



Scale: 5" / 100'
Measured Depth Log

Well Name Five Rivers K09-66-1AHN

Location SWNW SEC 9, T4N, R66W

State COLORADO

County WELD

Country USA

Rig Number H&P 330

API Number 05-123-39479

Field WATTENBERG

Region DJ BASIN

Drilling Completed 9/1/2014

Spud Date 8/23/2014

Surface Coordinates 2150' FNL, 512' FWL

Bottom Hole Coordinates 326' FSL, 4862' FEL

Ground Elevation 4699'

K.B. Elevation 4729'

Logged Interval 6346' To 12096'

Total Depth 12096'

Formation NIOBRARA C CHALK

Type of Drilling Fluid LSND

Operator

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Geologist

Name RENEE CLACKLER

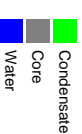
Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202


































Other

WELL SITE GEOLOGIST ANDREA ZUIDEMA
JESSICA SILVEY























































Zone Color Coding



Rock Types

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

Accessories

 F FOSSIL	 ARGILLACEOUS	 GLAUCONITE	 TUFFACEOUS
 GASTROPOD	 ARGILLITE GRAIN	 GYPSIFEROUS	
 ALGAE	 B BENTONITE	 HEAVY MINERAL	
 AMPHIPORA	 BITUMENOUS SUBSTANCE	 INOCERAMUS	 ANHYDRITE STRINGER
 BELEMNITE	 BRECCIA FRAGMENTS	 K KAOLIN	 BENTONITE STRINGER
 BIOCLASTIC	 C CALCAREOUS	 M MARLSTONE	 COAL STRINGER
 BRACHIOPOD	 CARBONACEOUS FLAKES	 MINERAL CRYSTALS	 DOLOMITE STRINGER
 BRYOZOA	 CHTDK	 N NODULES	 GYPSUM STRINGER
 CEPHALOPOD	 CHTLT	 PHOSPHATE PELLETS	 LIMESTONE STRINGER
 CORAL	 COAL - THIN BEDS	 P PYRITE	 MARLSTONE (CALC) STRG
 CRINOID	 D DOLOMITIC	 S SALT CAST	 MARLSTONE (DOL) STRG
 ECHINOID	 F FELDSPAR	 S SANDY	 SANDSTONE STRINGER
 FISH	 FERRUGINOUS PELLET	 S SILICEOUS	 SHALE STRINGER
 FORAMINIFERA	 F FERRUGINOUS	 S SILTY	 SILTSTONE STRINGER

















Minerals

Stringer

Engineering

Oil Show


Porosity

 MOLDIC	 CONNECTION (LEFT)	 QUESTIONABLE
 ORGANIC	 CONNECTION (RIGHT)	 SPOTTED STAINING
 PINPOINT	 CONNECTION GAS	
 DEAD	 CORE - LOST	
 EVEN	 INTERFRACTURE	
 VUGGY	 CORE - RECOVERED	
	 INTEROOLITIC	
	 DST INTERVAL	

Other Symbols

 FAULT  WIRELINE TESTED - LEFT **E** EARTHY

 FORMATION TOP  WIRELINE TESTED - RT **FX** FINELYXLN

 GAS SHOW **GS** GRAINSTONE

Rounding

 **MINDEPTH** MN DEPTH **L** LITHOGRAPHIC

 NORMAL FAULT **A** ANGULAR **MX** MICROXLN


 OIL SHOW **R** ROUNDED **MS** MUDSTONE

 OVERTURNED STRATA **B** SUBANG **PS** PACKSTONE

 REVERSE FAULT **F** SUBRND **WS** WACKESTONE

 SIDEWALL CORE (LEFT)


Textures

 SIDEWALL CORE (RIGHT)

Sorting

 SLIDE **BS** BOUNDSTONE **M** MODERATE

 **DS** SURVEY **C** CHALKY **P** POOR

 TRIP GAS **CX** CRYPTOXLN **W** WELL

Slide/Rotate

BEGAN DRILLING CURVE
@ 08:46PM on08/27/2014

ROP
ROP

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

COLUMBINE LOGGING INC.
RIGGED UP ON 08/24/2014
MANNED 2-PERSON LOGGING
WITH BLOODHOUND GAS
CHROMATOGRAPH UNIT #0624
COLUMBINE BEGAN LOGGING
ON 08/24/2014

Bit Data
Bit #: 3
Type: Smith SD1611
Size: 8.75"
Depth In: 6,346 '
Depth Out: 7,552 '
Jets: 6X16
S/N: JU2936

