

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name SEYLER B10-62-1HN VERT

Location SEC 10 T5N R64W

State COLORADO

County WELD

Country USA

Rig Number H&P 315

API Number 05-123-37727

AFE # 139200

Region DJ BASIN

Field WATTENBERG

Spud Date 12/23/2013

Drilling Completed 12/26/2013

Surface Coordinates SWSW SEC 10 T5N R64W
1,176' FSL; 245' FWL

LAT/LON 40.409810/-104.544730

Bottom Hole Coordinates SESE SEC 10 T5N R64W
330' FSL; 700' FEL

Ground Elevation 4,582'

K.B. Elevation 4,606'

Logged Interval 2,000' **To** 5,970'

Total Depth 5,970'

Formation NIOBRARA B CHALK

Type of Drilling Fluid LSND

Operator

Company Noble Energy Inc

Address 1625 BROADWAY SUITE 2200
DENVER, CO 80202

Geologist

Name MARK COLE, MOHAMMED ALMUBARAK

Company COLUMBINE LOGGING, INC

Address 2385 S LIPAN ST
DENVER, CO 80223

Rock Types

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

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
 MARLSTONE
 MINERAL CRYSTALS
 NODULES
 PHOSPHATE PELLETS
 PYRITE
 SALT CAST
 SANDY
 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

