

Scale: 5" / 100'
Measured Depth Log

Total Depth 11429'

	CARBON
	SANDSTONE
	CONGLOMERATE
	SLATE
	MARBLE
	GNEISS
	CHALK
	BRECCIA
	BENTONITE
	ANHYDRITE
	UNKNOWN
	CLAYSTONE
	CLAY SHALE
	CLAY SILTSTONE
	SILTSTONE
	SANDSTONE
	CONGLOMERATE

Operator

BY INC.

Suite 2200
202

Geologist

LER

BY INC.

Suite 2200
202

Other

Rock Types

CONGLOMERATE

DOLOMITE

GRANITE

GYPSUM

IGNEOUS

SIDERITE or LIMONITE

LIMESTONE

MARLSTONE

METAMORPHIC

NO SAMPLE

SALT

SANDSTONE

SALT-PEPPER SANC

SHALE

SHALE COLORED

SHALE GRAY

SHALY SANDSTONE

SHALY SILTSTONE

SILTY SHALE

SILTSTONE

TUFF

WELDED TUFF

Accessories

F FOSSIL

GASTROPOD

OOLITE

AMPHIROA

BELEMITE

BIOLASTIC

BRACHIOPOD

BRYOZOA

CEPHALOPOD

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

ARGILLACEOUS

ARGILLITE GRAIN

B BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTDK

CHTLT

COAL - THIN BEDS

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

INOCERAMUS

KAOLIN

MARLSTONE

MINERAL CRYSTALS

NODULES

PHOSPHATE PELLET:

