



Scale: 5" / 100'  
Measured Depth Log

**Well Name** Raindance 20-322HN

**Location** NENE SEC 30 T6N R67W

**State** COLORADO

**County** WELD

**Country** USA

**Rig Number** PRECISION 460

**API Number** 05-123-44984-0000

**AFE #** 17DC0072

**Geographic Region** DJ BASIN

**Field** WATTENBERG

**Spud Date** 8/9/2017

**Drilling Completed** 8/11/2017

**Ground Elevation** 4789'

**K.B. Elevation** 4809'

**Logged Interval** 6000 To 12371'

**Total Depth** 12371'

**Formation** NIOBRARA B 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** Gabriel Rubio & Mark Sowinski

**Company** Terra Guidance

**Address** 1298 O Road  
Loma CO 81524  
(970) 260-5408



Color Coding

Oil

Note

Error

Condensate

Core

Water

Gas

Pressure

Seal

Rock Types

LIMESTONE

Chalk

Marl

SHALE

Silty Shale

Shaly Siltstone

SILTSTONE

Shaly Sandston

SANDSTONE

BENTONITE

CEMENT

UNKNOWN

ANHYDRITE

GYPSUM

SALT

SIDERITE or LIMONITE

DOLOMITE

CHERT

COAL

MARLSTONE

CLAYSTONE

SHALE GRAY

SHALE COLORED

CONGLOMERATE

BRECCIA

TILL

TUFF

IGNEOUS

METAMORPHIC

Accessories

**Fossils**

F FOSSIL

GASTROPOD

ALGAE

AMPHIPORA

BELEMNITE

BIOCLASTIC

BRACHIOPOD

BRYOZOA

CEPHALOPOD

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

ARGILLACEOUS

ARGILLITE GRAIN

B BENTONITE

BITUMINOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTDK

CHTLT

COAL - THIN BEDS

DOLOMITIC

+ FELDSPAR

● FERRUGINOUS PELLET

✂ FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

H KAOLIN

M MARLSTONE

M MINERAL CRYSTALS

N NODULES

P PHOSPHATE PELLETS

P PYRITE

S SALT CAST

S SANDY

S SILICEOUS

S SILTY

T TUFFACEOUS

**Stringer**

ANHYDRITE STRINGER

BENTONITE STRINGER

COAL STRINGER

DOLOMITE STRINGER

GYPSUM STRINGER

LIMESTONE STRINGER

MARLSTONE (CALC) STRG

MARLSTONE (DOL) STRG

SANDSTONE STRINGER

SHALE STRINGER

SILTSTONE STRINGER

Other Sy

ORGANIC

P PINPOINT

D DEAD

V VUGGY

● EVEN

○ QUESTIONABLE

SPOTTED STAINING

BIT

NORMA

OIL SH

OVERTURN

REVERS

SIDEWALL (LEFT)

SIDEWALL (RIGHT)

SLIDE

SURV

TRIP

WIRELINE

Engineering

CASING

REVERS

OVERTURN

POROSITY

CONNECTION (LEFT)

CONNECTION (RIGHT)

SLIDE

SURV

TRIP

WIRELINE

Porosity

E EARTHY

F FENESTRAL

F FRACTURE

INTERCRYSTALLINE

INTEROOLITIC

M MOLDIC

FAULT

WIRELINE

CONNECTION GAS

SLIDE

SURV

TRIP

WIRELINE

# ymbols

FORMATION TOP L LITHOGRAPHIC

## Rounding

LOW MX MICROXLN

MIN DEPTH AN ANGULAR MS MUDSTONE

FL FAULT R ROUNDED PS PACKSTONE

DW SUBANG WS WACKESTONE

TURNED STRATA R SUBRND

## Sorting

SE FAULT

## Textures

ALL CORE (LEFT) M MODERATE

ALL CORE (RIGHT) BS BOUNDSTONE P POOR

C CHALKY W WELL

KEY CX CRYPTOXLN

3AS E EARTHY

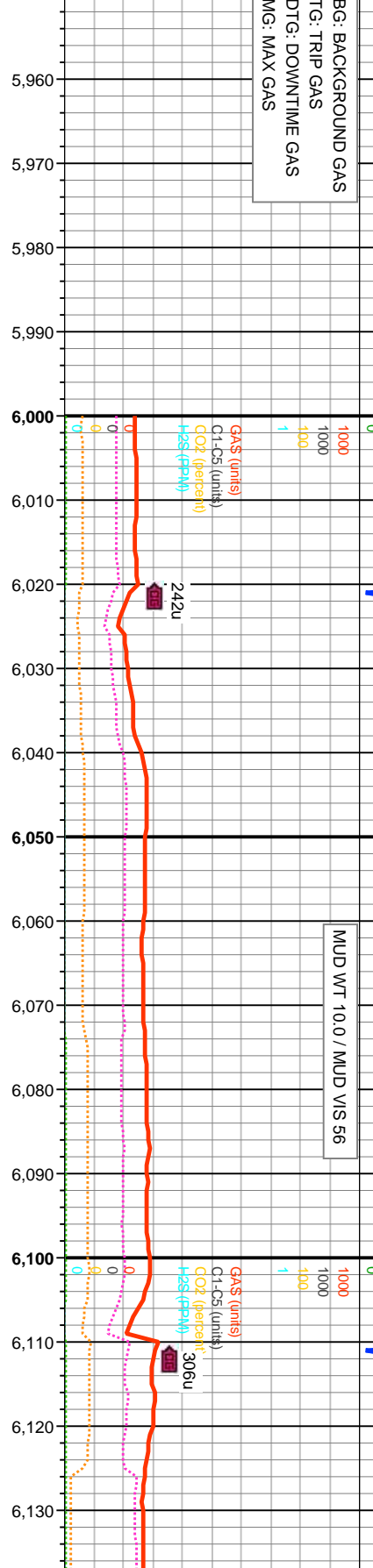
NE TESTED - LEFT FX FINELYXLN

NE TESTED - RT GS GRAINSTONE

TERRA GUIDANCE  
BEGAN LOGGING @ 4:05MST 08/10/2017  
BLOODHOUND GAS CHROMATOGRAPH #5098

ROP  
ROP  
Gamma

GAPS IN GAMMA DATA DUE TO  
RAPID DRILL RATES



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

GAS (units)  
C1-C5 (units)  
CO2 (percent)  
H2S (ppm)

MUD WT 10.0 / MUD VIS 56

GAS (units)  
C1-C5 (units)  
CO2 (percent)  
H2S (ppm)



Images

% Lithology

MD: 5,996'  
INC: 30.15°  
AZM: 353.97°  
TVD: 5,784.24'  
VS: 181.9'

MD: 6,086'  
INC: 29.74°  
AZM: 353.47°  
TVD: 5,862.22'  
VS: 191.61'

Well Bore  
TVD

TVD (ft)

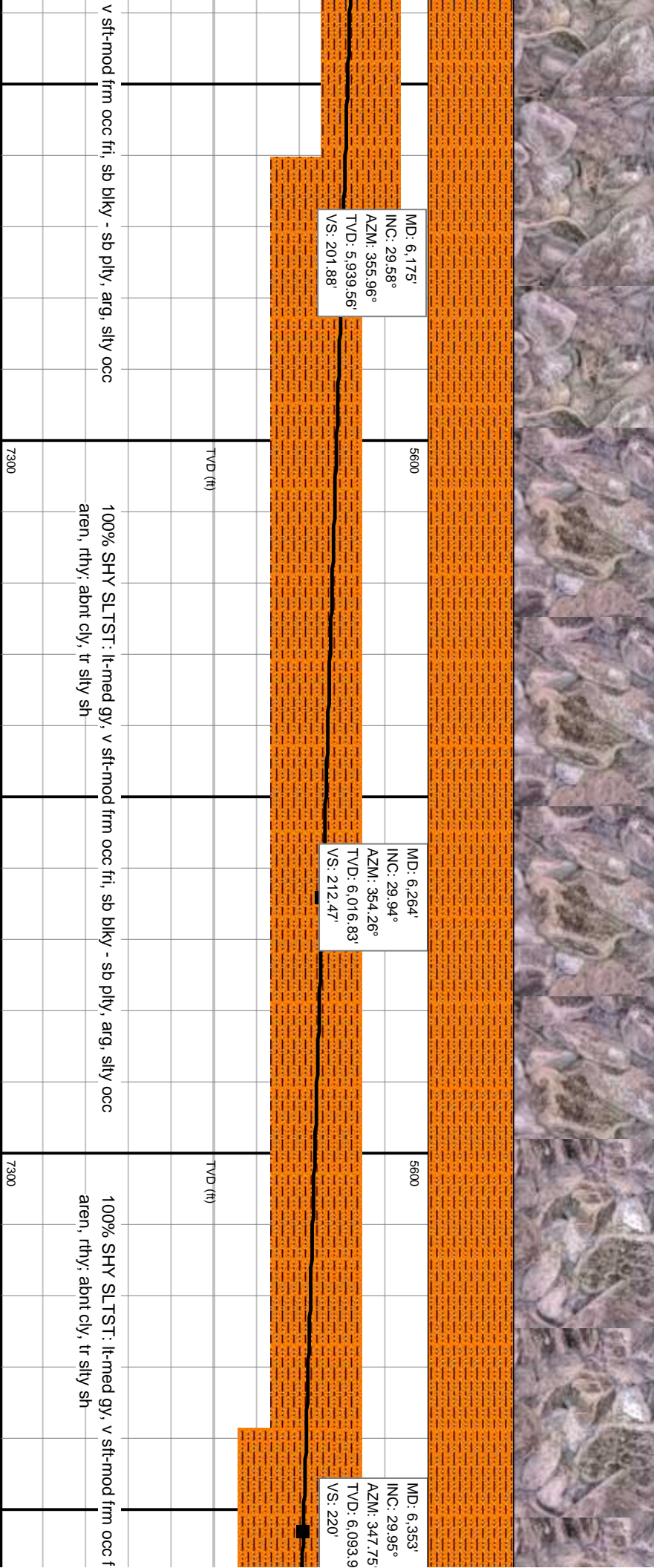
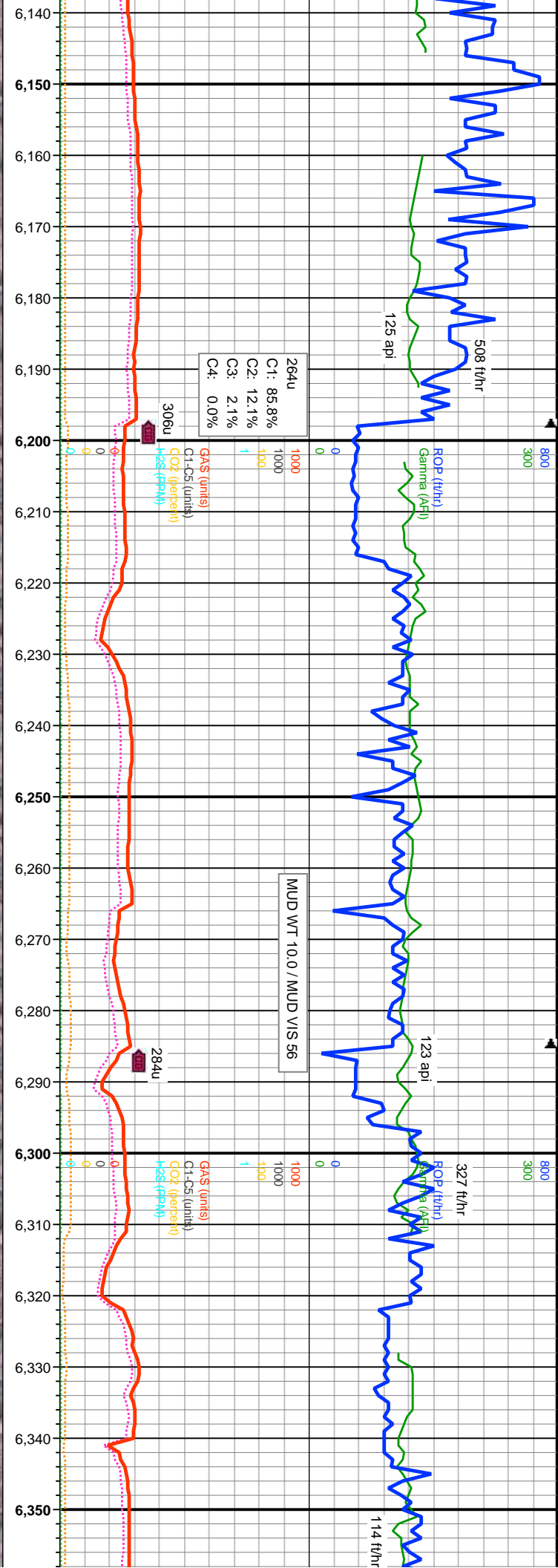
TVD (ft)

100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blkly - sb plty, arg, silty occ  
aren, rthy; abnt cly, tr silty sh

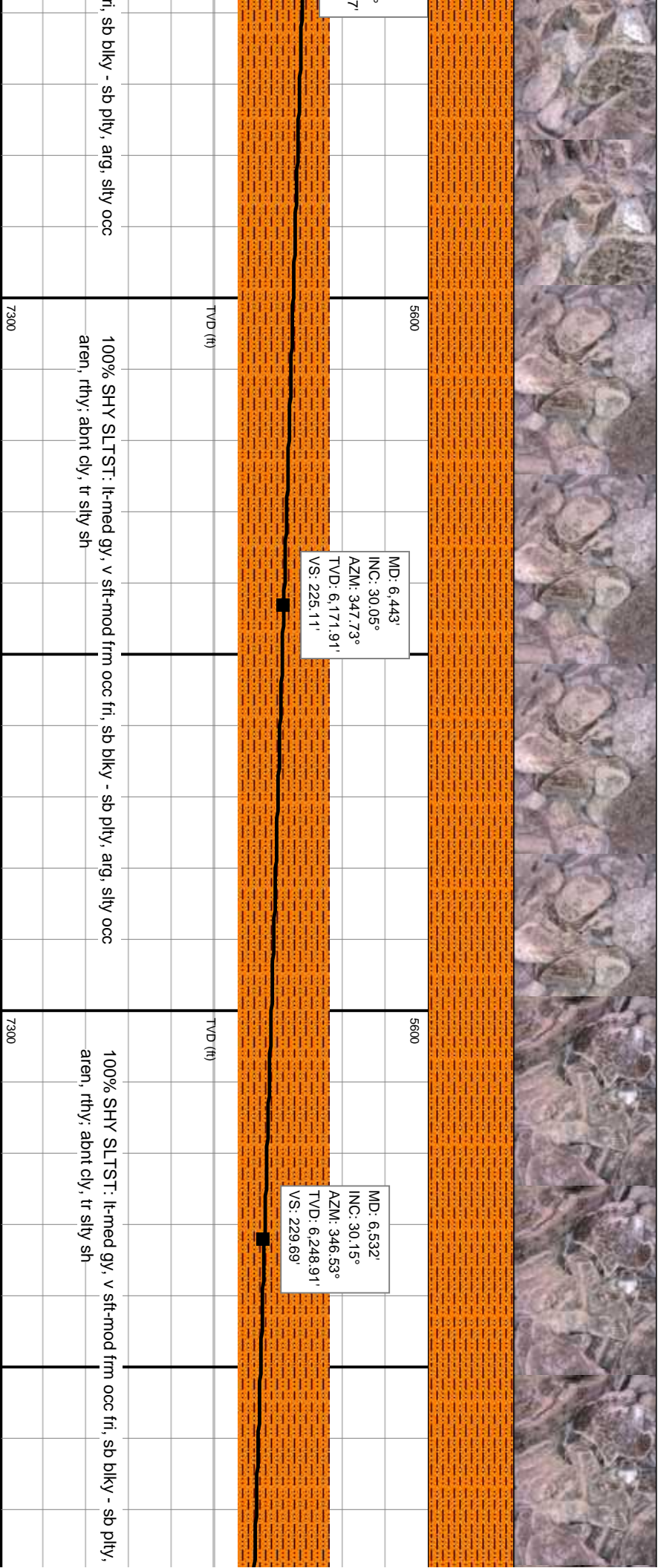
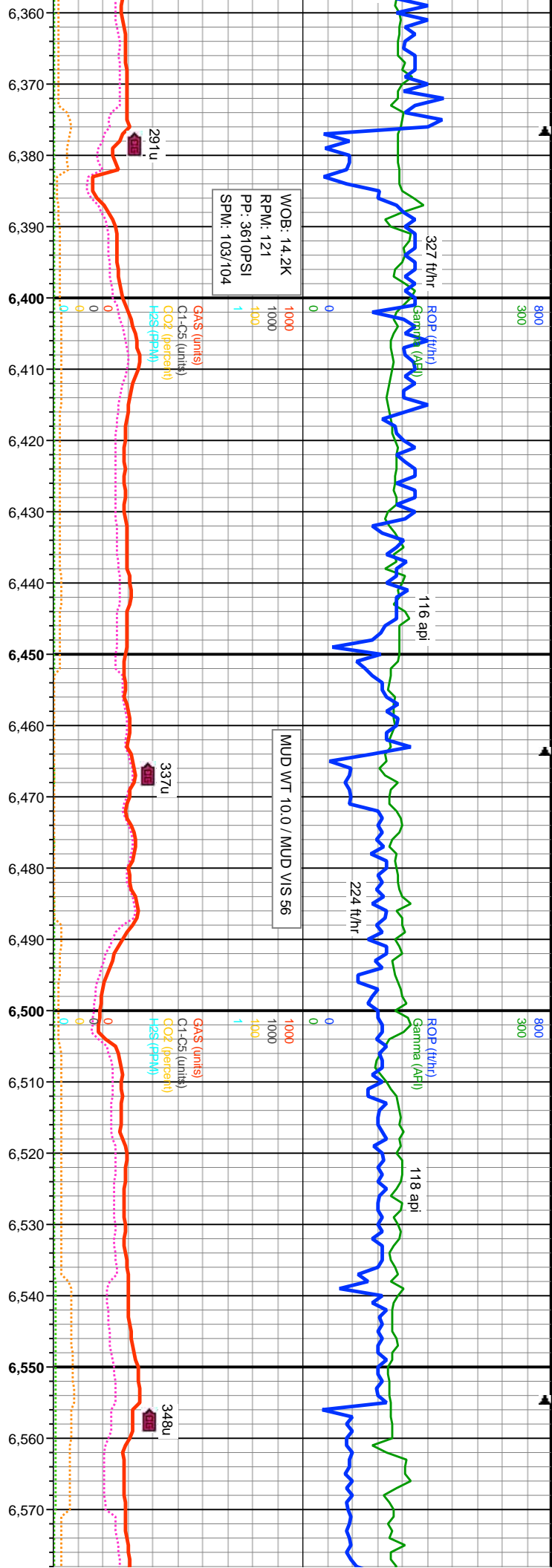
100% SHY SLTST: lt-med gy,  
aren, rthy; abnt cly, tr silty sh

