



Scale: 5" / 100'  
Measured Depth Log

**Well Name** Seltzer LD 09-376HN

**Location** SECTION 4, T1S, R67W

**State** COLORADO

**Country** UNITED STATES

**API Number** 05001101970000

**Geographic Region** DJ BASIN

**County** ADAMS

**Rig Number** PD 460

**AFF #** 20DC0278

**Field** WATTENBERG

**Ground Elevation** 5140'

**K.B. Elevation** 5160'

**Logged Interval** 6000' MD To 18175' MD

**Total Depth** 18175' MD

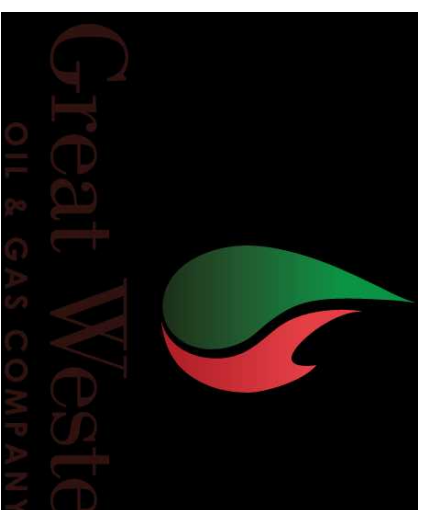
**Formation** NIOBRARA B CHALK

**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

**Company** TERRA GUIDANCE, LLC

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



## Other

MUDLOG START DATE 07/10/2021

MUDLOG END DATE 07/13/2021

## Rock Types

Chalk TT TT TT Marl Silty Shale Shaly Siltstone

## Other Symbols

### Engineering

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

Onsite Geological Services provided by  
Terra Guidance

Loggers on Location: 07/10/2021

Logging Depth Reached:

14:20 MT, 07/10/2021

Bloodhound Unit: #5933

Sample Collection/Description Interval:

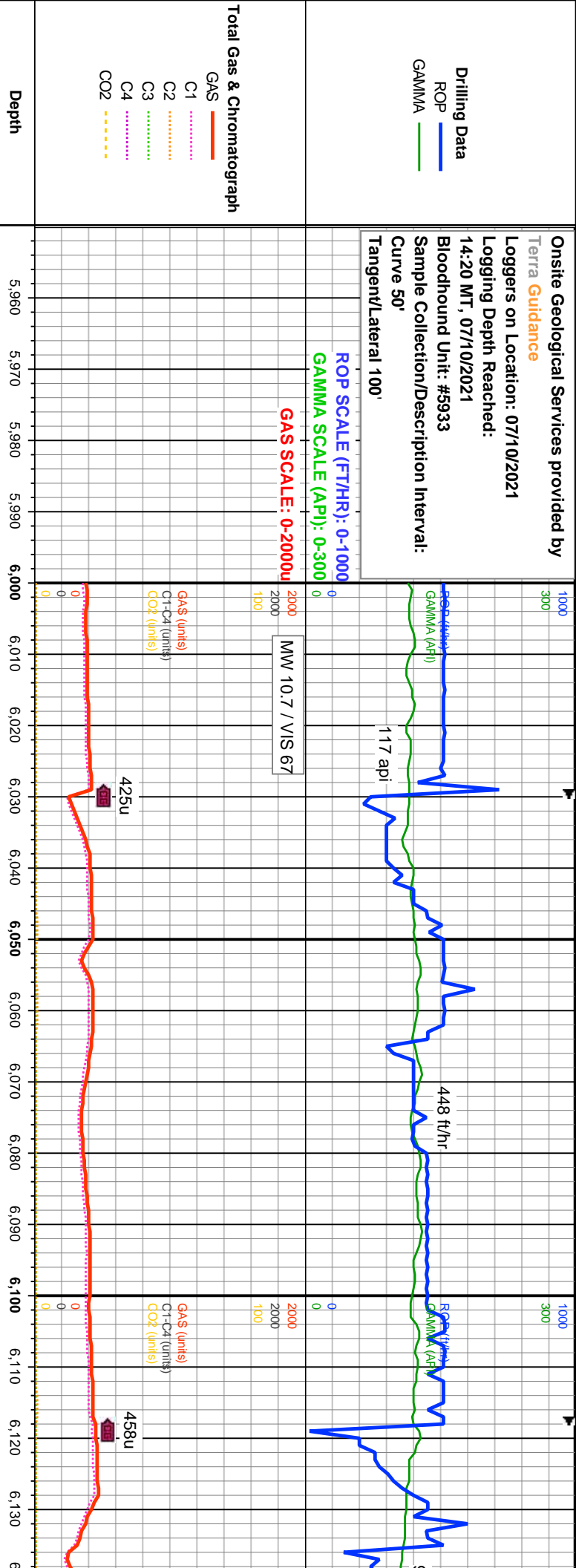
Curve 50'

Tangen/Lateral 100'

ROP SCALE (FT/HR): 0-1000  
GAMMA SCALE (API): 0-300

GAS SCALE: 0-2000u

MW 10.7 / VIS 67



100% SHY SLTST: lt-meddy, tr brn-gyshbn, v-mod sft, fri, sl frm, sb blkly-sb plty, sb fls, arg, slty, v sl sdy, rthy, ip aren, sl rch cly mtx, sl calc

MD: 6.079'  
INC: 29.59°  
AZM: 294.22°  
TVD: 5.861.54'  
VS: -194.4'

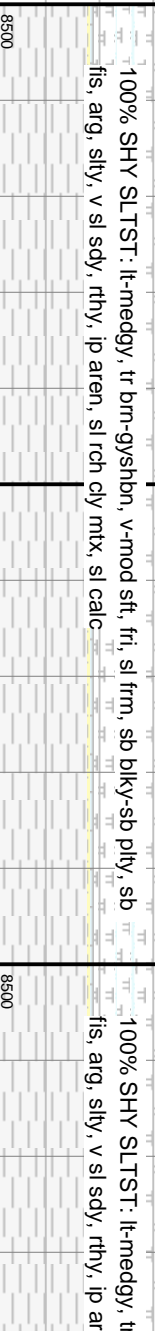
100% SHY SLTST: lt-meddy, tr brn-gyshbn, v-mod sft, fri, sl frm, sb blkly-sb plty, sb fls, arg, slty, v sl sdy, rthy, ip aren, sl rch cly mtx, sl calc

