



Scale: 5" / 100'
Measured Depth Log

Well Name Brook LC28-74-1AHNC

Location SWSE SEC 28 T9N R59W

State COLORADO

County WELD

Country USA

Rig Number H&P 273

API Number 05-123-38844

Field WILDCAT

Region DJ BASIN

Drilling Completed 8/3/2014

Spud Date 7/28/2014

Surface Coordinates 340' FSL; 1848' FEL

Bottom Hole Coordinates 675' FNL; 1815' FEL

Ground Elevation 4843'

K.B. Elevation 4867'

Logged Interval 5460' To 10474'

Total Depth 10474'

Formation NIOBRARA

Type of Drilling Fluid LSND

Operator

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Geologist

Name RENEE CLACKLER

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

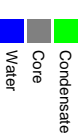
Other

Wellsite Geologist #1 Laura Kellogg













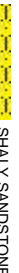








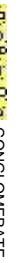











Wellsite Geologist #2 Tim Bright

Wellsite Geological Services Provided By Columbine Logging
























































Zone Color Coding



Rock Types

 CHALK	 CEMENT	 IGNEOUS	 SHALE GRAY
 MARLSTONE	 CHERT	 SIDERITE or LIMONITE	 SHALY SILTSTONE
 SANDSTONE	 CLAY CHOQE SANC	 LIMESTONE	 SILTSTONE
 SHALY SANDSTONE	 CLAYSTONE	 METAMORPHIC	 TILL
 SILTY SHALE	 COAL	 NO SAMPLE	 TUFF
 UNKNOWN	 CONGLOMERATE	 SALT	 WELDED TUFF
 ANHYDRITE	 DOLOMITE	 SALT-PEPPER SAND	
 BENTONITE	 GRANITE	 SHALE	
 BRECCIA	 GYPSUM	 SHALE COLORED	

Accessories

 F FOSSIL	 ARGILLACEOUS	 GLAUCONITE	 TUFFACEOUS
 GASTROPOD	 ARGILLITE GRAIN	 GYPSIFEROUS	
 OOLITE	 B BENTONITE	 HEAVY MINERAL	
 AMPHIPORA	 BITUMENOUS SUBSTANCE	 INOCERAMUS	
 BELEMNITE	 BRECCIA FRAGMENTS	 KAOLIN	 ANHYDRITE STRINGER
 BIOCLASTIC	 CALCAREOUS	 MARLSTONE	 BENTONITE STRINGER
 BRACHIOPOD	 CARBONACEOUS FLAKES	 MINERAL CRYSTALS	 COAL STRINGER
 BRYOZOA	 CHITDK	 NODULES	 DOLOMITE STRINGER
 CEPHALOPOD	 CHITLT	 PHOSPHATE PELLETS	 GYPSUM STRINGER
 CORAL	 COAL - THIN BEDS	 PYRITE	 LIMESTONE STRINGER
 CRINOID	 DOLOMITIC	 SALT CAST	 MARLSTONE (CALC) STRG
 ECHINOID	 FELDSPAR	 SANDY	 MARLSTONE (DOL) STRG
 FISH	 FERRUGINOUS PELLETT	 SILICEOUS	 SANDSTONE STRINGER
 FORAMINIFERA	 FERRUGINOUS	 SILTY	 SHALE STRINGER
	 ANHYDRITIC		 SILTSTONE STRINGER


















Minerals

Stringer

Engineering

Oil Show


Porosity

 MOLDIC	 CONNECTION (LEFT)	 QUESTIONABLE
 ORGANIC	 CONNECTION (RIGHT)	 SPOTTED STAINING
 PINPOINT	 CORE - LOST	 EVEN
 VUGGY	 FENESTRAL	 DEAD
	 FRACTURE	
	 INTERCRYSTALLINE	
	 CORE - RECOVERED	
	 INTEROOLITIC	
	 DST INTERVAL	

Other Symbols

 FAULT  WIRELINE TESTED - LEFT **E** EARTHY

 FORMATION TOP  WIRELINE TESTED - RT **FX** FINELYXLN

 GAS SHOW **GS** GRAINSTONE

Rounding

 MINDEPTH MN DEPTH **L** LITHOGRAPHIC

 NORMAL FAULT **A** ANGULAR **MX** MICROXLN

 OIL SHOW **R** ROUNDED **MS** MUDSTONE

 OVERTURNED STRATA **B** SUBANG **PS** PACKSTONE

 REVERSE FAULT **F** SUBRND **WS** WACKESTONE

 SIDEWALL CORE (LEFT)


Textures

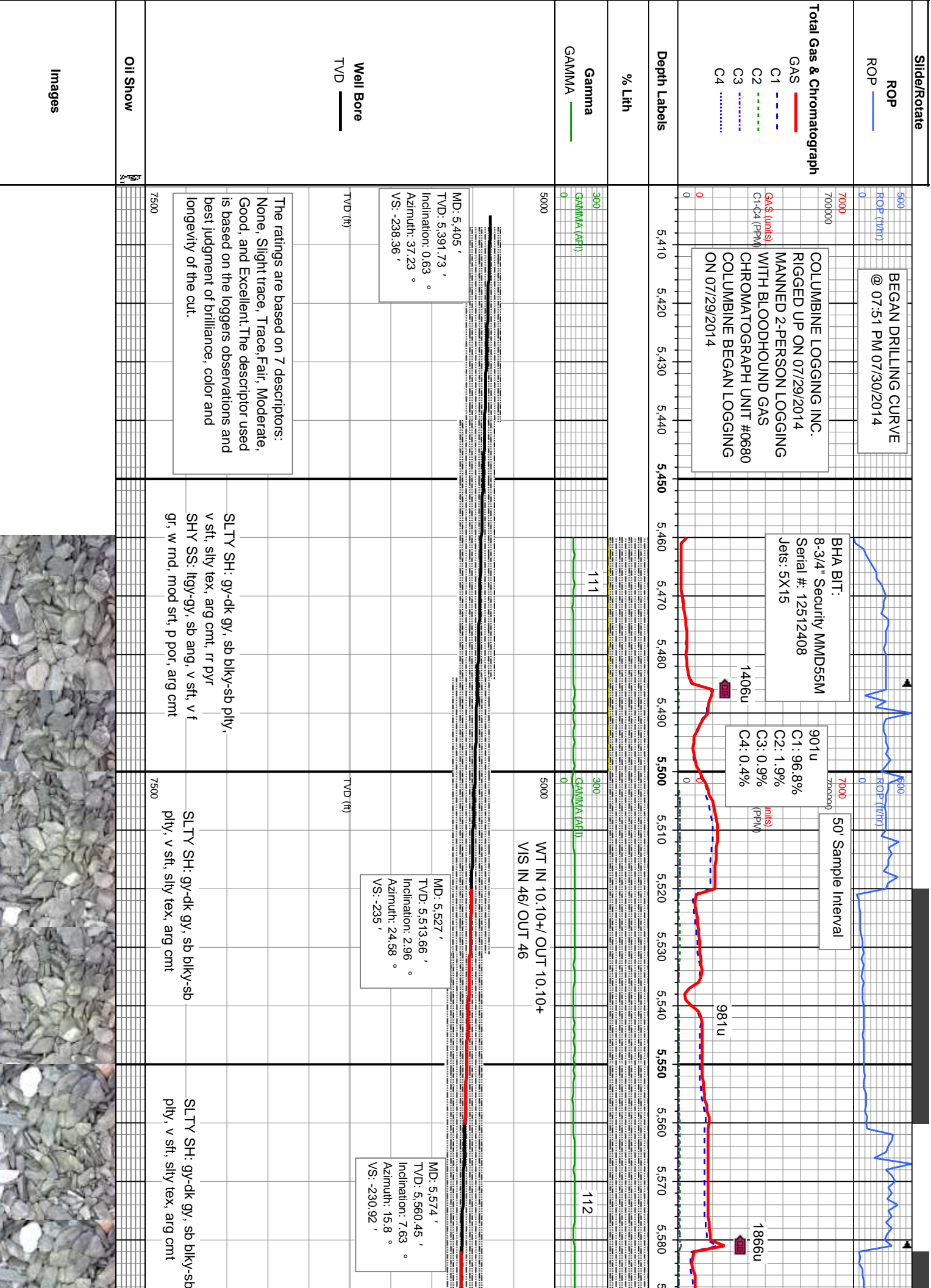
 SIDEWALL CORE (RIGHT)

