

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Aggie State AA17-635

**Location** SWNW SEC 17 T6N R63W

**State** COLORADO

**County** WELD

**Country** USA

**Rig Number** H&P 273

**API Number** 05-123-40902

**Field** WILDCAT

**Region** DJ BASIN

**Drilling Completed** 2/12/2015

**Spud Date** 2/7/2015

**Surface Coordinates** 1126' FSL; 574' FWL

**Bottom Hole Coordinates** 1650' FFSLL; 50' FFWLL

**Ground Elevation** 4668'

**K.B. Elevation** 4692'

**Logged Interval** 916' To 6000'

**Total Depth** 11235'

**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

P PINPOINT

V VUGGY

### Engineering

BIT

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

FORMATION TOP

GAS SHOW

MINDEPTH 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

FINELYXLN

GRAINSTONE

LITHOGRAPHIC

MICROXLN

MUDSTONE

PACKSTONE

WACKESTONE

ANGULAR

ROUNDED

SUBANG

SUBRND

BOUNDSTONE

CHALKY

CRYPTOXLN

CRYSTALS

CRYSTALS

CRYSTALS

CRYSTALS

CRYSTALS

CRYSTALS

CRYSTALS

CRYSTALS

## Zone Color Coding

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

## Accessories

### Fossils

- ALGAE
- AMPHIPORA
- BELEMNITE
- BIOCLASTIC
- BRACHIOPOD

FOSSIL

GASTROPOD

INOCERAMUS

OOLITE

OSTRACOD

PELECYPOD

PELLET

ANHYDRITIC

ARGILLACEOUS

ARGILLITE GRAIN

BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CAL CAREOUS

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

KAOLIN

MARLSTONE

MINERAL CRYSTALS

TUFFACEOUS

### Stringer

- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER

↑ BRYOZOA  
🐙 CEPHALOPOD  
🪸 CORAL  
🪼 CRINOID  
🐚 ECHINOID  
🐟 FISH  
🔍 FORAMINIFERA

🔍 PISOLITE  
🌿 PLANT REMAINS  
🍄 PLANT SPORES  
🐚 SCAPHOPOD  
🪸 STROMATOPOROID

## Minerals

■ CARBONACEOUS FLAKES  
▲ CHTDK  
△ CHTLT  
— COAL - THIN BEDS  
🔍 DOLOMITIC  
+ FELDSPAR  
● FERRUGINOUS PELLET

🔍 NODULES  
● PHOSPHATE PELLETS  
🔍 PYRITE  
🔍 SALT CAST  
· SANDY  
🔍 SILICEOUS  
· SILTY

🔍 GYPSUM STRINGER  
🔍 LIMESTONE STRINGER  
🔍 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  
X X X X X X 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** Tim Bright

**Wellsite Geologist #2** Nick Kopiasz

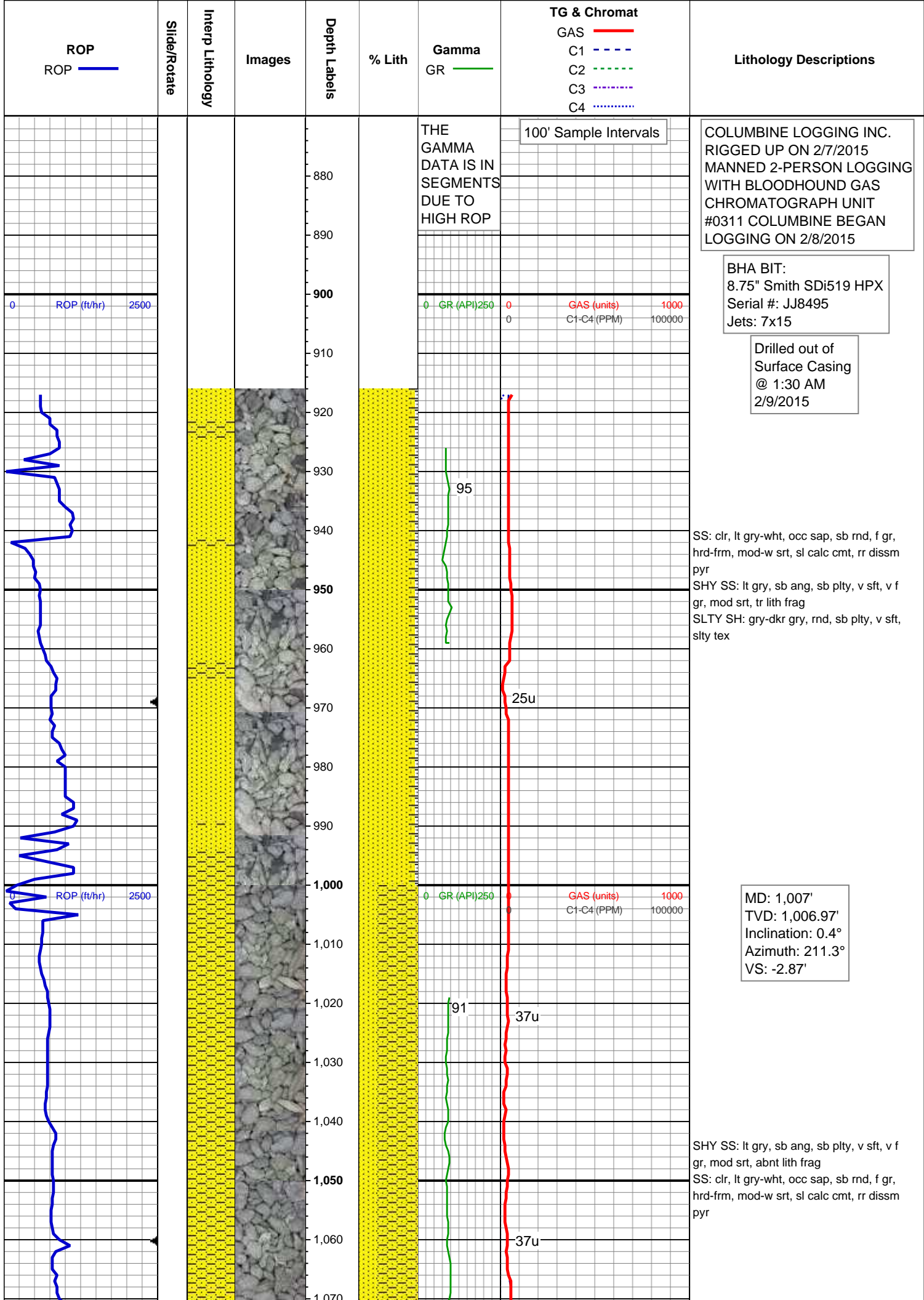
**Wellsite Geological Services Provided By** Columbine Logging Inc.

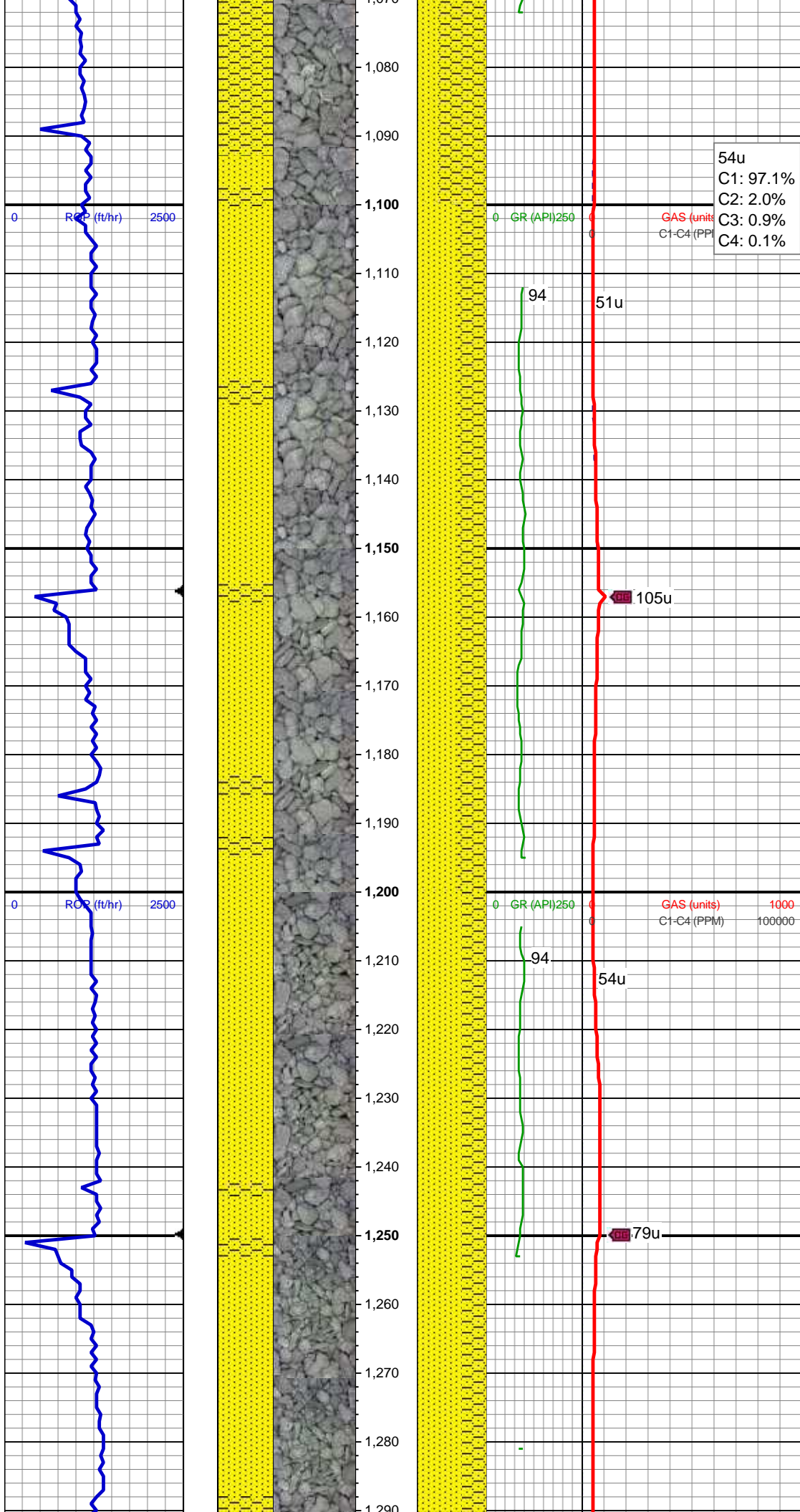
## Geologist

**Name** JAMES TAYLOR

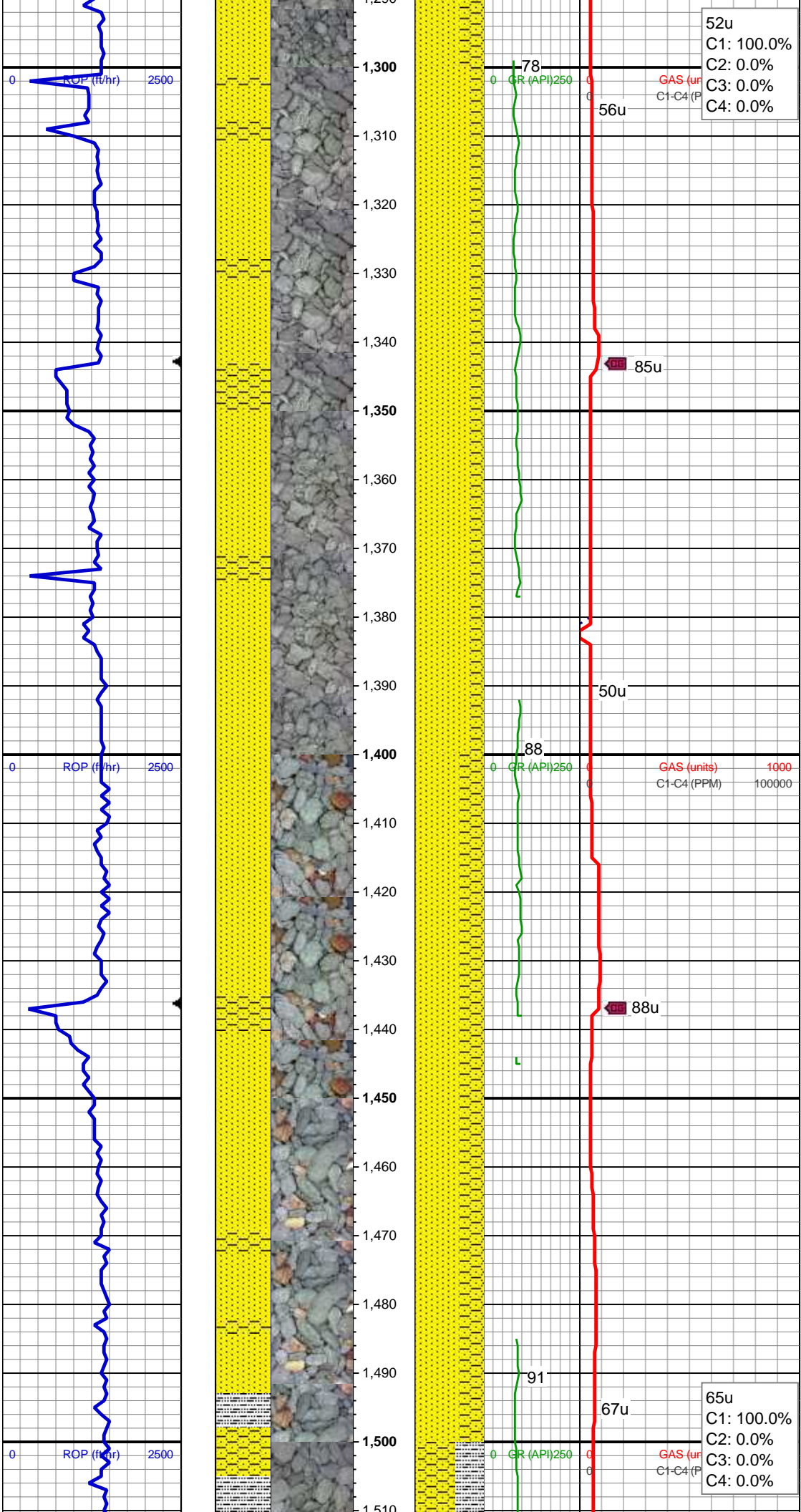
**Company** NOBLE ENERGY INC.

