



Scale: 5" / 100'
Measured Depth Log

Well Name Ottesen LE 06-290HN

Location SECTION 33, T1N, R66W

State COLORADO

Country USA

API Number 051234433500

Geographic Region DJ BASIN

County WELD

Rig Number PRECISION 466

AFE # 18DC0189

Field WATTENBERG

Ground Elevation 5076.5'

K.B. Elevation 5096.5'

Logged Interval 6000' MD To 17953' MD

Total Depth 17953' MD

Formation NIOBRARA C CHALK

Type of Drilling Fluid OIL BASED MUD

Operator

Company Great Western Oil and Gas

Address 1801 Broadway, Ste 500
Denver, CO 80202



Geologist

Name Zach Souvall, Wyatt Wicks

Company Terra Guidance

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

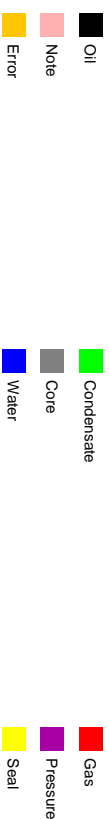


Other

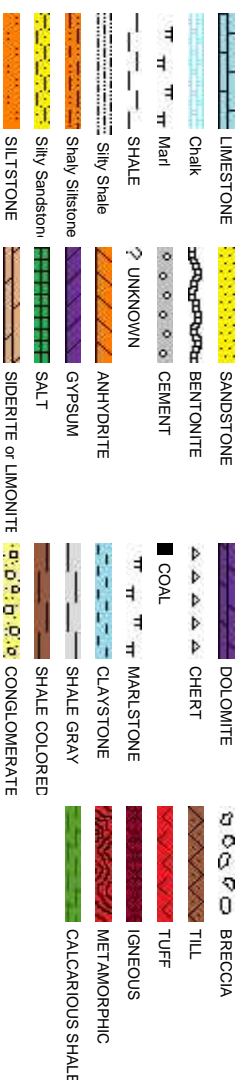
Mudlog Start Date 01/10/2019

Mudlog End Date 01/13/2019

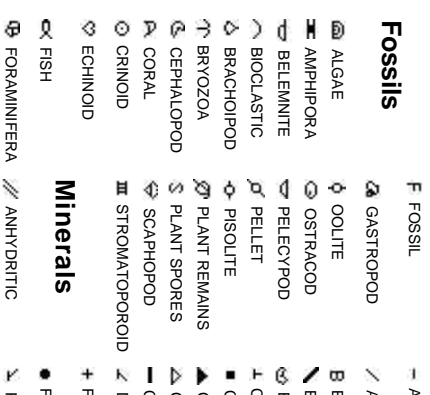
Color Coding



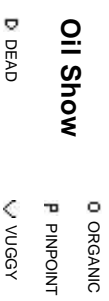
Rock Types



Fossils



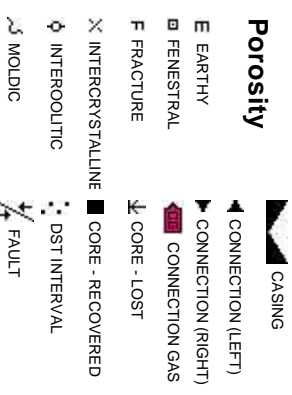
Minerals



Oil Show



Porosity



Accessories

RGILLACEOUS	GLAUCONITE
RGILLITE GRAIN	GYPSIFEROUS
RENTONITE	HEAVY MINERAL
ITUMENOUS SUBSTANCE	KAOLIN
ARECCIA FRAGMENTS	MARLSTONE
ALCAREOUS	MINERAL CRYSTALS
CARBONACEOUS FLAKES	NODULES
HTDK	PHOSPHATE PELLETS
HTLT	PYRITE
COAL - THIN BEDS	SALT CAST
DOLOMITIC	SANDY
ELDSPAR	SILICEOUS
ERRUGINOUS PELLET	SILTY
ERRUGINOUS	TUFFACEOUS
	SILTSTONE STRINGER

Stringer

ANHYDRITE STRINGER
BENTONITE STRINGER
COAL STRINGER
DOLOMITE STRINGER
GYPSUM STRINGER
LIMESTONE STRINGER
MARLSTONE (CALC) STRG
MARLSTONE (DOL) STRG
SANDSTONE STRINGER
SHALE STRINGER

Other Symbols

FORMATION TOP	L LITHOGRAPHIC
GAS SHOW	MICROXLN
MINDEPTH	MIN DEPTH
MINDEPTH	ANGULAR
NORMAL FAULT	ROUNDED
OIL SHOW	SUBANG
OVERTURNED STRATA	SUBRND
REVERSE FAULT	
SIDEWALL CORE (LEFT)	
SIDEWALL CORE (RIGHT)	BOUNDSTONE
SLIDE	CHALKY
SURVEY	CRYPTOXLN
TRIP GAS	E EARTHY
WIRELINE TESTED - LEFT	FINELYXLN
WIRELINE TESTED - RT	GRAINSTONE
	CALCARIOUS SHALE
	CALCARIOUS SHALE

Rounding

ANGULAR	MUDSTONE
ROUNDED	PACKSTONE
SUBANG	WACKESTONE

Sorting

MODERATE
POOR
WELL

Textures

BOUNDSTONE
CHALKY
WELL

CALCARIOUS SHALE

CALCARIOUS SHALE

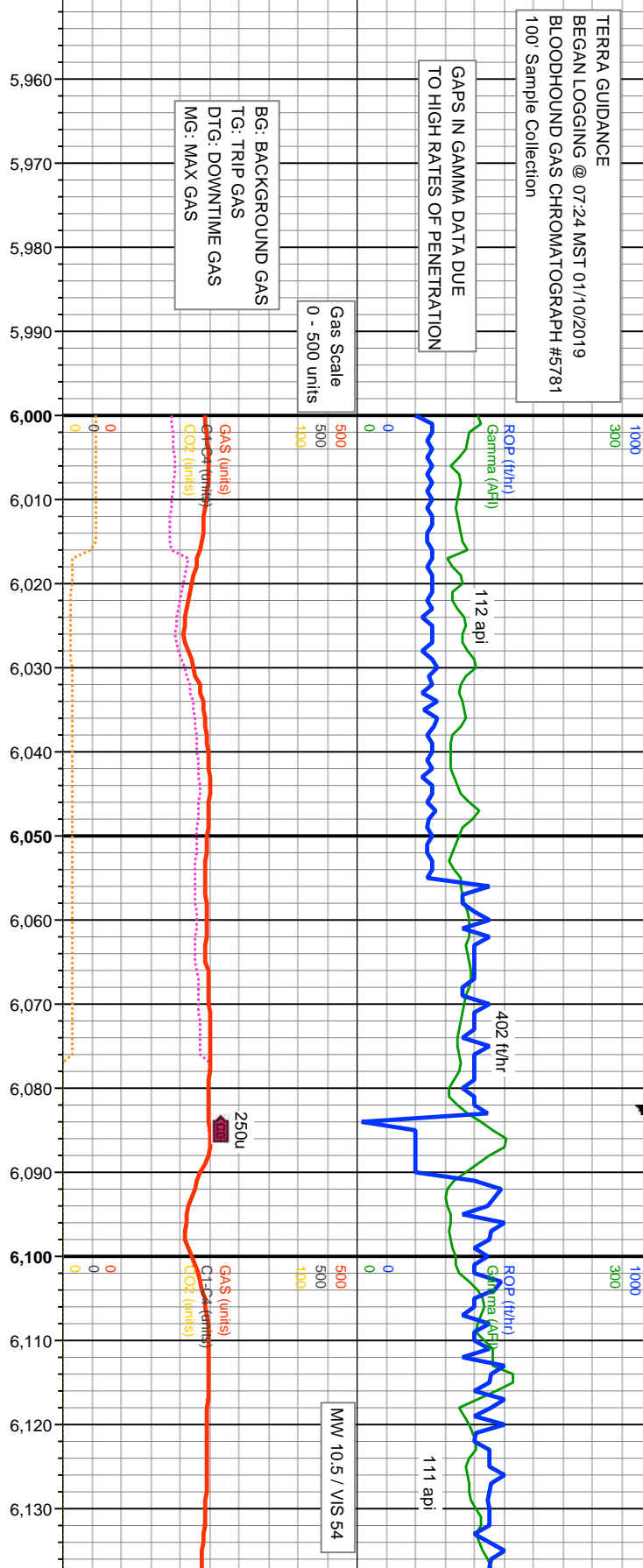
TERRA GUIDANCE
BEGAN LOGGING @ 07:24 MST 01/10/2019
BLOODHOUND GAS CHROMATOGRAPH #5781
100' Sample Collection

ROP
ROP
Gamma

GAPS IN GAMMA DATA DUE
TO HIGH RATES OF PENETRATION

Gas Scale
0 - 500 units

BG: BACKGROUND GAS
TG: TRIP GAS
DTG: DOWNTIME GAS
MG: MAX GAS



Images



% Lithology

TVD Scale
4700' - 9000'

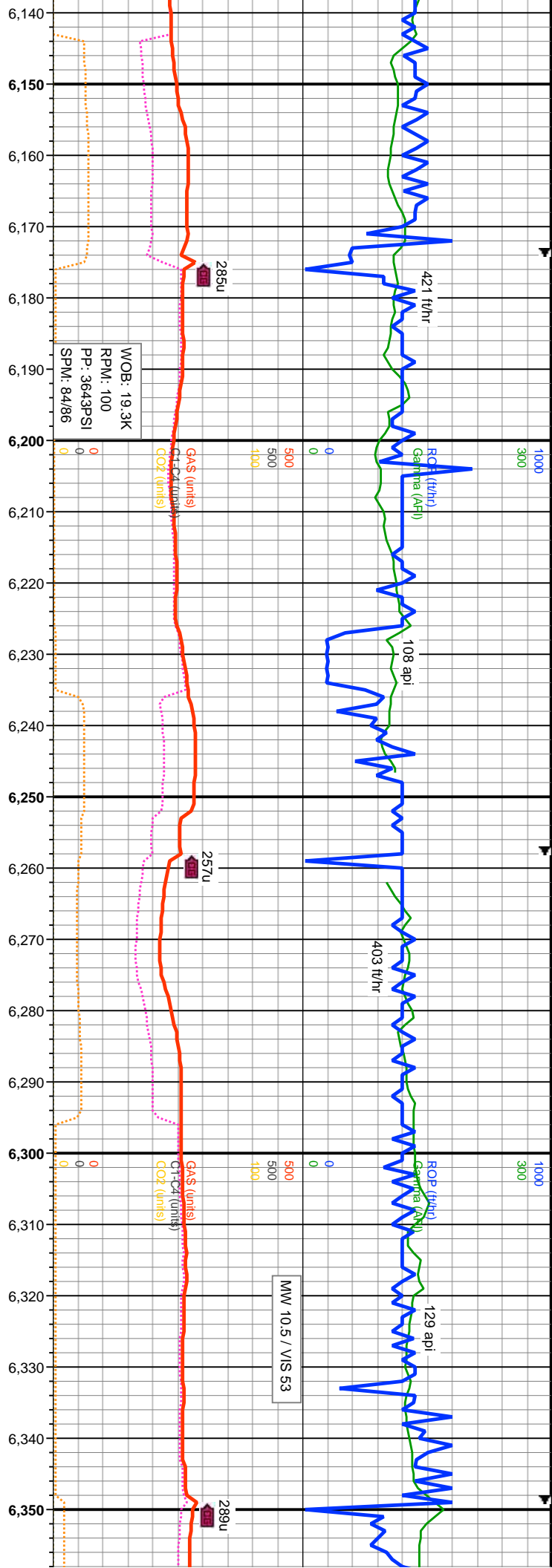
MD: 6.058'
INC: 47.58°
AZM: 214.03°
TVD: 4.894.17'
VS: 2.438.55'

Well Bore
TVD

Bit #: 1
Size: 8.5
Make: Ulterra
Model: SPL516
Depth In: 1.777
Jets: 4x11, 4x12
S/N: 45520

100% SHY SLTST: lt-medgy, sme dk brn, sft-rii, sb blkyy-plyt tr fis, rthy, silty, mod cly rich mtb, v sl calc.

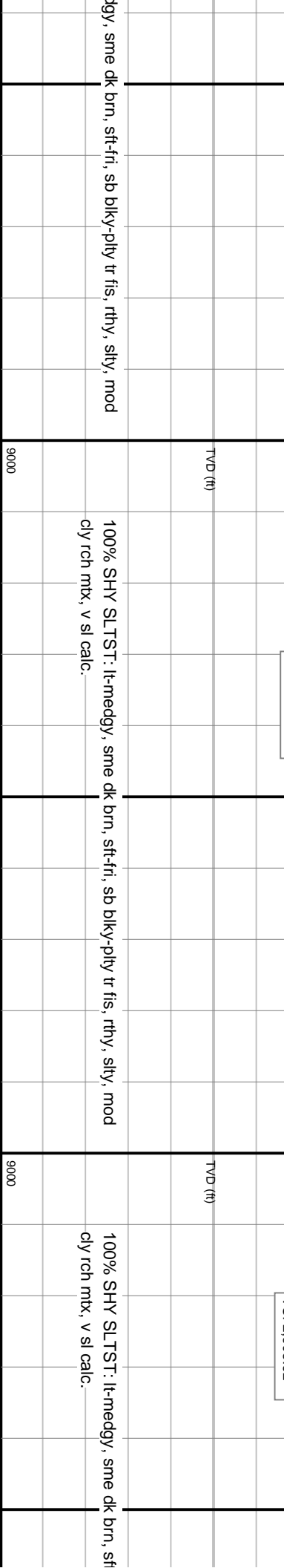
100% SHY SLTST: lt-medgy, sme dk brn, sft-rii, sb blkyy-plyt tr fis, rthy, silty, mod cly rich mtb, v sl calc.

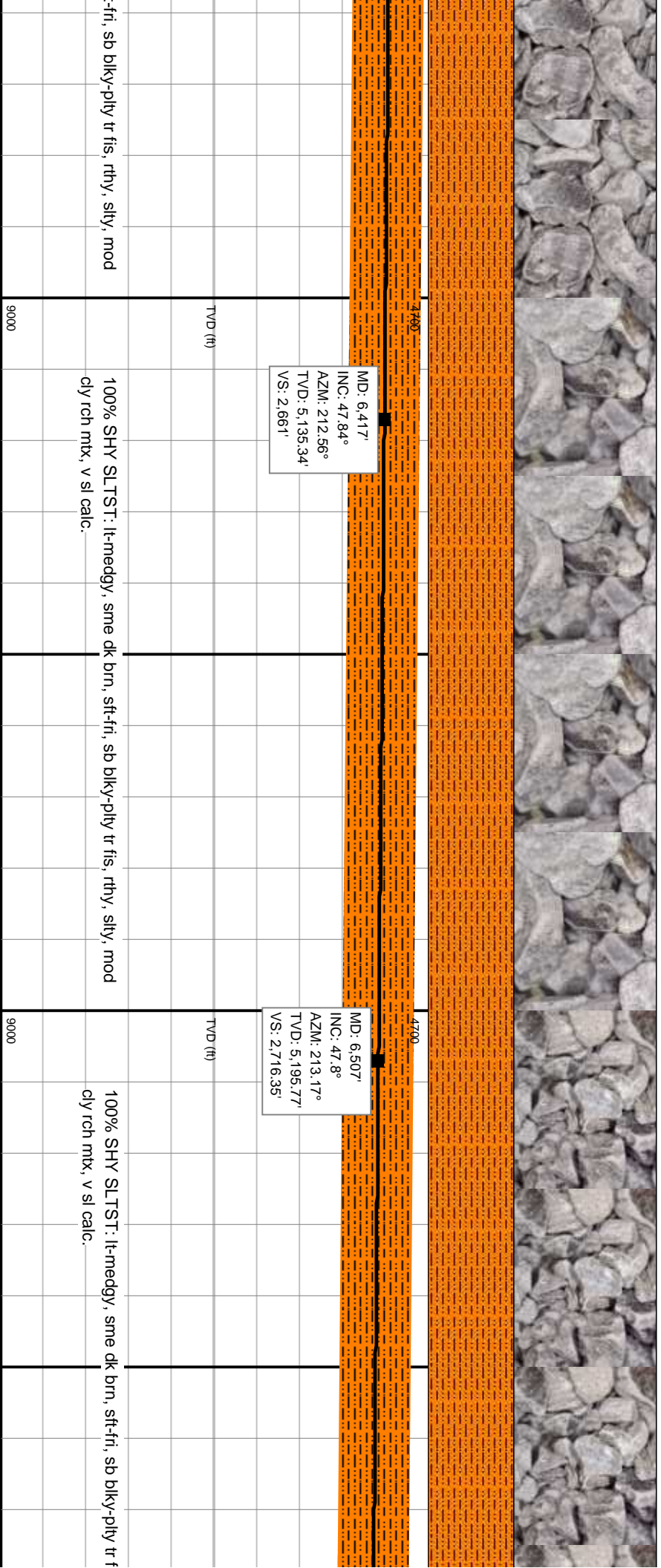
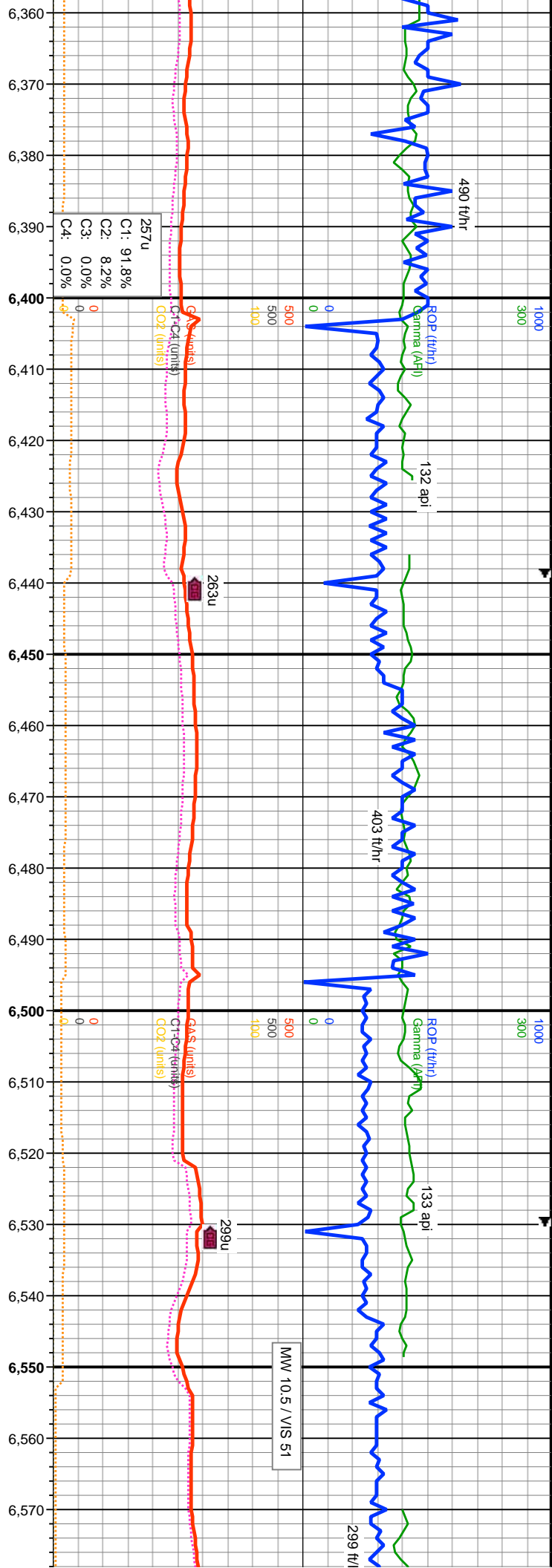


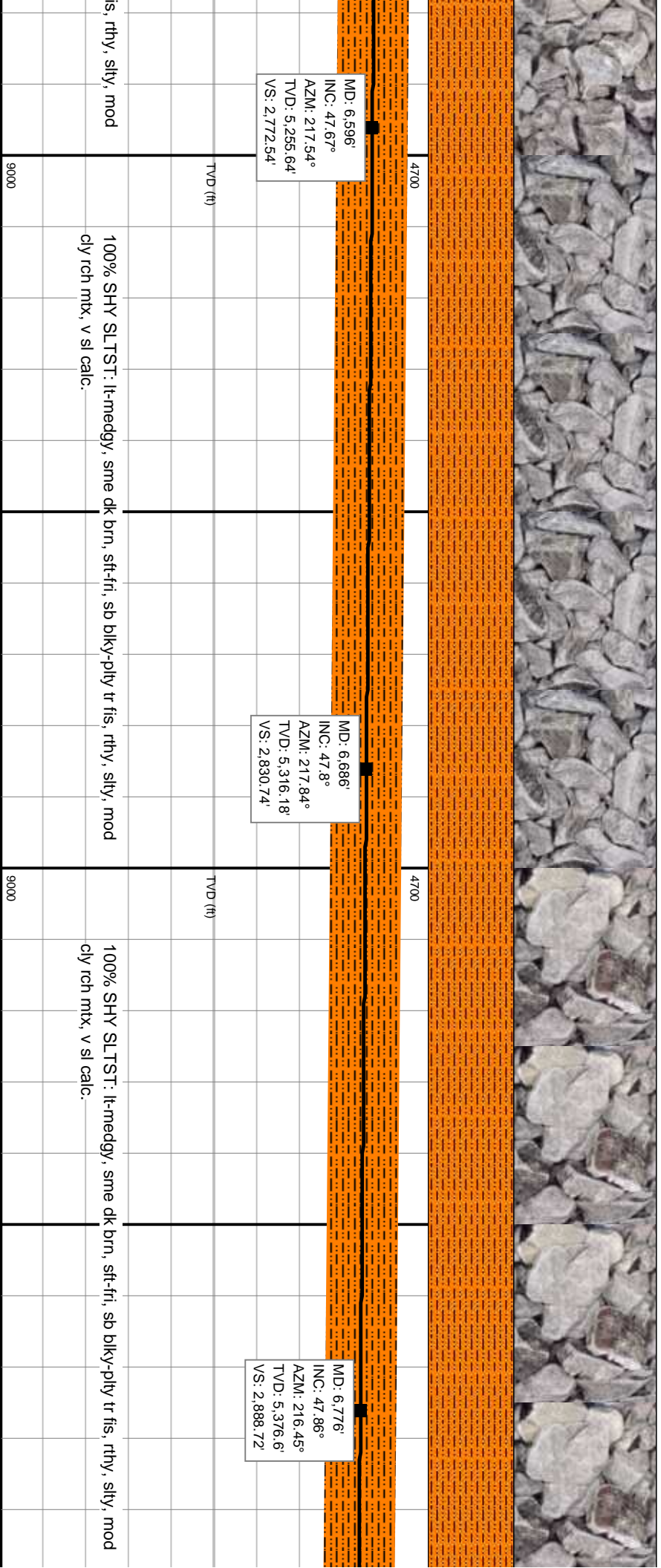
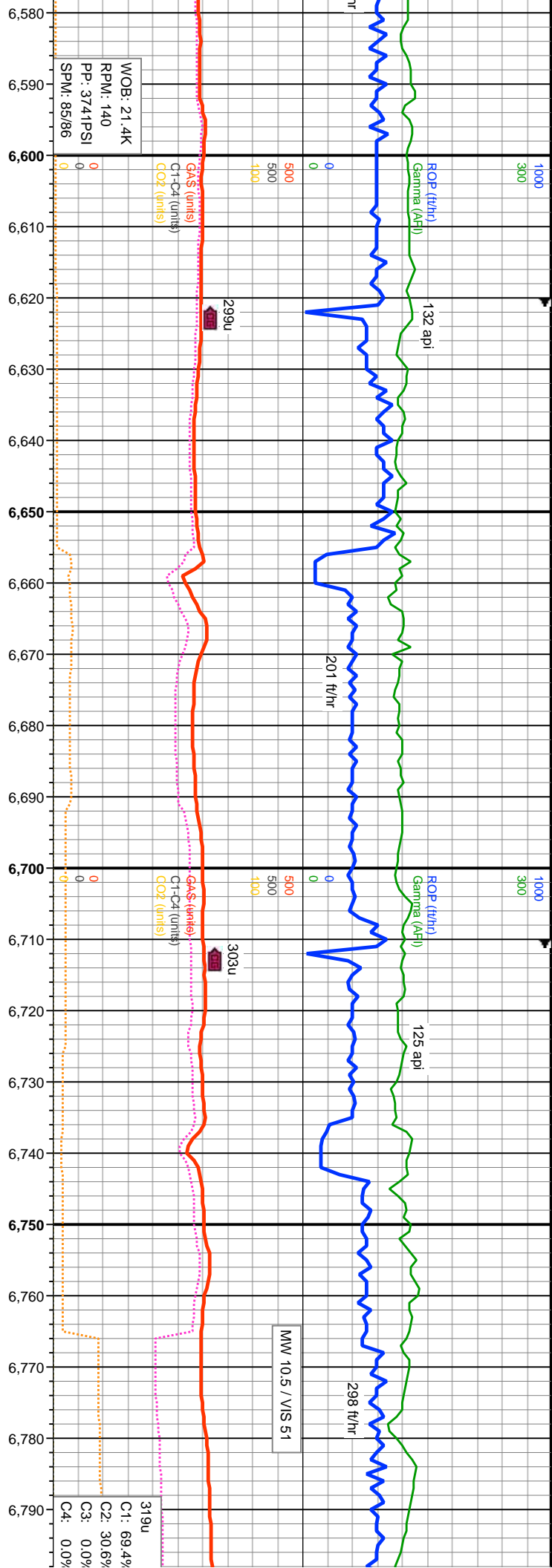
MD: 6,147'
INC: 47.79°
AZM: 213.08°
TVD: 4,954.08'
VS: 2,493.61'

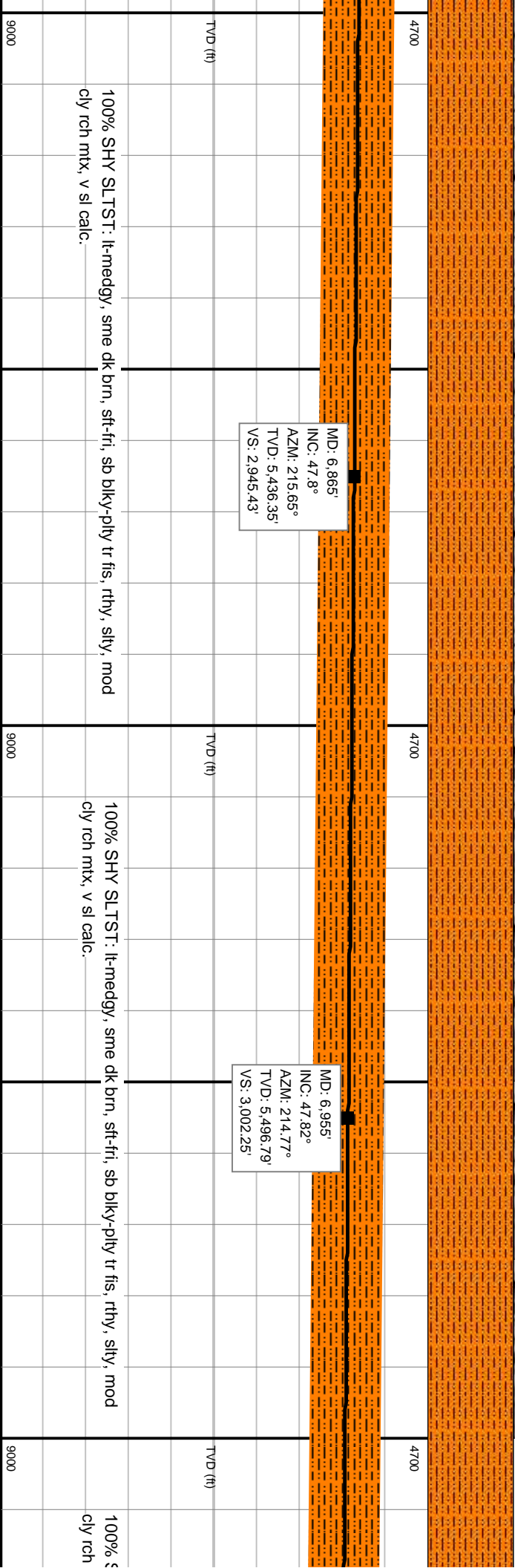
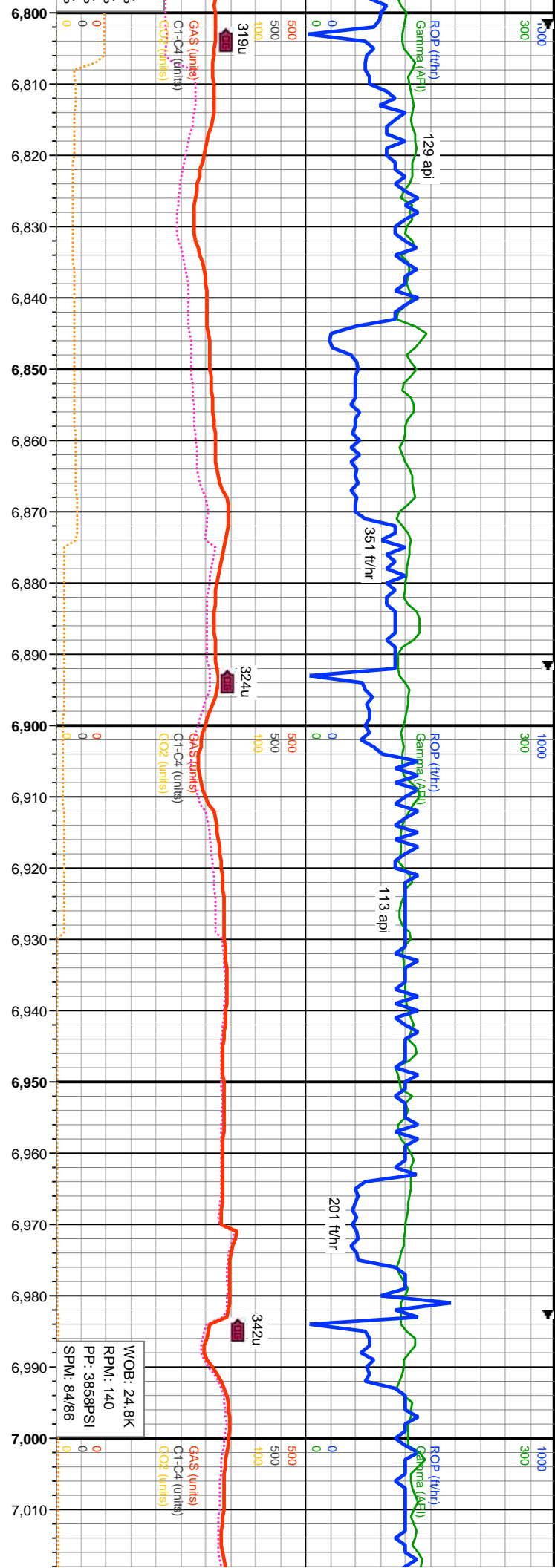
MD: 6,237'
INC: 47.91°
AZM: 214.5°
TVD: 5,014.48'
VS: 2,549.58'

