

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Dreiling 27C-32HZ

Location SESE SEC 32, T2N, R65W

State COLORADO

Country USA

API Number 05-123-38404

Region DJ BASIN

Spud Date 1/22/2014

Surface Coordinates 687' FSL & 280' FEL
40.089635 -104.67928

Bottom Hole Coordinates 460' FNL & 806' FEL
40.100970 -104.681196

Ground Elevation 4924'

Logged Interval 6778' To 11876'

Formation CODELL

Type of Drilling Fluid FSNL

County WELD

Rig Number ENSIGN 132

AFE # 2075500

Field WATTENBERG

Drilling Completed 1/27/2014

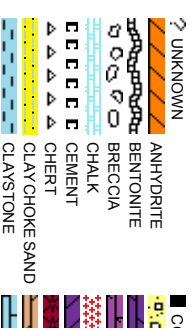
K.B. Elevation 4937'

Total Depth 5098'

Company ANADARKO PE
Address 1099 18th St, S
Denver, CO 80202

Name JAKE STUART
Company ANADARKO PE
Address 1099 18th St, S
Denver, CO 80202

SHANA SW



Operator

ETROLEUM INC.

uite 1800
202

Geologist

ETROLEUM INC.

uite 1800
202

Other

IRIN, MOHAMMED ALMUBARAK

Rock Types

CONGLOMERATE	MARLSTONE	SHALY SANDSTONE
DOLomite	METAMORPHIC	SHALY SLTSTONE
DOLomite	NOSAMPLE	SILTY SHALE
DOLomite	SALT	SILTSTONE
GRANITE	SANDSTONE	TUFF
GYPSUM	SALT-PEPPER SAND	WELDED TUFF
IGNEOUS	SHALE	
SIDERITE or LIMONITE	SHALE COLORED	
LIMESTONE	SHALE GRAY	

Accessories

Fossils	GASTROPOD	ARGILLITE GRAIN	HEAVY MINERAL
INOCERAMUS	B BENTONITE	K KAOLIN	ANHYDRITE STRINGER
ALGAE	O OOLITE	BITUMINOUS SUBSTANCE	M MARLSTONE
AMPHIPORA	O OSTRACOD	BRECCIA FRAGMENTS	MICACEOUS
BELEMNITE	P PELECYPOD	CALCAREOUS	MINERAL CRYSTALS
BIOCLASTIC	P PELLET	CARBONACEOUS FLAKES	N NODULES
BRACHIOPOD	P PISOLITE	CHERT	PHOSPHATE PELLETS
BRYOZOA	P PLANT REMAINS	COAL - THIN BEDS	P PYRITE
CEPHALOPOD	S PLANT SPORES	D DOLOMITE	S SALT CAST
CORAL	S SCAPHOPOD	F FELDSPAR	S SANDY
CRINOID	S STROMATOPOROID	F FERRUGINOUS PELLET	S SILTY
ECHINOID			
Minerals	F FISH	F FERRUGINOUS	T TUFACEOUS
FORAMINIFERA	A ANHYDRITIC	G GLAUCONITE	
F FOSSIL	A ARGILLACEOUS	G GYPSIFEROUS	Stringer

Other Symbols

Oil Show	P PINPOINT	DST INTERVAL	WIRELINE TESTED - LEFT	E EARTHY
V VUGGY	FAULT	WIRELINE TESTED - RT	FX FINELY XLN	
Engineering	FORMATION TOP	DRILL STEM TEST	GS GRAINSTONE	
D DEAD	GAS SHOW	MN DEPTH	L LITHOGRAPHIC	
E EVEN	OIL SHOW		MX MICROXLN	
Q QUESTIONABLE	BIT			
SPOTTED STAINING	CONNECTION (UP)	Rounding	MS MUDSTONE	
		A ANGULAR	PS PACKSTONE	
Porosity	CONNECTION (DOWN)	B SUBANG	WS WACKESTONE	
CONNECTION GAS	NORMAL FAULT	R ROUNDED		
CONNECTION GAS (LEFT)	OVERTURNED STRATA	P SUBUND		
F FENESTRAL	REVERSE FAULT			Sorting
F FRACTURE	TRIP GAS	CASING	M MODERATE	
INTERGRYSTALLINE	TRIP GAS (LEFT)	SIDEWALL CORE (LEFT)	P POOR	
INTERCRUSTAL	DOWN TIME GAS	SIDEWALL CORE (RIGHT)	W WELL	
M MOLDIC	DOWN TIME GAS (LEFT)	SLIDE		
O ORGANIC	CORE - LOST	SURVEY		
	CORE - RECOVERED			

Slide/Rotate

Columbine Logging Two Person
Rigged Up 0630hrs 01/22/2014
With Bloodhound Unit # 0313

ROP
ROF
GAMMA

Logging Started @
2054hrs 01/22/2014
at 6778' MD

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

Bit Data
Bit #: 02
Type: SMITH SD1611
Size: 8.75
Depth In: 1,024'
Depth Out: 7,720'
Jets: 6x16
S/N: JH8112

Depth Labels

% Lith

Begin in Sussex Formation

Well Bore
TVD

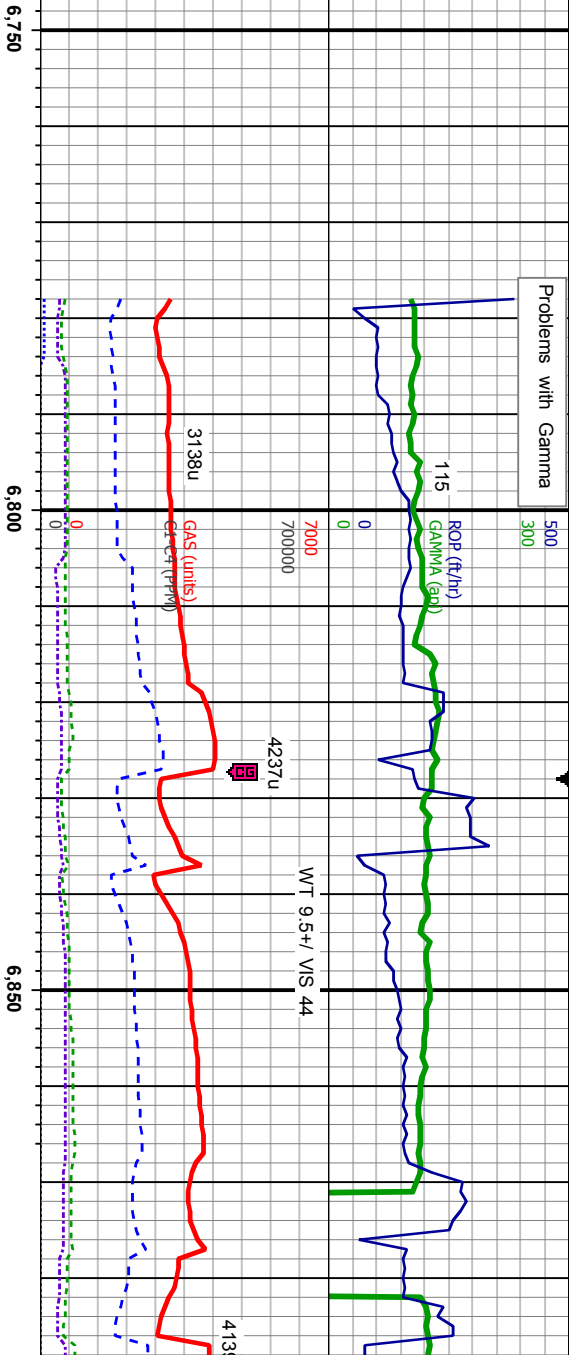
Acetone was used as the cutting agent with the dimple filled to the rim
The ratings are based on 7 descriptors:
None, Slight trace, Trace, Fair, Moderate, Good, and Excellent. The descriptor used is based on the loggers observations and best judgement of brilliance, color and longevity of the cut.

Oil Show

ST
FM
CE

Images

Problems with Gamma



MD: 6,782'
TVD: 6,699.31'
Inclination: 2.73°
Azimuth: 325.77°
VS: 663.05'

MD: 6,830'
TVD: 6,747.05'
Inclination: 8.93°
Azimuth: 343.87°
VS: 648.52'

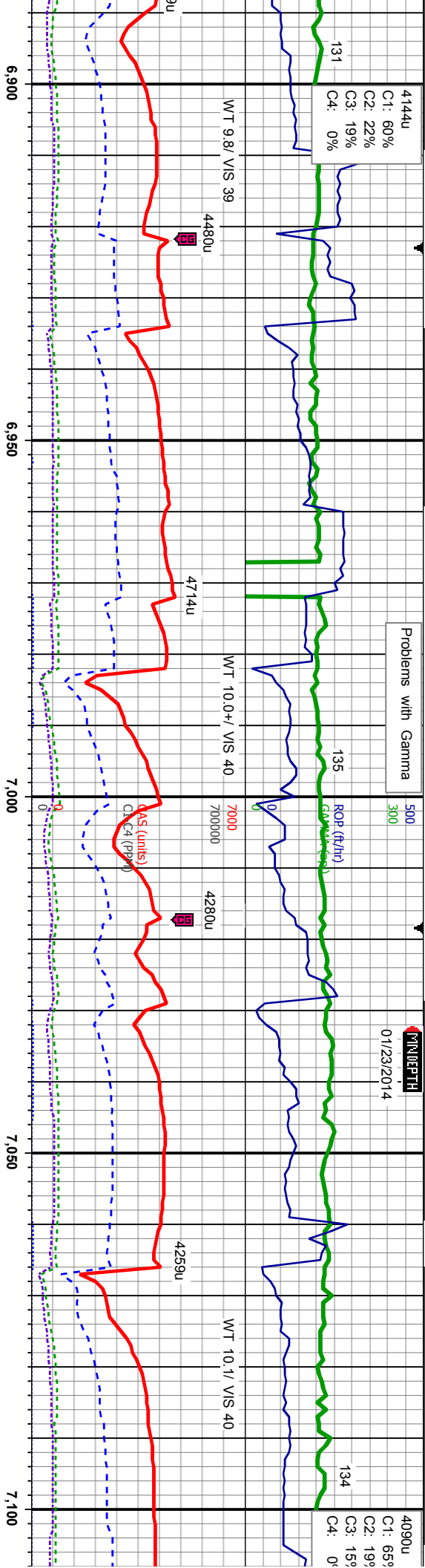
MD: 6,877'
TVD: 6,793.09'
Inclination: 14.07°
Azimuth: 342.76°
VS: 639.55'

SLTY SH: lt-med gy, sb
ply-sb blkly, mod sft-fm, w
srt, sb md-sb ang, mod fri,
tr shy ss, string bl cut, dull
yel ring

SLTY SH: lt-med gy, sb
ply-sb blkly, mod sft-fm, w
srt, sb md-sb ang, mod fri,
tr shy ss, string bl cut, dull
yel ring