**Address** 1625 Broadway Suite 2200  
Denver, CO 80202









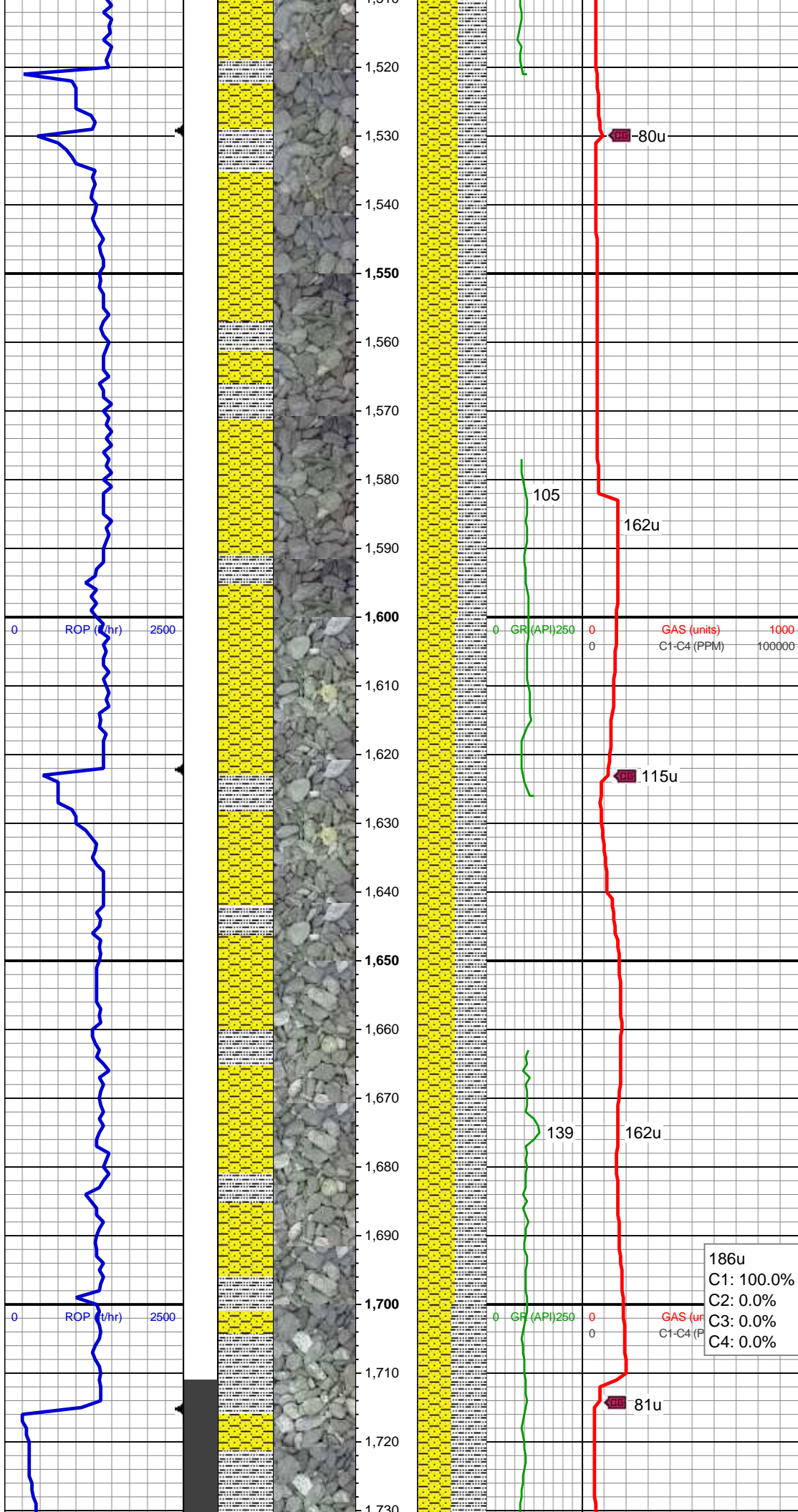
52u  
C1: 100.0%  
C2: 0.0%  
C3: 0.0%  
C4: 0.0%

65u  
C1: 100.0%  
C2: 0.0%  
C3: 0.0%  
C4: 0.0%

SS: clr, lt gry-wht, occ sap, sb rnd, f gr,  
hrd frm, mod-w srt, sl calc cmt  
SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, abnt lith frag, tr glau

SS: clr, lt gry-wht, occ sap, sb rnd, f gr,  
hrd frm, mod-w srt, sl calc cmt  
SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, abnt lith frag, tr glau

MD: 1,470'  
TVD: 1,469.95'  
Inclination: 0.65°  
Azimuth: 195.13°  
VS: -4.1'



SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag  
SS: clr, lt gry-wht, occ sap, sb rnd, f gr, hrd-frn, mod-w srt, sl calc cmt

MD: 1,561'  
TVD: 1,560.94'  
Inclination: 0.66°  
Azimuth: 185.43°  
VS: -4.42'

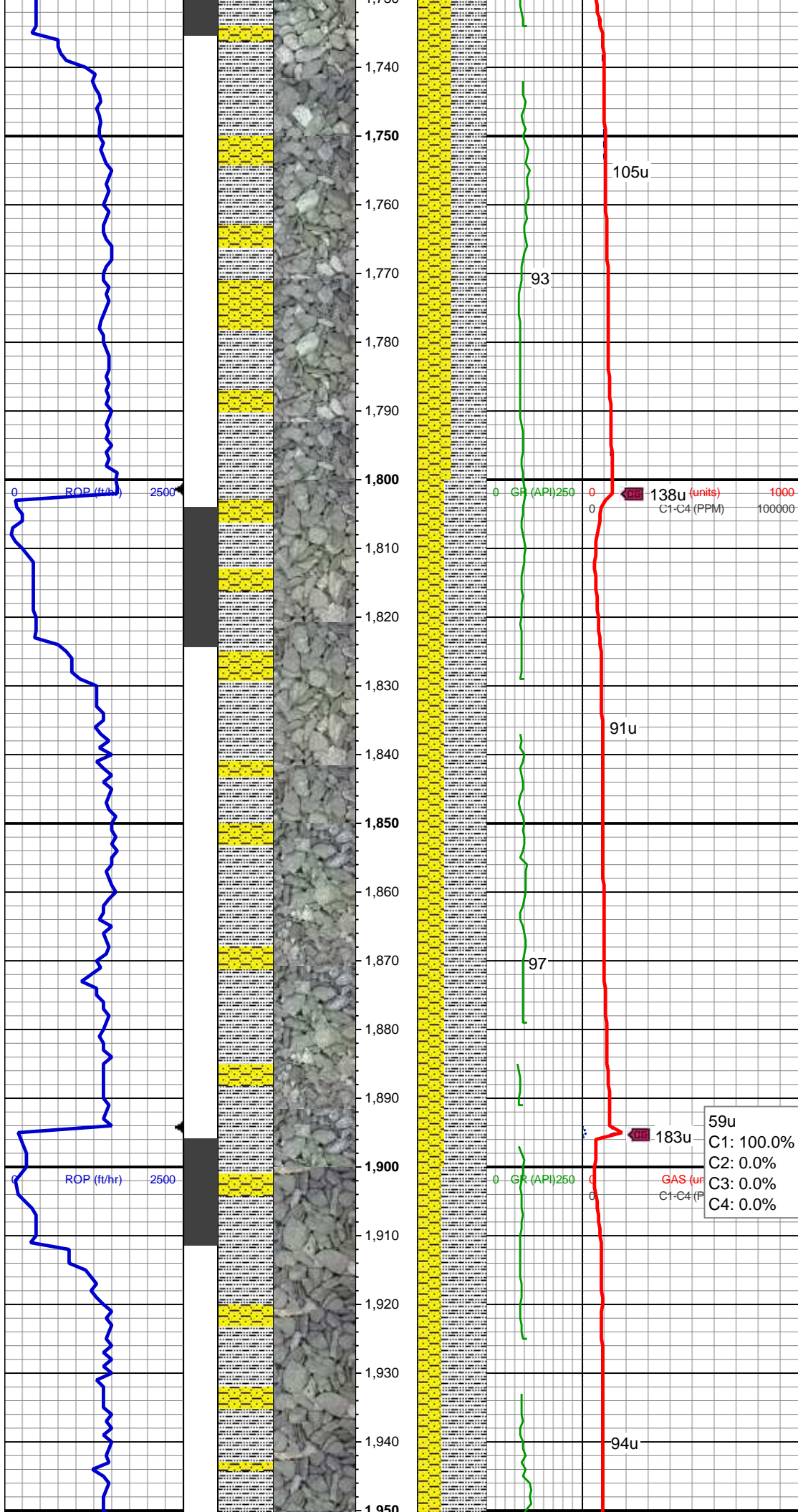
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag,  
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex

MD: 1,653'  
TVD: 1,652.93'  
Inclination: 0.56°  
Azimuth: 184.7°  
VS: -4.64'

186u  
C1: 100.0%  
C2: 0.0%  
C3: 0.0%  
C4: 0.0%

MD: 1,746'





TVD: 1,745.9'  
Inclination: 3.1°  
Azimuth: 353.47°  
VS: -4.68'

SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag,  
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex

