Décollement Consulting Inc.

Scale: 5" / 100'
Measured Depth Log

Well Name	North Platte 21-24-34HNB		
Location	SE/SW Section 27, T5N - R63W		
State	CO	**County**	Weld
Country	USA	**Rig Number**	Xtreme 22
API Number	05-123-41883	**Field**	Wattenberg
Region	D.J. Basin	**Drilling Completed**	10/6/2015
Spud Date	9/11/2015		
Surface Coordinates	1136 FSL x 2463 FWL (Lat: 40.36634, -104.42244)		
Bottom Hole Coordinates	470 FSL x 2067 FWL (Lat: 40.35002, -104.42399)		
Ground Elevation	4,541	**K.B. Elevation**	4,558
Logged Interval	6,936 **To** 11,074	**Total Depth**	11,074
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 Dan Kabala & Brian Spitzmiller

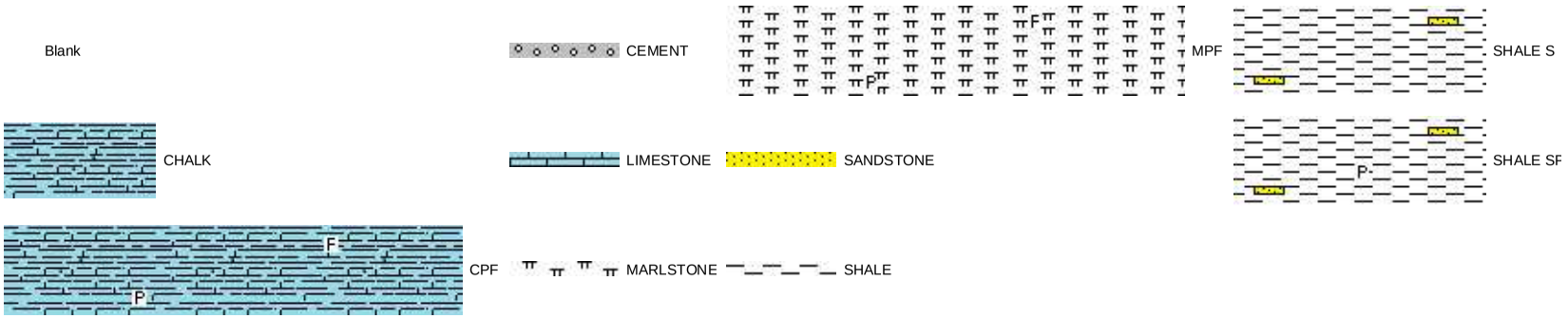
Company Decollement Consulting Inc.

Address 13300 Braun Rd.
Golden, CO. 80401

Zone Color Coding

Oil	Condensate	Gas
Note	Core	Pressure
Error	Water	Seal

Rock Types



Accessories

Fossils

- ALGAE
- AMPHIPORA
- BELEMNITE
- BIOCLASTIC
- BRACHOIPOD
- BRYOZOA
- CEPHALOPOD
- CORAL
- CRINOID
- ECHINOID
- FISH
- FORAMINIFERA
- FOSSIL
- GASTROPOD
- OOLITE
- OSTRACOD
- PELECYPOD
- PELLET
- PISOLITE
- PLANT REMAINS
- PLANT SPORES
- SCAPHOPOD
- STROMATOPOROID

Minerals

- ANHYDRITIC
- ARGILLACEOUS
- ARGILLITE GRAIN
- BENTONITE
- BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHTDK
- CHTLT
- COAL - THIN BEDS
- DOLOMITIC
- FELDSPAR
- FERRUGINOUS PELLET
- FERRUGINOUS
- GLAUCONITE
- GYPSIFEROUS
- HEAVY MINERAL
- KAOLIN
- MARLSTONE
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETS
- PYRITE
- SALT CAST
- SANDY
- SILICEOUS
- SILTY
- TUFFACEOUS

Stringer

- 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

O ORGANIC

FORMATION TOP

L LITHOGRAPHIC

il Show

Rounding

P PINPOINT

GAS SHOW

MX MICROXLN

DEAD

VUGGY

MN DEPTH

ANGULAR

MS MUDSTONE

EVEN

NORMAL FAULT

R ROUNDED

PS PACKSTONE

Engineering

QUESTIONABLE

OIL SHOW

SUBANG

WS WACKESTONE

SPOTTED STAINING

BIT

OVERTURNED STRATA

SUBRND

Sorting

CASING

REVERSE FAULT

orosity

Textures

CONNECTION (LEFT)

SIDEWALL CORE (LEFT)

M MODERATE

EARTHY

CONNECTION (RIGHT)

SIDEWALL CORE (RIGHT)