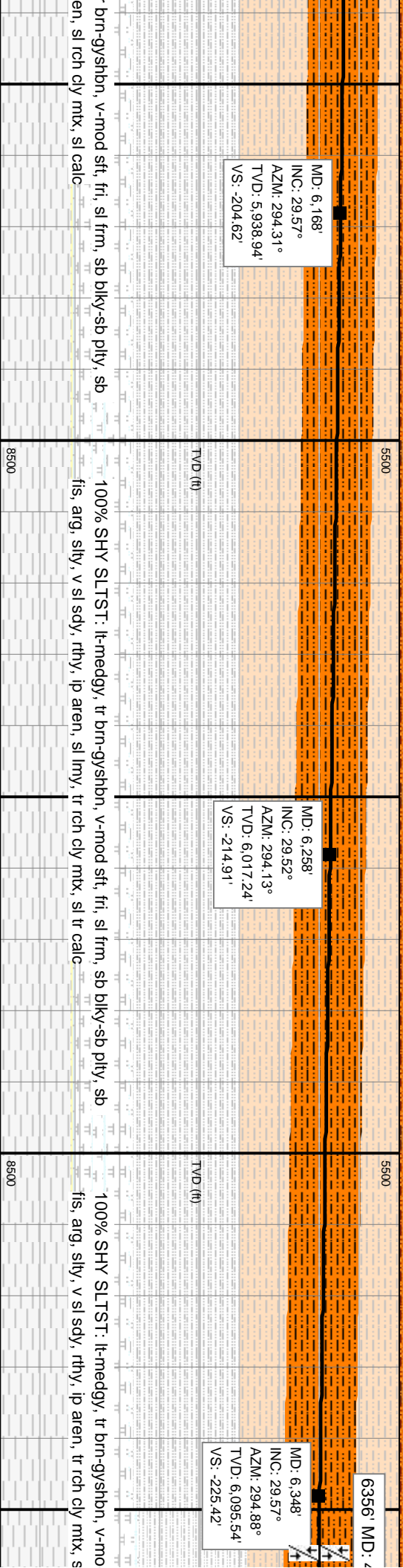
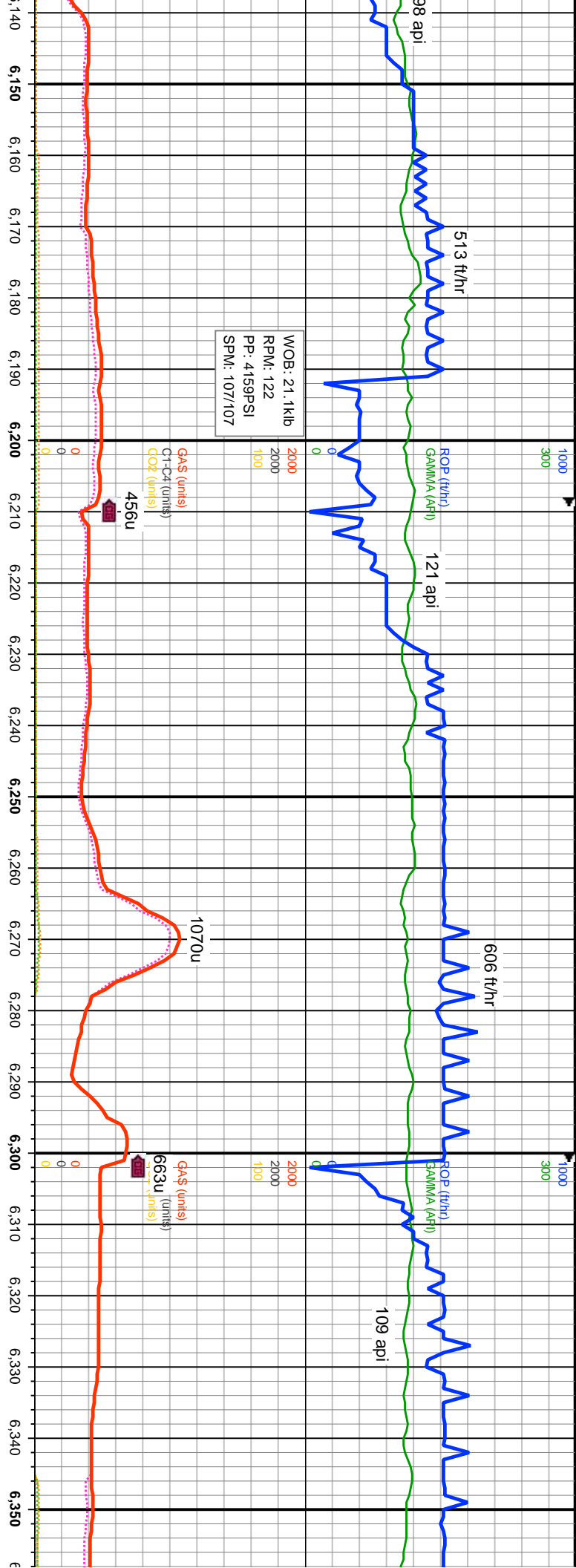
100% SHY SLTST: lt-meddy, tr brn-gyshbn, v-mod sft, fri, sl frm, sb blkly-sb plty, sb fls, arg, slty, v sl sdy, rthy, ip aren, sl rch cly mtx, sl calc