WT IN 8.50/ OUT 8.50  
VIS IN 28/ OUT 28

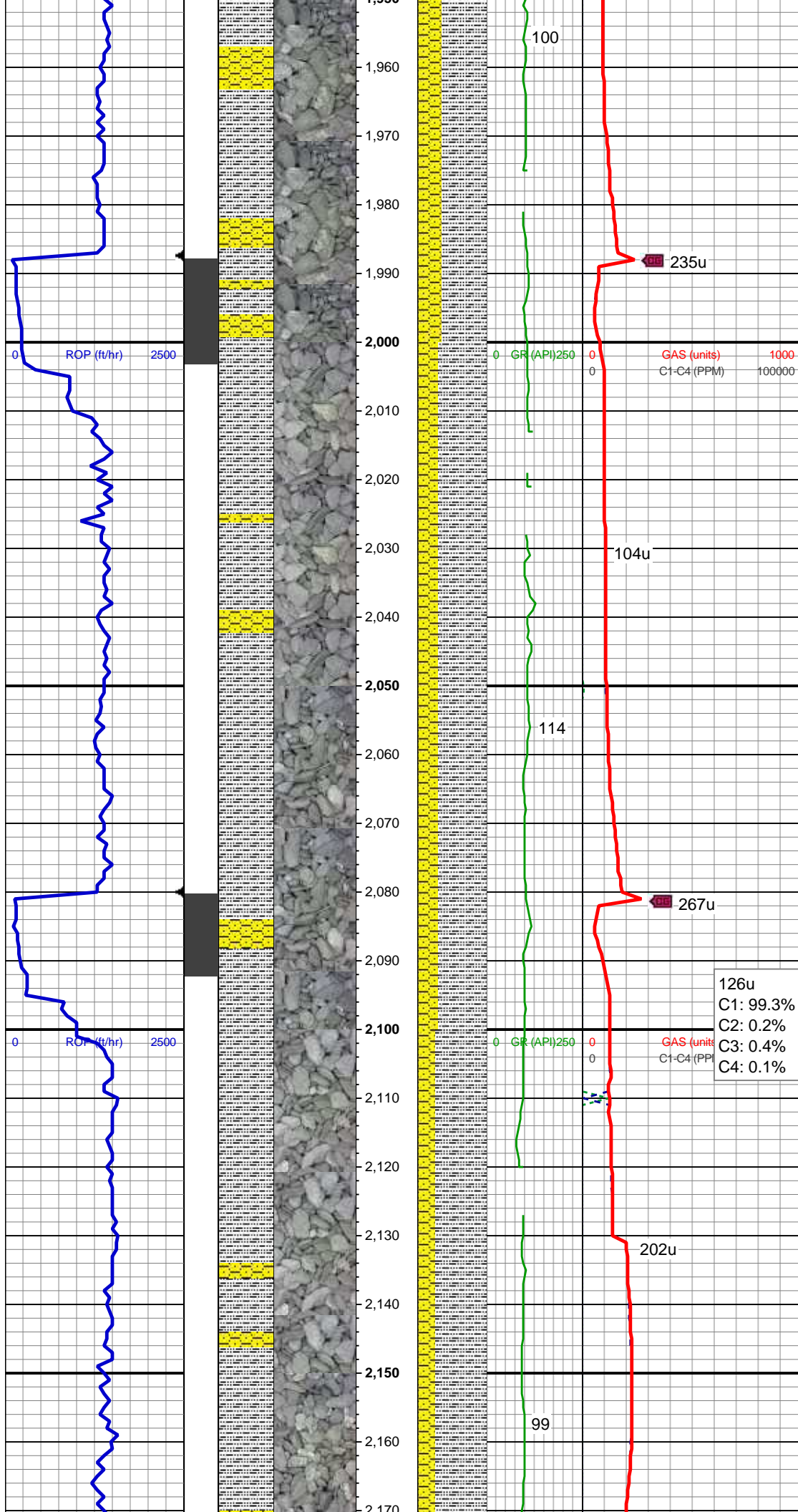
MD: 1,838'  
TVD: 1,837.63'  
Inclination: 5.44°  
Azimuth: 346.85°  
VS: -5.05'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag

59u  
C1: 100.0%  
C2: 0.0%  
C3: 0.0%  
C4: 0.0%

MD: 1,930'  
TVD: 1,929.12'  
Inclination: 6.66°  
Azimuth: 336.03°  
VS: -6.97'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,



SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag

MD: 2,022'  
TVD: 2,020.37'  
Inclination: 7.99°  
Azimuth: 342.94°  
VS: -9.52'

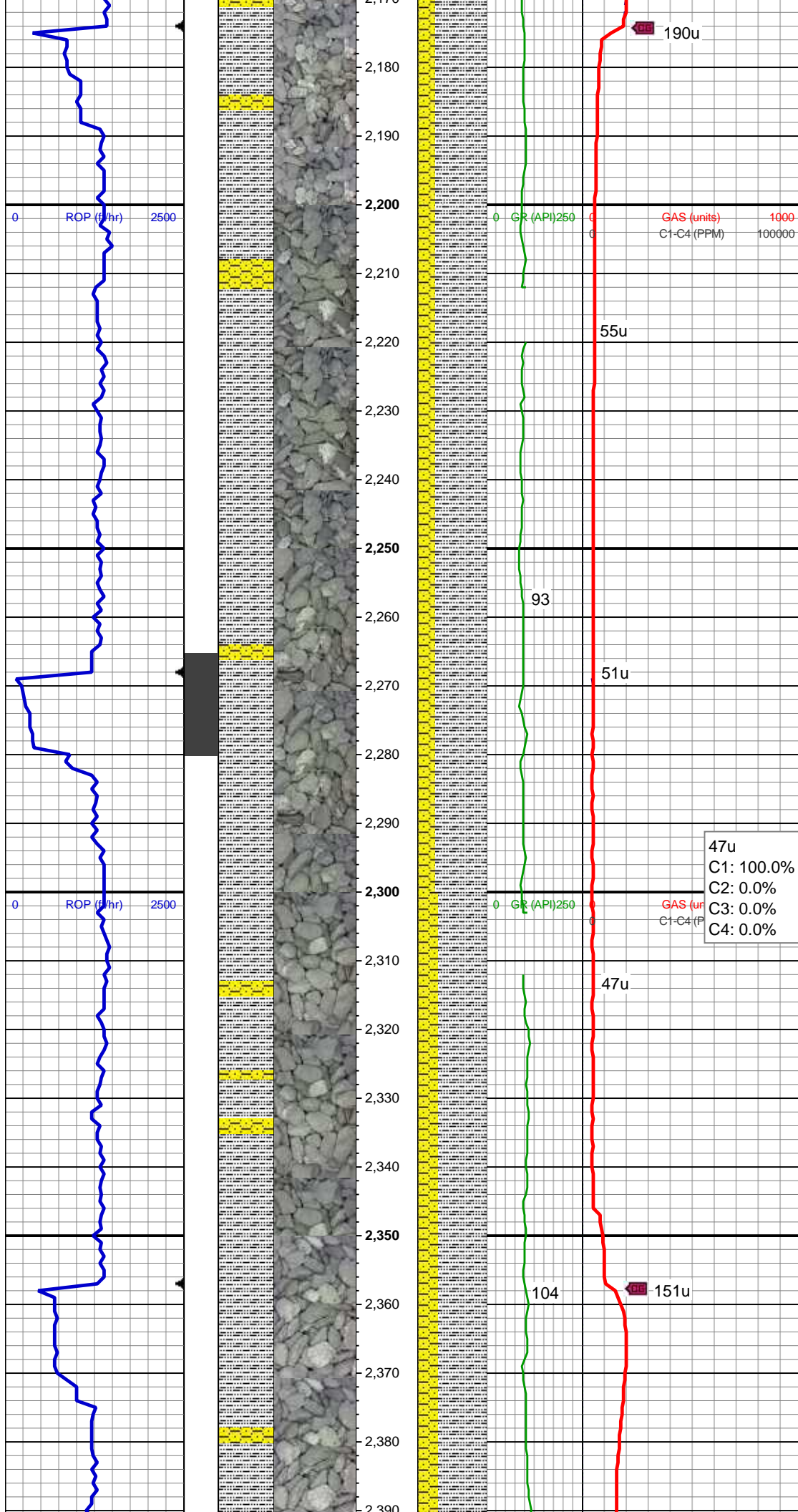
SLTY SH: lt gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry - gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag

126u  
C1: 99.3%  
C2: 0.2%  
C3: 0.4%  
C4: 0.1%

MD: 2,114'  
TVD: 2,111.38'  
Inclination: 8.83°  
Azimuth: 350.66°  
VS: -10.77'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag

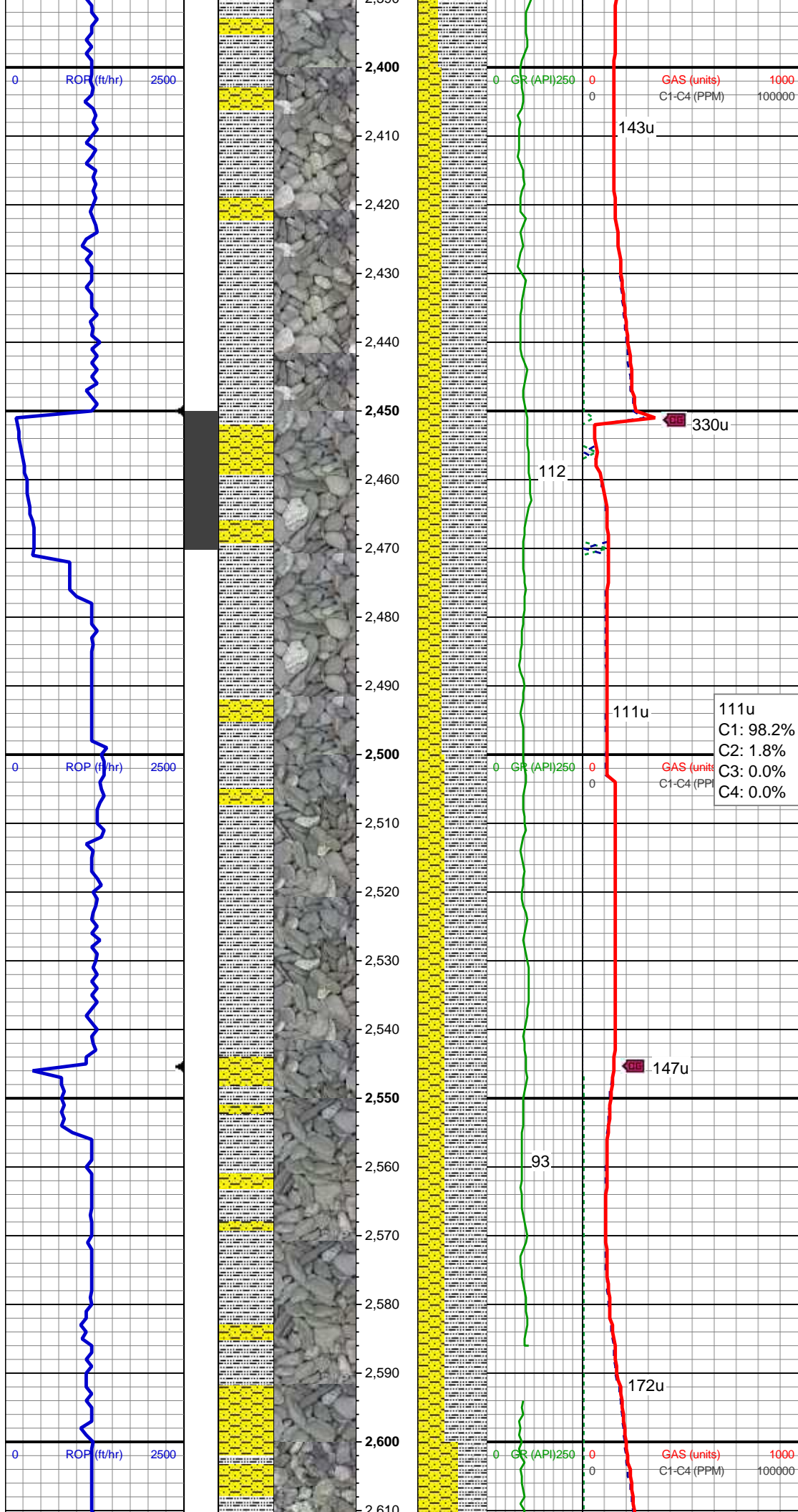




MD: 2,207'  
TVD: 2,203.4'  
Inclination: 7.88°  
Azimuth: 348.31°  
VS: -11.43'

MD: 2,300'  
TVD: 2,295.38'  
Inclination: 9.1°  
Azimuth: 352.16°  
VS: -11.9'

MD: 2,392'  
TVD: 2,386.42'



Inclination: 7.43°  
Azimuth: 345.84°  
VS: -12.6'

