



Scale: 5" / 100'
Measured Depth Log

Well Name Troudt 5

Location S 32 T2N R67W

State Colorado

County Weld

Country USA

Rig Number Savanna 802

API Number 05-123-41434-00

Field Wattenberg

Region DJ Basin

Drilling Completed 8/22/2015

Spud Date 8/18/2015

Surface Coordinates Lat: 40° 5' 20.64"N
Long: 104° 54' 32.81"W

Bottom Hole Coordinates Lat: 40° 6' 54.54"N
Long: 104° 54' 35.22"W

Ground Elevation 5,079'

K.B. Elevation 5,094'

Logged Interval 5,000' To 7,000'

Total Depth 17,418'

Formation Niobrara

Type of Drilling Fluid Invert

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

- E EARTHY
- F FENESTRAL
- F FRACTURE
- X INTERCRYSTALLINE
- ◇ INTEROOLITIC
- MOLDIC

ORGANIC

P PINPOINT

V VUGGY

Engineering

BIT

CASING

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

Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

Textures

- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- E EARTHY
- FINELYXLN
- GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

MS MUDSTONE

PS PACKSTONE

WS WACKSTONE

Sorting

- M MODERATE
- P POOR
- W WELL

Zone Color Coding

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

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

Equipment ML 461

Comments Start: 8-19-15
TD: 8-22-15

Logger Names Brian Ferwerda / Mark Gross

Services Provided 2-man Logging

Address Empirica, LLC.
6360 W Sam Houston Pkwy N
Suite 100
Houston, TX 77041

Operator

Company Extraction Oil & Gas

Address 1888 Sherman St., Suite 200
Denver, CO 80203

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
 CEMENT

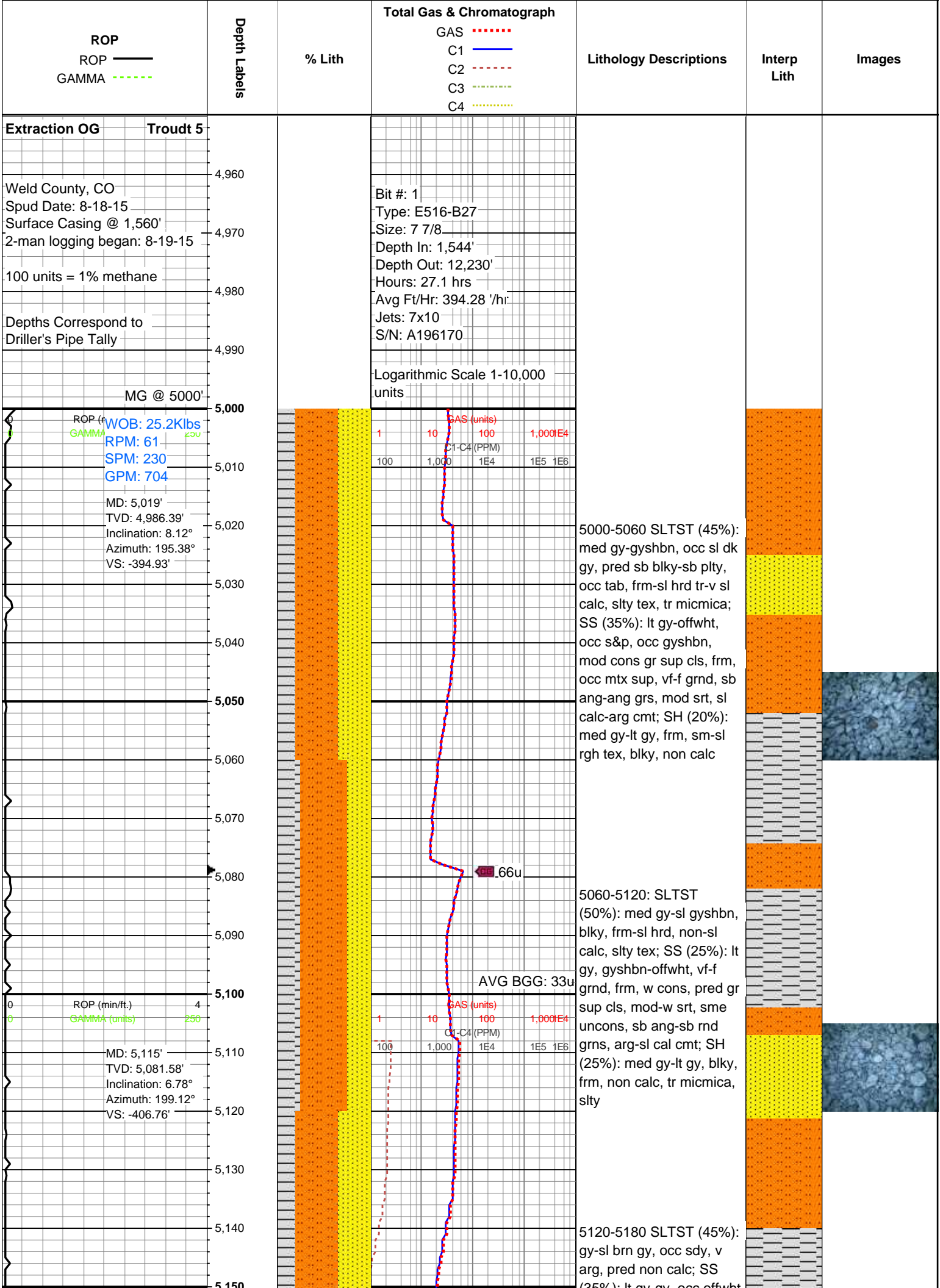
Geologist

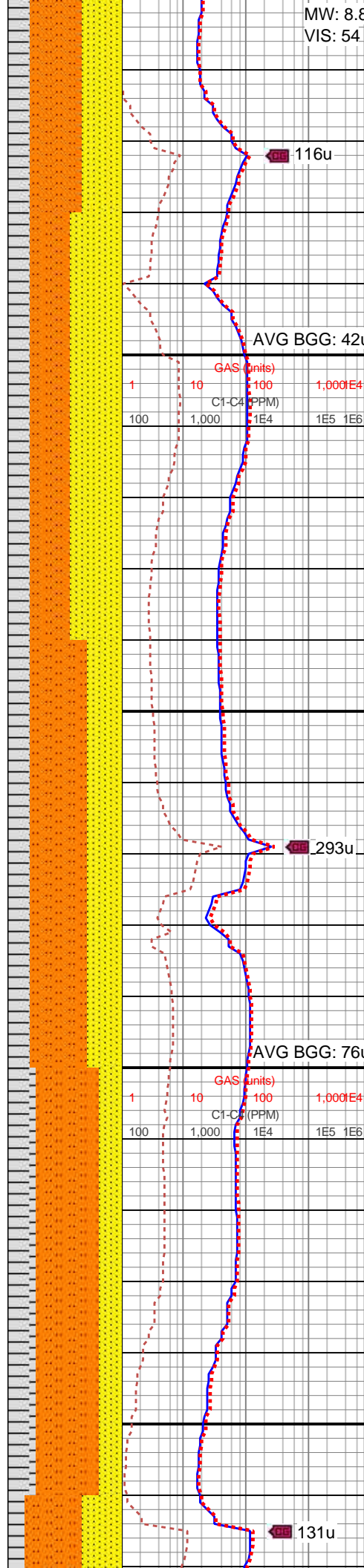
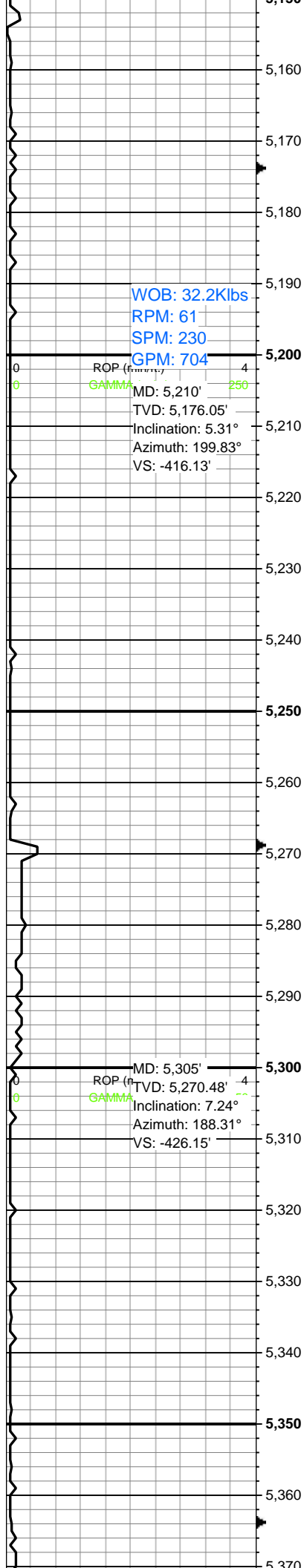
Name Jared Rouse

Company Extraction Oil & Gas

Address 1888 Sherman St., Suite 200







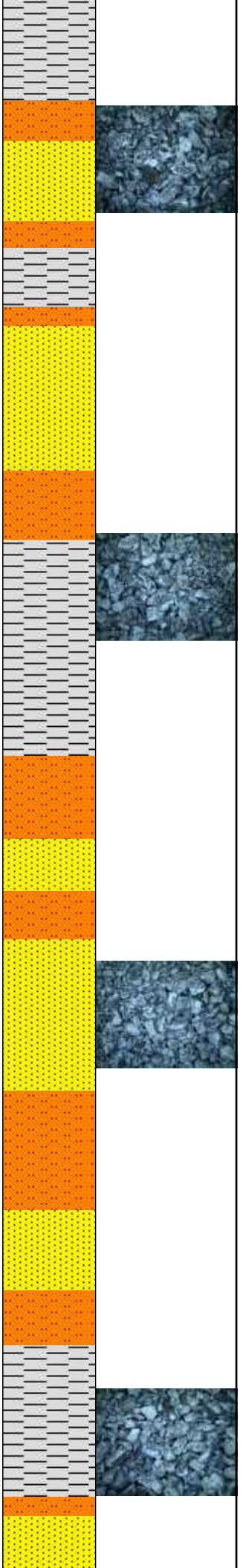
MW: 8.8
VIS: 54

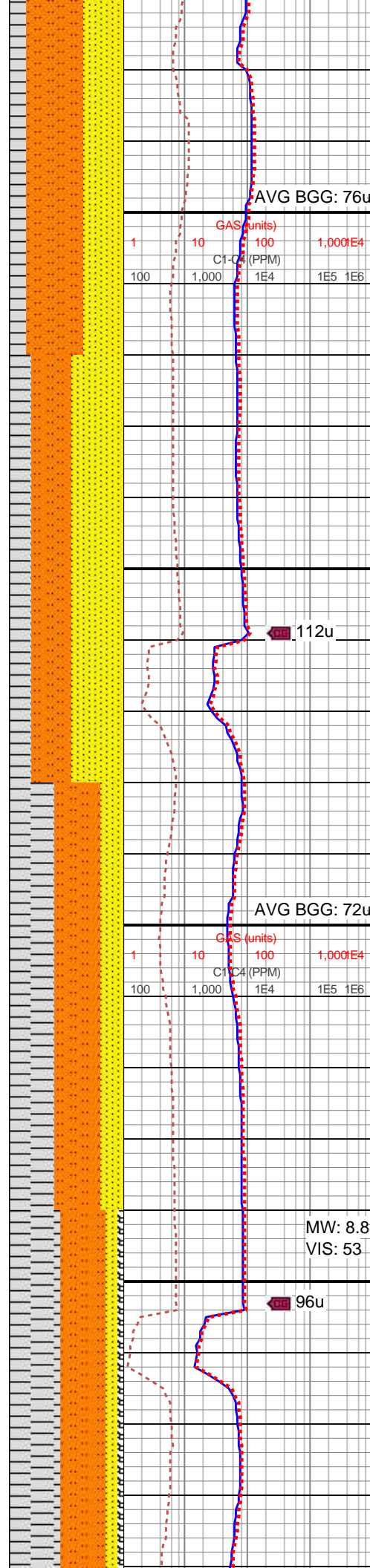
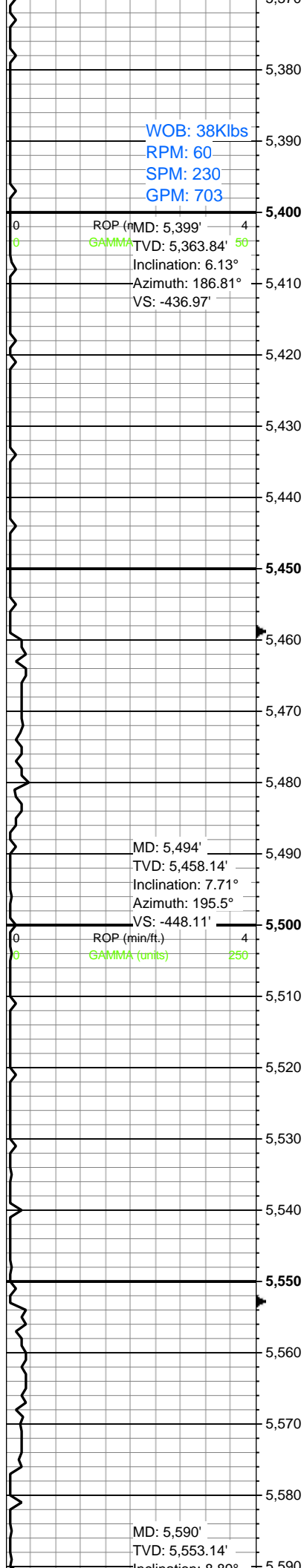
(35 %): lt gy-gy, occ offwht
sdy intbds-clr sd grs, vf-f
grs, med frm, mod w
srted, gr sup cls cons wi
sil cmt-com arg cmt, sl
sly thru, sil-cal cmt, pred
med calc; SH (5%): gy-lt
brn-tn gy, sl brit, mod fis
sb plty, frm-v frm, sly-sdy
tex, non calc

