

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Sandau K25-66-1HN

Location SEC 25 T4N R66W

State Colorado

County Weld

Country USA

Rig Number Percision Drilling 829

API Number 05-123-37764

AFE # 136987

Region DJ Basin

Field Hambert

Spud Date 2/17/2014

Drilling Completed 3/1/2014

Surface Coordinates 40.28214, 104.73374
2332' FSL x 318' FWL

Bottom Hole Coordinates 40.28474, 104.7158
2210' FNL x 75' FEL

Ground Elevation 4780'

K.B. Elevation 4796'

Logged Interval 671' **To** 6488'

Total Depth 12230'

Formation Nio C chalk

Type of Drilling Fluid FW LSND

Operator

Company Noble Energy, INC.

Address 1625 BROADWAY
DENVER, CO 80202

Geologist

Name Holly Duncan

Company Noble Energy, Inc.

Address 1625 BROADWAY
DENVER, CO 80202

Other

Columbine Logging, Inc.

2385 S. LIPAN STREET
DENVER, CO 80223

Well Site Geologists

Ryan Shilling
Whitney Jacks

Rock Types

<ul style="list-style-type: none"> UNKNOWN ANHYDRITE BENTONITE BRECCIA CEMENT CHALK CHERT CLAY CHOKE SAND CLAYSTONE 	<ul style="list-style-type: none"> COAL CONGLOMERATE DOLOMITE DOLOMITIC LIMESTONE GRANITE GYPHUM IGNEOUS LIMESTONE SIDERITE or LIMONITE 	<ul style="list-style-type: none"> MARLSTONE METAMORPHIC NO SAMPLE SALT SALT- PEPPER SAND SANDSTONE SHALE SHALE COLORED SHALE GRAY 	<ul style="list-style-type: none"> SHALY SANDSTONE SHALY SILTSTONE SILTSTONE SILTY SHALE TILL TUFF WELDED TUFF
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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
- GYPHIFEROUS

- HEAVY MINERAL
- KAOLIN
- MARLSTONE
- MICACEOUS
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETS
- PYRITE
- SALT CAST
- SANDY
- SILICEOUS
- SILTY

Stringer

- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER
- GYPHUM 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
- FENESTRAL
- F FRACTURE
- INTERCRYSTALLINE
- INTEROOLITIC
- MOLDIC

- ORGANIC
- PINPOINT
- 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

- DRILL STEM TEST
- WIRELINE TESTED - LEFT
- WIRELINE TESTED - RT

Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

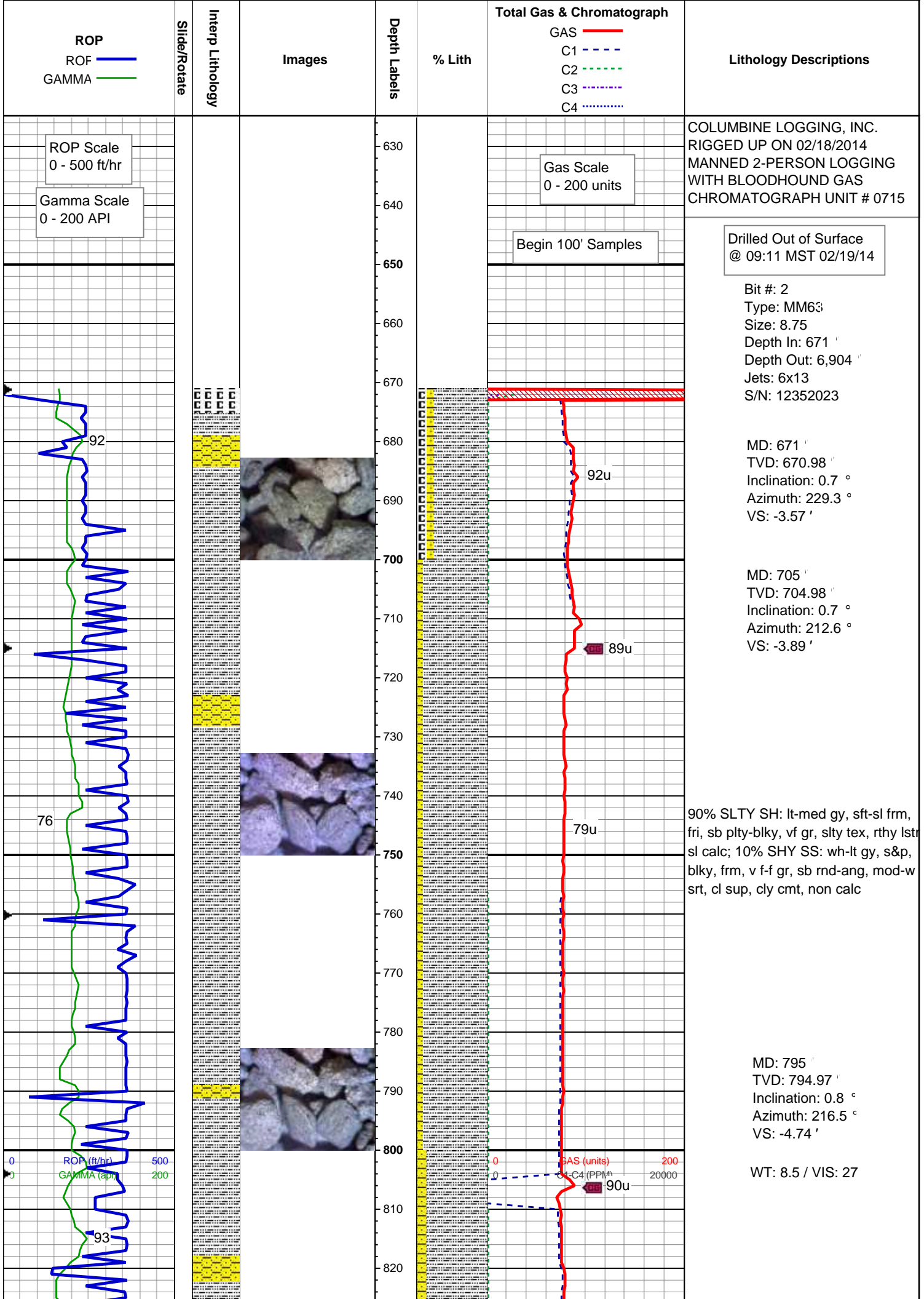
Textures

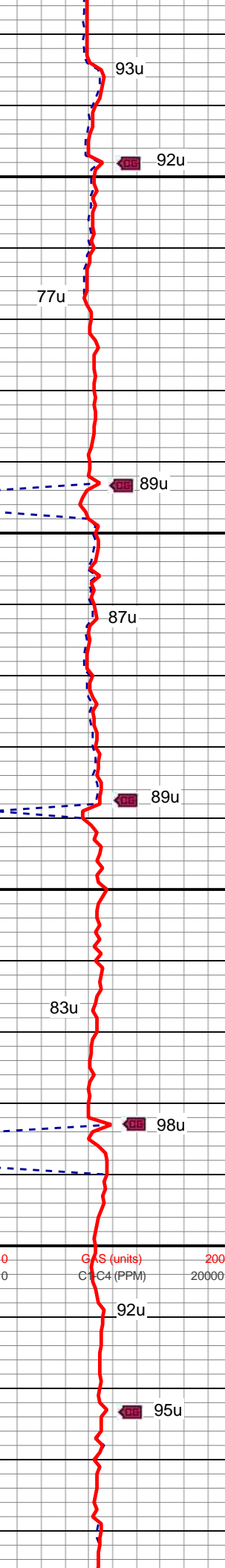
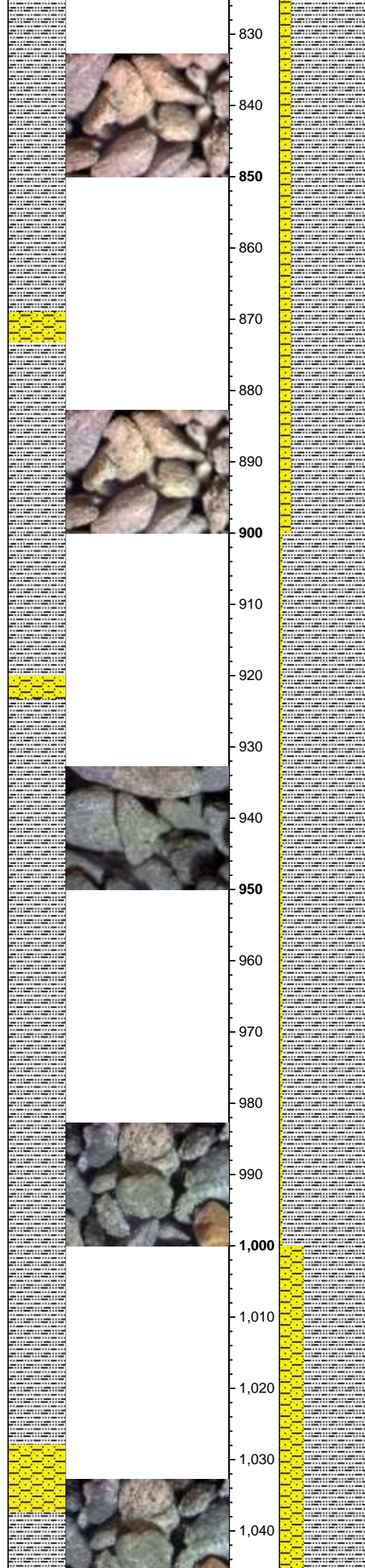
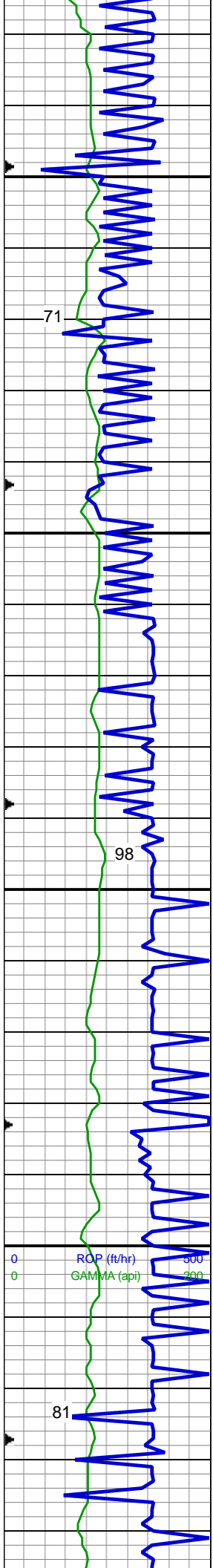
- BOUNDSTONE
- CHALKY
- CRYPTOXLN

- E EARTHY
- FXY FINELYXLN
- GS GRAINSTONE
- L LITHOGRAPHIC
- MX MICROXLN
- MS MUDSTONE
- PS PACKSTONE
- WS WACKSTONE

Sorting

- M MODERATE
- P POOR
- WJ WELL





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

MD: 884 '
 TVD: 883.96 '
 Inclination: 0.8 °
 Azimuth: 218 °
 VS: -5.67 '

WT: 8.5 / VIS: 27

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

MD: 974 '
 TVD: 973.96 '
 Inclination: 0.8 °
 Azimuth: 209.6 °
 VS: -6.55 '

WT: 8.5 / VIS: 27

70% SLTY SH: lt-med gy, sft-sl frm,

71

98

81

93u

92u

77u

89u

87u

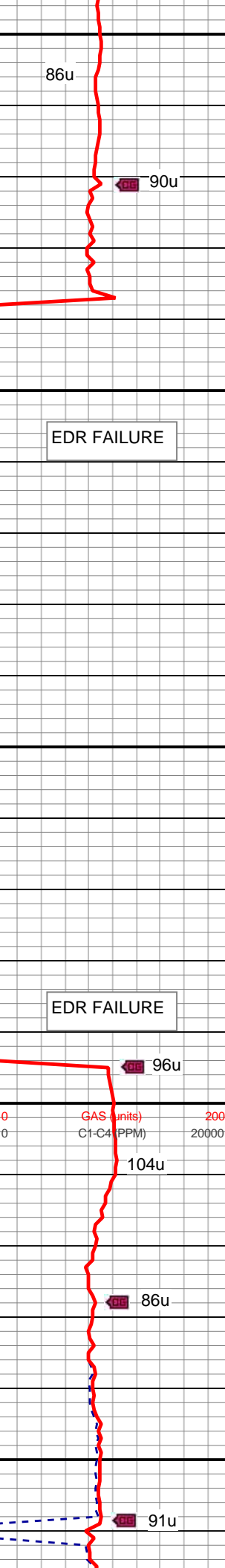
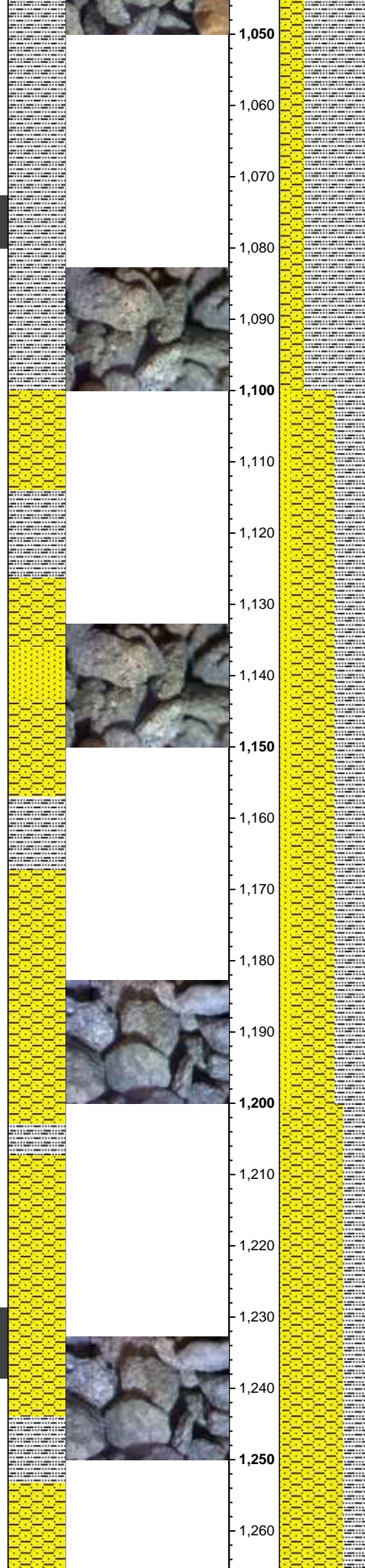
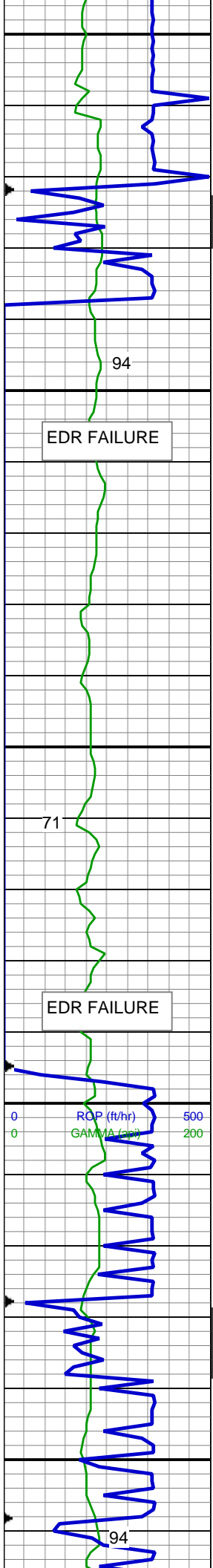
89u