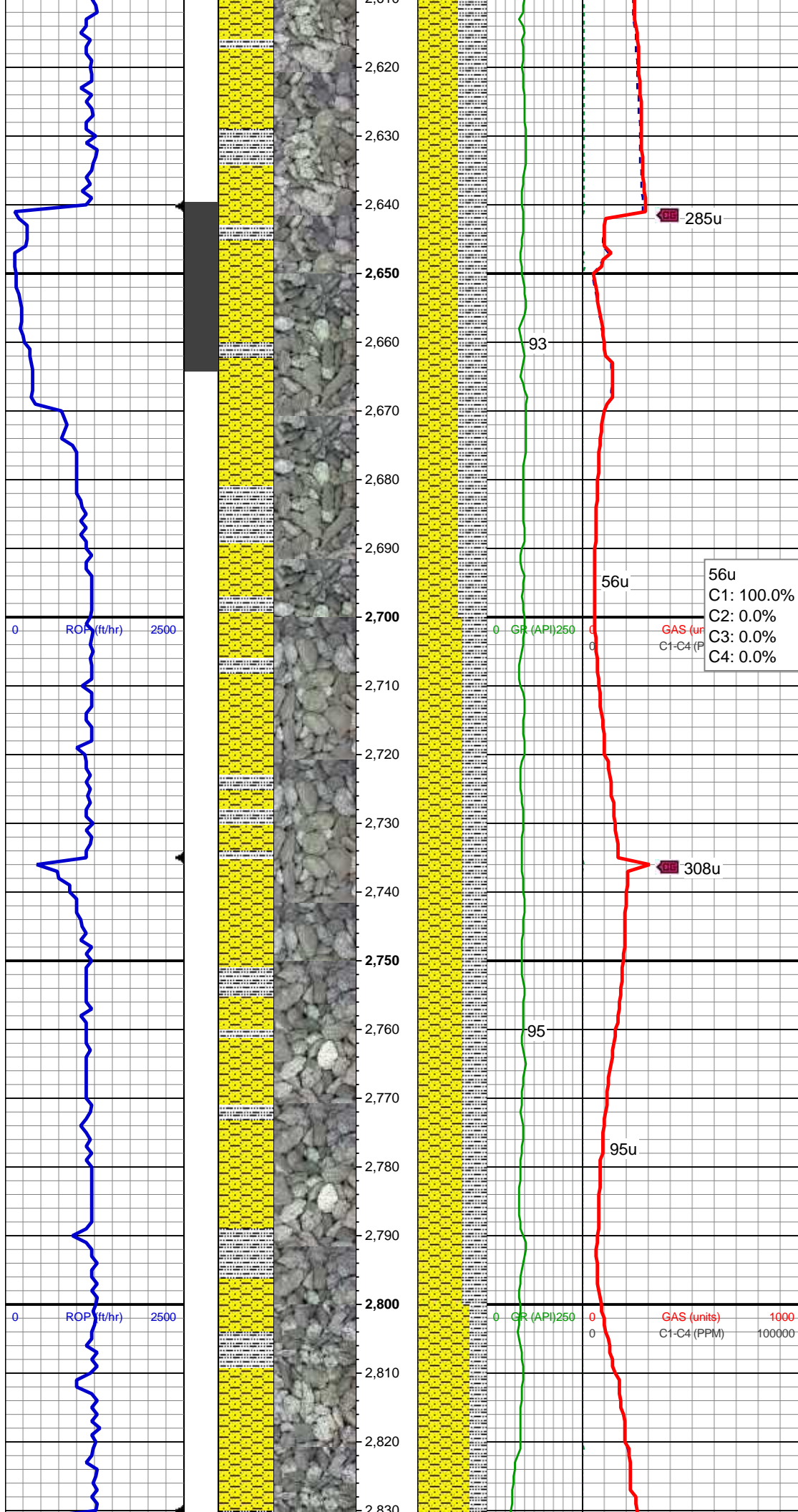
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, stly tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag

MD: 2,487'  
TVD: 2,480.4'  
Inclination: 9.33°  
Azimuth: 354°  
VS: -13.08'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, stly tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag

MD: 2,581'  
TVD: 2,573.31'  
Inclination: 8.13°  
Azimuth: 352.44°  
VS: -12.85'





SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag,  
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
sfty tex

MD: 2,676'  
TVD: 2,667.05'  
Inclination: 10.52°  
Azimuth: 354.6°  
VS: -12.49'

56u  
C1: 100.0%  
C2: 0.0%  
C3: 0.0%  
C4: 0.0%

SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag, tr diss pyr  
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
sfty tex

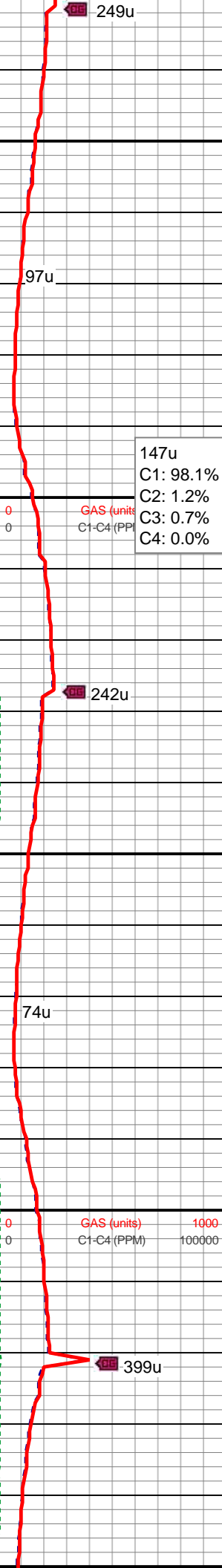
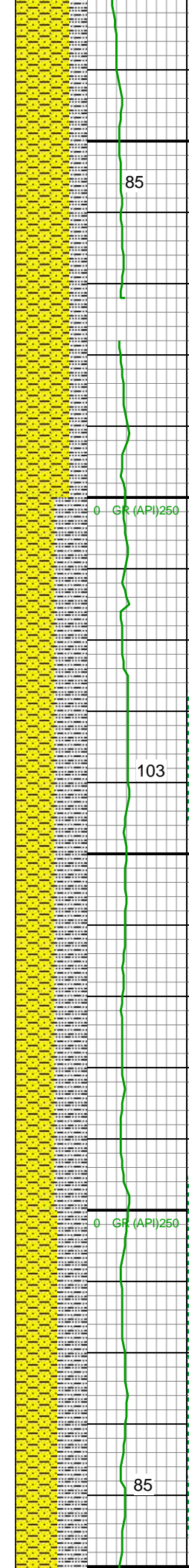
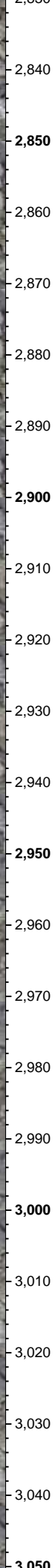
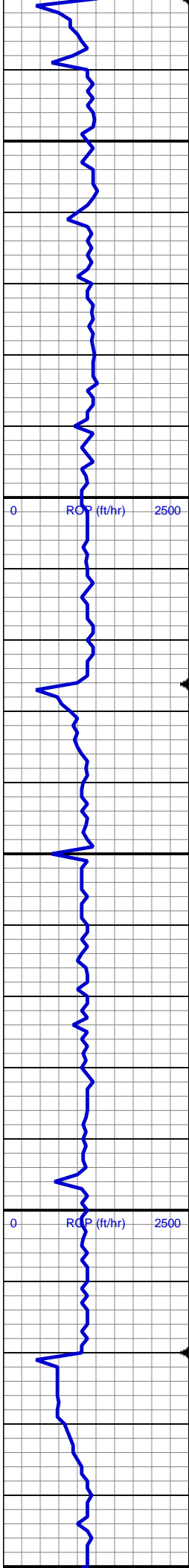
0 ROP (ft/hr) 2500

0 ROP (ft/hr) 2500

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

0 GR (API)250 0 1000  
0 GAS (units) 100000  
0 C1-C4 (PPM)





SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag, tr dissim pyr  
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
silty tex

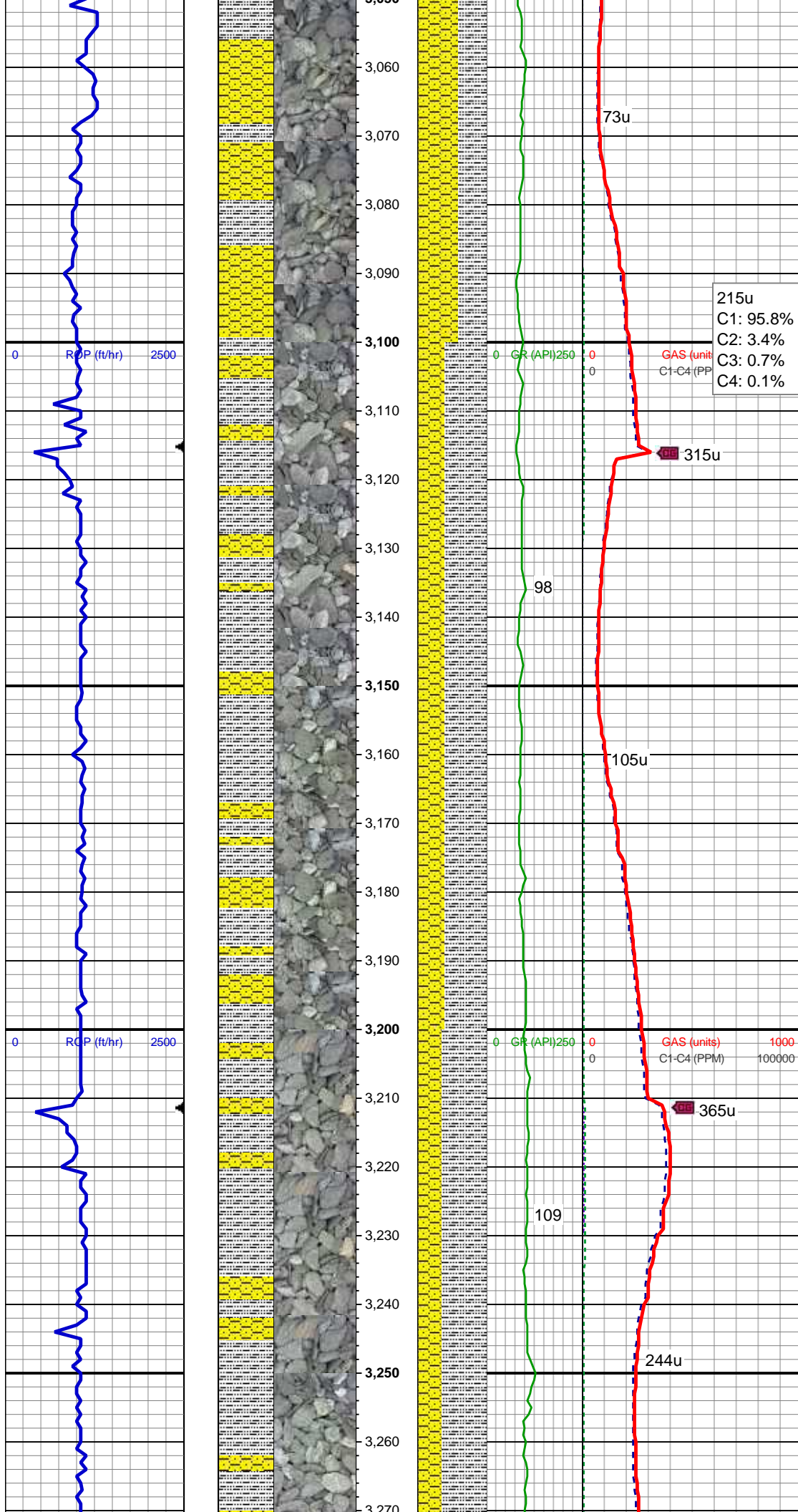
MD: 2,866'  
TVD: 2,853.76'  
Inclination: 10.85°  
Azimuth: 351.07°  
VS: -12.21'

147u  
C1: 98.1%  
C2: 1.2%  
C3: 0.7%  
C4: 0.0%

SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag, tr dissim pyr  
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
silty tex

MD: 2,960'  
TVD: 2,946.17'  
Inclination: 10.26°  
Azimuth: 348.94°  
VS: -12.91'

SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag, tr dissim pyr



SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex

MD: 3,054'  
TVD: 3,038.68'  
Inclination: 10.14°  
Azimuth: 347.98°  
VS: -14.04'

215u  
C1: 95.8%  
C2: 3.4%  
C3: 0.7%  
C4: 0.1%

GAS (units)  
C1-C4 (PPM)

