



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

Well Name: Wolf 12L-0103-01
API: 05-123-3942101
Location: NWSW 27-T10N-R59W Weld County, Colorado
License Number: 05-123-3942101
Spud Date: 8/25/2014
Surface Coordinates: Lat.: 40.852944 Long.: -103.934211

Region: Redtail Field
Drilling Completed: 9/6/2014

Bottom Hole
Coordinates:
Ground Elevation (ft): 4953
Logged Interval (ft): 5350 To: 6649
Formation: Pierre, Sharon Springs, Niobrara, N100
Type of Drilling Fluid: Water Based Mud
K.B. Elevation (ft): 4770
Total Depth (ft): N/A

Printed by HORIZONTAL.LOG 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: Craig Dreiling, Jim Wenger, Brendan Donahue
Company: Acme Geologic Consulting
Address: 108 Berry Street
Little Rock, AR 72205

Drilling Company

Frontier
Rig #26

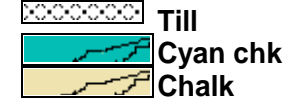
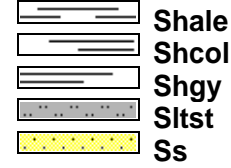
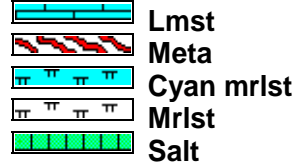
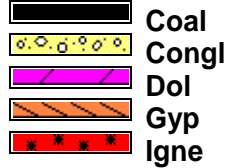
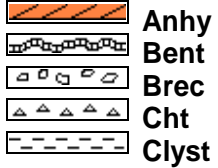
Gas Detection

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

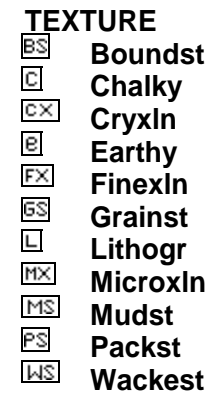
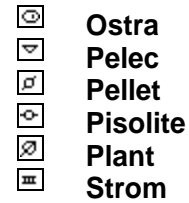
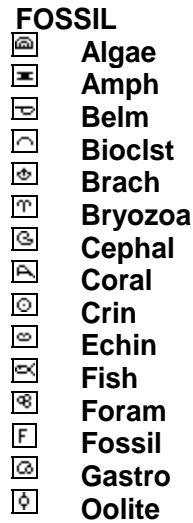
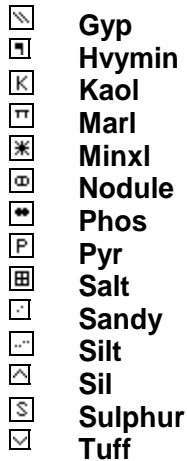
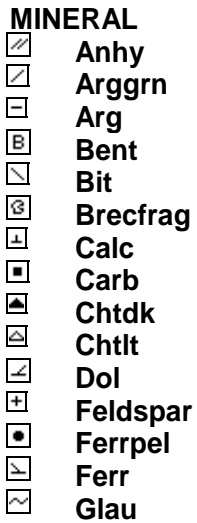
Comments

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



OTHER SYMBOLS

- POROSITY**
E Earthy
□ Fenest
F Fracture
X Inter
M Moldic
O Organic

- P Pinpoint
V Vuggy

- SORTING**
W Well
M Moderate
P Poor

- ROUNDING**
R Rounded
r Subrnd
a Subang
A Angular

- OIL SHOW**
● Good
◐ Fair
◑ Poor

- INTERVAL**
■ Core

- ▣ Dst

- EVENT**
▤ Rft
▥ Sidewall

TG, C1-C4

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

10e4
 10e6
 10e6
 10e6
 10e6
 1000
 10e5
 10e5
 10e5
 10e5

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

10
 1000
 1000
 1000
 1000
 1
 100
 100
 100
 100

9/1/2014

10e4
 10e6
 10e6
 10e6
 10e6
 1000
 10e5
 10e5
 10e5
 10e5

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

10
 1000
 1000
 1000
 1000
 1
 100
 100
 100
 100

Wt 10.2
 Vis 42

9/2/2014

Depth

00

5350

5400

5450

5200 TVD
 Sub Sea (-430)

Acme Geologic Consulting
 arrived and rigged up on
 8/25/2014

5200 TVD
 Sub Sea (-430)

TOOH at 15:17 on 9/1/2014 and
 5486' MD after time drill off whip
 stock for new bit. Resumed drilling
 at 03:50 on 9/2/2014

KOP 5432' reached at 12:55,
 on 9/1/2014

5432-5450 Slst dk gy, frm, sb blk-sb
 plty, nsfoc, slst 85%, cmnt 15%

5450-5500 Slst dk gy, frm-mod frm,
 blk, occ sb plty, NSOFC, slst 100%

Well Bore Cross Section

5675
 (-905)

5675
 (-905)

6150
 (-1380)

6150
 (-1380)

% Lithology

**Side/rotate
 Data Curves**

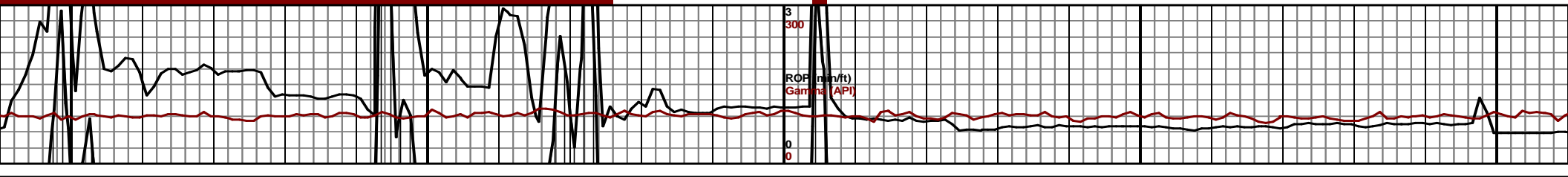
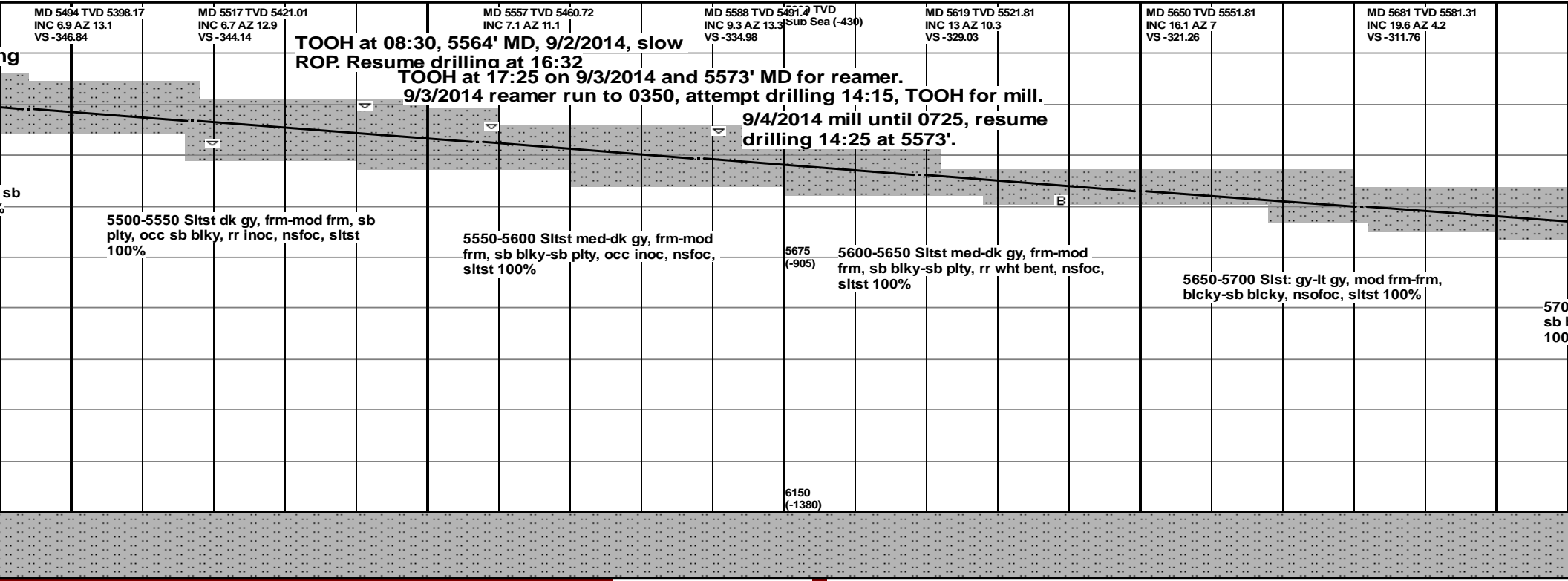
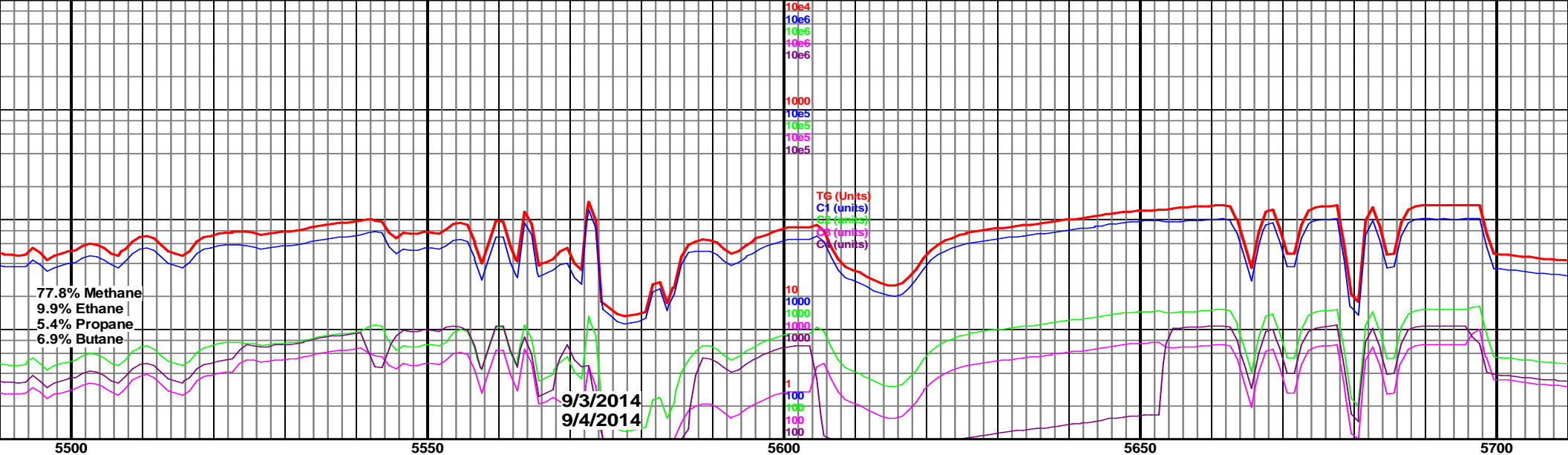
ROP (min/ft) ———
 Gamma (API) ———

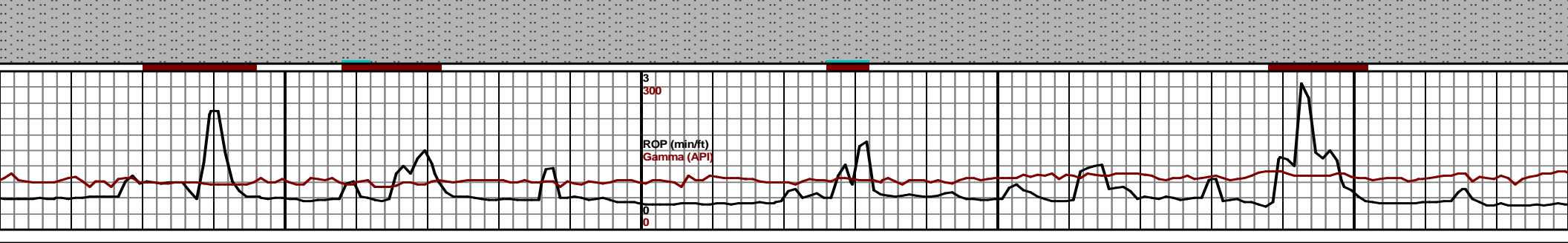
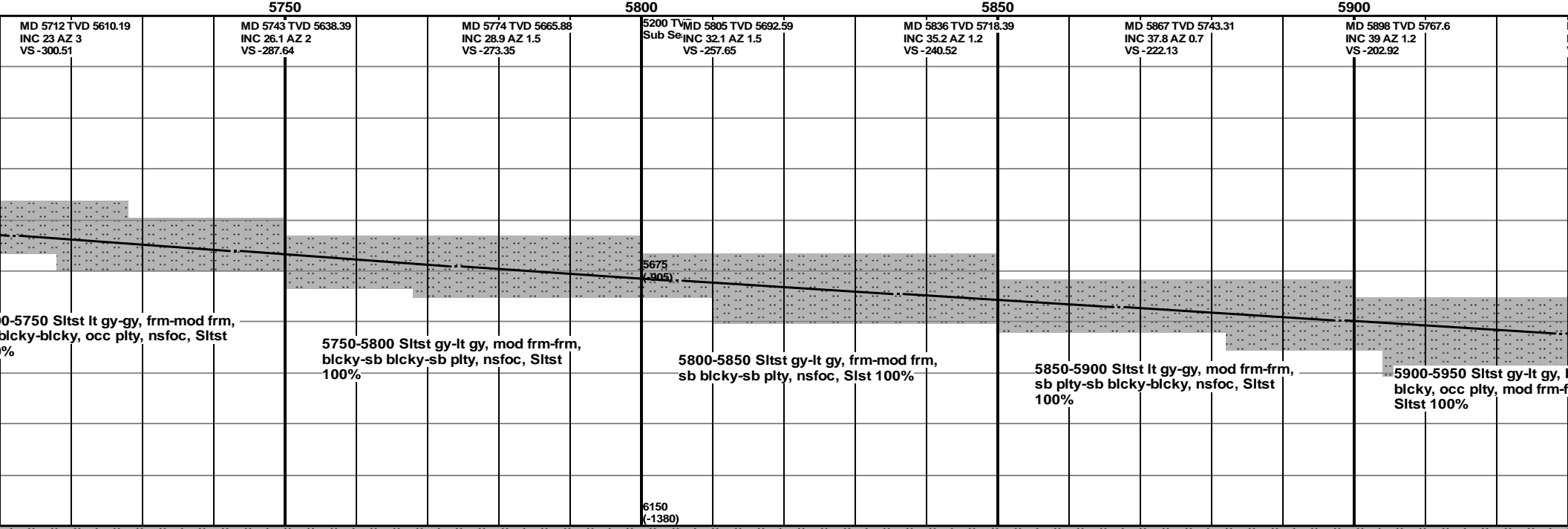
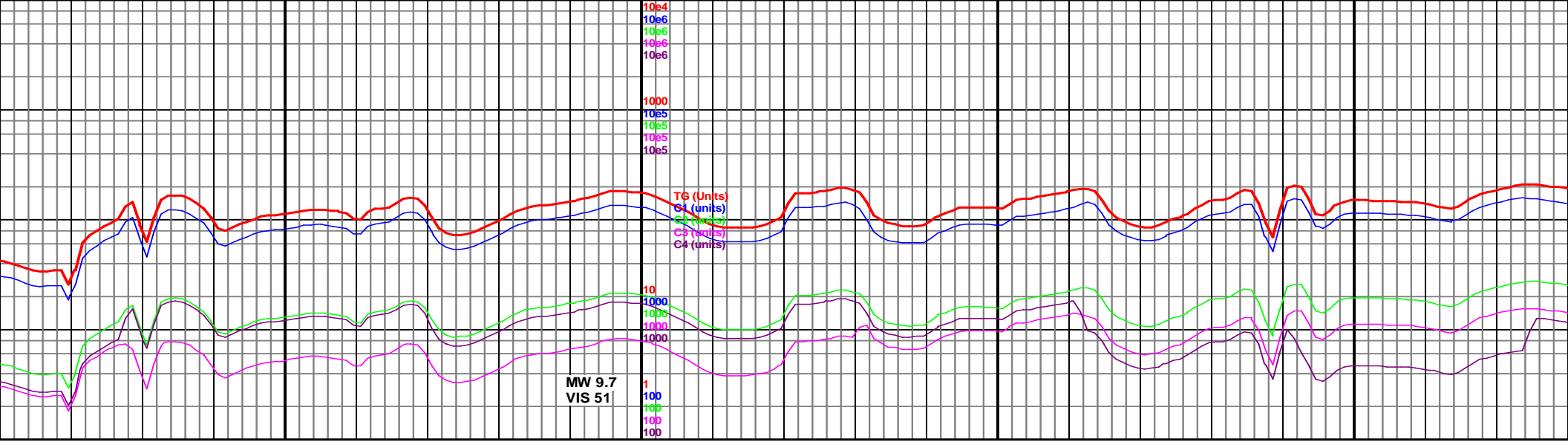
3
 300
 ROP (min/ft)
 Gamma (API)

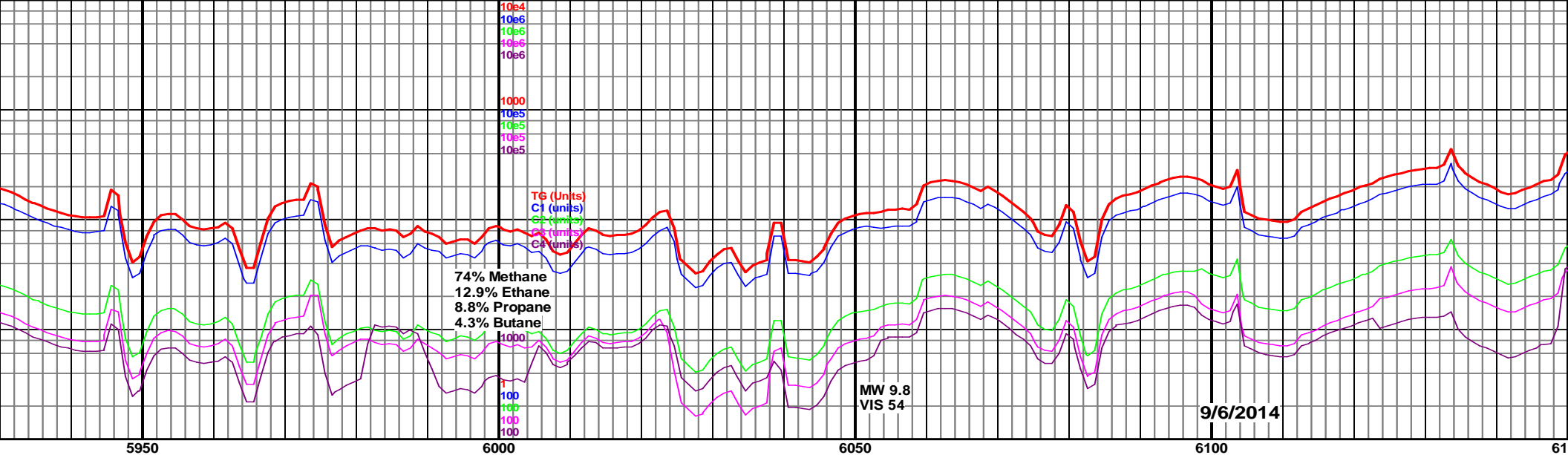
Pioneer 54

3
 300
 ROP (min/ft)
 Gamma (API)

Oil Shows







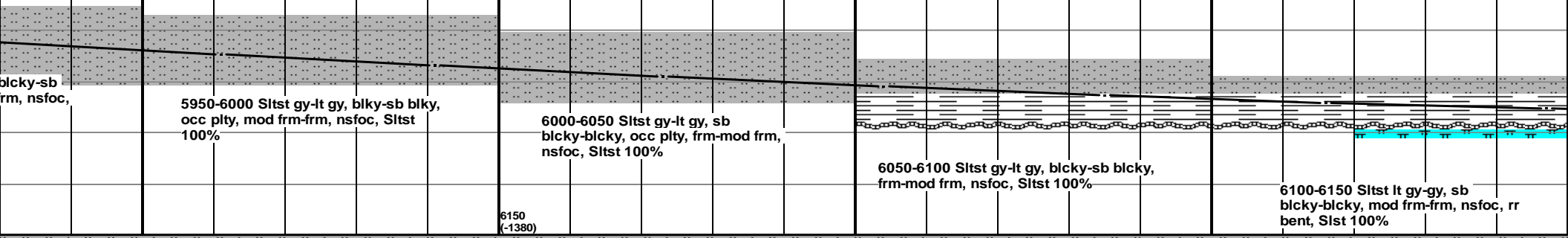
MD 5929 TVD 5791.21 INC 41.8 AZ 1.4 VS -182.88	MD 5961 TVD 5814.48 INC 44.9 AZ 2.6 VS -160.95	MD 5991 TVD 5835.10 INC 48.2 AZ 2.2 Sea (-430) VS -139.19	MD 6023 TVD 5855.65 INC 51.9 AZ 1.4 VS -114.71	MD 6054 TVD 5873.69 INC 56.9 AZ 3.1 VS -89.54	MD 6085 TVD 5889.56 INC 61.5 AZ 1.2 VS -62.96	MD 6116 TVD 5903.37 INC 65.6 AZ 358.4 VS -35.34	MD 6150 TVD 5917.18 INC 69.7 AZ 371.1 VS -10.12
--	--	---	--	---	---	---	---

TOOH at 23:00, 5977' MD, 9/4/2014, for motor. Resumed at 08:00

TOOH at 11:40 on 9/5/2014 and 6023' for motor. Resumed at 20:20

P200 6018' MD, 5852' TVD

P300 6136' MD, 5910' TVD

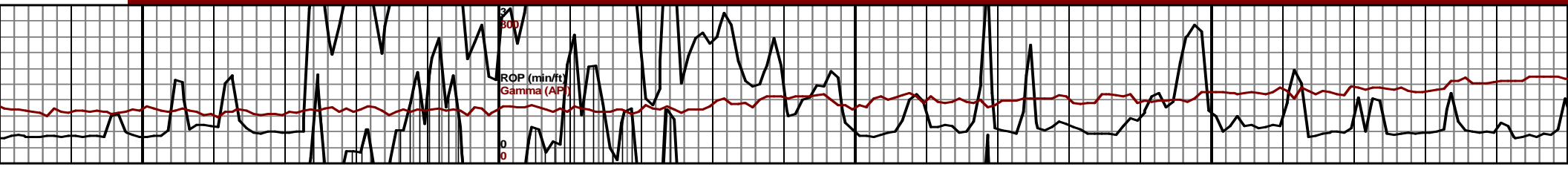


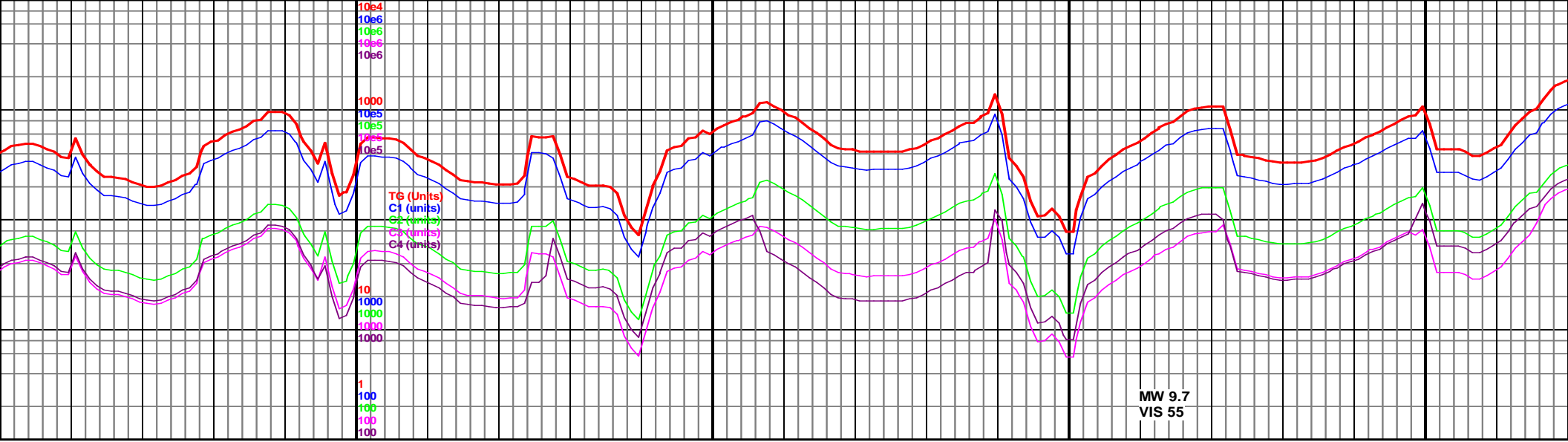
5950-6000 Slitst gy-lt gy, blkly-sb blkly, occ plty, mod frm-frm, nsfoc, Slitst 100%

6000-6050 Slitst gy-lt gy, sb blkly-bkly, occ plty, frm-mod frm, nsfoc, Slitst 100%

6050-6100 Slitst gy-lt gy, blkly-sb blkly, frm-mod frm, nsfoc, Slitst 100%

6100-6150 Slitst lt gy-gy, sb blkly-bkly, mod frm-frm, nsfoc, rr bent, Slitst 100%





50 6200 6250 6300 6350

6147 TVD 5914.95 INC 70.5 AZ 357.5 VS -6.82	MD 6178 TVD 5924.58 INC 73.3 AZ 356.1 VS 22.34	5200 TVD Sub Sea (-43) MD 6209 TVD 5933.18 INC 74.5 AZ 354 VS 51.66	MD 6240 TVD 5940.76 INC 77.2 AZ 352.5 VS 81.07	MD 6271 TVD 5947.63 INC 77.2 AZ 352.8 VS 110.59	MD 6303 TVD 5954.31 INC 78.7 AZ 350.8 VS 141.04	MD 6334 TVD 5960.22 INC 79.3 AZ 350.7 VS 170.52	MD 6365 TVD 5966.13 INC 80.0 AZ 350.6 VS 200.00
---	--	---	--	---	---	---	---

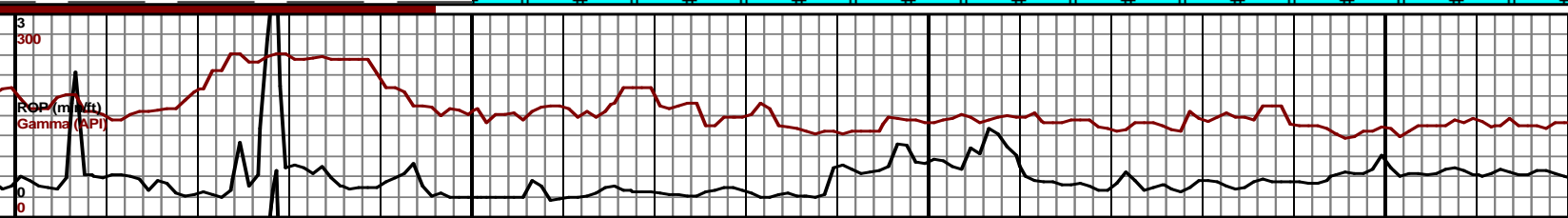
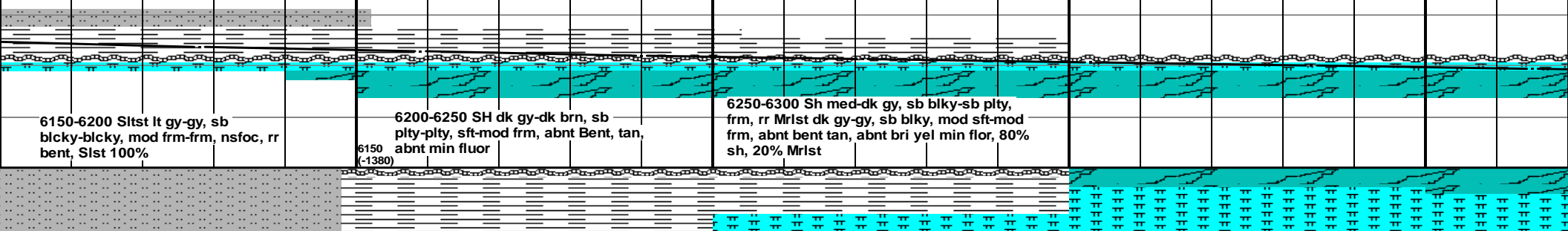
350 6186' MD, 5927' TVD

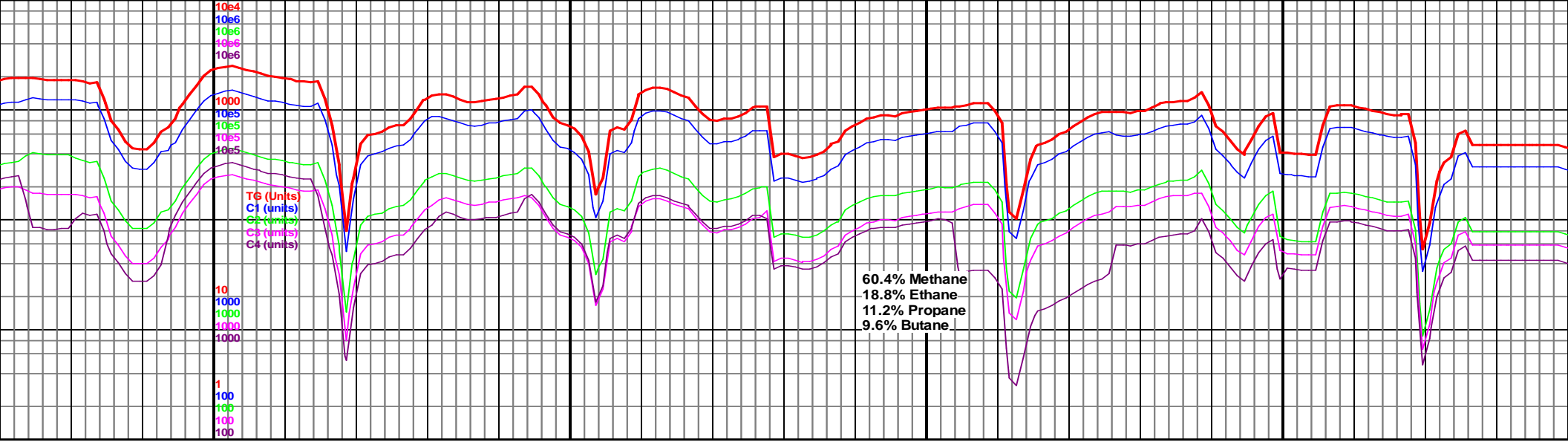
Niobrara 6246' MD, 5942' TVD

Sharon Springs 6221' MD, 5936' TVD

6300-6350 Mrlst gy-dk gy, blkcy-sb blkcy, sft-mod frm, abnt Ch lt gy-gy, sb blkcy-sb plty, mod sft, rr pyr frags, abnt bent, tan-dull grn, occ bri min flur 70% Mrlst 30% Ch

6350-6400 Mrlst gy-sft-mod frm, Ch lt gy-rr fine gr pyr, occ be flur, rr kao, wht, 60%





MD 6365 TVD 5965.92 INC 80.5 AZ 351 VS 229.65	MD 6396 TVD 5971.39 INC 80.2 AZ 351.39 VS 229.65	MD 6428 TVD 5976.25 INC 82.3 AZ 350.7 VS 260.3	MD 6459 TVD 5979.9 INC 84.2 AZ 350.3 VS 290.09	MD 6490 TVD 5982.79 INC 85.1 AZ 349.9 VS 319.9	MD 6521 TVD 5985.22 INC 85.9 AZ 350.4 VS 349.76	MD 6552 TVD 5987.33 INC 86.3 AZ 350.3 VS 379.66	MD 6583 TVD 5989.44 INC 87.3 AZ 350.3 VS 409.55
---	--	--	--	--	---	---	---

N100 6383' MD, 5969' TVD

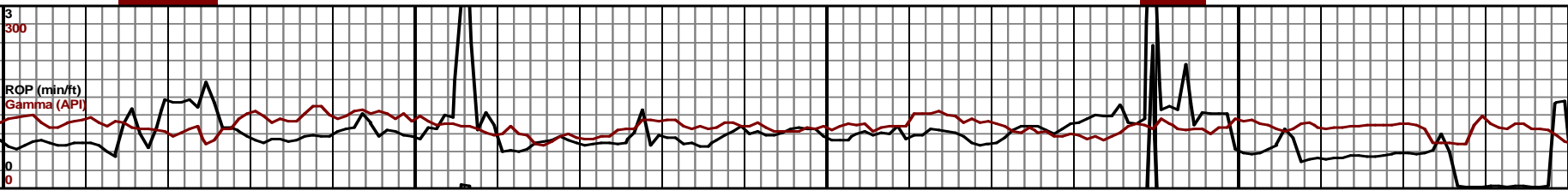
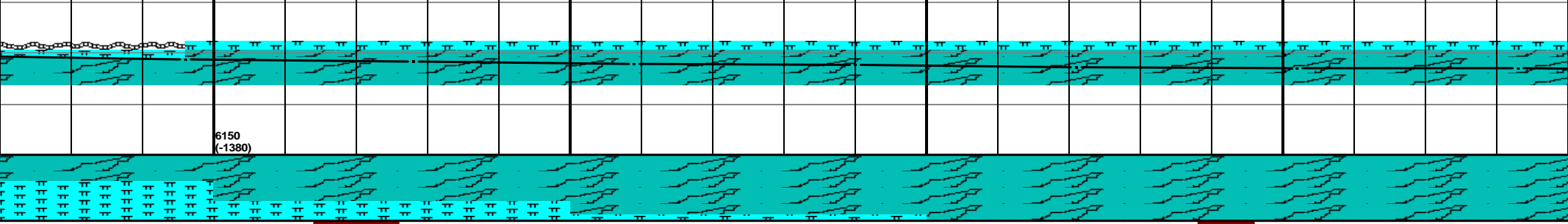
dk gy, bicky-sb bicky, mod
gy, sb bicky-sb plty, mod sft,
nt, tan-dull grn, occ brt min
% Mrlst 40% Ch

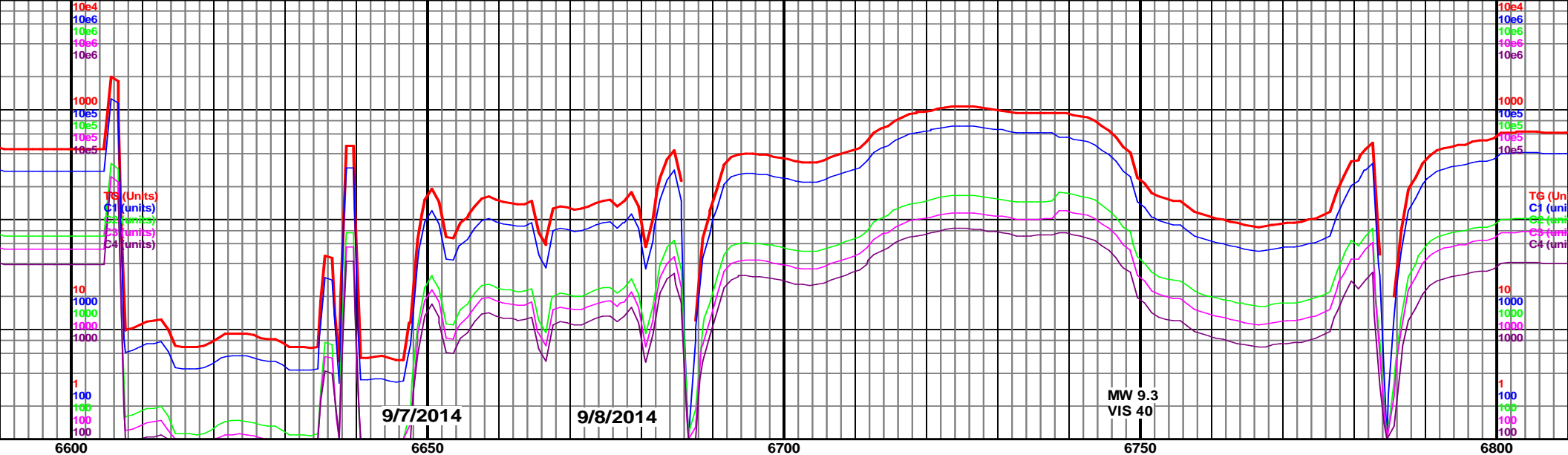
6400-6450 Ch lt gy-gy, sb bicky-sb plty, mod sft,
Mrlst gy-dk gy, bicky-sb bicky, mod sft-mod frm,
occ bent, tan-off wht, rr brt min fluor, 70% Ch,
Mrlst 30%

6450-6500 Ch lt gy-gy, sb bicky-sb plty, mod sft,
occ Mrlst gy-dk gy, bicky-sb bicky, mod sft-mod frm,
occ bent, tan-off wht, rr brt min fluor, slo cut,
90% Ch, Mrlst 10%

6500-6550 Ch lt gy-gy, sb bicky-sb plty, mod sft,
rr bent, tan-dull grn, rr brt min fluor, slo cut, 90%
Ch, 10% Mrlst

6550-6600 Ch lt gy-gy, sb bicky-sb plty,
sft, slo cut, 90% Ch, 10% Mrlst





TVD 5989.06 AZ 350.4
 MD 6602 TVD 5989.84
 INC 88 AZ 350.7
 VS 427.97

MD 6727 TVD 5992.35
 INC 89.7 AZ 351.7
 VS 549.27

5200 TVD (-43)
 Sub Sea

**Curve Landed 6649' MD, 5990.66'
 TVD, 12:00 on 9/6/2014**

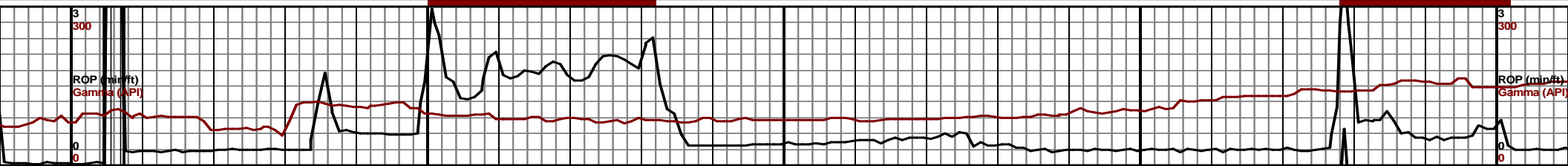
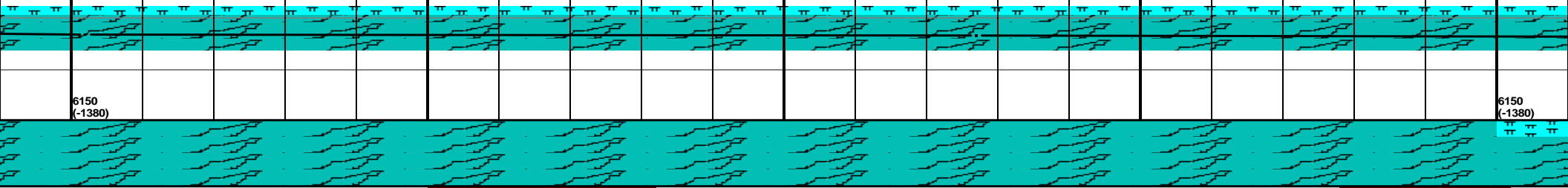
**TIH with lateral assembly Resume
 Drilling at 22:00 on 9/7/2014**

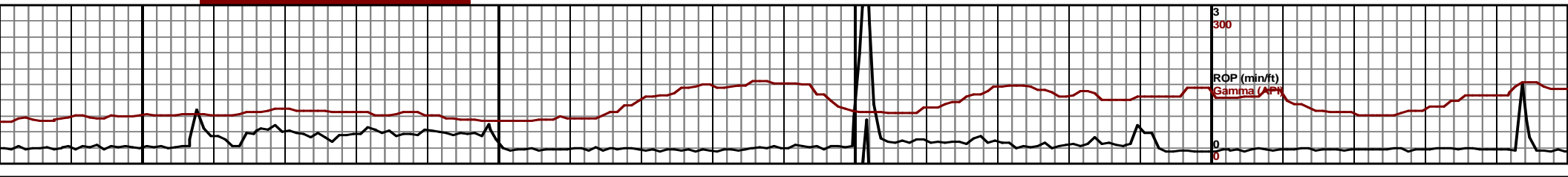
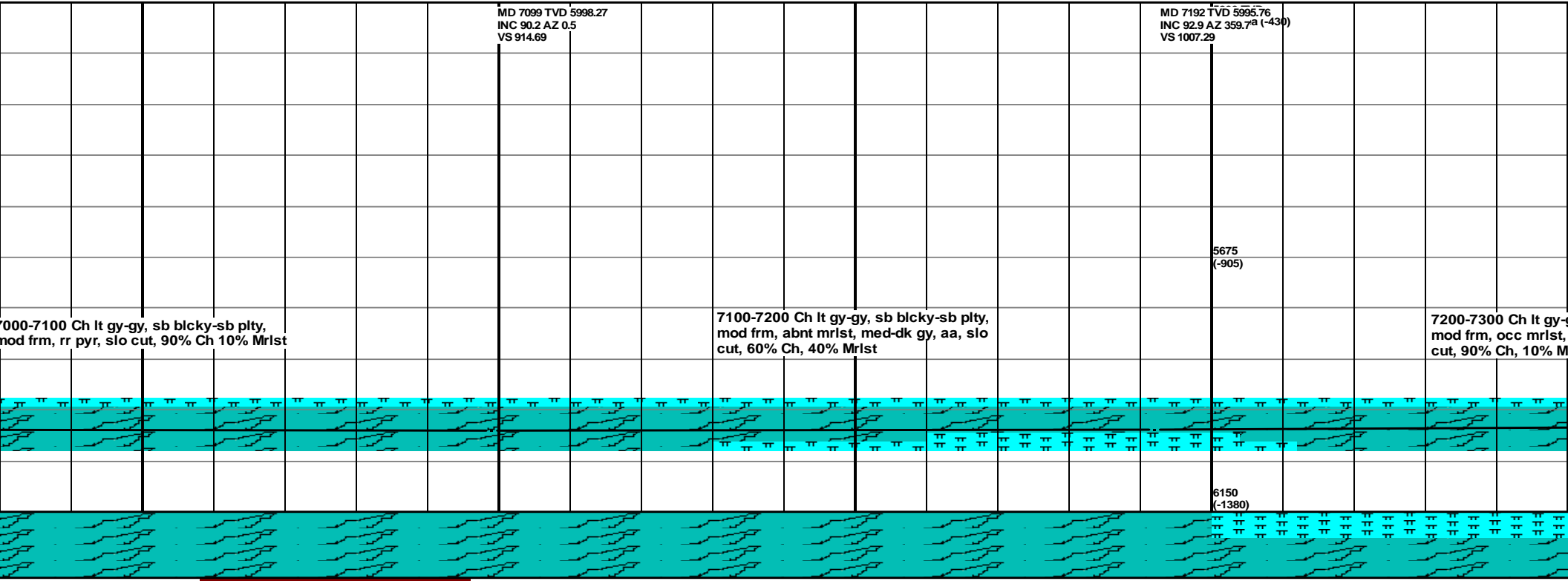
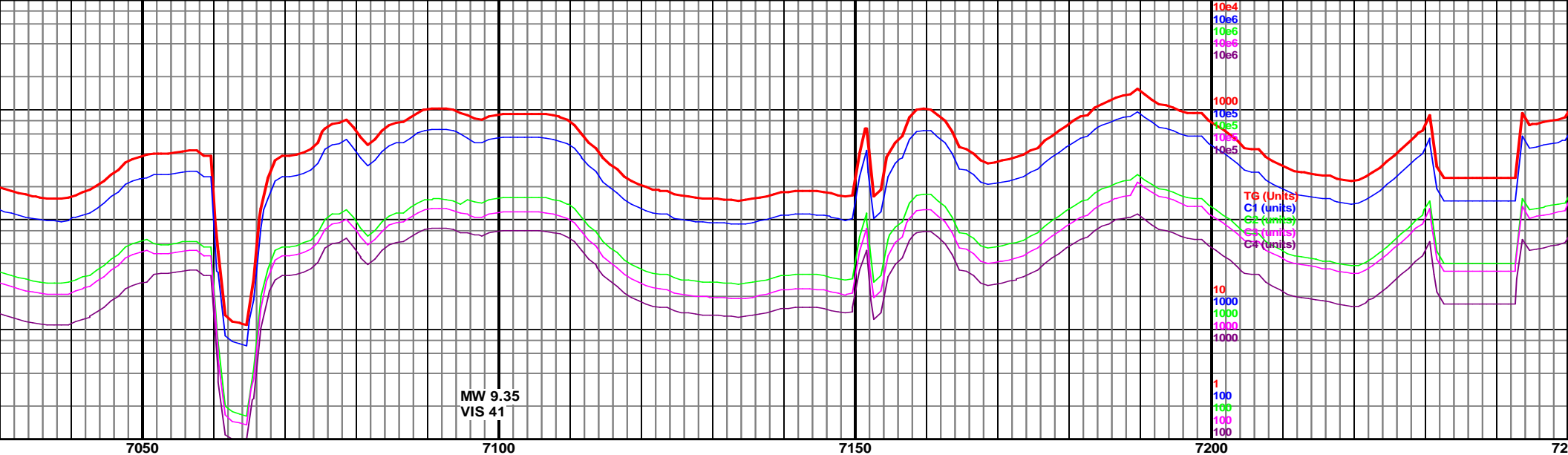
**TOOH to strap pipe at 6662'
 MD 23:30 9/7/2014. Resume
 drilling at 07:00 9/8/2014.**