Depth Labels

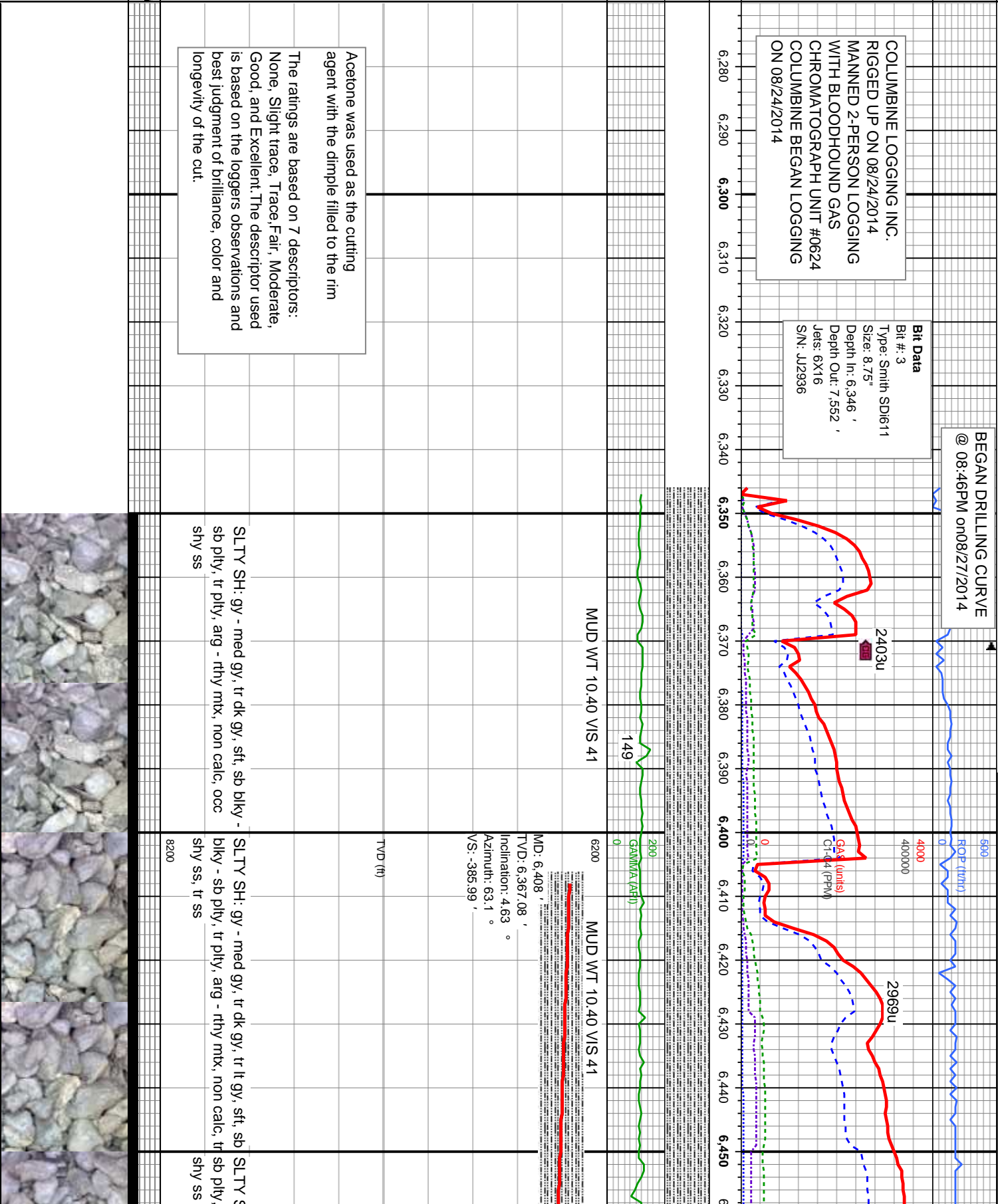
% Lith

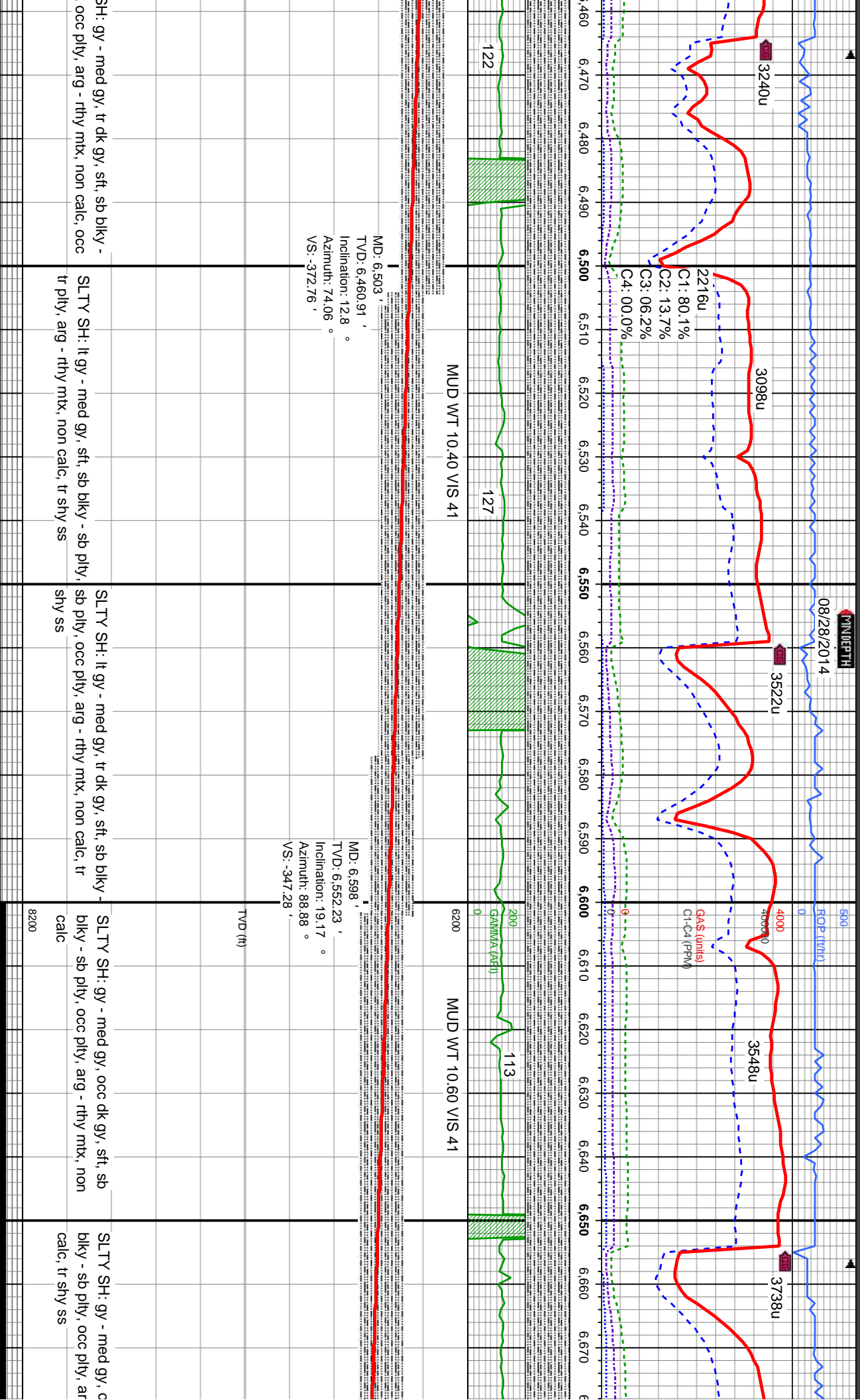
Gamma
GAMMA

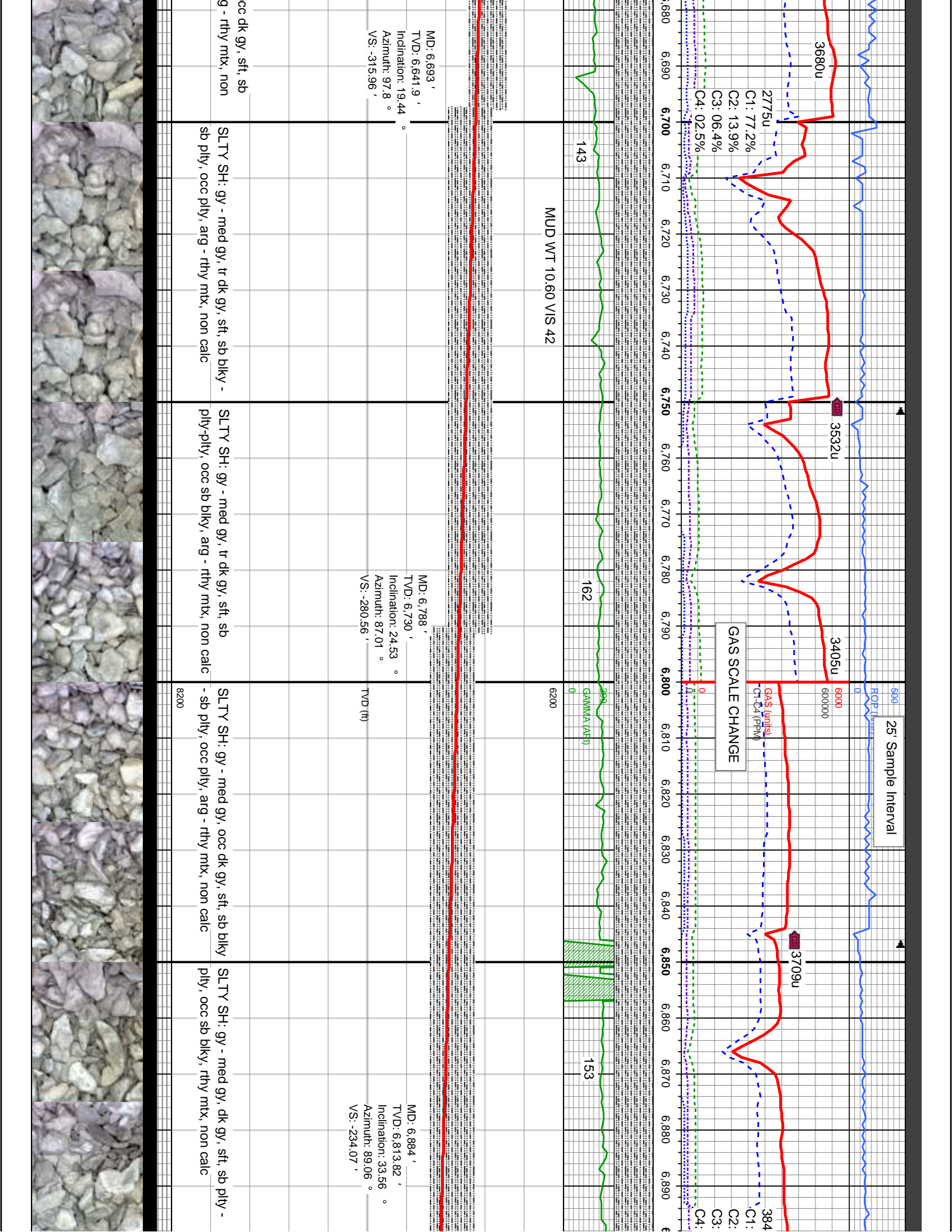
Well Bore
TVD

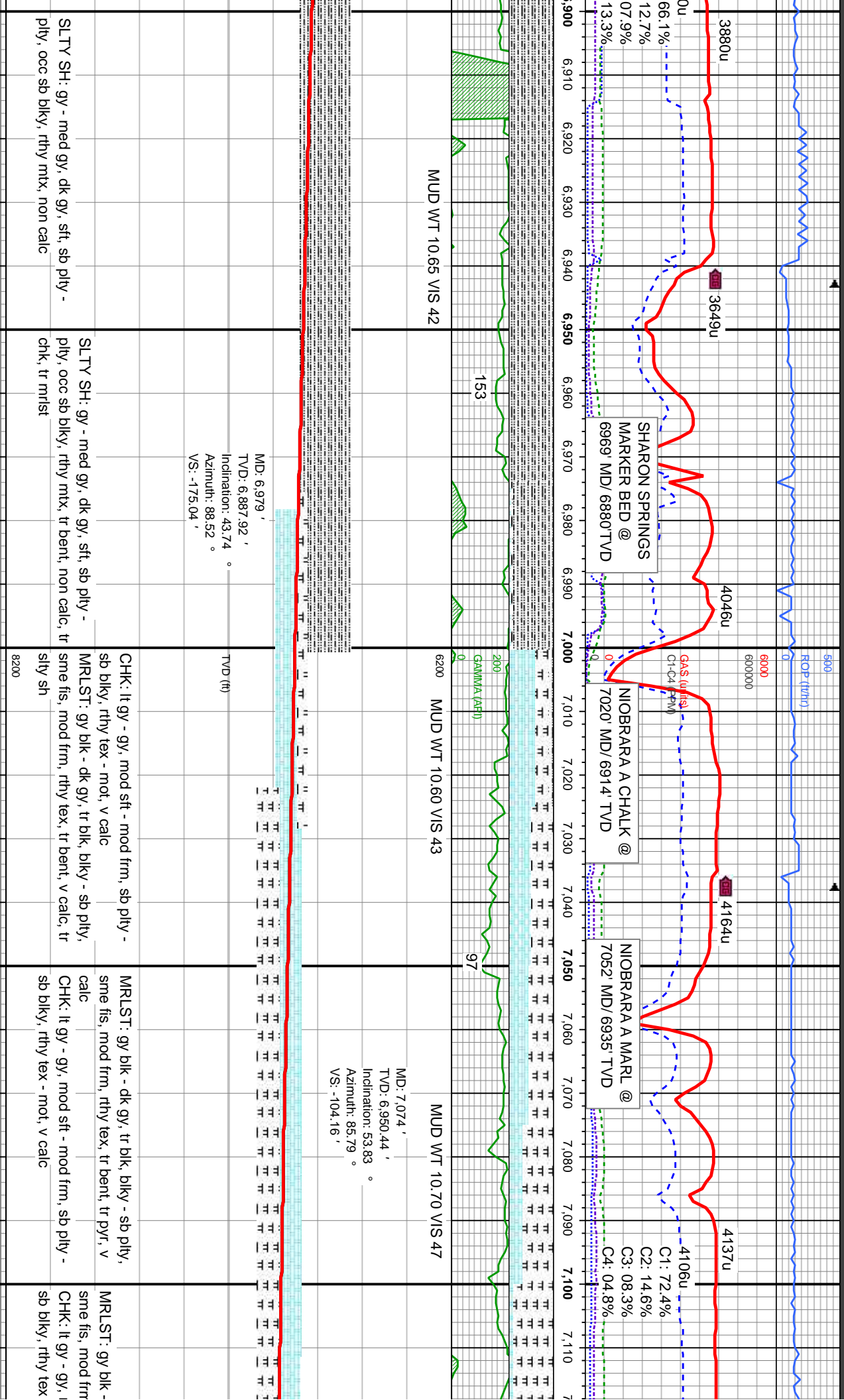
Oil Show

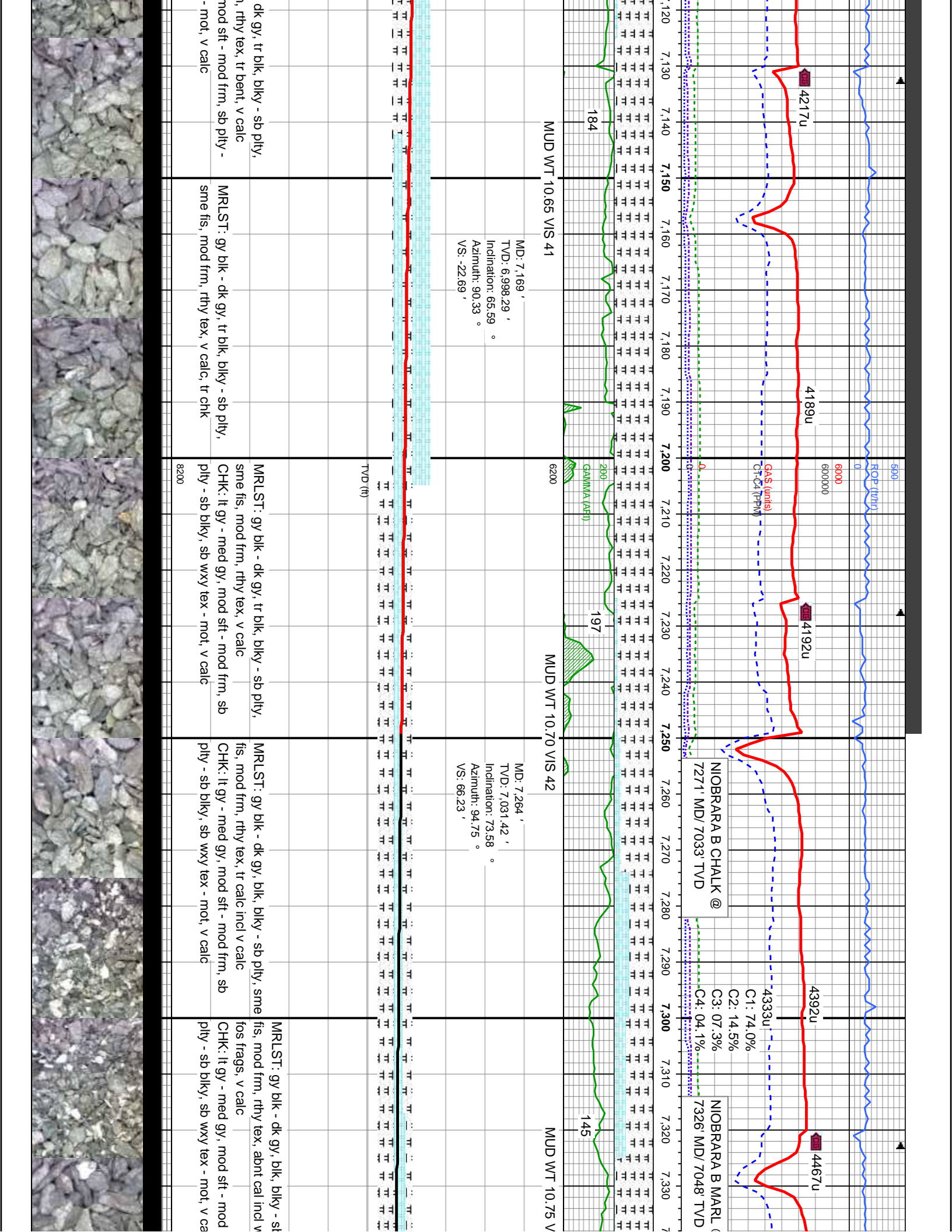
Images

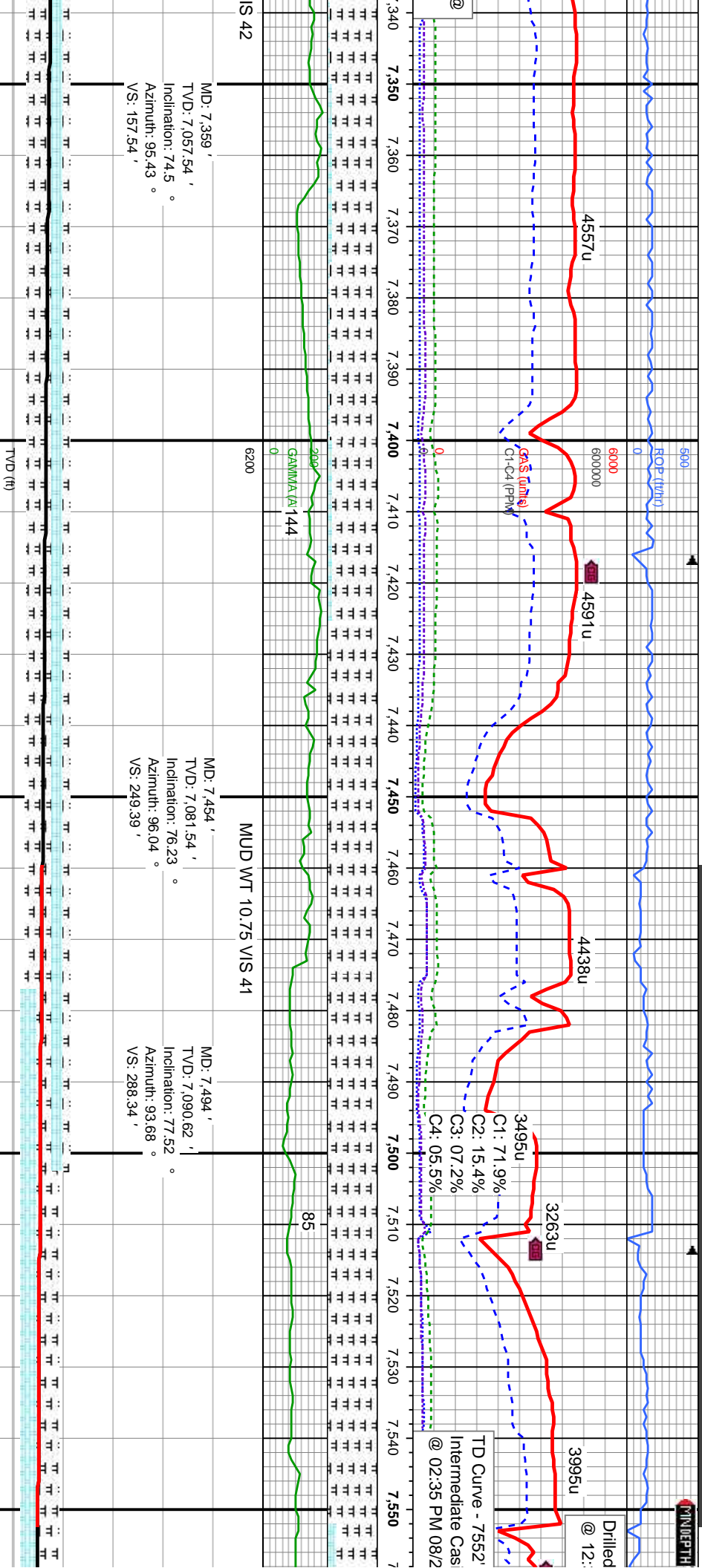












MUD WT 10.75 VIS 41

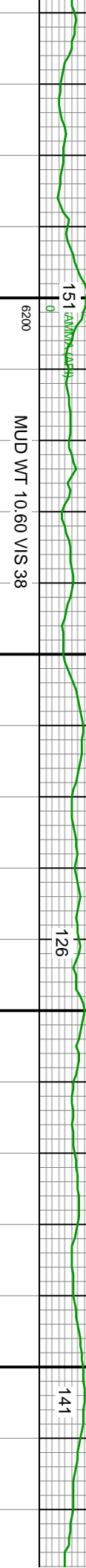
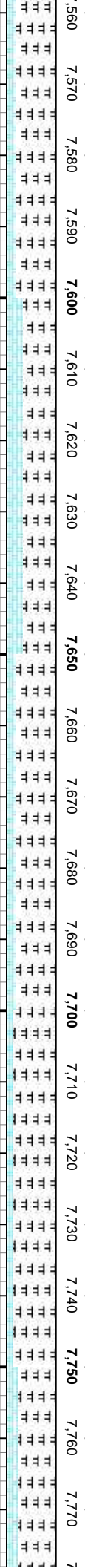
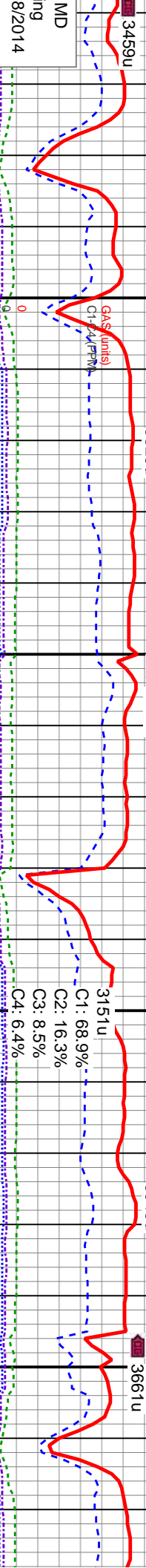
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MD: 7,359 ' TVD: 7,057.54 ' Inclination: 74.5 ° Azimuth: 95.43 ° VS: 157.54 '

ply, sme	MRLST: gy blk - dk gy, blk, blk - sb ply, sme	MRLST: gy blk - dk gy, blk, blk - sb ply, sme	MRLST: gy blk - dk gy, blk, blk - sb ply, sme	MRLST: gy blk - dk gy, blk, blk - sb ply, sme	MRLST: gy blk - dk gy, blk, blk - sb ply, sme
