

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

Well Name Castor Federal LD15-73-1HN

Location NENE SEC. 15 T9N R58W

State COLORADO

Country UNITED STATES

API Number 05-123-37432

Region DJ BASIN

Spud Date 12/17/2013

Surface Coordinates 300' FNL; 698' FEL

County WELD

Rig Number H&P 273

Field WILDCAT

Drilling Completed 12/21/2013

Ground Elevation 4706'

K.B. Elevation 4730'

Logged Interval 4838'

To 9807'

Total Depth 9807'

Formation NIOBRARA

Type of Drilling Fluid LSND

Company NOBLE ENERGY INC

Address 1625 Broadway Suite  
Denver, CO 80202

Name SARAH COMPTON

Company NOBLE ENERGY INC  
Address 1625 Broadway Suite  
Denver, CO 80202

Wellsite Geologist #1: LAURA  
Wellsite Geologist #2: CONO  
Wellsite Geological Services



## Operator

IC.

2200

## Geologist

IC.

2200

## Other

AKELLOGG  
R PESICKA

Provided By Columbine Logging Inc.

## Rock Types



## Accessories

<b>Fossils</b>	F FOSSIL	ARGILLACEOUS	GLAUCONITE	TUFFACEOUS
GASTROPOD	ARGILLITE GRAIN	GYP SIFEROUS		
ALGAE	DOLITE	B BENTONITE	HEAVY MINERAL	
AMPHIPORA	OSTRACOD	BITUMENOUS SUBSTANCE	INOCERAMUS	
BELEMITE	PELECYPOD	BRECCIA FRAGMENTS	KAOLIN	
BIOCLASTIC	PELLET	CALCAREOUS	MARLSTONE	
BRACHOPOD	PISOLITE	CARBONACEOUS FLAKES	MINERAL CRYSTALS	
BRYOZOA	PLANT REMAINS	CHTDK	NODULES	
CEPHALOPOD	PLANT SPORES	CHTLT	PHOSPHATE PELLETS	
CORAL	SCAPHOPOD	COAL - THIN BEDS	PYRITE	
CRINOID	STROMATOPOROID	DOLOMITIC	SALT CAST	
ECHINOID		FELDSPAR	SANDY	
FISH		FERRUGINOUS PELLETS	SILICEOUS	
FORAMINIFERA	ANHYDRITIC	FERRUGINOUS	SILTY	
				SILTSTONE STRINGER

## Stringer

ANHYDRITE STRINGER
BENTONITE STRINGER
COAL STRINGER
DOLomite STRINGER
GYP SUM STRINGER
LIMESTONE STRINGER
MARLSTONE (CALC) STRG
MARLSTONE (DOL) STRG
SANDSTONE STRINGER

## Other Symbols

<b>Oil Show</b>	MOLDIC	FAULT	WIRELINE TESTED - LEFT	E EARTHY
ORGANIC	GAS SHOW	FORMATION TOP	WIRELINE TESTED - RT	FN FINELYXLN
DEAD	PINPOINT			GS GRAINSTONE
EVEN	VUGGY	MINDEPTH MN DEPTH		L LITHOGRAPHIC
QUESTIONABLE		NORMAL FAULT	ANGULAR	MX MICROXLN
SPOTTED STAINING	BIT	OIL SHOW	ROUNDED	MS MUDSTONE
<b>Porosity</b>	CONNECTION (LEFT)	OVERTURNED STRATA	SUBANG	PS PACKSTONE
E EARTHY	CONNECTION (RIGHT)	REVERSE FAULT	SUBRND	WS WACKSTONE
FENESTRAL	CONNECTION GAS	SIDEWALL CORE (LEFT)		
FRACTURE	CORE - LOST	SIDEWALL CORE (RIGHT)		
INTERCRYSTALLINE	CORE - RECOVERED	SLIDE		
INTEROOLITIC	DST INTERVAL	SURVEY		
		TRIP GAS		
			BOUNDSTONE	M MODERATE
			CHALKY	P POOR
			CRYPTOXLN	W WELL

Slide/Rotate

BEGAN DRILLING CURVE  
@ 12:19 AM 12/19/2013

FIN DEPTH 12/19/2013

ROP

ROF

Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4

COLUMBINE LOGGING INC.  
RIGGED UP ON 12/18/2013  
MANNED 2-PERSON LOGGING  
WITH BLOODHOUND GAS  
CHROMATOGRAPH UNIT #0540  
COLUMBINE BEGAN LOGGING  
ON 12/18/2013

50' Sample Interval

BHA BIT:  
HUGHES 8.75" DP504X  
Serial #: 7146044  
Jets: 6x15

499u  
C1: 86.4%  
C2: 3.1%  
C3: 10.5%  
C4: 0.0%

987u

Depth Labels

% Lith

Gamma

GAMMA

WT IN 9.80/ OUT 9.80  
VIS IN 34.00/ OUT 34.00

Well Bore  
TVD

TVD (ft)

The ratings are based on 7 descriptors:  
None, Slight trace, Trace,Fair, Moderate,  
Good, and Excellent. The descriptor used  
is based on the loggers observations and  
best judgment of brilliance, color and  
longevity of the cut.

SLTY SH: gy-dk gy, rr ltgy, sb blkY-sb plty,  
sft-sl frm, silty tex, arg cmt

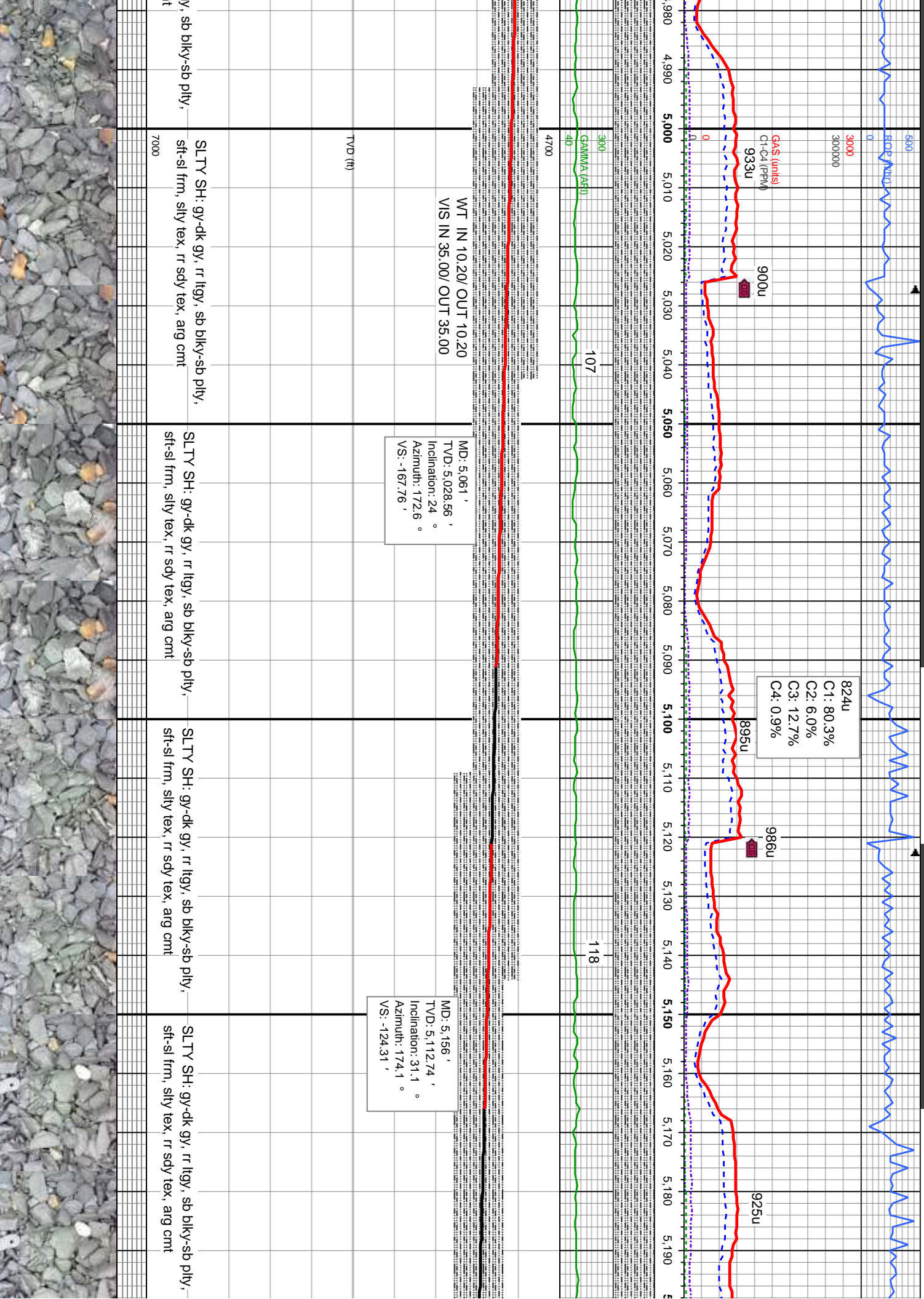
SLTY SH: gy-dk gy, rr ltgy, sb blkY-sb plty,  
sft-sl frm, silty tex, arg cmt

