



Scale: 5" / 100'
Measured Depth Log

Well Name Winder South 6

Location Sec. 9-T6N-R67W

State Colorado

County Weld

Country USA

Rig Number Patterson 346

API Number 05-123-43403-00

Field Wattenberg

Geographic Region DJ Basin

Drilling Completed 9/25/2016

Spud Date 9/21/2016

Surface Coordinates SHL: 2306'FNL, 428' FEL, Sec. 9 T6N R67W

Lat: 40.502673 / 40° 30' 9.6228"
Long: -104.890411 / -104.890411

Bottom Hole Coordinates PBHL: 1705'FSL, 460' FWL, Sec. 8 T6N R67W

Ground Elevation 4,855'

K.B. Elevation 4,879.5'

Logged Interval 5,000' MD To 6,820'

Total Depth 17,050'

Formation Niobrara B Chalk

Type of Drilling Fluid Oil Based Mud

Operator

Company Extaction Oil & Gas

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

Geologist

Name Jared Rouse

Company Extraction Oil & Gas

Zone Color Coding

Oil	Condensate	Gas
Note	Core	Pressure
Error	Water	Seal

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

Other

Equipment ML-589

Comments Start: 9-21-16
TD: 9-25-16

Services Provided 2-man Logging
On Site Geosteering

Logger Names Dominic Pitre/ Nicholas Watkins

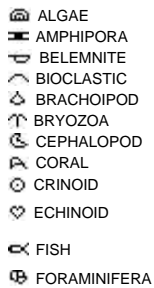
Address ALS Empirica
6510 Guhn Road
Houston, Texas 77040

Rock Types



Accessories

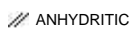
Fossils



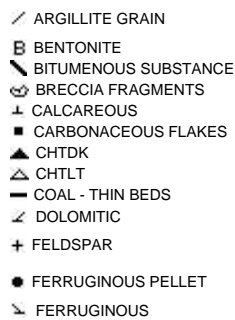
Fossil



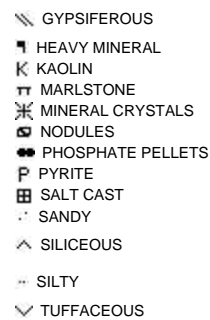
Minerals



ARGILLACEOUS



GLAUCONITE

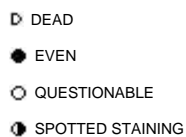


Stringer

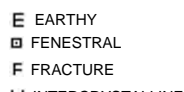


Other Symbols

Oil Show



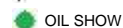
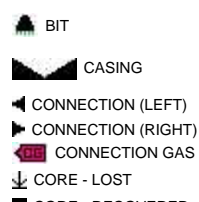
Porosity