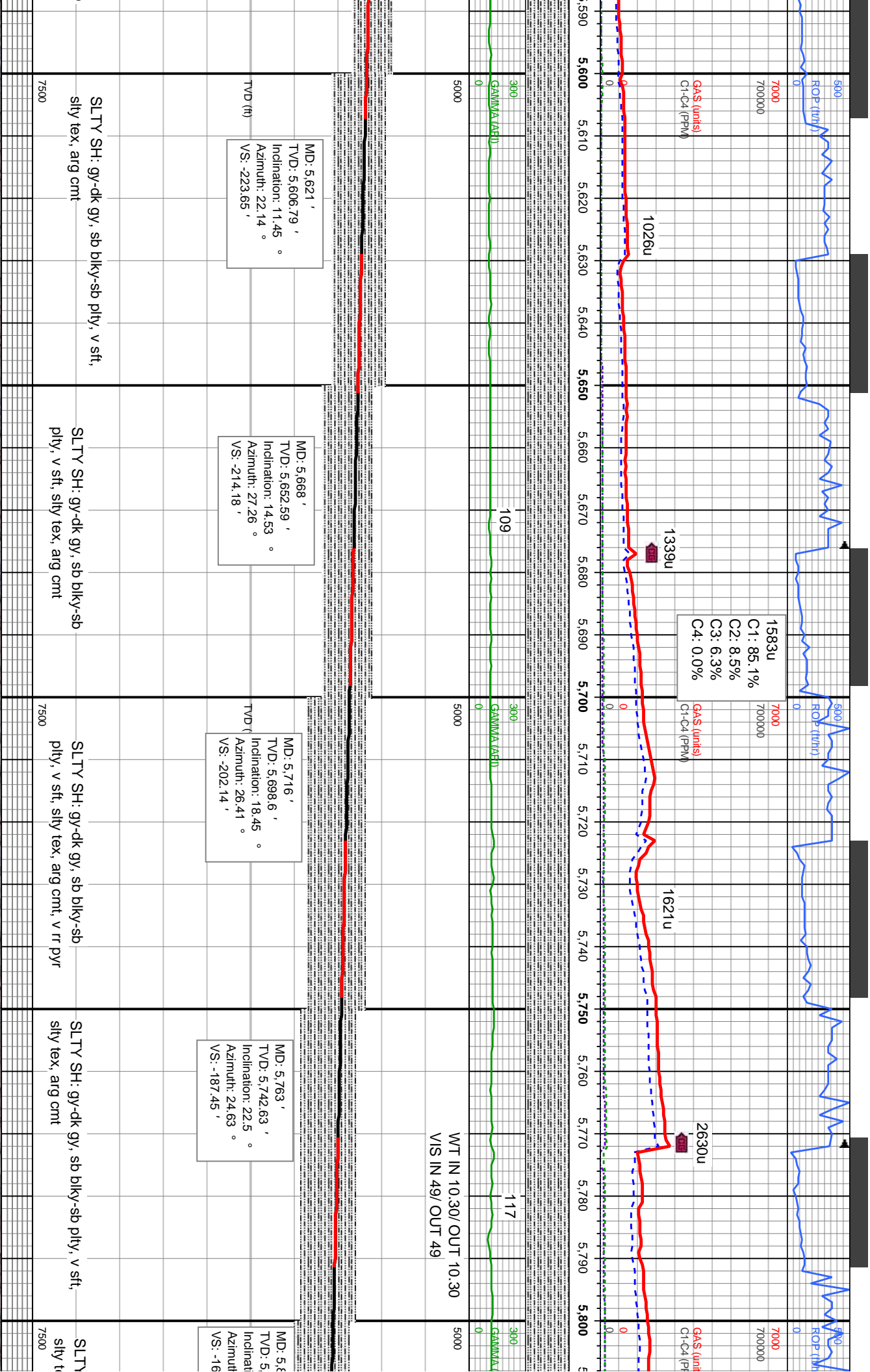
Sorting

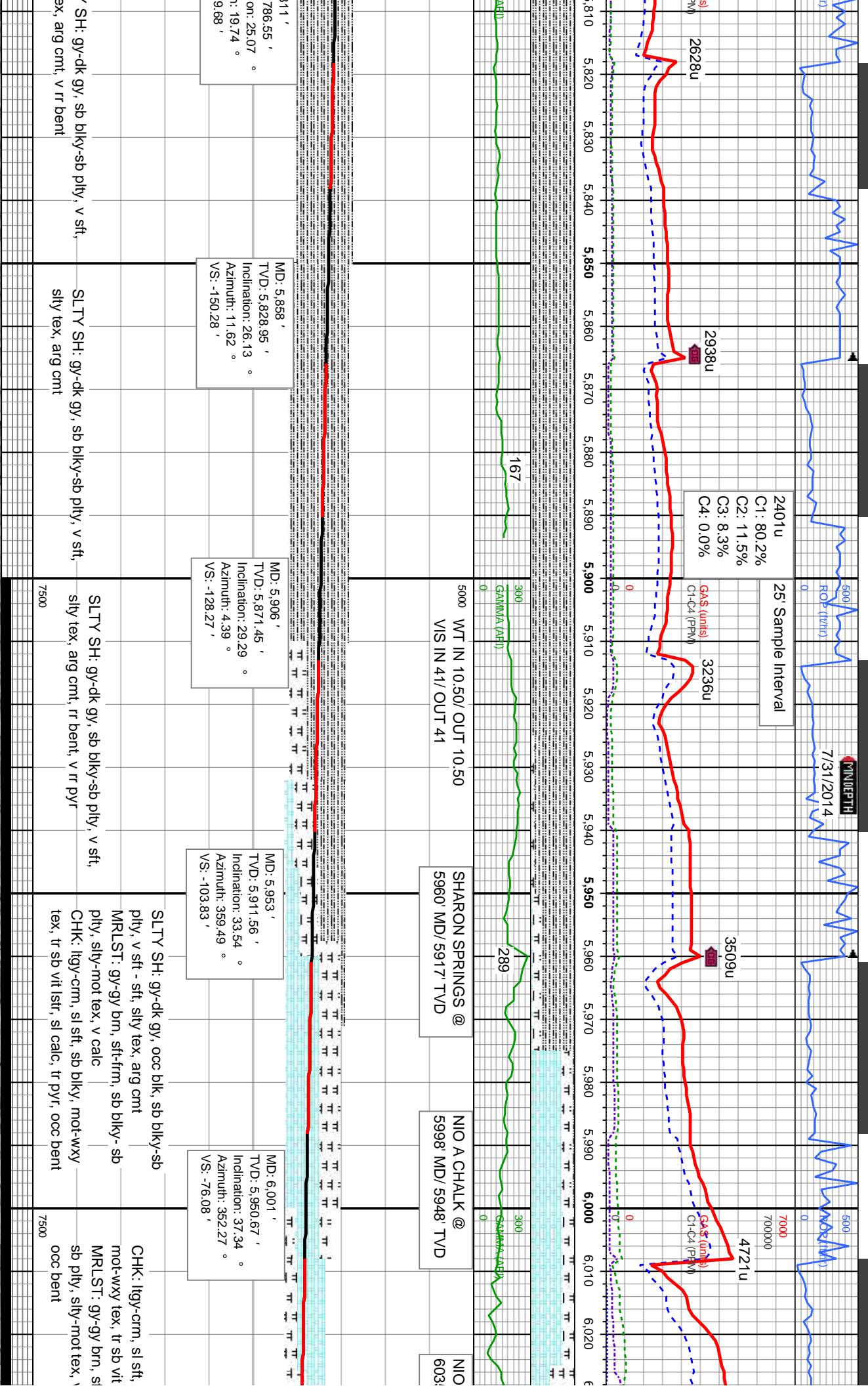
 SLIDE **BS** BOUNDSTONE **M** MODERATE

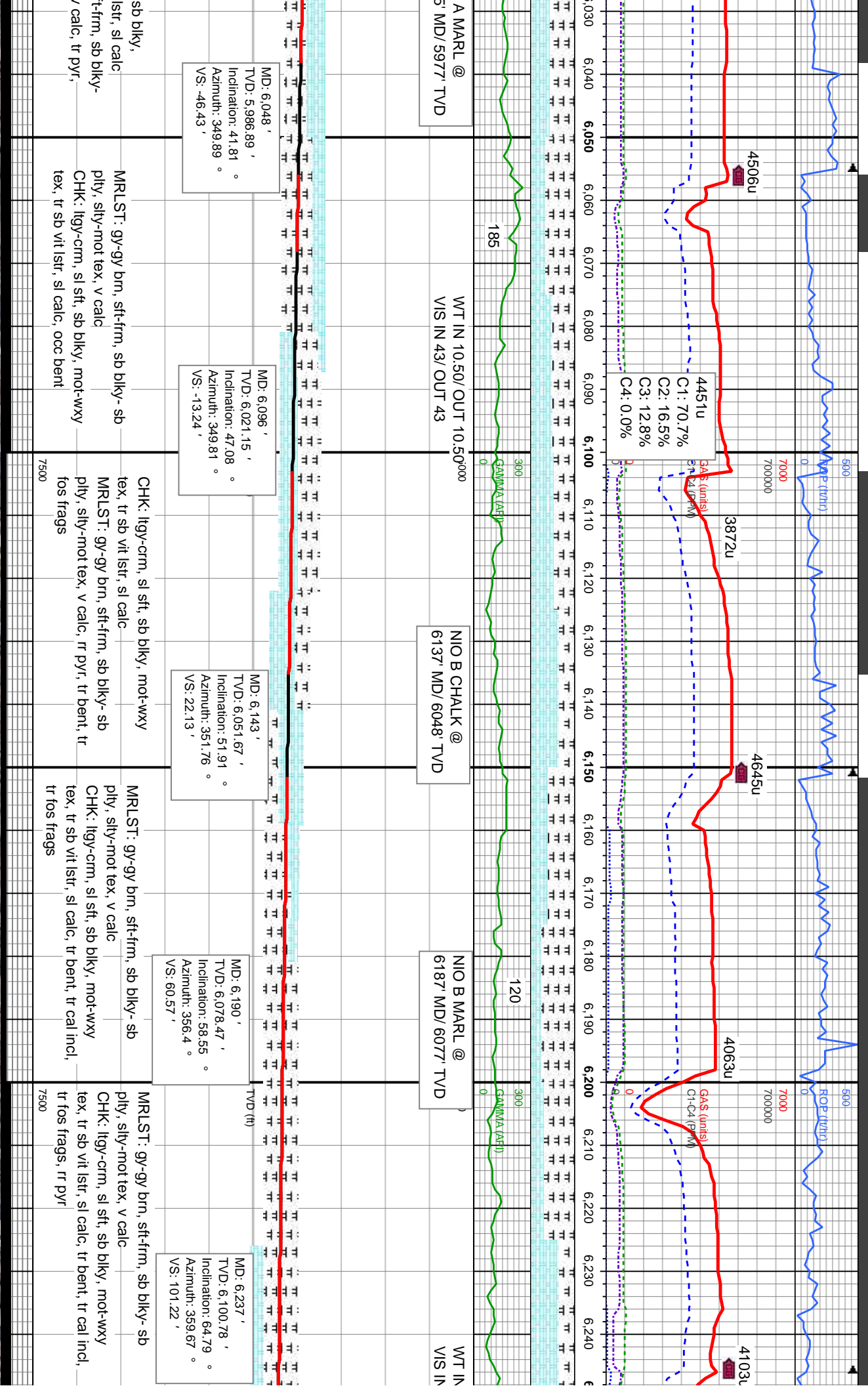
 SURVEY **C** CHALKY **P** POOR

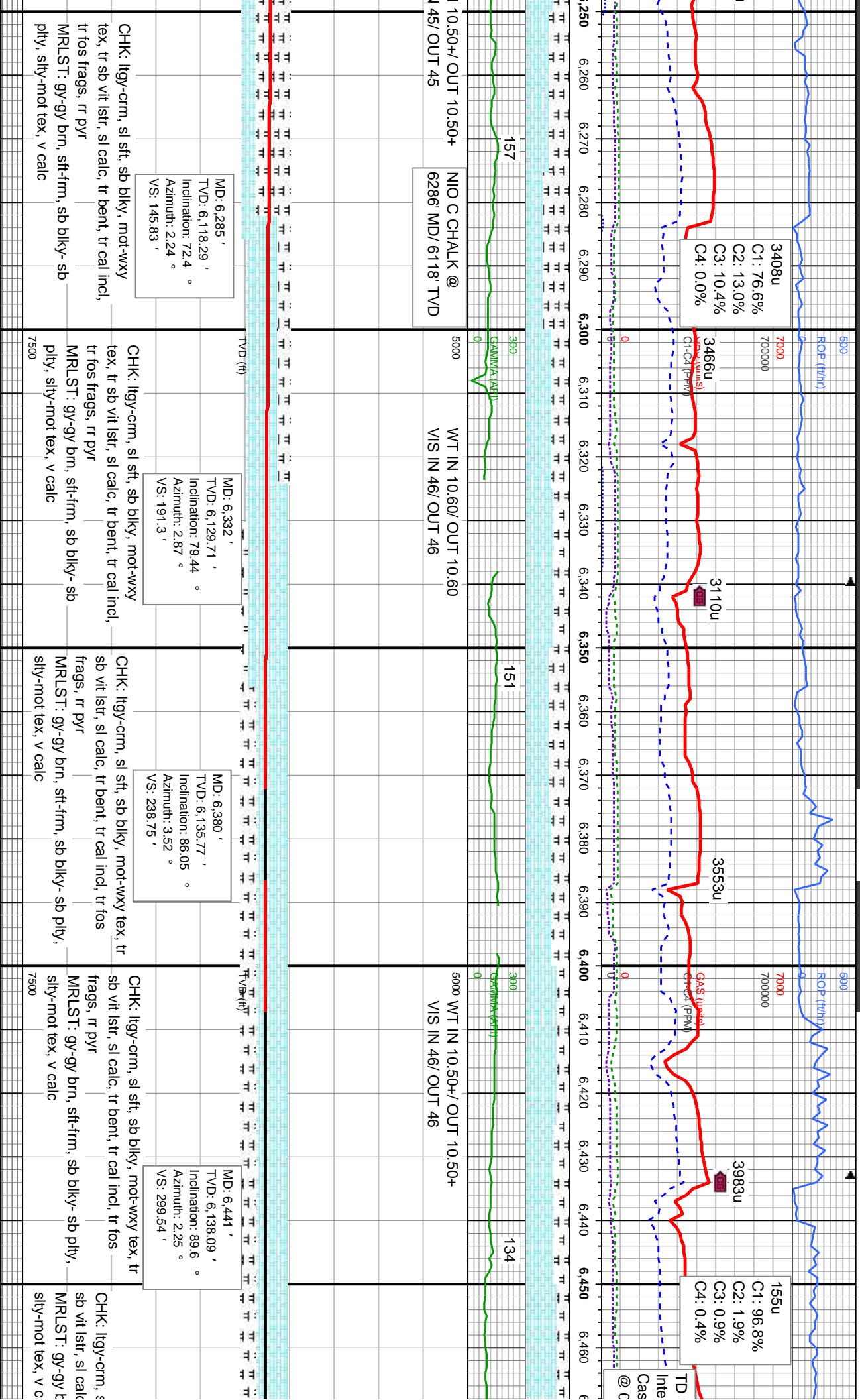
 TRIP GAS **CX** CRYPTOXLN **W** WELL











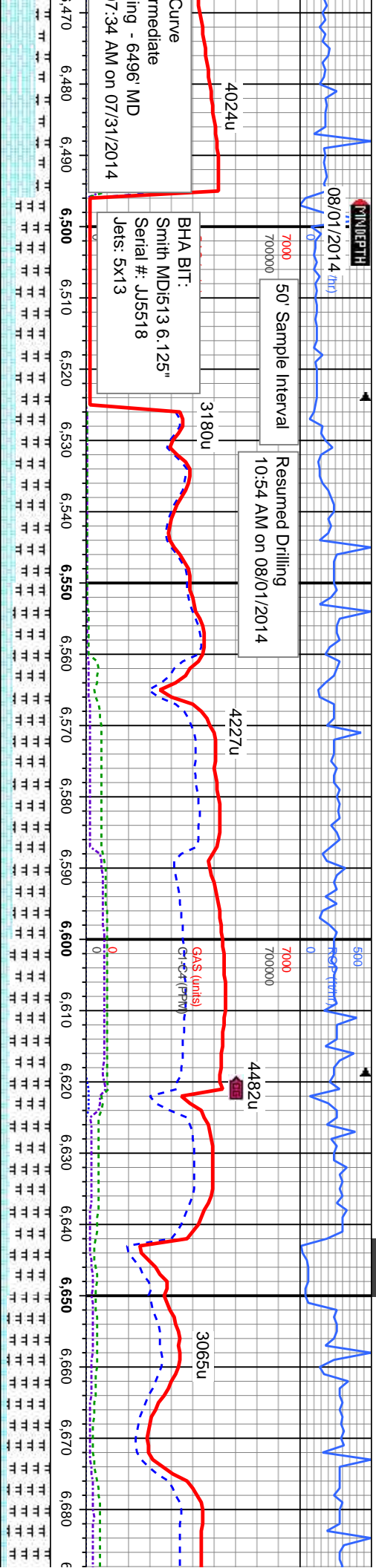
08/01/2014 (m)

50' Sample Interval

Resumed Drilling
10:54 AM on 08/01/2014

BHA BIT:
Smith MD1513 6.125"
Serial #: J15518
Jets: 5x13

Curve
ing - 6496 MD
7:34 AM on 07/31/2014



WT IN 10.50/ OUT 10.50
VIS IN 46/ OUT 46

WT IN 9.90/ OUT 9.80+
VIS IN 41/ OUT 39

WT IN 9.80+
VIS IN 39/ OUT

MD: 6.496 '
TVD: 6.138.47 '
Inclination: 89.6 °
Azimuth: 2.25 °
