

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Heatland State H01-74-1HN

Location Sec 25, T4N, R65W

State Colorado

County WELD

Country USA

Rig Number Precision #829

API Number 05-123-39550

AFE # 200373

Region DJ BASIN

Field WATTENBERG

Spud Date 8/5/2014

Drilling Completed 8/27/2014

Surface Coordinates 282' FSL, 784' FEL
40.27673, -104.60515

Bottom Hole Coordinates 75' FSL, 1650' FEL
40.24724, -104.60842

Ground Elevation 4834'

K.B. Elevation 4850'

Logged Interval 744' To 6307'

Total Depth 17522'

Formation Niobrara B well Sidetracked to C well

Type of Drilling Fluid FW 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

FX FINELYXLN

GS GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

MS MUDSTONE

PS PACKSTONE

WS WACKSTONE

Sorting

- M MODERATE
- P POOR
- W WELL

Accessories

Fossils

- ALGAE
- AMPHIPORA

GASTROPOD

INOCERAMUS

OOLITE

OSTRACOD

ARGILLITE GRAIN

B BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

HEAVY MINERAL

K KAOLIN

MARLSTONE

MICACEOUS

ANHYDRITE STRINGER

BENTONITE STRINGER

COAL STRINGER

DOLOMITE STRINGER

BELEMNITE
BIOCLASTIC
BRACHIOPOD
BRYOZOA
CEPHALOPOD
CORAL
CRINOID
ECHINOID
FISH
FORAMINIFERA
FOSSIL

PELECYPOD
PELLET
PISOLITE
PLANT REMAINS
PLANT SPORES
SCAPHOPOD
STROMATOPOROID

Minerals

ANHYDRITIC
ARGILLACEOUS

CALCAREOUS
CARBONACEOUS FLAKES
CHTDK
CHTLT
COAL - THIN BEDS
DOLOMITIC
FELDSPAR
FERRUGINOUS PELLET
FERRUGINOUS
GLAUCONITE
GYPSIFEROUS

MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY
TUFFACEOUS

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

Other

Columbine Logging, Inc. 2385 S. Lipan St. Denver, CO 80223

Well Site Geologists Ryan Shilling Shannon Whitmore

Zone Color Coding

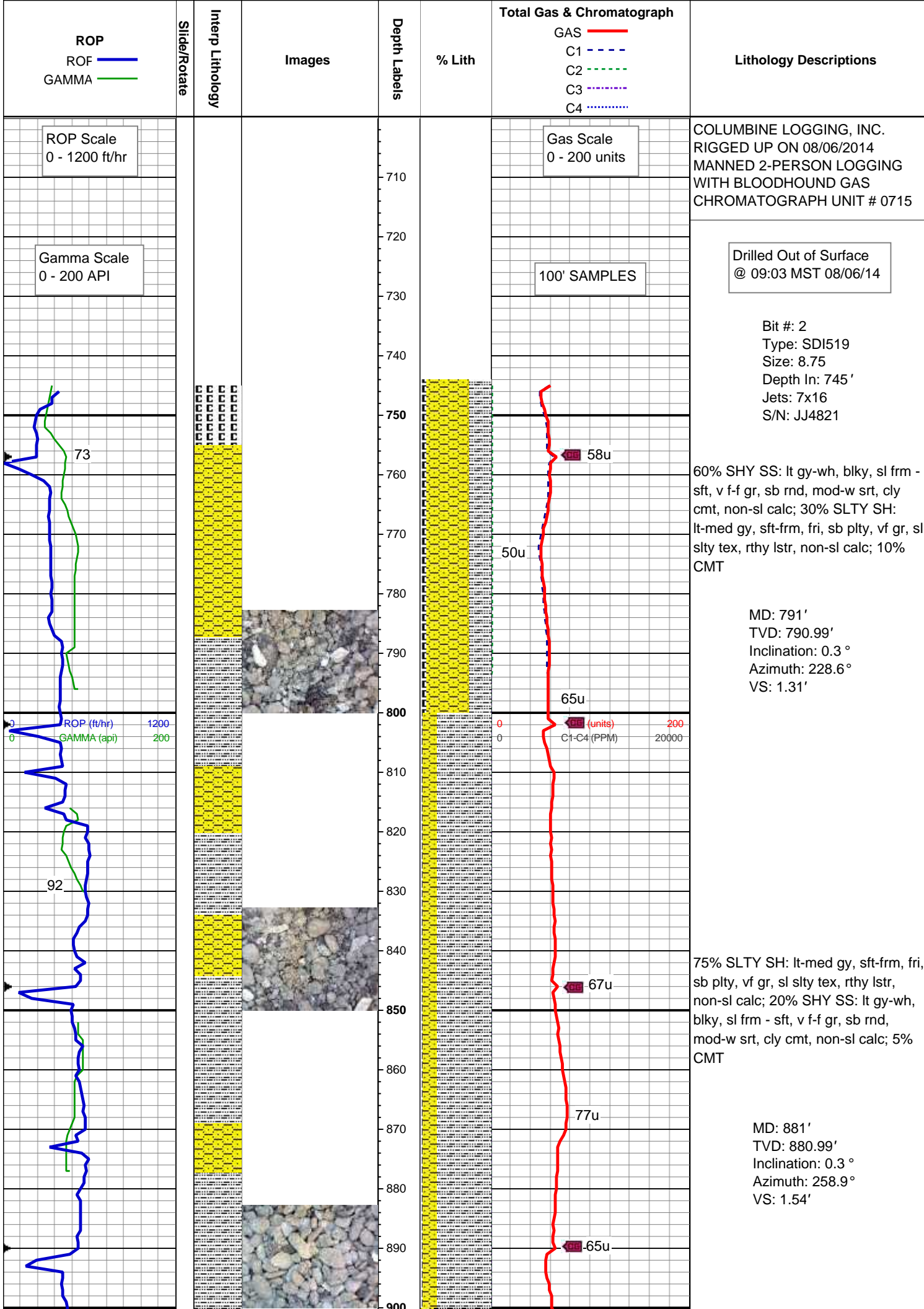
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Note
Error
Condensate
Core
Water
Gas
Pressure
Seal

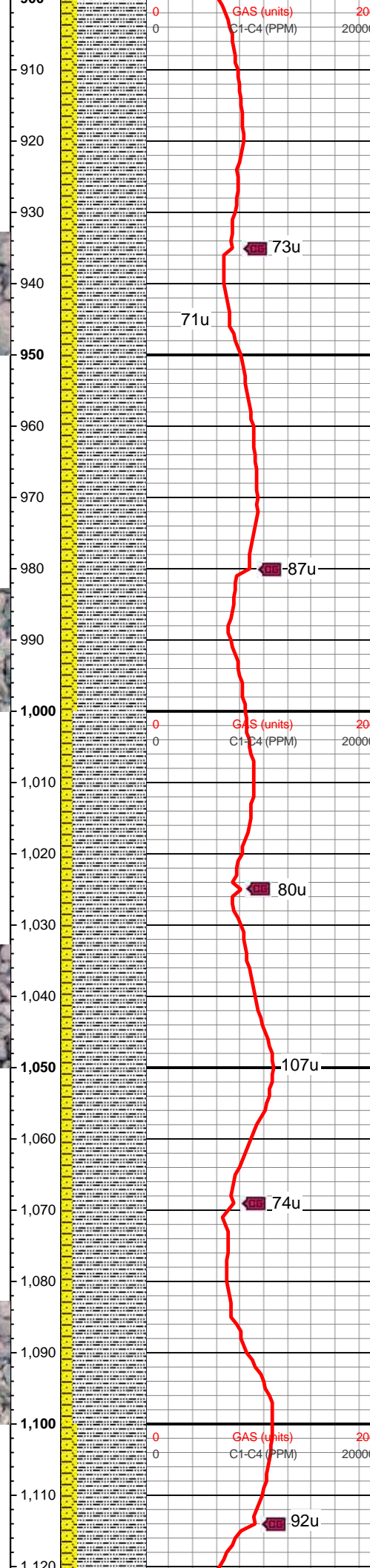
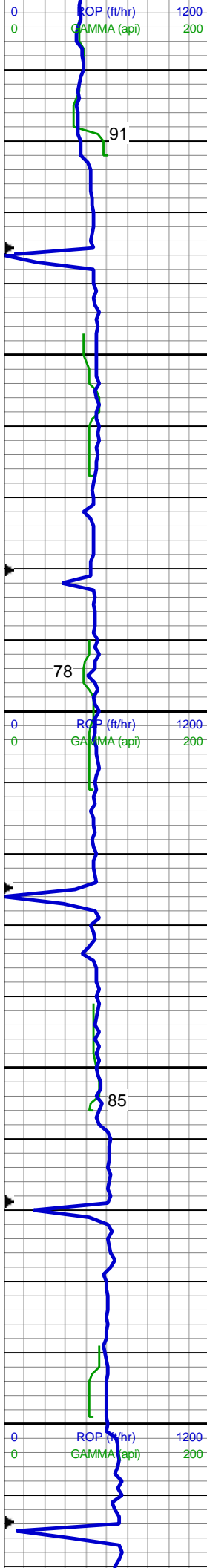
Geologist

Name Holly Duncan

Company Noble Energy, Inc.

Address 1625 BROADWAY
DENVER, CO 80202



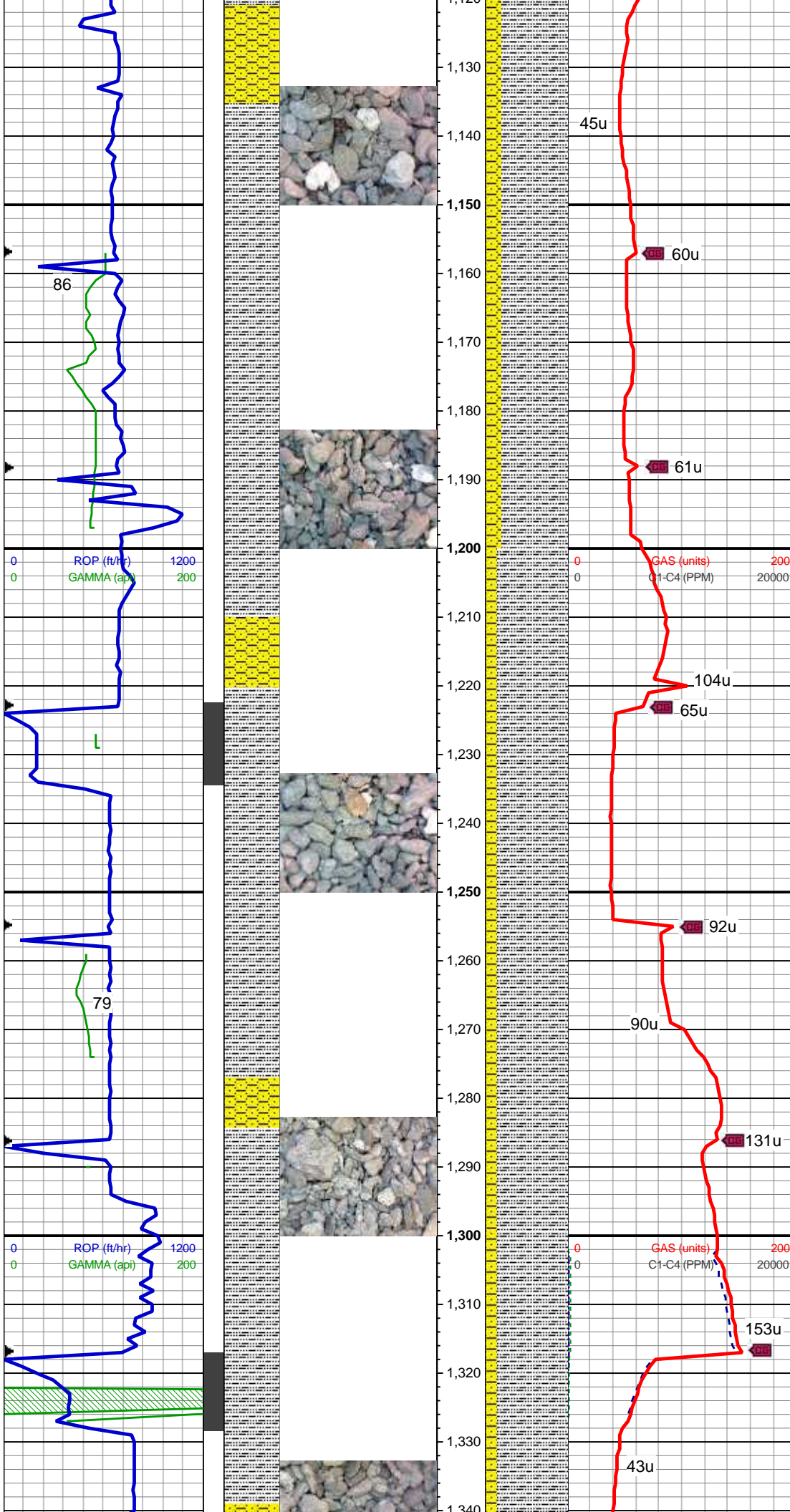


80% SLTY SH: lt-med gy, sft frm, fri, sb plty, vf gr, sl slty tex, rthy lstr, non-sl calc; 20% SHY SS: lt gy-wh, blk, sl frm - sft, v f-f gr, sb rnd, mod-w srt, cly cmt, non-sl calc

MD: 970'
TVD: 969.99'
Inclination: 0.4 °
Azimuth: 247.3 °
VS: 1.75'

85% SLTY SH: lt-med gy, sft frm, fri, sb plty, vf gr, sl slty tex, rthy lstr, non-sl calc; 15% SHY SS: lt gy-wh, blk, sl frm - sft, v f-f gr, sb rnd, mod-w srt, cly cmt, non-sl calc

MD: 1,060'
TVD: 1,059.99'
Inclination: 0.4 °
Azimuth: 250.7 °
VS: 2.01'