PYRITE

SALT CAST

SANDY

SILICEOUS

SILT

TUFFACEOUS

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 Symbols

MOLDIC

ORGANIC

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

FAULT

FORMATION TOP

GAS SHOW

MINDEPTH MN DEPTH

NORMAL FAULT

OIL SHOW

OVERTURNED STRATA

REVERSE FAULT

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

WIRELINE TESTED - LEFT

WIRELINE TESTED - RT

ANGULAR

ROUNDED

SUBANG

SUBRND

BOUNDSTONE

CHALKY

CRYPTOXLN

E EARTHY

FINELYXLN

GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

MMS MUDSTONE

PS PACKSTONE

WSS WACKSTONE

Porosity

E EARTHY

F FRACTURE

INTERCRYSTALLINE

INTEROOLITIC

FENESTRAL

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

Engineering

BIT

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE

SURVEY

TRIP GAS

Textures

BOUNDSTONE

CHALKY

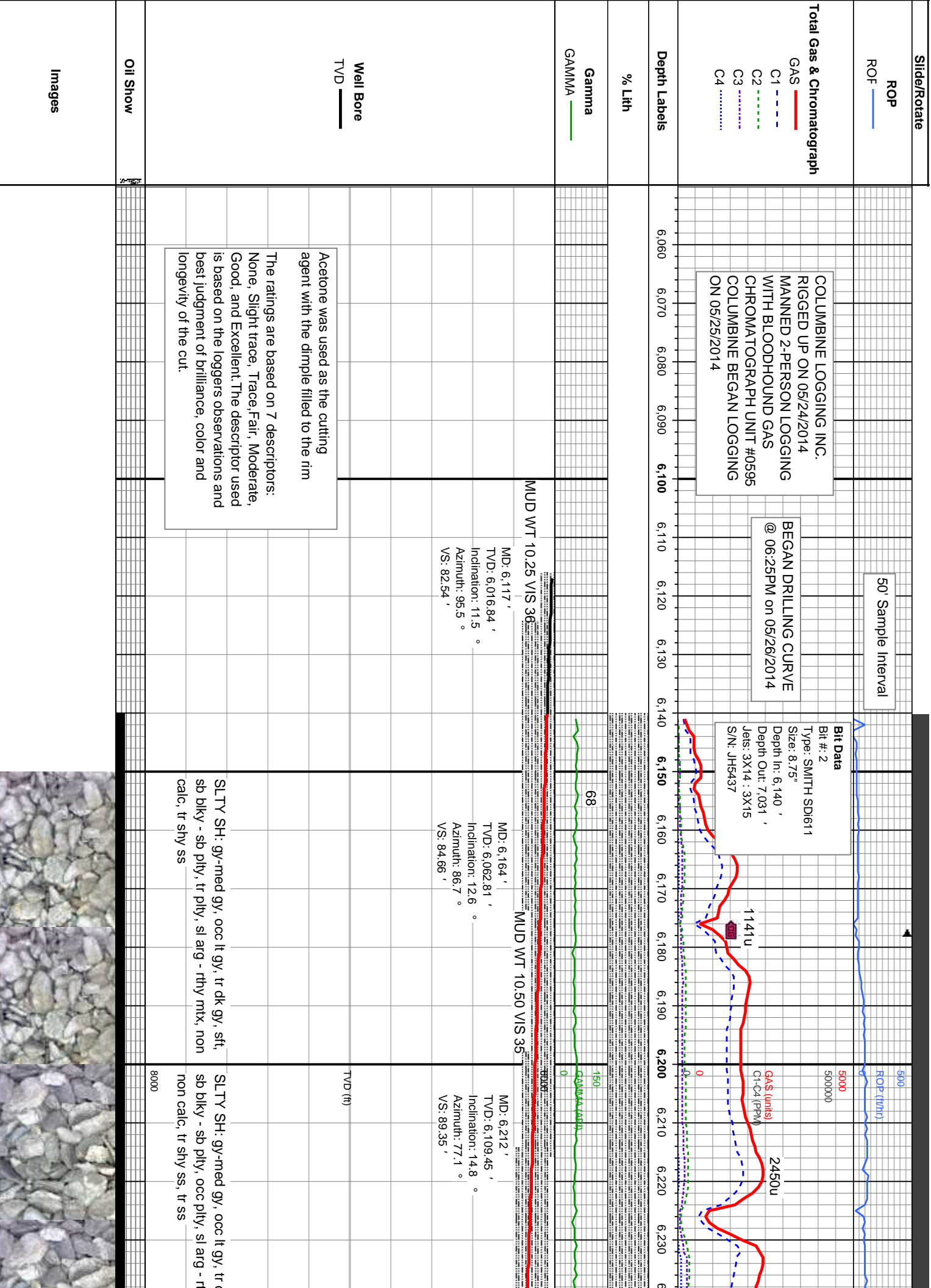
CRYPTOXLN

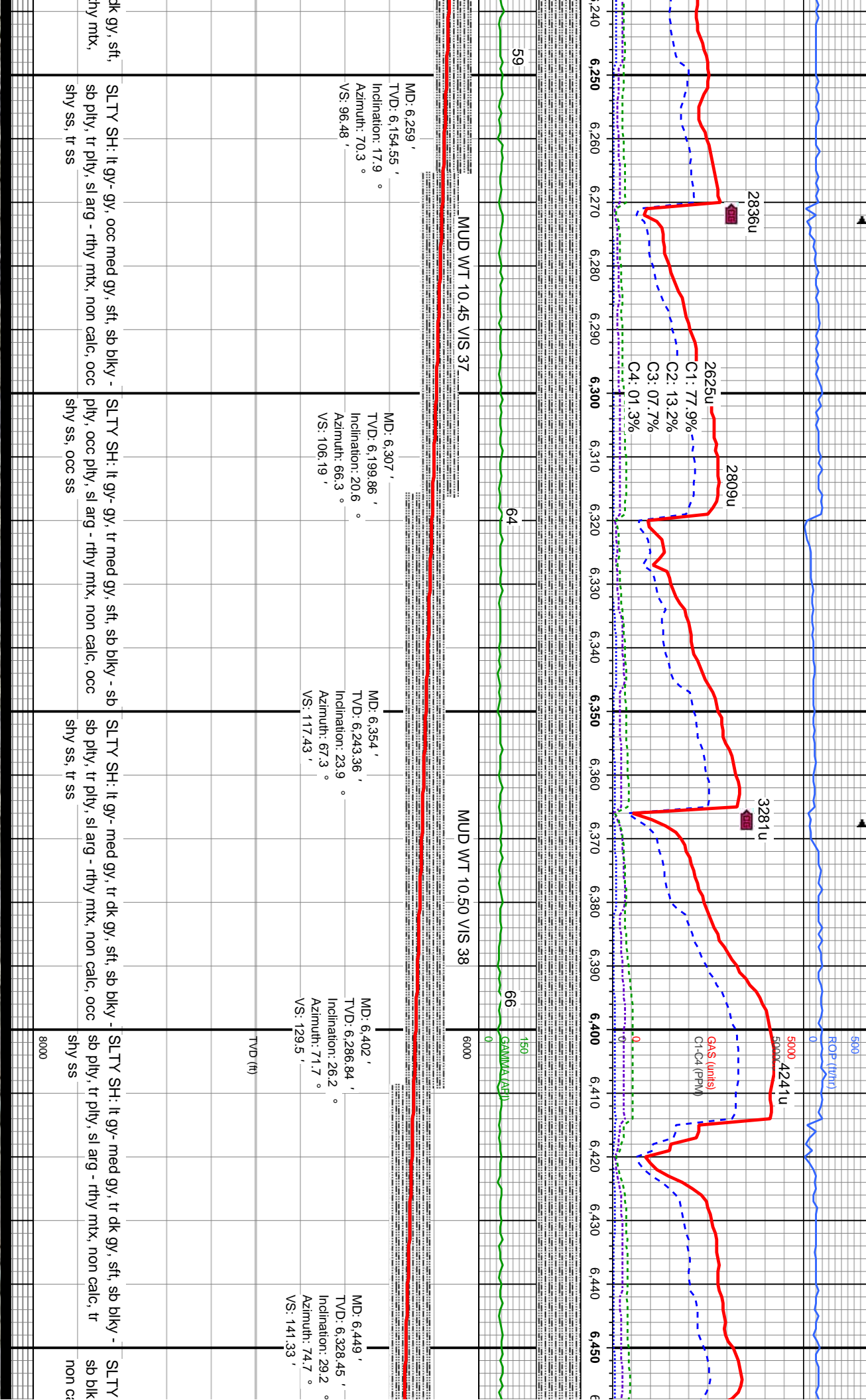
Sorting

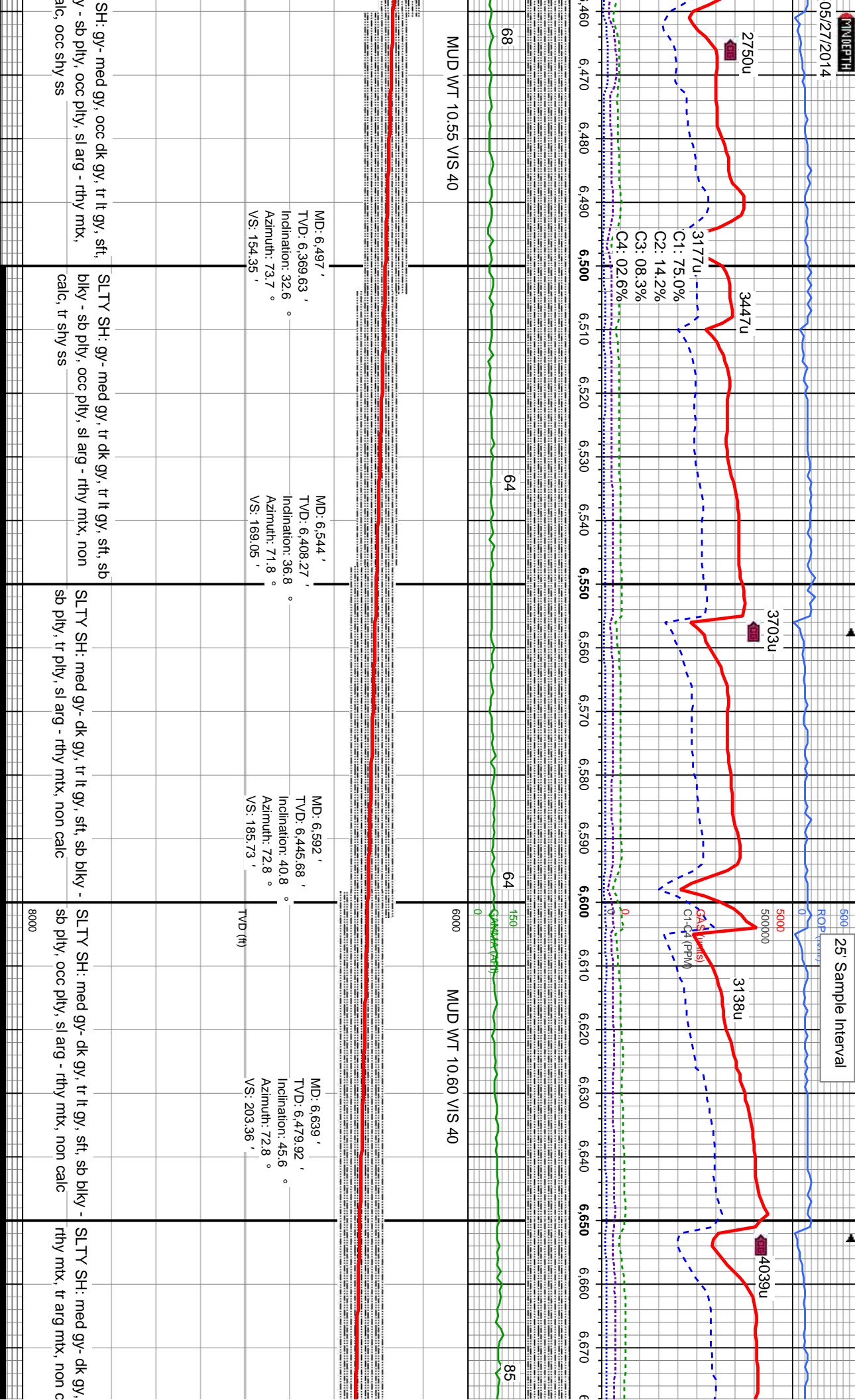
MODERATE

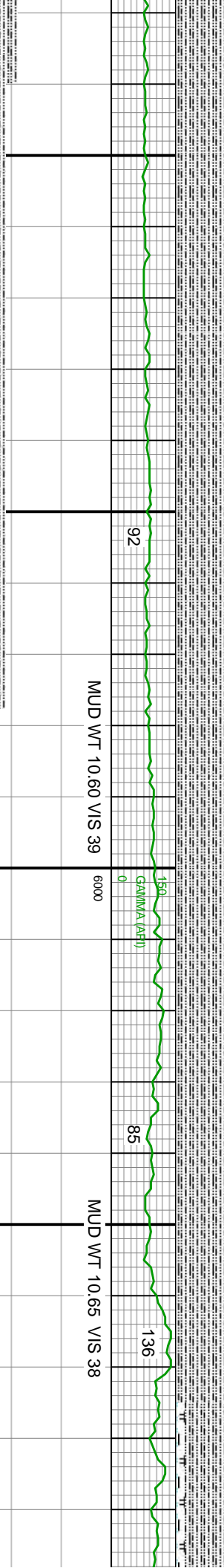
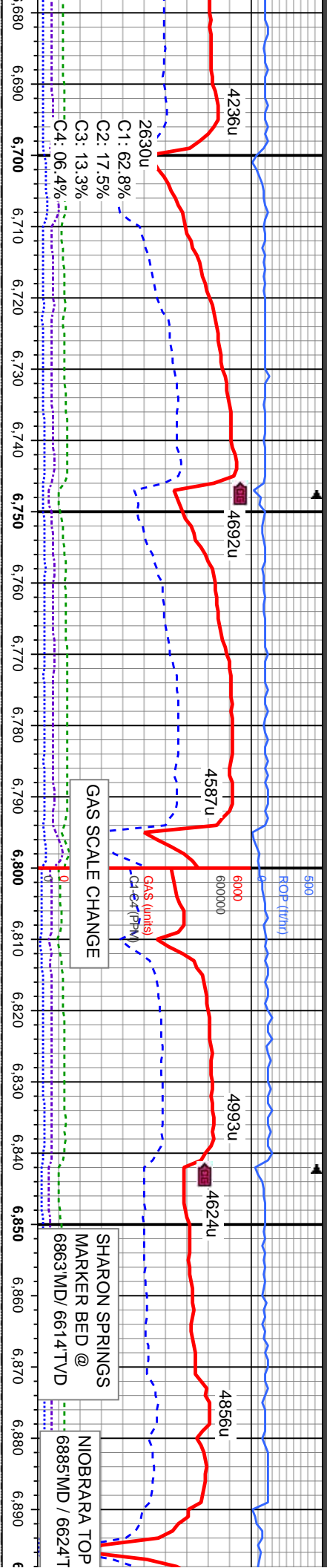
POOR