83u

98u

92u

95u



fri, sb pty-blky, vf gr, slty tex, rthy lstr
 sl calc; 30% 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

86u

90u

EDR FAILURE

EDR FAILURE

WT: 8.5 / VIS: 27

50% 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; 35% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb pty-blky, vf gr, slty tex, sl calc; 15% SS: wh-lt gy, clr-trnsl, speckl blk, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 1,172 '
 TVD: 1,171.94 '
 Inclination: 1.1 °
 Azimuth: 307.2 °
 VS: -8.72 '

EDR FAILURE

EDR FAILURE

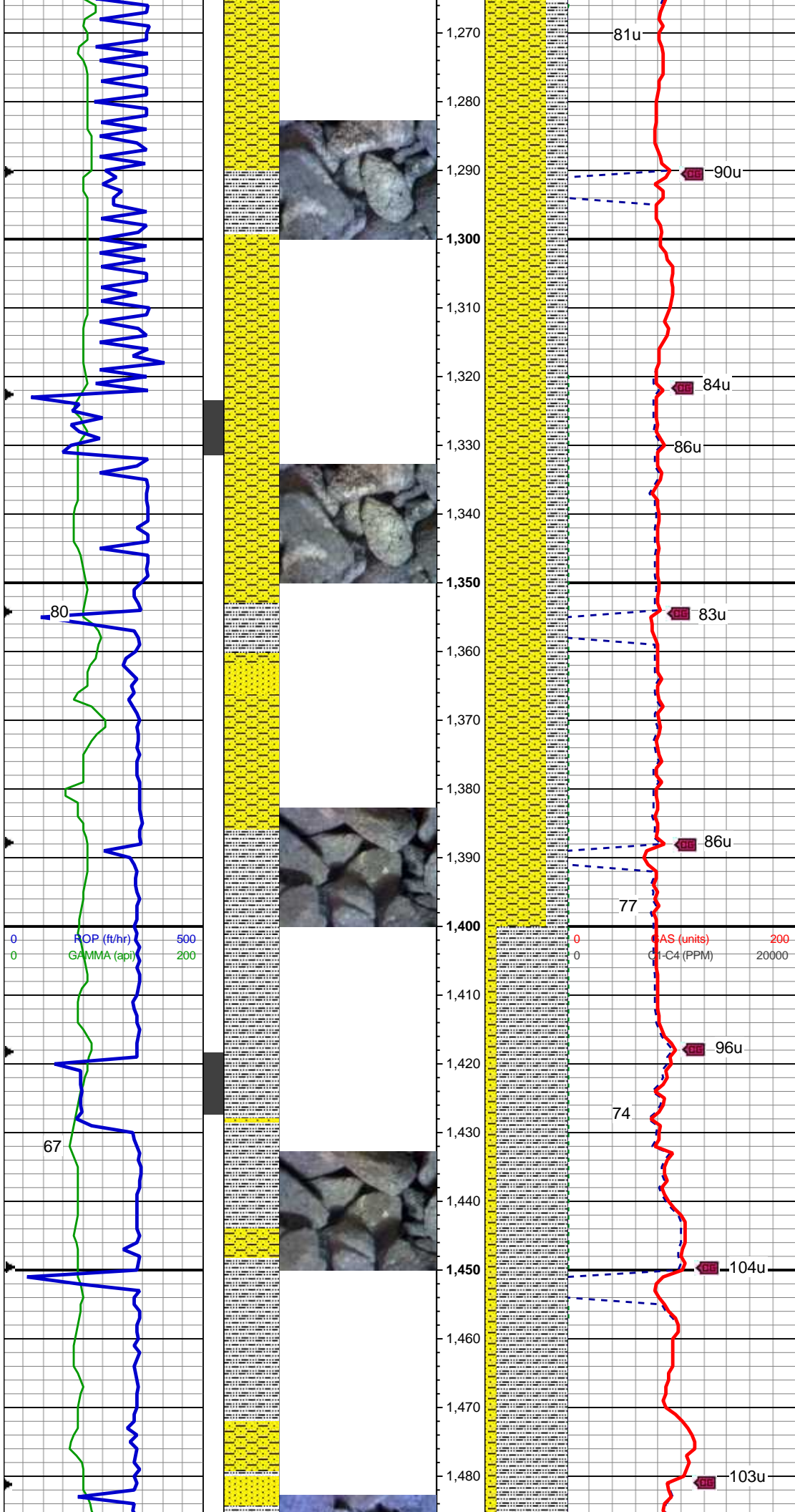
96u

104u

86u

70% 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; 25% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb pty-blky, vf gr, slty tex, sl calc; 5% SS: wh-lt gy, clr-trnsl, speckl blk, sb rnd-ang, p srt, w cons, f gr, non calc

91u



MD: 1,267 '
 TVD: 1,266.87 '
 Inclination: 3.2 °
 Azimuth: 323.5 °
 VS: -10.46 '

WT: 8.5 / VIS: 27

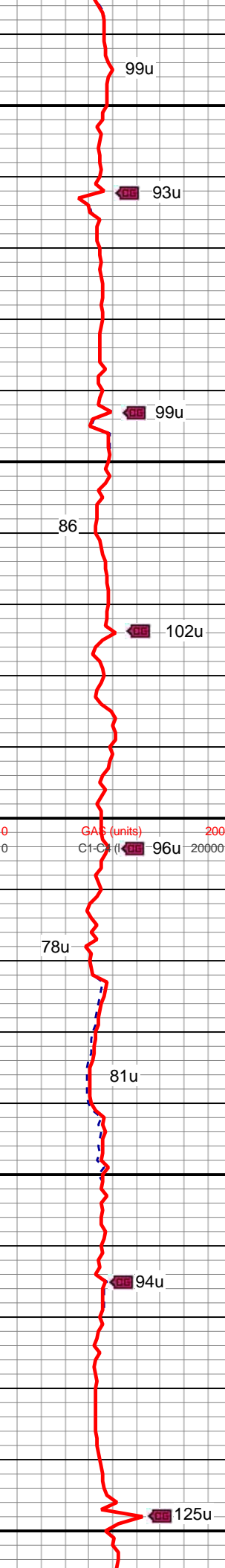
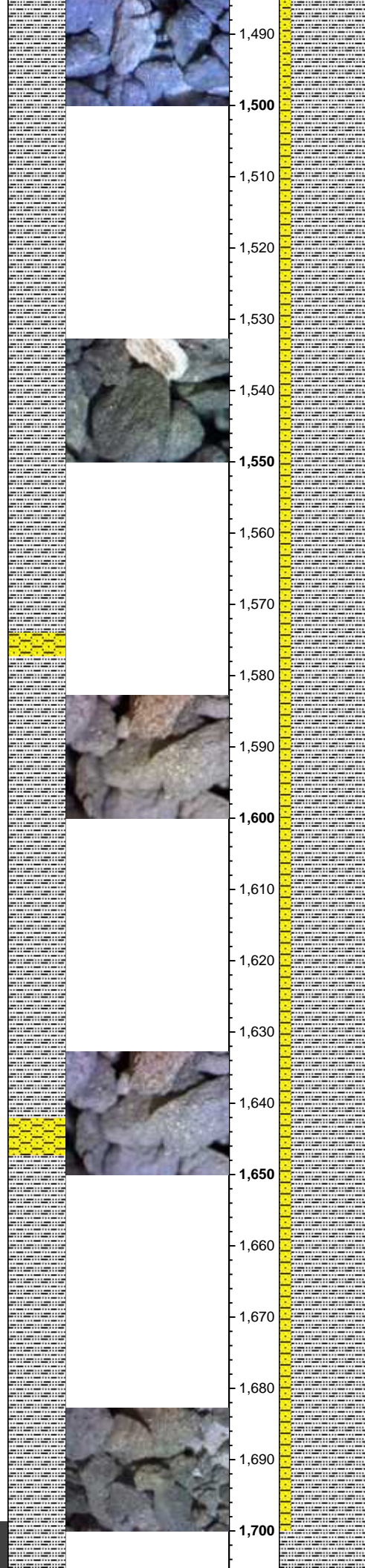
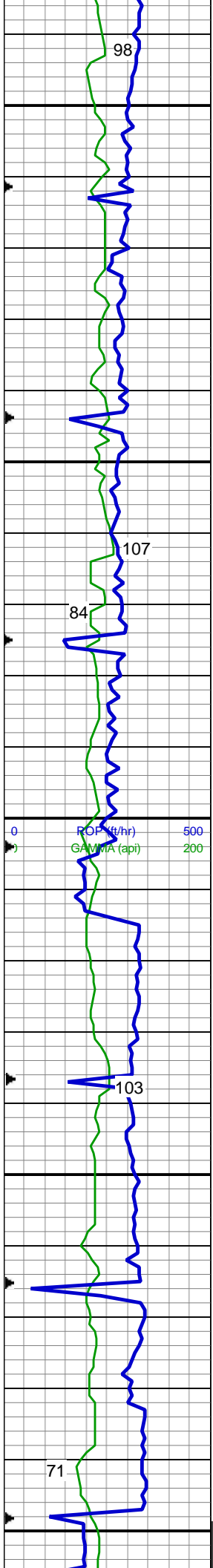
70% SHY SS: wh-lt gy, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 25% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 5% SS: wh-lt gy, clr-trnsl, speckl blk, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 1,363 '
 TVD: 1,362.66 '
 Inclination: 4.4 °
 Azimuth: 335.6 °
 VS: -12.44 '

WT: 8.5 / VIS: 27

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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 5% SS: wh-lt gy, clr-trnsl, speckl blk, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 1,456 '
 TVD: 1,455.3 '
 Inclination: 5.7 °
 Azimuth: 339.9 °
 VS: -13.14 '



WT: 8.5 / VIS: 27

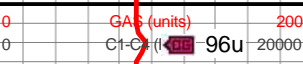
85% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 15% SHY SS: wh-lt gy, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

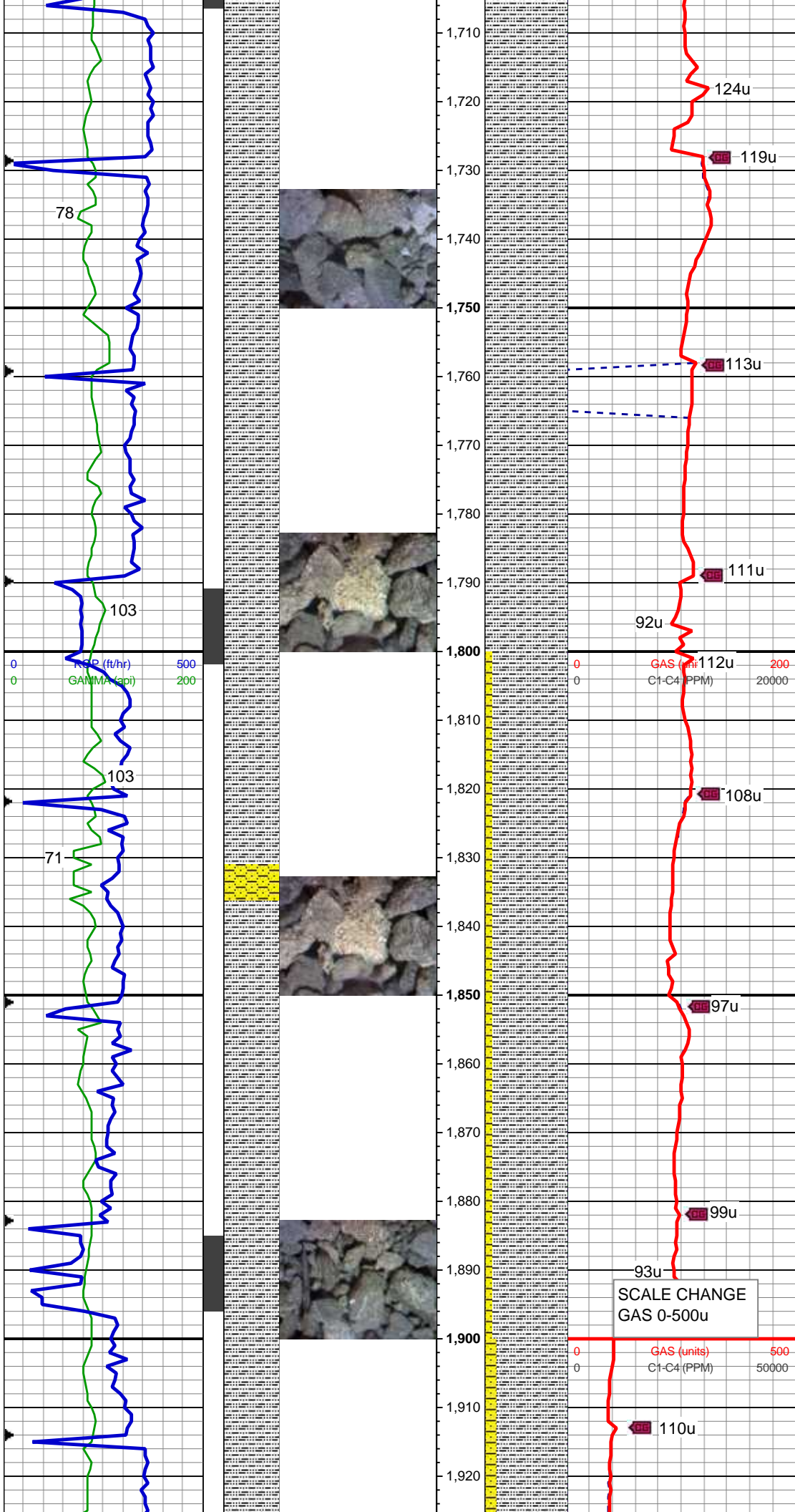
MD: 1,549 '
 TVD: 1,547.84 '
 Inclination: 5.7 °
 Azimuth: 338.5 °
 VS: -14.67 '