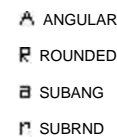
ORGANIC



Engineering



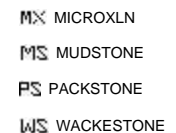
Rounding



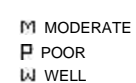
Textures



LITHOGRAPHIC



Sorting



✕ INTERCRYSTALLINE

⊕ INTEROOLITIC

↗ MOLDIC

■ CORE - RECOVERED

⋮ DST INTERVAL

↗ FAULT

🔴 TRIP GAS

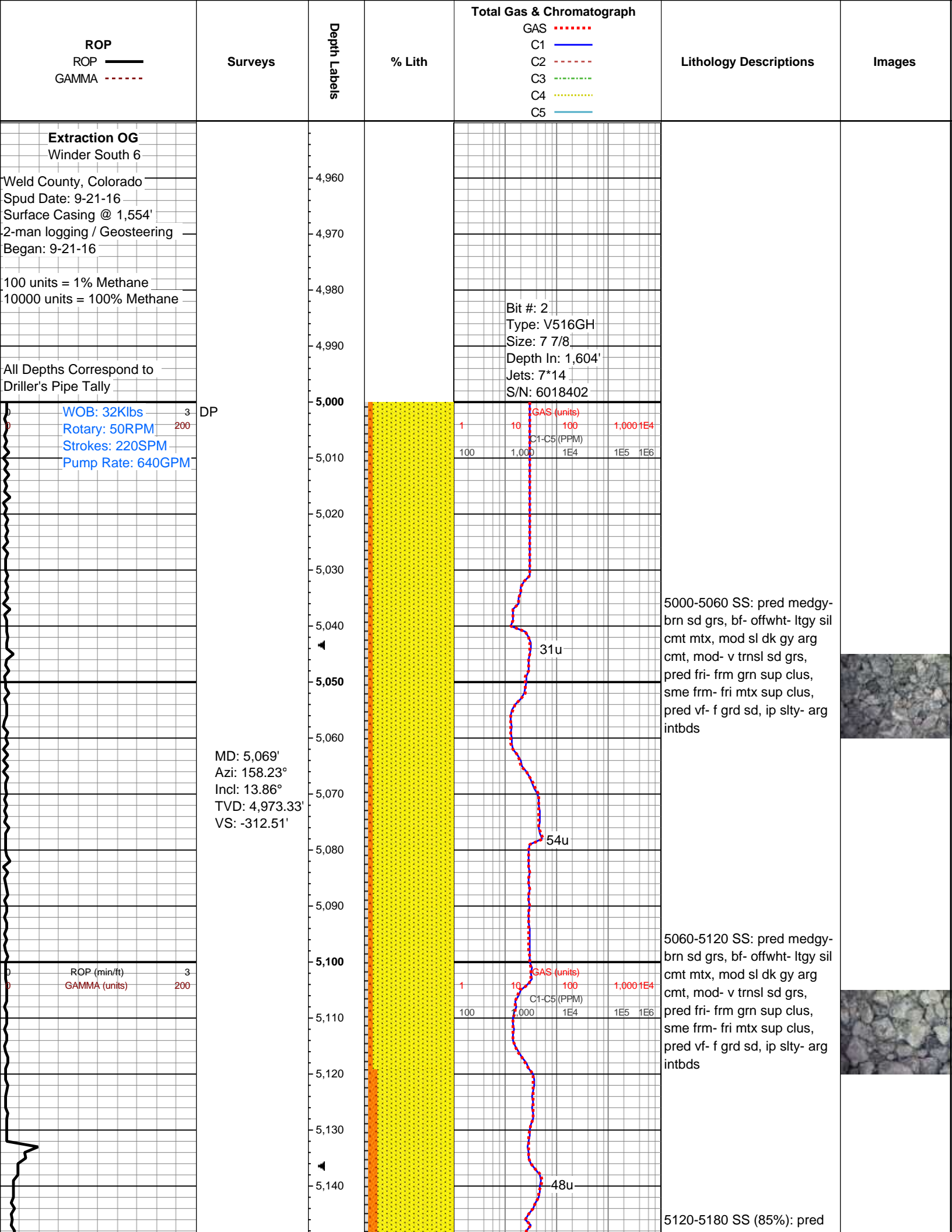
◀ WIRELINE TESTED - LEFT

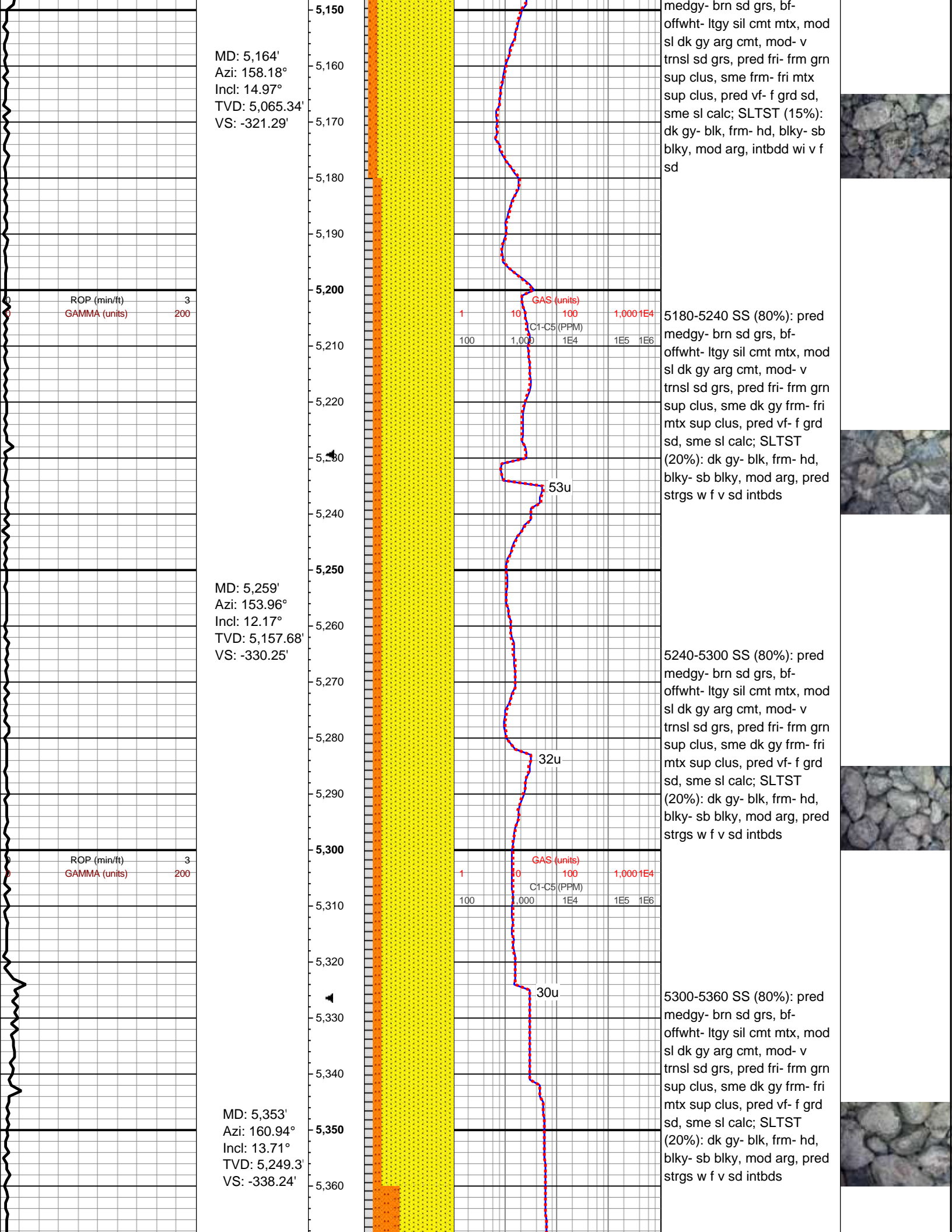
▶ WIRELINE TESTED - RT

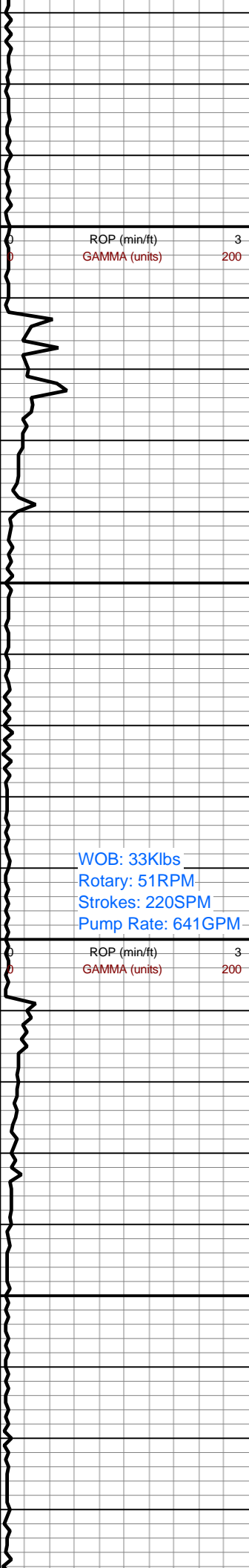
⚡ EARTHY

FX FINELYXLN

SS GRAINSTONE





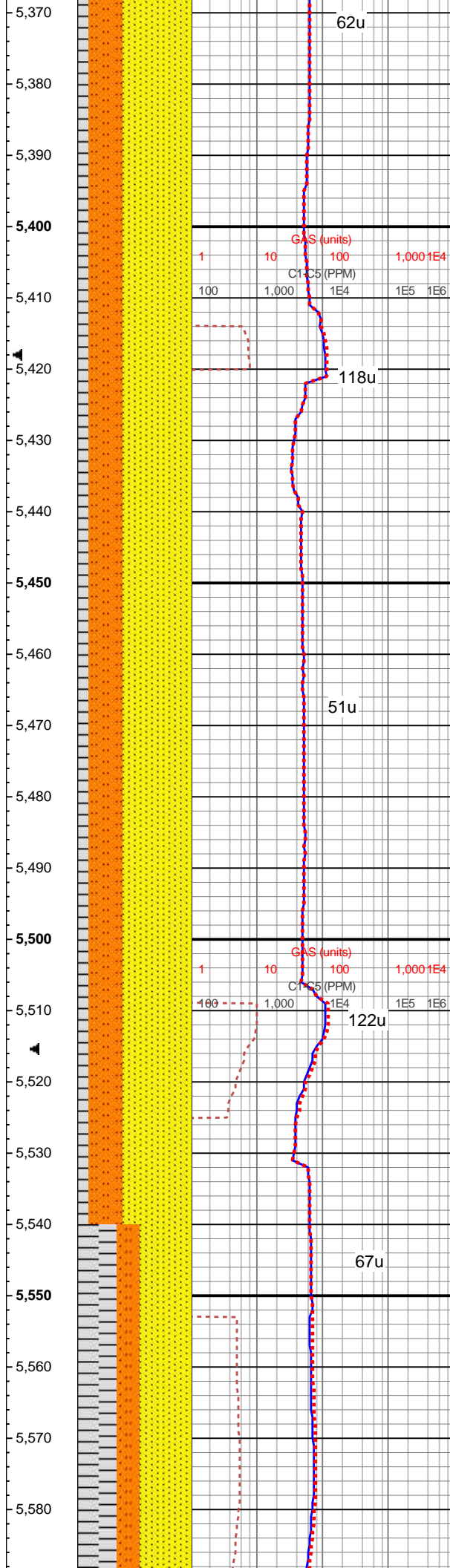


MD: 5,448'
Azi: 164.49°
Incl: 15.2°
TVD: 5,341.29'
VS: -345.25'

WOB: 33Klbs
Rotary: 51RPM
Strokes: 220SPM
Pump Rate: 641GPM

ROP (min/ft) 3
GAMMA (units) 200

MD: 5,543'
Azi: 166.15°
Incl: 16.49°
TVD: 5,432.68'
VS: -351.81'



62u