VS: 354.44 '

MD: 6.555 '
TVD: 6.137.6 '
Inclination: 90.89 °
Azimuth: 0.78 °
VS: 413.41 '

MD: 6.650 '
TVD: 6.134.53 '
Inclination: 92.81 °
Azimuth: 358.98 °
VS: 508.34 '

si sft, sb blk, mot-wxy tex, tr
sily-mot tex, v calc
CHK: lly-crm, sl sft, sb blk, mot-wxy tex, tr
sb vit lstr, sl calc, tr bent, tr cal incl

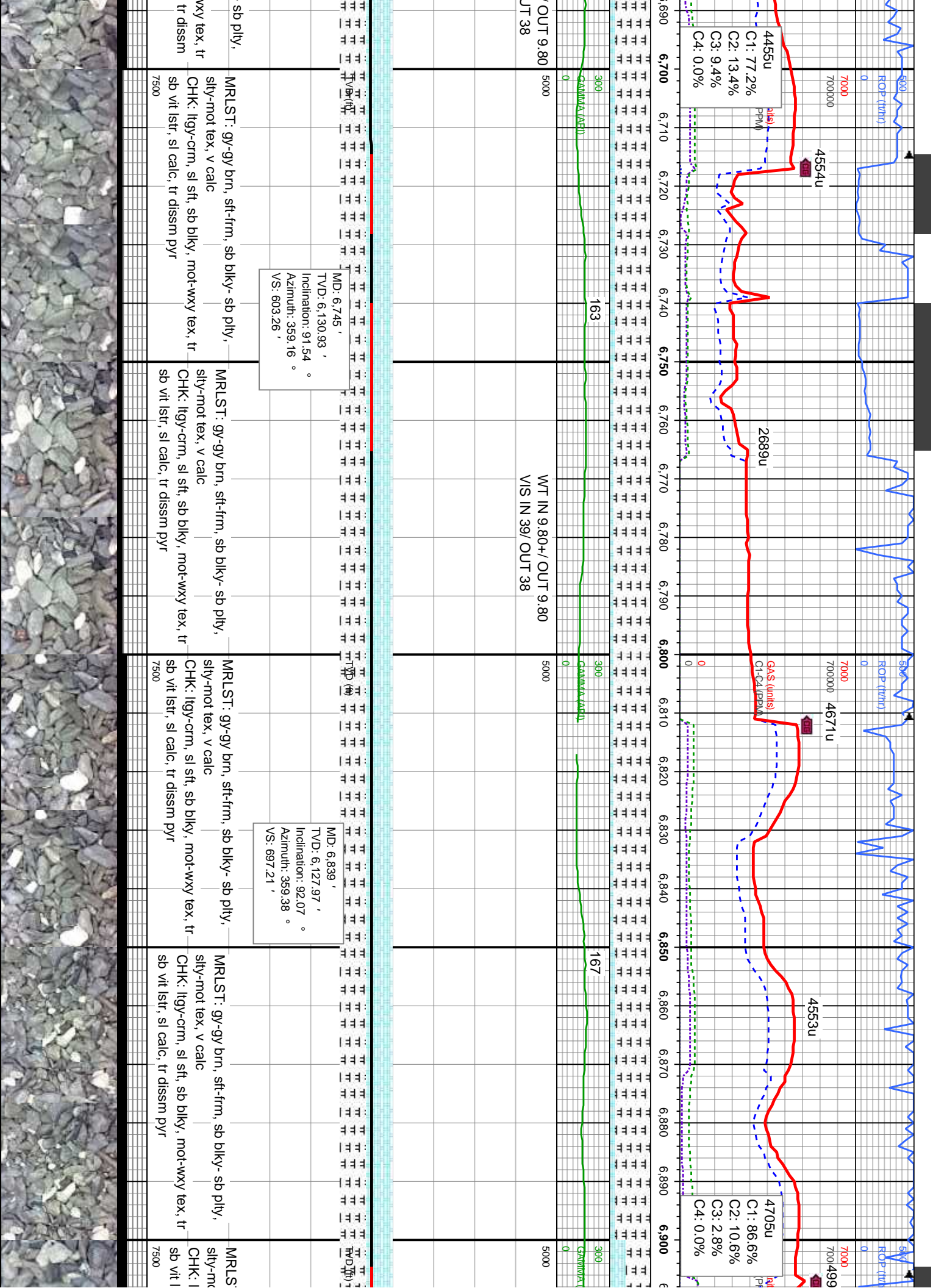
MRLST: gy-gy brn, sft-fm, sb blk- sb ply,
sily-mot tex, v calc
CHK: lly-crm, sl sft, sb blk, mot-wxy tex, tr
sb vit lstr, sl calc, tr bent, tr cal incl

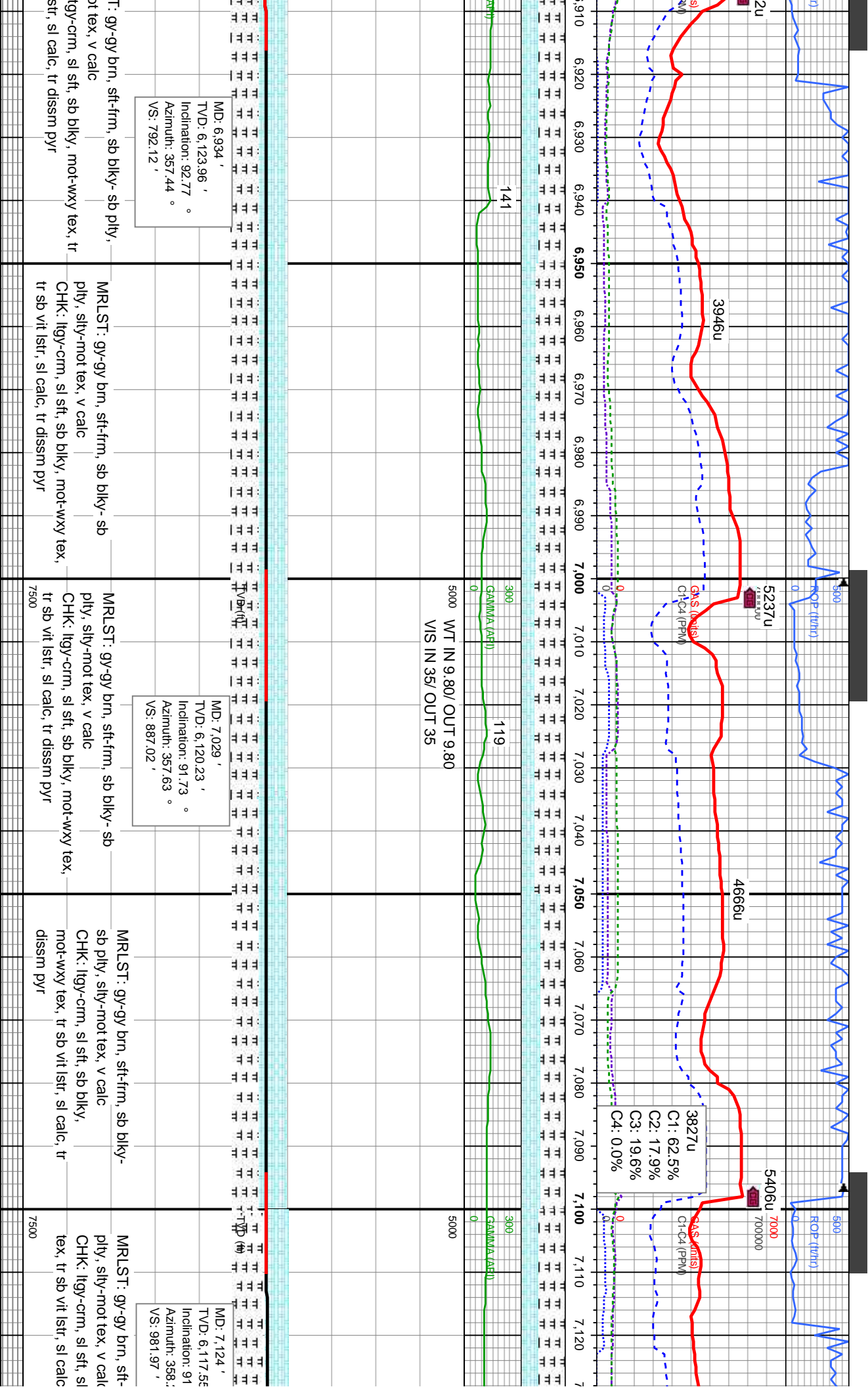
MRLST: gy-gy brn, sft-fm, sb blk- sb ply,
sily-mot tex, v calc
CHK: lly-crm, sl sft, sb blk, mot-wxy tex, tr
sb vit lstr, sl calc, tr bent, tr cal incl