WT: 8.5 / VIS: 27

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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

MD: 1,641 '
 TVD: 1,639.34 '
 Inclination: 6.2 °
 Azimuth: 337.4 °
 VS: -16.47 '





MD: 1,734 '
 TVD: 1,731.69 '
 Inclination: 7.4 °
 Azimuth: 339.7 °
 VS: -18.41 '

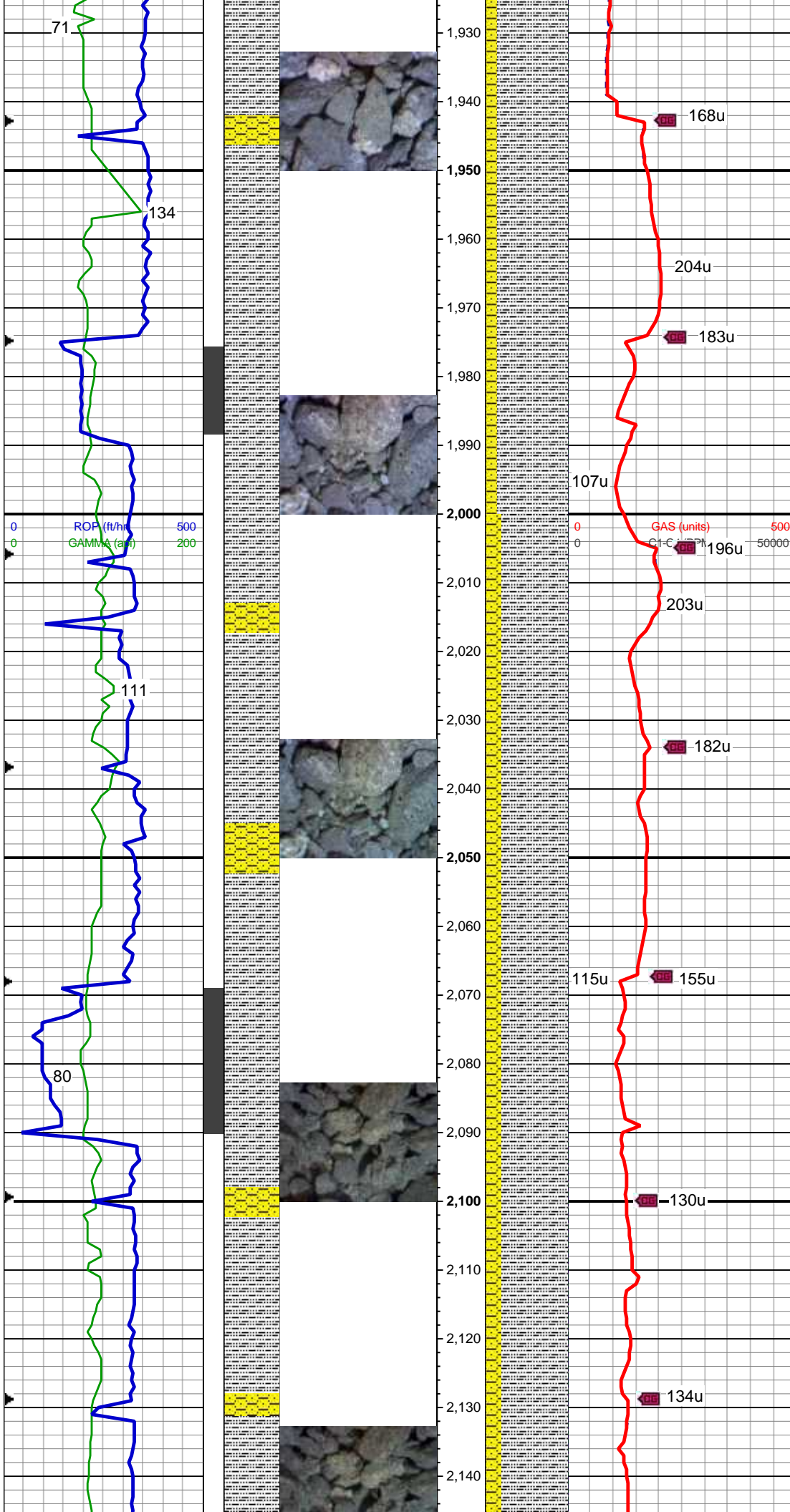
100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc, tr shy ss

WT: 8.5 / VIS: 27

MD: 1,827 '
 TVD: 1,823.78 '
 Inclination: 8.6 °
 Azimuth: 337.4 °
 VS: -20.72 '

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, s&p, blky, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

MD: 1,919 '
 TVD: 1,914.62 '
 Inclination: 9.7 °
 Azimuth: 326.7 °
 VS: -24.99 '
 WT: 8.5 / VIS: 27



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, s&p, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

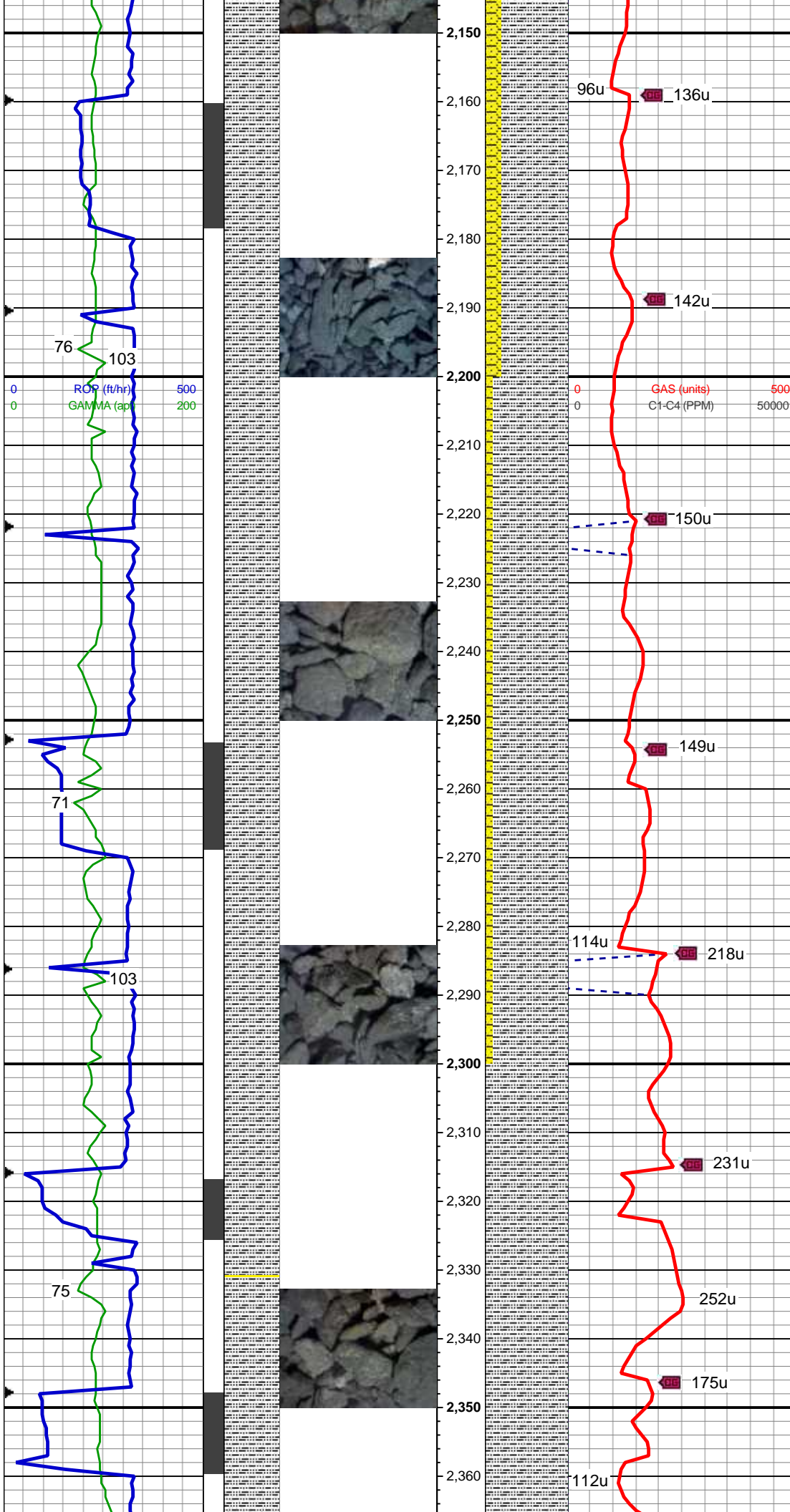
MD: 2,012 '
 TVD: 2,006.22 '
 Inclination: 10.2 °
 Azimuth: 324.4 °
 VS: -31.34 '

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, s&p, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

WT: 8.5 / VIS: 27

MD: 2,105 '
 TVD: 2,097.64 '
 Inclination: 10.9 °
 Azimuth: 326.2 °
 VS: -38.11 '

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, s&p, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, tr ss



MD: 2,197 '
 TVD: 2,187.68 '
 Inclination: 12.8 °
 Azimuth: 327 °
 VS: -45.24 '

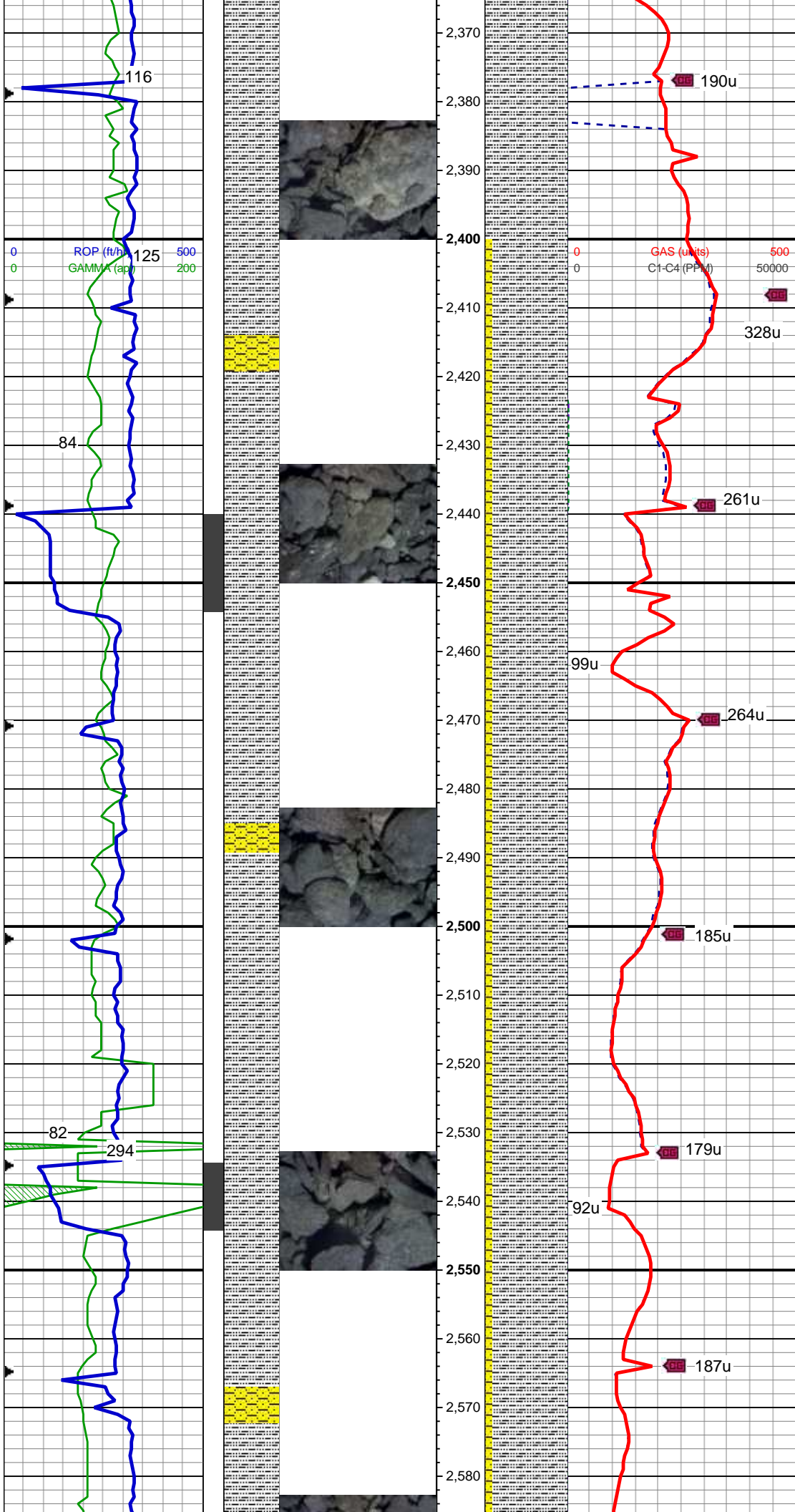
90% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 10% SHY SS: wh-lt gy, s&p, blky, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, mod pyr

WT: 8.5 / VIS: 27

MD: 2,291 '
 TVD: 2,279.21 '
 Inclination: 13.5 °
 Azimuth: 328.3 °
 VS: -52.94 '

