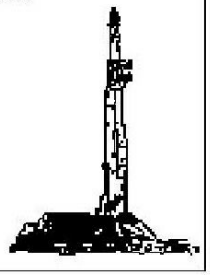
GOOLSBY BROTHERS
and associates, inc.

575 Union Blvd, Suite 208
Lakewood, CO 80228
303-945-2860 Office

PETCOM

Geological Wellsite
Supervision

www.goolsbybrothers.com



Scale 1:240 (5"=100') Imperial
Measured Depth Log

Well Name:	**GITTLEIN 29N-28HZ**
Location:	**Section 33 T2N R65W, Weld County, CO.**
License Number:	**API: 05-123-36218-0000 /AFE: 2075260**
Spud Date:	**September 19, 2013**
Surface Coordinates:	**191' FSL & 2061' FWL Sec.33 T2N R65W**
	Lat: 40.088349 N Long: -104.670906 W
Bottom Hole Coordinates:	**BHL: 7226.74 ft Northing; -63.08 ft Easting;**
	Closure distance: 7227.02 ft
Ground Elevation (ft):	**4,911**
Logged Interval (ft):	**6,450 To: 14,164**
Formation:	**Pierre Shales / Sands, Niobrara "B"**
Type of Drilling Fluid:	**LSND (Polymer-Water)**

Region: **Wattenberg**
Drilling Completed: **September 28, 2013**

K.B. Elevation (ft): **4,936**
Total Depth (ft): **14,164**

Printed by HORIZONTAL.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: **Anadarko Petroleum Corporation**
Address: **Granite Tower - 1099 18th St, Ste 1800**
Denver, CO 80202
CO Geologist, Tom Birmingham.

GEOLOGIST

Name: **Marek Ciesnik/Tekabe Gedamu**
Company: **Goolsby Brothers & Assoc. (GBA), Inc. (www.goolsbybrothers.com)**
Address: **575 Union Blvd.**
Suite 208,
Lakewood CO. 80228

E-logs

MWD Gamma:

Casing

9 5/8" Surface Casing (IPSCO 36# J55) set @ 1,307'.
7" Intermediate Casing (IPSCO 26# P110) set @ 7513'.
4 1/2" Production Liner set @ 14,162'

Comments

1) Drilling Contractor: H&P 311
Pumps 1 & 2: Gardner Denver PZ 11 6" x 11" (.0914 bbl/stk)
Rig Manager: Jack Truett, James Baggett.
Drillers: Michael Munroe, Christopher Moore, Kenneth Jones, Christopher Beckstead.

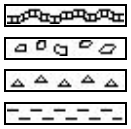
2) Company Man: Doug Blair, David Wells

3) Mud Company: Halliburton, James Steen

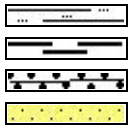
4) Directional Drilling: Scientific Drilling
Directional Drillers: John Noakes, Ian Ensell
MWD: Joshua Denning, Mohamed Sharker.

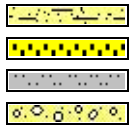
5) Gas Equipment: Mudlogging Systems Inc.
by Terra Services
Redbox # ML-362

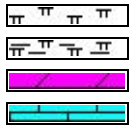
ROCK TYPES

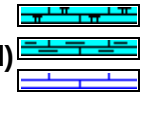

Bent
Brec
Cht
Clyst


Coal
Anhydrite
Shale
Sh (col)