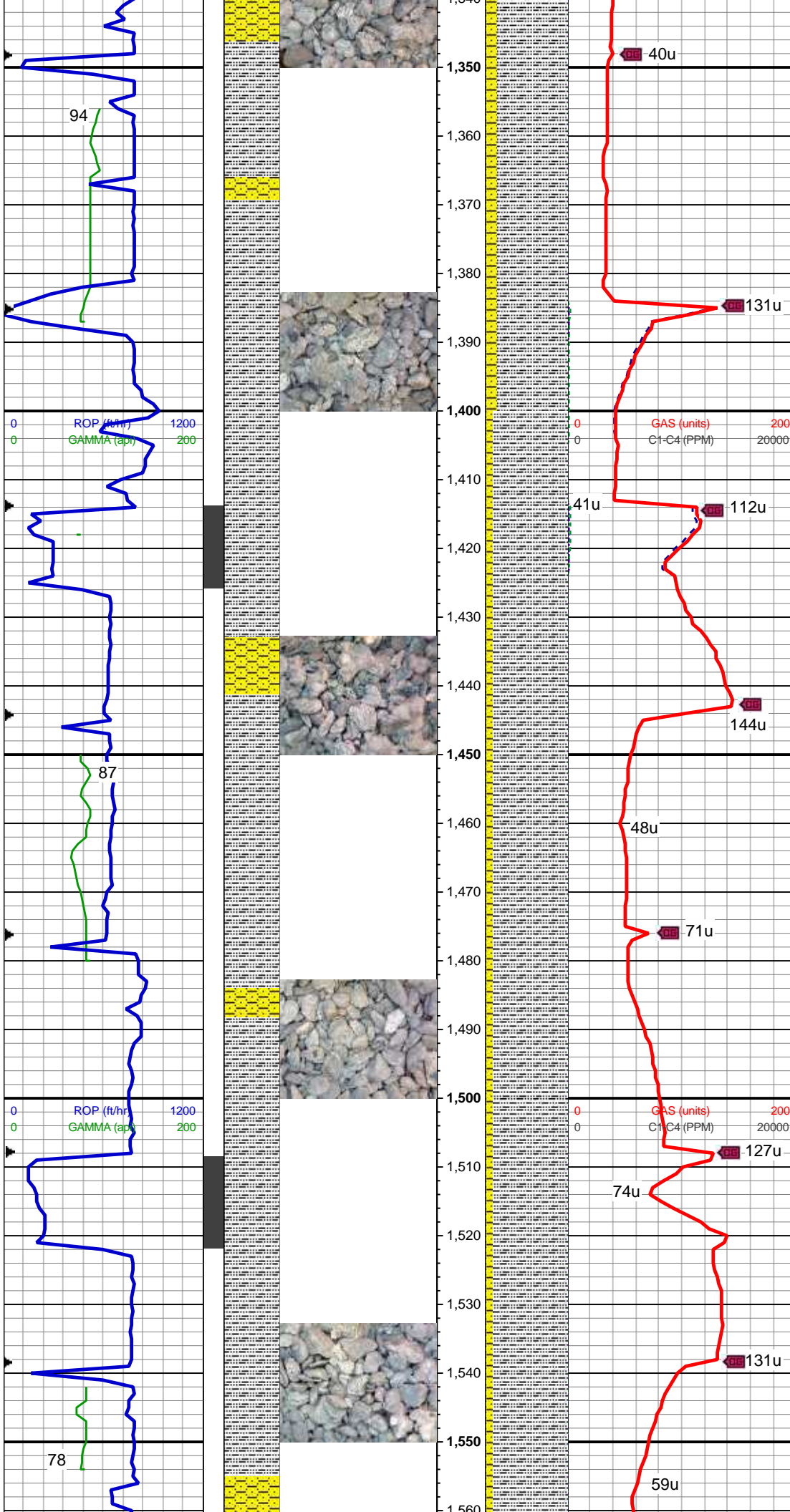


80% SLTY SH: lt-med gy, sft frm, fri, sb pty, vf gr, sl slty tex, rthy lstr, non-sl calc; 20% SHY SS: lt gy-wh, blk, sl frm - sft, v f-f gr, sb rnd, mod-w srt, cly cmt, non-sl calc

MD: 1,168'
TVD: 1,167.99'
Inclination: 0.3 °
Azimuth: 255.9°
VS: 2.25'

85% SLTY SH: lt-med gy, sft frm, fri, sb pty, vf gr, sl slty tex, rthy lstr, non-sl calc; 15% SHY SS: lt gy-wh, blk, sl frm - sft, v f-f gr, sb rnd, mod-w srt, cly cmt, non-sl calc

MD: 1,263'
TVD: 1,262.97'
Inclination: 1.7 °
Azimuth: 296°
VS: 1.81'



85% SLTY SH: lt-med gy, sft-frn, fri,
sb plty, vf gr, sl slty tex, rthy lstr,
non-sl calc; 15% SHY SS: lt gy-wh,
blky, sl frm - sft, v f-f gr, sb rnd,
mod-w srt, cly cmt, non-sl calc

MD: 1,360'
TVD: 1,359.88'
Inclination: 3.3 °
Azimuth: 309.1 °
VS: -0.32'

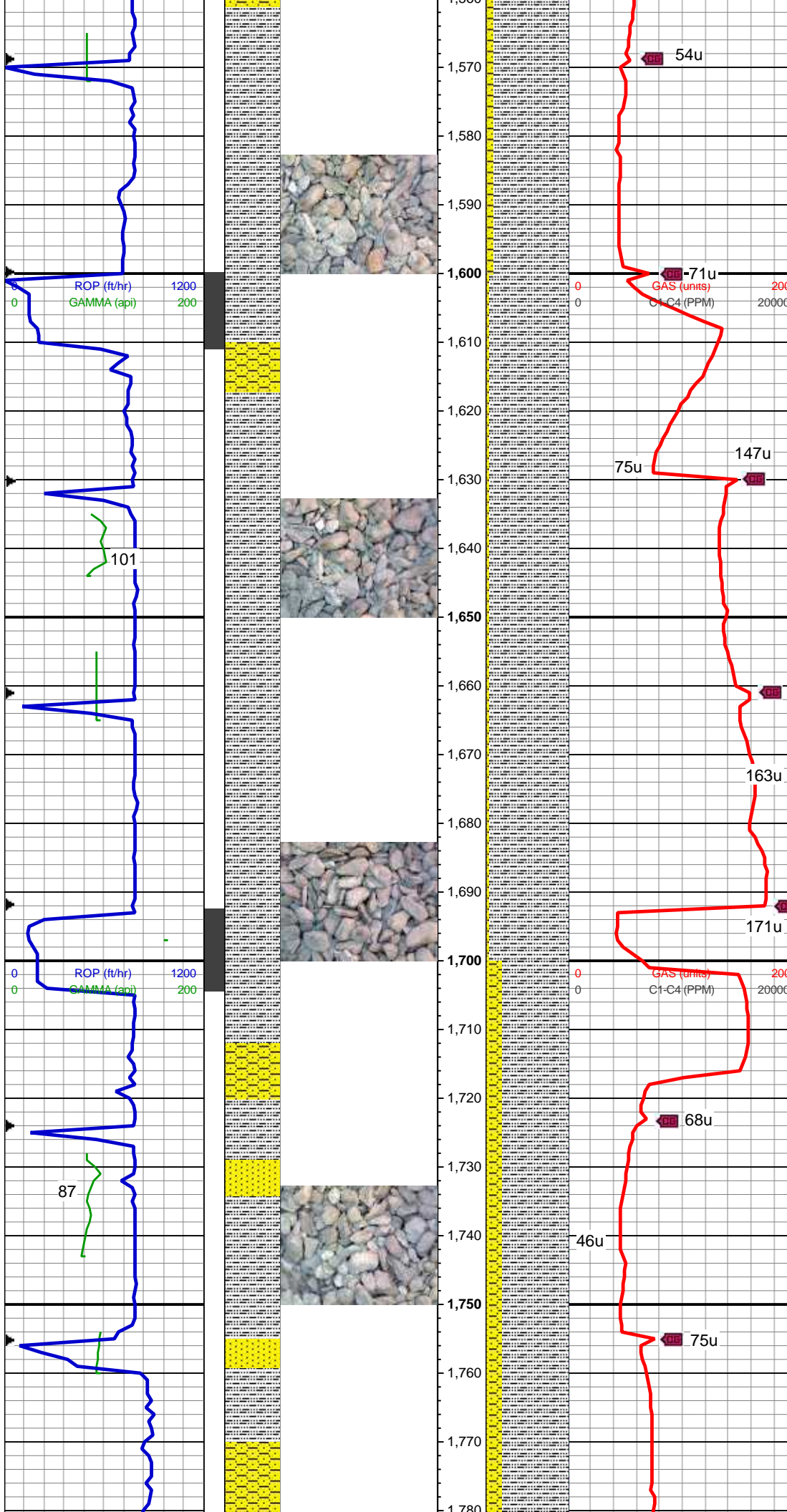
WT: 8.5 / VIS: 28

MD: 1,453'
TVD: 1,452.58'
Inclination: 5.8 °
Azimuth: 308.8 °
VS: -4.51'

90% SLTY SH: lt-med gy, sft-frn, fri,
sb plty, vf gr, sl slty tex, rthy lstr,
non-sl calc; 10% SHY SS: lt gy-wh,
blky, sl frm - sft, v f-f gr, sb rnd,
mod-w srt, cly cmt, non-sl calc

MD: 1,545'
TVD: 1,543.94'
Inclination: 7.7 °
Azimuth: 300.1 °
VS: -9.83'

90% SLTY SH: lt-med gy, sft-frn, fri,
sb plty, vf gr, sl slty tex, rthy lstr,
non-sl calc; 10% SHY SS: lt gy-wh,
blky, sl frm - sft, v f-f gr, sb rnd,
mod-w srt, cly cmt, non-sl calc

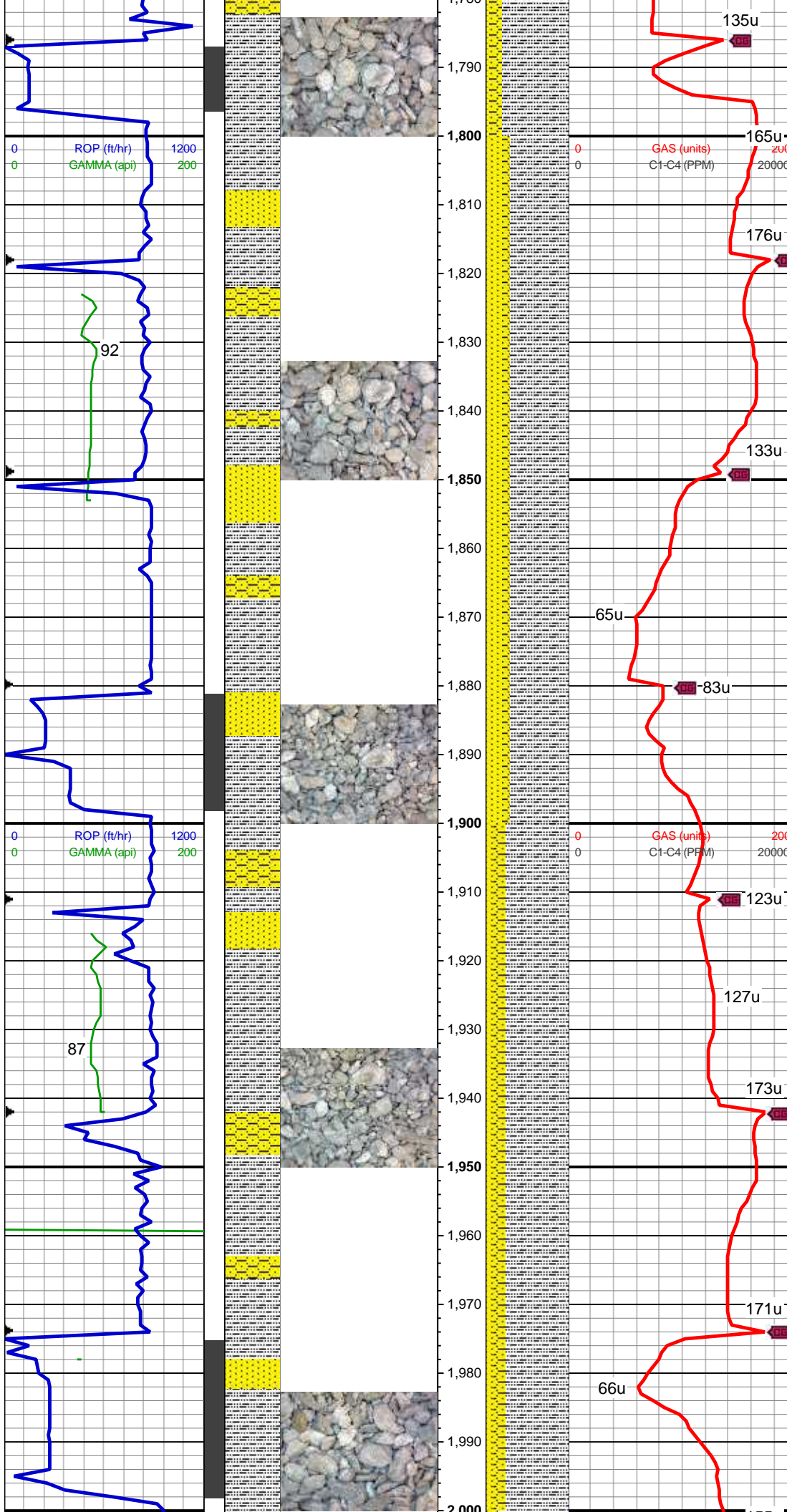


MD: 1,638'
TVD: 1,636.06'
Inclination: 8.1 °
Azimuth: 286.9°
VS: -13.97'

