

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name 70 Ranch 04-63-03-4956CH

Operator

Company Bill Barrett Corporation

Geologist

Name John Roesink

Company Bill Barrett Corporation

Address 1099 18th St., Ste. 2300
Denver, CO 80202

Rock Types

UNKNOWN	COAL	METAMORPHIC	SHALY SILTSTONE
ANHYDRITE	CONGLOMERATE	NO SAMPLE	SILTSTONE
BENTONITE	DOLOMITE	SALT	SILTY SHALE
BRECCIA	GRANITE	SALT- PEPPER SAND	TILL
CEMENT	GYPSUM	SANDSTONE	TUFF
CHALK	IGNEOUS	SHALE	WELDED TUFF
CHERT	LIMESTONE	SHALE COLORED	
CLAY CHOKE SAND	SIDERITE or LIMONITE	SHALE GRAY	
CLAYSTONE	MARLSTONE	SHALY SANDSTONE	

Accessories

Fossils

ALGAE
 AMPHIPORA
 BELEMNITE
 BIOCLASTIC
 BRACHIOIPOD
 BRYOZOA
 CEPHALOPOD
 CORAL
 CRINOID
 ECHINOID
 FISH
 FORAMINIFERA

Fossils

GASTROPOD
 INOCERAMUS
 OOLITE
 OSTRACOD
 PELECYPOD
 PELLET
 PISOLITE
 PLANT REMAINS
 PLANT SPORES
 SCAPHOPOD
 STROMATOPOROID

Minerals

Accessories

ANHYDRITIC
 ARGILLACEOUS
 ARGILLITE GRAIN
 BENTONITE
 BITUMENOUS SUBSTANCE
 BRECCIA FRAGMENTS
 CALCAREOUS
 CARBONACEOUS FLAKES
 CHTDK
 CHTLT
 COAL - THIN BEDS
 DOLOMITIC
 FELDSPAR
 FERRUGINOUS PELLET

Accessories

FERRUGINOUS
 GLAUCONITE
 GYPSIFEROUS
 HEAVY MINERAL
 KAOLIN
 MARLSTONE
 MINERAL CRYSTALS
 NODULES
 PHOSPHATE PELLETS
 PYRITE
 SALT CAST
 SANDY
 SILICEOUS
 SILTY

