



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

**Well Name:** Horsetail 30F-3107  
**Well Id:**  
**Location:** SENW 30-T10N-R57W, Weld County, Colorado  
**License Number:** 05-123-3920100  
**Spud Date:** 7/12/2014  
**Region:** Redtail Field  
**Drilling Completed:**  
**Surface Coordinates:**

**Bottom Hole  
Coordinates:**  
**Ground Elevation (ft):** 4780  
**Logged Interval (ft):** 4950  
**Formation:** Pierre, Sharon Springs, Niobrara  
**Type of Drilling Fluid:** Water Based Mud

**K.B. Elevation (ft):** 4797  
**Total Depth (ft):**

Printed by HORIZONTAL.LOG from WellSight Systems 1-800-447-1534 [www.WellSight.com](http://www.WellSight.com)

**OPERATOR**

**Company:** Whiting Oil & Gas Corp.  
**Address:** 1700 Broadway Suite 2300  
Denver, CO 80290

**GEOLOGIST**

**Name:** Kyle Newman, Mark Denler  
**Company:** Acme Geologic Consulting  
**Address:** 108 Berry Street  
Little Rock, AR 72205

## Drilling Company

Xtreme 18

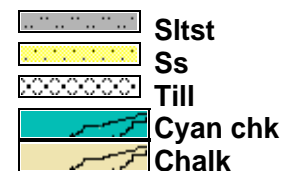
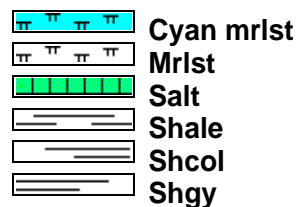
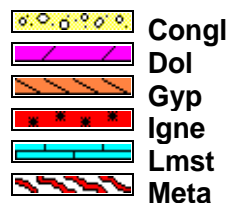
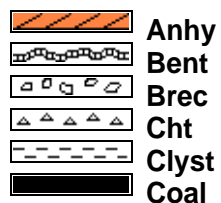
## Gas Detection

Mudlogging Systems, Inc., M Logger, Model TGC, Total Gas and Chromatograph, #328

## Comments

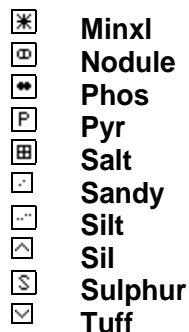
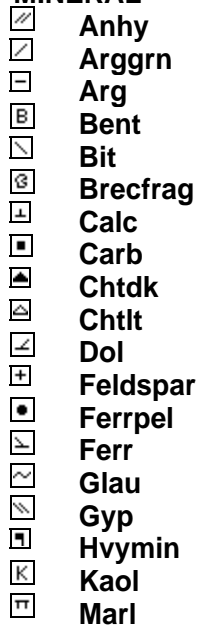
Lithologies and tops at drilled depths, not corrected to elogs. Where the well bore gas is 100% methane, the C1 line is moved to 85% for graphical purposes only.

## ROCK TYPES

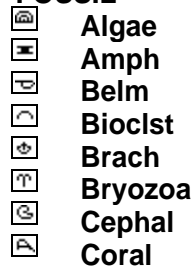


## ACCESSORIES

### MINERAL



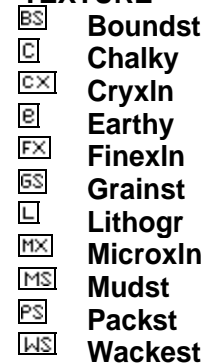
### FOSSIL



### STRINGER











### TEXTURE



OTHER SYMBOLS




POROSITY

-  Earthy
-  Fenest
-  Fracture
-  Inter
-  Moldic
-  Organic
-  Pinpoint
-  Vuggy

SORTING





-  Well
-  Moderate
-  Poor

ROUNDING



-  Rounded
-  Subrnd
-  Subang

-  Angular

OIL SHOW

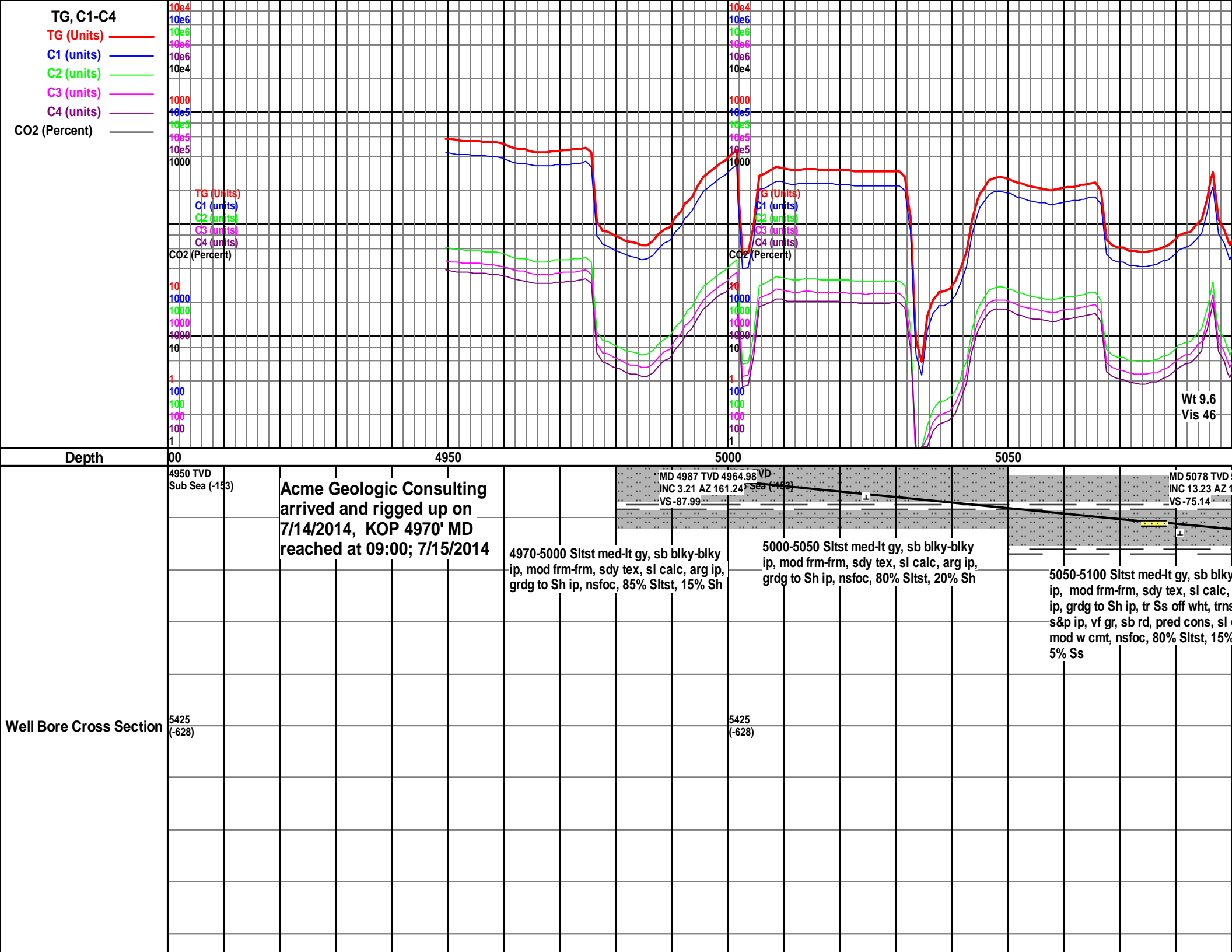
-  Even
-  Spotted
-  Ques
-  Dead

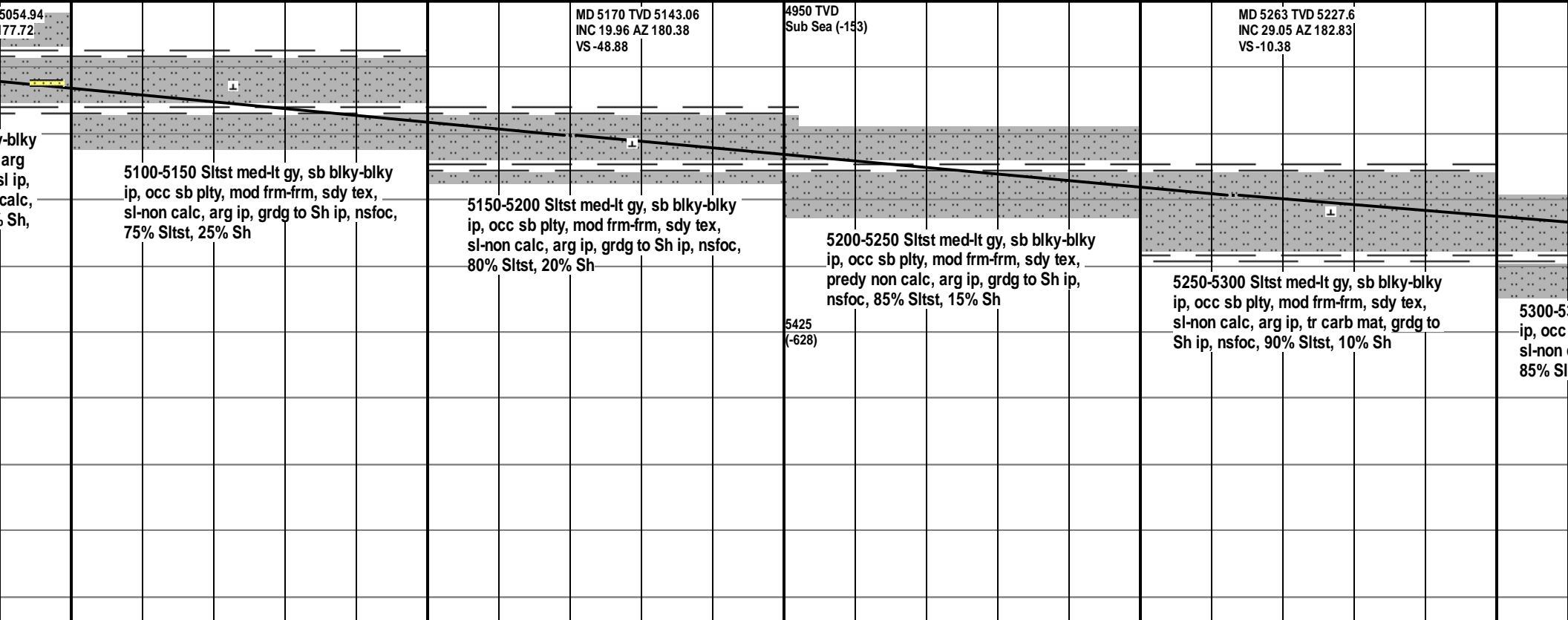
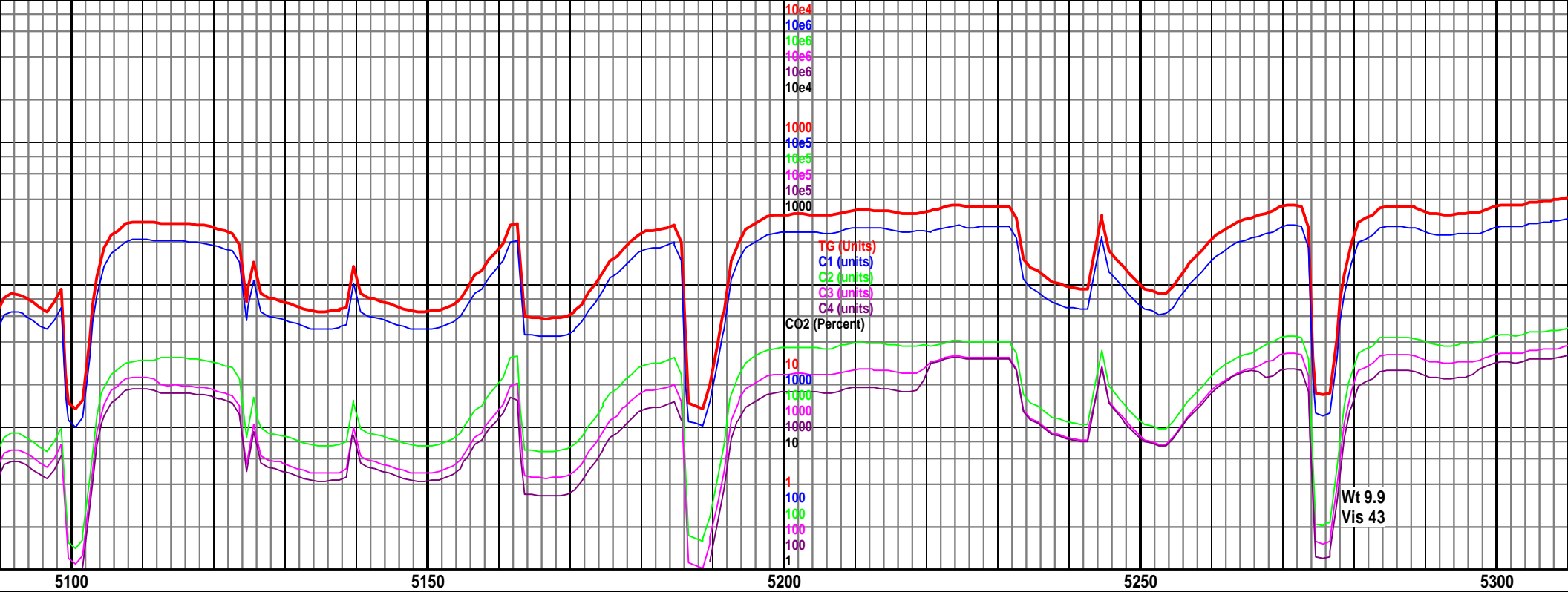
INTERVAL