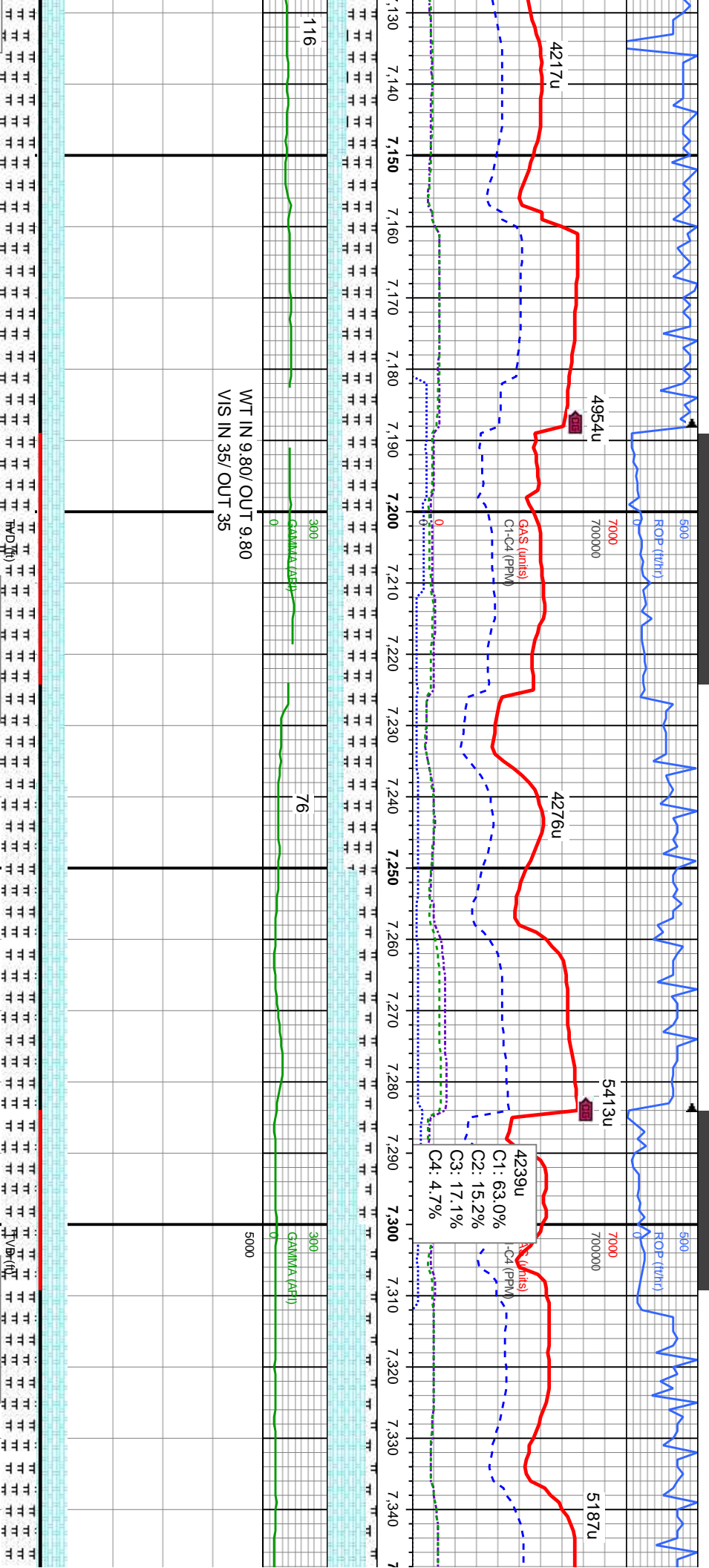
MRLST: gy-gy brn, sft-fm, sb blk- sb ply,
sily-mot tex, v calc
CHK: lly-crm, sl sft, sb blk, mot-wxy tex, tr
sb vit lstr, sl calc, tr bent, tr cal incl

MRLST: gy-gy brn, sft-fm, sb blk-
sily-mot tex, v calc
CHK: lly-crm, sl sft, sb blk, mot-v
sb vit lstr, sl calc, tr bent, tr cal incl,
pyr









MD: 7,219 '
TVD: 6,115.68 '
Inclination: 90.74 °
Azimuth: 359.15 °
VS: 1,076.95 '

firm, sb blkly- sb
sb blkly, mot-wxy
tr dissim pyr

MRLST: gy-gy brn, sft-firm, sb blkly-
sb ply, silty-mot tex, v calc
CHK: ltgy-crm, sl sft, sb blkly,
mot-wxy tex, tr sb vit lstr, sl calc, tr
dissim pyr

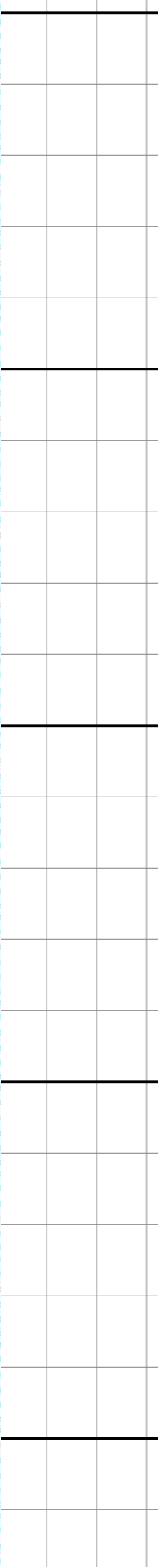
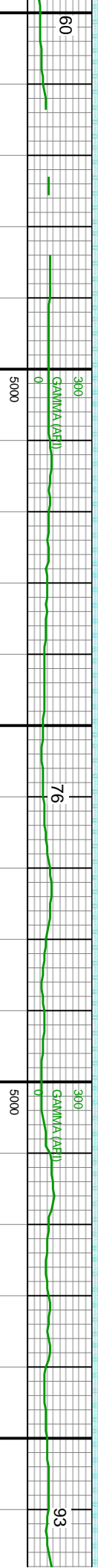
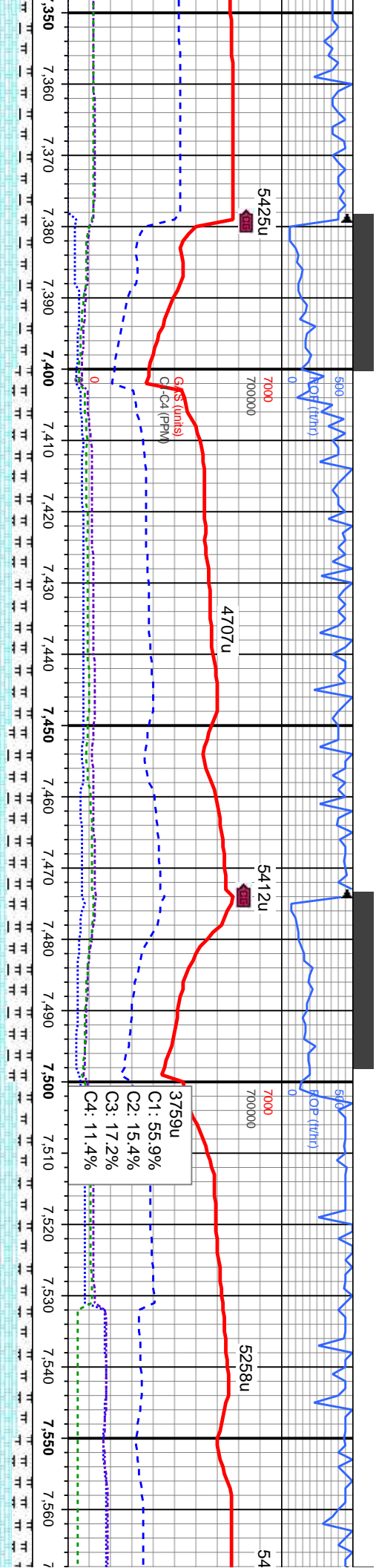
MRLST: gy-gy brn, sft-firm, sb blkly- sb ply,
silty-mot tex, v calc
CHK: ltgy-crm, sl sft, sb blkly, mot-wxy tex, tr
sb vit lstr, sl calc, tr dissim pyr