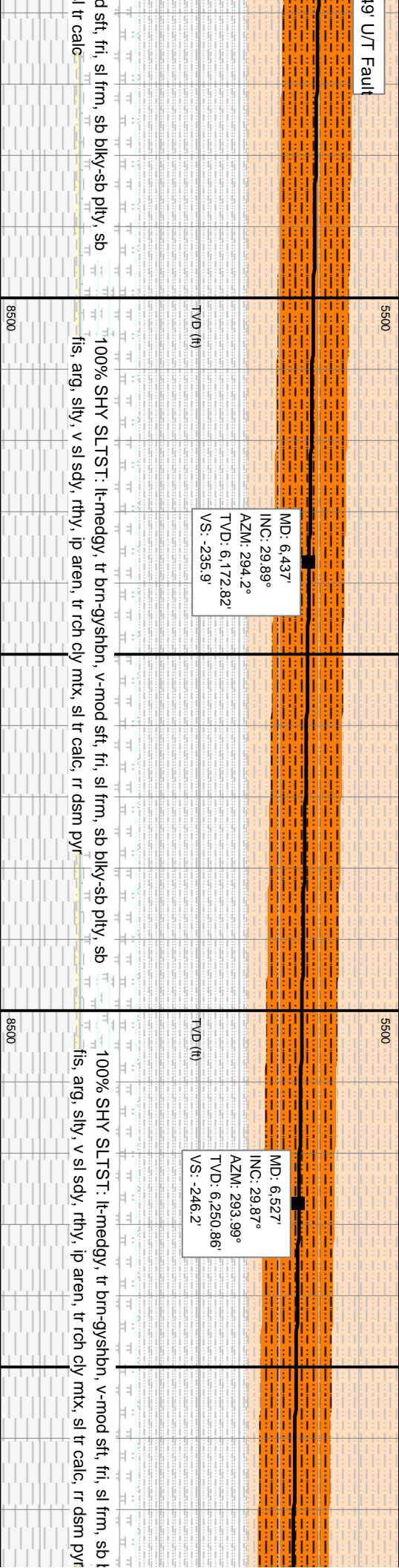
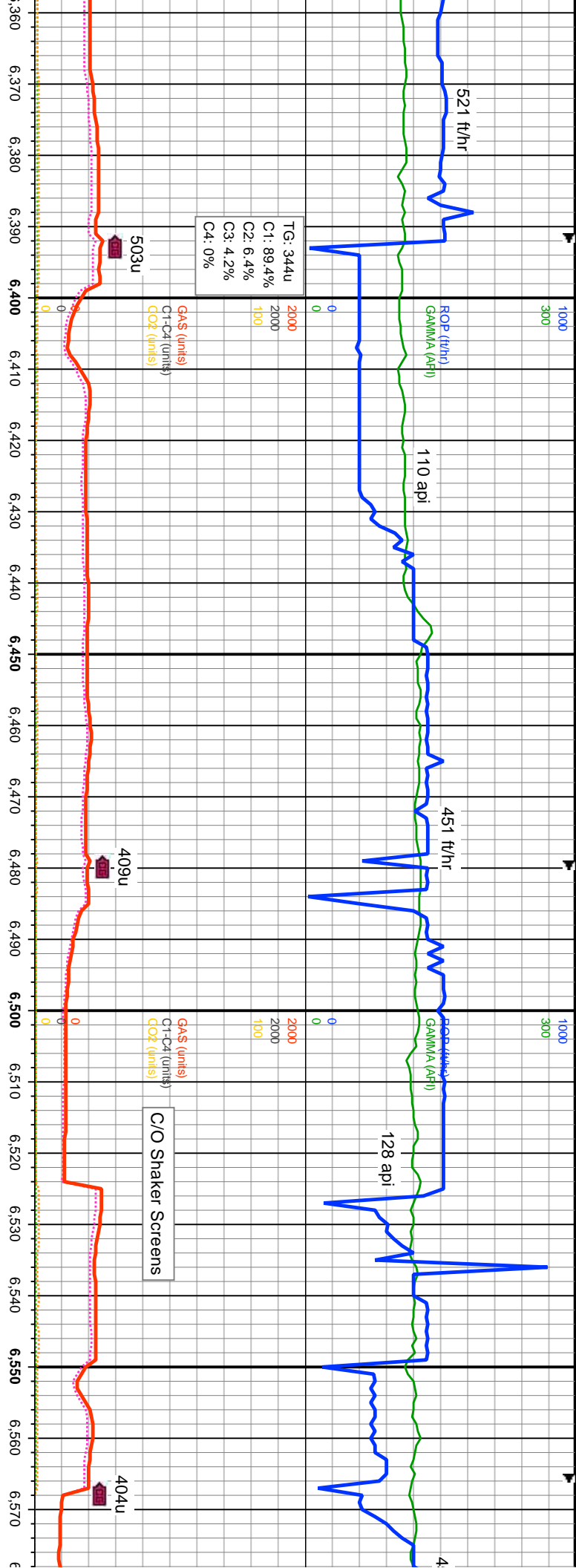
Bit #: 1  
Size: 8.5"  
Make: SMITH  
Model: N516 PDC New  
Jets: 6x10, 1x11  
S/N: JV4764  
Depth In: 2.052'

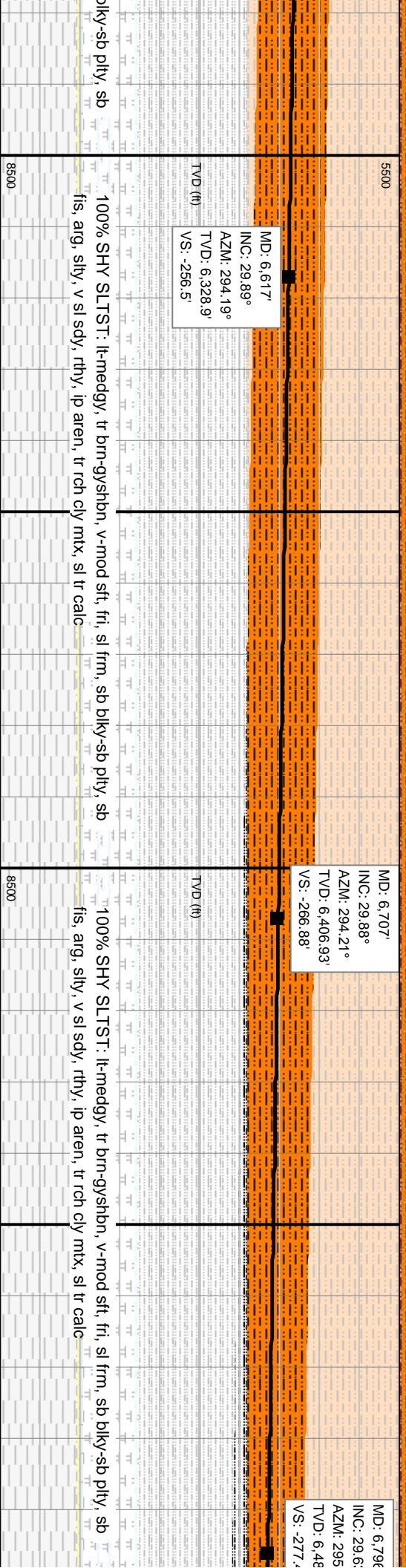
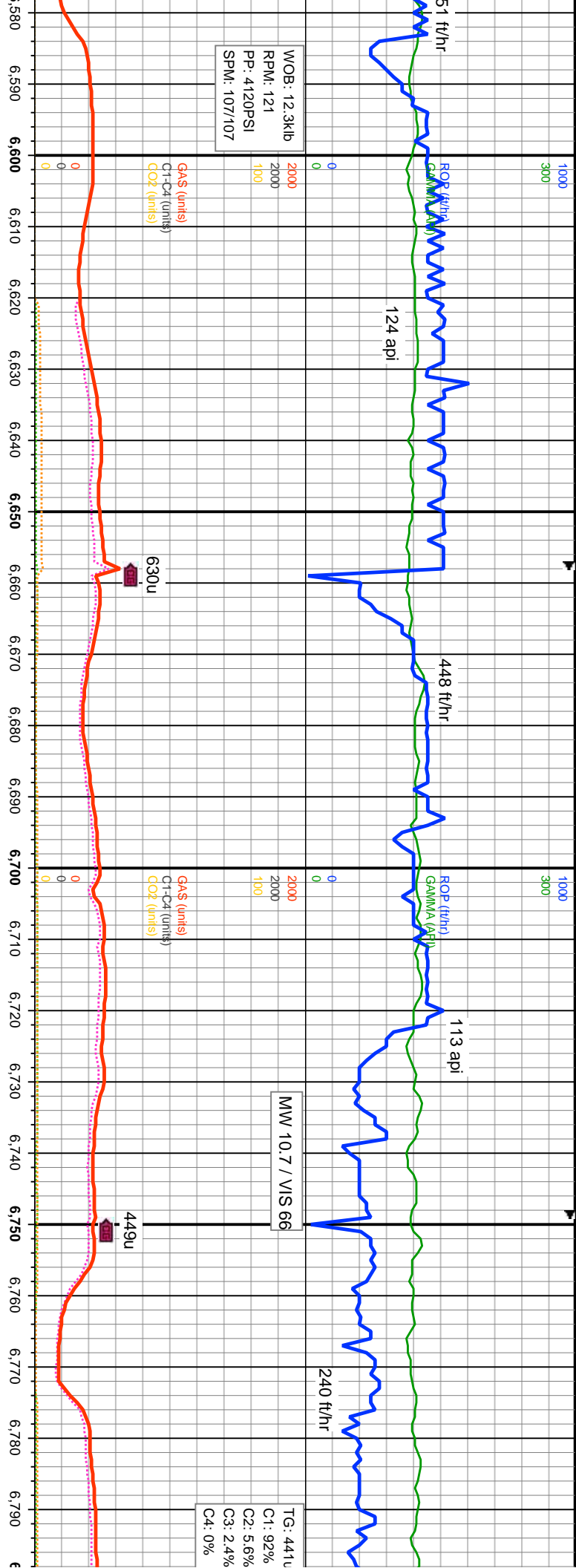
Well Bore  
TVD