Slty sh
Carb sh
Carb sh_
Ss


Arg ss
Ss (f gr+)
Sltst
Congl


Mrlst
Mrlst/sh (intbdd)
Dol
Lmst


Marly limestone
Arg limestone
Chalk

ACCESSORIES

MINERAL


Anhy


Arggrn


Arg


Bent


Bit


Brecfrag


Calc


Carb


Chtdk


Chtlt


Dol


Feldspar


Ferrpel


Ferr


Glau


Gyp


Hvymin


Kaol


Marl


Minxl


Nodule


Phos


Pyr


Salt


Sandy


Silt


Sil


Sulphur


Tuff

FOSSIL


Algae


Amph


Belm


Bioclst


Brach


Bryozoa


Cephal


Coral


Crin


Echin


Fish

Foram

Fossil

Gastro

Oolite

Ostra

Pelec

Pellet

Pisolite

Plant

Strom

STRINGER

Anhy

Arg

Bent

Coal

Dol

Ls

Chlk

Mrst

Ss strg

Sltst strg

TEXTURE

Boundst

Chalky

Cryxln

Earthy

Finexln

Grainst

Lithogr

Microxln

Mudst

Packst

Wackest

OTHER SYMBOLS

SAMPLE SHOWS

Even

Near even

Spotted/patchy

Very spotty

Questionable

Dead

POROSITY TYPE

Earthy

Fenest

Fracture

Inter

Moldic

Organic

Pinpoint

Vuggy

ROUNDING

Rounded

Subrnd

Subang

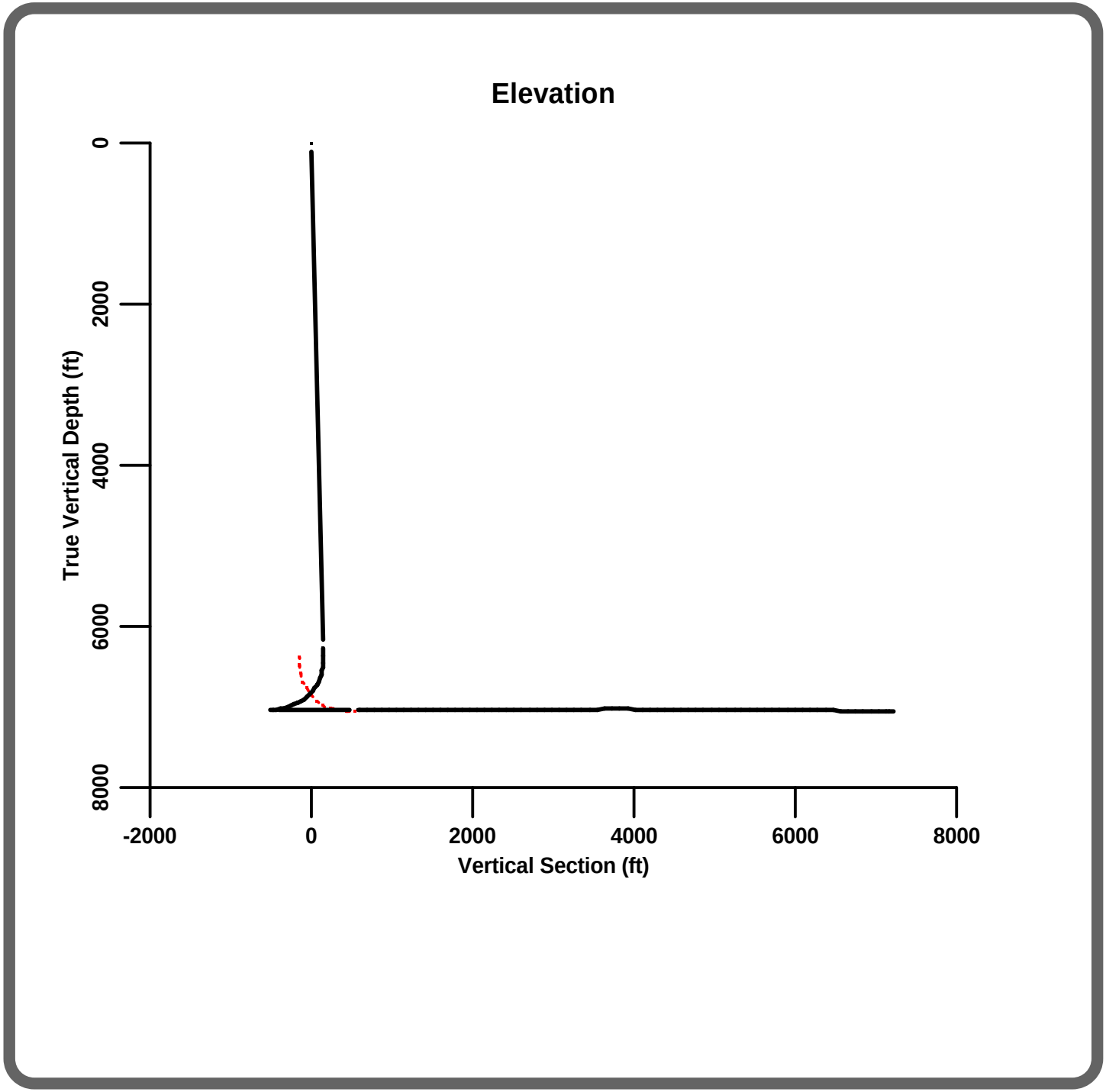
Angular

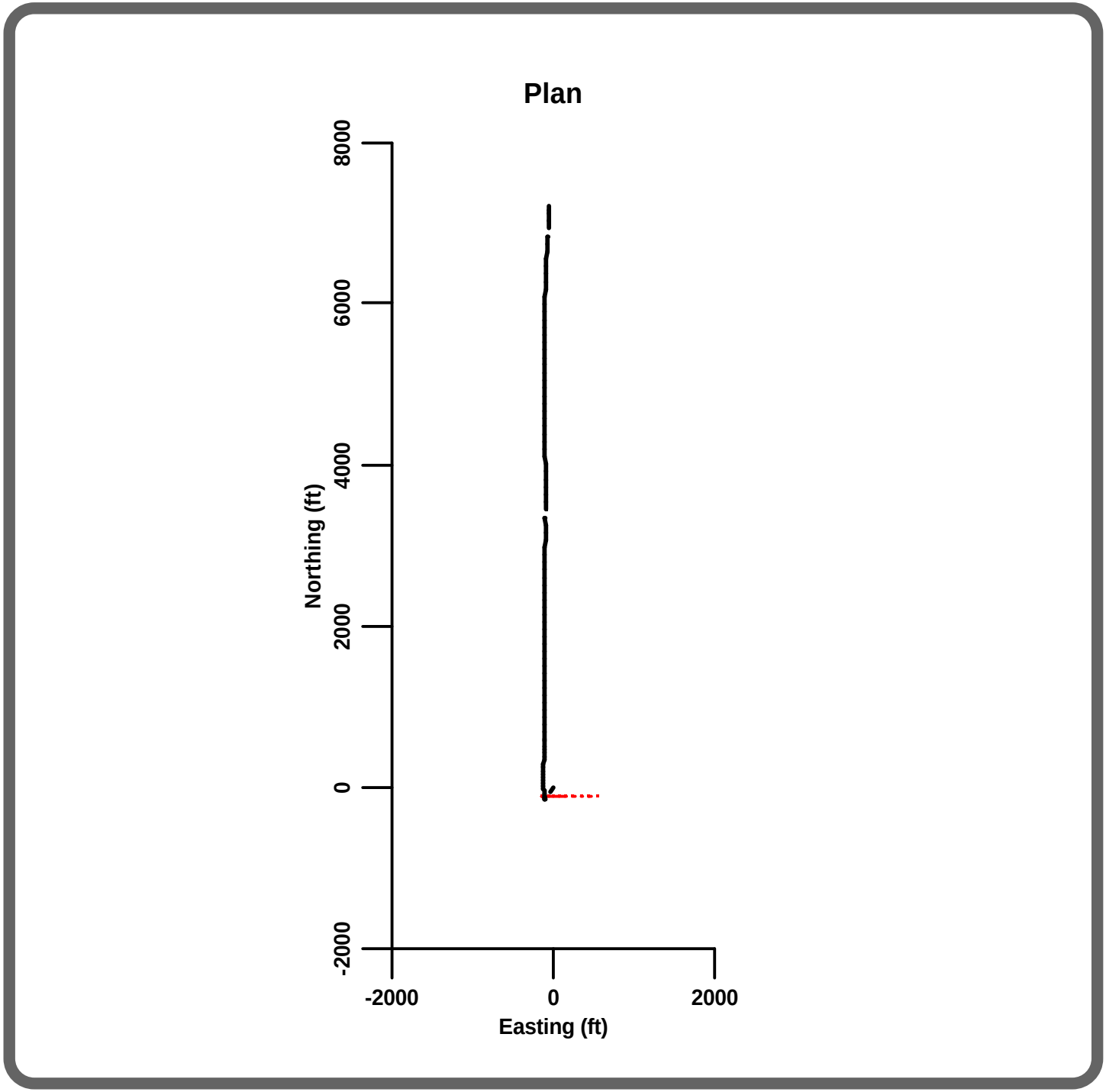
SORTING

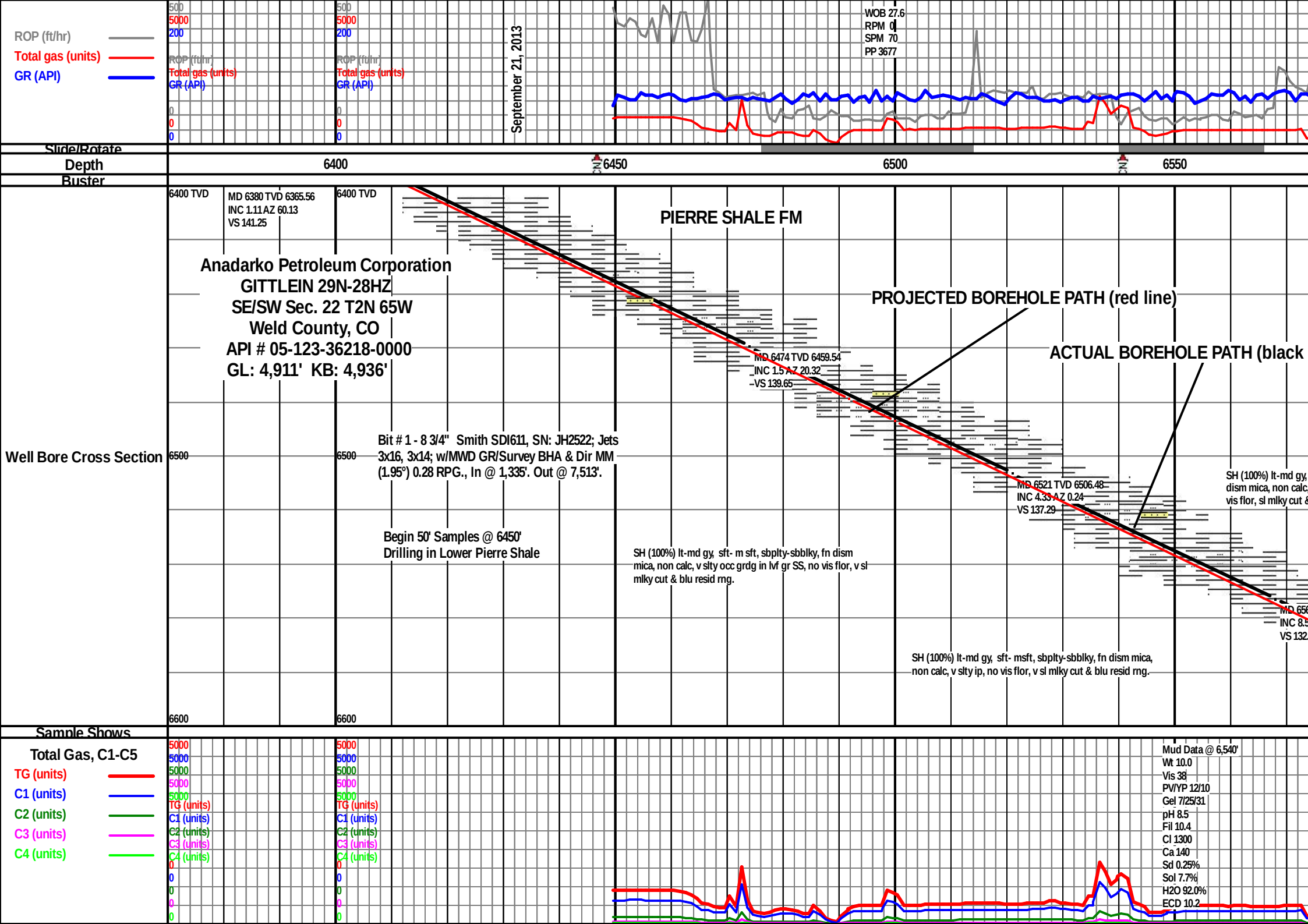
Well

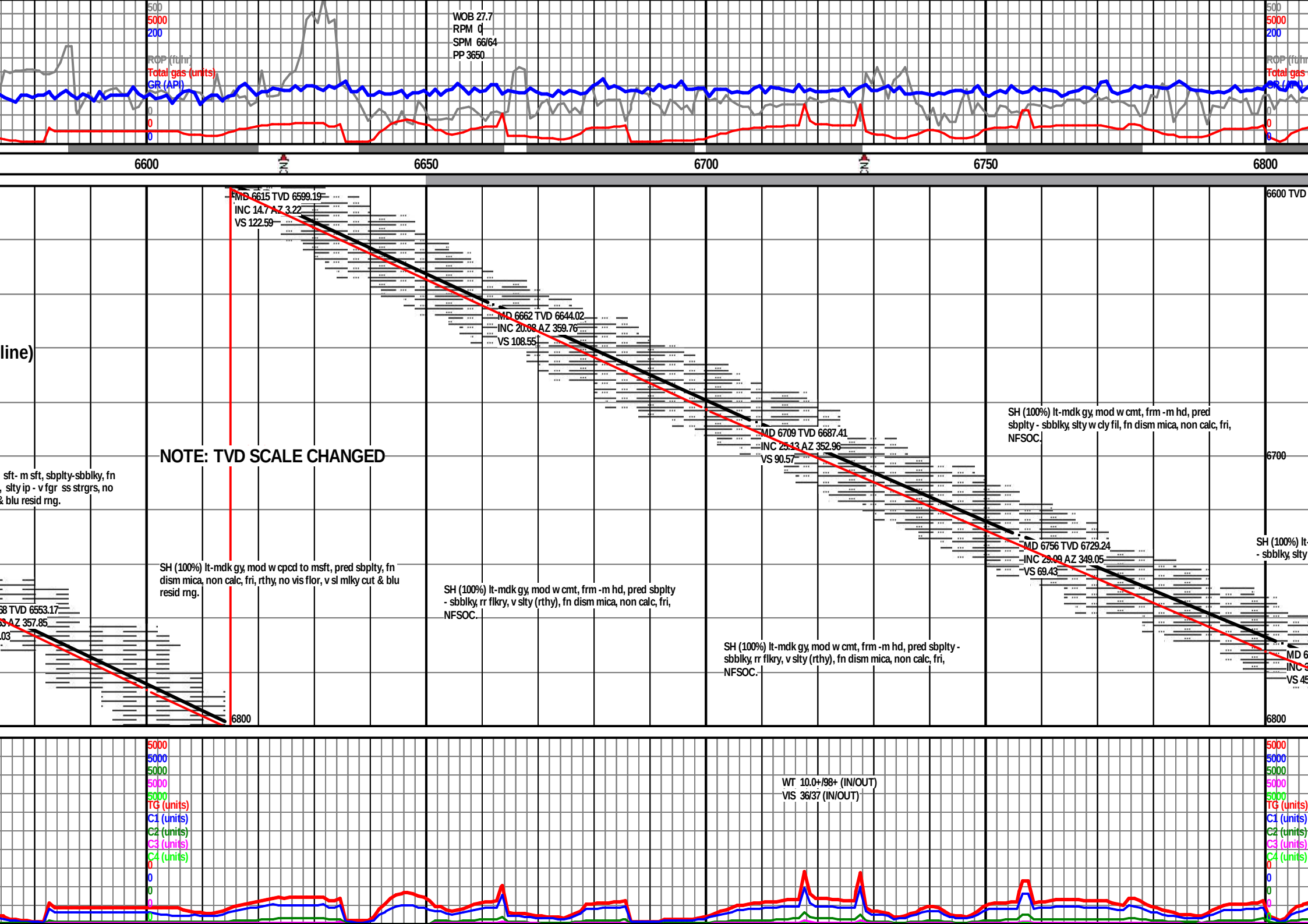
Moderate

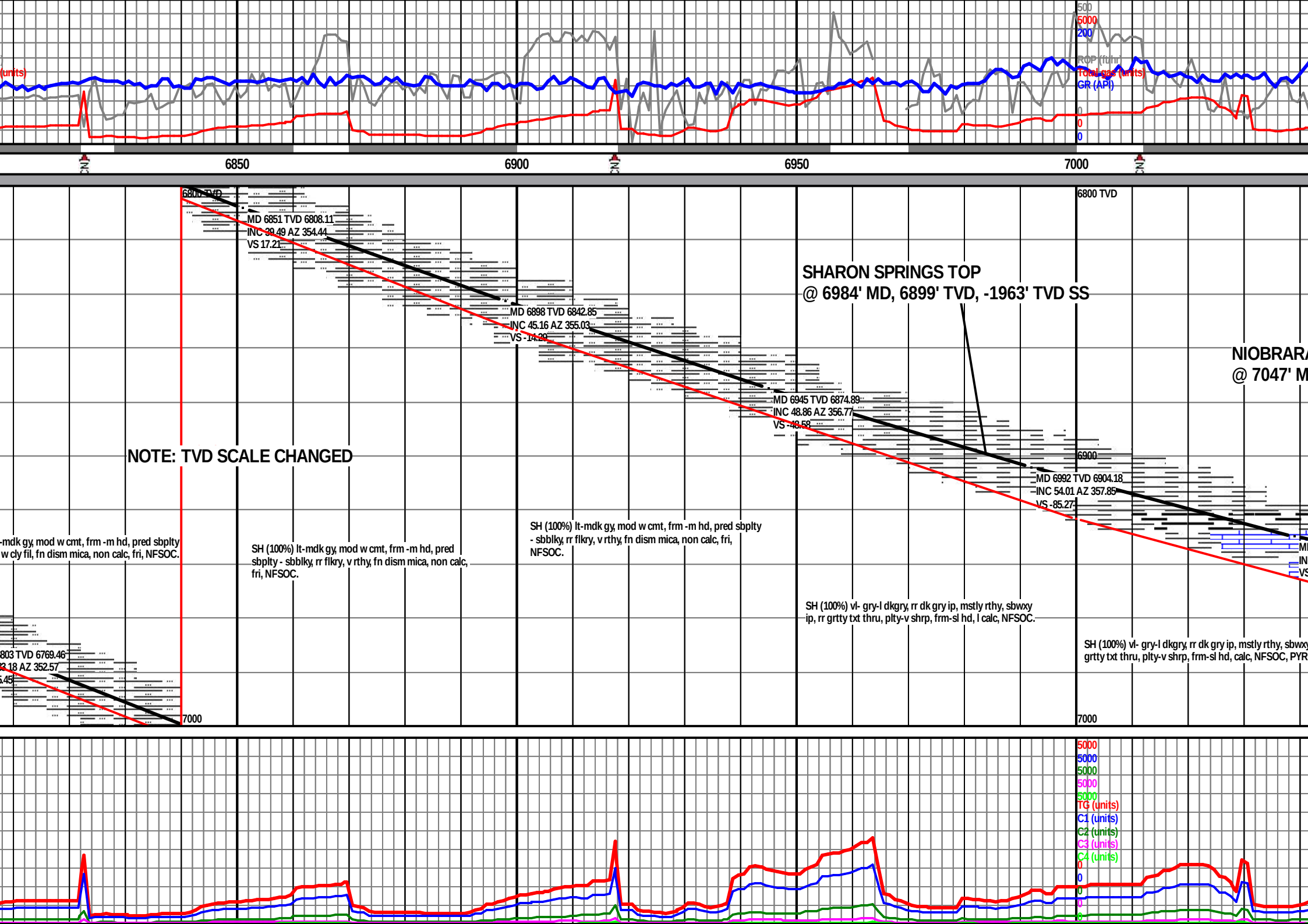
Poor

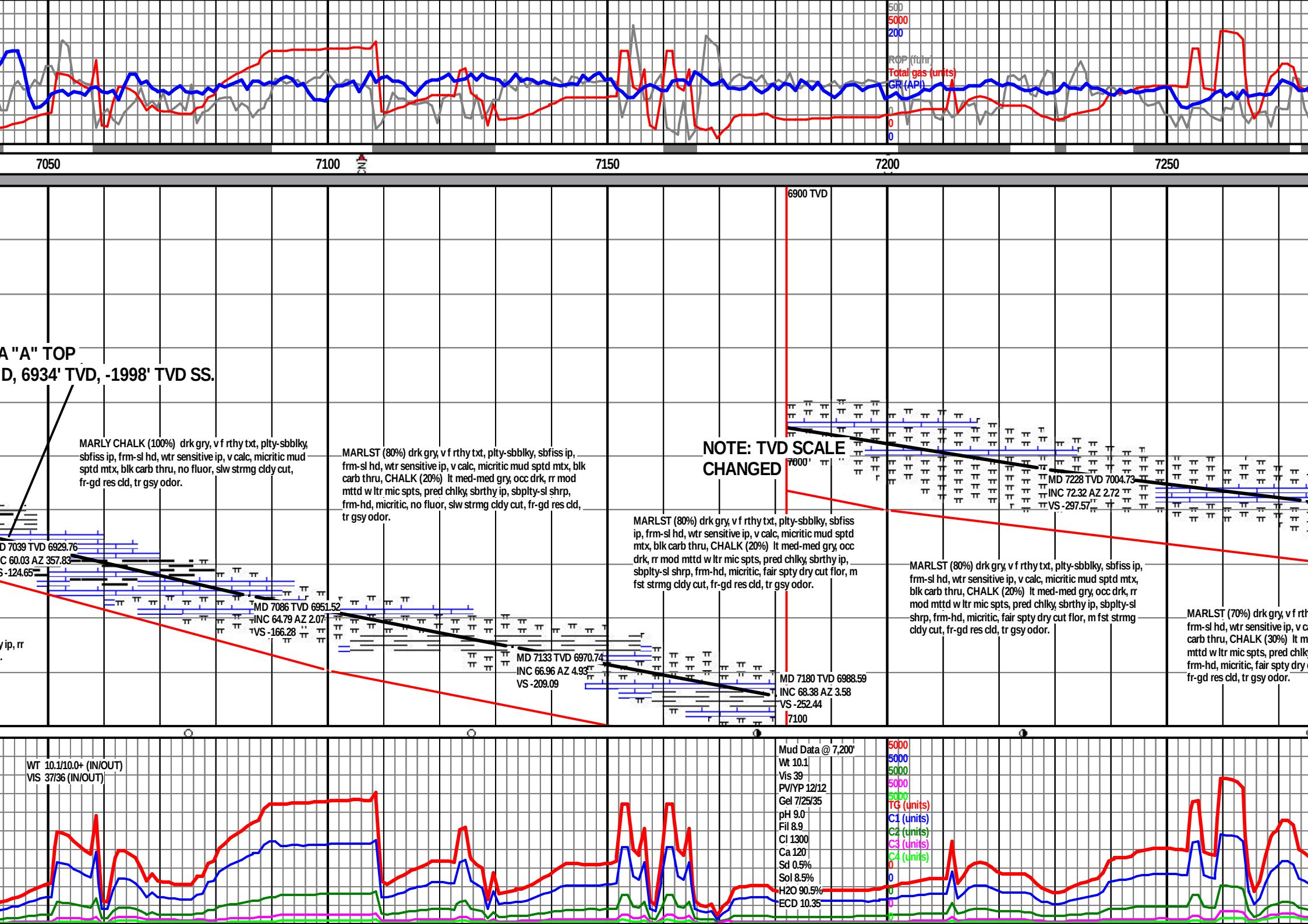

Elevation
True Vertical Depth (ft)
0
2000
4000
6000
8000
-2000
0
2000
4000
6000
8000
Vertical Section (ft)

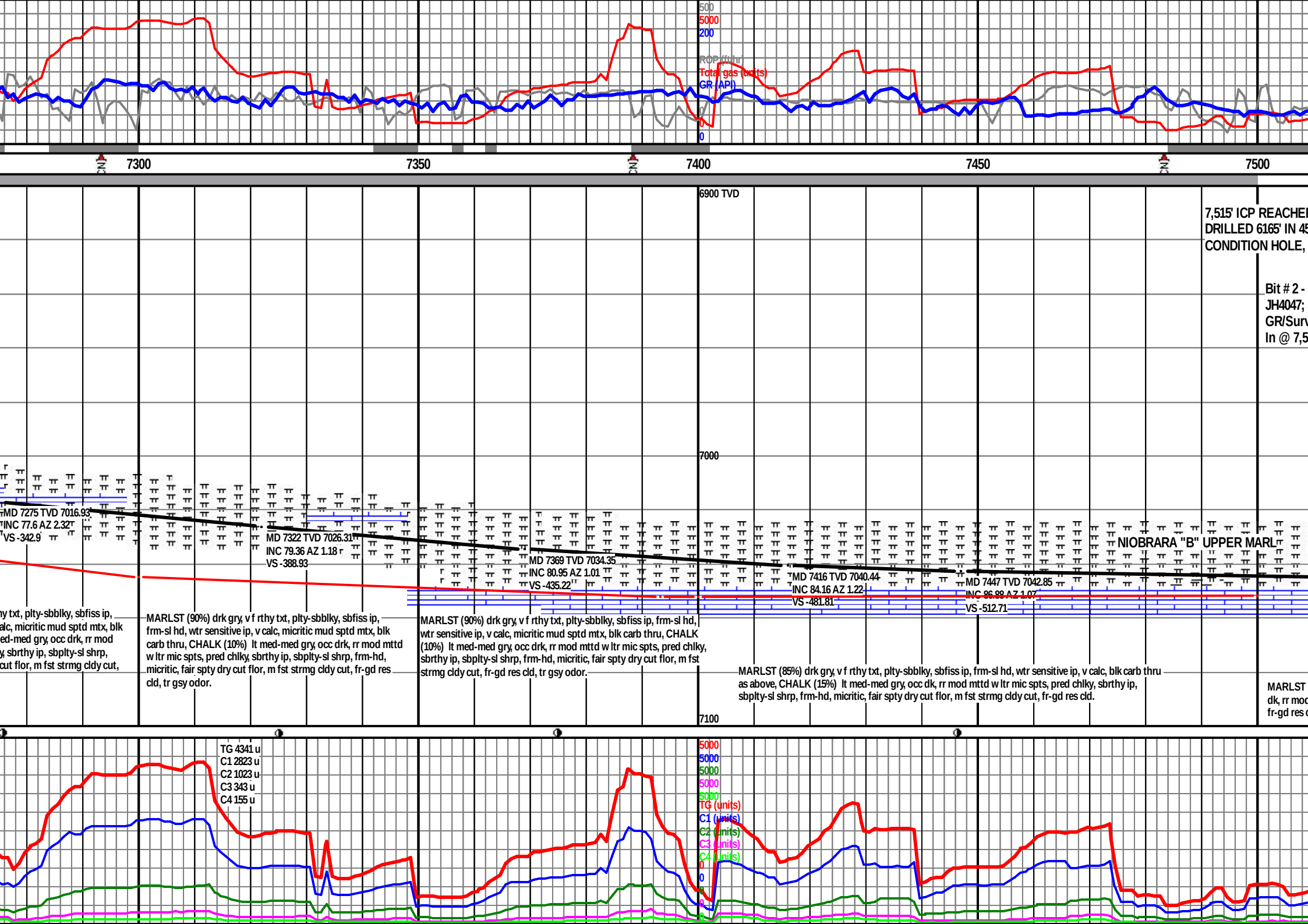

Plan
8000
6000
4000
2000
0
-2000
Northing (ft)
-2000
0
2000
Easting (ft)

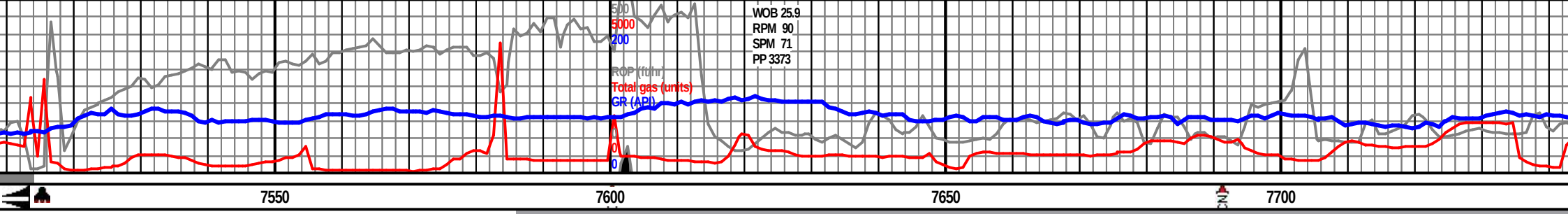

ROP (ft/hr)
Total gas (units)
GR (API)
500
5000
200
0
0
0
September 21, 2013
WOB 27.6
RPM 0
SPM 70
PP 3677
Slide/Rotate
Depth
6400
6450
6500
6550
Buster
Well Bore Cross Section
6400 TVD
MD 6380 TVD 6365.56
INC 1.11 AZ 60.13
VS 141.25
Anadarko Petroleum Corporation
GITTLEIN 29N-28HZ
SE/SW Sec. 22 T2N 65W
Weld County, CO
API # 05-123-36218-0000
GL: 4,911' KB: 4,936'
PIERRE SHALE FM
PROJECTED BOREHOLE PATH (red line)
ACTUAL BOREHOLE PATH (black
MD 6474 TVD 6459.54
INC 1.5 AZ 20.32
VS 139.65
MD 6521 TVD 6506.48
INC 4.33 AZ 0.24
VS 137.29
Bit # 1 - 8 3/4" Smith SDI611, SN: JH2522; Jets 3x16, 3x14; w/MWD GR/Survey BHA & Dir MM (1.95°) 0.28 RPG., In @ 1,335'. Out @ 7,513'.
Begin 50' Samples @ 6450'
Drilling in Lower Pierre Shale
SH (100%) lt-md gy, sft- m sft, sbplty-sbblky, fn dism mica, non calc, v slty occ grdg in lvf gr SS, no vis flor, v sl mlky cut & blu resid rng.
SH (100%) lt-md gy, sft- msft, sbplty-sbblky, fn dism mica, non calc, v slty ip, no vis flor, v sl mlky cut & blu resid rng.
SH (100%) lt-md gy,
dism mica, non calc,
vis flor, sl mlky cut &
Sample Shows
Total Gas, C1-C5
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
Mud Data @ 6,540'
Wt 10.0
Vis 38
PV/YP 12/10
Gel 7/25/31
pH 8.5
Fil 10.4
Cl 1300
Ca 140
Sd 0.25%
Sol 7.7%
H2O 92.0%
ECD 10.2


500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
WOB 27.7
RPM 0
SPM 66/64
PP 3650
6600
6650
6700
6750
6800
MD 6615 TVD 6599.19
INC 14.7 AZ 3.22
VS 122.59
MD 6662 TVD 6644.02
INC 20.08 AZ 359.76
VS 108.55
MD 6709 TVD 6687.41
INC 25.13 AZ 352.96
VS 90.57
MD 6756 TVD 6729.24
INC 29.09 AZ 349.05
VS 69.43
NOTE: TVD SCALE CHANGED
SH (100%) lt-mdk gy, mod w cpcd to msft, pred sbplty, fn dism mica, non calc, fri, rthy, no vis flor, v sl mlky cut & blu resid rng.
SH (100%) lt-mdk gy, mod w cmt, frm -m hd, pred sbplty - sbblky, rr flkry, v slty (rthy), fn dism mica, non calc, fri, NFSOC.
SH (100%) lt-mdk gy, mod w cmt, frm -m hd, pred sbplty - sbblky, slty w cly fil, fn dism mica, non calc, fri, NFSOC.
SH (100%) lt-mdk gy, mod w cmt, frm -m hd, pred sbplty - sbblky, rr flkry, v slty (rthy), fn dism mica, non calc, fri, NFSOC.
6600 TVD
6700
6800
line)
sft- m sft, sbplty-sbblky, fn
slty ip - v fgr ss strgrs, no
& blu resid rng.
WT 10.0+/98+ (IN/OUT)
VIS 36/37 (IN/OUT)
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)


500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
(units)
6850
6900
6950
7000
6800 TVD
MD 6851 TVD 6808.11
INC 39.49 AZ 354.44
VS 17.21
MD 6898 TVD 6842.85
INC 45.16 AZ 355.03
VS -14.29
MD 6945 TVD 6874.89
INC 48.86 AZ 356.77
VS -48.58
MD 6992 TVD 6904.18
INC 54.01 AZ 357.85
VS -85.27
SHARON SPRINGS TOP
@ 6984' MD, 6899' TVD, -1963' TVD SS
NIOBRARA
@ 7047' M
NOTE: TVD SCALE CHANGED
6900
7000
-mdk gy, mod w cmt, frm -m hd, pred sbplty
w cly fil, fn dism mica, non calc, fri, NFSOC.
SH (100%) lt-mdk gy, mod w cmt, frm -m hd, pred sbplty - sbblky, rr flkry, v rthy, fn dism mica, non calc, fri, NFSOC.
SH (100%) lt-mdk gy, mod w cmt, frm -m hd, pred sbplty - sbblky, rr flkry, v rthy, fn dism mica, non calc, fri, NFSOC.
SH (100%) vl- gry-l dkgry, rr dk gry ip, mstly rthy, sbwxy ip, rr grtty txt thru, plty-v shrp, frm-sl hd, l calc, NFSOC.
SH (100%) vl- gry-l dkgry, rr dk gry ip, mstly rthy, sbwxy
grtty txt thru, plty-v shrp, frm-sl hd, calc, NFSOC, PYR
803 TVD 6769.46
3.18 AZ 352.57
5.45
7000
7000
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0


500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
7050
7100
7150
7200
7250
6900 TVD
7000'
A "A" TOP
D, 6934' TVD, -1998' TVD SS.
MARLY CHALK (100%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, micritic mud sptd mtx, blk carb thru, no fluor, slw strmg cldy cut, fr-gd res cld, tr gsy odor.
MARLST (80%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, micritic mud sptd mtx, blk carb thru, CHALK (20%) lt med-med gry, occ drk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic, no fluor, slw strmg cldy cut, fr-gd res cld, tr gsy odor.
NOTE: TVD SCALE CHANGED
MARLST (80%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, micritic mud sptd mtx, blk carb thru, CHALK (20%) lt med-med gry, occ drk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic, fair spty dry cut flor, m fst strmg cldy cut, fr-gd res cld, tr gsy odor.
MARLST (80%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, micritic mud sptd mtx, blk carb thru, CHALK (20%) lt med-med gry, occ drk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic, fair spty dry cut flor, m fst strmg cldy cut, fr-gd res cld, tr gsy odor.
MARLST (70%) drk gry, v f rth
frm-sl hd, wtr sensitive ip, v c
carb thru, CHALK (30%) lt m
mttd w ltr mic spts, pred chlk
frm-hd, micritic, fair spty dry
fr-gd res cld, tr gsy odor.
D 7039 TVD 6929.76
C 60.03 AZ 357.83
S -124.65
y ip, rr
MD 7086 TVD 6951.52
INC 64.79 AZ 2.07
VS -166.28
MD 7133 TVD 6970.74
INC 66.96 AZ 4.93
VS -209.09
MD 7180 TVD 6988.59
INC 68.38 AZ 3.58
VS -252.44
7100
MD 7228 TVD 7004.73
INC 72.32 AZ 2.72
VS -297.57
WT 10.1/10.0+ (IN/OUT)
VIS 37/36 (IN/OUT)
Mud Data @ 7,200'
Wt 10.1
Vis 39
PV/YP 12/12
Gel 7/25/35
pH 9.0
Fil 8.9
Cl 1300
Ca 120
Sd 0.5%
Sol 8.5%
H2O 90.5%
ECD 10.35
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0


500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
7300
7350
7400
7450
7500
6900 TVD
7000
7100
7,515' ICP REACHE
DRILLED 6165' IN 45
CONDITION HOLE,
Bit # 2 -
JH4047;
GR/Surv
In @ 7,5
MD 7275 TVD 7016.93
INC 77.6 AZ 2.32
VS -342.9
MD 7322 TVD 7026.31
INC 79.36 AZ 1.18
VS -388.93
MD 7369 TVD 7034.35
INC 80.95 AZ 1.01
VS -435.22
MD 7416 TVD 7040.44
INC 84.16 AZ 1.22
VS -481.81
MD 7447 TVD 7042.85
INC 86.88 AZ 1.07
VS -512.71
NIOBRARA "B" UPPER MARL
hy txt, plty-sbblky, sbfiss ip,
alc, micritic mud sptd mtx, blk
ed-med gry, occ drk, rr mod
y, sbrthy ip, sbplty-sl shrp,
cut flor, m fst strmg cldy cut,
MARLST (90%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, micritic mud sptd mtx, blk carb thru, CHALK (10%) lt med-med gry, occ drk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic, fair spty dry cut flor, m fst strmg cldy cut, fr-gd res cld, tr gsy odor.
MARLST (90%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, micritic mud sptd mtx, blk carb thru, CHALK (10%) lt med-med gry, occ drk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic, fair spty dry cut flor, m fst strmg cldy cut, fr-gd res cld, tr gsy odor.
MARLST (85%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, blk carb thru as above, CHALK (15%) lt med-med gry, occ dk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic, fair spty dry cut flor, m fst strmg cldy cut, fr-gd res cld.
MARLST
dk, rr mod
fr-gd res c
TG 4341 u
C1 2823 u
C2 1023 u
C3 343 u
C4 155 u
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0



7550 7600 7650 7700

D ON 9/22/13. BIT #1
5.5 HOURS.
TOH, 7" CASING.

6 1/8" Smith MDi513, SN:
Jets 3x16, 2x14; w/ MWD
vey BHA & Dir MM (Bend 1.25°),
513'. Out @ 10,417'.

6900 TVD

7000

MD 7513 TVD 7044.92
INC 89.53 AZ 1.69
VS 578.65

MD 7530 TVD 7045.05
INC 89.56 AZ 1.73
VS 595.64

MD 7621 TVD 7045.4
INC 90 AZ 0.86
VS 686.62

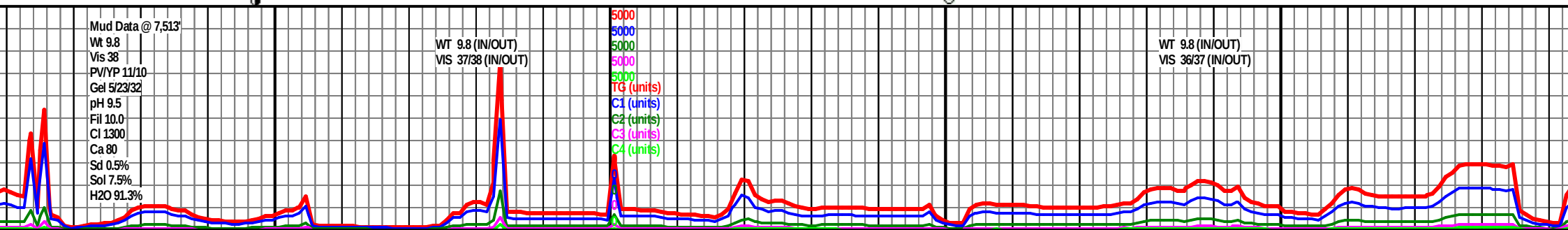
MD 7713 TVD 7045.4
INC 90 AZ 0.47
VS 778.61

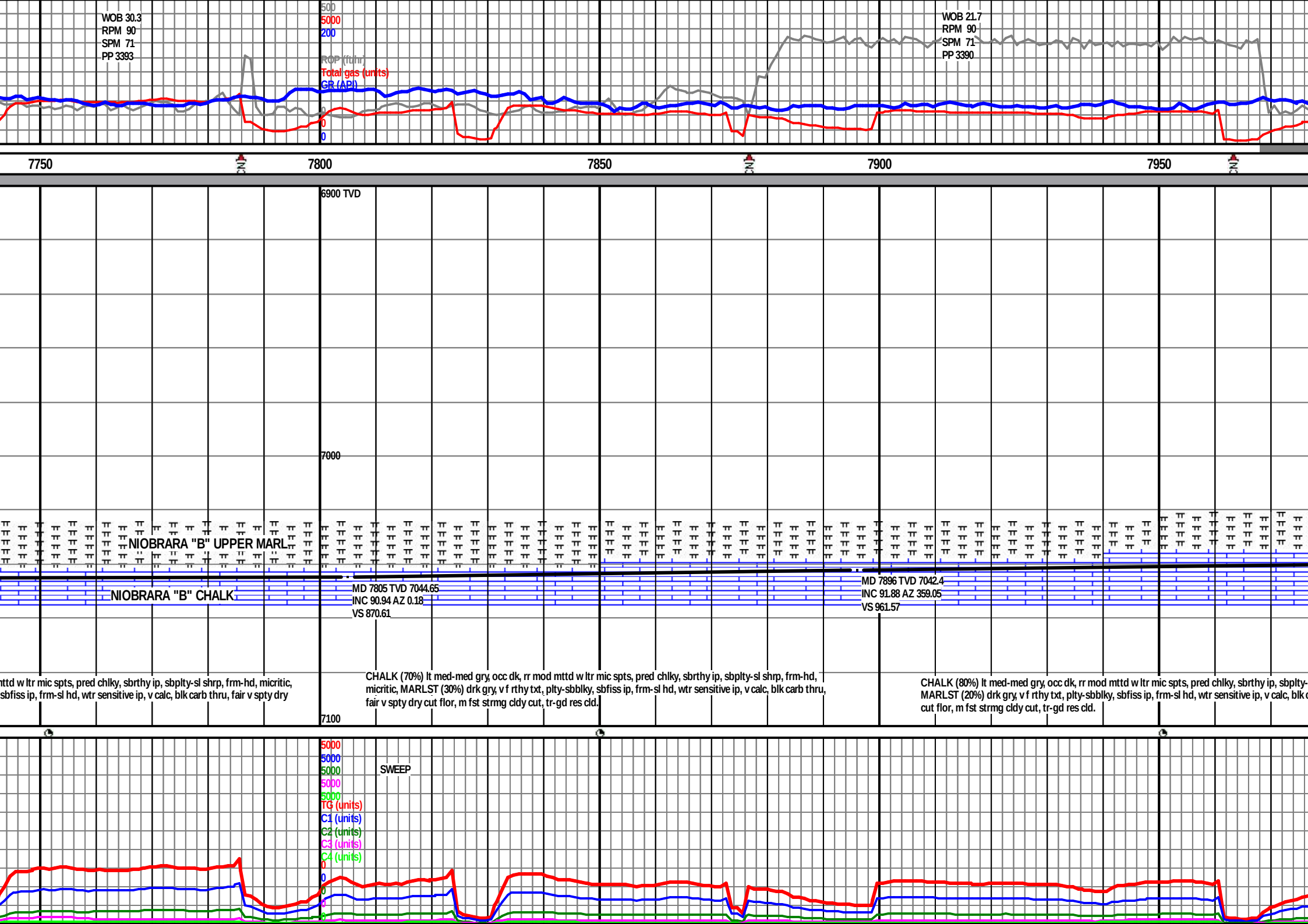
(80%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, CHALK (20%) lt med-med gry, occ
d mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic, fair spty dry cut flor, m fst strmg cldy cut,
cld.

