

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Wahlert\_AC23-68-HN\_Vertical

**Location** NENE S23 T7N R63W

**State** COLORADO

**County** WELD

**Country** USA

**Rig Number** ENSIGN #121

**API Number** 05-123-37157

**AFE #** 138931

**Region** DJ BASIN

**Field** WATTENBERG

**Spud Date** 8/20/2013

**Drilling Completed** 8/28/2013

**Surface Coordinates** 355' FNL, 280' FEL

**Bottom Hole Coordinates** 660' FNL, 535' FWL

**Ground Elevation** 4788'

**K.B. Elevation** 4801'

**Logged Interval** 1100 To 11104

**Total Depth** 11104

**Formation** NIOBRARA B CHALK

**Type of Drilling Fluid** H2O, LSND

## Operator

**Company** Noble Energy Inc

## Geologist

**Name** RYAN SULLIVAN

**Company** COLUMBINE LOGGING INC.

## Rock Types

? UNKNOWN

ANHYDRITE

GYPSUM

SALT

SIDERITE or LIMONITE

LIMESTONE

DOLOMITE

CHERT

COAL

MARLSTONE

CLAYSTONE

SHALE

SHALE GRAY

SHALE COLORED

SILTSTONE

SANDSTONE

CONGLOMERATE

BRECCIA

TILL

BENTONITE

TUFF

IGNEOUS

METAMORPHIC

Silty Shale

## Accessories

### Fossils

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

### F FOSSIL

GASTROPOD  
 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

E EARTHY  
 F FENESTRAL  
 F FRACTURE  
 X INTERCRYSTALLINE  
 O INTEROOLITIC

### MOLDIC

O ORGANIC  
 P PINPOINT  
 V 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

A ANGULAR  
 R ROUNDED  
 B SUBANG  
 F SUBRND

### Textures

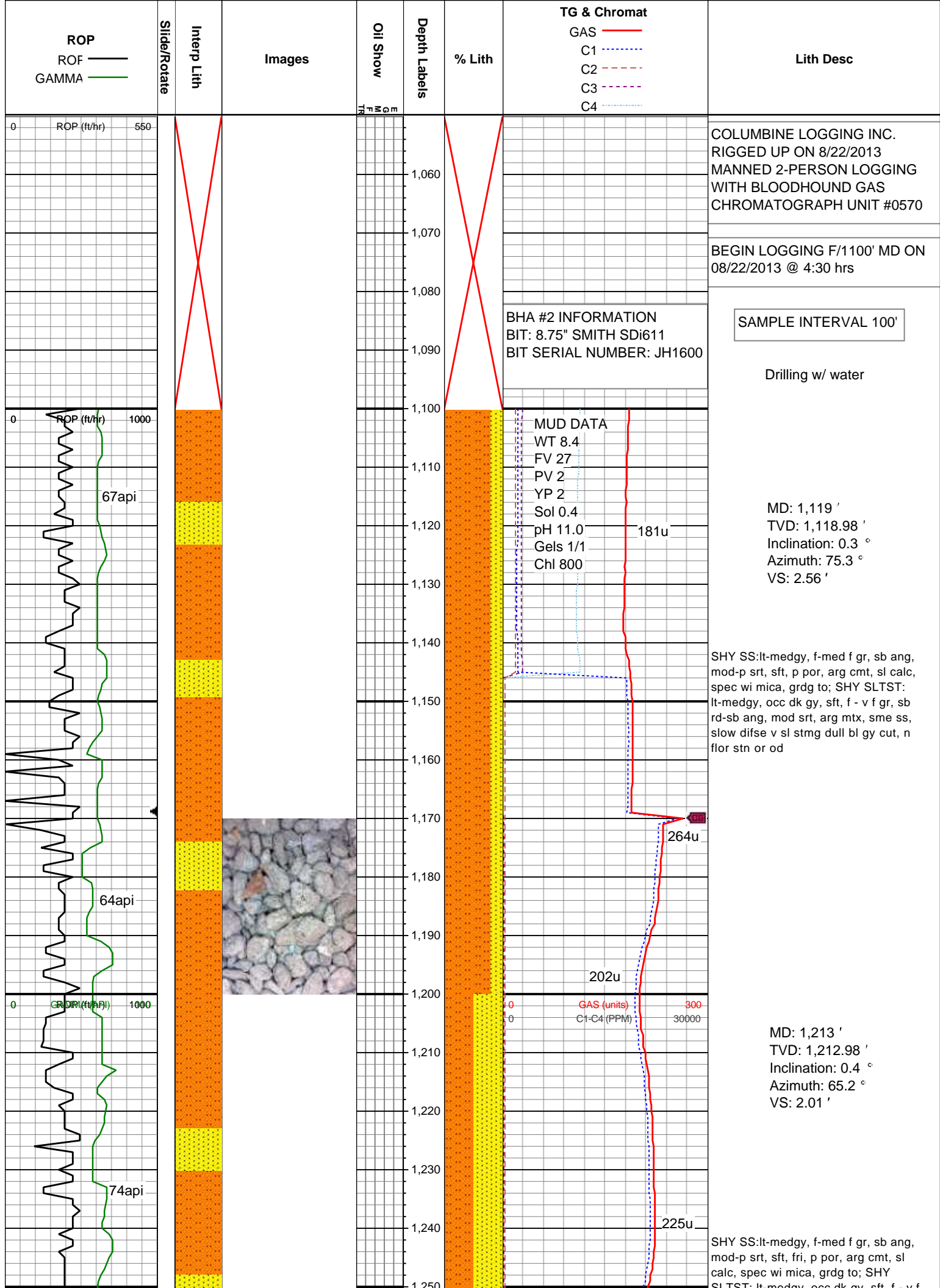
BS BOUNDSTONE  
 C CHALKY  
 CX CRYPTOXLN

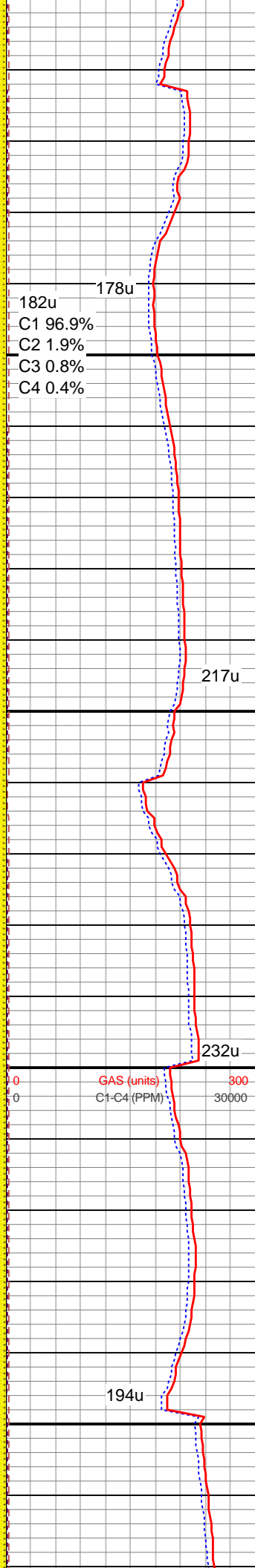
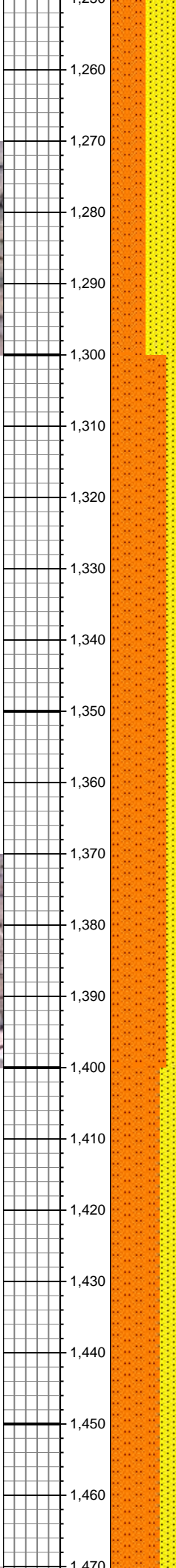
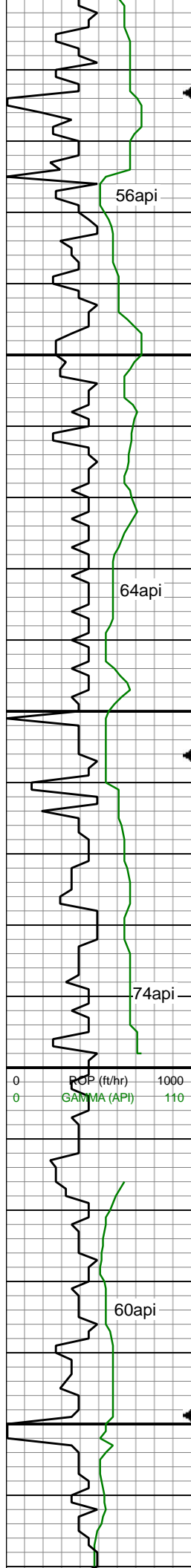
### E EARTHY

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

### Sorting

M MODERATE  
 P POOR  
 W WELL





SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx, sme  
ss, slow difse v sl stmg dull bl gy cut, n  
flor stn or od

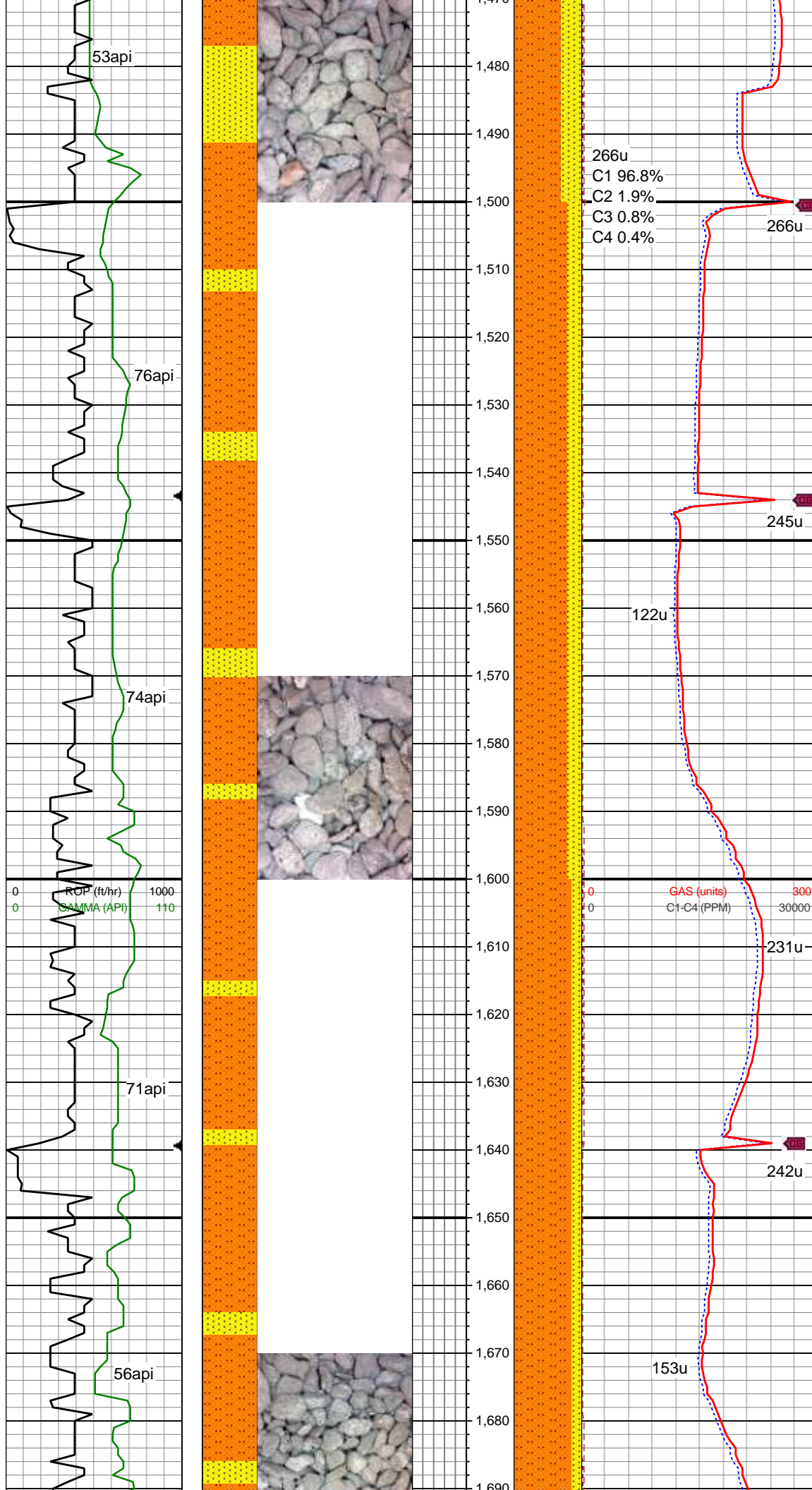
MD: 1,305 '  
TVD: 1,304.97 '  
Inclination: 0.7 °  
Azimuth: 49 °  
VS: 1.26 '