ply, occ	fis, mod frm, rthy tex, tr - occ cal incl, tr fos	sme fis, mod frm, rthy tex, tr cal incl, tr pyr, v	fis, mod frm, rthy tex, sl tr cal incl, tr pyr, tr	fis, mod frm, rthy tex, tr pyr, tr bent, v calc, tr chk	fis, mod frm, rthy tex, tr pyr, tr bent, v calc, tr cal incl
frm, sb	frags, v calc	calc	CHK: lt gy - med gy, mod sft - mod frm, sb	CHK: lt gy - med gy, mod sft - mod frm, sb	CHK: lt gy - med gy, mod sft - mod frm, sb
ic	ply - sb blk, sb wxy tex - mot, v calc	ply - sb blk, sb wxy tex - mot, v calc	ply - sb blk, sb wxy tex - mot, v calc	ply - sb blk, sb wxy tex - mot, v calc	ply - sb blk, sb wxy tex - mot, v calc
	8200				



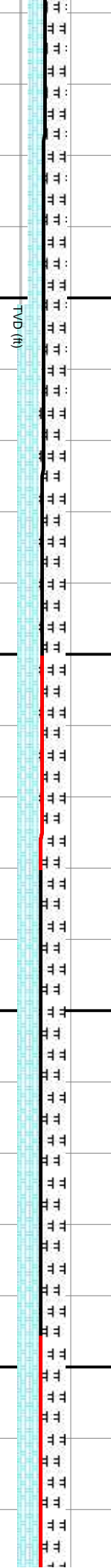
08/29/2014
08/30/2014
out of 7" Casing
38 PM 08/30/2014



MD: 7,565 '
TVD: 7,106.98 '
Inclination: 81.79 °
Azimuth: 87.52 °
VS: 377.66 '

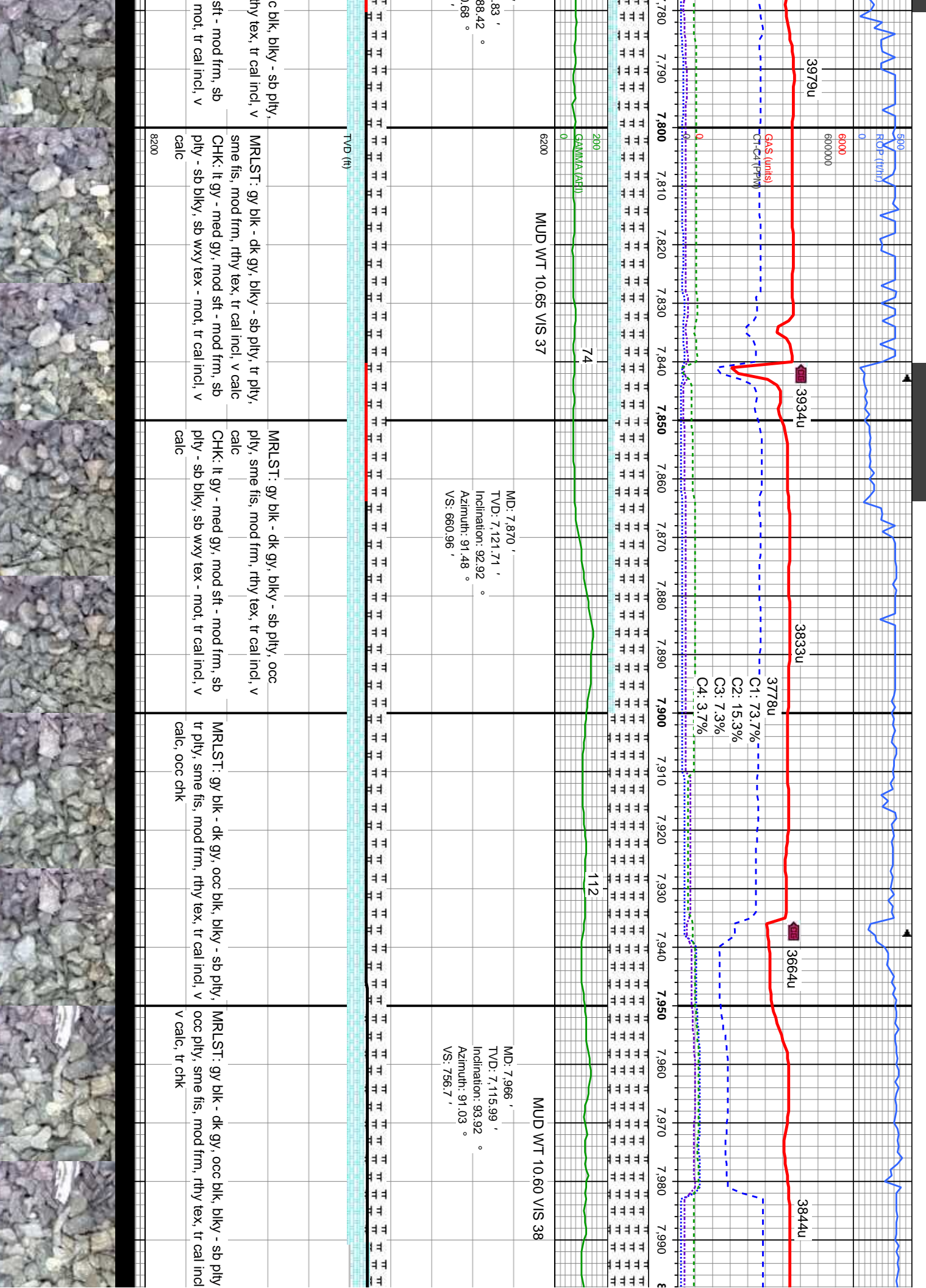
MD: 7,680 '
TVD: 7,117.64 '
Inclination: 85.32 °
Azimuth: 88.03 °
VS: 471.53 '

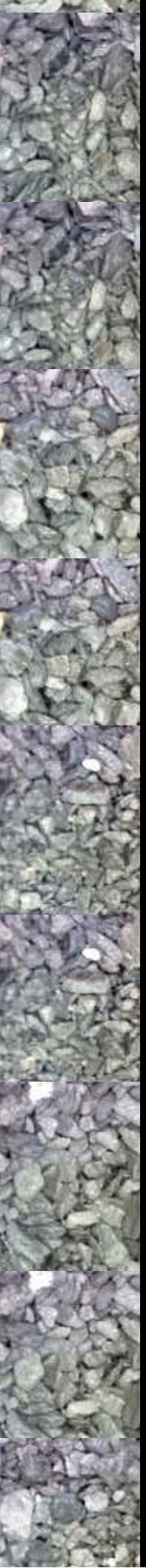
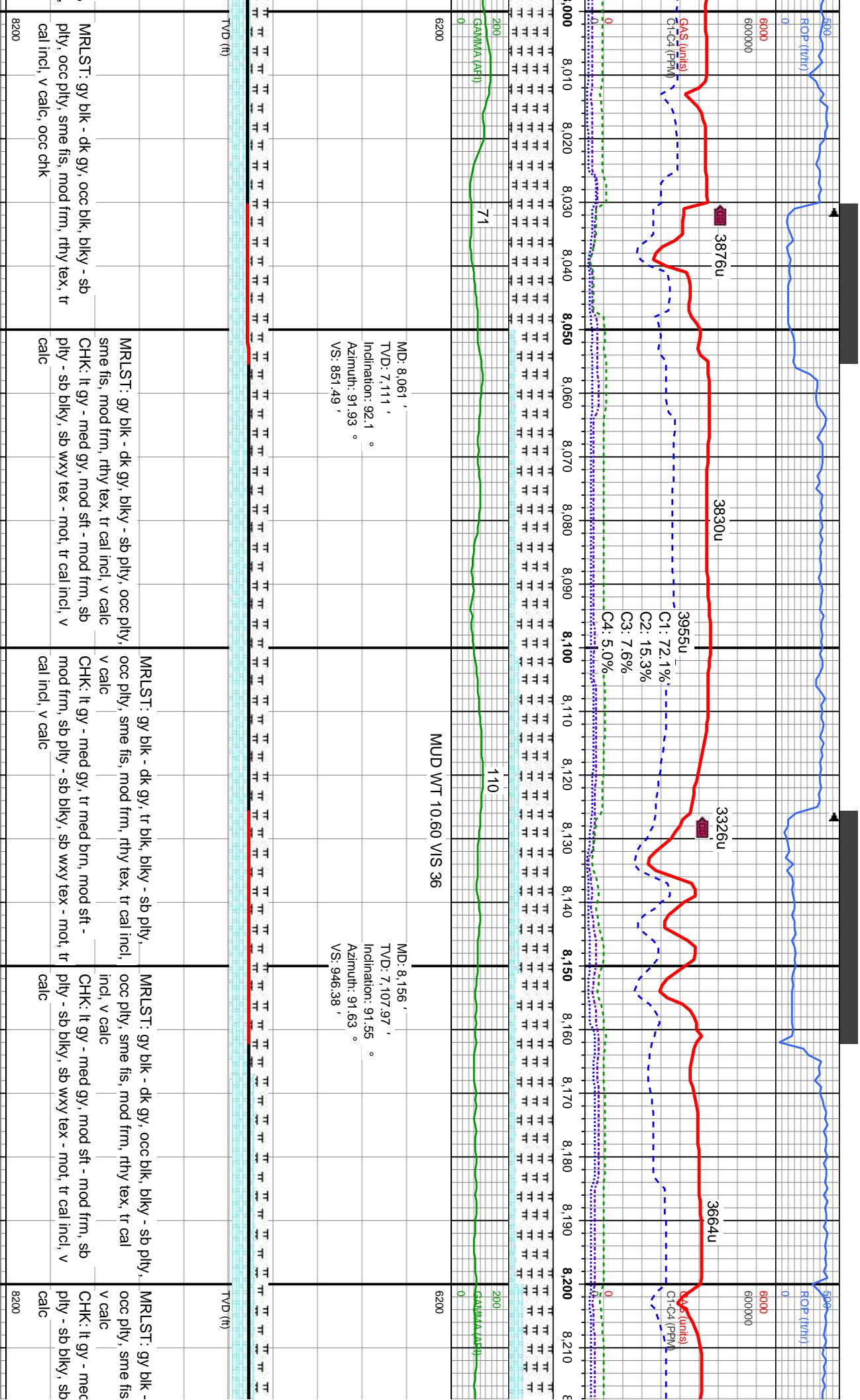
MD: 7,775 '
TVD: 7,122 '
Inclination: 90 °
Azimuth: 90 °
VS: 566.09 '

