



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

Well Name: Razor 33P-3316  
Well Id: 05-123-4022000  
Location: SESE 33-T10N-R58W  
License Number: 05-123-4022000  
Spud Date: 12/8/2014  
Surface Coordinates: 40.788575, -103.862503

Region: Redtail Field  
Drilling Completed: 12/12/2014

Bottom Hole 100 FNL 165 FEL  
Coordinates:  
Ground Elevation (ft): 4708      K.B. Elevation (ft): 4730  
Logged Interval (ft): 5174      To: 10510      Total Depth (ft): 10510  
Formation: Pierre, Sharon Springs, Niobrara A  
Type of Drilling Fluid: Water Based Mud

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

## Drilling Company

Frontier Drilling  
Rig #26

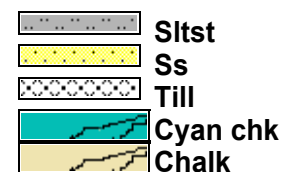
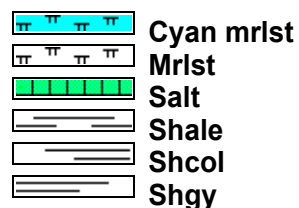
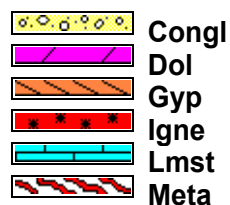
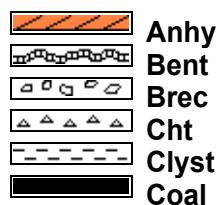
## Gas Detection

Mudlogging Systems, Inc., M Logger, Model TGC, Total Gas and Chromatograph, #592

## Comments

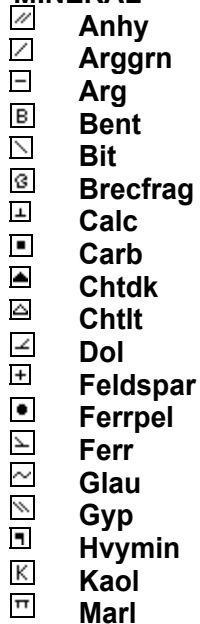
Lithologies and tops at drilled depths, not corrected to elogs. Where the well bore gas is 100% methane, the C1 line is moved to 85% for graphical purposes only.

## ROCK TYPES

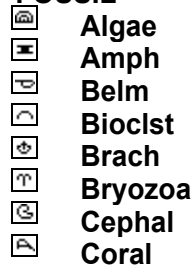


## ACCESSORIES

### MINERAL



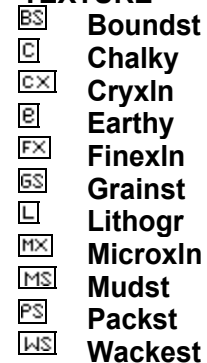
### FOSSIL



### 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.

Re-zero Gas  
Detection  
Equipment

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

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

ML-592

Wt 10.2  
Vis 48

MD

5050 TVD (-320 SS)

MD 5126 TVD 5105.99  
INC 1.78 AZ 11.25  
VS -170.86

5050 TVD (-320 SS)

MD 5221 TVD 5200.66  
INC 7.31 AZ 356.29  
VS -163.4

MD 5268 TVD 5246.94  
INC 12.51 AZ 359.46  
VS -155.36

5174-5200 Siltst lt gy-med gy, sb blkly-sb plty,  
silty tex, sl frm, non calc, rr Sh med gy-dk gy,  
sb plty-plty, frm, non calc, nsfoc, 90% siltst  
10% sh

5200-5250 Siltst lt gy-med gy, sb blkly-sb plty,  
silty tex, frm, non calc, nsfoc, 100% siltst

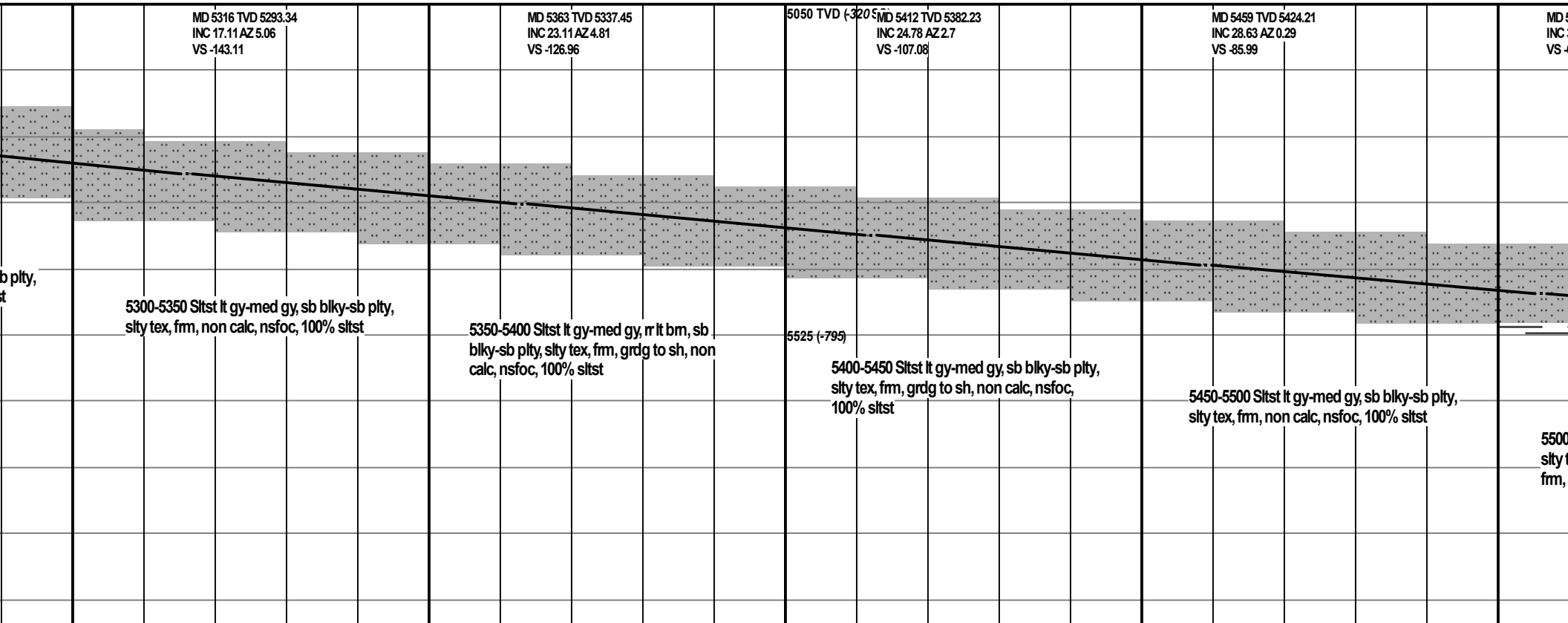
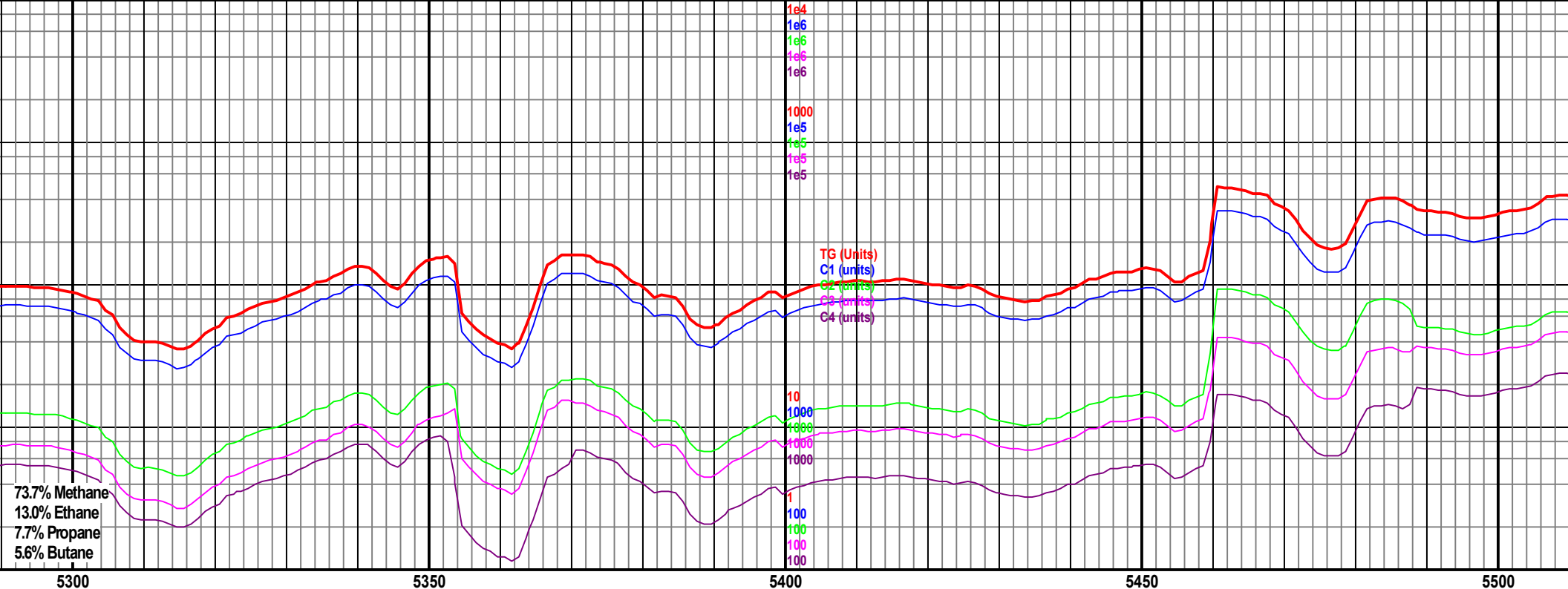
5250-5300 Siltst lt gy-med gy, sb blkly-s  
silty tex, frm, non calc, nsfoc, 100% siltst

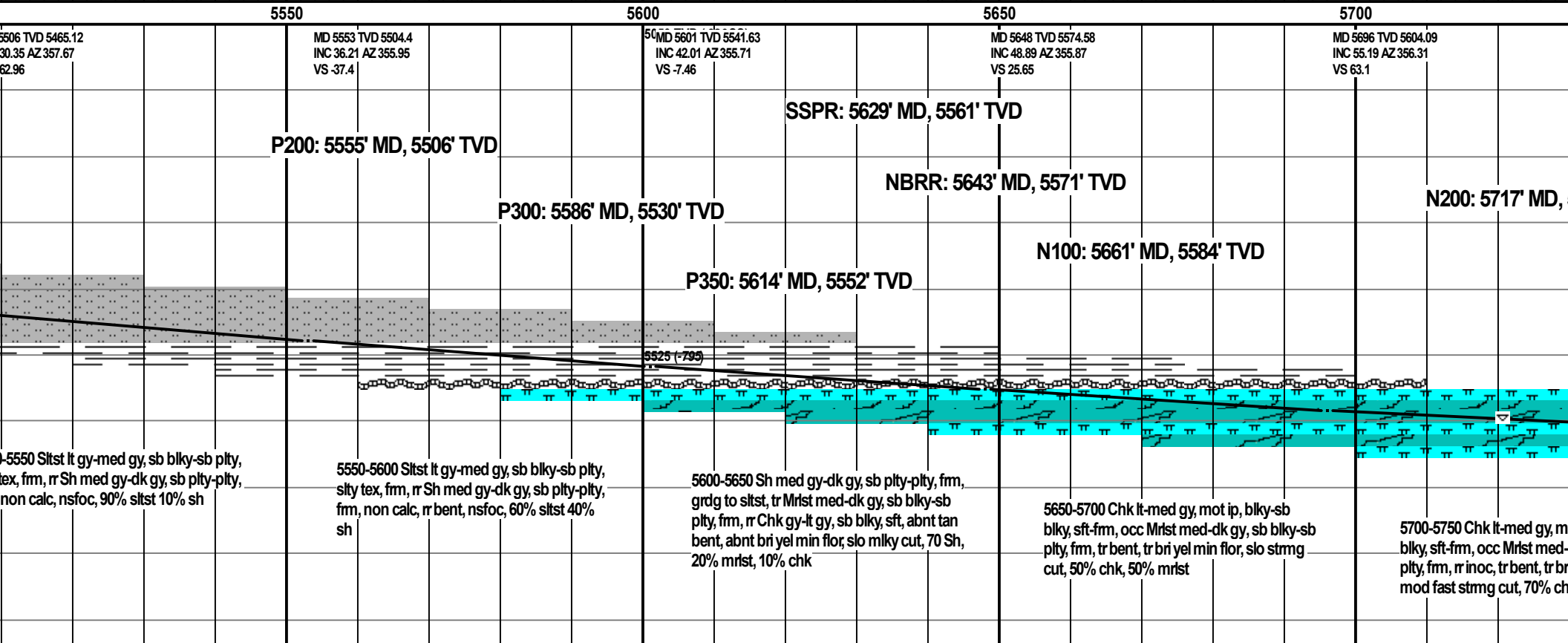
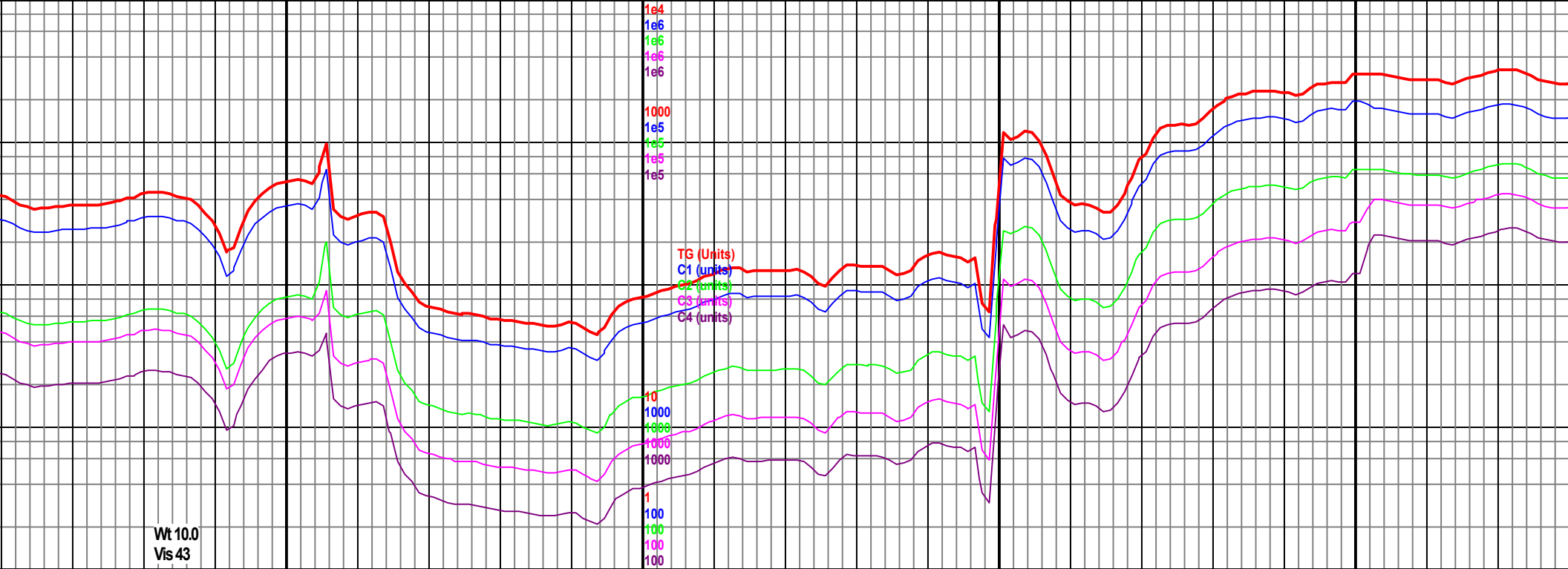
Well Bore Cross Section