WT: 8.5 / 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, abnt pyr



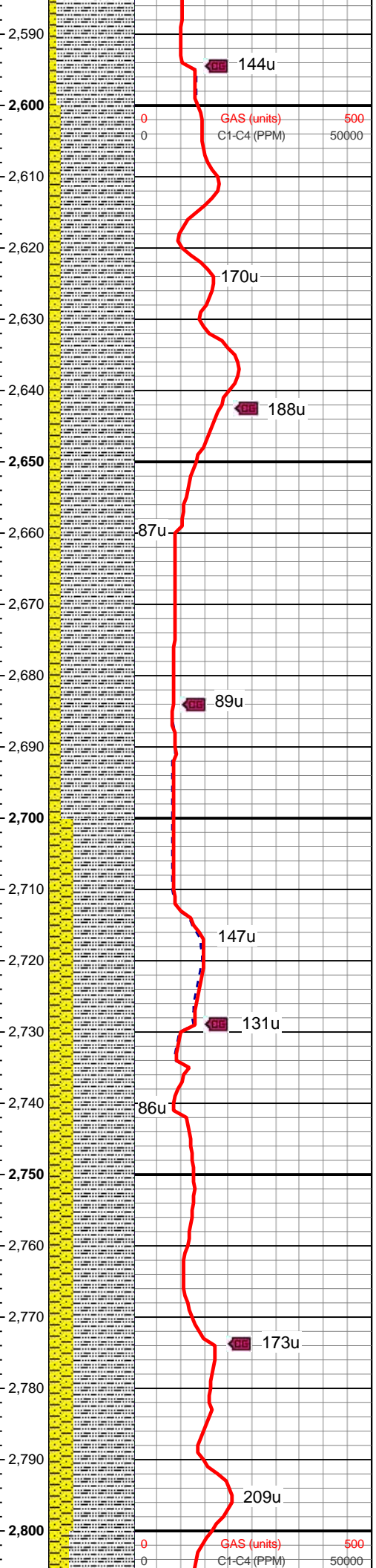
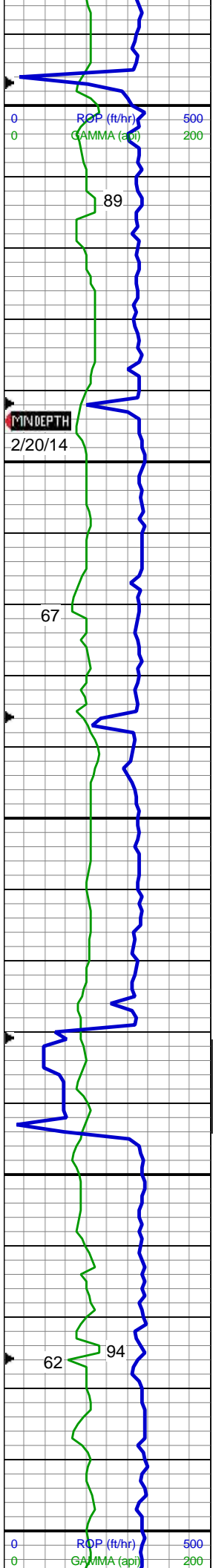
MD: 2,384 '
 TVD: 2,369.93 '
 Inclination: 12 °
 Azimuth: 339.2 °
 VS: -58.35 '

WT: 8.6 / VIS: 27
 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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, mod pyr

MD: 2,479 '
 TVD: 2,462.59 '
 Inclination: 13.5 °
 Azimuth: 342.9 °
 VS: -61.13 '

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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, mod pyr

MD: 2,586 '
 TVD: 2,566.18 '
 Inclination: 15.5 °
 Azimuth: 342.9 °
 VS: -61.13 '



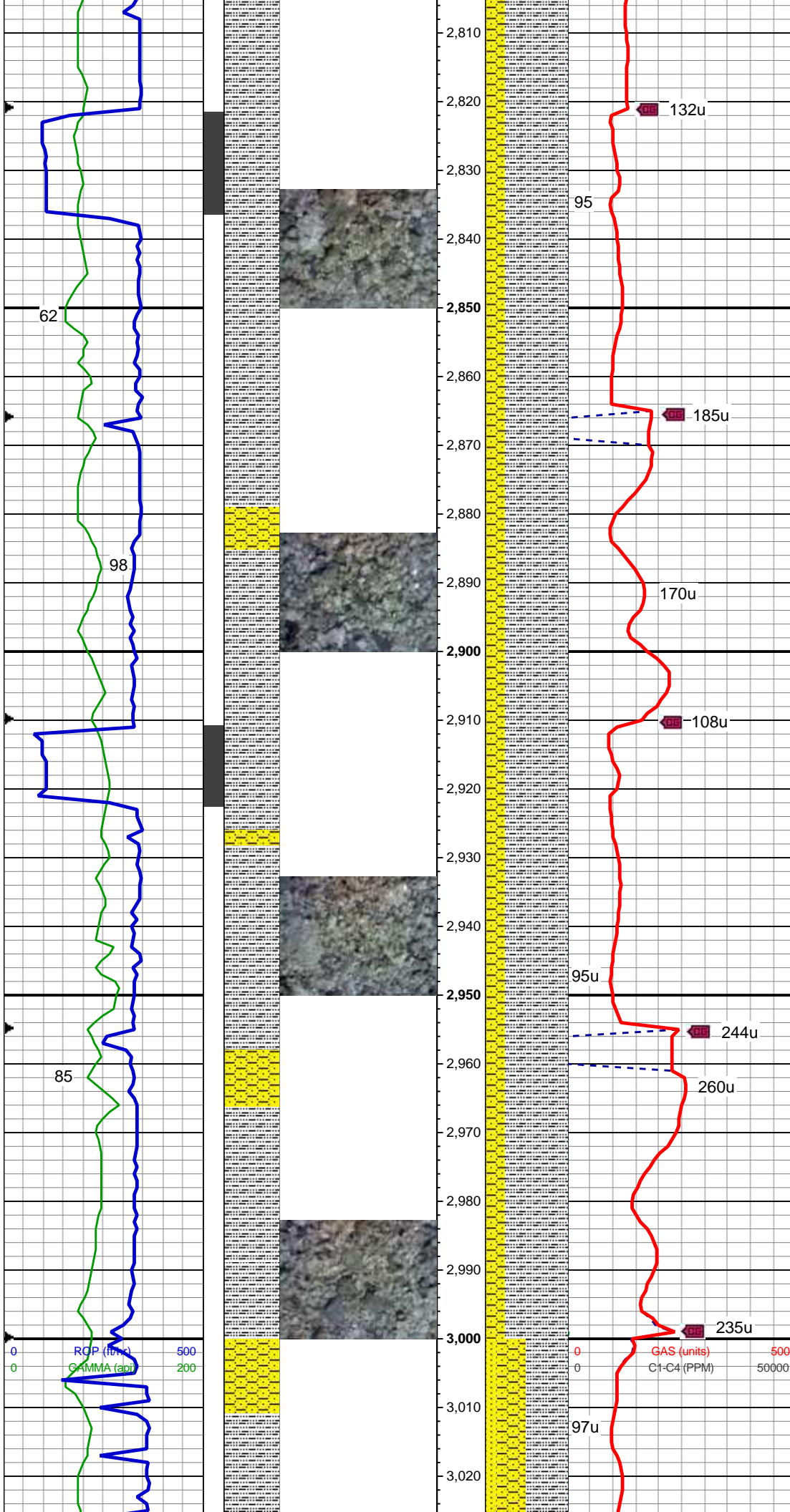
Inclination: 15.5 °
Azimuth: 340 °
VS: -64.59 '
WT: 8.5 / VIS: 27

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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, tr ss

MD: 2,676 '
TVD: 2,652.73 '
Inclination: 16.3 °
Azimuth: 336.5 °
VS: -69.11 '

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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, mod pyr, tr ss

MD: 2,766 '
TVD: 2,739.1 '
Inclination: 16.4 °
Azimuth: 338.3 °
VS: -74.11 '



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, s&p, blky, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, mod pyr

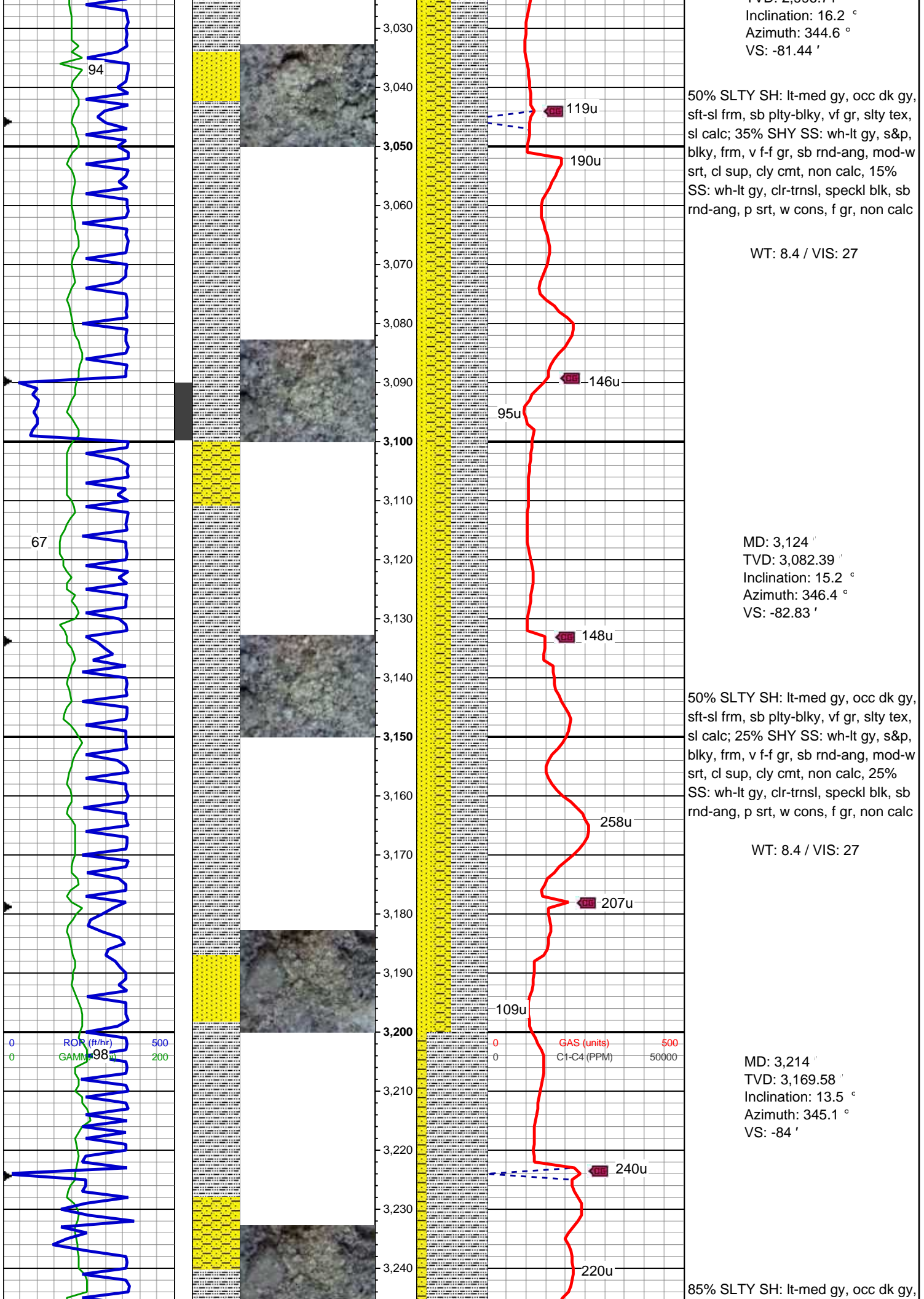
MD: 2,855 '
 TVD: 2,824.32 '
 Inclination: 17.1 °
 Azimuth: 343.7 °
 VS: -77.55 '

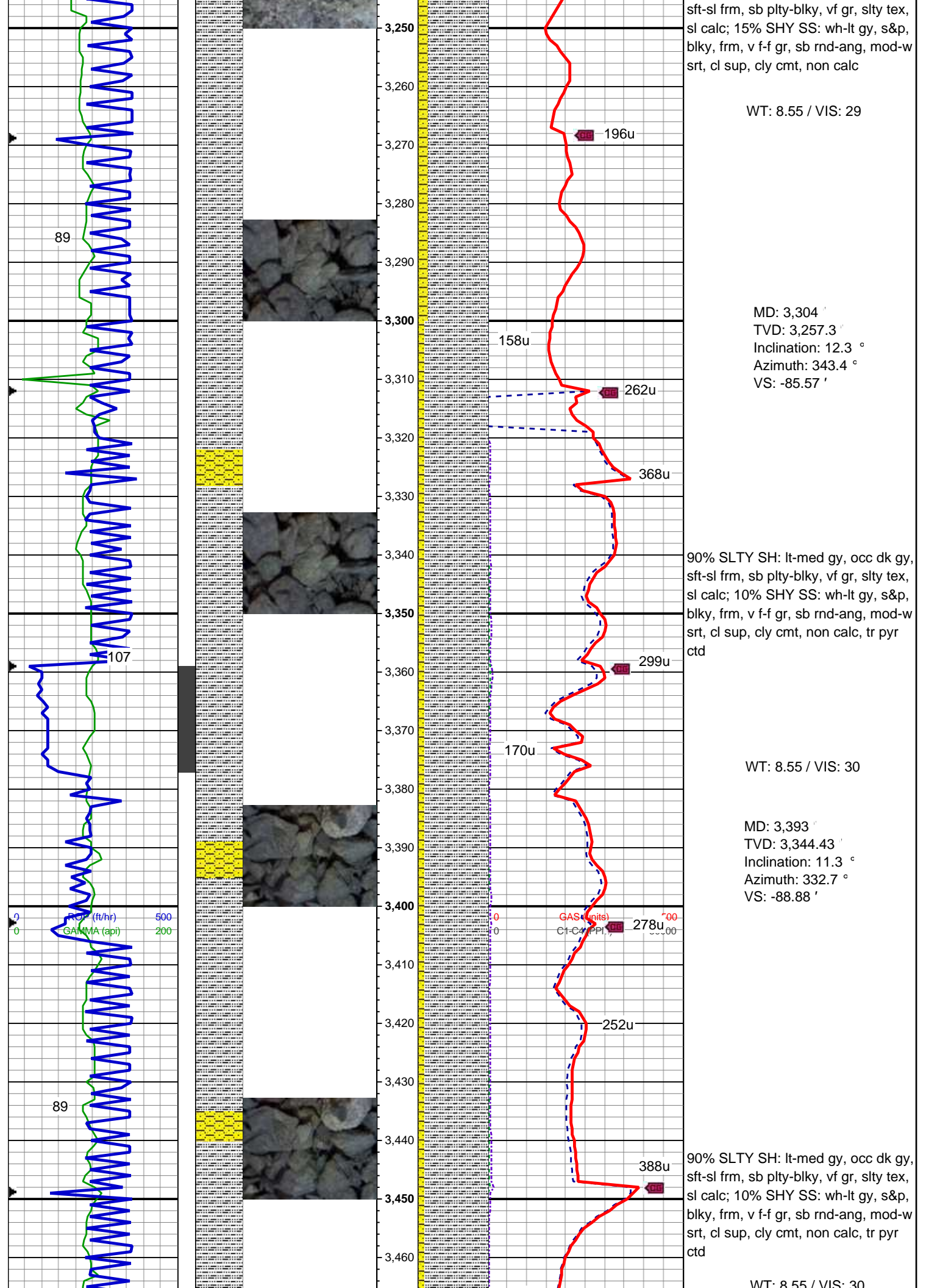
WT: 8.5 / VIS: 27

MD: 2,945 '
 TVD: 2,910.41 '
 Inclination: 16.8 °
 Azimuth: 344.8 °
 VS: -79.63 '

