

Décollement Consulting Inc.



Scale: 5" / 100'
Measured Depth Log

Well Name Antelope E-A-21HNB

Location SW/SW Section 21, T5N - R62W

State CO

County Weld

Country USA

Rig Number Xtreme 22

API Number 05-123-41371

Field Wattenberg

Region D.J. Basin

Drilling Completed 6/20/2015

Spud Date 6/15/2015

Surface Coordinates 507 FSL x 864 FWL (Lat: 40.379316, -104.335072)

Bottom Hole Coordinates 470 FNL x 50 FWL (Lat: 40.391100, -104.337822)

Ground Elevation 4,640'

K.B. Elevation 4,657'

Logged Interval 6,809' To 10,982'

Total Depth 10,982'

Formation Niobrara "B" Chalk

Type of Drilling Fluid Water Based Mud

Operator

Address Bonanza Creek Energy, Inc.
410 17th Street, Suite 1500
Denver, Colorado 80202

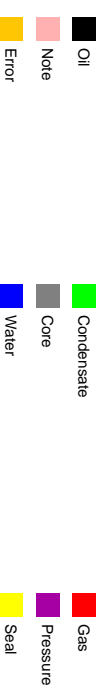
Geologist

Name Scott Sawyer & Paul Givens

Company Decollement Consulting Inc.

Address 13300 Braun Rd.
Golden, CO. 80401

Zone Color Coding



Rock Types

Blank

CHALK

CEMENT

LIMESTONE

MPF

MARL BF

SHALE

SHALE S

SHALE SF

CPF

TT

TT

TT

TT

MARLSTONE

SANDSTONE

Accessories

F FOSSIL

GASTROPOD

OOLITE

OSTRACOD

PELECYPOD

PELLET

PISOLITE

PLANT REMAINS

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

ARGILLACEOUS

ARGILLITE GRAIN

B BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTDK

CHTLT

COAL - THIN BEDS

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

GLAUCONITE

GYPSEFEROUS

HEAVY MINERAL

KAOLIN

MARLSTONE

MINERAL CRYSTALS

NODULES

PHOSPHATE PELLETS

PYRITE

SALT CAST

SANDY

SILICEOUS

SILTY

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

FISH

FORAMINIFERA

ANHYDRITIC

MINERALS

Other Symbols

ORGANIC

FORMATION TOP

L LITHOGRAPHIC

Oil Show

P PINPOINT

GAS SHOW

MX MICROXLN

Rounding

DEAD

VUGGY

MINDEPTH MN DEPTH

A ANGULAR

MS MUDSTONE

EVEN

NORMAL FAULT

R ROUNDED

PS PACKSTONE

Engineering

QUESTIONABLE

OIL SHOW

B SUBANG

WS WACKESTONE

SPOTTED STAINING BIT

OVERTURNED STRATA

R SUBRND

Sorting

CASING

REVERSE FAULT

Porosity

CONNECTION (LEFT)

SIDEWALL CORE (LEFT)

M MODERATE

E EARTHY

CONNECTION (RIGHT)

