



Scale: 5" / 100'  
Measured Depth Log

**Well Name** Rio LC 12-368HC

**Location** SECTION 6, T1S, R67W

**State** COLORADO

**County** ADAMS

**Country** UNITED STATES

**Rig Number** PRECISION 460

**API Number** 050011046200

**AFE #** 19DC0161

**Geographic Region** DJ BASIN

**Field** WATTENBERG

**Ground Elevation** 5068.4'

**K.B. Elevation** 5088.4'

**Logged Interval** 6000' MD To 18283' MD

**Total Depth** 18283' MD

**Formation** CODELL

**Type of Drilling Fluid** OIL BASED MUD

## Operator

**Company** Great Western Operating Company, LLC

**Address** 1001 17th Street, Suite 2000  
Denver, CO 80202



## Geologist

**Name** Joey Luce, Zac Olds, Hunter Newman

**Company** Terra Guidance

**Address** 67 W. Floyd Ave. Ste 105  
Englewood, CO 80110  
(970) 260-5408

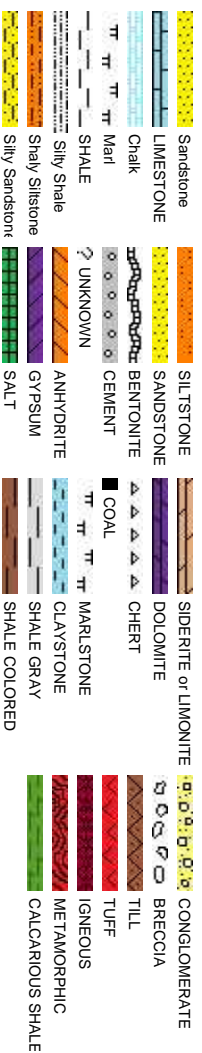


## Other

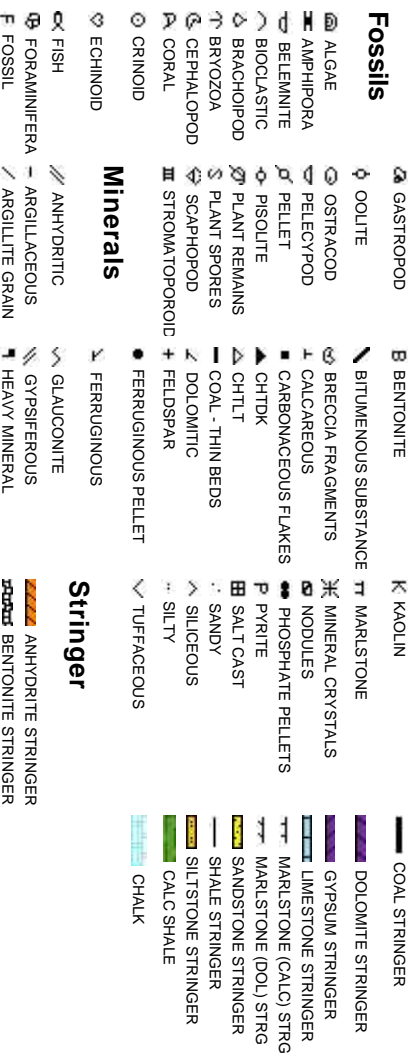
MUDLOG START DATE 07/27/2019

MUDLOG END DATE 08/03/2019

## Rock Types



## Accessories



## Fossils

## Minerals

## Stringer

## Porosity

## Engineering

## Oil Show

ORGANIC

PINPOINT

DEAD

VUGGY

EVEN

QUESTIONABLE

SPOTTED STAINING BIT

CASING

CONNECTION (LEFT)

CONNECTION (RIGHT)

E EARTHY

CONNECTION GAS

F FRACTURE

CORE - LOST

INTERCRYSTALLINE CORE - RECOVERED

INTEROOLITIC DST INTERVAL




MOLDIC FAULT

# Other Symbols

 FORMATION TOP      L LITHOGRAPHIC


## Rounding

GAS SHOW       MICROXLN

 MIN DEPTH       ANGULAR       MUDSTONE

NORMAL FAULT       ROUNDED       PACKSTONE

OIL SHOW       SUBANG       WACKESTONE

OVERTURNED STRATA       SUBRND

## Sorting

REVERSE FAULT

## Textures

SIDEWALL CORE (LEFT)       MODERATE


SIDEWALL CORE (RIGHT)       BOUNDSTONE       POOR

SLIDE       CHALKY       WELL


 SURVEY       CRYPTOXLN

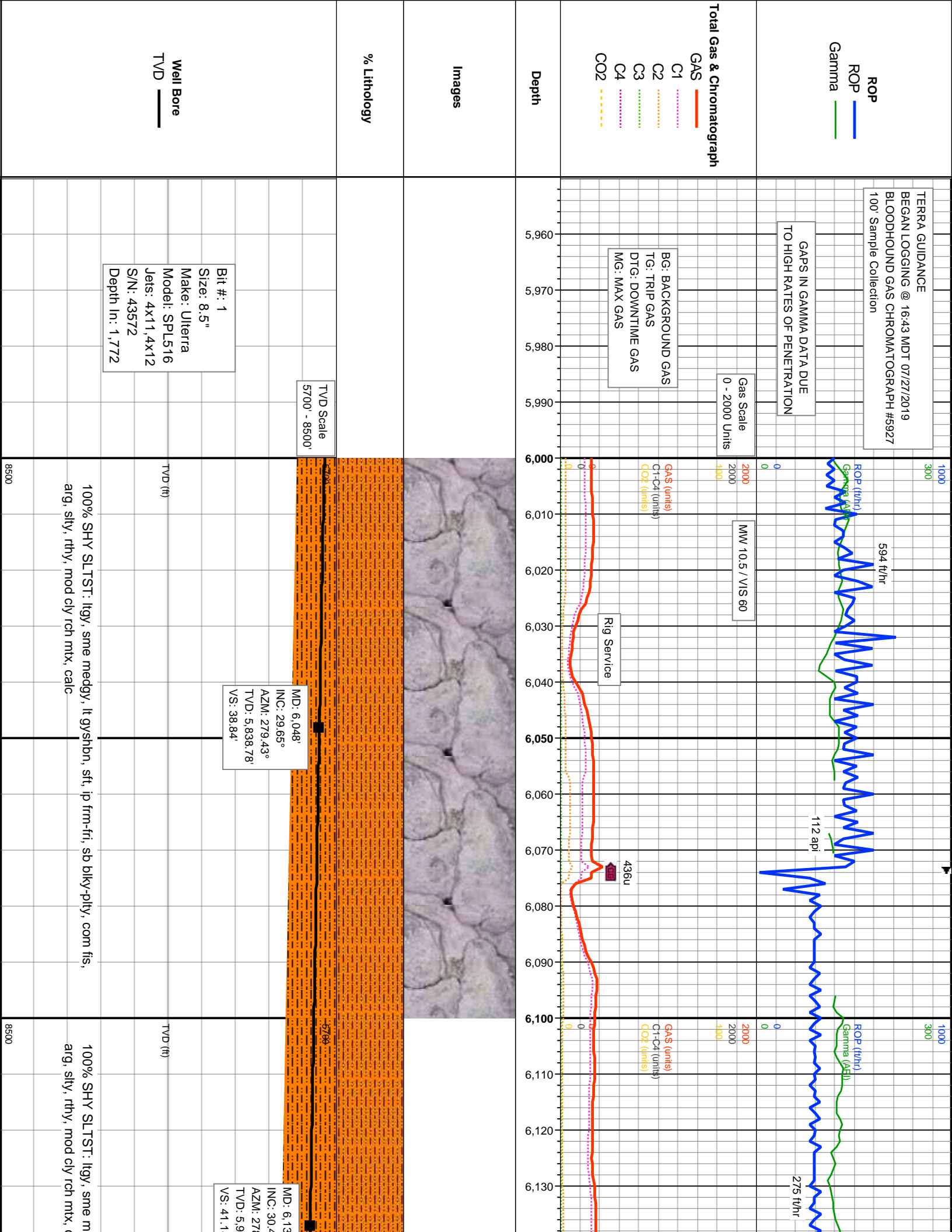
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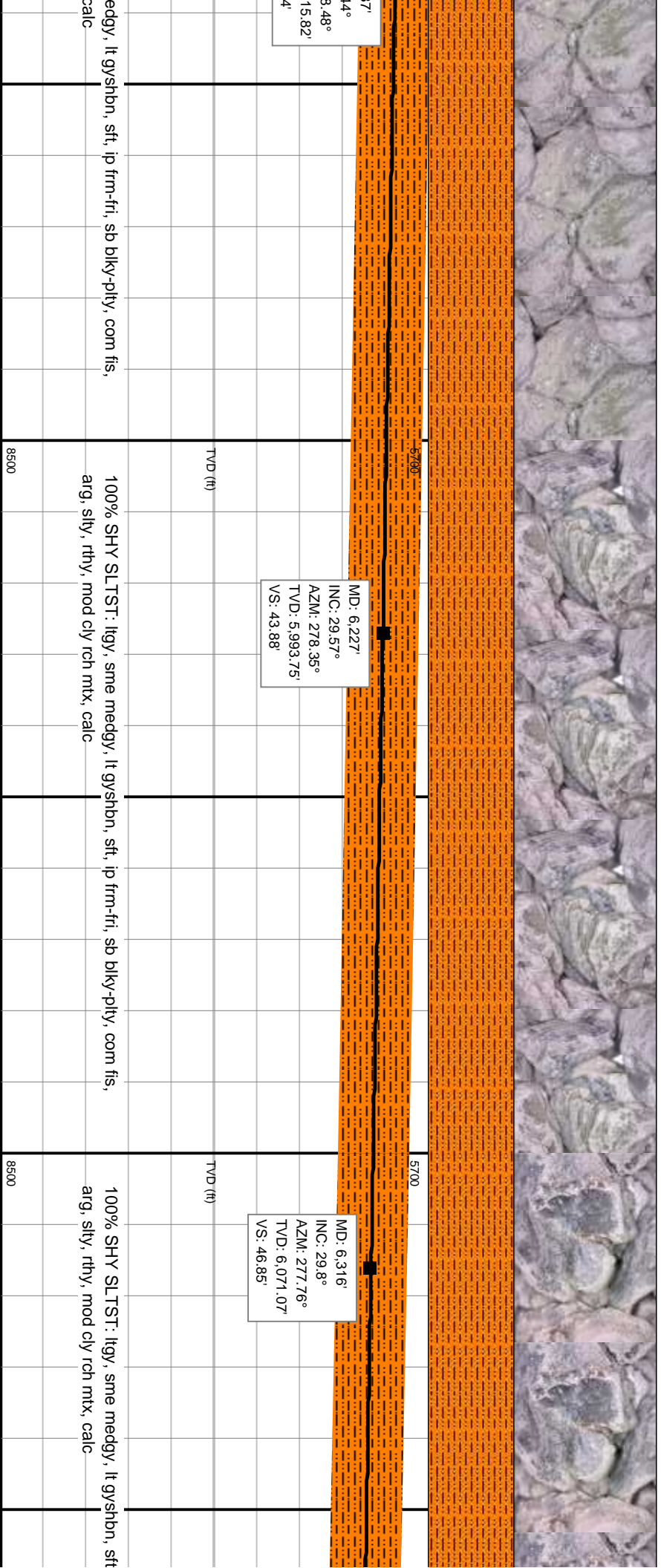
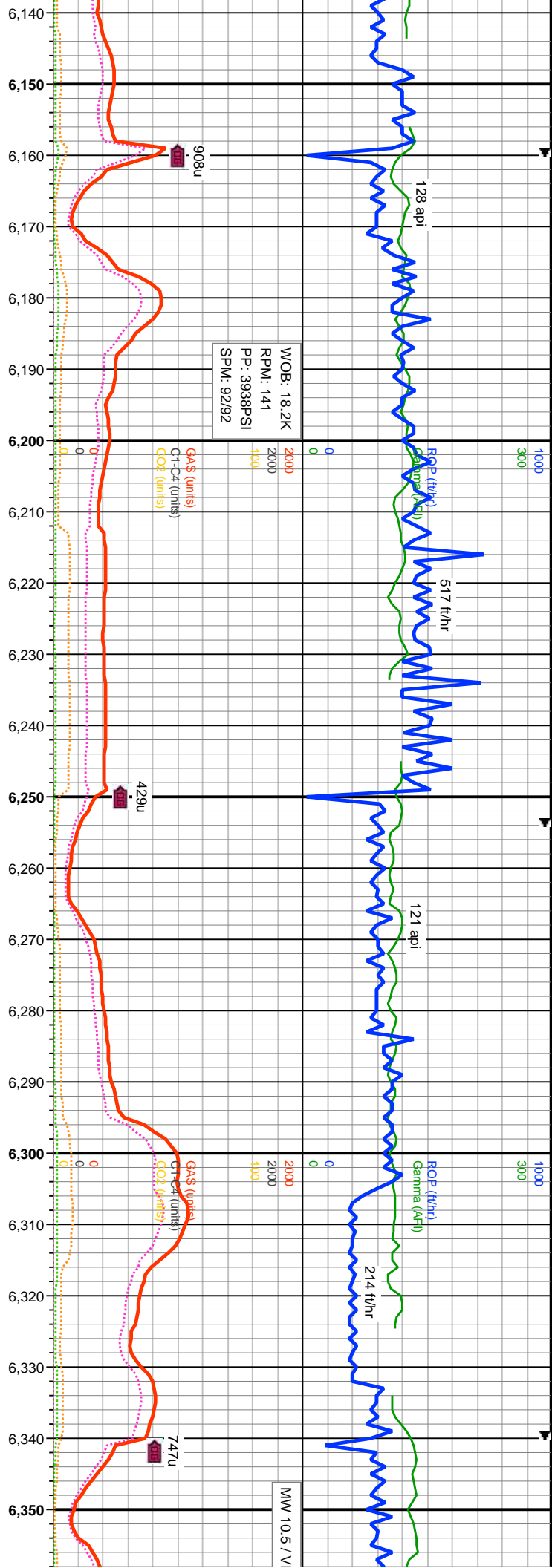
 TRIP GAS       EARTHY

WIRELINE TESTED - LEFT       FINELYXLN

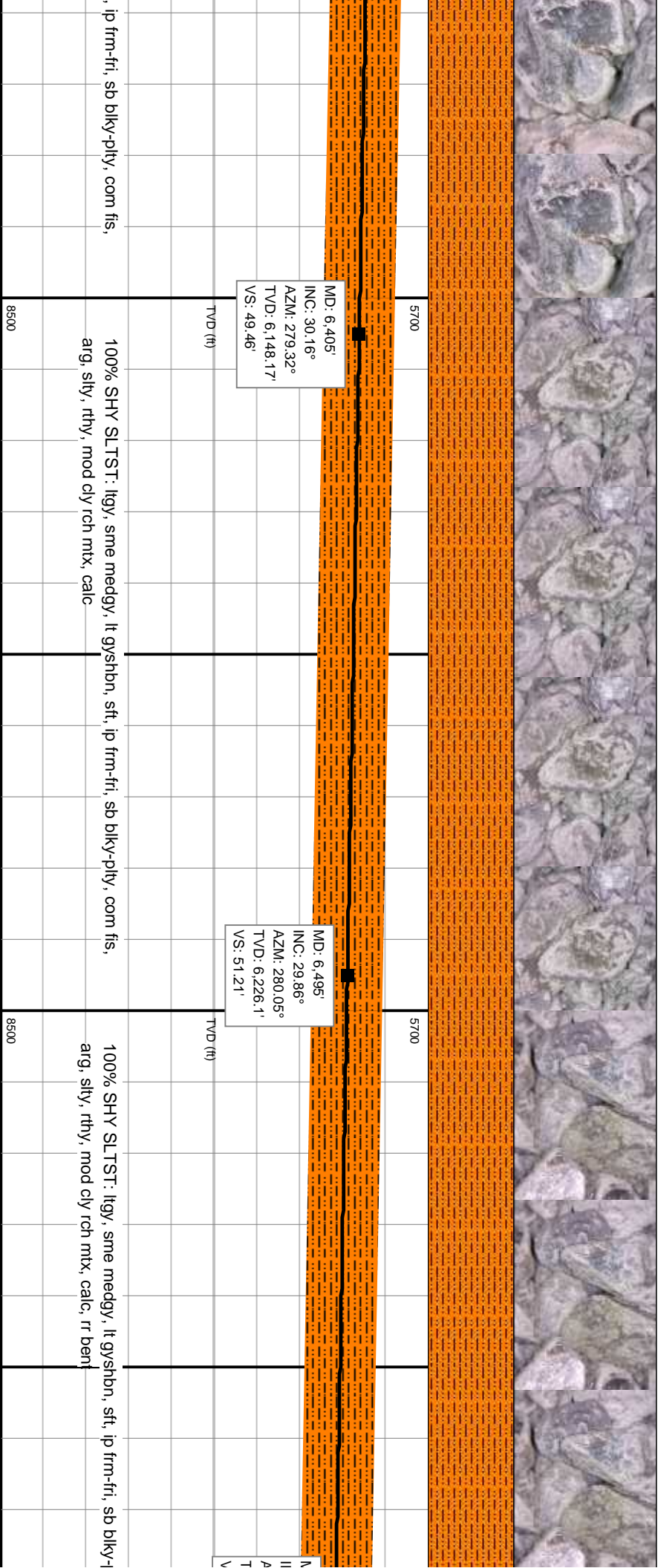
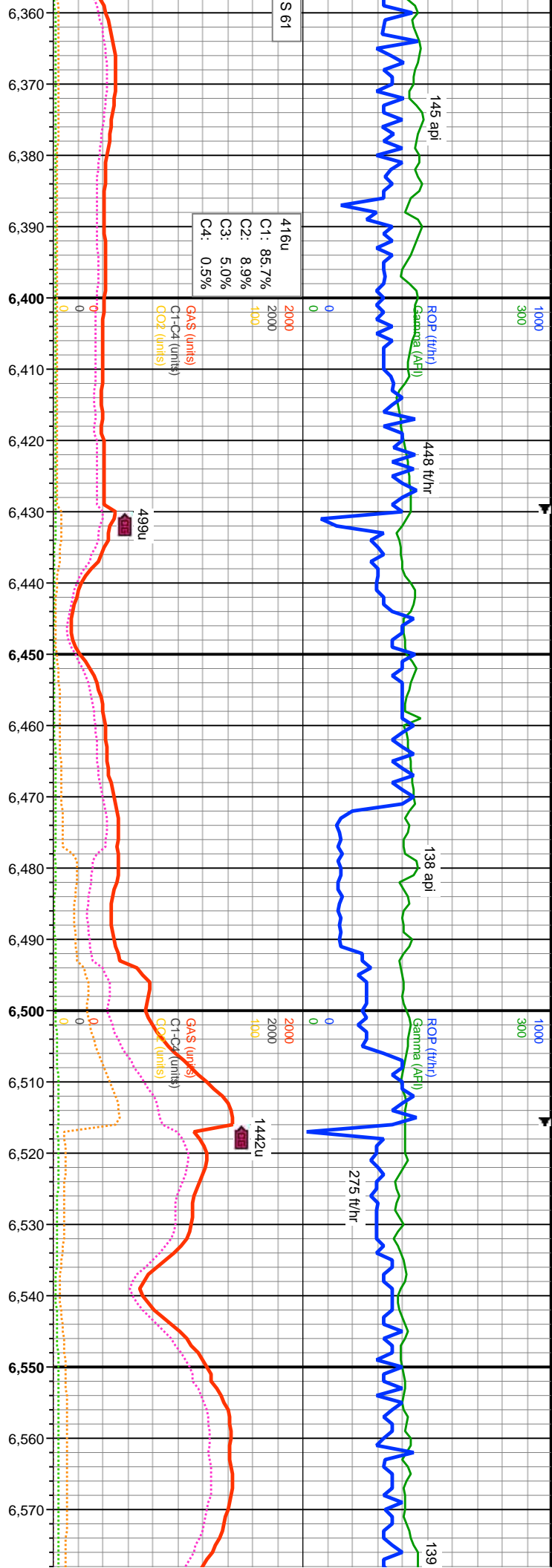
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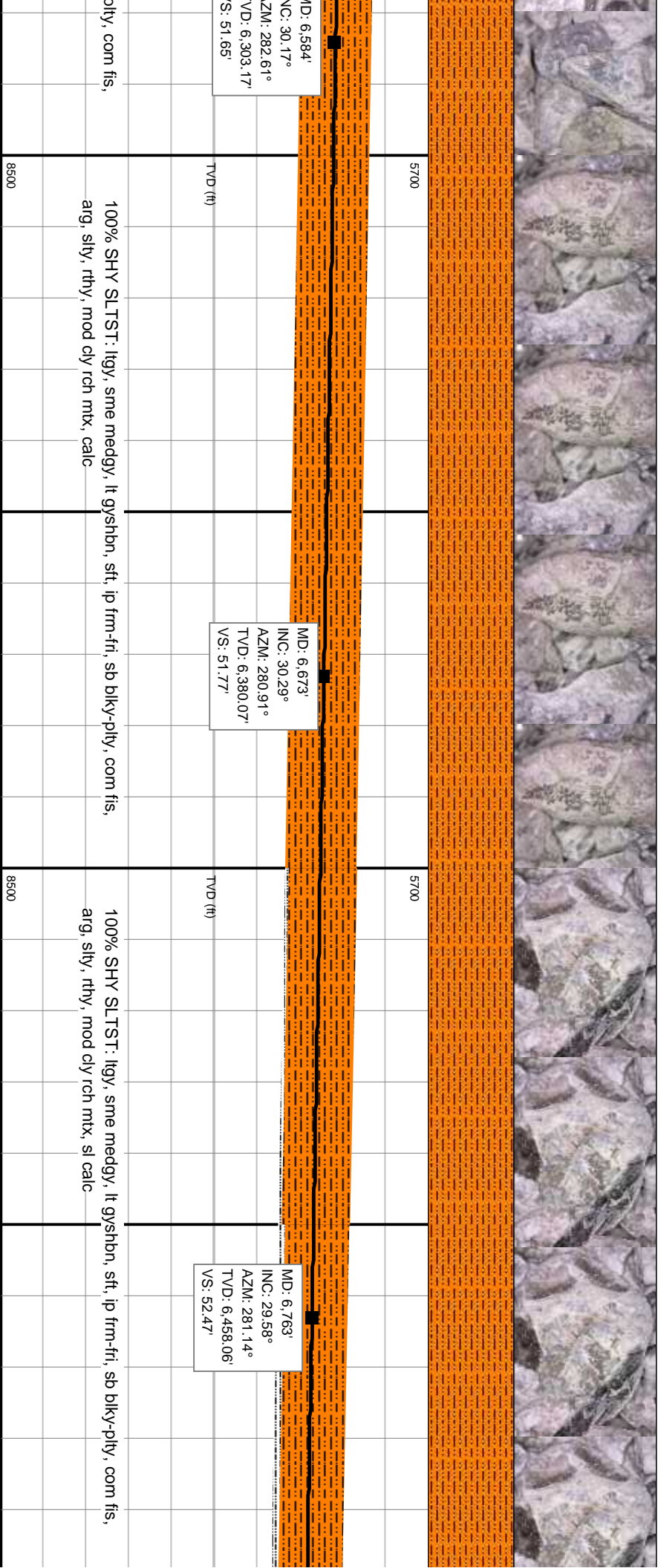
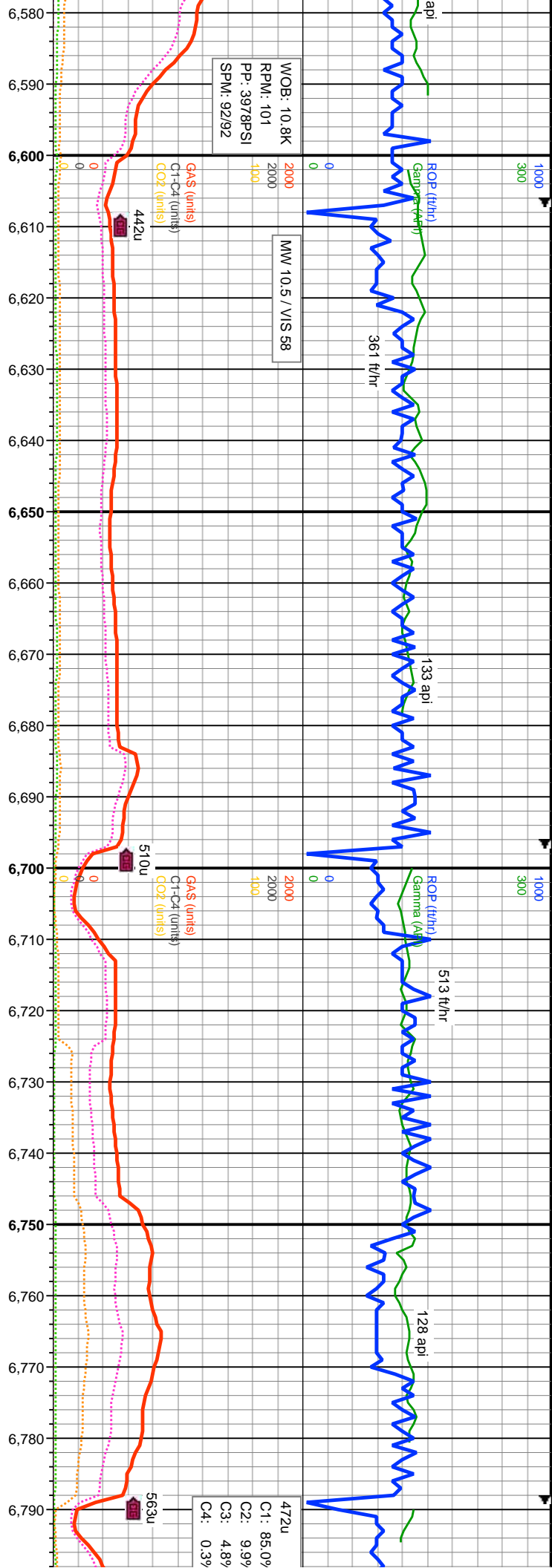
WIRELINE TESTED - RT       GRAINSTONE



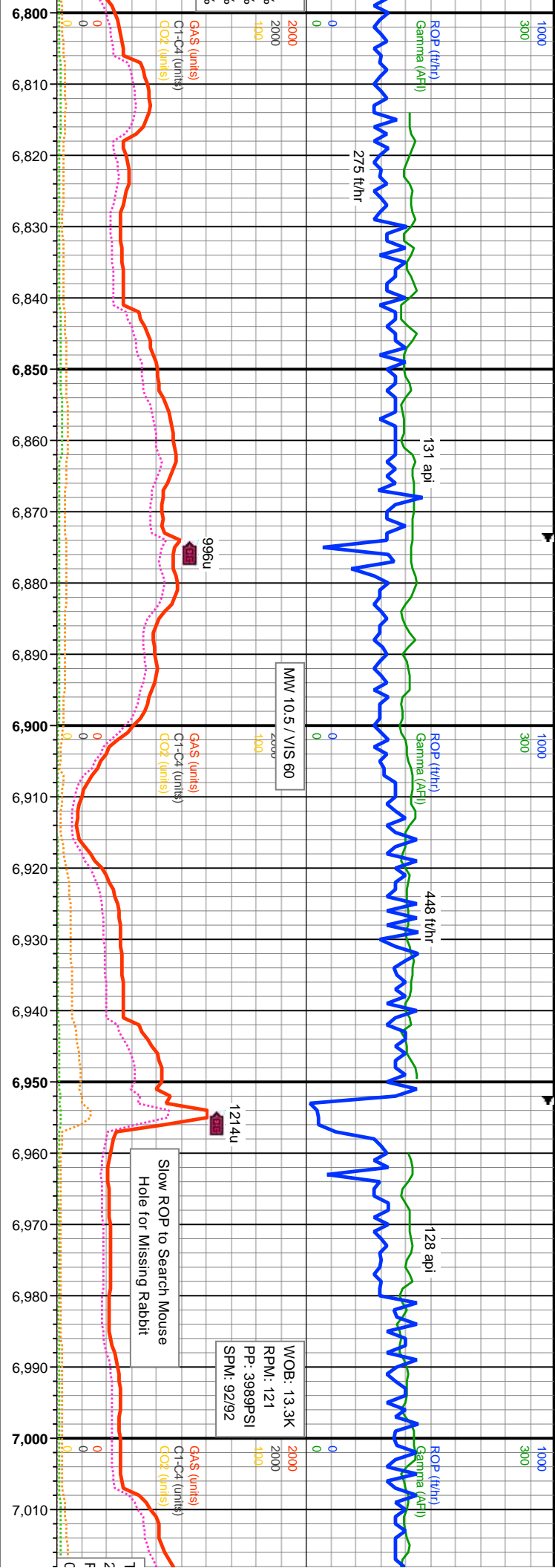






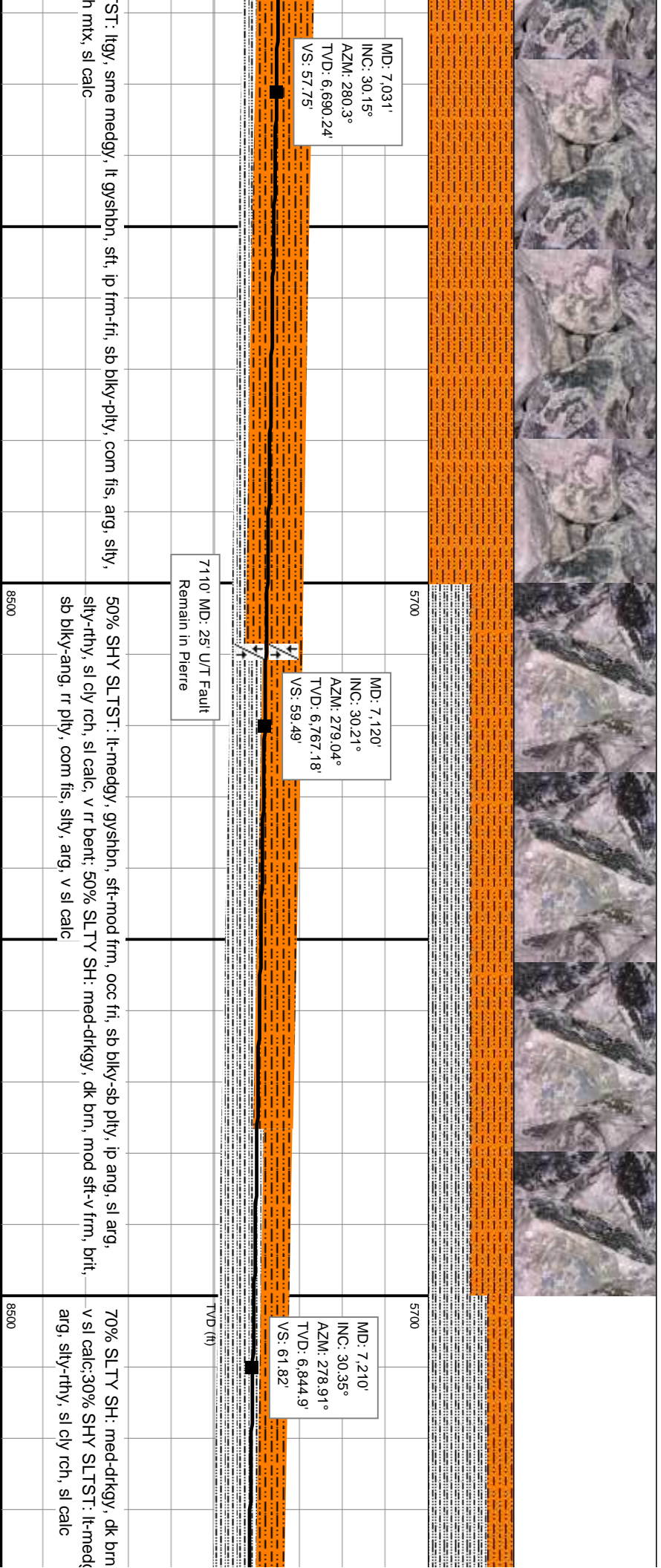
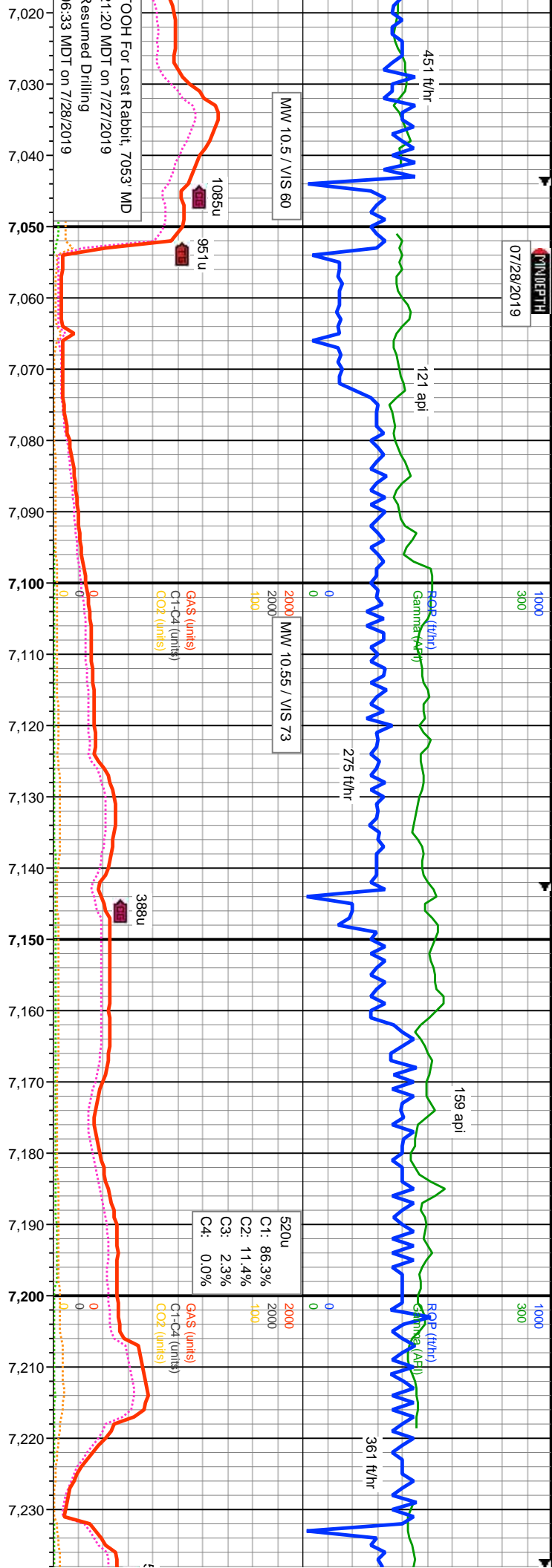






