



Scale: 5" / 100'  
Measured Depth Log

**Well Name** Seltzer LD 09-379HC

**Location** SECTION 4, T1S, R67W

**State** COLORADO

**County** ADAMS

**Country** UNITED STATES

**Rig Number** PD 460

**API Number** 05001101930000

**AFE #** 20DCC0286

**Geographic Region** DJ BASIN

**Field** WATTENBERG

**Ground Elevation** 5140'

**K.B. Elevation** 5160'

**Logged Interval** 6000' MD To 18614' MD

**Total Depth** 18614' MD

**Formation** CODELL

**Type of Drilling Fluid** OIL BASED MUD

### Operator

**Company** Great Western Operating Company, LLC

**Address** 1001 17th Street, Suite 2000  
Denver, CO 80202



### Geologist

**Name** JOEY LUCE, TIM BRIGHT, TRACY LAWSON

**Company** TERRA GUIDANCE, LLC

**Address** 67 W FLOYD AVE  
STE 105  
ENGLEWOOD, CO 80110



## Other

MUDDLOG START DATE 06/25/2021






MUDDLOG STOP DATE 06/29/2021

## Rock Types

	LIMESTONE		Silty Shale		SANDSTONE
	Chalk		Shaly Siltstone		CARBONACEOUS SHALE
	Marl		Silty Sandstone		CALCAREOUS SHALE

## Other Symbols

### Engineering

-  CONNECTION (RIGHT)
-  CONNECTION GAS
-  FAULT
-  MIN DEPTH
-  TRIP GAS

Onsite Geological Services provided by  
Terra **Guidance**

Loggers on Location: 06/25/2021

Logging Depth Reached:

21:39 MT, 06/25/2021

Bloodhound Unit: #5933

Sample Collection/Description Interval:

Curve 50'

Tangen/Lateral 100'

ROP SCALE (FT/HR): 0-1000

GAMMA SCALE (API): 0-300

GAS SCALE: 0-1500u

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

CO2

Depth

5.960

5.970

5.980

5.990

6.000

6.010

6.020

6.030

6.040

6.050

6.060

6.070

6.080

6.090

6.100

6.110

6.120

6.130

6.140

6.150

6.160

6.170

6.180

6.190

6.200

6.210

6.220

6.230

6.240

1000

300

0

ROP (ft/hr)

GAMMA (API)

GAMMA (API)

GAMMA (API)

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ROP (ft/hr)

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MW 11.0 / VIS 64

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MD: 6.077'  
INC: 29.87°  
AZM: 287.01°  
TVD: 5,744.72'  
VS: -32.06'

Bit #: 1  
Size: 8.5"  
Make: Smith  
Model: N516  
Jets: 7x10  
S/N: JV4781  
Depth In: 2,036'

TVD SCALE: 5500' - 8500'



100% SHY SLTST: lt-med gy, v-modly sft, fri, sl-modly frm, sb blkly-sb plty, sb fis, arg, silty, v sl sdy, rthy, ip aren, sl rch dly mix, sl calc

100% SHY SLTST: lt-med gy, arg, silty, v sl sdy, rthy, ip aren

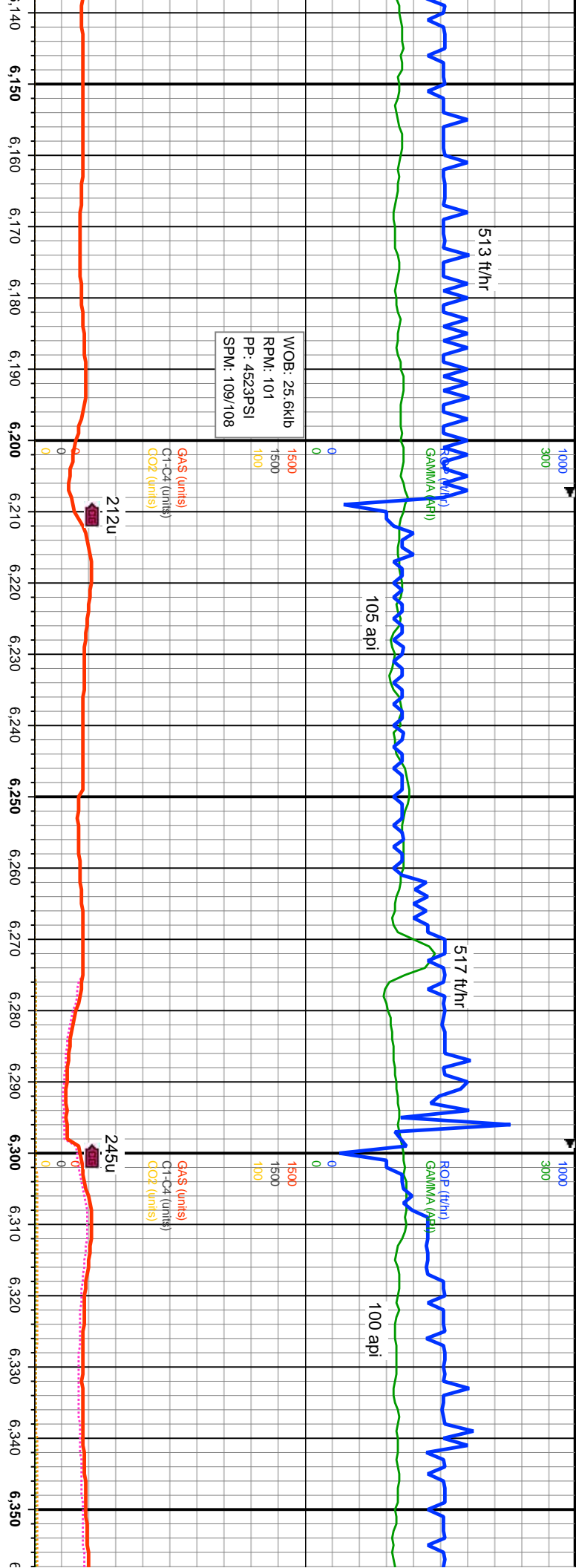
Well Bore  
TVD

TVD (ft)

TVD (ft)

8500

8500



MD: 6.166'  
INC: 30.01°  
AZM: 287.38°  
TVD: 5.821,84'  
VS: -34.37'

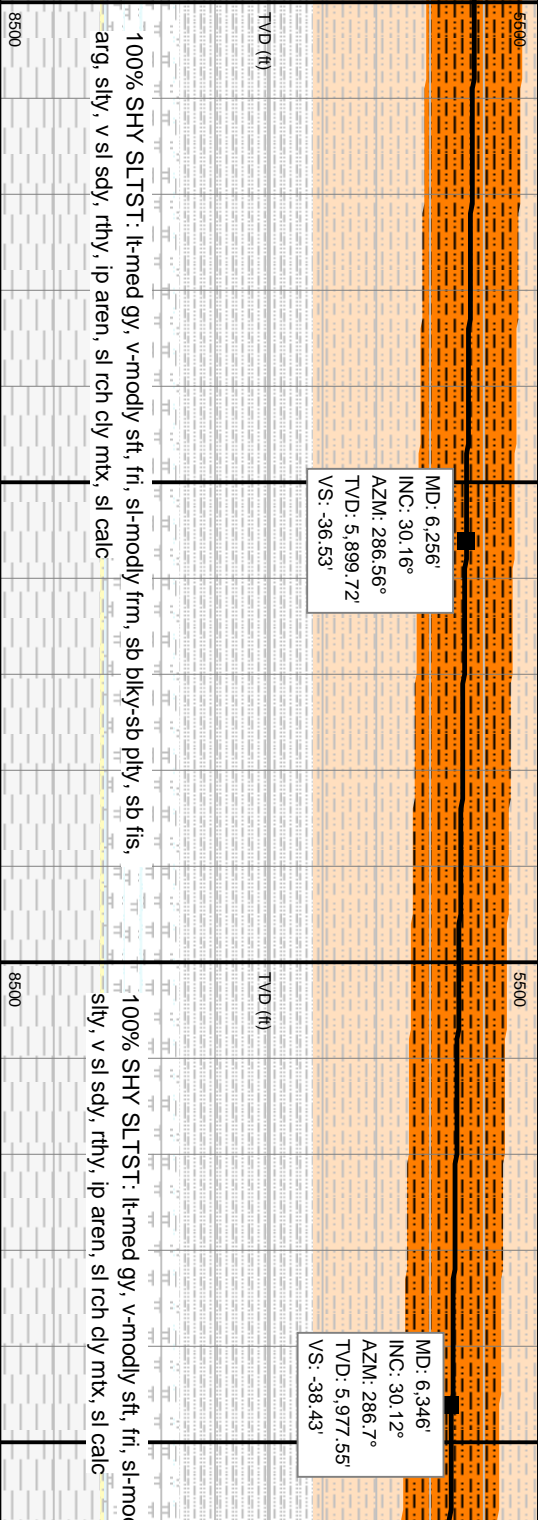
MD: 6.256'  
INC: 30.16°  
AZM: 286.56°  
TVD: 5.899,72'  
VS: -36.53'

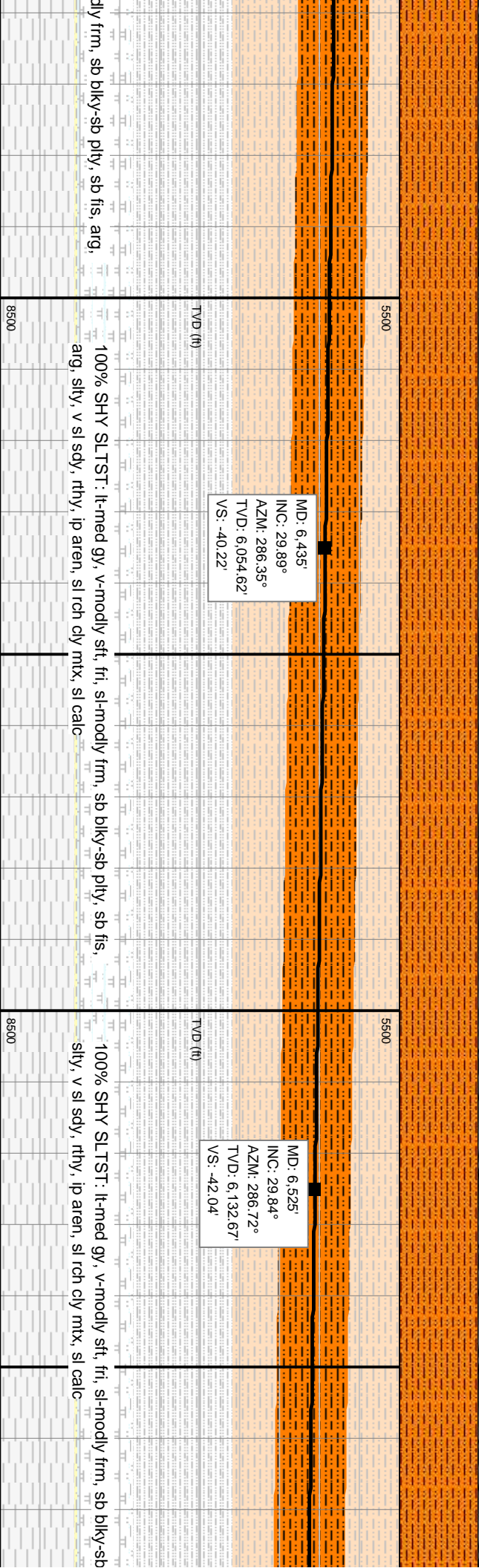
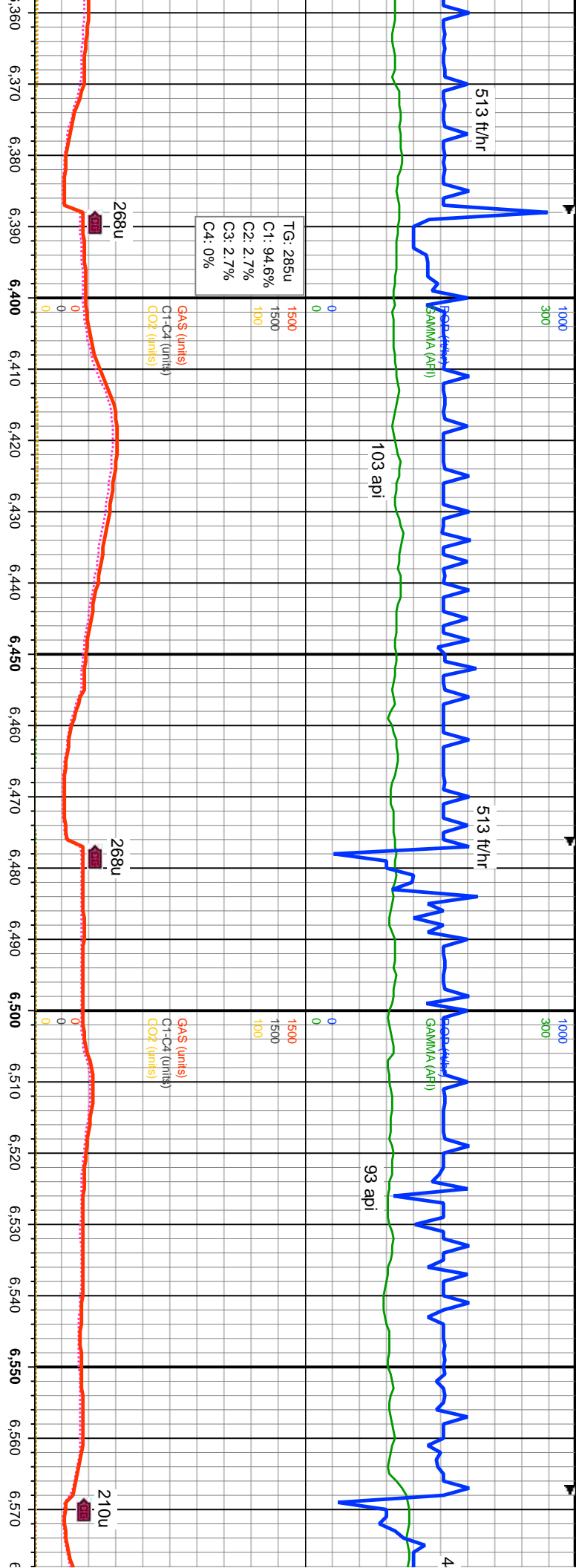
MD: 6.346'  
INC: 30.12°  
AZM: 286.7°  
TVD: 5.977,55'  
VS: -38.43'

v-modly sft, fri, si-modly frm, sb blkv-sb plty, sb fis, n, sl rch cly mtx, sl calc

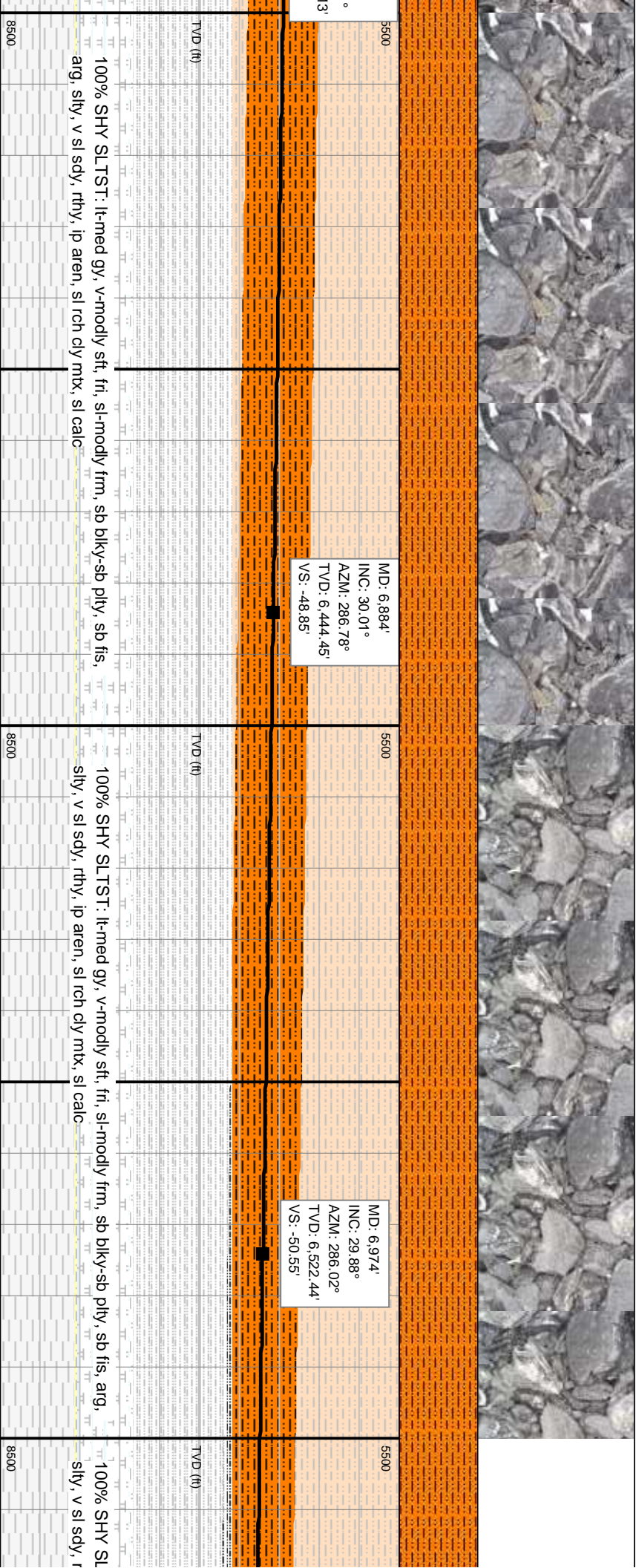
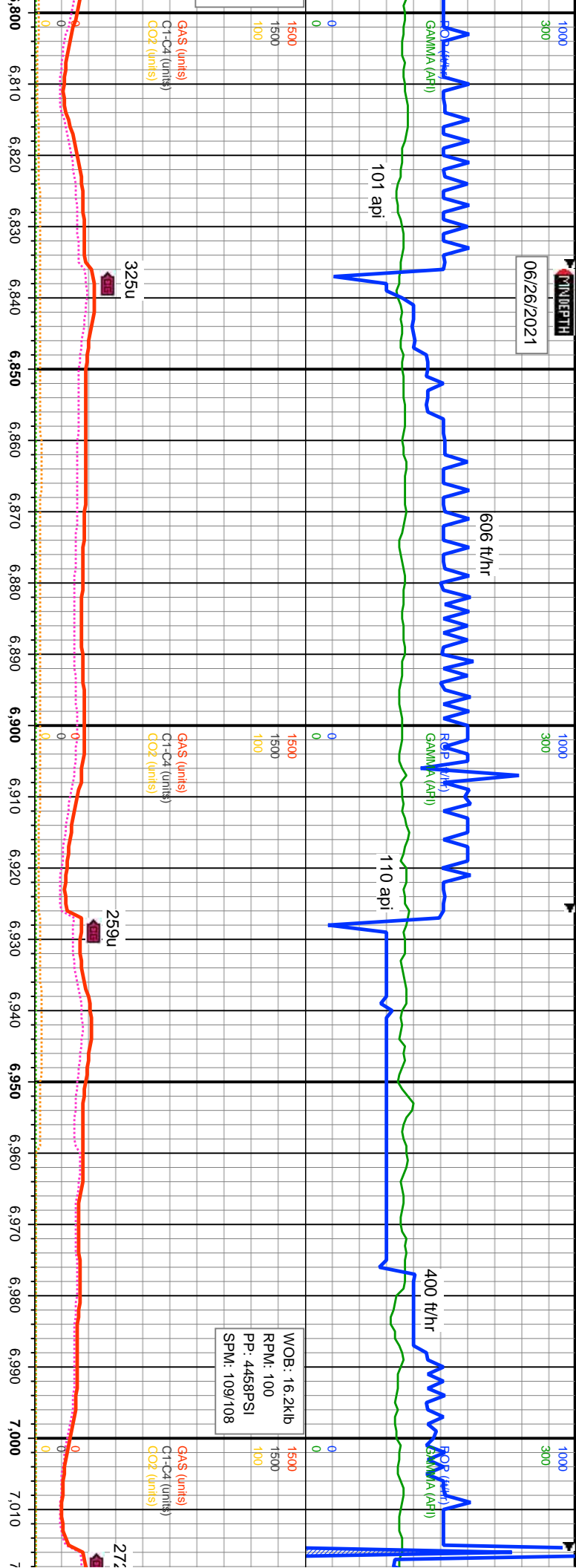
100% SHY SLTST: lt-med gy, v-modly sft, fri, si-modly frm, sb blkv-sb plty, sb fis, atq, sily, v sl sdy, rthy, ip aren, sl rch cly mtx, sl calc

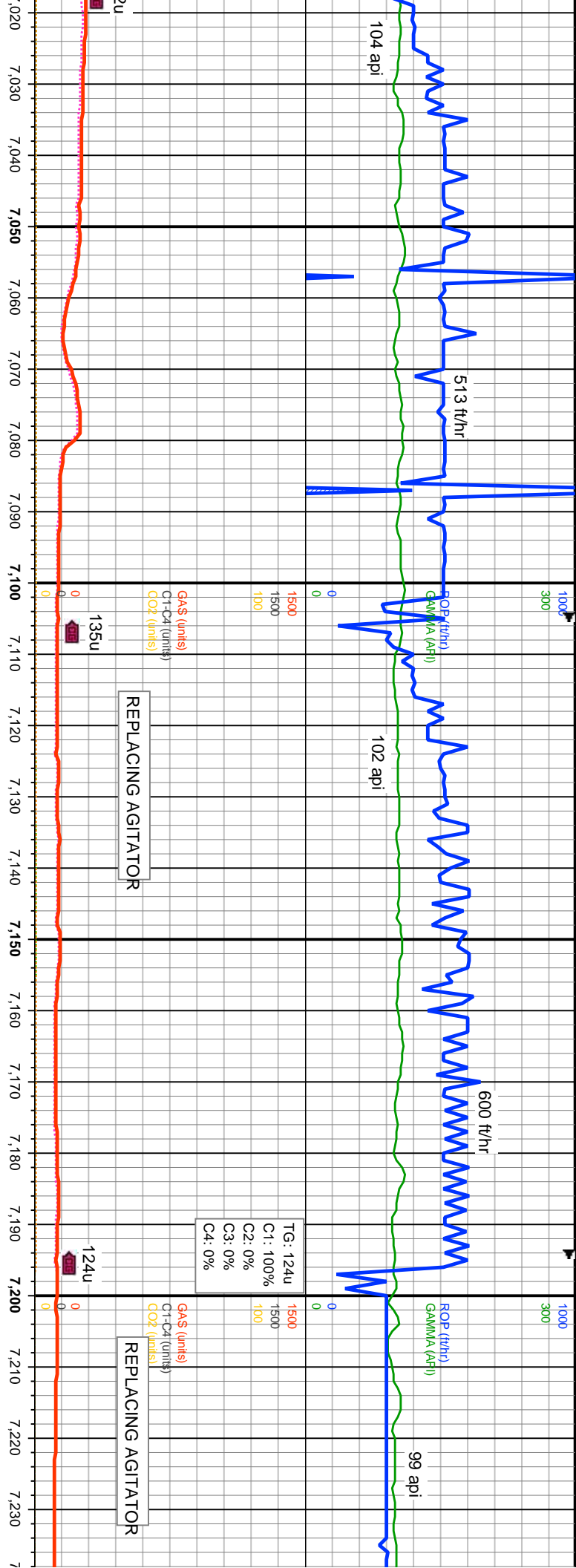
100% SHY SLTST: lt-med gy, v-modly sft, fri, si-modly frm, sb blkv-sb plty, sb fis, atq, sily, v sl sdy, rthy, ip aren, sl rch cly mtx, sl calc











MD: 7.063'  
 INC: 29.91°  
 AZM: 285.5°  
 TVD: 6.599.6'  
 VS: -51.74'

MD: 7.153'  
 INC: 29.99°  
 AZM: 285.76°  
 TVD: 6.677.58'  
 VS: -52.85'

ST: lt-med gy, v-modly sft, fri, sl-modly frm, sb blk-ly-sb plty, sb fis, arg, thly, ip aren, sl rch cly mtx, sl calc

100% SHY SLTST: lt-med gy, v-modly sft, fri, sl-modly frm, sb blk-ly-sb plty, sb fis, arg, slty, v sl sdy, rthy, ip aren, sl rch cly mtx, sl calc

90% SHY SLTST: lt-medgy, v-mn sl sdy, rthy, ip aren, sl rch cly mtx sft-frm, brt, sb blk-ly-ang, rr plty, c

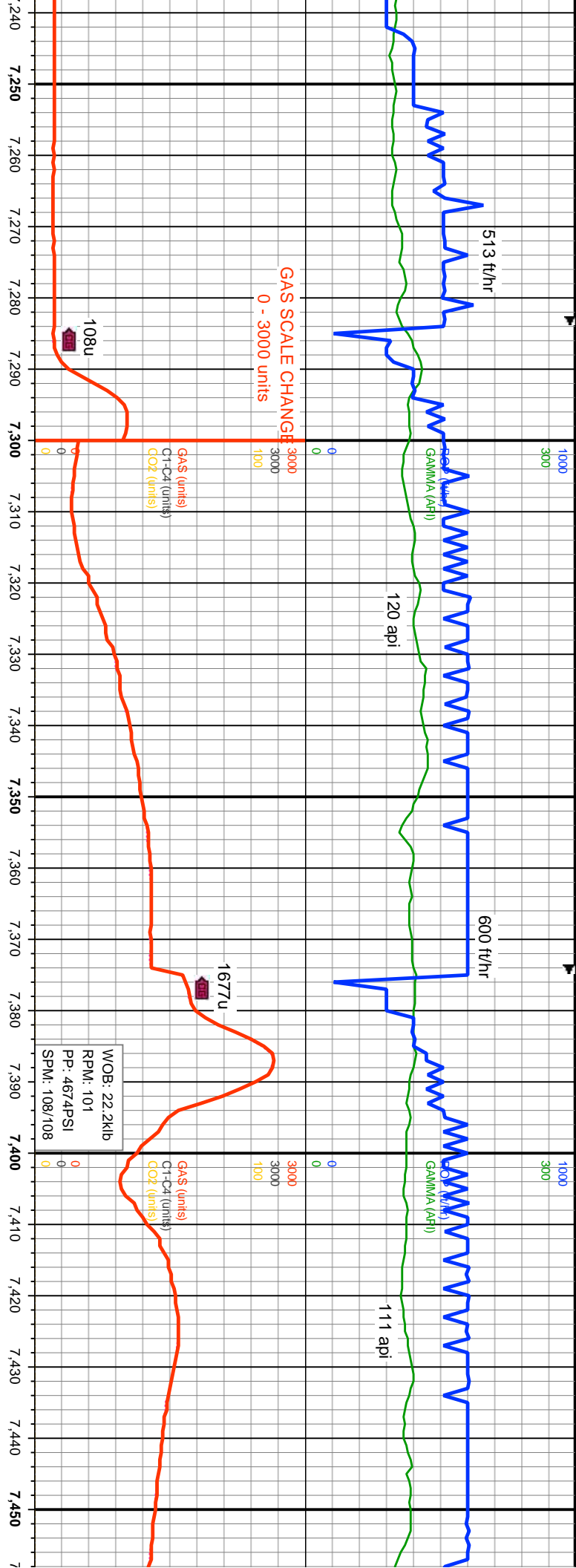
5500  
 TVD (ft)

8500

5500  
 TVD (ft)

8500

M  
 IN  
 IN  
 AZ  
 TV  
 VS



D: 7.243'  
C: 29.9°  
MI: 284.87°  
D: 6.755.56'  
S: -53.7'

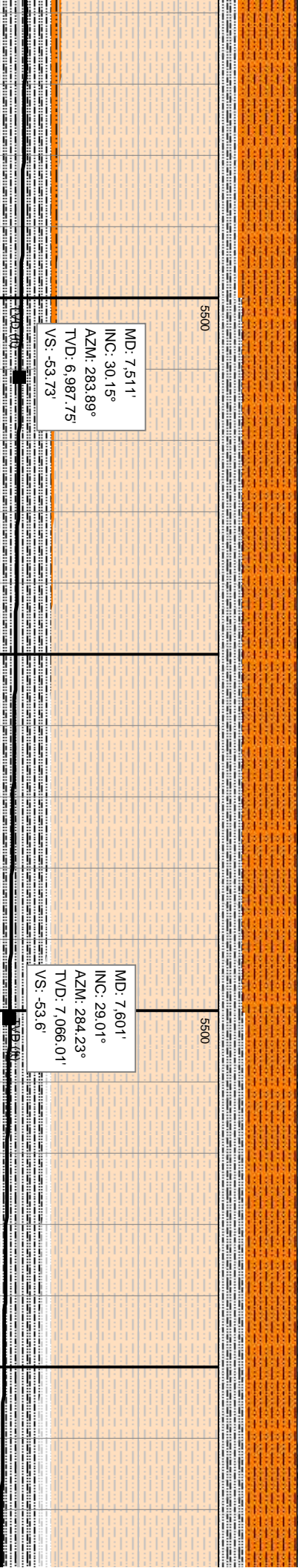
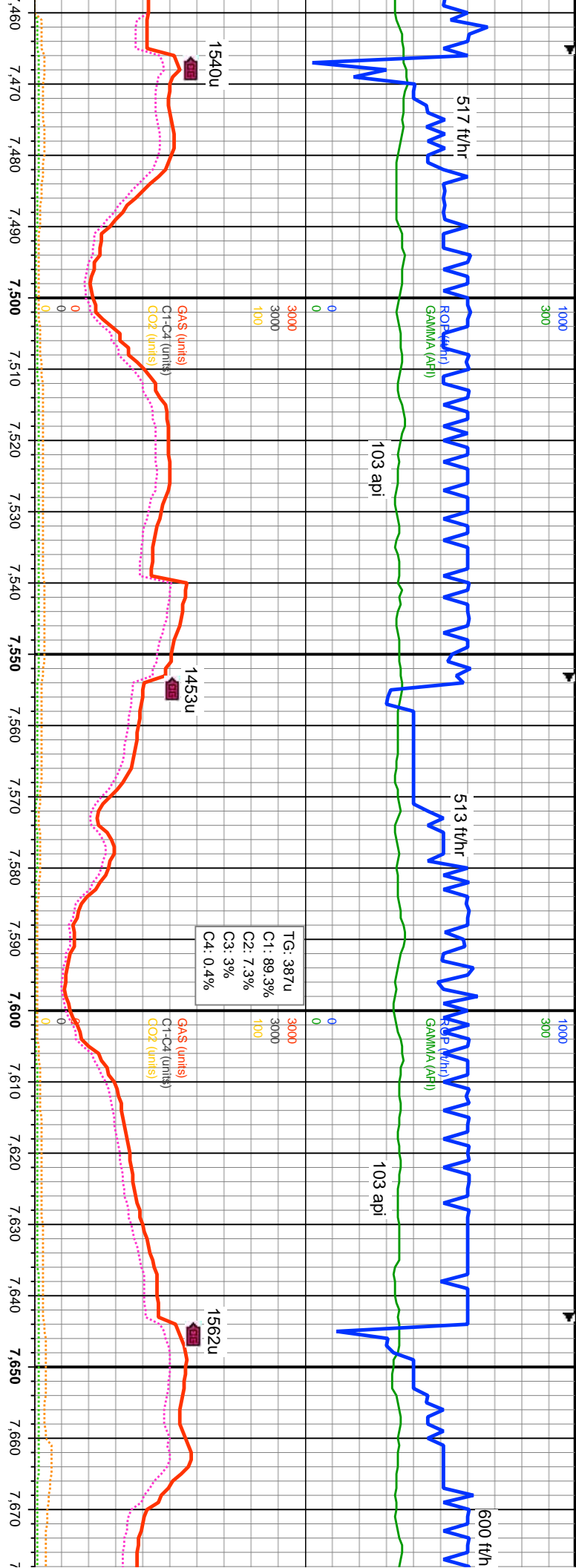
MD: 7.332'  
INC: 30.04°  
AZM: 283.79°  
TVD: 6.832.66'  
VS: -53.79'