SIDEWALL CORE (RIGHT) BS BOUNDSTONE

P POOR

FENESTRAL

CONNECTION GAS

SLIDE

C CHALKY

W WELL

F FRACTURE

CORE - LOST

SURVEY

CX CRYPTOXLN

INTERCRYSTALLINE

CORE - RECOVERED

TRIP GAS

E EARTHY

INTEROOLITIC

DST INTERVAL

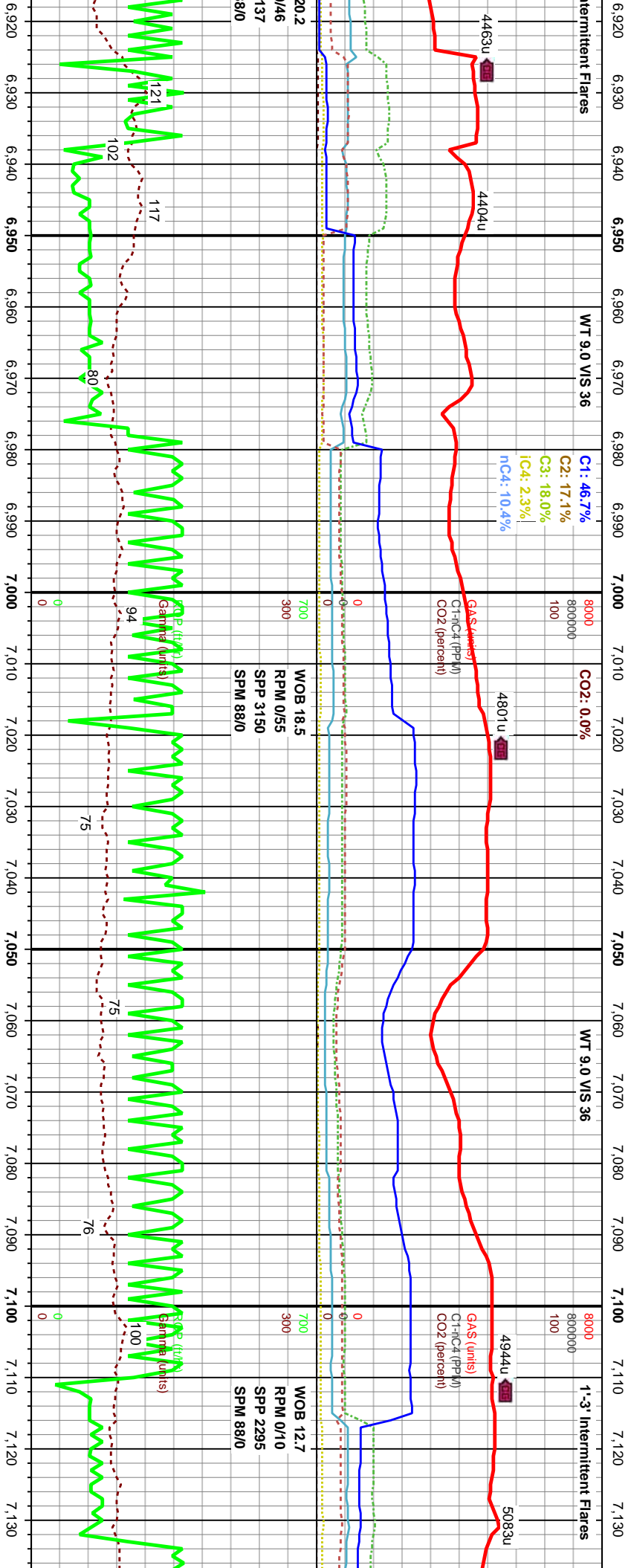
WIRELINE TESTED - LEFT FX FINELYXLN

MOLDIC

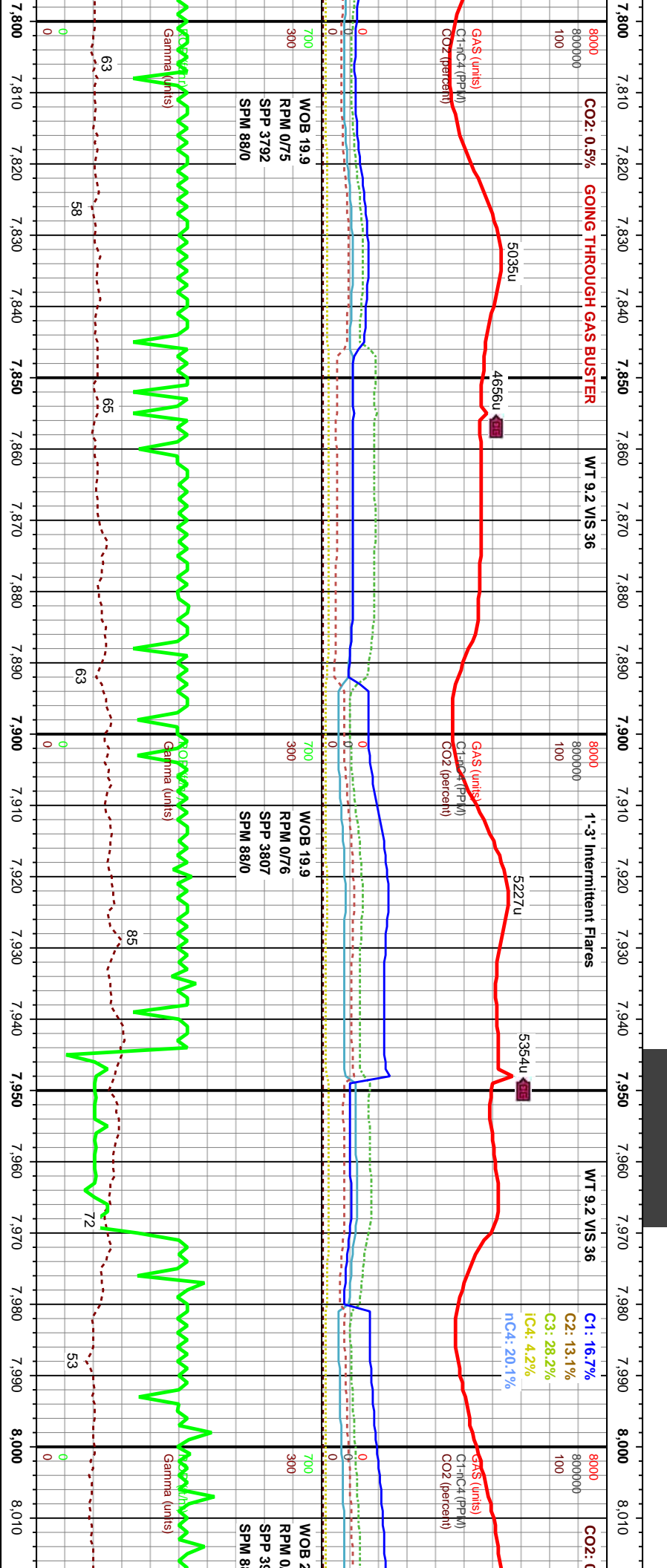
FAULT

WIRELINE TESTED - RT

GS GRAINSTONE



F		F		F		F	
TT	TT	TT	TT	TT	TT	TT	TT
TT	TT	TT	TT	TT	TT	TT	TT
TT	TT	TT	TT	TT	TT	TT	TT
TT	TT	TT	TT	TT	TT	TT	TT
TT	TT	TT	TT	TT	TT	TT	TT
TT	TT	TT	TT	TT	TT	TT	TT
			5800				5800
MD: 6.966' TVD: 6,347.36' Inclination: 89.53° Azimuth: 1.65°							
TVD (ft)						TVD (ft)	
100% CHK: lt-m brn, tan, lt-m brn-gy/wh, lt-m gy, sft-fm, sb blk, rthy lstr, v calc, sl brn/bk sin, dull yel flr, lt yel flr, lt milky cut				100% CHK: lt-m brn, tan, lt-m brn-gy/wh, lt-m gy, sft-fm, sb blk, rthy lstr, v calc, sl brn/bk sin, dull yel flr, lt milky cut			
Tr MARL: dk brn/gy, dk gy, sft, sb pily-sb blk, rthy lstr, inbdd carb mat, v calc, tr foss				Tr MARL: dk brn/gy, dk gy, sft, sb pily-sb blk, rthy lstr, inbdd carb mat, v calc, tr foss			
			7000				7000



5800		5800		5800		5800
7,802'	MD: 7,802'	7,895'	MD: 7,895'	7,987'	MD: 7,987'	
6,344.1'	TVD: 6,344.1'	6,344'	TVD: 6,344'	6,343.21'	TVD: 6,343.21'	
Inclination: 90.03°	Inclination: 90.03°	Inclination: 90.09°	Inclination: 90.09°	Inclination: 90.89°	Inclination: 90.89°	
2.44°	2.44°	2.53°	2.53°	0.26°	0.26°	
TV	TV	TV	TV	TV	TV	TV
100% CHK: It brn, tan, lt-m brn/gy/wh, lt-m gy, sft-frm, occ brlt, sb blk, rthy lstr, v calc, sl brn/blik sin, dull yel flr, lt milky cut, tr foss	100% CHK: It brn, tan, lt-m brn/gy/wh, lt-m gy, sft-frm, occ brlt, sb blk, rthy lstr, v calc, sl brn/blik sin, dull yel flr, lt milky cut, tr foss	100% CHK: It brn, tan, lt-m brn/gy/wh, lt gy, sft-frm, occ brlt, sb blk, rthy lstr, v calc, sl brn/blik sin, dull yel flr, lt milky cut, tr foss	100% CHK: It brn, tan, lt-m brn/gy/wh, lt gy, sft-frm, occ brlt, sb blk, rthy lstr, v calc, sl brn/blik sin, dull yel flr, lt milky cut, tr foss	100% CHK: It brn, tan, lt-m brn/gy/wh, lt gy, sft-frm, occ brlt, sb blk, rthy lstr, v calc, sl brn/blik sin, dull yel flr, lt milky cut, tr foss	100% CHK: It brn, tan, lt-m brn/gy/wh, lt gy, sft-frm, occ brlt, sb blk, rthy lstr, v calc, sl brn/blik sin, dull yel flr, lt milky cut, tr foss	100% CHK: It brn, tan, lt-m brn/gy/wh, lt gy, sft-frm, occ brlt, sb blk, rthy lstr, v calc, sl brn/blik sin, dull yel flr, lt milky cut, tr foss
7000		7000		7000		7000