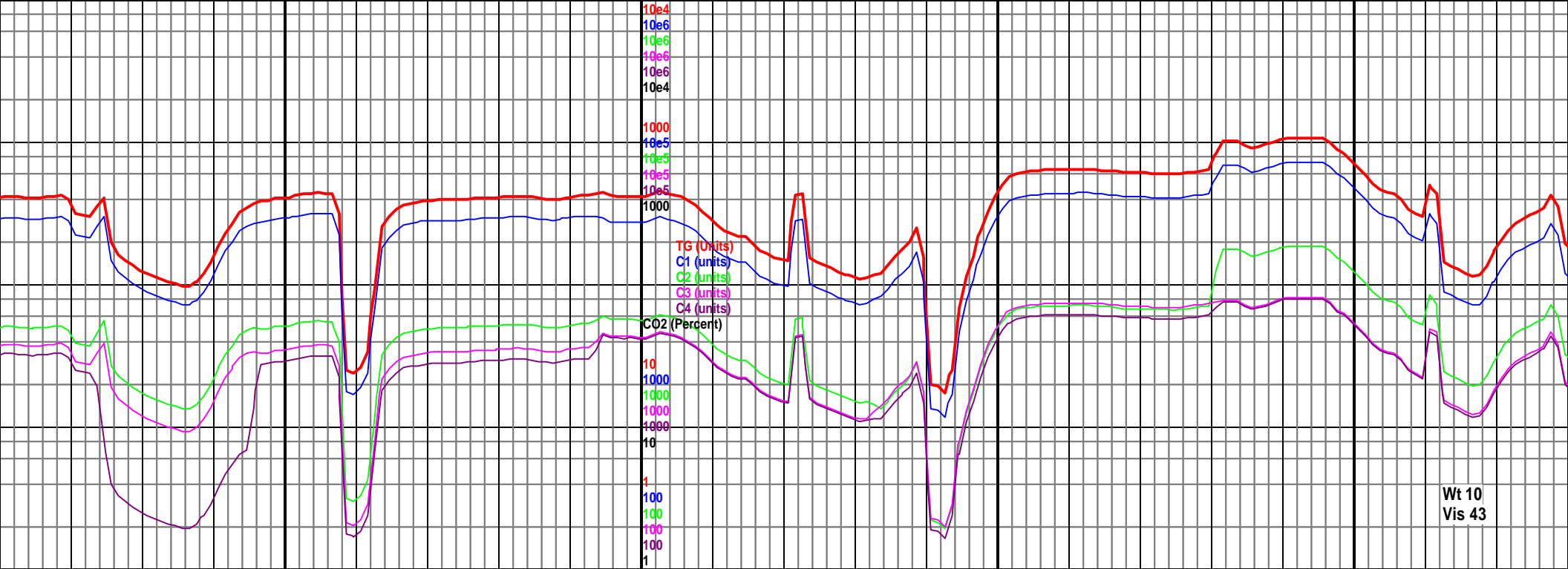
-  Core
-  Dst

EVENT

-  Rft
-  Sidewall







5350

5400

5450

5500

MD 5355 TVD 5303.99  
INC 38.51 AZ 177.91  
VS 40.68

4950 TVD  
Sub Sea (-153)

MD 5446 TVD 5370.4  
INC 47.65 AZ 180.96  
VS 102.75

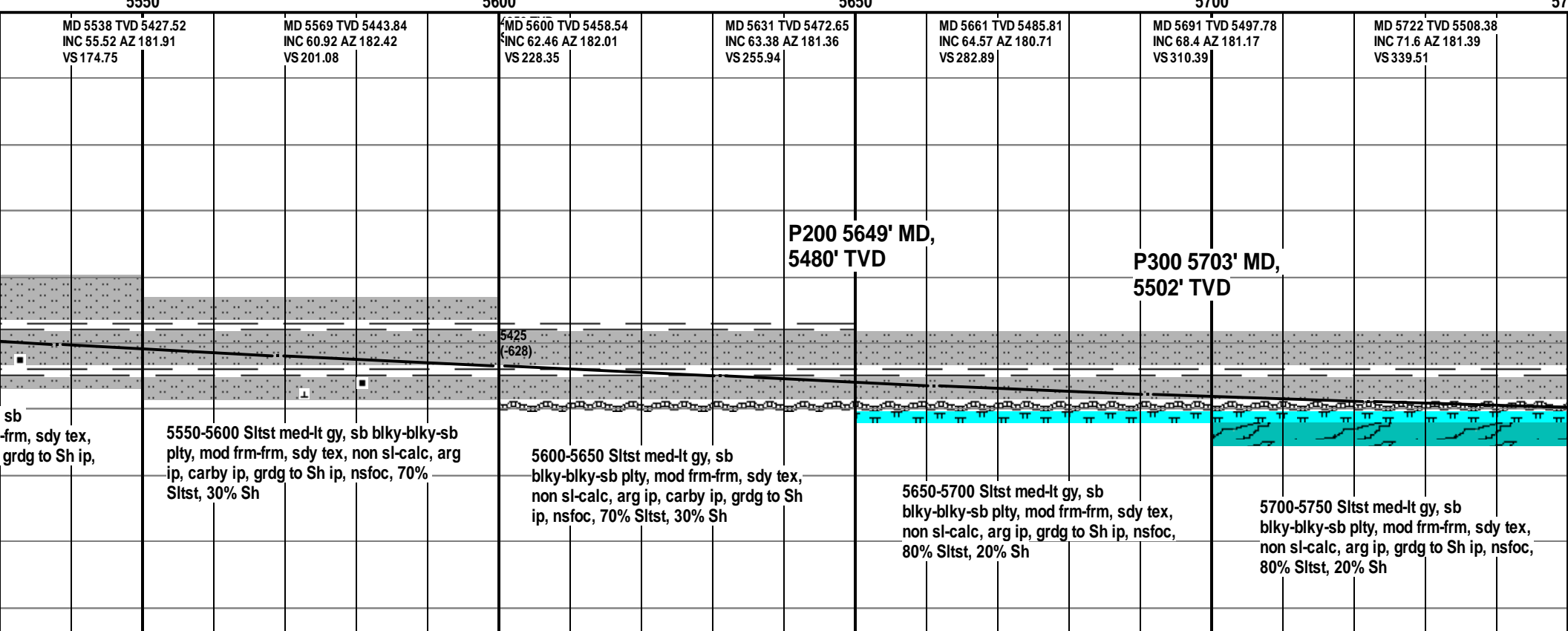
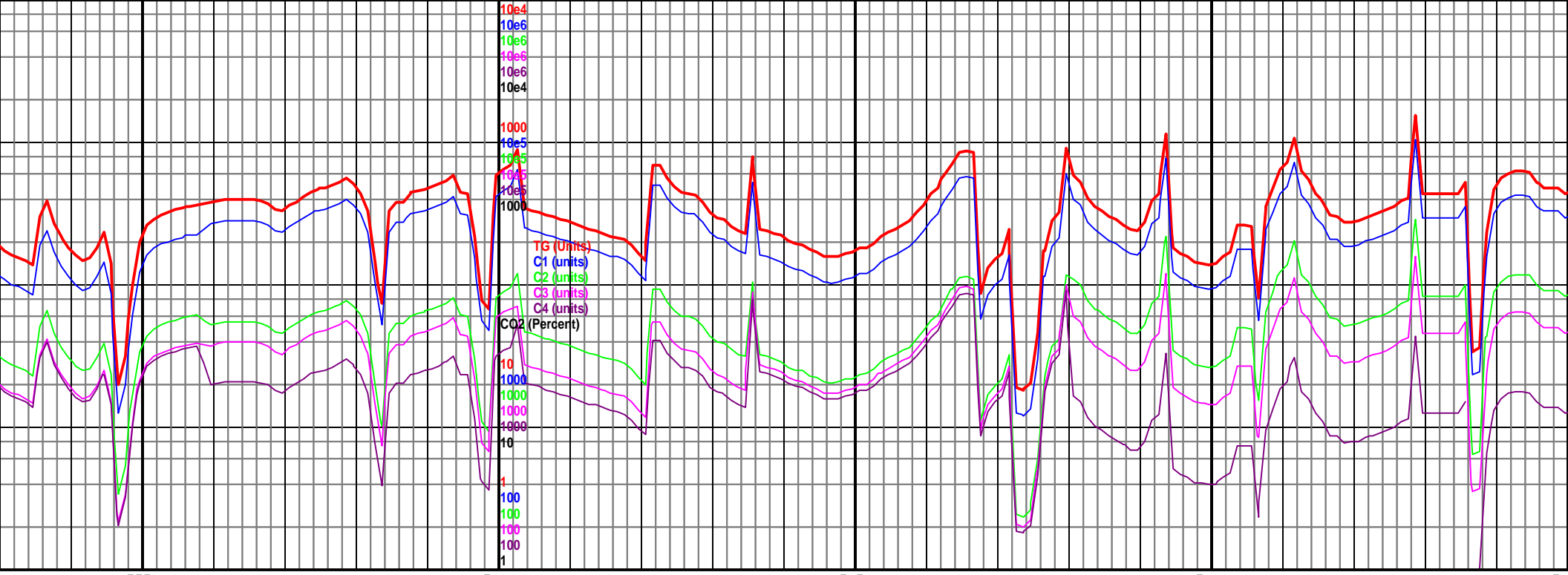
350 Slst med-lt gy, sb blkylkyl  
sb plty, mod frm-frm, sdy tex,  
calc, arg ip, grdg to Sh ip, nsfoc,  
tst, 15% Sh

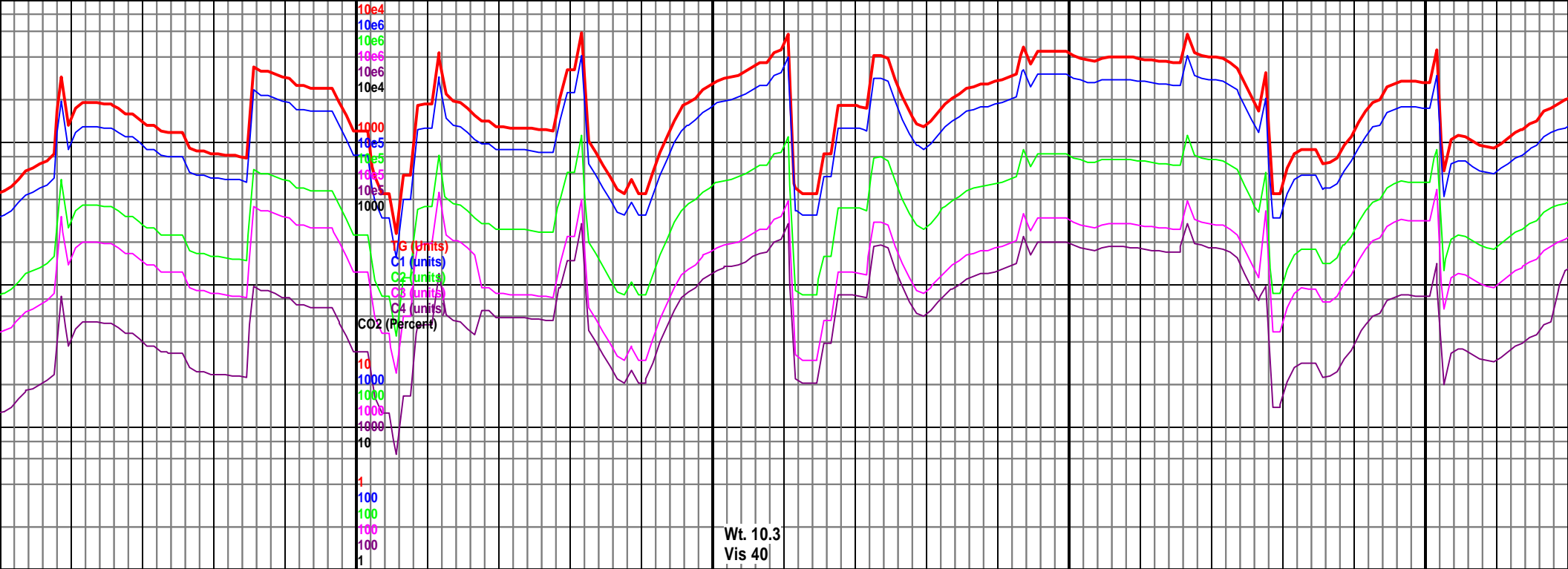
5350-5400 Slst med-lt gy, sb  
blkylkyl-sb plty, mod frm-frm, sdy tex,  
sl-non calc, arg ip, grdg to Sh ip, nsfoc,  
75% Slst, 25% Sh

5425  
(-628) 5400-5450 Slst med-lt gy, sb  
blkylkyl-sb plty, mod frm-frm, sdy tex,  
non calc, arg ip, grdg to Sh ip, nsfoc,  
80% Slst, 20% Sh

5450-5500 Slst med-lt gy, sb  
blkylkyl-sb plty, mod frm-frm, sdy tex,  
non calc, arg ip, grdg to Sh ip, nsfoc,  
80% Slst, 20% Sh

5500-5550 Slst med-lt gy,  
blkylkyl-sb plty, mod frm  
non calc, arg ip, carby ip,  
nsfoc, 75% Slst, 25% Sh





Wt. 10.3  
Vis 40

5800 5850 5900 5950

MD 5783 TVD 5526.76  
INC 73.32 AZ 181.52  
VS 397.65

MD 5814 TVD 5535.63  
INC 73.45 AZ 181.41  
VS 427.35

MD 5844 TVD 5543.64  
INC 75.56 AZ 180.11  
VS 456.25

MD 5875 TVD 5550.68  
INC 78.2 AZ 178.9  
VS 486.44

MD 5906 TVD 5556.59  
INC 79.82 AZ 178.02  
VS 516.86

MD 5936 TVD 5560.96  
INC 83.43 AZ 178.52  
VS 546.52

P350 5760' MD,  
5520' TVD

Sharon Springs 5792' MD,  
5529' TVD

Niobrara 5810' MD,  
5534' TVD

N100 5838' MD,  
5542' TVD

5750-5800 Mrlst med-lt gy, sb blkly-plty,  
frm-mod frm ip, occ Sh med gy, sb  
plty-blky, frm, slty tex, sl-mod calc, tr  
Chk, lt gy, mod frm, sb blkly-blky, occ  
sb plty, tr pyr, tr bent, 40% mrlst, 40%  
sh, 20%, chk

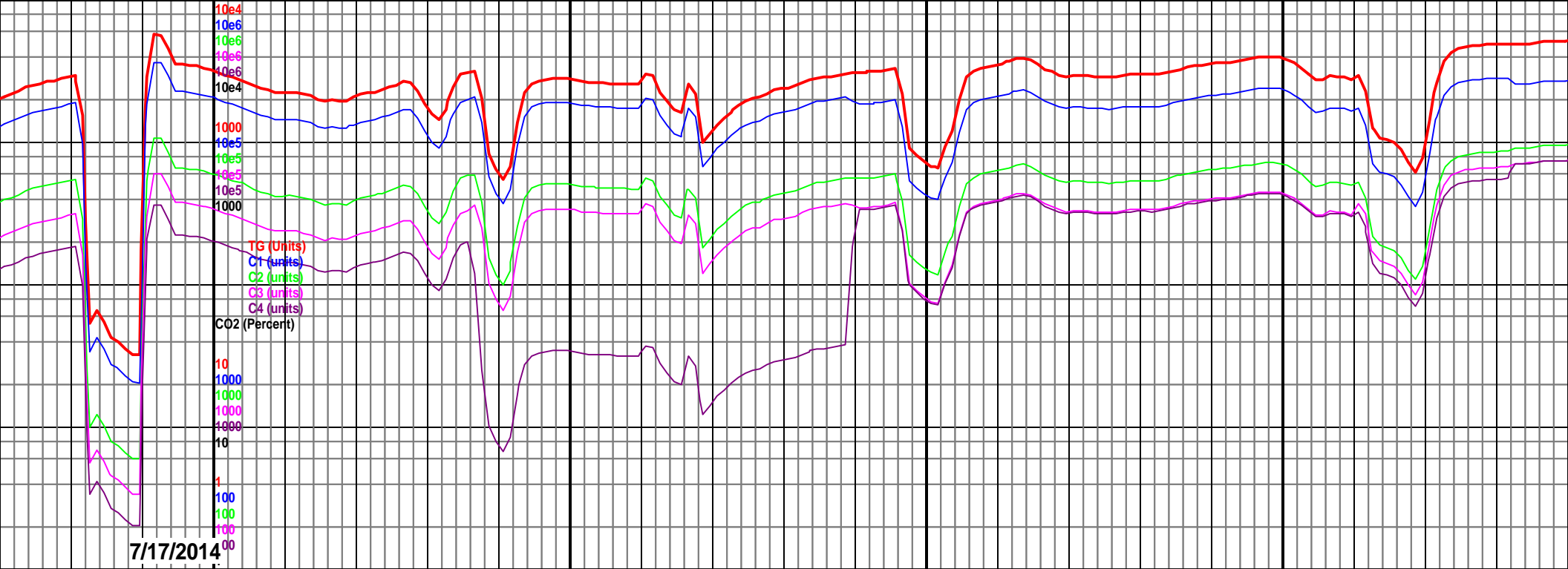
5750-5800 Mrlst med-lt gy, sb blkly-plty,  
frm-mod frm ip, Chk, lt gy, mod frm, sb  
blkly-blky, occ sb plty, tr bent, 50%  
mrlst, 50%, chk

5850-5900 Chk lt-med gy, sb blkly-plty,  
mottled ip, abnt Mrlst med-dk gy,  
blkly-sb blkly, dull yel flor, wk oil cut,  
65% chk, 35% mrlst

5900-5950 Chk lt-med gy, sb blkly-plty,  
mottled ip, tr Mrlst med-dk gy, blkly-sb  
blkly, dull yel flor, wk oil cut, 80% chk,  
20% mrlst

5950-5990 Chk lt-med gy, sb blkly-plty,  
mottled ip, tr Mrlst med-dk gy, blkly-sb  
blkly, dull yel flor, wk oil cut, 80% chk,  
20% mrlst





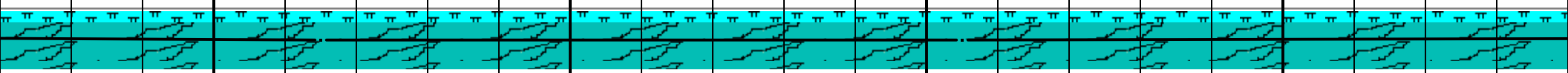
6000 6050 6100 6150

4950 TVD  
Sub Sea (-153)

MD 6015 TVD 5564.89  
INC 90.86 AZ 180.74  
VS 625.36

MD 6105 TVD 5563.89  
INC 90.42 AZ 179.21  
VS 715.35

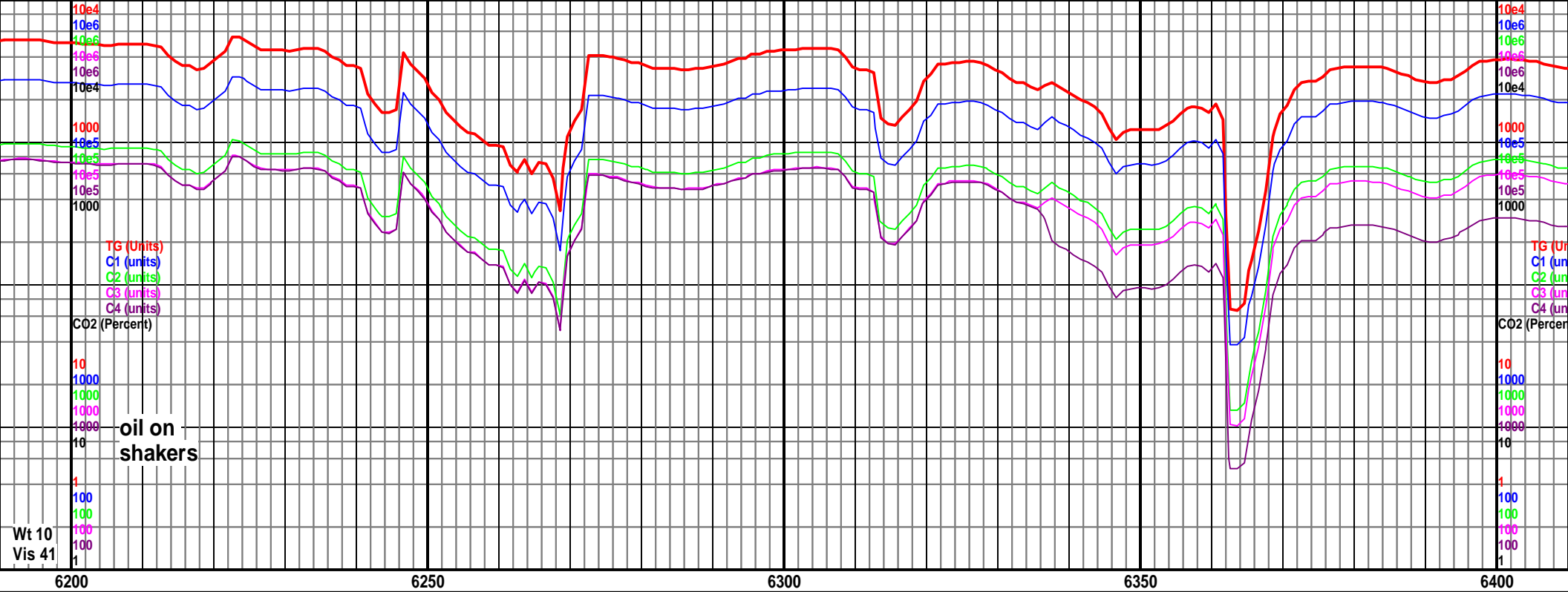
Intermediate casing point  
reached at 22:07 on  
7/15/2014 at a depth of  
5990' MD. Resume drilling  
operations at



lt-med gy, sb blkly-plty,  
sist med-dk gy, blkly-sb  
r, wk oil cut, 80% chk,

5990-6100 Chk lt-med gy, sb blkly-plty,  
mottled ip, tr Mrlist med-dk gy, blkly-sb  
blkly, dull yel flor, wk oil cut, 70% chk,  
30% mrlist