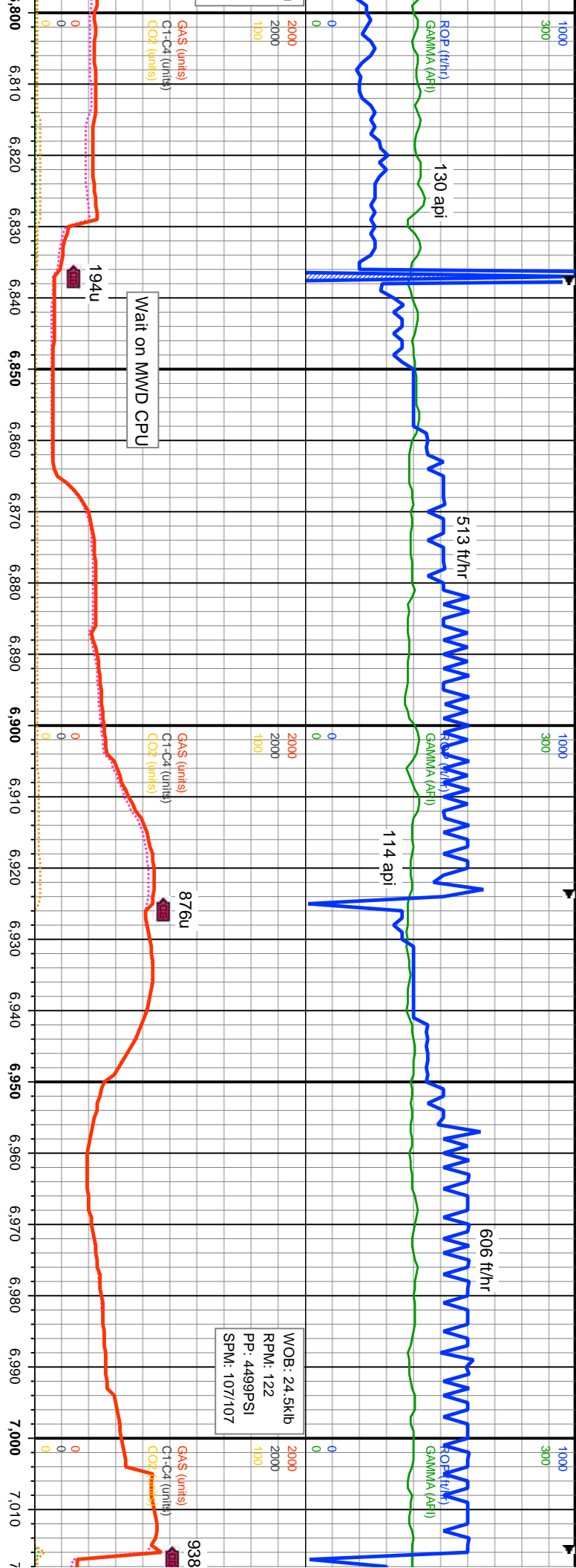
TVD SCALE: 5500' - 8500'