8,240 8,250 8,260 8,270 8,280 8,290 8,300 8,310 8,320 8,330 8,340 8,350 8,360 8,370 8,380 8,390 8,400 8,410 8,420 8,430 8,440 8,450

WT 9.2 VIS 36 6/20/2015

GOING THROUGH GAS BUSTER

WT 9.2 VIS 36

CO2: 0.7%

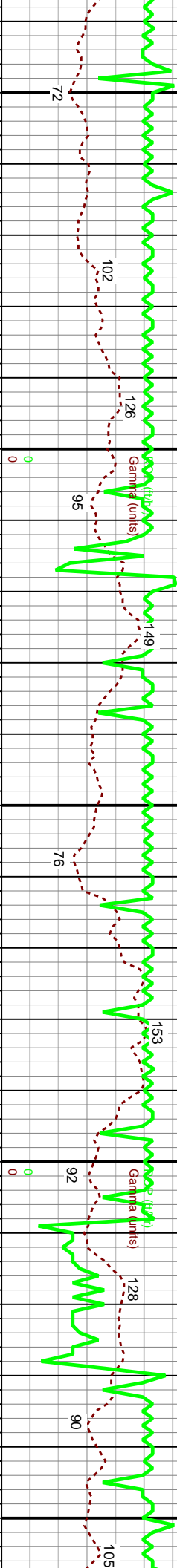
GAS (units)
C1+IC4 (PPM)
CO2 (percent)

C1: 41.8%
C2: 17.7%
C3: 19.2%
IC4: 2.5%
nC4: 10.7%

GAS (units)
C1+IC4 (PPM)
CO2 (percent)

WOB 21.5
RPM 0/80
SPM 4039
SPM 88/0

WOB 46.4
RPM 0/9
SPM 3615
SPM 86/0



MD: 8,265'
TVD: 6,342.32'
Inclination: 89.62°
Azimuth: 359.56°

MD: 8,368'
TVD: 6,343.75'
Inclination: 88.61°
Azimuth: 358.84°

MD: 8,450'
TVD: 6,346.22'
Inclination: 88.32°
Azimuth: 0.22°

TVD (ft)

TVD (ft)

70% CHK: lt-m brn-tan, lt-m brn/gy/wh, lt-m gy, sft-frn, occ brt, sb blk/gy, rthy lstr, v calc, sl brn/bk stn, dull yel flr, lt milky cut

60% MARL: dk gy, dk brn/gy, sft-frn, sb ply-sb blk/gy, rthy lstr, inbdd carb mat, v calc, tr foss

60% MARL: dk gy, dk brn/gy, sft-frn, sb ply-sb blk/gy, rthy lstr, inbdd carb mat, v calc, tr foss

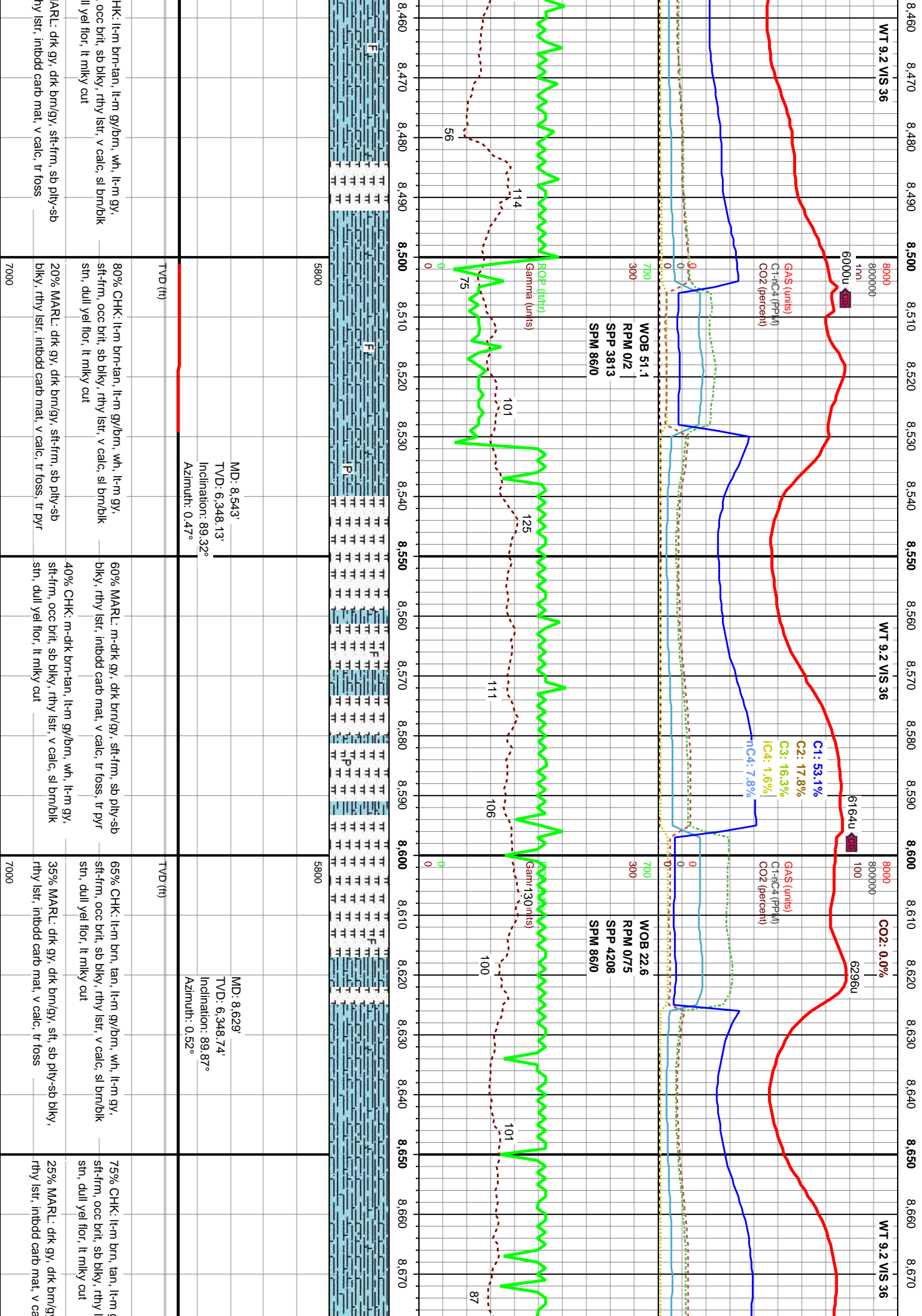
30% MARL: dk gy, dk brn/gy, sft-frn, sb ply-sb blk/gy, rthy lstr, inbdd carb mat, v calc, tr foss