5180-5240 SS (45%):
med gy-lt gyshbn, pred
vf-f grn, frm-fri, pred gr
sup cls, cons wi sil-arg
cmt, tr sl cal, occ unconc,
sb ang, sly; SLTST
(35%): dk gy-med gy,
plty-blky, frm-sl hrd, non
calc, arg thru; SH: (10%)
dk gy-v dk gy, plty, non
calc, sl hrd, rgh tex, sly

5240-5300: SLTST
(50%): med gy-sl dk gy,
gyshbn, plty-sb blky,
frm-sl hrd, non-sl calc,
pred sly tex; SH (30%):
med gy-dk gy, blky, frm, tr
micmica, non calc, sly;
SS (20%): lt gy-gyshbn,
offwht, vf grnd, w cons, gr
sup-mtx sup cls, frm,
sme unconc, mod-w srt,
occ f, sb ang-ang grs,
arg-sl cal

5300-5360: SLTST
(55%): pred med gy-sl dk
gy, occ gyshbn, plty-sb
blky, frm-sl hrd, tr-sl calc,
sly tex; SS (20%): pred lt
gy, gyshbn-offwht ip, vf
grnd, occ f, mod-w srt,
frm, w cons, pred gr sup
cls, sme unconc, sb
ang-ang grs, arg-sl cal
cmt; SH (25%): med gy-lt
gy, frm, blky, sly, non calc



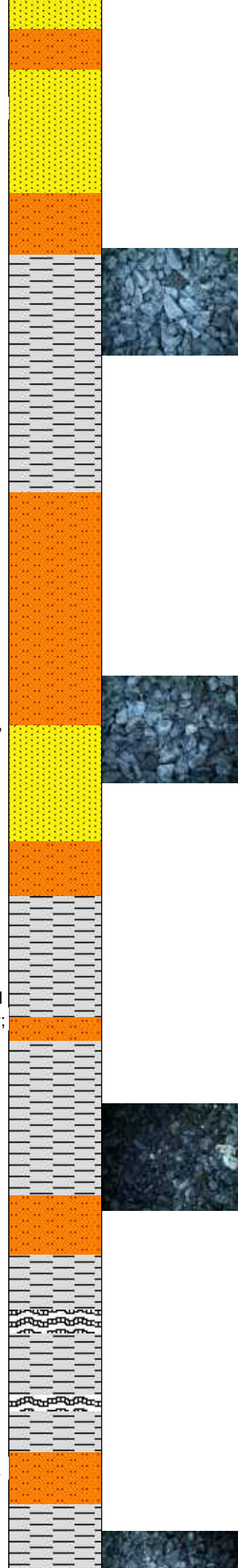


5360-5420 SLTST (50%): med gy-gyshbn, plty-blky, frm-sl hrd, non calc, arg thru; SS (35%): lt gy-offwht, vf-f grn, sb ang-sb rnd, frm-fri, pred gr sup cls, cons w/sil-arg cmt, sme uncon, tr sl calc; SH: (15%) dk gy-med gy, plty, slty tex, sl hrd, non calc

5420-5480 SS (45%): med gy-lt gy-offwht, tr s&p, vf-f grnd, sub ang-ang, pred gr sup cls, frm, fri, w cons w/sil-arg cmt, sme uncon, w srt; SLTST (35%): pred dk gy-med gy, occ gyshbn, sb blk-plty, frm-sl hrd, occ tab, slty tex, non-v sl calc, tr micmica; SH (20%): dk gy-v dk gy, plty, non calc, frm, sl hrd ip, rgh tex, slty

5480-5540 SH (40%): dk gy-med gy, plty-sb blk, sl hrd, non calc, rgh tex, slty; SLTST (40%): med gy-gyshbn, blk-plty, sdy, v arg, pred non calc; SS (20%): lt gy-offwht, gyshbn, pred vf-f, sb ang, frm-fri, pred gr sup cls, cons w/ sil-arg cmt, occ uncon, qtz sd grs, slty

5540-5600 SH (45%): med gy-dk gy, frm, blk, sm-sl rgh tex, non calc; SLTST (40%): dk gy-gyshbn, frm-sl hrd, pred sb blk-plty, tr-v sl calc, slty-sl rgh tex; SS (10%): pred lt gy-offwht, occ s&p, occ gyshbn, frm, mod-w cons gr sup cls, occ mtx sup, vf-f grnd, mod srt, sb ang-ang grns, sl calc-arg cmt;



Inclination: 6.89°
Azimuth: 192.79°
VS: -461.49'

WOB: 30.1Klbs
RPM: 61
SPM: 230
GPM: 703

ROP (ft/hr)
GAMMA (GAPI)

MD: 5,684'
TVD: 5,646.18'
Inclination: 7.45°
Azimuth: 189.48°
VS: -474.53'