7300

7300

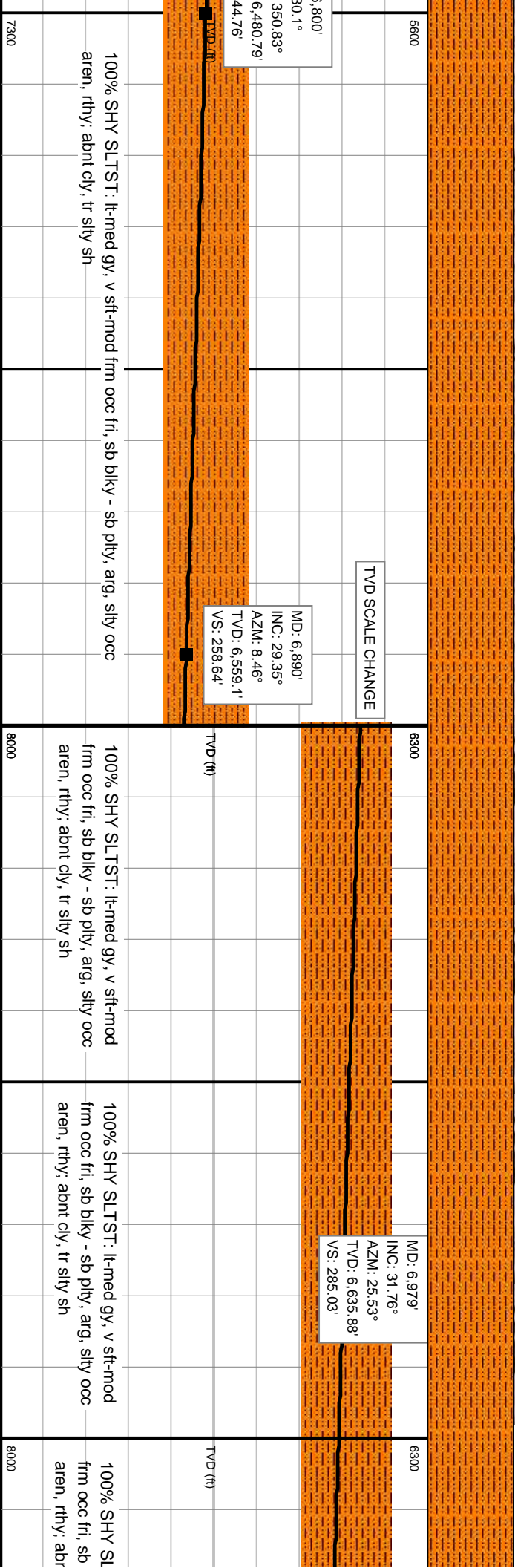
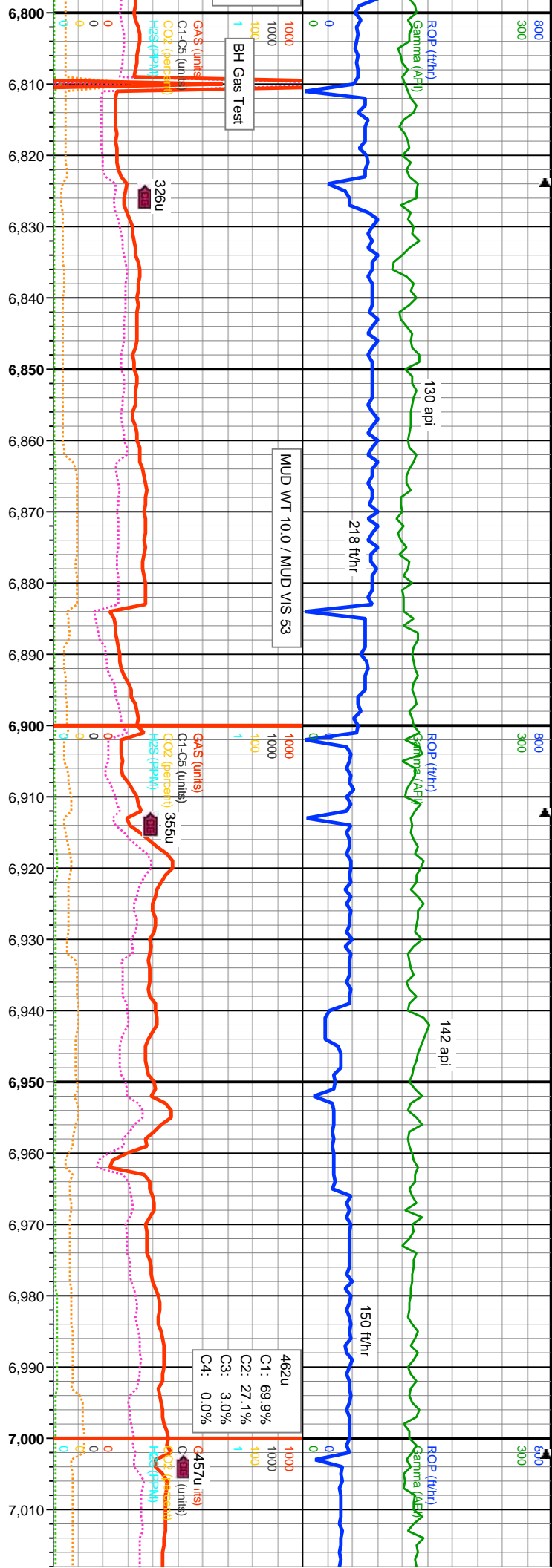




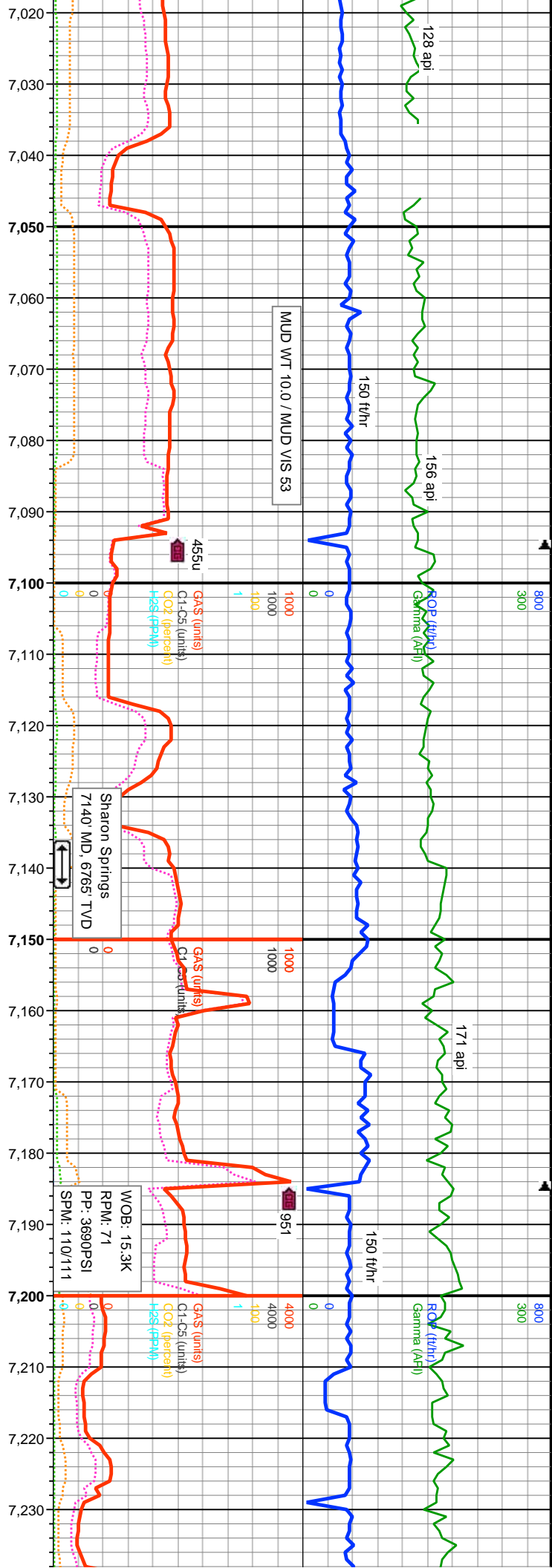




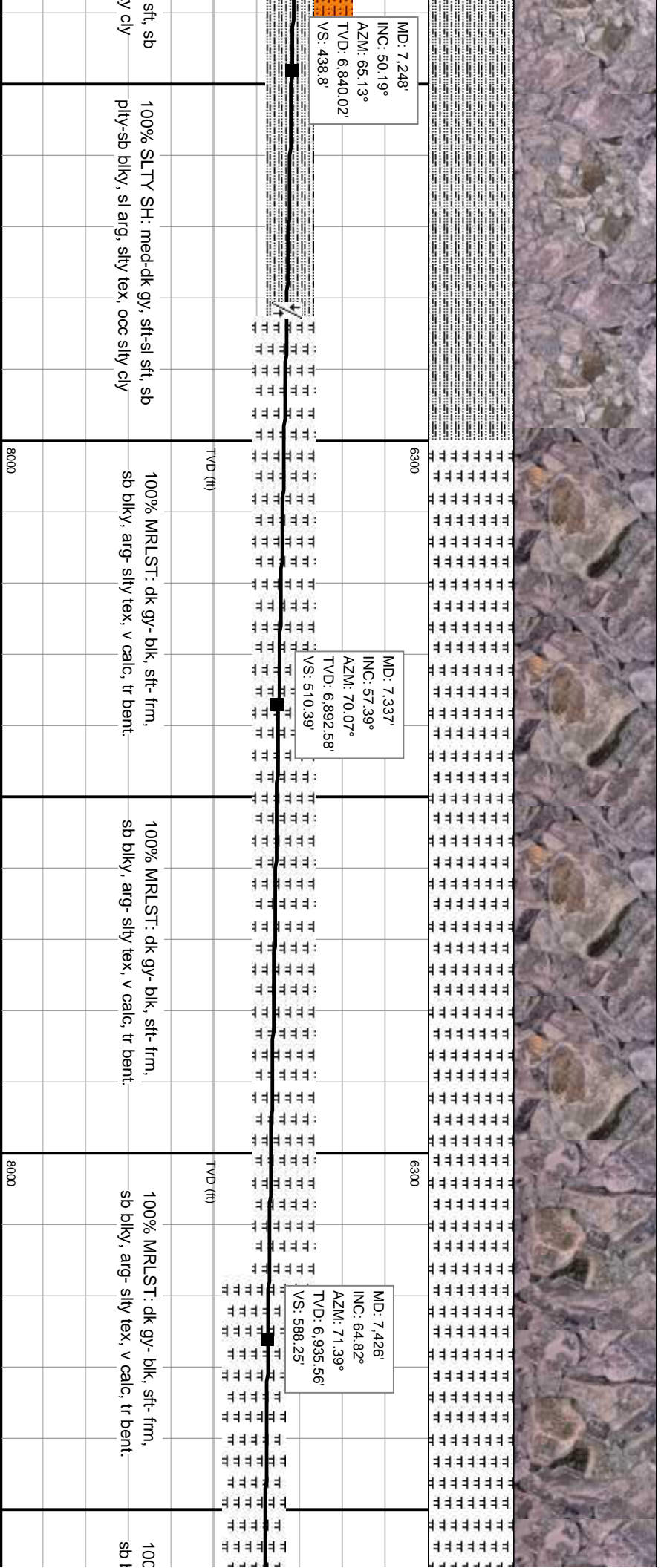
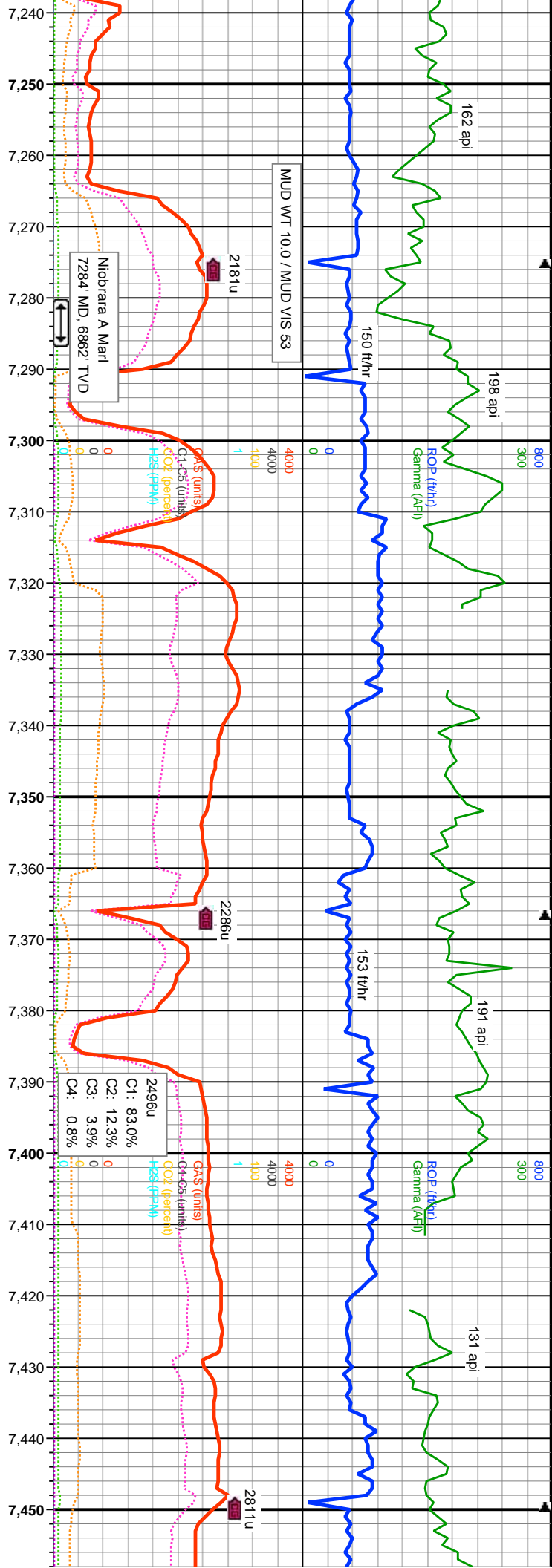




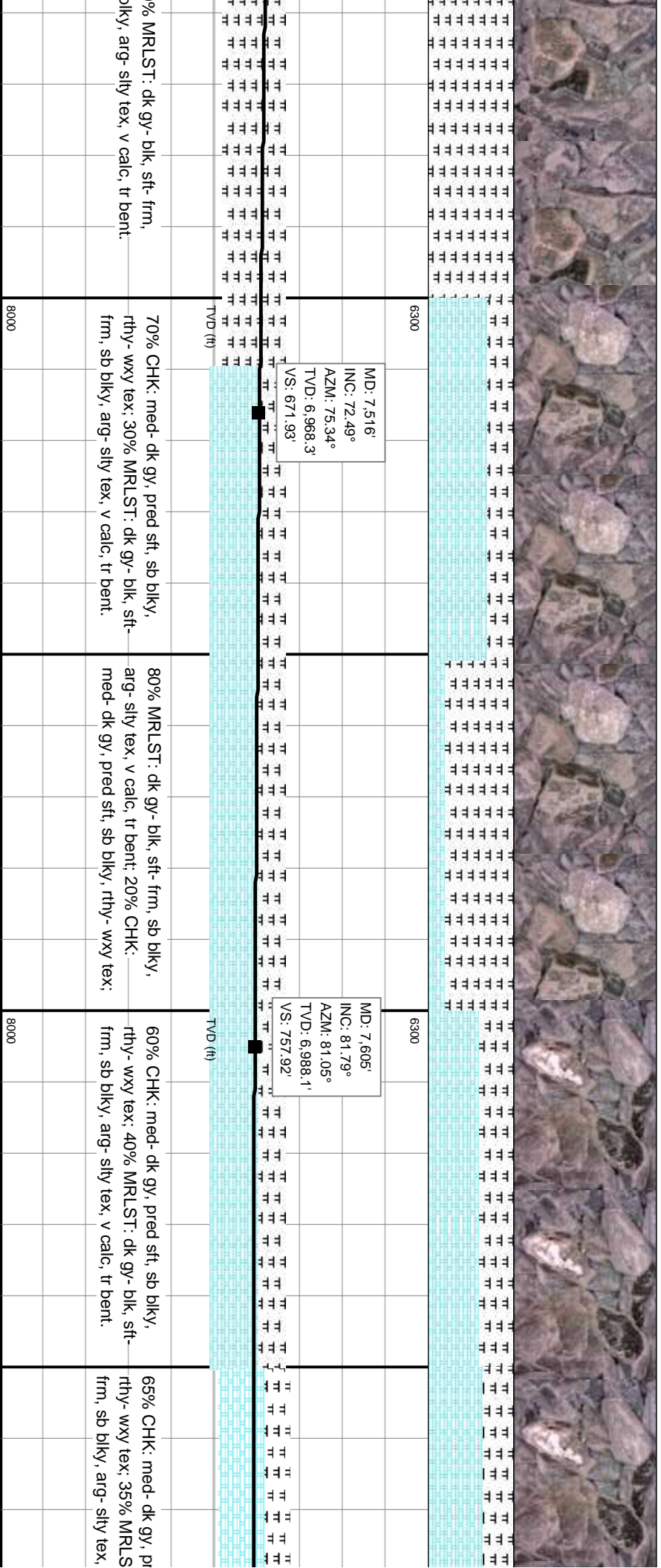
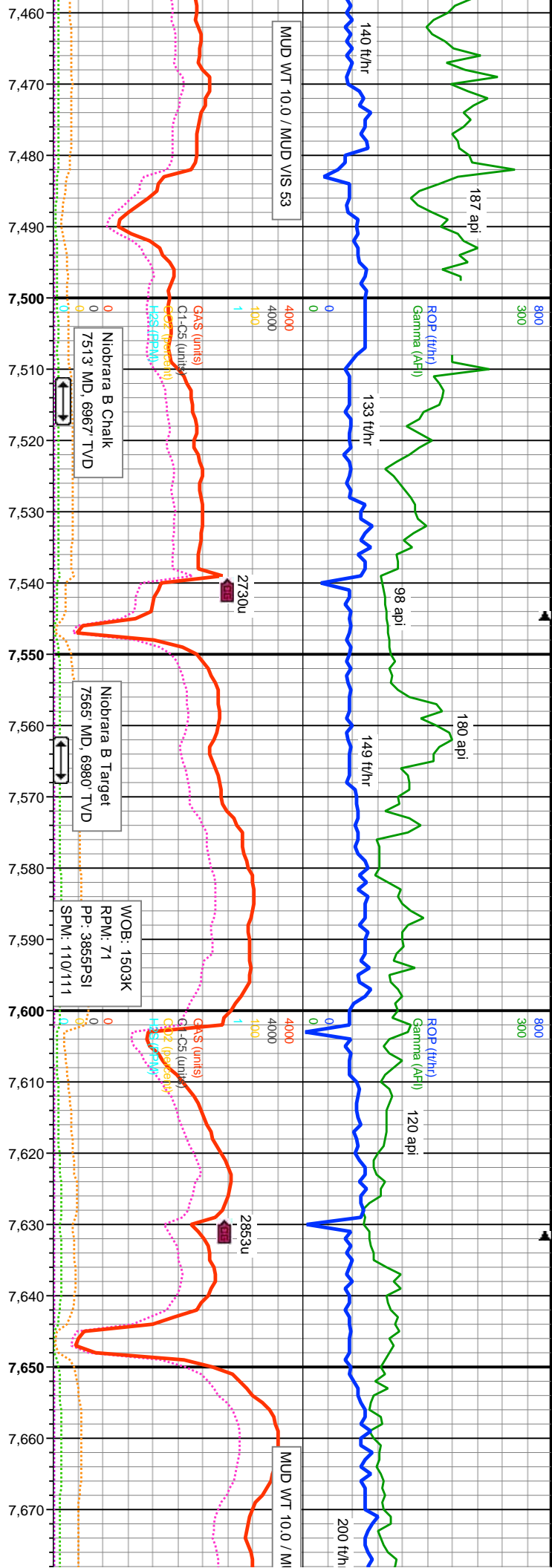