GAS (units) 1 10 100 1,000 1E4
C1-C5 (PPM) 100 1,000 1E4 1E5 1E6

118u

51u

GAS (units) 1 10 100 1,000 1E4
C1-C5 (PPM) 100 1,000 1E4 1E5 1E6

122u

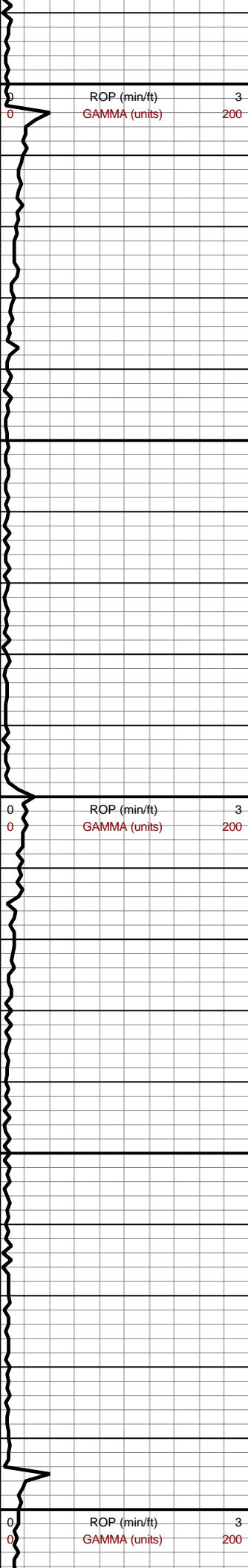
67u

5360-5420 SS (60%): pred medgy- brn sd grs, pred bf-offwht- ltgy sil cmt mtx, occ sl dk gy arg cmt, mod- v trnsl sd grs, pred fri- frm grn sup clus, sme dk gy frm- fri mtx sup clus, pred vf- f grd sd, sme sl calc; SLTST (40%): dk gy- blk, frm- hd, blk- sb blk, mod arg, pred strgs w f v sd intbds

5420-5480 SS (55%): pred medgy- brn sd grs, pred bf-offwht- ltgy sil cmt mtx, occ sl dk gy arg cmt, mod- v trnsl sd grs, pred fri- frm grn sup clus, sme dk gy frm- fri mtx sup clus, pred vf- f grd sd, sme sl calc; SLTST/SLTY SH (45%): dk gy- blk, sme brn mot, frm- hd, blk- sb blk, mod- v arg, wi f v sd intbds