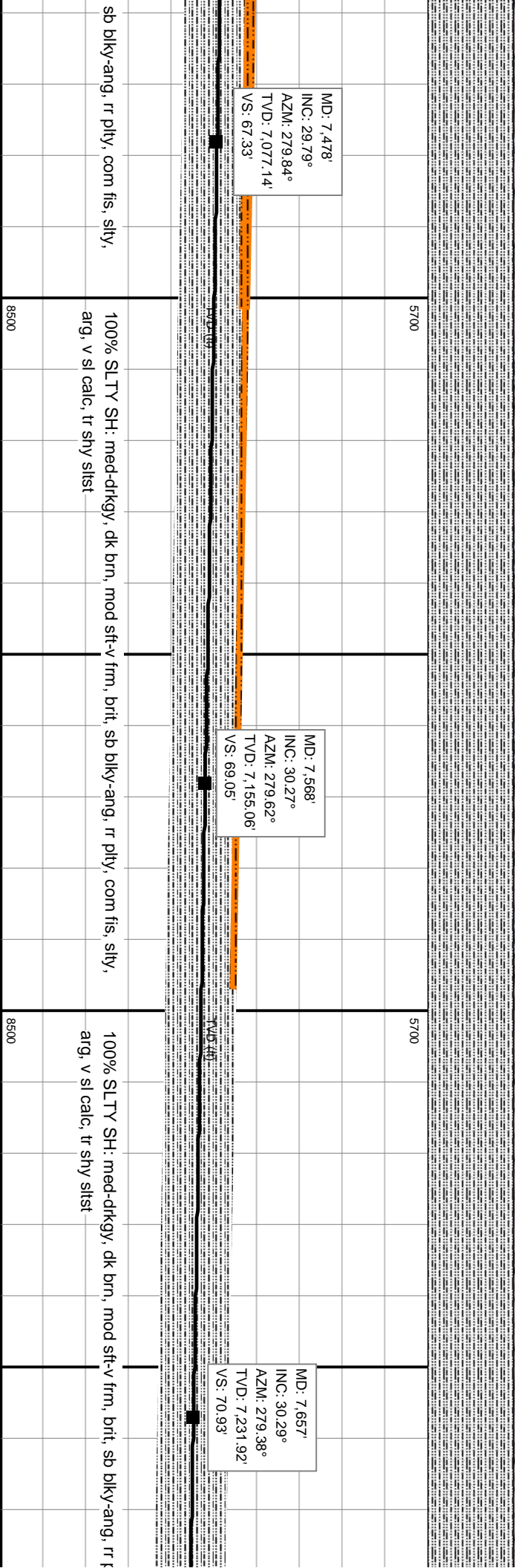
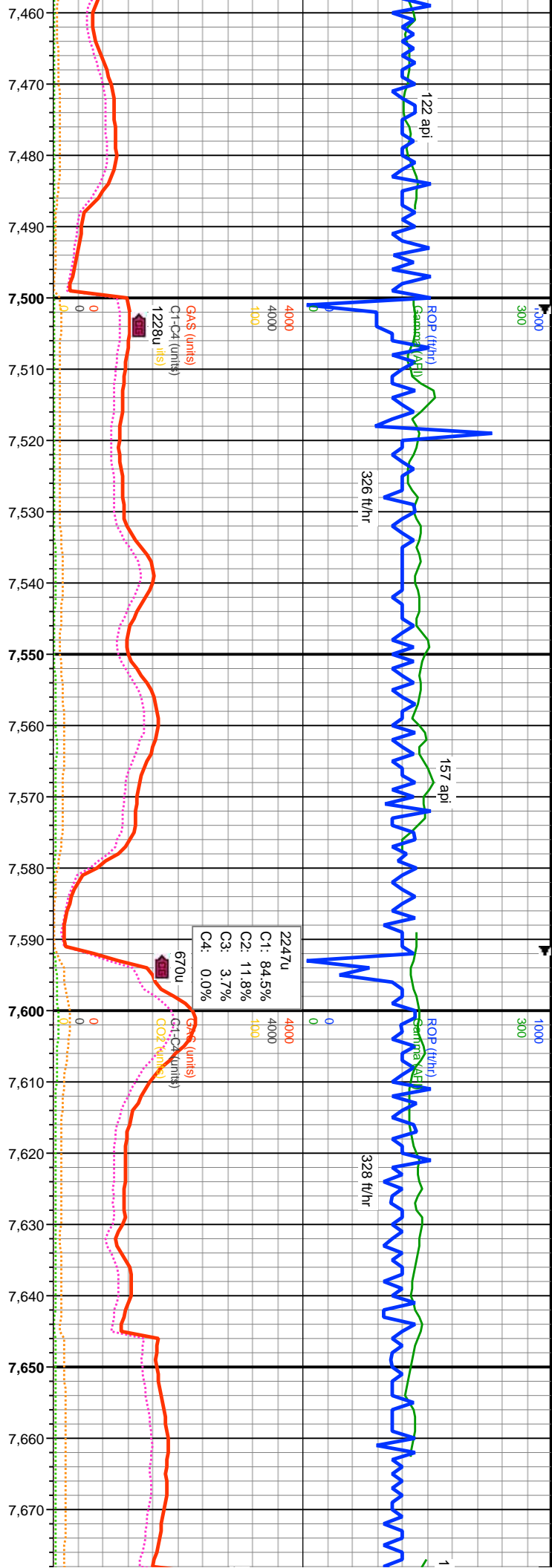
MD: 6,852' INC: 29.86° AZM: 280.82° TVD: 6,535.35' VS: 53.18'		MD: 6,941' INC: 30.17° AZM: 277.44° TVD: 6,612.42' VS: 55.35'	
5700		5700	
TVD (ft)		TVD (ft)	
100% SHY SLTST: lgy, sme medgy, lt gysbhn, sft, ip frm-fri, sb blkv-plty, com fis, arg, silty, rthy, mod cly rch mtx, sl calc		100% SHY SLTST: lgy, sme medgy, lt gysbhn, sft, ip frm-fri, sb blkv-plty, com fis, arg, silty, rthy, mod cly rch mtx, sl calc	
8500		8500	
TVD (ft)		TVD (ft)	
100% SHY SLTST: lgy, sme medgy, lt gysbhn, sft, ip frm-fri, sb blkv-plty, com fis, arg, silty, rthy, mod cly rch mtx, sl calc		100% SHY SLTST: lgy, sme medgy, lt gysbhn, sft, ip frm-fri, sb blkv-plty, com fis, arg, silty, rthy, mod cly rch mtx, sl calc	
8500		8500	
TVD (ft)		TVD (ft)	









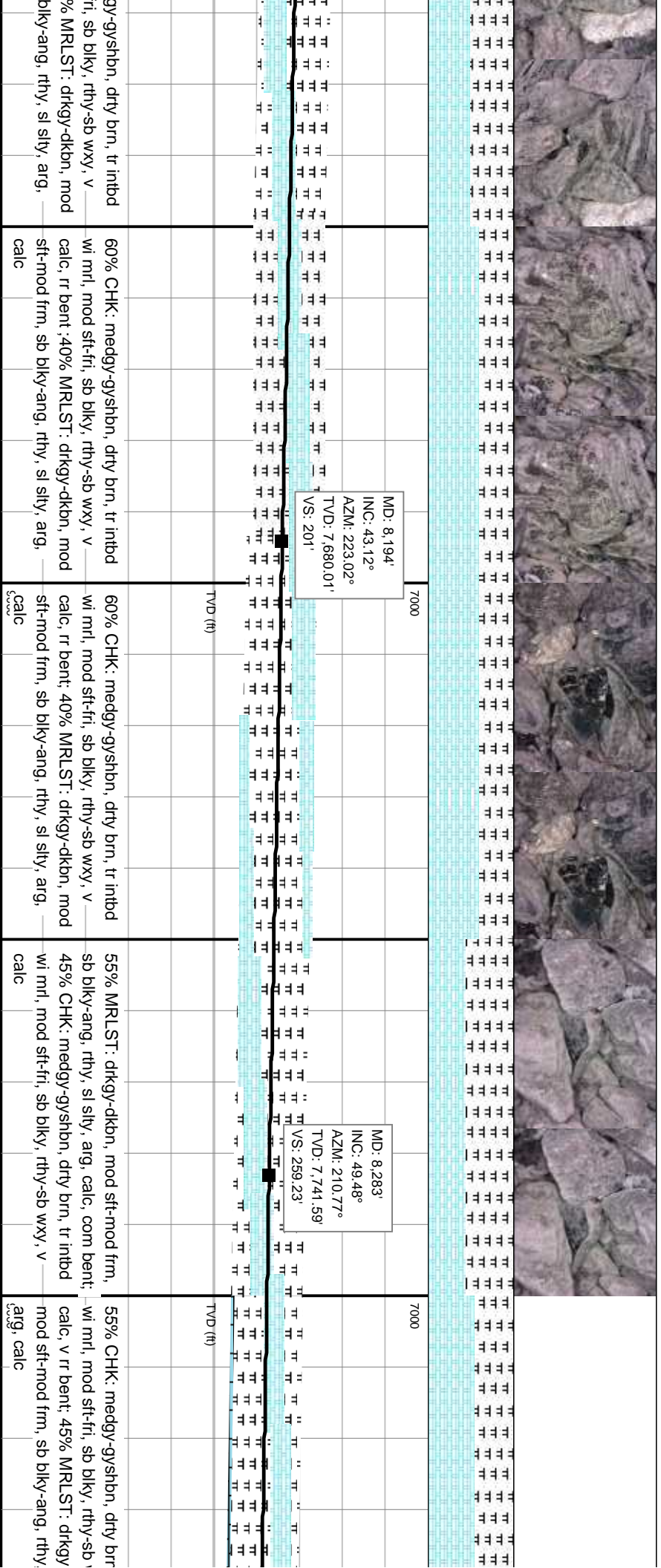
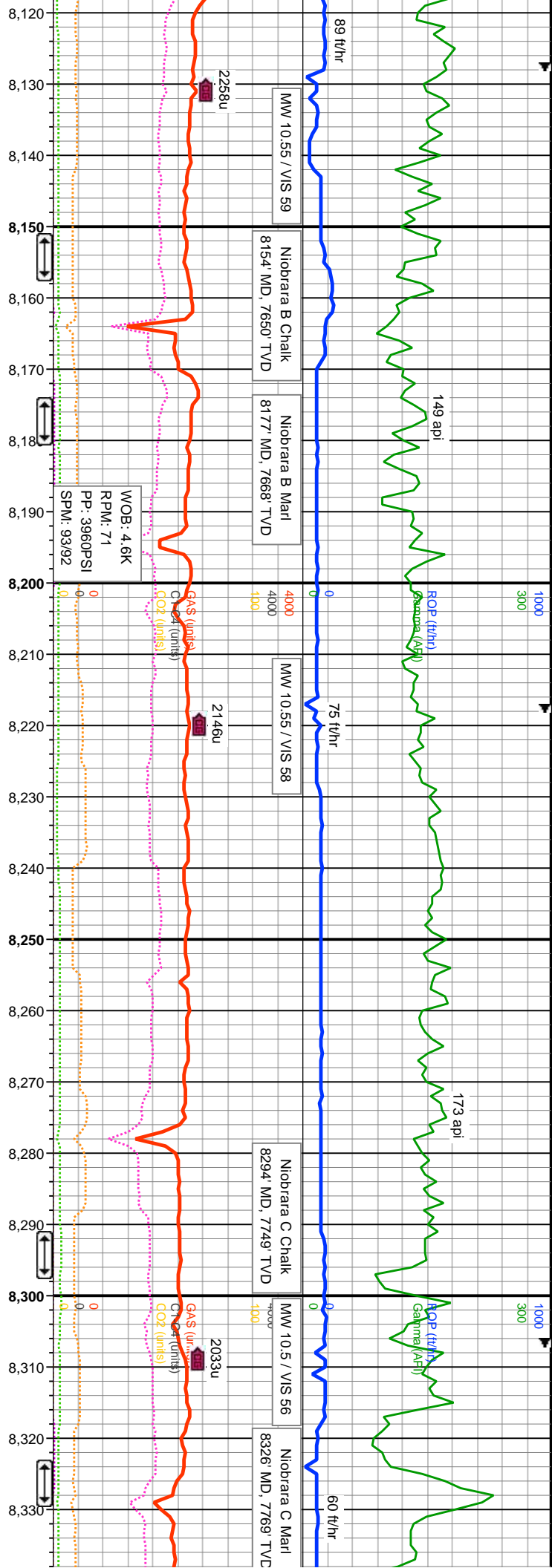




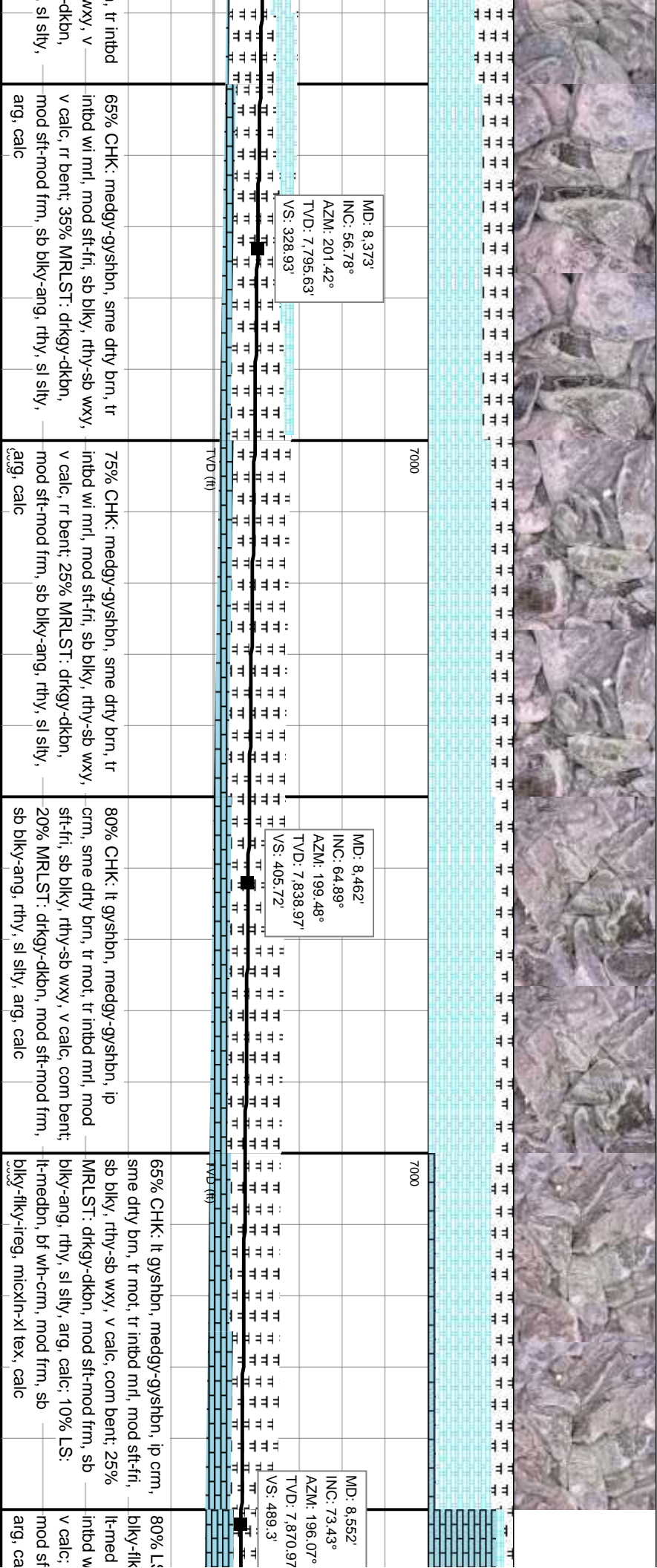
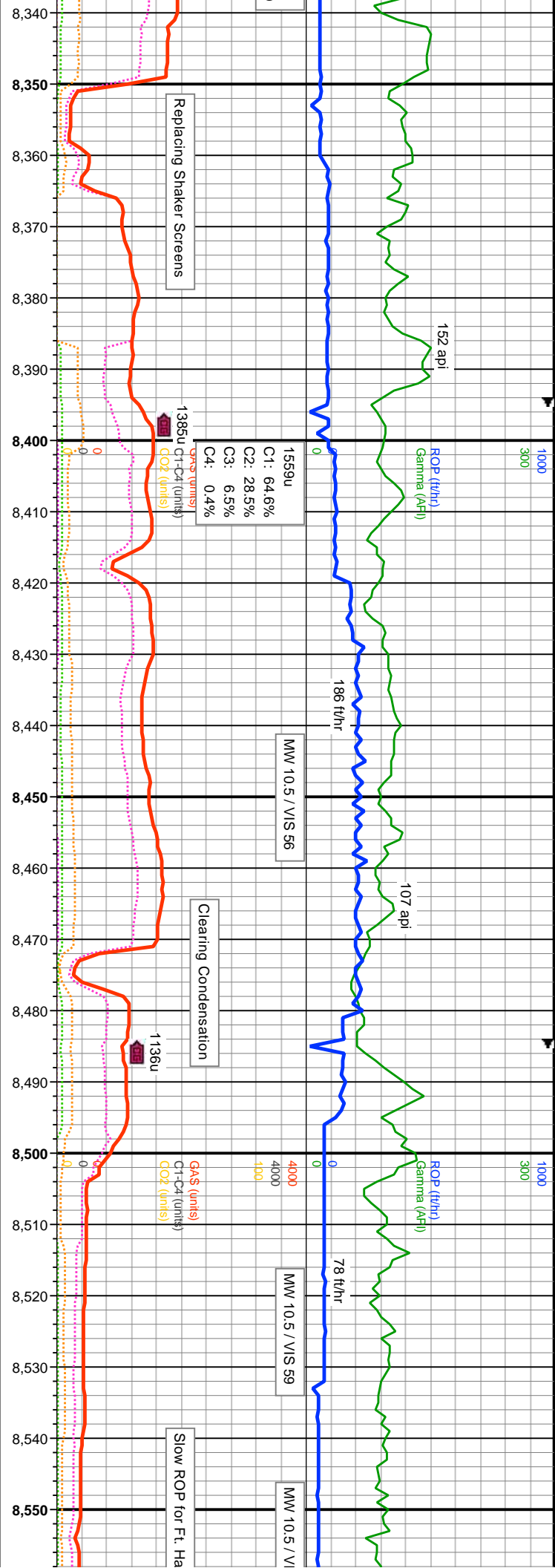


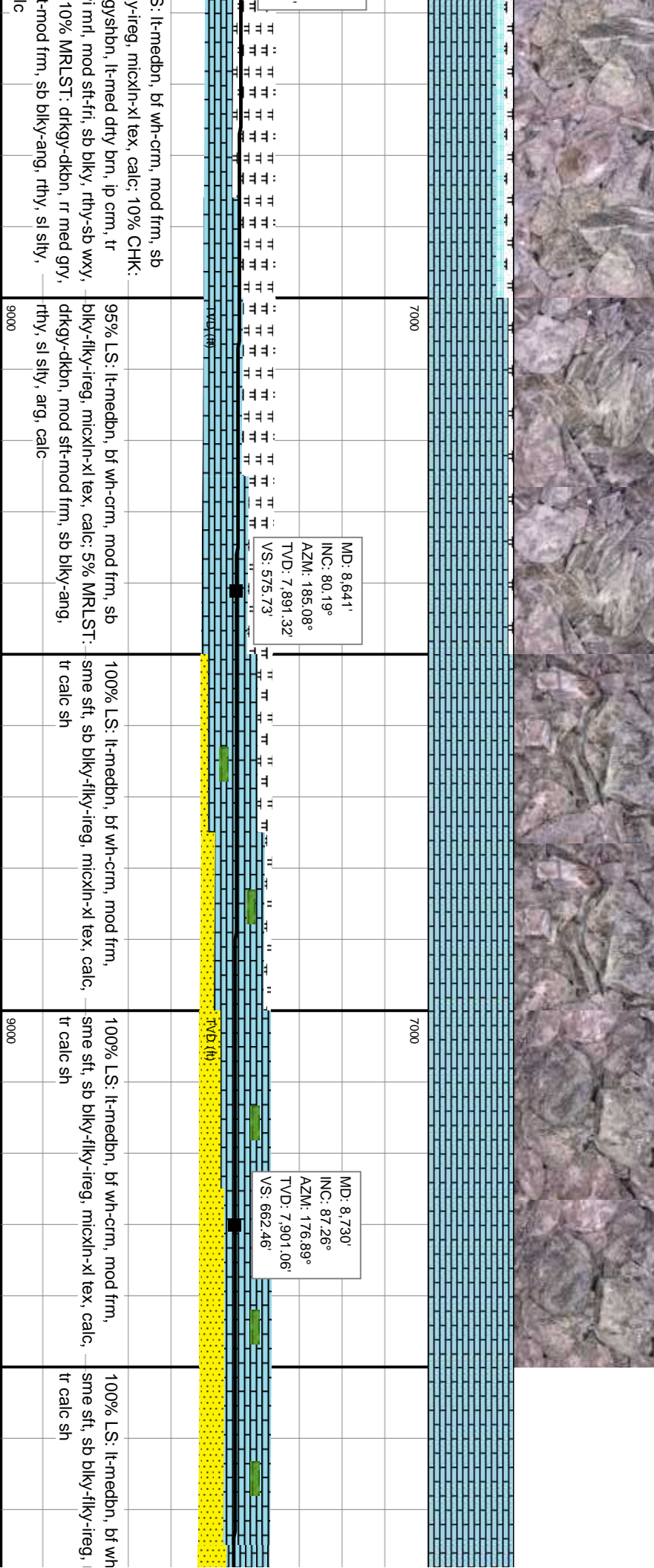
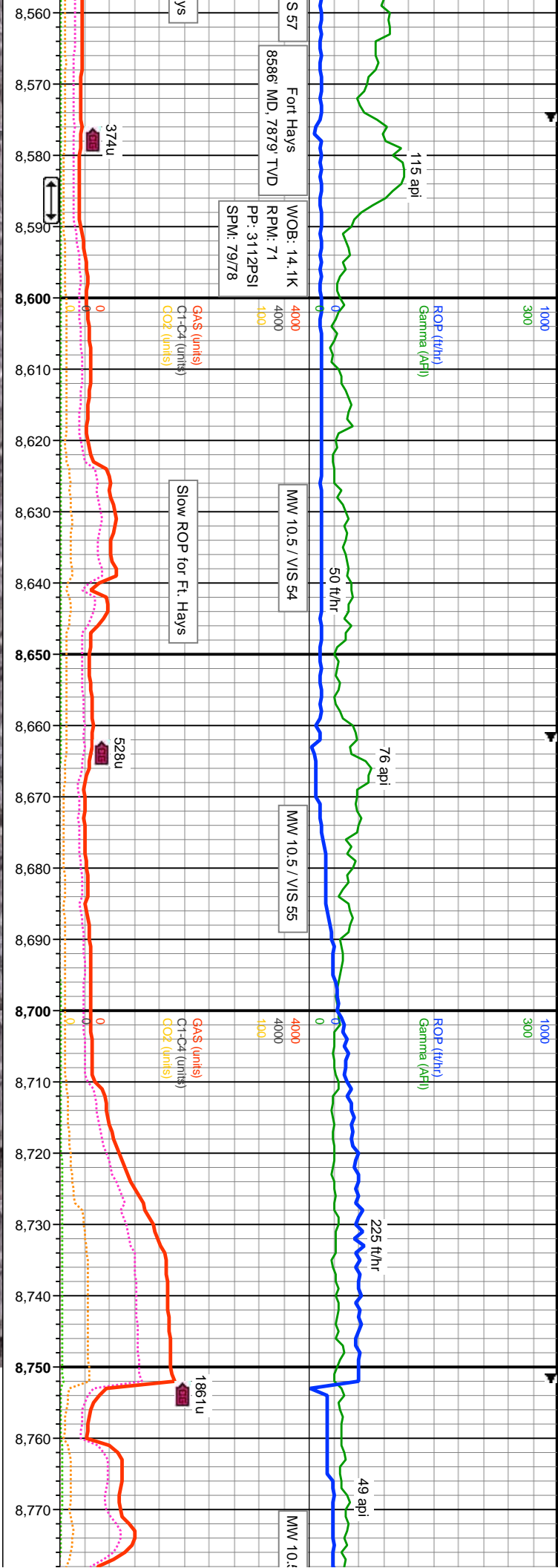




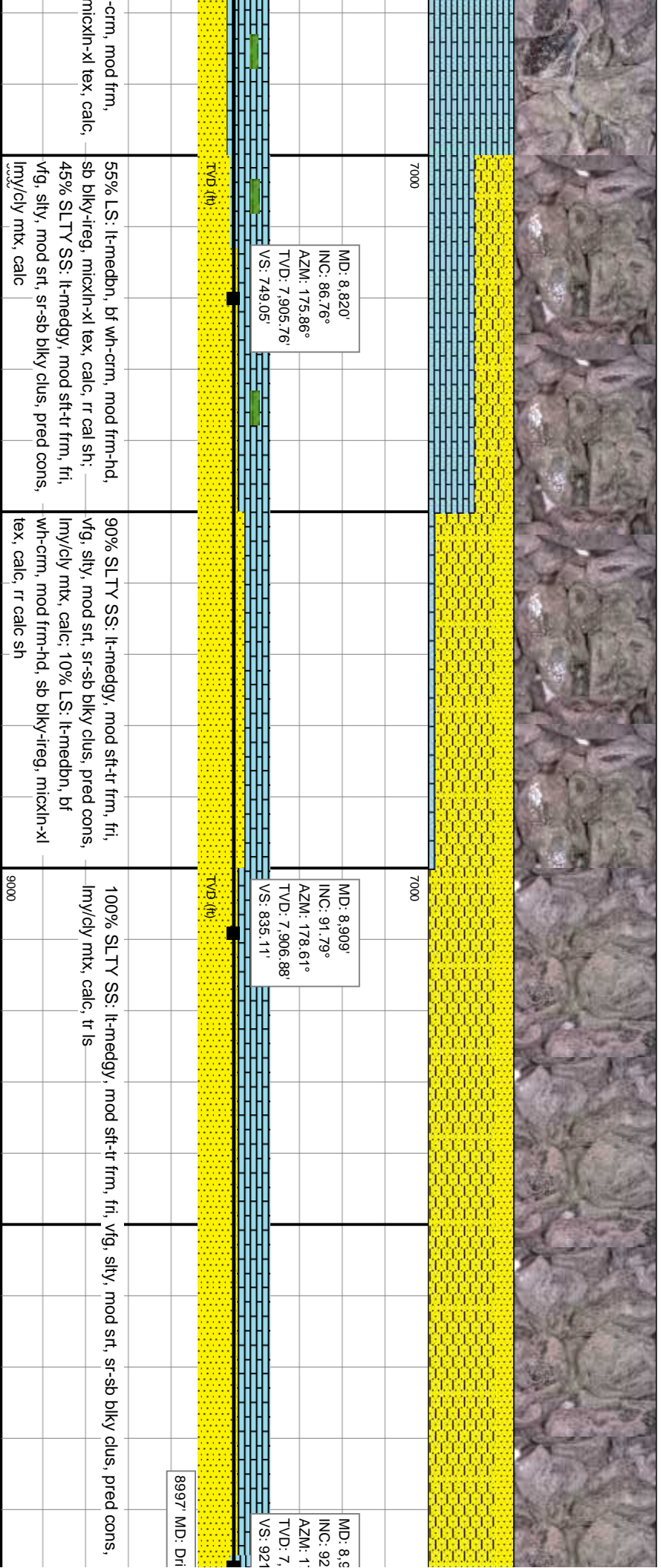
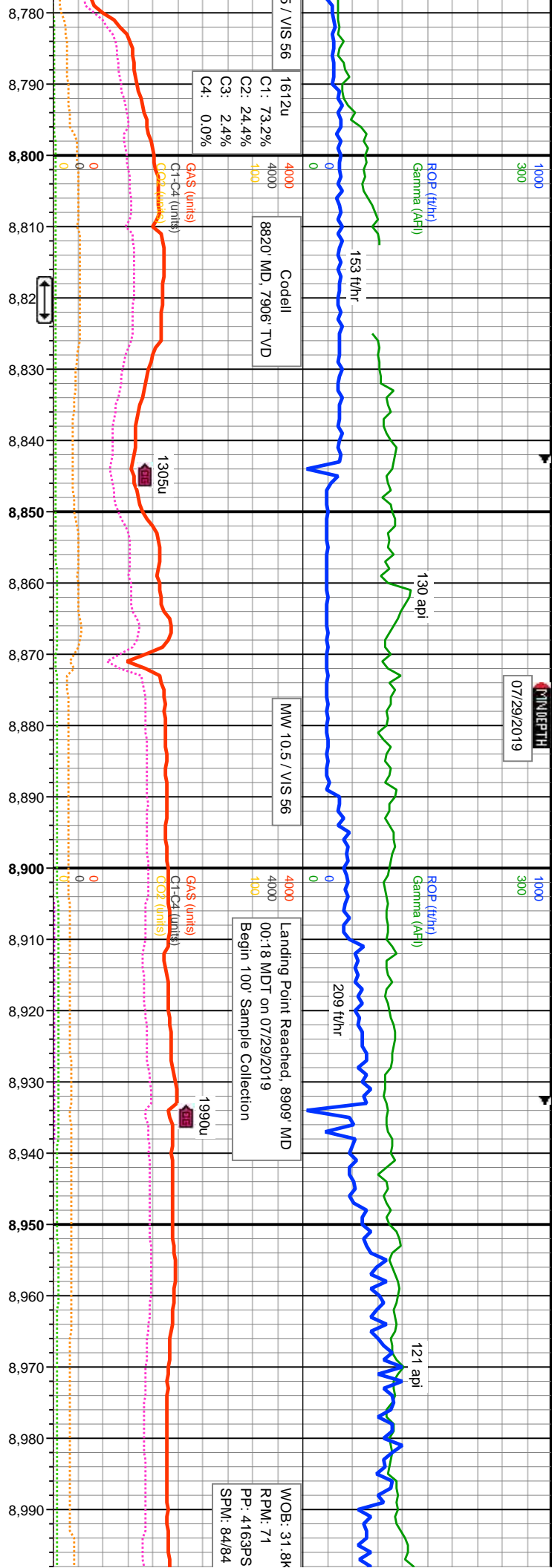




