



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

Well Name: Razor 27J-2209A
Well Id:
Location: NWSW 27-T10N-R58W
License Number: 05-123-38067-00
Spud Date: 10/10/2014
Surface Coordinates: 40.808664, -103.848444

Region: Redtail Field
Drilling Completed: 10/17/2014

Bottom Hole
Coordinates:
Ground Elevation (ft): 4767 K.B. Elevation (ft): 4789
Logged Interval (ft): 5080 To: 13677 Total Depth (ft): 13677
Formation: Pierre, Sharon Springs, Niobrara A
Type of Drilling Fluid: Water Based Mud

Printed by WellSight Log Manager from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

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

GEOLOGIST

Name: Camille Warren, Christian VanWyngarden
Company: Acme Geologic Consulting
Address: 108 Berry Street
Little Rock, AR 72205

Drilling Company

Frontier Drilling
Rig #26

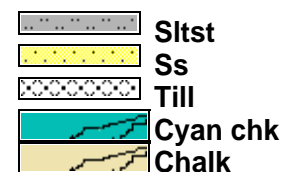
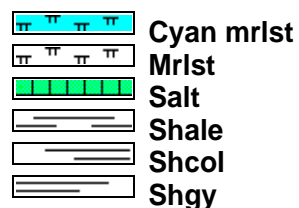
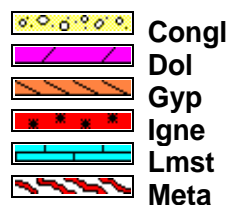
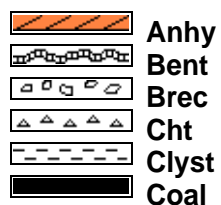
Gas Detection

Mudlogging Systems, Inc., M Logger, Model TGC, Total Gas and Chromatograph, #394/#410

Comments

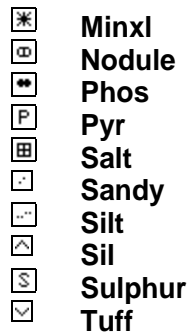
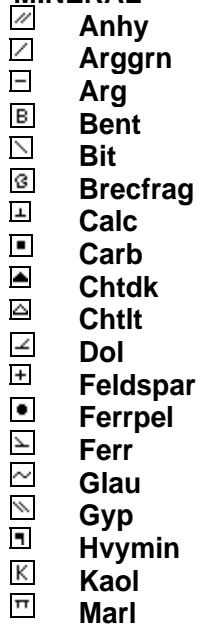
Lithologies and tops at drilled depths, not corrected to elogs. Where the well bore gas is 100% methane, the C1 line is moved to 85% for graphical purposes only.

ROCK TYPES

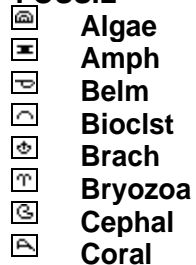


ACCESSORIES

MINERAL



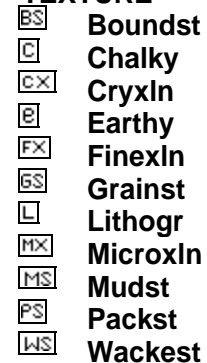
FOSSIL



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

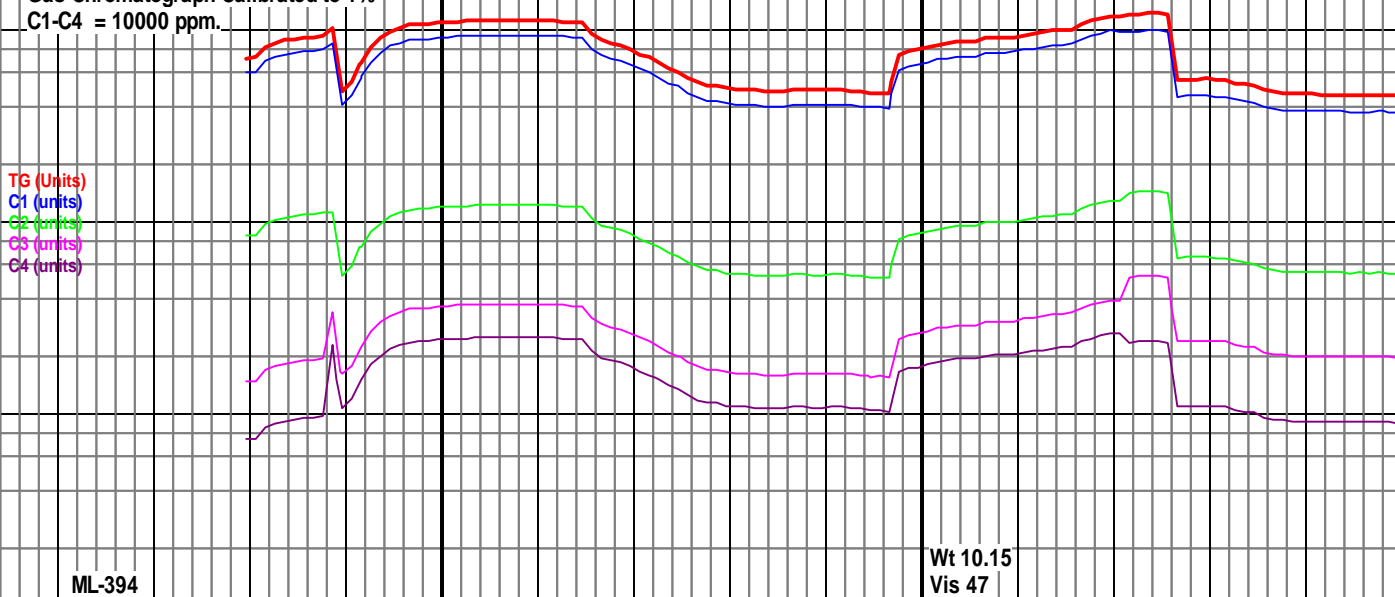
EVENT

-  Rft
-  Sidewall

TG, C1-C4
TG (Units) —
C1 (units) —
C2 (units) —
C3 (units) —
C4 (units) —

MSI Model TGC Total Gas and
Chromatograph
Total Gas Calibrated to
1% Methane = 100 units,
99.0% Methane = 9900 units.
Gas Chromatograph Calibrated to 1%
C1-C4 = 10000 ppm.

10e4
10e6
10e6
10e6
10e6
1000
10e5
10e5
10e5
10e5
10
1000
1000
1000
1000
1
100
100
100
100
100



10e4
10e6
10e6
10e6
10e6
1000
10e5
10e5
10e5
10e5
10
1000
1000
1000
1000
1
100
100
100
100
100

TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)

TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)

Depth

50 5100 5150 5200

5000 TVD MD 5057 TVD 4997.93
Sub Sea (INC 1.69 AZ 50.23
VS -38.69

MD 5088 TVD 5028.9
INC 3.17 AZ 25.27
VS -37.69

MD 5119 TVD 5059.79
INC 6.71 AZ 1.37
VS -35.14

MD 5149 TVD 5089.39
INC 11.82 AZ 354.58
VS -30.32

MD 5180 TVD 5119.47
INC 16.08 AZ 352.56
VS -22.85

5000 TVD MD 5210 TVD 5148.02
Sub Sea (-21 INC 19.64 AZ 354.07
VS -13.66

5080-5150 Sltst lt gy-med gy, sb
blky-blky, slty tex, sl frm, non calc, grdg
to sh, tr Sh med gy-dk gy, sb plty-plty, gt
tex, mod frm, non calc, nsfoc, 90% sltst
10% sh

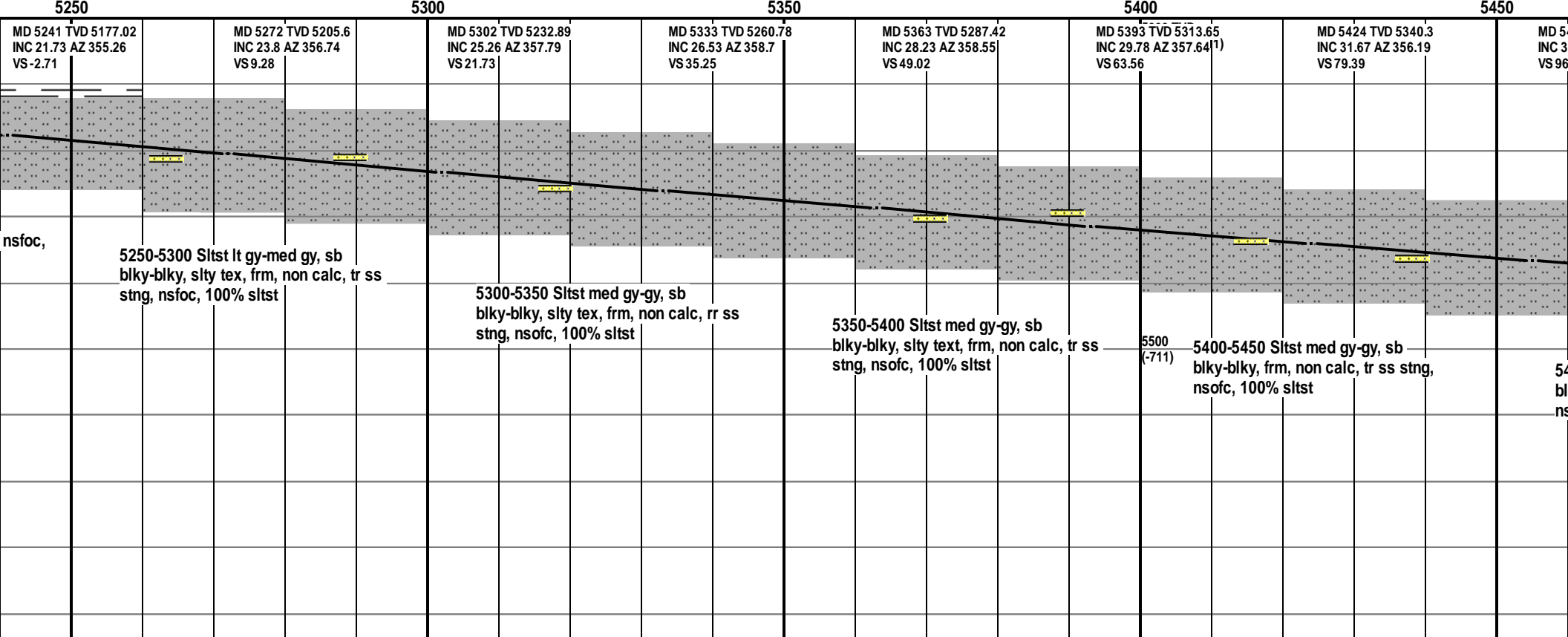
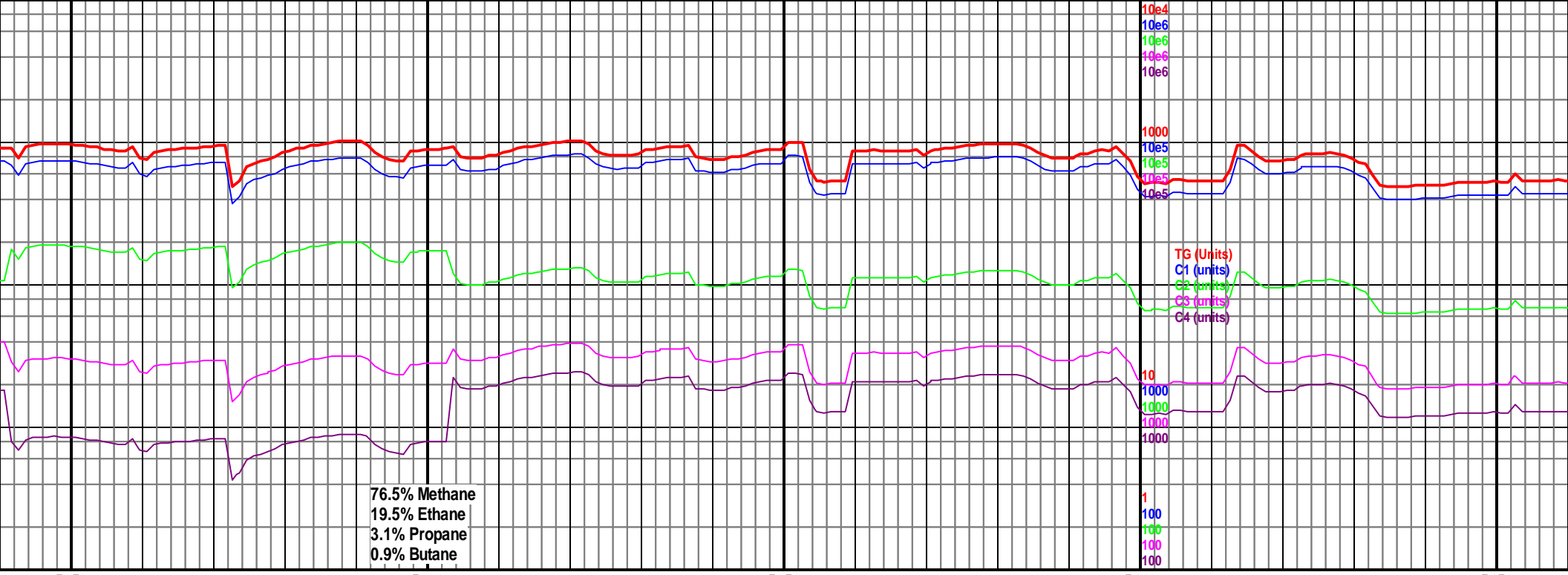
5150-5200 Sltst lt gy-med gy, sb
blky-blky, slty tex, non calc, sl frm,
grdg to sh, tr Sh med gy-dk gy, sb plty,
gt tex, mod frm, non calc, nsfoc, 95%
sltst 5% sh

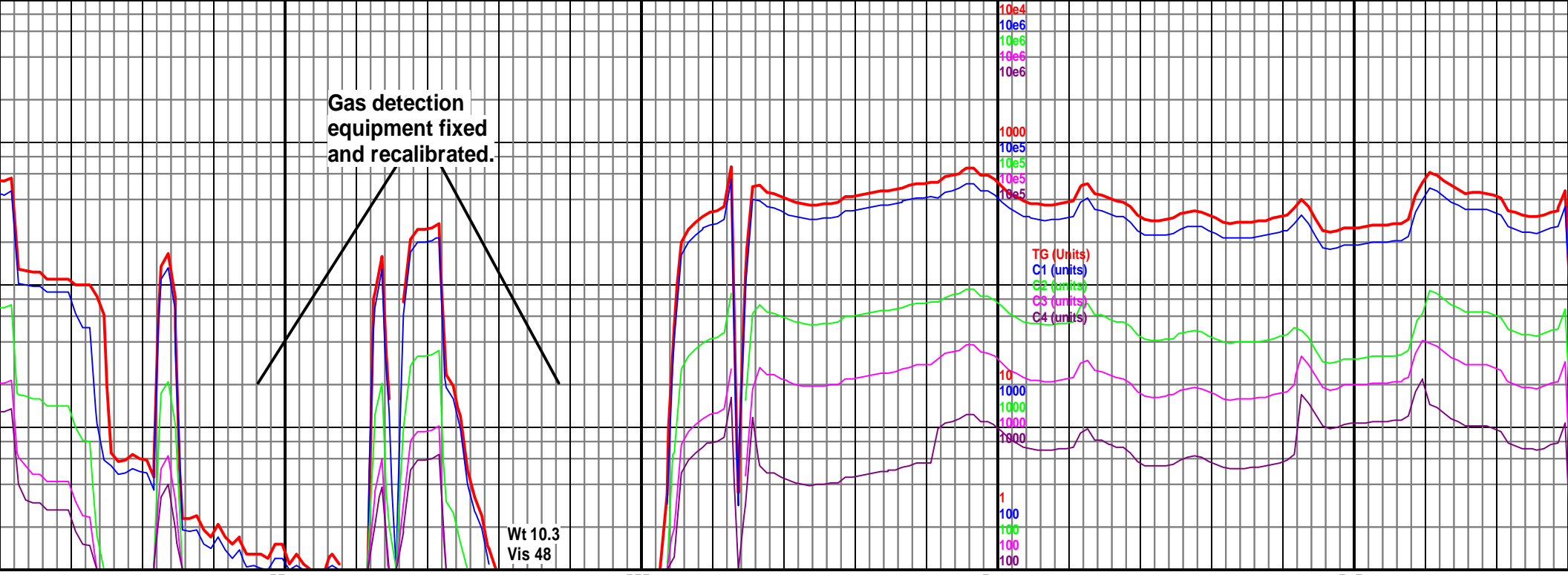
5200-5250 Sltst lt gy-med gy, sb
blky-blky, slty tex, frm, non calc,
100% sltst

Well Bore Cross Section

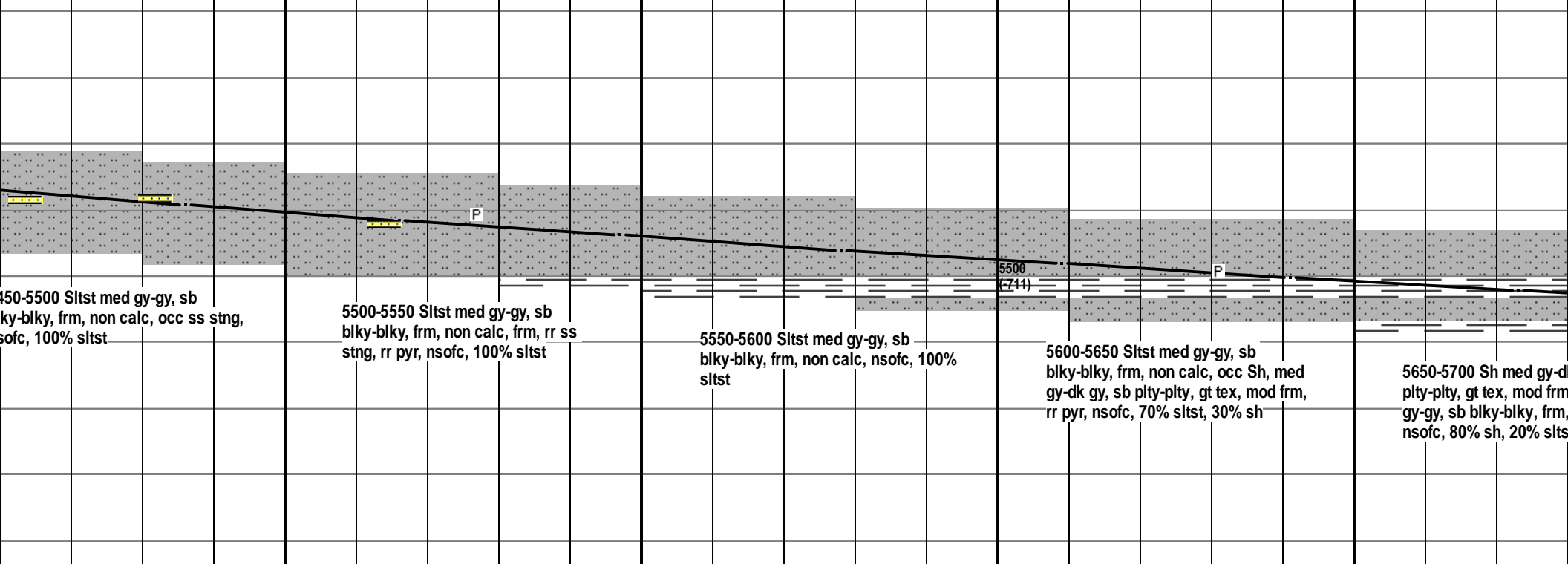
5500 (-711) 5500 (-711)