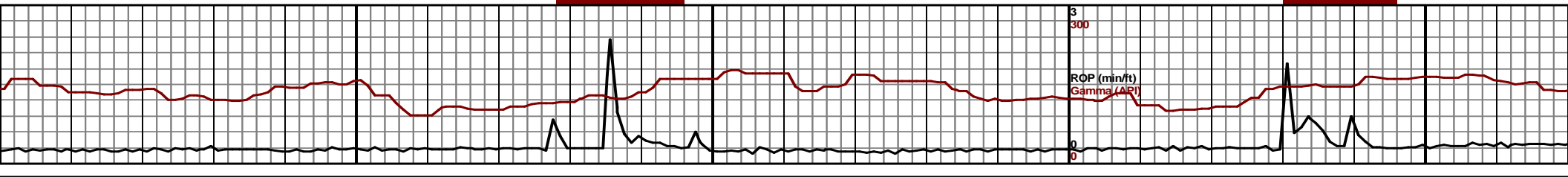
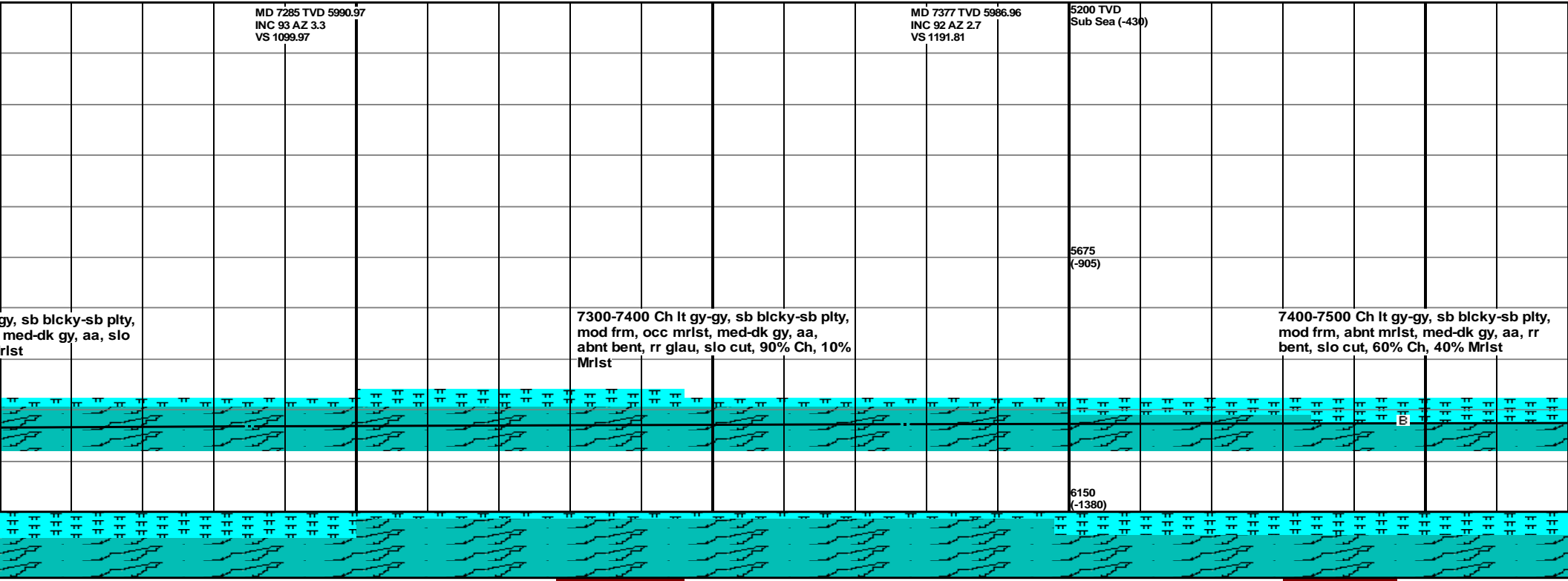
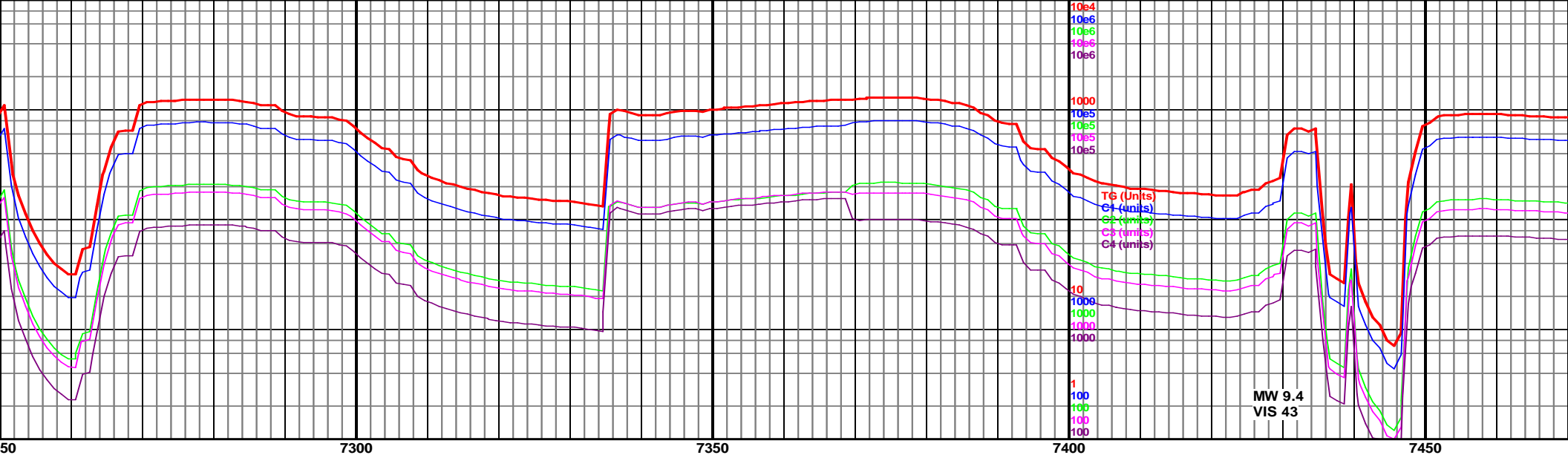
6600-6650 Ch lt gy-gy, sb bicky-sb plty, mod
 sft, fast cut, 100% Ch

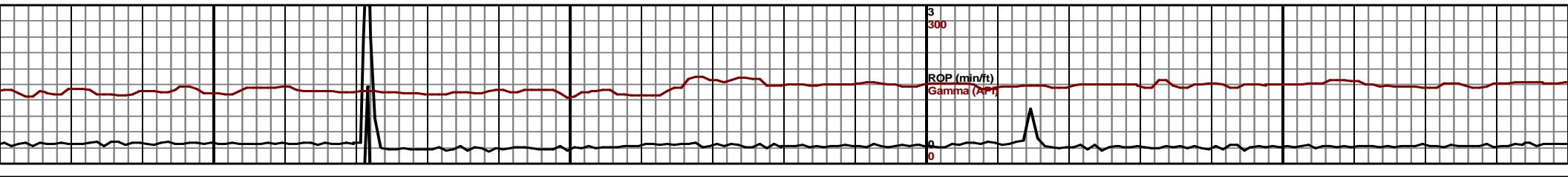
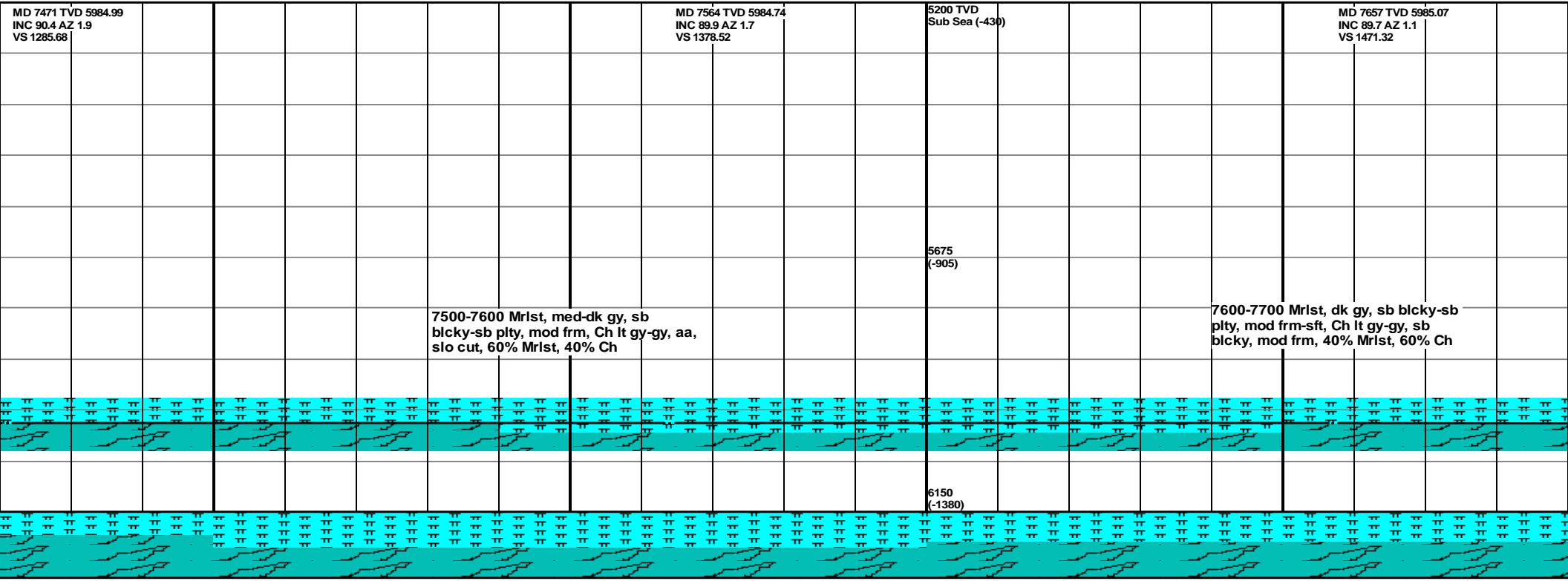
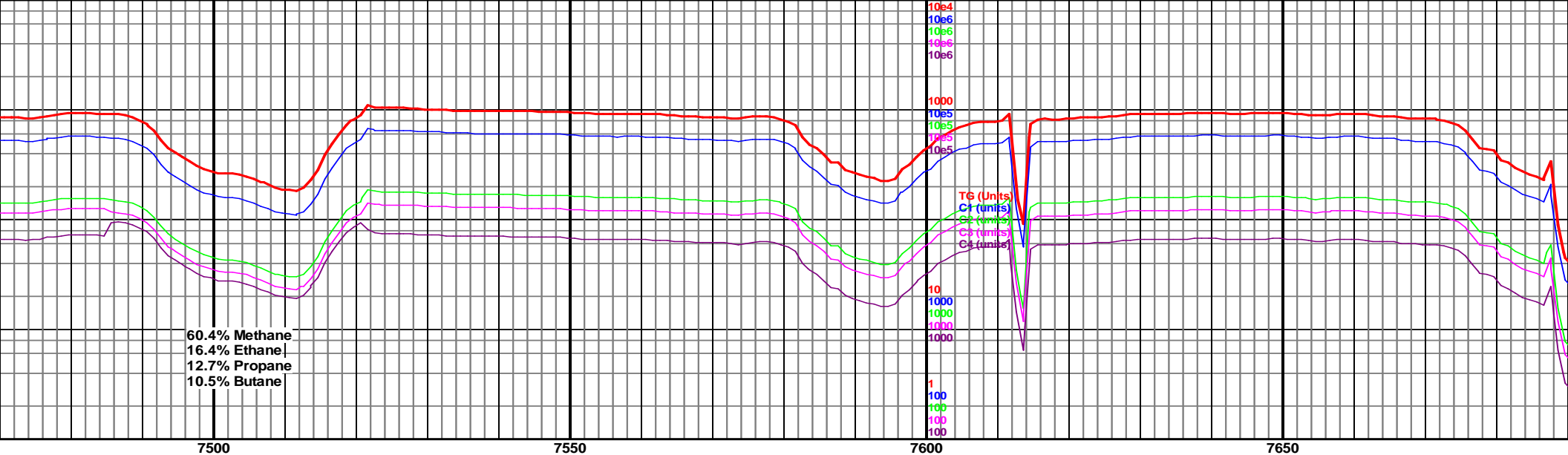
6650-6700 Ch lt gy-gy, sb bicky-sb plty,
 mod sft, occ pyr, nsfoc, 90% Ch 10%

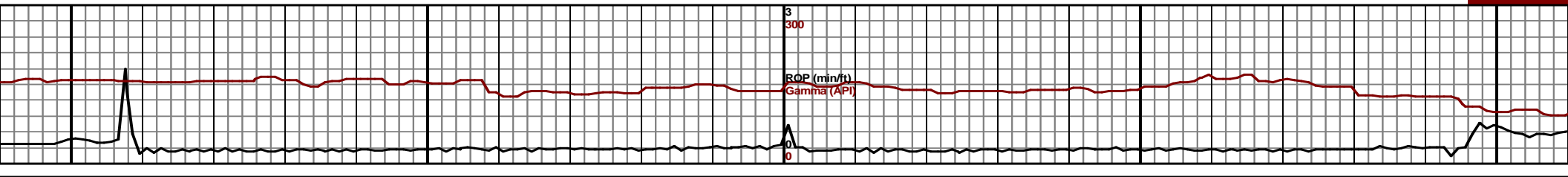
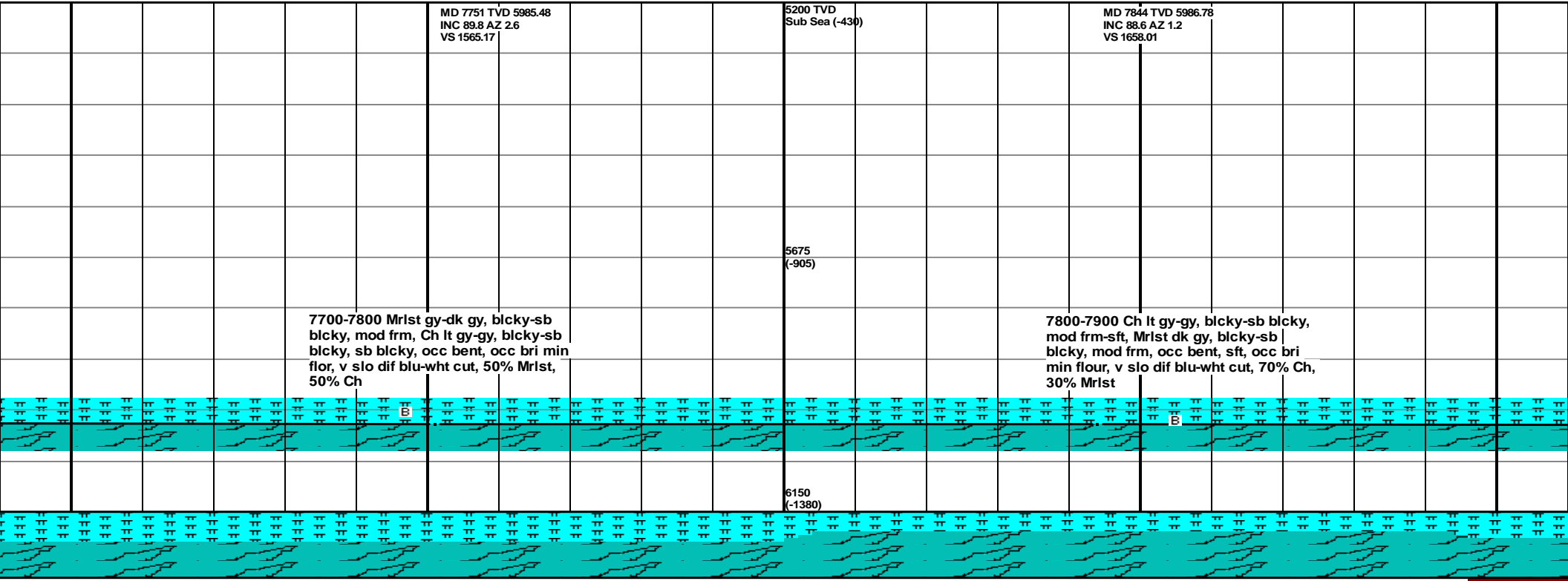
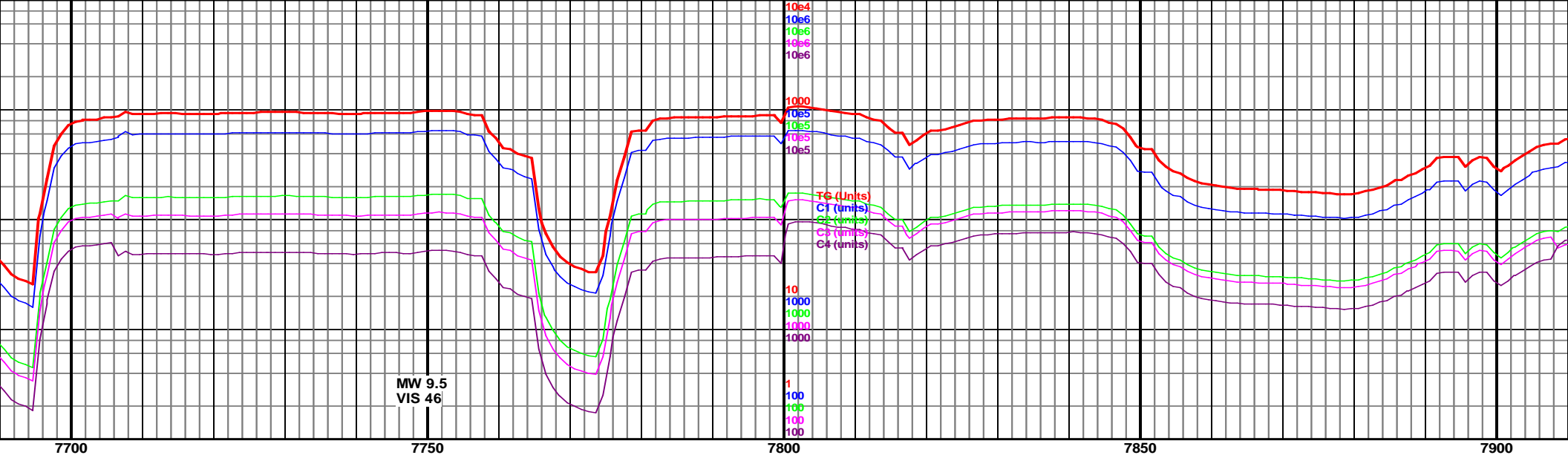
6700-6800 Ch lt gy-gy, sb bicky-sb plty,
 mod frm, mod cut, 90% Ch Mrlst 10%

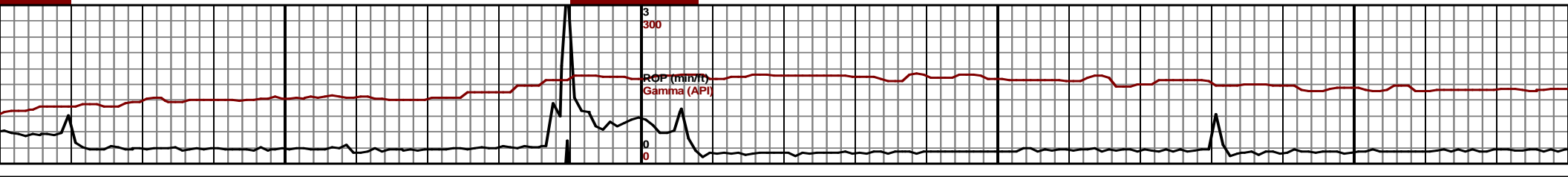
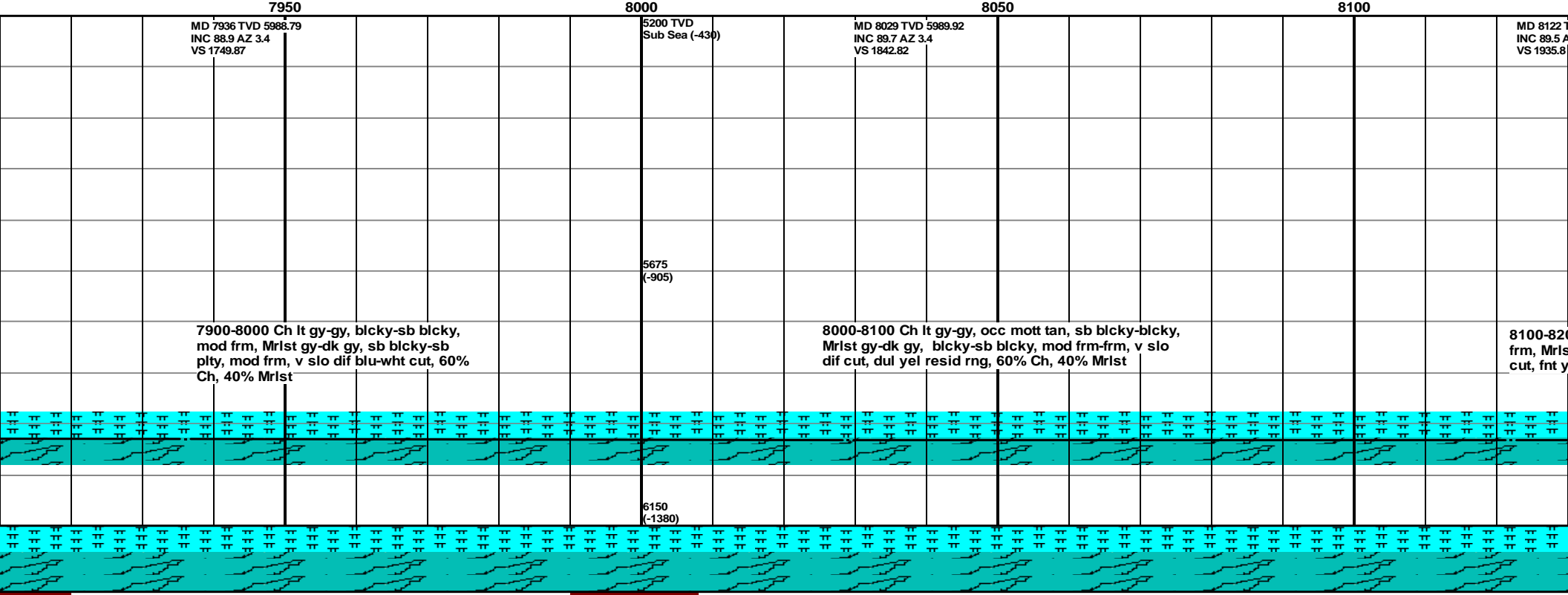
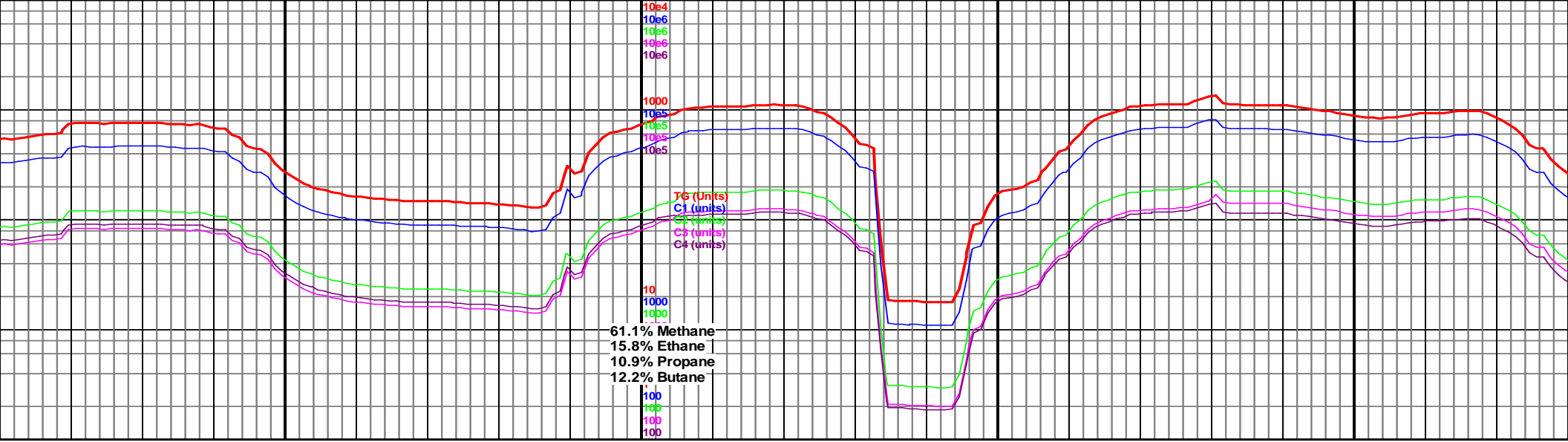


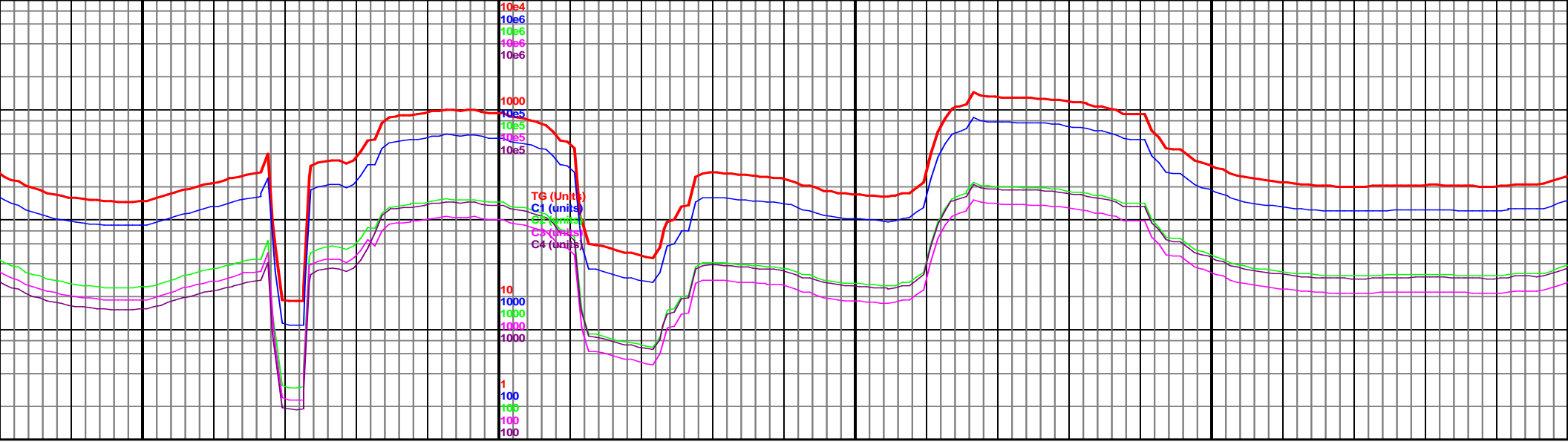










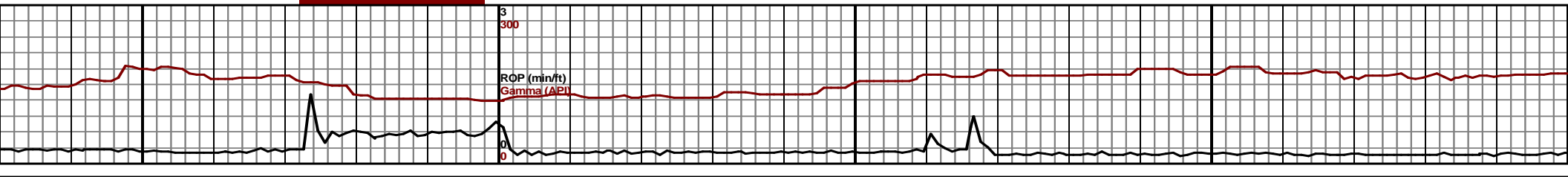


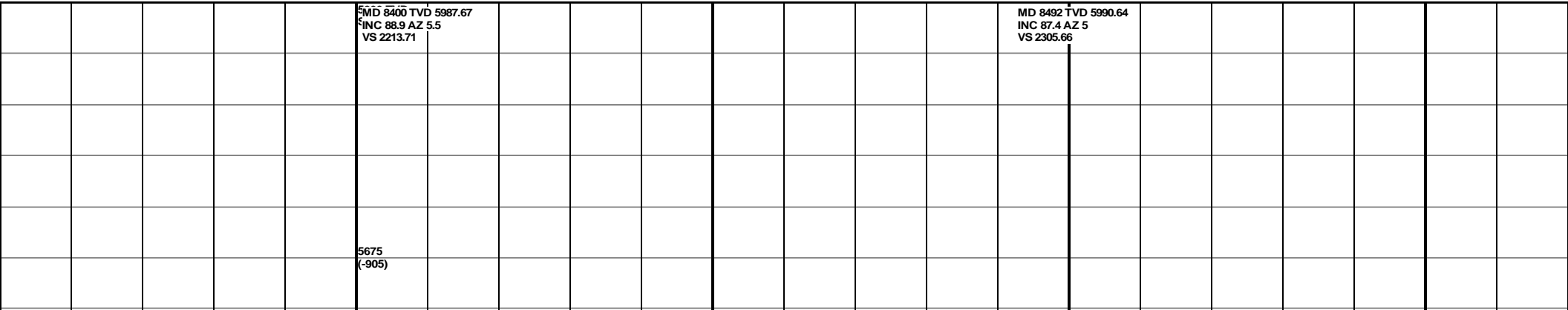
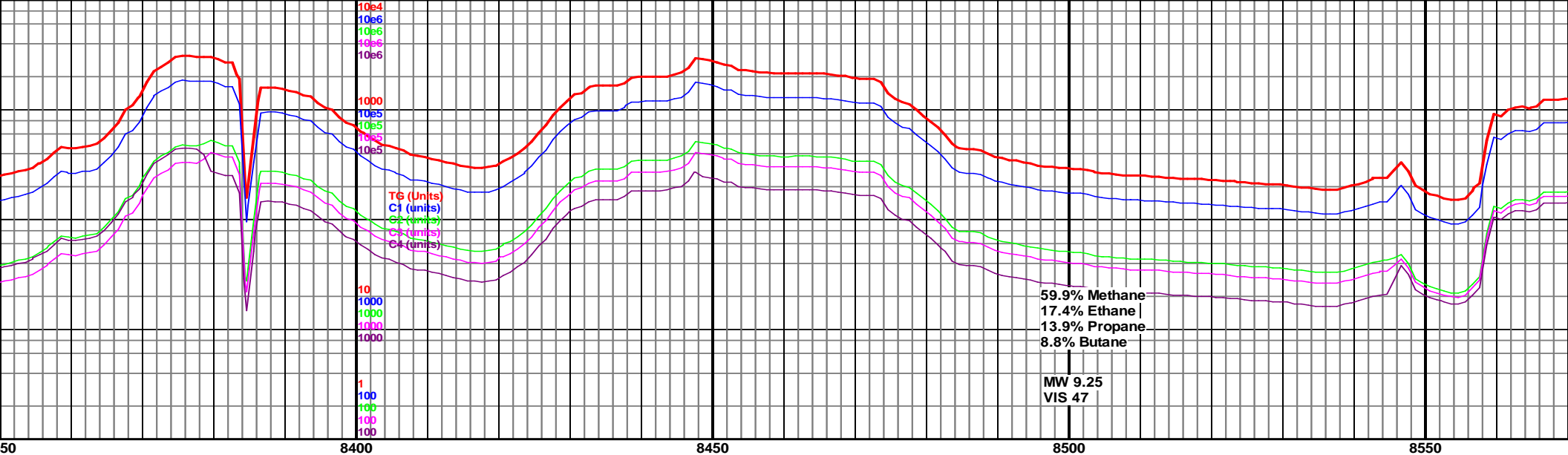
TVD 5990.57 AZ 4.2	8150	5200 TVD Sub Sea (-430) MD 8215 TVD 5990.16 INC 91 AZ 5.6 VS 2028.79	8250	MD 8307 TVD 5988.08 INC 91.6 AZ 7.1 VS 2120.74	8300
-----------------------	------	--	------	--	------

00 Ch It gy-gy, occ mott tan, sb blkcy-sb plty, mod
 st gy-dk gy, blkcy-sb blkcy, mod frm, v slo dif blu-wht
 el resid rng, 60% Ch, 40% Mrlst

8200-8300 Mrlst gy-dk gy, blkcy-sb blkcy, mod frm, Ch It
 gy-gy, occ mott tan, blkcy-sb plty, mod frm, v slo dif cut, 60%
 Mrlst, 40% Ch

8300-8400 Ch It gy-gy, occ n
 mod frm, Mrlst gy-dk gy, blk
 resid rng, 75% Ch, 25% Mrlst

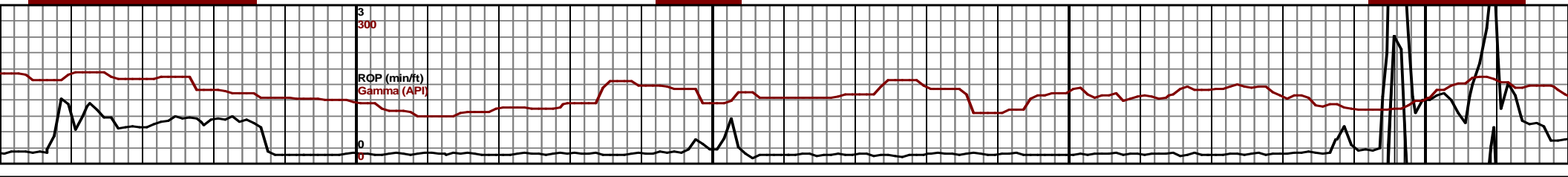
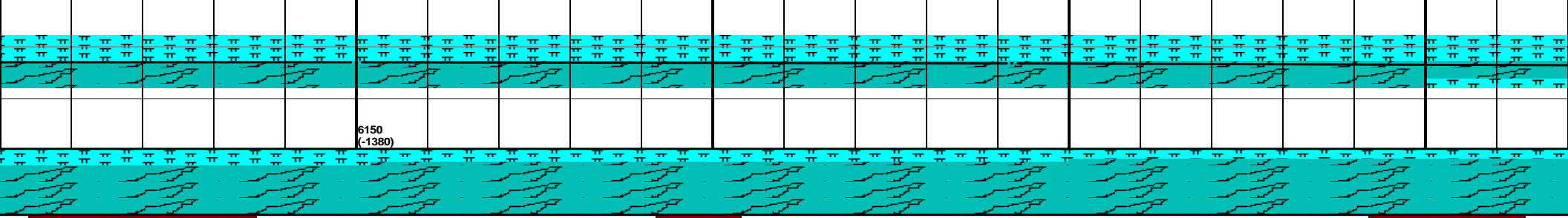


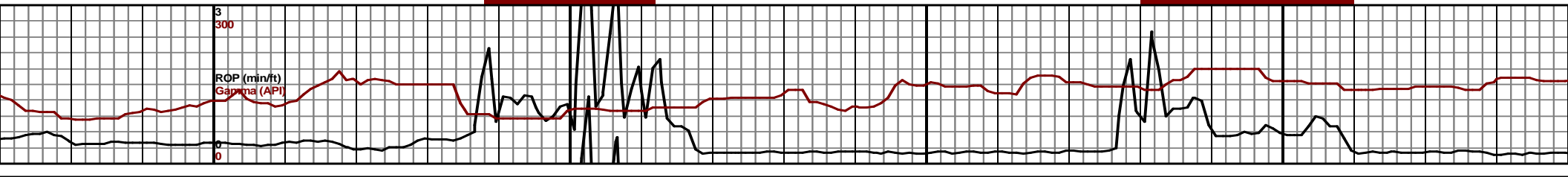
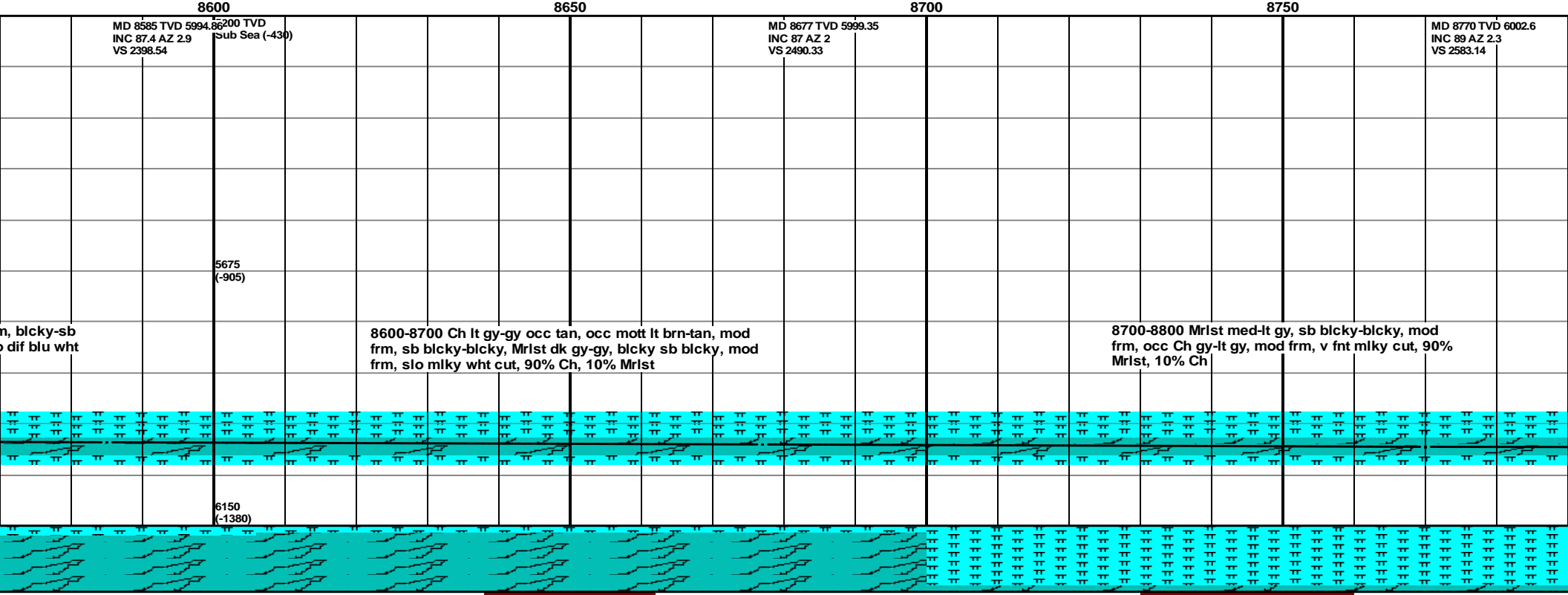
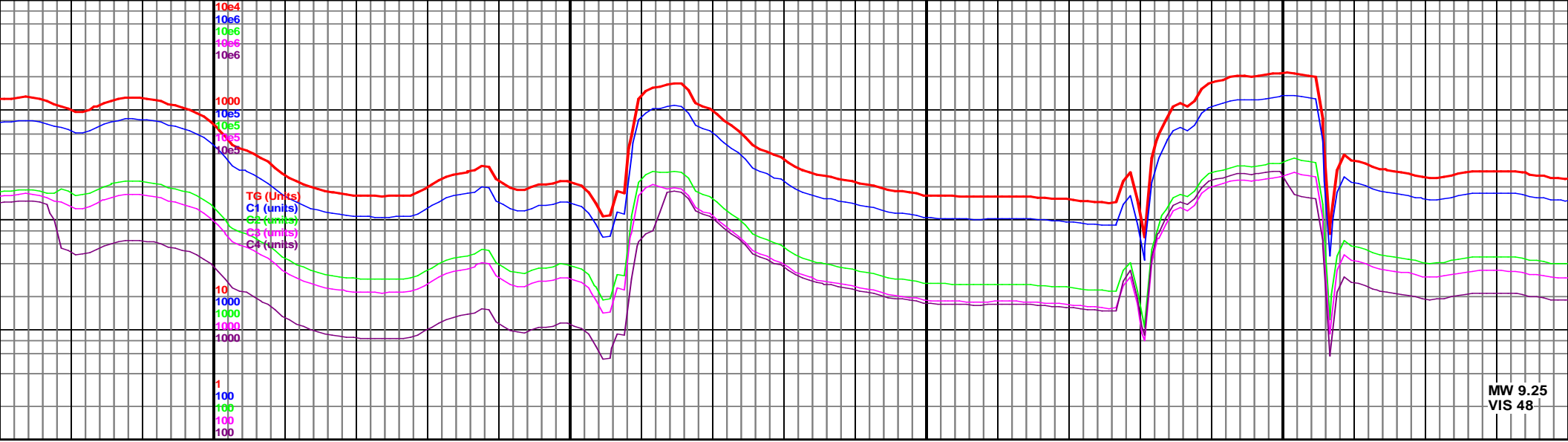


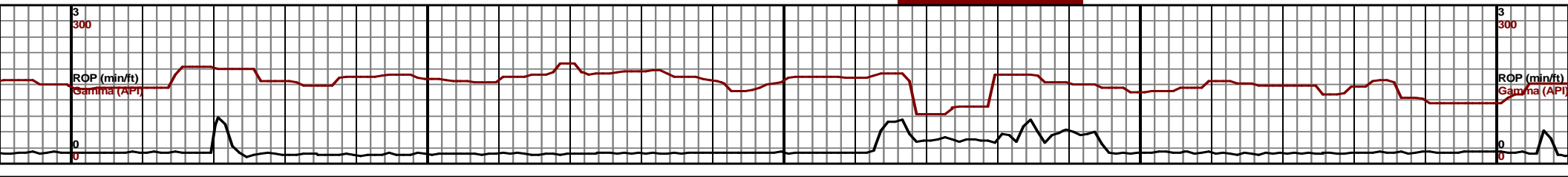
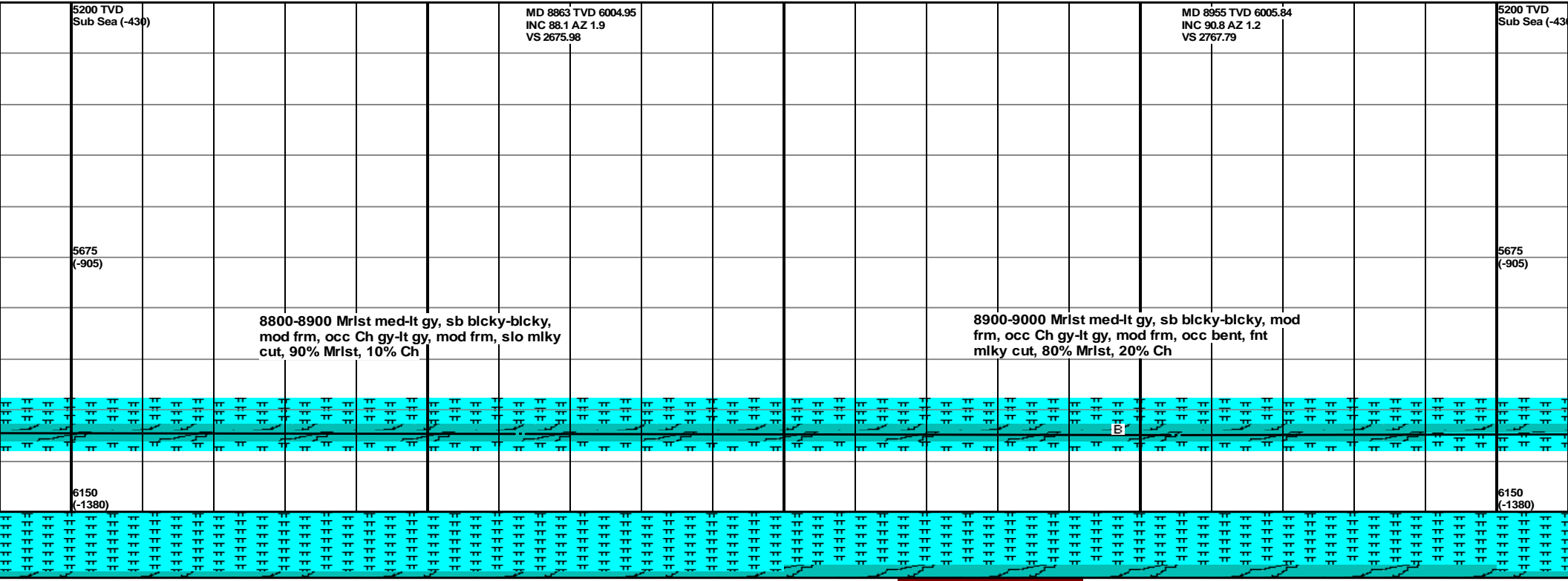
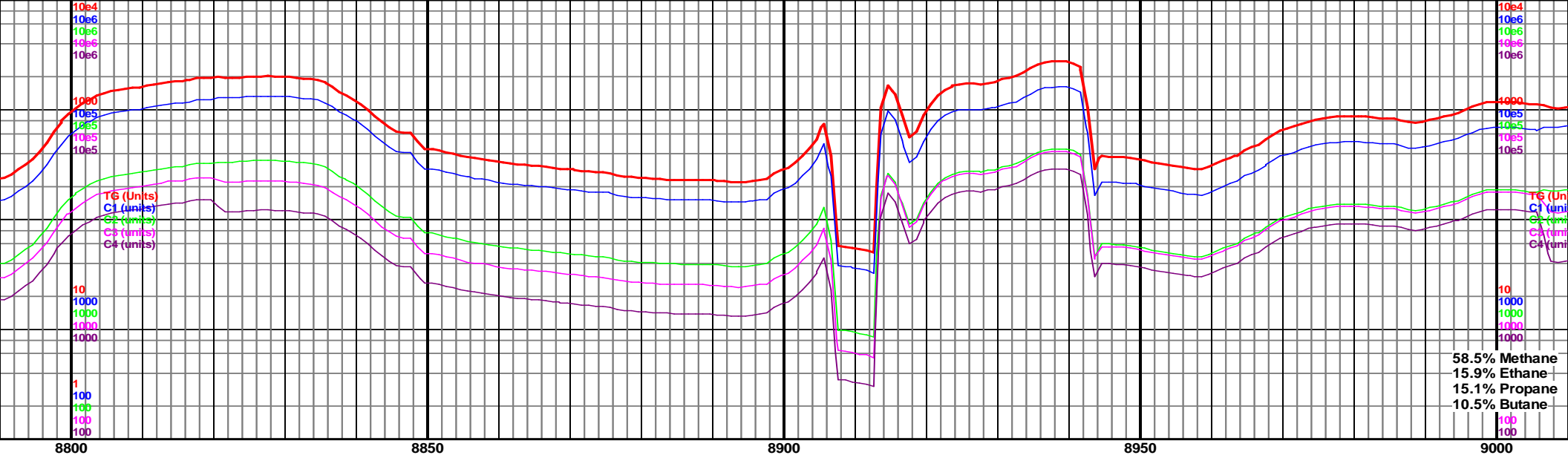
mott lt brn-tan, blk-sb blkky,
 ky-sb plty, mod frm, fst fnt yel
 st