315u

98

105u

365u

109

244u

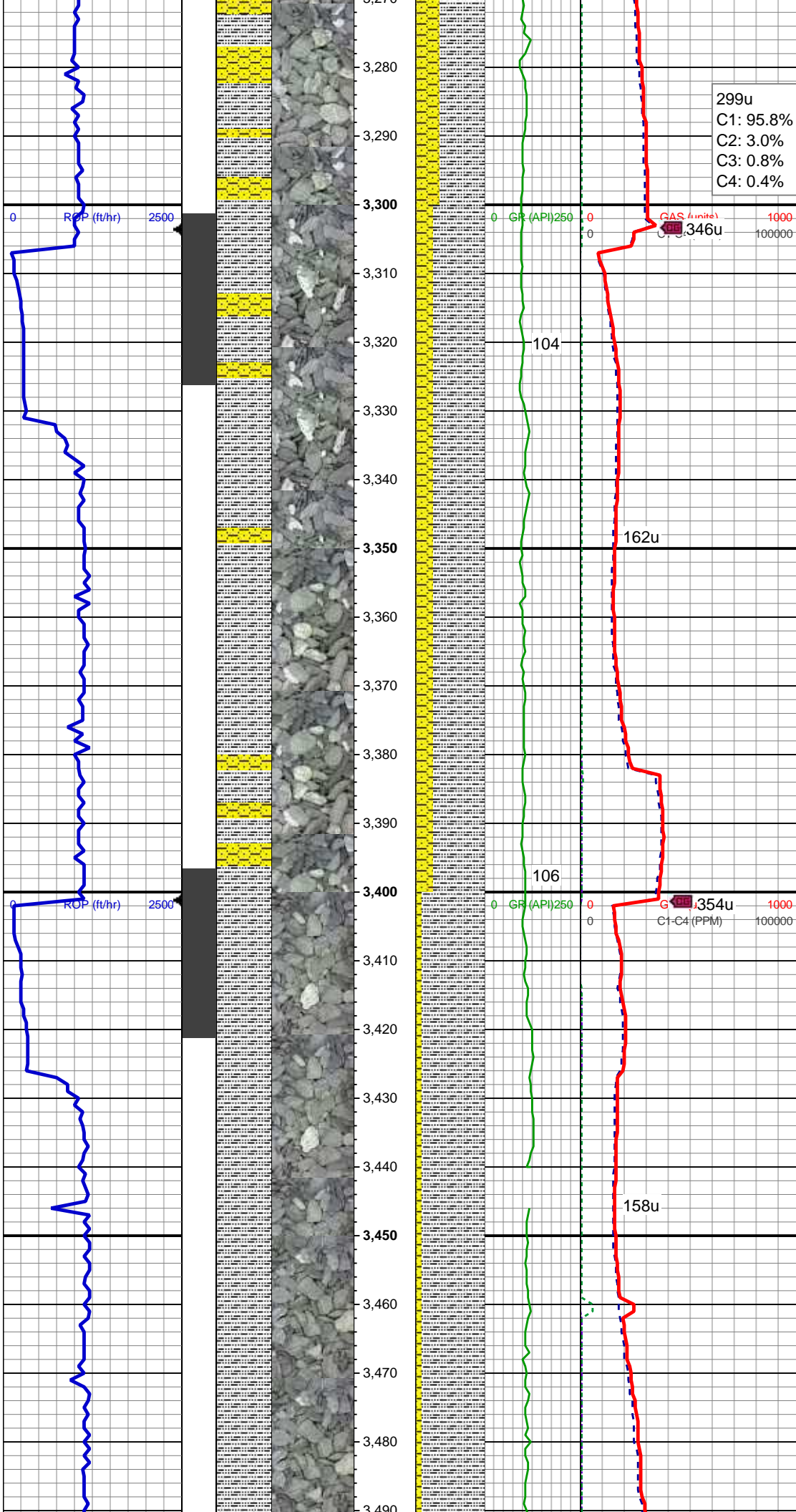
MD: 3,149'  
TVD: 3,132.3'  
Inclination: 9.48°  
Azimuth: 343.51°  
VS: -15.88'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag, rr dissim pyr, tr glau

MD: 3,243'  
TVD: 3,225.32'  
Inclination: 6.99°  
Azimuth: 341.85°  
VS: -18.11'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag, rr dissim pyr





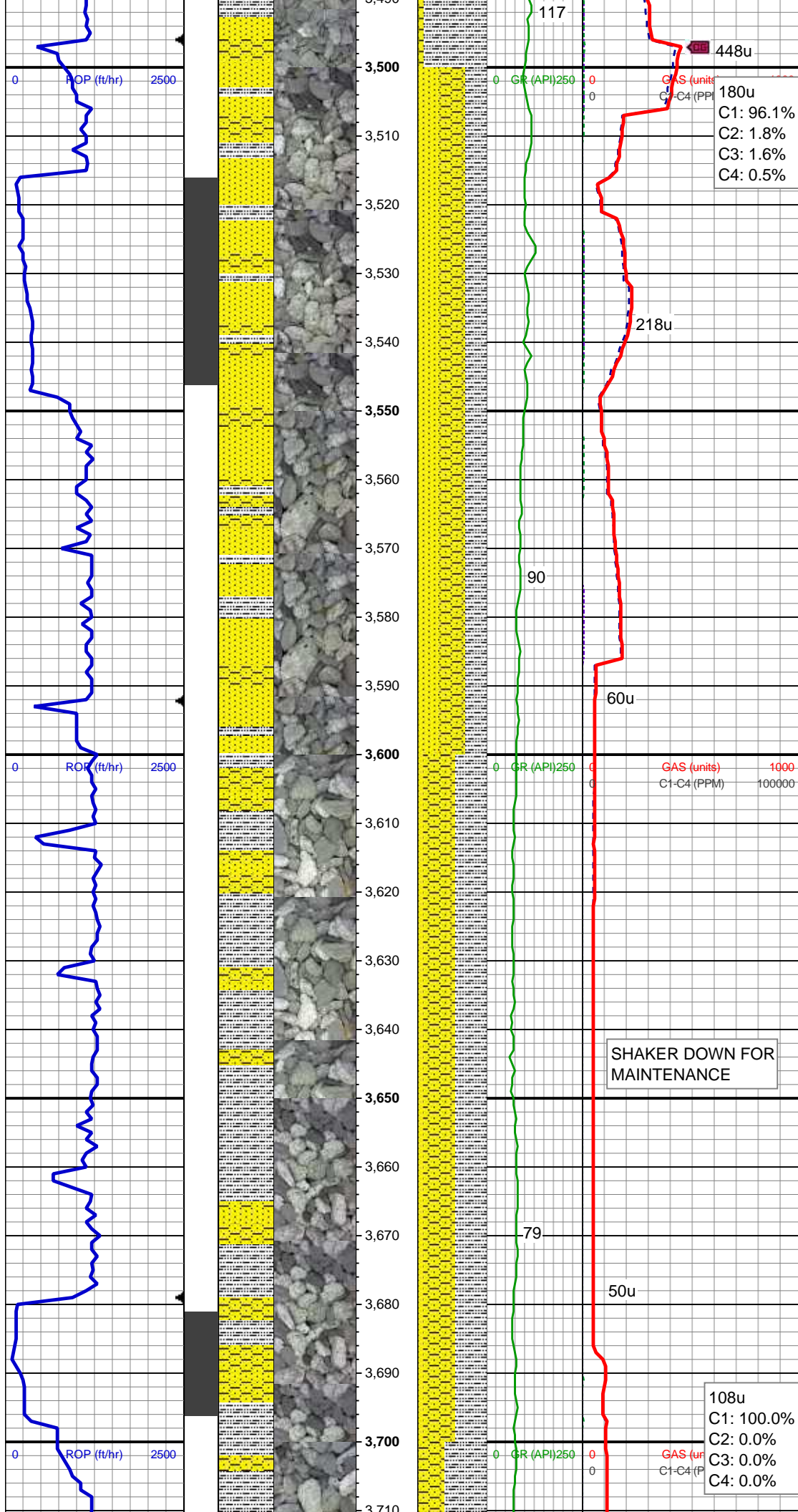
MD: 3,338'  
TVD: 3,319.53'  
Inclination: 7.83°  
Azimuth: 349.81°  
VS: -19.45'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag, rr dissim pyr, tr glau

MD: 3,433'  
TVD: 3,413.68'  
Inclination: 7.56°  
Azimuth: 359.69°  
VS: -18.94'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag, rr dissim pyr, tr glau





MD: 3,528'  
TVD: 3,507.8'  
Inclination: 8.01°  
Azimuth: 6.56°  
VS: -16.51'

SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag  
SS: clr, lt gry-wht, occ sap, sb rnd, f gr, hrd frm, mod-w srt, sl calc cmt, tr diss pyr, tr glau  
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex

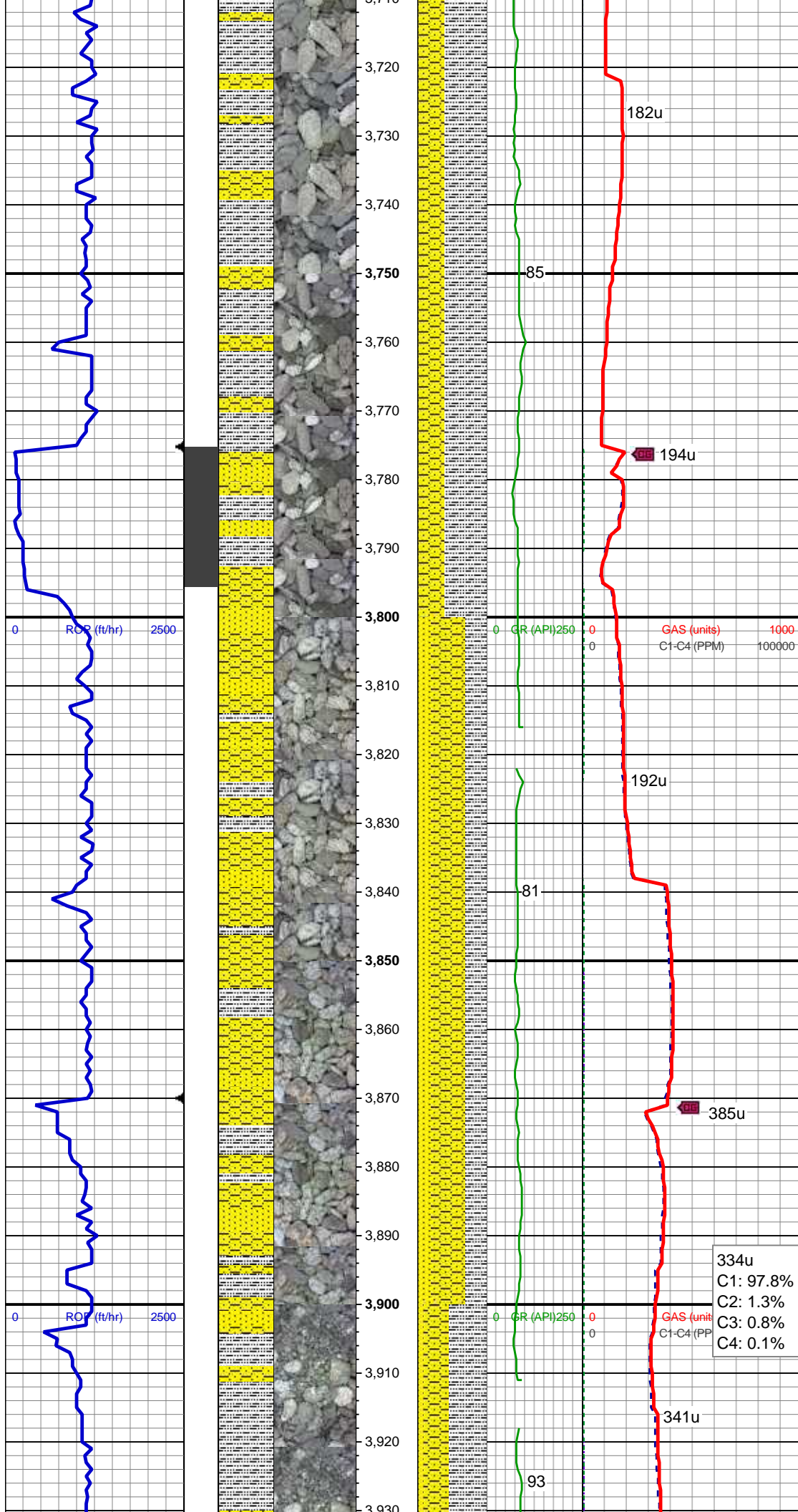
WT IN 8.45/ OUT 8.45  
VIS IN 28/ OUT 28

MD: 3,622'  
TVD: 3,600.67'  
Inclination: 9.79°  
Azimuth: 8.54°  
VS: -12.68'

SHAKER DOWN FOR MAINTENANCE

SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag  
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex  
SS: clr, lt gry-wht, occ sap, sb rnd, f gr, hrd frm, mod-w srt, sl calc cmt, tr diss pyr, tr glau

108u  
C1: 100.0%  
C2: 0.0%  
C3: 0.0%  
C4: 0.0%



MD: 3,717'  
TVD: 3,694.03'  
Inclination: 11.5°  
Azimuth: 1.11°  
VS: -8.98'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag, rr dissim pyr, tr glau