6100-6200 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, rr Mrlist med-dk gy,  
blkly-sb blkly, brt yel flor, fst oil cut,  
95% chk, 5% mrlist



MD 6195 TVD 5563.02  
INC 90.68 AZ 178.51  
VS 805.33

MD 6284 TVD 5561.42  
INC 91.38 AZ 179.33  
VS 894.3

MD 6374 TVD 5561.49  
INC 88.53 AZ 179.22  
VS 984.28

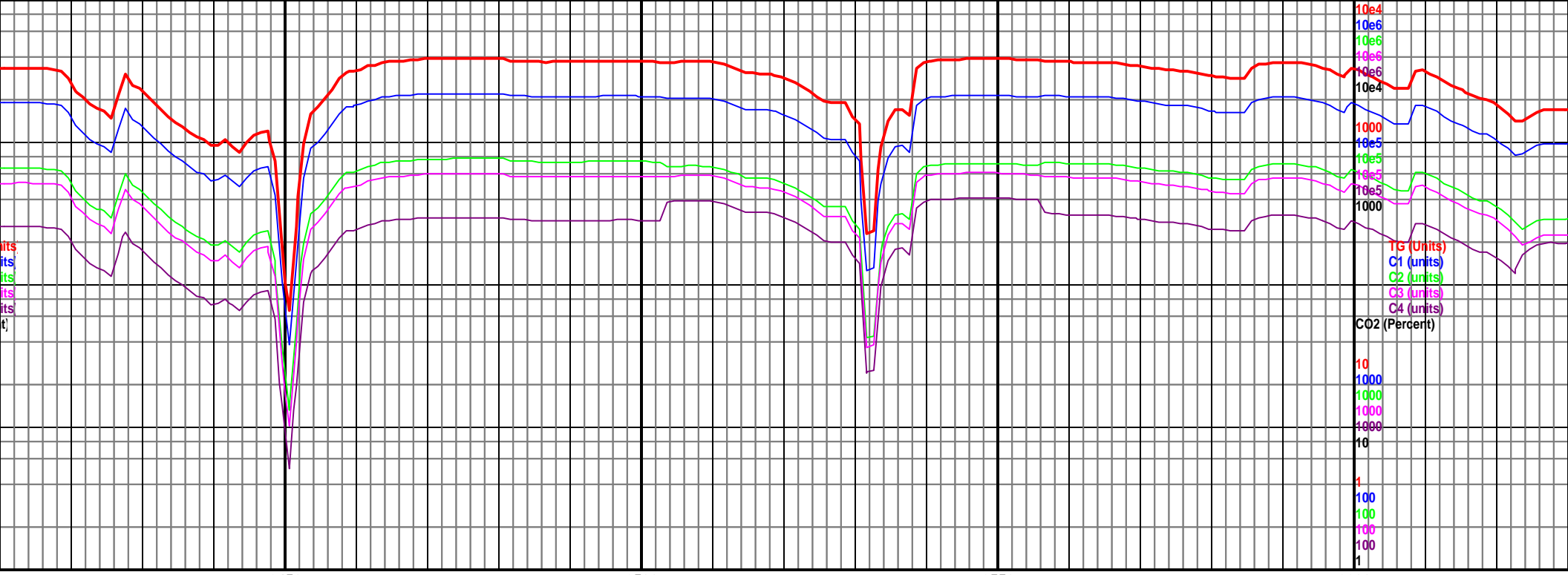
4950 TVD  
Sub Sea (-15)

5425  
(-628)

5425  
(-628)

6200-6300 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blkly-sb blkly, brt yel flor, fst oil cut,  
80% chk, 20% mrlst

6300-6400 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blkly-sb blkly, brt yel flor, fst oil cut,  
95% chk, 5% mrlst



6450

6500

6550

6600

MD 6463 TVD 5563.64  
INC 88.7 AZ 180.37  
VS 1073.25

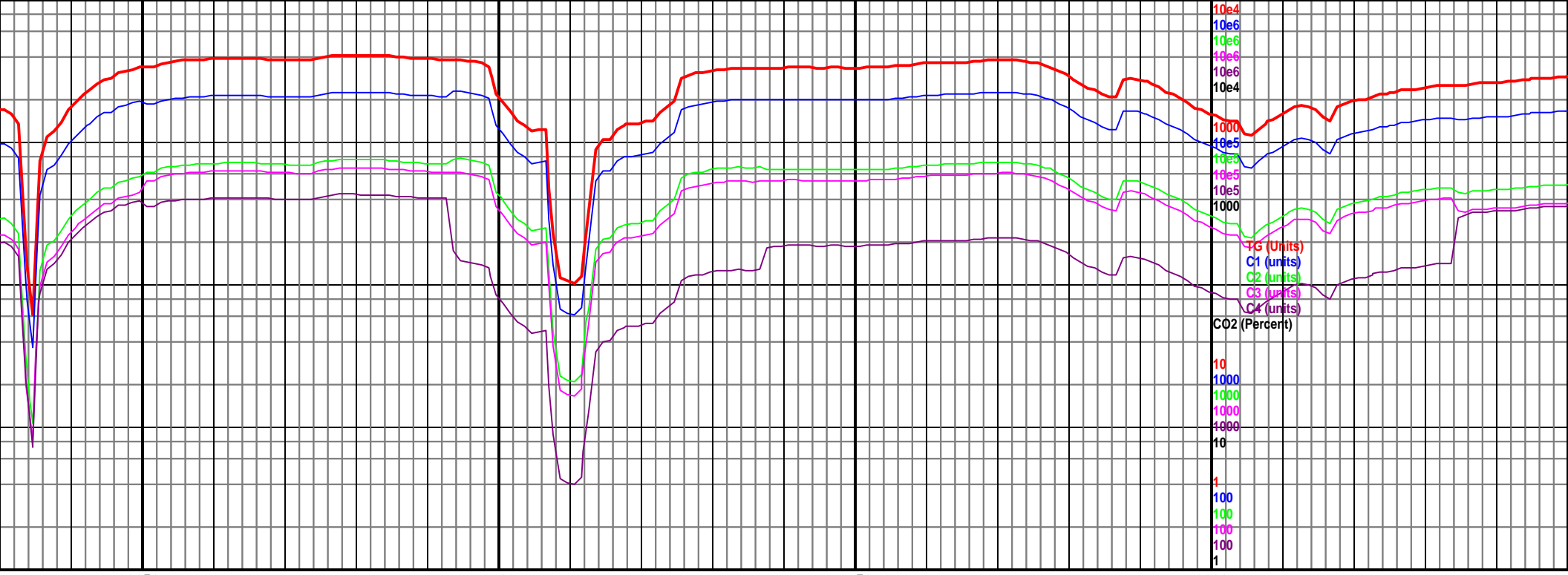
MD 6553 TVD 5565.72  
INC 88.66 AZ 180.28  
VS 1163.23

4950 TVD  
Sub Sea (-153)

5425  
(-628)

6400-6500 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blkly-sb blkly, brt yel flor, fst oil cut,  
95% chk, 5% mrlst

6500-6600 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, occ Mrlst med-dk  
gy, blkly-sb blkly, brt yel flor, fst oil cut,  
80% chk, 20% mrlst



6650

6700

6750

6800

6850

MD 6643 TVD 5568.06  
INC 88.35 AZ 180.75  
VS 1253.19

MD 6732 TVD 5570.56  
INC 88.44 AZ 181.47  
VS 1342.14

4950 TVD  
Sub Sea (-153)

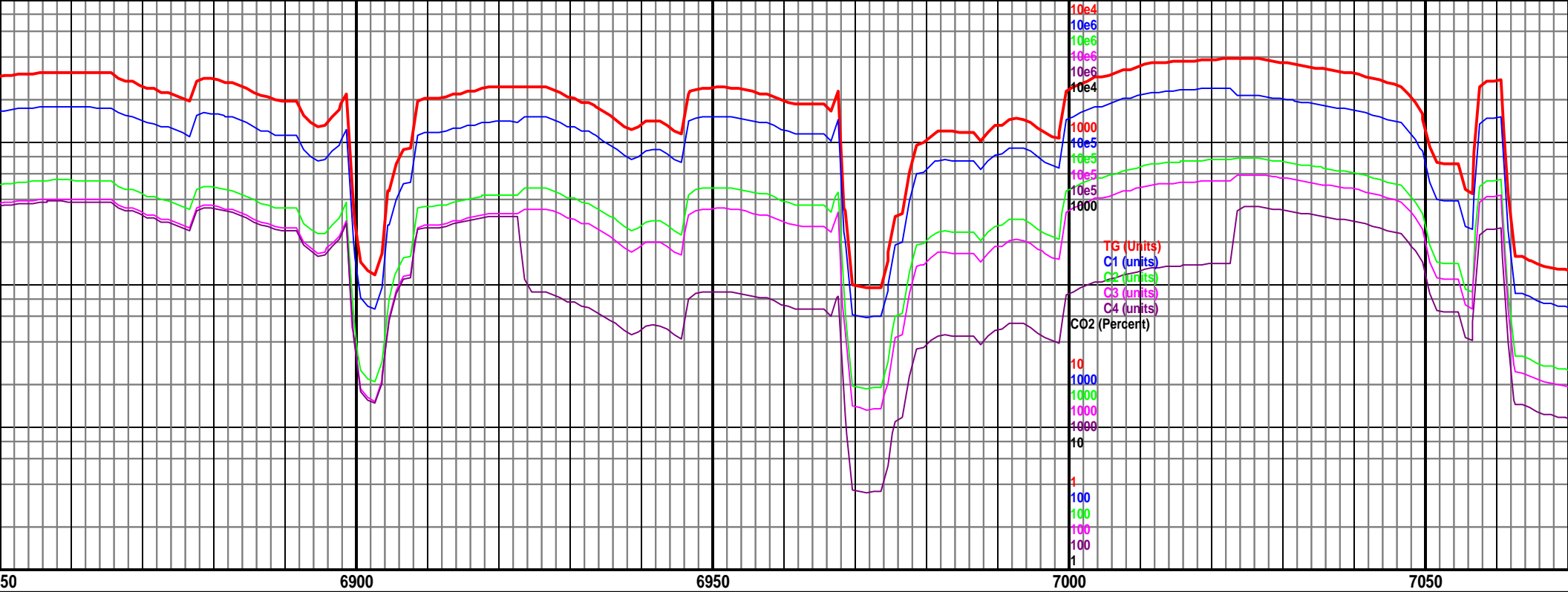
MD 6822 TVD 5572.87  
INC 88.62 AZ 181.48  
VS 1432.08

5425  
(-628)

6600-6700 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, occ Mrlst med-dk  
gy, blkly-sb blkly, brt yel flor, fst oil cut,  
80% chk, 20% mrlst

6700-6800 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, abnt Mrlst med-dk  
gy, blkly-sb blkly, rr pyr, slo oil cut, 60%  
chk, 40% mrlst

6800-6900 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, abnt Mrlst med-dk  
gy, blkly-sb blkly, rr pyr, slo oil cut, 50%  
chk, 50% mrlst



MD 6911 TVD 5574.81  
 INC 88.88 AZ 181.74  
 VS 1521.03

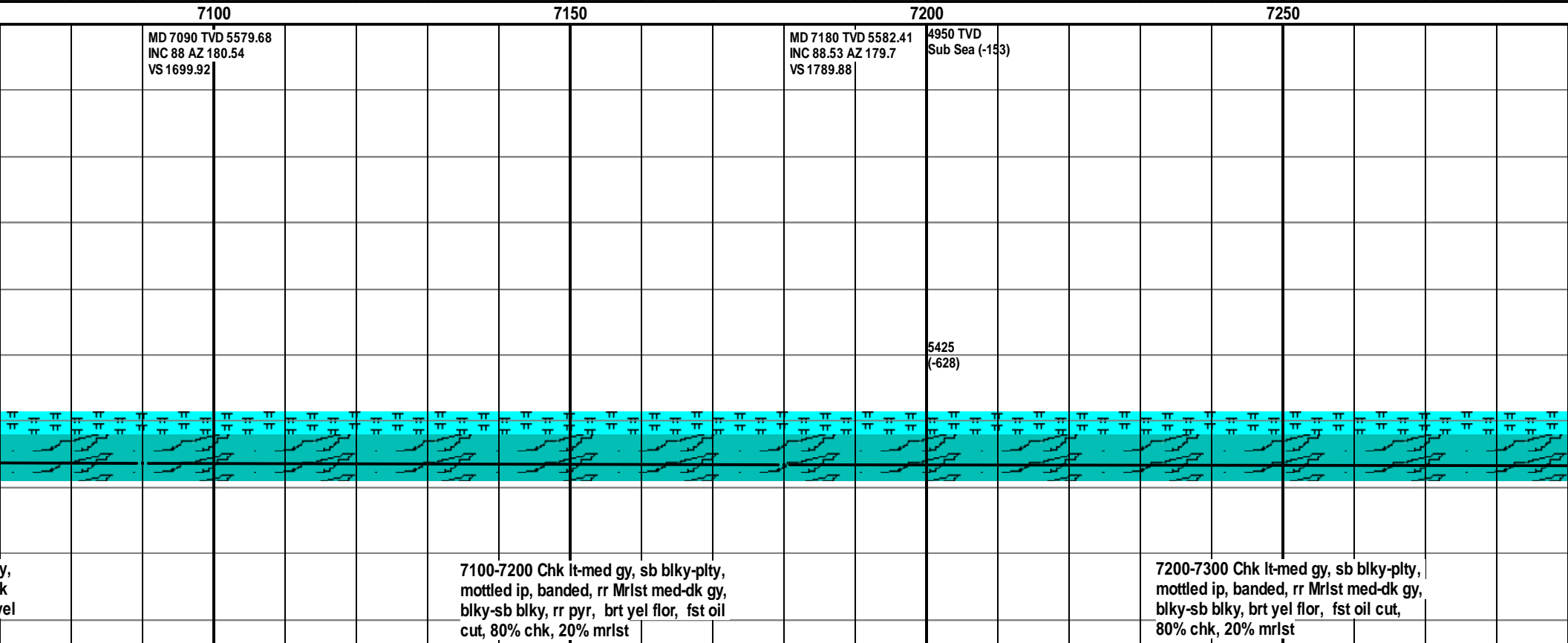
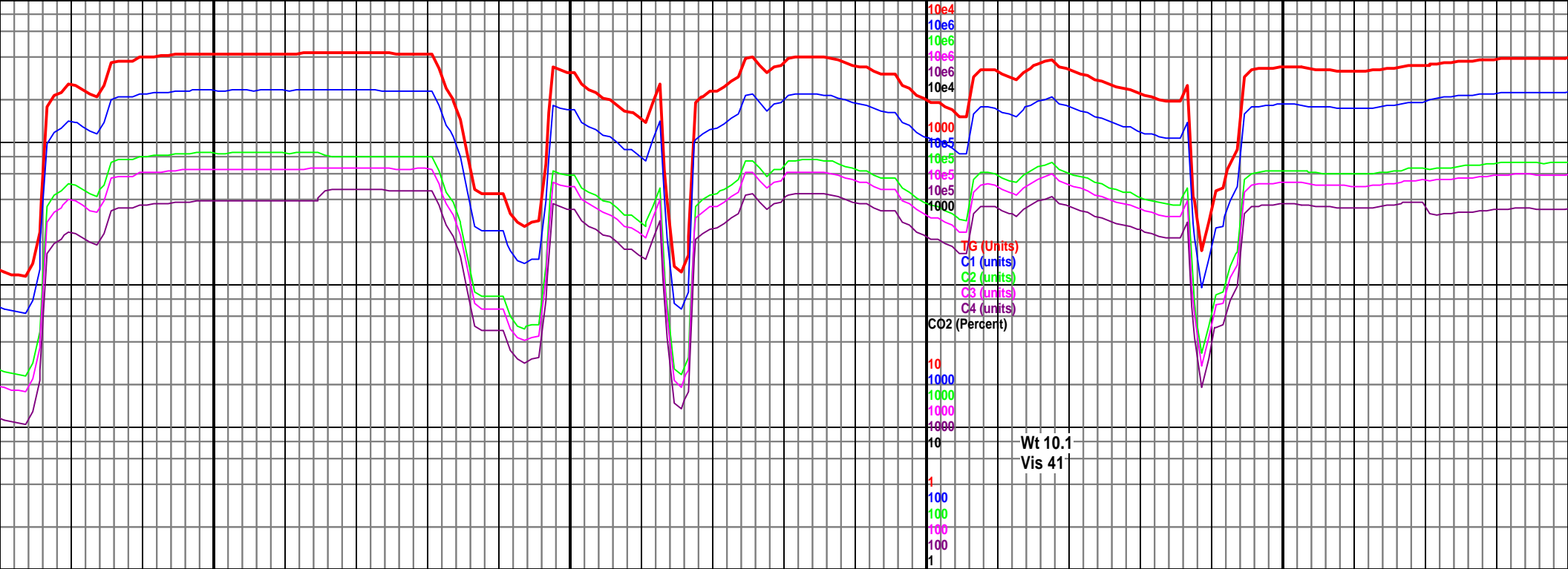
4950 TVD  
 Sub Sea (-153)

5425  
 (-628)

-med gy, sb blk-y-pty,  
 d, abnt Mrlst med-dk  
 rr pyr, slo oil cut, 50%

6900-7000 Chk lt-med gy, sb blk-y-pty,  
 mottled ip, banded, abnt Mrlst med-dk  
 gy, blk-y-sb blk-y, rr bent, fst oil cut,  
 50% chk, 50% mrlst

7000-7100 Chk lt-med gy, sb blk-y-pty  
 mottled ip, banded, abnt Mrlst med-d  
 gy, blk-y-sb blk-y, tr bent, rr inoc, brt y  
 flor, fst oil cut, 70% chk, 30% mrlst