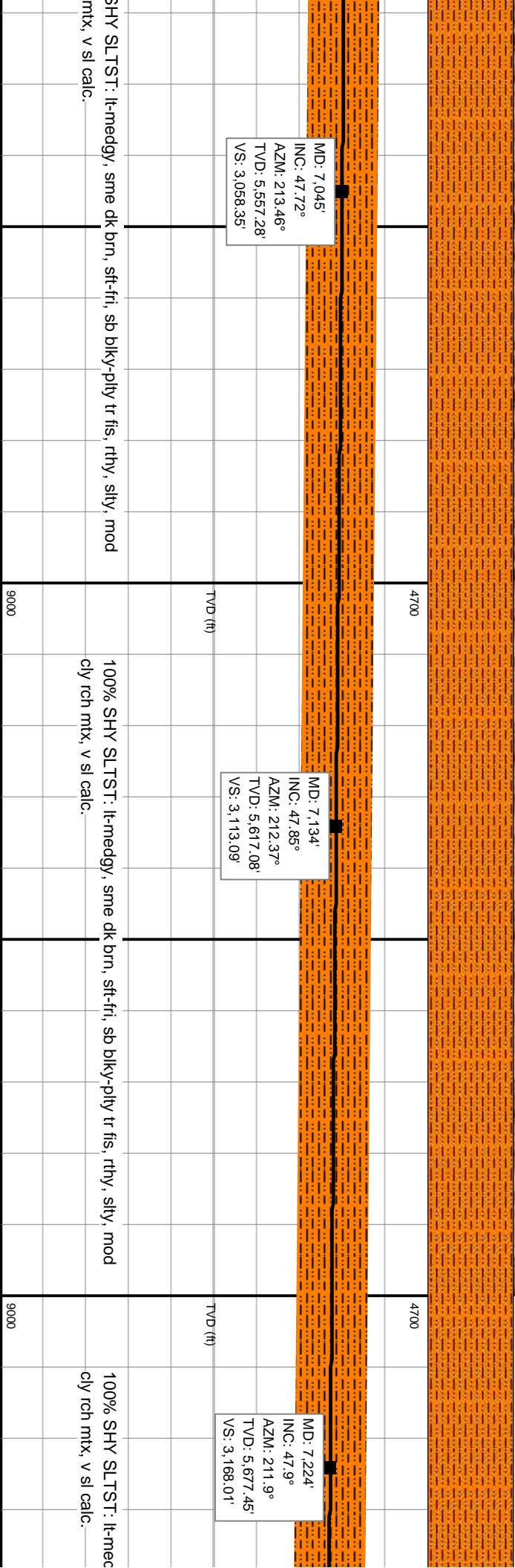
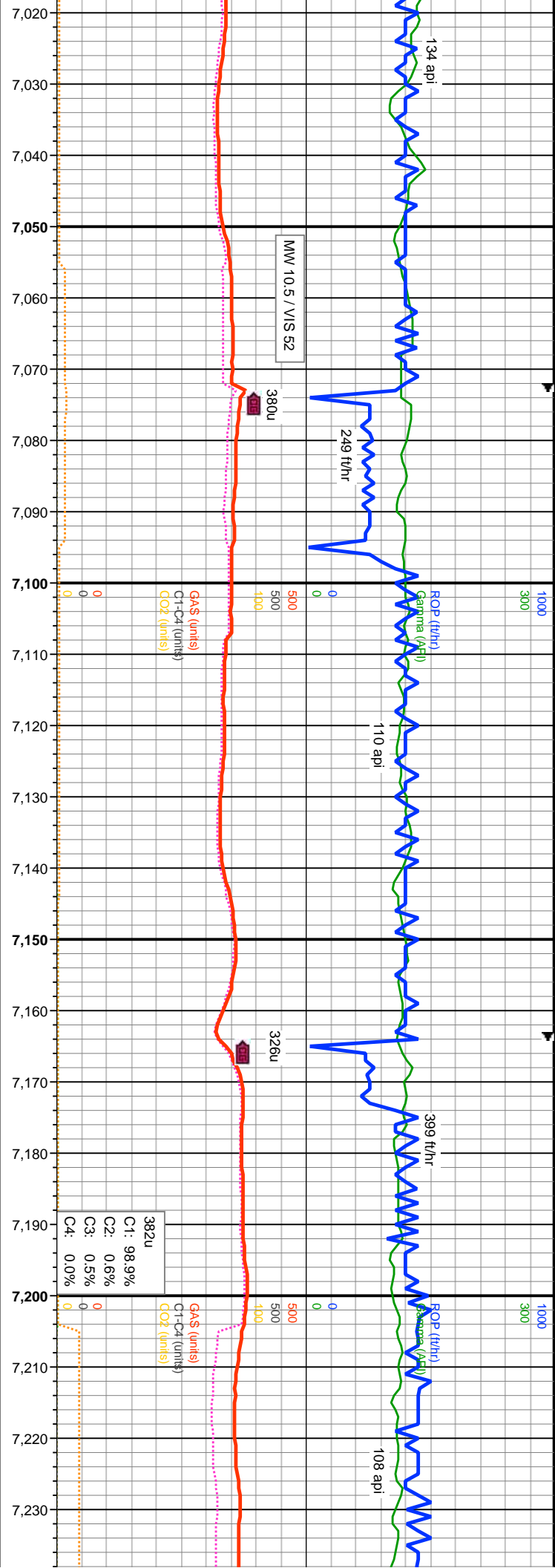
MD: 6,327'
INC: 47.77°
AZM: 213.31°
TVD: 5,074.89'
VS: 2,605.62'

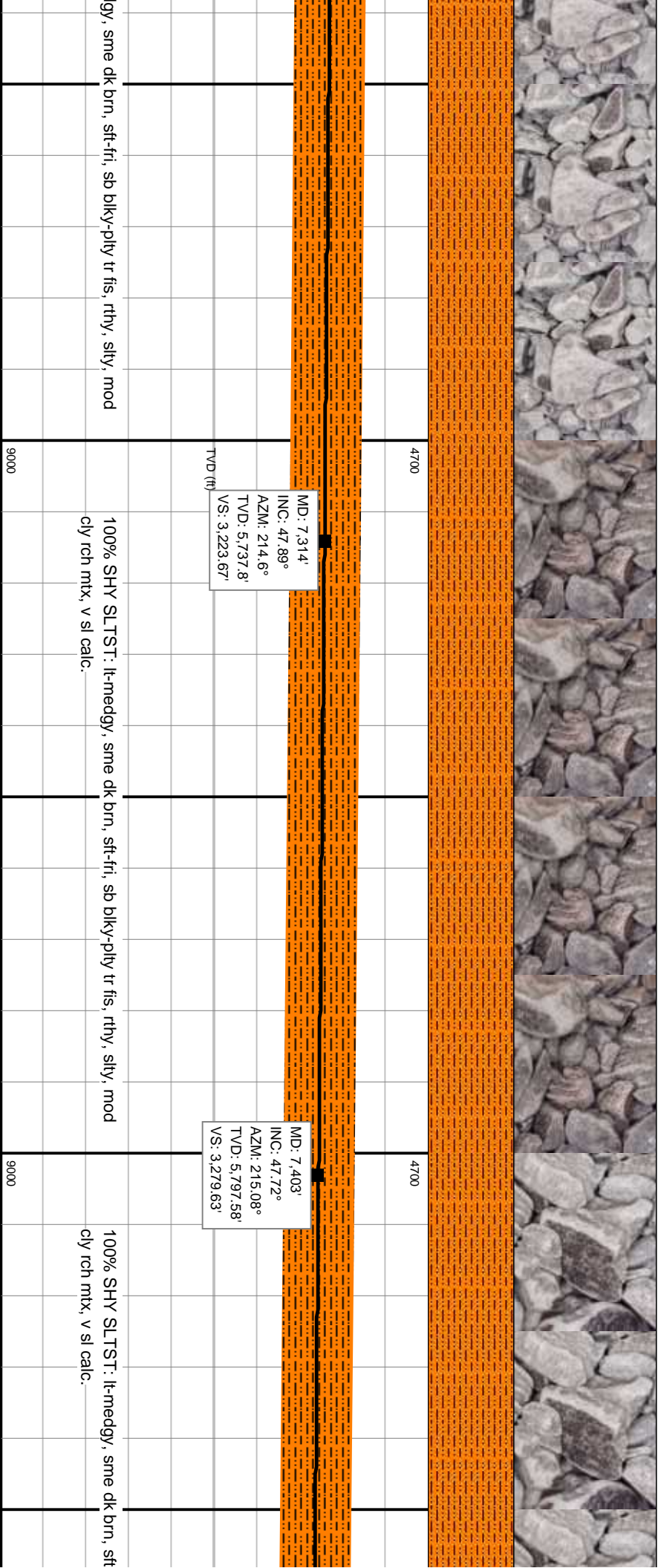
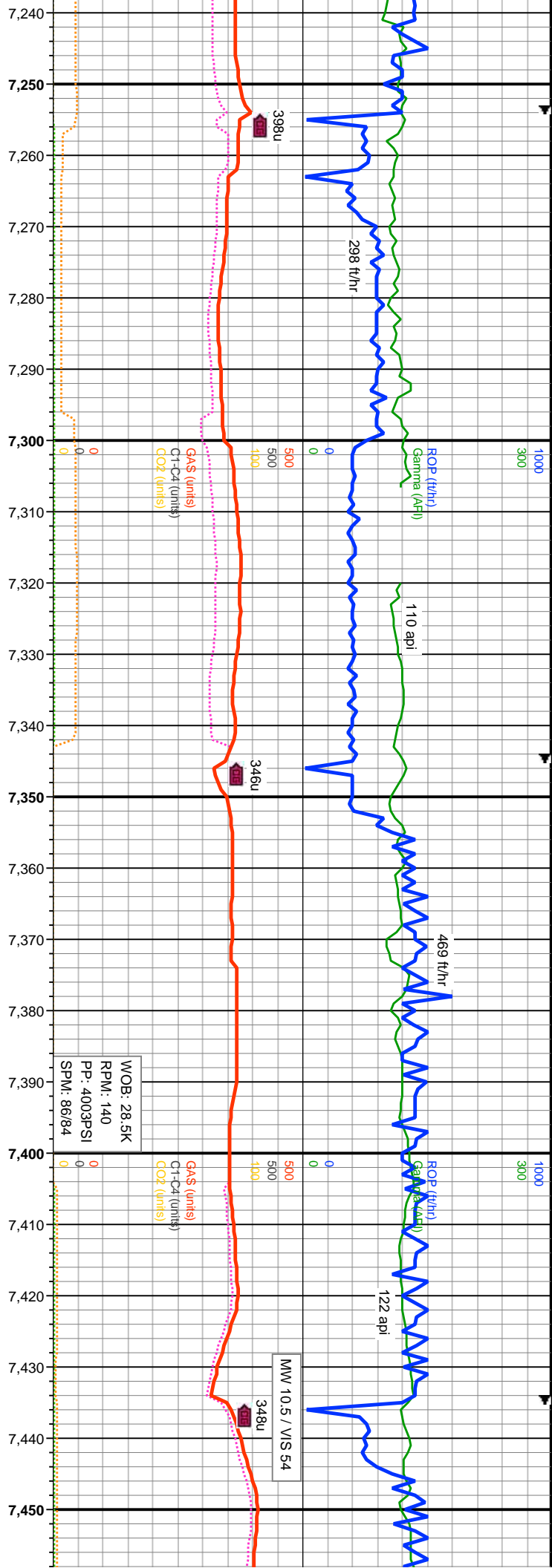


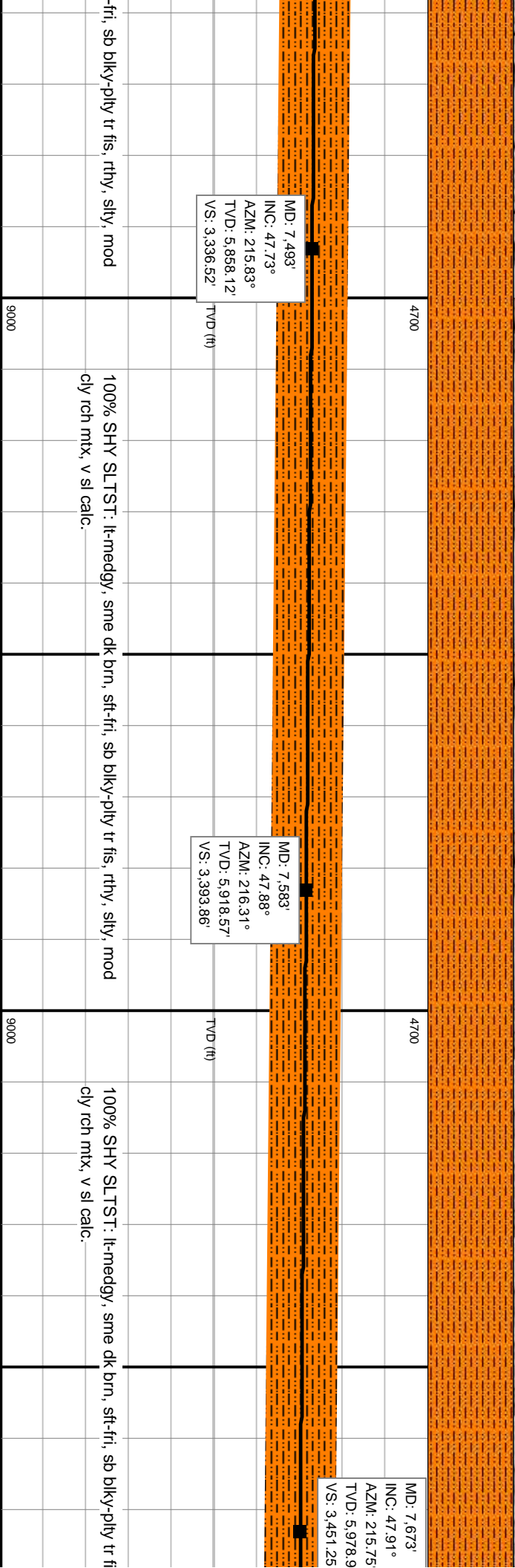
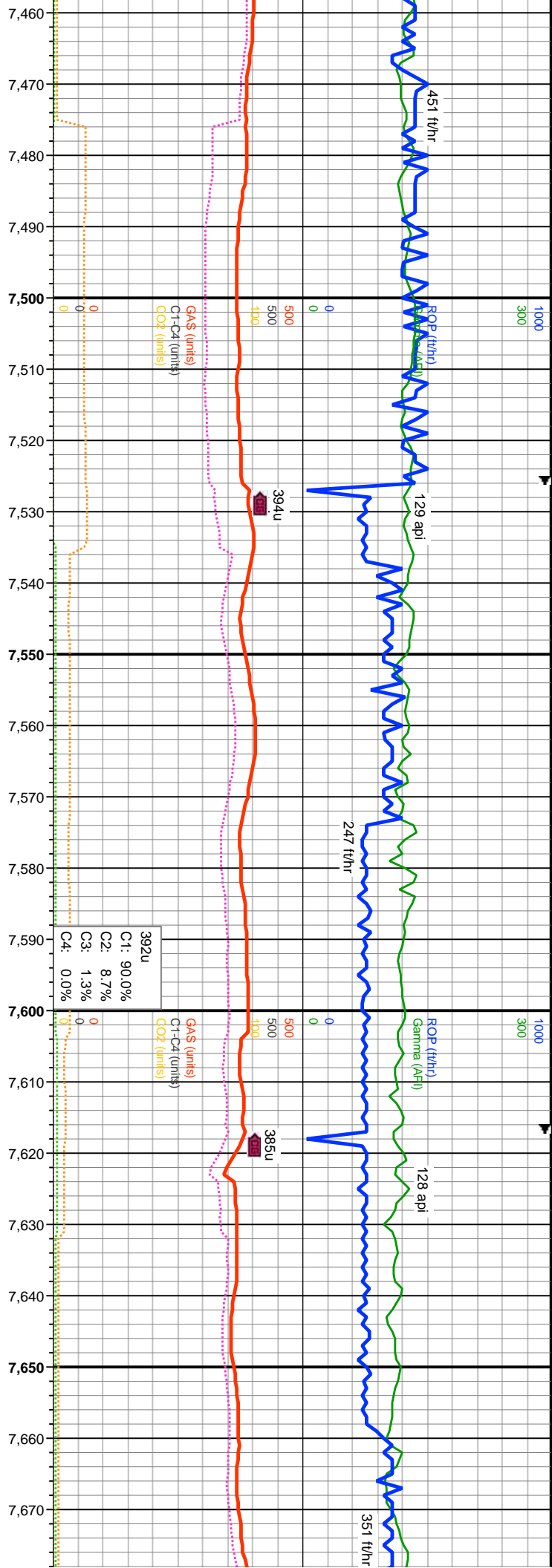


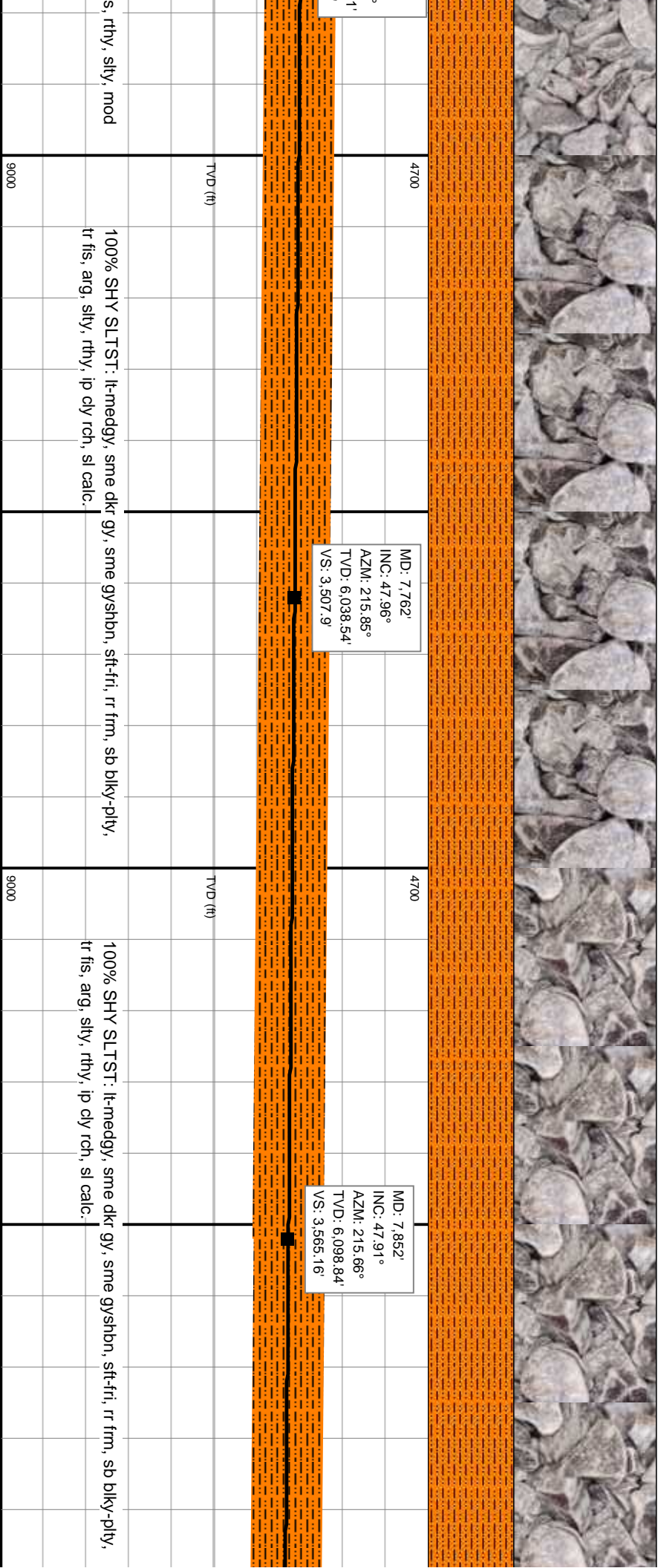
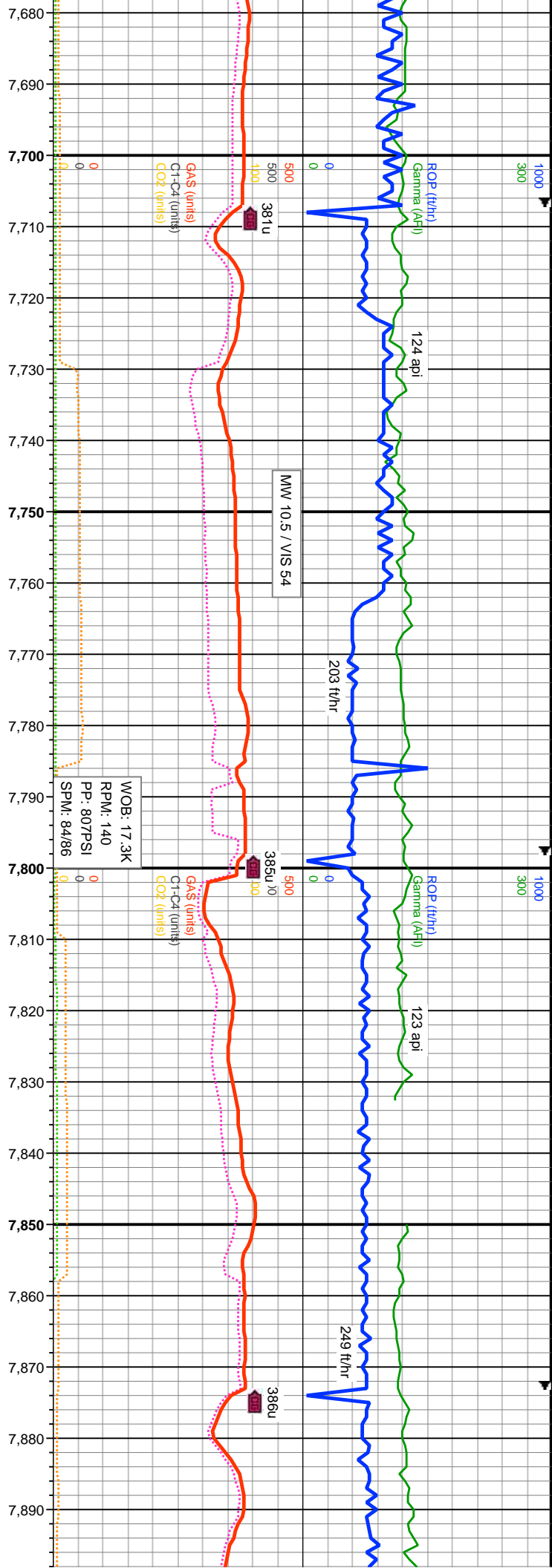


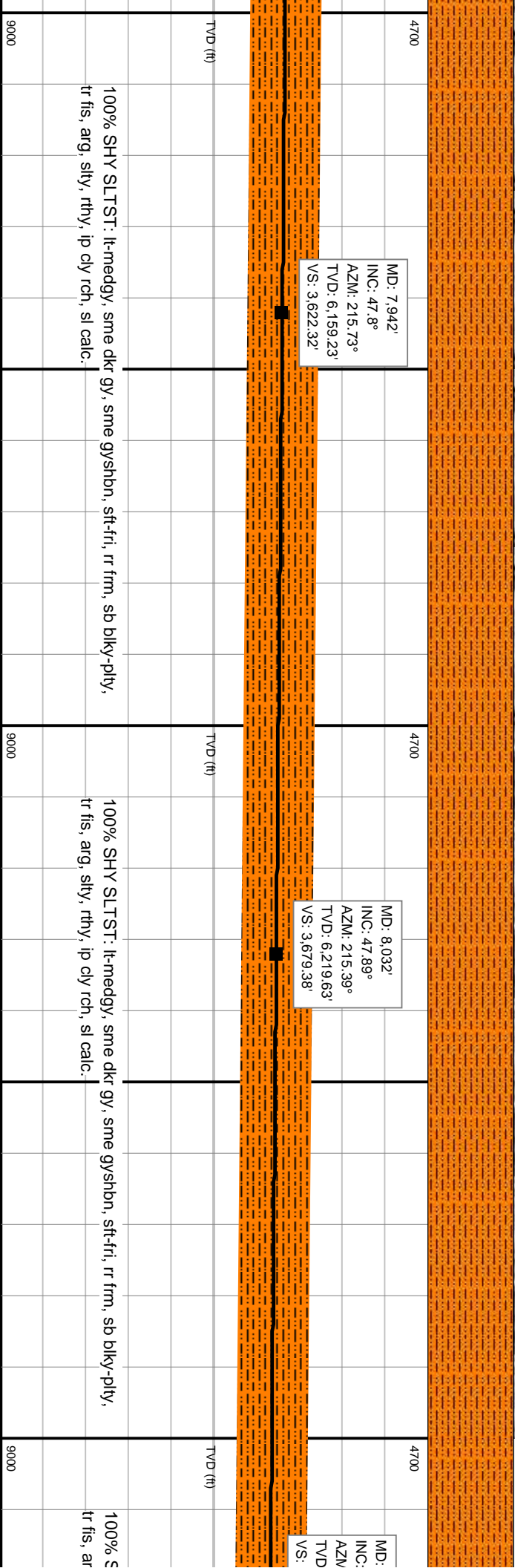
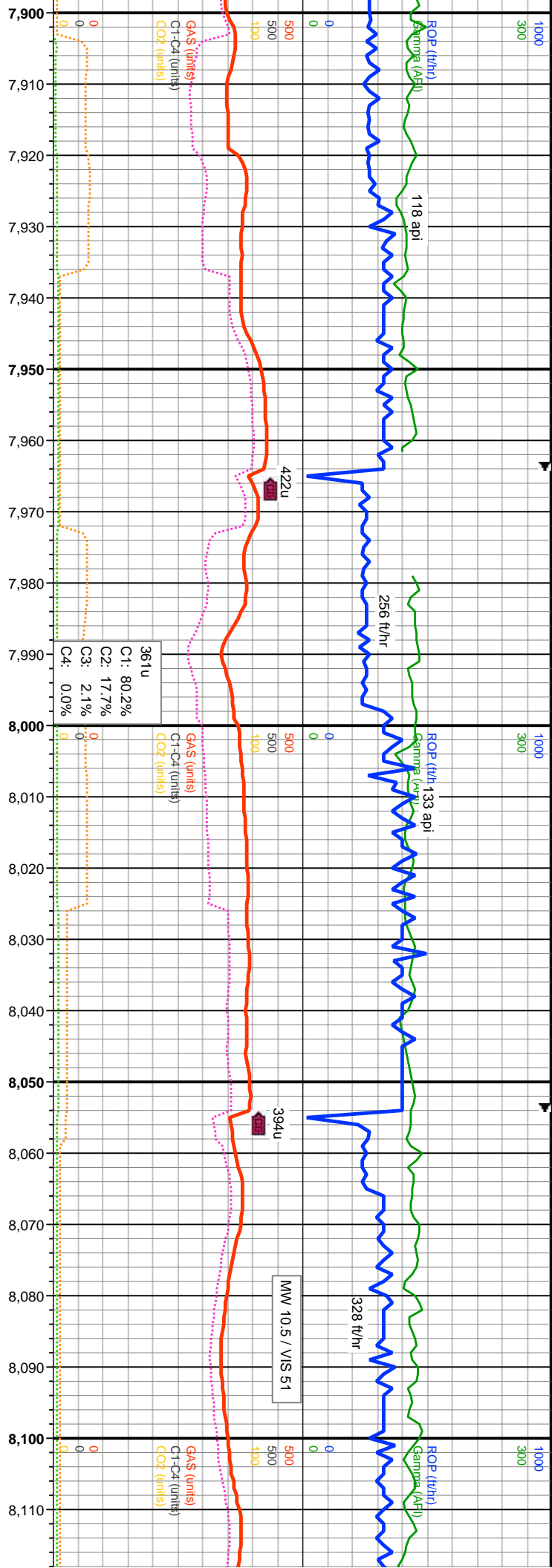