WELL









MD: 6.687 ' TVD: 6.512.25 ' Inclination: 49.7 ° Azimuth: 68.9 ° VS: 223.82 '	MD: 6.734 ' TVD: 6.541.46 ' Inclination: 53.4 ° Azimuth: 64.1 ° VS: 247.72 '	MD: 6.782 ' TVD: 6.569.33 ' Inclination: 55.7 ° Azimuth: 58.7 ° VS: 275.18 '	MD: 6.829 ' TVD: 6.595.53 ' Inclination: 56.6 ° Azimuth: 52.9 ° VS: 305.15 '	MD: 6.877 ' TVD: 6.621.73 ' Inclination: 57.2 ° Azimuth: 48 ° VS: 338.33 '
SLTY SH: med gy- dk gy, sft, sb pily, occ pily, rthy mt, tr arg mt, non calc	SLTY SH: med gy- dk gy, sft, sb pily, occ pily, rthy mt, tr arg mt, non calc	SLTY SH: med gy- dk gy, sft, sb pily, occ pily, rthy mt, tr arg mt, non calc	SLTY SH: med gy- dk gy, sft, sb pily, occ pily, rthy mt, tr arg mt, non calc	SLTY SH: med gy- dk gy, sft, sb pily, occ pily, rthy mt, tr arg mt, non calc
CHK: lt gy, tr crm - wh, mod sft - mod frm, sb pily-sb blk, rthy tex - mot, v calc	CHK: lt gy, tr crm - wh, mod sft - mod frm, sb pily-sb blk, rthy tex - mot, v calc	CHK: lt gy, tr crm - wh, mod sft - mod frm, sb pily-sb blk, rthy tex - mot, v calc	CHK: lt gy, tr crm - wh, mod sft - mod frm, sb pily-sb blk, rthy tex - mot, v calc	CHK: lt gy, tr crm - wh, mod sft - mod frm, sb pily-sb blk, rthy tex - mot, v calc



05/28/2014

MINDEPTH

5900
ROP (ft/hr)

6000
6000000

TOOH for Mud Motor @
7031' MD 09:38AM 05/27/2014

Bit Data

Bit #: 3
Type: SMITH FDS+
Size: 8.75"
Depth In: 7,031 '
Depth Out: 7,322 '
Jets: 3X20
S/N: RA6583

Resumed Drilling @
08:37 PM 05/27/2014

C1: 68.4%
C2: 16.8%
C3: 09.8%
C4: 05.0%

C1: 69.0%
C2: 16.9%
C3: 09.5%
C4: 04.6%

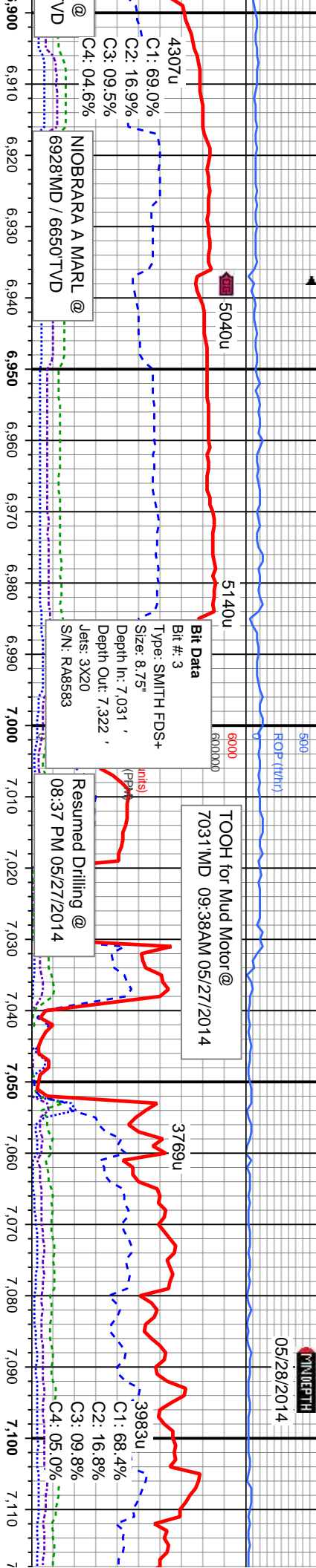
NOBRARA A MARL @
6928' MD / 6650' TVD

5040u

5140u

3769u

3983u



173

155

150
GAMMA (API)

85

MUD WT 10.60 VIS 38

MUD WT 10.75 VIS 38

MUD WT 10.70 VIS 38

MUD WT

MD: 6,972 '
TVD: 6,674.95 '
Inclination: 53.8 °
Azimuth: 37.7 °
VS: 408.77 '

MD: 7,019 '
TVD: 6,703.11 '
Inclination: 52.6 °
Azimuth: 32.5 °
VS: 444.3 '

MD: 7,067 '
TVD: 6,730.56 '
Inclination: 55.8 °
Azimuth: 26 °
VS: 482.92 '

MD: 7,114 '
TVD: 6,755.34 '
Inclination: 62 °
Azimuth: 20.6 °
VS: 522.15 '

MD: 6,924 '
TVD: 6,647.48 '
Inclination: 56.4 °
Azimuth: 41.8 °
VS: 372.75 '

TVD (ft)

CHK: lt gy, tr crm - wh, mod sft - mod frm, sb
ply-sb blkly, rthy tex - mot, v calc
MRLST: gy blk-blk, blkly-sb ply, sme fis,
mod frm, rthy tex, v calc
SLTY SH: med gy-dk gy, sft, sb ply, occ ply,
rthy mtx, tr arg mtx, occ bent, non calc

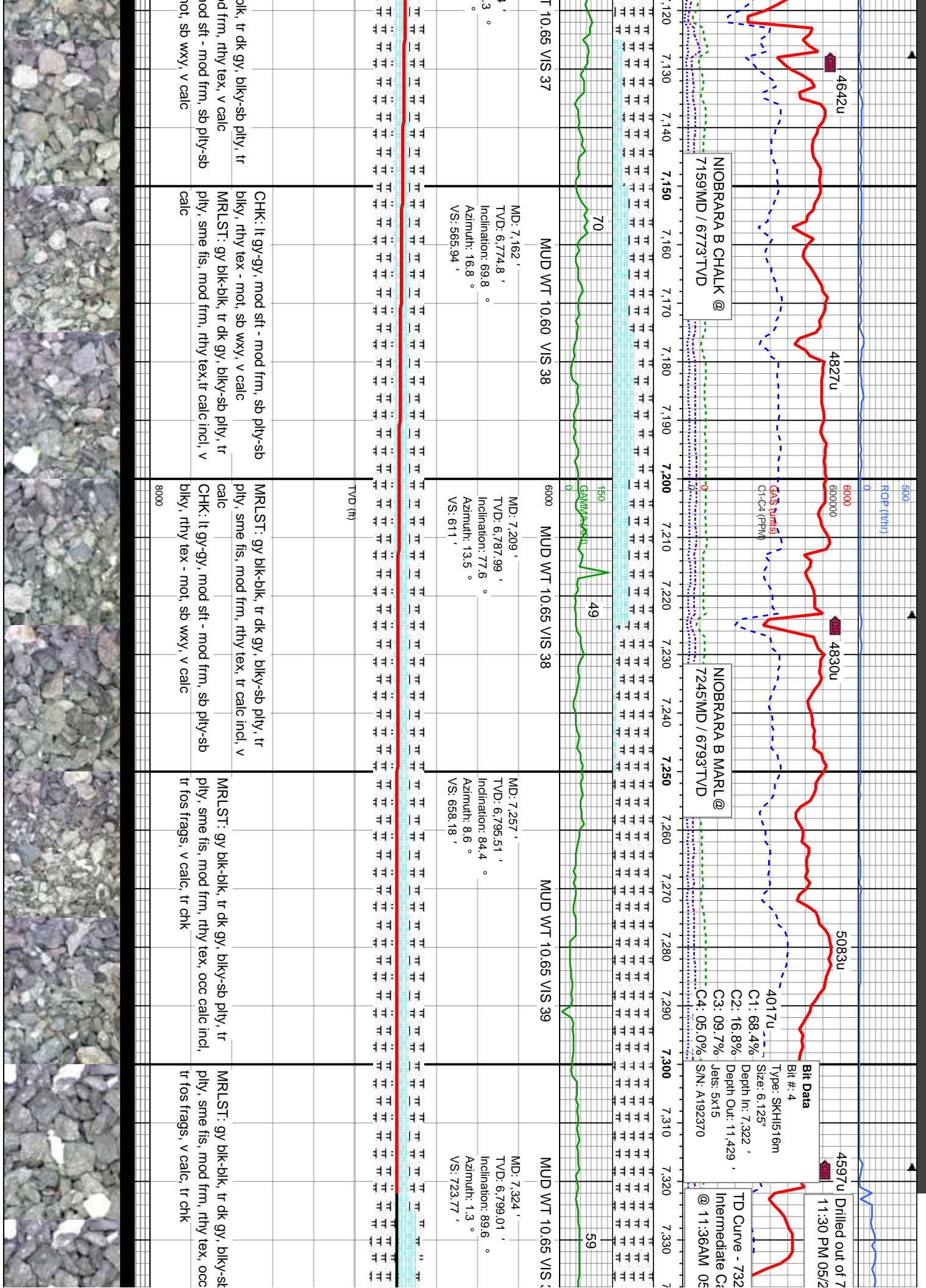
MRLST: gy blk-blk, blkly-sb ply, sme fis, mod
frm, rthy tex, v calc
CHK: lt gy, tr crm - wh, mod sft - mod frm, sb
ply-sb blkly, rthy tex - mot, v calc