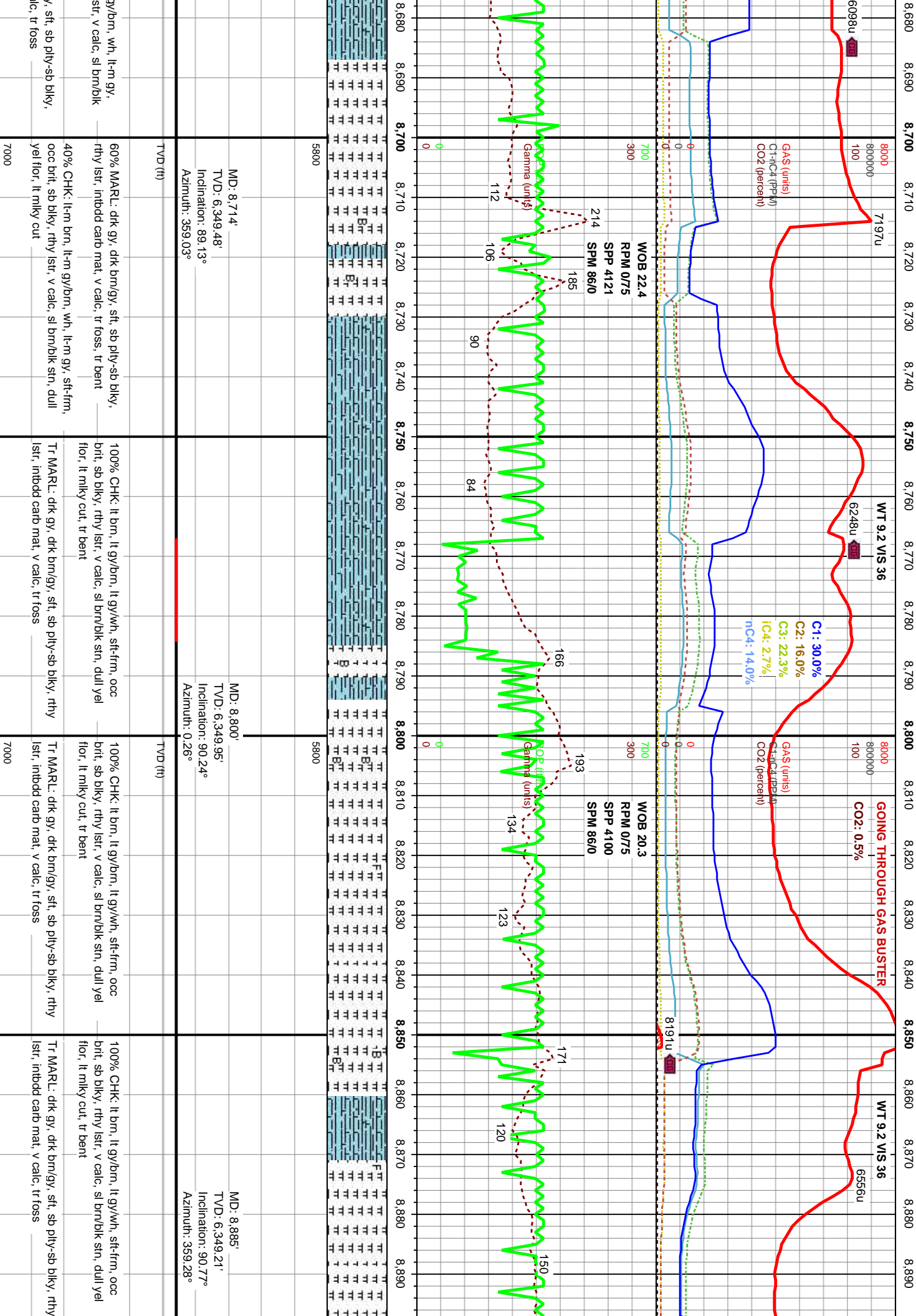
40% CHK: brn, brn/gy/wh, gy, sft-frn, occ brt, sb blk/gy, rthy lstr, v calc, sl brn/bk stn, dull yel flr, lt milky cut

40% CHK: brn, brn/gy/wh, gy, sft-frn, occ brt, sb blk/gy, rthy lstr, v calc, sl brn/bk stn, dull yel flr, lt milky cut

45% CHK: brn, brn/gy/wh, gy, sft-frn, occ brt, sb blk/gy, rthy lstr, v calc, sl brn/bk stn, dull yel flr, lt milky cut

30% MARL: dk gy, dk brn/gy, sft-frn, sb blk/gy, rthy lstr, inbdd carb mat, v calc, tr foss





9,120 9,130 9,140 9,150 9,160 9,170 9,180 9,190 9,200 9,210 9,220 9,230 9,240 9,250 9,260 9,270 9,280 9,290 9,300 9,310 9,320 9,330

WT 9.3 VIS 38

WT 9.3 VIS 35

GOING THROUGH
1-3' Intermittent Flares

C1: 53.1%
C2: 10.1%
C3: 19.1%
iC4: 2.1%
nC4: 9.2%

Gas (units)
C1-iC4 (PPM)
CO2 (percent)

Gas (units)
C1-iC4 (PPM)
CO2 (percent)

99.4
176
135
140

WOB 23.7
RPM 076
SPP 4168
SPM 840

WOB 20.8
RPM 076
SPP 3866
SPM 840

ROP (ft/hr)
Gamma (units)