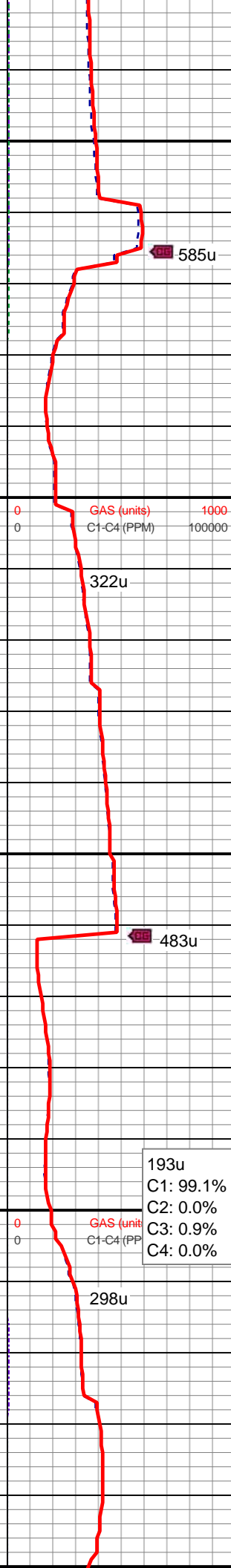
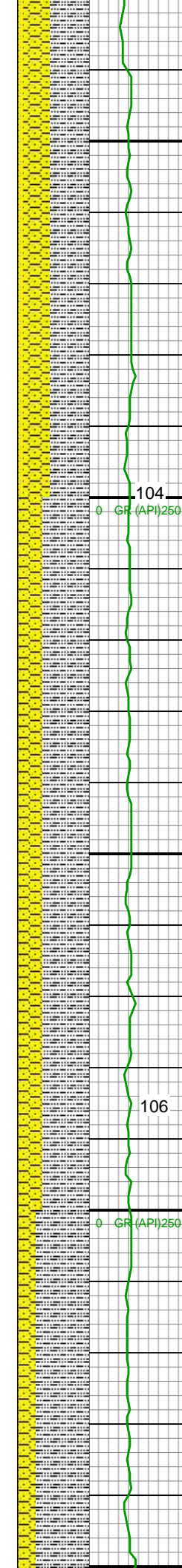
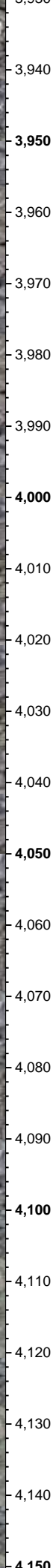
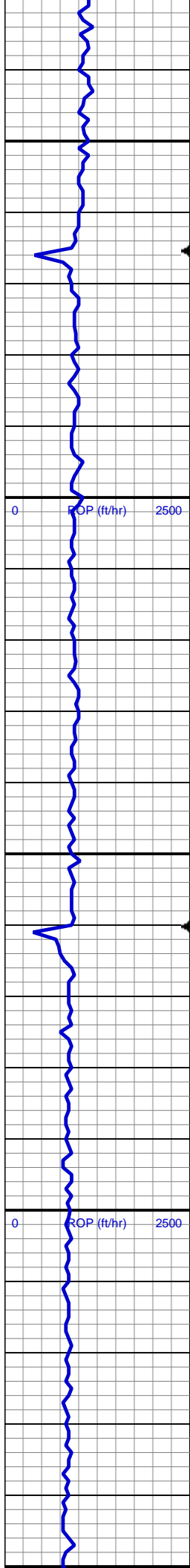
MD: 3,812'  
TVD: 3,786.93'  
Inclination: 12.71°  
Azimuth: 350.27°  
VS: -7.92'

SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag  
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex  
SS: clr, lt gry-wht, occ sap, sb rnd, f gr, hrd frm, mod-w srt, sl calc cmt, tr dissim pyr, tr glau

334u  
C1: 97.8%  
C2: 1.3%  
C3: 0.8%  
C4: 0.1%

MD: 3,907'  
TVD: 3,879.47'  
Inclination: 13.44°  
Azimuth: 350.79°  
VS: -8.6'





SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag  
SS: clr, lt gry-wht, occ sap, sb rnd, f gr, hrd frm, mod-w srt, sl calc cmt, tr diss pyr, tr glau

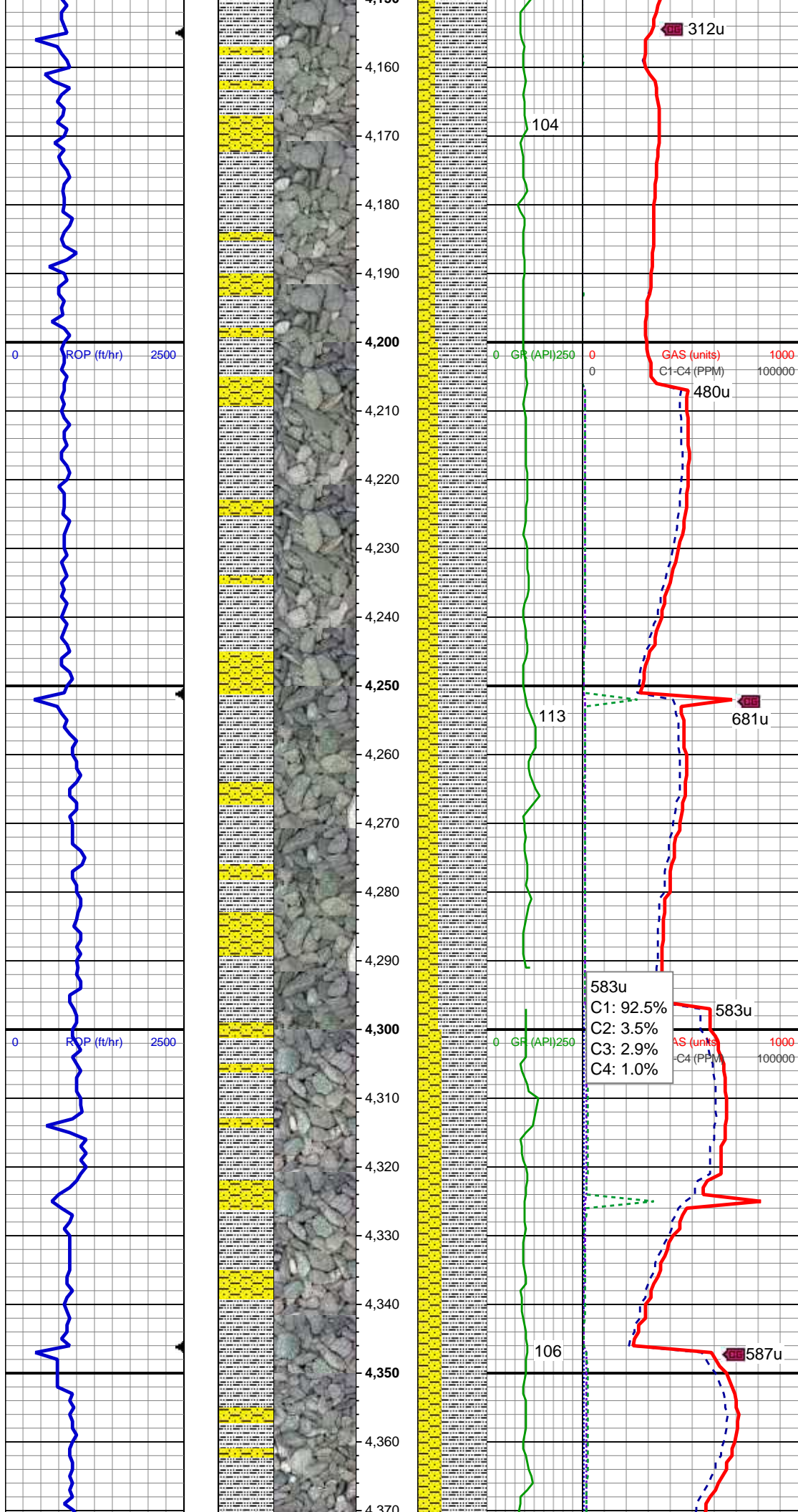
MD: 4,001'  
TVD: 3,971.02'  
Inclination: 12.75°  
Azimuth: 351.38°  
VS: -9.07'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag, rr diss pyr, tr glau

MD: 4,094'  
TVD: 4,061.89'  
Inclination: 11.86°  
Azimuth: 350.73°  
VS: -9.52'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,





SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag, rr dissim pyr, tr glau

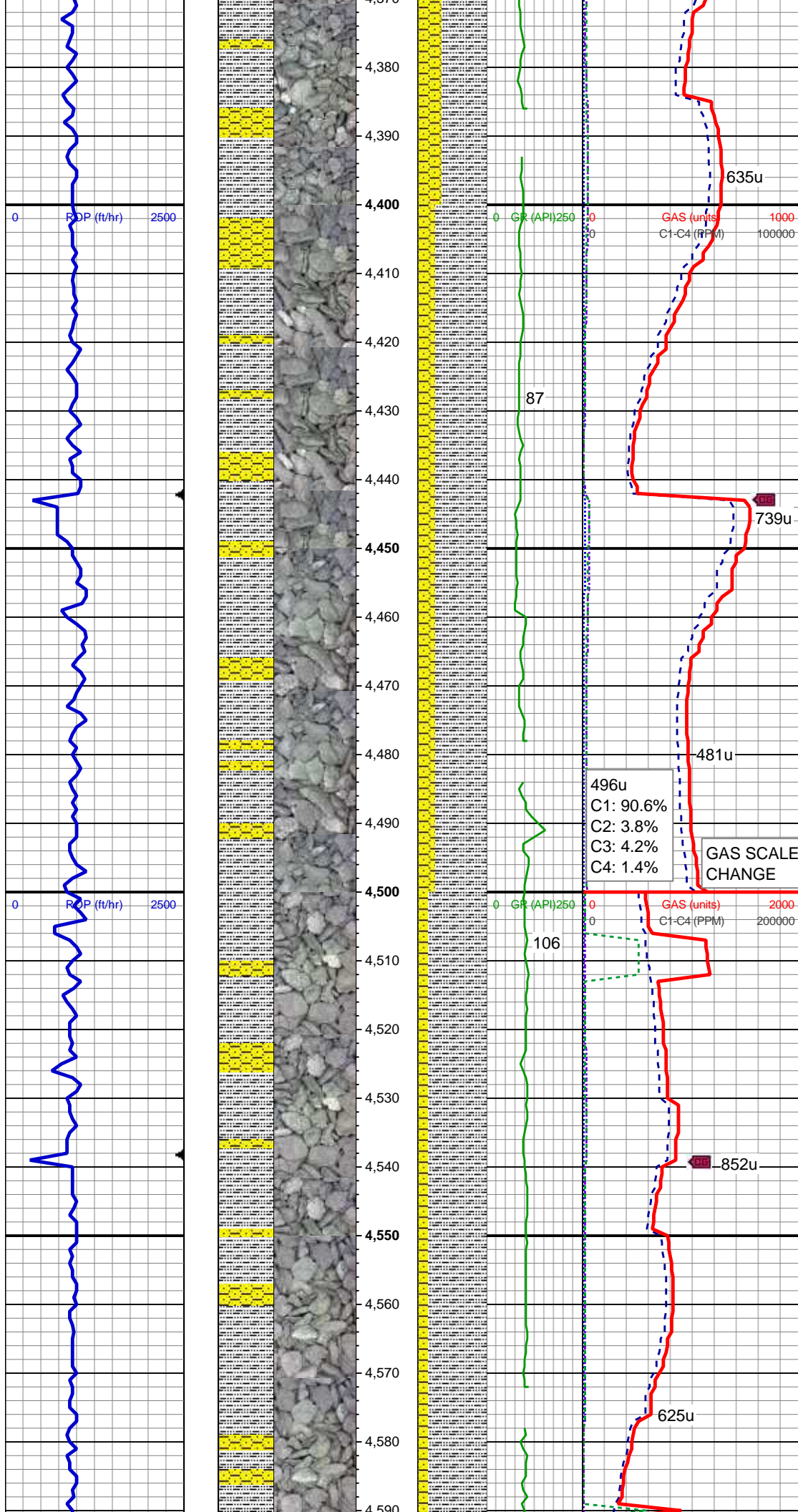
MD: 4,189'  
TVD: 4,155.08'  
Inclination: 10.49°  
Azimuth: 349.85°  
VS: -10.17'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
sly tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag, rr dissim pyr, tr glau

MD: 4,284'  
TVD: 4,248.65'  
Inclination: 9.41°  
Azimuth: 352.99°  
VS: -10.46'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
sly tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag, rr dissim pyr

583u  
C1: 92.5%  
C2: 3.5%  
C3: 2.9%  
C4: 1.0%



MD: 4,378'  
TVD: 4,341.54'  
Inclination: 8.2°  
Azimuth: 348.06°  
VS: -10.88'