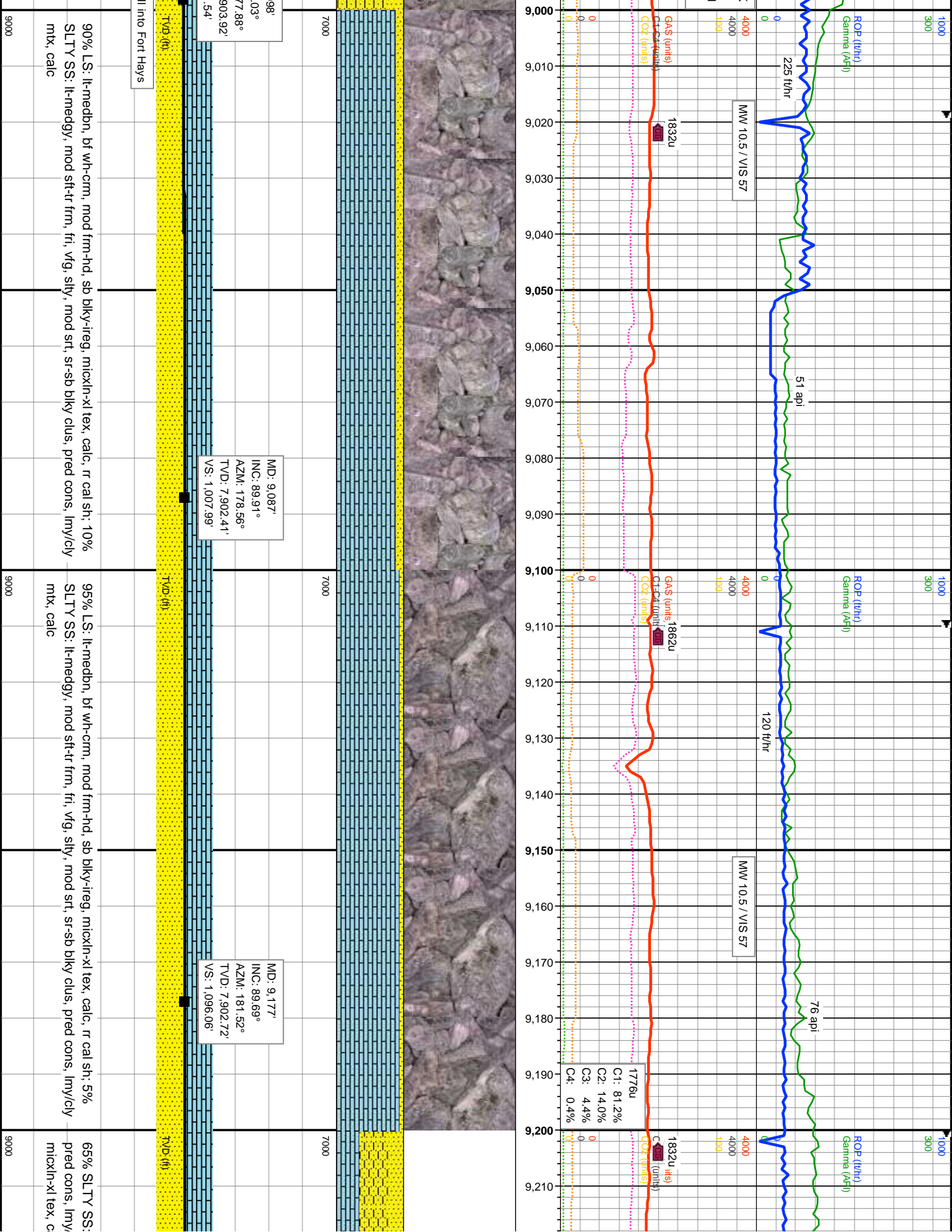


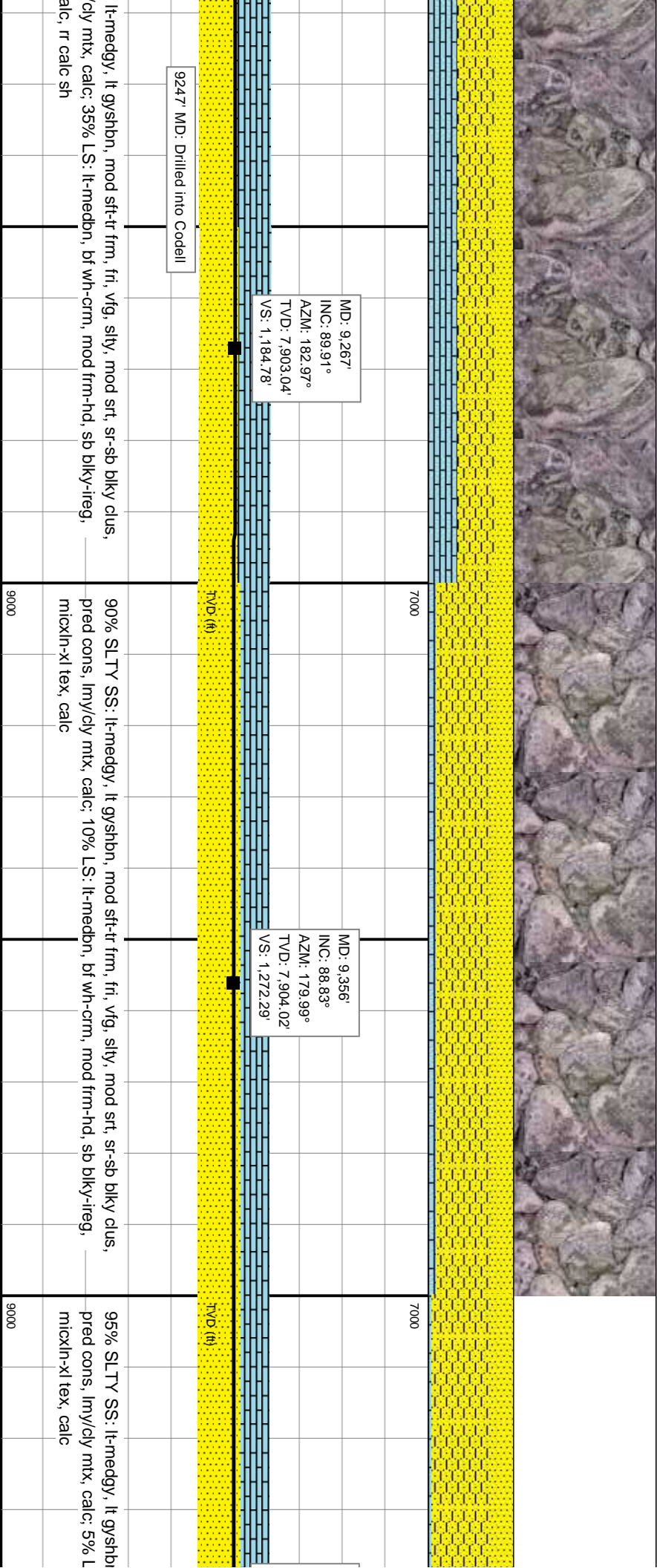
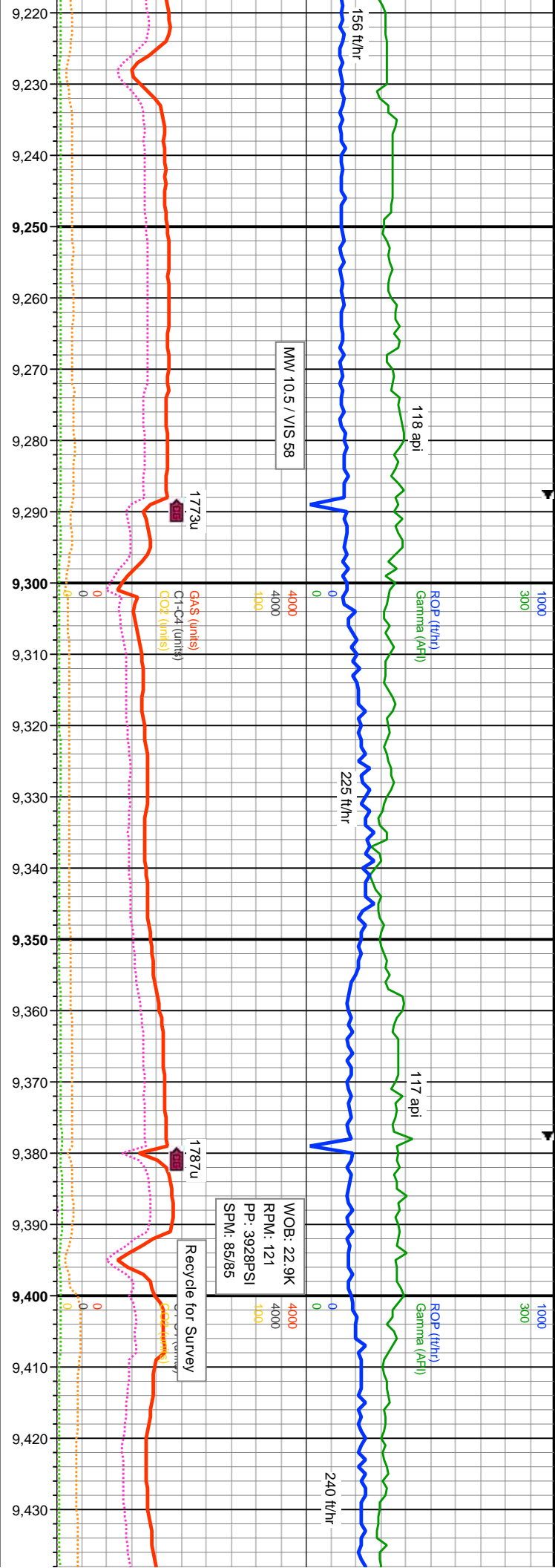




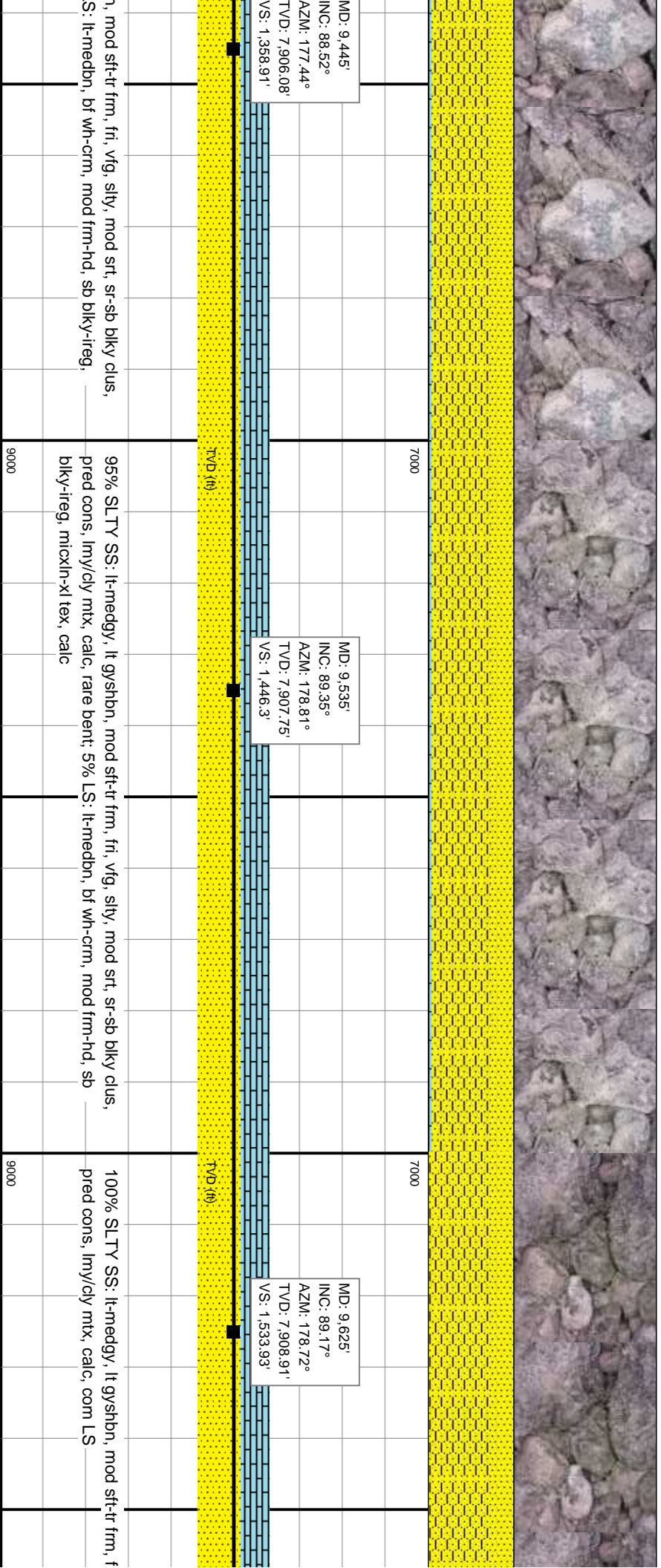
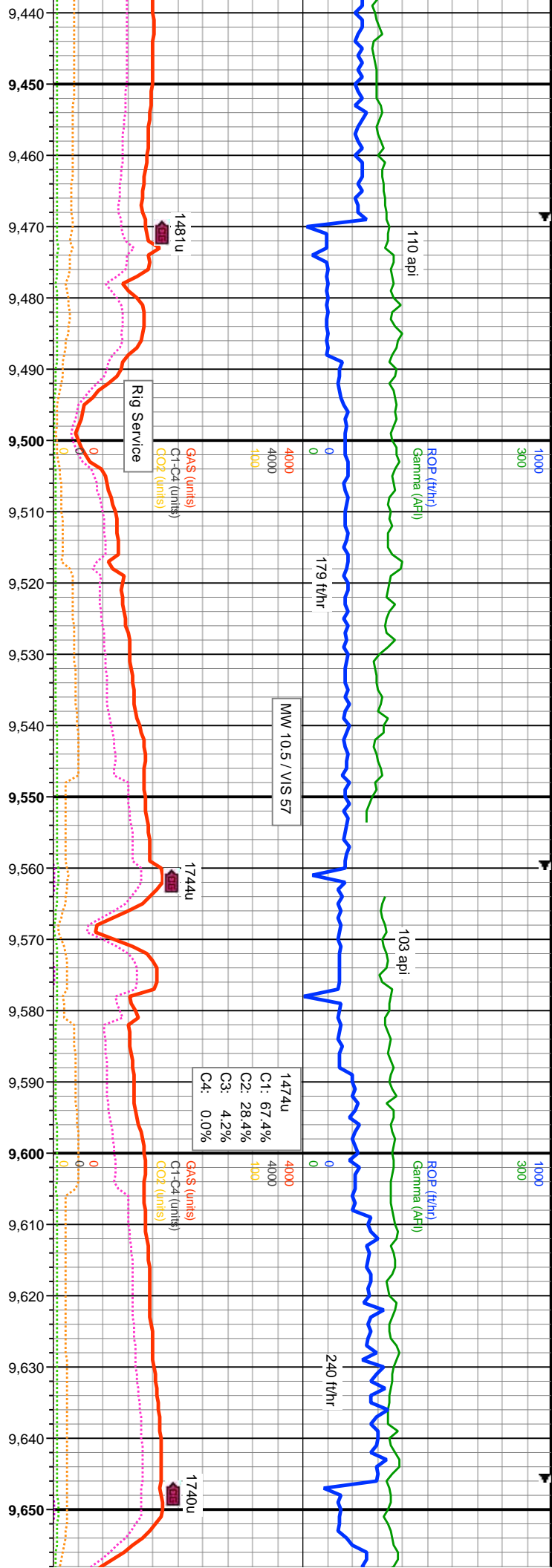












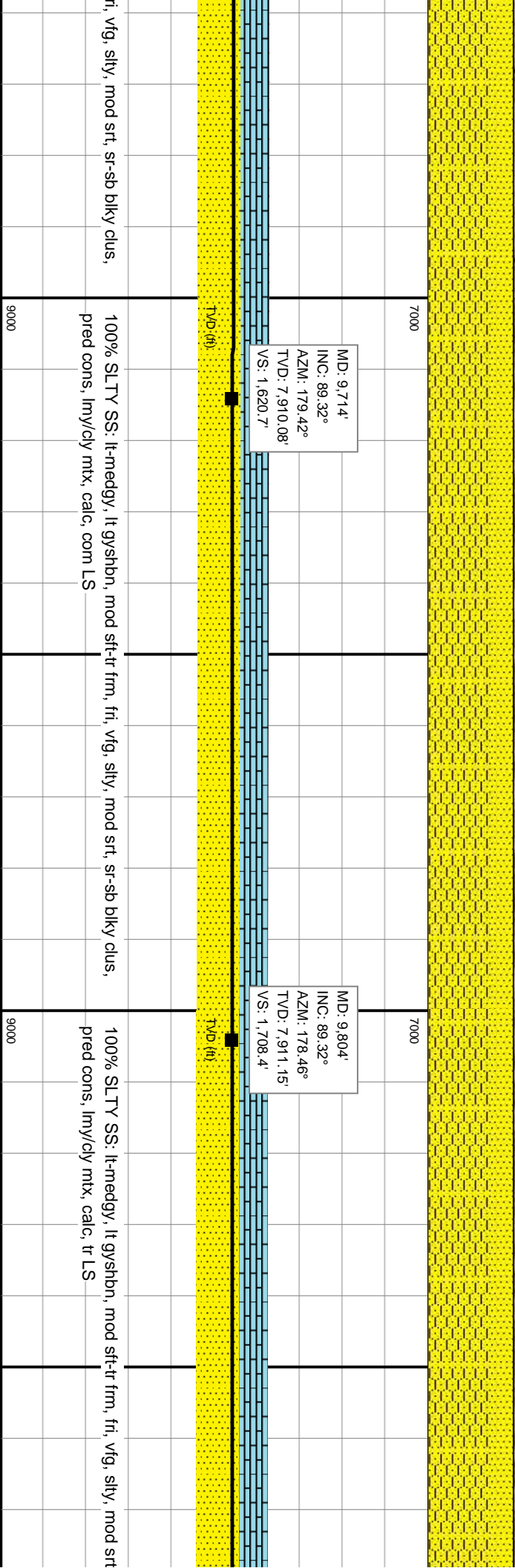
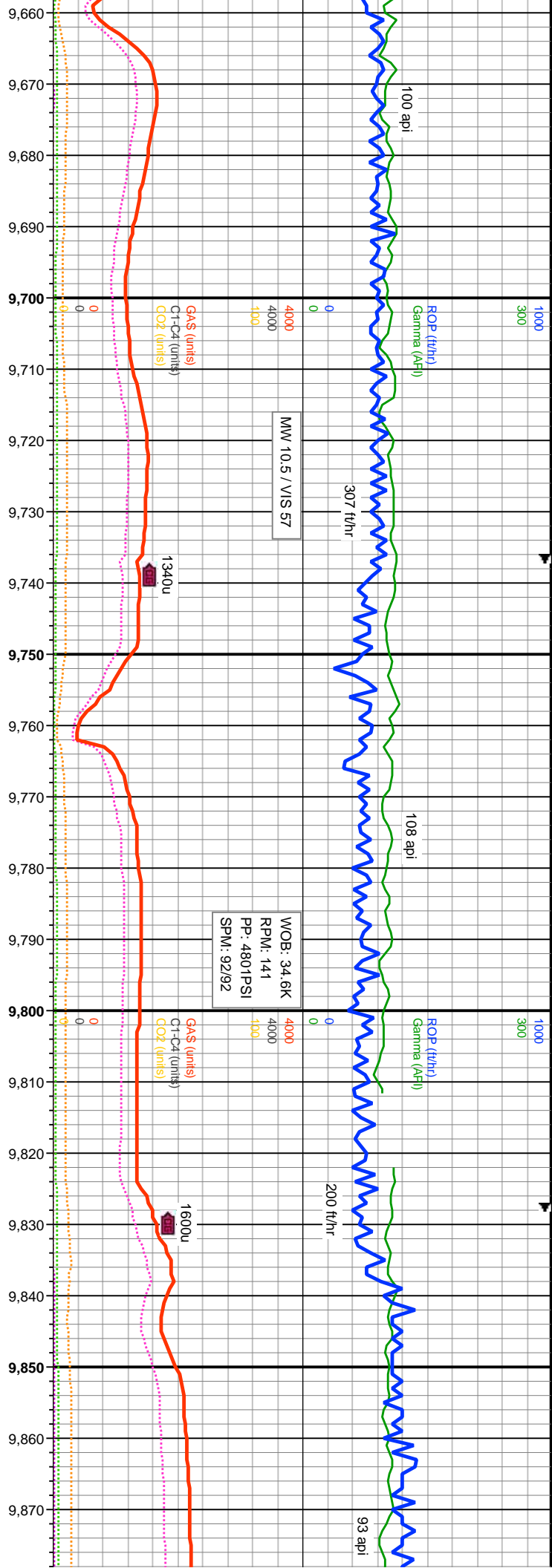
MD: 9,445'  
INC: 88.52°  
AZM: 177.44°  
TVD: 7,906.08'  
VS: 1,358.91'

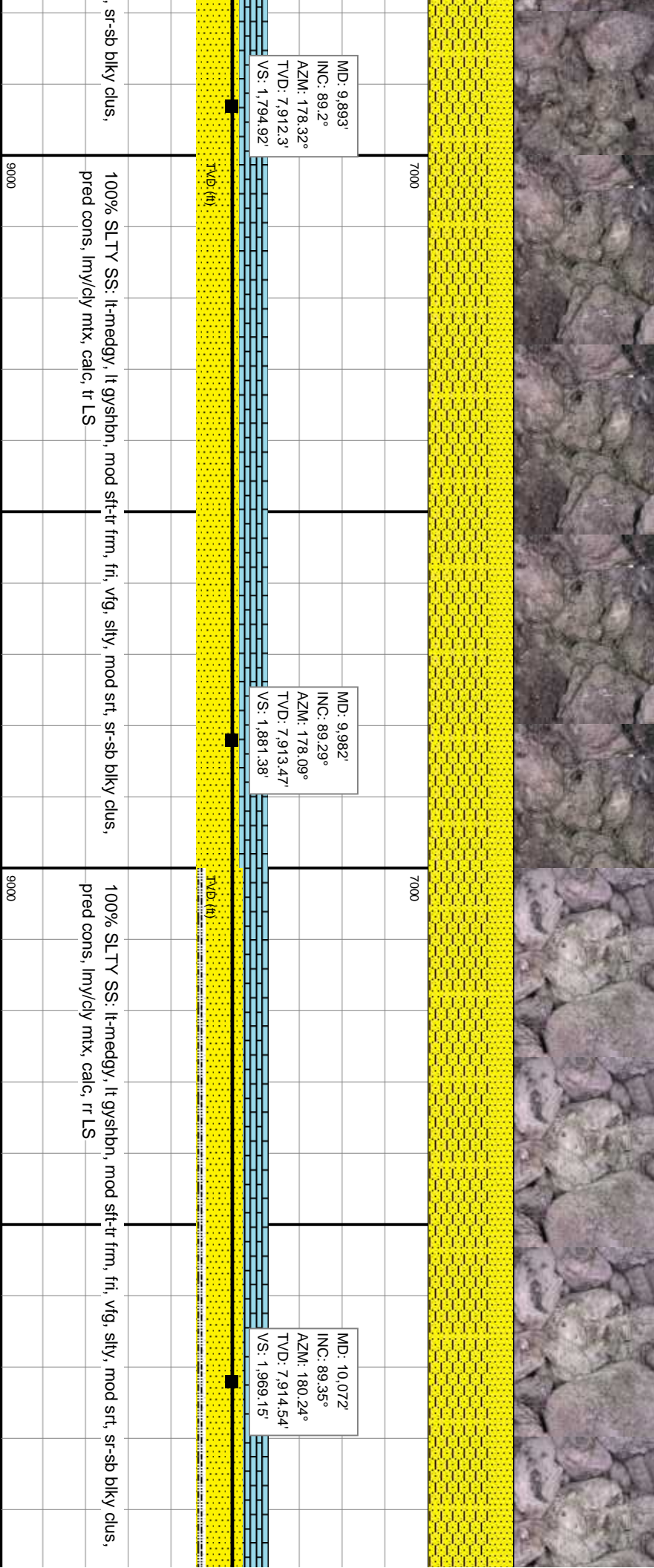
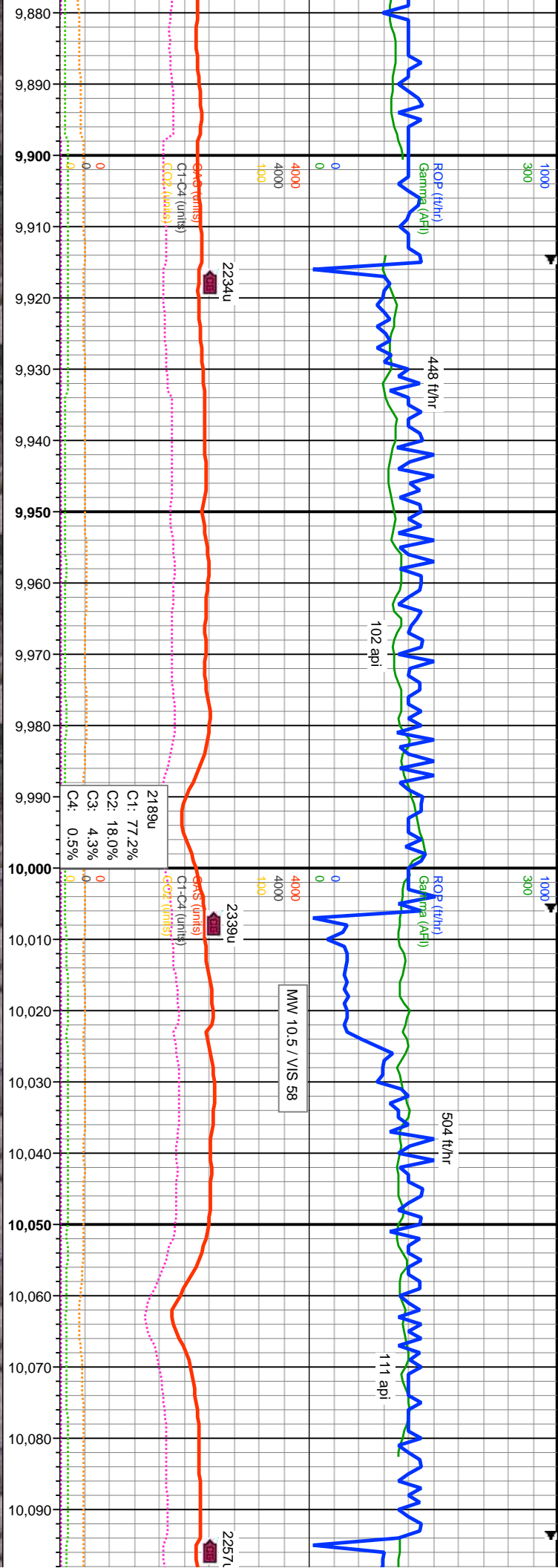
MD: 9,535'  
INC: 89.35°  
AZM: 178.81°  
TVD: 7,907.75'  
VS: 1,446.3'

MD: 9,625'  
INC: 89.17°  
AZM: 178.72°  
TVD: 7,908.91'  
VS: 1,533.93'

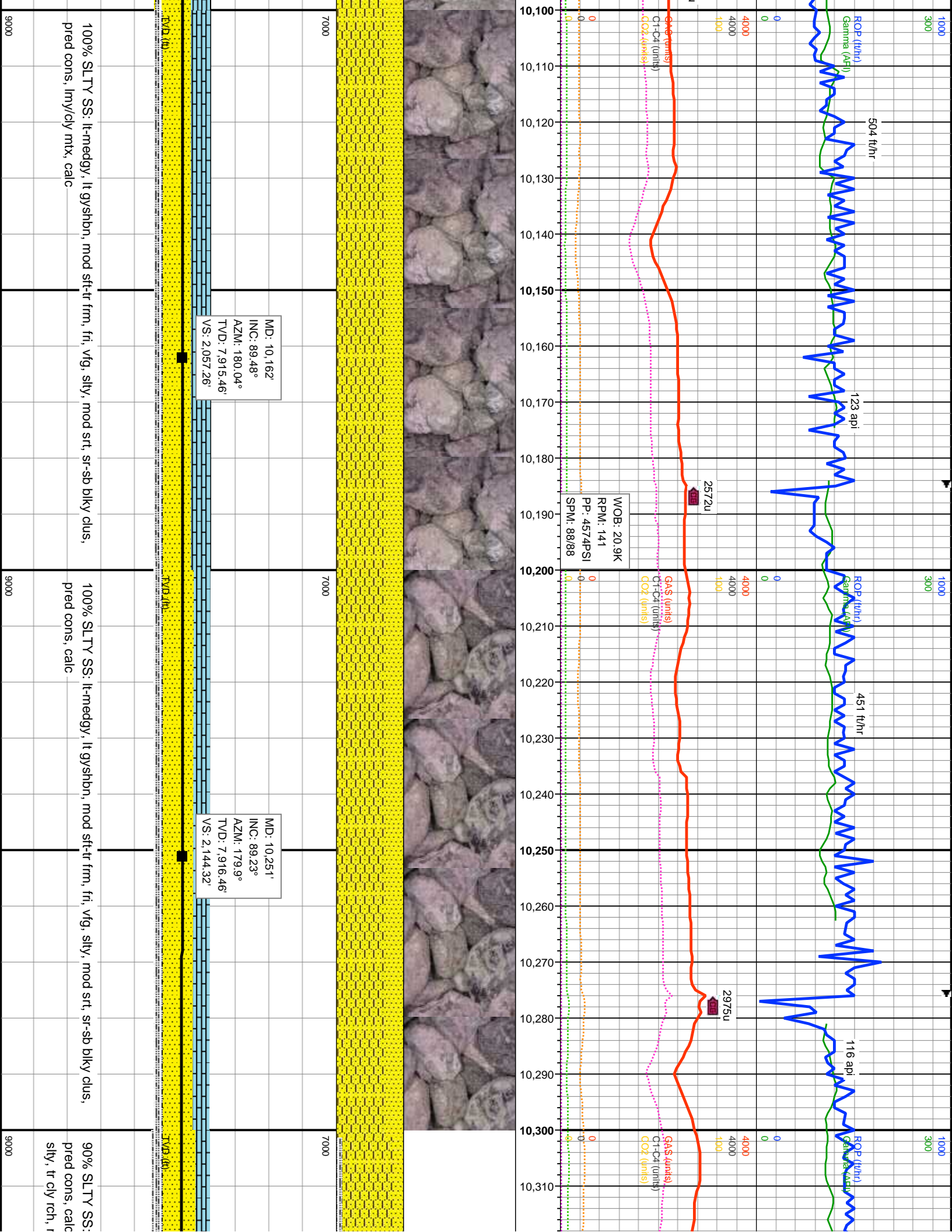
mod sft-tr frm, fri, vfg, silty, mod srt, sr-sb blkly clus, S: lt-medbn, bf wh-crm, mod frm-hd, sb blkly-ireg, 95% SLTY SS: lt-medgy, lt gysbhn, mod sft-tr frm, fri, vfg, silty, mod srt, sr-sb blkly clus, pred cons, lmy/cly mtx, calc, rare bent; 5% LS: lt-medbn, bf wh-crm, mod frm-hd, sb blkly-ireg, micxln-xl tex, calc 100% SLTY SS: lt-medgy, lt gysbhn, mod sft-tr frm, f pred cons, lmy/cly mtx, calc, com LS



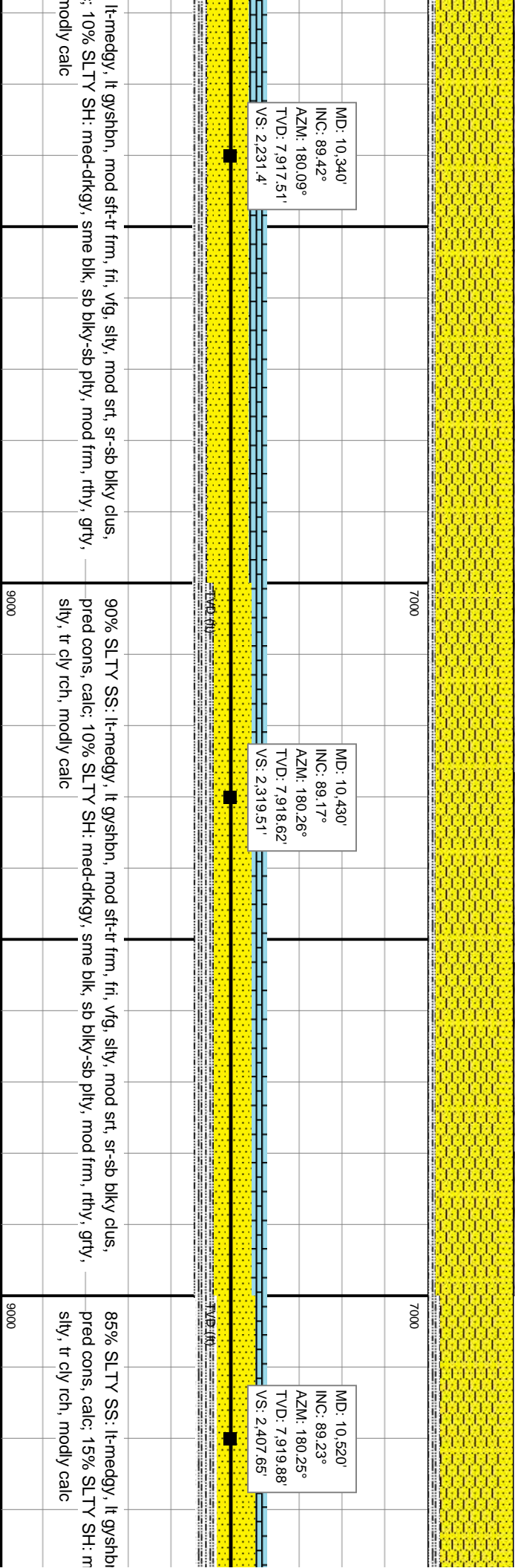
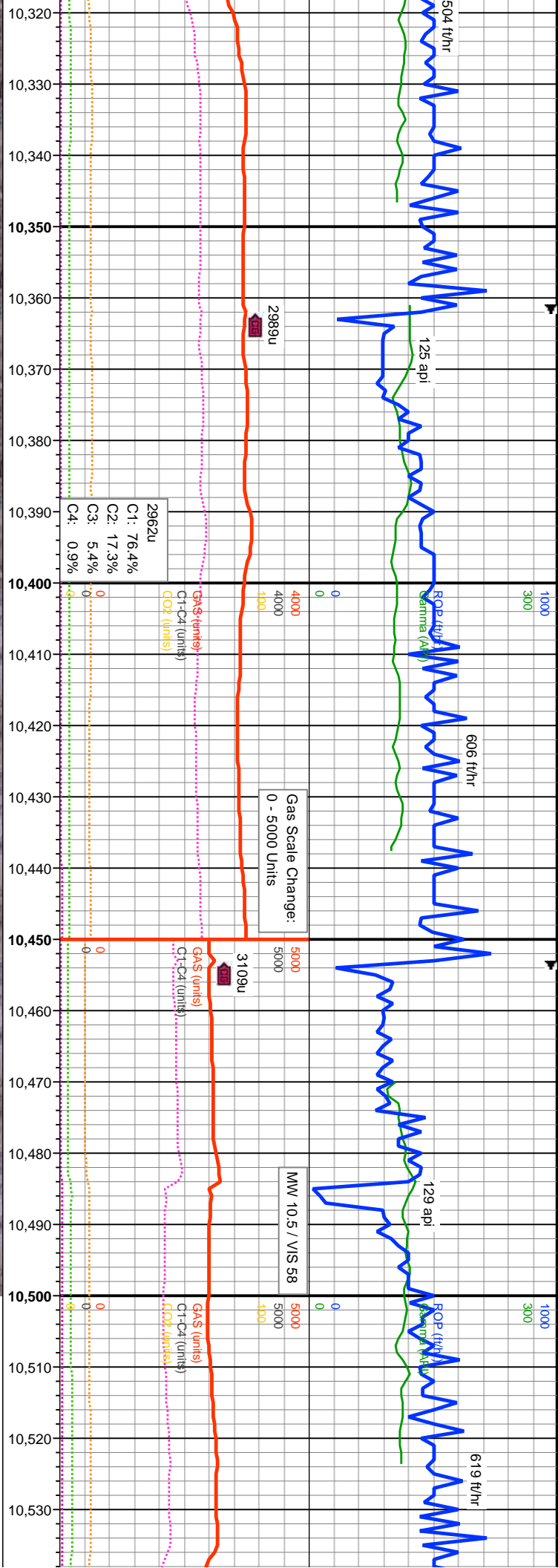