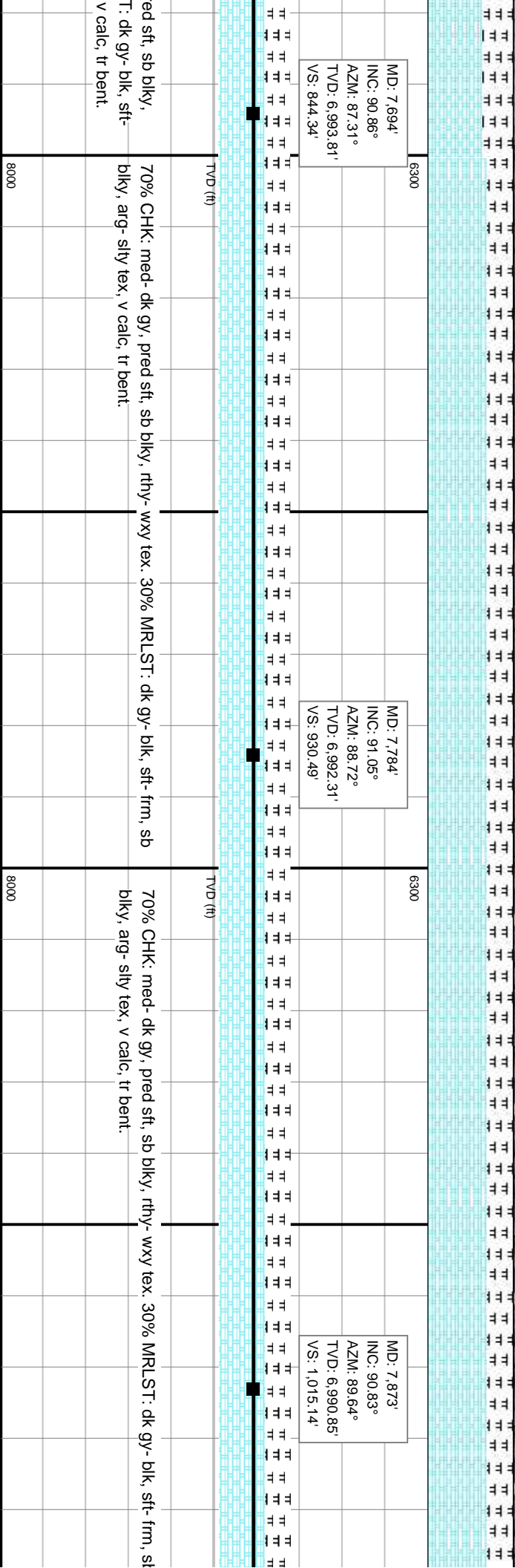
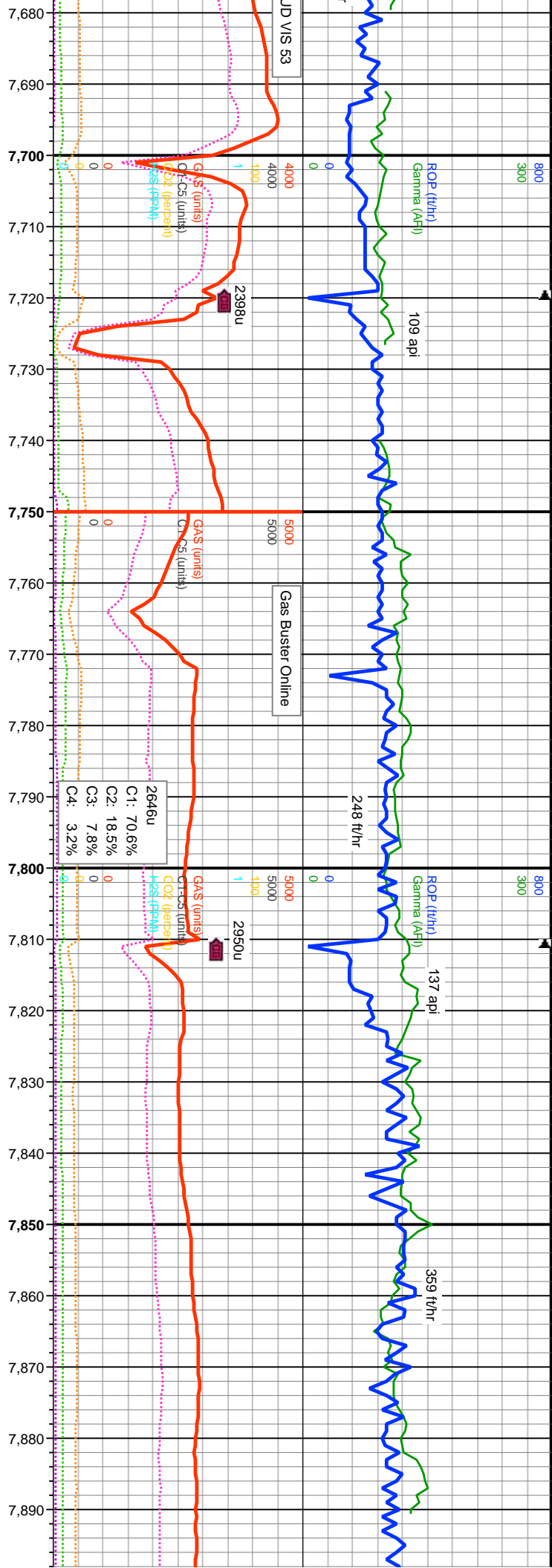
		MD: 7,069' INC: 36.89° AZM: 36.91° TVD: 6,710.26' VS: 323.95'		MD: 7,158' INC: 43.52° AZM: 51.5° TVD: 6,778.35' VS: 375.03'	
		6300		6300	
		TVD (ft)		TVD (ft)	
		8000		8000	
		60% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blkly - sb plty, arg, silty occ aren, rthy; abnt cly; 40% SLTY SH: med-dk gy, sft-sl sft, sb plty-sb blkly, sl arg, silty tex, occ silty cly		60% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blkly - sb plty, arg, silty occ aren, rthy; abnt cly; 40% SLTY SH: med-dk gy, sft-sl sft, sb plty-sb blkly, sl arg, silty tex, occ silty cly	
		100% SLTY SH: med-dk gy, sft-sl plty-sb blkly, sl arg, silty tex, occ silty		70% SLTY SH: med-dk gy, sft-sl sft, sb plty-sb blkly, sl arg, silty tex, occ silty cly; 30% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blkly - sb plty, arg, silty occ aren, rthy; abnt cly	
		ST: lt-med gy, v sft-mod blkly - sb plty, arg, silty occ t cly, tr silty sh			

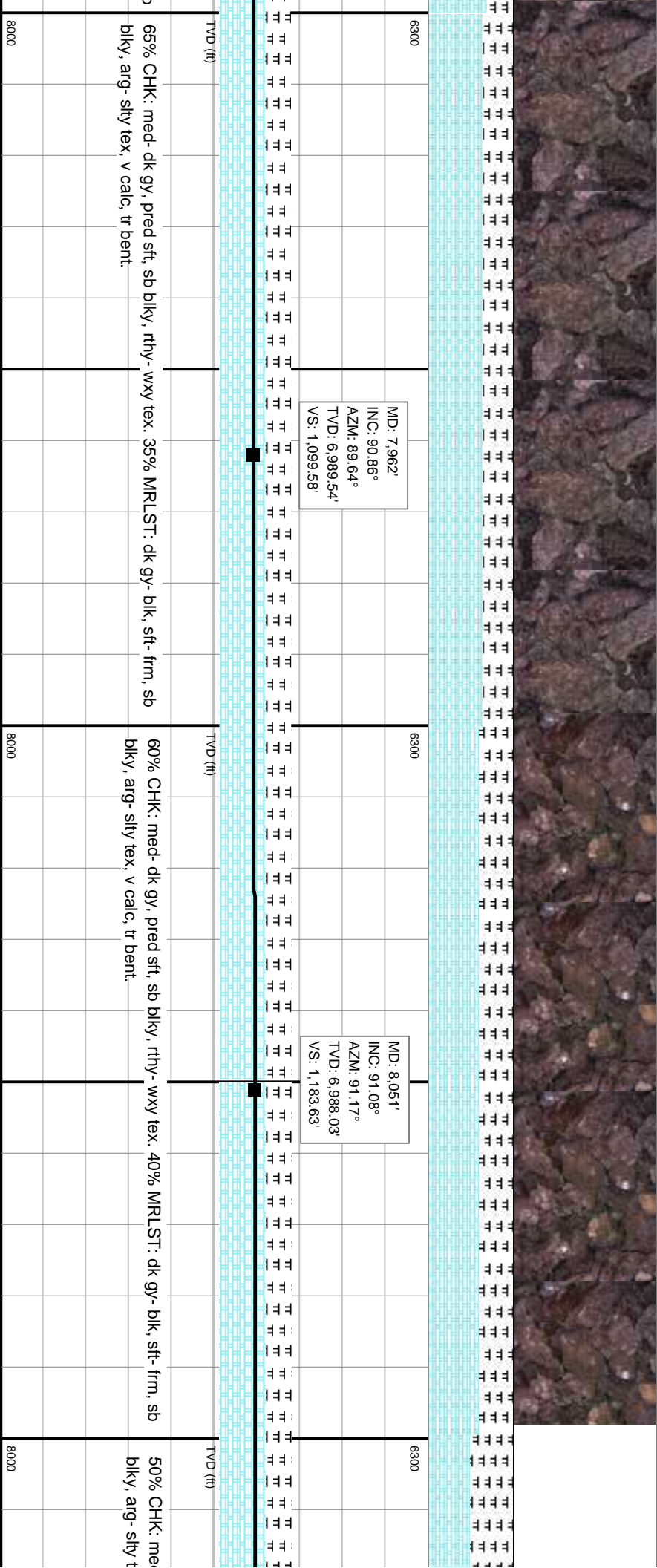
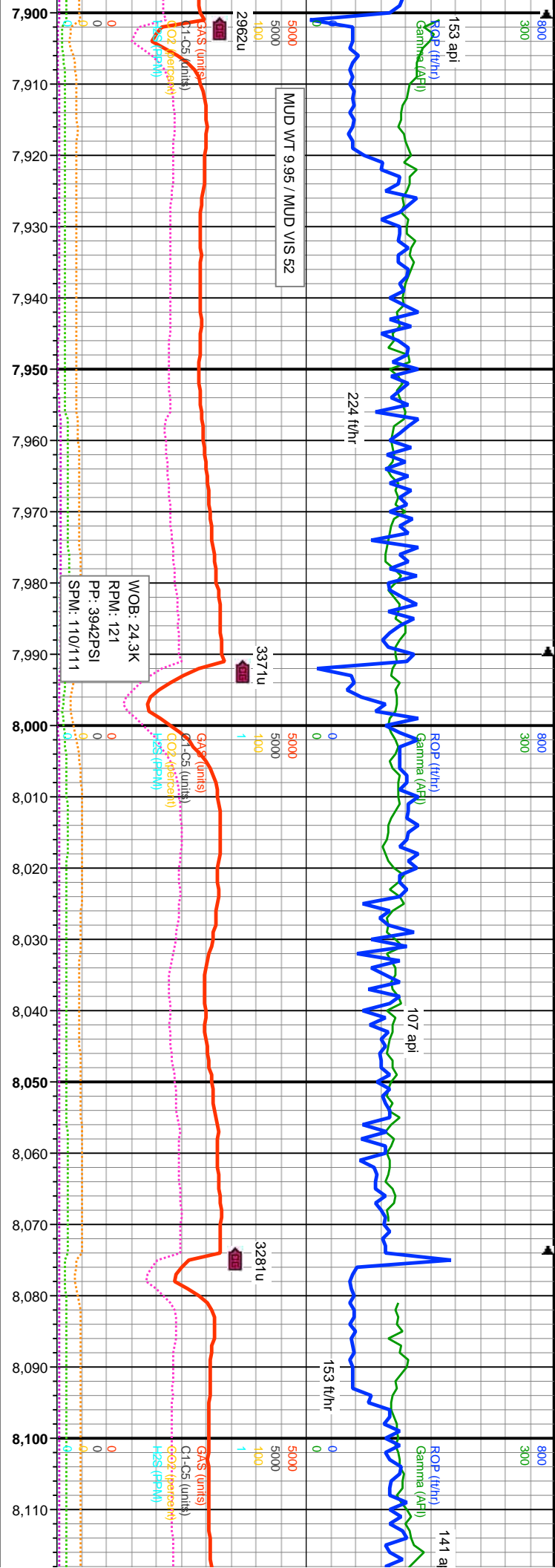




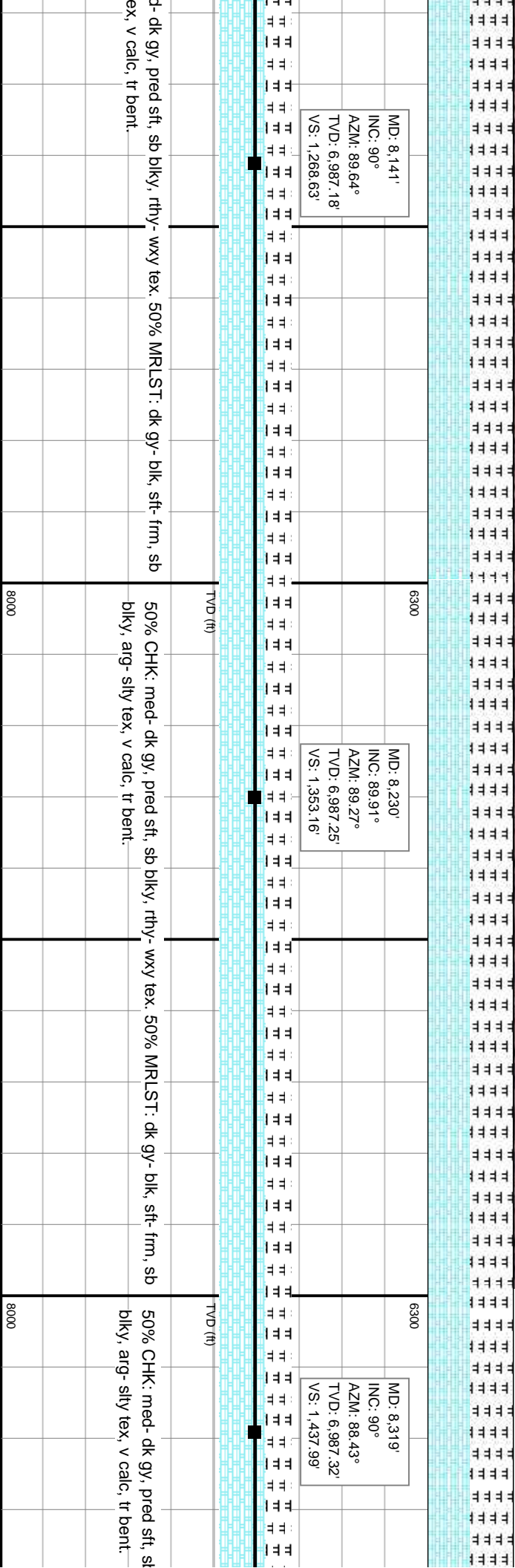
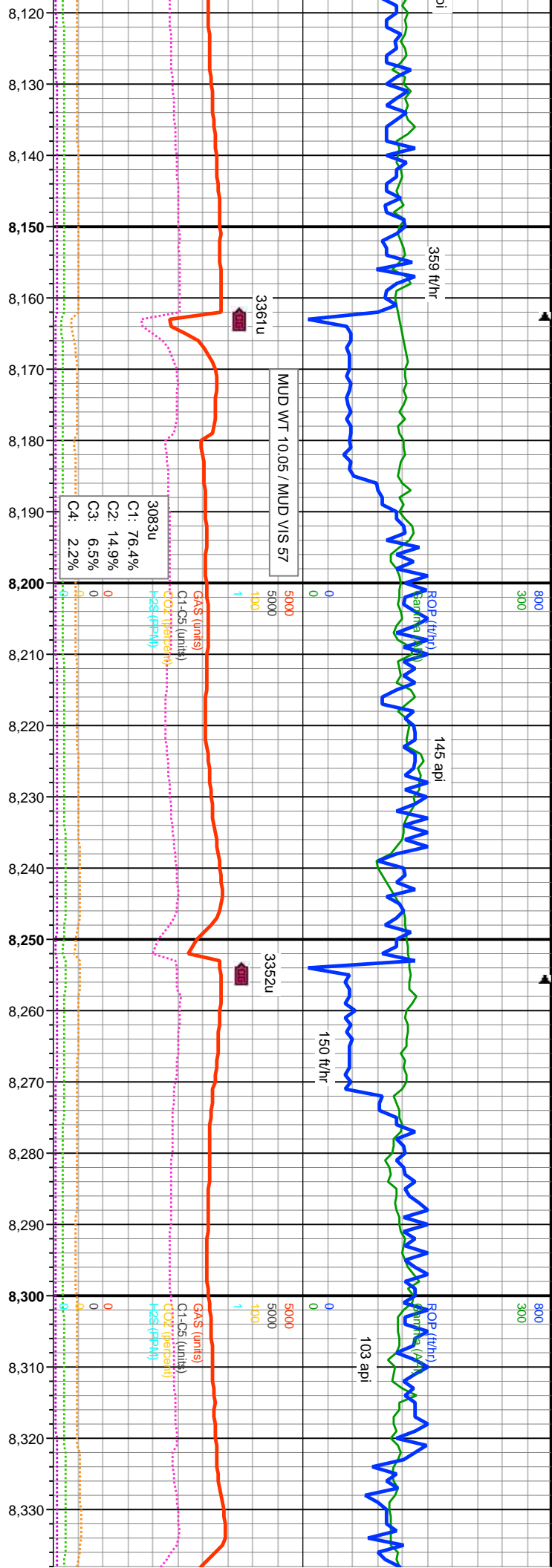