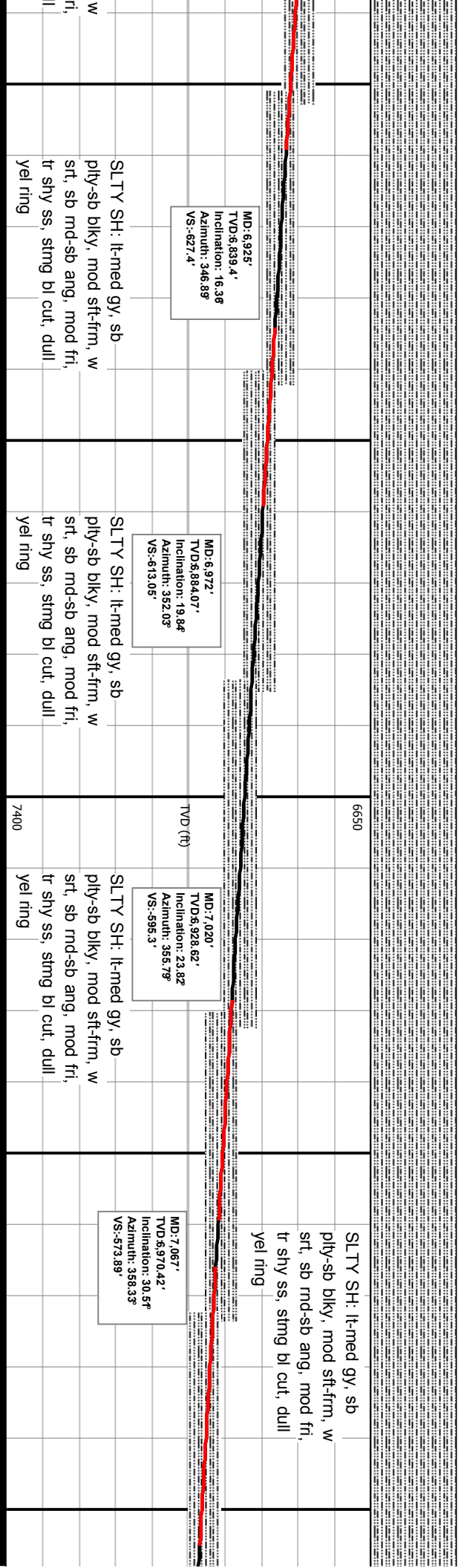
SLTY SH: lt-med gy, sb
ply-sb blkly, mod sft-fm, w
srt, sb md-sb ang, mod fri,
tr shy ss, string bl cut, du
yel ring