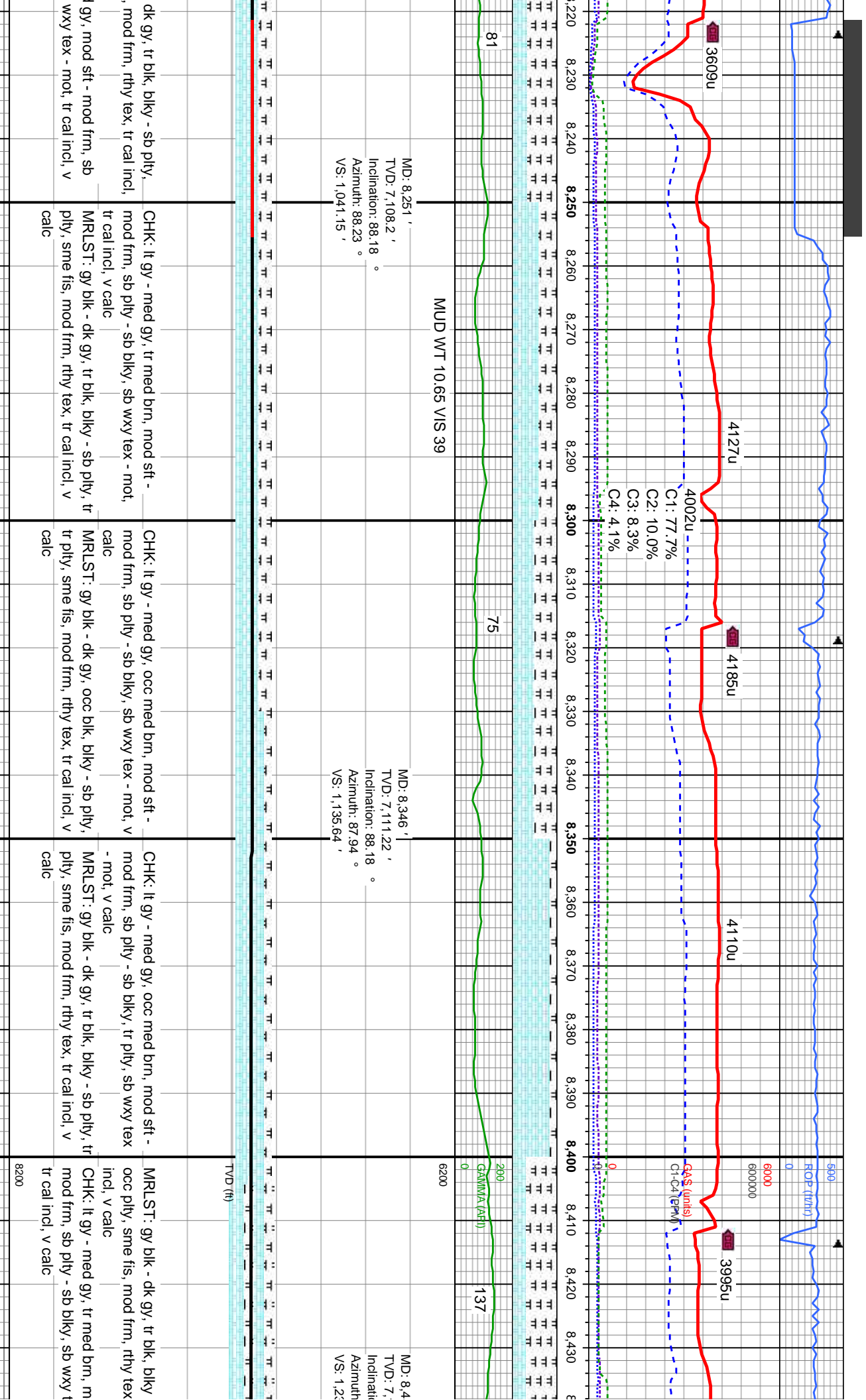


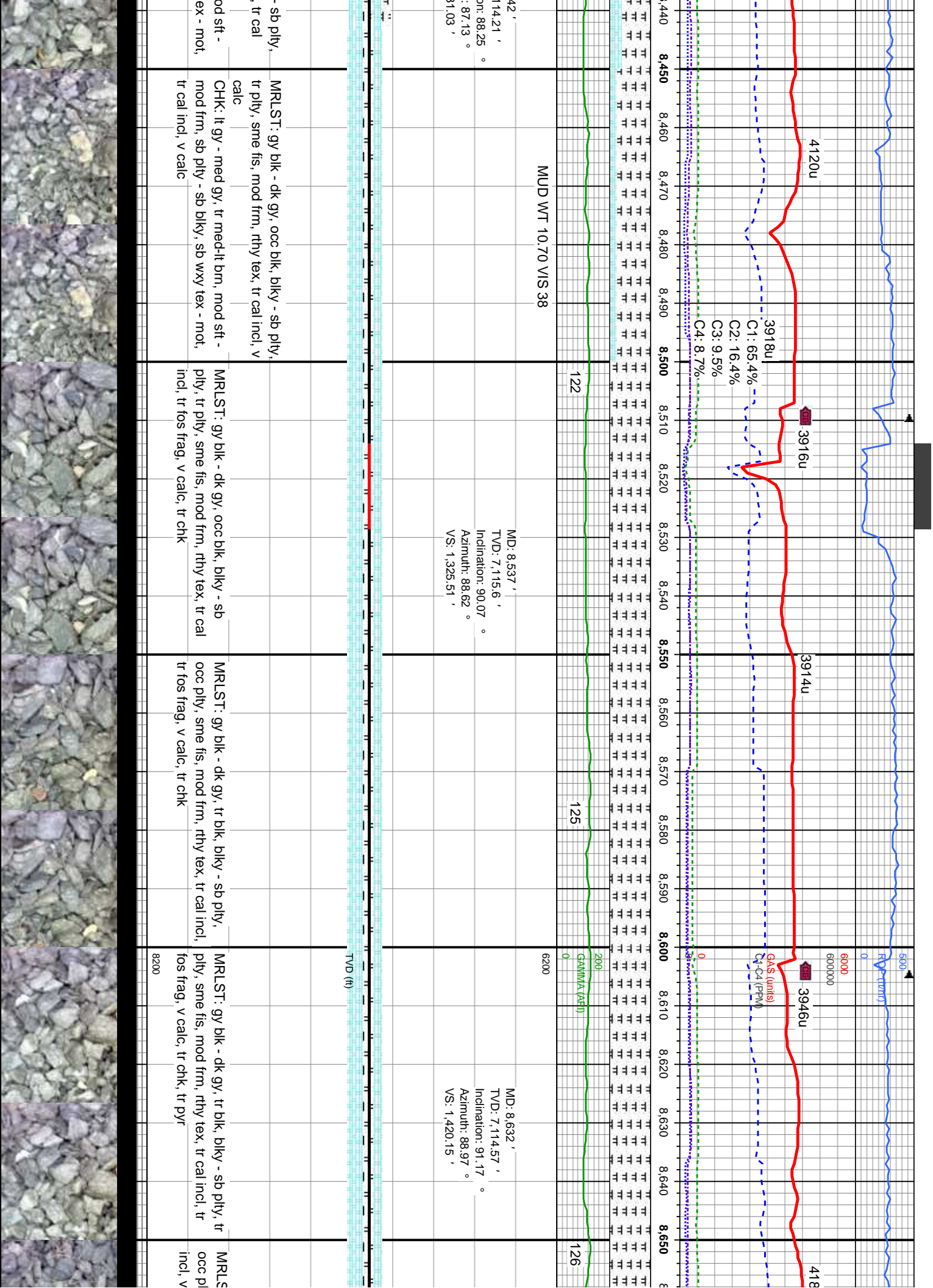
gy blk - dk gy, blk, blkly - sb pily, tr
fis, mod frm, rthy tex, tr cal incl, v
calc
gy - med gy, occ med brn, mod sft -
n, sb pily - sb blkly, sb wxy tex - mot, tr
calc
MRLST: gy blk - dk gy, occ blk, blkly - sb pily,
occ pily, sme fis, mod frm, rthy tex, tr cal incl,
v calc, tr cmt
CHK: lt gy - med gy, tr med brn, mod sft -
mod frm, sb pily - sb blkly, sb wxy tex - mot, tr
cal incl, v calc
MRLST: gy blk - dk gy, tr blk, blkly - sb pily,
occ pily, sme fis, mod frm, rthy tex, tr cal
incl, v calc, tr cmt
CHK: lt gy - med gy, mod sft - mod frm, sb
pily - sb blkly, sb wxy tex - mot, tr cal incl, v
calc
MRLST: gy blk - dk gy, occ blk, blkly - sb pily,
tr pily, sme fis, mod frm, rthy tex, tr cal incl, v
calc, tr cmt
CHK: lt gy - med gy, mod sft - mod frm, sb
pily - sb blkly, sb wxy tex - mot, tr cal incl, v
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MRLST: gy blk - dk gy, occ blk, blkly - sb pily,
tr pily, sme fis, mod frm, rthy tex, tr cal incl, v
calc, tr cmt
CHK: lt gy - med gy, mod sft - mod frm, sb
pily - sb blkly, sb wxy tex - mot, tr cal incl, v
calc