Other Symbols

Oil Show

DEAD
 EVEN
 QUESTIONABLE
 SPOTTED STAINING

Porosity

EARTHY
 FENESTRAL
 FRACTURE
 INTERCRYSTALLINE
 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

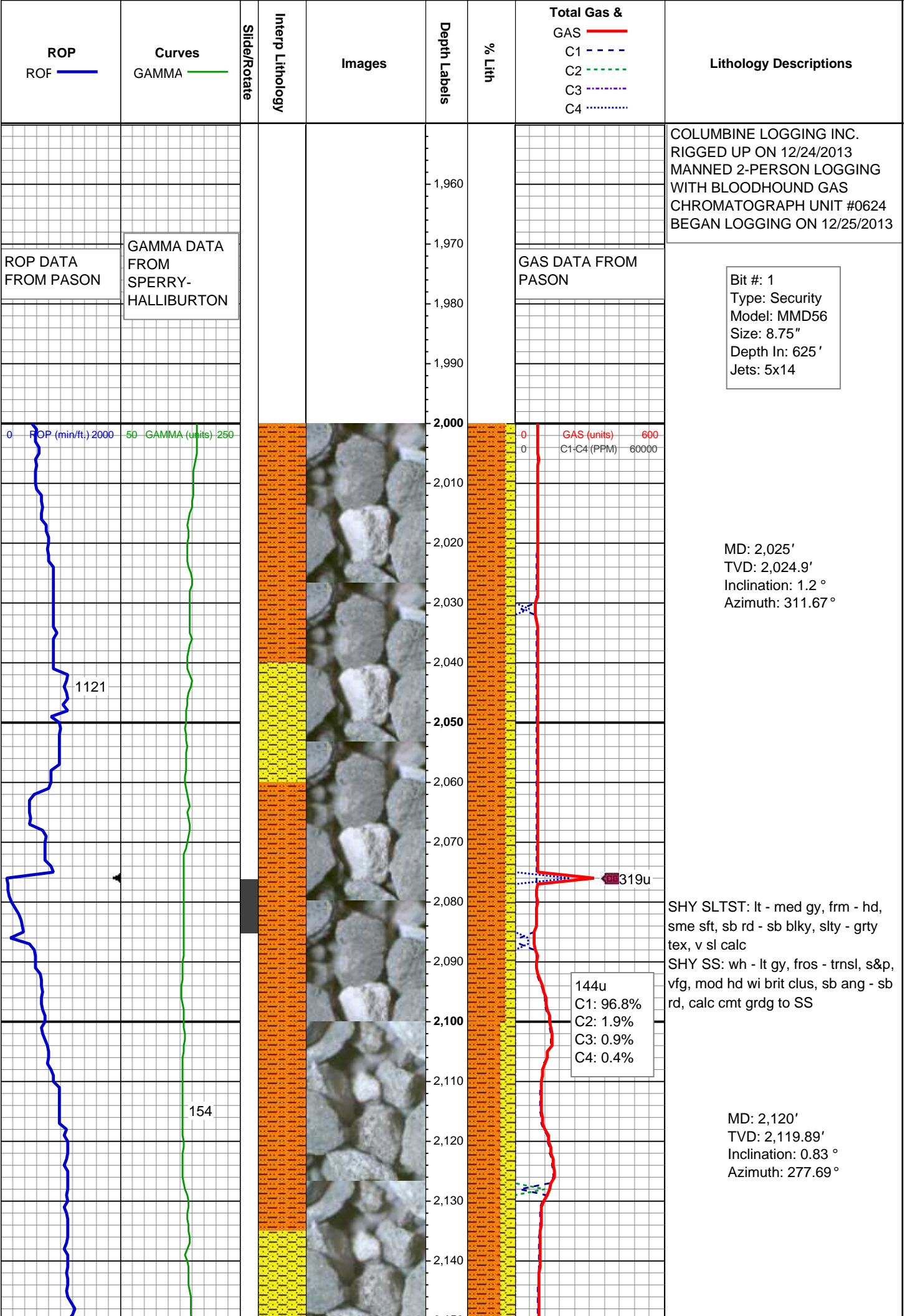
BOUNDSTONE
 CHALKY
 CRYPTOXLN

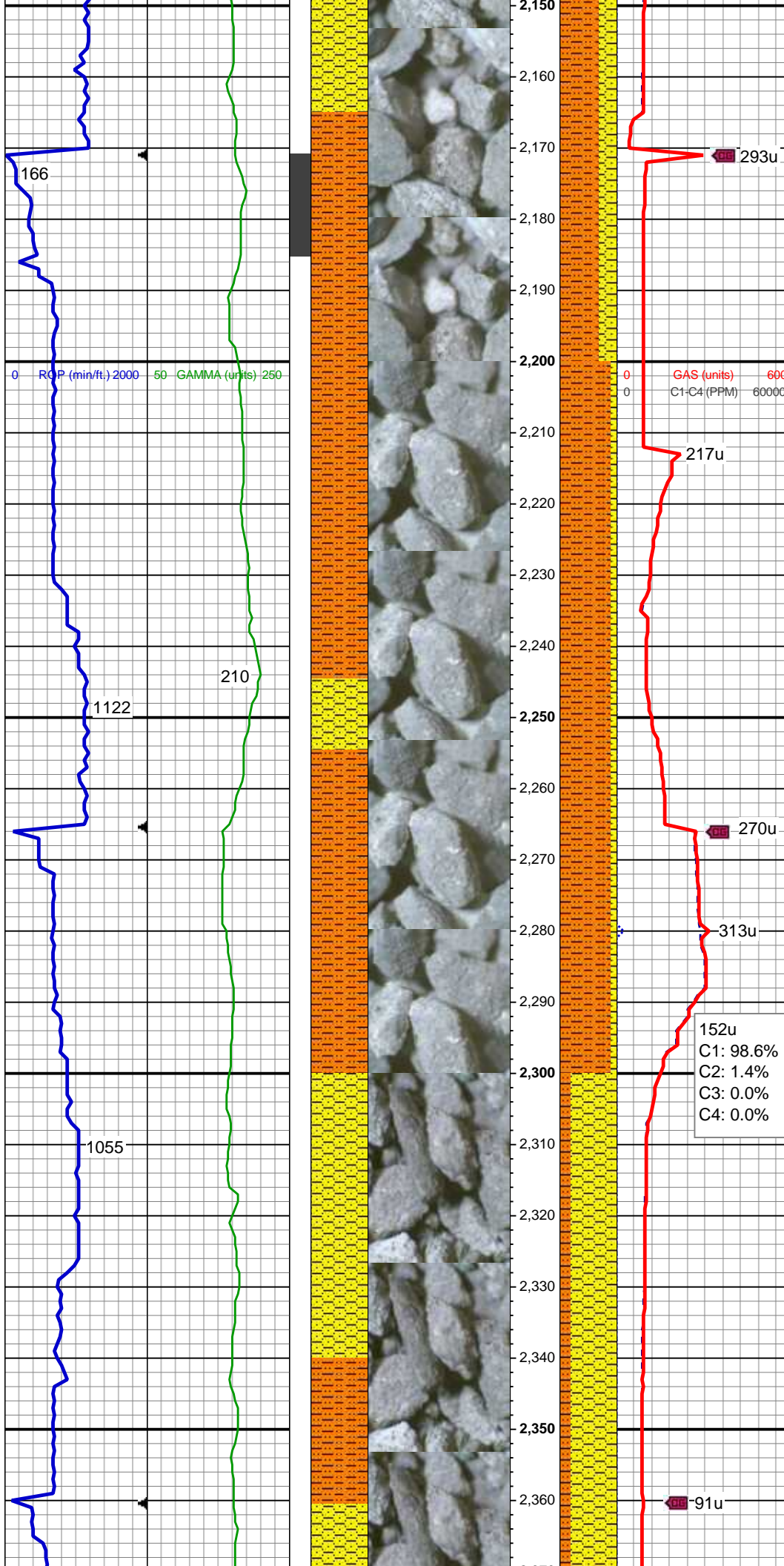
Earthy

FINELYXLN
 GRAINSTONE
 LITHOGRAPHIC
 MICROXLN
 MUDSTONE
 PACKSTONE
 WACKESTONE

Sorting

MODERATE
 POOR
 WELL



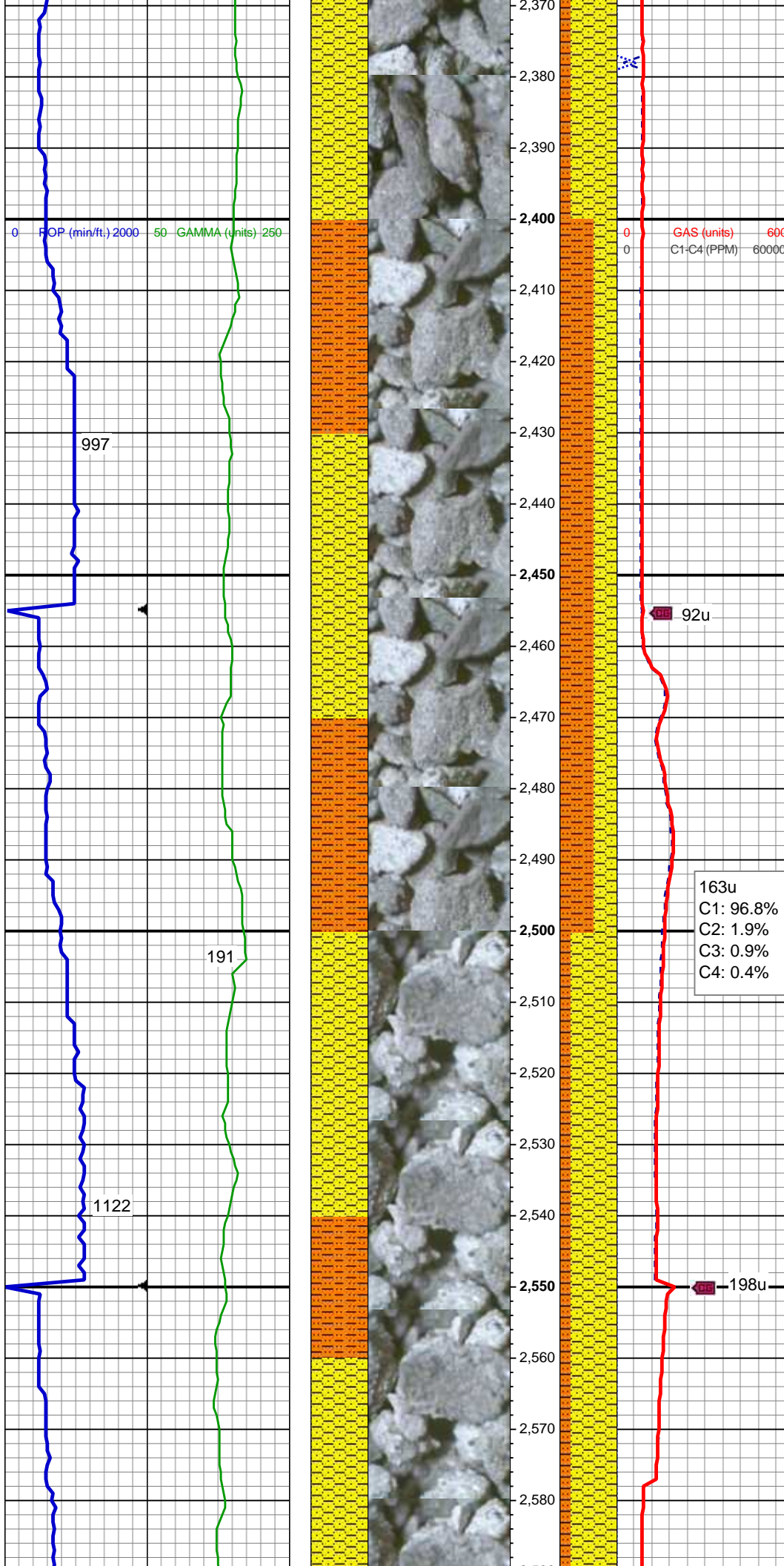


SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blk, slty - grty
tex, v sl calc
SHY SS: wh - lt gy, fros - trns, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt grd to SS

MD: 2,215'
TVD: 2,214.88'
Inclination: 1.15 °
Azimuth: 180.89 °

SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blk, slty - grty
tex, v sl calc
SHY SS: wh - lt gy, fros - trns, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt grd to SS

MD: 2,310'
TVD: 2,309.86'
Inclination: 0.86 °
Azimuth: 165.73 °



SHY SS: wh - lt gy, fros - trnsl, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt grd to SS
SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blkly, slty - grty
tex, v sl calc

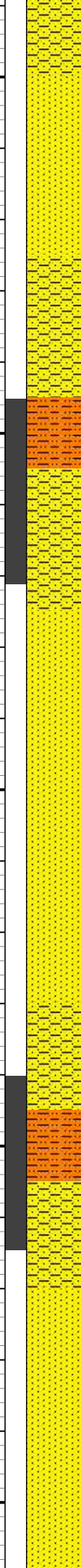
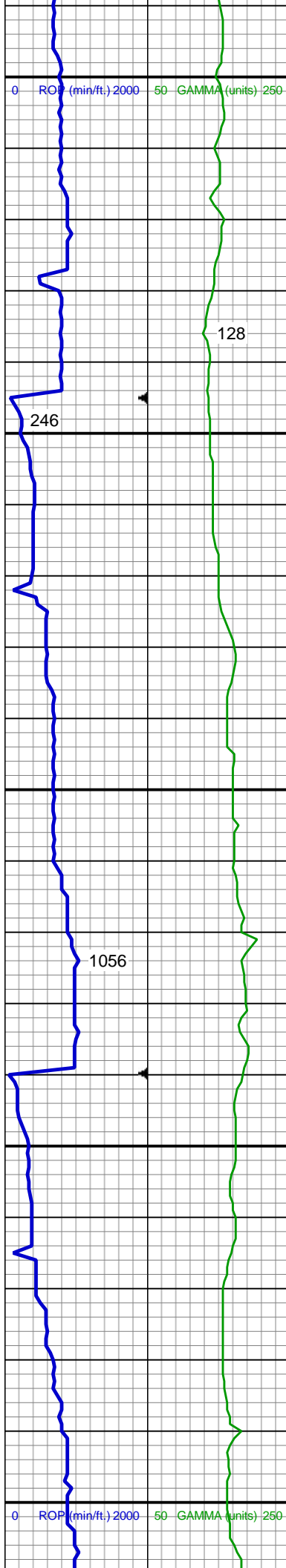
MD: 2,405'
TVD: 2,404.86'
Inclination: 0.22 °
Azimuth: 8.5°

SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blkly, slty - grty
tex, v sl calc
SHY SS: wh - lt gy, fros - trnsl, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt grd to SS

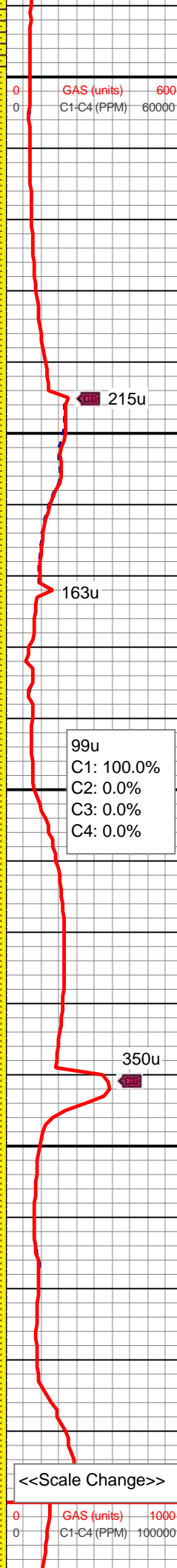
MD: 2,499'
TVD: 2,498.86'
Inclination: 0.46 °
Azimuth: 240.65°

MD: 2,594'
TVD: 2,593.85'
Inclination: 0.62 °
Azimuth: 252.43°

SHY SS: wh - lt gy, fros - trnsl, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt grd to SS



2,590
2,600
2,610
2,620
2,630
2,640
2,650
2,660
2,670
2,680
2,690
2,700
2,710
2,720
2,730
2,740
2,750
2,760
2,770
2,780
2,790
2,800



rd, calc cmt grg to SS
SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blkly, slty - grty
tex, v sl calc

MD: 2,689'
TVD: 2,688.82'
Inclination: 2.18 °
Azimuth: 215.38 °

SS: wh, fros - trnsl, speckl wi mica,
f gr, hd brit clus, ang - sb ang, v calc
cmt

SHY SS: wh - lt gy, fros - trnsl, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt

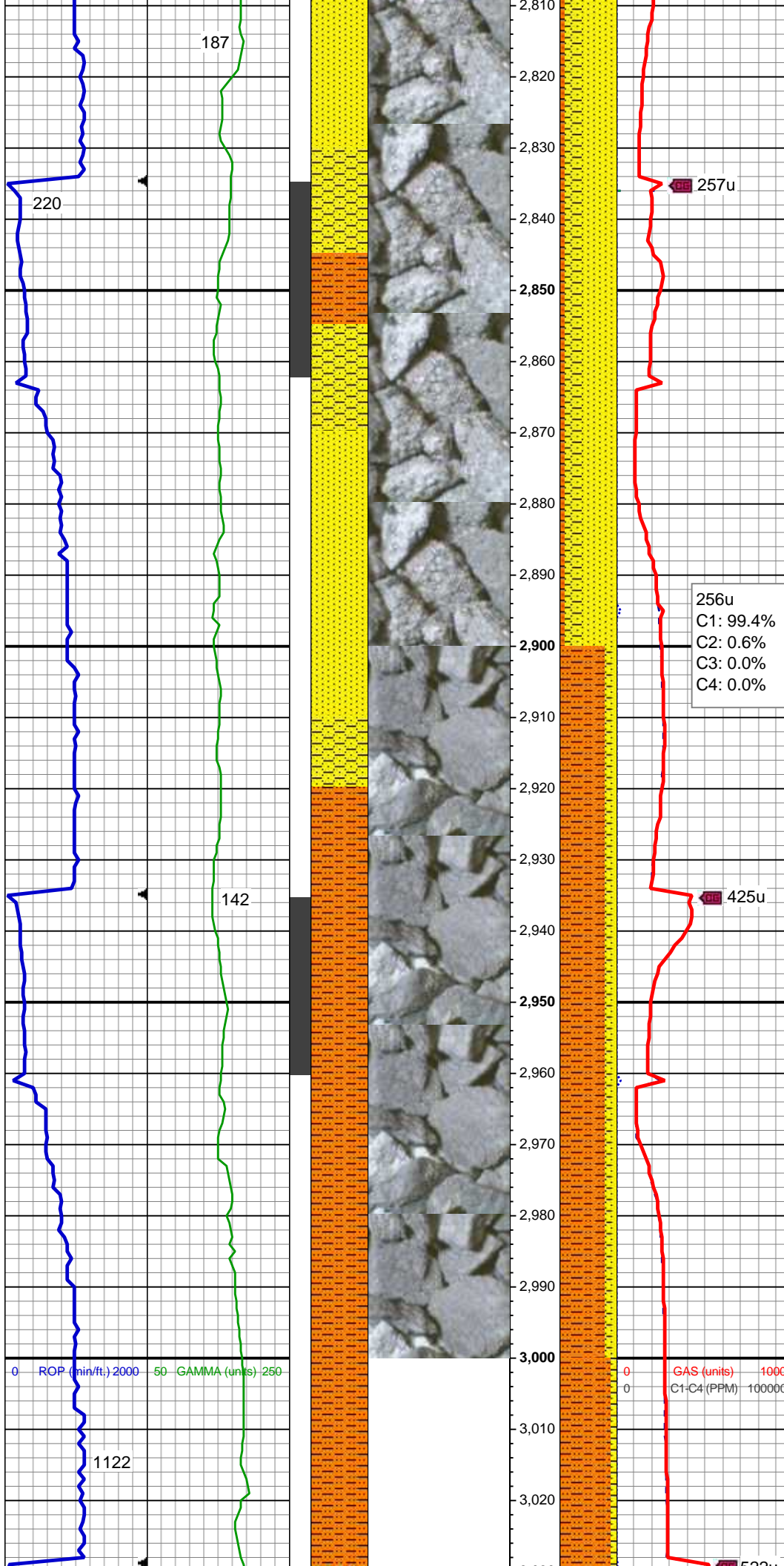
SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blkly, slty - grty
tex, v sl calc

MD: 2,784'
TVD: 2,783.69'
Inclination: 3.85 °
Azimuth: 206.54 °

SS: wh, fros - trnsl, speckl wi mica,
f gr, hd brit clus, ang - sb ang, v calc
cmt

SHY SS: wh - lt gy, fros - trnsl, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt

SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blkly, slty - grty
tex, v sl calc



MUD WT: 8.60/8.95
VIS: 30/34 IN/OUT

MD: 2,879'
TVD: 2,878.4'
Inclination: 5.11 °
Azimuth: 191.47 °

SS: wh, fros - trnsl, speckl wi mica,
f gr, hd brit clus, ang - sb ang, v calc
cmt

SHY SS: wh - lt gy, fros - trnsl, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt

SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blkly, slty - grty
tex, v sl calc

256u
C1: 99.4%
C2: 0.6%
C3: 0.0%
C4: 0.0%

MD: 2,973'
TVD: 2,971.94'
Inclination: 6.23 °
Azimuth: 195.59 °

SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blkly, slty - grty
tex, v sl calc

SS: wh, fros - trnsl, speckl wi mica,
f gr, hd brit clus, ang - sb ang, v calc
cmt

SHY SS: wh - lt gy, fros - trnsl, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt



MD: 3,068'
TVD: 3,066.27'
Inclination: 7.39 °
Azimuth: 199.67 °

SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blk, slty - grty
tex, v sl calc
SHY SS: wh - lt gy, fros - trns, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt grdg to tr SS

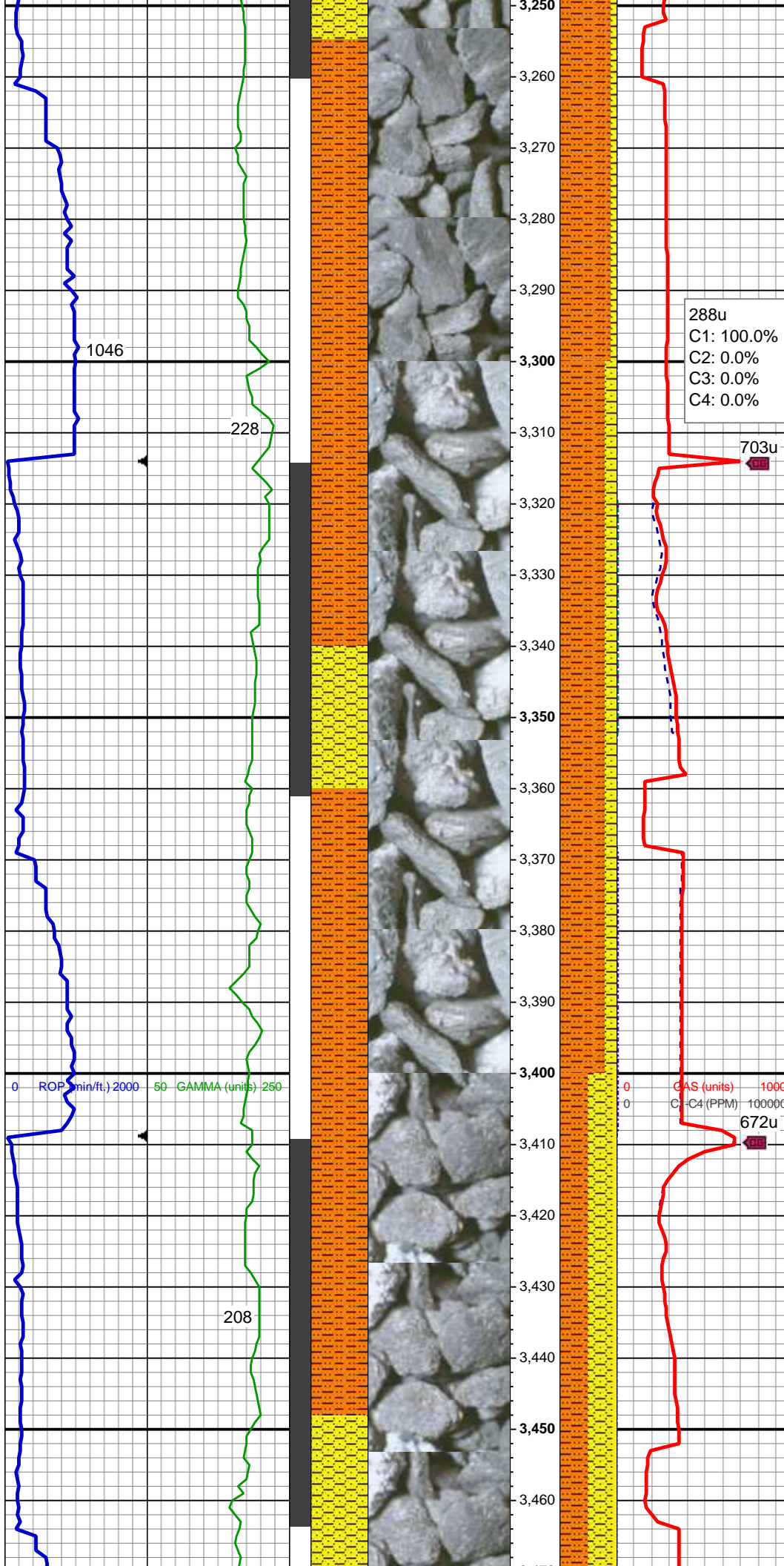
167u
C1: 97.8%
C2: 1.2%
C3: 1.0%
C4: 0.0%

413u

MD: 3,163'
TVD: 3,160.16'
Inclination: 10.07 °
Azimuth: 198.84 °

SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blk, slty - grty
tex, v sl calc
SHY SS: wh - lt gy, fros - trns, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt

620u



MD: 3,258'
TVD: 3,253.46'
Inclination: 11.62 °
Azimuth: 196.42 °

SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blkly, slty - grty
tex, v sl calc
SHY SS: wh - lt gy, fros - trnsf, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt