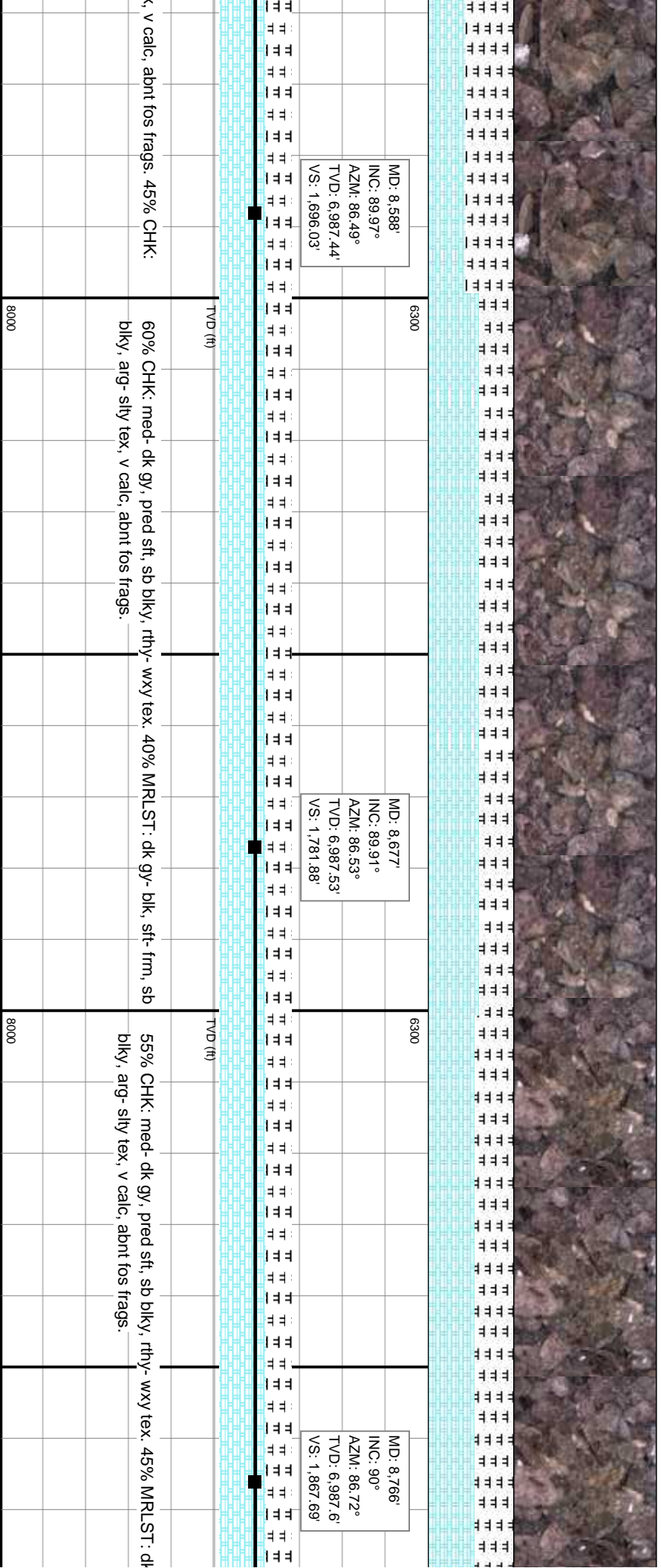
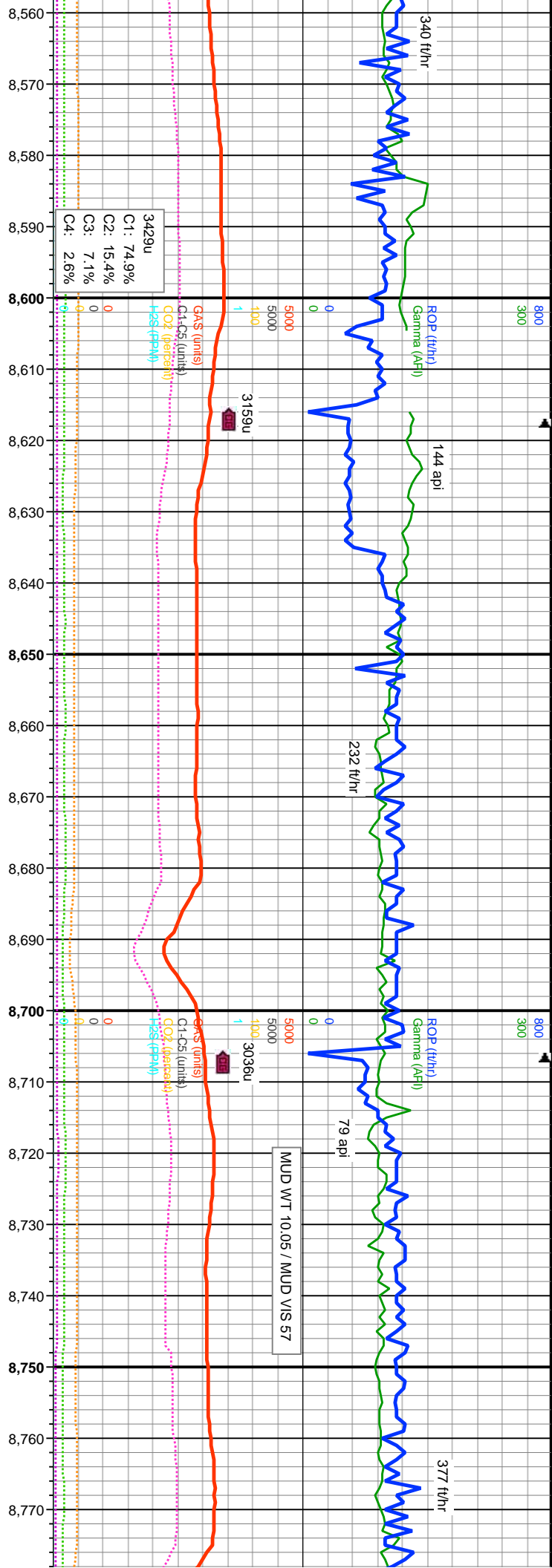




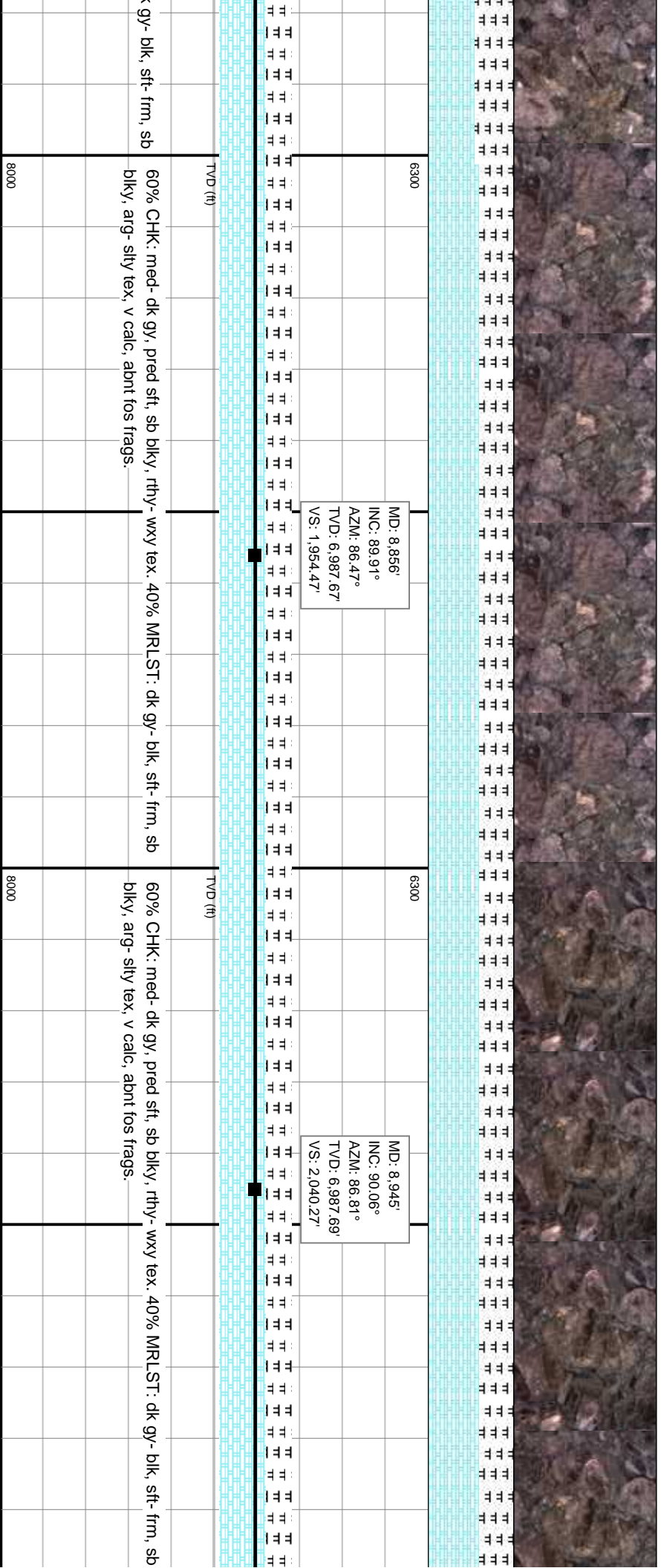
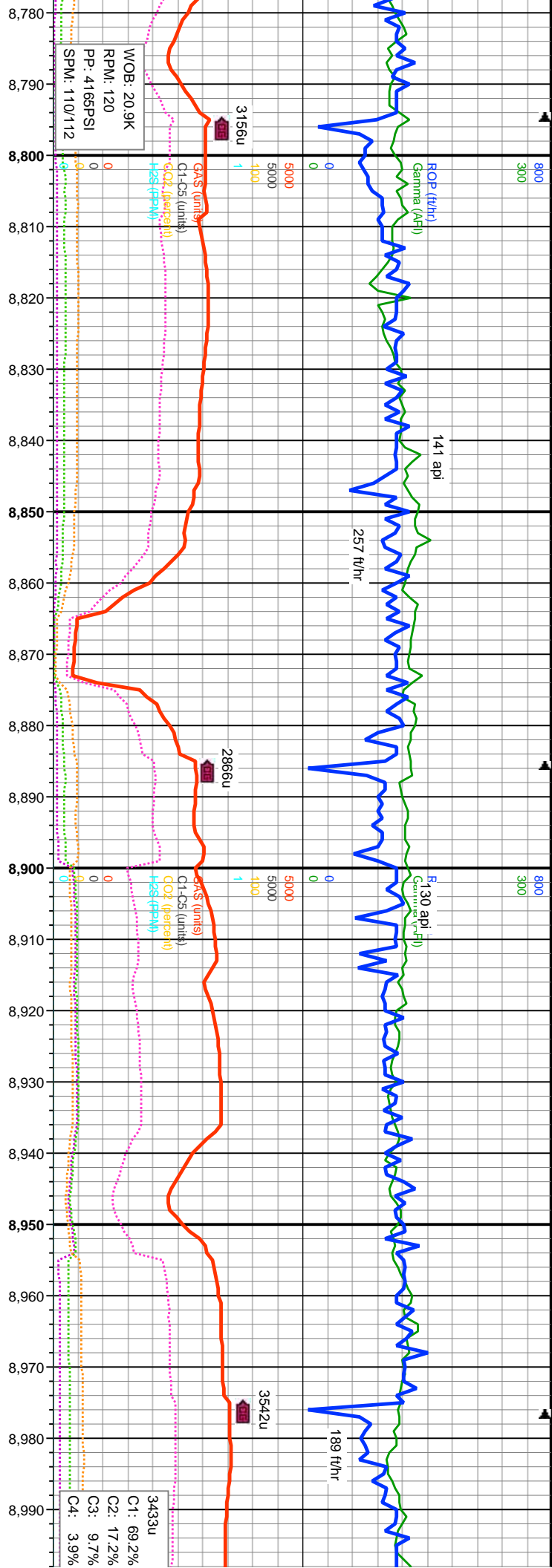




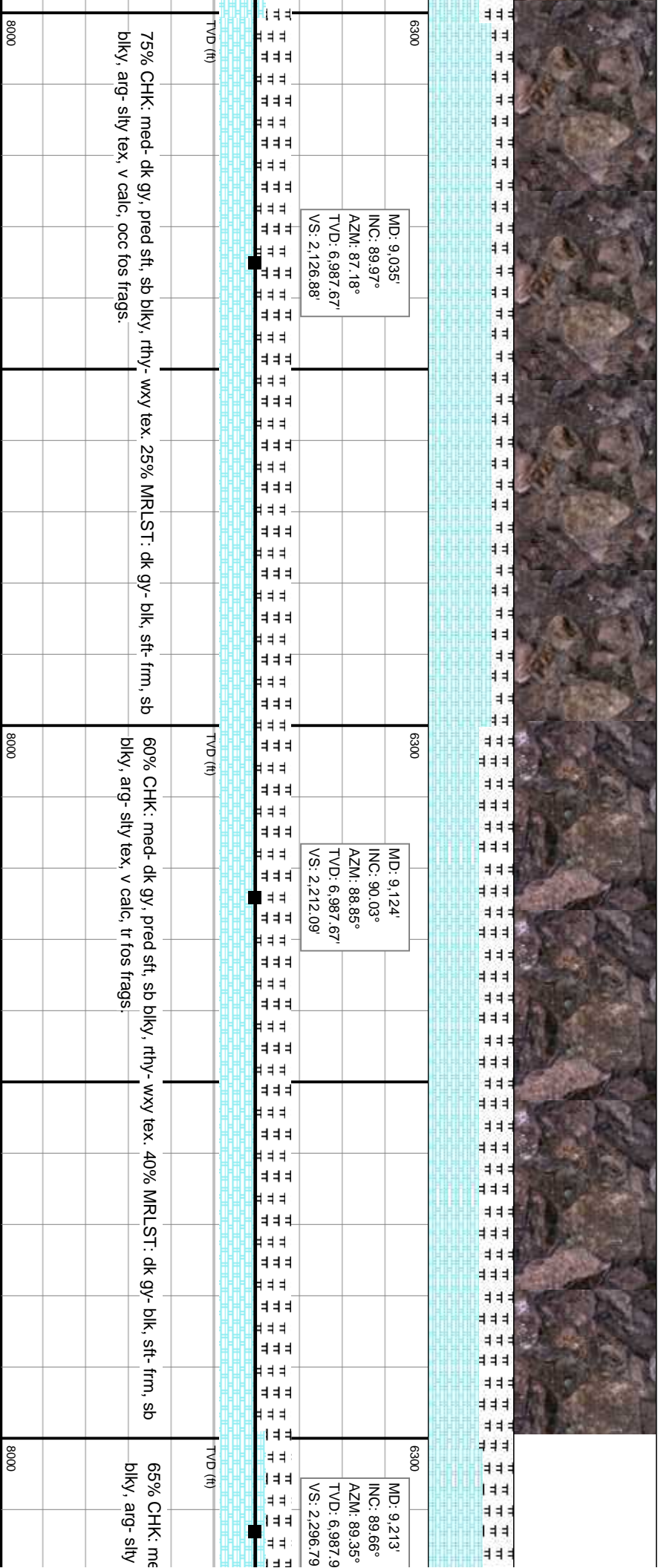
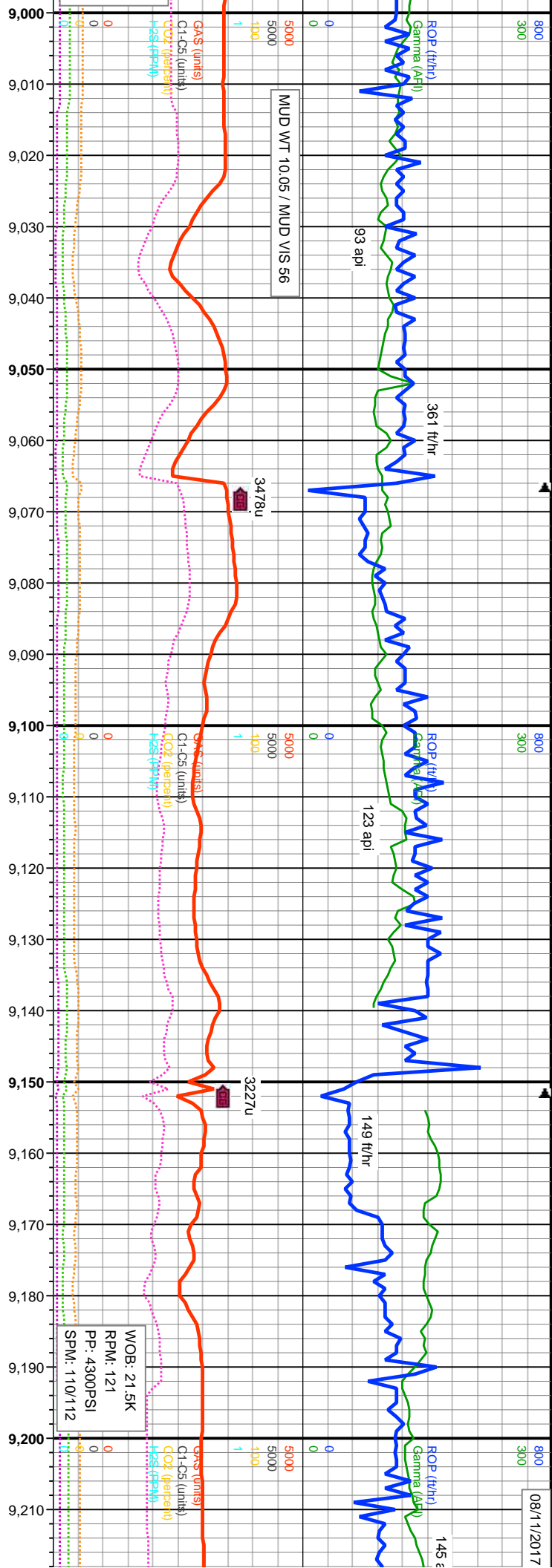