Accessories

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

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

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

- MOLDIC
- ORGANIC
- P 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

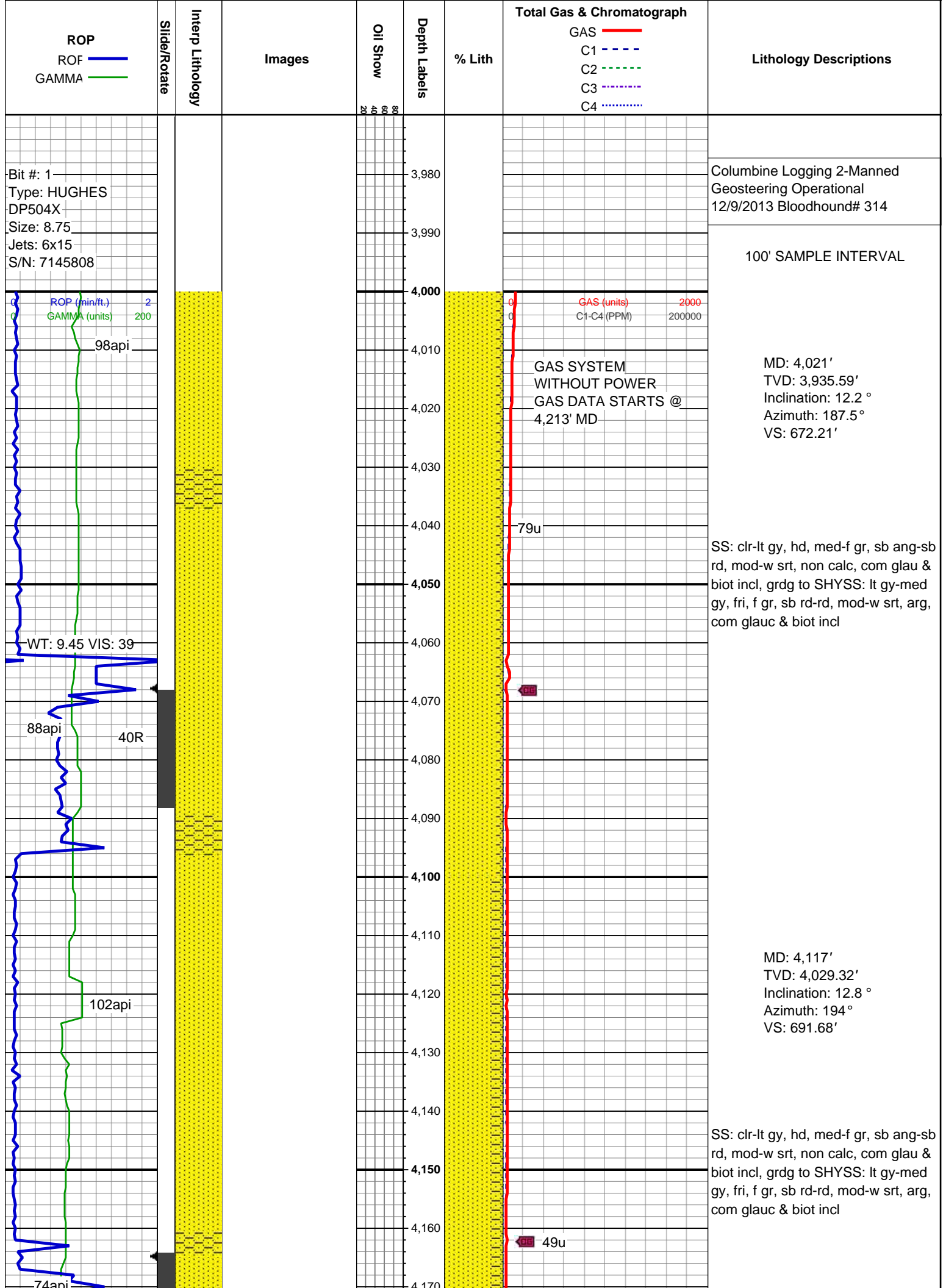
Textures

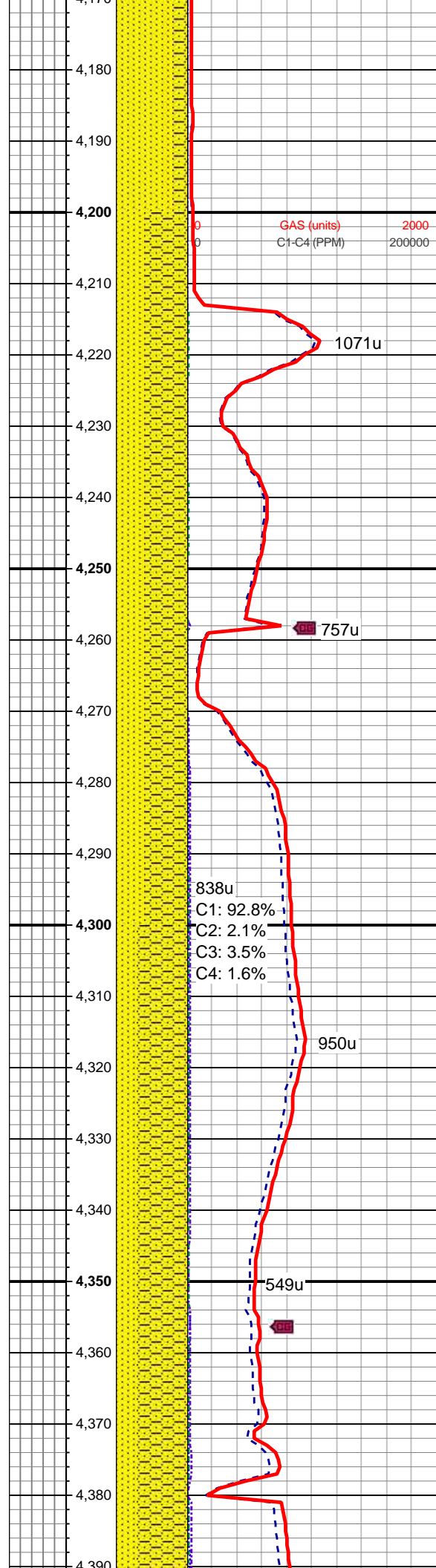
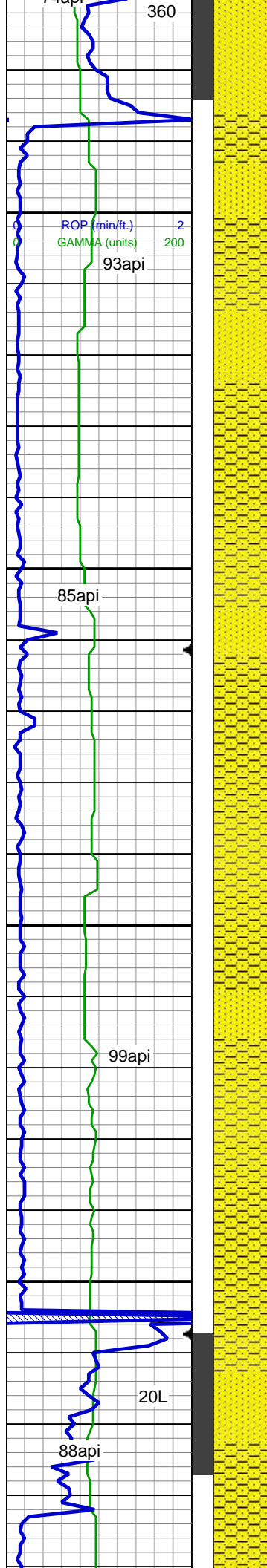
- BOUNDSTONE
- CHALKY
- CRYPTOXLN