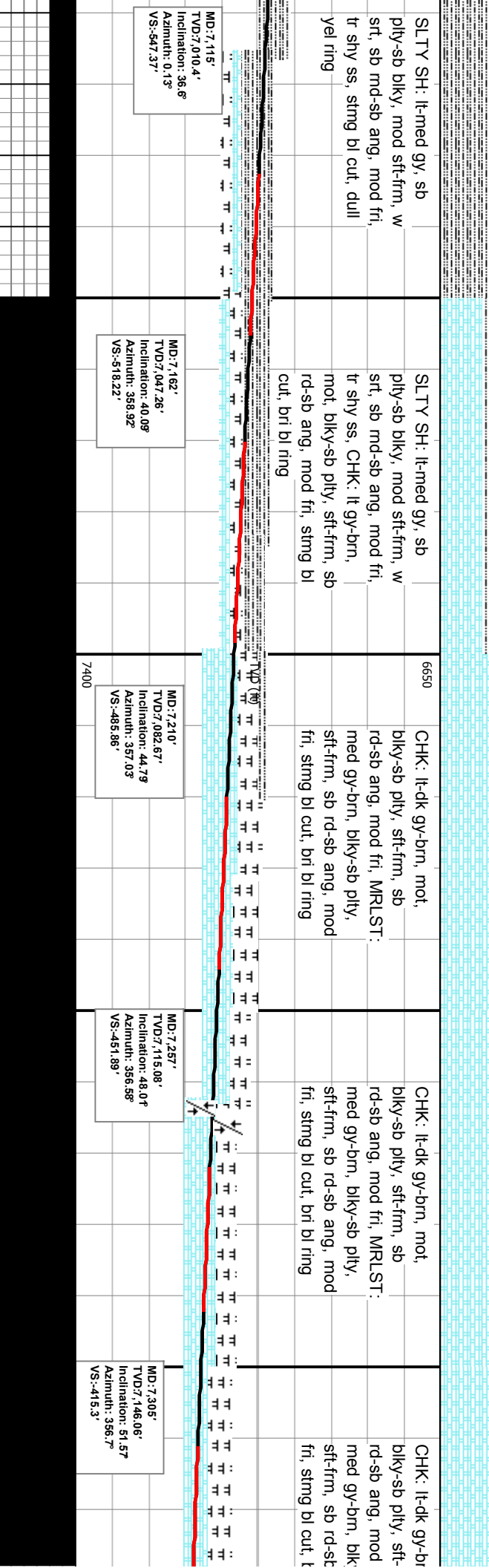




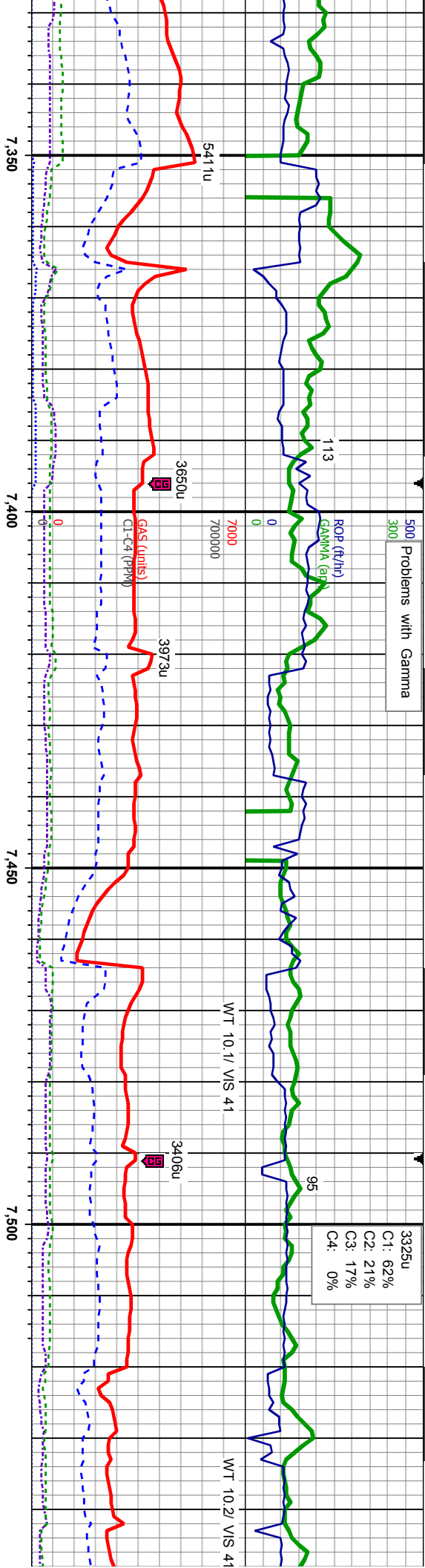
Problems with Gamma

01/23/2014

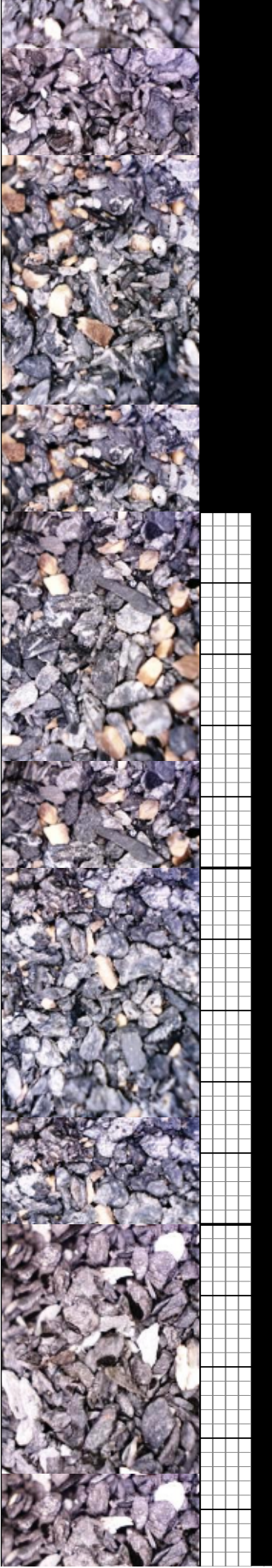


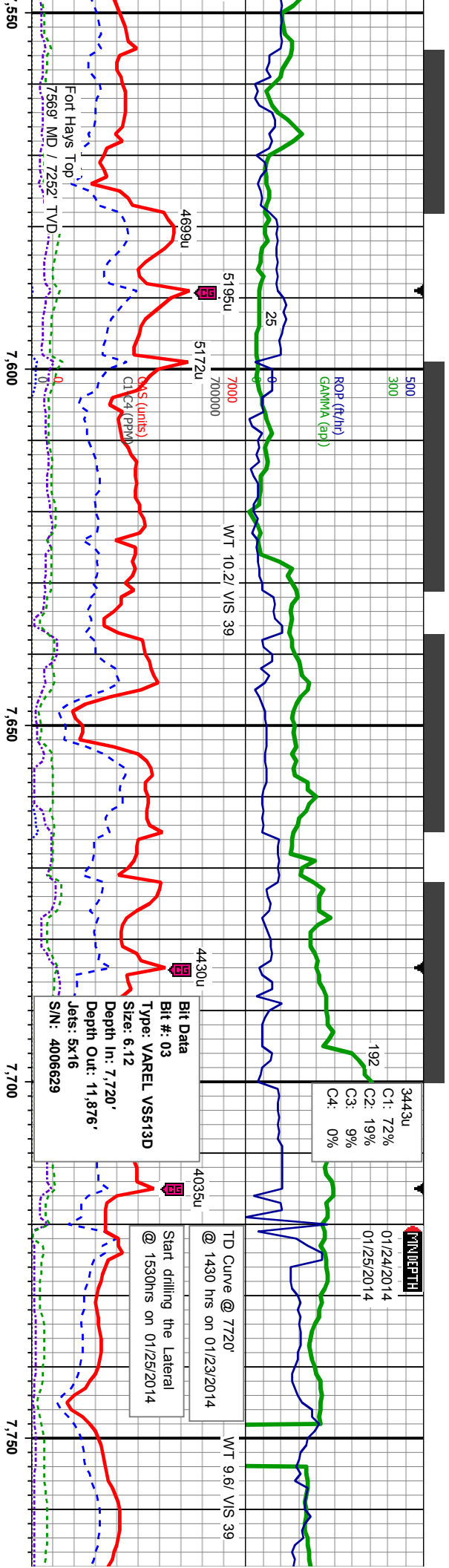


Problems with Gamma

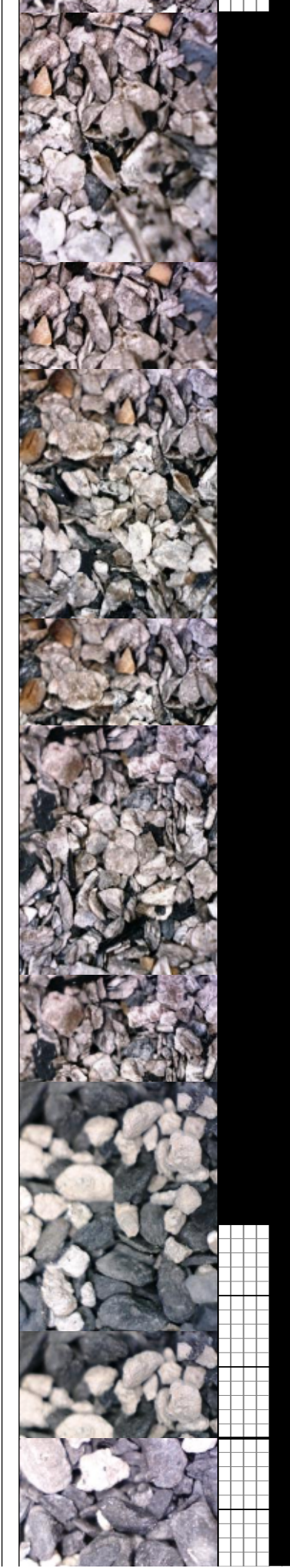


n, mot, frm, sb fri, MRLST: y-sb ply, ang, mod nt bl ring	CHK: lt-dk gy-brn, abnt wh-crm, blk-y-sb ply, sft-frm, sb rd-sb ang, mod fri, MRLST: med-dk gy-brn, blk-y-sb ply, sft-frm, sb rd-sb ang, mod fri, sting bl cut, bri bl ring	6650	CHK: lt-dk gy-brn, abnt wh-crm, blk-y-sb ply, sft-frm, sb rd-sb ang, mod fri, MRLST: med-dk gy-brn, blk-y-sb ply, sft-frm, sb rd-sb ang, mod fri, sting bl cut, dull yel ring	MD:7.401' TVD:7,195.69' Inclination: 64.48° Azimuth: 359.37° VS:-333.43'	MD:7.448' TVD:7,214.58' Inclination: 68.11° Azimuth: 0.24° VS:-290.41'	CHK: lt gy-brn, abnt wh-crm, blk-y-sb ply, sft-frm, sb rd-sb ang, mod fri, MRLST: med-dk gy-brn, blk-y-sb ply, sft-frm, sb rd-sb ang, mod fri, tr lmst, stmg bl cut, dull yel ring	MD:7.496' TVD:7,231.21' Inclination: 71.33° Azimuth: 0.85° VS:-245.39'	LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blk-y-sb ply, tr SH: blk-dk gy-sb ply-pty, mod sft-frm, tr CHK: lt gy-brn, occ crm, blk-y-sb ply, sft-frm, sb rd-sb ang, mod fri, sting blwp cut, dull yel ring	TMD:7.543' TVD:7,245. Inclination: Azimuth: 1 VS:-200.57
MD:7.353' TVD:7,173.18' Inclination: 59.57° Azimuth: 357.25° VS:-375.79'									
7400									

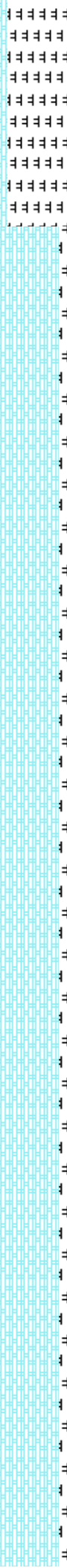
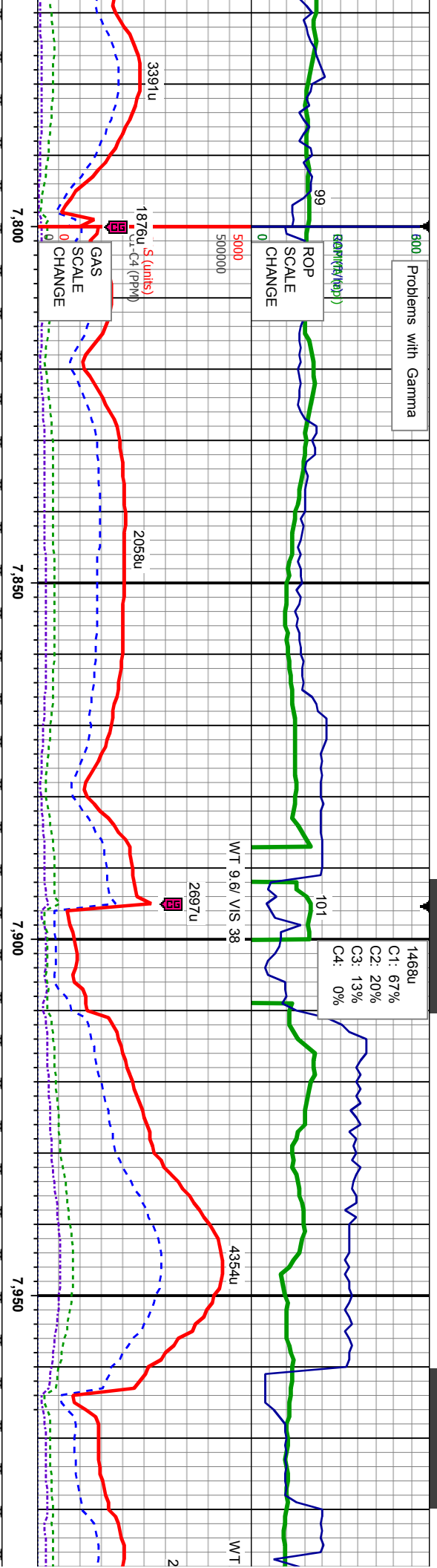




LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blk-ly-sb ply, SH: blk-dk gy-sb ply-ply, mod sft-frm, sting bl cut, bri bl ring	LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blk-ly-sb ply, SH: blk-dk gy-sb ply-ply, mod sft-frm, sting bl cut, bri bl ring	MRLST: med-dk gy-brn, blk-ly-sb ply, sft-frm, sb rd-sb ang, mod fri, CHK: med-dk gy-brn, mot, blk-ly-sb ply, sft-frm, sb rd-sb ang, mod fri, sting bl cut, bri bl ring	MRLST: med-dk gy-brn, blk-ly-sb ply, sft-frm, sb rd-sb ang, mod fri, CHK: med-dk gy-brn, mot, blk-ly-sb ply, sft-frm, sb rd-sb ang, mod fri, sting bl cut, dull yel ring	MRLST: med-dk gy-brn, blk-ly-sb ply, sft-frm, sb rd-sb ang, mod fri, CHK: med-dk gy-brn, mot, blk-ly-sb ply, sft-frm, sb rd-sb ang, mod fri, sting bl cut, dull yel ring
MD: 7,591' TVD: 7,257.43' Inclination: 77.07° Azimuth: 3.12° VS: -154.17'	MD: 7,638' TVD: 7,265.96' Inclination: 81.99° Azimuth: 2.54° VS: -108.02'	MD: 7,670' TVD: 7,269.38' Inclination: 85.74° Azimuth: 2.62° VS: -76.24'	MD: 7,756' TVD: 7,271.93' Inclination: 90.83° Azimuth: 2.04° VS: 8.62'	MD: 7,756' TVD: 7,271.93' Inclination: 90.83° Azimuth: 2.04° VS: 8.62'
TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)
7400	7400	7400	7400	7400



Problems with Gamma

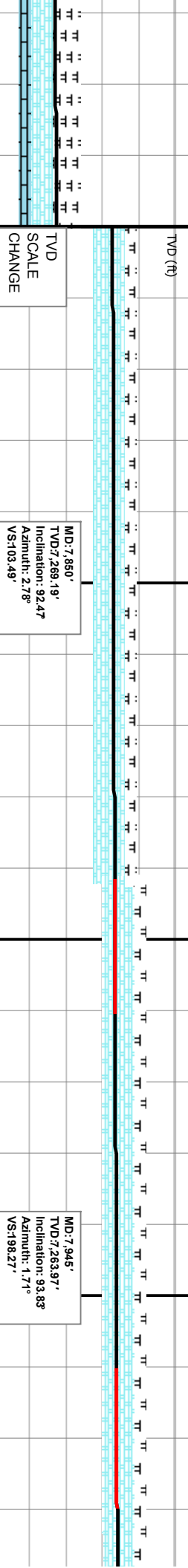


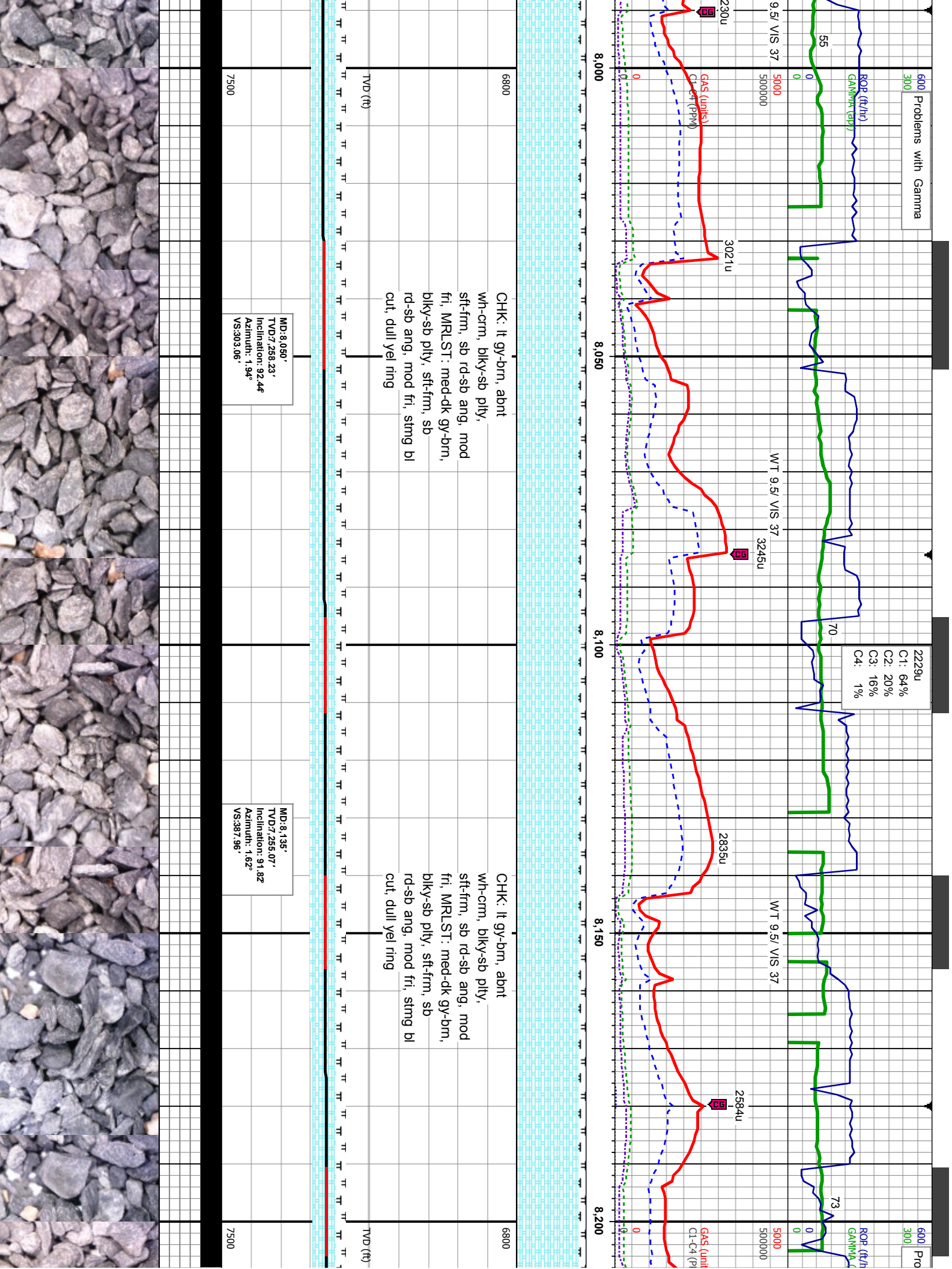
med-dk gy-brn, ply, sft-fm, sb ang, mod fri, CHK: < gy-brn, mod ply, sft-fm, mot, ang, mod fri, sting bl ill yel ring