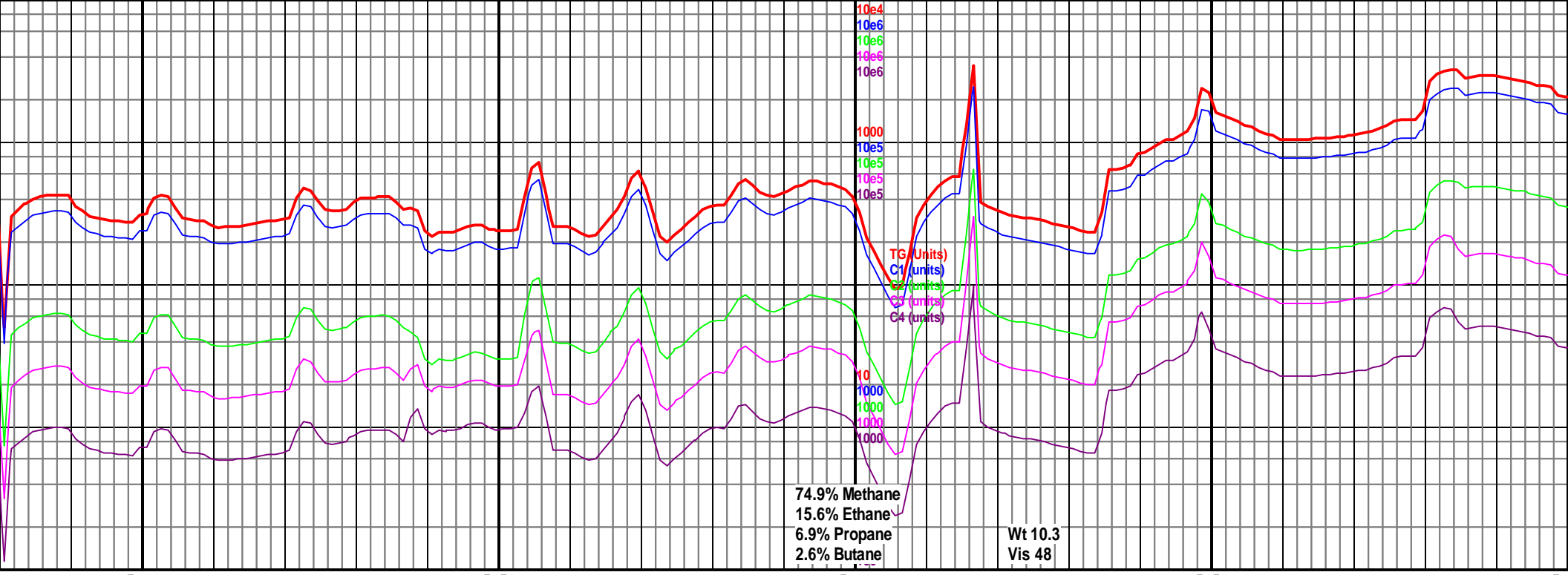
Acme Geologic Consulting
arrived and rigged up on
10/11/2014, sample catching
began at KOP of 5080' at
10:15 on 10/12/2014



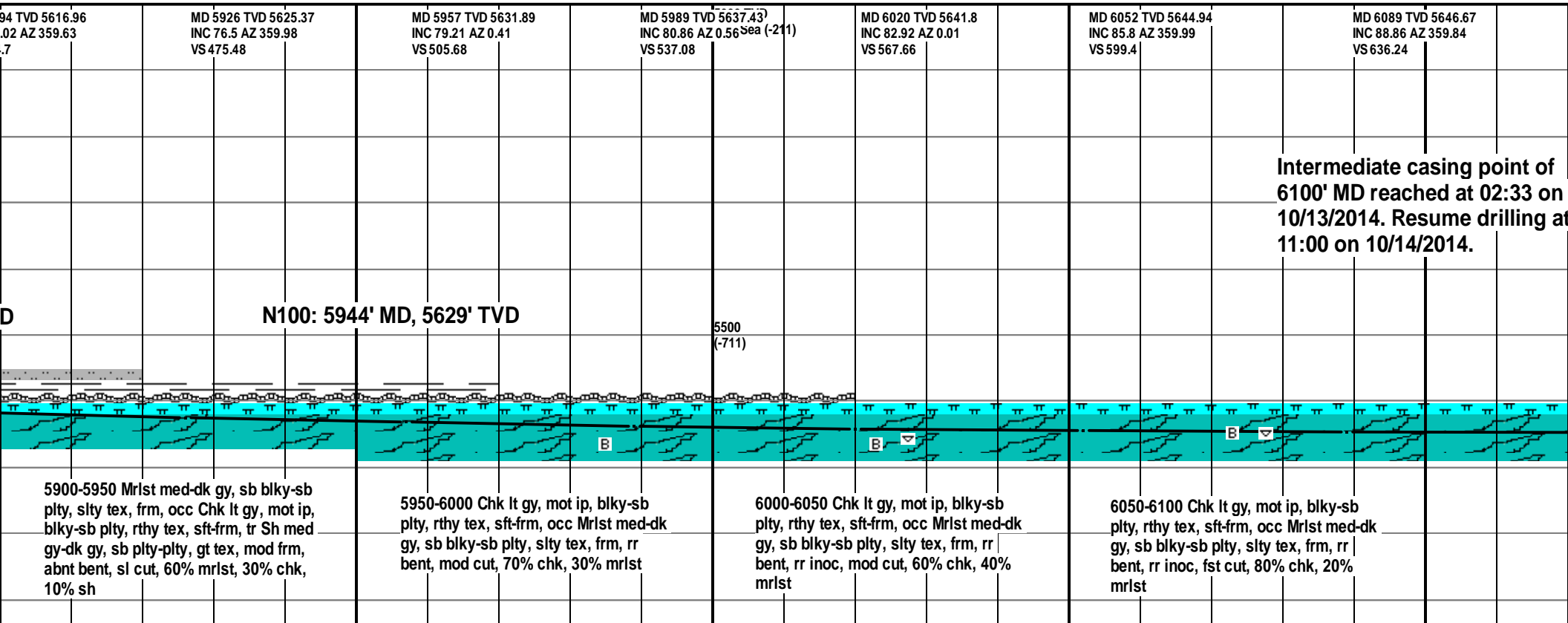
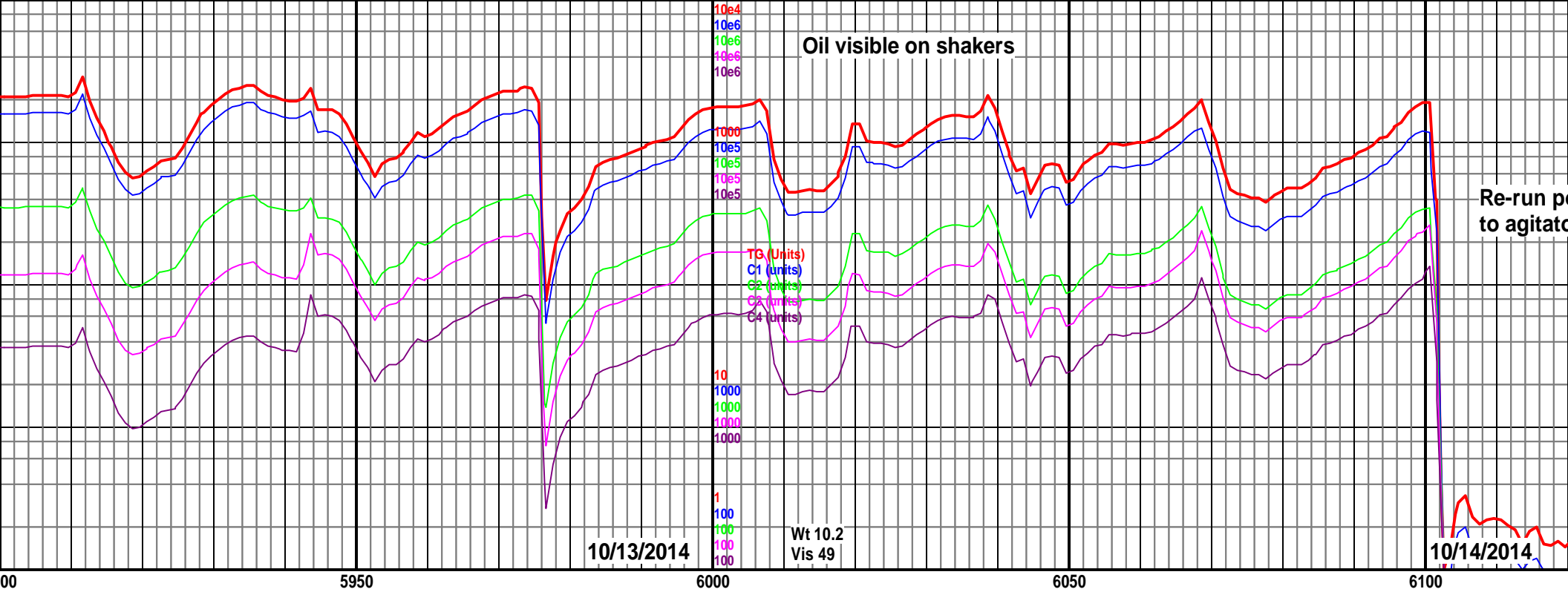


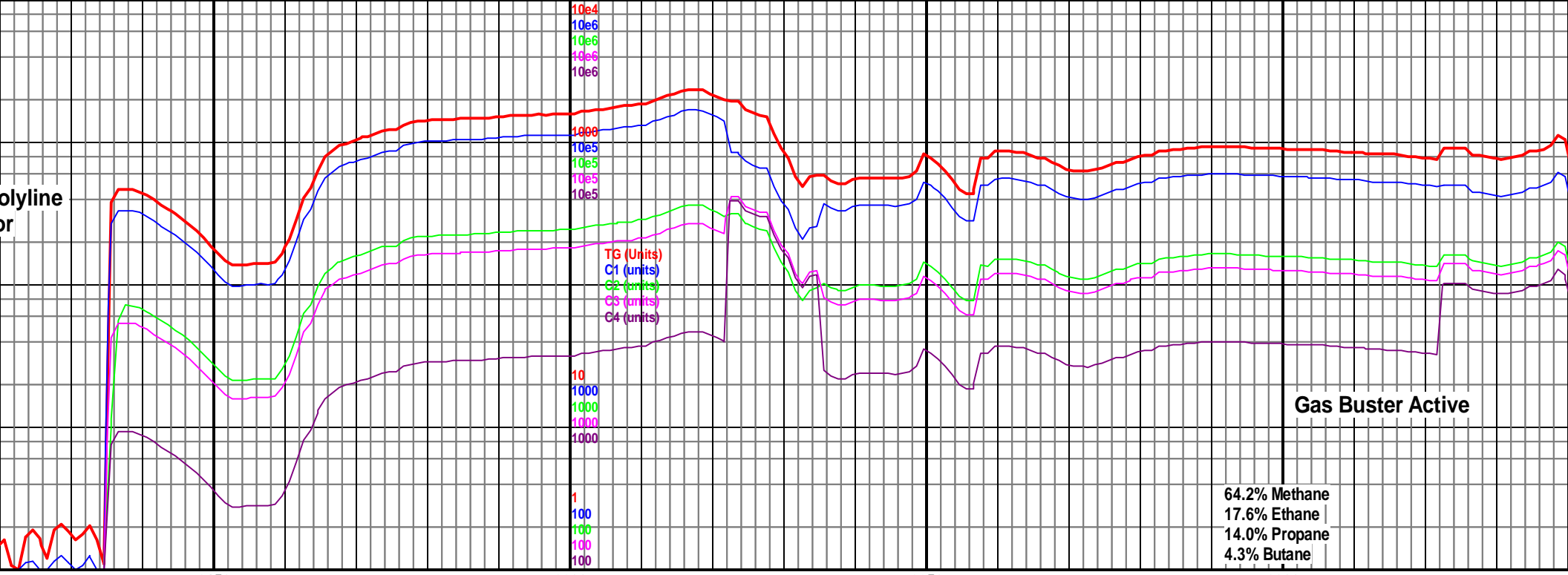
5455 TVD 5366.36 INC 3.94 AZ 356.64 VS 118	MD 5486 TVD 5391.65 INC 36.7 AZ 357.47 VS 114.09	MD 5516 TVD 5415.17 INC 40.02 AZ 358.76 VS 132.69	MD 5547 TVD 5438.31 INC 43.38 AZ 359.51 VS 153.26	MD 5578 TVD 5460.31 INC 46.19 AZ 359.45 VS 175.05	5600 TVD Sub Sea (-21) MD 5609 TVD 5481.35 INC 48.31 AZ 359.45 VS 197.75	MD 5641 TVD 5502.01 INC 51.27 AZ 359.29 VS 222.13	MD 5671 TVD 5522.01 INC 53.47 AZ 359.29 VS 247.4
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MD 5705 TVD 5539.99 INC 56.16 AZ 359.29 VS 273.51	MD 5736 TVD 5556.67 INC 58.72 AZ 359.72 VS 299.57	MD 5768 TVD 5572.68 INC 61.25 AZ 358.35 VS 327.22	MD 5799 TVD 5586.36 INC 66.37 AZ 358.81 VS 354.99	MD 5831 TVD 5597.8 INC 71.71 AZ 358.77 VS 384.81	MD 5863 TVD 5607.7 INC 72.24 AZ 359.21 VS 415.18	MD 5895 TVD 5617.6 INC 73.76 AZ 359.72 VS 444.22
P200: 5710' MD, 5542' TVD		P300: 5768' MD, 5573' TVD		P350: 5823' MD, 5595' TVD		
5700-5750 Slst med gy-gy, sb blky-blky, frm, non calc, rr pyr, occ Sh med gy-dk gy, sb plty-plty, gt tex, mod frm, nsofc, 60% sltst, 40% sh		5750-5800 Slst med gy-gy, sb blky-blky, frm, non calc, occ Sh med gy-dk gy, sb plty-plty, gt tex, mod frm, rr bent, nsofc, 90% sltst, 10% sh		5800-5850 Slst med gy-gy, sb blky-blky, frm, non calc, occ Sh med gy-dk gy, sb plty-plty, gt tex, mod frm, abnt bent, nsofc, 70% sltst, 30% sh		5850-5900 Sh med gy-dk gy, sb plty-plty, gt tex, mod frm, occ Slst med gy-gy, sb blky-blky, frm, non calc, abnt bent, v sl cut, 60% sh, 30% sltst, 10% mrilst





6150

6200

6250

6300

MD 6184 TVD 5649.5300 TVD
INC 87.69 AZ 357.21 Sub Sea (-211)
VS 731.06

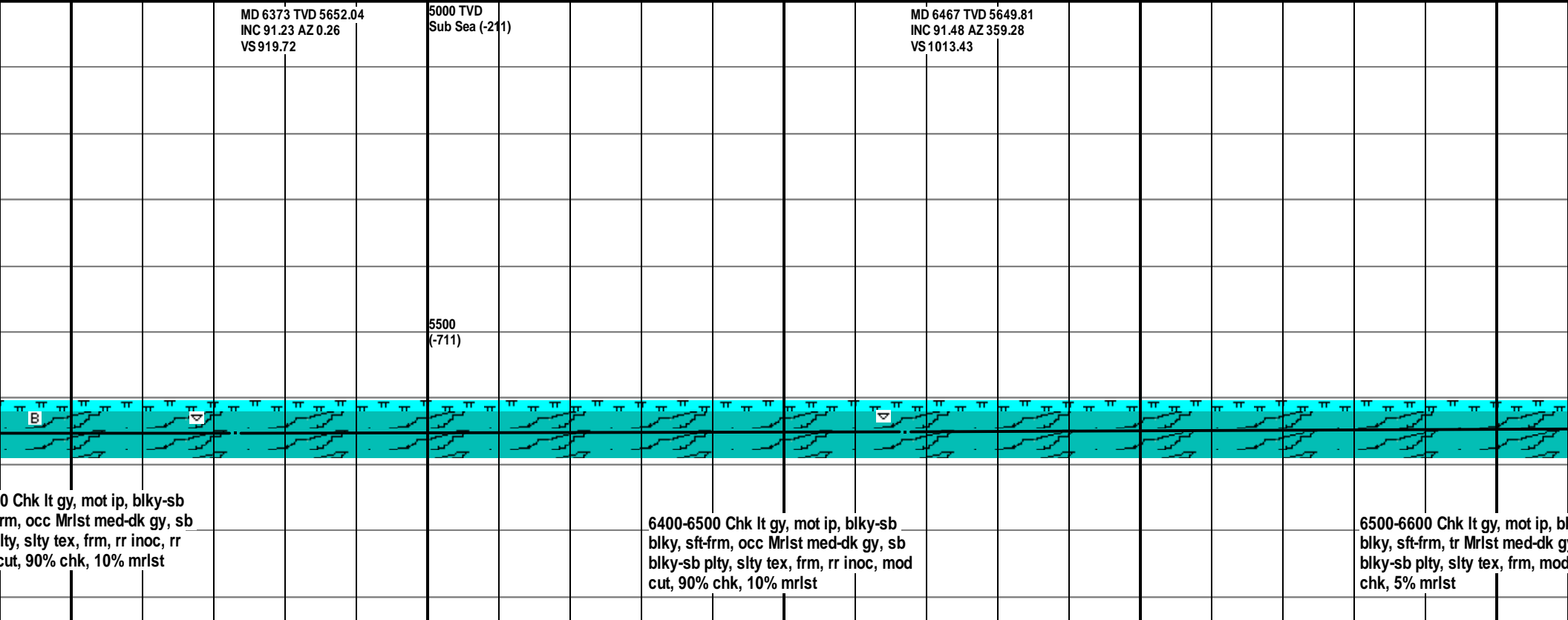
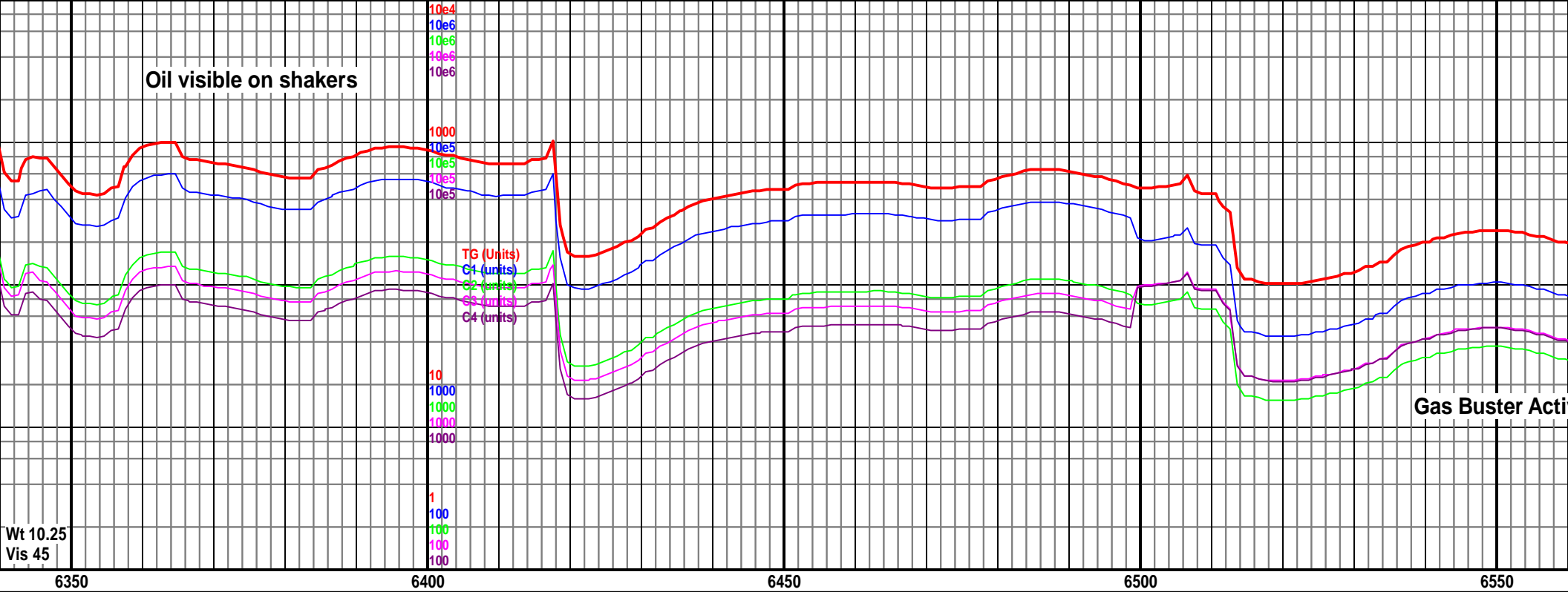
MD 6278 TVD 5652.23
INC 89.01 AZ 358.29
VS 824.94