ROP (min/ft.)
GAMMA (units)

MD: 5,779'
TVD: 5,740.17'
Inclination: 9.23°
Azimuth: 192.39°
VS: -488'

WOB: 35Klbs
RPM: 60
SPM: 230
GPM: 703

ROP (ft/hr)
GAMMA (GAPI)

AVG BGG: 71u

GAS (units)
C1-C4 (PPM)

AVG BGG: 106u

GAS (units)
C1-C4 (PPM)

197u

AVG BGG: 153u

GAS (units)
C1-C4 (PPM)

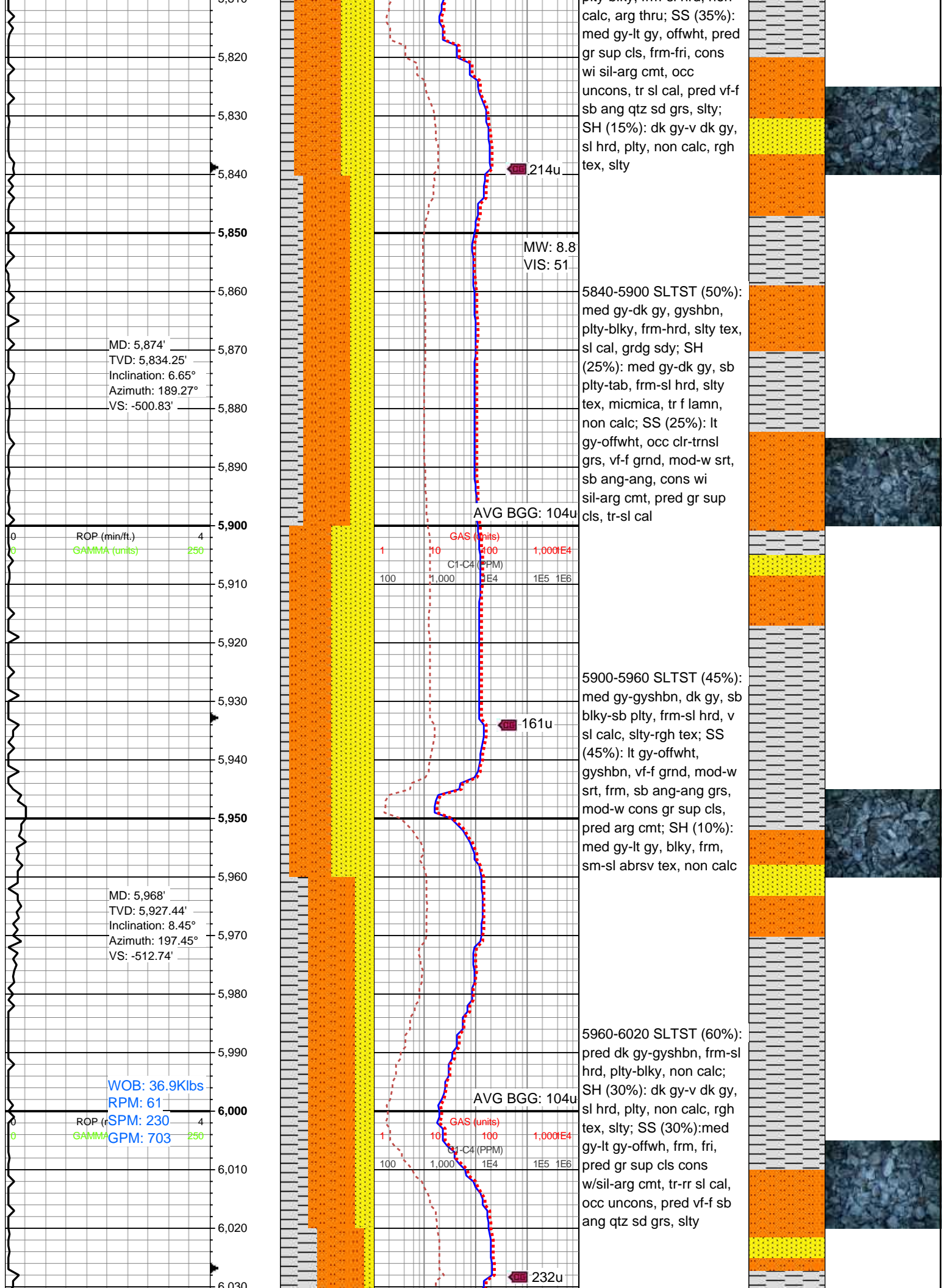
BENT(5%): offwht-crm, lt
brn, sft, blkly, sm-clly tex,
thn lamn

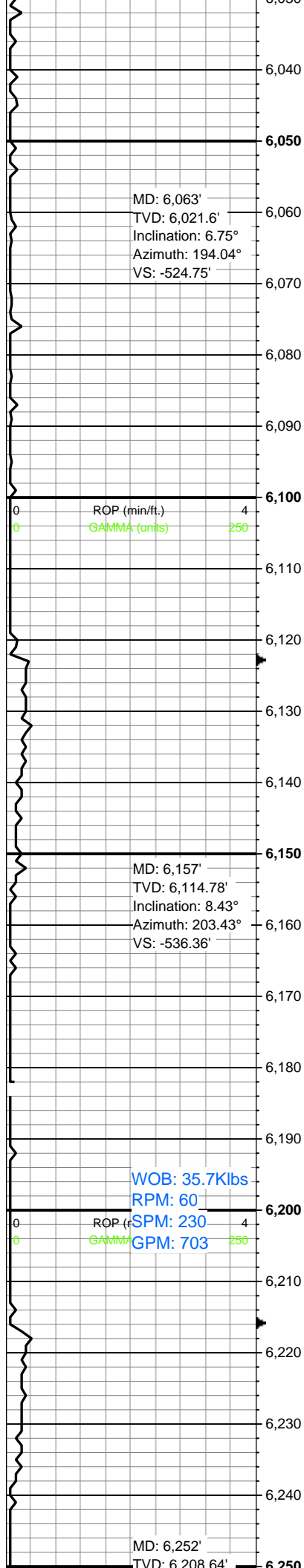
5600-5660 SLTST (45%):
pred med gy-sl brn gy,
grdg to ss, v arg, pred
non calc; SS (30%): lt
gy-offwht, sdy intbds-clr
sd grs, vf-f grs, med
frm-fri, mod w srt, gr
sup cls cons wi sil-com
arg cmt, sl slty thru, occ vf
pyr, sil-calc cmt; SH
(20%): med gy-dk gy, sb
plty-tab, frm-v frm,
slty-abrsv tex, non calc