288u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

MUD WT: 8.55/8.75
VIS: 30/30 IN/OUT

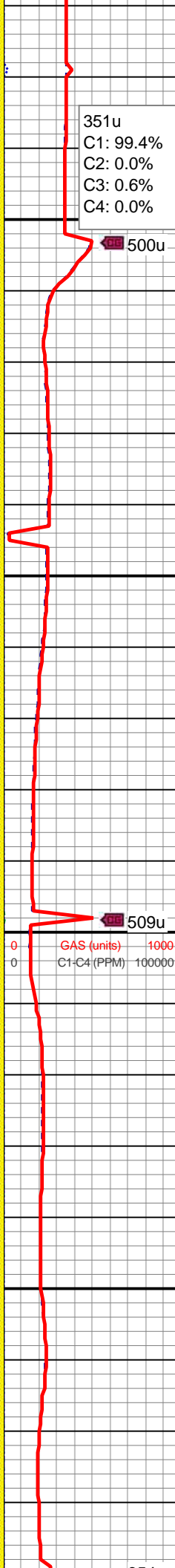
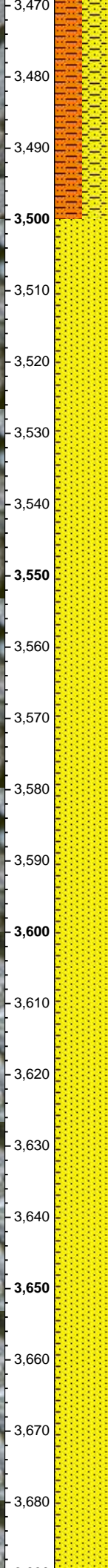
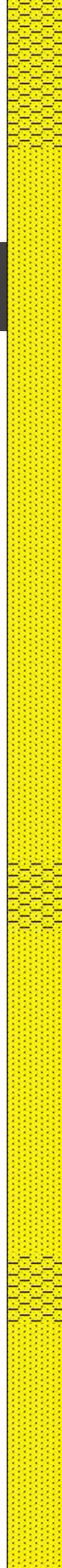
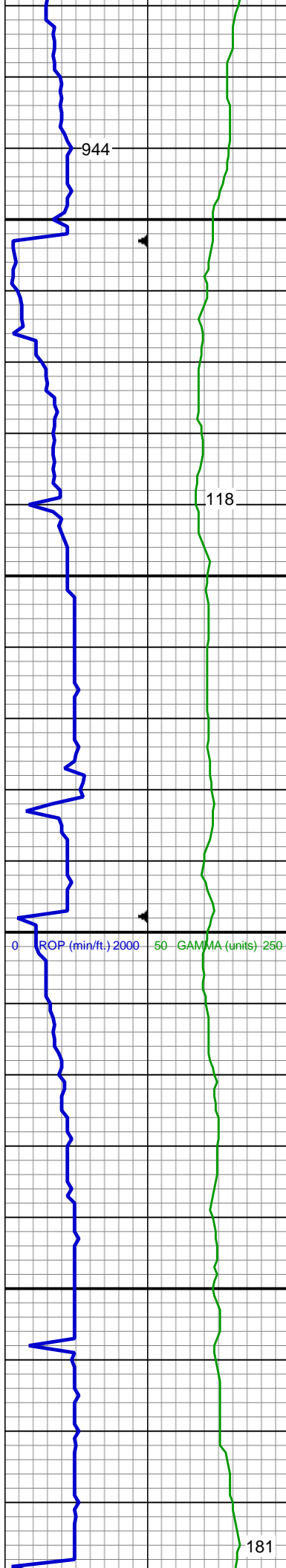
MD: 3,353'
TVD: 3,346.36'
Inclination: 12.54 °
Azimuth: 194.93 °

SHY SLTST: lt - med gy, frm - hd,
sme sft, sb rd - sb blkly, slty - grty
tex, v sl calc
SHY SS: wh - lt gy, fros - trnsf, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt

0 GAS (units) 1000
0 C1-C4 (PPM) 100000

MD: 3,448'
TVD: 3,438.77'
Inclination: 14.25 °
Azimuth: 198.53 °

Parkman Top @
3,448' MD; 3,439' TVD



SHY SLTST: lt - med gy, frm - hd, sme sft, sb rd - sb blk, slty - grty tex, v sl calc

SHY SS: lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

SS: wh, fros - trnsl, speckl wi mica, f gr, hd brit clus, ang - sb ang, v calc cmt

SS: wh, fros - trnsl, speckl wi mica, f gr, hd brit clus, sb ang - sb rd, v calc cmt grdg to

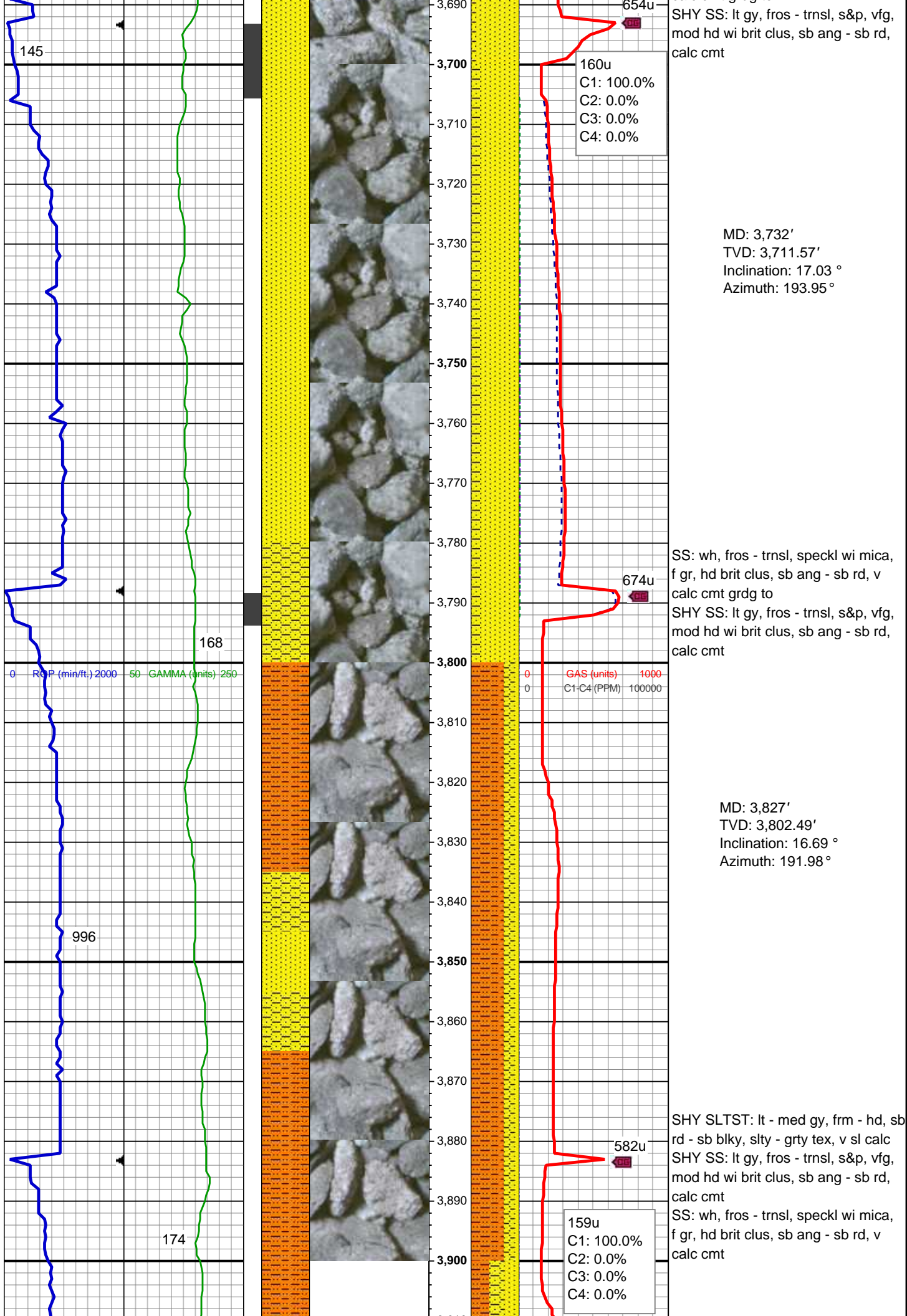
SHY SS: lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

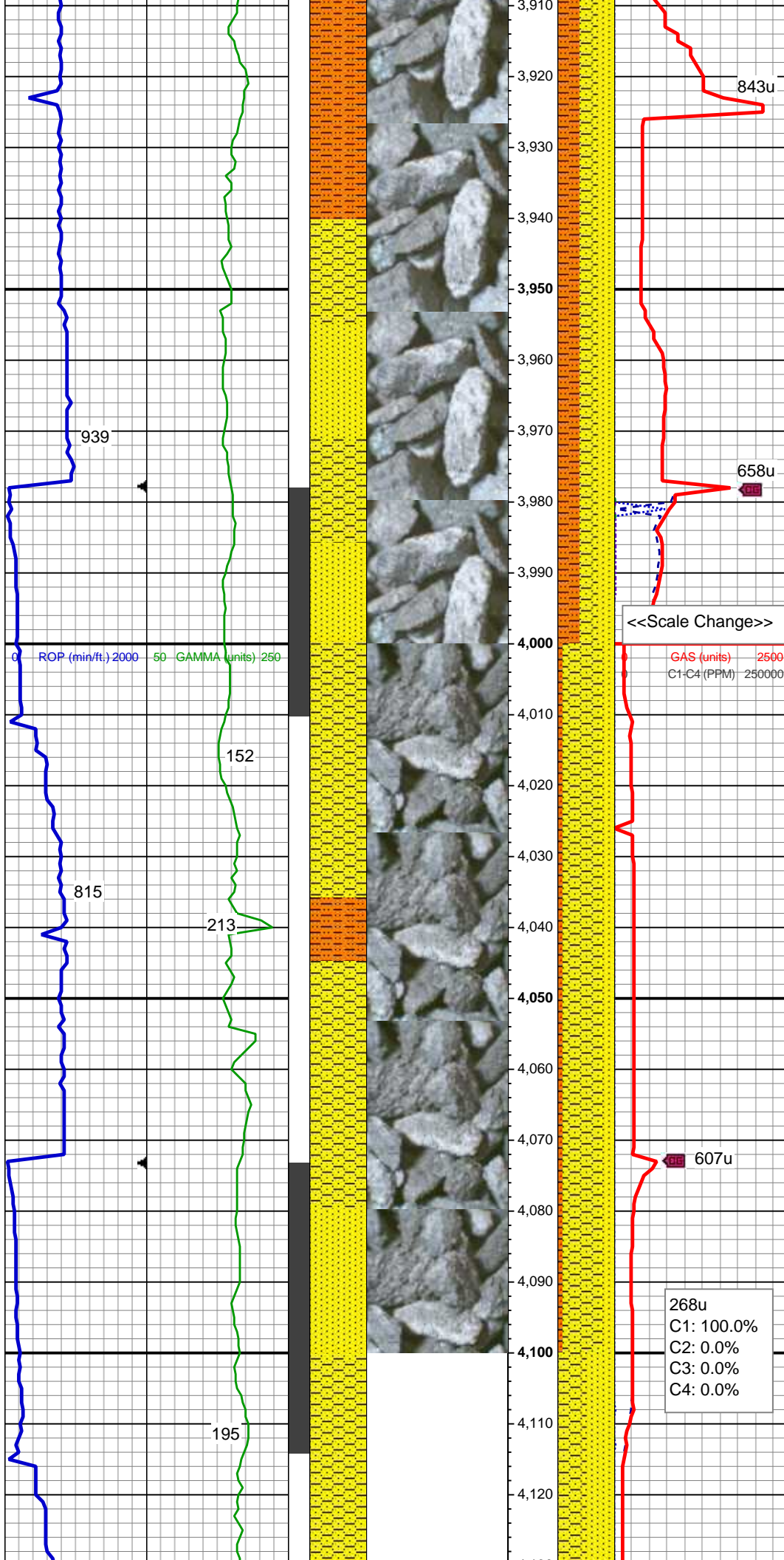
SS: wh, fros - trnsl, speckl wi mica, f gr, hd brit clus, sb ang - sb rd, v calc cmt grdg to