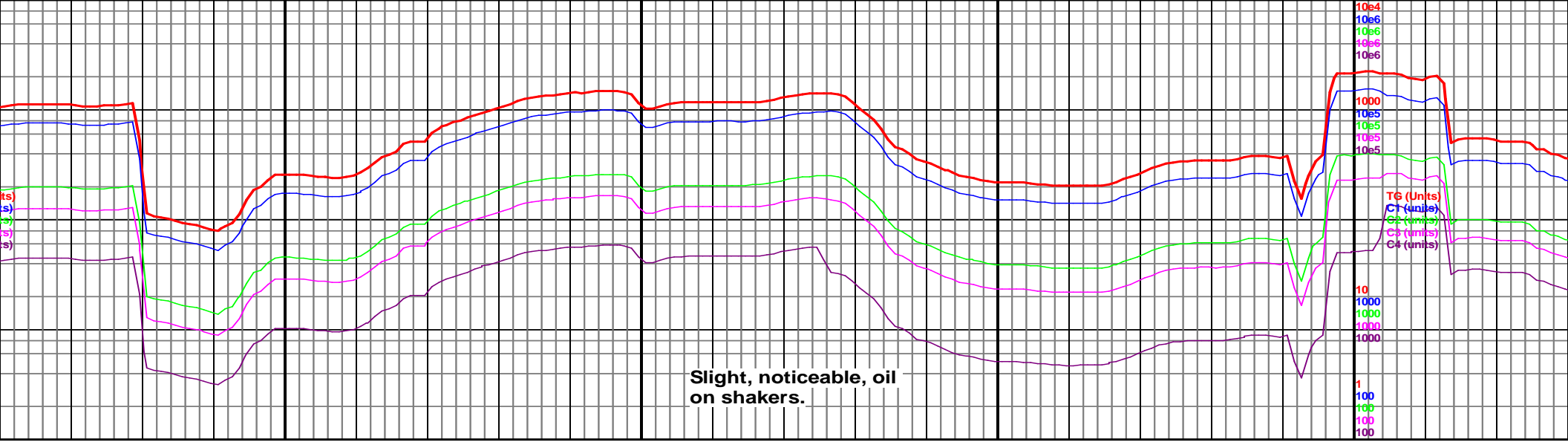
8400-8500 Ch lt gy-gy, occ mott lt brn-tan, blk-sb
 blkky, mod frm, Mrlst gy-dk gy, blkky-sb plty, mod frm,
 fst fnt yel resid rng, 75% Ch, 25% Mrlst

8500-8600 Ch lt gy-gy, occ mott tal-t brn, mod frm
 blkky, Mrlst dk gy, blkky-sb blkky, mod frm, v slo
 mlky cut, 80% Ch, 20% Mrlst









9050

9100

9150

9200

MD 9047 TVD 6004.95
 INC 90.3 AZ 0.7
 VS 2859.54

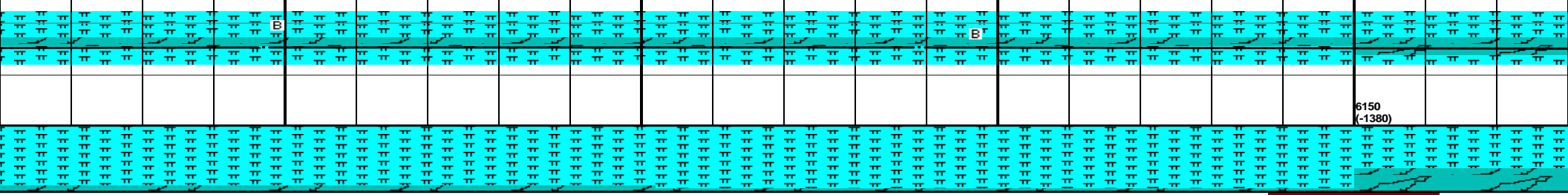
MD 9139 TVD 6005.27
 INC 89.3 AZ 359.7
 VS 2951.2

5200 TVD
 Sub Sea (-430)

9000-9100 Mrlst med-lt gy, sb bicky-bicky,
 mod frm, occ Ch gy-lt gy, mod frm, occ bent, v
 fnt mlky cut, 90% Mrlst, 10% Ch

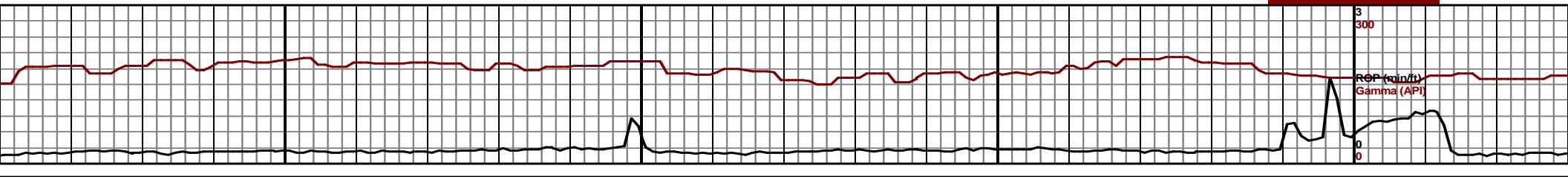
9100-9200 Mrlst med-lt gy, sb bicky-bicky,
 mod frm, occ Ch gy-lt gy, mod frm, occ bent, v
 fnt mlky cut, 95% Mrlst, 5% Ch

9200
 frm
 cut



5675
 (-905)

6150
 (-1380)

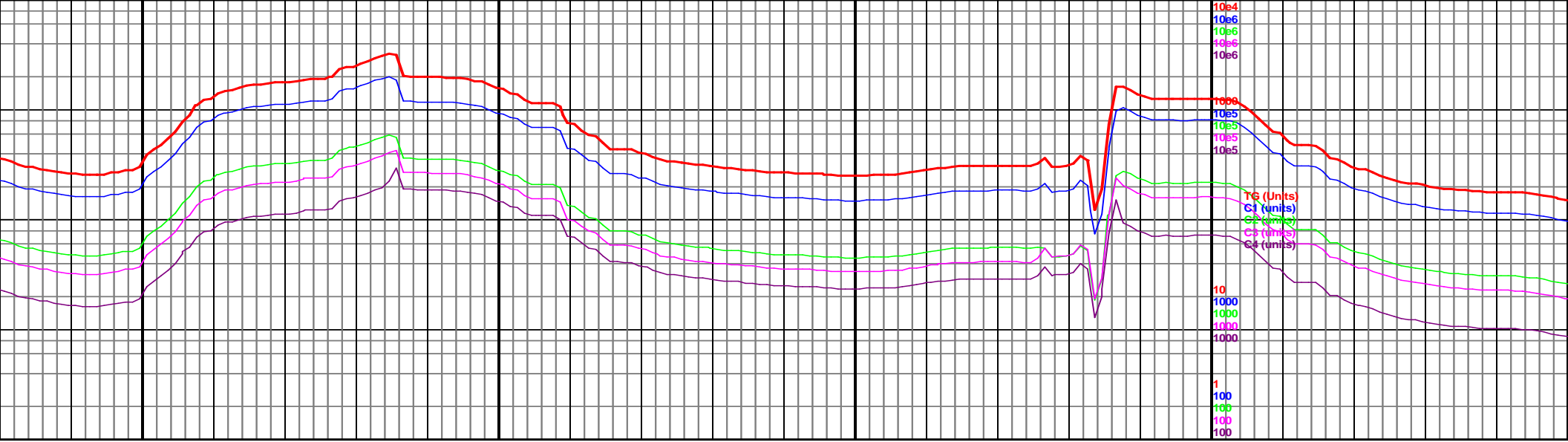


3

300

0

0



10e4
 10e6
 10e6
 10e6
 10e6
 10e6
 TG (Units)
 C1 (units)
 C2 (units)
 C3 (units)
 C4 (units)
 10
 1000
 1000
 1000
 1000
 1
 100
 100
 100
 100

9250

9300

9350

9400

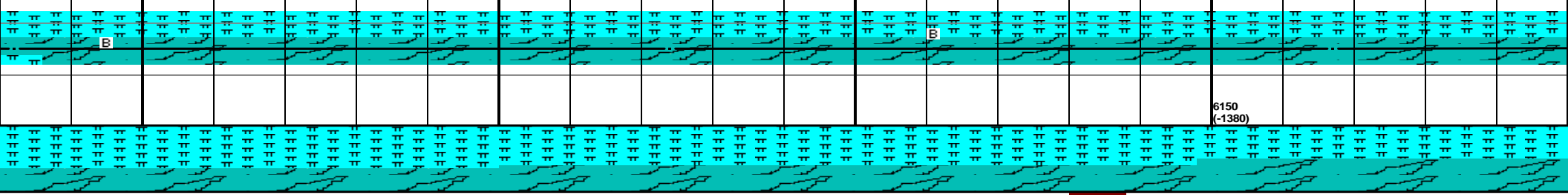
94

MD 9232 TVD 6005.68 INC 90.2 AZ 359.7 VS 3043.79		MD 9324 TVD 6005.76 INC 89.7 AZ 359.9 VS 3135.39		MD 9200 TVD 6006.49 Sub Sea (-430) VS 5675 (-905)	MD 9417 TVD 6006.49 INC 89.4 AZ 359.2 VS 3227.95
--	--	--	--	---	--

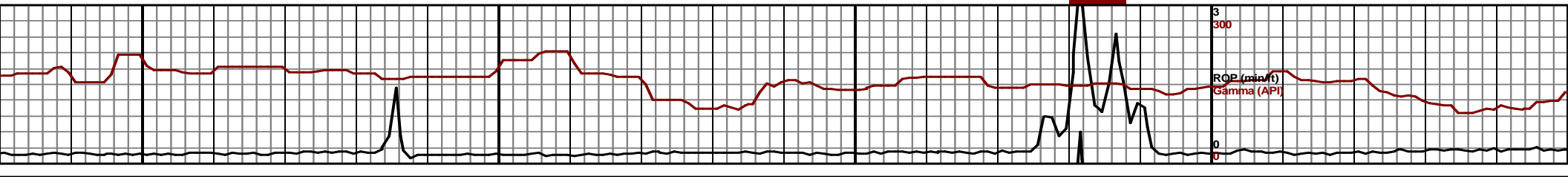
900-9300 Mrlst med-lt gy, sb bicky-bicky, mod
 fr, Ch gy-lt gy, mod frm, rr bent, med mlky
 cut, 70% Mrlst, 30% Ch

9300-9400 Mrlst med-lt gy, sb bicky-bicky,
 mod frm, Ch gy-lt gy, mod frm, tr bent, med
 mlky cut, 60% Mrlst, 40% Ch

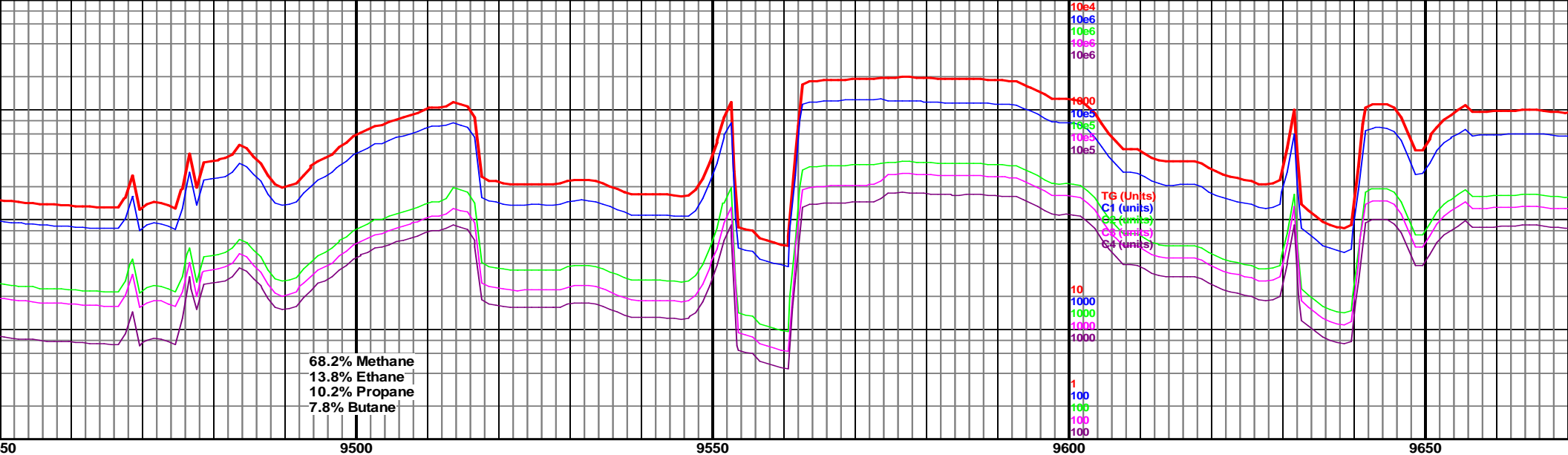
9400-9500 Mrlst med-lt
 mod frm, Ch gy-lt gy, m
 cut, 50% Ch, 50% Mrlst



6150 (-1380)



3
 300
 ROP (min/f)
 Gamma (API)
 0
 0

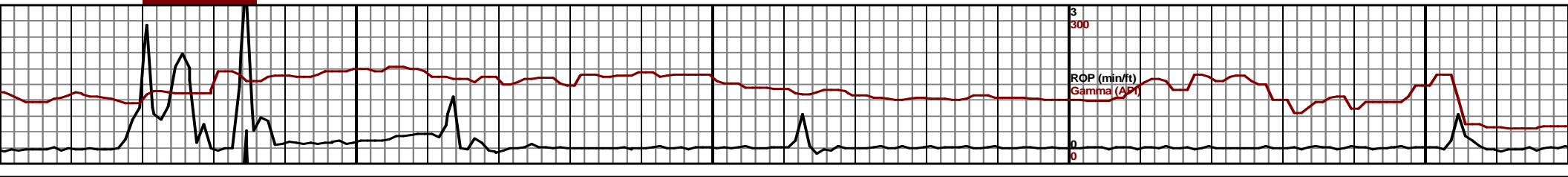
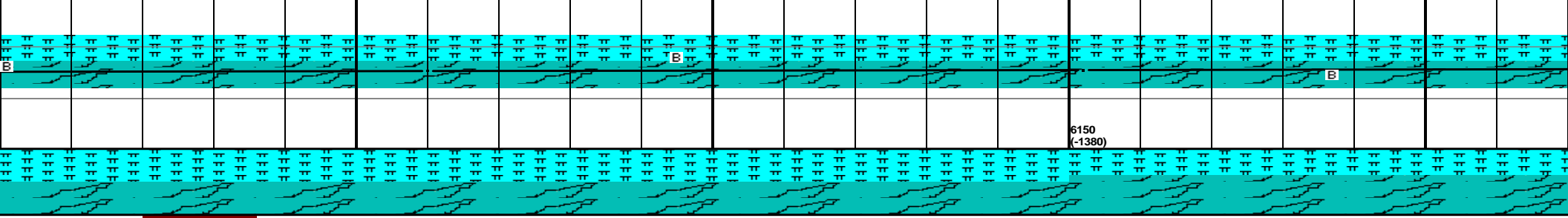


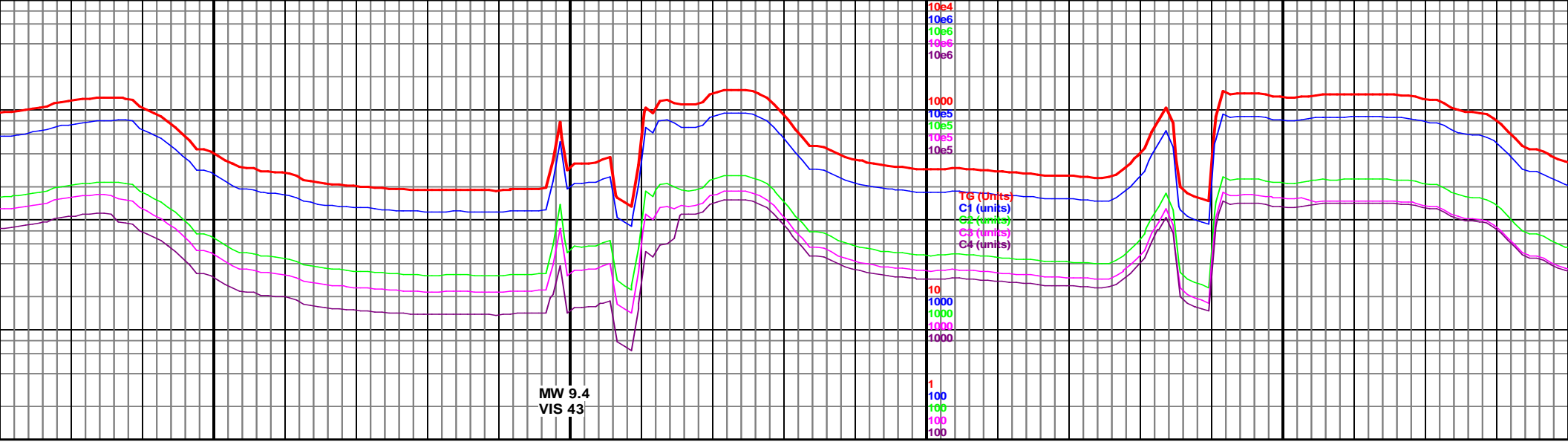
	MD 9510 TVD 6005.36 INC 92 AZ 0.5 VS 3320.54	MD 9602 TVD 6002.47 INC 91.6 AZ 359 VS 3412.09
--	--	--

gy, sb blkky-blkky, mod frm, tr bent, fnt mlky t

9500-9600 Mrist med-lt gy, sb blkky-blkky, mod frm, Ch gy-lt gy, mod frm, occ bent, dull grn, v fnt mlky cut, 50% Ch, 50% Mrist

9600-9700 Ch gy-lt gy, mod frm, sb blkky-sb pl Mrist med-lt gy, sb blkky-blkky, aa, tr bent, dull v fnt mlky cut, 60% Ch, 40% Marl





9700

9750

9800

9850

MD 9695 TVD 5999.71
INC 91.8 AZ 358.3
VS 3504.46

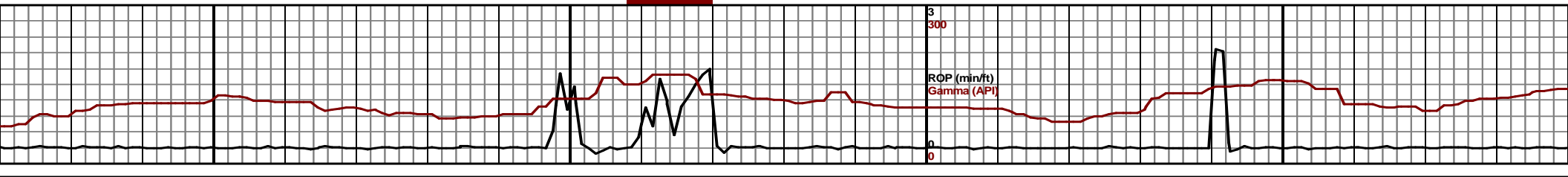
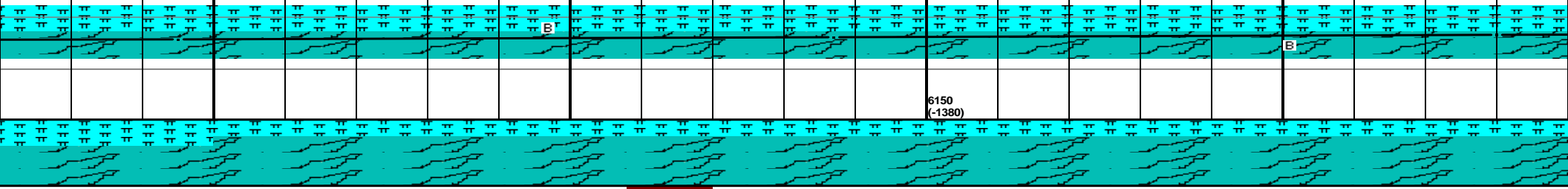
MD 9787 TVD 5996.09 TVD
INC 92.7 AZ 357 Sub Sea (-430)
VS 3595.61

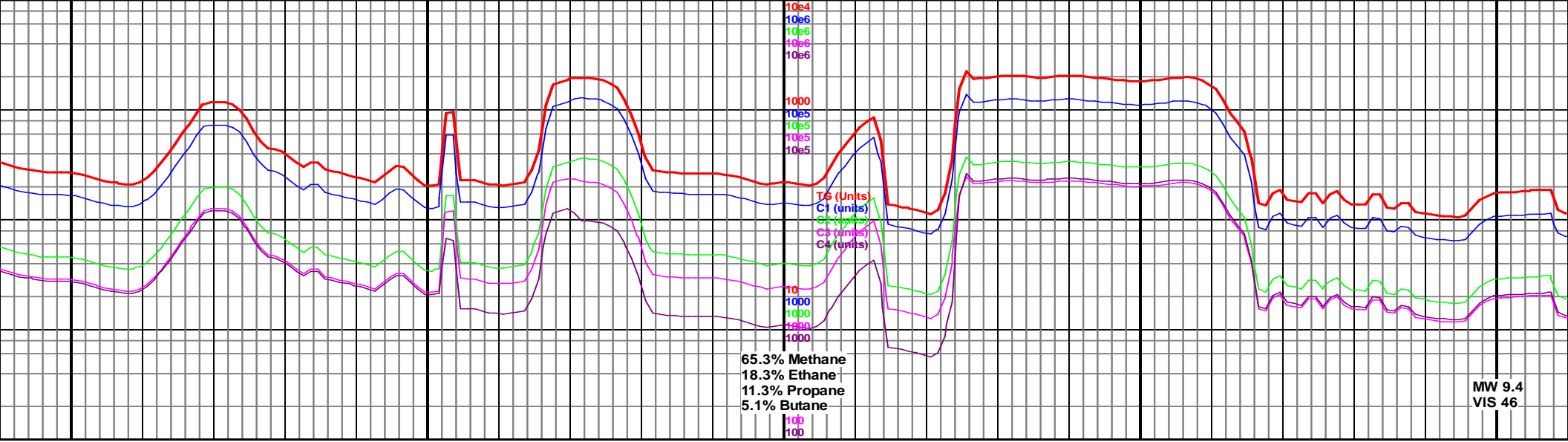
MD 9880 TVD
INC 92.9 AZ
VS 3687.44

ty,
grn,

9700-9800 Ch gy-lt gy, mod frm, sb blk-y-sb plty,
Mrlst med-lt gy, sb blk-y-blky, aa, tr bent, dull grn,
v fnt mlky cut, 75% Ch, 25% Marl

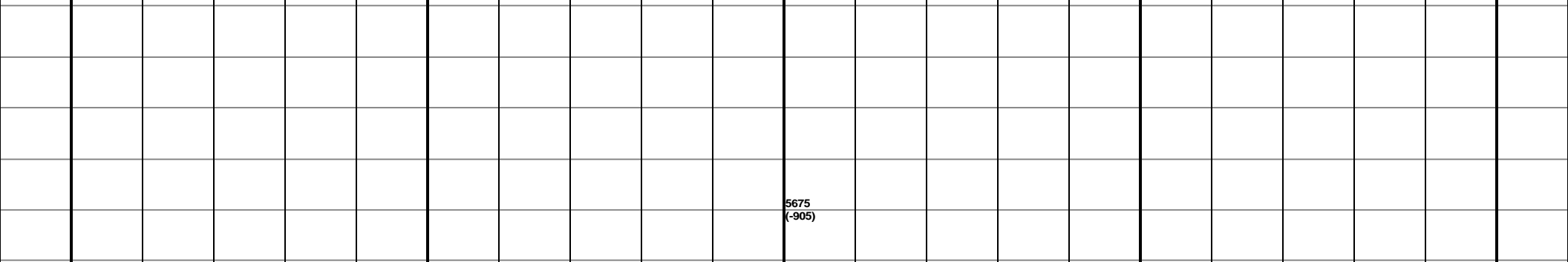
9800-9900 Ch gy-lt gy, sb blk-y-sb plty, mod frm,
Mrlst med-lt gy, sb blk-y-blky, aa, rr bent, dull grn, v
fnt mlky cut, 75% Ch, 25% Marl





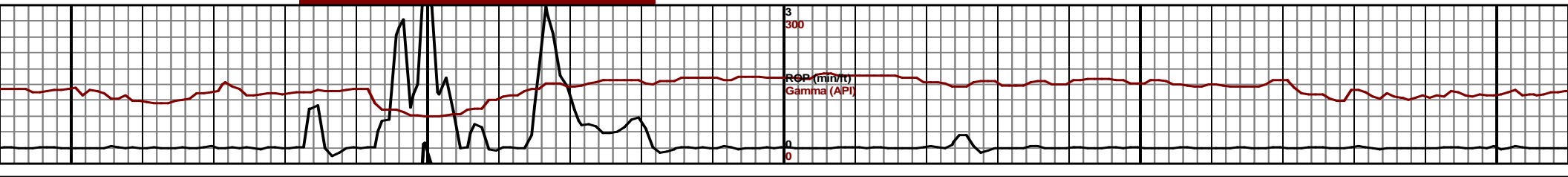
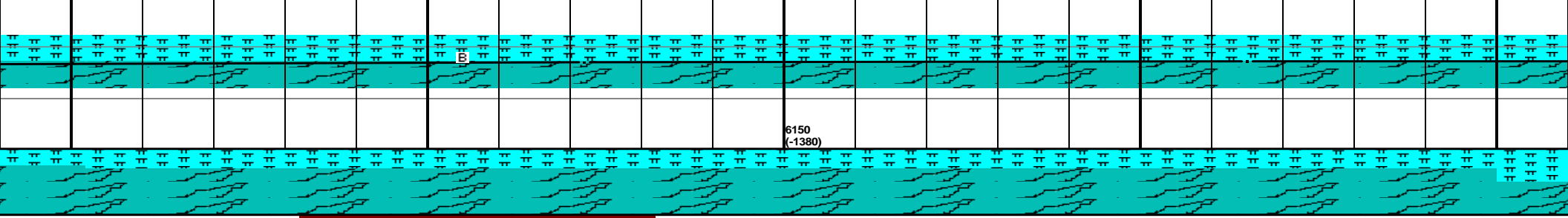
9900 9950 10000 10050 10100

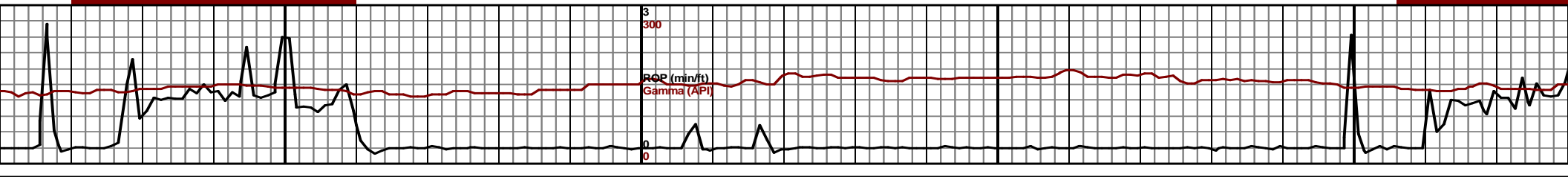
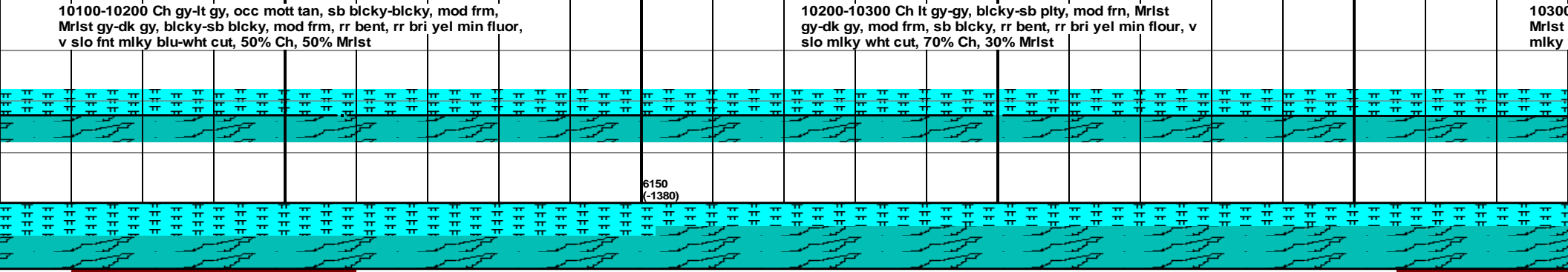
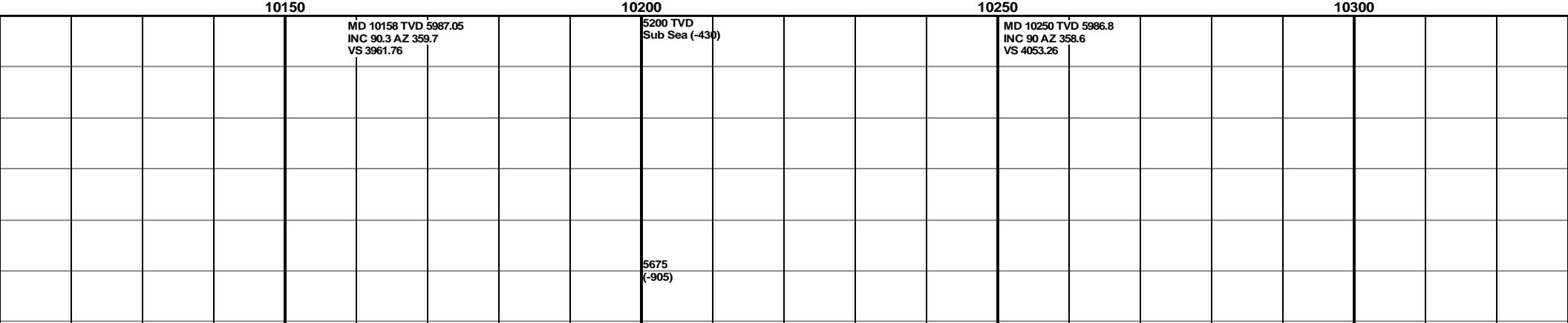
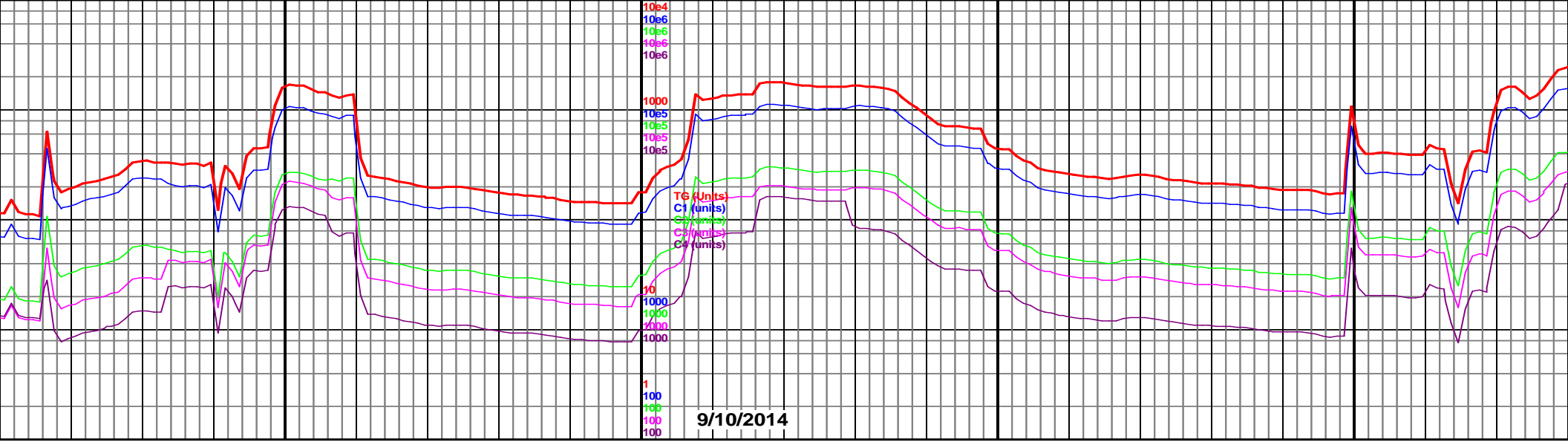
5991.55
 355.9
 MD 9972 TVD 5988.02
 INC 91.5 AZ 355.9
 VS 3778.18
 5200 TVD
 Sub Sea (-430)
 MD 10065 TVD 5987.05
 INC 89.7 AZ 354.2
 VS 3869.74

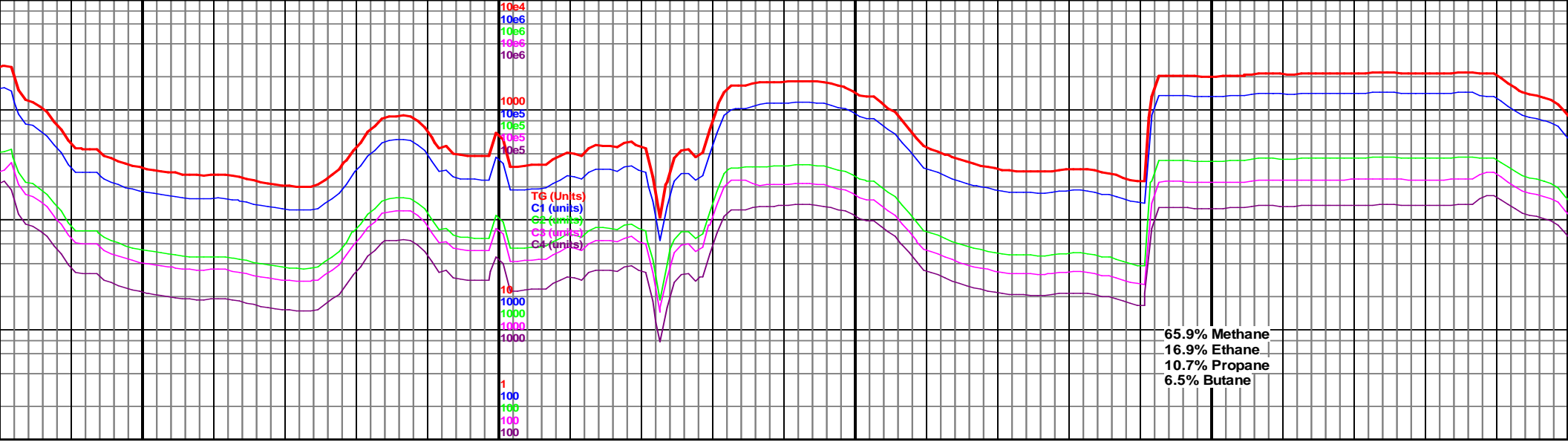


9900-10000 Ch med-lt gy, bicky-sb bicky, mod frm, Mrlst gy-dk
 gy, sb bicky-bicky, rr bent, dull grn, rr bri yel min fluor, v slo fnt
 mlky blu-wht cut, 70% Ch, 30% Mrlst

10000-10100 Ch med-lt gy, bicky-sb bicky, mod frm, Mrlst
 gy-dk gy, sb bicky-bicky, rr bent, dull grn, rr bri yel min fluor, v
 slo fnt mlky blu-wht cut, 70% Ch, 30% Mrlst

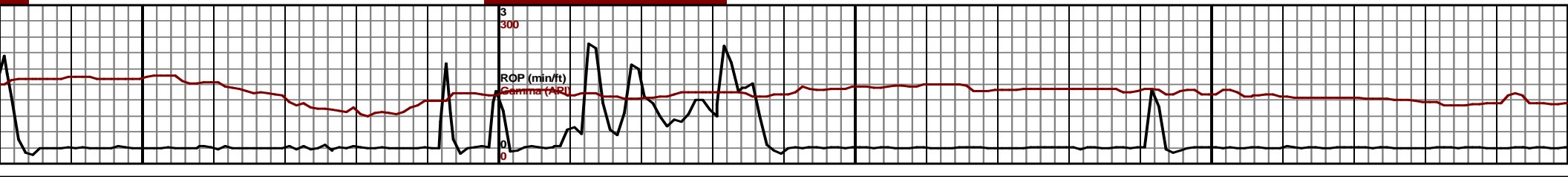
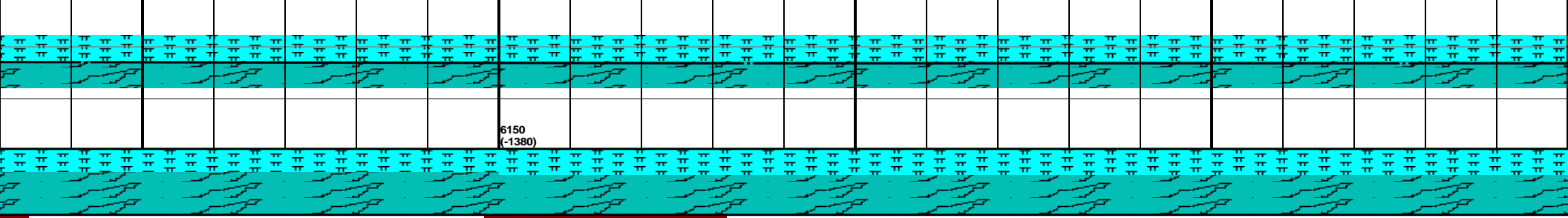


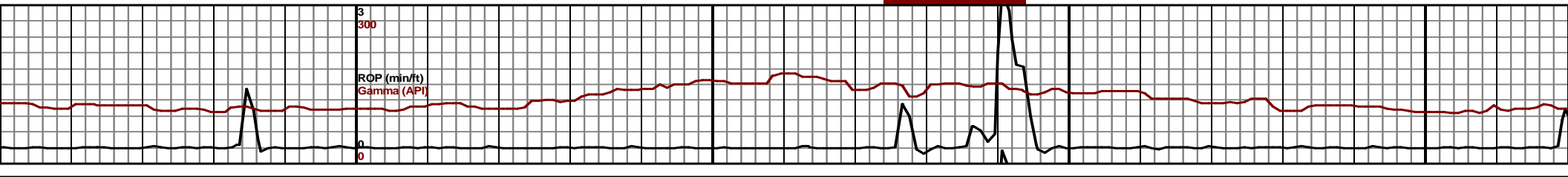
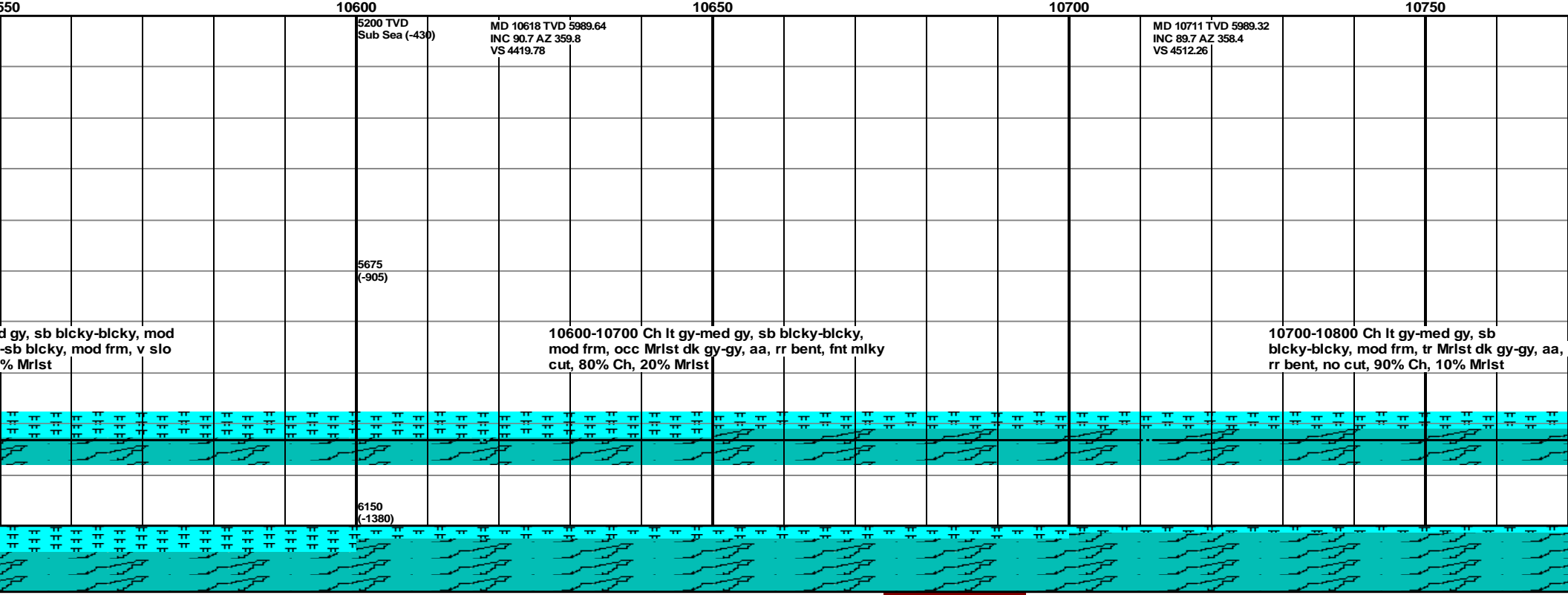
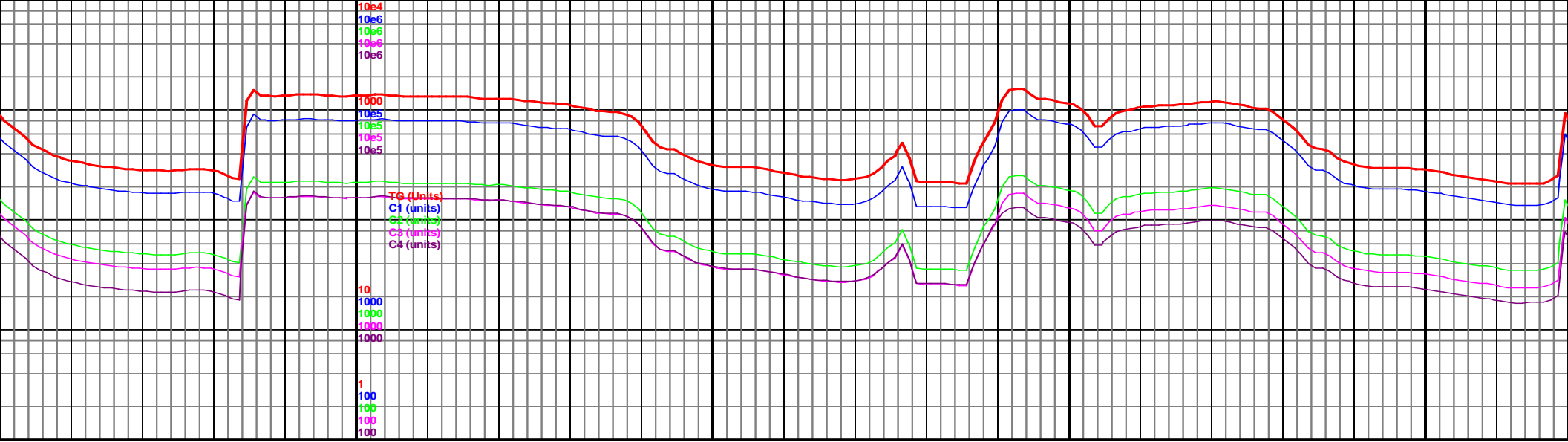