5660-5720 SLTST
(45%): pred gy-sl brn gy,
occ sdy, v arg, pred non
calc; SH (30%): med gy-lt
brn, sb plty, sl brit, frm-v
frm, sm-slty tex, non calc;
SS (25%): lt gy-gy, occ
offwht intbds, clr sd grs,
med frm, cons wi sil-arg
cmt, gr sup cls, mod w
srt, vf grs, sl slty thru, occ
vf pyr, sil-cal cmt, pred sl
calc

5720-5780 SLTST
(50%):pred med
gy-gyshbn, frm-sl hrd, v
arg, sb blkly-plty, predy
non calc, occ sdy; SS
(30%): lt gy, offwht-clr sd
grs, vf-f grs, frm-sl fri,
mod w srt, sil-arg cmt, sl
slty thru; SH (20%): dk
gy-med gy, plty-sb blkly,
frm, sm-abrsv tex, non
calc, tr micmica

5780-5840 SLTST (50%):
pred dk gy-gyshbn,
plty-blkv, frm-sl hrd, non



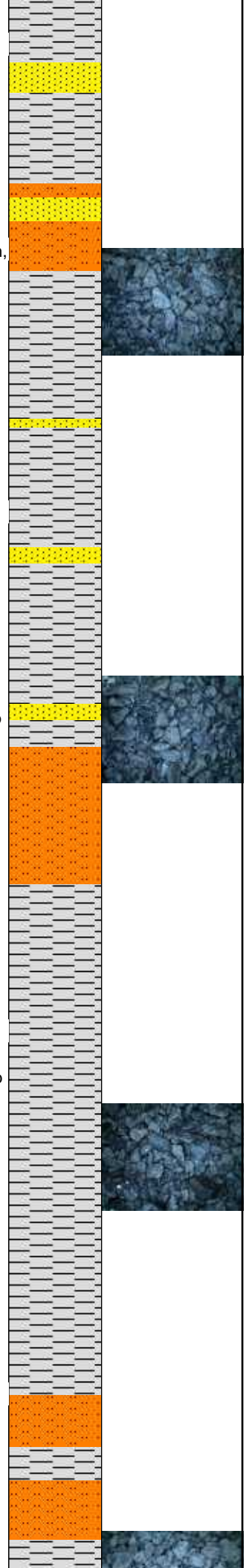


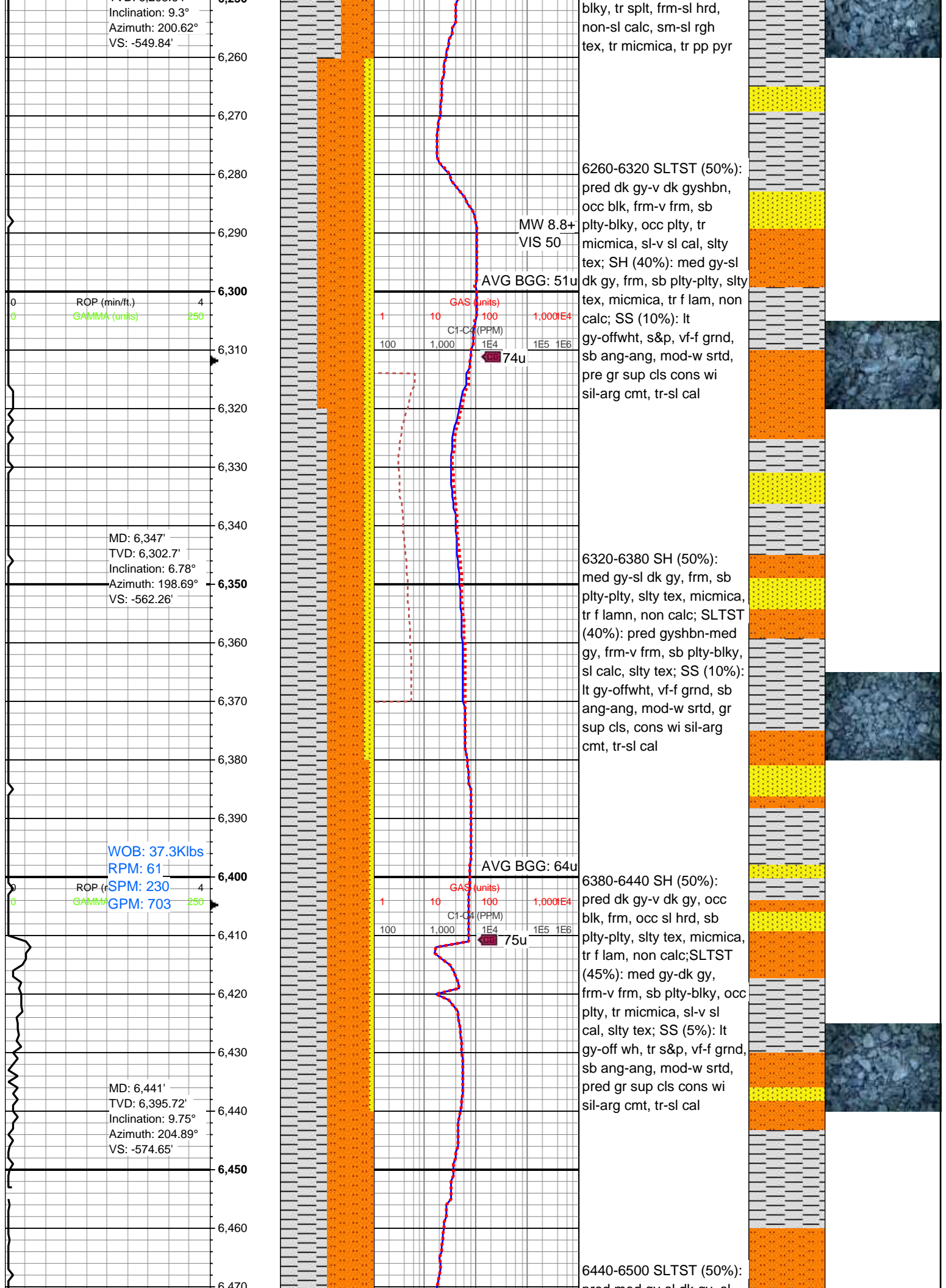
6020-6080 SLTST (50%):
pred med gy-dk gy,
gyshbn, v arg, occ sdy,
pred non calc, tr f lamn;
SH (40%): dk gy-med gy,
pred plty-sb blk, frm-sl
hrd, non-sl calc, sm-sl
silty tex, tr micmica, tr pp
pyr; SS (10%): lt
gy-gyshbn, offwht, vf-f grn,
sb ang-ang, cons wi
arg-sil cmt, sl calc, grdg
sltst, mnrlse qtz grns

