

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name TINA LC29-75-1HNA

Location SWSE SEC 29 T9N R59W

State COLORADO

County WELD

Country USA

Rig Number H&P 273

API Number 05-123-38781

Field WILDCAT

Region DJ BASIN

Drilling Completed 6/8/2014

Spud Date 6/6/2014

Surface Coordinates 340' FSL; 2129' FEL

Ground Elevation 4872'

K.B. Elevation 4896'

Logged Interval 640' To 5517'

Total Depth 5517'

Formation NIOBRARA

Type of Drilling Fluid LSND

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

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

MOLDIC

ORGANIC

PINPOINT

VUGGY

Engineering

BIT

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

FORMATION TOP

GAS SHOW

MN DEPTH

NORMAL FAULT

OIL SHOW

OVERTURNED STRATA

REVERSE FAULT

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE

SURVEY

TRIP GAS

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

Zone Color Coding

- Oil
- Condensate
- Gas
- Note
- Core
- Pressure
- Error
- Water
- Seal

Accessories

Fossils

- ALGAE
- AMPHIPORA
- BELEMNITE
- BIOCLASTIC
- BRACHIOPOD
- BRYOZOA
- CEPHALOPOD
- CORAL

F FOSSIL

GASTROPOD

INOCERAMUS

OOLITE

OSTRACOD

PELECYPOD

PELLET

PISOLITE

PLANT REMAINS

PLANT PRODES

ANHYDRITIC

ARGILLACEOUS

ARGILLITE GRAIN

BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTDK

CLUTL

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

KAOLIN

MARLSTONE

MINERAL CRYSTALS

NODULES

PHOSPHATE PELLETS

TYNITE

TUFFACEOUS

Stringer

- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER
- GYPSUM STRINGER
- LIMESTONE STRINGER
- MARLSTONE (OIL) STRINGER

CORAL
CRINOID
ECHINOID
FISH
FORAMINIFERA

PLANT SPORES
SCAPHOPOD
STROMATOPOROID

Minerals

CHERT
COAL - THIN BEDS
DOLOMITIC
FELDSPAR
FERRUGINOUS PELLET

PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY

MARLSTONE (CALC) STRG
MARLSTONE (DOL) STRG
SANDSTONE STRINGER
SHALE STRINGER
SILTSTONE STRINGER

Rock Types

UNKNOWN
CHALK
MARLSTONE
SANDSTONE
SHALY SANDSTONE
SILTY SHALE
ANHYDRITE
BENTONITE
BRECCIA

CEMENT
CHERT
CLAY CHOKE SAND
CLAYSTONE
COAL
CONGLOMERATE
DOLOMITE
GRANITE
GYPSUM

IGNEOUS
LIMESTONE
SIDERITE or LIMONITE
METAMORPHIC
NO SAMPLE
SALT
SALT- PEPPER SAND
SHALE
SHALE COLORED

SHALE GRAY
SHALY SILTSTONE
SILTSTONE
TILL
TUFF
WELDED TUFF

Operator

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

Wellsite Geologist #1 Jeremy Loftness

Wellsite Geologist #2 Tim Bright

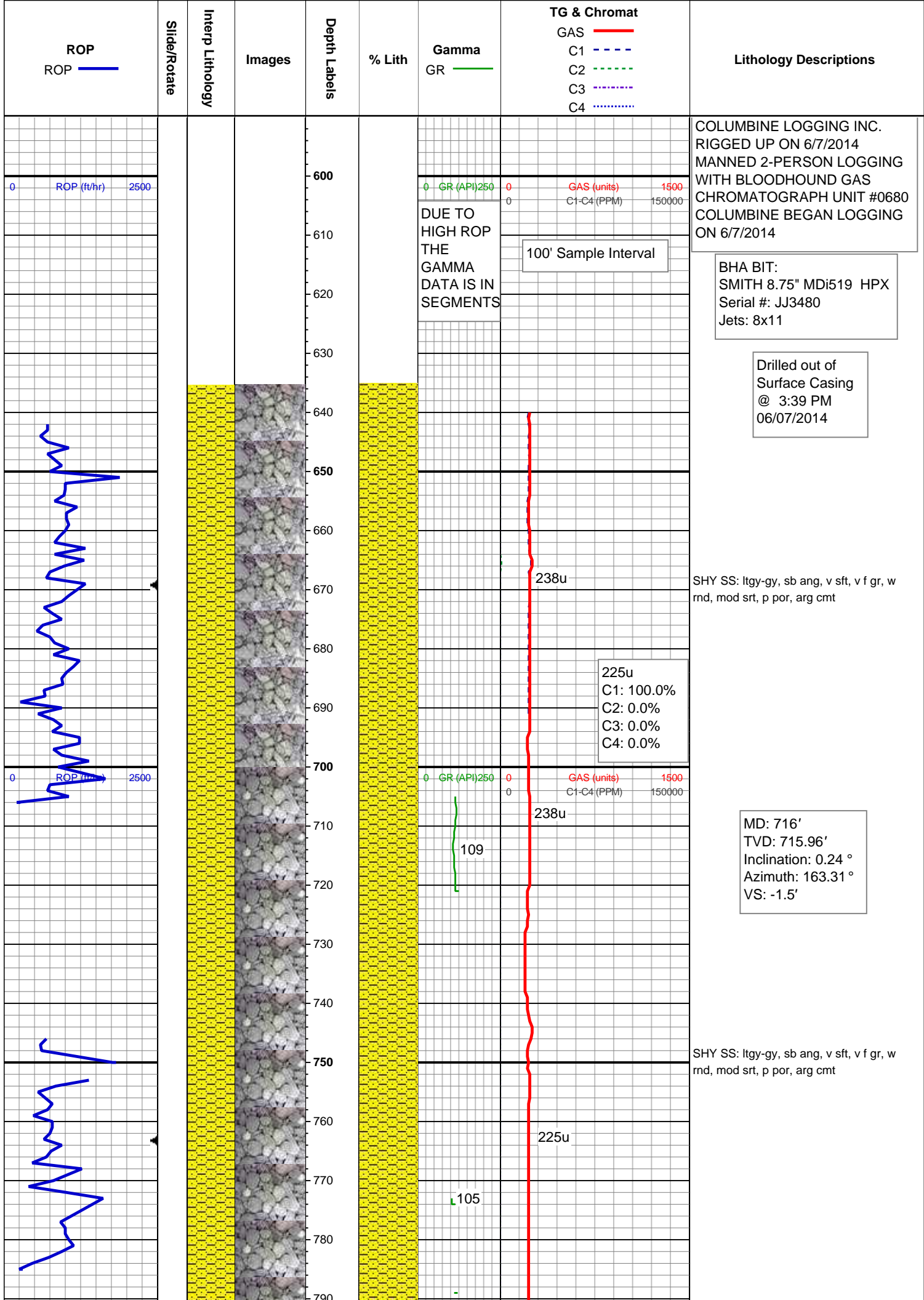
Wellsite Geological Services Provided By Columbine Logging Inc.

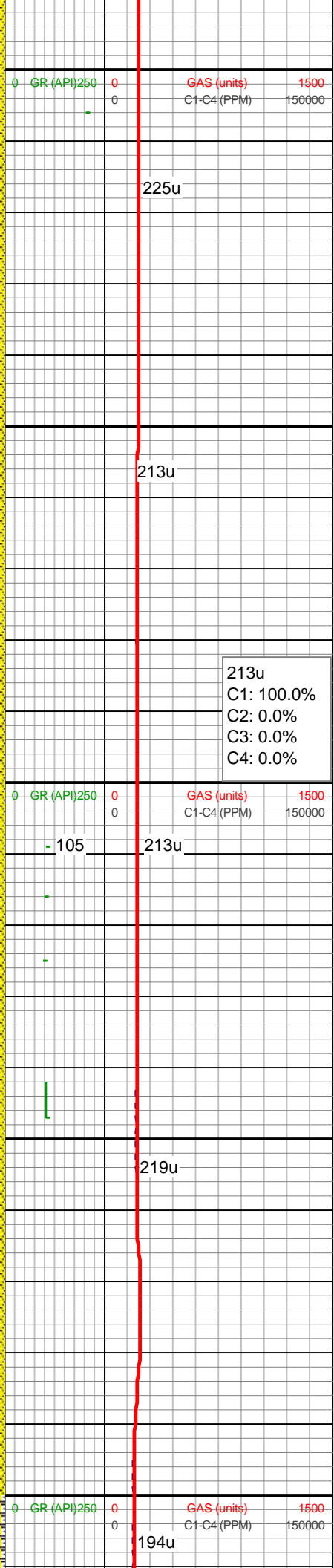
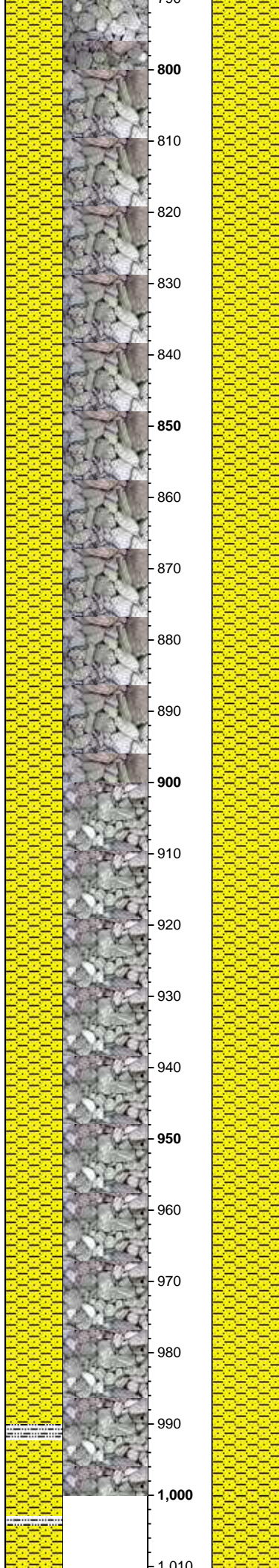
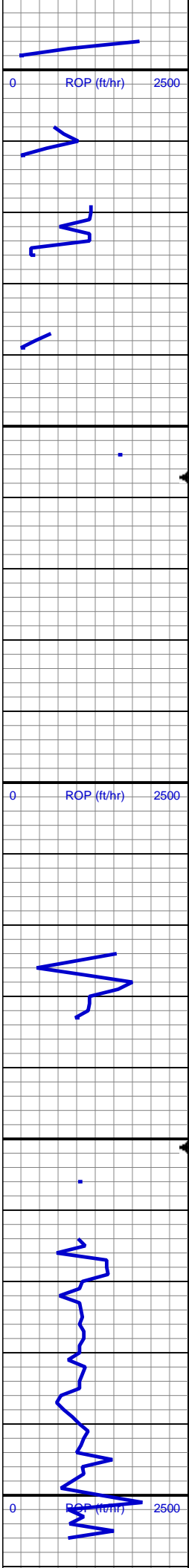
Geologist

