



Scale: 5" / 100'
Measured Depth Log

Well Name Wells Ranch BB09-665

Location Section 9,10,11, T5N R63W

State Colorado County Weld

Country United States Rig Number H&P 321

API Number 05-123-44967 Field Wattenberg

Geographic Region DJ Basin

Spud Date 8/23/2018

Surface Coordinates 675 FNL 235 FWL Sec: 11 T5N R63W

Bottom Hole Coordinates 16xx FNL 5xx FWL Sec: 9 T5N R63W

Ground Elevation 4685 K.B. Elevation 4715

Logged Interval 6000

Formation Codell

Type of Drilling Fluid OBM

Operator

Company Noble Energy, Inc.

Address 1625 Broadway Suite 2200
Denver, CO 80202



Geologist


Name Renee Clackler


Company Noble Energy Inc


Other


Wellsite Geologist Mark Weirdspon, Isaac Crenson


Color Coding


 Oil


 Note


 Error


 Condensate

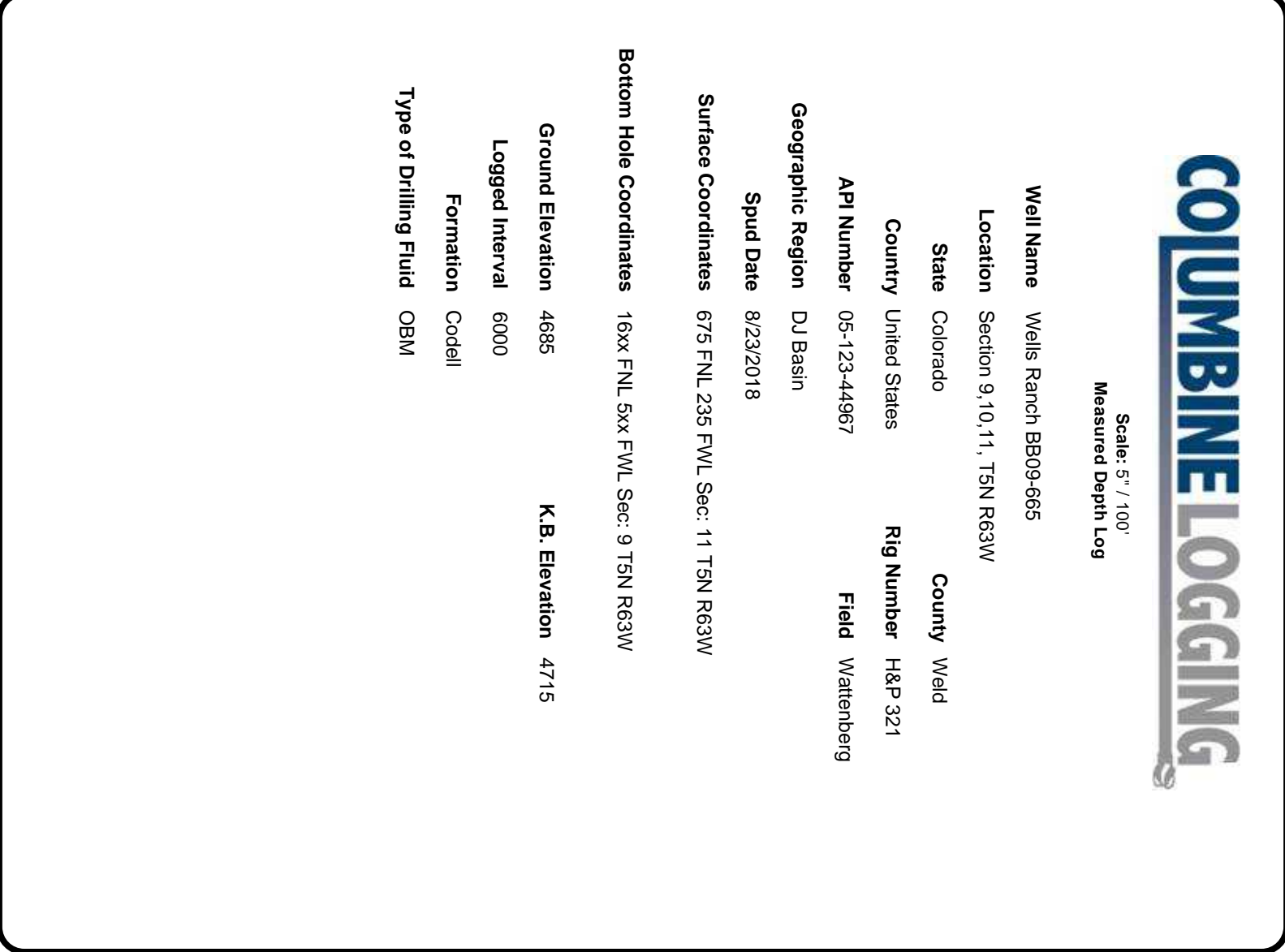
 Core

 Water

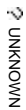





















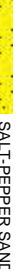











 Gas

 Pressure

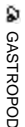

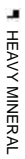





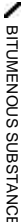


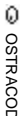
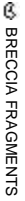

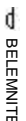


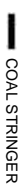




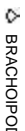


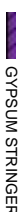

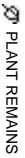


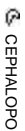
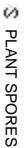
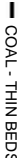


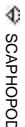




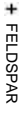

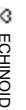


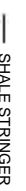

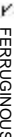
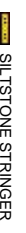

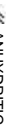




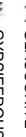
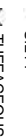
 Seal



Rock Types

 UNKNOWN	 COAL	 MARLSTONE	 SHALY SANDSTONE
 ANHYDRITE	 CONGLOMERATE	 METAMORPHIC	 SHALY SILTSTONE
 BENTONITE	 DOLOMITE	 NO SAMPLE	 SILTY SHALE
 BRECCIA	 DOLOMITIC LIMESTONE	 SALT	 SILTSTONE
 CHALK	 GRANITE	 SANDSTONE	 TILL
 CEMENT	 GYPSUM	 SALT-PEPPER SAND	 TUFF
 CHERT	 IGNEOUS	 SHALE	 WELDED TUFF
 CLAY CHOKE SAND	 SIDERITE or LIMONITE	 SHALE COLORED	
 CLAYSTONE	 LIMESTONE	 SHALE GRAY	







Accessories

 GASTROPOD	 ARGILLITE GRAIN	 HEAVY MINERAL	
 INOCERAMUS	 B BENTONITE	 K KAOLIN	
 ALGAE	 Ø OOLITE	 BITUMENOUS SUBSTANCE	 ANHYDRITE STRINGER
 AMPHIPORA	 O OSTRACOD	 BRECCIA FRAGMENTS	 BENTONITE STRINGER
 BELEMNITE	 P PELECYPOD	 C CALCAREOUS	 COAL STRINGER
 BIOCLASTIC	 P PELLET	 CARBONACEOUS FLAKES	 DOLOMITE STRINGER
 BRACHIOPOD	 P PISOLITE	 ▲ CHTDK	 GYPSUM STRINGER
 BRYOZOA	 P PLANT REMAINS	 ▲ CHTL	 LIMESTONE STRINGER
 CEPHALOPOD	 S PLANT SPORES	 — COAL - THIN BEDS	 MARLSTONE (CALC) STRG
 CORAL	 S SCAPHOPOD	 L DOLOMITIC	 MARLSTONE (DOL) STRG
 CRINOID	 S STROMATOPOROID	 + FELDSPAR	 SANDSTONE STRINGER
 ECHINOID	 ● FERRUGINOUS PELLET	 \$ SIDERITE	 — SHALE STRINGER
 FISH	Minerals	 > FERRUGINOUS	 SILTSTONE STRINGER
 FORAMINIFERA	 // ANHYDRITIC	 > GLAUCONITE	 > SILTY
 F FOSSIL	 — ARGILLACEOUS	 > GYPSIFEROUS	 > TUFFACEOUS

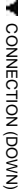










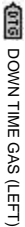

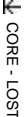

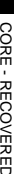
Oil Show

 P PINPOINT
 V VUGGY

Engineering

 D DEAD	
 ● EVEN	
 ○ QUESTIONABLE	 BIT
 ● SPOTTED STAINING	 ▲ CONNECTION (UP)

Porosity

 ▼ CONNECTION (DOWN)	 CONNECTION GAS
 E EARTHY	 CONNECTION GAS (LEFT)
 F FENESTRAL	 TRIP GAS
 F FRACTURE	 TRIP GAS (LEFT)
 X INTERCRYSTALLINE	 DOWN TIME GAS
 Ø INTEROOLITIC	 DOWN TIME GAS (LEFT)
 M MOLDIC	 ↓ CORE - LOST
 O ORGANIC	 ■ CORE - RECOVERED

aw, Andre Florito

ther Symbols

 DST INTERVAL  WIRELINE TESTED - LEFT **E** EARTHY

 FAULT  WIRELINE TESTED - RT **FX** FINELYXLN

 FORMATION TOP  DRILL STEM TEST **GS** GRAINSTONE

 GAS SHOW  **MINDEPTH** MN DEPTH **L** LITHOGRAPHIC


 OIL SHOW **MX** MICROXLN


 **MINDEPTH** MN DEPTH UP **MS** MUDSTONE

Rounding

 **MINDEPTH** MN DEPTH (DOWN) **A** ANGULAR **PS** PACKSTONE

 NORMAL FAULT **R** ROUNDED **WS** WACKESTONE

 OVERTURNED STRATA **B** SUBANG **MS** MUDSTONE

 REVERSE FAULT **P** SUBRND

Sorting

 CASING **M** MODERATE

Textures

 SIDEWALL CORE (LEFT) **P** POOR

 SIDEWALL CORE (RIGHT) **BS** BOUNDSTONE **W** WELL

 SLIDE **C** CHALKY

 SURVEY **CX** CRYPTOXLN

Columbine Logging Inc. Rigged up 2 man logging 08/24/2018. Began Logging at 6000 MD @ 01:38 MDT on 08/25/2018

ROP
ROP —
GAMMA —

ROP Imported from Pason EDR
Gamma Provided by Baker Hughes Directional

Total Gas & Chromatograph

GAS —
C1 - - -
C2 - - -
C3 - - -
C4 - - -

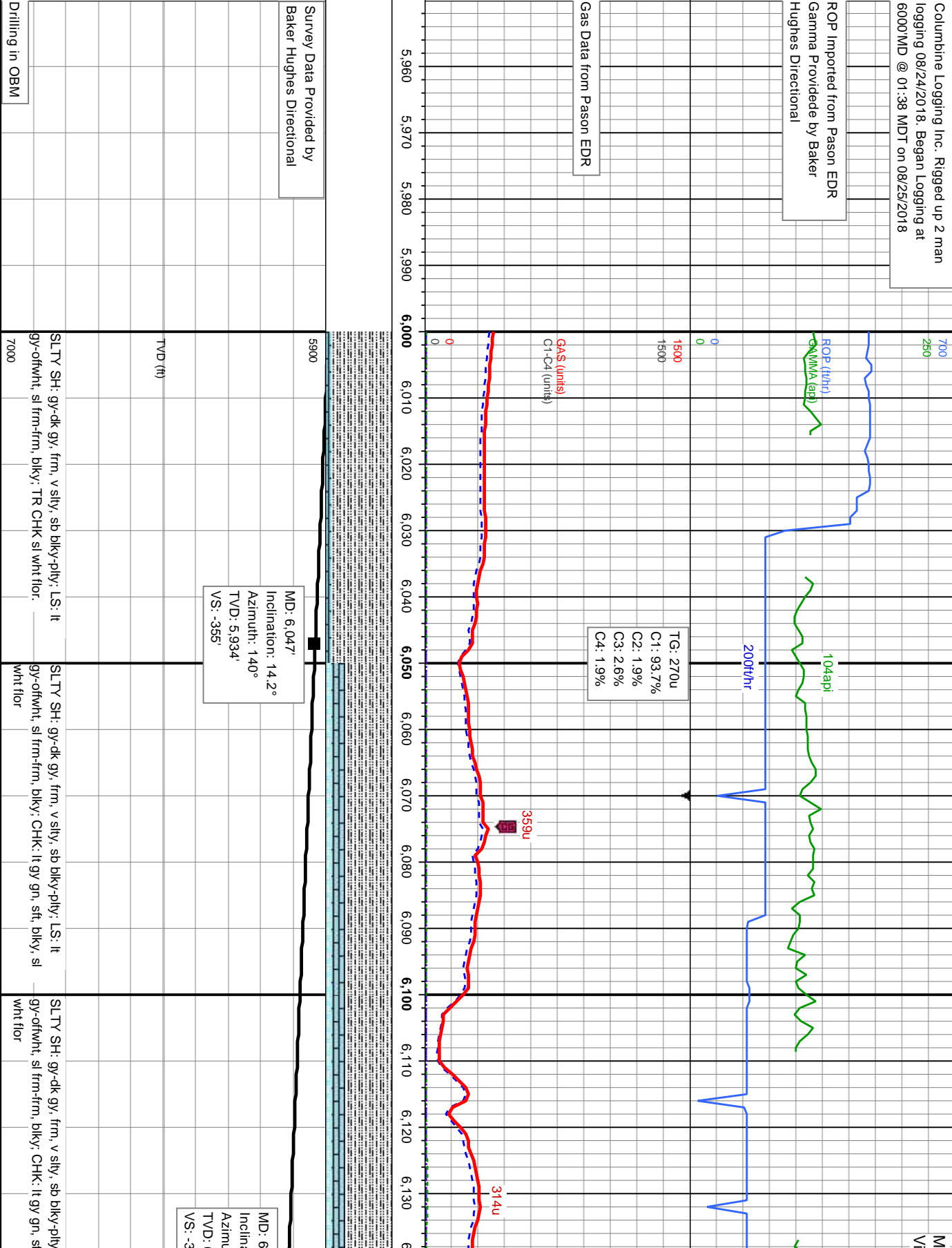
Gas Data from Pason EDR

Depth Labels

% Lith

Well Bore
TVD —

Images



MD: 6.047'
Inclination: 14.2°
Azimuth: 140°
TVD: 5.934'
VS: -355'

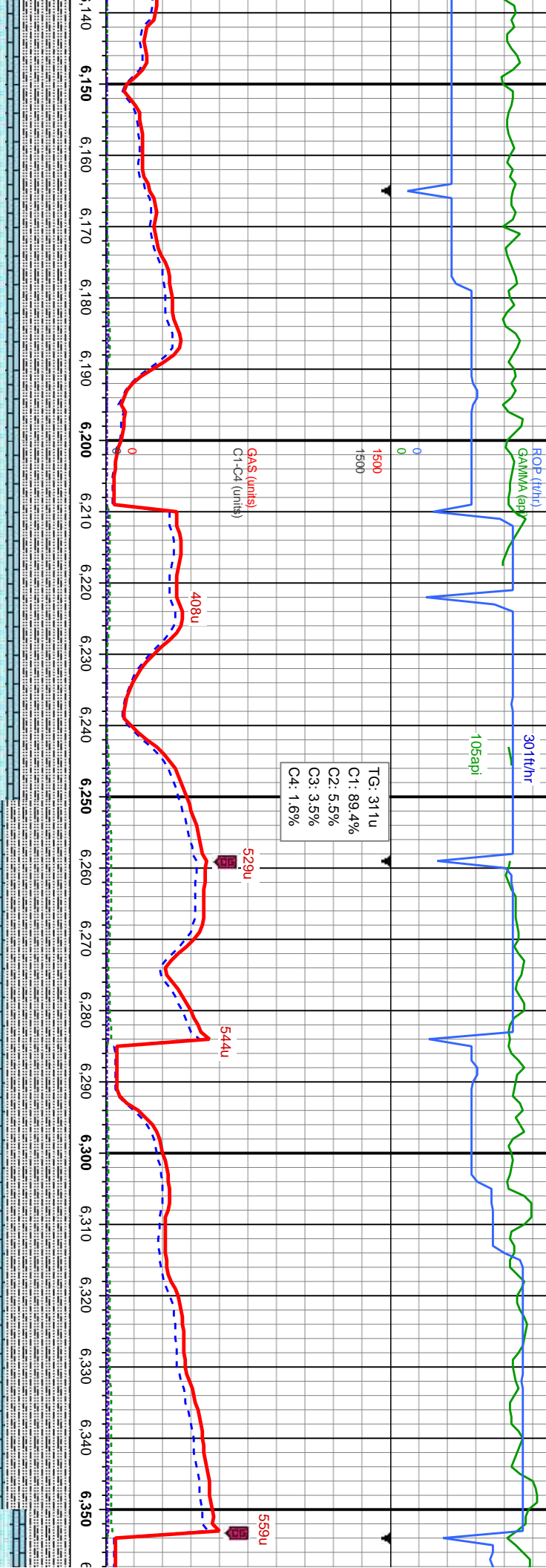
TG: 270u
C1: 93.7%
C2: 1.9%
C3: 2.6%
C4: 1.9%

MD: 6
Inclination
Azimuth
TVD: 1
VS: -3

ud Wt: 9.3
s: 42

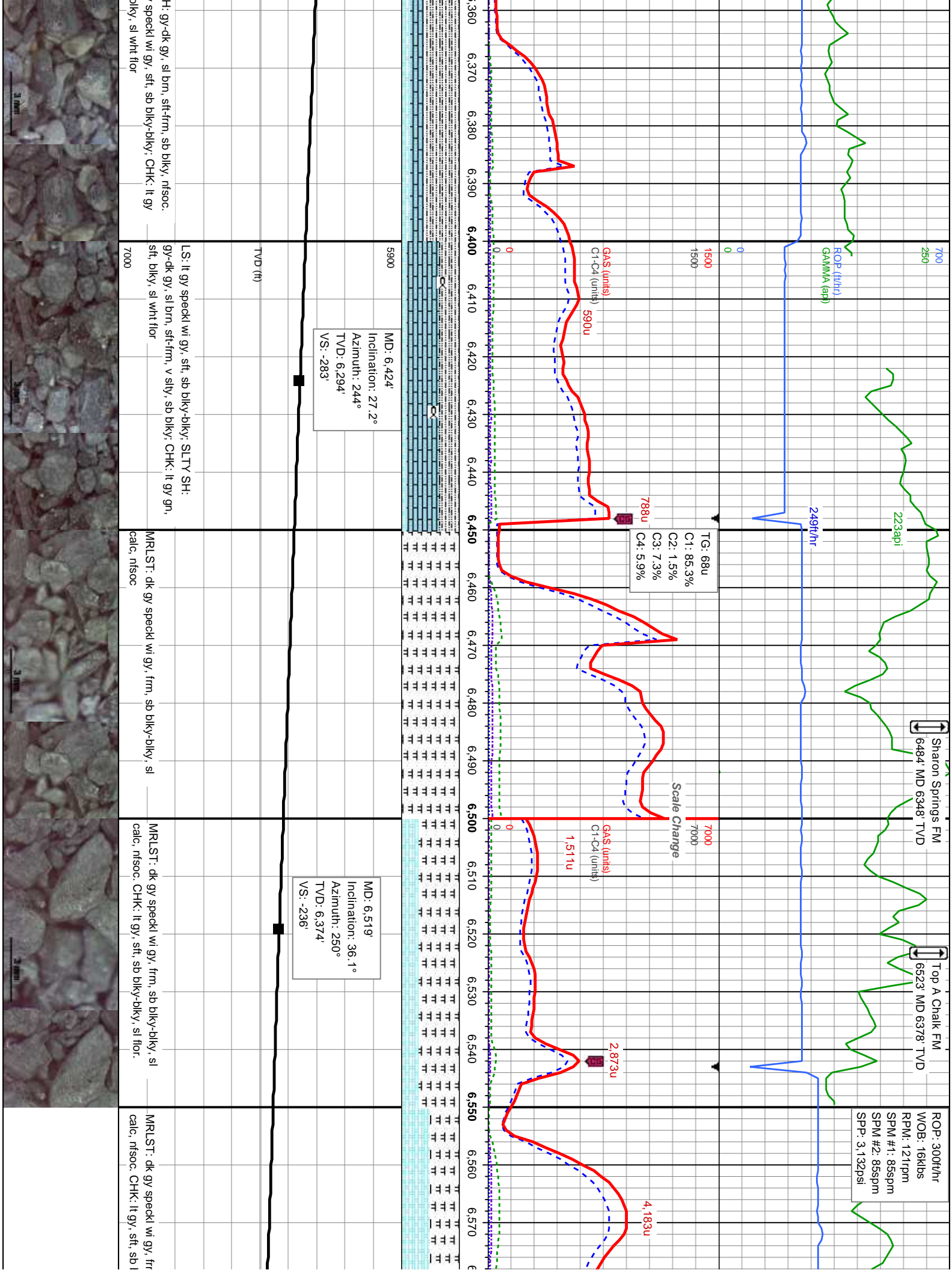
ROP: 150ft/hr
WOB: 13.4klbs
RPM: 122rpm
SPM #1: 85spm
SPM #2: 85spm
SPP: 2.641psi

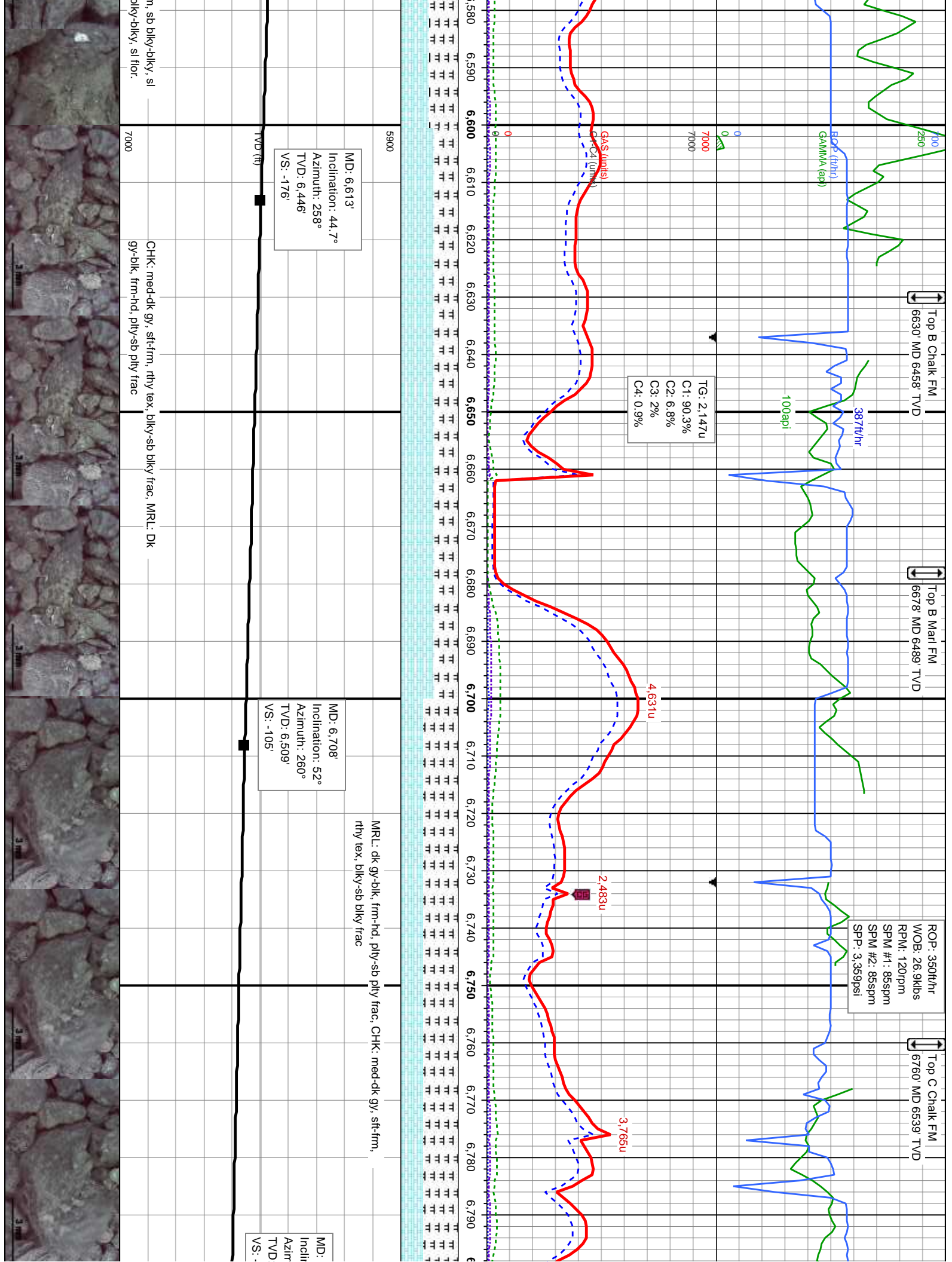
ROP: 326ft/hr
WOB: 14.6klbs
RPM: 121rpm
SPM #1: 85spm
SPM #2: 85spm
SPP: 3.029psi



