



Scale: 5" / 100'  
Measured Depth Log

**Well Name** Waag 19

**Location** Sec. 19 T7N R65W

**State** CO

**County** Weld

**Country** USA

**Rig Number** Savanna 802

**API Number** 05-123-40351

**Field** Wattenberg

**Region** DJ Basin

**Drilling Completed** 10/9/2015

**Spud Date** 10/4/2015

**Surface Coordinates** Lat: 40°N 33' 16.092"  
Lon: 104°W 42' 25.740"

**Ground Elevation** 4,868'

**K.B. Elevation** 4,883'

**Logged Interval** 5,000' **To** 6,900'

**Total Depth** 12,080'

**Formation** Codell

**Type of Drilling Fluid** Invert

## Operator

**Company** Extraction Oil & Gas

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










## Geologist

**Name** Jared Rouse

**Company** Extraction Oil & Gas

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

## Zone Color Coding

 Oil	 Condensate	 Gas
 Note	 Core	 Pressure
 Error	 Water	 Seal



## Other

**Equipment** ML-197

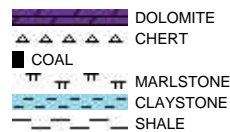
**Comments** Start: 10-4-15  
TD: 10-9-15

**Logger Names** Brian Ferwerda / Mark Gross

**Services Provided** 2-man Logging

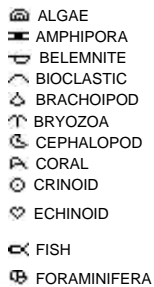
**Address** Empirica, LLC.  
6360 W Sam Houston Pkwy N  
Suite 100  
Houston, TX 77041

## Rock Types



## Accessories

### Fossils



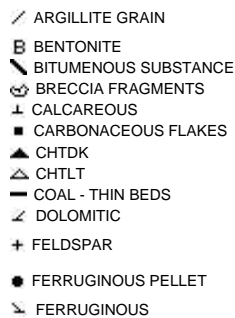
### Fossil



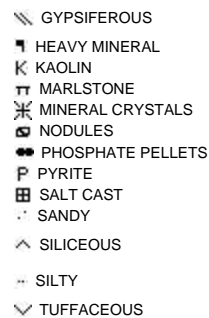
### Minerals



### Argillaceous



### Glauconite

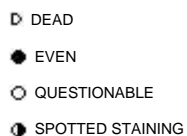


### Stringer

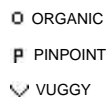
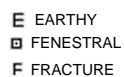


## Other Symbols

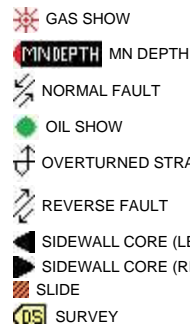
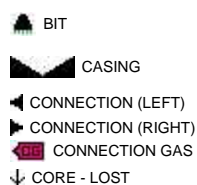
### Oil Show