MD: 3,542'
TVD: 3,529.5'
Inclination: 16.06 °
Azimuth: 198.63 °

MUD WT: 8.55/8.75
VIS: 30/30 IN/OUT

MD: 3,637'
TVD: 3,620.65'
Inclination: 16.68 °
Azimuth: 198.31 °





MD: 3,922'
TVD: 3,894.12'
Inclination: 13.89 °
Azimuth: 185.21 °

12/25/2013
Mud Wt: 8.65
FVis: 31
PVis: 5
YP: 5
GELS: 2/4/6
API Filt: n/s
CAKE: n/s
pH: 8.7
Cl: 1,100
Ca: 360

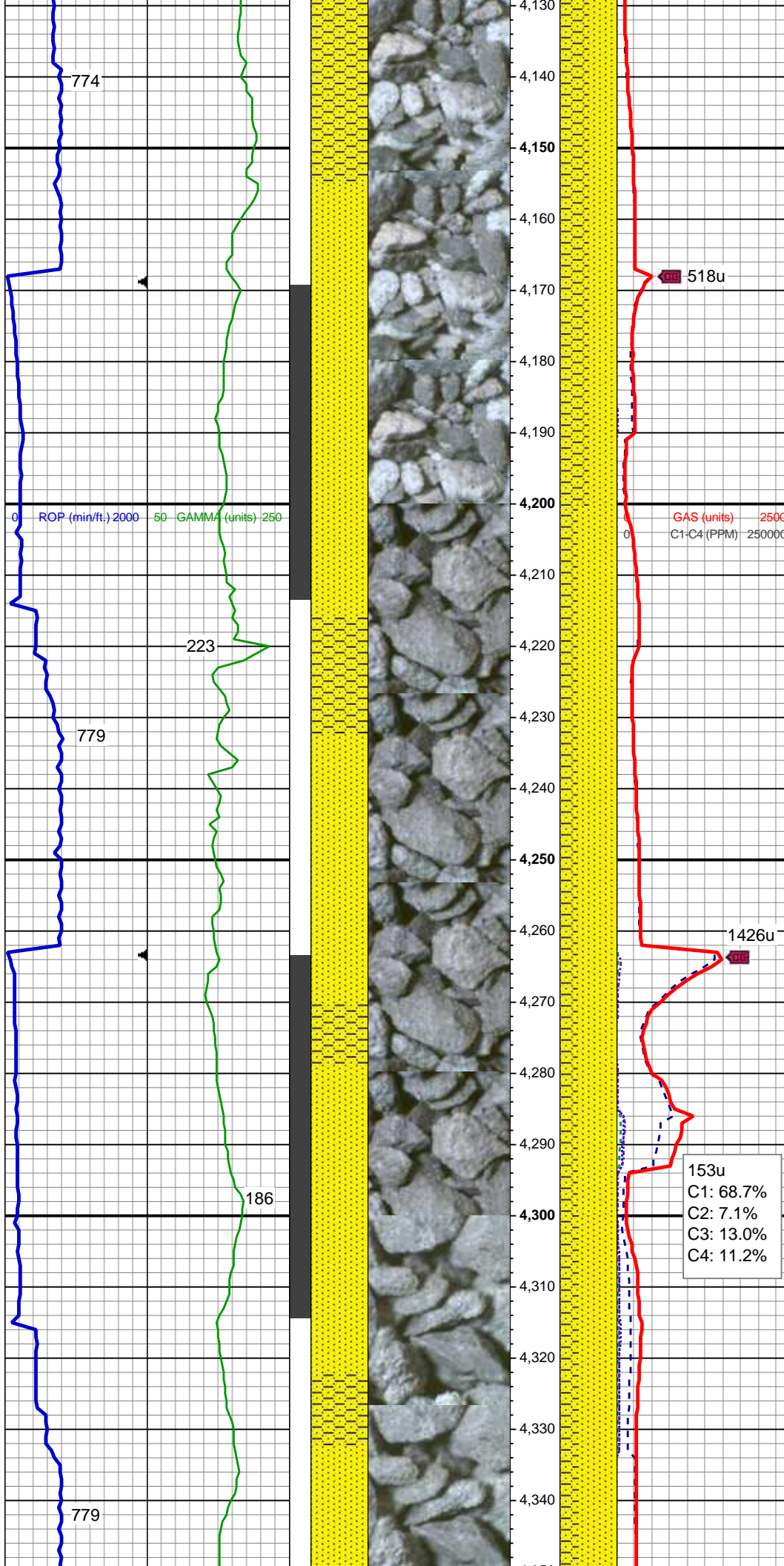
SHY SLTST: lt - med gy, frm - hd, sb
rd - sb blk, slty - grty tex, v sl calc
SHY SS: lt gy, fros - trnsl, s&p, vfg,
mod hd wi brit clus, sb ang - sb rd,
calc cmt
SS: wh, fros - trnsl, speckl wi mica,
f gr, hd brit clus, sb ang - sb rd, v
calc cmt

MD: 4,017'
TVD: 3,986.56'
Inclination: 12.79 °
Azimuth: 191.01 °

MUD WT: 8.60/8.70
VIS: 32/34 IN/OUT

SHY SS: lt gy, fros - trnsl, s&p, vfg,
mod hd wi brit clus, sb ang - sb rd,
calc cmt
SS: wh, fros - trnsl, speckl wi mica,
f gr, hd brit clus, sb ang - sb rd, v
calc cmt
SHY SLTST: lt - med gy, frm - hd, sb
rd - sb blk, slty - grty tex, v sl calc

MD: 4,112'
TVD: 4,079.19'
Inclination: 12.87 °
Azimuth: 192.94 °



Sussex Top @
4,155' MD; 4,121' TVD

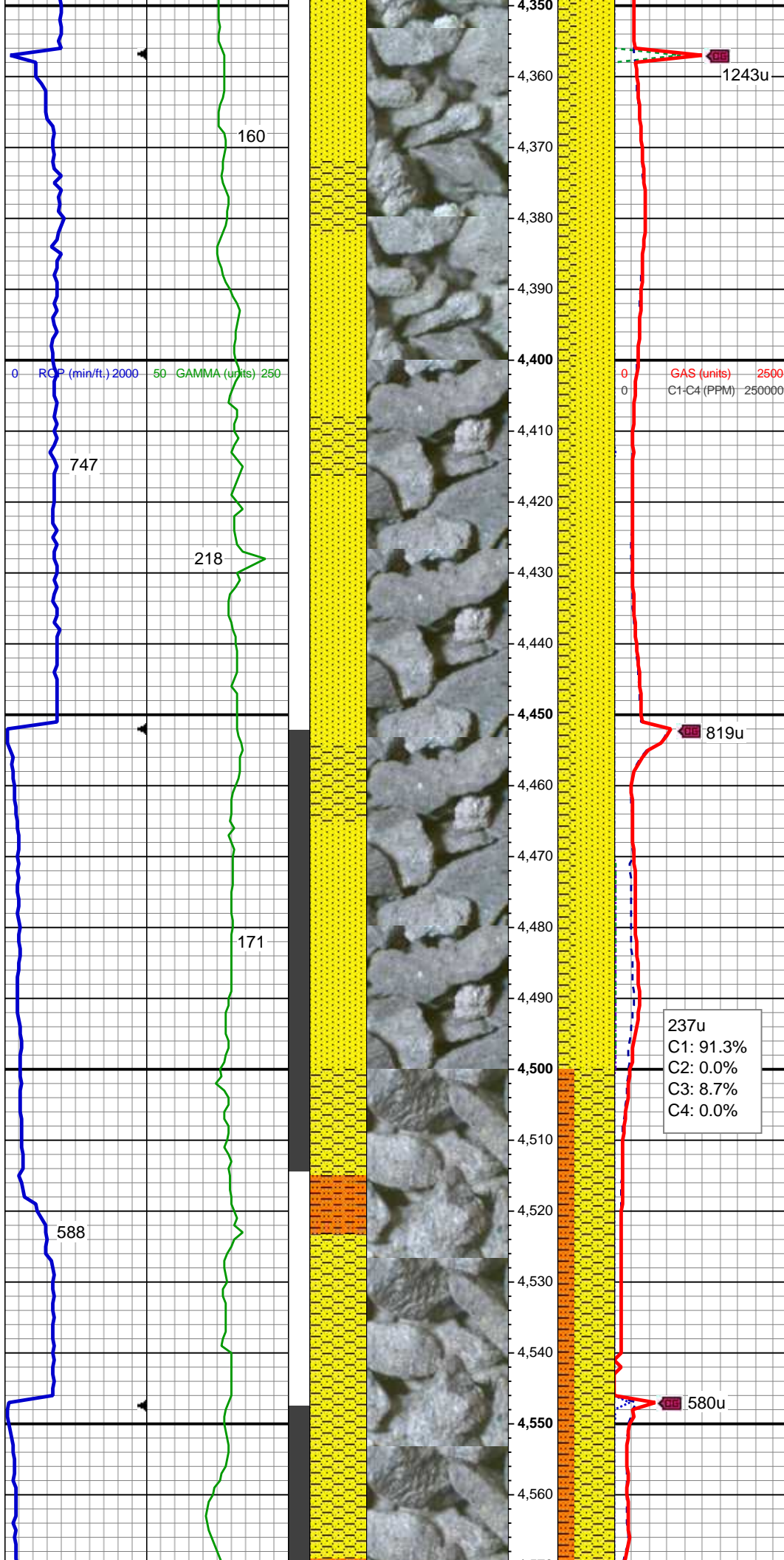
SS: wh, fros - trnsl, speckl wi mica,
f gr, hd brit clus, sb ang - sb rd, v
calc cmt
SHY SS: lt gy, fros - trnsl, s&p, vfg,
mod hd wi brit clus, sb ang - sb rd,
calc cmt