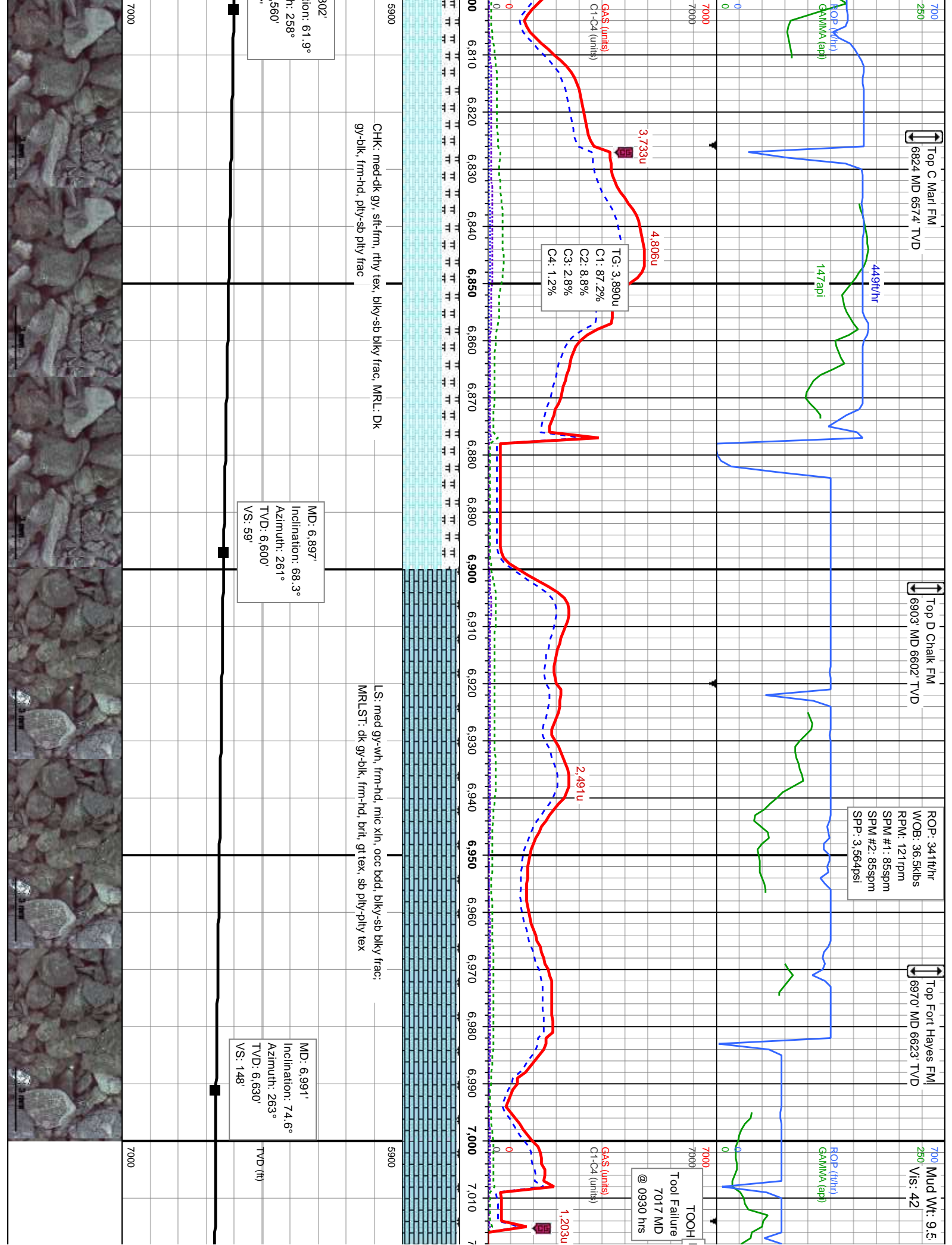
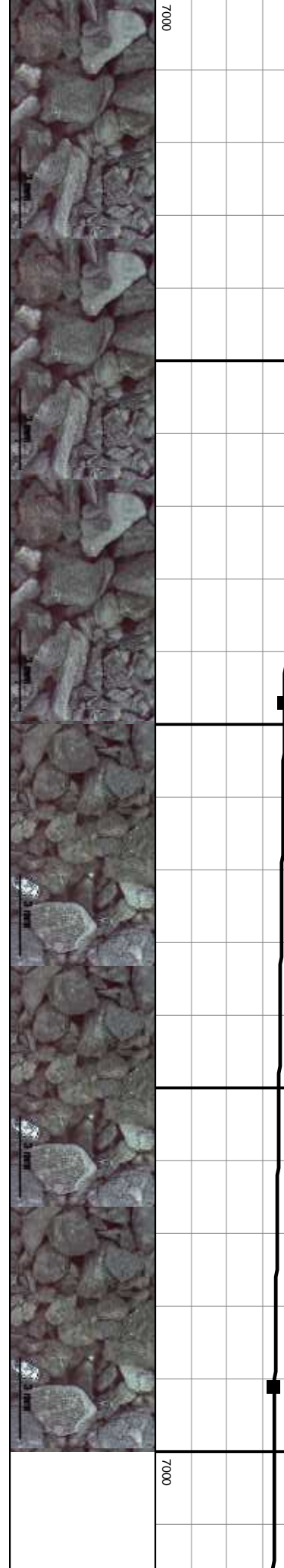
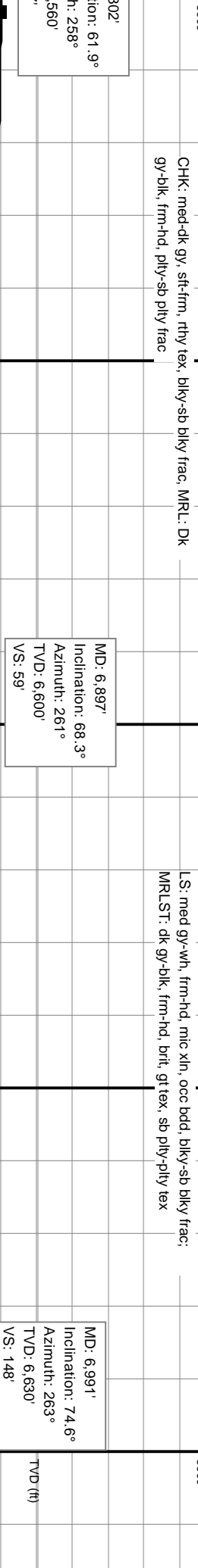
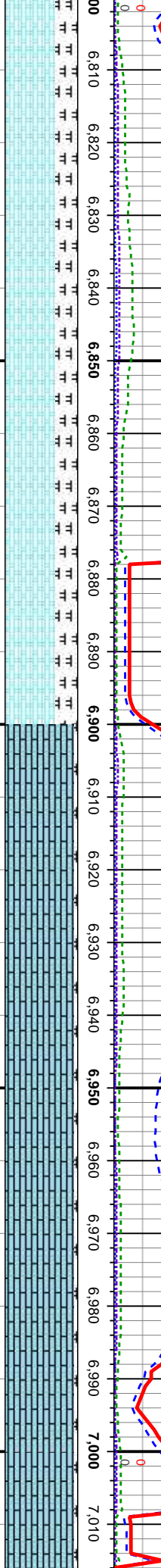
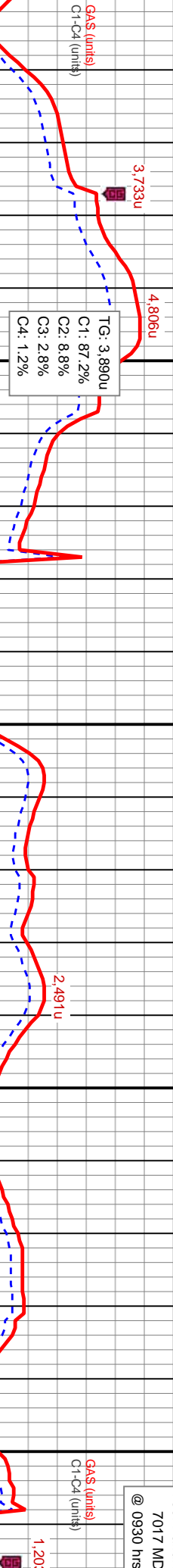
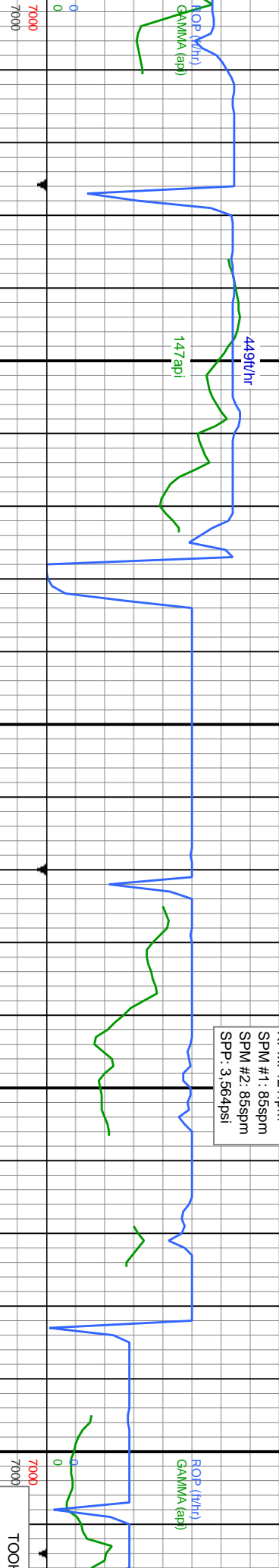
SLTY SH: gy-dk gy, frm, v silty, sb blk-y-pily; LS: lt gy-offwht, sl frm-frm, blk-y; CHK: lt gy gn, sft, blk-y, sl wnt flr	SLTY SH: gy-dk gy, frm, v silty, sb blk-y-pily; LS: lt gy-offwht, sl frm-frm, blk-y; CHK: lt gy gn, sft, blk-y, sl wnt flr	SLTY SH: gy-dk gy, frm, v silty, sb blk-y-pily; LS: lt gy-offwht, sl frm-frm, blk-y; TR CHK sl wnt flr.	SLTY S LS: lt gy, gn, sft, l
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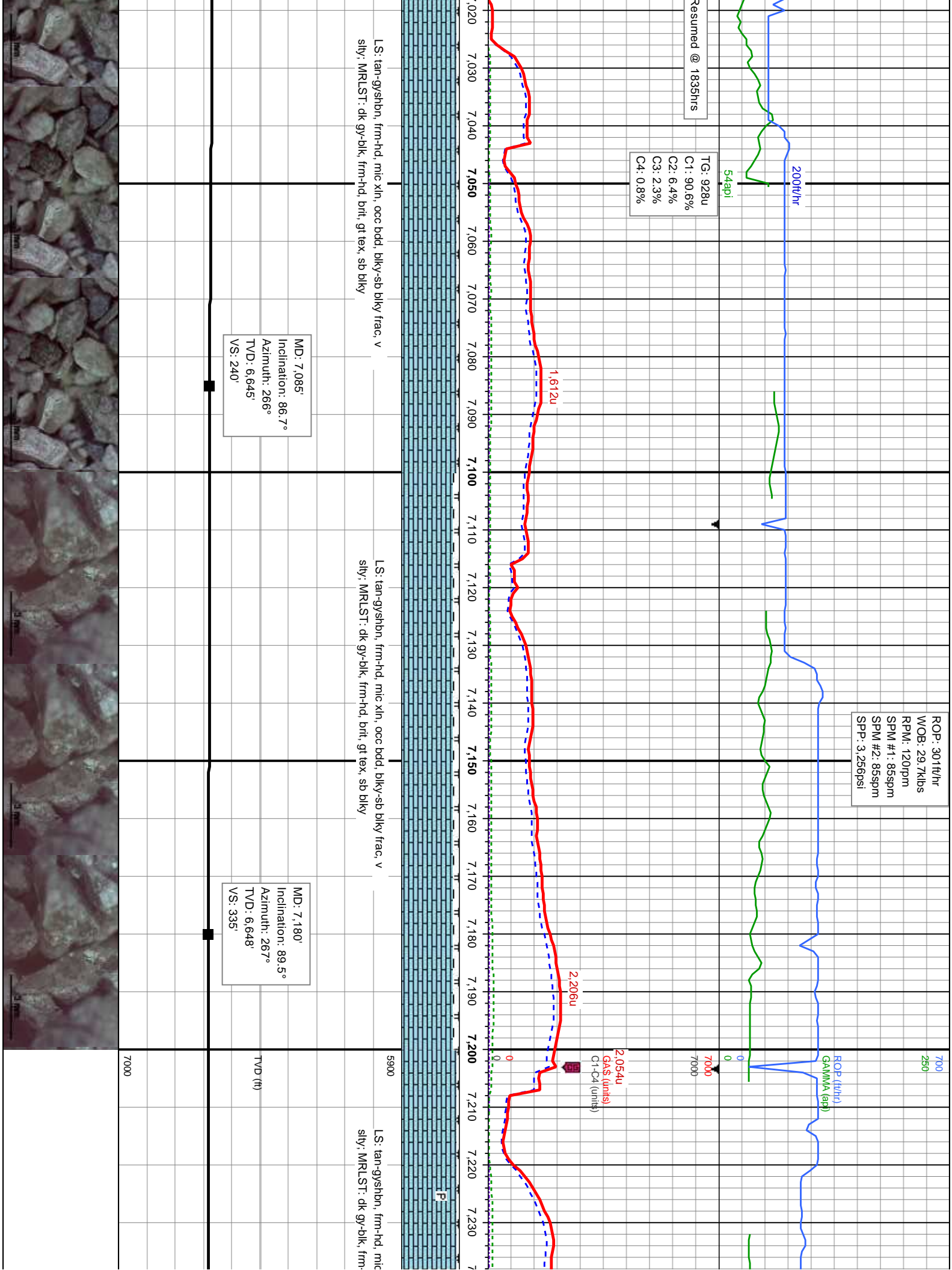


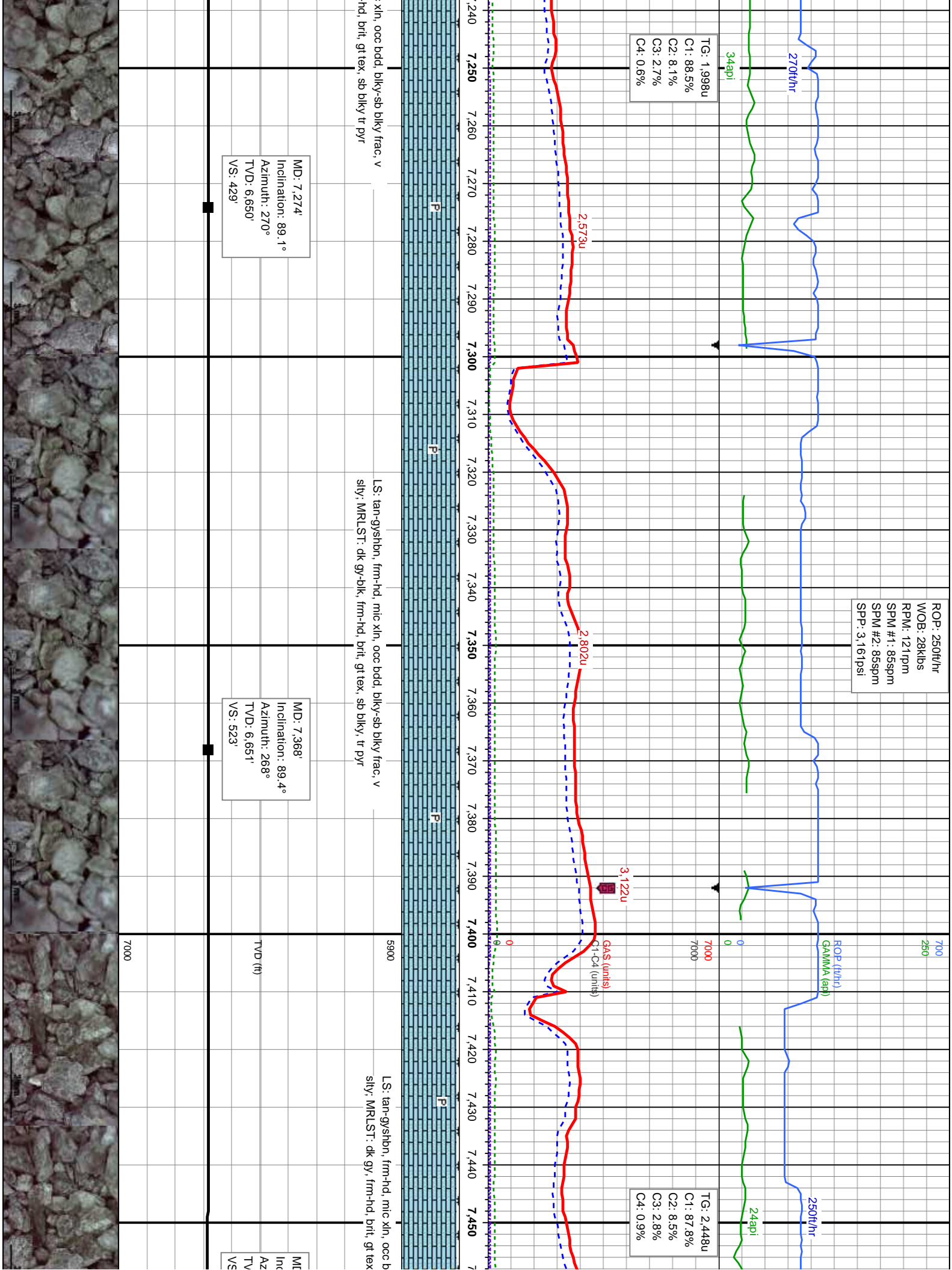




700 250
Top C Marl FM
6824 MD 6574' TVD
Top D Chaik FM
6903 MD 6602' TVD
Top Fort Hayes FM
6970 MD 6623' TVD
700 Mud Wt: 9.5
250 V/S: 42







Top Codell FM
7540' MD 6654' TVD

ROP: 250ft/hr
WOB: 22.8klbs
RPM: 100rpm
SPM #1: 85spm
SPM #2: 85spm
SPP: 3.154psi

ROP (ft/hr)
GAMMA (api)

300ft/hr

68api

TG: 2.570u
C1: 87.1%
C2: 8.6%
C3: 3%
C4: 1.2%

GA\$ (units)
C1-C4 (units)

2.100u

2.863

3.384u

3.646u

2.659u

7.460 7.470 7.480 7.490 7.500 7.510 7.520 7.530 7.540 7.550 7.560 7.570 7.580 7.590 7.600 7.610 7.620 7.630 7.640 7.650 7.660 7.670

P

P

P

P

dd, blkly-sb blkly frac, v
sb blkly, tr pyr
SS: gy speckl wi clt & blk grns, vf-f, sub ang-sub md, p por, ply
cntd; LS: tan-gysbhn, frm-hd, mic xin, occ bdd, blkly-sb blkly
frac, v silty, tr pyr

SS: gy speckl wi clt & blk grns, vf-f, sub ang-sub md, p por, ply
cntd; LS: tan-gysbhn, frm-hd, mic xin, occ bdd, blkly-sb blkly
frac, v silty, tr pyr

SS: gy speckl wi clt & blk grns, vf-f, sub ang-sub md, p por, ply
cntd; LS: tan-gysbhn, frm-hd, mic xin, occ bdd, blkly-sb blkly
frac, v silty, tr pyr

MD: 7.463'
Inclination: 89°
Azimuth: 276°
TVD: 6.652'
VS: 617'

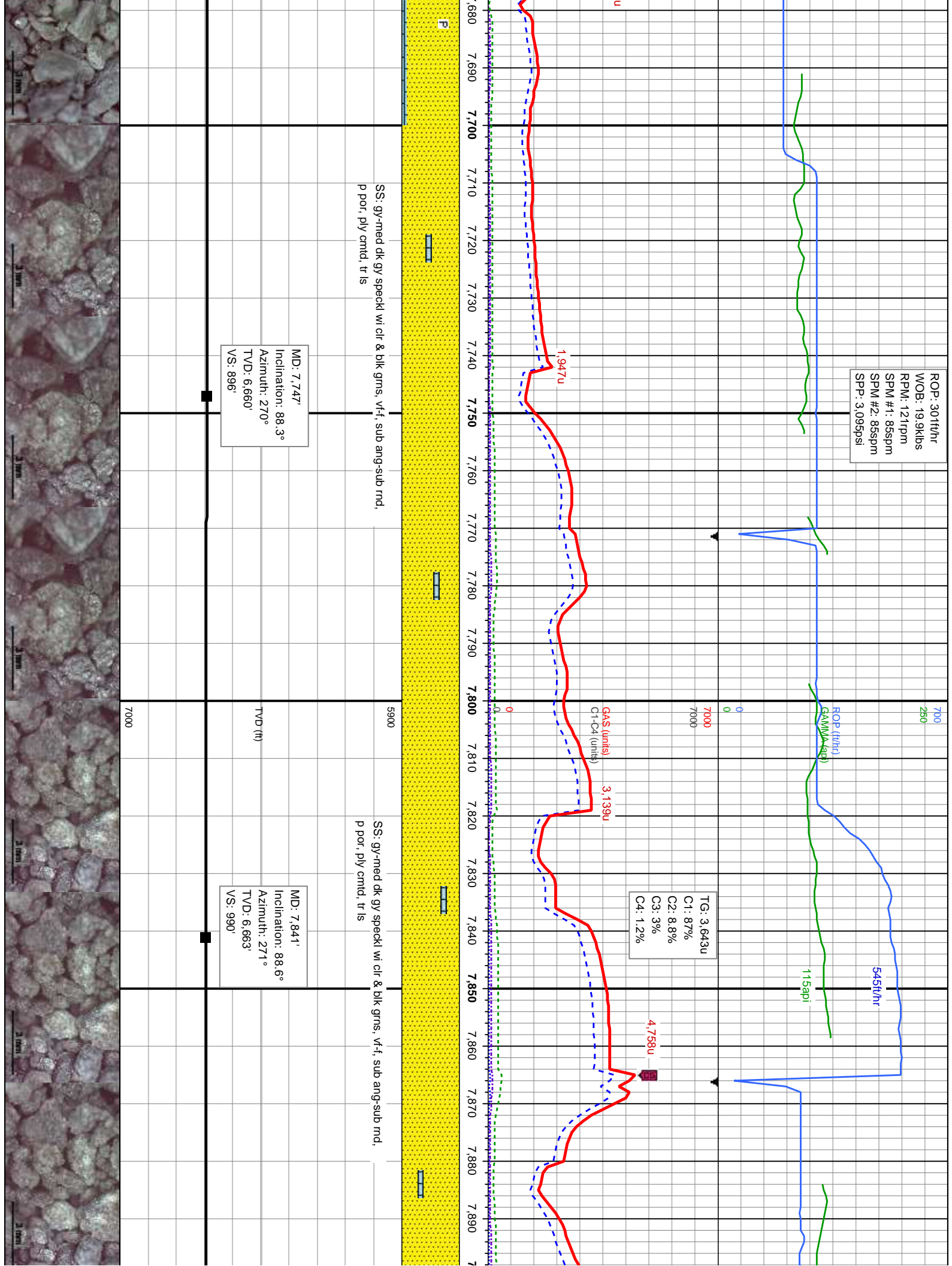
MD: 7.558'
Inclination: 88.1°
Azimuth: 278°
TVD: 6.655'
VS: 710'

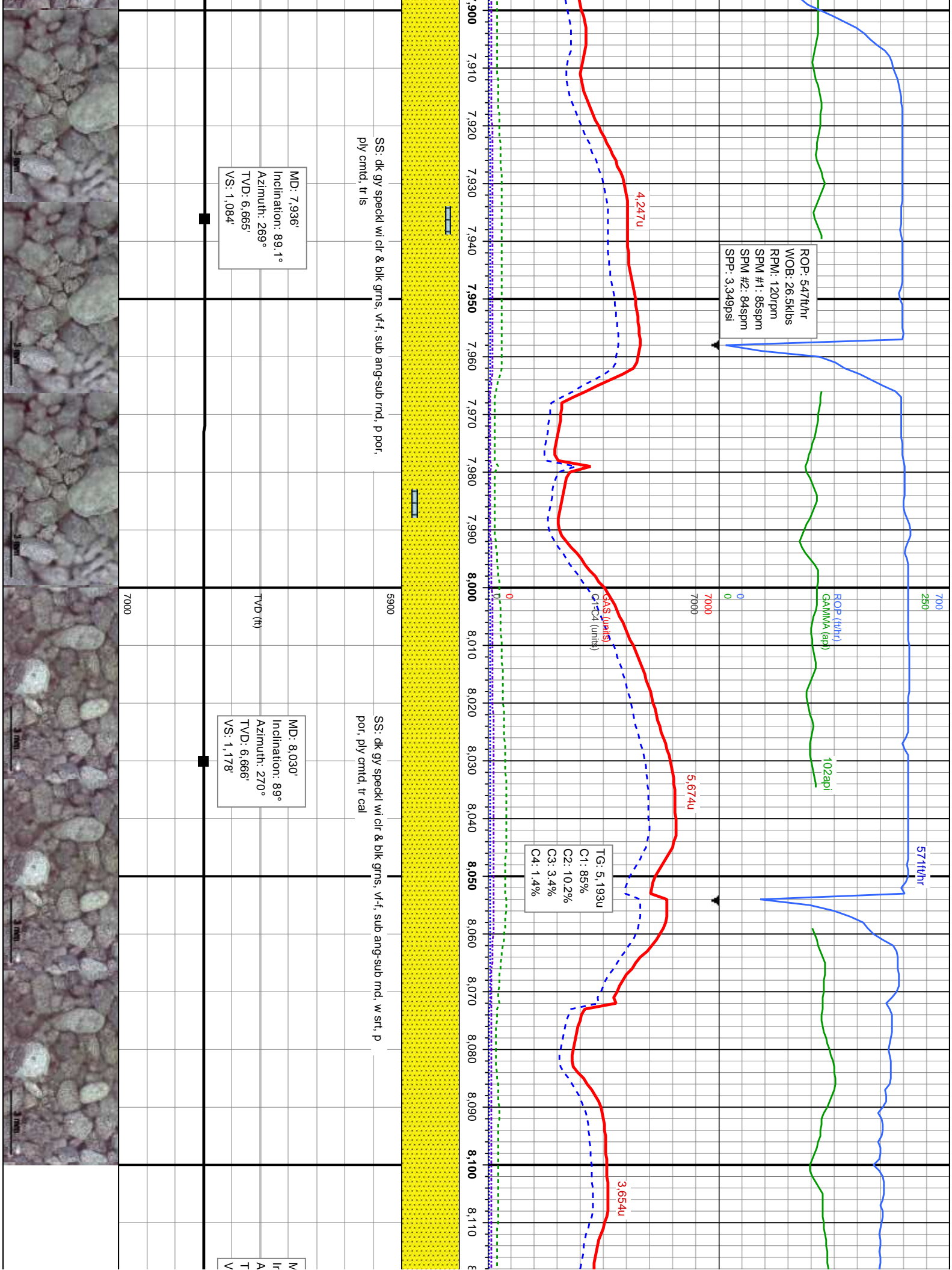
MD: 7.652'
Inclination: 88.3°
Azimuth: 273°
TVD: 6.658'
VS: 802'

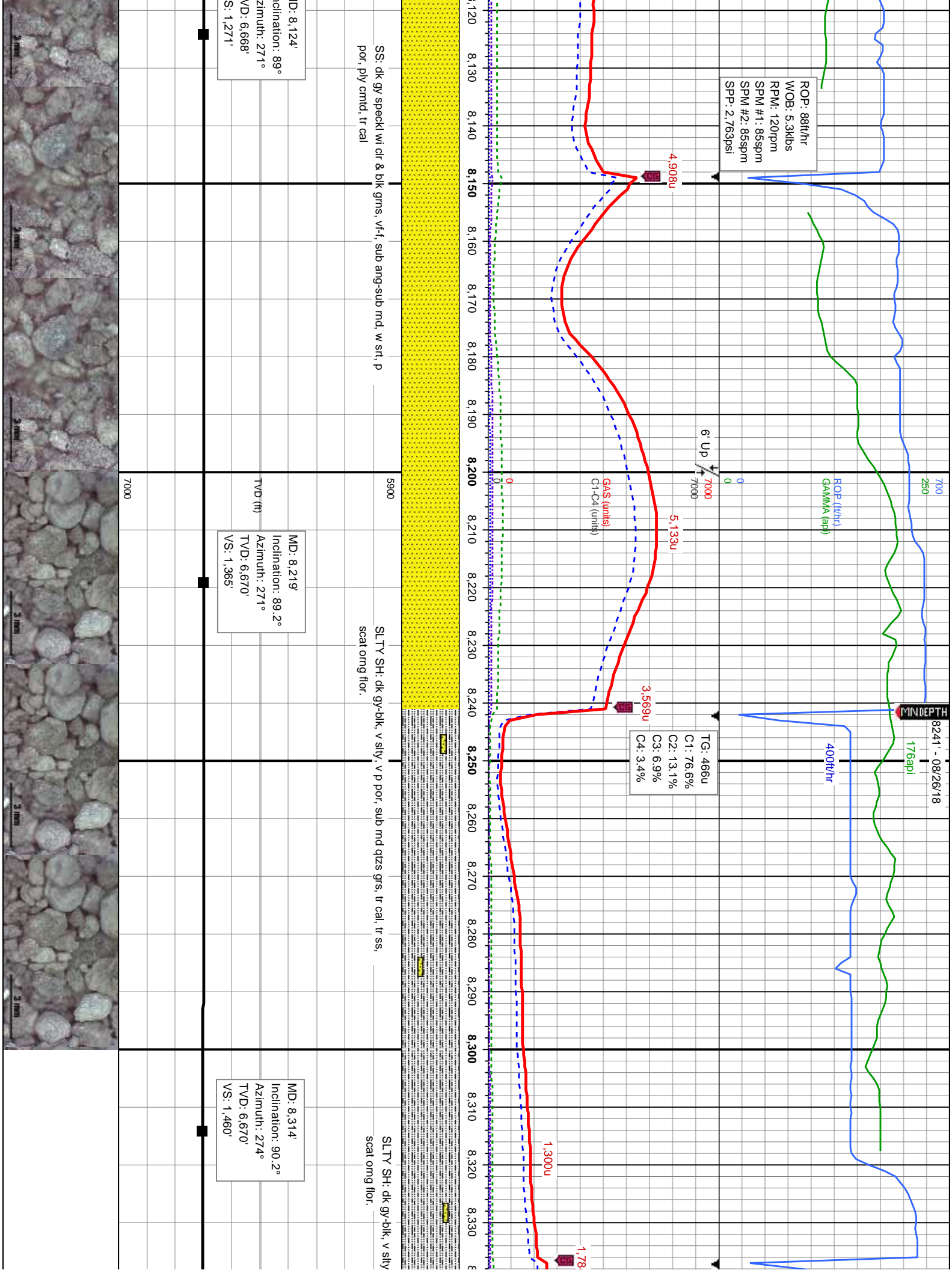
TVD (ft)