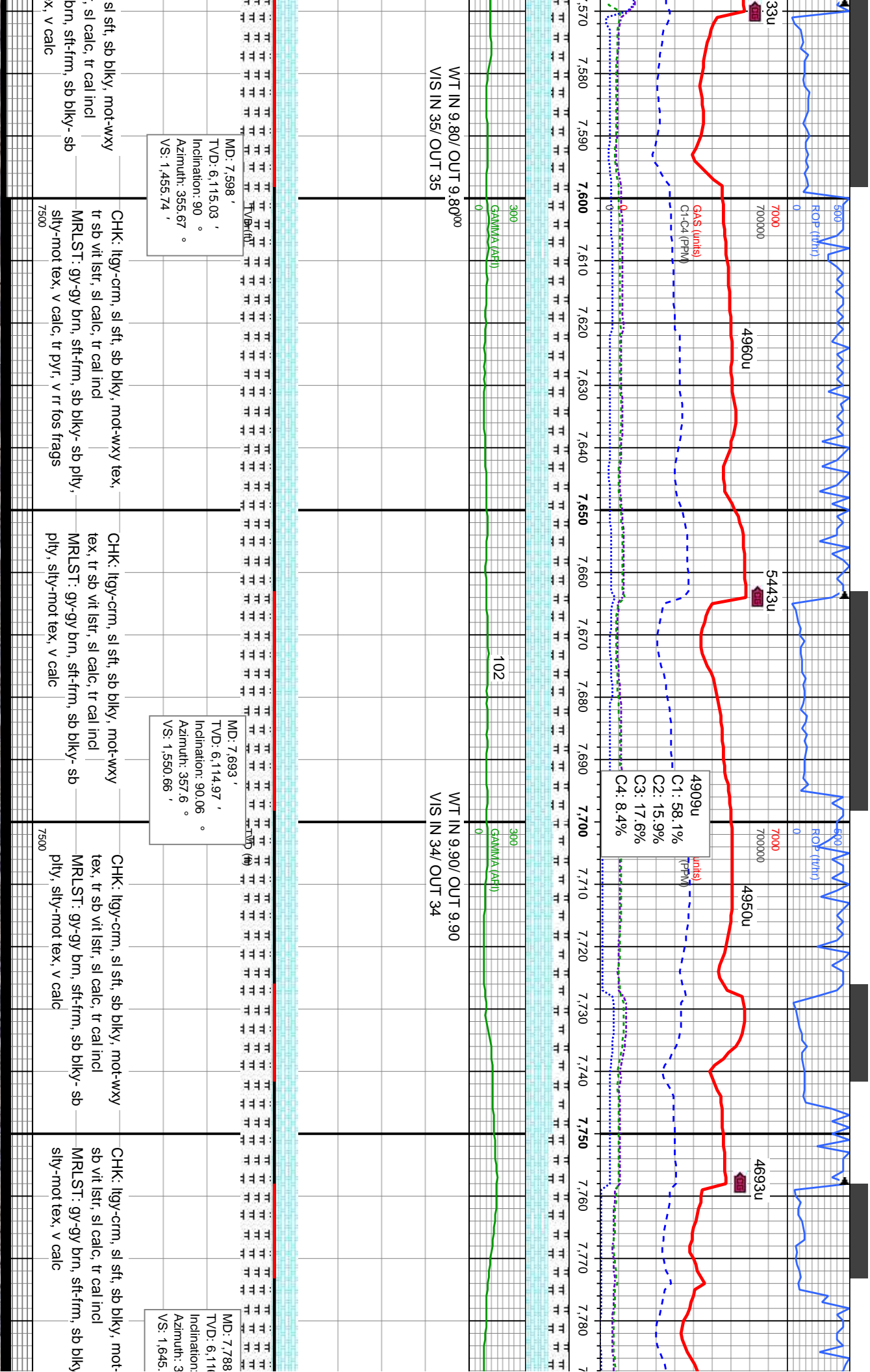
MRLST: gy-gy brn, sft-firm, sb blkly- sb
ply, silty-mot tex, v calc

CHK: ltgy-crm, sl sft, sb blkly, mot-wxy
tex, tr sb vit lstr, sl calc, tr bent, tr cal incl
MRLST: gy-gy brn, sft-firm, sb blkly- sb
ply, silty-mot tex, v calc

MD: 7,313 '
TVD: 6,115.23 '
Inclination: 89.81 °
Azimuth: 358.21 °
VS: 1,170.95 '







MD: 7.598 '
TVD: 6,115.03 '
Inclination: 90 °
Azimuth: 355.67 °
VS: 1,455.74 '

MD: 7.693 '
TVD: 6,114.97 '
Inclination: 90.06 °
Azimuth: 357.6 °
VS: 1,550.66 '

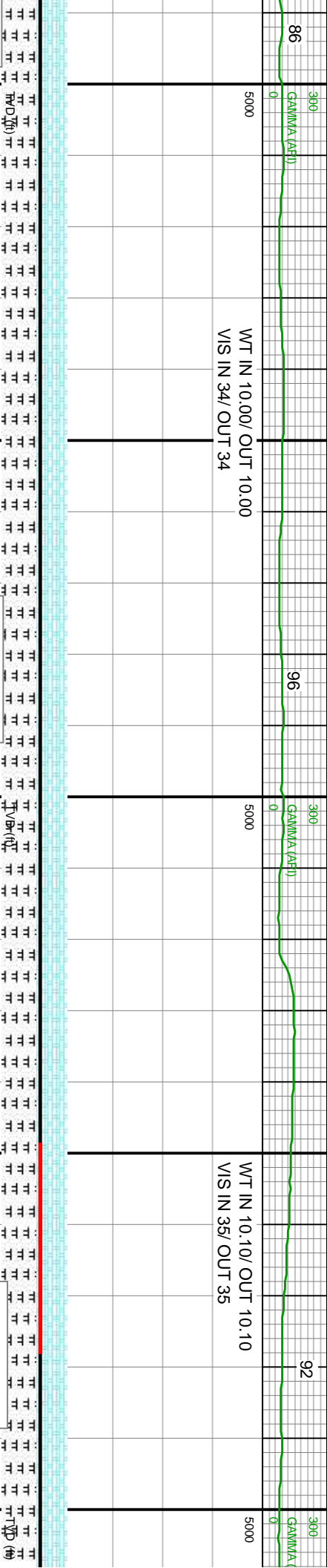
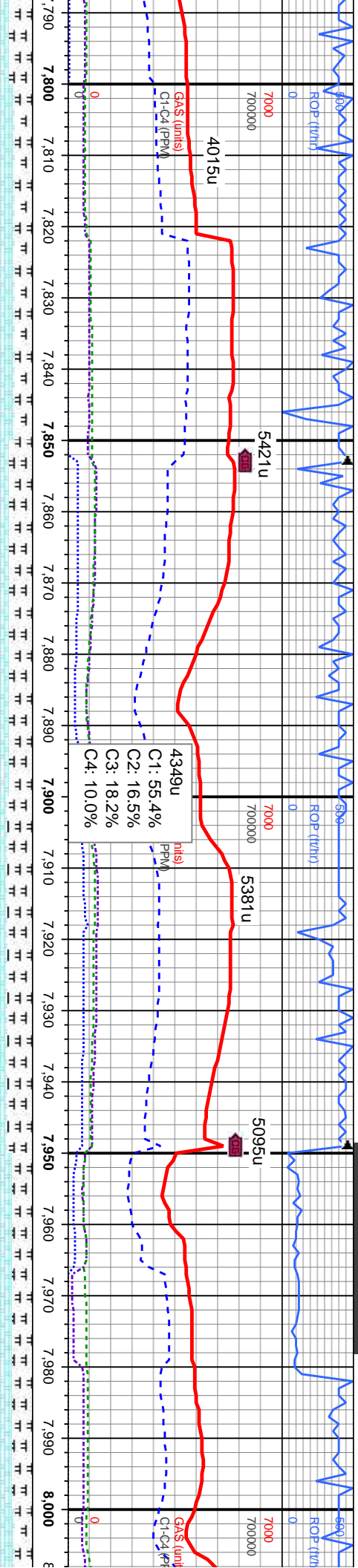
MD: 7.788 '
TVD: 6,111 '
Inclination: 90.06 °
Azimuth: 357.6 °
VS: 1,645.74 '

CHK: Itgy-crm, sl sft, sb blkly, mot-wxy tex,
tr sb vit istr, sl calc, tr cal incl
MRLST: gy-gy brn, sft-frm, sb blkly-sb ply,
silty-mot tex, v calc, tr pyr, v rr fos frags

CHK: Itgy-crm, sl sft, sb blkly, mot-wxy
tex, tr sb vit istr, sl calc, tr cal incl
MRLST: gy-gy brn, sft-frm, sb blkly-sb
ply, silty-mot tex, v calc

CHK: Itgy-crm, sl sft, sb blkly, mot-wxy
tex, tr sb vit istr, sl calc, tr cal incl
MRLST: gy-gy brn, sft-frm, sb blkly-sb
ply, silty-mot tex, v calc

CHK: Itgy-crm, sl sft, sb blkly, mot-wxy
tex, tr sb vit istr, sl calc, tr cal incl
MRLST: gy-gy brn, sft-frm, sb blkly-sb
ply, silty-mot tex, v calc