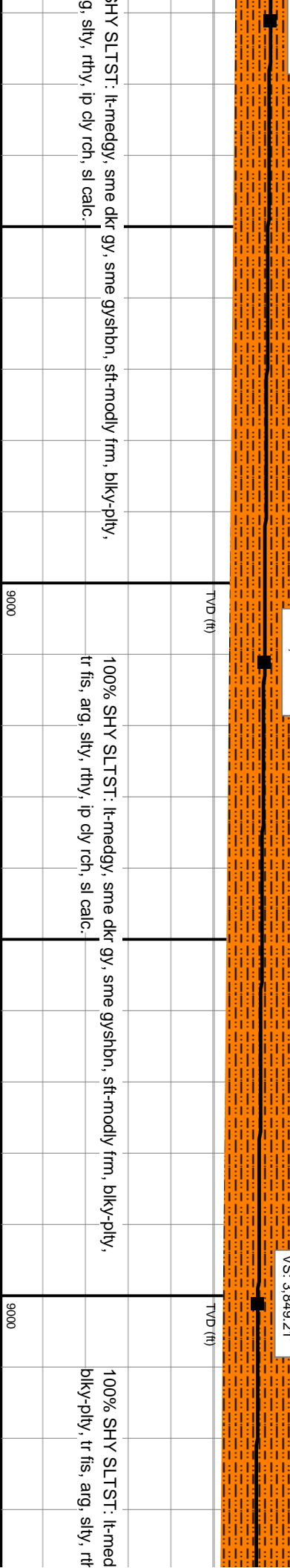
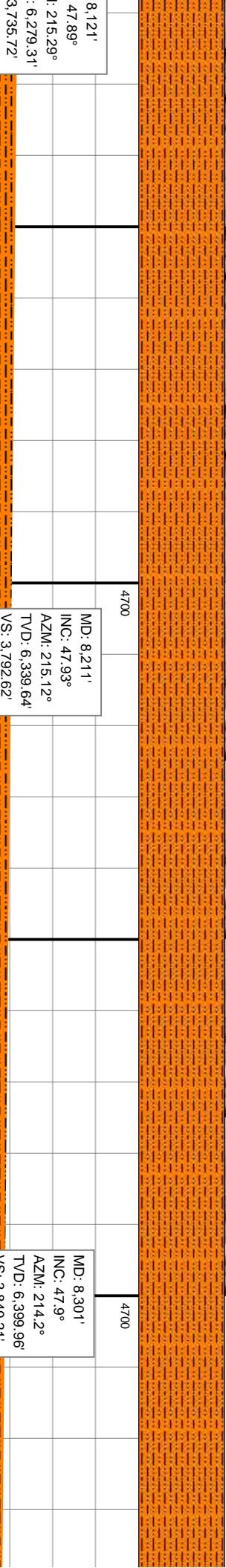
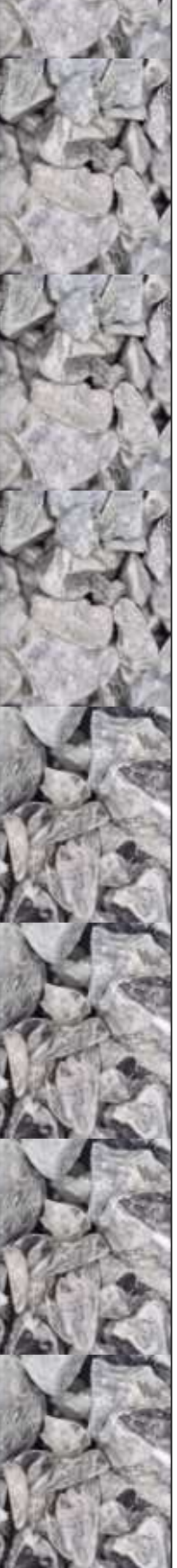
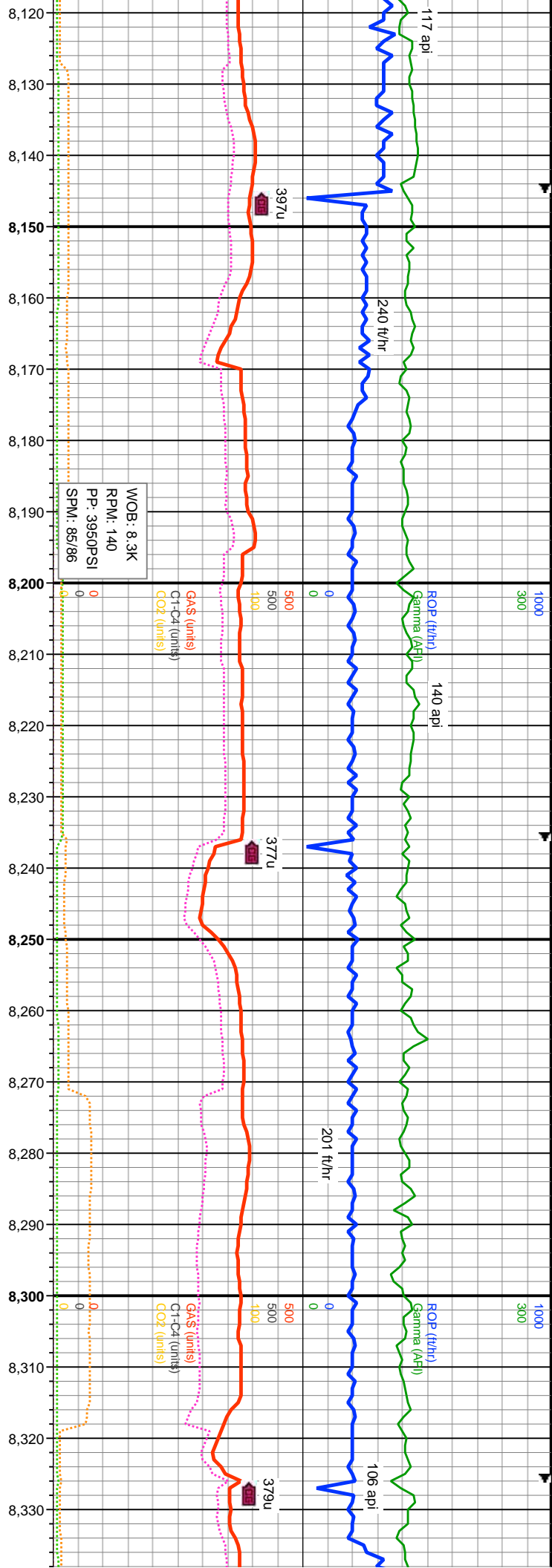


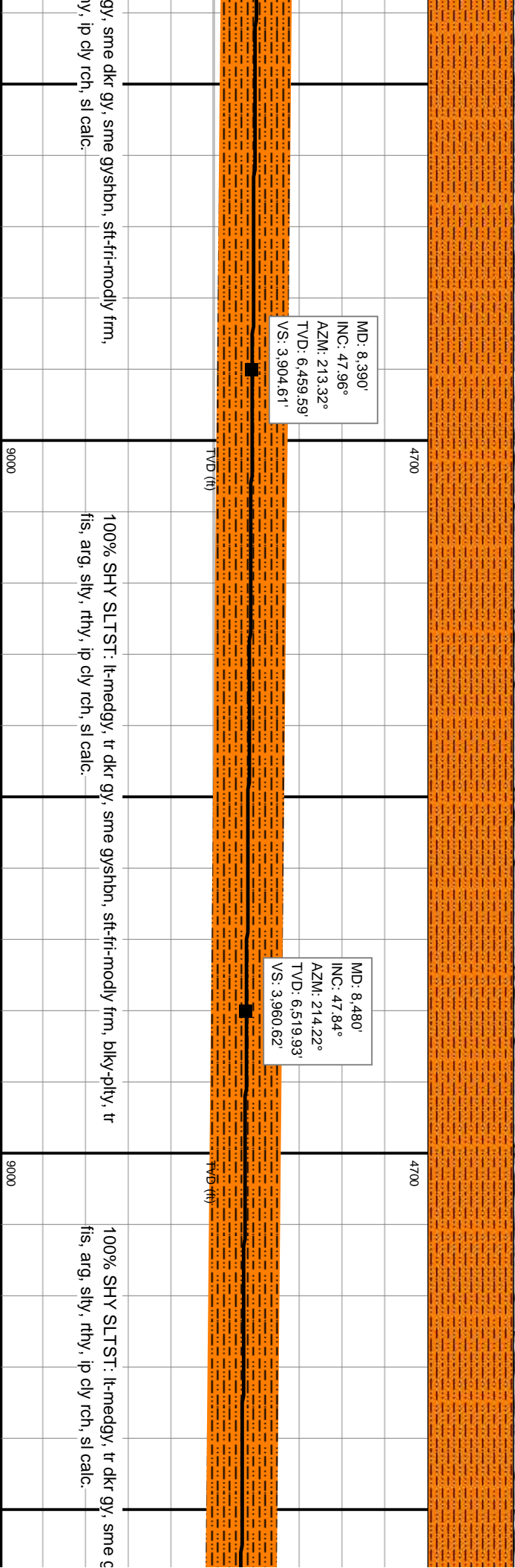
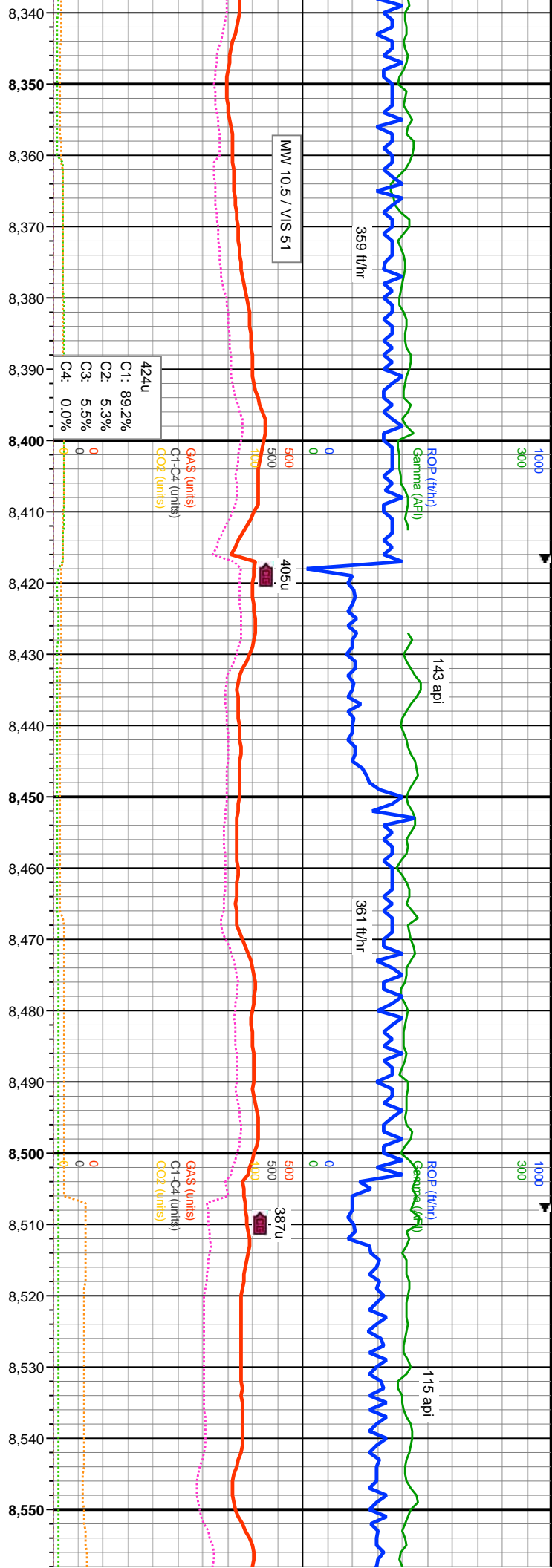


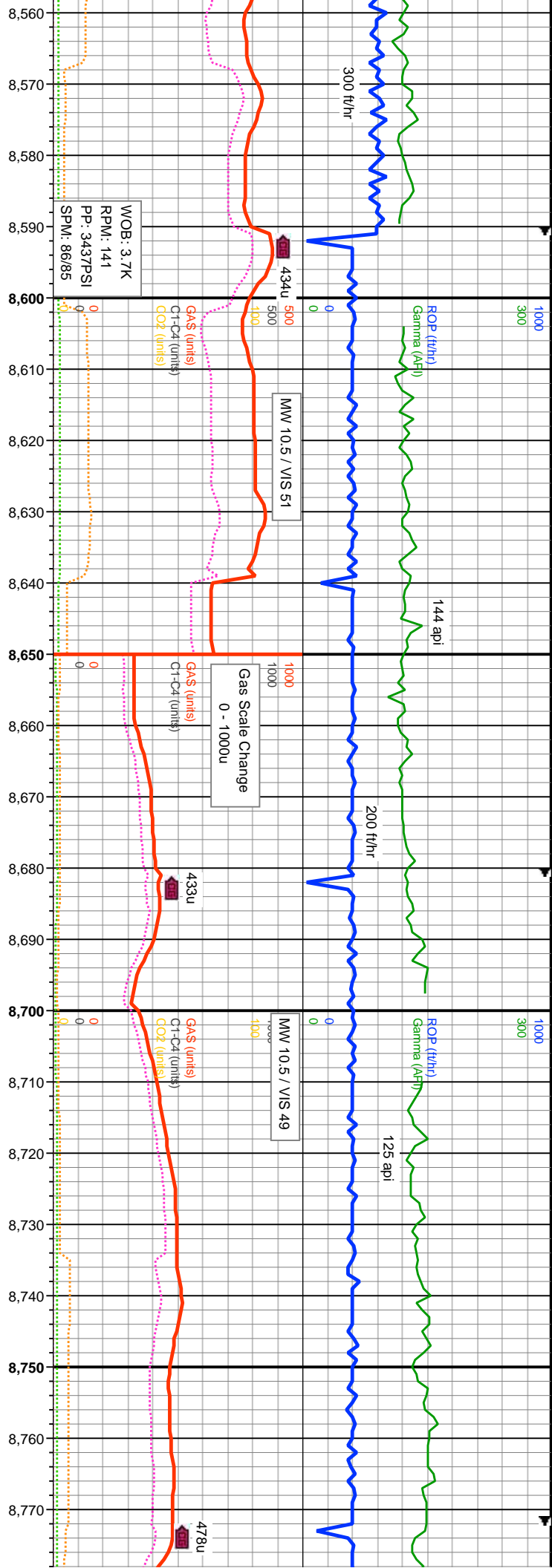




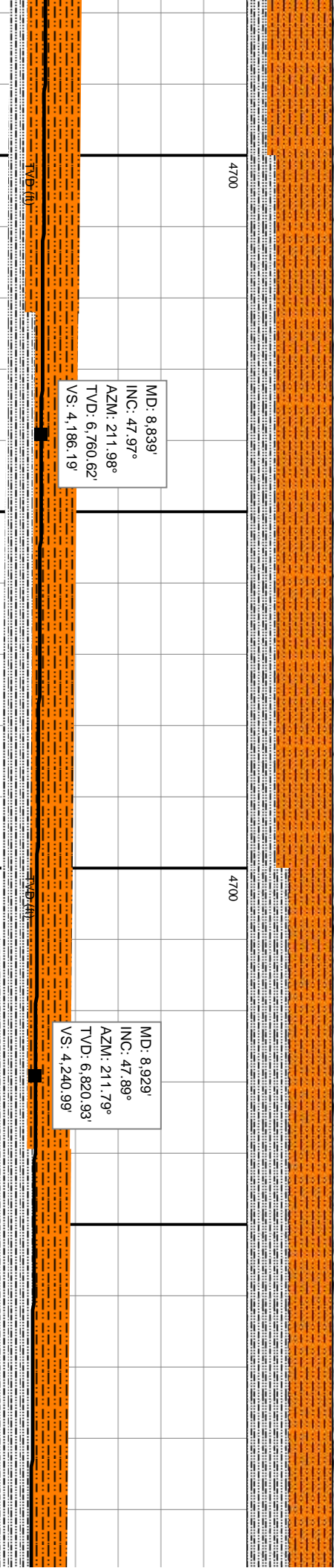
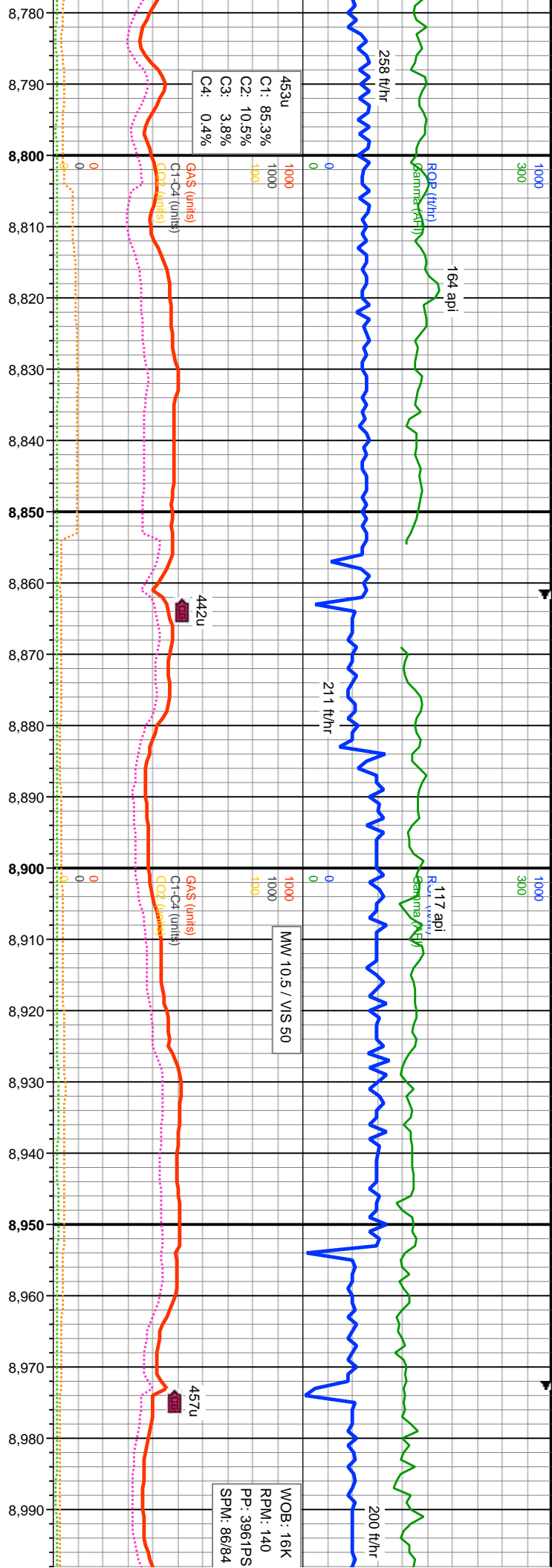




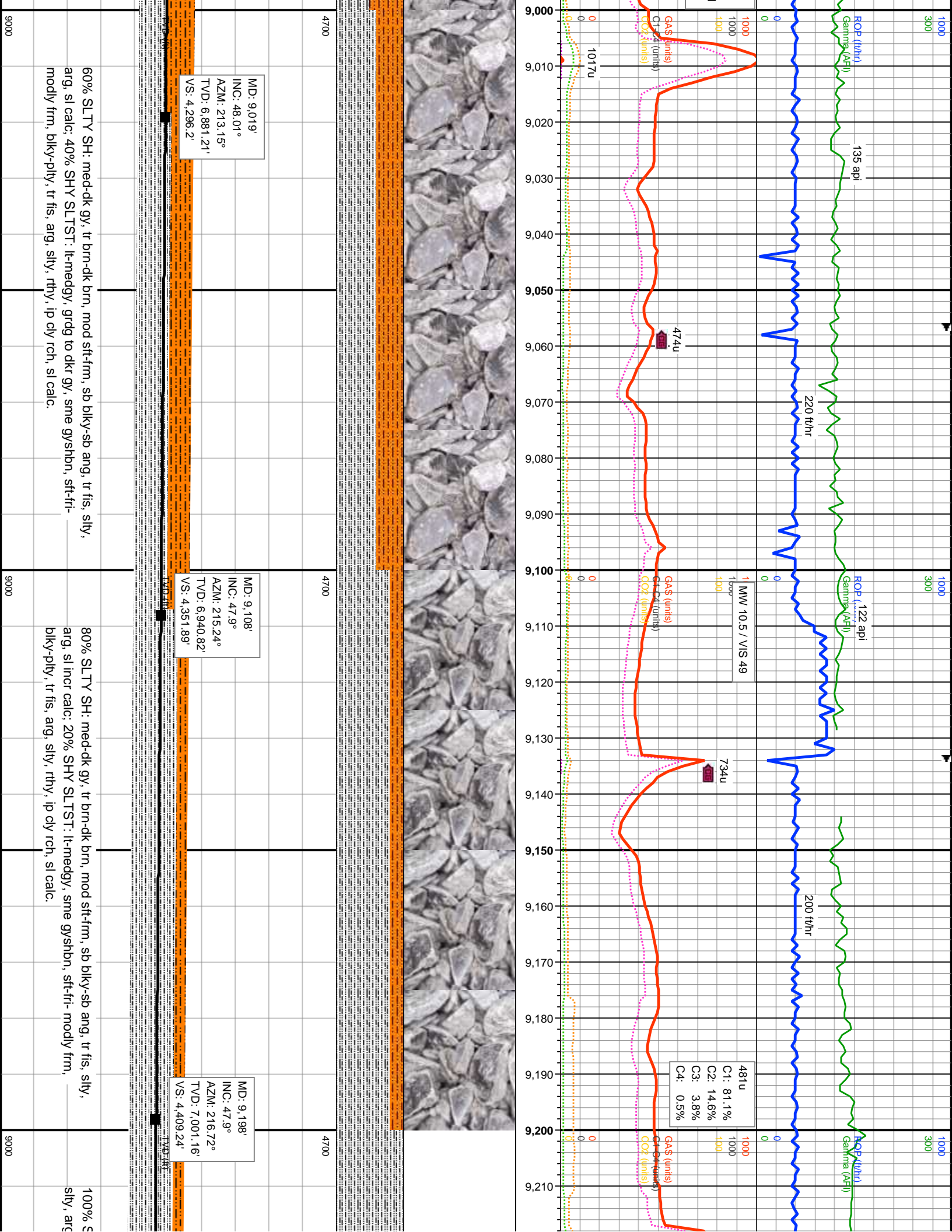


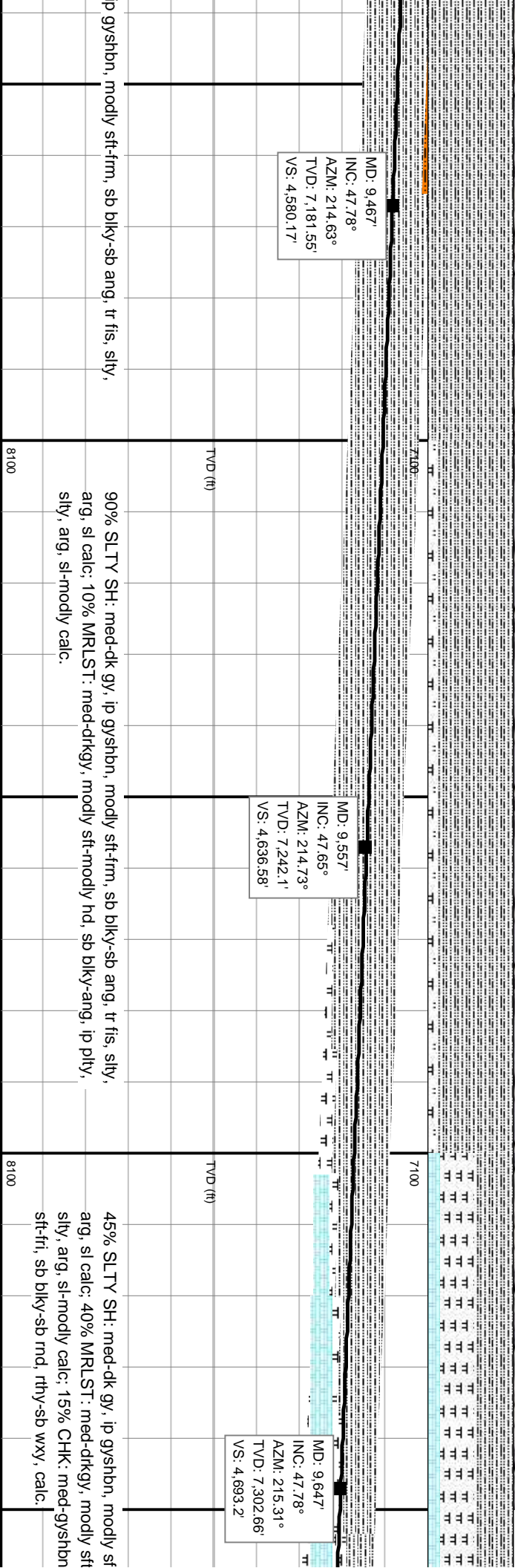
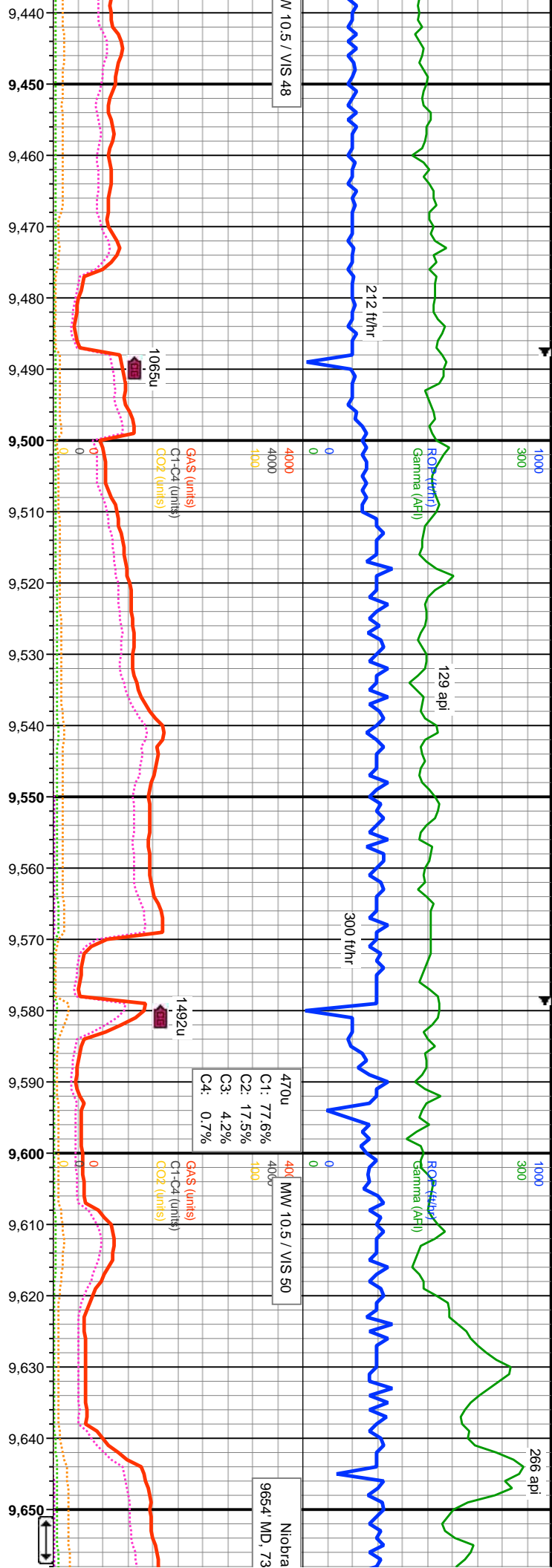