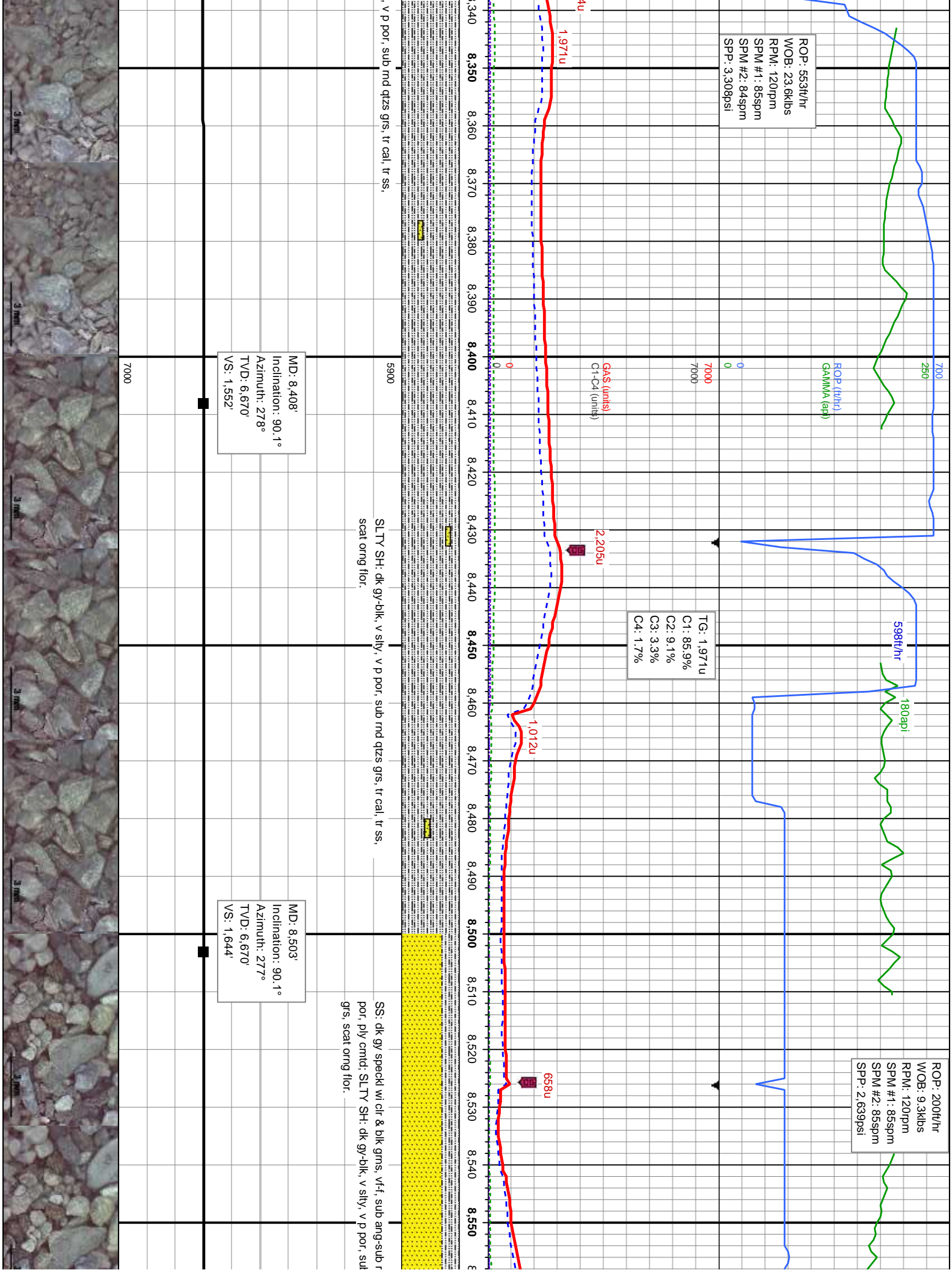
7000

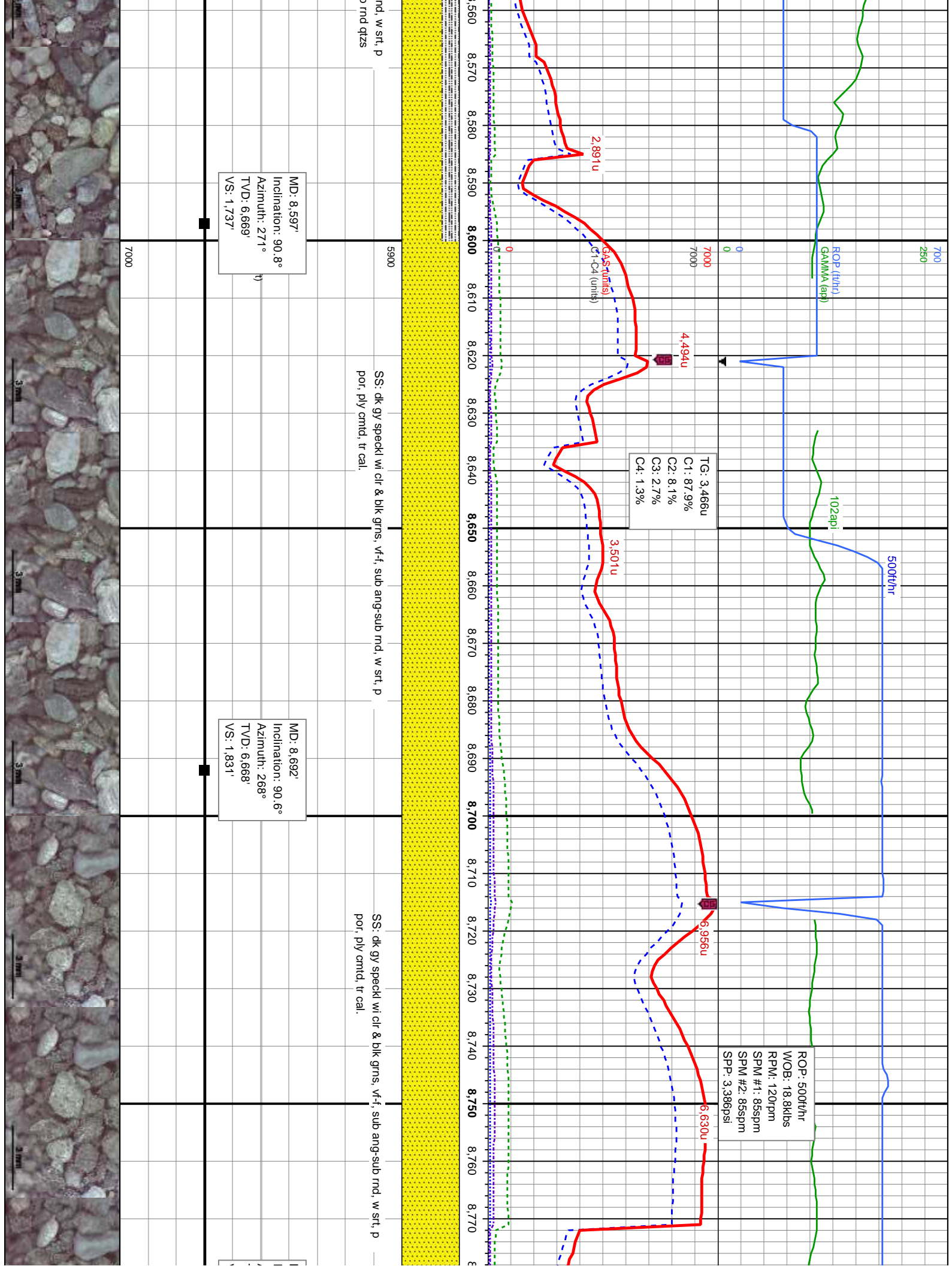


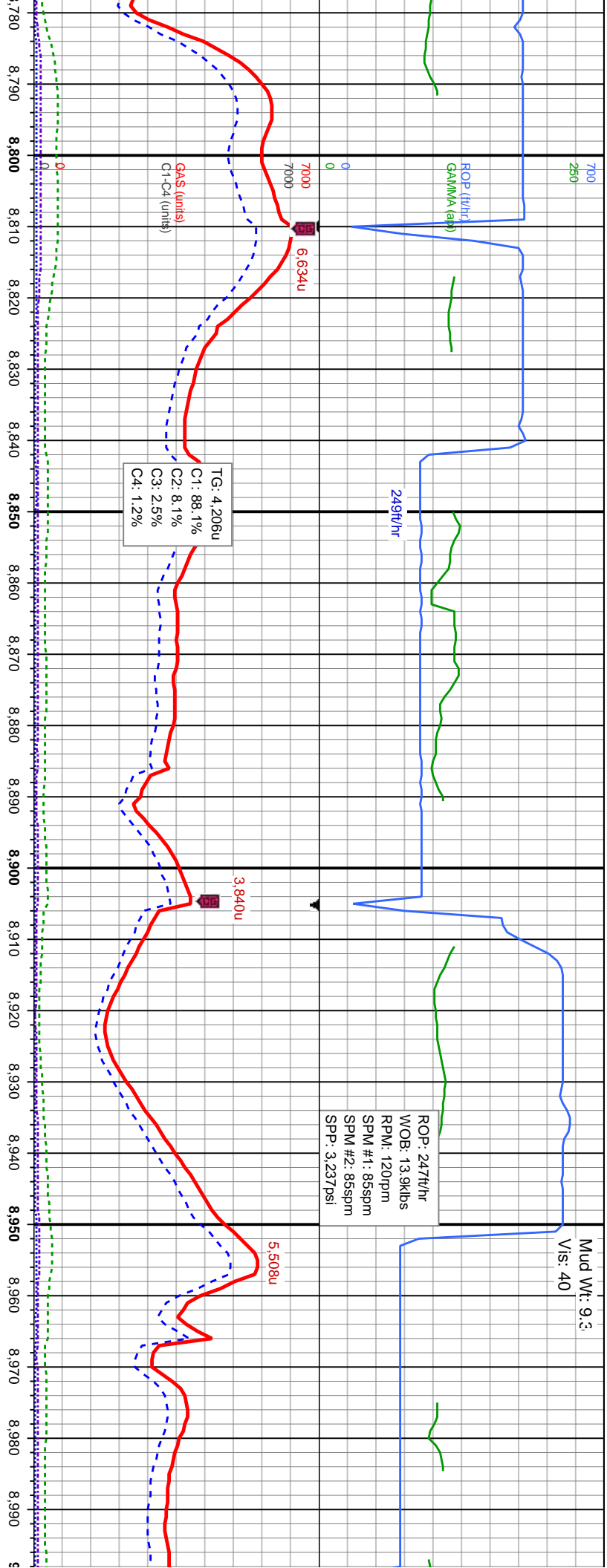












MD: 8,786'
Inclination: 90.5°
Azimuth: 267°
TVD: 6,667'
VS: 1,925'

5900
TVD (ft)

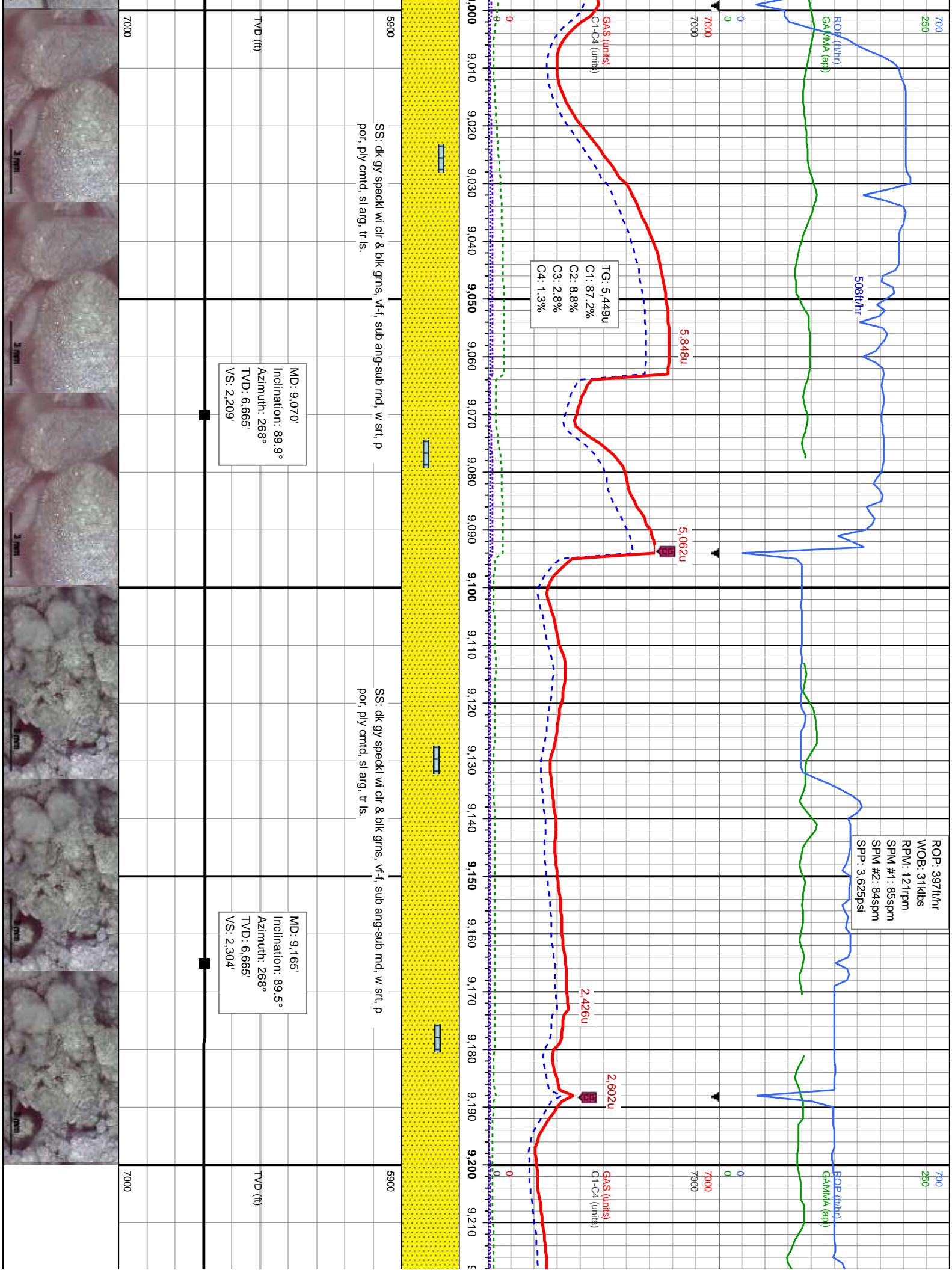
SS: dk gy speckl wi dr & blk grns, vf-f, sub ang-sub rnd, w srt, p
por, ply cmtd, tr cal.

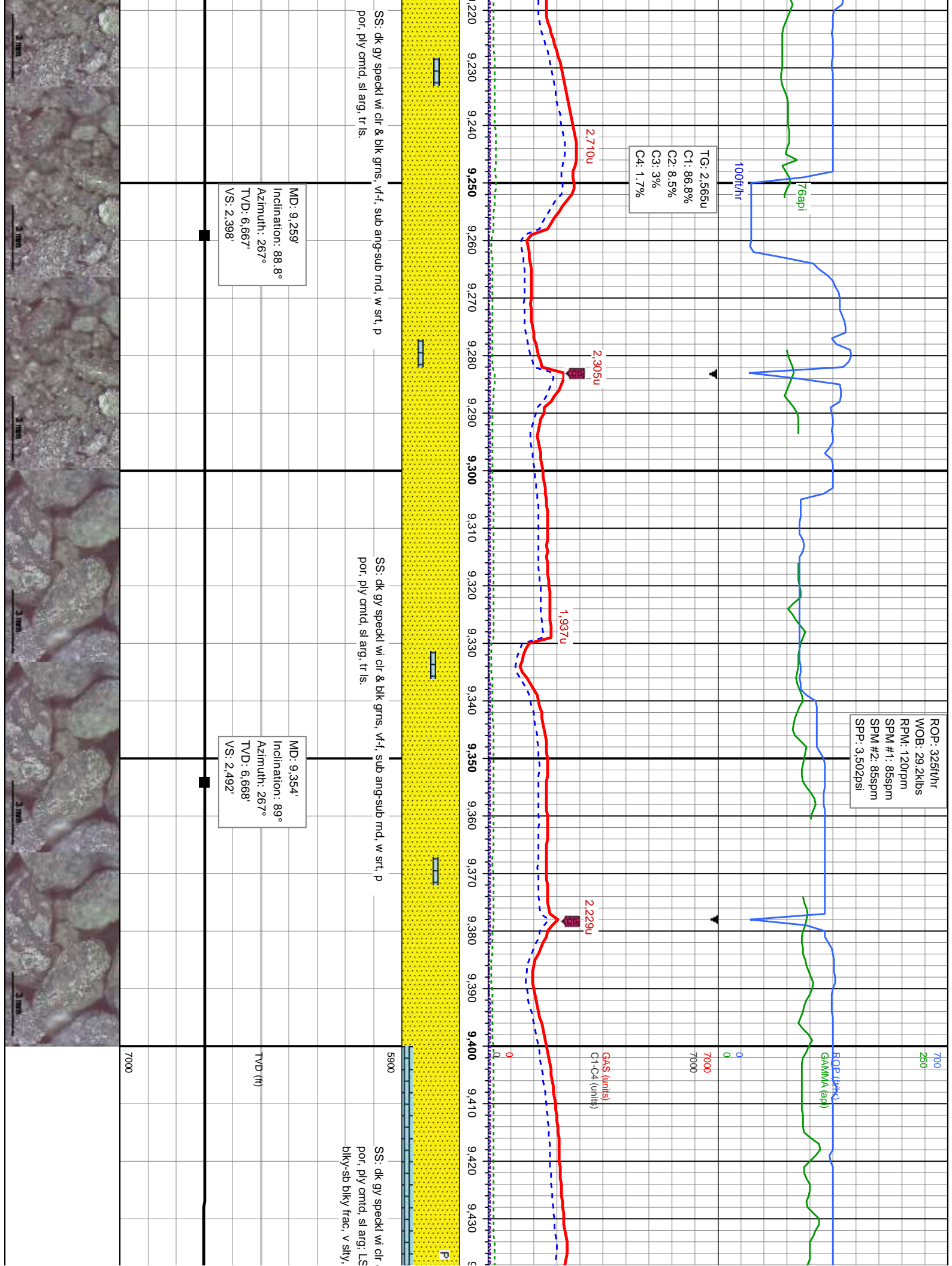
MD: 8,881'
Inclination: 90.7°
Azimuth: 263°
TVD: 6,666'
VS: 2,020'

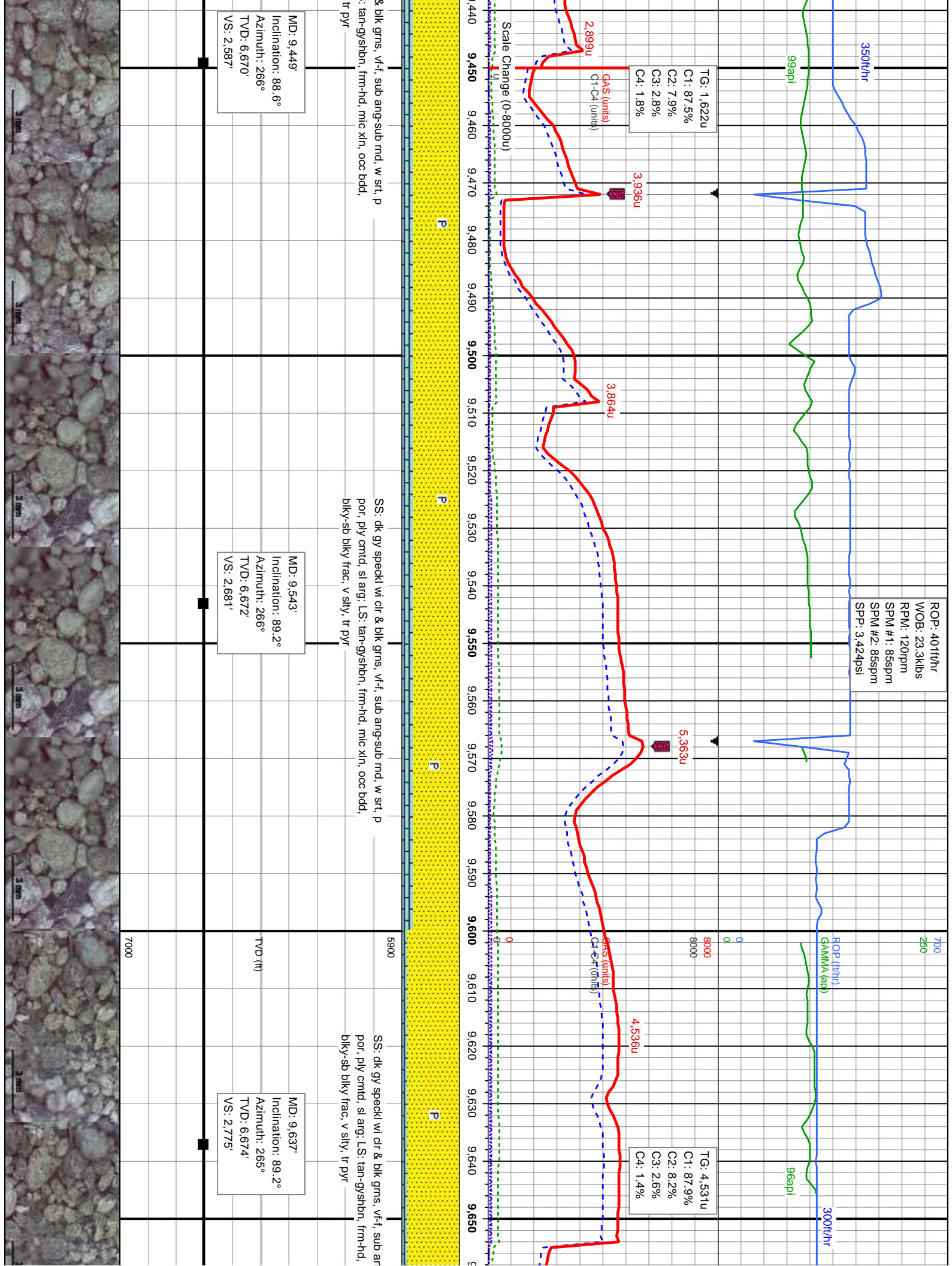
SS: dk gy speckl wi dr & blk grns, vf-f, sub ang-sub rnd, w srt, p
por, ply cmtd, tr cal.