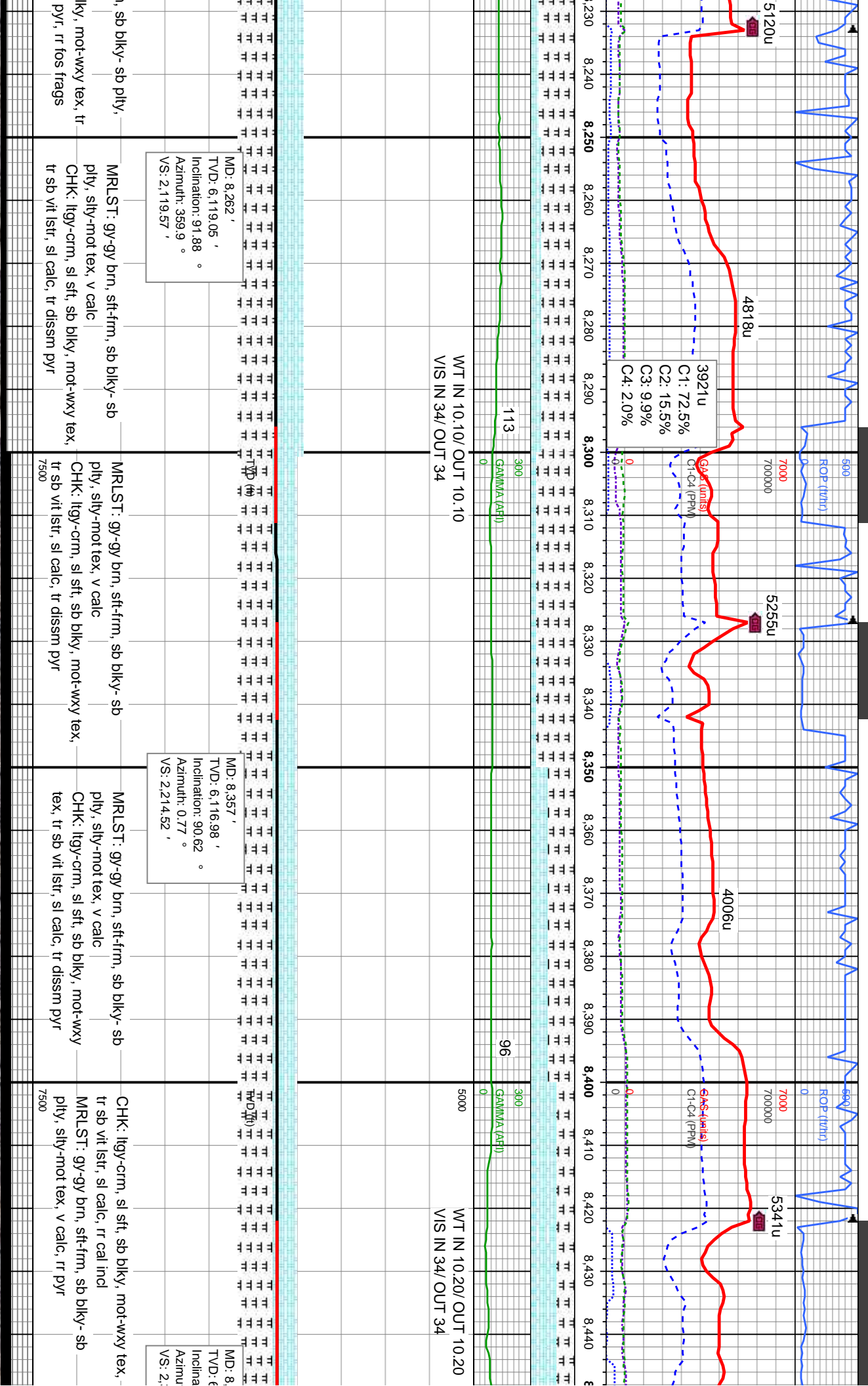


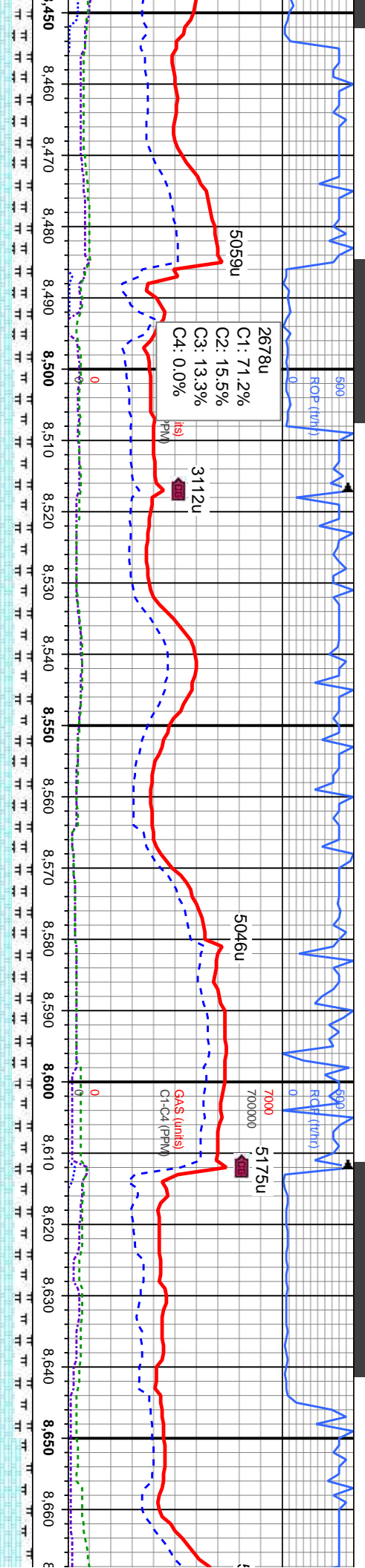
MD: 7.883 '
TVD: 6,117.76 '
Inclination: 90.59 °
Azimuth: 358.02 °
VS: 1,740.62 '

CHK: Itgy-crm, sl sft, sb blkly, mot-wxy tex, tr wxy tex, tr sb vit lstr, sl calc, tr cal incl
MRLST: gy-gy brn, sft-frm, sb blkly- sb ply, silty-mot tex, v calc

CHK: Itgy-crm, sl sft, sb blkly, mot-wxy tex, tr mot-wxy tex, tr sb vit lstr, sl calc, tr cal incl
MRLST: gy-gy brn, sft-frm, sb blkly- sb ply, silty-mot tex, v calc





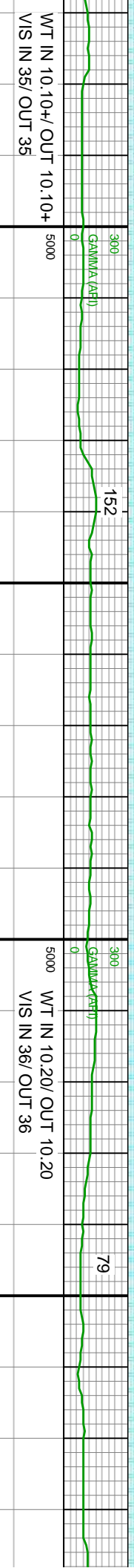
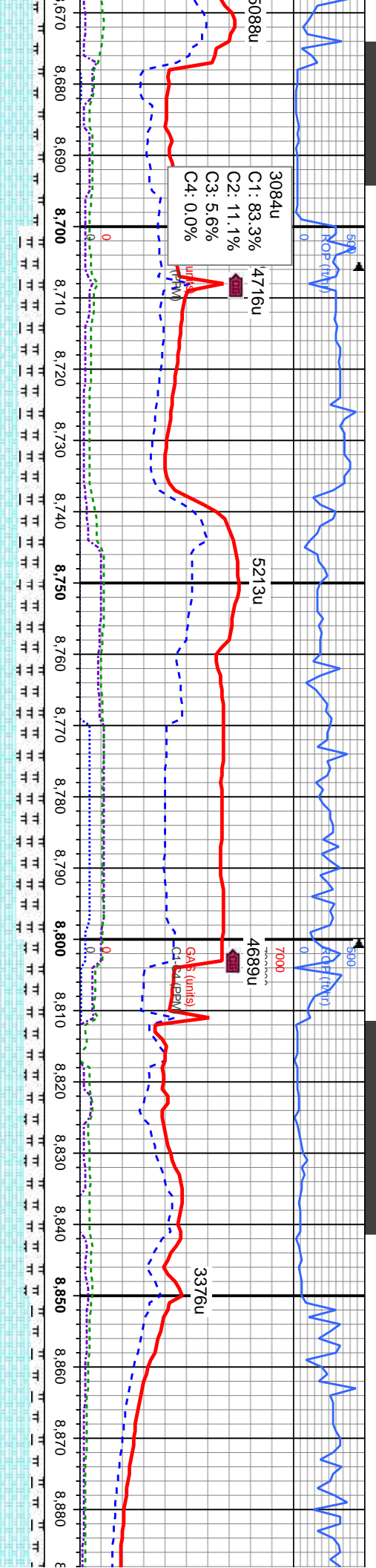


107	300	GAMMA (API)	128	300	GAMMA (API)	94
WT IN 10.20/ OUT 10.20 VIS IN 35/ OUT 35						
MD: 8.546 ' TVD: 6.116.52 ' Inclination: 89.82 ° Azimuth: 358.93 ° VS: 2.403.48 '						
CHK: Itgy-crm, sl sft, sb blkly, mot-wxy tex, tr sb vit lstr, sl calc, rr cal incl						
MRLST: gy-gy brn, sft-frm, sb blkly- sb plty, slty-mot tex, v calc, rr pyr						
7500						

107	300	GAMMA (API)	128	300	GAMMA (API)	94
WT IN 10.20/ OUT 10.20 VIS IN 35/ OUT 35						
MD: 8.641 ' TVD: 6.117.33 ' Inclination: 89.2 ° Azimuth: 358.76 ° VS: 2.498.47 '						
CHK: Itgy-crm, sl sft, sb blkly, mot-wxy tex, tr sb vit lstr, sl calc, rr cal incl						
MRLST: gy-gy brn, sft-frm, sb blkly- sb plty, slty-mot tex, v calc, rr pyr						
7500						

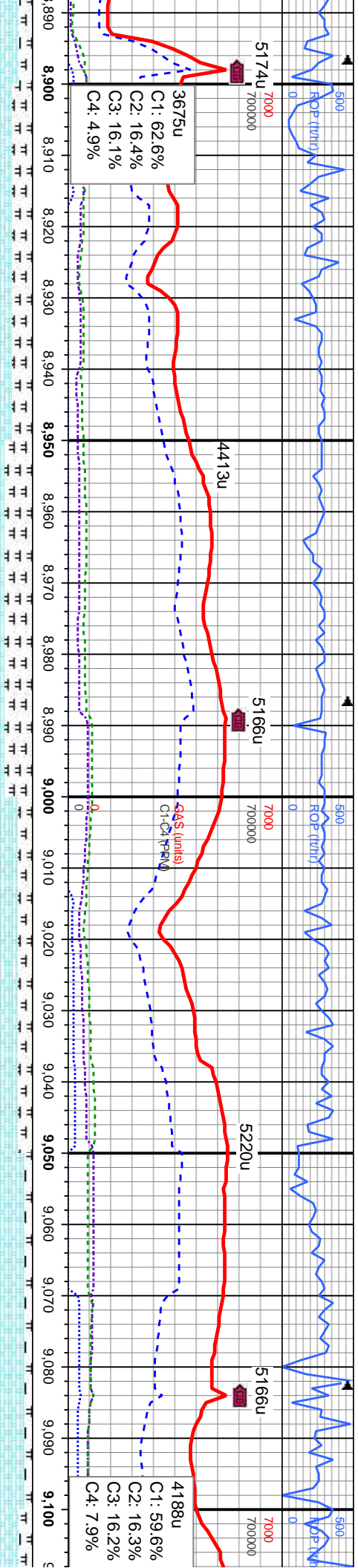
107	300	GAMMA (API)	128	300	GAMMA (API)	94
WT IN 10.20/ OUT 10.20 VIS IN 35/ OUT 35						
MD: 8.641 ' TVD: 6.117.33 ' Inclination: 89.2 ° Azimuth: 358.76 ° VS: 2.498.47 '						
CHK: Itgy-crm, sl sft, sb blkly, mot-wxy tex, tr sb vit lstr, sl calc, rr cal incl						
MRLST: gy-gy brn, sft-frm, sb blkly- sb plty, slty-mot tex, v calc, rr pyr						
7500						





MD: 8,736 ' TVD: 6,118.08 ' Inclination: 89.91 ° Azimuth: 359.57 ° VS: 2,593.47 '	MD: 8,831 ' TVD: 6,118.28 ' Inclination: 89.85 ° Azimuth: 0.93 ° VS: 2,688.44 '
CHK: ltgy-crm, sl sft, sb blkly, mot-wxy tex, tr sb vit lstr, sl calc, rr cal incl MRLST: gy-gy brn, sft-firm, sb blkly- sb ply, slty-mot tex, v calc	CHK: ltgy-crm, sl sft, sb blkly, mot-wxy tex, tr sb vit lstr, sl calc, rr cal incl MRLST: gy-gy brn, sft-firm, sb blkly- sb ply, slty-mot tex, v calc