- E EARTHY
- FX FINELYXLN
- GS GRAINSTONE
- L LITHOGRAPHIC
- MX MICROXLN
- MS MUDSTONE
- PS PACKSTONE
- WS WACKESTONE

Sorting

- M MODERATE
- P POOR
- W WELL



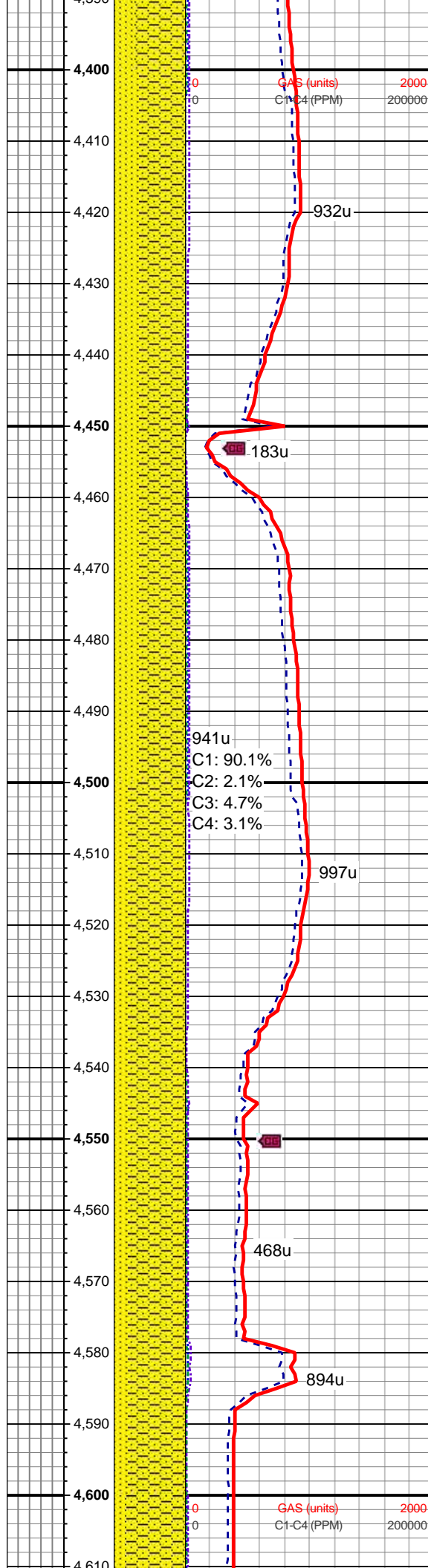
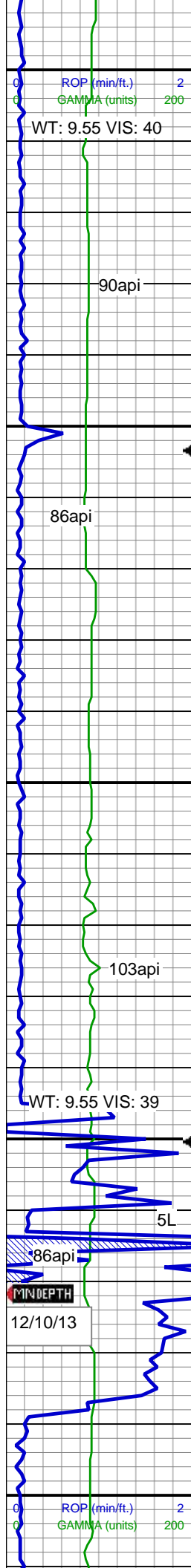


MD: 4,214'
TVD: 4,123.64'
Inclination: 14.2 °
Azimuth: 193.1 °
VS: 712.54'

SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau & biot incl, grdg to SHYSS: lt gy-med gy, fri, f gr, sb rd-rd, mod-w srt, arg, com glauc & biot incl

MD: 4,310'
TVD: 4,216.81'
Inclination: 13.7 °
Azimuth: 193.1 °
VS: 733.92'

SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau & biot incl, grdg to SHYSS: lt gy-med gy, fri, f gr, sb rd-rd, mod-w srt, arg, com glauc & biot incl



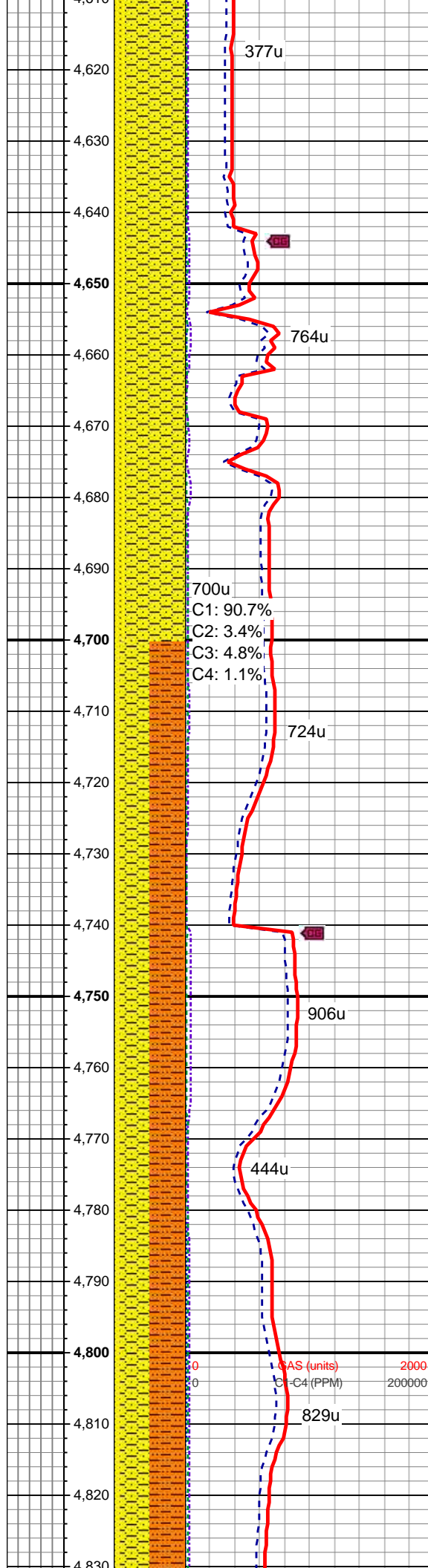
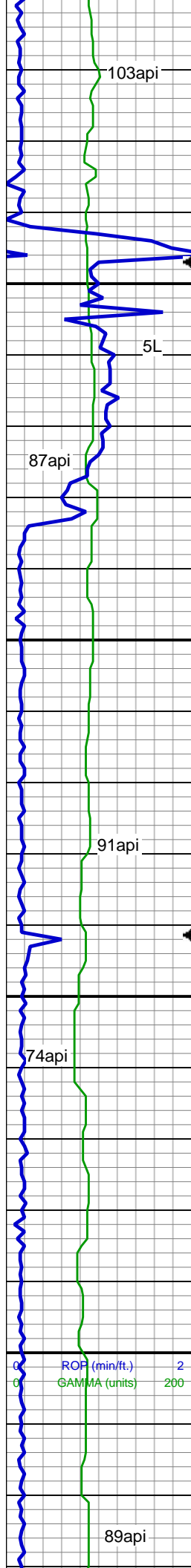
MD: 4,406'
TVD: 4,310.08'
Inclination: 13.7 °
Azimuth: 189.4 °
VS: 755.19'