95% SLTY SH: lt-med gy, sft frm, fri, sb plty, vf gr, sl slty tex, rthy lstr, non-sl calc; 5% SHY SS: lt gy-wh, blkly, sl frm - sft, v f-f gr, sb rnd, mod-w srt, cly cmt, non-sl calc

MD: 1,731'
TVD: 1,728.02'
Inclination: 9.1 °
Azimuth: 274.6°
VS: -15.45'

80% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blkly, vf gr, slty tex, sl calc; 15% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc



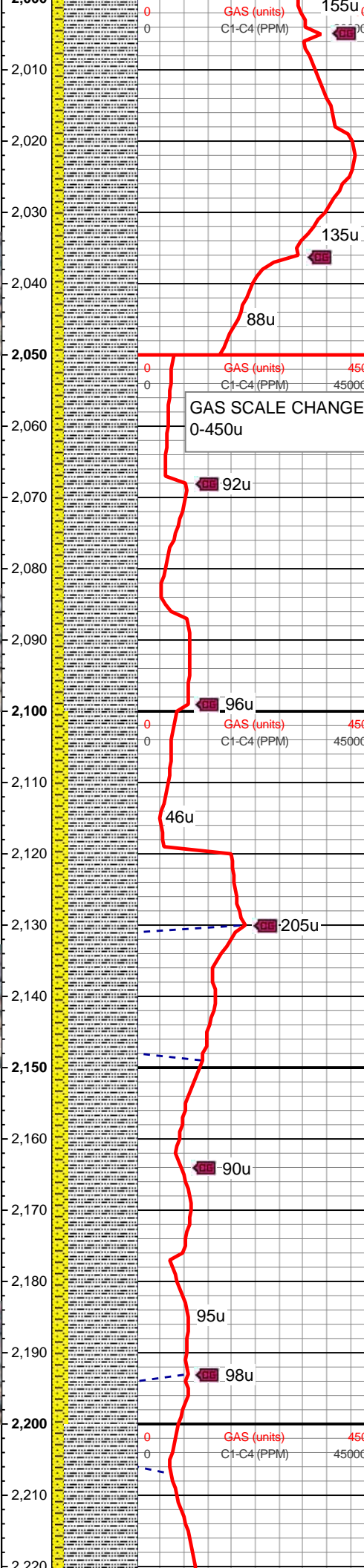
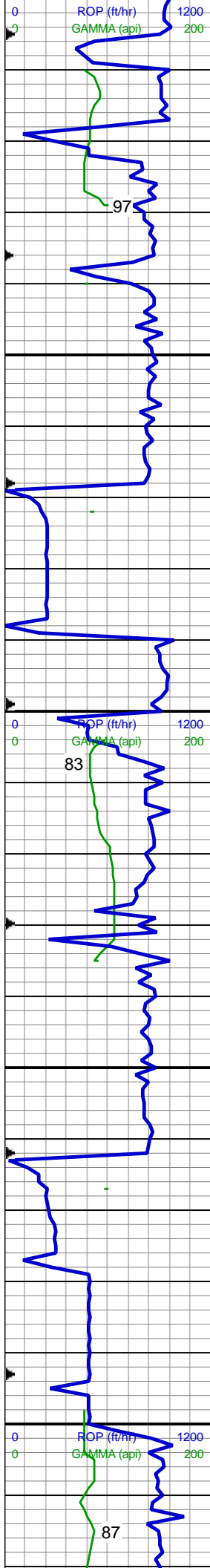
MD: 1,825'
TVD: 1,820.63'
Inclination: 10.6 °
Azimuth: 273.1 °
VS: -15.31'

70% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 20% SS: wh-lt gy, clr-trnsl, speckl blk, sb rnd-ang, p srt, w cons, f gr, non calc; 10% SHY SS: wh-lt gy, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

MD: 1,918'
TVD: 1,912.03'
Inclination: 10.7 °
Azimuth: 269.2 °
VS: -14.37'

75% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 15% SHY SS: wh-lt gy, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 10% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 2,013'
TVD: 2,005.19'
Inclination: 11.9 °
Azimuth: 267 °
VS: -12.35'



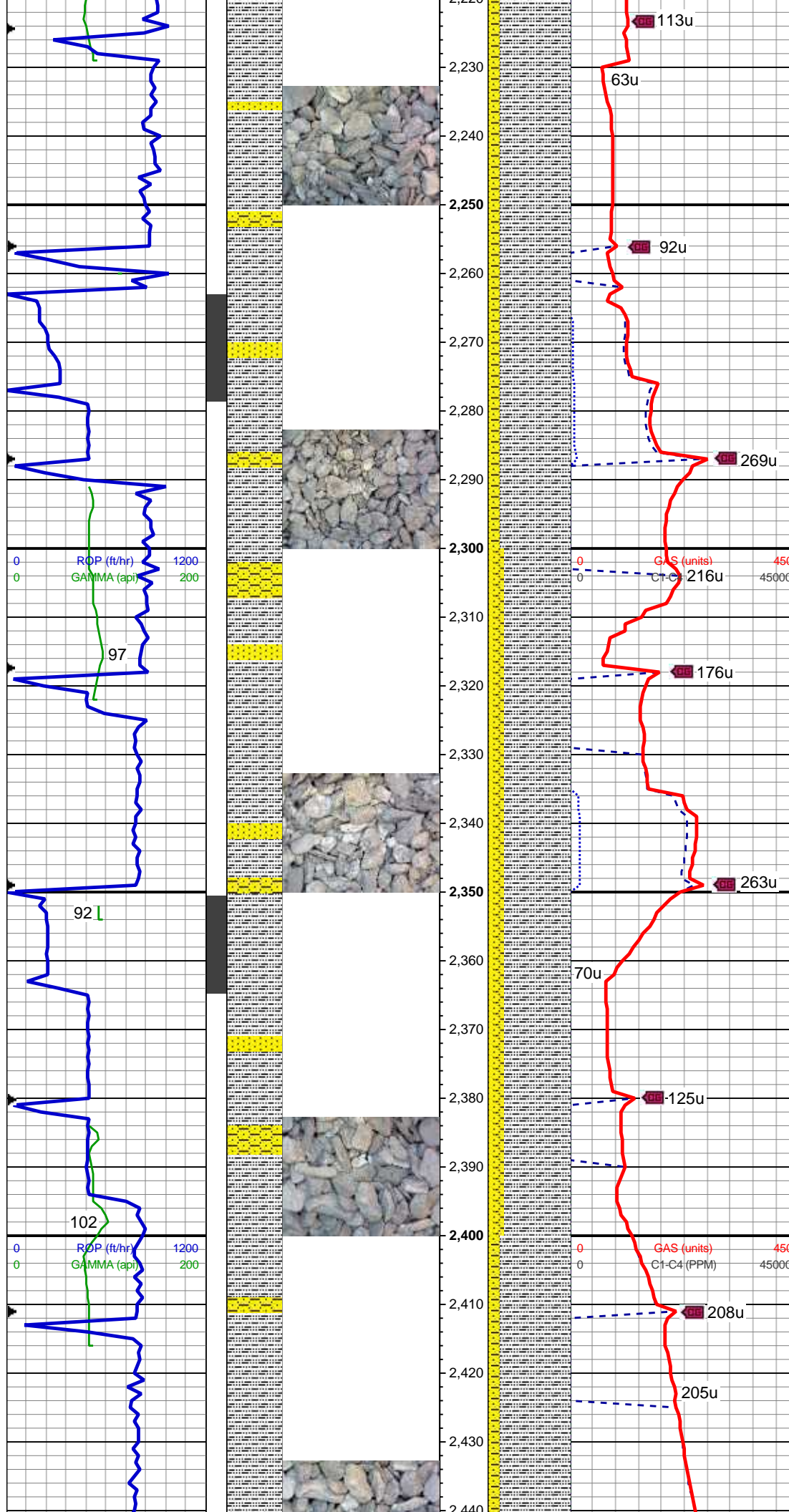
WT: 8.5 / VIS: 28

85% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 10% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 2,107'
TVD: 2,096.96'
Inclination: 13.1 °
Azimuth: 267.9 °
VS: -9.93'

80% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 15% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 2,201'
TVD: 2,188.46'
Inclination: 13.4 °
Azimuth: 268.7 °
VS: -7.69'



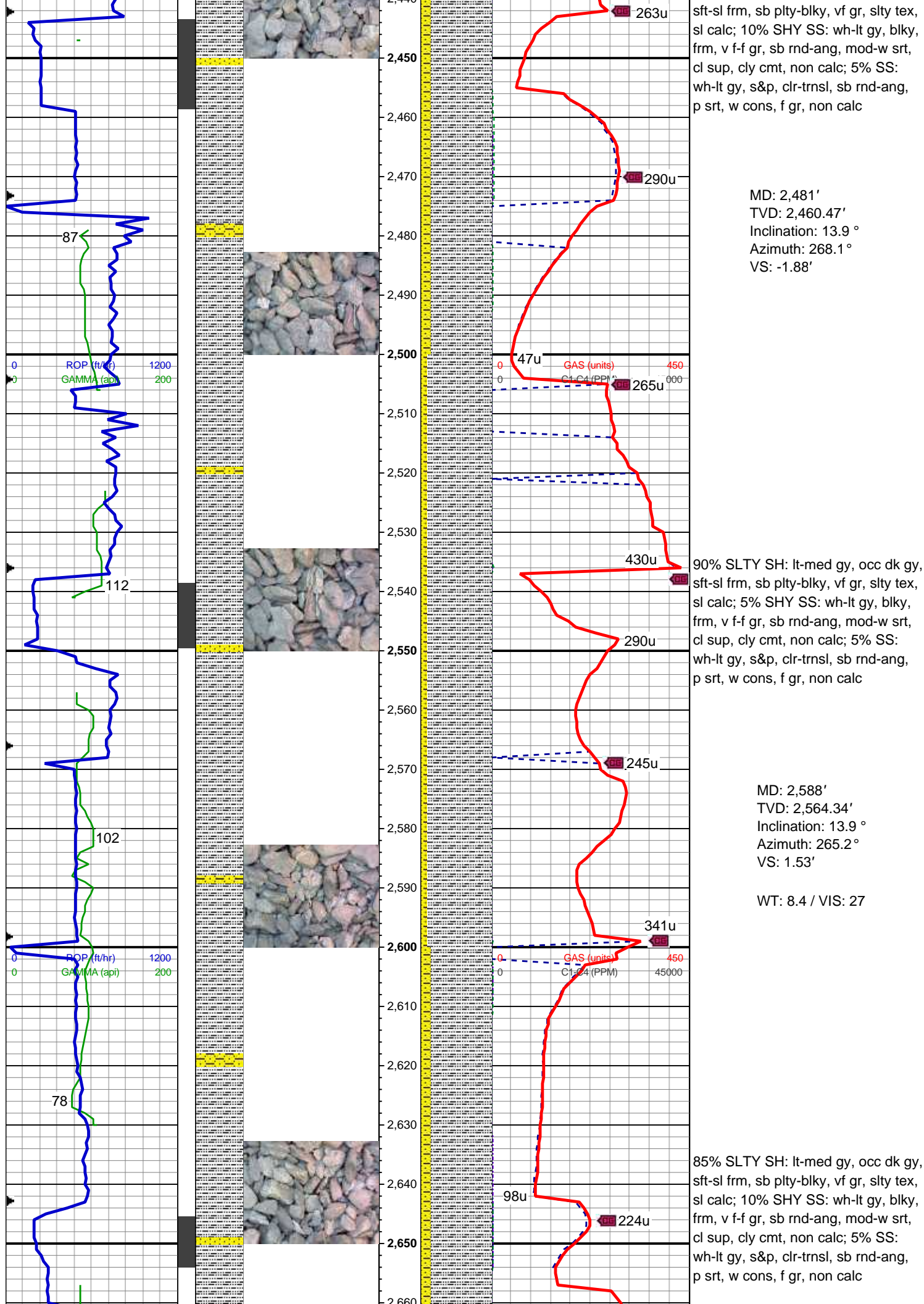
85% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 10% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