Name SARAH COMPTON

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202





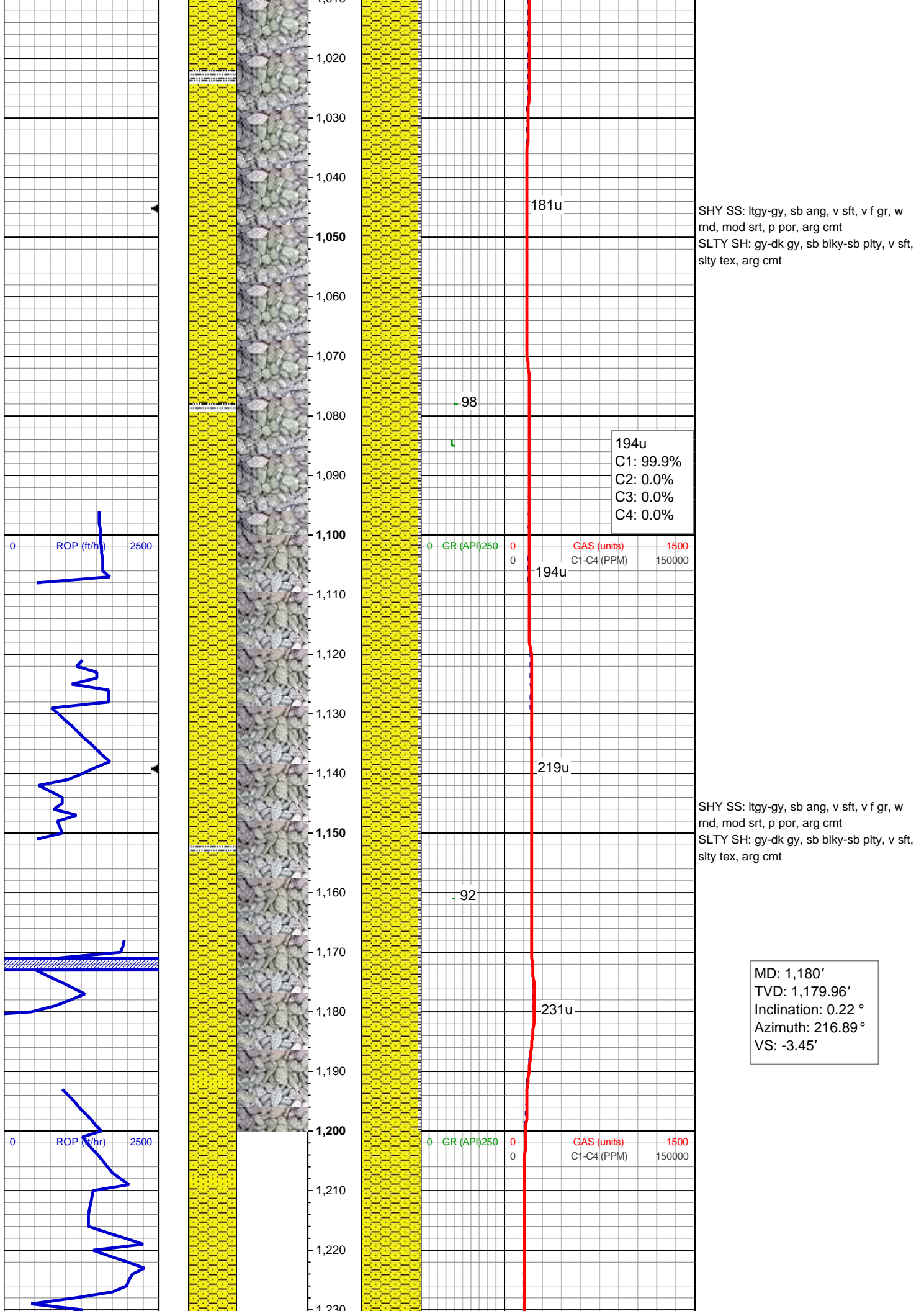
MD: 809'
TVD: 808.96'
Inclination: 0.33 °
Azimuth: 202.14 °
VS: -1.93'

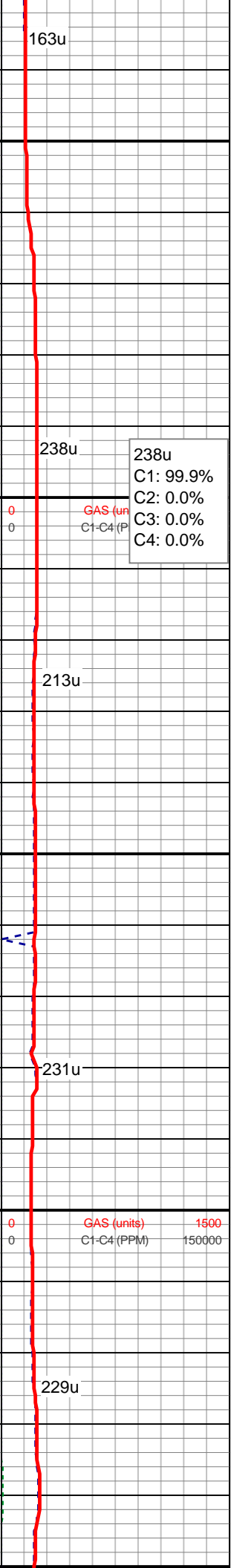
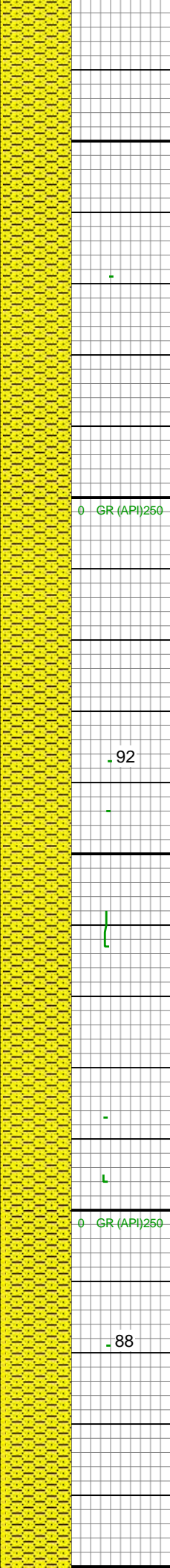
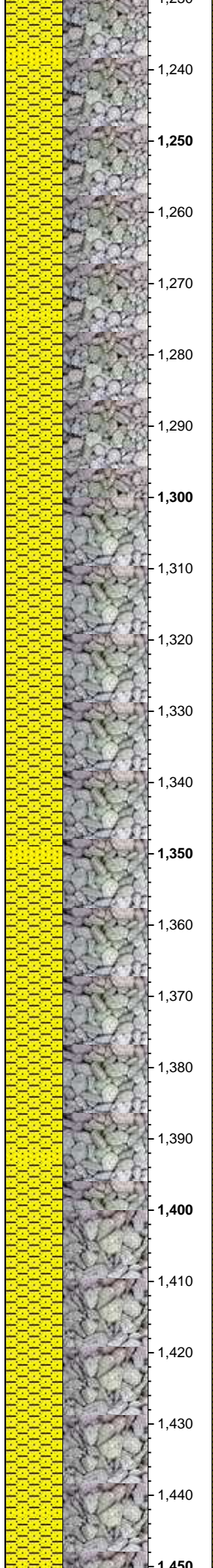
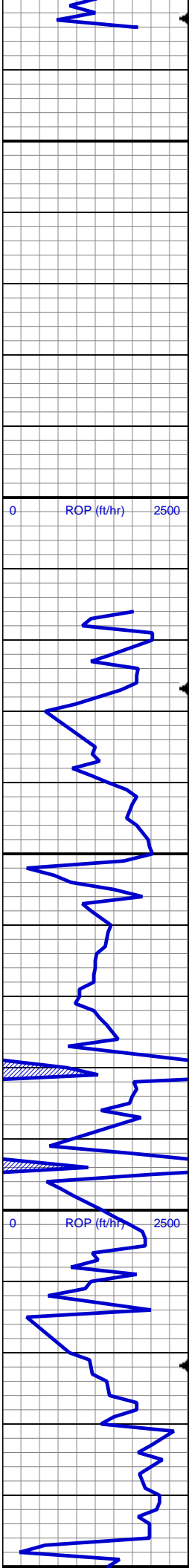
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt

213u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt

MD: 995'
TVD: 994.96'
Inclination: 0.28 °
Azimuth: 212.74 °
VS: -2.8'





SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag

163u

238u

213u

92

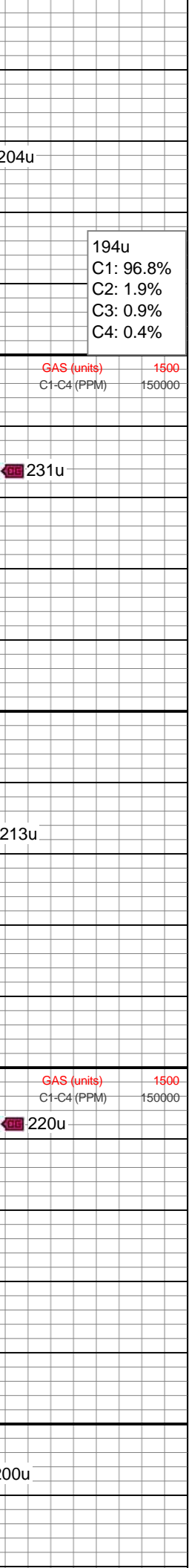
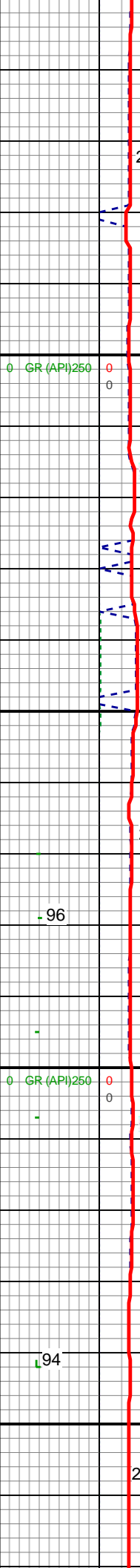
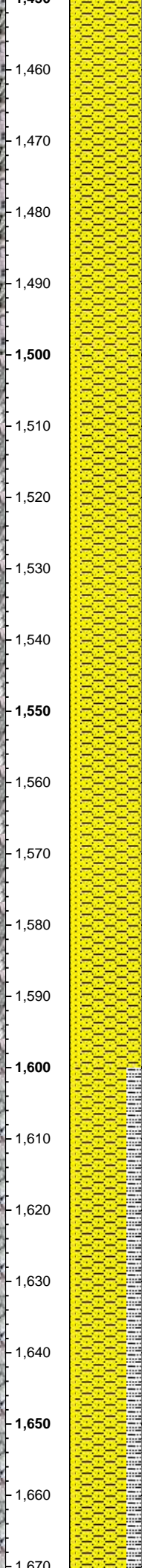
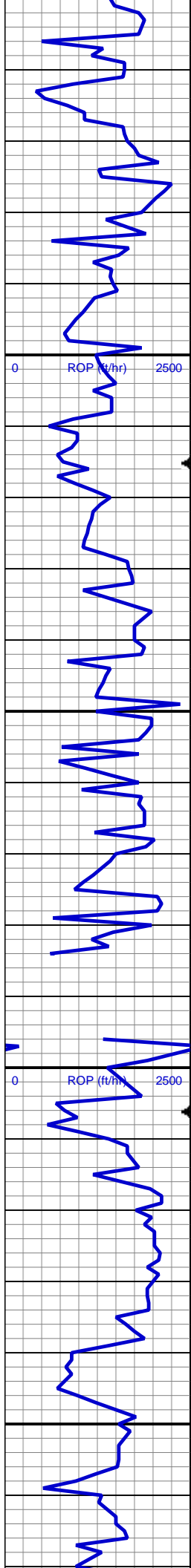
231u

88

229u

MD: 1,365'
TVD: 1,364.96'
Inclination: 0.11 °
Azimuth: 239.58 °
VS: -3.81'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,