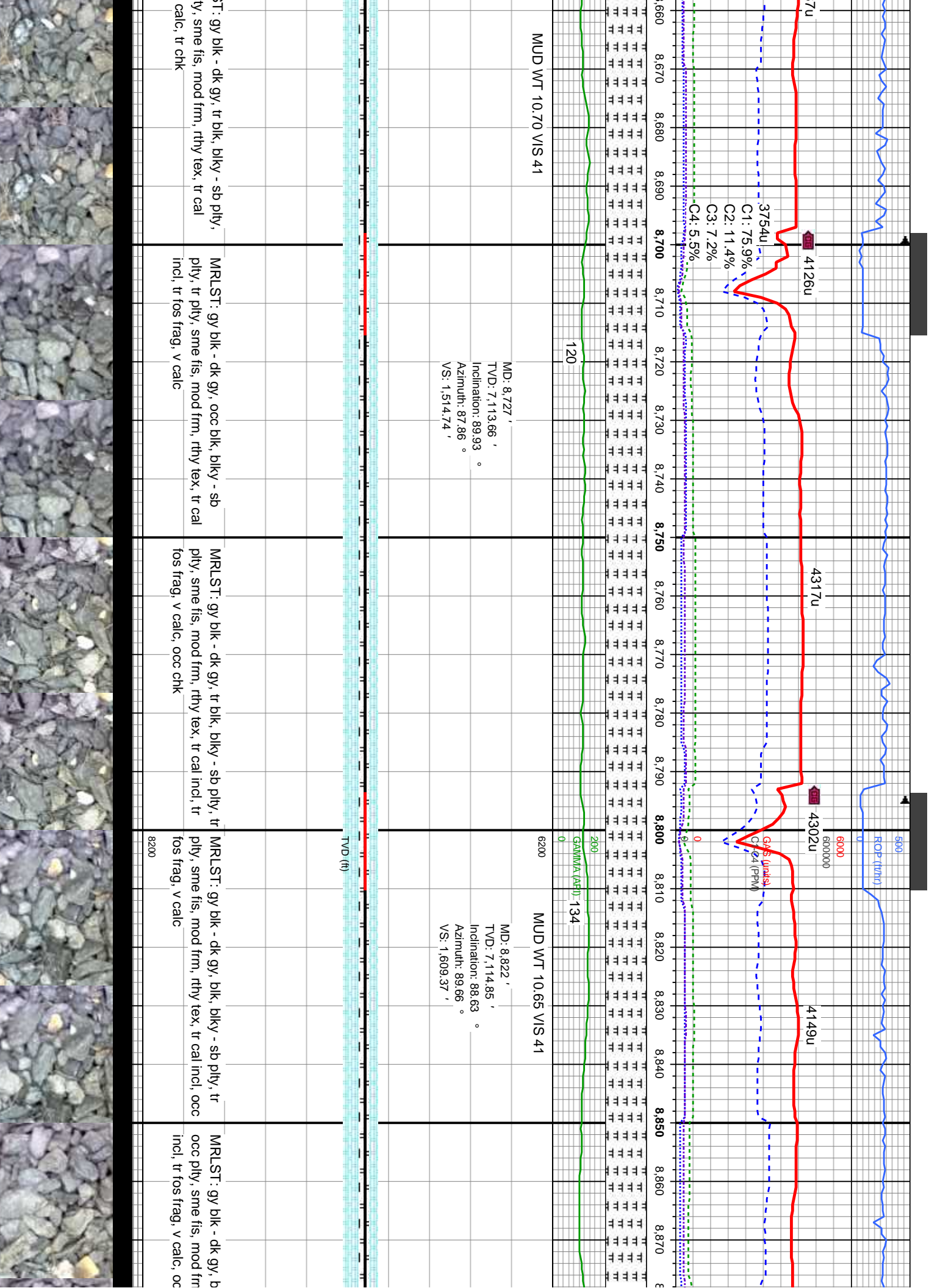


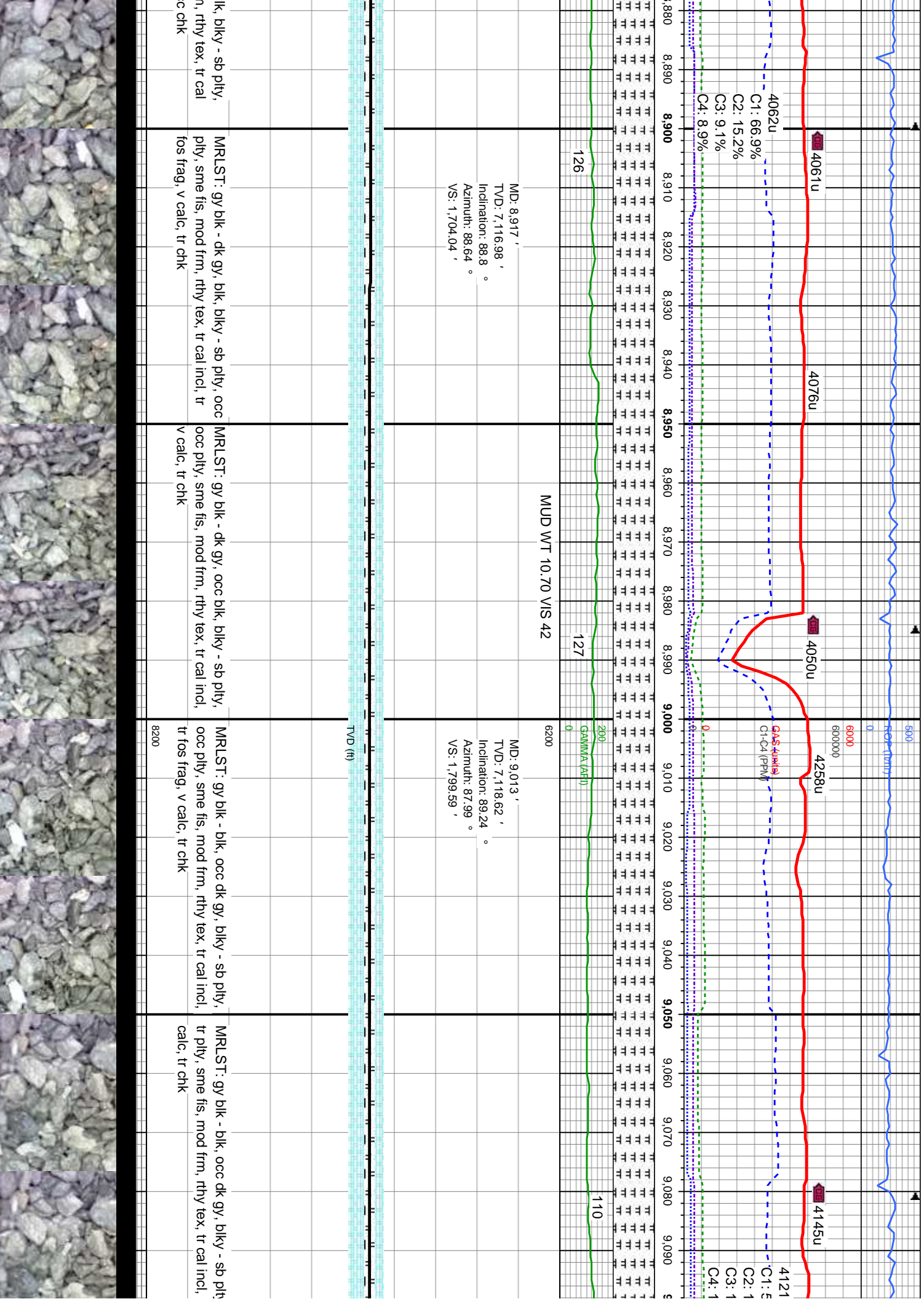


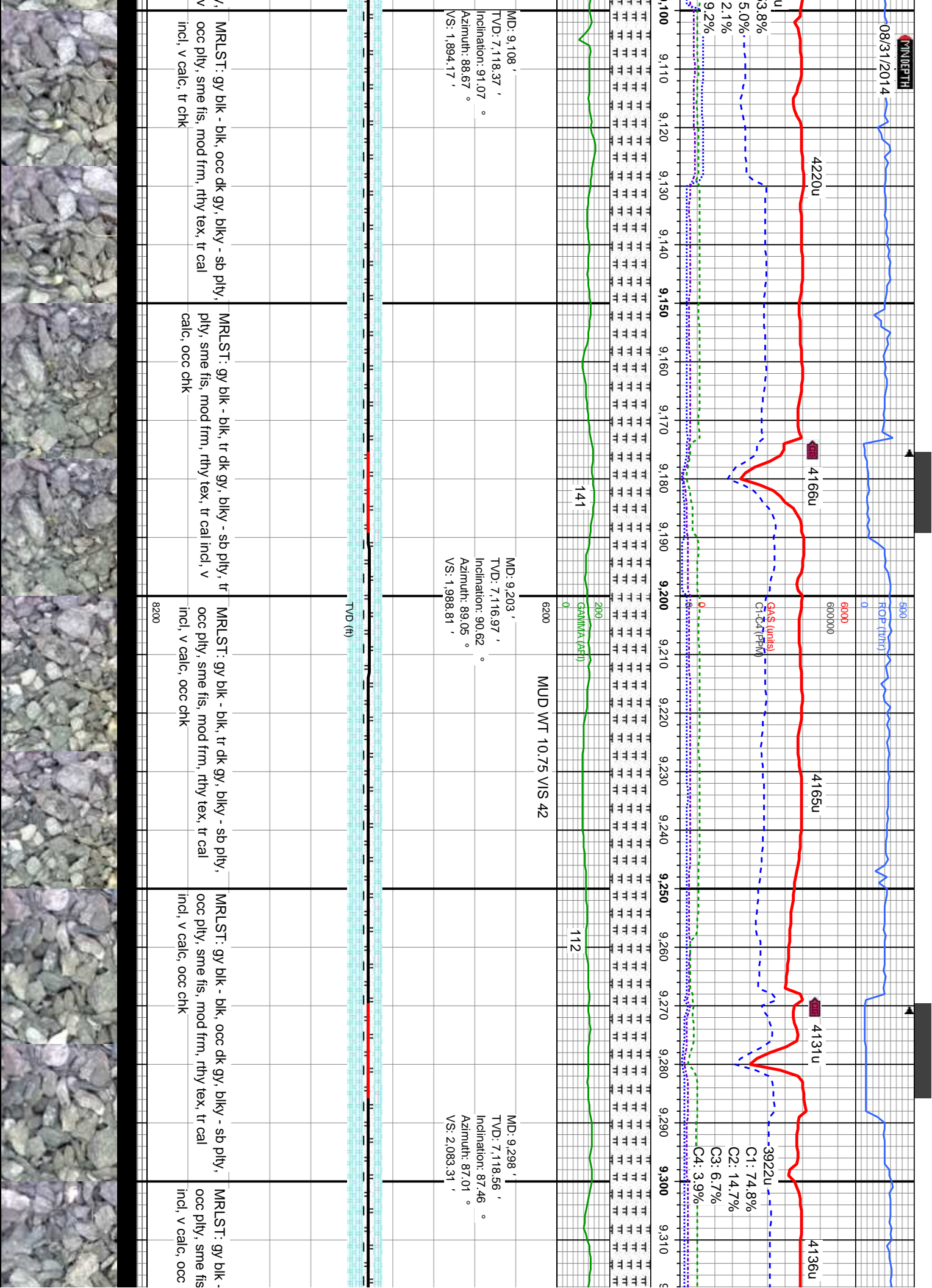


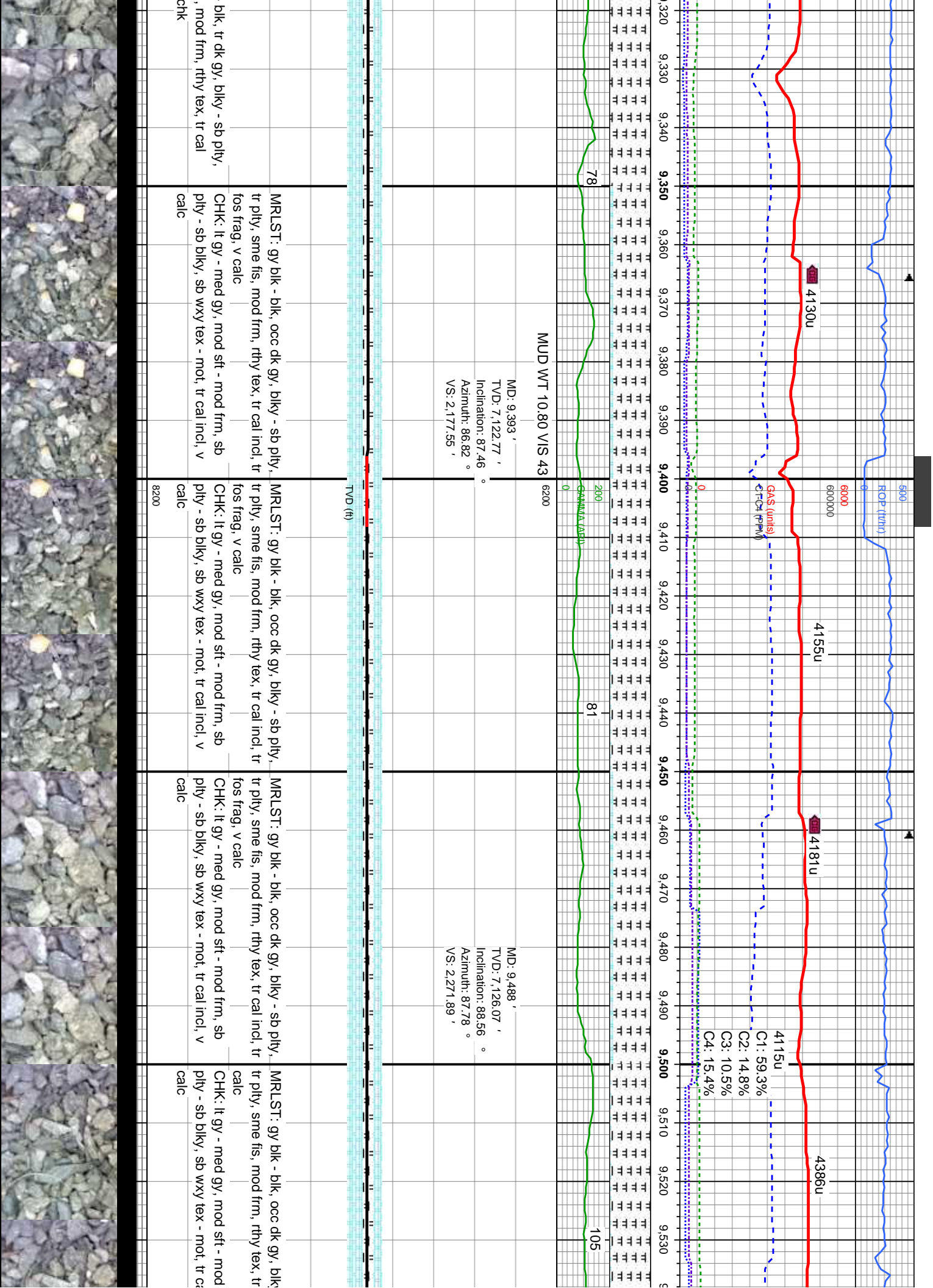