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, s&p, blky, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, mod pyr

MD: 3,035 '
 TVD: 2,996.71 '





sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 15% 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

WT: 8.55 / VIS: 29

MD: 3,304 '
 TVD: 3,257.3 '
 Inclination: 12.3 °
 Azimuth: 343.4 °
 VS: -85.57 '

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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, tr pyr ctd

WT: 8.55 / VIS: 30

MD: 3,393 '
 TVD: 3,344.43 '
 Inclination: 11.3 °
 Azimuth: 332.7 °
 VS: -88.88 '

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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, tr pyr ctd

WT: 8.55 / VIS: 30

MD: 3,483 '
TVD: 3,432.85 '
Inclination: 10.2 °
Azimuth: 326.3 °
VS: -94.37 '

WT: 8.6 / VIS: 34

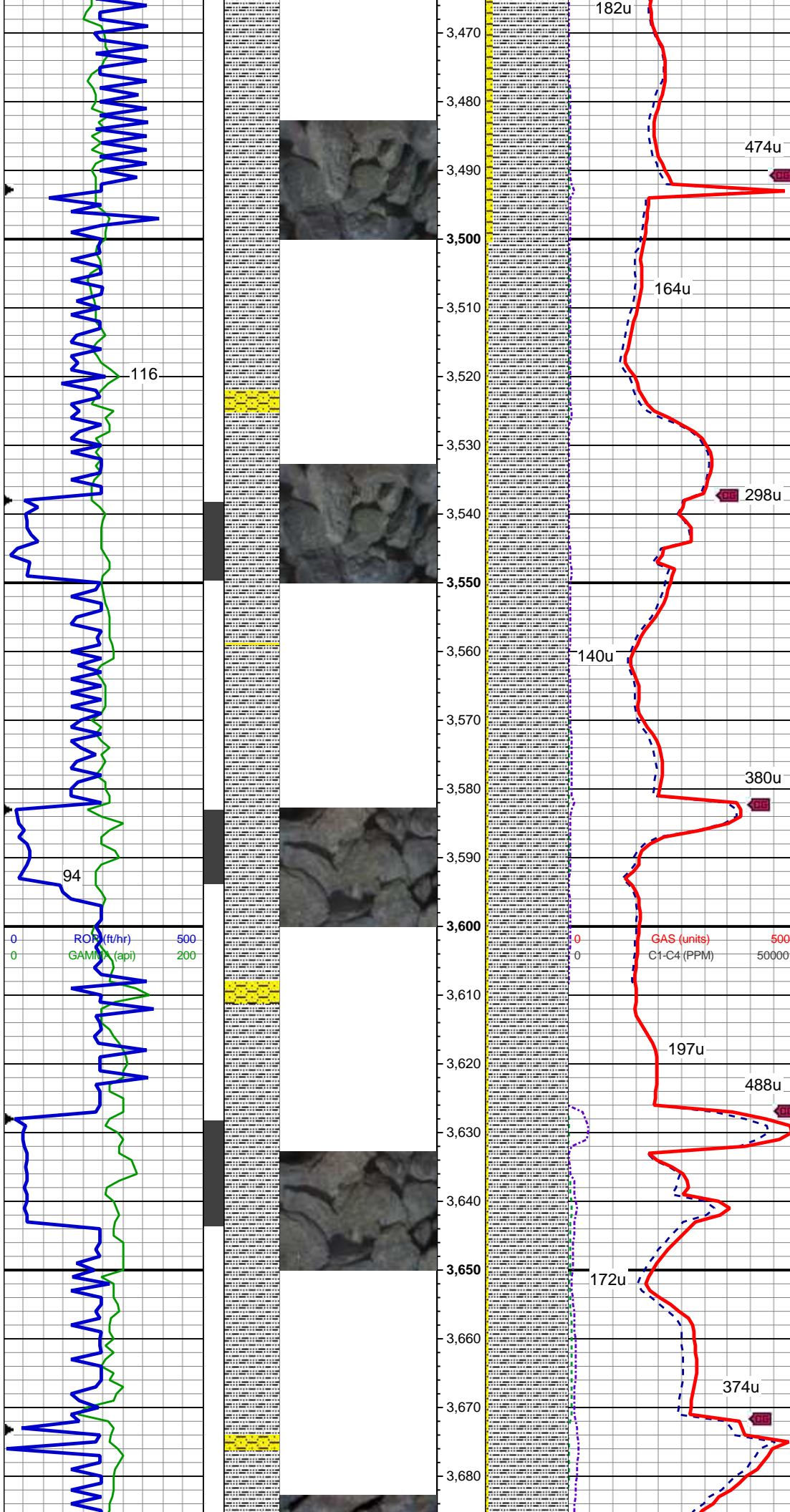
95% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 5% SHY SS: wh-lt gy, s&p, blky, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, tr pyr ctd

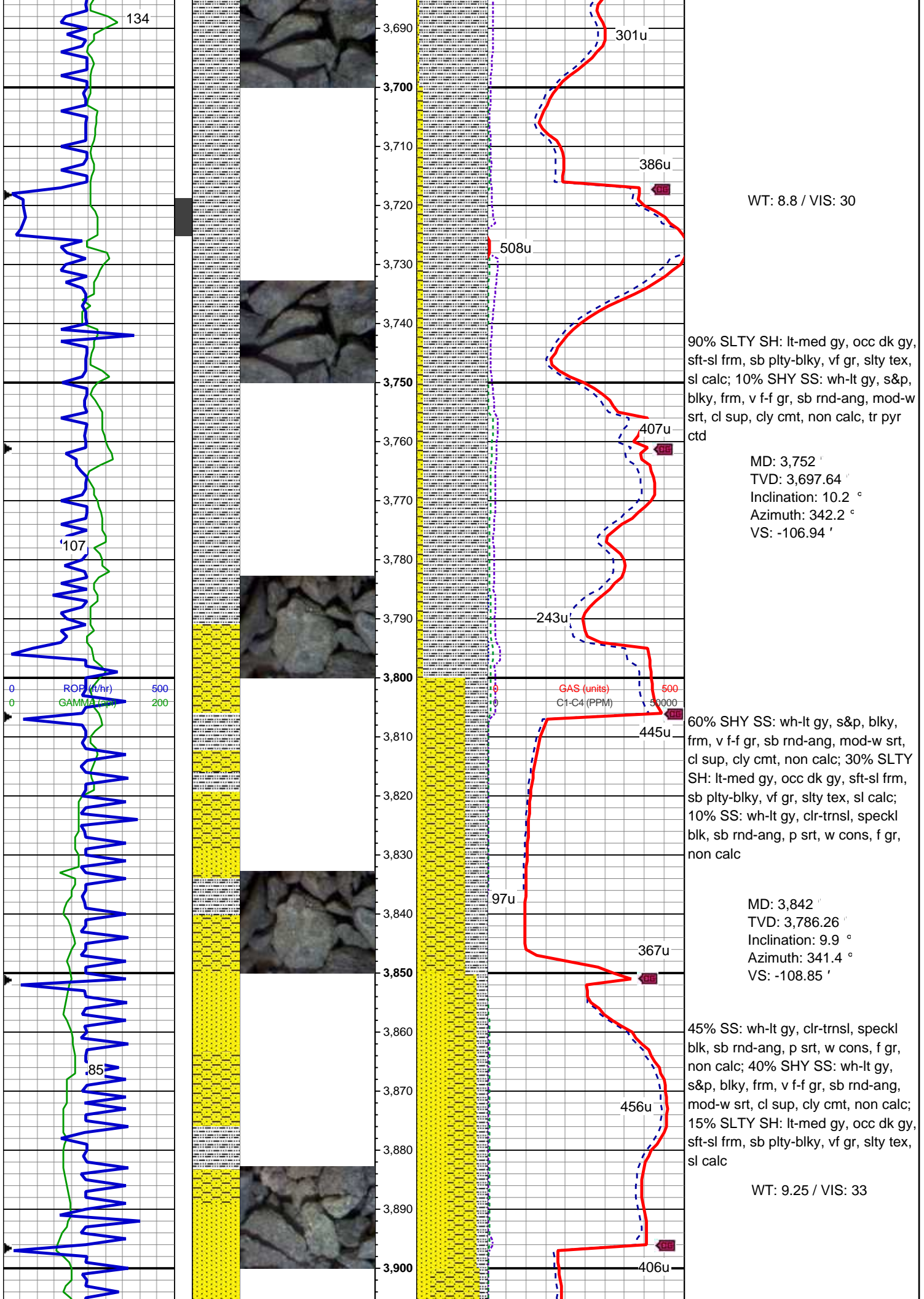
MD: 3,573 '
TVD: 3,521.46 '
Inclination: 10 °
Azimuth: 326.7 °
VS: -100.35 '

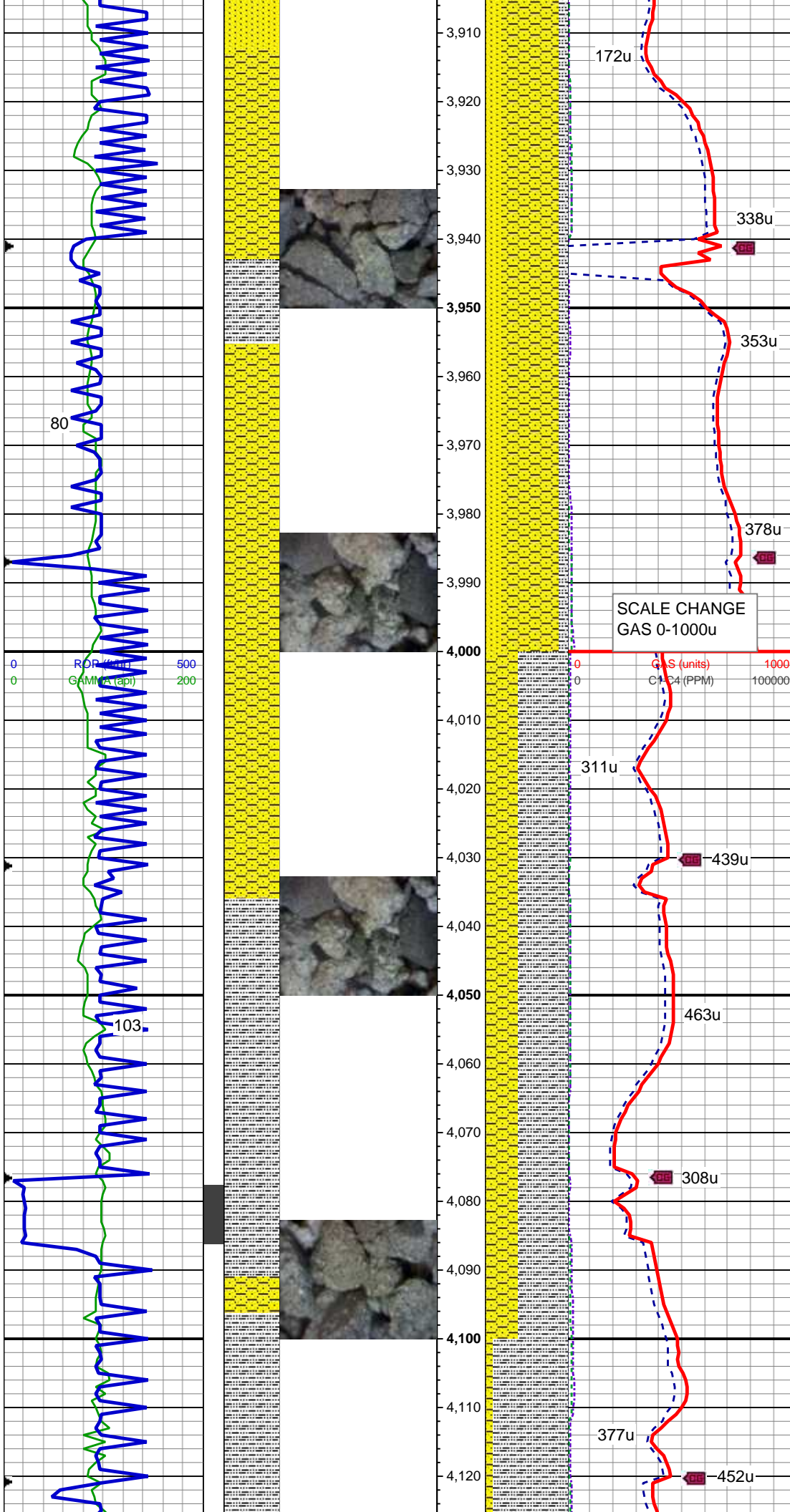
WT: 8.55 / VIS: 34

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

MD: 3,662 '
TVD: 3,609.08 '
Inclination: 10.3 °
Azimuth: 338.8 °
VS: -104.63 '







MD: 3,931 '
 TVD: 3,873.92 '
 Inclination: 10 °
 Azimuth: 340 °
 VS: -111.01 '

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

MD: 4,021 '
 TVD: 3,962.51 '
 Inclination: 10.3 °
 Azimuth: 339 °
 VS: -113.57 '

60% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 40% 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, tr ss