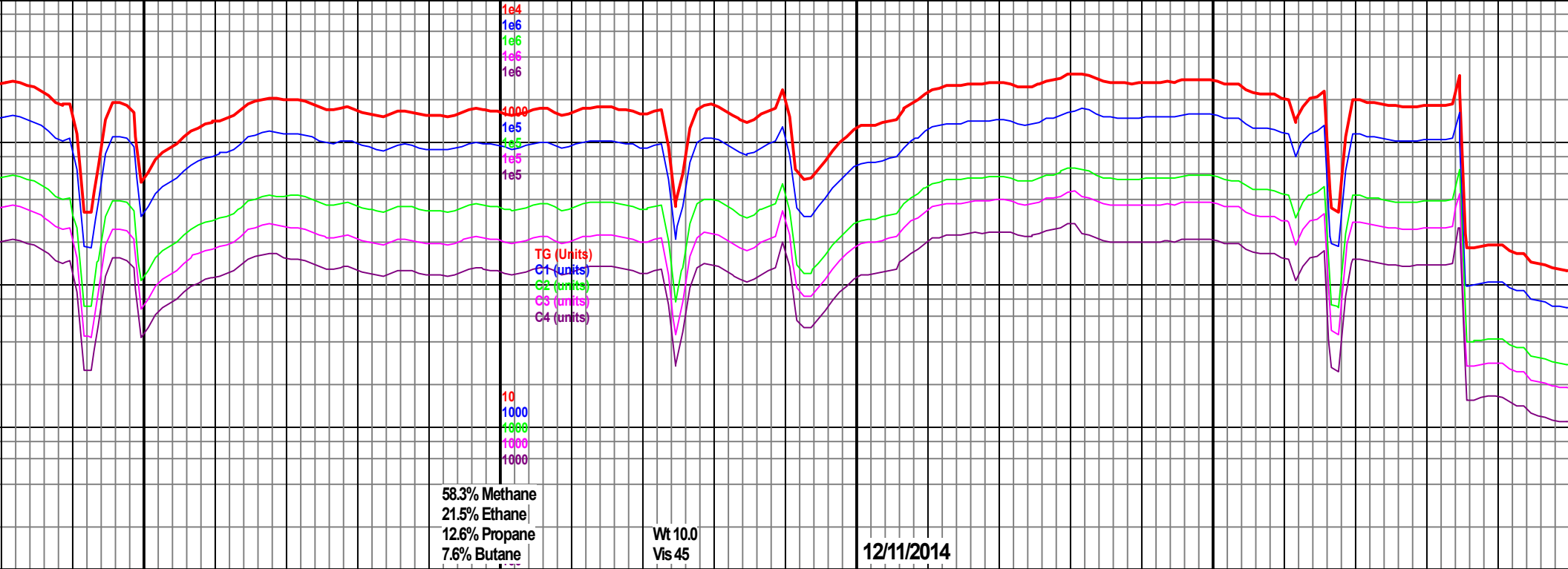
5525 (-795)

Acme Geologic Consulting  
arrived and rigged up on  
12/9/2014, sample catching  
began at KOP of 5174' MD at  
15:38 on 12/9/2014

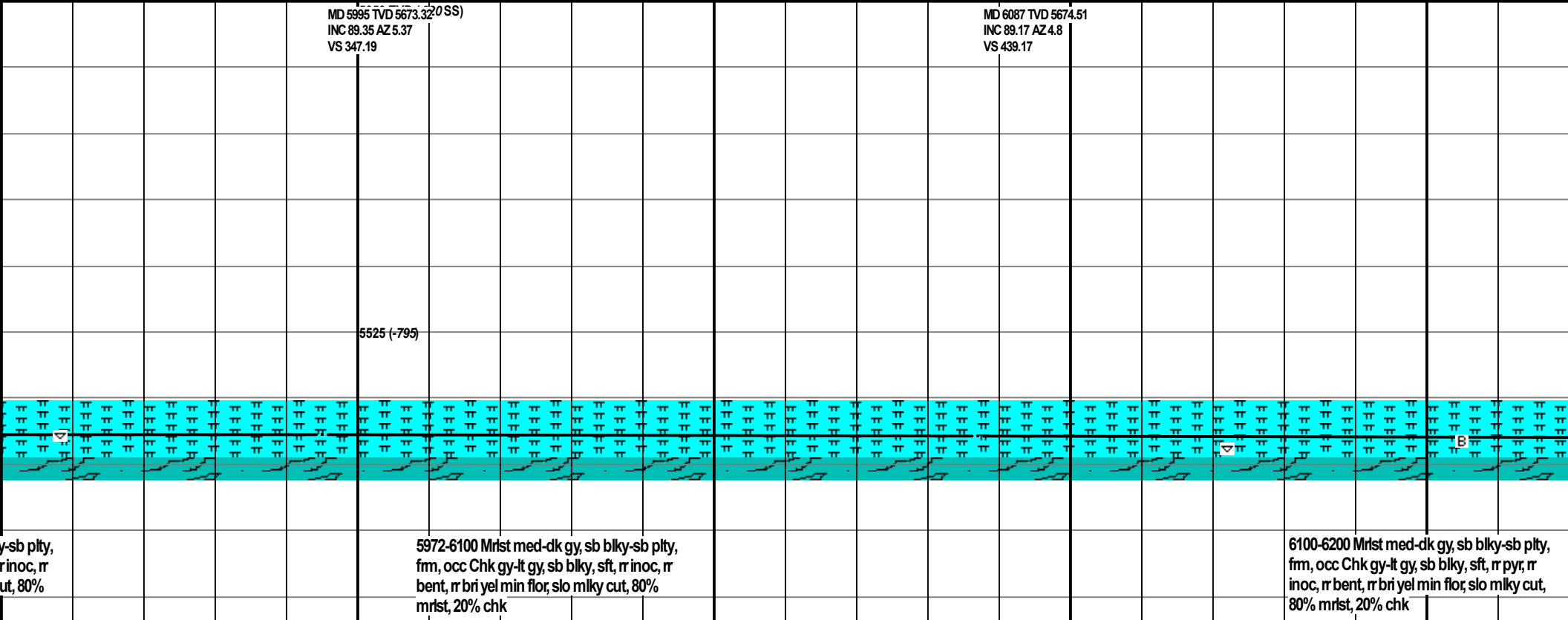
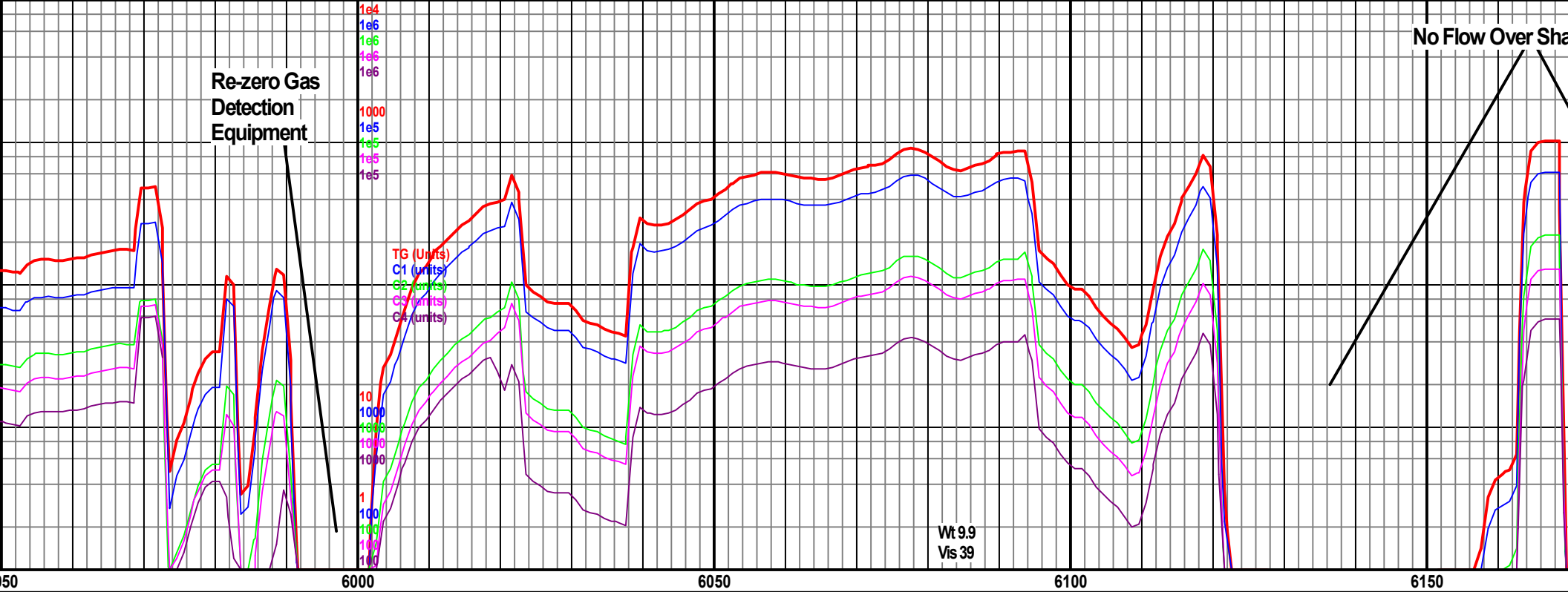
5525 (-795)