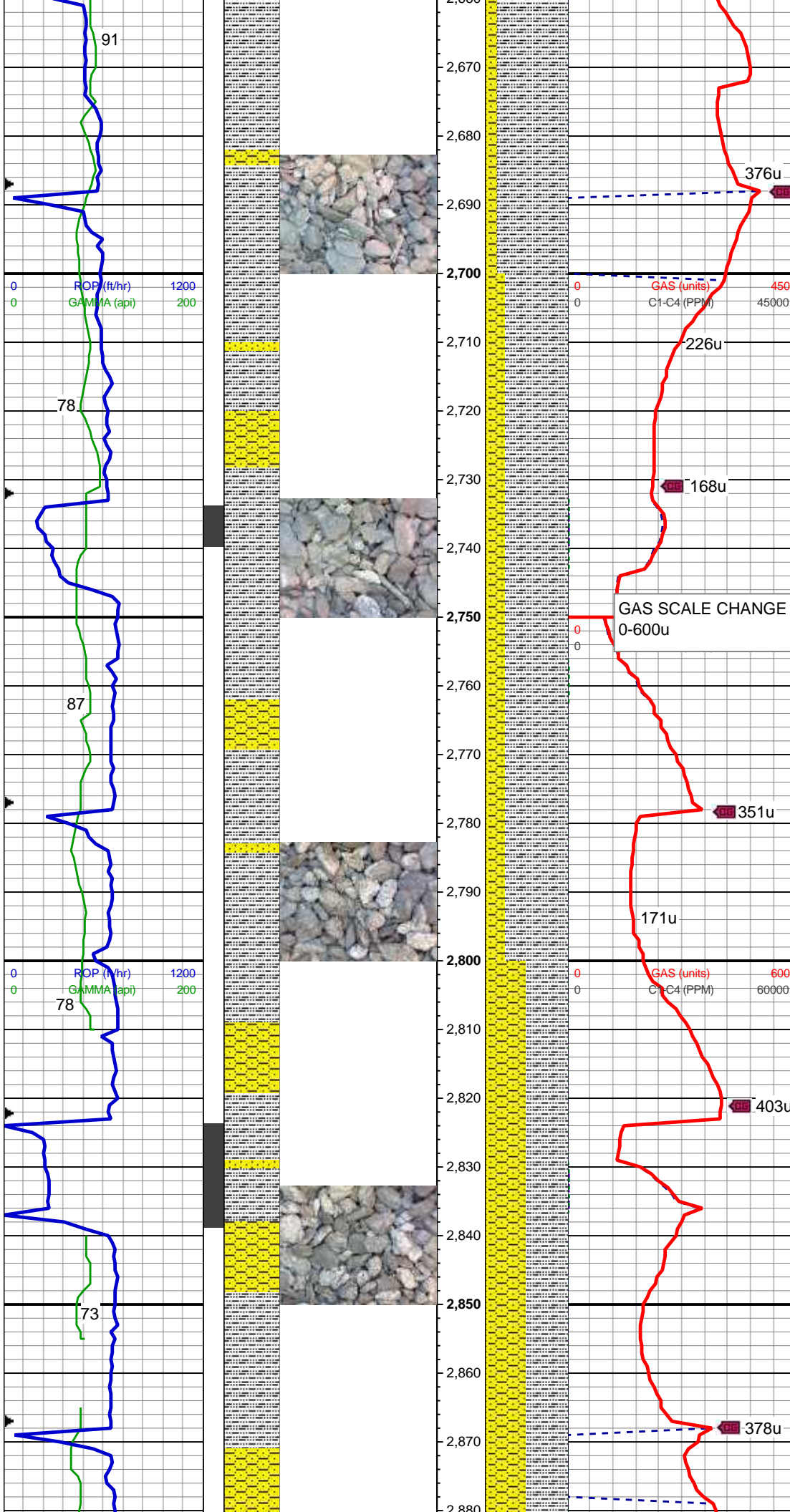
MD: 2,294'
TVD: 2,278.87'
Inclination: 13.7 °
Azimuth: 270.8 °
VS: -5.98'

80% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 10% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 10% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 2,386'
TVD: 2,368.23'
Inclination: 13.8 °
Azimuth: 268.6 °
VS: -4.23'

85% SLTY SH: lt-med gy, occ dk gy,





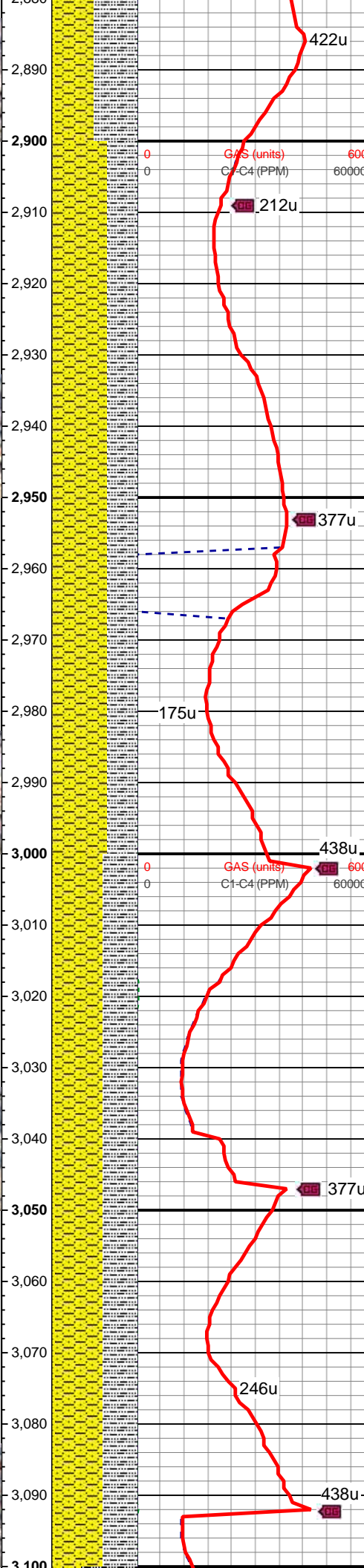
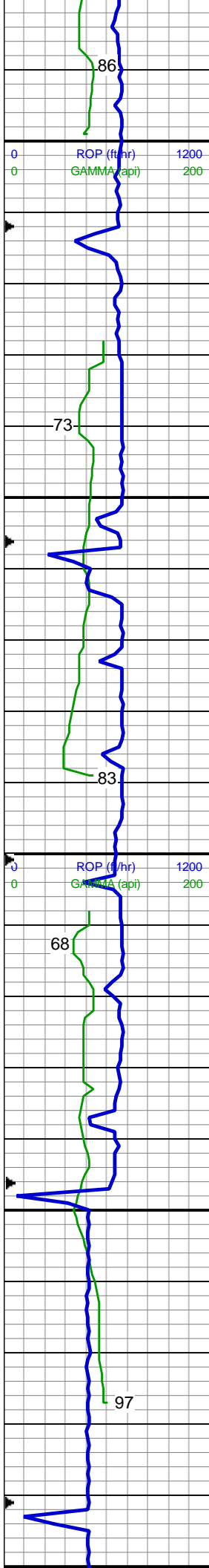
MD: 2,677'
TVD: 2,650.73'
Inclination: 13.9 °
Azimuth: 268.5 °
VS: 4.3'

75% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 20% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 2,767'
TVD: 2,738.17'
Inclination: 13.5 °
Azimuth: 270.7 °
VS: 6.04'

50% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 45% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 2,857'
TVD: 2,825.5'
Inclination: 14.5 °
Azimuth: 272.4 °
VS: 7.07'

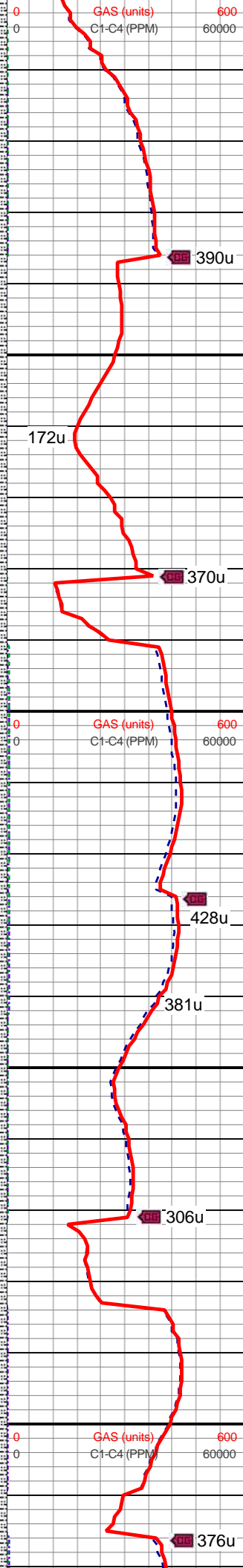
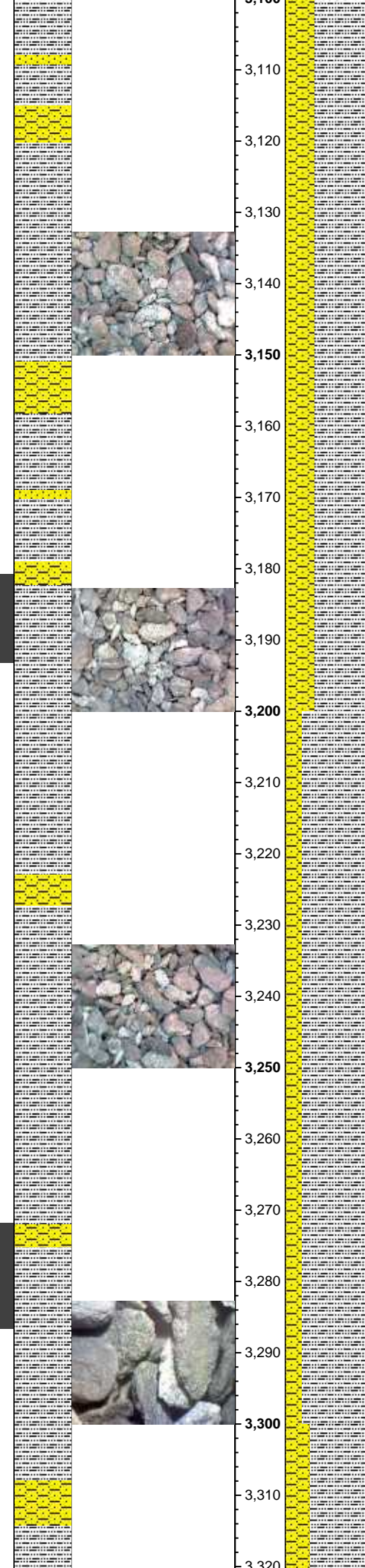
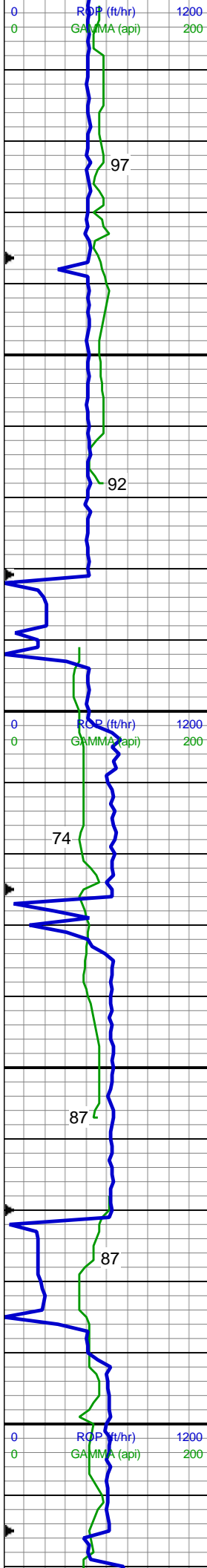


65% SHY SS: wh-lt gy, blkly, frm, v f-
gr, sb rnd-ang, mod-w srt, cl sup,
cly cmt, non calc; 35% SLTY SH:
lt-med gy, occ dk gy, sft-sl frm, sb
plty-blky, vf gr, slty tex, sl calci, tr SS

MD: 2,946'
TVD: 2,911.65'
Inclination: 14.6 °
Azimuth: 271.7 °
VS: 7.94'

55% SHY SS: wh-lt gy, blkly, frm, v f-
gr, sb rnd-ang, mod-w srt, cl sup,
cly cmt, non calc; 40% SLTY SH:
lt-med gy, occ dk gy, sft-sl frm, sb
plty-blky, vf gr, slty tex, sl calci; 5%
SS: wh-lt gy, s&p, clr-trnsl, sb
rnd-ang, p srt, w cons, f gr, non calc

MD: 3,036'
TVD: 2,998.72'
Inclination: 14.7 °
Azimuth: 269.7 °
VS: 9.36'



MD: 3,125'
TVD: 3,084.98'
Inclination: 13.8 °
Azimuth: 267.9 °
VS: 11.44'

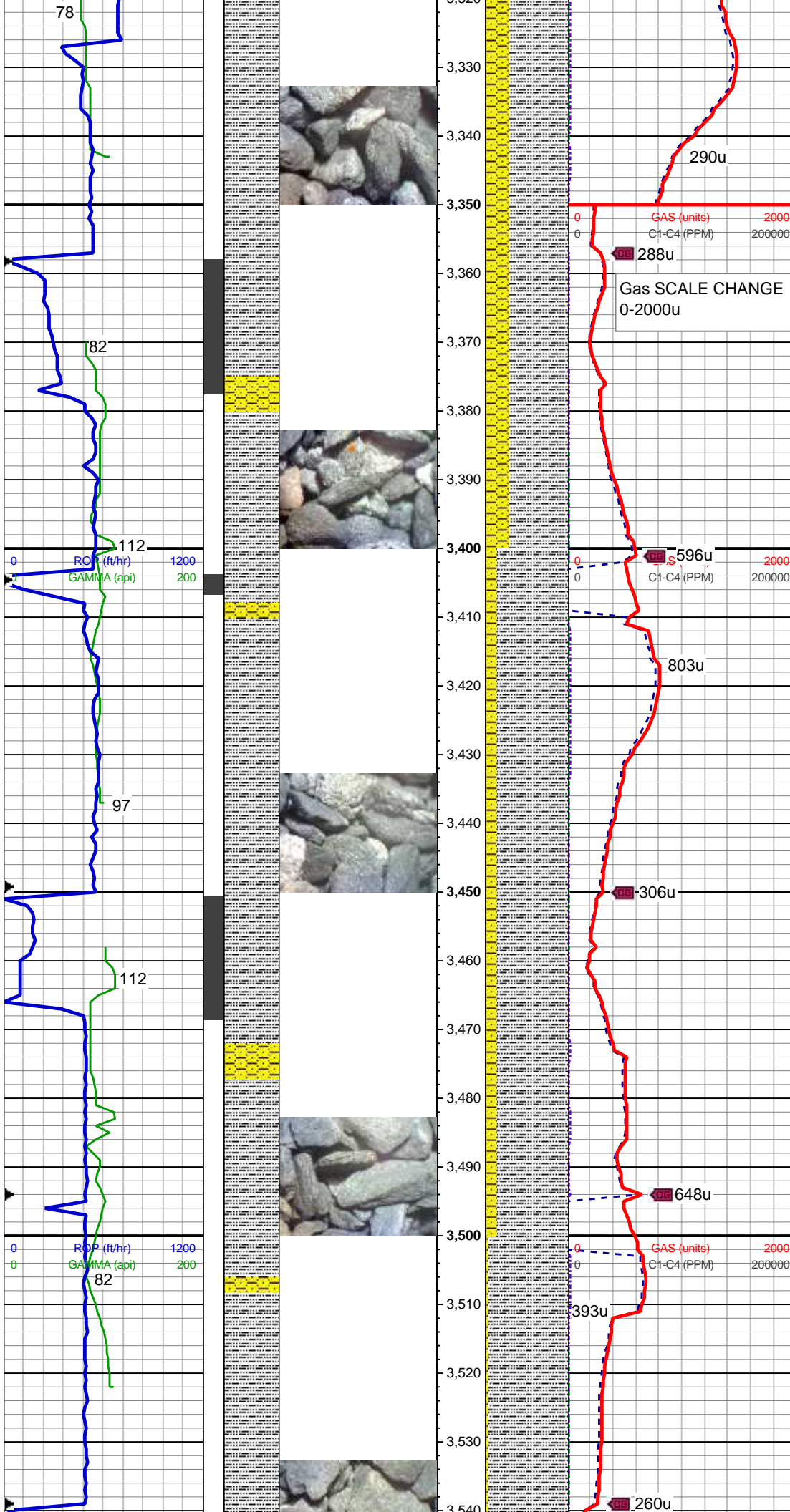
65% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 30% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 3,215'
TVD: 3,172.6'
Inclination: 12.6 °
Azimuth: 263.4 °
VS: 14.39'