MD: 8,976'
Inclination: 90.6°
Azimuth: 267°
TVD: 6,665'
VS: 2,115'

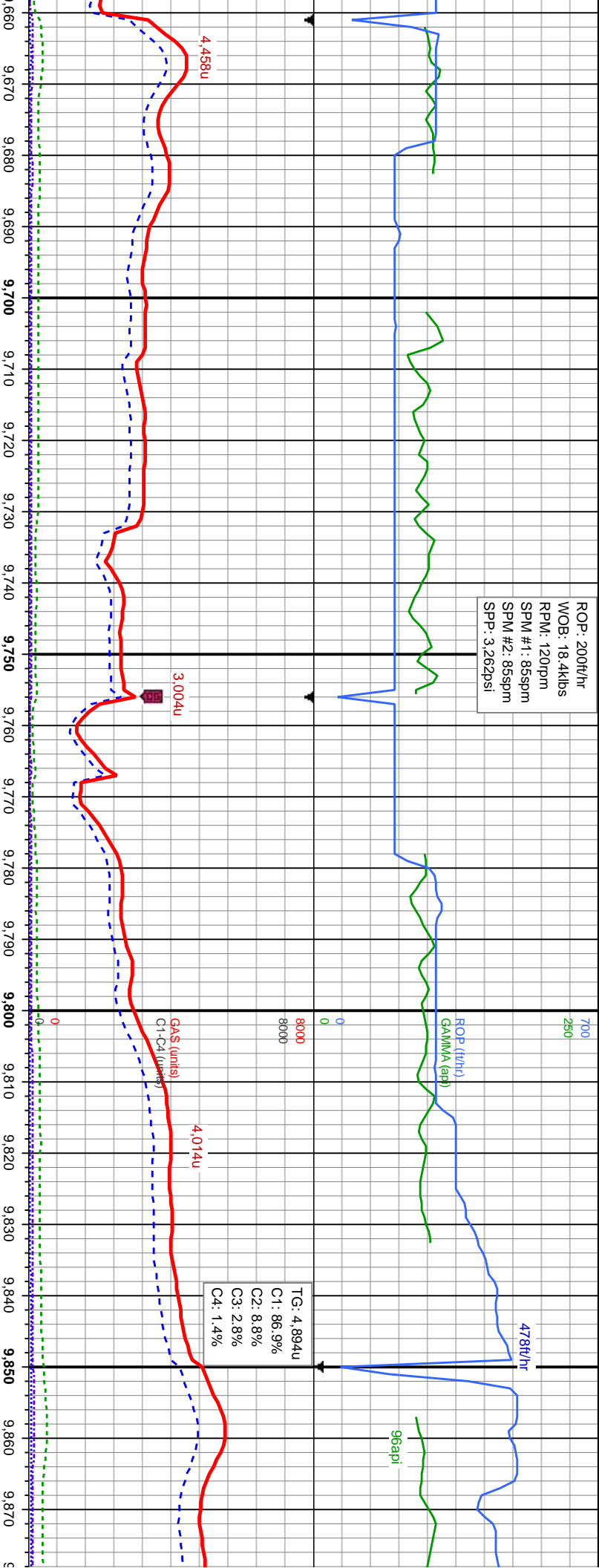








ROP: 200ft/hr
WOB: 18.4klbs
RPM: 120rpm
SPM #1: 85spm
SPM #2: 85spm
SPP: 3.262psi



TG: 4.894u
C1: 86.9%
C2: 8.8%
C3: 2.8%
C4: 1.4%

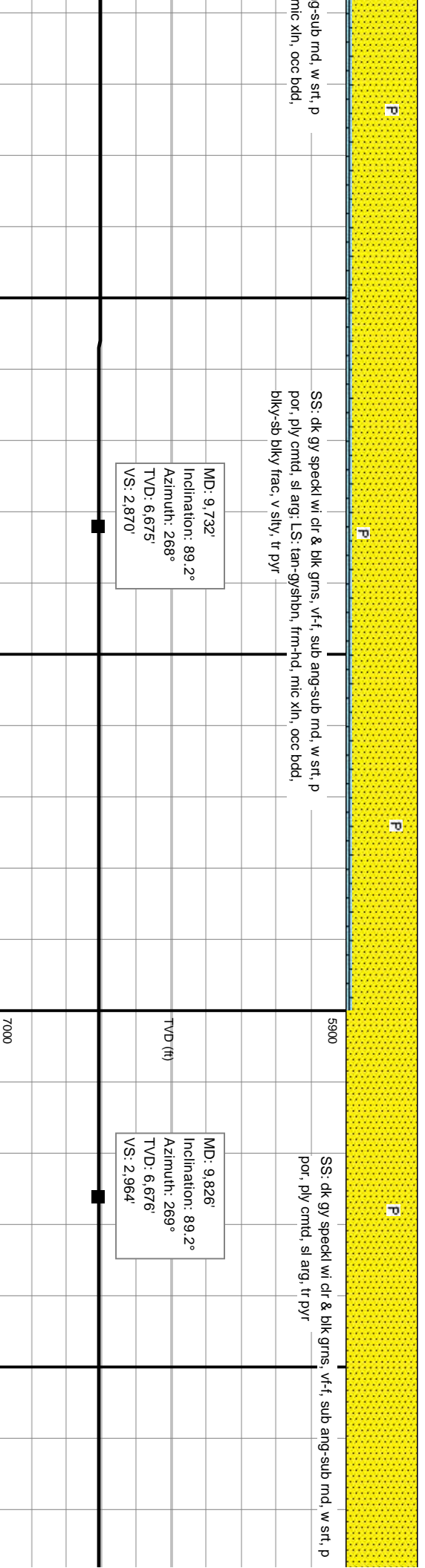
g-sub md, w srt, p
mic xin, occ bdd,

SS: dk gy speckl wi dr & blk grns, vf-f, sub ang-sub md, w srt, p
por, ply crntd, sl arg; LS: tan-gyshn, frm-hd, mic xin, occ bdd,
blkys-sb blkys frac, v slty, tr pyr

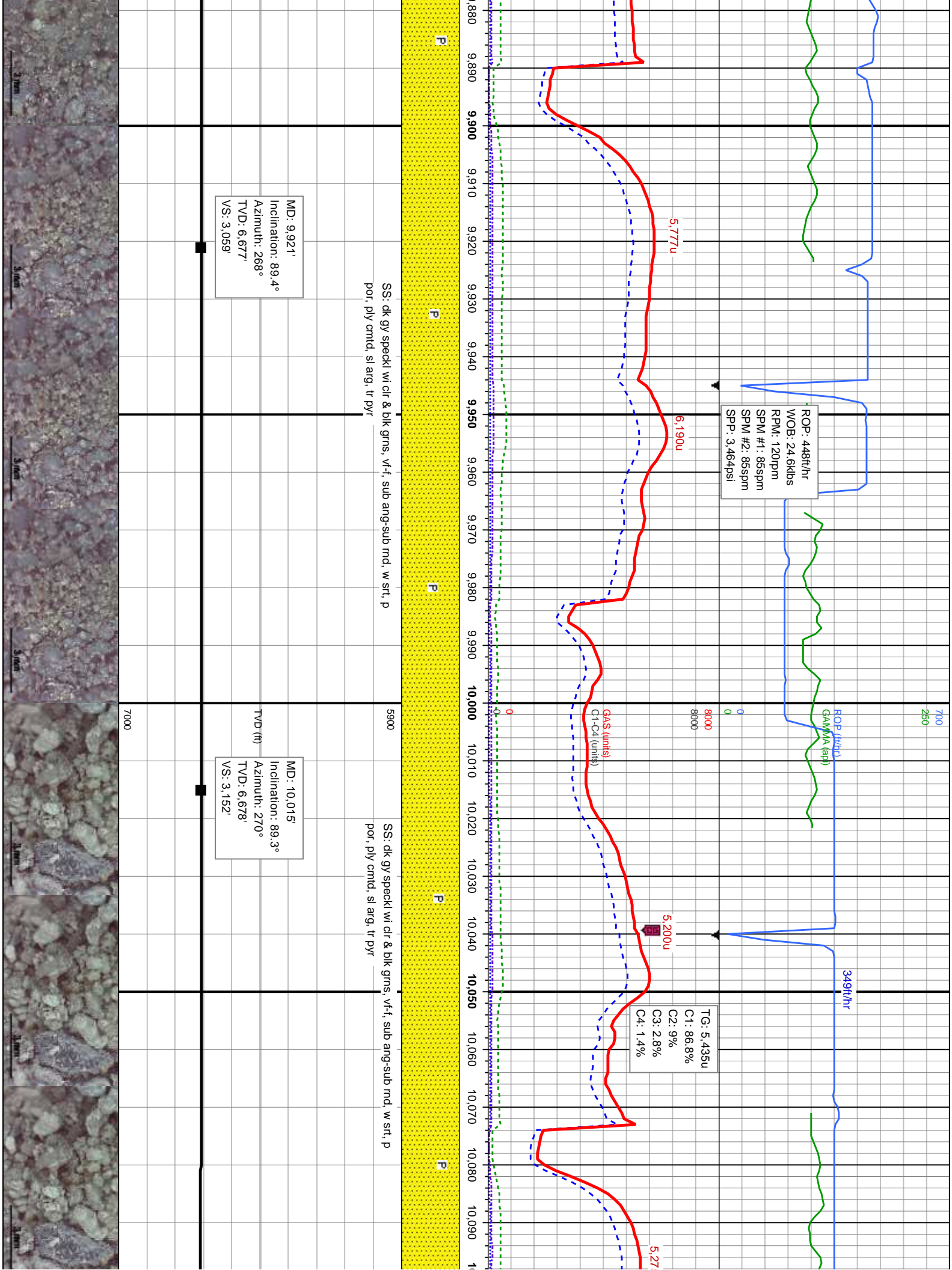
SS: dk gy speckl wi dr & blk grns, vf-f, sub ang-sub md, w srt, p
por, ply crntd, sl arg, tr pyr

MD: 9.732'
Inclination: 89.2°
Azimuth: 268°
TVD: 6.675'
VS: 2.870'

MD: 9.826'
Inclination: 89.2°
Azimuth: 269°
TVD: 6.676'
VS: 2.964'



TVD (ft)
7000



ROP: 448ft/hr
WOB: 24.6kbs
RPM: 120rpm
SPM #1: 85spm
SPM #2: 85spm
SPP: 3.464psi

TG: 5.435u
C1: 86.8%
C2: 9%
C3: 2.8%
C4: 1.4%

MD: 9,921'
Inclination: 89.4°
Azimuth: 268°
TVD: 6,677'
VS: 3.059'

MD: 10,015'
Inclination: 89.3°
Azimuth: 270°
TVD: 6,678'
VS: 3.152'

SS: dk gy speckl wi clr & blk grns, v-f, sub ang-sub md, w srt, p
por, ply cntd, sl arg, tr pyr

SS: dk gy speckl wi clr & blk grns, v-f, sub ang-sub md, w srt, p
por, ply cntd, sl arg, tr pyr

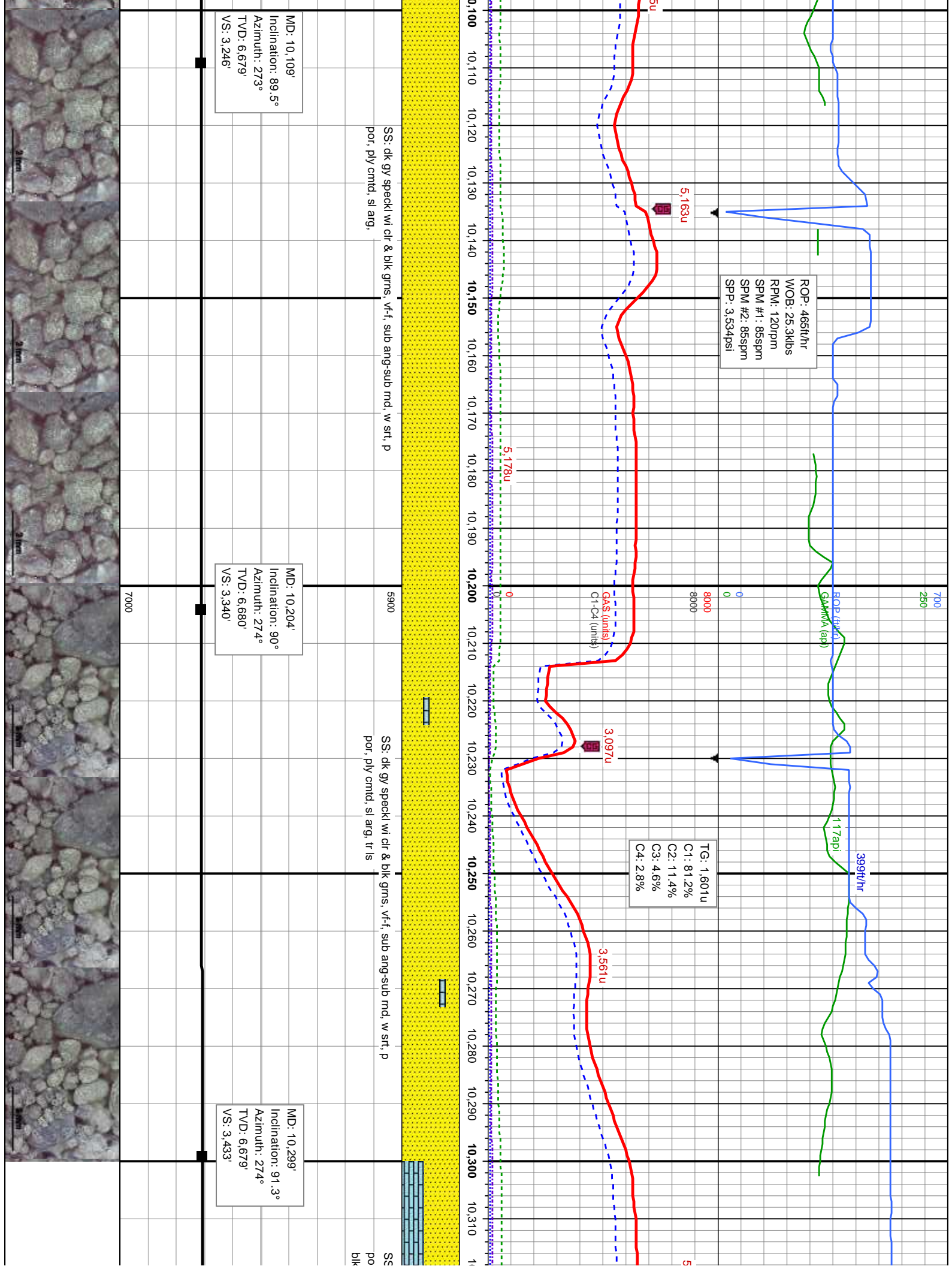
P

P

P

P

P



ROP: 444ft/hr
WOB: 25.1kbs
RPM: 120rpm
SPM #1: 85spm
SPM #2: 84spm
SP: 3.665psi

ROP (ft/hr)
GAMMA (api)

37api
75ft/hr

TG: 1.266u
C1: 84.9%
C2: 8.9%
C3: 3.8%
C4: 2.4%

GA\$ (units)
C1-C4 (units)

1.462u

1.264u

1.269u

4.553u

6.661u

15.5' Down

10,320 10,330 10,340 10,350 10,360 10,370 10,380 10,390 10,400 10,410 10,420 10,430 10,440 10,450 10,460 10,470 10,480 10,490 10,500 10,510 10,520 10,530

P

P

P

P

P

dk gy speckl wi clr & blk gms, v-f-f, sub ang-sub md, w srt, p
t, ply cntd, sl arg; LS: tan-gyshbn, frm-hd, mic xln, occ bdd,
y-sb blk y frac, v silty, tr pyr

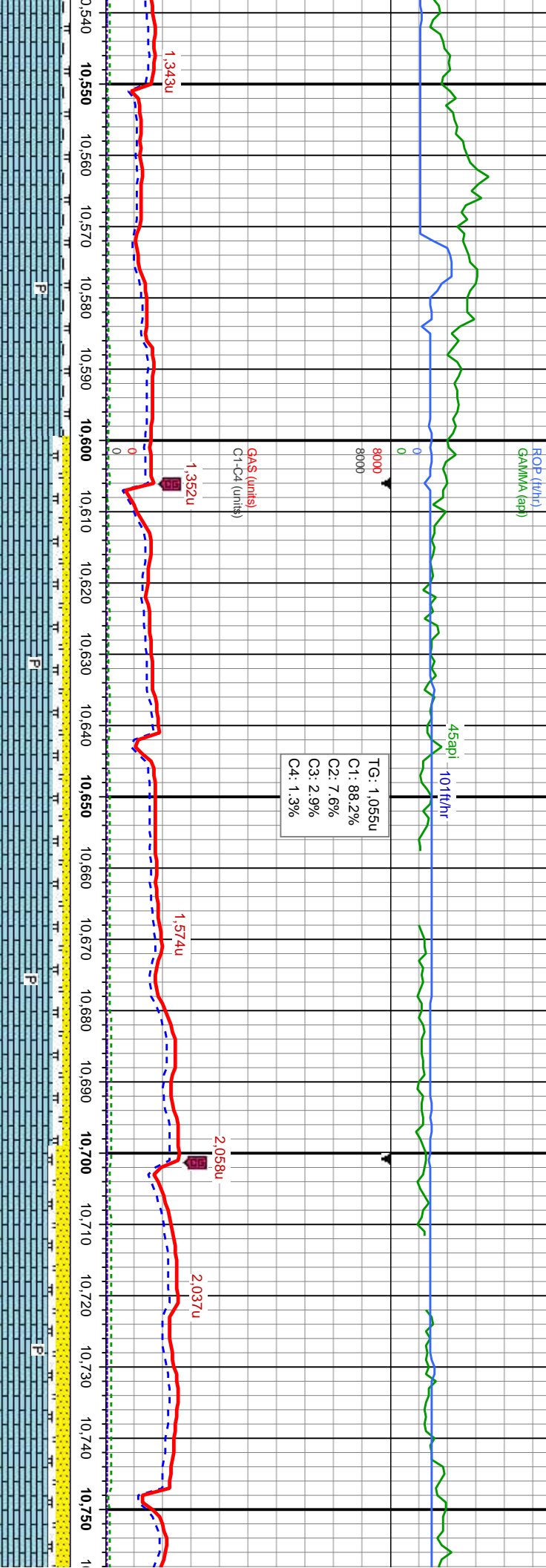
LS: tan-gyshbn, frm-hd, mic xln, occ bdd, blk y-sb blk y frac, v
silty, MRLST: dk gy, frm-hd, brt, gt tex, sb blk y, tr pyr

LS: tan-gyshbn, fr
silty, MRLST: dk gy

MD: 10,393'
Inclination: 90.4°
Azimuth: 271°
TVD: 6,677'
VS: 3,526'

MD: 10,487'
Inclination: 90.1°
Azimuth: 269°
TVD: 6,677'
VS: 3,620'





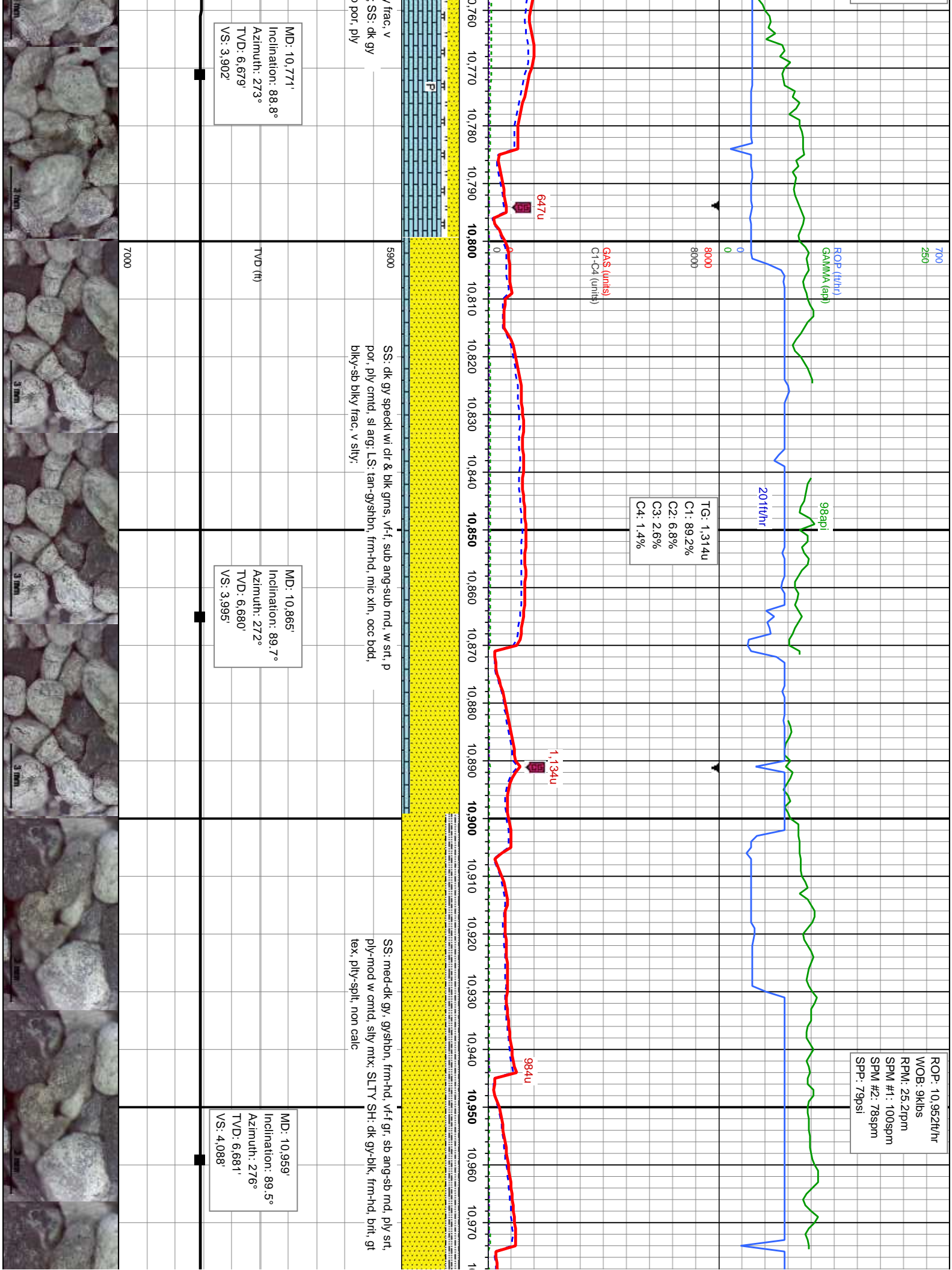
TG: 1.055u
C1: 88.2%
C2: 7.6%
C3: 2.9%
C4: 1.3%

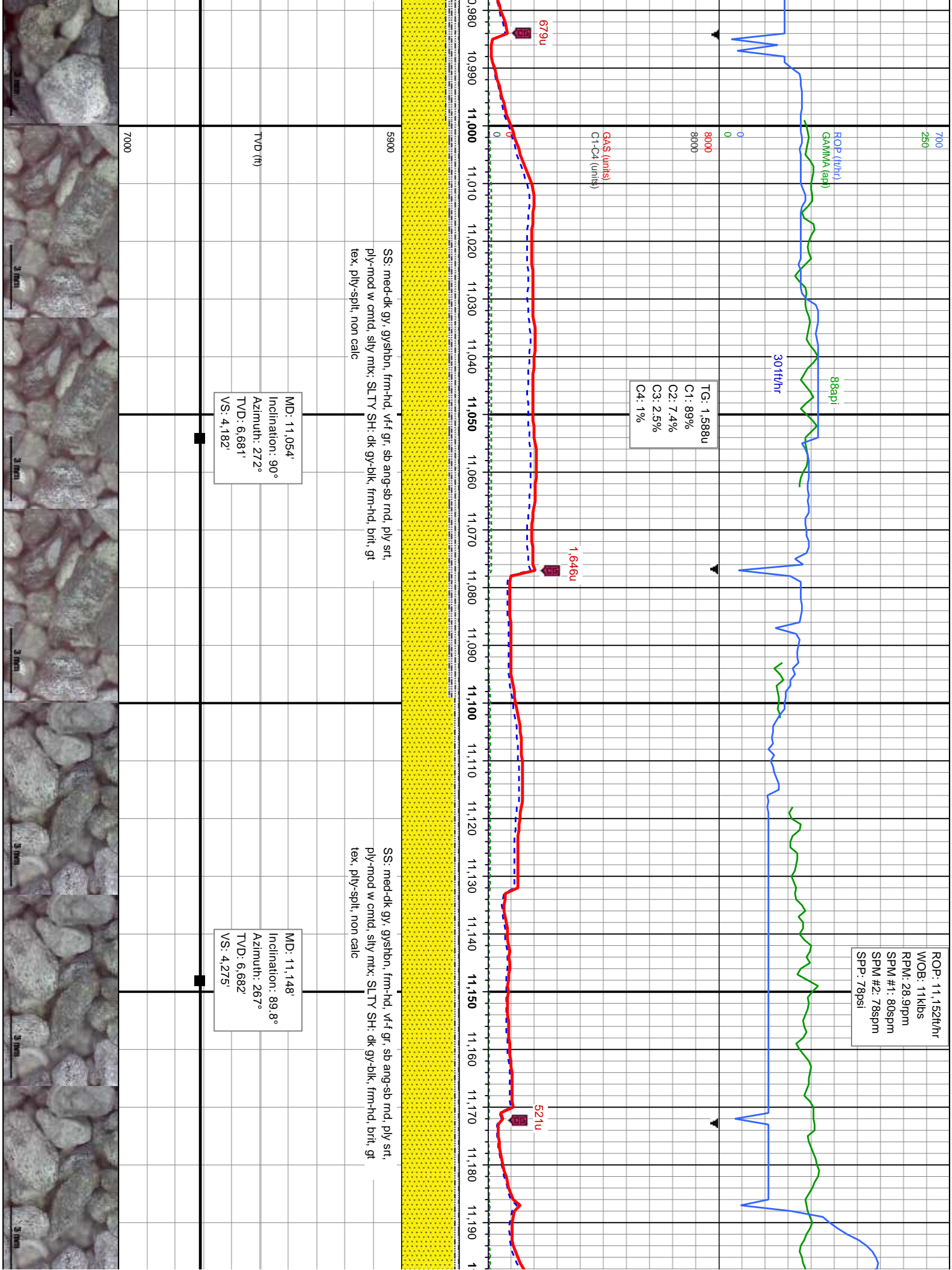
MD: 10,582'
Inclination: 89.6°
Azimuth: 269°
TVD: 6,677'
VS: 3,714'

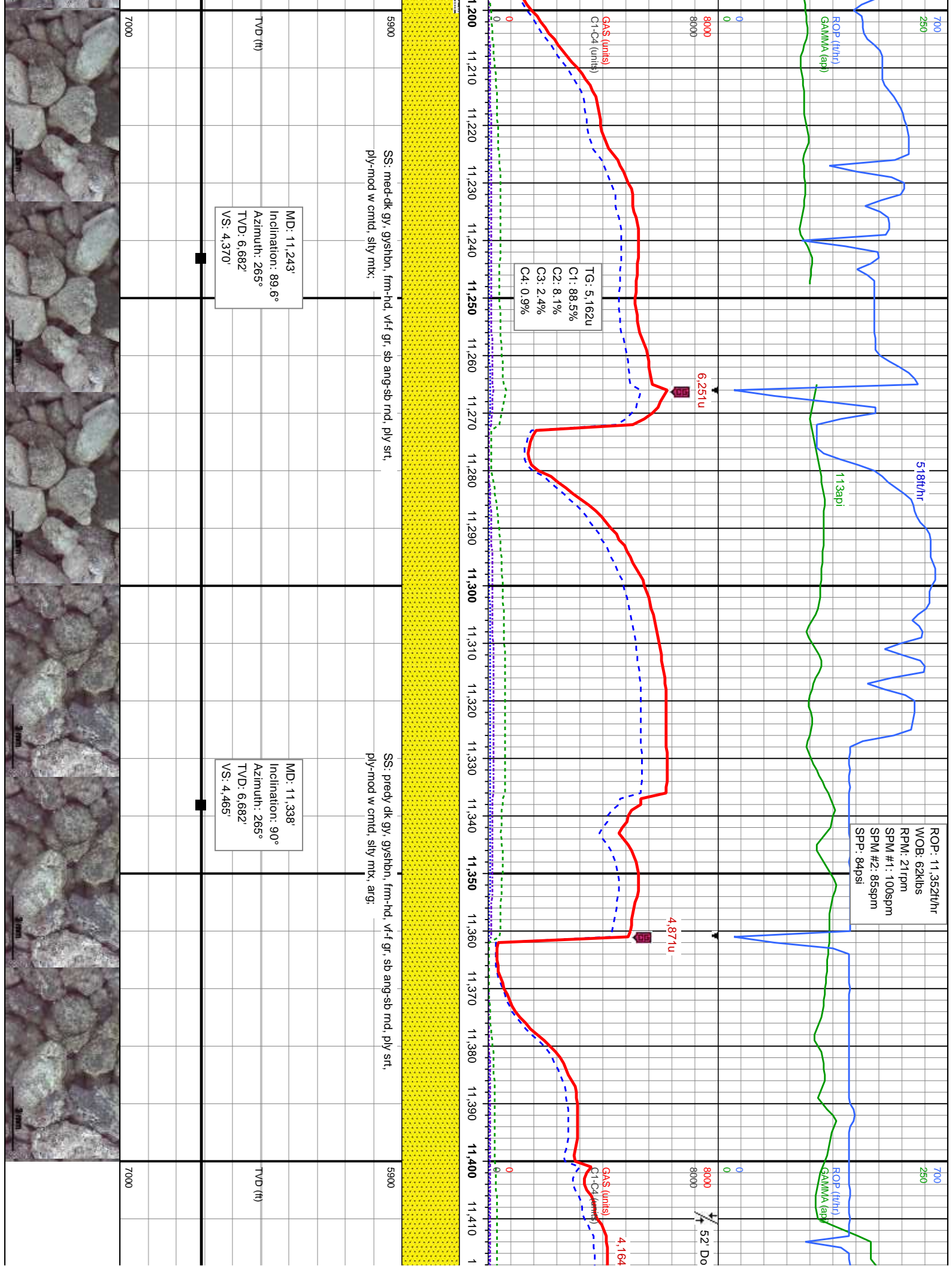
MD: 10,676'
Inclination: 89.5°
Azimuth: 272°
TVD: 6,678'
VS: 3,808'

