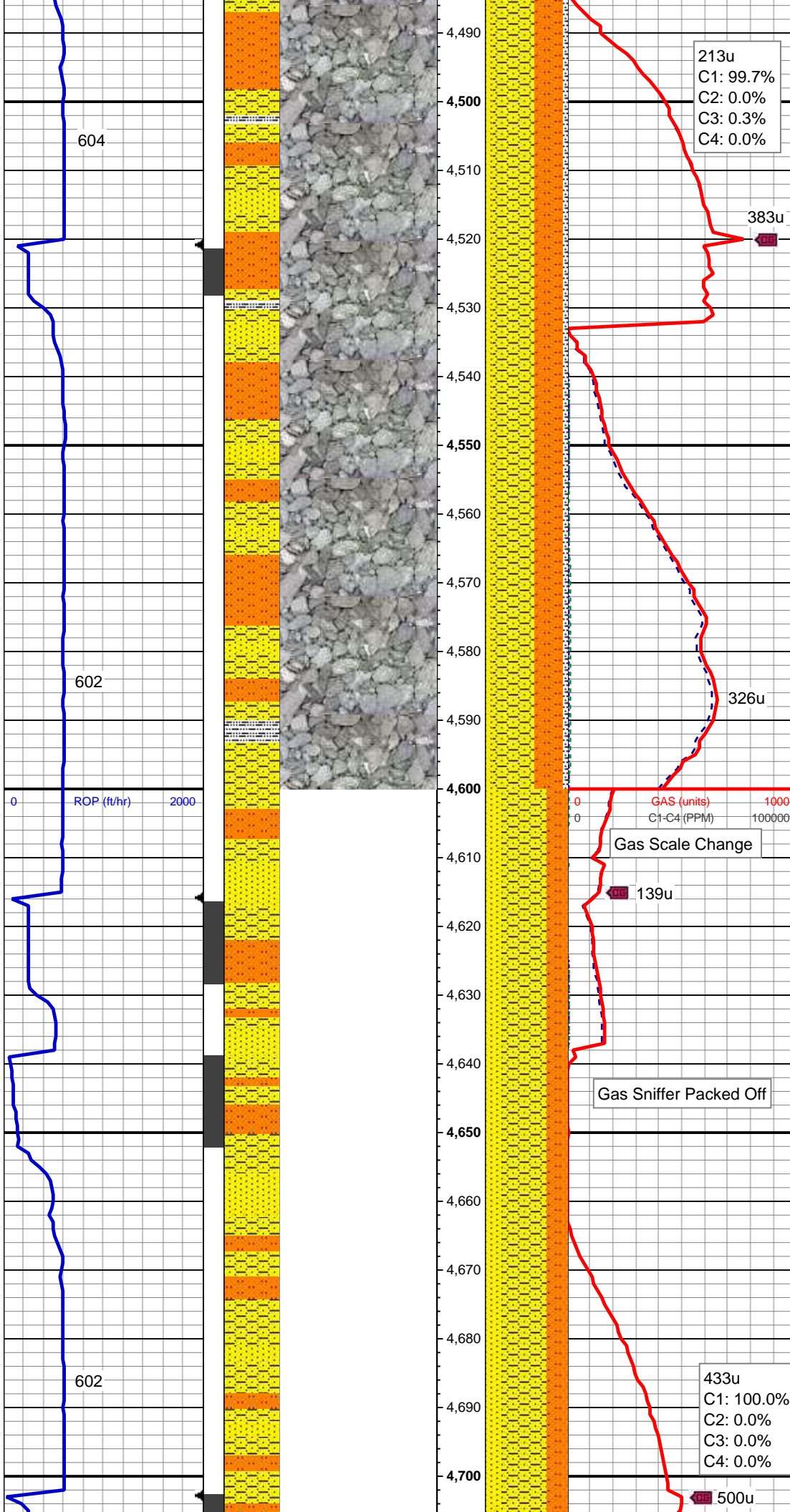
MD: 4,272'
TVD: 4,246.38'
Inclination: 8.02°
Azimuth: 150.8°
VS: -167.78'

60% SLTST: lt - med gy, occ dk gy, mod frm, brit, sb plty - sb blk, gt tex, slty - arg mtx, 30% SLTY SH: med-dk gy, mod - v frm, brit fri ip, plty - sb plty, sm - sb wxy tex, arg - slty mtx, sl calc, 10% SHY SS: lt - med gy, occ dk gy, f - vf gr, mod frm, brit, sb rnd - sb ang, shy - arg mtx, cons, nfsoc

MD: 4,367'
TVD: 4,340.46'
Inclination: 7.86°
Azimuth: 149.2°
VS: -173.82'