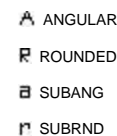
### Porosity



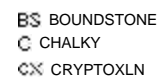
### Engineering



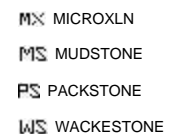
### Rounding



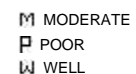
### Textures



### Lithographic



### Sorting



✕ INTERCRYSTALLINE

◊ INTEROOLITIC

✂ MOLDIC

■ CORE - RECOVERED

⋮ DST INTERVAL

⚡ FAULT

🔧 TRIP GAS

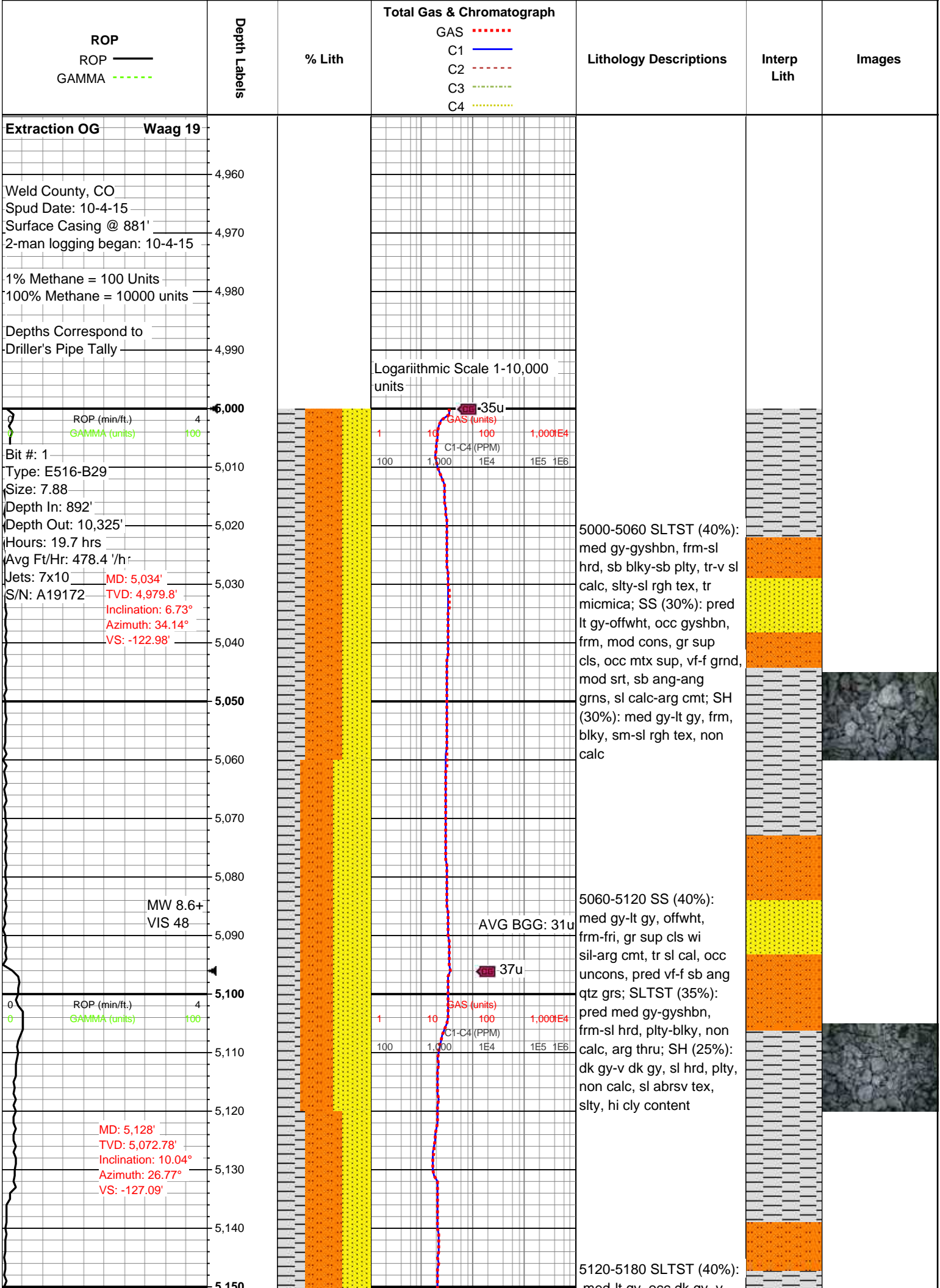
◀ WIRELINE TESTED - LEFT

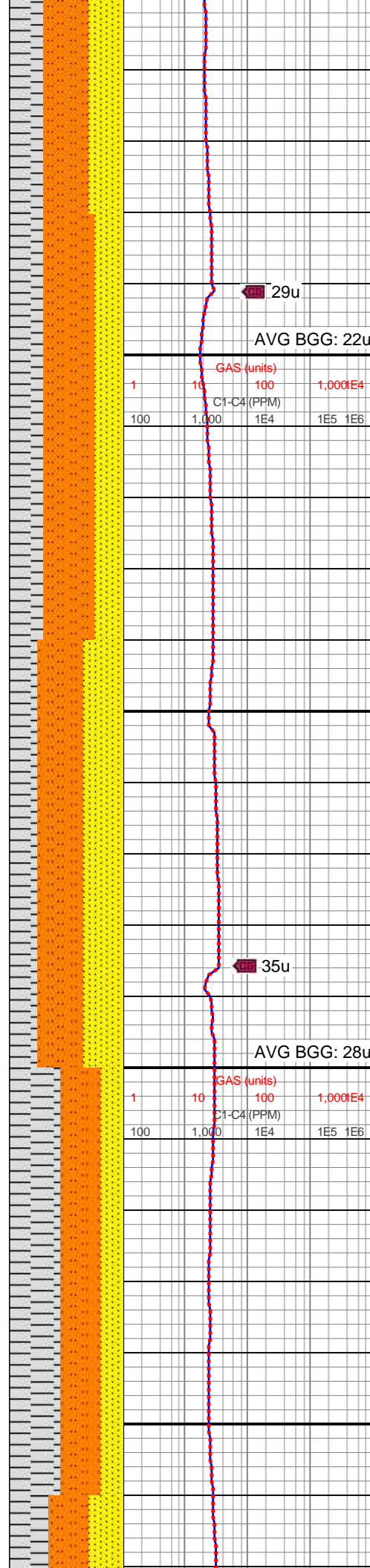
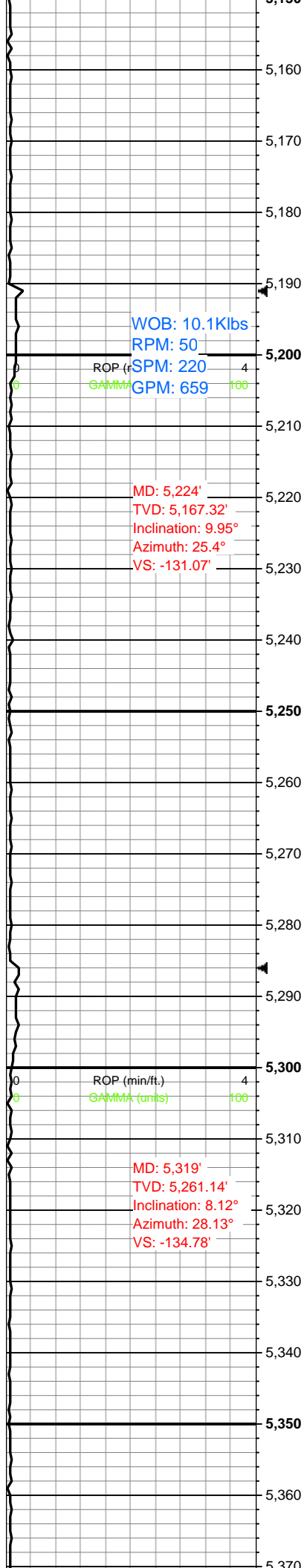
▶ WIRELINE TESTED - RT

E EARTHY

F✕ FINELYXLN

🪨 GRAINSTONE



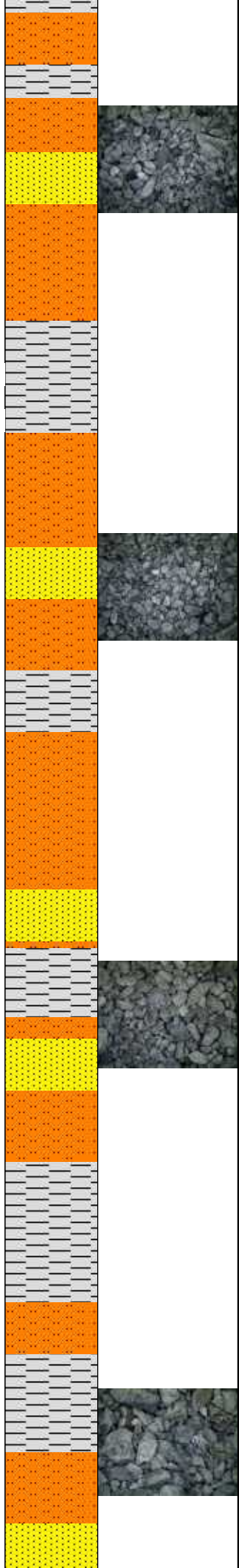


med-lt gy, occ dk gy, v  
arg, occ sdy, pred non  
calc, blk; SS (30%): pred  
lt gy-gy, mod w srt, vf-uf  
grs, med frm-fri, gr sup  
cls wi sil-arg cmt, sl slty  
thru; SH (30%): mot med  
gy-dk gy, frm-v frm,  
mod-hi fis, sb plty-tab,  
sm-slty tex ip