6800

CHK: lt gy-brn, abt wh-crm, blk-y-sb ply, sft-fm, sb rd-sb ang, mod fri, MRLST: med-dk gy-brn, blk-y-sb ply, sft-fm, sb rd-sb ang, mod fri, sting bl cut, dull yel ring

TVD (ft)





1608u

C1: 97%
C2: 2%
C3: 1%
C4: 0%

600 Problems with Gamma

300

ROP (ft/hr)

GAMMA (cp)

24

0

WT 9.5/ VIS 39

3094u

5000

5000000

4650u

WT

GAS (m/s)

CL-C (psi)

8,450

8,500

8,550

8,600

648u

1394u

CHK: lt gy-brn, abnt

wh-crm, blk-y-sb ply,

sft-frm, sb rd-sb ang, mod

fri, MRLST: med-dk gy-brn,

blk-y-sb ply, sft-frm, sb

rd-sb ang, mod fri, tr inst,

stng bl cut, dull yel ring

LMST: lt gy-brn, offwh-crm,

mod sft-mod hd, sb blk-y-sb

ply, CHK: lt gy-brn, occ

crm, blk-y-sb ply, sft-frm, sb

rd-sb ang, mod fri, tr SH:

blk-dk gy,sb ply-ply, mod

sft-frm, stng bl cut, dull yel

ring

6800

LMST: lt gy

mod sft-mc

ply, CHK: l

crm, blk-y-s

rd-sb ang, l

blk-dk gy,sl

sft-frm, stm

ring

TVD (ft)

MD: 8.516'

TVD: 2,552.99'

Inclination: 87.28°

Azimuth: 357.92°

VS: 768.5'

MD: 8.611'

TVD: 2,552.24'

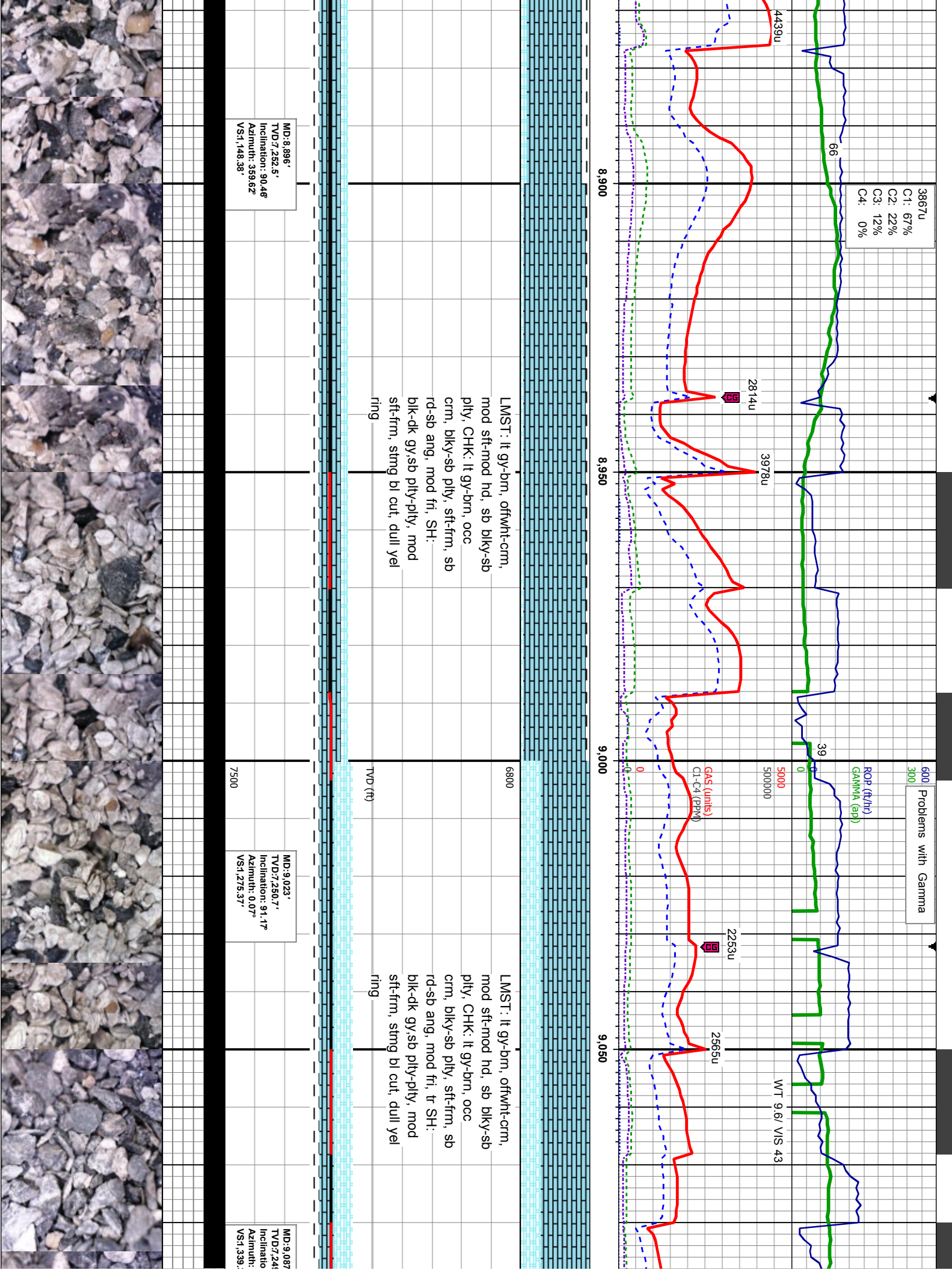
Inclination: 90°

Azimuth: 358.94°

VS: 863.43'

03'

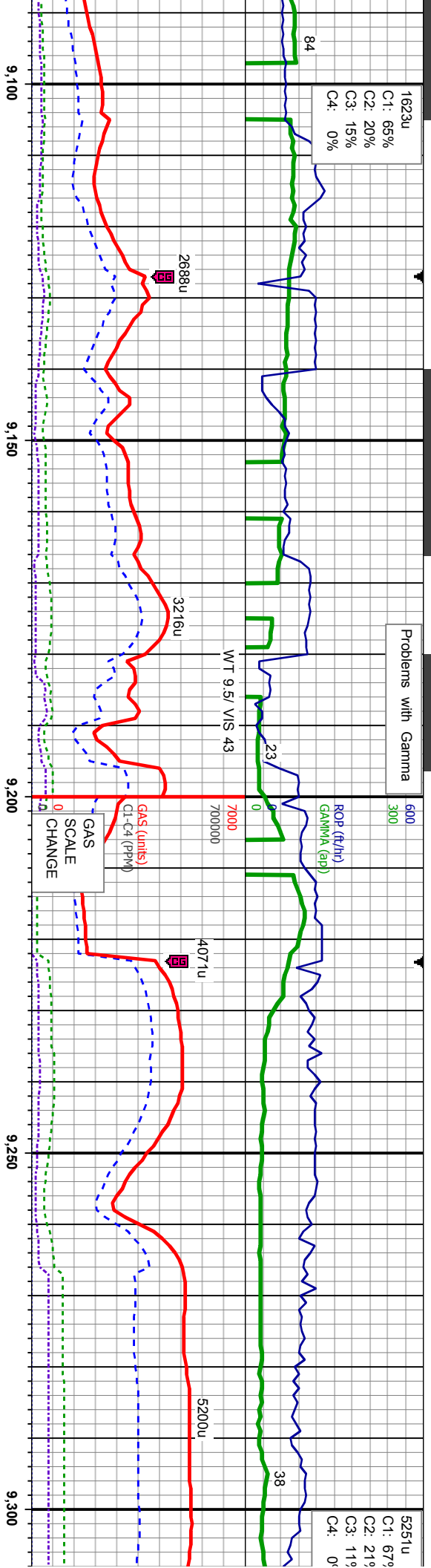
8'



1623u
C1: 65%
C2: 20%
C3: 15%
C4: 0%

Problems with Gamma

5251u
C1: 67%
C2: 21%
C3: 11%
C4: 0%



LMST: lt gy-bm, offwht-crm,
mod sft-mod hd, sb blk-ysb
ply, tr SH: blk-dk gy,sb
ply-ply, mod sft-fm, sting
bl cut, dull yel ring

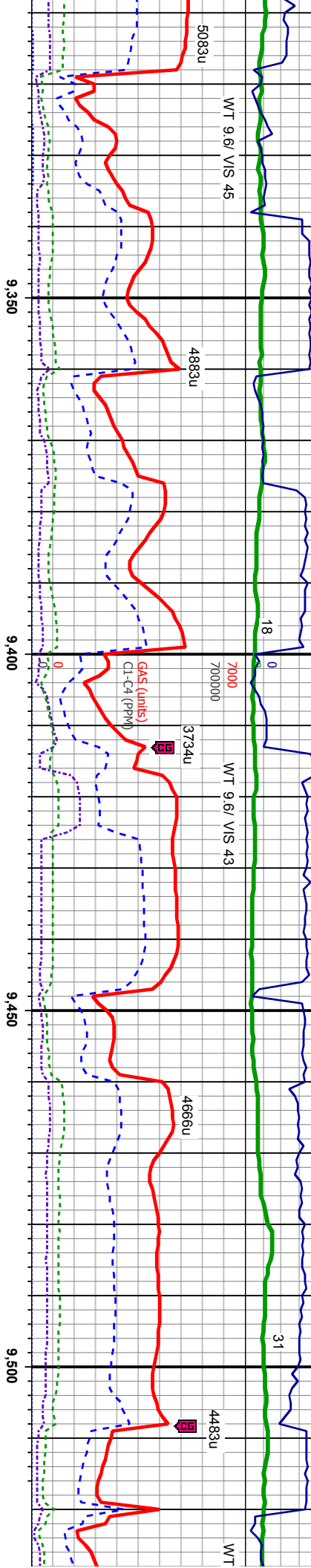
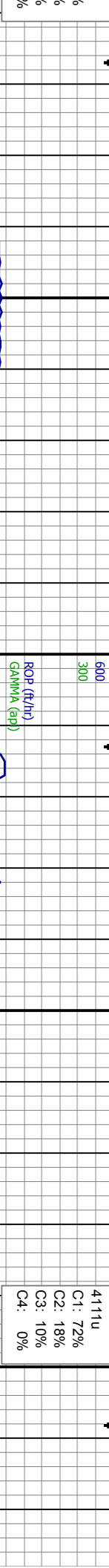
LMST: lt gy-bm, offwht-crm,
mod sft-mod hd, sb blk-ysb
ply, tr SH: blk-dk gy,sb
ply-ply, mod sft-fm, sting
bl cut, dull yel ring