ROP (ft/hr)
Gamma (units)

112
165
93
150

188
179

196

194

MD: 9,142'
TVD: 6,346'
Inclination: 89.9°
Azimuth: 358.27°

MD: 9,228'
TVD: 6,346.75'
Inclination: 89.1°
Azimuth: 358.03°

MD: 9,314'
TVD: 6,348.82'
Inclination: 88.15°
Azimuth: 358.39°

frm, gy/wh, frm, occ brit, sb ply,
brn/bk stn, dull yel flr, lt mky

80% CHK: gy, gy/wh, frm, occ brit, sb blk, rthy lstr,
v calc, sl brn/bk stn, dull yel flr, lt mky cut

80% CHK: gy-gy/wh, frm, occ brit, sb blk, rthy lstr,
v calc, sl brn/bk stn, dull yel flr, lt mky cut

60% MARL: dk gy, dk gy/brn, frm-hd, occ brit,
sb blk-sb ply, rthy lstr, intbdd carb mat, v calc,
tr foss, tr bent

70% MARL: dk gy-dk gy/brn, frm, occ
blk-sb ply, rthy lstr, intbdd carb mat, v
foss, tr bent

brn, drk gy, frm, occ brit, blk,
b mat, v calc, tr foss, tr bent

20% MARL: drk gy-gy/brn, blk, frm-hd, occ brit,
blk, rthy lstr, intbdd carb mat, v calc, tr foss, tr bent

20% MARL: drk gy, dk gy/brn, frm-hd, occ brit, sb
blk-sb ply, rthy lstr, intbdd carb mat, v calc, tr
foss, tr bent

40% CHK: m-dk gy, gy/wh, frm, occ brit, sb blk,
rthy lstr, v calc, sl brn/bk stn, dull yel flr, lt mky
cut

30% CHK: m-dk gy, gy/wh, frm, occ brit,
rthy lstr, v calc, sl brn/bk stn, dull yel flo
cut

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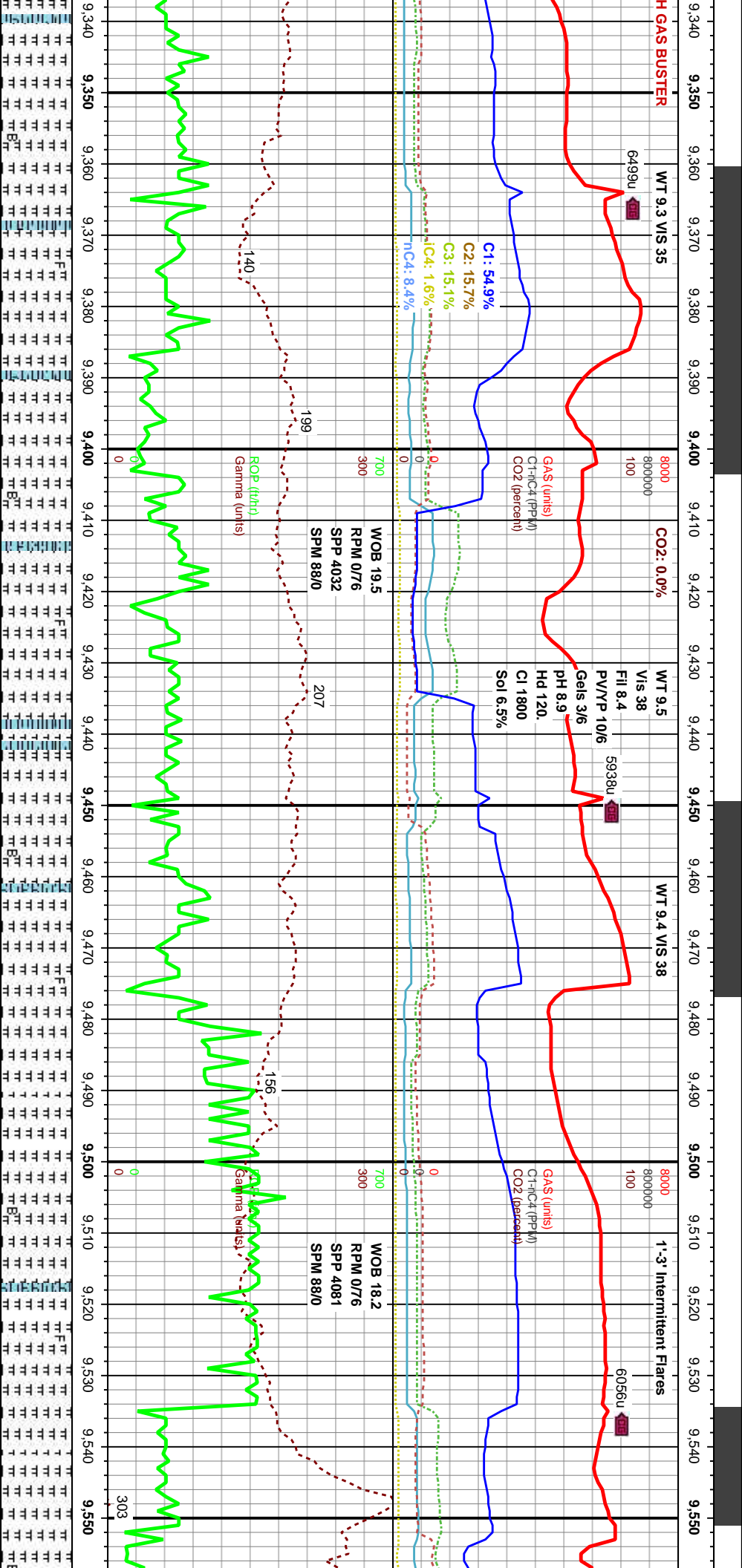
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TVD (ft)

TVD (ft)