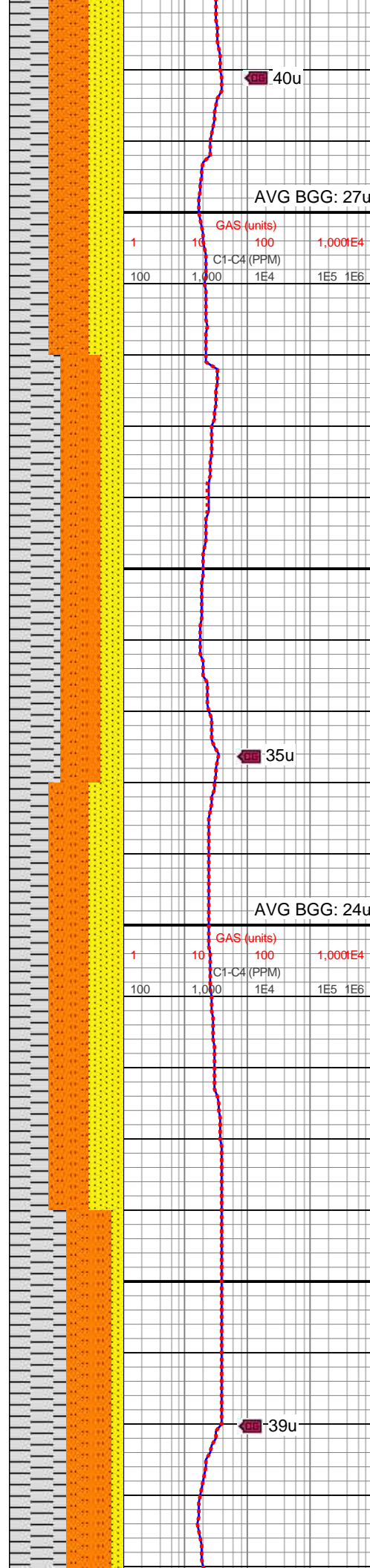
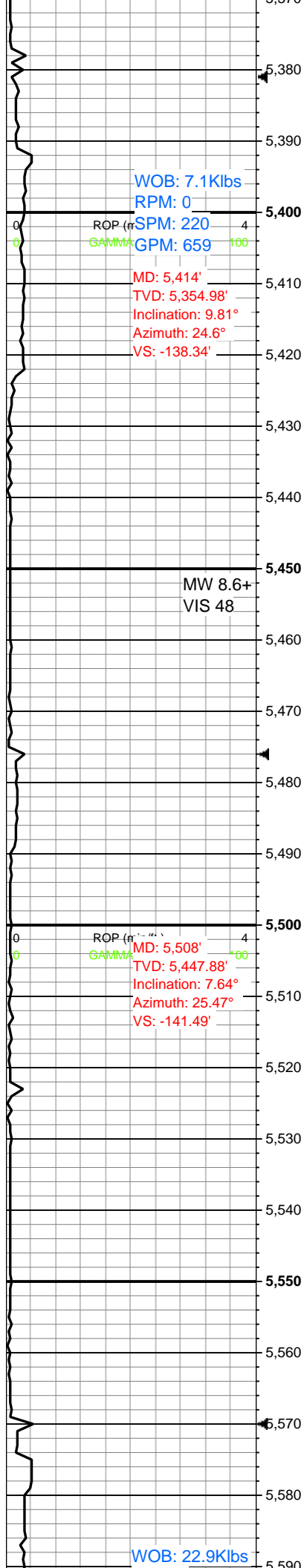
5180-5240 (45%) SLTST:  
pred dk gy-gyshbn, frm-sl  
hrd, plty-sb blk, non calc,  
arg thru; SH: (30%) dk  
gy-med gy, sl hrd, sb plty,  
non calc, rgh tex, slty, hi  
cly content; SS (25%):  
med gy-lt gy-offwh, frm,  
fri, pred gr sup cls wi  
sil-arg cmt, tr sl cal, occ  
uncons, pred vf-f sb ang  
qtz sd grs, slty

5240-5300: SLTST  
(40%): med gy-dk gy, occ  
gyshbn, tab-sb blk, non  
calc, frm-sl hrd, pred slty  
tex; SS (35%): mot lt  
gy-gyshbn, offwh ip, frm,  
vf-f grn, sb ang-sb rnd, w  
cons, pred gr sup cls,  
occ mtx sup, uncons,  
mod srt, arg-sl cal cmt;  
SH (25%): mot med  
gy-dk gy, frm, blk, non  
calc, tr micmica, slty, hi  
cly content

5300-5360 SH (45%): dk  
gy-med gy, frm-sl hrd,  
plty-sb spl, non calc, slty  
tex; SLTST (35%): dk  
gy-med gy, occ gyshbn,  
frm-sl hrd, sb blk-plty,  
slty tex, non calc, tr  
micmica; SS (25%): lt  
gy-offwh, frm-fri, gr sup  
cls wi sil-arg cmt, sme  
uncons, vf-f grnd, sb  
ang-sb rnd, w srt