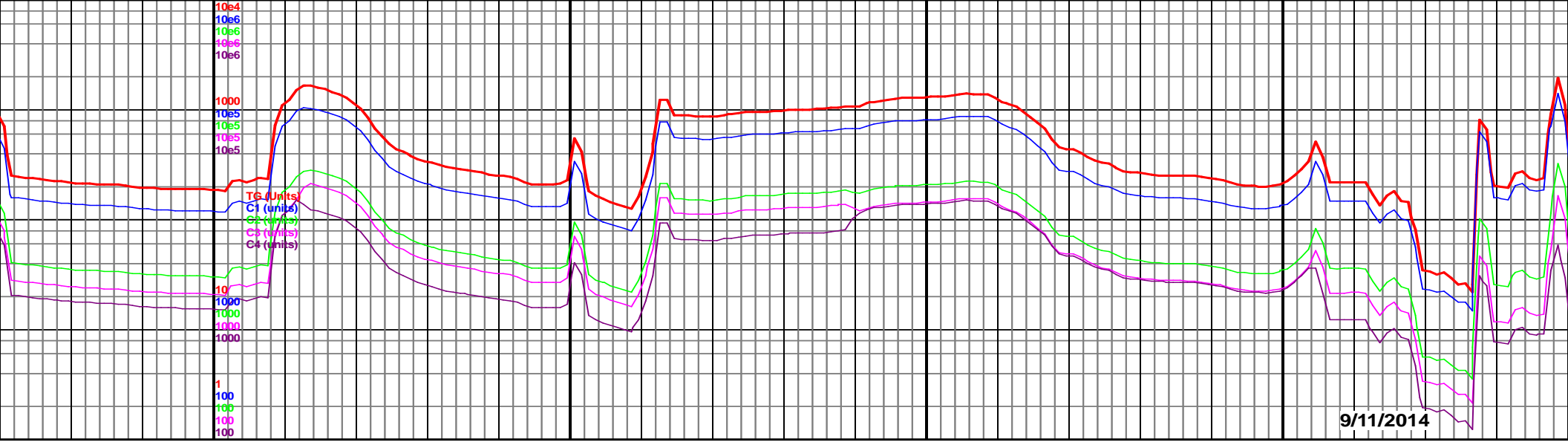


10350 MD 10342 TVD 5988.65 INC 87.7 AZ 0.8 VS 4144.82	10400 5200 TVD Sub Sea (-430)	10450 MD 10435 TVD 5990.52 INC 90 AZ 0.4 VS 4237.51	10500	MD 10527 TVD 5990.36 INC 90.2 AZ 359.9 VS 4329.17	10550
--	-------------------------------------	--	-------	---	-------

0-10400 Ch lt-med gy, sb blkky-blkky, mod frm, mdk gy-gy, mod frm, sb blkky-blkky, mod frm, v slo wht cut, 70% Ch, 30% Mrlst
 10400-10500 Ch lt gy-med gy, occ mott tan-lt brn, blkky-sb blkky, mod frm, Mrlst dk gy-gy, sb blkky-blkky, mod frm, v slo mlky cut, 60% Ch, 40% Mrlst
 10500-10600 Ch lt gy-med frm, Mrlst dk gy-gy, blkky mlky wht cut, 60% Ch, 40% Mrlst







10800

10850

10900

10950

5200 TMD 10804 TVD 5989.72
 Sub S INC 89.8 AZ 358.6
 VS 4604.64

MD 10896 TVD 5991.57
 INC 87.9 AZ 356.6
 VS 4695.83

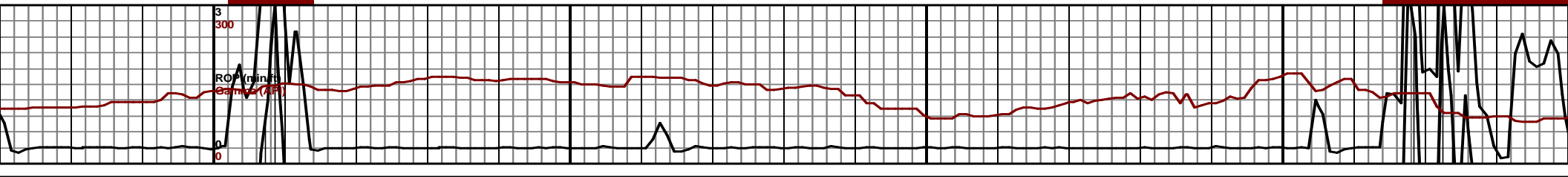
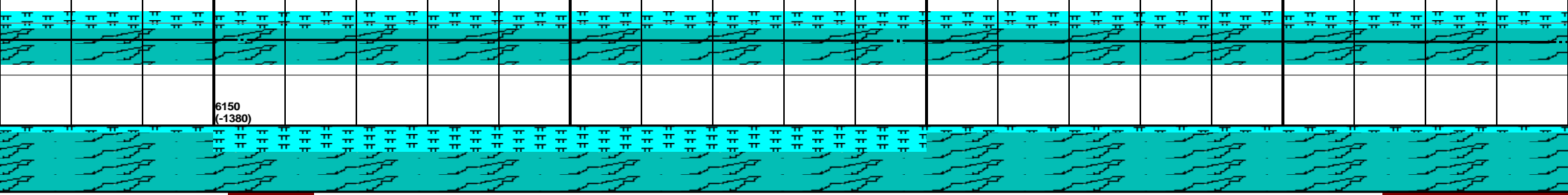
TOOH for agitation and new B
 10970' MD 15:05, 9/10/2014
 Resume Drilling at 05:10, 9/11/2014

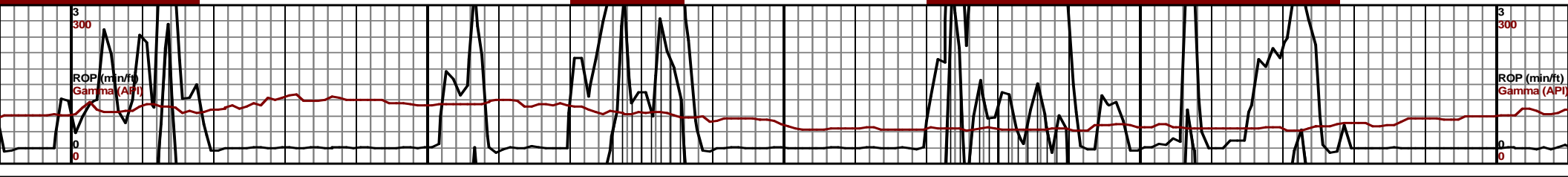
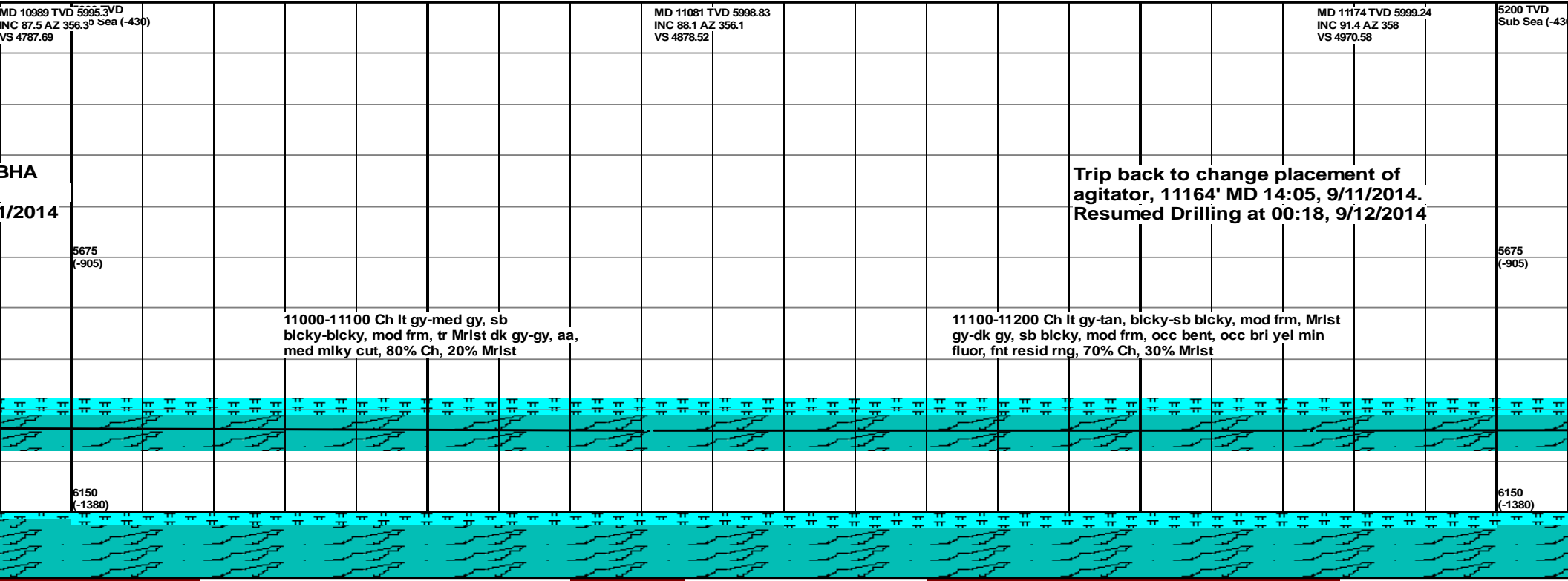
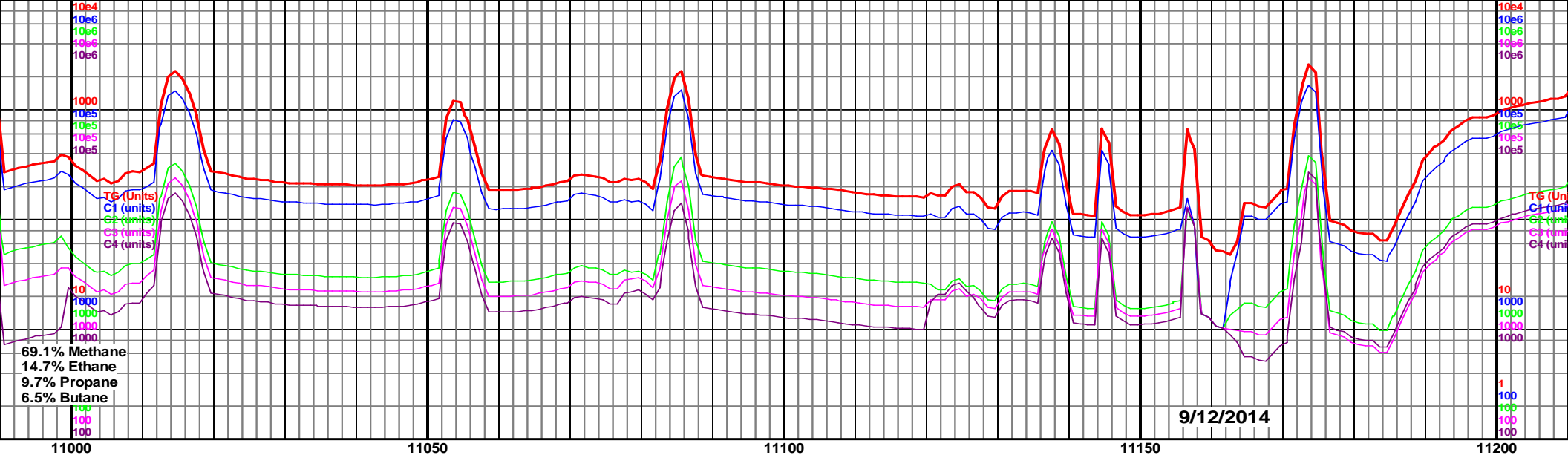
10800-10900 Ch lt gy-med gy, sb
 bicky-bicky, mod frm, Mrlst dk gy-gy, aa, no
 cut, 60% Ch, 40% Mrlst

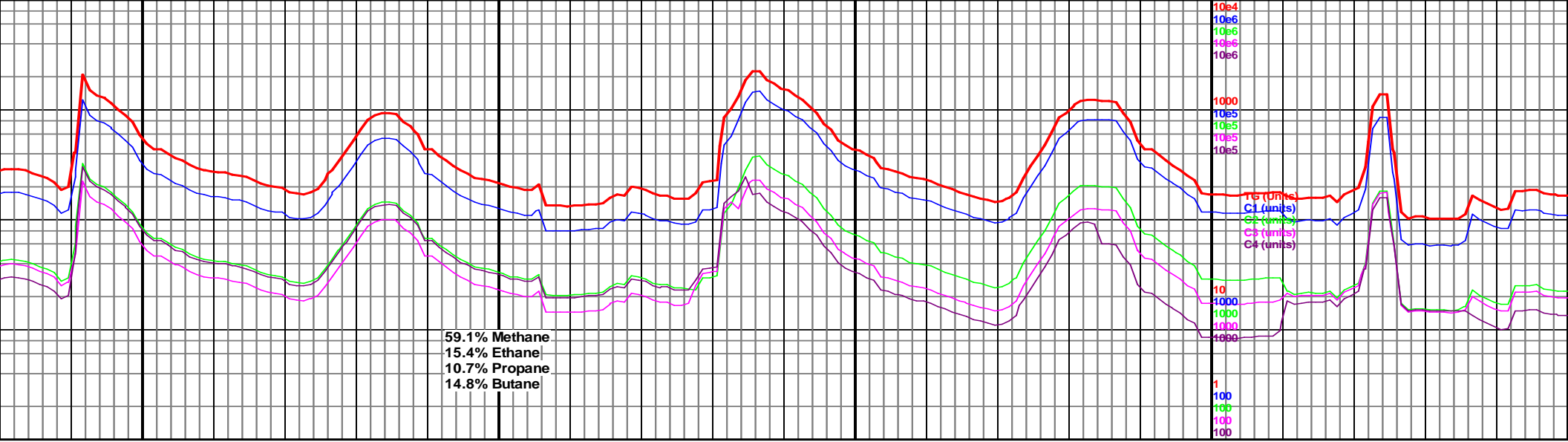
10900-11000 Ch lt gy-med gy, sb
 bicky-bicky, mod frm, tr Mrlst dk gy-gy, aa,
 fst mlky cut, 90% Ch, 10% Mrlst

5675
 (-905)

6150
 (-1380)





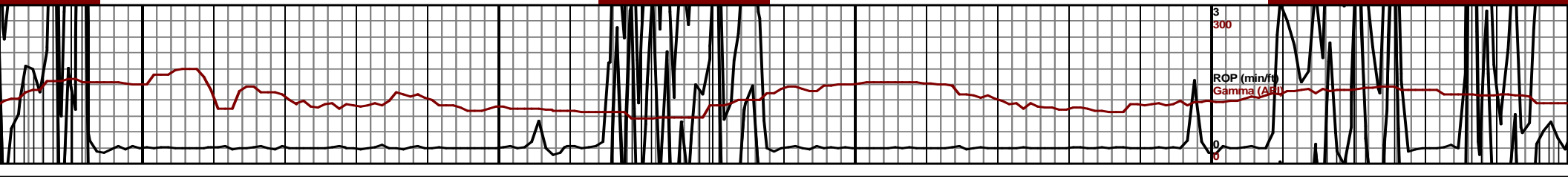
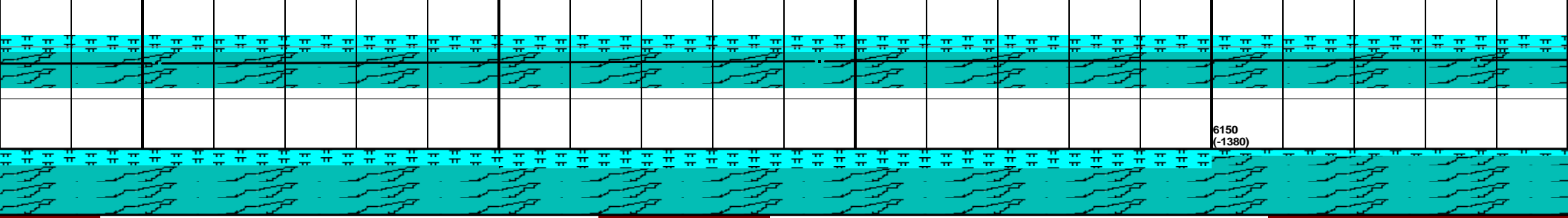


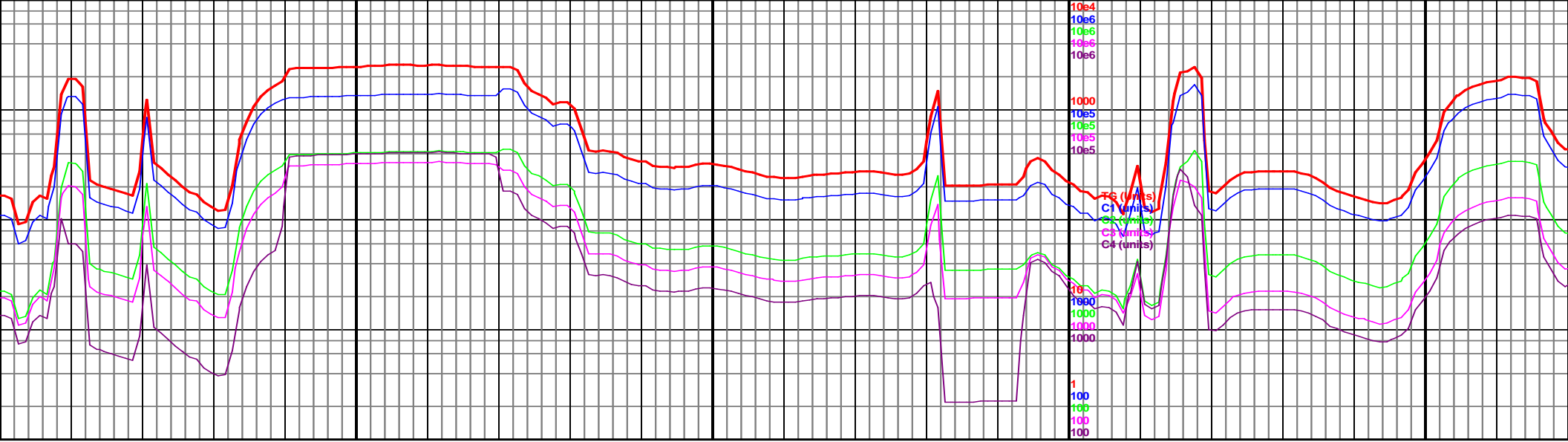
11450	MD 11452 TVD 5989.38 INC 92.2 AZ 358.2 VS 5246.23	11500	MD 11545 TVD 5986.38 INC 91.5 AZ 358 VS 5338.48	11550	MD 11637 TVD 5986.38 INC 91.6 AZ 358.2 VS 5429.81
-------	---	-------	---	-------	---

11450-11500 Ch, med gy, occ grdg lt gy-tan, sb
y-blky, mod frm, Mrlst, med-dk gy, aa, slo
y cut, 75% Ch, 25% Mrlst

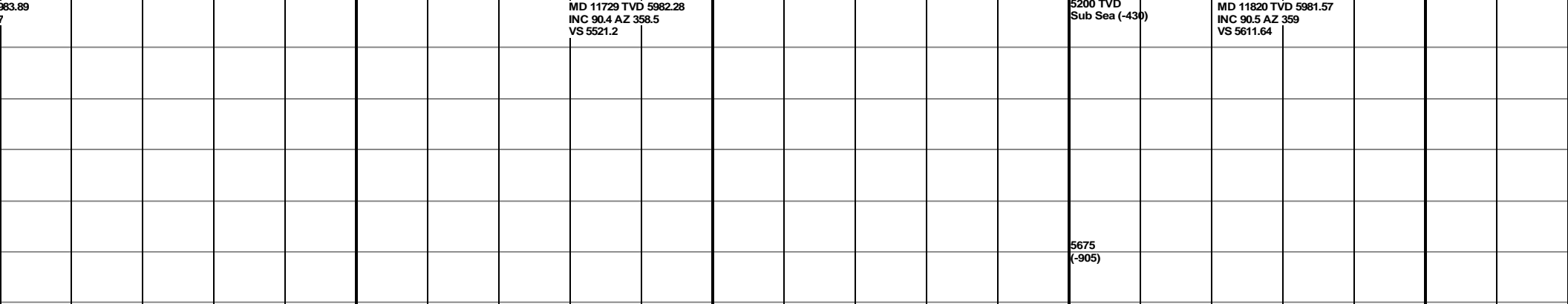
11500-11600 Ch, med gy, occ lt gy, sb
blky-blky, mod frm, Mrlst, med-dk gy, aa,
fst mlky cut, 70% Ch, 30% Mrlst

11600-11700 Ch, med-l
frm, Mrlst, med-dk gy, s
slo mlky cut, 90% Ch, 10% Mrlst





1150 1170 1175 1180 1185



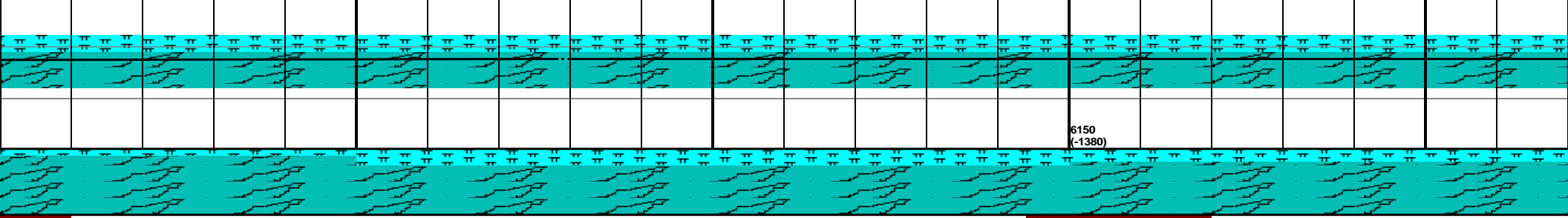
1183.89

MD 11729 TVD 5982.28
INC 90.4 AZ 358.5
VS 5521.2

5200 TVD
Sub Sea (-430)

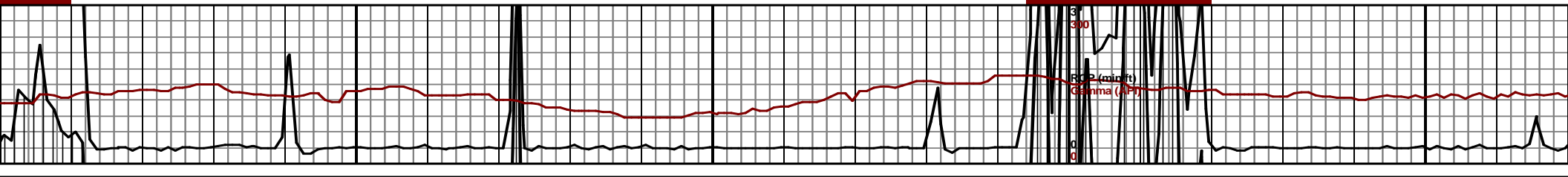
MD 11820 TVD 5981.57
INC 90.5 AZ 359
VS 5611.64

0% Mrlst
11700-11800 Ch lt gy-gy, occ tan-lt brn, sb blkky-sb plty, mod frm, Mrlst, gy-dk gy, sb blkky-blcky, mod frm, v slo dull yel cut, 75% Ch, 25% Mrlst
11800-11900 Ch lt gy-tan, occ lt brn, sb blkky-blcky, mod frm, Mrlst, gy-dk gy, sb blkky-blcky, mod frm, slo dul yel cut, 80% Ch, 20% Mrlst

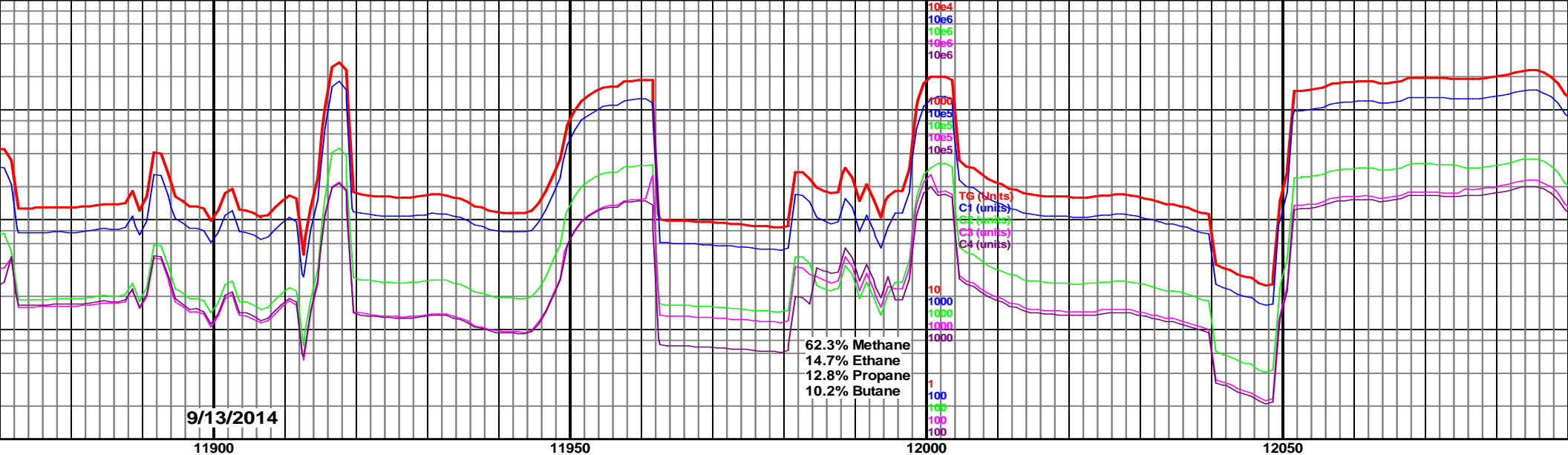


5675
(-905)

6150
(-1380)



300
RCP (mgmt)
Gamma (API)
0

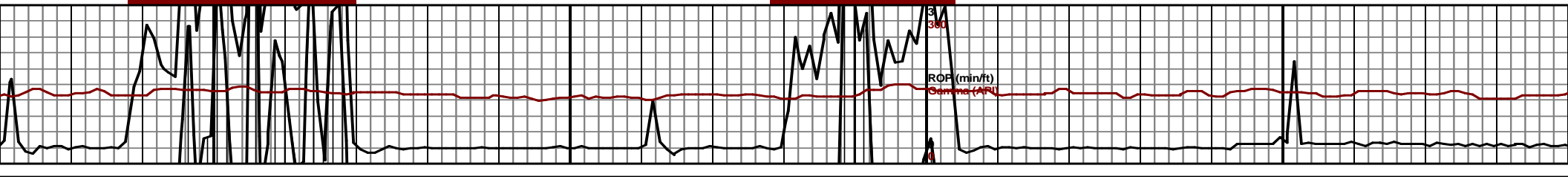
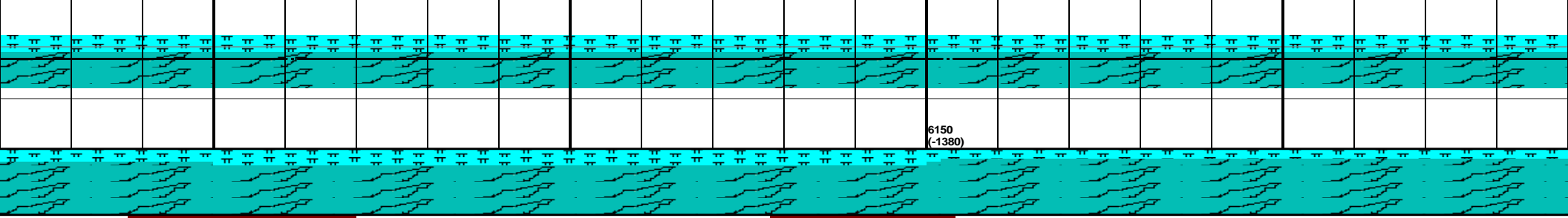


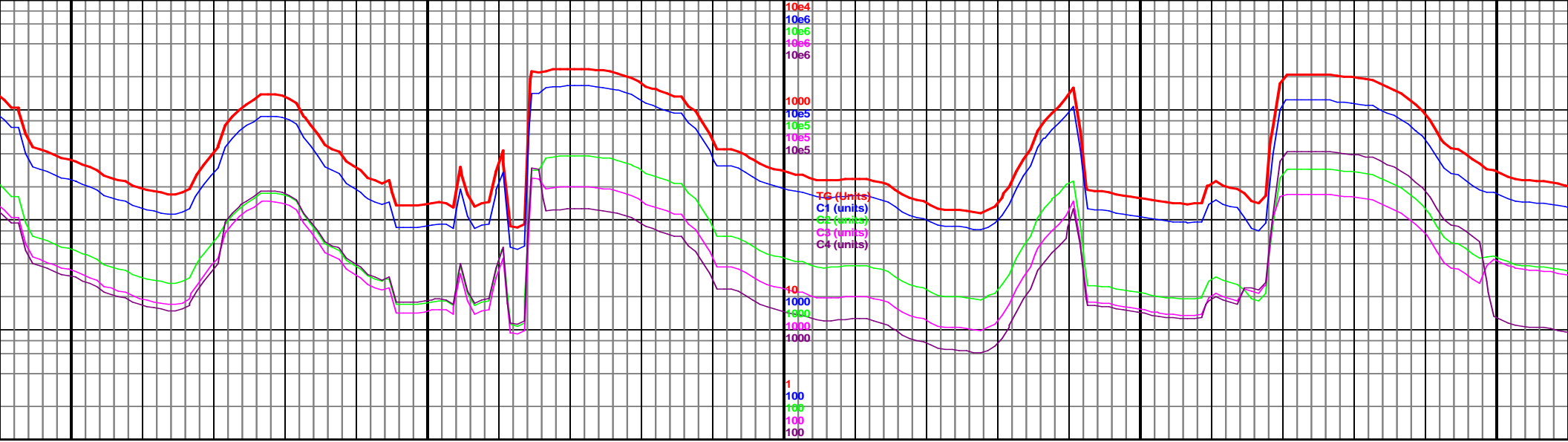
	MD 11911 TVD 5981.65 INC 89.4 AZ 0.6 VS 5702.24		5200 MD 12003 TVD 5982.05 Sub INC 90.1 AZ 3.1 VS 5794.08
--	---	--	--

sb plty, frm, v

11900-12000 Ch lt gy-gy, occ tan, sb bicky-bicky, mod frm, Mrlst, gy-dk gy, sb bicky-bicky, mod frm, v slo dul yel cut , 75% Ch, 25% Mrlst

12000-12100 Ch lt gy-gy, occ tan, bicky-sb bicky, mod frm, Mrlst dk gy-gy, bicky, mod frm, slo mlky wht cut 80% Ch, 20% Mrlst





12100

12150

12200

12250

12300

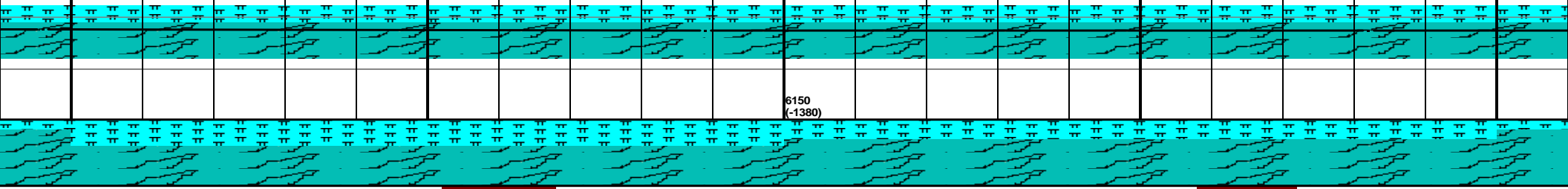
MD 12096 TVD 5982.7
INC 89.1 AZ 1.1
VS 5886.95

MD 12189 TVD 5983.27D
INC 90.2 AZ 0.8
VS 5979.7

MD 12282 TVD 5983.59
INC 89.4 AZ 0.6
VS 6072.42

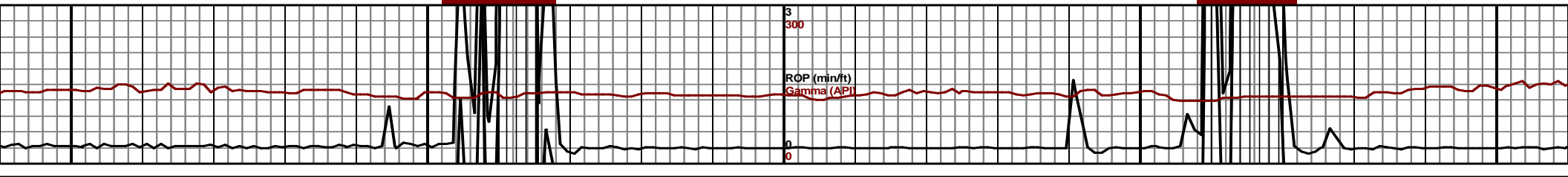
12100-12200 Ch lt gy-gy, occ tan, bcky-sb
bcky, mod frm, Mrlst dk gy-gy, bcky, mod
frm, slo mlky cut 60% Ch, 40% Mrlst

12200-12300 Ch lt gy-gy, occ tan, bcky-sb
bcky, mod frm, Mrlst dk gy-gy, bcky, mod frm, v
slo mlky cut, 65% Ch, 35% Mrlst



5675
(-905)

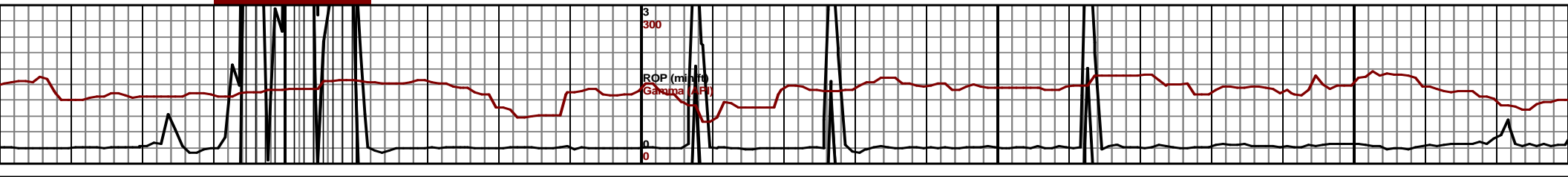
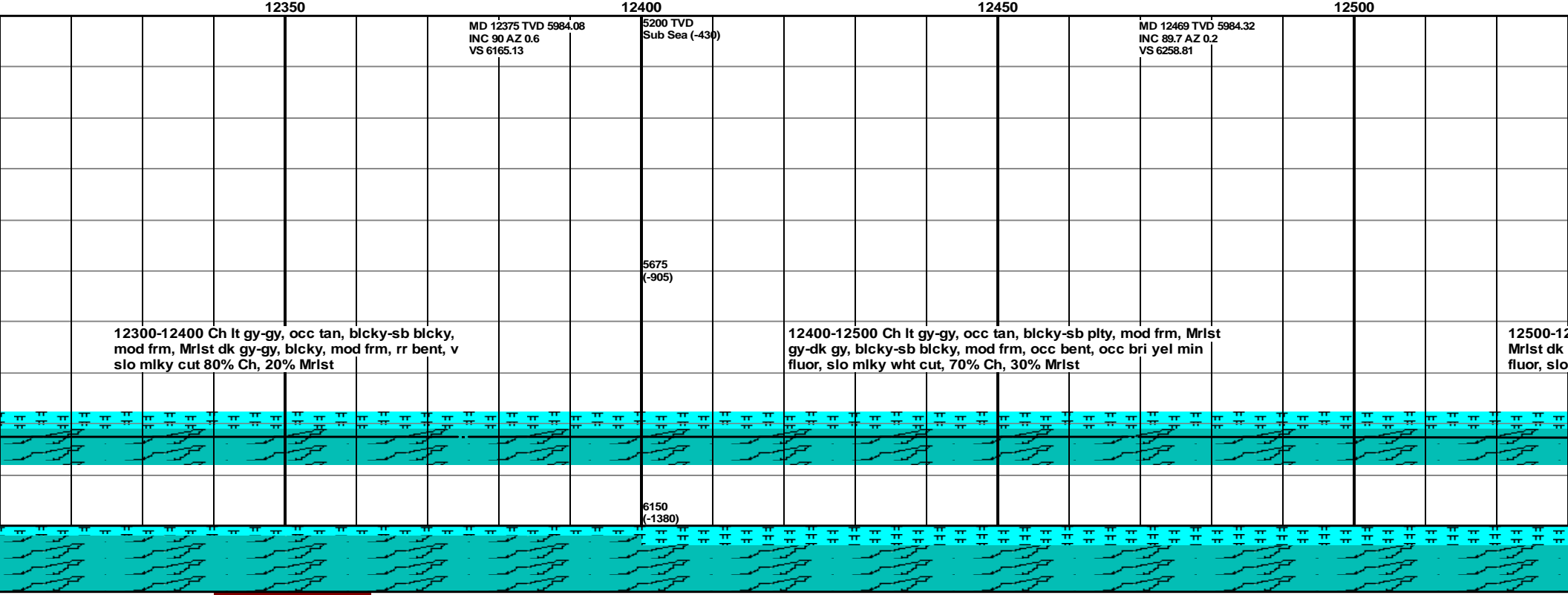
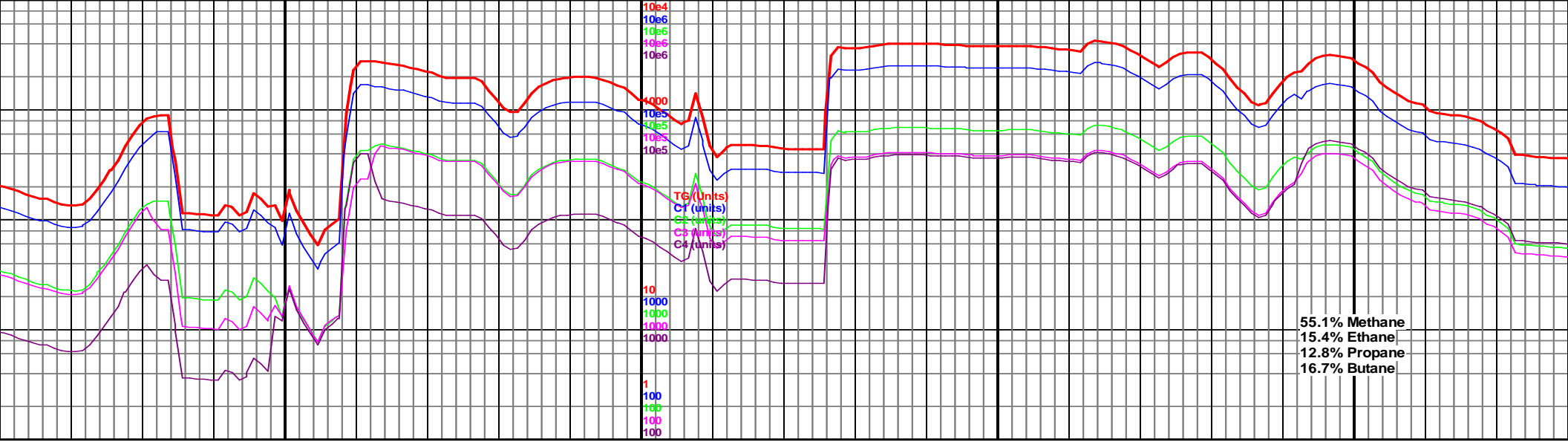
6150
(-1380)

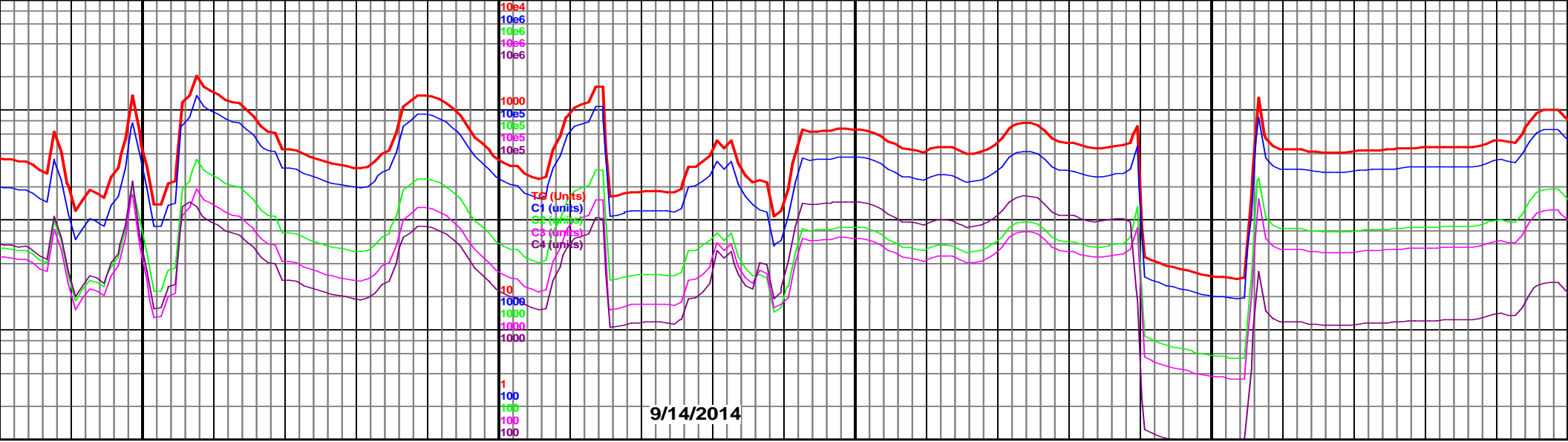


3
300

ROP (min/ft)
Gamma (API)

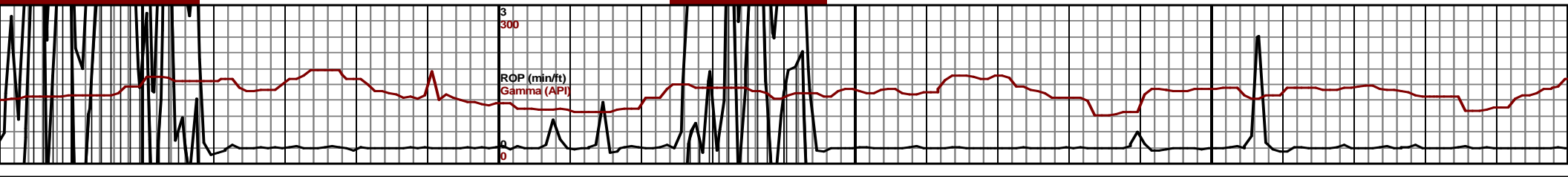
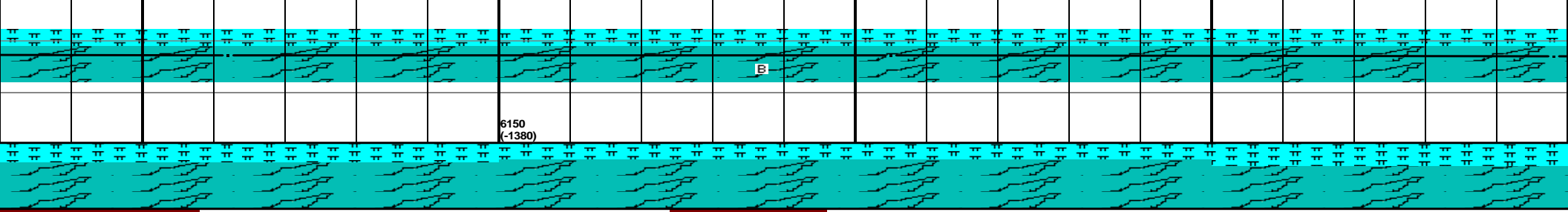
0
0