SHY SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx,  
grdg to; SHY SS:lt-medgy, f-med f gr,  
sb ang, mod-p srt, sft, fri, p por, arg  
cmt, sl calc, spec wi mica; sme ss,  
slow difse v sl stmg dull bl gy cut, n  
flor stn or od

MD: 1,399 '  
TVD: 1,398.96 '  
Inclination: 0.6 °  
Azimuth: 36.8 °  
VS: 0.47 '

SHY SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx,  
wi glau, grdg to; SHY SS:lt-medgy,  
f-med f gr, sb ang, mod-p srt, sft, fri, p  
por, arg cmt, sl calc, spec wi mica;  
sme ss, sme lse pyr, slow difse v sl  
stmg dull bl gy cut, n flor stn or od





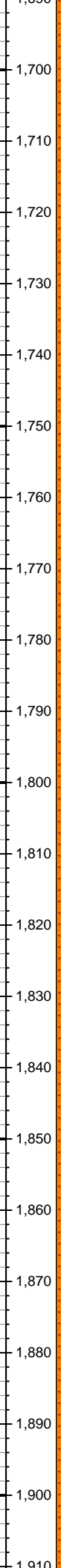
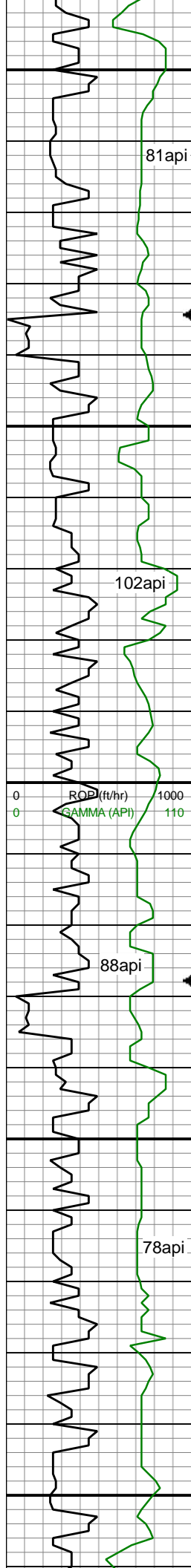
MD: 1,494 '  
TVD: 1,493.96 '  
Inclination: 0.6 °  
Azimuth: 82.7 °  
VS: -0.35 '

SHY SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx,  
grdg to; SHY SS:lt-medgy, f-med f gr,  
sb ang, mod-p srt, sft, fri, p por, arg  
cmt, sl calc, spec wi mica; slow difse  
v sl stmg dull bl gy cut, n flr stn or od

MD: 1,589 '  
TVD: 1,588.92 '  
Inclination: 2.7 °  
Azimuth: 161.7 °  
VS: -1.38 '

SHY SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx,  
grdg to; SHY SS:lt-medgy, f-med f gr,  
sb ang, mod-p srt, sft, fri, p por, arg  
cmt, sl calc, spec wi mica; tr dul gn  
mnrl flr, slow difse v sl stmg dull bl  
gy cut, n stn or od

MD: 1,684 '  
TVD: 1,683.73 '  
Inclination: 4.5 °  
Azimuth: 162.4 °  
VS: -2.75 '



224u  
C1 96.8%  
C2 1.9%  
C3 0.8%  
C4 0.4%

0 100  
0 30000

GAS (units)  
C1-C4 (PPM)

239u  
C1 96.9%  
C2 1.9%  
C3 0.9%  
C4 0.4%

233u

266u

171u

268u

275u

165u

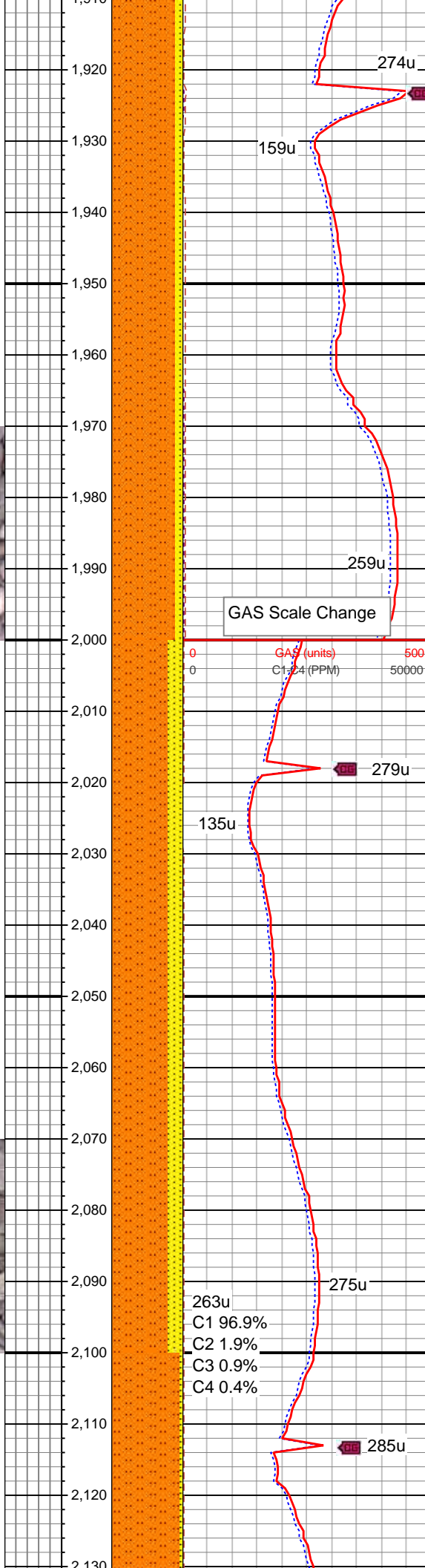
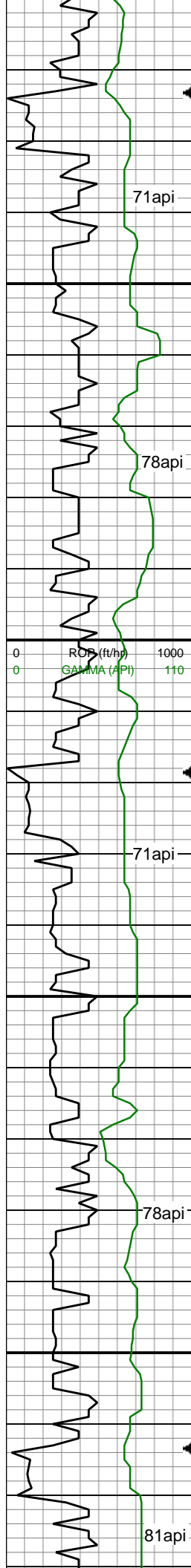
254u

SHY SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx,  
grdg to; SHY SS:lt-medgy, f-med f gr,  
sb ang, mod-p srt, sft, fri, p por, arg  
cmt, sl calc, spec wi mica; slow difse  
v sl stmg dull bl gy cut, n flor stn or od

MD: 1,778 '  
TVD: 1,777.39 '  
Inclination: 5.2 °  
Azimuth: 157.6 °  
VS: -4.88 '

SHY SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx,  
spec wi mica; tr shy ss, slow difse v  
sl stmg dull bl gy cut, n flor stn or od

MD: 1,873 '  
TVD: 1,871.94 '  
Inclination: 6 °  
Azimuth: 158.5 °  
VS: -7.64 '



SHY SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx,  
spec wi mica; tr shy ss, tr dism, pyr,  
slow difse v sl stmg dull bl gy cut, n  
flor stn or od

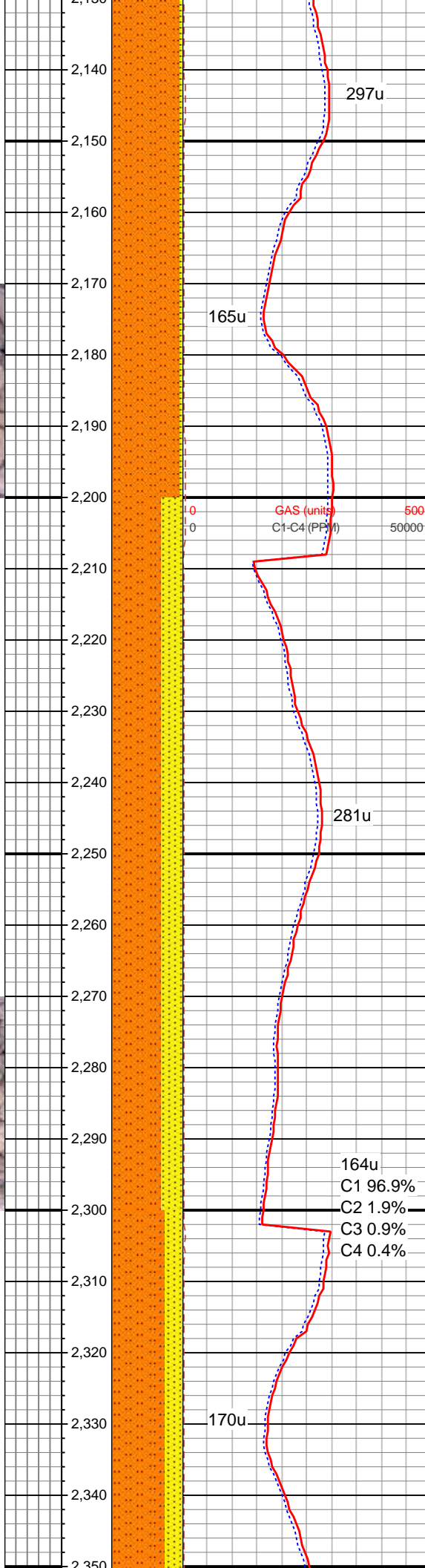
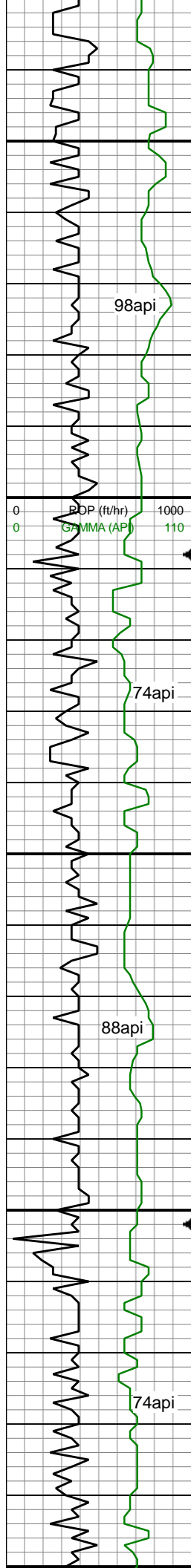
MD: 1,968 '  
TVD: 1,966.29 '  
Inclination: 7.4 °  
Azimuth: 160.1 °  
VS: -10.7 '