MD: 7.421'  
INC: 29.82°  
AZM: 284.52°  
TVD: 6.909.79'  
VS: -53.74'

80% SHY SLTST: lt-medgy, v-modly sft, fri, rr mod frm, sb blk-y-sb pily, sb fis, arg, sily, v sl sdy, rthy, ip aren, sl rch cly mtx, sl calc: 20% SLTY SH: med-dkgy, dk gysbhn, mod sft-frm, brit, sb blk-y-ang, rr pily, com fis, sily, arg, v sl calc

75% SHY SLTST: lt-medgy, v-modly sft, fri, rr mod sily, v sl sdy, rthy, ip aren, sl rch cly mtx, sl calc: 25 gysbhn, mod sft-frm, brit, sb blk-y-ang, rr pily, com fr

8500



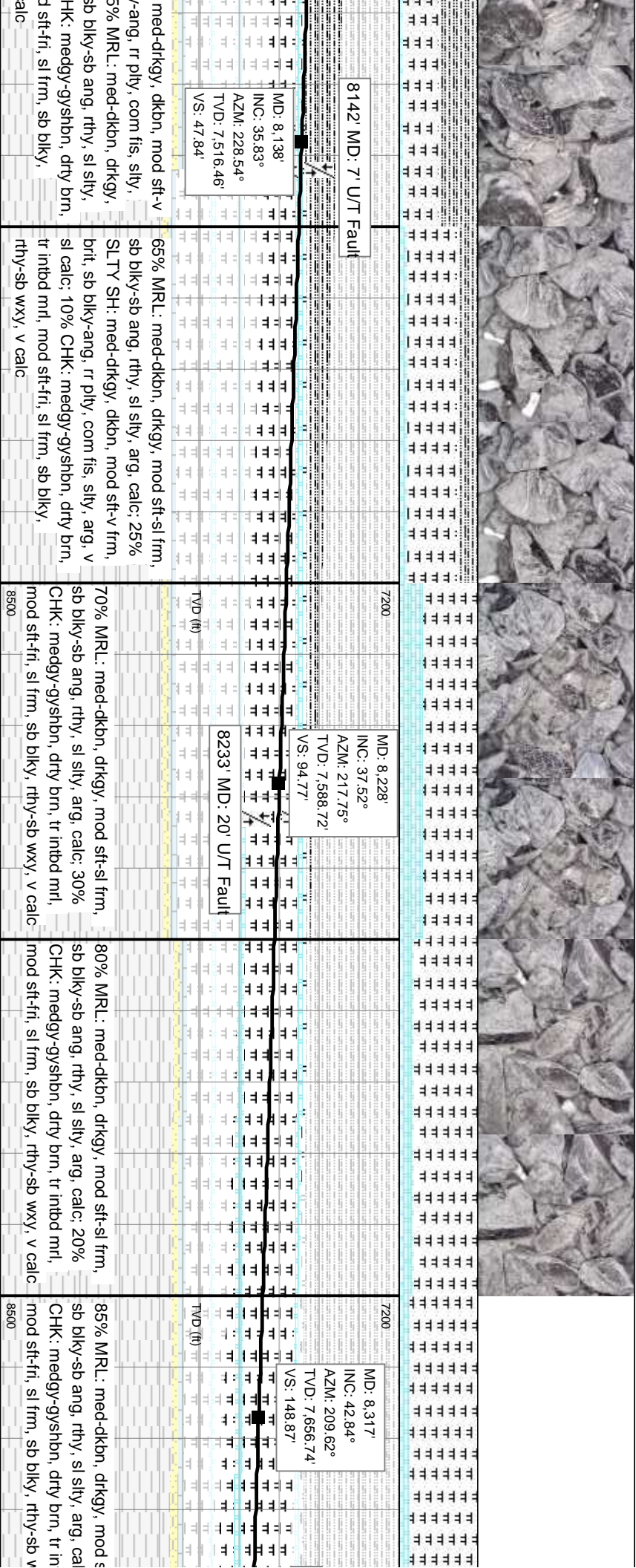
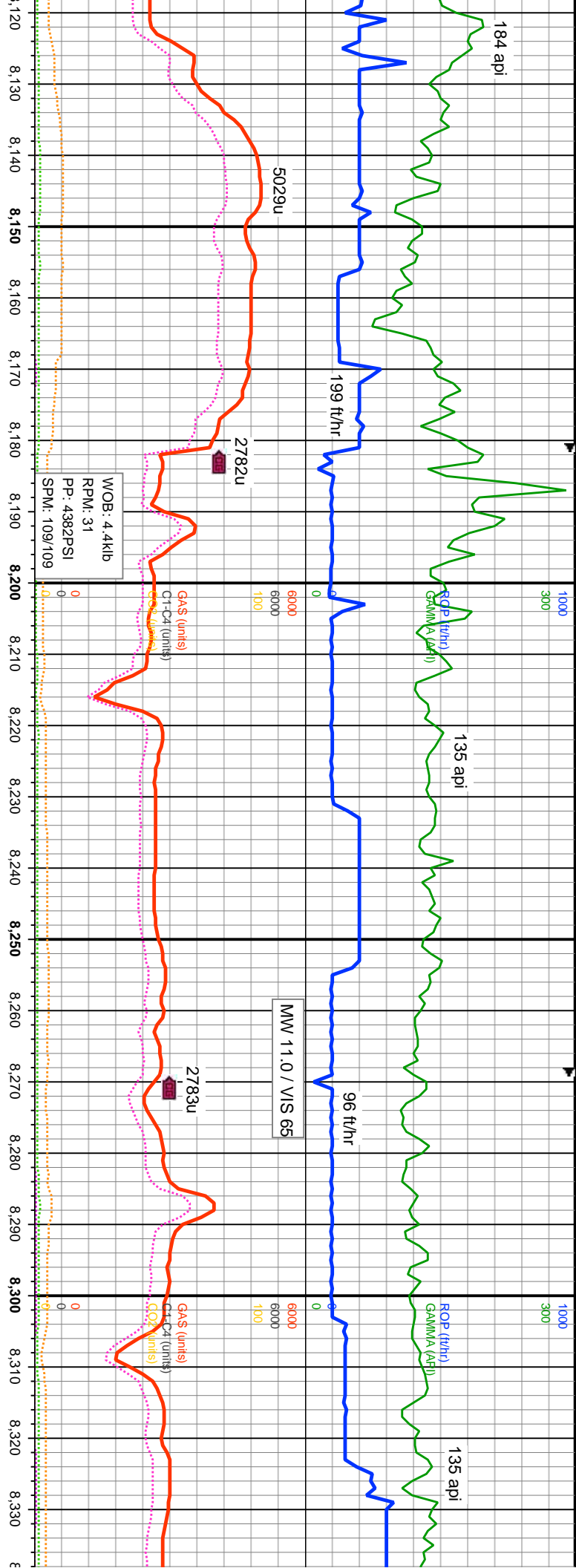
firm, sb blk-y-sb pily, sb fis, arg, % SLTY SH: med-dkgy, dk s, stly, arg, v sl calc

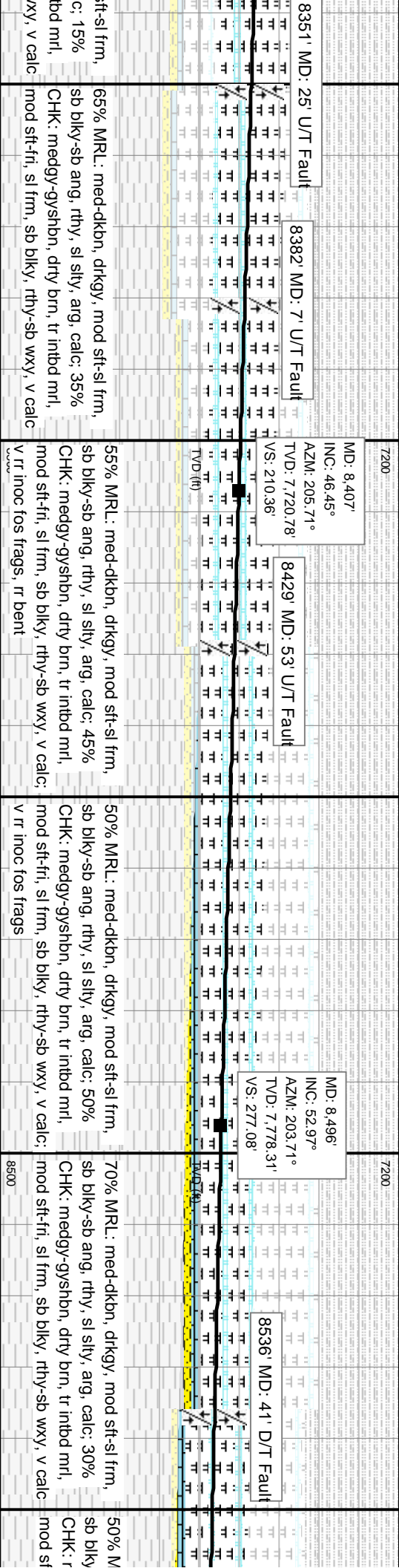
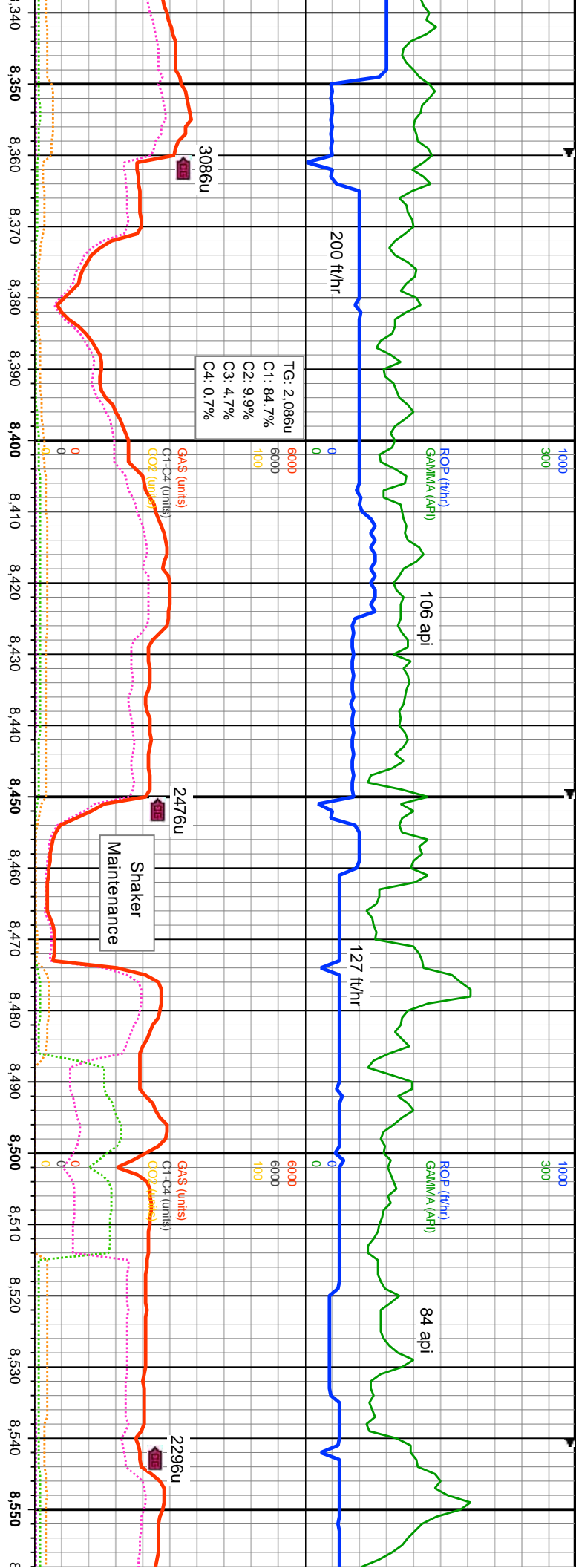
70% SHY SLTST: lt-medgy, v-modly sft, fri, rr mod frm, sb blk-y-sb pily, sb fis, arg, stly, v sl sdy, rthy, ip aren, sl rch cly mtz, sl calc: 30% SLTY SH: med-dkgy, dk gysbhn, mod sft-frm, brt, sb blk-y-ang, rr pily, com fis, stly, arg, v sl calc

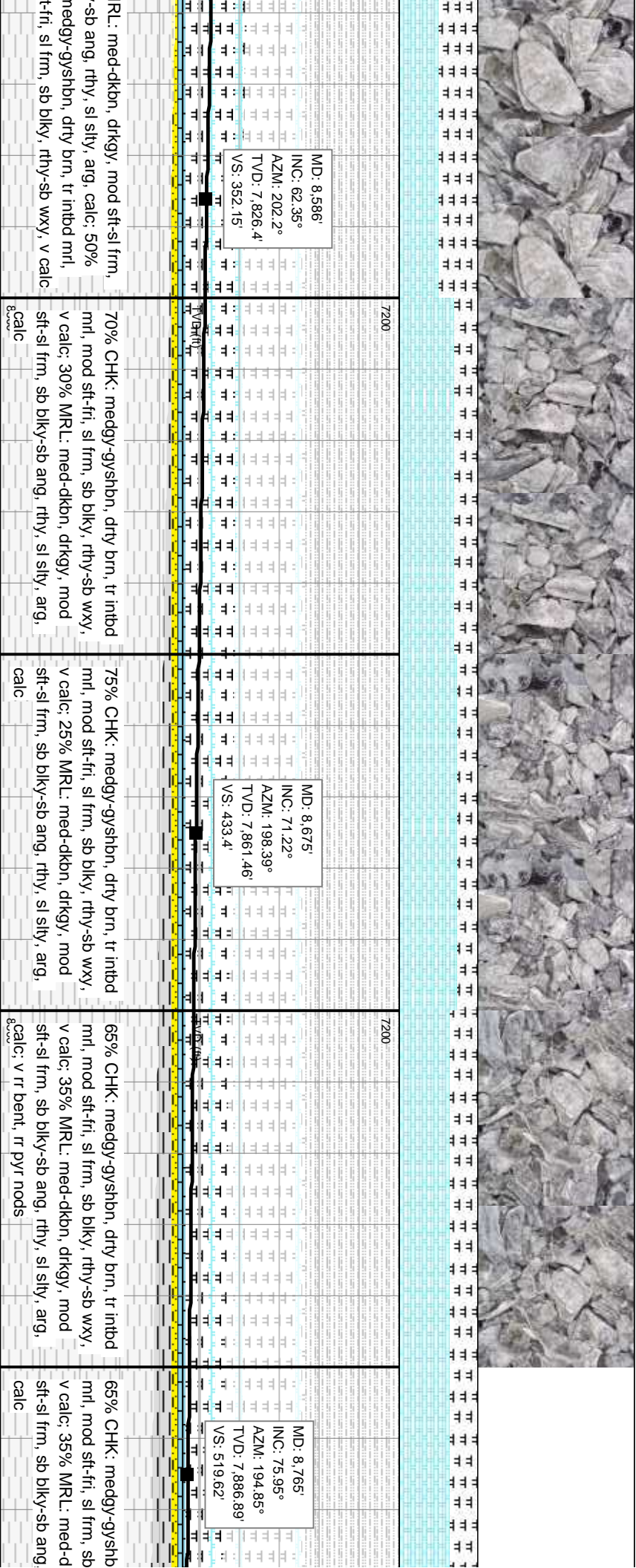
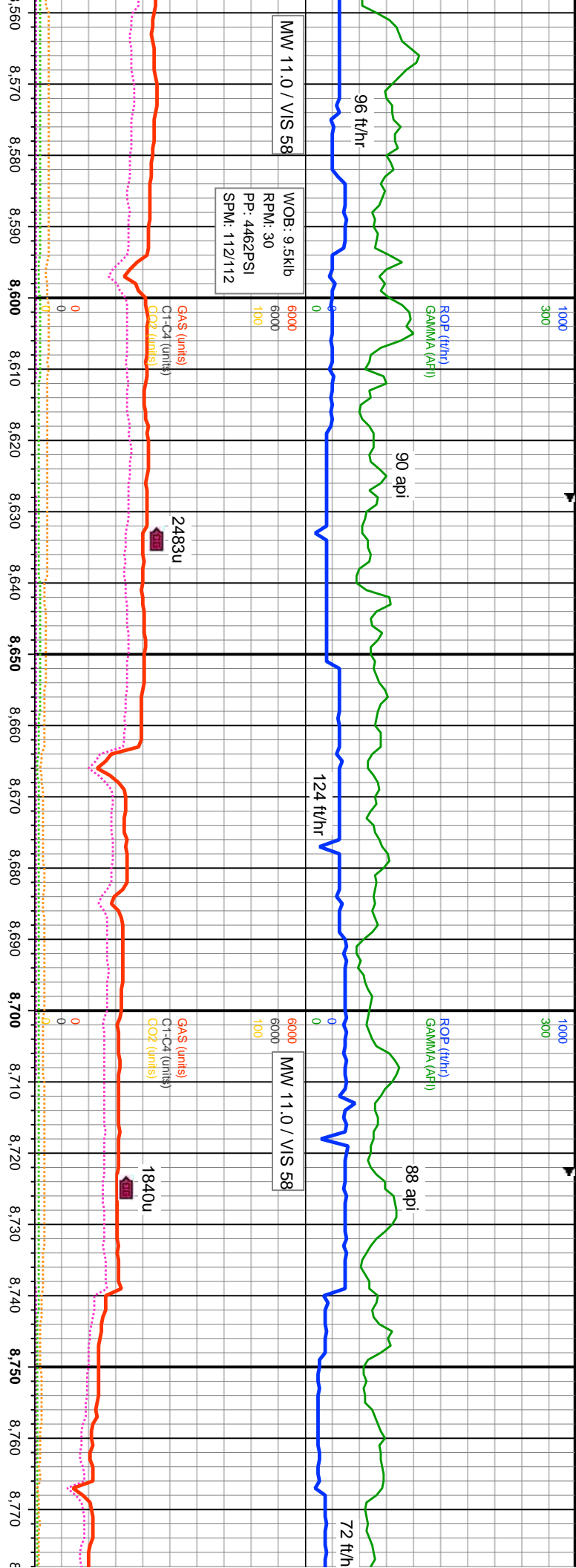
65% SHY SLTST: lt-medgy, v-modly sft, fri, rr mod frm, sb blk-y-sb pily, s sdy, rthy, ip aren, sl rch cly mtz, sl calc: 35% SLTY SH: med-dkgy, dk gy sft-frm, brt, sb blk-y-ang, rr pily, com fis, stly, arg, v sl calc

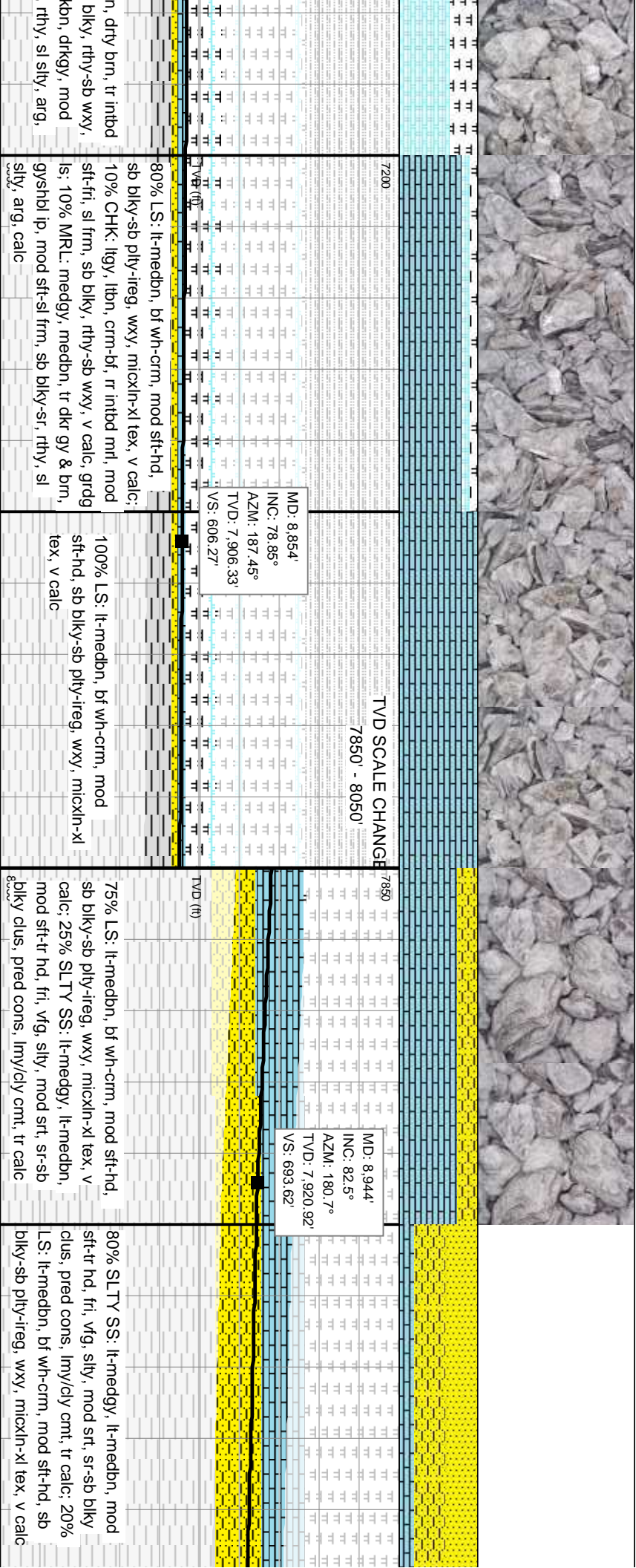
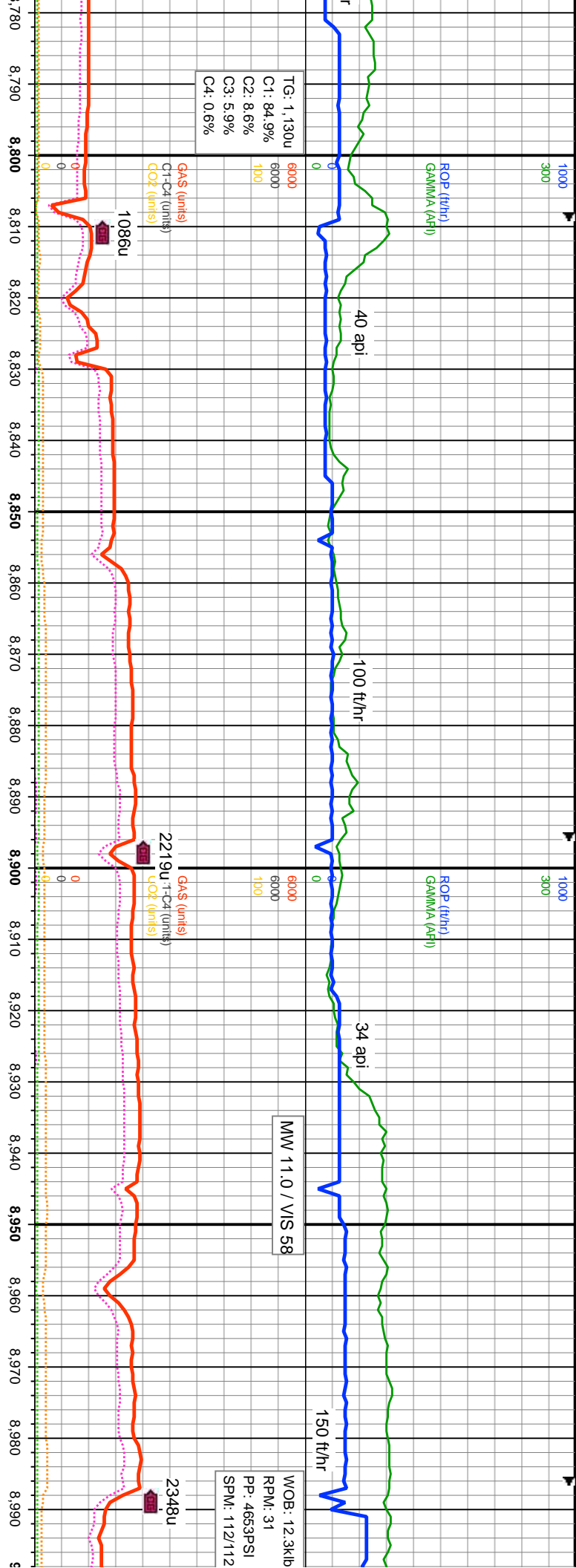