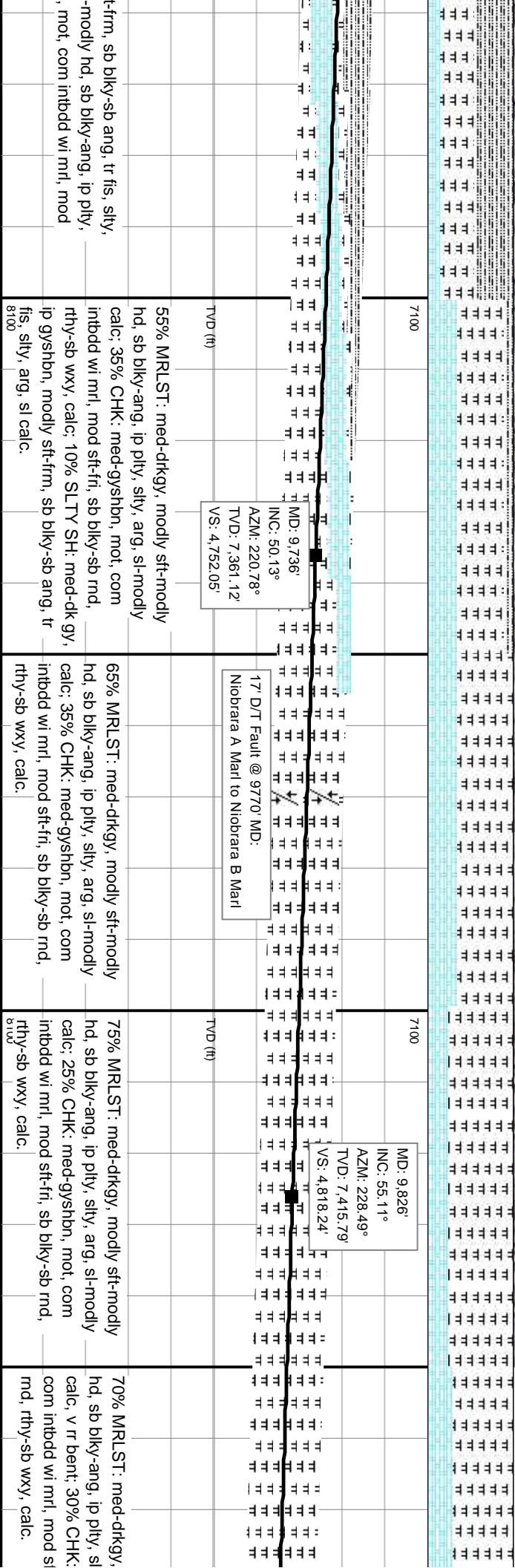
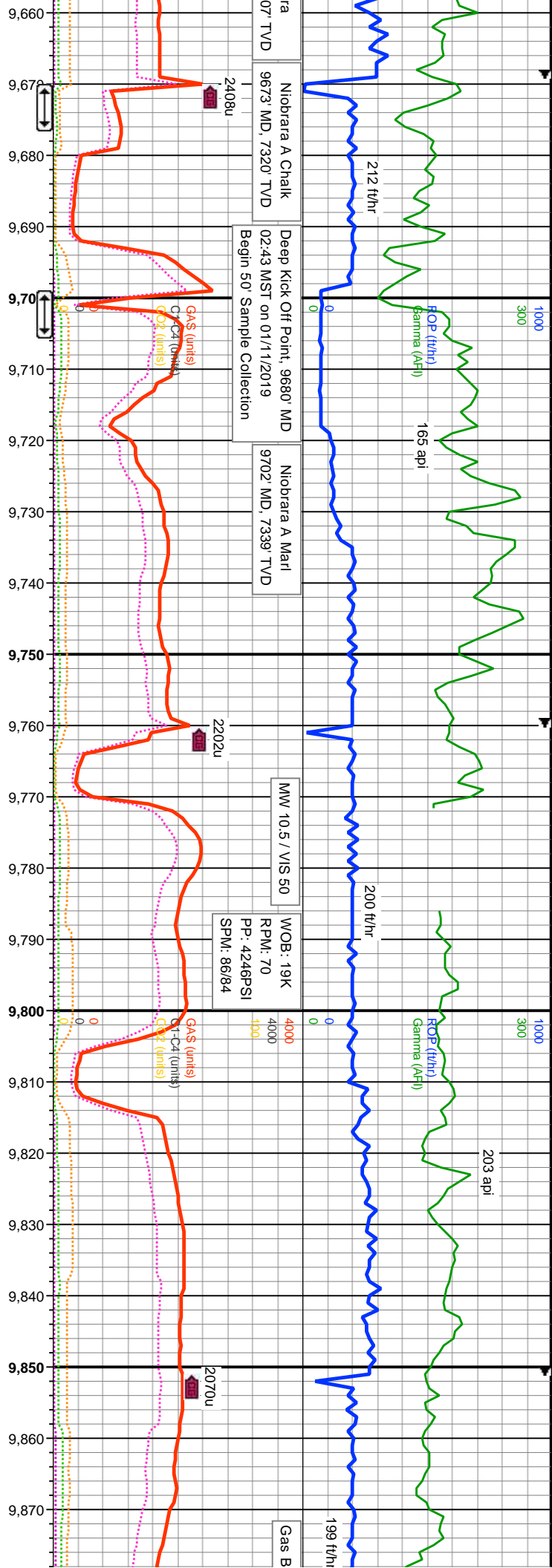
MD: 8,570' INC: 47.88° AZM: 216.51° TVD: 6,580.32' VS: 4,017.57'	MD: 8,660' INC: 47.89° AZM: 216.01° TVD: 6,640.68' VS: 4,075.09'	MD: 8,749' INC: 47.93° AZM: 213.07° TVD: 6,700.34' VS: 4,130.94'
85% SHY SLTST: lt-medgy, tr dkr gy, sme gysbhn, sft-fri-modly frm, blk-ply, tr fis, arg, silty, rthy, ip cly rch, sl calc, 15% SLTY SH: med-dk gy, mod sft-frm, sb blk-sb ang, tr fis, silty, arg, sl calc.	85% SHY SLTST: lt-medgy, tr dkr gy, sme gysbhn, sft-fri-modly frm, blk-ply, tr fis, arg, silty, rthy, ip cly rch, sl calc, 15% SLTY SH: med-dk gy, mod sft-frm, sb blk-sb ang, tr fis, silty, arg, sl calc.	75% SHY SLTST: lt-medgy, grgd to dkr gy, sme gysbhn, sft-fri-modly frm, blk-ply, tr fis, arg, silty, rthy, ip cly rch, sl calc, 25% SLTY SH: mod sft-frm, sb blk-sb ang, tr fis, silty, arg, sl calc.

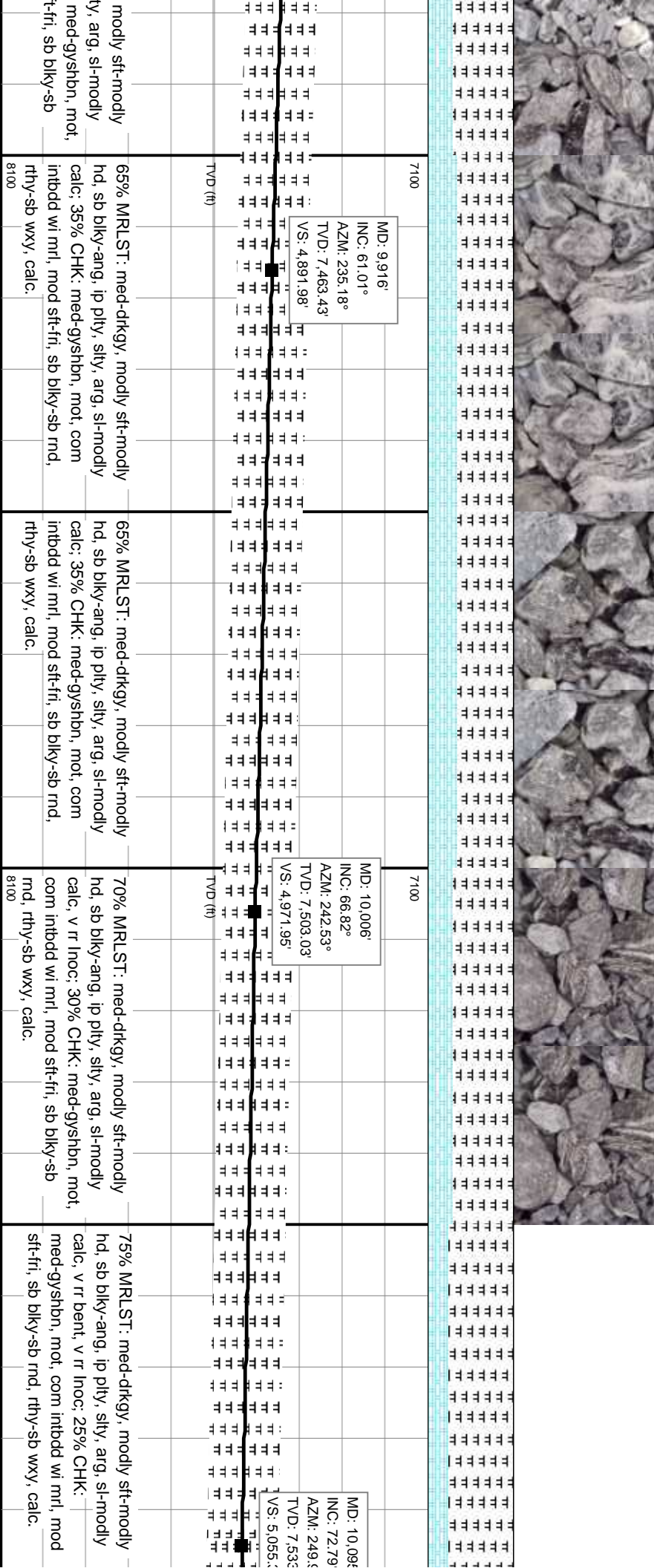
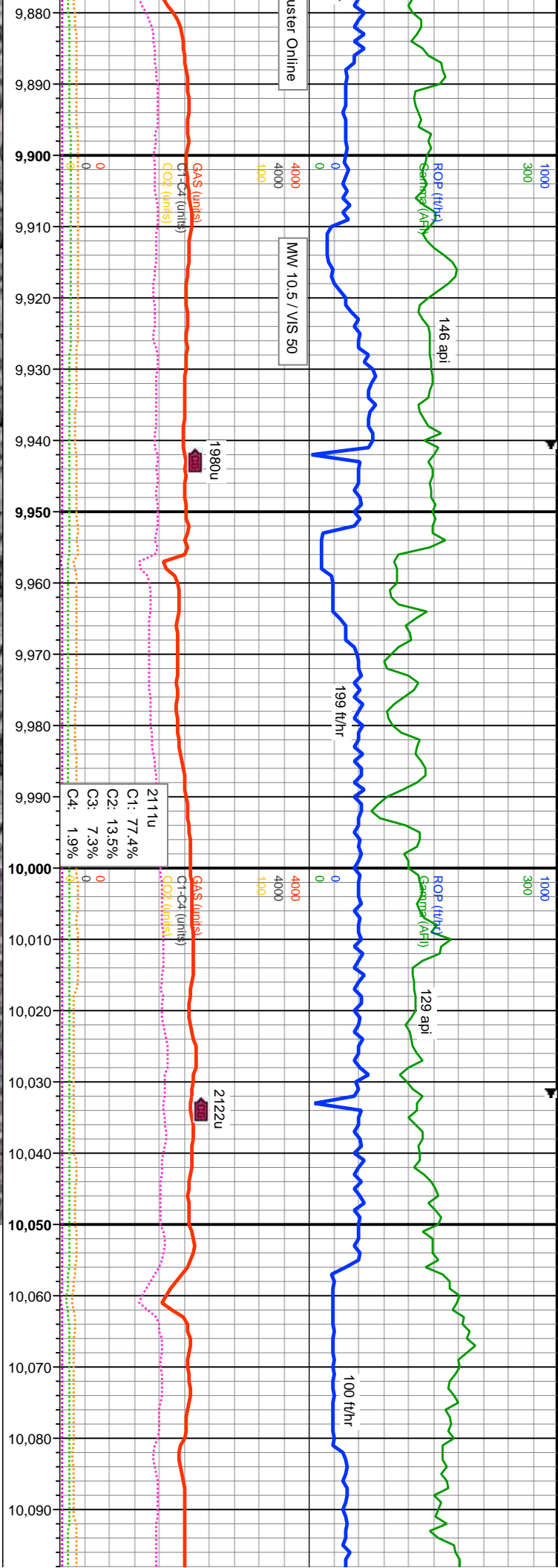


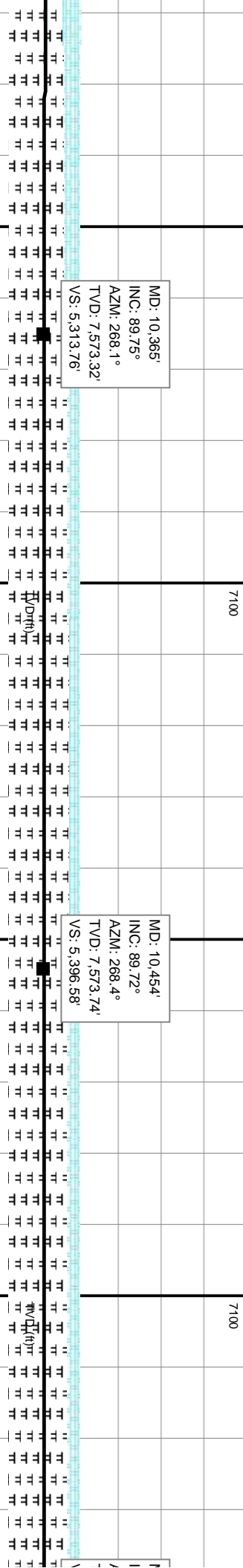
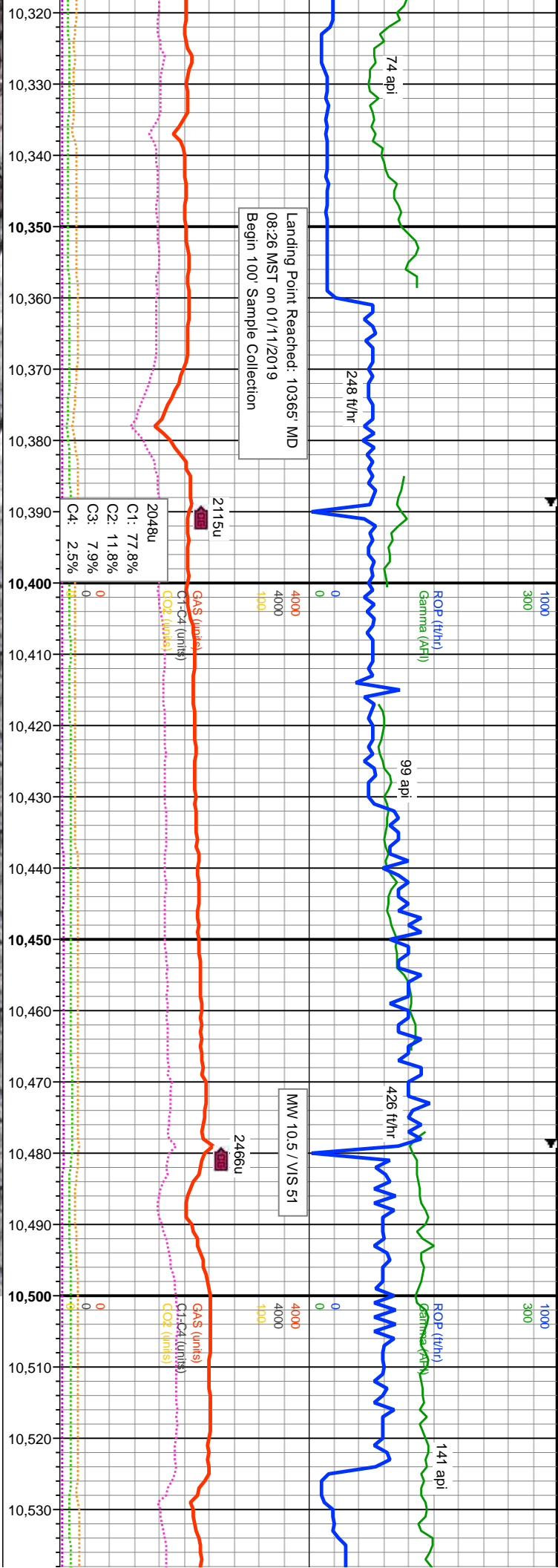
mod firm, med-dk gy, mod
65% SHY SLTST: lt-medgy, grdg to dkr gy, sme gyshbn, sft-fr- modly frm, blkly-pty, tr fis, arg, silty, ip cly rch, sl calc, 35% SLTY SH: med-dk gy, mod sft-frm, sb blkly-sb ang, tr fis, silty, arg, sl calc.
50% SLTY SH: med-dk gy, tr brn-dk brn, mod sft-frm, sb blkly-sb ang, tr fis, silty, arg, sl calc, 50% SHY SLTST: lt-medgy, grdg to dkr gy, sme gyshbn, sft-fr- modly frm, blkly-pty, tr fis, arg, silty, rthy, ip cly rch, sl calc.









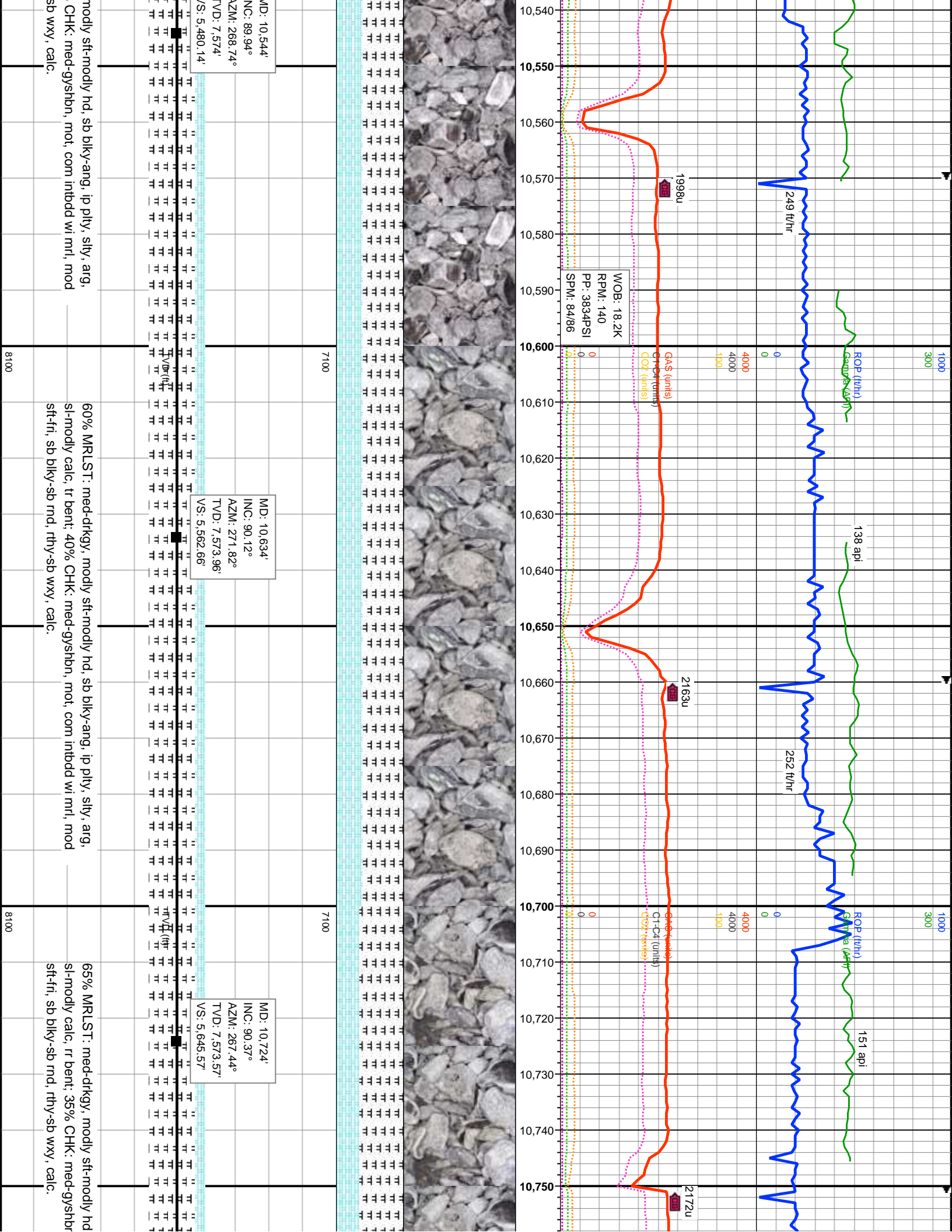


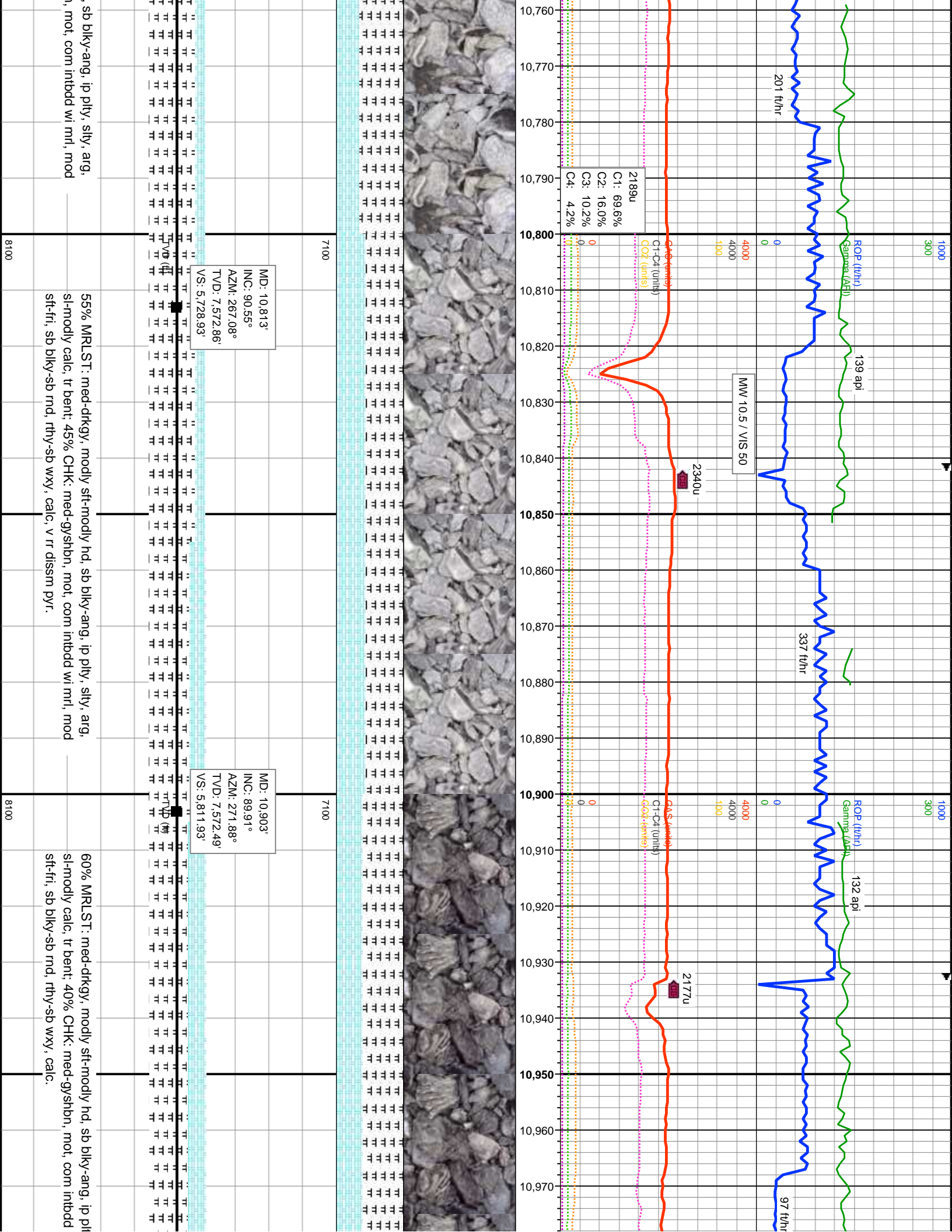
med-drkg, modly sft-modly
ip pty, slty, arg, si-modly
med-gyshbn, mot, com
od sft-fri, sb blkly-sb rd,
bent.