WT: 9.4 / VIS: 35

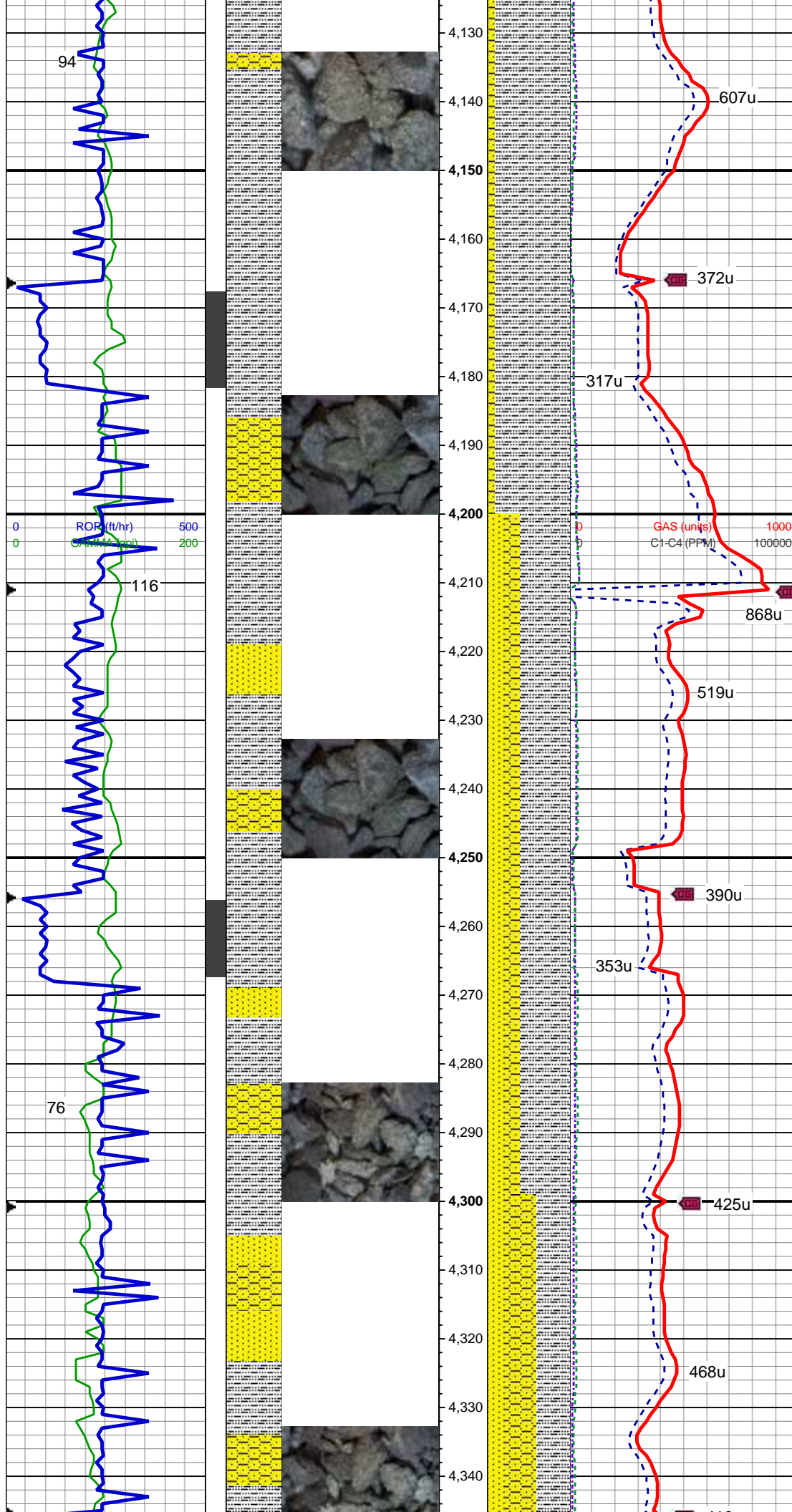
MD: 4,111 '
 TVD: 4,051.13 '
 Inclination: 9.8 °
 Azimuth: 339.7 °
 VS: -116.15 '

ROP (ft/min) 500
 GAMMA (API) 200

SCALE CHANGE
 GAS 0-1000u
 GAS (units) 1000
 CH4 (PPM) 100000

80

103



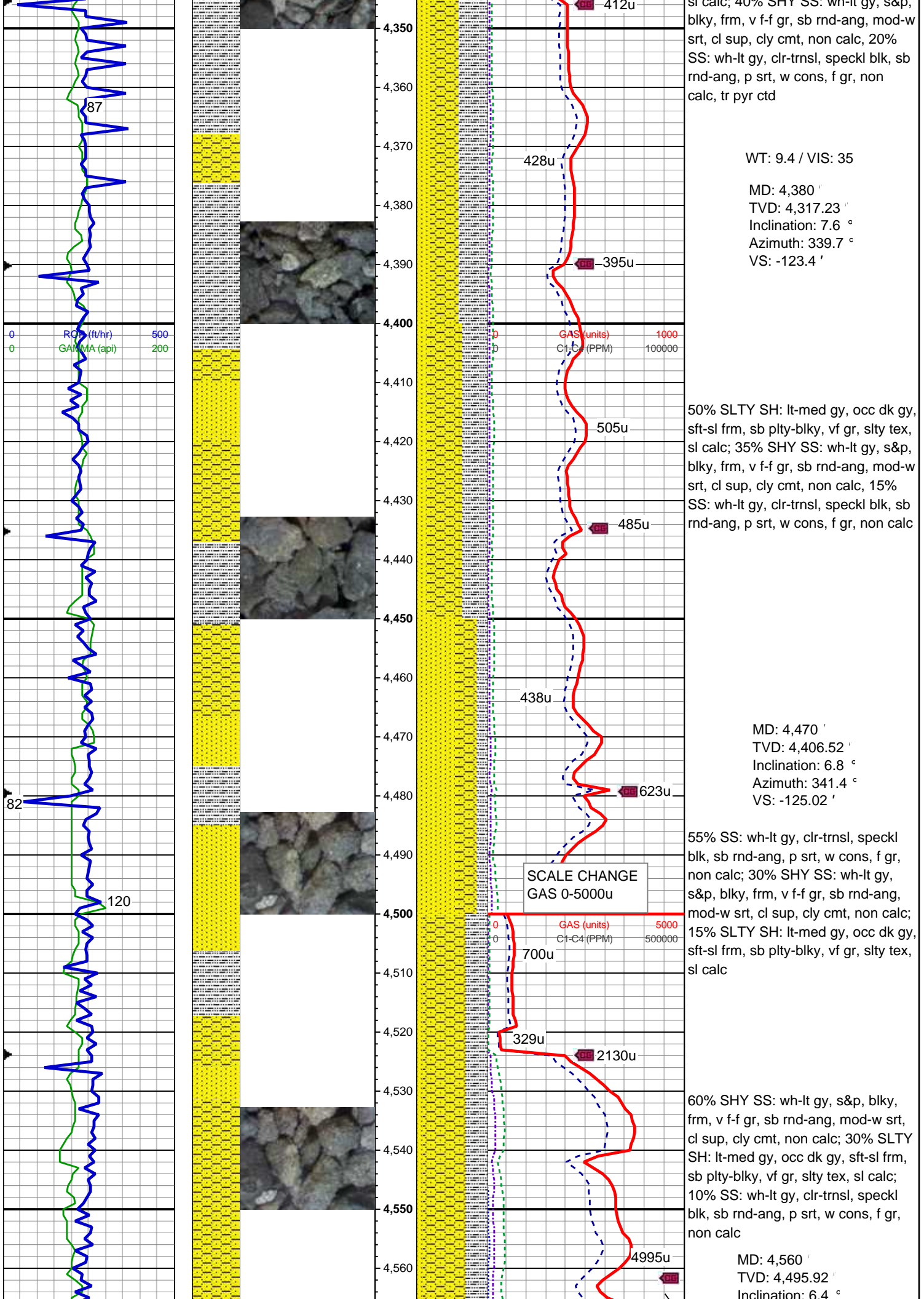
90% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 10% SHY SS: wh-lt gy, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

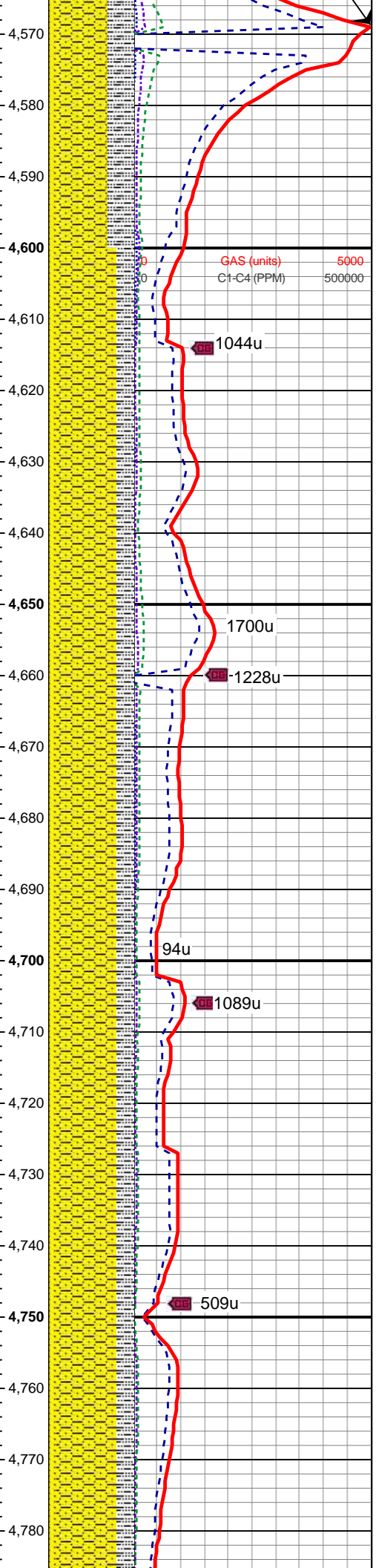
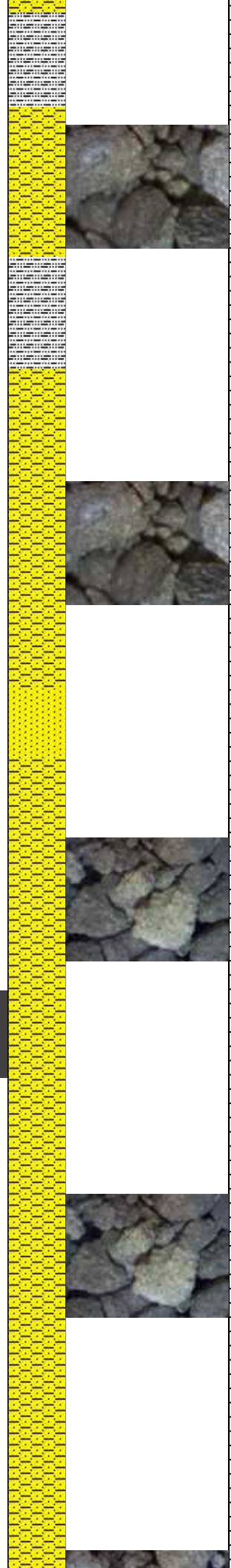
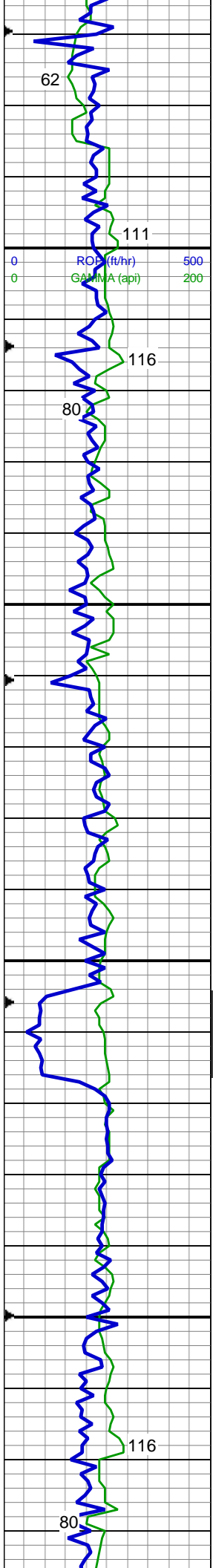
MD: 4,201 '
 TVD: 4,139.99 '
 Inclination: 8.5 °
 Azimuth: 335.1 °
 VS: -118.93 '

60% 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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc, 20% SS: wh-lt gy, clr-trnsl, speckl blk, sb rnd-ang, p srt, w cons, f gr, non calc

MD: 4,291 '
 TVD: 4,229.05 '
 Inclination: 8 °
 Azimuth: 339.7 °
 VS: -121.49 '

40% 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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc





Azimuth: 340.2 °
VS: -126.45 '

MD: 4,650 '
TVD: 4,585.36 '
Inclination: 6.4 °
Azimuth: 336.3 °
VS: -128.28 '

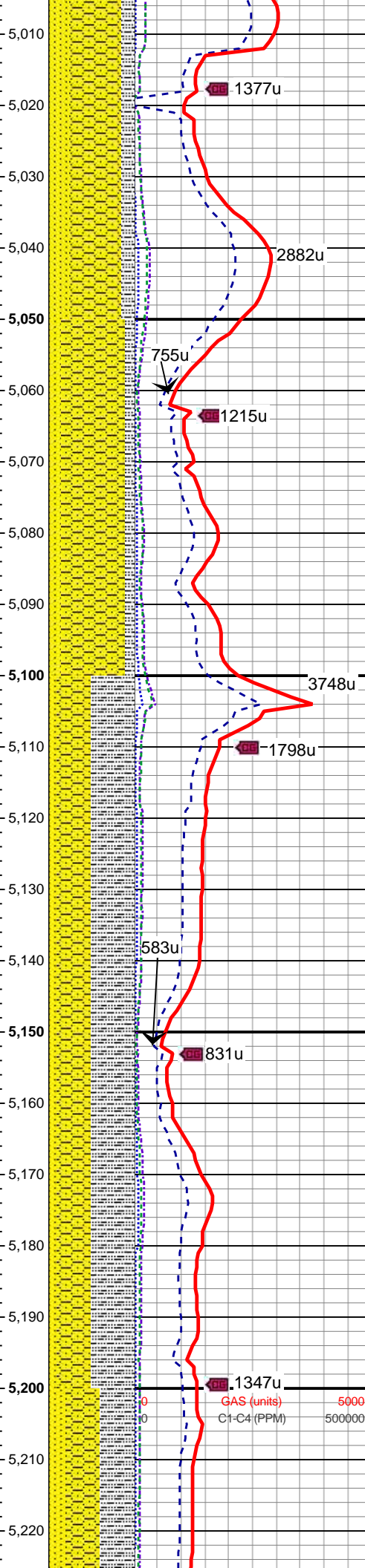
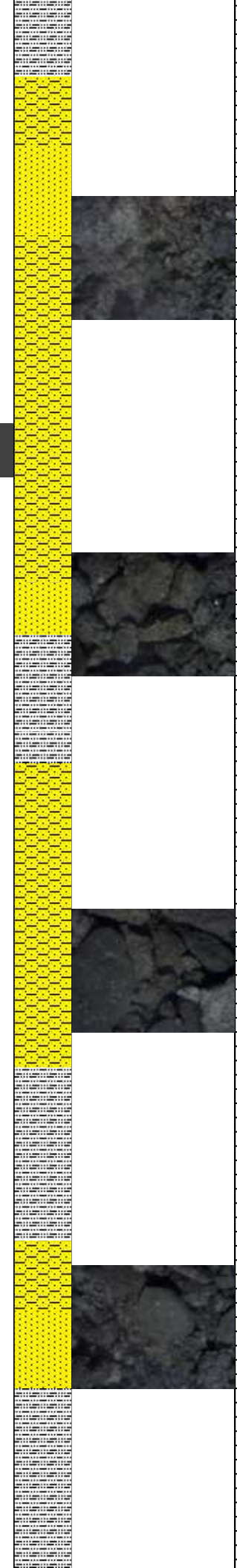
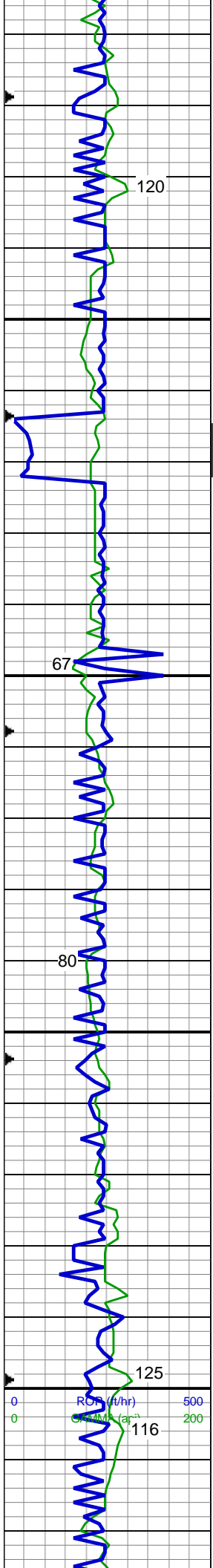
70% SHY SS: wh-lt gy, s&p, blkly, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc; 20% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb pty-blky, vf gr, slty tex, sl calc; 10% SS: wh-lt gy, clr-trnsl, speckl blk, sb rnd-ang, p srt, w cons, f gr, non calc