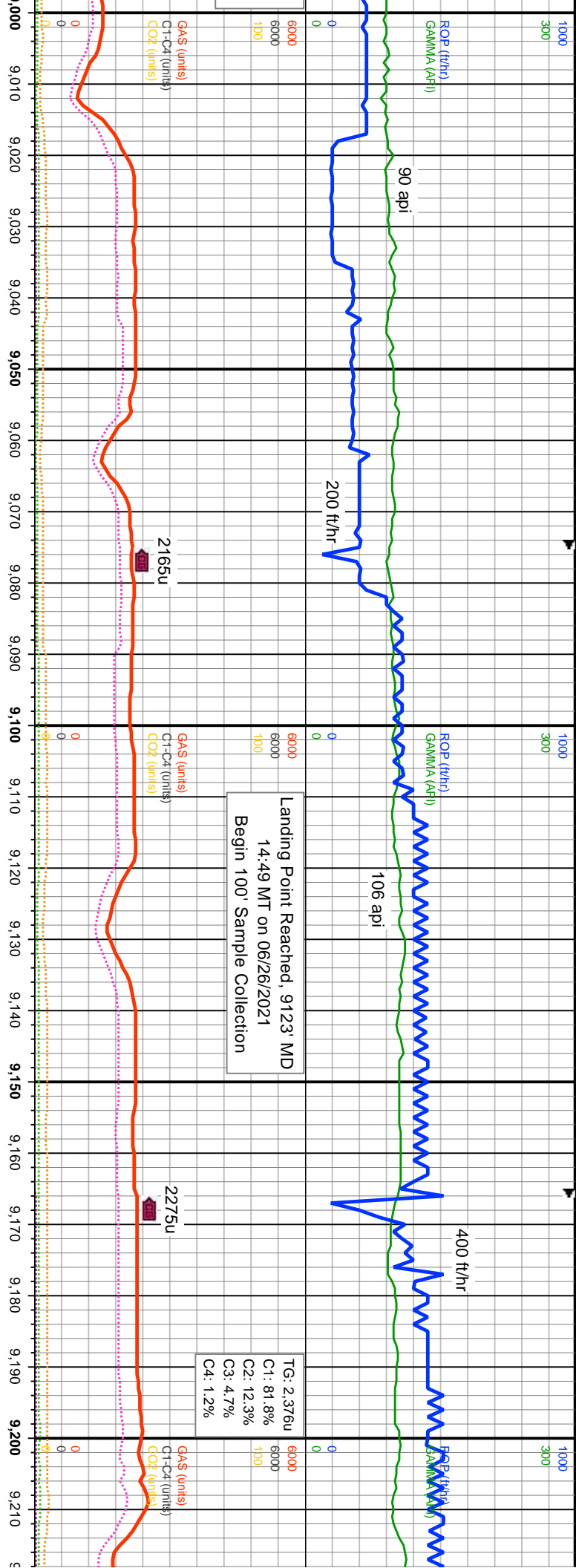




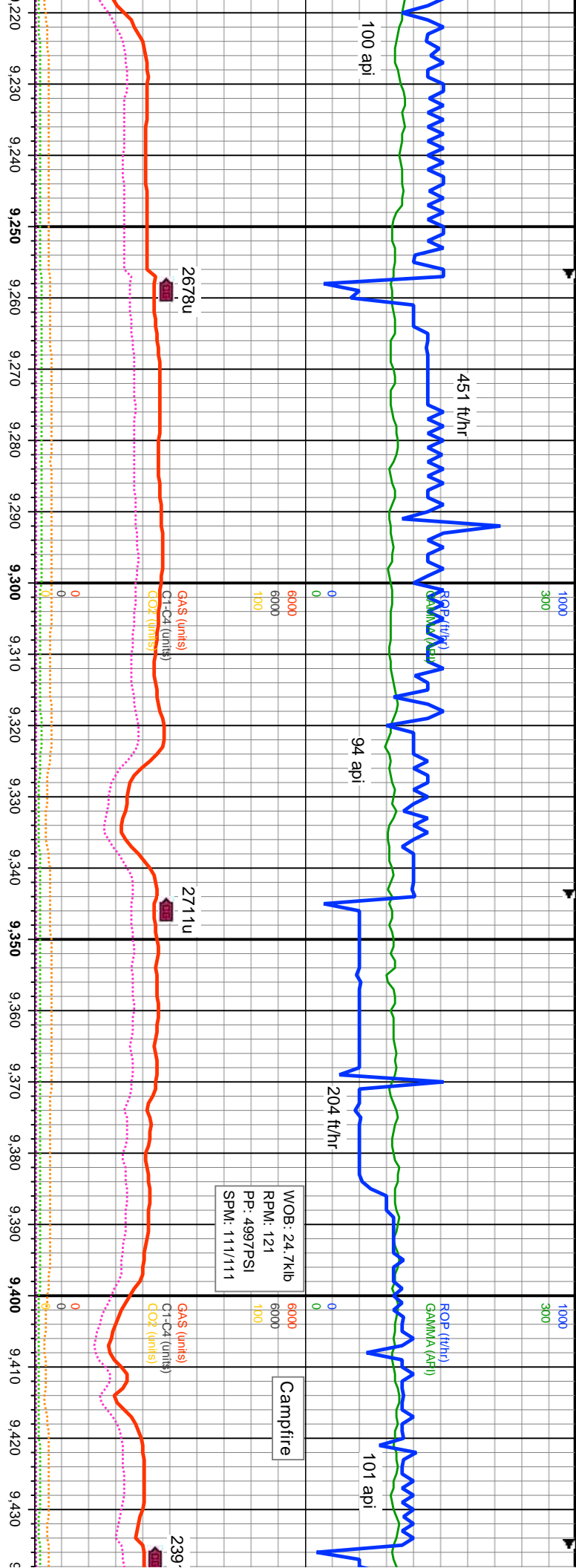




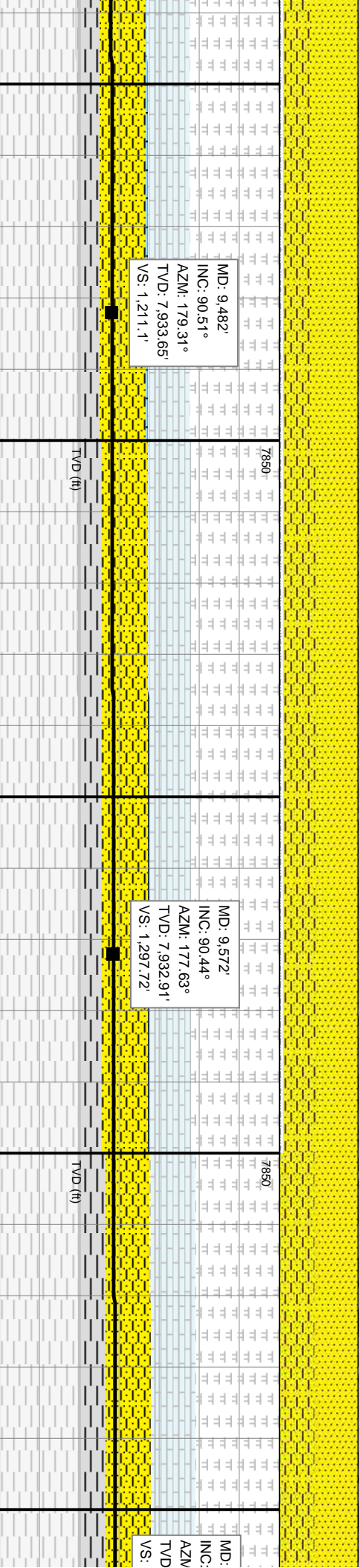
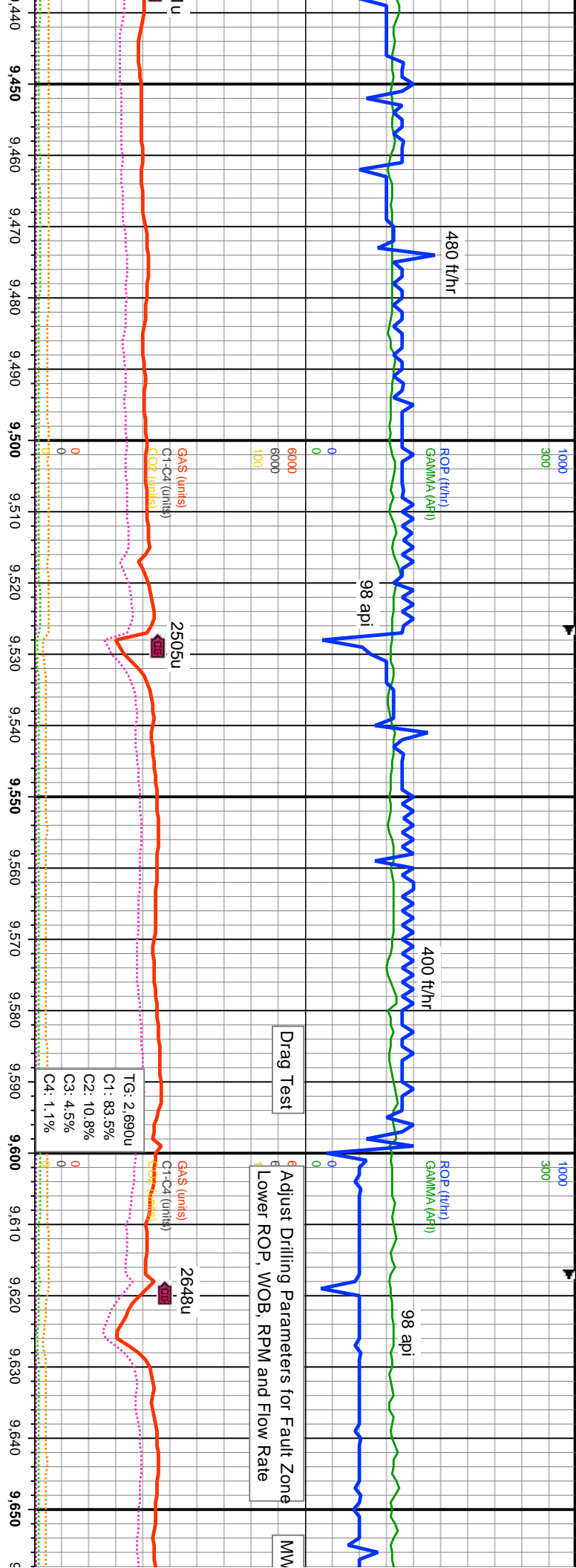




7850	MD: 9.034' INC: 87.06° AZM: 177.02° TVD: 7.929, 1' VS: 780.01'	95% SLTY SS: lt-medgy, lt-medbn, mod sft-tr hd, fri, vfg, silty, mod srt, sr-sb blkly clus, pred cons, lmy/clv cnt, tr calc, tr LS w/ foss; 5% SLTY SH: med-dfkg, sb blkly-sb plty, mod sft-fri, rthy, grty, silty-aren, tr calc
7850	MD: 9.123' INC: 89.3° AZM: 177.36° TVD: 7.931, 93' VS: 865.06'	90% SLTY SS: lt-medgy, lt-medbn, mod sft-tr hd, fri, vfg, silty, mod srt, sr-sb blkly clus, pred cons, lmy/clv cnt, v r calc; 10% SLTY SH: med-dfkg, sb blkly-sb plty, mod sft-fri, rthy, grty, silty-aren, rr calc
7850	MD: 9.213' INC: 89.26° AZM: 178.62° TVD: 7.933, 0' VS: 951.46'	95% SLTY clus, pred mod sft-fri



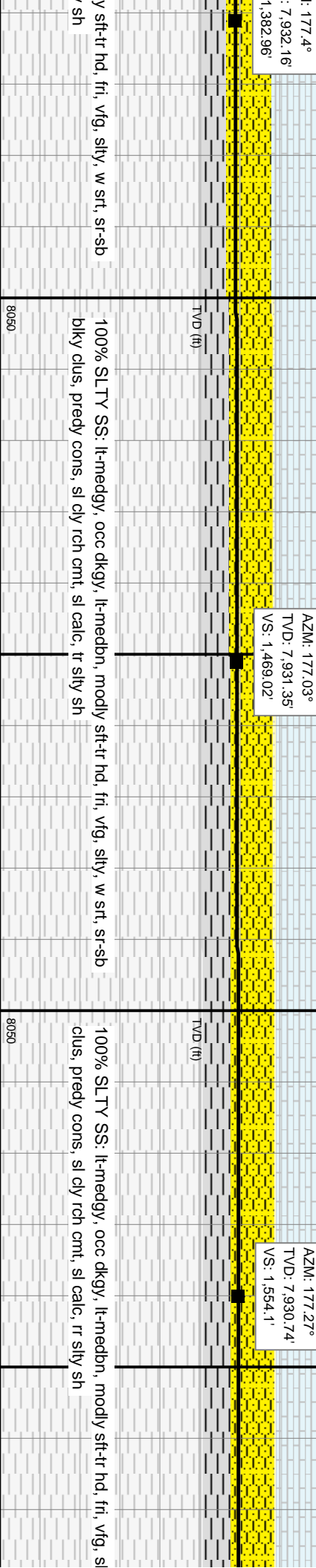
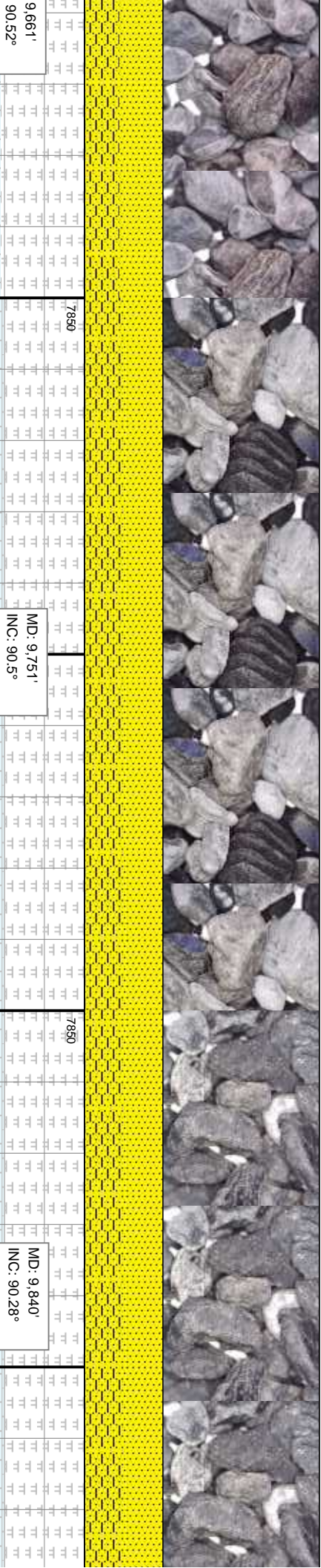
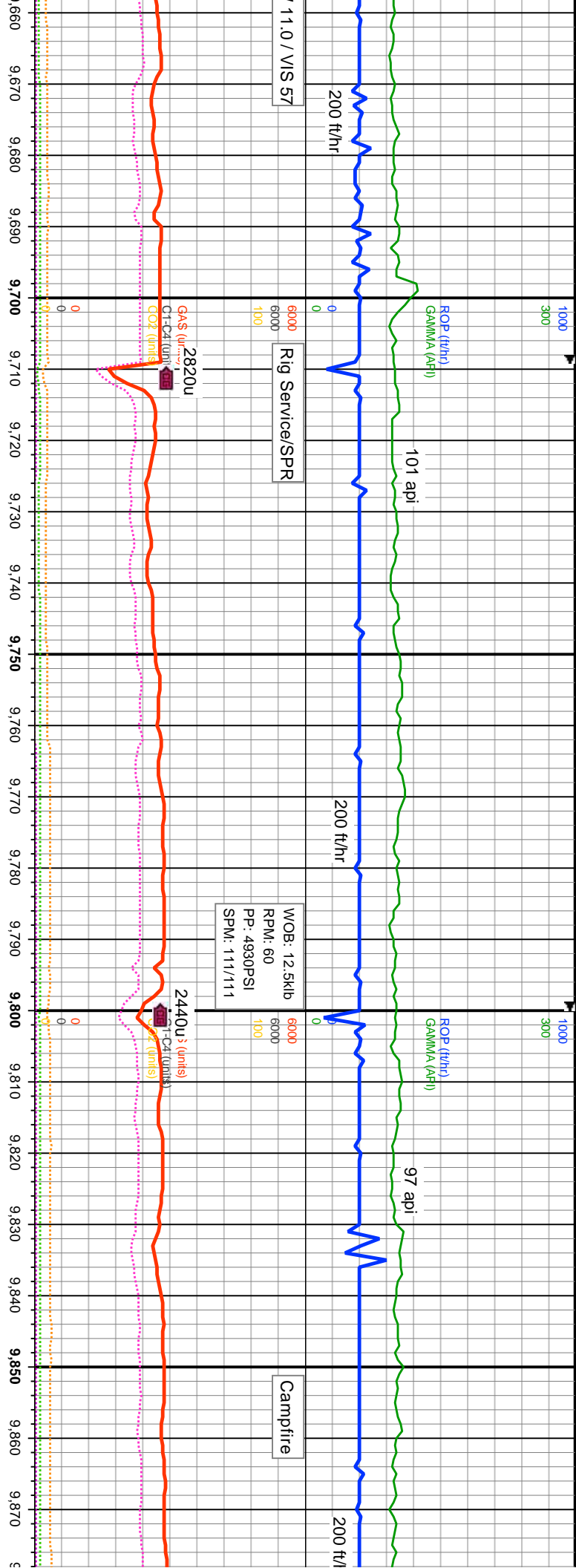
Section	MD (ft)	INC (ft)	AZM (°)	TVD (ft)	VS (ft)	Notes
8050	7850	9.302'	89.34°	7.934, 15'	1.037, 26'	SS: lt-medgy, lt-medbn, mod sft-tr hd, fri, vfg, silty, mod srt, sr-sb blkly cons, lmy/clv cmt, v rr calc, 5% SLTY SH: med-drtkgy, sb blkly-sb plty, rthy, grty, silty-aren, rr calc
7850	7850	9.392'	90.39°	7.934, 36'	1.124, 15'	95% SLTY SS: lt-medgy, lt-medbn, mod sft-tr hd, fri, vfg, silty, mod srt, sr-sb blkly clus, pred cons, lmy/clv cmt, v rr calc, 5% SLTY SH: med-drtkgy, sb blkly-sb plty, mod sft-fri, rthy, grty, silty-aren, rr calc
8050	7850	9.392'	90.39°	7.934, 36'	1.124, 15'	95% SLTY SS: lt-medgy, lt-medbn, mod sft-tr hd, fri, vfg, silty, mod srt, sr-sb blkly clus, pred cons, lmy/clv cmt, v rr calc, 5% SLTY SH: med-drtkgy, sb blkly-sb plty, mod sft-fri, rthy, grty, silty-aren, rr calc

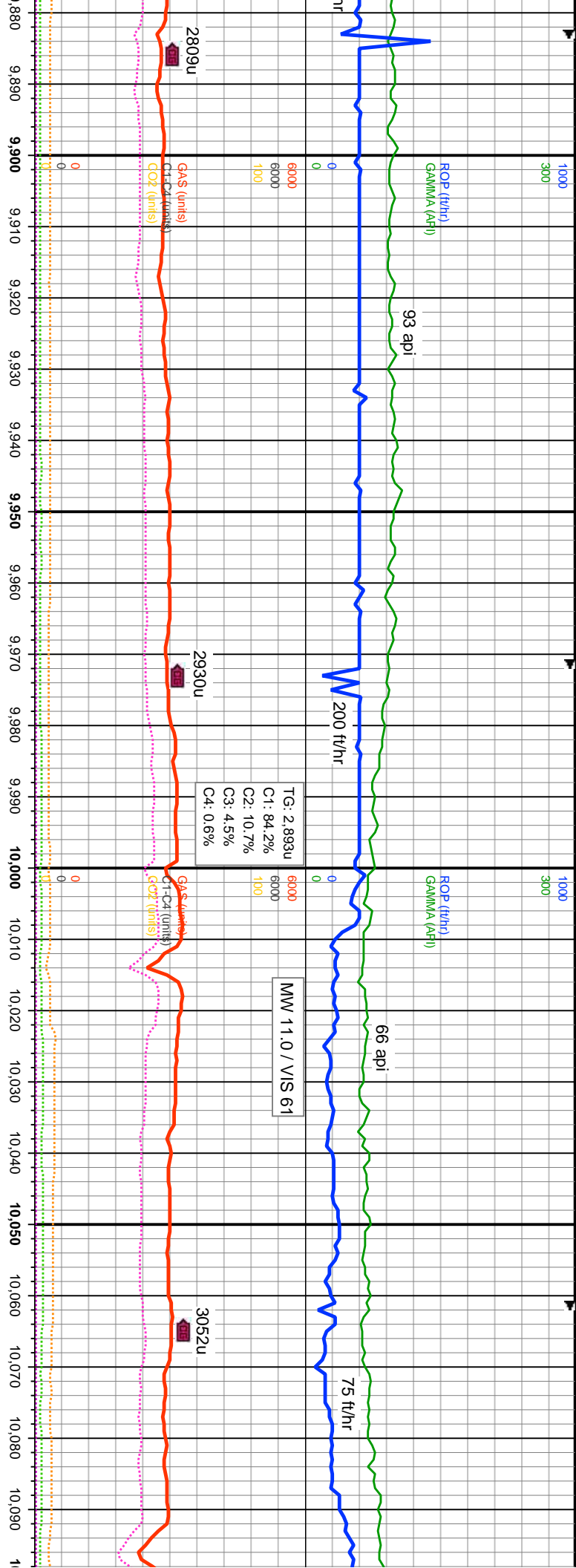


modly sft-tr hd, fri, vfg, sily, modly srt, sr-sb  
cmt, v rr calc: 5% SLTY SH: med-dtkgy, sb blkly-sb  
aren, rr calc

95% SLTY SS: lt-medgy, lt-medbn, modly sft-tr hd, fri, vfg, sily, modly srt, sr-sb blkly  
clus, pedy cons, lmy/cly cmt, v rr calc: 5% SLTY SH: med-dtkgy, sb blkly-sb plty, mod  
sft-fri, rthy, grty, sily-aren, rr calc

100% SLTY SS: lt-medgy, ooc dky, lt-medbn, modly  
blkly clus, pedy cons, sl cly rch cmt, sl calc, sme sily



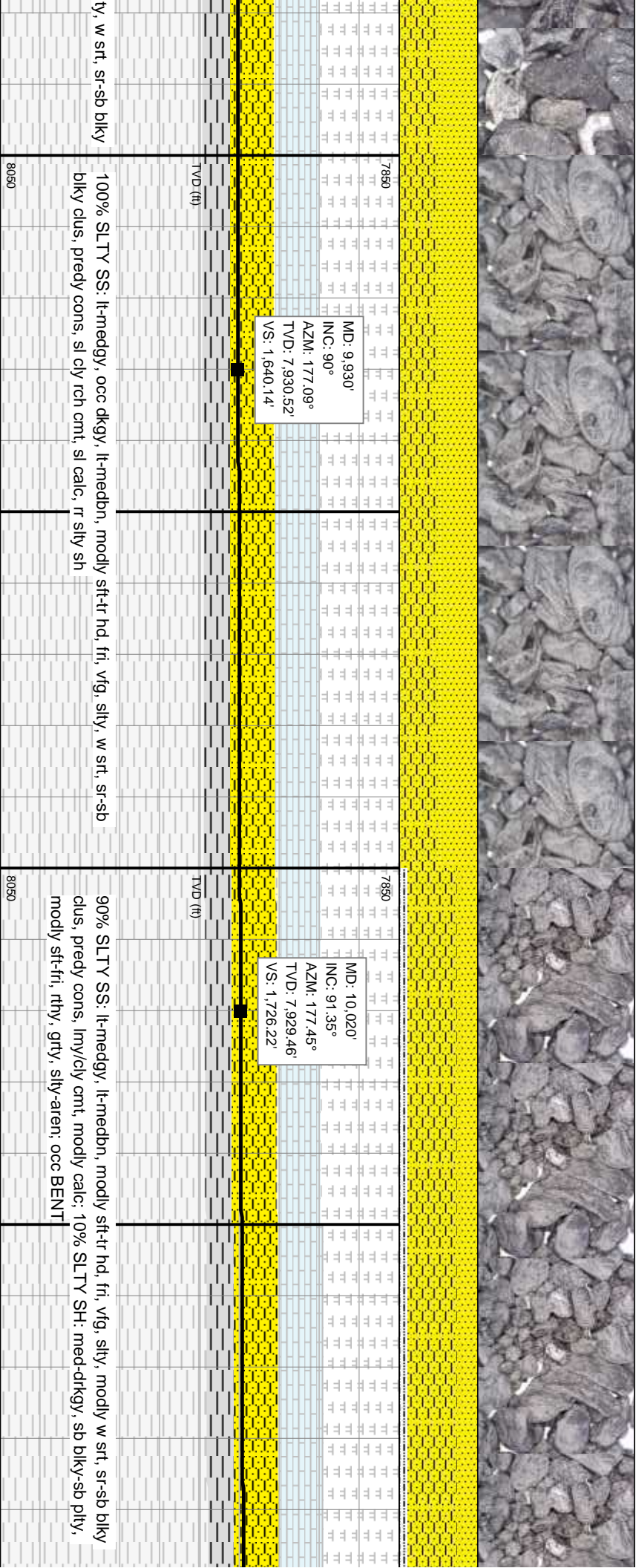


TG: 2.893u  
 C1: 84.2%  
 C2: 10.7%  
 C3: 4.5%  
 C4: 0.6%

MW 11.0 / VIS 61

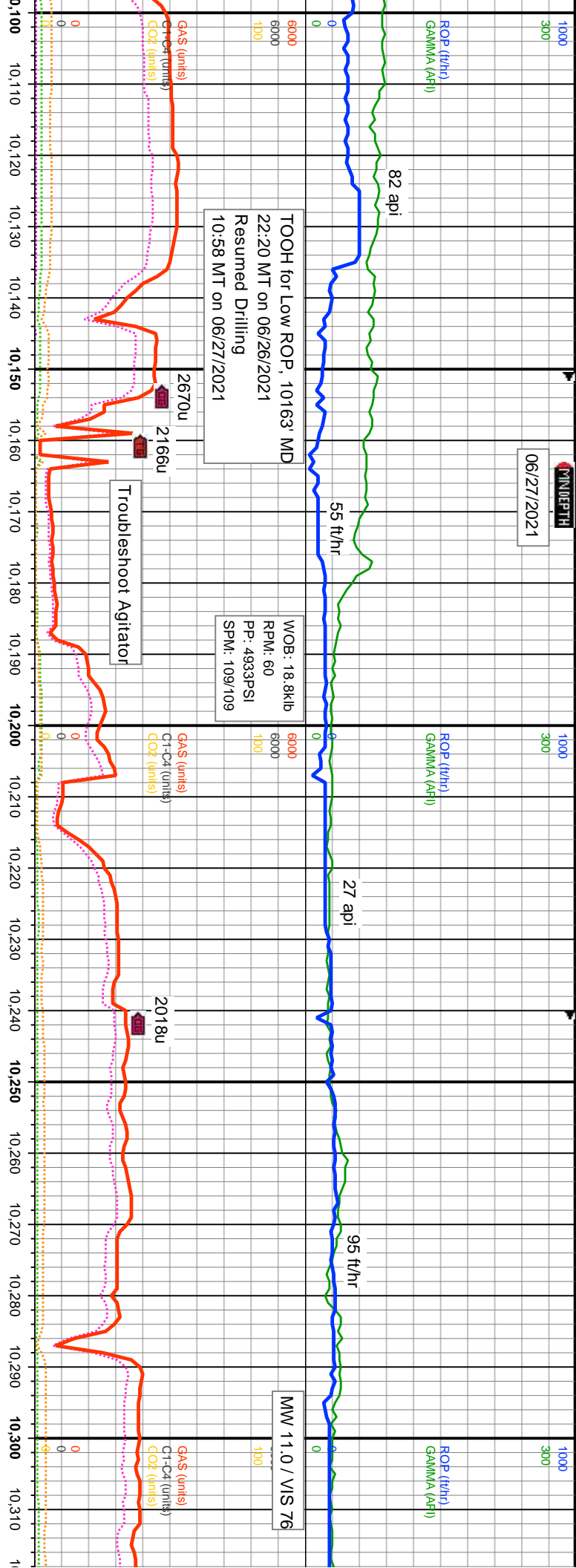
MD: 9.930'  
 INC: 90°  
 AZM: 177.09°  
 TVD: 7.930.52'  
 VS: 1.640.14'

MD: 10.020'  
 INC: 91.35°  
 AZM: 177.45°  
 TVD: 7.929.46'  
 VS: 1.726.22'



100% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly clus, predy cons, sl cily rch cmt, sl calc, rr slty sh

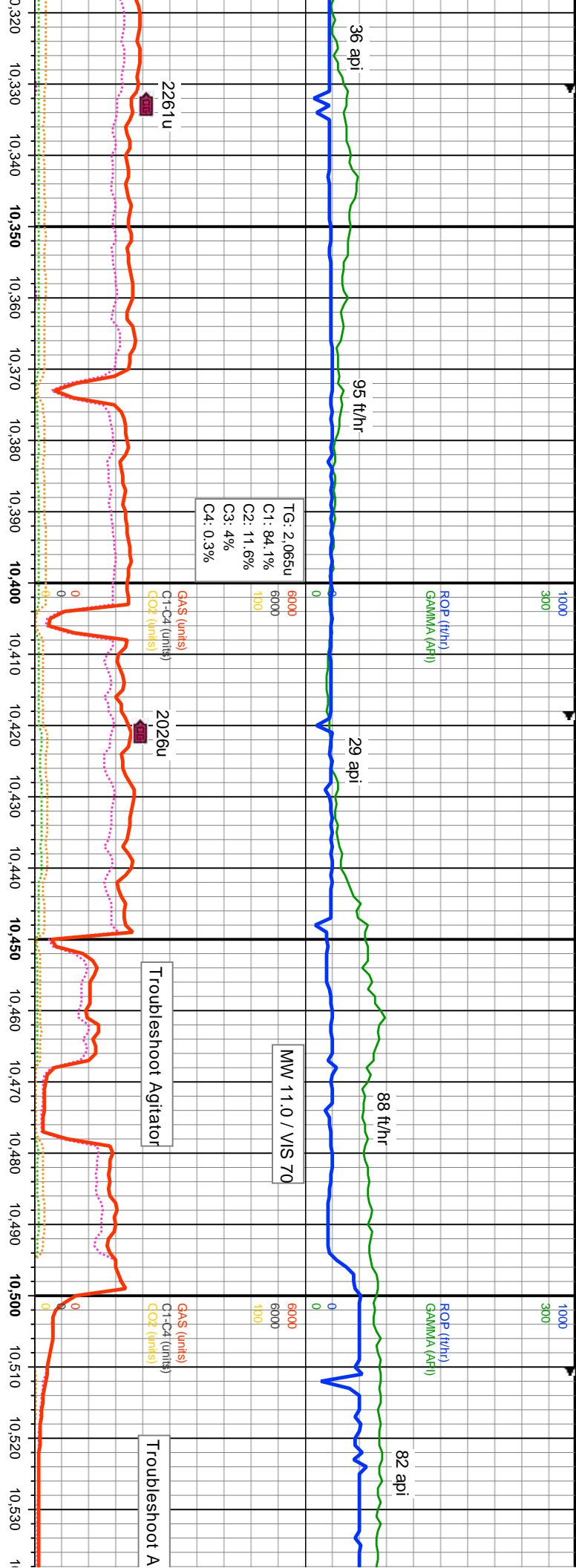
90% SLTY SS: lt-medgy, lt-medbn, modly sft-tr hd, fri, vfg, slty, modly w srt, sr-sb blkly clus, predy cons, lmy/cly cmt, modly calc: 10% SLTY SH: med-drkgy, sb blkly-sb plty, modly sft-fri, rthy, grty, slty-aren: occ BENT



7850	7850	7850
MD: 10,109 INC: 90.78° AZM: 178.81° TVD: 7,927.8' VS: 1,811.72'	MD: 10,199 INC: 91.61° AZM: 181.15° TVD: 7,925.92' VS: 1,898.93'	MD: 10,289 INC: 89.65° AZM: 185.54° TVD: 7,924.93' VS: 1,987.28'
Bit #: 2 Size: 8.5" Make: Smith Model: MDS1616 Jets: 5x11, 1x12 S/N: JV1412 Depth In: 10,163		
10176' MD: 42 D/T Fault		

60% CARB SH: drkgy-dkbn, mot gysbhn, modly-v sft, sb blkly-sb pily, rthy, stly, arg, v calc; 30% SLTY 90% LS: lt-medbn, bf wh-crm, mod SS: drkgy-brn, modly sft-hd, fri, vfg, stly, modly-w sft, predy cons, tr-modly calc; 10% SLTY SH: miclxn-xl tex, v calc; 10% CARB SH: med-drkgy, predy pily-sb pily, occ sb blkly, frm, brit, drkgy-dkbn, mot gysbhn, modly-v sft, rthy, grty, stly-aren, modly calc sb blkly-sb pily, rthy, stly, arg, v calc