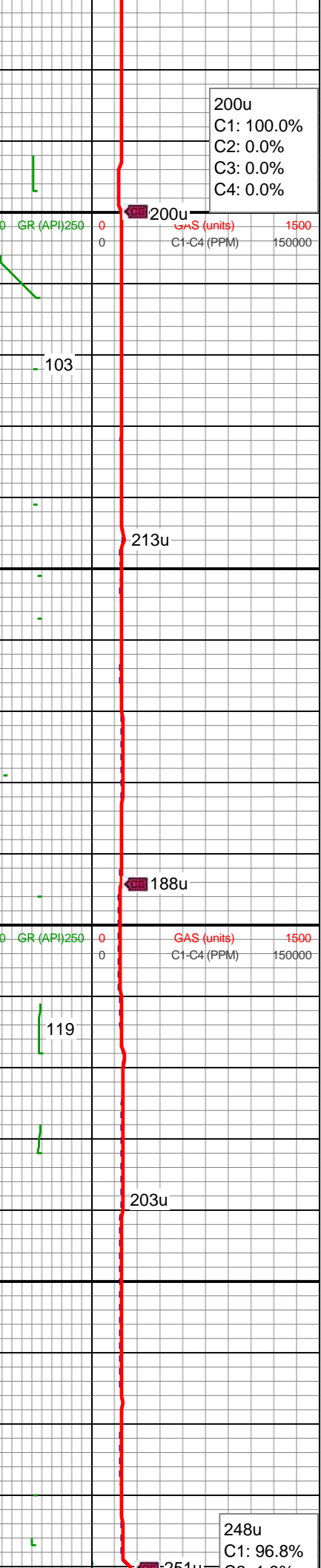
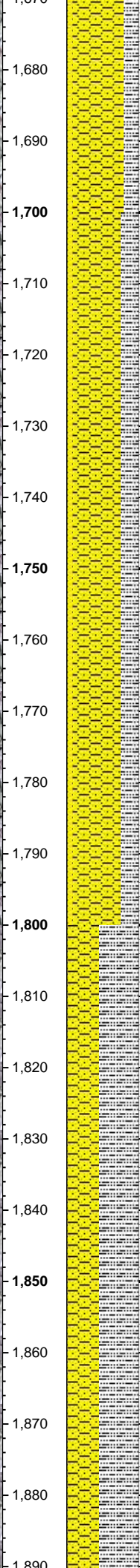
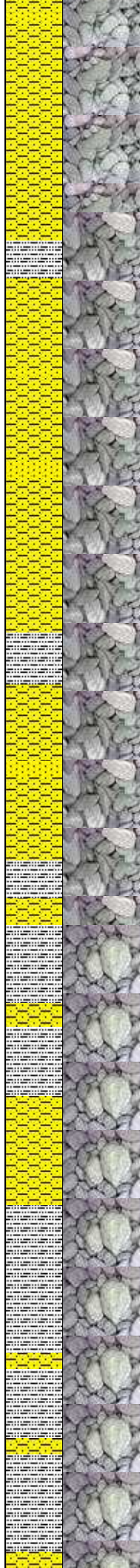
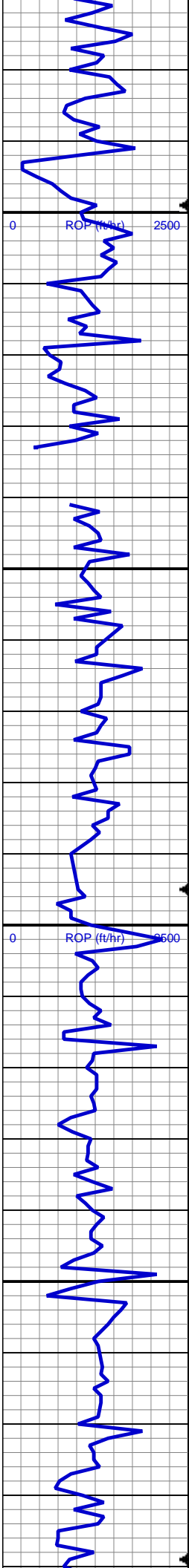


mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag

MD: 1,551'
TVD: 1,550.96'
Inclination: 0.1 °
Azimuth: 201.03 °
VS: -4.04'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blk-y-sb plty, v sft,
slyt tex, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag



200u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

200u

GR (API) 250

GAS (units) 1500

C1-C4 (PPM) 150000

103

213u

188u

119

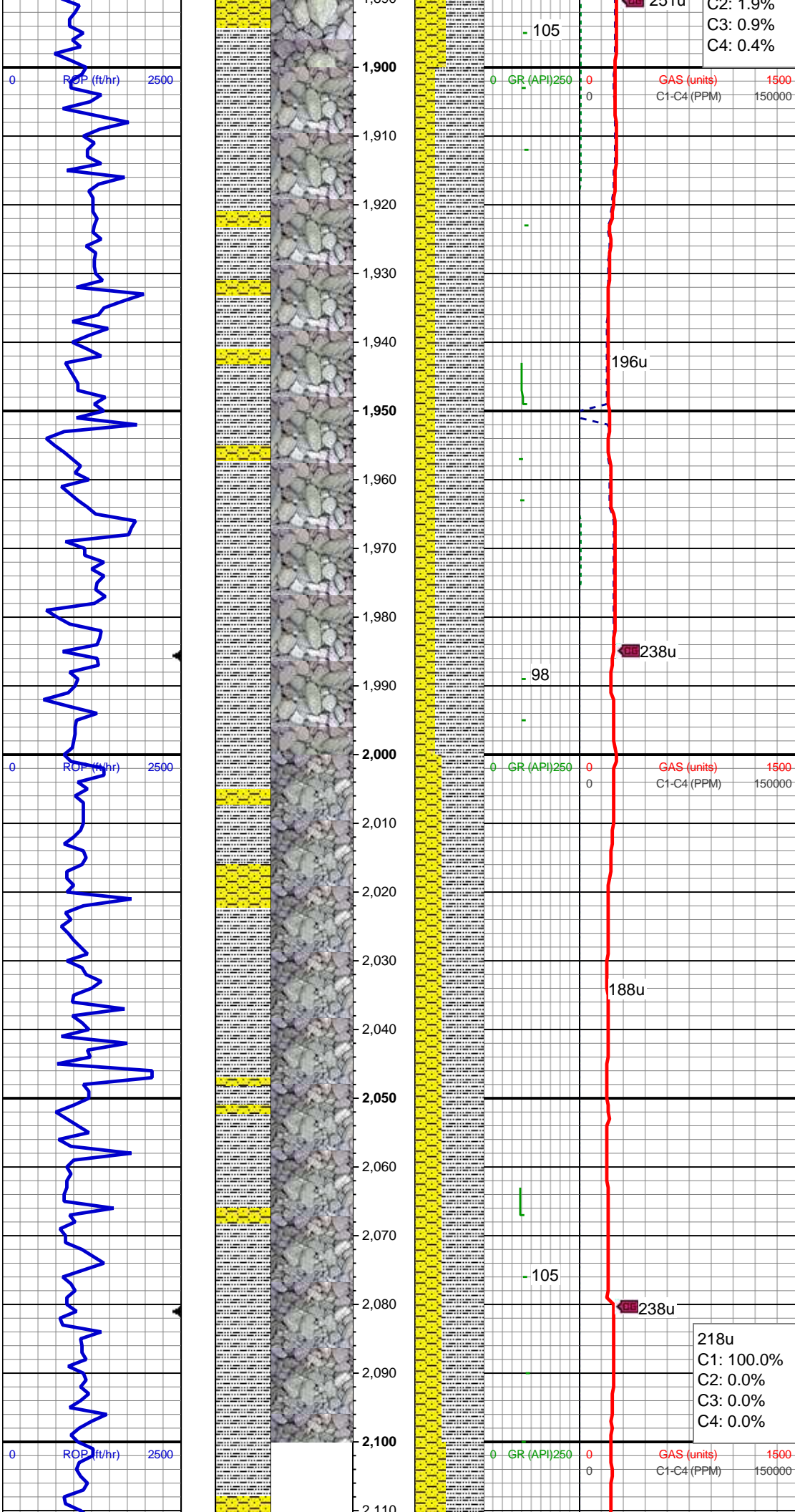
203u

248u
C1: 96.8%
C2: 1.2%
C3: 0.0%
C4: 0.0%

MD: 1,737'
TVD: 1,736.96'
Inclination: 0.23 °
Azimuth: 261.55 °
VS: -4.24'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt



MD: 1,926'
TVD: 1,925.96'
Inclination: 0.14 °
Azimuth: 142.76 °
VS: -4.26'

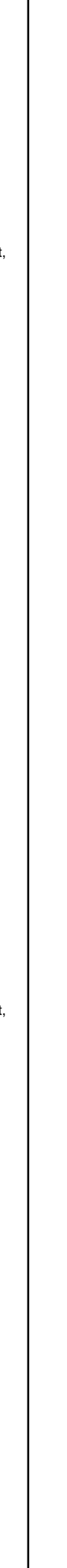
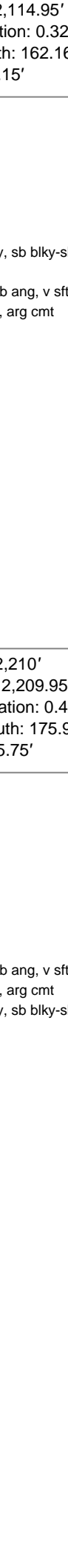
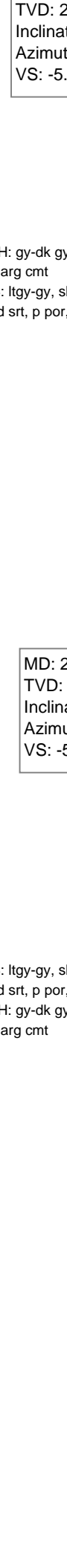
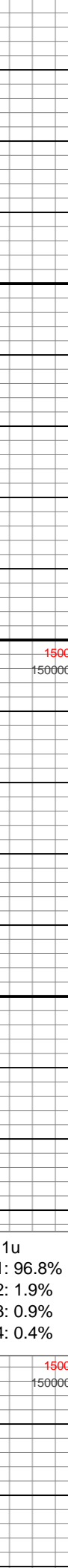
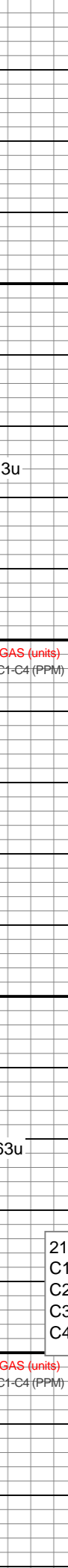
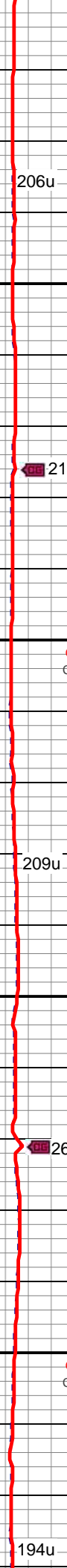
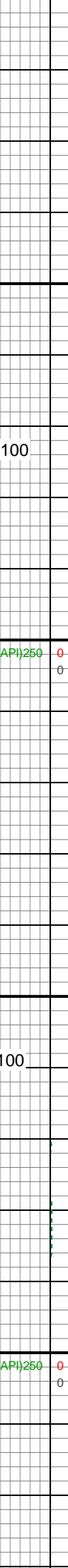
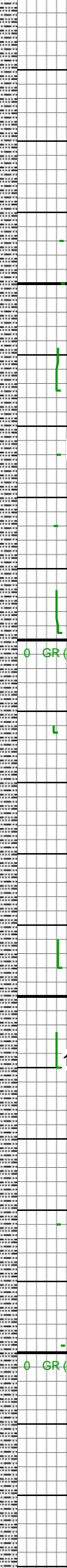
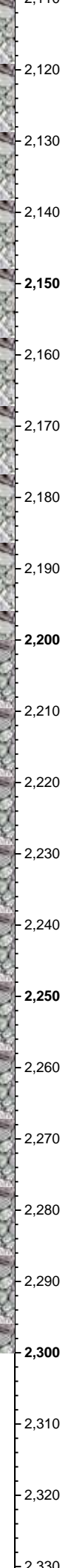
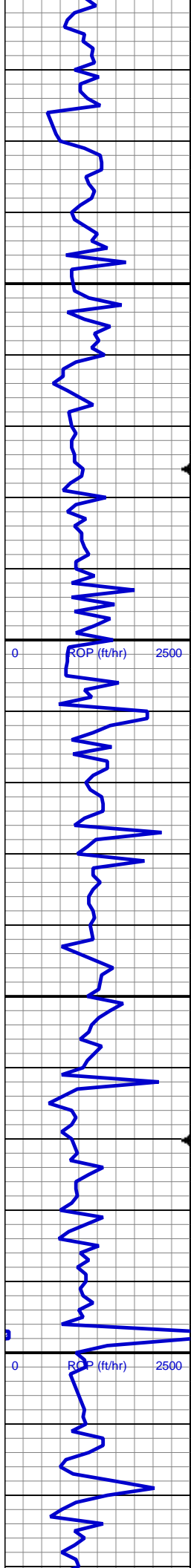
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt