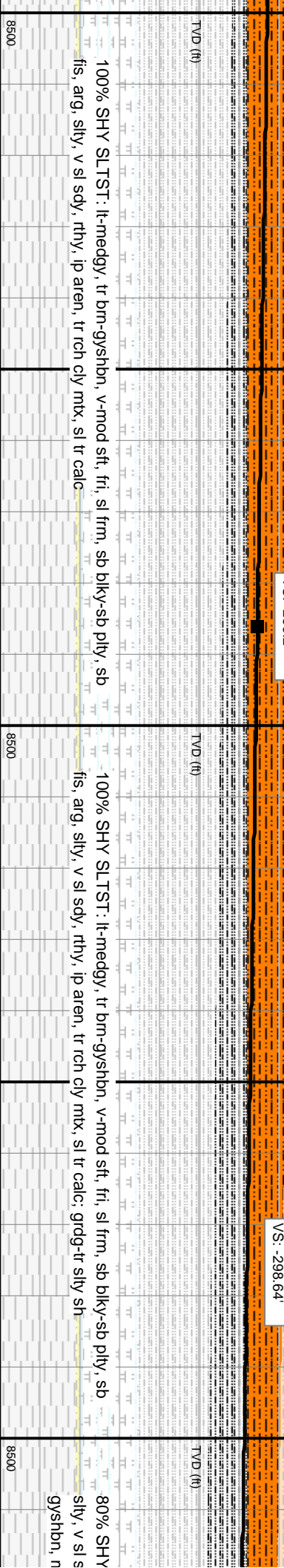


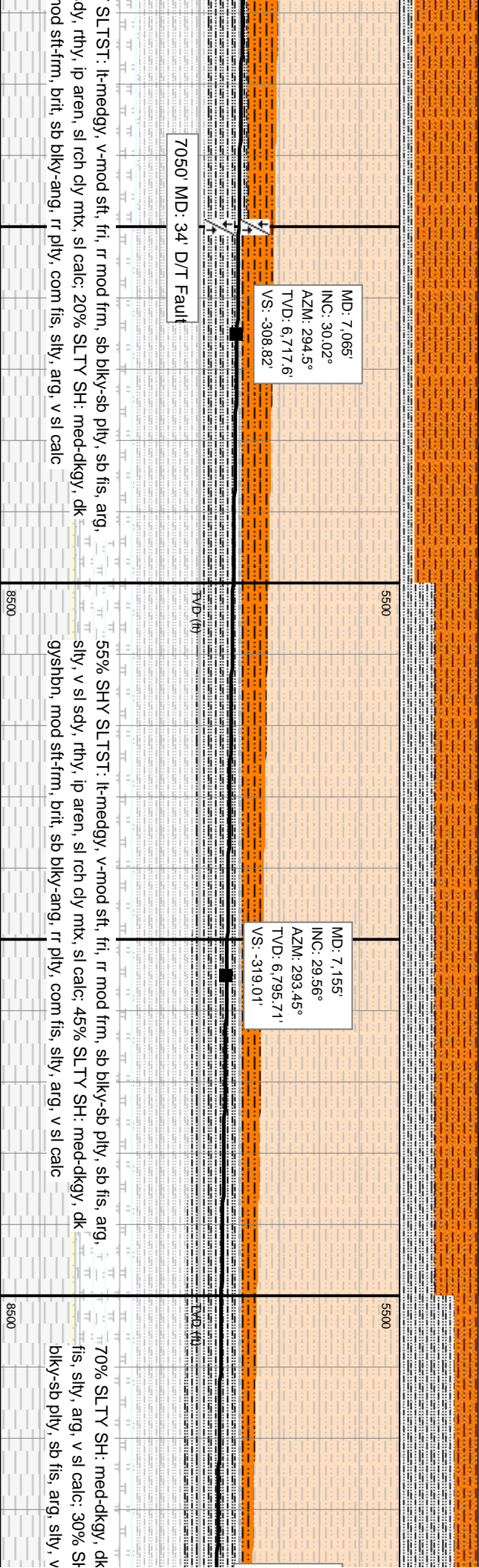
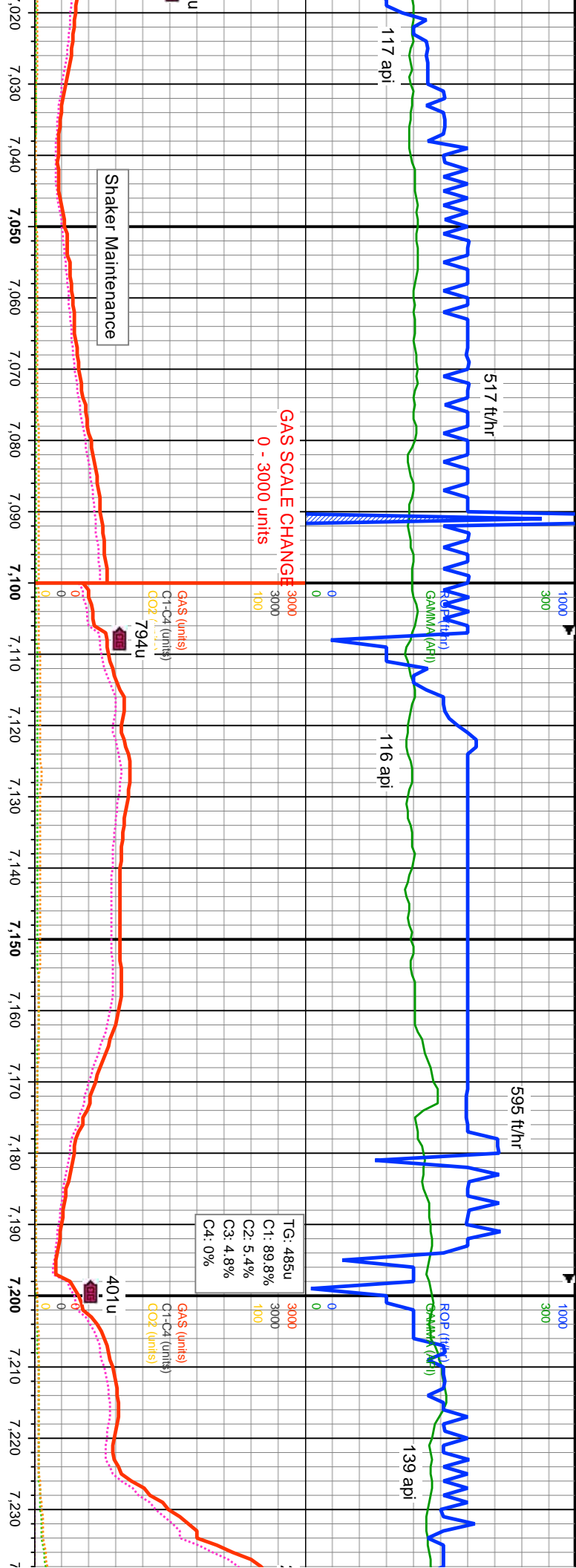


3°  
 02°  
 4.19'  
 2'

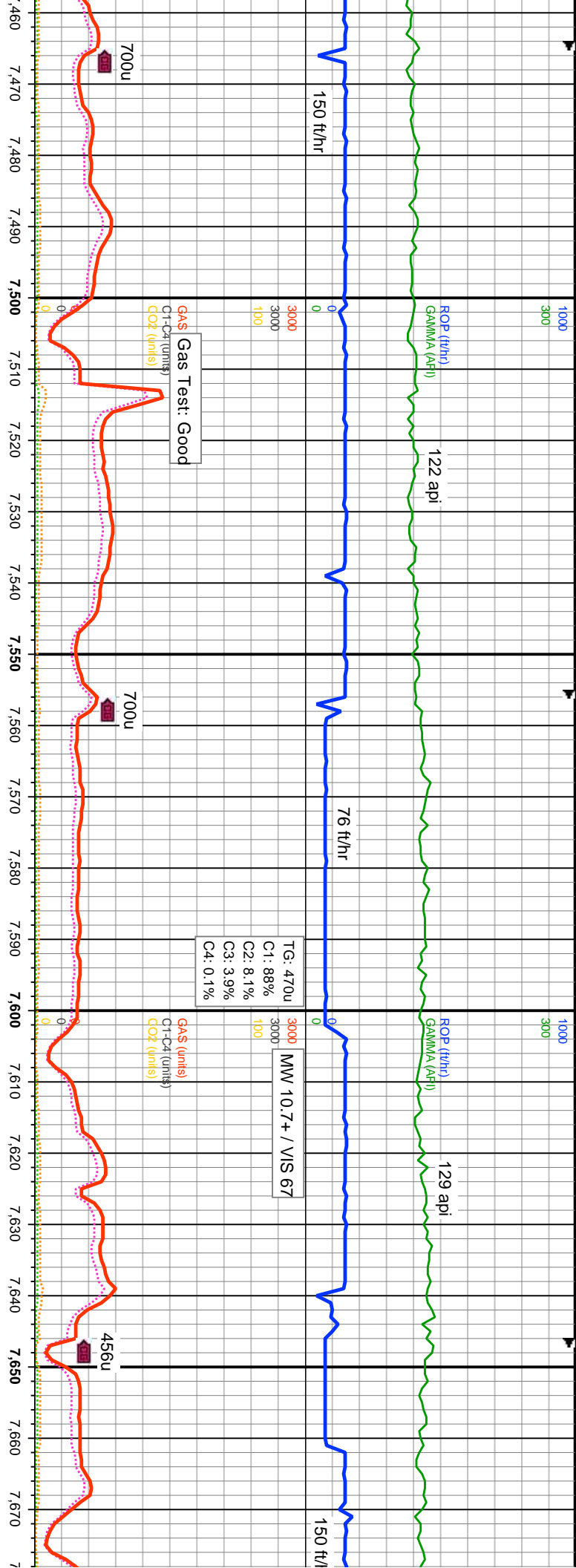
MD: 6.886'  
 INC: 29.94°  
 AZM: 294.52°  
 TVD: 6.562.31'  
 VS: -288.2'