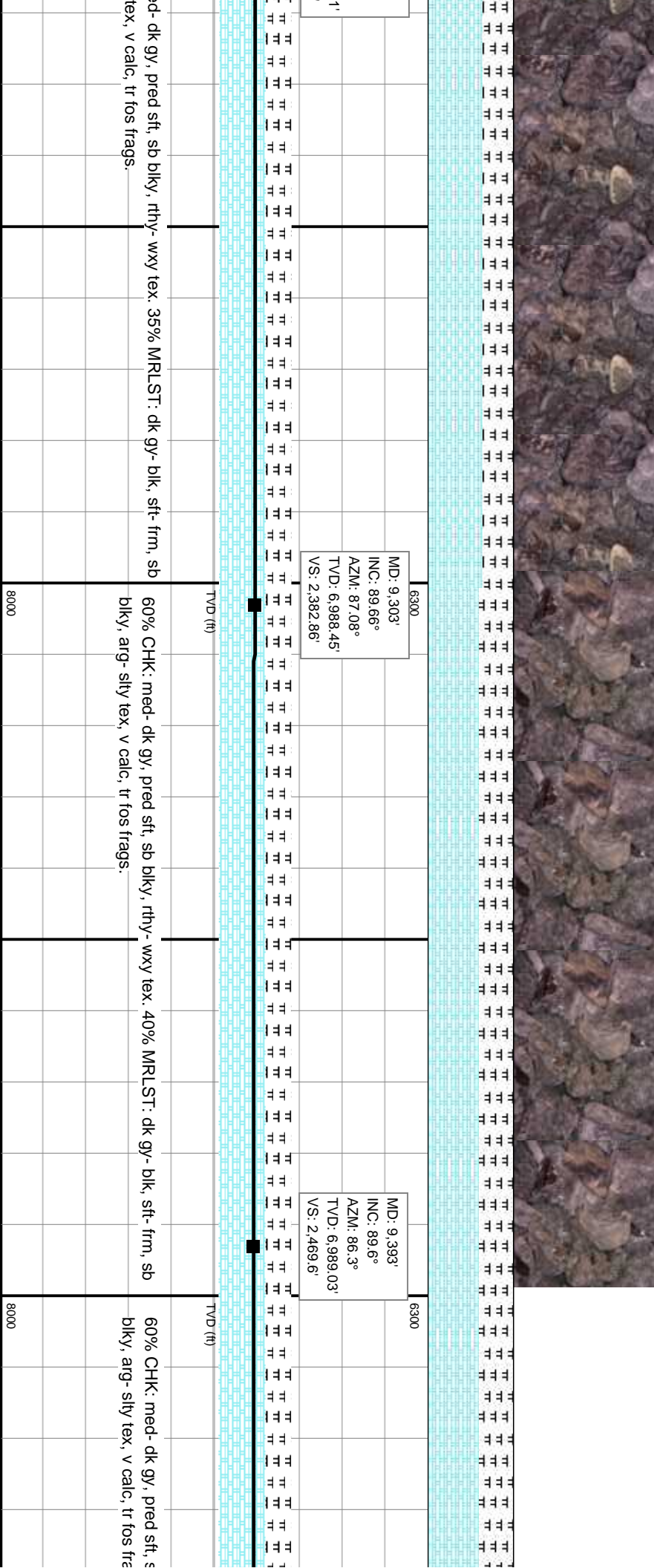
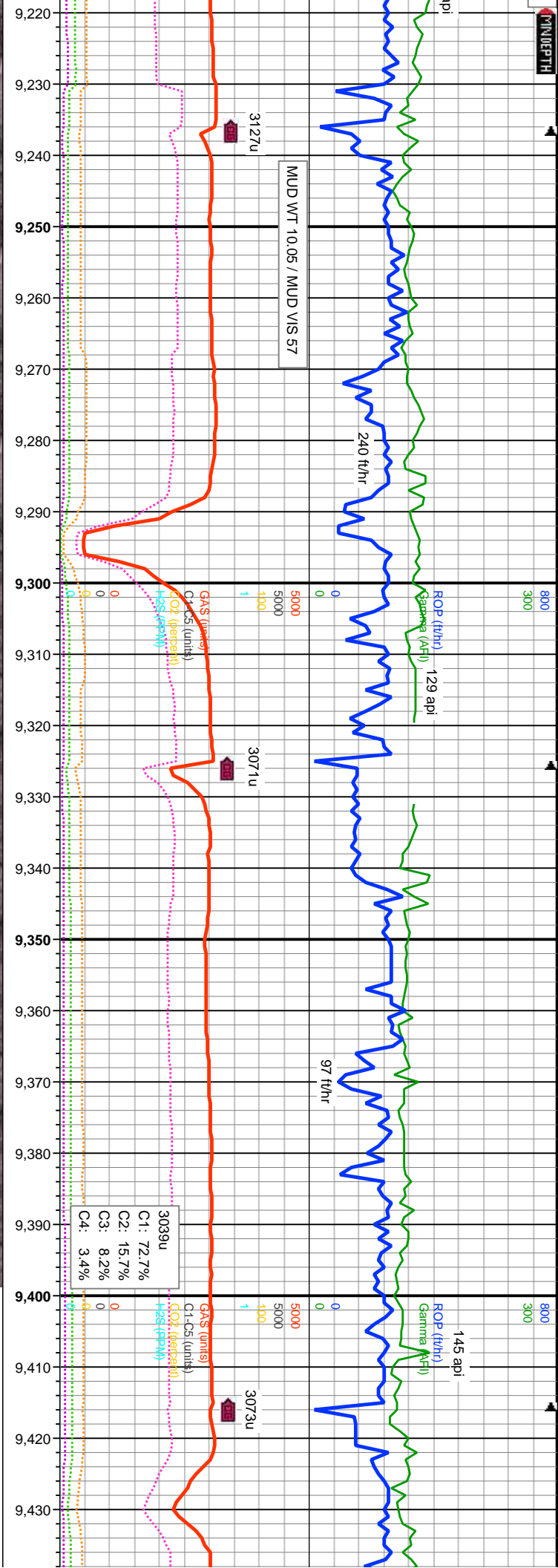




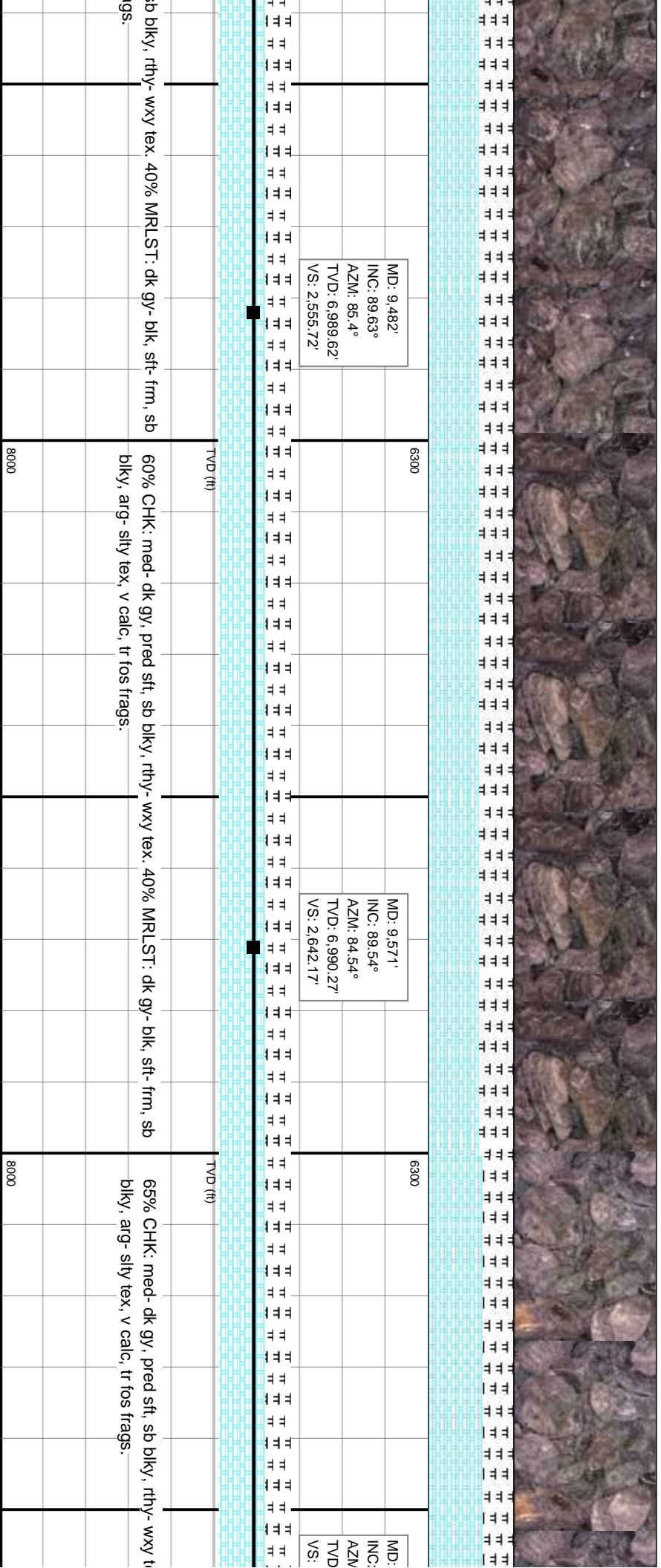
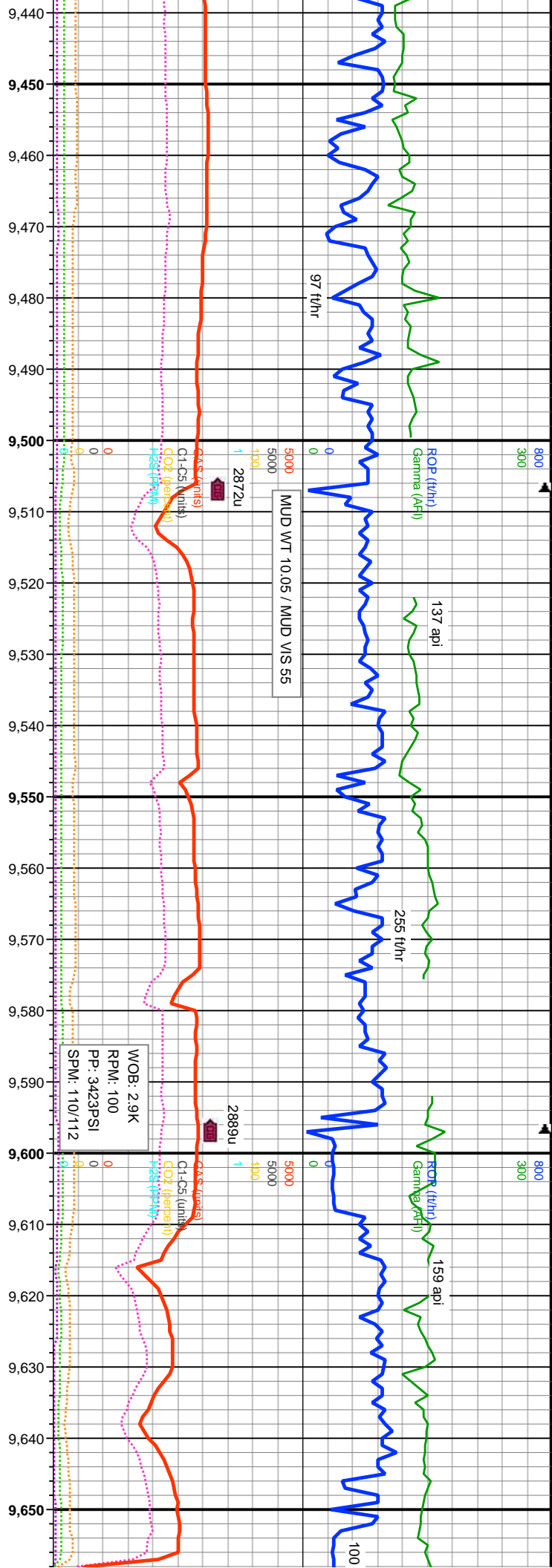




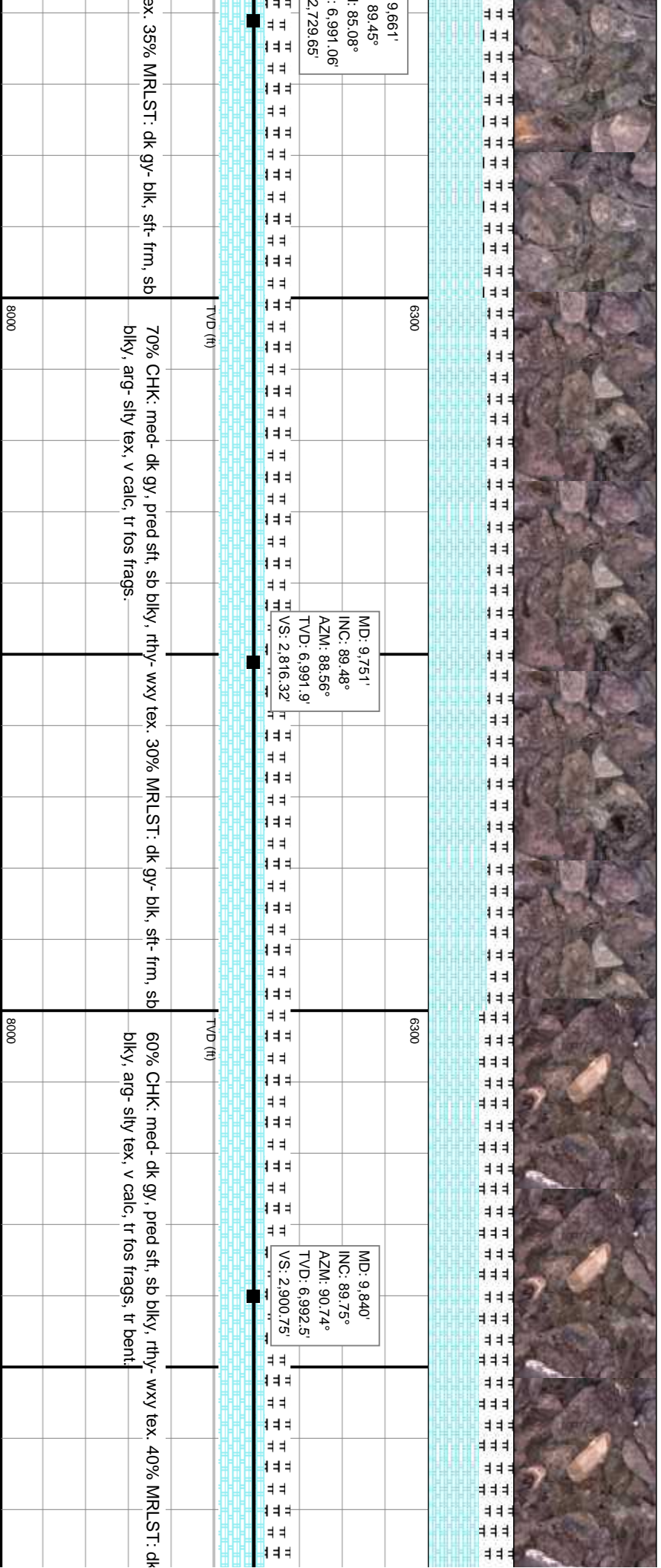
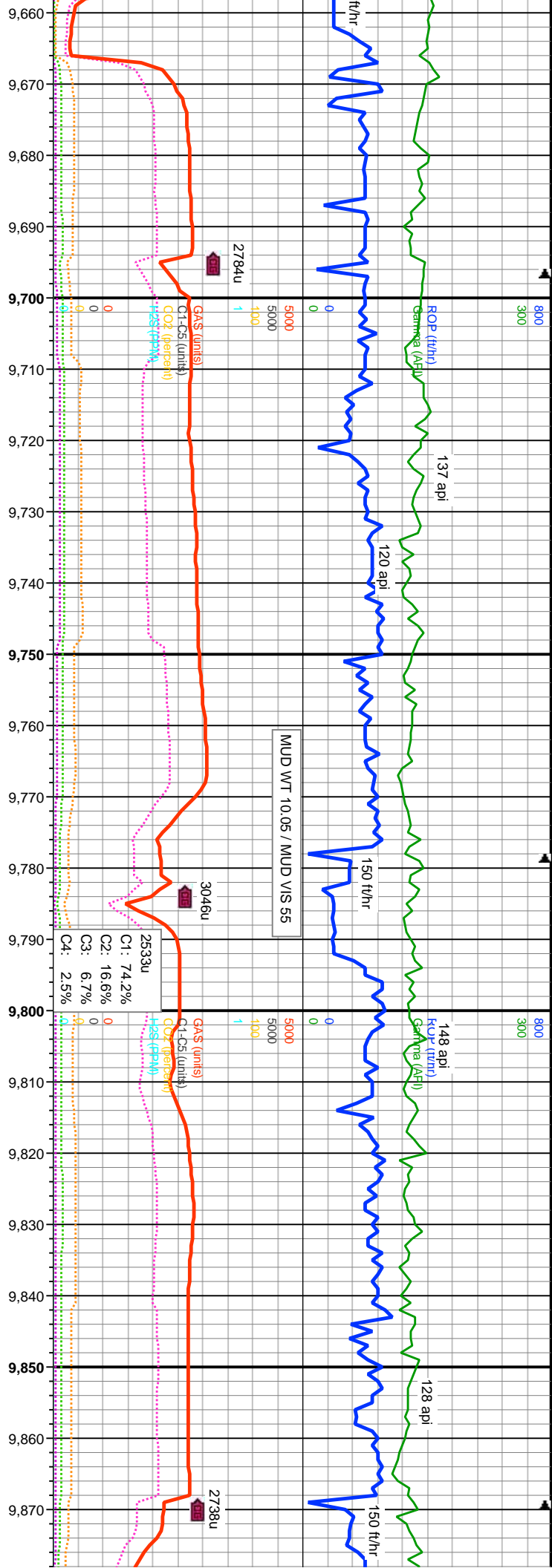