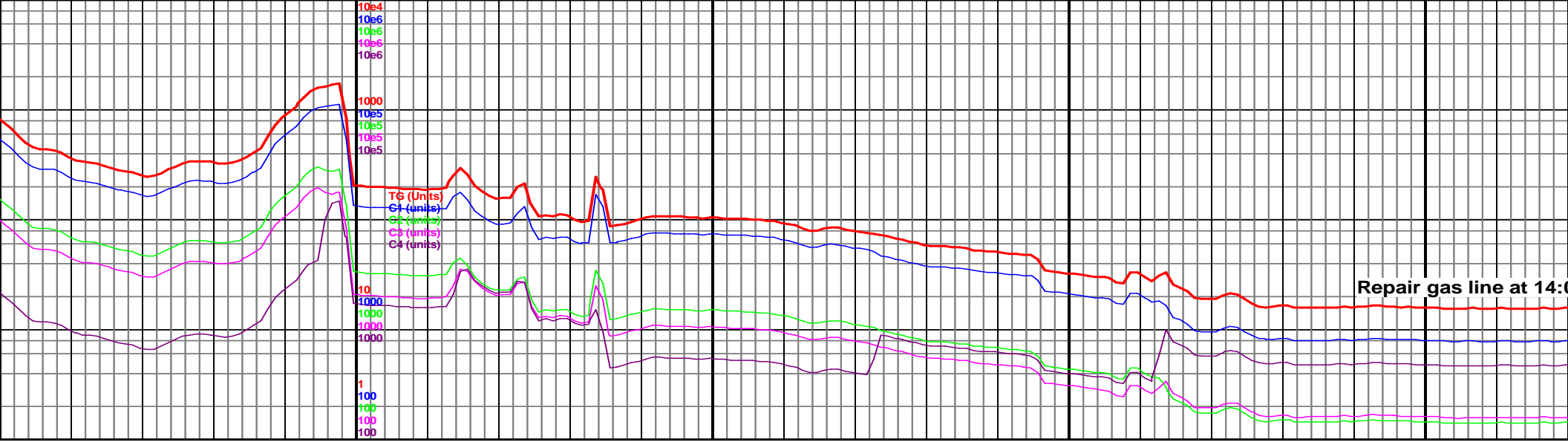




	MD 12562 TVD 5985.22 INC 89.2 AZ 1.5 VS 6351.55	5200 TVD Sub Sea (-430) 5675 (-905)	MD 12655 TVD 5986.43 INC 89.3 AZ 1.5 VS 6444.36	M IN V
--	---	--	---	--------------

12600 Ch gy-lt gy, occ tan, sb bicky-bicky, mod frm, gy-gy, bicky, mod frm, rr tr bent, tr bri yrl min mlky wht cut 70% Ch, 30% Mrlst
 12600-12700 Ch lt gy-gy, bicky-sb bicky, mod frm, Mrlst gy-dk gy, bicky, mod frm, rr tr bent, rr bri yel min fluor, slo mlky wht cut, 75% Ch, 25% Mrlst
 12700-12800 Ch gy-lt gy frm, Mrlst gy-dk gy, sb b mlky wht cut 60% Ch, 40% Mrlst

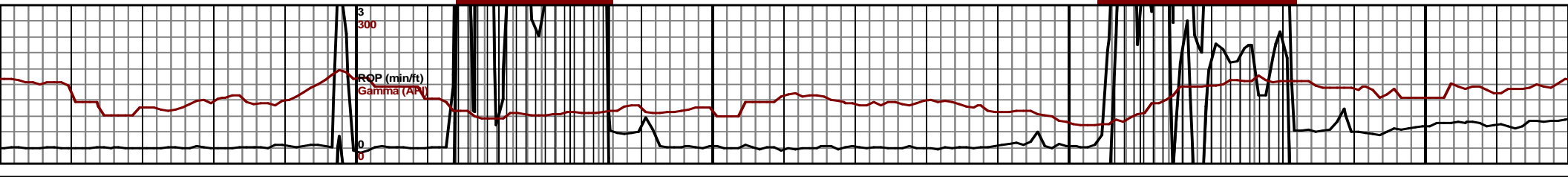
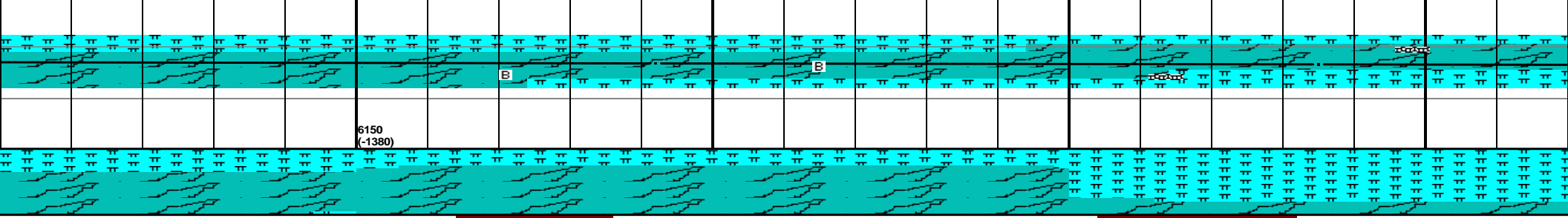


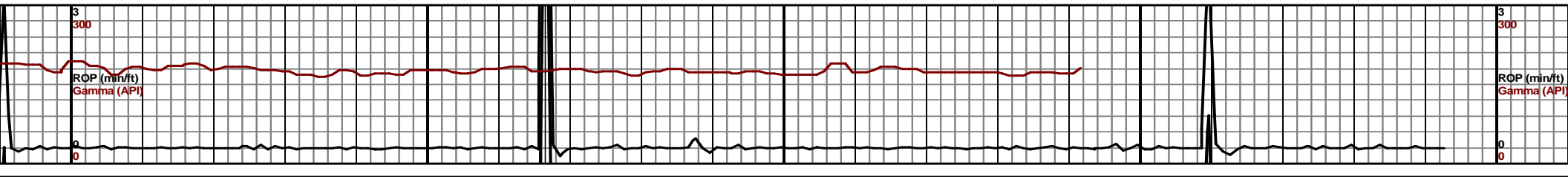
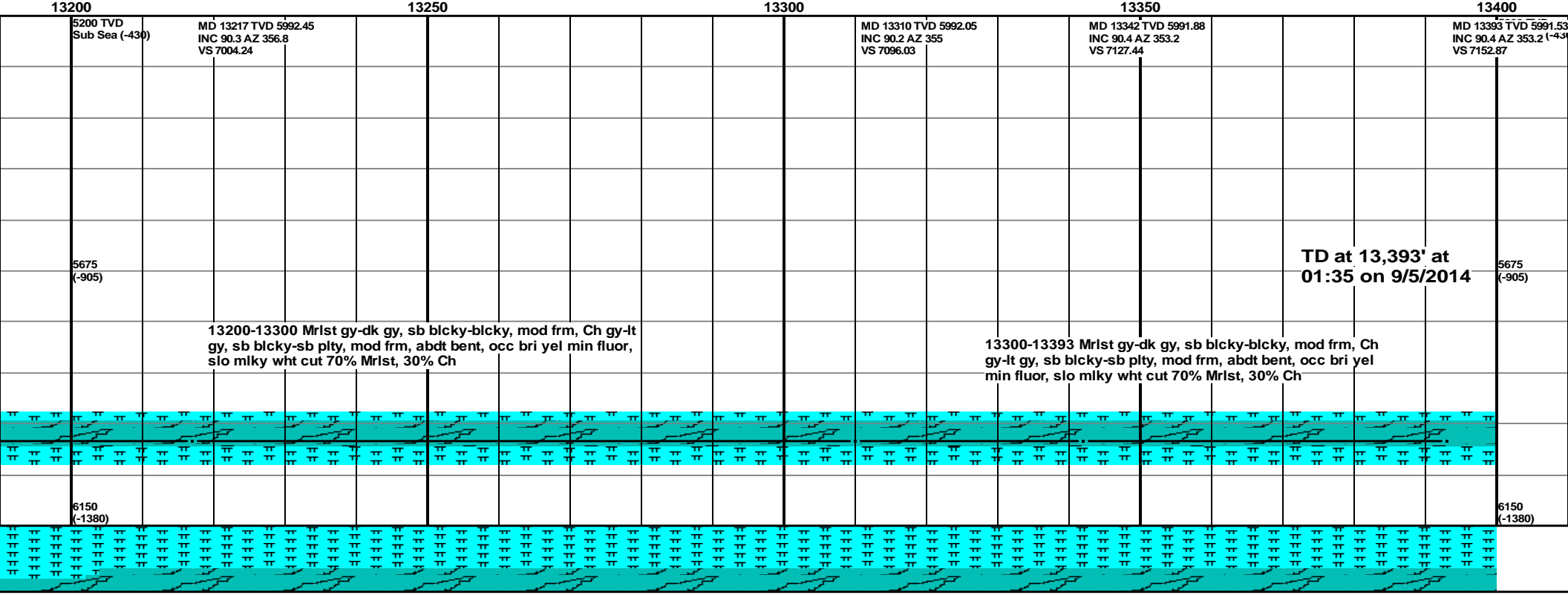
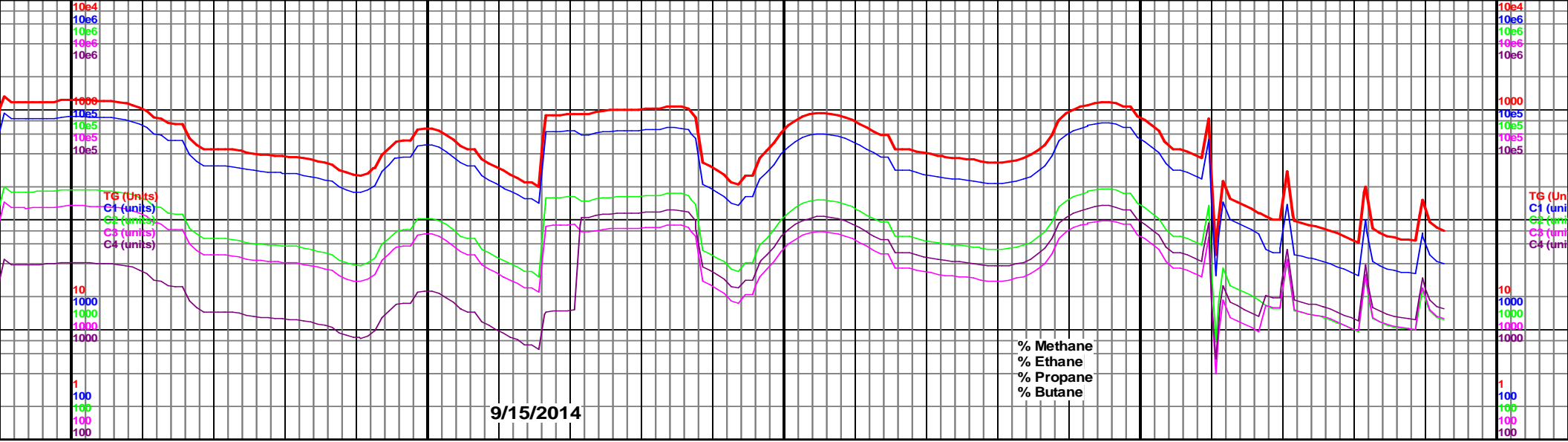


750 12800 12850 12900 12950

<p>ID 12748 TVD 5988.38 INC 88.3 AZ 0.9 VS 6537.12</p>	<p>5200 TVD Sub Sea (-430)</p>	<p>MD 12842 TVD 5990.92 INC 88.6 AZ 0.5 VS 6630.81</p>	<p>MD 12935 TVD 5992.71 INC 89.2 AZ 0.9 VS 6723.51</p>
--	------------------------------------	--	--

blcky-sb blcky, mod blcky, mod frm, v slo % Mrlst
 12800-12900 Ch gy-lt gy, blcky-sb blcky, mod frm, Mrlst gy-dk gy, sb blcky, aa, tr bent, tr yel min fluor, v slo mlky wht cut, 70% Ch, 30% Mrlst
 12900-13000 Mrlst gy-dk gy, sb blcky, mod frm, Ch blky-sb blky, mod frm, abnt bent, dull grn, occ bri y fluor, fnt resdl fluor, 80% Mrlst, 20% Ch







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

Well Name: Wolf 12L-0103
API: 05-123-3942101
Location: NWSW 27-T10N-R59W Weld County, Colorado
License Number: 05-123-3942101
Spud Date: 8/25/2014
Surface Coordinates: Lat.: 40.852944 Long.: -103.934211

Region: Redtail Field
Drilling Completed: 9/15/2014

Bottom Hole Coordinates: Lat.: 40.873983 Long.: -103.931842
Ground Elevation (ft): 4953
Logged Interval (ft): 5450 To: 13393
Formation: Pierre, Sharon Springs, Niobrara, N100
Type of Drilling Fluid: Water Based Mud
K.B. Elevation (ft): 4770
Total Depth (ft): 13393

Printed by HORIZONTAL.LOG 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: Craig Dreiling, Jim Wenger, Brendan Donahue
Company: Acme Geologic Consulting
Address: 108 Berry Street
Little Rock, AR 72205

Drilling Company

Pioneer #54


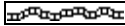
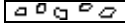

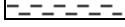








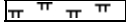


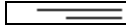






Gas Detection

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

 Anhy  Bent  Brec  Cht  Clyst	 Coal  Congl  Dol  Gyp  Igne	 Lmst  Meta  Cyan mrlst  Mrlst  Salt	 Shale  Shcol  Shgy  Sltst  Ss	 Till  Cyan chk  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  Gyp  Ls  Mrst	 Sltstrg  Ssstrg TEXTURE  Boundst  Chalky  Cryxln  Earthy  Finexln  Grainst  Lithogr  Microxln  Mudst  Packst  Wackest
---	---	---	---	--

OTHER SYMBOLS

- POROSITY**
E Earthy
□ Fenest
F Fracture
X Inter
M Moldic
O Organic

- P Pinpoint
V Vuggy

- SORTING**
W Well
M Moderate
P Poor

- ROUNDING**
R Rounded
r Subrnd
a Subang
A Angular

- OIL SHOW**
● Good
◐ Fair
◑ Poor

- INTERVAL**
■ Core

- ▣ Dst

- EVENT**
▤ Rft
▥ Sidewall

TG, C1-C4

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

10e4
 10e6
 10e6
 10e6
 10e6
 1000
 10e5
 10e5
 10e5
 10e5

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

10
 1000
 1000
 1000
 1000

1
 100
 100
 100
 100

9/1/2014

10e4
 10e6
 10e6
 10e6
 10e6
 1000
 10e5
 10e5
 10e5
 10e5

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

10
 1000
 1000
 1000
 1000

1
 100
 100
 100
 100

Wt 10.2
 Vis 42

9/2/2014

Depth

00

5350

5400

5450

5200 TVD
 Sub Sea (-430)

Acme Geologic Consulting
 arrived and rigged up on
 8/25/2014

5200 TVD
 Sub Sea (-430)

TOOH at 15:17 on 9/1/2014 and
 5486' MD after time drill off whip
 stock for new bit. Resumed drilling
 at 03:50 on 9/2/2014

KOP 5432' reached at 12:55,
 on 9/1/2014

5432-5450 Slstst dk gy, frm, sb blk-sb
 plty, nsfoc, sltst 85%, cmnt 15%

5450-5500 Slstst dk gy, frm-mod frm,
 blk, occ sb plty, NSOFC, sltst 100%

Well Bore Cross Section

5675
 (-905)

5675
 (-905)

6150
 (-1380)

6150
 (-1380)

% Lithology

**Side/rotate
 Data Curves**

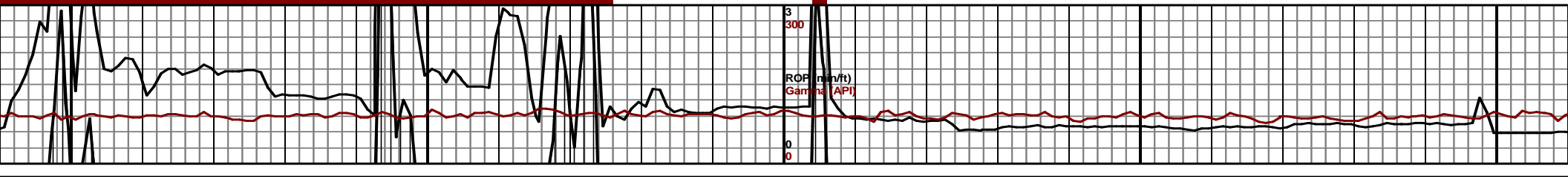
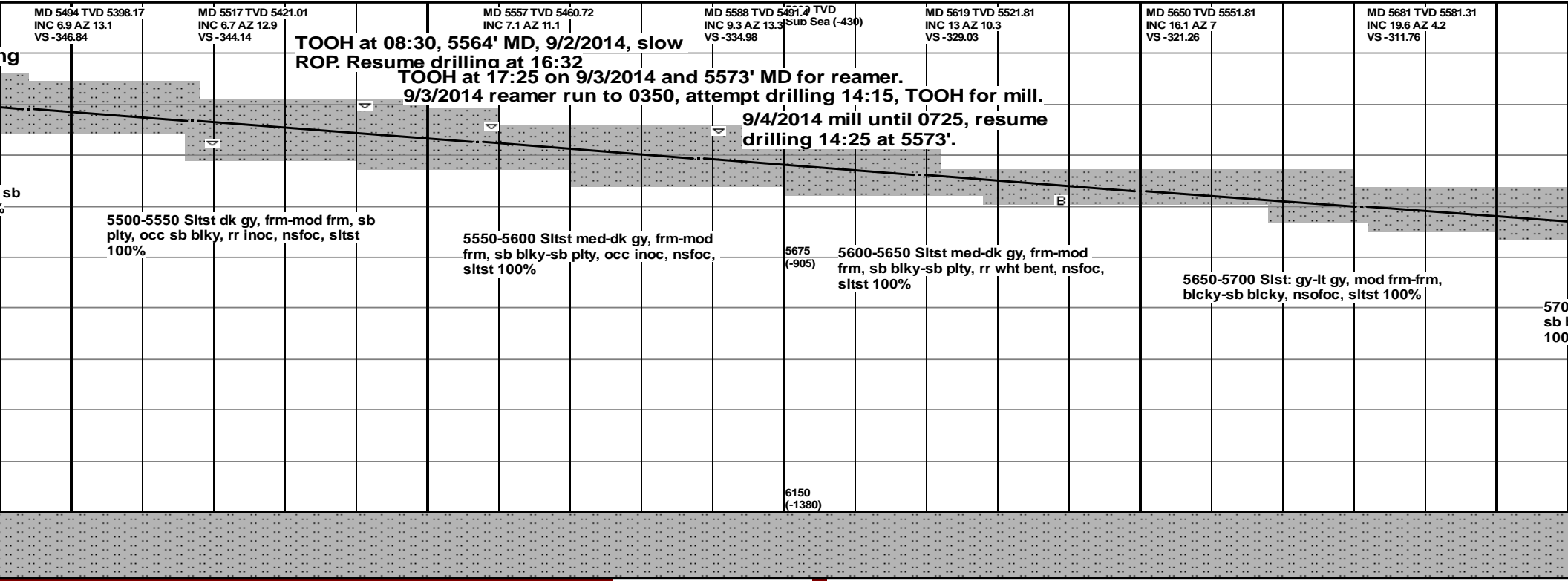
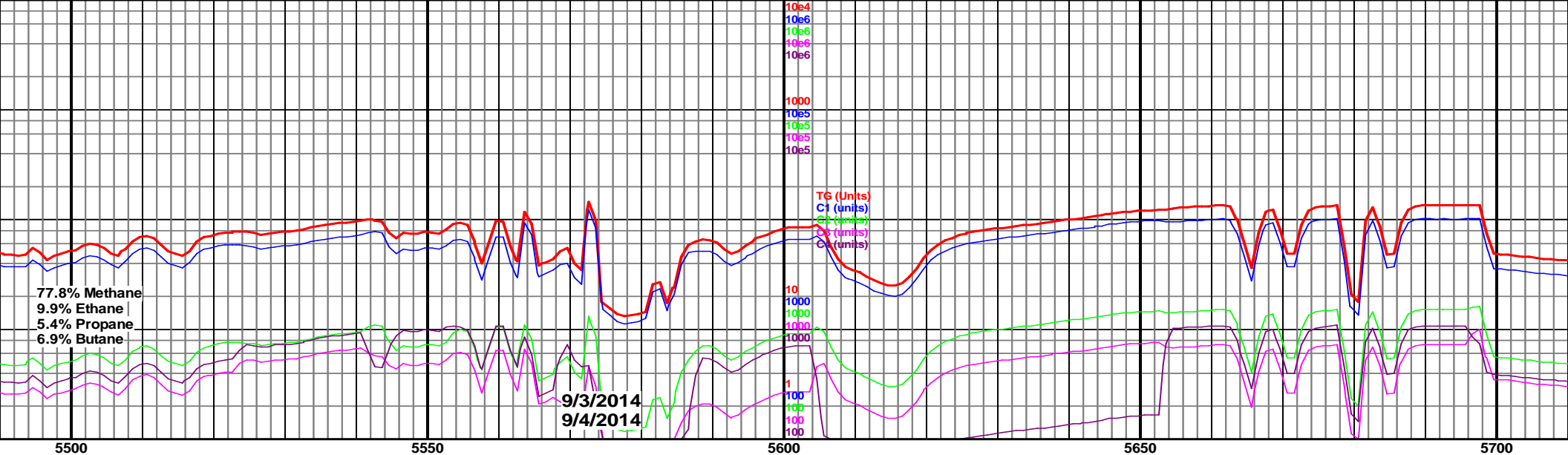
ROP (min/ft) ———
 Gamma (API) ———

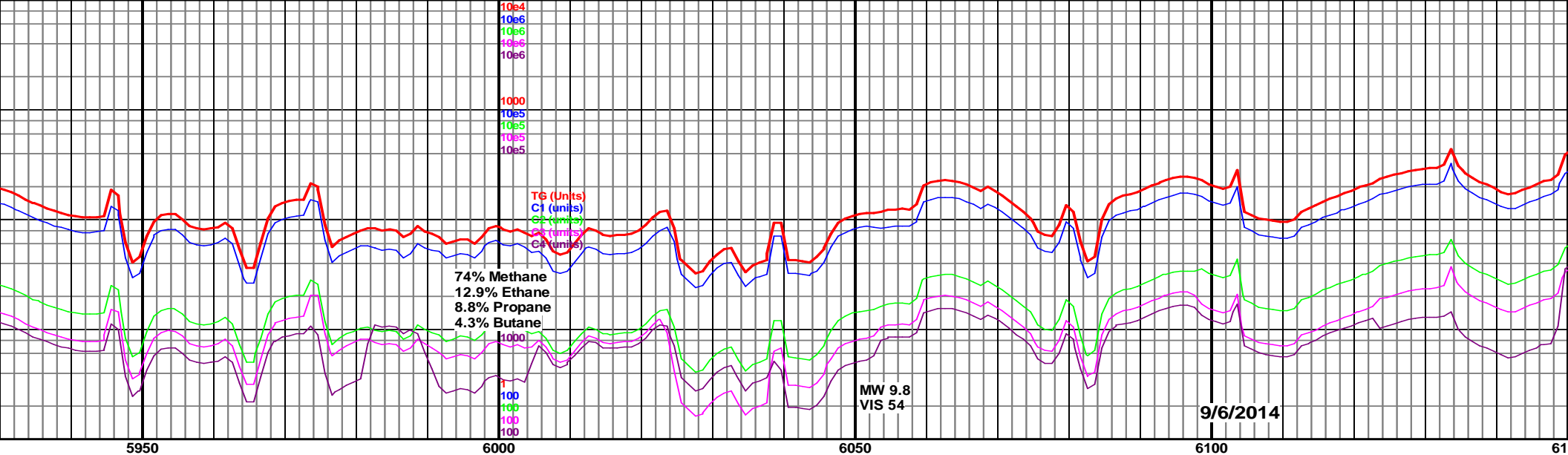
3
 300
 ROP (min/ft)
 Gamma (API)

Pioneer 54

3
 300
 ROP (min/ft)
 Gamma (API)

Oil Shows





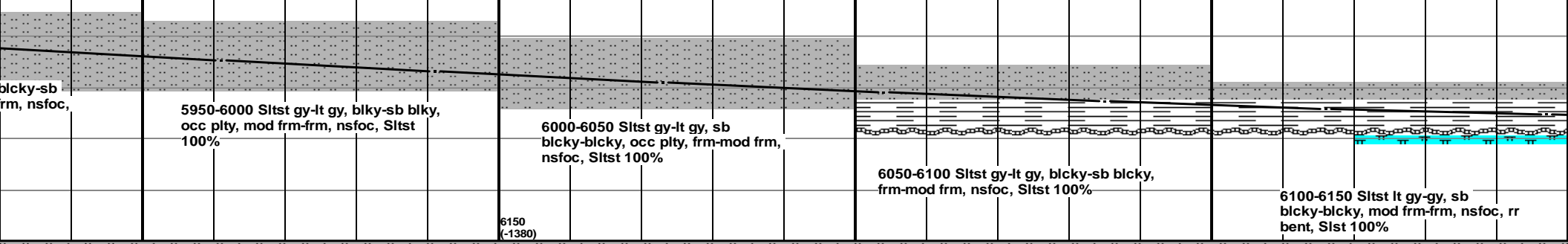
MD 5929 TVD 5791.21 INC 41.8 AZ 1.4 VS -182.88	MD 5961 TVD 5814.48 INC 44.9 AZ 2.6 VS -160.95	MD 5991 TVD 5835.10 INC 48.2 AZ 2.2 Sea (-430) VS -139.19	MD 6023 TVD 5855.65 INC 51.9 AZ 1.4 VS -114.71	MD 6054 TVD 5873.69 INC 56.9 AZ 3.1 VS -89.54	MD 6085 TVD 5889.56 INC 61.5 AZ 1.2 VS -62.96	MD 6116 TVD 5903.37 INC 65.6 AZ 358.4 VS -35.34	MD 6150 TVD 5917.18 INC 69.7 AZ 371.1 VS -10.12
--	--	---	--	---	---	---	---

TOOH at 23:00, 5977' MD, 9/4/2014, for motor. Resumed at 08:00

TOOH at 11:40 on 9/5/2014 and 6023' for motor. Resumed at 20:20

P200 6018' MD, 5852' TVD

P300 6136' MD, 5910' TVD

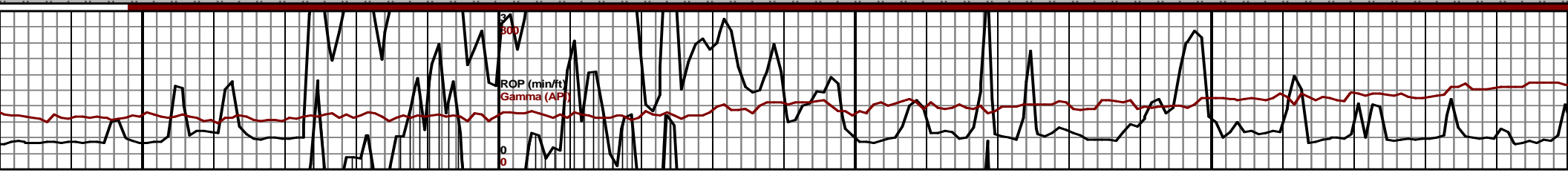


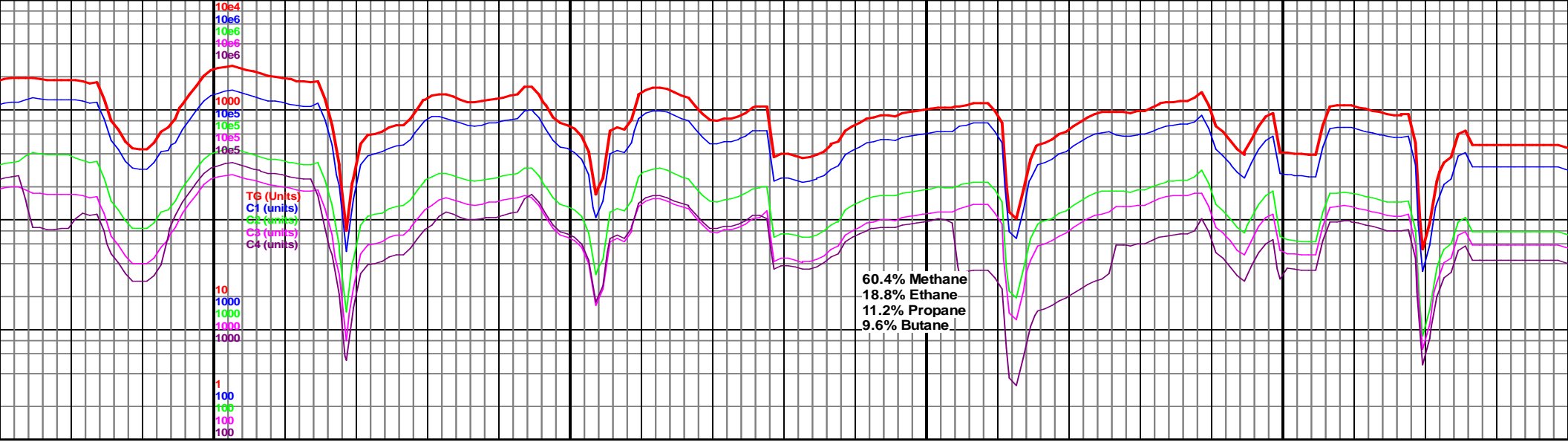
5950-6000 Slst gy-lt gy, blkly-sb blkly, occ plty, mod frm-frm, nsfoc, Slst 100%

6000-6050 Slst gy-lt gy, sb blkly-bkly, occ plty, frm-mod frm, nsfoc, Slst 100%

6050-6100 Slst gy-lt gy, blkly-sb blkly, frm-mod frm, nsfoc, Slst 100%

6100-6150 Slst lt gy-gy, sb blkly-bkly, mod frm-frm, nsfoc, rr bent, Slst 100%





MD 6365 TVD 5965.92 INC 80.5 AZ 351 VS 229.65	MD 6396 TVD 5971.39 INC 80.2 AZ 351.39 VS 229.65	MD 6428 TVD 5976.25 INC 82.3 AZ 350.7 VS 260.3	MD 6459 TVD 5979.9 INC 84.2 AZ 350.3 VS 290.09	MD 6490 TVD 5982.79 INC 85.1 AZ 349.9 VS 319.9	MD 6521 TVD 5985.22 INC 85.9 AZ 350.4 VS 349.76	MD 6552 TVD 5987.33 INC 86.3 AZ 350.3 VS 379.66	MD 6583 TVD 5989.44 INC 86.7 AZ 350.3 VS 409.56
---	--	--	--	--	---	---	---

N100 6383' MD, 5969' TVD

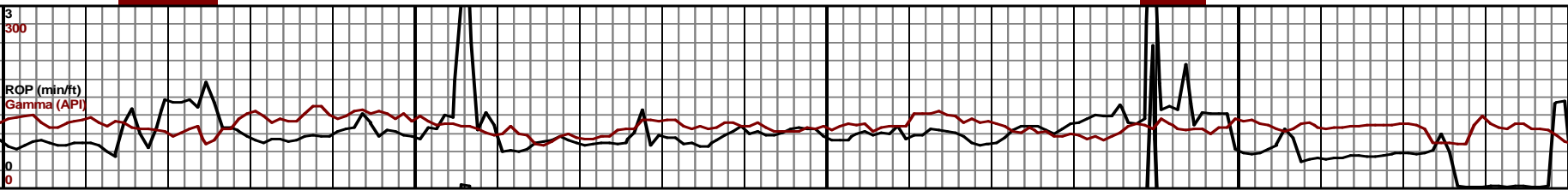
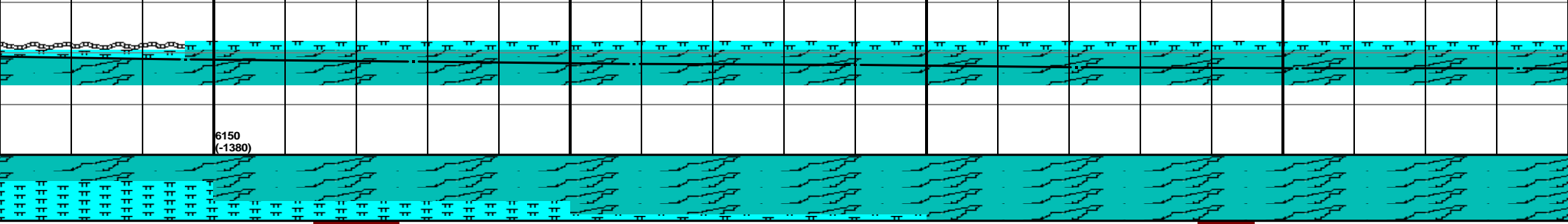
dk gy, bicky-sb bicky, mod
gy, sb bicky-sb plty, mod sft,
nt, tan-dull grn, occ brt min
% Mrlst 40% Ch

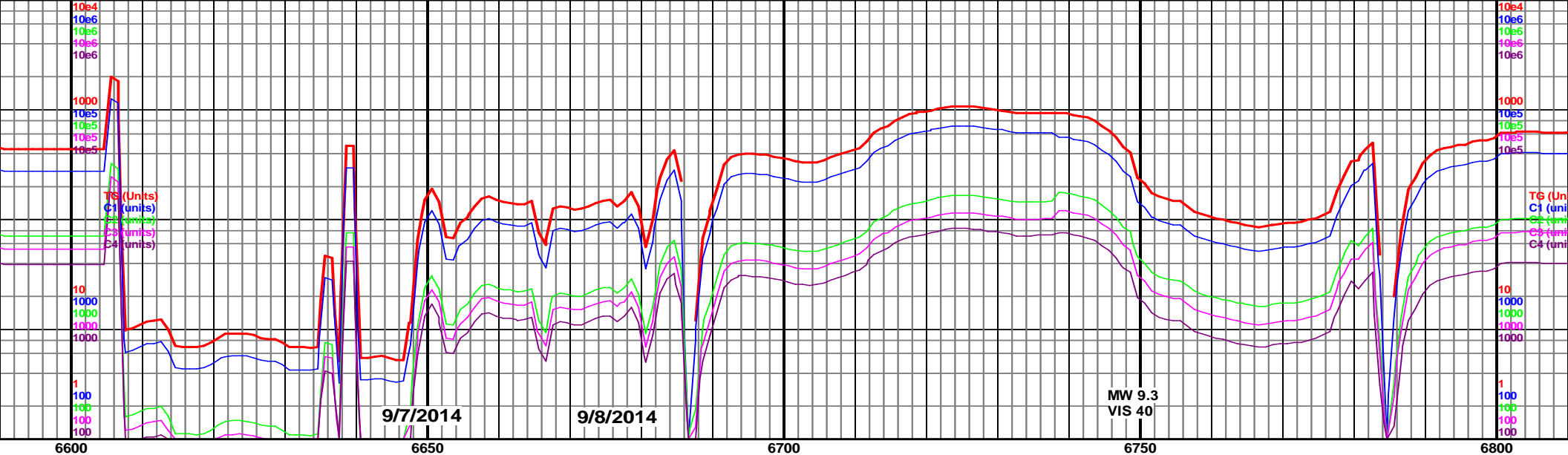
6400-6450 Ch lt gy-gy, sb bicky-sb plty, mod sft,
Mrlst gy-dk gy, bicky-sb bicky, mod sft-mod frm,
occ bent, tan-off wht, rr brt min fluor, 70% Ch,
Mrlst 30%

6450-6500 Ch lt gy-gy, sb bicky-sb plty, mod sft,
occ Mrlst gy-dk gy, bicky-sb bicky, mod sft-mod frm,
occ bent, tan-off wht, rr brt min fluor, slo cut,
90% Ch, Mrlst 10%

6500-6550 Ch lt gy-gy, sb bicky-sb plty, mod sft,
rr bent, tan-dull grn, rr brt min fluor, slo cut, 90%
Ch, 10% Mrlst

6550-6600 Ch lt gy-gy, sb bicky-sb plty,
sft, slo cut, 90% Ch, 10% Mrlst





TVD 5989.06 AZ 350.4 9
 MD 6602 TVD 5989.84
 Sub Sea (-43)
 INC 88 AZ 350.7
 VS 427.97
 MD 6727 TVD 5992.35
 INC 89.7 AZ 351.7
 VS 549.27
 5200 TVD (-43)
 Sub Sea (-43)

**Curve Landed 6649' MD, 5990.66'
 TVD, 12:00 on 9/6/2014**

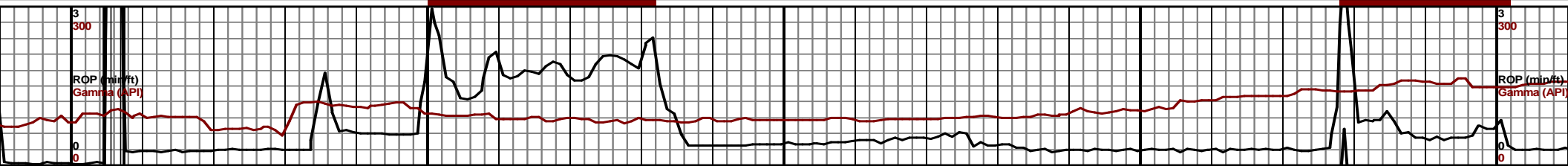
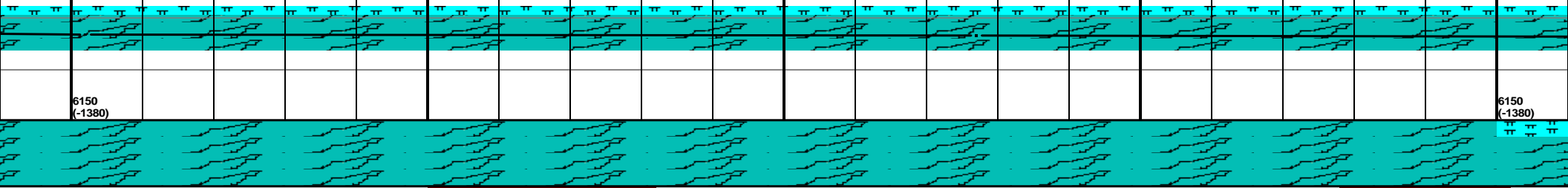
**TIH with lateral assembly Resume
 Drilling at 22:00 on 9/7/2014**

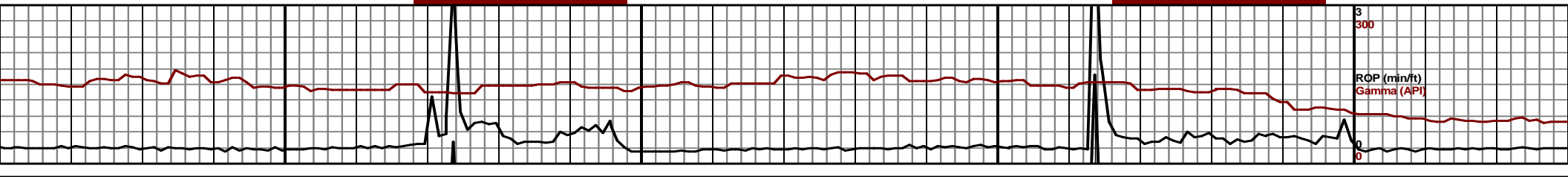
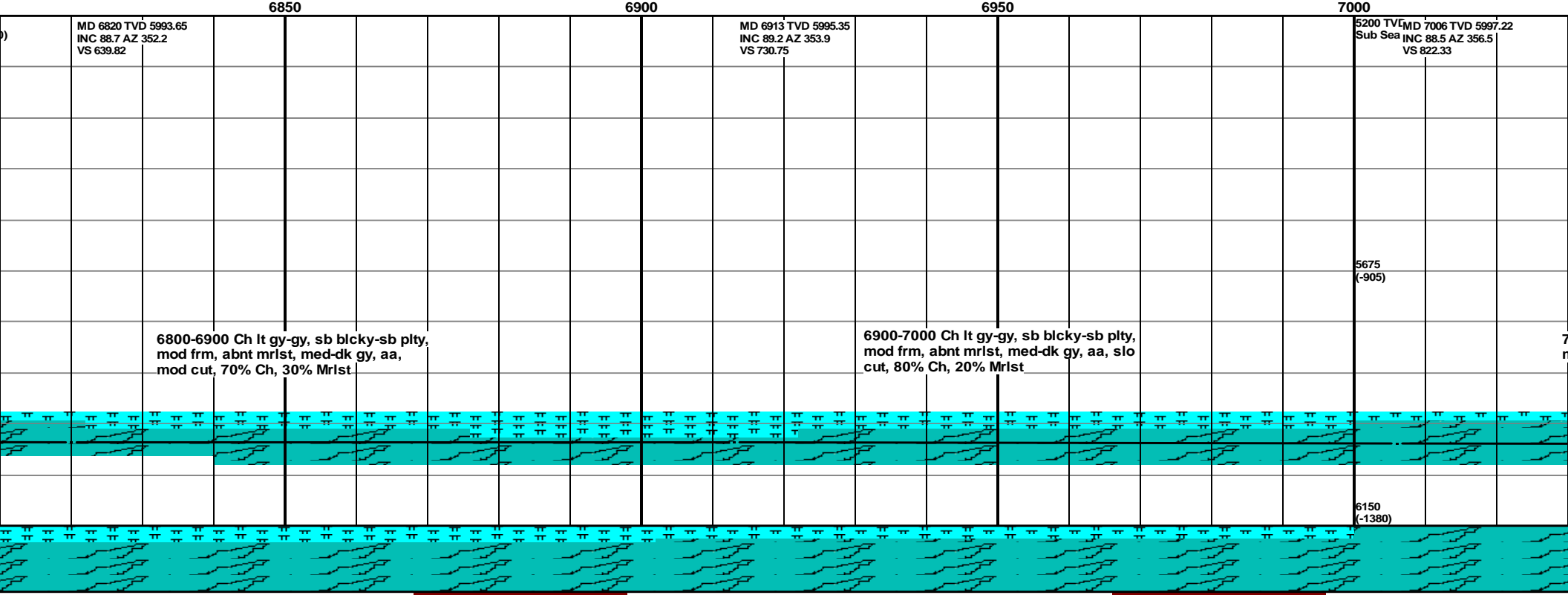
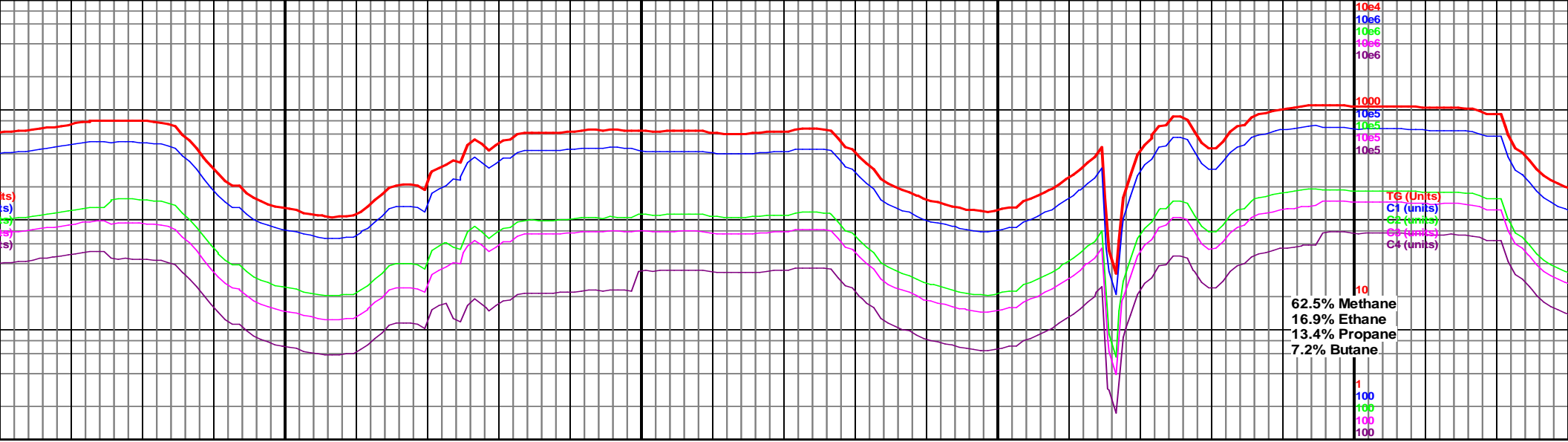
**TOOH to strap pipe at 6662'
 MD 23:30 9/7/2014. Resume
 drilling at 07:00 9/8/2014.**