MD: 4,207'
TVD: 4,171.78'
Inclination: 13.02 °
Azimuth: 199.44 °

SS: wh, fros - trnsl, speckl wi mica,
f gr, hd brit clus, sb ang - sb rd, v
calc cmt
SHY SS: lt gy, fros - trnsl, s&p, vfg,
mod hd wi brit clus, sb ang - sb rd,
calc cmt

153u
C1: 68.7%
C2: 7.1%
C3: 13.0%
C4: 11.2%

MD: 4,302'
TVD: 4,264.03'
Inclination: 14.62 °
Azimuth: 198.02 °



SS: wh, fros - trnsl, speckl wi mica,
f gr, hd brit clus, sb ang - sb rd, v
calc cmt
SHY SS: lt gy, fros - trnsl, s&p, vfg,
mod hd wi brit clus, sb ang - sb rd,
calc cmt

MD: 4,397'
TVD: 4,356.34'
Inclination: 12.7 °
Azimuth: 195.76 °

MD: 4,491'
TVD: 4,447.98'
Inclination: 12.99 °
Azimuth: 194.25 °

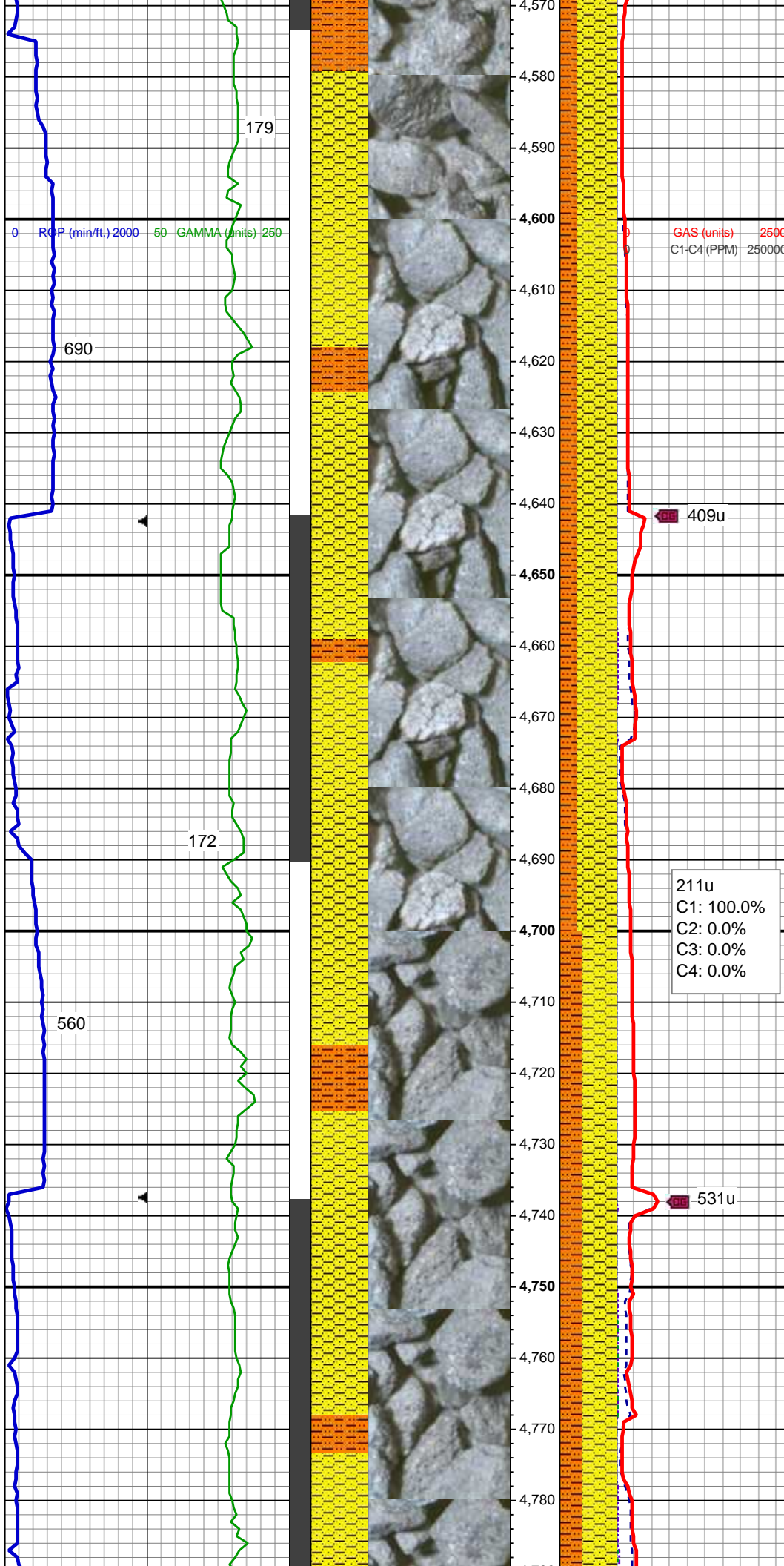
SS: wh, fros - trnsl, speckl wi mica,
f gr, hd brit clus, sb ang - sb rd, v
calc cmt
SHY SS: lt gy, fros - trnsl, s&p, vfg,
mod hd wi brit clus, sb ang - sb rd,
calc cmt

237u
C1: 91.3%
C2: 0.0%
C3: 8.7%
C4: 0.0%

MUD WT: 8.75/9.05
VIS: 36/33 IN/OUT

MD: 4,586'
TVD: 4,540.4'
Inclination: 13.78 °

Azimuth: 195.42 °



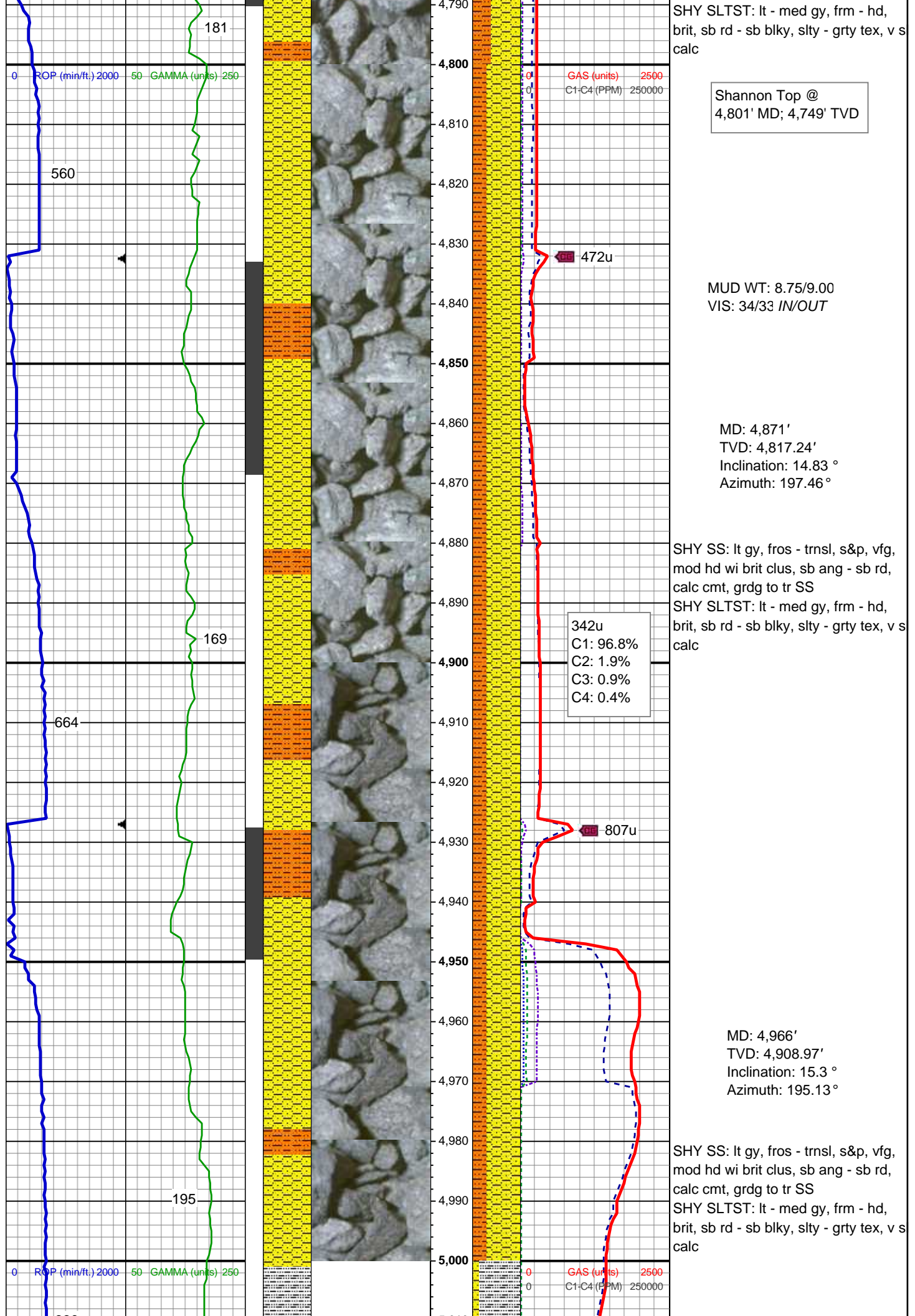
SHY SS: lt gy, fros - trnsl, s&p, vfg,
mod hd wi brit clus, sb ang - sb rd,
calc cmt, grdg to tr SS
SHY SLTST: lt - med gy, frm - hd,
brit, sb rd - sb blk, slty - grty tex, v s
calc