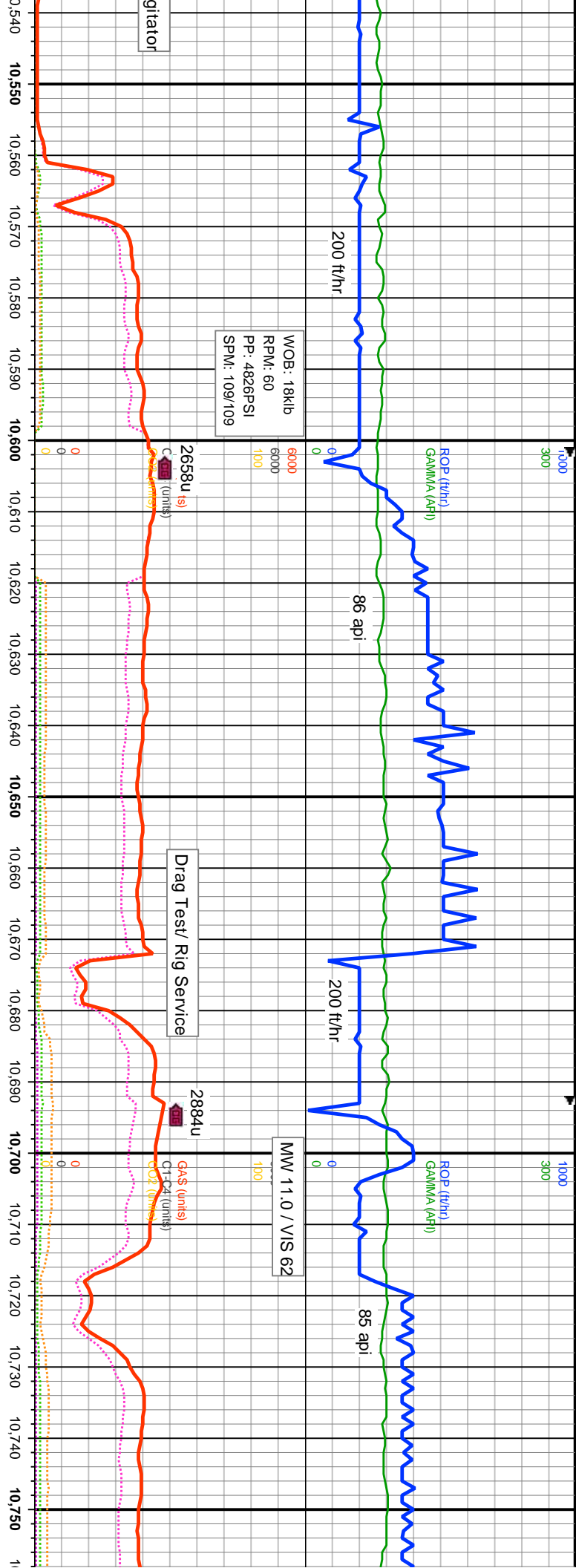
100% LS tex, v calc



MD: 10.379°  
 INC: 90.73°  
 AZM: 183.54°  
 TVD: 7.924.64'  
 VS: 2.076°

MD: 10.468°  
 INC: 89.75°  
 AZM: 181.2°  
 TVD: 7.924.26'  
 VS: 2.163.09°



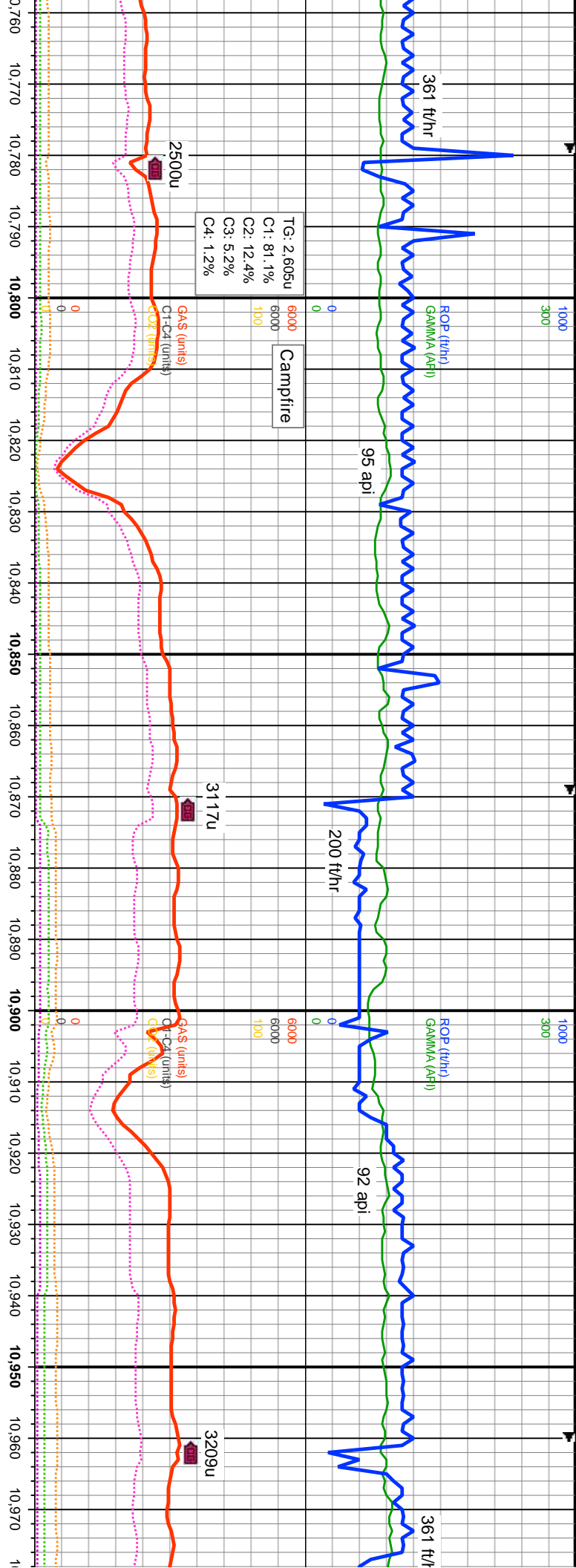


MD: 10,558'  
 INC: 89.49°  
 AZM: 179.75°  
 TVD: 7,924.86'  
 VS: 2,250.51'

MD: 10,648'  
 INC: 88.51°  
 AZM: 182.38°  
 TVD: 7,926.43'  
 VS: 2,338.12'

MD: 10,737'  
 INC: 89.93°  
 AZM: 178.9°  
 TVD: 7,927.64'  
 VS: 2,424.61'

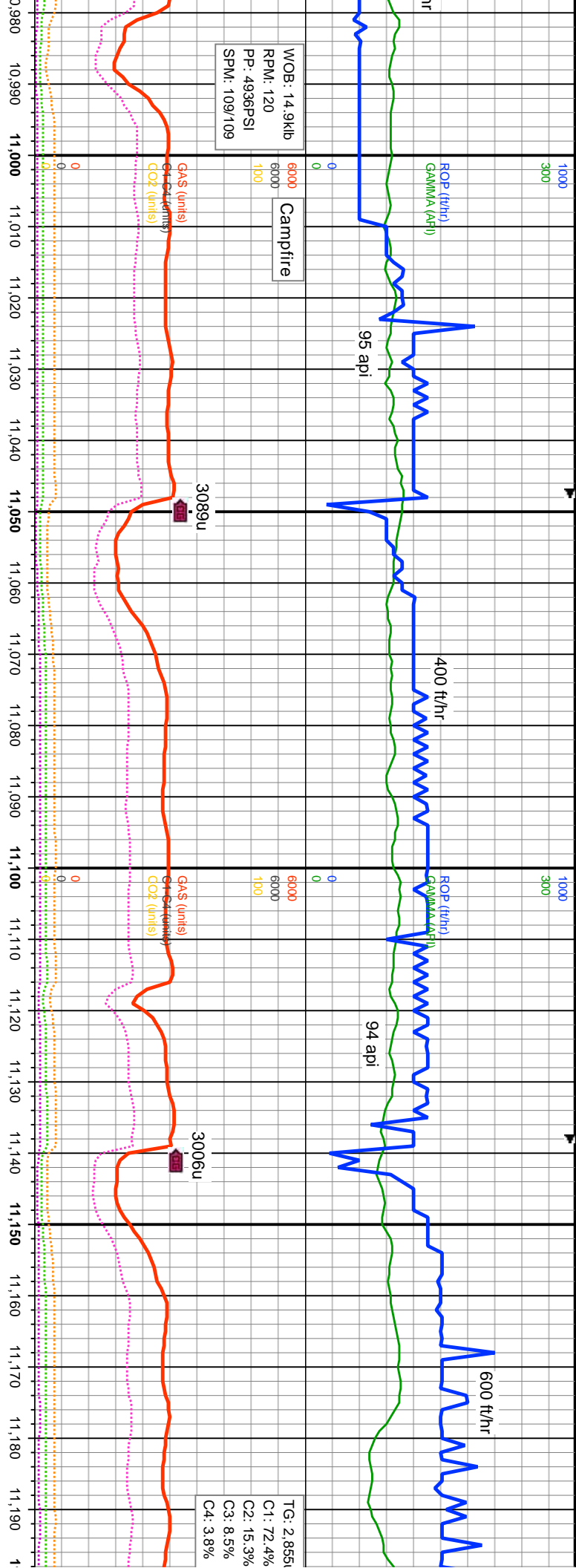
Depth (ft)	Stratigraphic Unit	Notes
10,550 - 10,600	8050	lt-medbn, modly sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly calc; 15% LS; lt-medbn, bf wh-crm, mod sft-hd, sb v calc
10,600 - 10,650	7850	
10,650 - 10,700	8050	100% SLTY SS; lt-medgy, occ dkgy, lt-medbn, modly sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly clus, predy cons, sl cly roh cnt, sl calc, rr LS
10,700 - 10,750	7850	
10,750 - 10,800	8050	100% SLTY SS; lt-medgy, occ dkgy, lt-medbn, modly sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly clus, predy cons, sl cly roh cnt, sl calc



7850	MD: 10.827 INC: 88.52° AZM: 180.06° TVD: 7.928.85' VS: 2.511.64'
7850	MD: 10.917 INC: 89.26° AZM: 177.06° TVD: 7.930.59' VS: 2.598.27'

8050  
 TVD (ft)  
 95% SLTY SS: lt-medgy, lt-medbn, modly sft-tr hd, fri, vfg, silty, modly srt, sr-sb blkly clus, priedy cons, lmy/cly cmt, v rr calc: 5% SLTY SH: med-drkgy, sb blkly-sb pily, mod sft-fri, rthy, grty, silty-aren, rr calc

8050  
 TVD (ft)  
 95% SLTY SS: lt-medgy, lt-medbn, modly sft-tr hd, fri, vfg, silty, modly srt, sr-sb blkly clus, priedy cons, lmy/cly cmt, v rr calc: 5% SLTY SH: med-drkgy, sb blkly-sb pily, mod sft-fri, rthy, grty, silty-aren



WOB: 14.9klb  
 RPM: 120  
 PP: 4936PSI  
 SPM: 109/109

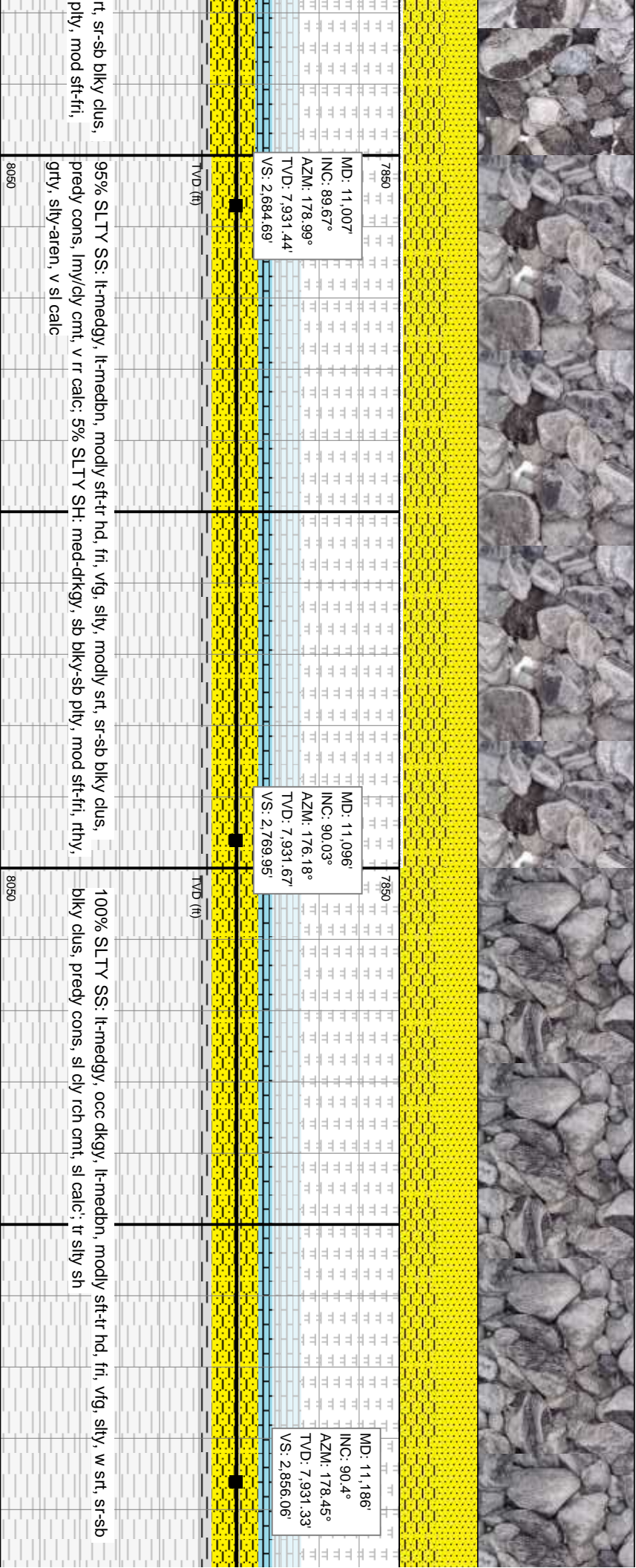
Campfire

TG: 2.8551  
 C1: 72.4%  
 C2: 15.3%  
 C3: 8.5%  
 C4: 3.8%

MD: 11,007'  
 INC: 89.67°  
 AZM: 178.99°  
 TVD: 7,931.44'  
 VS: 2,684.69'

MD: 11,096'  
 INC: 90.03°  
 AZM: 176.18°  
 TVD: 7,931.67'  
 VS: 2,769.95'

MD: 11,186'  
 INC: 90.4°  
 AZM: 178.45°  
 TVD: 7,931.33'  
 VS: 2,856.06'



95% SLTY SS: lt-medgy, lt-medbn, modly sft-tr hd, fri, vfg, slty, modly srt, sr-sb blkly clus, predy cons, lmy/clay cmt, v rr calc; 5% SLTY SH: med-dkgy, sb blkly-sb plty, mod sft-fri, rthy, grty, slty-aren, v sl calc

100% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly clus, predy cons, sl clay rch cmt, sl calc; tr slty sh

7850  
 TVD (ft)

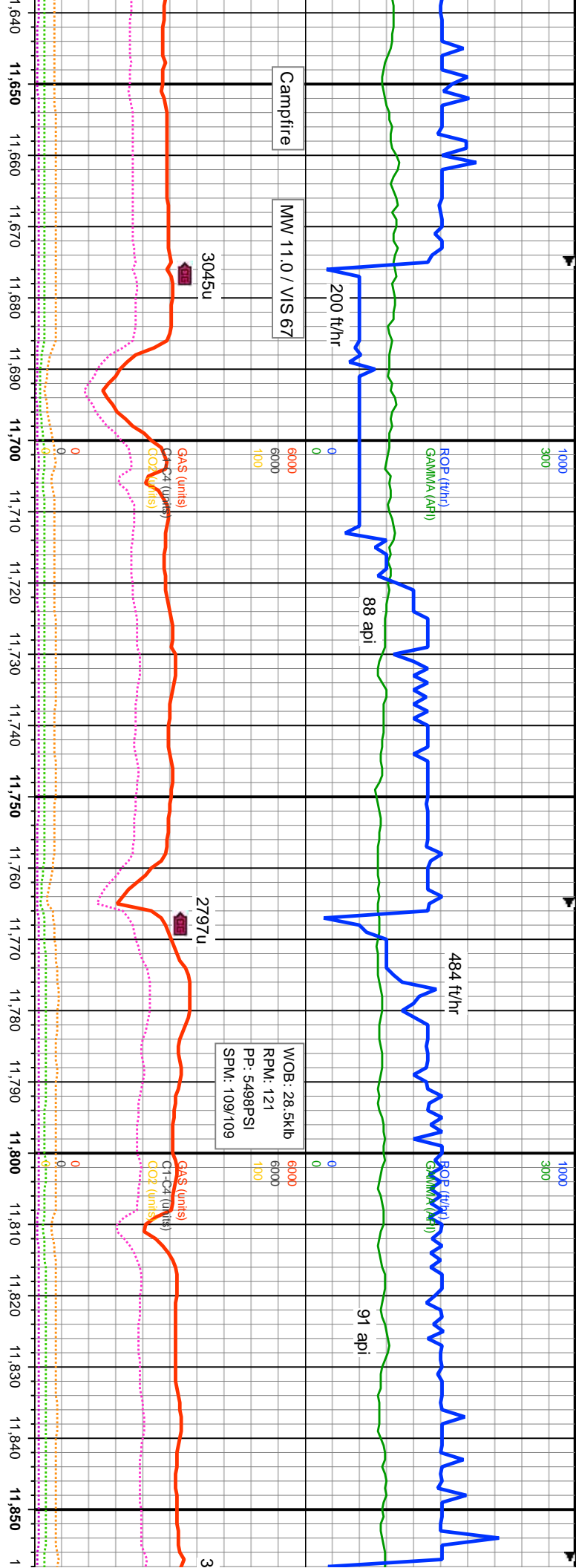
7850  
 TVD (ft)

8060

8060







Camplfire

MW 11.0 / VIS 67

3045u

200 ft/hr

ROP (ft/hr)  
GAMMA (API)

Gas (units)  
CO2 (units)

88 api

484 ft/hr

WOB: 28.5klb  
RPM: 121  
PP: 5498PSI  
SPM: 109/109

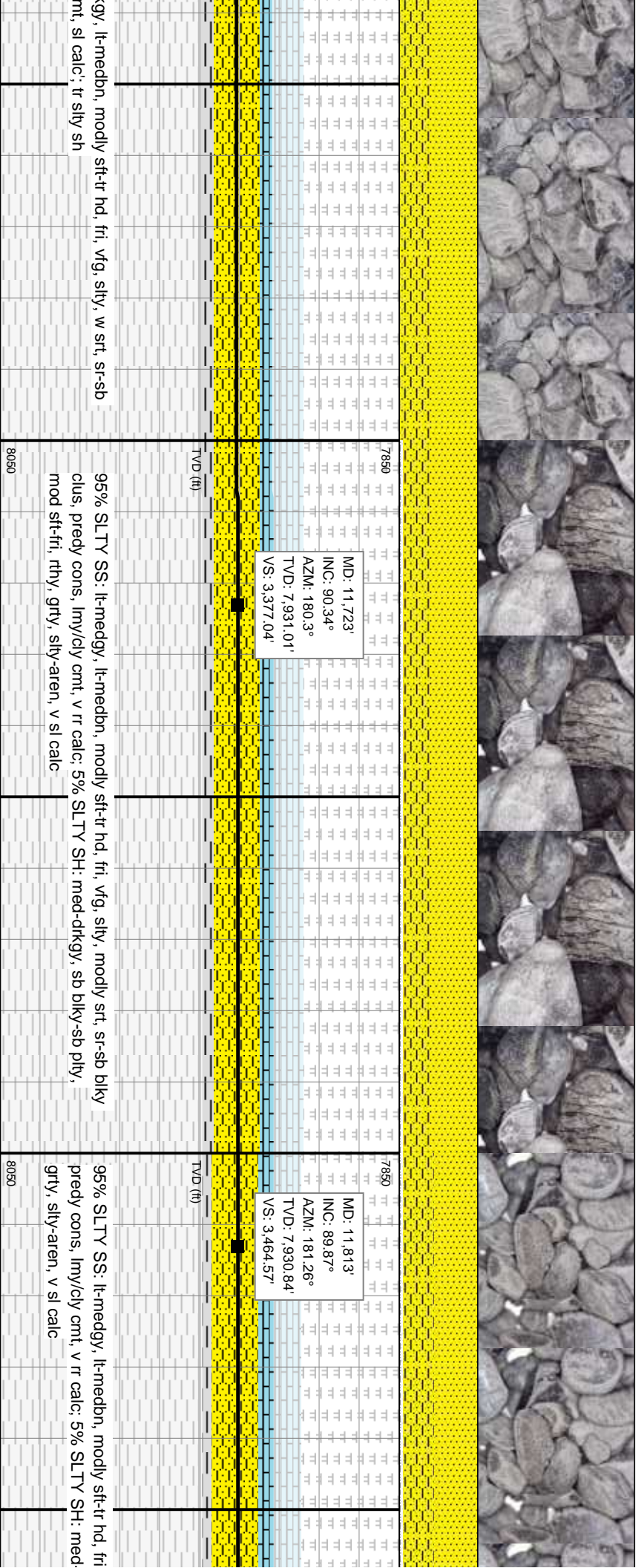
2797u

ROP (ft/hr)  
GAMMA (API)

Gas (units)  
CO2 (units)

91 api

3



gy, lt-medbn, modly sft-tr hd, fri, vfg, slty, w srt, sr-sb  
mt, sl calc; tr slty sh

95% SLTY SS: lt-medgy, lt-medbn, modly sft-tr hd, fri, vfg, slty, modly srt, sr-sb blkly  
clus, prdy cons, lmy/clv cnt, v rr calc; 5% SLTY SH: med-drtgy, sb blkly-sb pty,  
mod sft-fri, rthy, grty, slty-aren, v sl calc

95% SLTY SS: lt-medgy, lt-medbn, modly sft-tr hd, fri  
prdy cons, lmy/clv cnt, v rr calc; 5% SLTY SH: med-  
grty, slty-aren, v sl calc

MD: 11,723'  
INC: 90.34°  
AZM: 180.3°  
TVD: 7,931.01'  
VS: 3,377.04'

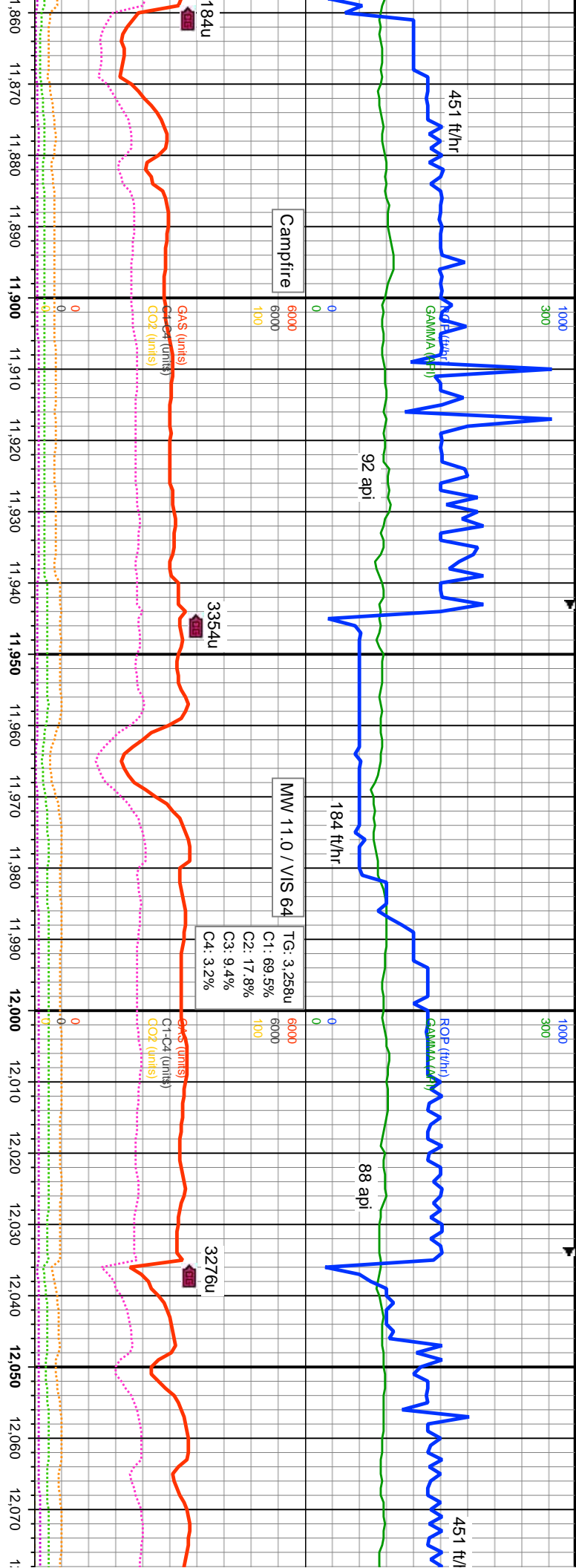
MD: 11,813'  
INC: 89.87°  
AZM: 181.26°  
TVD: 7,930.84'  
VS: 3,464.57'

TVD (ft)

TVD (ft)

8050

8050



MD: 11,902'  
 INC: 89.67°  
 AZM: 180.55°  
 TVD: 7,931.2'  
 VS: 3,551.17'

MD: 11,992'  
 INC: 90.41°  
 AZM: 178.22°  
 TVD: 7,931.13'  
 VS: 3,638.17'

MD:  
 INC:  
 AZM:  
 TVD:  
 VS:

TVD (ft)

TVD (ft)

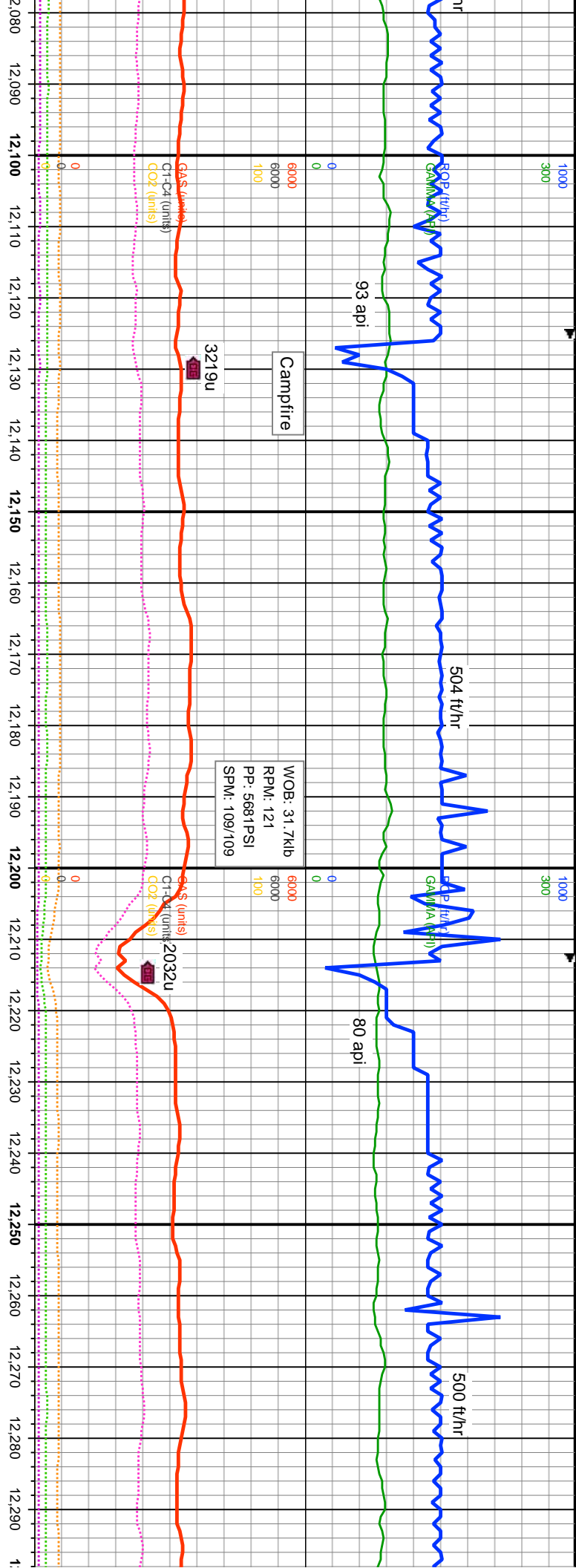
vfg, slty, modly srt, sr-sb blkly clus, drfgy, sb blkly-sb plty, mod sft-fri, rthly,

100% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly clus, predy cons, sl cly roh cnt, sl calc, tr slty sh

100% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly sft-tr hd, fri, vfg, blkly clus, predy cons, sl cly roh cnt, sl calc, tr slty sh

8050

8050



3219u  
Campfire

WOB: 31.7klb  
RPM: 121  
PP: 5681PSI  
SPM: 109/109

504 ft/hr  
93 api

80 api

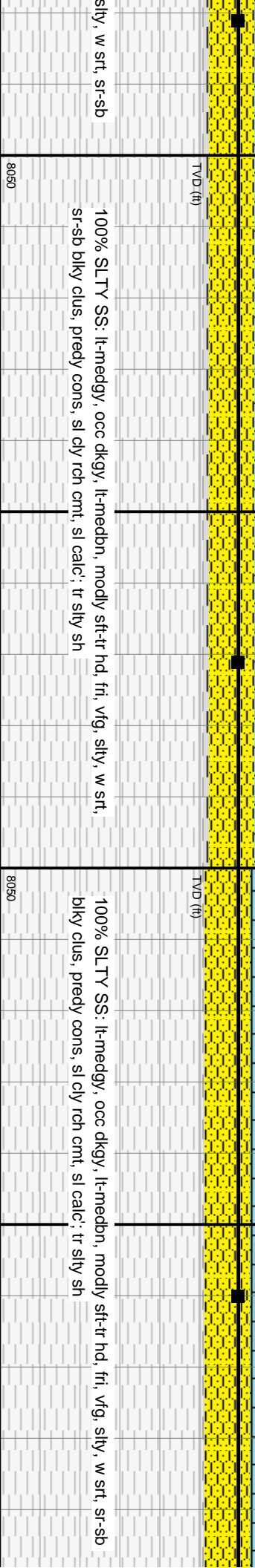
500 ft/hr

2032u

12,081'  
INC: 90.07°  
AZM: 177.91°  
TVD: 7,930.76'  
VS: 3,723.65'