MD: 4,462'
TVD: 4,434.69'
Inclination: 6.76°
Azimuth: 153.83°
VS: -179.12'

50% SHY SS: lt - med gy, occ dk gy,

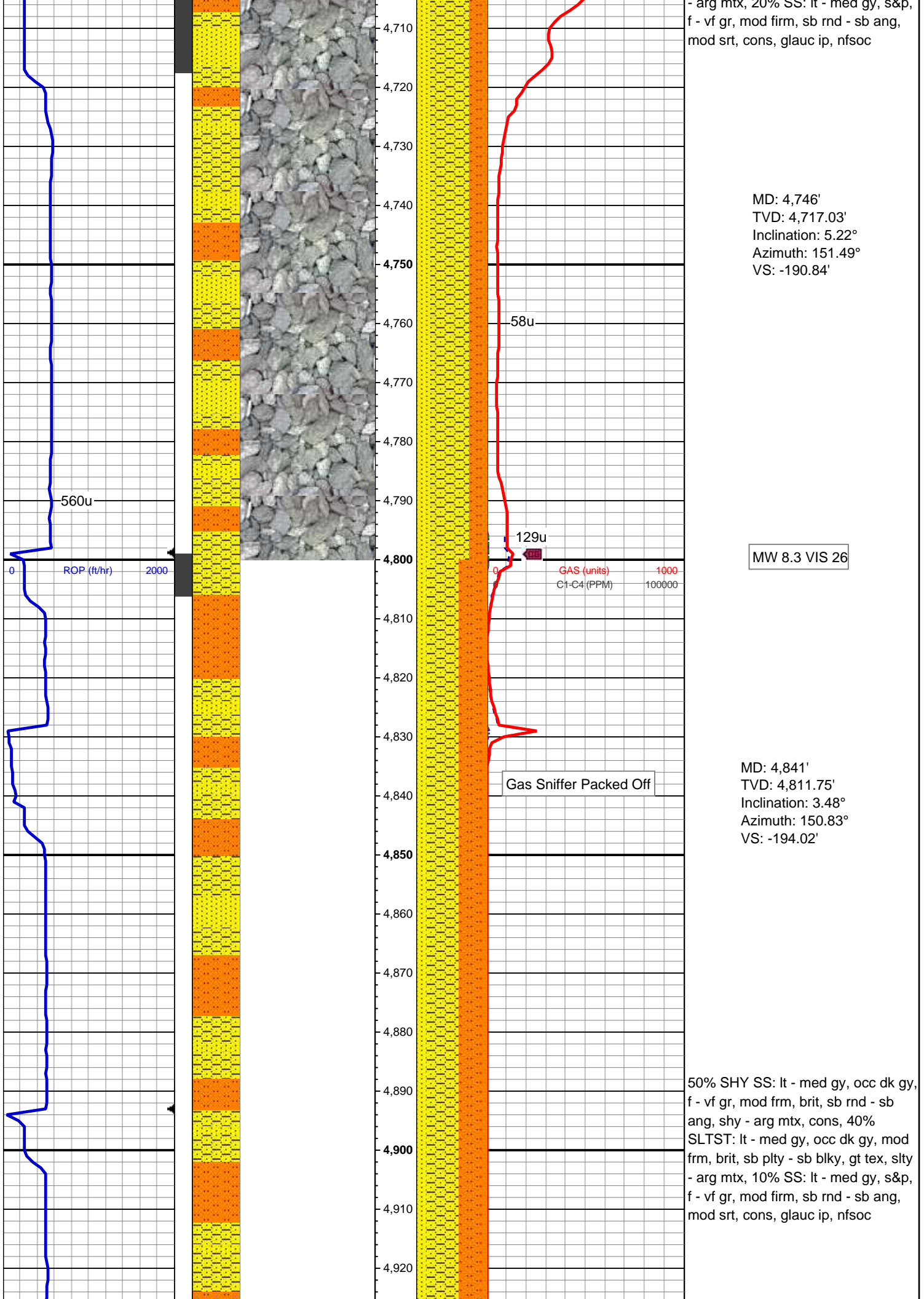


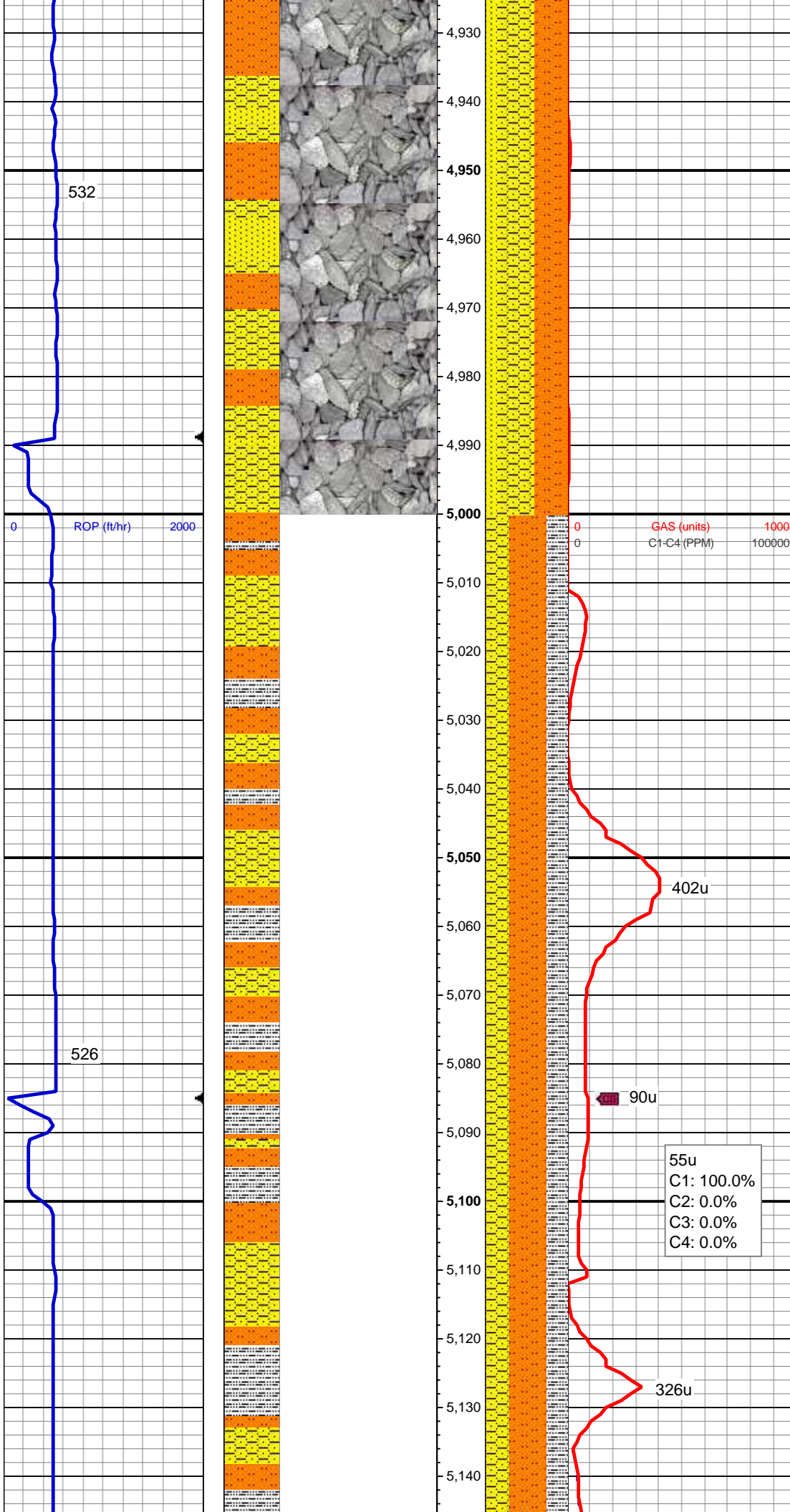
f - vf gr, mod frm, brit, sb rnd - sb ang, shy - arg mtx, cons, 35% SLTST: lt - med gy, occ dk gy, mod frm, brit, sb plty - sb blk, gt tex, slty - arg mtx, 10% SS: lt - med gy, s&p, f - vf gr, mod frm, sb rnd - sb ang, mod srt, cons, glauc ip, 5% SLTY SH: med-dk gy, mod - v frm, brit fri ip, plty - sb plty, sm - sb wxy tex, arg - slty mtx, sl calc, nfsoc

MD: 4,557'
TVD: 4,529'
Inclination: 7.07°
Azimuth: 156.71°
VS: -183.42'

MD: 4,651'
TVD: 4,622.44'
Inclination: 5.41°
Azimuth: 154.32°
VS: -187.2'

55% SHY SS: lt - med gy, occ dk gy, f - vf gr, mod frm, brit, sb rnd - sb ang, shy - arg mtx, cons, 25% SLTST: lt - med gy, occ dk gy, mod frm, brit, sb plty - sb blk, gt tex, slty