MD: 9.85'
TVD: 7.90, 3.46
Inclination: 359.39°
Azimuth: 1.63°
VS: 1.434, 3.33°

MD: 9.182'
TVD: 7.251, 4.87
Inclination: 87.69°
Azimuth: 1.63°
VS: 1.434, 3.33°

MD: 9.277'
TVD: 7.253, 9.9°
Inclination: 89.28°
Azimuth: 2.23°
VS: 1.529, 2.4°





LMST: lt gy-brn, ofwht-cm,
mod sft-mod hd, sb blk-ly-sb
ply, tr SH: blk-dk gy, sb
ply-ply, mod sft-fm, stmg
bl cut, brl bl ring

MD: 9,372'
TVD: 7,255.52'
Inclination: 88.88°
Azimuth: 1.34°
VS: 1,624.18'

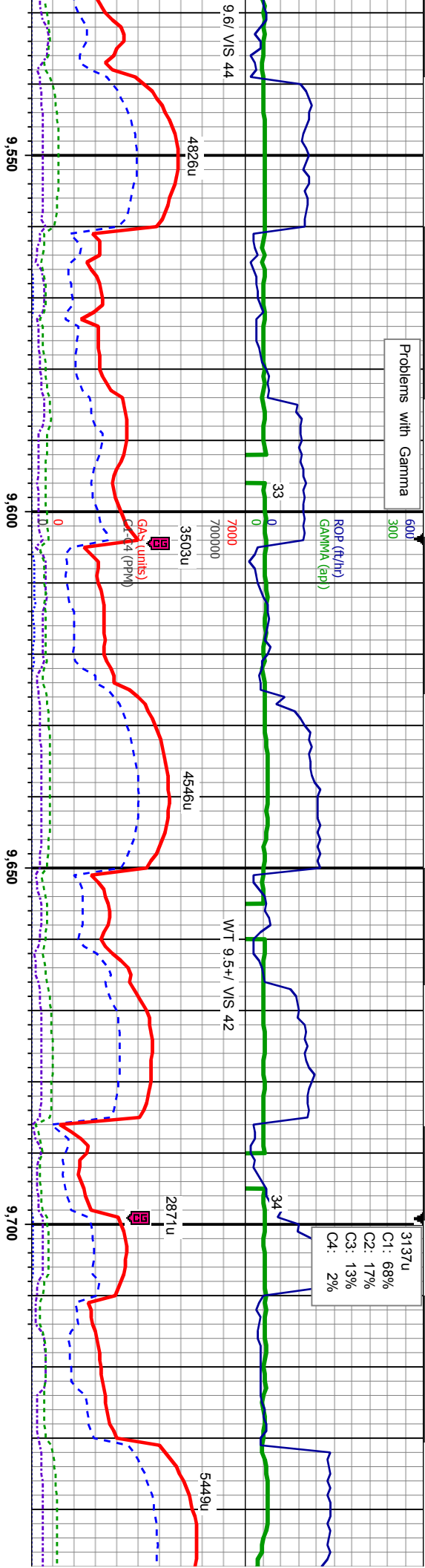
TVD (ft)

LMST: lt gy-brn, ofwht-cm,
mod sft-mod hd, sb blk-ly-sb
ply, tr SH: blk-dk gy, sb
ply-ply, mod sft-fm, stmg
bl cut, brl bl ring

MD: 9,467'
TVD: 7,257.46'
Inclination: 88.8°
Azimuth: 1.18°
VS: 1,719.14'



Problems with Gamma



LMST: lt gy-bm, offwht-crm,
mod sft-mod hd, sb blk-ysb
ply, tr SH: blk-dk gy, sb
ply-pty, mod sft-frm, sting
bl cut, bri bl ring

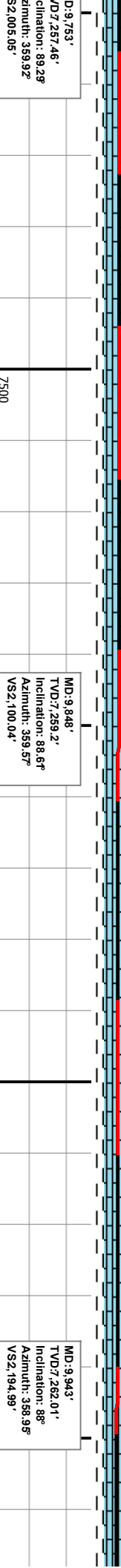
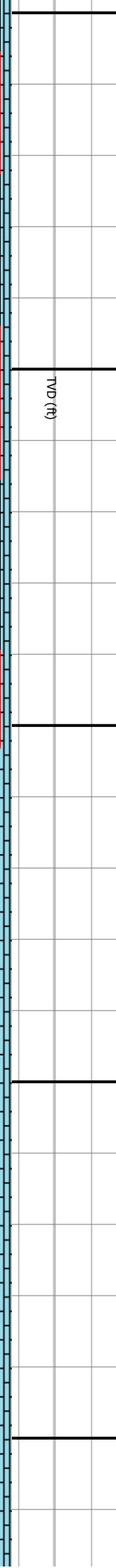
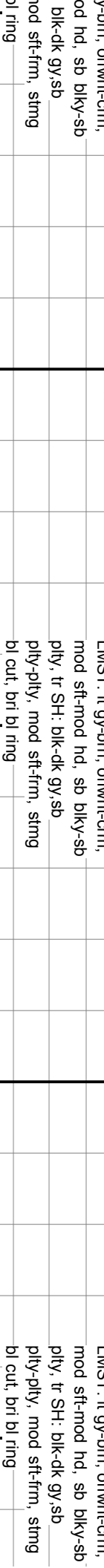
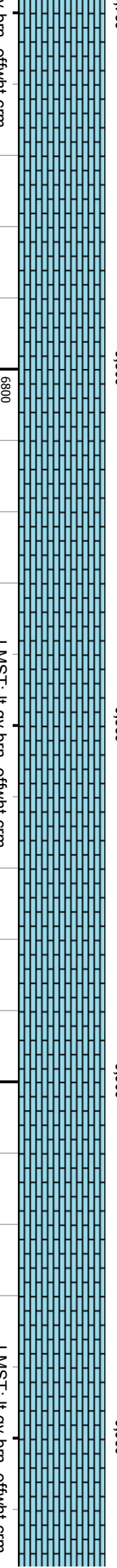
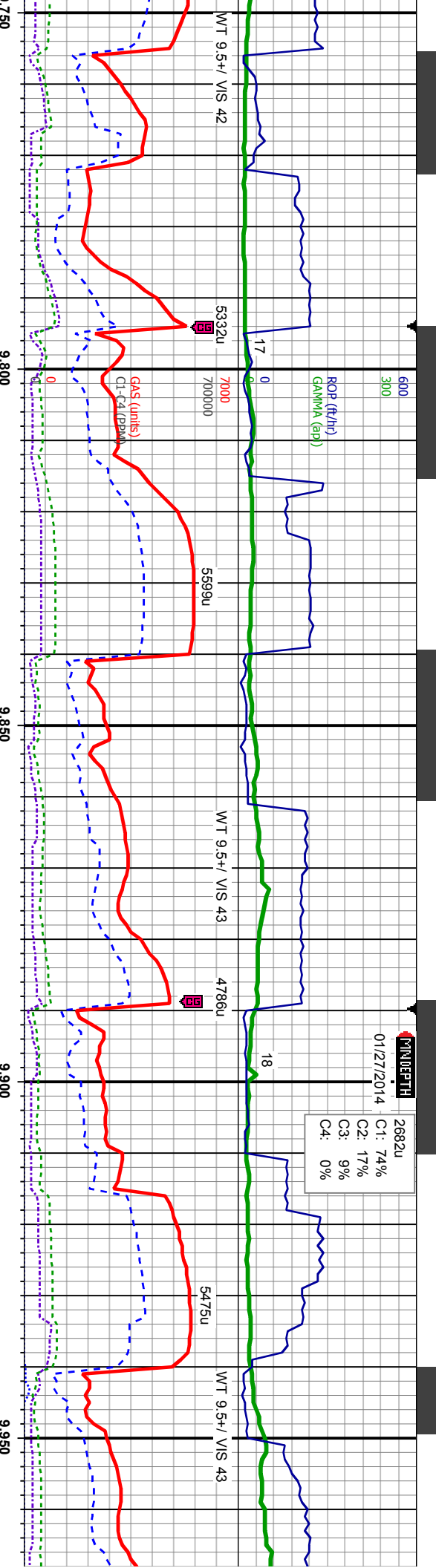
LMST: lt gy-bm, offwht-crm,
mod sft-mod hd, sb blk-ysb
ply, tr SH: blk-dk gy, sb
ply-pty, mod sft-frm, sting
bl cut, bri bl ring

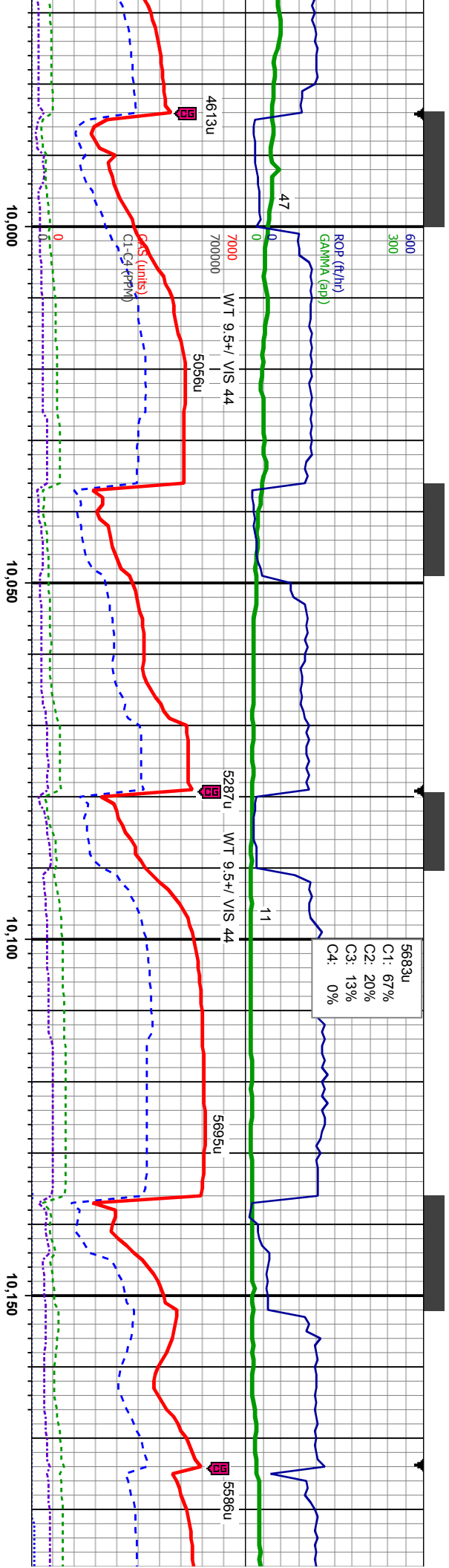
LMST: lt g
mod sft-m
ply, tr SH:
ply-pty, n
bl cut, bri l

MD: 9,562'
TVD: 7,257.87'
Inclination: 90.7°
Azimuth: 1.66°
VS: 1,814.1'

MD: 9,657'
TVD: 7,257.07'
Inclination: 90.25°
Azimuth: 1.33°
VS: 1,909.06'