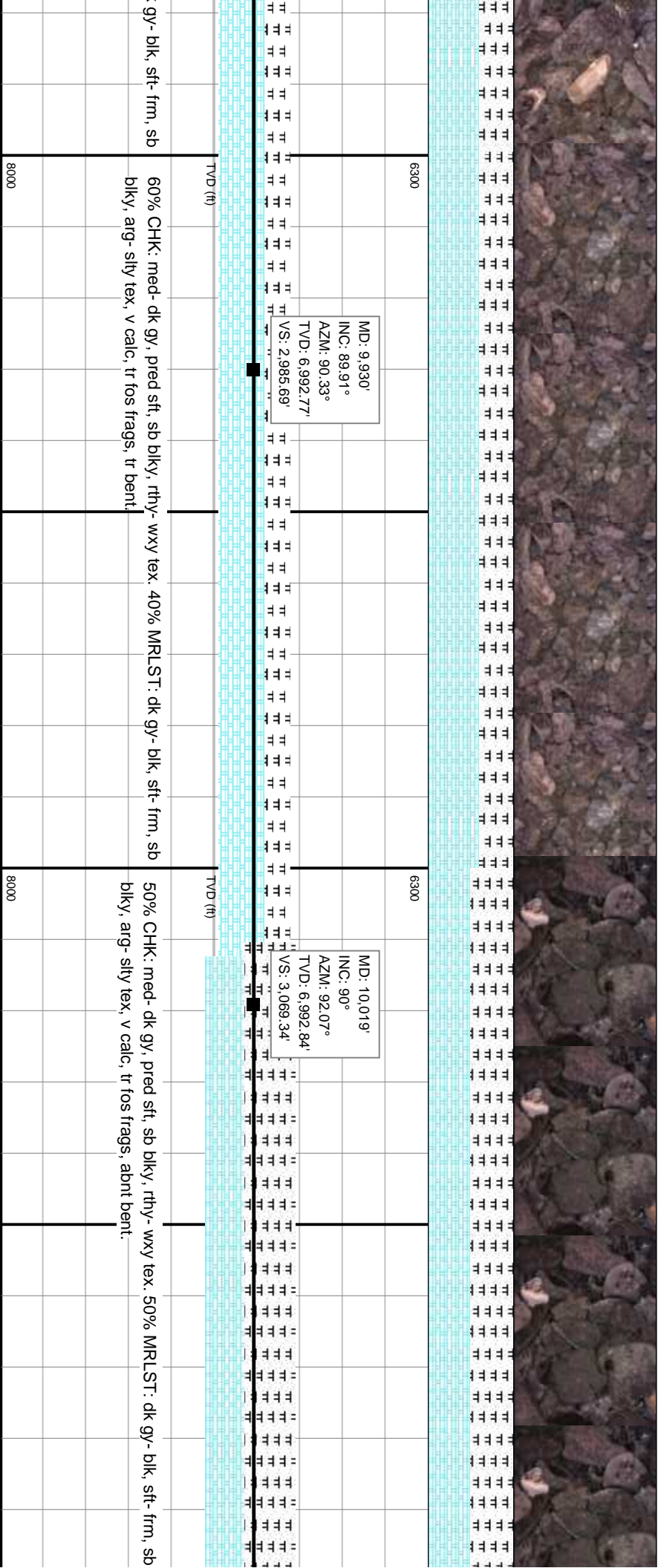
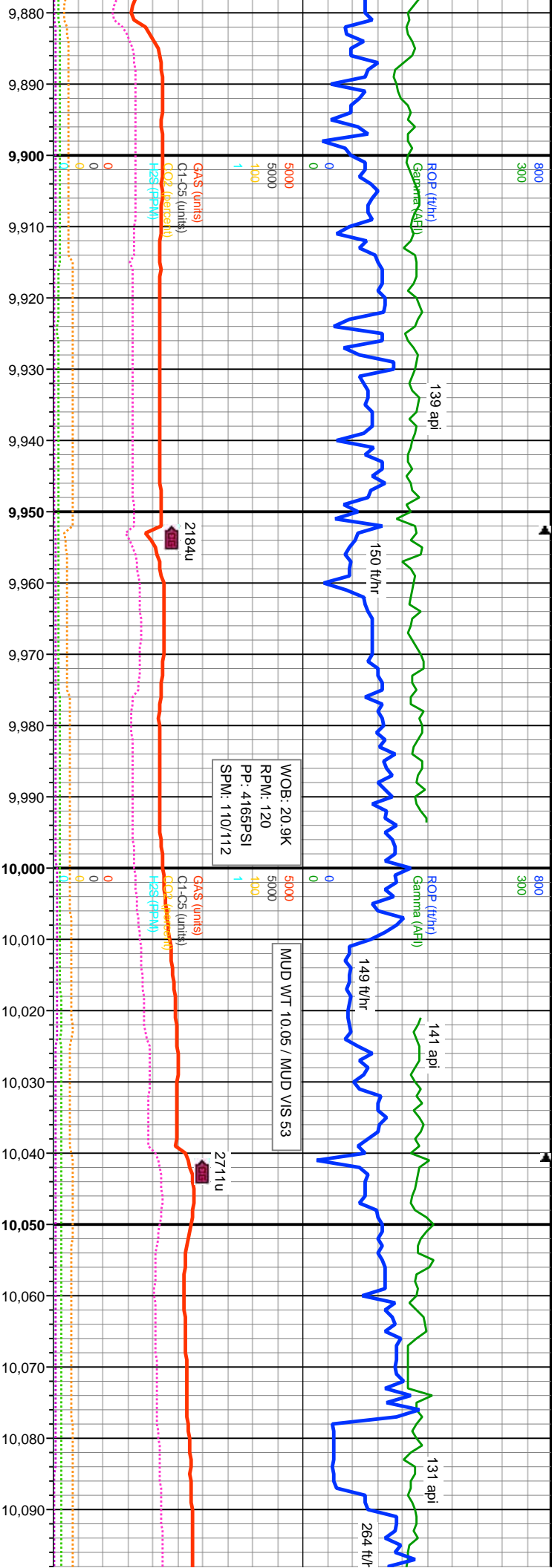




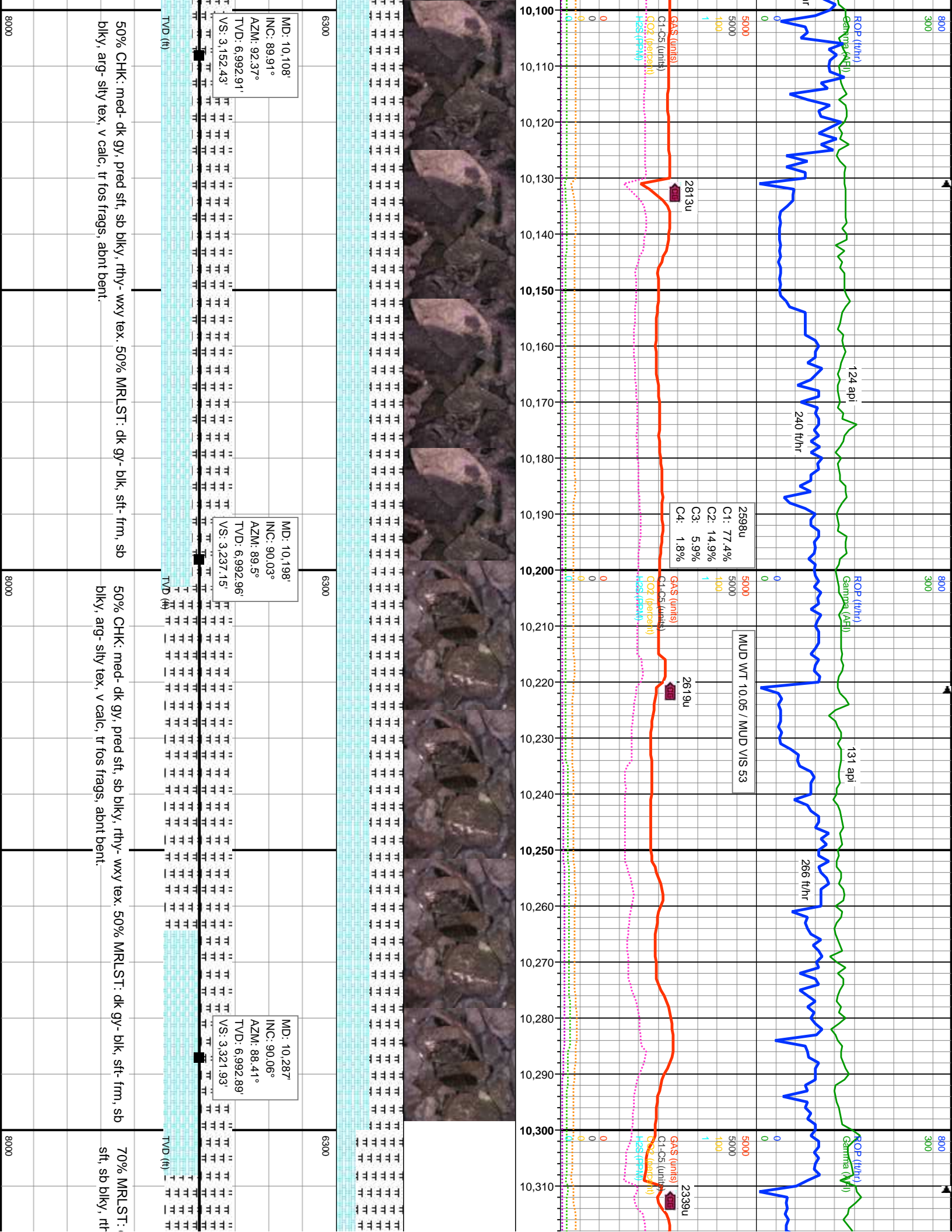


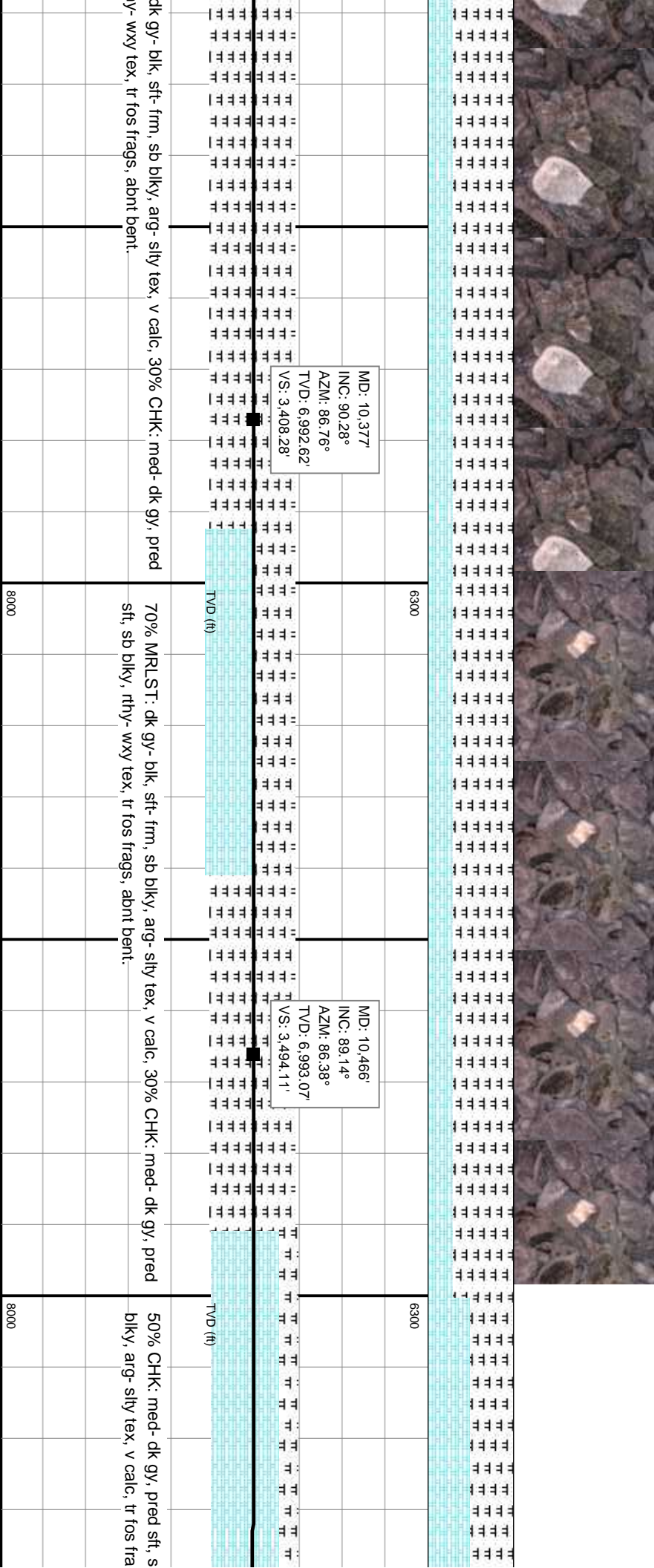
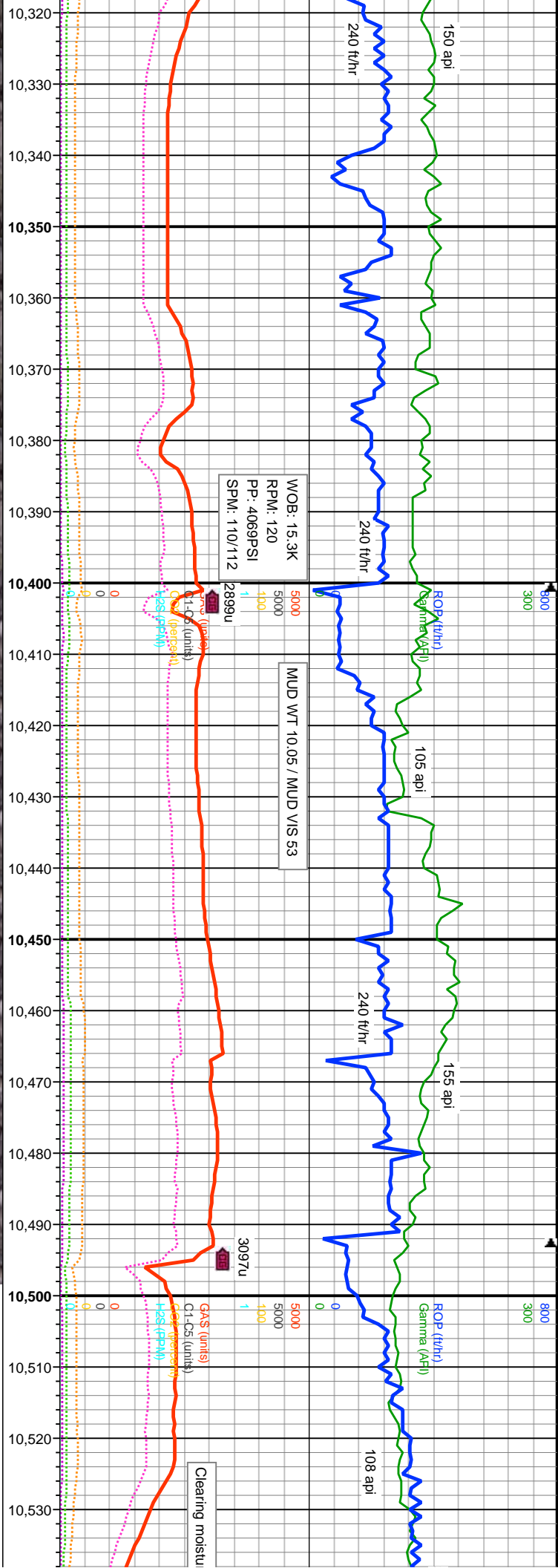




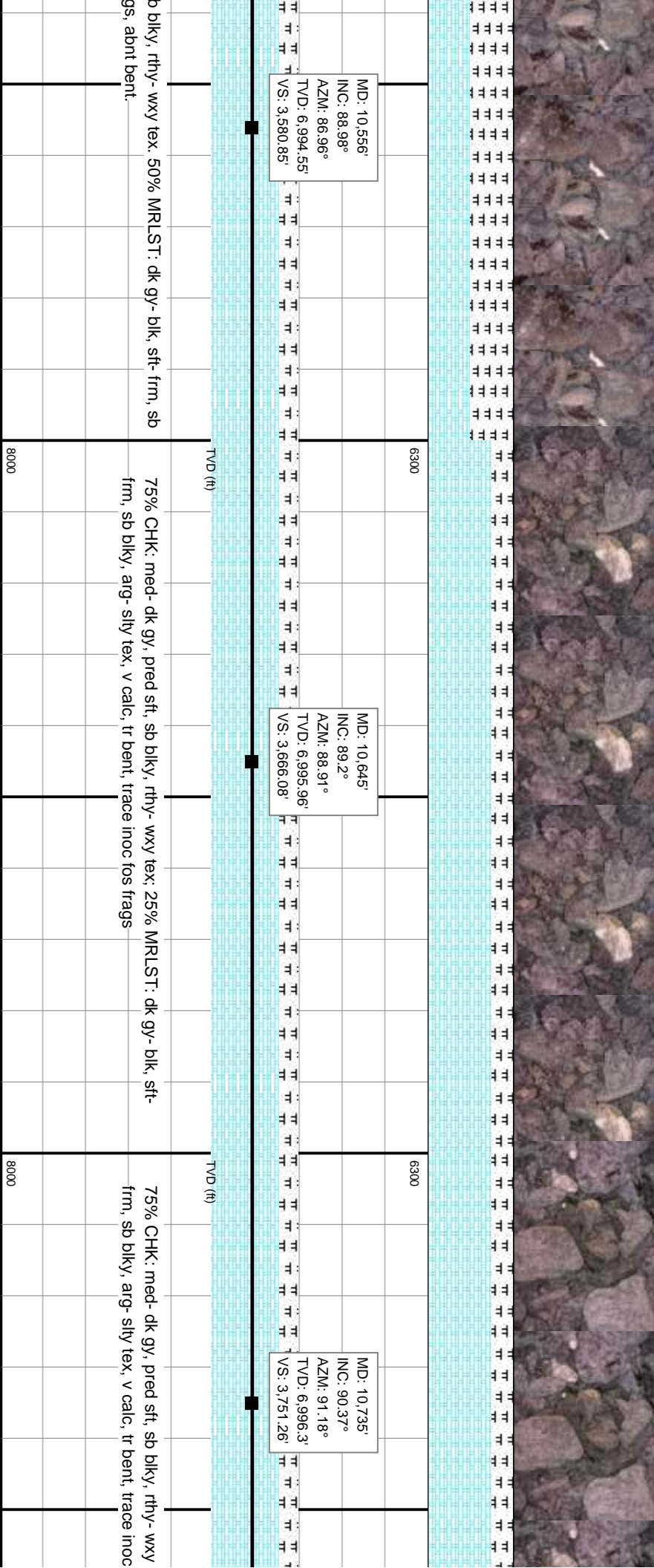
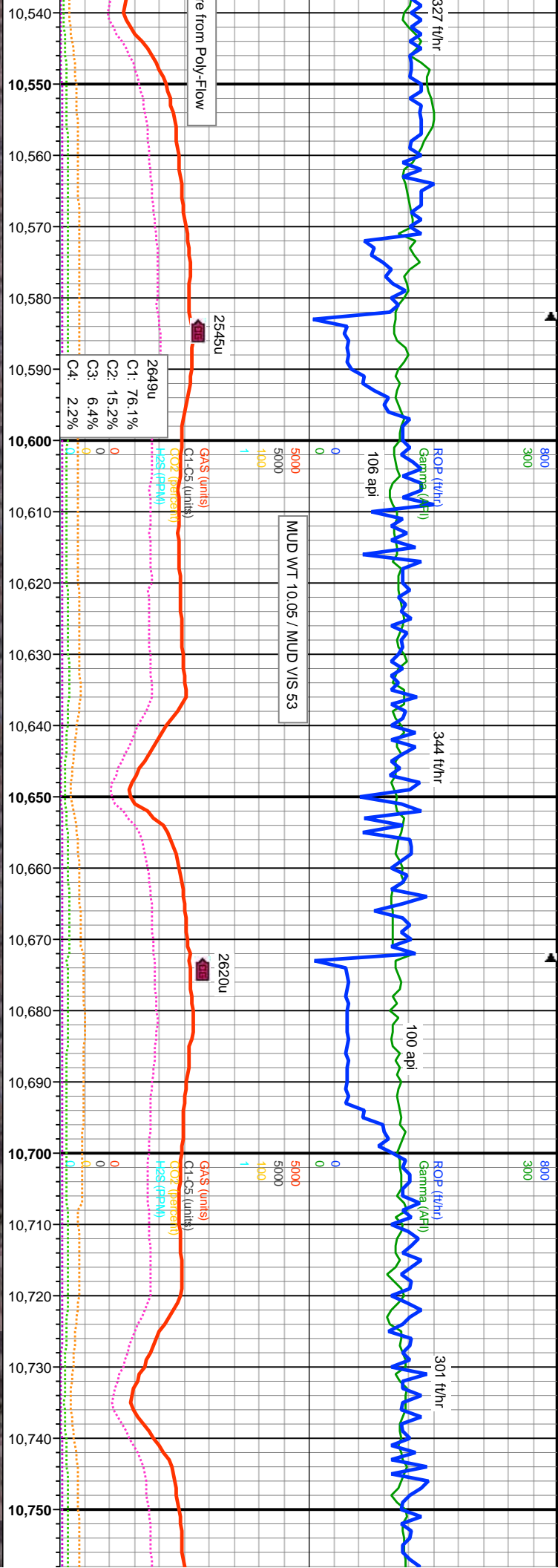