SHY SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx,  
spec wi mica, grdg to; SHY  
SS:lt-medgy, f-med f gr, sb ang, mod-p  
srt, sft, fri, p por, arg cmt, sl calc; slow  
difse v sl stmg dull bl gy cut, n flor stn  
or od

MD: 2,063 '  
TVD: 2,060.38 '  
Inclination: 8.5 °  
Azimuth: 149.3 °  
VS: -15.41 '

263u  
C1 96.9%  
C2 1.9%  
C3 0.9%  
C4 0.4%





SHY SLTST: lt-medgy, occ dk gy, sft -  
occ mod frm, f - v f gr, sb rd-sb ang,  
mod srt, arg mtx, spec wi mica; tr shy  
ss, tr dism, pyr, slow difse v sl stmg  
dull bl gy cut, n flor stn or od

MD: 2,158 '  
TVD: 2,154.34 '  
Inclination: 8.5 °  
Azimuth: 137.9 °  
VS: -22.78 '

MD: 2,252 '  
TVD: 2,247.33 '  
Inclination: 8.3 °  
Azimuth: 136 °  
VS: -31.31 '

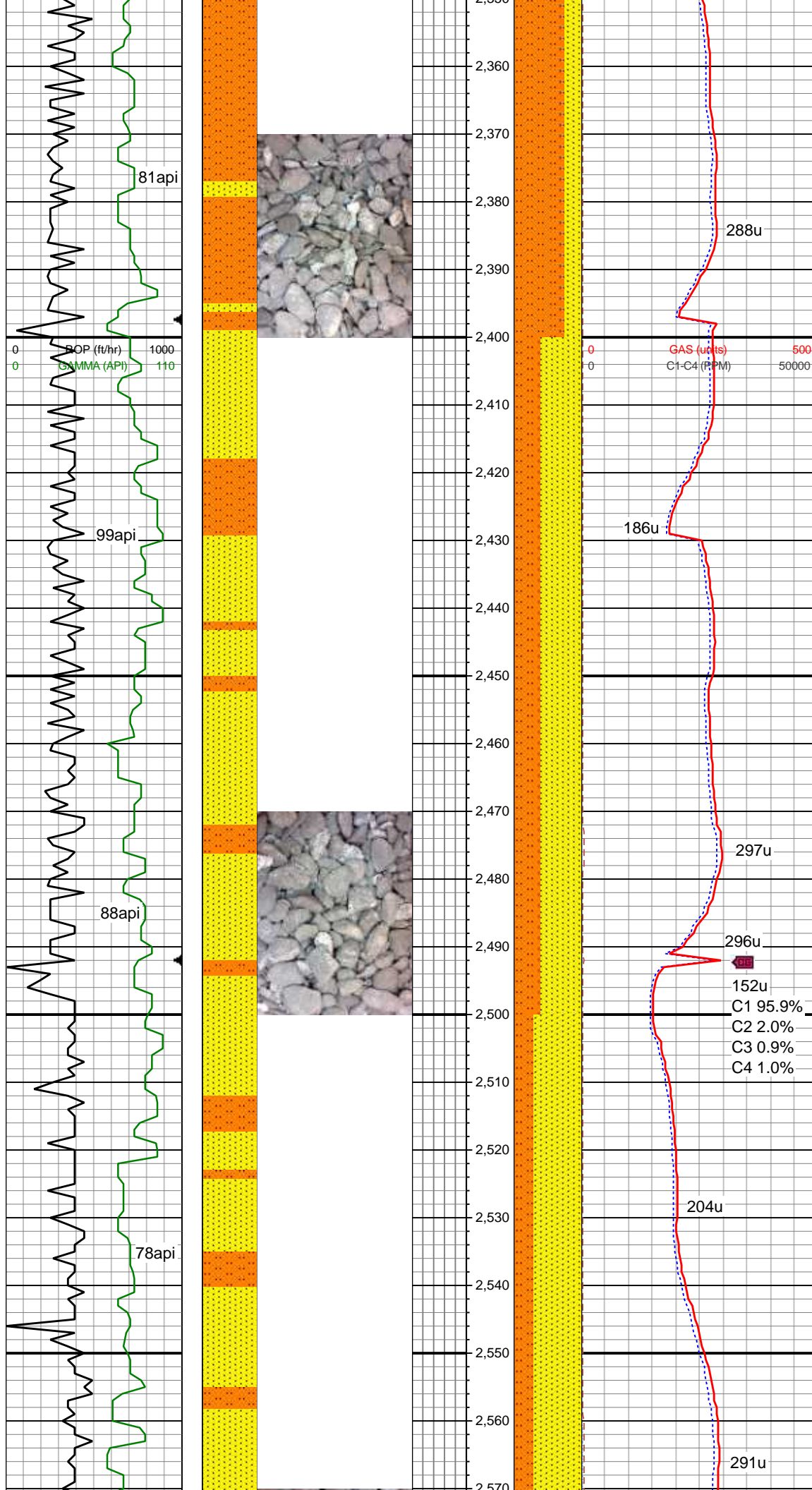
SHY SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx,  
spec wi mica, sme dism pyr, grdg to;  
SHY SS:lt-medgy, f-med f gr, sb ang,  
mod-p srt, sft, fri, p por, arg cmt, sl  
calc; slow difse v sl stmg dull bl gy  
cut, n flor stn or od

164u  
C1 96.9%  
C2 1.9%  
C3 0.9%  
C4 0.4%

MD: 2,347 '  
TVD: 2,341.38 '  
Inclination: 8 °  
Azimuth: 133 °  
VS: -40.12 '

SHY SLTST: lt-medgy, occ dk gy, sft, f -  
v f gr, sb rd-sb ang, mod srt, arg mtx,  
spec wi mica, sme dism pyr, grdg to;  
SHY SS:lt-medgy, f-med f gr, sb ang





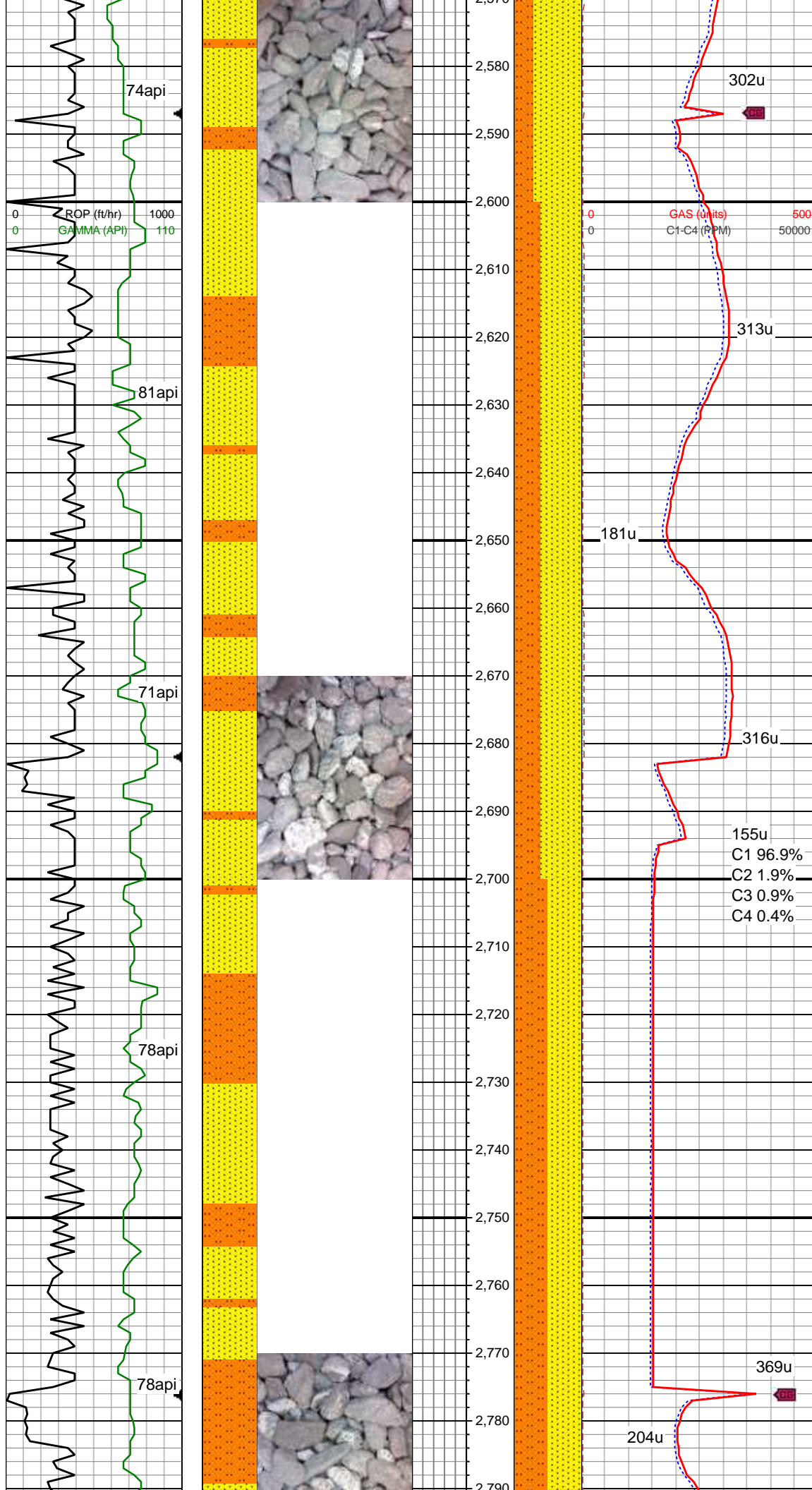
SHY SS:lt-medgy, f-med f gr, sb ang, mod-p srt, sft, fri, p por, arg cmt, sl calc; slow difse v sl stmg fnt bl cut, n flr stn or od

MD: 2,442 '  
TVD: 2,435.47 '  
Inclination: 7.9 °  
Azimuth: 123.2 °  
VS: -49.74 '

SHY SS:lt-medgy, f-med f gr, sb ang, mod-p srt, sft, fri, p por, arg cmt, sl calc, grdg to; SHY SLTST: lt-medgy, occ dk gy, sft, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, sme dism pyr, slow difse v sl stmg fnt bl cut, n flr stn or od

MD: 2,537 '  
TVD: 2,529.6 '  
Inclination: 7.6 °  
Azimuth: 119.3 °  
VS: -60.12 '

SHY SS:lt-medgy, f-med f gr, sb ang, mod-p srt, sft, fri, p por, arg cmt, sl calc, grdg to; SHY SLTST: lt-medgy, occ dk gy, sft, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flr stn or od