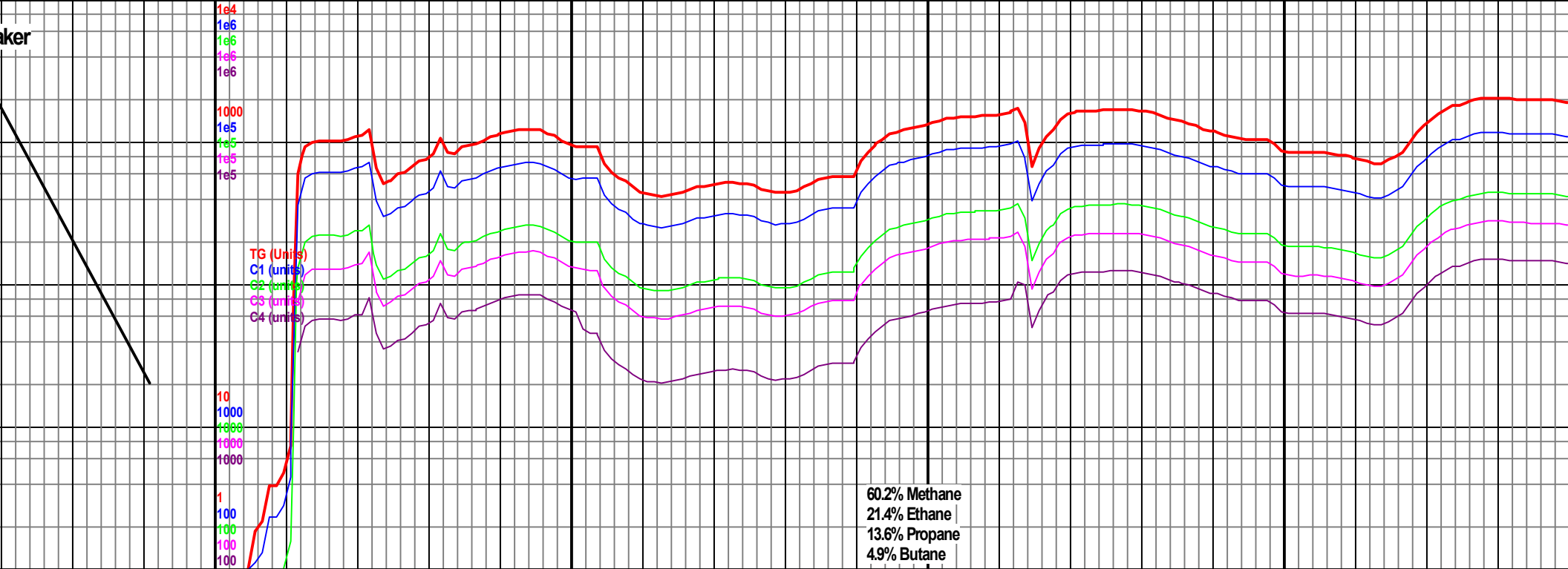




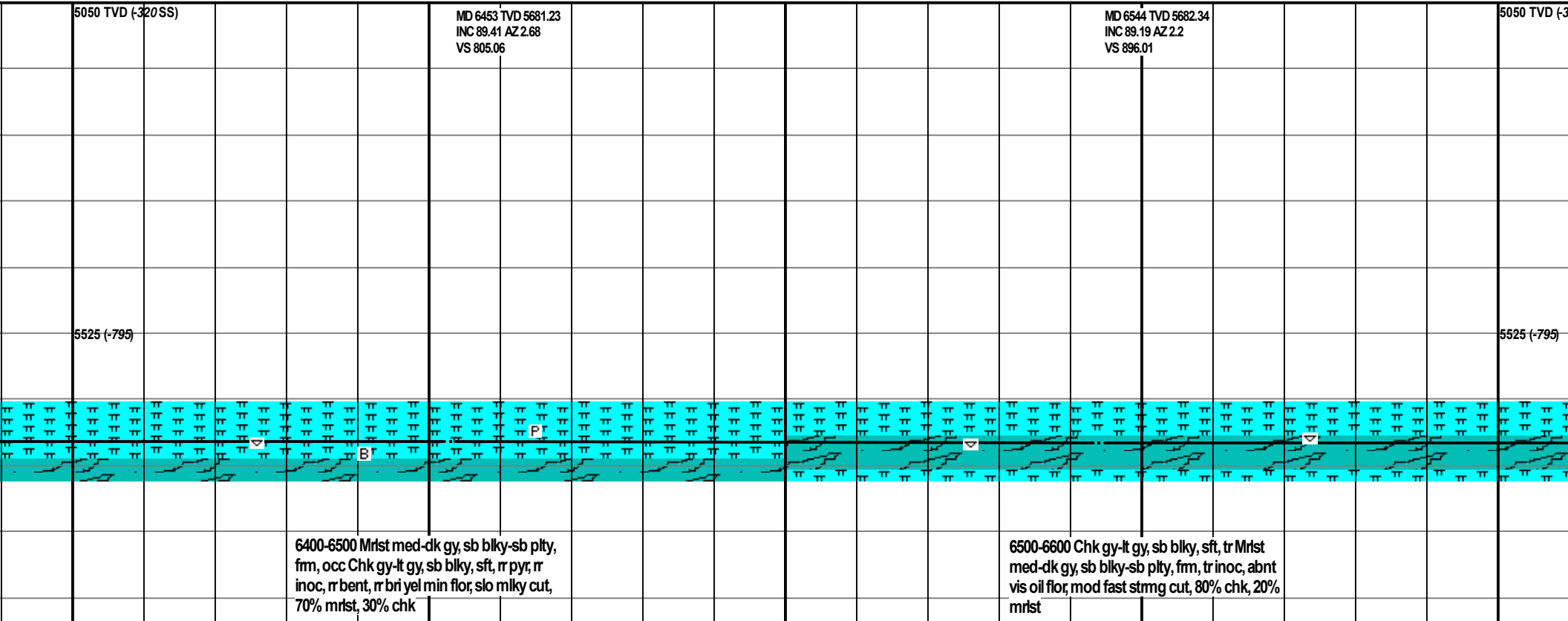
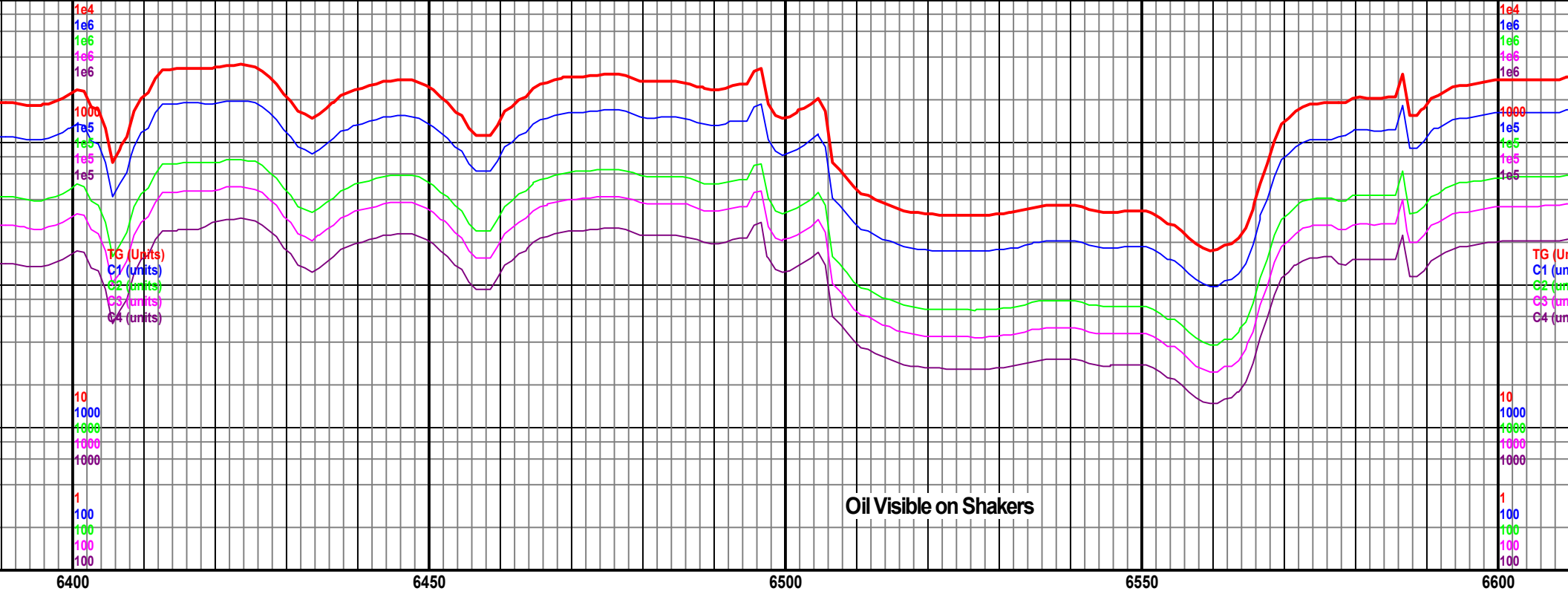
5750		5800		5850		5900	5950
MD 5743 TVD 5628.29 INC 62.78 AZ 356.42 VS 102.97		MD 5791 TVD 5647.63D (-320 SS) INC 69.66 AZ 356.87 VS 146.49		MD 5838 TVD 5661.11 INC 77 AZ 358.15 VS 191.18		MD 5886 TVD 5669.36 INC 83.2 AZ 2.91 VS 238.33	MD 5924 TVD 5672.07 INC 88.63 AZ 5.22 VS 276.21
5615' TVD							
N250: 5745' MD, 5629' TVD							
		5525 (-795)	N430: 5825' MD, 5657' TVD			Intermediate casing point of 5972' MD reached at 01:36 on 12/10/2014. Resume drilling at 16:00 on 12/11/2014.	
ot ip, blk-y-sb							
dk gy, sb blk-y-sb							
i yel min flor,							
k, 30% mrlst	5750-5800 Mrlst med-dk gy, sb blk-y-sb plty, frm, occ Chk gy-lt gy, sb blk-y, sft, r r inoc, occ lt gm bent, occ bri yel min flor, slo strmg cut, 70% mrlst, 30% chk		5800-5850 Mrlst med-dk gy, sb blk-y-sb plty, frm, occ Chk gy-lt gy, sb blk-y, sft, tr bent, tr bri yel min flor, slo strmg cut, 60% mrlst, 40% chk	5850-5900 Mrlst med-dk gy, sb blk-y-sb plty, frm, occ Chk gy-lt gy, sb blk-y, sft, tr inoc, r bent, r bri yel min flor, slo streaming cut, 70% mrlst, 30% chk		5900-5972 Mrlst med-dk gy, sb blk-y-sb plty, frm, occ Chk gy-lt gy, sb blk-y, sft, r bent, r bri yel min flor, v slo mlky c mrlst, 20% chk	

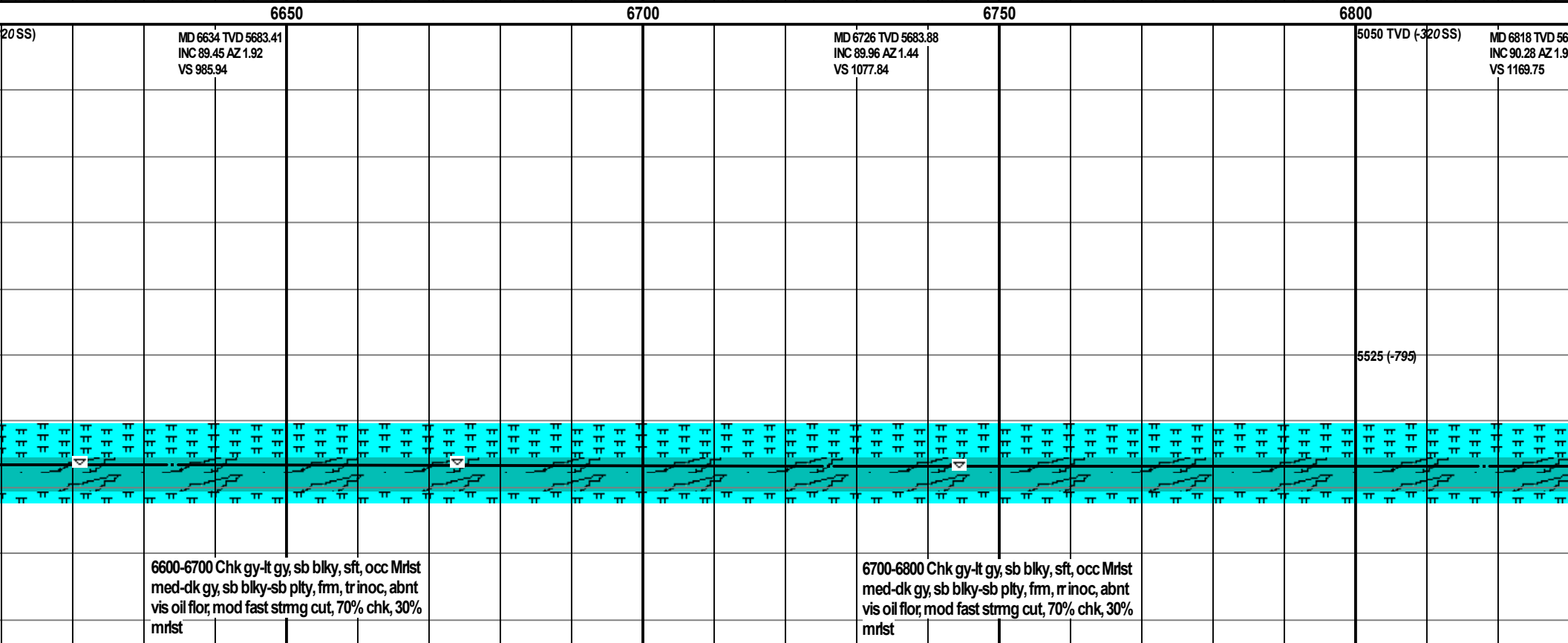
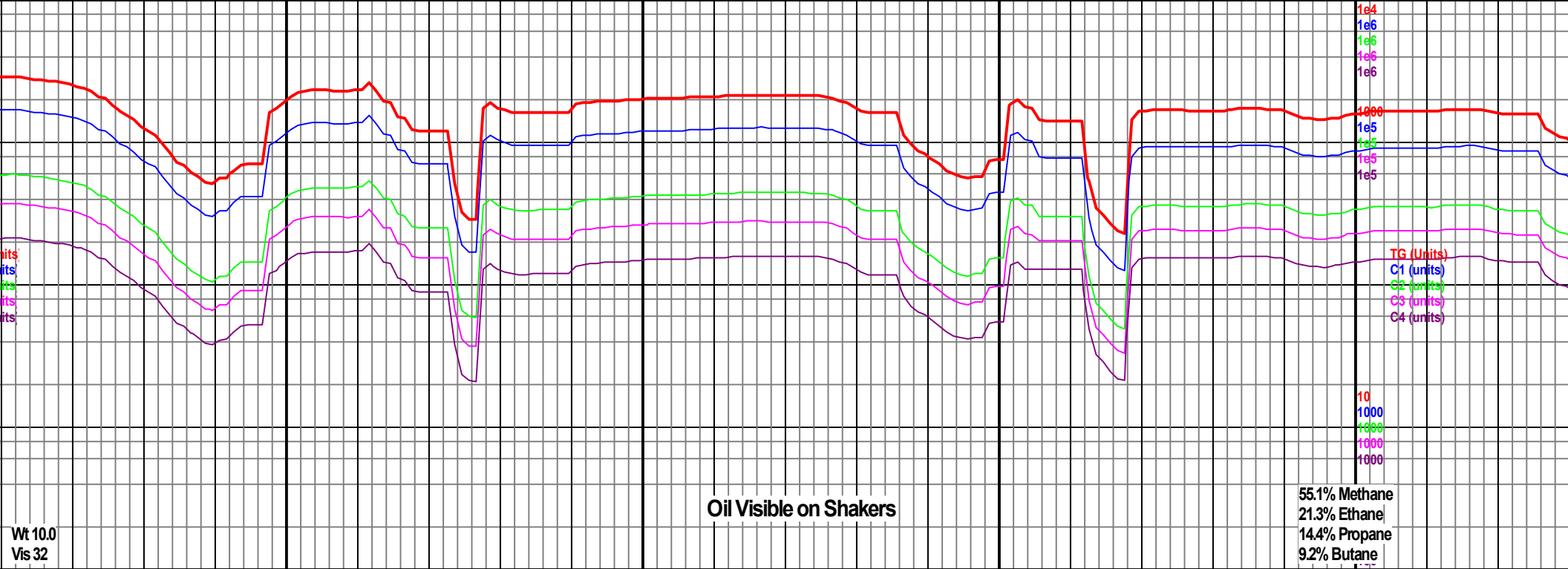




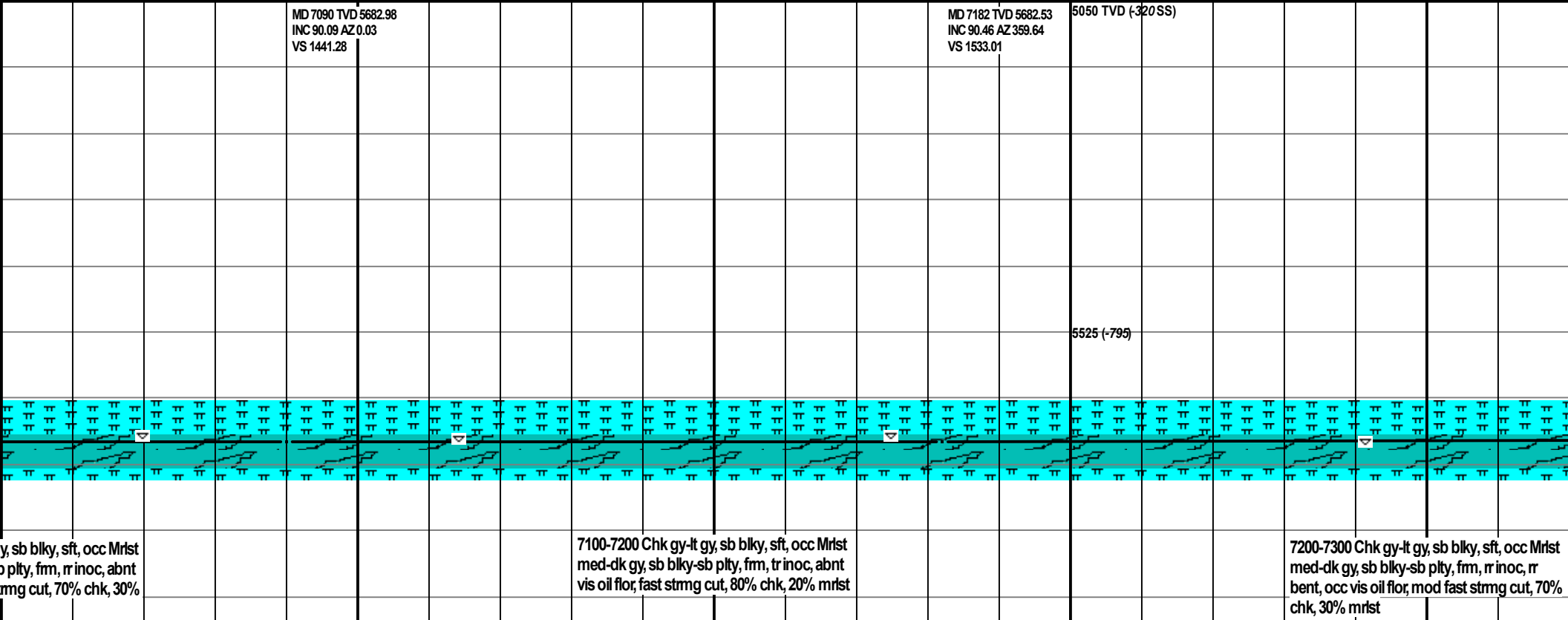
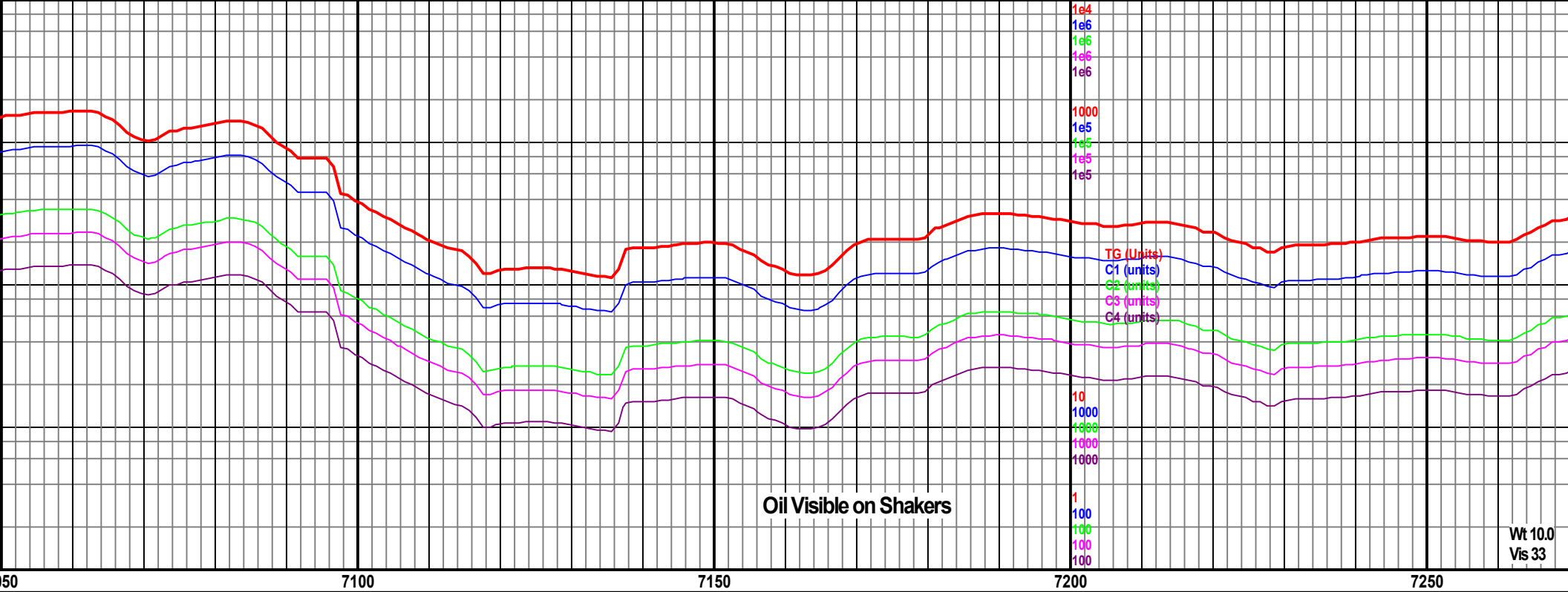