MD: 2,020'
TVD: 2,019.95'
Inclination: 0.34 °
Azimuth: 164.23 °
VS: -4.62'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt

218u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

MD: 2,115'



TVD: 2,114.95'
Inclination: 0.32 °
Azimuth: 162.16 °
VS: -5.15'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt

MD: 2,210'
TVD: 2,209.95'
Inclination: 0.42 °
Azimuth: 175.92 °
VS: -5.75'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt

211u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

206u

100

213u

0 GR (API) 250

0

GAS (units)
C1-C4 (PPM)

1500
150000

209u

100

263u

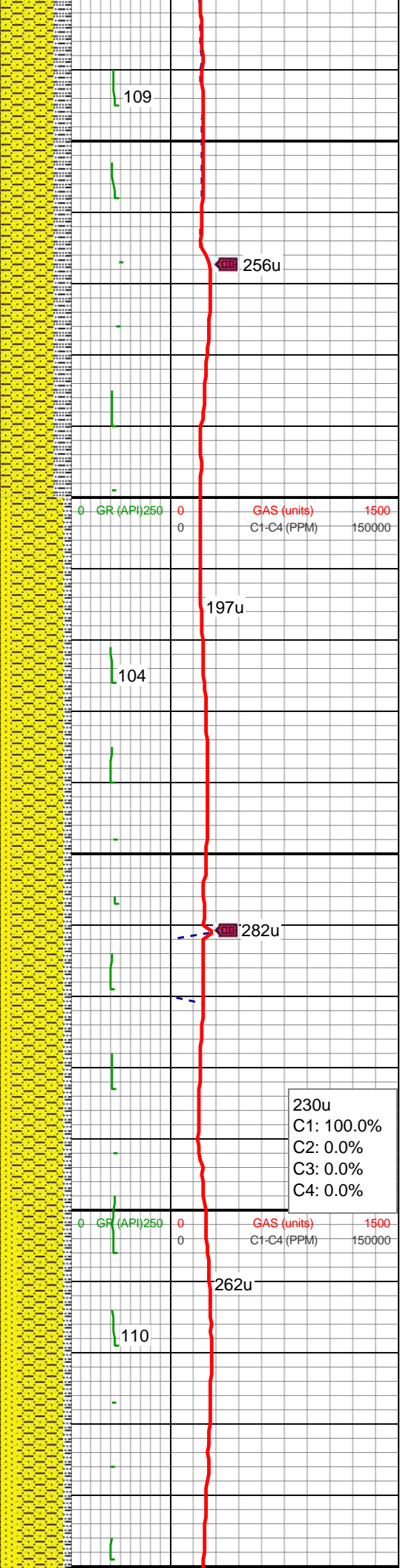
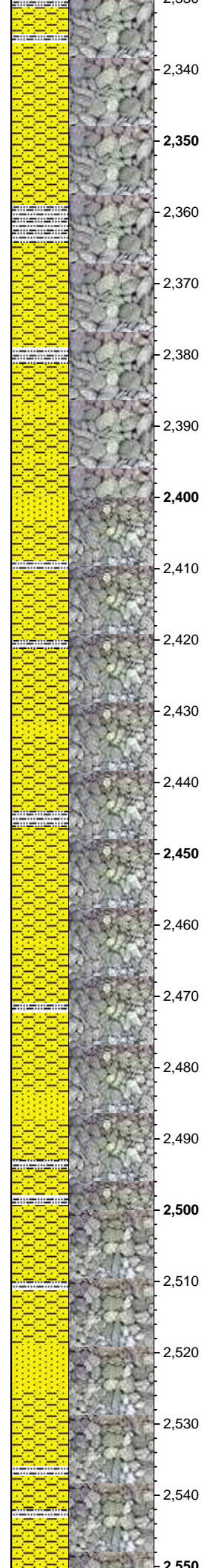
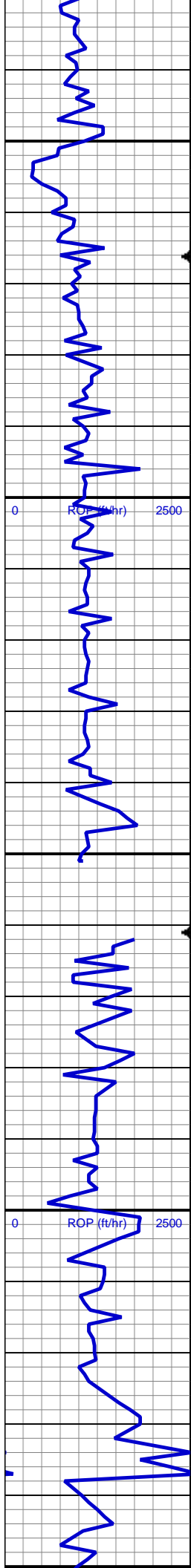
0 GR (API) 250

0

GAS (units)
C1-C4 (PPM)

1500
150000

194u



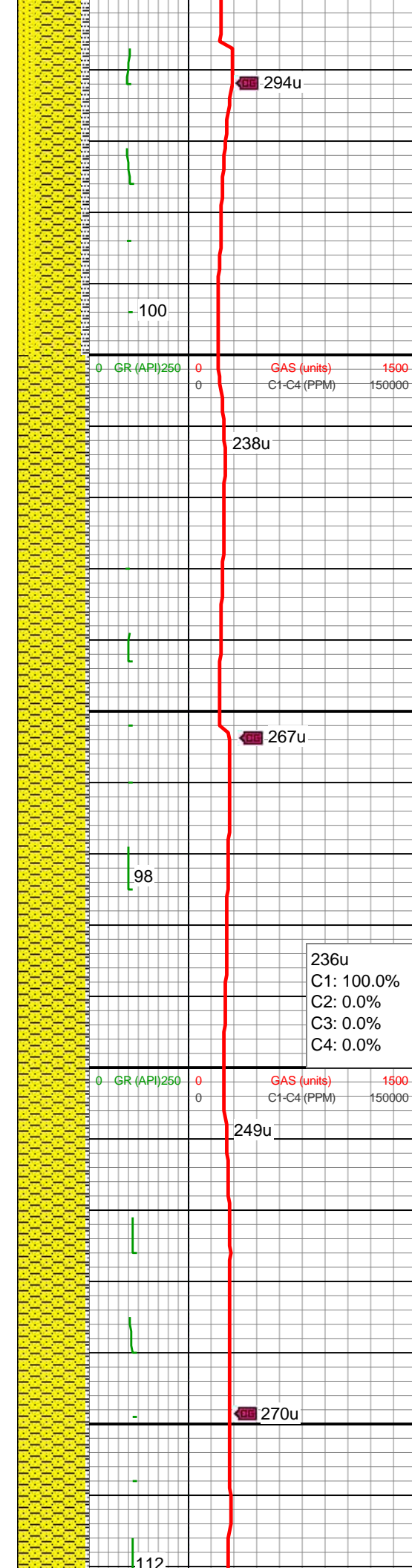
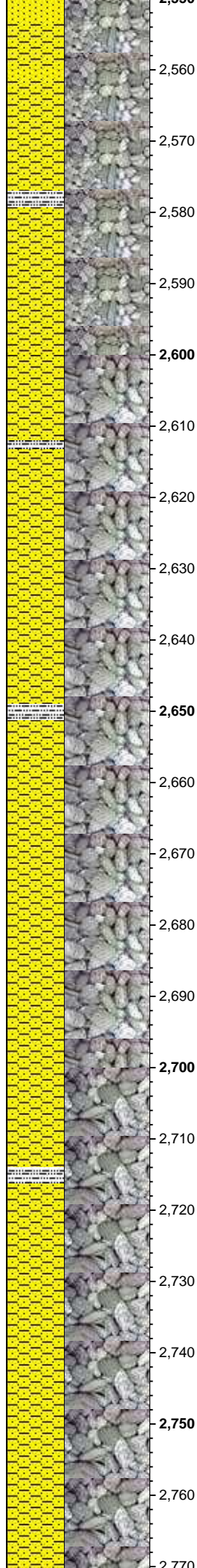
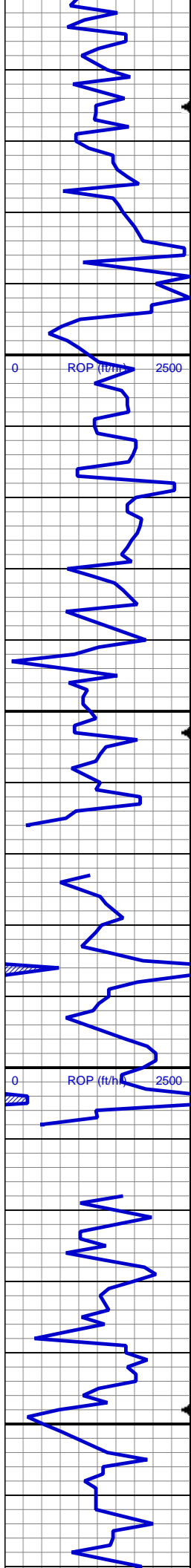
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt

MD: 2,399'
TVD: 2,398.94'
Inclination: 0.71 °
Azimuth: 186.77 °
VS: -7.6'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt

MD: 2,494'
TVD: 2,493.93'
Inclination: 0.76 °
Azimuth: 175.52 °
VS: -8.82'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,



mod md, p srt, p por, arg cmt, oco glau,
tr lith frag
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
silty tex, arg cmt

MD: 2,589'
TVD: 2,588.93'
Inclination: 0.81 °
Azimuth: 175.96 °
VS: -10.12'

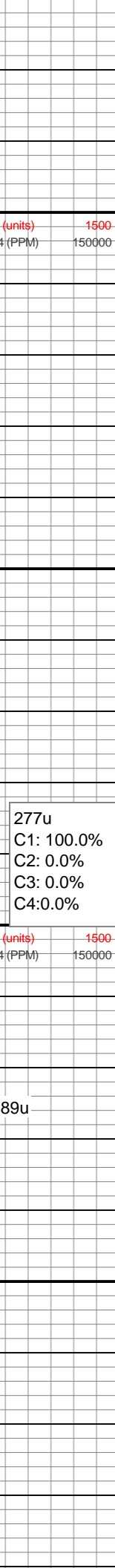
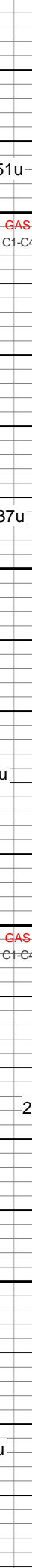
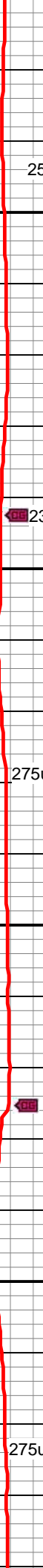
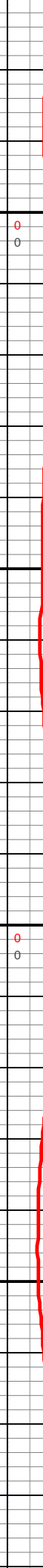
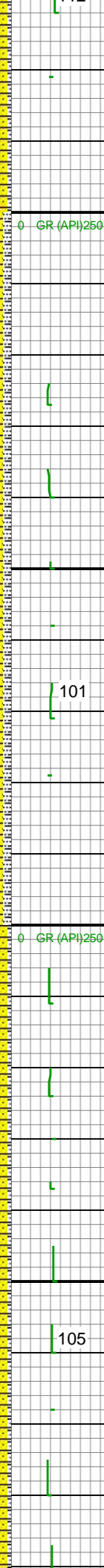
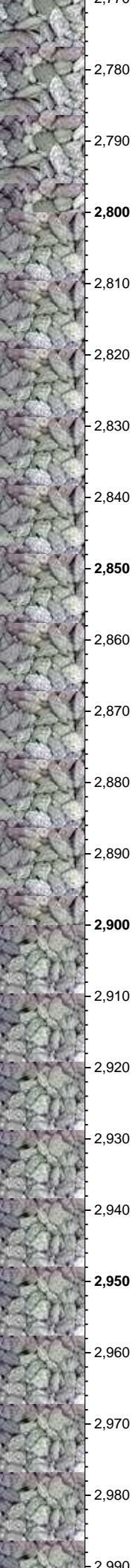
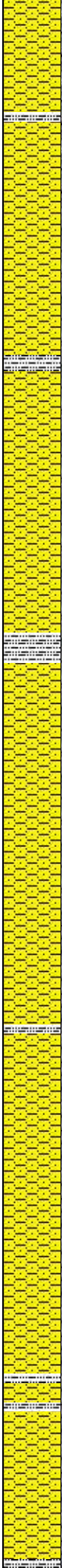
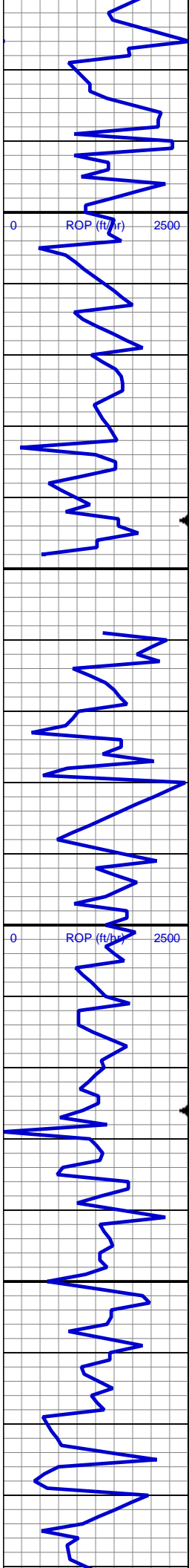
WT IN 8.70/ OUT 8.70
VIS IN 27/ OUT 27