SS: clr-lt gy, hd, med-f gr, sb ang-sb
rd, mod-w srt, non calc, com glau &
biot incl, grdg to SHYSS: lt gy-med
gy, fri, f gr, sb rd-rd, mod-w srt, arg,
com glauc & biot incl

MD: 4,503'
TVD: 4,404.64'
Inclination: 12 °
Azimuth: 189.8 °
VS: 775.59'

SS: clr-lt gy, hd, med-f gr, sb ang-sb
rd, mod-w srt, non calc, com glau &
biot incl, grdg to SHYSS: lt gy-med
gy, fri, f gr, sb rd-rd, mod-w srt, arg,
com glauc & biot incl

MD: 4,599'
TVD: 4,498.48'
Inclination: 12.4 °
Azimuth: 187.3 °
VS: 794.89'

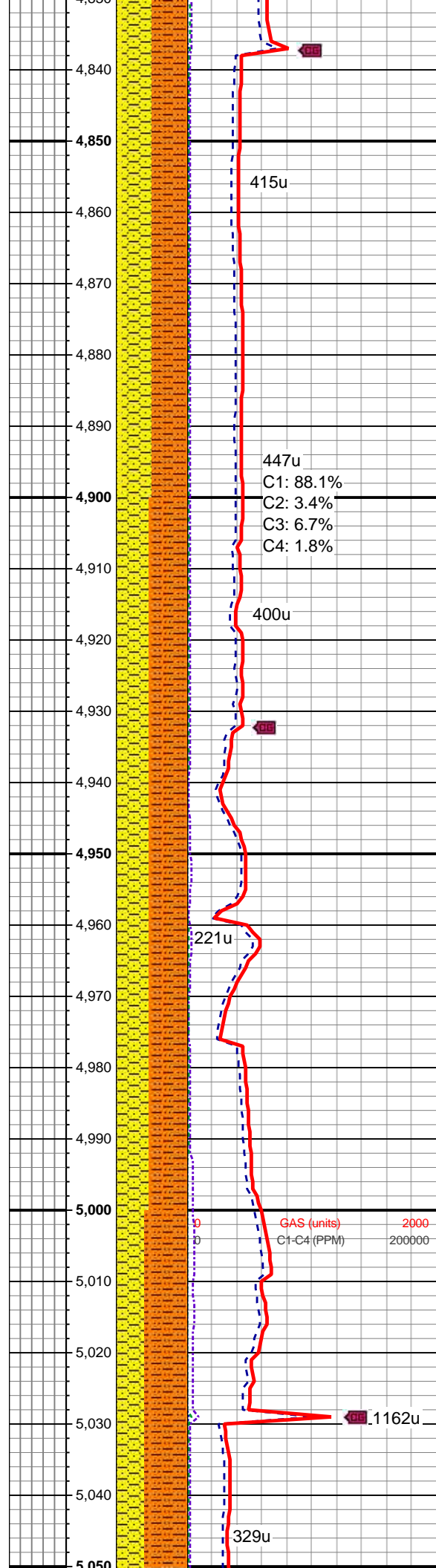
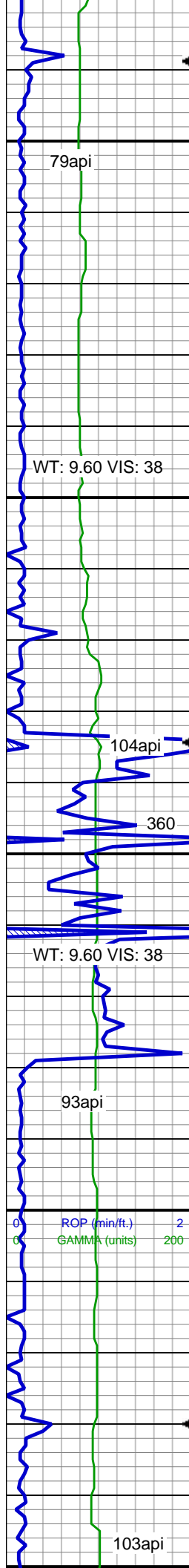


SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau & biot incl, grdg to SHYSS: lt gy-med gy, fri, f gr, sb rd-rd, mod-w srt, arg, com glauc & biot incl

MD: 4,695'
TVD: 4,591.96'
Inclination: 13.9 °
Azimuth: 185.5 °
VS: 815.91'