SLTY SH: gy-dk gy, rr ltgy,  
sft-sl frm, silty tex, arg cmt

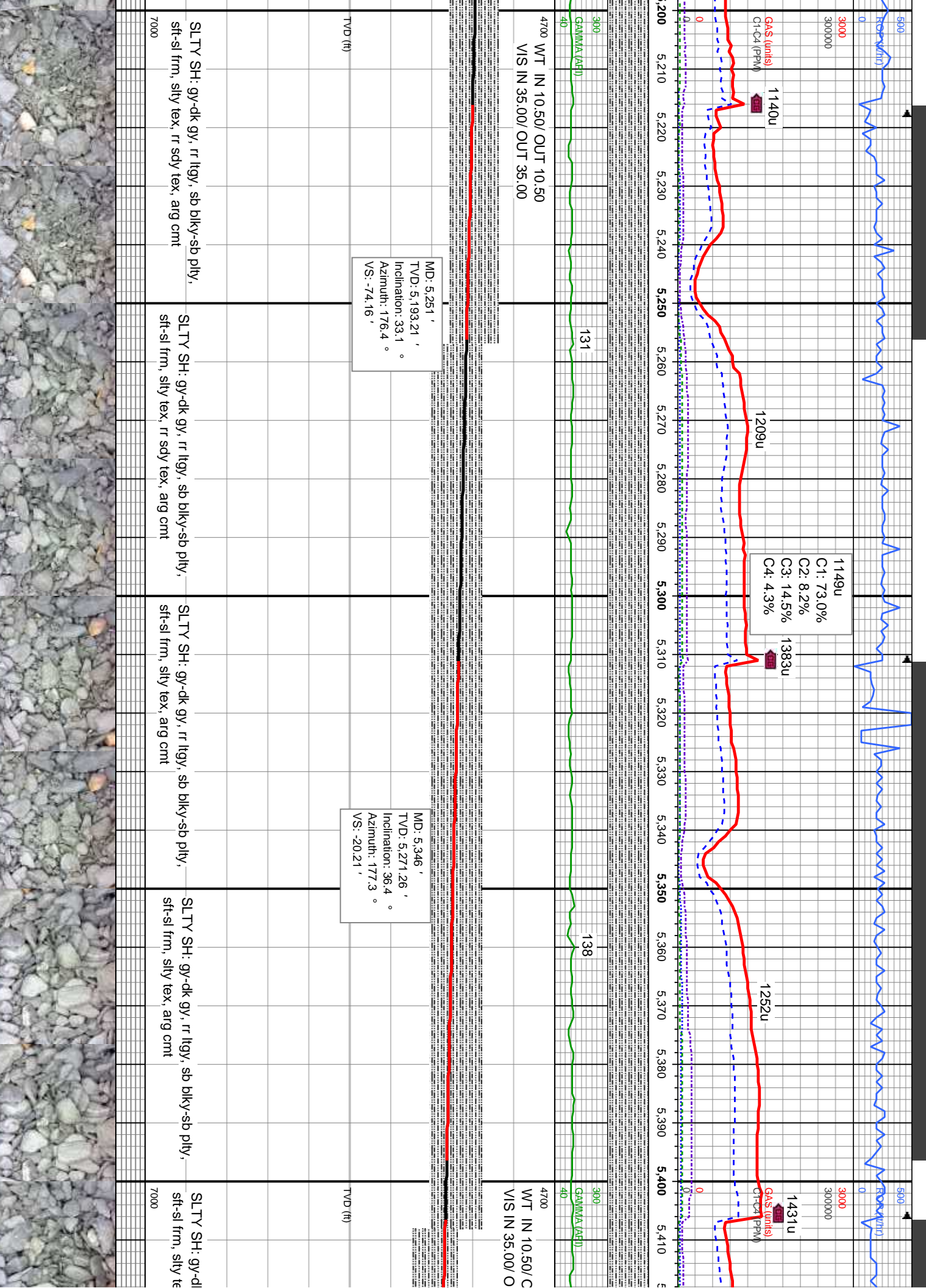
Oil Show

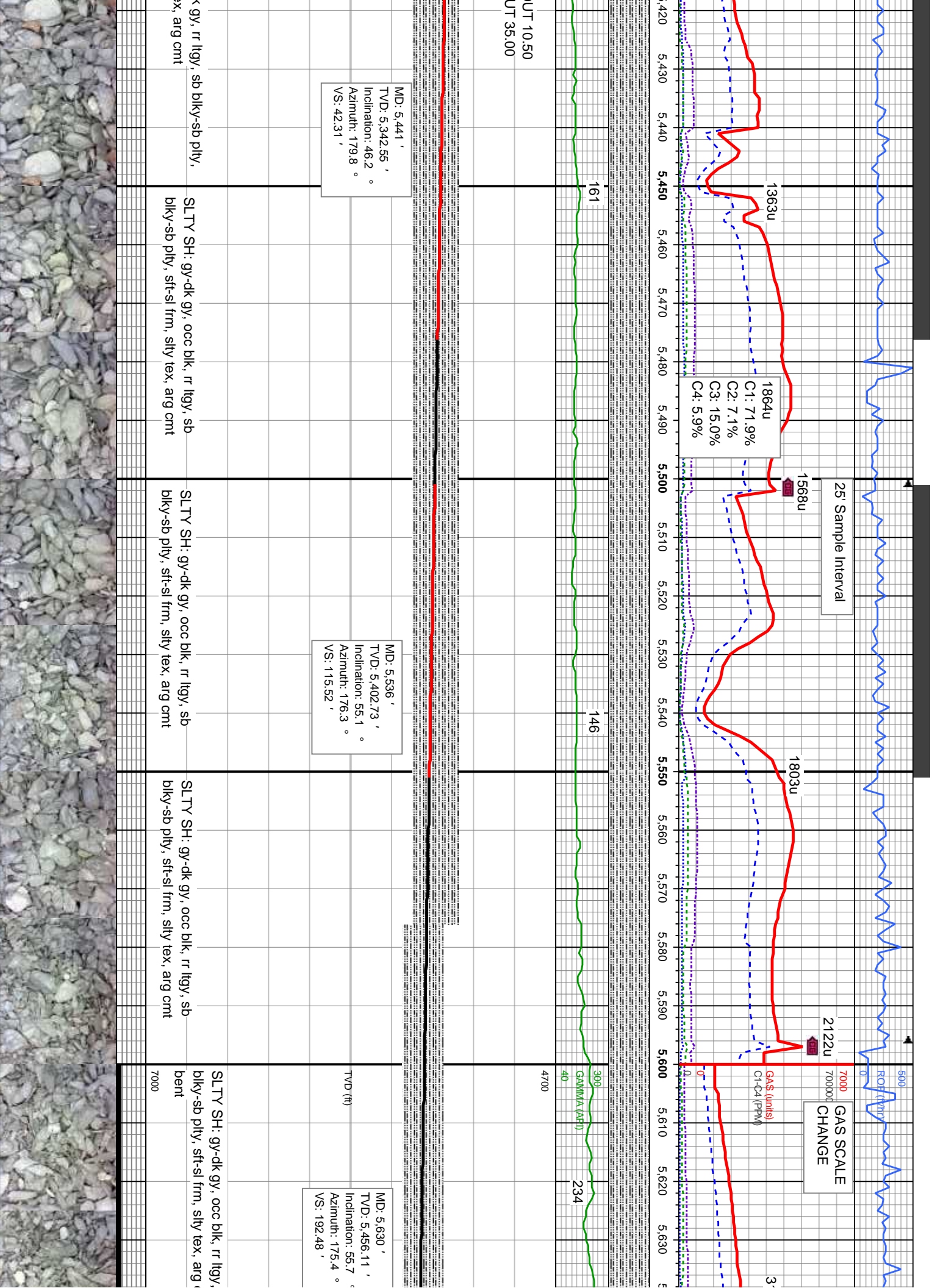
Images



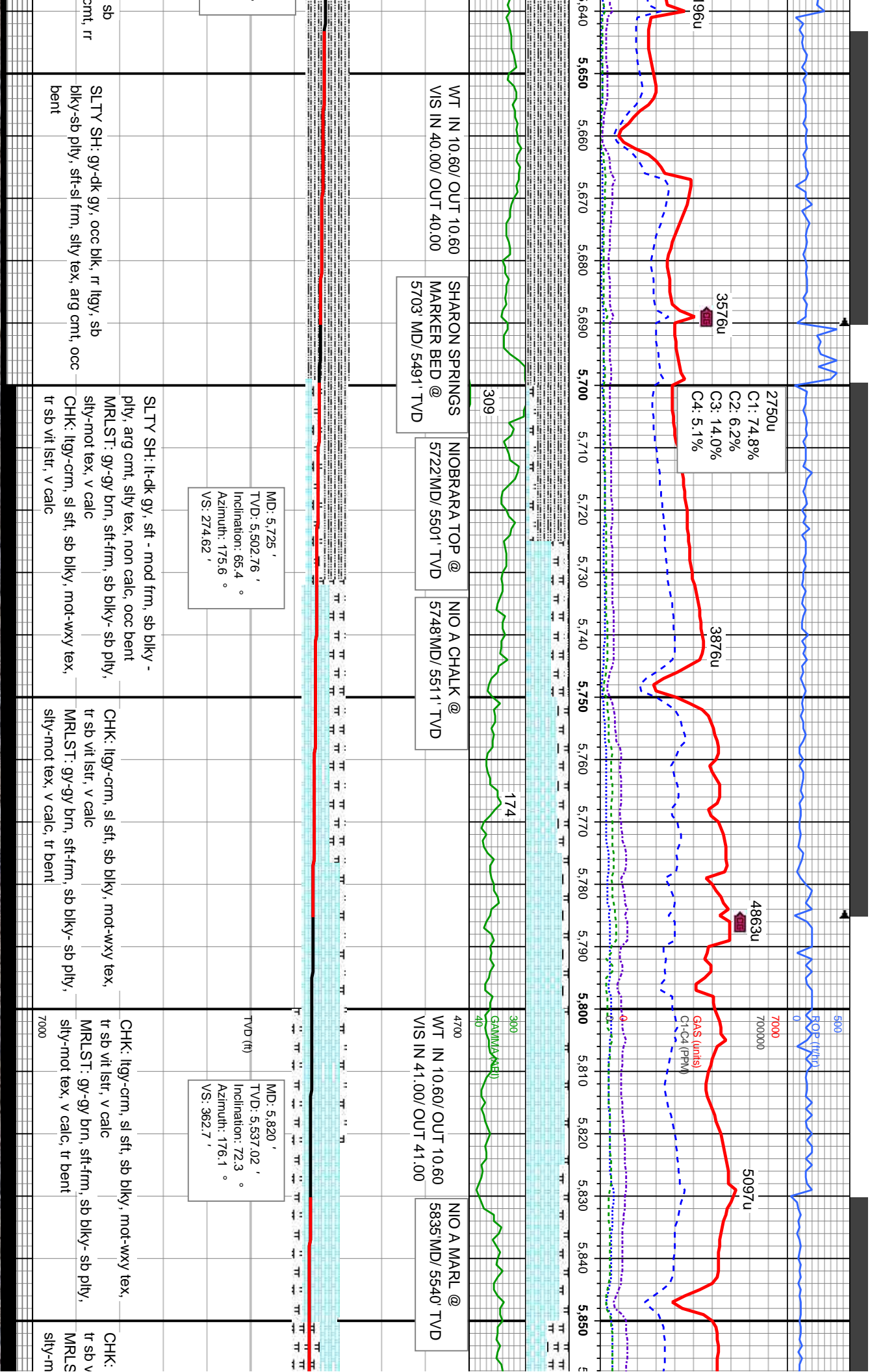












MD: 5,725 '  
TVD: 5,502.76 '  
Inclination: 65.4 °  
Azimuth: 175.6 °  
VS: 274.62 '