MD 7090 TVD 5579.68  
INC 88 AZ 180.54  
VS 1699.92

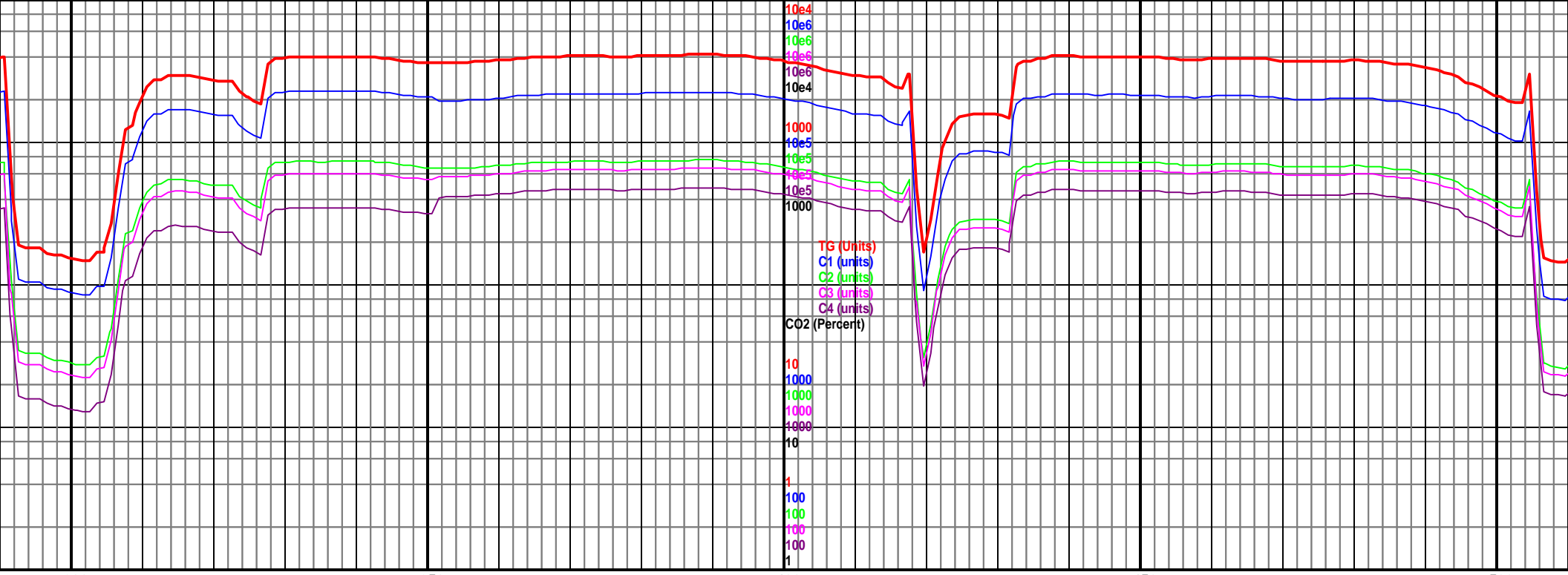
MD 7180 TVD 5582.41  
INC 88.53 AZ 179.7  
VS 1789.88

4950 TVD  
Sub Sea (-153)

5425  
(-628)

7100-7200 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blkly-sb blkly, rr pyr, brt yel flor, fst oil  
cut, 80% chk, 20% mrlst

7200-7300 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blkly-sb blkly, brt yel flor, fst oil cut,  
80% chk, 20% mrlst



7300 7350 7400 7450 7500

MD 7357 TVD 5584.37  
INC 90.2 AZ 180.39  
VS 1966.86

4950 TVD  
Sub Sea (-153)

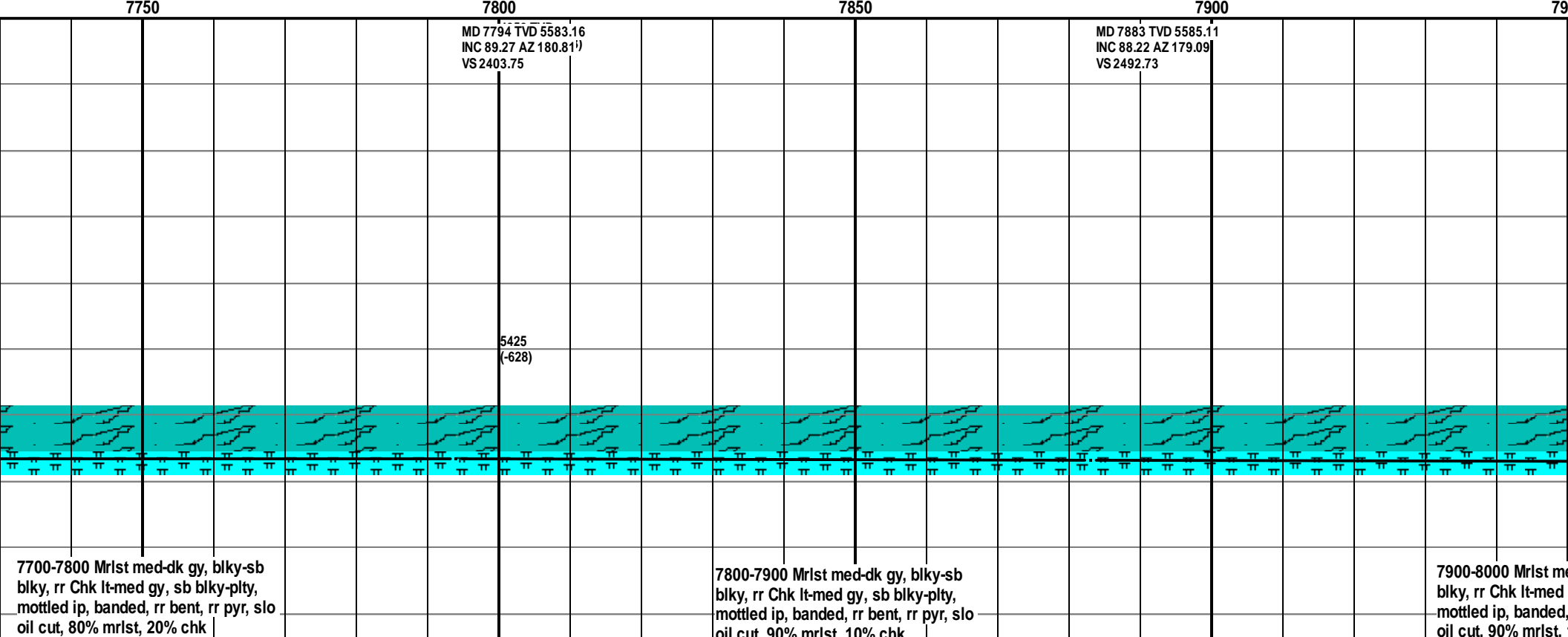
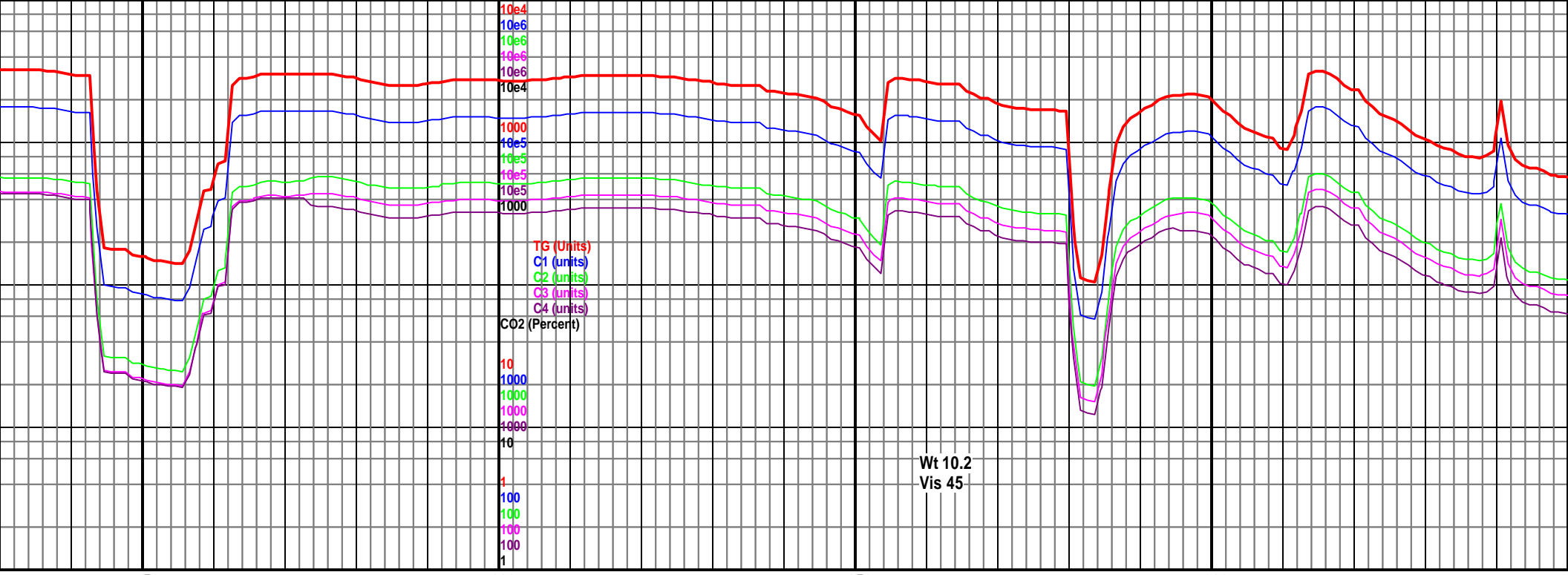
5425  
(-628)

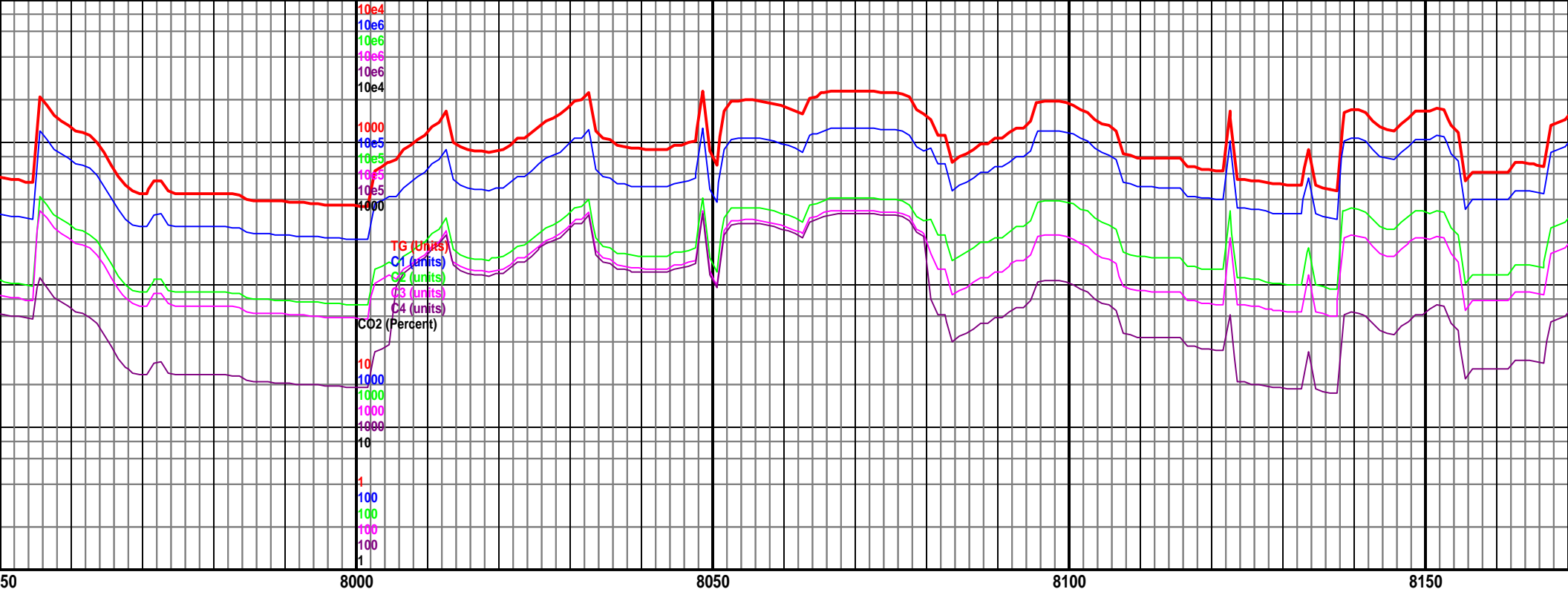
7300-7400 Chk lt-med gy, sb blk-pty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blk-sb blk, brt yel flr, rr bent, fst oil  
cut, 80% chk, 20% mrlst

7400-7500 Chk lt-med gy, sb blk-pty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blk-sb blk, brt yel flr, rr bent, fst oil  
cut, 90% chk, 10% mrlst









MD 7976 TVD 5587.61  
INC 88.7 AZ 179.66  
VS 2585.69

4950 TVD  
Sub Sea (-153)

MD 8068 TVD 5589.8  
INC 88.57 AZ 179.38  
VS 2677.66

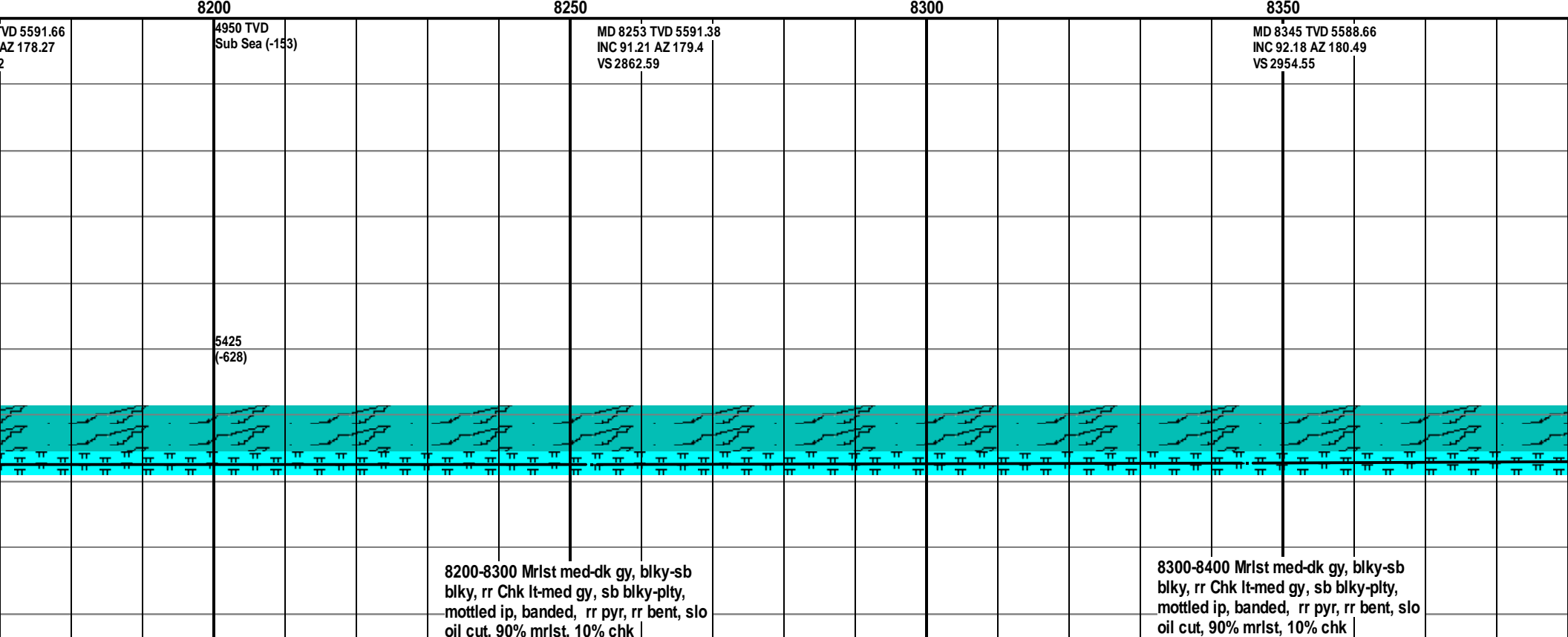
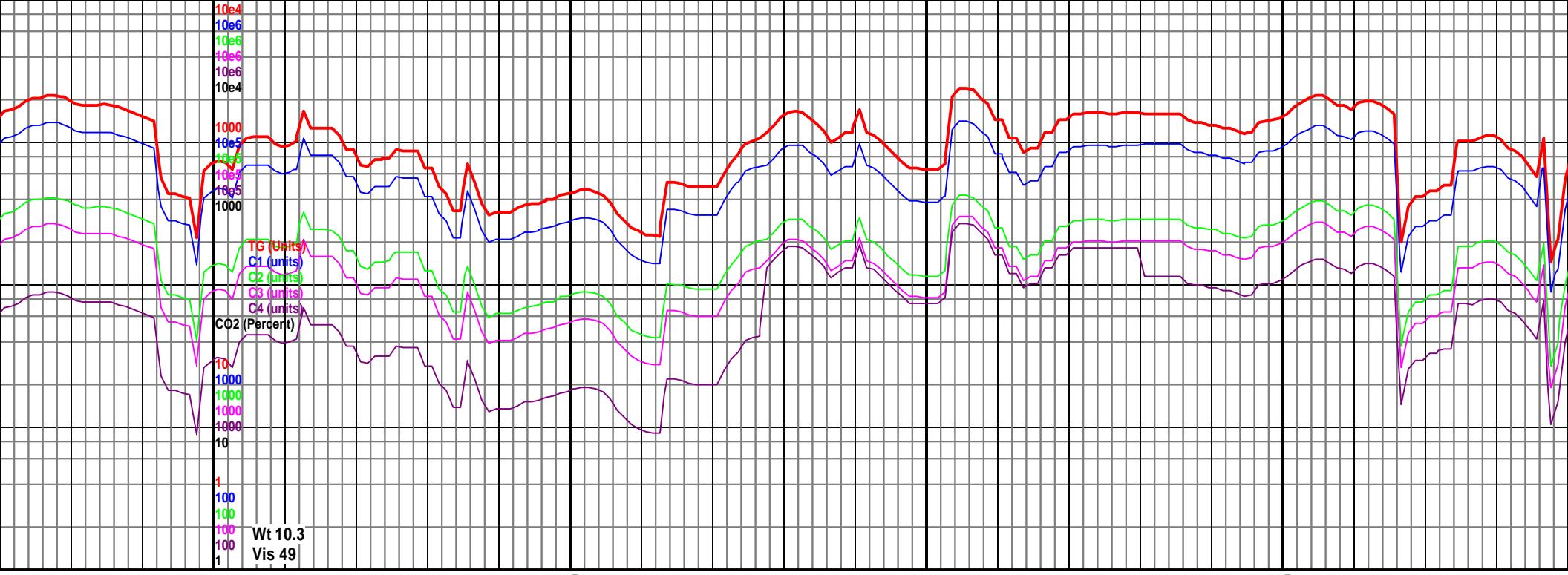
MD 8161 TVD 5590.8  
INC 89.14 AZ 179.38  
VS 2770.66