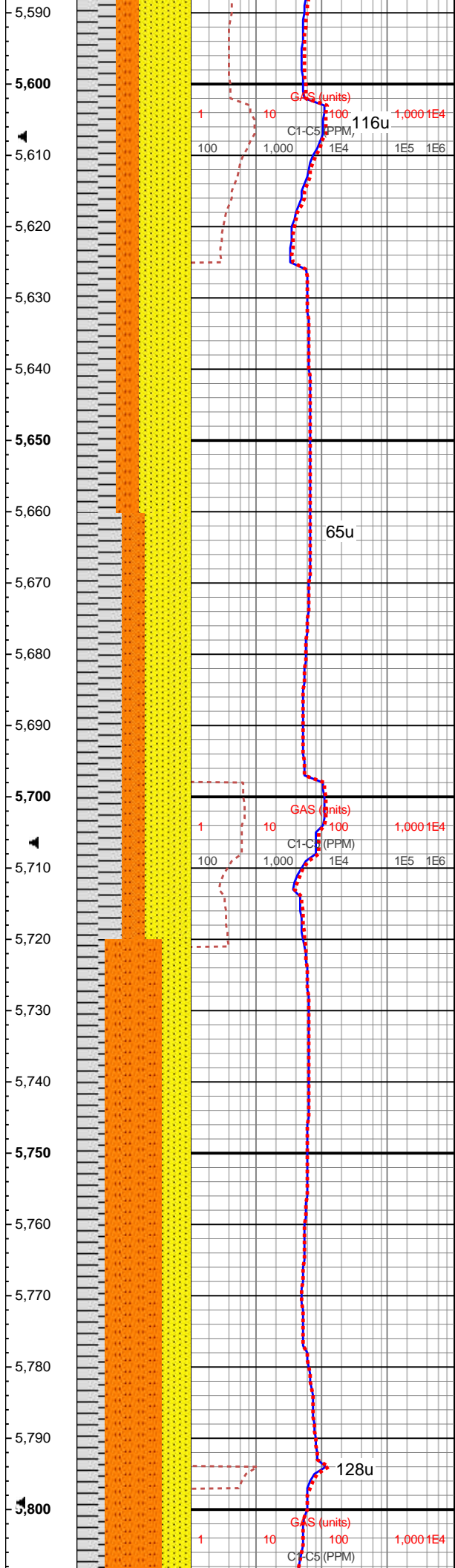
5480-5540 SS (55%): pred medgy- brn sd grs, pred bf-offwht- ltgy sil cmt mtx, occ sl dk gy arg cmt, mod- v trnsl sd grs, pred fri- frm grn sup clus, sme dk gy frm- fri mtx sup clus, pred vf- f grd sd, sme sl calc; SLTST/SLTY SH (45%): dk gy- blk, sme brn mot, frm- hd, blk- sb blk, mod- v arg, wi f v sd intbds

5540-5600 SS (45%): pred medgy- gy sd grs, sme lt brn grs, abnt offwht- lt brn cmt, mod dk gy arg cmt, mod- v trnsl sd grs, pred fri- frm grn sup clus, ip frm- fri mtx sup clus, pred vf- f grd sd, mod slty- arg intbds; SH (35%): crm- tn, sme lt brn- bf str, sb blk, sl frm- sl sft,



MD: 5,638'
Azi: 170.81°
Incl: 18°
TVD: 5,523.41'
VS: -357.38'

MD: 5,733'
Azi: 171.58°
Incl: 16.81°
TVD: 5,614.06'
VS: -361.74'



vf sd- slty intbds; SLTST (20%): medgy, sme brn mot, sb blk, frm- hd, intbdd wi v f sd

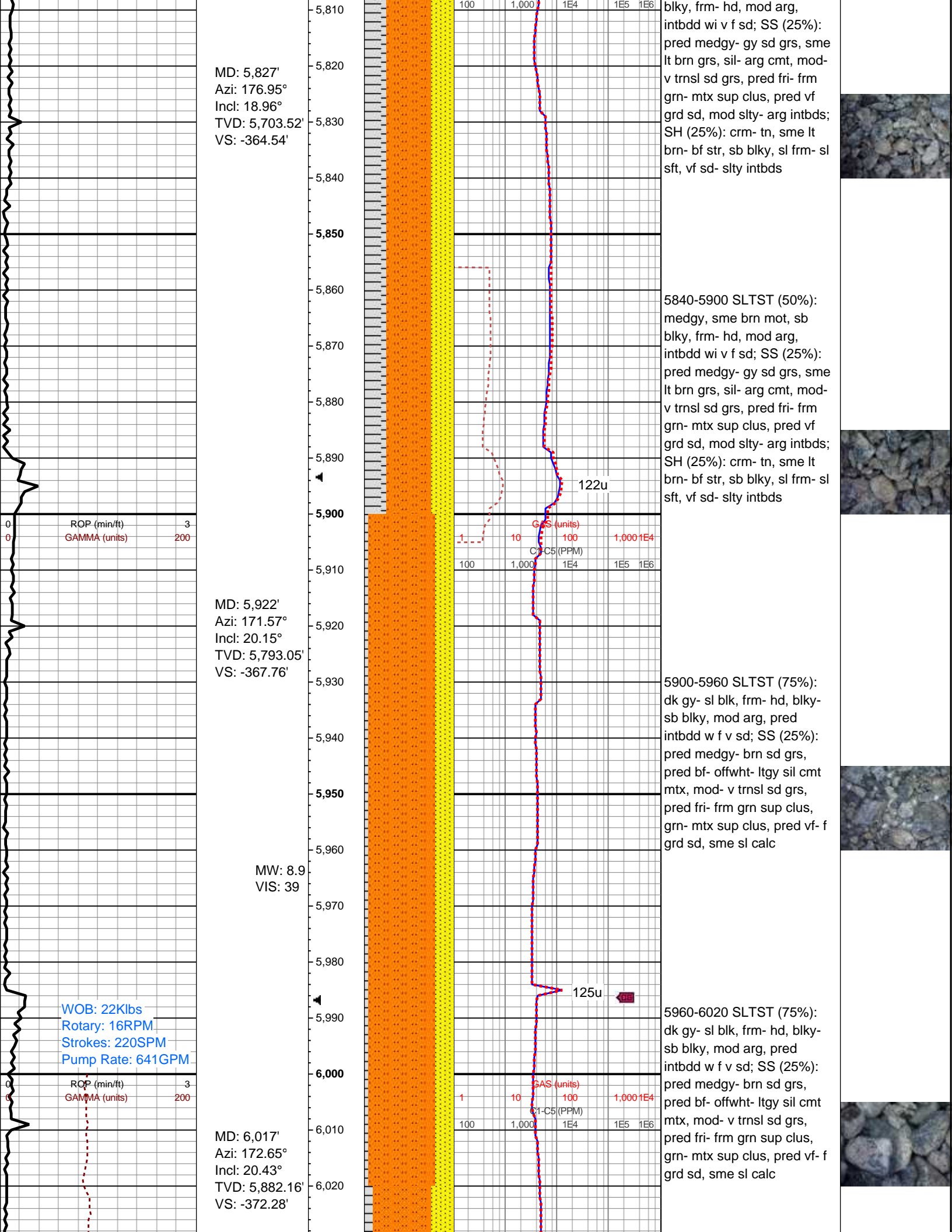
5600-5660 SS (45%): pred medgy- gy sd grs, sme lt brn grs, abnt offwht- lt brn cmt, mod dk gy arg cmt, mod- v trnsd sd grs, pred fri- frm grn sup clus, ip frm- fri mtz sup clus, pred vf grd sd, mod slty- arg intbds; SH (35%): crm- tn, sme lt brn- bf str, sb blk, sl frm- sl sft, vf sd- slty intbds; SLTST (20%): medgy, sme brn mot, sb blk, frm- hd, intbdd wi v f sd