5800		5800		5800	
MD: 9,400'	MD: 9,485'	MD: 9,485'	MD: 9,485'	MD: 9,485'	MD: 9,485'
TVD: 6,351.16'	TVD: 6,352.74'	TVD: 6,352.74'	TVD: 6,352.74'	TVD: 6,352.74'	TVD: 6,352.74'
Inclination: 88.73°	Inclination: 89.13°	Inclination: 89.13°	Inclination: 89.13°	Inclination: 89.13°	Inclination: 89.13°
Azimuth: 359.71°	Azimuth: 1.15°	Azimuth: 1.15°	Azimuth: 1.15°	Azimuth: 1.15°	Azimuth: 1.15°
TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)
80% MAARL: dtk gy/brn, dtk gy, frm, occ brt, sb blk-y-sb ply, rthy lstr, intbdd carb mat, v calc, tr foss, tr bent	90% MAARL: dtk brn/gy-dtk brn, frm, occ brt, sb ply, rthy lstr, intbdd carb mat, v calc, tr foss, tr bent	90% MAARL: dtk brn, dtk brn/gy, frm, occ brt, sb ply, rthy lstr, intbdd carb mat, v calc, tr foss, tr bent	90% MAARL: dtk brn, dtk brn/gy, frm, occ brt, sb ply, rthy lstr, intbdd carb mat, v calc, tr foss, tr bent	90% MAARL: dtk brn, dtk brn/gy, frm, occ brt, sb ply, rthy lstr, intbdd carb mat, v calc, tr foss, tr bent	90% MAARL: dtk brn, dtk brn/gy, frm, occ brt, sb ply, rthy lstr, intbdd carb mat, v calc, tr foss, tr bent
15% CHK: gy/wh-brn/wh, dtk gy/brn, frm, occ brt, sb blk-y, rthy lstr, v calc, sl brn/blk stn, dull yel flr, lt mlky cut	10% CHK: gy/wh-brn/wh, dtk gy/brn, frm, occ brt, sb blk-y, rthy lstr, v calc, sl brn/blk stn, dull yel flr, lt mlky cut	10% CHK: gy/wh-brn/wh, dtk gy/brn, frm, occ brt, sb blk-y, rthy lstr, v calc, sl brn/blk stn, dull yel flr, lt mlky cut	10% CHK: dtk gy/brn, dtk gy/wh-brn/wh, frm, occ brt, sb blk-y, rthy lstr, v calc, sl brn/blk stn, dull yel flr, lt mlky cut	10% CHK: dtk gy/brn, dtk gy/wh-brn/wh, frm, occ brt, sb blk-y, rthy lstr, v calc, sl brn/blk stn, dull yel flr, lt mlky cut	10% C: lstr, v c
7000	7000	7000	7000	7000	7000

9,560 9,570 9,580 9,590 9,600 9,610 9,620 9,630 9,640 9,650 9,660 9,670 9,680 9,690 9,700 9,710 9,720 9,730 9,740 9,750 9,760 9,770

WT 9.3 VIS 38

C1: 36.0%
C2: 13.9%
C3: 26.7%
iC4: 2.8%
nC4: 14.0%

GAS (units)
C1-iC4 (PPM)
CO2 (percent)

8000
6168u

CO2: 0.0%

WOB 22.2
RPM 075
SPM 3757
SPM 86/0

154
168
106
184

ROE (ft)
Gamma (units)

0
0

WT 9.1 VIS 36

1-3' Intermittent Flares

GAS (units)
C1-iC4 (PPM)
CO2 (percent)

8000
6347u

WOB 21.7
RPM 055
SPM 3843
SPM 0/85

168

ROE (ft)
Gamma (units)

0
0

WT 9.1 VIS 36

C1: 55
C2: 17
C3: 15
iC4: 1
nC4: 7

MD: 9.571'
TVD: 6.353.65'
Inclination: 89.66°
Azimuth: 1.55°

MD: 9.656'
TVD: 6.354.25'
Inclination: 89.53°
Azimuth: 1.43°

MD: 9.742'
TVD: 6.365.75'
Inclination: 88.48°
Azimuth: 1.15°

TVD (ft)

TVD (ft)

MARL: dkf brn/gy, dkf brn, frm, occ brt, sb
ply, rthy lstr, intbdd carb mat, v calc, tr foss, tr
bent

85% MARL: dkf brn, dkf brn/gy, frm, occ brt, sb
ply, rthy lstr, intbdd carb mat, v calc, tr foss, tr
bent

85% MARL: dkf brn/gy, dkf brn, frm, occ brt, sb
ply, rthy lstr, intbdd carb mat, v calc, tr foss, tr
bent

90% MARL: dkf brn, dkf brn/gy, frm, occ brt, sb
ply, rthy lstr, intbdd carb mat, v calc, tr foss, tr
bent

90% MARL: dkf brn/gy, frm,
lstr, intbdd carb mat, v calc, tr

HK: m-lt gy, gy/brn, frm, occ brt, blk, rthy
calc, sl brn/blk str, dull yel flr, lt milky cut

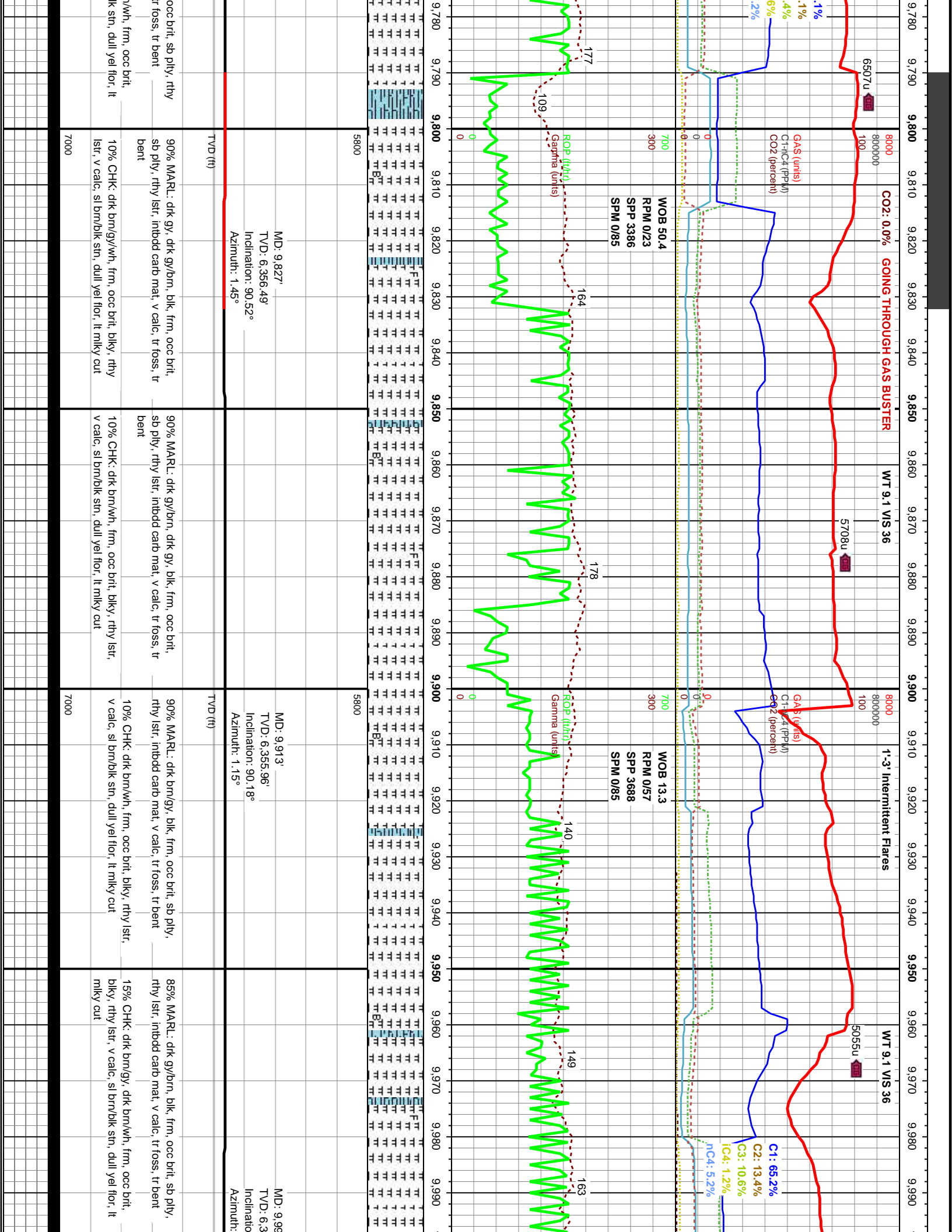
15% CHK: gy, gy/wh, dkf brn/gy, frm, occ brt, sb
blk, rthy lstr, v calc, sl brn/blk str, dull yel flr, lt
milky cut