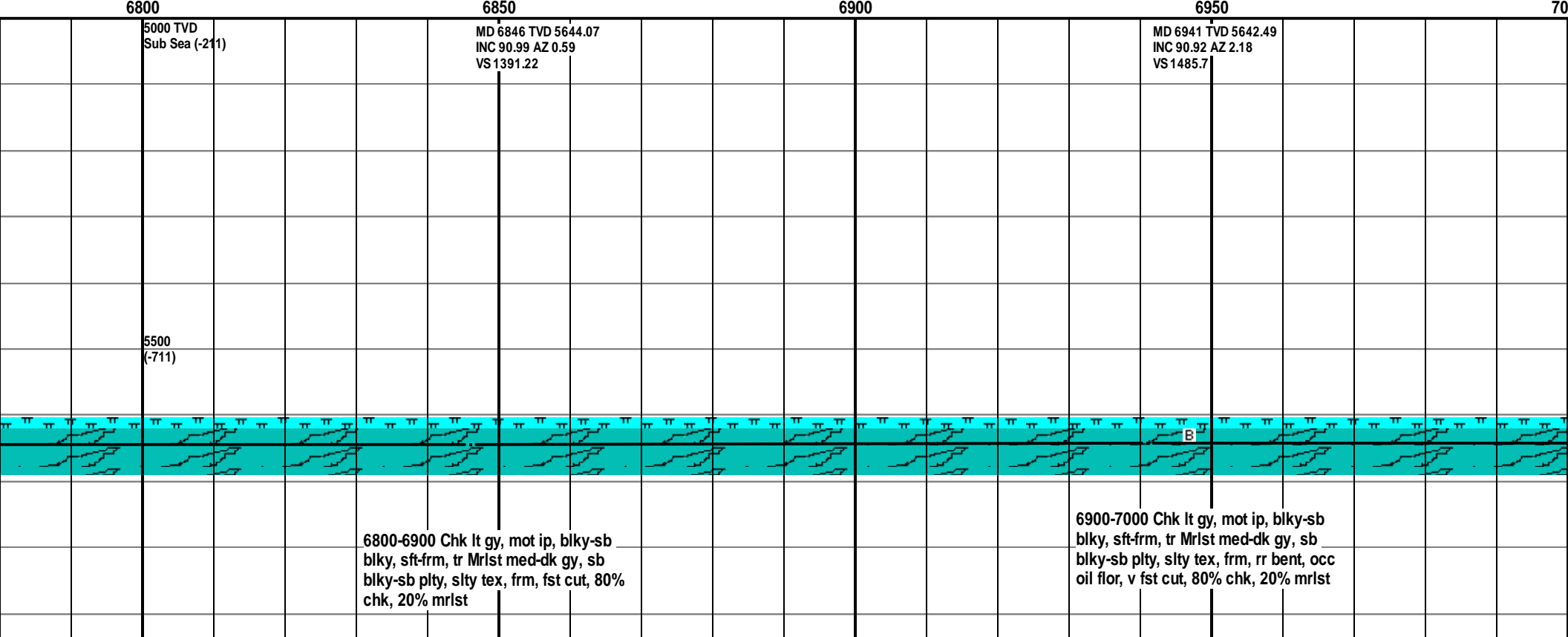
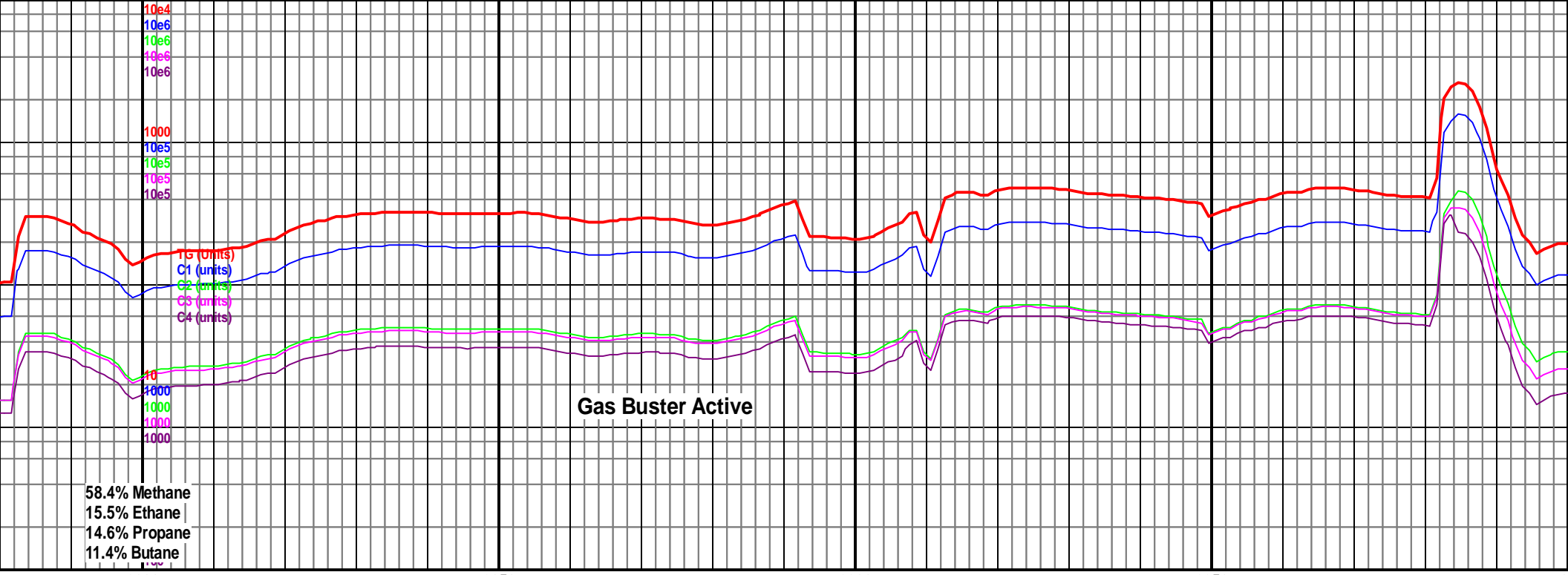
5500
(-711)

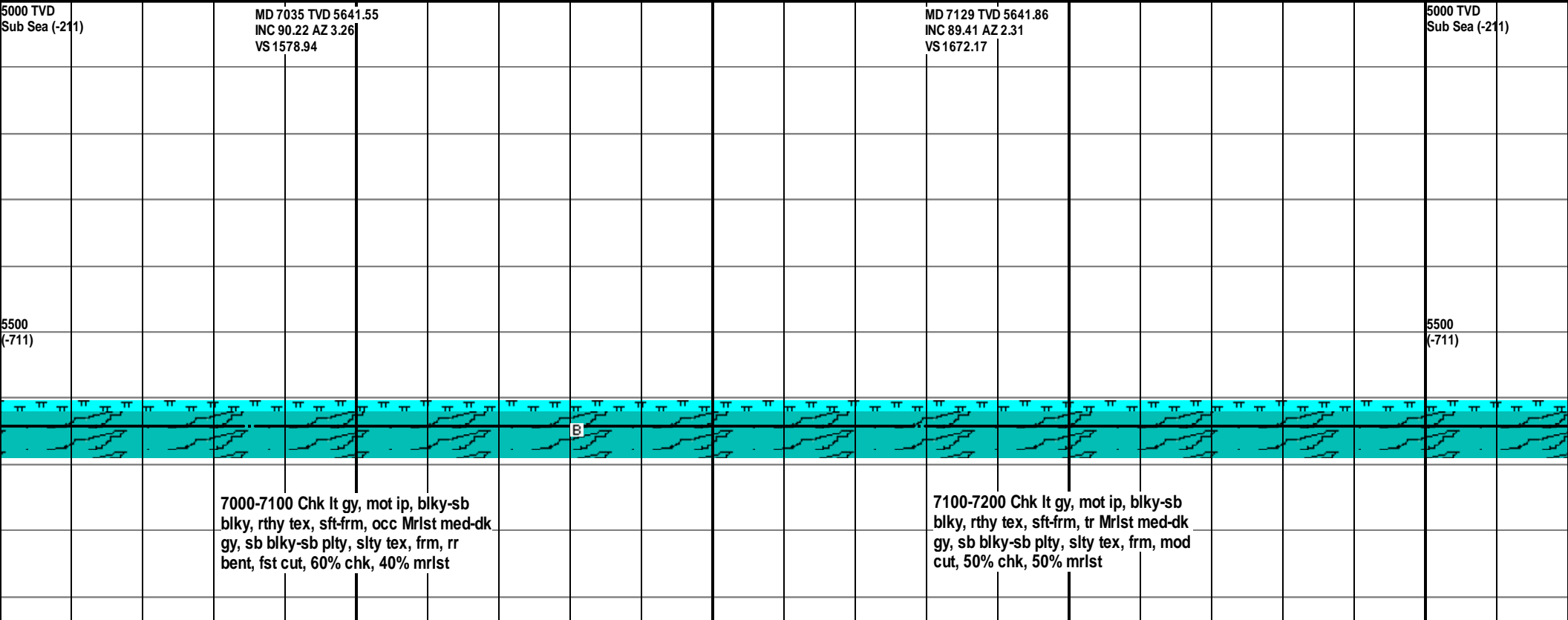
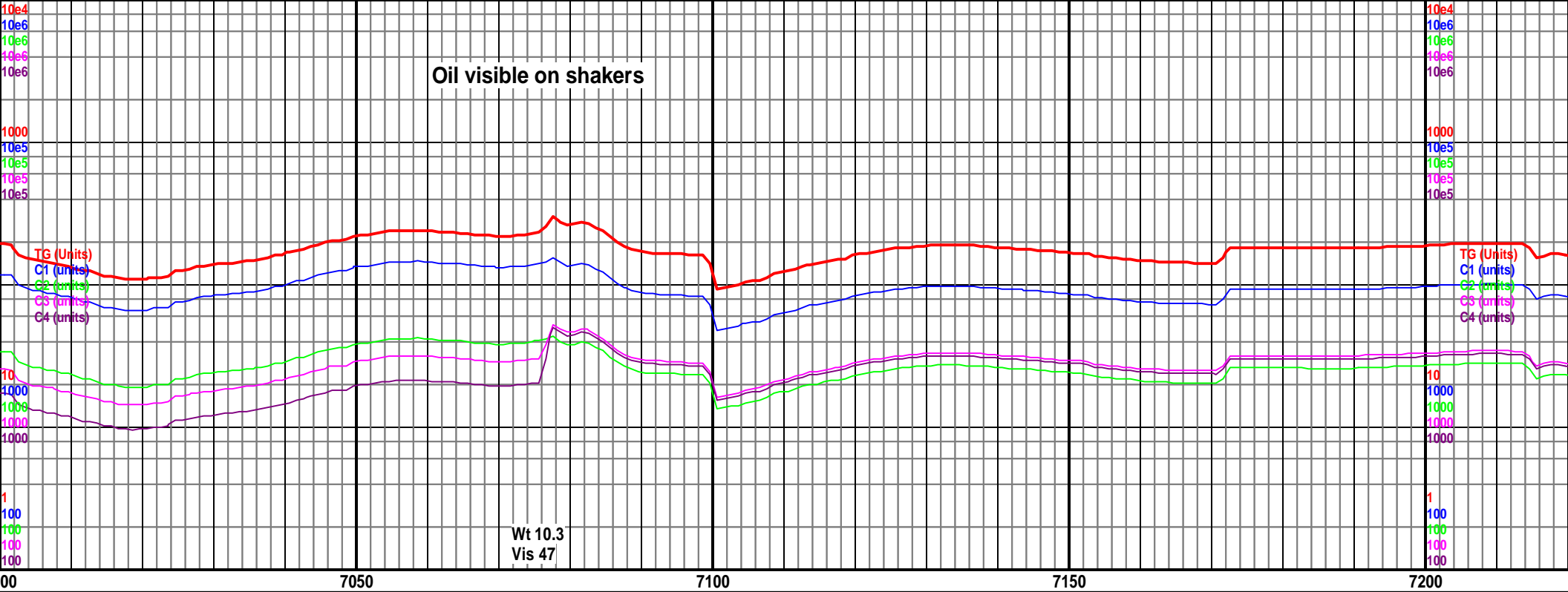
6100-6200 Chk lt gy, mot ip, blk-sb
plty, sft frm, occ Mrlst med-dk gy, sb
blk-sb, slty tex, frm, rr bent, rr inoc,
fst cut, 80% chk, 20% mrlst

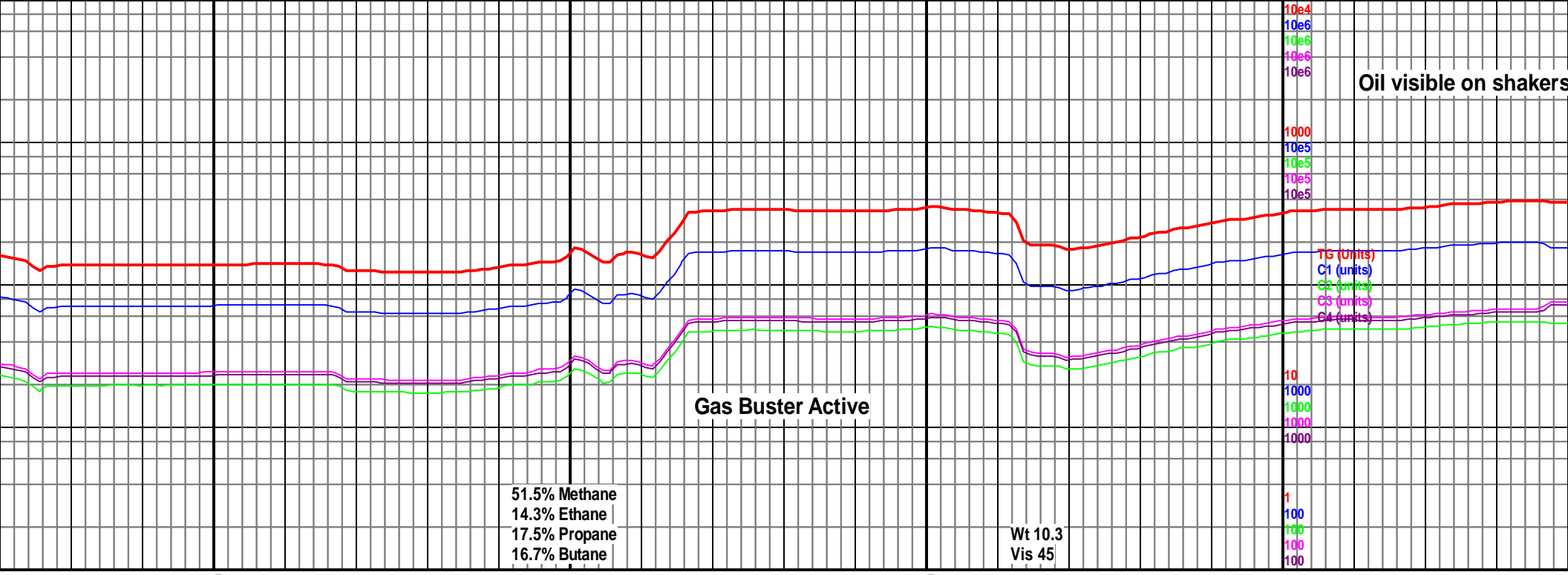
6200-6300 Chk lt gy, mot ip, blk-sb
blk-sb, sft frm, occ Mrlst med-dk gy, sb
blk-sb plty, slty tex, frm, rr inoc, fst
cut, 90% chk, 10% mrlst

6300-6400
blk-sb, sft frm, occ Mrlst med-dk gy, sb
blk-sb plty, slty tex, frm, rr inoc, fst
cut, 90% chk, 10% mrlst









7250

7300

7350

7400

MD 7224 TVD 5642.49
INC 89.82 AZ 2.52
VS 1766.47

MD 7318 TVD 5643.6
INC 88.83 AZ 1.27
VS 1859.87

5000 TVD
Sub Sea (-211)

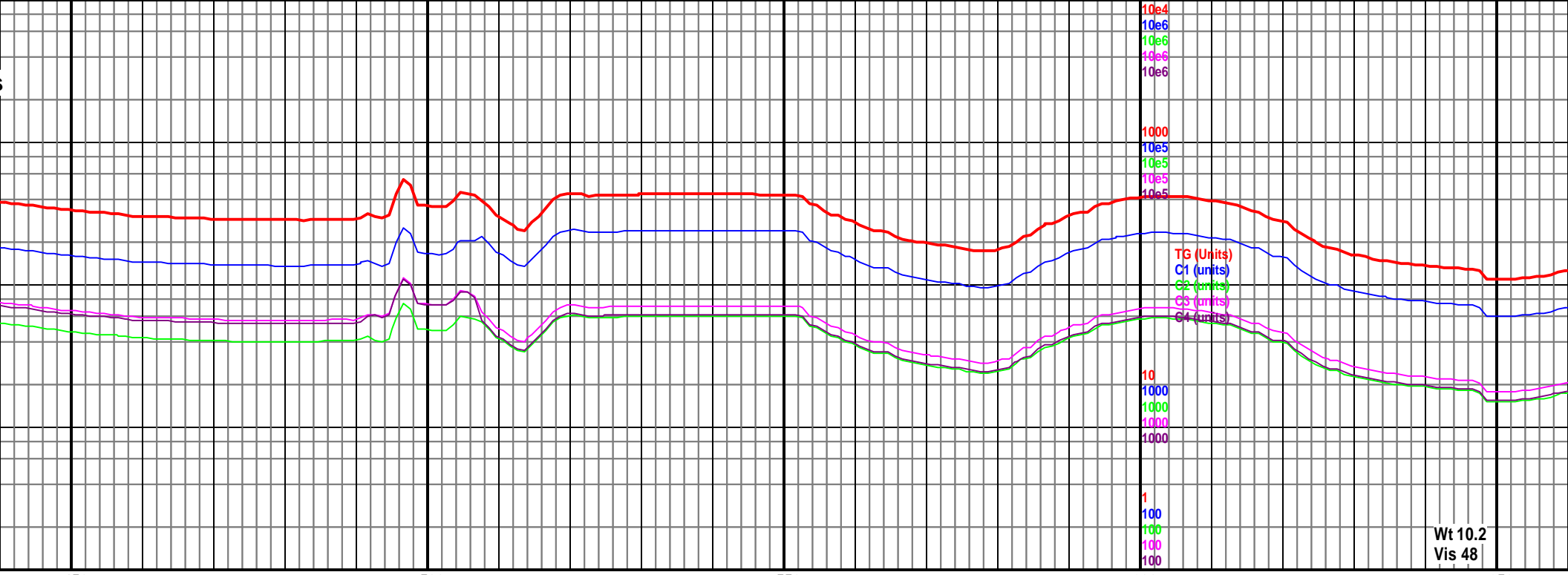
MD 7413 TVD 5645
INC 89.48 AZ 1.82
VS 1954.33

5500
(-711)

7200-7300 Chk lt gy, mot ip, blk-sb
blk, rthy tex, sft-frm, tr Mrlst med-dk
gy, sb blk-sbthy tex, plty, slty tex, frm,
abnt vis oil flor, v fst cut, 90% chk, 10%
mrlst

7300-7400 Chk lt gy, mot ip, blk-sb
blk, rthy tex, sft-frm, tr Mrlst med-dk
gy, sb blk-sb plty, slty tex, frm, v fst
cut, 90% chk, 10% mrlst

7400-7500
blk, rthy
gy, sb blk
cut, 90%



Wt 10.2
Vis 48

7450 7500 7550 7600 7650

MD 7508 TVD 5646.54
INC 88.67 AZ 359.39
VS 2048.93

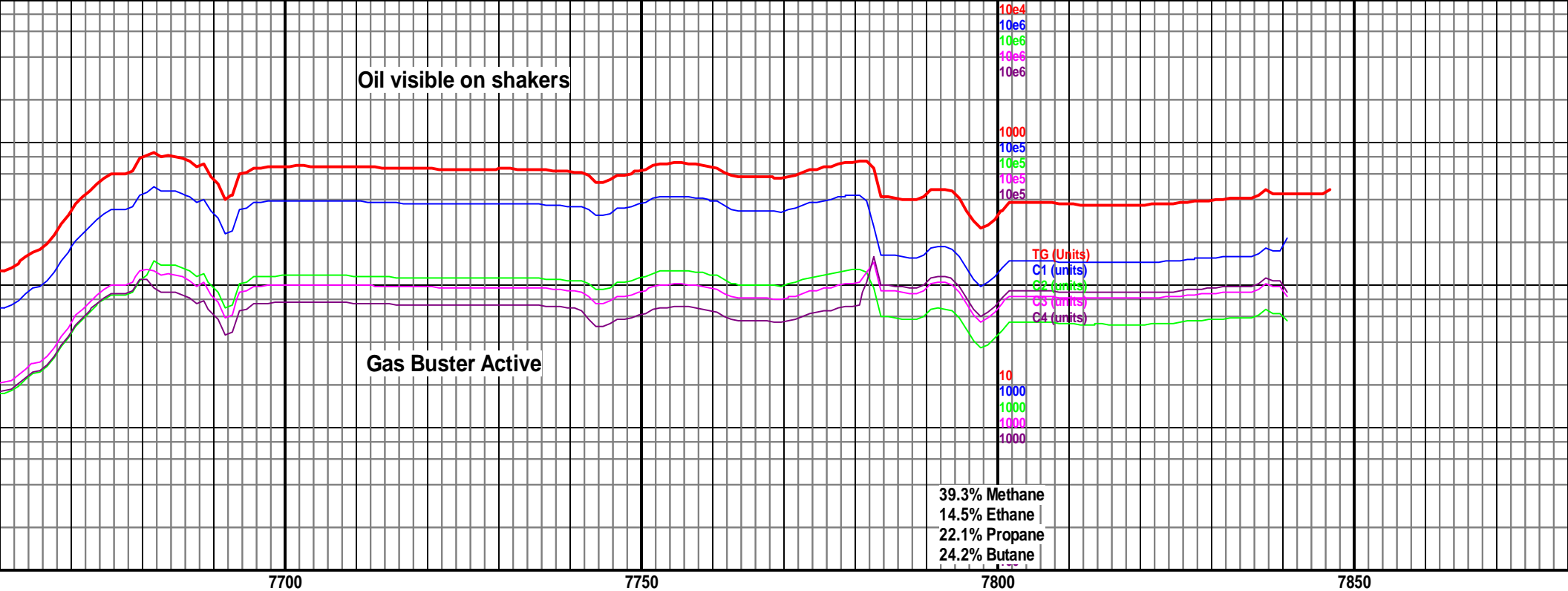
MD 7602 TVD 5647.53
INC 90.12 AZ 359.73
VS 2142.68