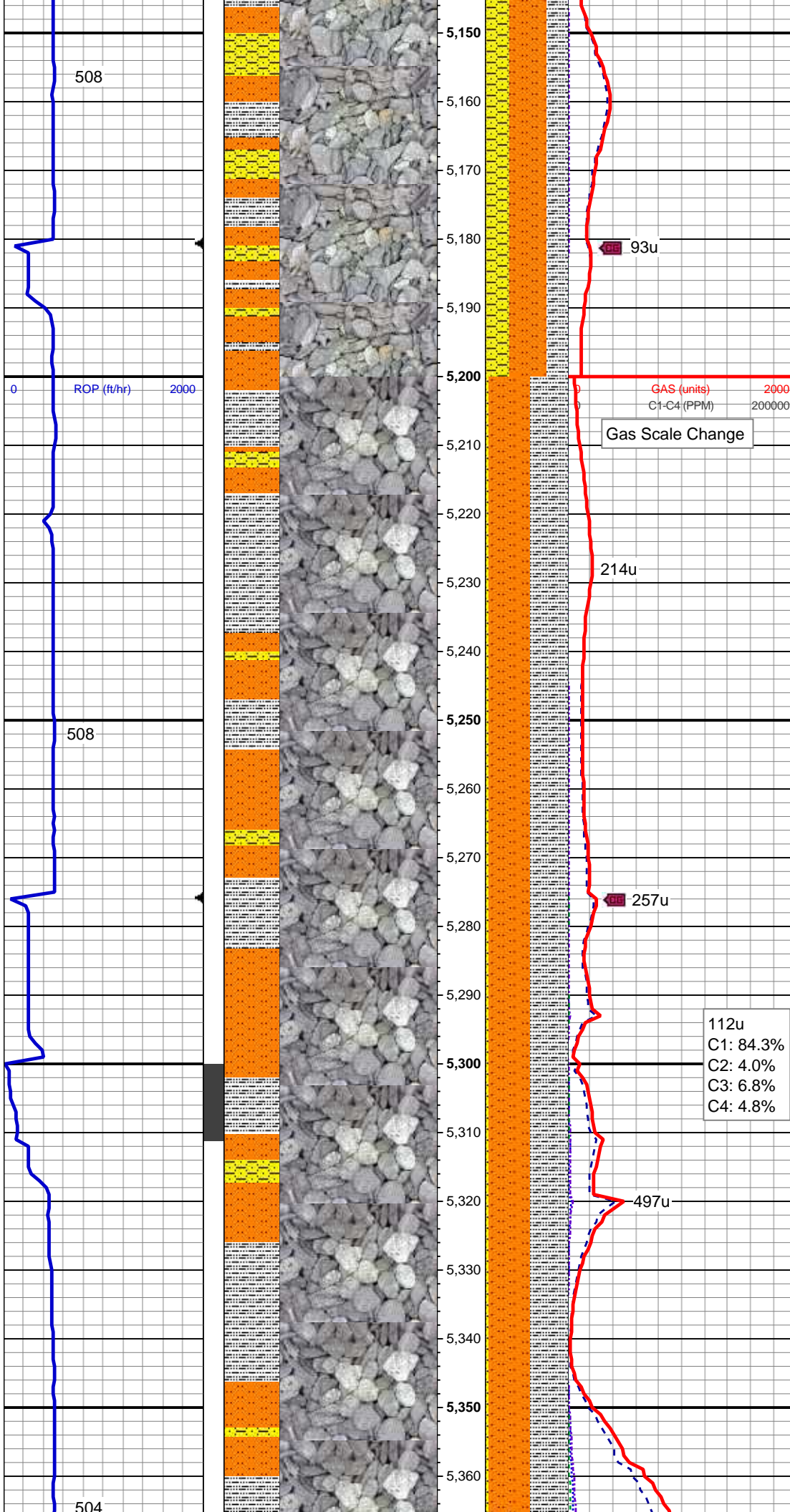


MD: 4,936'
TVD: 4,906.63'
Inclination: 2.32°
Azimuth: 158.21°
VS: -195.94'

MD: 5,031'
TVD: 5,001.56'
Inclination: 2.12°
Azimuth: 160.54°
VS: -197.08'

45% SLTST: lt - med gy, occ dk gy, mod frm, brit, sb plty - sb blk, gt tex, slty - arg mtx, 30% SHY SS: lt - med gy, occ dk gy, f - vf gr, mod frm, brit, sb rnd - sb ang, shy - arg mtx, cons, 25% SLTY SH: med-dk gy, mod - v frm, brit fri ip, plty - sb plty, sm - sb wxy tex, arg - slty mtx, sl calc, nfsoc