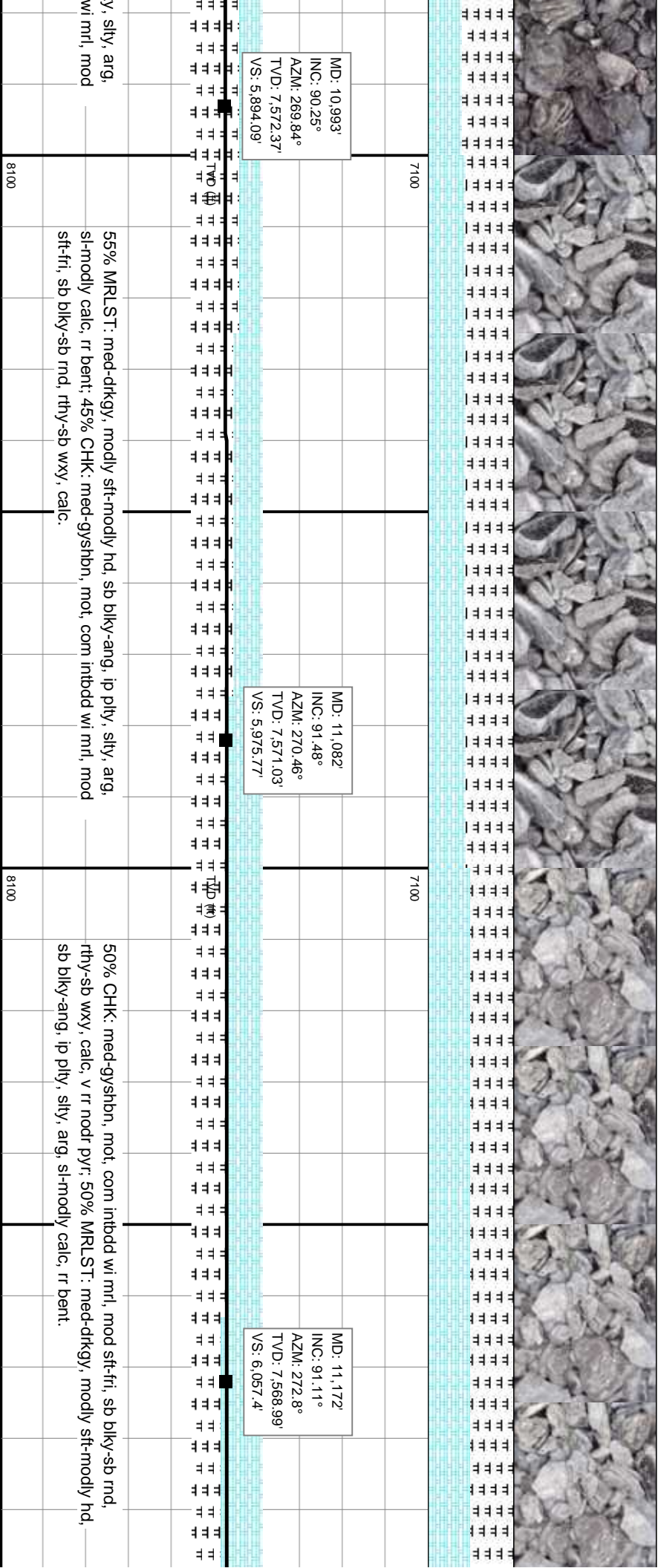
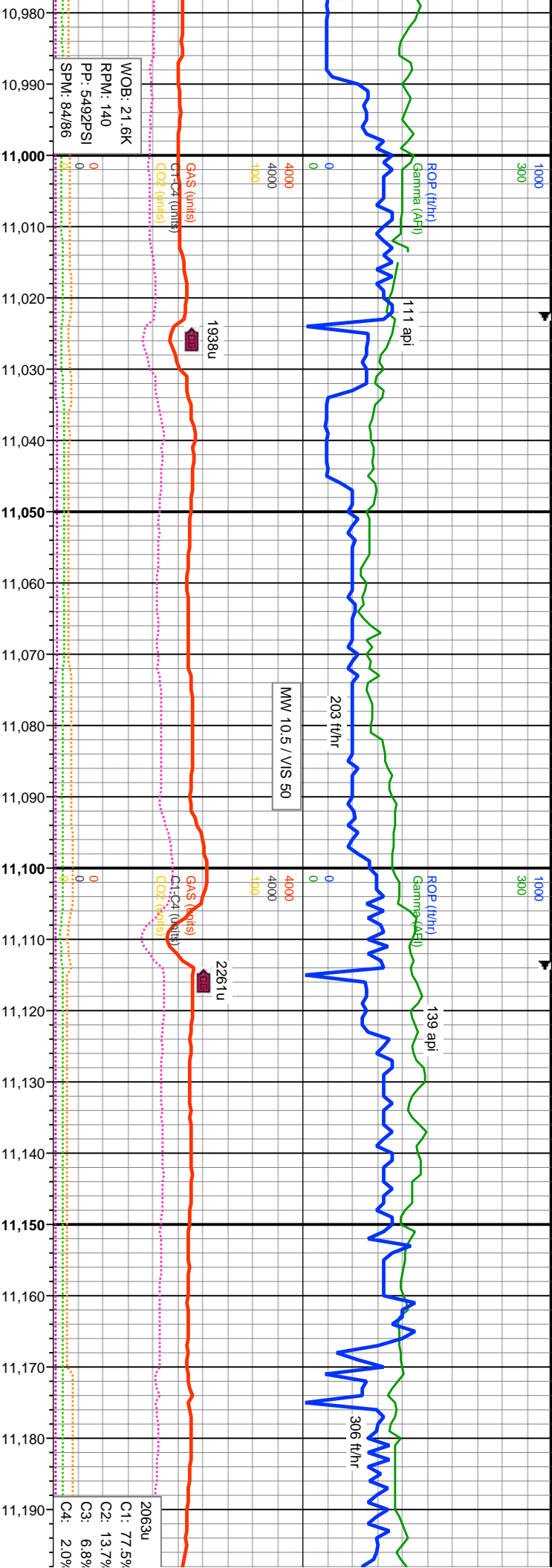
55% CHK: med-gyshbn, mot, com intbodd
wi mrl, mod sft-fri, sb blkly-sb rd, rthy-sb
wxy, calc, v rr dissim pyr; 45% MRLST:
med-drkg, modly sft-modly hd, sb
blkly-ang, ip pty, slty, arg, si-modly calc, v rr
bent.

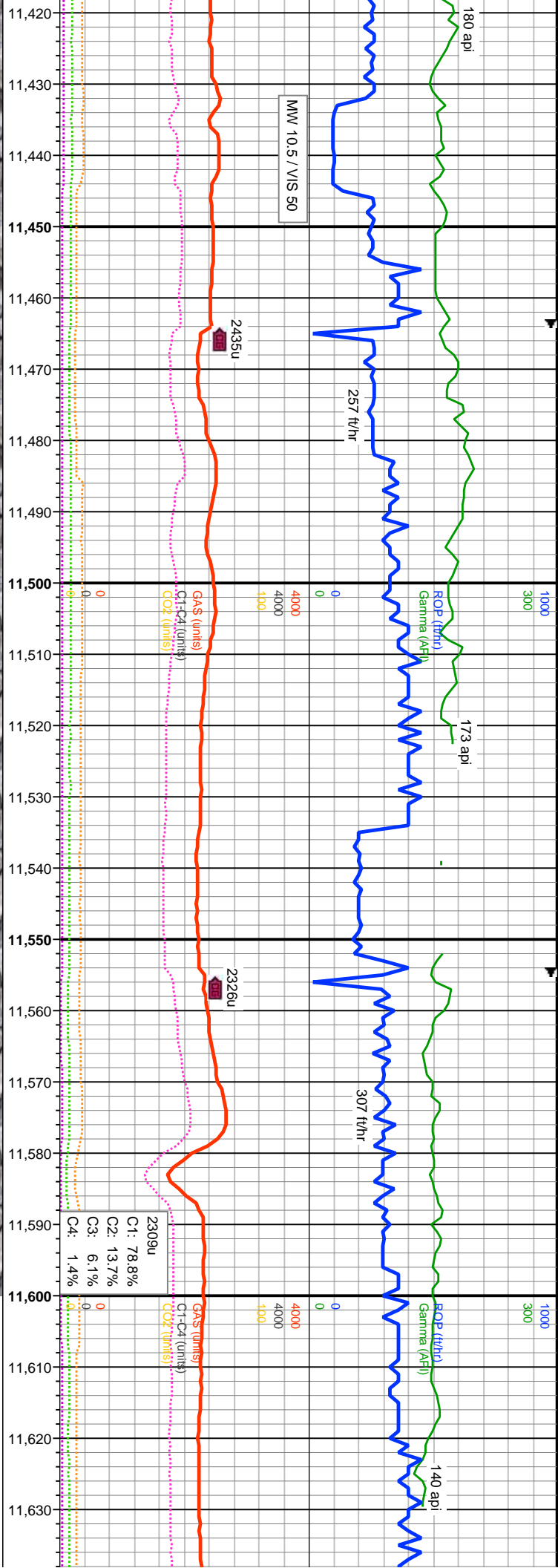
50% CHK: med-gyshbn, mot, com intbodd wi mrl, mod sft-fri, sb blkly-sb rd,
rthy-sb wxy, calc, 50% MRLST: med-drkg, modly sft-modly hd, sb blkly-ang, ip
pty, slty, arg, si-modly calc, v rr bent.

60% MRLST: med-drkg, l
si-modly calc, tr bent; 40%
sft-fri, sb blkly-sb rd, rthy-









MD: 11,441'
INC: 90.71°
AZM: 272.62°
TVD: 7,564.97'
VS: 6,299.04'

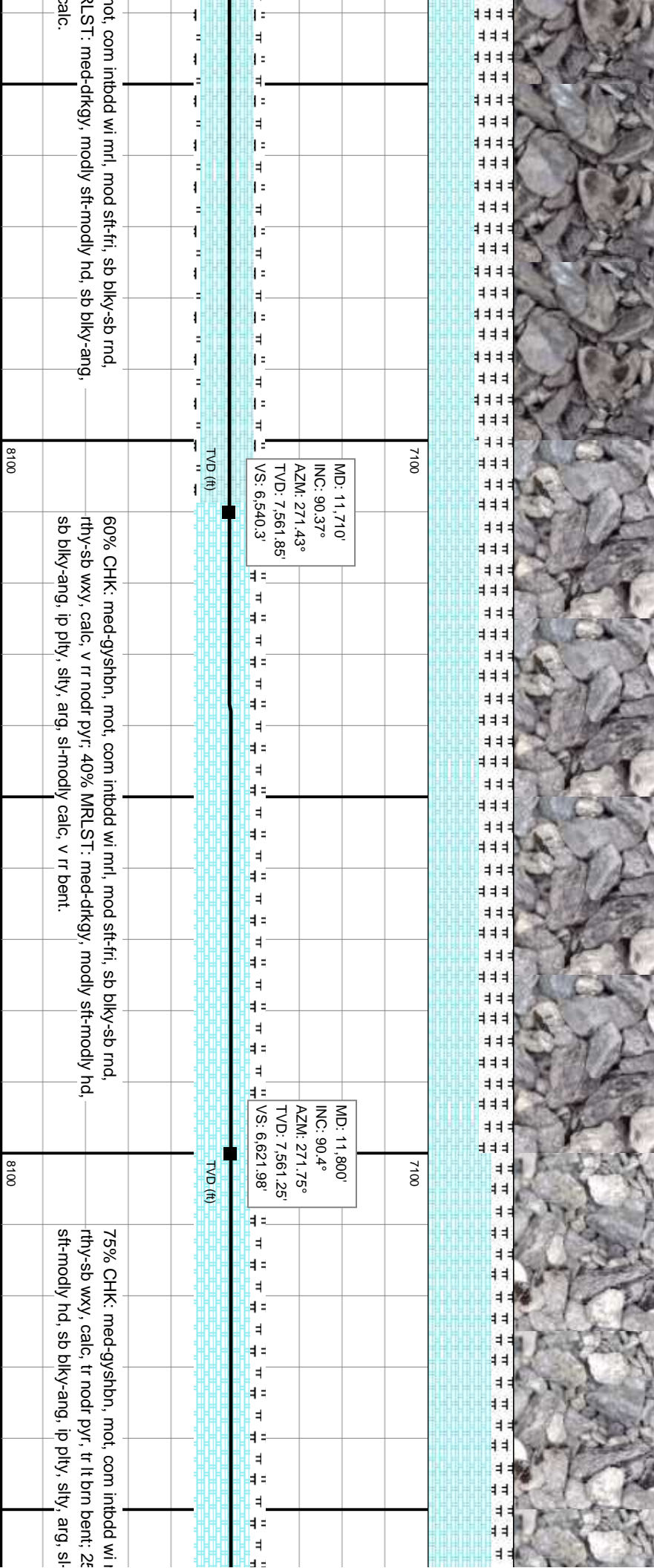
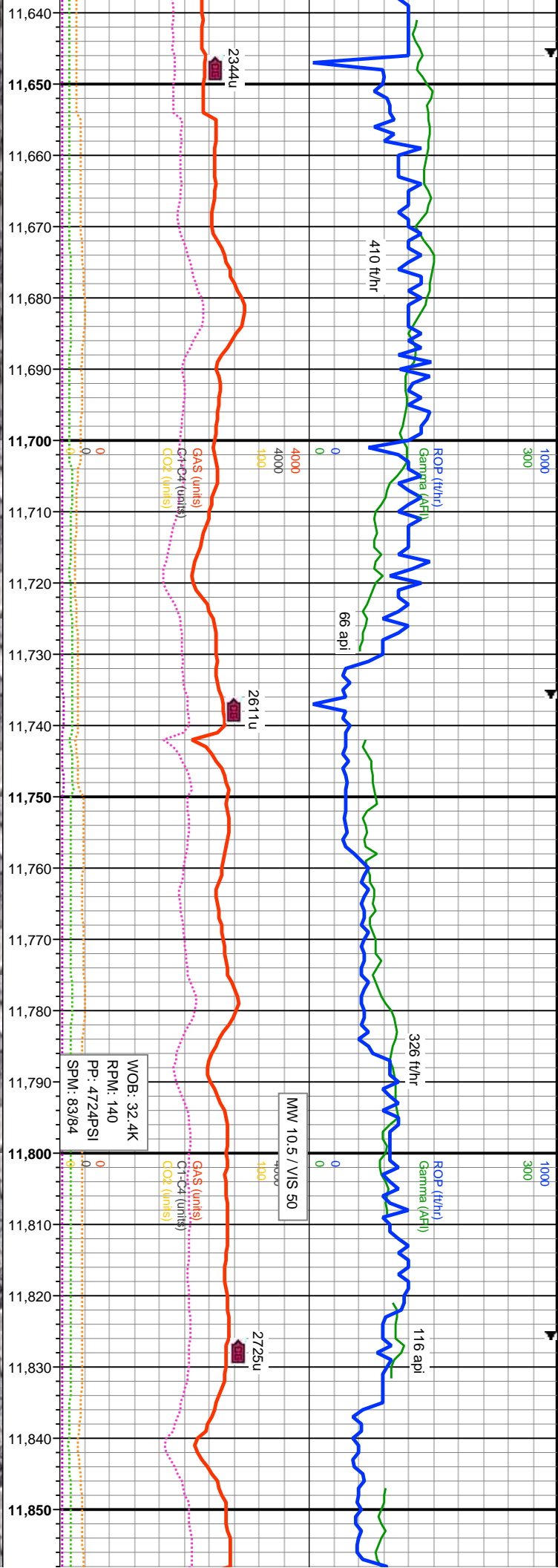
MD: 11,531'
INC: 90.8°
AZM: 273.51°
TVD: 7,563.78'
VS: 6,379.72'

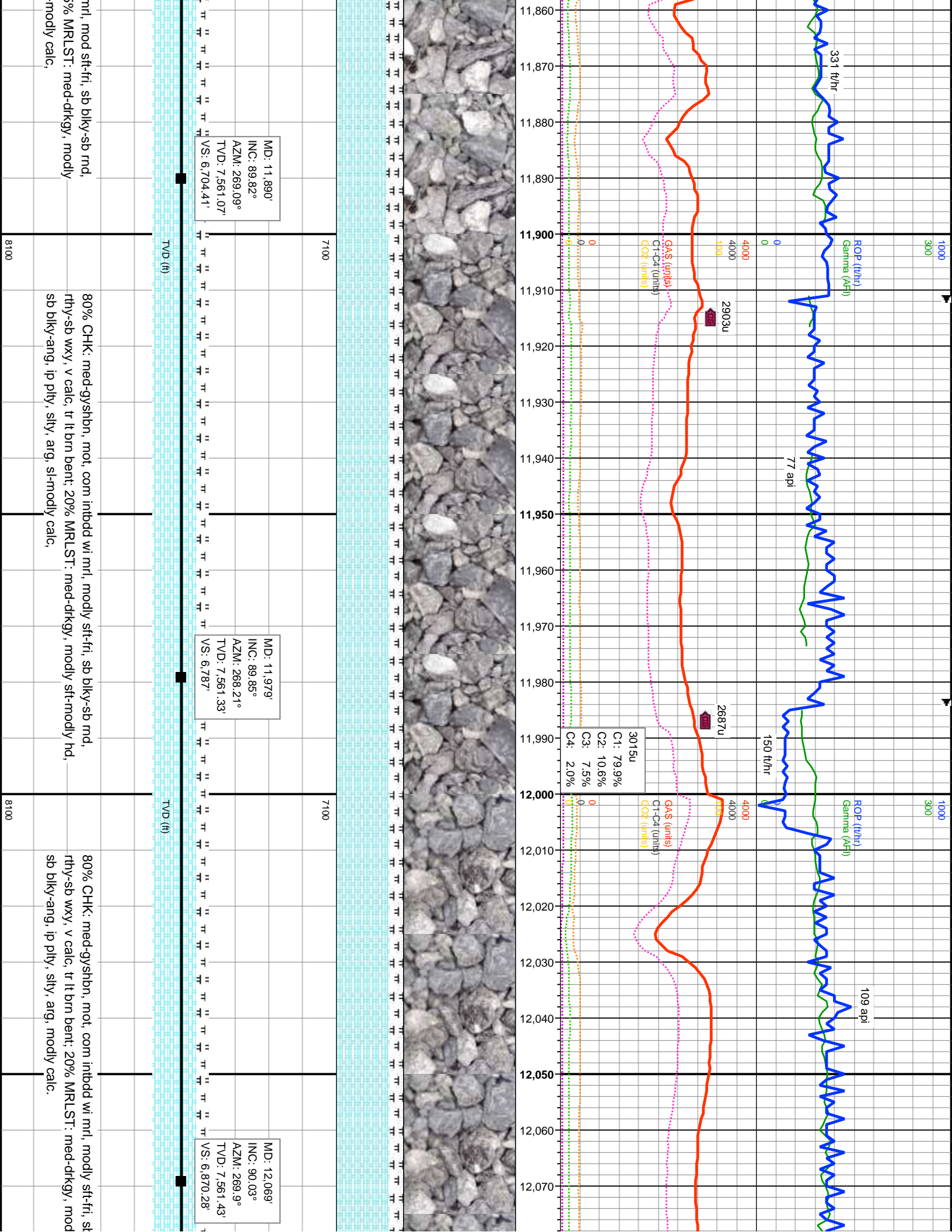
MD: 11,621'
INC: 90.65°
AZM: 273.48°
TVD: 7,562.64'
VS: 6,460.1'

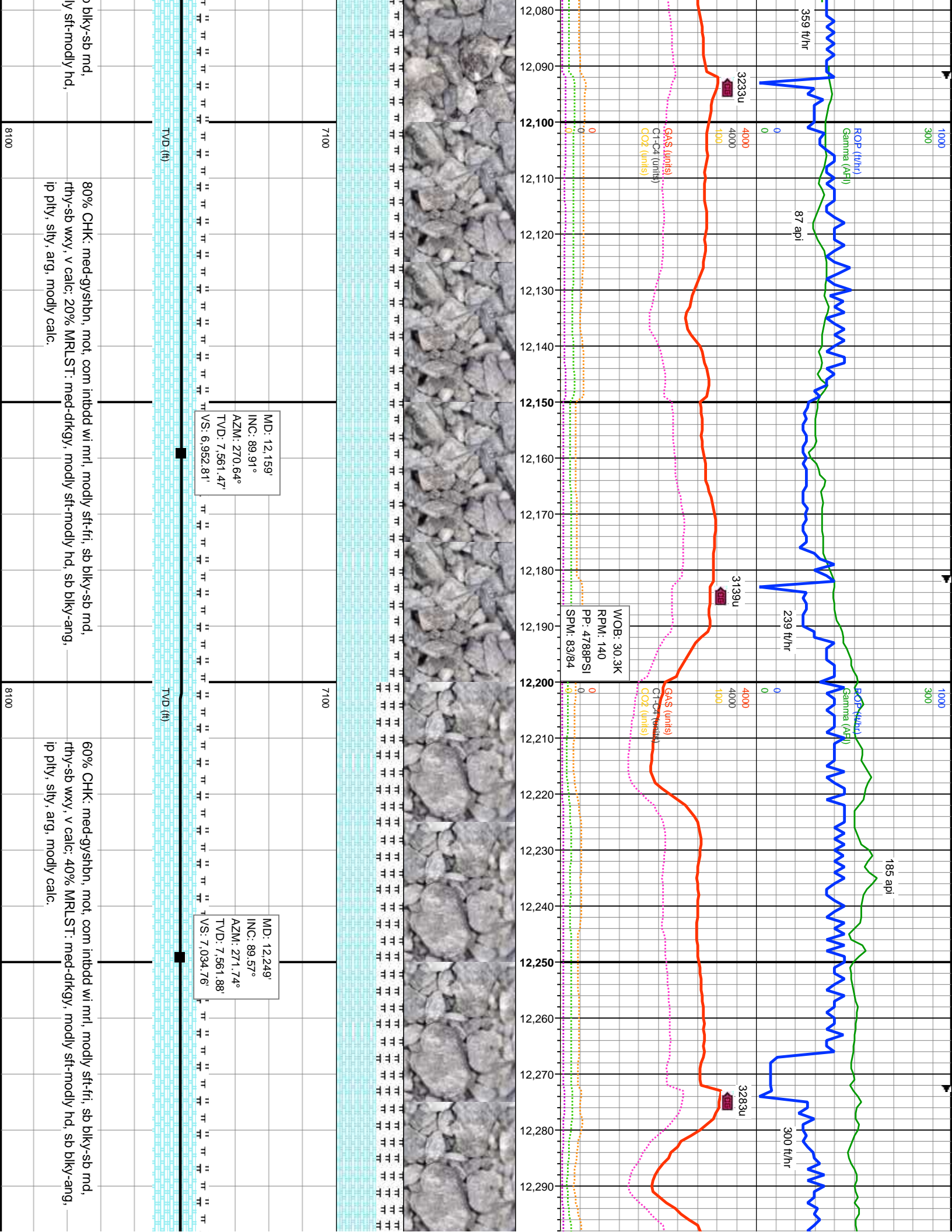
RLST: med-dkgy, modly sft-noddy hd, sb blk-y-ang, ip plty, silty, arg,
sl-modly calc, 40% CHK: med-gyshbn, mot, com intbdd wi mrl, mod
b blk-y-sb rnd, rthy-sb wxy, calc, v rr dissim pyr.

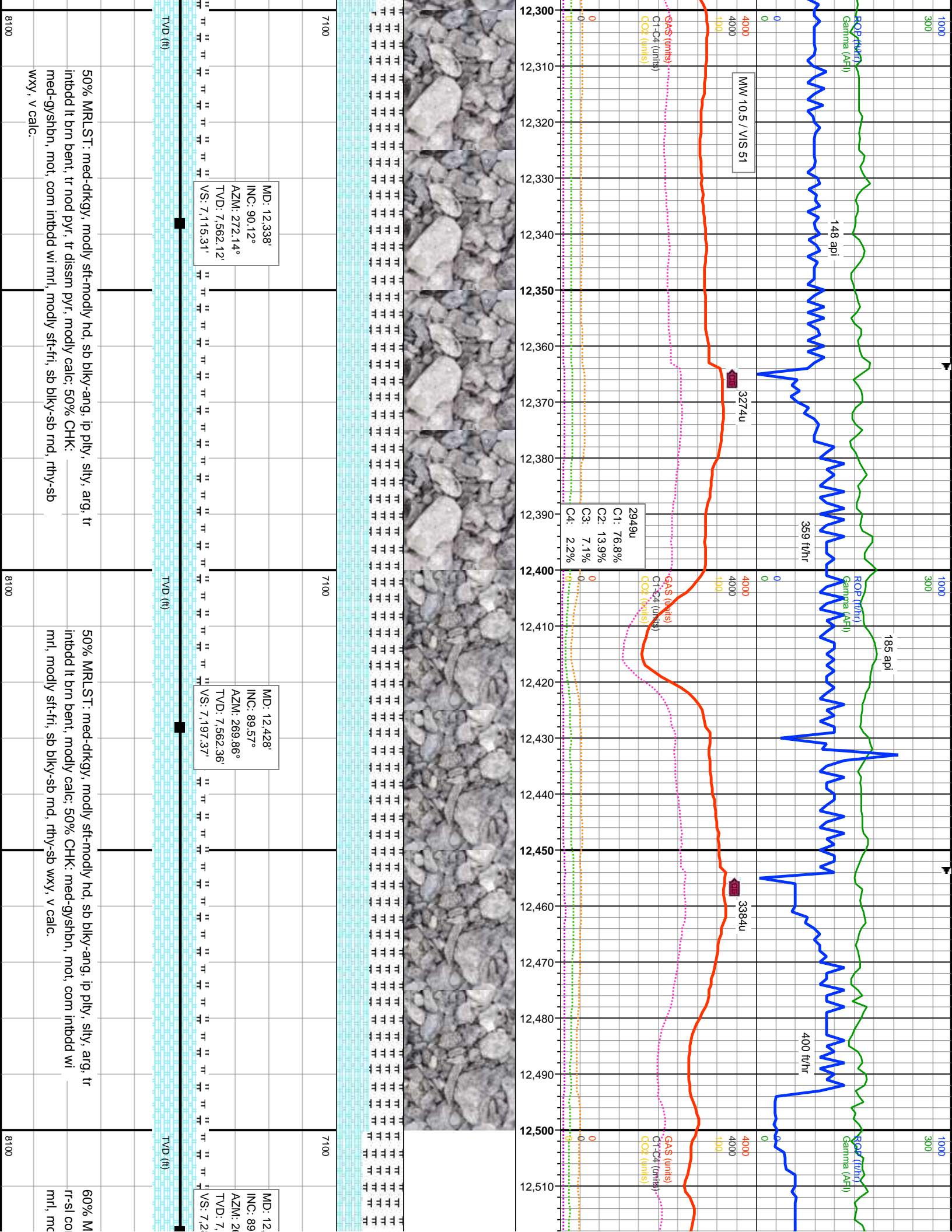
50% MRLST: med-dkgy, modly sft-noddy hd, sb blk-y-ang, ip plty, silty, arg,
sl-modly calc, v rr bent; 50% CHK: med-gyshbn, mot, com intbdd wi mrl,
mod sft-trl, sb blk-y-sb rnd, rthy-sb wxy, calc.

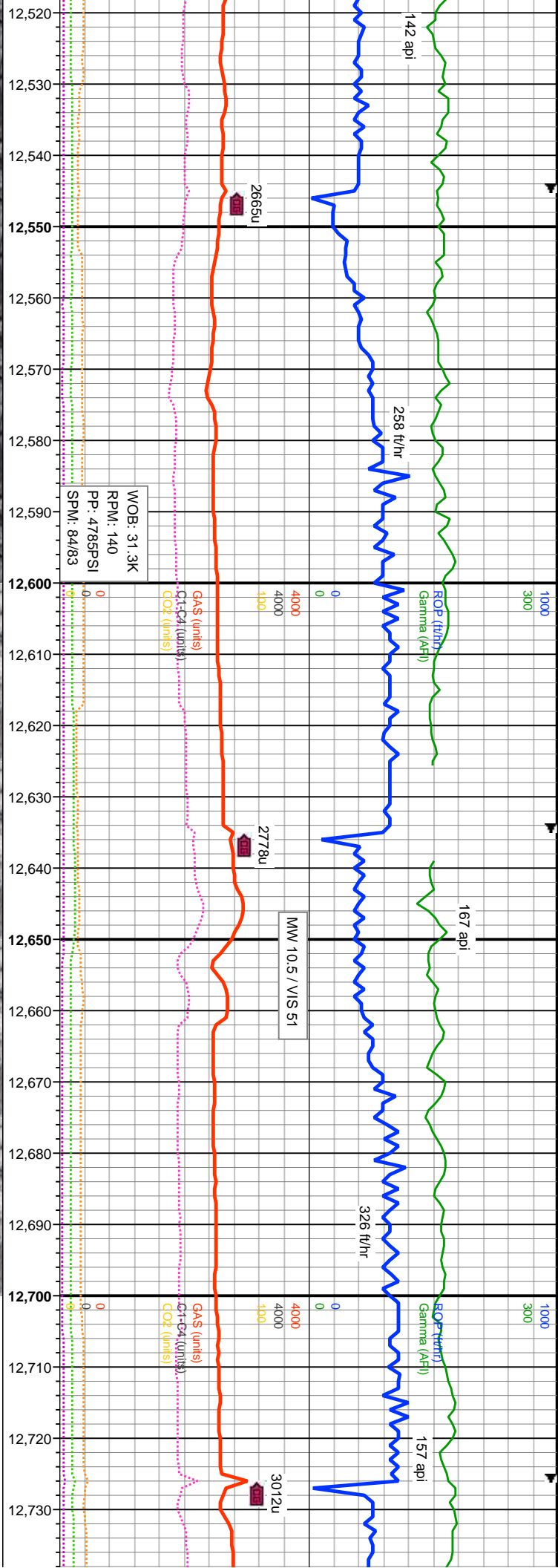
55% CHK: med-gyshbn, n
rthy-sb wxy, calc, 45% MF
ip plty, silty, arg, sl-modly c