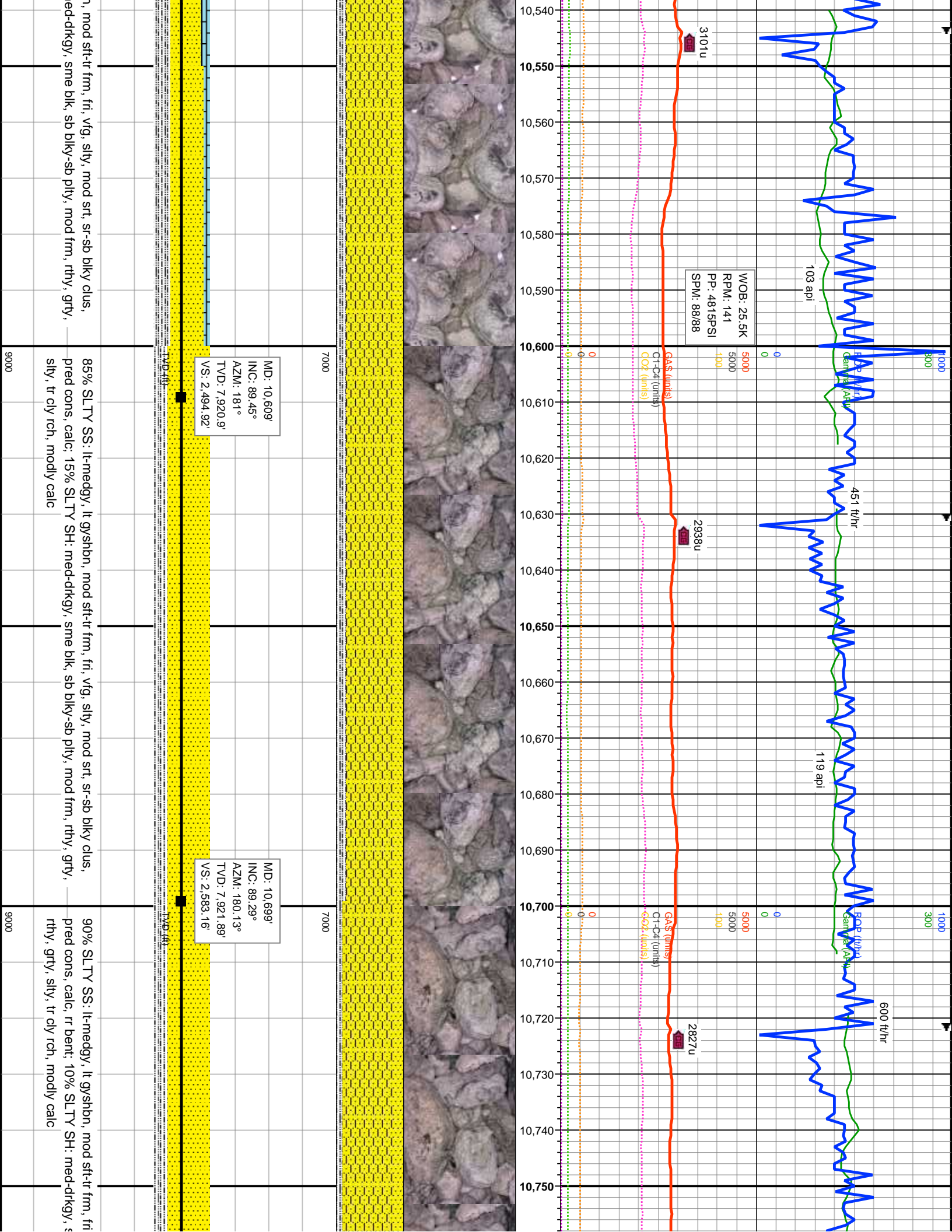




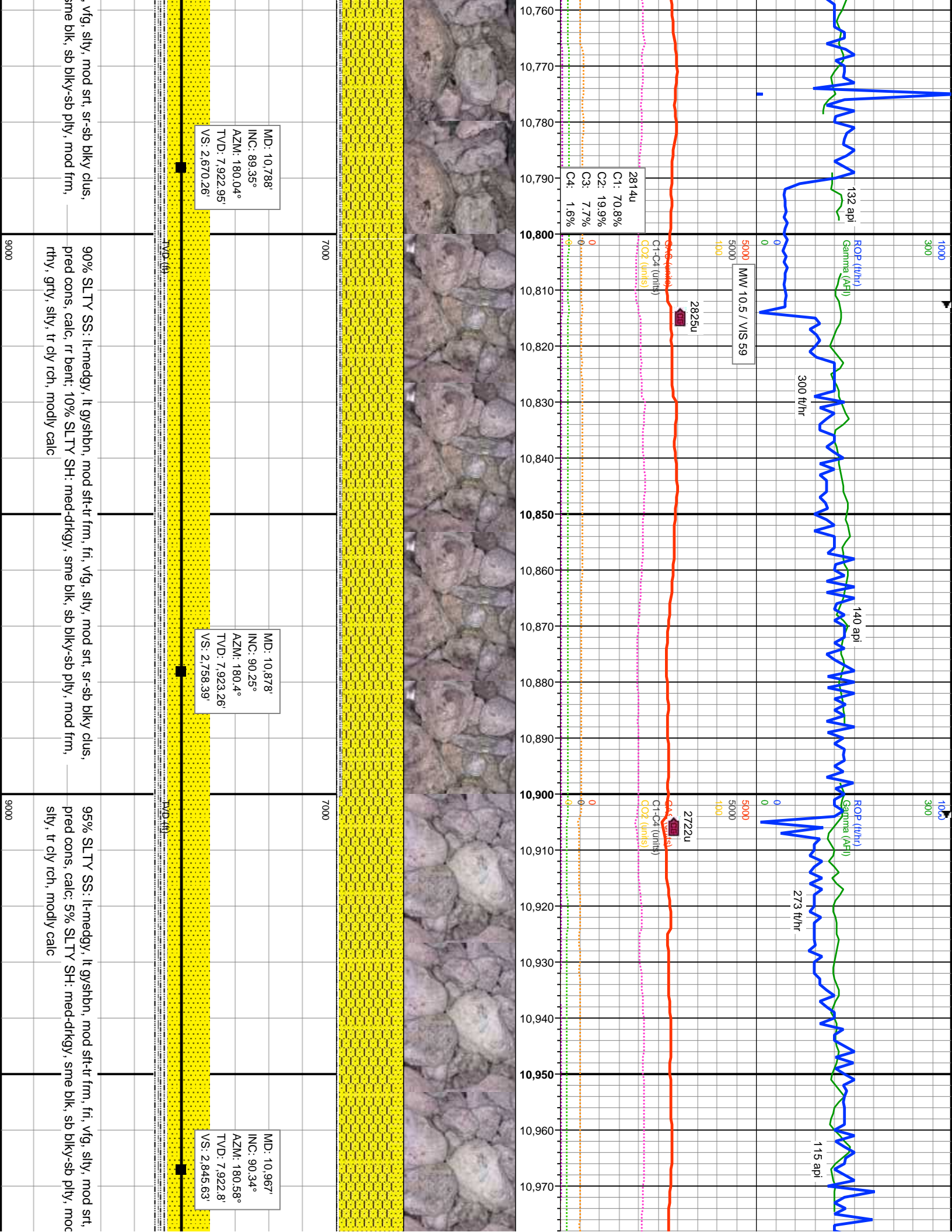




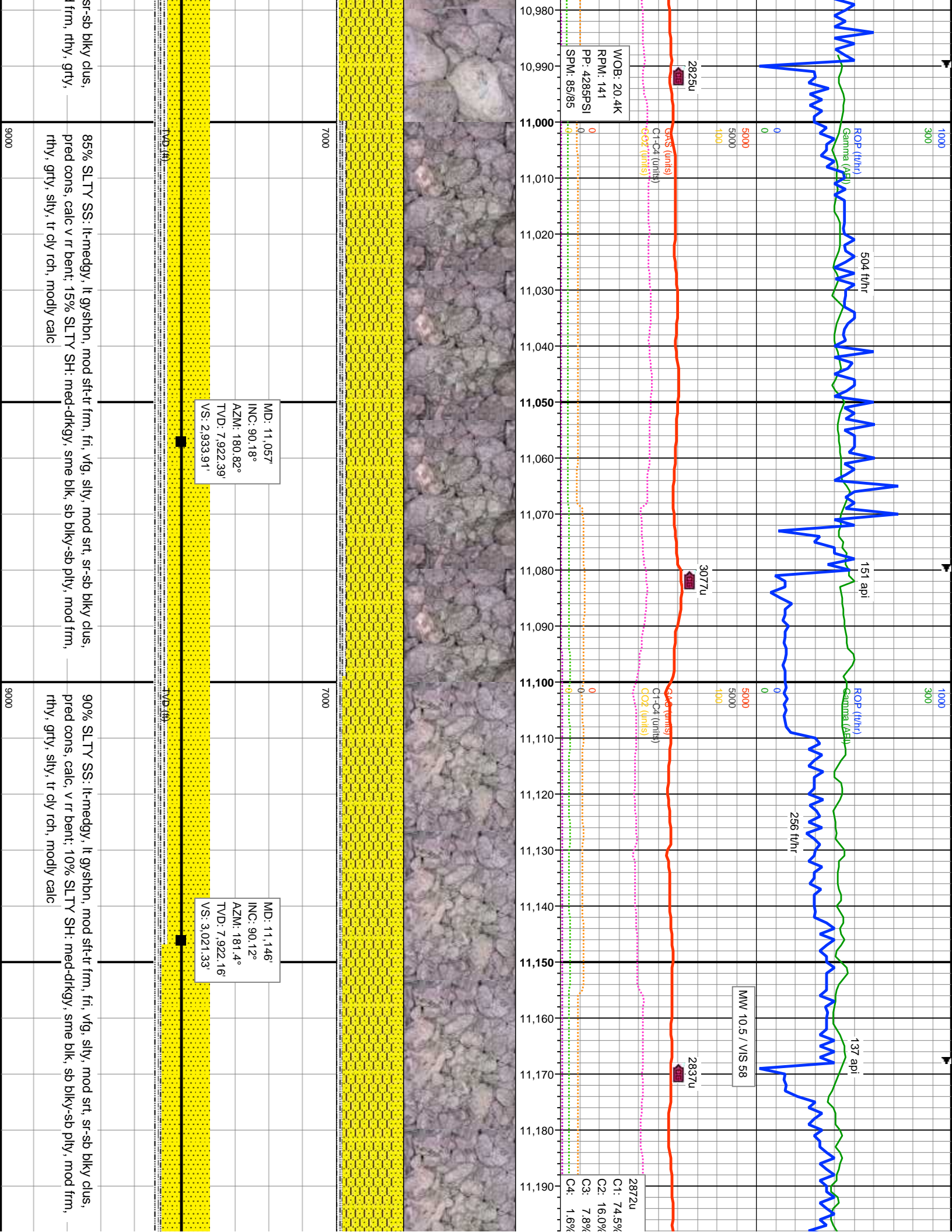


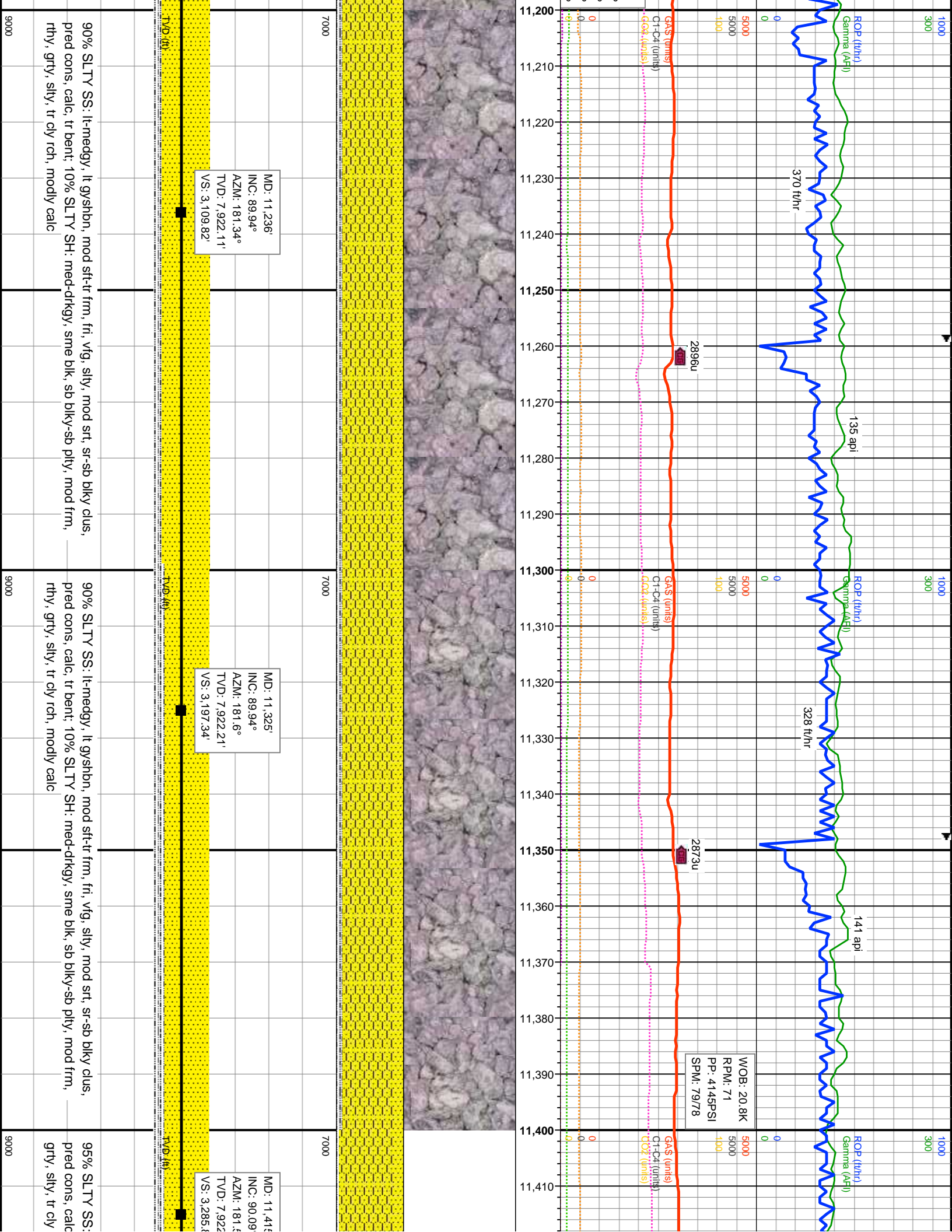




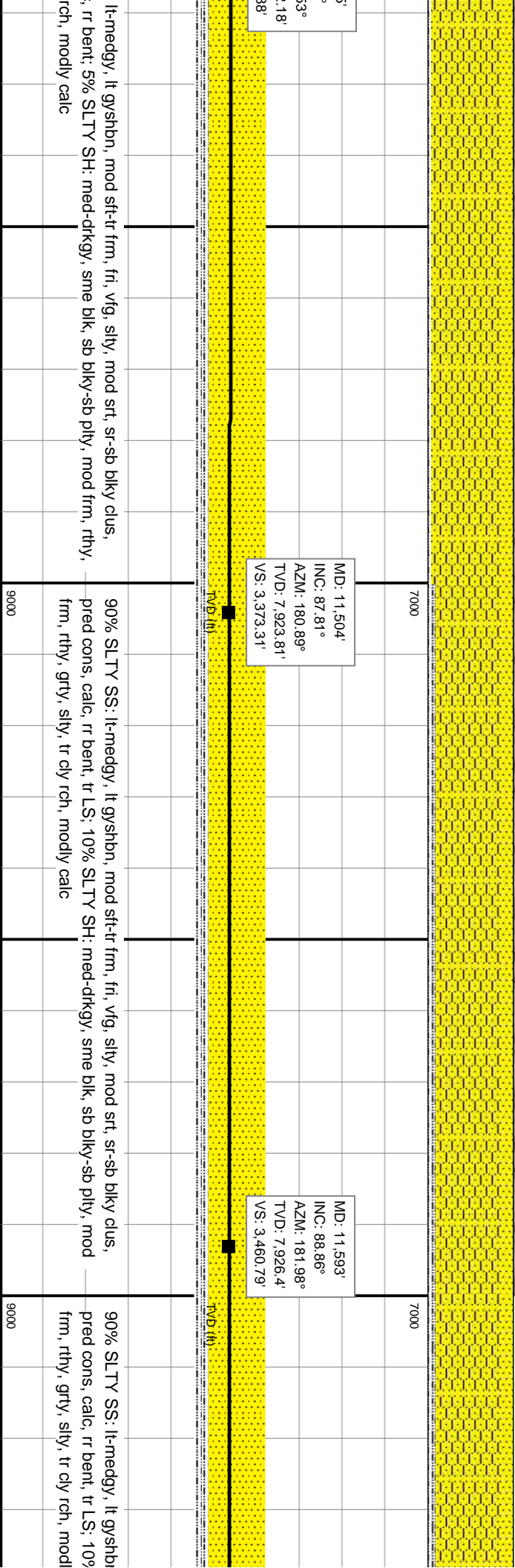
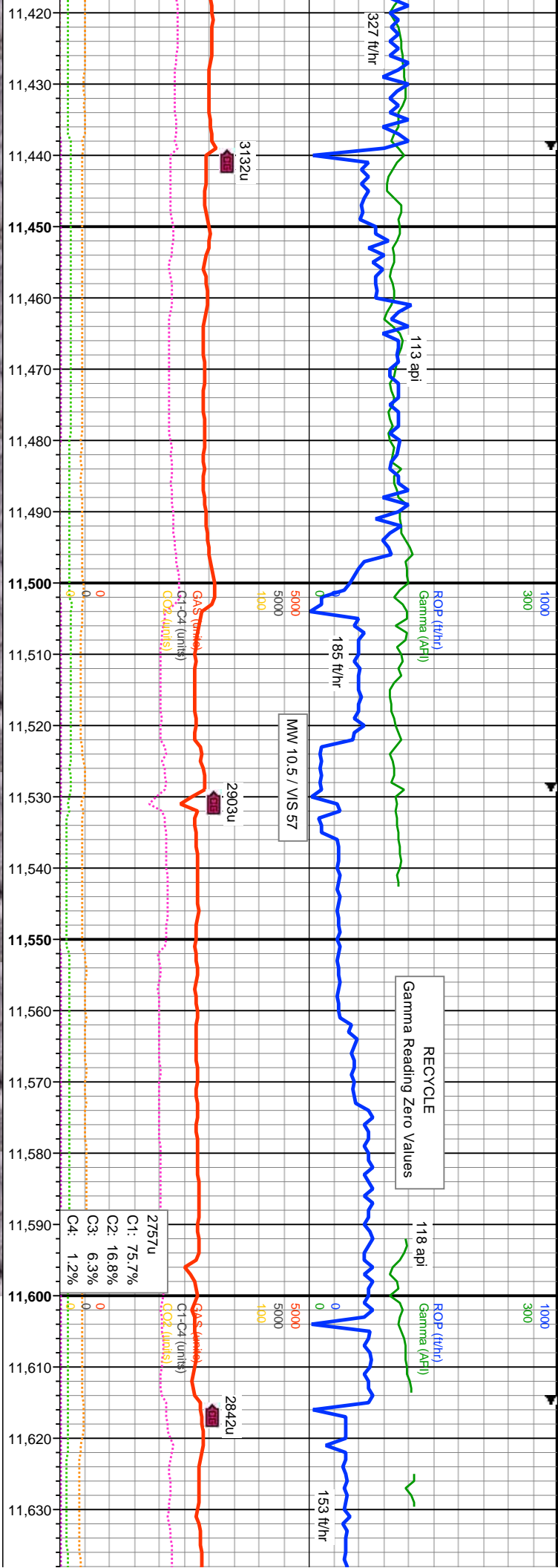




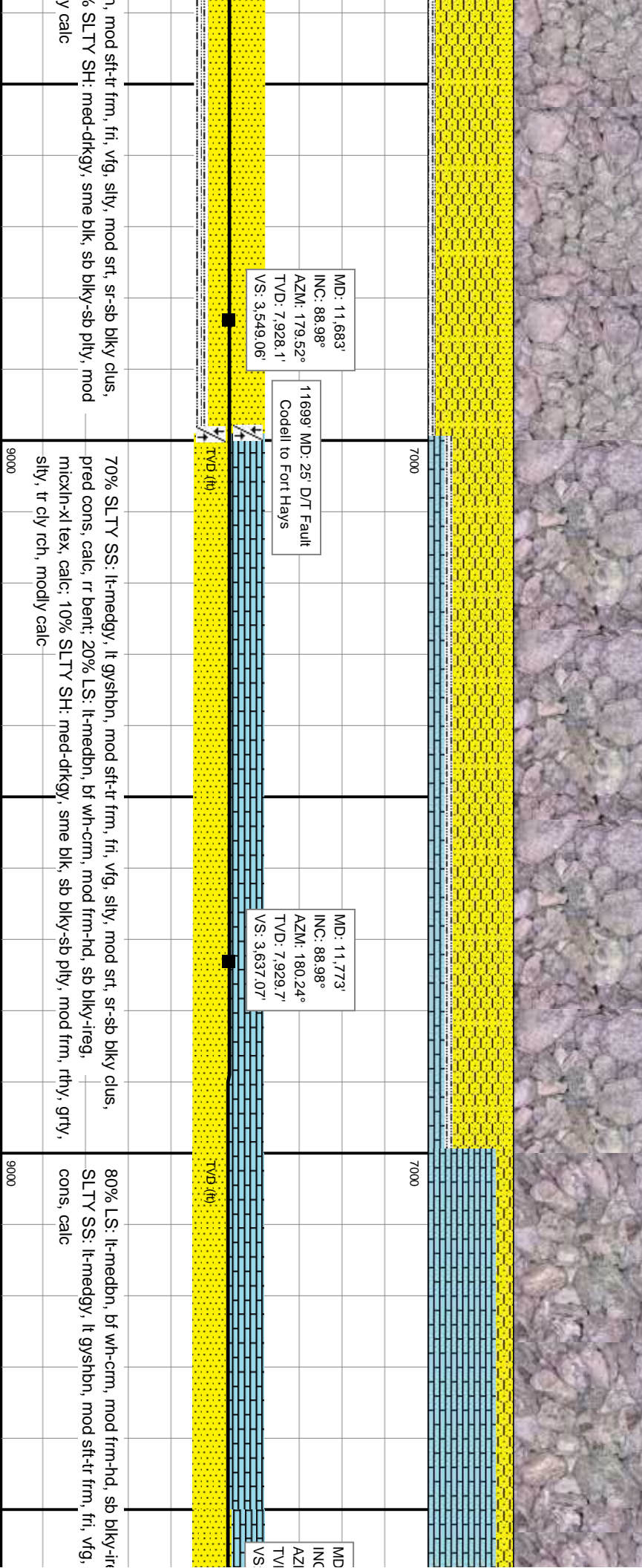
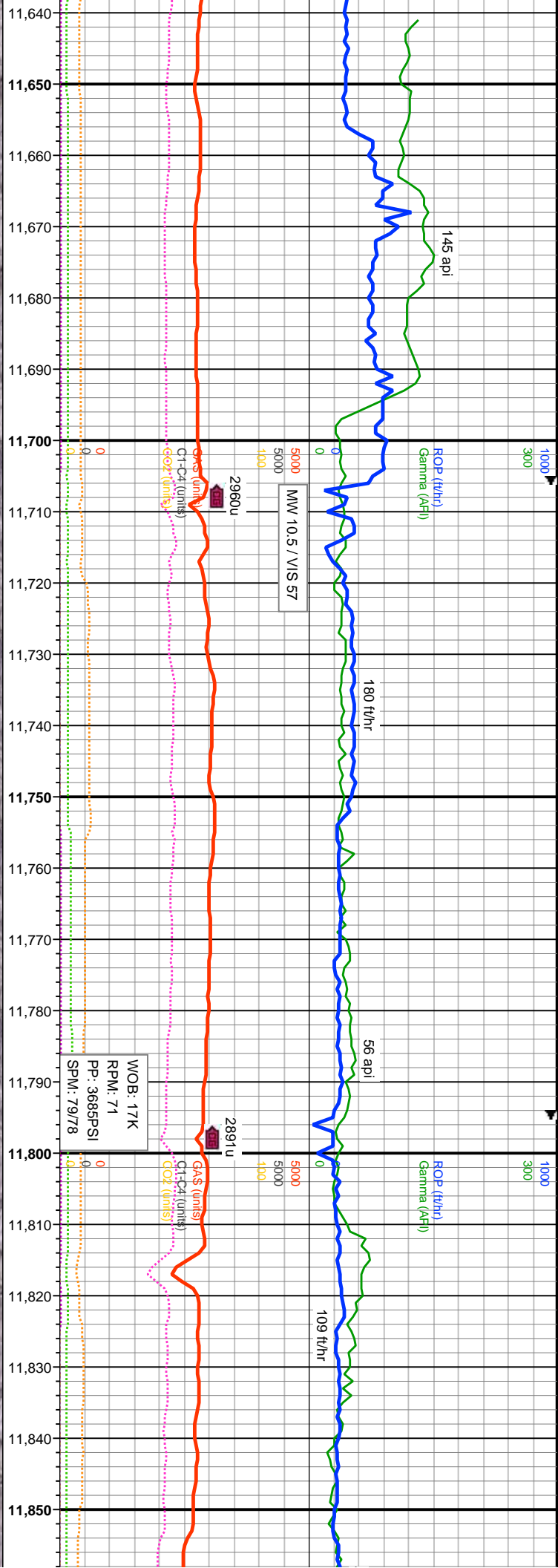


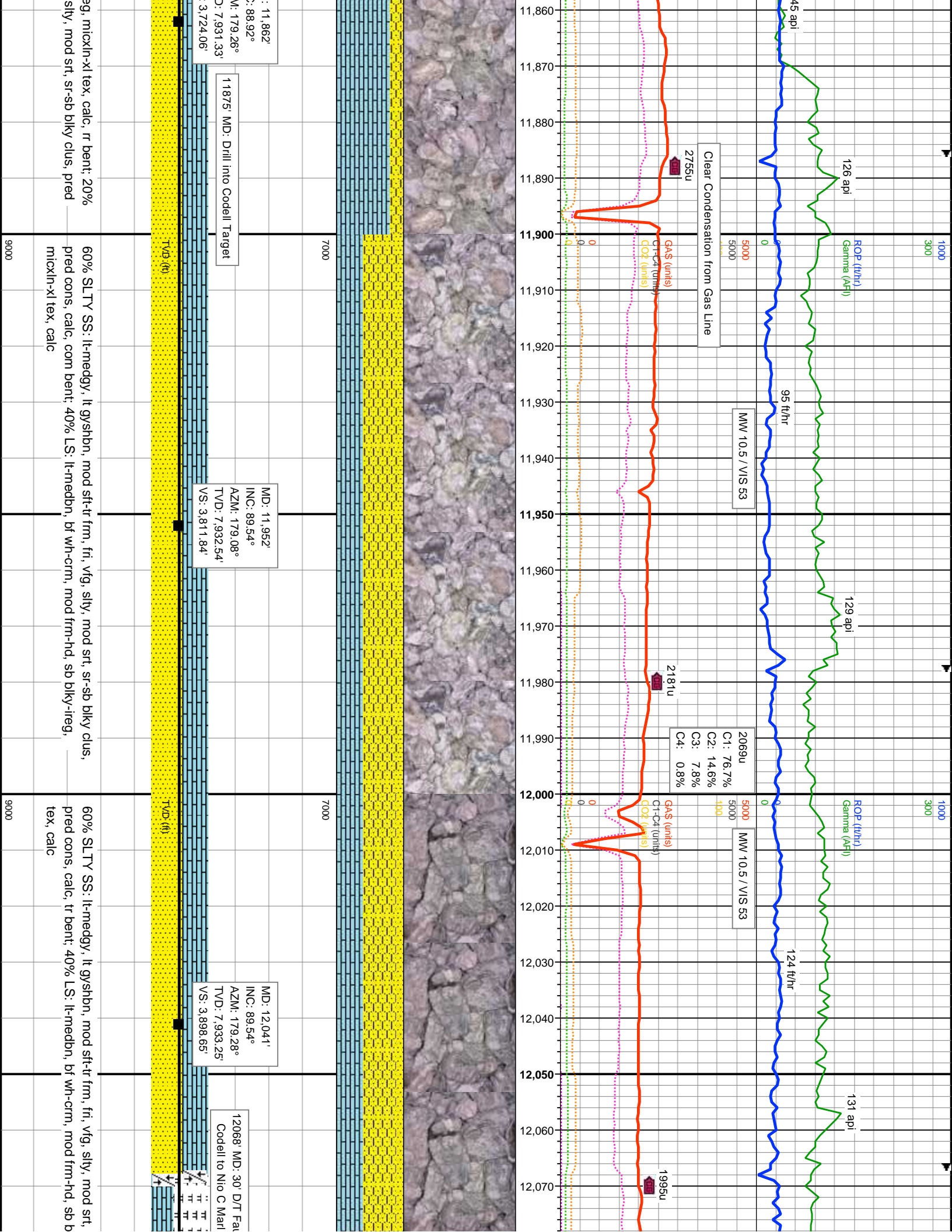






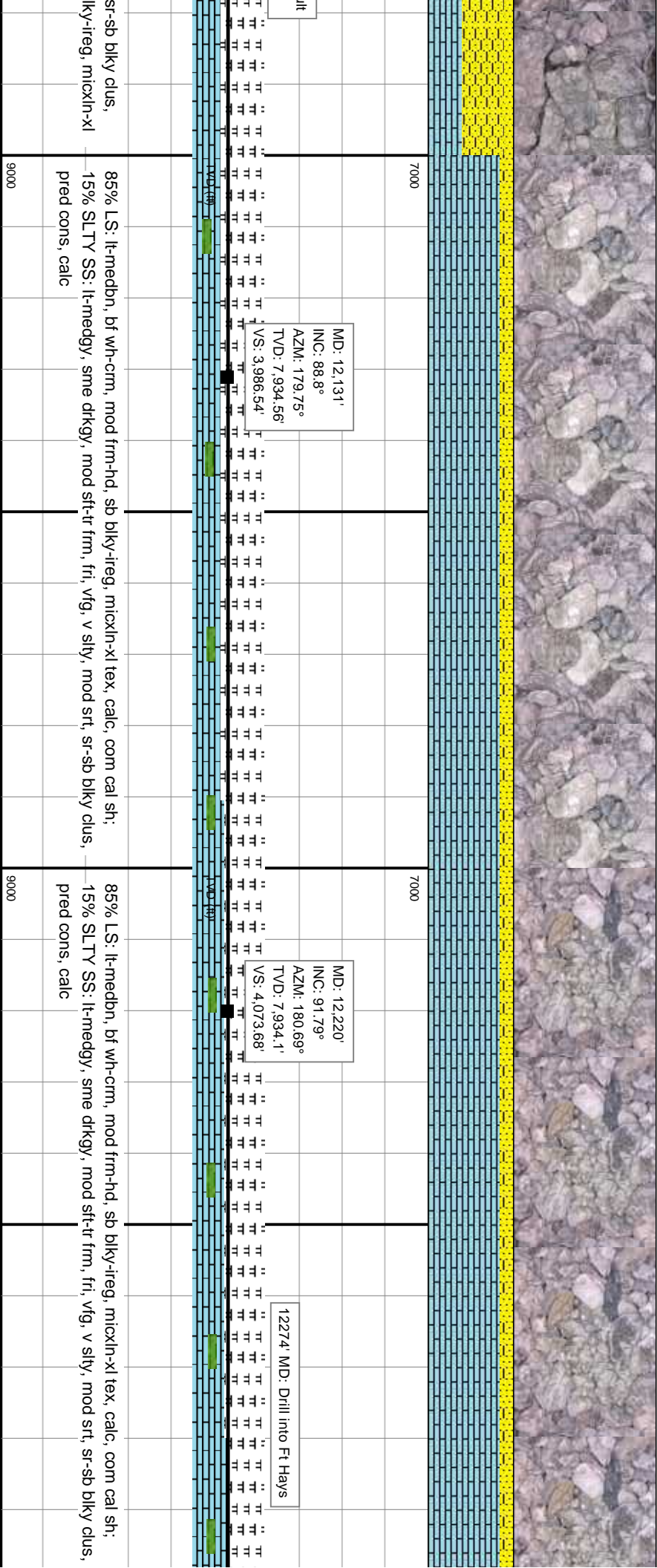
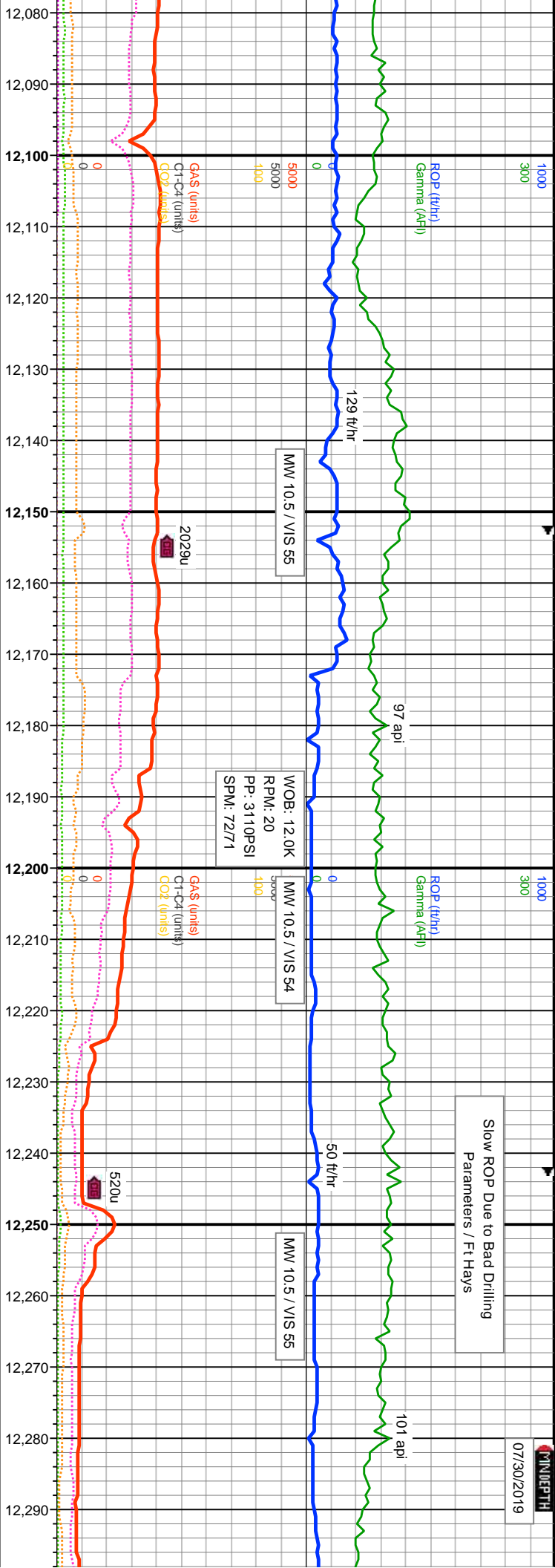