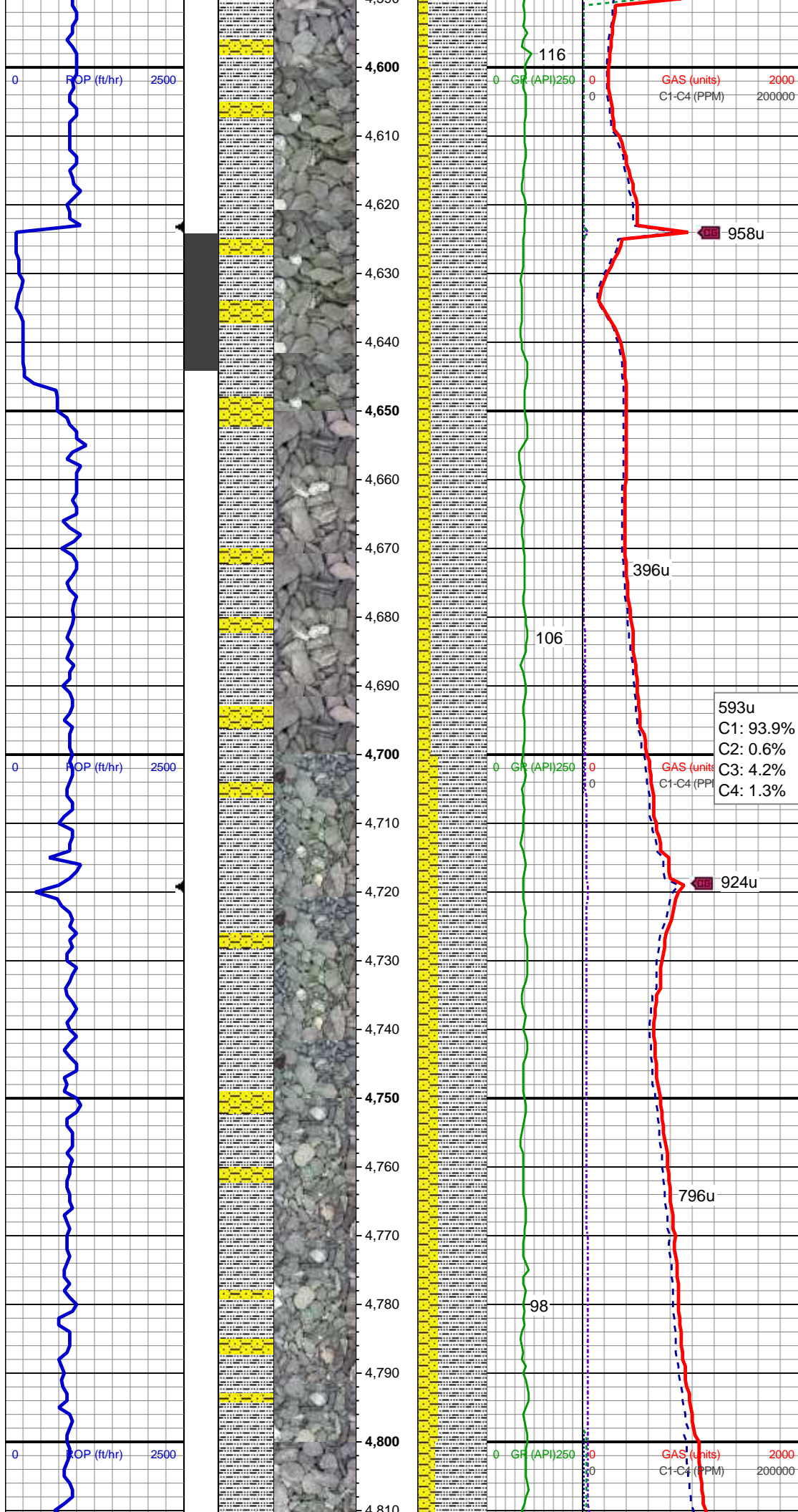
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag, rr dissim pyr

MD: 4,472'  
TVD: 4,434.66'  
Inclination: 7.5°  
Azimuth: 346.9°  
VS: -11.96'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag, rr dissim pyr

MD: 4,566'  
TVD: 4,527.96'  
Inclination: 6.54°  
Azimuth: 347.22°  
VS: -13.02'





SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag, rr dissm pyr, rr fos frags

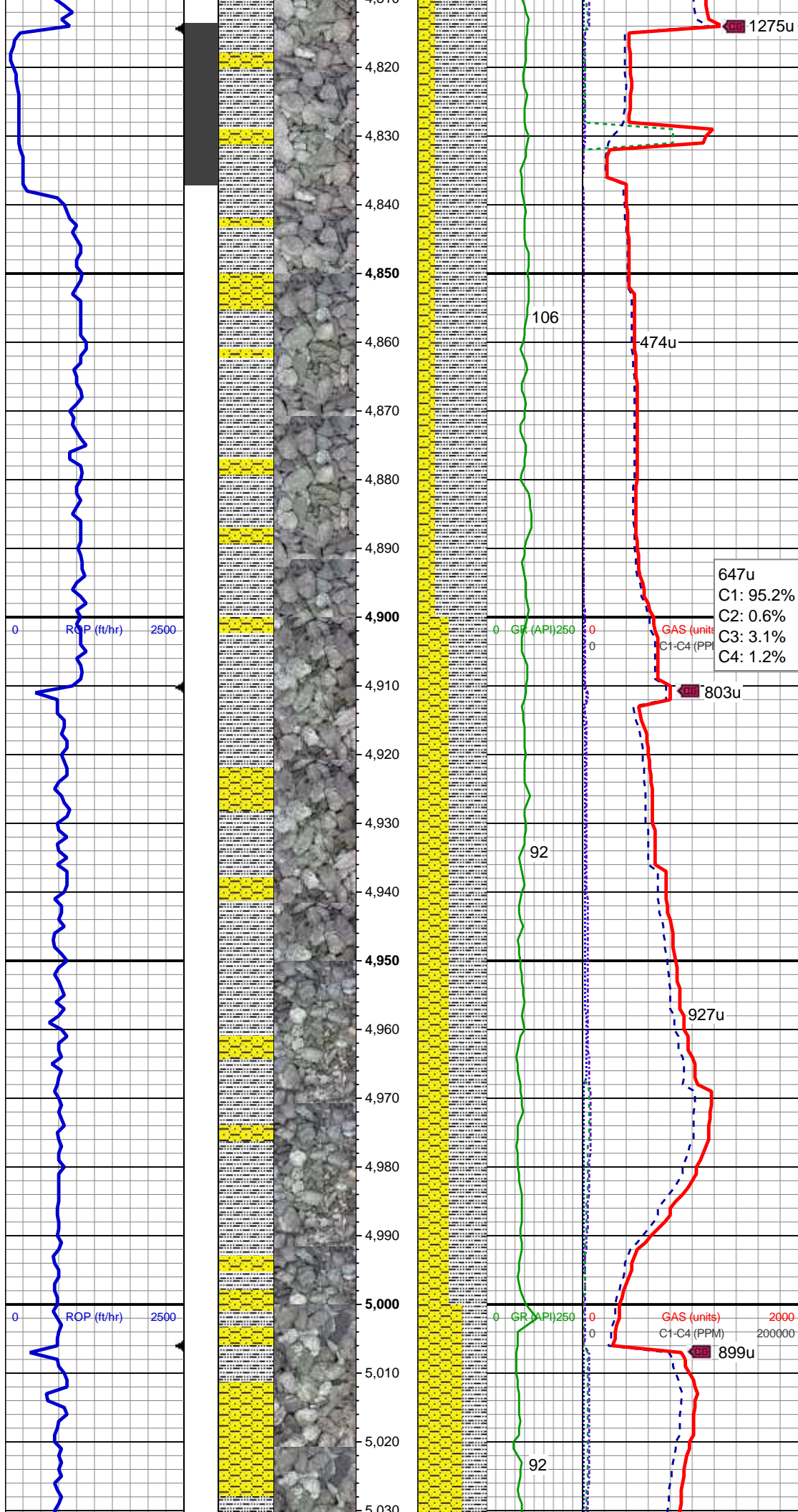
MD: 4,660'  
TVD: 4,621.23'  
Inclination: 7.79°  
Azimuth: 3.56°  
VS: -12.26'

593u  
C1: 93.9%  
C2: 0.6%  
C3: 4.2%  
C4: 1.3%

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, tr lith frag, rr dissm pyr

MD: 4,755'  
TVD: 4,715.47'  
Inclination: 6.68°  
Azimuth: 1.95°  
VS: -10.09'





WT IN 8.90/ OUT 8.90  
VIS IN 34/ OUT 34

MD: 4,849'  
TVD: 4,808.8'  
Inclination: 7.17°  
Azimuth: 344.53°  
VS: -9.98'

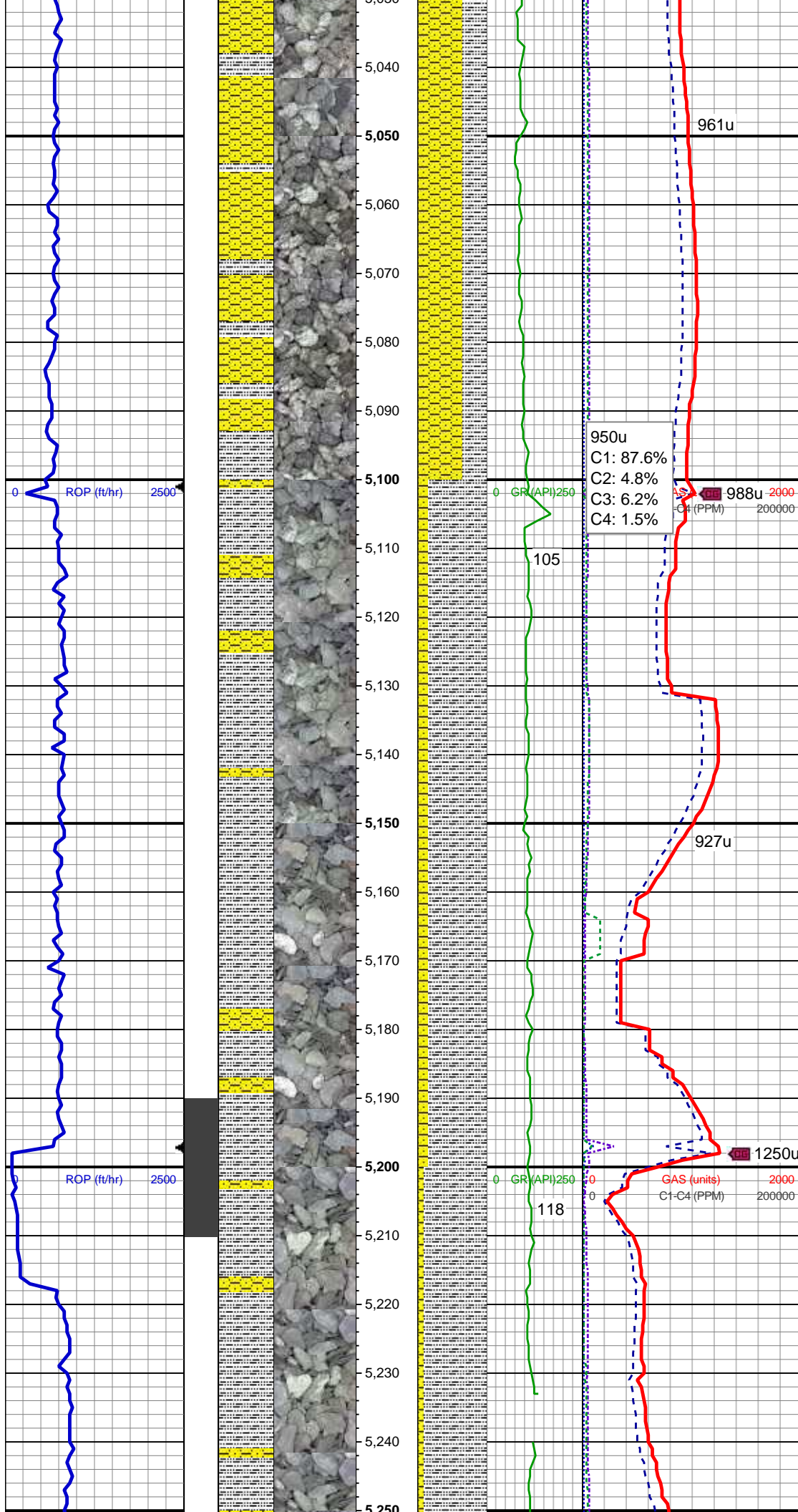
SLTY SH: gry-dkr gry, rnd, sb pty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb pty, v sft, v f gr, mod srt, tr lith frag

647u  
C1: 95.2%  
C2: 0.6%  
C3: 3.1%  
C4: 1.2%

MD: 4,944'  
TVD: 4,903.19'  
Inclination: 5.76°  
Azimuth: 348.55°  
VS: -11.1'

SLTY SH: gry-dkr gry, rnd, sb pty, v sft, slty tex,  
SHY SS: lt gry, sb ang, sb pty, v sft, v f gr, mod srt, tr lith frag, rr diss pyr

MD: 5,038'  
TVD: 4,996.73'



Inclination: 5.61°  
Azimuth: 345.57°  
VS: -11.95'

SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag  
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
sly tex, tr diss pyr

MD: 5,132'  
TVD: 5,090.35'  
Inclination: 4.66°  
Azimuth: 346.88°  
VS: -12.86'