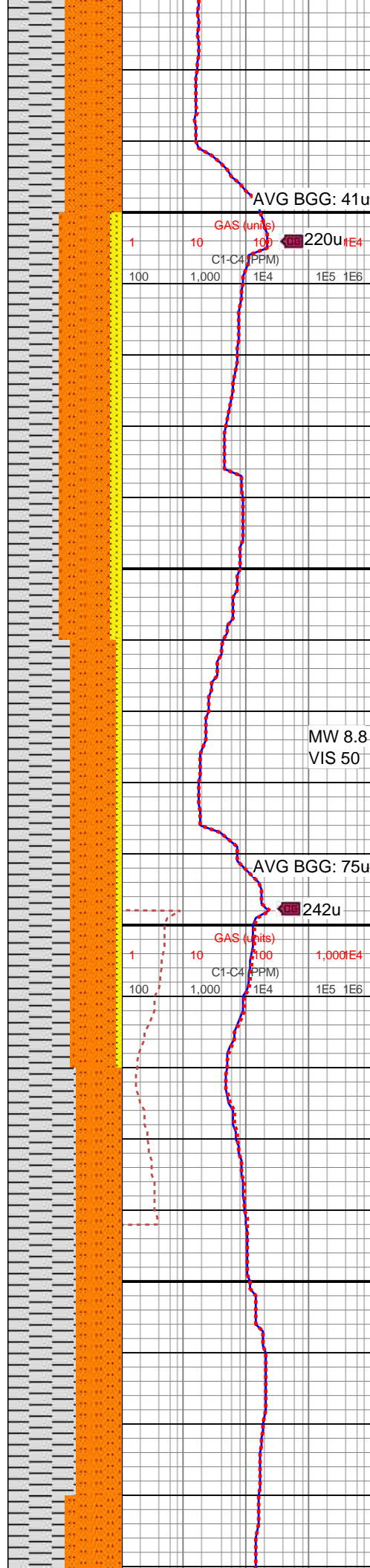
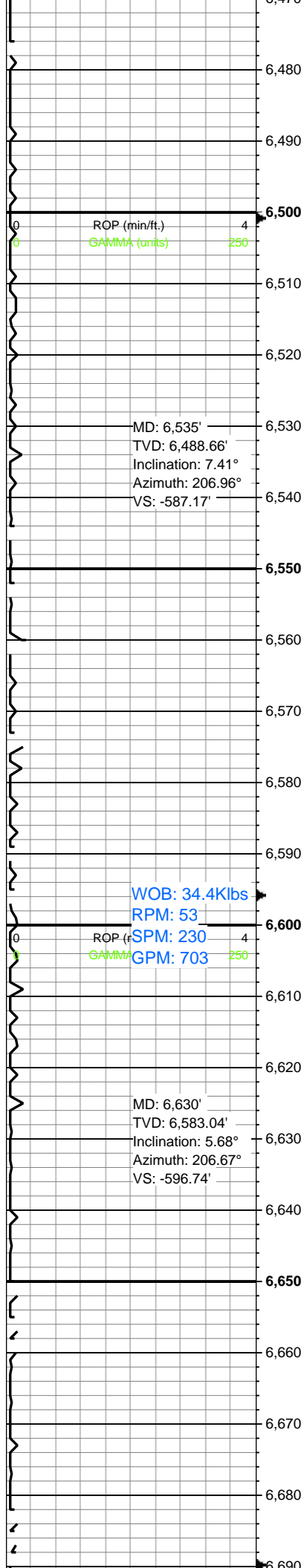
6080-6140 SLTST (50%):
med gy-dk gy, v arg thru,
sb blk-blky, frm-sl hd, sl
calc; SH (45%): med
gy-dk gy, sl frm-hrd, sme
fis, sb plty-plty, sm-abrsv
tex, grdg sltst, sme f
lamn; SS (5%): lt
gy-gyshbn, offwht, frm-sl
hrd, fri, vf-f grn, sb ang-sb
rnd, cons wi sil-arg cmt,
grdg sltst, sl calc

6140-6200 SLTST (50%):
pred dk gy-v dk gy, ip sl
brn, occ blk, v arg thru, sb
blk-blky, frm-sl hd, ip sl
calc; SH (50%): pred
gy-dk gy, sft-sl frm, sme
fis, sb plty-plty, sm-silty
tex, rr sdy, sme f lam

6200-6260 SLTST (65%):
pred med gy-sl dk gy, sl
mot ip, occ lt gy, frm-sl
hrd, sb blk-plty, occ sl
calc, pred rgh tex, tr-scat
sdy, occ arg, tr micmica;
SH (35%): dk gy-v dk gy,
occ blk, pred plty, occ sb