5500
(-711)

0 Chk lt gy, mot ip, blk-sb
tex, sft-frn, tr Mrlst med-dk
y-sb plty, slty tex, frm, v fst
chk, 10% mrlst

7500-7600 Chk lt gy, mot ip, blk-sb
blk, rthy tex, sft-frn, tr Mrlst med-dk
gy, sb blk-sb plty, slty tex, frm, v fst
cut, 80% chk, 20% mrlst

7600-7700 Chk lt gy, mot ip, blk-sb
blk, rthy tex, sft-frn, tr Mrlst med-dk
gy, sb blk-sb plty, slty tex, frm, v fst
cut, 80% chk, 20% mrlst



MD 7697 TVD 5647.74
INC 89.63 AZ 359.33
VS 2237.44

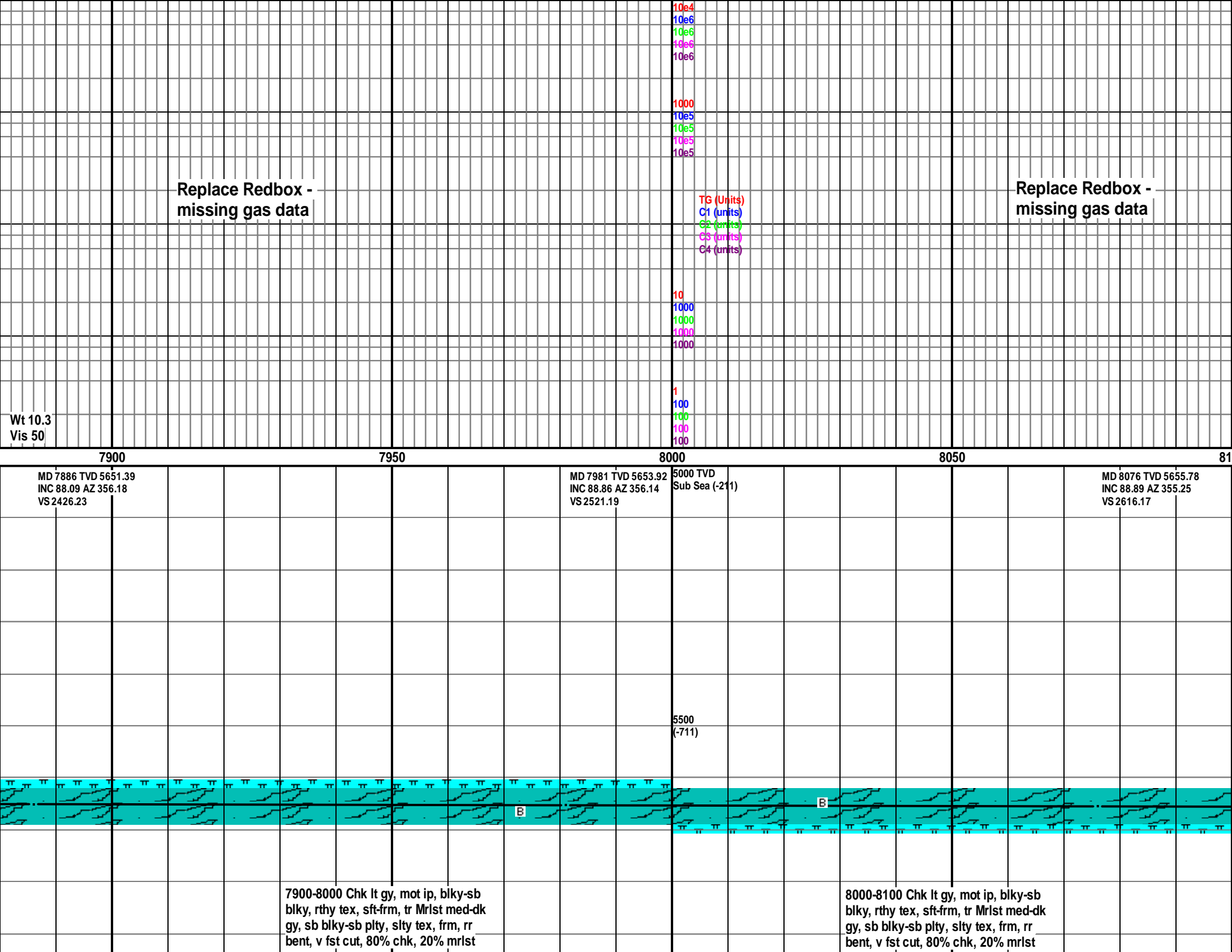
MD 7792 TVD 5648.94
INC 88.92 AZ 357.63
VS 2332.3

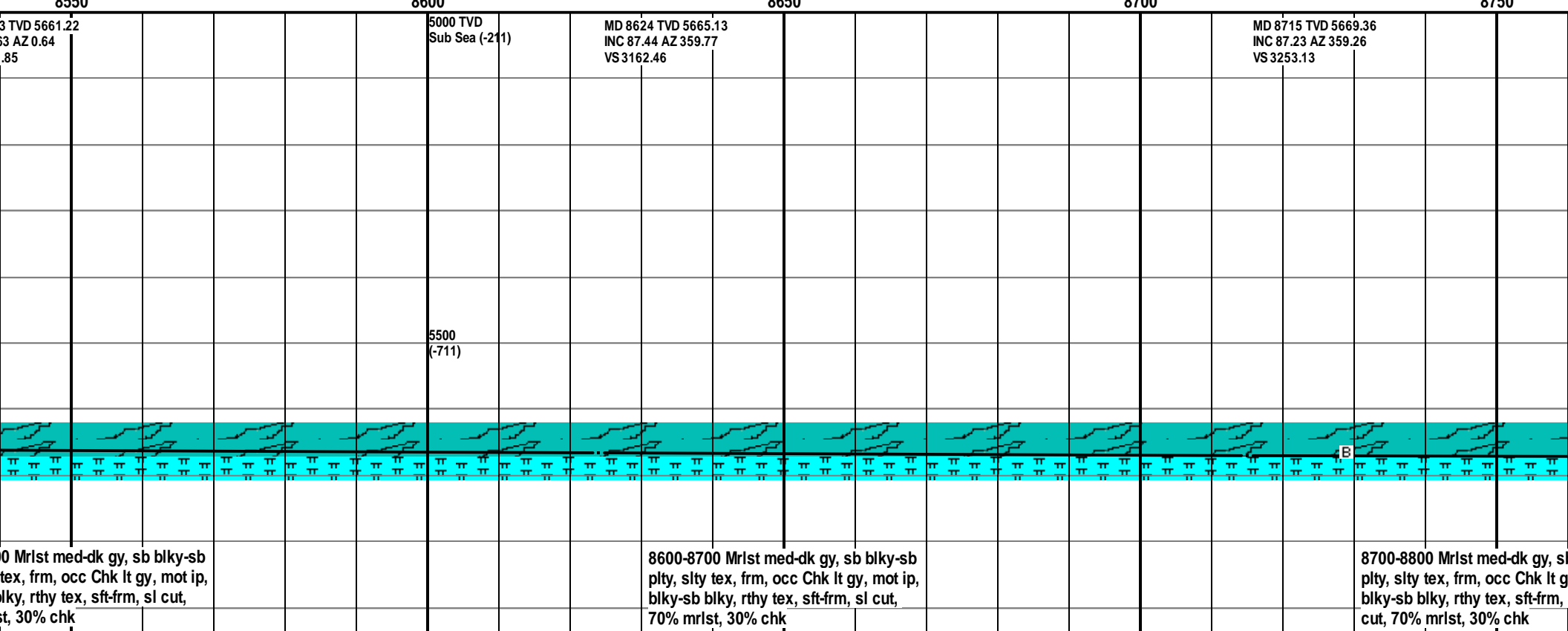
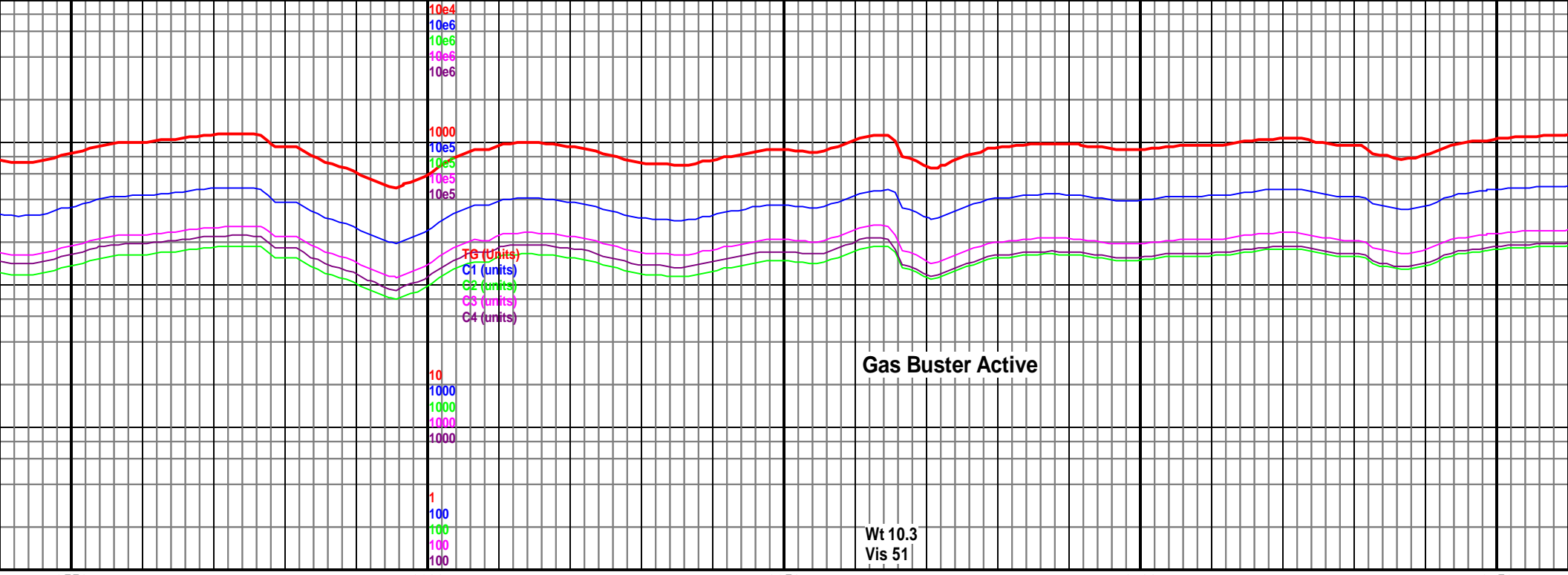
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(-711)

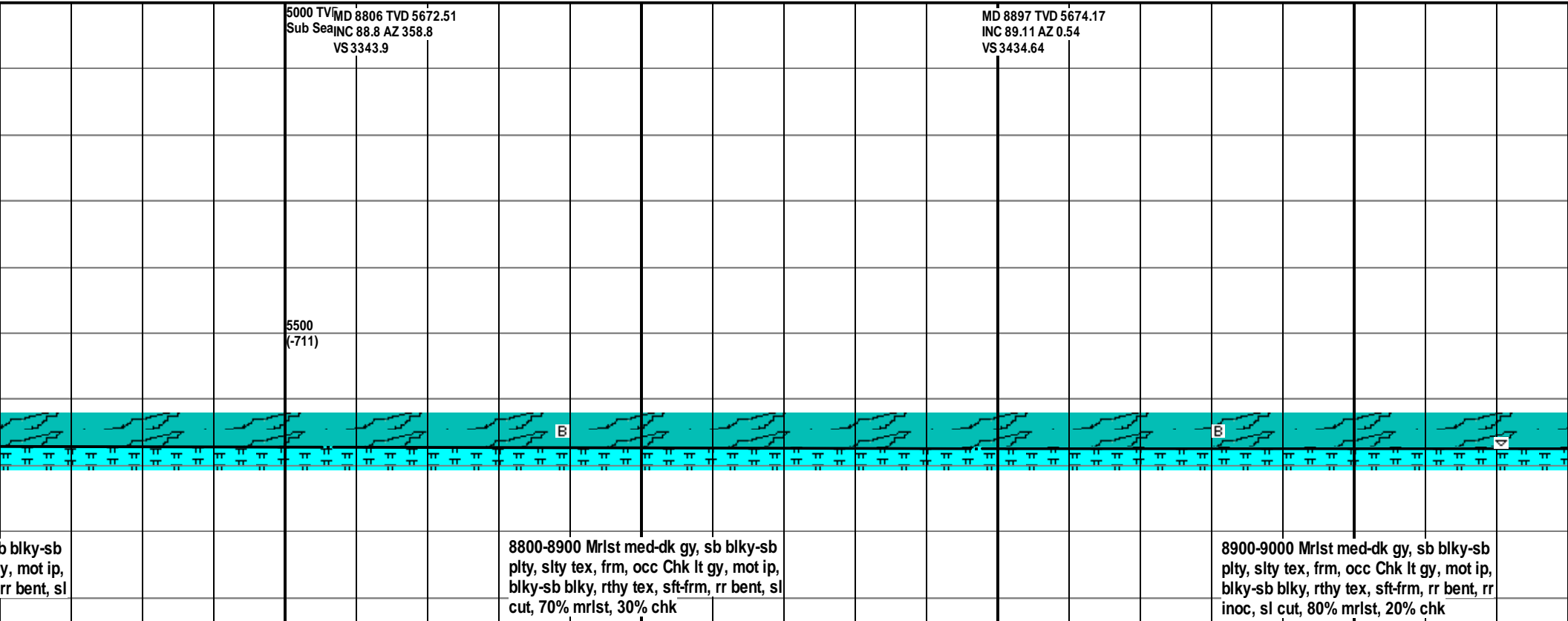
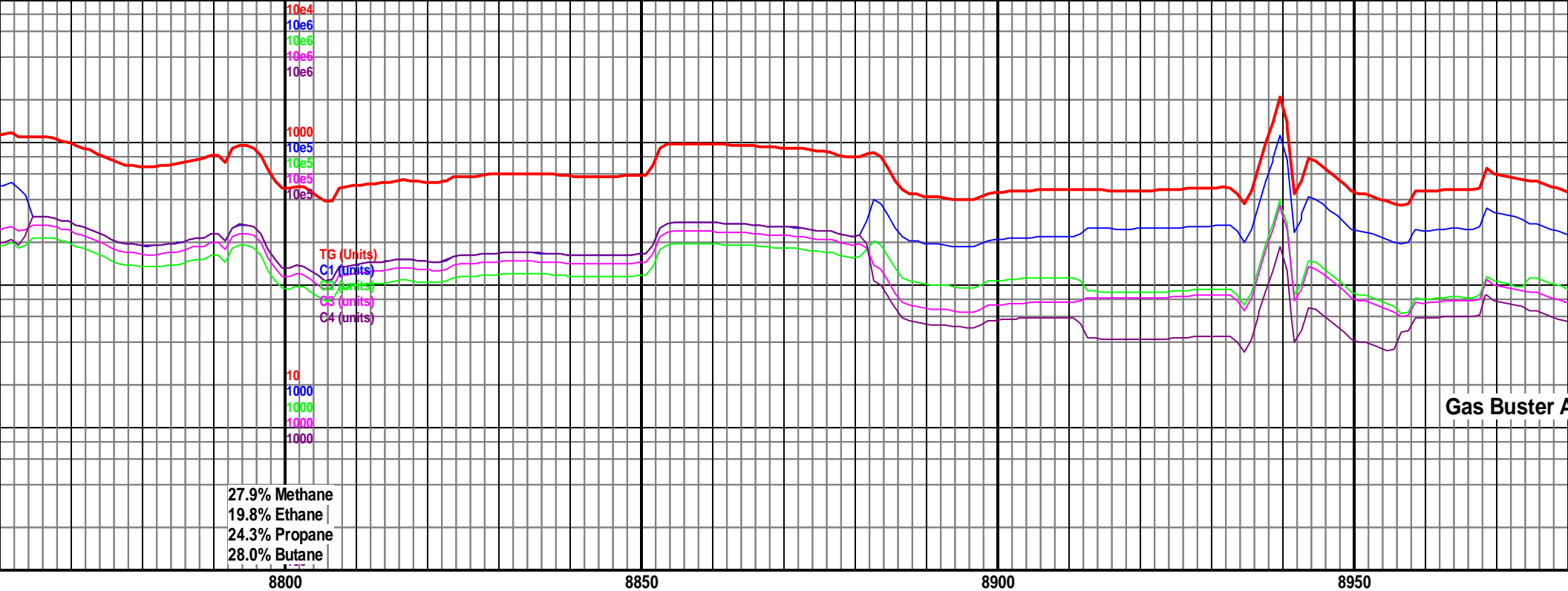
blky-sb
med-dk
m, v fst

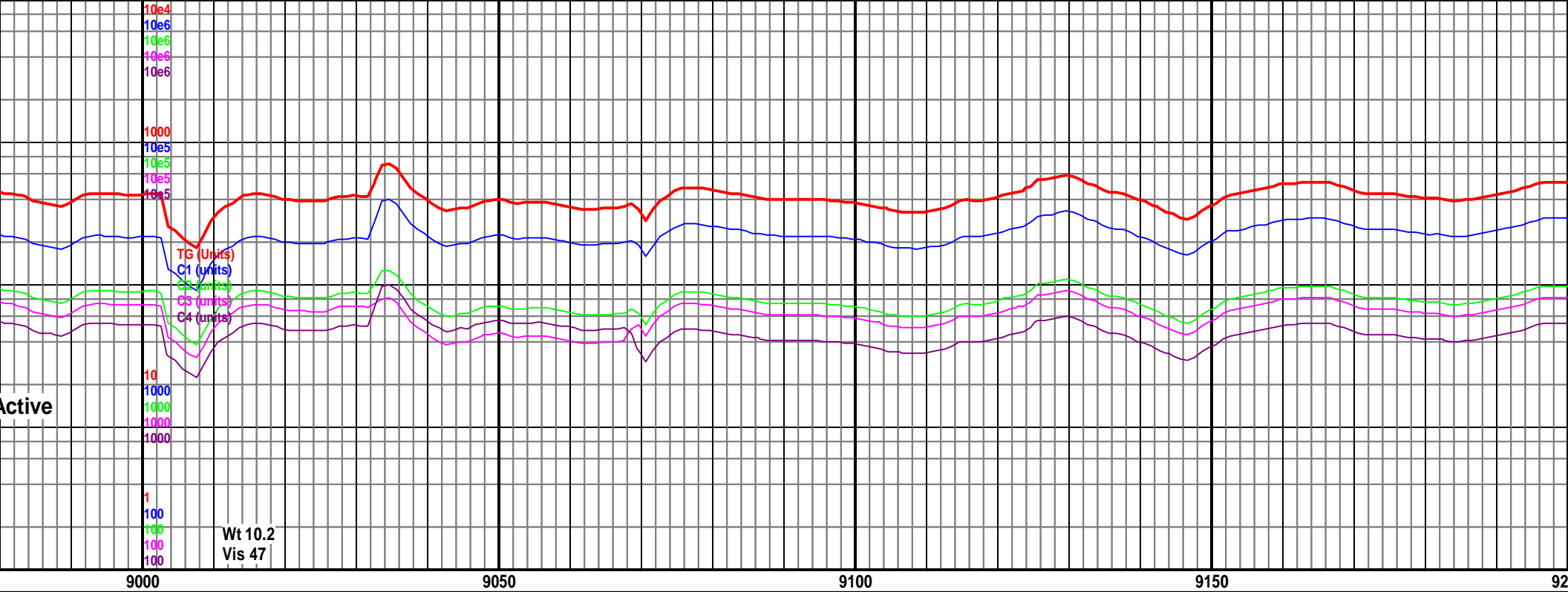
7700-7800 Chk lt gy, mot ip, blky-sb
blky, rthy tex, sft frm, tr Mrlst med-dk
gy, sb blky-sb plty, slty tex, frm, v fst
cut, 80% chk, 20% mrlst

7800-7900 Chk lt gy, mot ip, blky-sb
blky, rthy tex, sft frm, occ Mrlst med-dk
gy, sb blky-sb plty, slty tex, frm, v fst
cut, 70% chk, 30% mrlst