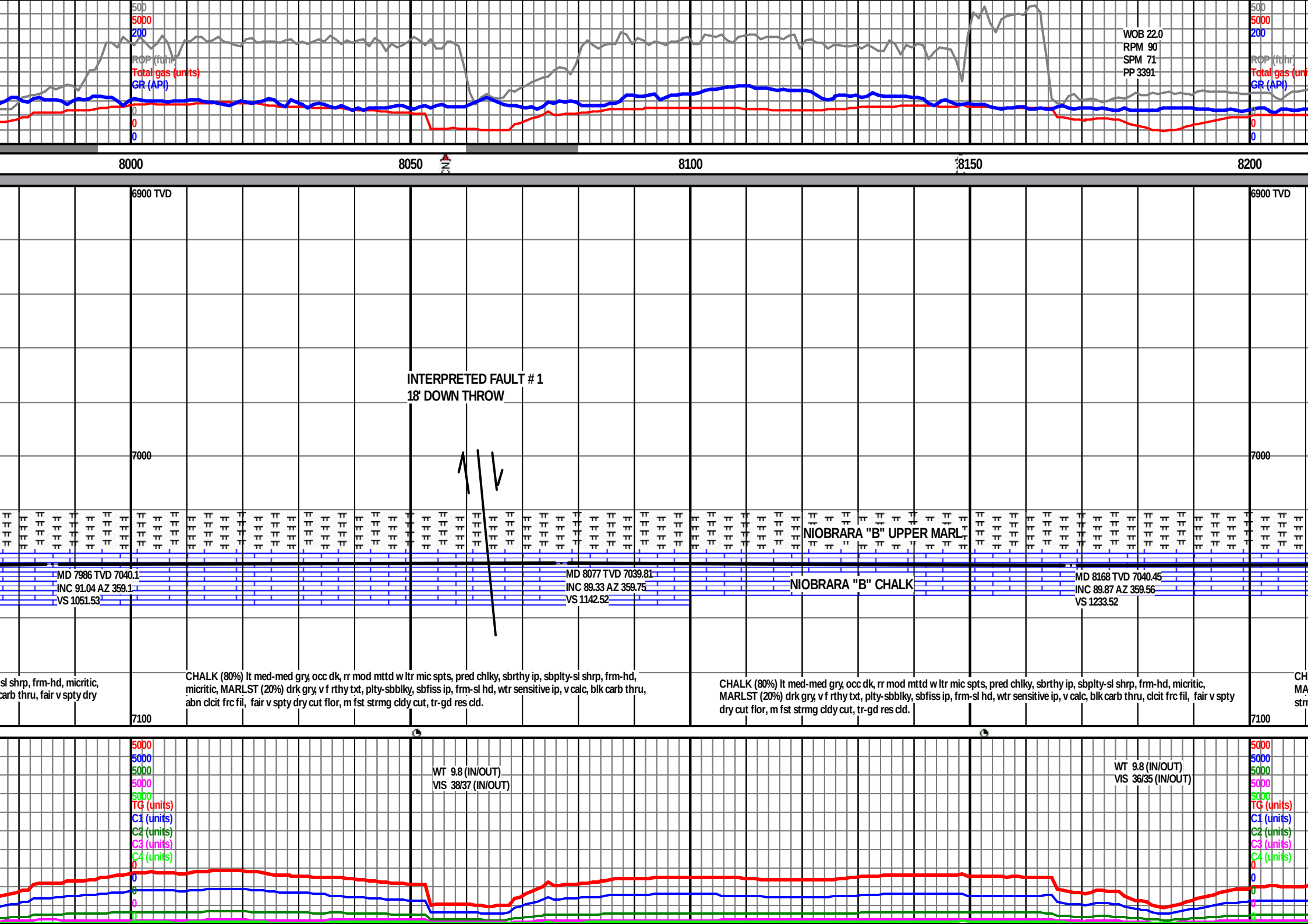
CHALK (60%) lt med-med gry, occ dk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic,
MARLST (40%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, blk carb thru, fair v spty dry cut flor,
m fst strmg cldy cut, tr-gd res cld.

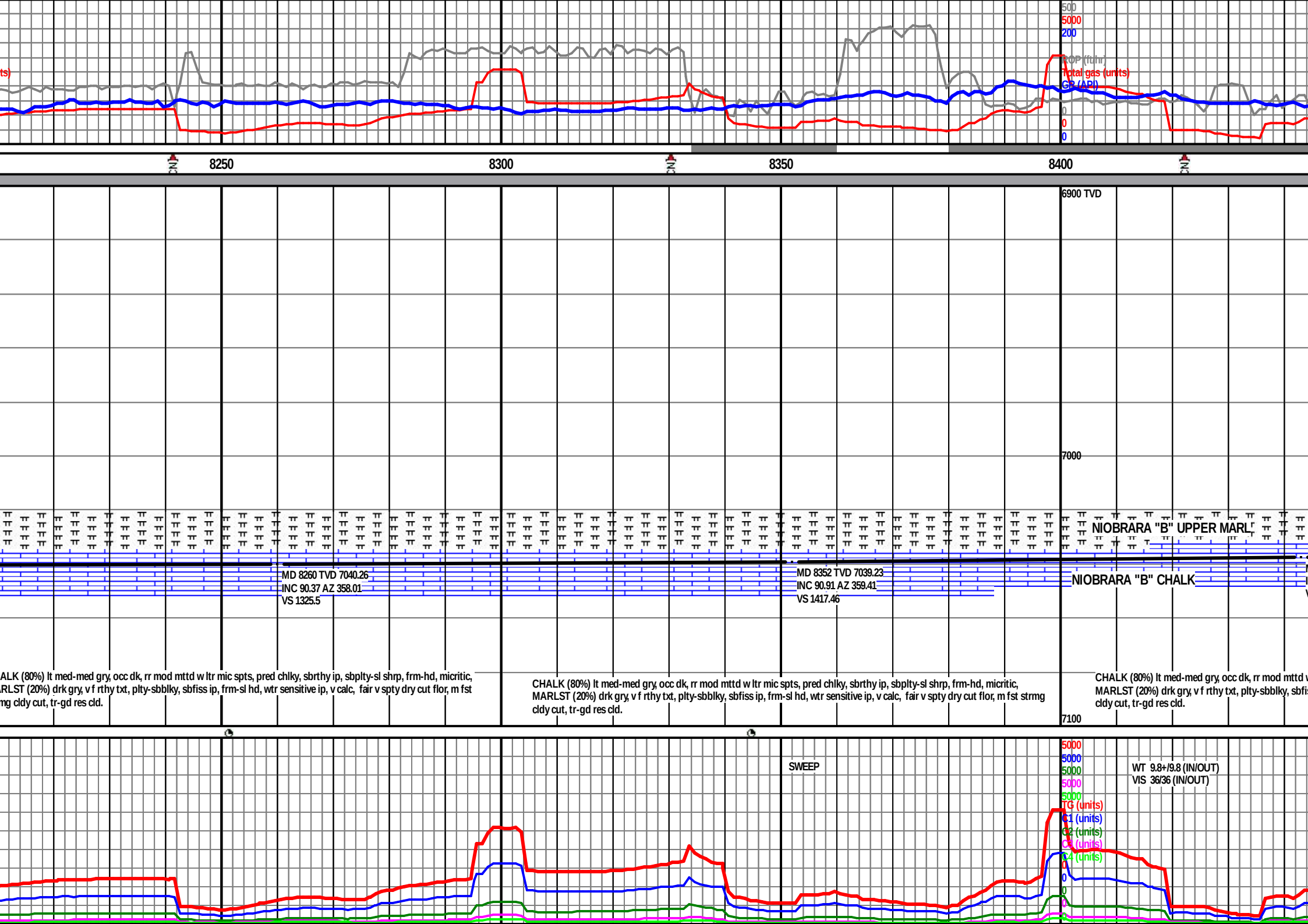
CHALK (70%) lt med-med gry, occ dk, rr mod m
MARLST (30%) drk gry, v f rthy txt, plty-sbblky,
cut flor, m fst strmg cldy cut, tr-gd res cld.

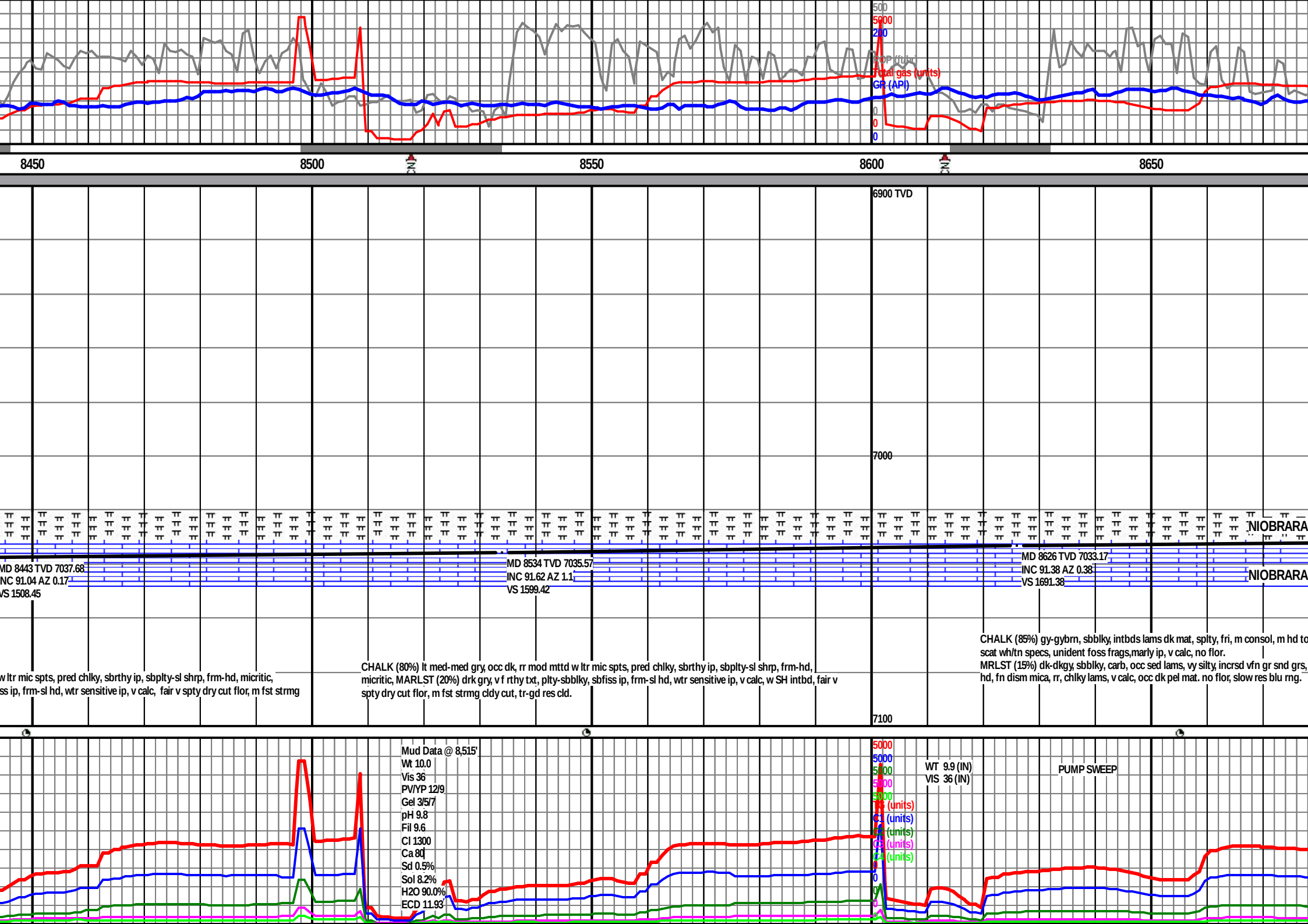
7100

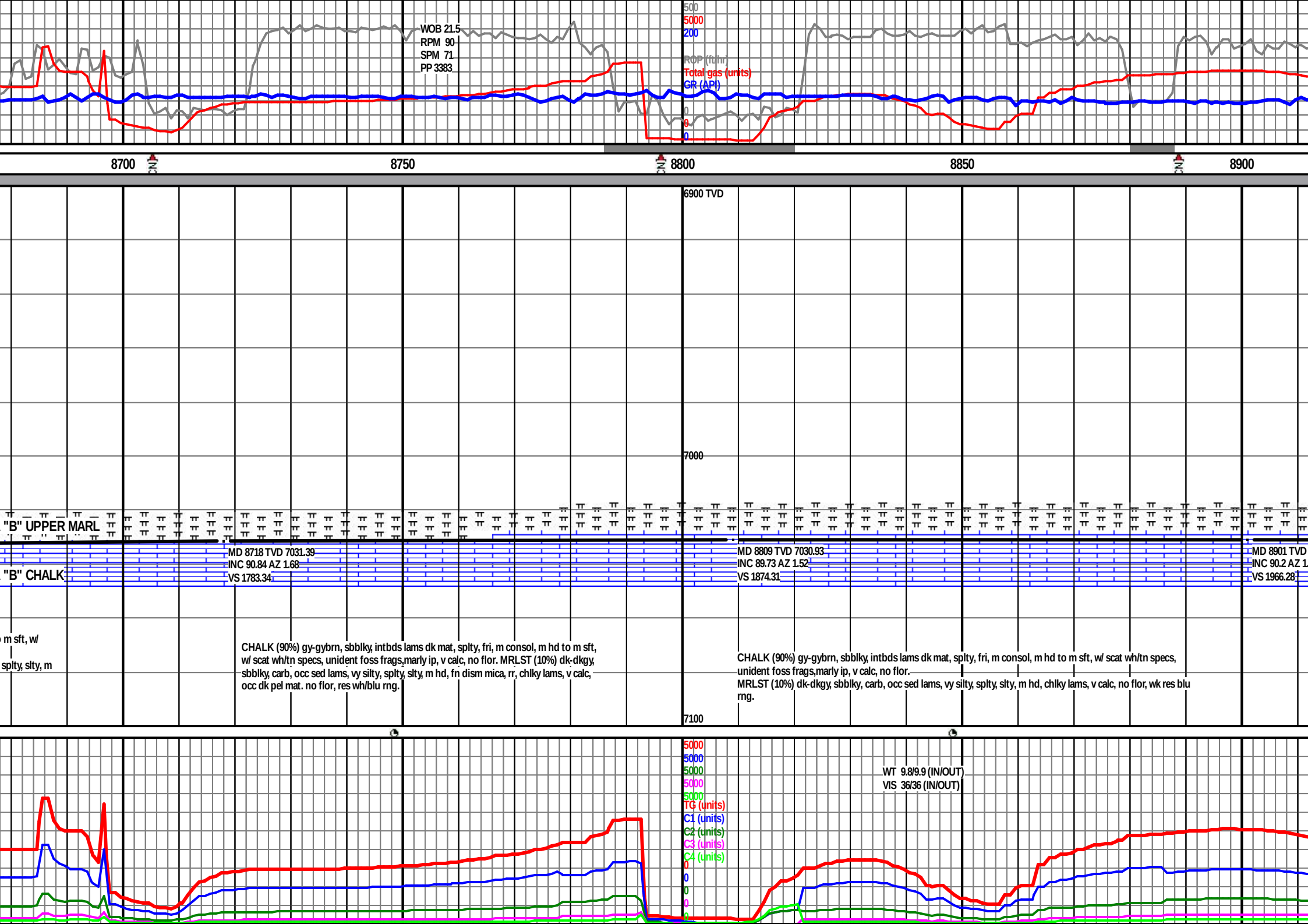


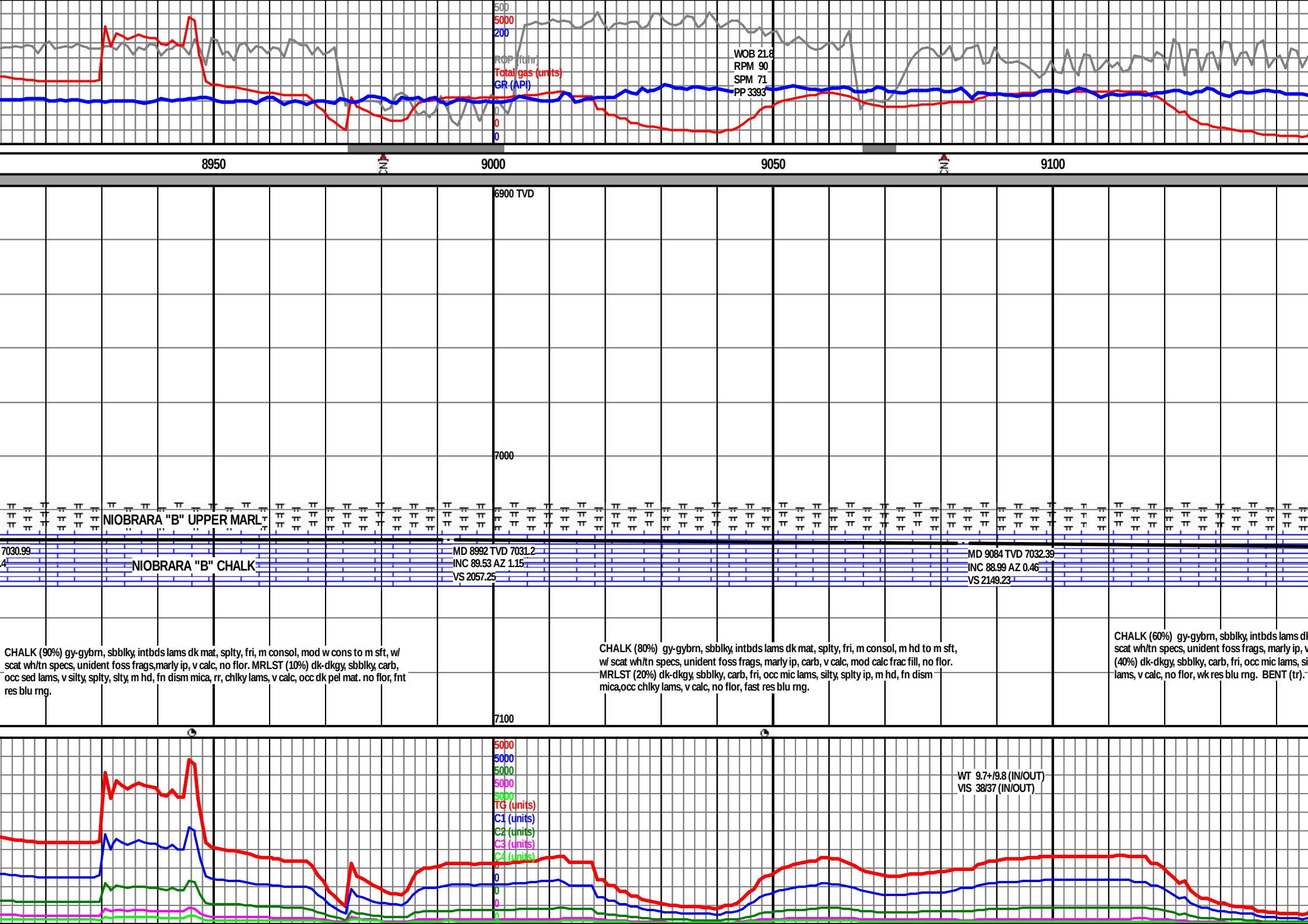

WOB 30.3
RPM 90
SPM 71
PP 3393
500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
WOB 21.7
RPM 90
SPM 71
PP 3390
7750
CN
7800
7850
CN
7900
7950
CN
6900 TVD
7000
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
MD 7805 TVD 7044.65
INC 90.94 AZ 0.18
VS 870.61
MD 7896 TVD 7042.4
INC 91.88 AZ 359.05
VS 961.57
mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, blk carb thru, fair v spty dry
CHALK (70%) lt med-med gry, occ dk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic, MARLST (30%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, blk carb thru, fair v spty dry cut flor, m fst strmg cldy cut, tr-gd res cld.
CHALK (80%) lt med-med gry, occ dk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-
MARLST (20%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, blk
cut flor, m fst strmg cldy cut, tr-gd res cld.
7100
5000
5000
5000
5000
5000
SWEEP
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0