5425  
(-628)

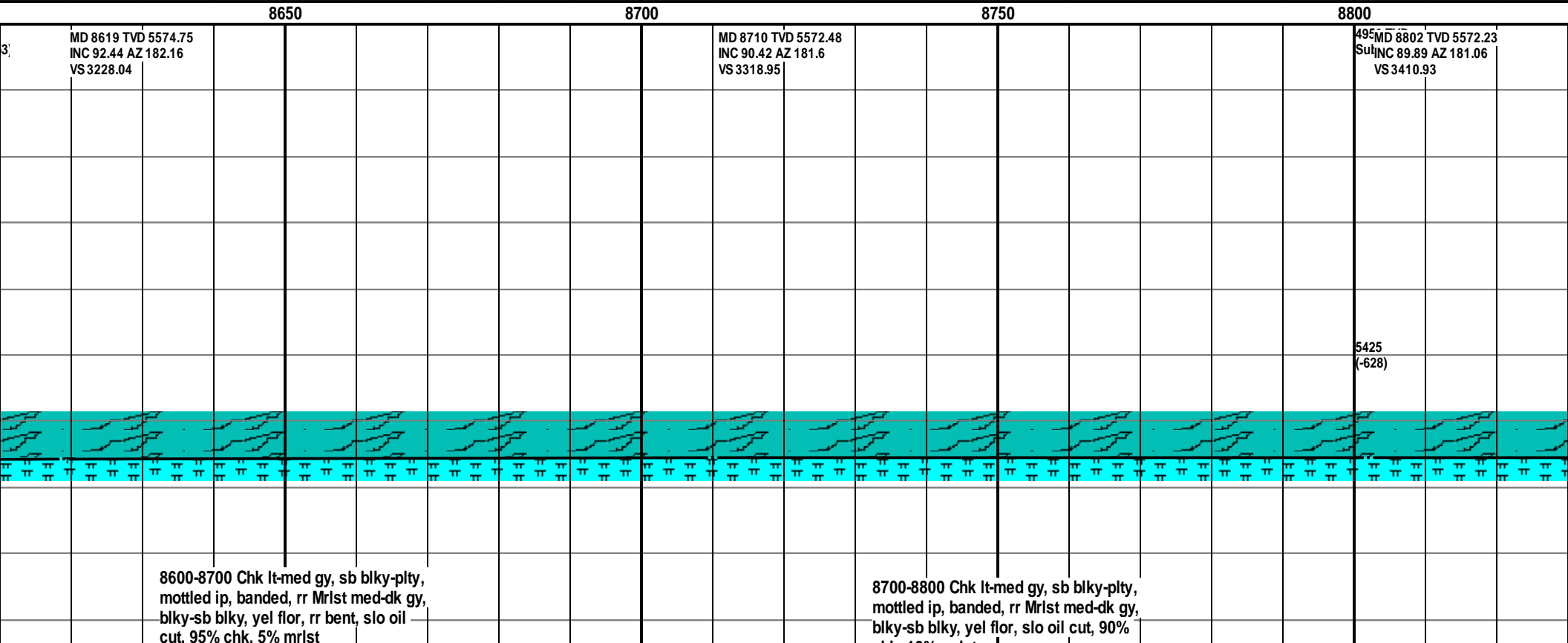
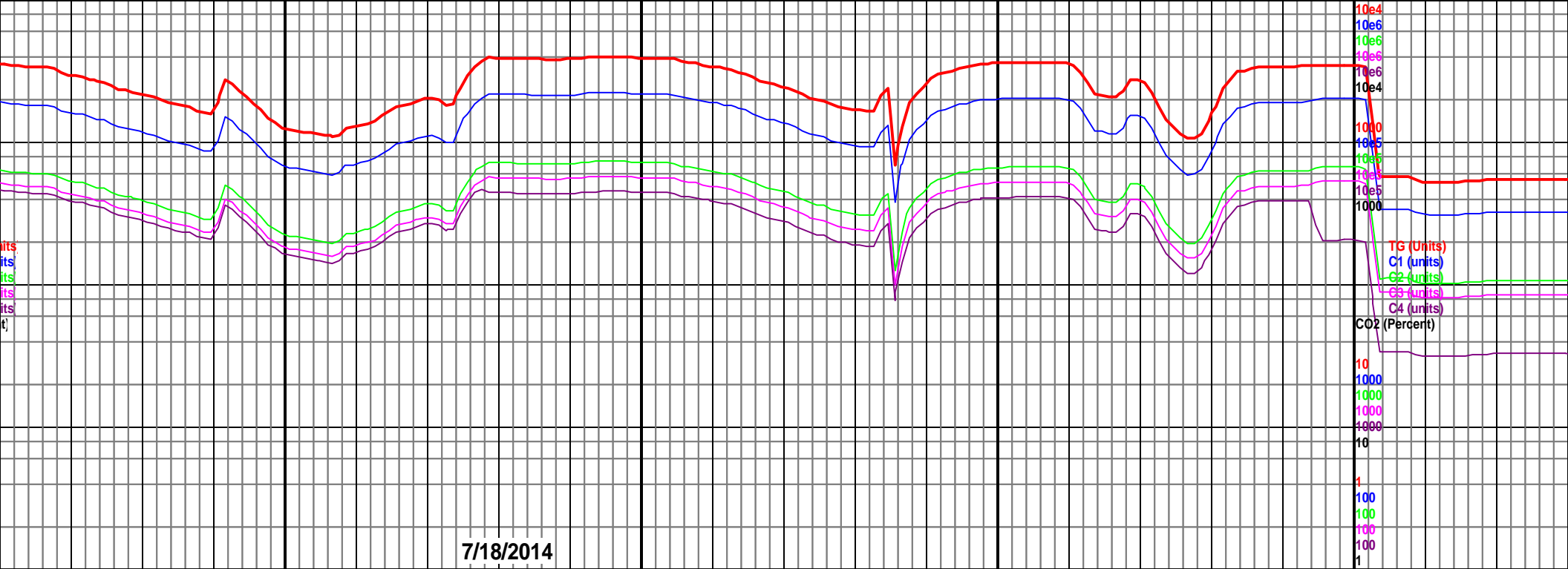
med-dk gy, blk-sb  
gy, sb blk-plty,  
rr bent, rr pyr, slo  
oil cut, 10% chk

8000-8100 Mrst med-dk gy, blk-sb  
blk, rr Chk lt-med gy, sb blk-plty,  
mottled ip, banded, rr pyr, rr inoc, slo  
oil cut, 95% mrst, 5% chk

8100-8200 Mrst med-dk gy, blk-sb  
blk, rr Chk lt-med gy, sb blk-plty,  
mottled ip, banded, rr pyr, rr bent, slo  
oil cut, 90% mrst, 10% chk





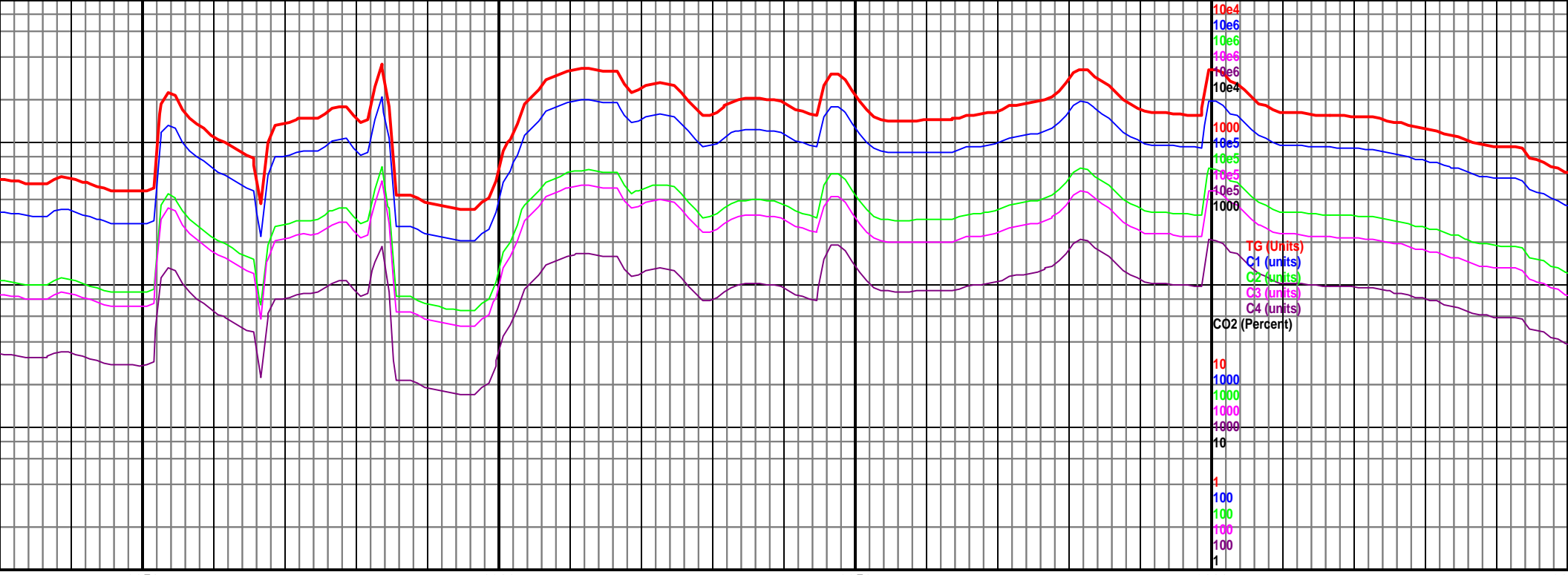


MD 8619 TVD 5574.75  
INC 92.44 AZ 182.16  
VS 3228.04

MD 8710 TVD 5572.48  
INC 90.42 AZ 181.6  
VS 3318.95

MD 8802 TVD 5572.23  
INC 89.89 AZ 181.06  
VS 3410.93

5425  
(-628)



8850

8900

8950

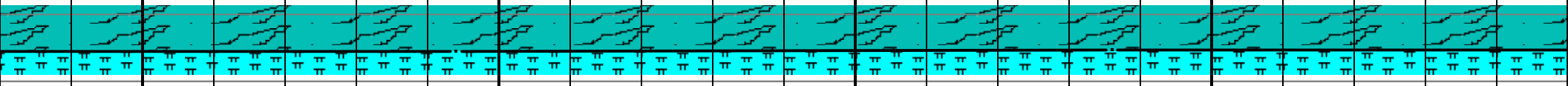
9000

9000

MD 8894 TVD 5571.49  
INC 91.03 AZ 182.4  
VS 3502.88

MD 8986 TVD 5570.40 TVD  
INC 90.33 AZ 180.21 Sea (-153)  
VS 3594.84

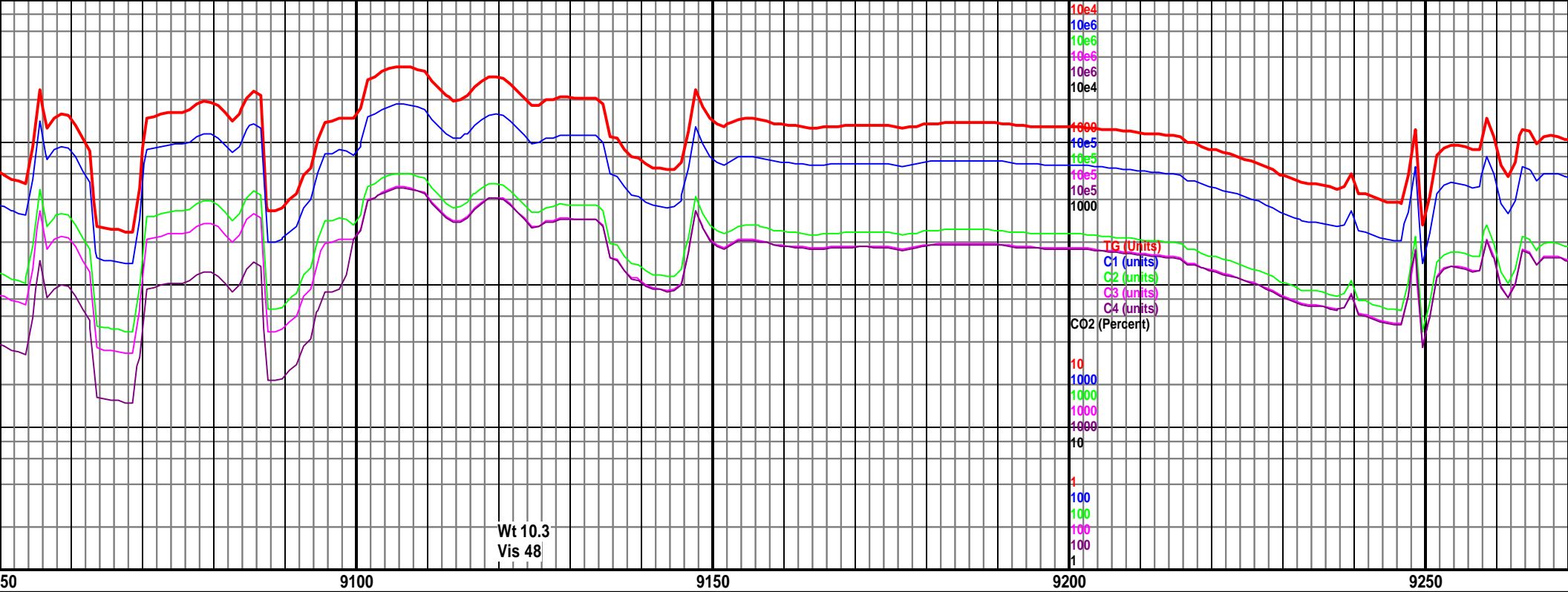
5425  
(-628)



8800-8900 Chk lt-med gy, sb blk-ply,  
mottled ip, banded, rr Mrst med-dk gy,  
blk-sb blk, rr bent, rr pyr, yel flor, slo  
oil cut, 95% chk, 5% mrst

8900-9000 Chk lt-med gy, sb blk-ply,  
mottled ip, banded, rr Mrst med-dk gy,  
blk-sb blk, rr bent, rr pyr, yel flor, slo  
oil cut, 90% chk, 10% mrst

9000-9100 Chk lt-n  
mottled ip, banded  
blk-sb blk, yel fl  
chk, 5% mrst



MD 9078 TVD 5569.37  
INC 90.95 AZ 180.96  
VS 3686.83

MD 9169 TVD 5562.13  
INC 90.59 AZ 178.36  
VS 3777.94

4950 TVD  
Sub Sea (-153)

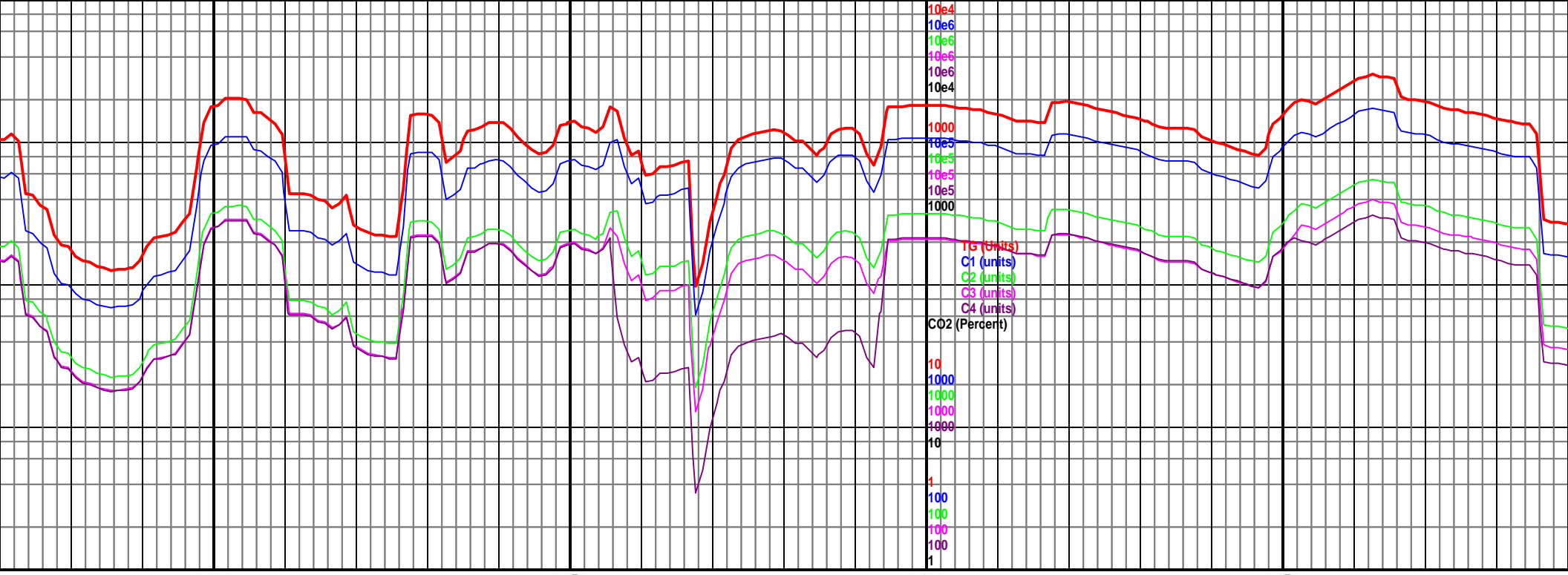
MD 9261 TVD 5562.13  
INC 89.45 AZ 178.36  
VS 3869.83