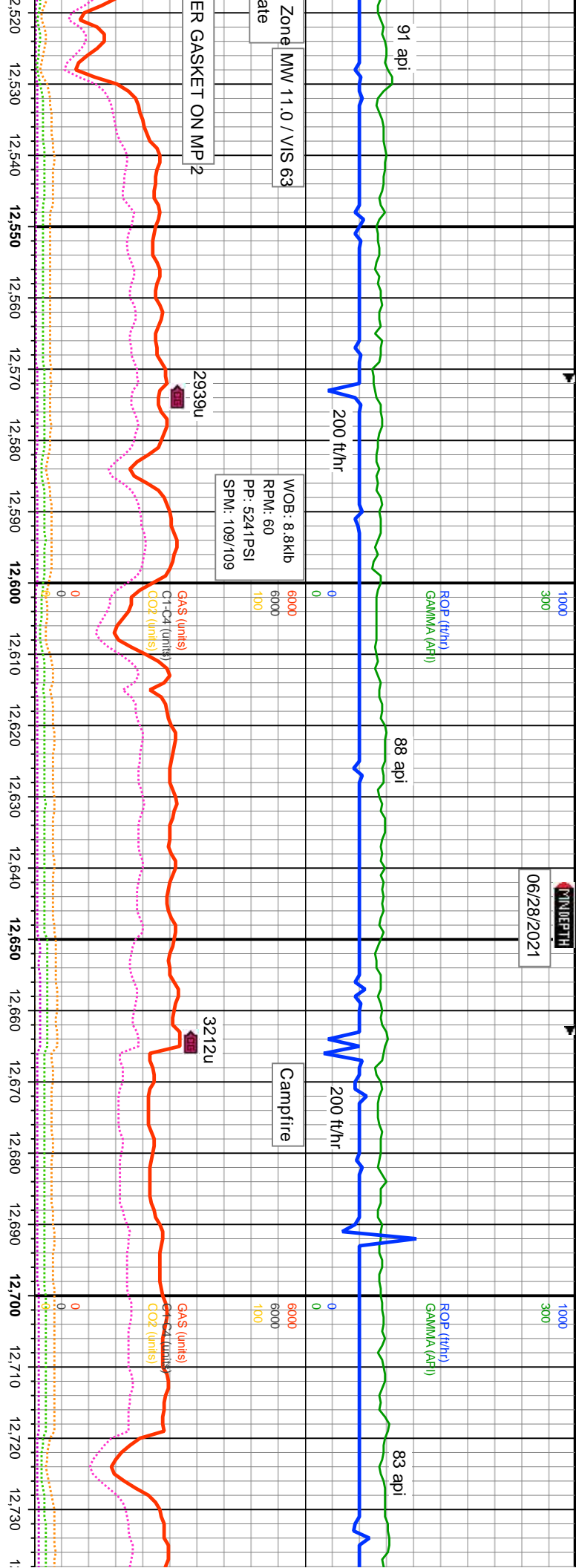
MD: 12,171'  
INC: 90.41°  
AZM: 179.85°  
TVD: 7,930.38'  
VS: 3,810.44'

MD: 12,260'  
INC: 89.51°  
AZM: 179.64°  
TVD: 7,930.45'  
VS: 3,896.61'





06/28/2021



MD: 12,529'  
 INC: 90°  
 AZM: 176.89°  
 TVD: 7,929.74'  
 VS: 4,155.51'

MD: 12,618'  
 INC: 90.26°  
 AZM: 173.8°  
 TVD: 7,929.54'  
 VS: 4,239.72'

MD: 12,708'  
 INC: 89.38°  
 AZM: 174.52°  
 TVD: 7,929.82'  
 VS: 4,324.25'

7850

7850

8050

8050

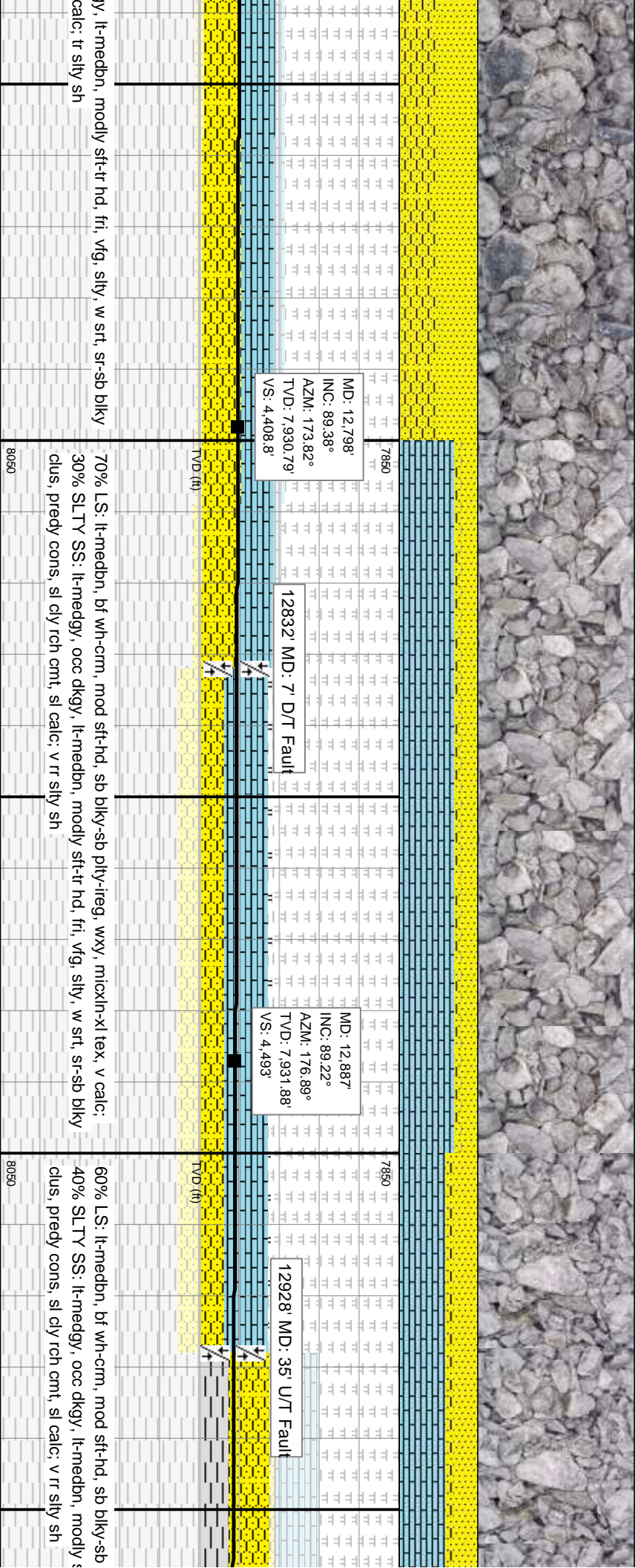
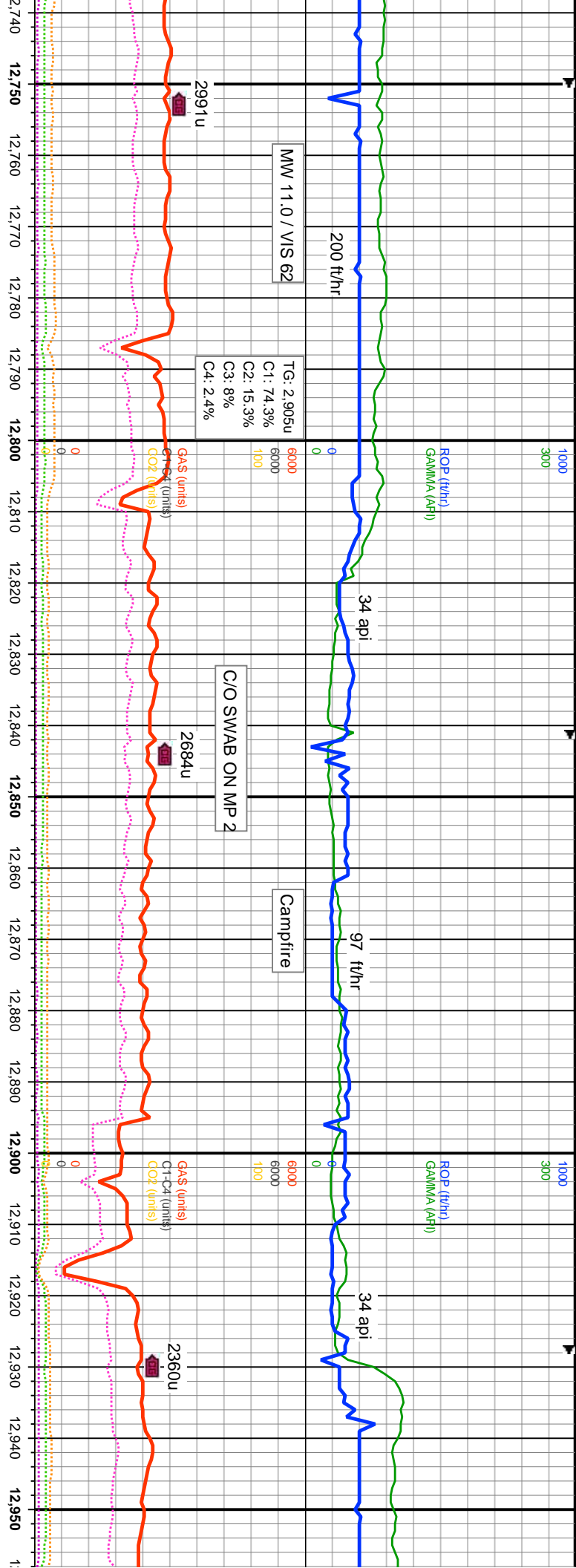
TV D (ft)

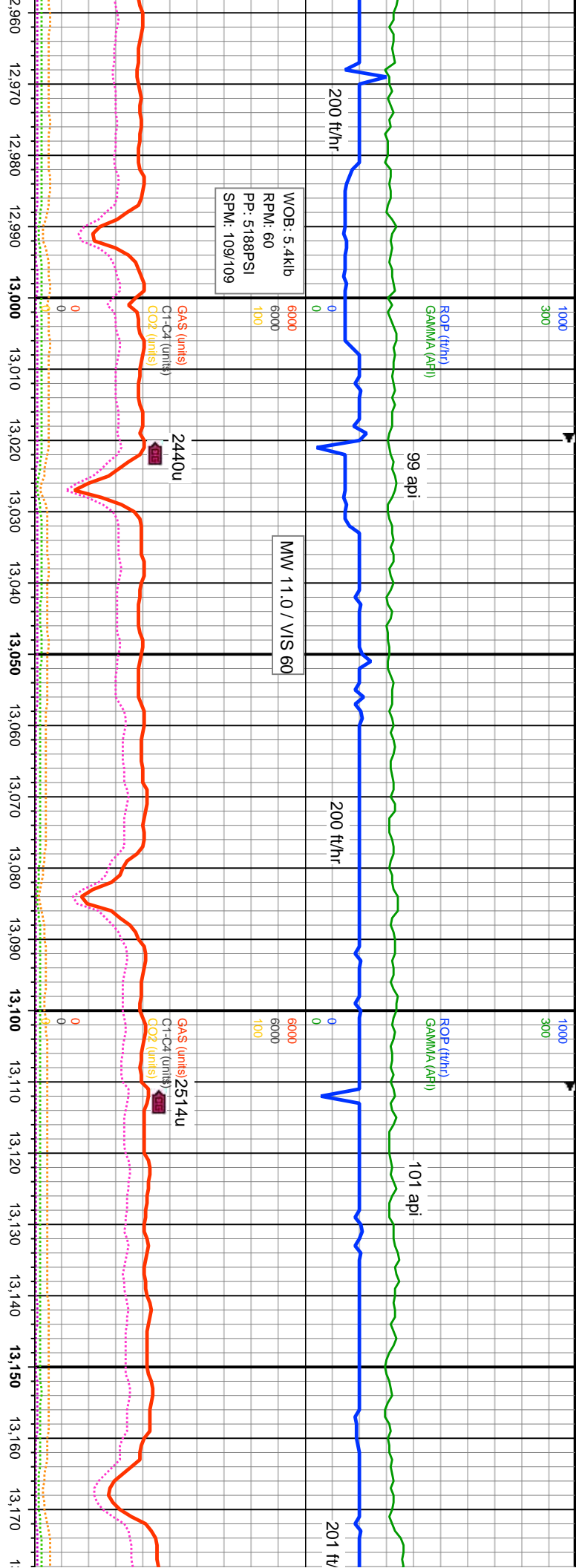
TV D (ft)

SS: lt-medgy, lt-medbn, modly sft-tr hd, fri, vfg, silty, modly srt, sr-sb blkly cons, lmy/cly cmt, v rr calc: 5%. SLTY SH: med-dkgy, sb blkly-sb plty, thty, grty, silty-aren, v sl calc

100% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly c/us, predy cons, sl cly rch cmt, sl calc: tr silty sh

100% SLTY SS: lt-medgy, occ dkgy c/us, predy cons, sl cly rch cmt, sl

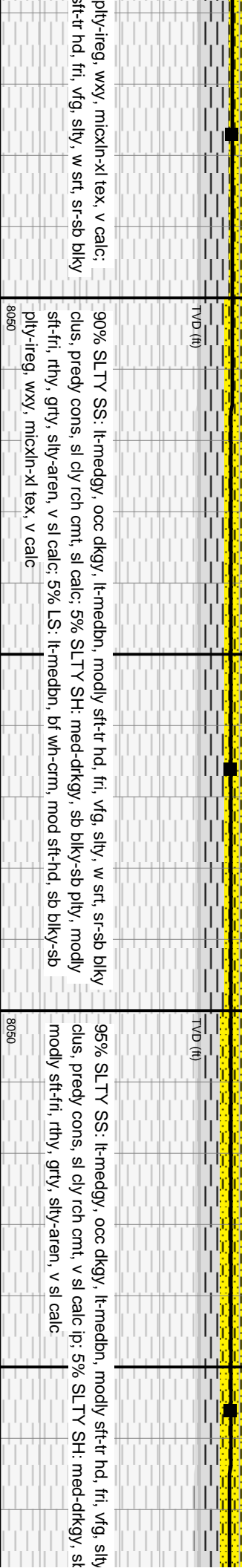




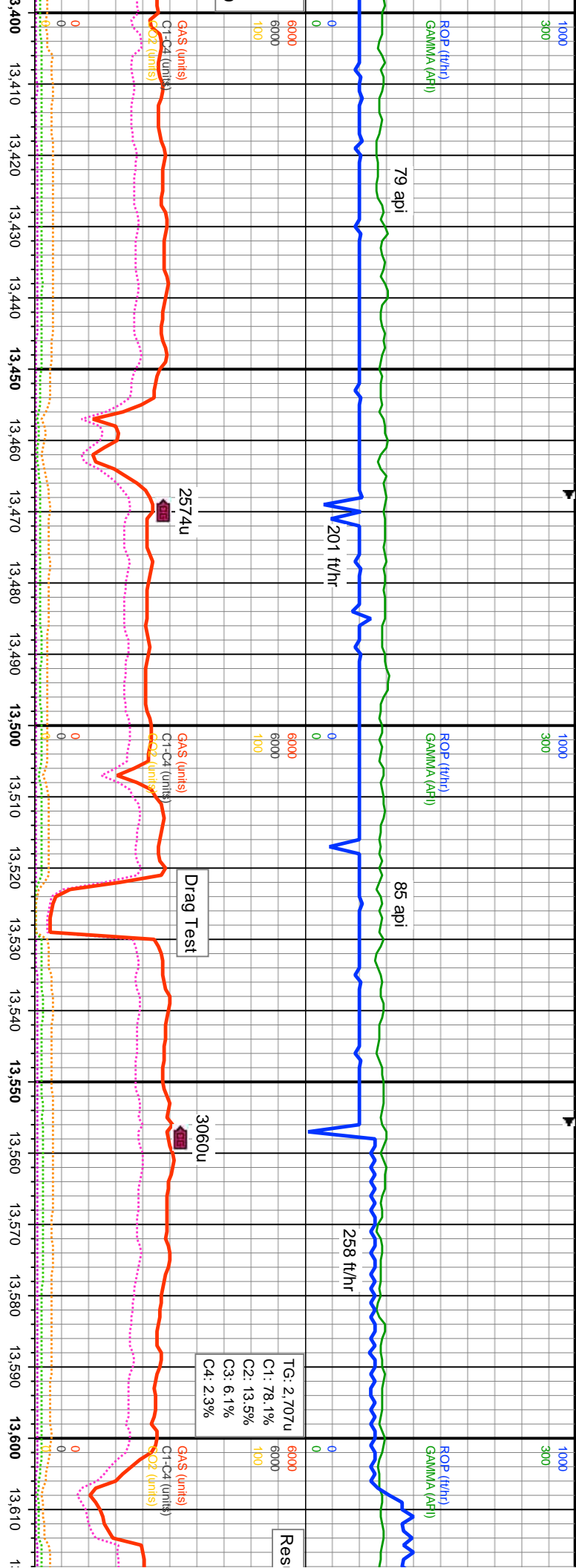
MD: 12.977  
INC: 88.62°  
AZM: 180.11°  
TVD: 7.933.58'  
VS: 4.579.61'

MD: 13.066  
INC: 90.34°  
AZM: 179.87°  
TVD: 7.934.39'  
VS: 4.665.87'

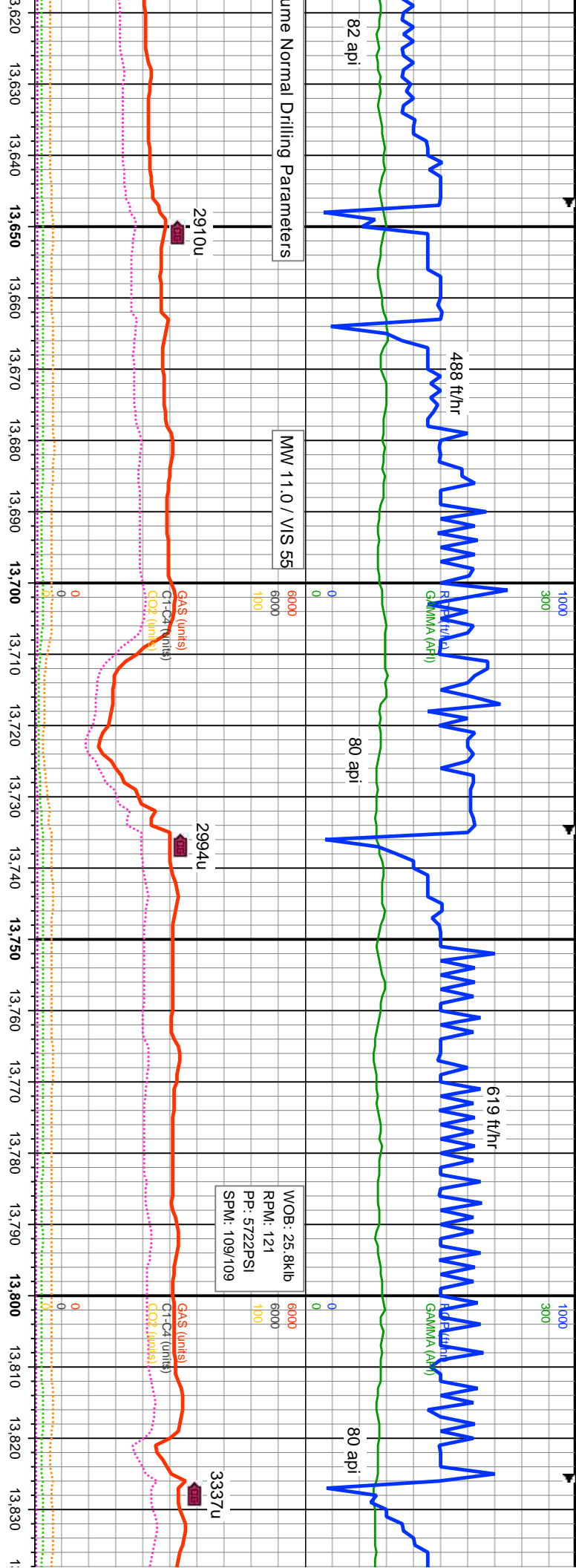
MD: 13.156  
INC: 89.4°  
AZM: 183.38°  
TVD: 7.934.59'  
VS: 4.753.69'







7850	MD: 13.425' INC: 91.46° AZM: 179.57° TVD: 7.932.42' VS: 5.019.52'	95% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly st-tr hd, fri, vfg, slty, w srt, sr-sb blkly clus, predy cons, sl cly rch cmt, v sl calc ip; 5% SLTY SH: med-drkgy, sb blkly-sb plty, modly st-fr, rthy, grty, slty-aren, v sl calc
7850	MD: 13.514' INC: 90.15° AZM: 176.96° TVD: 7.931.17' VS: 5.105.08'	95% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly st-tr hd, fri, vfg, slty, w srt, sr-sb blkly clus, predy cons, sl cly rch cmt, v sl calc ip; 5% SLTY SH: med-drkgy, sb blkly-sb plty, modly st-fr, rthy, grty, slty-aren, v sl calc
7850	MD: 13.604' INC: 89.84° AZM: 179.17° TVD: 7.931.18' VS: 5.191.52'	95% SLTY SS: clus, predy con modly st-fr, rth



MD: 13.694'  
 INC: 90.53°  
 AZM: 179.06°  
 TVD: 7.930.89'  
 VS: 5.278.41'

MD: 13.784'  
 INC: 90.47°  
 AZM: 182.17°  
 TVD: 7.930.11'  
 VS: 5.365.87'

TVD (ft)

TVD (ft)

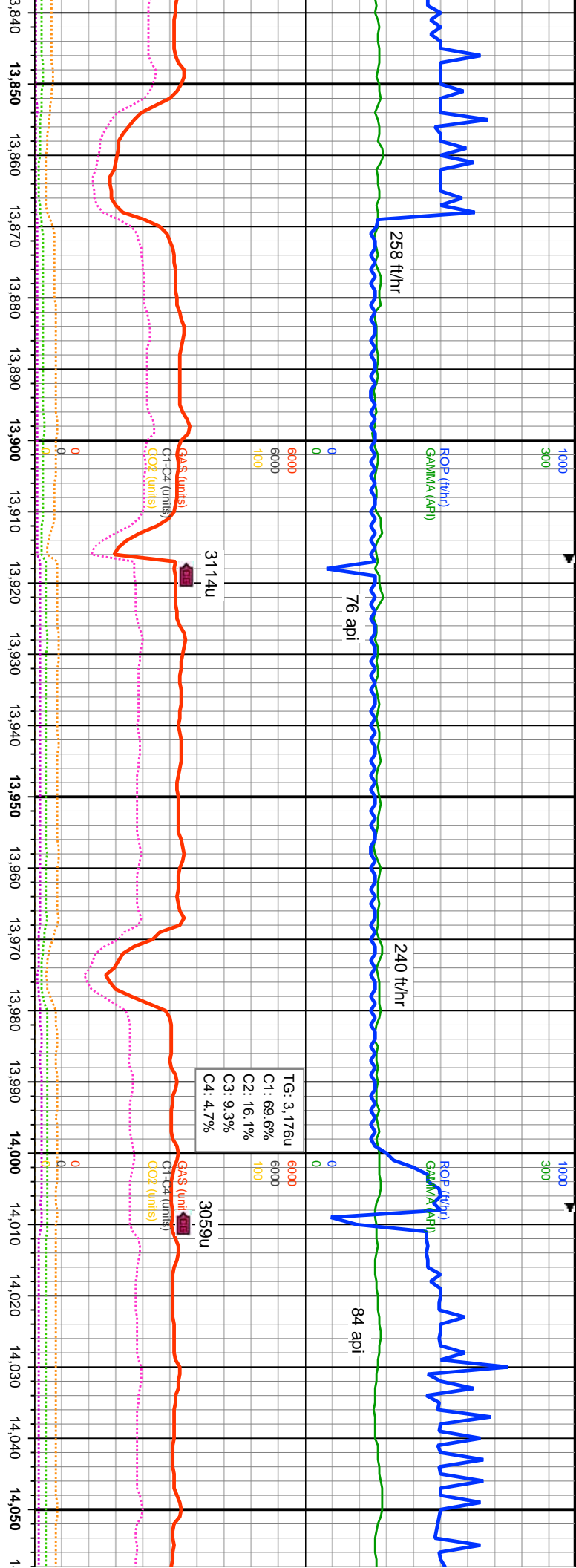
It-medgy, occ dkgy, It-medbn, modly st-fr hd, fri, vfg, slty, w srt, sr-sb blkly  
 sl cly rch cnt, v sl calc ip; 5% SLTY SH: med-drkgy, sb blkly-sb plty,  
 y- grty, slty-aren, v sl calc

90% SLTY SS: It-medgy, occ dkgy, It-medbn, modly st-fr hd, fri, vfg, slty, w srt, sr-sb blkly  
 clus, predy cons, sl cly rch cnt, v sl calc ip; 10% SLTY SH: med-drkgy, sb blkly-sb plty,  
 modly st-fr, rthy, grty, slty-aren, v sl calc; v rr bent

95% SLTY SS: It-medgy, occ dkgy  
 clus, predy cons, sl cly rch cnt, v s  
 modly st-fr, rthy, grty, slty-aren, v

8050

8050

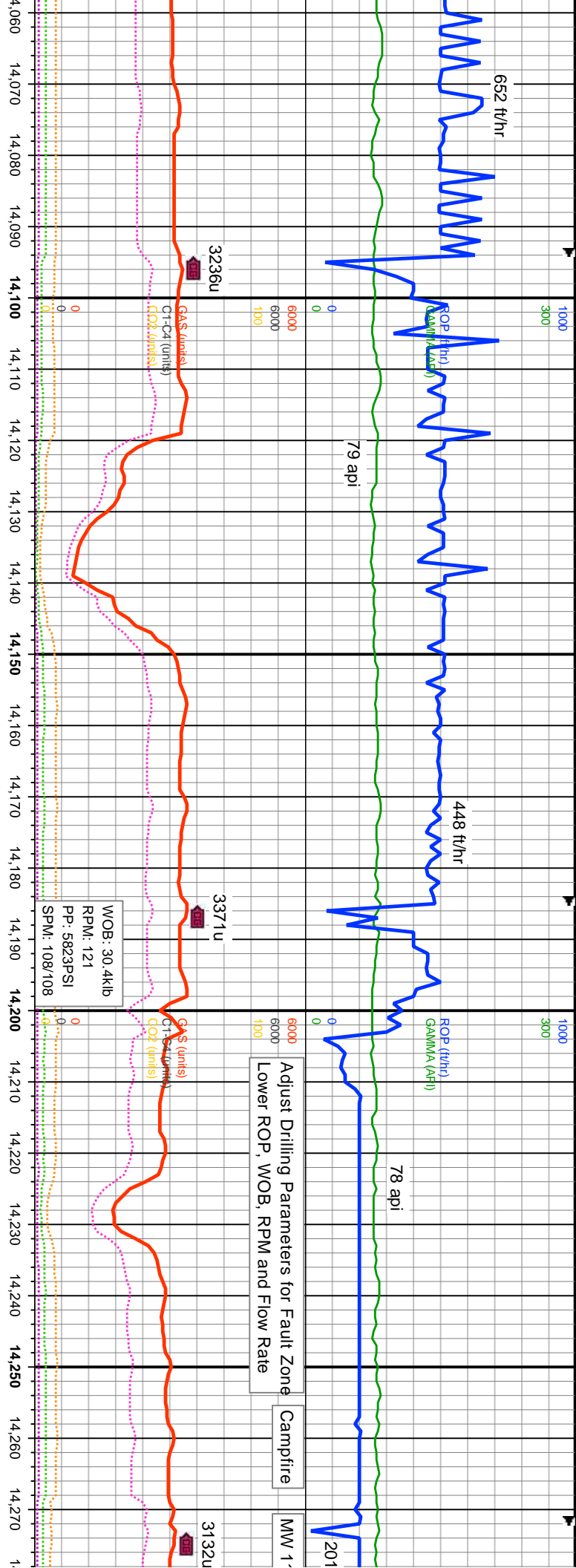


MD: 13.873'  
 INC: 89.63°  
 AZM: 180.74°  
 TVD: 7.930.04'  
 VS: 5.452.67'

MD: 13.963'  
 INC: 90.42°  
 AZM: 179.45°  
 TVD: 7.930'  
 VS: 5.539.95'

MD: 14.052'  
 INC: 89.17°  
 AZM: 182.93°  
 TVD: 7.930.31'  
 VS: 5.626.64'

Depth (ft)	Interval (ft)	Description
13840 - 13850	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
13850 - 13860	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc
13860 - 13870	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
13870 - 13880	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc
13880 - 13890	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
13890 - 13900	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc
13900 - 13910	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
13910 - 13920	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc
13920 - 13930	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
13930 - 13940	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc
13940 - 13950	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
13950 - 13960	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc
13960 - 13970	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
13970 - 13980	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc
13980 - 13990	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
13990 - 14000	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc
14000 - 14010	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
14010 - 14020	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc
14020 - 14030	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
14030 - 14040	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc
14040 - 14050	10	lt-medbn, modly sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly
14050 - 14060	10	sl calc ip; 5% SLTY SH: med-drtkgy, sb blkly-sb plty, sl calc



MD: 14,142'  
 INC: 90.51°  
 AZM: 180.92°  
 TVD: 7,930.56'  
 VS: 5,714.57'

MD: 14,231'  
 INC: 89.32°  
 AZM: 180.48°  
 TVD: 7,930.66'  
 VS: 5,801.1'

TVD (ft)

TVD (ft)

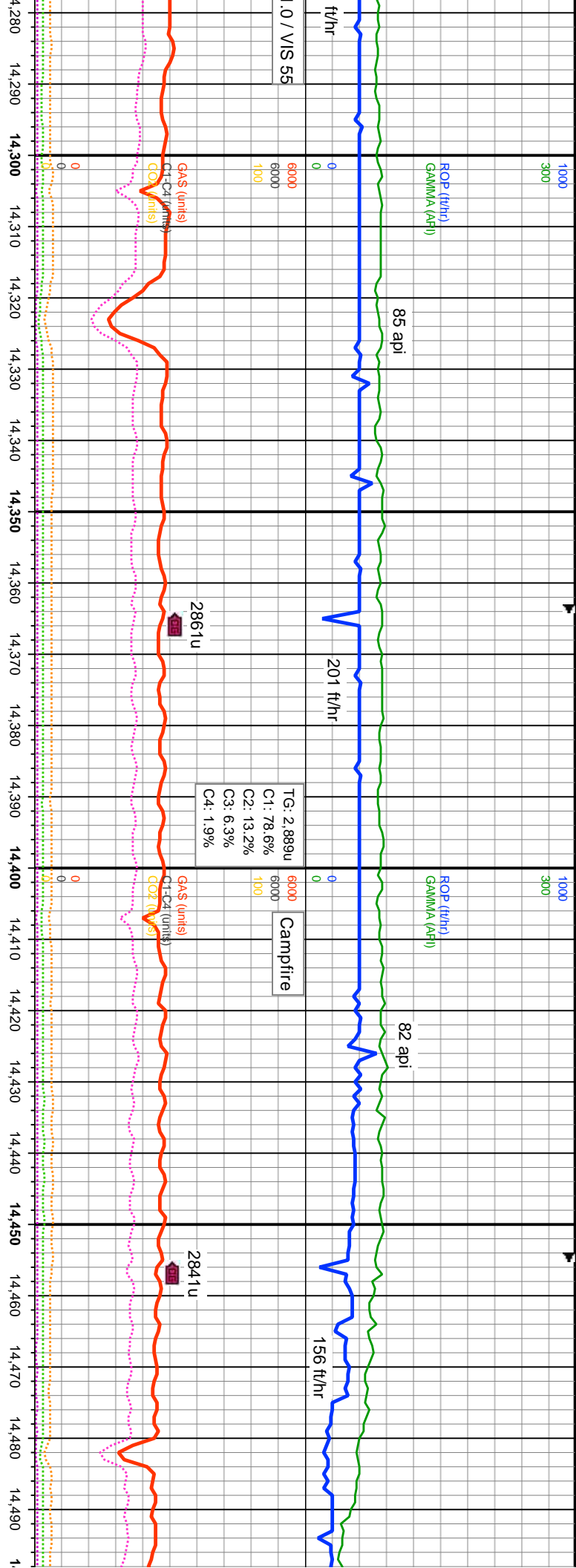
st-fr hd, fri, vfg, slty, w srt, sr-sb blkly  
 SH: med-dkgy, sb blkly-sb plty,

95% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly st-fr hd, fri, vfg, slty, w srt, sr-sb blkly  
 clus, predy cons, sl cly rch cnt, v sl calc ip; 5% SLTY SH: med-dkgy, sb blkly-sb plty,  
 modly st-fri, rthy, grty, slty-aren, v sl calc; v tr bent

95% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly st-fr hd, fri, vfg, slty  
 clus, predy cons, sl cly rch cnt, v sl calc ip; 5% SLTY SH: med-dkgy, sb  
 modly st-fri, rthy, grty, slty-aren, v sl calc

8050

8050



MD: 14,321'  
 INC: 88.82°  
 AZM: 178.6°  
 TVD: 7,932.15'  
 VS: 5,888.15'

MD: 14,411'  
 INC: 88.84°  
 AZM: 178.71°  
 TVD: 7,933.99'  
 VS: 5,974.83'

MD: 14,411'  
 INC: 88.84°  
 AZM: 178.71°  
 TVD: 7,933.99'  
 VS: 5,974.83'

TVD (ft)

TVD (ft)

TVD (ft)

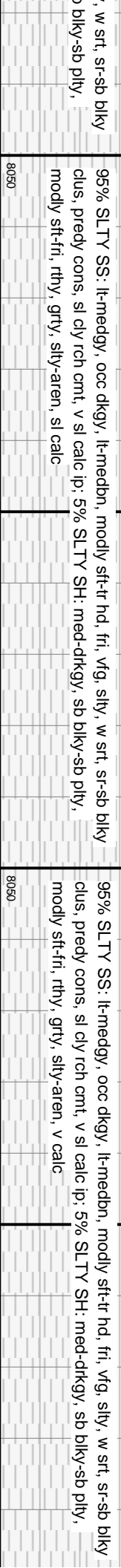
95% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly st-tr hd, fri, vfg, slty, w srt, sr-sb blkly clus, preyd cons, sl cly rch cnt, v sl calc ip; 5% SLTY SH: med-dkgy, sb blkly-sb plty, modly st-fri, rthy, grty, slty-aren, sl calc

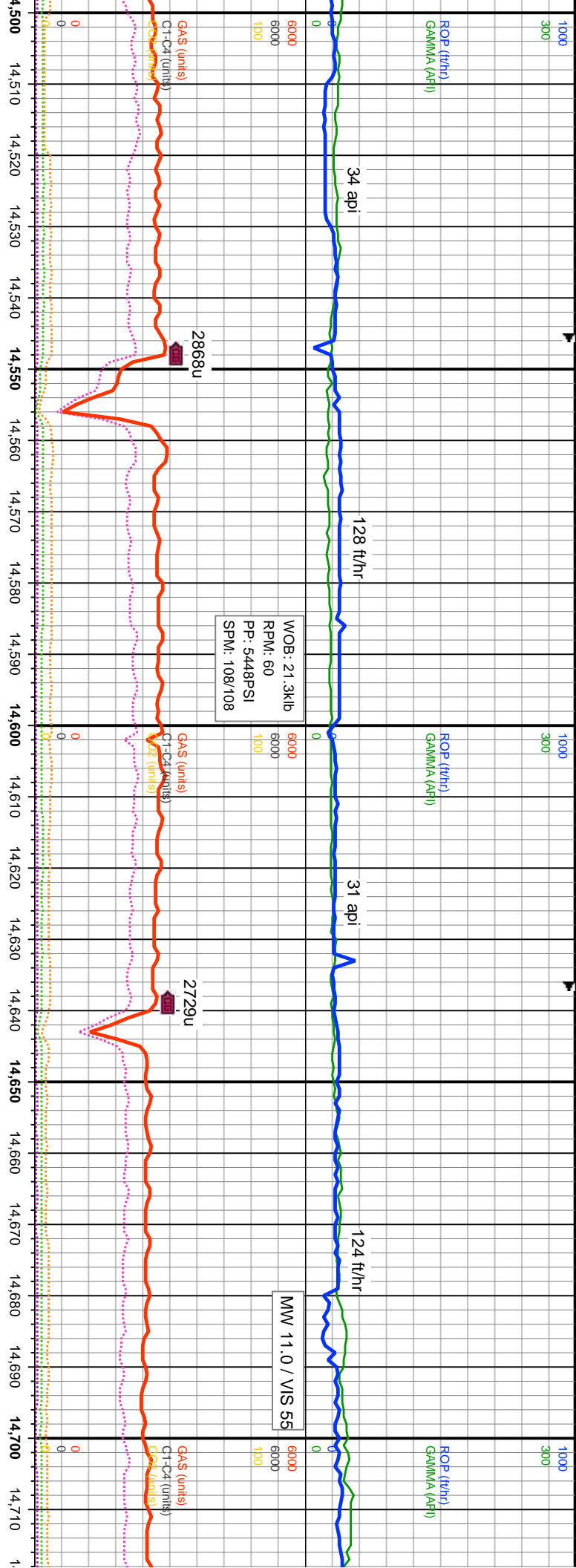
95% SLTY SS: lt-medgy, occ dkgy, lt-medbn, modly st-tr hd, fri, vfg, slty, w srt, sr-sb blkly clus, preyd cons, sl cly rch cnt, v sl calc ip; 5% SLTY SH: med-dkgy, sb blkly-sb plty, modly st-fri, rthy, grty, slty-aren, v calc

8050

8050

8050





WOB: 21.3klb  
 RPM: 60  
 PP: 5448PSI  
 SPM: 108/108

7850	4,500'	180.63°	7,936.46'	VS: 6,148.84'	MD: 14,590'	INC: 90.05°	AZM: 182.91°	TVD: 7,936'
8060	4,500'	180.63°	7,936.46'	VS: 6,148.84'	MD: 14,590'	INC: 90.05°	AZM: 182.91°	TVD: 7,936'

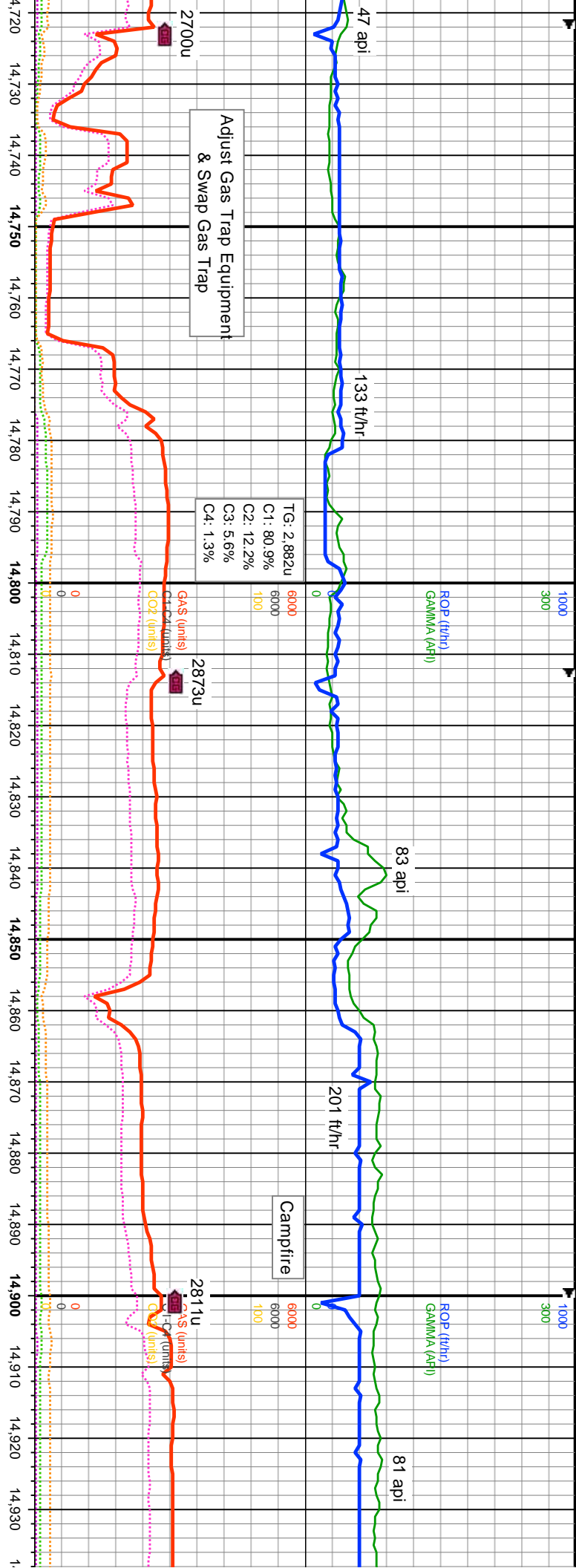
7850	14,680'	183.85°	7,936.76'	VS: 6,237.23'	MD: 14,680'	INC: 90.25°	AZM: 183.85°	TVD: 7,936.76'
8060	14,680'	183.85°	7,936.76'	VS: 6,237.23'	MD: 14,680'	INC: 90.25°	AZM: 183.85°	TVD: 7,936.76'

7850	14,700'	183.85°	7,936.76'	VS: 6,237.23'	MD: 14,680'	INC: 90.25°	AZM: 183.85°	TVD: 7,936.76'
8060	14,700'	183.85°	7,936.76'	VS: 6,237.23'	MD: 14,680'	INC: 90.25°	AZM: 183.85°	TVD: 7,936.76'

80% LS: lt-medbn, bf wh-crm, mod sft-hd, sb blkly-sb plty-ireg, wxy, micxn-xl tex, v calc:  
 20% SLTY SS: lt-medgy, occ dkg, lt-medbn, modly sft-tr hd, fri, vlg, slty, w str, sr-sb blkly  
 clus, predy cons, sl cly rch cmt, v calc; v rr slty sh

90% LS: lt-medbn, bf wh-crm, mod sft-hd, sb blkly-sb plty-ireg, wxy, micxn-xl tex, v calc:  
 10% SLTY SS: lt-medgy, occ dkg, lt-medbn, modly sft-tr hd, fri, vlg, slty, w str, sr-sb blkly  
 clus, predy cons, sl cly rch cmt, v calc; v rr slty sh

95% LS: lt-med  
 tr bent; 5% SLTY  
 predy cons, tr c



MD: 14,769'  
INC: 90.48°  
AZM: 180.42°  
TVD: 7,935.2'  
VS: 6,324.24'

MD: 14,859'  
INC: 90.41°  
AZM: 179.17°  
TVD: 7,934.5'  
VS: 6,411.4'

14871' MD: 32' U/T Fault

bn, bf wh-crm, mod sft-v hd, sb blk-y-sb ply-i-reg, wxy, micxn-xl tex, v calc, y SS: med-dkgy, dkbn, modly sft-tr hd, fri, vfg, sily, mod srt, sr-sb blk-y-clus, v-lmy rch cmt, v calc, tr sily sh grdg mrl

95% LS: lt-medbn, bf wh-crm, mod sft-hd, sb blk-y-sb ply-i-reg, wxy, micxn-xl tex, v calc, tr ss, tr nod pyr: 5% CALC SH: lt-medgy, tr dkgy, ip gy/shbl, v sft-frm, sb blk-y-sb ply, sily, arg, sb wxy, v calc, ip grdg mrl

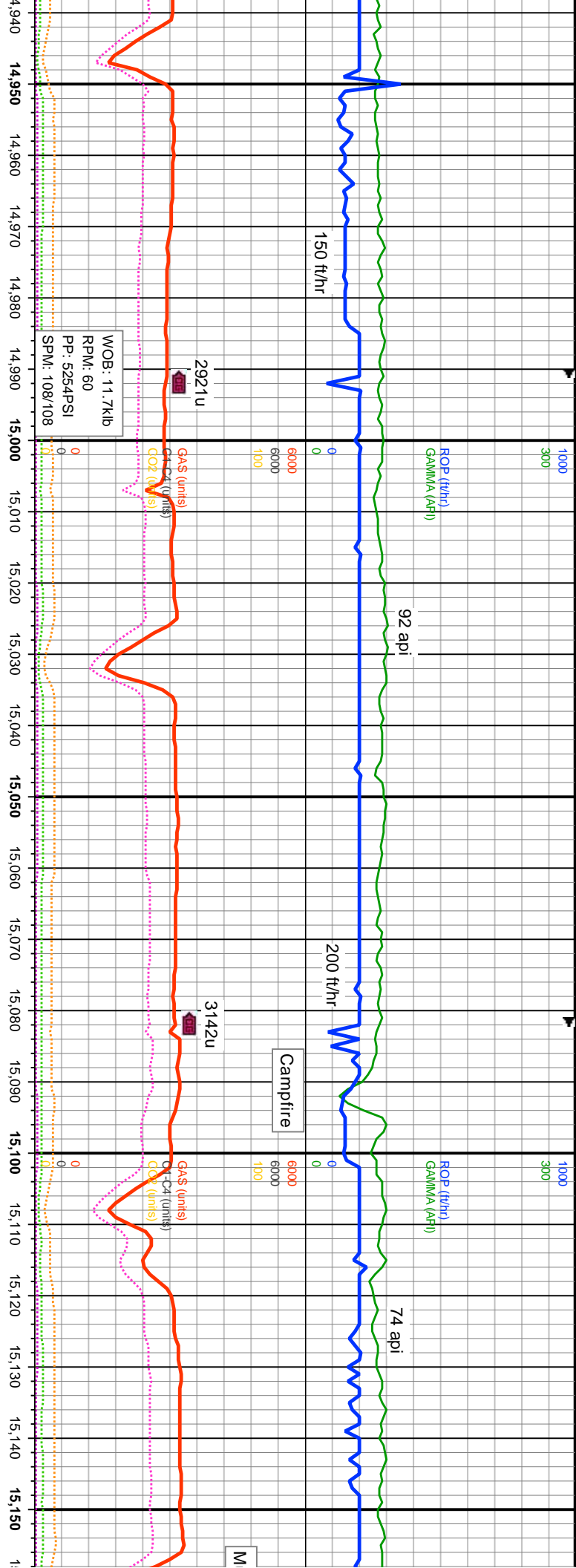
50% LS: bf wh-crm, lt-medbn, mod calc: 40% SLTY SS: med-dkgy, m srt, sr-sb blk-y-clus, pred cons, lmy blk, pred ply-ip sb blk-y, mod sft-fr

8050

8050

TVD (ft)

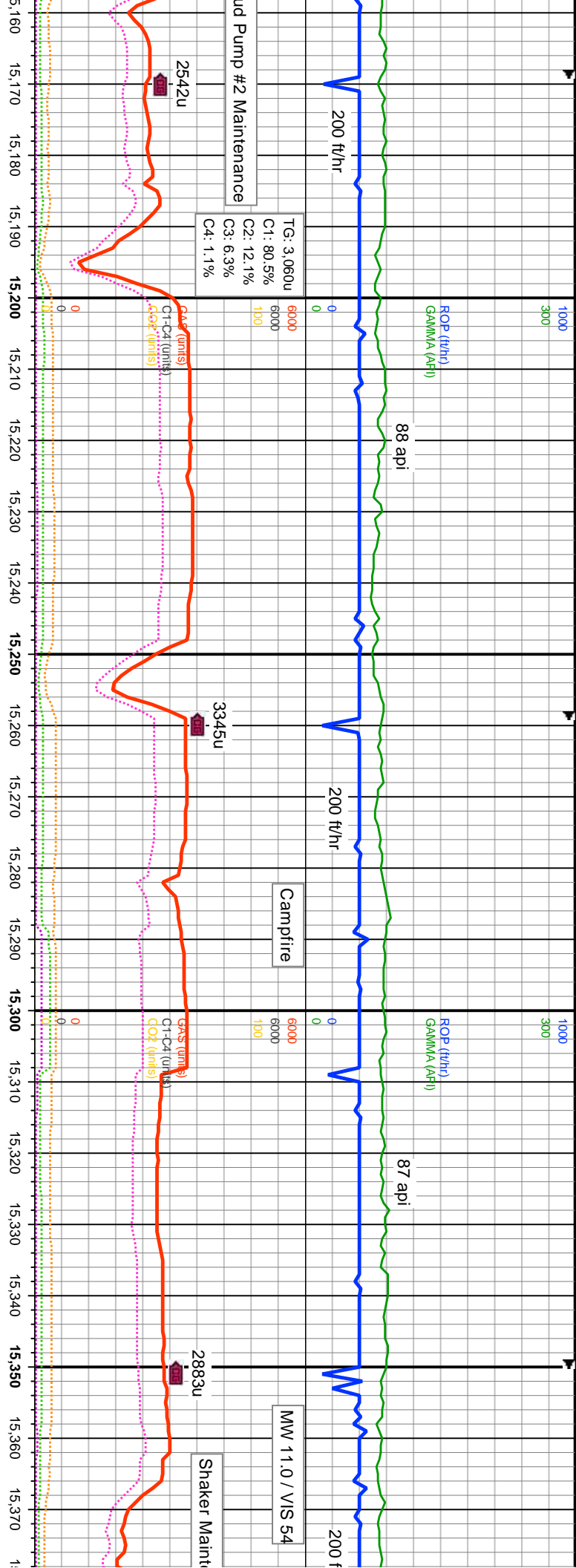
TVD (ft)



MD: 14,948'	MD: 15,038'	MD: 15,128'
INC: 90.3°	INC: 89.55°	INC: 89.72°
AZM: 179.41°	AZM: 179.33°	AZM: 179.67°
TVD: 7.933.95'	TVD: 7.934.07'	TVD: 7.934.64'
VS: 6.497.4'	VS: 6.584.39'	VS: 6.671.43'

70% SLTY SS: med-dkgy, med-dkbn, ip lgy-ltbn, mod sft-tr hd, fri, vfg, slty, mod-w srt, sr-sb blkly clus, pred cons, lmy/cly rch cmt, mod calc: 25% LS: bf wh-crm, lt-medbn, mod sft-v hd, sb blkly-sb plty-i-reg, wxy, micxn-xl tex, v calc: 5% SLTY SH: med-dtkgy, ip blk, pred plty-ip sb blkly, mod sft-fri, rthy, grty, sl slty, tr calc

80% SLTY SS: med-dkgy, med-dkbn, ip lgy-ltbn, mod sft-tr hd, fri, vfg, slty, mod-w srt, sr-sb blkly clus, pred cons, lmy/cly rch cmt, mod calc: 25% LS: bf wh-crm, lt-medbn, mod sft-v hd, sb blkly-sb plty-i-reg, wxy, micxn-xl tex, v calc: 5% SLTY SH: med-dtkgy, ip blk, pred plty-ip sb blkly, mod sft-fri, rthy, grty, sl slty, tr calc



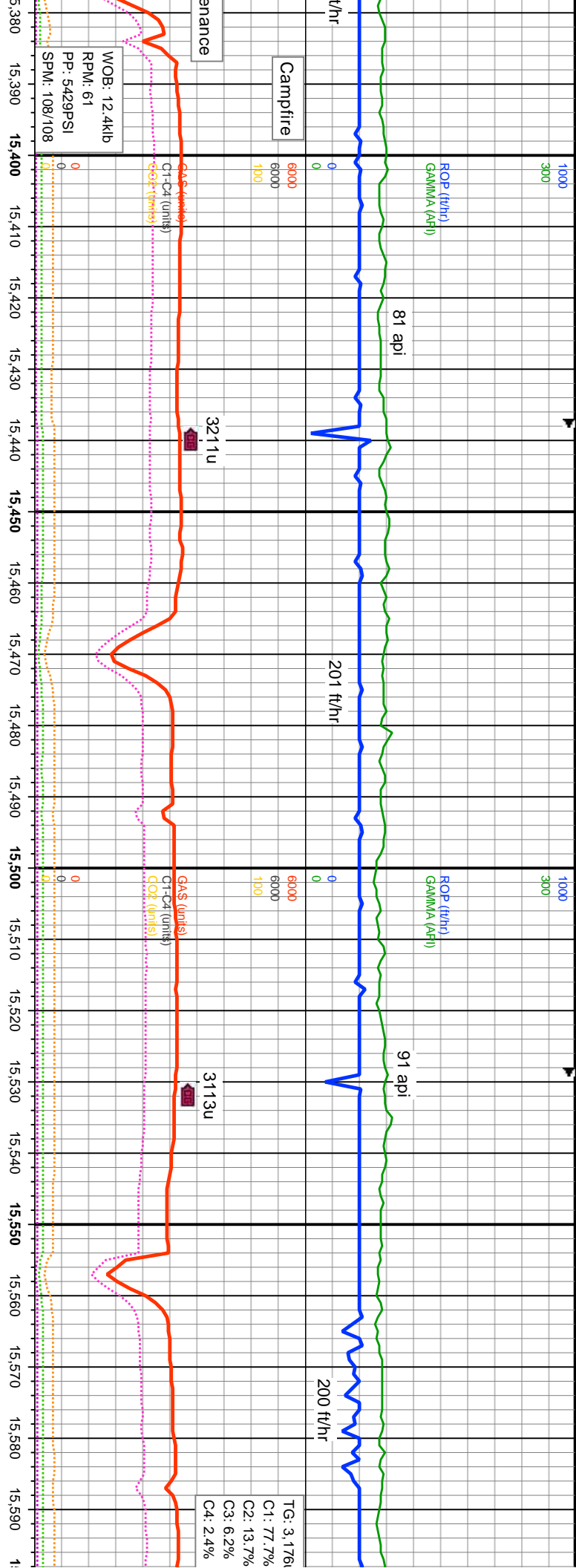
MD: 15.217'  
 INC: 89.13°  
 AZM: 180.28°  
 TVD: 7.935.54'  
 VS: 6.757.69'

MD: 15.307'  
 INC: 89.5°  
 AZM: 179.21°  
 TVD: 7.936.61'  
 VS: 6.844.83'

80% SLTY SS: med-dkgy, med-dkbn, ip ltgy-iltbn, mod sft-tr hd, fri, vfg, slty, mod-w srt, sr-sb blkly clus, pred cons, lmy/cly rch cmt, mod calc: 15% LS: bf wh-crm, lt-medbn, mod sft-v hd, sb blkly-sb plty-ireg, wxy, micxn-xl tex, v calc: 5% SLTY SH: med-drkgy, ip blk, pred plty-ip sb blkly, mod sft-fri, rthy, grty, sl slty, tr calc

80% SLTY SS: med-dkgy, med-dkbn, ip ltgy-iltbn, mod sft-tr hd, fri, vfg, slty, mod-w srt, sr-sb blkly clus, pred cons, lmy/cly rch cmt, mod calc: 15% LS: bf wh-crm, lt-medbn, mod sft-v hd, sb blkly-sb plty-ireg, wxy, micxn-xl tex, v calc: 5% SLTY SH: med-drkgy, ip blk, pred plty-ip sb blkly, mod sft-fri, rthy, grty, sl slty, tr calc

90% SLTY SS: med-dkgy, med-dkbn, ip ltgy-iltbn, mod sft-tr hd, fri, vfg, slty, mod-w srt, sr-sb blkly clus, pred cons, lmy/cly rch cmt, mod tr calc, tr bent: 5% L1 lt-medbn, mod sft-v hd, sb blkly-sb plty-ireg, wxy, micxn-xl tex, v calc: 5% SLTY SH: med-drkgy, ip blk, pred plty-ip sb blkly, mod sft-fri, rthy, grty, sl slty, tr calc



MD: 15.396'  
INC: 89.57°  
AZM: 179.51°  
TVD: 7.937.33  
VS: 6.930.85'

MD: 15.486'  
INC: 89.32°  
AZM: 180.62°  
TVD: 7.938.2'  
VS: 7.018.11'

MD: 15.576'  
INC: 89.42°  
AZM: 178.64°  
TVD: 7.939.2'  
VS: 7.105.2'

TVD: (ft)

TVD: (ft)

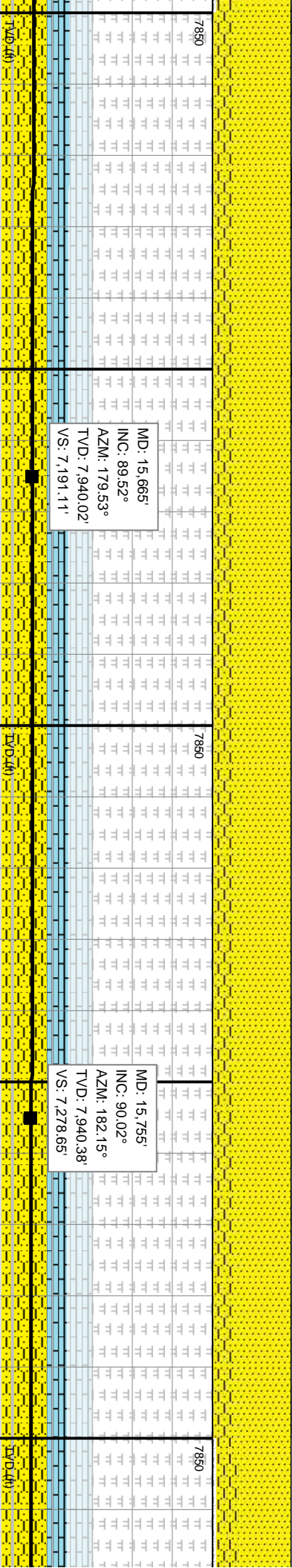
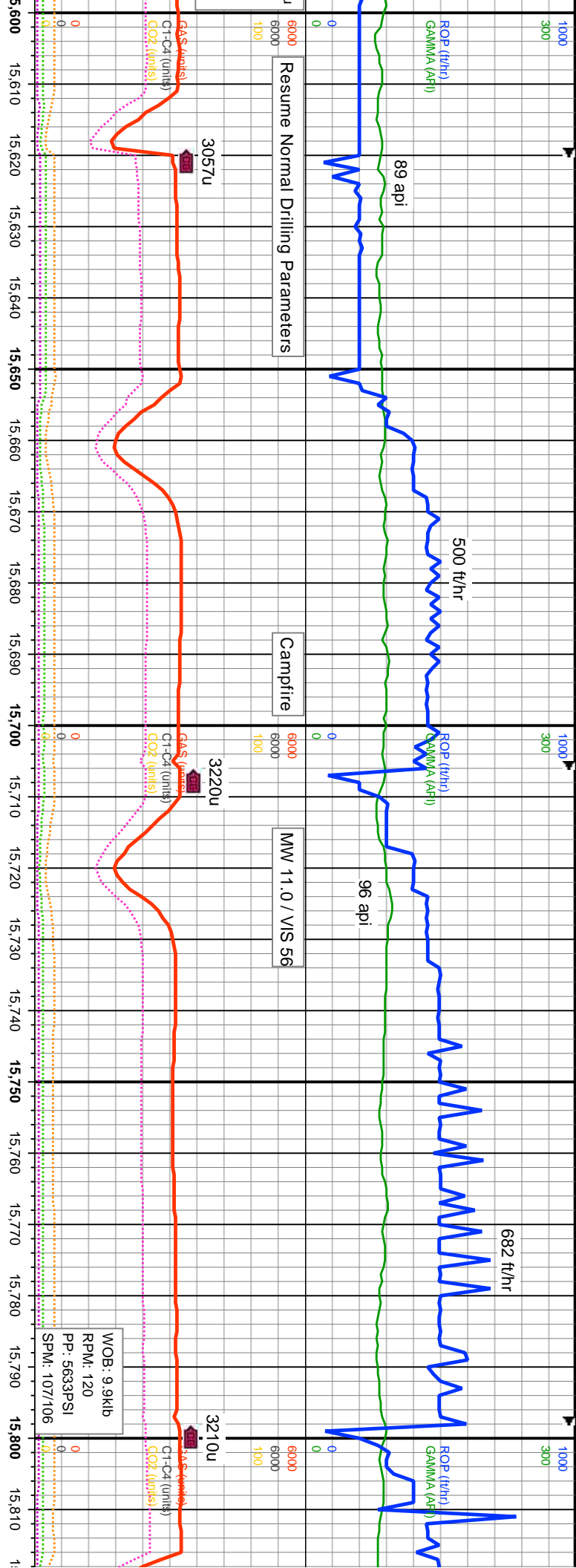
TVD: (ft)

95% SLTY SS: med-dkgy, med-dkbn, ip lgy-lbn, mod sft-tr hd, fri, vfg, slty, mod-w srt, sr-sb blkly clus, pred cons, tr lmy/clly rch cmt, tr calc, tr ls: 5% SLTY SH: med-dfkg, ip blk, pred plty-ip sb blkly, mod sft-fri, rthy, grty, sl slty, tr calc

95% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, slty, mod-w srt, sr-sb blkly clus, pred cons, tr cly rch cmt, sl tr calc, rr ls: 5% SLTY SH: med-dfkg, ip blk, pred plty-ip sb blkly, mod sft-fri, rthy, grty, sl slty, tr calc

95% SLTY SH: mod-w srt, sr-sb blkly clus, pred cons, tr lmy/clly rch cmt, tr calc, tr ls: 5% SLTY SH: med-dfkg, ip blk, pred plty-ip sb blkly, mod sft-fri, rthy, grty, sl slty, tr calc