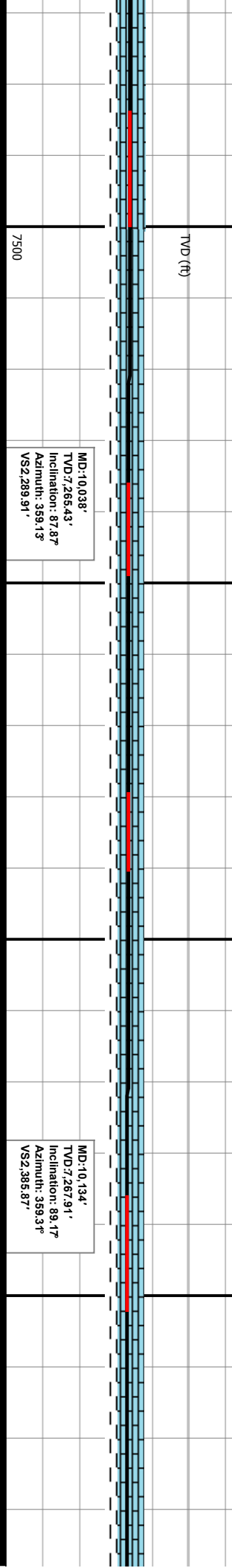






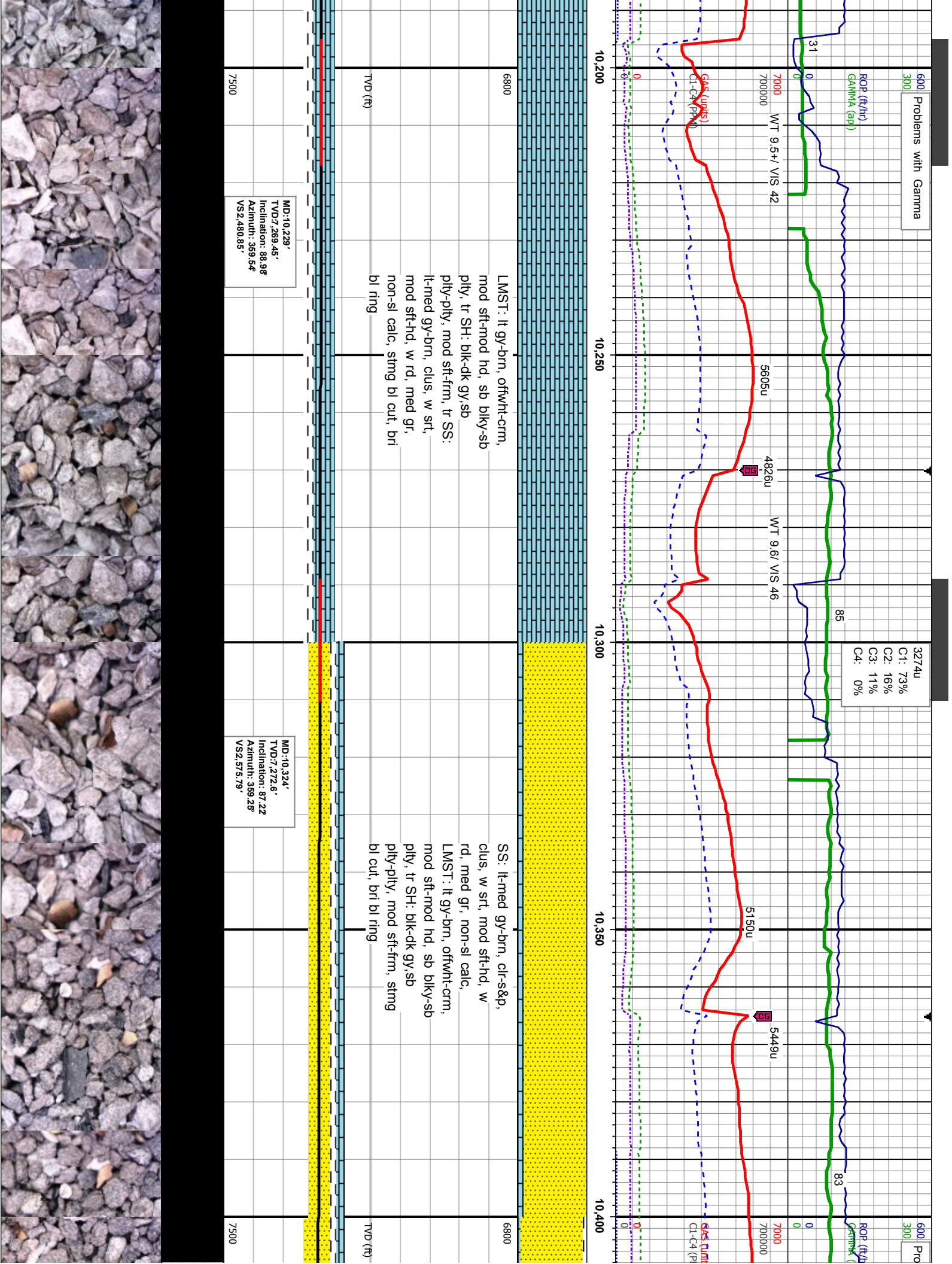
LMST: lt gy-brn, ofwht-crm,
mod sft-mod hd, sb blk-ysb
ply, tr SH: blk-dk gy, sb
ply-ply, mod sft-fm, stmg
bl cut, bri bl ring

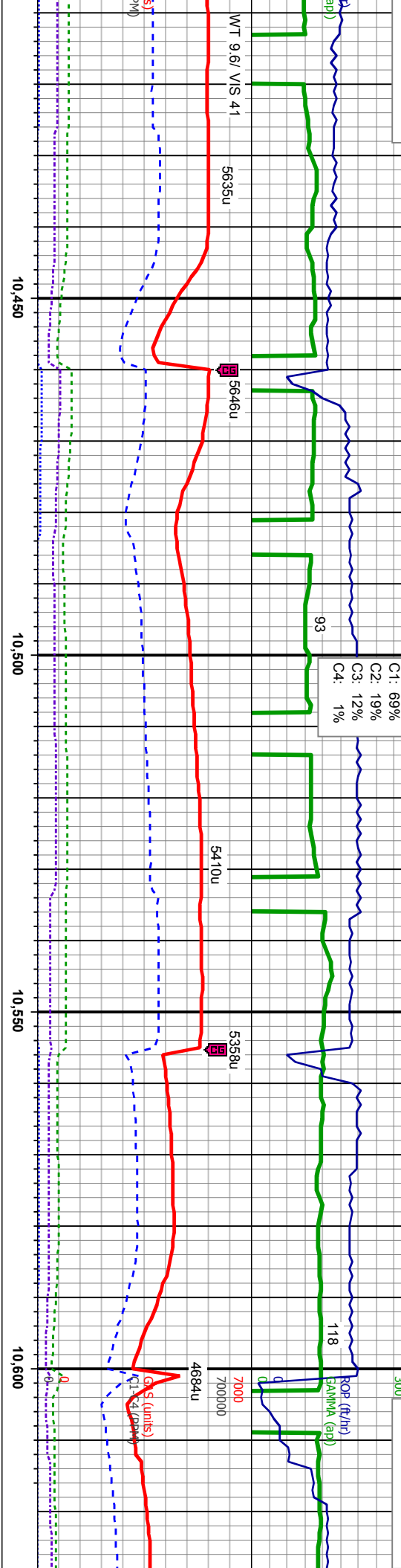
LMST: lt gy-brn, ofwht-crm,
mod sft-mod hd, sb blk-ysb
ply, tr SH: blk-dk gy, sb
ply-ply, mod sft-fm, stmg
bl cut, bri bl ring



MD:10.134'
TVD: 7,267.91'
Inclination: 89.17°
Azimuth: 359.34°
VS2: 385.87'





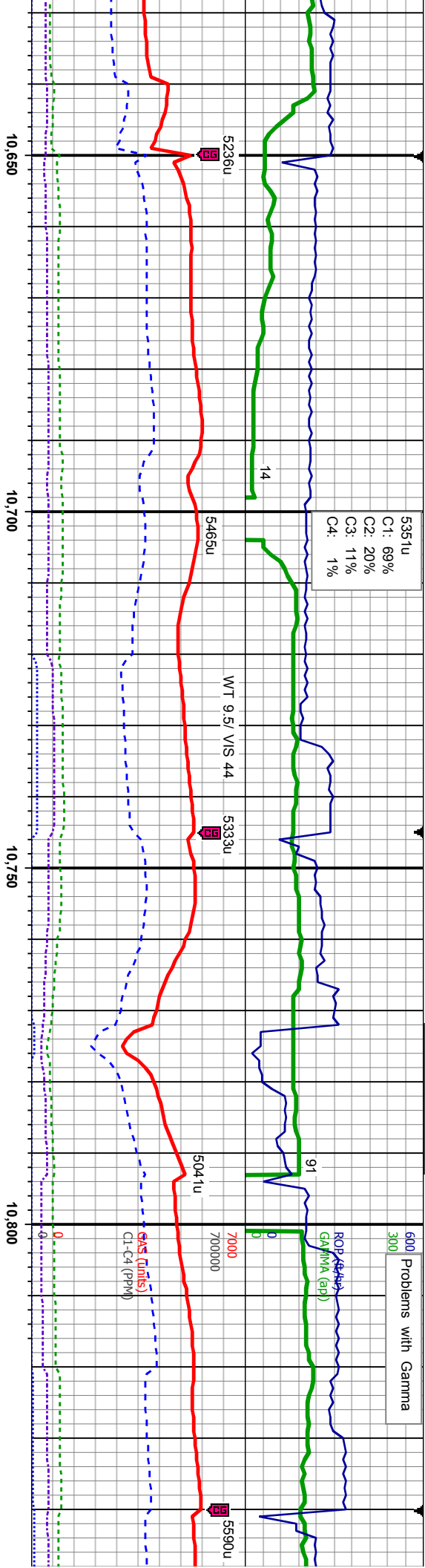


SS: lt-med gy-brn, clr-s&p,
clus, w srt, mod sft-hd, w
rd, med gr, non-sl calc,
LMST: lt gy-brn, offwht-crm,
mod sft-mod hd, sb blk-y-sb
pily, SH: blk-dk gy,sb
pily-pily, mod sft-frn, sting
bl cut, bri bl ring

SS: lt-med gy-brn, clr-s&p,
clus, w srt, mod sft-hd, w
rd, med gr, non-sl calc,
LMST: lt gy-brn, offwht-crm,
mod sft-mod hd, sb blk-y-sb
pily, SH: blk-dk gy,sb
pily-pily, mod sft-frn, sting
bl cut, bri bl ring

MD-10.419' TVD: 2,276.56' Inclination: 87.99 Azimuth: 359.38° VS2.670.7'	MD-10.514' TVD: 2,278.56' Inclination: 89.6° Azimuth: 359.72° VS2.766.67'	MD-10.609' TVD: 2,278.99' Inclination: 89.88 Azimuth: 0.03° VS2.860.67'
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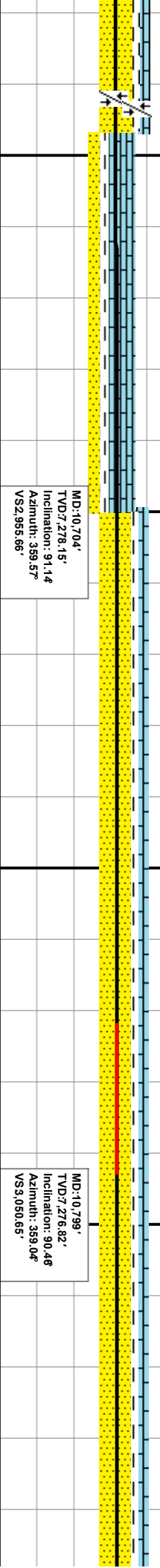