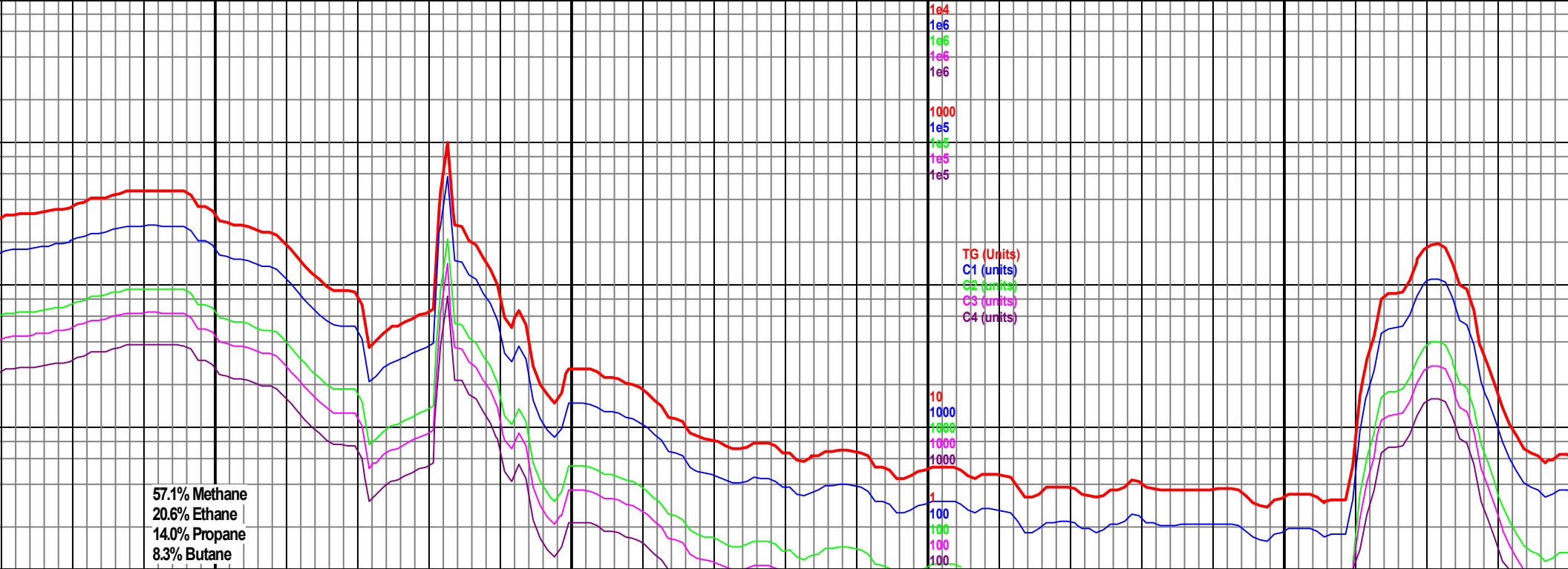
MD 6179 TVD 5676.11 INC 88.83 AZ 4.21 VS 531.16	5050 TVD (-320 SS)	MD 6270 TVD 5677.88 INC 88.95 AZ 3.56 VS 622.14	MD 6362 TVD 5679.75 INC 88.72 AZ 2.76 VS 714.1
P	B	P	B
	6200-6300 Mrst med-dk gy, sb blk-y-sb plty, fm, occ Chk gy-lt gy, sb blk-y, sft, r pyr, tr inoc, r bent, r bri yel min flor, slo mlky cut, 70% mrlst, 30% chk	6300-6400 Mrst med-dk gy, sb blk-y-sb plty, fm, occ Chk gy-lt gy, sb blk-y, sft, tr inoc, r bent, r bri yel min flor, slo mlky cut, 70% mrlst, 30% chk	





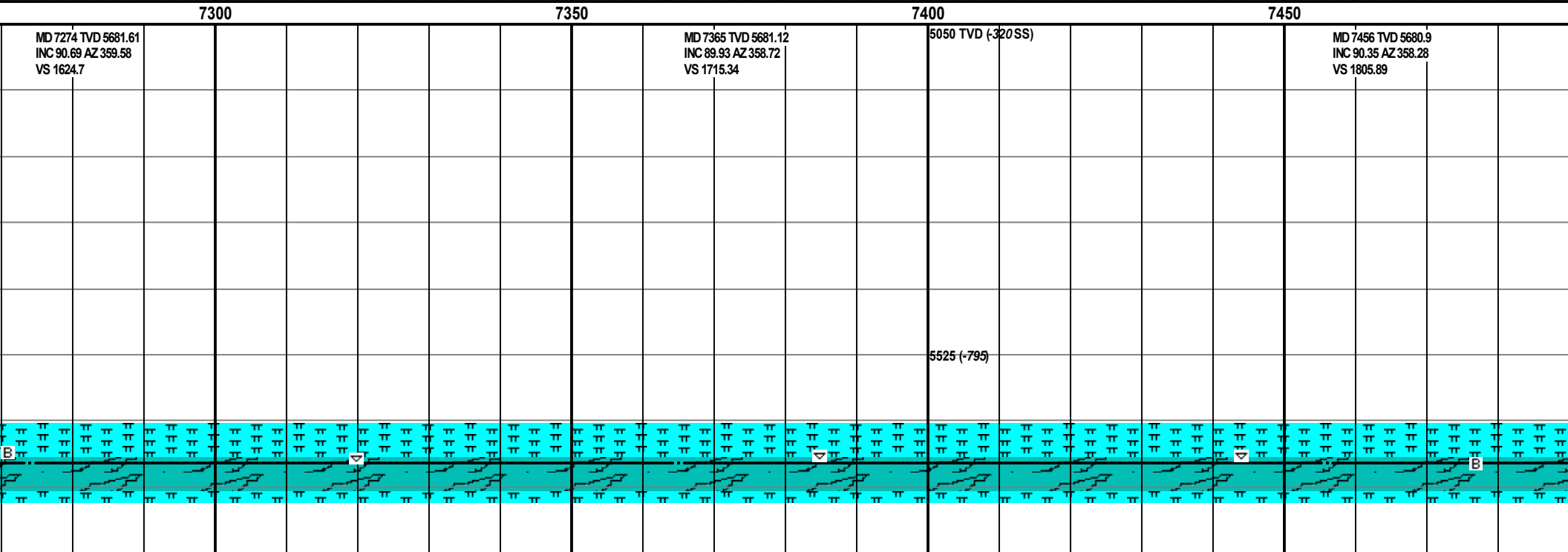






57.1% Methane  
20.6% Ethane  
14.0% Propane  
8.3% Butane

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



MD 7274 TVD 5681.61  
INC 90.69 AZ 359.58  
VS 1624.7

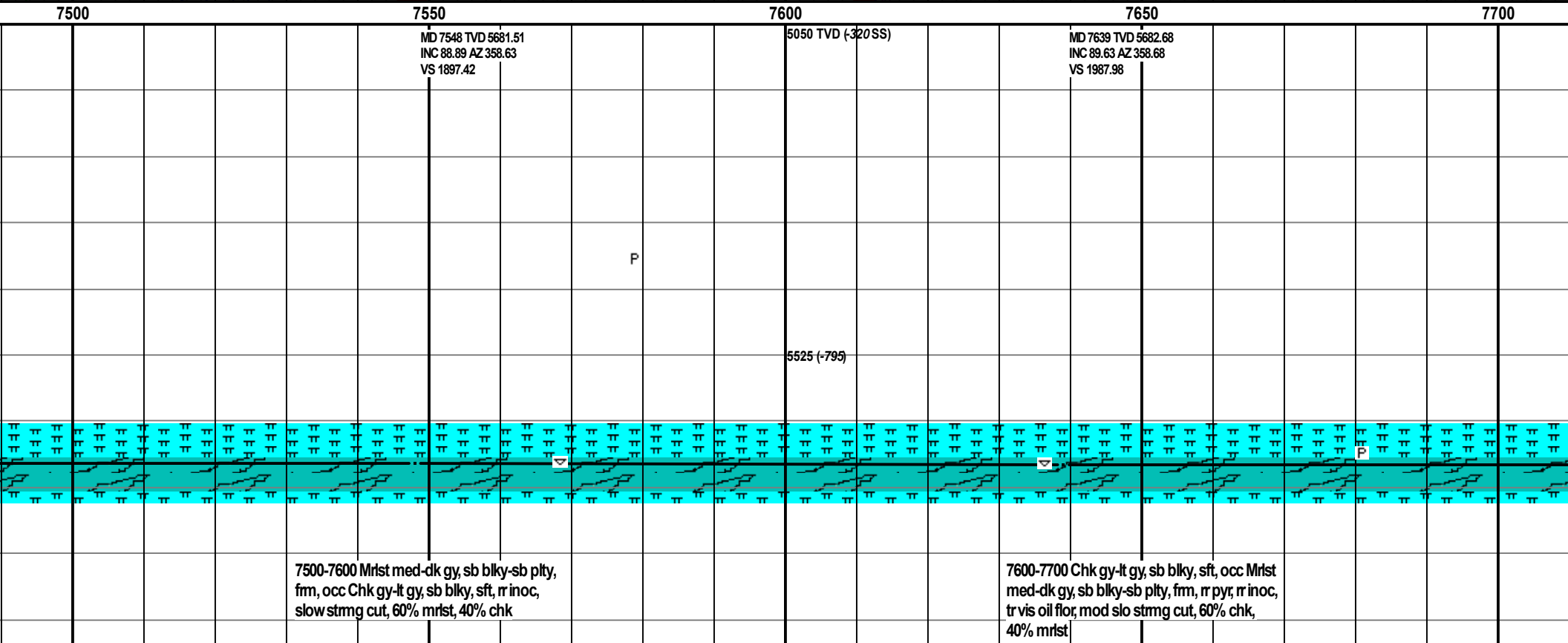
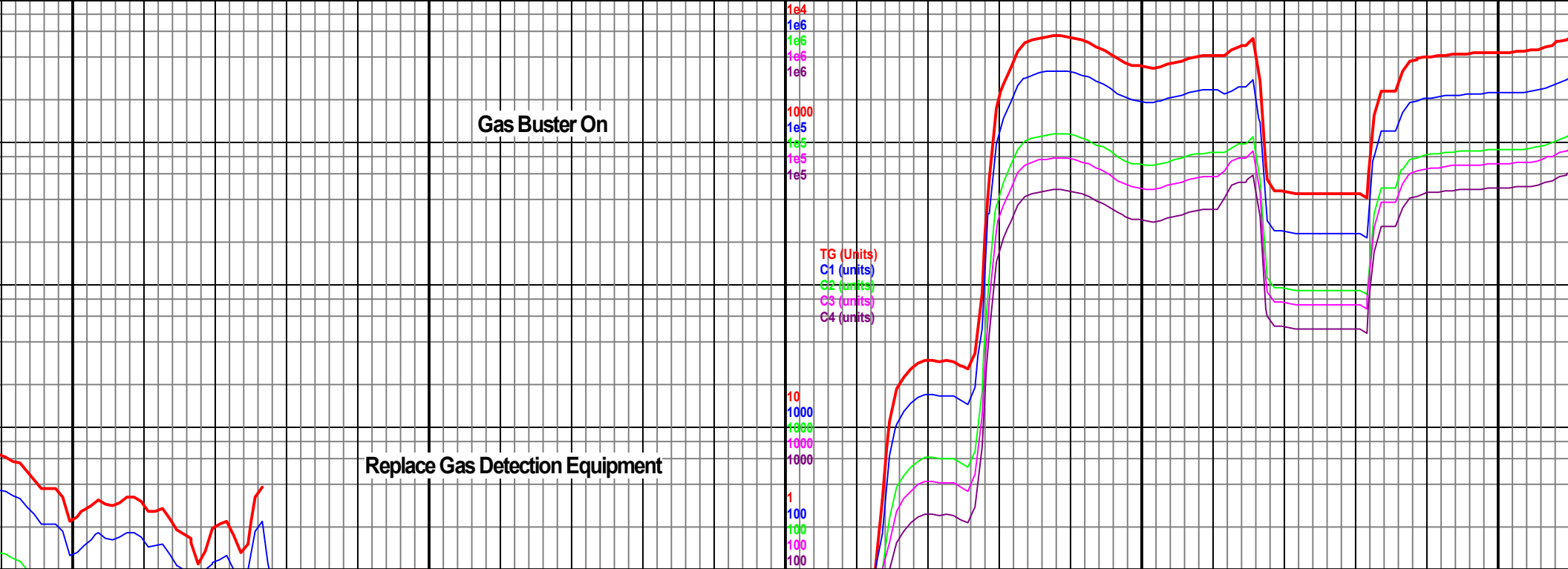
MD 7365 TVD 5681.12  
INC 89.93 AZ 358.72  
VS 1715.34