MD: 4,681'
TVD: 4,632.73'
Inclination: 13.46 °
Azimuth: 196.11 °

SHY SS: lt gy, fros - trnsl, s&p, vfg,
mod hd wi brit clus, sb ang - sb rd,
calc cmt, grdg to tr SS
SHY SLTST: lt - med gy, frm - hd,
brit, sb rd - sb blk, slty - grty tex, v s
calc

MD: 4,776'
TVD: 4,725.12'
Inclination: 13.47 °
Azimuth: 198.22 °

SHY SS: lt gy, fros - trnsl, s&p, vfg,
mod hd wi brit clus, sb ang - sb rd,
calc cmt, grdg to tr SS



SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

Shannon Top @ 4,801' MD; 4,749' TVD

MUD WT: 8.75/9.00
VIS: 34/33 IN/OUT

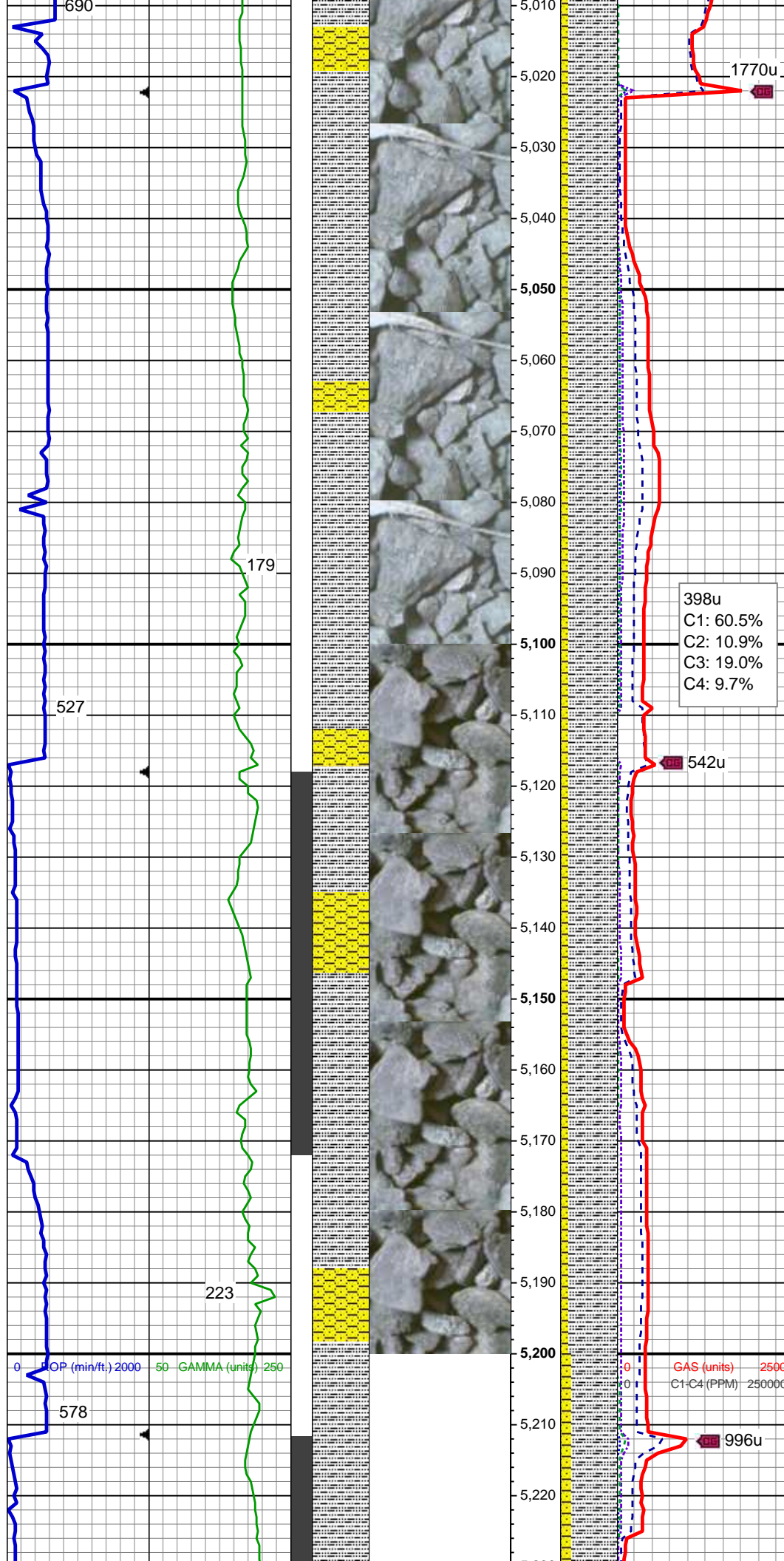
MD: 4,871'
TVD: 4,817.24'
Inclination: 14.83 °
Azimuth: 197.46 °

SHY SS: lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt, grdg to tr SS
SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

342u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

MD: 4,966'
TVD: 4,908.97'
Inclination: 15.3 °
Azimuth: 195.13 °

SHY SS: lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt, grdg to tr SS
SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc



MD: 5,061'
TVD: 5,001.2'
Inclination: 12.4 °
Azimuth: 192.92 °

SLTY SH: lt - med gy brn, occ dk gy,
frm - hd, plty - sb plty - sb blk, slty -
grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

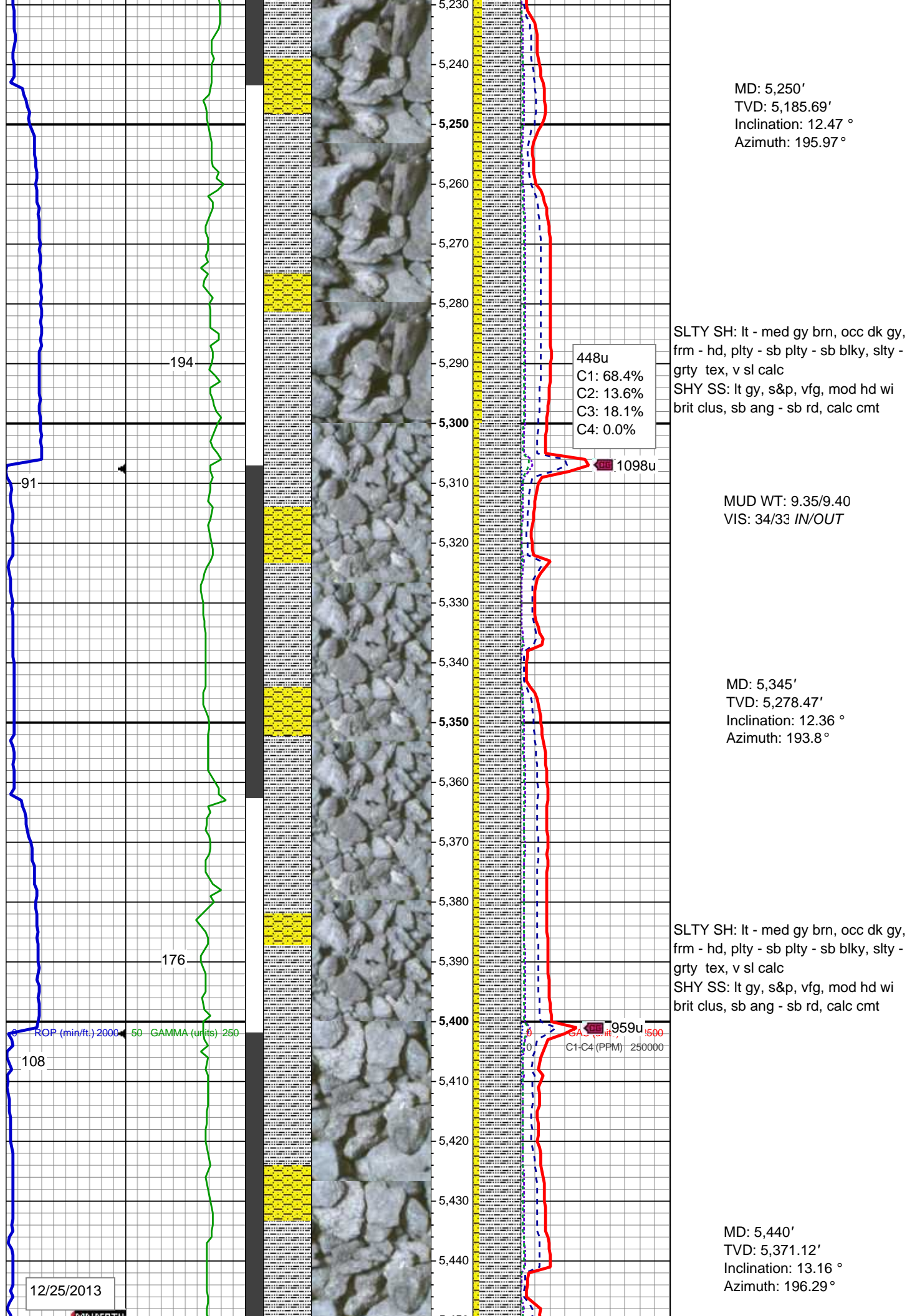
398u
C1: 60.5%
C2: 10.9%
C3: 19.0%
C4: 9.7%