MD: 5,820 '  
TVD: 5,537.02 '  
Inclination: 72.3 °  
Azimuth: 176.1 °  
VS: 362.7 '

SLTY SH: gy-dk gy, occ blk, tr lty, sb blk - sb ply, sft - sl frm, silty tex, arg cnt, occ bent

SLTY SH: lt-dk gy, sft - mod frm, sb blk - ply, arg cnt, silty tex, non calc, occ bent  
MRLST: gy-gy brn, sft - frm, sb blk - sb ply, silty - mot tex, v calc  
CHK: lty - crm, sl sft, sb blk, mot - wxy tex, tr sb vit lstr, v calc

CHK: lty - crm, sl sft, sb blk, mot - wxy tex, tr sb vit lstr, v calc  
MRLST: gy-gy brn, sft - frm, sb blk - sb ply, silty - mot tex, v calc, tr bent

CHK: lty - crm, sl sft, sb blk, mot - wxy tex, tr sb vit lstr, v calc  
MRLST: gy-gy brn, sft - frm, sb blk - sb ply, silty - mot tex, v calc, tr bent

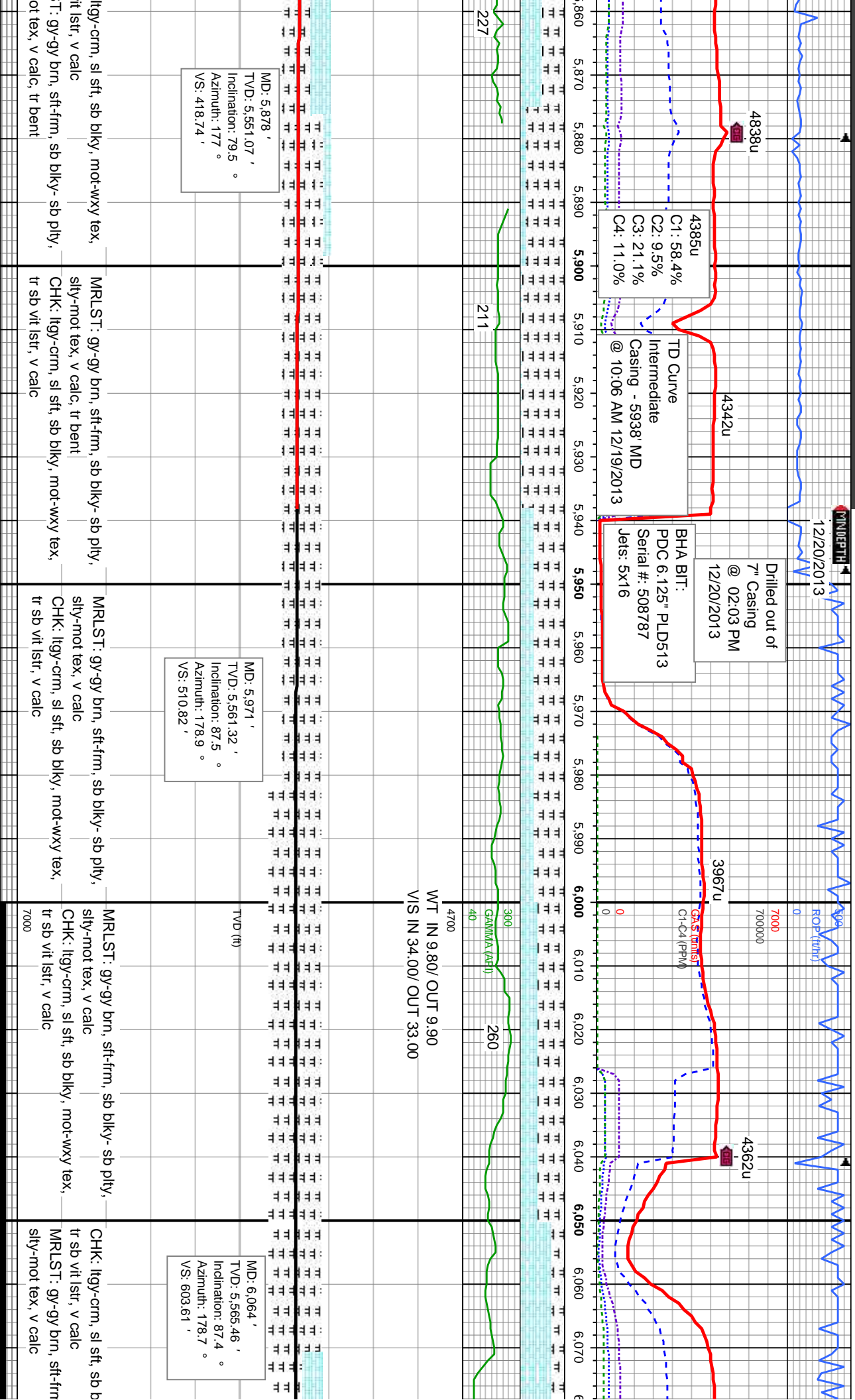
CHK: lty - crm, sl sft, sb blk, mot - wxy tex, tr sb vit lstr, v calc  
MRLST: gy-gy brn, sft - frm, sb blk - sb ply, silty - mot tex, v calc, tr bent

WT IN 10.60/ OUT 10.60  
VIS IN 40.00/ OUT 40.00  
SHARON SPRINGS  
MARKER BED @  
5703' MD/ 5491' TVD

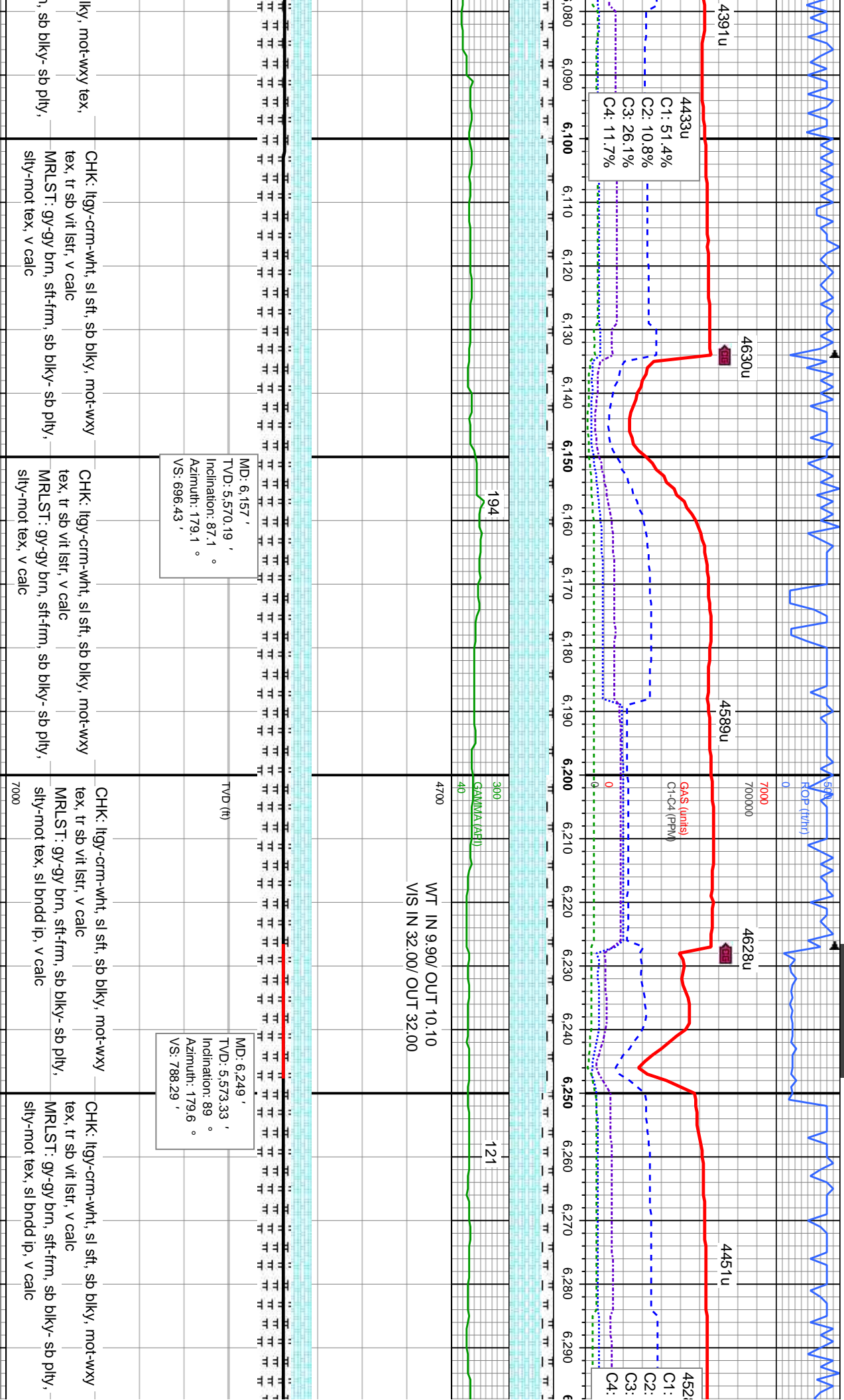
NIOBARA TOP @  
5722 MD/ 5501' TVD  
NIO A CHALK @  
5748 MD/ 5511' TVD