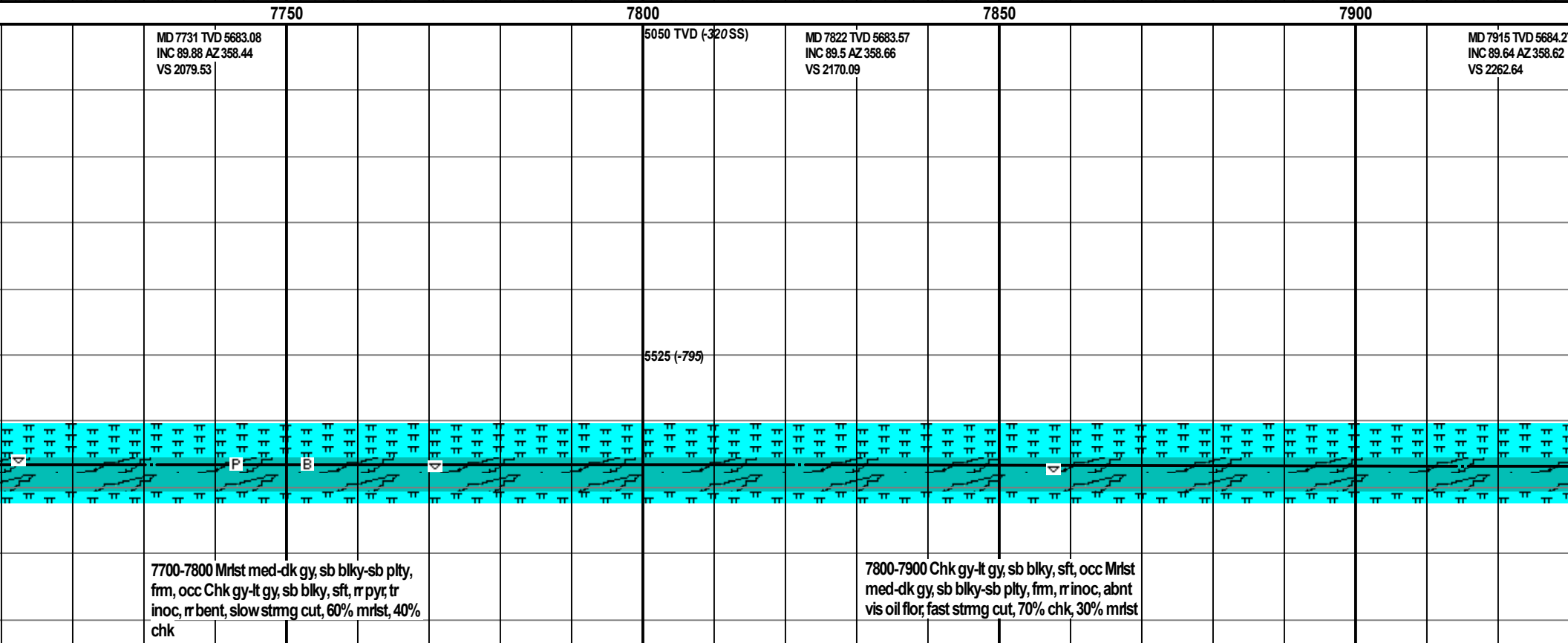
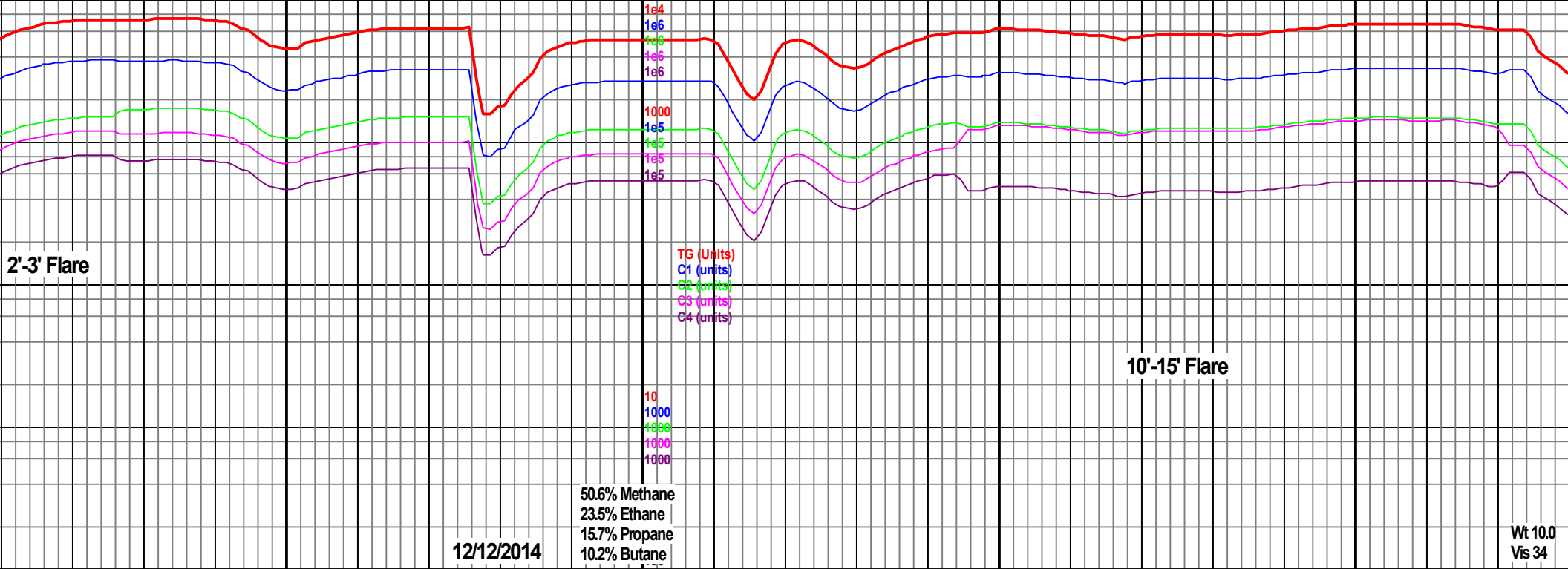
5050 TVD (-320 SS)

MD 7456 TVD 5680.9  
INC 90.35 AZ 358.28  
VS 1805.89

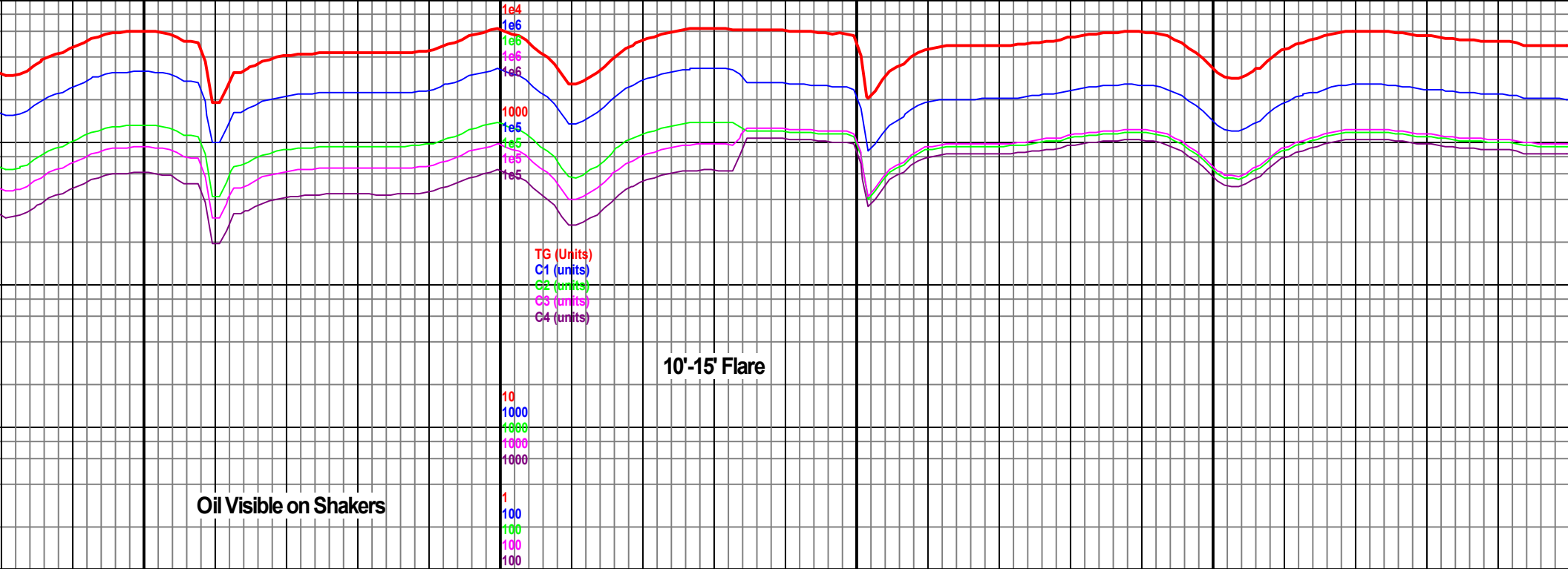
7300-7400 Chk gy-lt gy, sb blk, sft, occ Mrst  
med-dk gy, sb blk-sb plty, frm, tr inoc, occ  
vis oil flr, mod fast strng cut, 60% chk, 40%  
mrst

7400-7500 Chk gy-lt gy, sb blk, sft, occ Mrst  
med-dk gy, sb blk-sb plty, frm, r inoc, r  
bent, occ vis oil flr, mod fast strng cut, 60%  
chk, 40% mrst

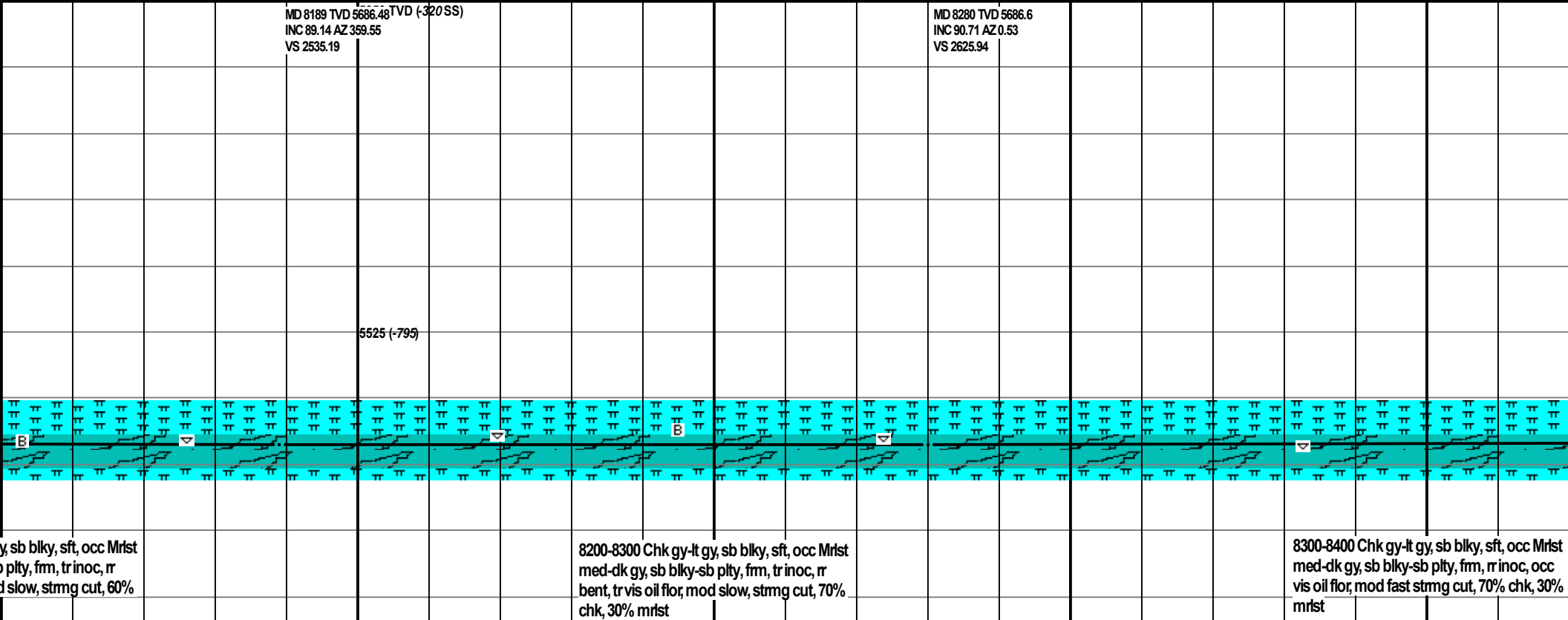
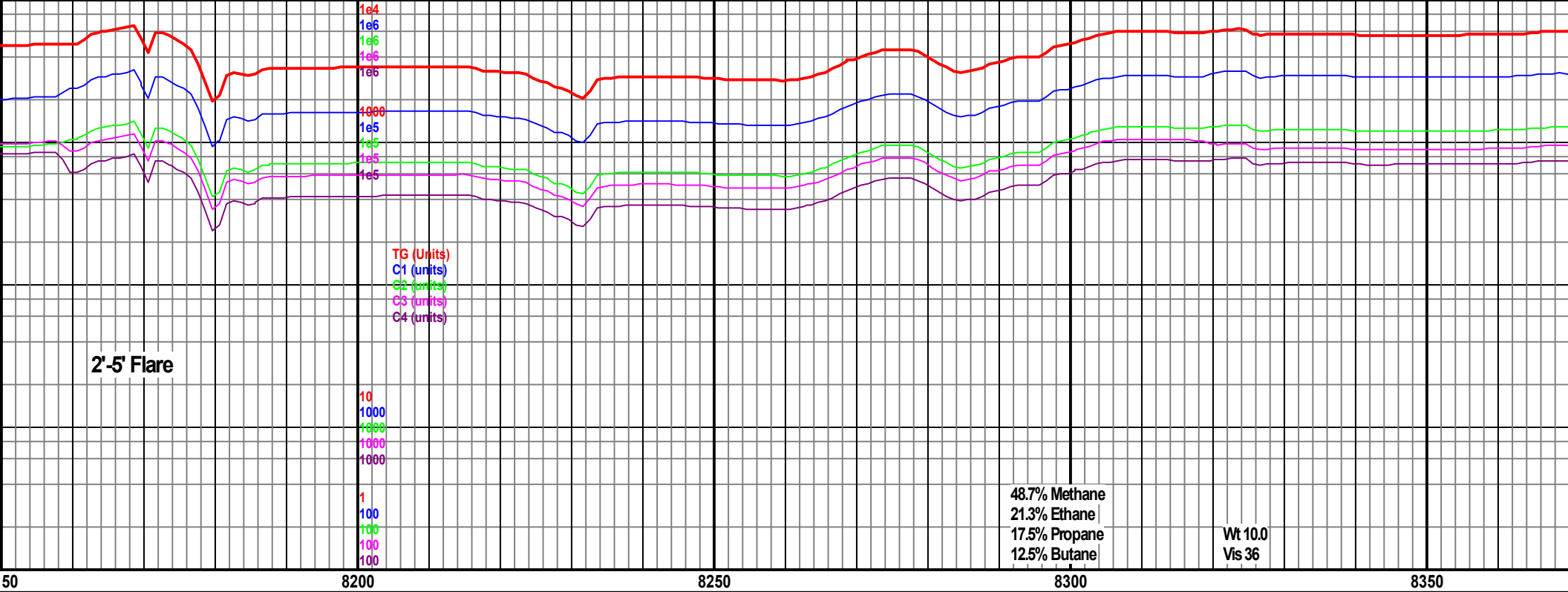