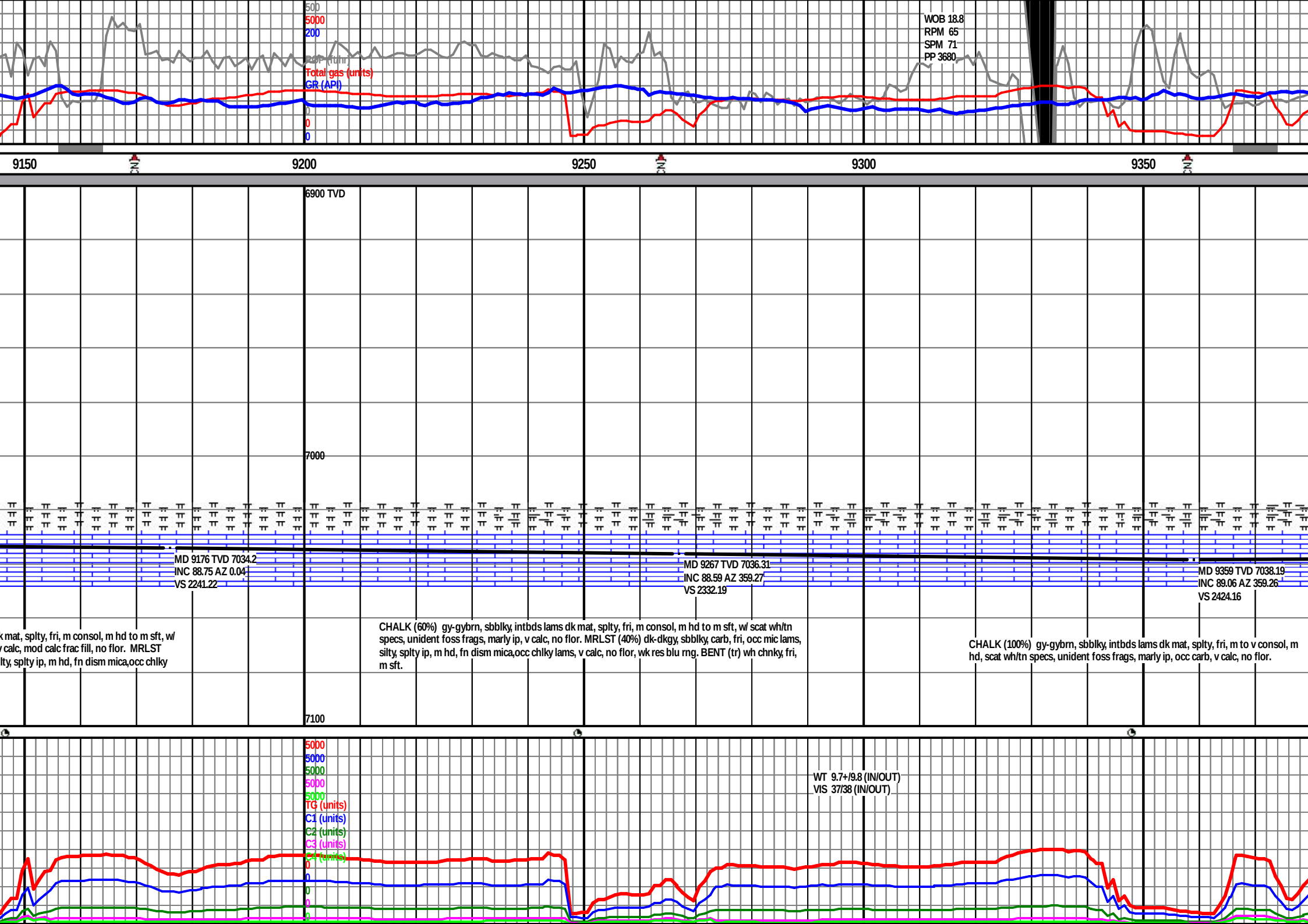

500
5000
200
ROP (fu/hr)
Total gas (units)
GR (API)
0
0
0
WOB 22.0
RPM 90
SPM 71
PP 3391
8000
8050
8100
8150
8200
6900 TVD
7000
7100
INTERPRETED FAULT # 1
18' DOWN THROW
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
MD 7986 TVD 7040.1
INC 91.04 AZ 359.1
VS 1051.53
MD 8077 TVD 7039.81
INC 89.33 AZ 359.75
VS 1142.52
MD 8168 TVD 7040.45
INC 89.87 AZ 359.56
VS 1233.52
sl shrp, frm-hd, micritic,
carb thru, fair v spty dry
CHALK (80%) lt med-med gry, occ dk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd,
micritic, MARLST (20%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, blk carb thru,
abn clcit frc fil, fair v spty dry cut flor, m fst strmg cldy cut, tr-gd res cld.
CHALK (80%) lt med-med gry, occ dk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic,
MARLST (20%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, blk carb thru, clcit frc fil, fair v spty
dry cut flor, m fst strmg cldy cut, tr-gd res cld.
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
WT 9.8 (IN/OUT)
VIS 38/37 (IN/OUT)
WT 9.8 (IN/OUT)
VIS 36/35 (IN/OUT)

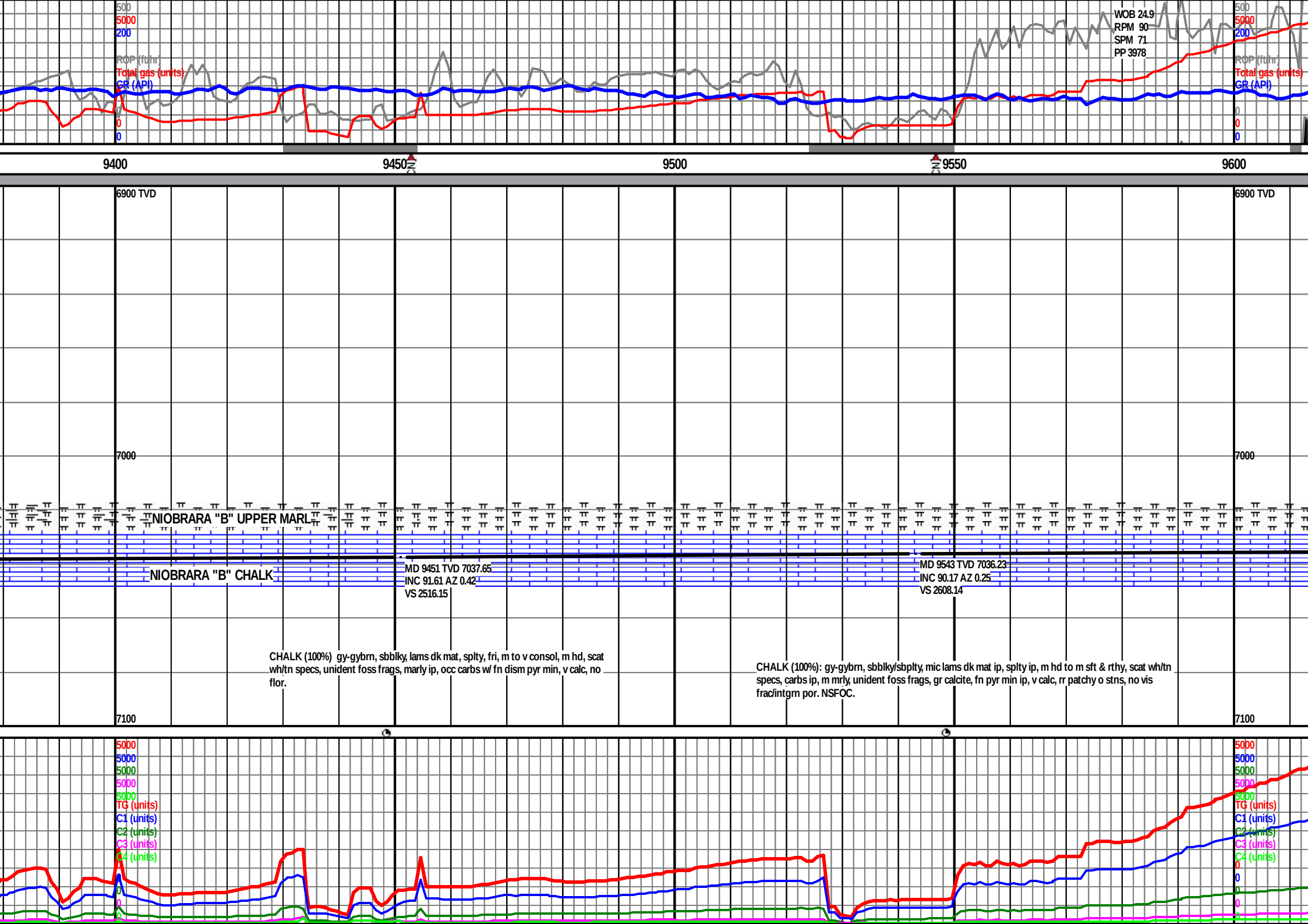

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
8250
8300
8350
8400
6900 TVD
7000
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
MD 8260 TVD 7040.26
INC 90.37 AZ 358.01
VS 1325.5
MD 8352 TVD 7039.23
INC 90.91 AZ 359.41
VS 1417.46
ALK (80%) lt med-med gry, occ dk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic,
RLST (20%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, fair v spty dry cut flor, m fst
mg cldy cut, tr-gd res cld.
CHALK (80%) lt med-med gry, occ dk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic,
MARLST (20%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, fair v spty dry cut flor, m fst strmg
cldy cut, tr-gd res cld.
CHALK (80%) lt med-med gry, occ dk, rr mod mttd w
MARLST (20%) drk gry, v f rthy txt, plty-sbblky, sbfi
cldy cut, tr-gd res cld.
7100
SWEEP
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0
WT 9.8+/9.8 (IN/OUT)
VIS 36/36 (IN/OUT)

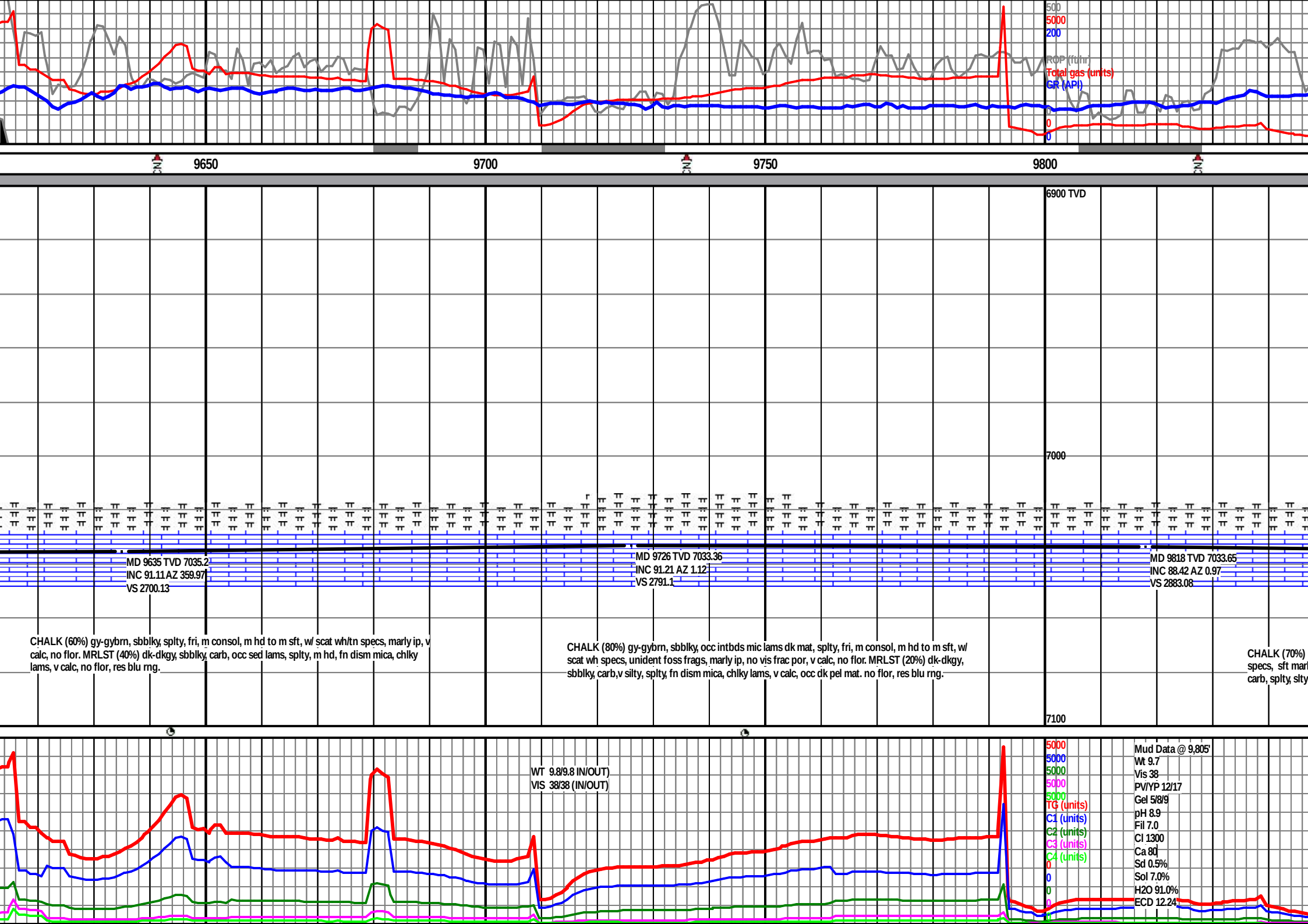

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
8450
8500
CN
8550
8600
CN
8650
6900 TVD
7000
7100
NIOBRARA
NIOBRARA
MD 8443 TVD 7037.68
INC 91.04 AZ 0.17
VS 1508.45
MD 8534 TVD 7035.57
INC 91.62 AZ 1.1
VS 1599.42
MD 8626 TVD 7033.17
INC 91.38 AZ 0.38
VS 1691.38
w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd, micritic,
ss ip, frm-sl hd, wtr sensitive ip, v calc, fair v spty dry cut flor, m fst strmg
CHALK (80%) lt med-med gry, occ dk, rr mod mttd w ltr mic spts, pred chlky, sbrthy ip, sbplty-sl shrp, frm-hd,
micritic, MARLST (20%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm-sl hd, wtr sensitive ip, v calc, w SH intbd, fair v
spty dry cut flor, m fst strmg cldy cut, tr-gd res cld.
CHALK (85%) gy-gybrn, sbblky, intbds lams dk mat, splty, fri, m consol, m hd to
scat wh/tn specs, unident foss frags,marly ip, v calc, no flor.
MRLST (15%) dk-dkgy, sbblky, carb, occ sed lams, vy silty, incrsd vfn gr snd grs,
hd, fn dism mica, rr, chlky lams, v calc, occ dk pel mat. no flor, slow res blu rng.
Mud Data @ 8,515'
Wt 10.0
Vis 36
PV/YP 12/9
Gel 3/5/7
pH 9.8
Fil 9.6
Cl 1300
Ca 80
Sd 0.5%
Sol 8.2%
H2O 90.0%
ECD 11.93
5000
5000
5000
5000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
WT 9.9 (IN)
VIS 36 (IN)
PUMP SWEEP

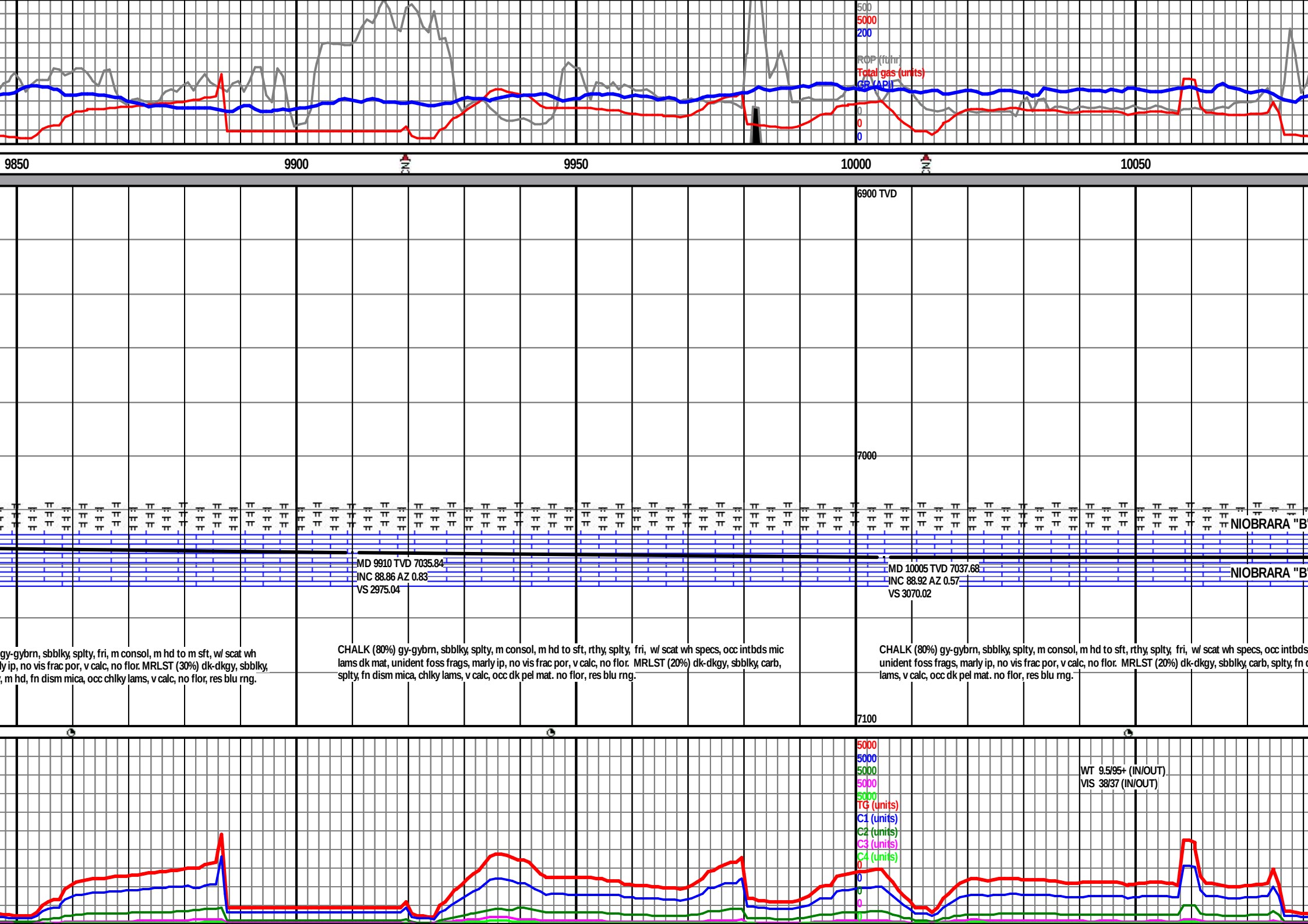

WOB 21.5
RPM 90
SPM 71
PP 3383
500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
8700
8750
8800
8850
8900
6900 TVD
7000
"B" UPPER MARL
"B" CHALK
MD 8718 TVD 7031.39
INC 90.84 AZ 1.68
VS 1783.34
MD 8809 TVD 7030.93
INC 89.73 AZ 1.52
VS 1874.31
MD 8901 TVD
INC 90.2 AZ 1.
VS 1966.28
m sft, w/
splty, slty, m
CHALK (90%) gy-gybrn, sbblky, intbds lams dk mat, splty, fri, m consol, m hd to m sft, w/ scat wh/tn specs, unident foss frags,marly ip, v calc, no flor. MRLST (10%) dk-dkgy, sbblky, carb, occ sed lams, vy silty, splty, slty, m hd, fn dism mica, rr, chlky lams, v calc, occ dk pel mat. no flor, res wh/blu rng.
CHALK (90%) gy-gybrn, sbblky, intbds lams dk mat, splty, fri, m consol, m hd to m sft, w/ scat wh/tn specs, unident foss frags,marly ip, v calc, no flor.
MRLST (10%) dk-dkgy, sbblky, carb, occ sed lams, vy silty, splty, slty, m hd, chlky lams, v calc, no flor, wk res blu rng.
7100
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
WT 9.8/9.9 (IN/OUT)
VIS 36/36 (IN/OUT)

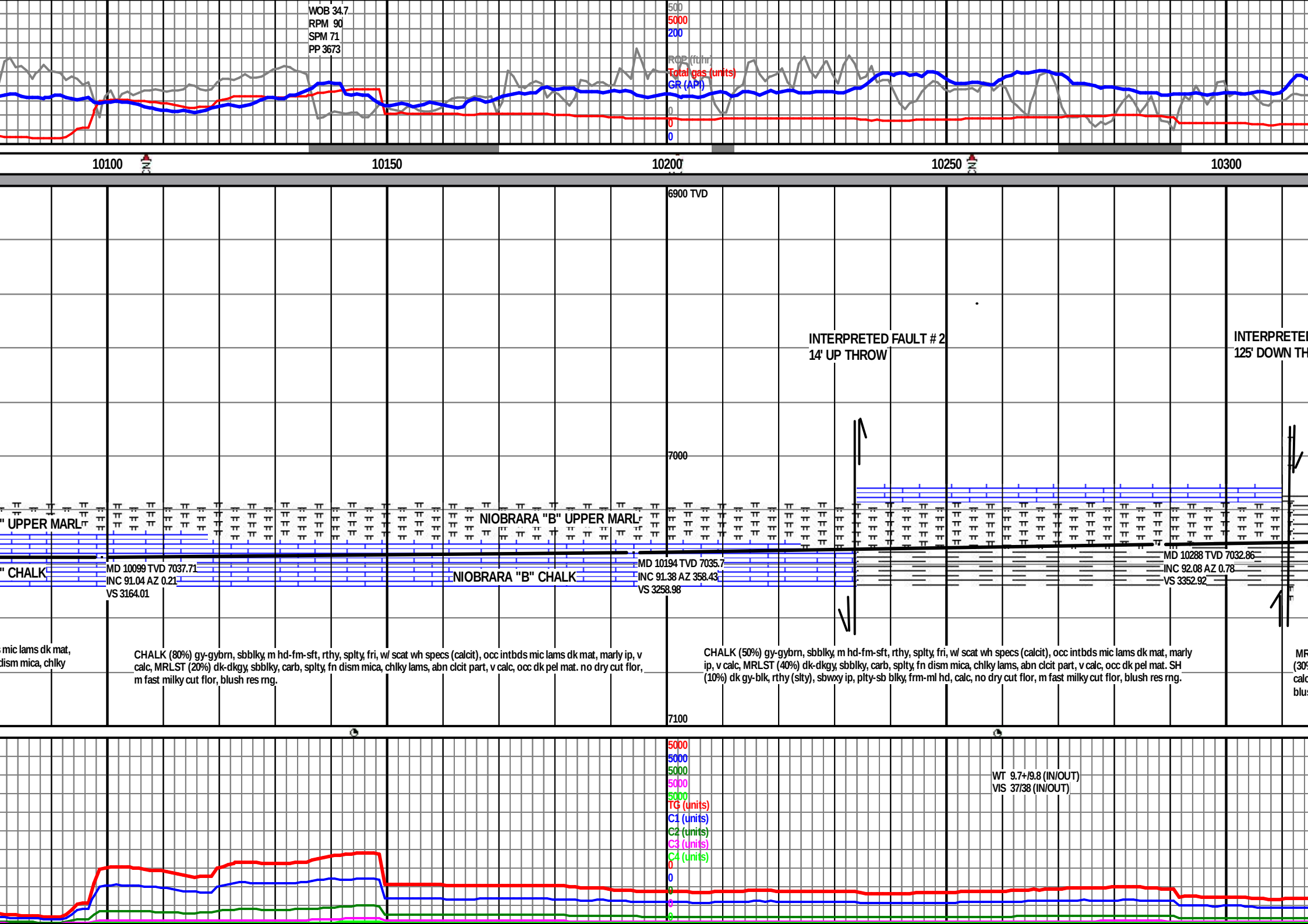

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
WOB 21.8
RPM 90
SPM 71
PP 3393
8950
9000
9050
9100
6900 TVD
7000
7100
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
7030.99
MD 8992 TVD 7031.2
INC 89.53 AZ 1.15
VS 2057.25
MD 9084 TVD 7032.39
INC 88.99 AZ 0.46
VS 2149.23
CHALK (90%) gy-gybrn, sbblky, intbds lams dk mat, splty, fri, m consol, mod w cons to m sft, w/ scat wh/tn specs, unident foss frags,marly ip, v calc, no flor. MRLST (10%) dk-dkgy, sbblky, carb, occ sed lams, v silty, splty, slty, m hd, fn dism mica, rr, chlky lams, v calc, occ dk pel mat. no flor, fnt res blu rng.
CHALK (80%) gy-gybrn, sbblky, intbds lams dk mat, splty, fri, m consol, m hd to m sft, w/ scat wh/tn specs, unident foss frags, marly ip, carb, v calc, mod calc frac fill, no flor. MRLST (20%) dk-dkgy, sbblky, carb, fri, occ mic lams, silty, splty ip, m hd, fn dism mica,occ chlky lams, v calc, no flor, fast res blu rng.
CHALK (60%) gy-gybrn, sbblky, intbds lams dk
scat wh/tn specs, unident foss frags, marly ip, v
(40%) dk-dkgy, sbblky, carb, fri, occ mic lams, si
lams, v calc, no flor, wk res blu rng. BENT (tr).
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
WT 9.7+/9.8 (IN/OUT)
VIS 38/37 (IN/OUT)