MUD WT: 9.05/9.10
VIS: 34/34 IN/OUT

MD: 5,155'
TVD: 5,092.96'
Inclination: 12.65 °
Azimuth: 194.01 °

SLTY SH: lt - med gy brn, occ dk gy,
frm - hd, plty - sb plty - sb blk, slty -
grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

GAS (units) 2500
C1-C4 (PPM) 250000



12/26/2013

193

94

181

ROP (min/ft): 2000 50 GAMMA (units): 250

5,450
5,460
5,470
5,480
5,490
5,500
5,510
5,520
5,530
5,540
5,550
5,560
5,570
5,580
5,590
5,600
5,610
5,620
5,630
5,640
5,650
5,660

322u
C1: 66.8%
C2: 13.4%
C3: 17.7%
C4: 2.2%

1276u

<<Scale Change>>

GAS (units) 3500
C1-C4 (PPM) 350000

MUD WT: 9.50/9.50
VIS: 31/32 IN/OUT

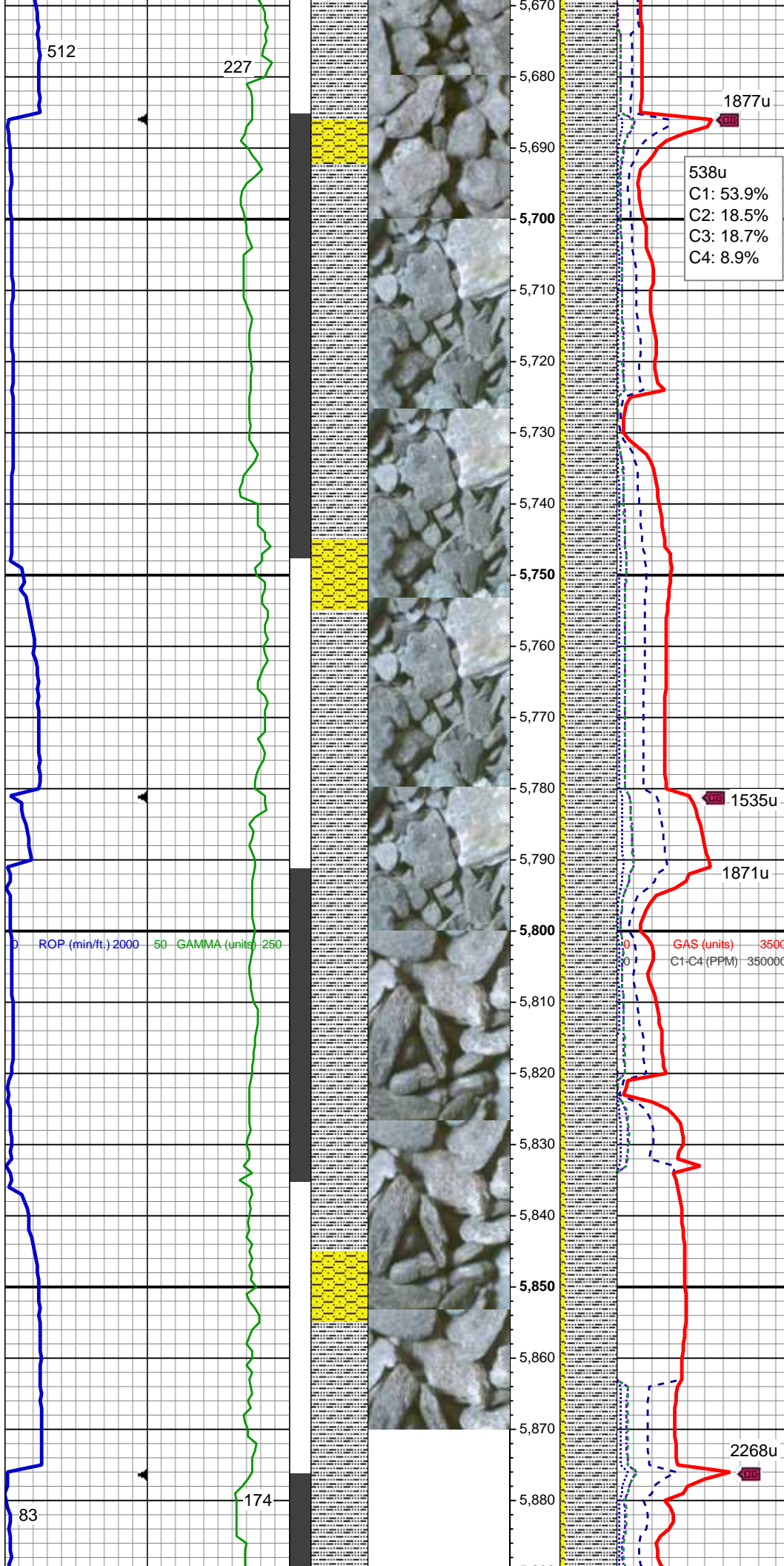
SLTY SH: lt - med gy brn, occ dk gy,
frm - hd, plty - sb plty - sb blk, slty -
grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

MD: 5,535'
TVD: 5,463.44'
Inclination: 14.11 °
Azimuth: 197.68 °

MUD WT: 9.65/9.65
VIS: 35/33 IN/OUT

SLTY SH: lt - med gy brn, occ dk gy,
frm - hd, plty - sb plty - sb blk, slty -
grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

MD: 5,630'
TVD: 5,555.65'
Inclination: 13.75 °
Azimuth: 198.48 °



MUD WT: 9.70/9.75
VIS: 34/34 IN/OUT

SLTY SH: lt - med gy brn, occ dk gy,
frm - hd, plty - sb plty - sb blk, slty -
grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

MD: 5,725'
TVD: 5,647.82'
Inclination: 14.34 °
Azimuth: 191.04 °

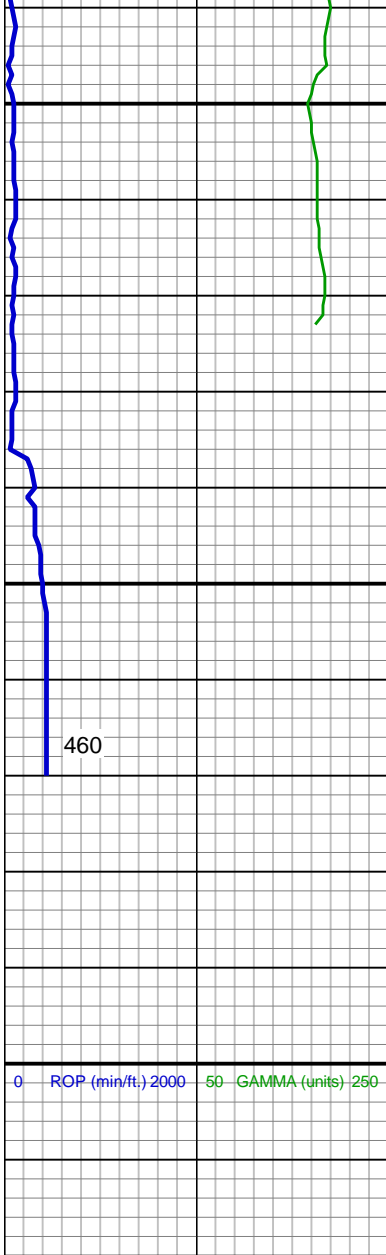
SLTY SH: lt - med gy brn, occ dk gy,
frm - hd, plty - sb plty - sb blk, slty -
grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, sl calc cmt

MD: 5,820'
TVD: 5,739.78'
Inclination: 14.71 °
Azimuth: 190.13 °

MUD WT: 9.80/9.80
VIS: 34/34 IN/OUT

Teepee Buttes Top @
5,852' MD; 5,770' TVD

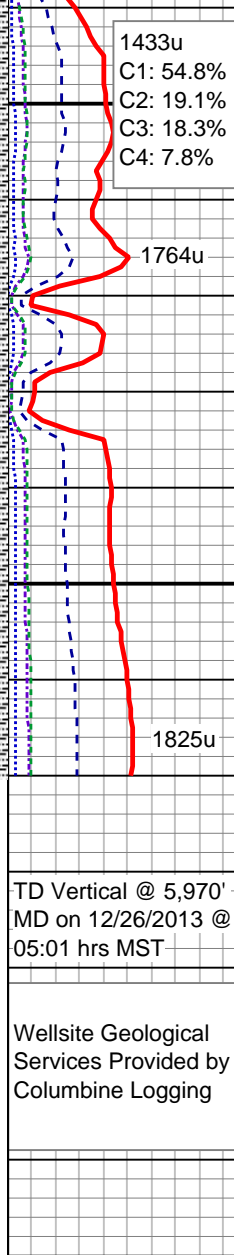
SLTY SH: lt - med gy brn, occ dk gy,
frm - hd, plty - sb plty - sb blk, slty -



Log data text (partially obscured by images)



Log data text (partially obscured by images)



grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, sl calc cmt

MD: 5,913'
TVD: 5,829.63'
Inclination: 15.22 °
Azimuth: 189.88 °

Projection to Bit:
MD: 5,970'
TVD: 5,884.63'
Inclination: 15.22 °
Azimuth: 189.88 °

SLTY SH: lt - med gy brn, occ dk gy,
frm - hd, plty - sb plty - sb blk, slty -
grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, sl calc cmt

TD Vertical @ 5,970'
MD on 12/26/2013 @
05:01 hrs MST

Wellsite Geological
Services Provided by
Columbine Logging

See Corresponding Horizontal Log
Seyler B10-62-1HN HORZ