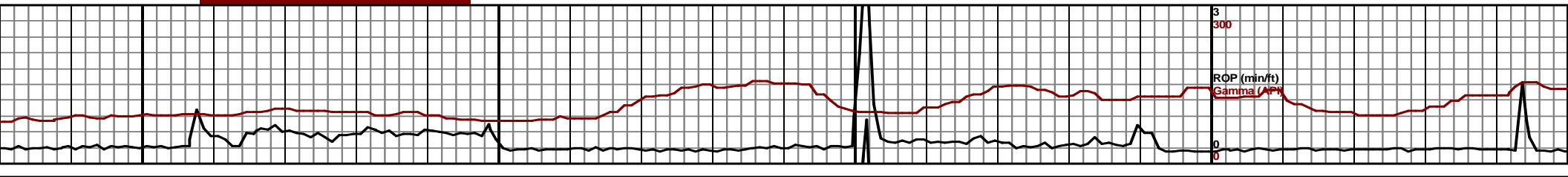
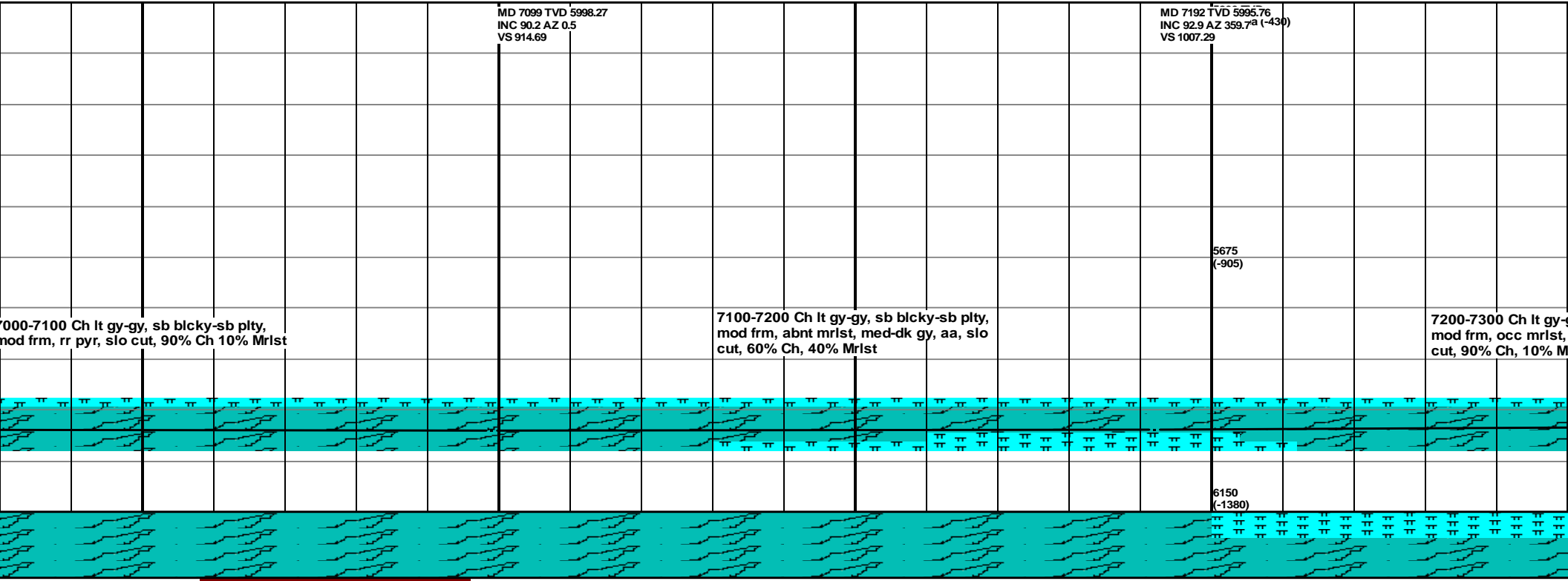
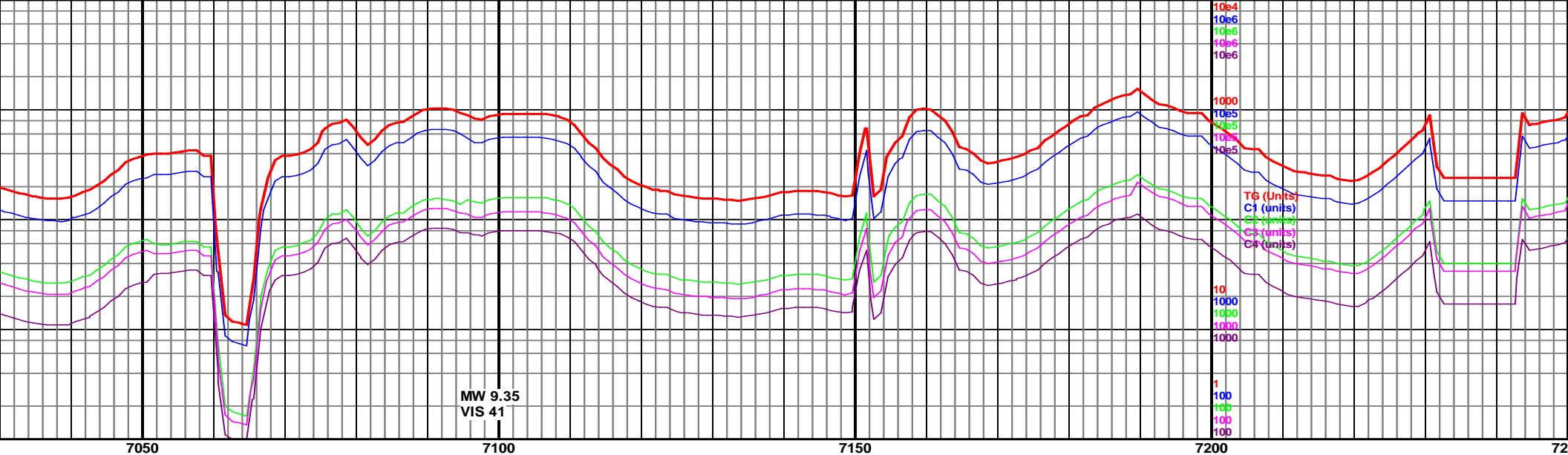
6600-6650 Ch lt gy-gy, sb bicky-sb plty, mod
 sft, fast cut, 100% Ch

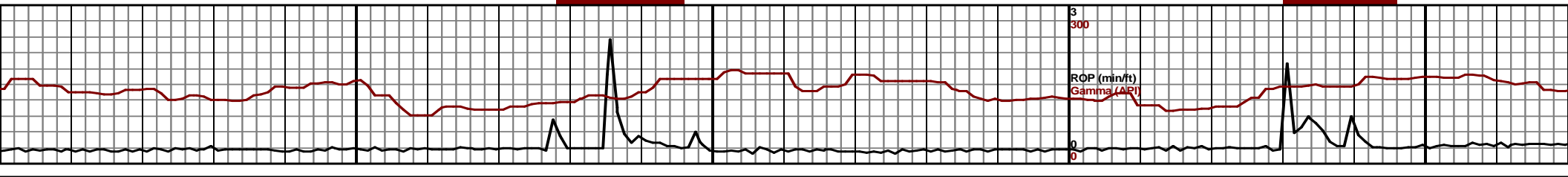
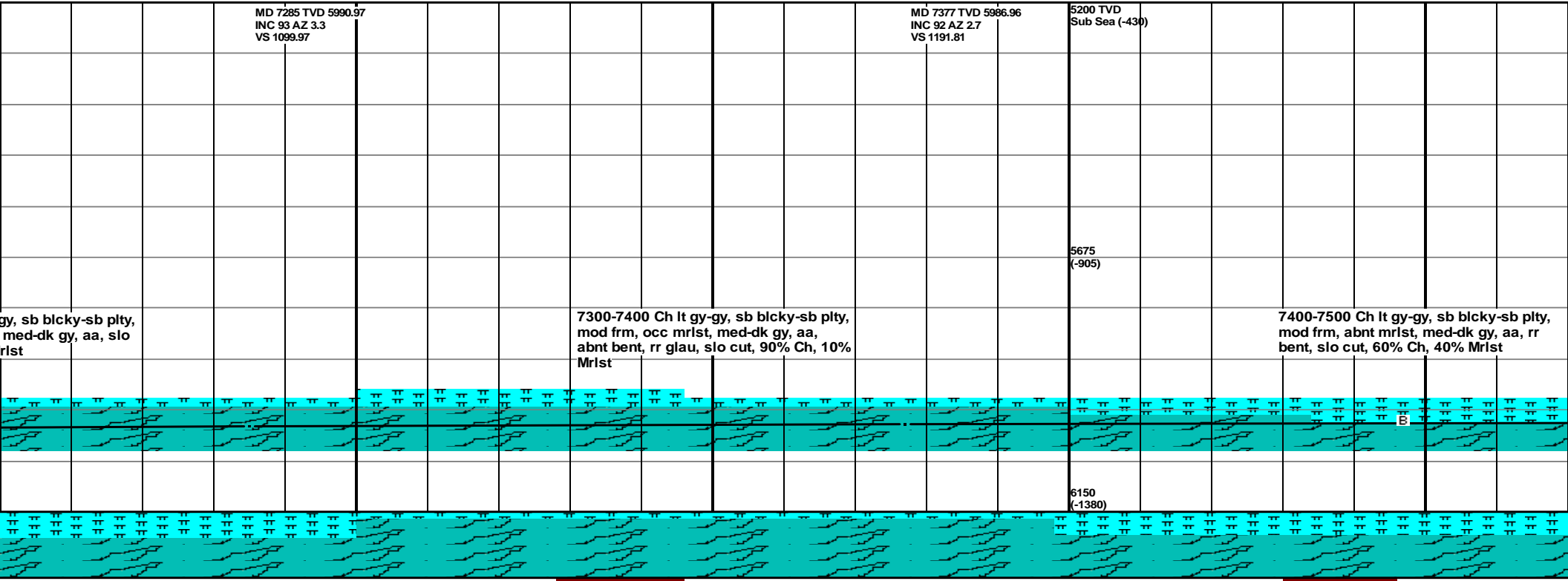
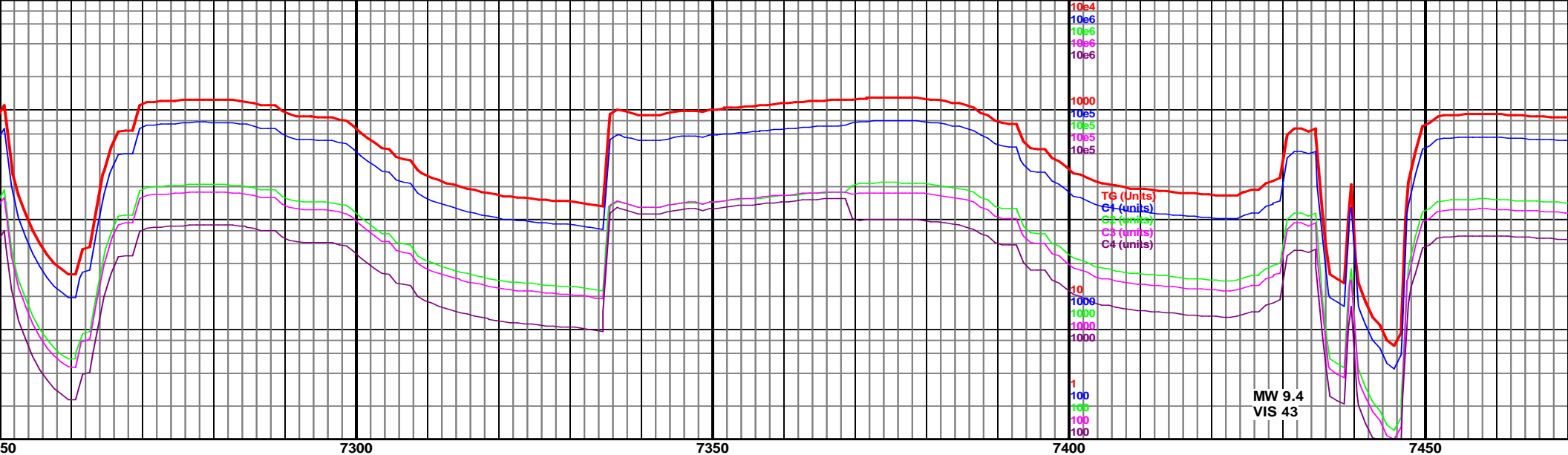
6650-6700 Ch lt gy-gy, sb bicky-sb plty,
 mod sft, occ pyr, nsfoc, 90% Ch 10%

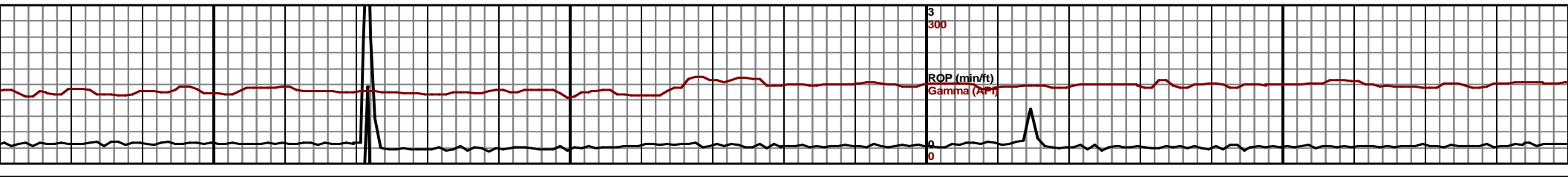
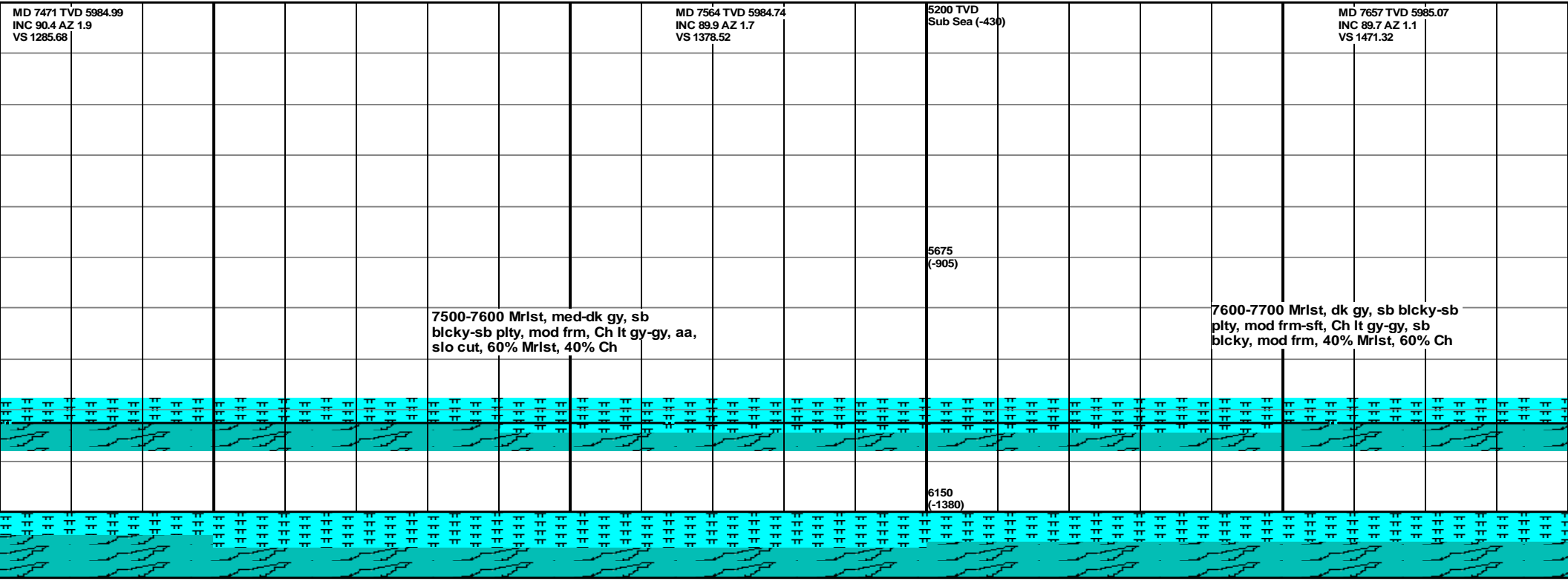
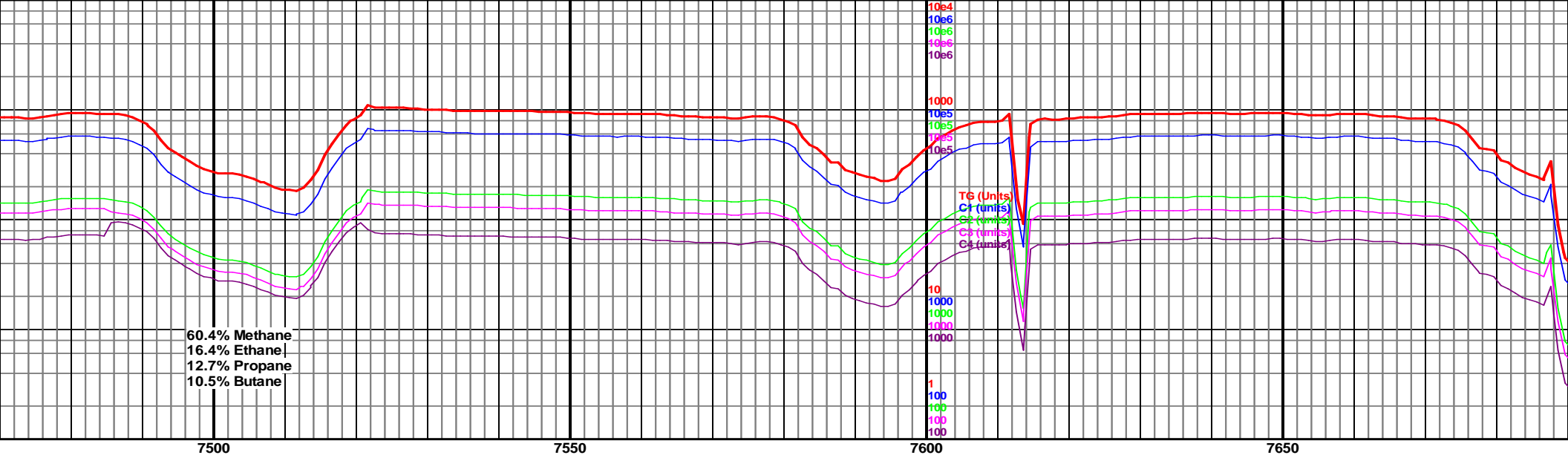
6700-6800 Ch lt gy-gy, sb bicky-sb plty,
 mod frm, mod cut, 90% Ch Mrlst 10%

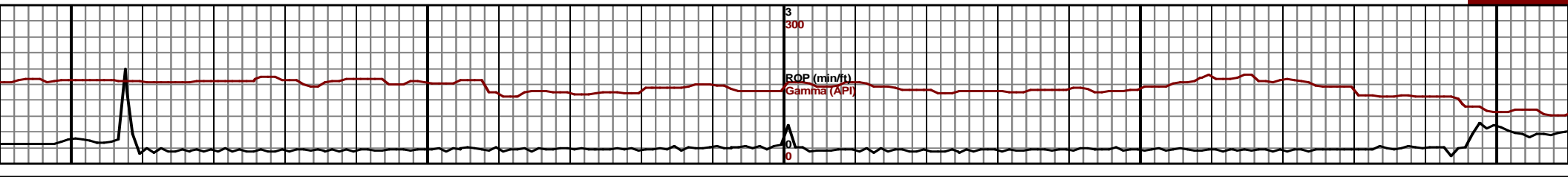
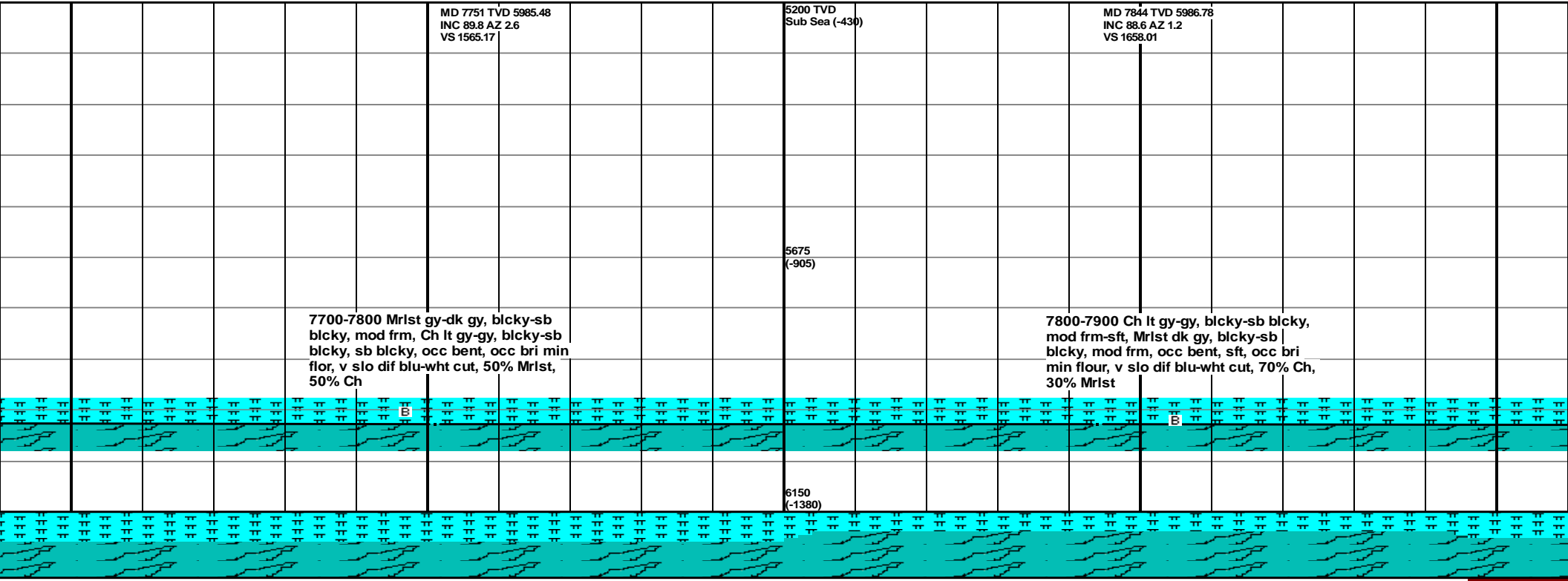
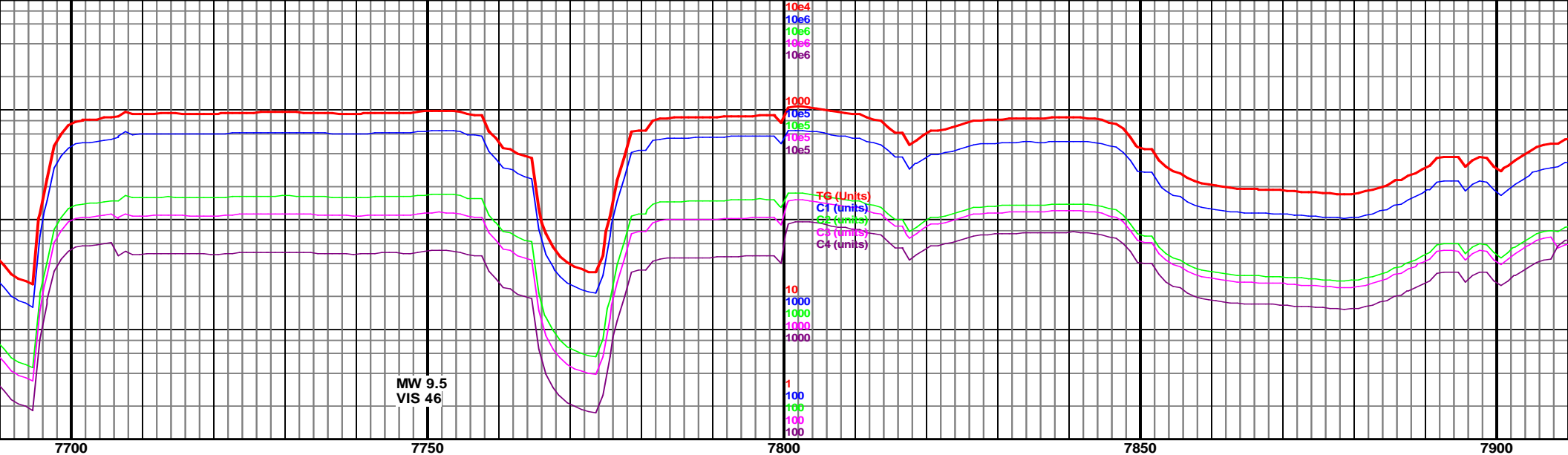


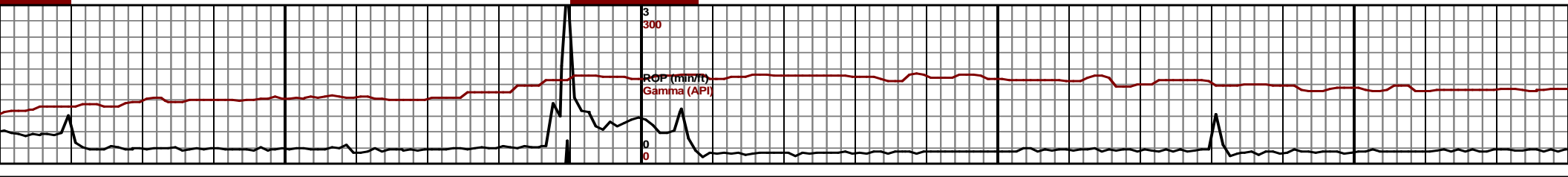
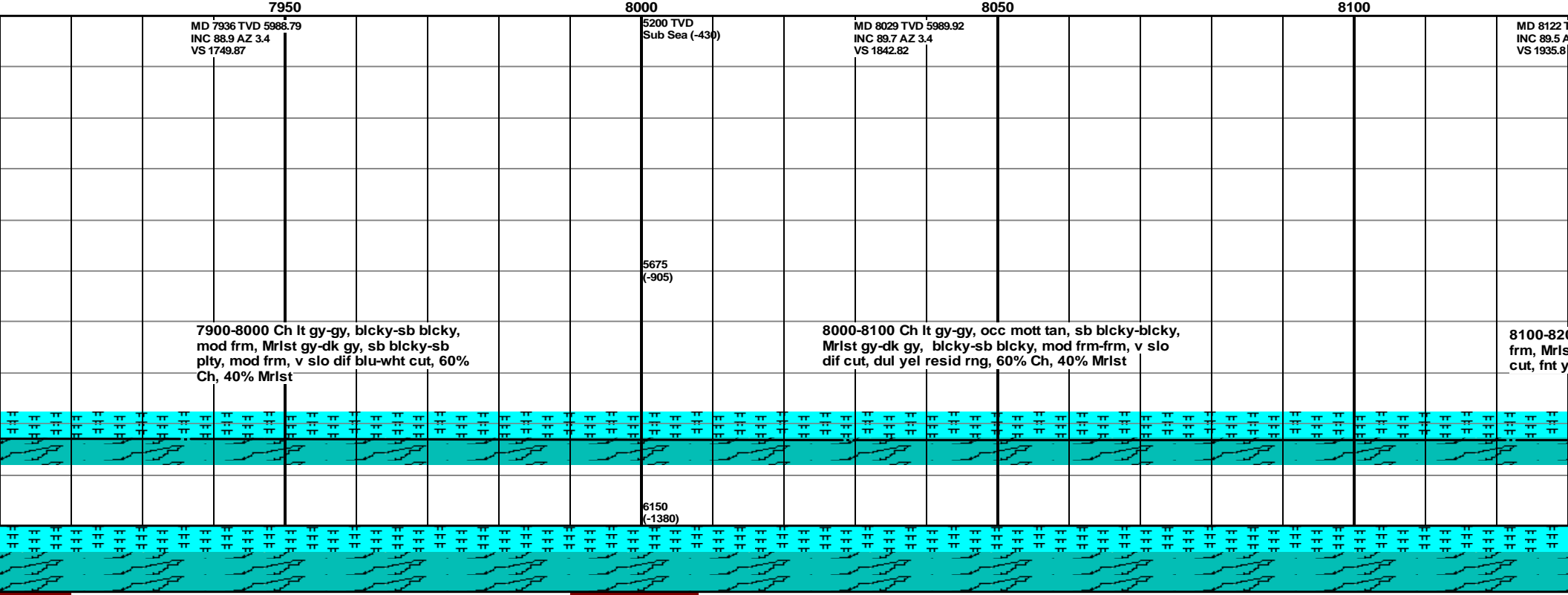
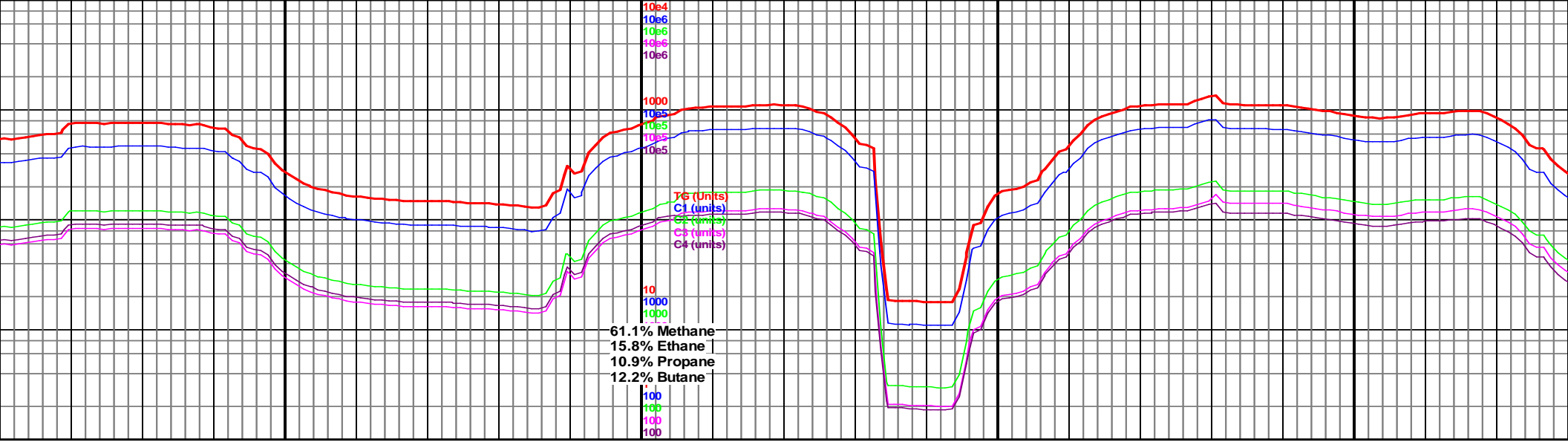


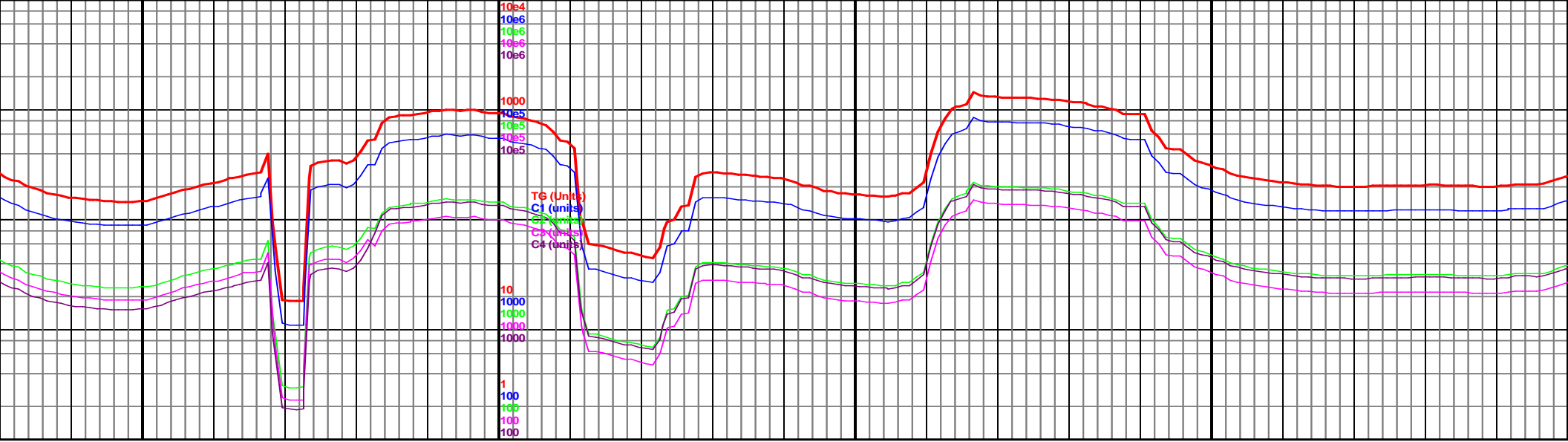










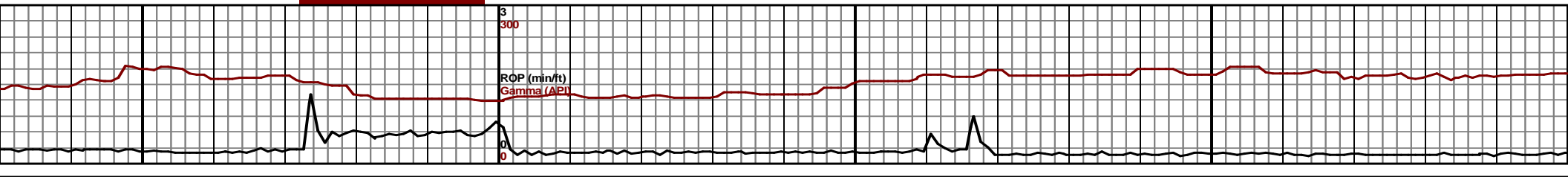


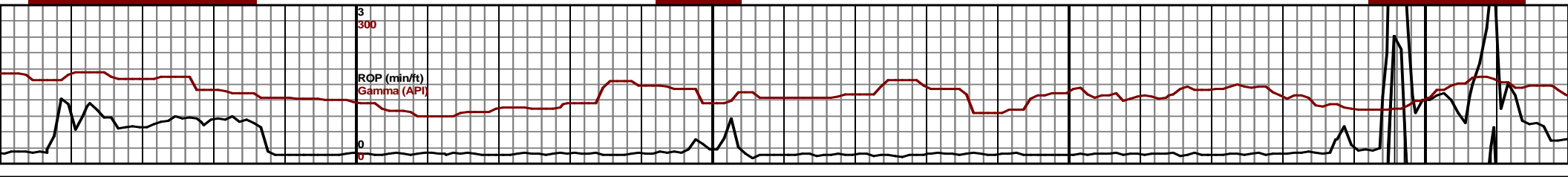
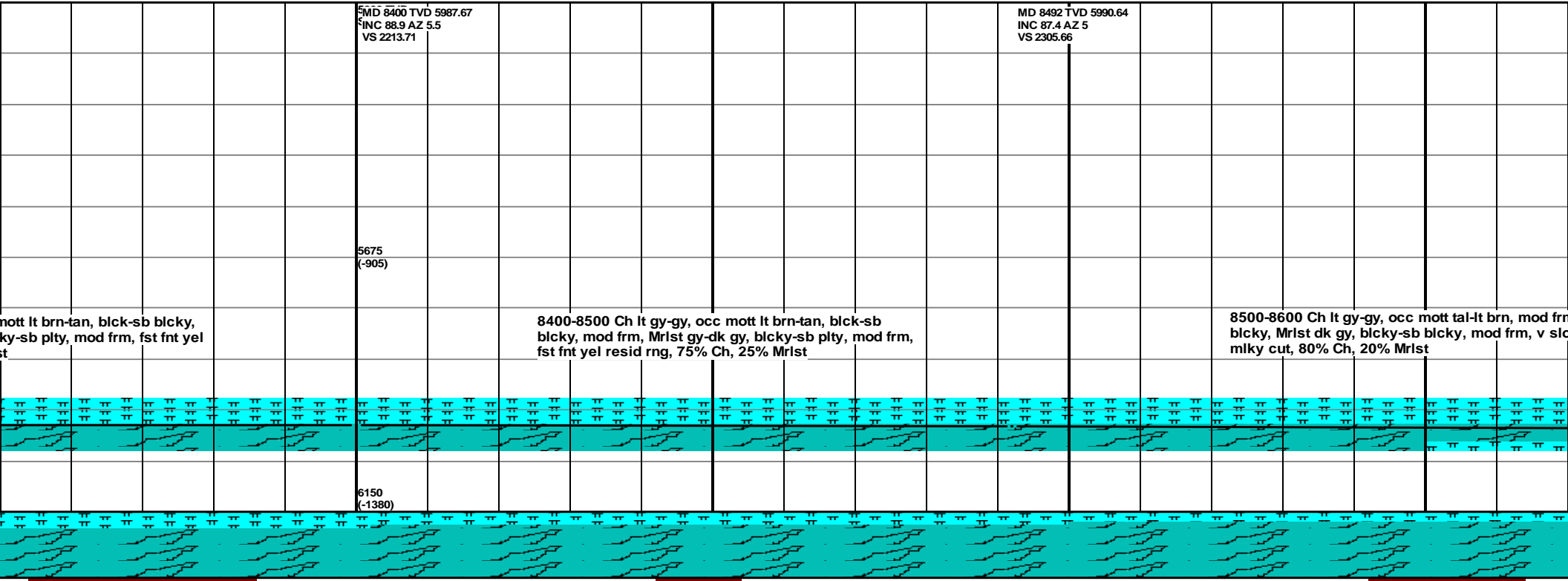
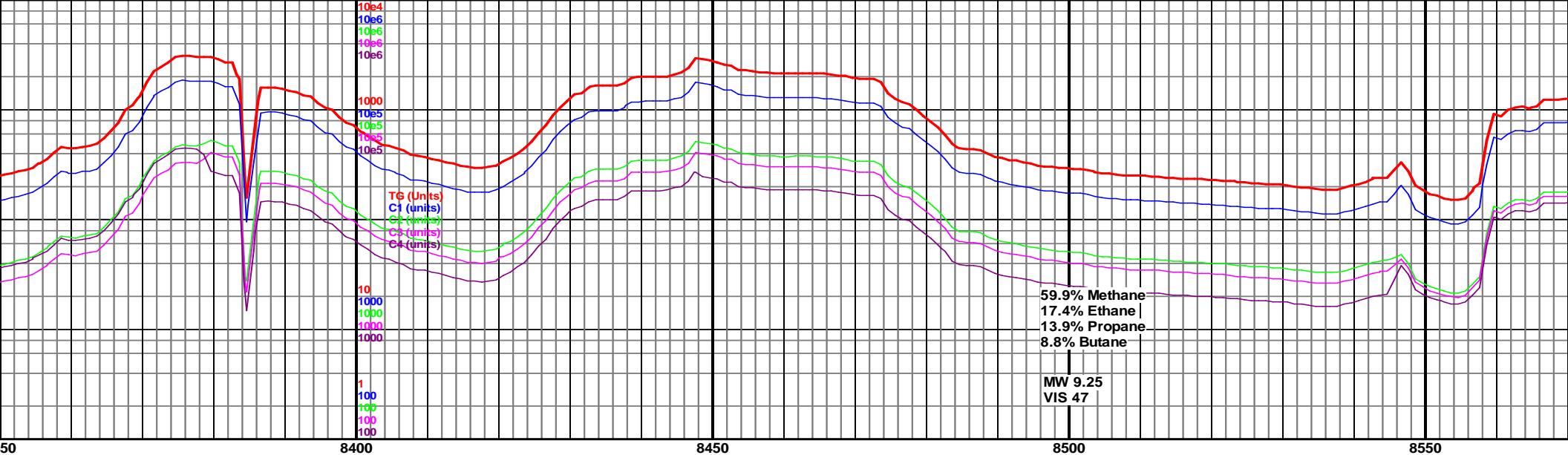
TVD 5990.57 AZ 4.2	8150	5200 TVD Sub Sea (-430) MD 8215 TVD 5990.16 INC 91 AZ 5.6 VS 2028.79	8250	MD 8307 TVD 5988.08 INC 91.6 AZ 7.1 VS 2120.74	8300
-----------------------	------	--	------	--	------

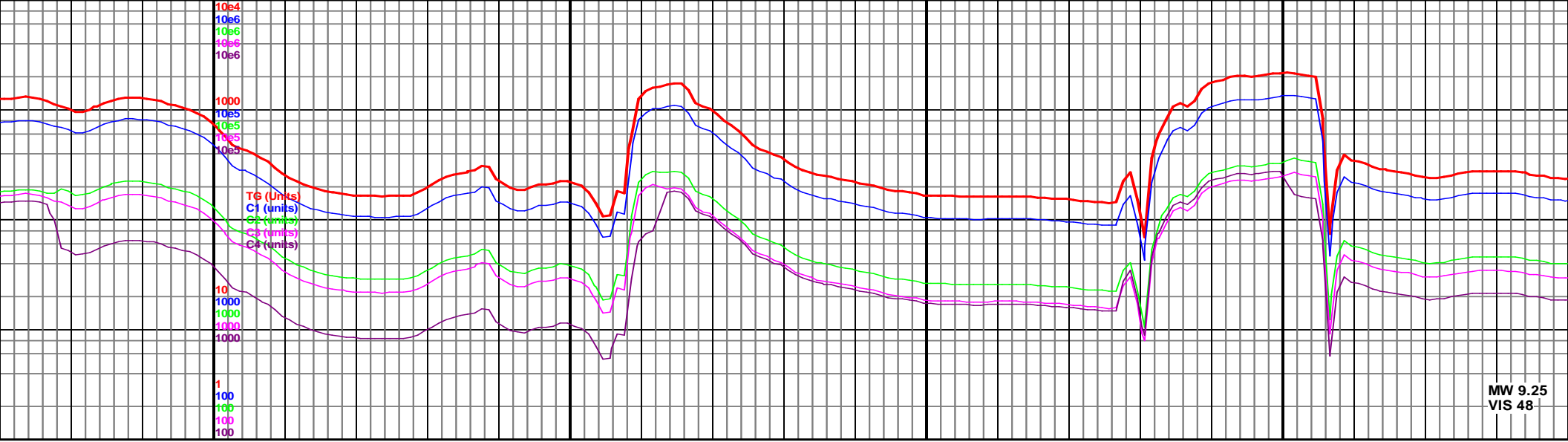
00 Ch It gy-gy, occ mott tan, sb blkcy-sb plty, mod
 st gy-dk gy, blkcy-sb blkcy, mod frm, v slo dif blu-wht
 el resid rng, 60% Ch, 40% Mrlst

8200-8300 Mrlst gy-dk gy, blkcy-sb blkcy, mod frm, Ch It
 gy-gy, occ mott tan, blkcy-sb plty, mod frm, v slo dif cut, 60%
 Mrlst, 40% Ch

8300-8400 Ch It gy-gy, occ n
 mod frm, Mrlst gy-dk gy, blk
 resid rng, 75% Ch, 25% Mrlst







MW 9.25
VIS 48"

8600 8650 8700 8750

MD 8585 TVD 5994.86
INC 87.4 AZ 2.9
VS 2398.54

200 TVD
Sub Sea (-430)

MD 8677 TVD 5999.35
INC 87 AZ 2
VS 2490.33

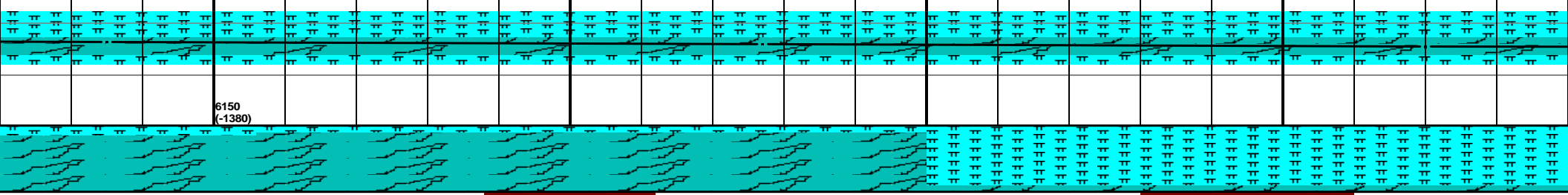
MD 8770 TVD 6002.6
INC 89 AZ 2.3
VS 2583.14

5675
(-905)

n, bicky-sb
dif blu wht

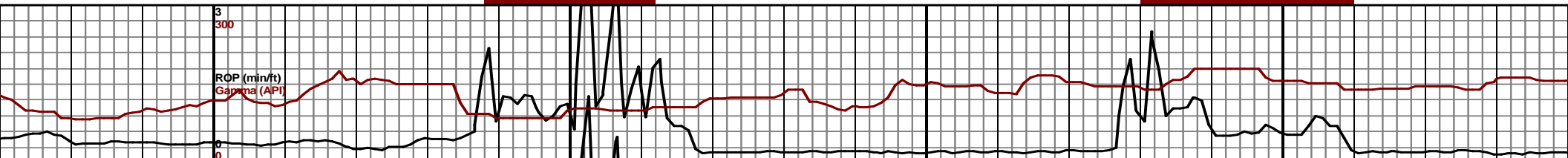
8600-8700 Ch lt gy-gy occ tan, occ mott lt brn-tan, mod
frm, sb bicky-bicky, Mrlst dk gy-gy, bicky sb bicky, mod
frm, slo milky wht cut, 90% Ch, 10% Mrlst