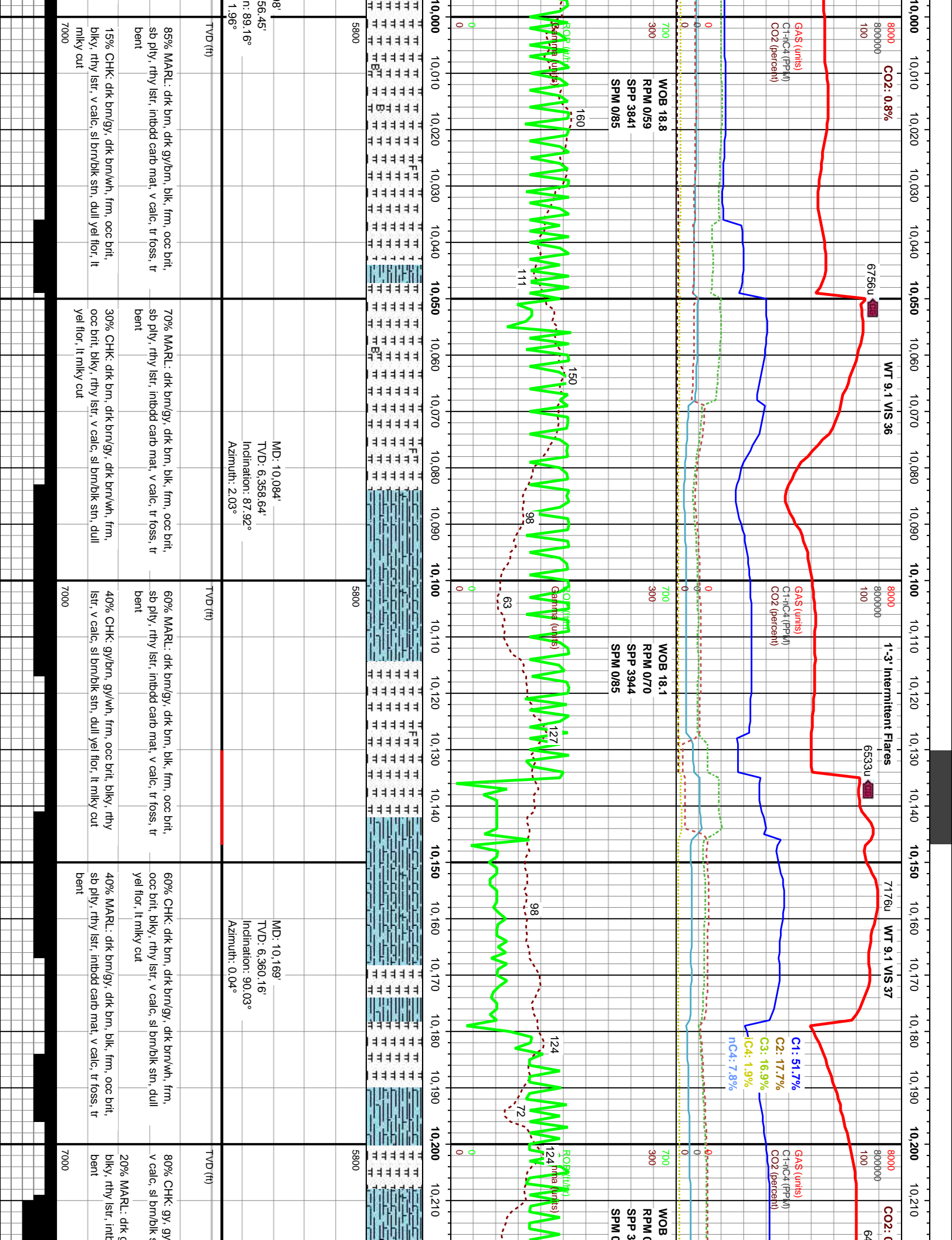
10% CHK: dkf gy/brn, dkf gy/wh, frm, occ brt, sb
blk, rthy lstr, v calc, sl brn/blk str, dull yel flr, lt
milky cut