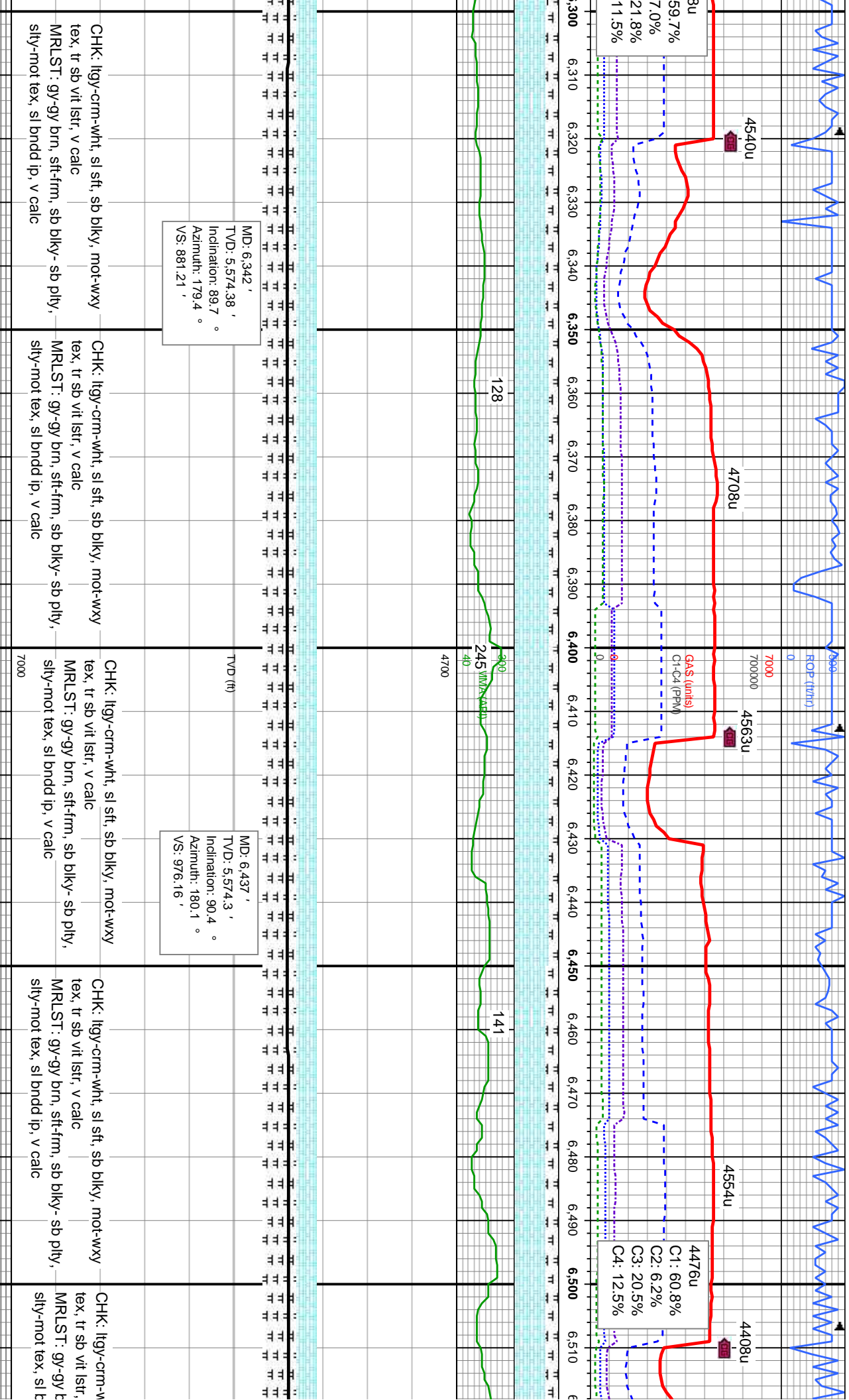
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VIS IN 41.00/ OUT 41.00  
NIO A MARL @  
5835 MD/ 5540' TVD