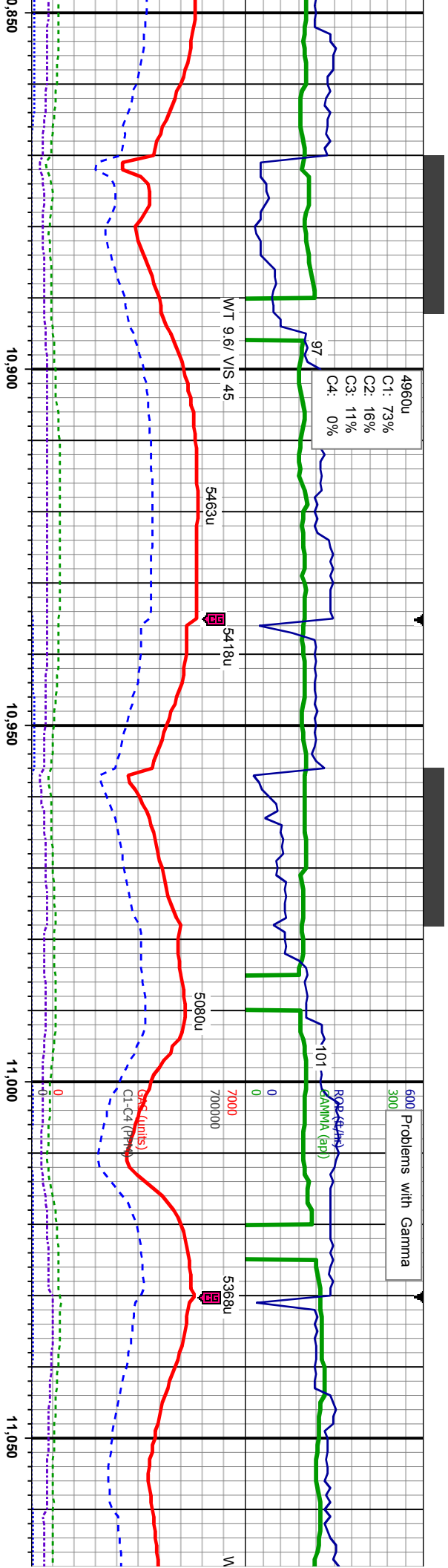


LMST: lt gy-bm, offwht-crm,
mod sft-mod hd, sb blk-ly-sb
ply, SS: lt-med gy-bm,
clr-s&p, clus, w srt, mod
sft-hd, w rd, med gr, non-sl
calc, SH: blk-dk gy, sb
ply-pty, mod sft-frm, sting
bl cut, bri bl ring

SS: lt-med gy-bm, clr-s&p,
clus, w srt, mod sft-hd, w
rd, med gr, non-sl calc,
LMST: lt gy-bm, offwht-crm,
mod sft-mod hd, sb blk-ly-sb
ply, SH: blk-dk gy, sb
ply-pty, mod sft-frm, sting
bl cut, bri bl ring

SS: lt-med i
clus, w srt,
rd, med gr,
LMST: lt gy-
mod sft-mod
ply, SH: blk
ply-pty, mc
bl cut, bri bl





4960u
C1: 73%
C2: 16%
C3: 11%
C4: 0%

WT 9.6/ VIS 45

97

5463U

5080

10

~~ROP (#/hr)~~
GAMMA (app)

~~1000~~ (1000)

700000

10,90

10,90

10,950

11.0

11,05

gy-brn, clr-s&p,

non-si calc

nd hd, sb bily-s

ring

SS: lt-med gy-brn, clr-s&p,
clus, w srt, mod sft-hd, w
rd, med gr, non-sl calc,
LMST: lt-gy-brn, offwht-crm,
mod sft-mod hd, sb blk-ly-sb
ply, SH: blk-dk gy,sb
ply-ply, mod sft-frn, sling
bl cut, bri bl rino

6800	SS: lt-med gy-brn, clr-s&p, clus, w srt, mod sft-hd, w rd, med gr, non-sl calc, LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blk-ly-sply, SH: blk-dk gy, sb pply-pty, mod sft-frn, sting bl cut, bri bl rino
------	---

TVD (ft)

MD:10.8947

TVD: 7,276.39'

Azimuth: 359.03°

VS3,145.63'

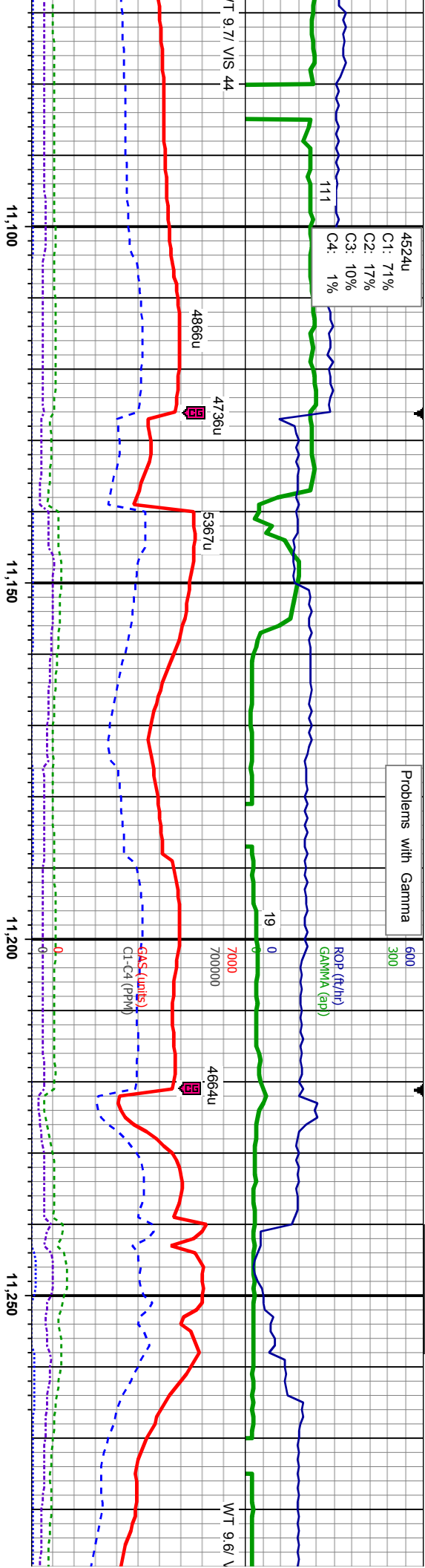
MD:10,989'
TVD:7,277.3
Inclination:
Azimuth: 35
VS3,240.62

TVD: 7,277.34'

Incination: 88.
Azimuth: 359.8

VS3,240.62'

7500



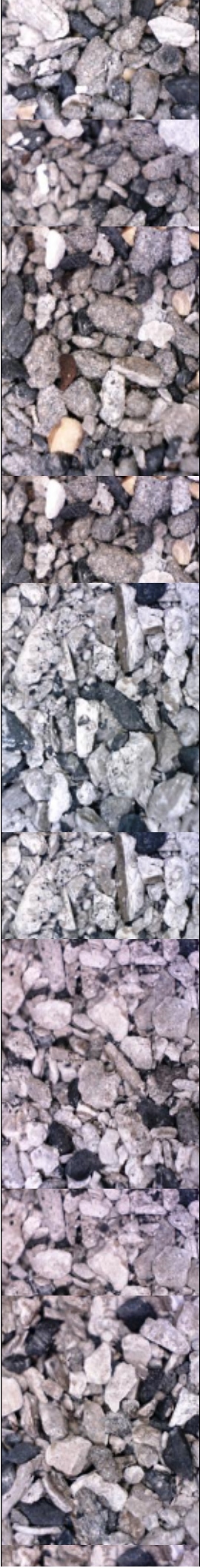
LMST: lt gy-brn, ofwht-crm,
mod sft-mod hd, sb blk-ysb
pity, SS: lt-med gy-brn,
clr-s&p, clus, w srt, mod
sft-hd, w rd, med gr, non-sl
calc, SH: blk-dk gy, sb
pity-pity, mod sft-fm, sting
bl cut, bri bl ring

LMST: lt gy-brn, ofwht-crm,
mod sft-mod hd, sb blk-ysb
pity, SS: lt-med gy-brn,
clr-s&p, clus, w srt, mod
sft-hd, w rd, med gr, non-sl
calc, SH: blk-dk gy, sb
pity-pity, mod sft-fm, sting
bl cut, bri bl ring

MD: 11,084'
TVD: 2,278.49'
Inclination: 89.8°
Azimuth: 359.93°
VS: 3,335.61'

MD: 11,180'
TVD: 2,277.74'
Inclination: 91.08°
Azimuth: 0.19°
VS: 3,431.61'

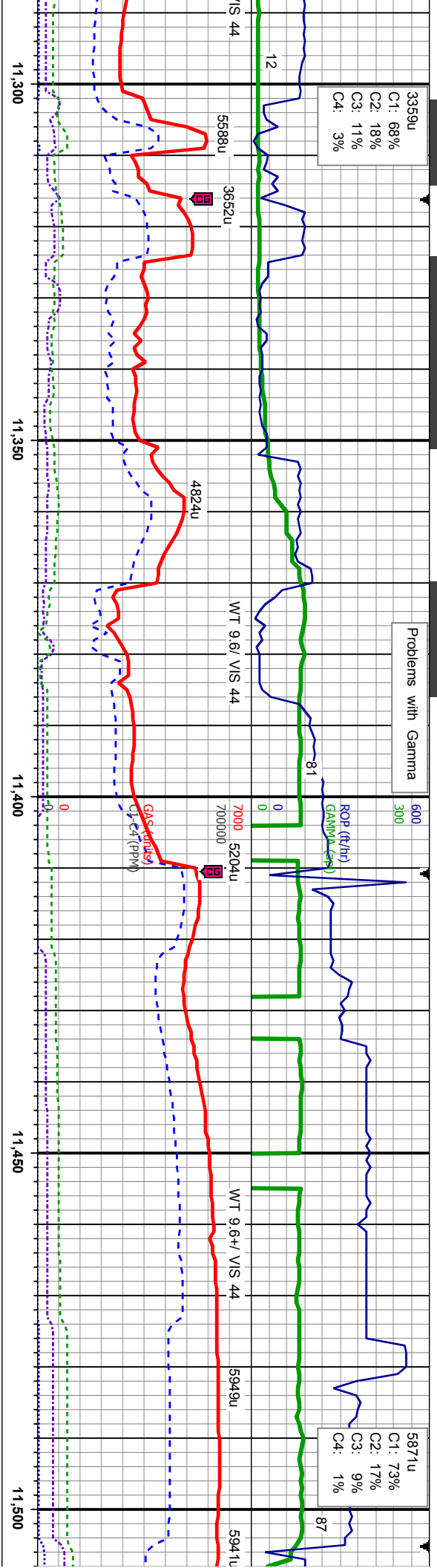
MD: 11,275'
TVD: 2,274.83'
Inclination: 92.48°
Azimuth: 358.94°
VS: 3,526.56'