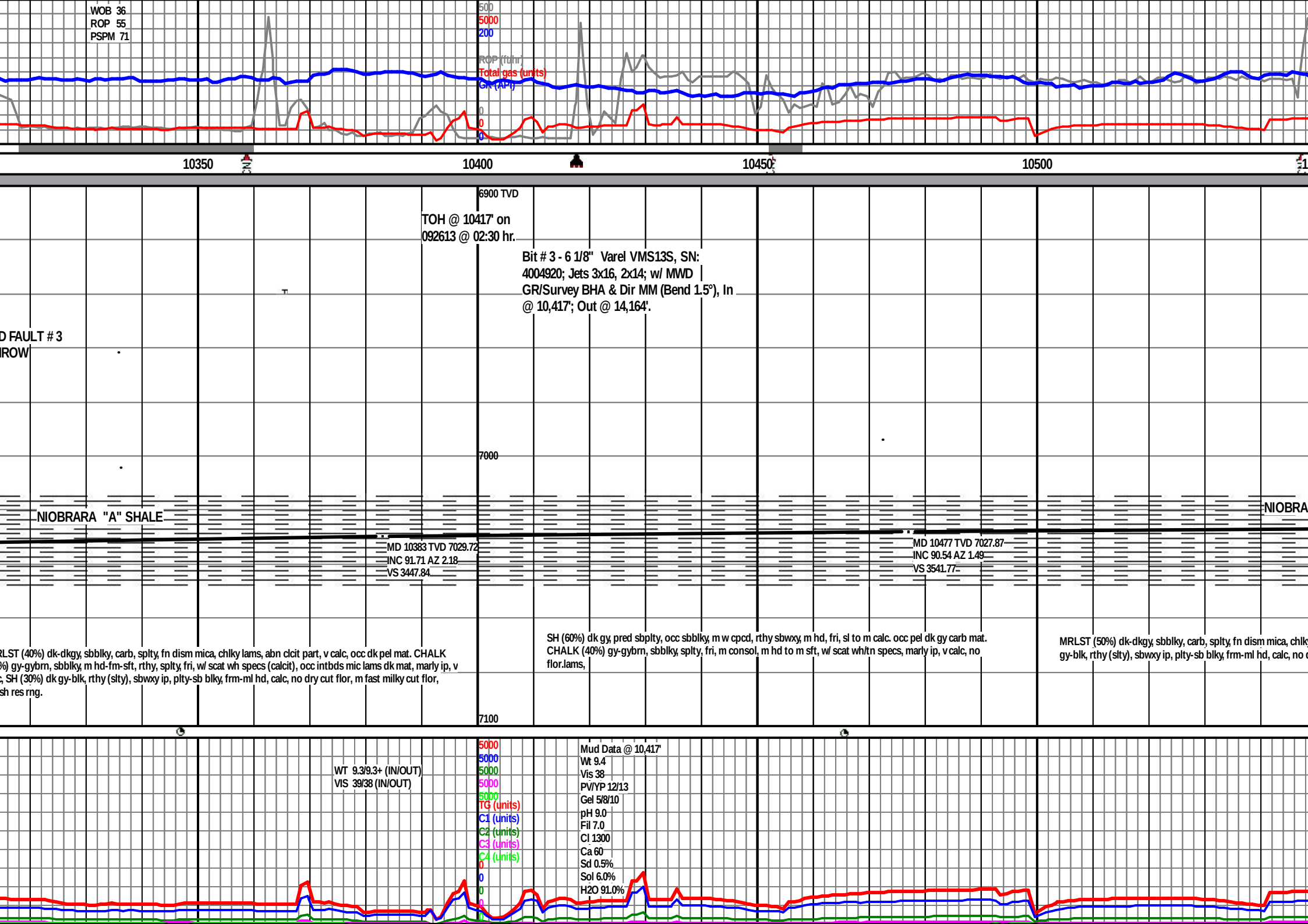

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
WOB 18.8
RPM 65
SPM 71
PP 3680
9150
9200
9250
9300
9350
6900 TVD
7000
7100
MD 9176 TVD 7034.2
INC 88.75 AZ 0.04
VS 2241.22
MD 9267 TVD 7036.31
INC 88.59 AZ 359.27
VS 2332.19
MD 9359 TVD 7038.19
INC 89.06 AZ 359.26
VS 2424.16
k mat, splty, fri, m consol, m hd to m sft, w/
v calc, mod calc frac fill, no flor. MRLST
lty, splty ip, m hd, fn dism mica,occ chlky
CHALK (60%) gy-gybrn, sbblky, intbds lams dk mat, splty, fri, m consol, m hd to m sft, w/ scat wh/tn specs, unident foss frags, marly ip, v calc, no flor. MRLST (40%) dk-dkgy, sbblky, carb, fri, occ mic lams, silty, splty ip, m hd, fn dism mica,occ chlky lams, v calc, no flor, wk res blu rng. BENT (tr) wh chnky, fri, m sft.
CHALK (100%) gy-gybrn, sbblky, intbds lams dk mat, splty, fri, m to v consol, m hd, scat wh/tn specs, unident foss frags, marly ip, occ carb, v calc, no flor.
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0
WT 9.7+/9.8 (IN/OUT)
VIS 37/38 (IN/OUT)

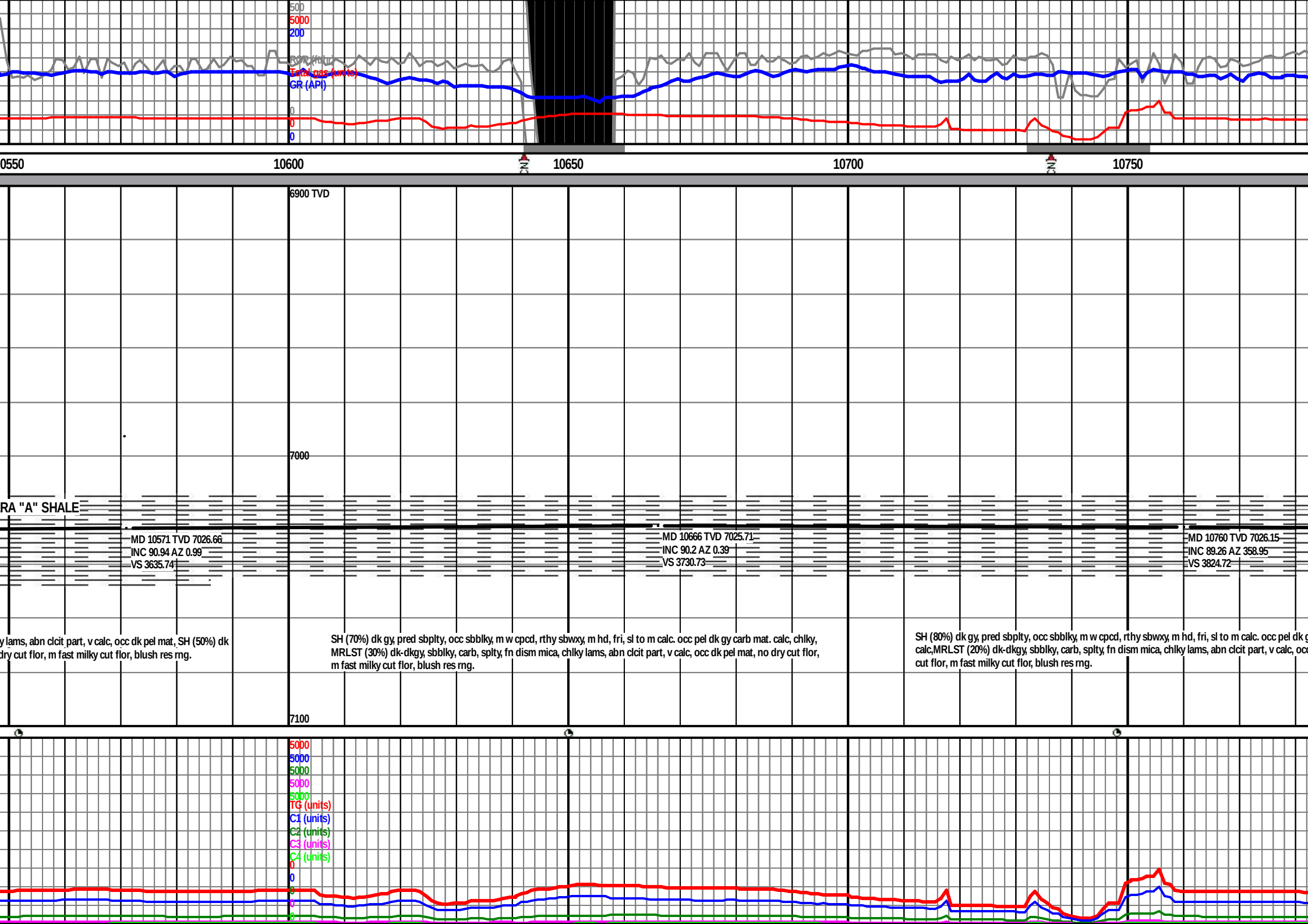

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
WOB 24.9
RPM 90
SPM 71
PP 3978
9400
9450
9500
9550
9600
6900 TVD
7000
7100
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
MD 9451 TVD 7037.65
INC 91.61 AZ 0.42
VS 2516.15
MD 9543 TVD 7036.23
INC 90.17 AZ 0.25
VS 2608.14
CHALK (100%) gy-gybrn, sbblky, lams dk mat, splty, fri, m to v consol, m hd, scat wh/tn specs, unident foss frags, marly ip, occ carbs w/ fn dism pyr min, v calc, no flor.
CHALK (100%): gy-gybrn, sbblky/sbplty, mic lams dk mat ip, splty ip, m hd to m sft & rthy, scat wh/tn specs, carbs ip, m mrly, unident foss frags, gr calcite, fn pyr min ip, v calc, rr patchy o stns, no vis frac/intgrn por. NSFOC.
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)

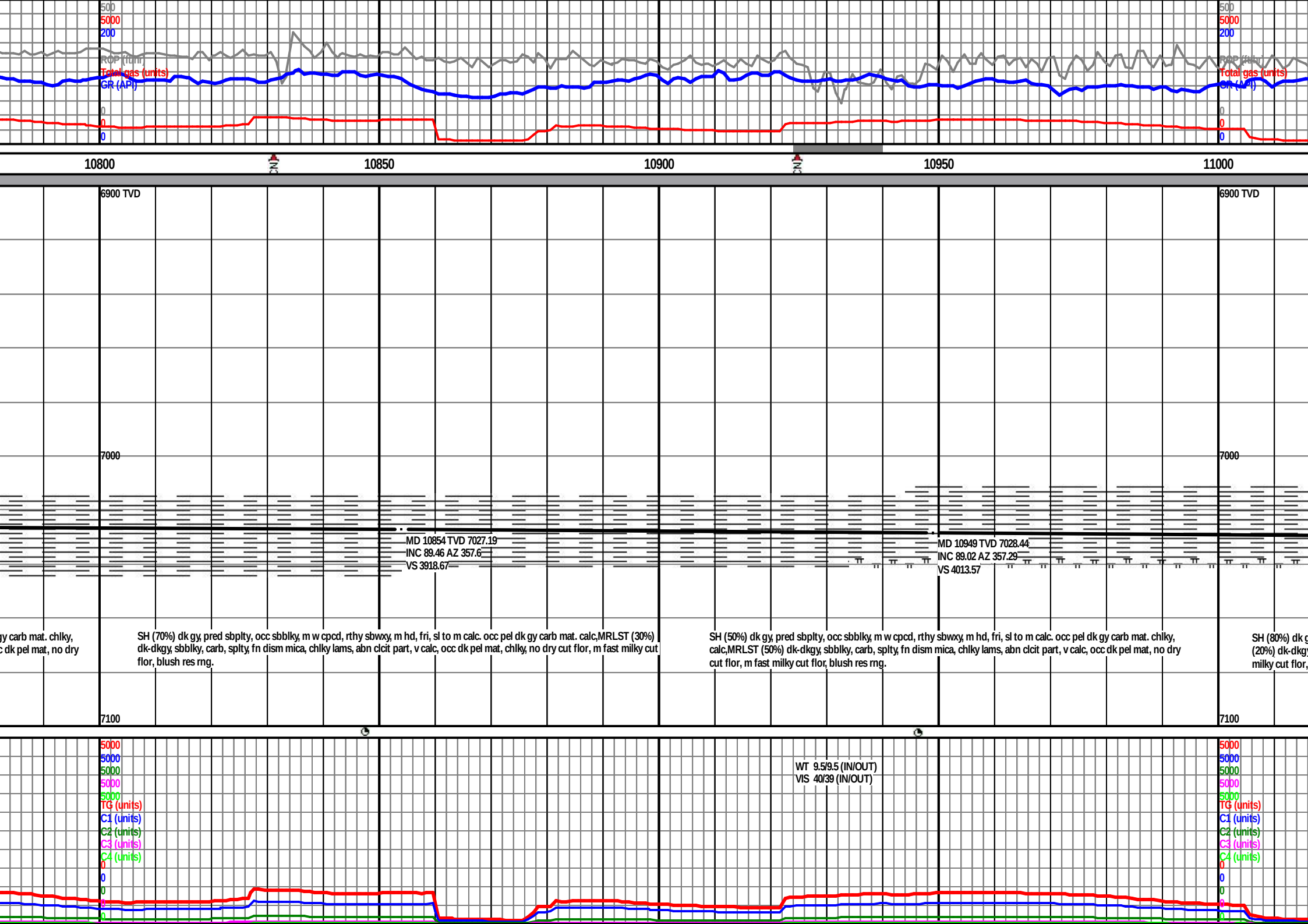

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
9650
9700
9750
9800
6900 TVD
7000
7100
MD 9635 TVD 7035.2
INC 91.11 AZ 359.97
VS 2700.13
MD 9726 TVD 7033.36
INC 91.21 AZ 1.12
VS 2791.1
MD 9818 TVD 7033.65
INC 88.42 AZ 0.97
VS 2883.08
CHALK (60%) gy-gybrn, sbblky, splty, fri, m consol, m hd to m sft, w/ scat wh/tn specs, marly ip, v calc, no flor. MRLST (40%) dk-dkgy, sbblky, carb, occ sed lams, splty, m hd, fn dism mica, chlky lams, v calc, no flor, res blu rng.
CHALK (80%) gy-gybrn, sbblky, occ intbds mic lams dk mat, splty, fri, m consol, m hd to m sft, w/ scat wh specs, unident foss frags, marly ip, no vis frac por, v calc, no flor. MRLST (20%) dk-dkgy, sbblky, carb,v silty, splty, fn dism mica, chlky lams, v calc, occ dk pel mat. no flor, res blu rng.
CHALK (70%)
specs, sft marl
carb, splty, slty
WT 9.8/9.8 IN/OUT)
VIS 38/38 (IN/OUT)
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0
Mud Data @ 9,805'
Wt 9.7
Vis 38
PV/YP 12/17
Gel 5/8/9
pH 8.9
Fil 7.0
Cl 1300
Ca 80
Sd 0.5%
Sol 7.0%
H2O 91.0%
ECD 12.24

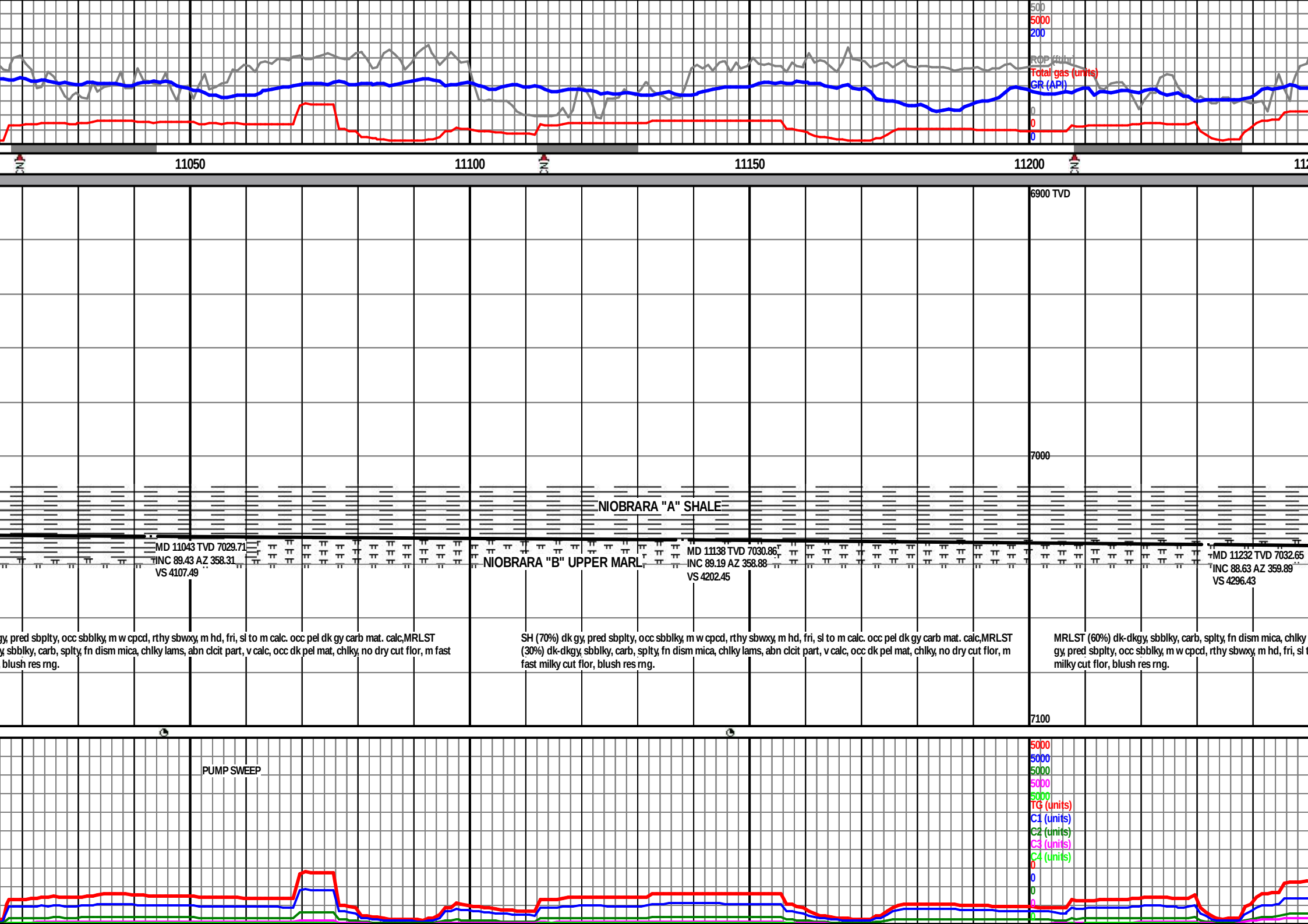

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
9850
9900
CN
9950
10000
CN
10050
6900 TVD
7000
NIOBRARA "B"
NIOBRARA "B"
MD 9910 TVD 7035.84
INC 88.86 AZ 0.83
VS 2975.04
MD 10005 TVD 7037.68
INC 88.92 AZ 0.57
VS 3070.02
gy-gybrn, sbblky, splty, fri, m consol, m hd to m sft, w/ scat wh
ly ip, no vis frac por, v calc, no flor. MRLST (30%) dk-dkgy, sbblky,
, m hd, fn dism mica, occ chlky lams, v calc, no flor, res blu rng.
CHALK (80%) gy-gybrn, sbblky, splty, m consol, m hd to sft, rthy, splty, fri, w/ scat wh specs, occ intbds mic
lams dk mat, unident foss frags, marly ip, no vis frac por, v calc, no flor. MRLST (20%) dk-dkgy, sbblky, carb,
splty, fn dism mica, chlky lams, v calc, occ dk pel mat. no flor, res blu rng.
CHALK (80%) gy-gybrn, sbblky, splty, m consol, m hd to sft, rthy, splty, fri, w/ scat wh specs, occ intbds
unident foss frags, marly ip, no vis frac por, v calc, no flor. MRLST (20%) dk-dkgy, sbblky, carb, splty, fn
lams, v calc, occ dk pel mat. no flor, res blu rng.
7100
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0
WT 9.5/95+ (IN/OUT)
VIS 38/37 (IN/OUT)