MD 8988 TVD 5674.7VD
INC 90.22 AZ 1.91 Sea (-211)
VS 3525.17

MD 9080 TVD 5673.36
INC 91.45 AZ 1.71
VS 3616.6

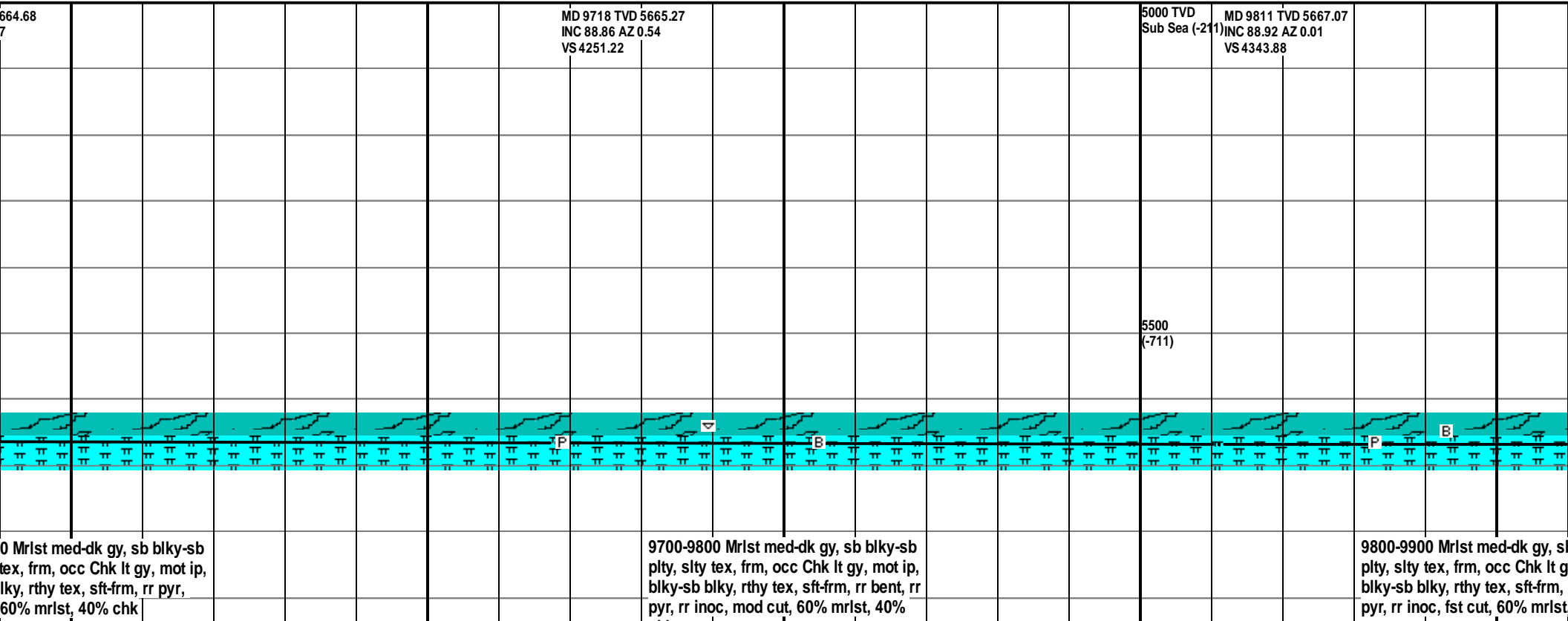
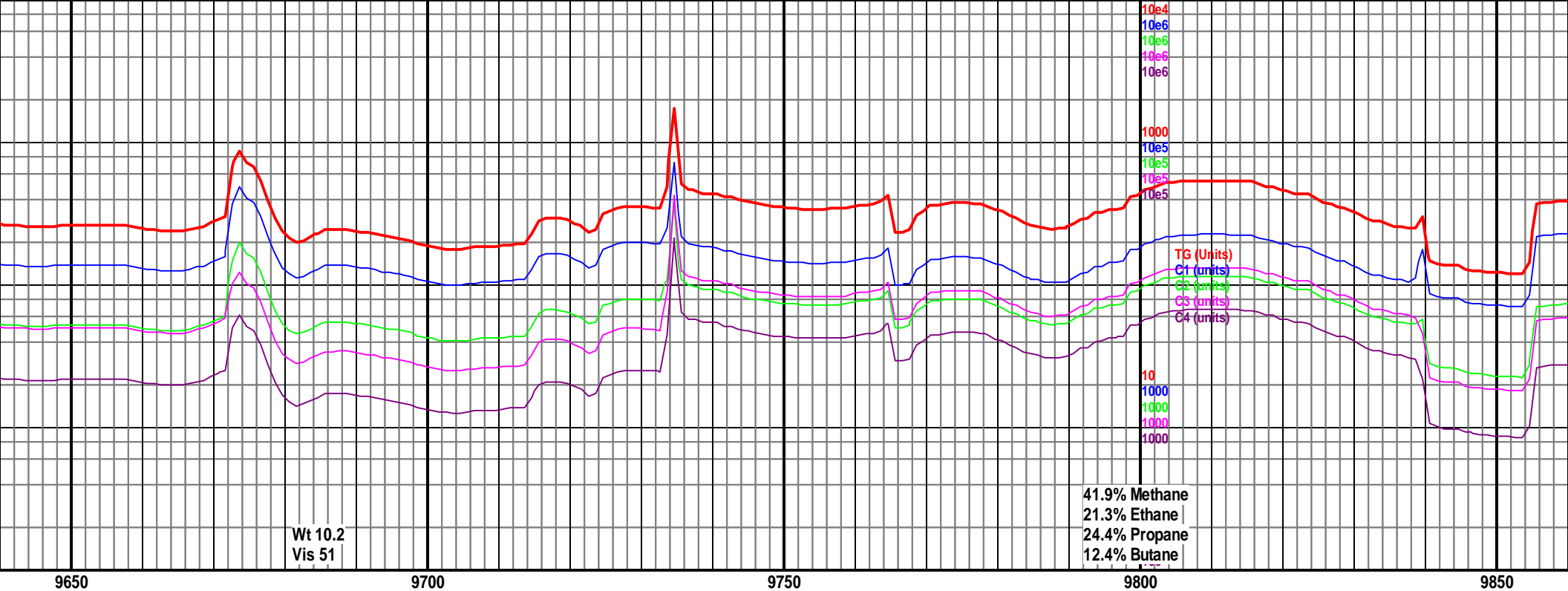
MD 9171 TVD 5671.26
INC 91.2 AZ 0.97
VS 3707.1

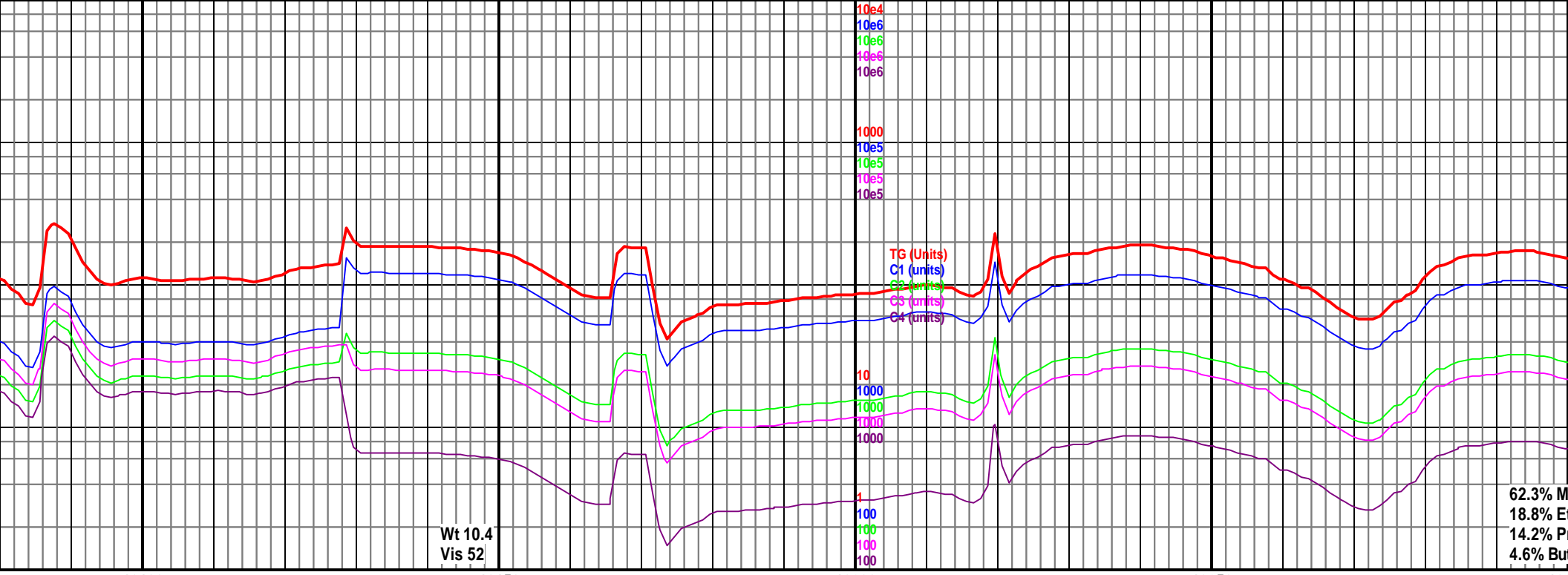
5500
(-711)

9000-9100 Mrlst med-dk gy, sb blk-y-sb
plty, slty tex, frm, occ Chk lt gy, mot ip,
blk-y-sb blk-y, rthy tex, sft-frm, rr bent, sl
cut, 80% mrlst, 20% chk

9100-9200 Mrlst med-dk gy, sb blk-y-sb
plty, slty tex, frm, occ Chk lt gy, mot ip,
blk-y-sb blk-y, rthy tex, sft-frm, rr bent, rr
inoc, sl cut, 90% mrlst, 10% chk

9600-970
ply, slty t
blky-sb b
mod cut,





MD 10085 TVD 5674.17
INC 88.4 AZ 359.06
VS 4617.08

MD 10176 TVD 5676.59
INC 88.55 AZ 358.88
VS 4707.88

5000 TVD
Sub Sea (-211)

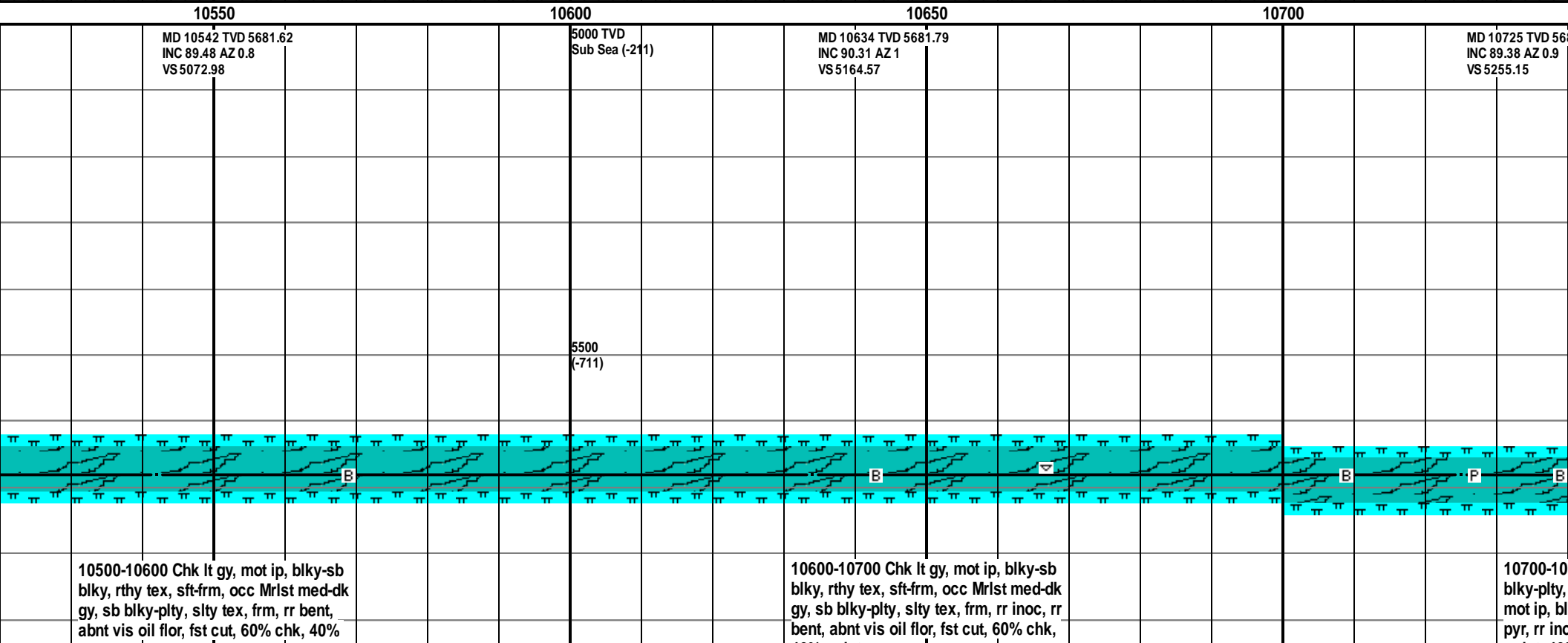
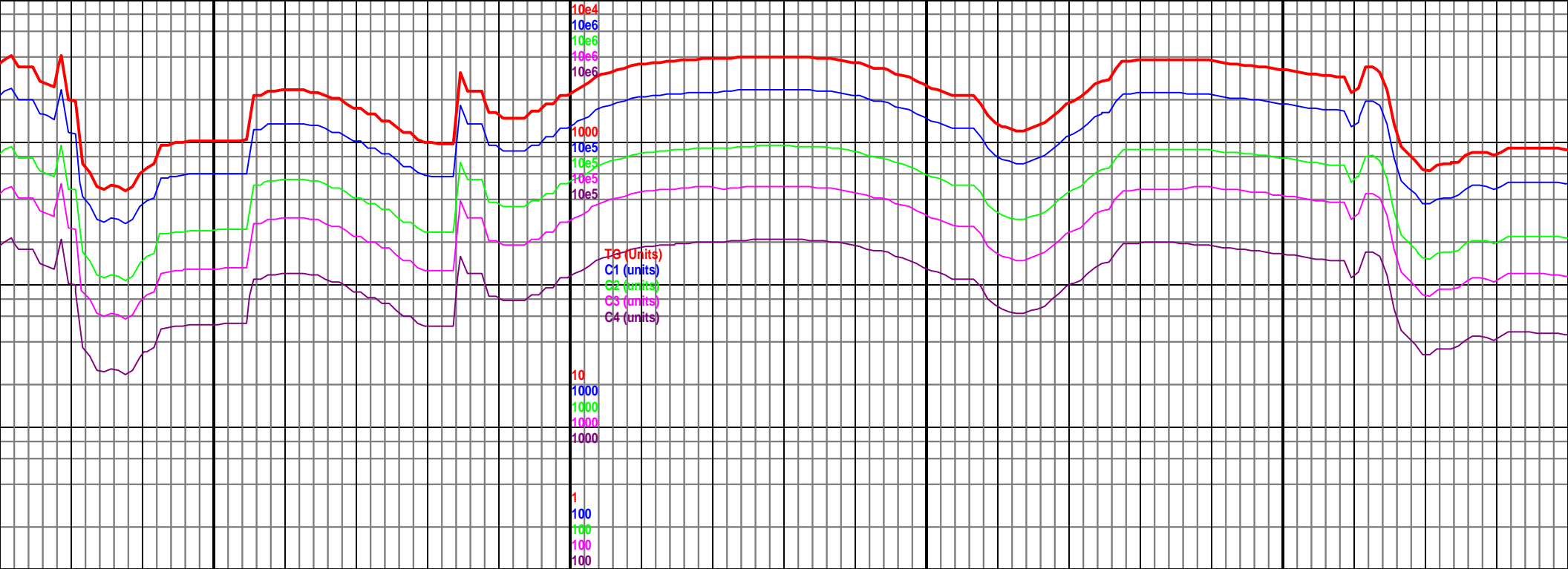
MD 10268 TVD 5678.64
INC 88.89 AZ 358.06
VS 4799.73

5500
(-711)

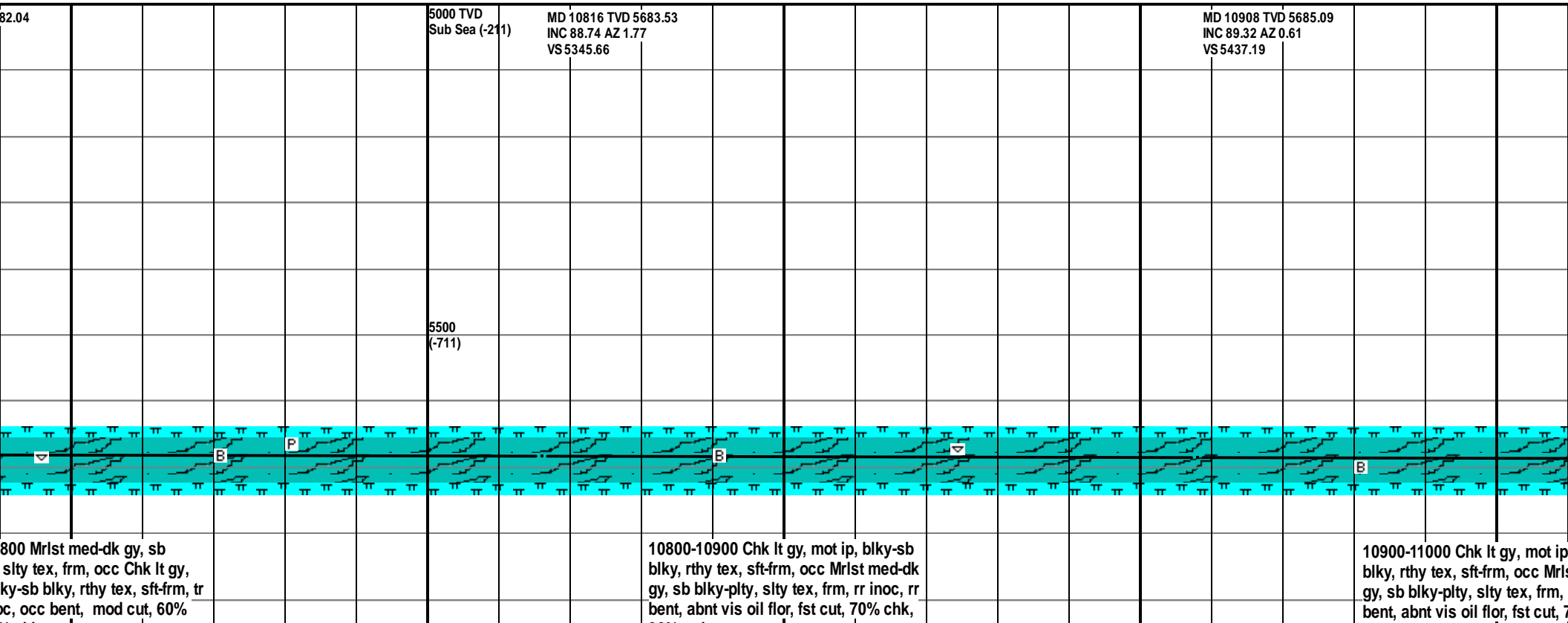
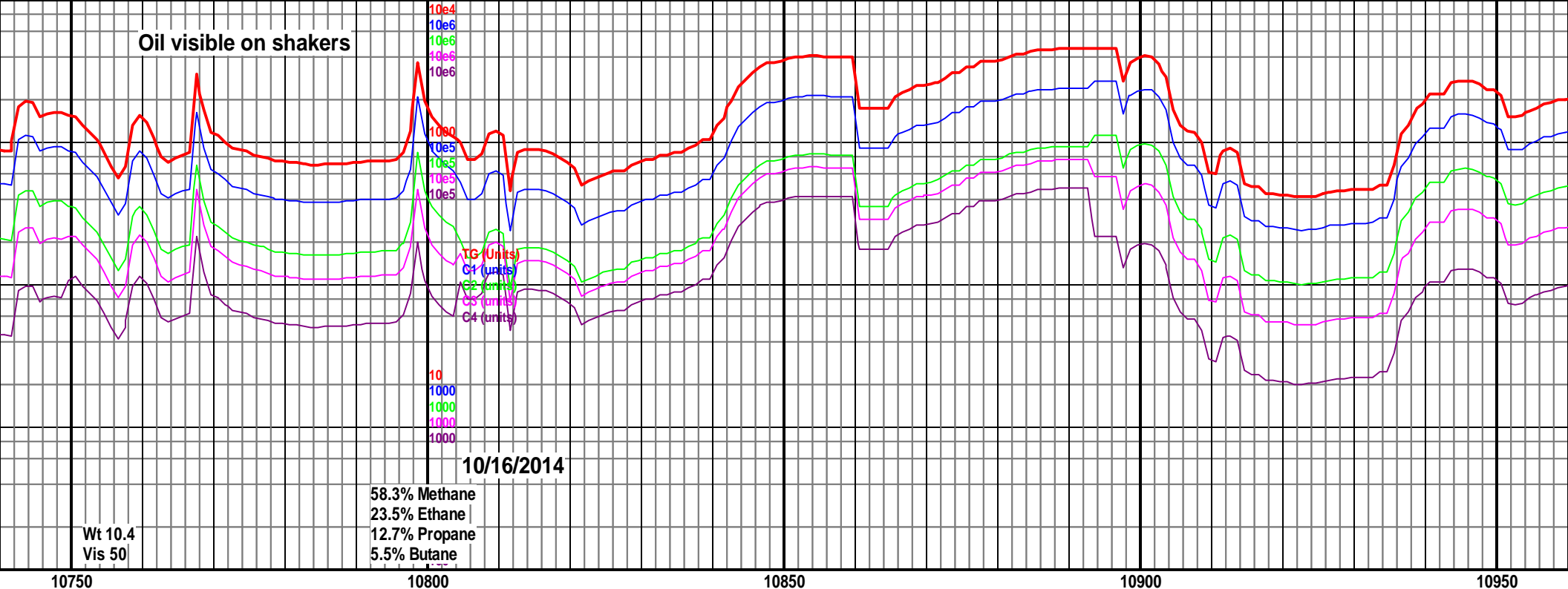