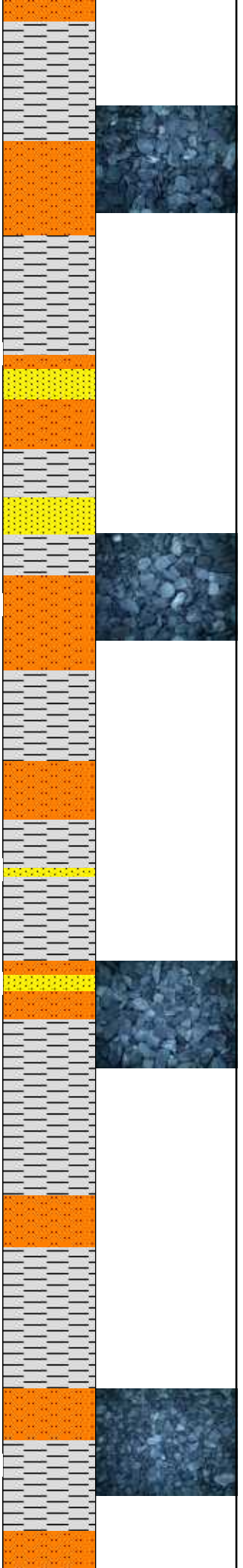


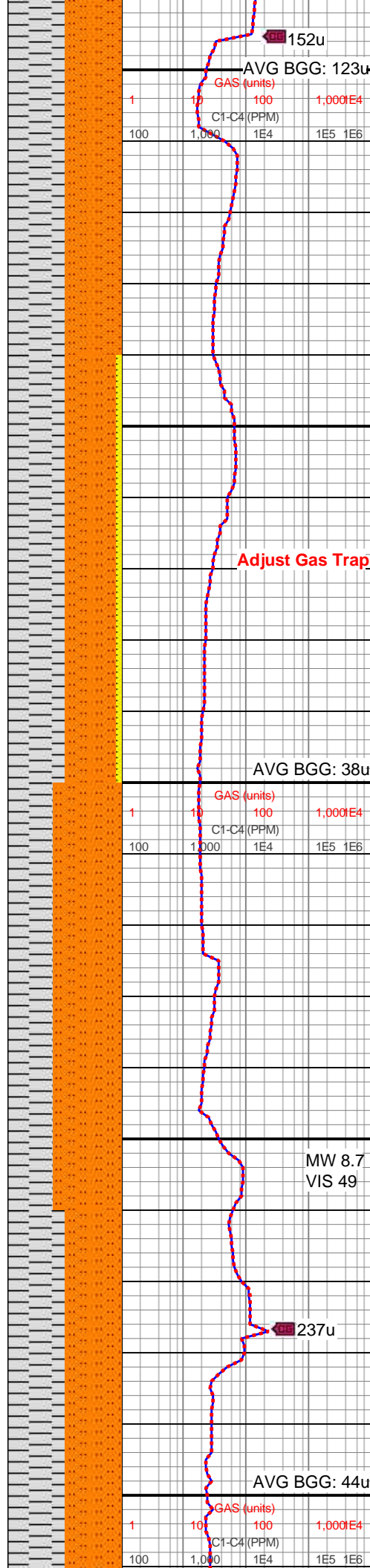
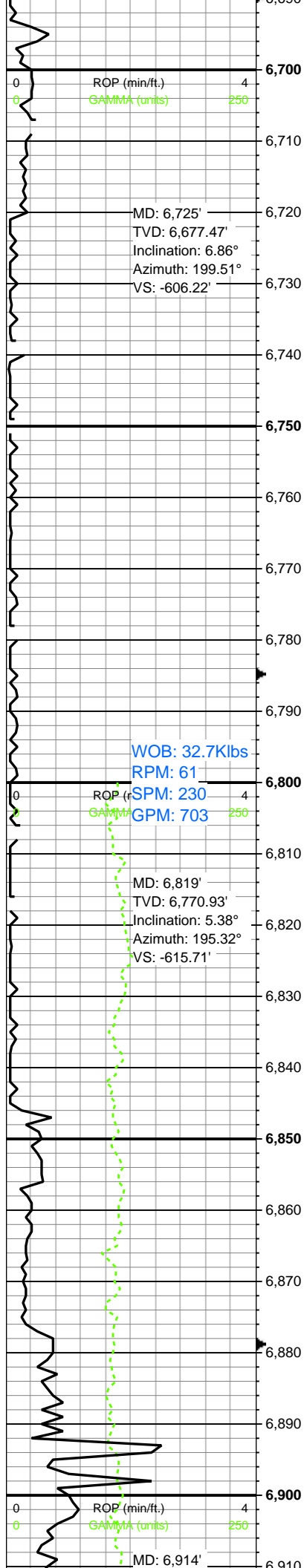
pred med gy-sl dk gy, sl
mot ip, occ lt gy, frm-sl
hrd, sb blkly-plty, occ sl
calc, pred rgh tex, tr-scat
sdy, occ arg, tr micmica;
SH (50%): dk gy-v dk gy,
occ blk, pred plty, occ sb
blkly, tr splt, frm-sl hrd,
non-sl calc, sm-sl rgh
tex, tr micmica, tr pp pyr

6500-5660 SLTST (45%):
med gy-gyshbn, v arg,
pred non calc; slty-grty
tex, mn r ss lamn; SH
(45%): dk gy-med gy,
frm-v frm, sl brit, sb
tab-plty, sm-slty tex, pred
non calc; SS (10%): pred
lt gy-lt gyshbn, mod w
srtd, med frm, vf f grs, gr
sup cls, sl slty thru, cons
wi sil-arg cmt, pred l-mod
calc

6560-6620 SH (55%): dk
gy-med gy, pred plty-sb
blkly, frm-sl hrd, non-sl
calc, sm-sl slty tex, tr
micmica, tr pp pyr; SLTST
(40%): pred med gy-dk
gy, gyshbn, v arg, occ
sdy, pred non calc, tr f
lamn; SS (5%): lt
gy-gyshbn, offwht, vf-f grn,
sb ang-ang, cons wi
arg-sil cmt, sl calc, grdg
sltst, mn r lse qtz grns

6620-6680 SH: (60%) dk
gy-vdk gy, occ blk, frm-v
frm, sl brit, sb plty-plty,
sm-slty tex, tr micmica,
tr-scat pp pyr; SLTST
(40%): dk gy-sl dk gy, occ
gyshbn, frm-sl hrd,
plty-sb blkly, non-sl calc, tr
sm tex, pred slty tex