5425  
(-628)

med gy, sb blkly-plty,  
, rr Mrlst med-dk gy,  
or, slo oil cut, 95%

9100-9200 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blkly-sb blkly, yel flor, slo oil cut, 95%  
chk. 5% mrlst

9200-9300 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blkly-sb blkly, yel flor, slo oil cut, 95%  
chk. 5% mrlst



VD 5562.1  
AZ 177.77  
3

MD 9354 TVD 5562.17  
INC 90.46 AZ 180.87  
VS 3962.86

4950 TVD  
Sub Sea (-153)

MD 9446 TVD 5561.89  
INC 89.89 AZ 181.55  
VS 4054.84

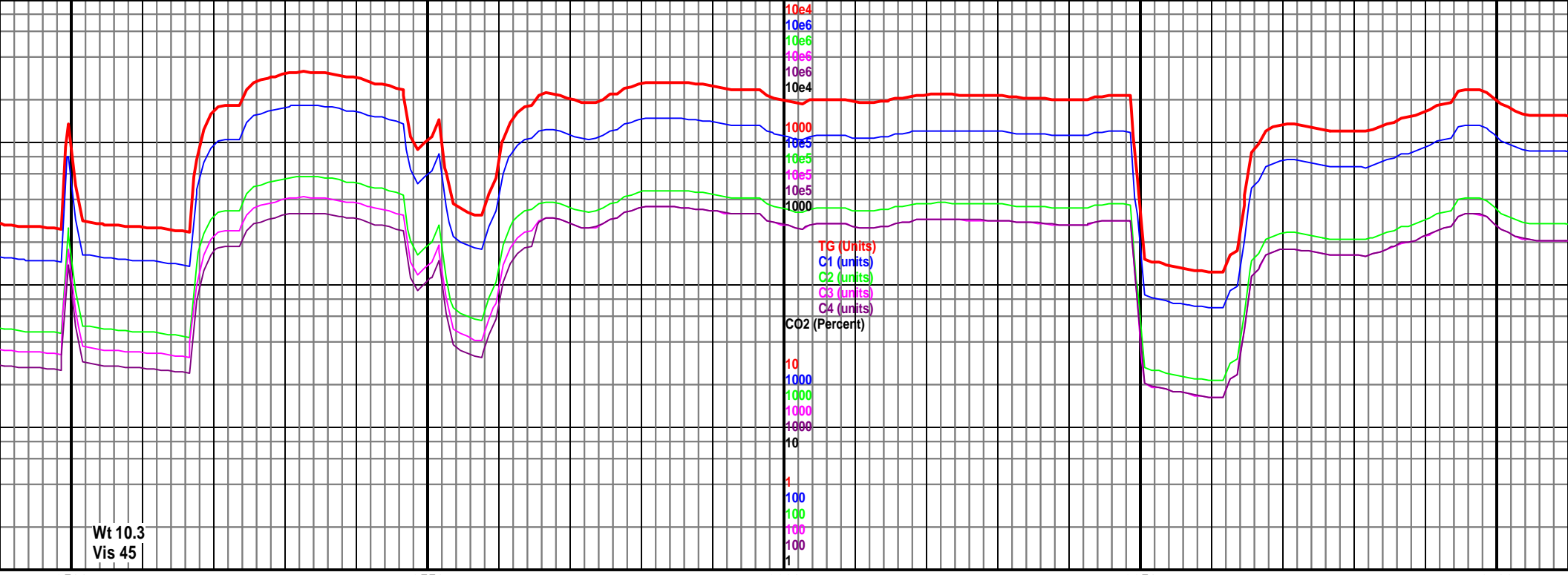
5425  
(-628)

y,  
y,  
o

9300-9400 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blkly-sb blkly, yel flor, fst oil cut, 80%  
chk, 20% mrlst

9400-9500 Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blkly-sb blkly, yel flor, fst oil cut, 80%  
chk, 20% mrlst





Wt 10.3  
Vis 45

9500

9550

9600

9650

9700

MD 9539 TVD 5561.82  
INC 90.2 AZ 183.34  
VS 4147.75

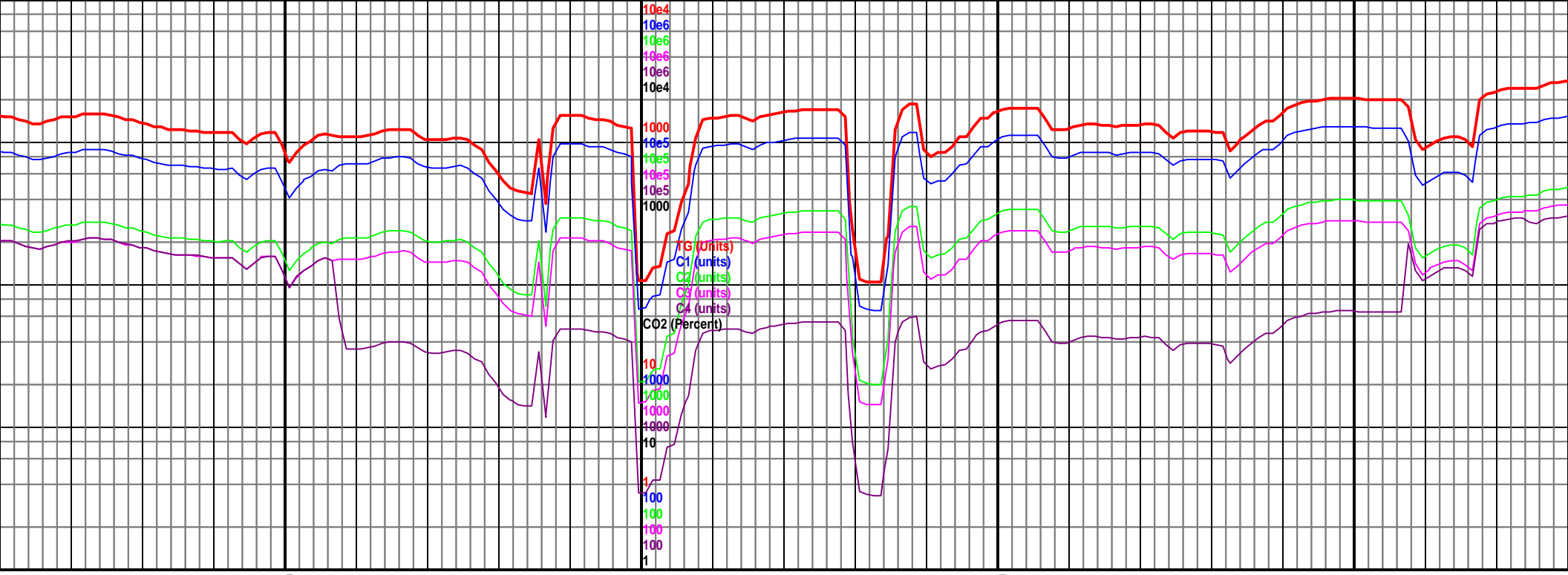
4950 TVD  
Sub Sea (-153)

MD 9631 TVD 5561.46  
INC 90.24 AZ 183.12  
VS 4239.6

5425  
(-628)

9500-9600 Chk lt-med gy, sb blk-y-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blk-y-sb blk-y, yel flor, fst oil cut, 80%  
chk, 20% mrlst

9600-9700 Chk lt-med gy, sb blk-y-plty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blk-y-sb blk-y, yel flor, fst oil cut, 80%  
chk, 20% mrlst



MD 9722 TVD 5561.11  
INC 90.2 AZ 182.1  
VS 4330.51

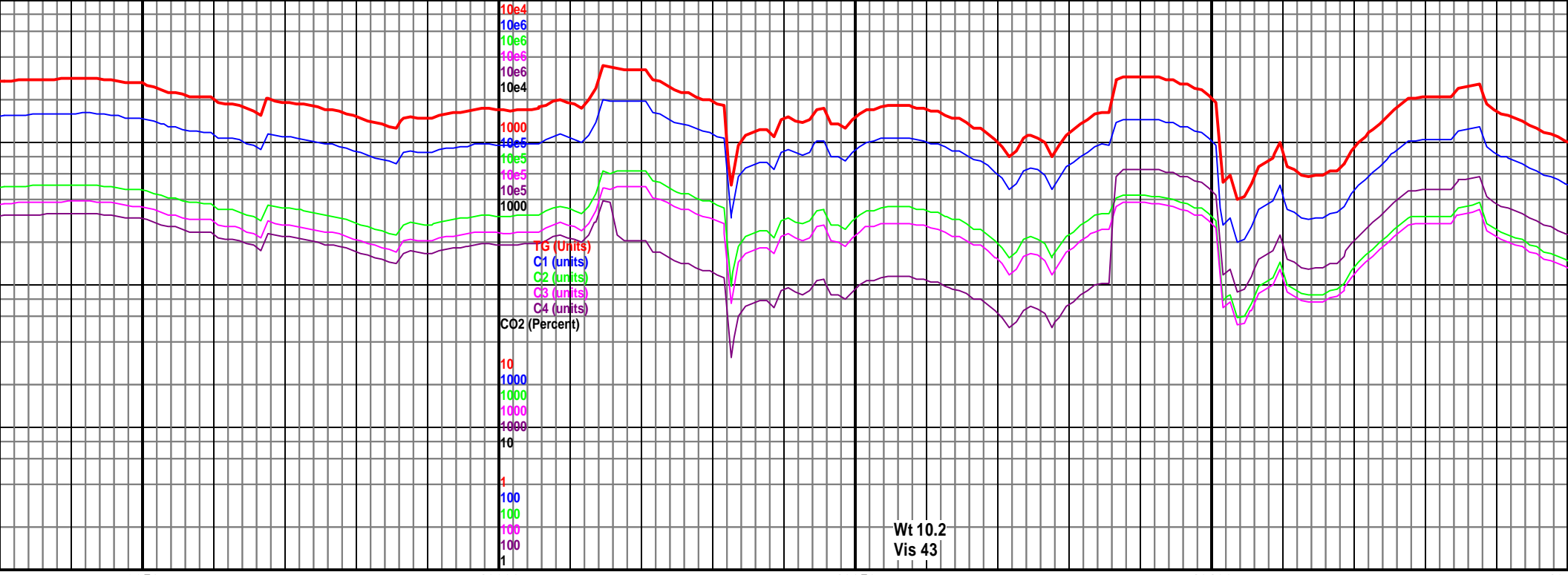
4950 TVD  
Sub Sea (-153)  
MD 9813 TVD 5560.42  
INC 90.68 AZ 184.92  
VS 4421.33

MD 9905 TVD 5560.31  
INC 89.45 AZ 185.04  
VS 4512.98

5425  
(-628)

9700-9800 Chk lt-med gy, sb blk-pty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blk-sb blk, yel flor, fst oil cut, 80%  
chk, 20% mrlst

9800-9900 Chk lt-med gy, sb blk-pty,  
mottled ip, banded, rr Mrlst med-dk gy,  
blk-sb blk, yel flor, fst oil cut, 90%  
chk, 10% mrlst



9950

10000

10050

10100

10150

Wt 10.2  
Vis 43

MD 9997 TVD 5561.76  
INC 88.75 AZ 184.33  
VS 4604.66

MD 10089 TVD 5562.17  
INC 90.73 AZ 183.88  
VS 4696.41

5425  
(-628)

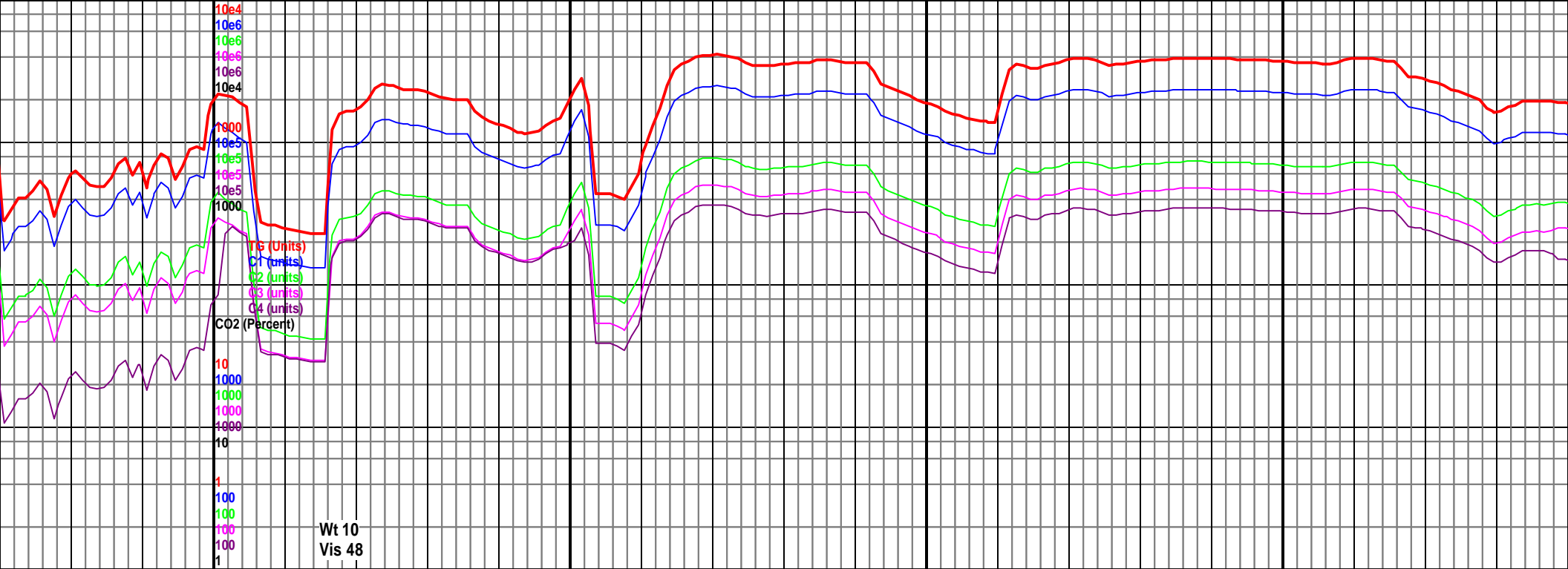


9900-10000 Chk lt-med gy, sb blkly-plty, mottled ip, banded, rr Mrlst med-dk gy, blkly-sb blkly, rr pyr, rr inoc, yel flor, fst oil cut, 95% chk, 5% mrlst

10000-10100 Chk lt-med gy, sb blkly-plty, mottled ip, banded, rr Mrlst med-dk gy, blkly-sb blkly, rr inoc, yel flor, fst oil cut, 95% chk, 5% mrlst

10100-10200 Chk lt-med gy, sb blkly-plty, mottled ip, banded, rr Mrlst med-dk gy, blkly-sb blkly, rr inoc, yel flor, fst oil cut, 95% chk, 5% mrlst