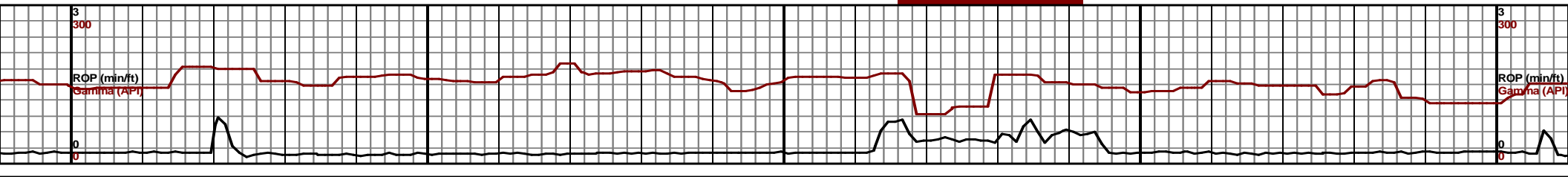
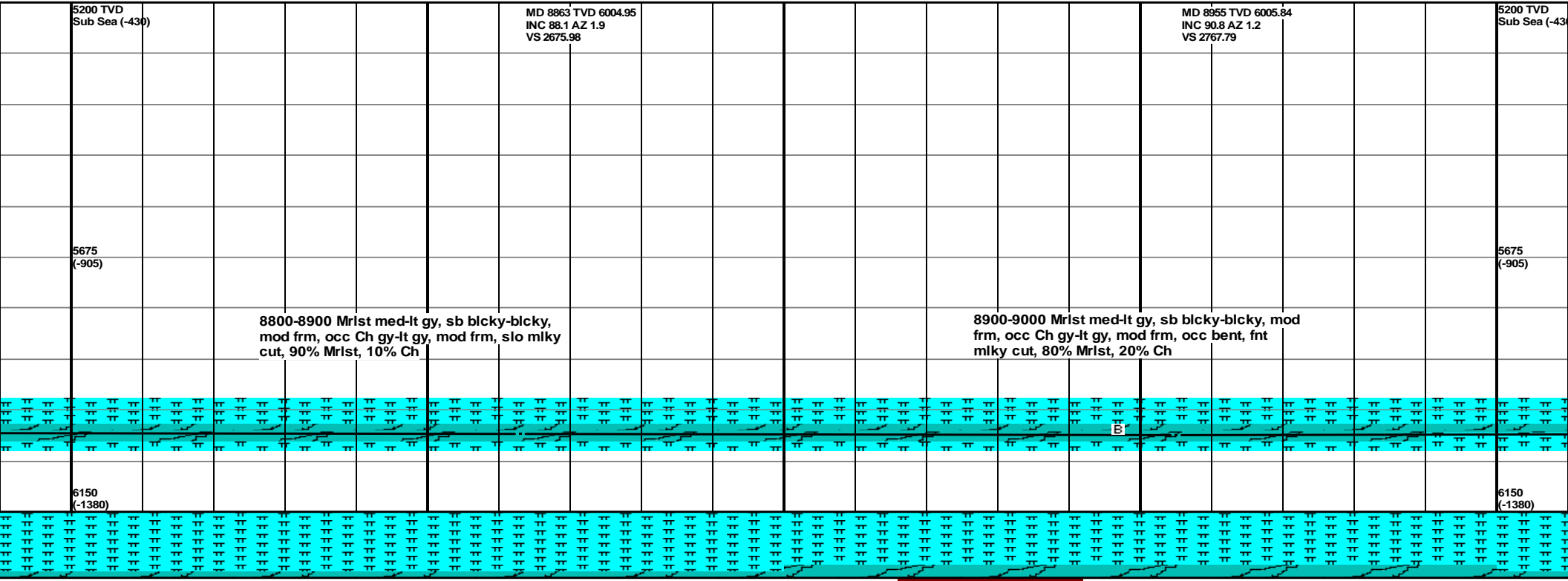
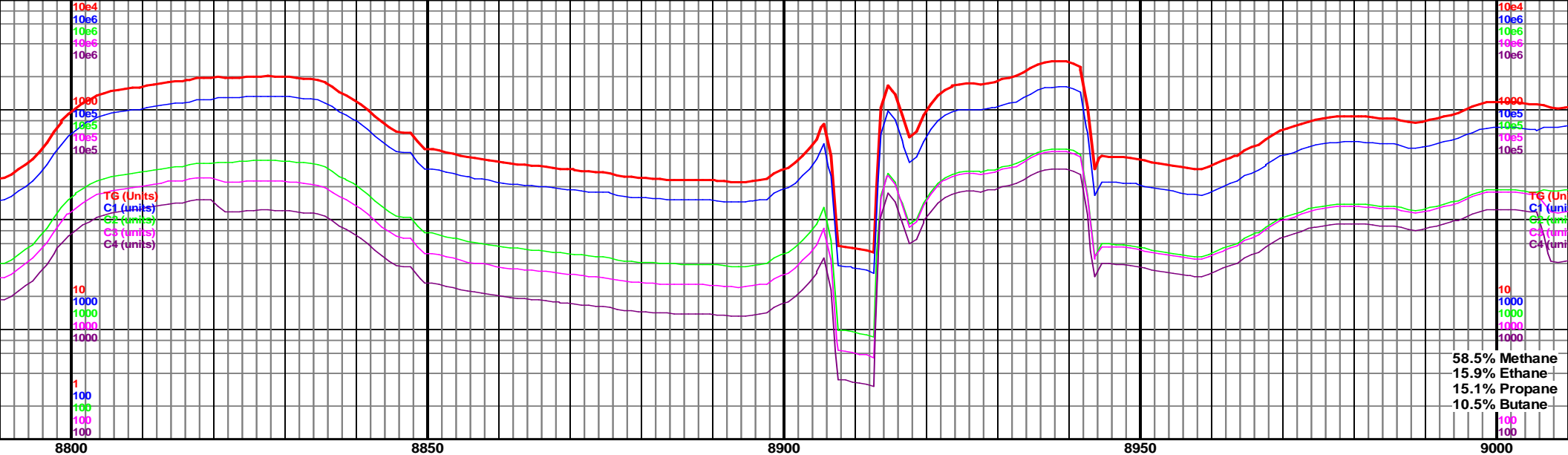
8700-8800 Mrlst med-lt gy, sb bicky-bicky, mod
frm, occ Ch gy-lt gy, mod frm, v fnt milky cut, 90%
Mrlst, 10% Ch

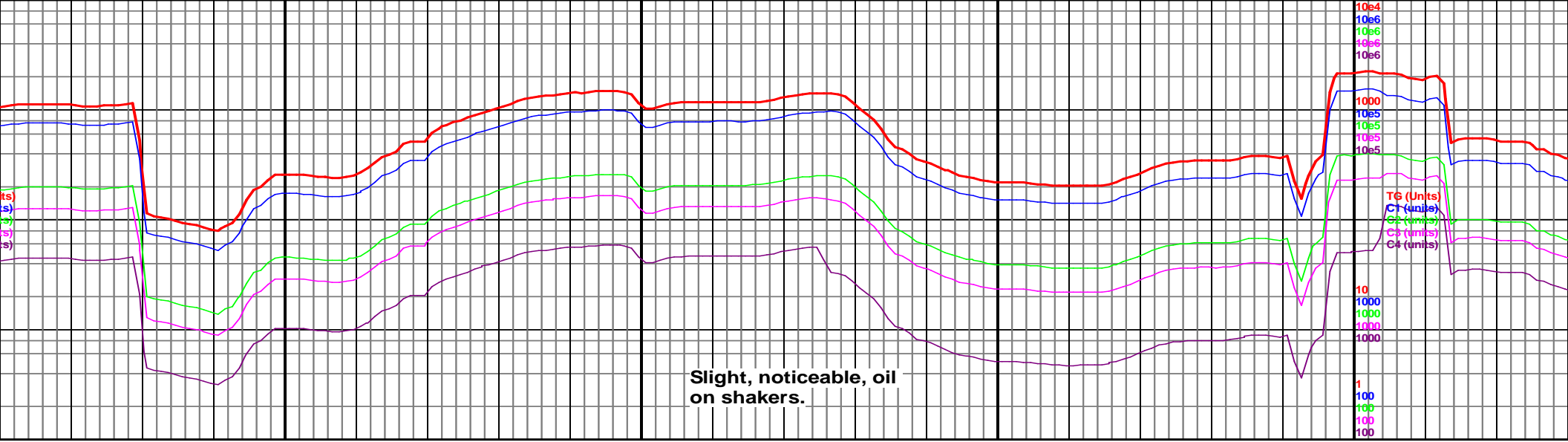


6150
(-1380)

3
300
ROP (min/ft)
Gamma (API)
0
0







9050

9100

9150

9200

MD 9047 TVD 6004.95
INC 90.3 AZ 0.7
VS 2859.54

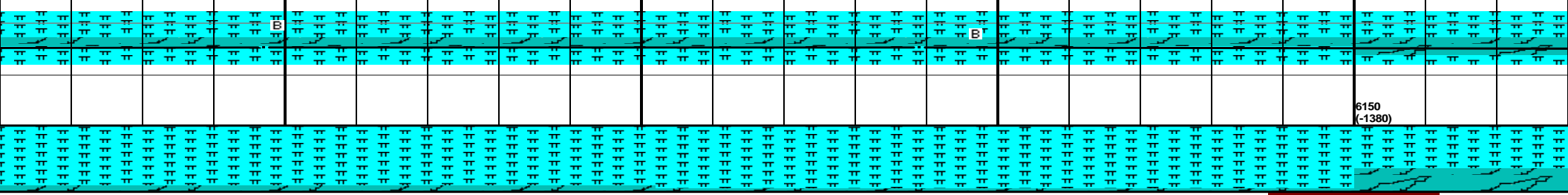
MD 9139 TVD 6005.27
INC 89.3 AZ 359.7
VS 2951.2

5200 TVD
Sub Sea (-430)

9000-9100 Mrlst med-lt gy, sb bicky-bicky,
mod frm, occ Ch gy-lt gy, mod frm, occ bent, v
fnt mlky cut, 90% Mrlst, 10% Ch

9100-9200 Mrlst med-lt gy, sb bicky-bicky,
mod frm, occ Ch gy-lt gy, mod frm, occ bent, v
fnt mlky cut, 95% Mrlst, 5% Ch

9200
frm
cut



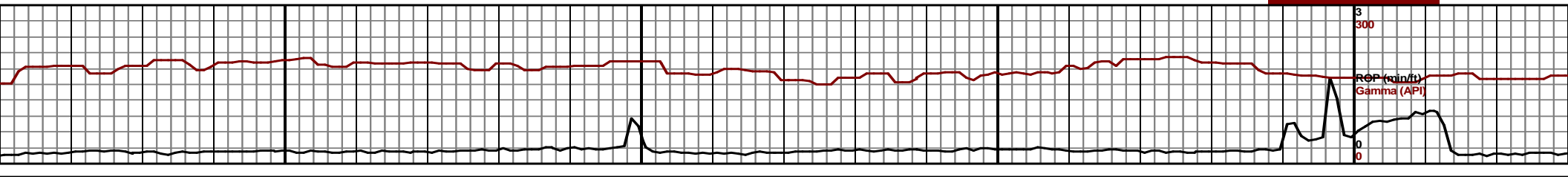
5675
(-905)

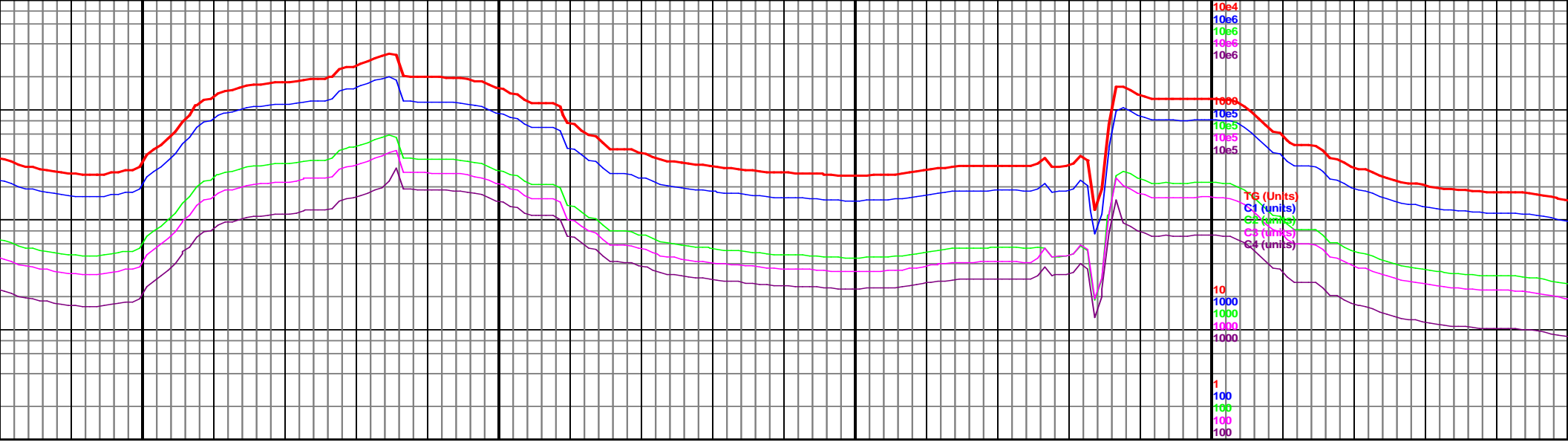
6150
(-1380)

3

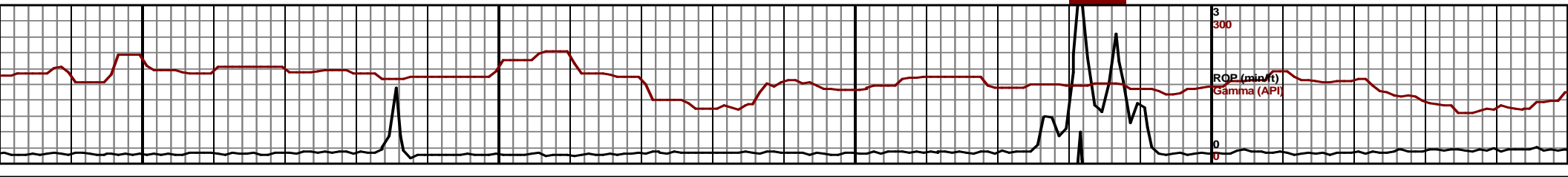
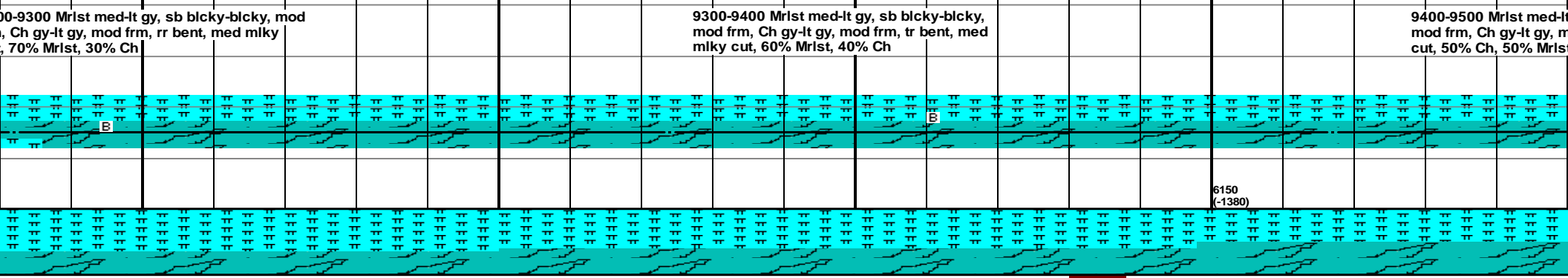
300

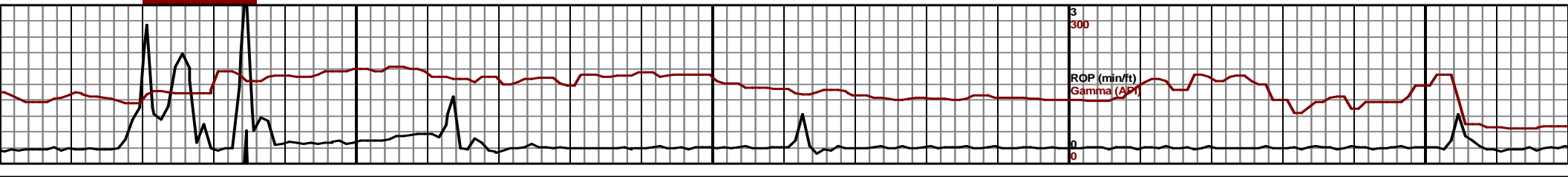
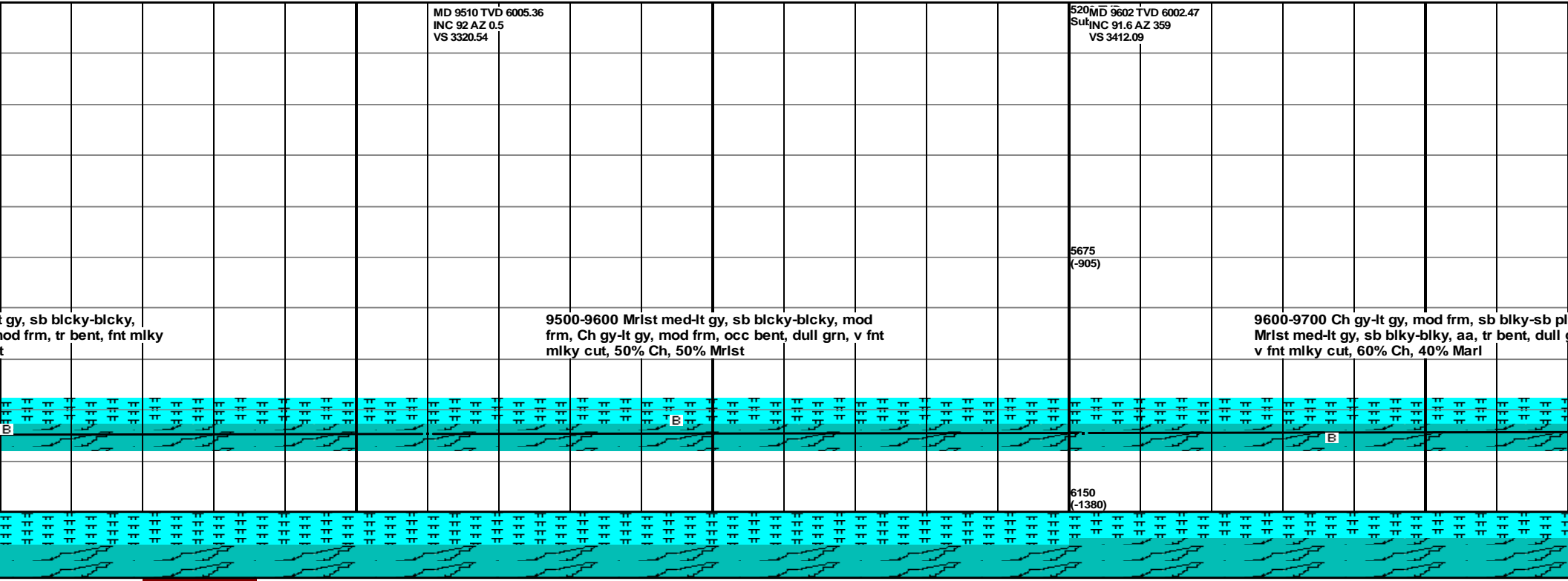
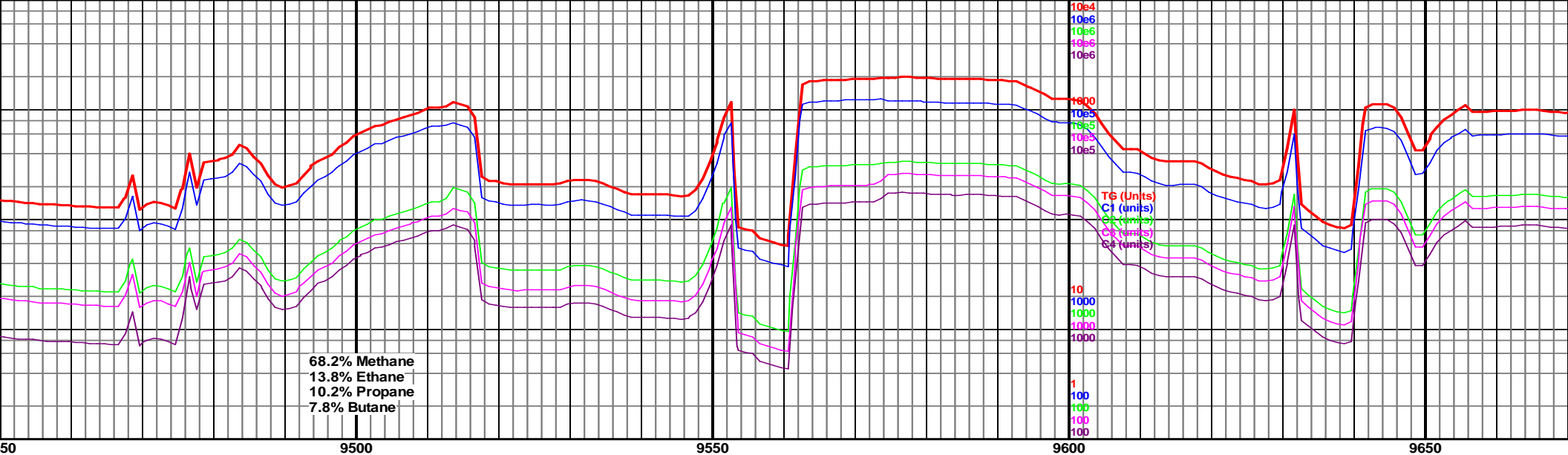
ROP (min/ft)
Gamma (API)

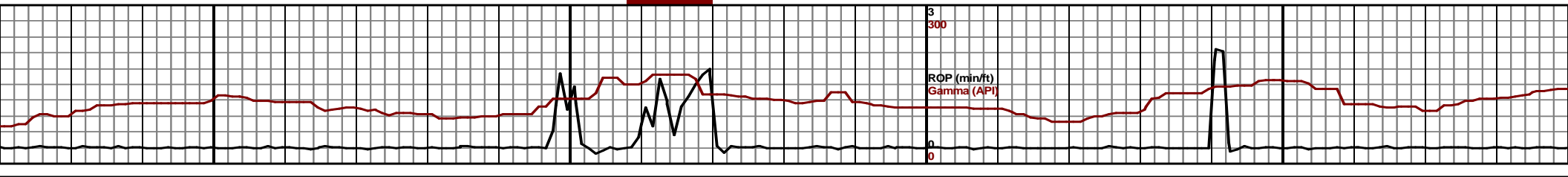
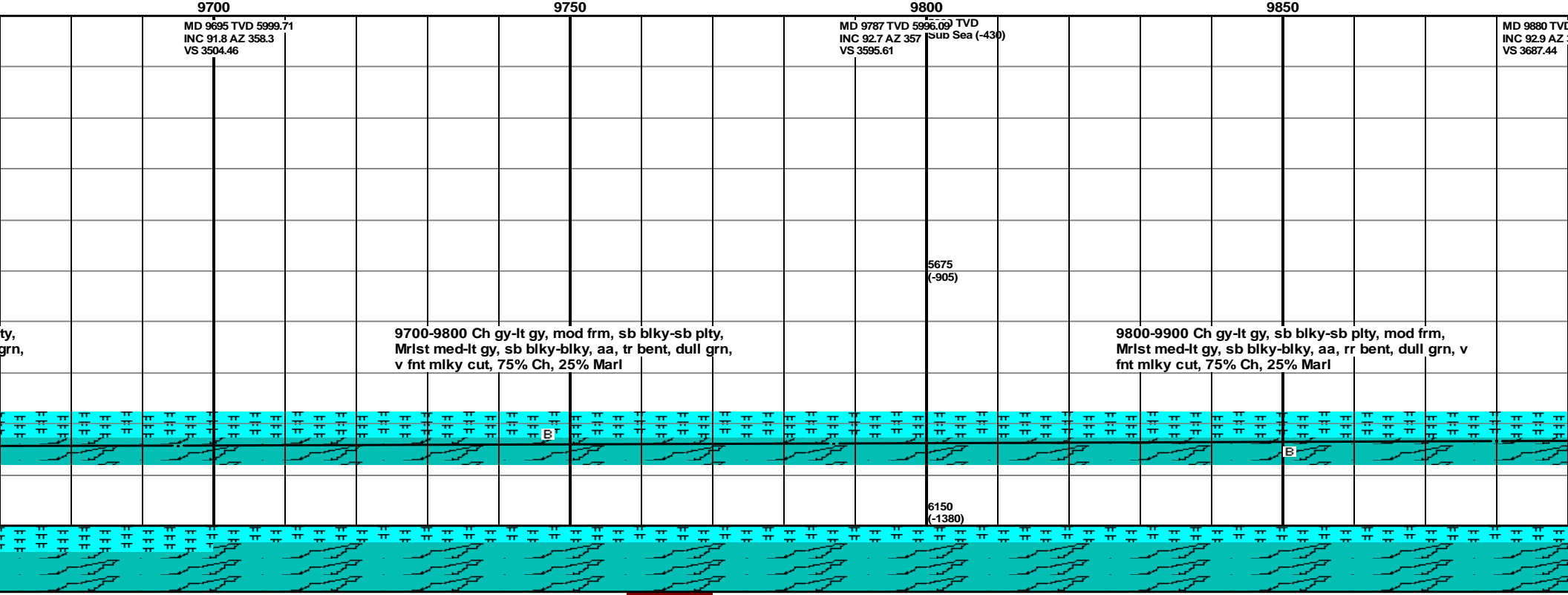
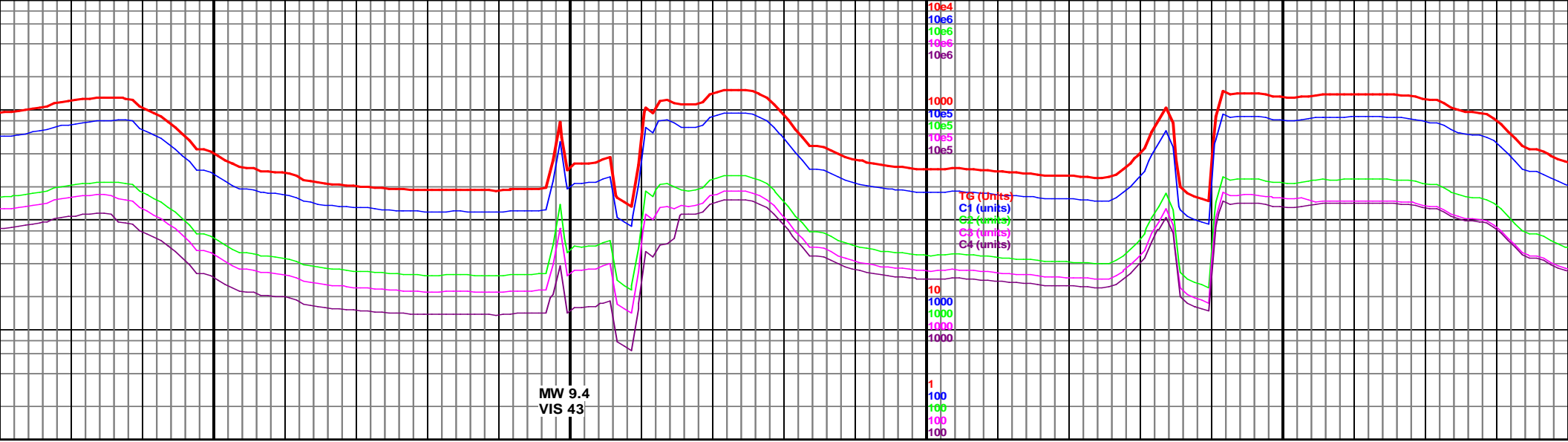


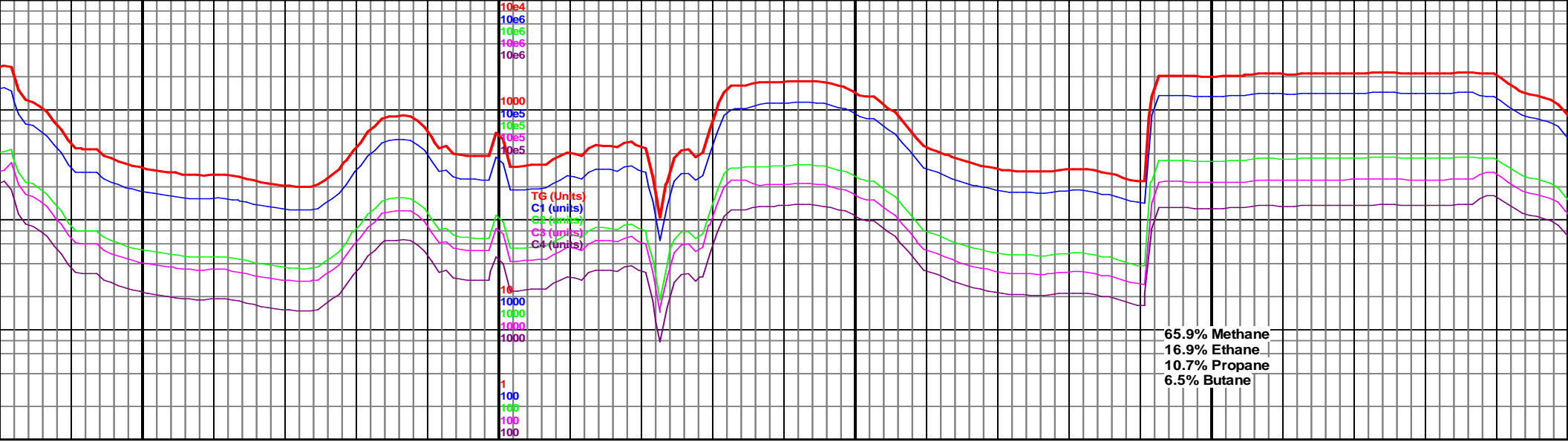


MD 9232 TVD 6005.68 INC 90.2 AZ 359.7 VS 3043.79	MD 9324 TVD 6005.76 INC 89.7 AZ 359.9 VS 3135.39	MD 9417 TVD 6006.49 INC 89.4 AZ 359.2 VS 3227.95	MD 9200 TVD 6005.68 INC 90.2 AZ 359.7 VS 3043.79
--	--	--	--



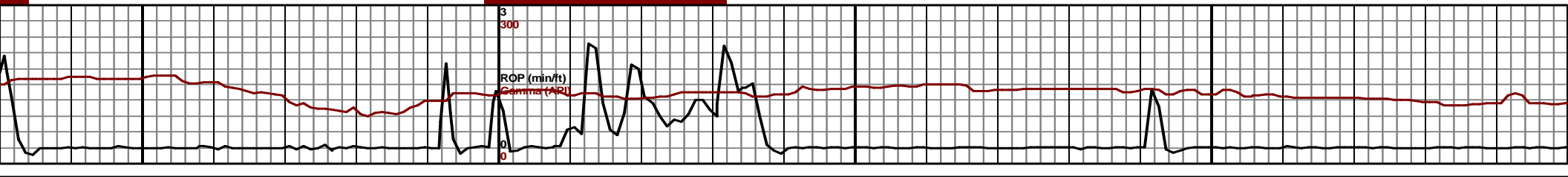
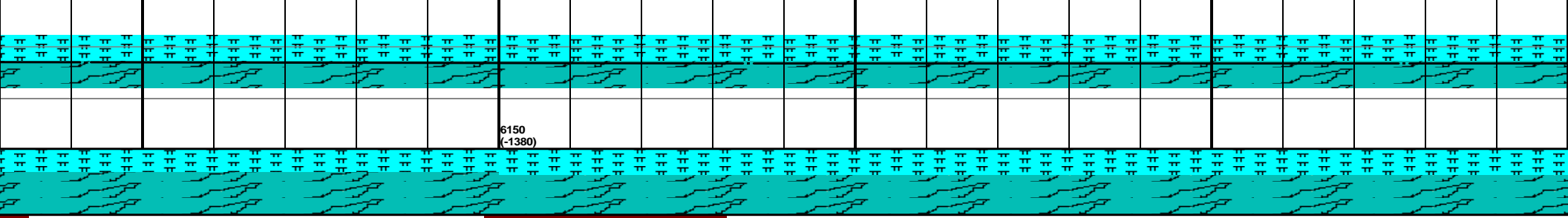


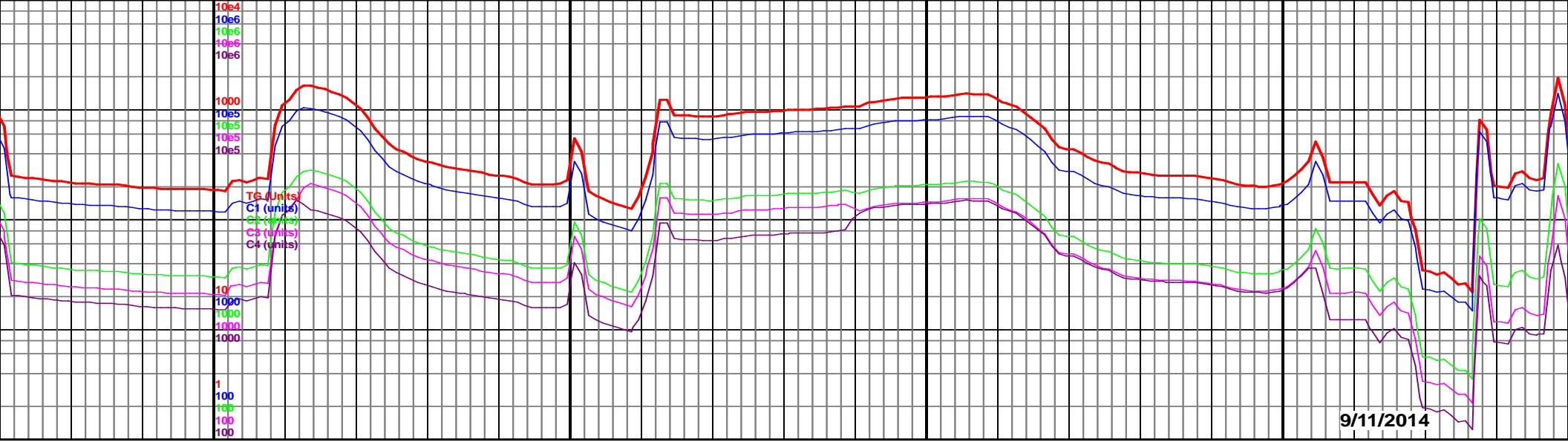




10350 MD 10342 TVD 5988.65 INC 87.7 AZ 0.8 VS 4144.82	10400 5200 TVD Sub Sea (-430)	10450 MD 10435 TVD 5990.52 INC 90 AZ 0.4 VS 4237.51	10500	MD 10527 TVD 5990.36 INC 90.2 AZ 359.9 VS 4329.17	10550
--	-------------------------------------	--	-------	---	-------

0-10400 Ch lt-med gy, sb blkcy-blcky, mod frm, mdk gy-gy, mod frm, sb blkcy-blcky, mod frm, v slo wht cut, 70% Ch, 30% Mrlst
 10400-10500 Ch lt gy-med gy, occ mott tan-lt brn, blkcy-sb blkcy, mod frm, Mrlst dk gy-gy, sb blkcy-blcky, mod frm, v slo mlky cut, 60% Ch, 40% Mrlst
 10500-10600 Ch lt gy-med frm, Mrlst dk gy-gy, blkcy mlky wht cut, 60% Ch, 40% Mrlst





10800

10850

10900

10950

5200 TMD 10804 TVD 5989.72
 Sub S_{INC} 89.8 AZ 358.6
 VS 4604.64

MD 10896 TVD 5991.57
 INC 87.9 AZ 356.6
 VS 4695.83

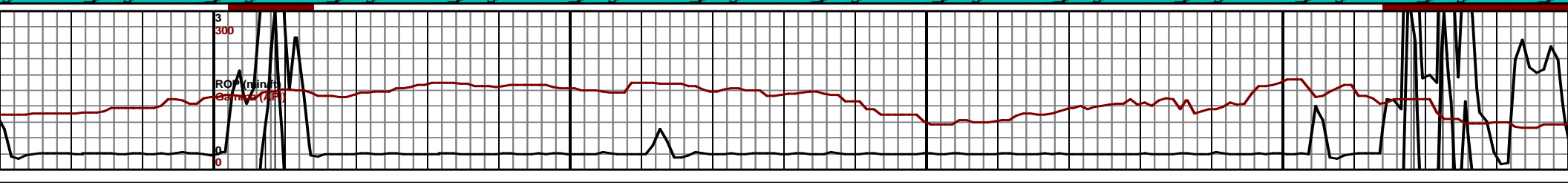
5675
(-905)

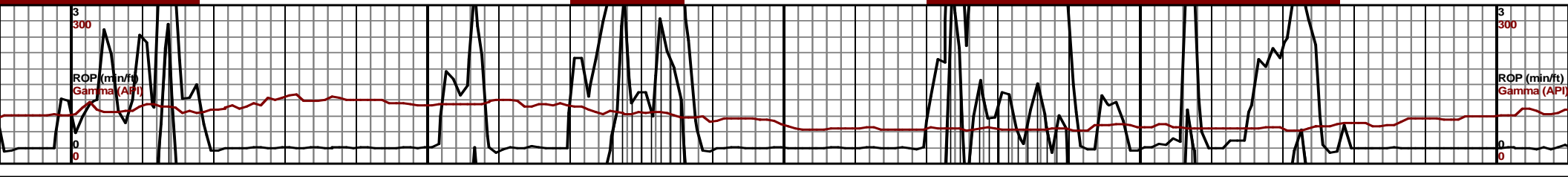
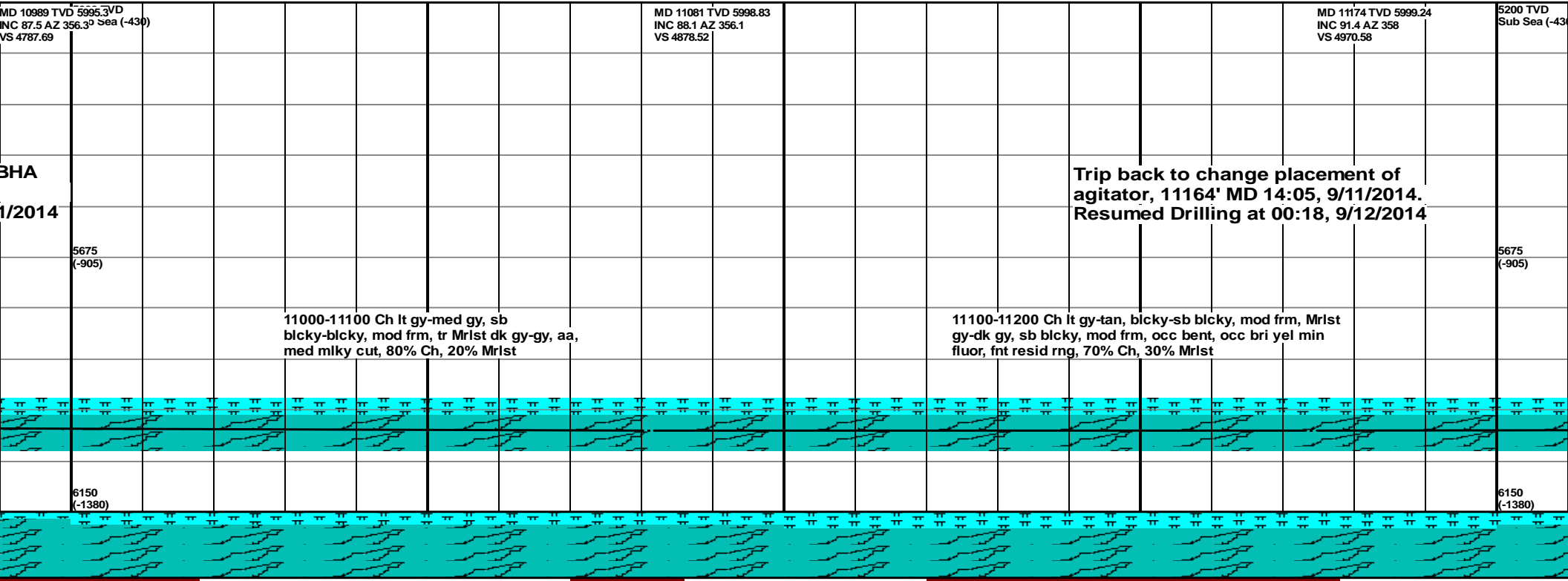
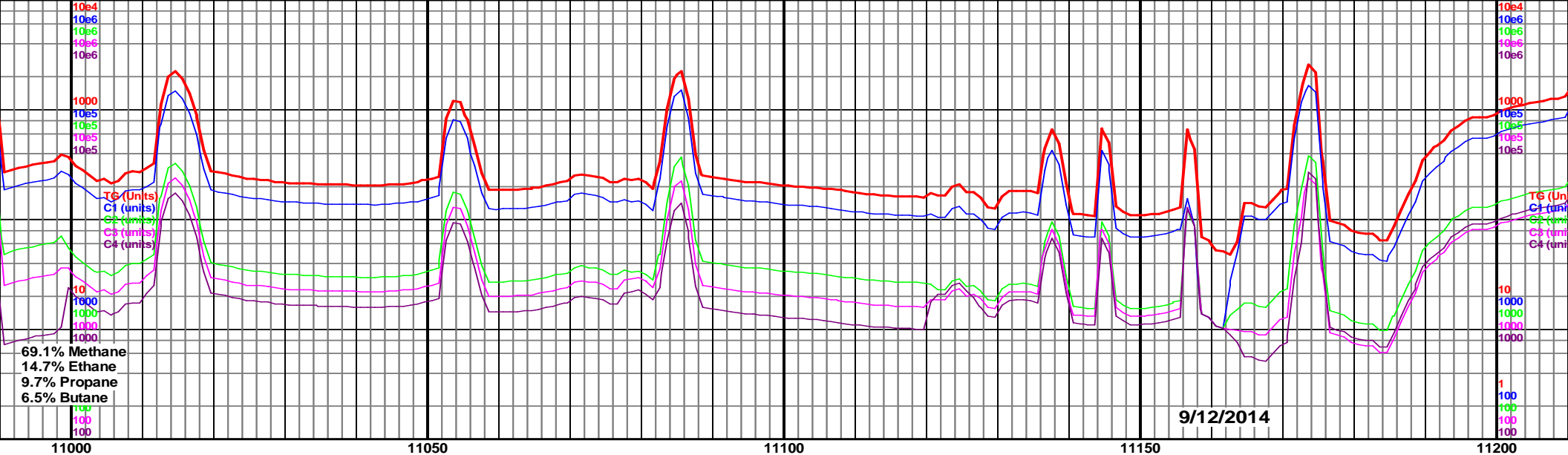
10800-10900 Ch lt gy-med gy, sb
 bicky-bicky, mod frm, Mrlst dk gy-gy, aa, no
 cut, 60% Ch, 40% Mrlst