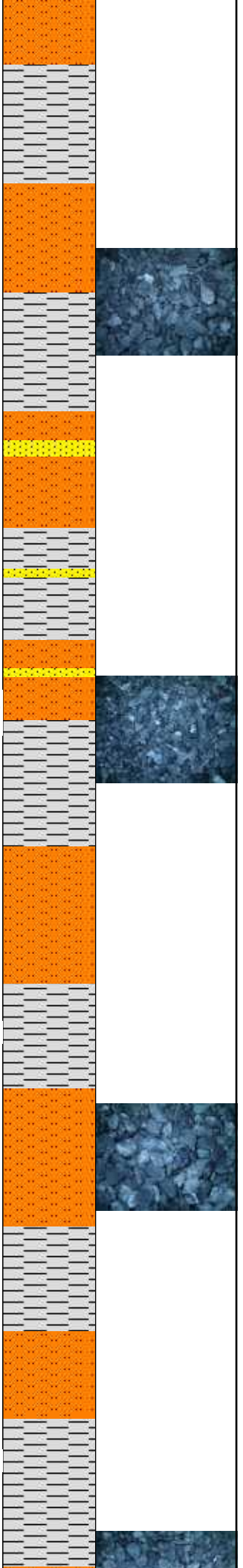


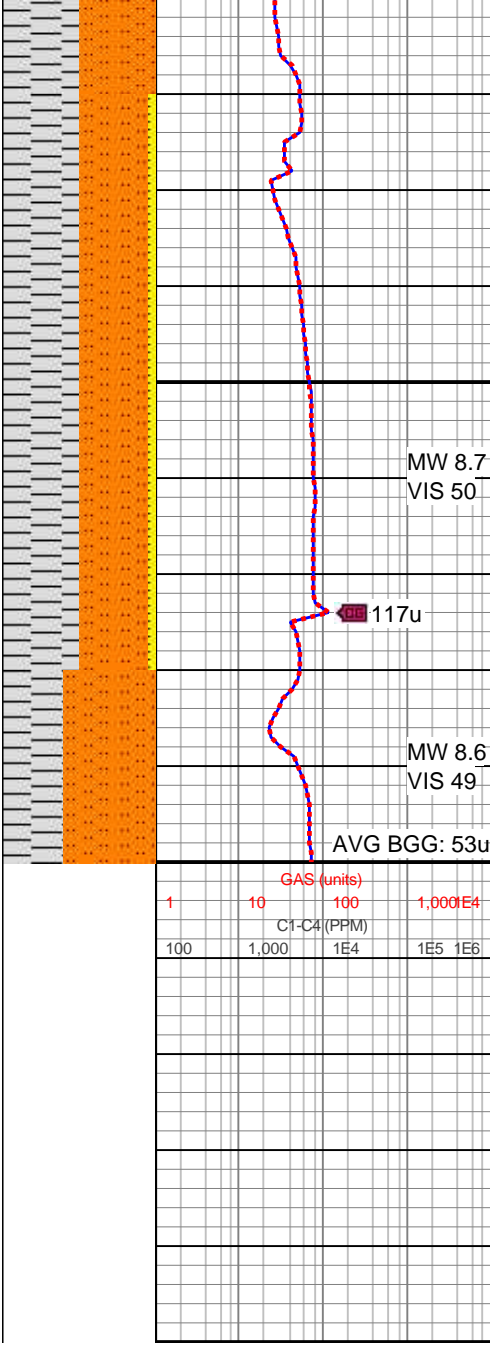
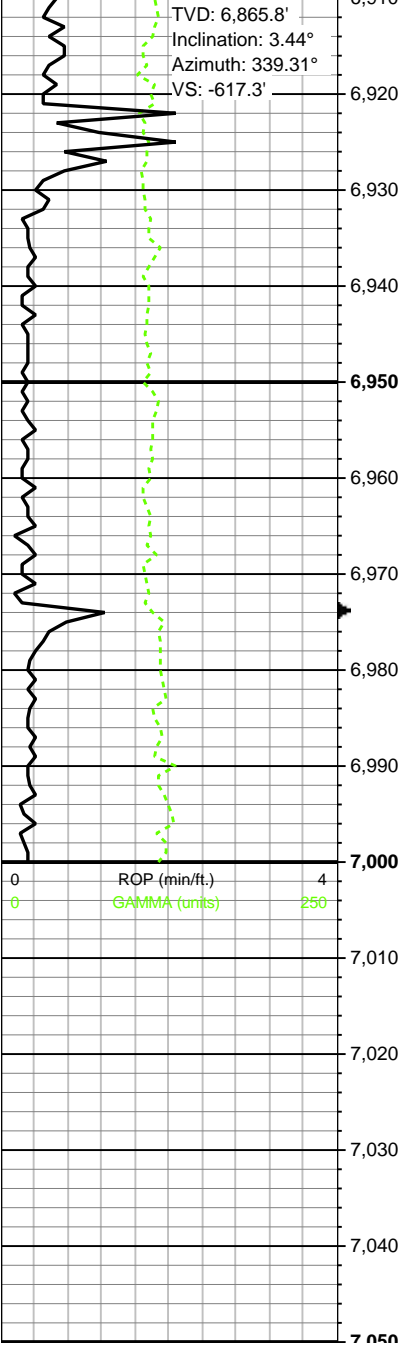
6680-6740 SH: (50%) dk gy-med gy, frm-v frm, sl brit, sb plty-plty, sm-sltly tex, tr micmica, tr-scat pp pyr; SLTST (50%): med gy-sl dk gy, occ gyshbn, frm-sl hrd, tab-sb blkly, non-sl calc, tr sm tex, pred abrsv tex

6740-6800 SH (50%): dk gy-med gy, frm-hrd, sb plty-blky, sm-abrsv tex, grdg sltst, sme f lamn; SLTST (45%): med gy-gyshbn, dk gy, v arg thru, sb blkly-tab, frm-sl hd, sl calc; SS (5%): lt gy-offwht, gyshbn, vf-f grn, frm-sl hrd, sb ang-sb rnd, fri, cons wi sil-arg cmt, grdg sltst, sl calc

6800-6860 SLTST (60%): pred med gy-dk gy, v arg thru, sb tab-blky, frm-sl hd, ip sl calc; SH (40%): pred med gy-dk gy, sl frm-hrd, sb blkly-plty, sm-sltly tex, sme f lamn, micmica

6860-6920 SLTST (50%): pred dk gy-v dk gyshbn, occ blk, frm-v frm, sb plty-blky, occ plty, tr micmica, sl-v sl cal, slty





tex; SH (50%): dk gy-v dk
gy, blk ip, frm, sb plty-plty,
sly tex, tr f lam, non calc

6920-6980 SLTST (45%):
gy-sl brn gy, v arg, pred
non calc; SH (50%): dk
gy-dk brn, occ blk, frm-v
frm, sl brit, sb plty,
sm-sly tex, pred non
calc; SS (5%): pred lt
gy-gy, mod w-w srtd vf f
grs, med frm gr sup cls
cons wi sil cmt-com arg
cmt, sl sly thru, sil-cal
cmt, pred l-med calc

**Log Continued in
Horizontal Format**