BS BOUNDSTONE

P POOR

FENESTRAL

CONNECTION GAS

SLIDE

C CHALKY

W WELL

FRACTURE

CORE - LOST

SURVEY

CX CRYPTOXLN

INTERCRYSTALLINE

CORE - RECOVERED

TRIP GAS

E EARTHY

INTEROOLITIC

DST INTERVAL

WIRELINE TESTED - LEFT

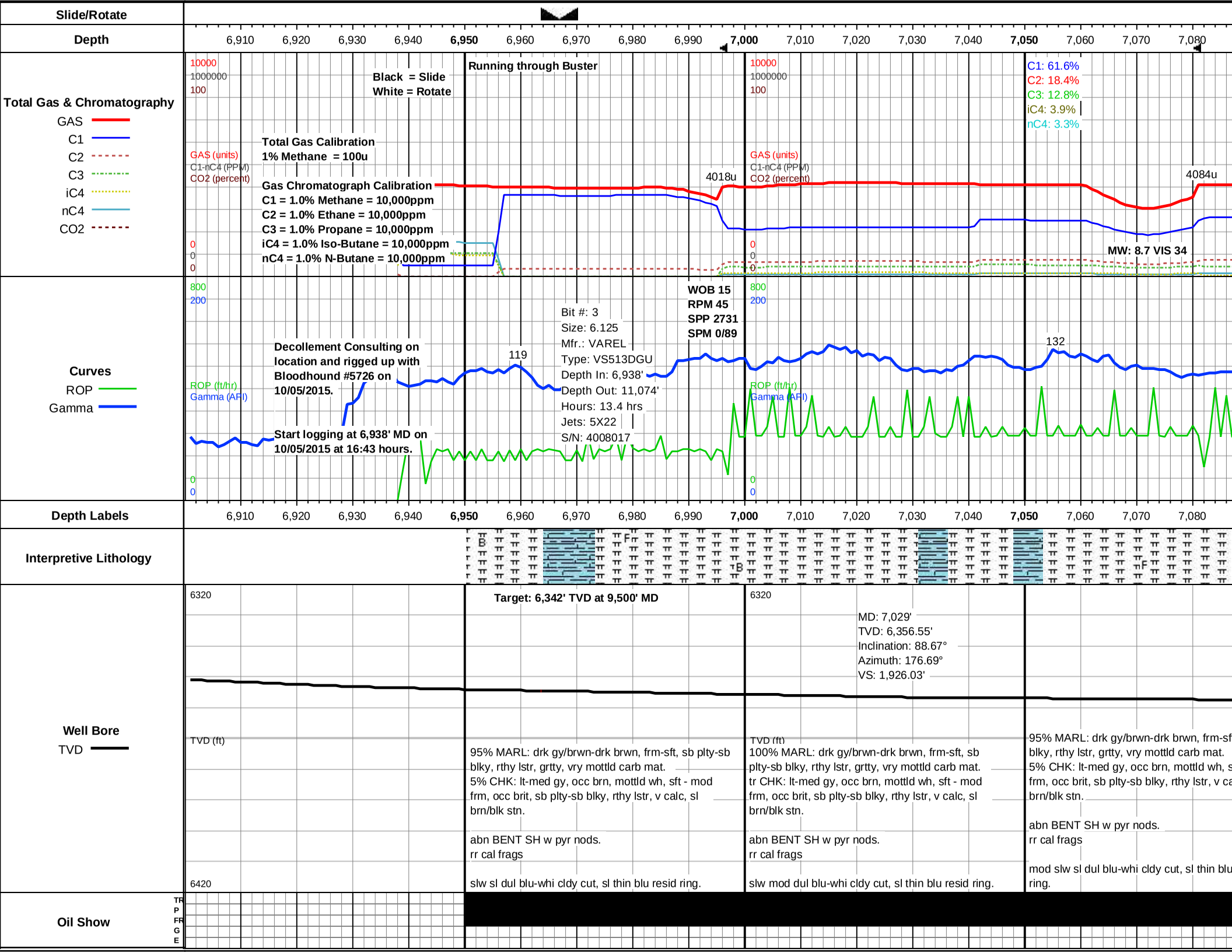
FX FINELYXLN

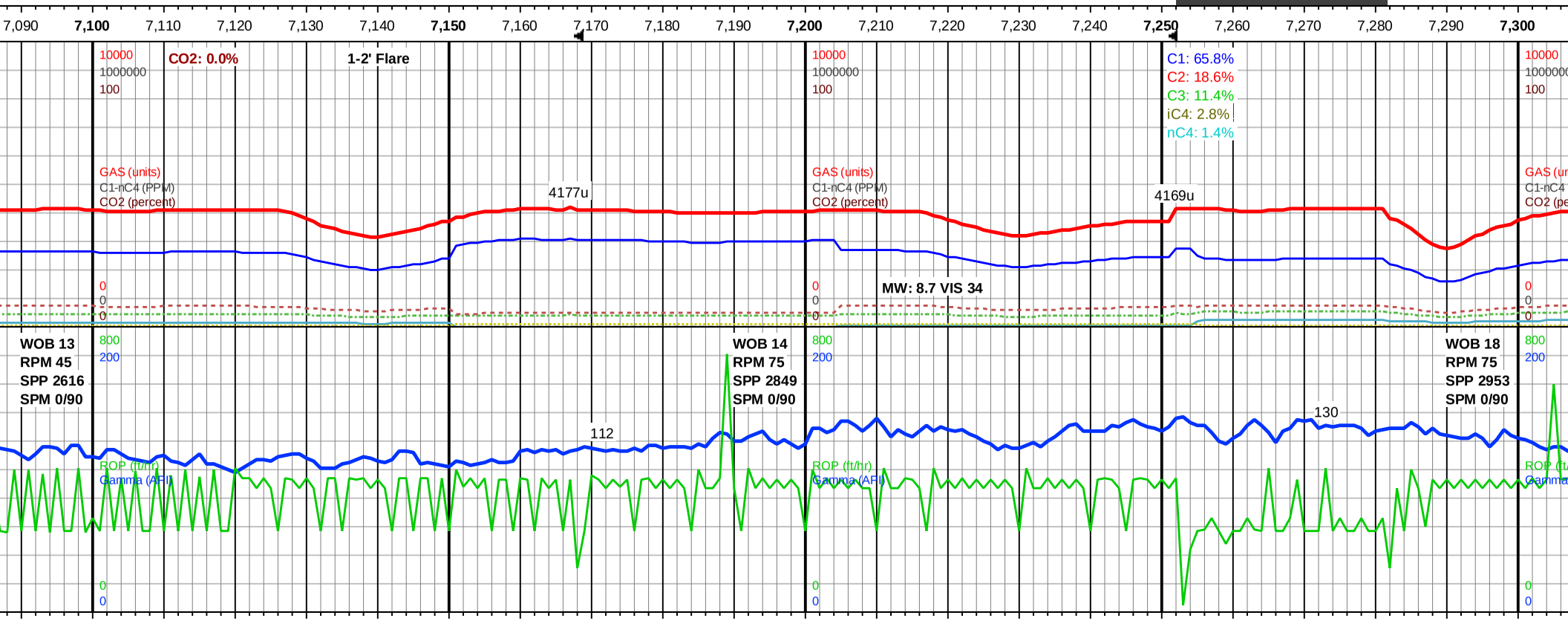
MOLDIC

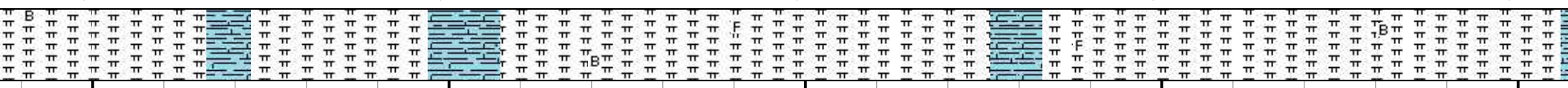
FAULT

WIRELINE TESTED - RT

GS GRAINSTONE


Slide/Rotate
Depth
6,910 6,920 6,930 6,940 6,950 6,960 6,970 6,980 6,990 7,000 7,010 7,020 7,030 7,040 7,050 7,060 7,070 7,080
Total Gas & Chromatography
GAS
C1
C2
C3
iC4
nC4
CO2
10000
1000000
100
Black = Slide
White = Rotate
Running through Buster
C1: 61.6%
C2: 18.4%
C3: 12.8%
iC4: 3.9%
nC4: 3.3%
Total Gas Calibration
1% Methane = 100u
GAS (units)
C1-nC4 (PPM)
CO2 (percent)
Gas Chromatograph Calibration
C1 = 1.0% Methane = 10,000ppm
C2 = 1.0% Ethane = 10,000ppm
C3 = 1.0% Propane = 10,000ppm
iC4 = 1.0% Iso-Butane = 10,000ppm
nC4 = 1.0% N-Butane = 10,000ppm
4018u
4084u
MW: 8.7 VIS 34
0
Curves
ROP
Gamma
800
200
ROP (ft/hr)
Gamma (API)
Decollement Consulting on location and rigged up with Bloodhound #5726 on 10/05/2015.
Start logging at 6,938' MD on 10/05/2015 at 16:43 hours.
119
132
Bit #: 3
Size: 6.125
Mfr.: VAREL
Type: VS513DGU
Depth In: 6,938'
Depth Out: 11,074'
Hours: 13.4 hrs
Jets: 5X22
S/N: 4008017
WOB 15
RPM 45
SPP 2731
SPM 0/89
Depth Labels
Interpretive Lithology
B
F
Well Bore
TVD
6320
6420
TVD (ft)
Target: 6,342' TVD at 9,500' MD
MD: 7,029'
TVD: 6,356.55'
Inclination: 88.67°
Azimuth: 176.69°
VS: 1,926.03'
95% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
5% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
abn BENT SH w pyr nods.
rr cal frags
slw sl dul blu-whi cldy cut, sl thin blu resid ring.
100% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
tr CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
abn BENT SH w pyr nods.
rr cal frags
slw mod dul blu-whi cldy cut, sl thin blu resid ring.
95% MARL: drk gy/brwn-drk brwn, frm-sf
blky, rthy lstr, grtty, vry mottld carb mat.
5% CHK: lt-med gy, occ brn, mottld wh, s
frm, occ brit, sb plty-sb blky, rthy lstr, v ca
brn/blk stn.
abn BENT SH w pyr nods.
rr cal frags
mod slw sl dul blu-whi cldy cut, sl thin blu
ring.
Oil Show
TR
P
FR
G
E





6320

MD: 7,114'
TVD: 6,357.75'
Inclination: 89.72°
Azimuth: 176.57°
VS: 2,010.29'

6320

MD: 7,285'
TVD: 6,356.44'
Inclination: 90.49°
Azimuth:MD: 7,291'
VS: 2,17TVD: 6,356.39'

6320

t, sb plty-sb
ft - mod
alc, sl
resid

90% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
10% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

com BENT SH w pyr nods.
rr cal frags

mod slw sl dul blu-whi strmg cut, sl thin blu resid ring.

90% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
10% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

com BENT SH w pyr nods.
rr cal frags

slw sl dul blu-whi mlky cut, sl thin blu resid ring.

TVD (ft)

90% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
10% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

com BENT SH w pyr nods.
rr cal frags

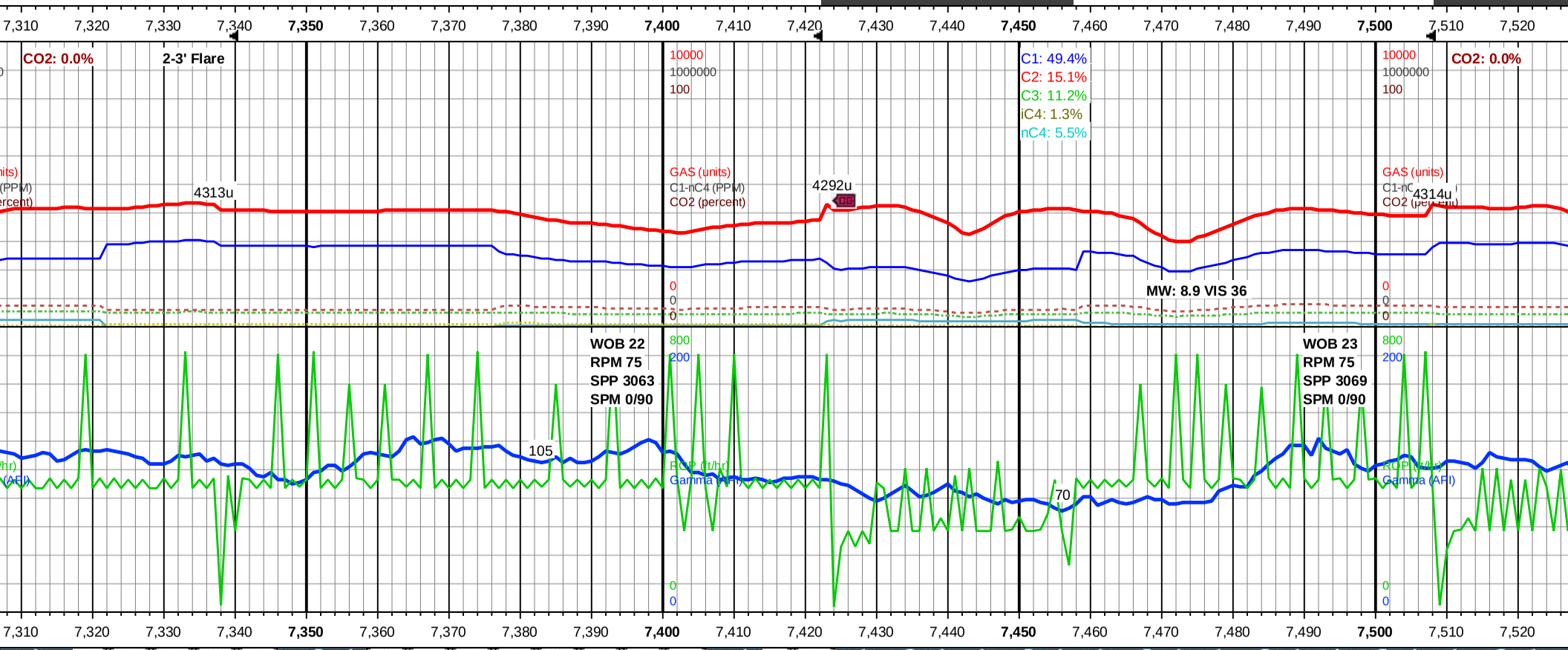
slw sl dul blu-whi cldy cut, sl thin blu resid ring.

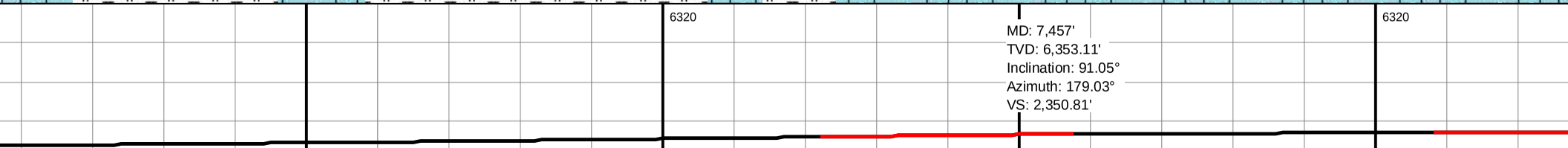
80% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
20% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr BENT SH w pyr nods.
rr cal frags

mod slw sl dul blu-whi cldy cut, sl thin blu resid ring.

TVD (ft)
80% M
blky, rth
20% CH
frm, occ
brn/blk
rr BENT
rr cal fr
sl fst sl





ARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb
ny lstr, grtty, vry mottld carb mat.
HK: lt-med gy, occ brn, mottld wh, sft - mod
c brit, sb plty-sb blky, rthy lstr, v calc, sl
stn.

T SH w pyr nods.
ags

dul blu-whi cldy cut, sl thin blu resid ring.

80% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
20% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr BENT SH w pyr nods.
rr cal frags

mod fst sl dul blu-whi mlky cut, sl thin blu resid ring.

50% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
50% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr BENT SH w pyr nods.
rr cal frags

v fst mod bri blu-whi strmg cut, sl thck blu resid ring.
6420

80% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
20% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

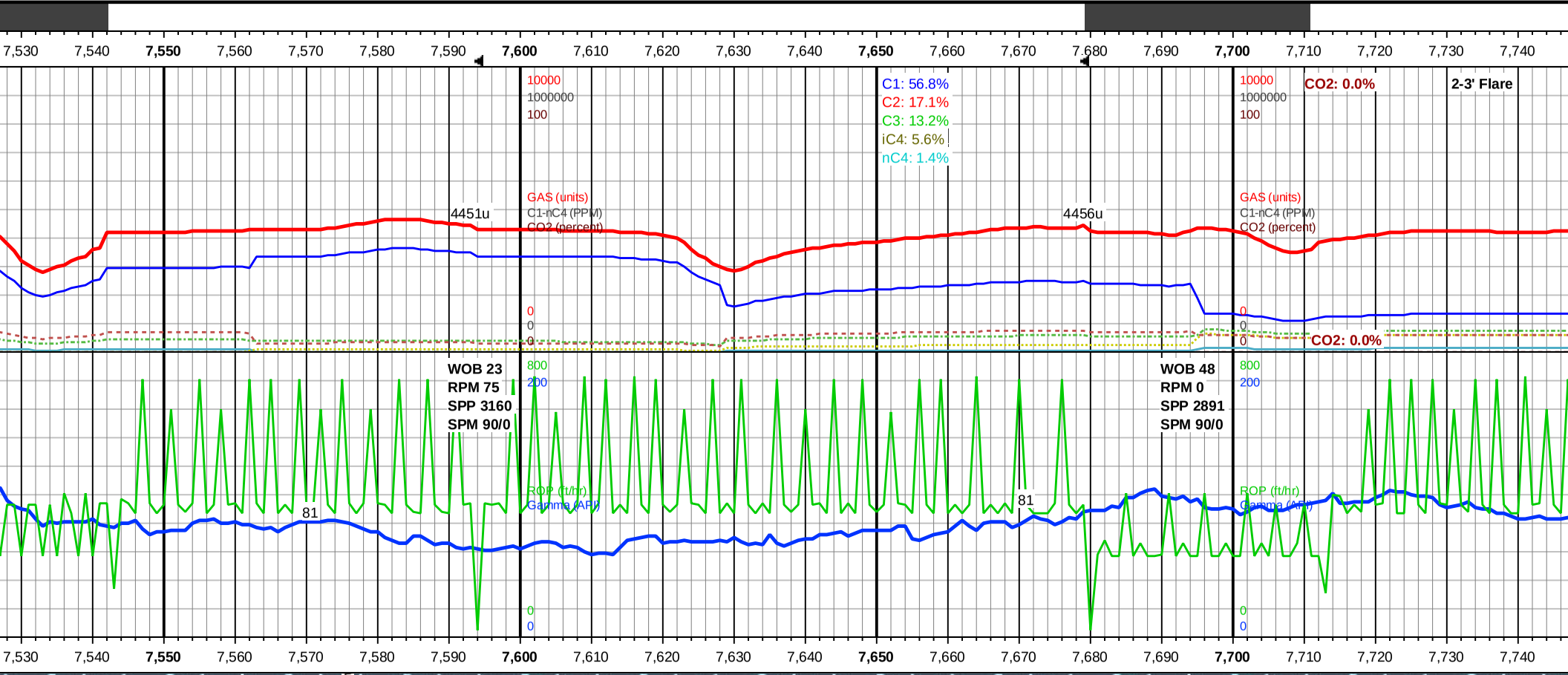
rr BENT SH w pyr nods.
rr cal frags

v fst sl bri blu-whi strmg cut, sl thck blu resid ring.