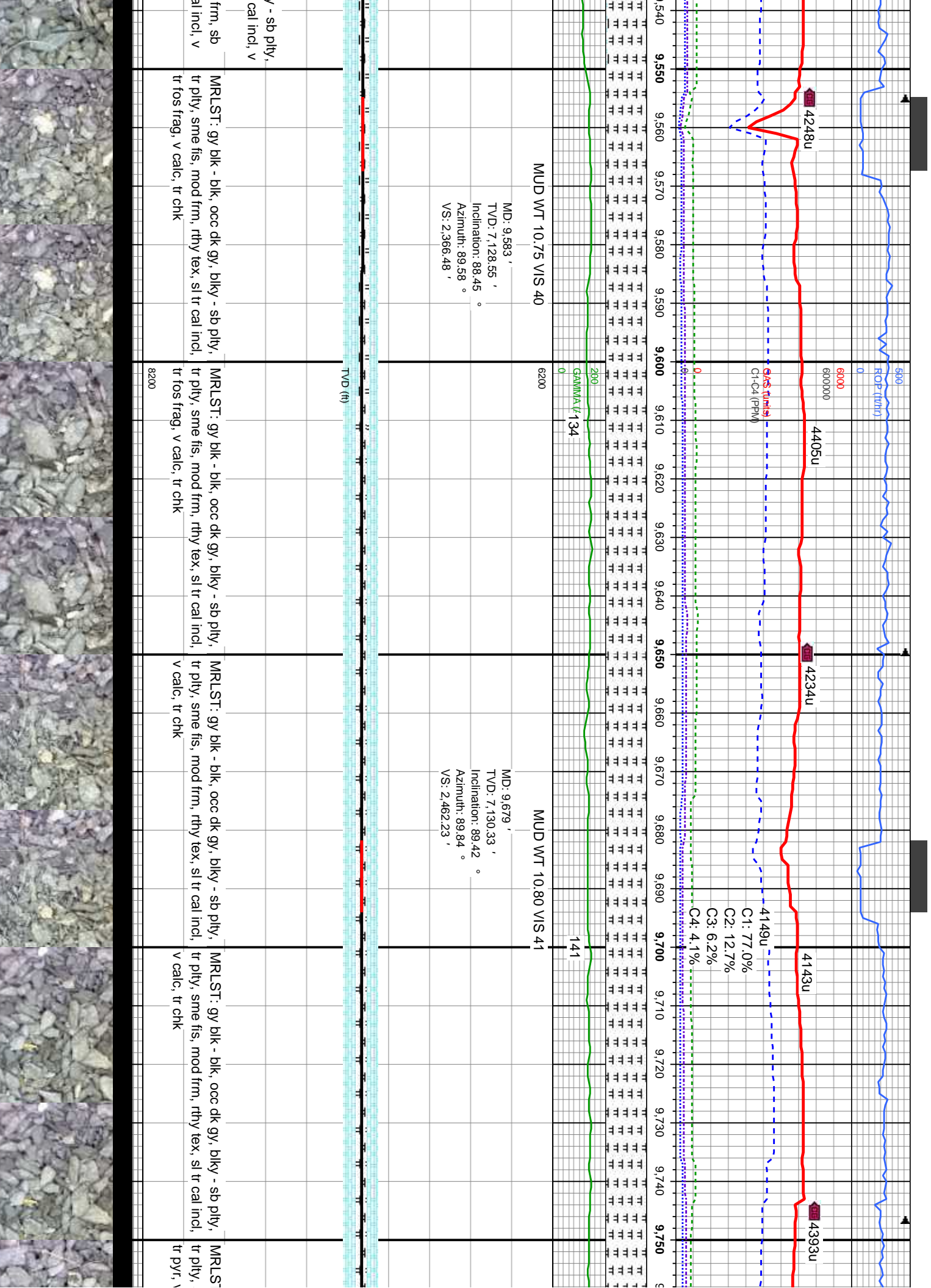


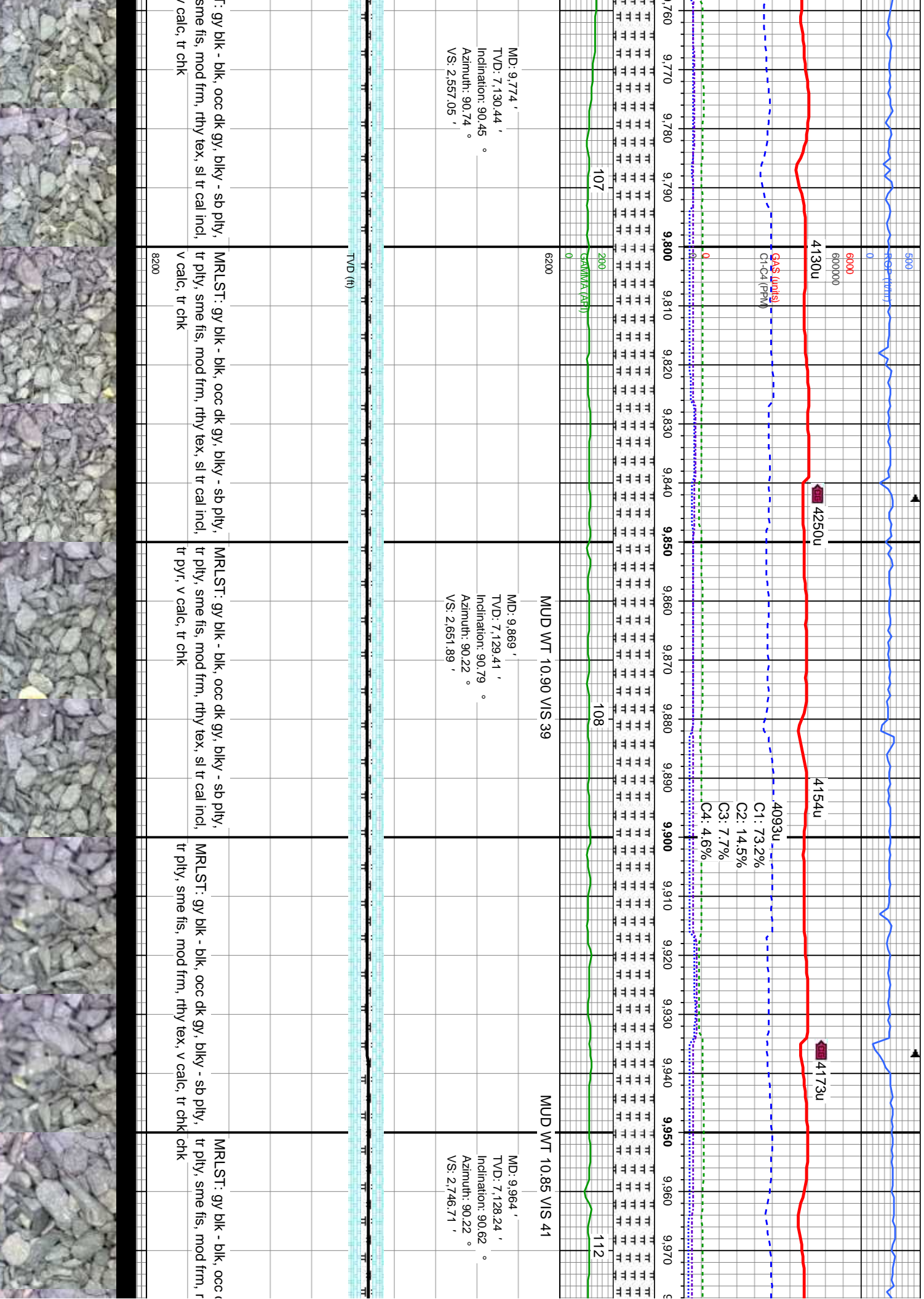


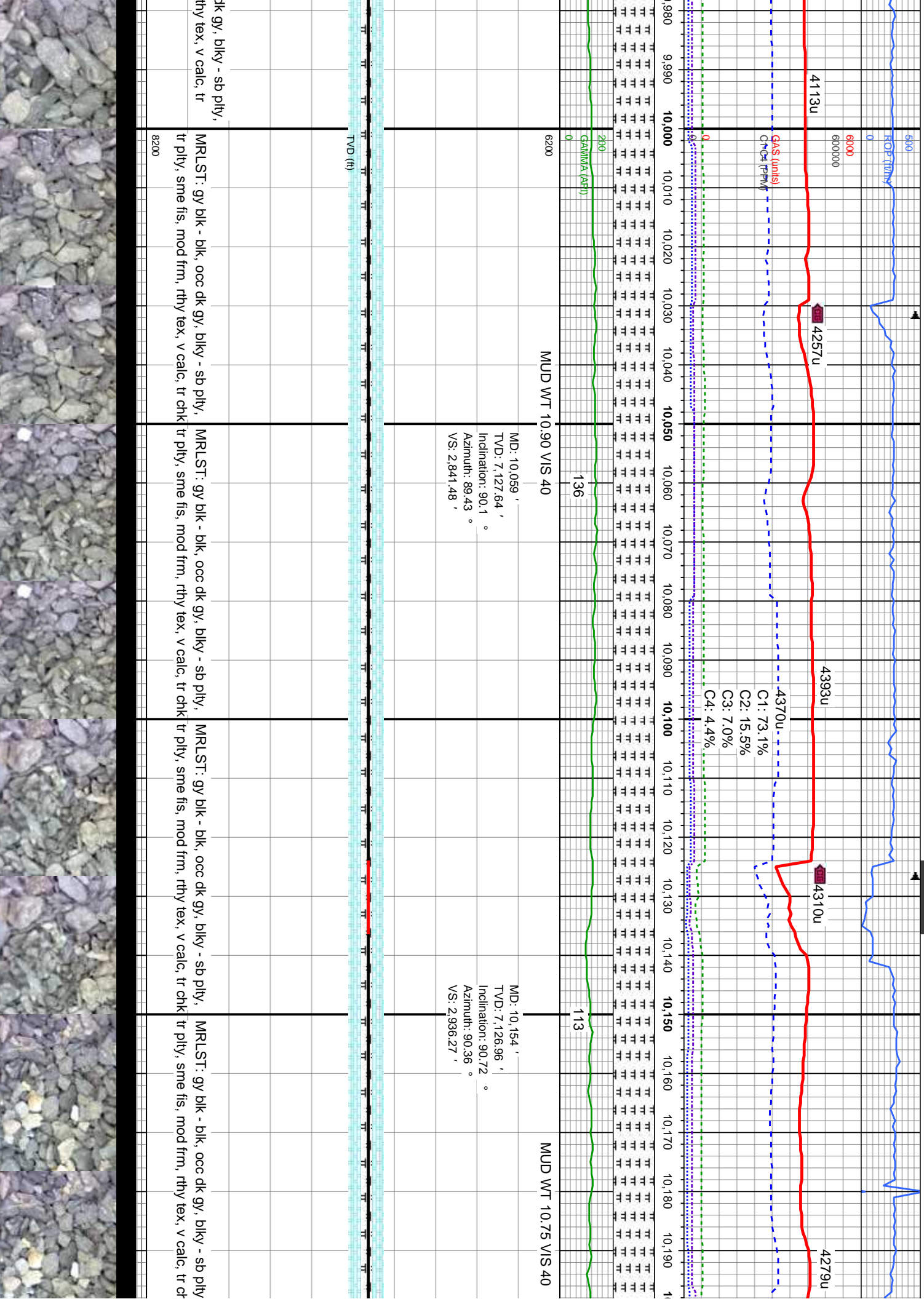


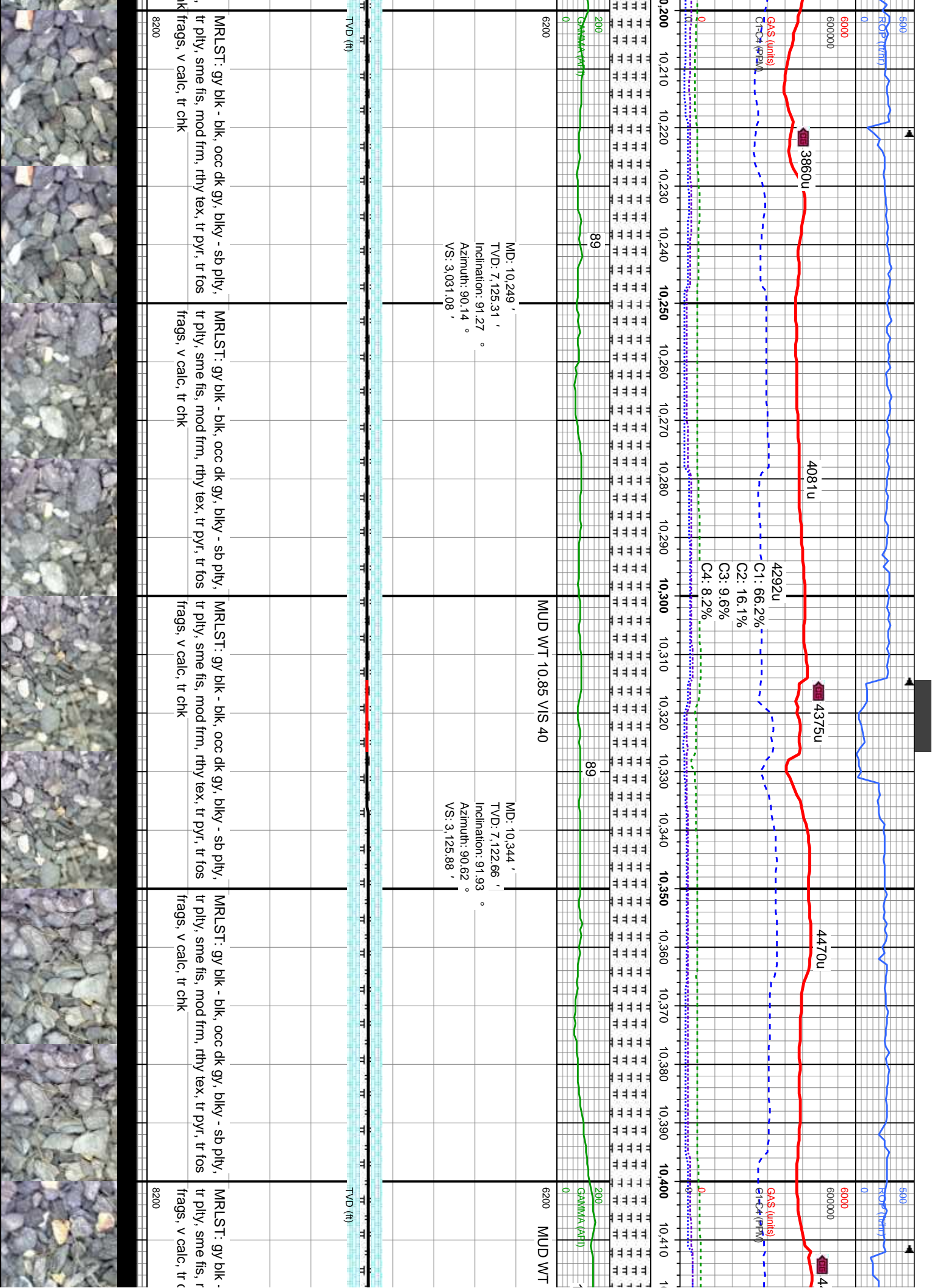


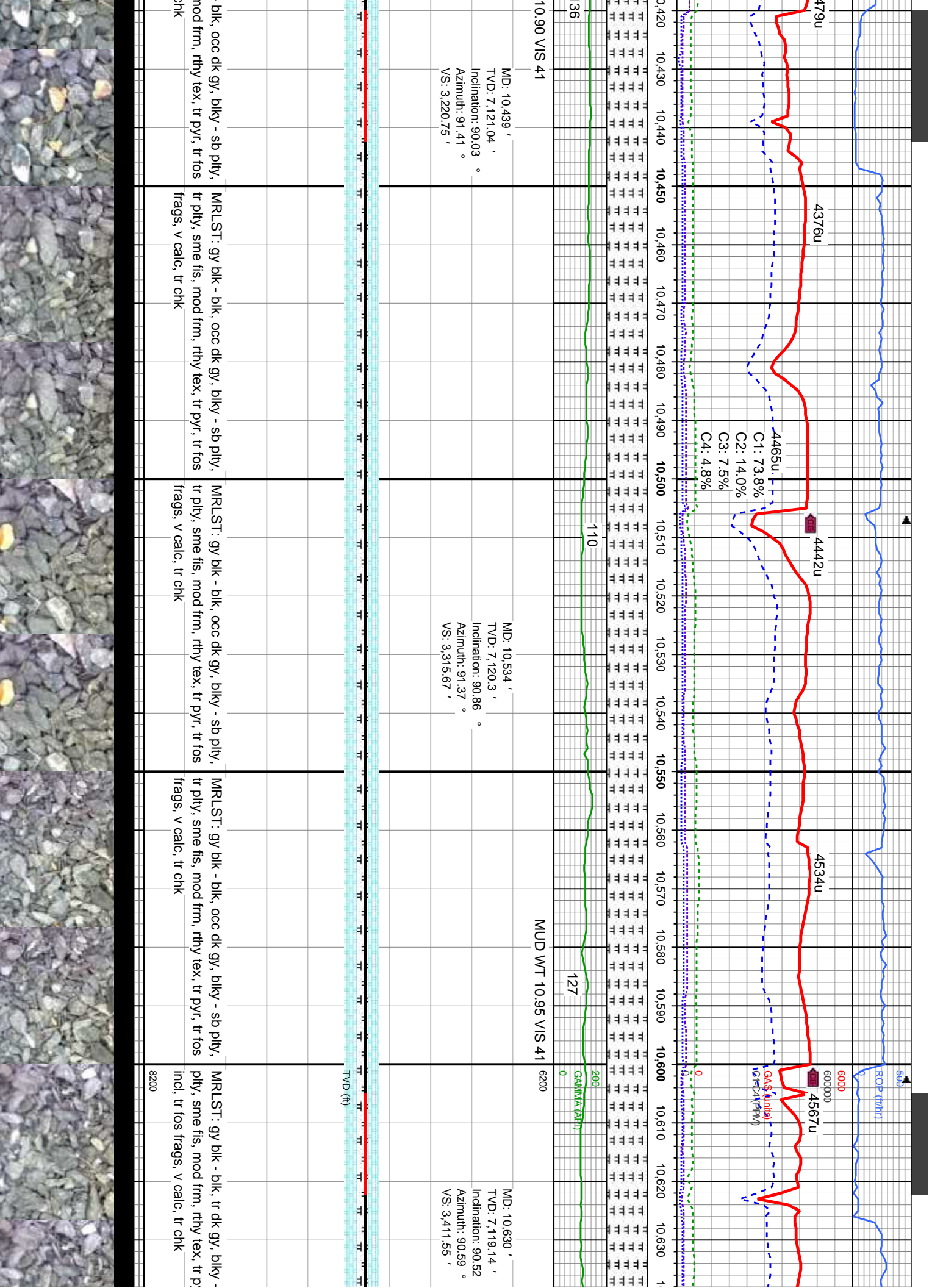