WT: 8.55 / VIS: 27

80% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 20% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; tr SS

MD: 3,305'
TVD: 3,260.55'
Inclination: 11.9 °
Azimuth: 263.9 °
VS: 17.91'



70% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 30% SHY SS: wh-lt gy, blky, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; tr SS

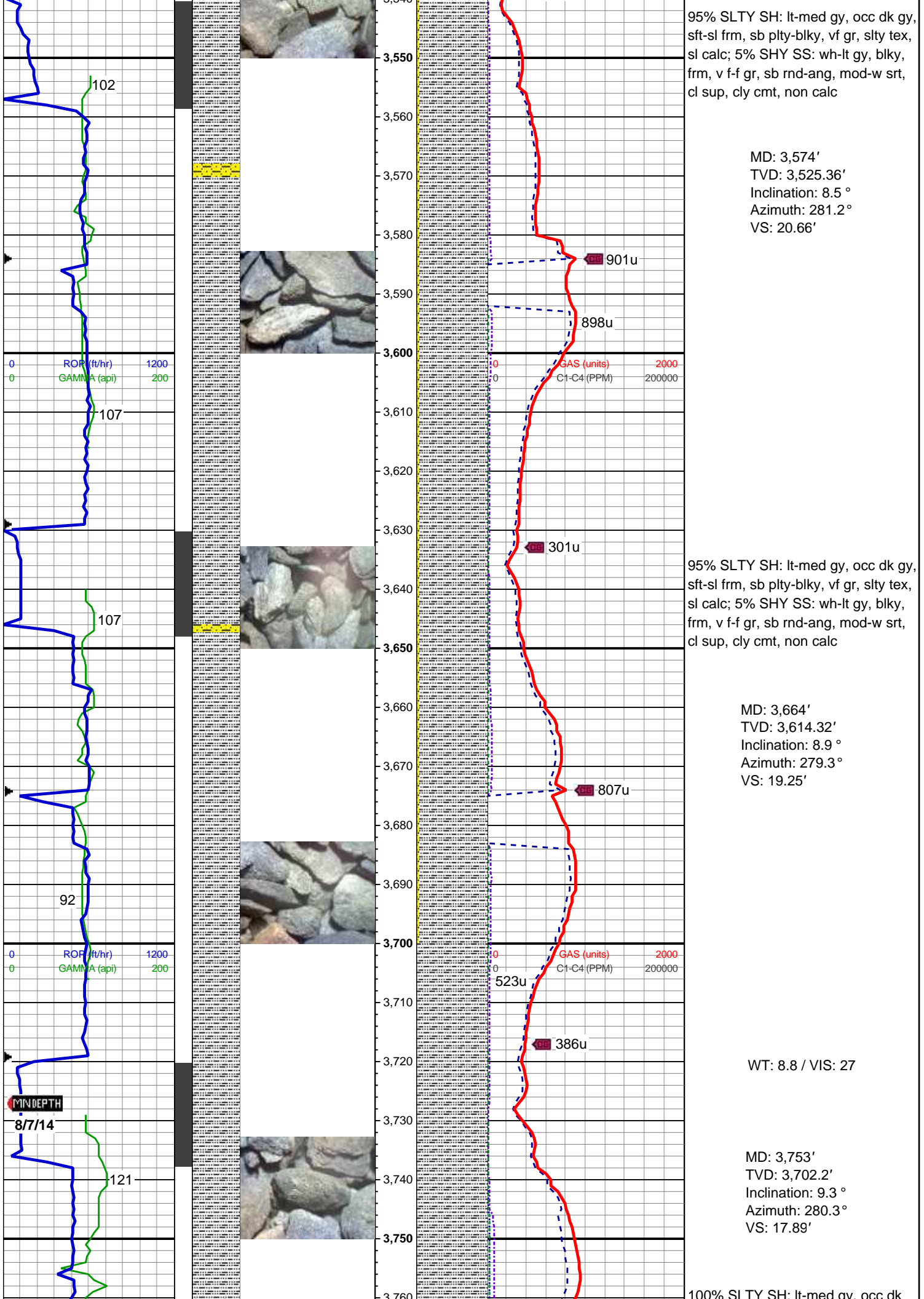
WT: 8.6 / VIS: 28

MD: 3,394'
TVD: 3,347.85'
Inclination: 10.6 °
Azimuth: 270.1 °
VS: 20.16'

85% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 15% SHY SS: wh-lt gy, blky, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; tr SS

MD: 3,484'
TVD: 3,436.46'
Inclination: 9.5 °
Azimuth: 271.6 °
VS: 21.11'

WT: 8.65 / VIS: 27





100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; tr SHY SS

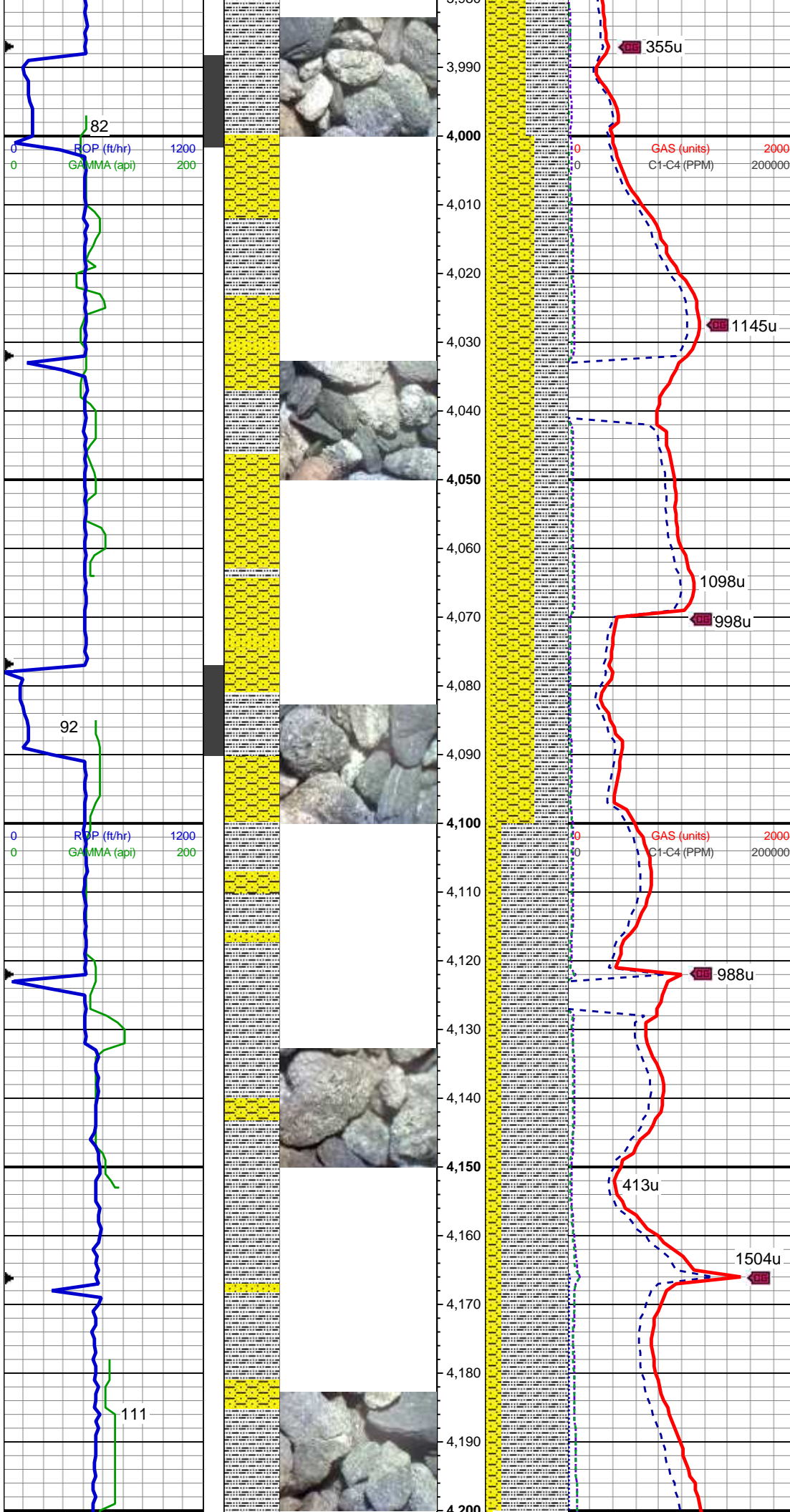
MD: 3,843'
TVD: 3,790.76'
Inclination: 11.2 °
Azimuth: 278.1 °
VS: 16.55'

75% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 25% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; tr SS

WT: 8.8 / VIS: 28

MD: 3,932'
TVD: 3,877.82'
Inclination: 12.8 °
Azimuth: 276.6 °
VS: 15.57'

50% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 45% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc



MD: 4,022'
TVD: 3,965.31'
Inclination: 14.3 °
Azimuth: 279.6 °
VS: 14.14'

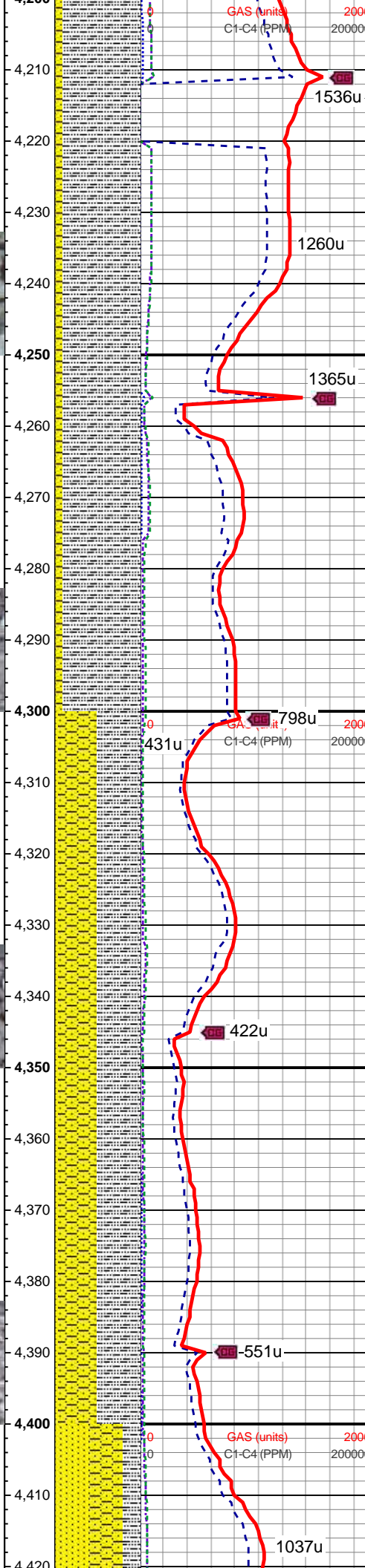
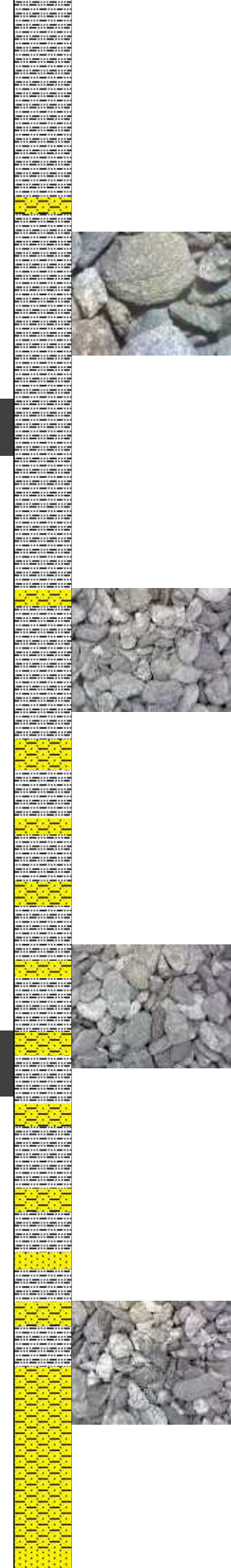
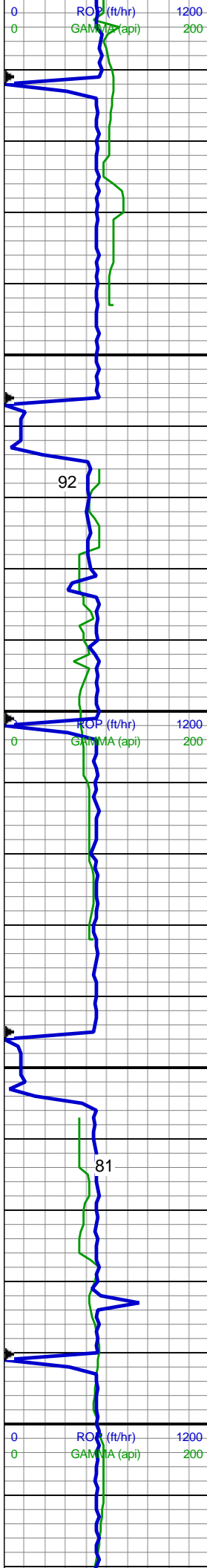
50% SHY SS: wh-lt gy, blk, frm, v f-gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 40% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cac; 10% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 4,111'
TVD: 4,051.36'
Inclination: 15.3 °
Azimuth: 278.1 °
VS: 12.33'