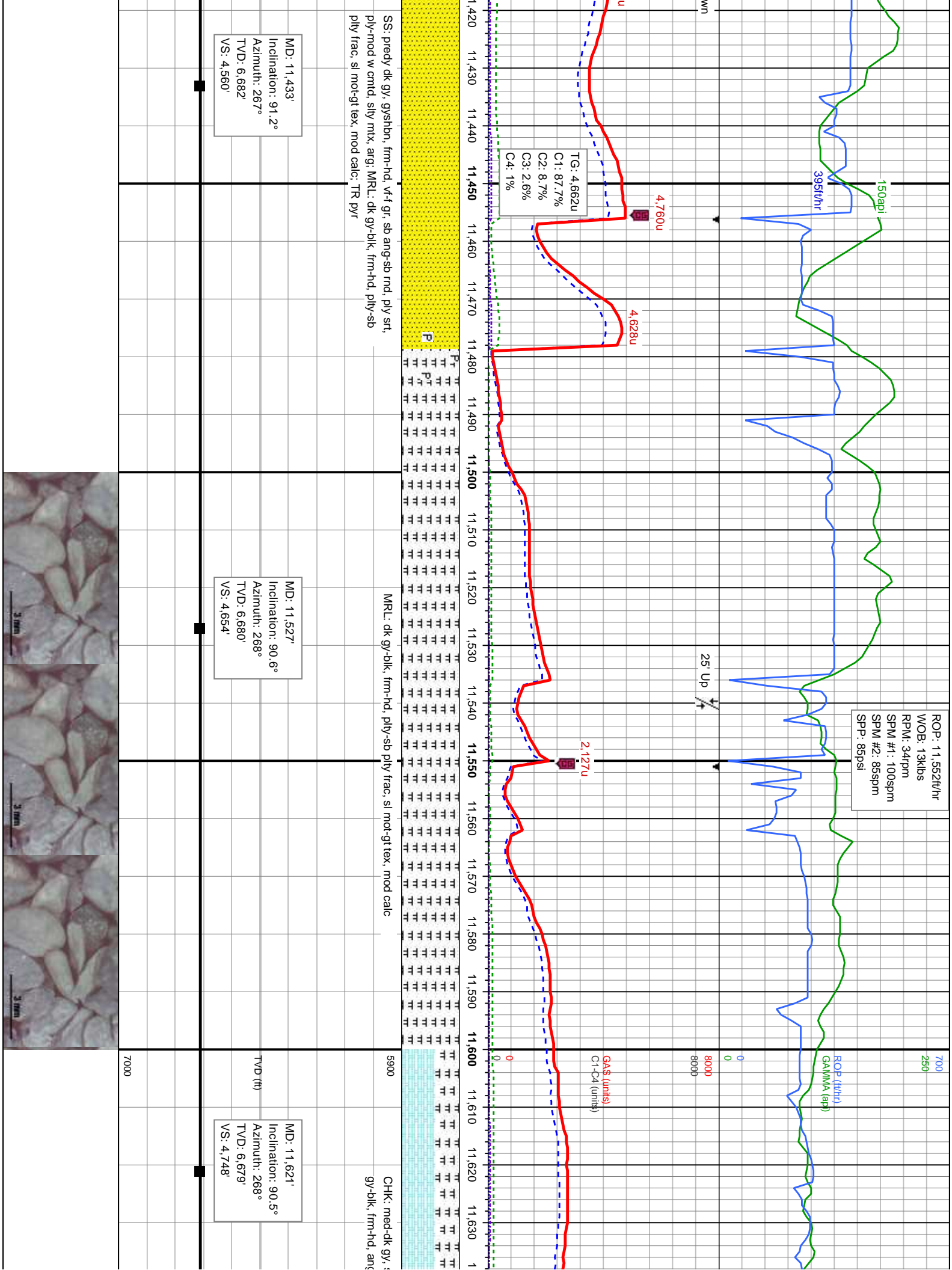
n-hd, mic xln, ooc bdd, blk-y-sb blk-y frac, v
/, frm-hd, brlt, gt tex, sb blk-y, tr pyr
LS: tan-gyshbn, frm-hd, mic xln, ooc bdd, blk-y-sb blk-y frac, v
sily; MRLST: dk gy, frm-hd, brlt, gt tex, sb blk-y, tr pyr; SS: dk gy
speckl wi clt & blk grns, vf-f, sub ang-sub rnd, w srt, p por, ply
cmdt, sl arg;

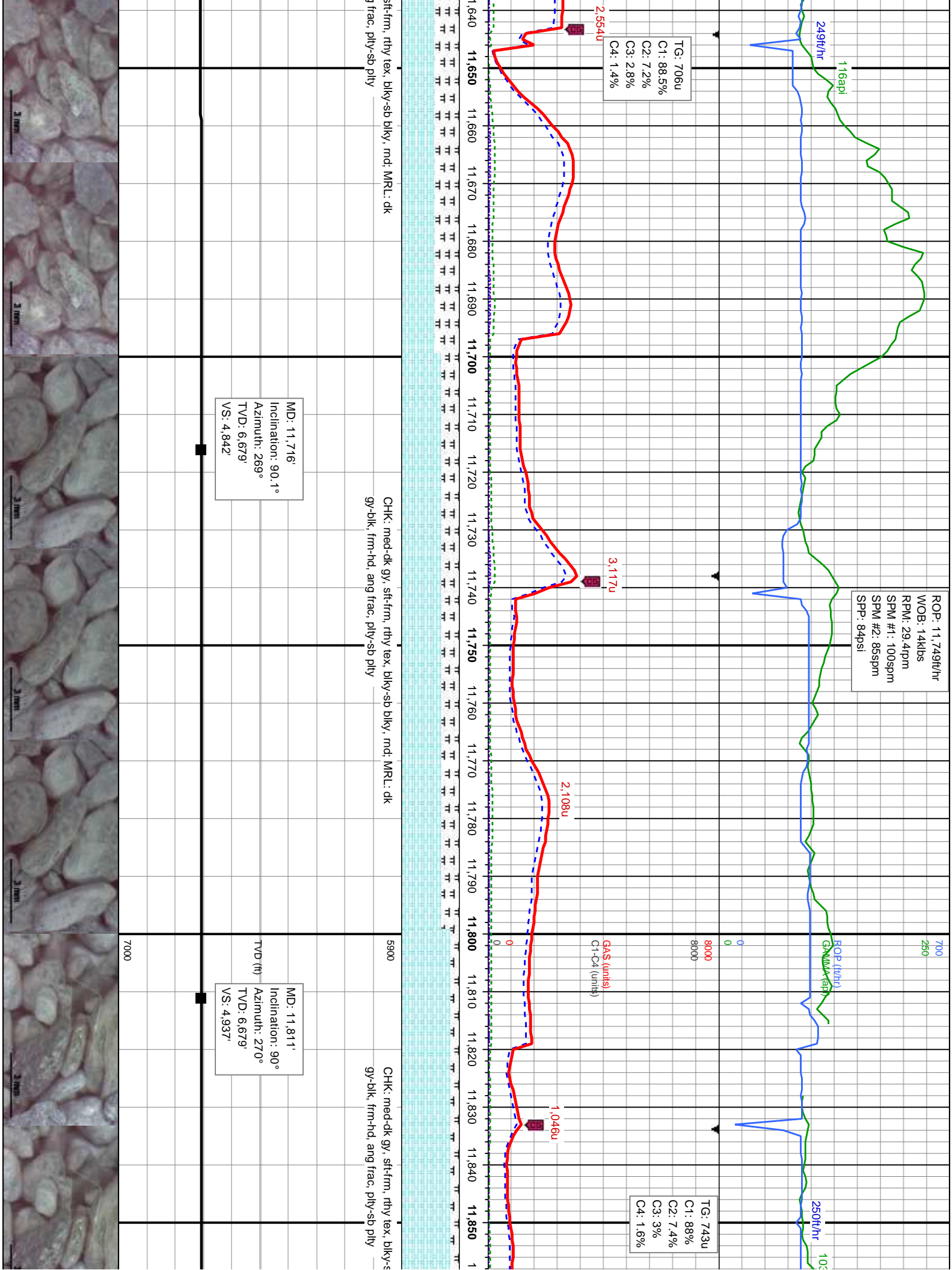












ROP: 11.949ft/hr
WOB: 0kbs
RPM: 27.3rpm
SPM #1: 75spm
SPM #2: 78spm
SP: 78psi

12009' MD - 08/27/18

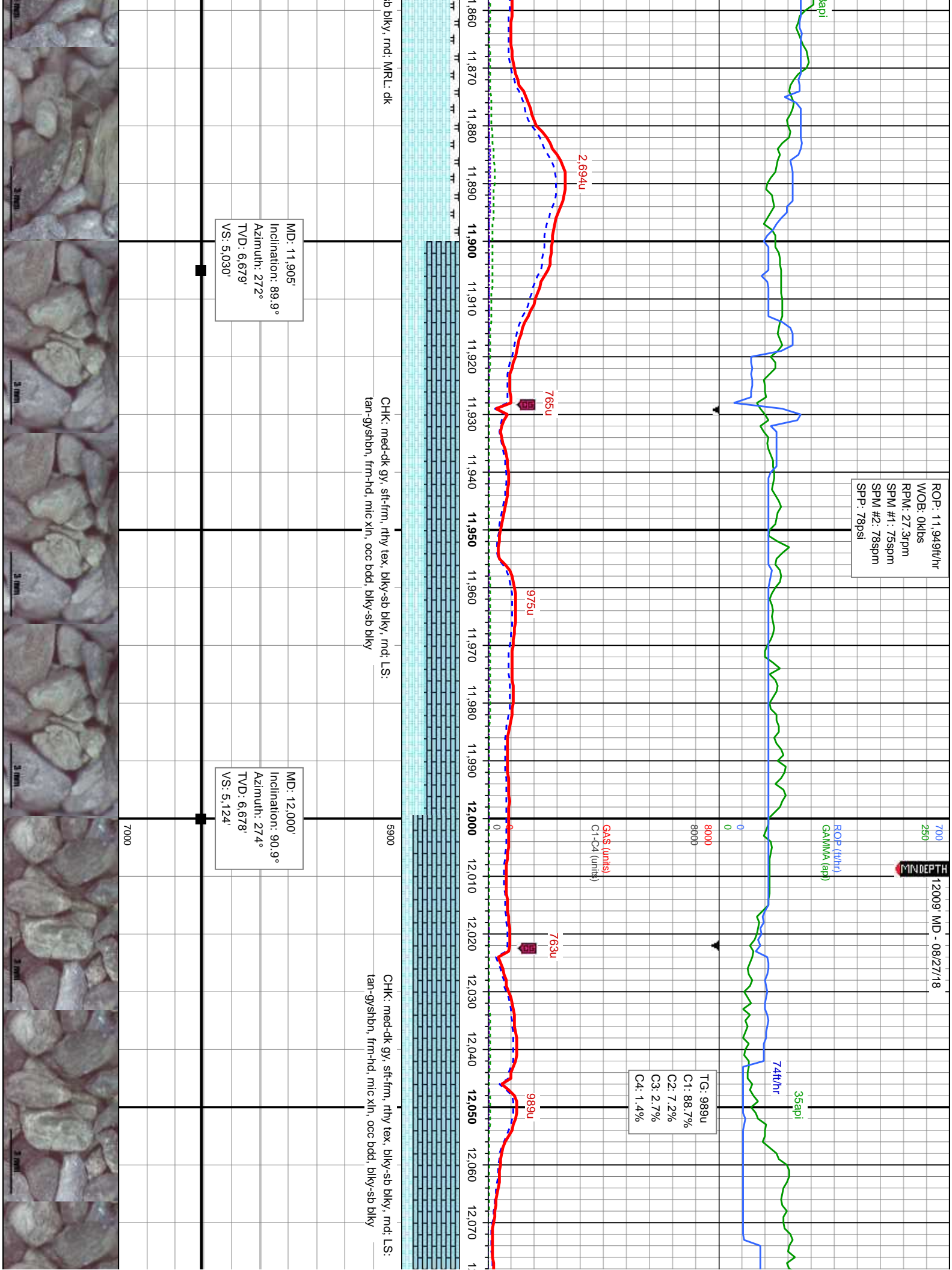
TG: 989u
C1: 88.7%
C2: 7.2%
C3: 2.7%
C4: 1.4%

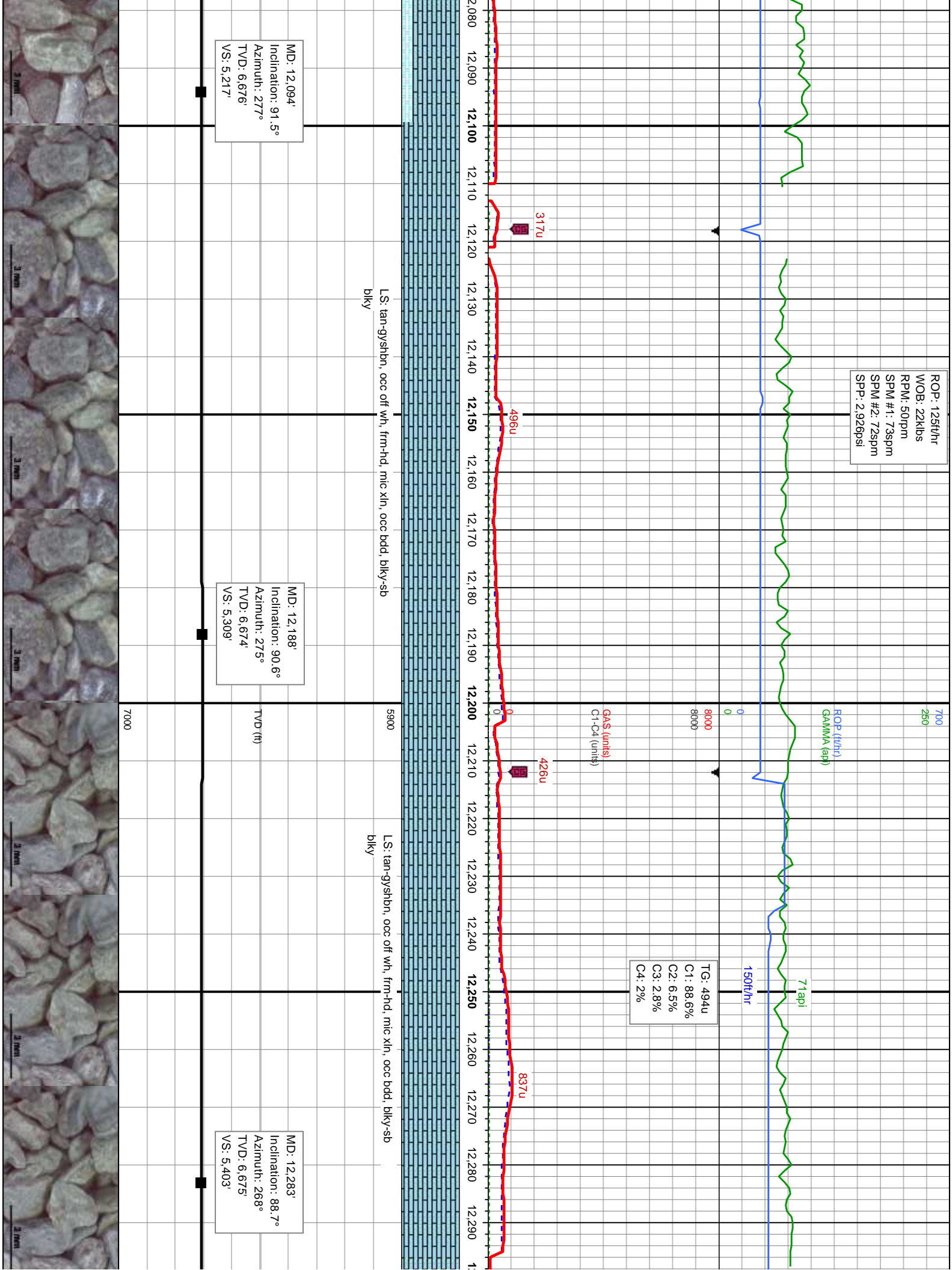
MD: 11,905'
Inclination: 89.9°
Azimuth: 272°
TVD: 6,679'
VS: 5.030'

MD: 12,000'
Inclination: 90.9°
Azimuth: 274°
TVD: 6,678'
VS: 5.124'

CHK: med-dk gy, sft-fm, rthy tex, blk-y-sb blk-y, md; LS:
tan-gyshn, frm-hd, mic xin, occ bdd, blk-y-sb blk-y

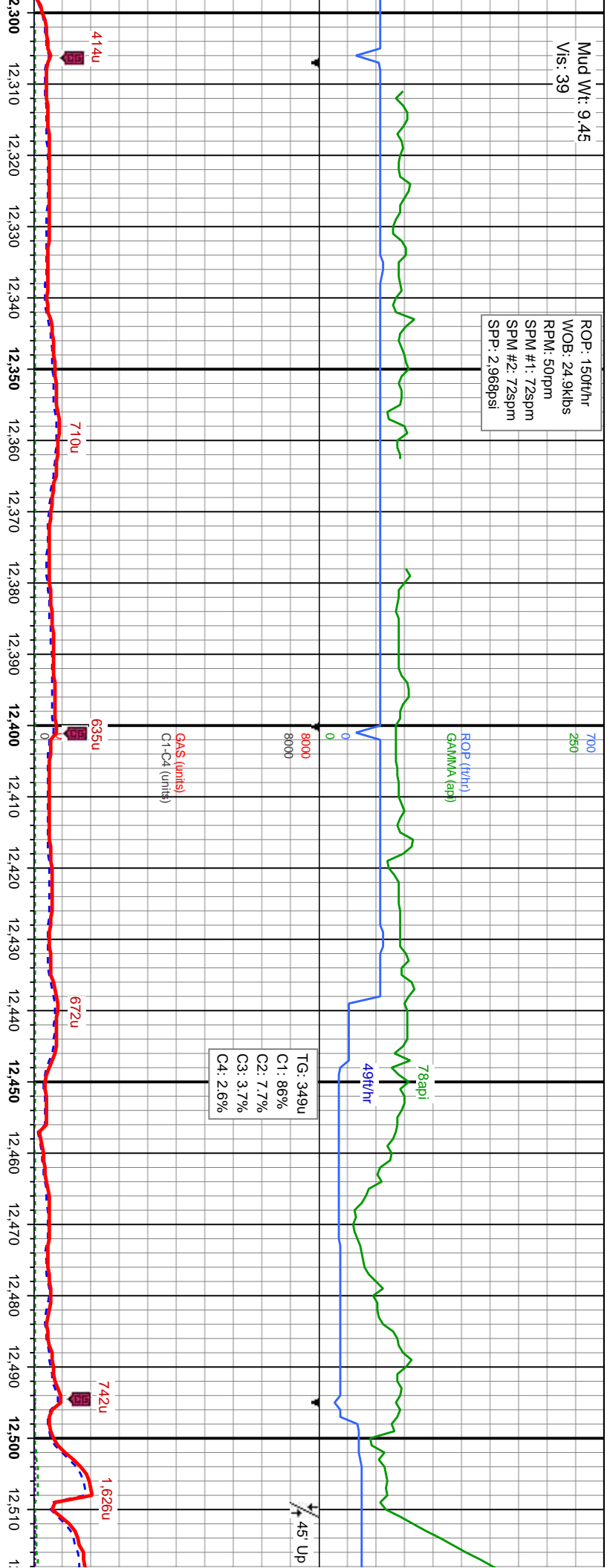
CHK: med-dk gy, sft-fm, rthy tex, blk-y-sb blk-y, md; LS:
tan-gyshn, frm-hd, mic xin, occ bdd, blk-y-sb blk-y





Mud Wt: 9.45
Vis: 39

ROP: 150ft/hr
WOB: 24.9klbs
RPM: 50rpm
SPM #1: 72spm
SPM #2: 72spm
SPP: 2.968psi



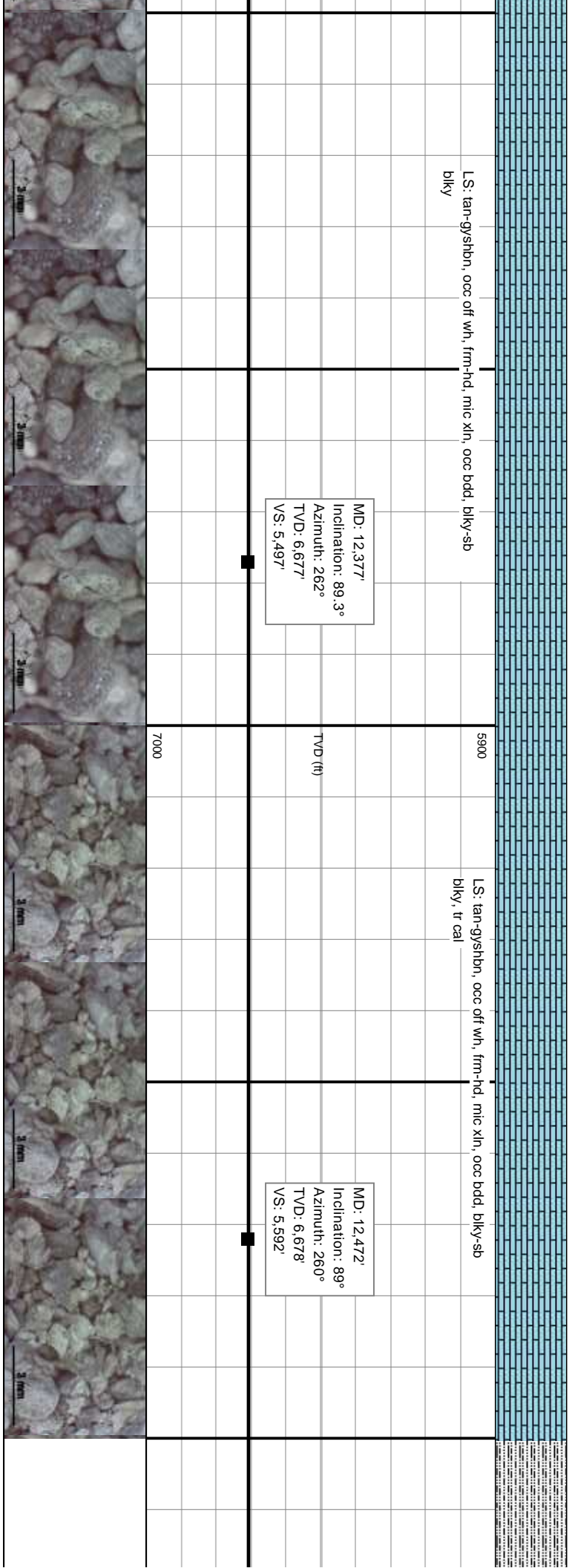
L.S: tan-gyshbn, occ off wh, frm-hd, mic xln, occ bdd, blk-y-sb
blk-y

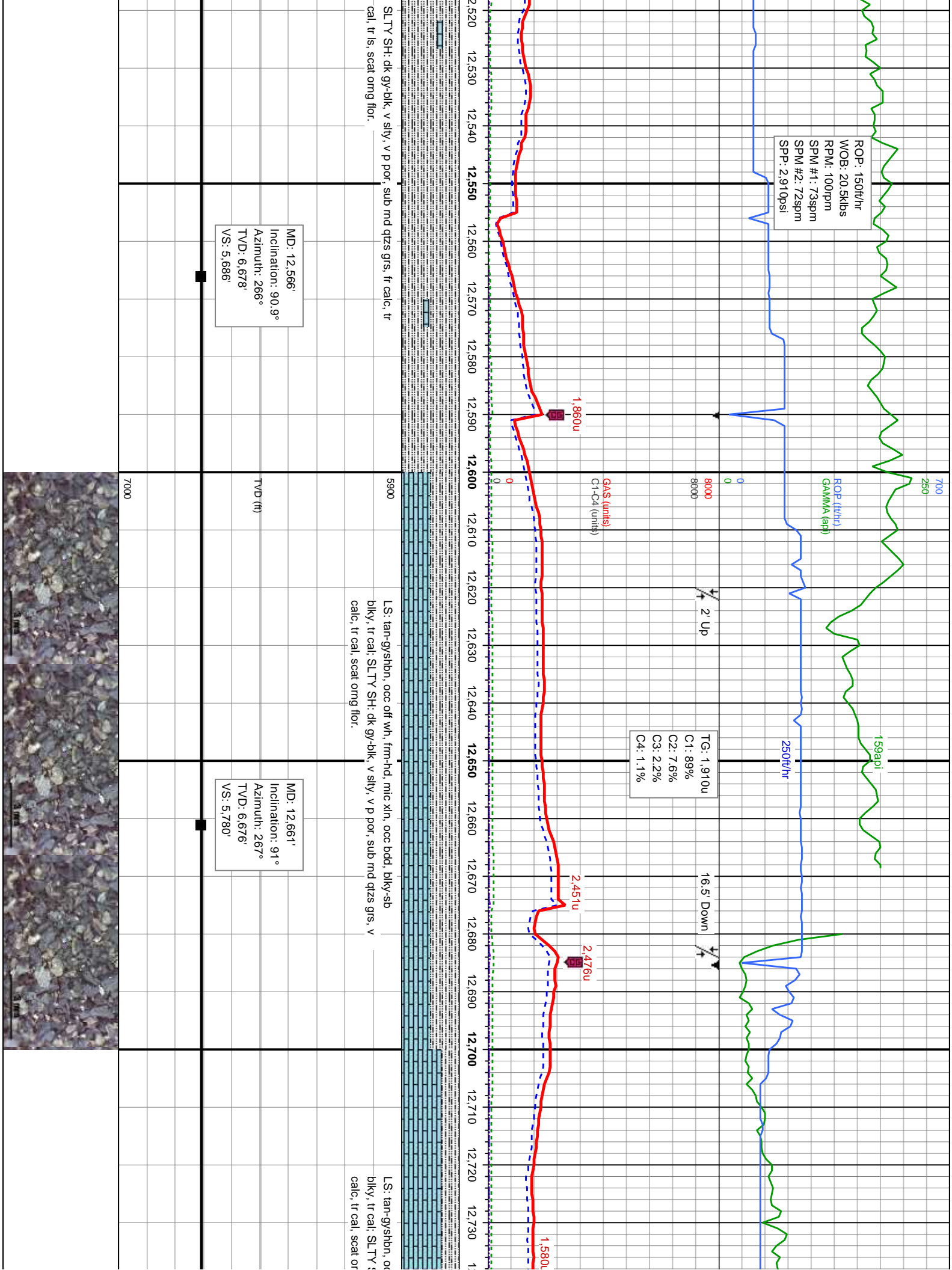
MD: 12,377'
Inclination: 89.3°
Azimuth: 262°
TVD: 6,677'
VS: 5,497'