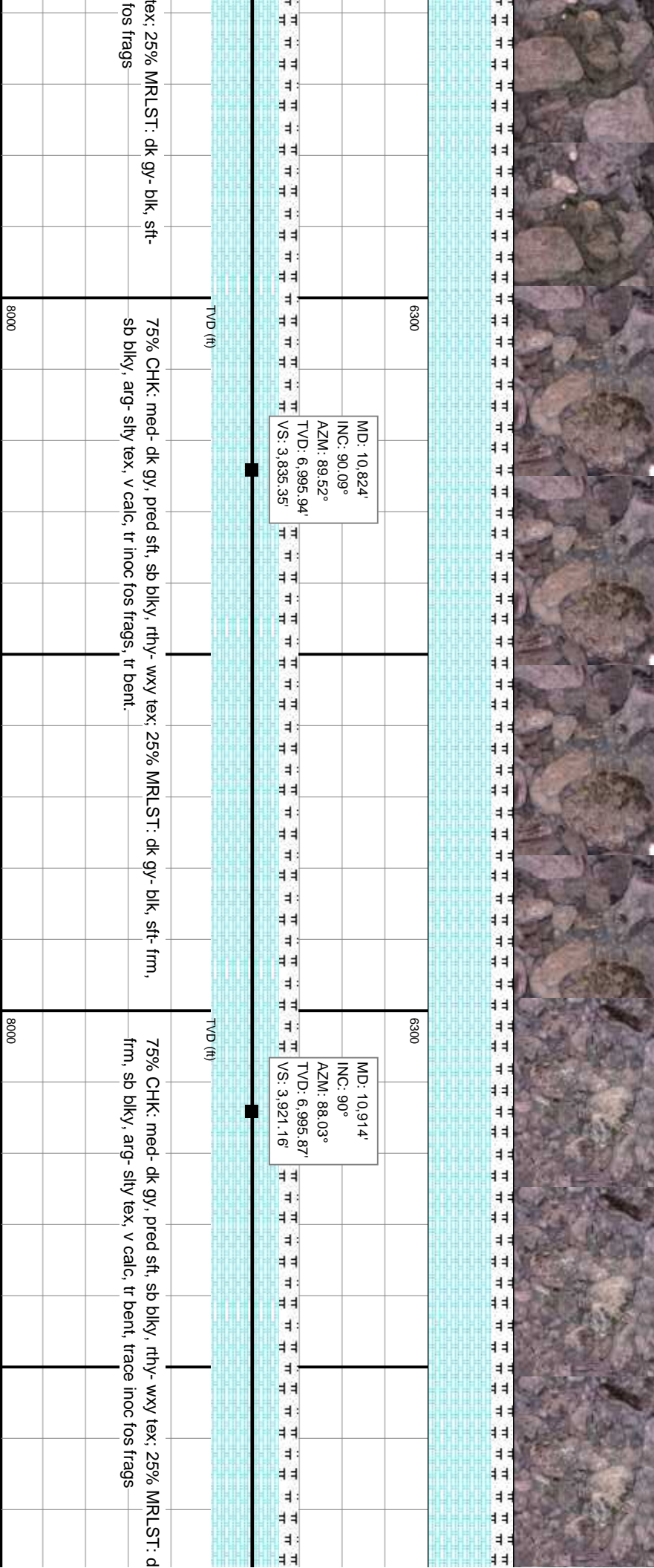
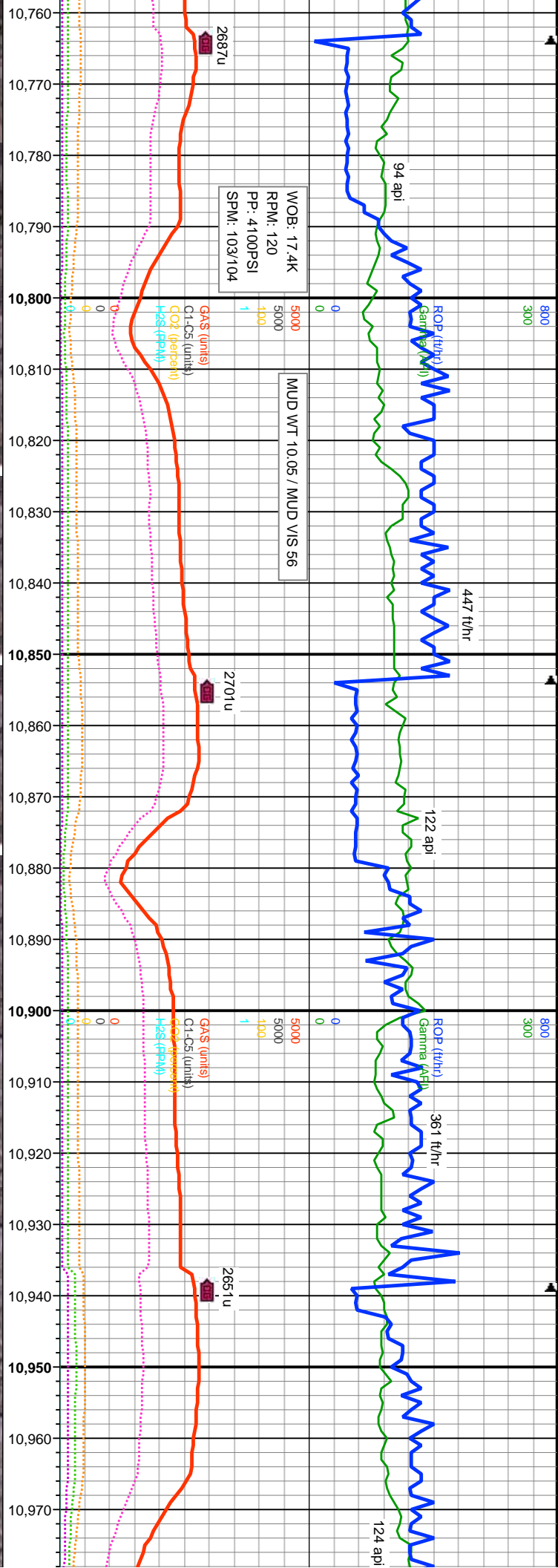




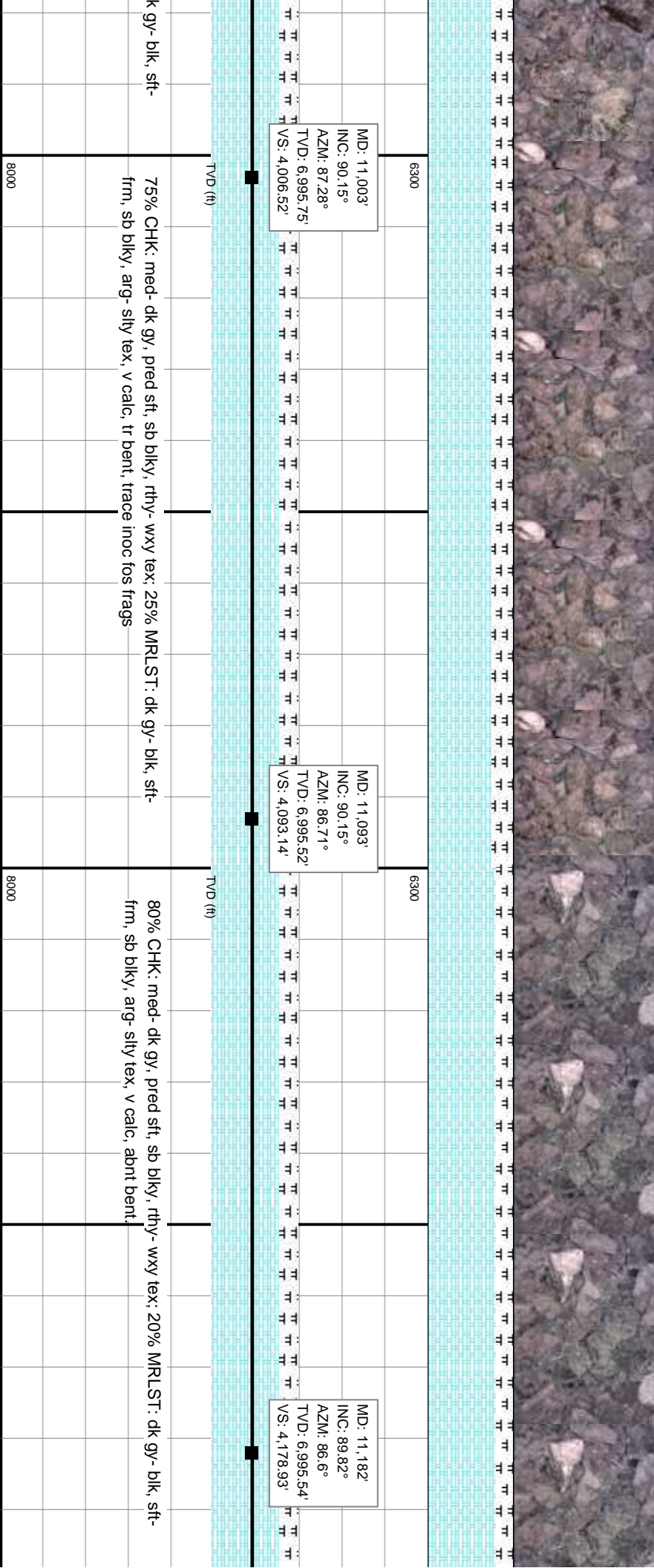
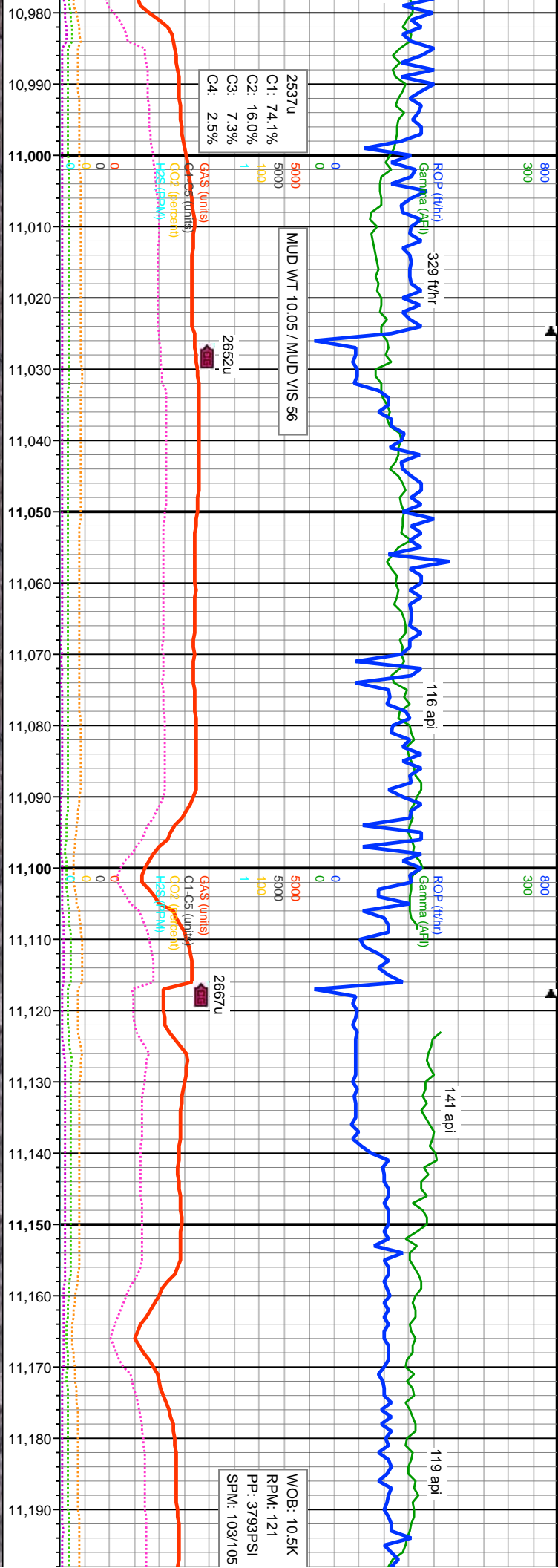


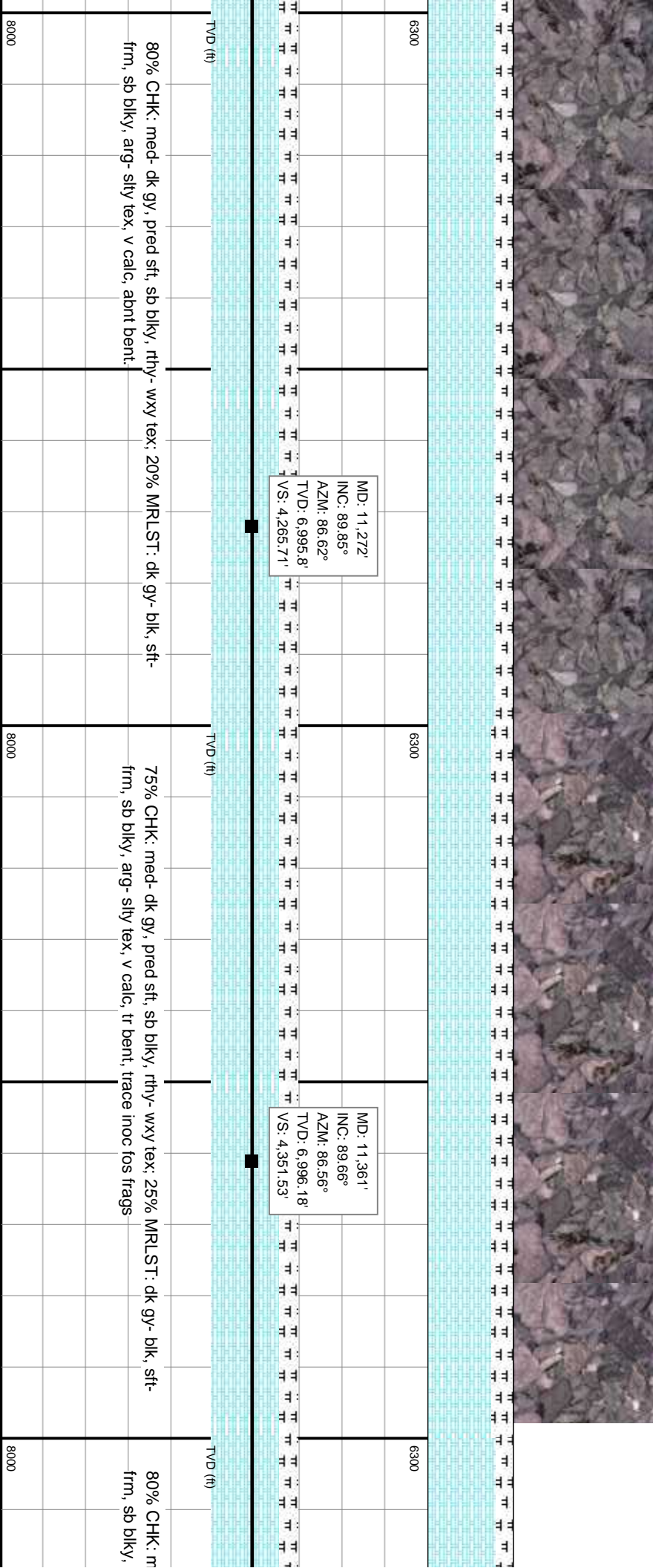
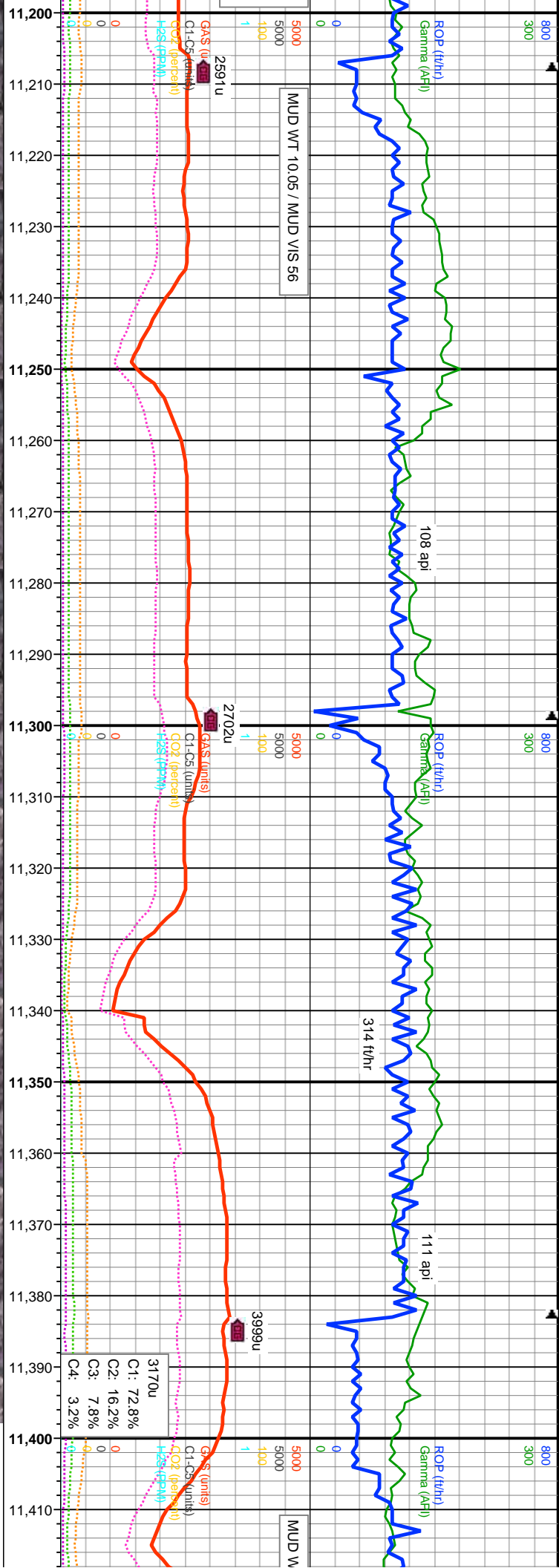