WT: 8.65 / VIS: 28

80% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cac; 15% SHY SS: wh-lt gy, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 4,201'
TVD: 4,138.39'
Inclination: 14.2 °



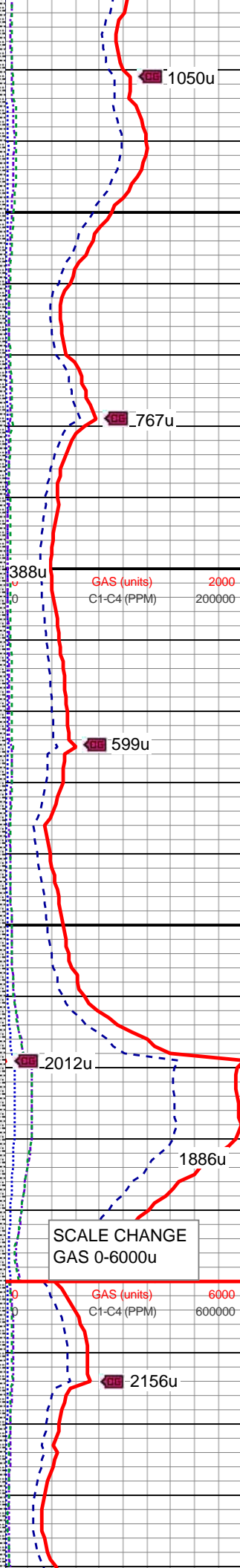
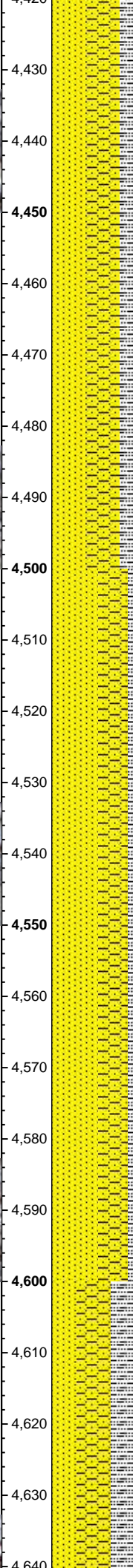
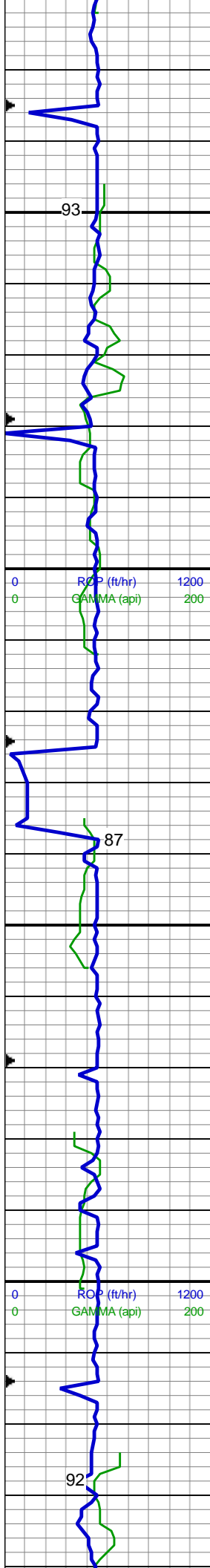
Azimuth: 275.6°
VS: 11.29'

90% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 10% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; tr SS

MD: 4,290'
TVD: 4,224.67'
Inclination: 14.2 °
Azimuth: 273.2 °
VS: 11.24'

50% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 45% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 4,380'
TVD: 4,311.9'
Inclination: 14.3 °
Azimuth: 272.4 °
VS: 11.82'



40% SHY SS: wh-lt gy, blk, frm, v f-
gr, sb rnd-ang, mod-w srt, cl sup,
cly cmt, non calc; 40% SS: wh-lt gy,
s&p, clr-trnsl, sb rnd-ang, p srt, w
cons, f gr, non calc; 20% SLTY SH:
lt-med gy, occ dk gy, sft-sl frm, sb
plty-blky, vf gr, slty tex, sl calc

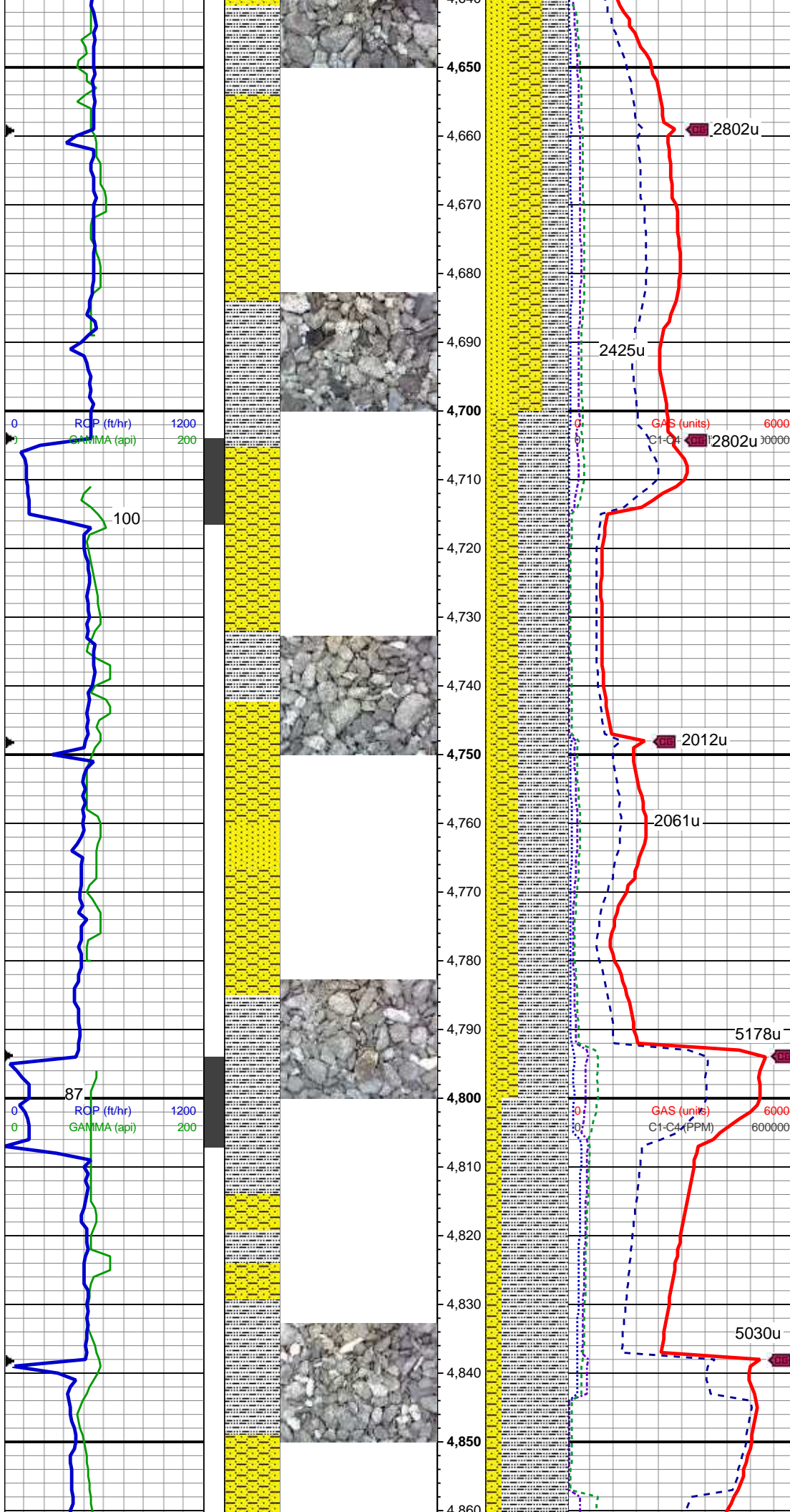
MD: 4,469'
TVD: 4,398.39'
Inclination: 13 °
Azimuth: 269.7 °
VS: 12.98'

WT: 8.6 / VIS: 27

55% SS: wh-lt gy, s&p, clr-trnsl, sb
rnd-ang, p srt, w cons, f gr, non
calc; 35% SHY SS: wh-lt gy, blk,
frm, v f-f gr, sb rnd-ang, mod-w srt,
cl sup, cly cmt, non calc; 10% SLTY
SH: lt-med gy, occ dk gy, sft-sl frm,
sb plty-blky, vf gr, slty tex, sl calc

MD: 4,559'
TVD: 4,485.99'
Inclination: 13.5 °
Azimuth: 272.3 °
VS: 14.15'

MD: 4,648'
TVD: 4,572.62'
Inclination: 13 °
Azimuth: 271.1 °
VS: 15.06'



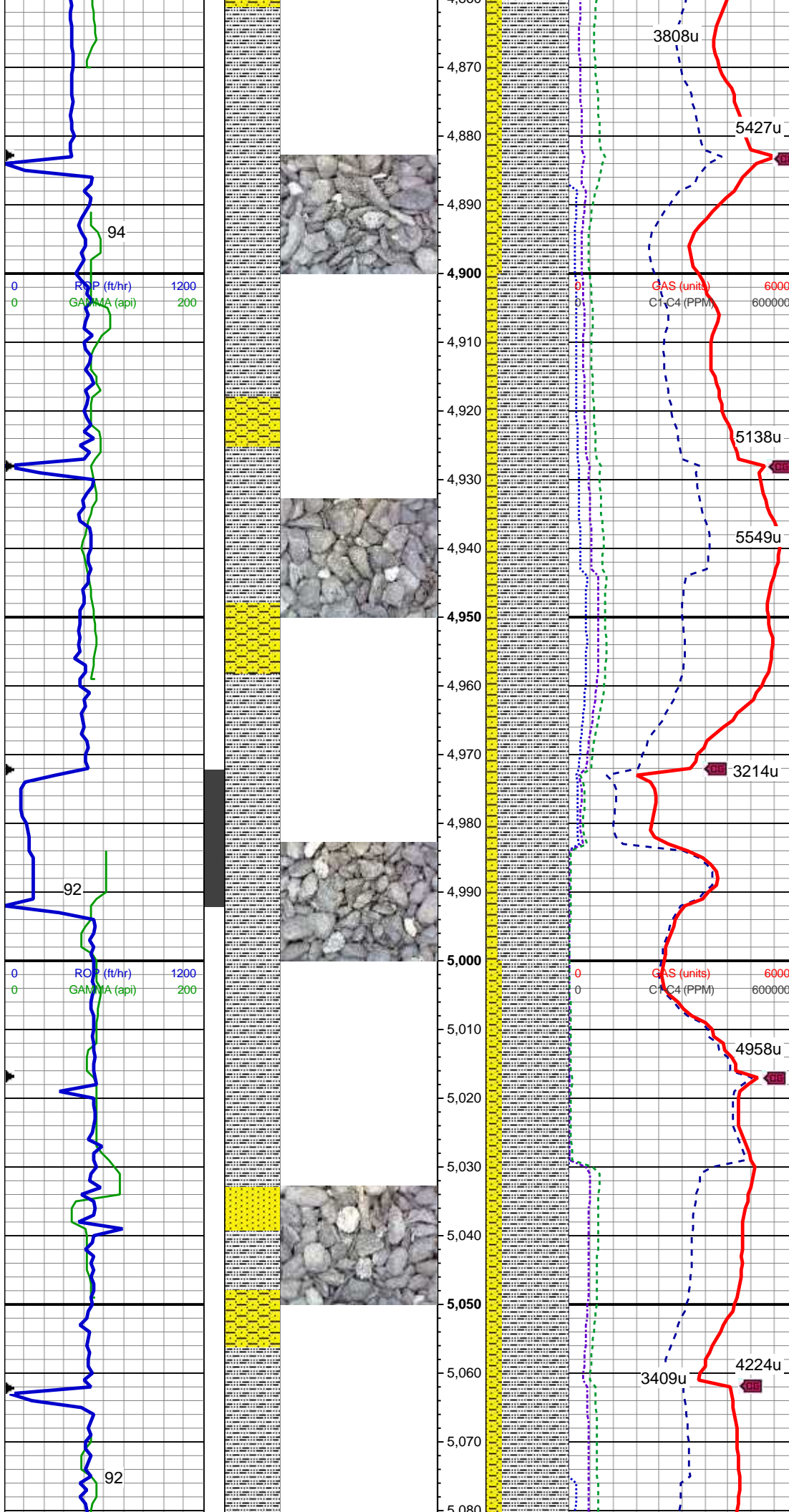
40% SHY SS: wh-lt gy, blk, frm, v f-
gr, sb rnd-ang, mod-w srt, cl sup,
cly cmt, non calc; 30% SS: wh-lt gy,
s&p, clr-trnsl, sb rnd-ang, p srt, w
cons, f gr, non calc; 30% SLTY SH:
lt-med gy, occ dk gy, sft-sl frm, sb
plty-blky, vf gr, slty tex, sl calc

MD: 4,738'
TVD: 4,660.21'
Inclination: 13.6 °
Azimuth: 273.3 °
VS: 15.8'