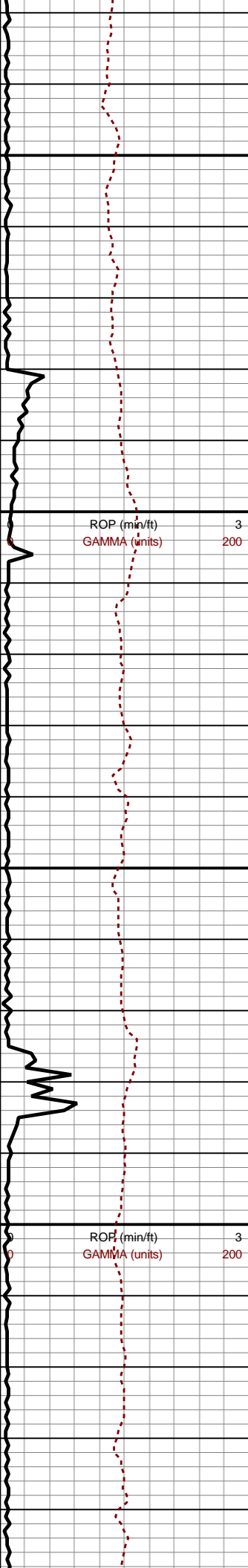
5660-5720 SS (40%): pred medgy- gy sd grs, sme lt brn grs, abnt offwht- lt brn cmt, mod dk gy arg cmt, mod- v trnsd sd grs, pred fri- frm grn sup clus, ip frm- fri mtz sup clus, pred vf grd sd, mod slty- arg intbds; SH (40%): crm- tn, sme lt brn- bf str, sb blk, sl frm- sl sft, vf sd- slty intbds; SLTST (20%): medgy, sme brn mot, sb blk, frm- hd, intbdd wi v f sd

5720-5780 SLTST (50%): medgy, sme brn mot, sb blk, frm- hd, mod arg, intbdd wi v f sd; SS (25%): pred medgy- gy sd grs, sme lt brn grs, sil- arg cmt, mod- v trnsd sd grs, pred fri- frm grn- mtz sup clus, pred vf grd sd, mod slty- arg intbds; SH (25%): crm- tn, sme lt brn- bf str, sb blk, sl frm- sl sft, vf sd- slty intbds

5780-5840 SLTST (50%): medgy, sme brn mot, sb

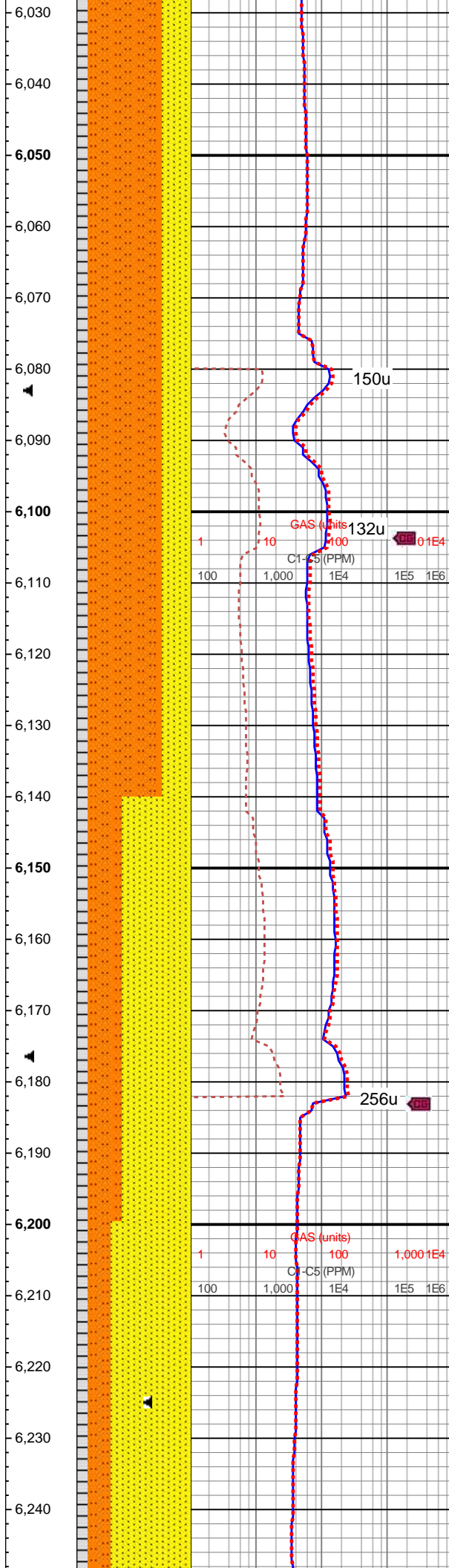






MD: 6,111'
Azi: 172.62°
Incl: 21.07°
TVD: 5,970.06'
VS: -376.55'

MD: 6,206'
Azi: 167.62°
Incl: 17.34°
TVD: 6,059.76'
VS: -381.78'