SHY SLTST: gy-dk gy, firm-hd, blk-y-sb bloky, occ sb blk-y-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f gr, sb rd-rd, mod-w srt, arg, com glauc incl, SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau incl

MD: 4,791'
TVD: 4,685.21'
Inclination: 13.6 °
Azimuth: 185.2 °
VS: 837.98'



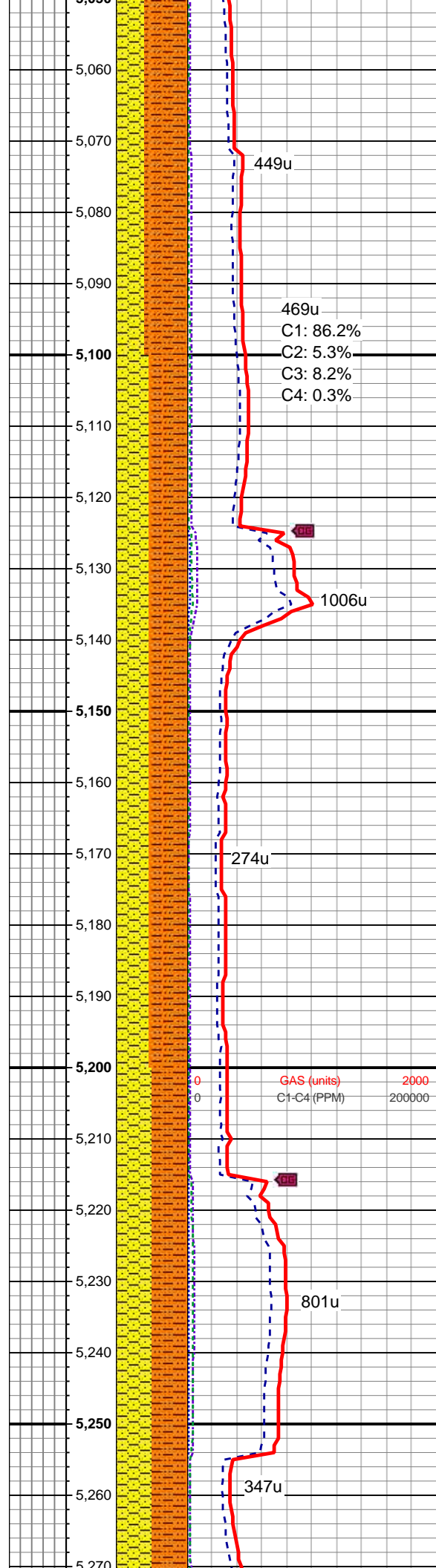
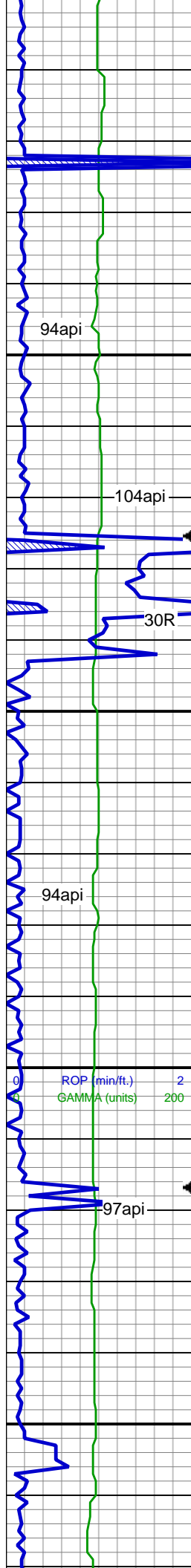
SHY SLTST: gy-dk gy, firm-hd, blk-y-sb bloky, occ sb blk-y-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f gr, sb rd- rd, mod-w srt, arg, com glauc incl, SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau incl

MD: 4,887'
TVD: 4,778.71'
Inclination: 12.6 °
Azimuth: 185 °
VS: 859.04'

SHY SLTST: gy-dk gy, firm-hd, blk-y-sb bloky, occ sb blk-y-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f gr, sb rd- rd, mod-w srt, arg, com glauc incl, SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau incl

MD: 4,983'
TVD: 4,872.32'
Inclination: 13 °
Azimuth: 182 °
VS: 879.77'

SHY SLTST: gy-dk gy, firm-hd, blk-y-sb bloky, occ sb blk-y-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f



gr, sb rd- rd, mod-w srt, arg, com
glauc incl, SS: clr-lt gy, hd, med-f gr,
sb ang-sb rd, mod-w srt, non calc,
com glau incl

MD: 5,078'
TVD: 4,965.44'
Inclination: 9.8 °
Azimuth: 181.8 °
VS: 898.18'