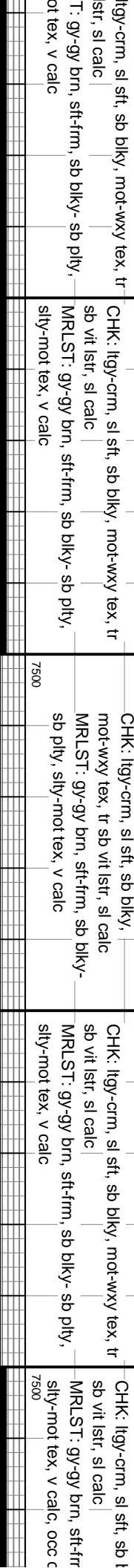
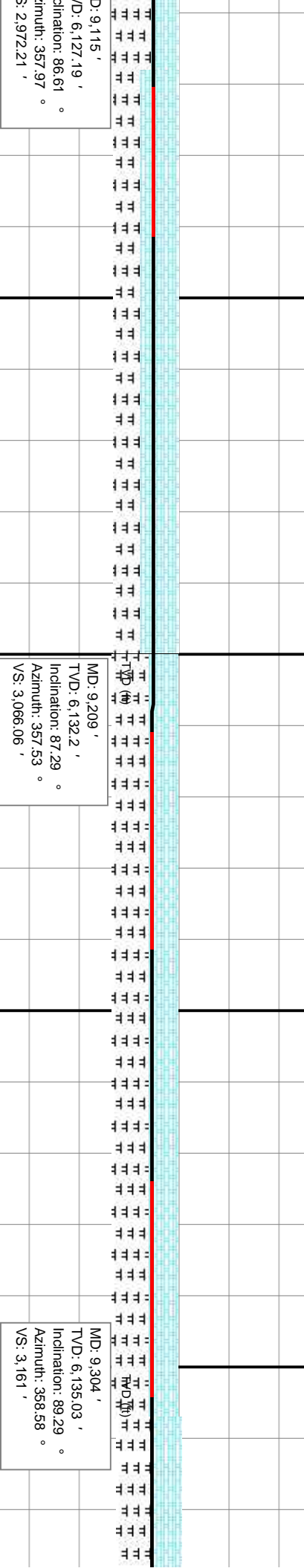
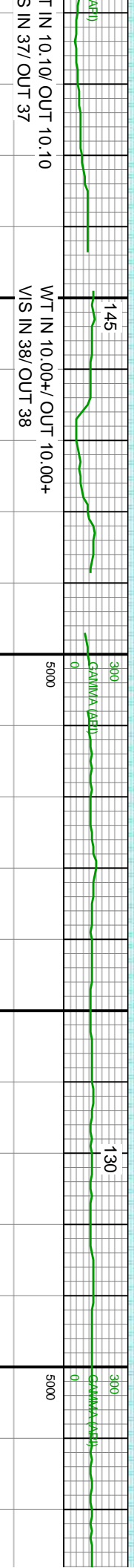
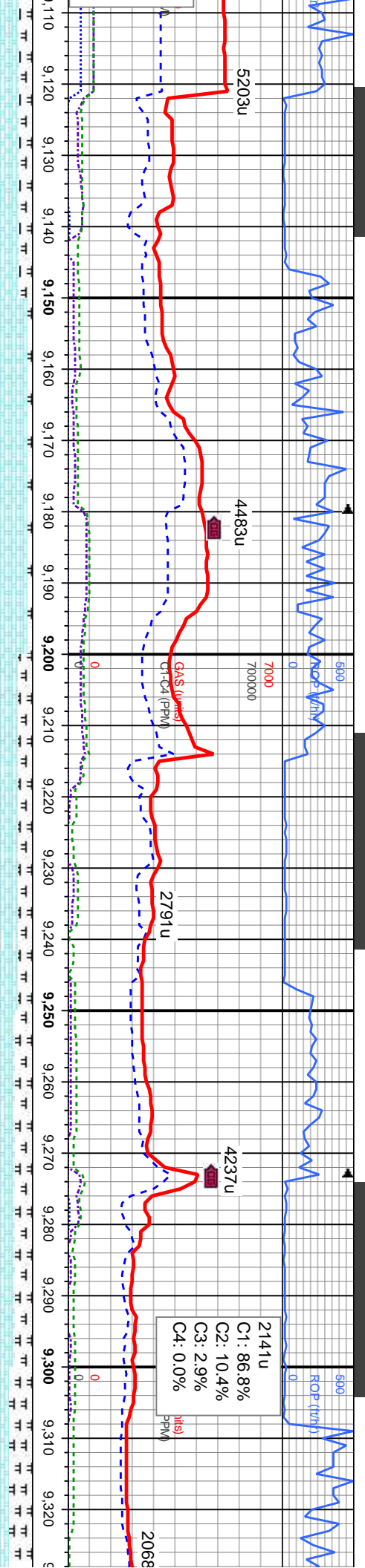
WT IN 10.10+ OUT 10.10+
VIS IN 37/ OUT 37

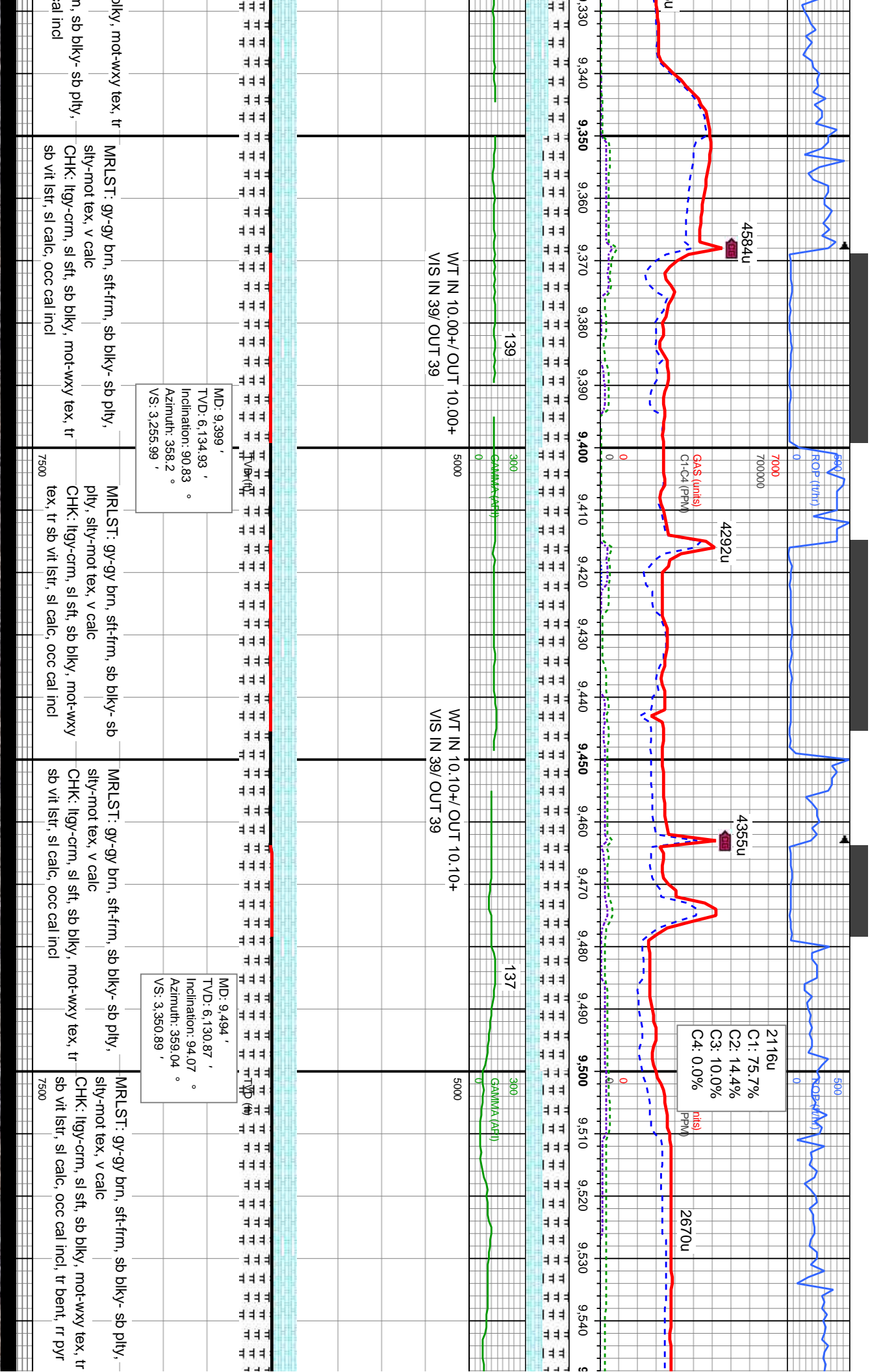
MD: 8.925 '
TVD: 6,119.44 '
Inclination: 88.74 °
Azimuth: 0.03 °
VS: 2,782.39 '

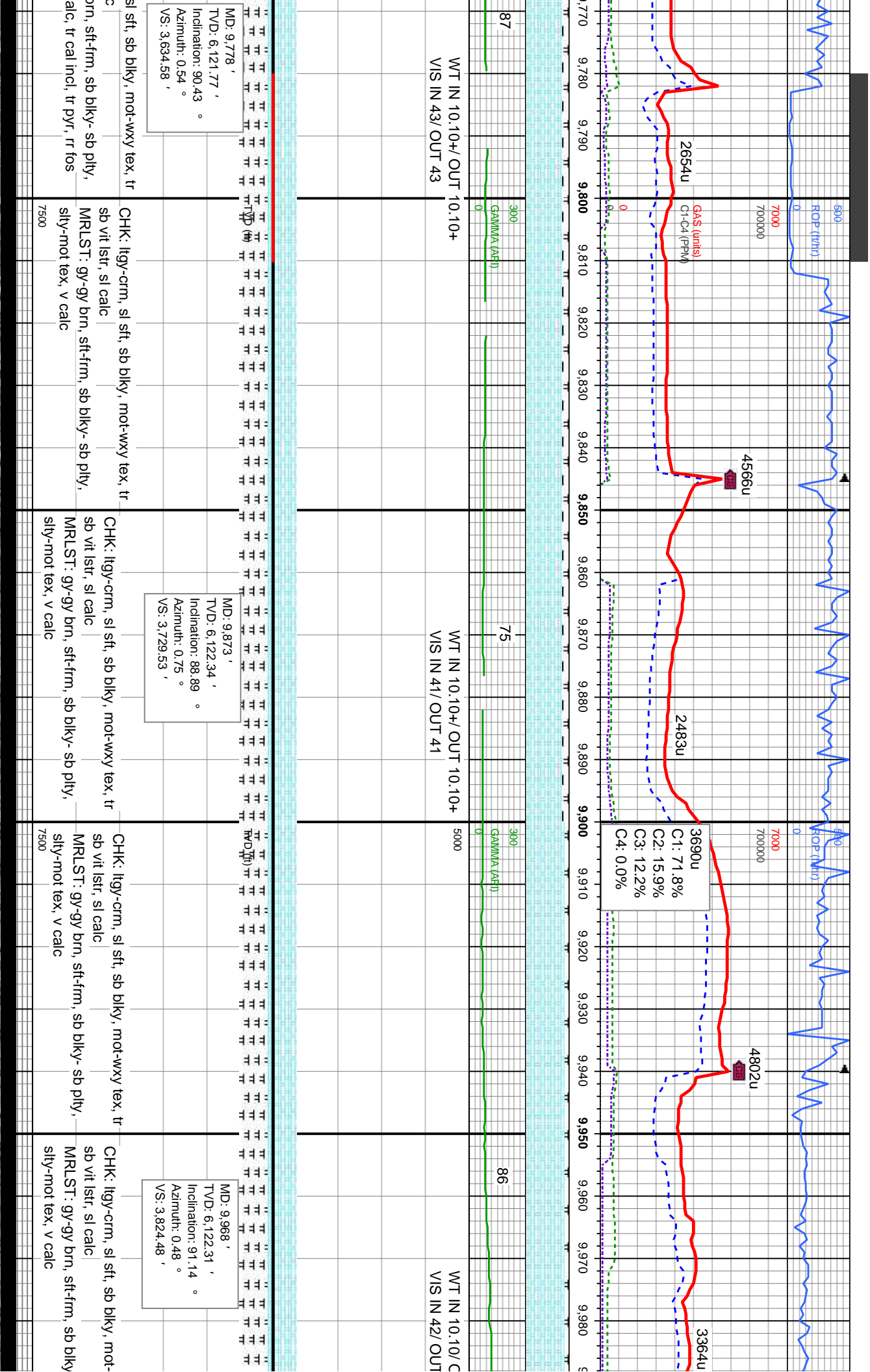
MD: 9.020 '
TVD: 6,122.43 '
Inclination: 87.66 °
Azimuth: 358.67 °
VS: 2,877.33 '