MD: 6.976.7'  
 INC: 29.66°  
 AZM: 293.9°  
 TVD: 6.641.01'  
 VS: -298.64'









MD: 7.513'  
 INC: 30°  
 AZMI: 264.42°  
 TVD: 7,106.32'  
 VS: -331.5'

MD: 7.603'  
 INC: 31.07°  
 AZMI: 248.97°  
 TVD: 7,183.96'  
 VS: -312.86'

SLTY SH: med-dkgy, dk gyshbn, mod sft-frm, brit, sb blkY-ang, rr plty, com fis, slty, ang, v sl calc; tr shly slst

100% SLTY SH: med-dkgy, dk gyshbn, mod sft-frm, brit, sb blkY-ang, rr plty, com fis, slty, ang, v sl calc; tr shly slst

100% SLTY SH: med-dkgy, dk gyshbn, mod sft-frm, brit, sb blkY-ang, rr plty, com fis, slty, ang, v sl calc; tr shly slst

100% SLTY SH: med-dkgy, dk gyshbn, mod sft-frm, brit, sb blkY-ang, rr plty, com fis, slty, ang, v sl calc; tr shly slst

100% SLTY SH: med-dkgy, dk gyshbn, mod sft-frm, brit, sb blkY-ang, rr plty, com fis, slty, ang, v sl calc; tr shly slst

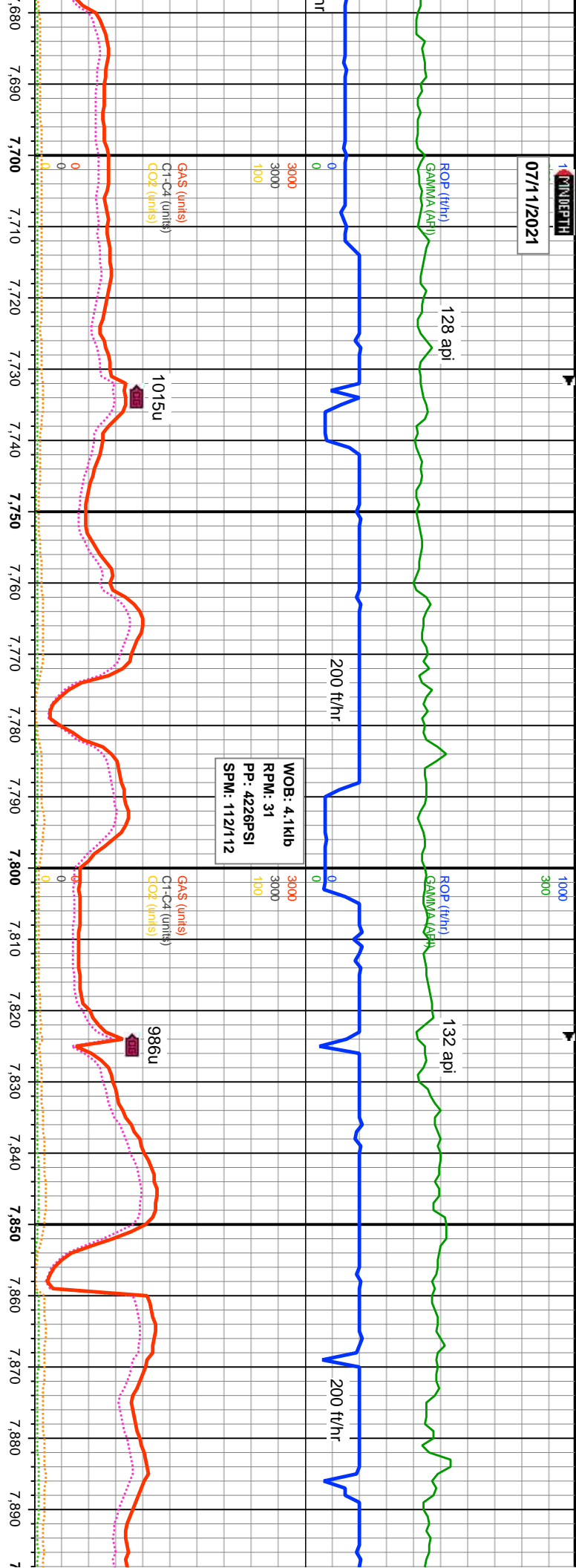
8500

5500

5500

8500

07/11/2021



MD: 7,692'  
 INC: 35.37°  
 AZM: 237.43°  
 TVD: 7,258.47'  
 VS: -283.01'

MD: 7,782'  
 INC: 41.9°  
 AZM: 226.11°  
 TVD: 7,328.82'  
 VS: -240.49'

MD: 7,871'  
 INC: 47.12°  
 AZM: 214.31°  
 TVD: 7,392.38'  
 VS: -186.2°

TVD SCALE CHANGE  
 7300' - 8200'

Depth (ft)	ROP (ft/hr)	GAMMA (API)	GAS (units)	C1-C4 (units)	CO2 (units)
7680	0	128	0	0	0
7690	0	128	0	0	0
7700	0	128	0	0	0
7710	0	128	0	0	0
7720	0	128	0	0	0
7730	0	128	0	0	0
7740	0	128	0	0	0
7750	200	128	0	0	0
7760	200	128	0	0	0
7770	200	128	0	0	0
7780	200	128	0	0	0
7790	200	128	0	0	0
7800	200	128	0	0	0
7810	200	128	0	0	0
7820	200	132	0	0	0
7830	200	132	0	0	0
7840	200	132	0	0	0
7850	200	132	0	0	0
7860	200	132	0	0	0
7870	200	132	0	0	0
7880	200	132	0	0	0
7890	200	132	0	0	0