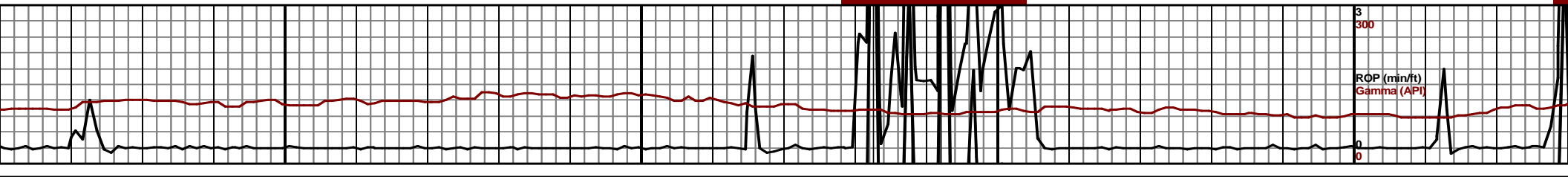
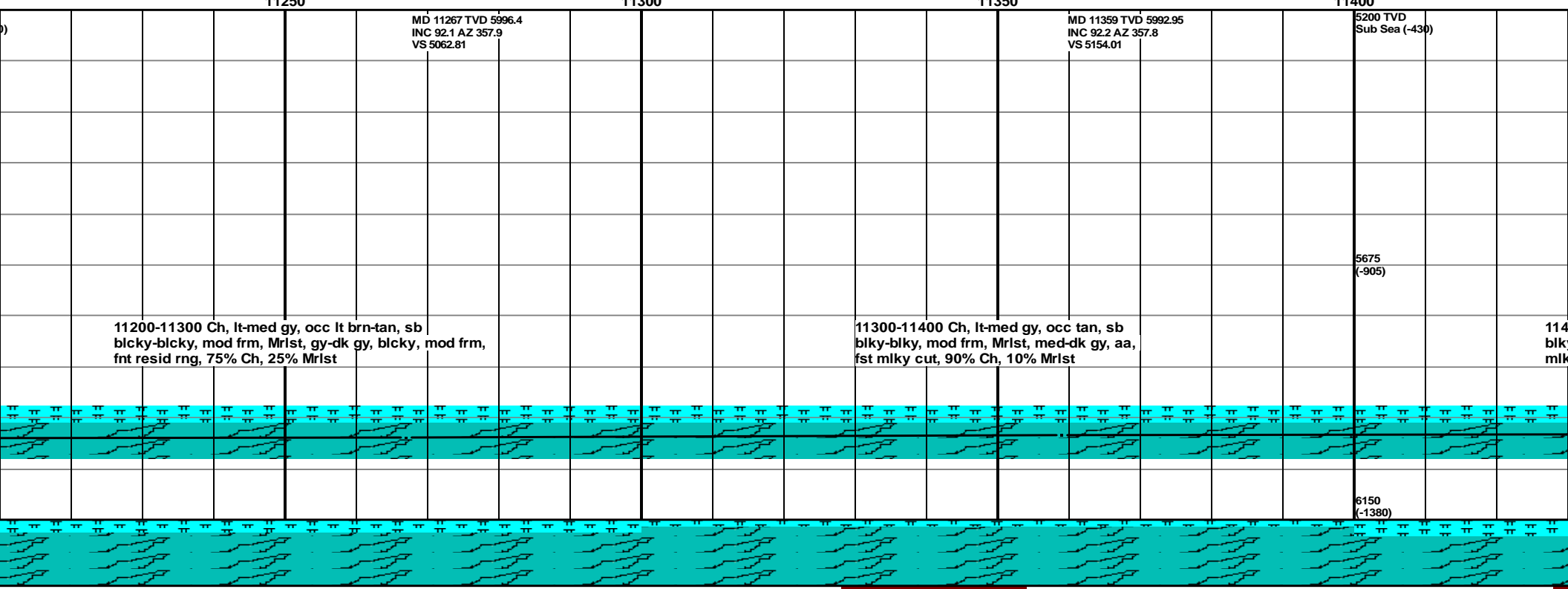
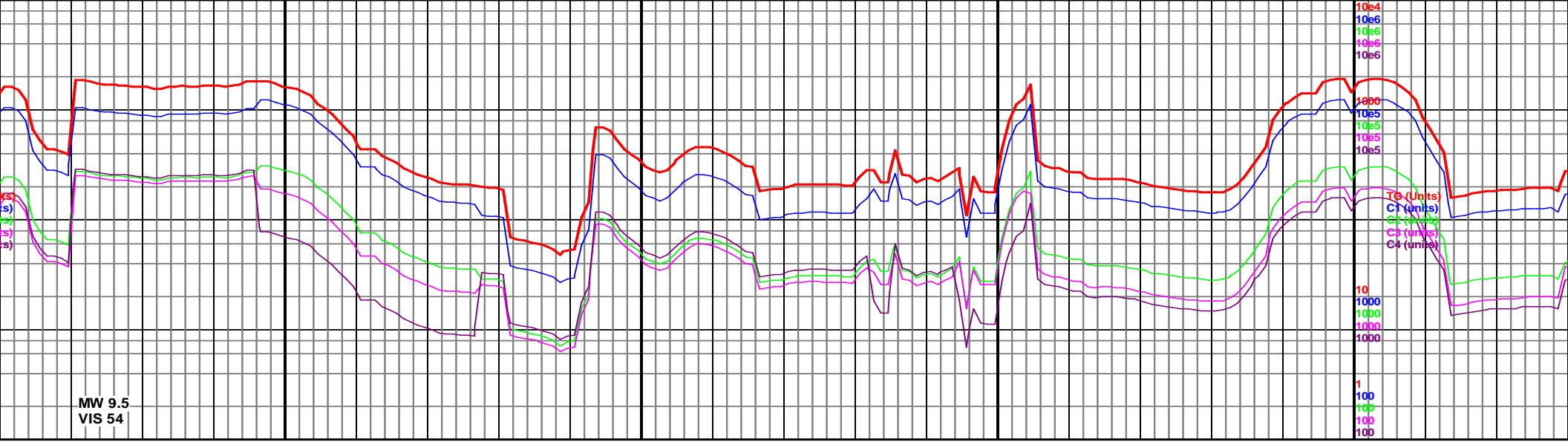
10900-11000 Ch lt gy-med gy, sb
 bicky-bicky, mod frm, tr Mrlst dk gy-gy, aa,
 fst mlky cut, 90% Ch, 10% Mrlst

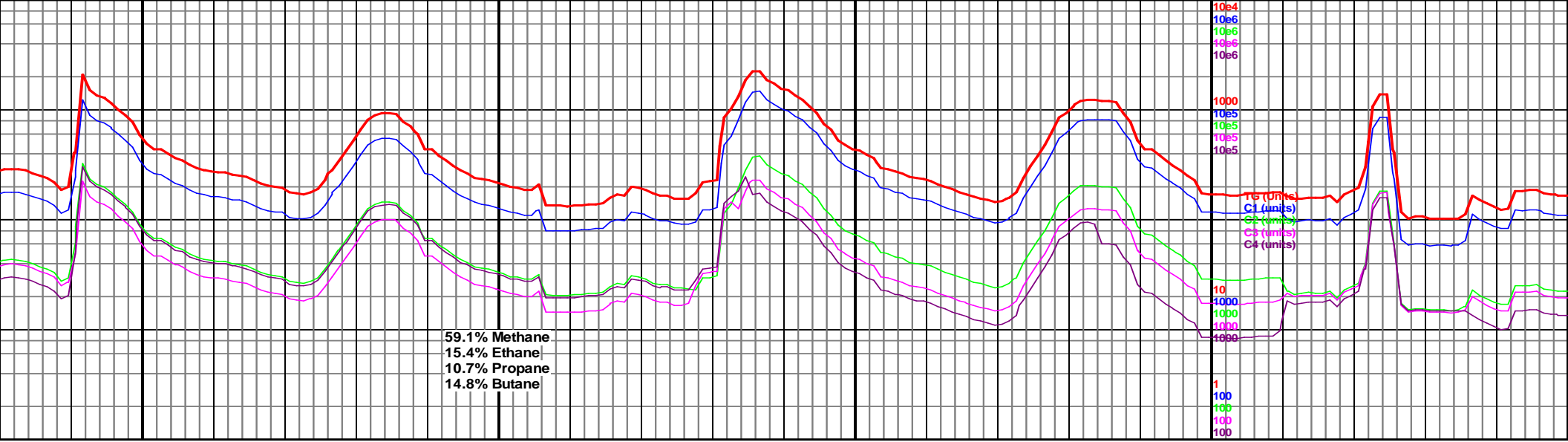
TOO H for agitation and new B
 10970' MD 15:05, 9/10/2014
 Resume Drilling at 05:10, 9/11/2014

6150
(-1380)







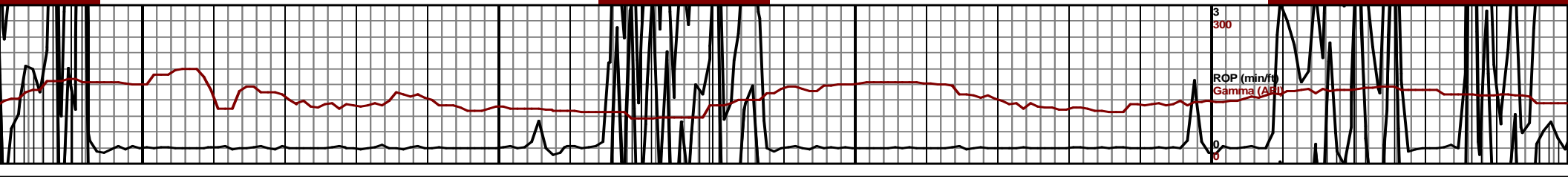
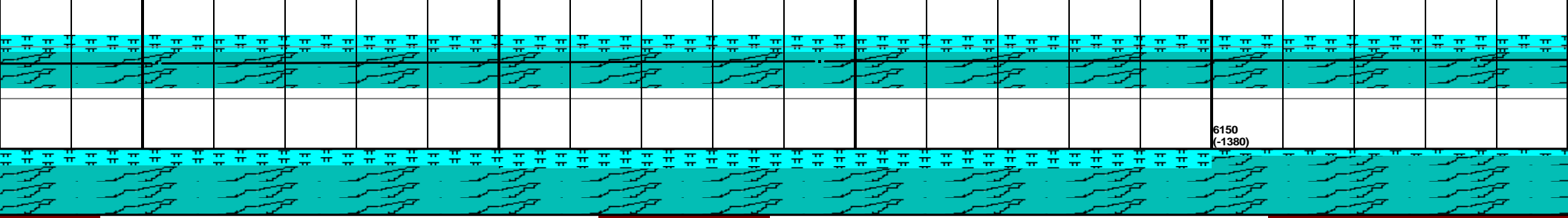


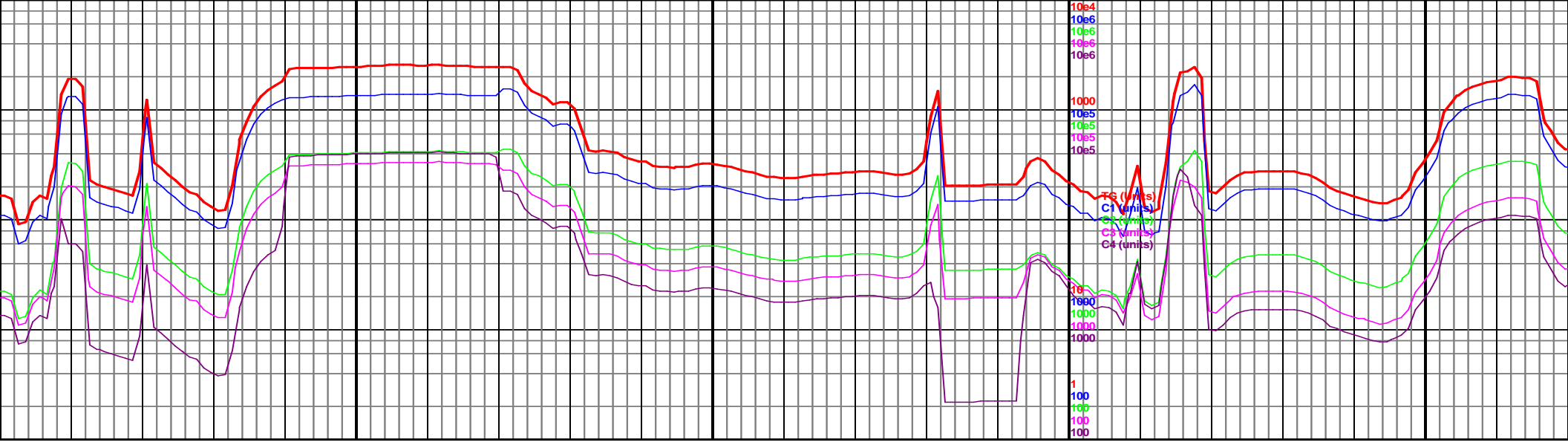
<p>11450</p> <p>MD 11452 TVD 5989.38 INC 92.2 AZ 358.2 VS 5246.23</p>	<p>11500</p>	<p>11550</p> <p>MD 11545 TVD 5986.38 INC 91.5 AZ 358 VS 5338.48</p>	<p>11600</p> <p>5200 TVD (-430) Sub Sea (-430)</p>	<p>11637 TVD 5989.38 INC 91.6 AZ 358.2 VS 5429.81</p>
---	--------------	---	--	---

11450-11500 Ch, med gy, occ grdg lt gy-tan, sb
y-blky, mod frm, Mrlst, med-dk gy, aa, slo
y cut, 75% Ch, 25% Mrlst

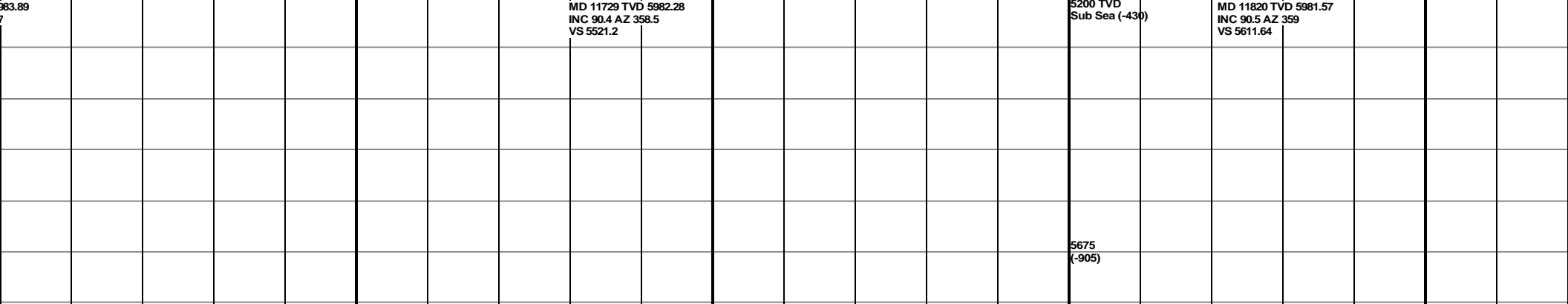
11500-11600 Ch, med gy, occ lt gy, sb
blky-blky, mod frm, Mrlst, med-dk gy, aa,
fst mlky cut, 70% Ch, 30% Mrlst

11600-11700 Ch, med-l
frm, Mrlst, med-dk gy, s
slo mlky cut, 90% Ch, 10% Mrlst

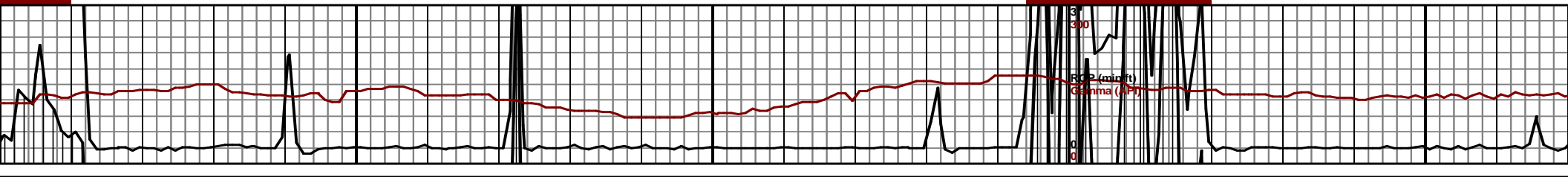
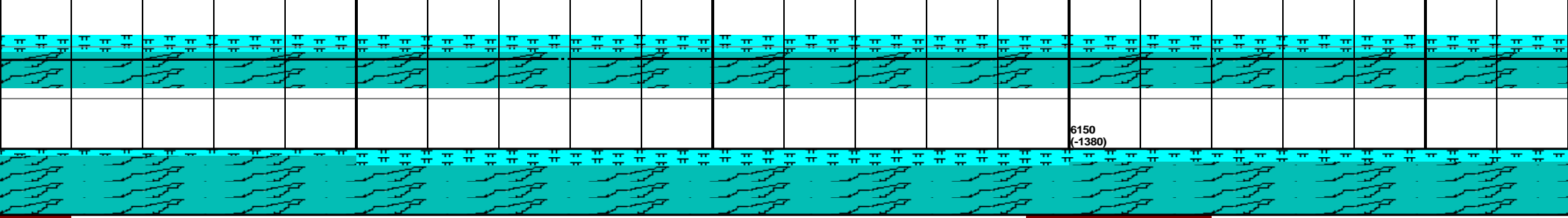


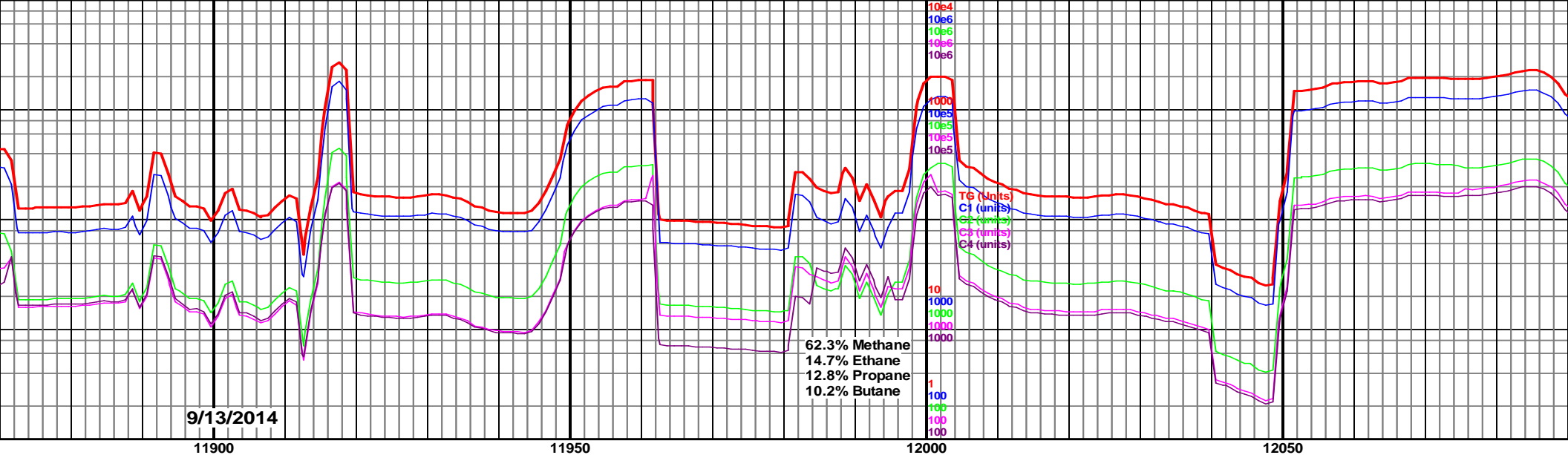


1150 11700 11750 11800 11850



0-11700 Ch lt gy, sb plty-blky, mod sb blky-blky, mod frm, 10% Mrlst
 11700-11800 Ch lt gy-gy, occ tan-lt brn, sb blcky-sb plty, mod frm, Mrlst, gy-dk gy, sb blcky-blcky, mod frm, v slo dull yel cut, 75% Ch, 25% Mrlst
 11800-11900 Ch lt gy-tan, occ lt brn, sb blcky-blcky, mod frm, Mrlst, gy-dk gy, sb blcky-blcky, mod frm, v slo dull yel cut, 80% Ch, 20% Mrlst



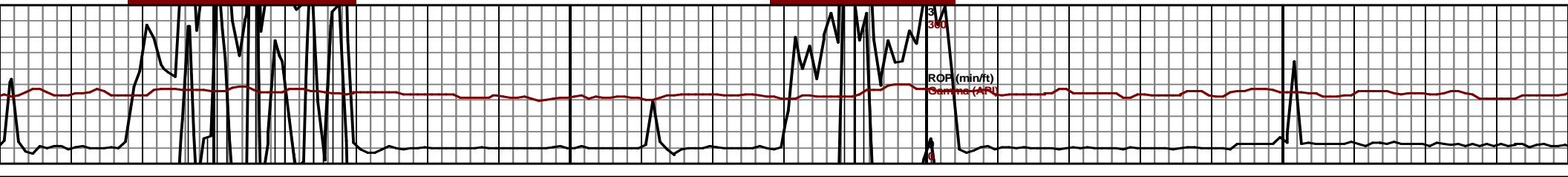
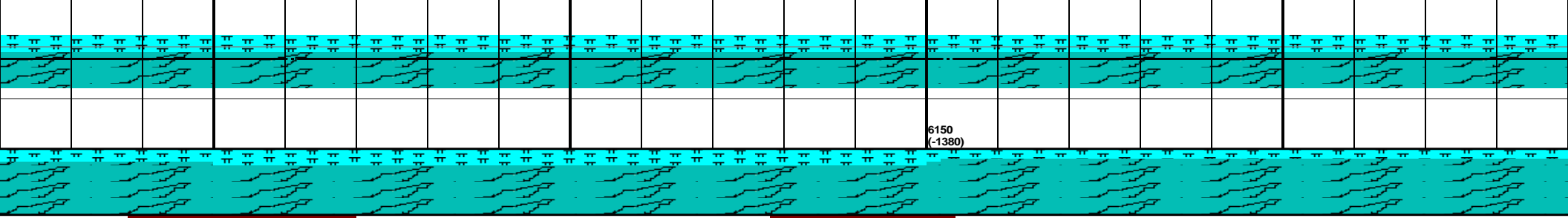


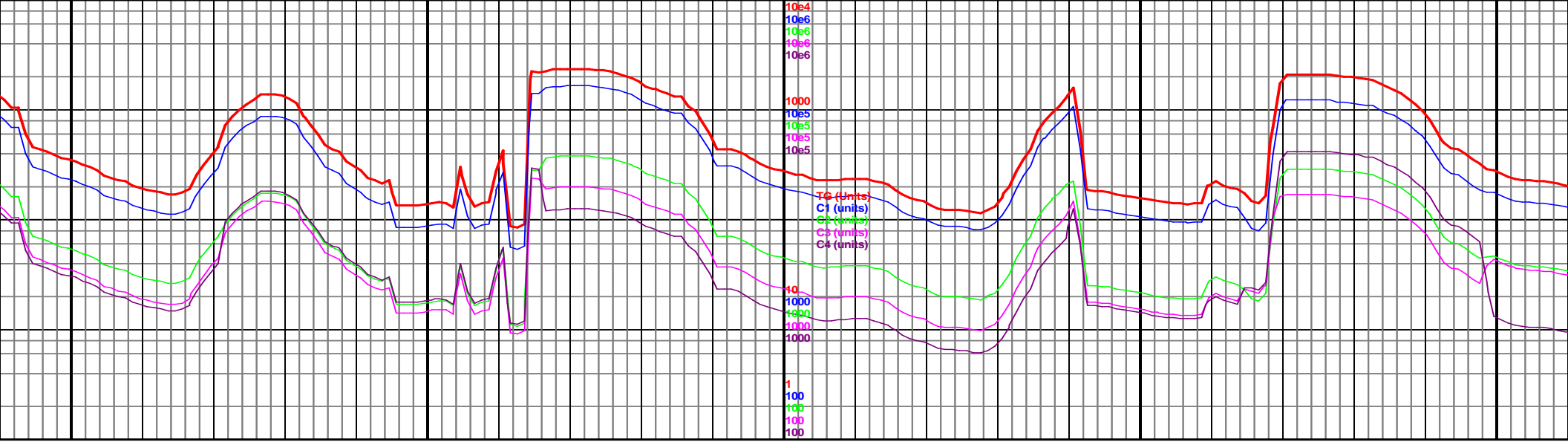
	<p>MD 11911 TVD 5981.65 INC 89.4 AZ 0.6 VS 5702.24</p>	<p>5200 MD 12003 TVD 5982.05 Sub INC 90.1 AZ 3.1 VS 5794.08</p>	
--	--	---	--

sb plty, frm, v

11900-12000 Ch lt gy-gy, occ tan, sb bicky-bicky, mod frm, Mrlst, gy-dk gy, sb bicky-bicky, mod frm, v slo dul yel cut , 75% Ch, 25% Mrlst

12000-12100 Ch lt gy-gy, occ tan, bicky-sb bicky, mod frm, Mrlst dk gy-gy, bicky, mod frm, slo mlky wht cut 80% Ch, 20% Mrlst





12100

12150

12200

12250

12300

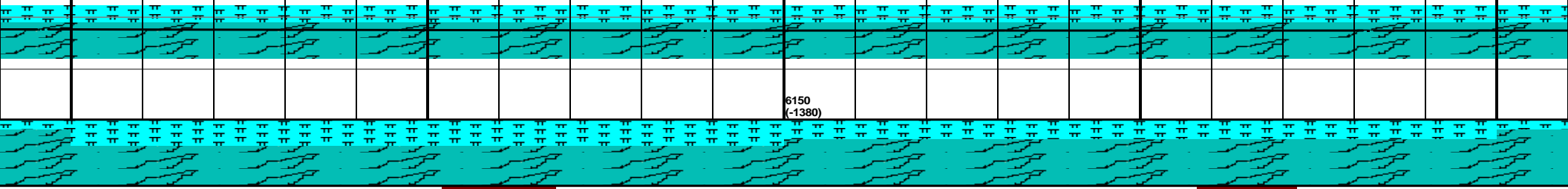
MD 12096 TVD 5982.7
INC 89.1 AZ 1.1
VS 5886.95

MD 12189 TVD 5983.27D
INC 90.2 AZ 0.8
VS 5979.7

MD 12282 TVD 5983.59
INC 89.4 AZ 0.6
VS 6072.42

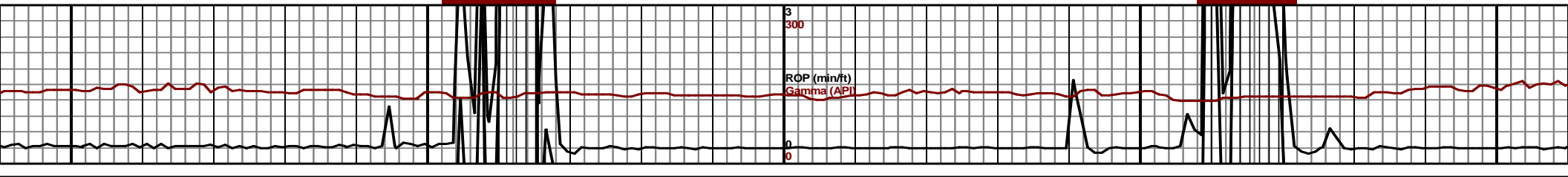
12100-12200 Ch lt gy-gy, occ tan, bcky-sb
bcky, mod frm, Mrlst dk gy-gy, bcky, mod
frm, slo mlky cut 60% Ch, 40% Mrlst

12200-12300 Ch lt gy-gy, occ tan, bcky-sb
bcky, mod frm, Mrlst dk gy-gy, bcky, mod frm, v
slo mlky cut, 65% Ch, 35% Mrlst



5675
(-905)

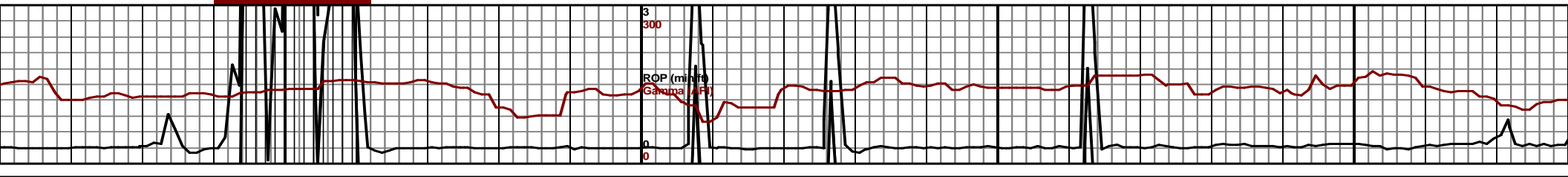
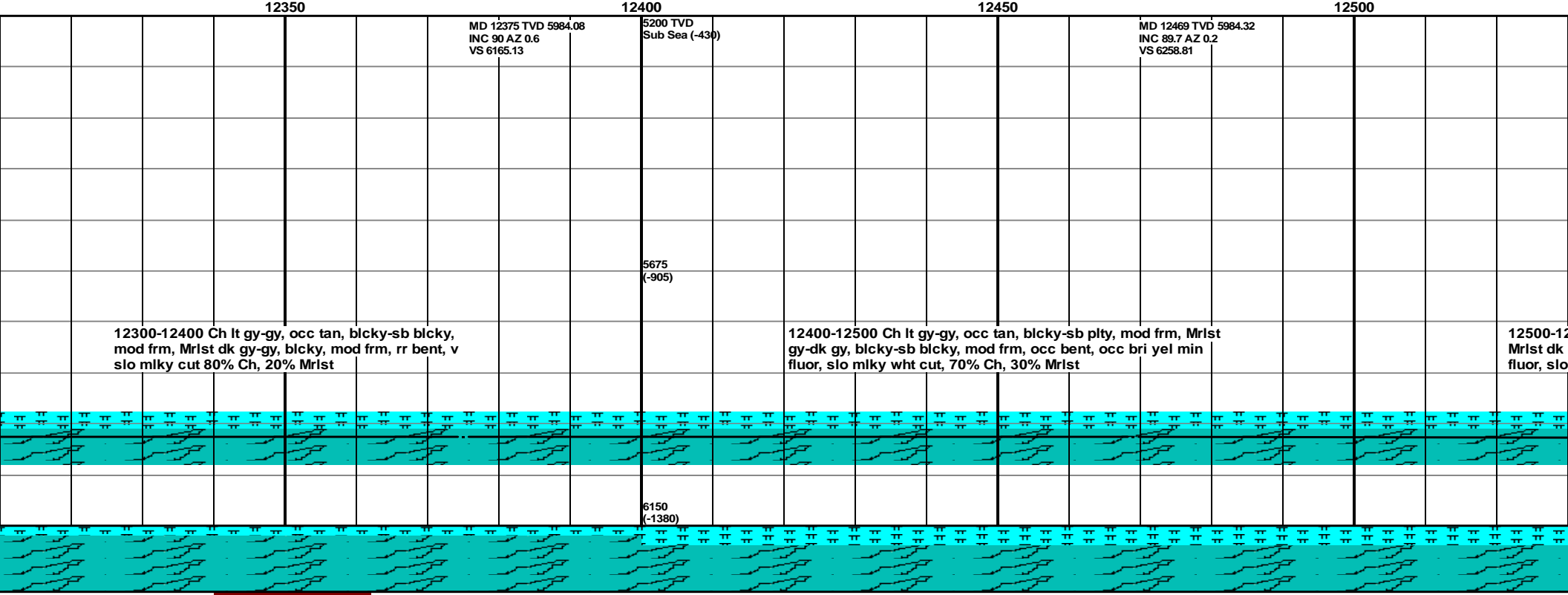
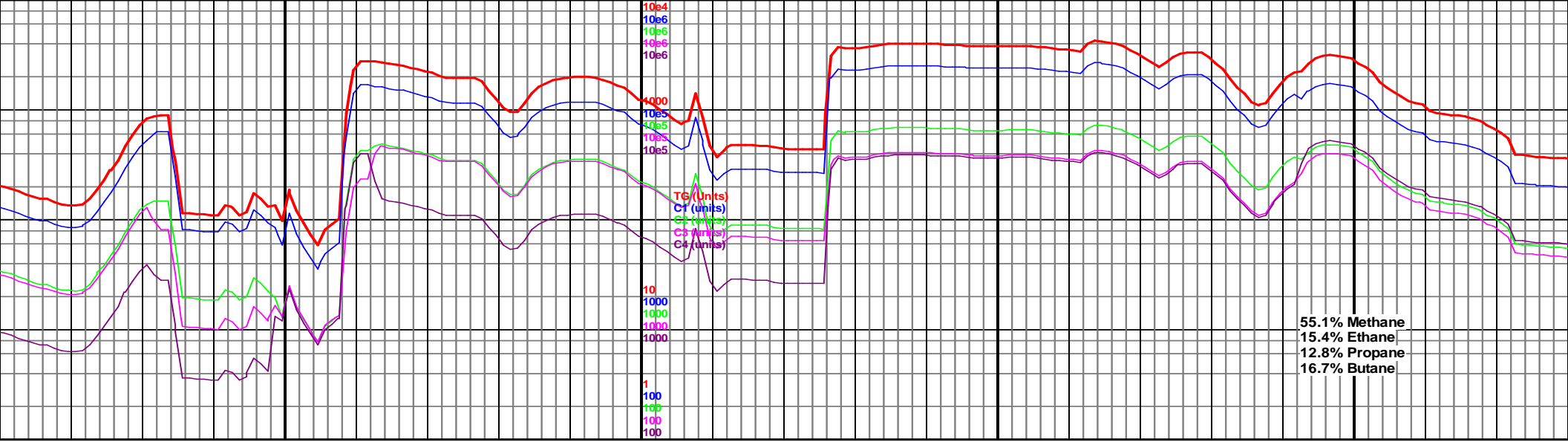
6150
(-1380)

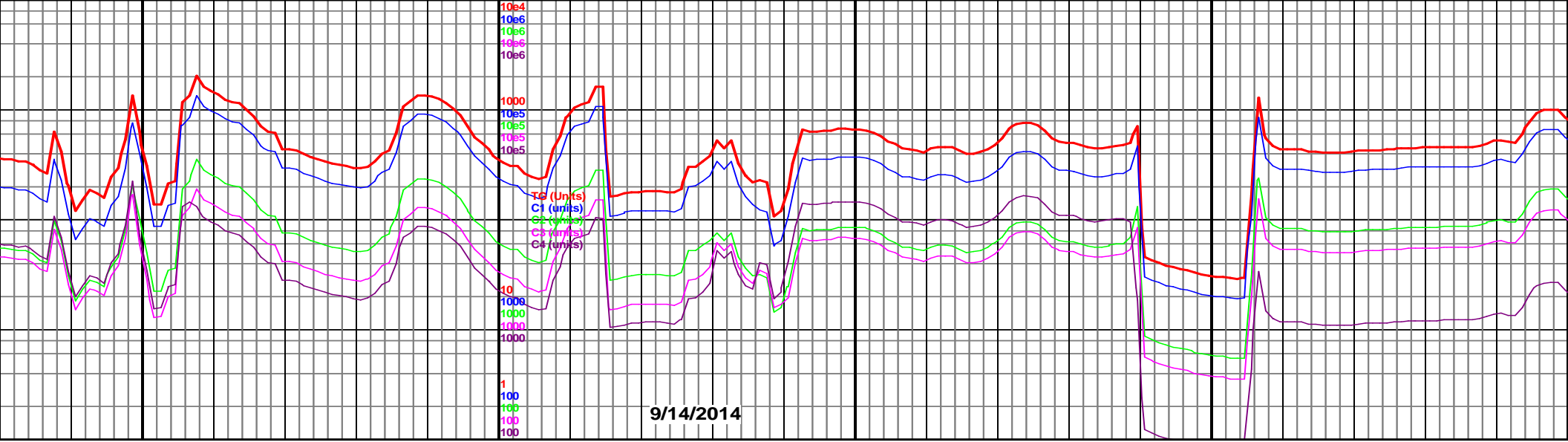


3
300

ROP (min/ft)
Gamma (API)

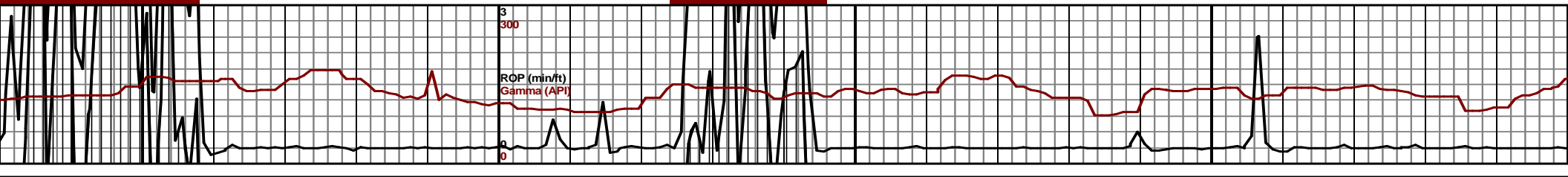
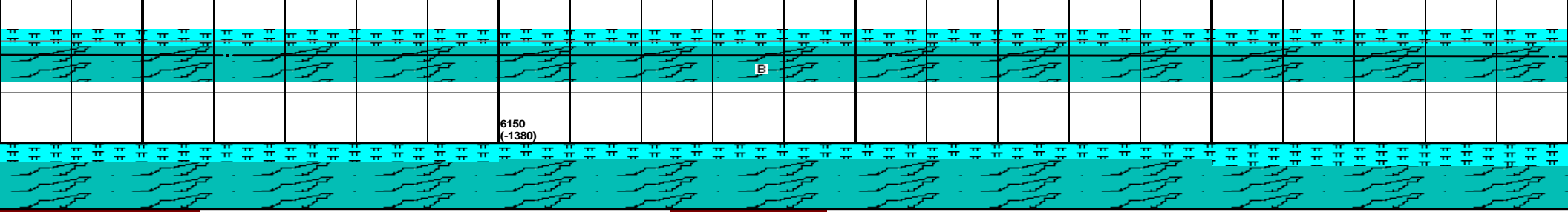
0
0

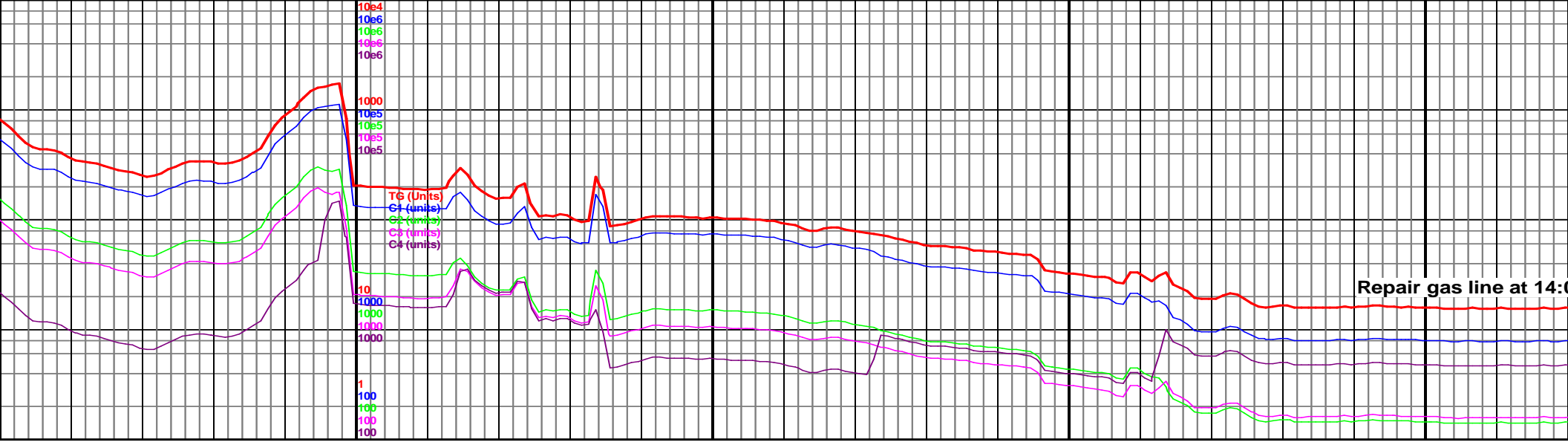




	MD 12562 TVD 5985.22 INC 89.2 AZ 1.5 VS 6351.55	5200 TVD Sub Sea (-430)	MD 12655 TVD 5986.43 INC 89.3 AZ 1.5 VS 6444.36	M IN V
--	---	----------------------------	---	--------------

12600 Ch gy-lt gy, occ tan, sb bicky-bicky, mod frm, gy-gy, bicky, mod frm, rr tr bent, tr bri yrl min mlky wht cut 70% Ch, 30% Mrlst
 12600-12700 Ch lt gy-gy, bicky-sb bicky, mod frm, Mrlst gy-dk gy, bicky, mod frm, rr tr bent, rr bri yel min fluor, slo mlky wht cut, 75% Ch, 25% Mrlst
 12700-12800 Ch gy-lt gy frm, Mrlst gy-dk gy, sb b mlky wht cut 60% Ch, 40% Mrlst





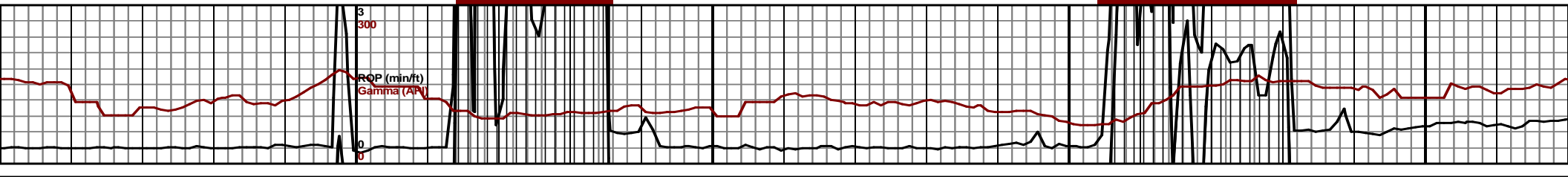
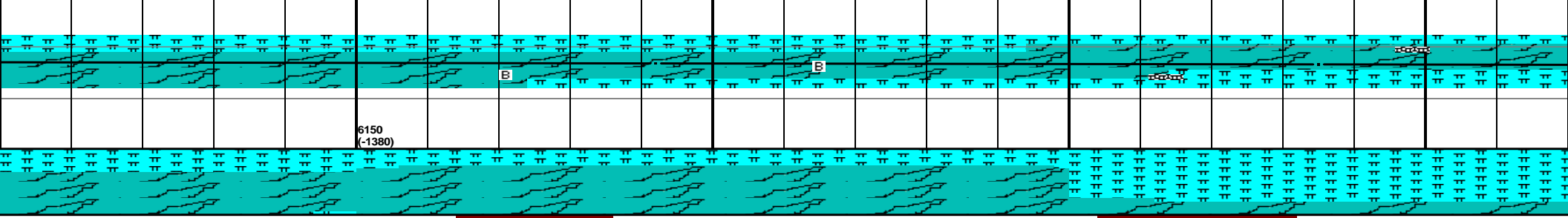
750 12800 12850 12900 12950

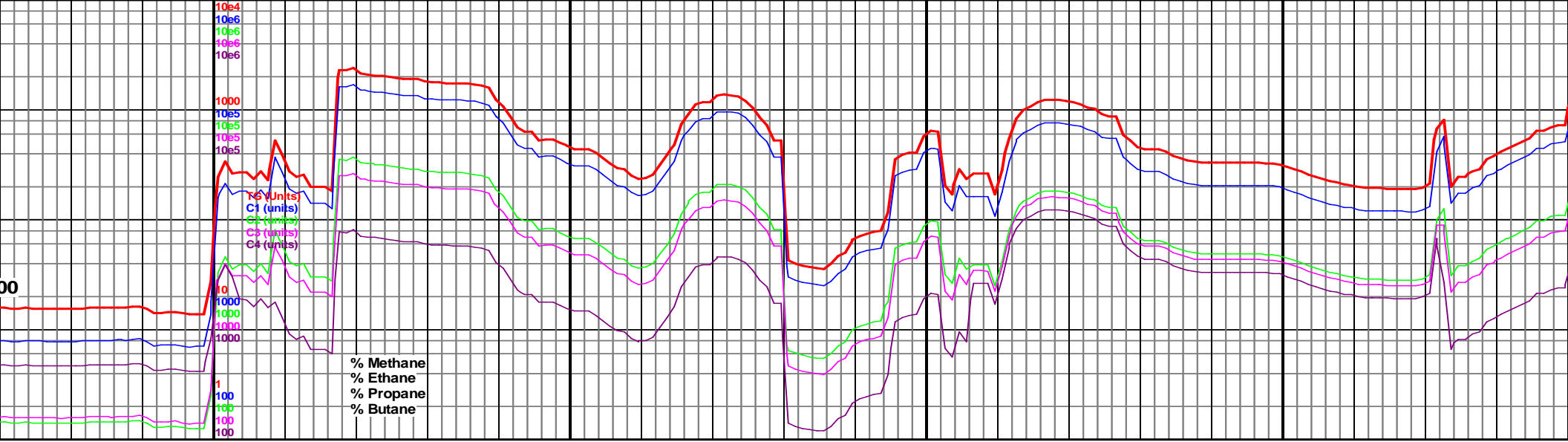
ID 12748 TVD 5988.38 INC 88.3 AZ 0.9 VS 6537.12	5200 TVD Sub Sea (-430)	MD 12842 TVD 5990.92 INC 88.6 AZ 0.5 VS 6630.81		MD 12935 TVD 5992.71 INC 89.2 AZ 0.9 VS 6723.51
---	----------------------------	---	--	---

blcky-sb blcky, mod blcky, mod frm, v slo % Mrlst

12800-12900 Ch gy-lt gy, blcky-sb blcky, mod frm, Mrlst gy-dk gy, sb blcky, aa, tr bent, tr yel min fluor, v slo mlky wht cut, 70% Ch, 30% Mrlst

12900-13000 Mrlst gy-dk gy, sb blcky, mod frm, Ch blky-sb blky, mod frm, abnt bent, dull grn, occ bri y fluor, fnt resdl fluor, 80% Mrlst, 20% Ch





	5200 TVD Sub Sea (-430)	MD 13028 TVD 5993.52 INC 89.8 AZ 0.4 VS 6816.23			MD 13124 TVD 5993.19 INC 90.6 AZ 0.1 VS 6911.88	
--	----------------------------	---	--	--	---	--

It-med gy, rel min
 13000-13100 Mrlst gy-dk gy, sb bicky-bicky, mod frm, Ch gy-lt gy, sb bicky-sb plty, mod frm, abdt bent, occ bri yel min fluor, slo mlky wht cut 70% Mrlst, 30% Ch
 13100-13200 Mrlst gy-dk gy, sb bicky-bicky, mod frm, Ch lt gy-gy, bicky-sb plty, mod frm, abdt bent, occ bri yel min fluor, slo mlky wht cut 80% Mrlst, 20% Ch