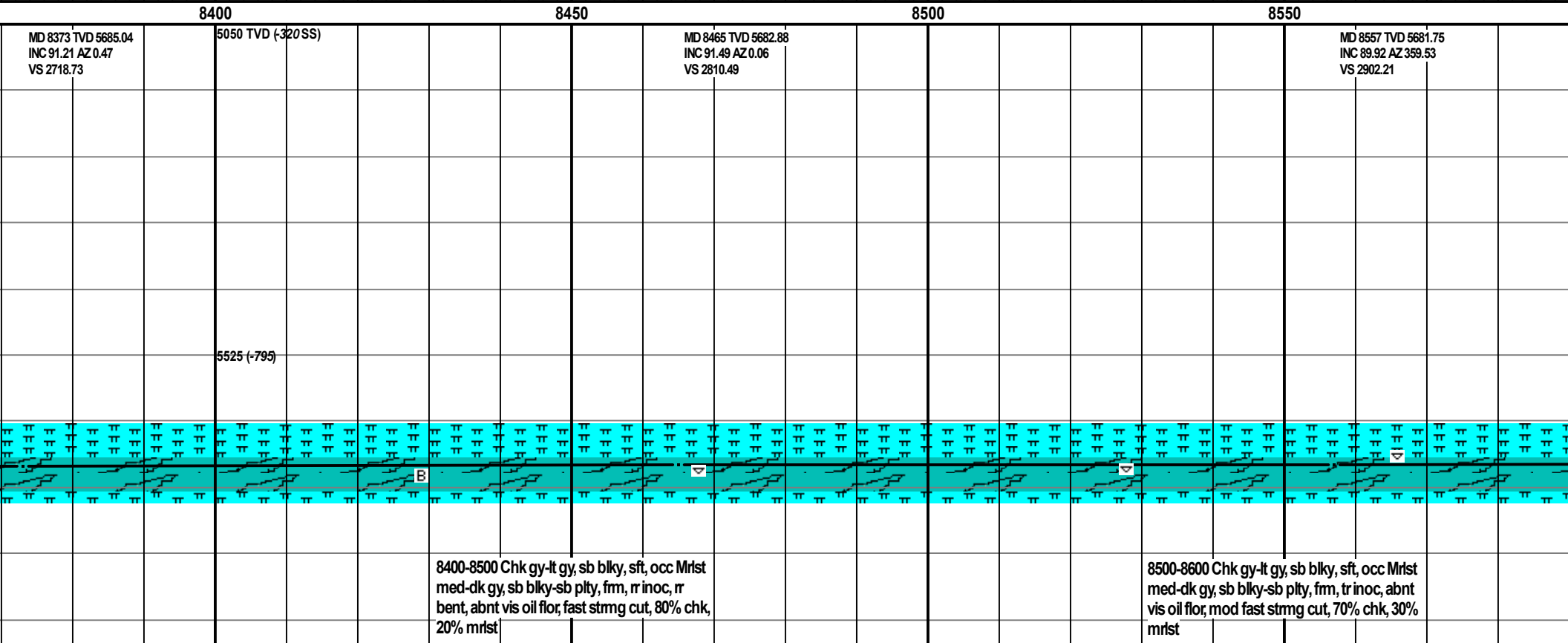
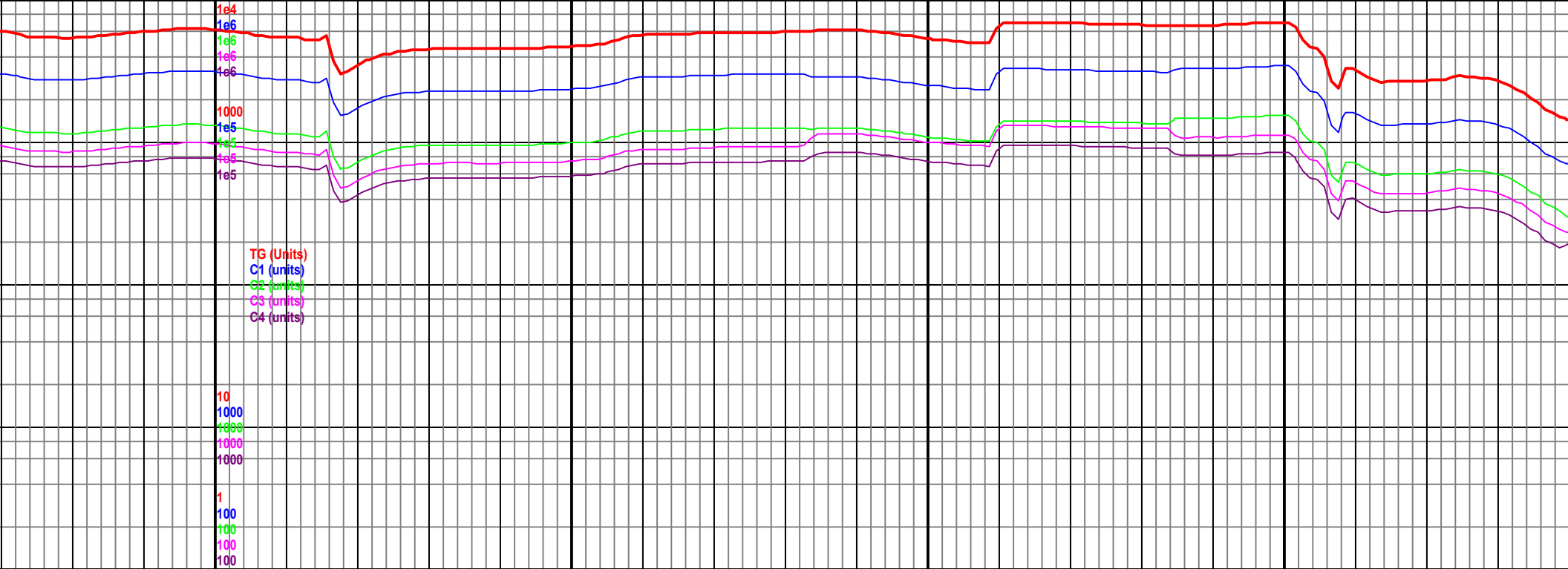


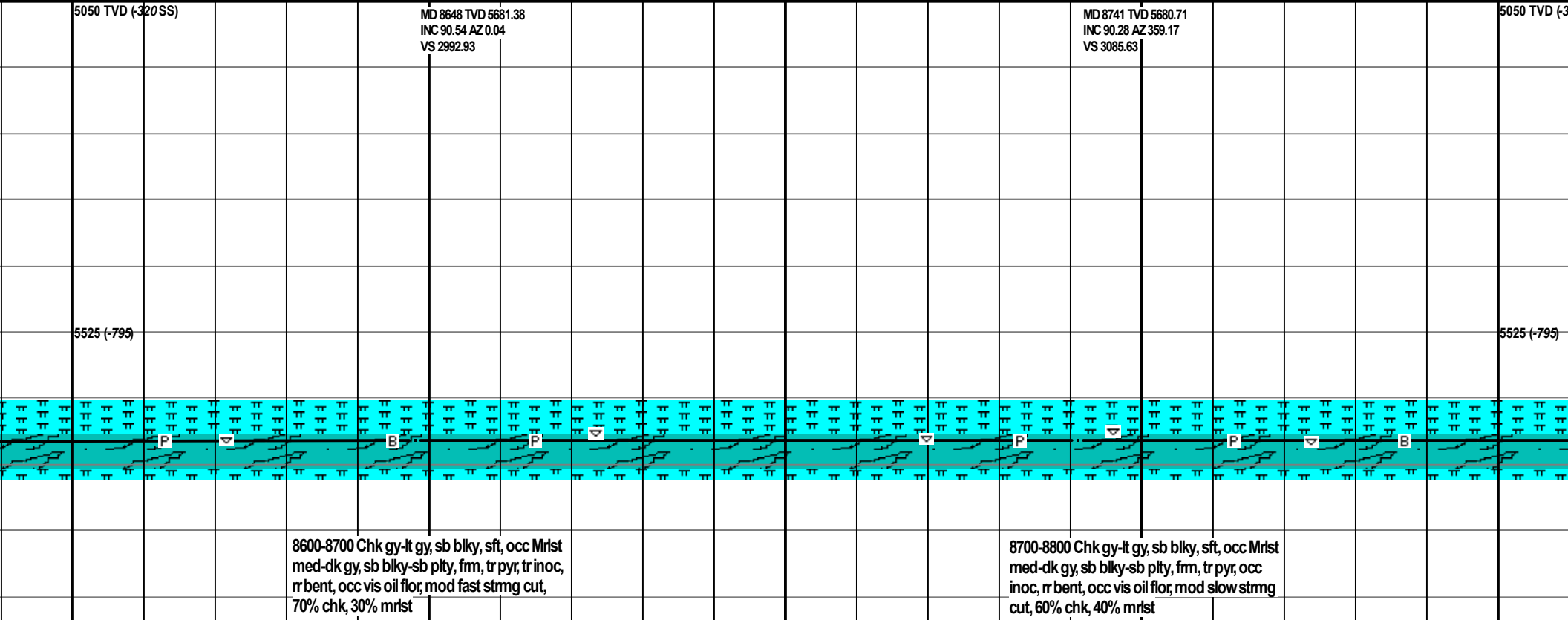
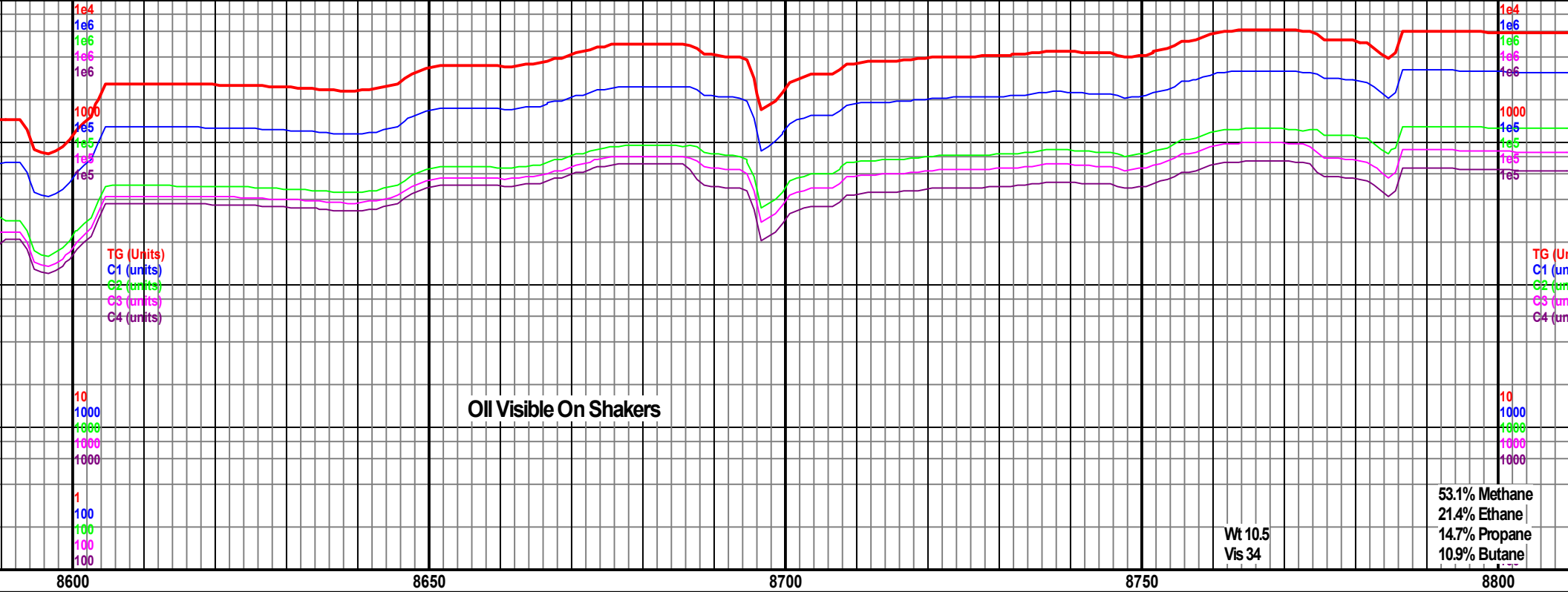




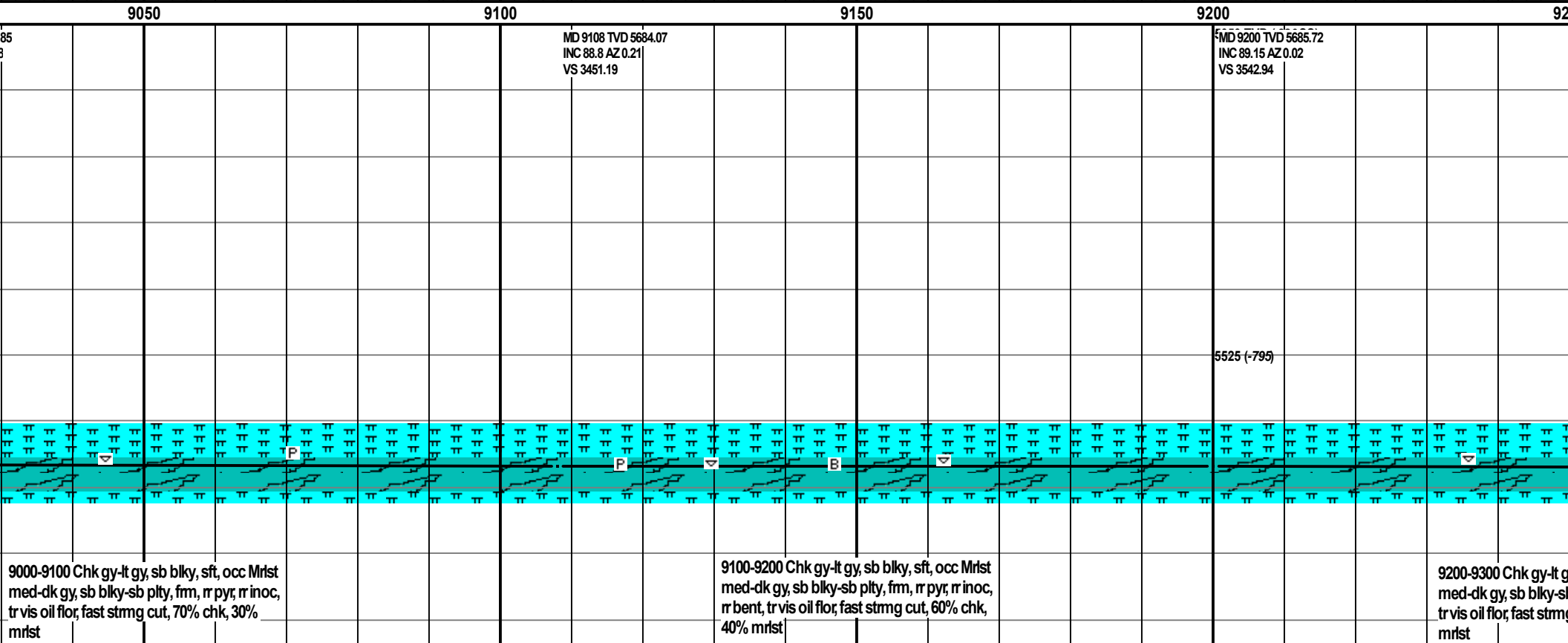
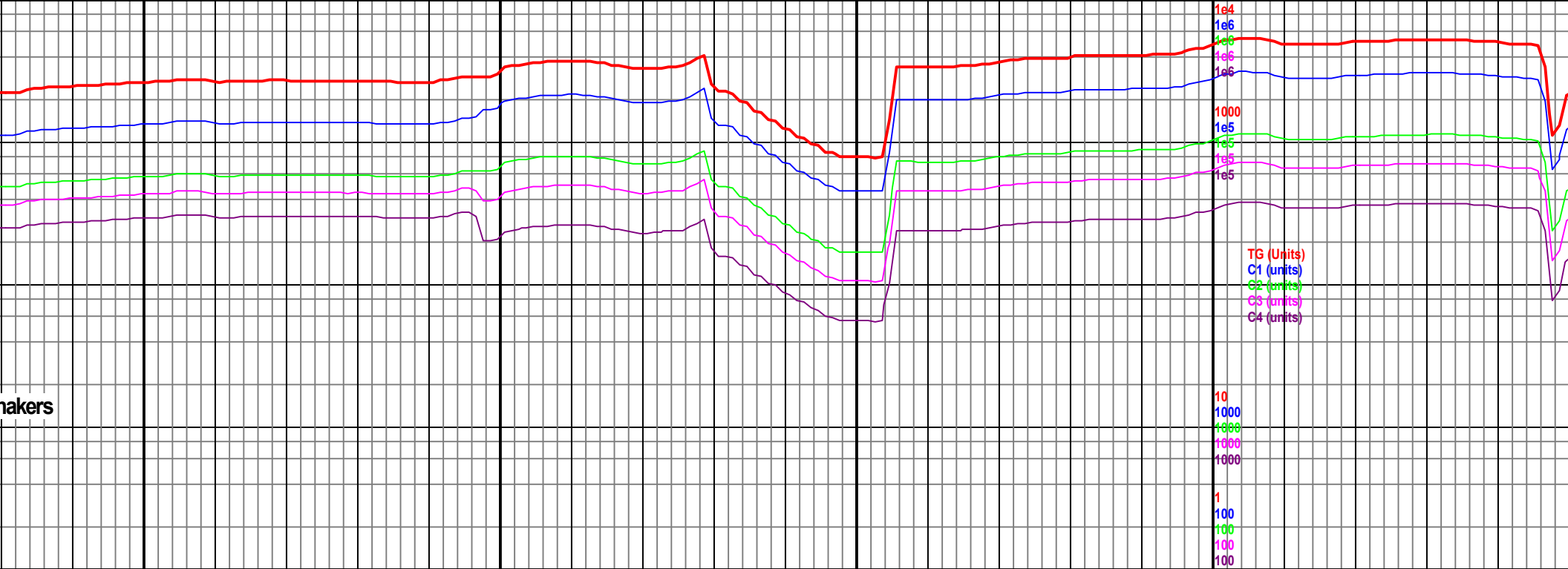
7950	8000	8050	8100	8150
MD 8006 TVD 5684.92 INC 89.53 AZ 358.21 VS 2353.17	MD 8097 TVD 5685.54 INC 89.69 AZ 357.75 VS 2443.63			
5525 (-795)				
7900-8000 Chk gy-lt gy, sb blk, sft, occ Mrst med-dk gy, sb blk-sb plty, frm, r r inoc, abnt vis oil flor, v fast strmg cut, 80% chk, 20% mrst	8000-8100 Chk gy-lt gy, sb blk, sft, occ Mrst med-dk gy, sb blk-sb plty, frm, tr inoc, r bent, abnt vis oil flor, fast strmg cut, 70% chk, 30% mrst			8100-8200 Chk gy-lt gy, sb blk, sft, occ Mrst med-dk gy, sb blk-sb plty, frm, r r inoc, abnt vis oil flor, v fast strmg cut, 80% chk, 20% mrst