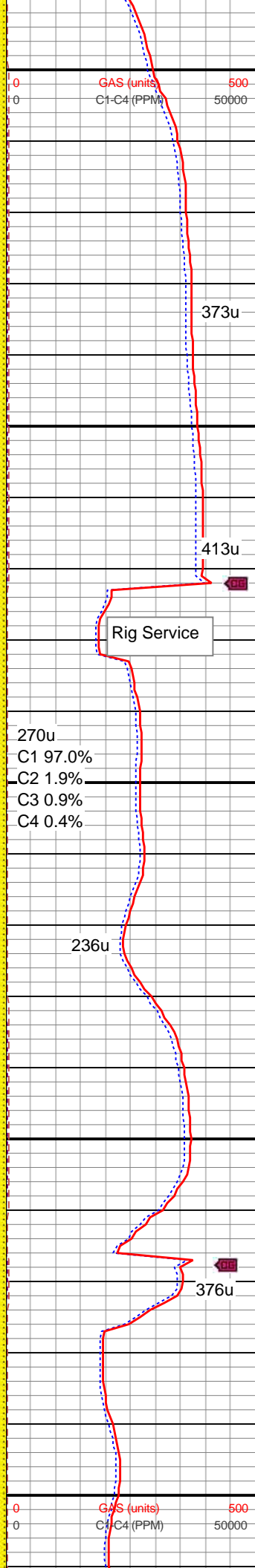
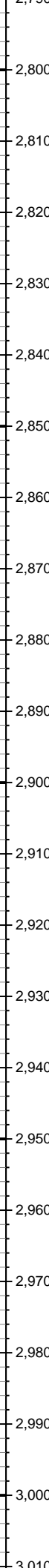
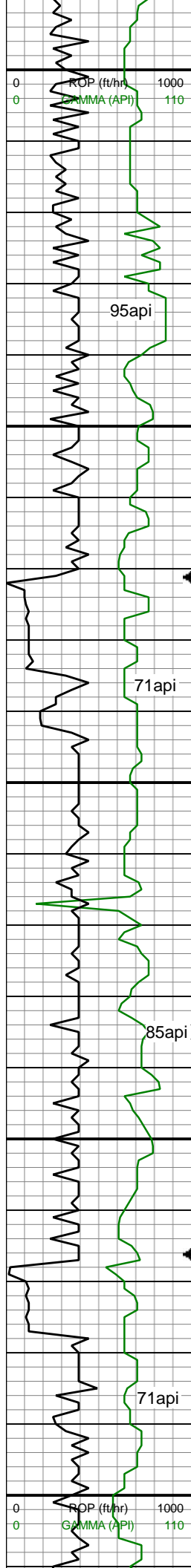
MD: 2,632 '  
TVD: 2,623.75 '  
Inclination: 7.7 °  
Azimuth: 116.8 °  
VS: -70.77 '

SHY SS:lt-medgy, f-med f gr, sb ang, mod-p srt, sft, fri, p por, arg cmt, sl calc, grdg to; SHY SLTST: lt-medgy, occ dk gy, sft- mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flor stn or od

MD: 2,726 '  
TVD: 2,716.97 '  
Inclination: 7.1 °  
Azimuth: 119.6 °  
VS: -80.95 '

SHY SLTST: lt-medgy, occ dk gy, sft - sme mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, grdg to; SHY SS:lt-medgy, f-med f gr, sb ang, mod-p srt, sft, fri, p por, arg cmt, sl calc, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flor stn or od





MD: 2,821 '  
TVD: 2,811.31 '  
Inclination: 6.4 °  
Azimuth: 129.1 °  
VS: -89.63 '

WT IN 9.1/9.2 OUT  
VIS IN 29/30 OUT

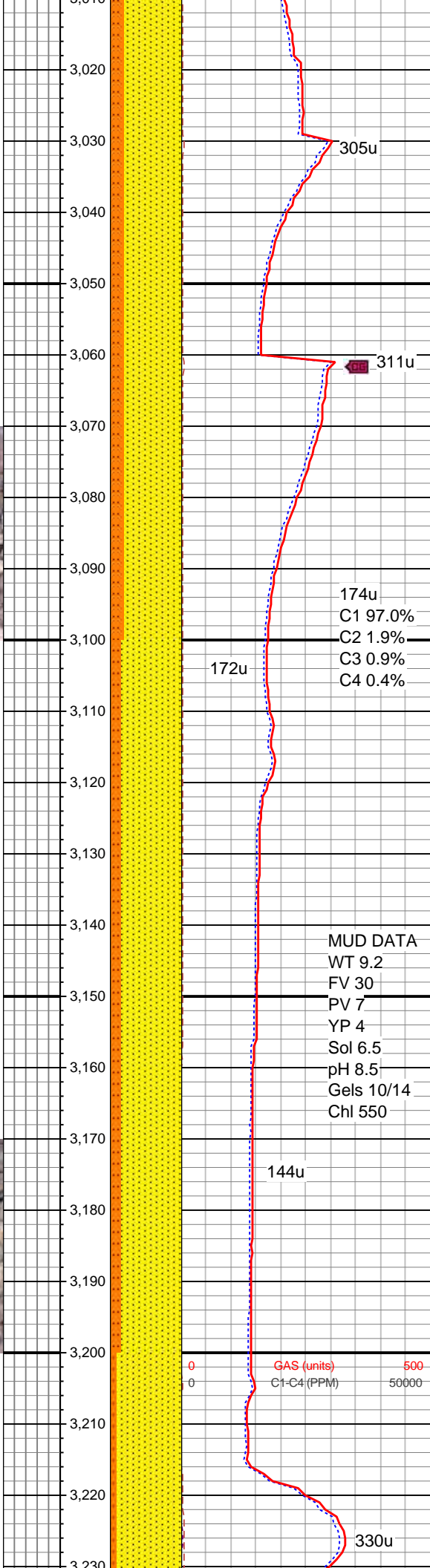
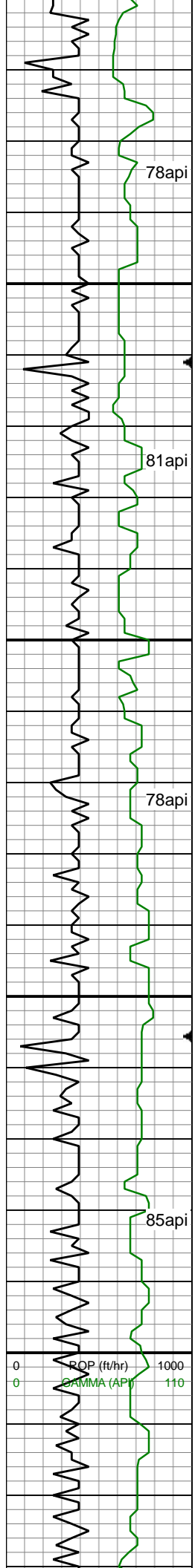
SHY SLTST: lt-medgy, occ dk gy, sft - sme mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, grdg to; SHY SS:lt-medgy, f-med f gr, sb ang, mod-p srt, sft, fri, p por, arg cmt, sl calc, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flor stn or od

MD: 2,916 '  
TVD: 2,905.73 '  
Inclination: 6.4 °  
Azimuth: 142.8 °  
VS: -96.31 '

SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, grdg to; SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flor stn or od

MD: 3,011 '  
TVD: 3,000.01 '  
Inclination: 7.7 °





Information:  
Azimuth: 153.9 °  
VS: -101.5 '

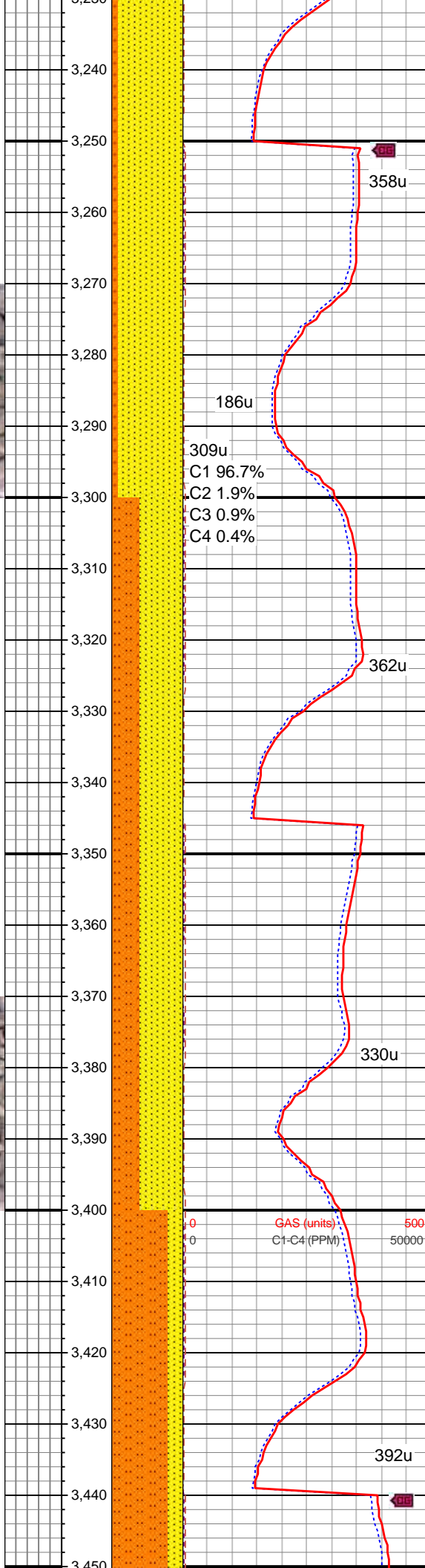
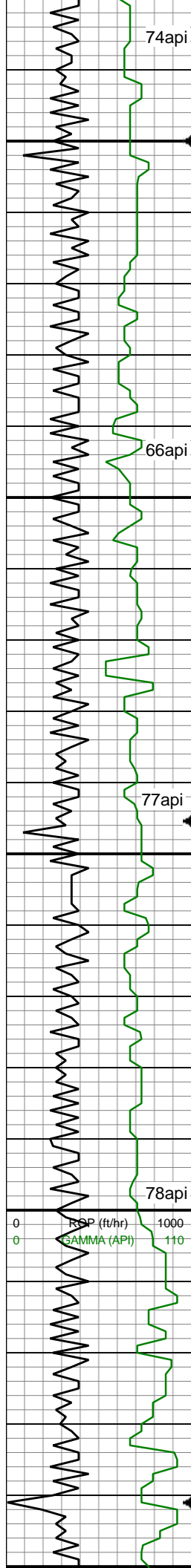
SHY SS:lt-medgy, f-med gr, sb ang,  
mod-p srt, mod frm, brit, p por, arg cmt,  
spec wi glau & mica, sl calc, grdg to;  
SHY SLTST: lt-medgy, occ dk gy, mod  
frm, brit, f - v f gr, sb rd-sb ang, mod  
srt, arg mtx, spec wi mica, occ wh ss,  
sme dism pyr, slow difse v sl stmg fnt  
bl cut, n flor stn or od

MD: 3,105 '  
TVD: 3,093.17 '  
Inclination: 7.7 °  
Azimuth: 150.9 °  
VS: -106.42 '

MUD DATA  
WT 9.2  
FV 30  
PV 7  
YP 4  
Sol 6.5  
pH 8.5  
Gels 10/14  
Chl 550

SHY SS:lt-medgy, f-med gr, sb ang,  
mod-p srt, mod frm, brit, p por, arg cmt,  
spec wi glau & mica, sl calc, grdg to;  
SHY SLTST: lt-medgy, occ dk gy, mod  
frm, brit, f - v f gr, sb rd-sb ang, mod  
srt, arg mtx, spec wi mica, occ wh ss,  
sme dism pyr, slow difse v sl stmg fnt  
bl cut, n flor stn or od

MD: 3,200 '  
TVD: 3,187.32 '  
Inclination: 7.6 °  
Azimuth: 148.1 °  
VS: -111.95 '



SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, grdg to; SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flor stn or od