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
silty tex, arg cmt

MD: 2,684'
TVD: 2,683.92'
Inclination: 0.78 °
Azimuth: 173.19 °
VS: -11.43'

236u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
silty tex, arg cmt



MD: 2,778'
TVD: 2,777.91'
Inclination: 0.94 °
Azimuth: 168.88 °
VS: -12.83'

251u

237u

275u

277u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

289u

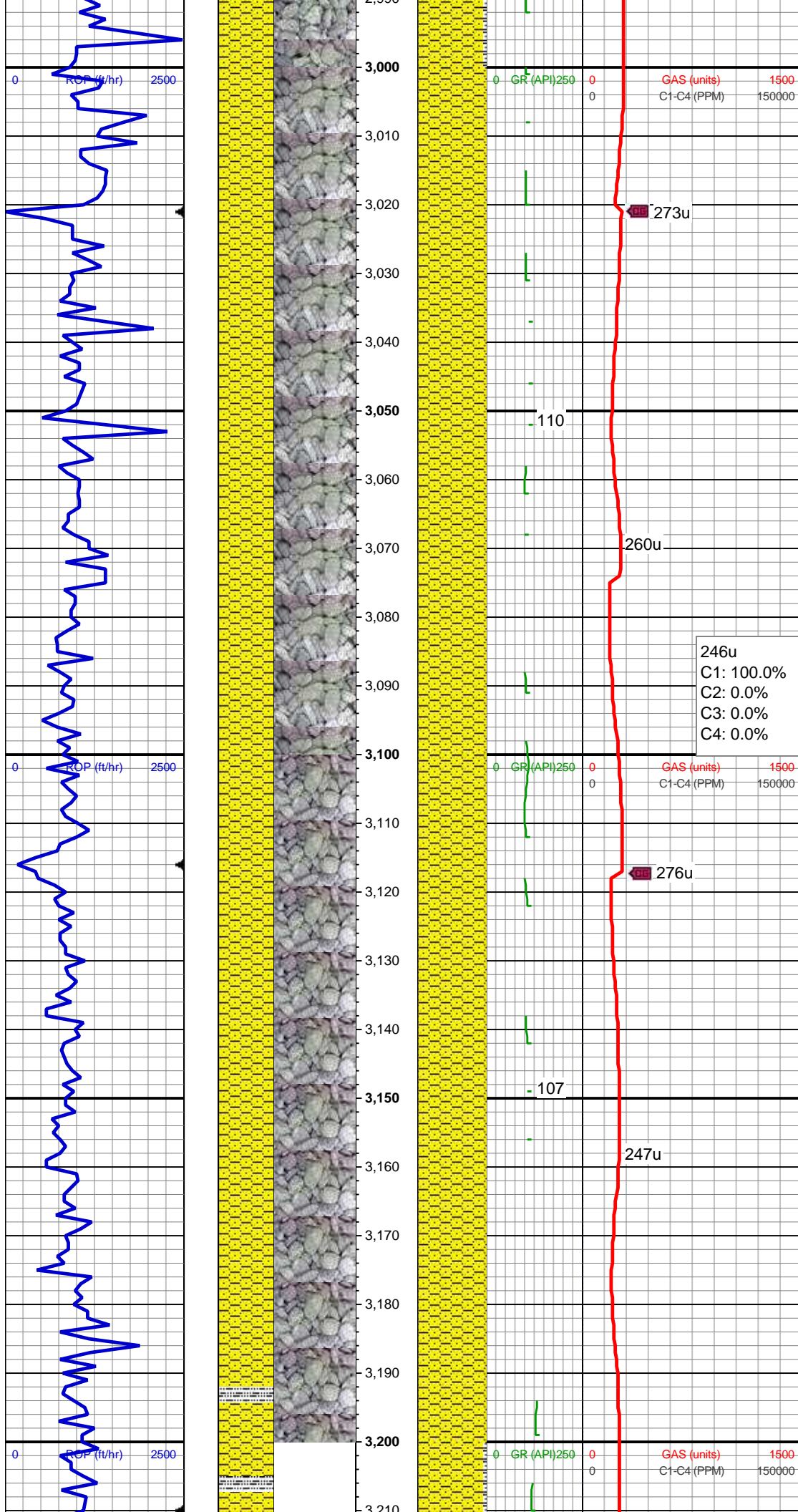
275u

101

105

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkgy-sb plty, v sft,
sly tex, arg cmt

MD: 2,968'
TVD: 2,967.89'
Inclination: 0.74 °
Azimuth: 187.38 °
VS: -15.58'

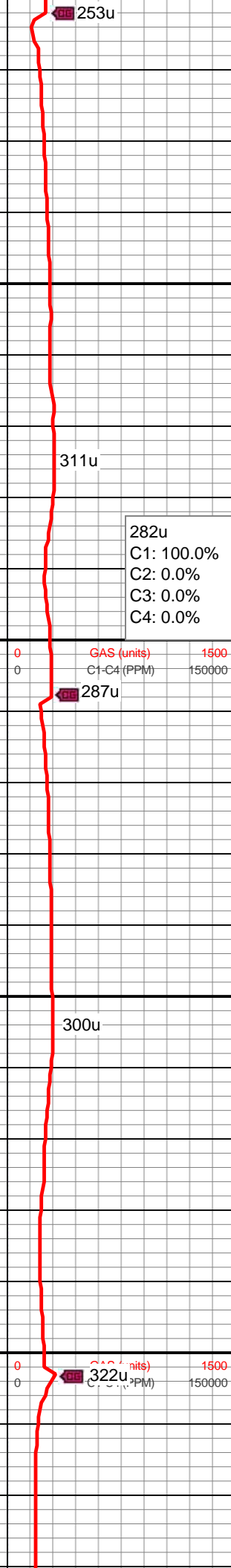
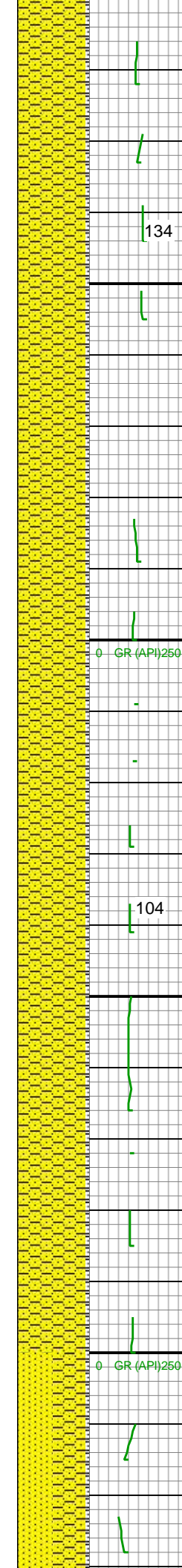
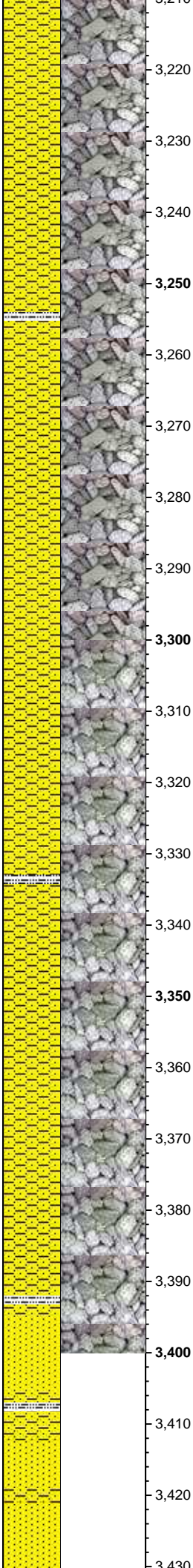
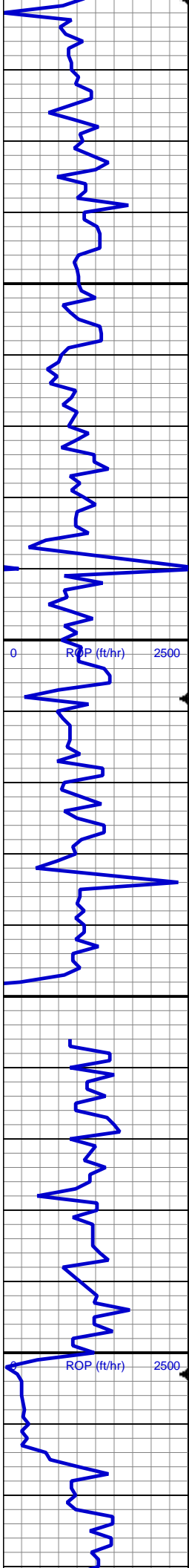


SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt

MD: 3,063'
TVD: 3,062.88'
Inclination: 0.77 °
Azimuth: 189.83 °
VS: -16.81'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt

MD: 3,158'
TVD: 3,157.87'
Inclination: 1 °
Azimuth: 197.41 °
VS: -18.22'



SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkgy-sb plty, v sft,
silty tex, arg cmt

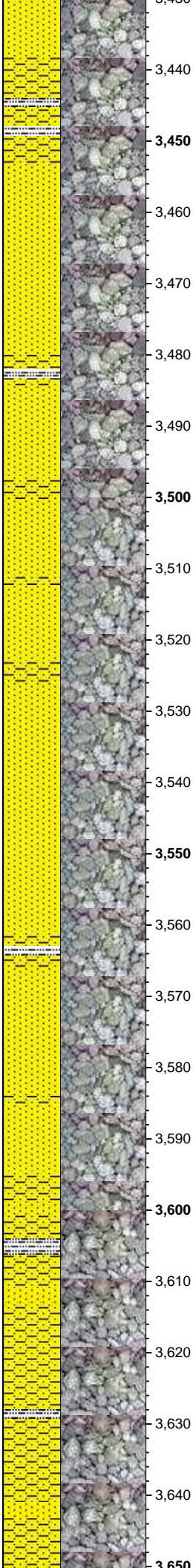
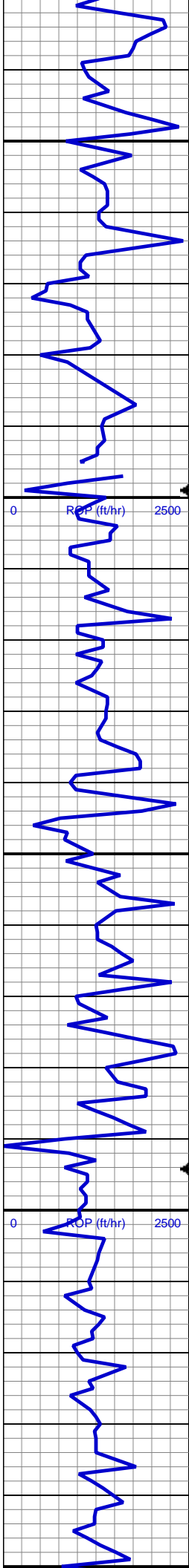
MD: 3,252'
TVD: 3,251.85'
Inclination: 1.43 °
Azimuth: 162.67 °
VS: -20.12'