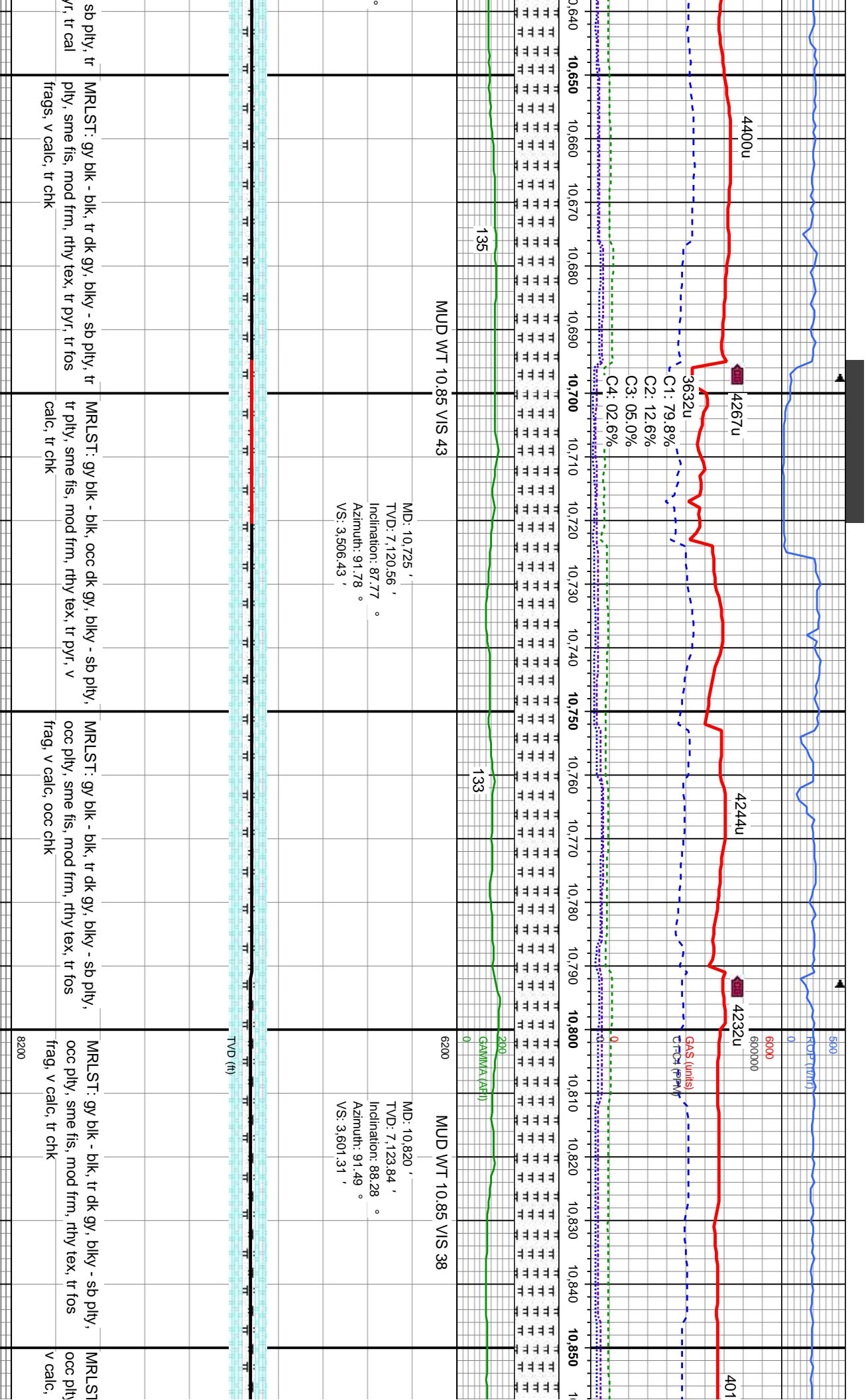


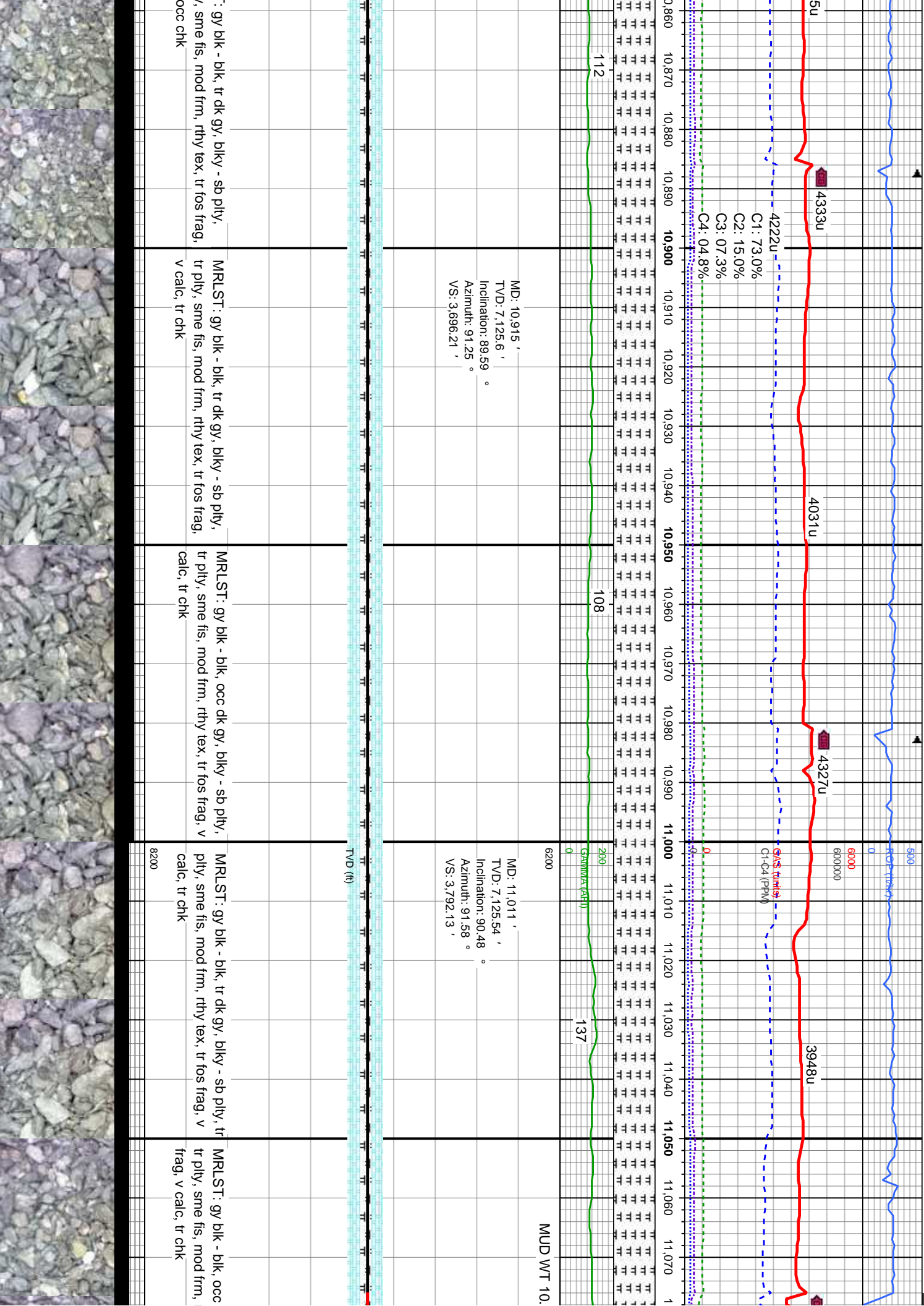


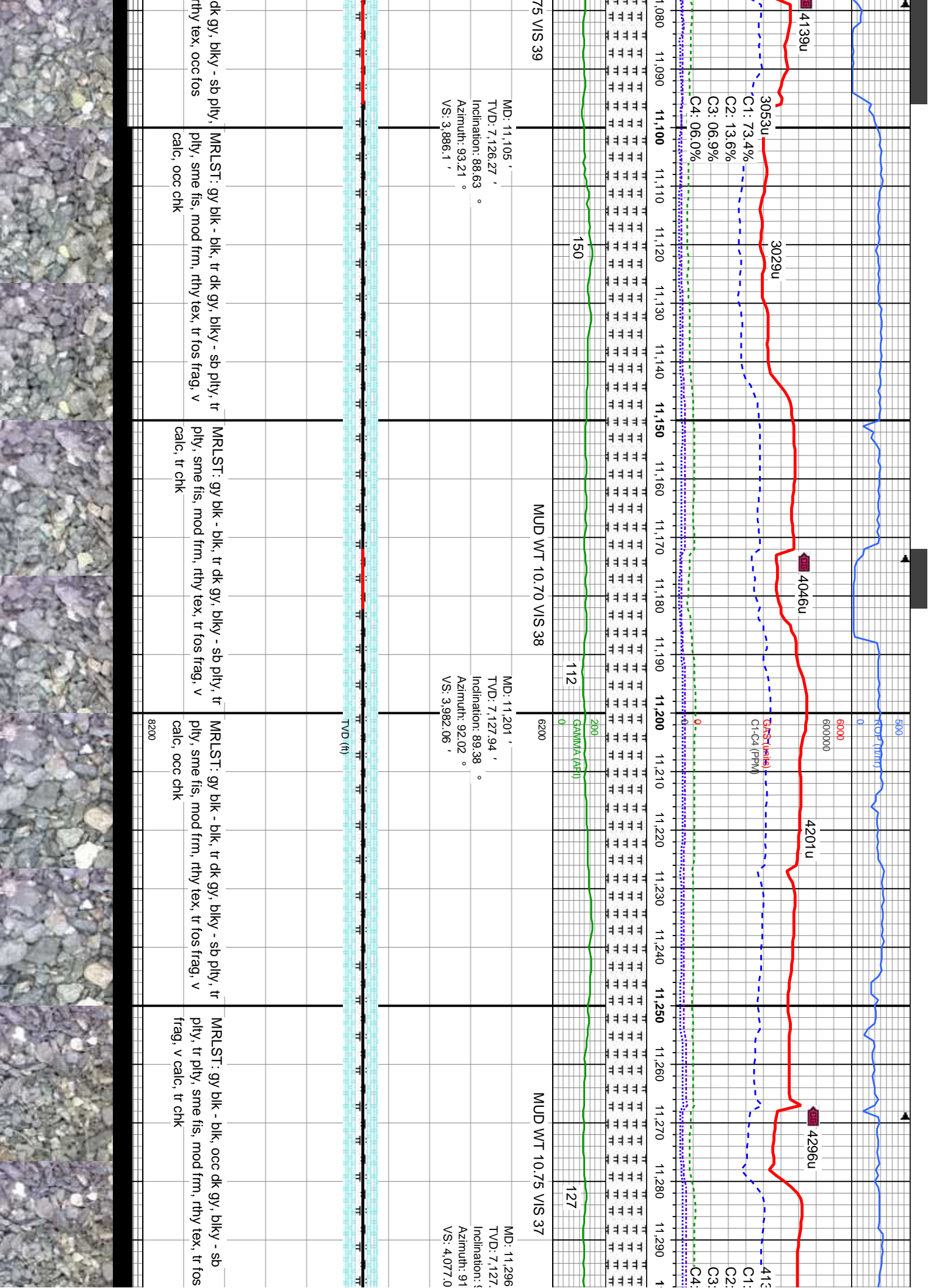


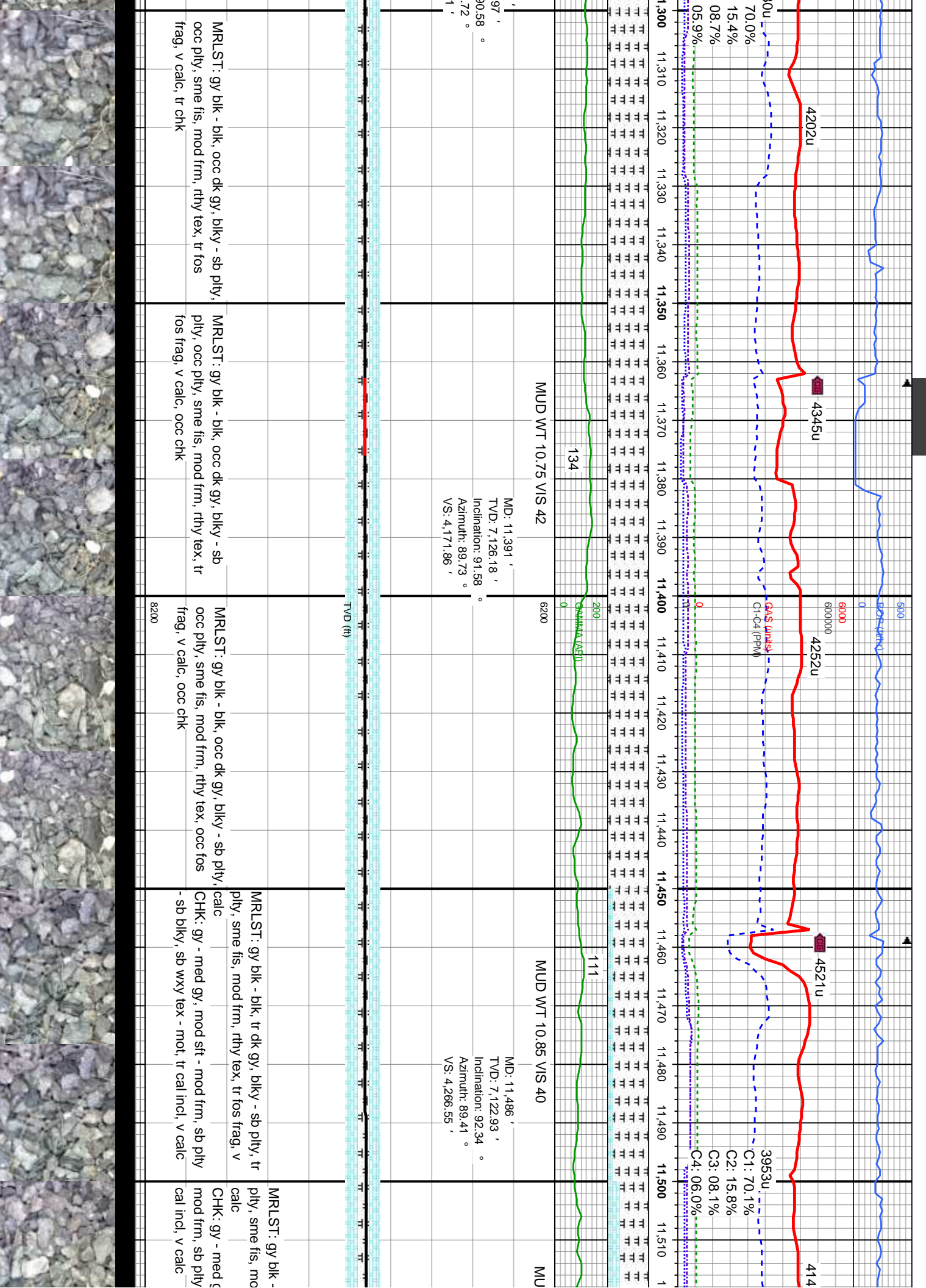