WT: 9.5 / VIS: 34

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

MD: 4,739 '
TVD: 4,673.83 '
Inclination: 6.2 °
Azimuth: 343.6 °
VS: -129.79 '

WT: 9.6 / VIS: 37



Azimuth: 329.7 °
 VS: -132.36'

60% 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; 25% SS: wh-lt gy, clr-trnsl, speckl blk, sb rnd-ang, p srt, w cons, f gr, non calc; 15% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc, tr cal

WT: 9.6 / VIS: 35

75% 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; 15% SS: wh-lt gy, clr-trnsl, speckl blk, sb rnd-ang, p srt, w cons, f gr, non calc; 10% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc

MD: 5,098'
 TVD: 5,031.7'
 Inclination: 2.4 °
 Azimuth: 353.6 °
 VS: -133.12'

50% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 40% 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, 10% SS: wh-lt gy, clr-trnsl, speckl blk, sb rnd-ang, p srt, w cons, f gr, non calc

WT: 9.65 / VIS: 35

MD: 5,187'
 TVD: 5,120.66'
 Inclination: 1 °
 Azimuth: 27 °
 VS: -132.49'

1377u

2882u

755u

1215u

3748u

1798u

583u

831u

1347u

GAS (units) 5000
 C1-C4 (PPM) 500000

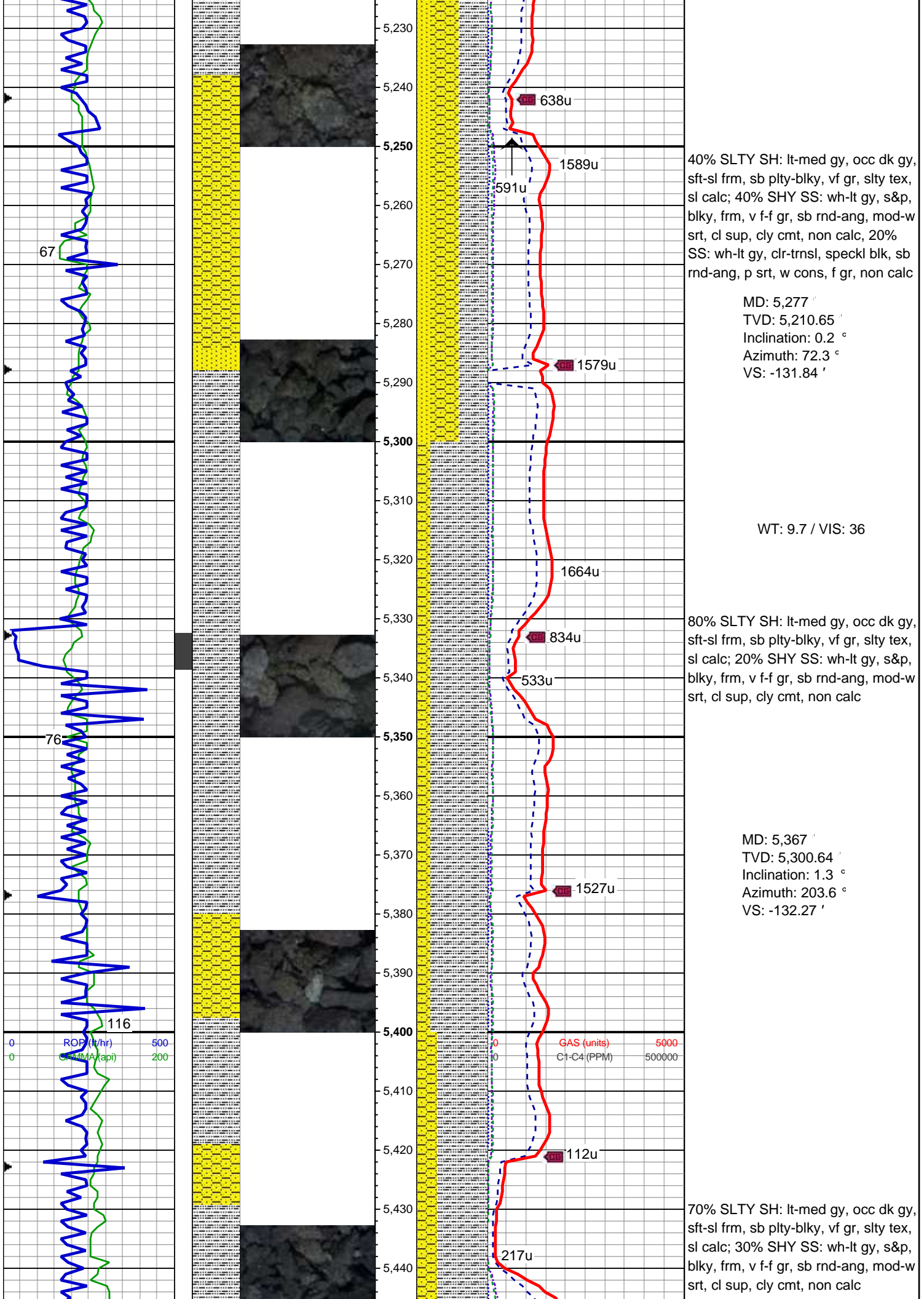
120

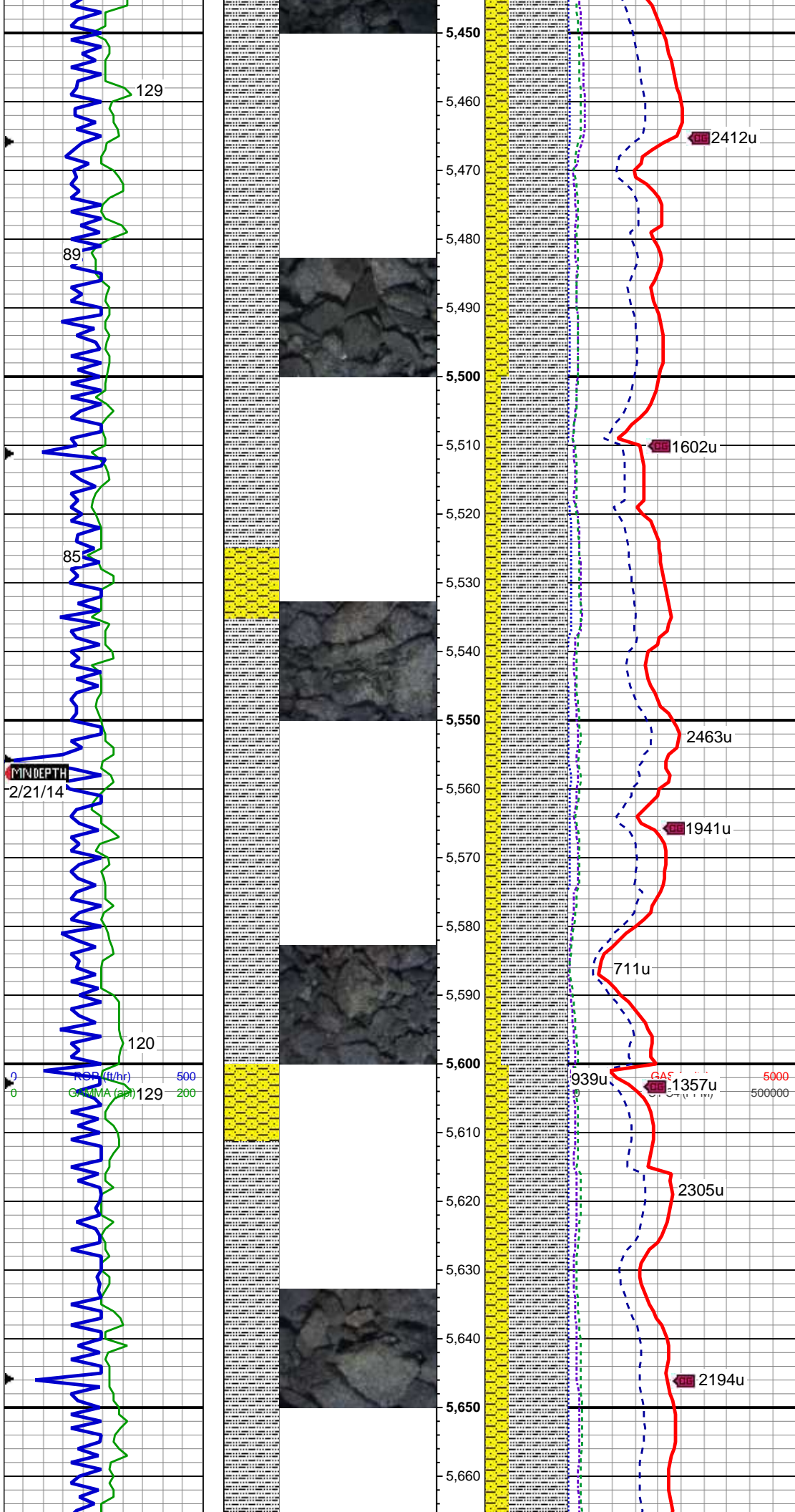
67

80

125

116





MD: 5,456 '
 TVD: 5,389.62 '
 Inclination: 1.1 °
 Azimuth: 202.1 °
 VS: -133.32 '

WT: 9.7 / VIS: 36

MD: 5,546 '
 TVD: 5,479.61 '
 Inclination: 0.9 °
 Azimuth: 180.4 °
 VS: -133.93 '

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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

MD: 5,636 '
 TVD: 5,569.6 '
 Inclination: 0.8 °
 Azimuth: 174.5 °
 VS: -134.14 '

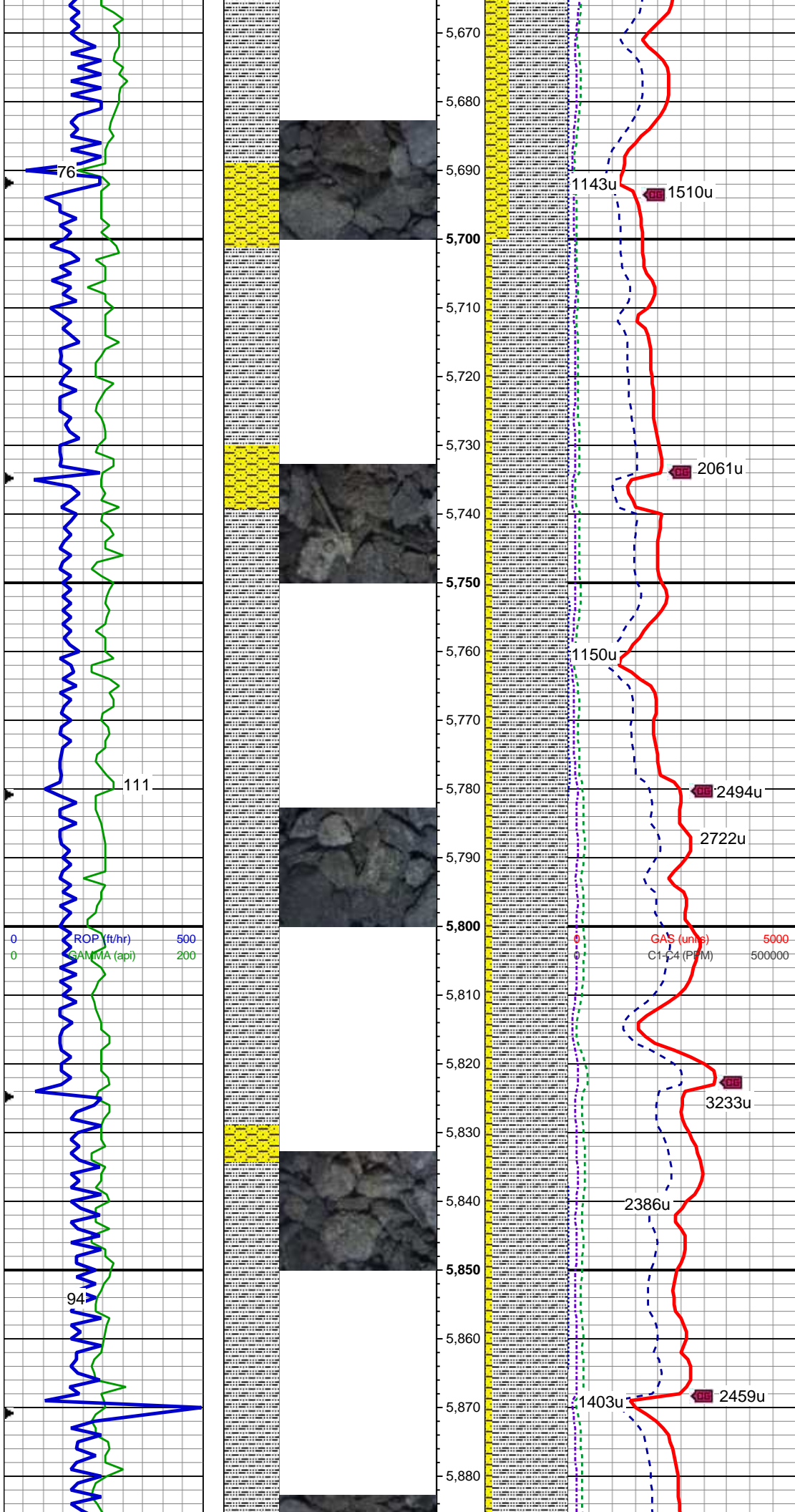
70% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb plty-blky, vf gr, slty tex, sl calc; 30% SHY SS: wh-lt gy, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