MRLST: gy blk-blk, blkly-sb ply, sme fis, mod
frm, rthy tex, v calc
CHK: lt gy, tr crm - wh, mod sft - mod frm, sb
ply-sb blkly, rthy tex - mot, v calc

MRLST: gy blk-blk, tr dk gy, blkly-sb ply, tr
ply, sme fis, mod frm, rthy tex, v calc
CHK: lt gy-gy, mod sft - mod frm, sb ply-sb
blkly, rthy tex - mot, v calc

MRLST: gy blk-l
ply, sme fis, mc
CHK: lt gy-gy, r
blkly, rthy tex - r





NIOBRARA B CHALK @
7159MD / 6773TVD

NIOBRARA B MARL @
7245MD / 6793TVD

Bit Data
Bit #: 4
Type: SKH1516m
Size: 6.125"
Depth In: 7.322 '
Depth Out: 11.429 '
Jets: 5x15
S/N: A192370

TD Curve - 732
Intermediate C:
@ 11:36AM 05/2

MD: 7.162 '
TVD: 6.774.8 '
Inclination: 69.8 °
Azimuth: 16.8 °
VS: 565.94 '

MD: 7.209 '
TVD: 6.787.99 '
Inclination: 77.6 °
Azimuth: 13.5 °
VS: 611 '

MD: 7.257 '
TVD: 6.795.51 '
Inclination: 84.4 °
Azimuth: 8.6 °
VS: 658.18 '

MD: 7.324 '
TVD: 6.799.01 '
Inclination: 89.6 °
Azimuth: 1.3 °
VS: 723.77 '

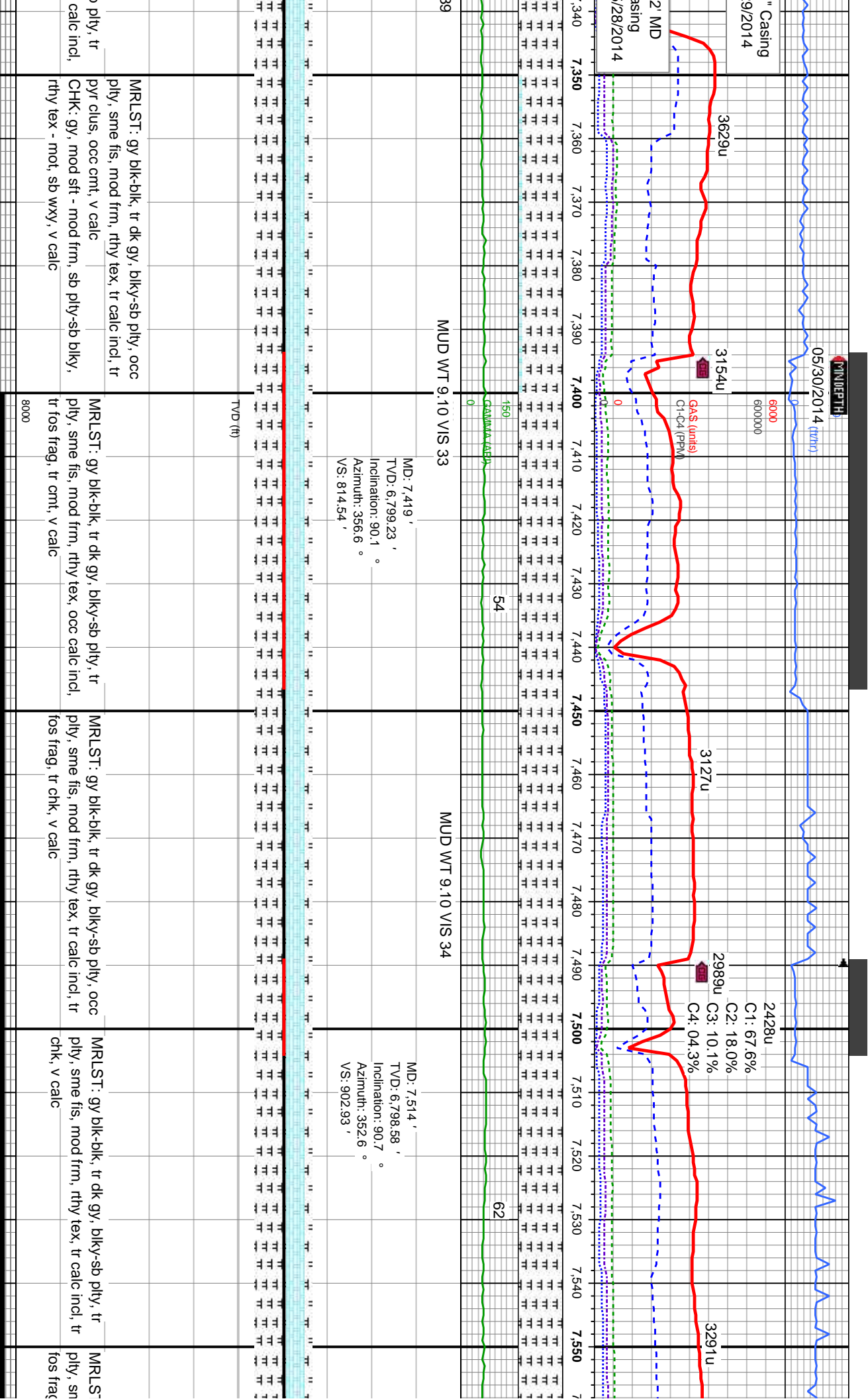
TVD (ft)