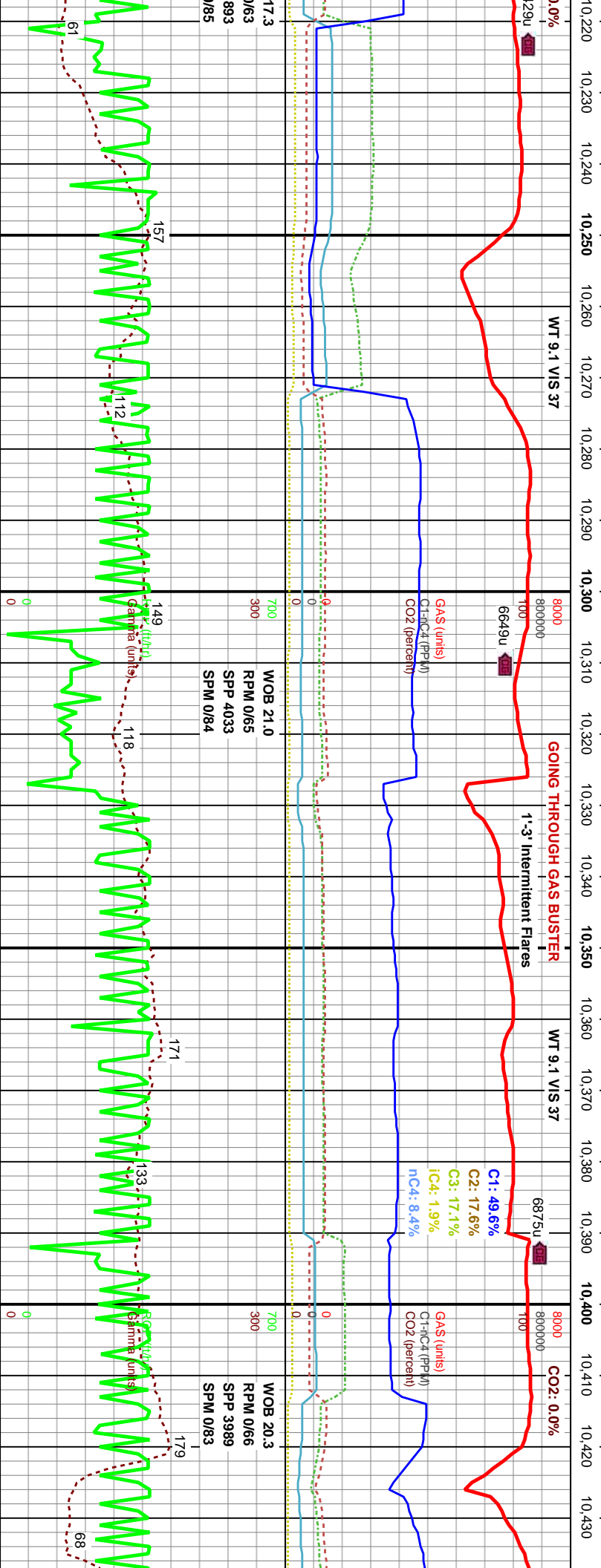
10% CHK: dkf gy/wh, dkf brn
blk, rthy lstr, v calc, sl brn/br

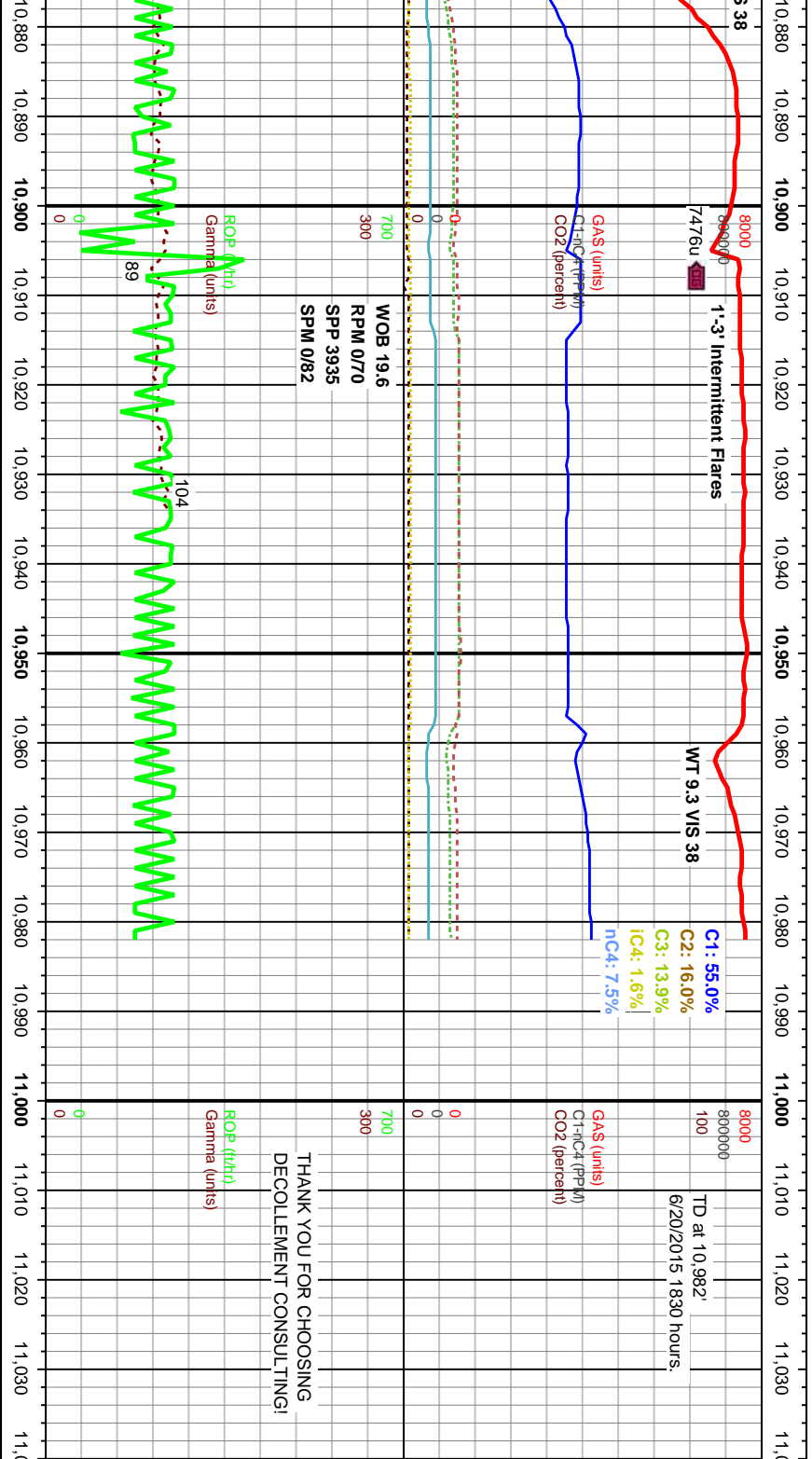
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