449u
469u
C1: 86.2%
C2: 5.3%
C3: 8.2%
C4: 0.3%

1006u

274u

801u

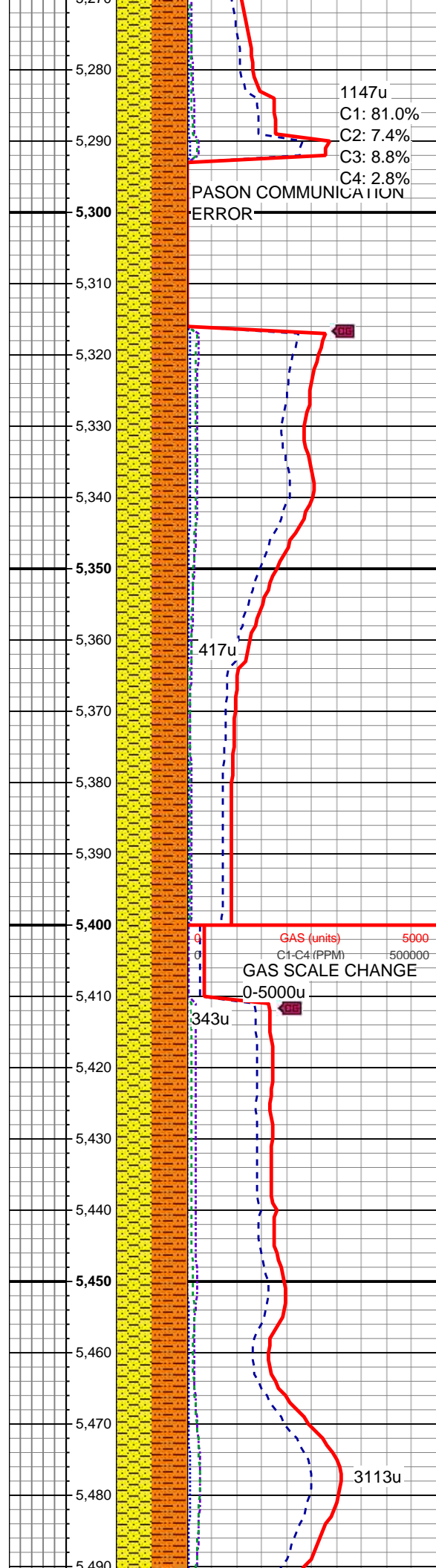
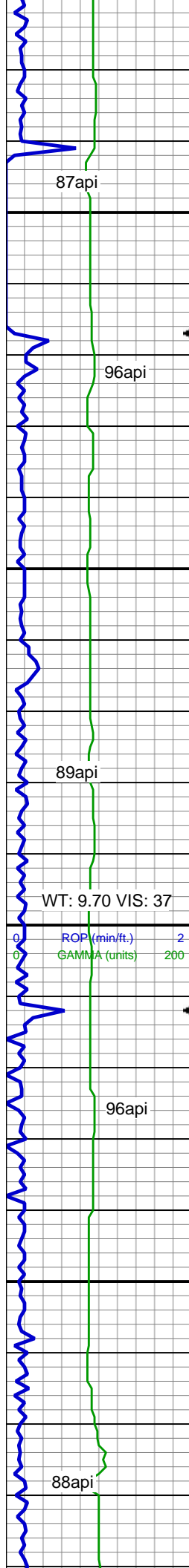
347u

SHY SLTST: gy-dk gy, firm-hd,
blky-sb bloky, occ sb blky-sb plty,
gr-rthy, occ sd, non calc, qtz gr, occ
cmt, arg, SHYSS: lt gy-med gy, fri, f
gr, sb rd- rd, mod-w srt, arg, com
glauc incl, SS: clr-lt gy, hd, med-f gr,
sb ang-sb rd, mod-w srt, non calc,
com glau incl

MD: 5,174'
TVD: 5,060.13'
Inclination: 9.1 °
Azimuth: 186.1 °
VS: 913.52'

SHY SLTST: gy-dk gy, firm-hd,
blky-sb bloky, occ sb blky-sb plty,
gr-rthy, occ sd, non calc, qtz gr, occ
cmt, arg, SHYSS: lt gy-med gy, fri, f
gr, sb rd- rd, mod-w srt, arg, com
glauc incl, SS: clr-lt gy, hd, med-f gr,
sb ang-sb rd, mod-w srt, non calc,
com glau incl

MD: 5,270'
TVD: 5,155.17'
Inclination: 7.1 °



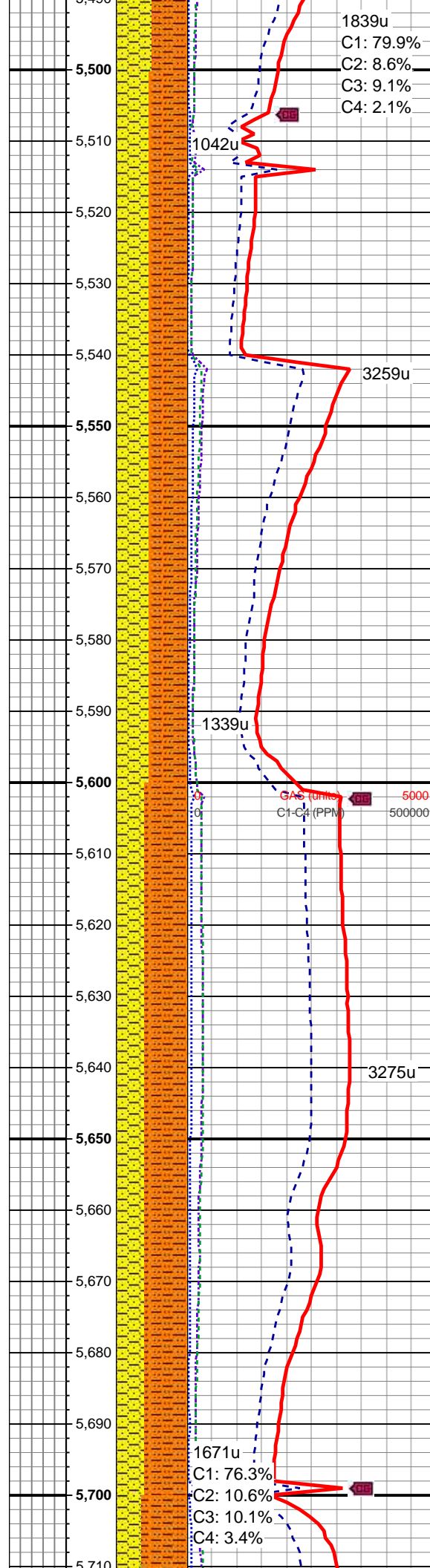
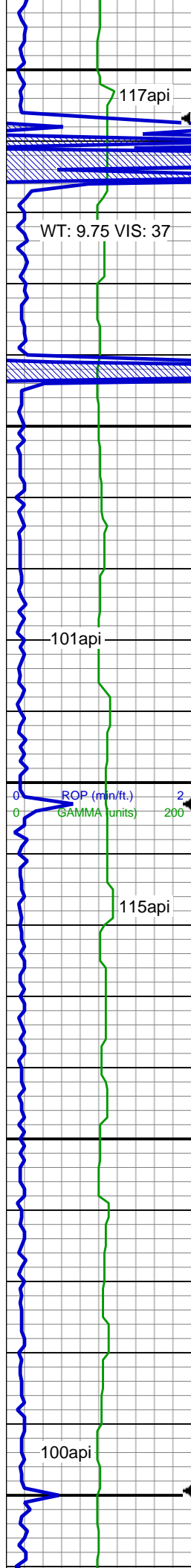
Inclination: 7.1°
Azimuth: 185°
VS: 926.58'