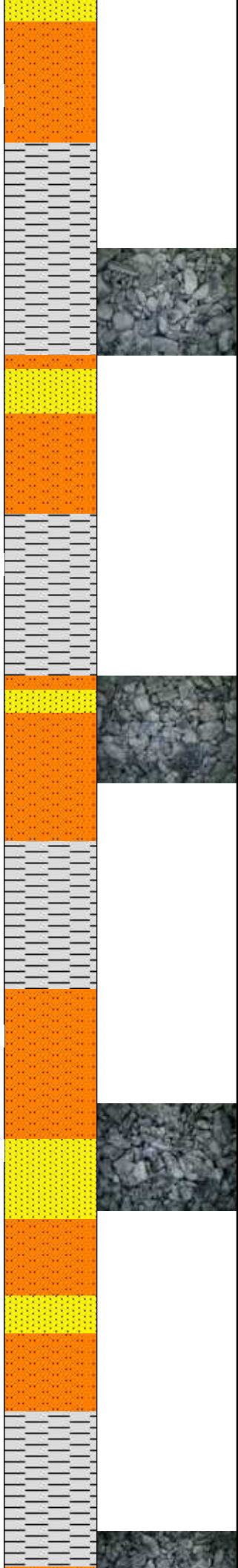


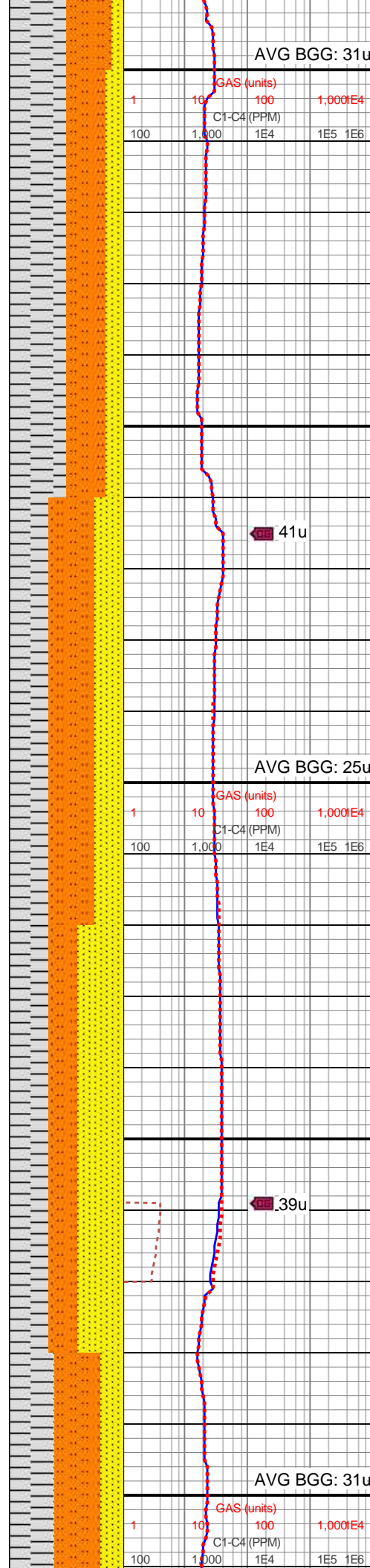
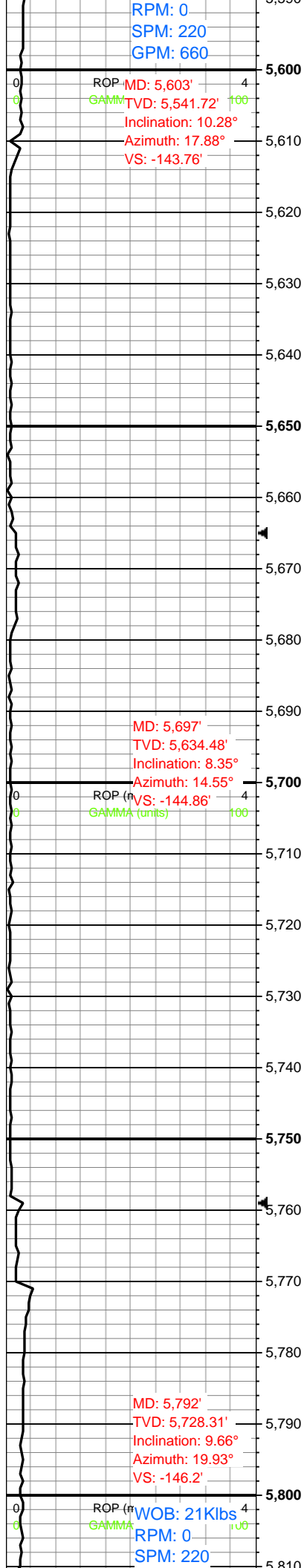
5360-5420 SLTST (35%):  
med gy-gyshbn, v arg,  
occ sdy, pred non calc,  
slty-sdy tex, hi cly content;  
SH (35%): med gy-lt gy,  
frm-v frm-sl hrd, sb  
plty-blky, sm-slty tex, pred  
non calc; SS (30%): lt  
gy-med gy, offwht, mod w  
srted, vf-f grs, med frm, gr  
sup cls wi sil-arg cmt, sl  
slty, sl cal cmt

5420-5480 SH (45%):  
med gy-dk gy, sm-slty tex,  
frm-v frm, sl brit, sb plty,  
non calc; SLTST (35%):  
pred med gy-bnshgy, occ  
sdy, v arg, non calc,  
tab-splt; SS (30%): lt  
gy-gyshbn, offwht-clr grs,  
vf-f grs, med frm, mod w  
srted, gr sup cls wi sil-arg  
cmt, sl slty

5480-5540: SH (35%):  
mot med gy-dk gy, frm,  
blky-sb tab, non calc, tr  
micmica, slty; SLTST  
(35%): med gy-dk gy,  
gyshbn, frm-sl hrd,  
plty-sb blky, non-sl calc, tr  
sm tex, pred slty tex; SS  
(30%): pred lt gy-gyshbn,  
offwht, frm, w cons, gr  
sup-mtx sup cls, sme  
uncons, mod w srt, vf-f gr,  
sb ang-sb rnd grns,  
arg-sl cal

5540-5600 SH (50%):  
mot dk gy-med gy, sb  
blky-tab, frm, sl-tr calc,  
slty; SLTST (40%): pred  
med-lt gy, occ dk gy,  
frm-sl hrd, pred sb blky,  
occ sb spltd, tr micmica, tr  
slty; SS (10%): med gy-lt  
gy, scat trns-lr grns, vf-f





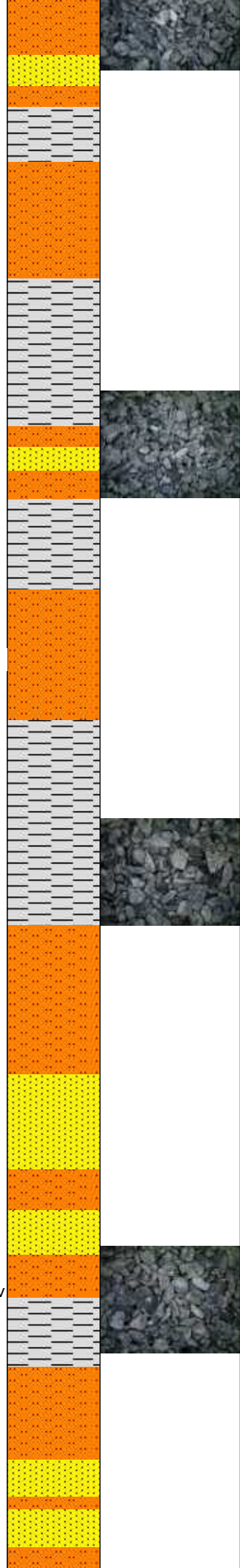
gr, mod-w srt, w cons, sb  
ang-ang grns, sme  
uncons cls, arg