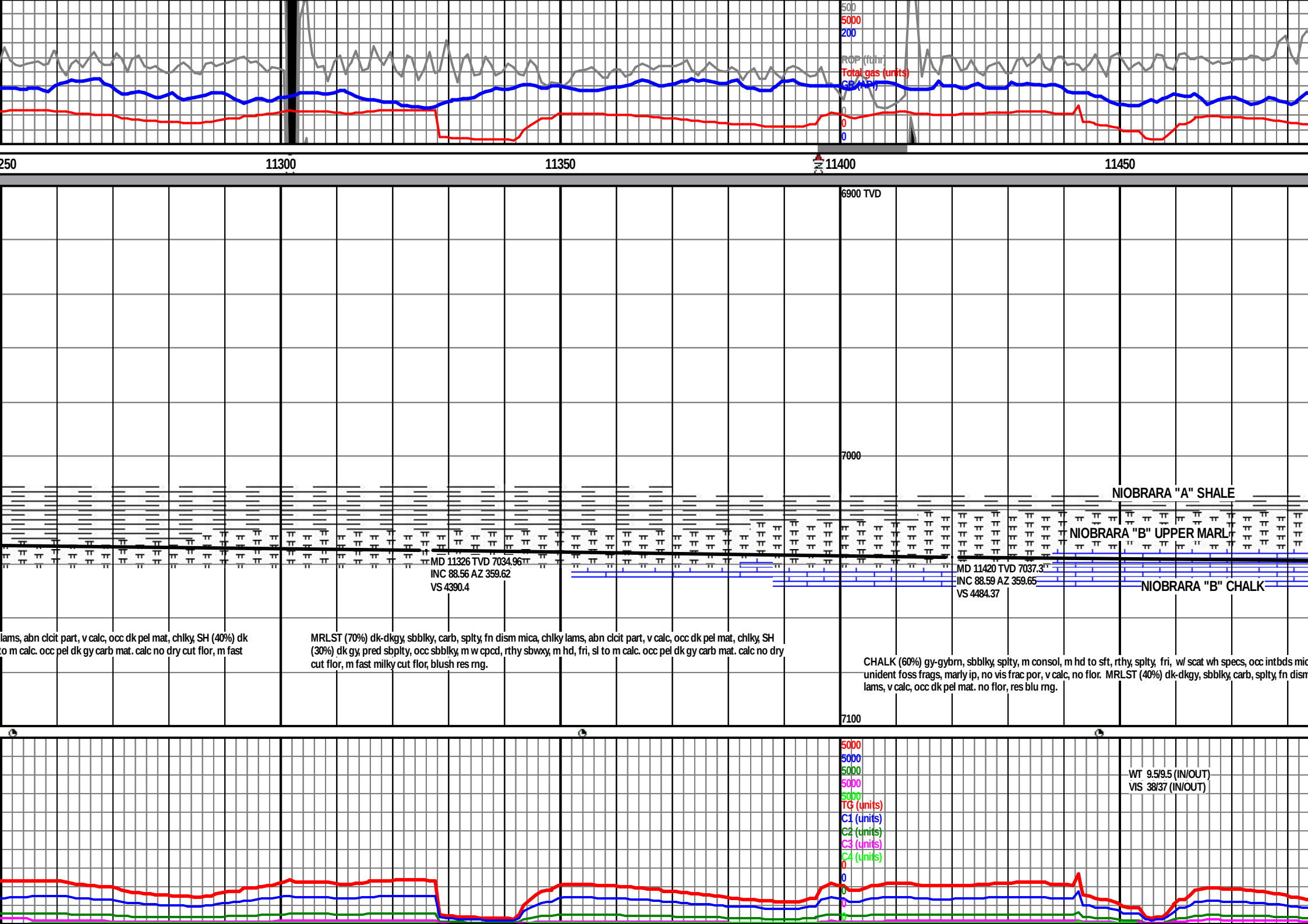

WOB 34.7
RPM 90
SPM 71
PP 3673
500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
10100
10150
10200
10250
10300
6900 TVD
7000
7100
INTERPRETED FAULT # 2
14' UP THROW
INTERPRETE
125' DOWN TH
" UPPER MARL
" CHALK
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
MD 10099 TVD 7037.71
INC 91.04 AZ 0.21
VS 3164.01
MD 10194 TVD 7035.7
INC 91.38 AZ 358.43
VS 3258.98
MD 10288 TVD 7032.86
INC 92.08 AZ 0.78
VS 3352.92
s mic lams dk mat,
dism mica, chlky
CHALK (80%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v calc, MRLST (20%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat. no dry cut flor, m fast milky cut flor, blush res rng.
CHALK (50%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v calc, MRLST (40%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat. SH (10%) dk gy-blk, rthy (slty), sbwxy ip, plty-sb blky, frm-ml hd, calc, no dry cut flor, m fast milky cut flor, blush res rng.
MR
(30
calc
blus
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
WT 9.7+/9.8 (IN/OUT)
VIS 37/38 (IN/OUT)

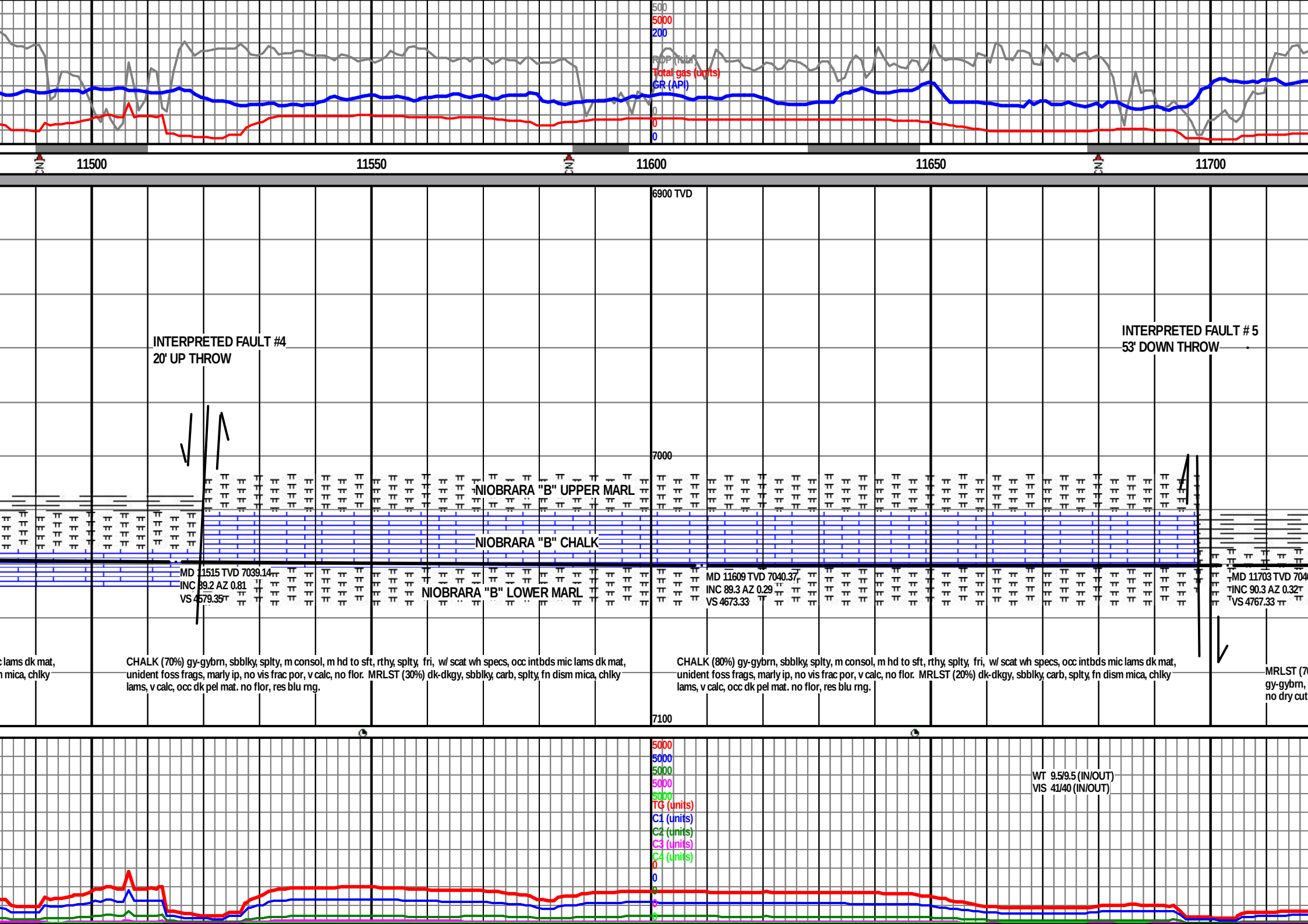

WOB 36
ROP 55
PSPM 71
500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
10350
10400
10450
10500
6900 TVD
TOH @ 10417' on
092613 @ 02:30 hr.
Bit # 3 - 6 1/8" Varel VMS13S, SN:
4004920; Jets 3x16, 2x14; w/ MWD
GR/Survey BHA & Dir MM (Bend 1.5°), In
@ 10,417'; Out @ 14,164'.
D FAULT # 3
IROW
7000
NIOBRARA "A" SHALE
NIOBRA
MD 10383 TVD 7029.72
INC 91.71 AZ 2.18
VS 3447.84
MD 10477 TVD 7027.87
INC 90.54 AZ 1.49
VS 3541.77
RLST (40%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat. CHALK
%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v
, SH (30%) dk gy-blk, rthy (slty), sbwxy ip, plty-sb blky, frm-ml hd, calc, no dry cut flor, m fast milky cut flor,
sh res rng.
SH (60%) dk gy, pred sbplty, occ sbblky, m w cpcd, rthy sbwxy, m hd, fri, sl to m calc. occ pel dk gy carb mat.
CHALK (40%) gy-gybrn, sbblky, splty, fri, m consol, m hd to m sft, w/ scat wh/tn specs, marly ip, v calc, no
flor.lams,
MRLST (50%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlk
gy-blk, rthy (slty), sbwxy ip, plty-sb blky, frm-ml hd, calc, no
7100
WT 9.3/9.3+ (IN/OUT)
VIS 39/38 (IN/OUT)
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
Mud Data @ 10,417'
Wt 9.4
Vis 38
PV/YP 12/13
Gel 5/8/10
pH 9.0
Fil 7.0
Cl 1300
Ca 60
Sd 0.5%
Sol 6.0%
H2O 91.0%

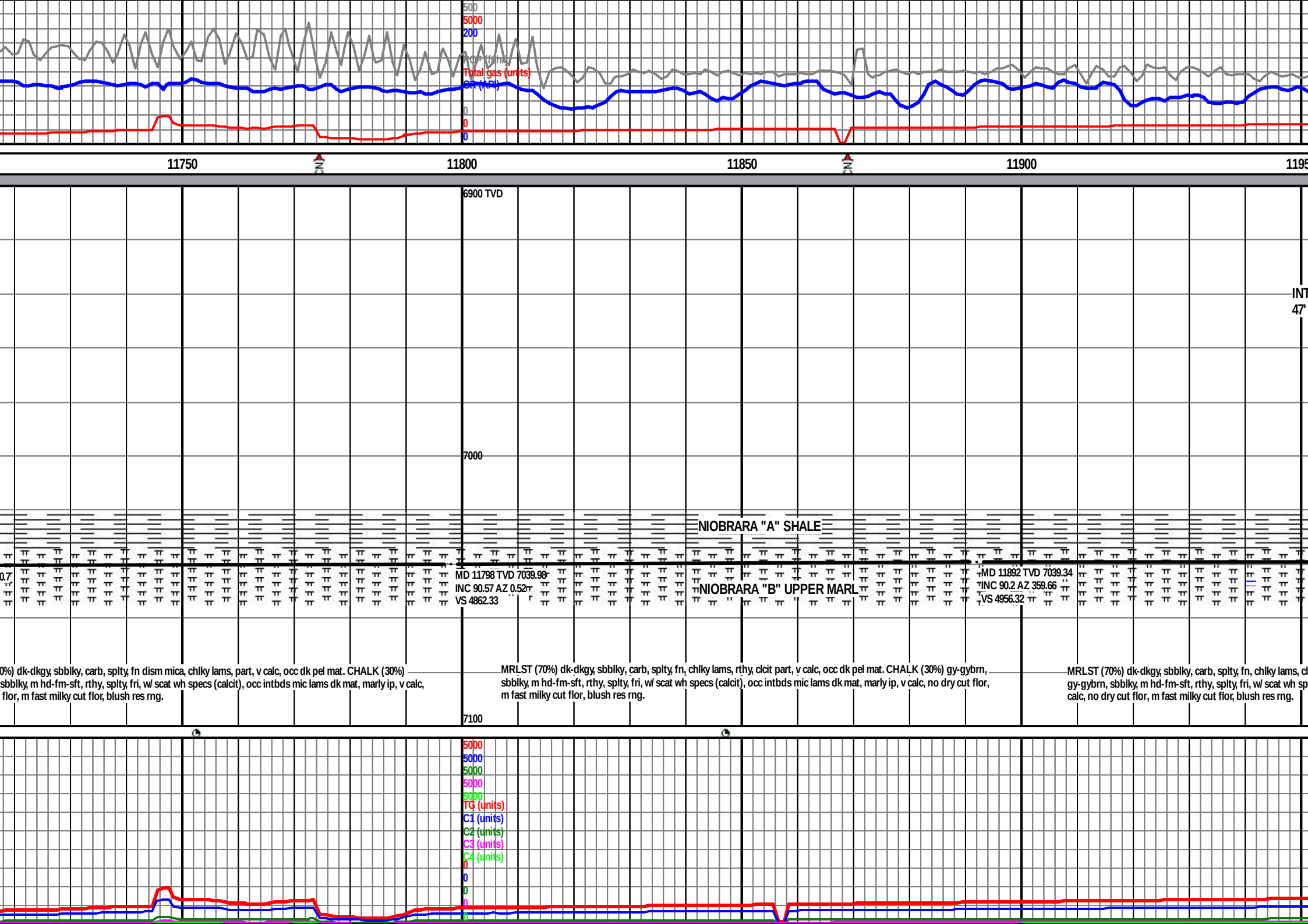

500
5000
200
ROP (min/ft)
Total gas (units)
GR (API)
0
0
0
0550
10600
CN
10650
10700
CN
10750
6900 TVD
7000
RA "A" SHALE
MD 10571 TVD 7026.66
INC 90.94 AZ 0.99
VS 3635.74
MD 10666 TVD 7025.71
INC 90.2 AZ 0.39
VS 3730.73
MD 10760 TVD 7026.15
INC 89.26 AZ 358.95
VS 3824.72
y lams, abn clcit part, v calc, occ dk pel mat, SH (50%) dk
dry cut flor, m fast milky cut flor, blush res rng.
SH (70%) dk gy, pred sbplty, occ sbblky, m w cpcd, rthy sbwxy, m hd, fri, sl to m calc. occ pel dk gy carb mat. calc, chlky,
MRLST (30%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat, no dry cut flor,
m fast milky cut flor, blush res rng.
SH (80%) dk gy, pred sbplty, occ sbblky, m w cpcd, rthy sbwxy, m hd, fri, sl to m calc. occ pel dk g
calc,MRLST (20%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ
cut flor, m fast milky cut flor, blush res rng.
7100
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0

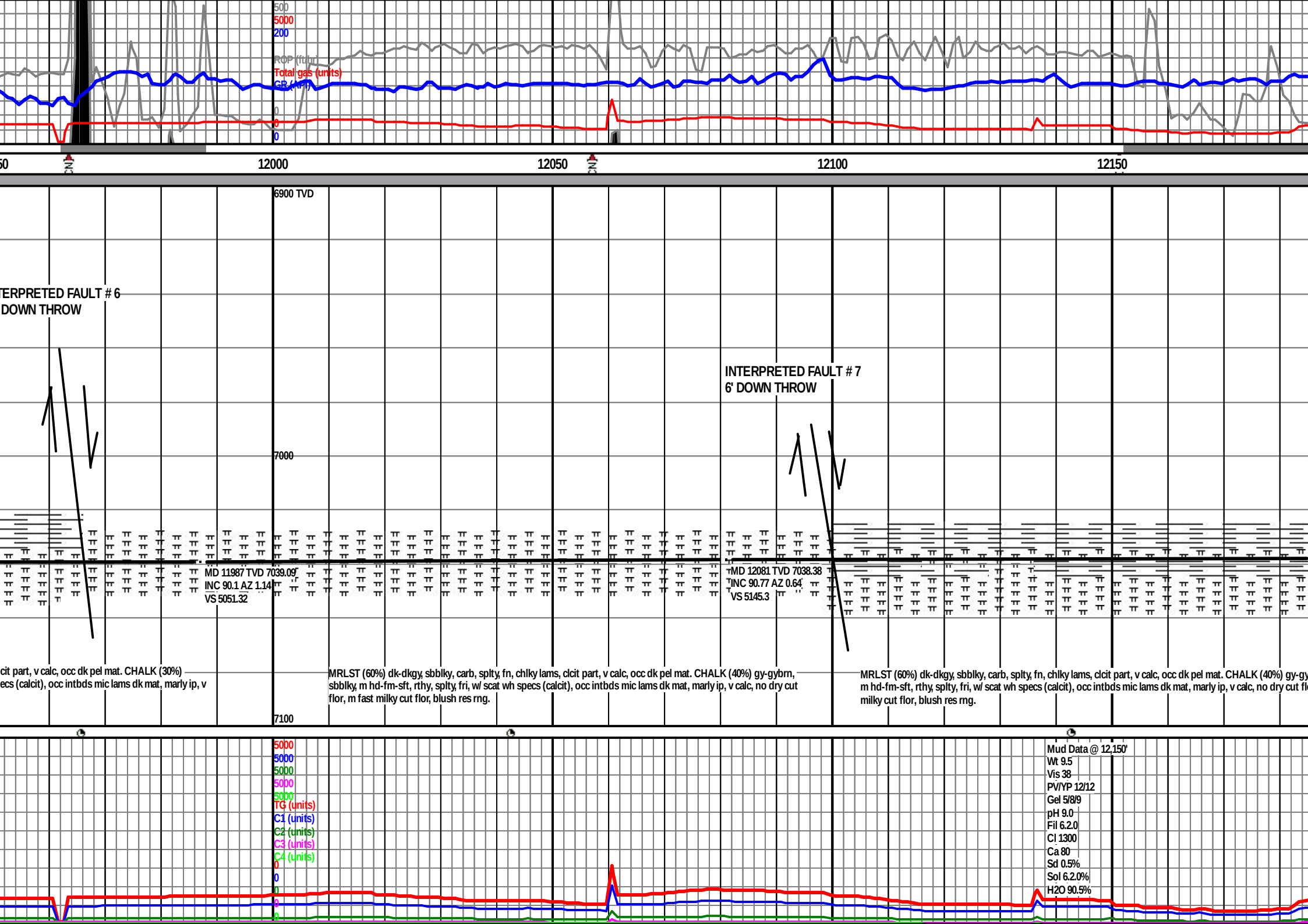

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
10800
INC
10850
10900
INC
10950
11000
6900 TVD
7000
MD 10854 TVD 7027.19
INC 89.46 AZ 357.6
VS 3918.67
MD 10949 TVD 7028.44
INC 89.02 AZ 357.29
VS 4013.57
SH (70%) dk gy, pred sbplty, occ sbblky, m w cpcd, rthy sbwxy, m hd, fri, sl to m calc. occ pel dk gy carb mat. calc,MRLST (30%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat, chlky, no dry cut flor, m fast milky cut flor, blush res rng.
SH (50%) dk gy, pred sbplty, occ sbblky, m w cpcd, rthy sbwxy, m hd, fri, sl to m calc. occ pel dk gy carb mat. chlky, calc,MRLST (50%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat, no dry cut flor, m fast milky cut flor, blush res rng.
7100
WT 9.5/9.5 (IN/OUT)
VIS 40/39 (IN/OUT)
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)

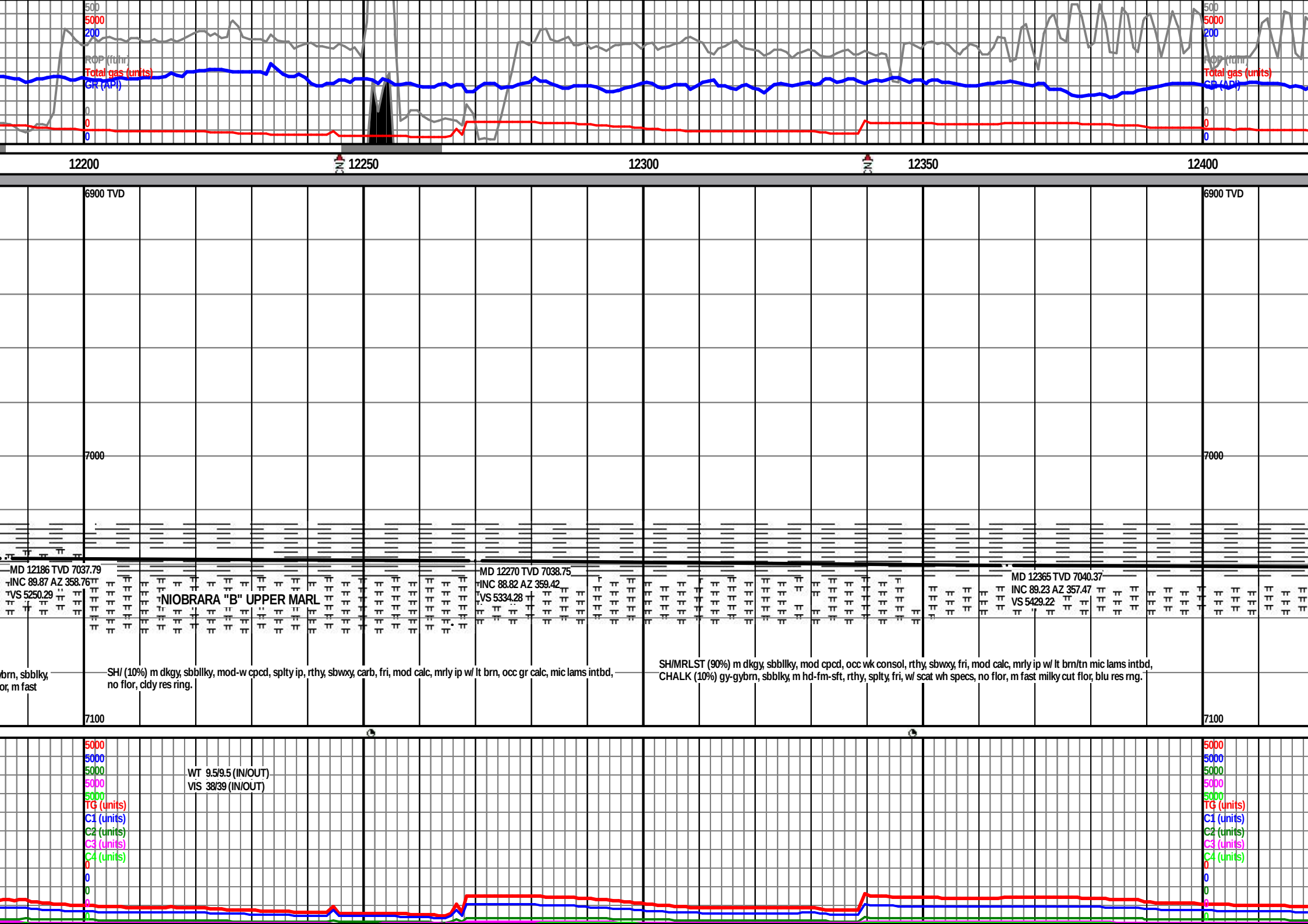

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
11050
11100
11150
11200
6900 TVD
7000
NIOBRARA "A" SHALE
MD 11043 TVD 7029.71
INC 89.43 AZ 358.31
VS 4107.49
NIOBRARA "B" UPPER MARL
MD 11138 TVD 7030.86
INC 89.19 AZ 358.88
VS 4202.45
MD 11232 TVD 7032.65
INC 88.63 AZ 359.89
VS 4296.43
gy, pred sbplty, occ sbblky, m w cpcd, rthy sbwxy, m hd, fri, sl to m calc. occ pel dk gy carb mat. calc,MRLST
y, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat, chlky, no dry cut flor, m fast
blush res rng.
SH (70%) dk gy, pred sbplty, occ sbblky, m w cpcd, rthy sbwxy, m hd, fri, sl to m calc. occ pel dk gy carb mat. calc,MRLST
(30%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat, chlky, no dry cut flor, m
fast milky cut flor, blush res rng.
MRLST (60%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky
gy, pred sbplty, occ sbblky, m w cpcd, rthy sbwxy, m hd, fri, sl t
milky cut flor, blush res rng.
7100
PUMP SWEEP
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0