MINDEPTH
 2/21/14

0 500
 0 200
 NSR (ft/hr)
 G (MMA) (api)

GAS
 C₁ (v %)

5000
 500000



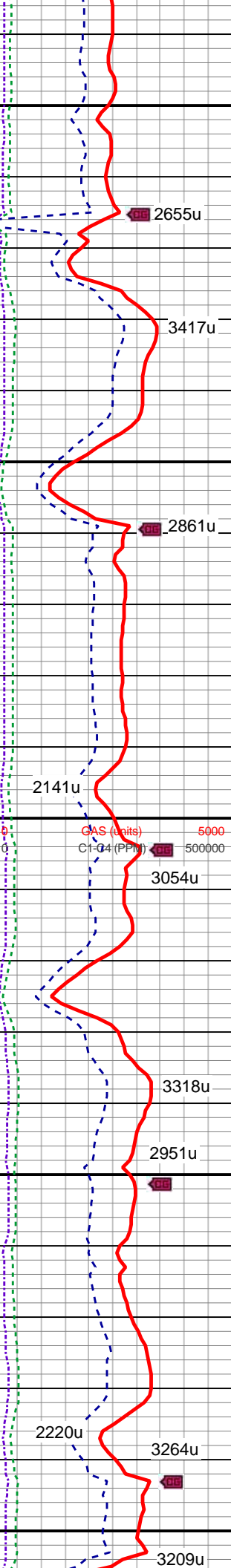
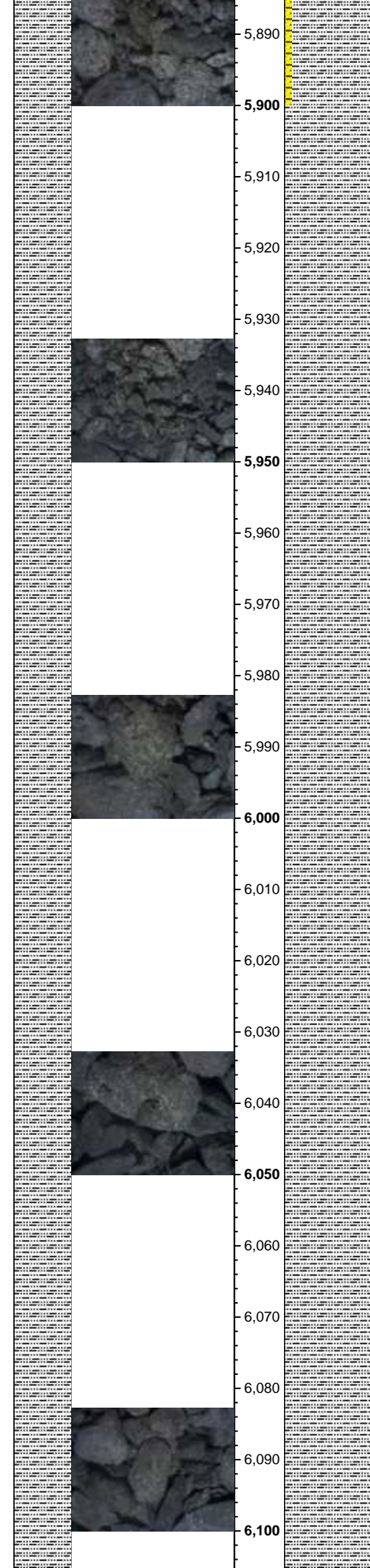
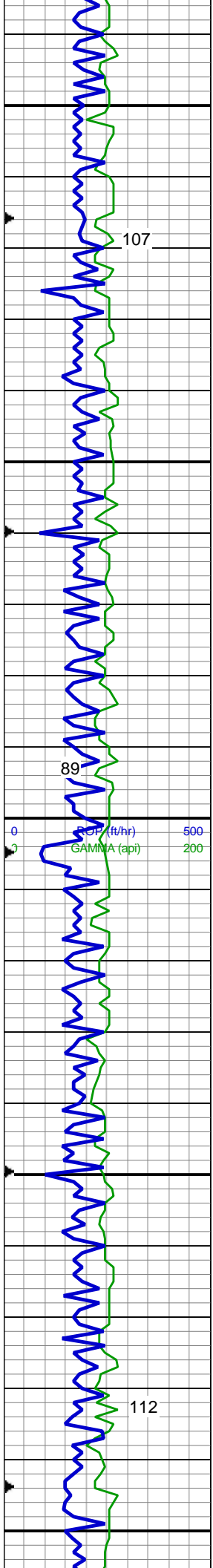
MD: 5,725 '
 TVD: 5,658.59 '
 Inclination: 1 °
 Azimuth: 177.3 °
 VS: -134.32 '

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, s&p, blky, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

MD: 5,815 '
 TVD: 5,748.58 '
 Inclination: 0.5 °
 Azimuth: 158.3 °
 VS: -134.36 '

WT: 9.75 / VIS: 36

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, s&p, blky, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc



MD: 5,905 '
 TVD: 5,838.58 '
 Inclination: 0.5 °
 Azimuth: 185.2 °
 VS: -134.4 '

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: 5,994 '
 TVD: 5,927.57 '
 Inclination: 0.6 °
 Azimuth: 167.2 °
 VS: -134.5 '

WT: 9.8 / VIS: 36

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

MD: 6,083 '
 TVD: 6,016.57 '
 Inclination: 0.7 °
 Azimuth: 149.5 °
 VS: -134.31 '

107

89

112

2655u

3417u

2861u

2141u

3054u

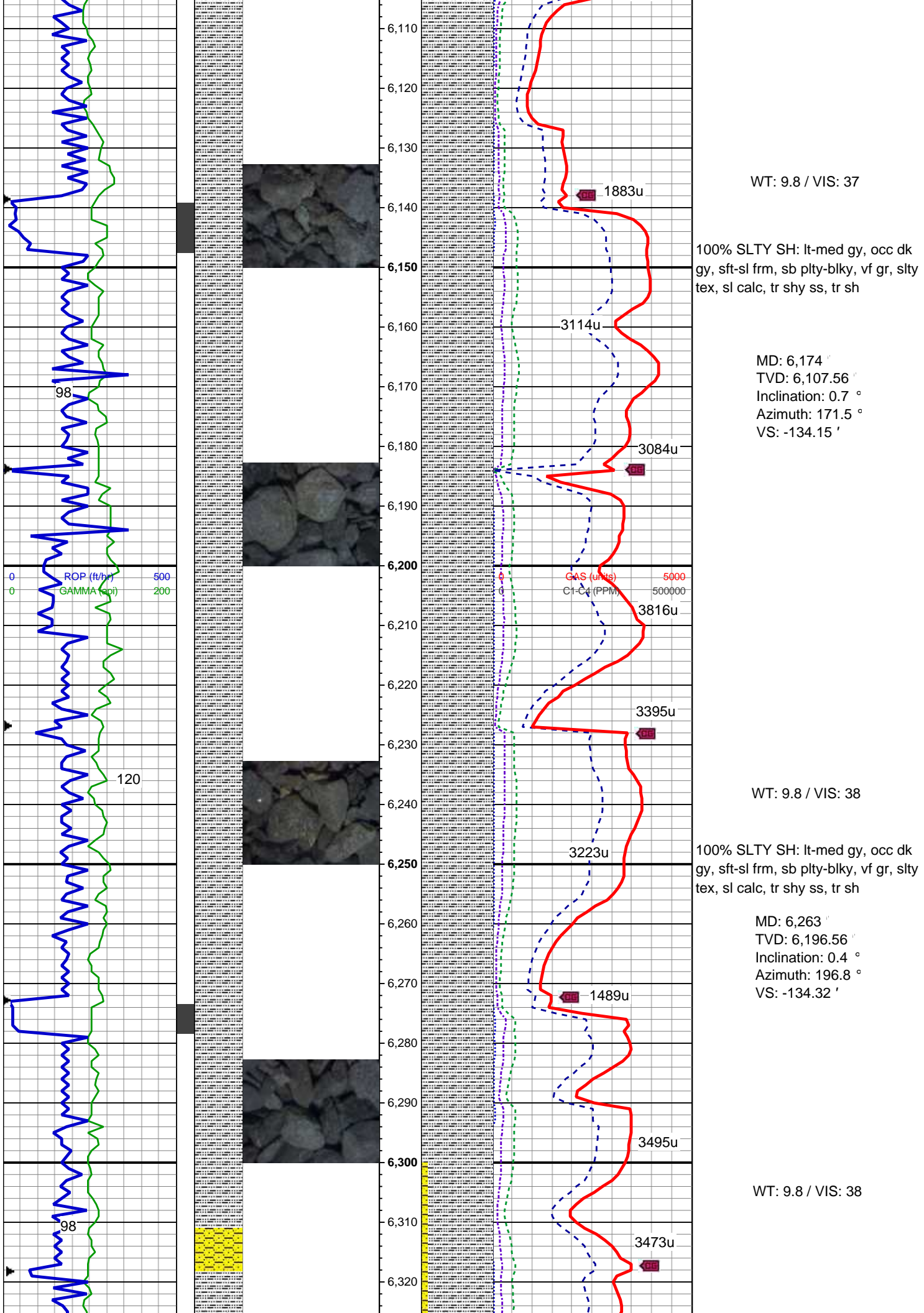
3318u

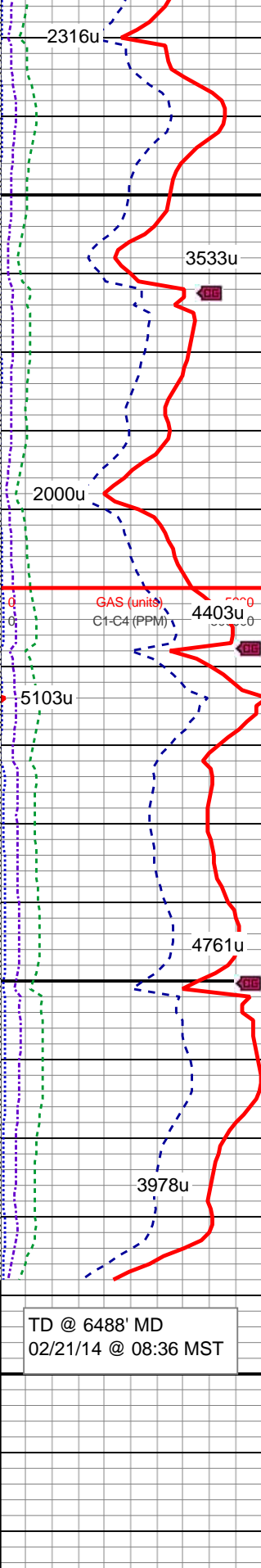
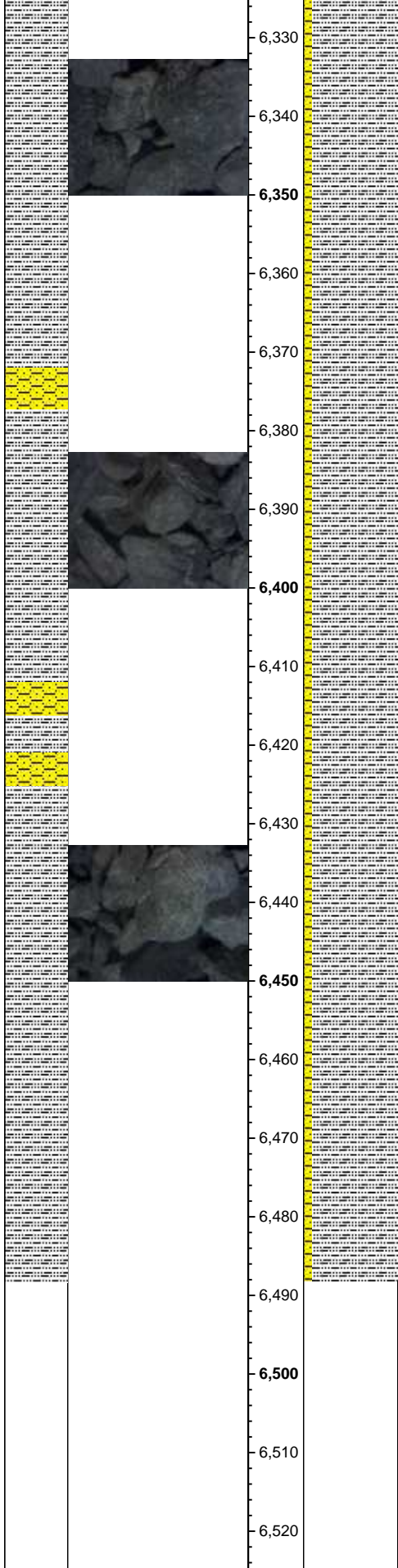
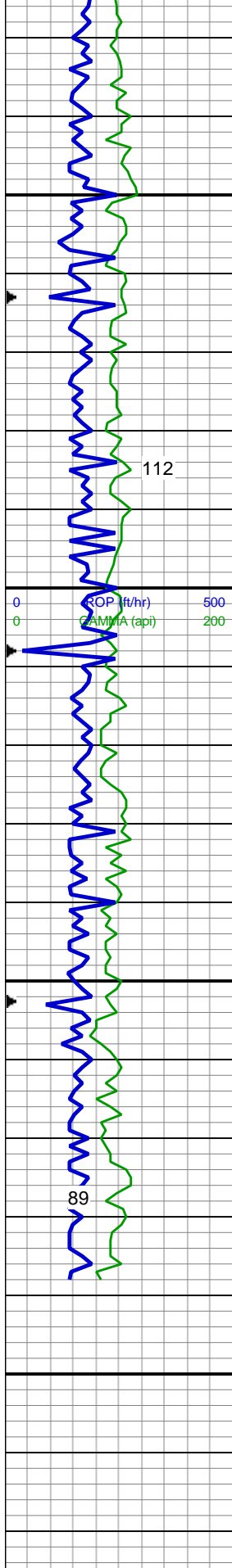
2951u

2220u

3264u

3209u





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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

MD: 6,353 '
TVD: 6,286.55 '
Inclination: 0.7 °
Azimuth: 276.9 °
VS: -134.99 '

WT: 9.85 / VIS: 38

MD: 6,442 '
TVD: 6,375.55 '
Inclination: 0.6 °
Azimuth: 251.6 °
VS: -135.97 '

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, s&p, blk, frm, v f-f gr, sb rnd-ang, mod-w srt, cl sup, cly cmt, non calc

TD @ 6488' MD
02/21/14 @ 08:36 MST

Log Continues on
Sandau K25-66-1HN-HORZ

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