5600-5660 SH (50%):  
mot med gy-lt brn, frm-v  
frm, sb plty, mod-hi cly  
content, sm-slty-sdy tex,  
non calc; SLTST (35%):  
pred gy-sl brn gy, v arg,  
occ sdy, pred non calc;  
SS (15%): pred lt gy-gy,  
occ offwht, mod w-w srt  
vf grs, med frm, gr sup  
cls wi sil-arg cmt, sl slty  
thru, occ vf pyr, pred sl  
calc

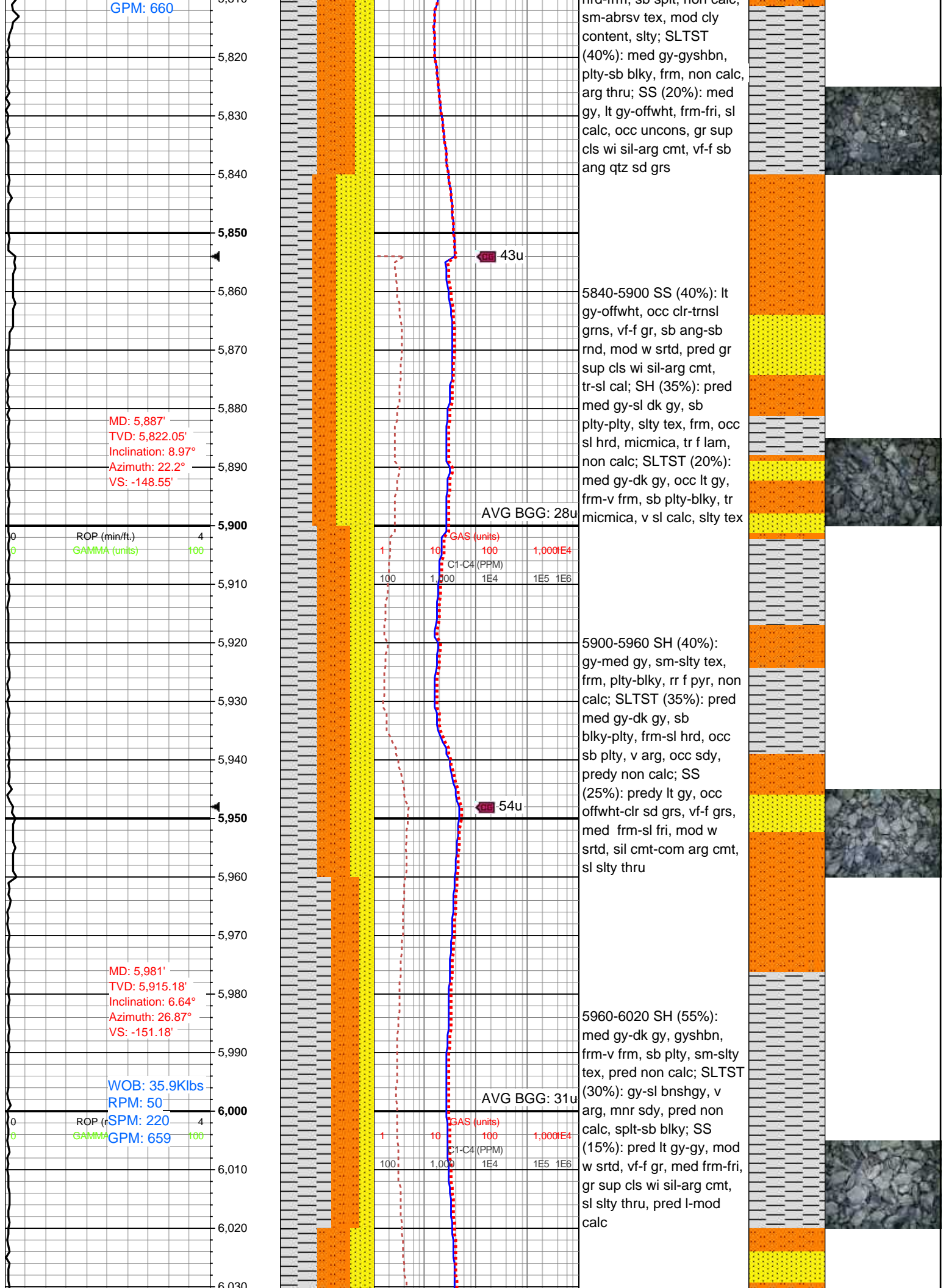
5660-5720 SLTST (40%):  
pred med gy-gyshbn,  
frm-sl hrd, sb blk, non  
calc, arg thru; SH (35%):  
dk gy-med gy, sl hrd,  
blk-sb spl, non calc, rgh  
tex, slty; SS (25%): med  
gy-lt gy-offwht, frm-fri,  
pred gr sup cls, cons wi  
sil-arg cmt, tr sl cal, pred  
vf-f sb ang qtz sd grs, occ  
uncons, slty

5720-5780 SS (40%):  
pred med gy-lt gy, mod-w  
srt, vf-f gr, sb ang grns,  
pred w cons gr sup cls,  
sil-arg cmt, tr-v sl calc;  
SH (35%): med gy-dk gy,  
frm-v frm, tab-sb plty, slty,  
micmica, sm-slty tex;  
SLTST (25%): pred dk  
gy-med gy, blk-plty, frm-v  
frm, tr-scat micmica,  
slty-sl sdy tex, tr-sl calc