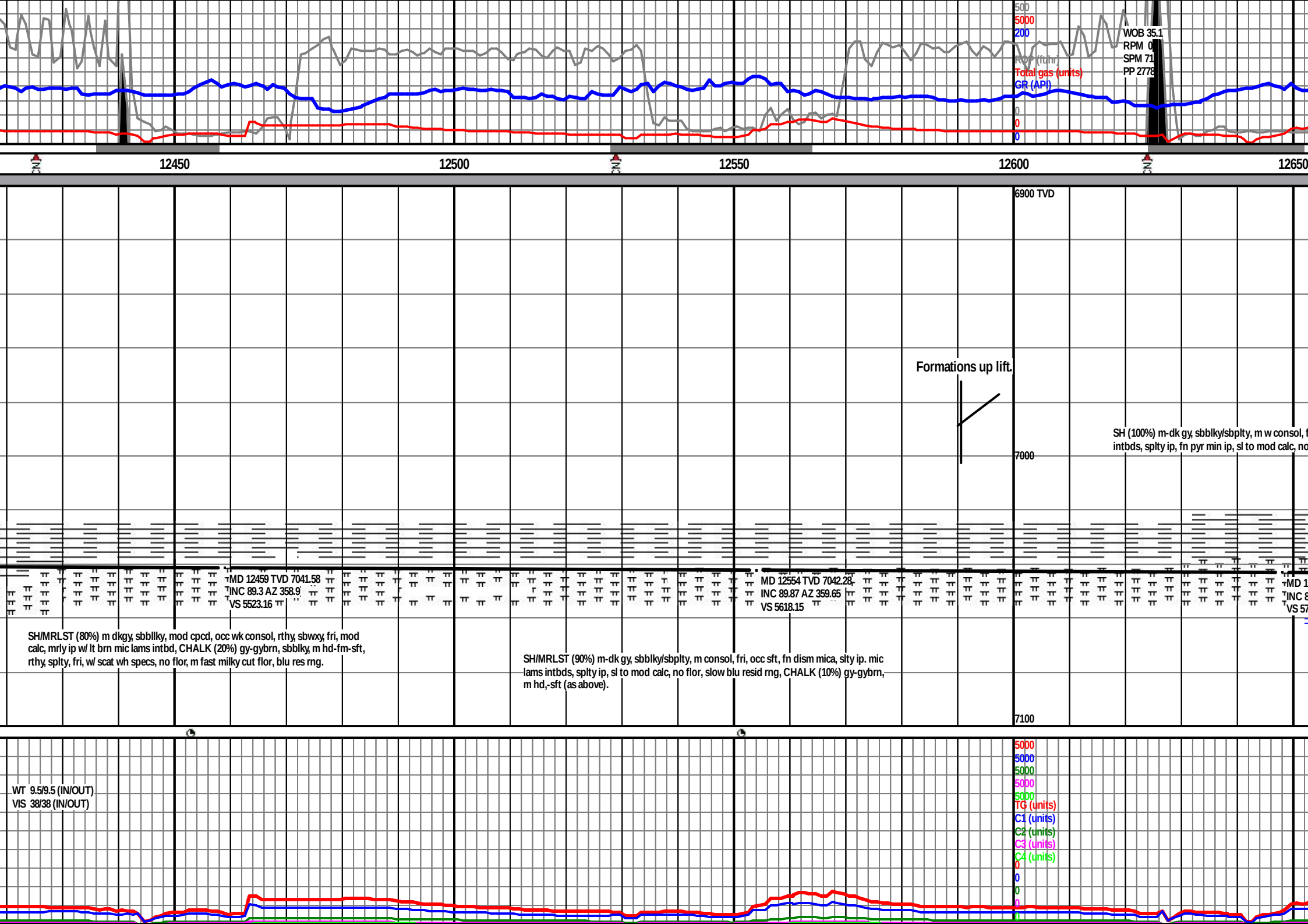

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
250
11300
11350
11400
11450
6900 TVD
7000
NIOBRARA "A" SHALE
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
MD 11326 TVD 7034.96
INC 88.56 AZ 359.62
VS 4390.4
MD 11420 TVD 7037.3
INC 88.59 AZ 359.65
VS 4484.37
lams, abn clcit part, v calc, occ dk pel mat, chlky, SH (40%) dk
o m calc. occ pel dk gy carb mat. calc no dry cut flor, m fast
MRLST (70%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat, chlky, SH (30%) dk gy, pred sbplty, occ sbblky, m w cpcd, rthy sbwxy, m hd, fri, sl to m calc. occ pel dk gy carb mat. calc no dry cut flor, m fast milky cut flor, blush res rng.
CHALK (60%) gy-gybrn, sbblky, splty, m consol, m hd to sft, rthy, splty, fri, w/ scat wh specs, occ intbds mic
unident foss frags, marly ip, no vis frac por, v calc, no flor. MRLST (40%) dk-dkgy, sbblky, carb, splty, fn dism
lams, v calc, occ dk pel mat. no flor, res blu rng.
7100
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0
WT 9.5/9.5 (IN/OUT)
VIS 38/37 (IN/OUT)

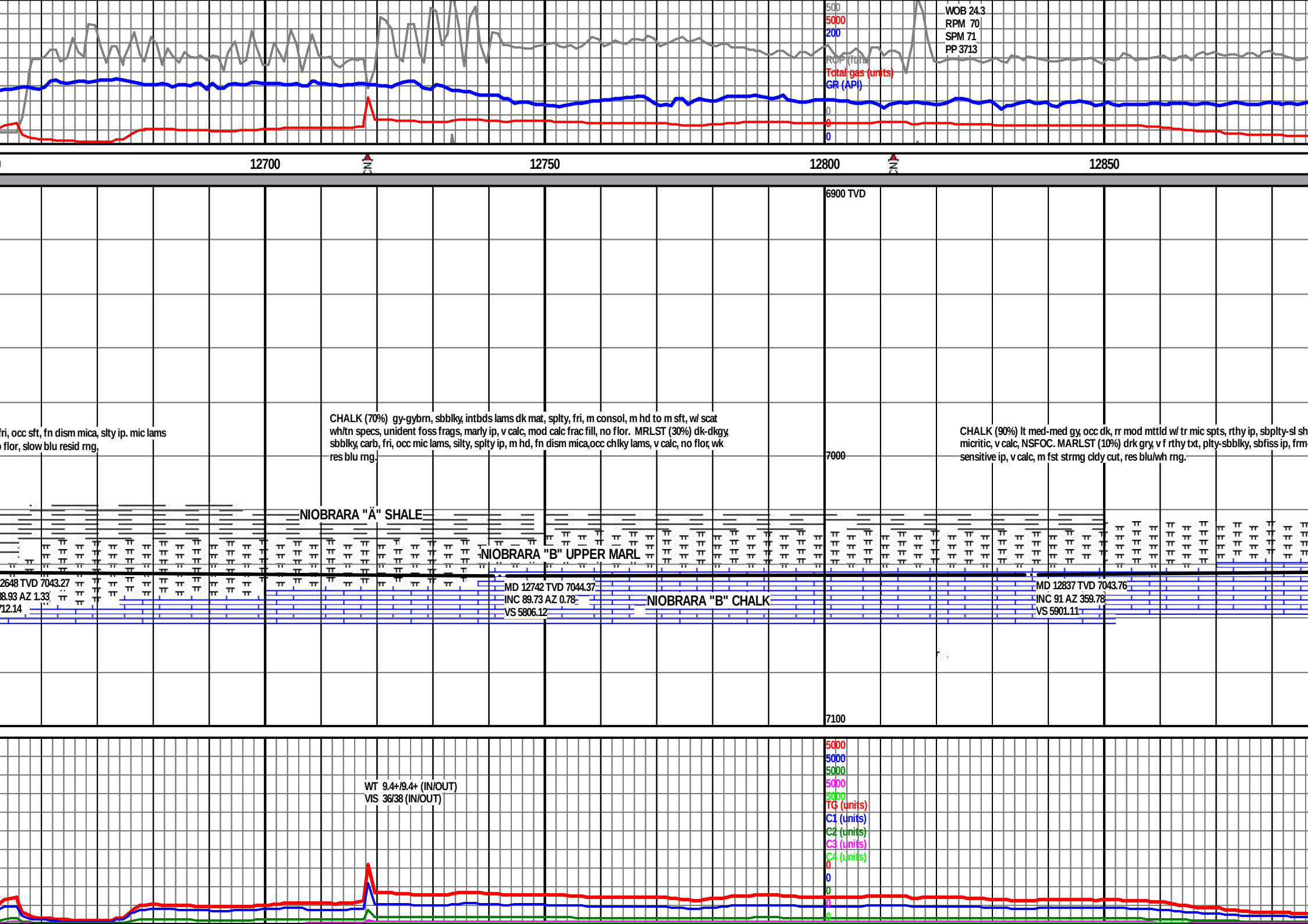

500
5000
200
ROP (min/ft)
Total gas (units)
GR (API)
0
0
0
11500
11550
11600
11650
11700
6900 TVD
7000
7100
INTERPRETED FAULT #4
20' UP THROW
INTERPRETED FAULT # 5
53' DOWN THROW
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
NIOBRARA "B" LOWER MARL
MD 11515 TVD 7039.14
INC 89.2 AZ 0.81
VS 4579.35
MD 11609 TVD 7040.37
INC 89.3 AZ 0.29
VS 4673.33
MD 11703 TVD 7040
INC 90.3 AZ 0.32
VS 4767.33
lams dk mat,
n mica, chlky
CHALK (70%) gy-gybrn, sbblky, splty, m consol, m hd to sft, rthy, splty, fri, w/ scat wh specs, occ intbds mic lams dk mat, unident foss frags, marly ip, no vis frac por, v calc, no flor. MRLST (30%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, v calc, occ dk pel mat. no flor, res blu rng.
CHALK (80%) gy-gybrn, sbblky, splty, m consol, m hd to sft, rthy, splty, fri, w/ scat wh specs, occ intbds mic lams dk mat, unident foss frags, marly ip, no vis frac por, v calc, no flor. MRLST (20%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, v calc, occ dk pel mat. no flor, res blu rng.
MRLST (70
gy-gybrn,
no dry cut
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0
WT 9.5/9.5 (IN/OUT)
VIS 41/40 (IN/OUT)

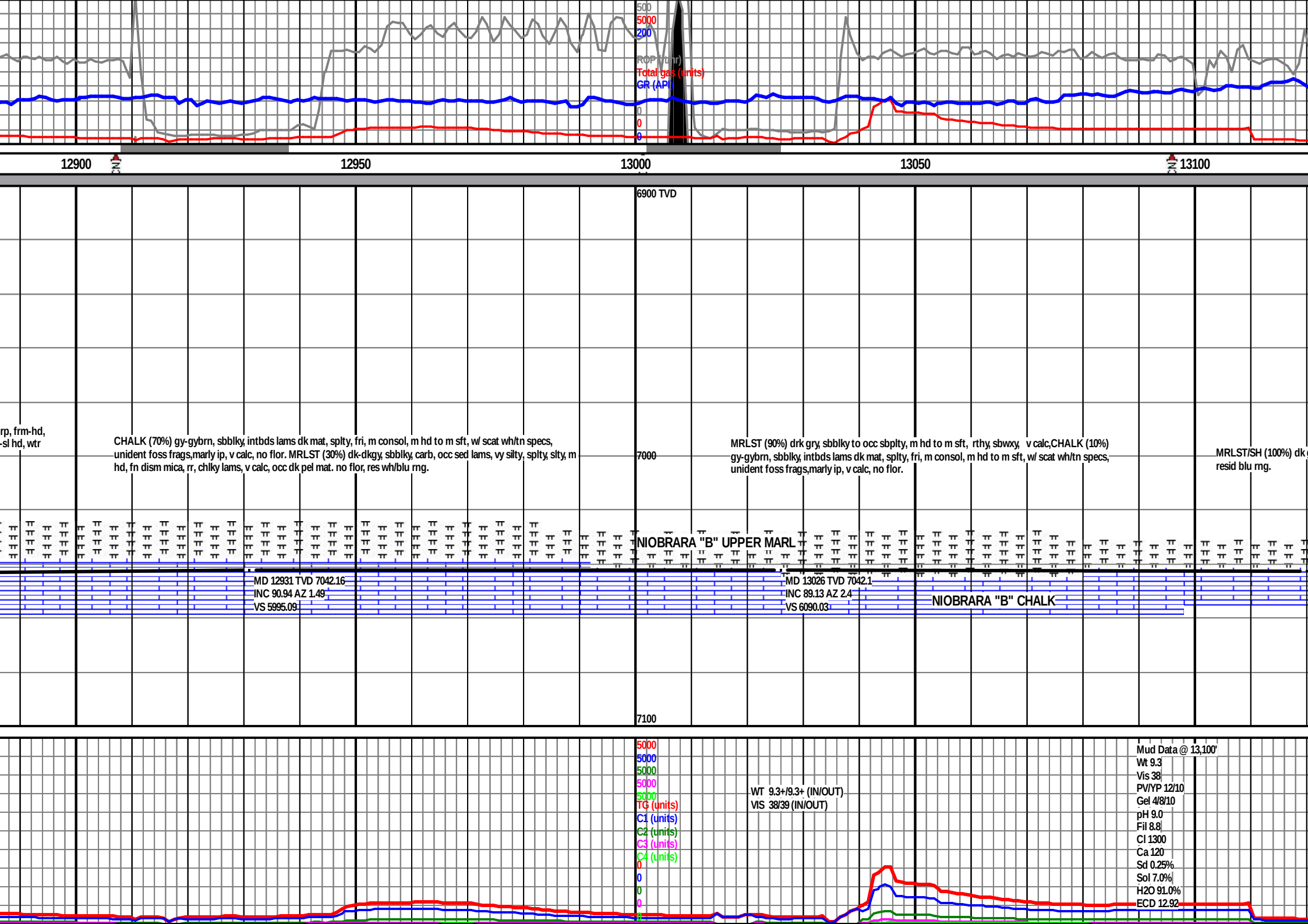

500
5000
200
ROP (min/ft)
Total gas (units)
BR (API)
0
0
0
11750
11800
11850
11900
6900 TVD
7000
7100
NIOBRARA "A" SHALE
NIOBRARA "B" UPPER MARL
MD 11798 TVD 7039.98
INC 90.57 AZ 0.52
VS 4862.33
MD 11892 TVD 7039.34
INC 90.2 AZ 359.66
VS 4956.32
INT
47'
0%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, part, v calc, occ dk pel mat. CHALK (30%)
sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v calc,
flor, m fast milky cut flor, blush res rng.
MRLST (70%) dk-dkgy, sbblky, carb, splty, fn, chlky lams, rthy, clcit part, v calc, occ dk pel mat. CHALK (30%) gy-gybrn,
sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v calc, no dry cut flor,
m fast milky cut flor, blush res rng.
MRLST (70%) dk-dkgy, sbblky, carb, splty, fn, chlky lams, cl
gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh sp
calc, no dry cut flor, m fast milky cut flor, blush res rng.
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0

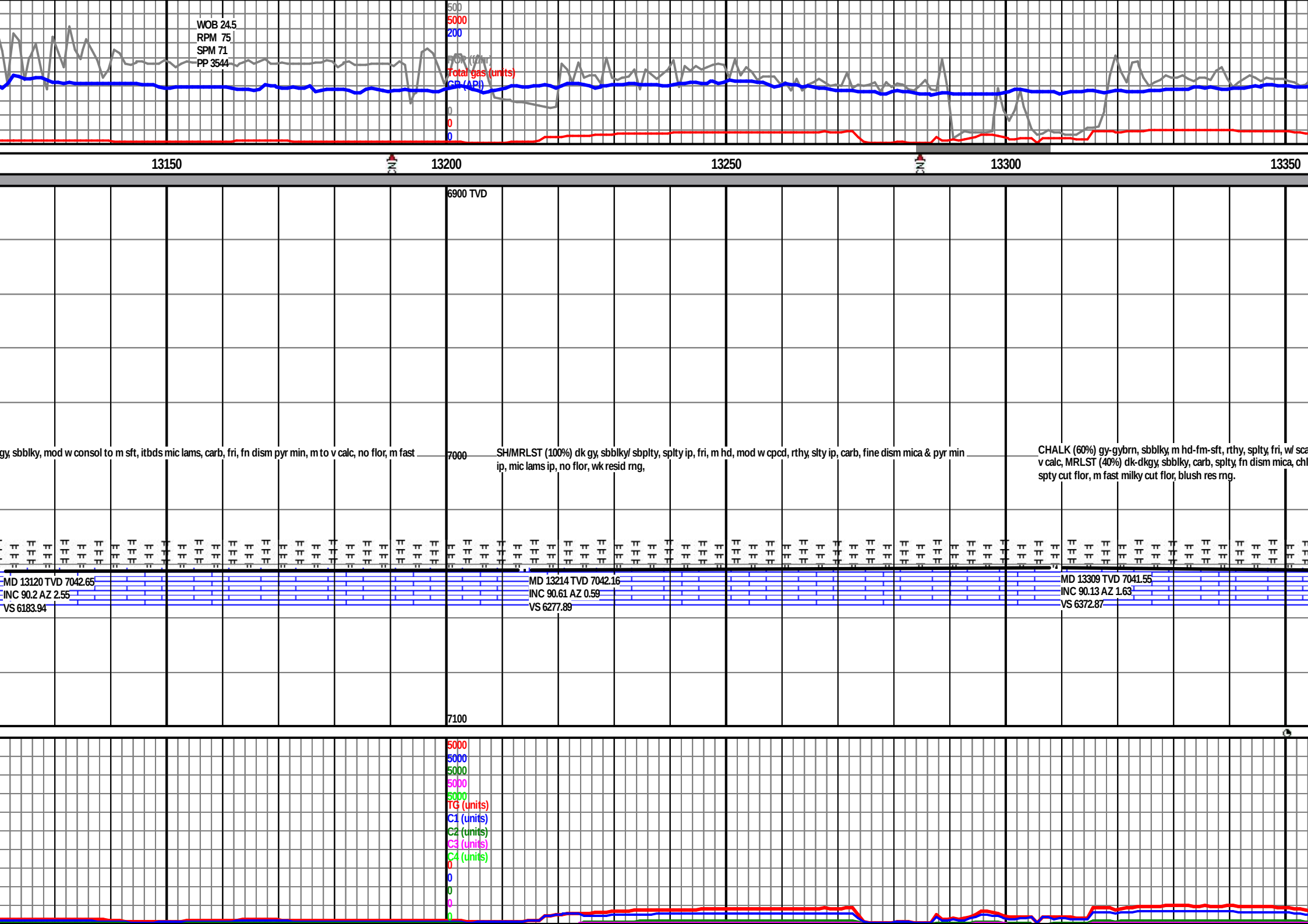

500
5000
200
ROP (ft/hr)
Total gas (units)
C2 (units)
0
0
0
12000
12050
12100
12150
6900 TVD
7000
7100
TERPRETED FAULT # 6
DOWN THROW
MD 11987 TVD 7039.09
INC 90.1 AZ 1.14
VS 5051.32
INTERPRETED FAULT # 7
6' DOWN THROW
MD 12081 TVD 7038.38
INC 90.77 AZ 0.64
VS 5145.3
cit part, v calc, occ dk pel mat. CHALK (30%)
ecs (calcit), occ intbds mic lams dk mat, marly ip, v
MRLST (60%) dk-dkgy, sbblky, carb, splty, fn, chlky lams, clcit part, v calc, occ dk pel mat. CHALK (40%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v calc, no dry cut flor, m fast milky cut flor, blush res rng.
MRLST (60%) dk-dkgy, sbblky, carb, splty, fn, chlky lams, clcit part, v calc, occ dk pel mat. CHALK (40%) gy-gy
m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v calc, no dry cut fl
milky cut flor, blush res rng.
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0
Mud Data @ 12,150'
Wt 9.5
Vis 38
PV/YP 12/12
Gel 5/8/9
pH 9.0
Fil 6.2.0
Cl 1300
Ca 80
Sd 0.5%
Sol 6.2.0%
H2O 90.5%