3359u
C1: 68%
C2: 18%
C3: 11%
C4: 3%

Problems with Gamma

5871u
C1: 73%
C2: 17%
C3: 9%
C4: 1%

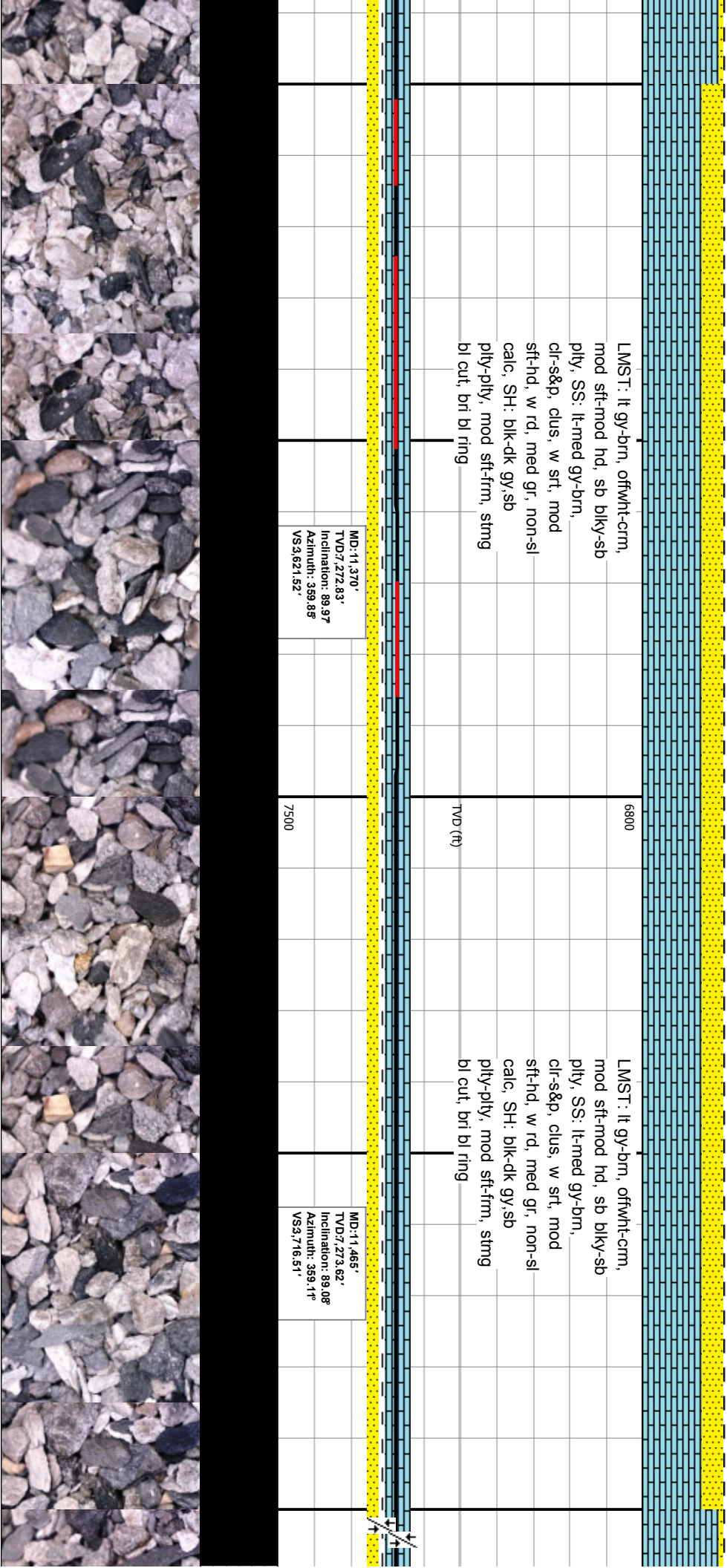


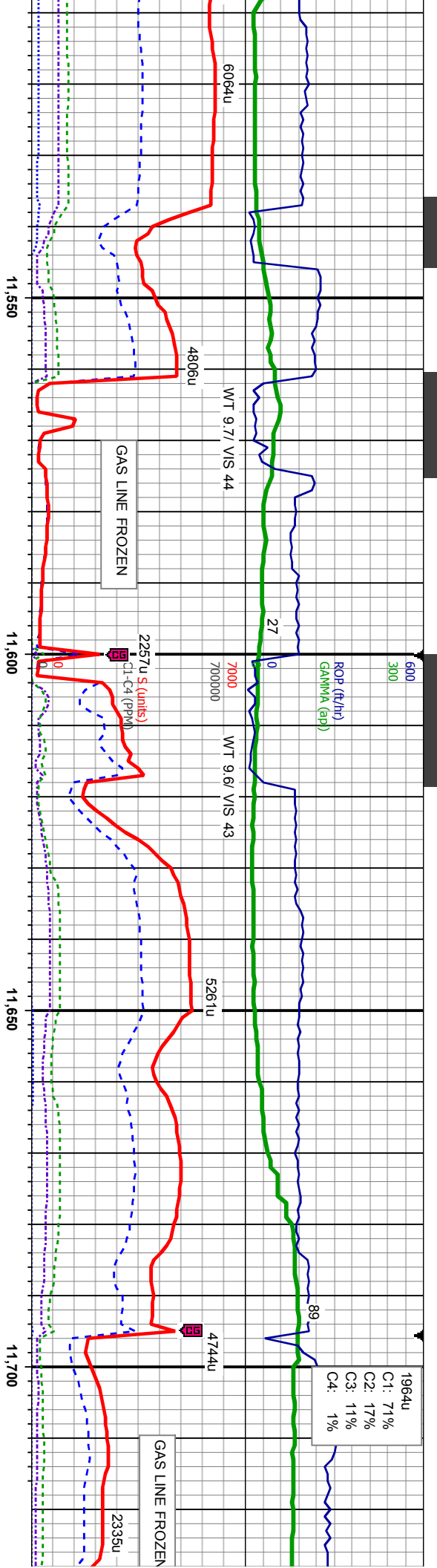
LMST: lt gy-brn, offwht-crm,
mod sft-mod hd, sb blk-y-sb
pfty, SS: lt-med gy-brn,
clr-s&g, clus, w srt, mod
sft-hd, w rd, med gr, non-sl
calc, SH: blk-dk gy,sb
pfty-pfty, mod sft-frm, stmg
bl cut, bri bl ring

LMST: lt gy-brn, offwht-crm,
mod sft-mod hd, sb blk-y-sb
pfty, SS: lt-med gy-brn,
clr-s&g, clus, w srt, mod
sft-hd, w rd, med gr, non-sl
calc, SH: blk-dk gy,sb
pfty-pfty, mod sft-frm, stmg
bl cut, bri bl ring

MD:11,370'
TVD:272.83'
Inclination: 89.97
Azimuth: 359.88
VS3,621.52'

MD:11,465'
TVD:273.62'
Inclination: 89.08
Azimuth: 359.17
VS3,716.51'





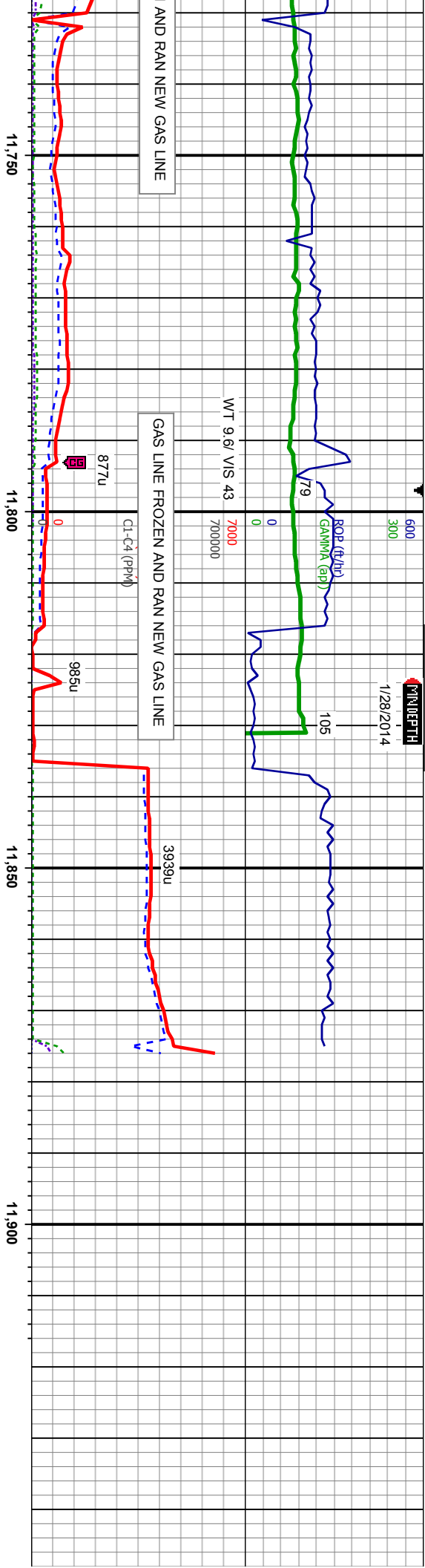
LMST: lt gy-brn, ofwht-crm, mod sft-mod hd, sb blk-ysb ply, SS: lt-med gy-brn, clr-s&p, clus, w srt, mod sft-hd, w rd, med gr, non-sl calc, SH: blk-dk gy, sb ply-ply, mod sft-frm, sting bl cut, bri bl ring

LMST: lt gy-brn, ofwht-crm, mod sft-mod hd, sb blk-ysb ply, SS: lt-med gy-brn, clr-s&p, clus, w srt, mod sft-hd, w rd, med gr, non-sl calc, SH: blk-dk gy, sb ply-ply, mod sft-frm, sting bl cut, bri bl ring

MD: 11,560' TVD: 7,274.78' Inclination: 89.58° Azimuth: 358.87° VS: 3,811.49'

MD: 11,656' TVD: 7,276.1' Inclination: 88.92° Azimuth: 358° VS: 3,907.44'





SS: lt-med gy-brn, clr-s&p,
clus, w srt, mod sft-hd, w
rd, med gr, non-sl calc,
LMST: lt gy-brn, offwht-crm,
mod sft-mod hd, sb blk-ky-sb
pty, tr SH: blk-dk gy,sb
pty-pty, mod sft-frn

TVD (ft)

MD:11,751'
TVD:7,277.96'
Inclination: 88.83
Azimuth: 358.19
VSA,002.37'

7500

MD:11,831'
TVD:7,279.06'
Inclination: 89.6
Azimuth: 358.34
VSA,082.33'

SS: lt-med gy-brn, clr-s&p,
clus, w srt, mod sft-hd, w
rd, med gr, non-sl calc,
LMST: lt gy-brn, offwht-crm,
mod sft-mod hd, sb blk-ky-sb
pty, SH: blk-dk gy,sb
pty-pty, mod sft-frn, sling
bl cut, bri bl ring

PROJECTION TO BIT

MD:11,876'
TVD:7,279.37'
Inclination: 89.6
Azimuth: 358.34
VSA,127.31'

ANADARKO
Drilling 27C-32HZ
WELL TD @ 11876' MD
ON 01/28/2014 @ 0045HRS

THANK YOU FOR USING
COLUMBINE LOGGING INC.