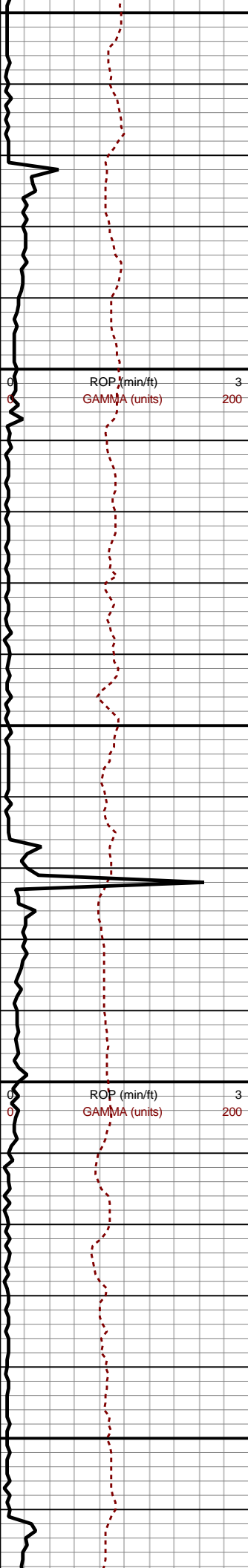
6020-6080 SLTST (65%):
dk gy- sl blk, frm- hd, blk-
sb blk, mod arg, pred
intbdt w f v sd; SS(35%):
pred medgy- brn sd grs,
pred bf- offwht- ltgy sil cmt
mtx, mod- v trnsd sd grs,
pred fri- frm grn sup clus,
grn- mtx sup clus, pred vf- f
grd sd, sme sl calc

6080-6140 SLTST (55%):
dk gy- sl blk, frm- hd, blk-
sb blk, mod arg, pred
intbdt w f v sd; SS (45%):
pred medgy- brn sd grs,
pred bf- offwht- ltgy sil cmt
mtx, mod- v trnsd sd grs,
pred fri- frm grn sup clus,
grn- mtx sup clus, pred vf- f
grd sd, sme sl calc

6140-6200 SS (60%): pred
medgy- brn sd grs, pred bf-
offwht- ltgy sil cmt mtx, mod-
v trnsd sd grs, pred fri- frm
grn sup clus, grn- mtx sup
clus, pred vf- f grd sd, sme
sl calc; SLTST (40%): dk gy-
sl blk, frm- hd, blk- sb blk,
mod arg, pred intbdt w f v
sd

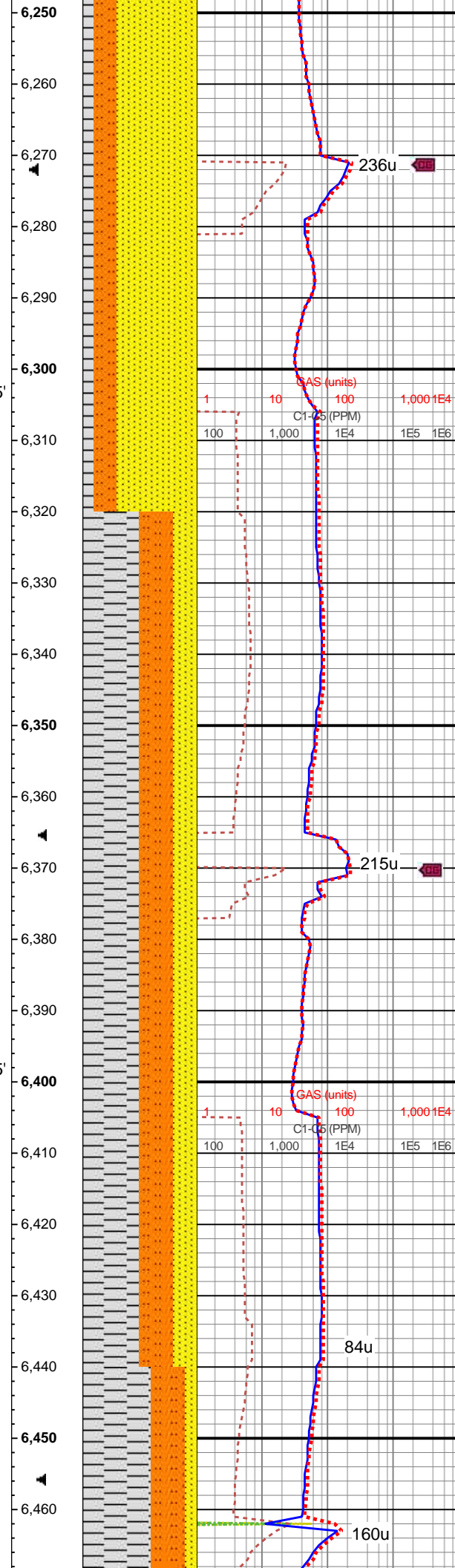
6200-6260 SS (70%): pred
medgy- brn sd grs, pred bf-
offwht- ltgy sil cmt mtx, sme
dk arg cmt, mod- v trnsd sd
grs, pred fri- frm grn sup
clus, sme mtx sup clus,
pred vf- f grd sd, sme sl
calc; SLTST (30%): dk gy- sl





MD: 6,300'
Azi: 170.53°
Incl: 18.29°
TVD: 6,149.25'
VS: -387.21'

MD: 6,395'
Azi: 170.74°
Incl: 19.42°
TVD: 6,239.15'
VS: -392.2'



calc; SLTST (30%): dk gy- sl
blk, frm- hd, blk- sb blk,
mod arg, pred intbdd w f v
sd

236u

6260-6320 SS (70%): pred
medgy- brn sd grs, pred bf-
offwh- ltgy sil cmt mtx, sme
dk arg cmt, mod- v trnsi sd
grs, pred fri- frm grn sup
clus, sme mtx sup clus,
pred vf- f grd sd, sme sl
calc; SLTST (30%): dk gy- sl
blk, frm- hd, blk- sb blk,
mod arg, pred intbdd w f v
sd