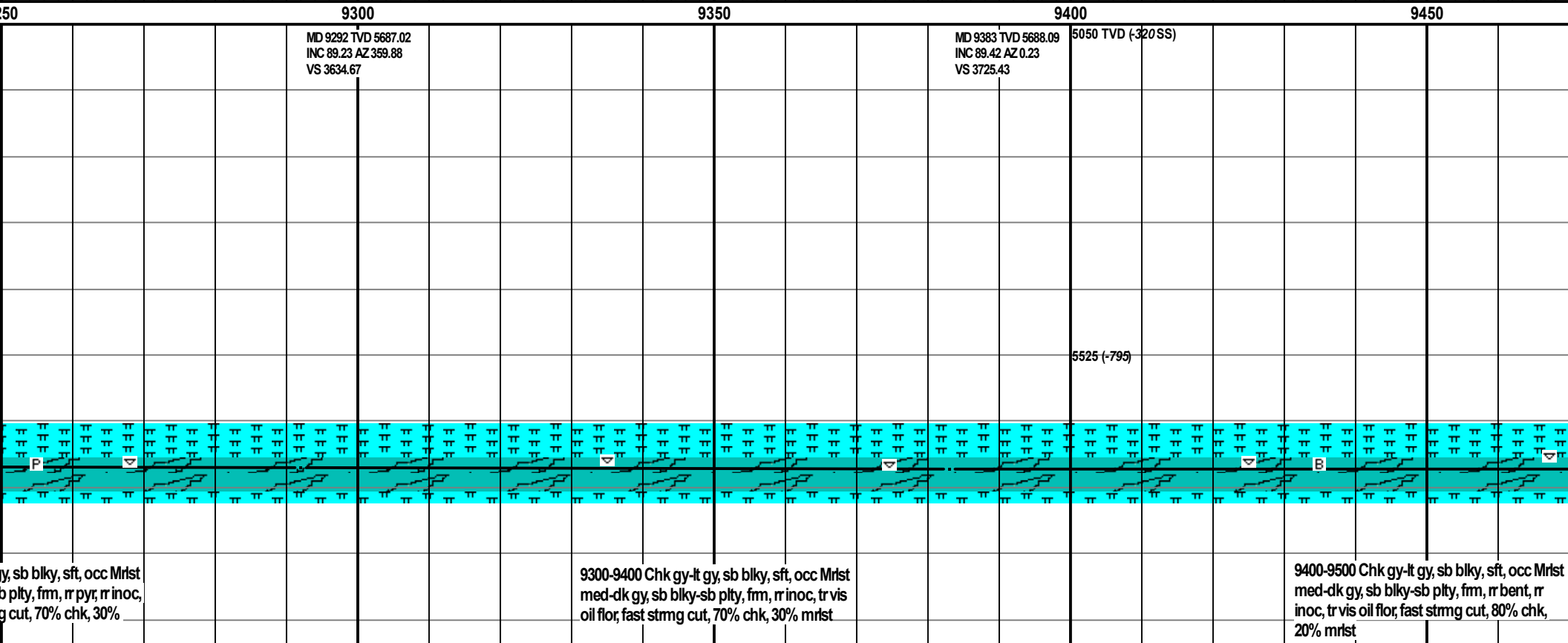
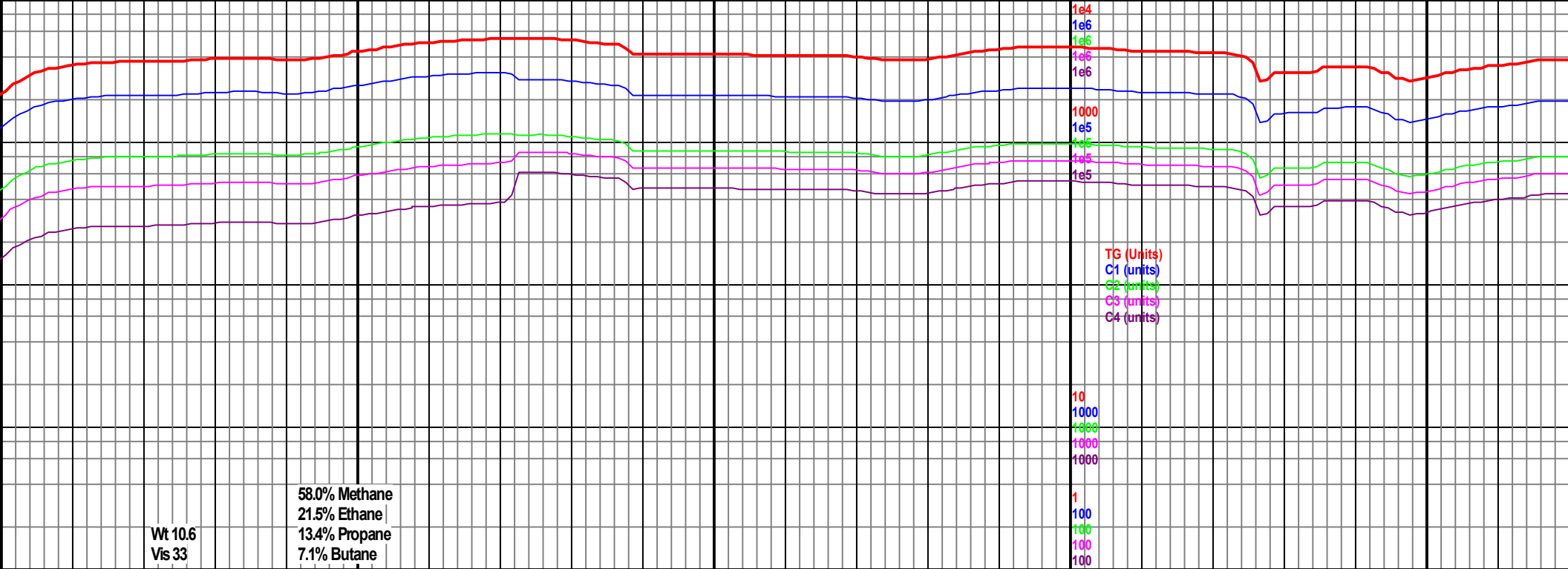


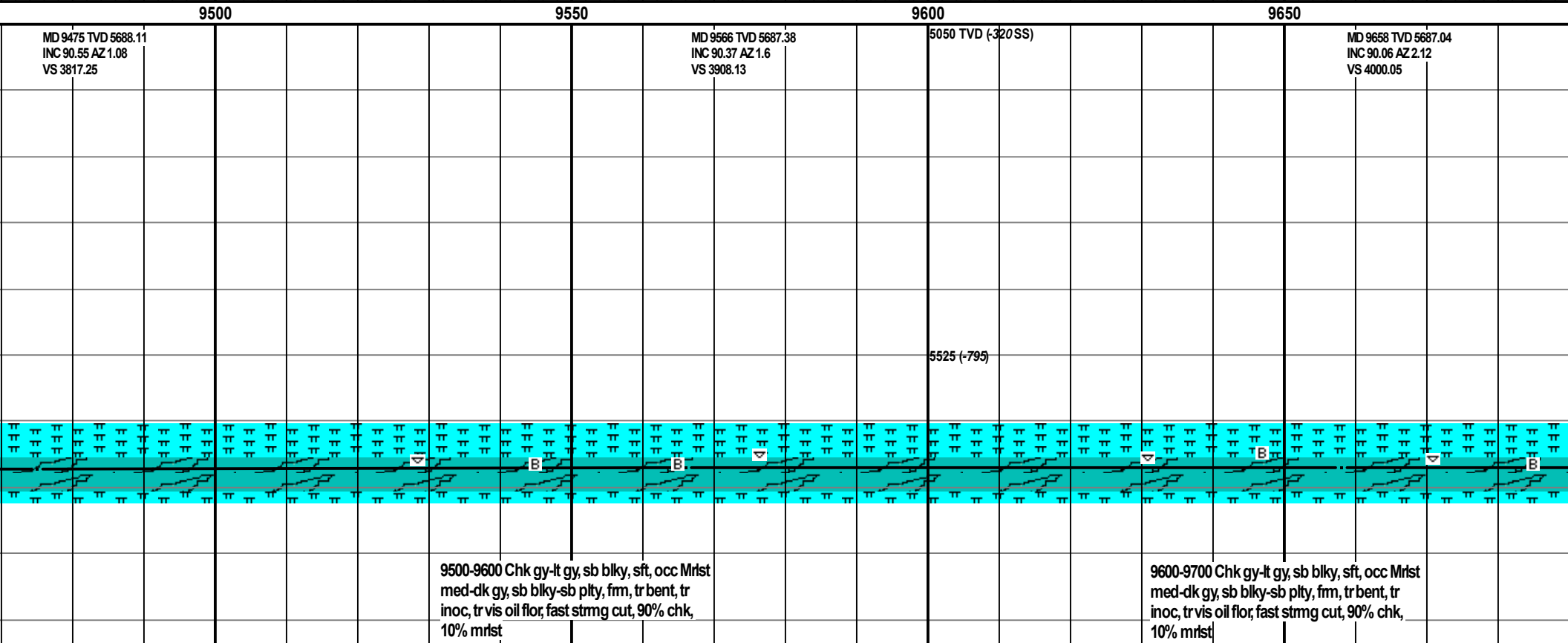
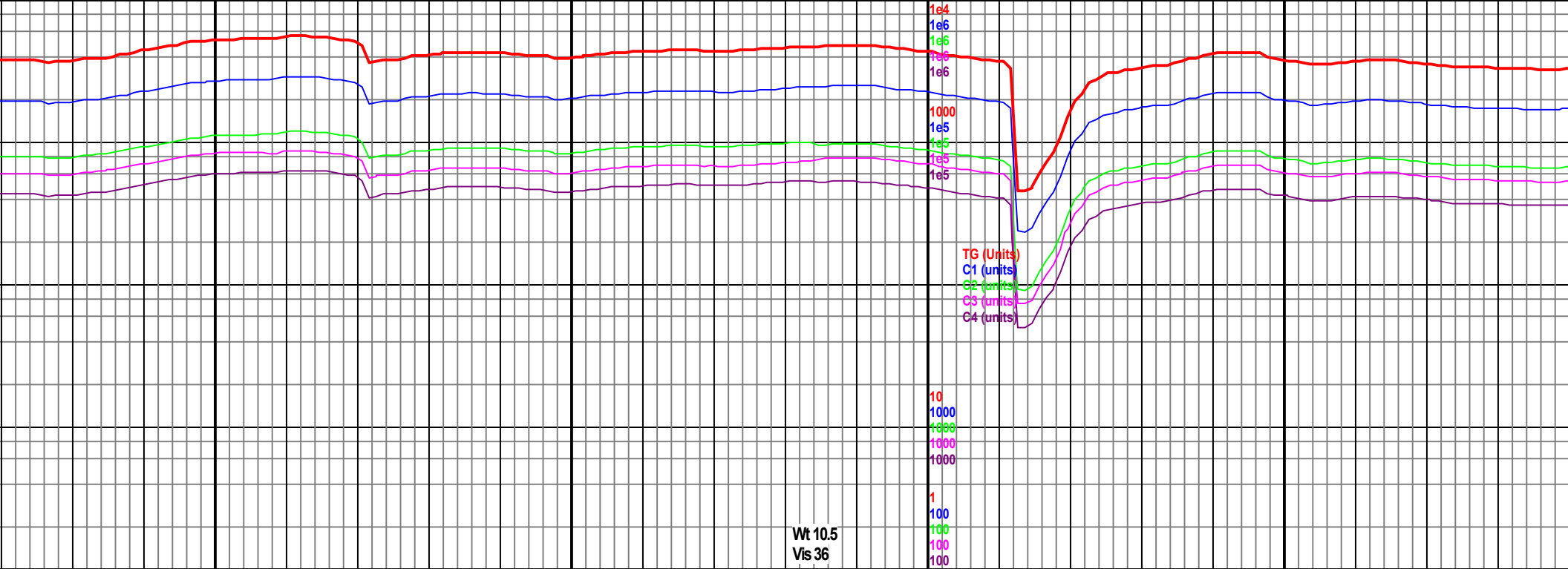