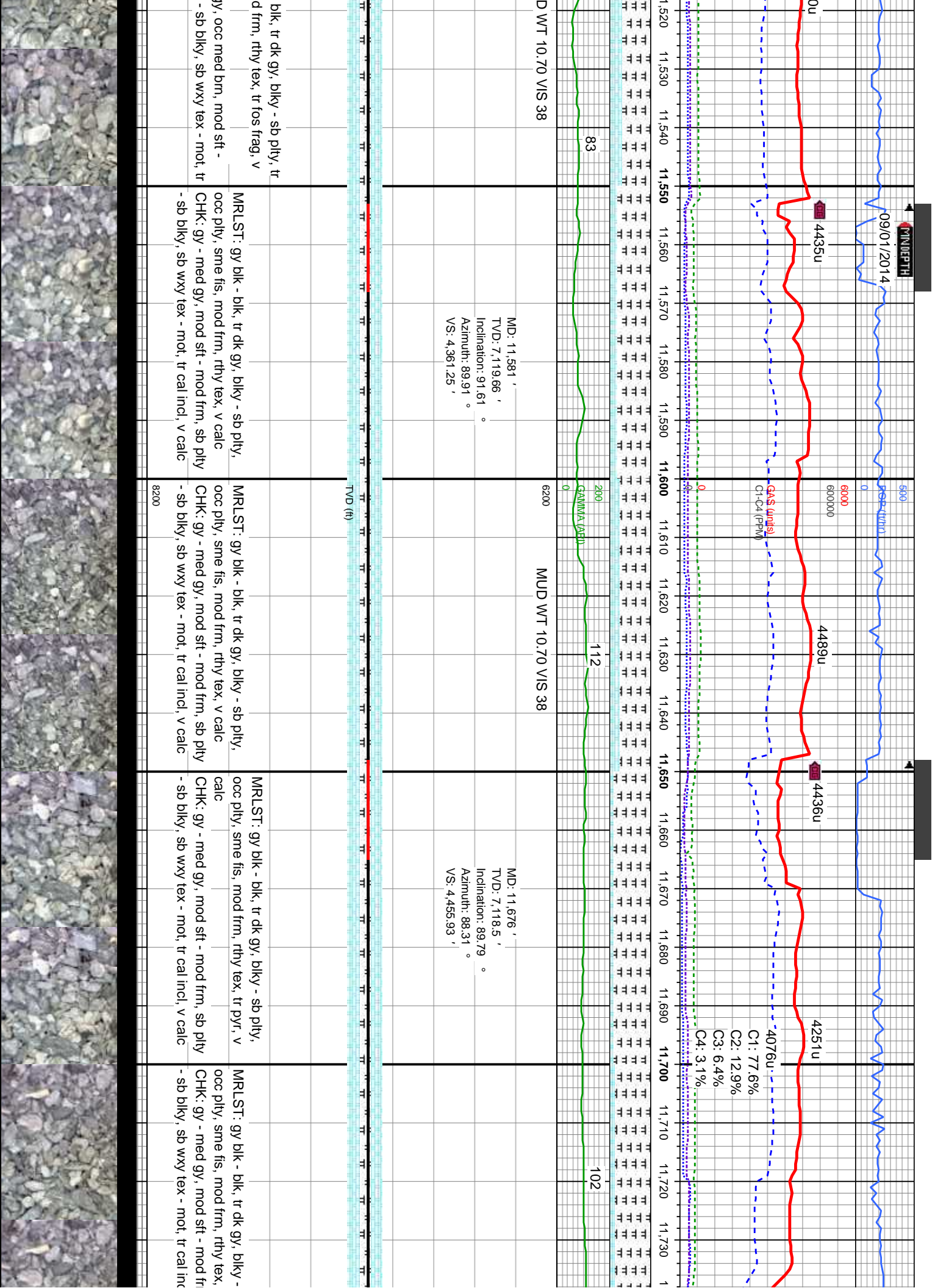


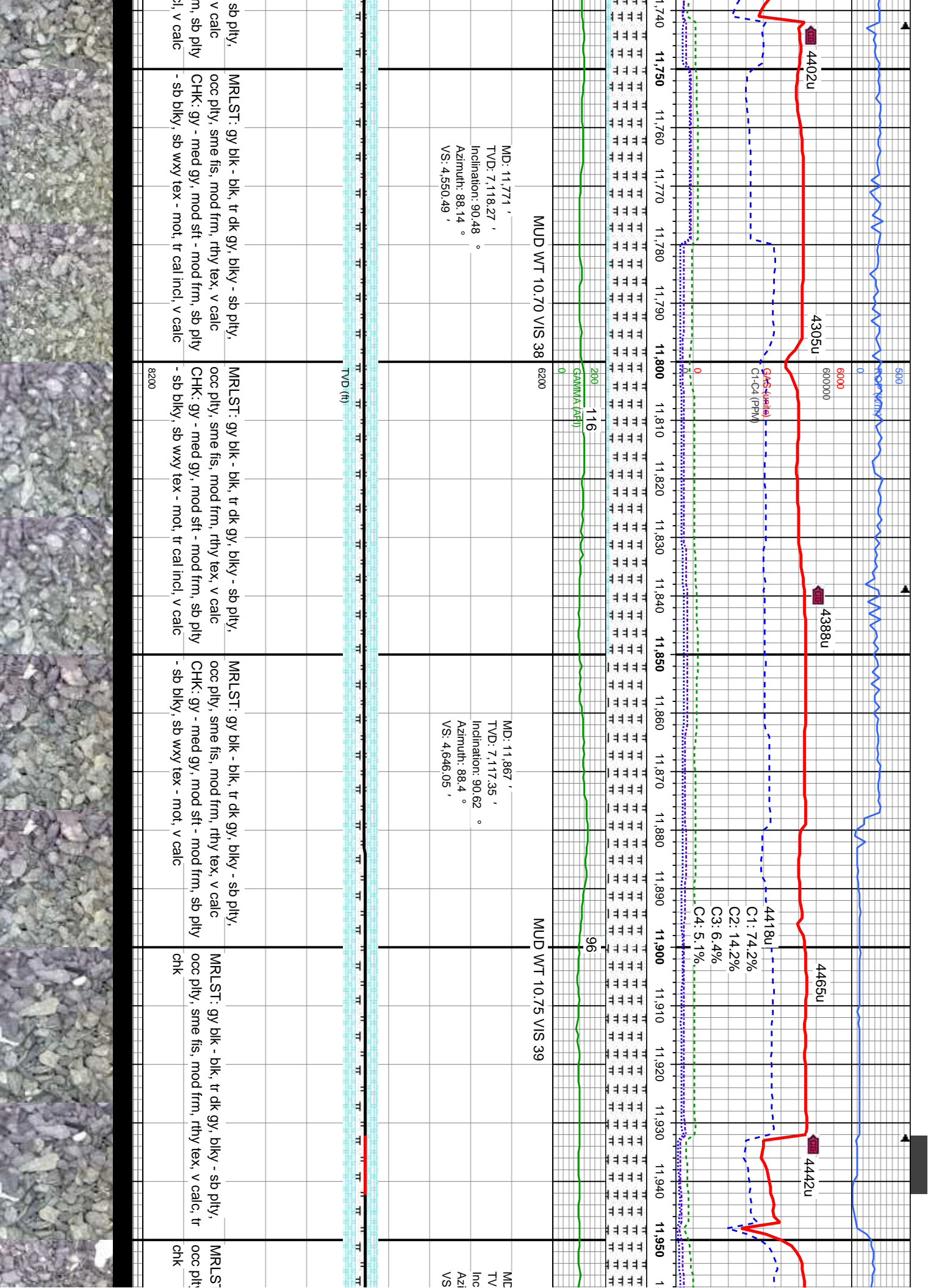












NOBLE ENERGY INC.
FIVE RIVERS K09-66-1AHN
TD @ 12,096' MD
09/01/2014 @ 08:45 AM
THANK YOU
COLUMBINE LOGGING INC.