90% CHK: lt-med gy, occ brn,
frm, occ brit, sb plty-sb blky, r
brn/blk stn.
10% MARL: drk gy/brwn-drk b
blky, rthy lstr, grtty, vry mottld

rr BENT SH w pyr nods.
rr cal frags

v fst mod bri blu-whi strmg cut
6420



MD: 7,542'
TVD: 6,352.54'
Inclination: 89.72°
Azimuth: 180.7°
VS: 2,435.57'

6320

MD: 7,715'
TVD: 6,353.95'
Inclination: 89.35°
Azimuth: 181.3°
VS: 2,608.3'

mottld wh, sft - mod
thy lstr, v calc, sl
rwn, frm-sft, sb plty-sb
carb mat.
t, sl thck blu resid ring.

100% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
rr MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr BENT SH w pyr nods.
rr cal frags

instnt mod bri blu-whi strmg cut, sl thck blu resid ring.

TVD (ft)

100% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
rr MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

instnt mod bri blu-whi strmg cut, sl thck blu resid ring.

100% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
tr MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

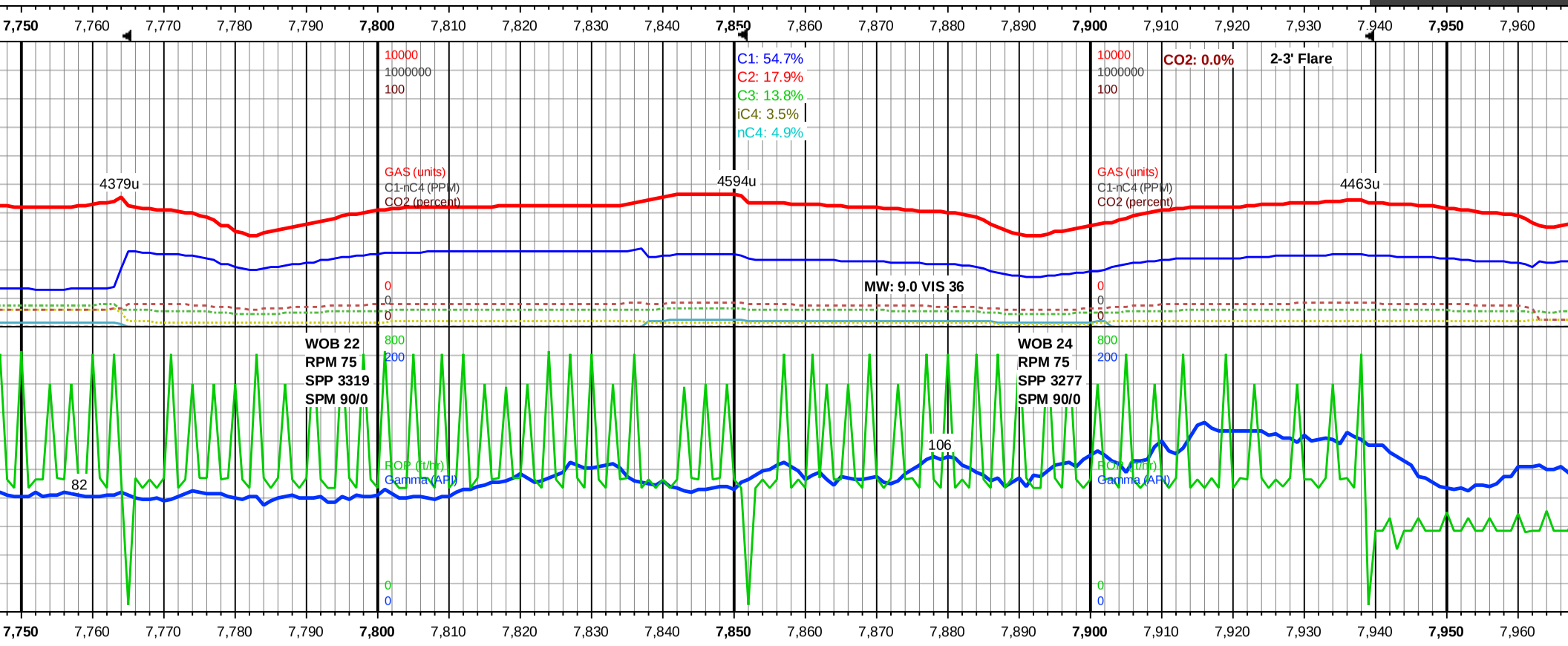
v fst mod bri blu-whi strmg cut, sl thck blu resid ring.

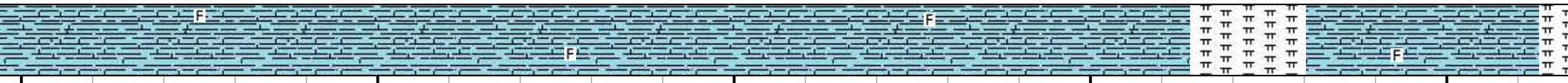
TVD (ft)

100% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
tr MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

insnt mod bri blu-whi strmg cut, sl thck blu resid ring.





MD: 7,802'
TVD: 6,354.16'
Inclination: 90.37°
Azimuth: 181.14°
VS: 2,695.18'

MD: 7,887'
TVD: 6,352.5'
Inclination: 91.86°
Azimuth: 181.76°
VS: 2,780.07'

6320

100% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
rr MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

v fst sl bri blu-whi strmg cut, sl thck blu resid ring.

TVD (ft)

100% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
tr MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

v fst mod bri blu-whi strmg cut, mod thck blu resid ring.

100% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
tr MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

instnt mod bri blu-whi strmg cut, sl thck blu resid ring.

6320

90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

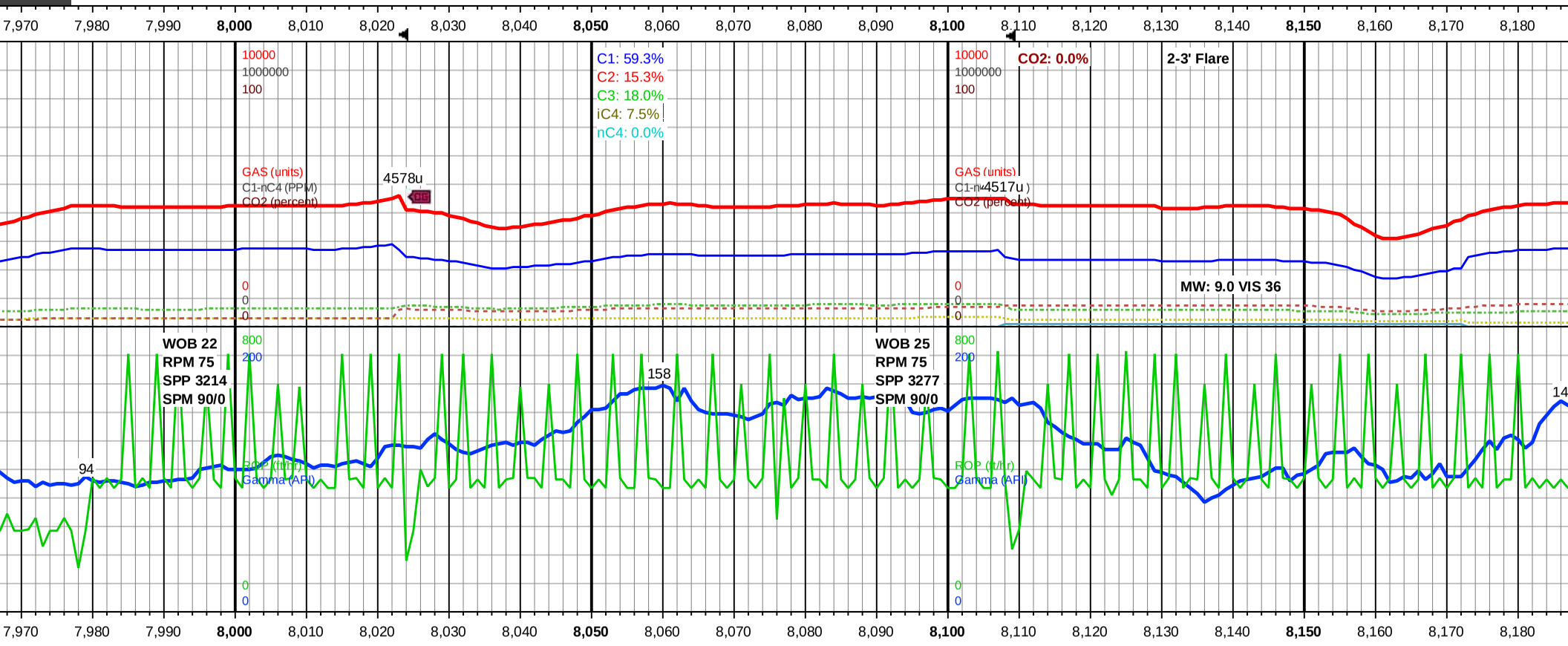
v fst mod bri blu-whi strmg cut, sl thck blu resid ring.

6420

95% CHK: lt-med
frm, occ brit, sb pl
brn/blk stn.
5% MARL: drk gy/
blky, rthy lstr, grtty

rr cal frags

v fst mod bri blu-w
ring.



: 7,973'
D: 6,350.48'
lination: 90.84°
: 7,971' 30.3°
D: 6,350.53'

6320

MD: 8,058'
TVD: 6,348.82'
Inclination: 91.39°
Azimuth: 180.42°
VS: 2,950.71'

6320

MD: 8,144'
TVD: 6,345.52'
Inclination: 93.02°
Azimuth: 180.26°
VS: 3,036.45'

TVD (ft)

gy, occ brn, mottld wh, sft - mod
ty-sb blky, rthy lstr, v calc, sl
/brwn-drk brwn, frm-sft, sb plty-sb
, vry mottld carb mat.

whi strmg cut, mod thck blu resid

90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

instnt mod bri blu-whi strmg cut, sl thck blu resid ring.

80% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
20% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

v fst mod bri blu-whi strmg cut, sl thck blu resid ring.

80% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
20% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

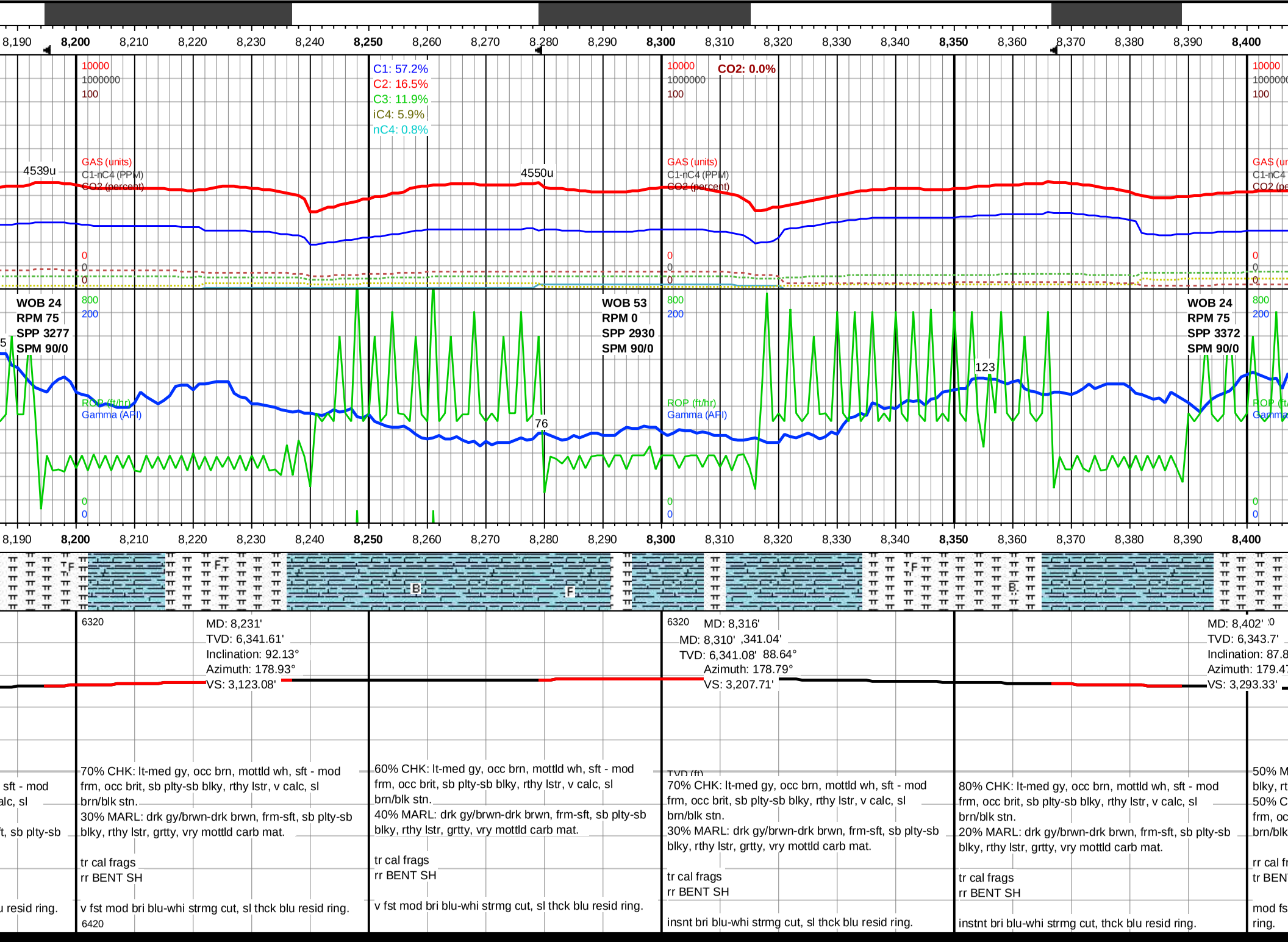
v fst mod bri blu-whi strmg cut, sl thck blu resid ring.

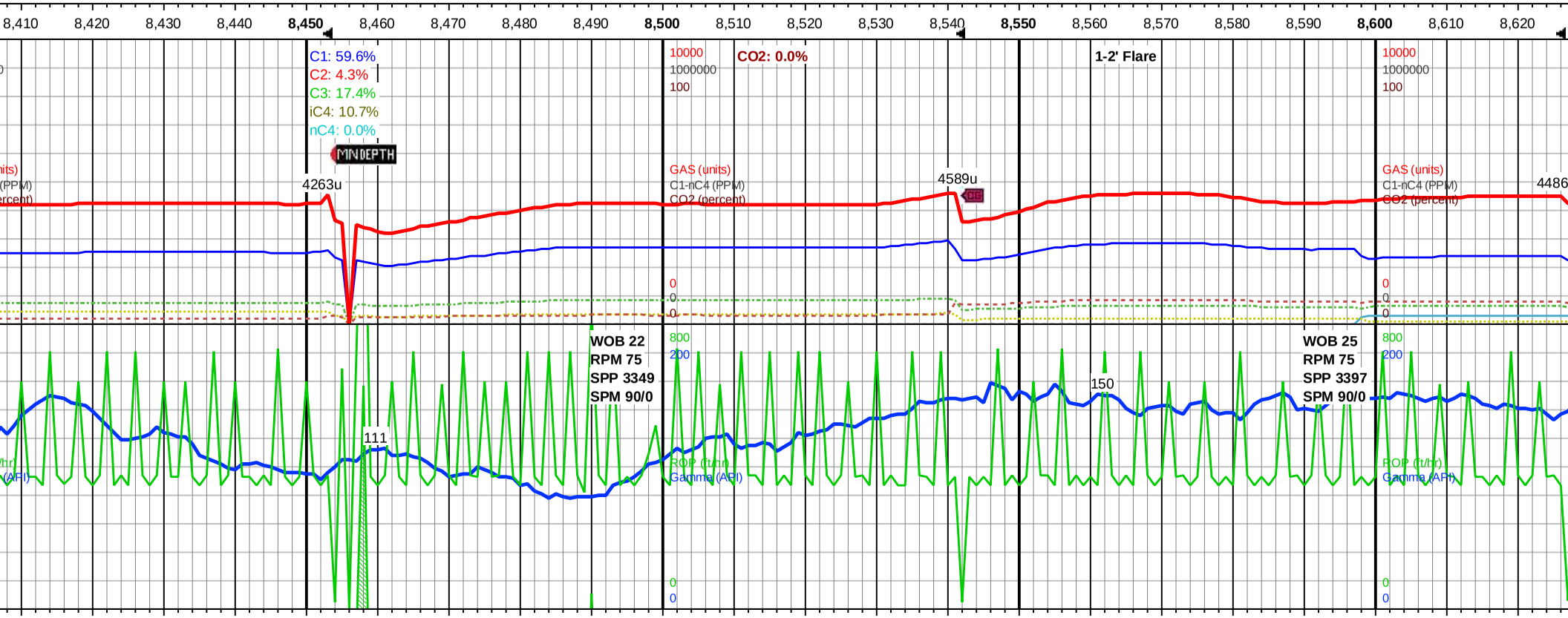
6420

70% CHK: lt-med gy, occ brn, mottld wh, frm, occ brit, sb plty-sb blky, rthy lstr, v ca brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sf blky, rthy lstr, grtty, vry mottld carb mat.

tr cal frags

v fst mod bri blu-whi strmg cut, sl thck blu


8,190
8,200
8,210
8,220
8,230
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
C1: 57.2%
C2: 16.5%
C3: 11.9%
iC4: 5.9%
nC4: 0.8%
CO2: 0.0%
4539u
4550u
GAS (units)
C1-nC4 (PPM)
CO2 (percent)
WOB 24
RPM 75
SPP 3277
SPM 90/0
WOB 53
RPM 0
SPP 2930
SPM 90/0
WOB 24
RPM 75
SPP 3372
SPM 90/0
ROP (ft/hr)
Gamma (API)
76
123
6320
MD: 8,231'
TVD: 6,341.61'
Inclination: 92.13°
Azimuth: 178.93°
VS: 3,123.08'
6320
MD: 8,316'
MD: 8,310'
,341.04'
TVD: 6,341.08'
88.64°
Azimuth: 178.79°
VS: 3,207.71'
MD: 8,402'
TVD: 6,343.7'
Azimuth: 179.4
VS: 3,293.33'
70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
tr cal frags
rr BENT SH
v fst mod bri blu-whi strmg cut, sl thck blu resid ring.
6420
60% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
40% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
tr cal frags
rr BENT SH
v fst mod bri blu-whi strmg cut, sl thck blu resid ring.
70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
tr cal frags
rr BENT SH
insnt bri blu-whi strmg cut, sl thck blu resid ring.
80% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
20% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
tr cal frags
rr BENT SH
instnt bri blu-whi strmg cut, thck blu resid ring.



MD: 8,488'
TVD: 6,346.3'
Inclination: 88.73°
Azimuth: 179°
VS: 3,378.97'

MD: 8,573'
TVD: 6,347.35'
Inclination: 89.85°
Azimuth: 179.03°
VS: 3,463.62'

6320

6320

6420

ARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb
hy lstr, grtty, vry mottld carb mat.
HK: lt-med gy, occ brn, mottld wh, sft - mod
c brit, sb plty-sb blky, rthy lstr, v calc, sl
stn.

rags
T SH

t sl bri blu-whi strmg cut, sl thck blu resid

60% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
40% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr cal frags
tr BENT SH

v fst mod bri blu-whi strmg cut, sl thck blu resid ring.

60% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
40% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

com cal frags
tr BENT SH

mod fst mod bri blu-whi strmg cut, sl thck blu resid ring.

60% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
40% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

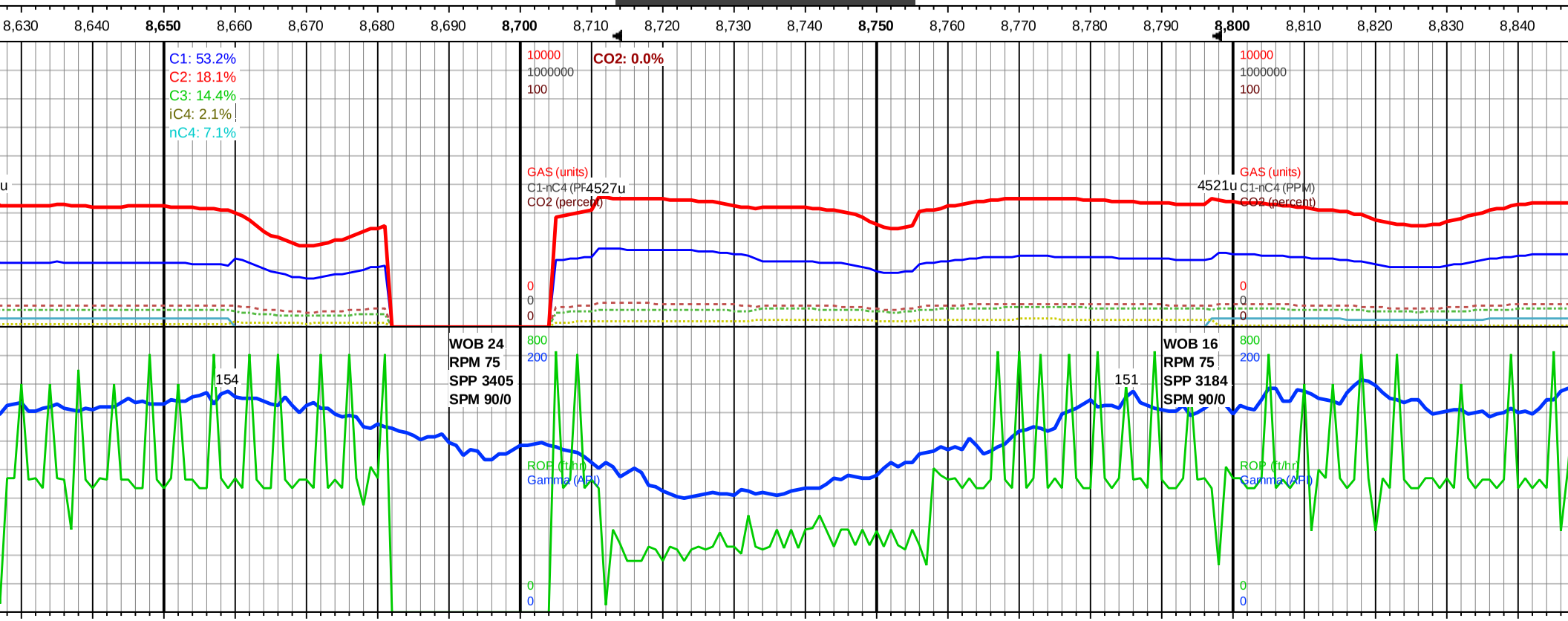
rr cal frags
tr BENT SH

v fst mod bri blu-whi strmg cut, sl thck blu resid ring.

70% MARL: drk gy/brwn-drk b
blky, rthy lstr, grtty, vry mottld
30% CHK: lt-med gy, occ brn,
frm, occ brit, sb plty-sb blky, r
brn/blk stn.

rr cal frags
tr BENT SH

v fst sl bri blu-whi strmg cut, n



MD: 8,658'
TVD: 6,346.68'
Inclination: 91.05°
Azimuth: 179.89°
VS: 3,548.33'

6320

MD: 8,744'
TVD: 6,346.28'
Inclination: 89.48°
Azimuth: 179.23°
VS: 3,634.05'

6320

MD: 8,829'
TVD: 6,347.38'
Inclination: 89.04°
Azimuth: 178.96°
VS: 3,718.71'

brwn, frm-sft, sb plty-sb
carb mat.
mottld wh, sft - mod
thy lstr, v calc, sl

nod thck blu resid ring.

70% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
30% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr cal frags
tr BENT SH

mod fst sl bri blu-whi strmg cut, sl thck blu resid ring.

60% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
40% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
rr BENT SH

v fst mod bri blu-whi strmg cut, sl thck blu resid ring.

6420

50% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
50% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
rr BENT SH

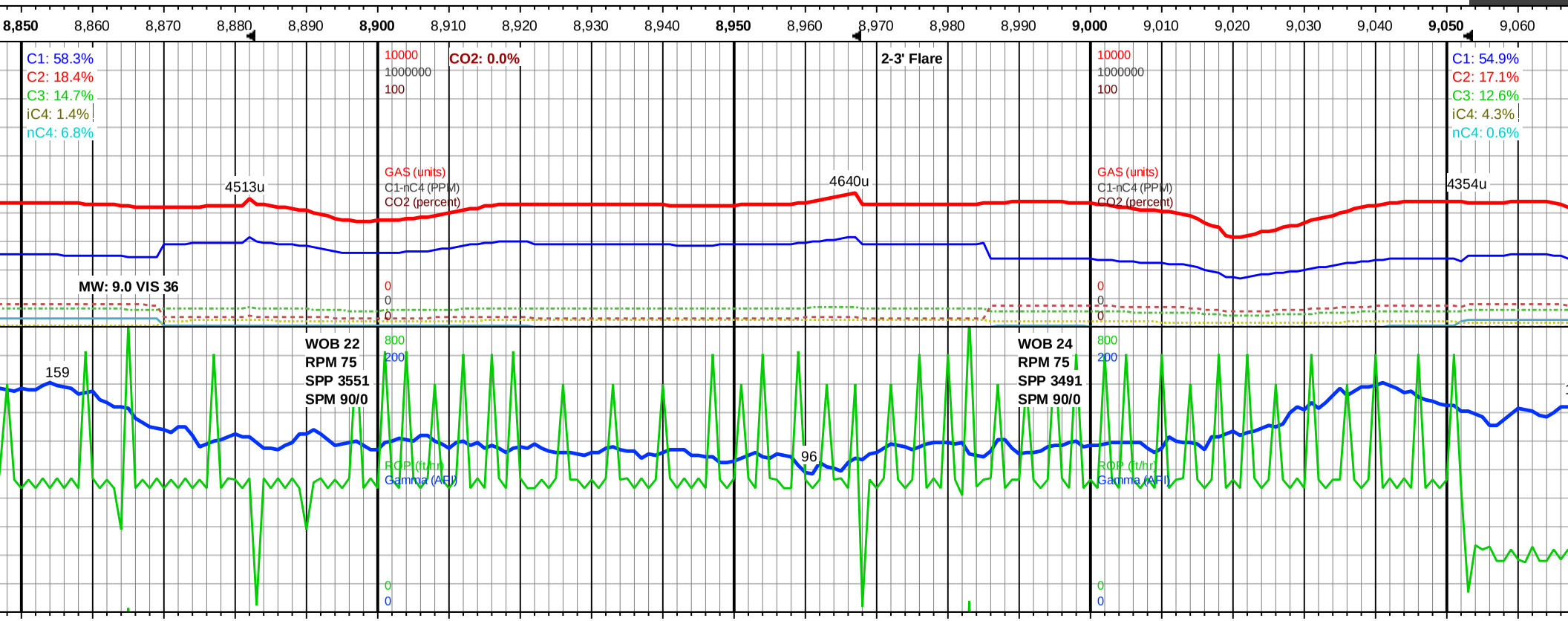
instnt bri blu-whi strmg cut, sl thck blu resid ring.

TVD (ft)

70% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
30% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr cal frags

mod fst sl bri blu-whi strmg cut, sl thck blu resid ring.



6320

MD: 8,915'
TVD: 6,348.12'
Inclination: 89.97°
Azimuth: 179.65°
VS: 3,804.4'

6320

TVD (ft)

90% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
10% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr cal frags
tr BENT SH

sl fst sl bri blu-whi strmg cut, sl thck blu resid ring.

TVD (ft)

50% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
50% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr cal frags
tr BENT SH

mod fst sl bri blu-whi strmg cut, thck blu resid ring.

60% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
40% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

instnt bri blu-whi strmg cut, sl thck blu resid ring.

TVD (ft)

50% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
50% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

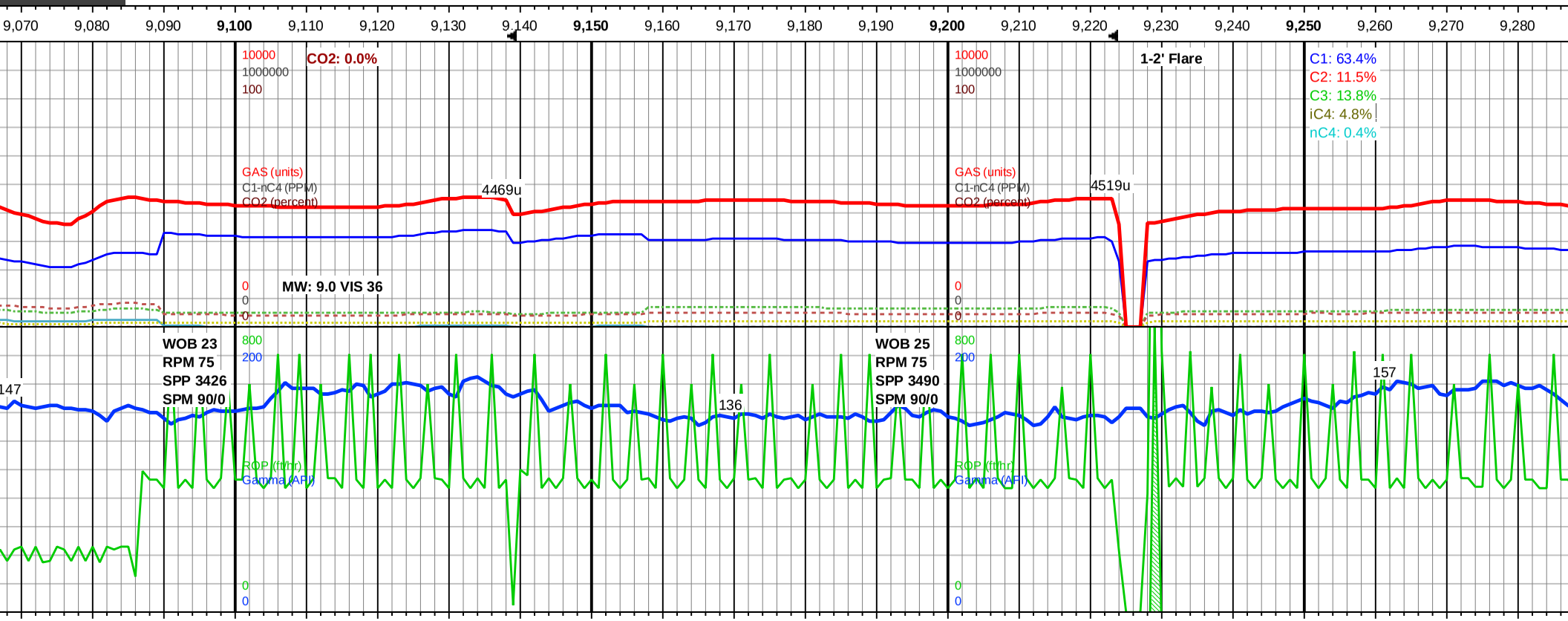
tr BENT SH

v fst sl bri blu-whi strmg cut, thck blu resid ring.

60% MARL: drk gy
blky, rthy lstr, grtty
40% CHK: lt-med
frm, occ brit, sb plt
brn/blk stn.

tr BENT SH

mod fst sl bri blu-w



MD: 9,086'
TVD: 6,347.13'
Inclination: 89.38°
Azimuth: 180.13°
VS: 3,974.8'

6320

MD: 9,173'
TVD: 6,347.44'
Inclination: 90.22°
Azimuth: 180.08°
VS: 4,061.58'

6320

TVD (ft)

/brwn-drk brwn, frm-sft, sb plty-sb
, vry mottld carb mat.
gy, occ brn, mottld wh, sft - mod
y-sb blky, rthy lstr, v calc, sl

hi strmg cut, thck blu resid ring.

80% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
20% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

tr BENT SH

mod fst sl bri blu-whi strmg cut, thck blu resid ring.

90% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
10% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

tr BENT SH

mod fst sl bri blu-whi strmg cut, thck blu resid ring.

TVD (ft)

90% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
10% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

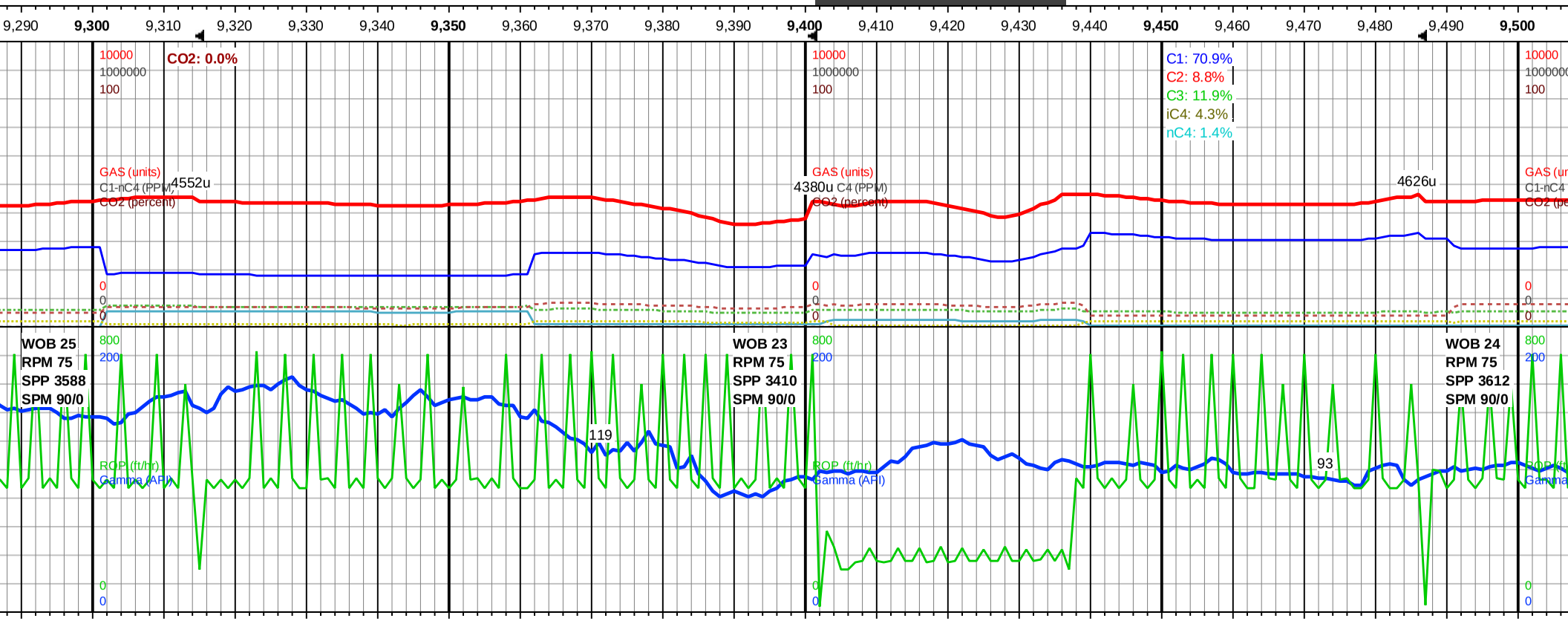
tr BENT SH

mod fst sl bri blu-whi strmg cut, thck blu resid ring.