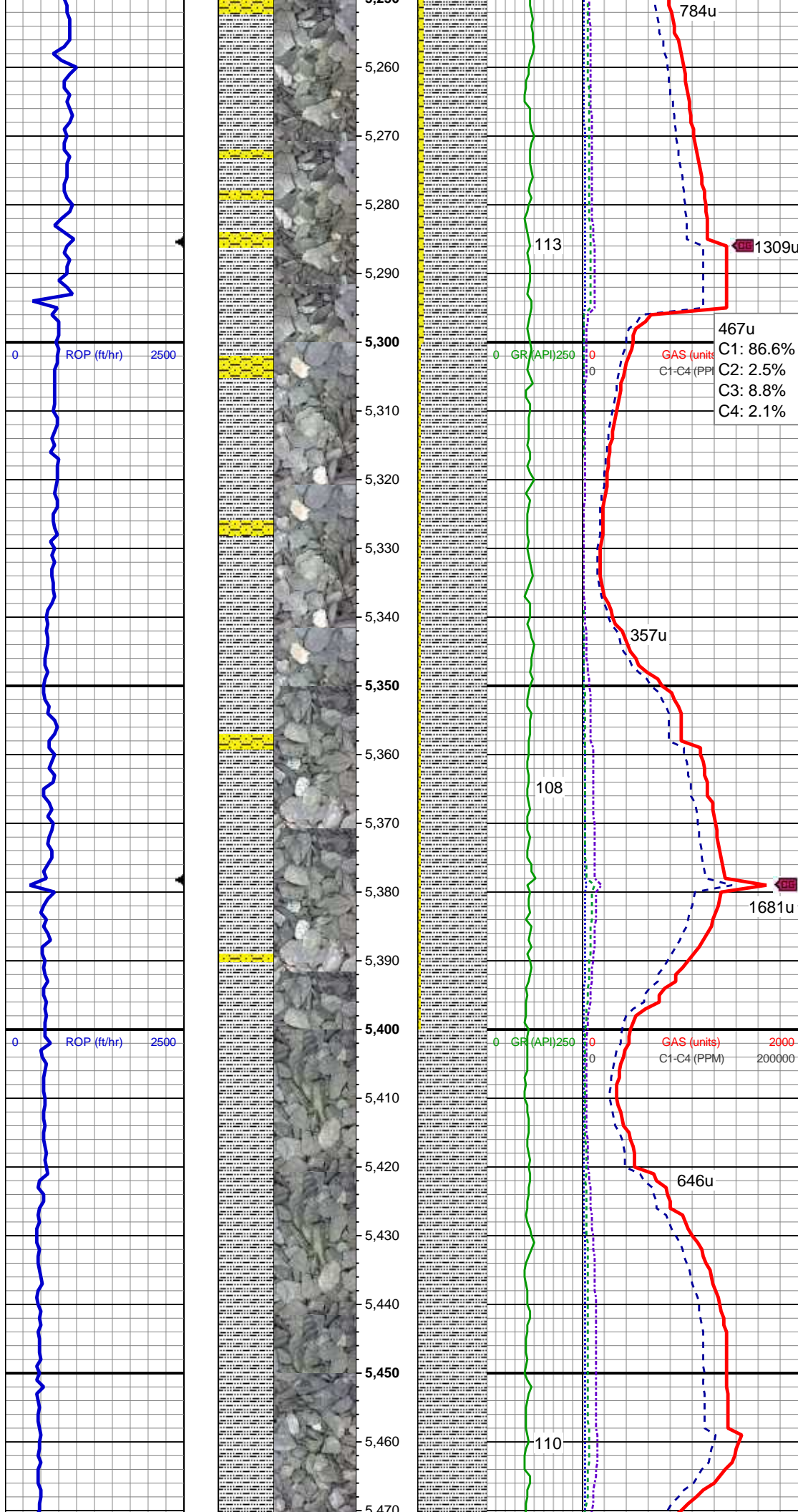
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, v f  
sly tex,  
SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag, rr diss pyr

WT IN 9.15/ OUT 9.15  
VIS IN 40/ OUT 40

MD: 5,227'  
TVD: 5,185.2'  
Inclination: 1.5°  
Azimuth: 351.03°  
VS: -13.26'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
sly tex,

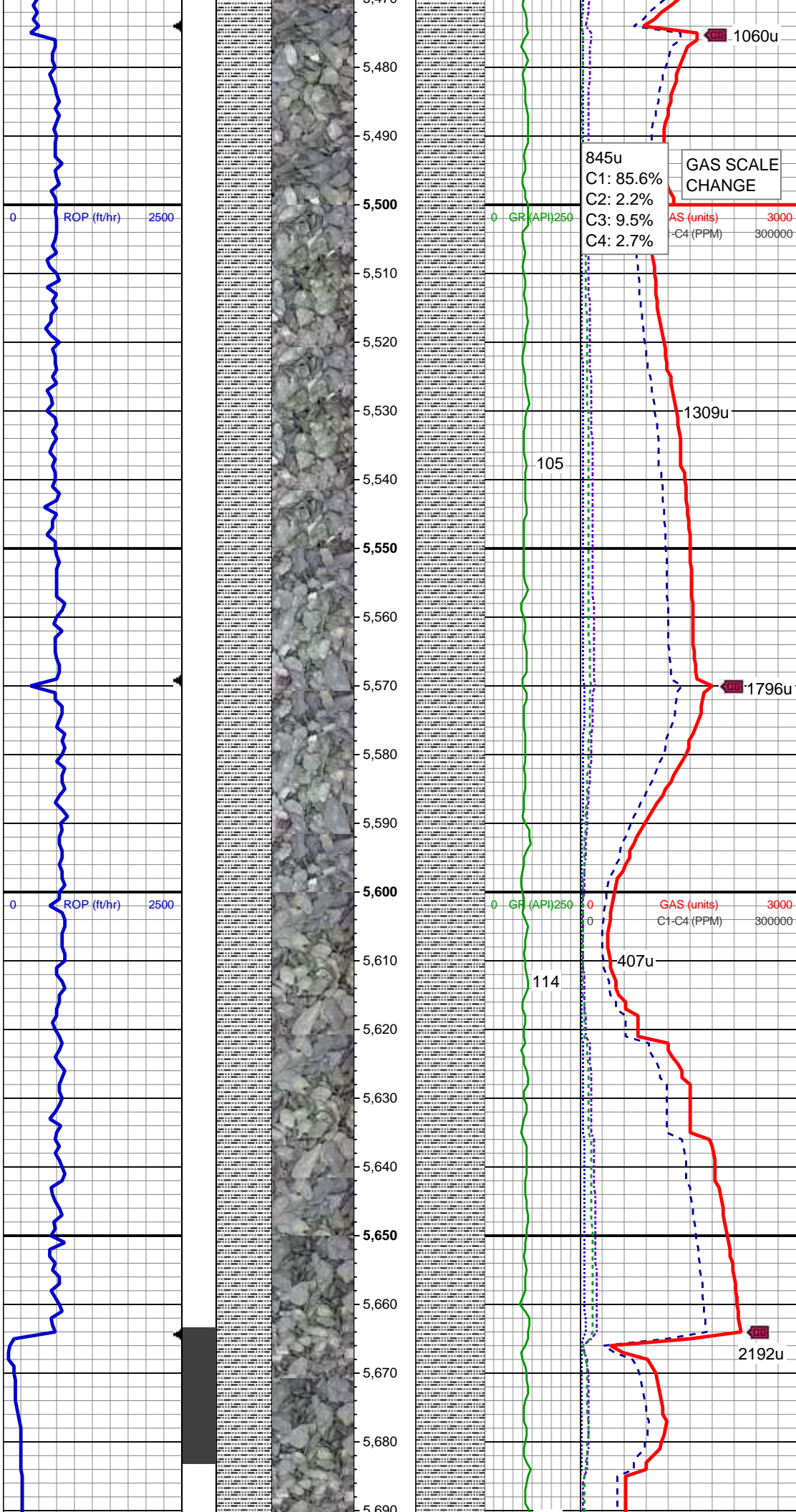




SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag, rr dissim pyr

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
slyt tex  
SHY SS: lt gry, sb ang, sb plty, v sft, v f  
gr, mod srt, tr lith frag, rr dissim pyr

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
slyt tex



845u  
C1: 85.6%  
C2: 2.2%  
C3: 9.5%  
C4: 2.7%

GAS SCALE  
CHANGE

AS (units) 3000  
C4 (PPM) 300000

1309u

105

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
slty tex

WT IN 9.60/ OUT 9.60  
VIS IN 37/ OUT 37

1796u

0 GR (API) 250

GAS (units) 3000  
C1-C4 (PPM) 300000

407u

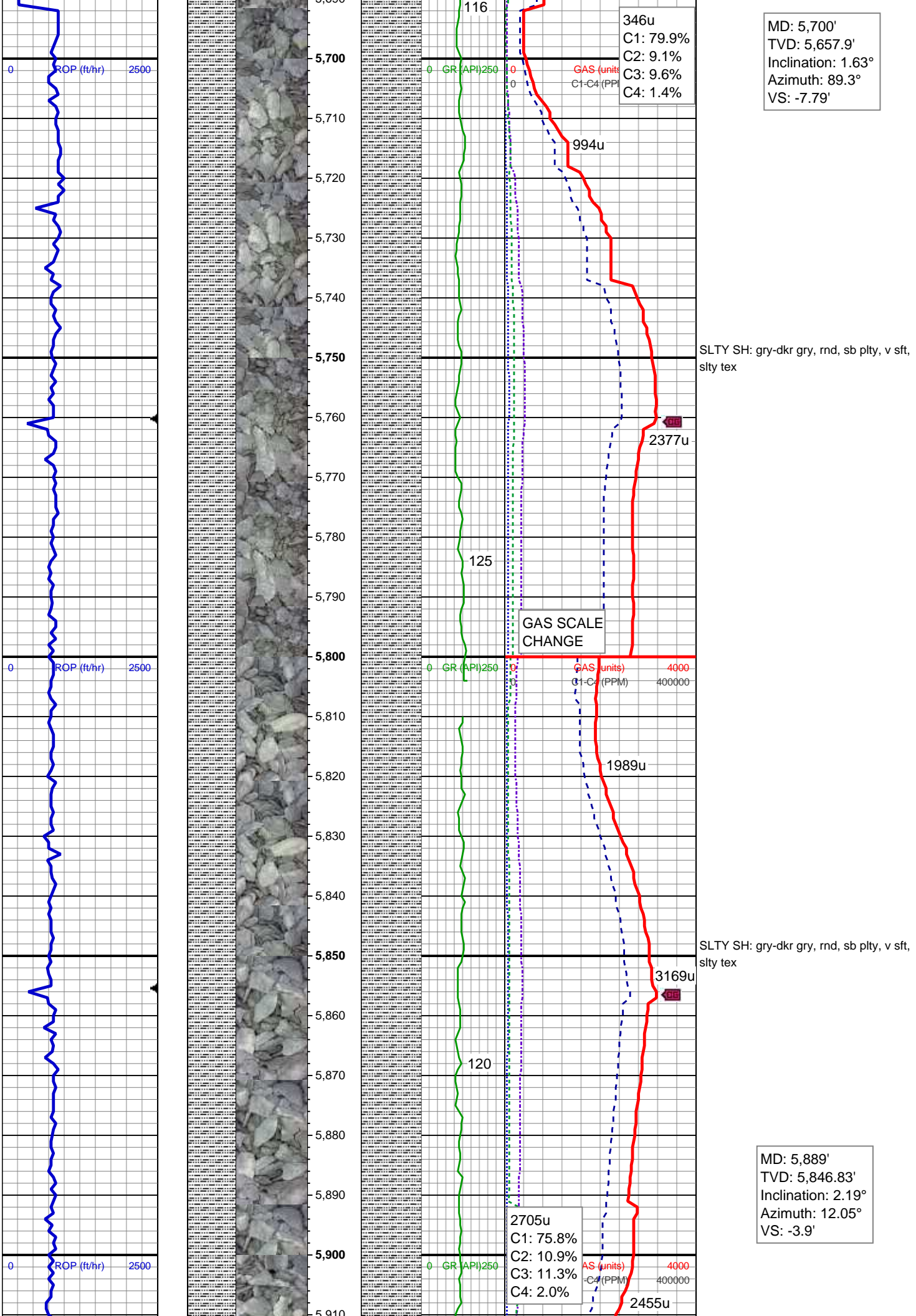
114

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,  
slty tex

2192u

MD: 5,605'  
TVD: 5,562.95'  
Inclination: 2.29°  
Azimuth: 9.27°  
VS: -9.68'





MD: 5,700'  
TVD: 5,657.9'  
Inclination: 1.63°  
Azimuth: 89.3°  
VS: -7.79'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex

MD: 5,889'  
TVD: 5,846.83'  
Inclination: 2.19°  
Azimuth: 12.05°  
VS: -3.9'