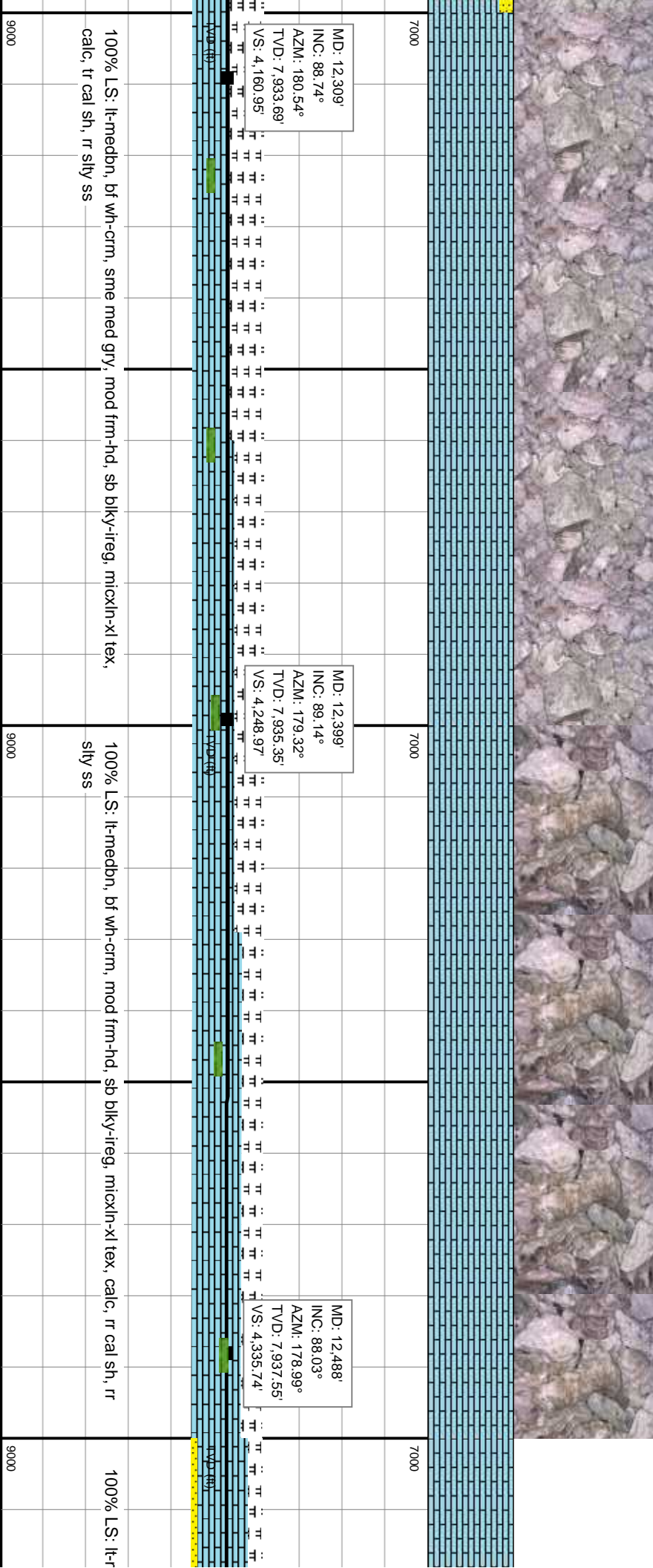
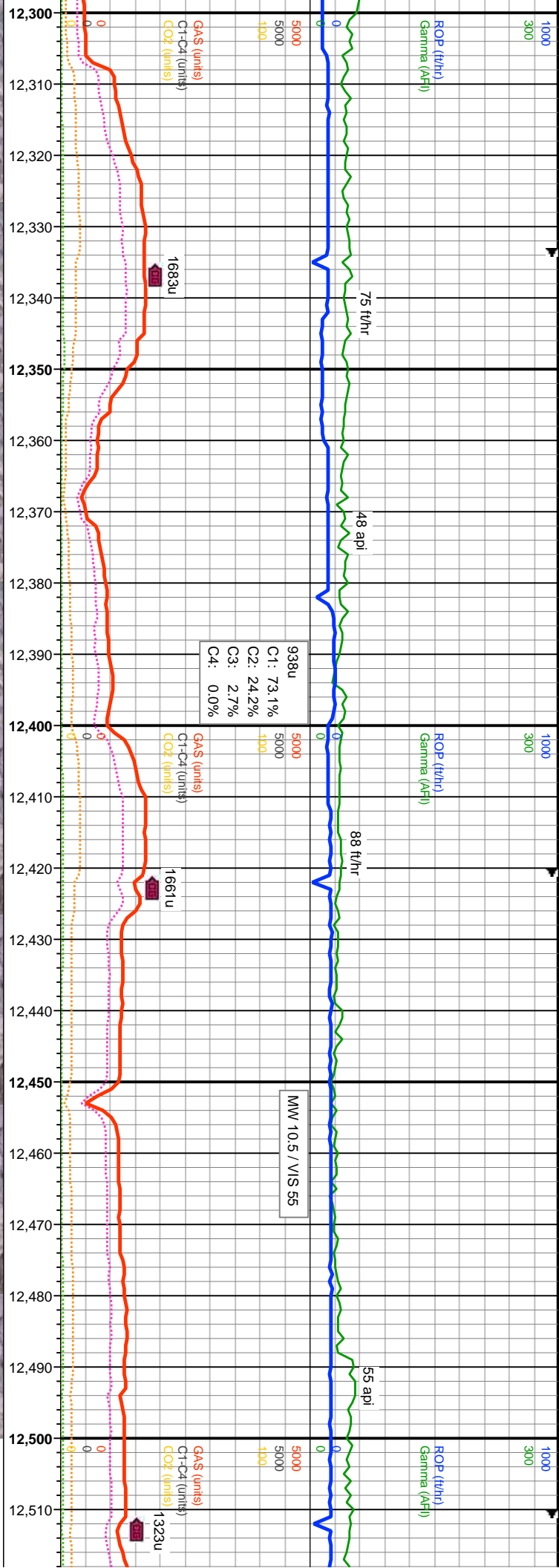




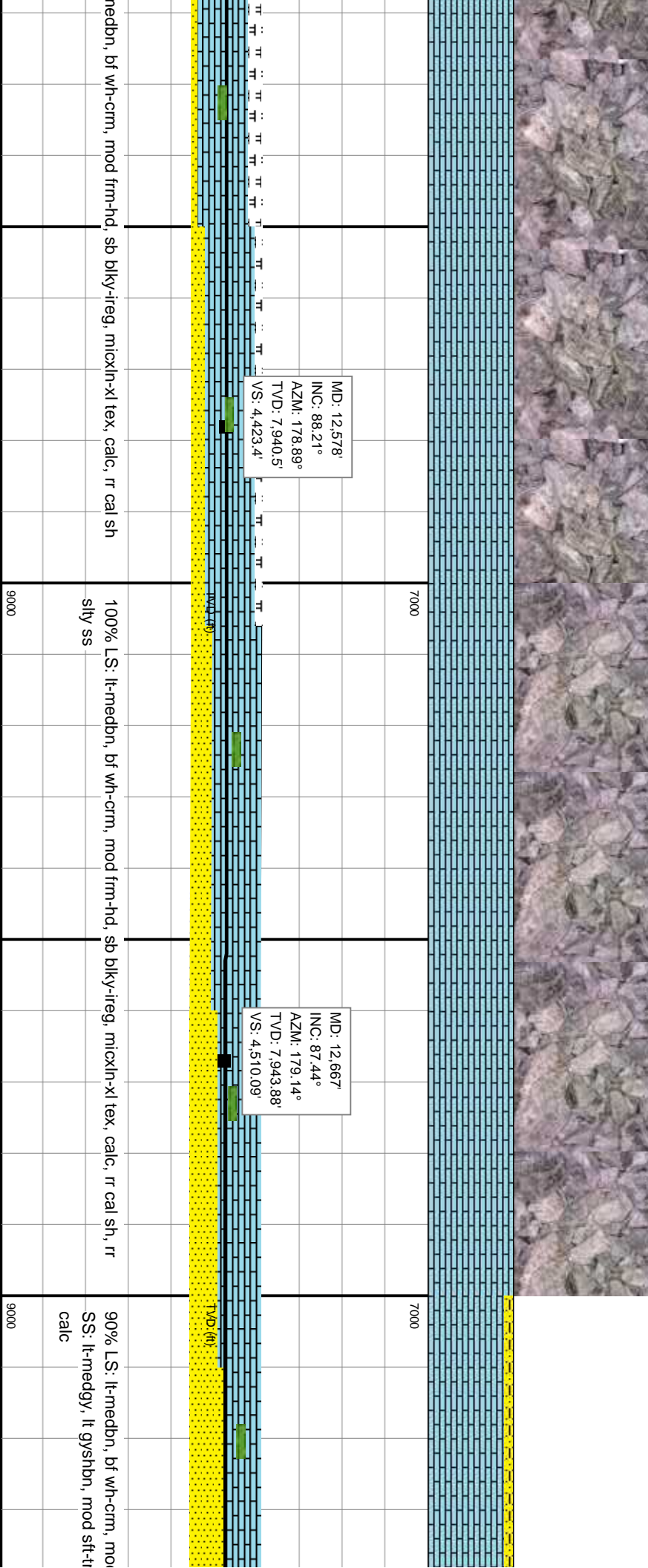
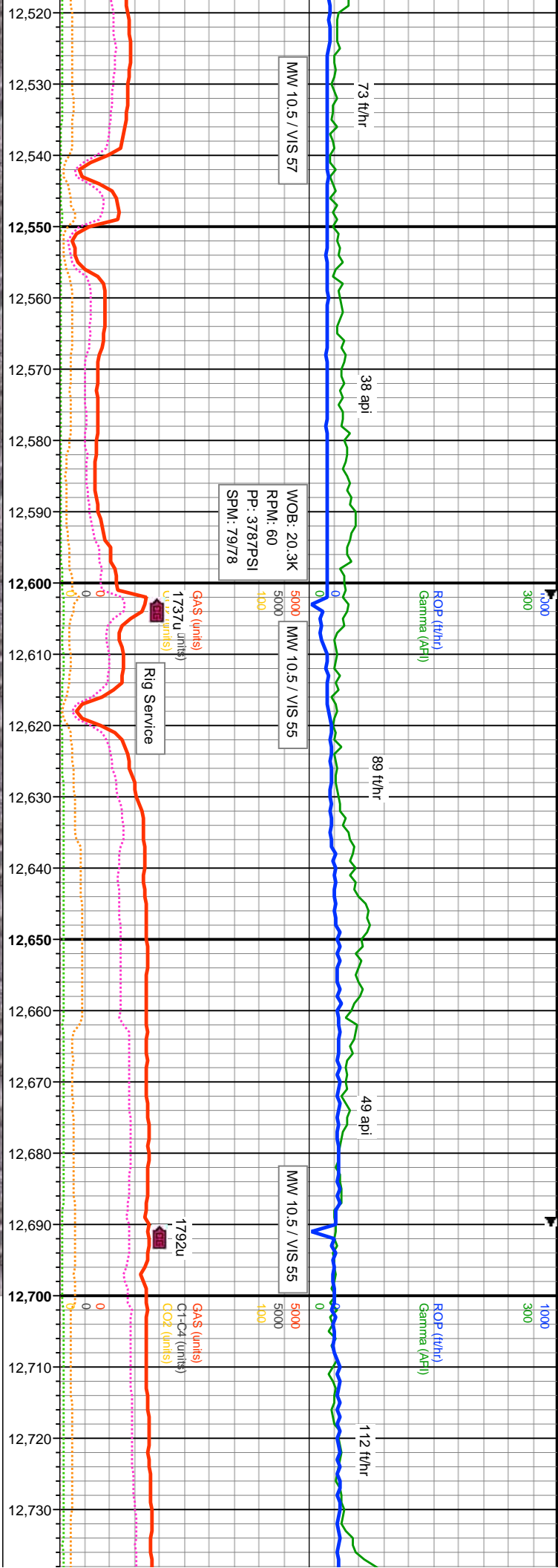


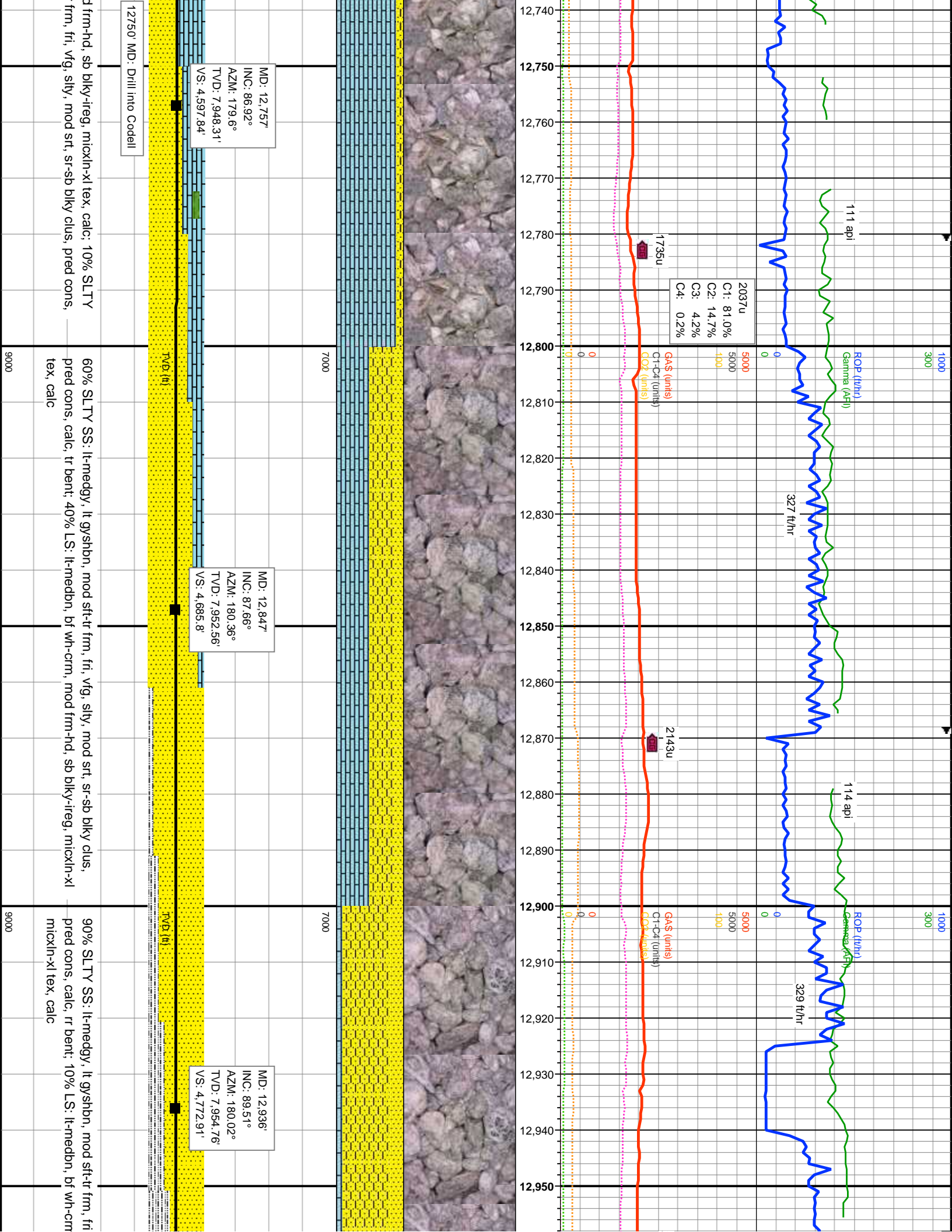
Slow ROP Due to Bad Drilling  
Parameters / Ft Hays



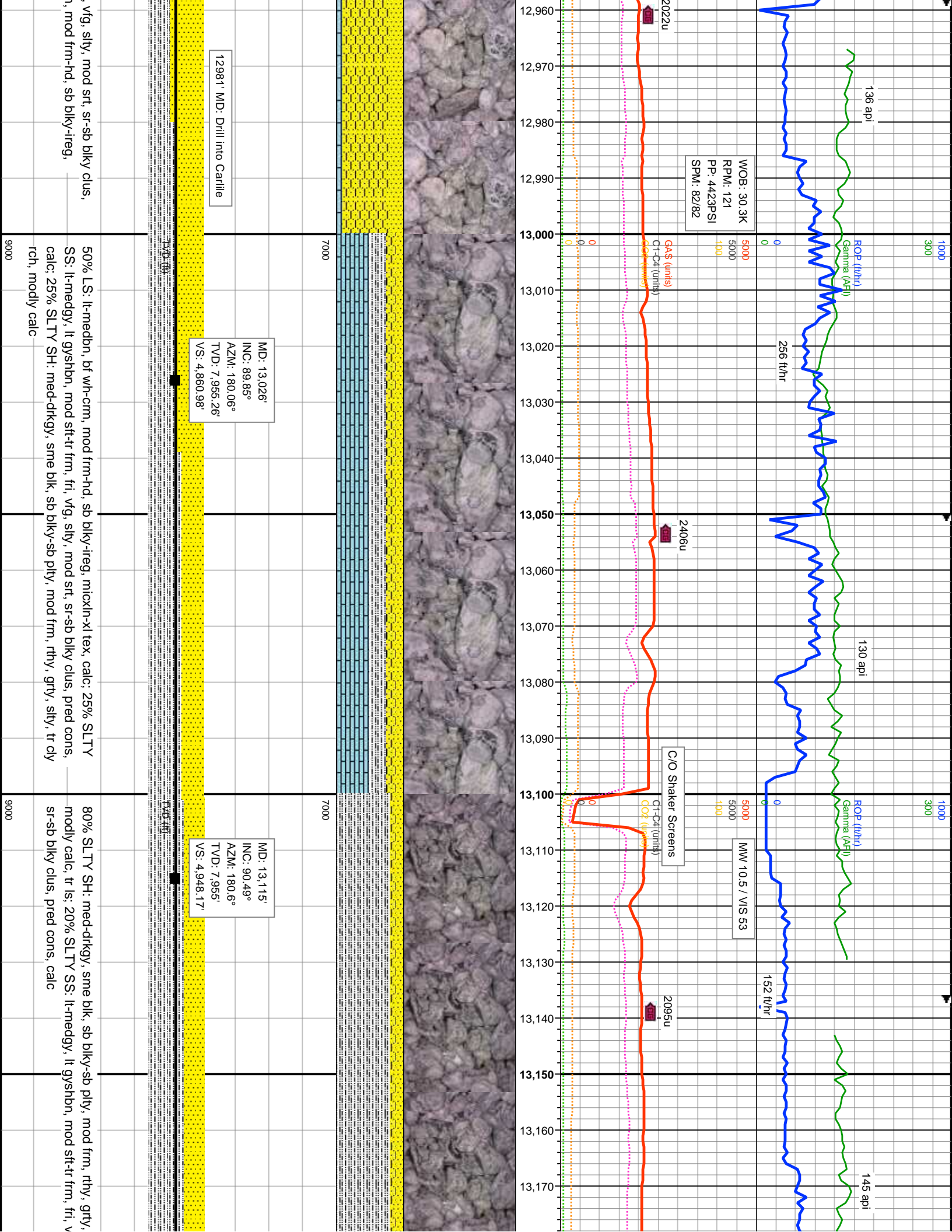


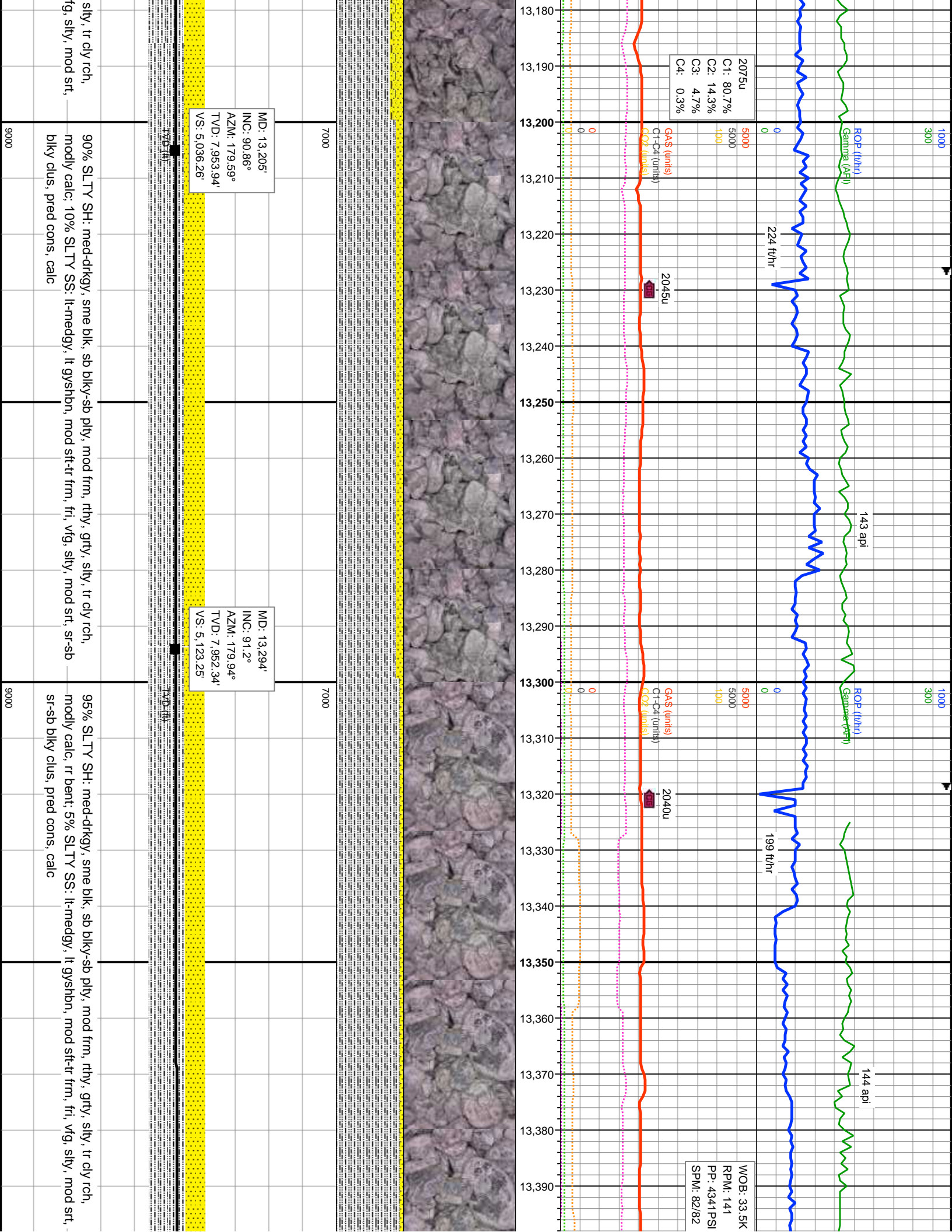




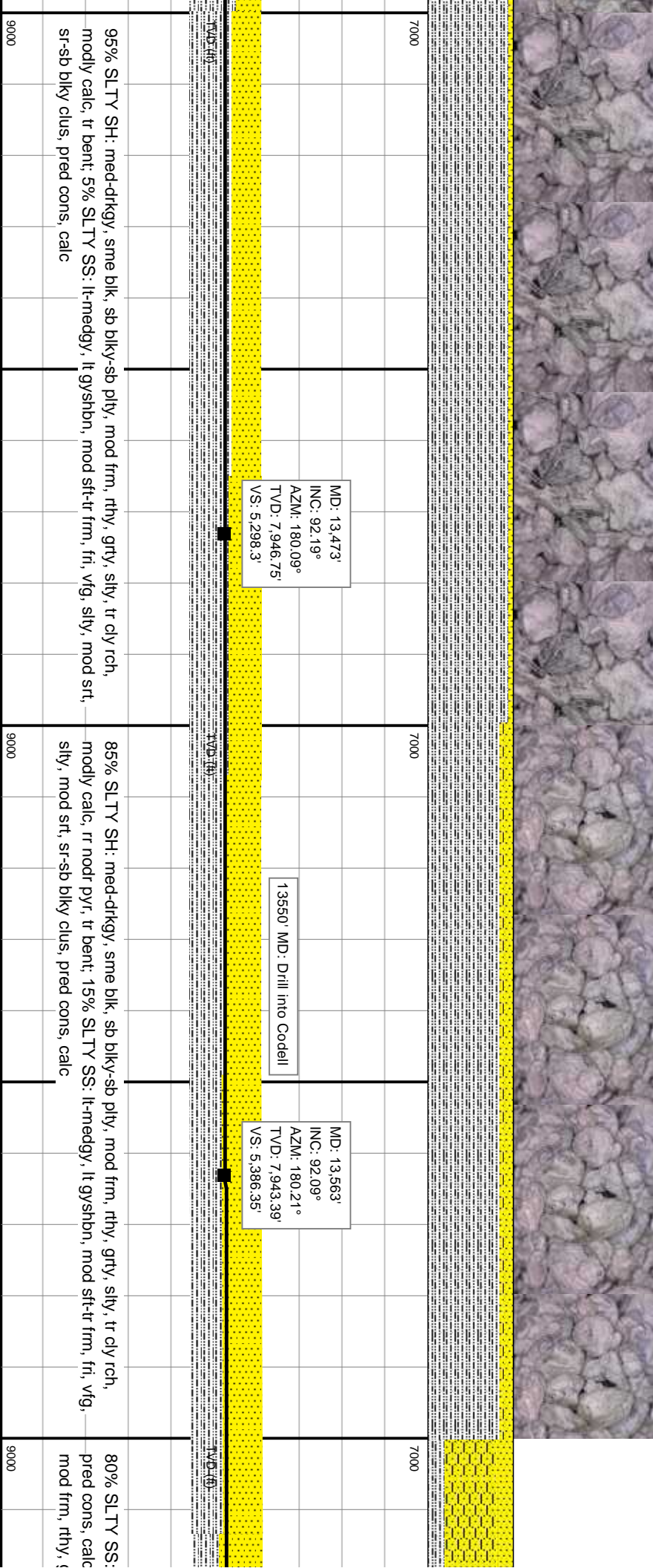
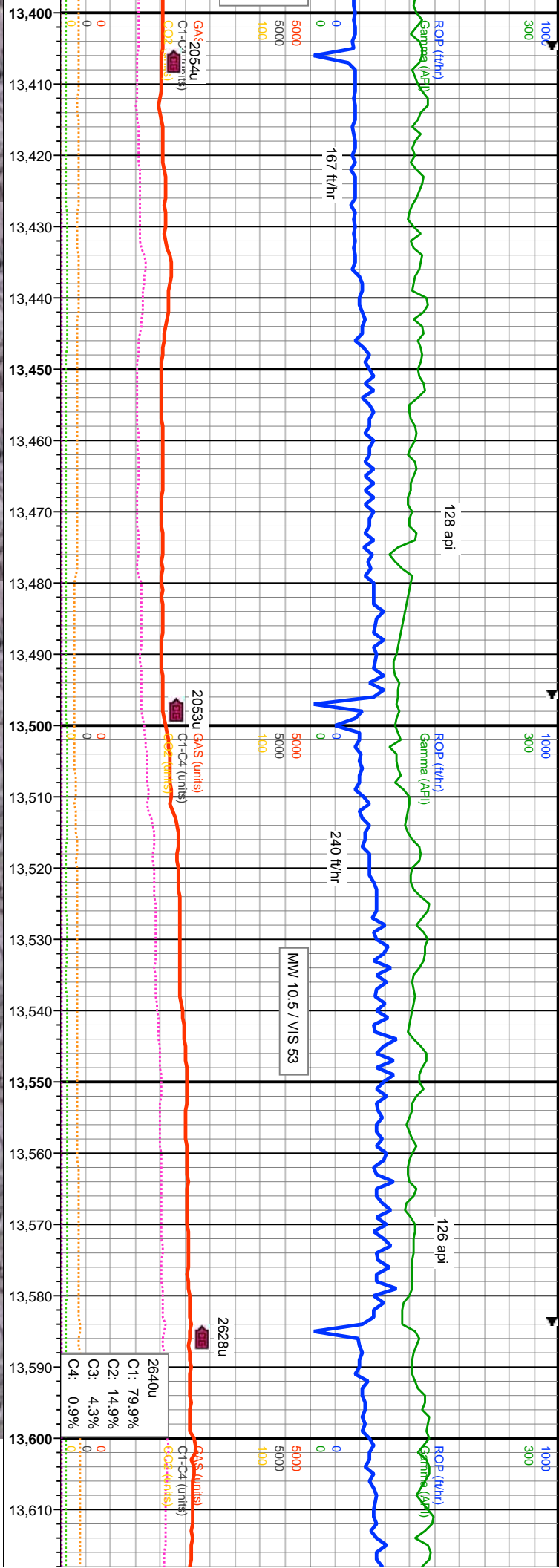