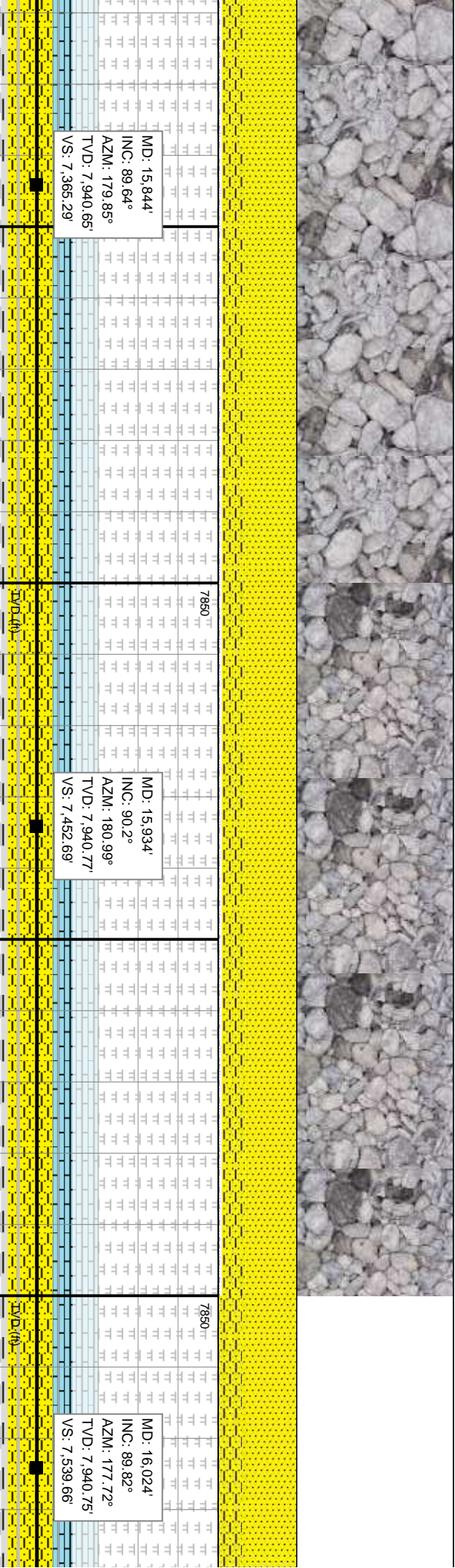
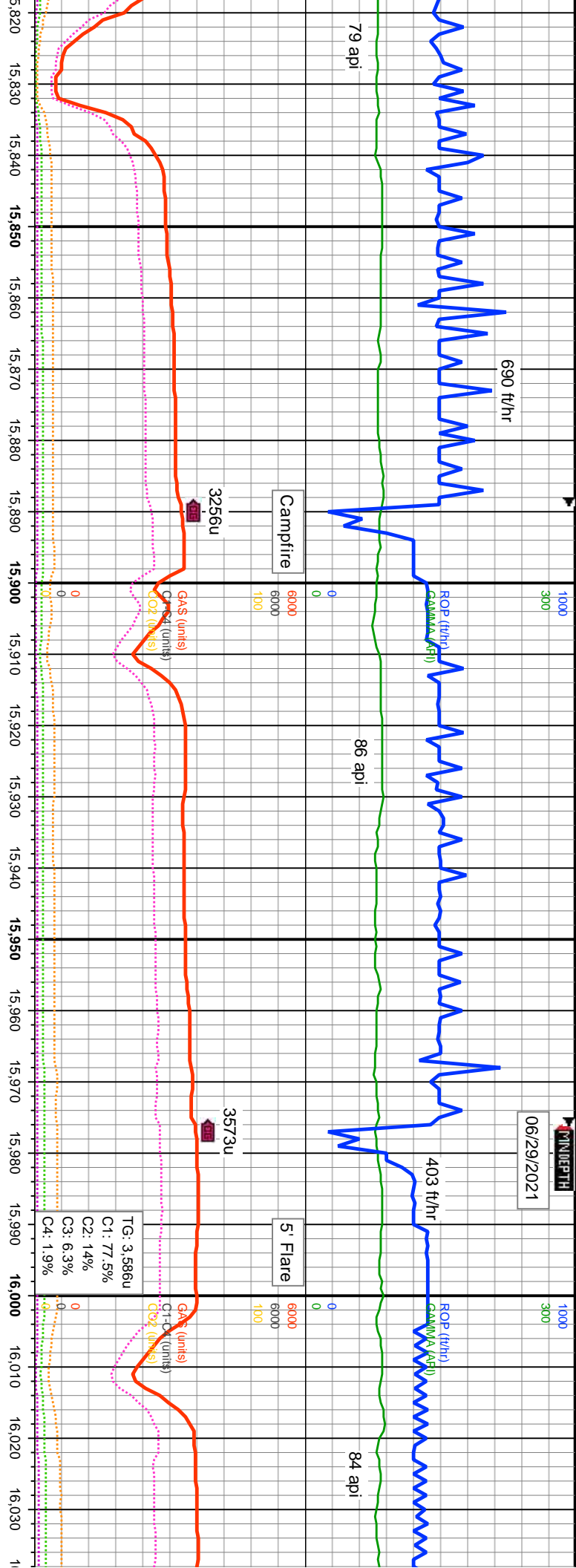
8050



**100% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, silty, mod-w srt, sr-sb**  
 blkly clus, pred cons, tr cly rch cmt, v sl calc, tr sh

**100% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, silty, w srt, sr-sb blkly**  
 clus, pred cons, tr cly rch cmt, v sl calc, tr sh

**95% SLTY S**  
 clus, pred cor  
 sb blkly, mod



8050

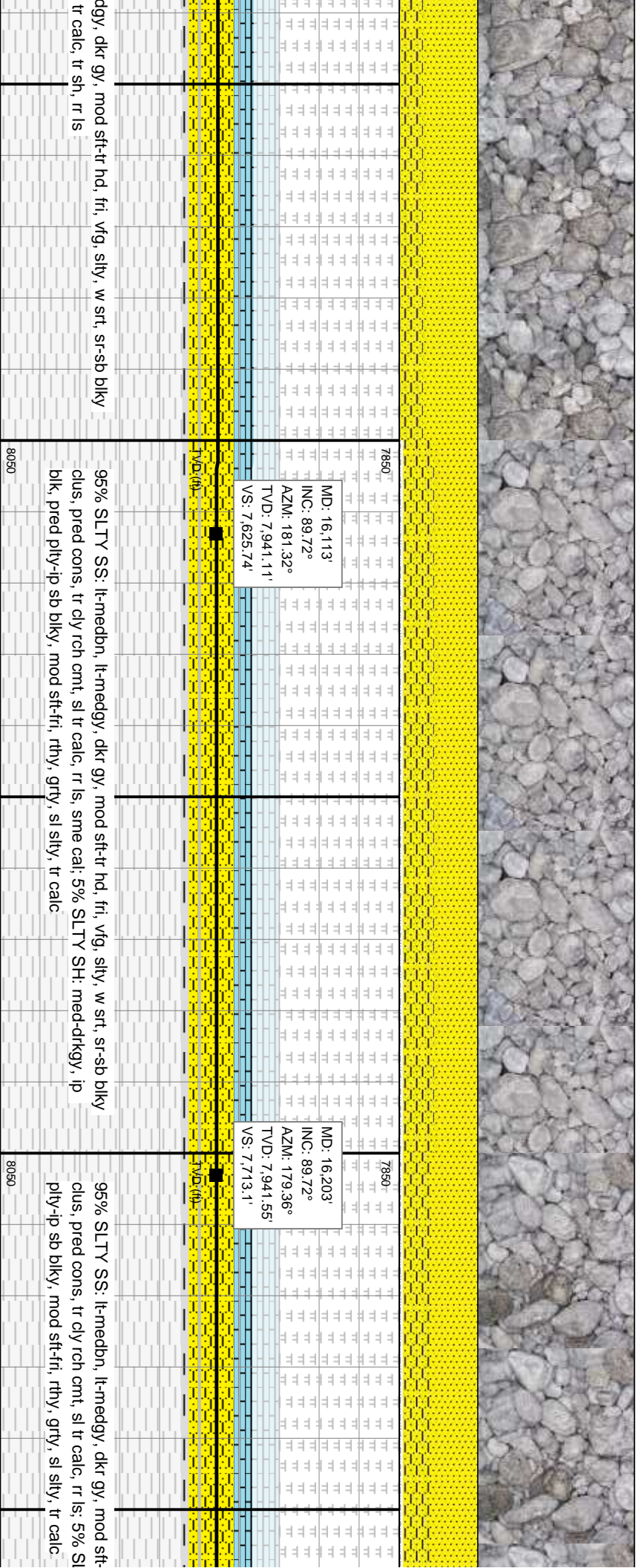
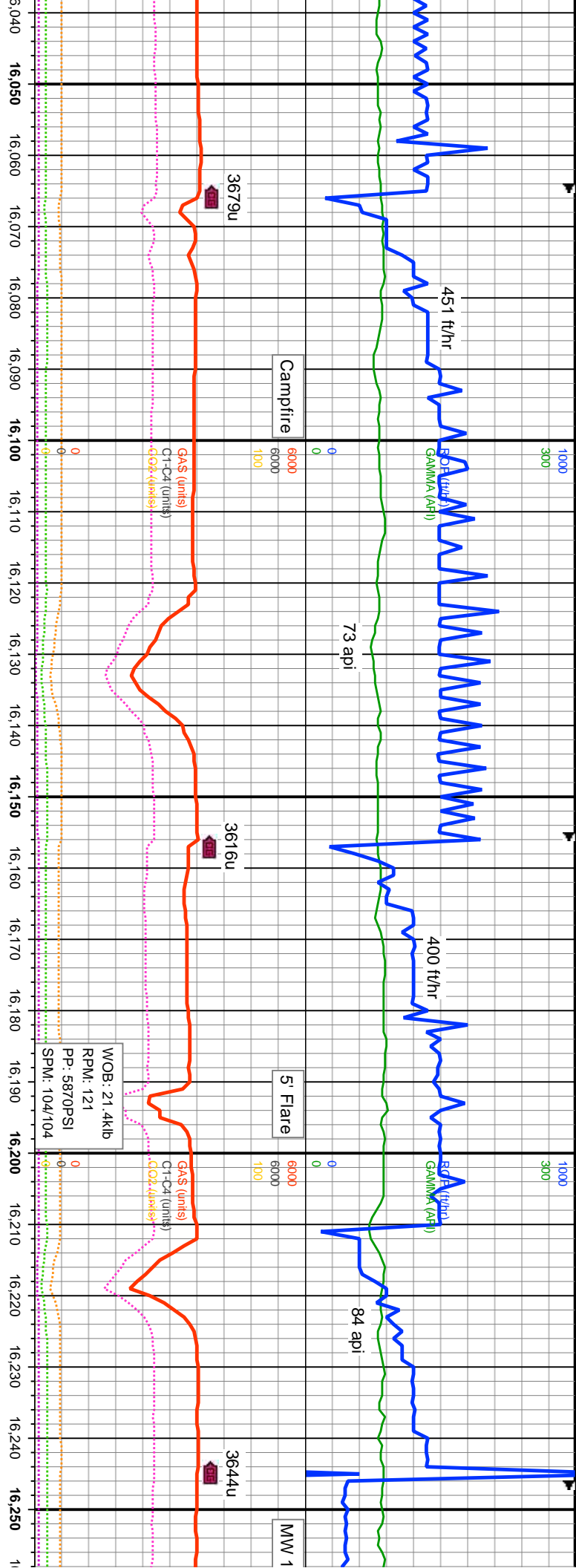
S: lt-medbn, lt-medgy, dkr gy, mod st-tr hd, fri, vfg, stly, w srt, sr-sb blkly  
 ss, tr cly rch cmt, v sl calc; 5% SLTY SH: med-drkgy, ip blk, pred pty-ip  
 st-fri, rthy, grty, sl stly, tr calc

8050

95% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod st-tr hd, fri, vfg, stly, w srt, sr-sb blkly  
 clus, pred cons, tr cly rch cmt, sl tr calc, rr ls; 5% SLTY SH: med-drkgy, ip blk, pred  
 pty-ip sb blkly, mod st-fri, rthy, grty, sl stly, tr calc

8050

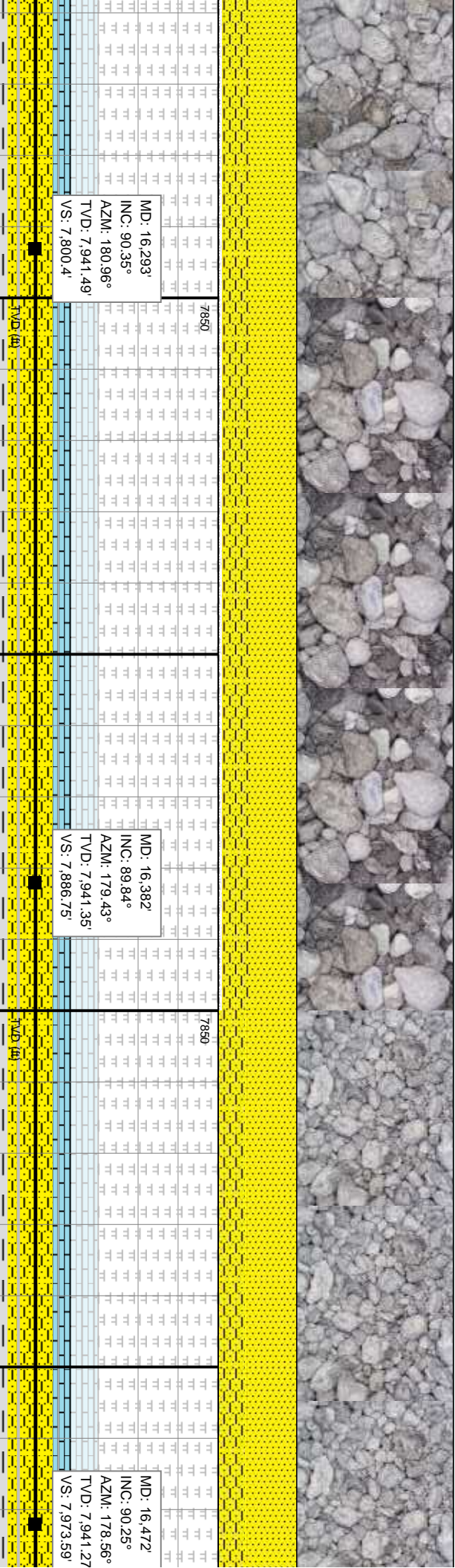
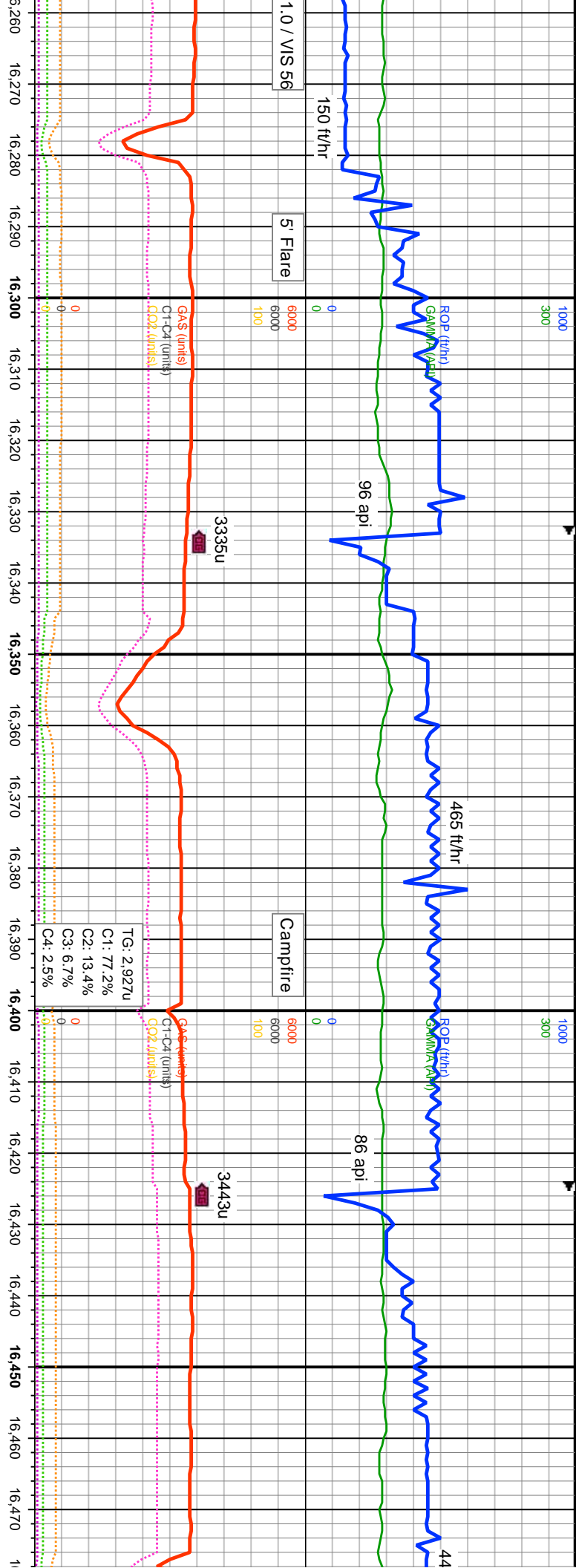
100% SLTY SS: lt-medbn, lt-me  
 clus, pred cons, tr cly rch cmt, sl



dyg, dkr gy, mod sft-tr hd, fri, vfg, slty, w srt, sr-sb blk  
 tr calc, tr sh, rr ls

95% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, slty, w srt, sr-sb blk  
 clus, pred cons, tr cly rch cnt, sl tr calc, rr ls, sme cal; 5% SLTY SH: med-drkgy, ip  
 blk, pred pty-ip sb blk, mod sft-fri, rthy, grty, sl slty, tr calc

95% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, slty, w srt, sr-sb blk  
 clus, pred cons, tr cly rch cnt, sl tr calc, rr ls; 5% SLTY SH: med-drkgy, ip  
 pty-ip sb blk, mod sft-fri, rthy, grty, sl slty, tr calc



MD: 16.293'  
 INC: 90.35°  
 AZM: 180.96°  
 TVD: 7.941.49'  
 VS: 7.800.4'

MD: 16.382'  
 INC: 89.84°  
 AZM: 179.43°  
 TVD: 7.941.35'  
 VS: 7.886.75'

MD: 16.472'  
 INC: 90.25°  
 AZM: 178.56°  
 TVD: 7.941.27'  
 VS: 7.973.59'

tr hd, fri, vfg, stly, w srt, sr-sb blkly  
 TY SH: med-dtkgy, ip blk, pred

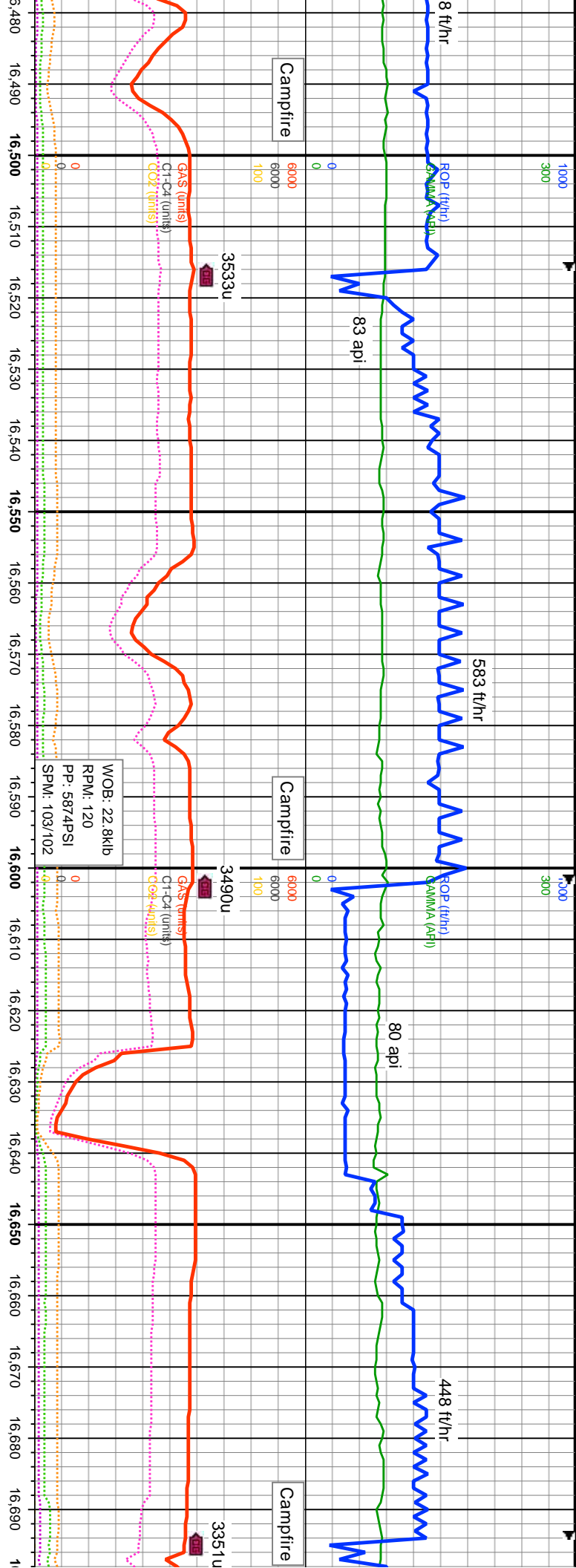
95% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, stly, w srt, sr-sb blkly  
 clus, pred cons, tr cly rch cnt, sl tr calc, v rr ls; 5% SLTY SH: med-dtkgy, ip blk, pred  
 pty-ip sb blkly, mod sft-fri, rthy, grty, sl stly, tr calc

100% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, stly,  
 clus, pred cons, tr cly rch cnt, sl tr calc, tr sh, v rr ls, r cal

8050

8050

8050

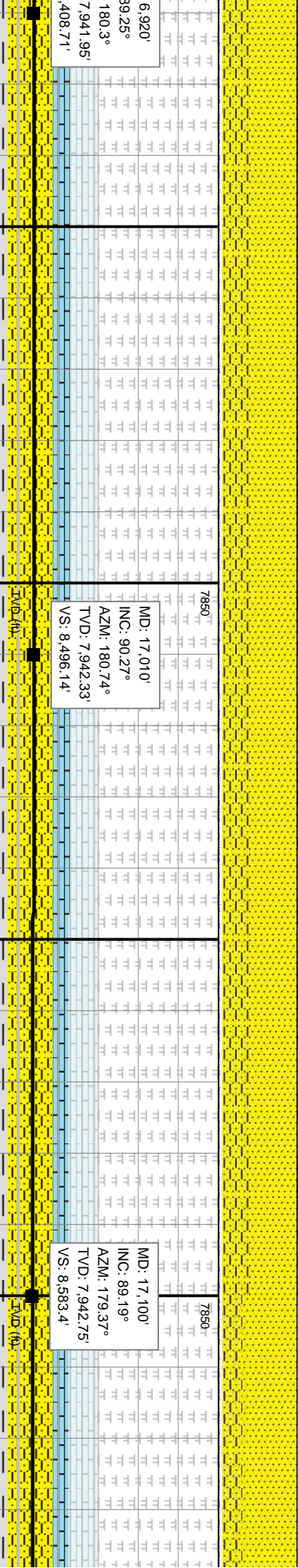
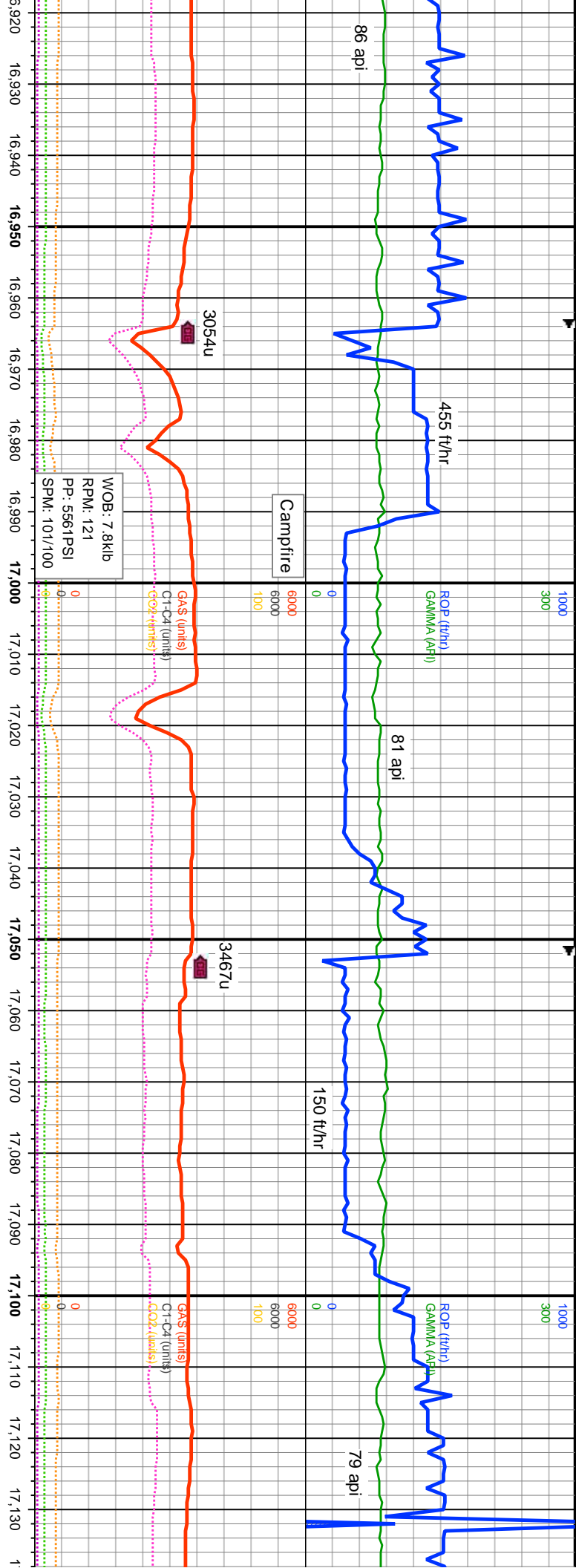


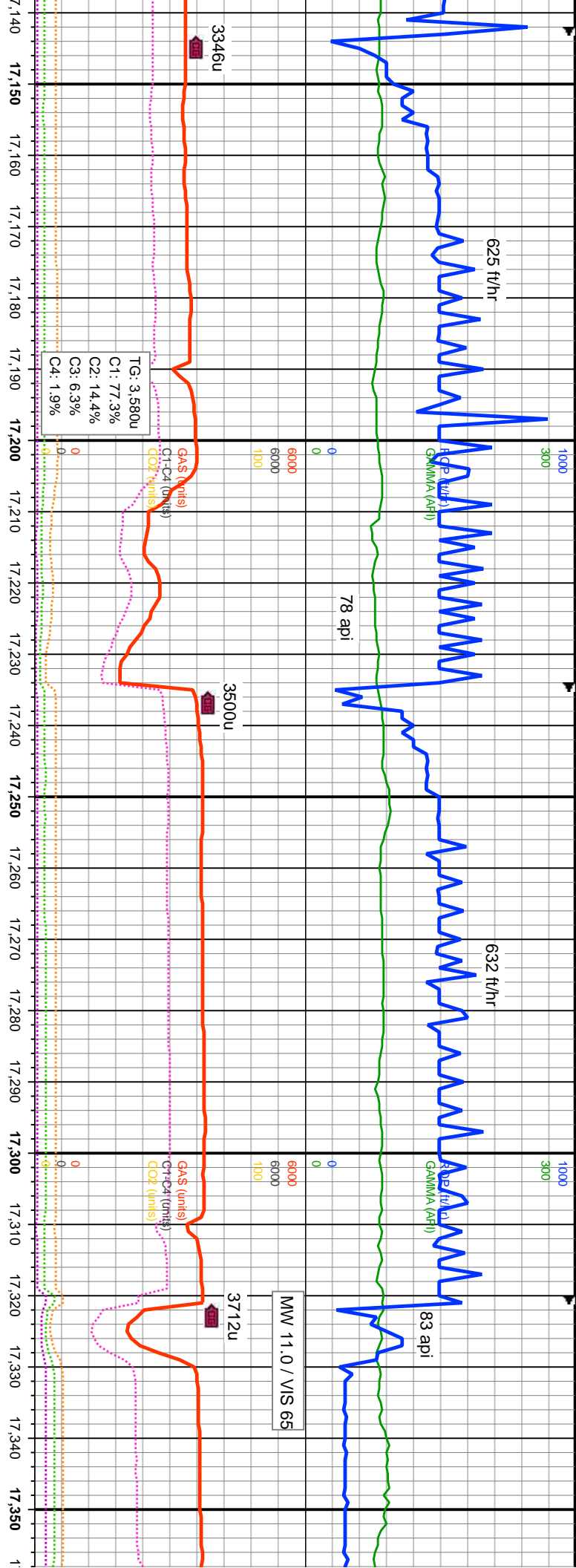
7850	VS: 8,060.74'	MD: 16.562' INC: 89.97° AZM: 181.01° TVD: 7,941.1'
7850	VS: 8,146.91'	MD: 16.651' INC: 89.94° AZM: 178.47° TVD: 7,941.17'

w srt, sr-sb blkly  
 100% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly  
 clus, pred cons, tr cly rch cmt, sl tr calc, tr sh, v rr ls, rr cal  
 8050

100% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly  
 clus, pred cons, tr cly rch cmt, v sl calc, tr sh  
 8050