95% MARL: drk gy/brwn-drk brwn, frm-sf
blky, rthy lstr, grtty, vry mottld carb mat.
5% CHK: lt-med gy, occ brn, mottld wh, s
frm, occ brit, sb plty-sb blky, rthy lstr, v ca
brn/blk stn.

tr BENT SH

sl fst sl bri blu-whi strmg cut, thck blu res



6320

MD: 9,346'
TVD: 6,345.03'
Inclination: 91.82°
Azimuth: 179.49°
VS: 4,234.06'

6320

MD: 9,431'
TVD: 6,343.24'
Inclination: 90.59°
Azimuth: 179.28°
VS: 4,318.74'

6320

TVD (ft)

TVD (ft)

ft, sb plty-sb

sft - mod
alc, sl

id ring.

90% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
10% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr cal frags
tr BENT SH

mod fst mod bri blu-whi strmg cut, thck blu resid ring.

90% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
10% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr cal frags
rr BENT SH

mod fst mod bri blu-whi strmg cut, thck blu resid ring.

60% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
40% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr BENT SH

mod fst mod bri blu-whi strmg cut, thck blu resid ring.

60% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
40% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

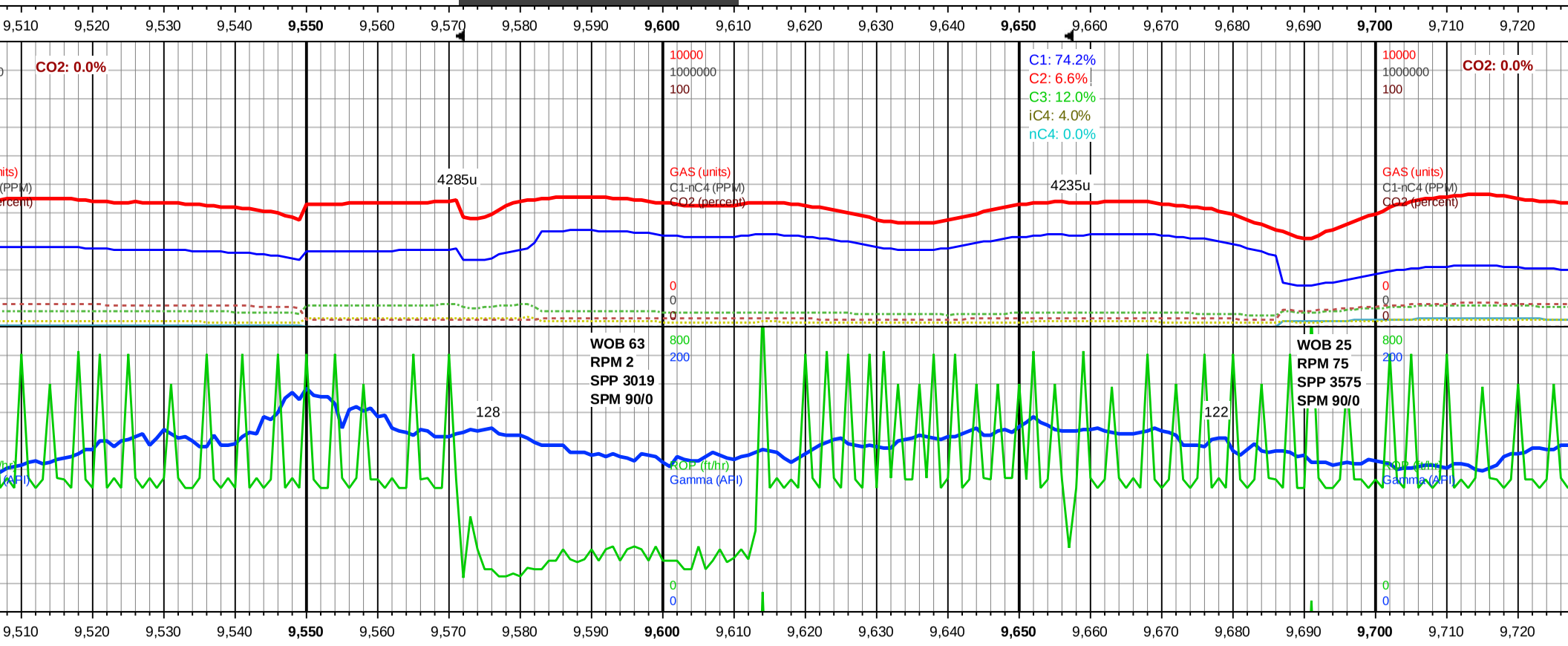
rr cal frags

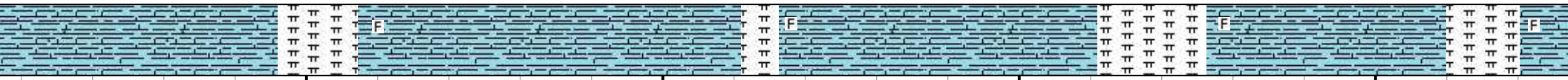
instnt bri blu-whi strmg cut, sl thck blu resid ring.

80% C
frm, oc
brn/blk
20% M
blky, rt

rr cal fr

instnt b





MD: 9,516'
TVD: 6,341.75'
Inclination: 91.42°
Azimuth: 179.36°
VS: 4,403.43'

Target: 6,338' TVD

MD: 9,601'
TVD: 6,340.56'
Inclination: 90.19°
Azimuth: 178.94°
VS: 4,488.09'

MD: 9,687'
TVD: 6,339.81'
Inclination: 90.8°
Azimuth: 178.37°
VS: 4,573.69'

6320

HK: lt-med gy, occ brn, mottld wh, sft - mod
c brit, sb plty-sb blky, rthy lstr, v calc, sl
stn.
ARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb
hy lstr, grtty, vry mottld carb mat.

rags

ri blu-whi strmg cut, sl thck blu resid ring.

90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

instnt bri blu-whi strmg cut, sl thck blu resid ring.

TVD (ft)
90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags

instnt bri blu-whi strmg cut, sl thck blu resid ring.
6420

70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

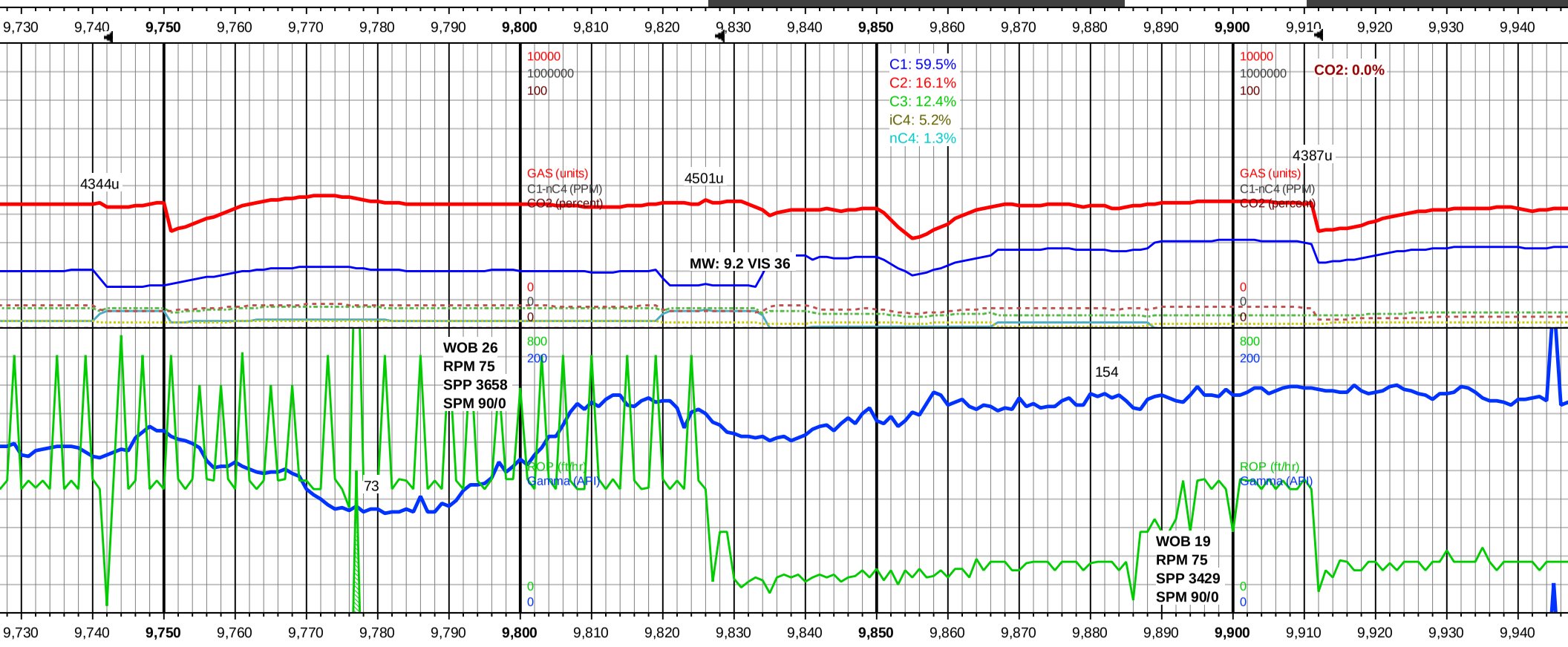
rr cal frags

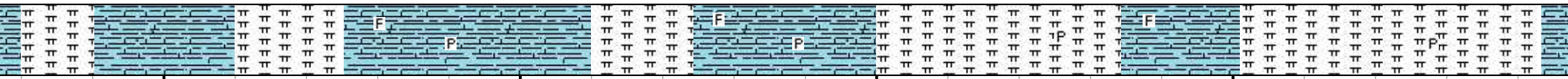
instnt bri blu-whi strmg cut, sl thck blu resid ring.

50% CHK: lt-med gy, occ brn, frm, occ brit, sb plty-sb blky, brn/blk stn.
50% MARL: drk gy/brwn-drk b blky, rthy lstr, grtty, vry mottld

rr cal frags

instnt bri blu-whi strmg cut, sl
6420





MD: 9,772'
TVD: 6,337.57'
Inclination: 92.23°
Azimuth: 178.24°
VS: 4,658.22'

6320

MD: 9,MD: 9,861'
TVD: 6TVD: 6,334.15'
Inclination: 92.34°
Azimuth: 178.82°
VS: 4,742.74'

6320

MD: 9,943'
TVD: 6,333.46
Inclination: 88.
Azimuth: 181.4
VS: 4,828.5'

mottld wh, sft - mod
thy lstr, v calc, sl

rwn, frm-sft, sb plty-sb
carb mat.

thck blu resid ring.

70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
tr BENT SH w pyr nods

instnt bri blu-whi strmg cut, sl thck blu resid ring.

70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
tr BENT SH w pyr nods

instnt bri blu-whi strmg cut, sl thck blu resid ring.

6420

70% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
30% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr BENT SH w pyr nods

inst bri blu-whi mlky cut, thck blu resid ring.