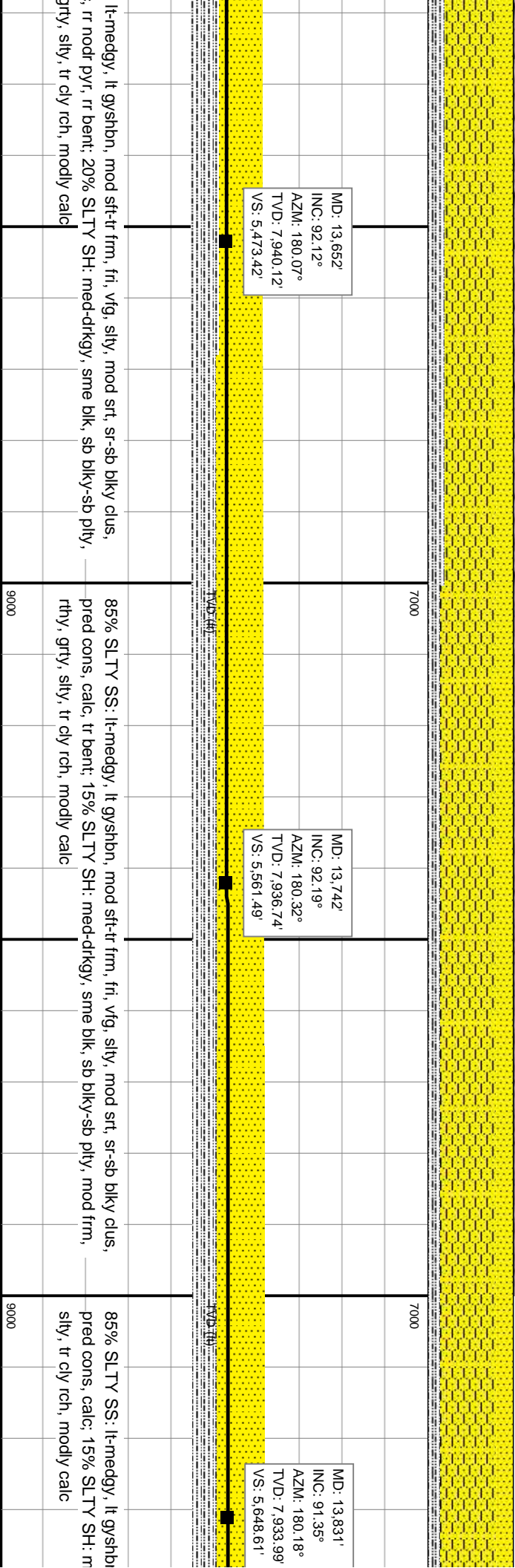
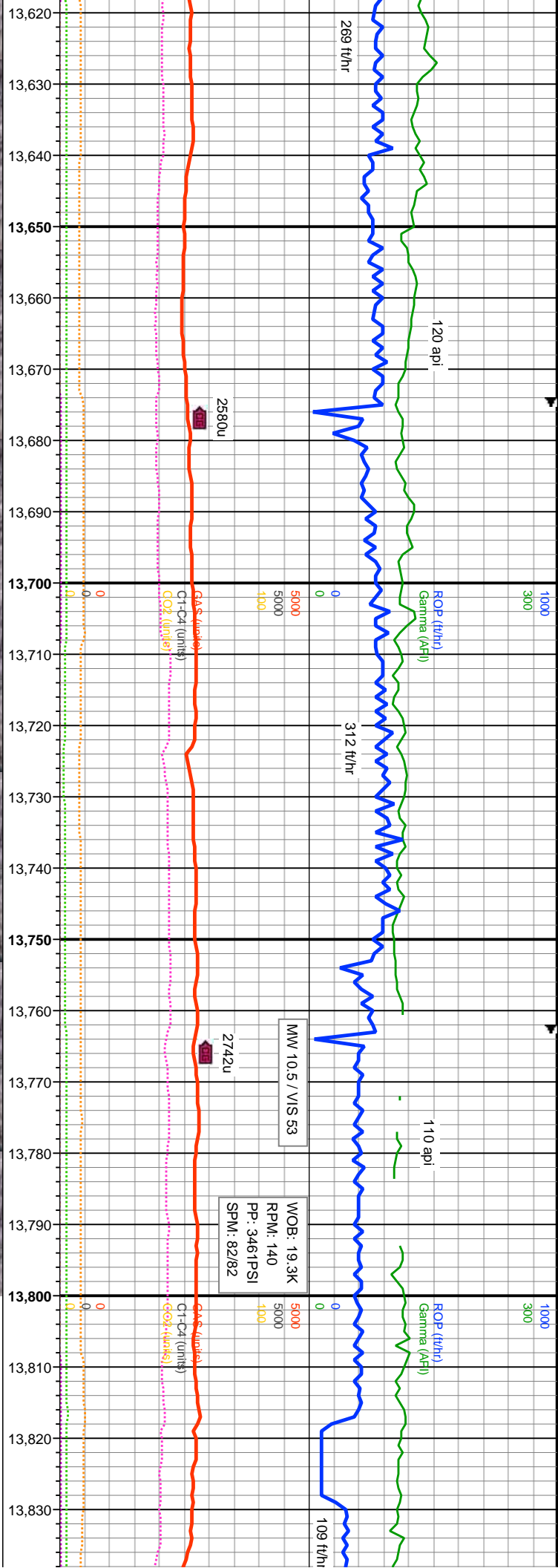




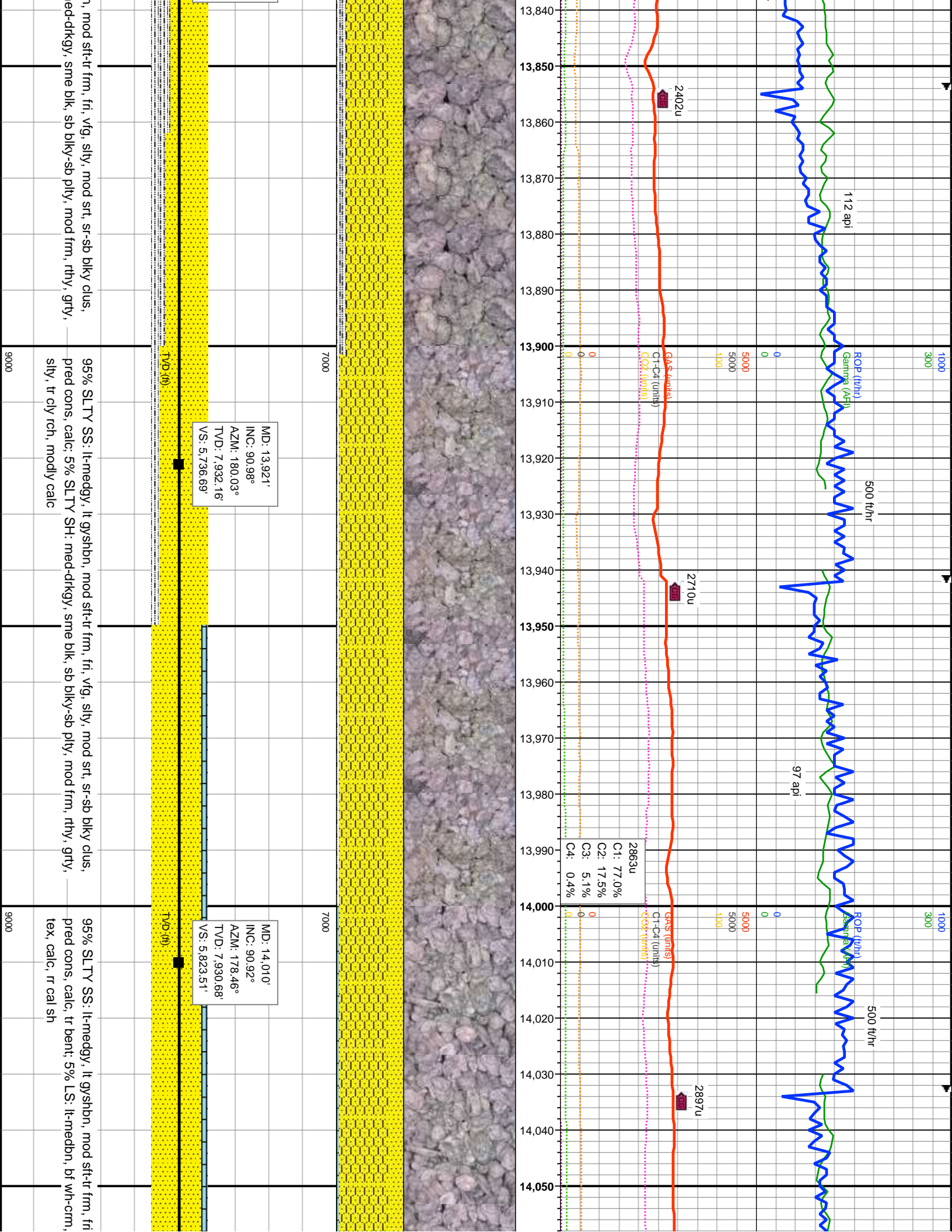






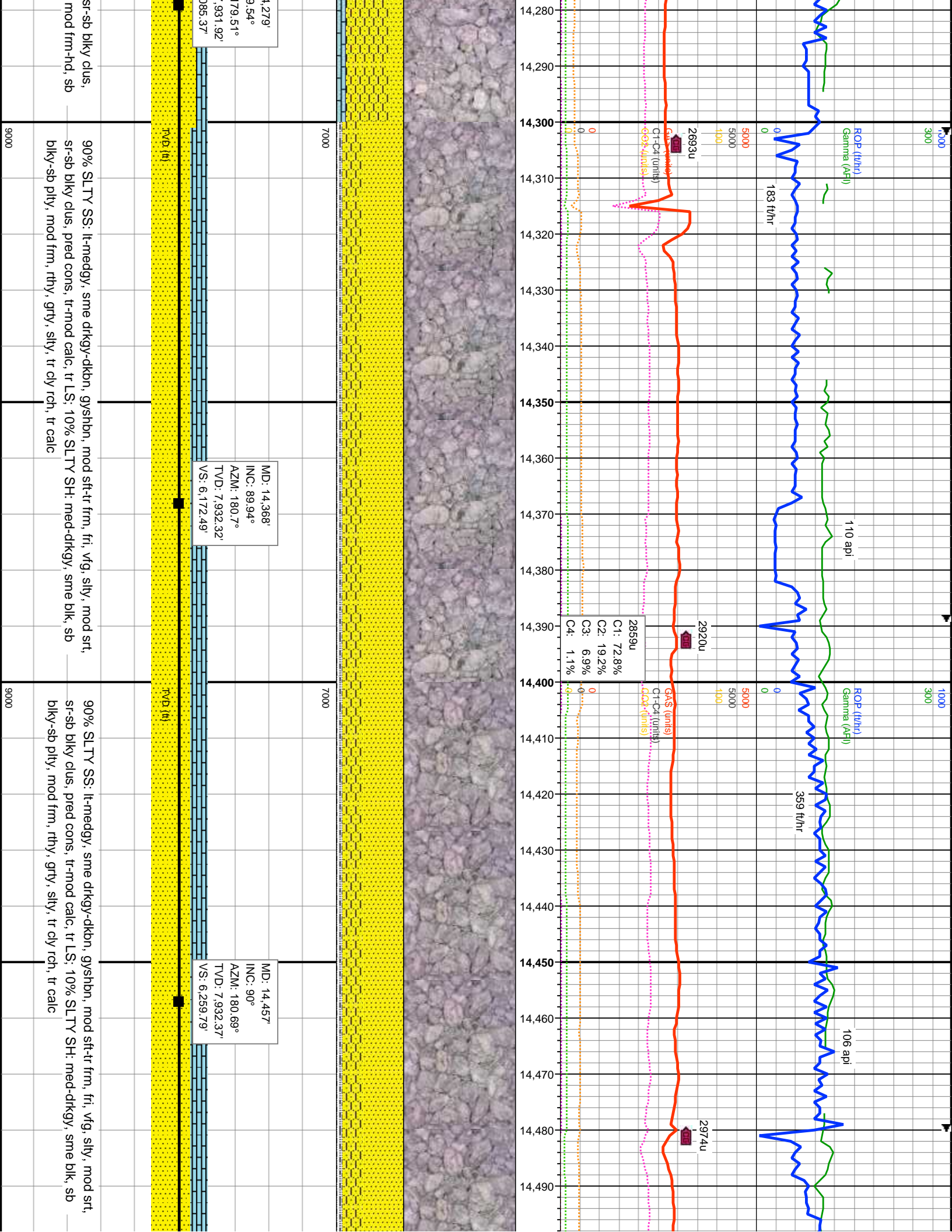


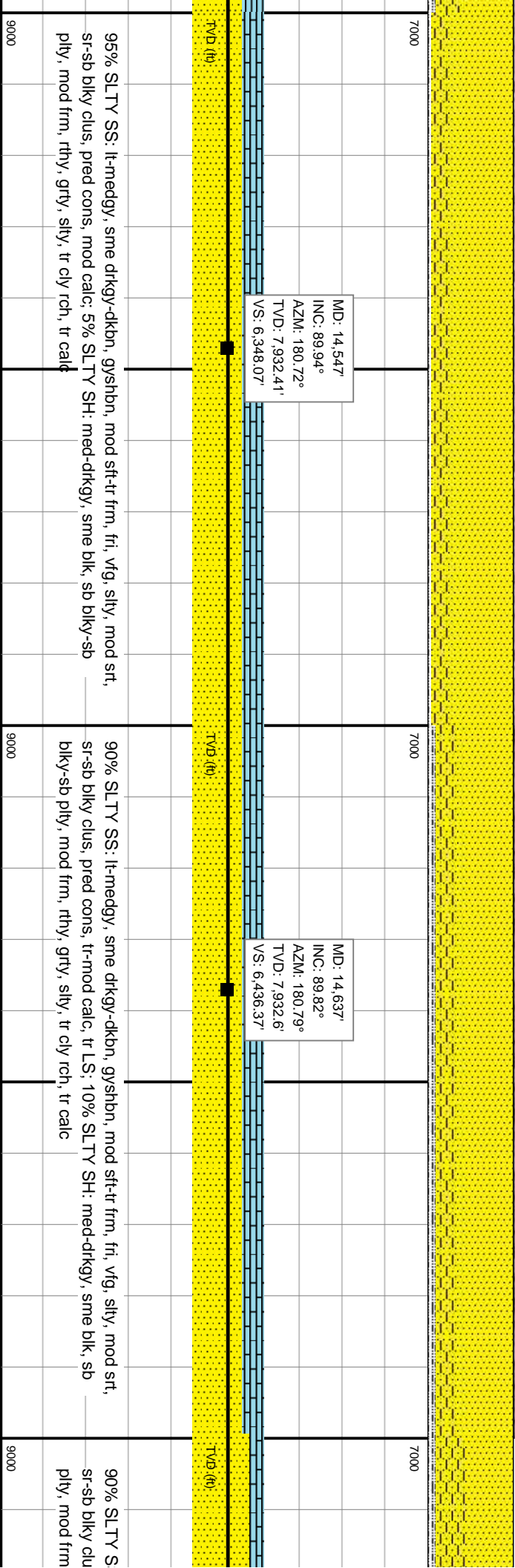
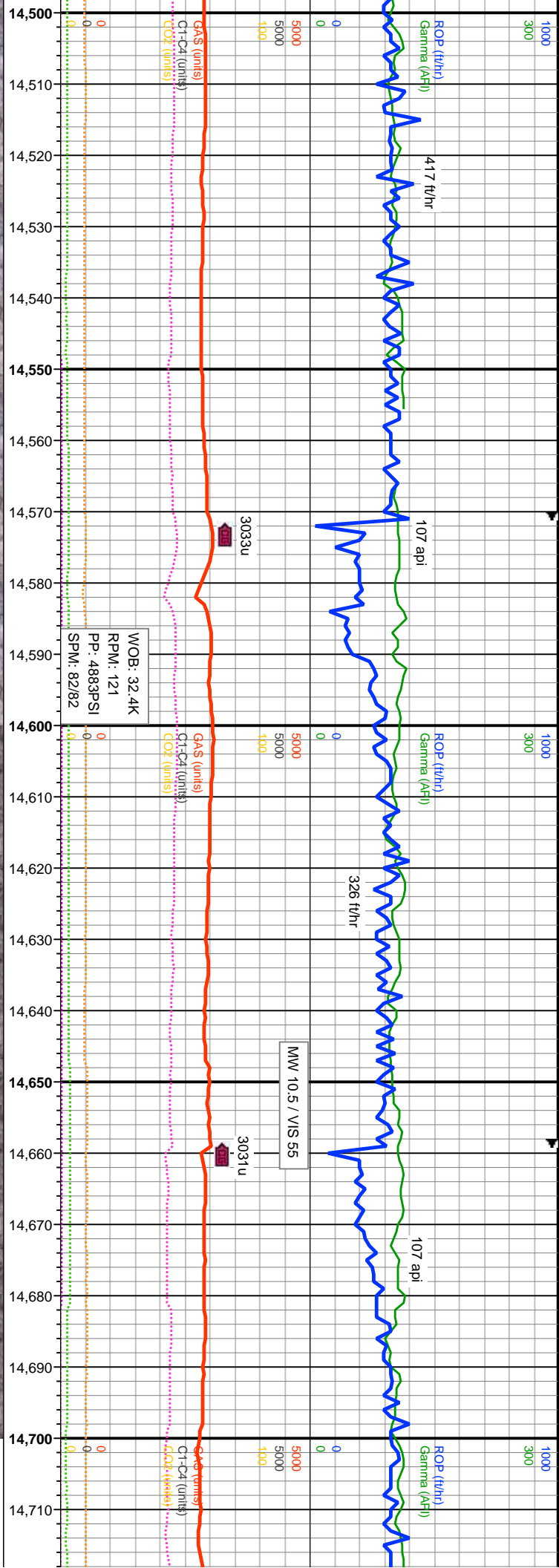




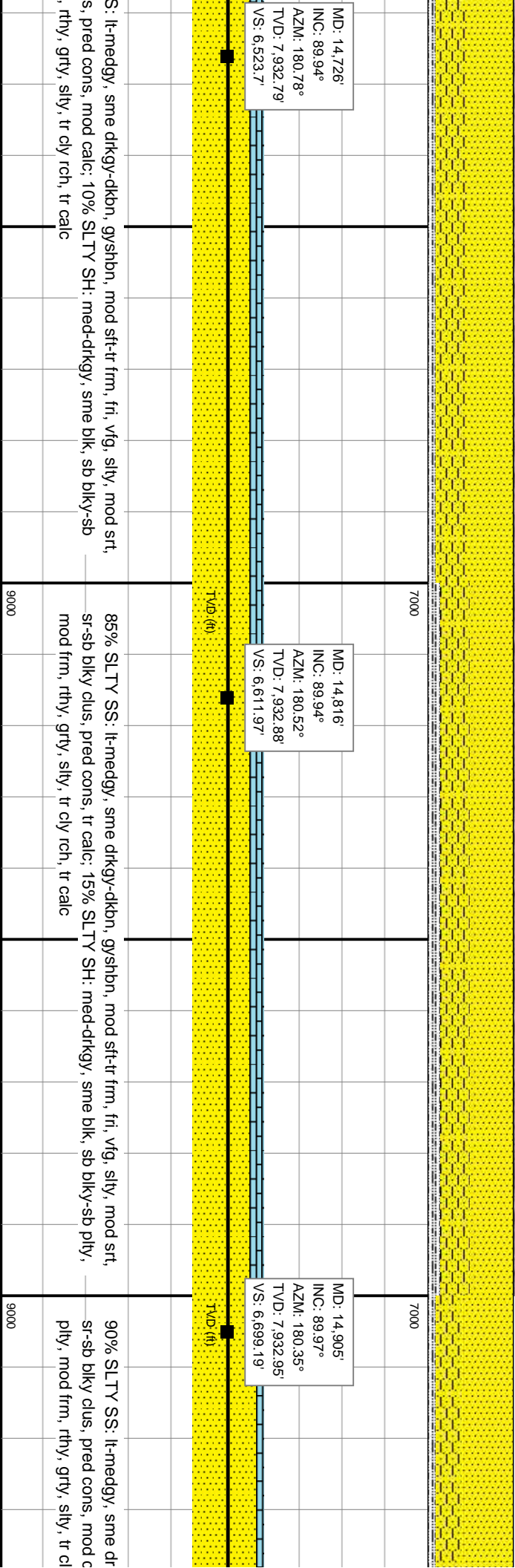
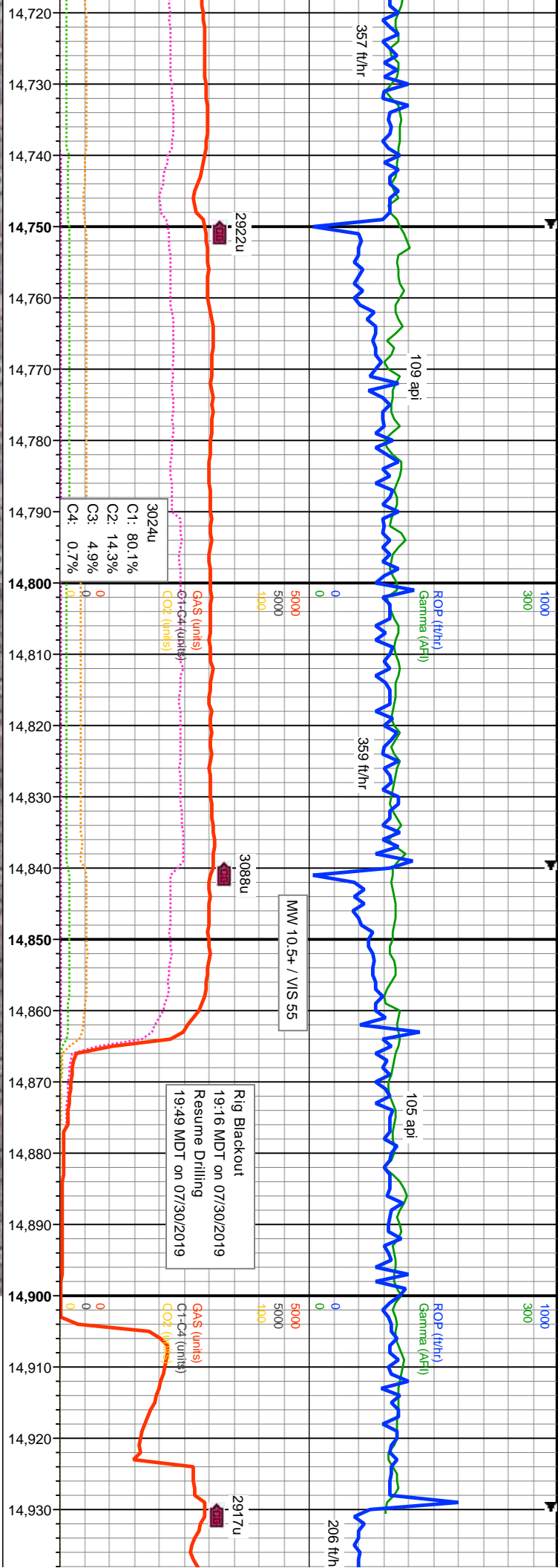


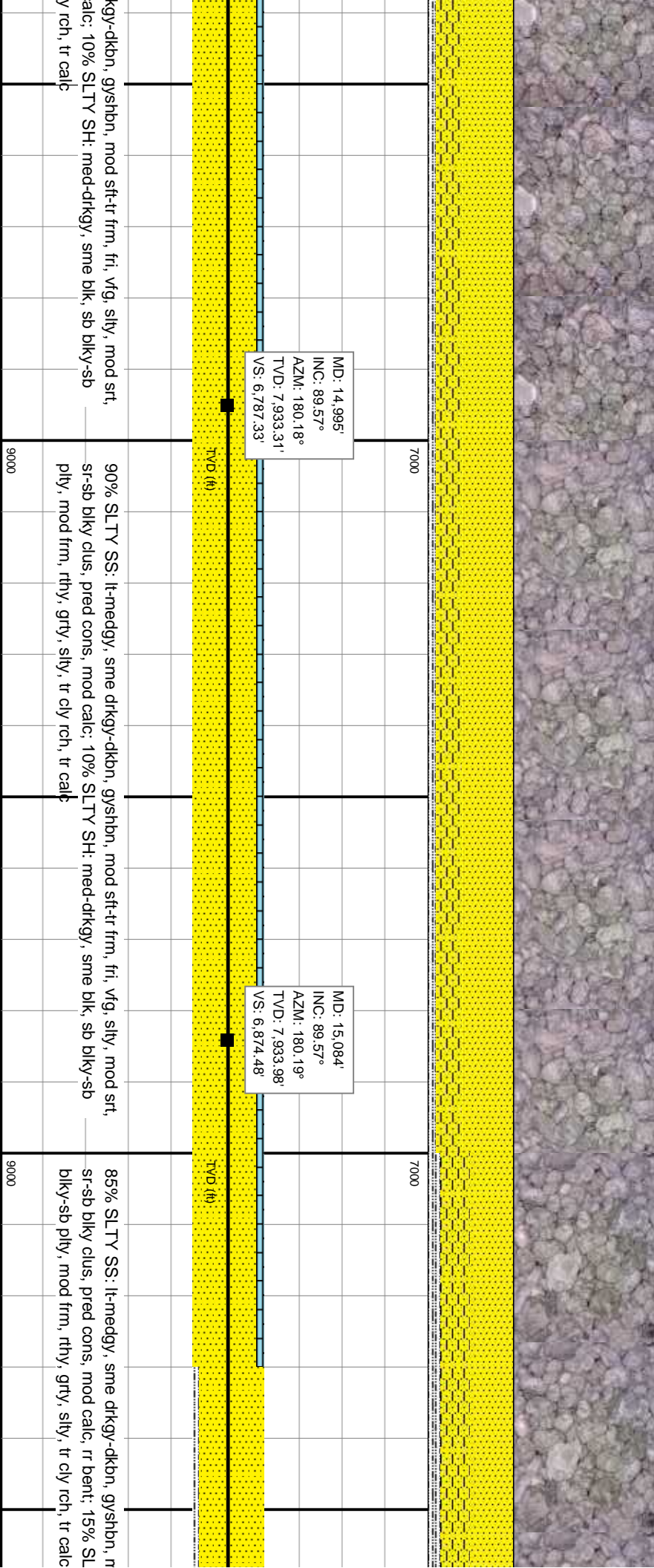
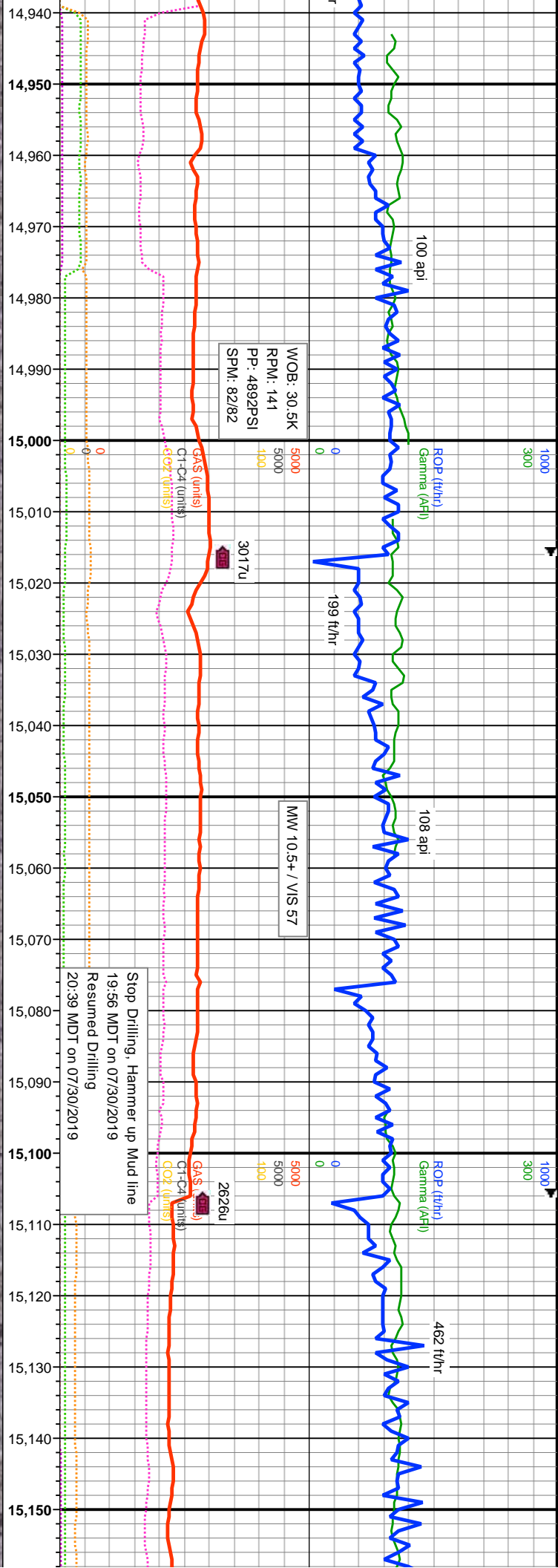




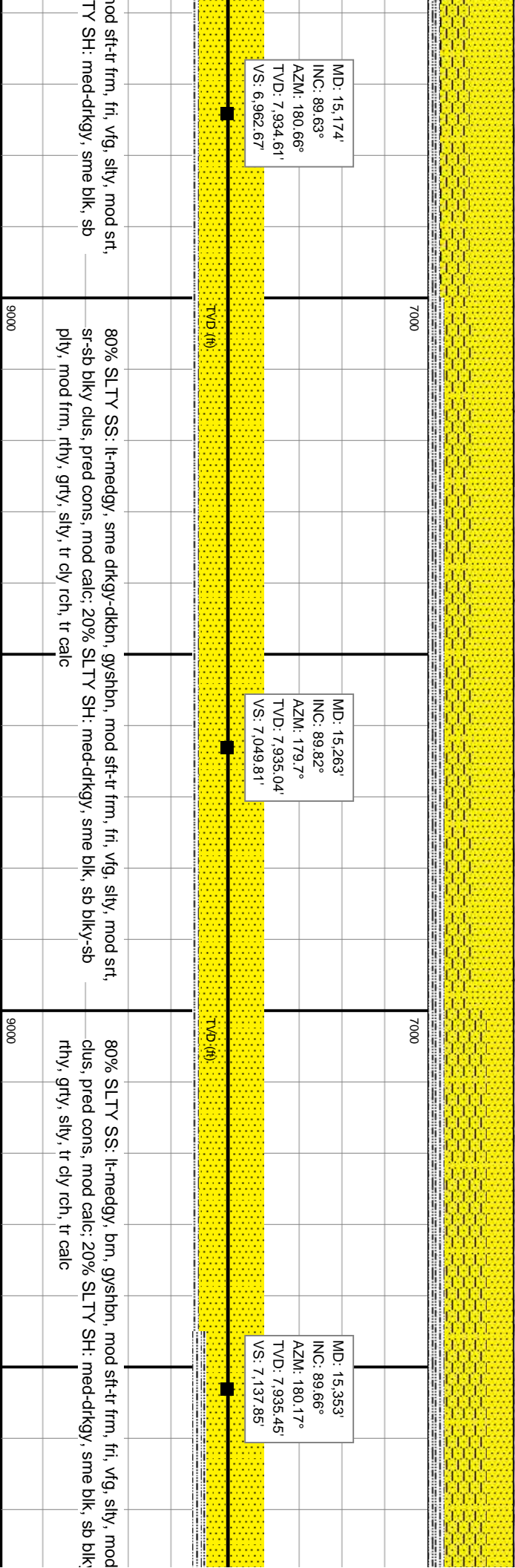
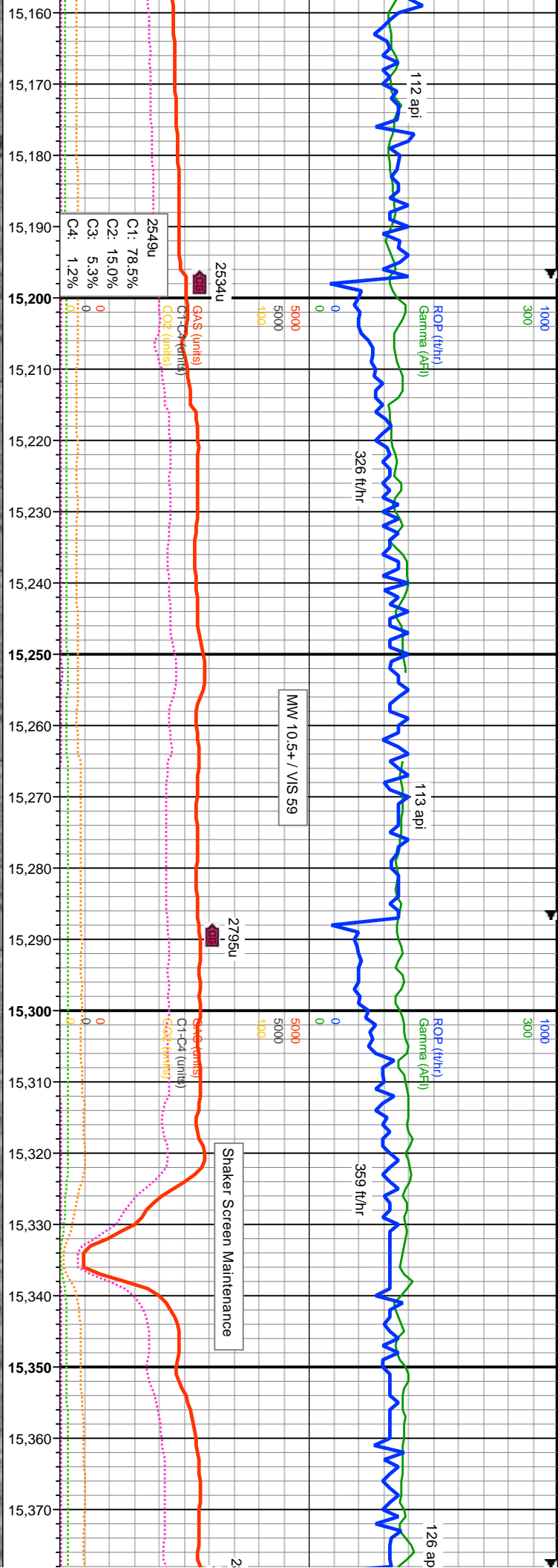