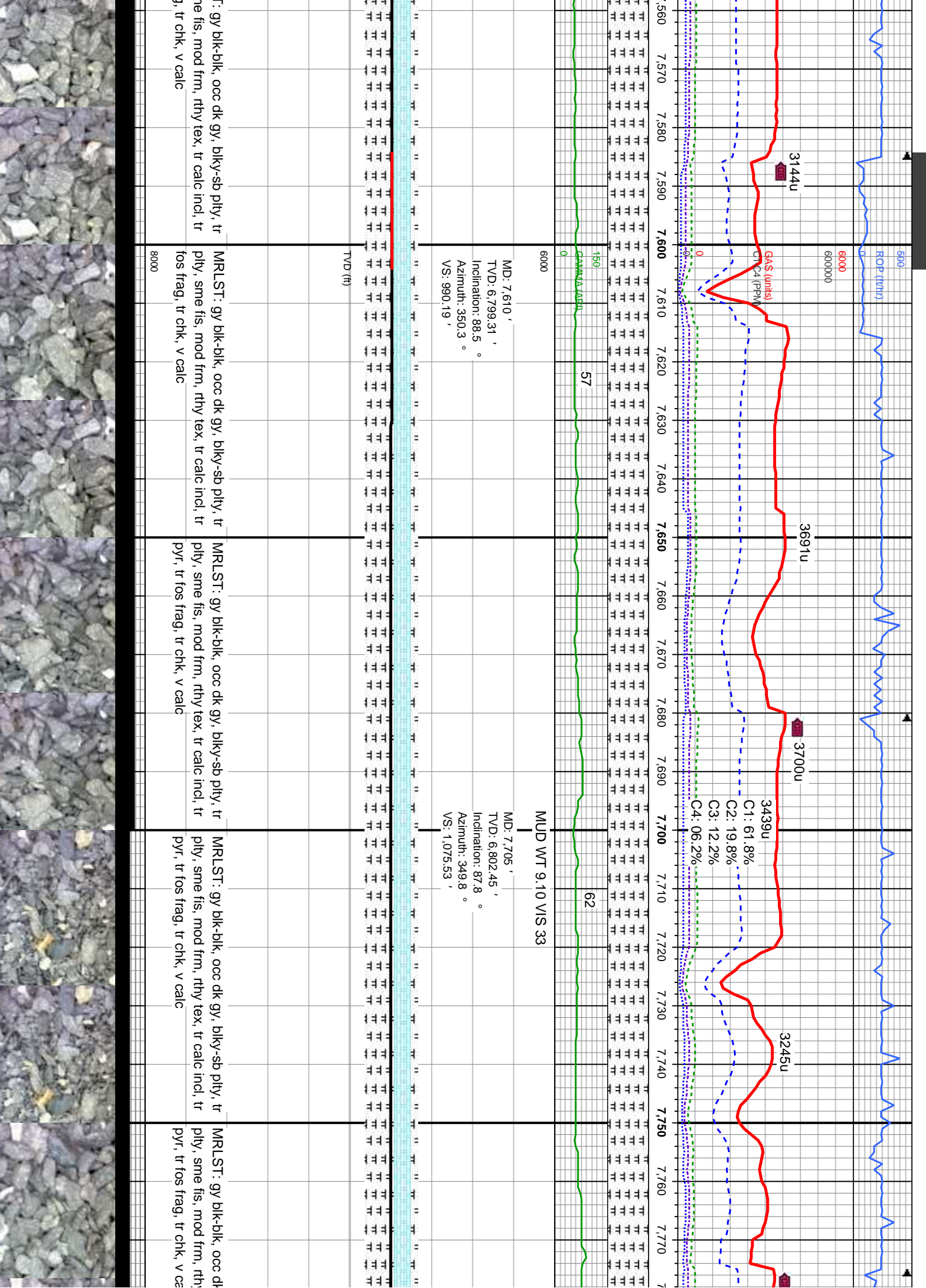
CHK: lt gy-gy, mod sft - mod frm, sb pty-sb pty, rthy tex - mot, sb wxy, v calc
MRLST: gy blk-blk, tr dk gy, blkly-sb pty, tr pty, sme fis, mod frm, rthy tex, tr calc incl, v calc

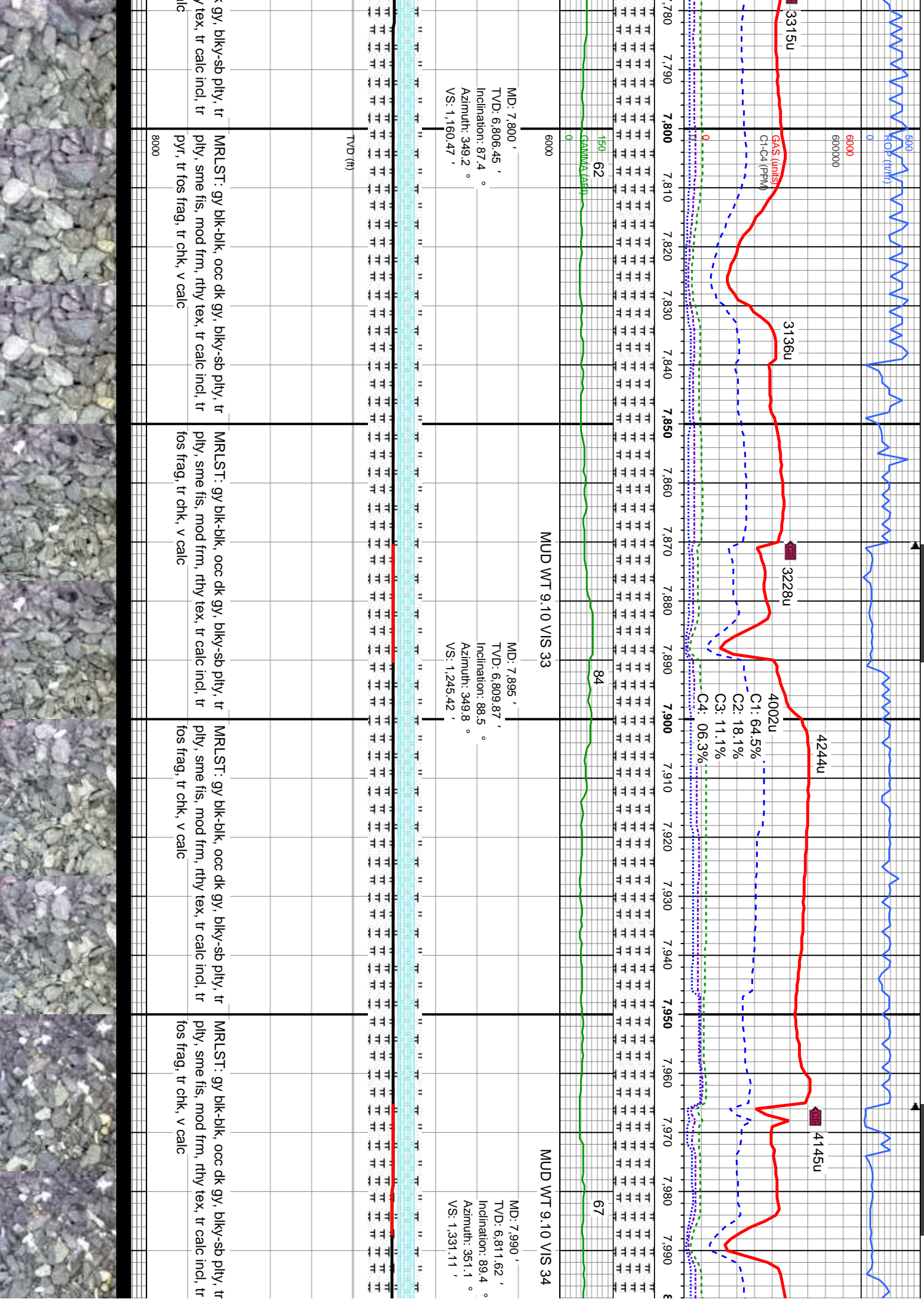
MRLST: gy blk-blk, tr dk gy, blkly-sb pty, tr pty, sme fis, mod frm, rthy tex, tr calc incl, v calc
CHK: lt gy-gy, mod sft - mod frm, sb pty-sb pty, rthy tex - mot, sb wxy, v calc

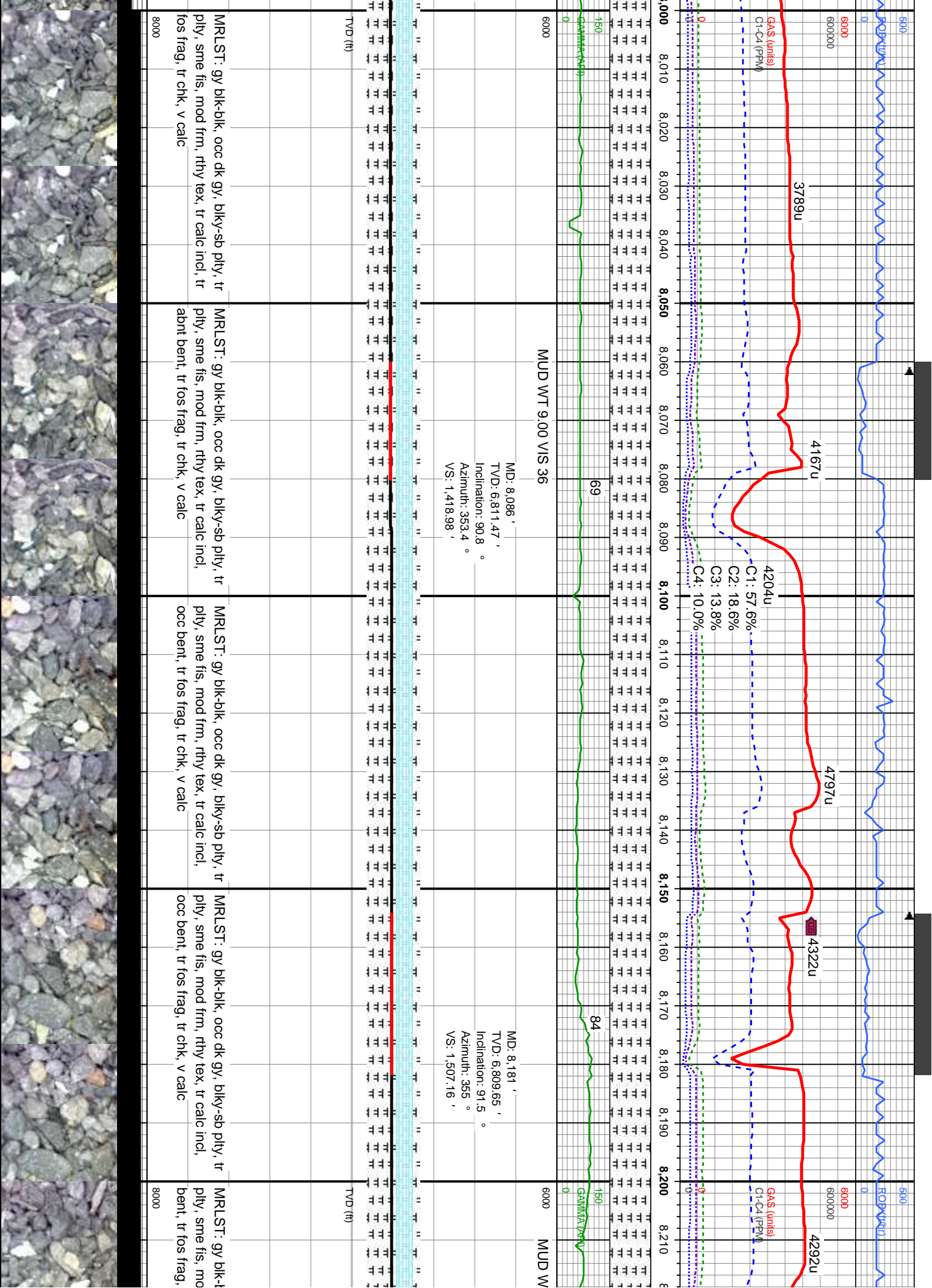
MRLST: gy blk-blk, tr dk gy, blkly-sb pty, tr pty, sme fis, mod frm, rthy tex, occ calc incl, tr fos frags, v calc, tr chk