10400 10450 10500 10550

10366 TVD 5562.93  
90.2 AZ 181  
973.24

4950 TVD  
Sub Sea (-153)

MD 10458 TVD 5562.93  
INC 89.8 AZ 178.13  
VS 5065.23

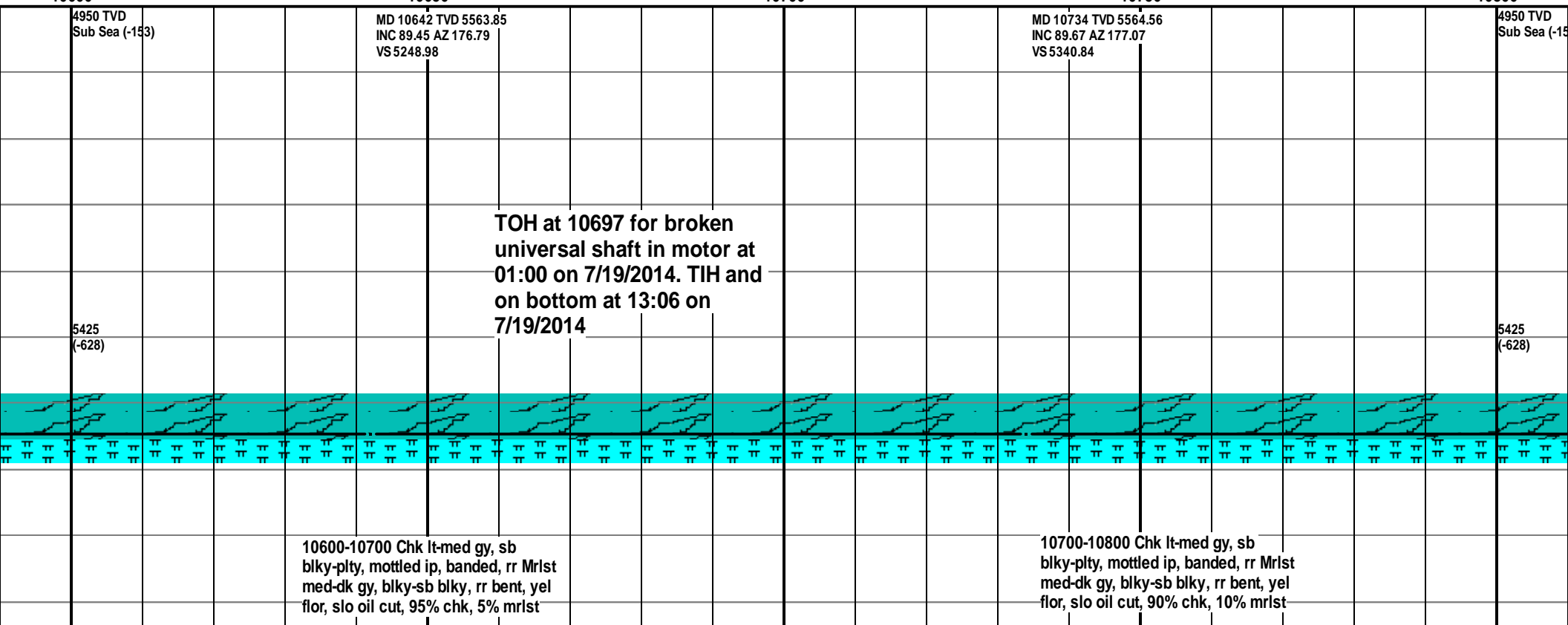
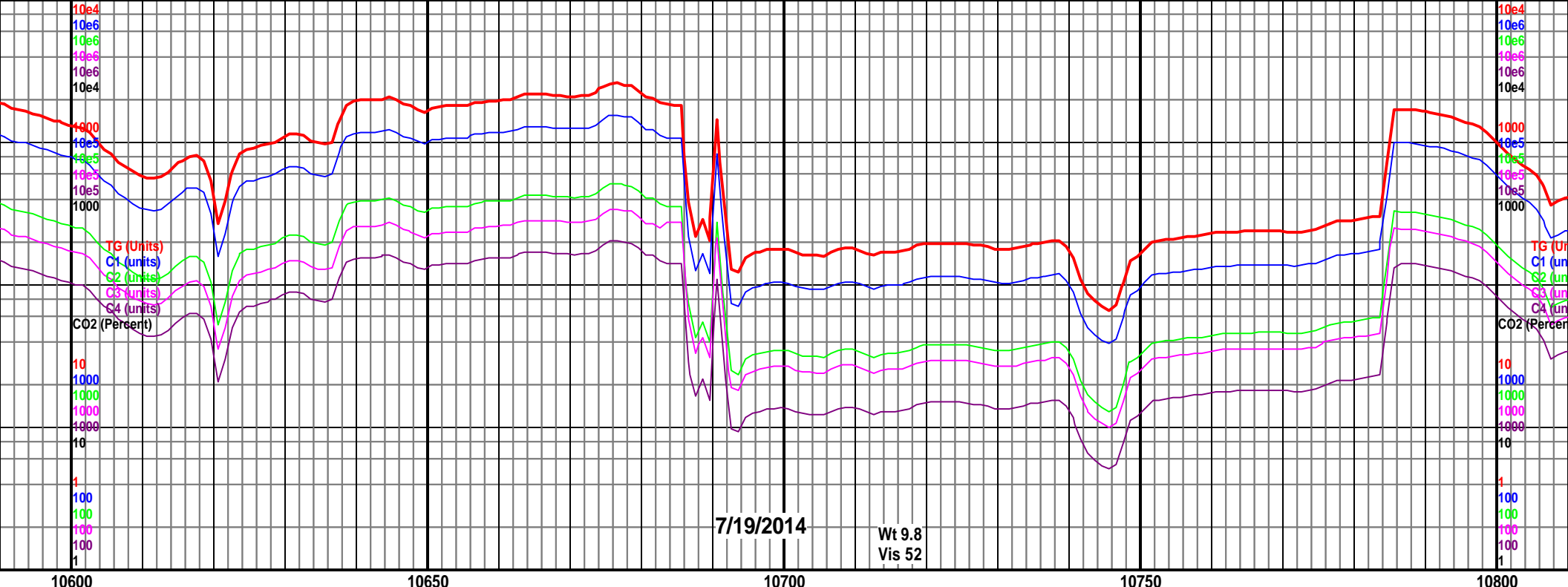
MD 10550 TVD 5563.25  
INC 89.8 AZ 176.68  
VS 5157.13

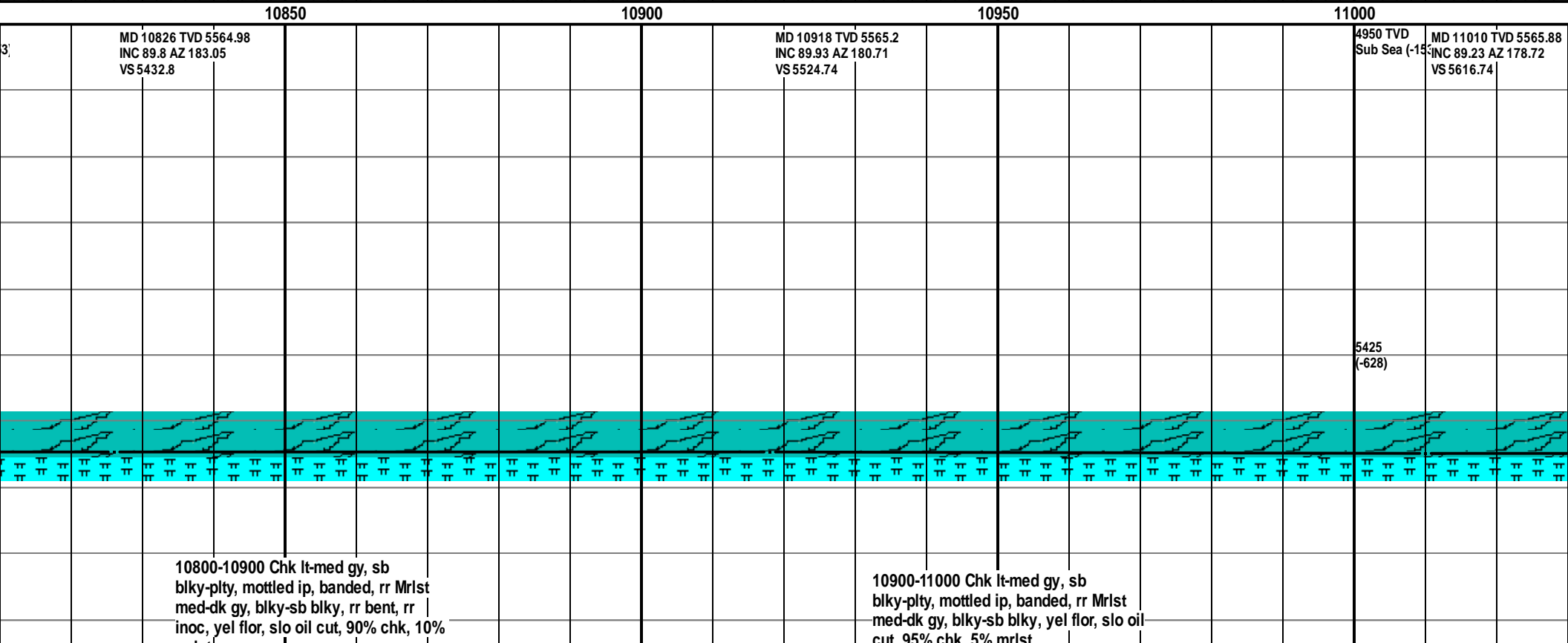
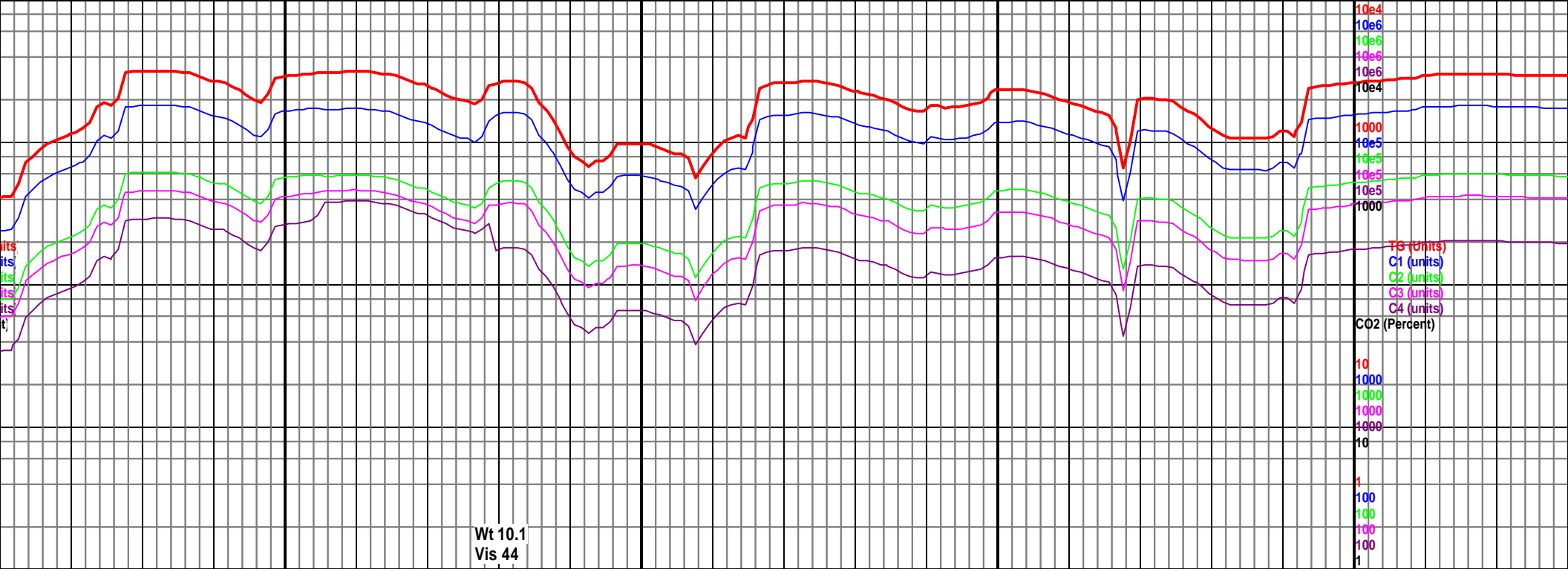
5425  
(-628)



10400-10500 Chk lt-med gy, sb  
blky-pty, mottled ip, banded, rr Mrlst  
med-dk gy, blky-sb blky, yel flor, slo oil  
cut, 95% chk, 5% mrlst

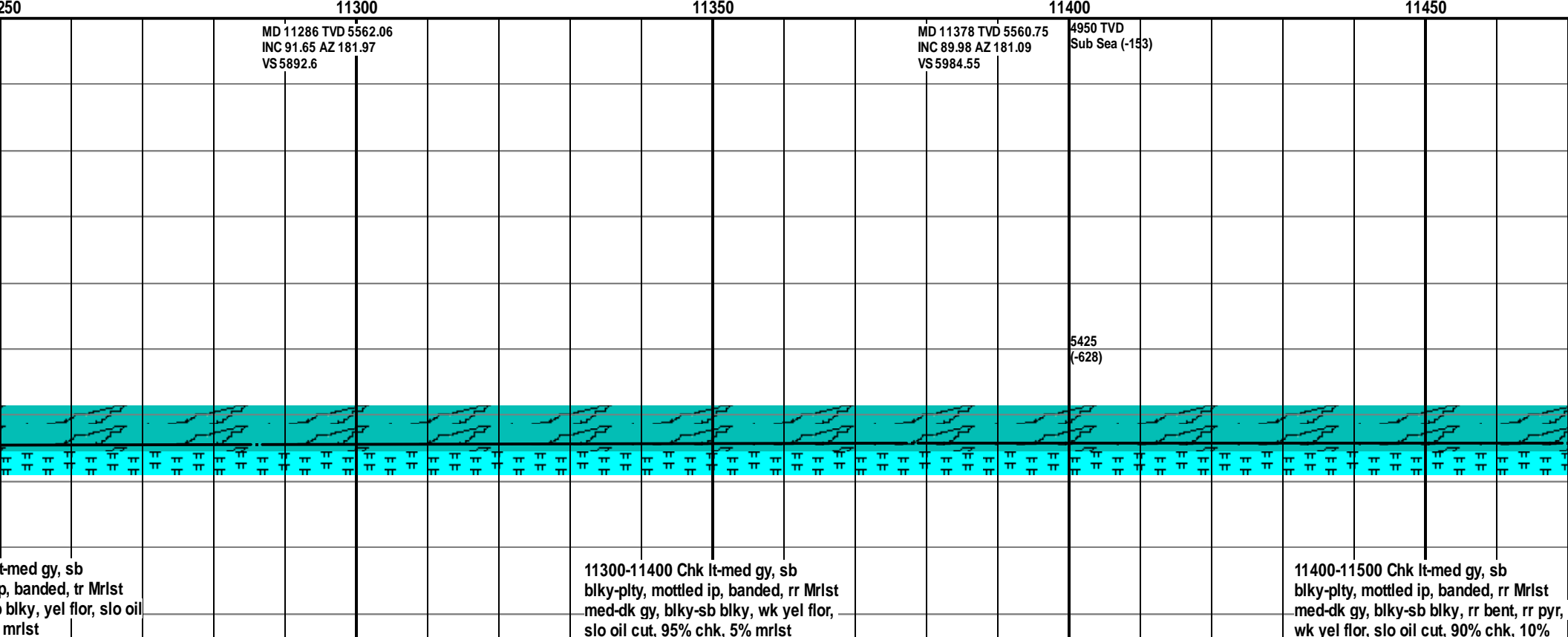
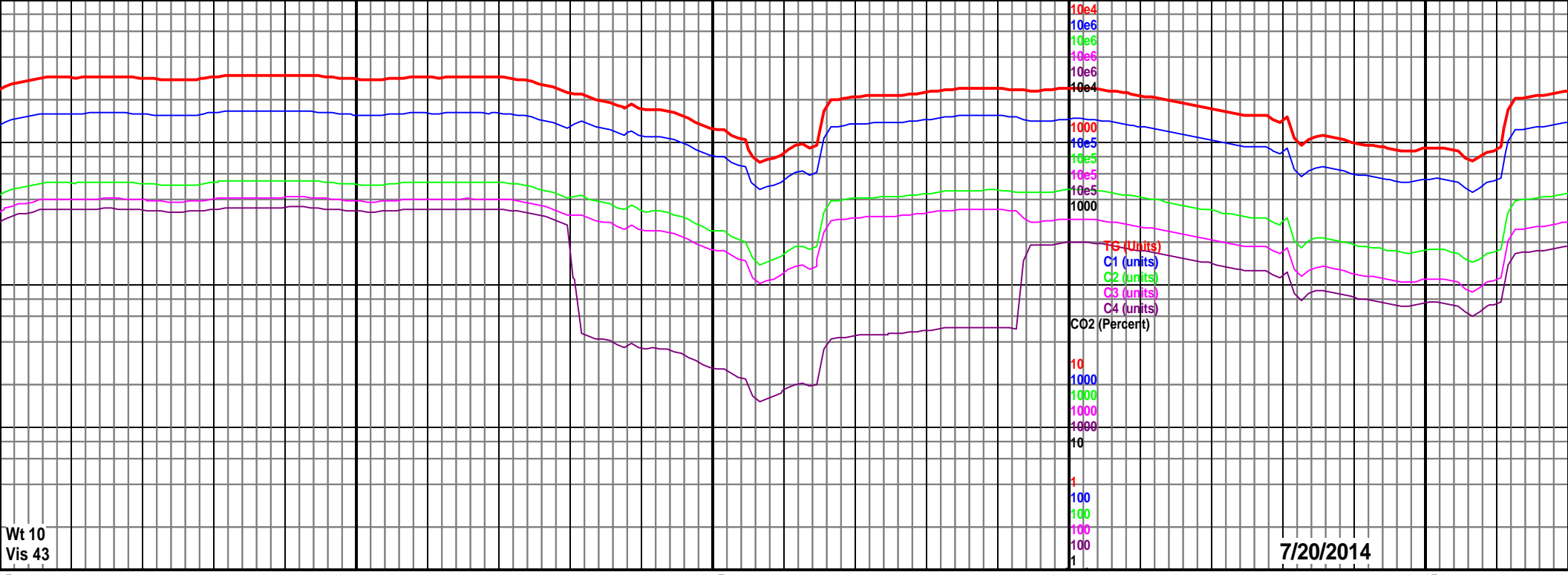
10500-10600 Chk lt-med gy, sb  
blky-pty, mottled ip, banded, rr Mrlst  
med-dk gy, blky-sb blky, yel flor, slo oil  
cut, 95% chk, 5% mrlst