L.S: tan-gyshbn, occ off wh, frm-hd, mic xln, occ bdd, blk-y-sb
blk-y, tr cal

TG: 349u
C1: 86%
C2: 7.7%
C3: 3.7%
C4: 2.6%

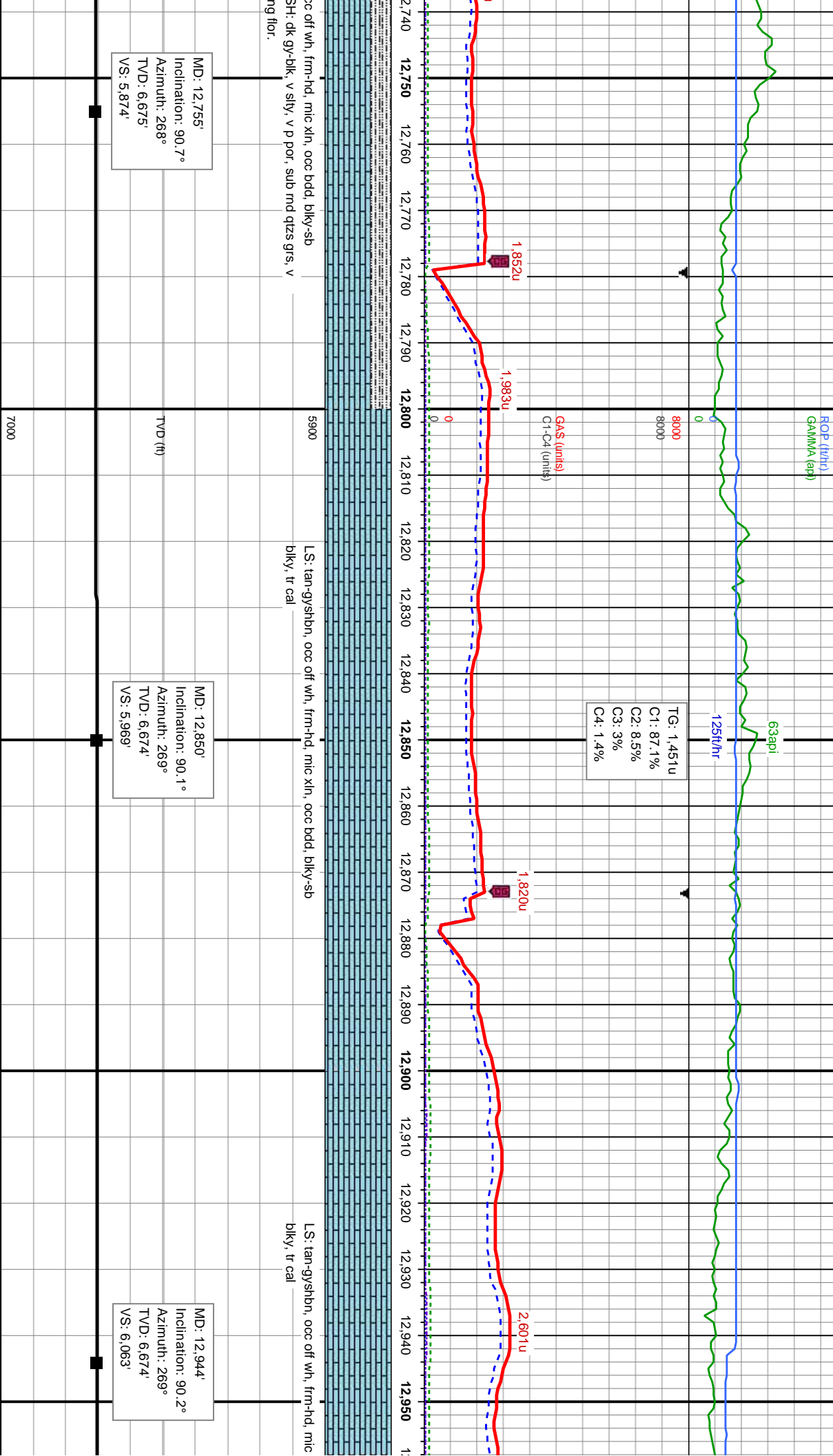
MD: 12,472'
Inclination: 89°
Azimuth: 260°
TVD: 6,678'
VS: 5,592'

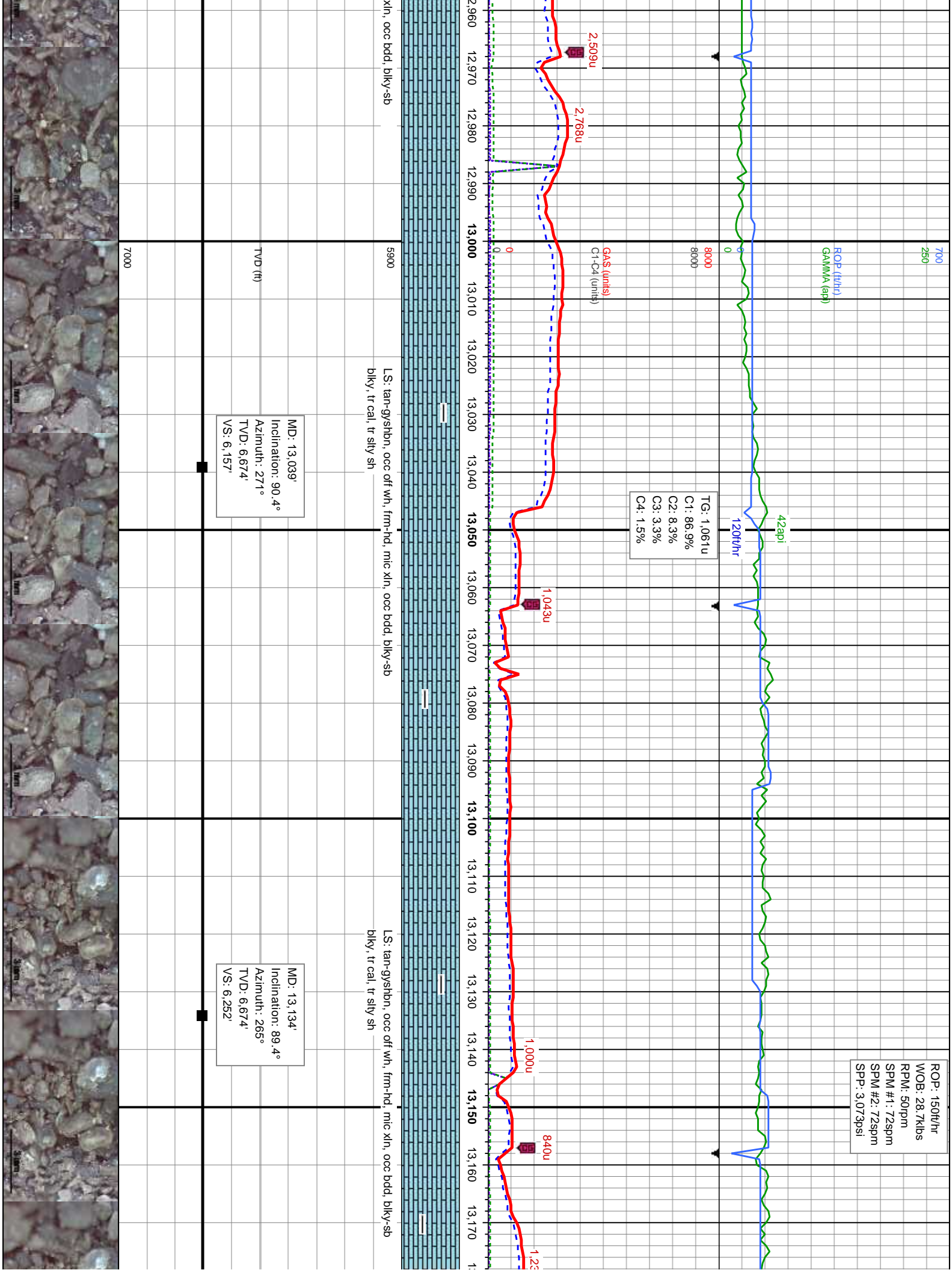


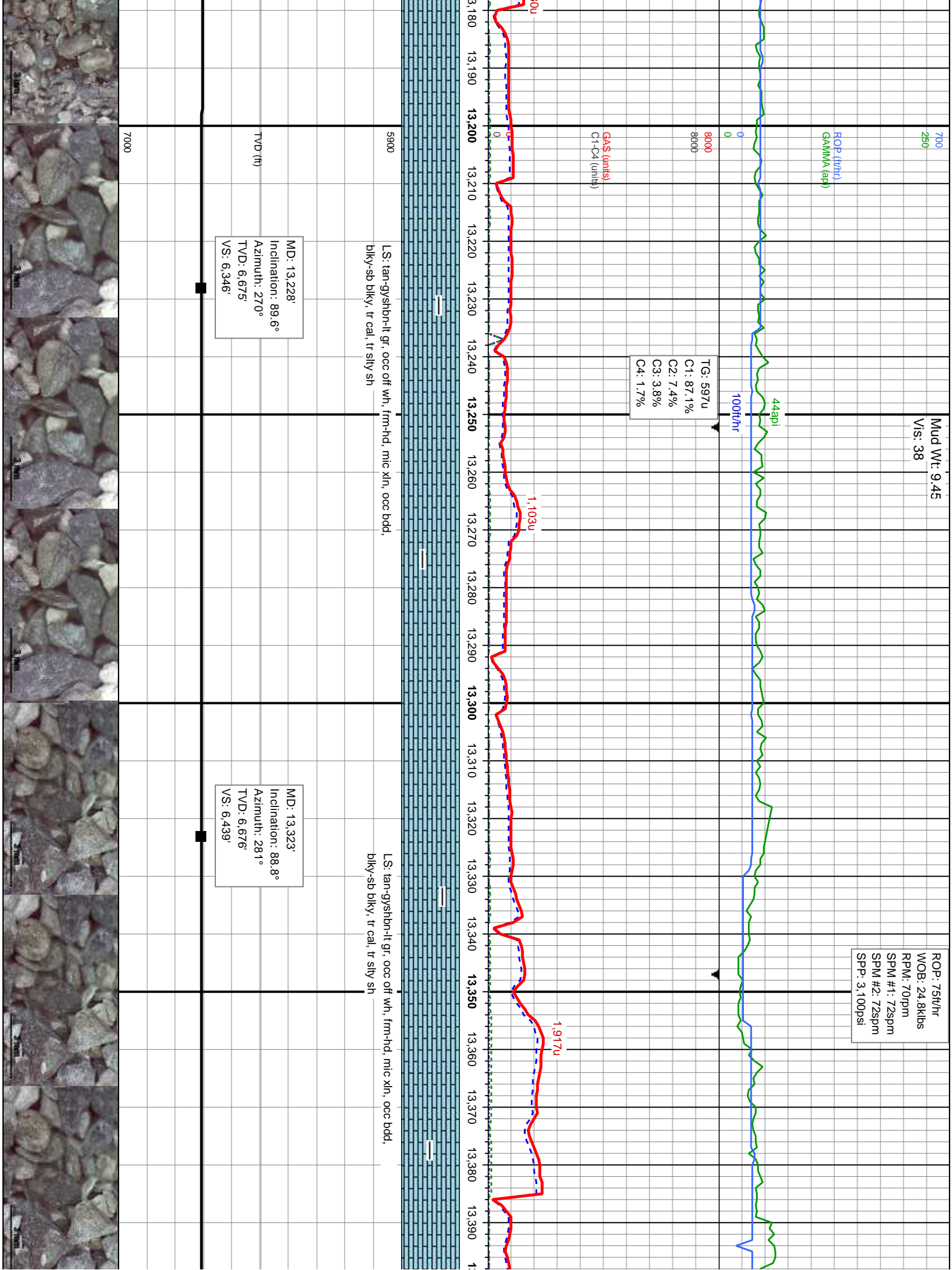


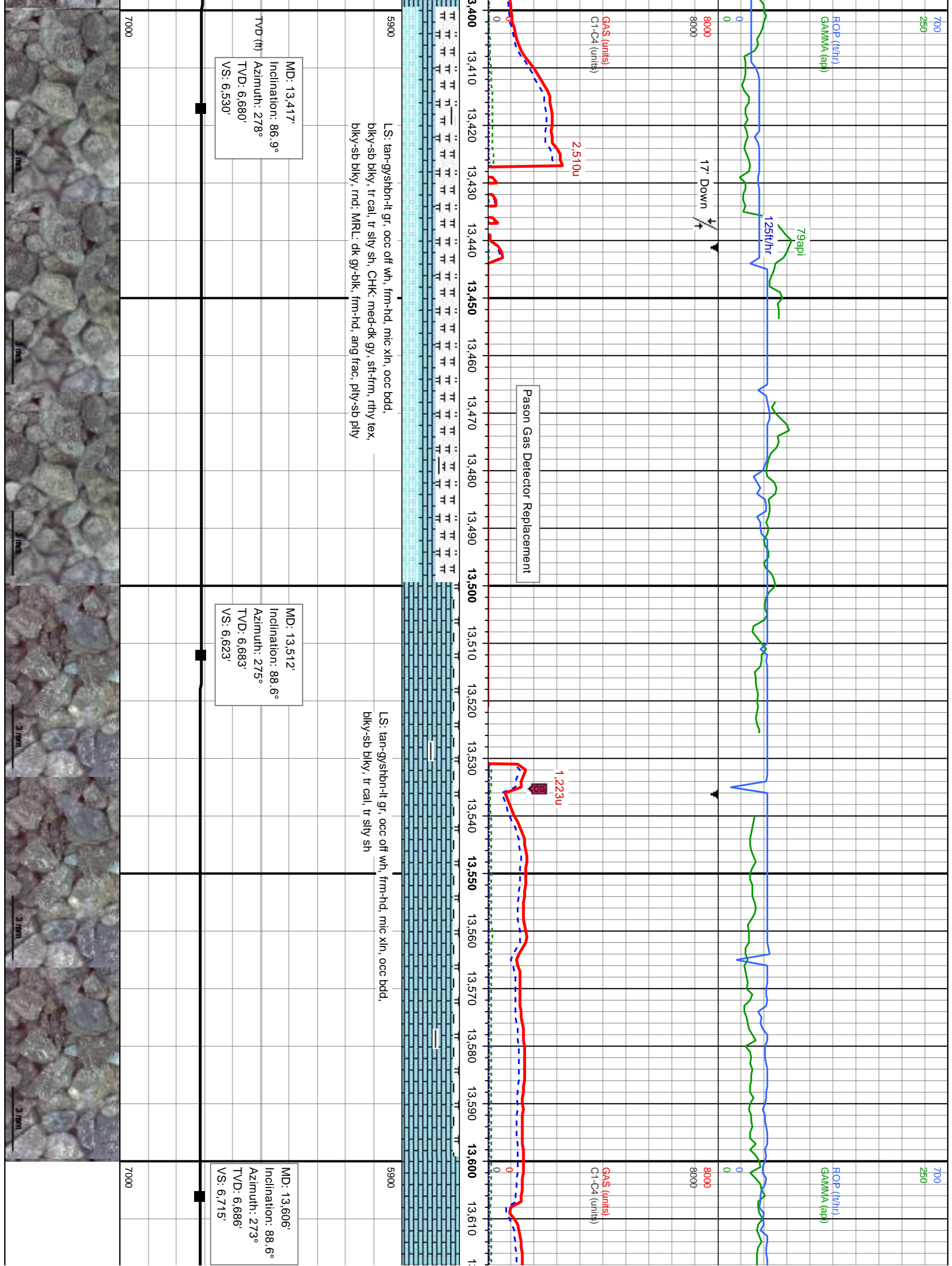
ROP: 125ft/hr
WOB: 23.5kbs
RPM: 70rpm
SPM #1: 72spm
SPM #2: 72spm
SP: 2.940psi

ROP: 100ft/hr
WOB: 29.8kbs
RPM: 70rpm
SPM #1: 72spm
SPM #2: 72spm
SP: 2.984psi









ROP: 150ft/hr
WOB: 27.8klbs
RPM: 50rpm
SPM #1: 73spm
SPM #2: 72spm
SPP: 3.242psi

ROP (ft/hr)
GAMMA (api)

TG: 1.437u
C1: 84.6%
C2: 10%
C3: 2.9%
C4: 2.5%

GA\$ (units)
C1-C4 (units)

Pason Gas Detector Recalibration

831u

1,085u

1,141u

LS: tan-gyshbn-lt gr, occ off wh, frm-hd, mic xln, occ bdd,
biky-sb biky, tr cal, tr slty sh

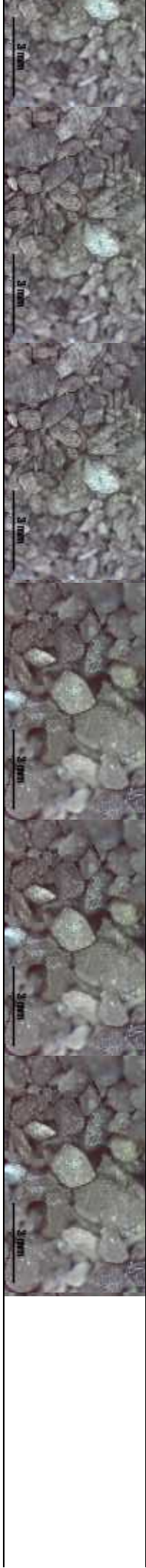
LS: tan-gyshbn-lt gr, occ off wh, frm-hd, mic xln, occ bdd,
biky-sb biky, tr cal, tr slty sh

LS: tan-gy
biky-sb bk

MD: 13,701'
Inclination: 88.3°
Azimuth: 272°
TVD: 6,688'
VS: 6,809'

MD: 13,796'
Inclination: 87.8°
Azimuth: 262°
TVD: 6,691'
VS: 6,904'

TVD (ft)

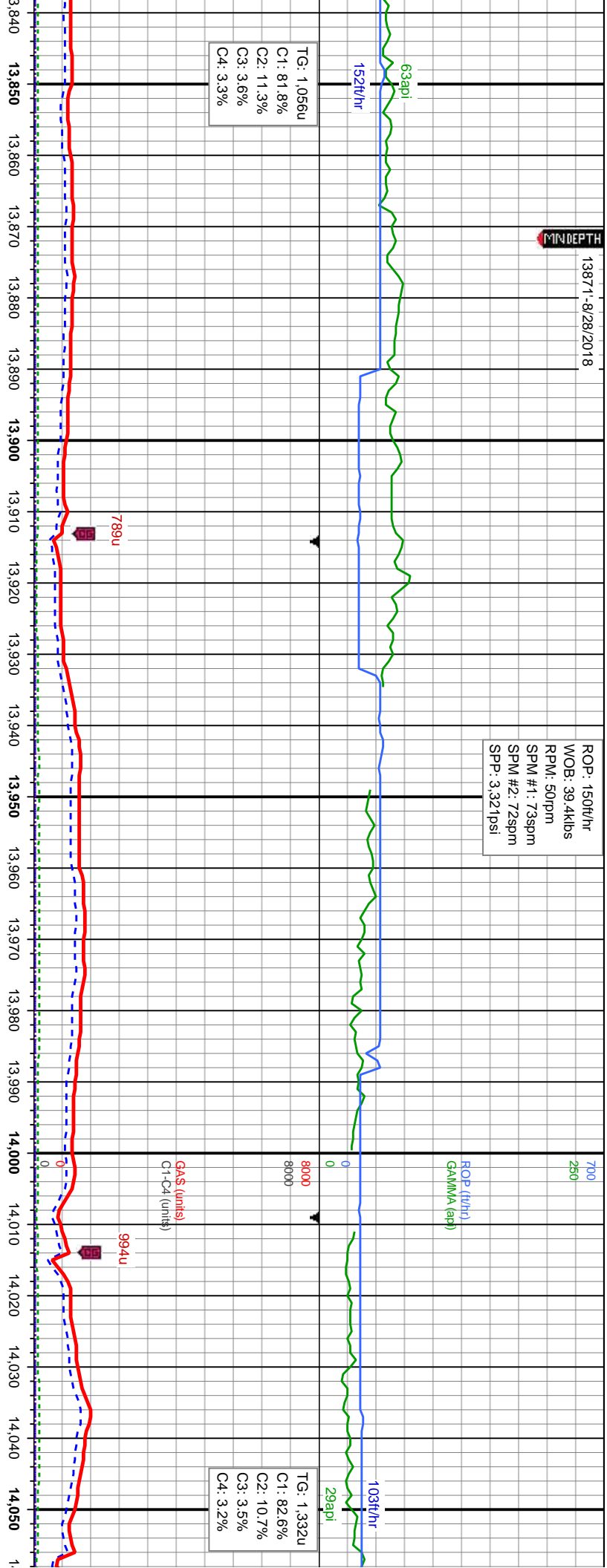


1387'1"-8/28/2018

ROP: 150ft/hr
WOB: 39.4klbs
RPM: 50rpm
SPM #1: 73spm
SPM #2: 72spm
SP: 3.321psi

TG: 1.056u
C1: 81.8%
C2: 11.3%
C3: 3.6%
C4: 3.3%

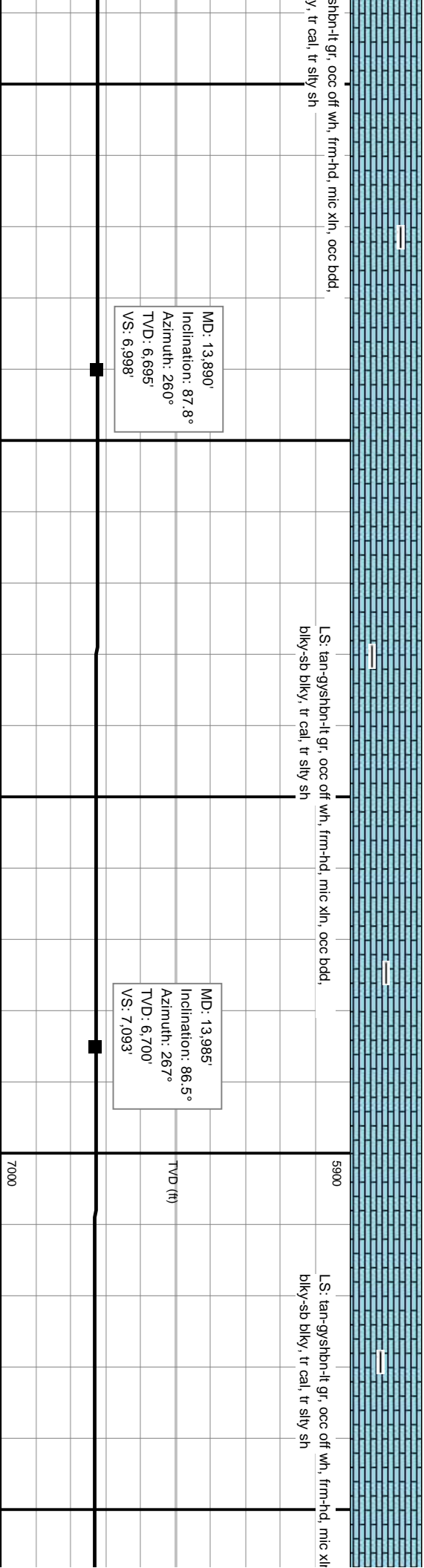
TG: 1.332u
C1: 82.6%
C2: 10.7%
C3: 3.5%
C4: 3.2%



fishn-lt gr, occ off wh, frm-hd, mic xln, occ bdd,
L.S. tan-gyshn-lt gr, occ off wh, frm-hd, mic xln, occ bdd,
bky-sb bky, tr cal, tr silty sh

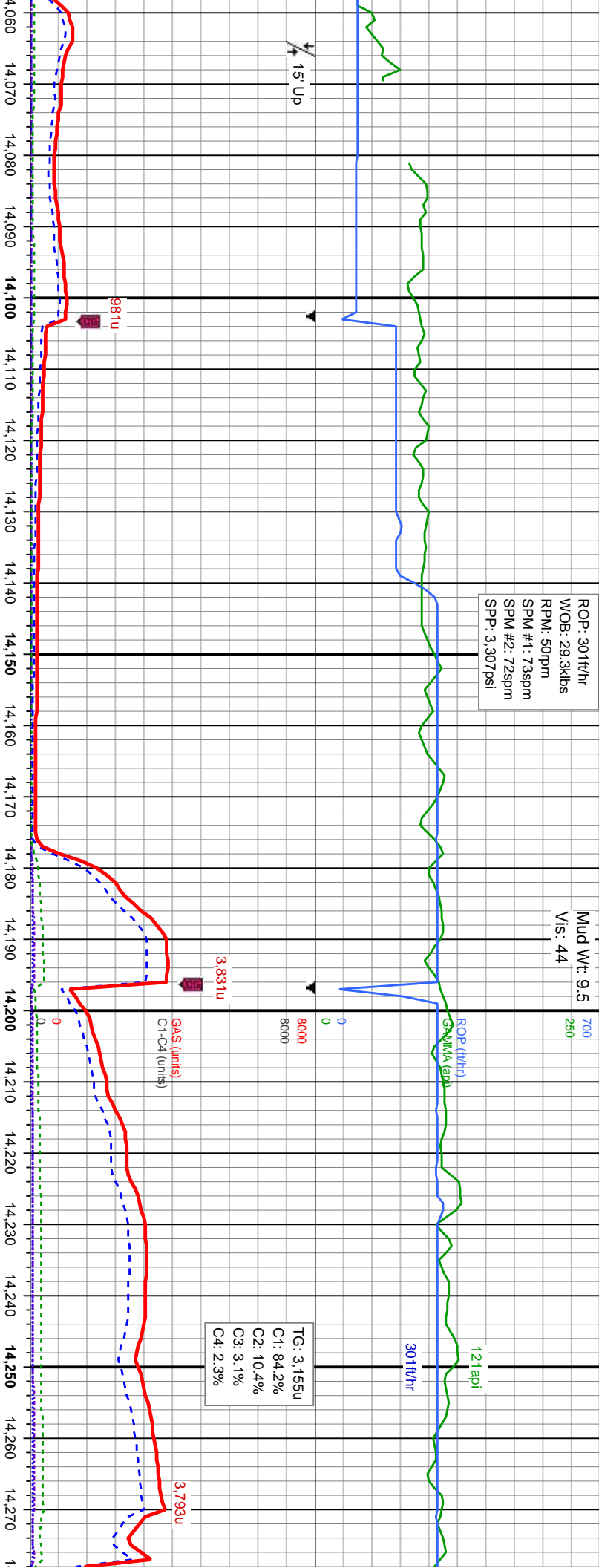
MD: 13,890'
Inclination: 87.8°
Azimuth: 260°
TVD: 6,695'
VS: 6,998'