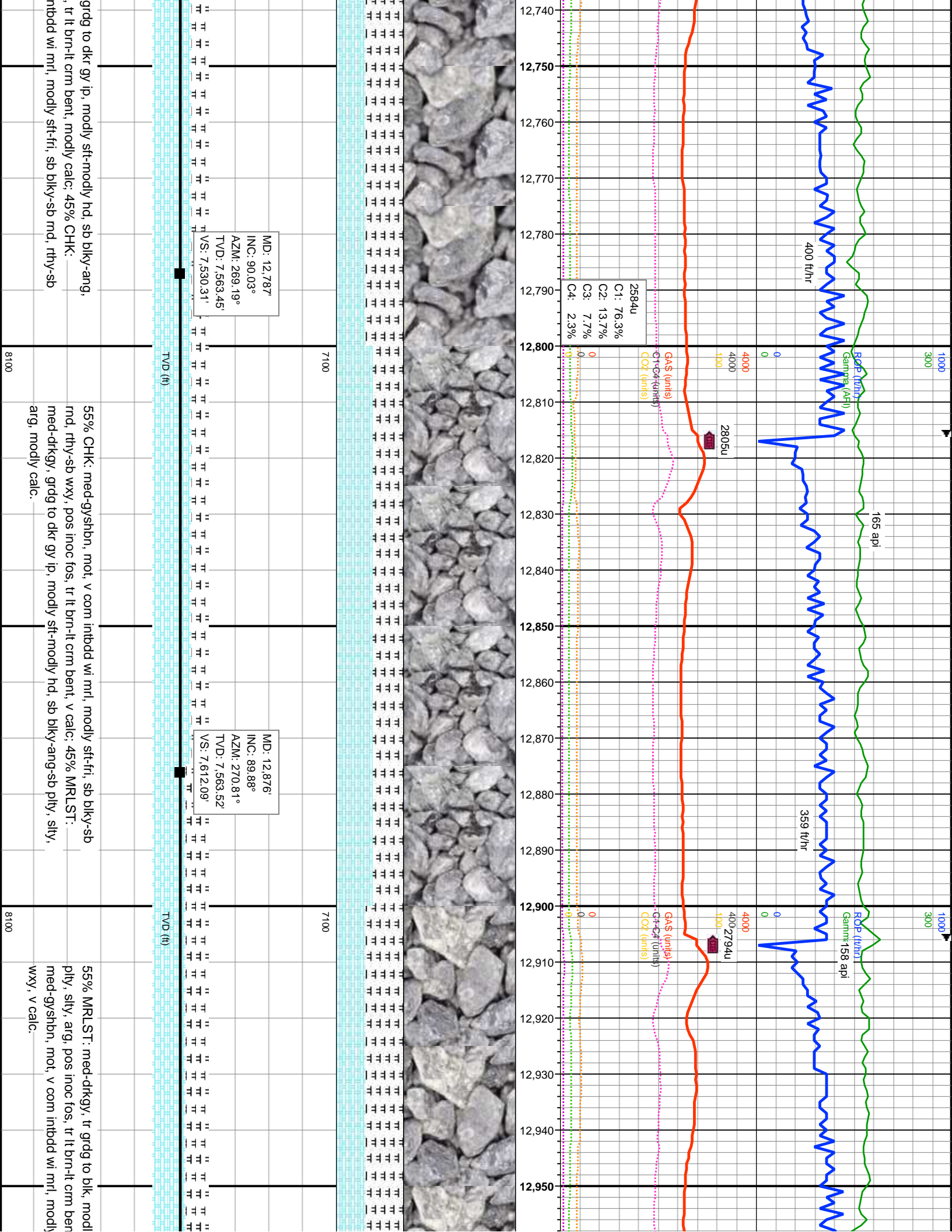


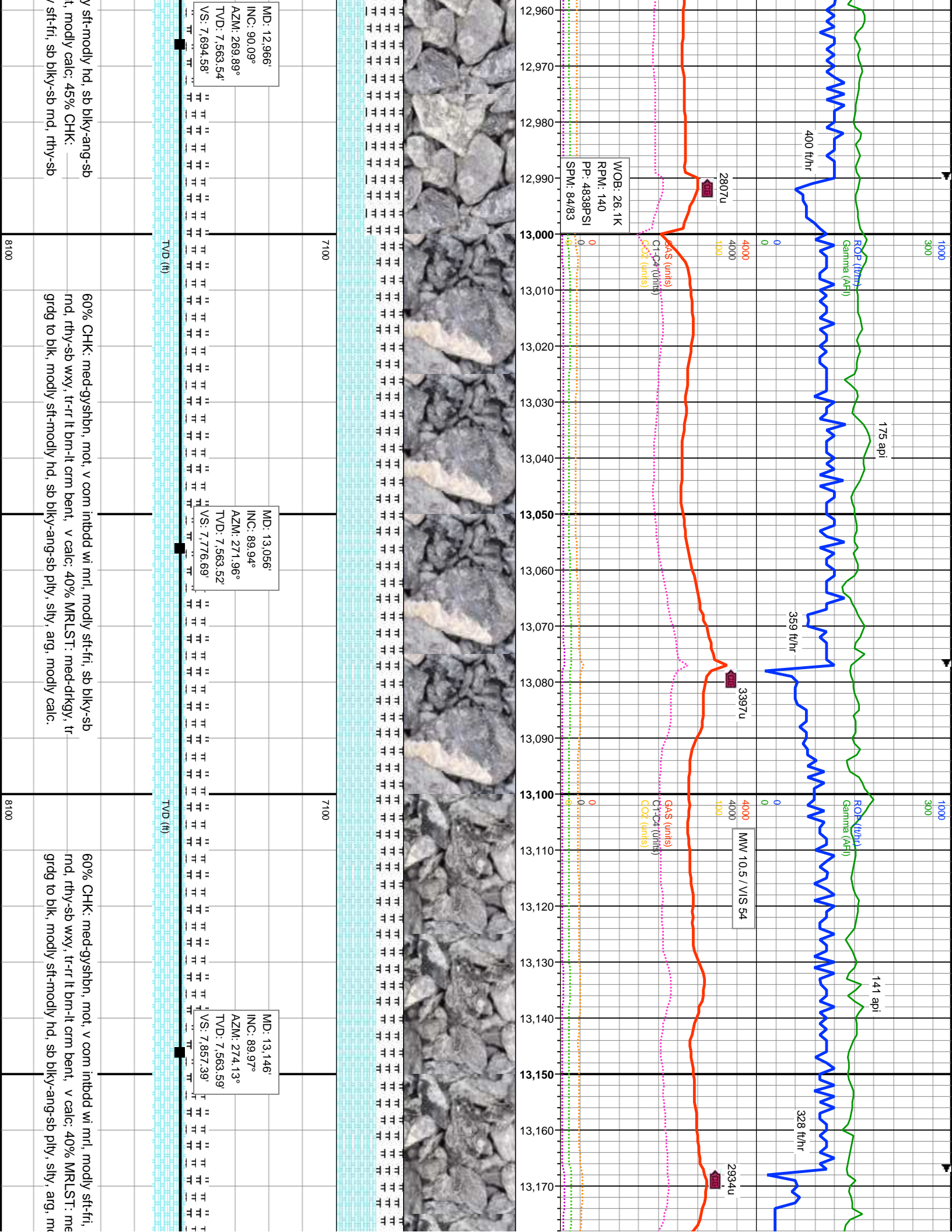


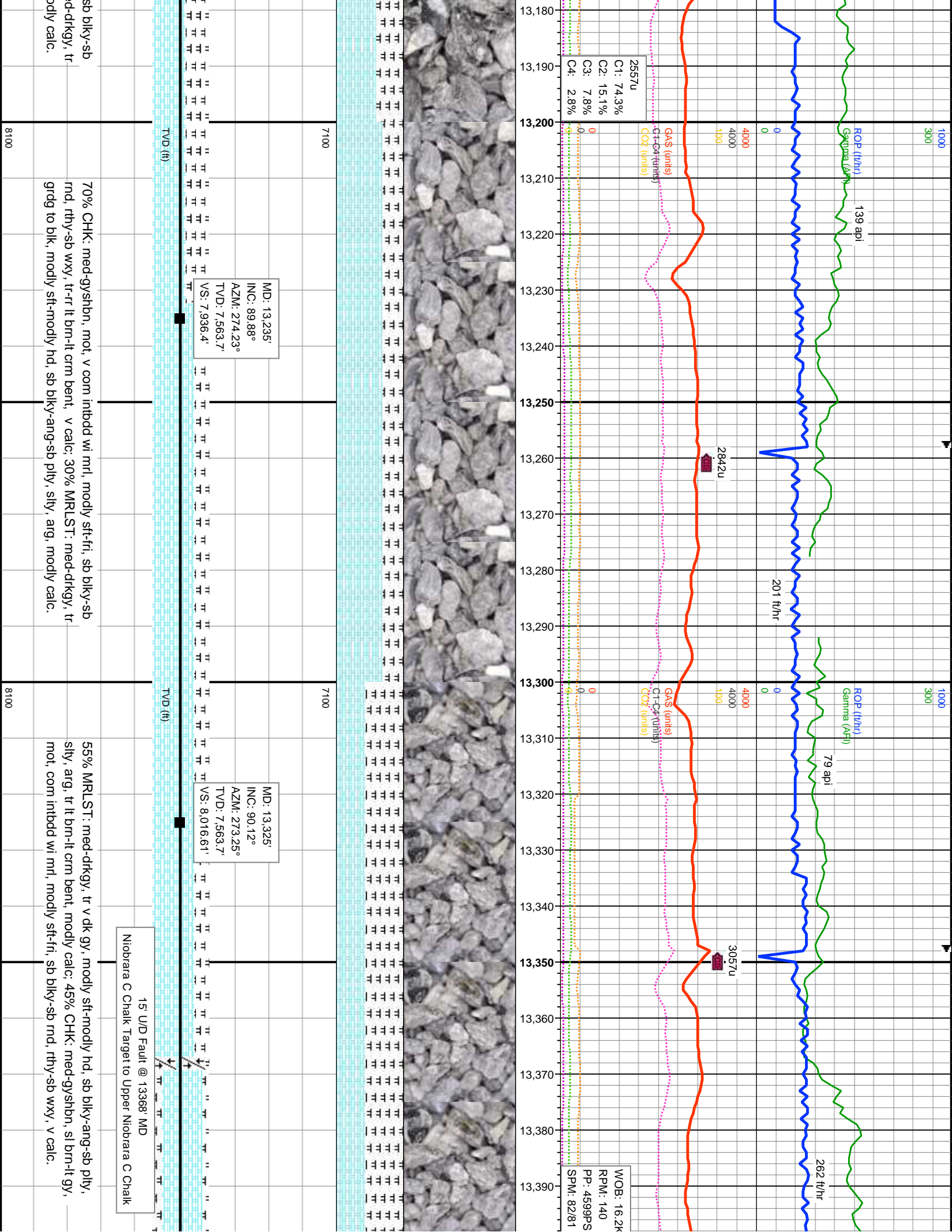


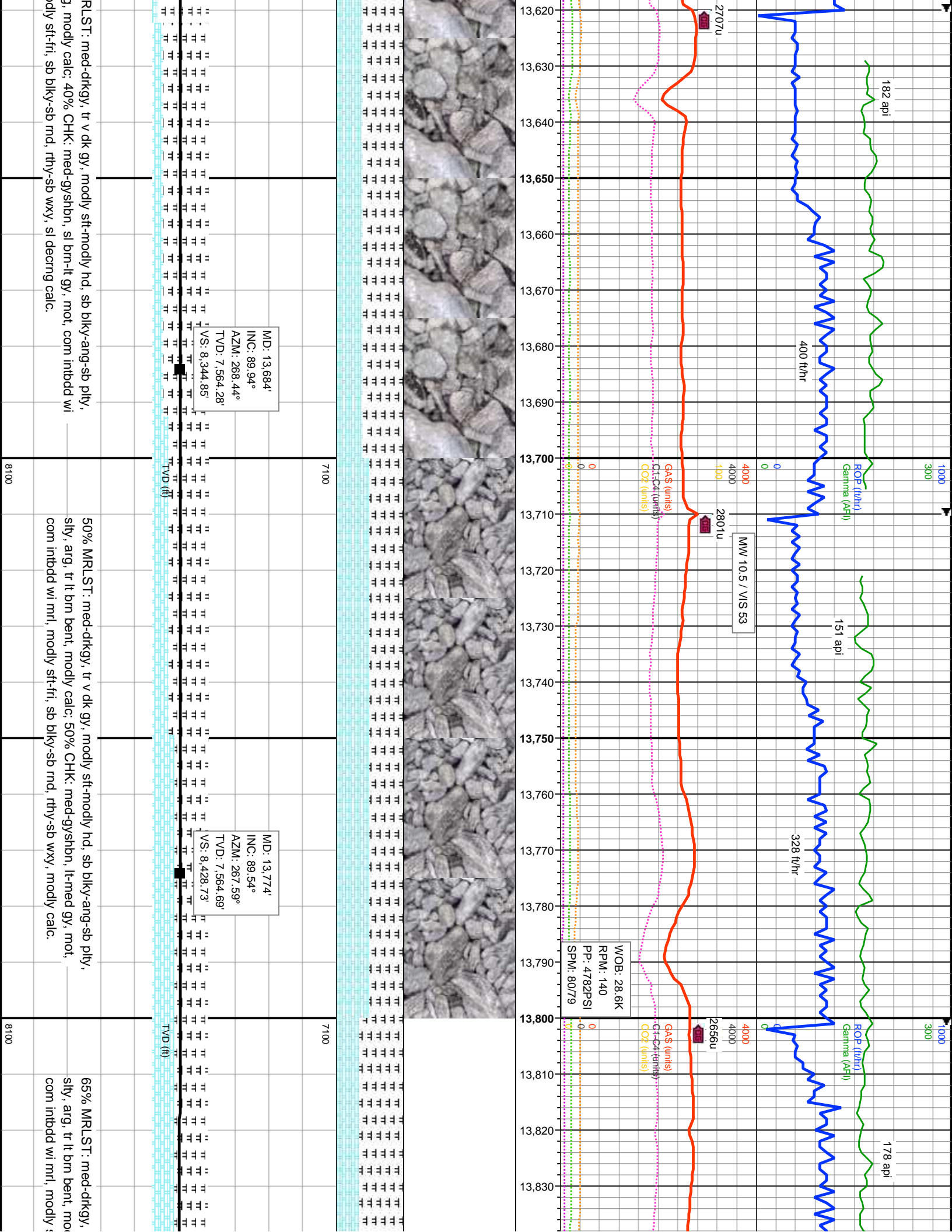


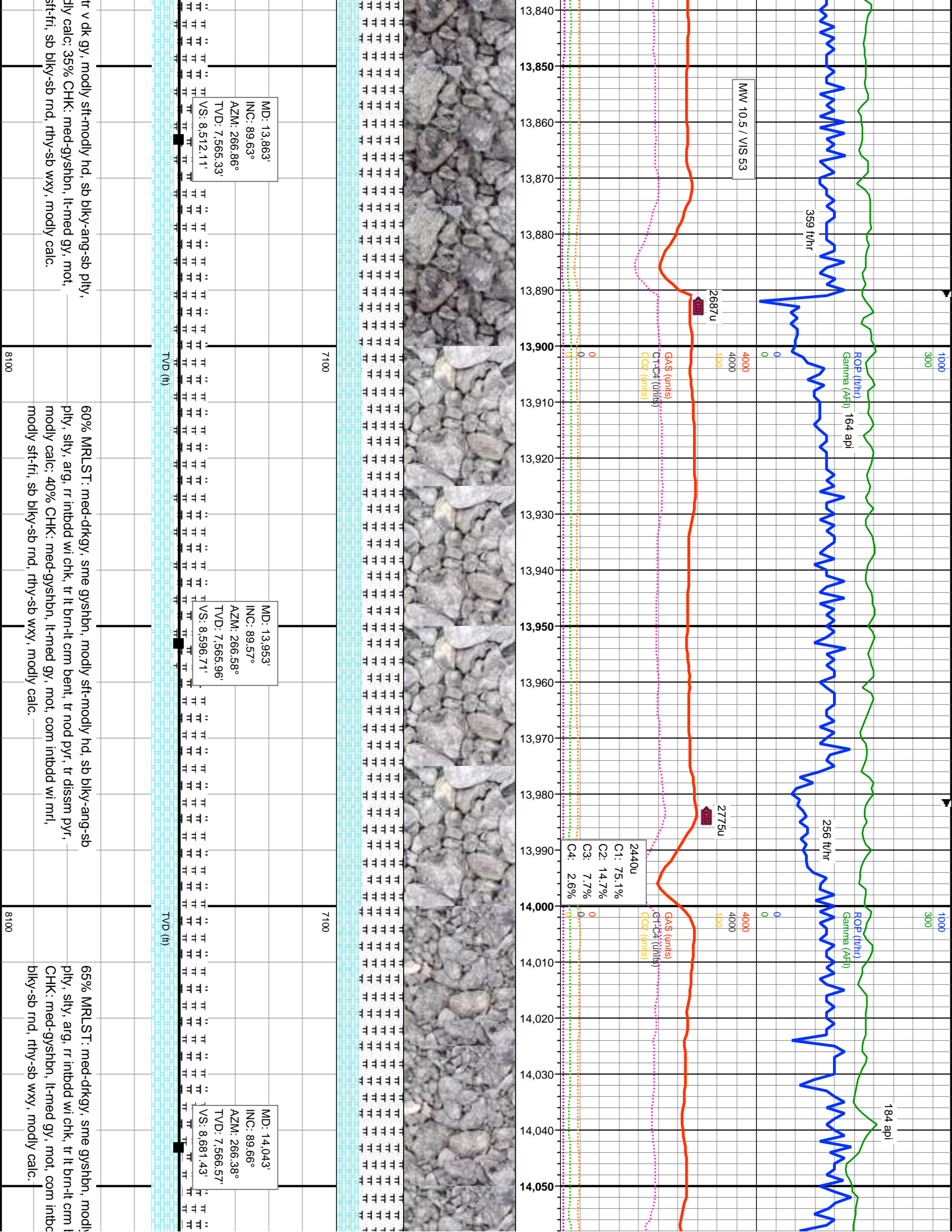
518'		7100		7100	
94°		MD: 12.607'		MD: 12.697'	
566.93°		INC: 89.88°		INC: 89.69°	
5662.75'		AZM: 269.24°		AZM: 269.19°	
31.03'		TVD: 7.562.89'		TVD: 7.563.23'	
		VS: 7.363.93'		VS: 7.447.11'	
		TVD (ft)		TVD (ft)	
RLST: med-dkgy, modly sft-modly hd, sb blk-y-ang, ip pily, silty, arg,		55% CHK: med-gyshbn, mot, com inbddd wi mrl, modly sft-fri, sb blk-y-sb md,		55% MRLST: med-dkgy,	
n nod pyr, modly calc; 40% CHK: med-gyshbn, mot, com inbddd wi		rthy-sb wxy, v calc; 45% MRLST: med-dkgy, modly sft-modly hd, sb blk-y-ang,		ip pily, silty, arg, tr nod pyr	
modly sft-fri, sb blk-y-sb md, rthy-sb wxy, v calc.		ip pily, silty, arg, tr nod pyr, pos inoc fos, modly calc.		med-gyshbn, mot, v com i	
				wxy, v calc.	
8100		8100		8100	

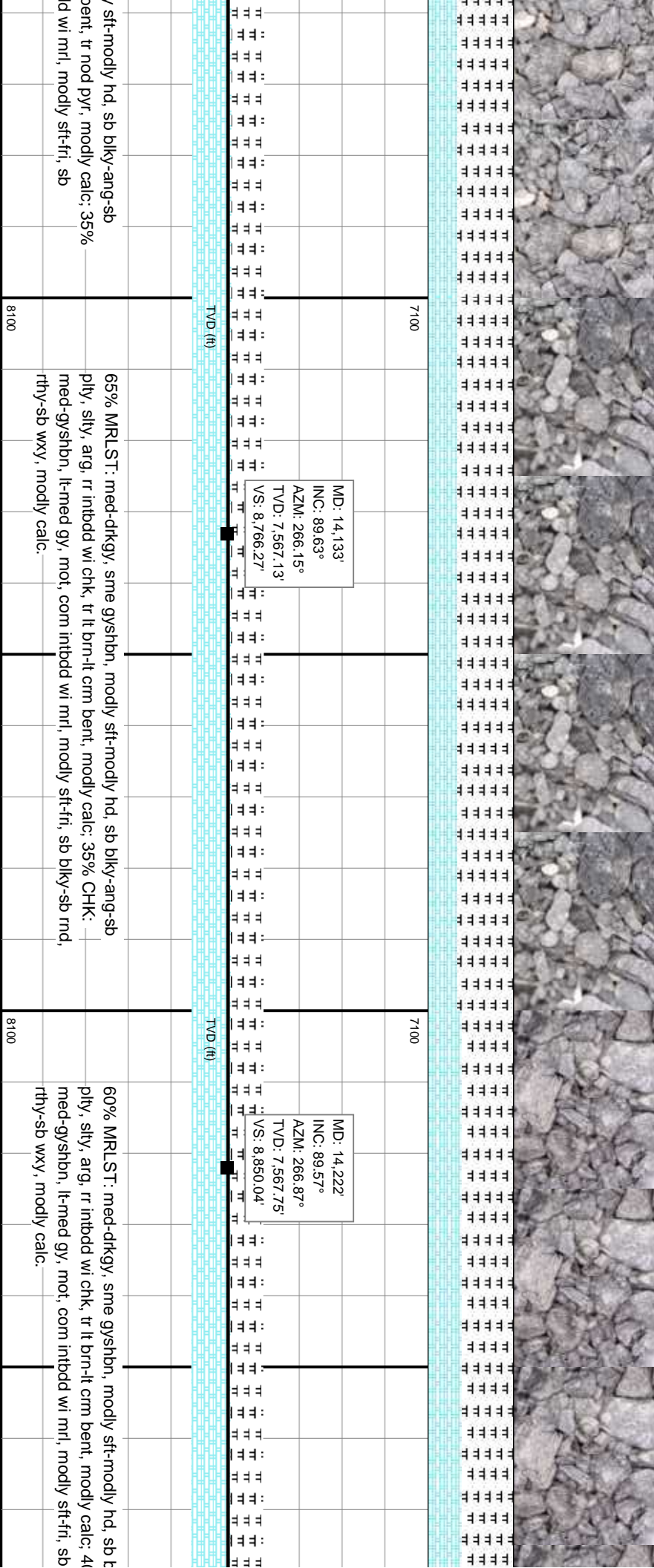
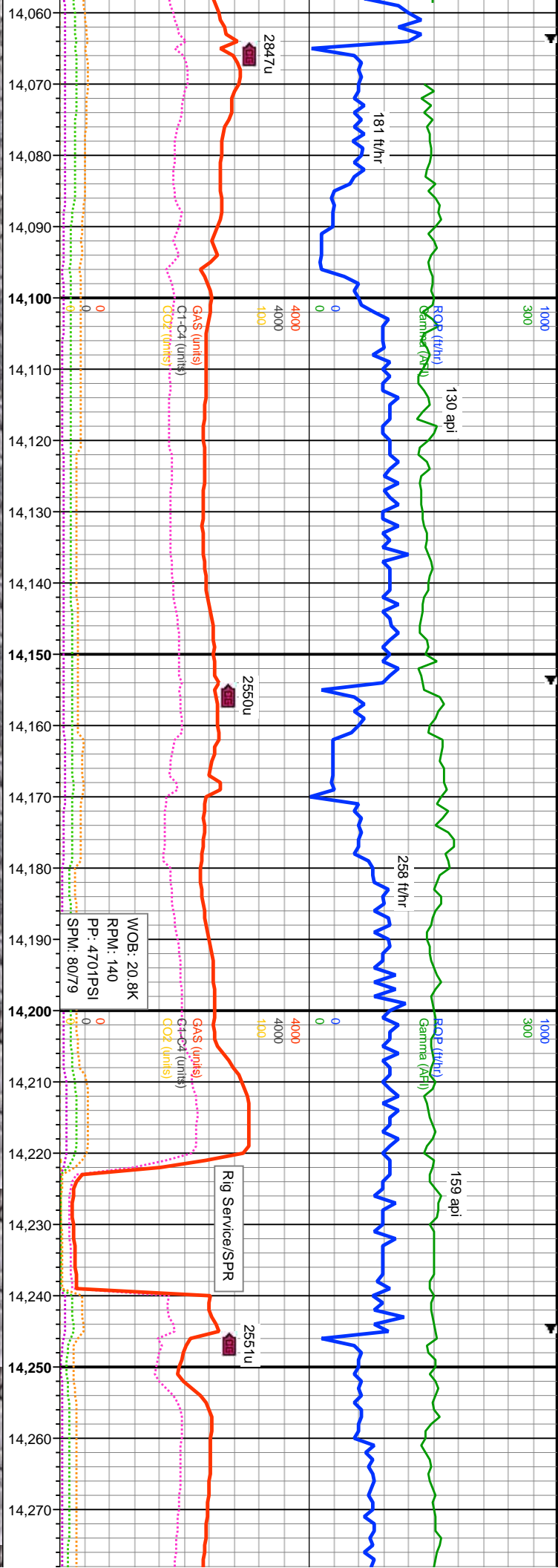