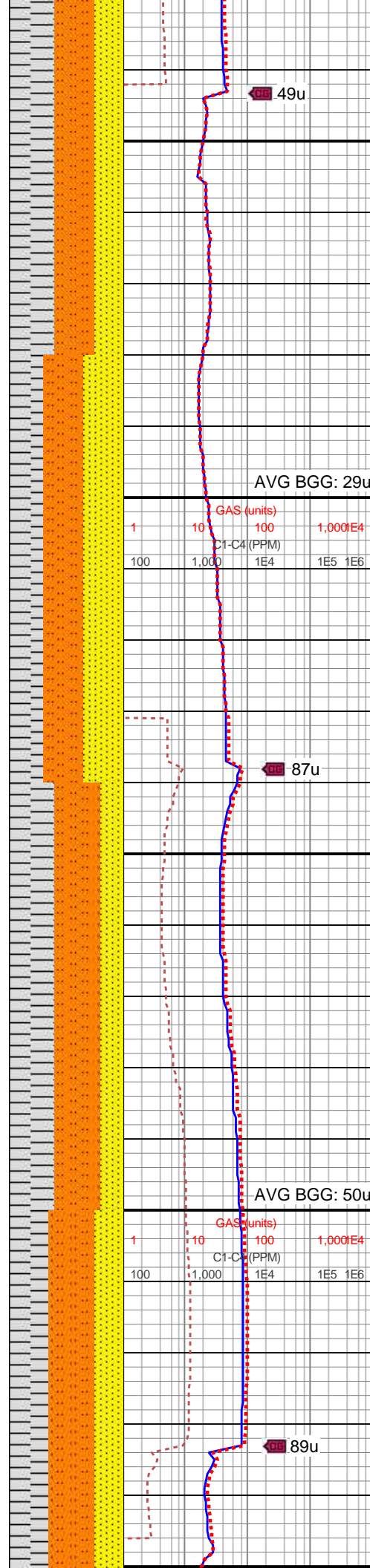
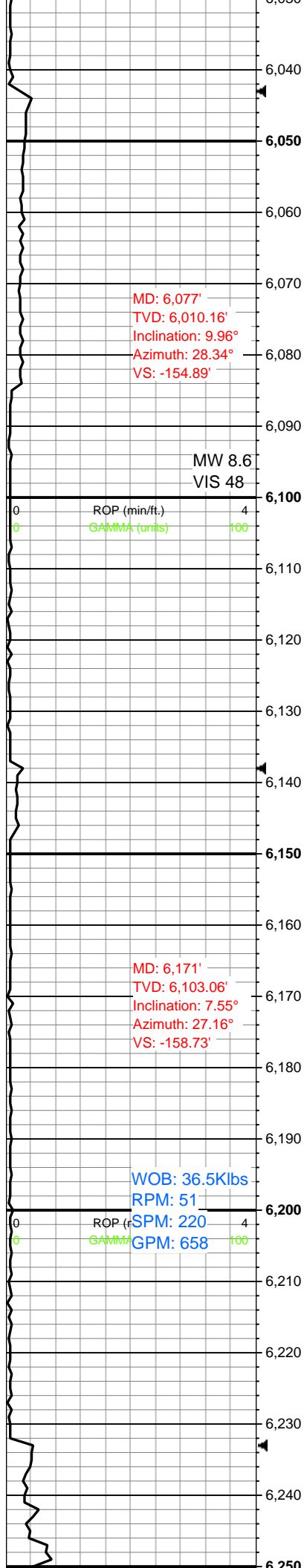
5780-5840 SH (40%):  
med gy-dk gy, lt gy, sl  
brd-frm, sb spl, non calc









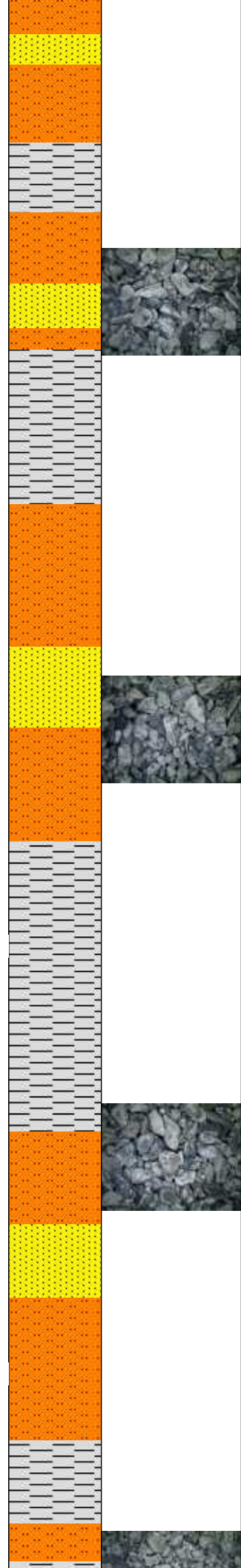


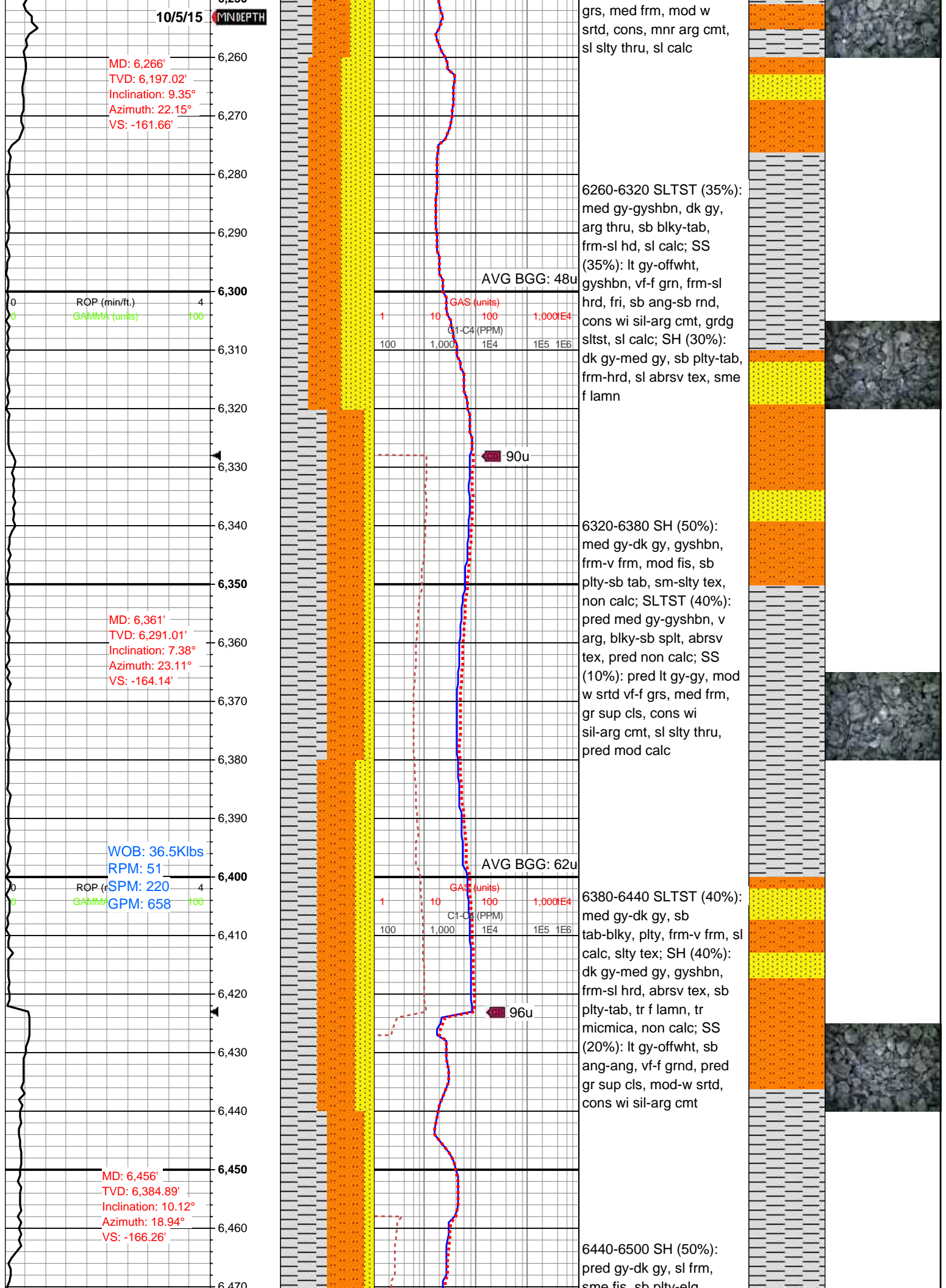
6020-6080 SH (40%):  
med gy-bnshgy, frm-v  
frm, sb plty-sb splt,  
sm-abrv tex, non calc;  
SLTST (35%): pred med  
gy-gyshbn, frm, blk-si  
plty, v arg, pred non calc;  
SS (25%): pred lt gy-gy,  
occ offwht intbds, clr sd  
grs, mod w srted, vf-f grs,  
med frm, gr sup cls wi  
sil-arg cmt, sl slty thru, tr  
vf pyr, silc-calc cmt