MD: 13,985'
Inclination: 86.5°
Azimuth: 267°
TVD: 6,700'
VS: 7,093'



ROP: 301ft/hr
WOB: 29.3kbs
RPM: 50rpm
SPM #1: 73spm
SPM #2: 72spm
SPP: 3.307psi

Mud Wt: 9.5
Vis: 44



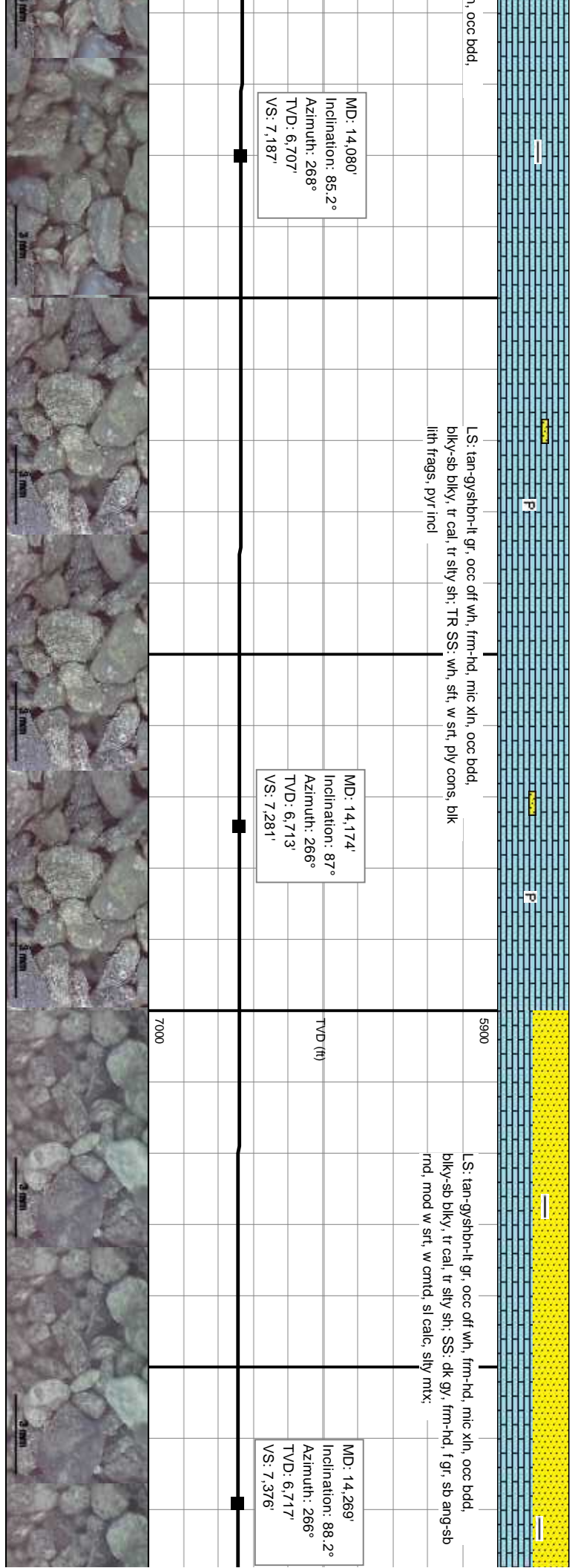
L.S: tan-gyshbn-ft-gr, occ off wh, frm-hd, mic xln, occ bdd,
blkys-sb blkly, tr cal, tr sily sh; TR SS: wh, sft, w srt, ply cons, blk
lith frags, pyr incl

L.S: tan-gyshbn-ft-gr, occ off wh, frm-hd, mic xln, occ bdd,
blkys-sb blkly, tr cal, tr sily sh; SS: dk gy, frm-hd, f gr, sb ang-sb
rnd, mod w srt, w cntd, sl calc, sily mx;

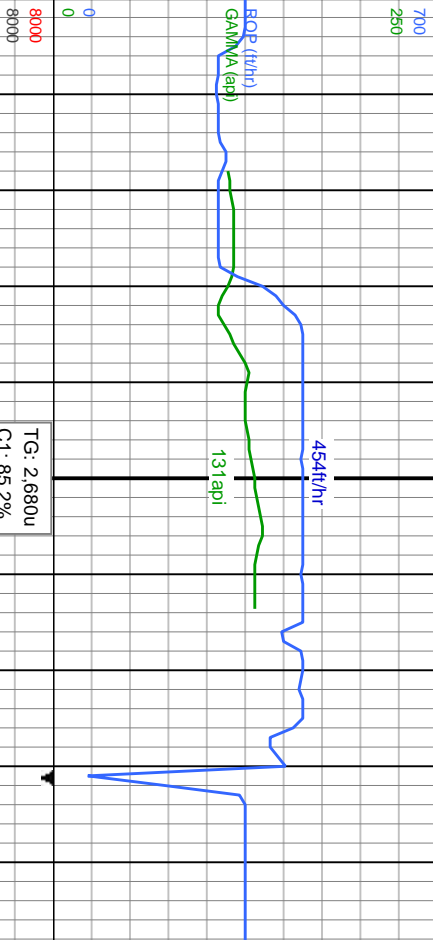
MD: 14,080'
Inclination: 85.2°
Azimuth: 268°
TVD: 6,707'
VS: 7,187'

MD: 14,174'
Inclination: 87°
Azimuth: 266°
TVD: 6,713'
VS: 7,281'

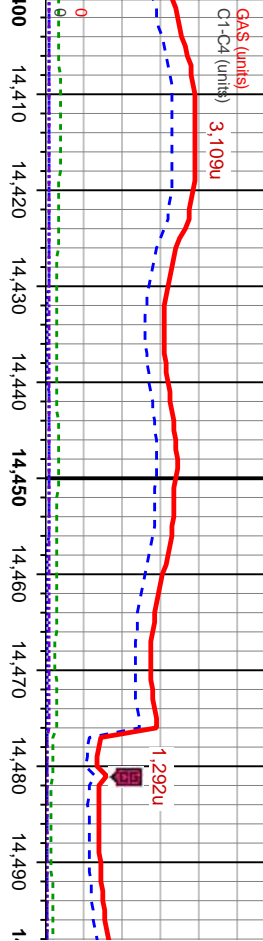
MD: 14,269'
Inclination: 88.2°
Azimuth: 266°
TVD: 6,717'
VS: 7,376'



ROP: 401ft/hr
MOB: 26.9kbs
RPM: 100rpm
SPM #: 85spm
SPM #: 84spm
SP: 4.217psi



TG: 2.680u
C1: 85.2%
C2: 9.7%
C3: 2.9%
C4: 2.3%

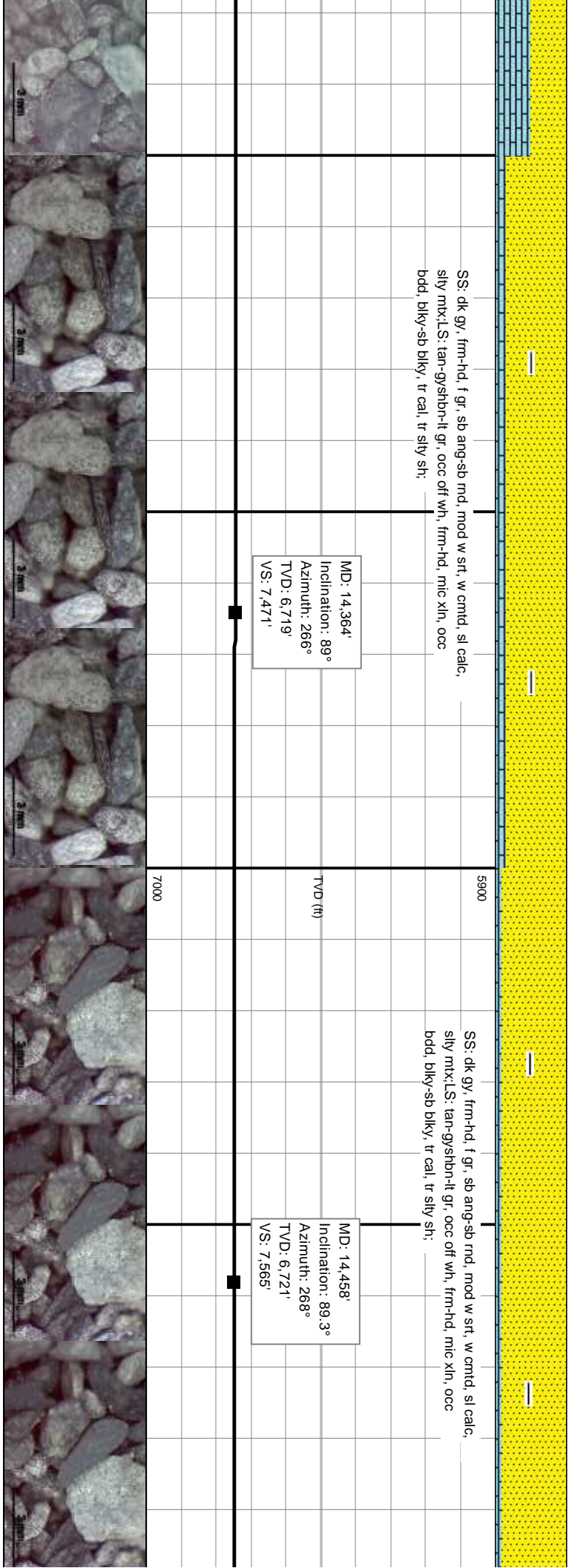


SS: dk gy, frm-hd, f gr, sb ang-sb md, mod w srt, w cntd, sl calc,
sily mix;LS: tan-gy/shn-lt gr, occ off wh, frm-hd, mic xln, occ
bdd, blk-y-sb blk-y, tr cal, tr sily sh;

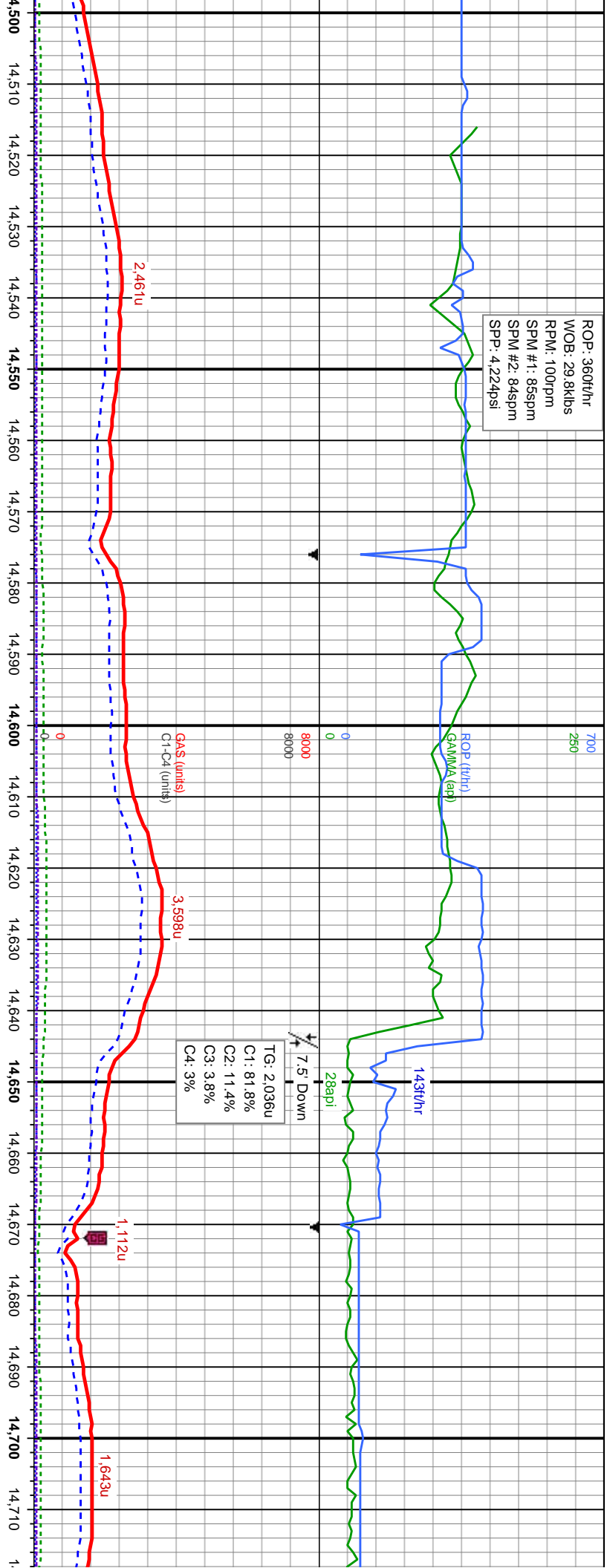
MD: 14,364'
Inclination: 89°
Azimuth: 266°
TVD: 6,719'
VS: 7.471'

SS: dk gy, frm-hd, f gr, sb ang-sb md, mod w srt, w cntd, sl calc,
sily mix;LS: tan-gy/shn-lt gr, occ off wh, frm-hd, mic xln, occ
bdd, blk-y-sb blk-y, tr cal, tr sily sh;

MD: 14,458'
Inclination: 89.3°
Azimuth: 268°
TVD: 6,721'
VS: 7.565'

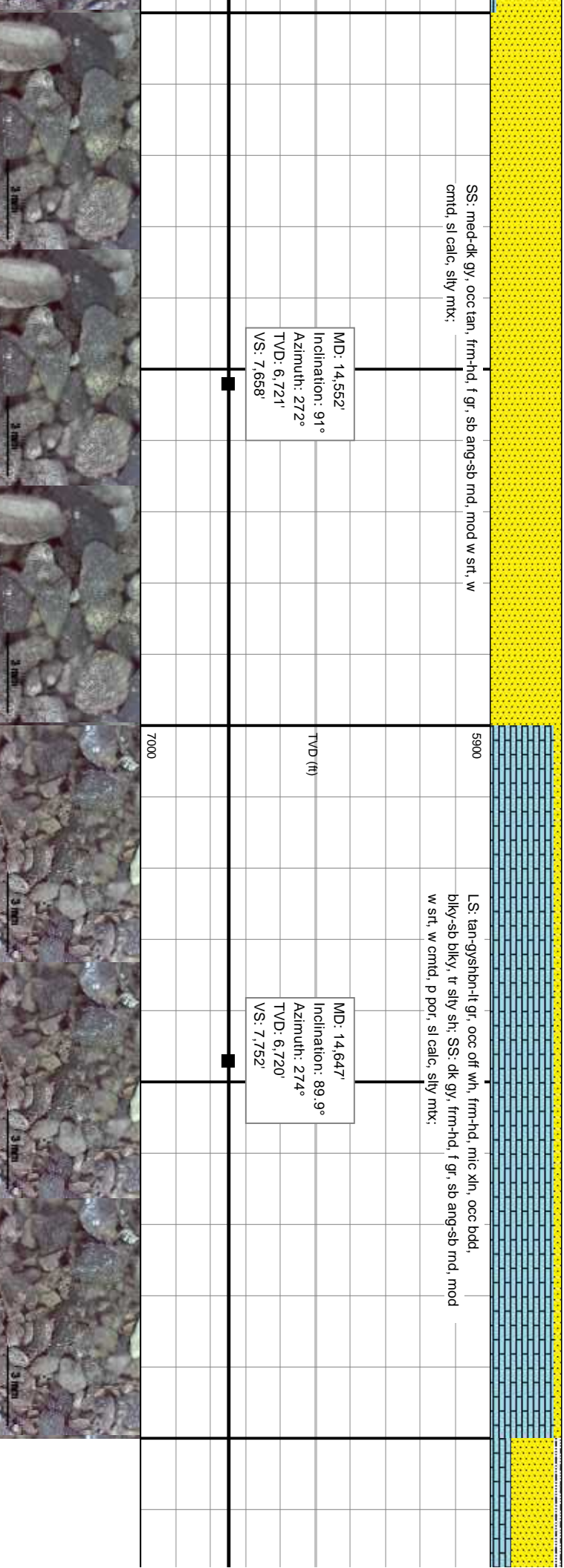


ROP: 360ft/hr
WOB: 29.8klbs
RPM: 100rpm
SPM #1: 85spm
SPM #2: 84spm
SPP: 4.224psi



SS: med-dk gy, occ tan, frm-hd, f gr, sb ang-sb md, mod w srt, w cmtd, sl calc, silty mtx;

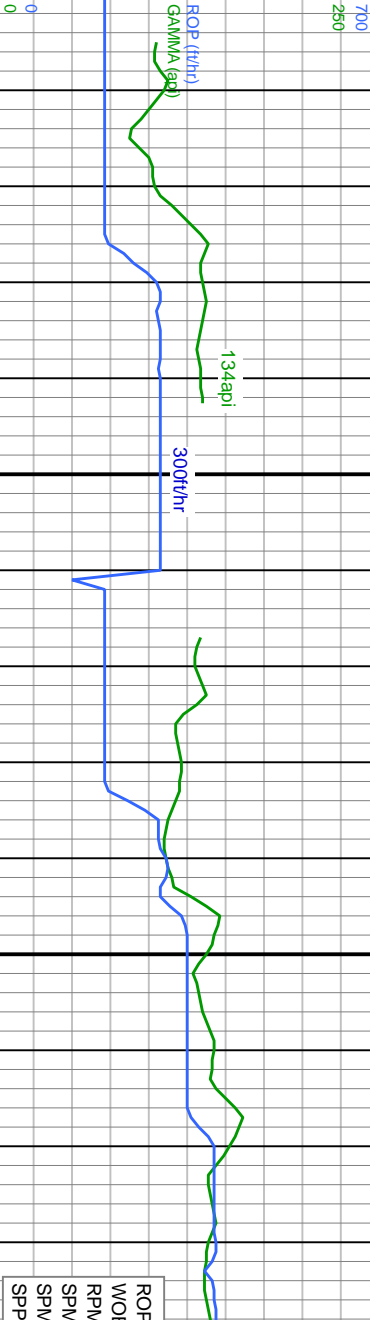
MD: 14,552'
Inclination: 91°
Azimuth: 272°
TVD: 6,721'
VS: 7,658'



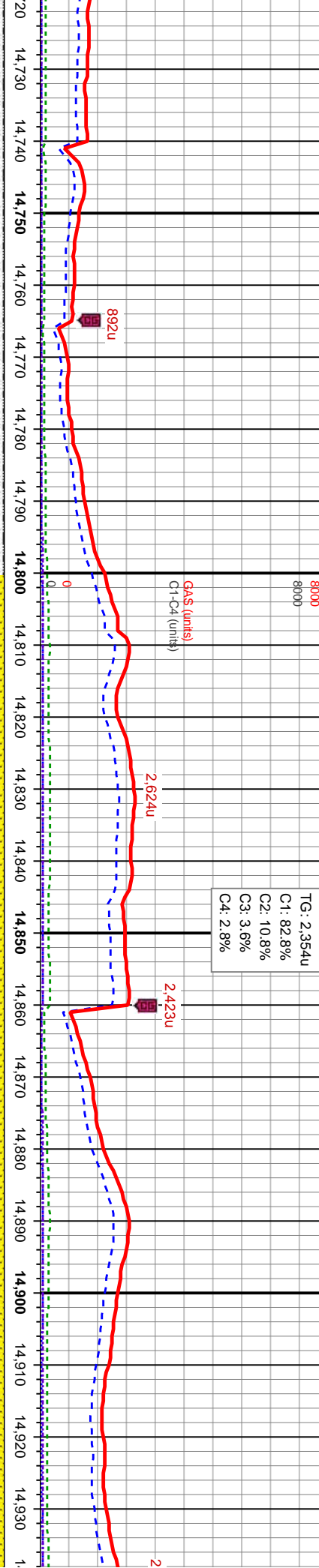
L.S: tan-gyshbr-lt gr, occ off wh, frm-hd, mic xln, occ bdd, blkly-sb blkly, tr silty sh, SS: dk gy, frm-hd, f gr, sb ang-sb md, mod w srt, w cmtd, p por, sl calc, silty mtx;

MD: 14,647'
Inclination: 89.9°
Azimuth: 274°
TVD: 6,720'
VS: 7,752'

ROP: 100ft/hr
WOB: 27.4klbs
RPM: 70rpm
SPM #1: 73spm
SPM #2: 72spm
SPP: 3.221psi

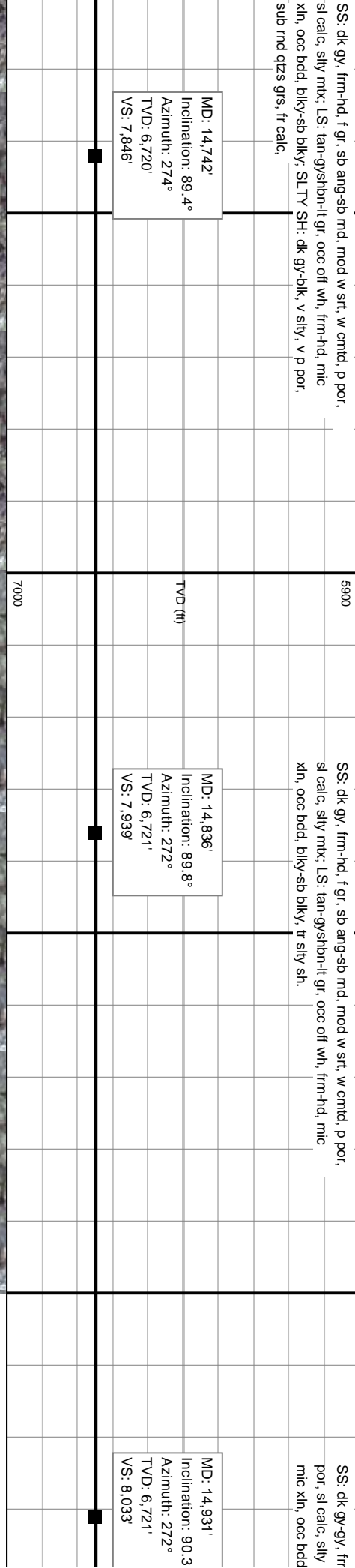


TG: 2.354u
C1: 82.8%
C2: 10.8%
C3: 3.6%
C4: 2.8%



SS: dk gy, frm-hd, f gr, sb ang-sb md, mod w srt, w cntd, p por,
sl calc, silty mtx; LS: tan-gysbhn-tt gr, occ off wh, frm-hd, mic
xln, occ bdd, blk-y-sb blk-y, SLTY SH: dk gy-blk, v silty, v p por,
sub md qtzs grs, tr calc,

MD: 14,742'
Inclination: 89.4°
Azimuth: 274°
TVD: 6,720'
VS: 7.846'

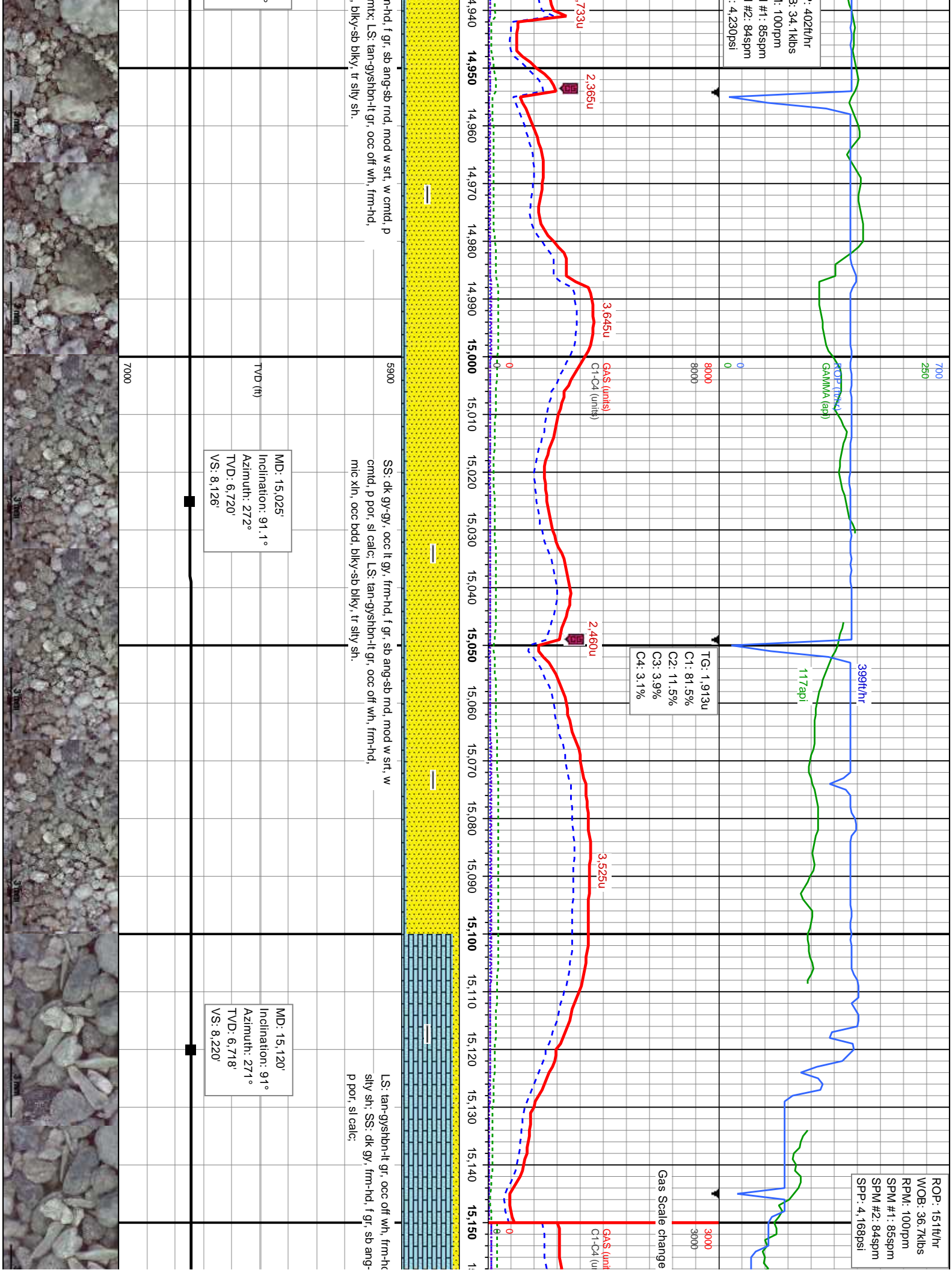


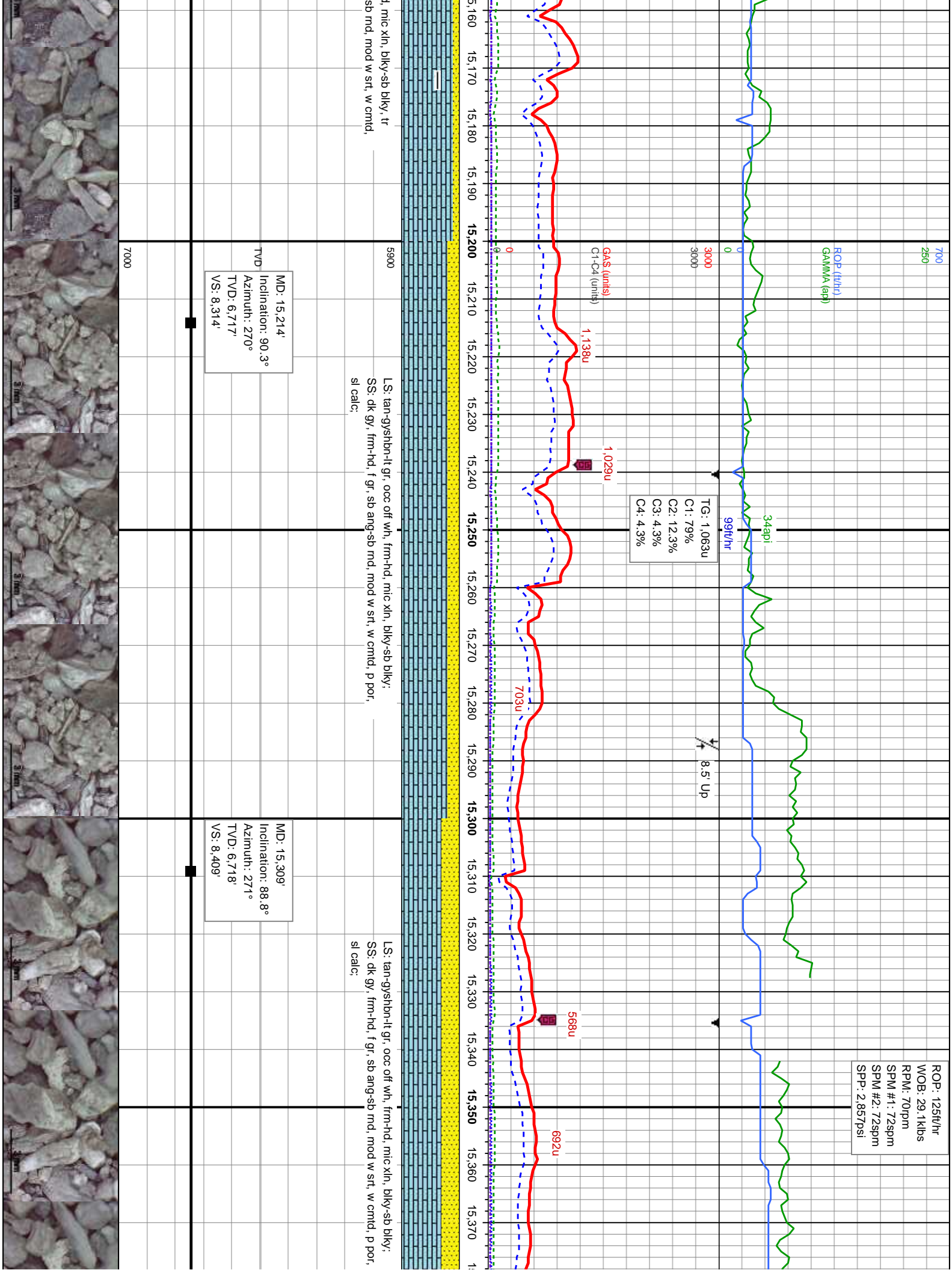
SS: dk gy, frm-hd, f gr, sb ang-sb md, mod w srt, w cntd, p por,
sl calc, silty mtx; LS: tan-gysbhn-tt gr, occ off wh, frm-hd, mic
xln, occ bdd, blk-y-sb blk-y, tr silty sh.