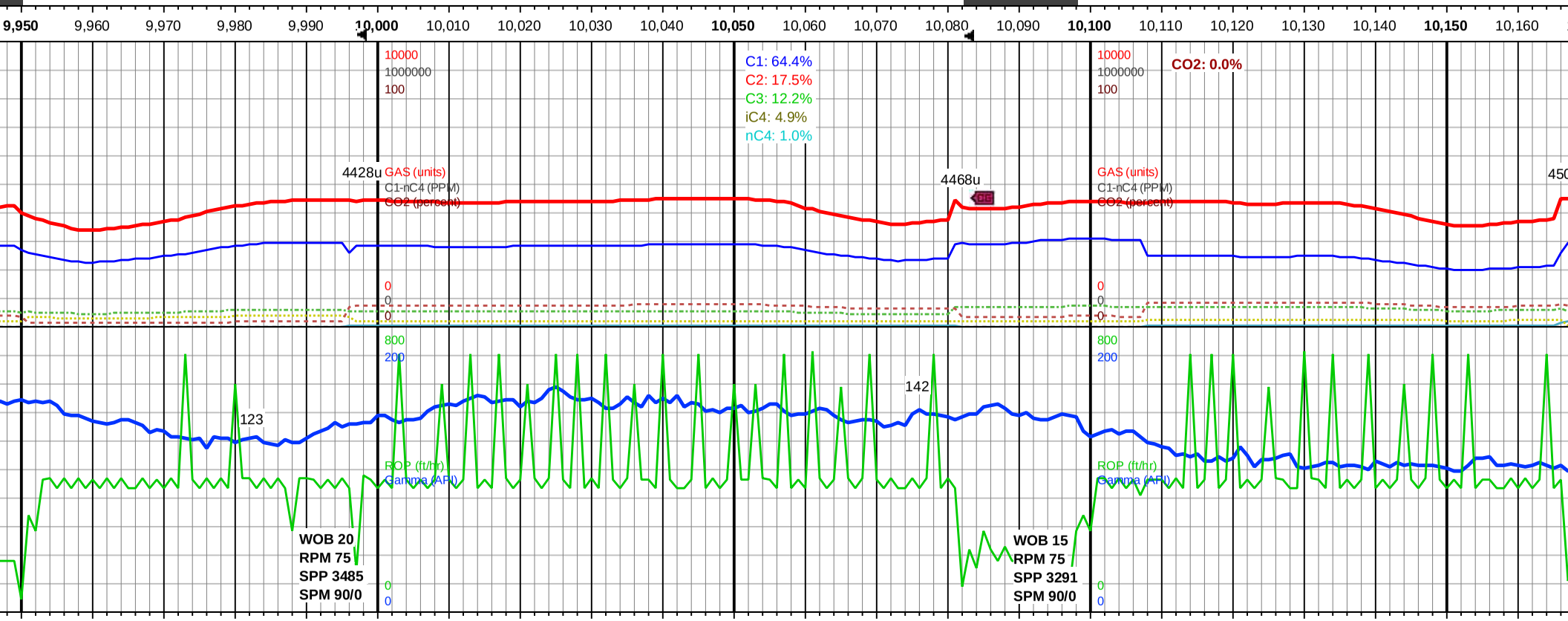
TVD (ft)

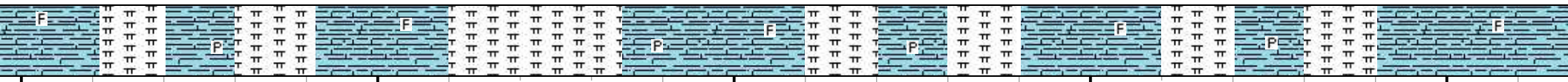
90% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
10% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

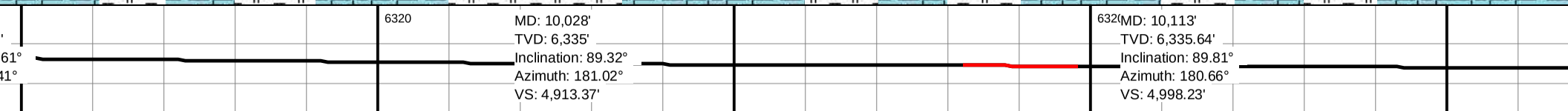
rr BENT SH w pyr nods

inst bri blu-whi mlky cut, thck blu resid ring.

6420







50% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
50% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
tr BENT SH w pyr nods

instnt bri blu-whi strmg cut, sl thck blu resid ring.

TVD (ft)

70% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
30% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr BENT SH w pyr nods

inst bri blu-whi mlky cut, thck blu resid ring.
6420

50% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
50% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

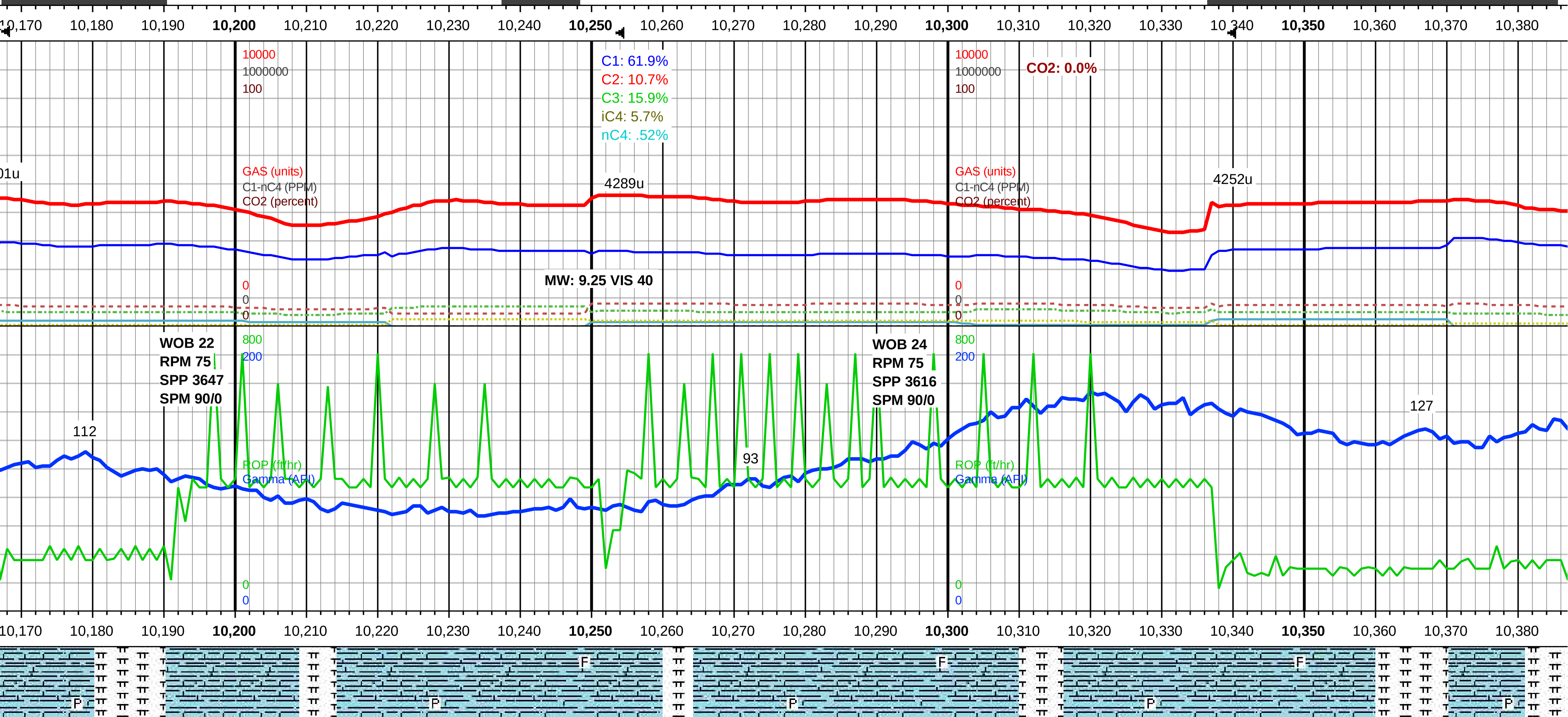
rr cal frags
tr BENT SH w pyr nods

instnt bri blu-whi mlky cut, sl thck blu resid ring.

60% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
40% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi mlky cut, sl thck blu resid ring.
6420



MD: 10,199'
TVD: 6,336.14'
Inclination: 89.53°
Azimuth: 180.36°
VS: 5,084.05'

MD: 10,281'
TVD: 6,335.69'
Inclination: 91.1°
Azimuth: 181.29°
VS: 5,168.9'

MD: 10,370'
TVD: 6,334.73'
Inclination: 90.15°
Azimuth: 179.84°
VS: 5,254.72'

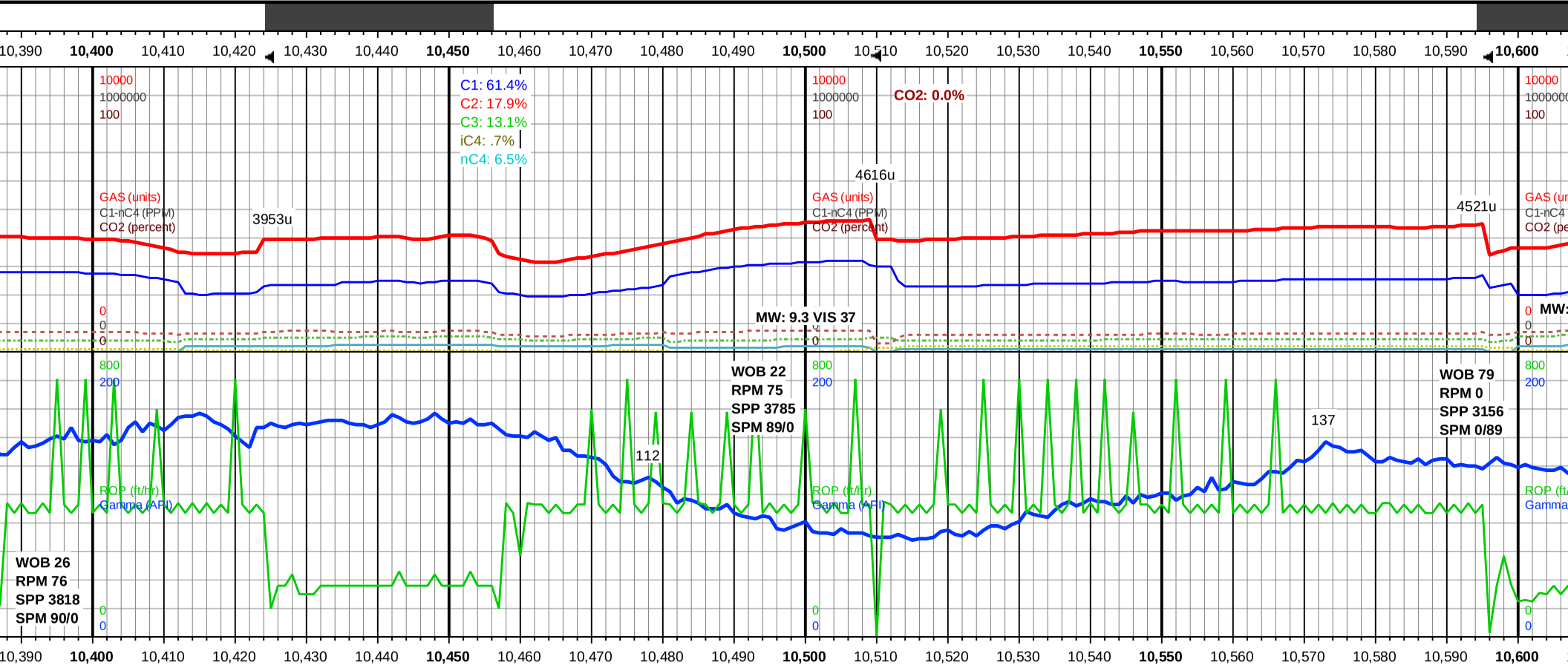
...gy, occ brn, mottld wh, sft - mod
...y-sb blky, rthy lstr, v calc, sl
.../brwn-drk brwn, frm-sft, sb plty-sb
... vry mottld carb mat.
...yr nods
...lky cut, sl thck blu resid ring.

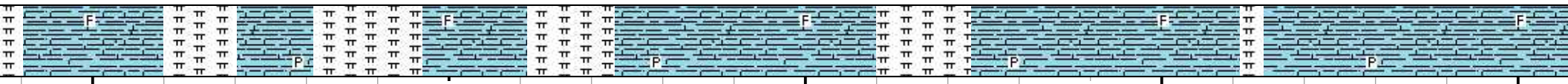
90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
rr cal frags
abn BENT SH w pyr nods
instnt bri blu-whi mlky cut, sl thck blu resid ring.

90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
rr cal frags
abn BENT SH w pyr nods
instnt bri blu-whi mlky cut, sl thck blu resid ring.

90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
rr cal frags
abn BENT SH w pyr nods
instnt bri blu-whi mlky cut, sl thck blu resid ring.