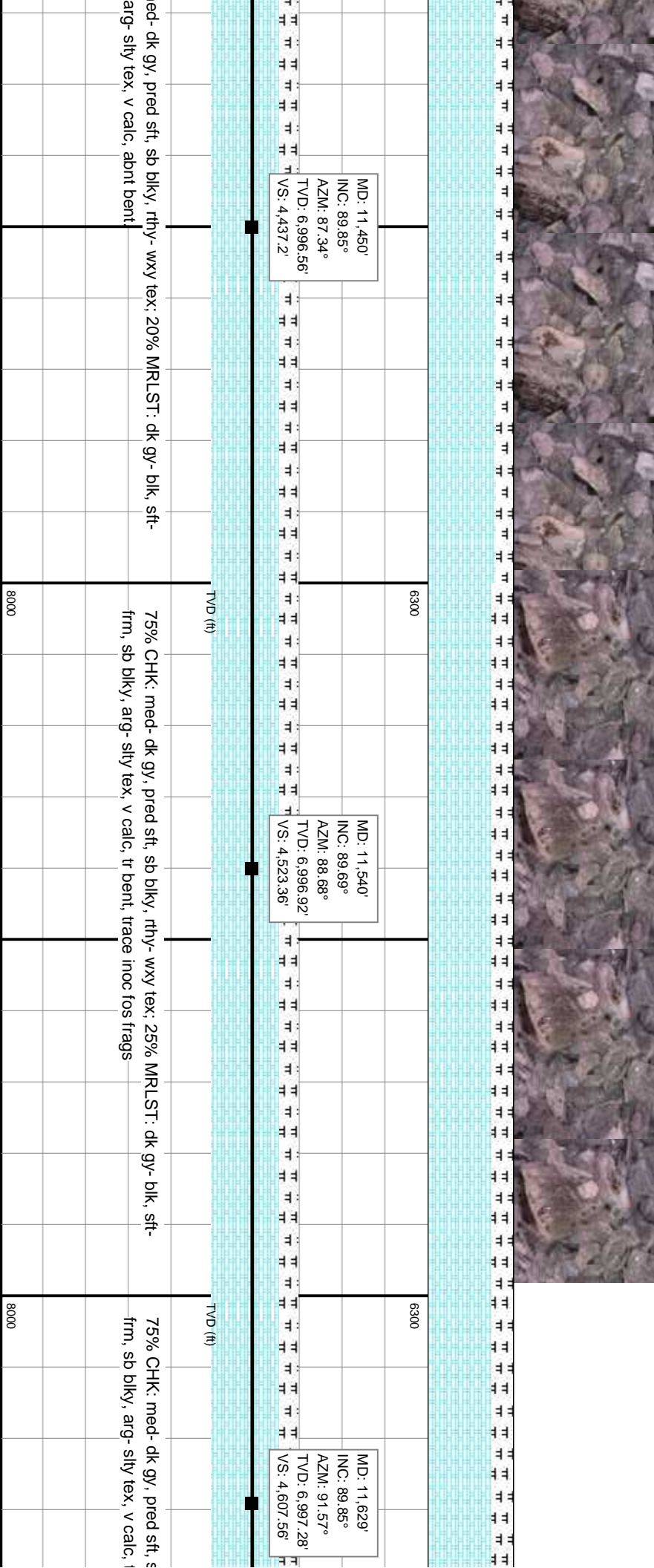
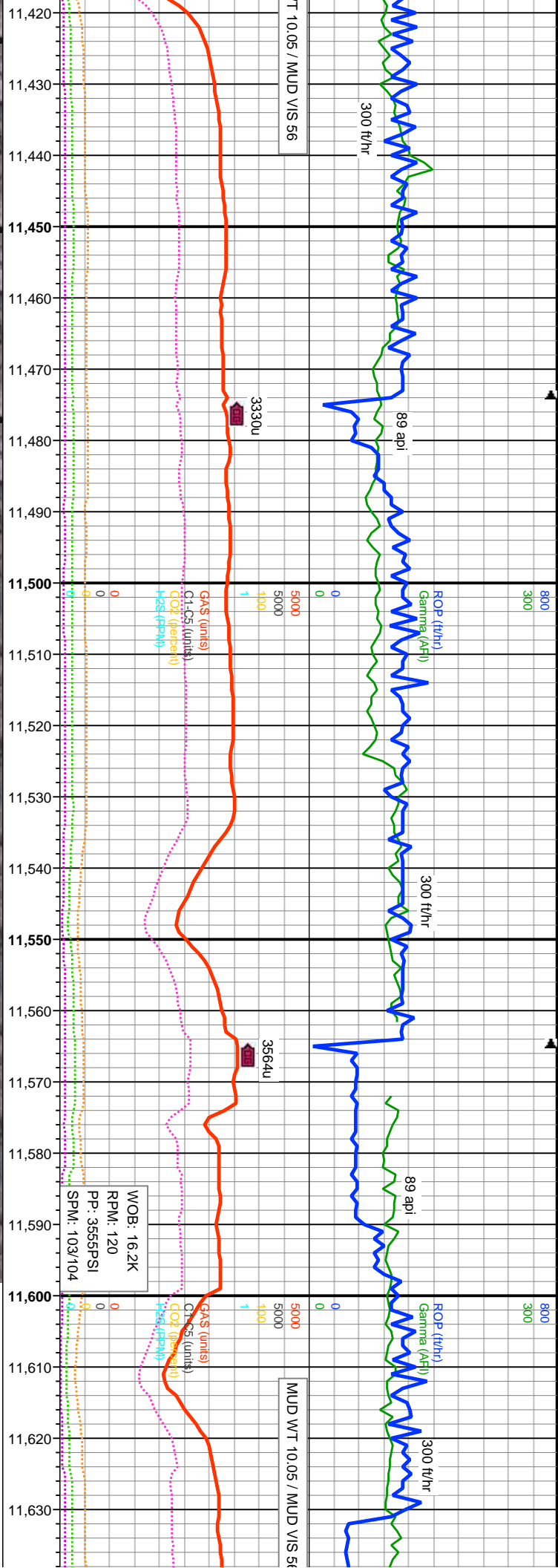


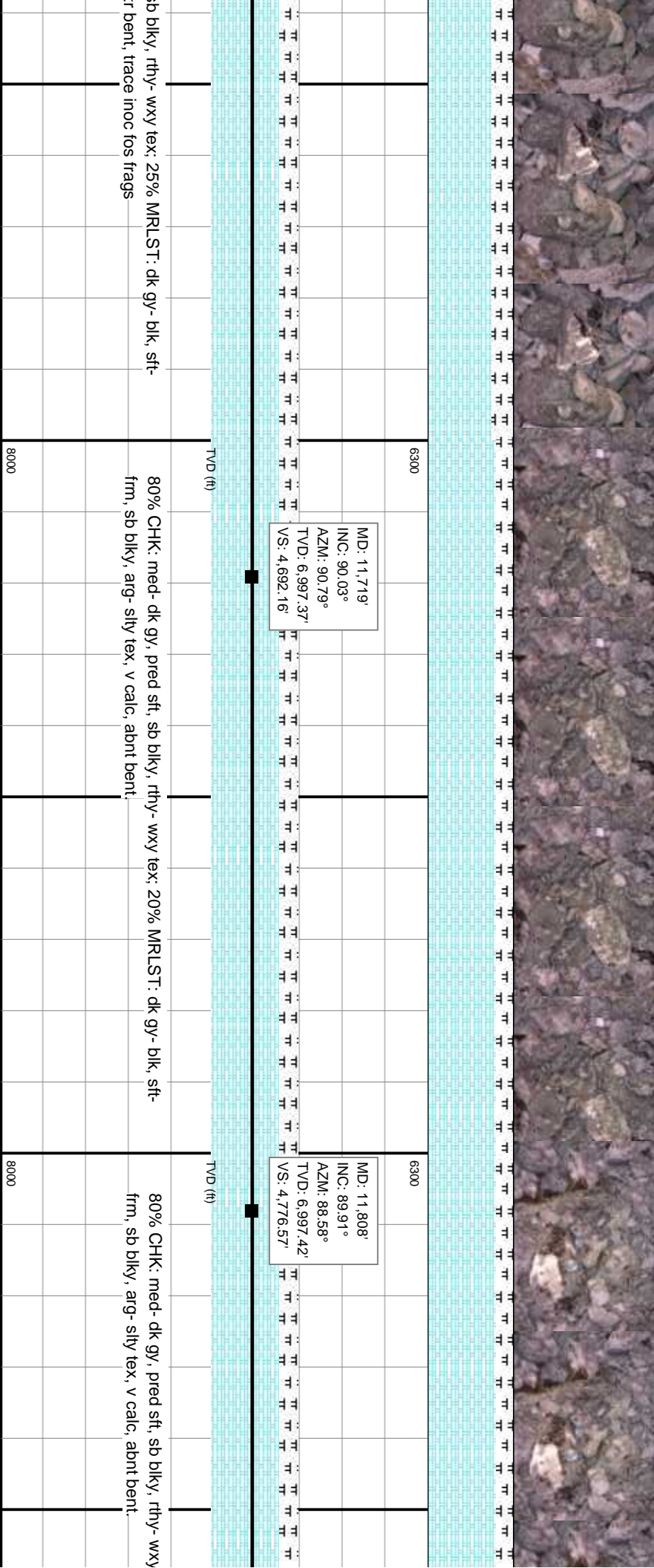
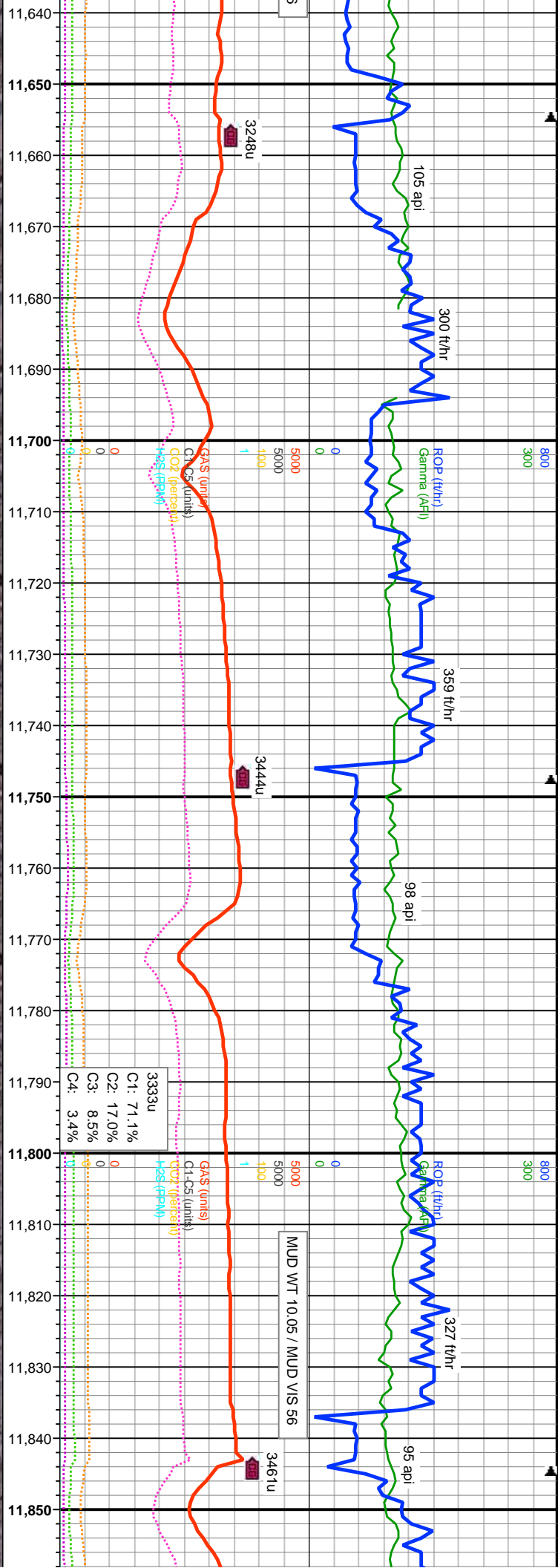




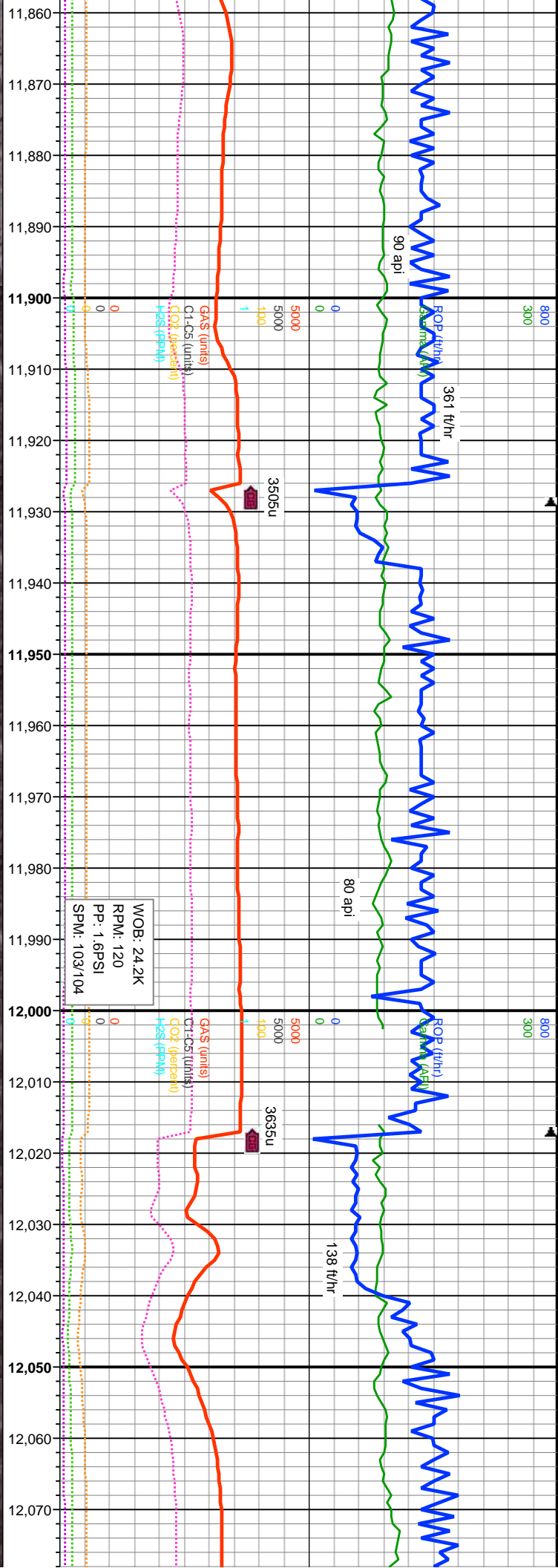








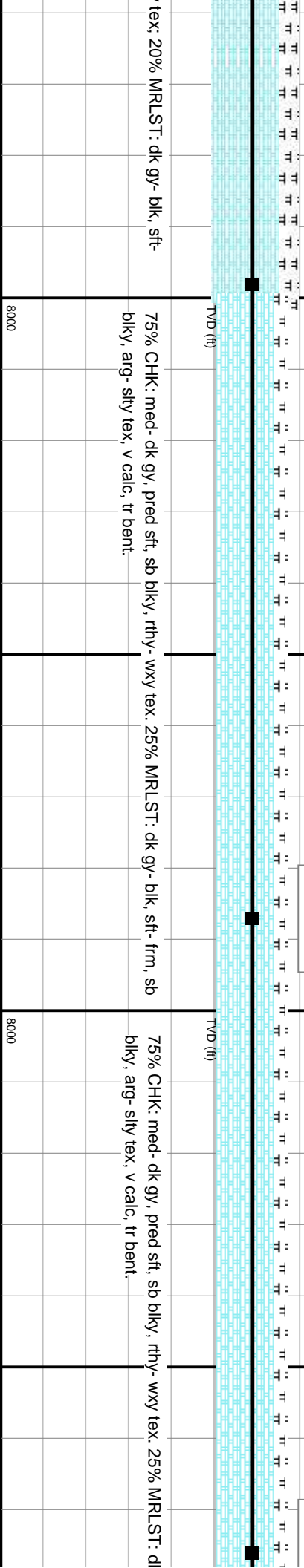




MD: 11,898'  
INC: 89.88°  
AZM: 89.15°  
TVD: 6,997.58'  
VS: 4,862.34'

MD: 11,987'  
INC: 89.82°  
AZM: 90.39°  
TVD: 6,997.82'  
VS: 4,946.72'

MD: 12,070'  
INC: 90.00°  
AZM: 90.5°  
TVD: 6,997.82'  
VS: 5,030.00'



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VS: 5,030.00'

75% CHK: med-dk gy, pred sft, sb blk, rthy-wxy tex. 25% MRLST: dk gy-blk, sft-fm, sb blk, arg-slt tex, v calc, tr bent.

75% CHK: med-dk gy, pred sft, sb blk, rthy-wxy tex. 25% MRLST: dk gy-blk, sft-fm, sb blk, arg-slt tex, v calc, tr bent.