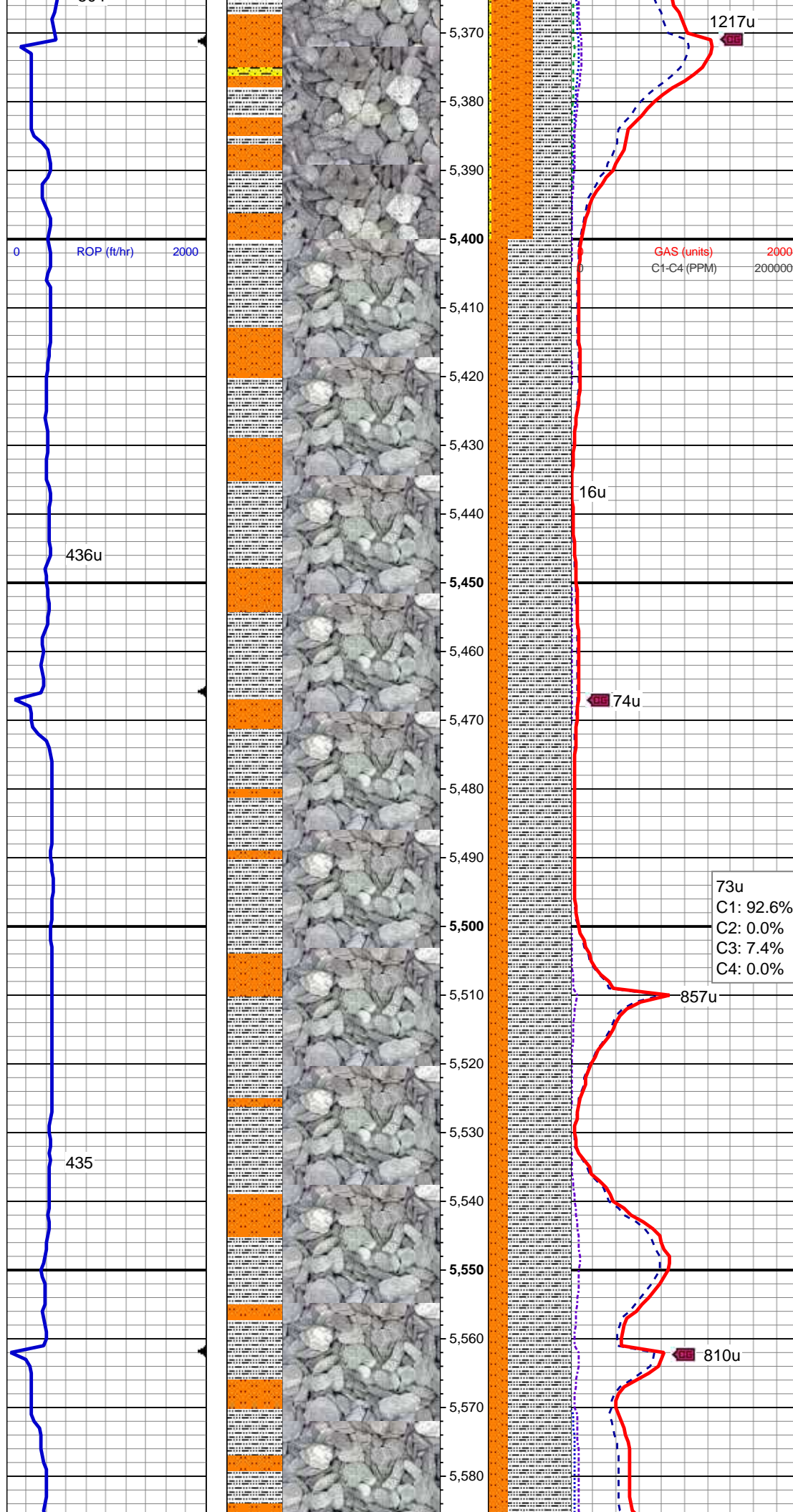
MD: 5,125'
TVD: 5,095.49'
Inclination: 2.19°
Azimuth: 157.09°
VS: -198.21'



MD: 5,220'
TVD: 5,190.43'
Inclination: 1.9°
Azimuth: 156.71°
VS: -199.39'

50% SLTST: lt - med gy, occ dk gy, mod frm, brit, sb plty - sb blkly, gt tex, slty - arg mtx, 45% SLTY SH: med-dk gy, mod - v frm, brit fri ip, plty - sb plty, sm - sb wxy tex, arg - slty mtx, sl calc, 5% SHY SS: lt - med gy, occ dk gy, f - vf gr, mod frm, brit, sb rnd - sb ang, shy - arg mtx, cons, nfsoc