6320-6380 SH (50%): lt
gy-gy, med frm-frm, l-mod
fis rd-sb blk-ctgs, sdy-slt
ip grdg to v arg SS, non calc,
SLTST (30%): v dk gy, frm,
med-hi fis ang-pty brit silc
ctgs, silc vn ip, occ vf-f sd
grs, tr vf pyr, non calc, SS
(20%): off wh-lt gy, mod srt
vf-u f sd grs, sli fri gr-mtx
sup ss clus cons wi arg
cmt, pred non calc, rr calc
grs ip

215u

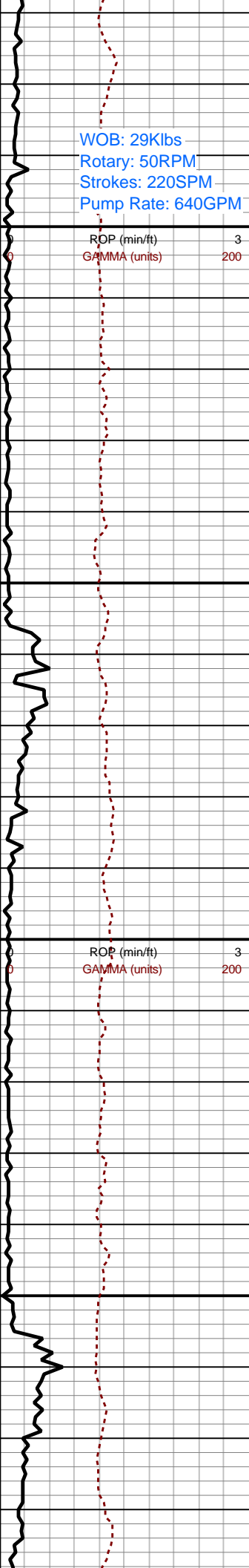
6380-6440 SH (50%): lt
gy-gy, med frm-frm, l-mod
fis rd-sb blk-ctgs, sdy-slt
ip grdg to v arg SS, non calc,
SLTST (30%): v dk gy, frm,
med-hi fis ang-pty brit silc
ctgs, silc vn ip, occ vf-f sd
grs, tr vf pyr, non calc, SS
(20%): off wh-lt gy, mod srt
vf-u f sd grs, sli fri gr-mtx
sup ss clus cons wi arg
cmt, non-l calc

84u

6440-6500 SH (60%): lt
gy-gy, med frm-frm, l-mod
fis sb rd-sb blk-ctgs, sdy-
slty ip, non calc, SLTST
(30%): v dk gy, frm, med-hi
fis ang-pty brit silc ctgs, occ
vf-f sd grs & sdy lamn, tr vf

160u

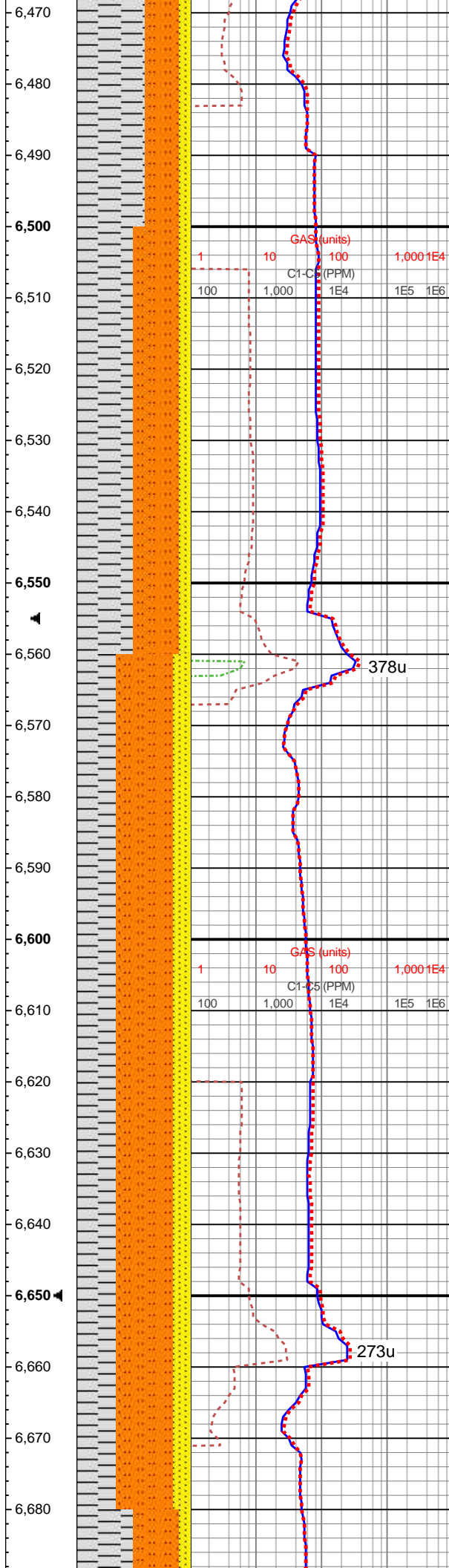




MD: 6,489'
Azi: 171.58°
Incl: 21.42°
TVD: 6,327.24'
VS: -397.23'

MD: 6,583'
Azi: 168.7°
Incl: 20.26°
TVD: 6,415.09'
VS: -402.93'

MD: 6,678'
Azi: 170.5°
Incl: 18.48°
TVD: 6,504.71'
VS: -408.64'



pyr, non calc, SS (10%): off wh-lt gy, mod srted vf-u f sd grs, med frm-sli fri pred mtz sup ss clus cons wi arg cmt grdng to sh ip, gr sup ip, non-l calc