60% CHK: lt-med gy, occ brn, mottld wh, ...
frm, occ brit, sb plty-sb blky, rthy lstr, v ca...
brn/blk stn.
40% MARL: drk gy/brwn-drk brwn, frm-s...
blky, rthy lstr, grtty, vry mottld carb mat.
rr cal frags
abn BENT SH w pyr nods
instnt bri blu-whi strmg cut, sl thck blu res...





6320

MD: 10,455'
TVD: 6,335.73'
Inclination: 88.51°
Azimuth: 181.87°
VS: 5,339.57'

6320

MD: 10,541'
TVD: 6,337.29'
Inclination: 89.41°
Azimuth: 180.95°
VS: 5,425.45'

6320

sft - mod
alc, sl

t, sb plty-sb

sid ring.

50% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
50% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi strmg cut, sl thck blu resid ring.
6420

70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi strmg cut, sl thck blu resid ring.

70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi strmg cut, sl thck blu resid ring.
6420

90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
abn BENT SH w pyr nods

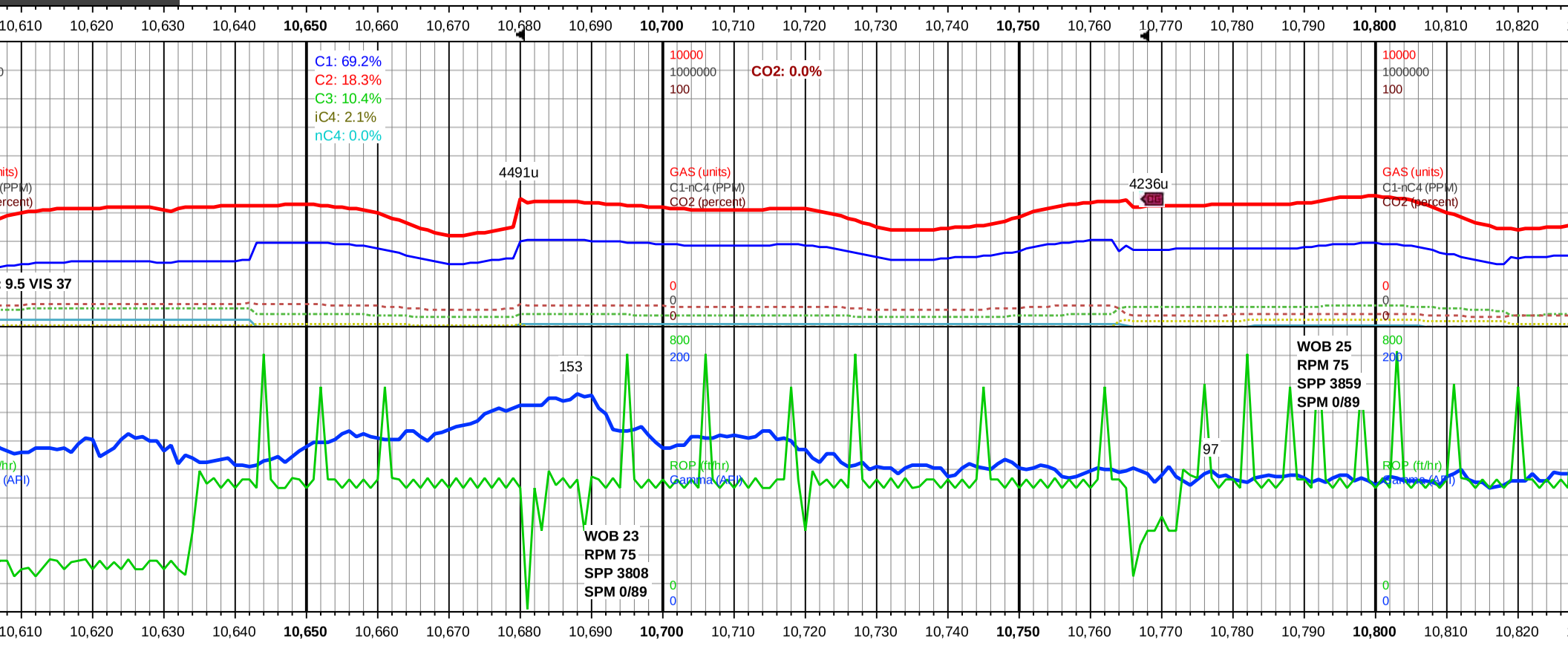
instnt bri blu-whi strmg cut, sl thck blu resid ring.

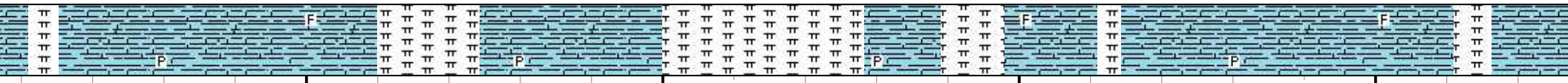
6320

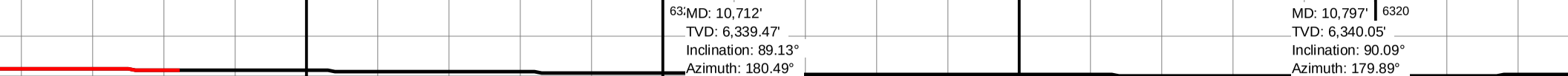
90% C
frm, oc
brn/blk
10% M
blky, rt

rr cal fr
abn BE

instnt b
6420







HK: lt-med gy, occ brn, mottld wh, sft - mod
c brit, sb plty-sb blky, rthy lstr, v calc, sl
stn.
ARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb
hy lstr, grtty, vry mottld carb mat.

ags
NT SH w pyr nods

ri blu-whi strmg cut, sl thck blu resid ring.

70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi mlky cut, sl thck blu resid ring.

TVD (ft)
80% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.
20% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.

rr BENT SH w pyr nods

inst bri blu-whi mlky cut, thck blu resid ring.
6420

90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

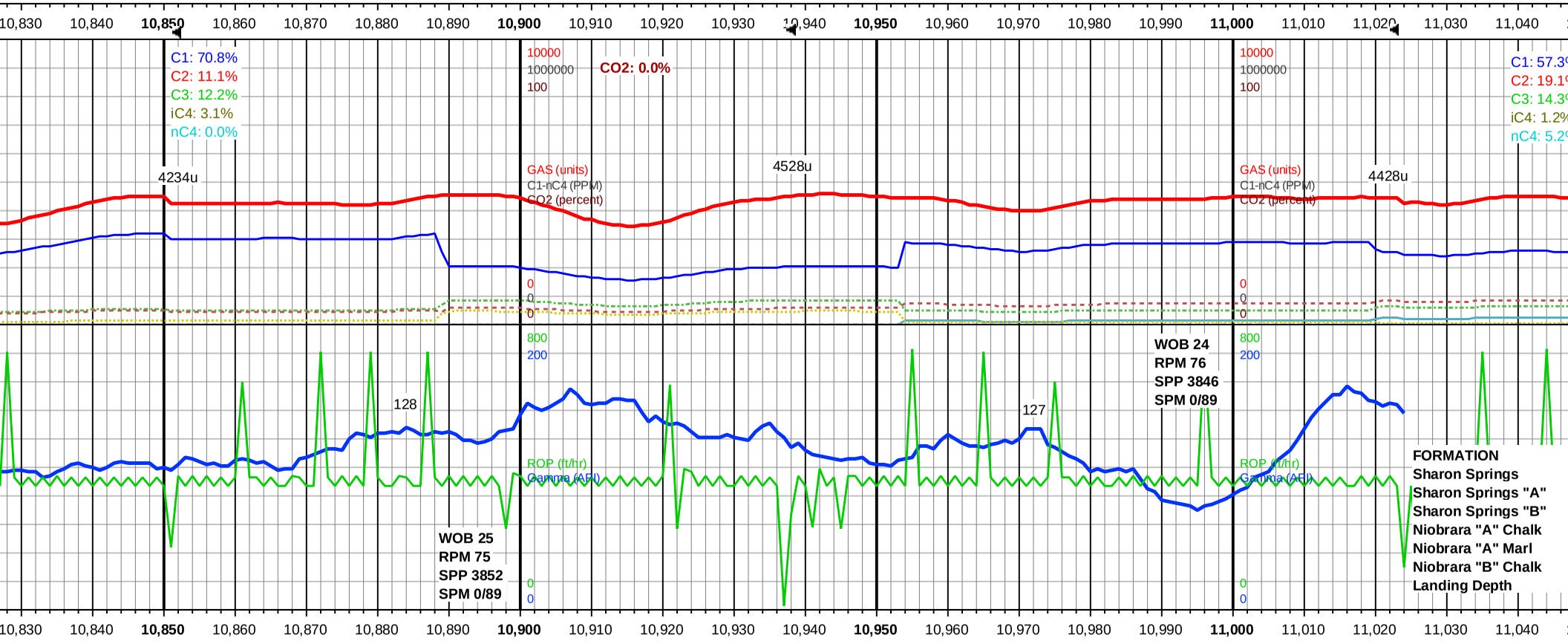
rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi mlky cut, sl thck blu resid ring.

90% CHK: lt-med gy, occ brn
frm, occ brit, sb plty-sb blky, r
brn/blk stn.
10% MARL: drk gy/brwn-drk b
blky, rthy lstr, grtty, vry mottld

rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi mlky cut, sl t
6420



MD: 10,883'
TVD: 6,339.1'
Inclination: 91.17°
Azimuth: 180.16°
VS: 5,766.69'

MD: 11,019'
TVD: 6,333.81'
Inclination: 93.29°
Azimuth: 179.63°
VS: 5,902.21'

6320

6320

, mottld wh, sft - mod
thy lstr, v calc, sl

brwn, frm-sft, sb plty-sb
carb mat.

hck blu resid ring.

70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi mlky cut, sl thck blu resid ring.

70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi mlky cut, sl thck blu resid ring.
6420

90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

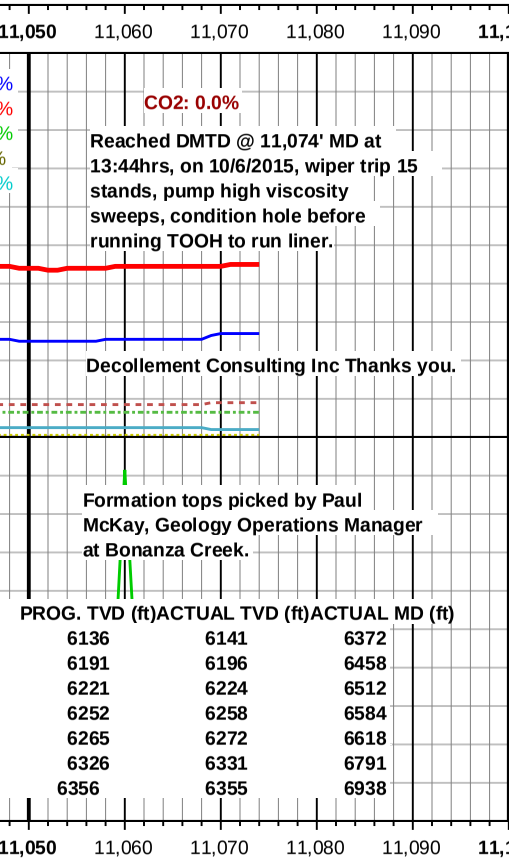
rr cal frags
abn BENT SH w pyr nods

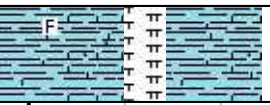
instnt bri blu-whi mlky cut, sl thck blu resid ring.

70% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
30% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi mlky cut, sl thck blu resid ring.
6420





MD: 11,074'
TVD: 6,330.65'
Inclination: 93.29°
Azimuth: 179.63°
VS: 5,956.94'

Projection To Bit

Bottoms Up Sample (11,074'MD)

90% CHK: lt-med gy, occ brn, mottld wh, sft - mod frm, occ brit, sb plty-sb blky, rthy lstr, v calc, sl brn/blk stn.
10% MARL: drk gy/brwn-drk brwn, frm-sft, sb plty-sb blky, rthy lstr, grtty, vry mottld carb mat.

rr cal frags
abn BENT SH w pyr nods

instnt bri blu-whi mlky cut, sl thck blu resid ring.