60% SLTY SH: lt-med gy, occ dk gy,
sft-sl frm, sb plty-blky, vf gr, slty tex,
sl calc; 30% SHY SS: wh-lt gy, blk,
frm, v f-f gr, sb rnd-ang, mod-w srt,
cl sup, cly cmt, non calc; 10% SS:
wh-lt gy, s&p, clr-trnsl, sb rnd-ang,
p srt, w cons, f gr, non calc

MD: 4,828'
TVD: 4,747.95'
Inclination: 12.1 °
Azimuth: 271.6 °
VS: 16.43'

80% SLTY SH: lt-med gy, occ dk gy,
sft-sl frm, sb plty-blky, vf gr, slty tex,
sl calc; 20% SHY SS: wh-lt gy, blk,
frm, v f-f gr, sb rnd-ang, mod-w srt,
cl sup, cly cmt, non calc, tr ss



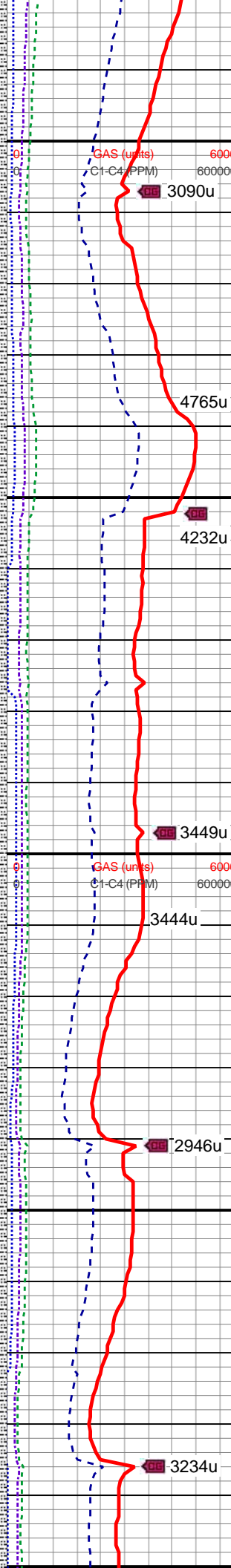
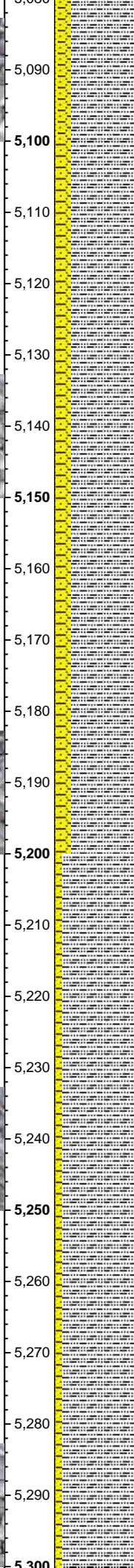
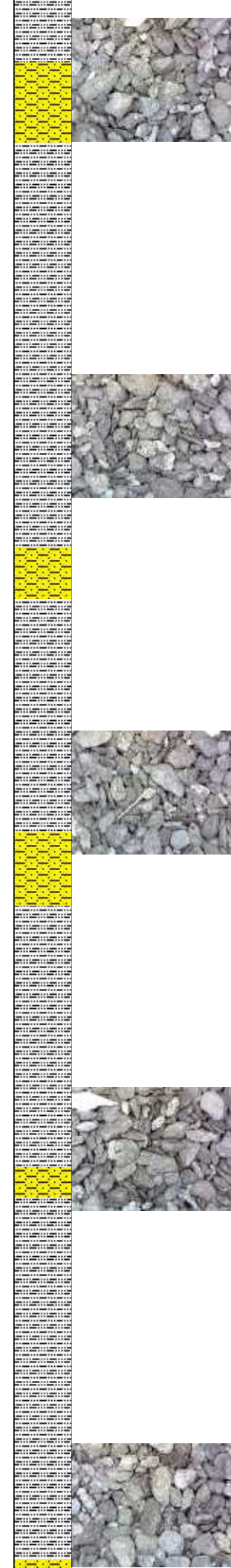
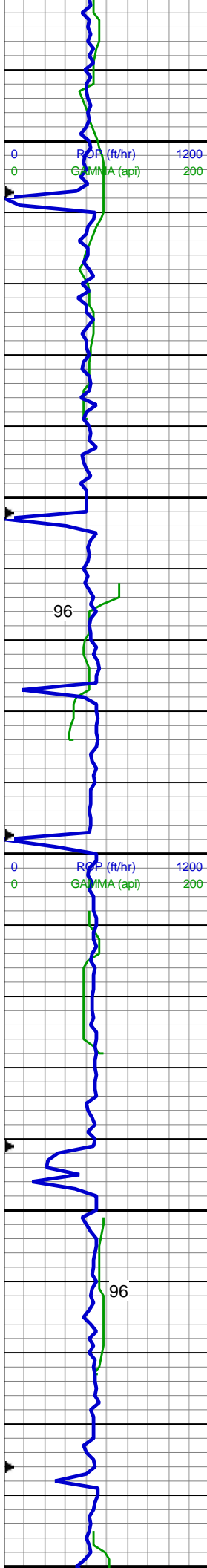
MD: 4,917'
TVD: 4,835.2'
Inclination: 10.7 °
Azimuth: 268.6 °
VS: 17.68'

85% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl clac; 15% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, tr ss

MD: 5,007'
TVD: 4,923.6'
Inclination: 10.9 °
Azimuth: 267.6 °
VS: 19.5'

80% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl clac; 15% SHY SS: wh-lt gy, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, s&p, clr-trnsl, sb rnd-ang, p srt, w cons, f gr, non calc

WT: 8.5 / VIS: 27



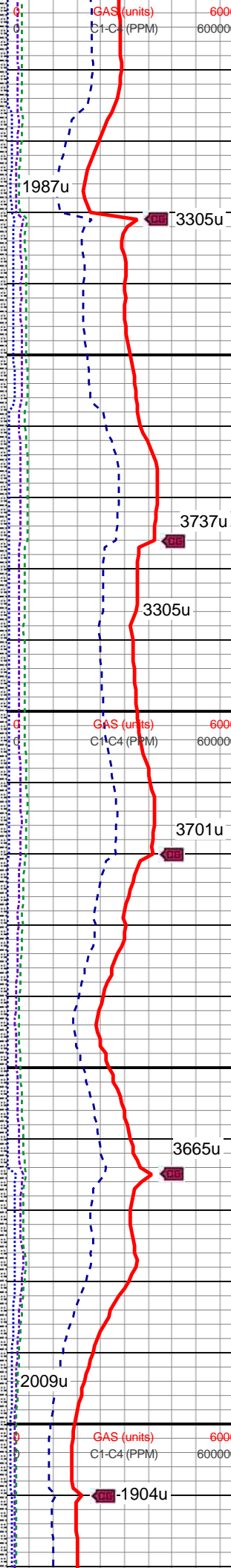
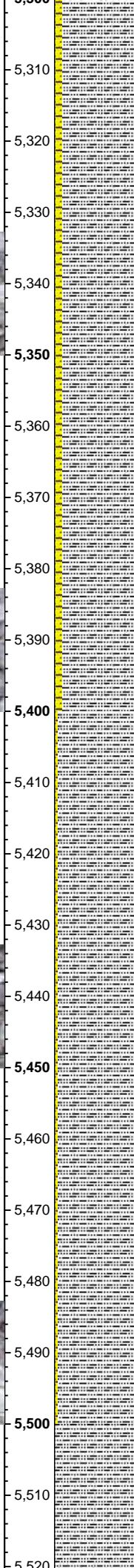
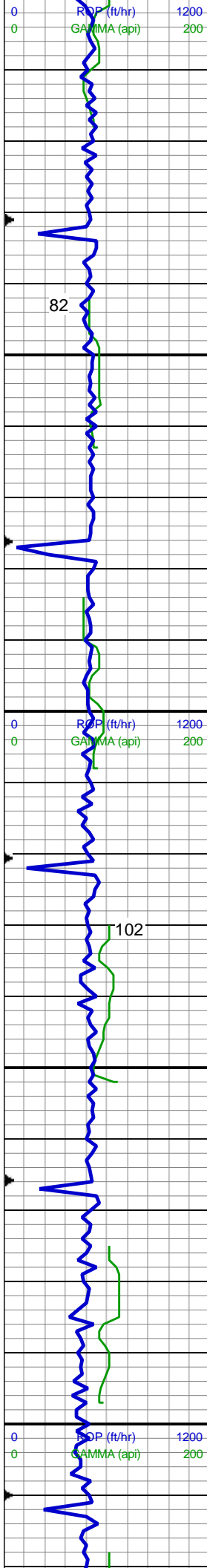
MD: 5,097'
TVD: 5,012.22'
Inclination: 9.2 °
Azimuth: 267 °
VS: 21.4'

80% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl clac; 20% SHY SS: wh-lt gy, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, tr ss

MD: 5,186'
TVD: 5,100.17'
Inclination: 8.4 °
Azimuth: 265 °
VS: 23.35'

90% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl clac; 10% SHY SS: wh-lt gy, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, tr ss

MD: 5,276'
TVD: 5,189.37'
Inclination: 6.9 °
Azimuth: 262.7 °
VS: 25.49'



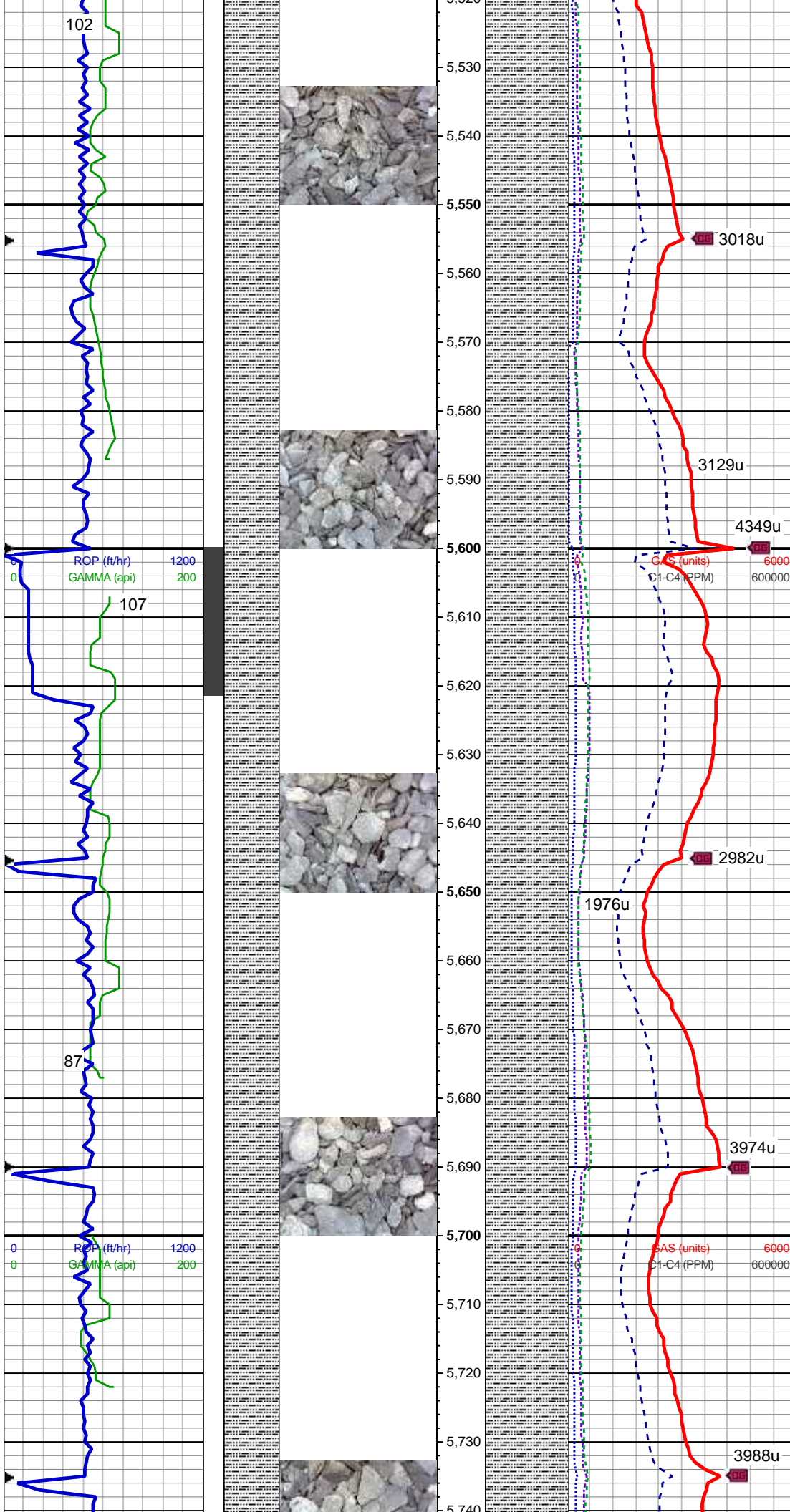
90% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cacl; 10% SHY SS: wh-lt gy, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, tr ss

MD: 5,365'
TVD: 5,277.84'
Inclination: 5.6 °
Azimuth: 259 °
VS: 27.71'

95% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cacl; 5% SHY SS: wh-lt gy, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, tr ss

MD: 5,455'
TVD: 5,367.49'
Inclination: 4.4 °
Azimuth: 253.6 °
VS: 30.09'