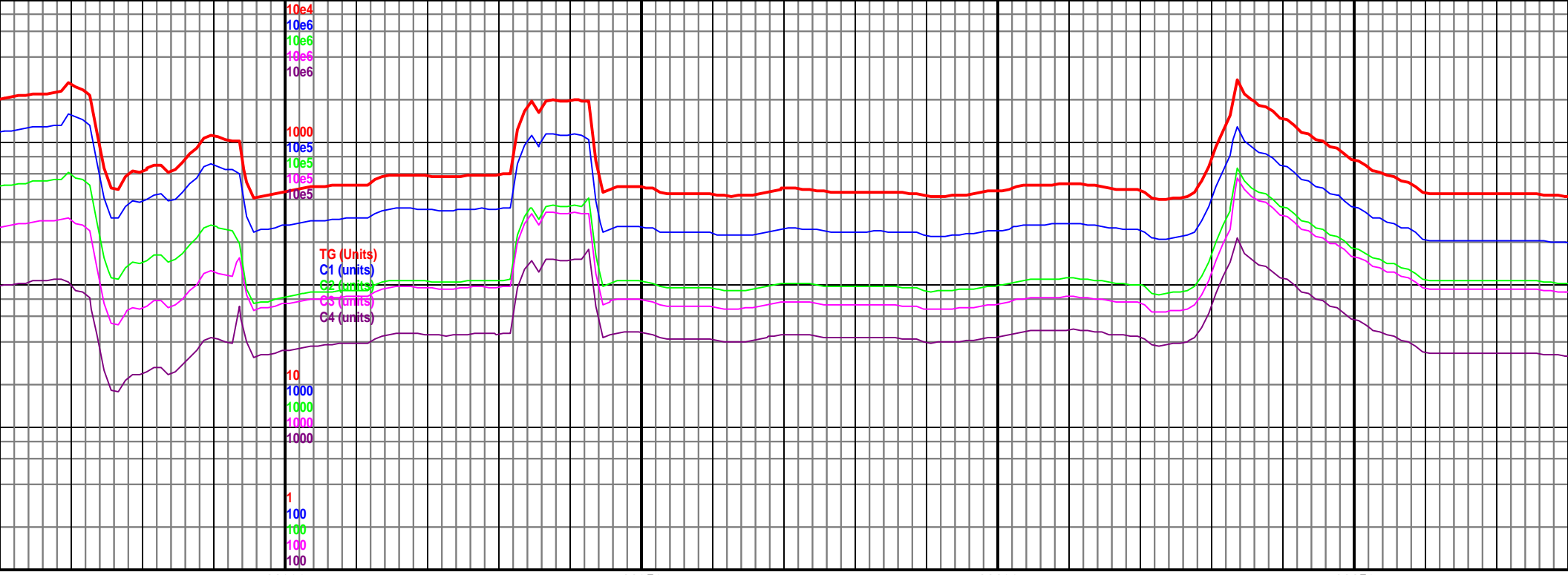
10100-10200 Mrlst med-dk gy, sb
blky-plty, slty tex, frm, occ Chk lt gy,
mot ip, blky-sb blky, rthy tex, sft-frm, rr
bent, sl cut, 90% mrlst, 10% chk

10200-10300 Mrlst med-dk gy, sb
blky-plty, slty tex, frm, occ Chk lt gy,
mot ip, blky-sb blky, rthy tex, sft-frm, rr
bent, fst cut, 80% mrlst, 20% chk



Oil visible on shakers





11000

11050

11100

11150

MD 11000 TVD 5687.67
INC 87.47 AZ 0.89
VS 5528.76

MD 11091 TVD 5691.75
INC 87.38 AZ 359.4
VS 5619.36

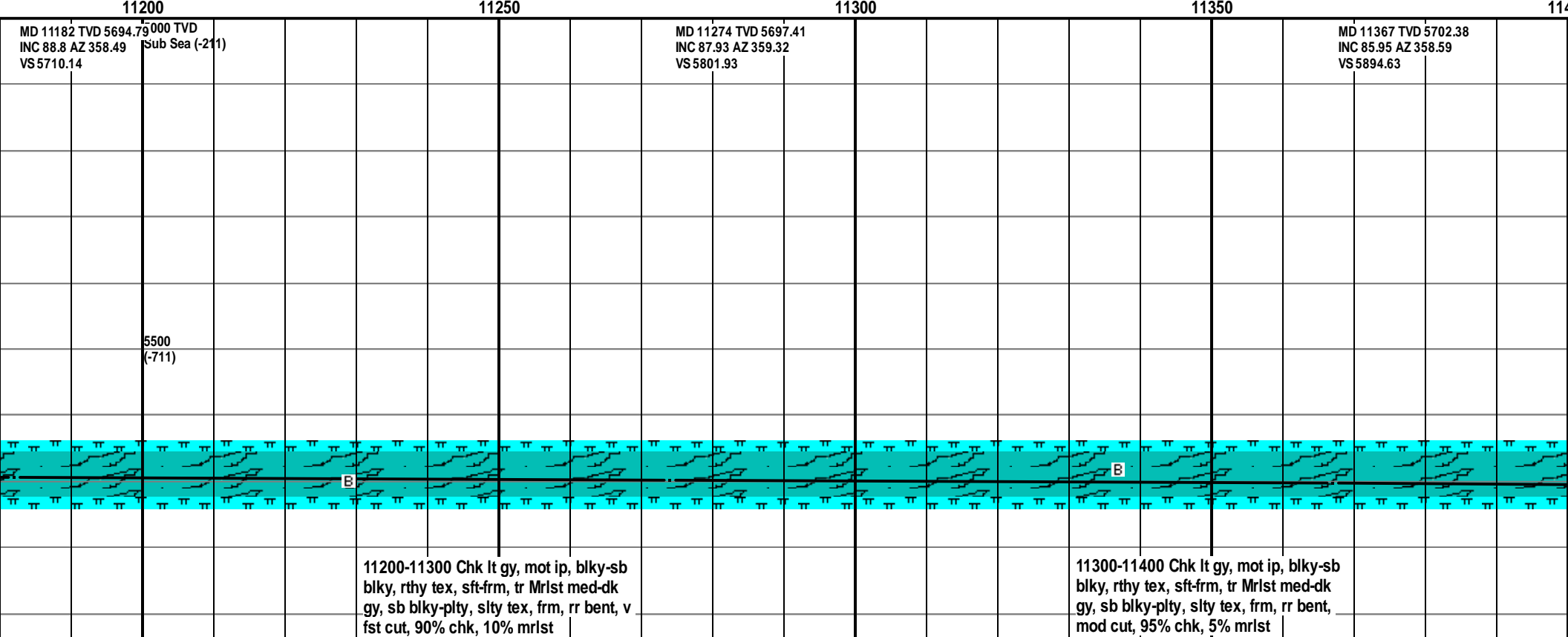
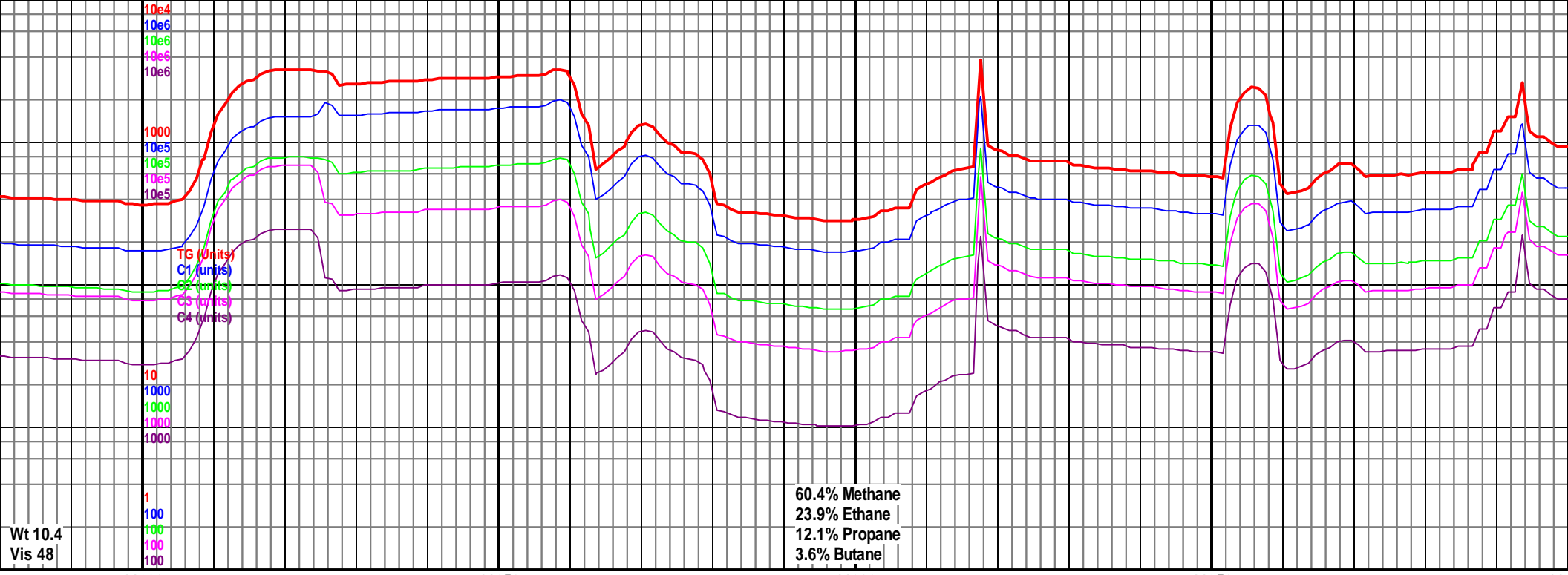
5500
(-711)

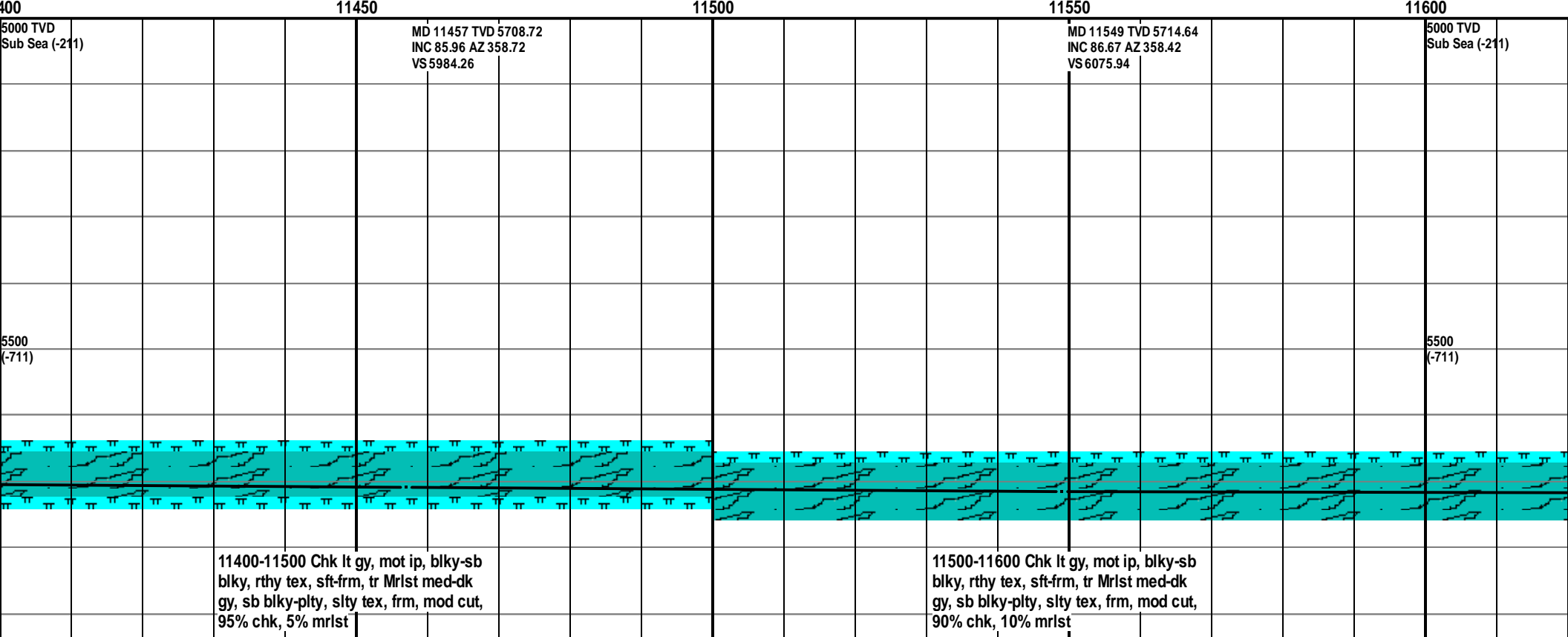
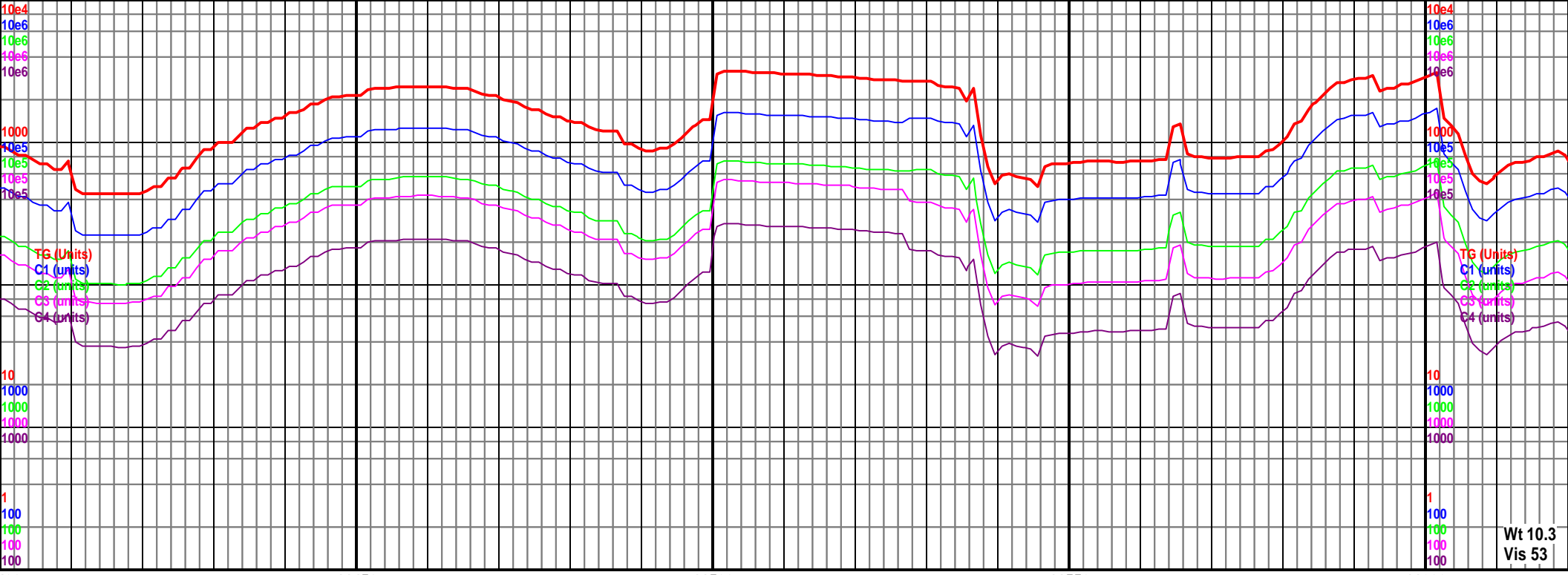


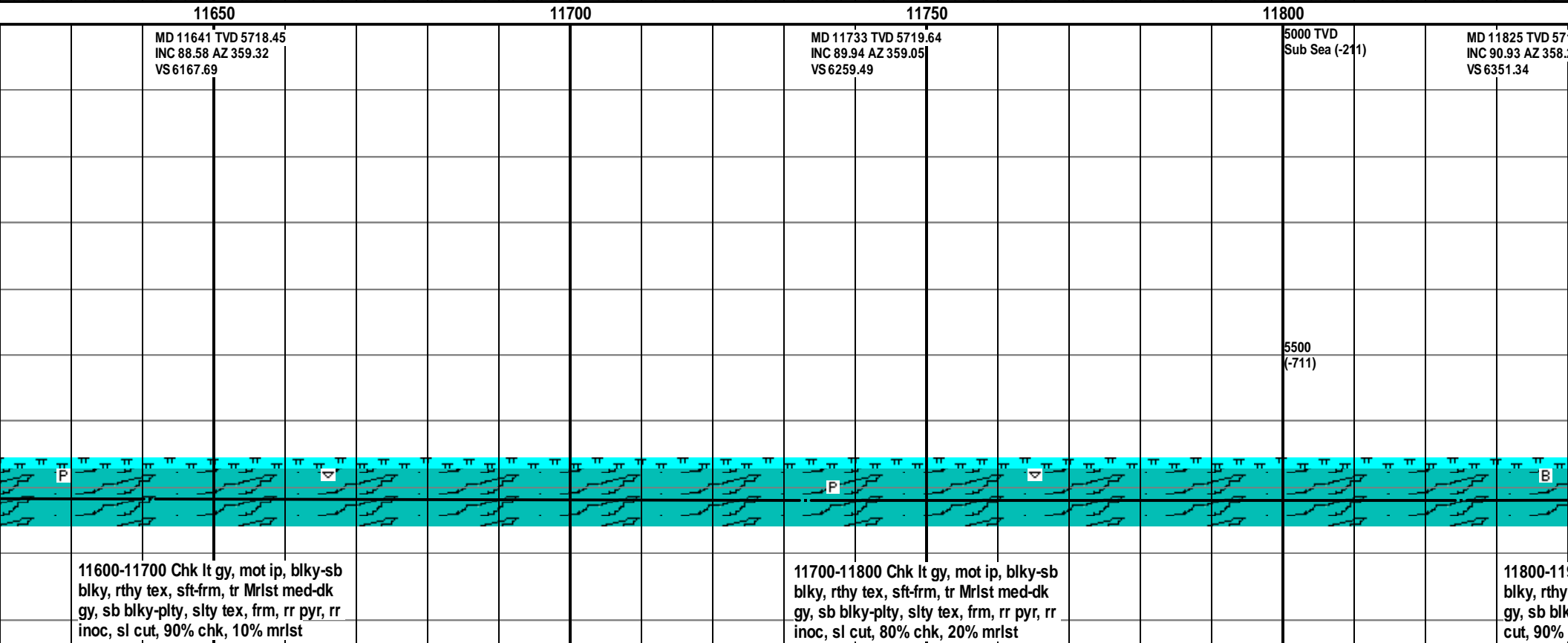
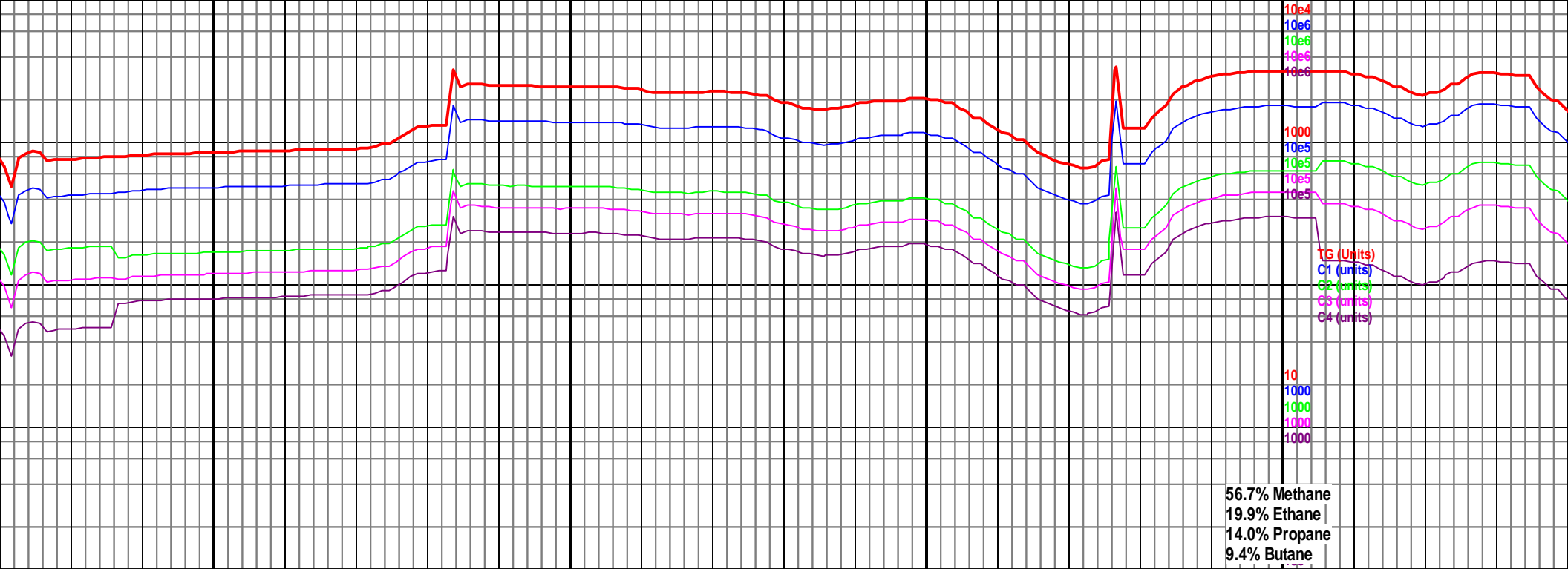
, blkly-sb
st med-dk
rr inoc, rr
70% chk,