282u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

MD: 3,347'
TVD: 3,346.82'
Inclination: 1.32 °
Azimuth: 149.07 °
VS: -22.22'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkgy-sb plty, v sft,
silty tex, arg cmt

322u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

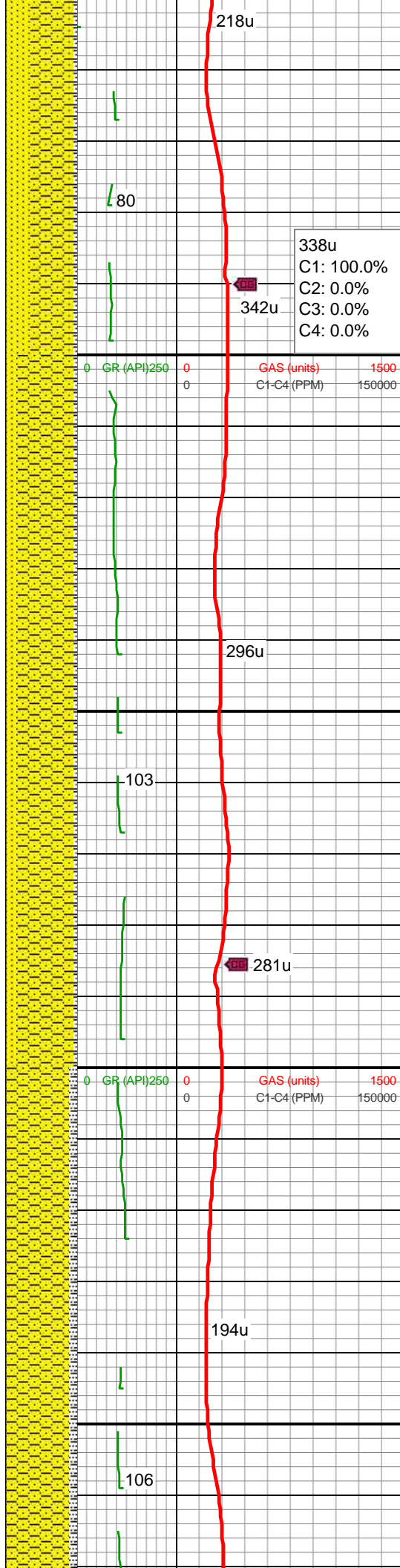
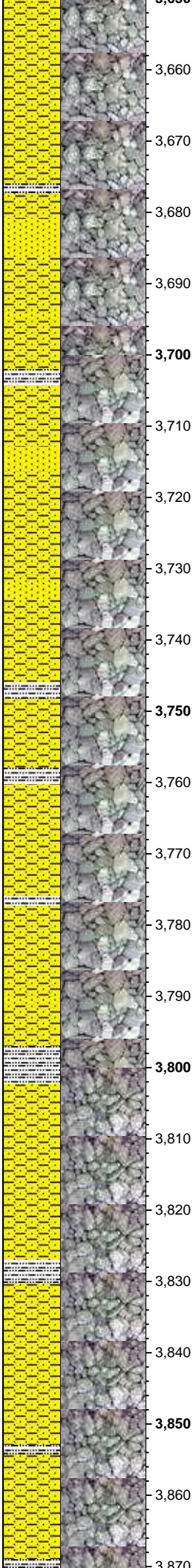
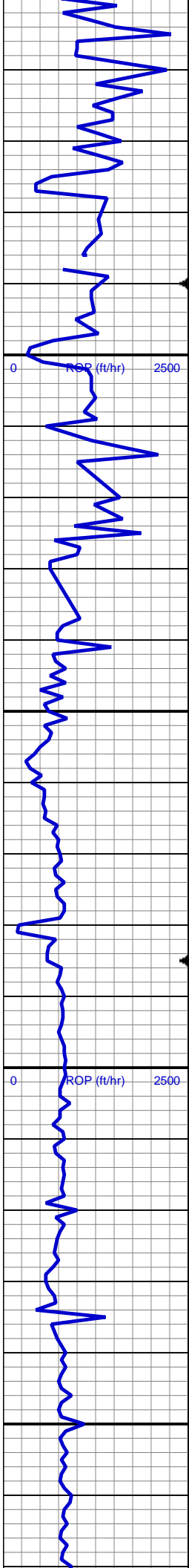


SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt

MD: 3,537'
TVD: 3,536.8'
Inclination: 0.47 °
Azimuth: 48.33 °
VS: -23.64'

SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,



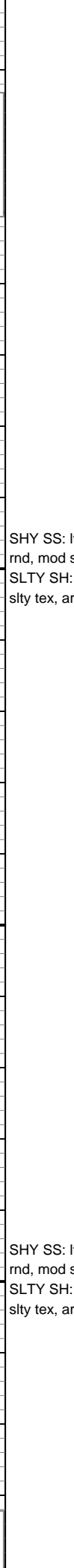
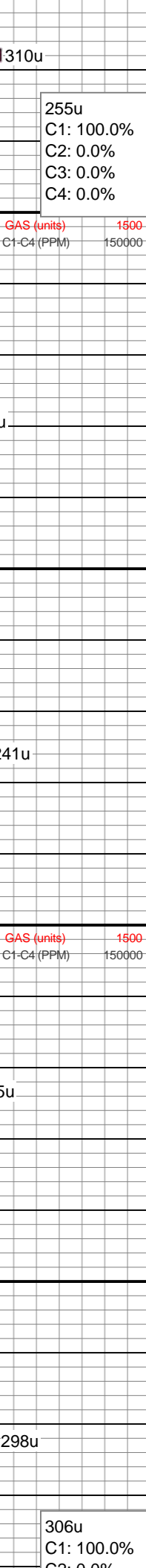
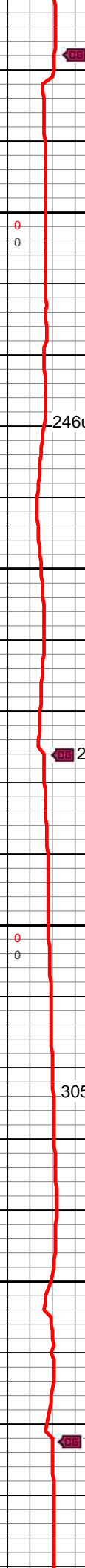
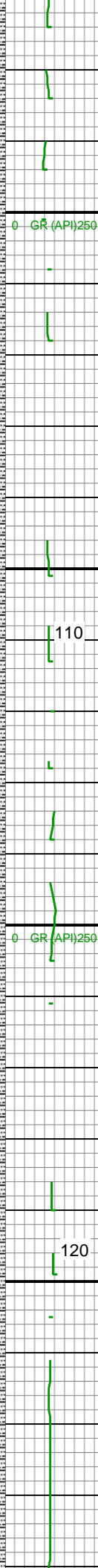
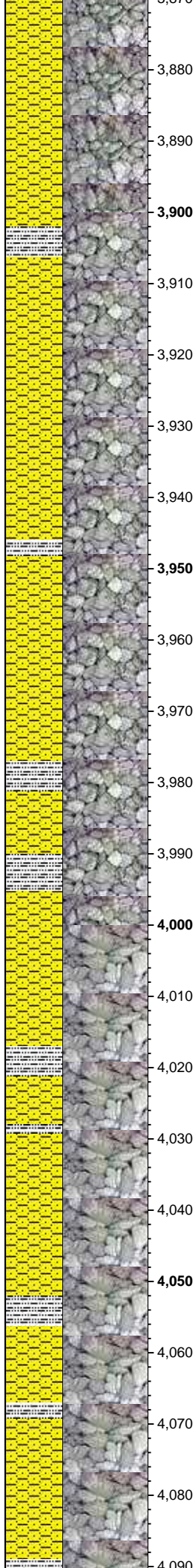
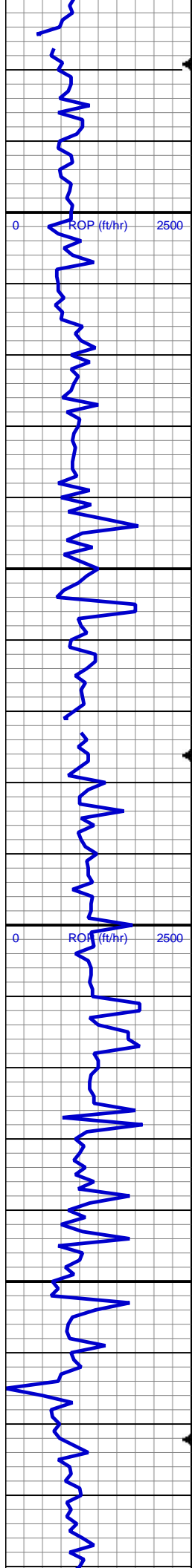
mod md, p srt, p por, arg cmt, occ glau,
tr lith frag
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt

MD: 3,727'
TVD: 3,726.8'
Inclination: 0.28 °
Azimuth: 48.29 °
VS: -22.84'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt

MD: 3,822'
TVD: 3,821.79'
Inclination: 0.36 °
Azimuth: 43.49 °
VS: -22.48'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt, rr pyr



MD: 3,916'
TVD: 3,915.79'
Inclination: 0.19 °
Azimuth: 20.31 °
VS: -22.13'

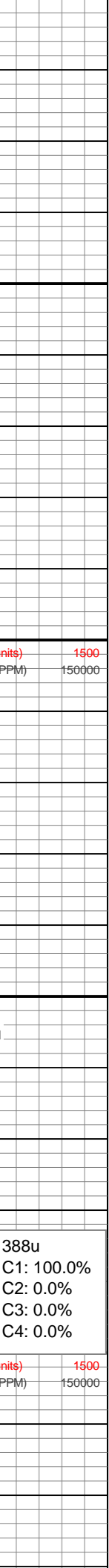
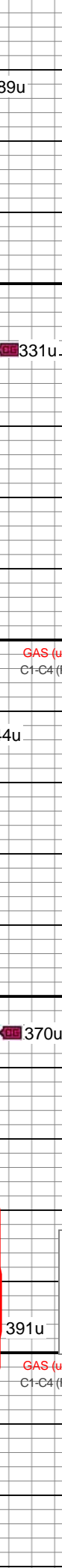
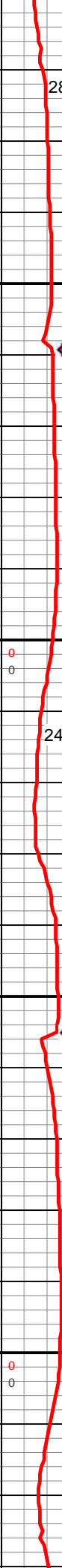
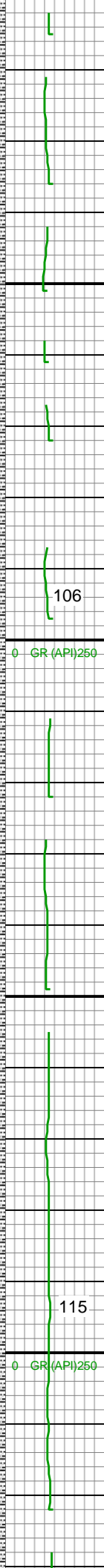
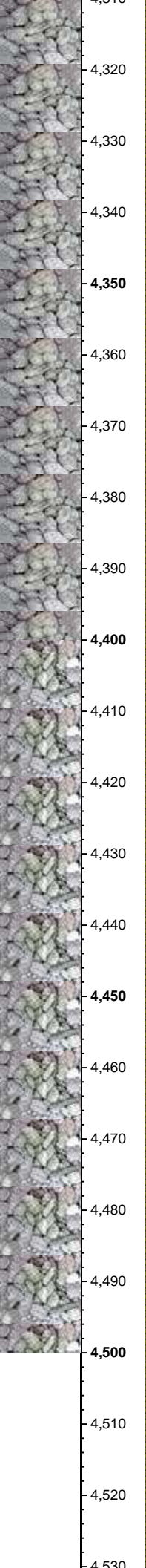
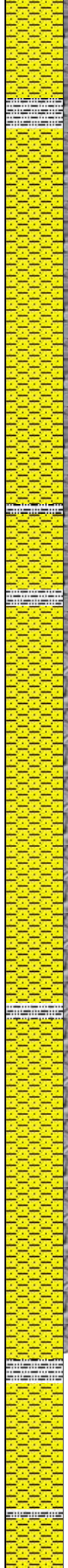
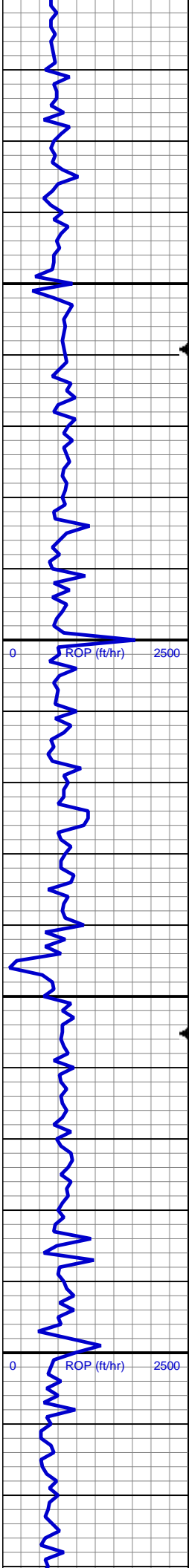
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkgy-sb plty, v sft,
silty tex, arg cmt, rr pyr