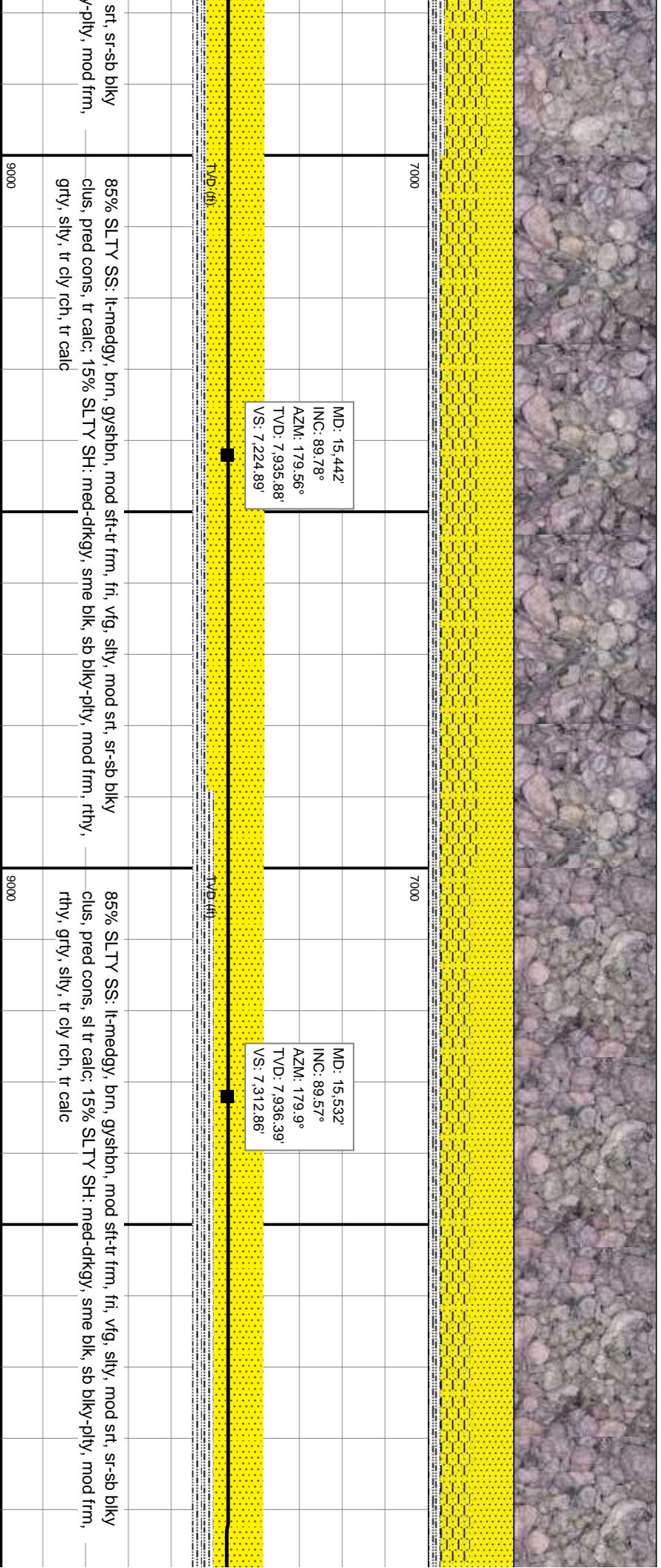
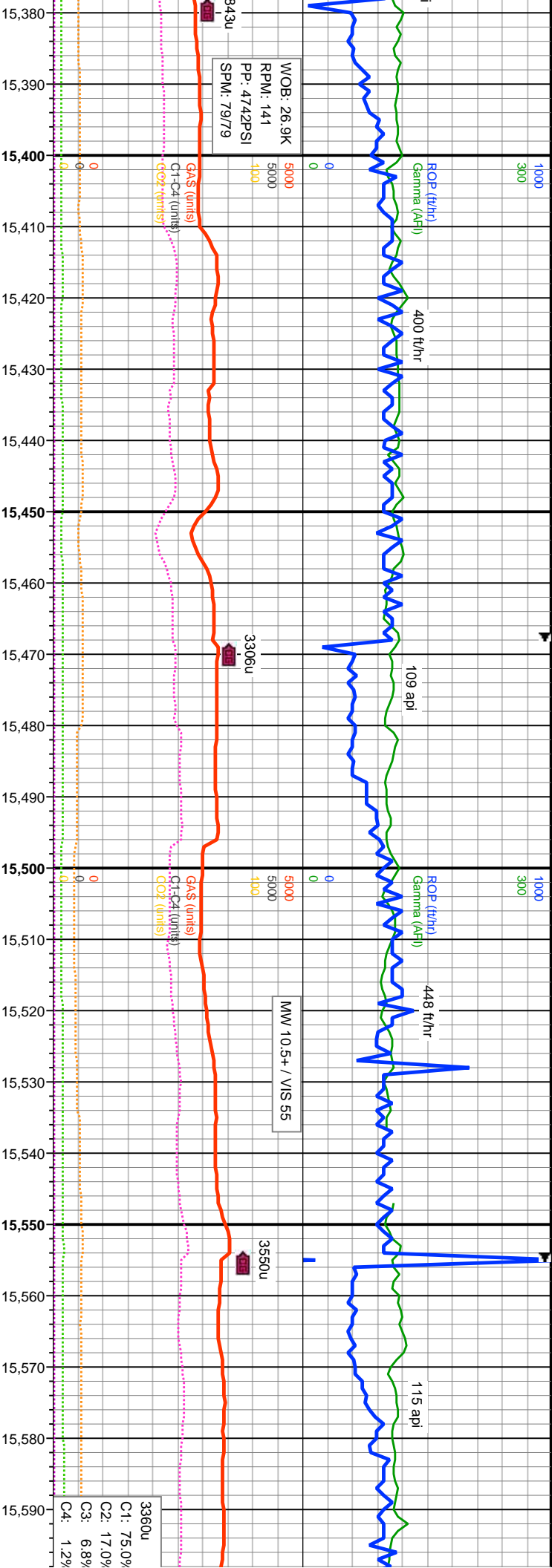




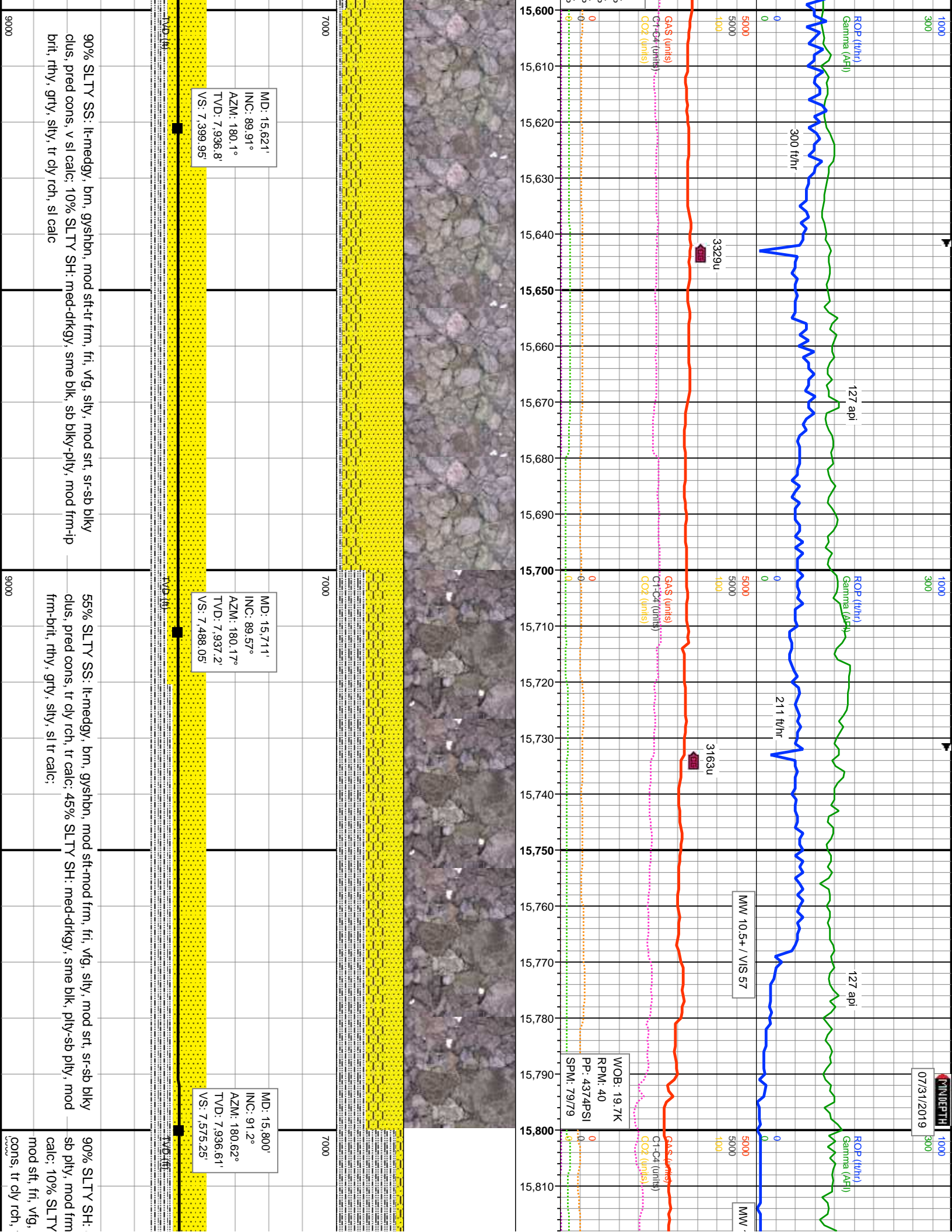


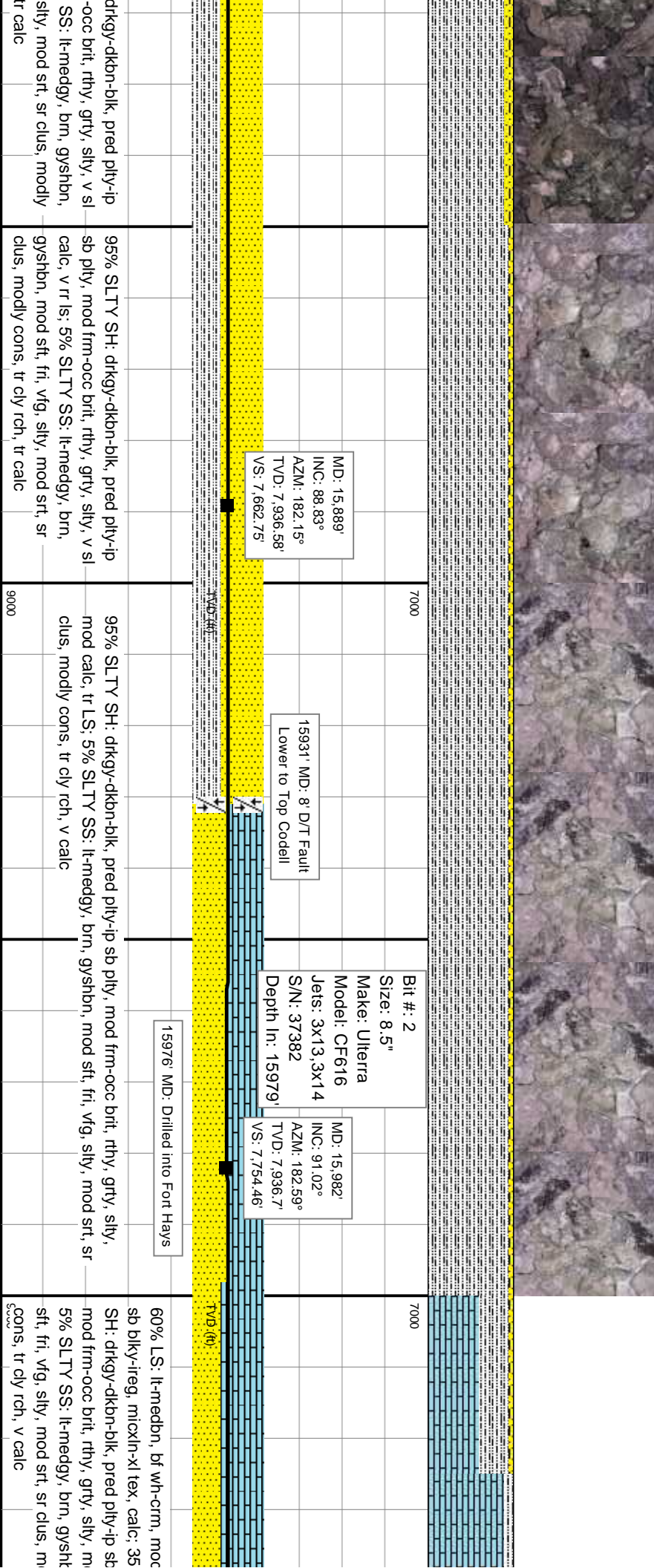
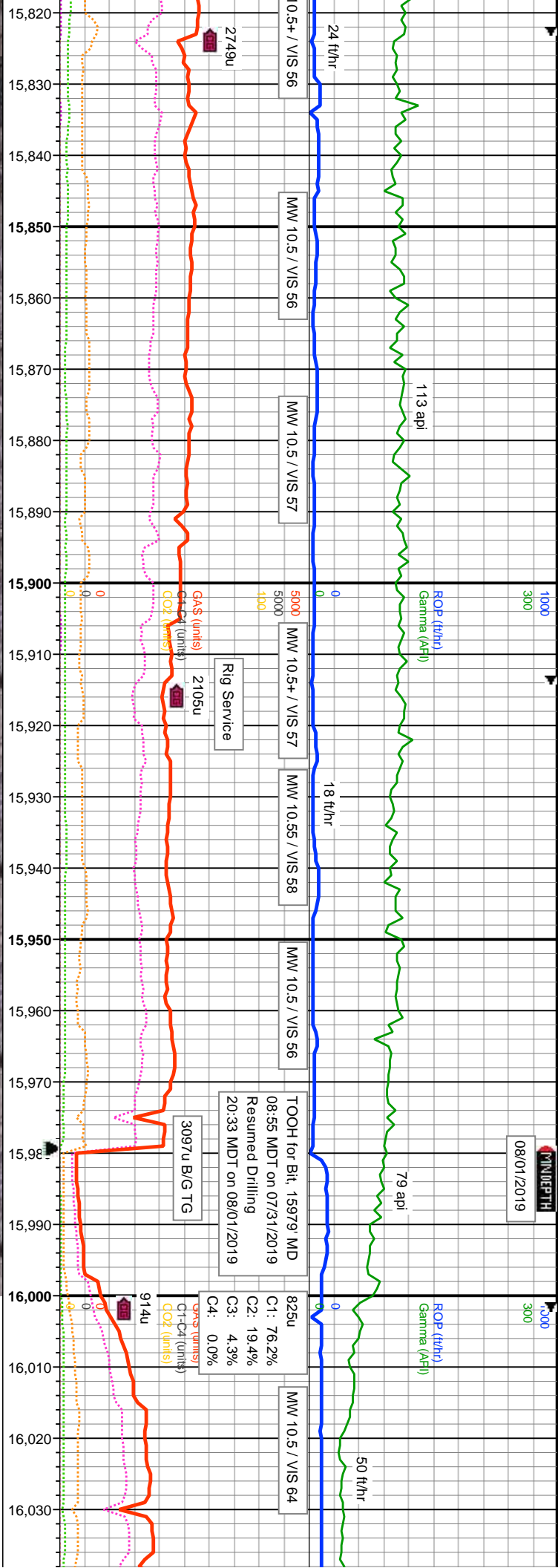




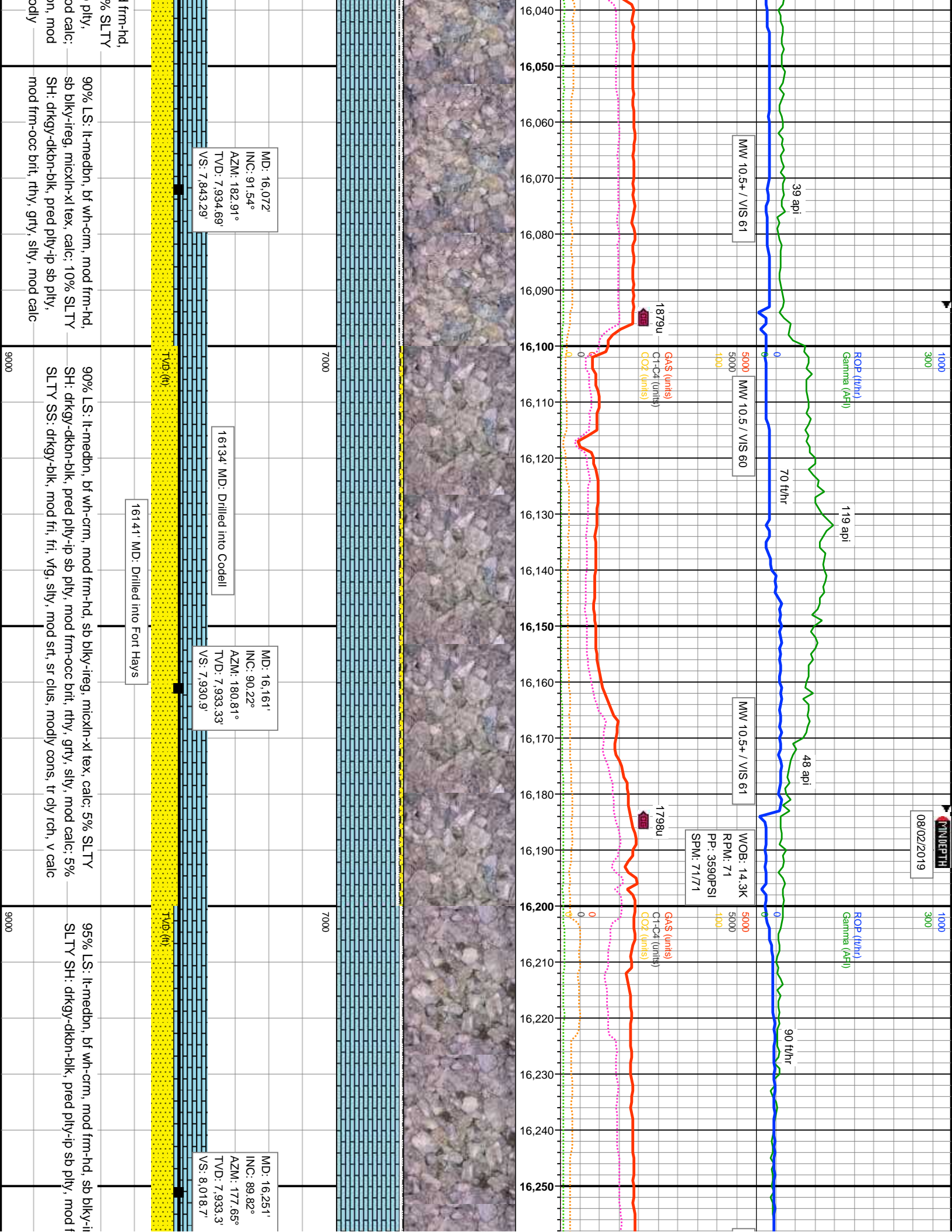


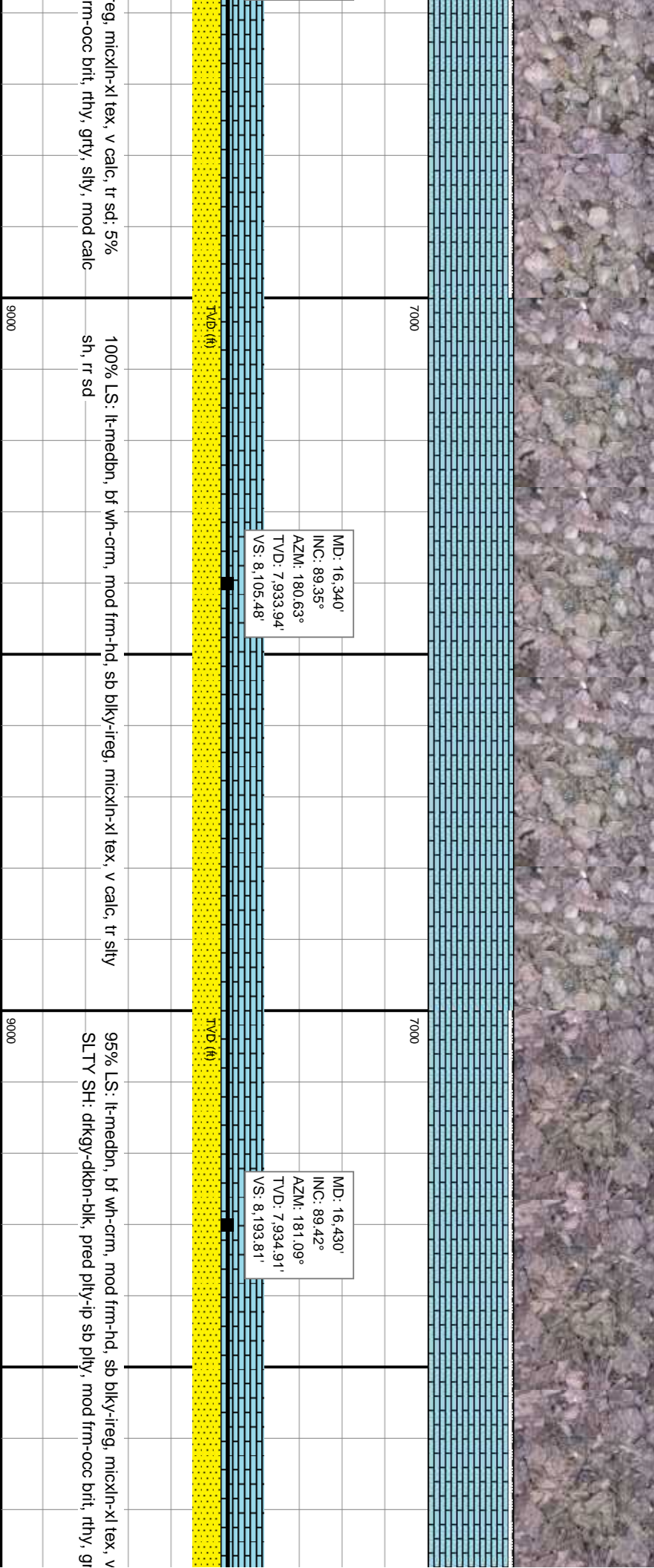
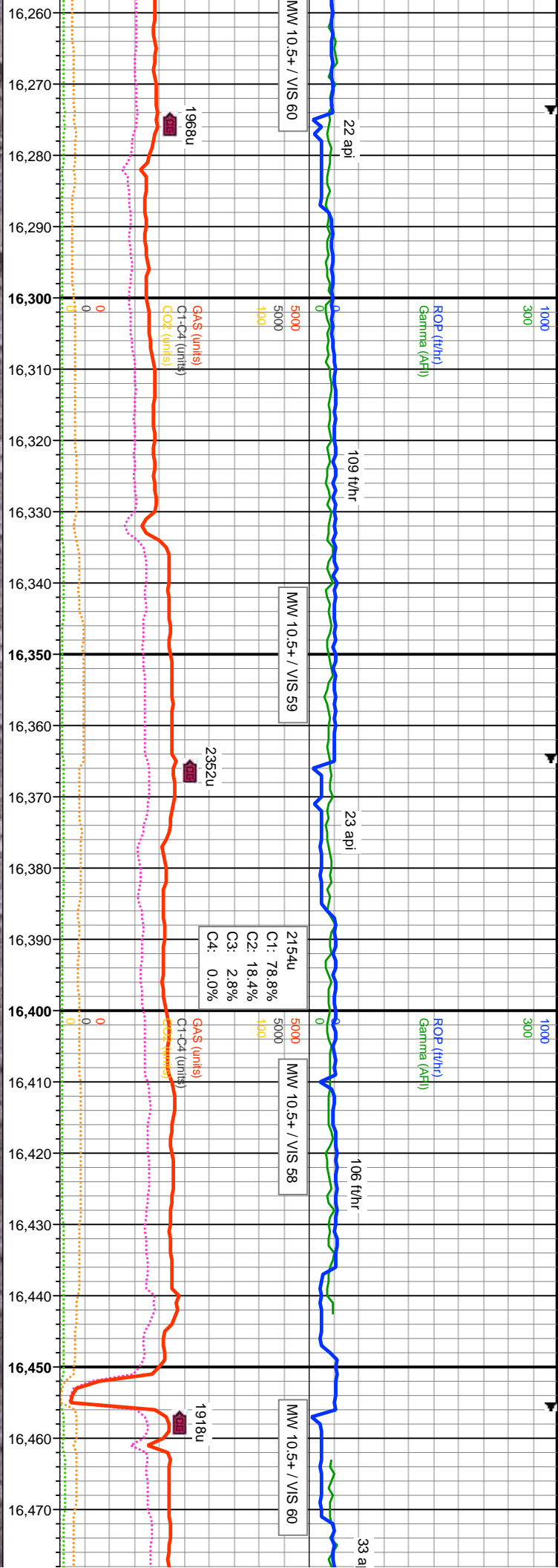