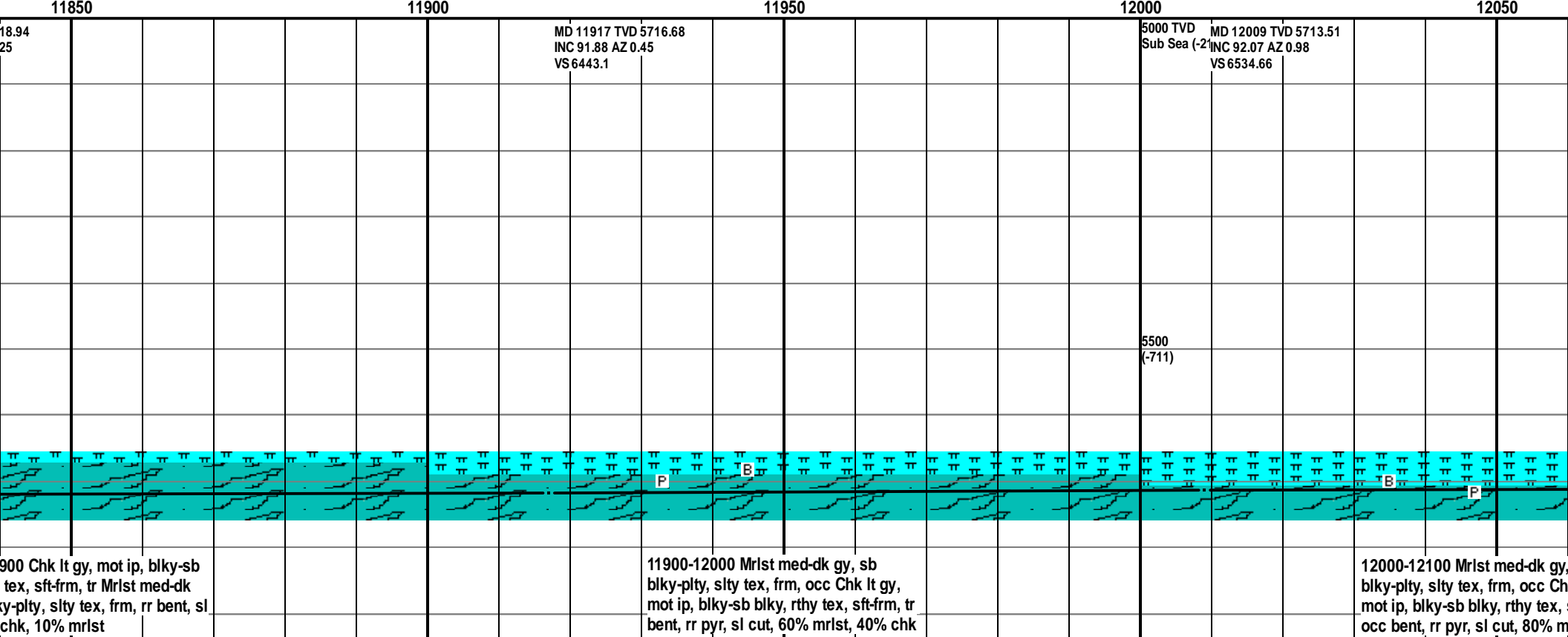
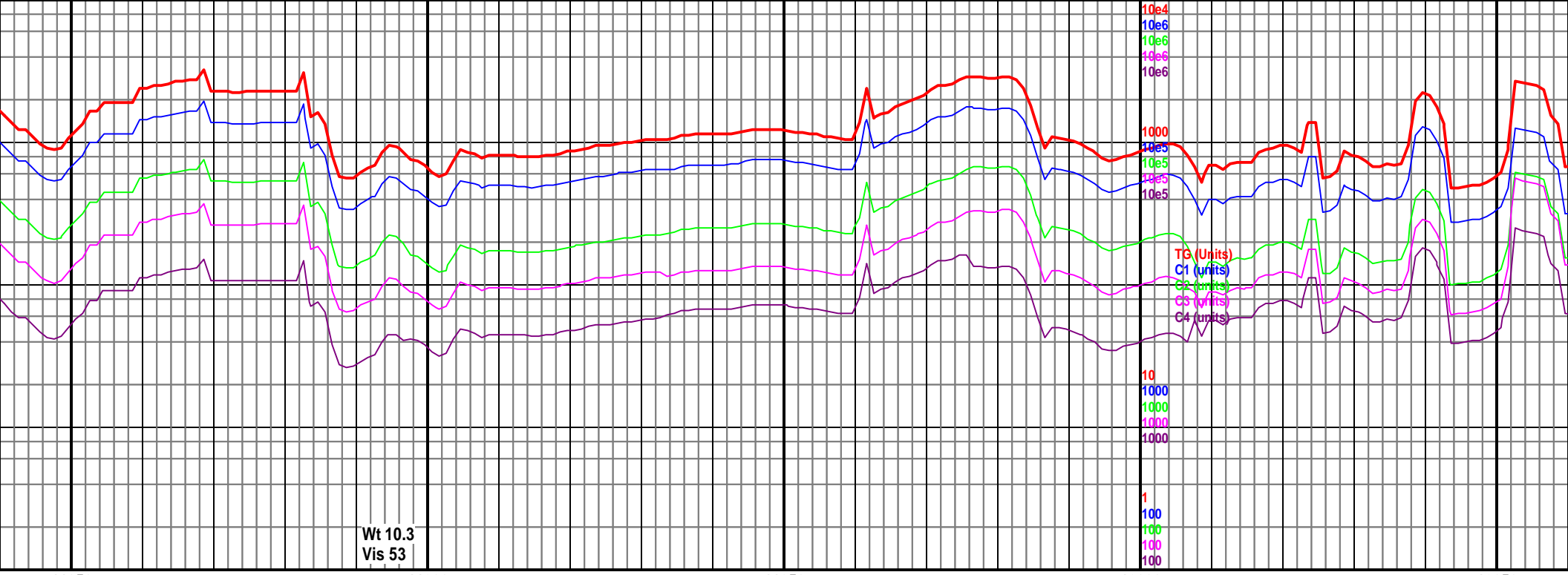
11000-11100 Chk lt gy, mot ip, blkly-sb
blkly, rthy tex, sft frm, occ Mrlst med-dk
gy, sb blkly-pty, slty tex, frm, rr bent,
occ vis oil flor, fst cut, 60% chk, 40%

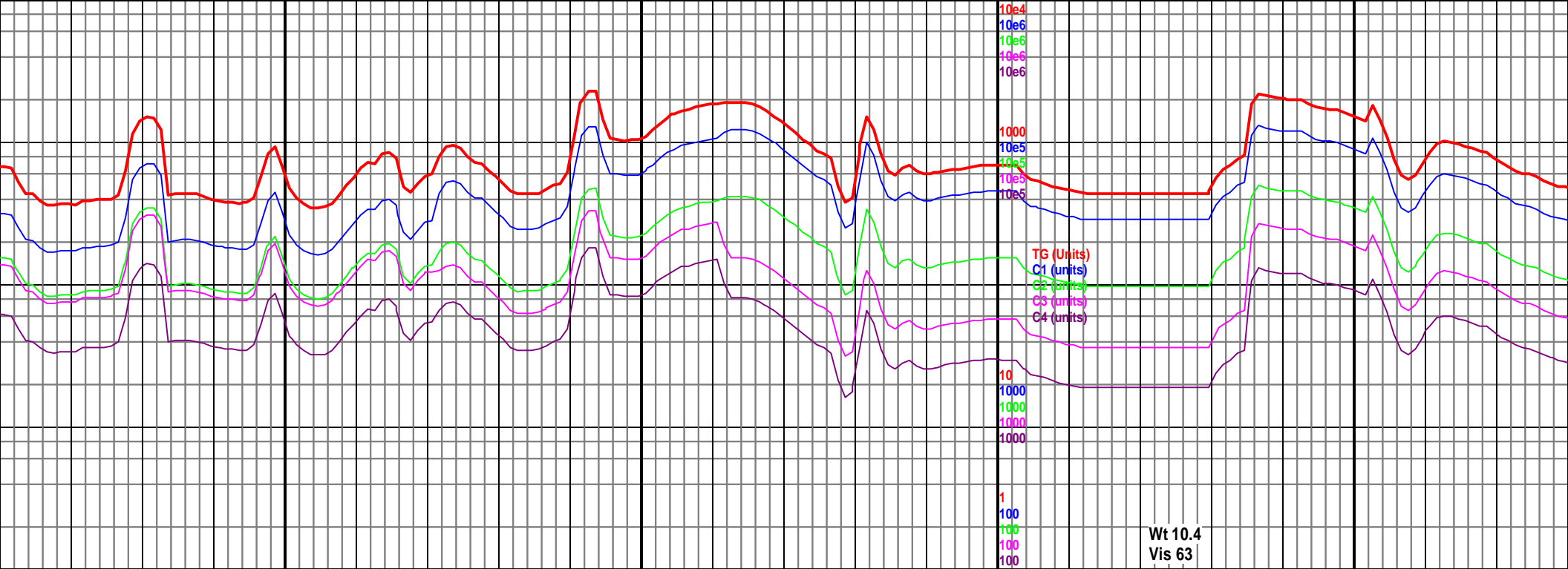
11100-11200 Chk lt gy, mot ip, blkly-sb
blkly, rthy tex, sft frm, tr Mrlst med-dk
gy, sb blkly-pty, slty tex, frm, rr pyr, rr
bent, occ vis oil flor, v fst cut, 90% chk,











12100

12150

12200

12250

MD 12100 TVD 5710.42
INC 91.82 AZ 2.34
VS 6625.07

MD 12193 TVD 5710.08
INC 88.61 AZ 0.88-271)
VS 6717.52

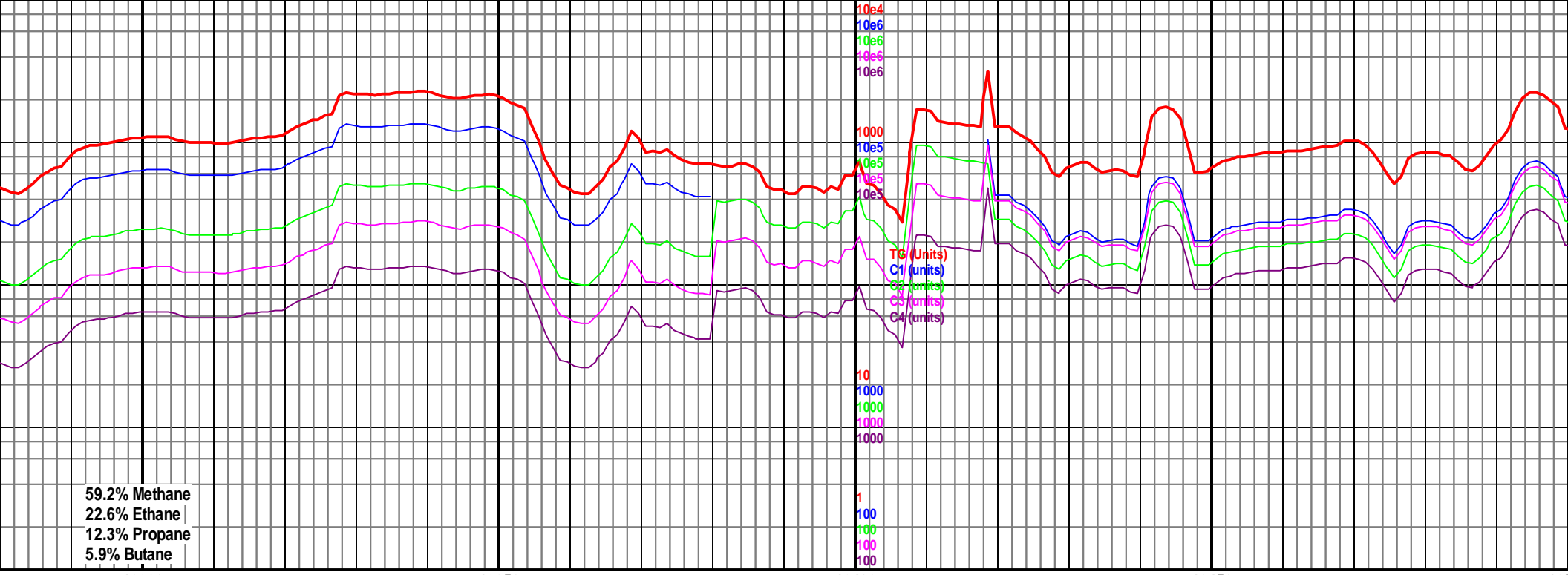
5500
(-711)



sb
k lt gy,
sft frm,
mlst, 20%

12100-12200 Mrlst med-dk gy, sb
blky-pty, slty tex, frm, occ Chk lt gy,
mot ip, blky-sb blky, rthy tex, sft frm, tr
bent, rr pyr, rr inoc, sl cut, 80% mrlst,

12200-12300 Mrlst med-dk gy, sb
blky-pty, slty tex, frm, occ Chk lt gy,
mot ip, blky-sb blky, rthy tex, sft frm, rr
bent, rr pyr, rr inoc, fst cut, 70% mrlst,



59.2% Methane
22.6% Ethane
12.3% Propane
5.9% Butane

MD 12283 TVD 5712.04
INC 88.89 AZ 0.45
VS 6807.13

MD 12376 TVD 5712.96
INC 89.97 AZ 0.84
VS 6899.75

5000 TVD
Sub Sea (-211)

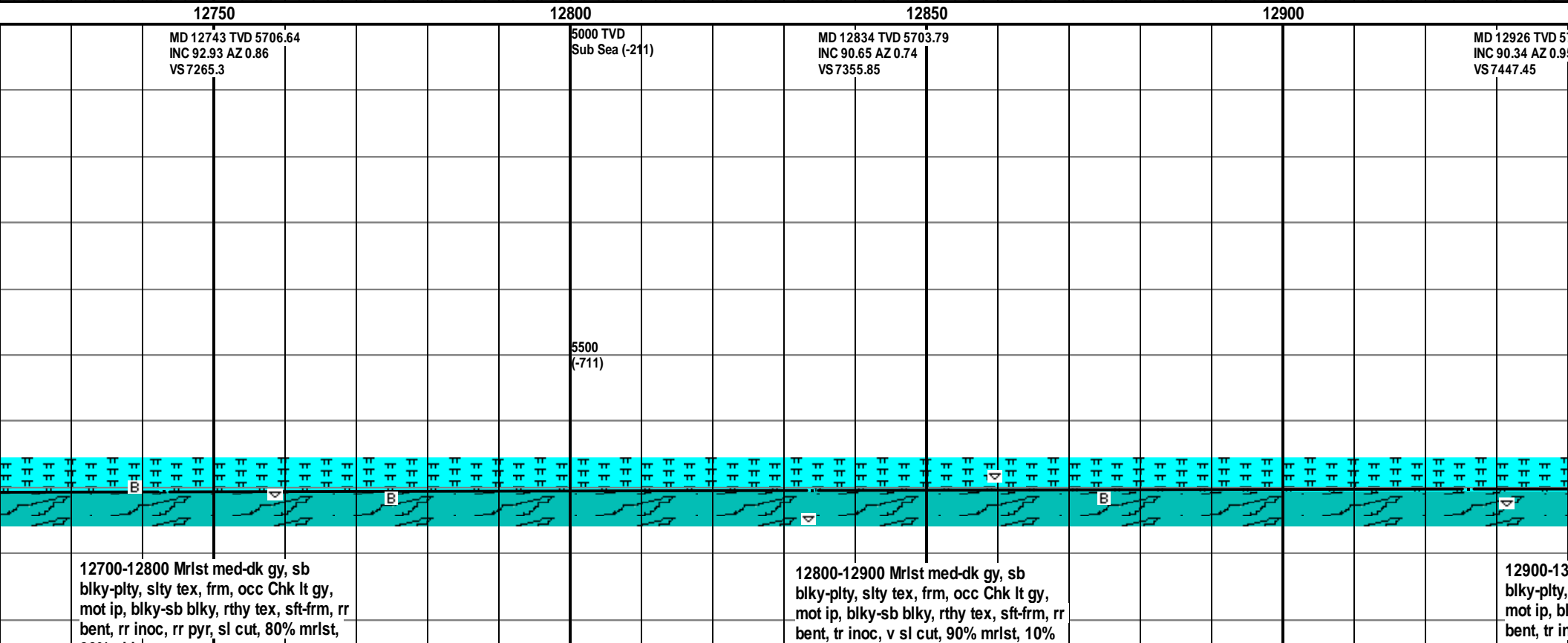
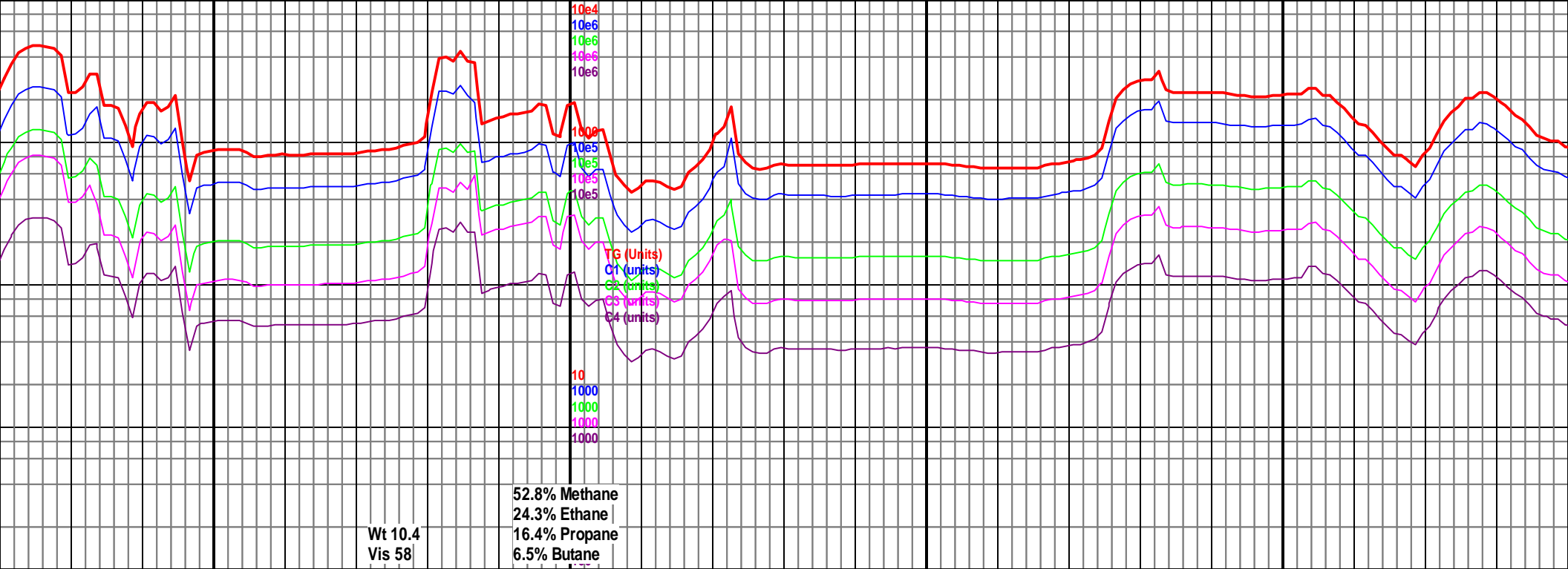
MD 12468 TVD 5712.47
INC 90.65 AZ 0.31
VS 6991.38