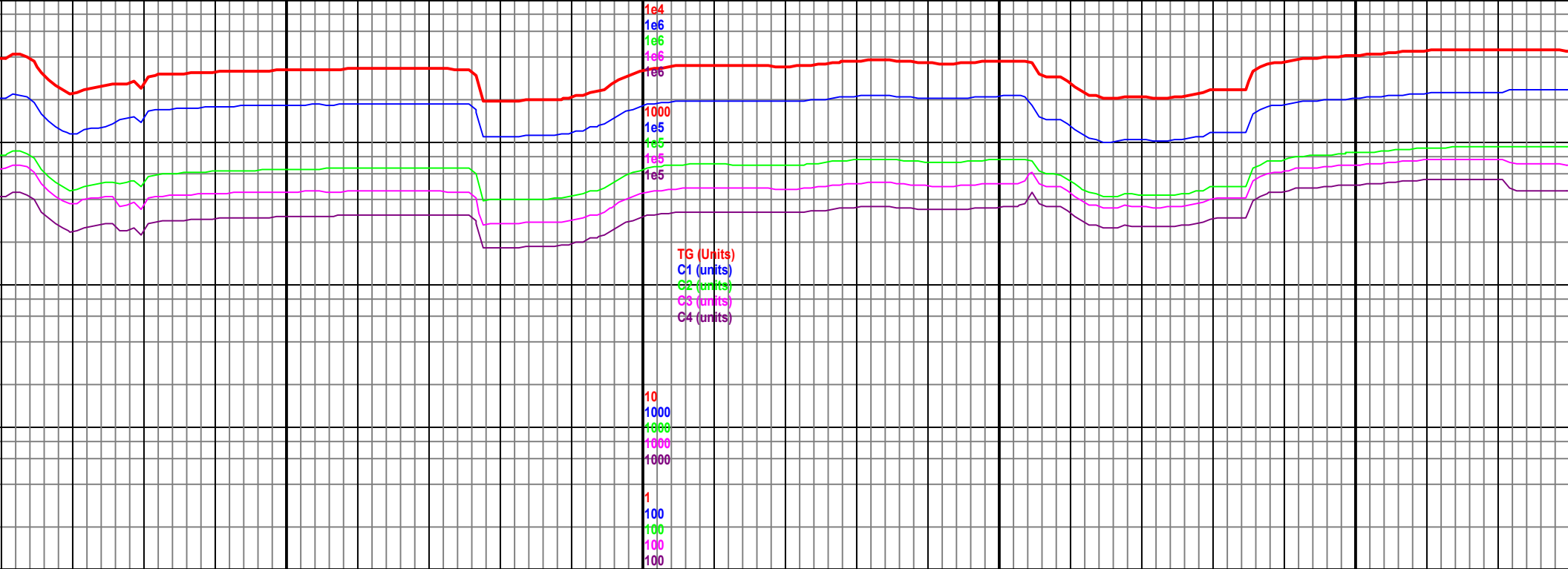












TG (Units)  
C1 (units)  
C2 (units)  
C3 (units)  
C4 (units)

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

9950 10000 10050 10100

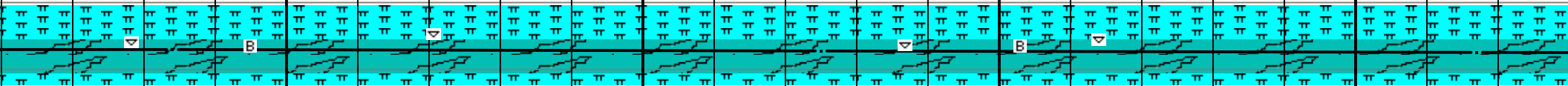
MD 9934 TVD 5686.97  
INC 88.74 AZ 357.39  
VS 4275.66

5050 TVD (-320 SS)

MD 10025 TVD 5689  
INC 88.71 AZ 356.92  
VS 4365.95

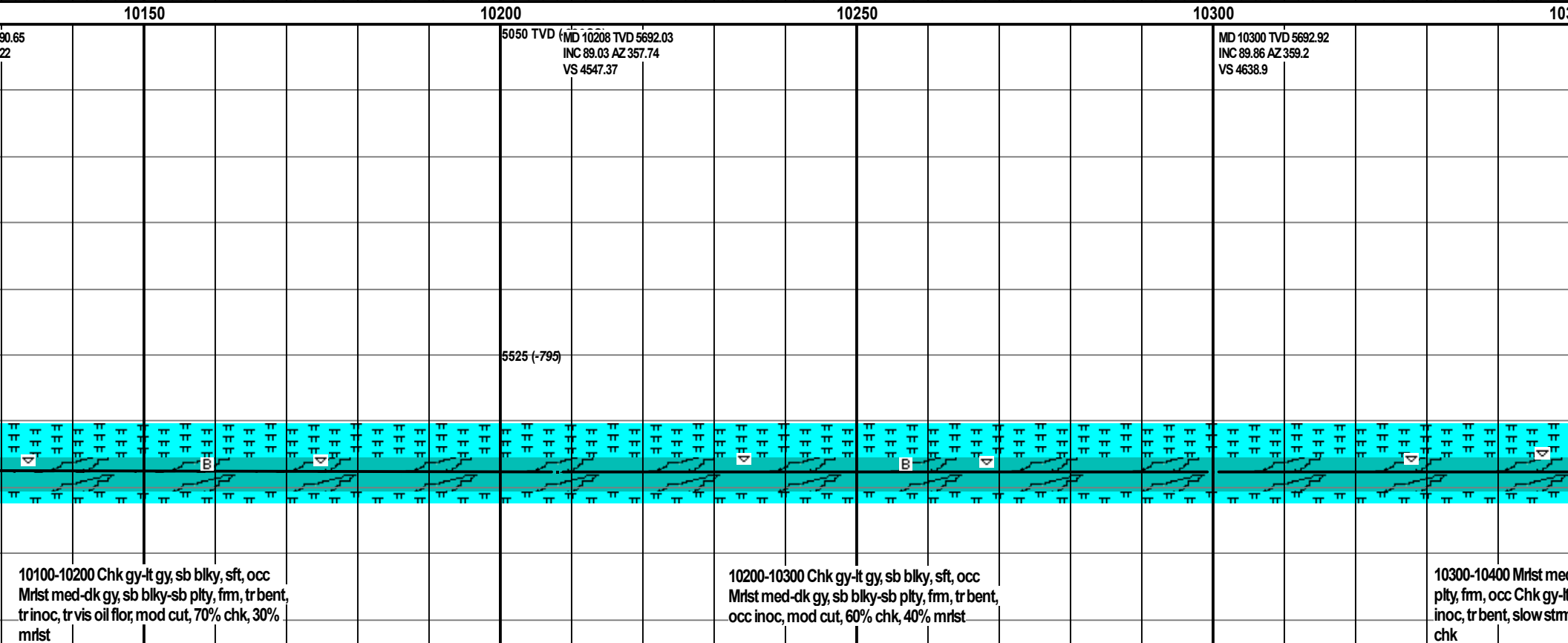
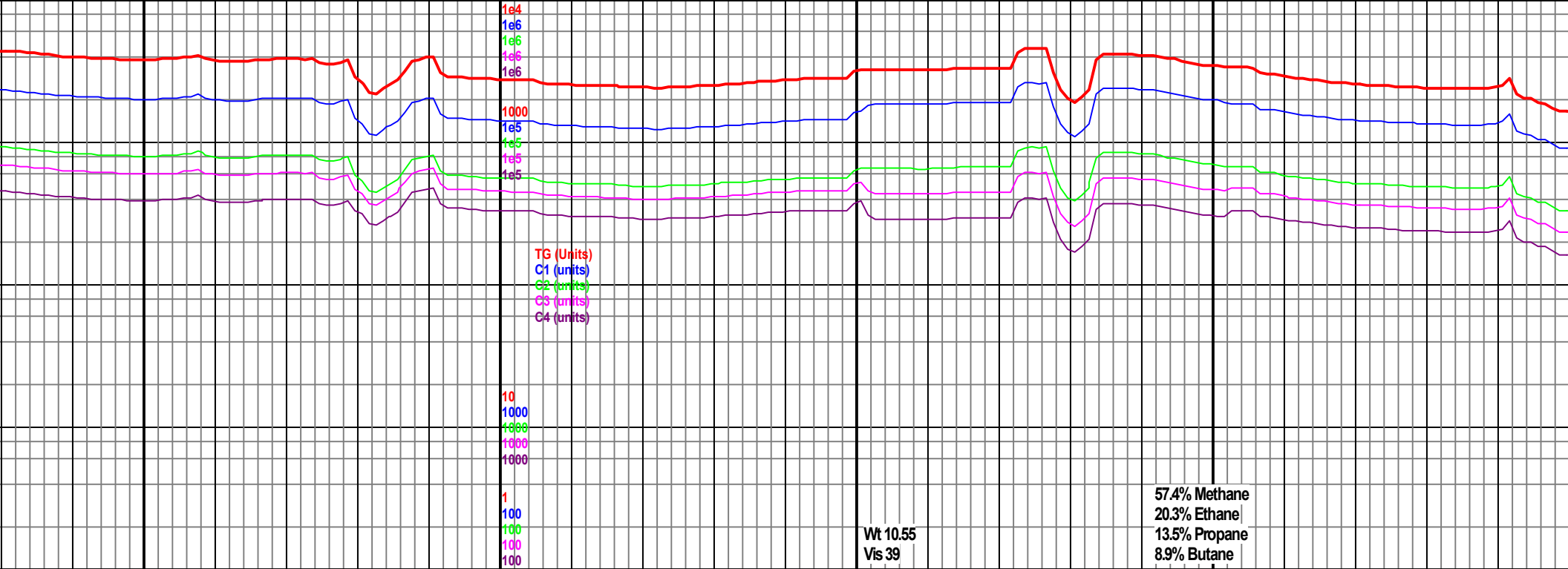
MD 10117 TVD 5689  
INC 89.23 AZ 356.92  
VS 4457.11

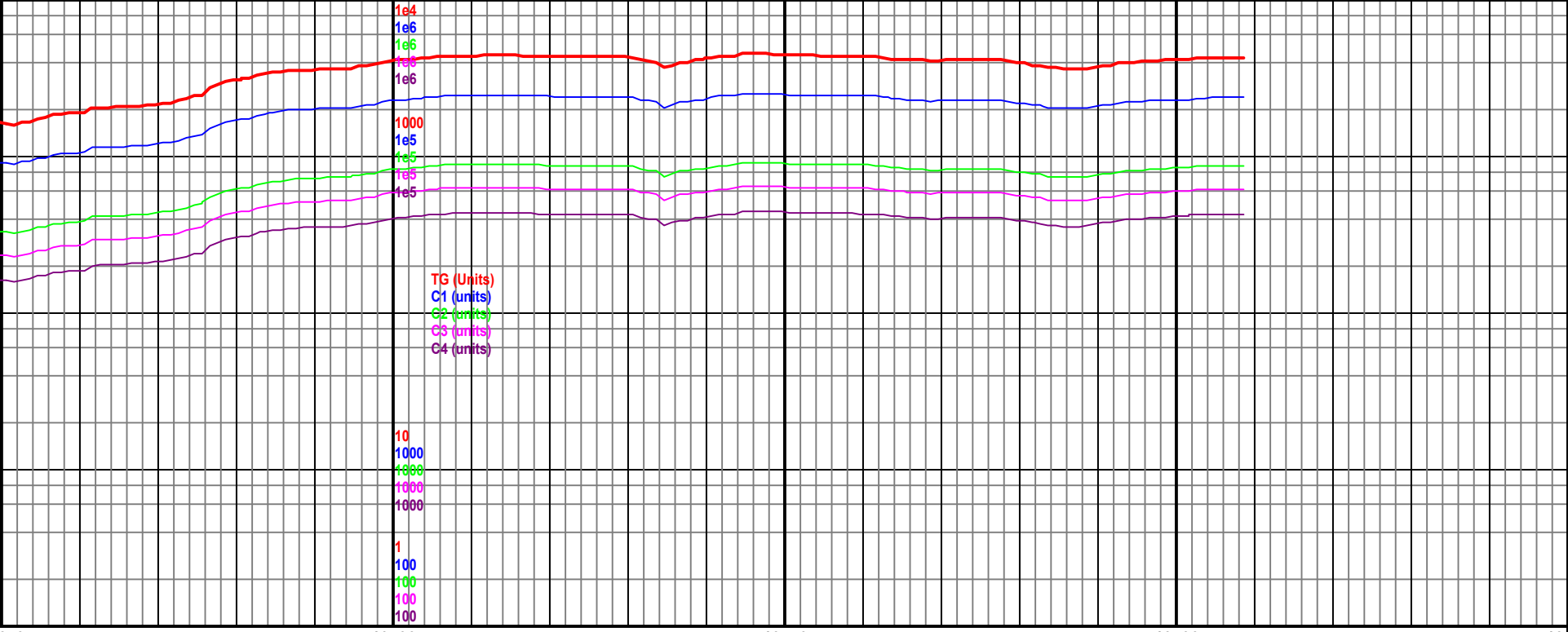
5525 (-795)



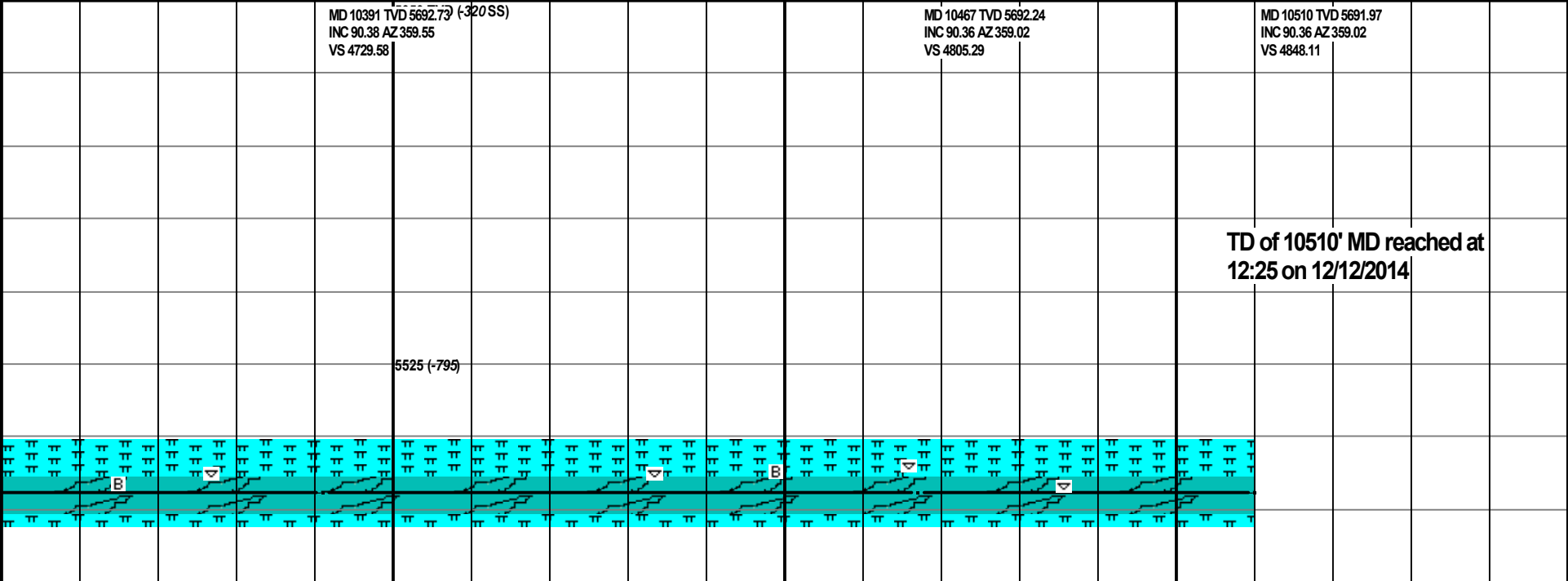
9900-10000 Chk gy-lt gy, sb blk, sft, occ  
Mrst med-dk gy, sb blk-sb plty, frm, tr bent,  
tr inoc, r vis oil flor, mod cut, 90% chk, 10%  
mrst

10000-10100 Chk gy-lt gy, sb blk, sft, occ  
Mrst med-dk gy, sb blk-sb plty, frm, tr bent,  
tr inoc, r vis oil flor, mod cut, 80% chk, 20%  
mrst





10350 10400 10450 10500 10550



med-dk gy, sb blkgy-sb  
t gy, sb blkgy, sft, occ  
ng cut, 60% mrst, 40%  
chk

10400-10510 Mrst med-dk gy, sb blkgy-sb  
plty, frm, occ Chk gy-lt gy, sb blkgy, sft, occ  
inoc, tr bent, slow strng cut, 60% mrst, 40%  
chk