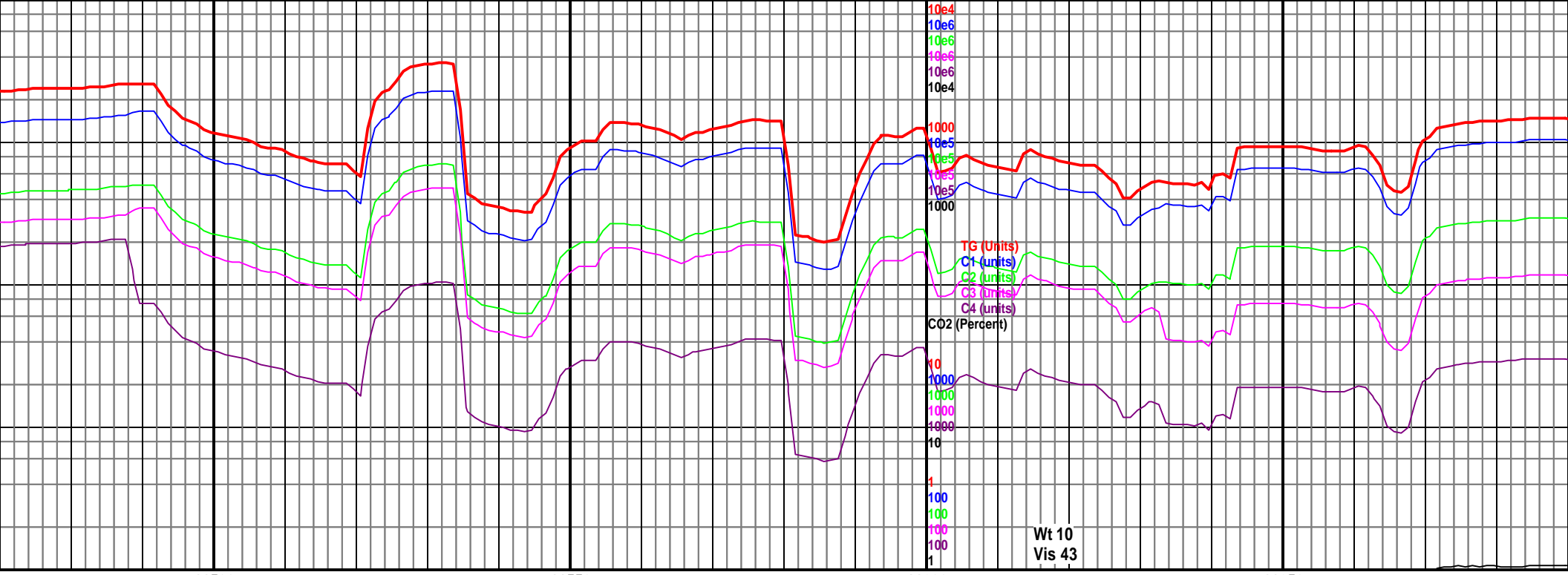




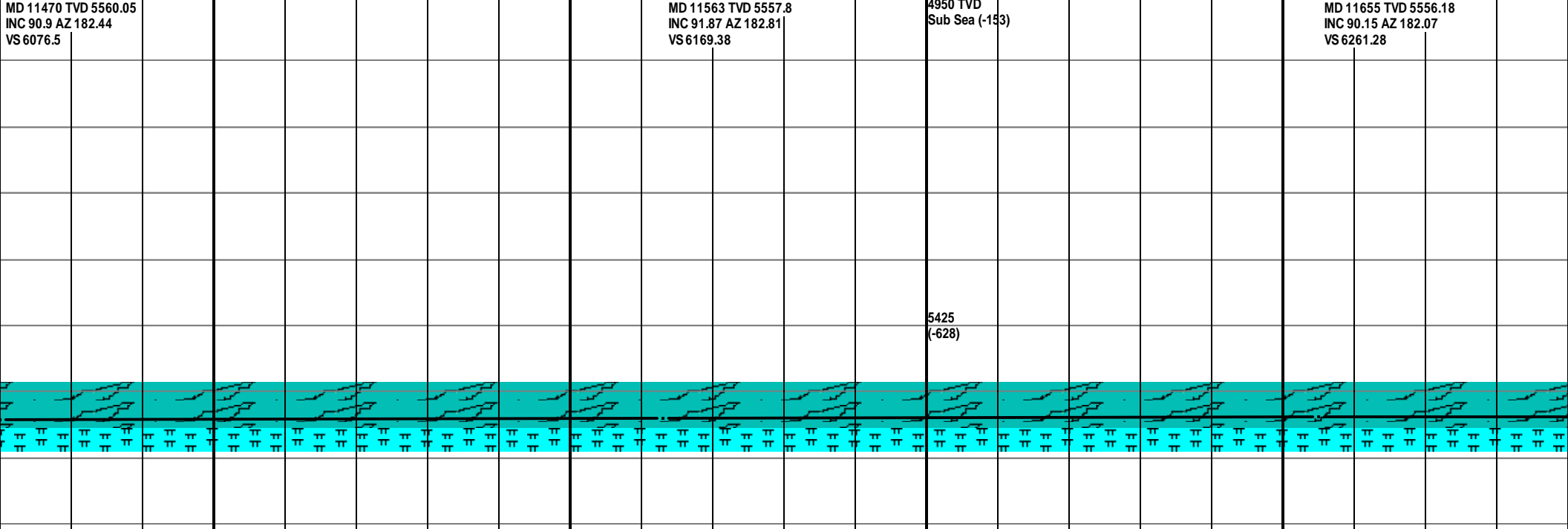








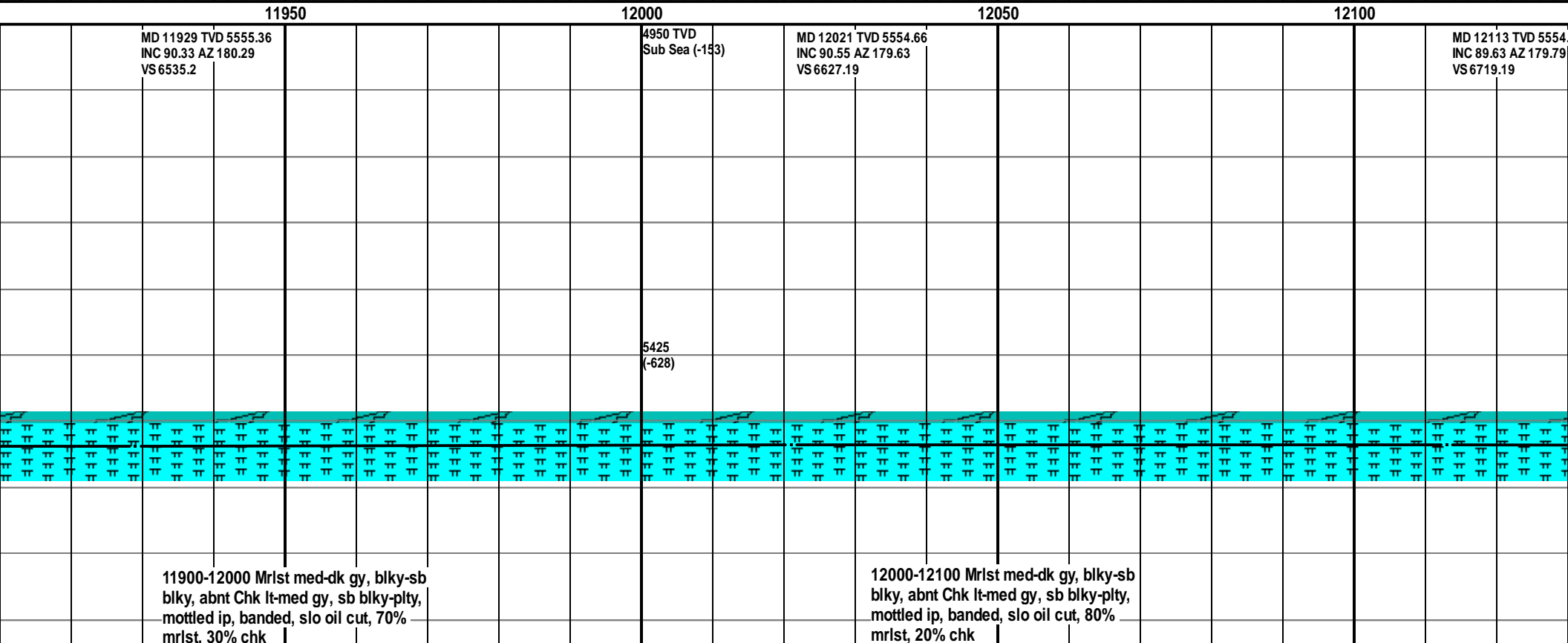
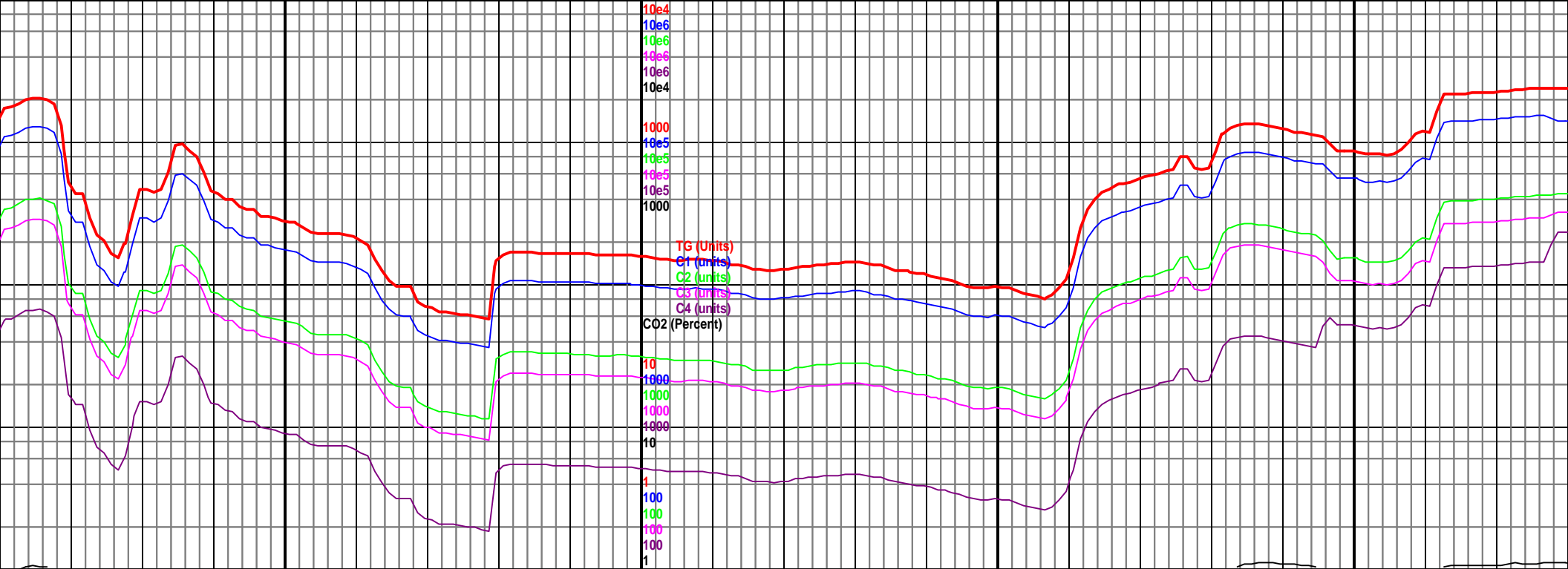
11500 11550 11600 11650



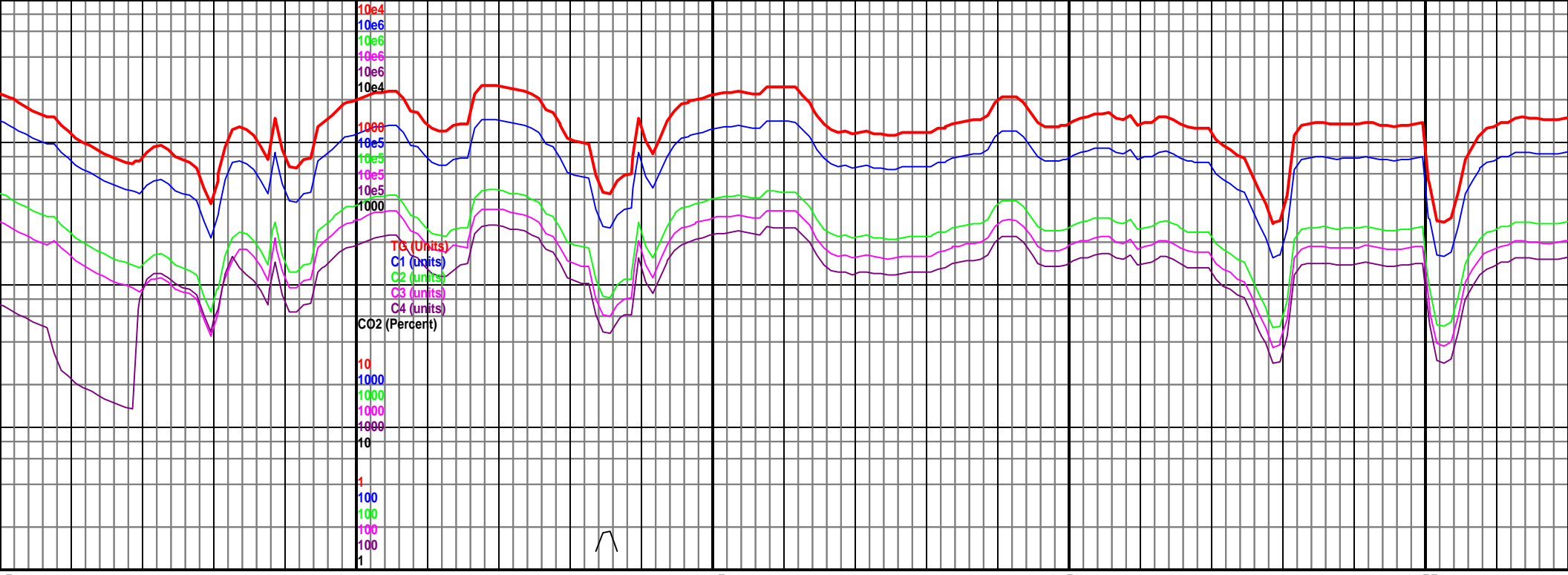
11500-11600 Mrlst med-dk gy, blk-y-sb  
blk-y, rr Chk lt-med gy, sb blk-y-pty,  
mottled ip, banded, rr pyr, abnt bent,  
abnt inc, slo oil cut, 80% mrlst, 20%

11600-11700 Mrlst med-dk gy, blk-y-sb  
blk-y, rr Chk lt-med gy, sb blk-y-pty,  
mottled ip, banded, rr pyr, rr bent, slo  
oil cut, 90% mrlst, 10% chk









12350 12400 12450 12500 12550

MD 12389 TVD 5560.37  
INC 89.41 AZ 181.35<sup>a</sup> (-153)  
VS 6995.11

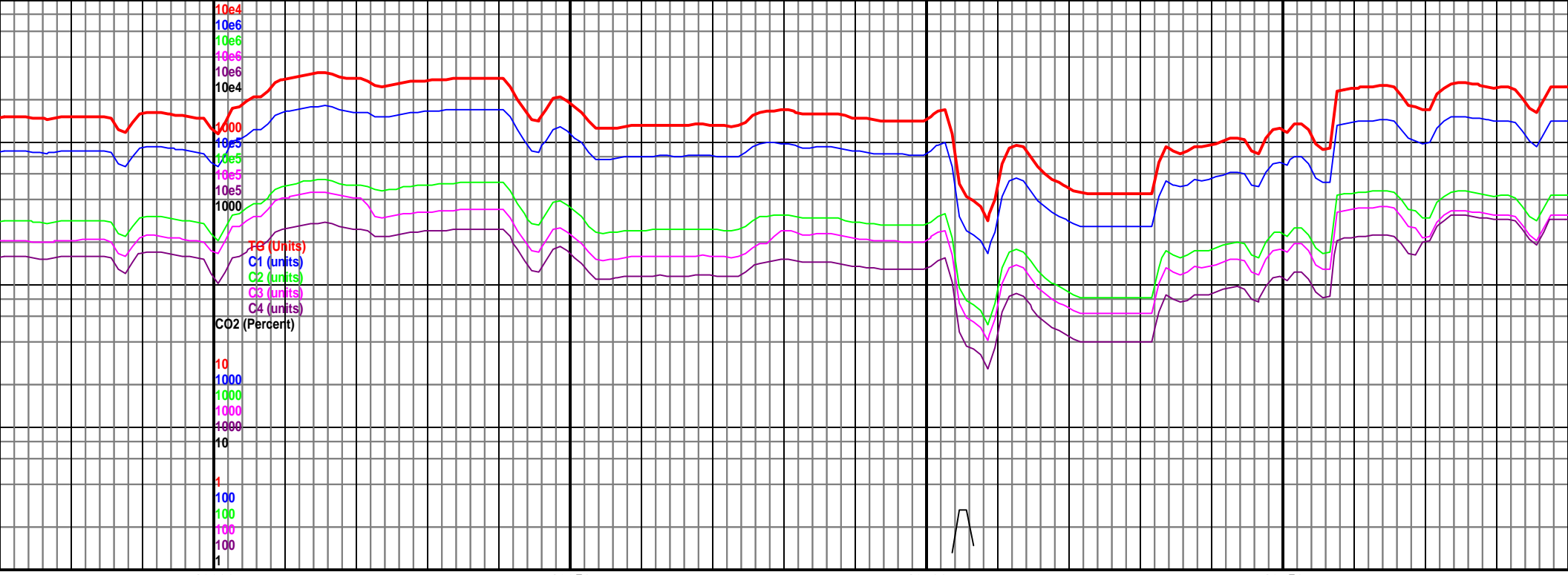
MD 12481 TVD 5560.77  
INC 90.1 AZ 182.6  
VS 7087.06

5425  
(-628)

400 Mrlst med-dk gy, blkly-sb  
t Chk lt-med gy, sb blkly-plty,  
o, banded, slo oil cut, 60%  
% chk

12400-12500 Mrlst med-dk gy, blkly-sb  
blkly, abnt Chk lt-med gy, sb blkly-plty,  
mottled ip, banded, slo oil cut, 60%  
mrlst, 40% chk

12500-12600 Mrlst med-dk gy, b  
blkly, abnt Chk lt-med gy, sb blkly  
mottled ip, banded, slo oil cut, 7  
mrlst, 30% chk



MD 12573 TVD 5560.45  
INC 90.29 AZ 181.8  
VS 7178.99

4950 TVD  
Sub Sea (-153)

MD 12664 TVD 5559.26  
INC 91.21 AZ 183.12  
VS 7269.89

MD 12756 TVD 5558.66  
INC 89.54 AZ 180.06  
VS 7361.84

5425  
(-628)

blky-sb  
y-pty,  
0%

12600-12700 Mrlst med-dk gy, blky-sb  
blky, abnt Chk lt-med gy, sb blky-pty,  
mottled ip, banded, slo oil cut, 70%  
mrlst, 30% chk

12700-12800 Chk lt-med gy, sb  
blky-pty, mottled ip, banded, rr Mrlst  
med-dk gy, blky-sb blky, rr pyr, yel flor,  
slo oil cut, 75% chk, 25% mrlst