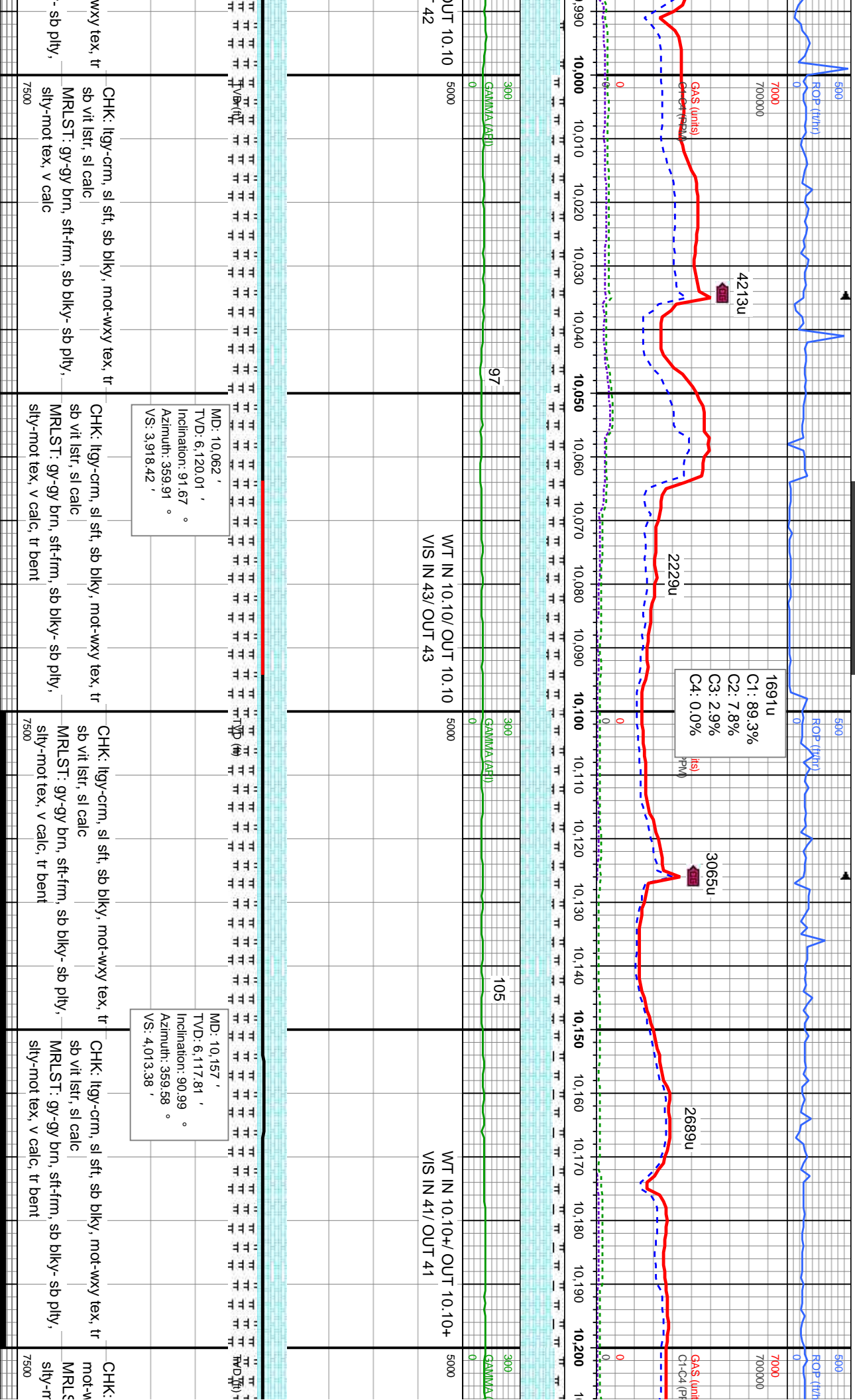
CHK: ltgy-crm, sl sft, sb blk, mot-wxy tex, tr sb vit lstr, sl calc	MRLST: gy-gy brn, sft-frn, sb blk- sb ply, tr sb vit lstr, sl calc	CHK: ltgy-crm, sl sft, sb blk, mot-wxy tex, tr sb vit lstr, sl calc	MRLST: gy-gy brn, sft-frn, sb blk- sb ply, tr sb vit lstr, sl calc	CHK: ltgy-crm, sl sft, sb blk, mot-wxy tex, tr sb vit lstr, sl calc	MRLST: gy-gy brn, sft-frn, sb blk- sb ply, tr sb vit lstr, sl calc	CHK: ltgy-crm, sl sft, sb blk, mot-wxy tex, tr sb vit lstr, sl calc	MRLST: gy-gy brn, sft-frn, sb blk- sb ply, tr sb vit lstr, sl calc	CHK: ltgy-crm, sl sft, sb blk, mot-wxy tex, tr sb vit lstr, sl calc	MRLST: gy-gy brn, sft-frn, sb blk- sb ply, tr sb vit lstr, sl calc
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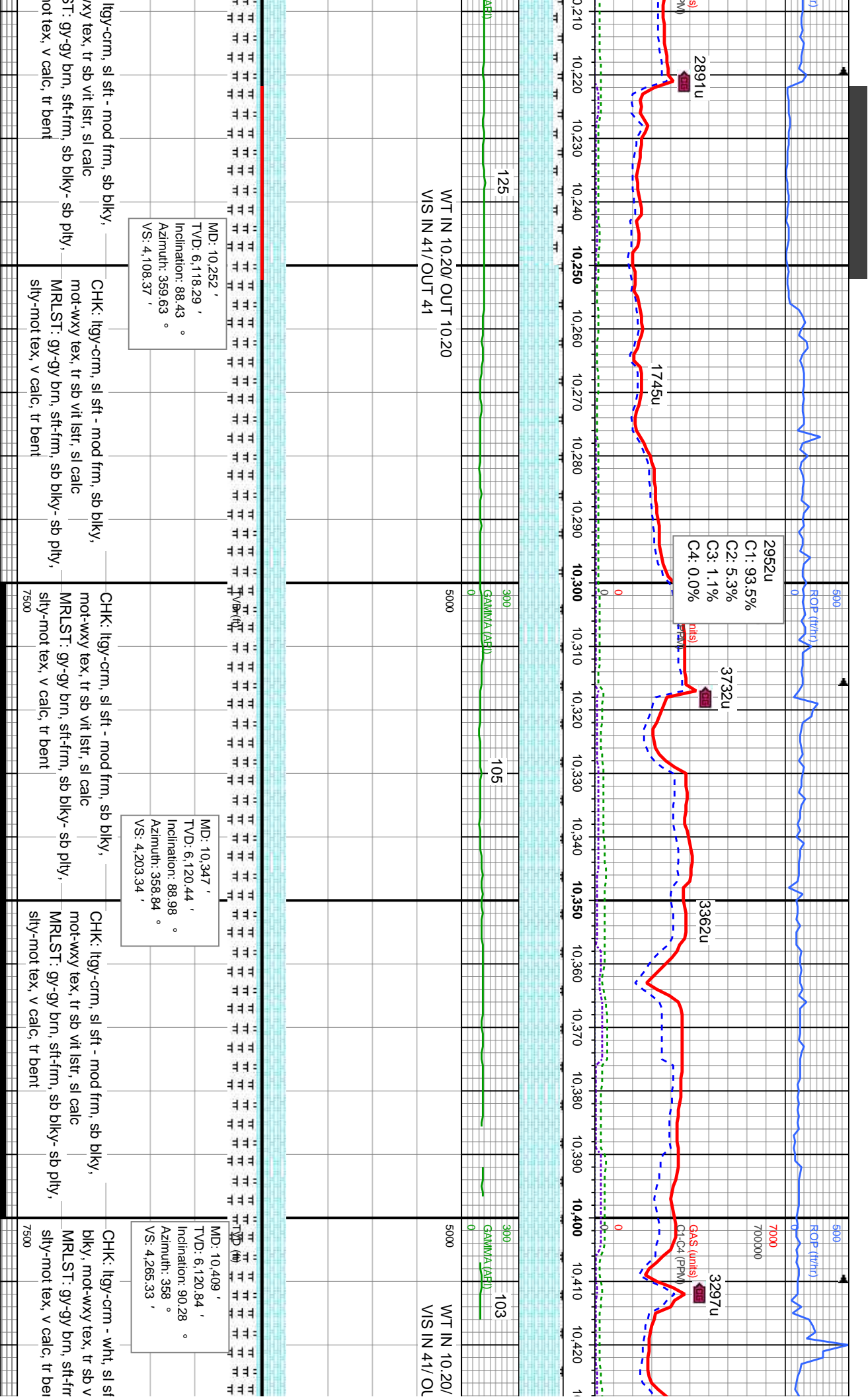


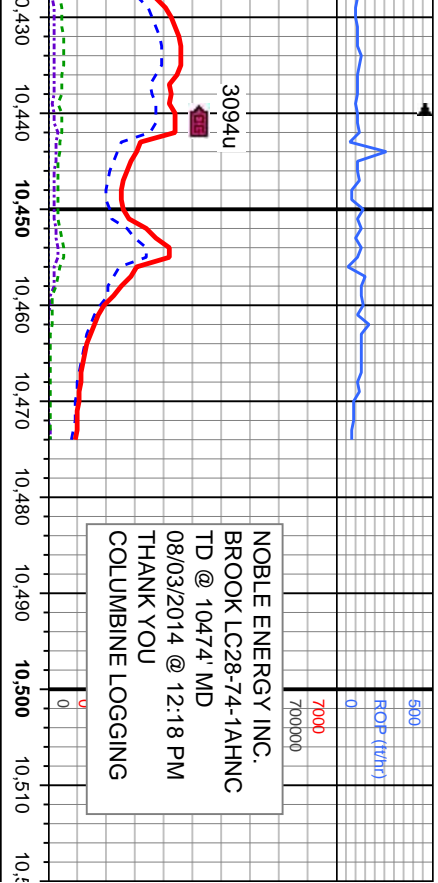




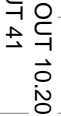








NOBLE ENERGY INC.
BROOK LC28-74-1AHNC
TD @ 10474' MID
08/03/2014 @ 12:18 PM
THANK YOU
COLUMBINE LOGGING



PROJECTED

MD: 10,474 '
 TVD: 6,120.53 '
 Inclination: 90.28 °
 Azimuth: 358 °
 VS: 4,330.33 '



nt
n, sb bly- sb pty,
it lstr, sl calc
t - mod frm, sb

CHK: Itgy-crm - wht, sl sft - mod frm, sb
biky, mot-wxy tex, tr sb vit lstr, sl calc
MRLST: gy-gy brn, sft-frm, sb biky- sb plty,
sfty-mot tex, v calc, tr bent

7500