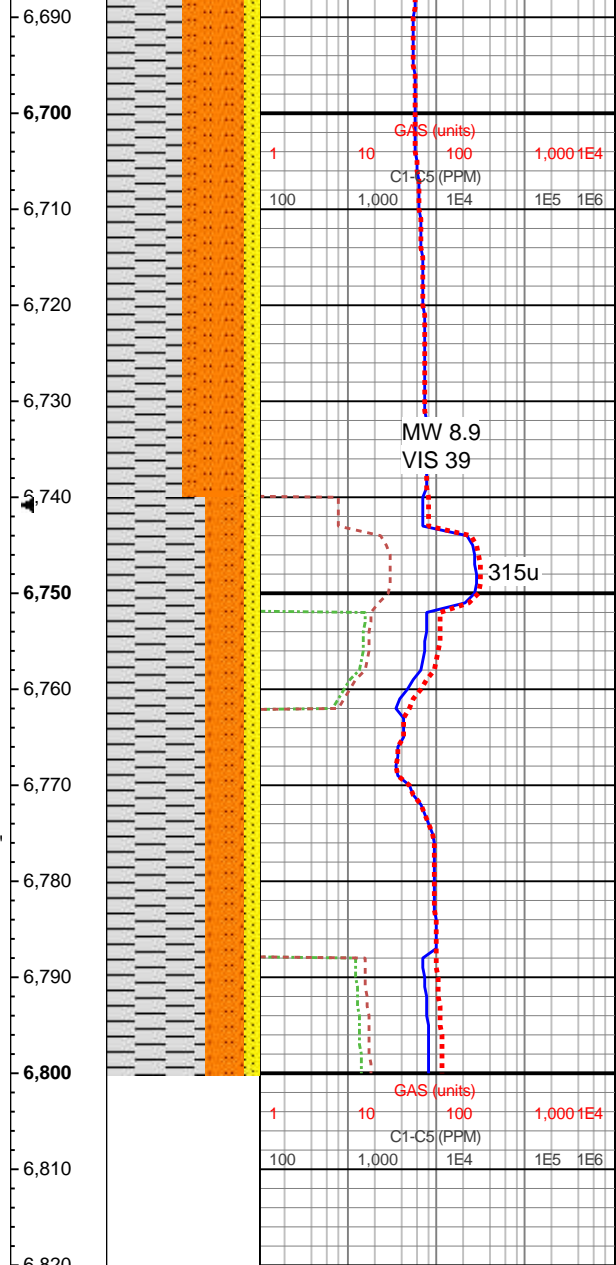
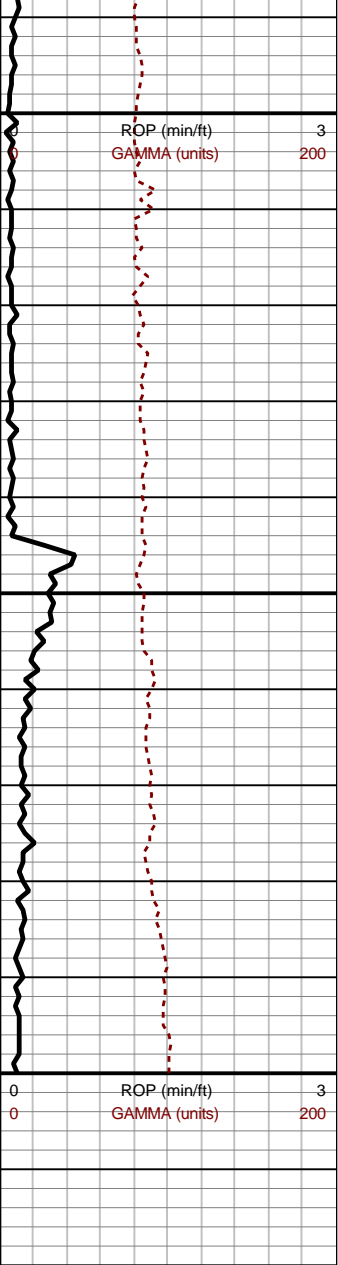
6500-6560 SH (50%): lt gy-gy, med frm-frm, l-mod fis sb rd-sb blkly tab ctgs, sdy-slty ip, non calc, SLTST (40%): v dk gy, frm, med-hi fis ang-plty brit silc ctgs, occ vf-f sd grs & sdy lamn & intbds, tr vf pyr, non calc, SS (10%): off wh-lt gy, mod srted vf-u f sd grs, med frm-sli fri pred mtz sup ss clus cons wi arg cmt grdng to sh ip, gr sup ip, non-l calc

6560-6620 SLTST (50%): v dk gy, frm, med-hi fis ang-plty brit ctgs, occ vf-f sd grs & sdy lamn & intbds, tr vf pyr, silc & non calc, SH (35%): lt gy-gy, med frm-frm, l-mod fis sb rd-sb blkly tab ctgs, sdy-slty ip, non calc, SS (15%): off wh-lt gy, mod srted vf-u f sd grs, med frm-sli fri pred mtz sup ss clus cons wi arg cmt grdng to sh ip, gr sup ip, non-l calc

6620-6680 SLTST (50%): v dk gy, frm, med-hi fis ang-plty brit ctgs, occ vf-f sd grs & sdy lamn & intbds, tr vf pyr, silc & non calc, SH (35%): lt gy-gy, med frm-frm, l-mod fis sb rd-sb blkly tab ctgs, sdy-slty ip, non calc, SS (15%): off wh-lt gy, mod srted vf-u f sd grs, med frm v fri-frm sli fri silc gr-arg mtz sup ss clus cons wi silc cmt & arg cmt, non-l calc

6680-6740 SH (50%): lt gy-gy, med frm-frm, l-mod





fis sb rd-sb blkly tab ctgs, sdy-slty ip, non calc, SLTST (40%): v dk gy, frm, med-hi fis ang-pty brit silc ctgs, occ vf-f sd grs & sdy lamn & intbds, tr vf pyr, non calc, SS (10%): off wh-lt gy, mod srted vf-u f sd grs, med frm-sli fri pred mtx sup ss clus cons wi arg cmt grd to sh ip, gr sup ip, non-l calc

6740-6800 SH (65%): lt gy-gy, med frm-frm, l-mod fis sb rd-sb blkly tab ctgs, pred sm tex, occ sdy-slty ip, non calc, SLTST (25%): v dk gy, frm-brit, med-hi fis ang-pty ctgs, tr vf pyr, silc, rr sdy intbds & lamn, non calc, wi intbdd SS (10%): off wh-lt gy, mod srted vf-u f sd grs, med frm-sli fri pred mtx sup ss clus cons wi arg cmt grd to sh ip, gr sup ip, non-l calc

Continued on horizontal log