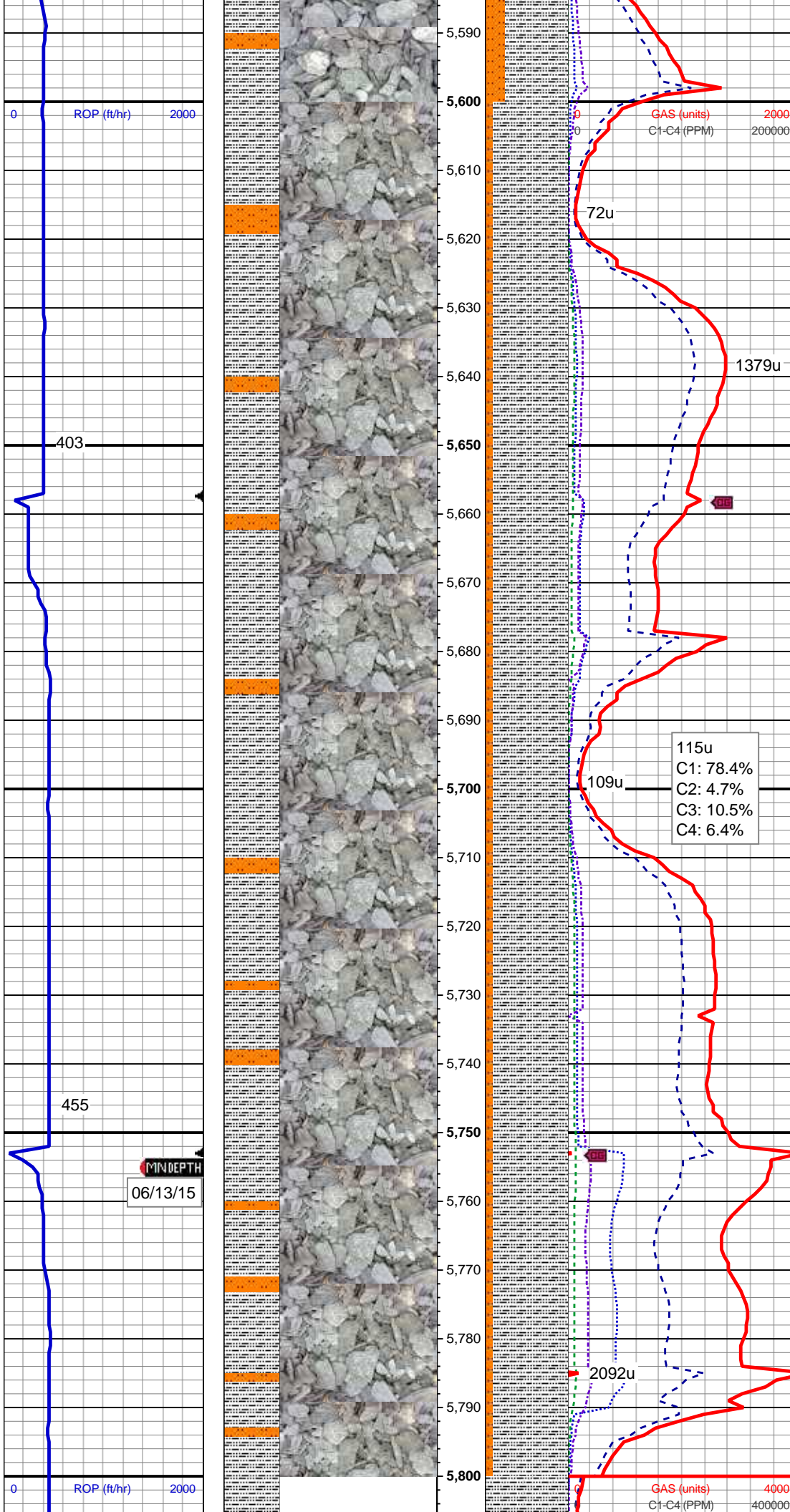
MD: 5,315'
TVD: 5,285.41'
Inclination: 0.58°
Azimuth: 171.58°
VS: -200'



MD: 5,410'
TVD: 5,380.41'
Inclination: 0.35°
Azimuth: 102.75°
VS: -200.33'

75% SLTY SH: med-dk gy, mod - v
frm, brit fri ip, plty - sb plty, sm - sb
wxy tex, arg - slty mtx, sl calc, 25%
SLTST: lt - med gy, occ dk gy, mod
frm, brit, sb plty - sb blkly, gt tex, slty
- arg mtx, nfsoc

MD: 5,505'
TVD: 5,475.41'
Inclination: 0.41°
Azimuth: 145.62°
VS: -200.79'



MD: 5,599'
TVD: 5,569.4'
Inclination: 0.03°
Azimuth: 69.37°
VS: -200.99'