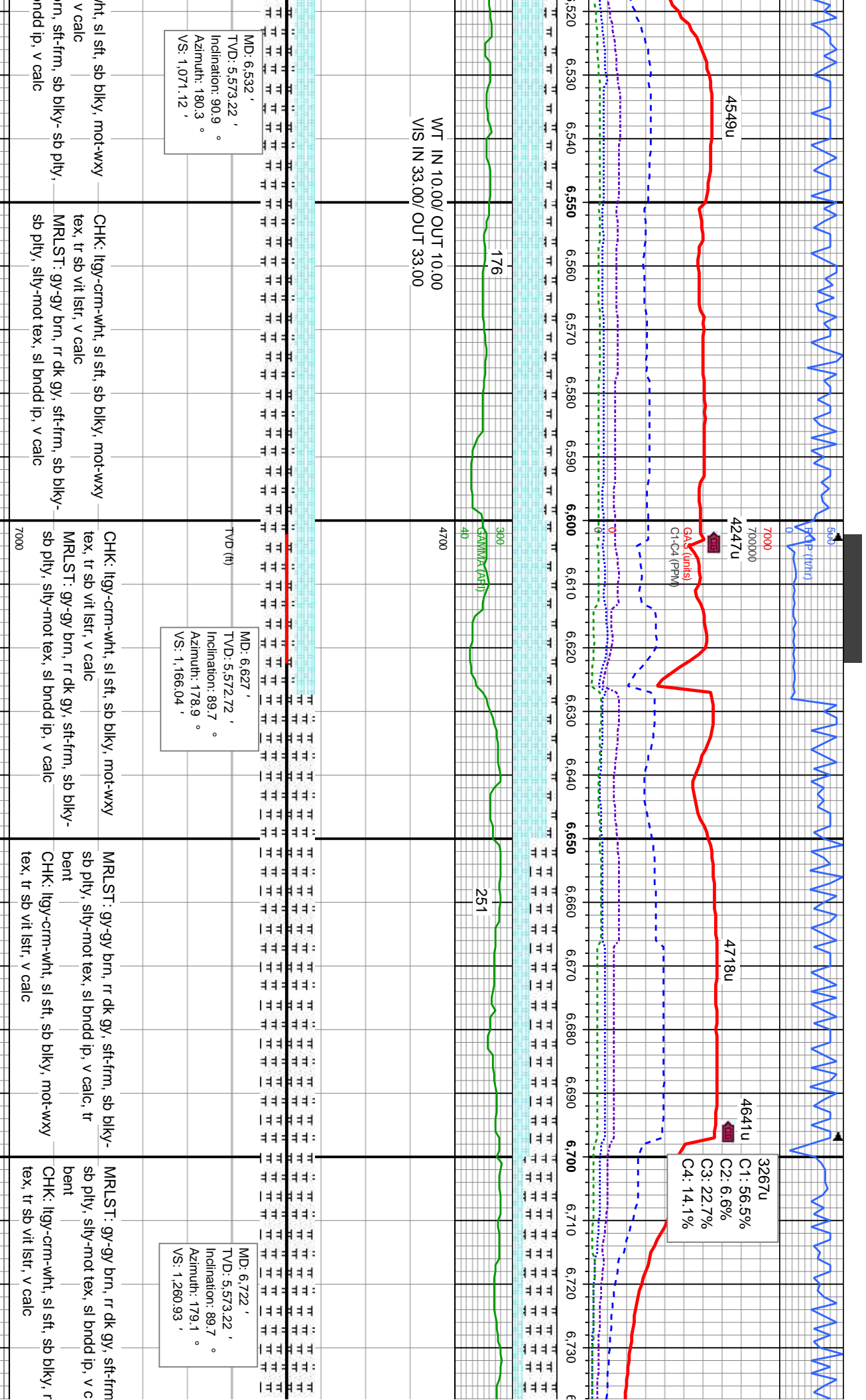




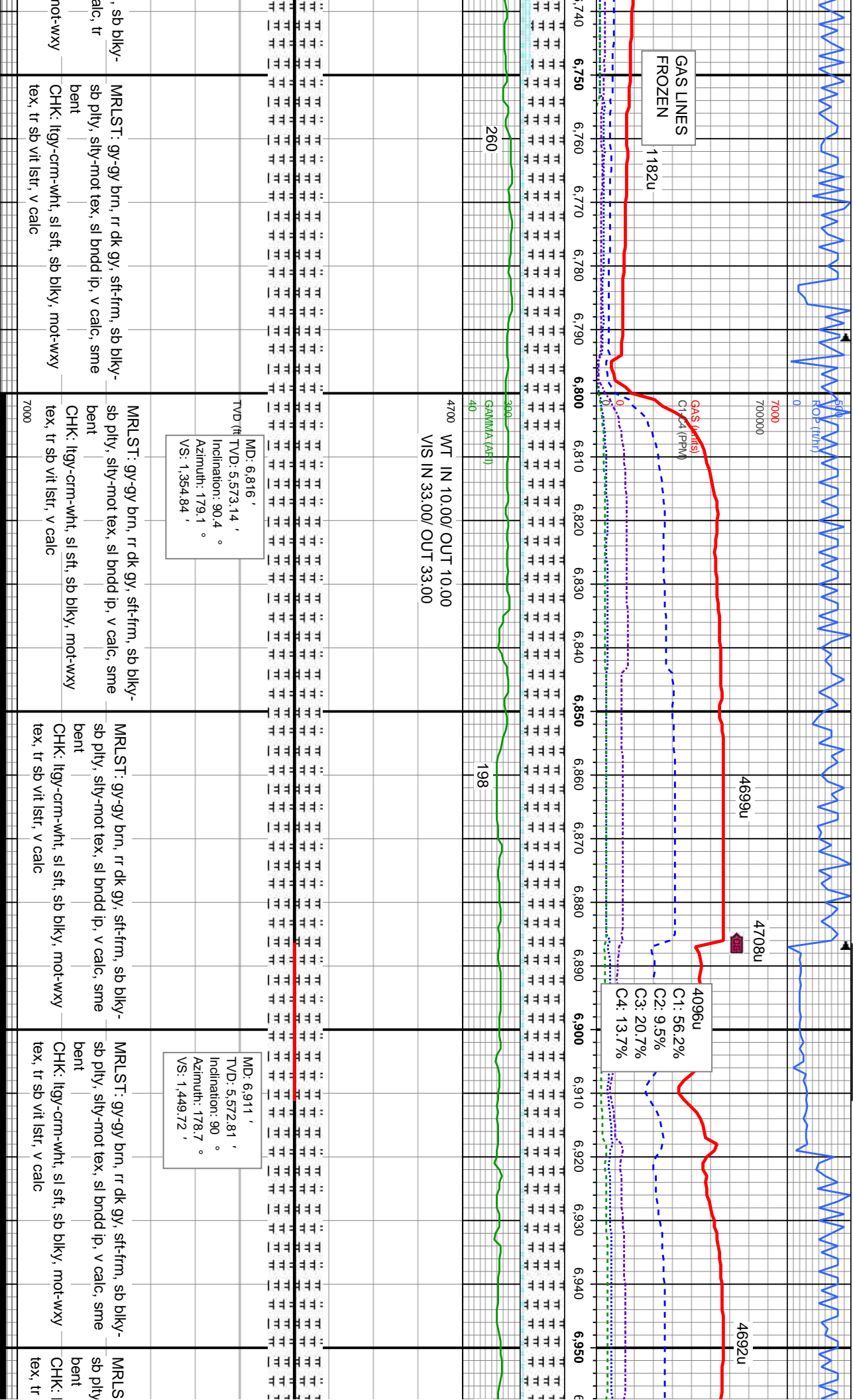


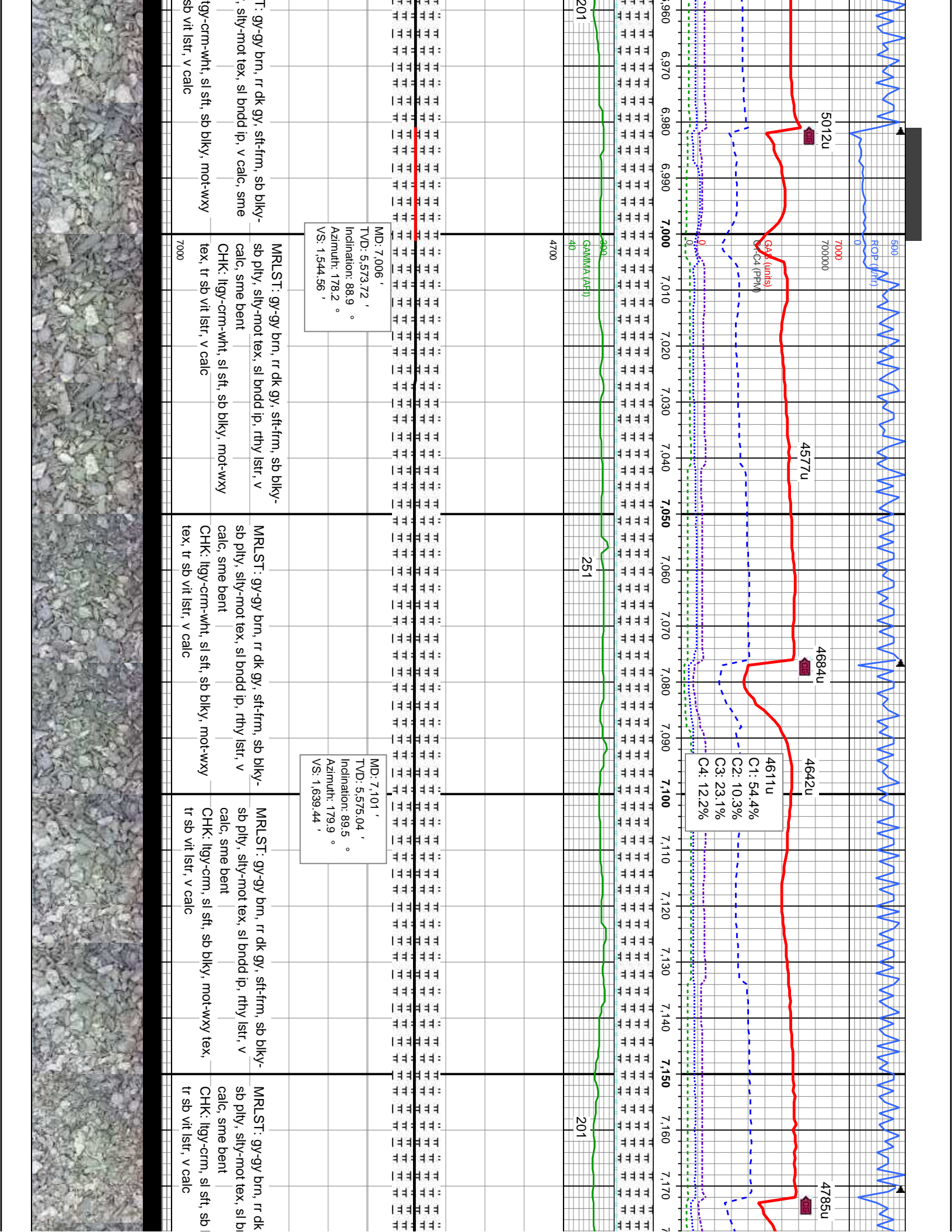




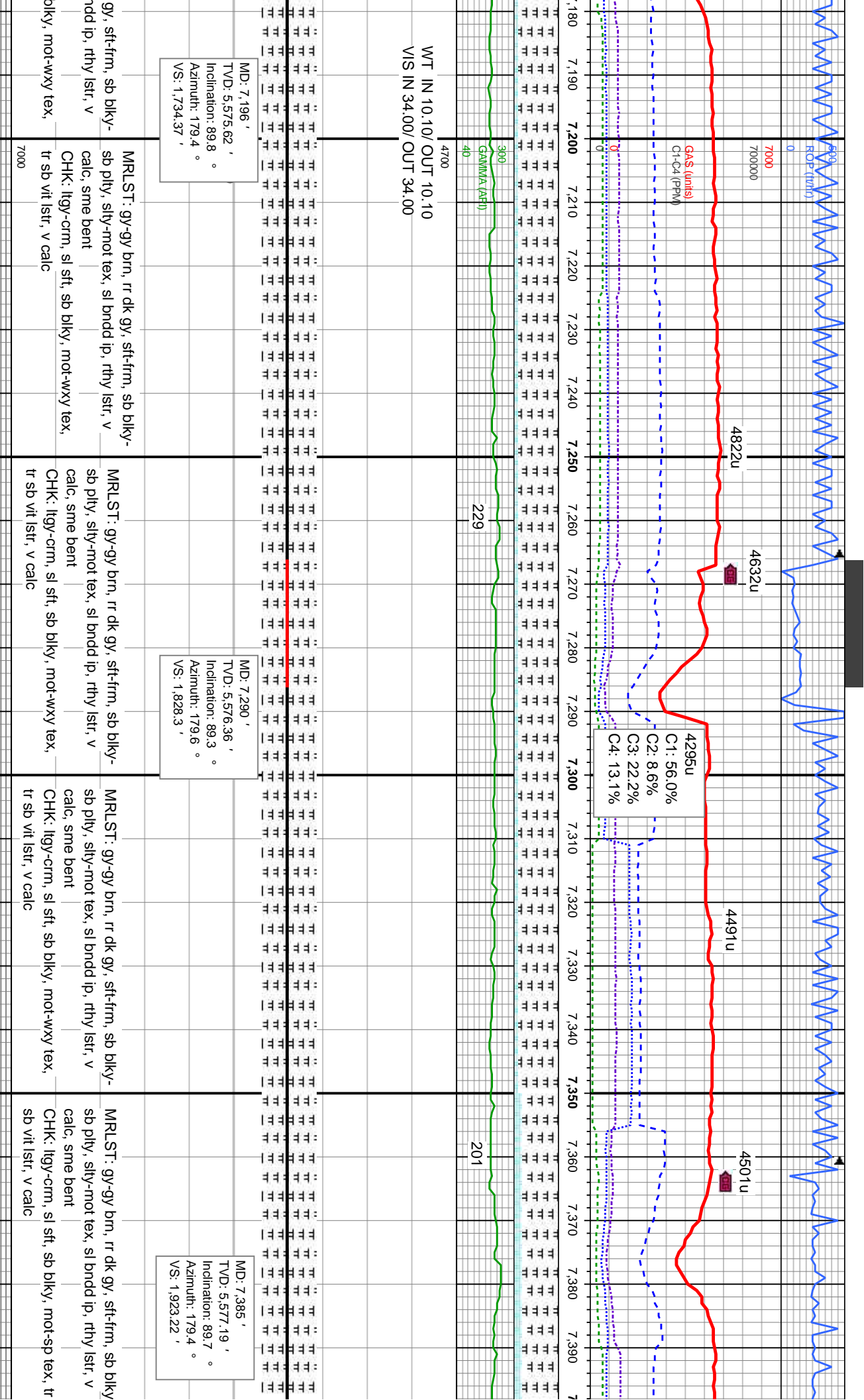




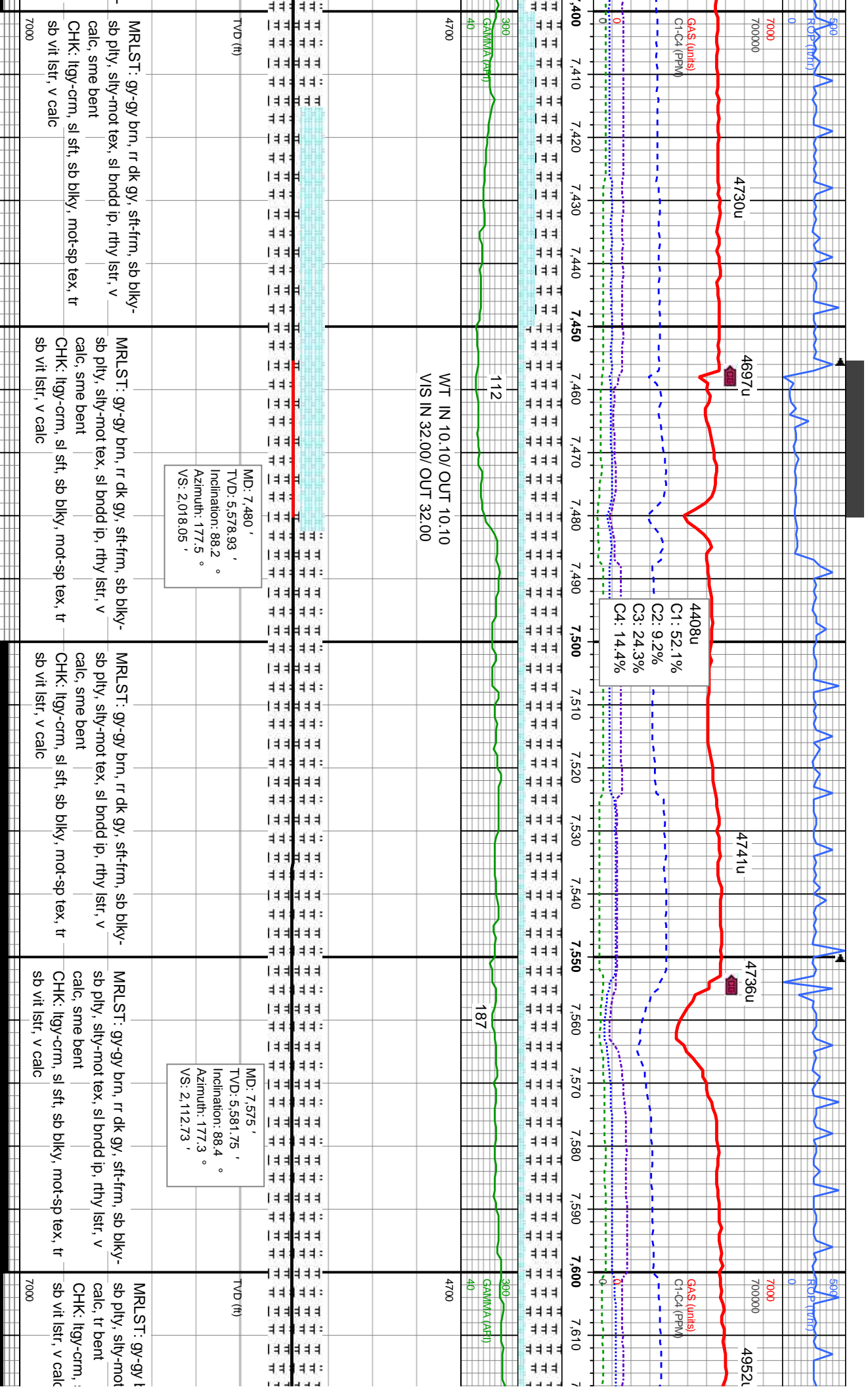


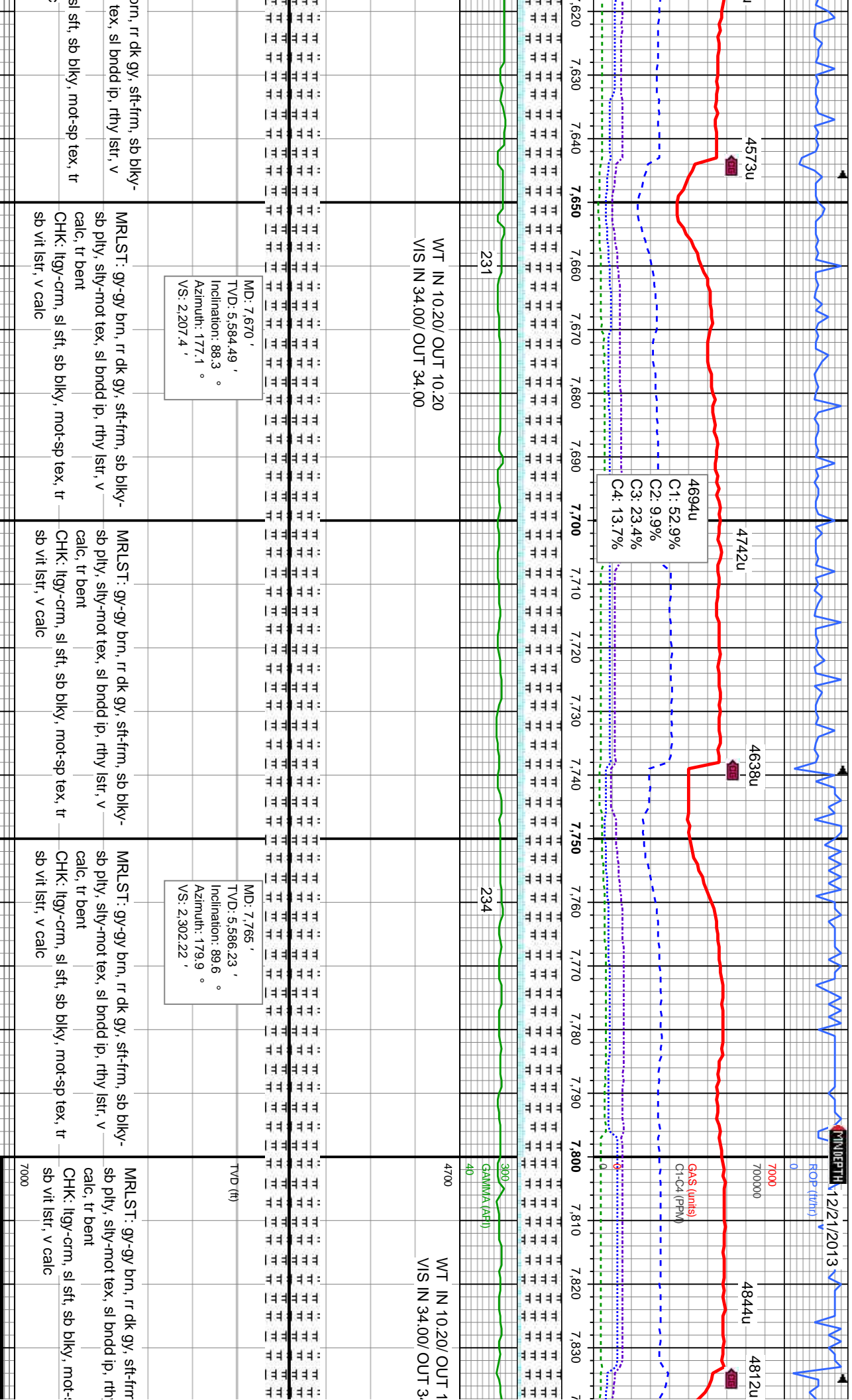




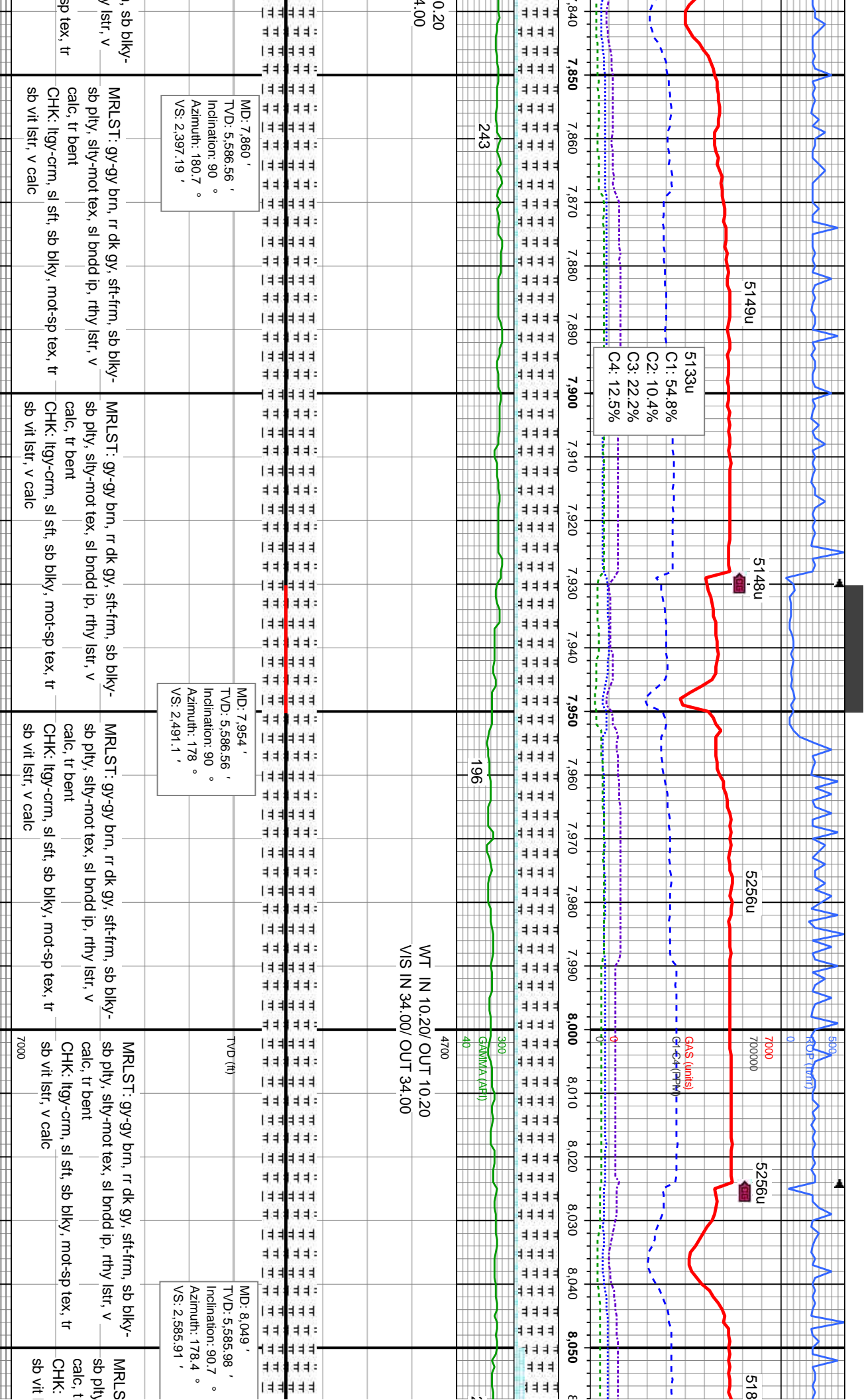




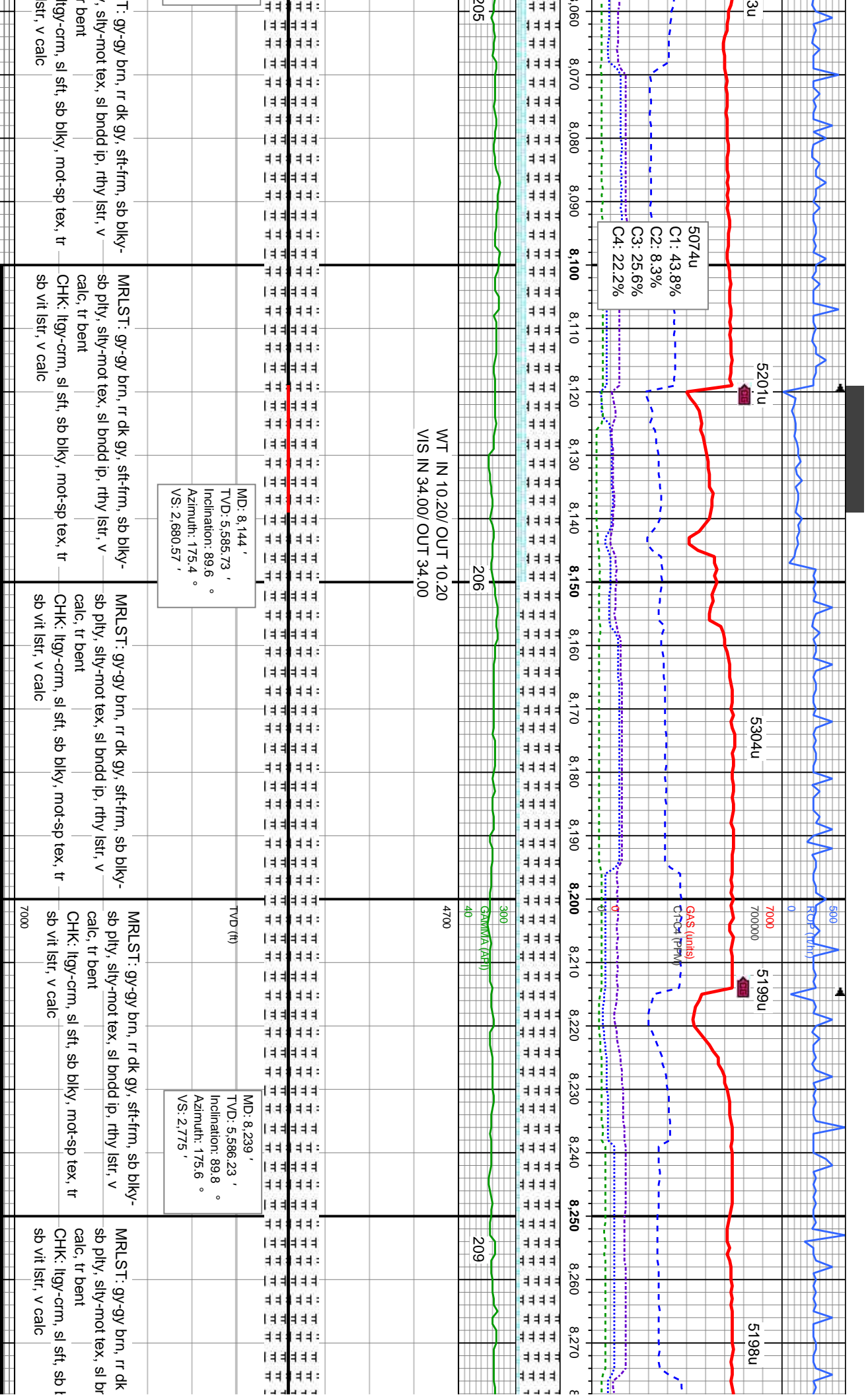


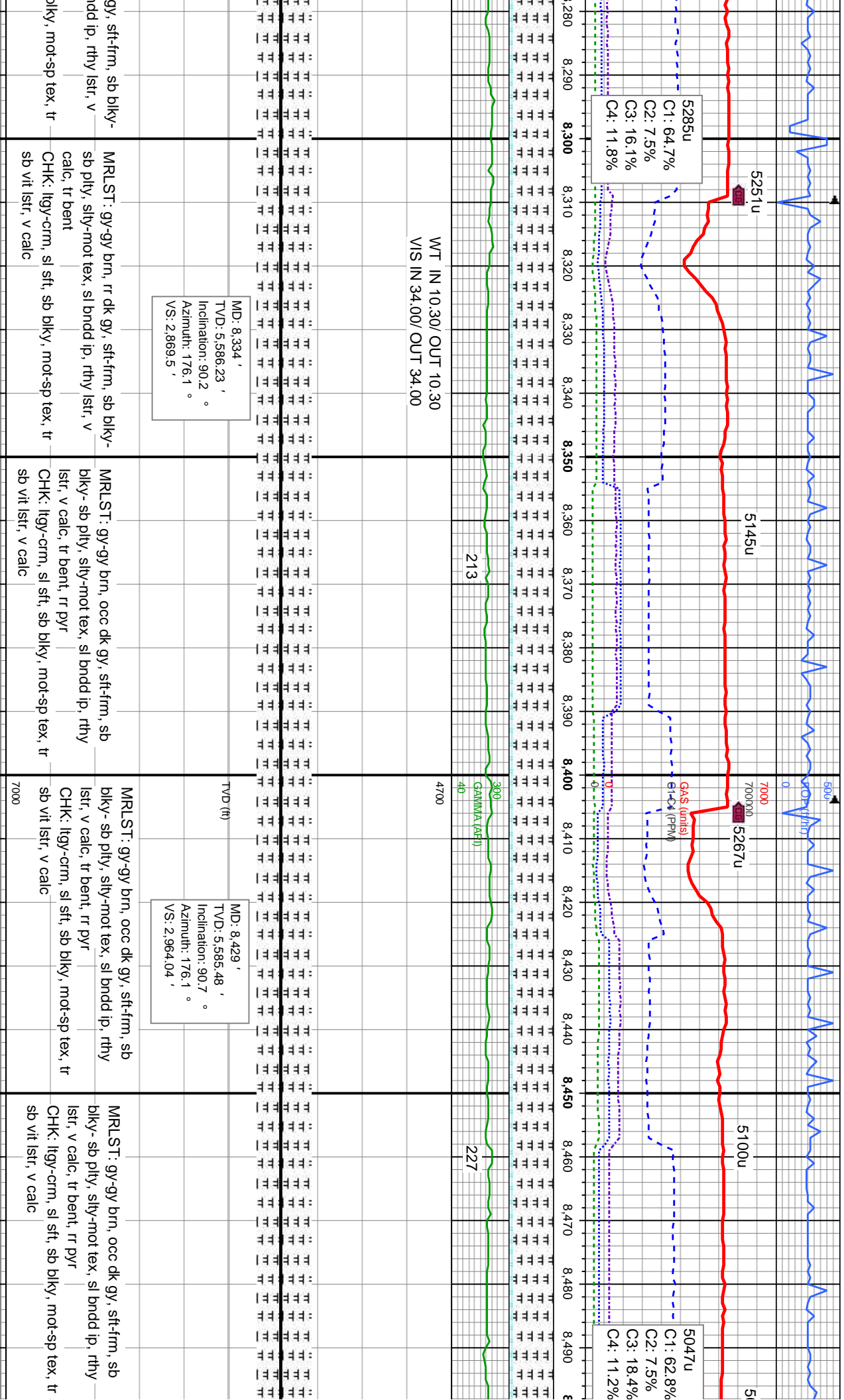




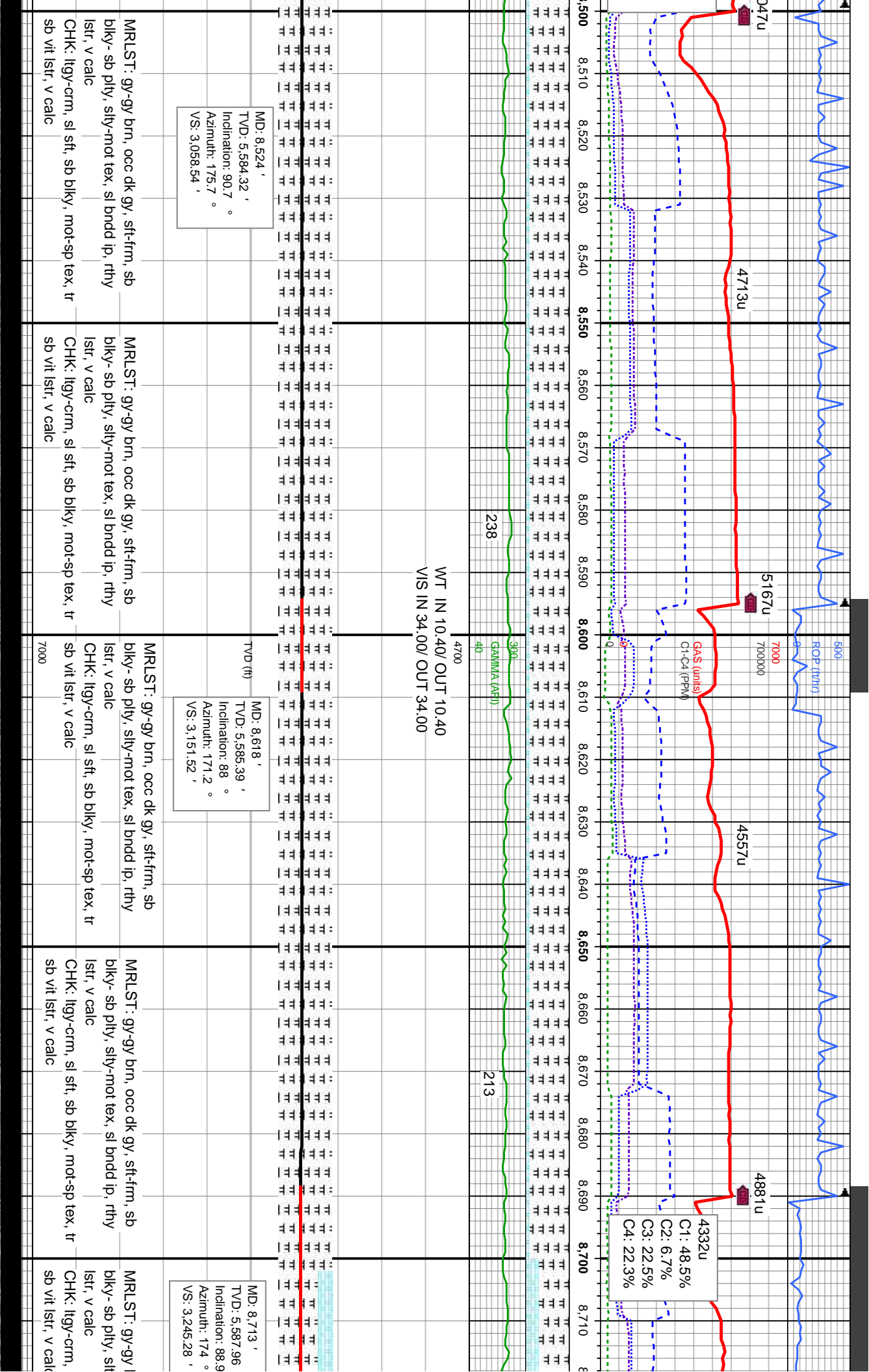






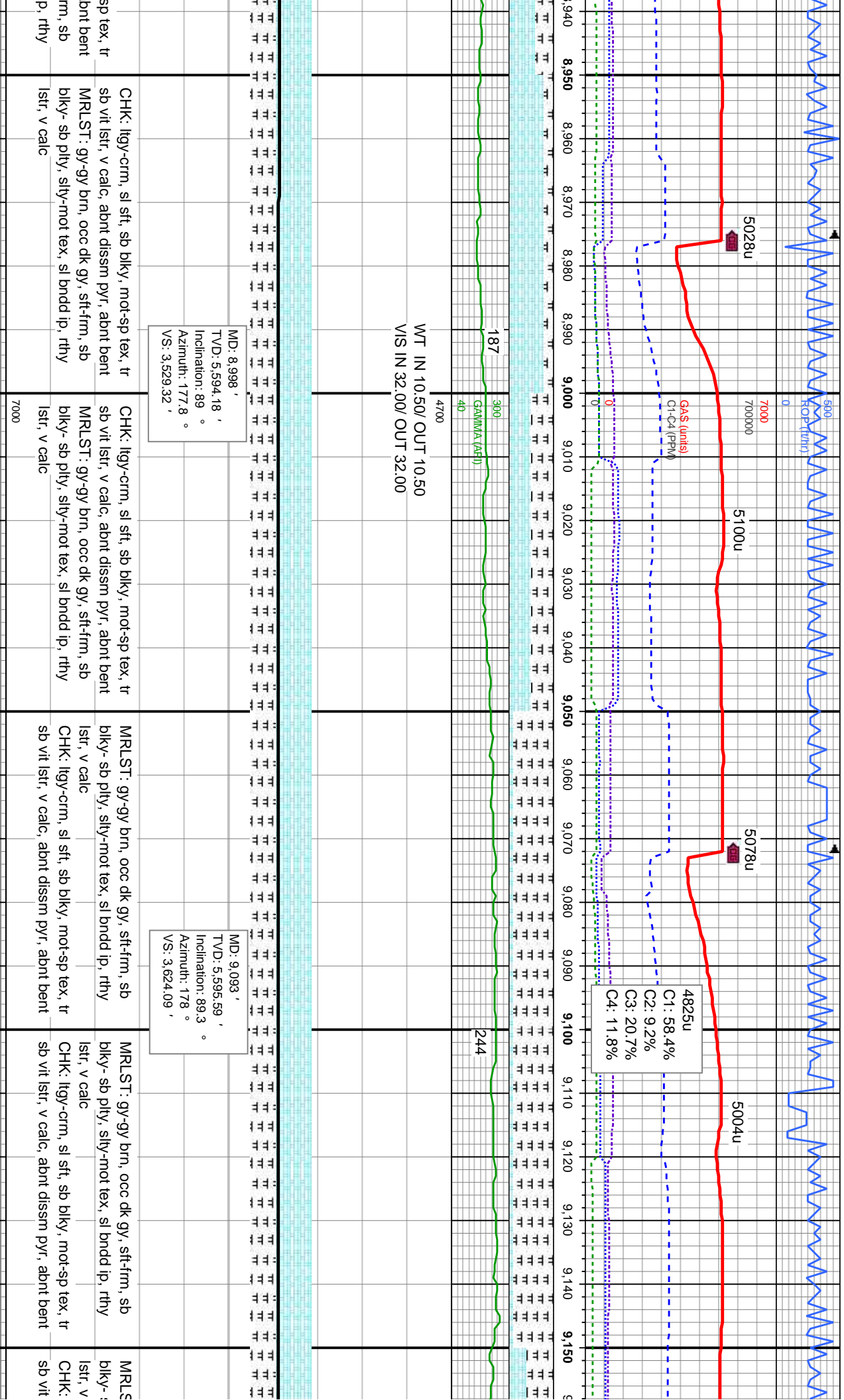