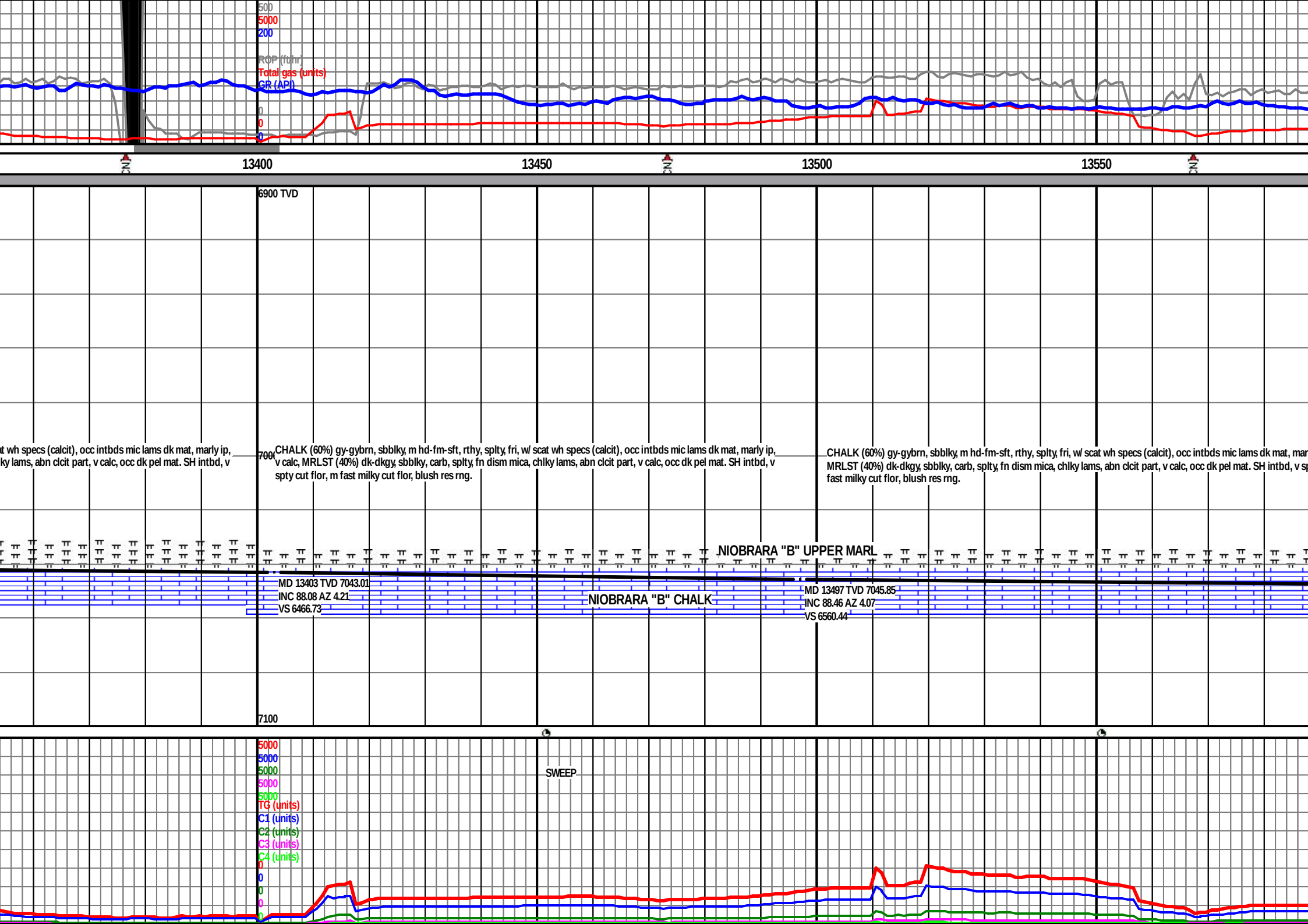

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
12200
CN
12250
12300
CN
12350
12400
6900 TVD
7000
7100
MD 12186 TVD 7037.79
INC 89.87 AZ 358.76
VS 5250.29
NIOBRARA "B" UPPER MARL
MD 12270 TVD 7038.75
INC 88.82 AZ 359.42
VS 5334.28
MD 12365 TVD 7040.37
INC 89.23 AZ 357.47
VS 5429.22
ybrn, sbblky,
or, m fast
SH/ (10%) m dkgy, sbbllky, mod-w cpcd, splty ip, rthy, sbwxy, carb, fri, mod calc, mrly ip w/ lt brn, occ gr calc, mic lams intbd,
no flor, cldy res ring.
SH/MRLST (90%) m dkgy, sbbllky, mod cpcd, occ wk consol, rthy, sbwxy, fri, mod calc, mrly ip w/ lt brn/tn mic lams intbd,
CHALK (10%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs, no flor, m fast milky cut flor, blu res rng.
WT 9.5/9.5 (IN/OUT)
VIS 38/39 (IN/OUT)
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0

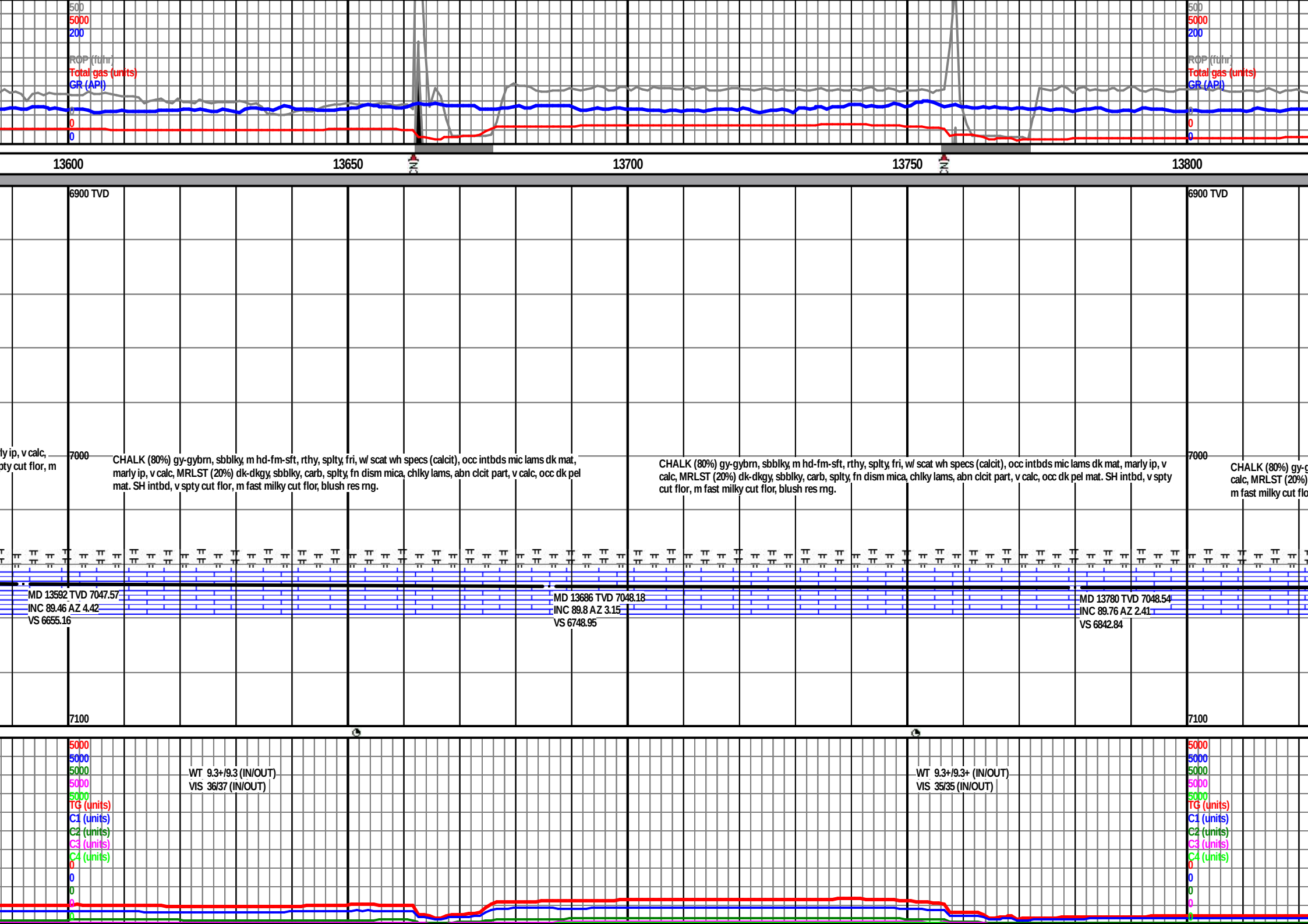

500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
WOB 35.1
RPM 0
SPM 71
PP 2778
12450
12500
12550
12600
12650
6900 TVD
Formations up lift.
SH (100%) m-dk gy, sbblky/sbplty, m w consol, f
intbds, splty ip, fn pyr min ip, sl to mod calc, no
7000
MD 12459 TVD 7041.58
INC 89.3 AZ 358.9
VS 5523.16
MD 12554 TVD 7042.28
INC 89.87 AZ 359.65
VS 5618.15
SH/MRLST (80%) m dkgy, sbbllky, mod cpcd, occ wk consol, rthy, sbwxy, fri, mod calc, mrly ip w/ lt brn mic lams intbd, CHALK (20%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs, no flor, m fast milky cut flor, blu res rng.
SH/MRLST (90%) m-dk gy, sbblky/sbplty, m consol, fri, occ sft, fn dism mica, slty ip. mic lams intbds, splty ip, sl to mod calc, no flor, slow blu resid rng, CHALK (10%) gy-gybrn, m hd,-sft (as above).
7100
WT 9.5/9.5 (IN/OUT)
VIS 38/38 (IN/OUT)
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0

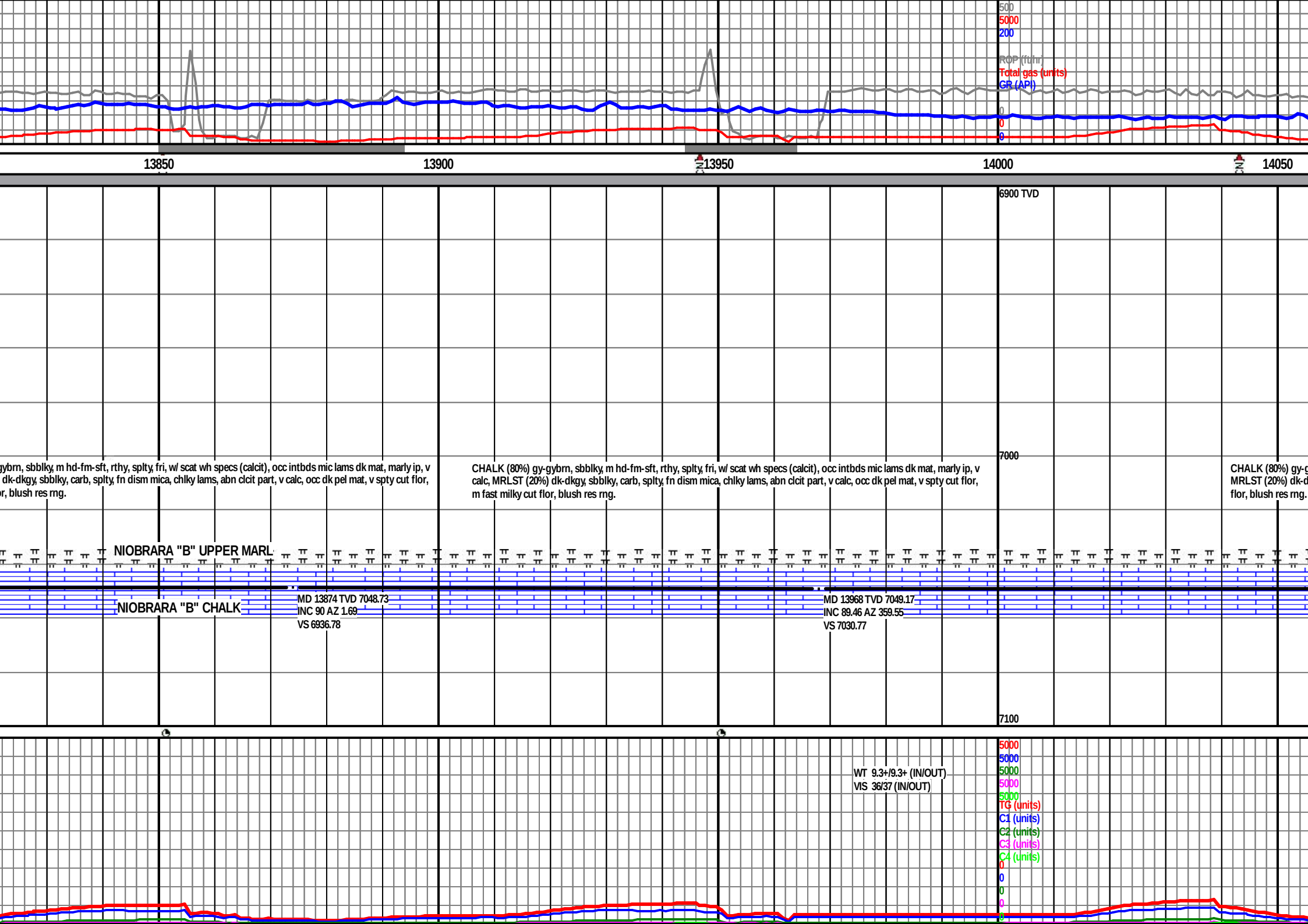

500
5000
200
ROP (furn)
Total gas (units)
GR (API)
0
0
0
WOB 24.3
RPM 70
SPM 71
PP 3713
12700
12750
12800
12850
6900 TVD
7000
7100
fri, occ sft, fn dism mica, slty ip. mic lams
flor, slow blu resid rng.
CHALK (70%) gy-gybrn, sbblky, intbds lams dk mat, splty, fri, m consol, m hd to m sft, w/ scat wh/tn specs, unident foss frags, marly ip, v calc, mod calc frac fill, no flor. MRLST (30%) dk-dkgy, sbblky, carb, fri, occ mic lams, silty, splty ip, m hd, fn dism mica,occ chlky lams, v calc, no flor, wk res blu rng.
CHALK (90%) lt med-med gy, occ dk, rr mod mttld w/ tr mic spts, rthy ip, sbplty-sl sh micritic, v calc, NSFOC. MARLST (10%) drk gry, v f rthy txt, plty-sbblky, sbfiss ip, frm sensitive ip, v calc, m fst strmg cldy cut, res blu/wh rng.
NIOBRARA "Ä" SHALE
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
2648 TVD 7043.27
8.93 AZ 1.33
712.14
MD 12742 TVD 7044.37
INC 89.73 AZ 0.78
VS 5806.12
MD 12837 TVD 7043.76
INC 91 AZ 359.78
VS 5901.11
WT 9.4+/9.4+ (IN/OUT)
VIS 36/38 (IN/OUT)
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0

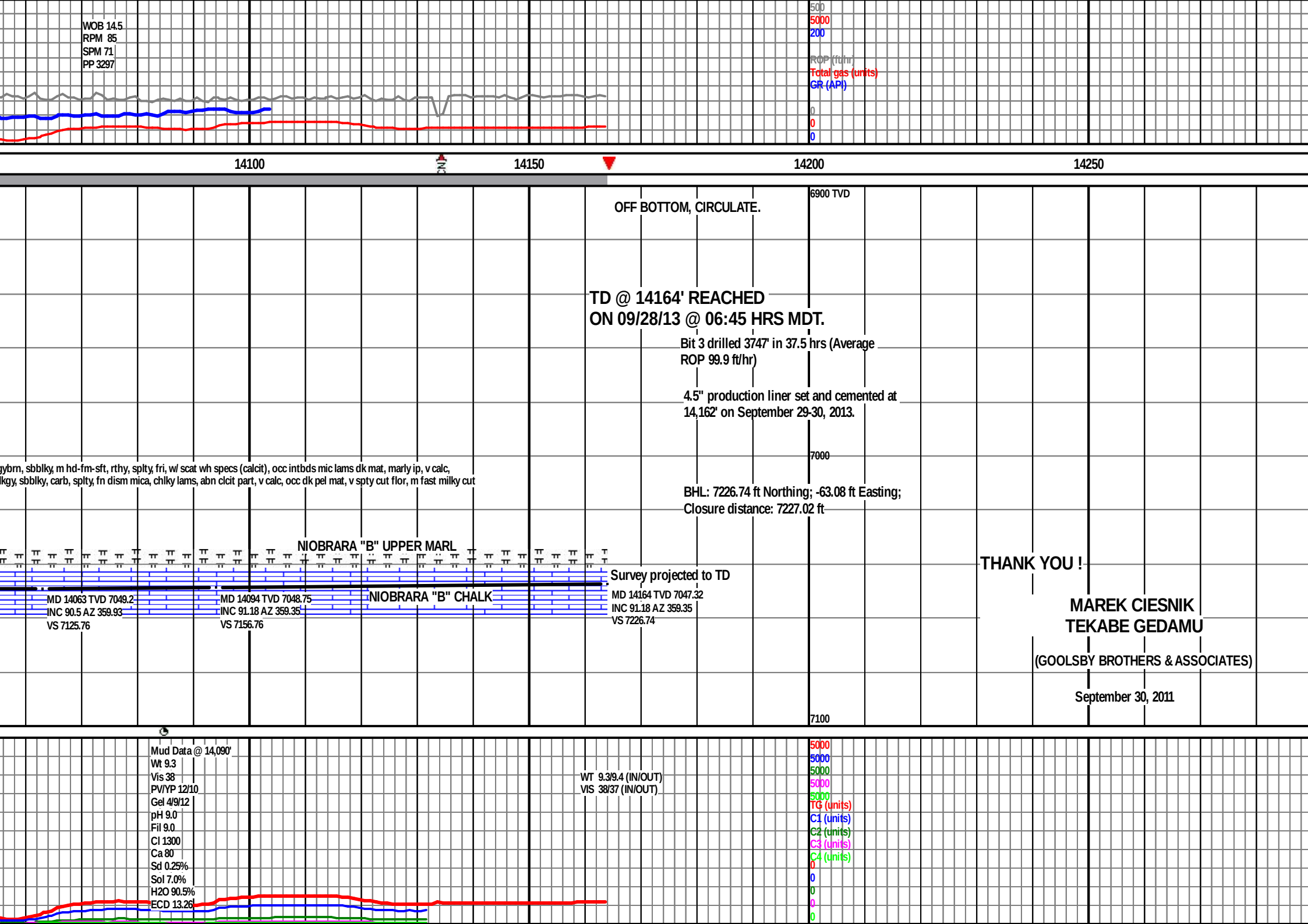

500
5000
200
ROP (min/ft)
Total gas (units)
GR (API)
0
0
0
12900
12950
13000
13050
13100
6900 TVD
7000
7100
rp, frm-hd,
-sl hd, wtr
CHALK (70%) gy-gybrn, sbblky, intbds lams dk mat, splty, fri, m consol, m hd to m sft, w/ scat wh/tn specs, unident foss frags,marly ip, v calc, no flor. MRLST (30%) dk-dkgy, sbblky, carb, occ sed lams, vy silty, splty, slty, m hd, fn dism mica, rr, chlky lams, v calc, occ dk pel mat. no flor, res wh/blu rng.
MRLST (90%) drk gry, sbblky to occ sbplty, m hd to m sft, rthy, sbwxy, v calc,CHALK (10%) gy-gybrn, sbblky, intbds lams dk mat, splty, fri, m consol, m hd to m sft, w/ scat wh/tn specs, unident foss frags,marly ip, v calc, no flor.
MRLST/SH (100%) dk
resid blu rng.
NIOBRARA "B" UPPER MARL
MD 12931 TVD 7042.16
INC 90.94 AZ 1.49
VS 5995.09
MD 13026 TVD 7042.1
INC 89.13 AZ 2.4
VS 6090.03
NIOBRARA "B" CHALK
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0
WT 9.3+/9.3+ (IN/OUT)
VIS 38/39 (IN/OUT)
Mud Data @ 13,100'
Wt 9.3
Vis 38
PV/YP 12/10
Gel 4/8/10
pH 9.0
Fil 8.8
Cl 1300
Ca 120
Sd 0.25%
Sol 7.0%
H2O 91.0%
ECD 12.92


WOB 24.5
RPM 75
SPM 71
PP 3544
500
5000
200
Total gas (units)
0
0
0
13150
13200
13250
13300
13350
6900 TVD
7000
7100
gy, sbblky, mod w consol to m sft, itbds mic lams, carb, fri, fn dism pyr min, m to v calc, no flor, m fast
SH/MRLST (100%) dk gy, sbblky/ sbplty, splty ip, fri, m hd, mod w cpcd, rthy, slty ip, carb, fine dism mica & pyr min ip, mic lams ip, no flor, wk resid rng,
CHALK (60%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ sca
v calc, MRLST (40%) dk-dkgy, sbblky, carb, splty, fn dism mica, chl
spty cut flor, m fast milky cut flor, blush res rng.
MD 13120 TVD 7042.65
INC 90.2 AZ 2.55
VS 6183.94
MD 13214 TVD 7042.16
INC 90.61 AZ 0.59
VS 6277.89
MD 13309 TVD 7041.55
INC 90.13 AZ 1.63
VS 6372.87
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0


500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
13400
13450
13500
13550
6900 TVD
7000
7100
CHALK (60%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v calc, MRLST (40%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat. SH intbd, v spty cut flor, m fast milky cut flor, blush res rng.
CHALK (60%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, mar
MRLST (40%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat. SH intbd, v sp
fast milky cut flor, blush res rng.
NIOBRARA "B" UPPER MARL
MD 13403 TVD 7043.01
INC 88.08 AZ 4.21
VS 6466.73
NIOBRARA "B" CHALK
MD 13497 TVD 7045.85
INC 88.46 AZ 4.07
VS 6560.44
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0
SWEEP


500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
13600
13650
INC
13700
13750
INC
13800
6900 TVD
7000
7100
CHALK (80%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v calc, MRLST (20%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat. SH intbd, v spty cut flor, m fast milky cut flor, blush res rng.
MD 13592 TVD 7047.57
INC 89.46 AZ 4.42
VS 6655.16
MD 13686 TVD 7048.18
INC 89.8 AZ 3.15
VS 6748.95
MD 13780 TVD 7048.54
INC 89.76 AZ 2.41
VS 6842.84
WT 9.3+/9.3 (IN/OUT)
VIS 36/37 (IN/OUT)
WT 9.3+/9.3+ (IN/OUT)
VIS 35/35 (IN/OUT)
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)


500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
13850
13900
13950
14000
14050
6900 TVD
7000
7100
gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v
dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat, v spty cut flor,
r, blush res rng.
CHALK (80%) gy-gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v
calc, MRLST (20%) dk-dkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat, v spty cut flor,
m fast milky cut flor, blush res rng.
CHALK (80%) gy-g
MRLST (20%) dk-d
flor, blush res rng.
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
MD 13874 TVD 7048.73
INC 90 AZ 1.69
VS 6936.78
MD 13968 TVD 7049.17
INC 89.46 AZ 359.55
VS 7030.77
WT 9.3+/9.3+ (IN/OUT)
VIS 36/37 (IN/OUT)
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0


WOB 14.5
RPM 85
SPM 71
PP 3297
500
5000
200
ROP (ft/hr)
Total gas (units)
GR (API)
0
0
0
14100
14150
14200
14250
6900 TVD
OFF BOTTOM, CIRCULATE.
TD @ 14164' REACHED
ON 09/28/13 @ 06:45 HRS MDT.
Bit 3 drilled 3747' in 37.5 hrs (Average ROP 99.9 ft/hr)
4.5" production liner set and cemented at 14,162' on September 29-30, 2013.
7000
BHL: 7226.74 ft Northing; -63.08 ft Easting;
Closure distance: 7227.02 ft
gybrn, sbblky, m hd-fm-sft, rthy, splty, fri, w/ scat wh specs (calcit), occ intbds mic lams dk mat, marly ip, v calc,
lkgy, sbblky, carb, splty, fn dism mica, chlky lams, abn clcit part, v calc, occ dk pel mat, v spty cut flor, m fast milky cut
NIOBRARA "B" UPPER MARL
NIOBRARA "B" CHALK
Survey projected to TD
MD 14063 TVD 7049.2
INC 90.5 AZ 359.93
VS 7125.76
MD 14094 TVD 7048.75
INC 91.18 AZ 359.35
VS 7156.76
MD 14164 TVD 7047.32
INC 91.18 AZ 359.35
VS 7226.74
THANK YOU !
MAREK CIESNIK
TEKABE GEDAMU
(GOOLSBY BROTHERS & ASSOCIATES)
September 30, 2011
7100
Mud Data @ 14,090'
Wt 9.3
Vis 38
PV/YP 12/10
Gel 4/9/12
pH 9.0
Fil 9.0
Cl 1300
Ca 80
Sd 0.25%
Sol 7.0%
H2O 90.5%
ECD 13.26
WT 9.3/9.4 (IN/OUT)
VIS 38/37 (IN/OUT)
5000
5000
5000
5000
5000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0