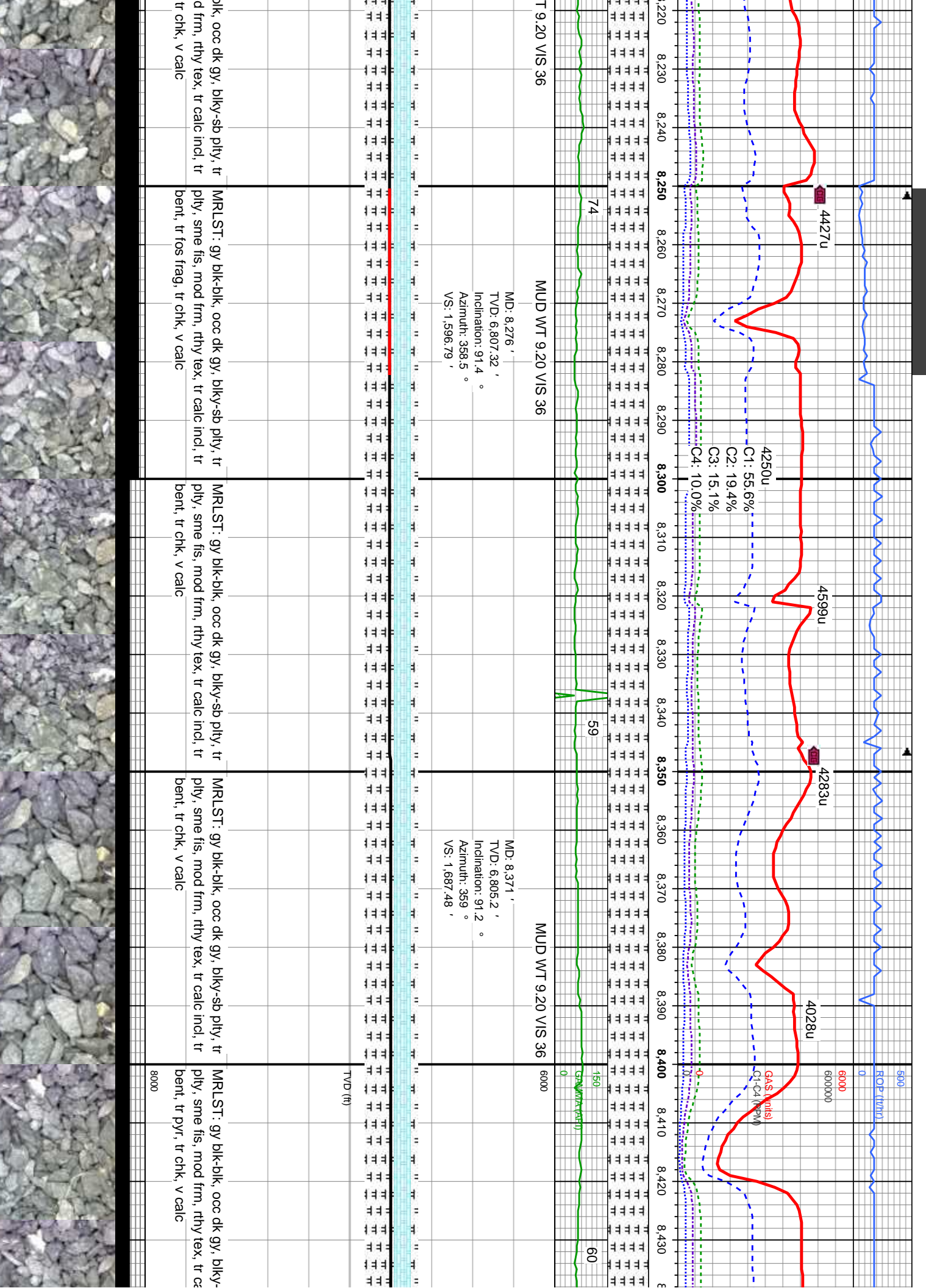
MRLST: gy blk-blk, tr dk gy, blkly-sb pty, sme fis, mod frm, rthy tex, occ tr fos frags, v calc, tr chk