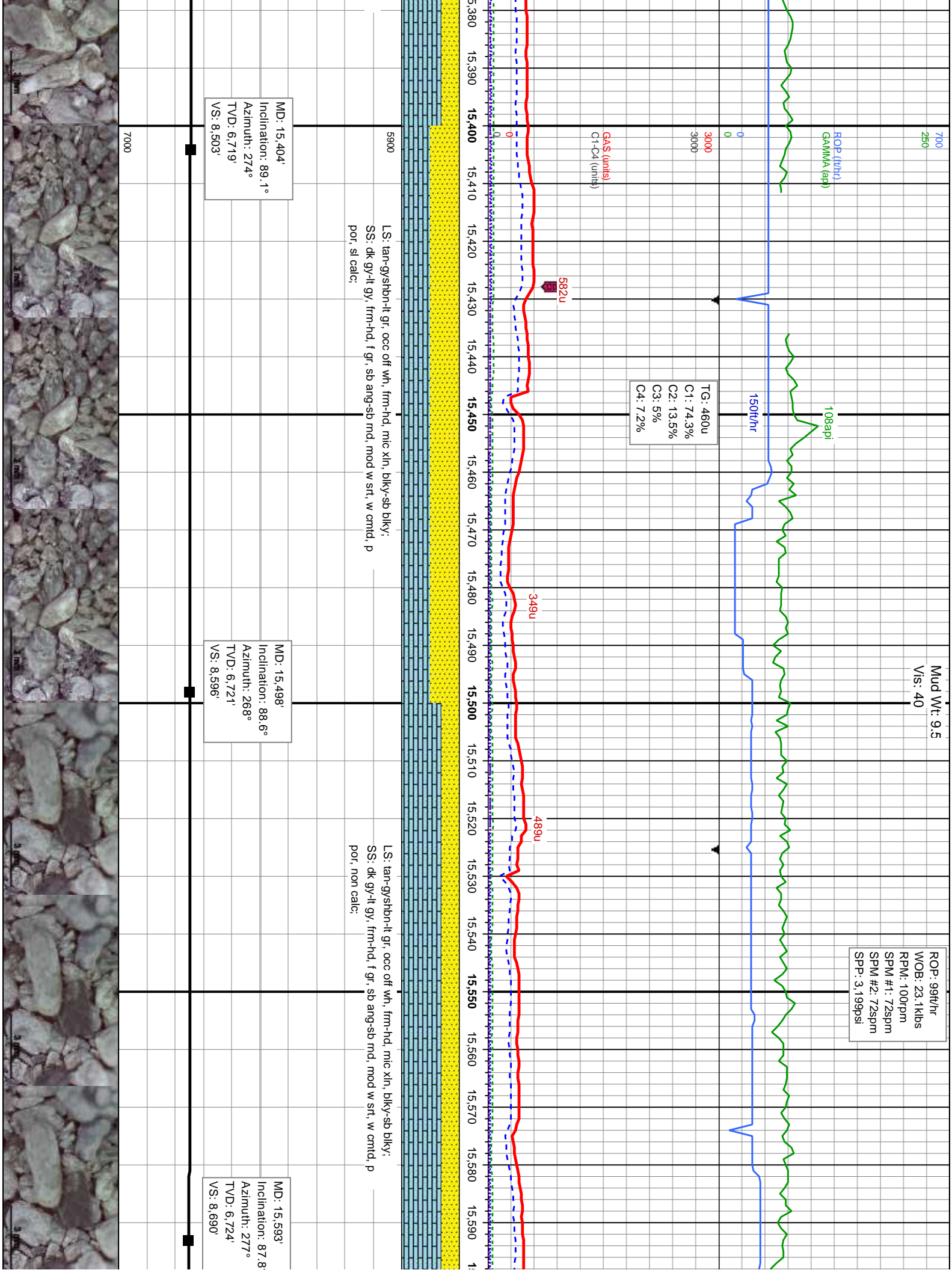
MD: 14,836'
Inclination: 89.8°
Azimuth: 272°
TVD: 6,721'
VS: 7.939'

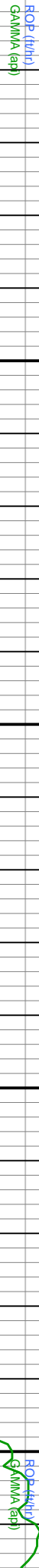
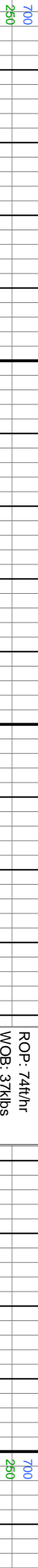


MD: 14,931'
Inclination: 90.3°
Azimuth: 272°
TVD: 6,721'
VS: 8.033'





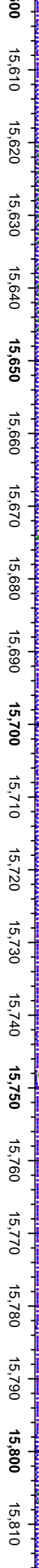
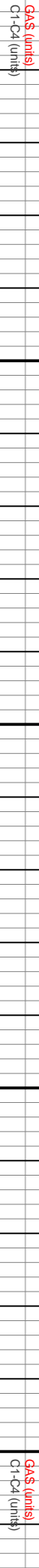




ROP: 74ft/hr
WOB: 37klbs
RPM: 71rpm
SPM #1: 73spm
SPM #2: 72spm
SP: 2.863psi



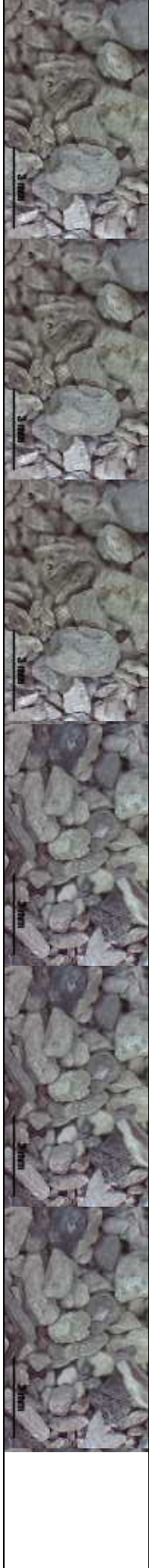
TG: 387u
C1: 73%
C2: 14.1%
C3: 5.1%
C4: 7.7%

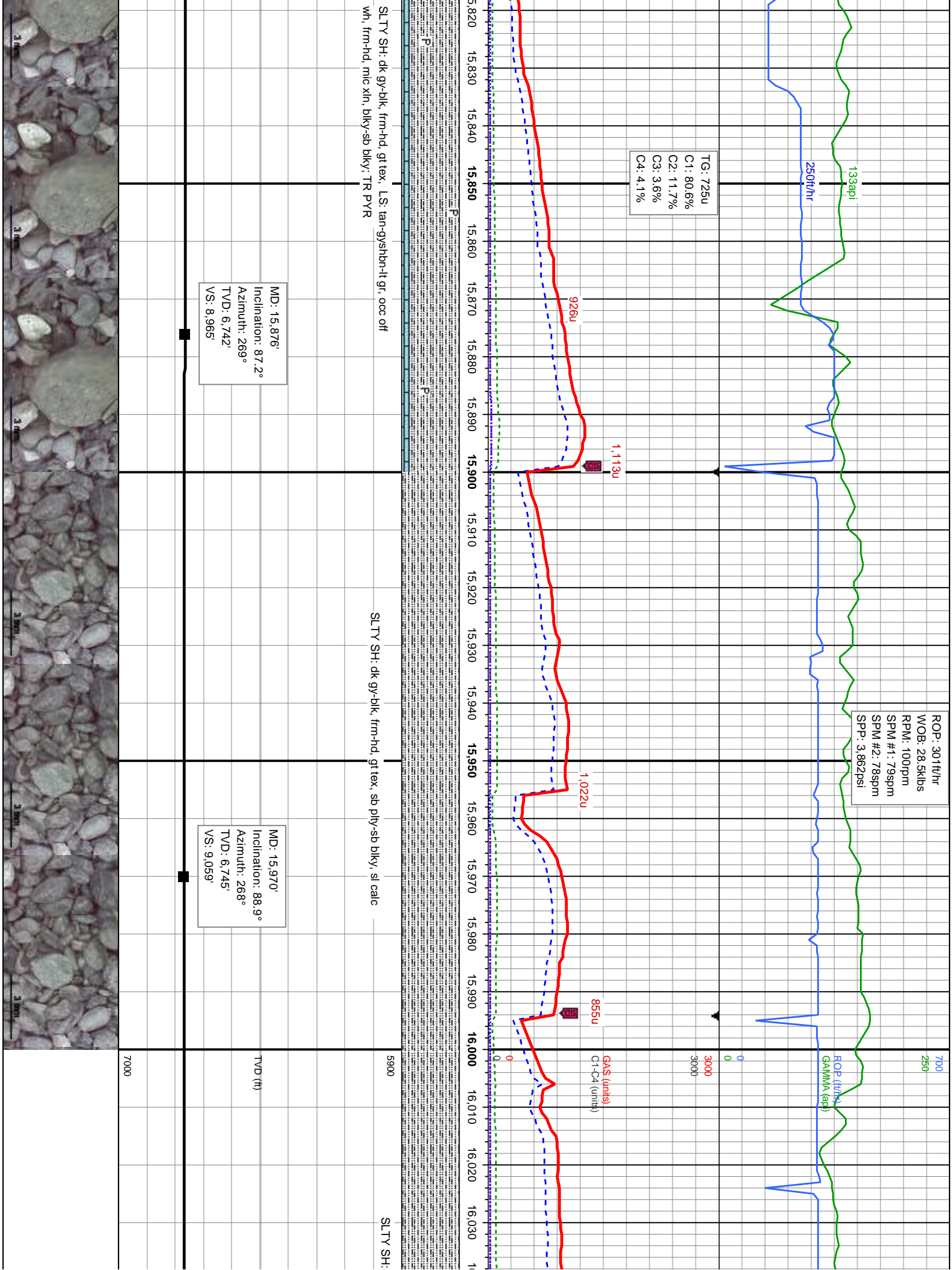


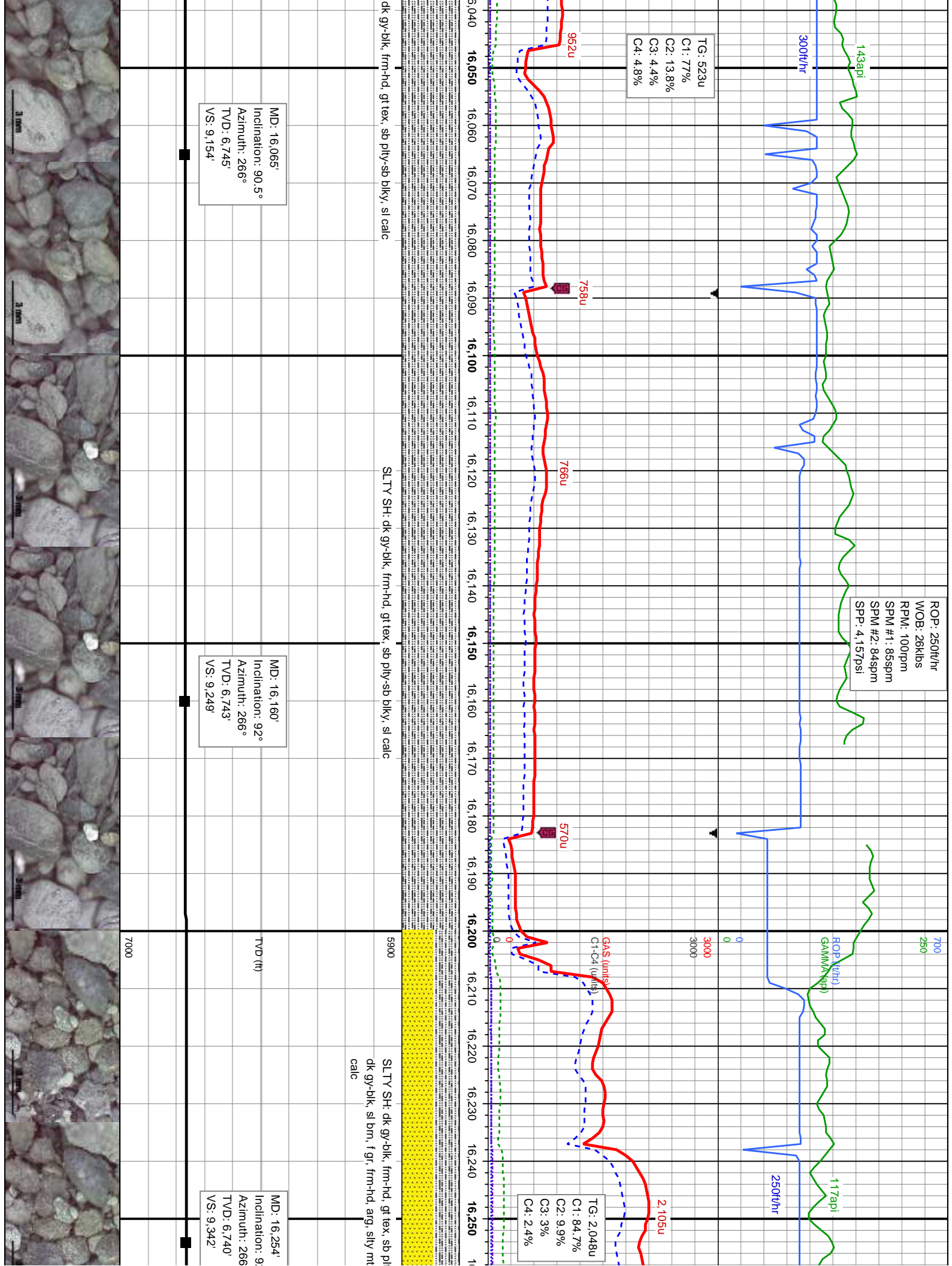
LS: tan-gyshbn-it gr, occ off wh, frm-hd, mic xln, blk-y-sb blk-y;
TR SLTY SH

MD: 15,687'
Inclination: 86.4°
Azimuth: 283°
TVD: 6,729'
VS: 8,780'

MD: 15,781'
Inclination: 85.6°
Azimuth: 274°
TVD: 6,736'
VS: 8,871'







16277 MD - 08/29/18

ROP: 250ft/hr
WOB: 33.7kls
RPM: 100rpm
SPM #1: 85spm
SPM #2: 84spm
SPP: 4.176psi

ROP (ft/hr)
GAMMA (api)

1.5' Up

1.193u

2.416u

912u

GA\$ (units)
C1-C4 (units)

1.056u

TG: 692u
C1: 80.2%
C2: 11.8%
C3: 3.8%
C4: 4.2%

26api
74ft/hr

SS: tan-gyshbn-lt gr, occ off wh, frm-hd, mic xln, blk-y-sb blk-y;
SS: dk gy-blk, sl brn, f gr, frm-hd, arg, silty mx, ply str, mod w
cons, sl calc

SS: tan-gyshbn-lt gr, occ off wh, frm-hd, mic xln, blk-y-sb blk-y;
SS: dk gy-blk, sl brn, f gr, frm-hd, arg, silty mx, ply str, mod w
cons, sl calc

SS: tan-gyshbn-lt gr, occ off wh, frm-hd, mic xln, blk-y-sb blk-y;
SS: dk gy-gy, sl brn, f gr, frm-hd, arg, silty mx, ply str, mod w
cons, sl calc

MD: 16,349'
Inclination: 91.1°
Azimuth: 266°
TVD: 6,737'
VS: 9,437'

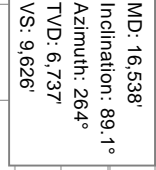
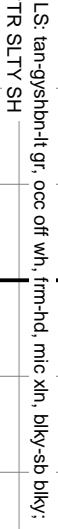
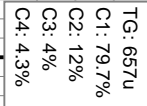
TVD (ft)

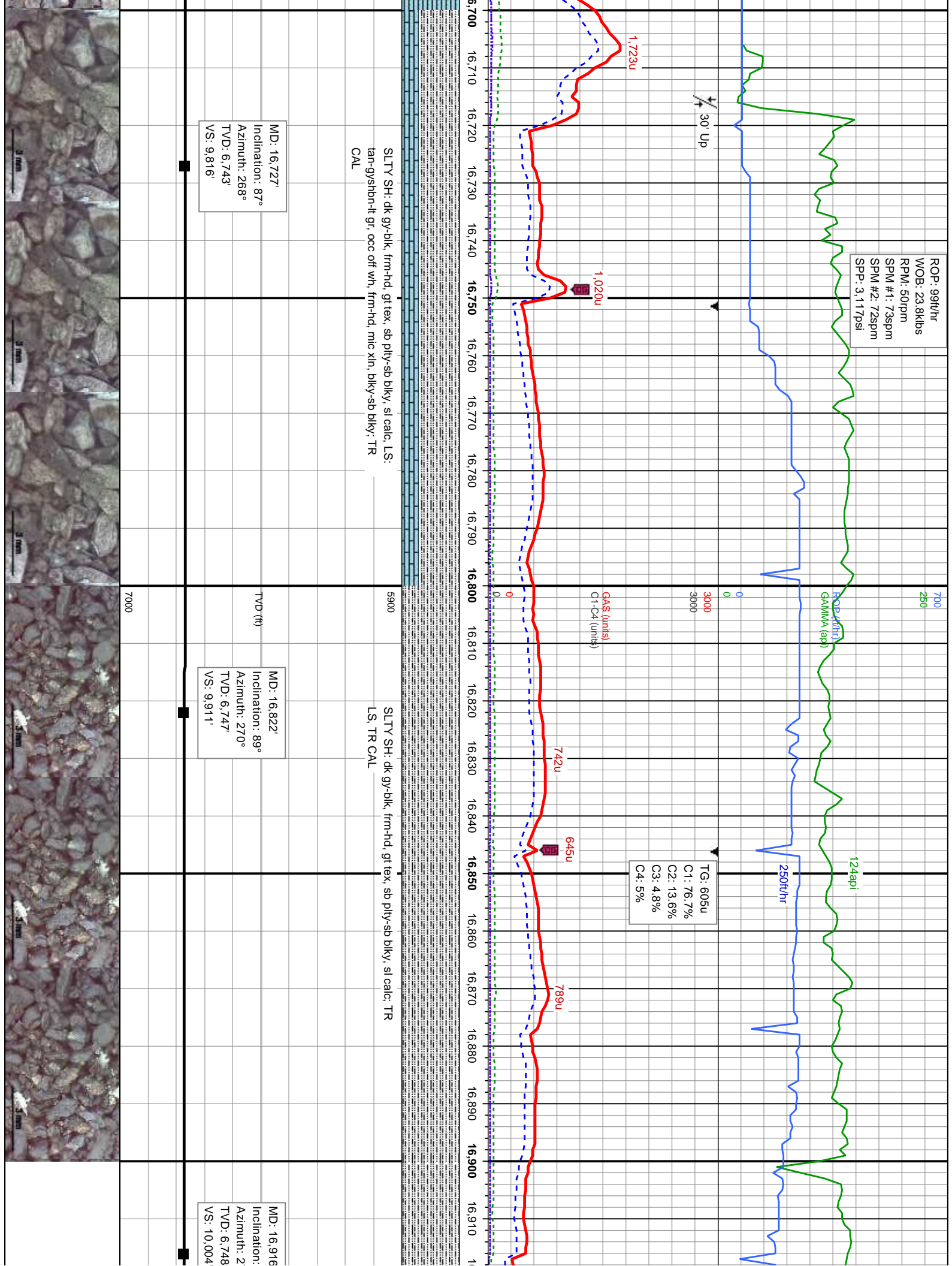
MD: 16,443'
Inclination: 90°
Azimuth: 264°
TVD: 6,736'
VS: 9,531'

7000

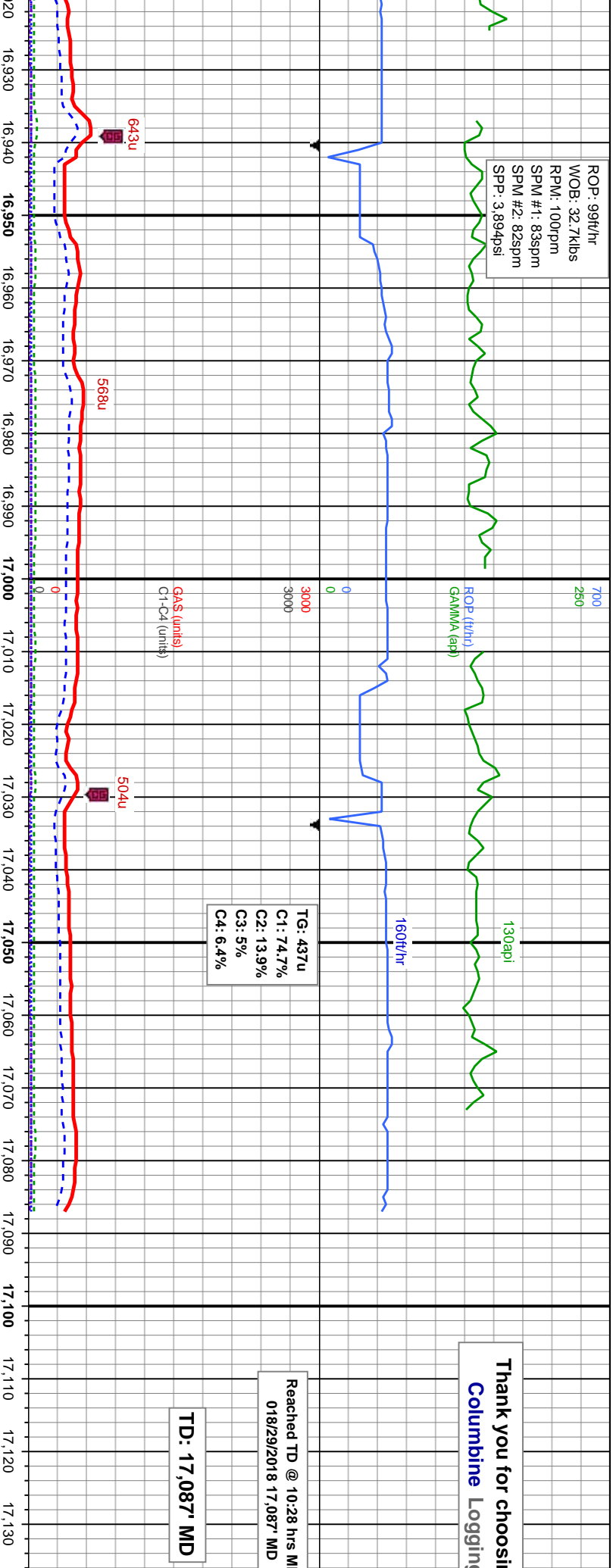


ROP: 75ft/hr
WOB: 32.4klbs
RPM: 50rpm
SPM #1: 73spm
SPM #2: 72spm
SPP: 3,294psi





ROP: 99ft/hr
WOB: 32.7kls
RPM: 100rpm
SPM #1: 83spm
SPM #2: 82spm
SPP: 3.894psi



Thank you for choosing
Columbine Logging

Reached TD @ 10:28 hrs MDT
018/29/2018 17,087' MD

TD: 17,087' MD

SLTY SH: dk gy-blk, frm-hd, gt tex, sb pily-sb blk, sl calc; TR
LS, TR SS, TR CAL

MD: 17,010'
Inclination: 89.6°
Azimuth: 273°
TVD: 6,750'
VS: 10,097'

SLTY SH: dk gy-blk, frm-hd, gt tex, sb pily-sb blk, sl calc; TR
LS, TR CAL

MD: 17,087'
Inclination: 89.6°
Azimuth: 273°
TVD: 6,751'
VS: 10,174'

PTB