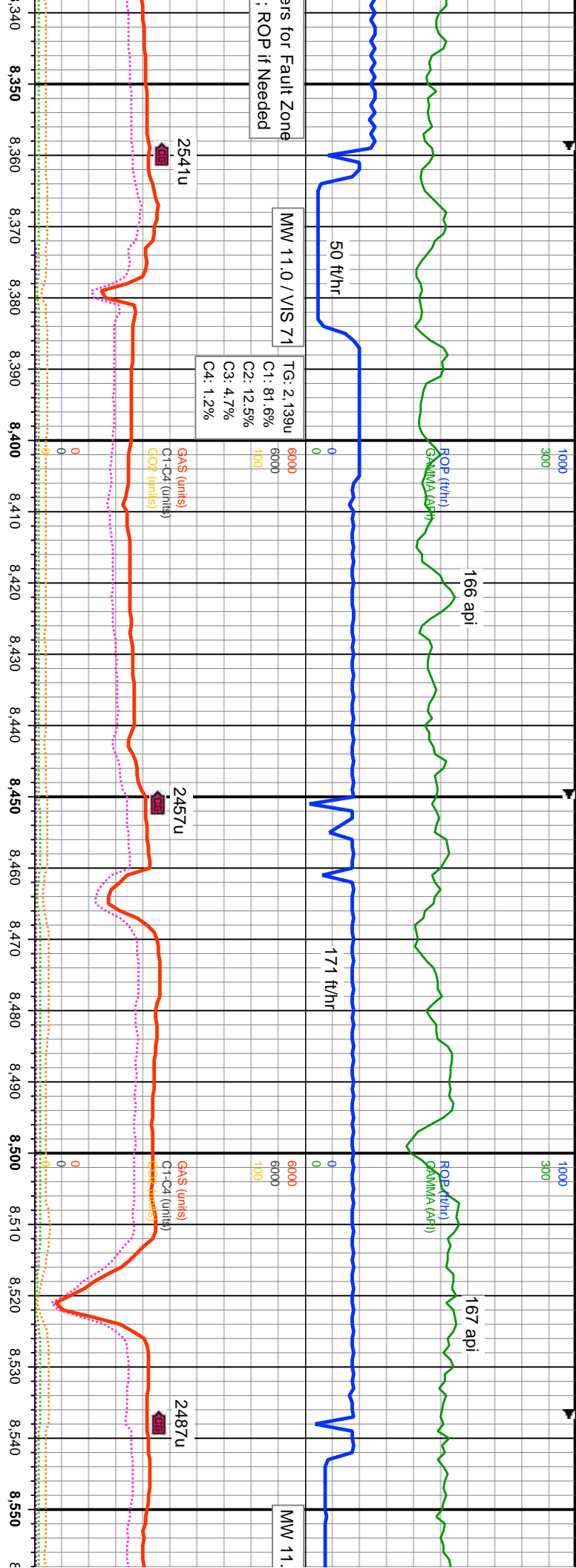
100% SLTY SH: med-dkg, dk gyshn, mod sft-frm, brit, sb blkY-ang, rr plty, com fis, slty, ang, v sl calc; rr shy slst