MD: 4,011'
TVD: 4,010.79'
Inclination: 1.08 °
Azimuth: 350.49 °
VS: -21.1'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkgy-sb plty, v sft,
silty tex, arg cmt, rr pyr

255u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

306u
C1: 100.0%
C2: 0.0%



289u

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt

MD: 4,391'
TVD: 4,390.66'
Inclination: 2.06 °
Azimuth: 323.44 °
VS: -12.43'

GR (API) 250 0 0 GAS (units) 1500
C1-C4 (PPM) 150000

244u

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt

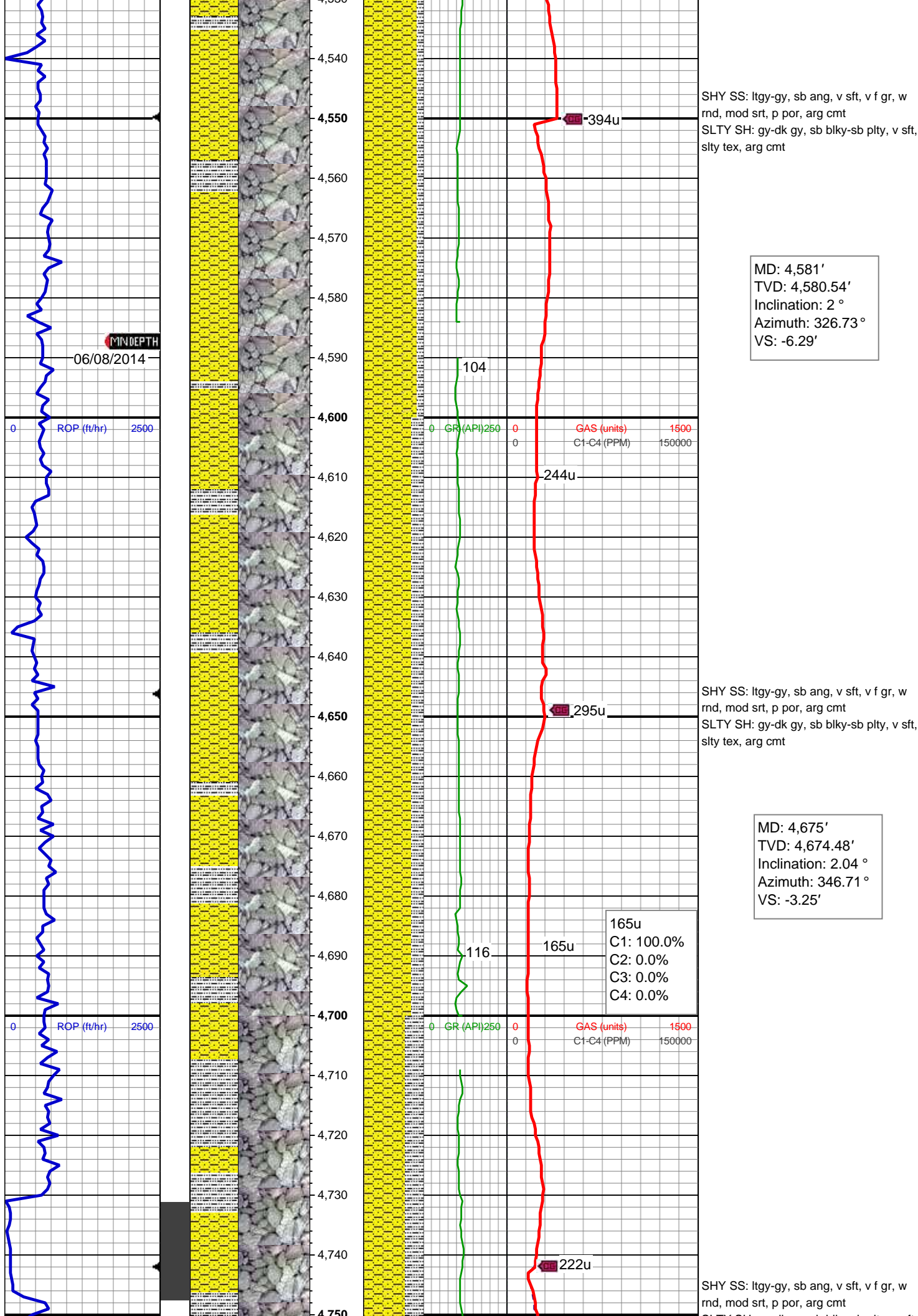
MD: 4,486'
TVD: 4,485.6'
Inclination: 2.14 °
Azimuth: 337.44 °
VS: -9.36'

GR (API) 250 0 0 GAS (units) 1500
C1-C4 (PPM) 150000

388u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

391u

115



SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkgy-sb plty, v sft,
sly tex, arg cmt

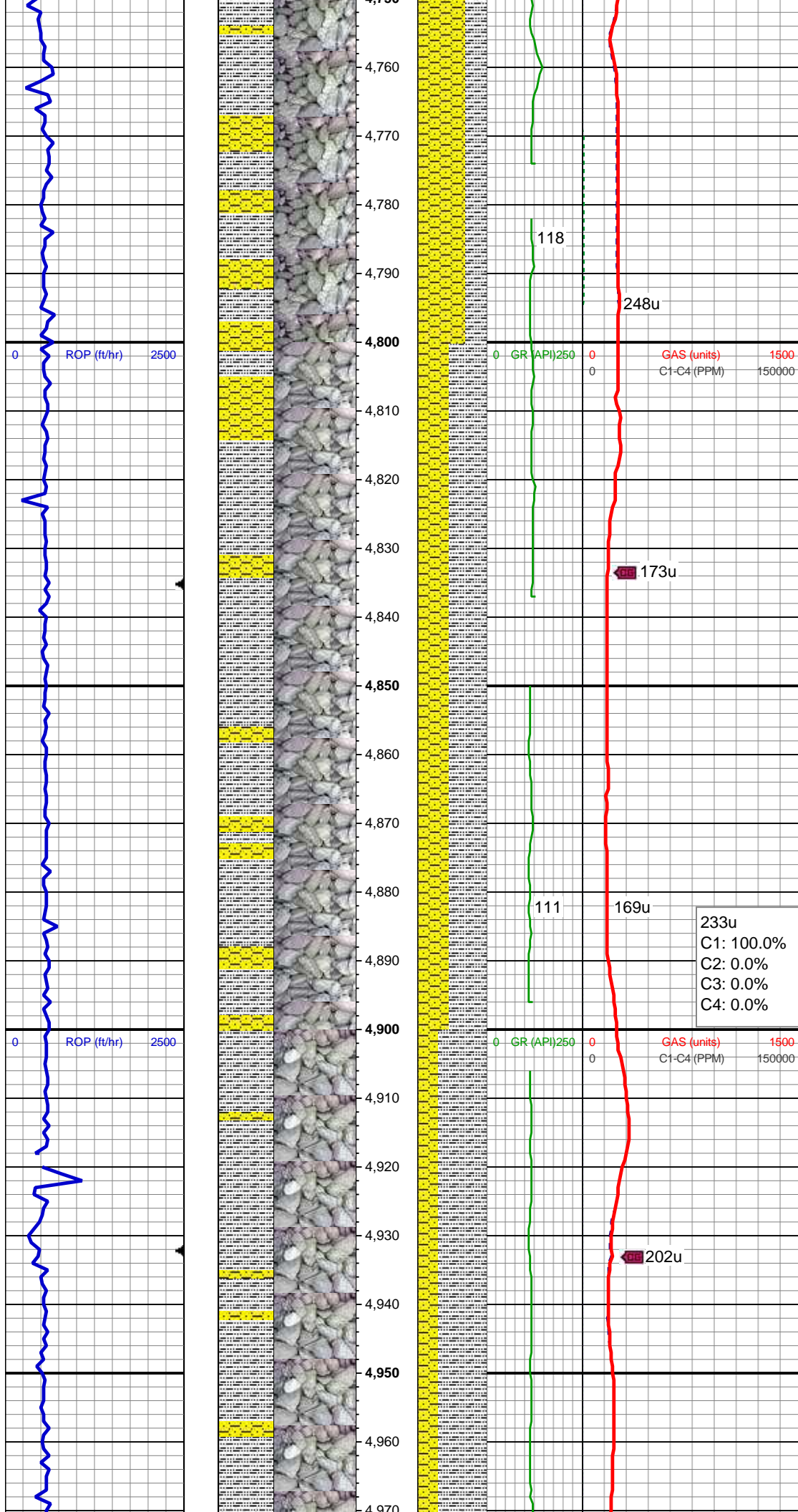
MD: 4,581'
TVD: 4,580.54'
Inclination: 2 °
Azimuth: 326.73 °
VS: -6.29'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkgy-sb plty, v sft,
sly tex, arg cmt

MD: 4,675'
TVD: 4,674.48'
Inclination: 2.04 °
Azimuth: 346.71 °
VS: -3.25'

165u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt



SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt

WT IN 9.50+/- OUT 9.50+
VIS IN 37/ OUT 37

MD: 4,770'
TVD: 4,769.44'
Inclination: 0.96 °
Azimuth: 353.31 °
VS: -0.8'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt, rr pyr