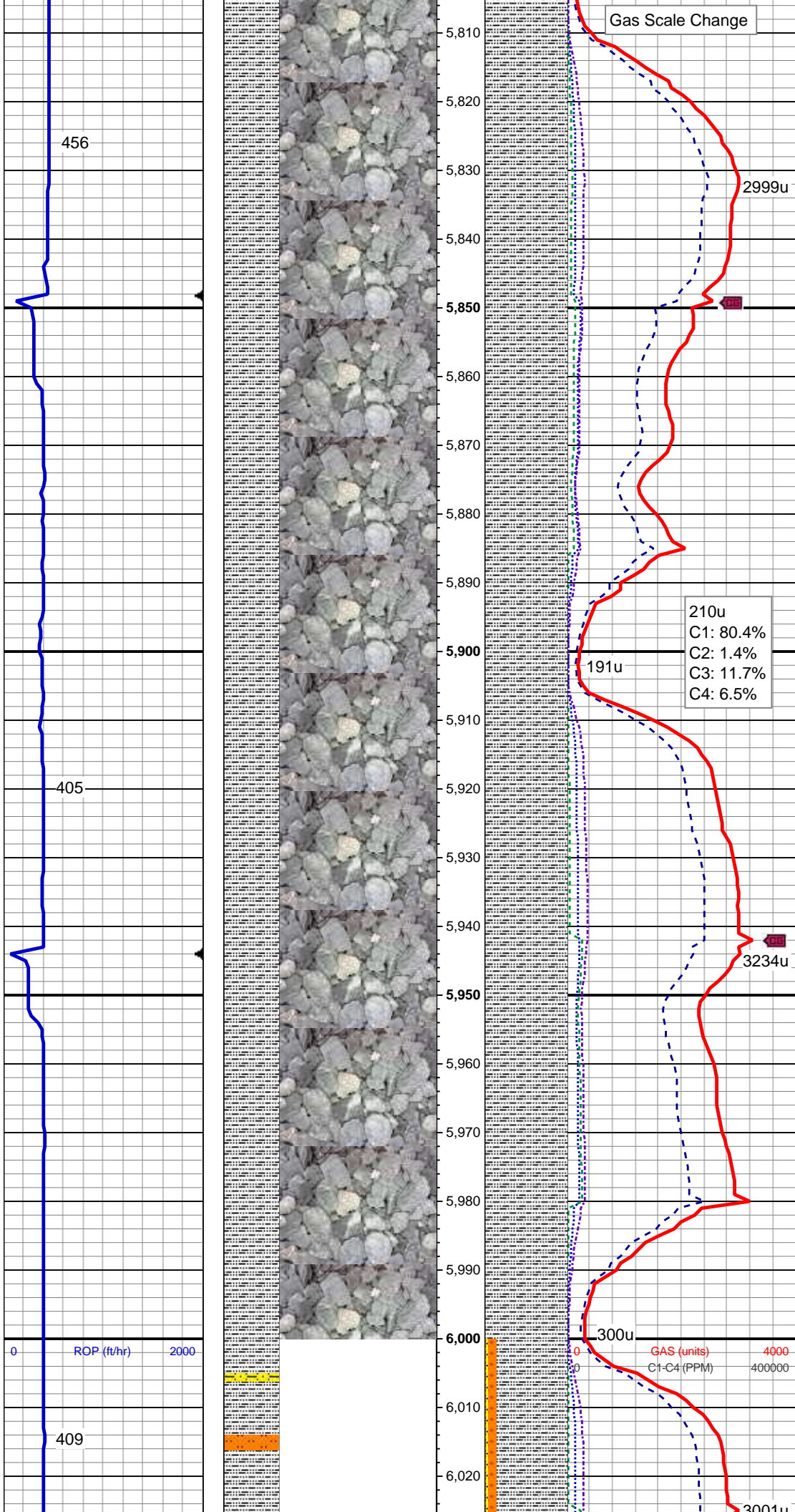
MW 9.4 VIS 33

MD: 5,694'
TVD: 5,664.4'
Inclination: 0.55°
Azimuth: 169.39°
VS: -201.07'

90% SLTY SH: med-dk gy, mod - v
frm, brit fri ip, plty - sb plty, sm - sb
wxy tex, arg - slty mtx, sl calc, 10%
SLTST: lt - med gy, occ dk gy, mod
frm, brit, sb plty - sb blkly, gt tex, slty
- arg mtx, nfsoc

MW 9.5 VIS 34

MD: 5,789'
TVD: 5,759.4'
Inclination: 0.51°
Azimuth: 204.26°
VS: -200.94'