6080-6140 SS (35%):  
predy lt gy, offwht, clr sd  
grs, med frm-sl fri, mod  
w srted, vf-f grs, sil-arg  
cmt, sl slty thru; SLTST  
(35%): pred med gy-dk  
gy, sb tab-plty, occ sb  
blk, frm-sl hrd, v arg,  
predy non calc; SH  
(35%): dk gy-med gy,  
frm-sl hrd, sm-slty tex,  
plty-sb blk, rr f pyr, non  
calc

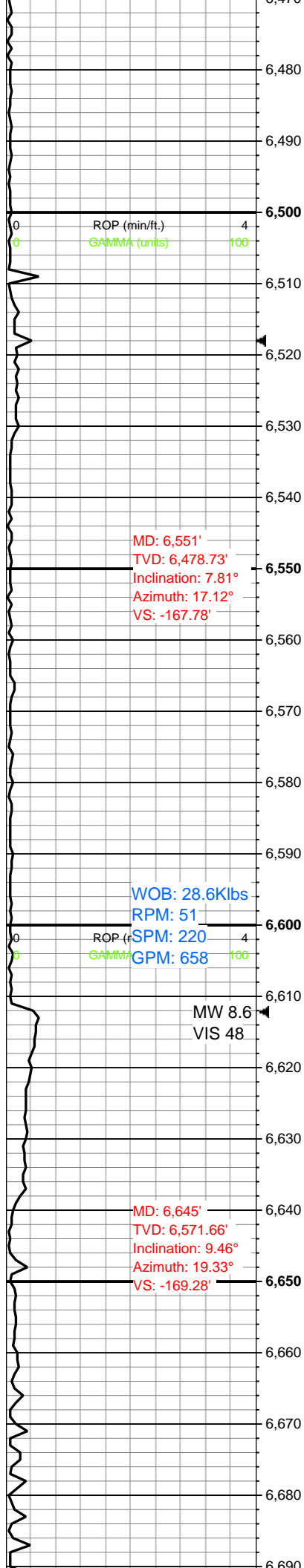
6140-6200 SLTST (40%):  
med gy-bnshgy, v arg,  
blk-sb tab, pred non  
calc; SH (40%): med  
gy-dk gy, frm-v frm, mod  
fis, sb plty-splt, sm-sl  
abrv tex, non calc; SS  
(20%): pred lt gy-gy,  
offwht, mod w srted, vf-f  
grs, med frm, gr sup cls  
wi sil-arg cmt, sl slty thru,  
pred mod calc

6200-6260 SLTST (40%):  
med gy-sl dk gy, occ  
gyshbn, blk, sl arg-arg,  
sl frm-frm, non calc; SH  
(35%): med gy-dk gy,  
gyshbn, blk-tab, frm-v  
frm, sl brit, sl slty-cly tex,  
mod hi cly, non calc; SS  
(25%): lt gy-offwht, vf-f









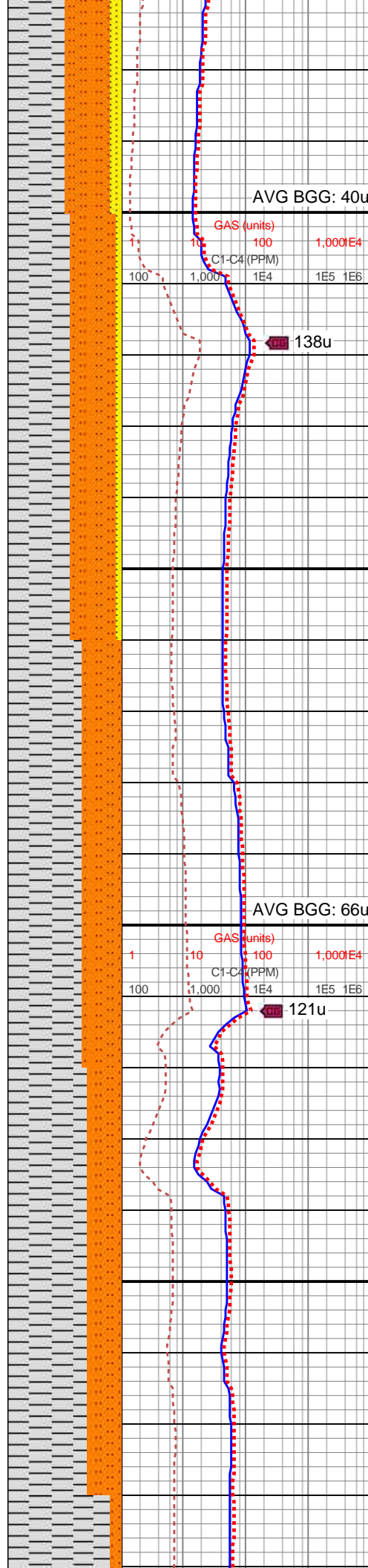
ROP (min/ft.)  
GAMMA (units)