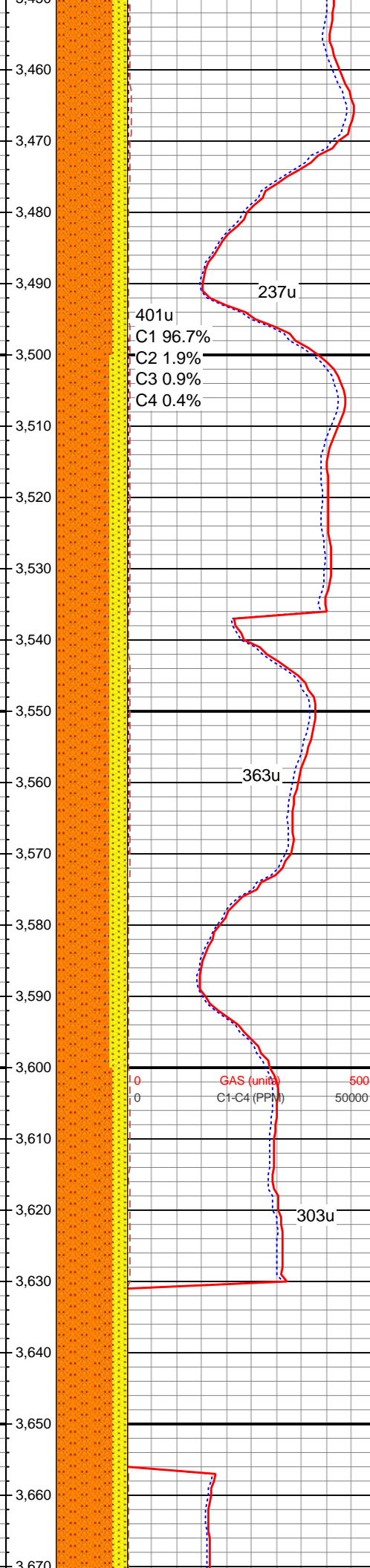
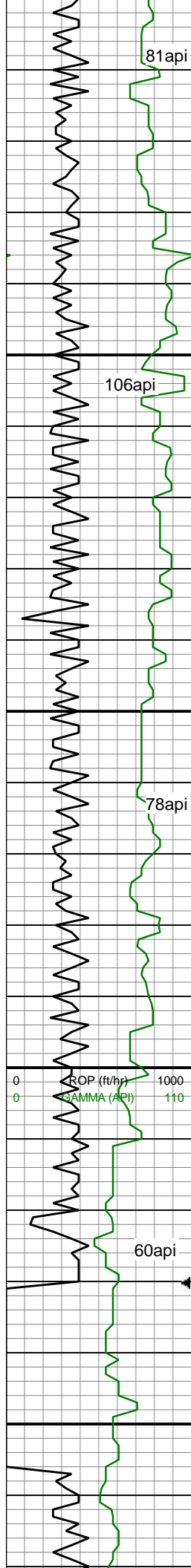
MD: 3,295 '  
TVD: 3,281.53 '  
Inclination: 7.2 °  
Azimuth: 144.8 °  
VS: -117.86 '

SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, grdg to; SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flor stn or od

MD: 3,390 '  
TVD: 3,375.84 '  
Inclination: 6.6 °  
Azimuth: 141.6 °  
VS: -123.93 '

SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, grdg to; SHY





SS:lt-medgy, f-med gr, sb ang, mod-p  
srt, mod frm, brit, p por, arg cmt, spec  
wi glau & mica, sl calc, slow difse v sl  
stmg fnt bl cut, n flor stn or od

MD: 3,485 '  
TVD: 3,470.29 '  
Inclination: 5.7 °  
Azimuth: 137.7 °  
VS: -129.85 '

Logger Top Parkman @  
3500' MD / 3485' TVD

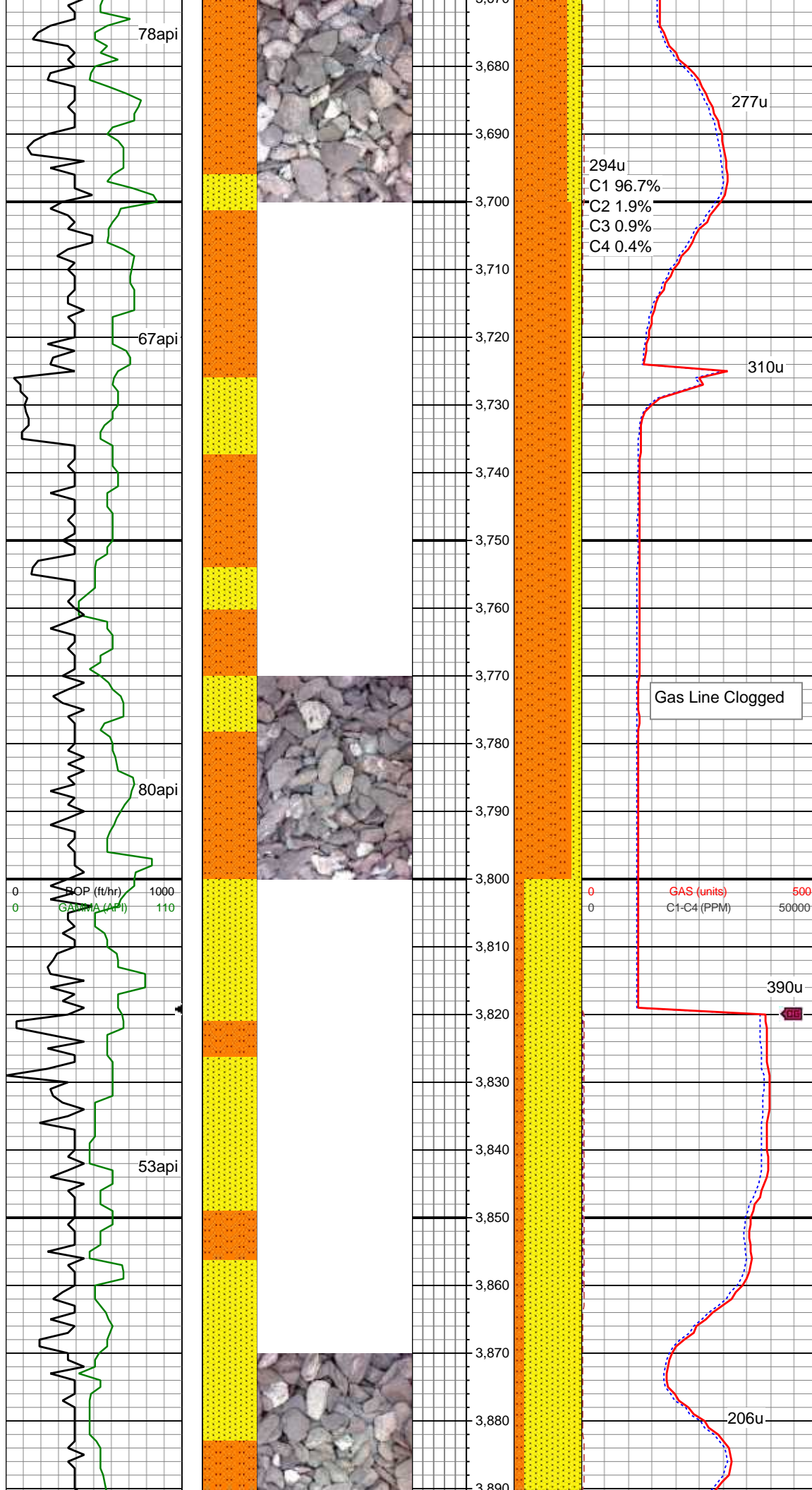
SHY SLTST: lt-medgy, occ dk gy, mod  
frm, brit, f - v f gr, sb rd-sb ang, mod  
srt, arg mtx, spec wi mica, occ wh ss,  
sme dism pyr, grdg to; SHY  
SS:lt-medgy, f-med gr, sb ang, mod-p  
srt, mod frm, brit, p por, arg cmt, spec  
wi glau & mica, sl calc, slow difse v sl  
stmg fnt bl cut, n flor stn or od

MD: 3,579 '  
TVD: 3,563.82 '  
Inclination: 5.8 °  
Azimuth: 134.1 °  
VS: -135.84 '

SHY SLTST: lt-medgy, occ dk gy, mod  
frm, brit, f - v f gr, sb rd-sb ang, mod  
srt, arg mtx, spec wi mica, occ wh ss,  
sme dism pyr, grdg to; SHY  
SS:lt-medgy, f-med gr, sb ang, mod-p  
srt, mod frm, brit, p por, arg cmt, spec  
wi glau & mica, sl calc, slow difse v sl  
stmg fnt bl cut, n flor stn or od

MD: 3,674 '





TVD: 3,658.32 '  
Inclination: 6 °  
Azimuth: 135.1 °  
VS: -142.22 '

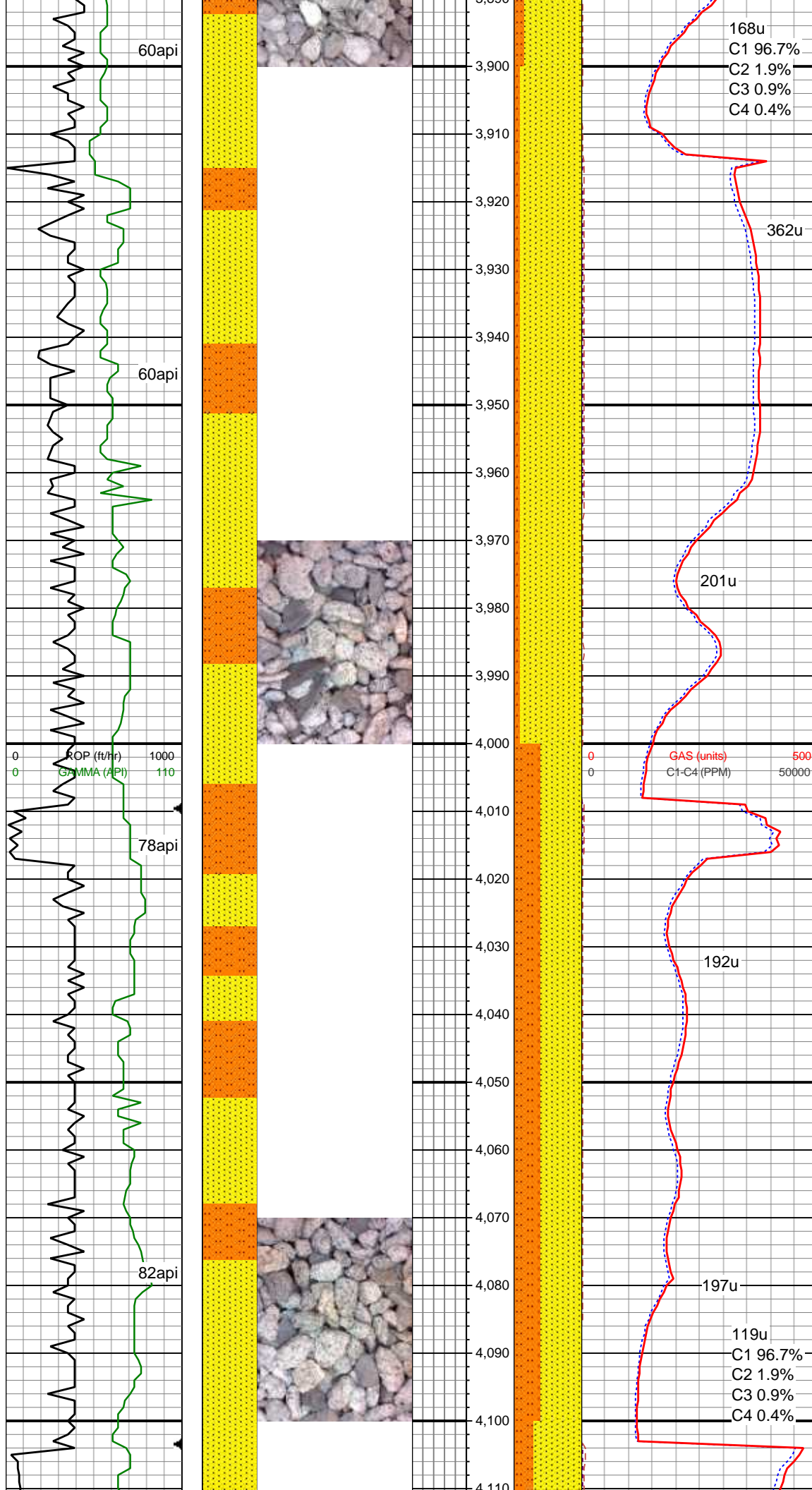
WT IN 8.7/9.1 OUT  
VIS IN 29/30 OUT

SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, grdg to; SHY  
SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, slow difse v sl stmg fnt bl cut, n flor stn or od