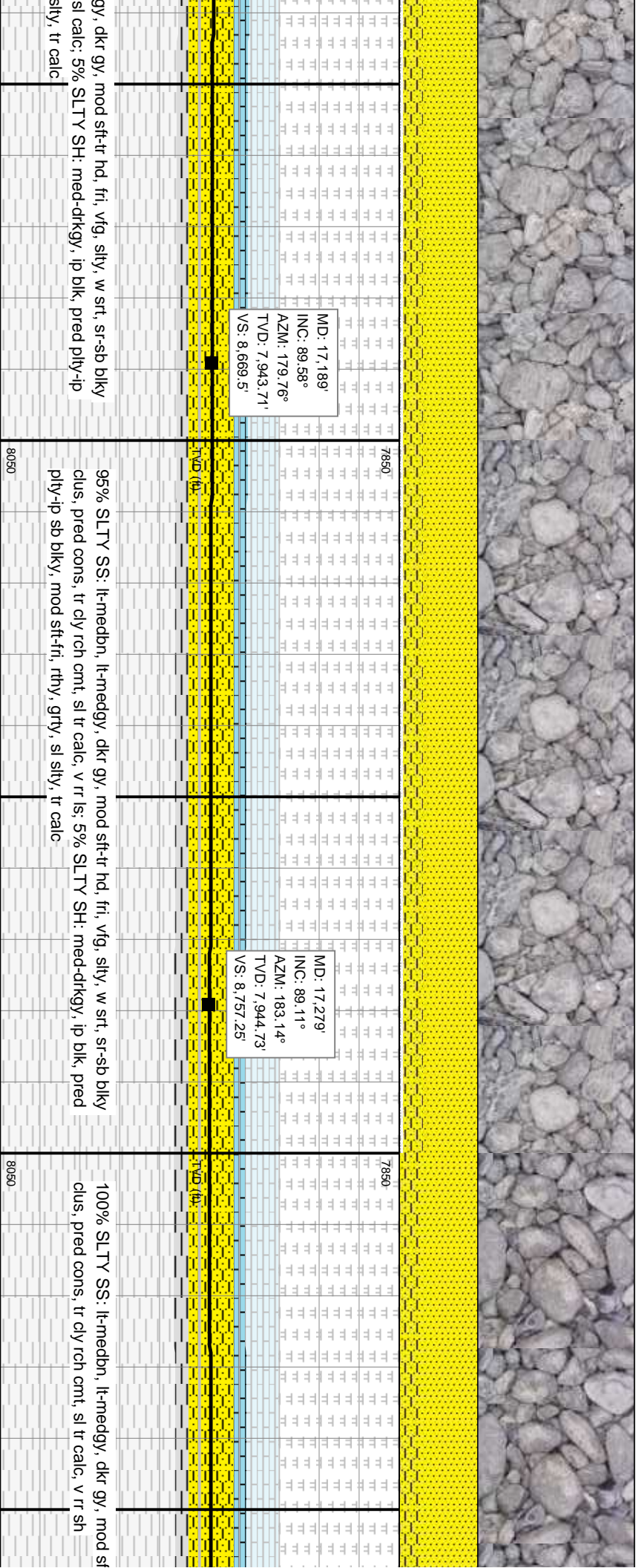




TG: 3.580u  
 C1: 77.3%  
 C2: 14.4%  
 C3: 6.3%  
 C4: 1.9%

MD: 17,189'  
 INC: 89.58°  
 AZM: 179.76°  
 TVD: 7,943.71'  
 VS: 8,669.5'

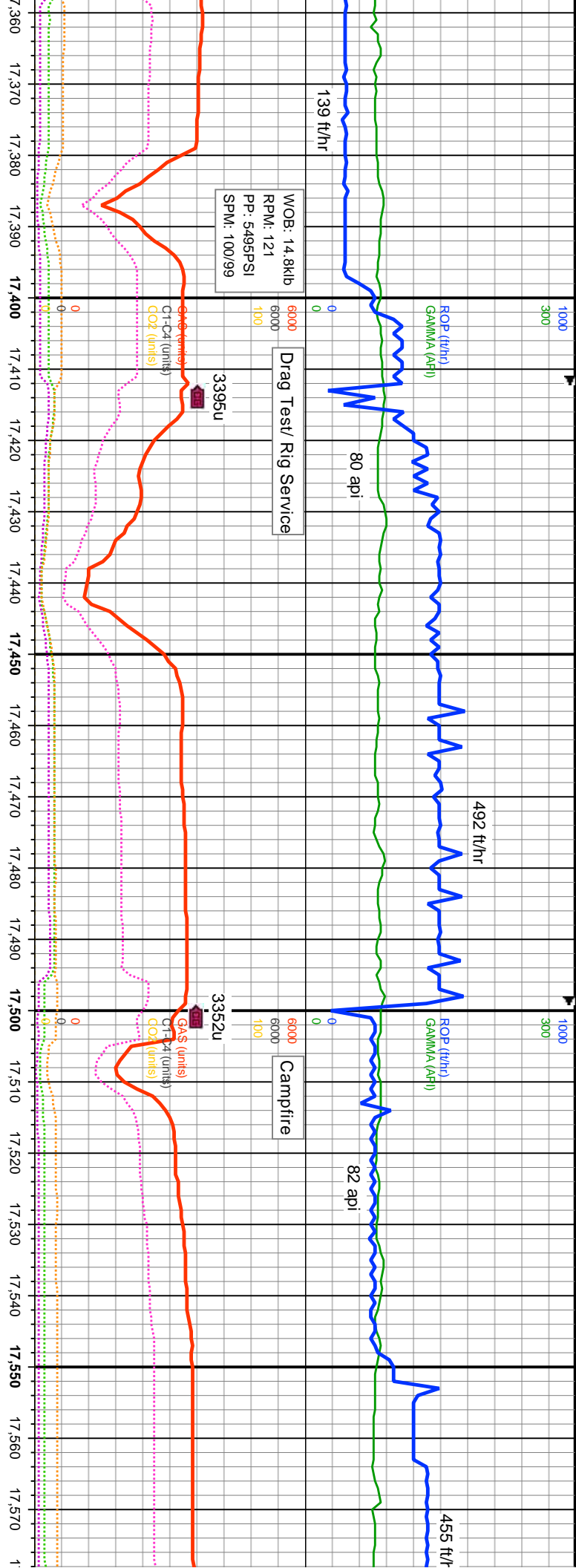
MD: 17,279'  
 INC: 89.11°  
 AZM: 183.14°  
 TVD: 7,944.73'  
 VS: 8,757.25'



gy, dkr gy, mod sft-tr hd, fri, vfg, stly, w srt, sr-sb blkly  
 sl calc; 5% SLTY SH: med-drkgy, ip blk, pred ply-ip  
 stly, tr calc

95% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, stly, w srt, sr-sb blkly  
 clus, pred cons, tr cly rch cnt, sl tr calc, v rr ls; 5% SLTY SH: med-drkgy, ip blk, pred  
 ply-ip-sb blkly, mod sft-fri, rthy, grty, sl stly, tr calc

100% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, stly, w srt, sr-sb blkly  
 clus, pred cons, tr cly rch cnt, sl tr calc, v rr sh



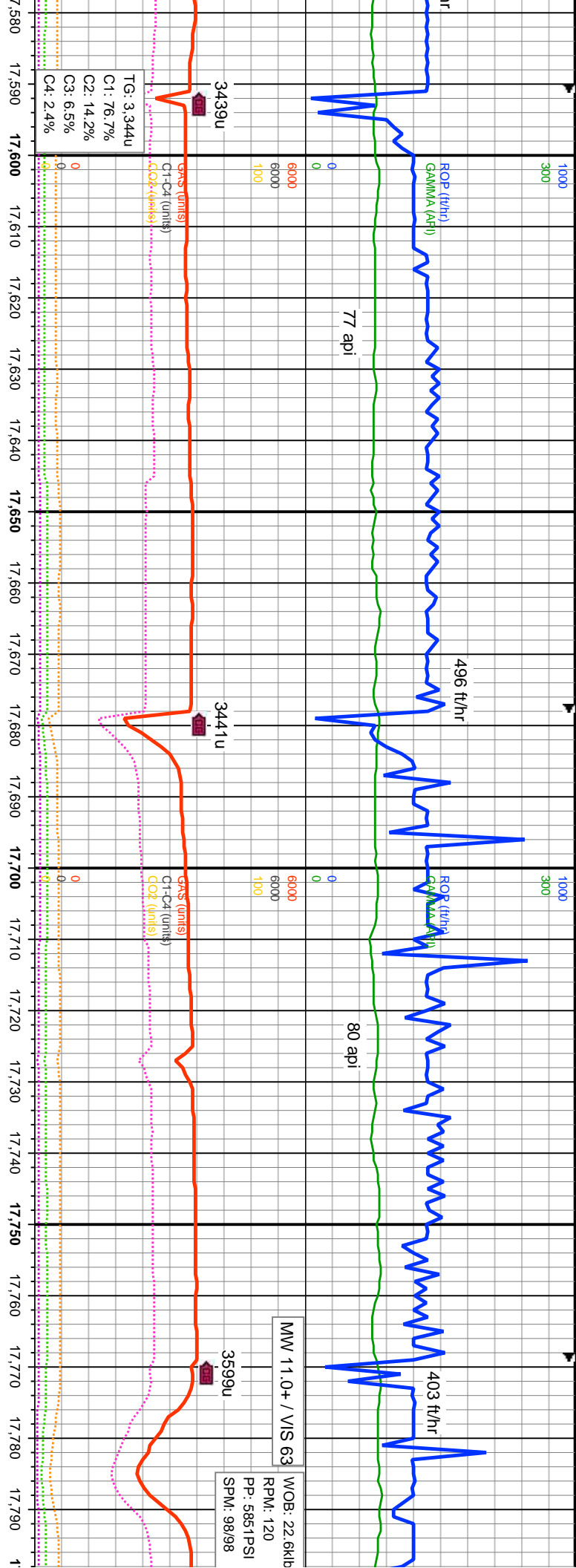
MD: 17,369'  
 INC: 91.09°  
 AZM: 181.71°  
 TVD: 7,944.57'  
 VS: 8.845,35'

MD: 17,458'  
 INC: 91.54°  
 AZM: 179.04°  
 TVD: 7,942.52'  
 VS: 8.931,73'

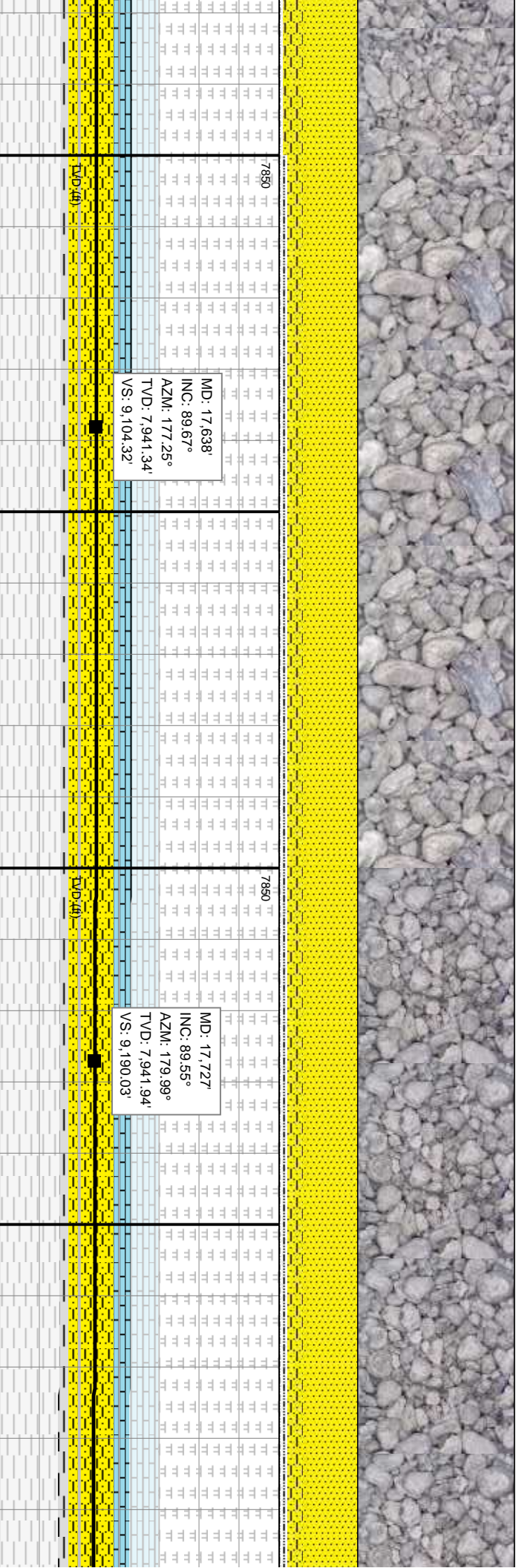
MD: 17,548'  
 INC: 90.15°  
 AZM: 177.35°  
 TVD: 7,941.19'  
 VS: 9.018,22'

1-tr hd, fri, vfg, slty, w srt, sr-sb blkly  
 95% SLTY SS: lt-medn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly  
 clus, pred cons, tr cly rch cnt, sl tr calc, v r r ls: 5% SLTY SH: med-drkgy, ip blk, pred  
 plty-ip sb blkly, mod sft-fri, rthy, grty, sl slty

8050  
 7850  
 7850  
 8050

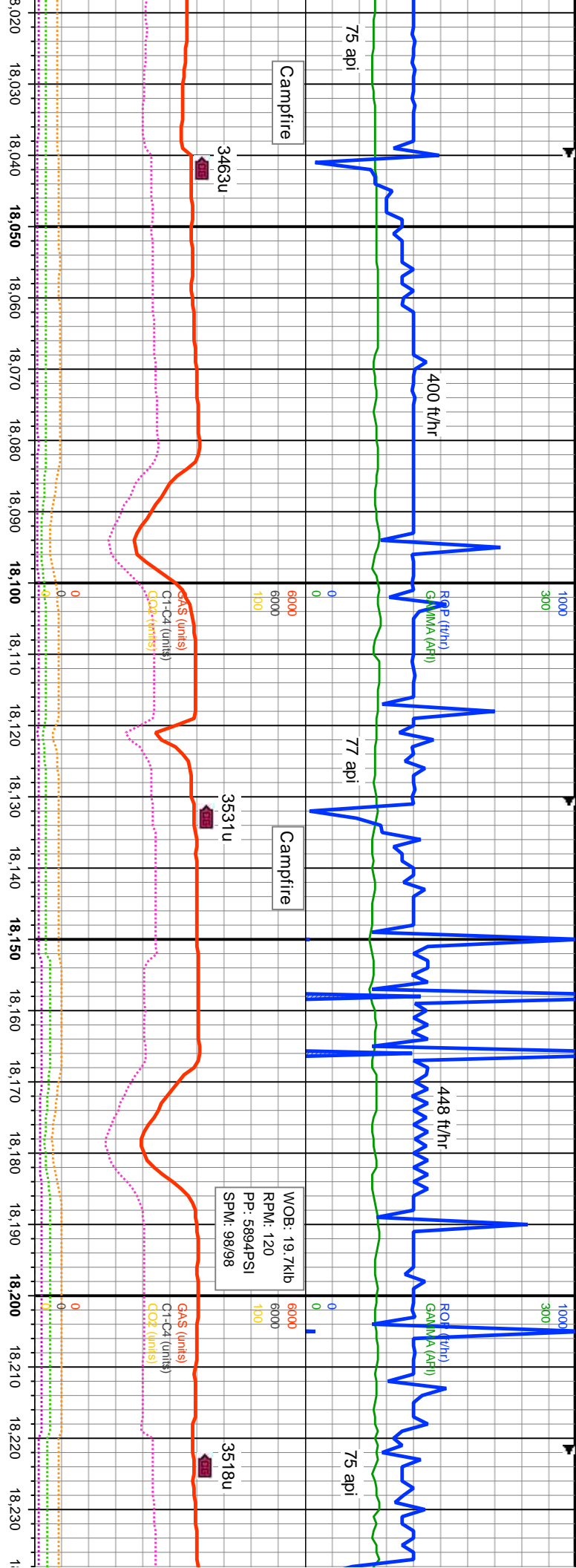


MW 11.0+ / VIS 63  
 WOB: 22.6klb  
 RPM: 120  
 PP: 5851PSI  
 SPM: 98/98



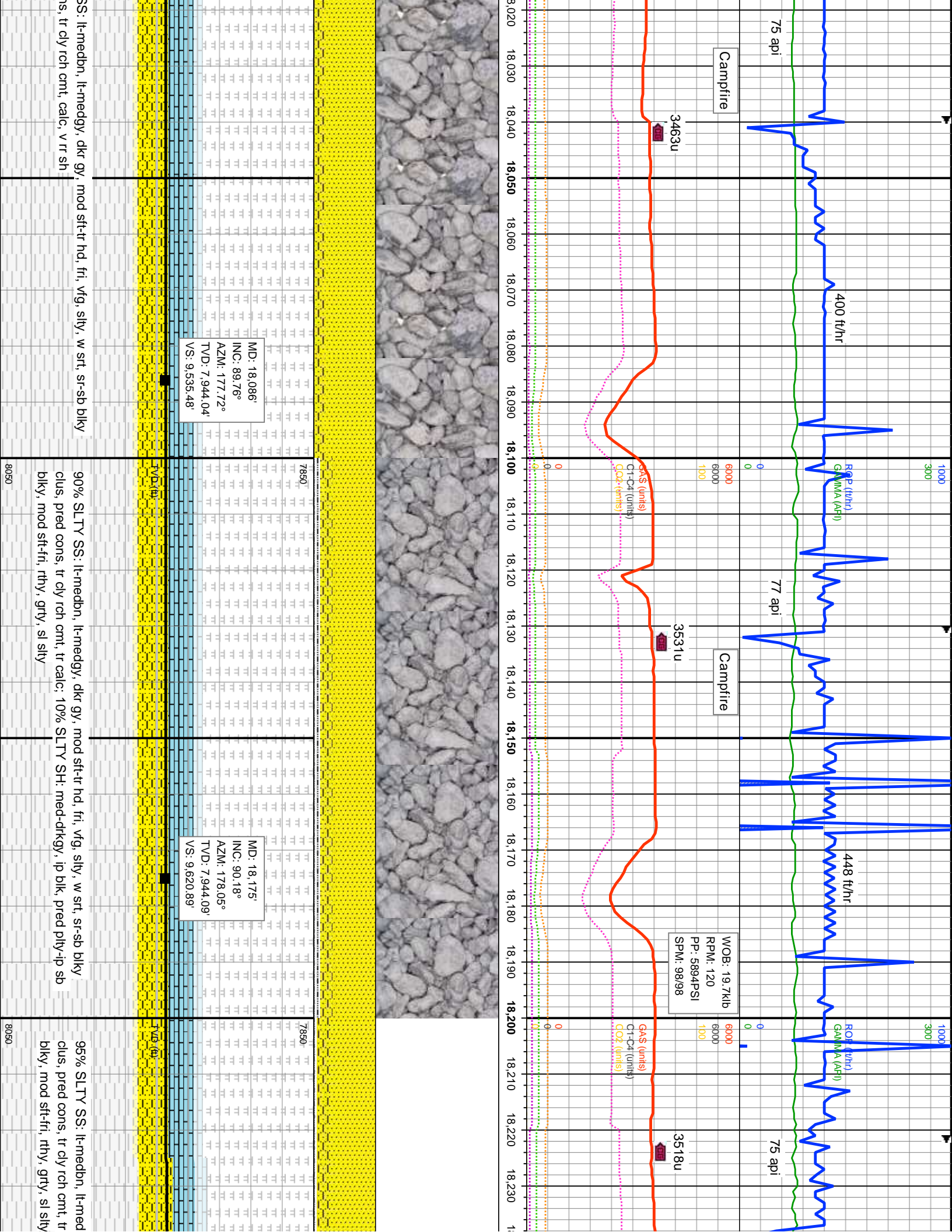
90% SLTY SS: ll-medbn, ll-medgy, dkr gy, mod stf-tr hd, fri, vfg, slty, w srt, sr-sb blkly clus, pred cons, tr cly rch cnt, sl tr calc; 10% SLTY SH: med-dtrgy, ip blk, pred plty-ip sb blkly, mod stf-fri, rthy, grty, sl slty

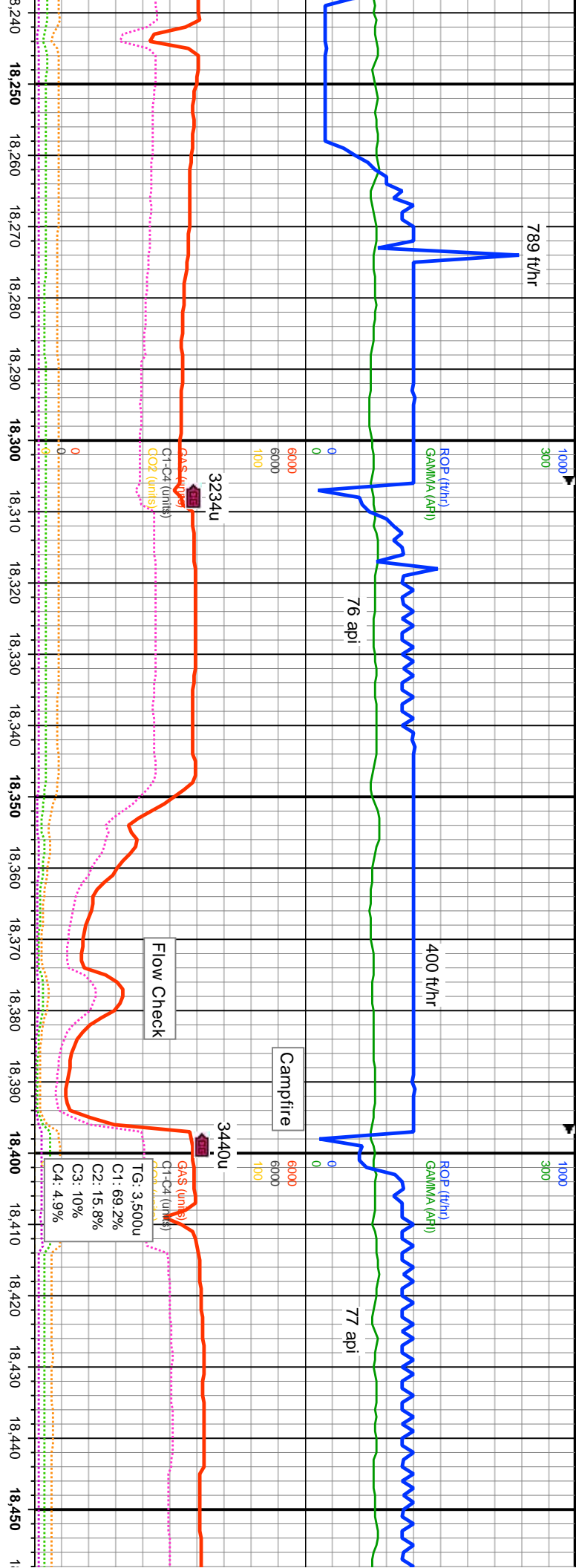




MD: 18,086'  
 INC: 89.76°  
 AZM: 177.72°  
 TVD: 7,944.04'  
 VS: 9,535.48'

MD: 18,175'  
 INC: 90.18°  
 AZM: 178.05°  
 TVD: 7,944.09'  
 VS: 9,620.89'





MD: 18,265'  
 INC: 90.18°  
 AZM: 178.29°  
 TVD: 7,943.8'  
 VS: 9,707.38'

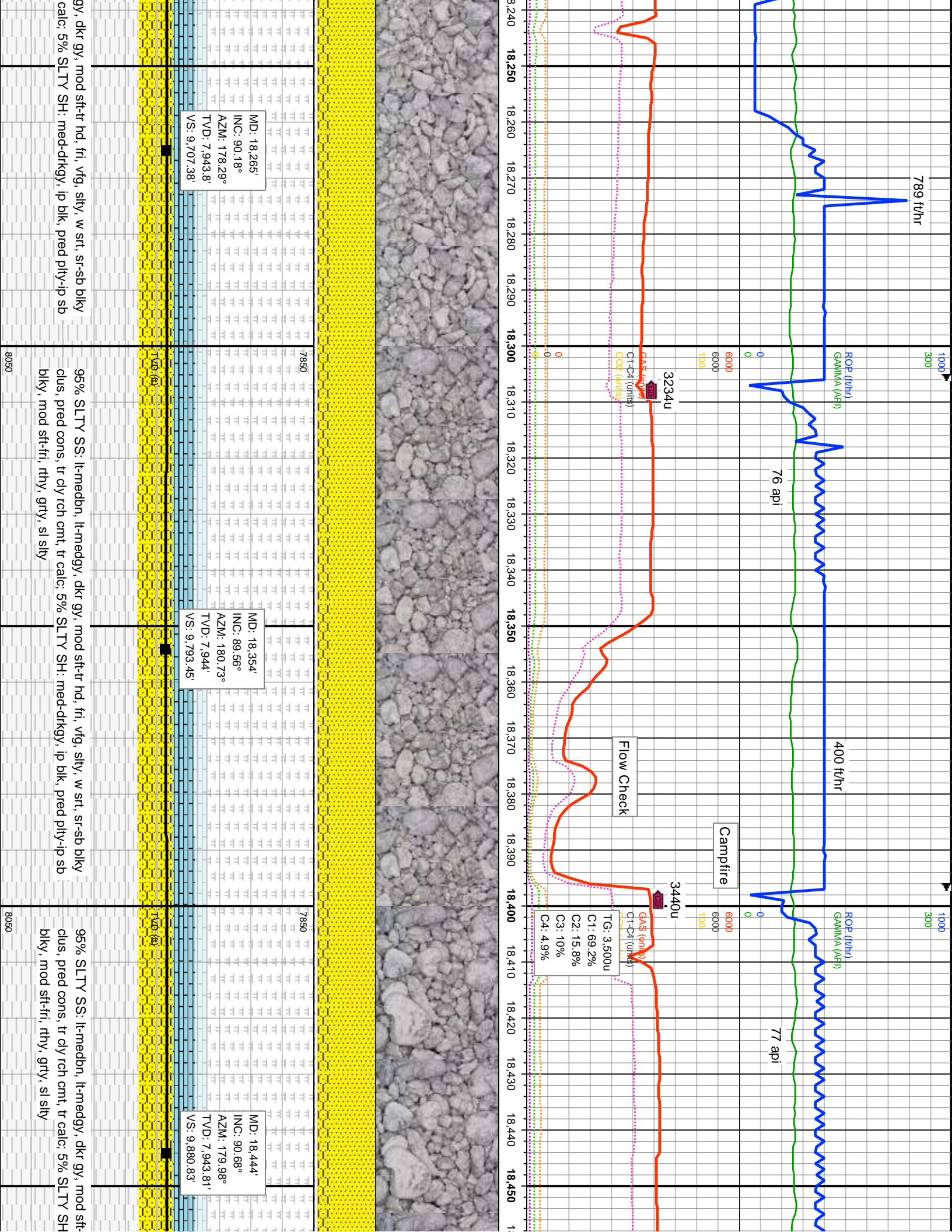
MD: 18,364'  
 INC: 89.56°  
 AZM: 180.73°  
 TVD: 7,944'  
 VS: 9,793.45'

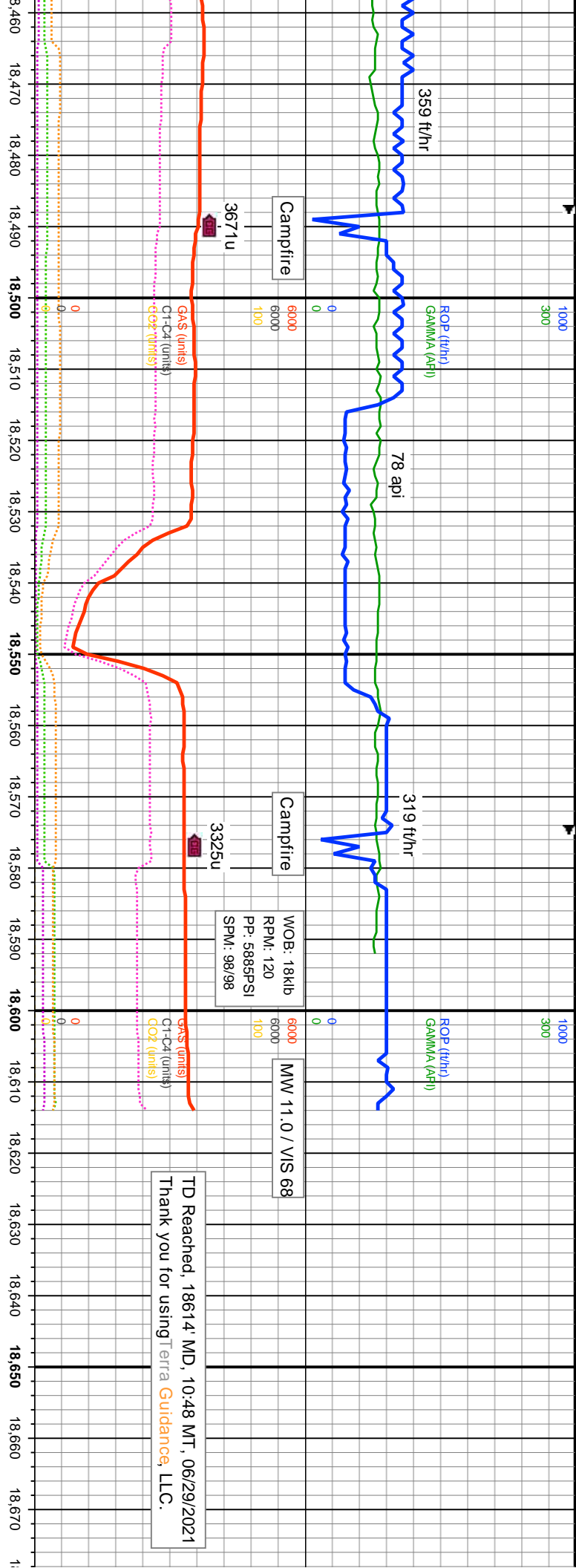
MD: 18,444'  
 INC: 90.68°  
 AZM: 179.98°  
 TVD: 7,943.81'  
 VS: 9,880.83'

gy, dkr gy, mod sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly  
 calc: 5% SLTY SH: med-dkrgy, ip blk, pred plty-ip sb

95% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly  
 clus, pred cons, tr cly rch cnt, tr calc: 5% SLTY SH: med-dkrgy, ip blk, pred plty-ip sb  
 blkly, mod sft-fri, rthy, grty, sl slty

95% SLTY SS: lt-medbn, lt-medgy, dkr gy, mod sft-tr hd, fri, vfg, slty, w srt, sr-sb blkly  
 clus, pred cons, tr cly rch cnt, tr calc: 5% SLTY SH: med-dkrgy, ip blk, pred plty-ip sb  
 blkly, mod sft-fri, rthy, grty, sl slty





7850  
 MD: 18,534'  
 INC: 89.53°  
 AZM: 178.8°  
 TVD: 7,943.64'  
 VS: 9,967.83'

7850  
 MD: 18,572'  
 INC: 89.21°  
 AZM: 178.97°  
 TVD: 7,944.06'  
 VS: 10,004.47'

7850  
**Projection to Bit**  
 MD: 18,614'  
 INC: 89.21°  
 AZM: 178.97°  
 TVD: 7,944.64'  
 VS: 10,044.99'