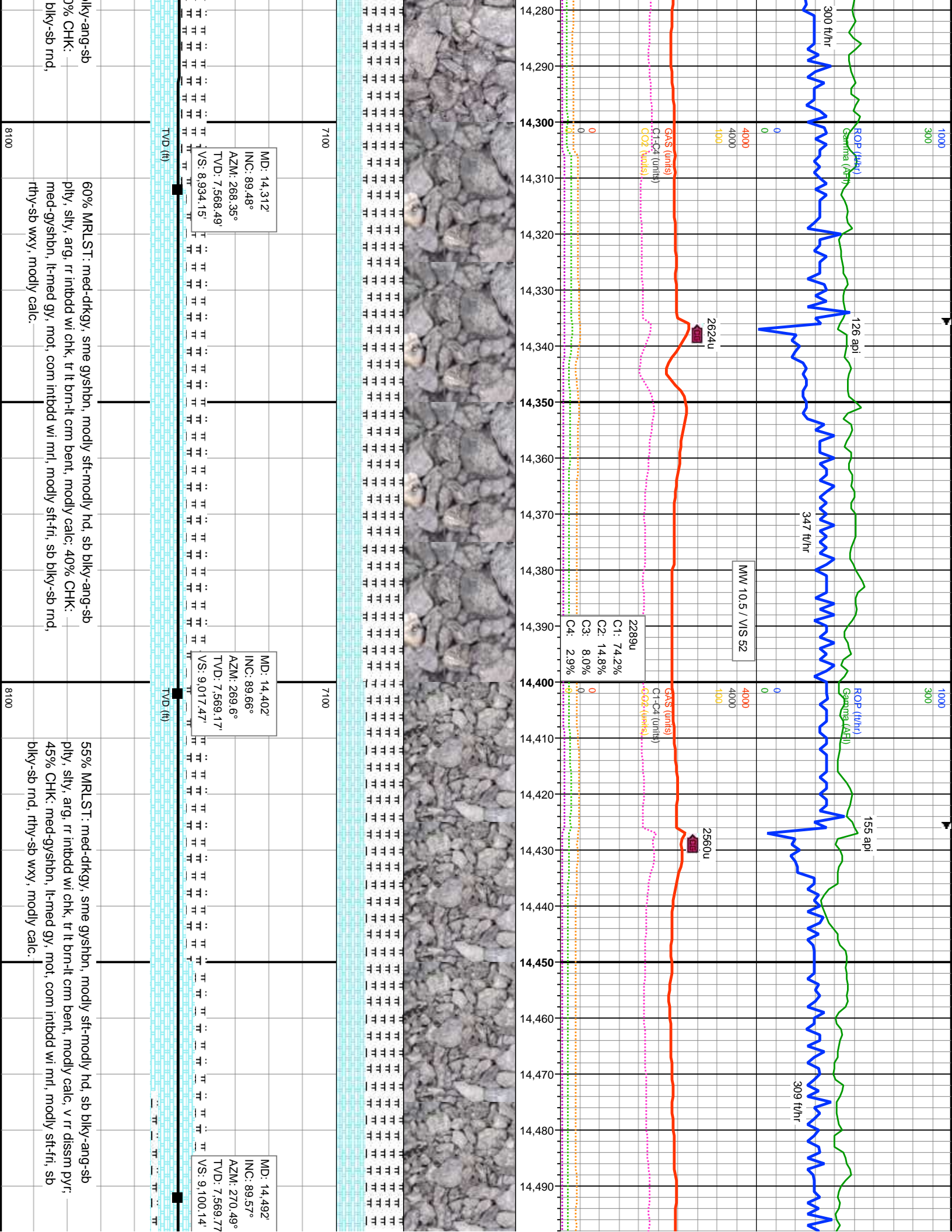


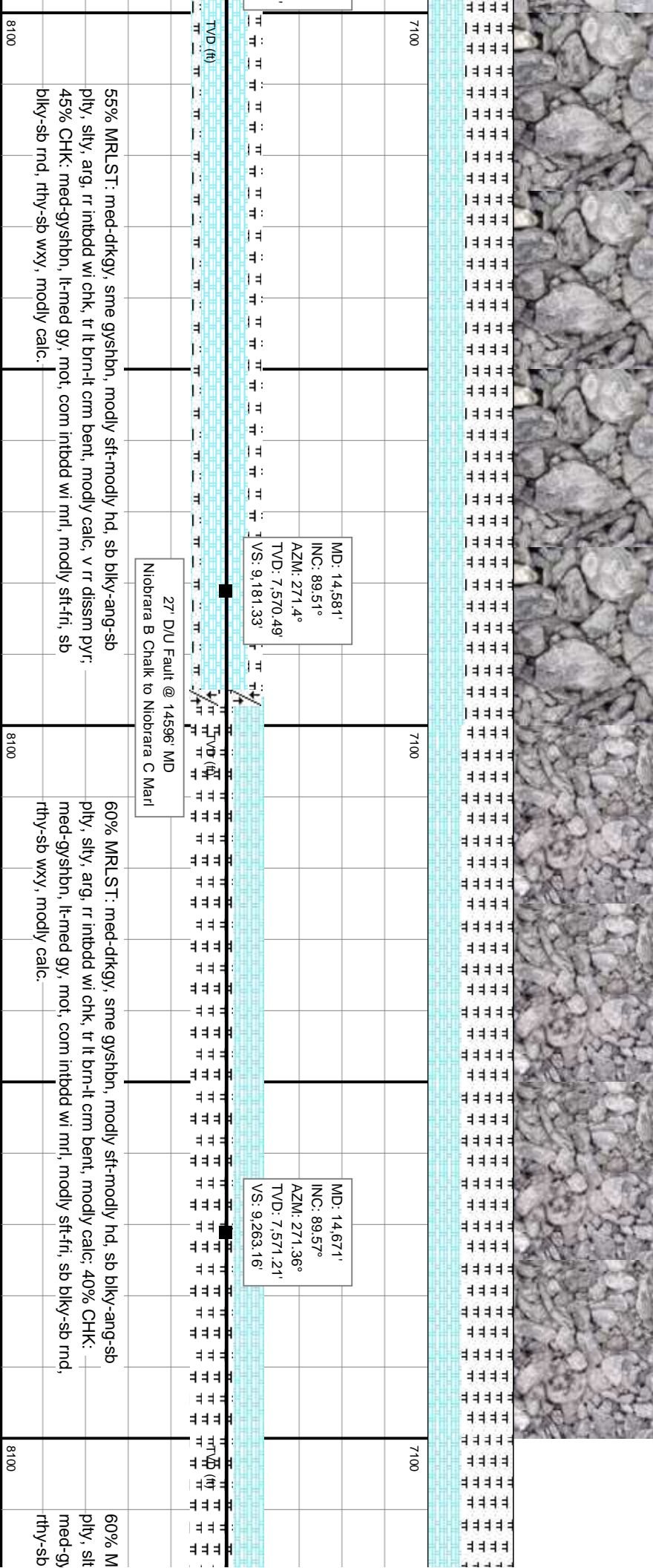
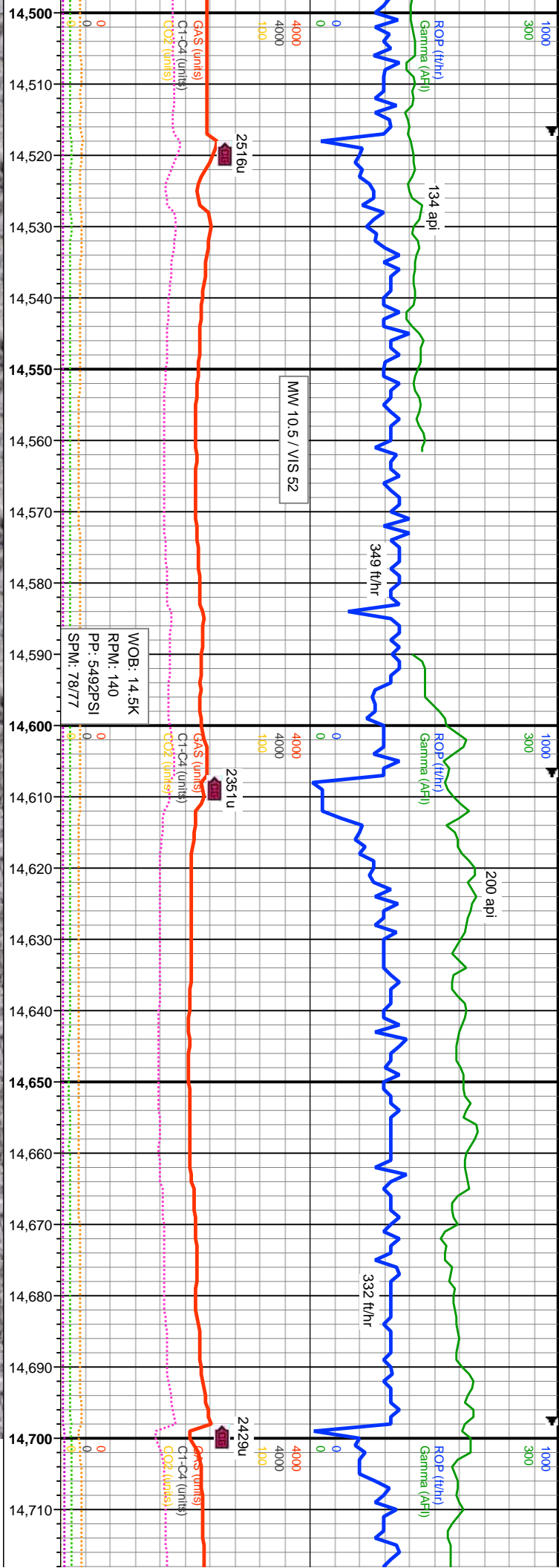


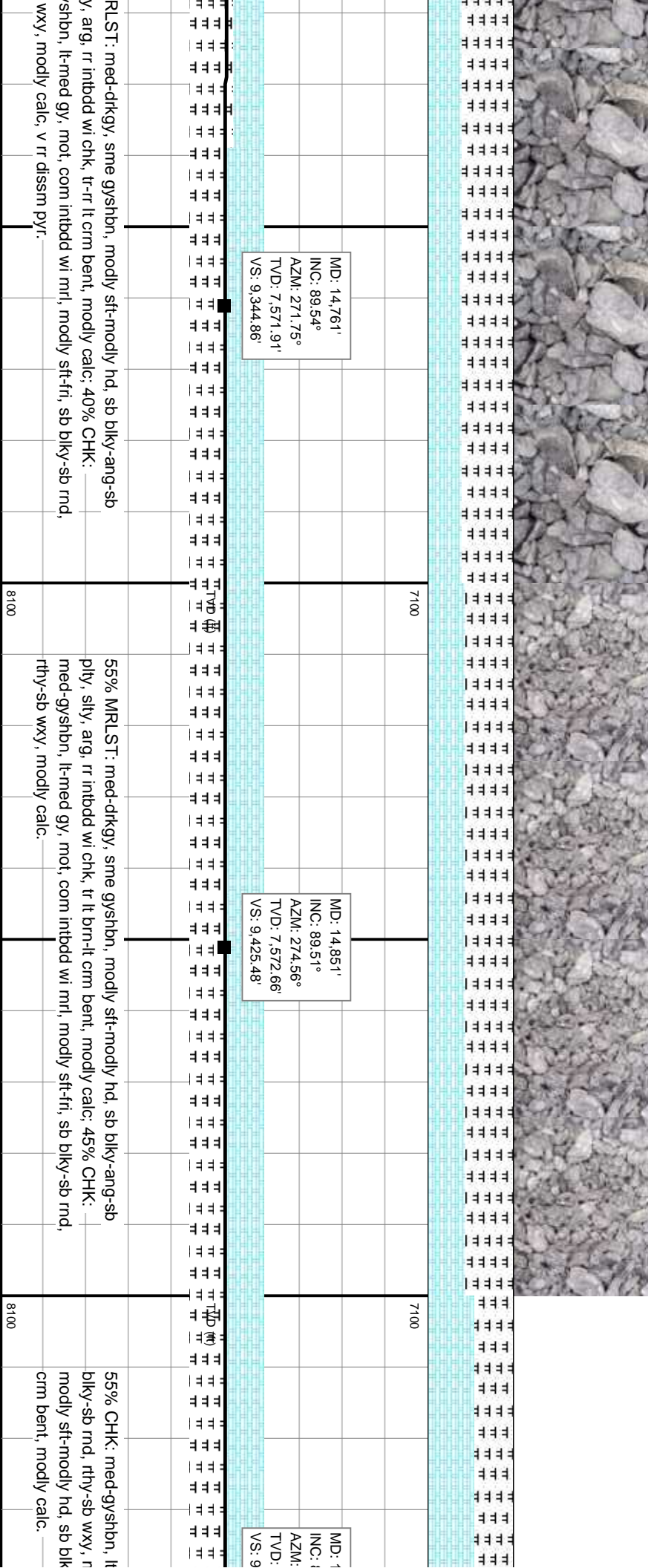
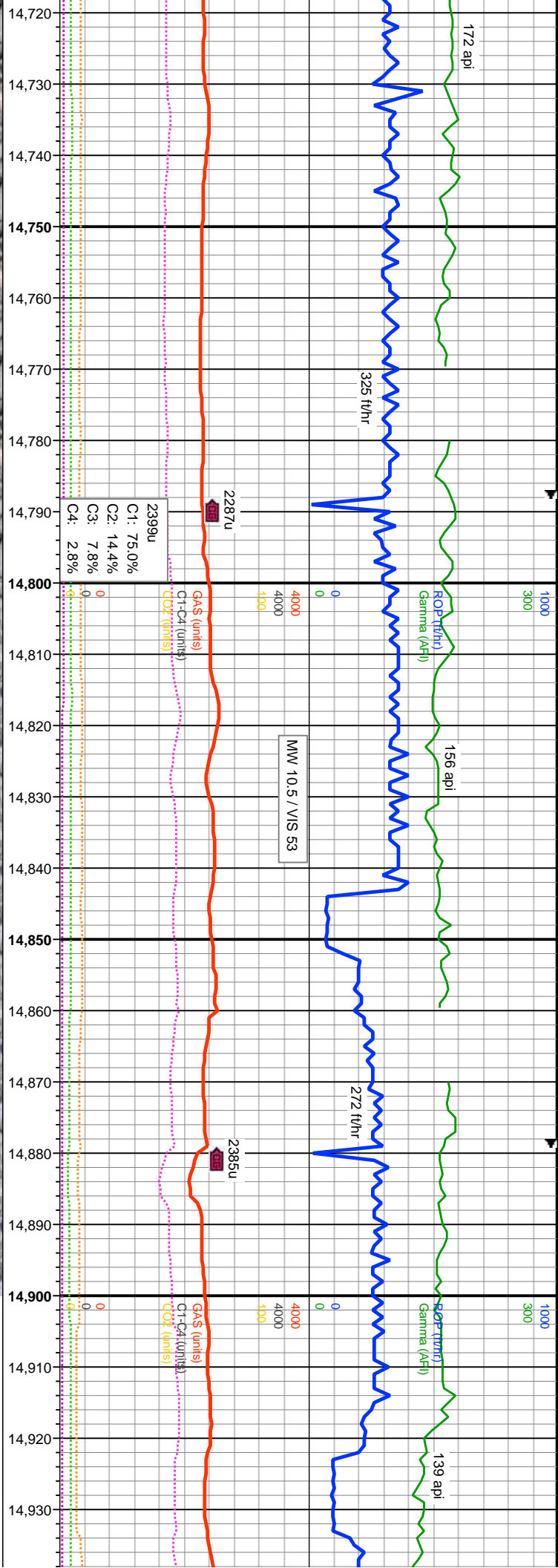


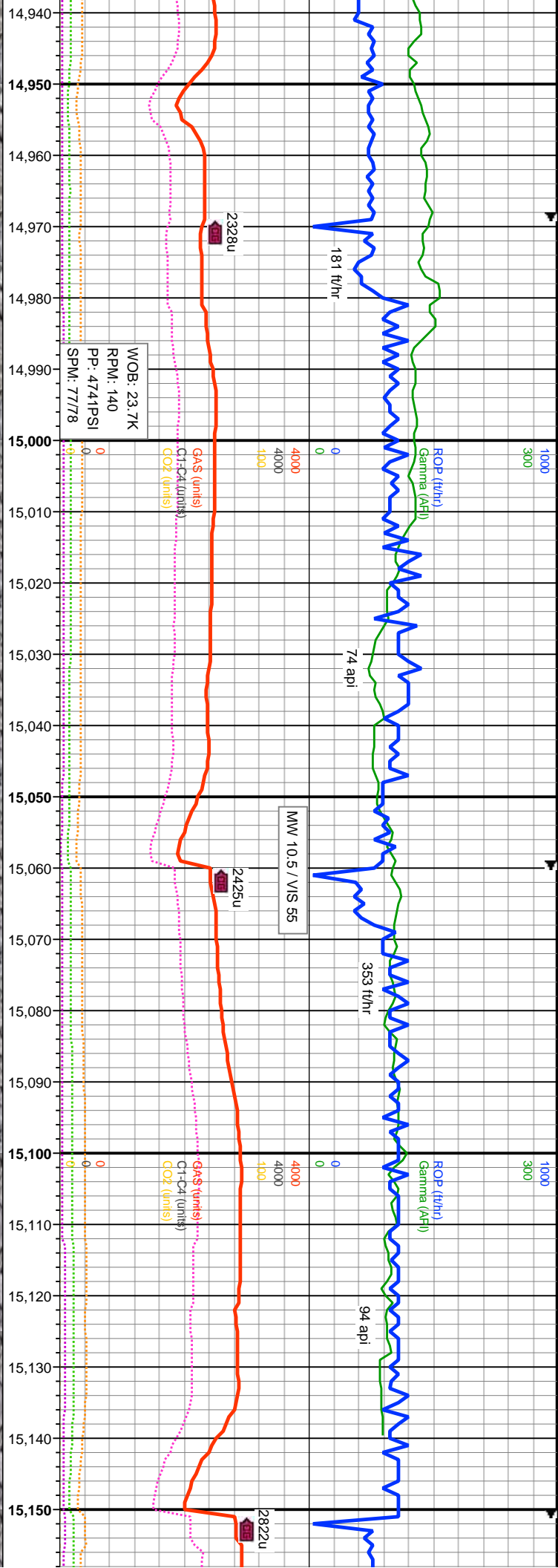








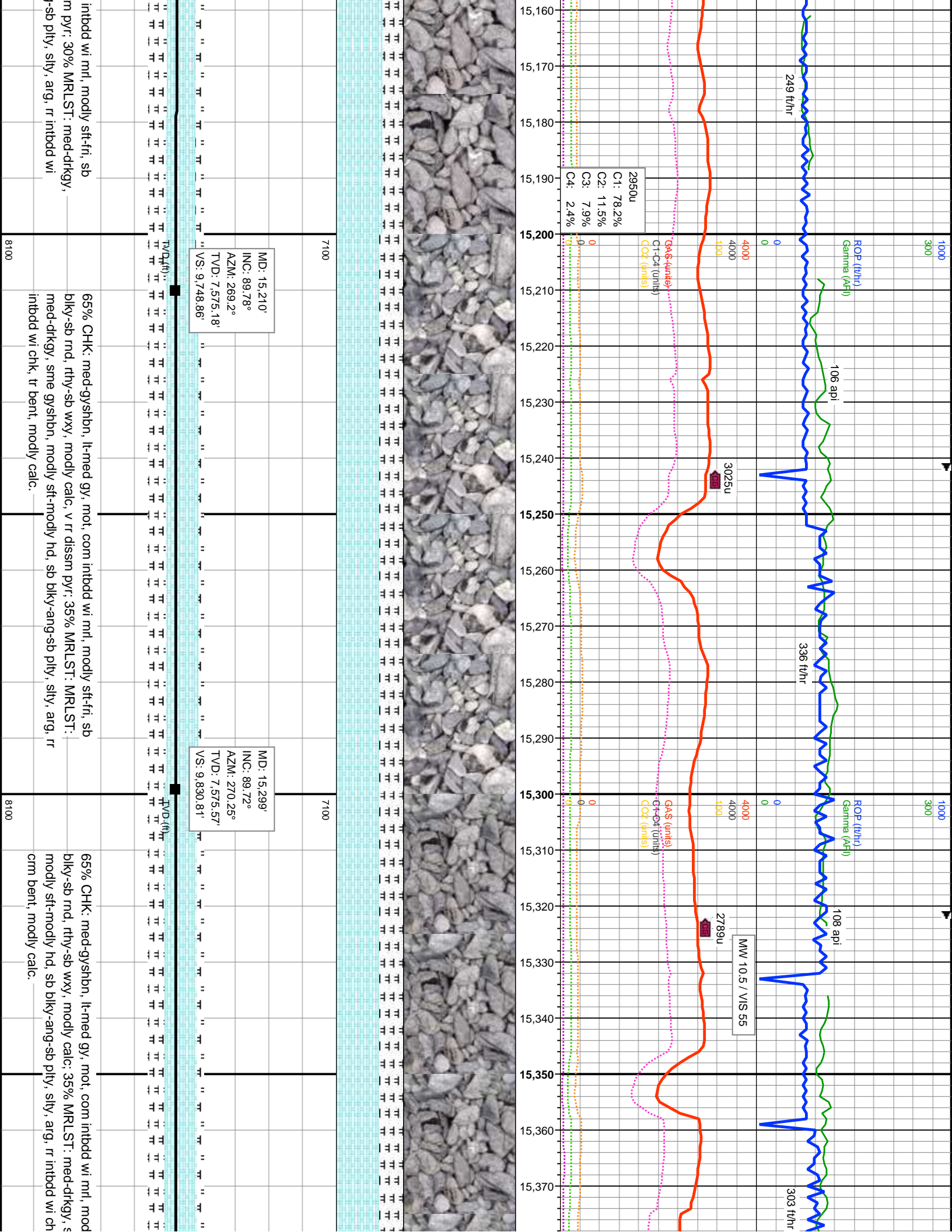


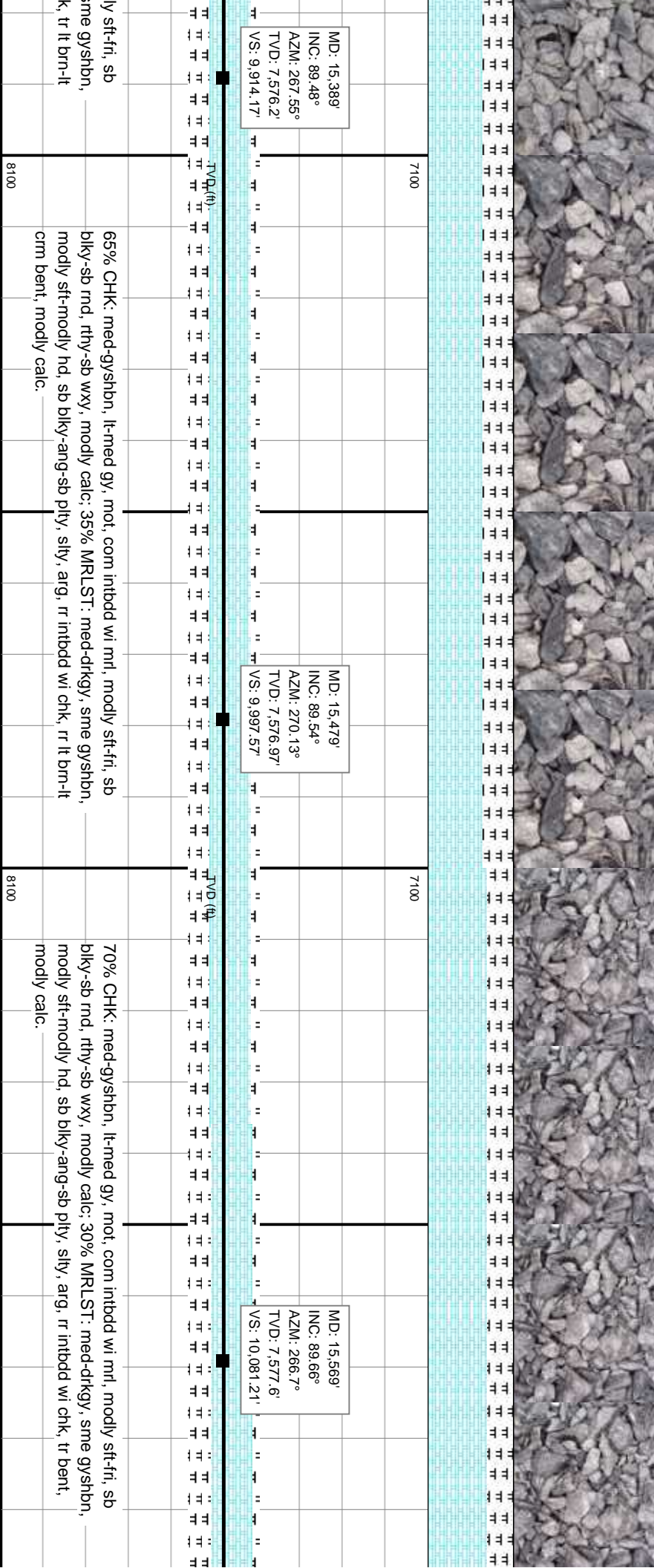
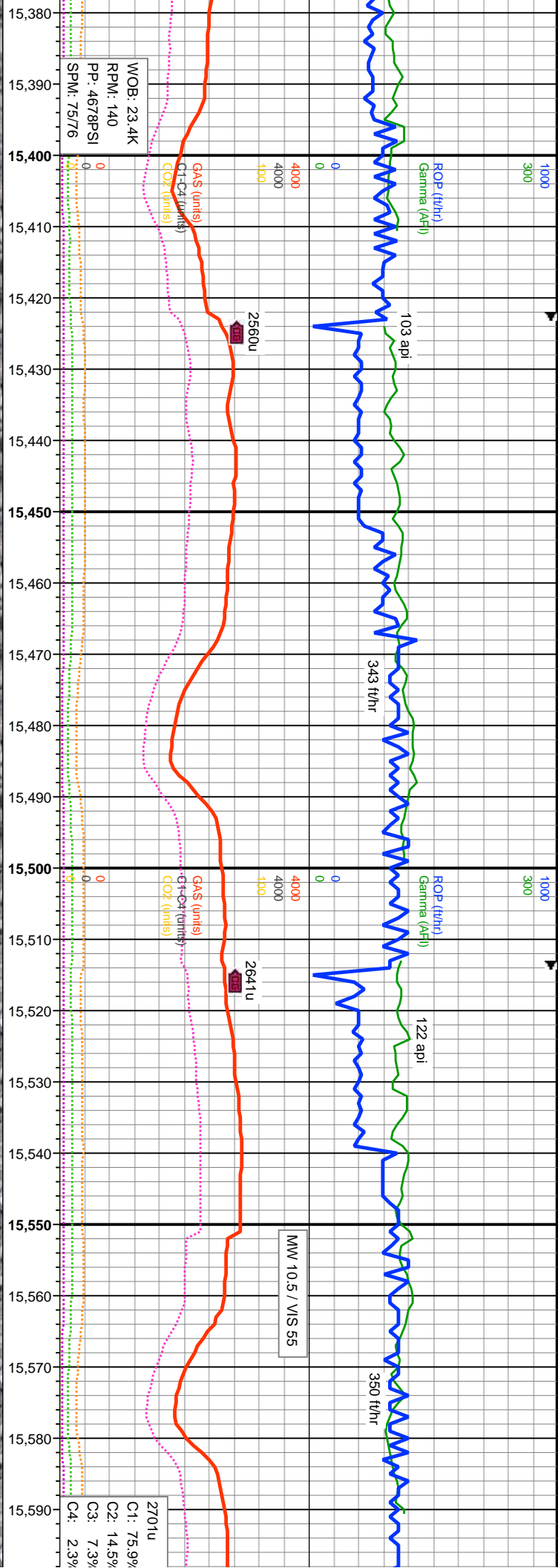


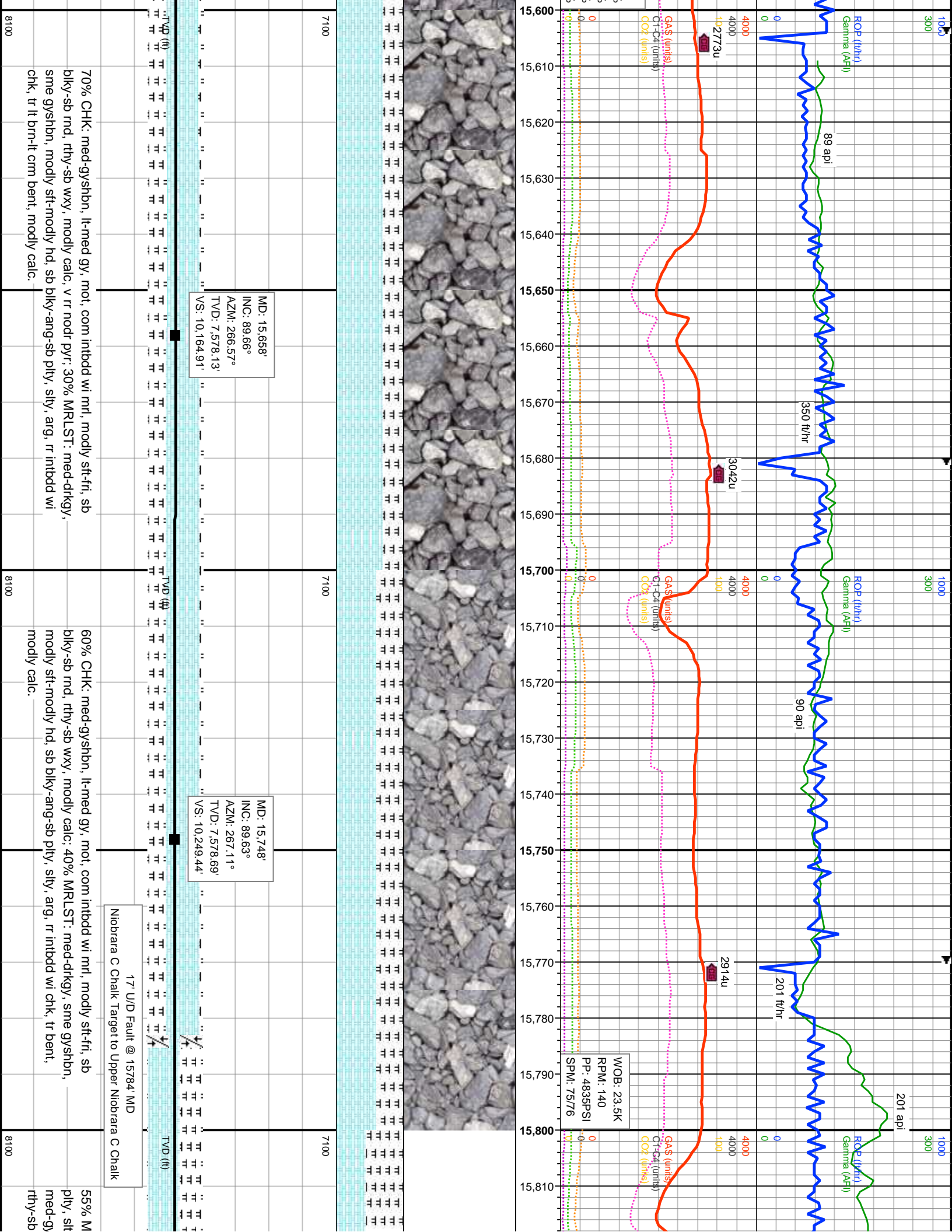
med gy, mot, com intbdd wi mrl, modly sft-fri, sb
modly calc; 45% MRLST: med-drkg, sme gysbhn,
y-ang-sb ply, silty, arg, rr intbdd wi chk, rr lt brn-lt

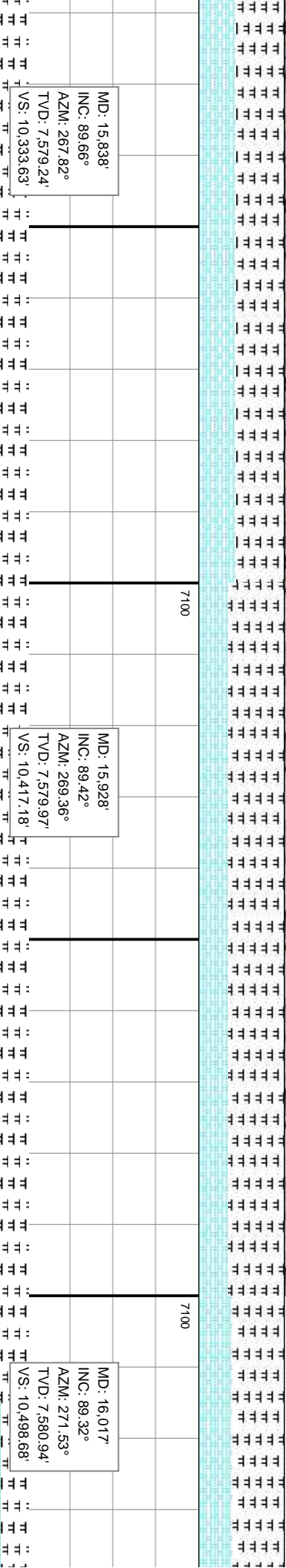
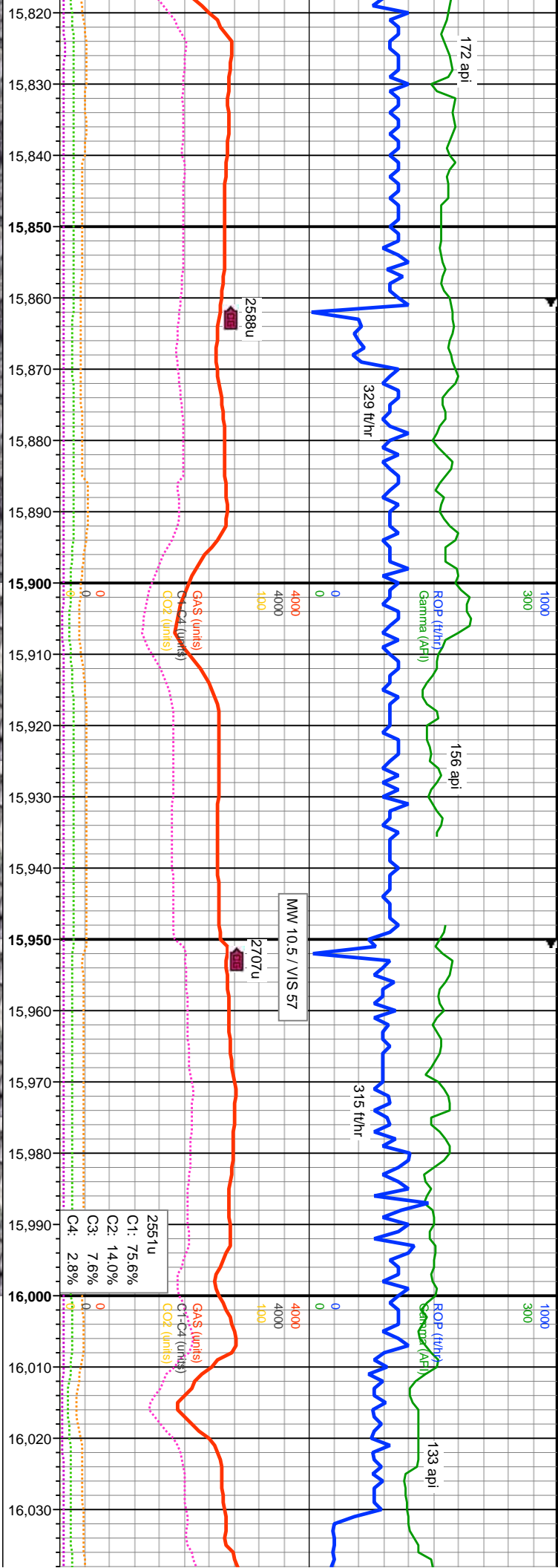
60% CHK: med-gysbhn, lt-med gy, mot, com intbdd wi mrl, modly sft-fri, sb
biky-sb rnd, rthy-sb wxy, modly calc, v rr nodr pyr; 40% MRLST: med-drkg,
sme gysbhn, modly sft-modly hd, sb biky-ang-sb ply, silty, arg, rr intbdd wi
chk, v rr lt brn-lt crm bent, modly calc.