MD: 3,769 '  
TVD: 3,752.83 '  
Inclination: 5.7 °  
Azimuth: 150.4 °  
VS: -147.42 '

SS:wh, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, grdg to; SHY  
SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flor stn or od

MD: 3,864 '  
TVD: 3,847.36 '  
Inclination: 5.7 °  
Azimuth: 147.1 °  
VS: -151.65 '

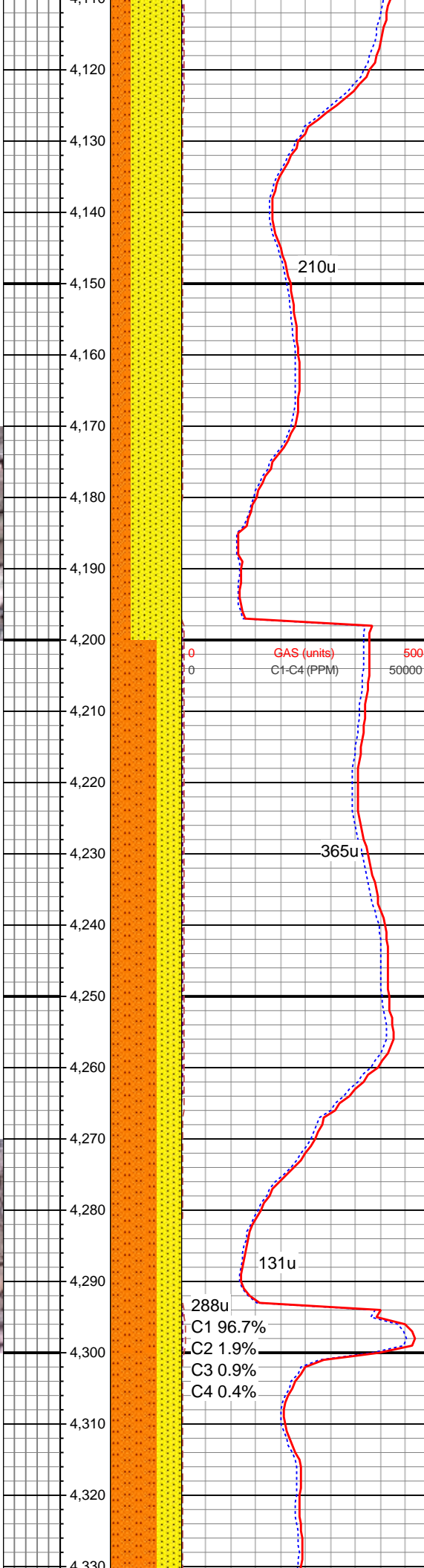
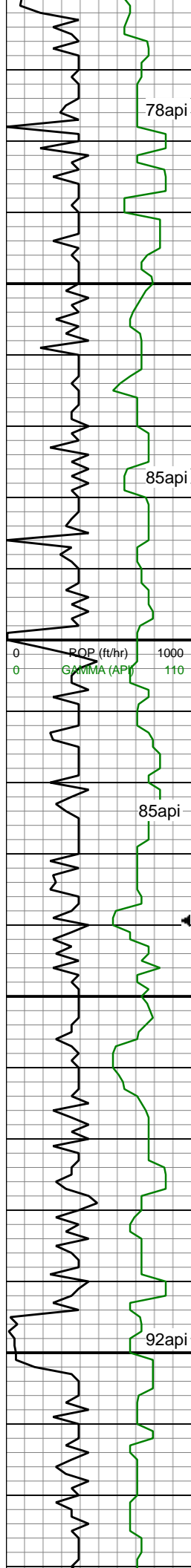


SS:wh, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, grdg to; SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flor stn or od

MD: 3,959 '  
TVD: 3,941.87 '  
Inclination: 5.9 °  
Azimuth: 145.7 °  
VS: -156.31 '

SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, grdg to; SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flor stn or od





MD: 4,148 '  
TVD: 4,129.89 '  
Inclination: 5.6 °  
Azimuth: 165.9 °  
VS: -164.05 '

SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, grdg to; SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, slow difse v sl stmg fnt bl cut, n flor stn or od

WT IN 8.6/8.9 OUT  
VIS IN 29/29 OUT

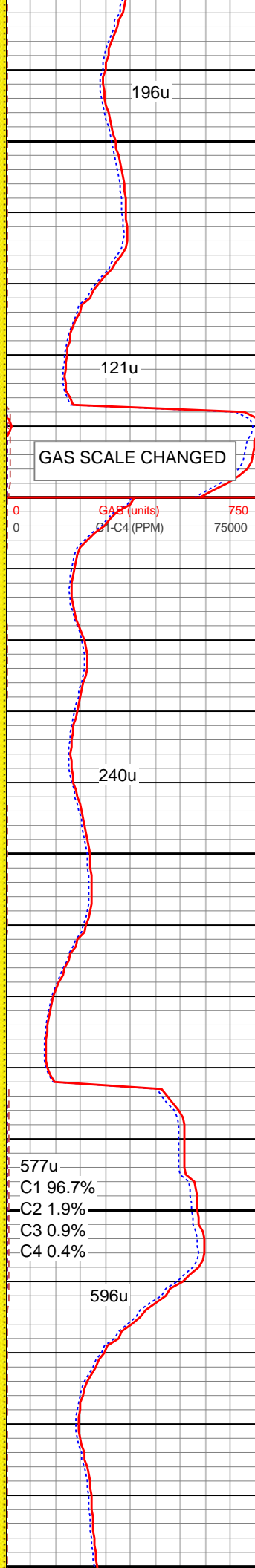
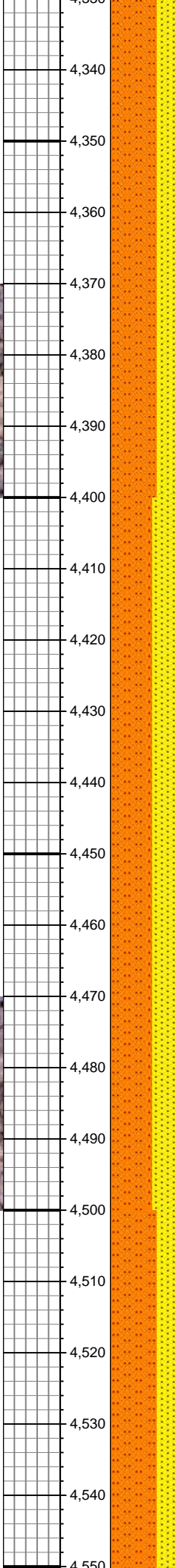
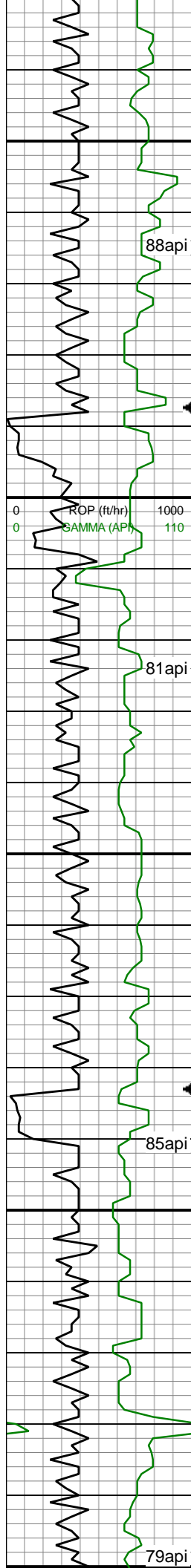
SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, grdg to; SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, slow difse v sl stmg fnt bl cut, n flor stn or od

MD: 4,243 '  
TVD: 4,224.5 '  
Inclination: 4.8 °  
Azimuth: 173.3 °  
VS: -164.96 '

288u  
C1 96.7%  
C2 1.9%  
C3 0.9%  
C4 0.4%

MD: 4,338 '  
TVD: 4,319.14 '  
Inclination: 5.2 °





Azimuth: 173.4 °  
VS: -165.26 '

SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, grdg to; SHY  
SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, slow difse v sl stmg fnt bl cut, n flr stn or od

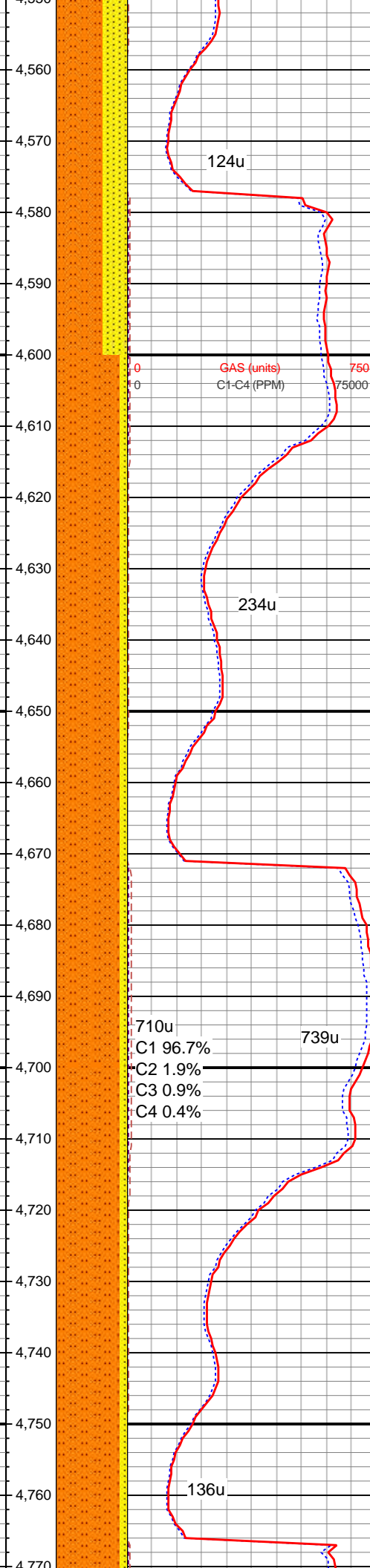
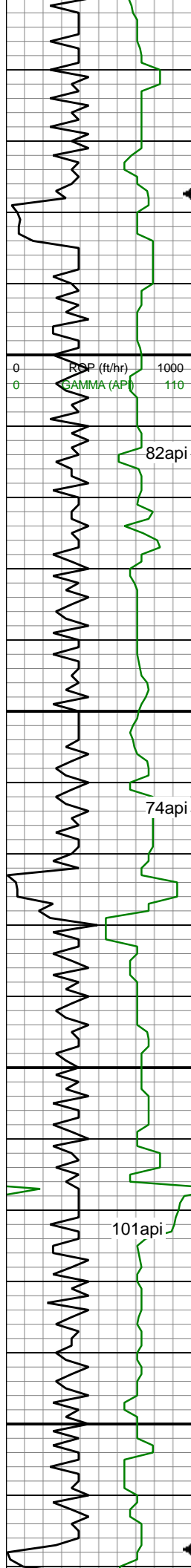
Logger's Top Sussex  
@ 4384' MD / 4365' TVD

MD: 4,432 '  
TVD: 4,412.7 '  
Inclination: 5.8 °  
Azimuth: 170.3 °  
VS: -165.83 '

SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, grdg to; SHY  
SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, slow difse v sl stmg fnt bl cut, n flr stn or od

MD: 4,527 '  
TVD: 4,507.13 '  
Inclination: 6.9 °  
Azimuth: 154.1 °  
VS: -168.33 '

SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, occ wh ss, sme dism pyr, grdg to; SHY



SS:lt-medgy, f-med gr, sb ang, mod-p  
srt, mod frm, brit, p por, arg cmt, spec  
wi glau & mica, sl calc, slow difse v sl  
stmg fnt bl cut, n flor stn or od