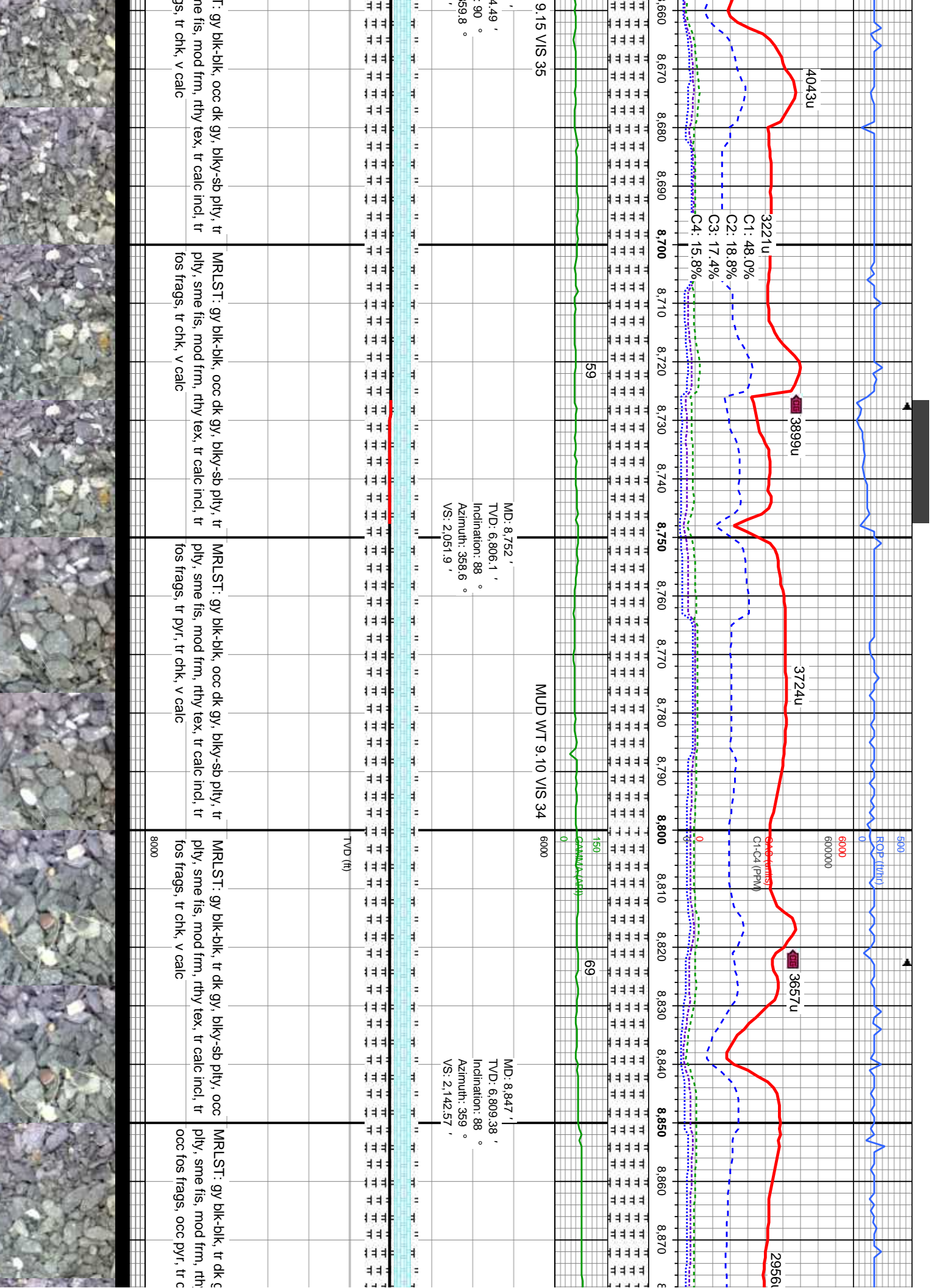


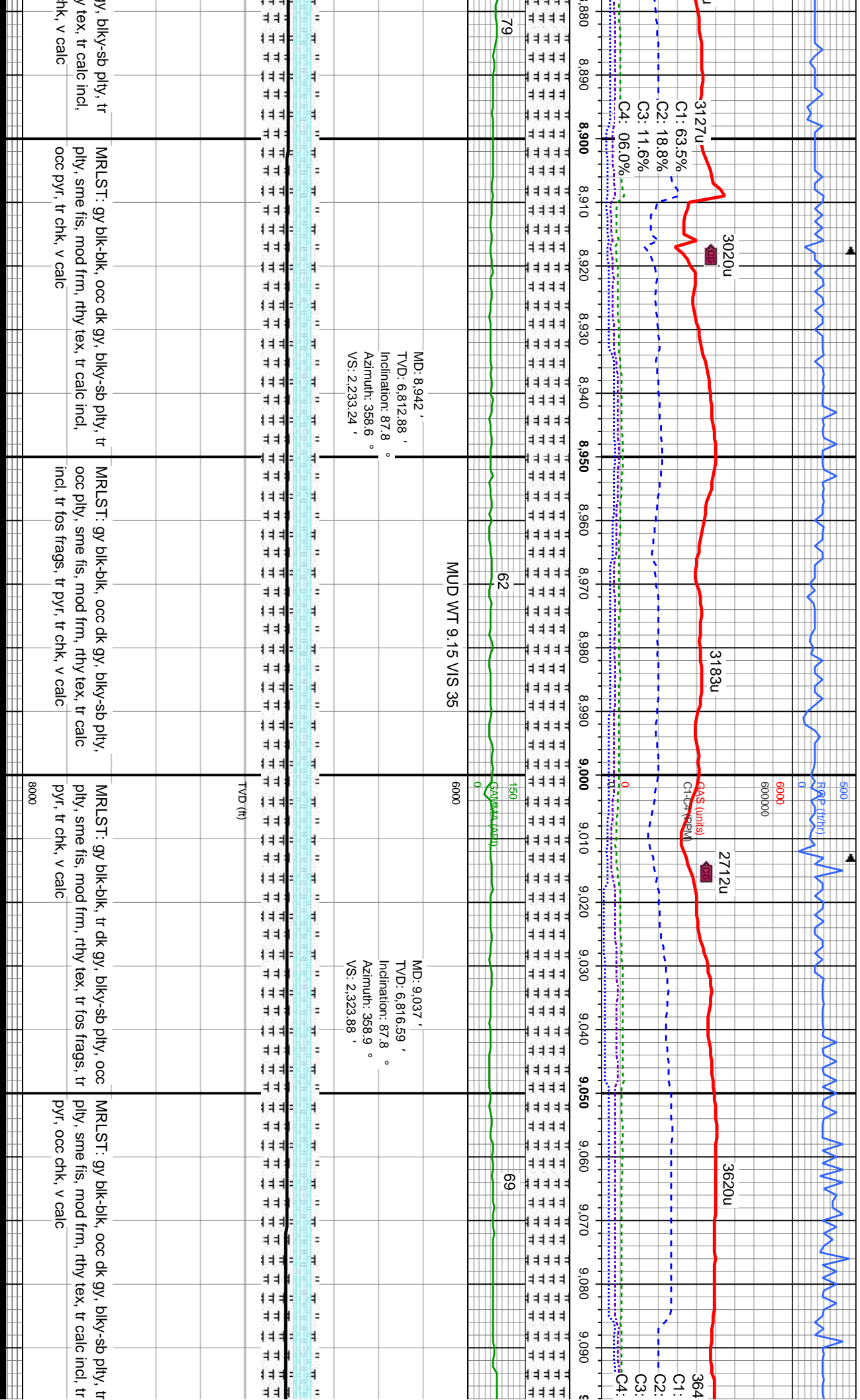


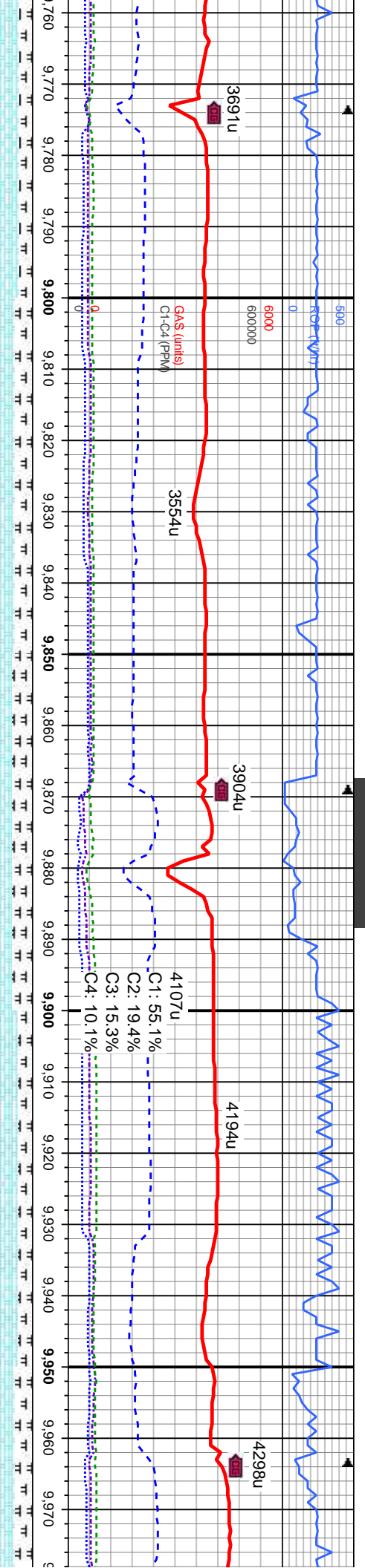












MD: 9.798 '
TVD: 6,819.34 '
Inclination: 89.9 °
Azimuth: 357.4 °
VS: 3.046.2 '

MD: 9.893 '
TVD: 6,819.78 '
Inclination: 89.6 °
Azimuth: 359.4 °
VS: 3.136.73 '