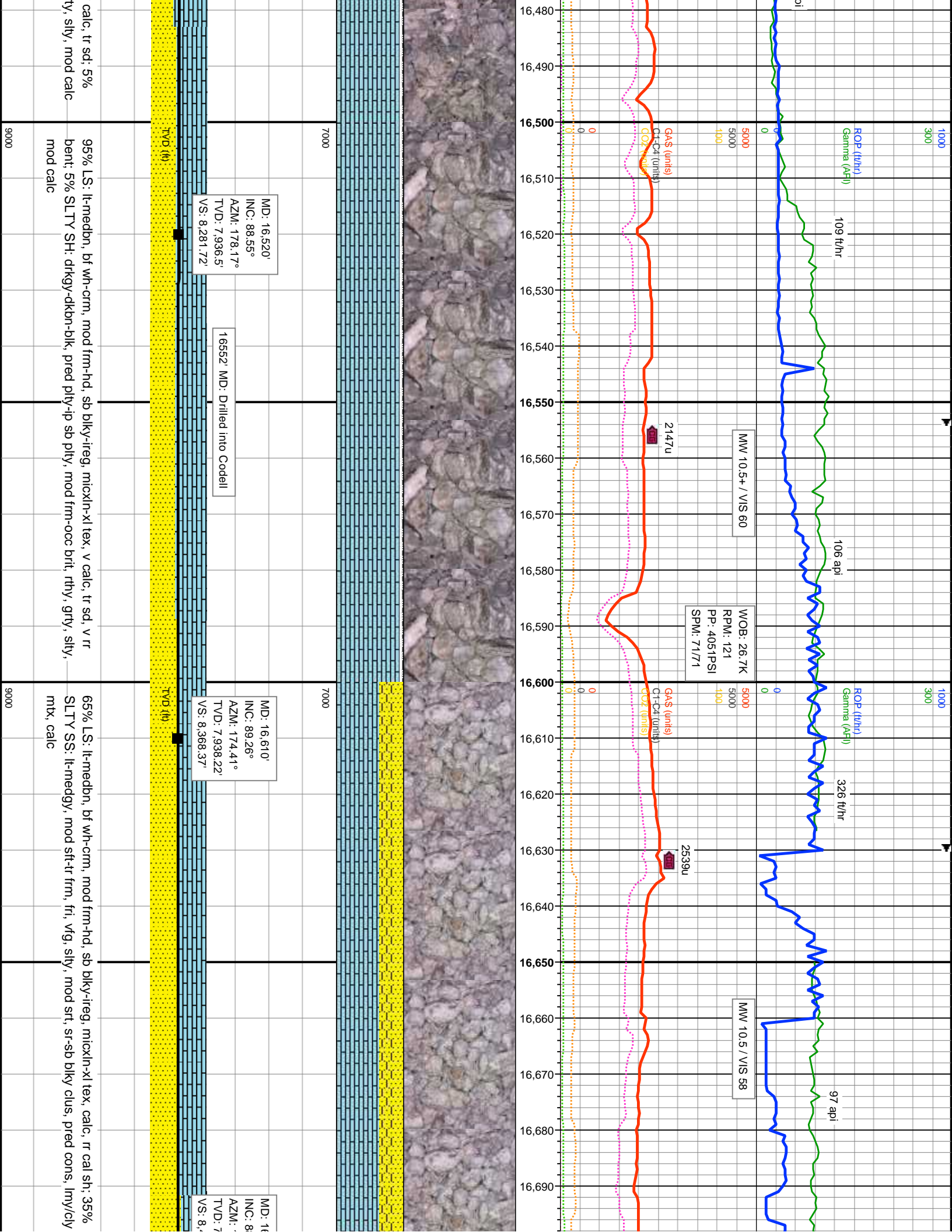


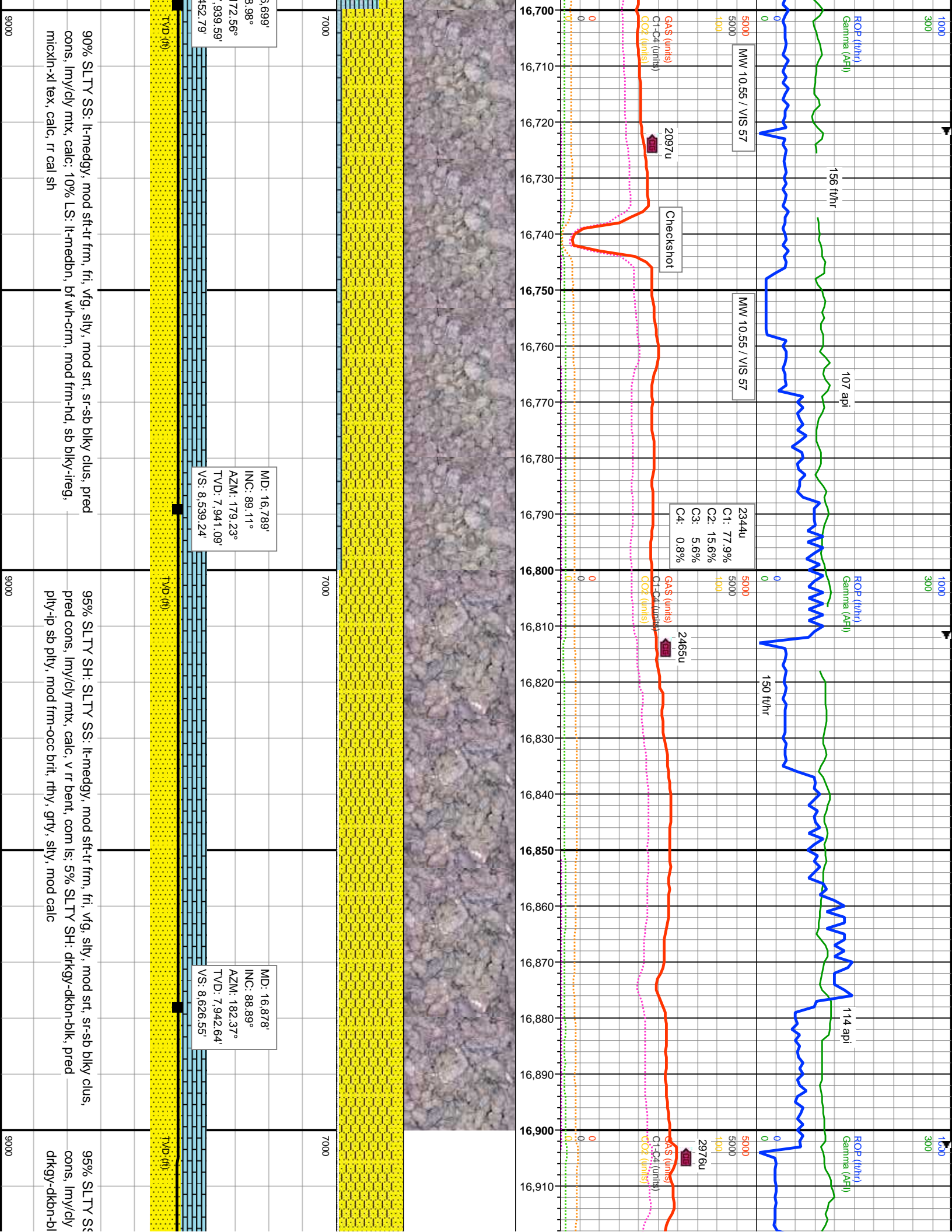




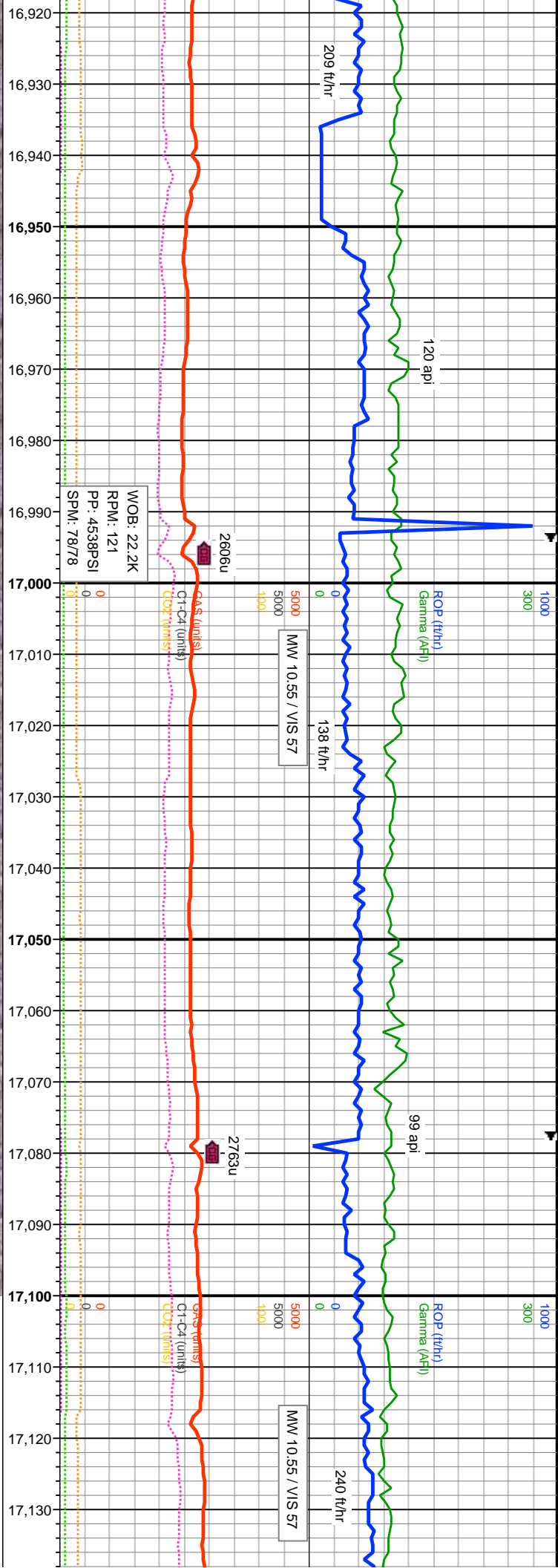




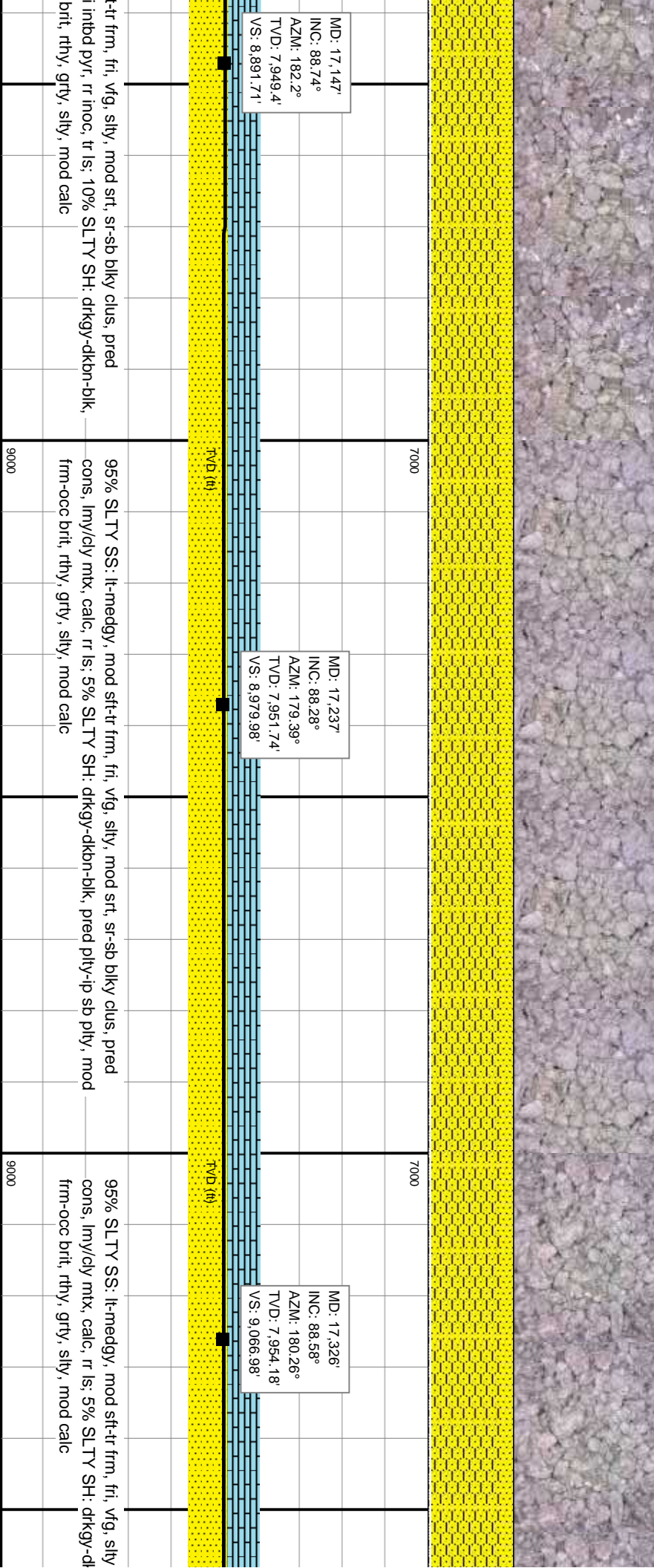
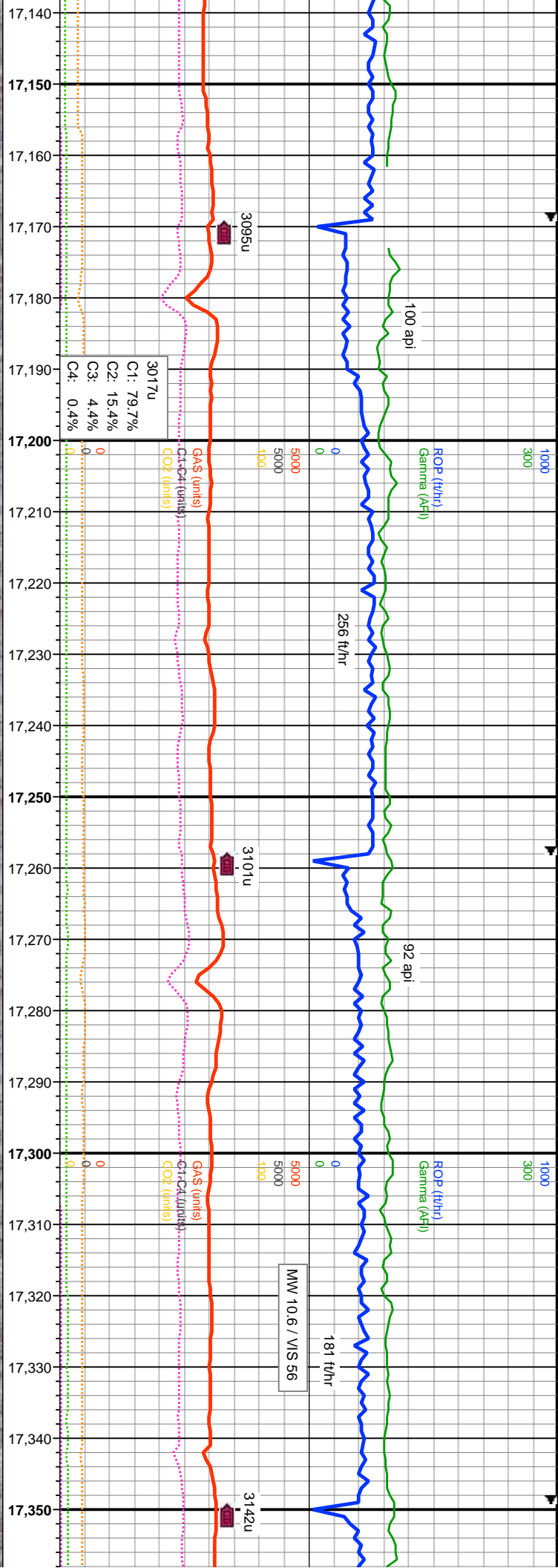




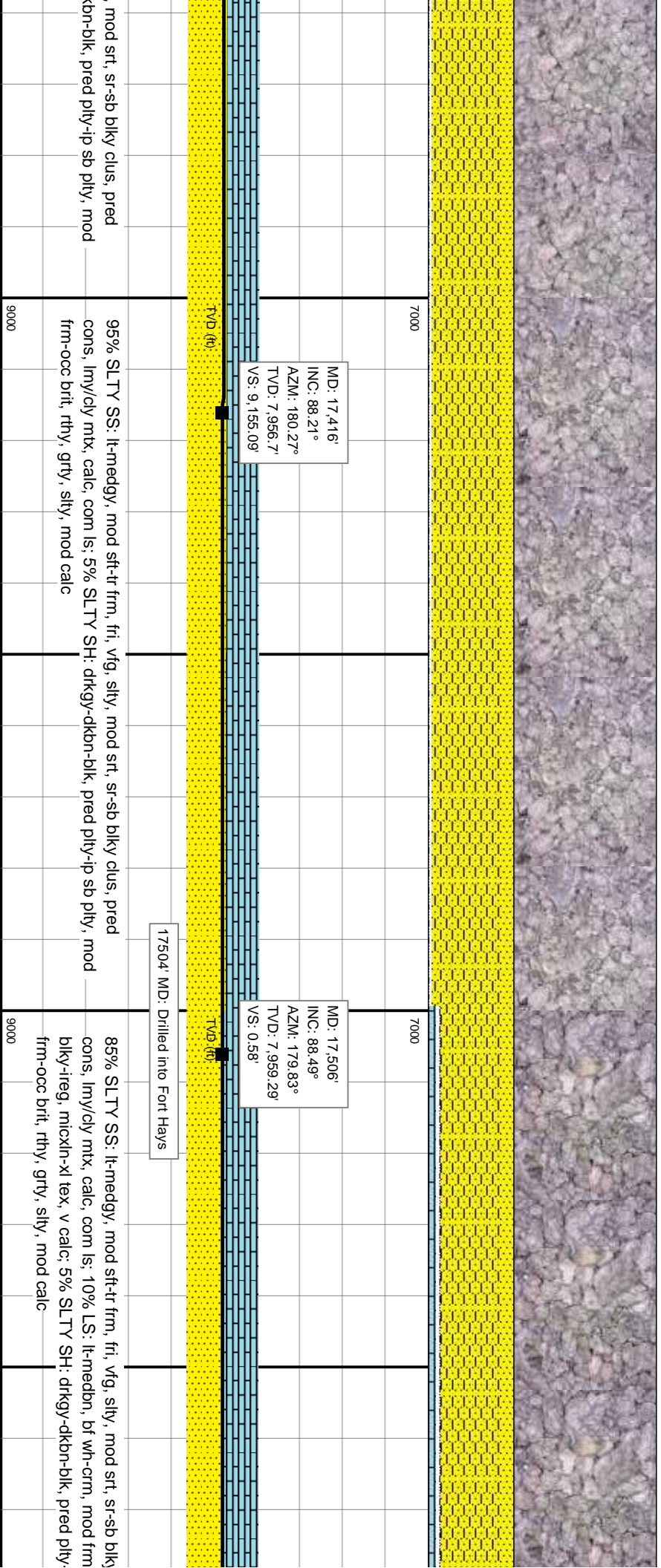
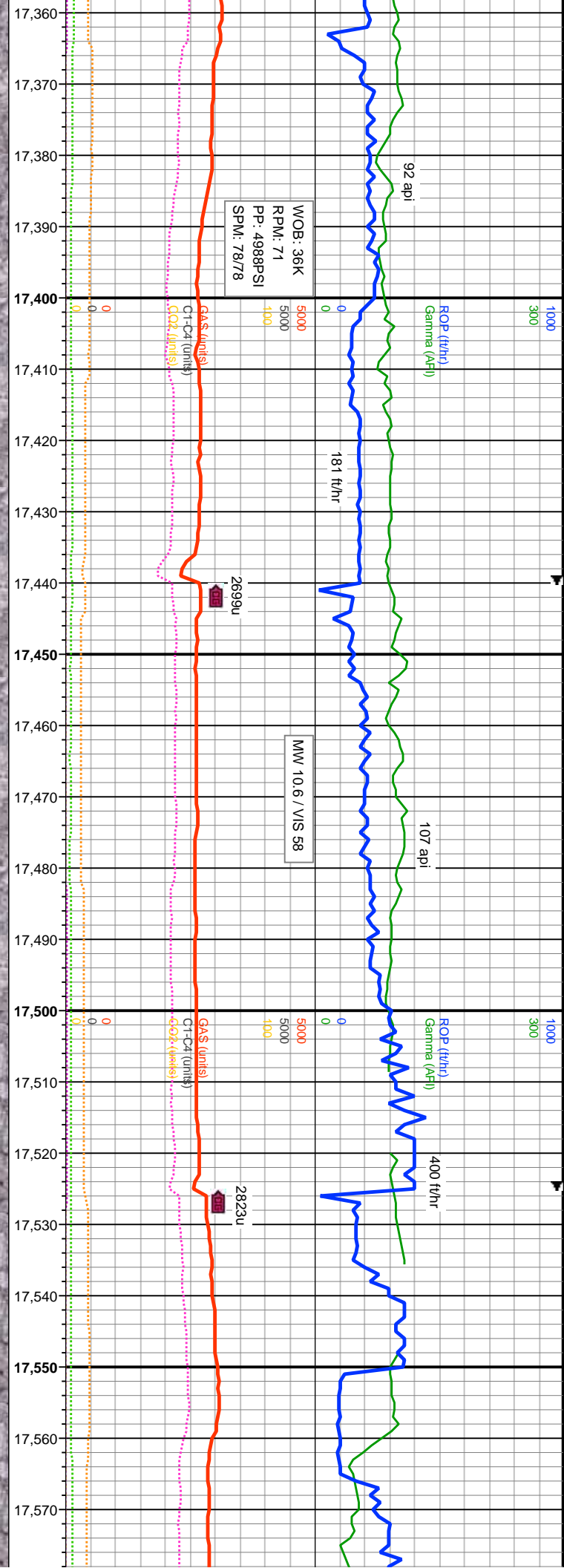


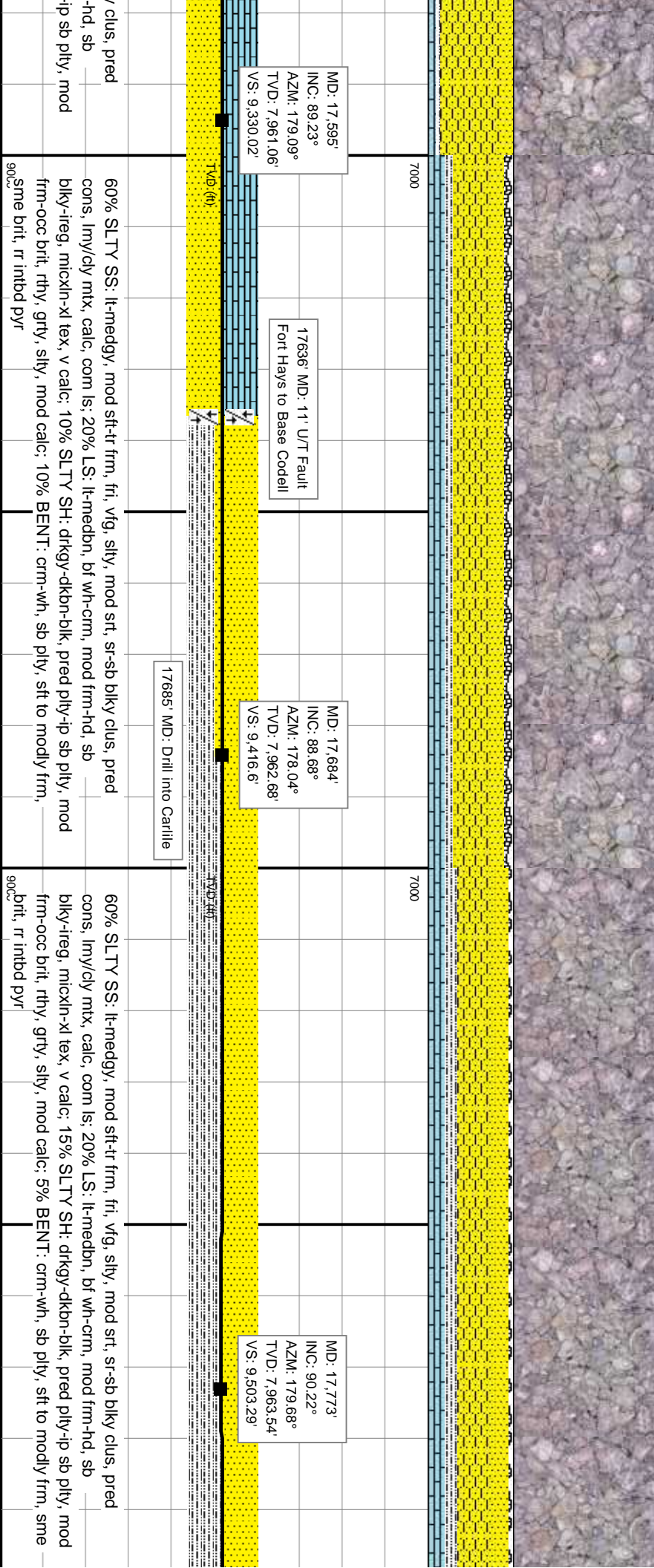
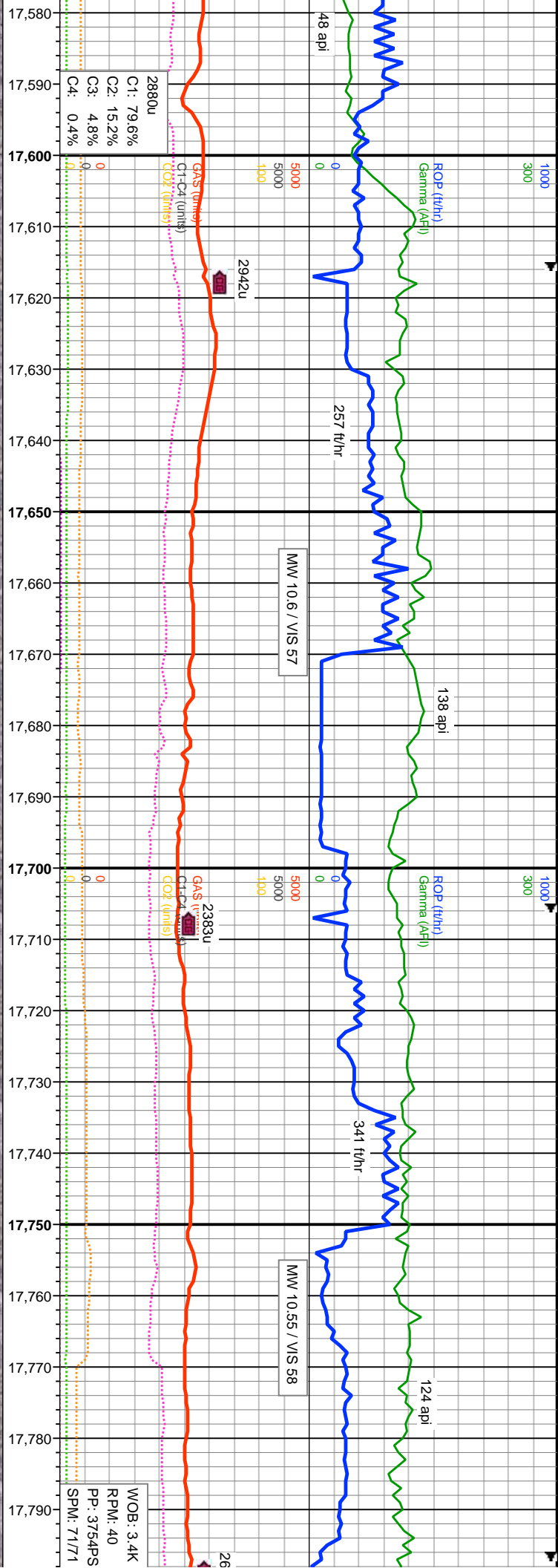


MD: 16,968' INC: 88.22° AZM: 182.12° TVD: 7,944.91' VS: 8.715.24'		MD: 17,058' INC: 88.65° AZM: 182.58° TVD: 7,947.37' VS: 8.803.96'	
TVD (ft)		TVD (ft)	
95% SLTY SS: lt-medgy, mod sft-tr frm, fri, vfg, silty, mod srt, sr-sb blkly clus, pred cons, lmy/clly mtx, calc, rr bent wi inbnd pyr, rr inoc, tr ls, 5% SLTY SH: drkgy-dkbn-blk, pred plty-ip sb ply, mod frm-occ brlt, rthy, grty, silty, mod calc		90% SLTY SS: lt-medgy, mod sft-tr frm, fri, vfg, silty, mod srt, sr-sb blkly clus, pred cons, lmy/clly mtx, calc, rr bent wi inbnd pyr, rr inoc, tr ls, 5% SLTY SH: drkgy-dkbn-blk, pred plty-ip sb ply, mod frm-occ brlt, rthy, grty, silty, mod calc	
7000		7000	
9000		9000	

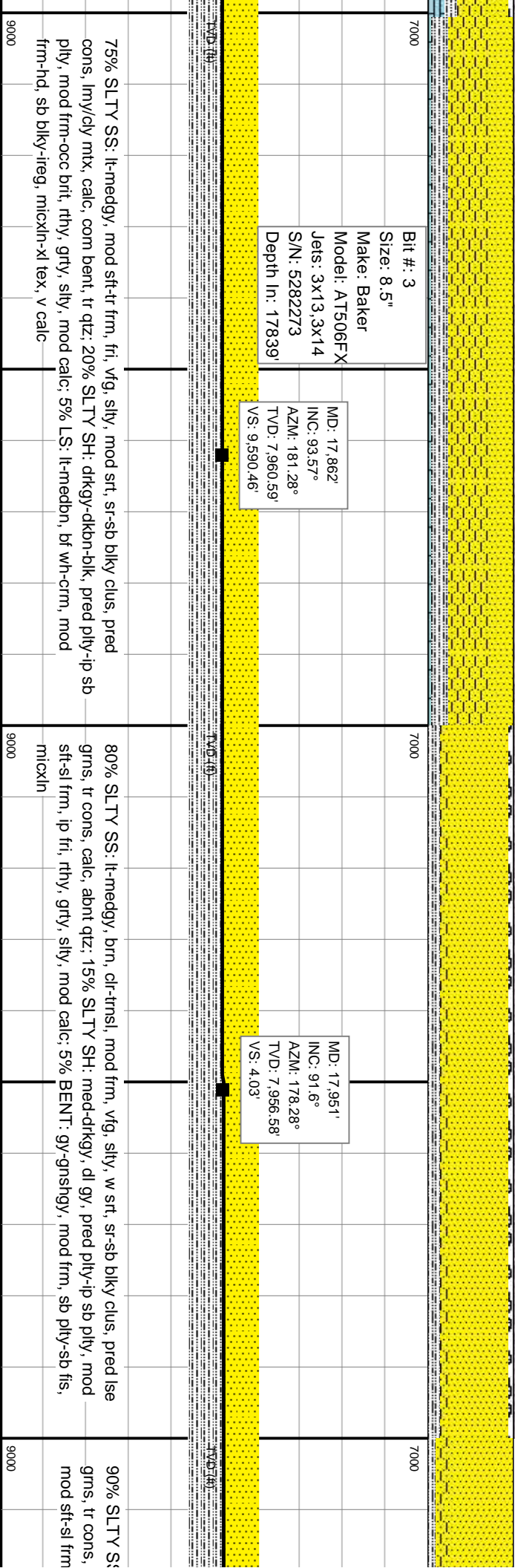
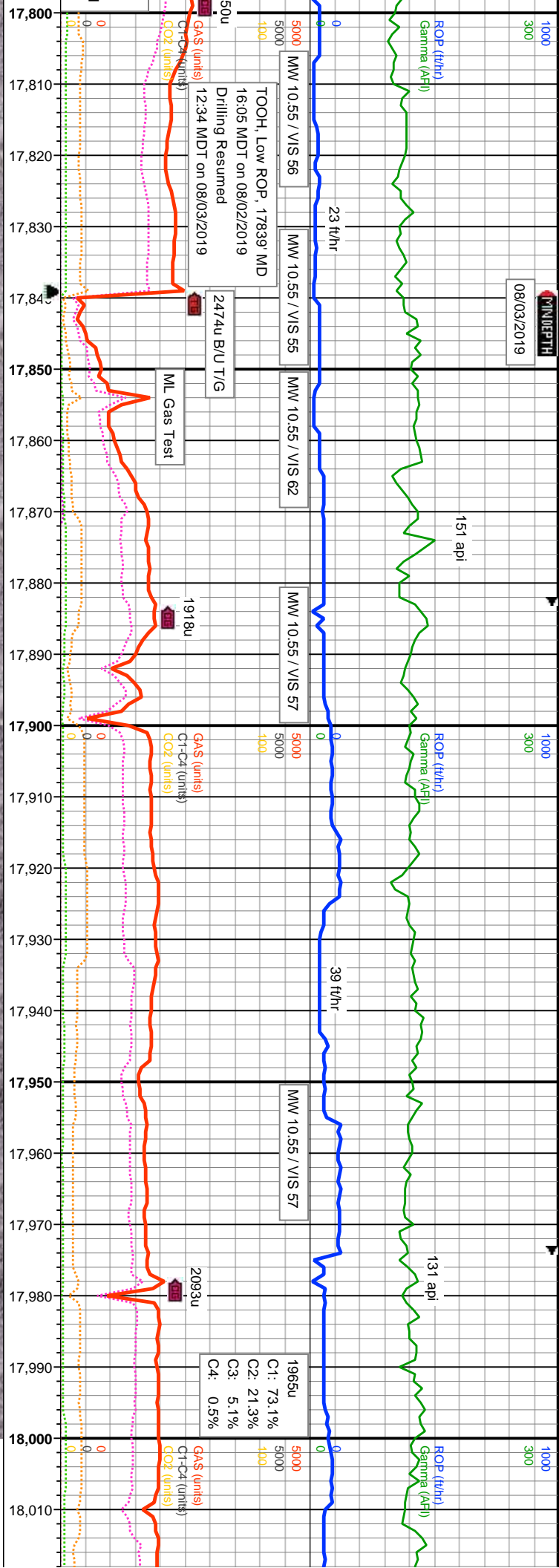


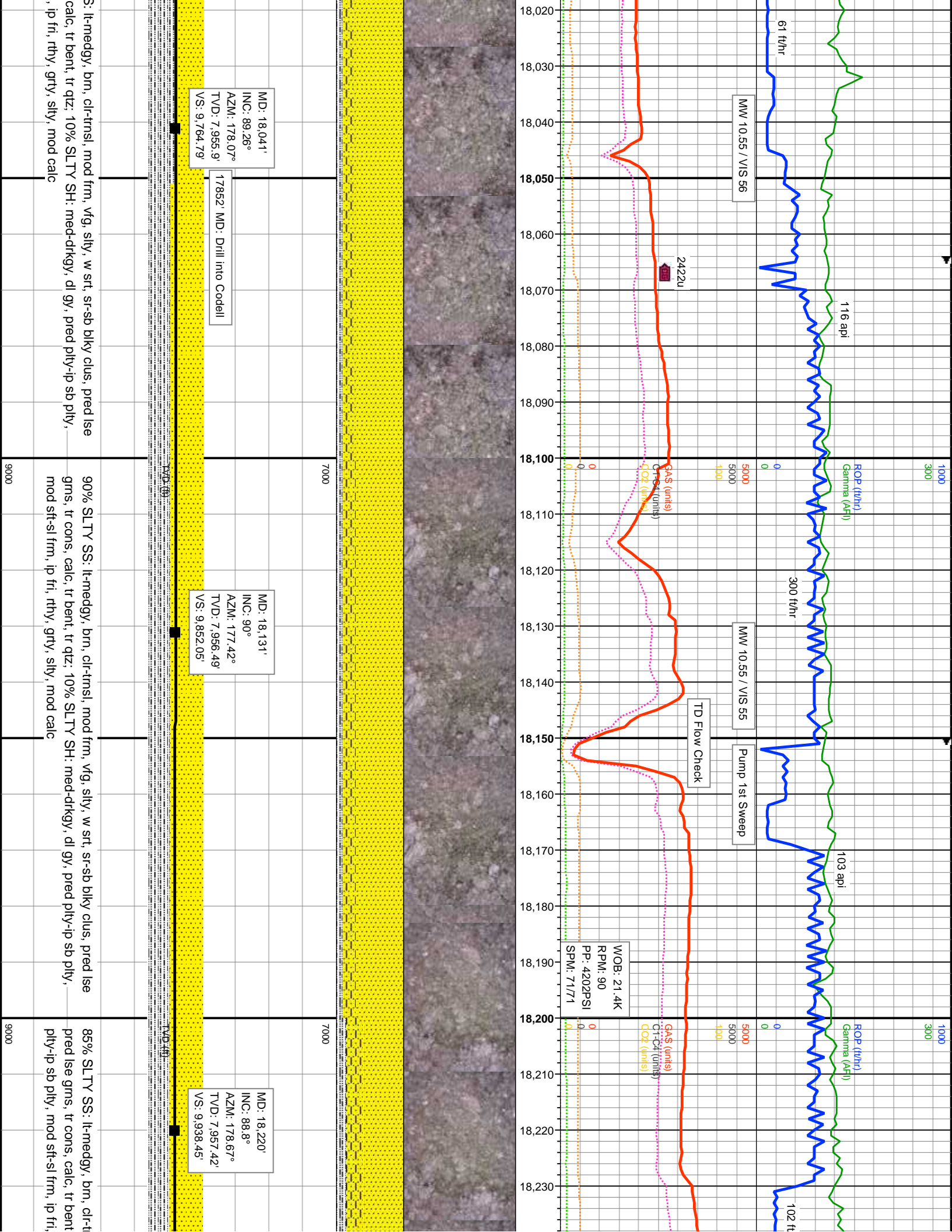




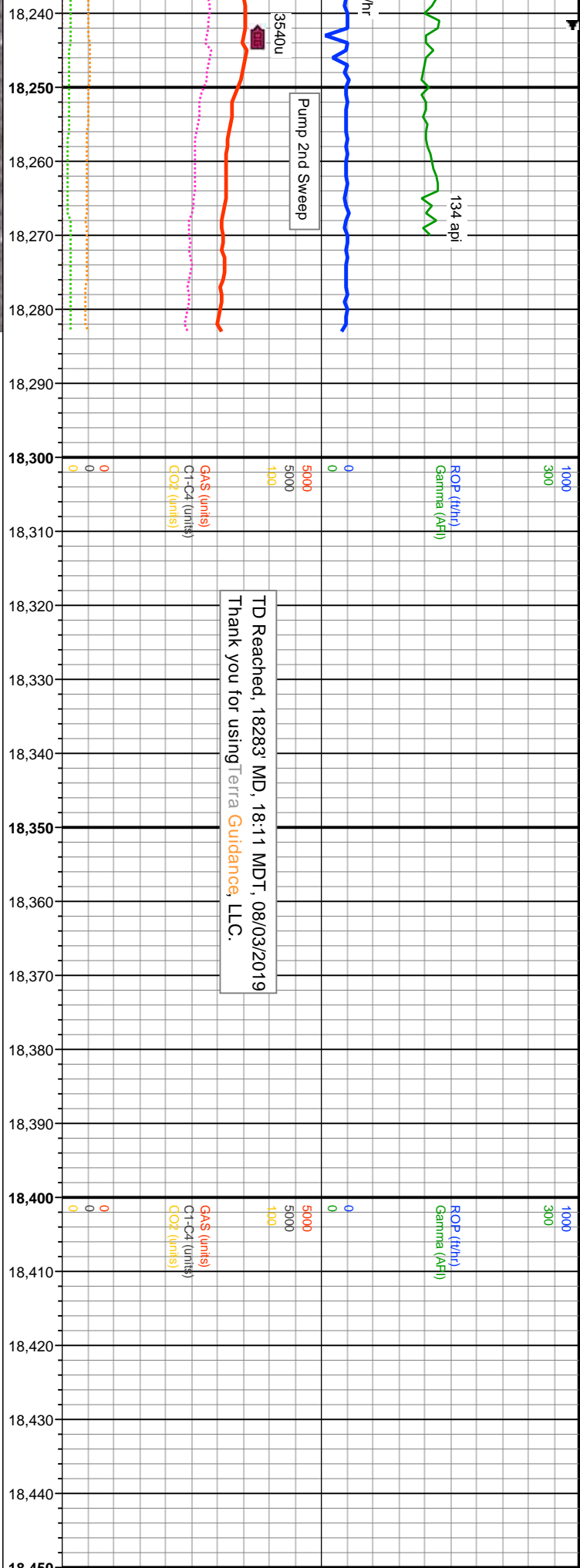












Projection to Bit

MD: 18,259'  
INC: 88.31°  
AZM: 179.16°  
TVD: 7,958.4'  
VS: 9,976.44'

MD: 18,283'  
INC: 88.31°  
AZM: 179.16°  
TVD: 7,959.11'  
VS: 9,999.84'

FM Name		Excursion Depths ('MD)							
Sharon Springs	7890								
Niobrara	7922								
Ft Hays	8586	8997	11699	12274	15976	16141	17504		
Codell	8820	9247	11875	12750	13550	16134	16552	17636	17852
Carlile				12981				17685	

nsi, mod frm, vfg, silty, w srt, sr-sb blkly clus,  
tr qtz; 15% SLTY SH: med-drkgy, dl gy, pred  
rthy, grty, silty, mod calc