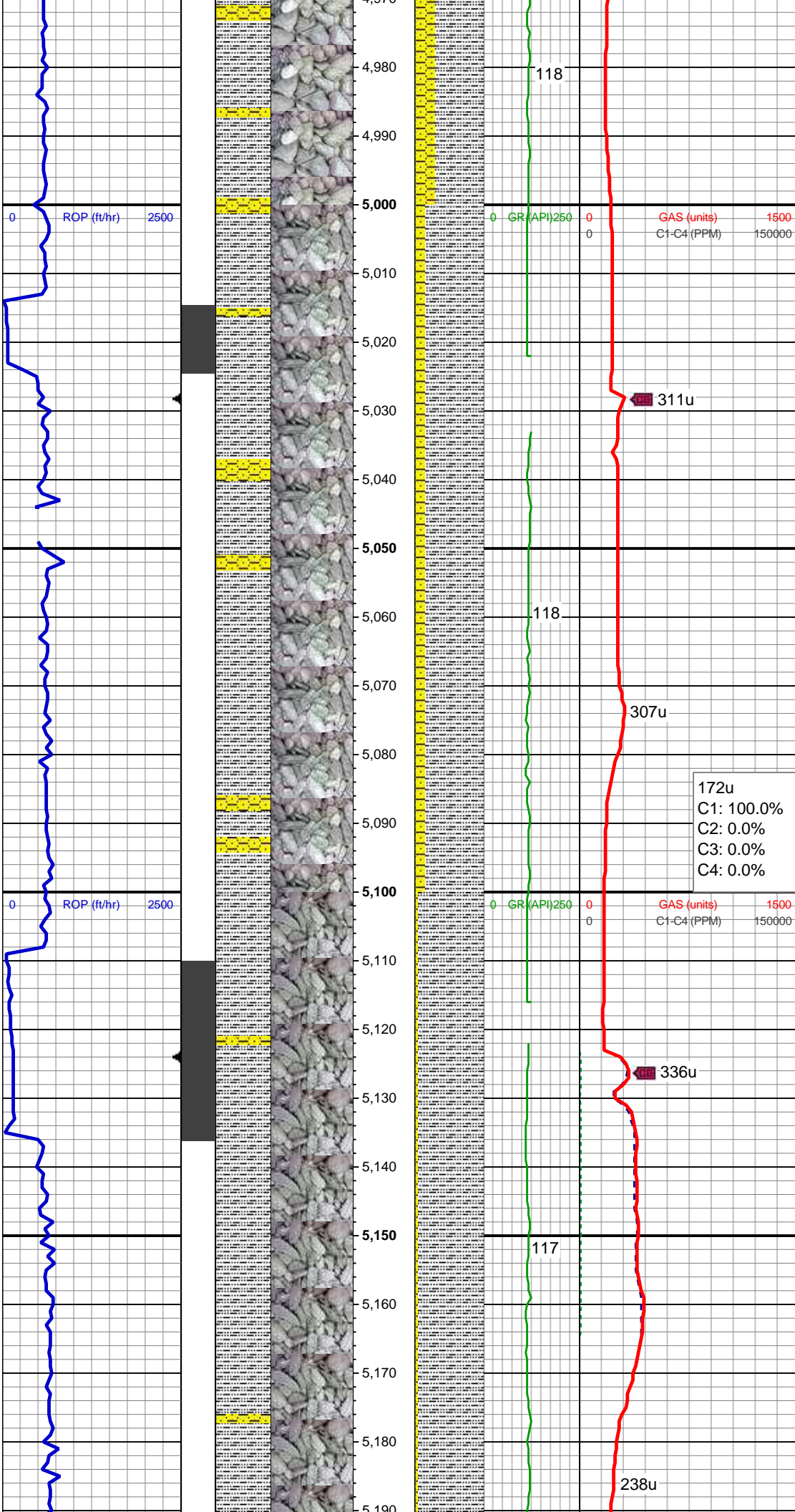
MD: 4,865'
TVD: 4,864.43'
Inclination: 0.99 °
Azimuth: 336.52 °
VS: 0.76'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt, rr pyr

MD: 4,960'
TVD: 4,959.42'
Inclination: 1.05 °
Azimuth: 332.36 °
VS: 0.81'

VS: 2.31'

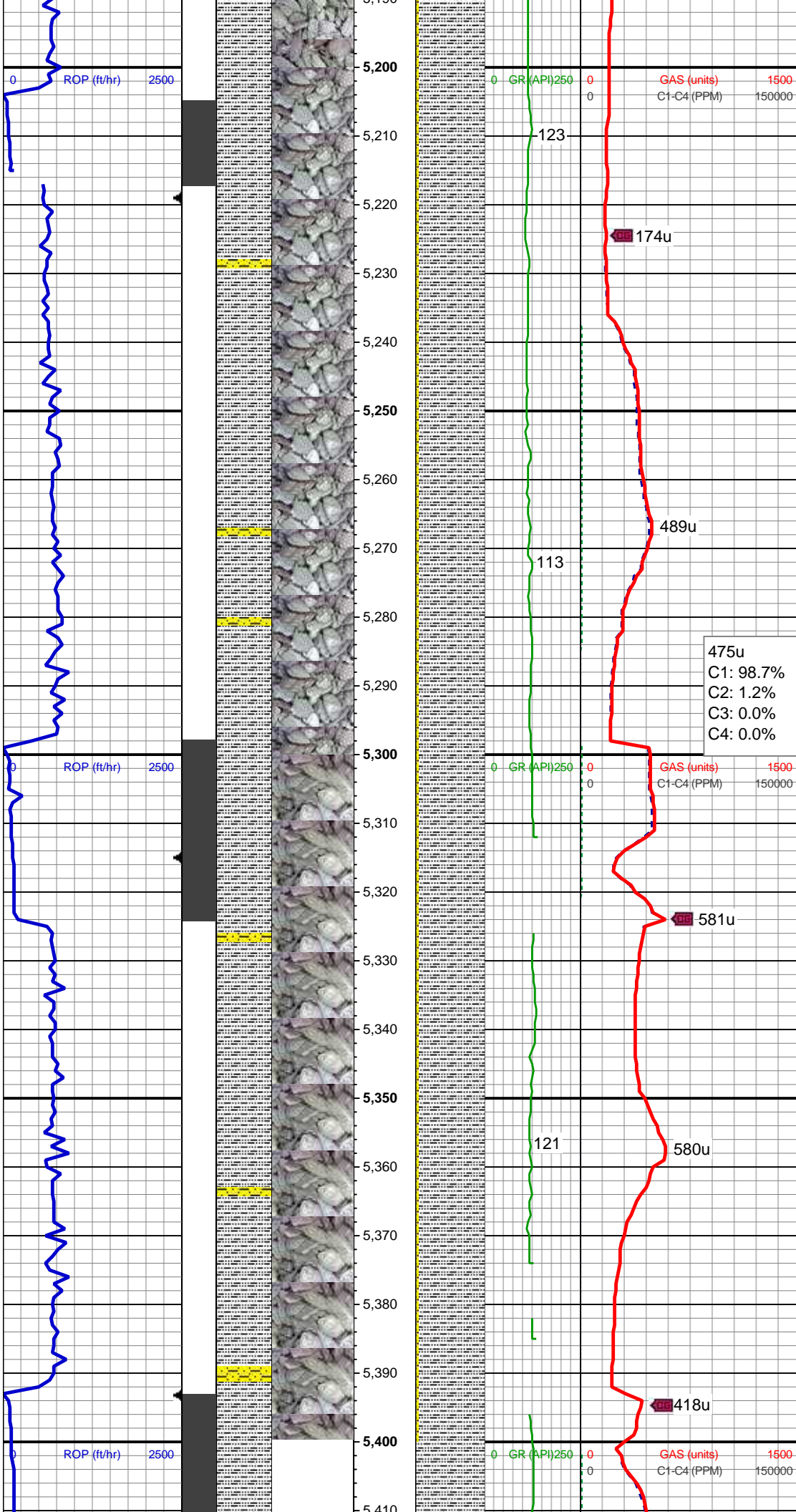


SLTY SH: gy-dk gy, sb blkgy-sb plty, v sft, slty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt

MD: 5,055'
TVD: 5,054.41'
Inclination: 0.09 °
Azimuth: 194.49 °
VS: 3.02'

MD: 5,150'
TVD: 5,149.38'
Inclination: 2.68 °
Azimuth: 257.04 °
VS: 2.52'

SLTY SH: gy-dk gy, sb blkgy-sb plty, v sft, slty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt, rr pyr



MD: 5,244'
TVD: 5,243.24'
Inclination: 3.47 °
Azimuth: 261.95 °
VS: 1.79'

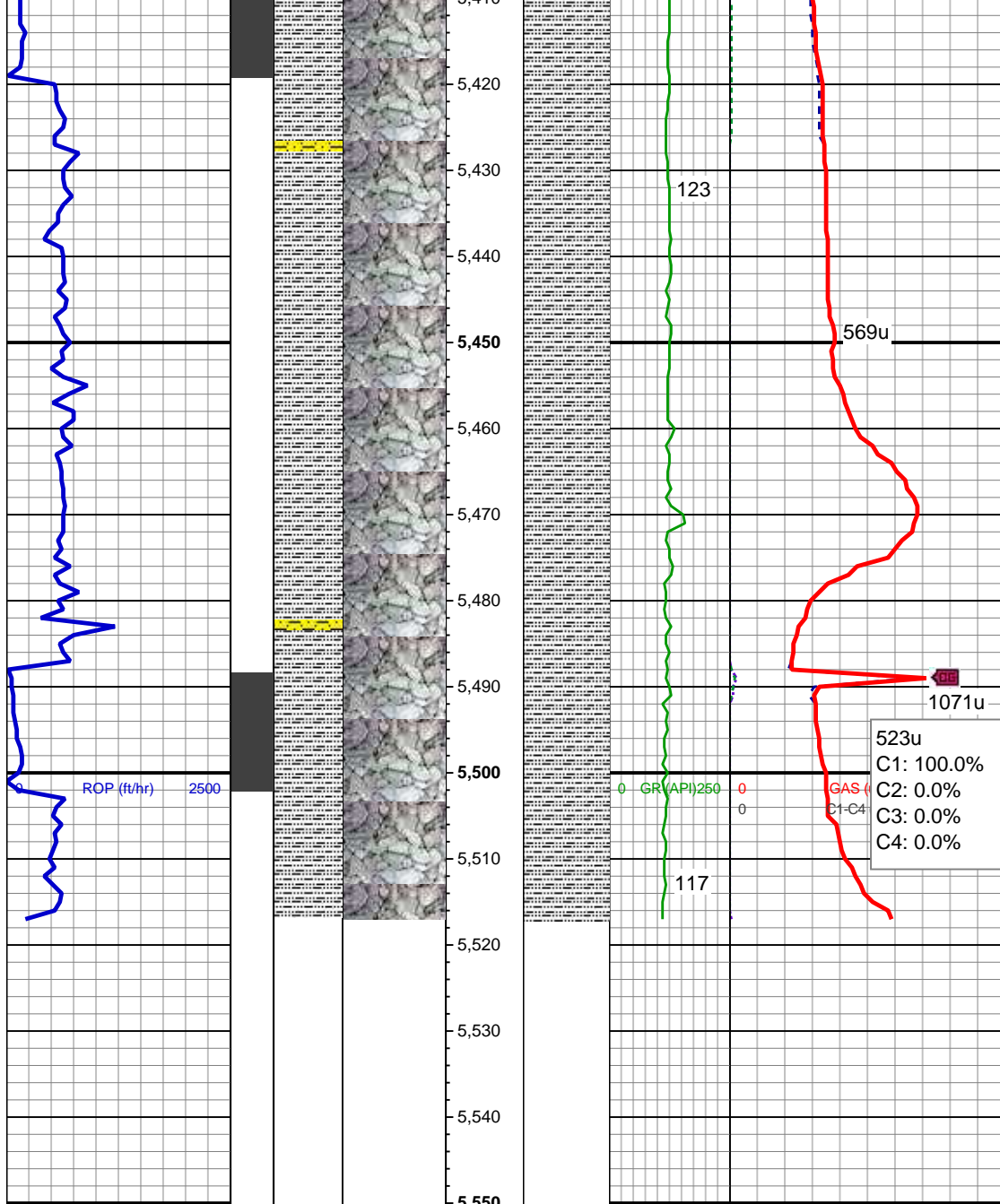
WT IN 9.90/ OUT 9.90
VIS IN 41/ OUT 41

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
slyt tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt

475u
C1: 98.7%
C2: 1.2%
C3: 0.0%
C4: 0.0%

MD: 5,339'
TVD: 5,337.96'
Inclination: 5.31 °
Azimuth: 258.65 °
VS: 0.76'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
slyt tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt



WT IN 10.00/ OUT 10.00
VIS IN 43/ OUT 43

MD: 5,434'
TVD: 5,432.41'
Inclination: 6.93 °
Azimuth: 264.74 °
VS: -0.3'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt, tr shy ss

WT IN 10.00/ OUT 10.00
VIS IN 43/ OUT 46

523u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

TD @ 5517' MD
06/08/2014 @ 04:13 PM

LOG CONTINUES ON MPlot
"TINA LC29-75-1HNA HORZ"