70% CHK: med-gysbhn, lt-med gy, mot, com
biky-sb rnd, rthy-sb wxy, modly calc, v rr diss
sme gysbhn, modly sft-modly hd, sb biky-ang-
chk, v rr bent, modly calc.





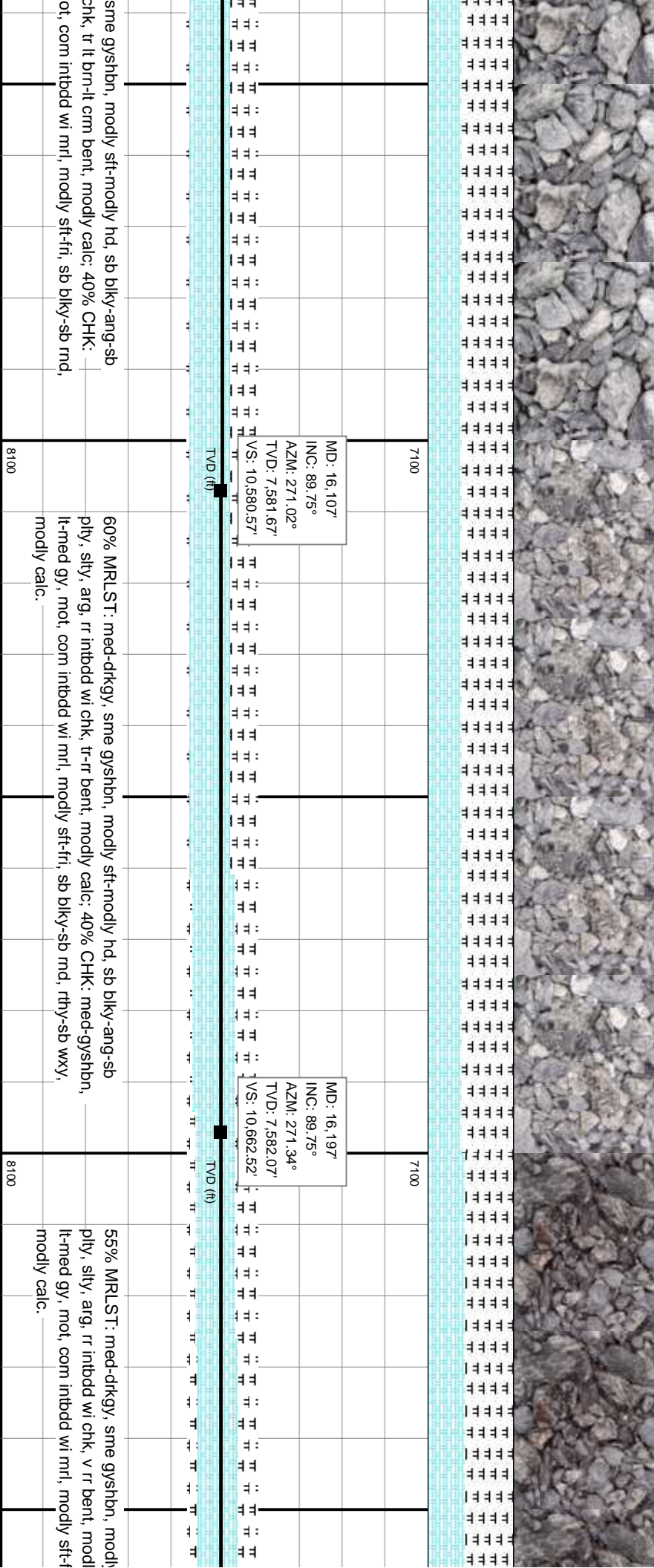
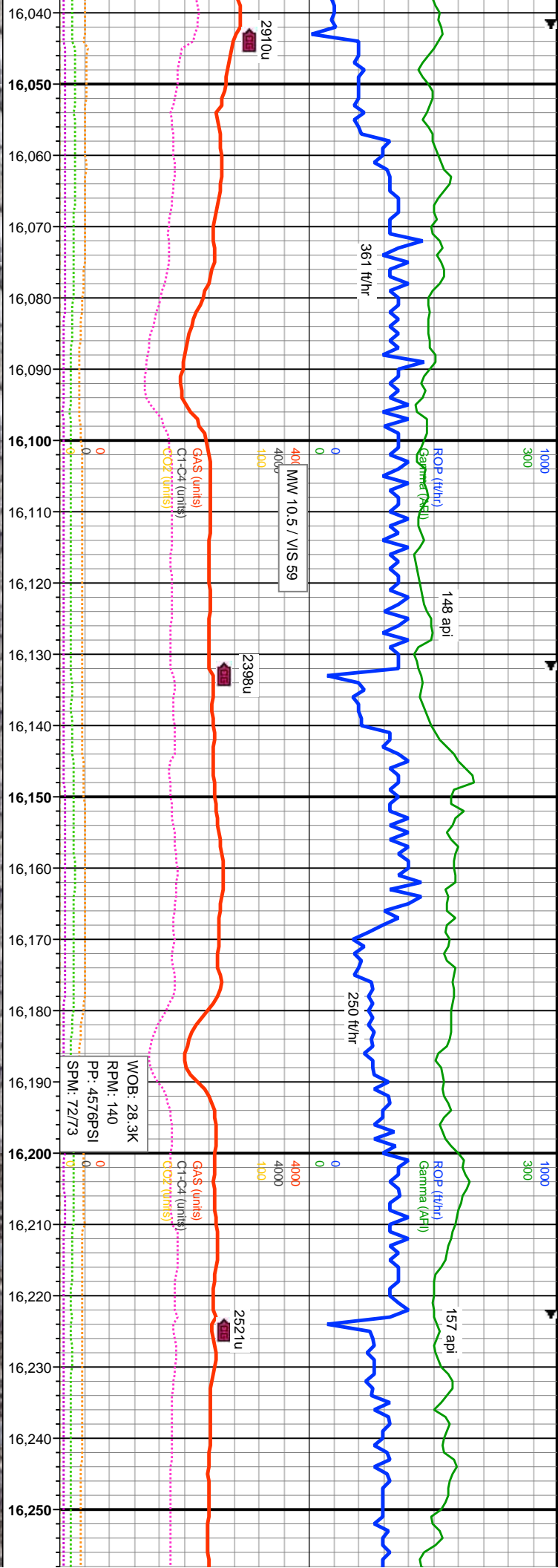


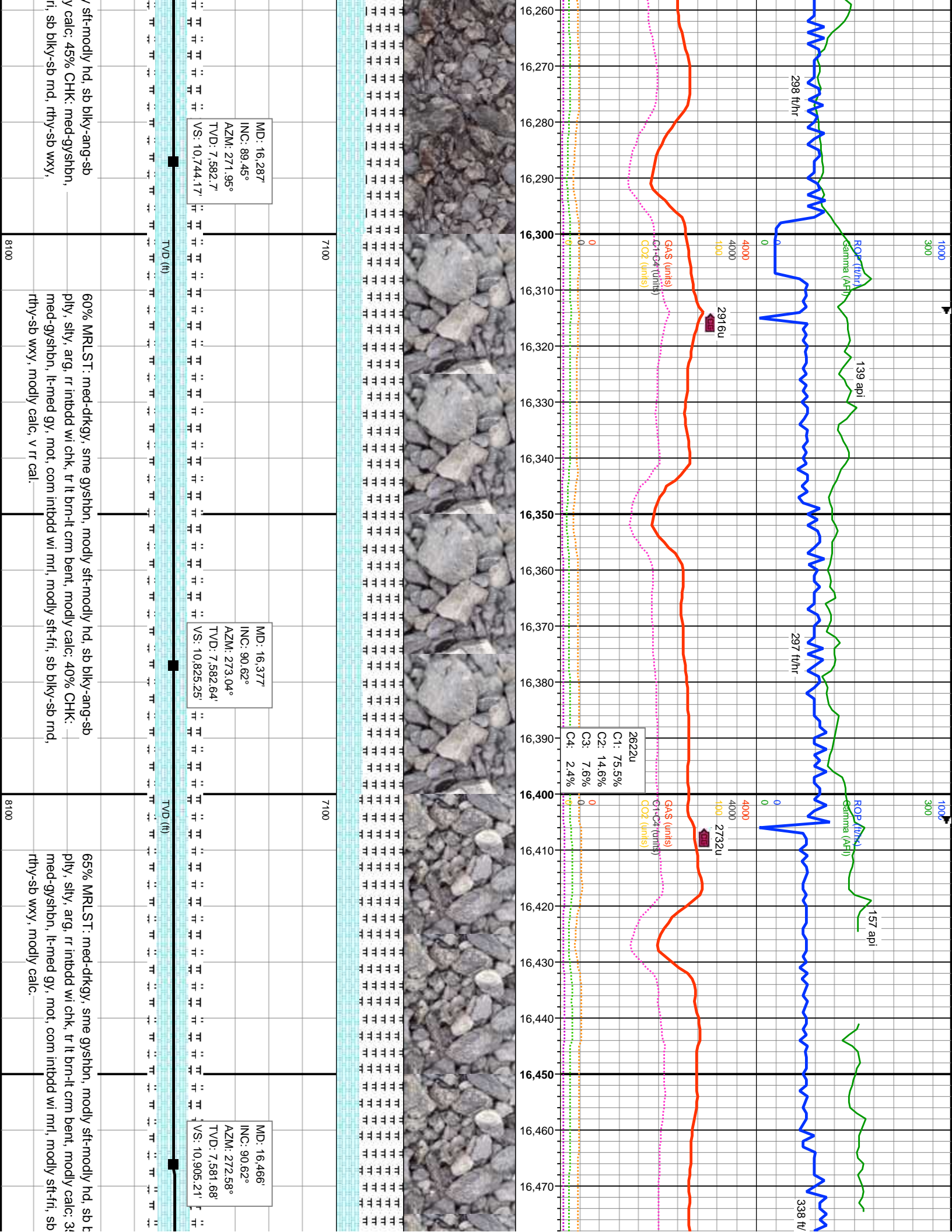


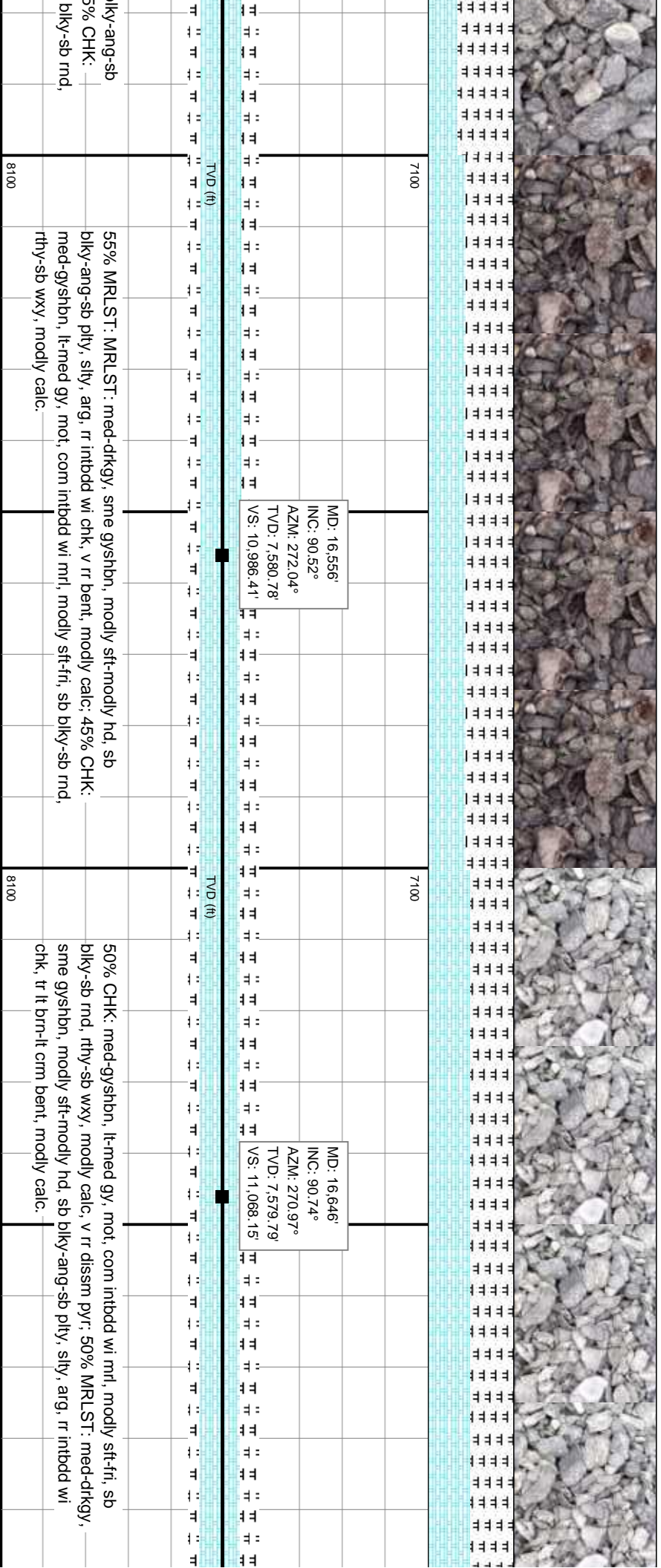
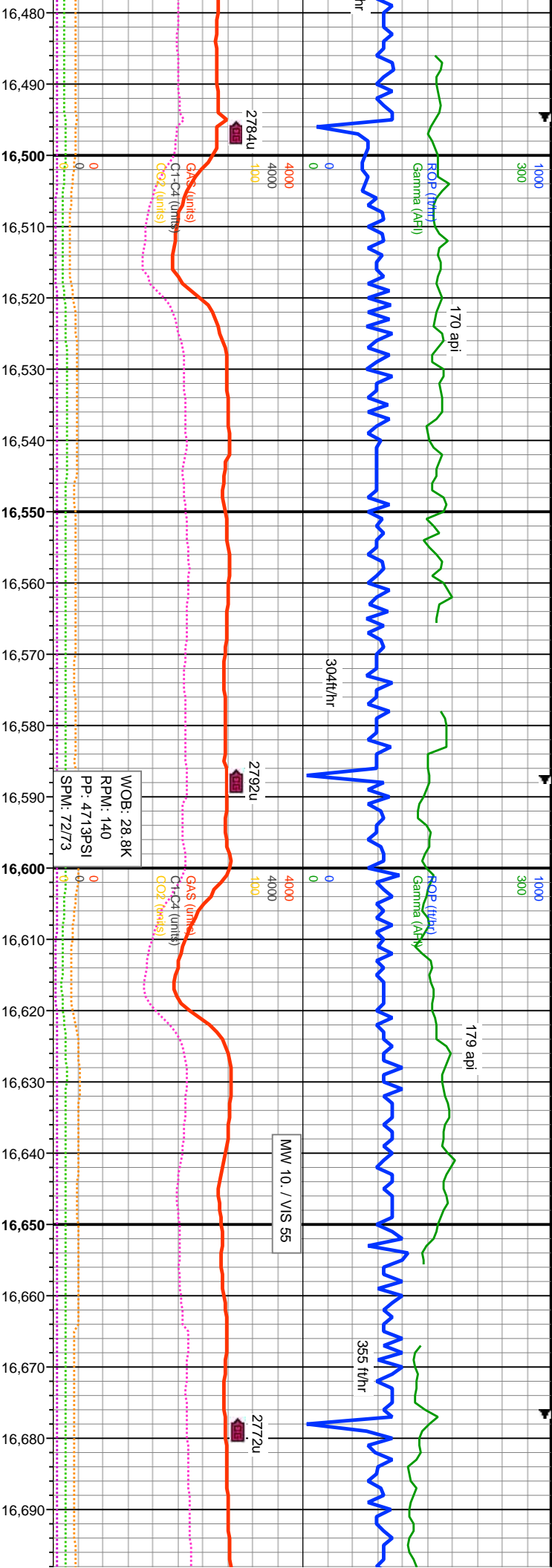
RLST: med-dkgy, sme gysbhn, modly sft-modly hd, sb blkly-ang-sb
y, arg, rr intbdd wi chk, tr lt brn-lt crm bent, modly calc, 45% CHK:
ysbhn, lt-med gy, mot, com intbdd wi mrl, modly sft-frt, sb blkly-sb rnd,
wxy, modly calc.

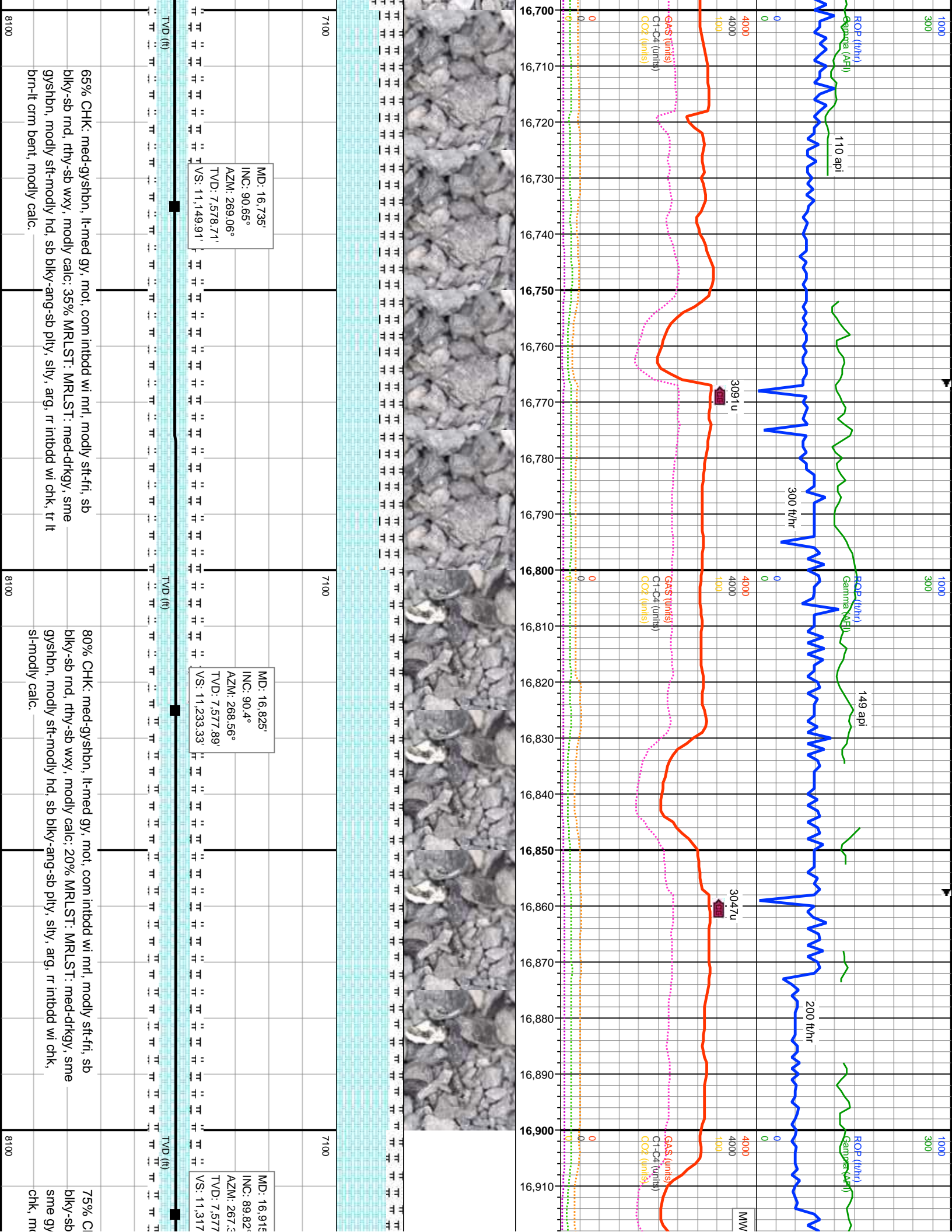
65% MRLST: med-dkgy, sme gysbhn, modly sft-modly hd, sb blkly-ang-sb
ply, stly, arg, rr intbdd wi chk, tr lt brn-lt crm bent, modly calc, 35% CHK:
med-gysbhn, lt-med gy, mot, com intbdd wi mrl, modly sft-frt, sb blkly-sb rnd,
rthy-sb wxy, modly calc.

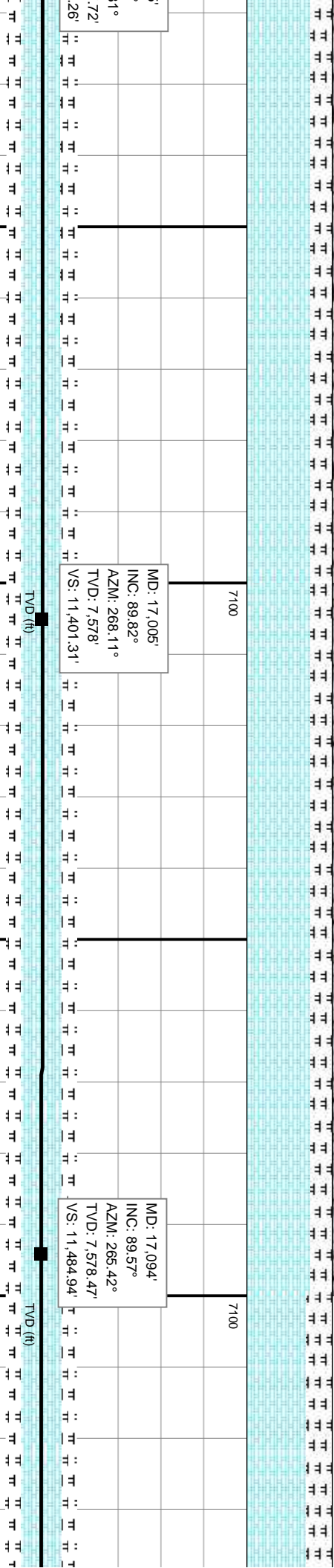
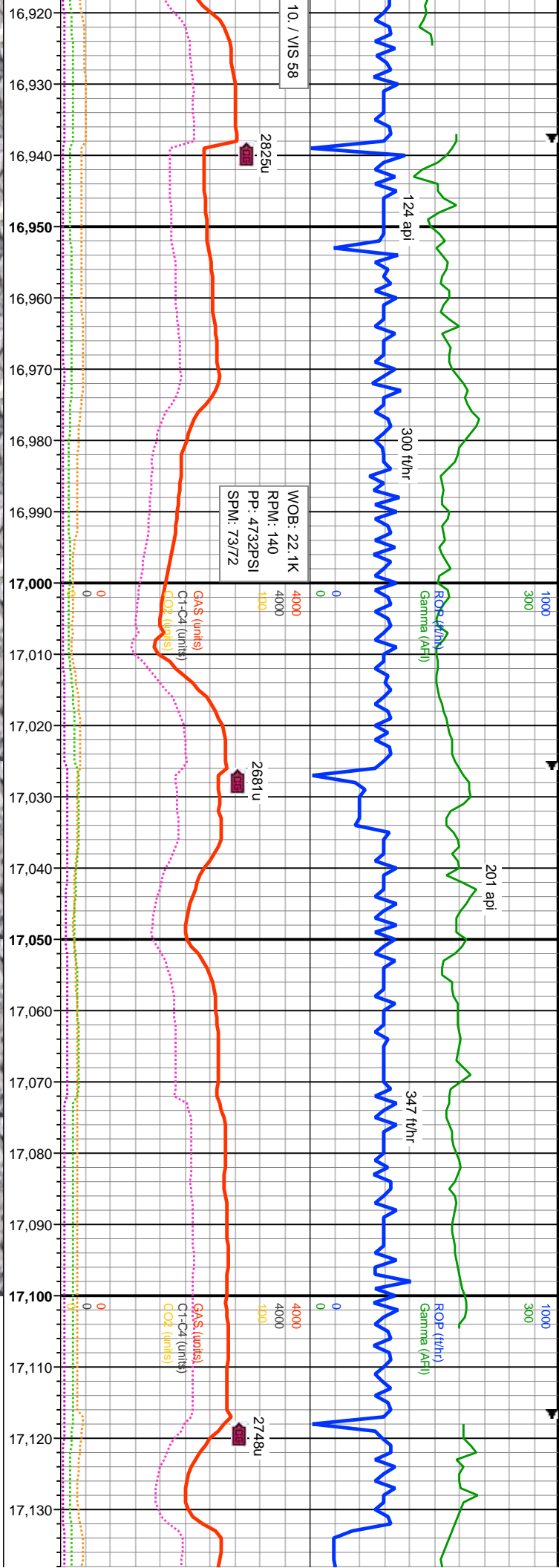
60% MRLST: med-dkgy,
ply, stly, arg, rr intbdd wi
med-gysbhn, lt-med gy, m
rthy-sb wxy, modly calc.











HK: med-gyshbn, lt-med gy, mot, com intbdd wi mrl, modly sft-fri, sb
rnd, rthy-sb wxy, tr lt brn bent, modly calc; 25% MRLST: med-dkgy,
shbn, modly sft-modly hd, sb blk-ang-sb ply, silty, arg, rr intbdd wi
modly calc.

75% CHK: med-gyshbn, lt-med gy, mot, com intbdd wi mrl, modly sft-fri, sb
blk-sb rnd, rthy-sb wxy, tr lt brn bent, modly calc; 25% MRLST: med-dkgy,
sme gysbhn, modly sft-modly hd, sb blk-sb ang, silty, arg, rr intbdd wi chk,
modly calc.

70% CHK: med-gyshbn, lt-med gy, mot, com intbdd wi mrl, modly sft-fri, sb
blk-sb rnd, rthy-sb wxy, tr lt brn bent, modly calc; 25% MRLST: med-dkgy,
gysbhn, modly sft-modly h
calc.