MUD WT 9.20 VIS 40

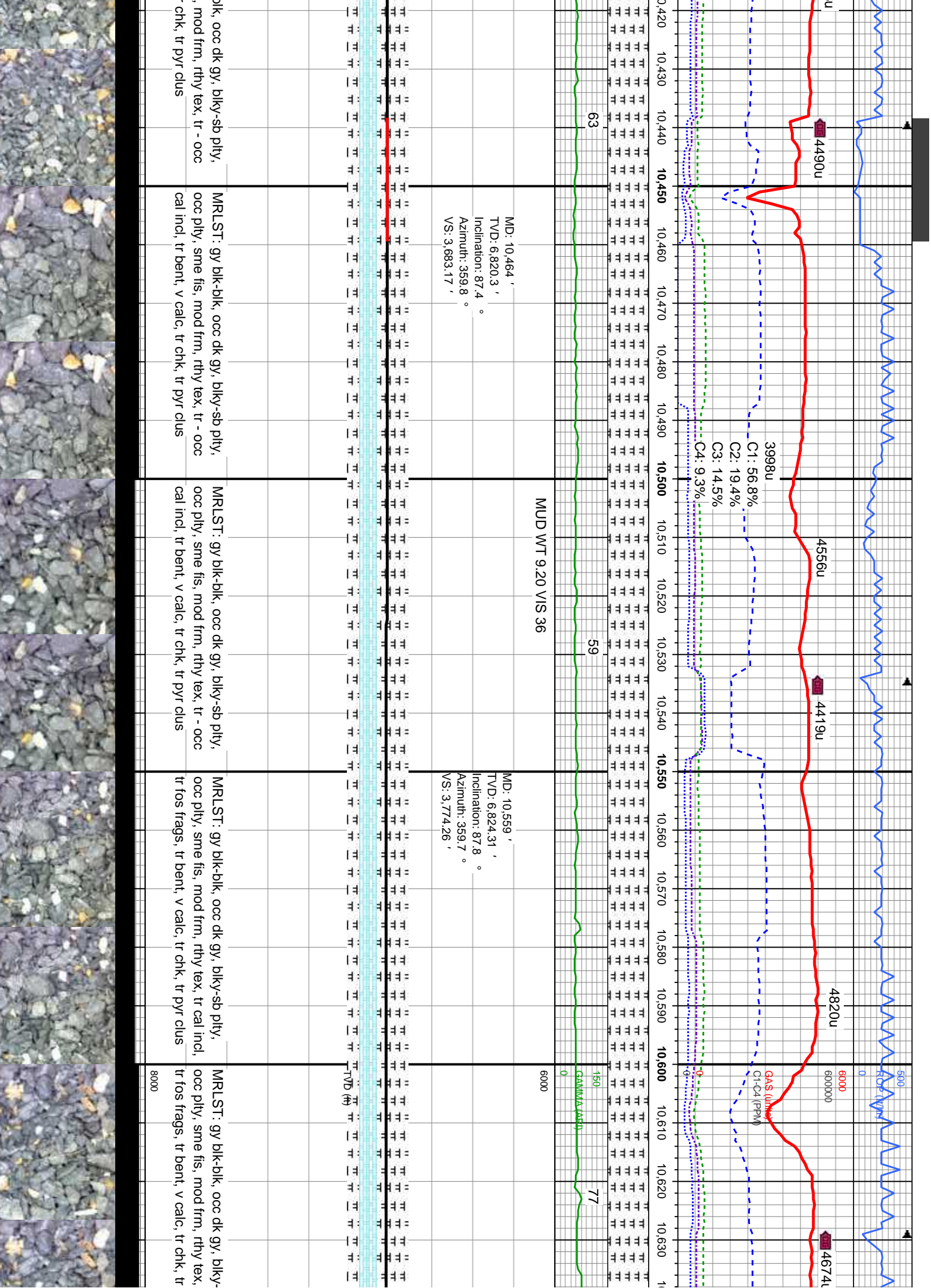
MUD WT 9.2

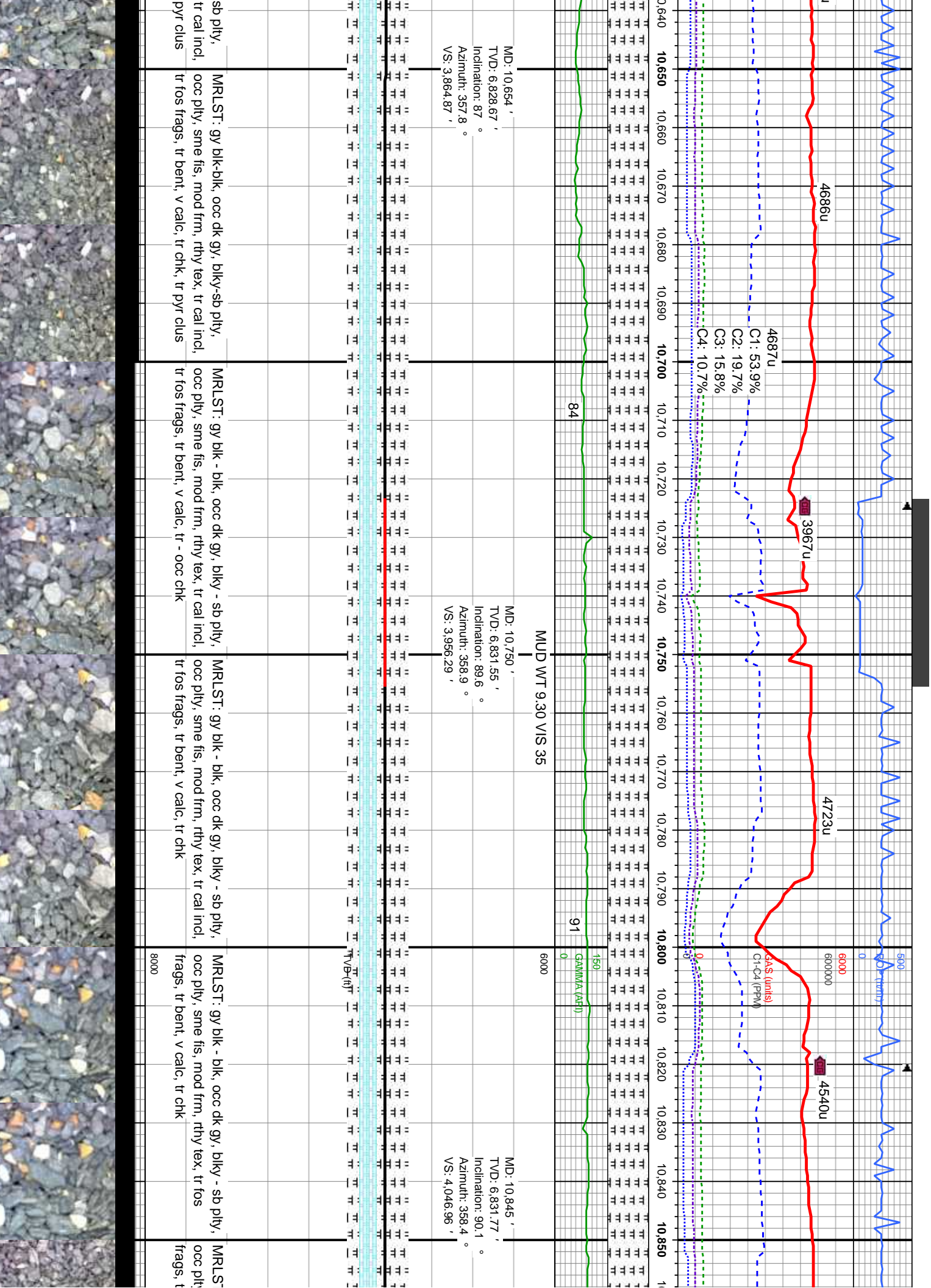
47	3554u	4107u	4194u	4298u
0	0	0	0	0
150	150	150	150	150
60000	60000	60000	60000	60000

TVD (ft)

gy-gy, tr lt brn, tr med gy, mod sft - n, sb ply-sb blkly, tr ply, rthy tex - mot, v calc	CHK: lt gy-gy, tr med gy, mod sft - mod frm, sb ply-sb blkly, tr ply, rthy tex - mot, sb wxy, v calc	CHK: lt gy-gy, tr med gy, mod sft - mod frm, sb ply-sb blkly, rthy tex - mot, sb wxy, v calc	CHK: lt gy-gy, occ med gy, mod sft - mod frm, ply-sb blkly, rthy tex - mot, sb wxy, v calc	CHK: lt gy-gy, tr lt brn, mo ply-sb blkly, rthy tex - mot, MRLST: gy blk-blk, blkly-sb ply, occ dk ply, sme fis, mod frm, rthy
gy blk-blk, blkly-sb ply, occ ply, sme d frm, rthy tex, tr calc incl, v calc	MRLST: gy blk-blk, blkly-sb ply, sme fis, mod frm, rthy tex, tr calc incl, v calc	MRLST: gy blk-blk, blkly-sb ply, tr ply, sme fis, mod frm, rthy tex, tr calc incl, v calc	MRLST: gy blk-blk, blkly-sb ply, occ ply, sme fis, mod frm, rthy tex, tr calc incl, v calc	
8000	8000			







MD: 10,654 '
TVD: 6,828.67 '
Inclination: 87 °
Azimuth: 357.8 °
VS: 3.864.87 '

MD: 10,750 '
TVD: 6,831.55 '
Inclination: 89.6 °
Azimuth: 358.9 °
VS: 3.956.29 '

MD: 10,845 '
TVD: 6,831.77 '
Inclination: 90.1 °
Azimuth: 358.4 °
VS: 4,046.96 '

MUD WT 9.30 VIS 35