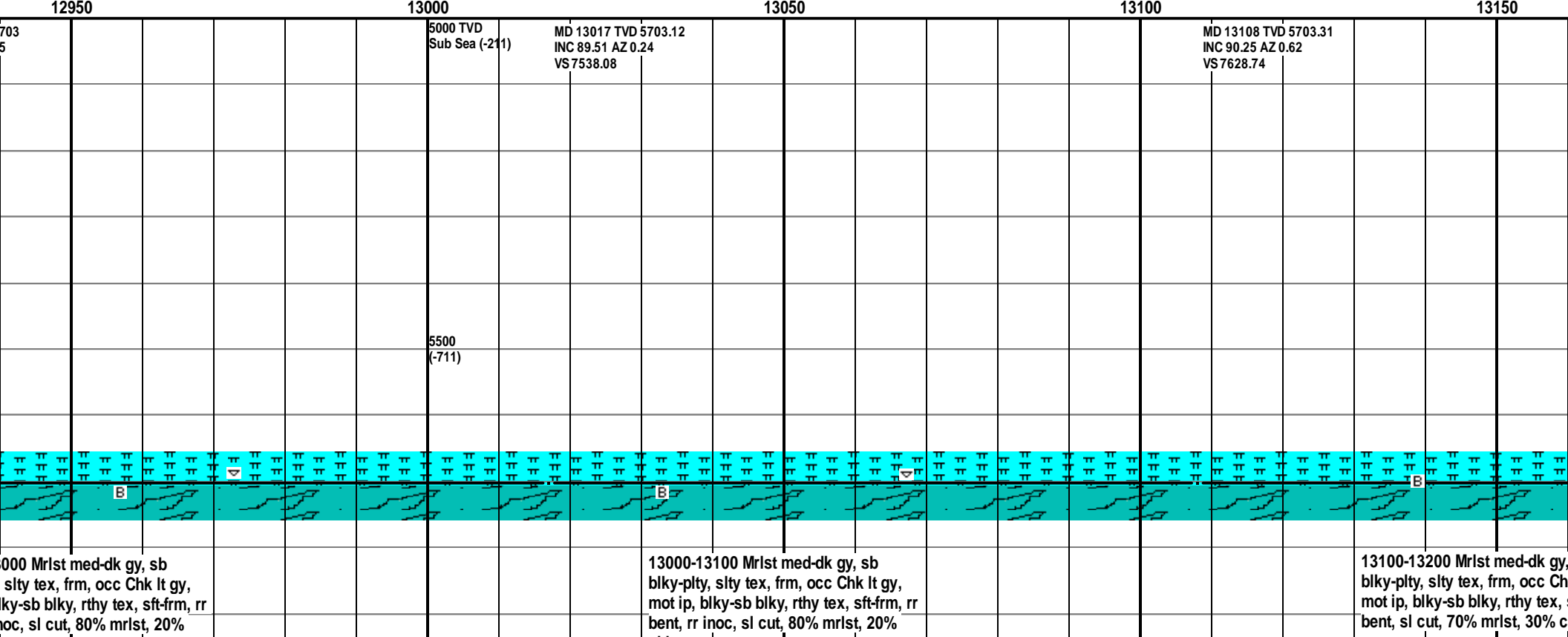
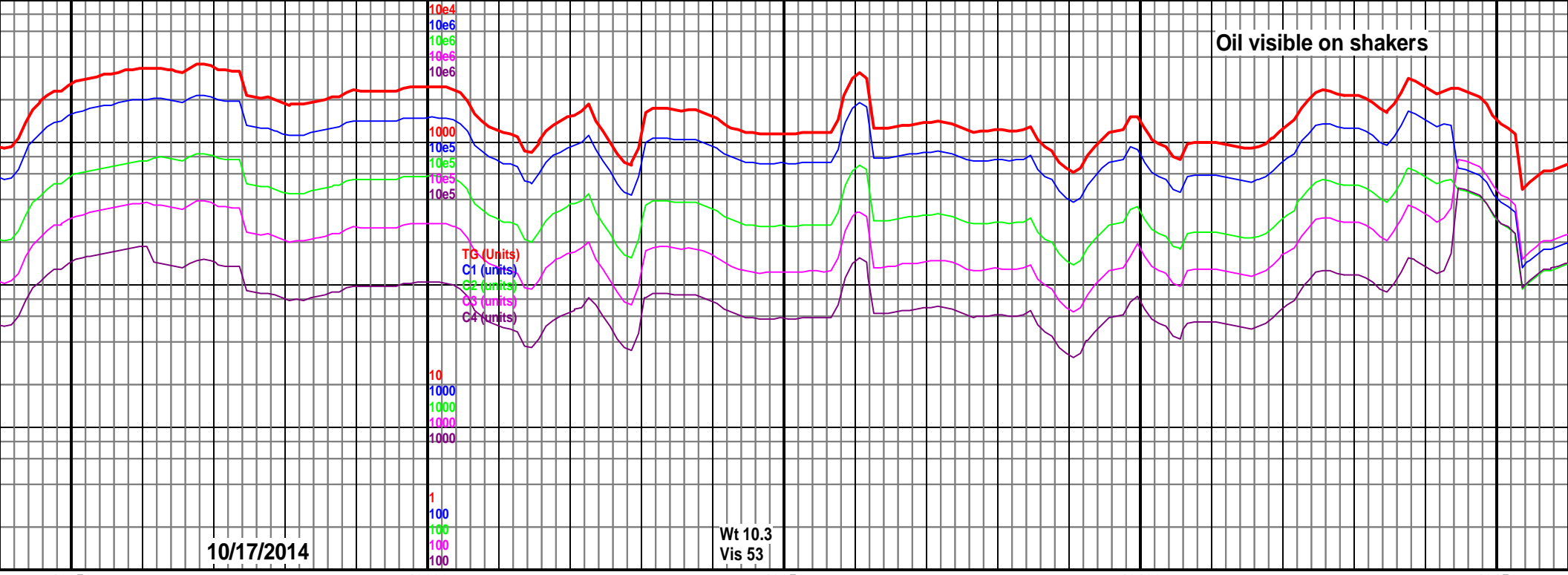
5500
(-711)

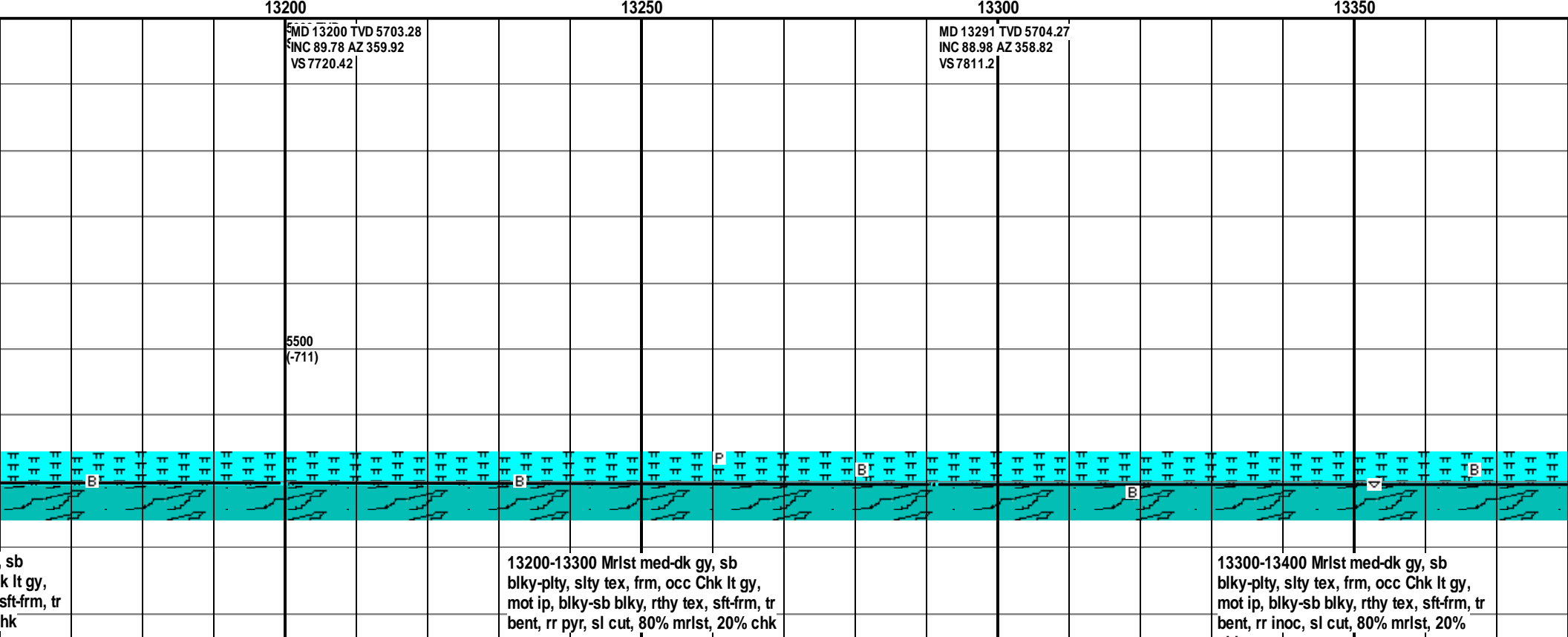
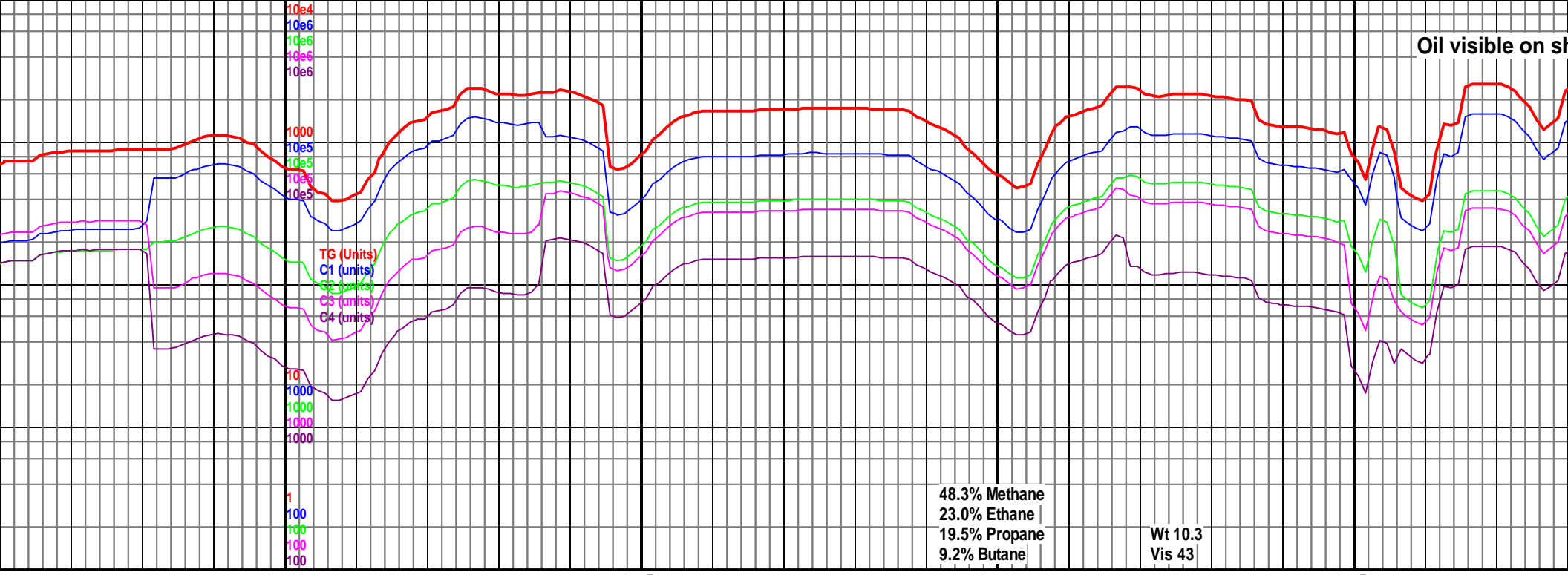


12300-12400 Mrlst med-dk gy, sb
blky-pty, slty tex, frm, occ Chk lt gy,
mot ip, blky-sb blky, rthy tex, sft-frm, rr
bent, rr inoc, sl cut, 70% mrlst, 30%

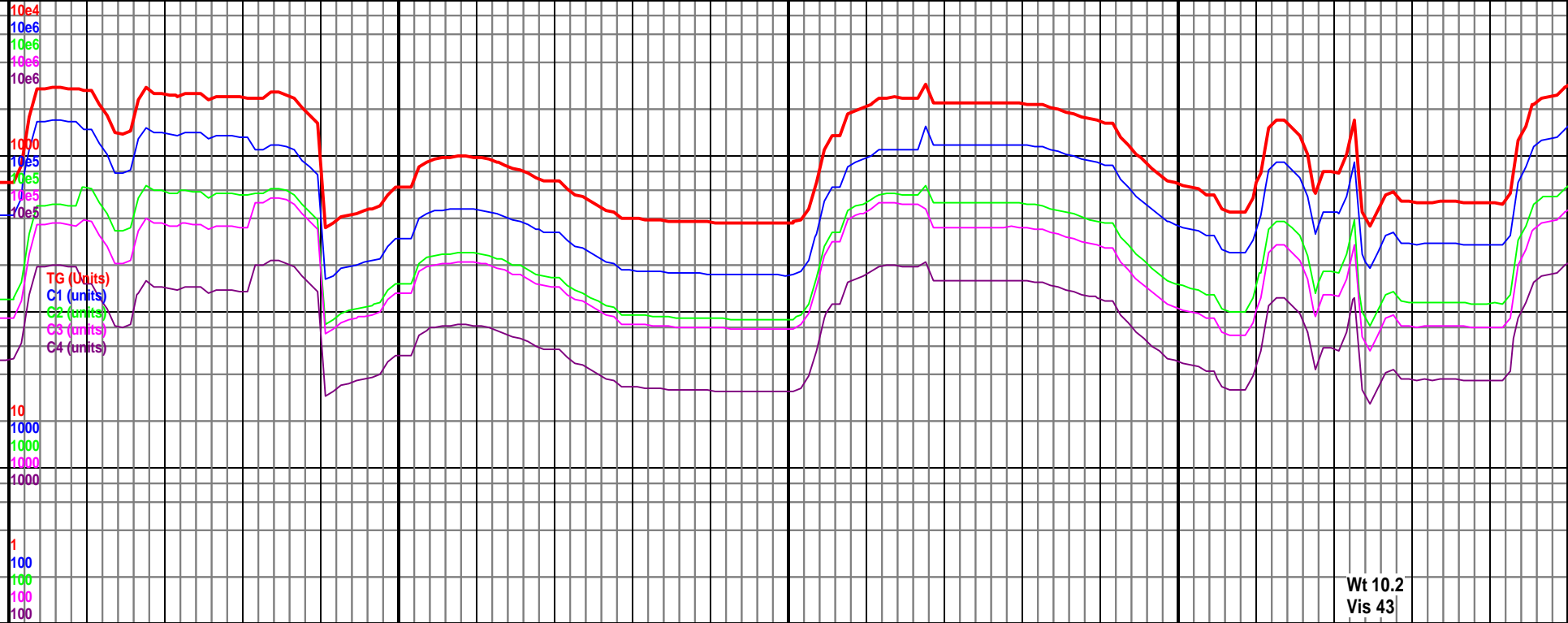
12400-12500 Mrlst med-dk gy, sb
blky-pty, slty tex, frm, occ Chk lt gy,
mot ip, blky-sb blky, rthy tex, sft-frm, rr
bent, rr inoc, sl cut, 80% mrlst, 20%







makers



MD 13383 TVD 5704.0700 TVD
INC 91.27 AZ 359.39 Sub Sea (-211)
VS 7903.01

MD 13473 TVD 5702.05
INC 91.3 AZ 359.39
VS 7992.77

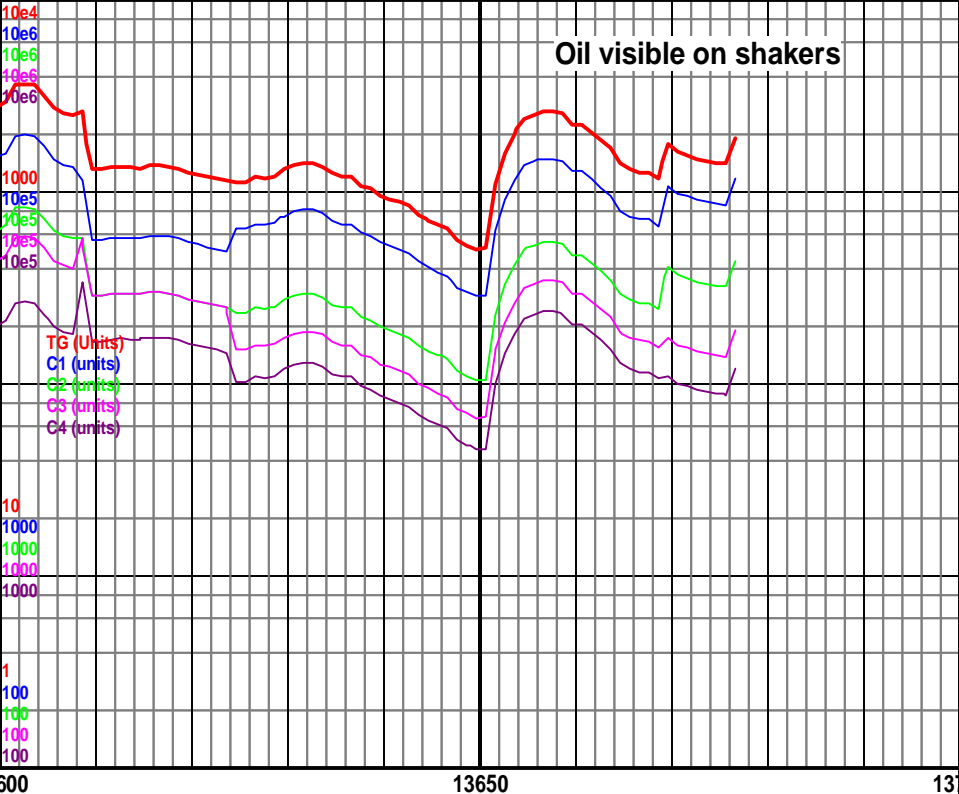
MD 13565 TVD 5700.19
INC 91.02 AZ 358.95
VS 8084.56

5500
(-711)



13400-13500 Mrlst med-dk gy, sb
blky-plty, slty tex, frm, occ Chk lt gy,
mot ip, blky-sb blky, rthy tex, sft-frm, tr
bent, rr inoc, mod cut, 70% mrlst, 30%

13500-13600 Mrlst med-dk gy, sb
blky-plty, slty tex, frm, occ Chk lt gy,
mot ip, blky-sb blky, rthy tex, sft-frm, tr
bent, rr inoc, mod cut, 60% mrlst, 40%



5000 TVD Sub Sea (-211)	MD 13634 TVD 5699.59 INC 89.97 AZ 359.38 VS 8153.41	MD 13677 TVD 5699.61 INC 89.97 AZ 359.38 VS 8196.31
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5500
(-711)

TD 13677' reached at 07:25
on 10/17/2014



13600-13677 Mrlst med-dk gy, sb
blky-plty, slty tex, frm, occ Chk lt gy,
mot ip, blky-sb blky, rthy tex, sft-frm, rr
bent, rr pyr, rr inoc, mod cut, 50%