MD: 4,622 '  
TVD: 4,601.57 '  
Inclination: 5.5 °  
Azimuth: 150.8 °  
VS: -172.3 '

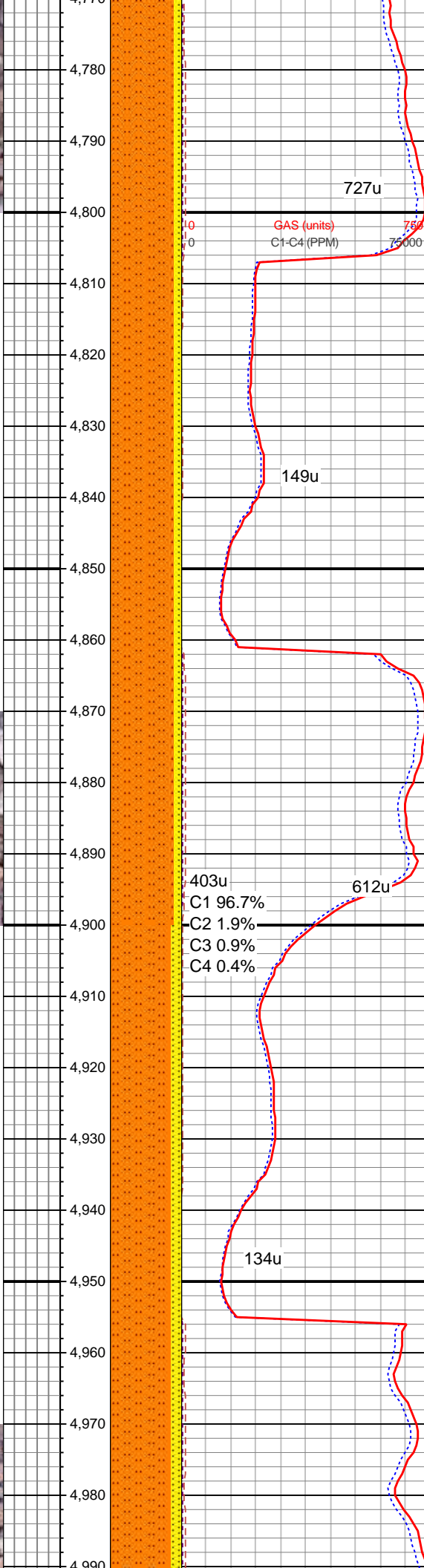
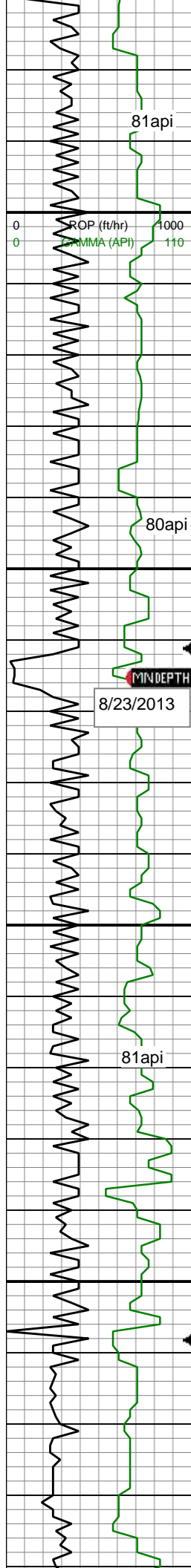
SHY SLTST: lt-medgy, occ dk gy, mod  
frm, brit, f - v f gr, sb rd-sb ang, mod  
srt, arg mtx, spec wi mica, sme dism  
pyr, grdg to; SHY SS:lt-medgy, f-med  
gr, sb ang, mod-p srt, mod frm, brit, p  
por, arg cmt, spec wi glau & mica, sl  
calc, slow difse v sl stmg fnt bl cut, n  
flor stn or od

WT IN 8.8/8.8 OUT  
VIS IN 27/27 OUT

MD: 4,717 '  
TVD: 4,696.24 '  
Inclination: 4 °  
Azimuth: 156.2 °  
VS: -175.29 '

SHY SLTST: lt-medgy, occ dk gy, mod  
frm, brit, f - v f gr, sb rd-sb ang, mod  
srt, arg mtx, spec wi mica, sme dism  
pyr, grdg to; SHY SS:lt-medgy, f-med  
gr, sb ang, mod-p srt, mod frm, brit, p  
por, arg cmt, spec wi glau & mica, sl  
calc, slow difse v sl stmg fnt bl cut, n  
flor stn or od





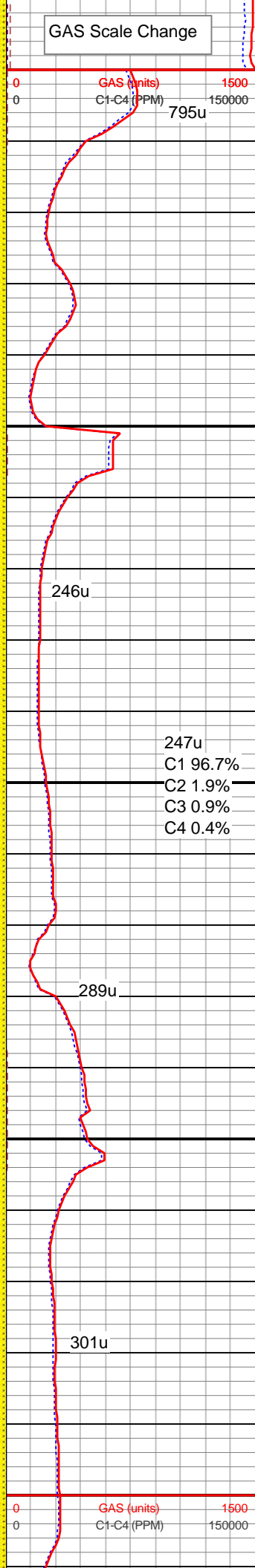
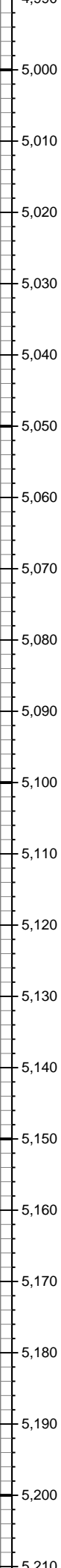
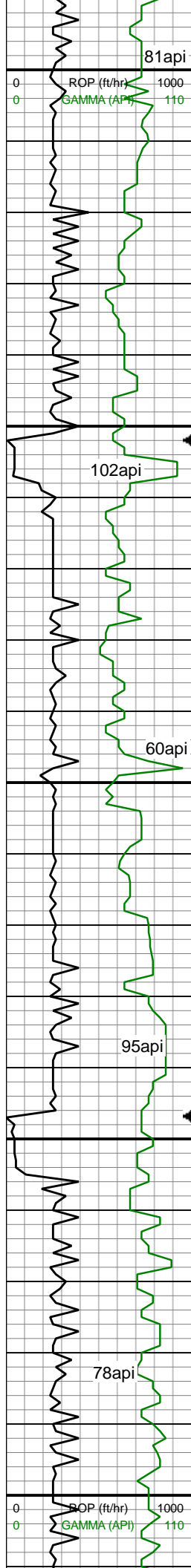
MD: 4,811 '  
 TVD: 4,790.05 '  
 Inclination: 3.3 °  
 Azimuth: 145.1 °  
 VS: -177.73 '

SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, sme dism pyr, grdg to; SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, slow difse v sl stmg fnt bl cut, n flr stn or od

MD: 4,906 '  
 TVD: 4,884.88 '  
 Inclination: 3.6 °  
 Azimuth: 149.3 °  
 VS: -180.43 '

SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, sme dism pyr, grdg to; SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, slow difse v sl stmg fnt bl cut, n flr stn or od





MD: 5,001 '  
TVD: 4,979.72 '  
Inclination: 3.1 °  
Azimuth: 142.7 °  
VS: -183.13 '

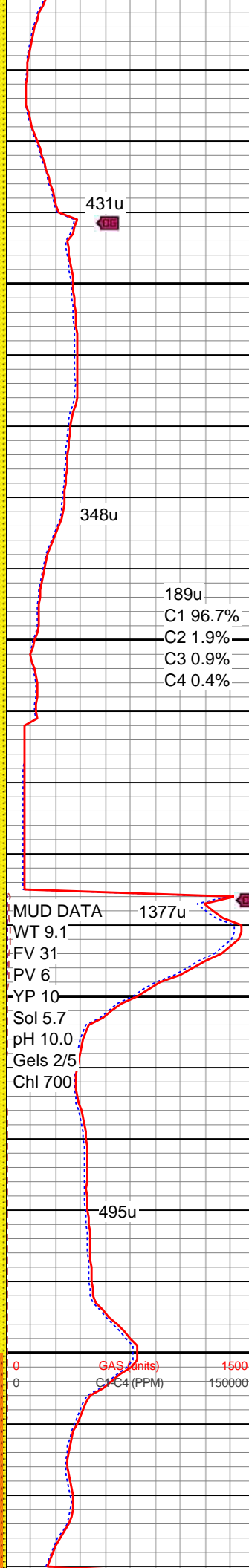
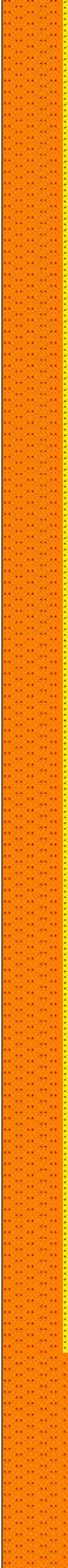
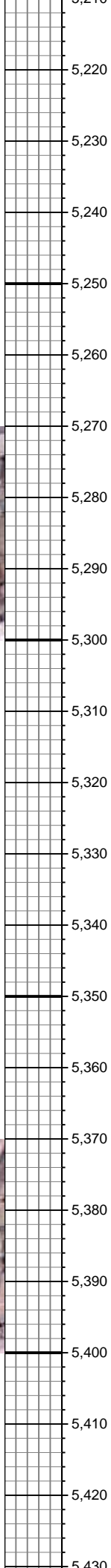
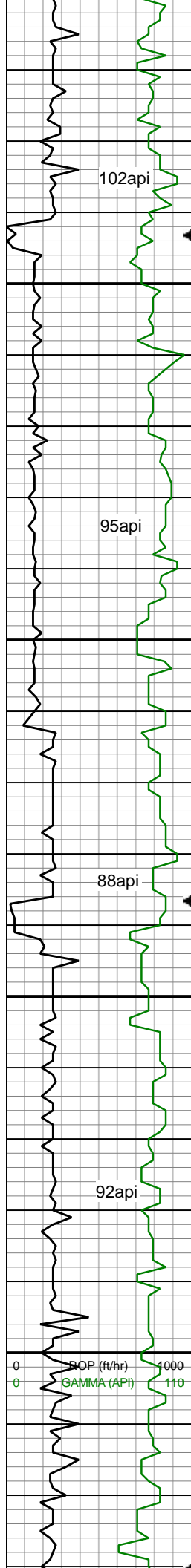
WT IN 8.6/8.7 OUT  
VIS IN 26/29 OUT

SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, sme dism pyr, grdg to; SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, slow difse v sl stmg fnt bl cut, n flr stn or od

MD: 5,096 '  
TVD: 5,074.62 '  
Inclination: 2 °  
Azimuth: 158.7 °  
VS: -184.99 '

SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, sme dism pyr, grdg to; SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, , slow difse v sl stmg fnt bl cut, n flr stn or od

MD: 5,191 '  
TVD: 5,169.59 '  
Inclination: 1.1 °  
Azimuth: 142.3 °  
VS: -185.97 '



SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, sme dism pyr, grdg to; SHY SS:lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, slow difse v sl stmg fnt bl cut, n flor stn or od

MD: 5,285 '  
TVD: 5,263.57 '  
Inclination: 0.9 °  
Azimuth: 137 °  
VS: -186.92 '

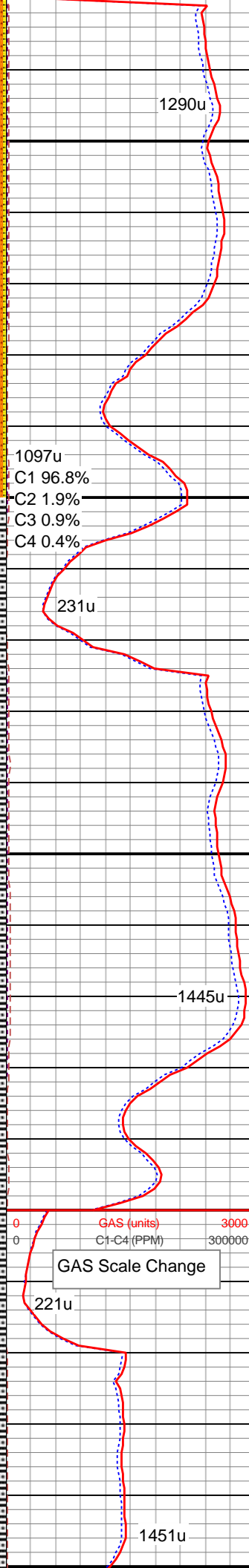
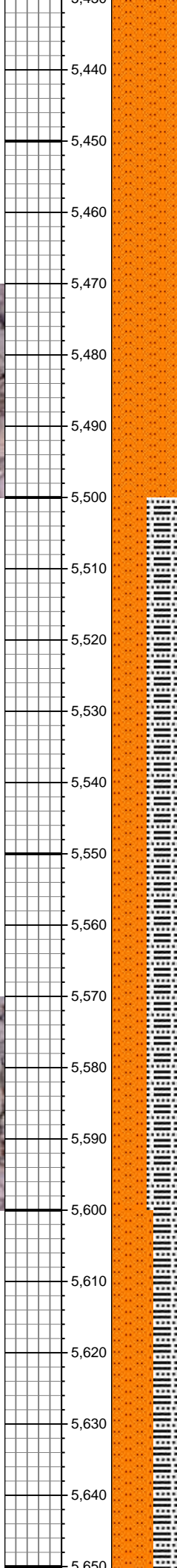
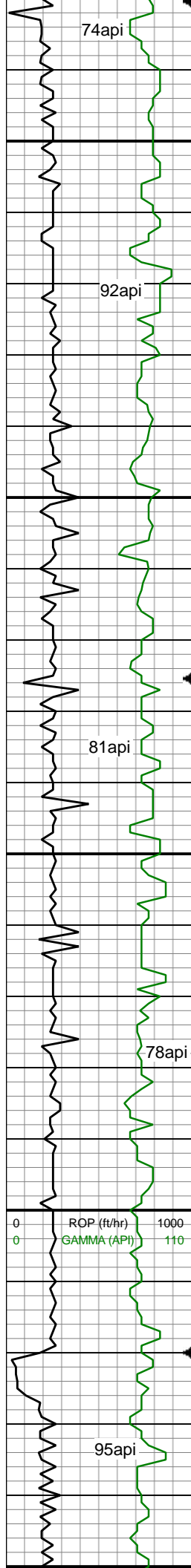
189u  
C1 96.7%  
C2 1.9%  
C3 0.9%  
C4 0.4%

MUD DATA  
WT 9.1  
FV 31  
PV 6  
YP 10  
Sol 5.7  
pH 10.0  
Gels 2/5  
Chl 700

SHY SLTST: lt-medgy, occ dk gy, mod frm, brit, f - v f gr, sb rd-sb ang, mod srt, arg mtx, spec wi mica, sme dism pyr grdg to; SHY SS: lt-medgy, f-med gr, sb ang, mod-p srt, mod frm, brit, p por, arg cmt, spec wi glau & mica, sl calc, slow difse v sl stmg fnt bl cut, n flor stn or od

MD: 5,380 '  
TVD: 5,358.57 '  
Inclination: 0.2 °  
Azimuth: 230.7 °  
VS: -187.24 '

WT IN 9.2/9.1 OUT  
VIS IN 34/30 OUT



SHY SLTST: lt-medgy, occ dk gy, mod  
frm - frm, brit, f - v f gr, sb rd-sb ang -  
sb plty, mod srt, arg mtx, spec wi  
mica, sme dism pyr, mod difse sl stmg  
mod bl cut, n flor stn or od

MD: 5,475 '  
TVD: 5,453.57 '  
Inclination: 0.2 °  
Azimuth: 186.1 °  
VS: -187.08 '

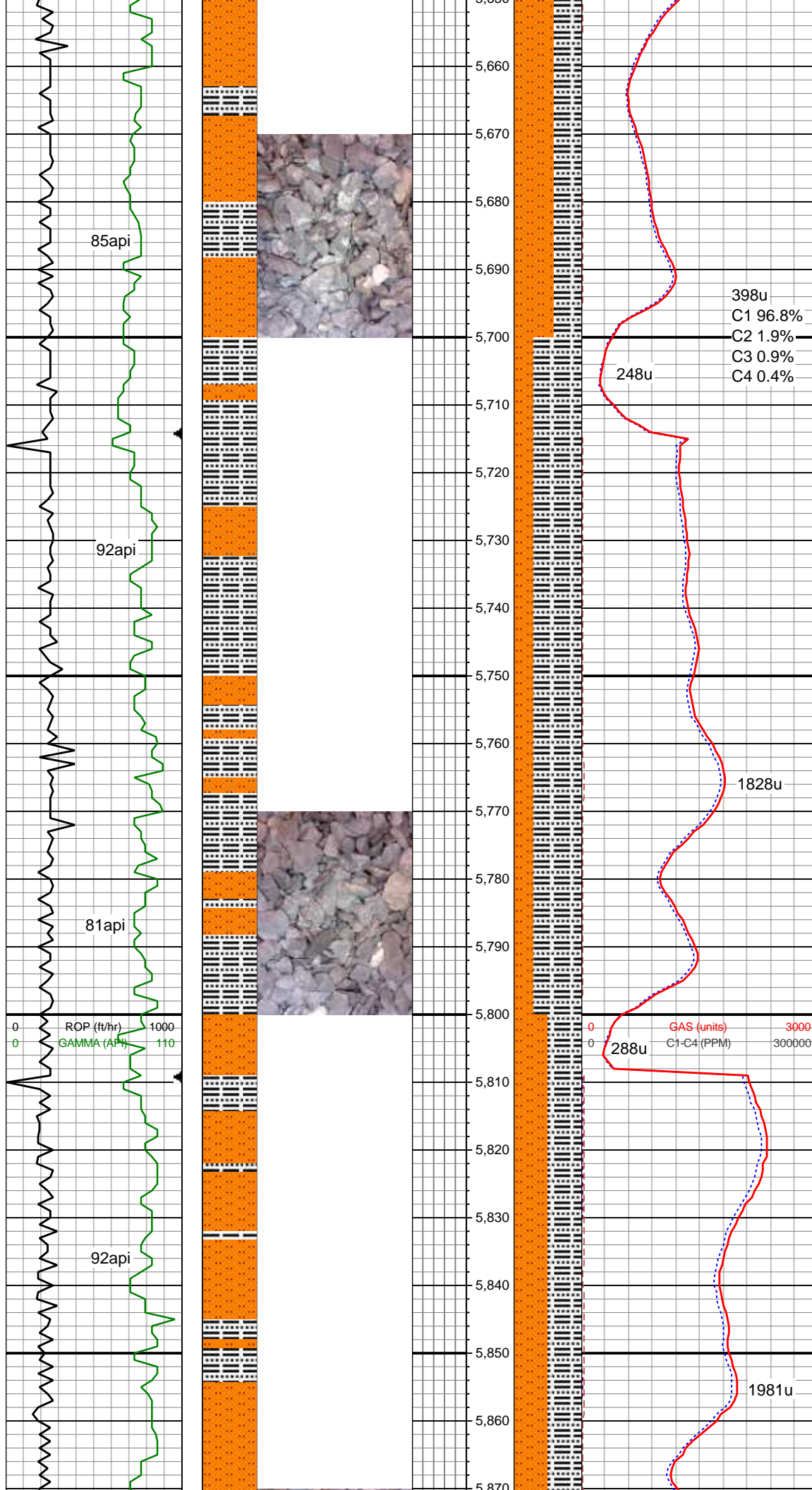
SHY SLTST: lt-medgy, occ dk gy, mod  
frm - frm, brit, f - v f gr, sb rd-sb ang -  
sb plty, mod srt, arg mtx, spec wi carb  
flk, grdg to; SLTY SH: lt-medgy, mod  
frm, sb blkly - sb plty, rthy - sl gritty tex,  
smwt slty, sme dism pyr thru, mod  
difse sl stmg mod bl cut, n flor stn or od

MD: 5,570 '  
TVD: 5,548.57 '  
Inclination: 0.1 °  
Azimuth: 124 °  
VS: -187.11 '

WT IN 9.4/9.2 OUT  
VIS IN 36/35 OUT

SHY SLTST: lt-medgy, occ dk gy, frm,  
brit, f - v f gr, sb rd-sb ang - sb plty,  
mod srt, arg mtx, spec wi carb flk,  
grdg to; SLTY SH: lt-medgy, frm, sb





grad to, SLTY SH: lt-medgy, frm, sb  
blky - sb plty, rthy - sl gritty tex, smwt  
slty, sme dism pyr thru, mod difse sl  
stmg mod bl cut, n flor stn or od

MD: 5,664 '  
TVD: 5,642.56 '  
Inclination: 0.8 °  
Azimuth: 325.8 °  
VS: -186.85 '

398u  
C1 96.8%  
C2 1.9%  
C3 0.9%  
C4 0.4%

248u

SLTY SH: lt-medgy, mod frm, sb blky -  
sb plty, rthy - sl gritty tex, smwt slty;  
SHY SLTST: lt-medgy, occ dk gy, frm,  
brit, f - v f gr, sb rd-sb ang - sb plty,  
mod srt, arg mtx, spec wi carb flk,  
sme dism pyr thru, mod fast difse sl  
stmg mod bl cut, n flor stn or od

MD: 5,759 '  
TVD: 5,737.56 '  
Inclination: 0.4 °  
Azimuth: 319.2 °  
VS: -186.33 '

1828u

288u

WT IN 9.6+9.7 OUT  
VIS IN 36/35 OUT

SLTY SH: lt-medgy, mod frm, sb blky -  
sb plty, rthy - sl gritty tex, smwt slty;  
SHY SLTST: lt-medgy, occ dk gy, frm,  
brit, f - v f gr, sb rd-sb ang - sb plty,  
mod srt, arg mtx, spec wi carb flk,  
sme dism pyr thru, mod fast difse sl  
stmg mod bl cut, n flor stn or od

MD: 5,854 '  
TVD: 5,832.56 '  
Inclination: 0.2 °

1981u

Azimuth: 45.8 °  
VS: -186.26 '

Logger Top Teepee Buttes @  
5868' MD / 5857' TVD

MD: 5,948 '  
TVD: 5,926.56 '  
Inclination: 0.4 °  
Azimuth: 352.9 °  
VS: -186.37 '

SLTY SH: lt-medgy, mod frm, sb blk -  
sb plty, rthy - sl gritty tex, smwt slty;  
SHY SLTST: lt-medgy, occ dk gy, frm,  
brit, f - v f gr, sb rd-sb ang - sb plty,  
mod srt, arg mtz, spec wi carb flk,  
sme dism pyr thru, mod fast difse sl  
stmg mod bl cut, n flor stn or od

Begin Building Curve @ 5999' MD