SHY SLTST: gy-dk gy, firm-hd, blky-sb bloky, occ sb blky-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f gr, sb rd- rd, mod-w srt, arg, com glauc incl, SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau incl

MD: 5,366'
TVD: 5,250.59'
Inclination: 5.5°
Azimuth: 184.8°
VS: 936.79'

SHY SLTST: gy-dk gy, firm-hd, blky-sb bloky, occ sb blky-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f gr, sb rd- rd, mod-w srt, arg, com glauc incl, SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau incl

MD: 5,462'
TVD: 5,346.24'
Inclination: 4.3°
Azimuth: 182.5°
VS: 944.77'



SHY SLTST: gy-dk gy, firm-hd, blk-y-sb bloky, occ sb blk-y-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f gr, sb rd- rd, mod-w srt, arg, com glauc incl, SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau incl

MD: 5,558'
TVD: 5,442.01'
Inclination: 3.6 °
Azimuth: 184 °
VS: 951.22'

SHY SLTST: gy-dk gy, firm-hd, blk-y-sb bloky, occ sb blk-y-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f gr, sb rd- rd, mod-w srt, arg, com glauc incl, SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau incl

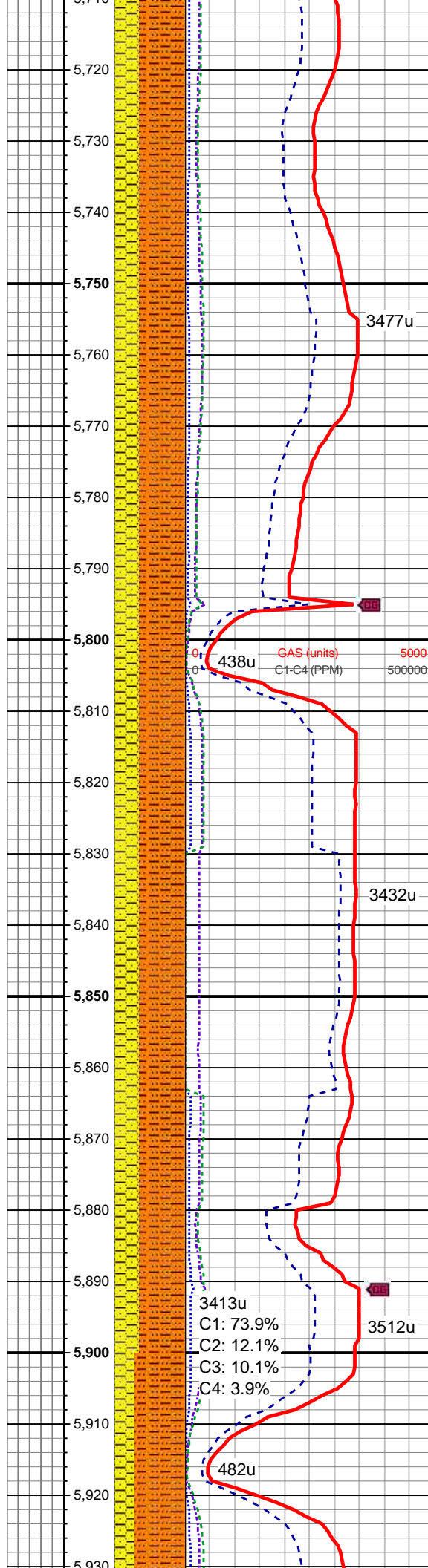
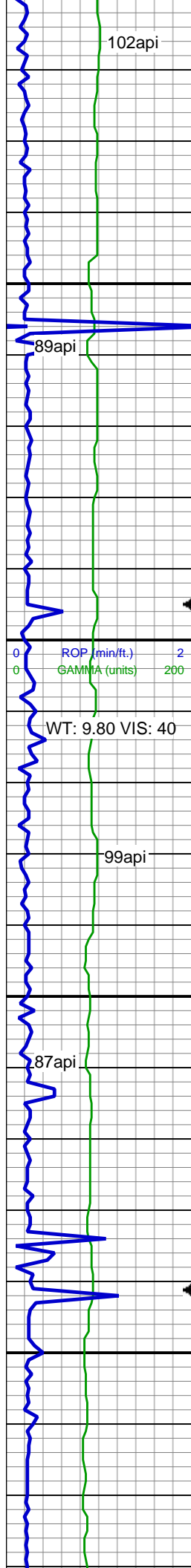
MD: 5,654'
TVD: 5,537.87'
Inclination: 2.6 °
Azimuth: 187.1 °
VS: 956.24'