WT: 8.6 / VIS: 27



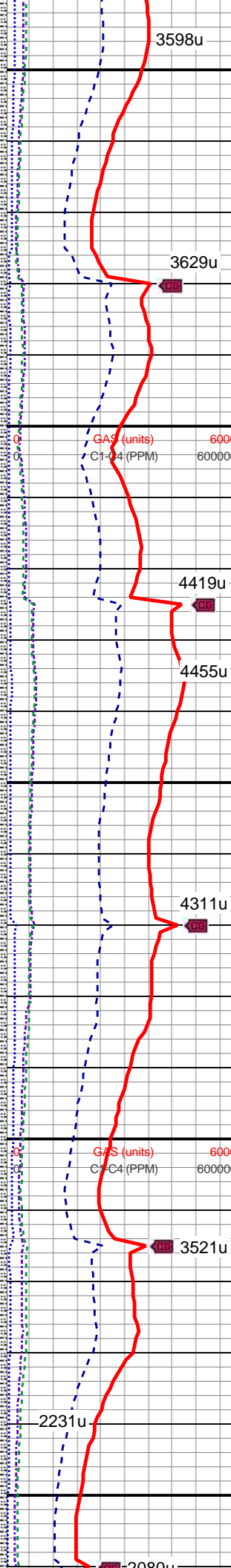
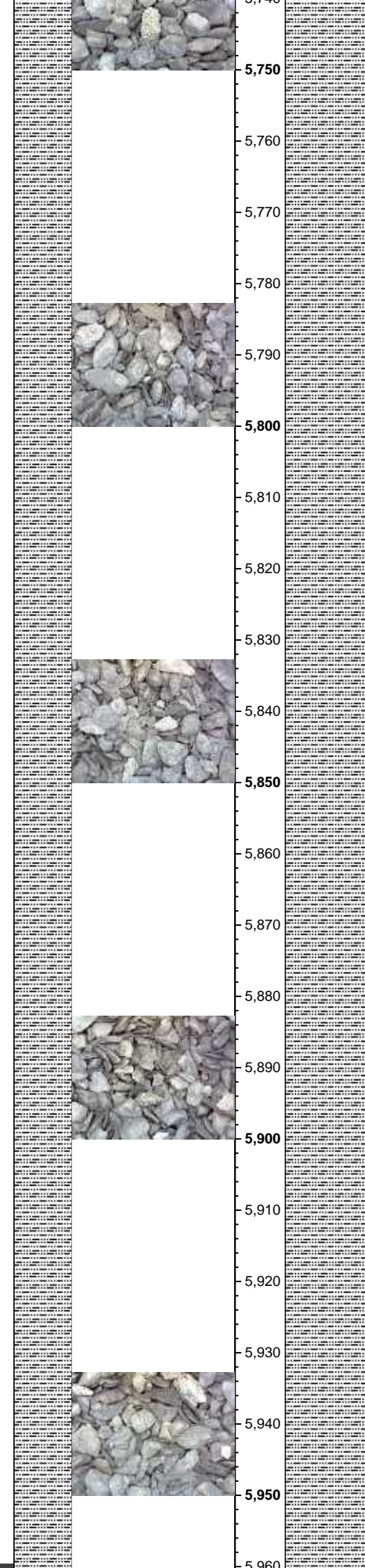
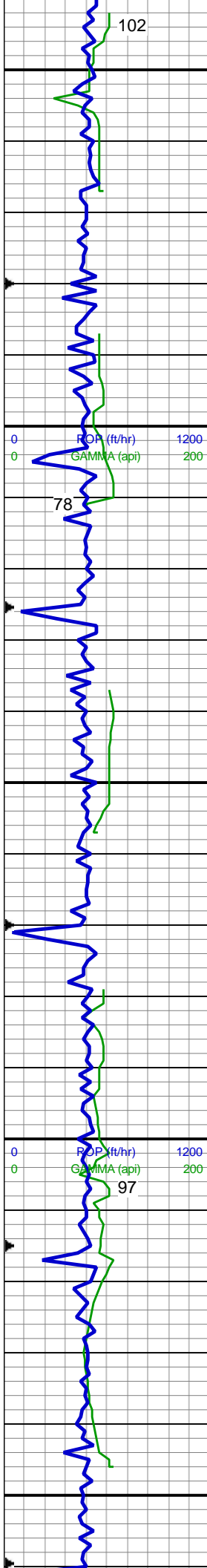
MD: 5,545'
TVD: 5,457.29'
Inclination: 3.2 °
Azimuth: 244.7 °
VS: 32.55'

100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cacl, tr shy ss, tr sh

MD: 5,634'
TVD: 5,546.2'
Inclination: 2.2 °
Azimuth: 272.3 °
VS: 33.83'

100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cacl, tr shy ss, tr sh

MD: 5,724'
TVD: 5,636.14'
Inclination: 1.8 °
Azimuth: 290.8 °
VS: 33.49'



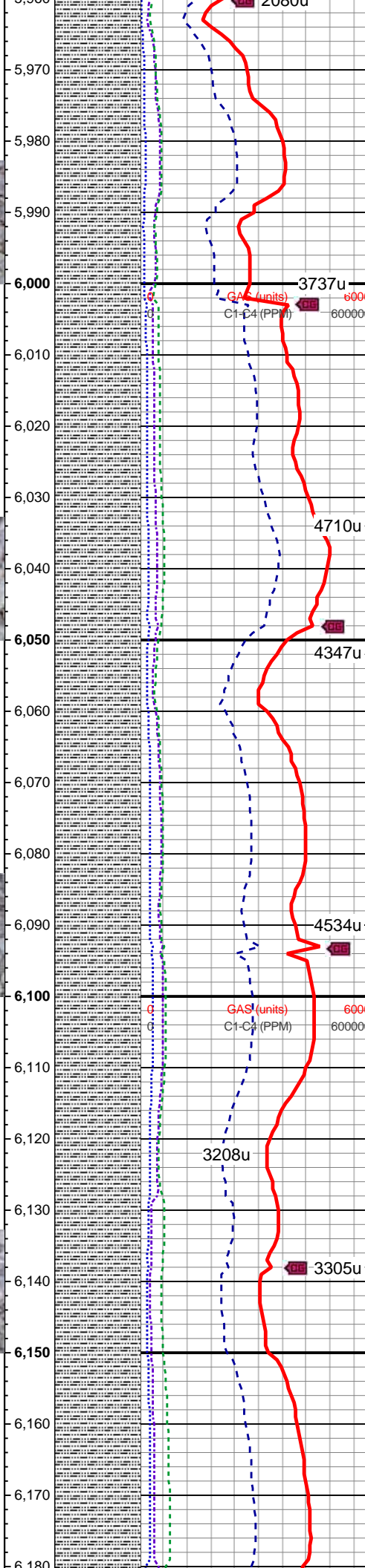
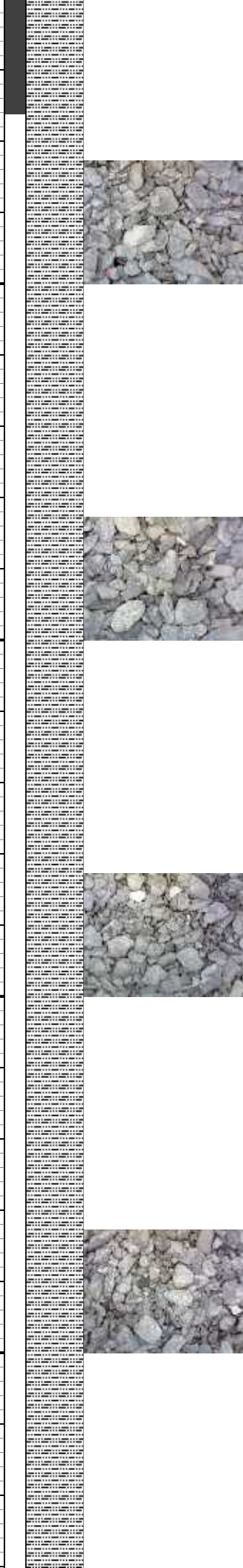
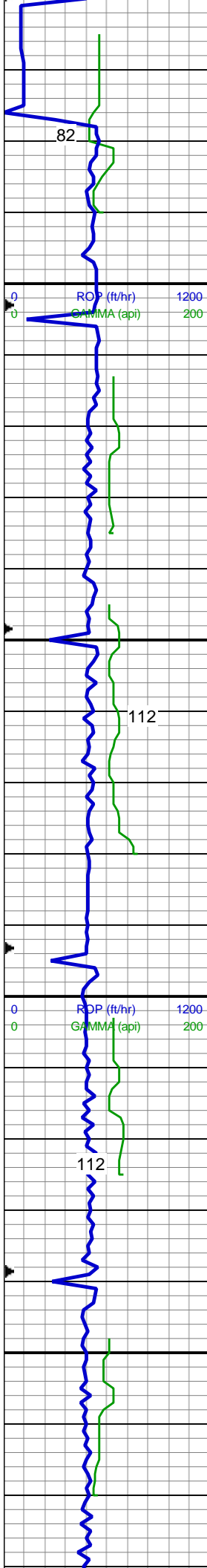
100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cacl, tr shy ss, tr sh

MD: 5,814'
TVD: 5,726.12'
Inclination: 0.6 °
Azimuth: 312.2 °
VS: 32.8'

100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cacl, tr shy ss, tr sh

MD: 5,903'
TVD: 5,815.12'
Inclination: 0.5 °
Azimuth: 1.3 °
VS: 32.12'

100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cacl, tr shy ss, tr sh



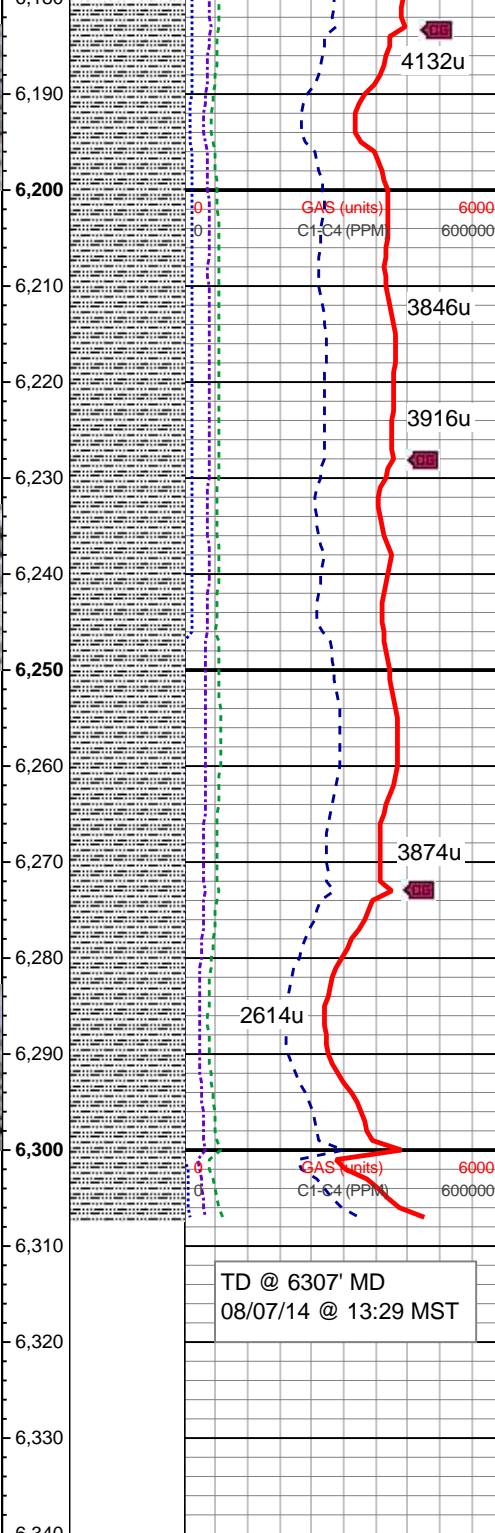
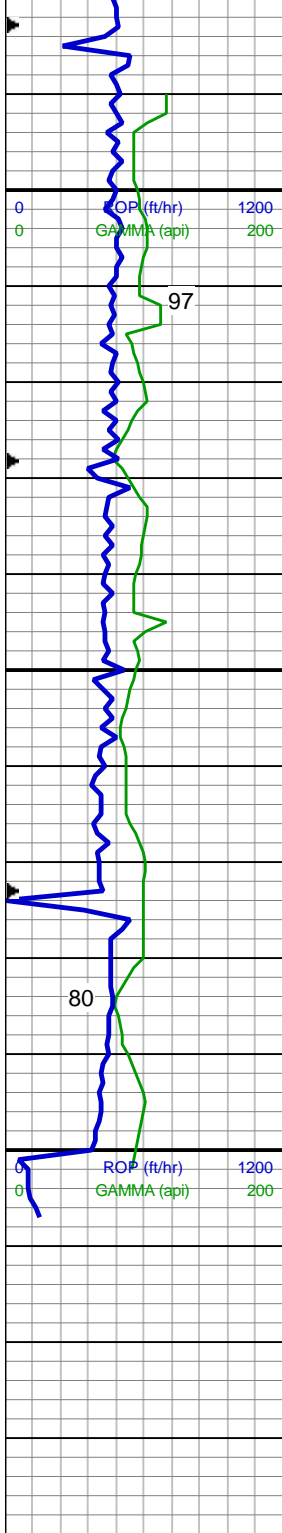
MD: 5,993'
TVD: 5,905.1'
Inclination: 1.9 °
Azimuth: 278.5 °
VS: 31.62'

100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cacl, tr shy ss, tr sh

MD: 6,083'
TVD: 5,995.06'
Inclination: 1.5 °
Azimuth: 275 °
VS: 31.5'

100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl cacl, tr shy ss

MD: 6,172'
TVD: 6,084.03'
Inclination: 1.2 °



Azimuth: 273.8°
VS: 31.49'

100% SLTY SH: lt-med gy, occ dk
gy, sft-sil frm, sb plty-blky, vf gr, slty
tex, sl cacl, tr shy ss

MD: 6,262'
TVD: 6,174.02'
Inclination: 0.8°
Azimuth: 255.6°
VS: 31.7'

WT: 8.9 / VIS: 29

MD: 6,307'
TVD: 6,219.02'
Inclination: 1°
Azimuth: 205.3°
VS: 32.17'

Log Continues on Heartland State
H01-74-1HN_Horizontal

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