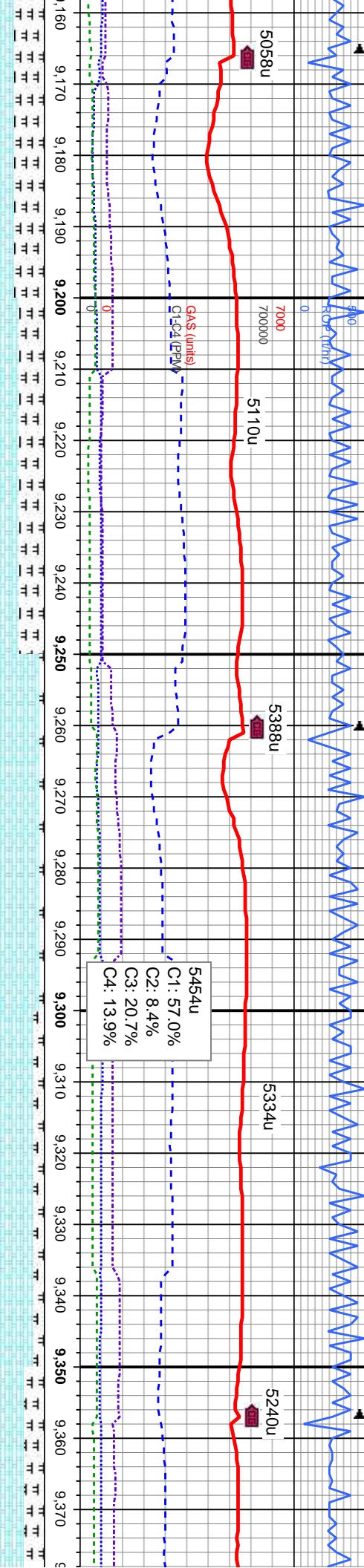












MD: 9,188 '  
TVD: 5,596.75 '  
Inclination: 89.3 °  
Azimuth: 177.7 °  
VS: 3,718.87 '

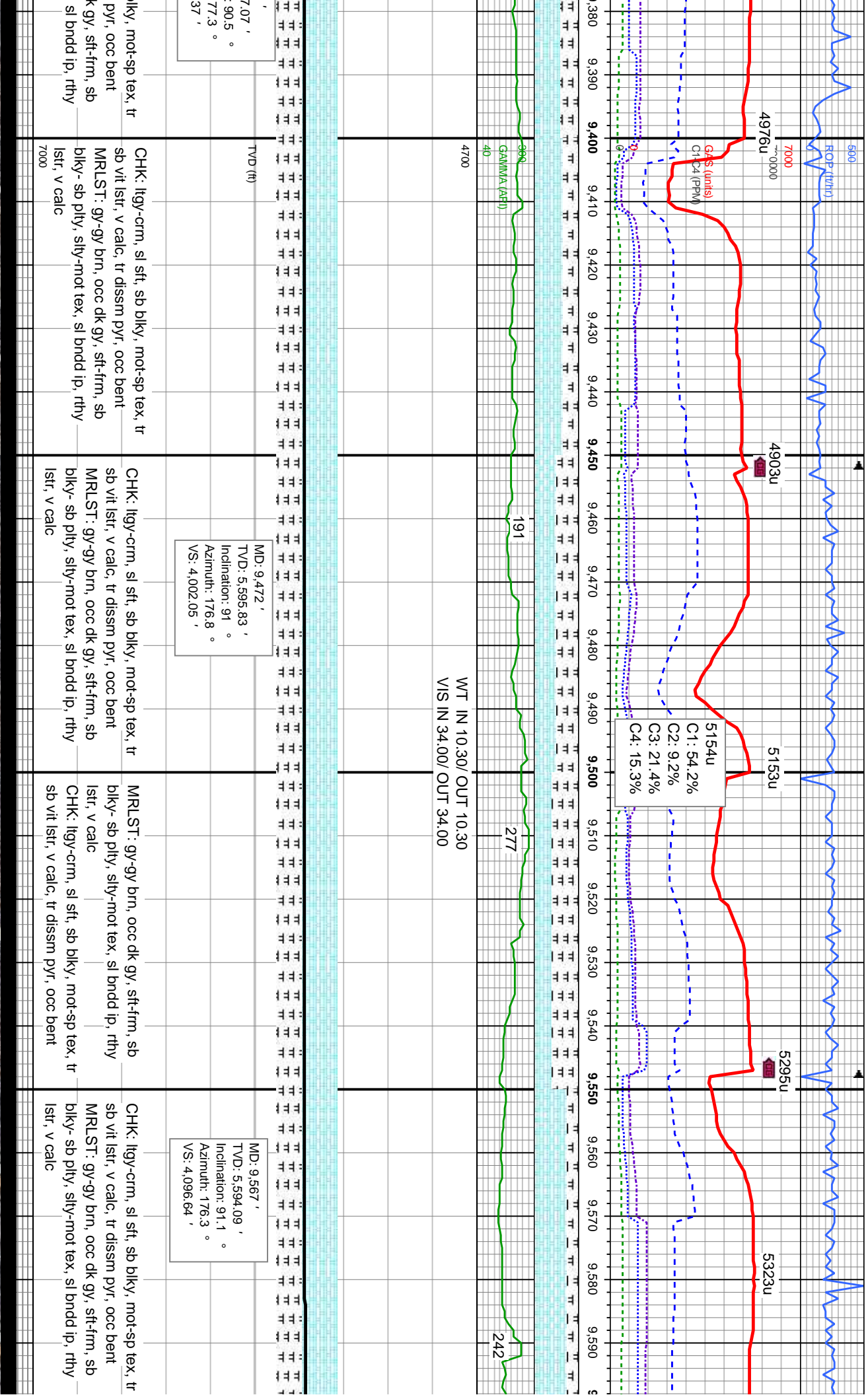
MD: 9,282 '  
TVD: 5,597.4 '  
Inclination: 89.9 °  
Azimuth: 177.7 °  
VS: 3,812.63 '

MD: 9,377 '  
TVD: 5,59 '  
Inclination: 89.9 °  
Azimuth: 177.7 °  
VS: 3,907 '

TY: gy-gy brn, occ dk gy, stf-frm, sb sb pily, stly-mot tex, sl bndd ip, rthy calc	MRIST: gy-gy brn, occ dk gy, stf-frm, sb bkly- sb