MD: 6,551'  
TVD: 6,478.73'  
Inclination: 7.81°  
Azimuth: 17.12°  
VS: -167.78'

WOB: 28.6Klbs  
RPM: 51  
SPM: 220  
GPM: 658

MW 8.6  
VIS 48

MD: 6,645'  
TVD: 6,571.66'  
Inclination: 9.46°  
Azimuth: 19.33°  
VS: -169.28'



AVG BGG: 40u

GAS (units)  
C1-C4 (PPM)

138u

AVG BGG: 66u

121u

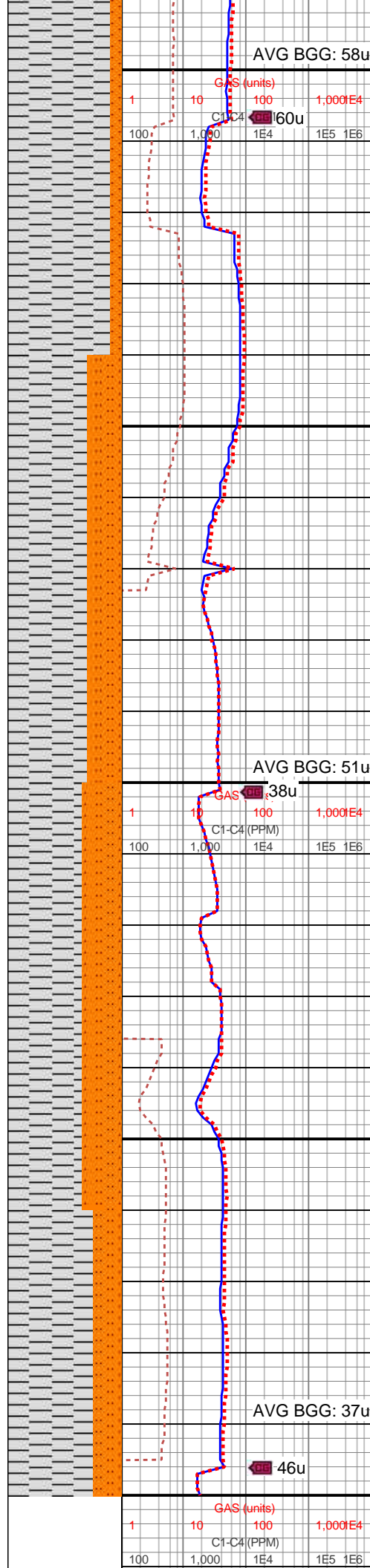
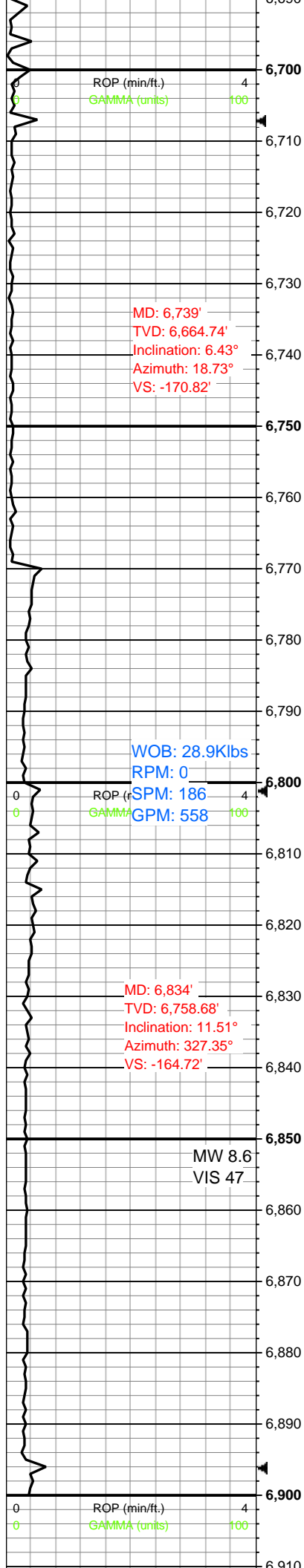
sm-sltly tex, tr micmica, tr f lam; SLTST (40%): pred med-dk gy, v arg thru, frm-sl hd, sb blkly-blky, ip sl calc; SS (10%): pred lt gy, vf-f grs, med frm, sl fri, mod srted, gr sup cls, cons wi sil cmt, sil-cal cmt, pred l-mod calc

6500-6560 SH (55%): pred med gy, occ dk gy, mod fis, frm-v frm, sb plty-plty, sm-sltly tex, non calc; SLTST (40%): gy-gyshbn, occ lt gy-dk gy, occ sd grs, mod-v arg, pred non calc-v sl calc; SS (5%): pred lt gy-gy, vf f grs, mod w srted, med frm-sl fri, gr sup cls, cons wi sil cmt-com arg cmt, sl slty thru, sl calc

6560-6620 SH: (65%) dk gy-med gy, occ dk gyshbn, frm-v frm, sl brit, sm-sltly tex, sb plty-splt, tr micmica, tr-scat pp pyr; SLTST (35%): med gy-sl dk gy, occ gyshbn, frm-sl hrd, plty-sb blkly, pred slty tex, tr sm tex, non-sl calc

6620-6680 SH (70%): pred dk gy-med gy, sb blkly-splt, sl frm-hrd, sm-sltly tex, mnr f lamn, tr micmica; SLTST (30%): pred med gy-dk gy, frm-sl hd, sb tab-blky, ip sl calc, v arg thru





6680-6740 SH (90%): dk gy-med gy, v dk gy, pred plty-sb splt, frm-sl hrd, non-sl calc, sm-sl abrsv tex, tr micmica, tr pp pyr; SLTST (10%): pred med gy-sl dk gy, sl mot ip, frm-sl hrd, sb blkly-plty, occ sl calc, pred rgh tex, occ arg, tr micmica

6740-6800 SH (70%): dk gy-med gy, frm-sl hrd, plty-tab, sl slty-rgh tex, non calc; SLTST (30%) med gy-lt gy, frm-sl hrd, micmica, non calc, slty tex, grd to med gy sh

6800-6860 SH (65%): dk gy-med gy, pred splt-sb blkly, frm-sl hrd, sm-sl slty tex, non calc, tr micmica, tr pp pyr; SLTST (35%): pred med gy-dk gy, gyshbn, sb blkly-elg, v arg, pred non calc, tr f lamn

Log Continued in Horizontal Format