C1: 76.3%

C2: 10.6%

C3: 10.1%

C4: 3.4%

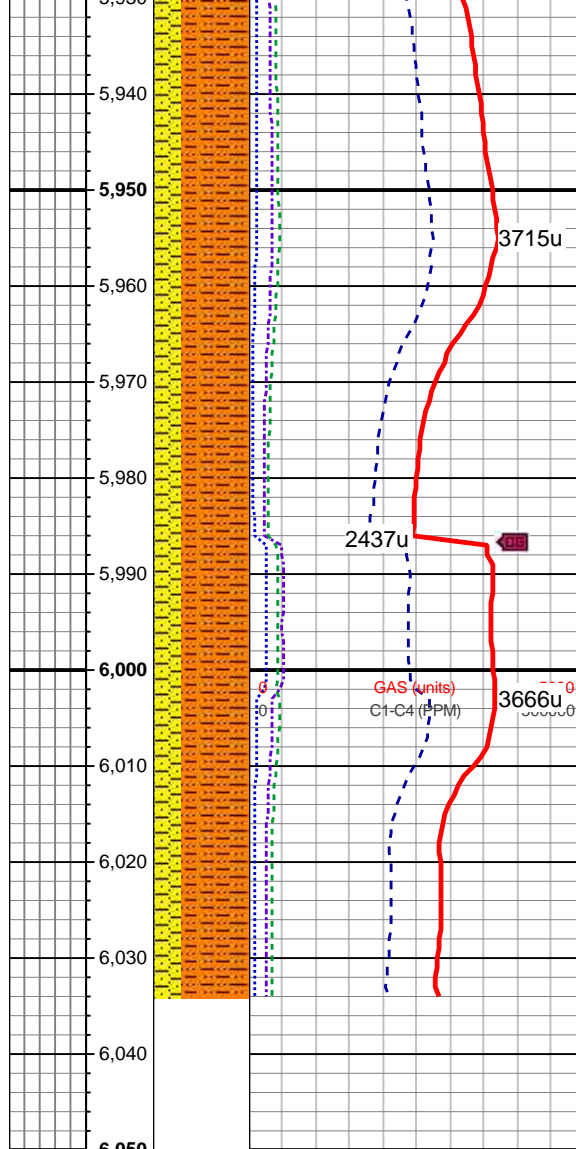
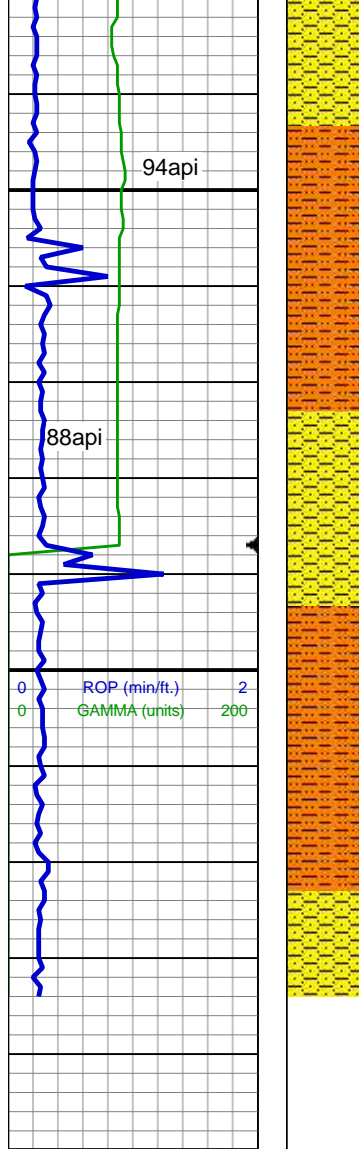


SHY SLTST: gy-dk gy, firm-hd, blky-sb bloky, occ sb blky-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f gr, sb rd- rd, mod-w srt, arg, com glauc incl, SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau incl

MD: 5,750'
TVD: 5,633.78'
Inclination: 2.2 °
Azimuth: 186.2 °
VS: 960.11'

MD: 5,844'
TVD: 5,727.73'
Inclination: 1.7 °
Azimuth: 183.1 °
VS: 963.21'

SHY SLTST: gy-dk gy, firm-hd, blky-sb bloky, occ sb blky-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f gr, sb rd- rd, mod-w srt, arg, com glauc incl, SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau incl



MD: 5,941'
TVD: 5,824.69'
Inclination: 1.2 °
Azimuth: 177.5 °
VS: 965.62'

SHY SLTST: gy-dk gy, firm-hd, blk-y-sb bloky, occ sb blk-y-sb plty, gr-rthy, occ sd, non calc, qtz gr, occ cmt, arg, SHYSS: lt gy-med gy, fri, f gr, sb rd- rd, mod-w srt, arg, com glauc incl, SS: clr-lt gy, hd, med-f gr, sb ang-sb rd, mod-w srt, non calc, com glau incl

MD: 5,987'
TVD: 5,870.69'
Inclination: 1.1 °
Azimuth: 178.7 °
VS: 966.54'