pily, stly-mot tex, sl bndd ip, rthy lstr, v calc	CHK: lly-crm, sl stf, sb bkly, mot-sp tex, tr sb vit lstr, v calc, tr diss pyr, occ bent	MRIST: gy-gy brn, occ dk gy, stf-frm, sb bkly- sb pily, stly-mot tex, sl bndd ip, rthy lstr, v calc	CHK: lly-crm, sl stf, sb bkly, mot-sp tex, tr sb vit lstr, v calc, tr diss pyr, occ bent	MRIST: gy-gy brn, occ dk gy, stf-frm, sb bkly- sb pily, stly-mot tex, sl bndd ip, rthy lstr, v calc	CHK: lly-crm, sl stf, sb bkly, mot-sp tex, tr sb vit lstr, v calc, tr diss pyr, occ bent	MRIST: gy-gy brn, occ dk gy, stf-frm, sb bkly- sb pily, stly-mot tex, sl bndd ip, rthy lstr, v calc	CHK: lly-crm, sl stf, sb bkly, mot-sp tex, tr sb vit lstr, v calc, tr diss pyr, occ bent	MRIST: gy-gy brn, occ dk gy, stf-frm, sb bkly- sb pily, stly-mot tex, sl bndd ip, rthy lstr, v calc
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MOBLE ENERGY INC.  
ASTOR FEDERAL LD15-73-1HN  
D @ 9807' MD  
2/21/2013 @ 01:21 PM  
THANK YOU  
COLUMBINE LOGGING