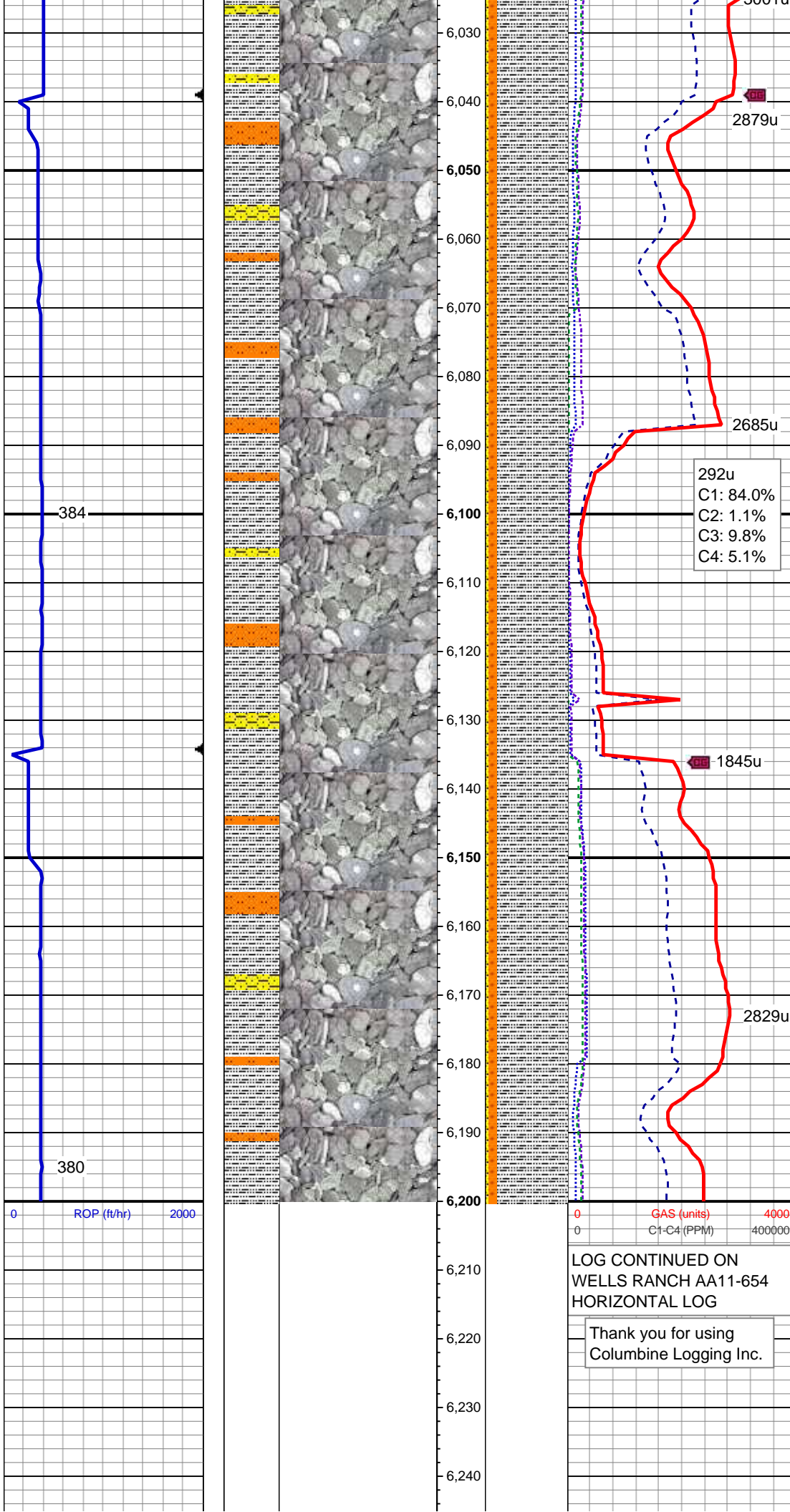


MD: 5,884'
TVD: 5,854.39'
Inclination: 0.65°
Azimuth: 245.3°
VS: -200.3'

100% SLTY SH: med-dk gy, mod - v
frm, brit fri ip, plty - sb plty, sm - sb
wxy tex, arg - slty mtx, sl calc, nfsoc

MW 9.5 VIS 35

MD: 5,979'
TVD: 5,949.38'
Inclination: 1.3°
Azimuth: 223.94°
VS: -198.97'



MD: 6,073'
TVD: 6,043.35'
Inclination: 1.66°
Azimuth: 219.9°
VS: -197.27'

85% SLTY SH: med-dk gy, mod - v
frm, brit fri ip, pty - sb pty, sm - sb
wxy tex, arg - slty mtx, sl calc, 10%
SLTST: lt - med gy, occ dk gy, mod
frm, brit, sb pty - sb blk, gt tex, slty
- arg mtx, 5% SHY SS: lt - med gy,
occ dk gy, f - vf gr, mod frm, brit, sb
rnd - sb ang, shy - arg mtx, cons,
nfsoc

MD: 6,168'
TVD: 6,138.31'
Inclination: 1.75°
Azimuth: 172.54°
VS: -196.46'

LOG CONTINUED ON
WELLS RANCH AA11-654
HORIZONTAL LOG

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