8500

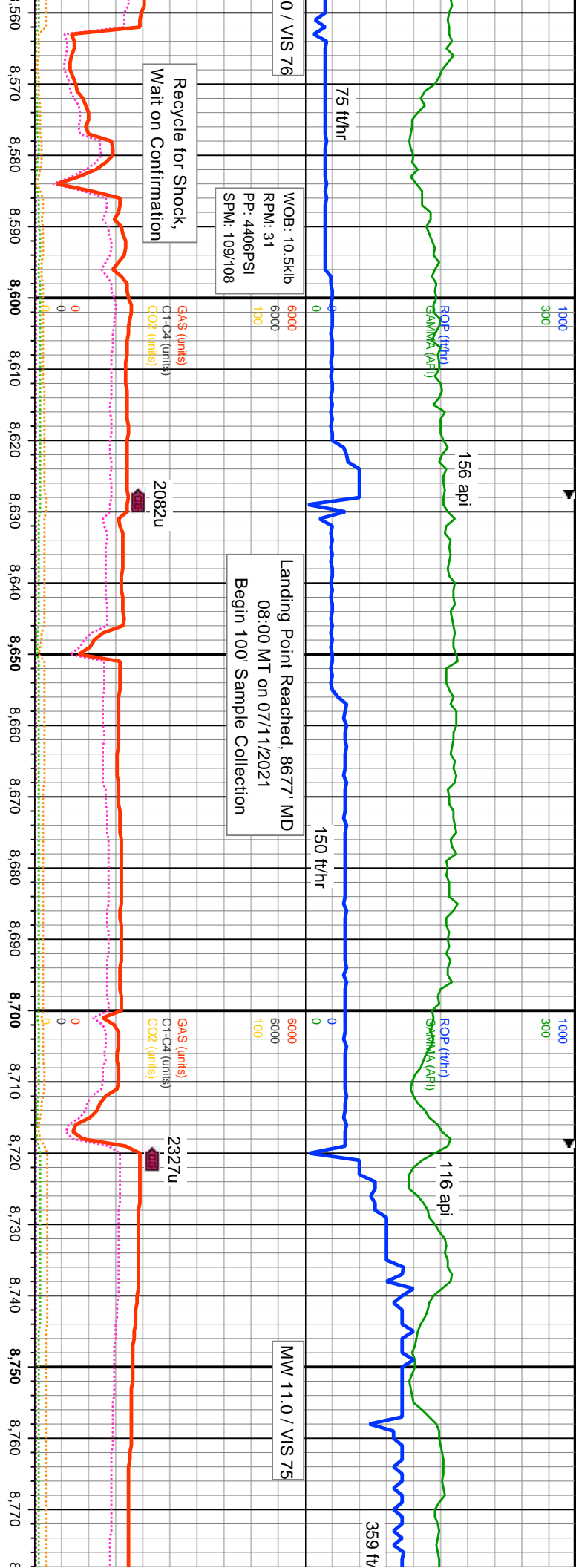
8200



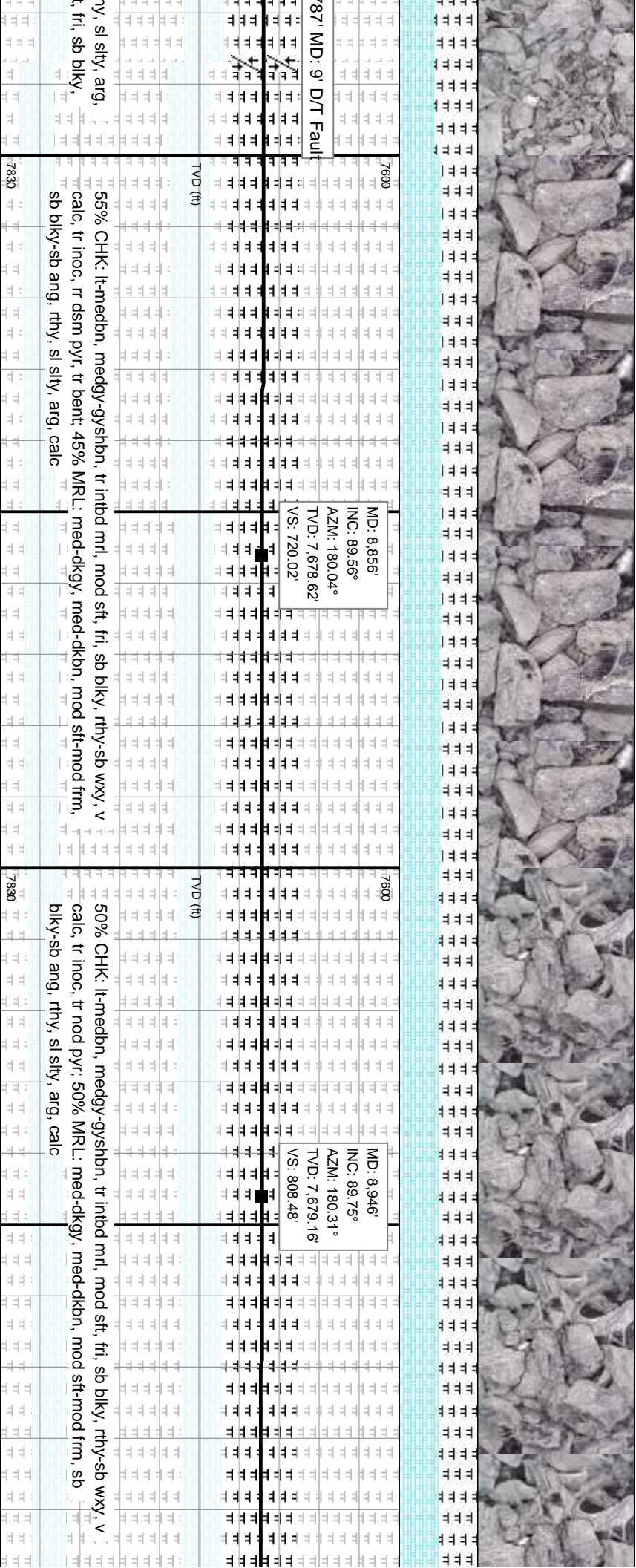
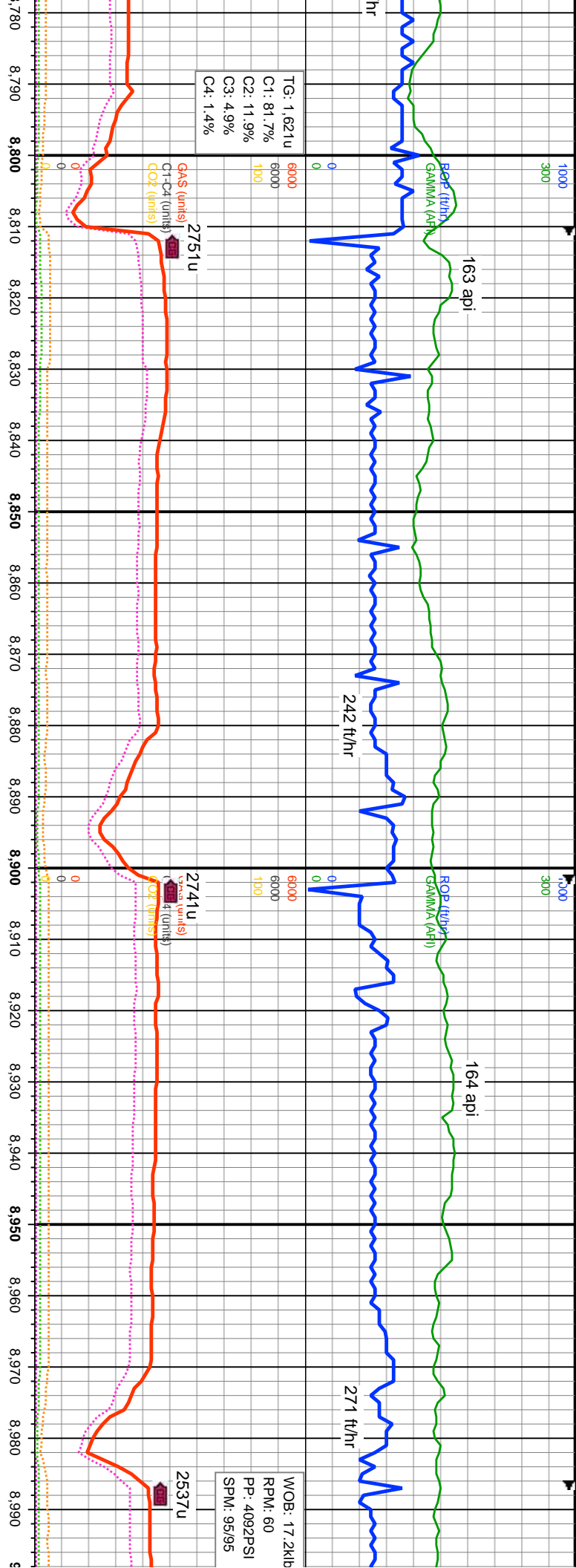


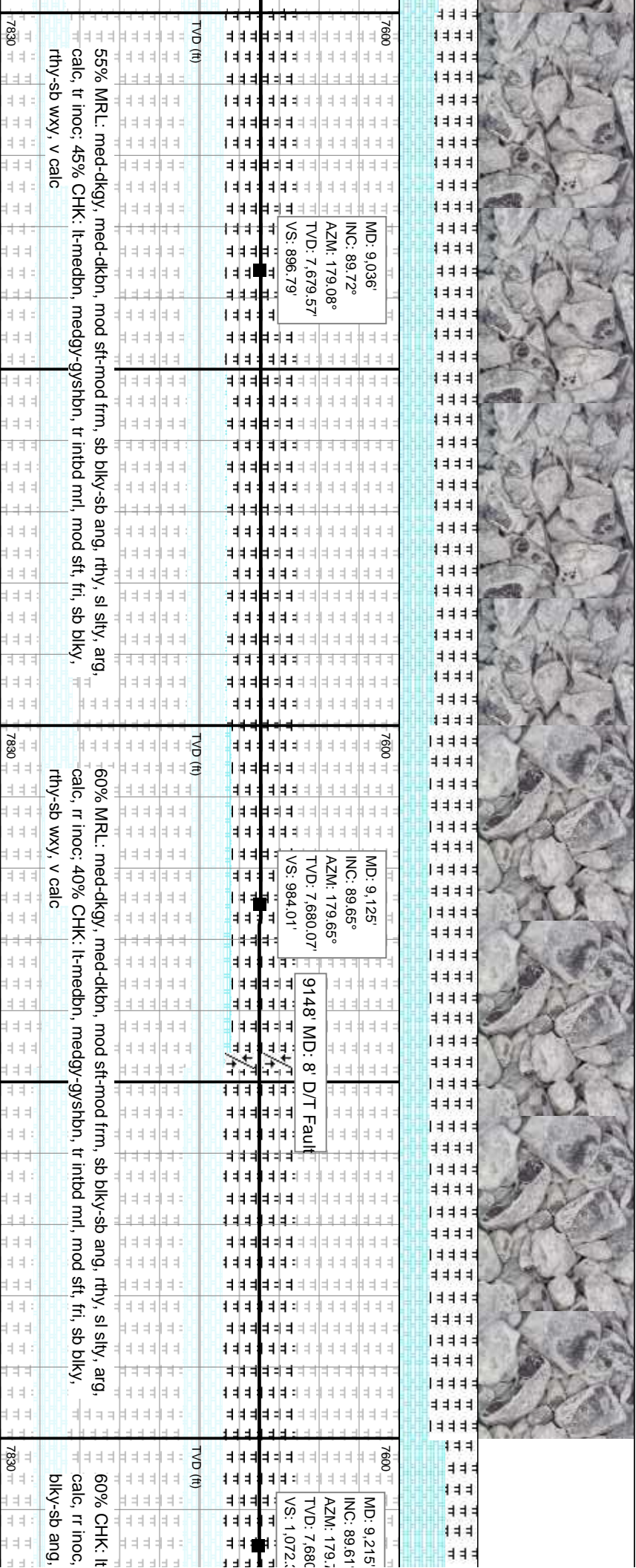
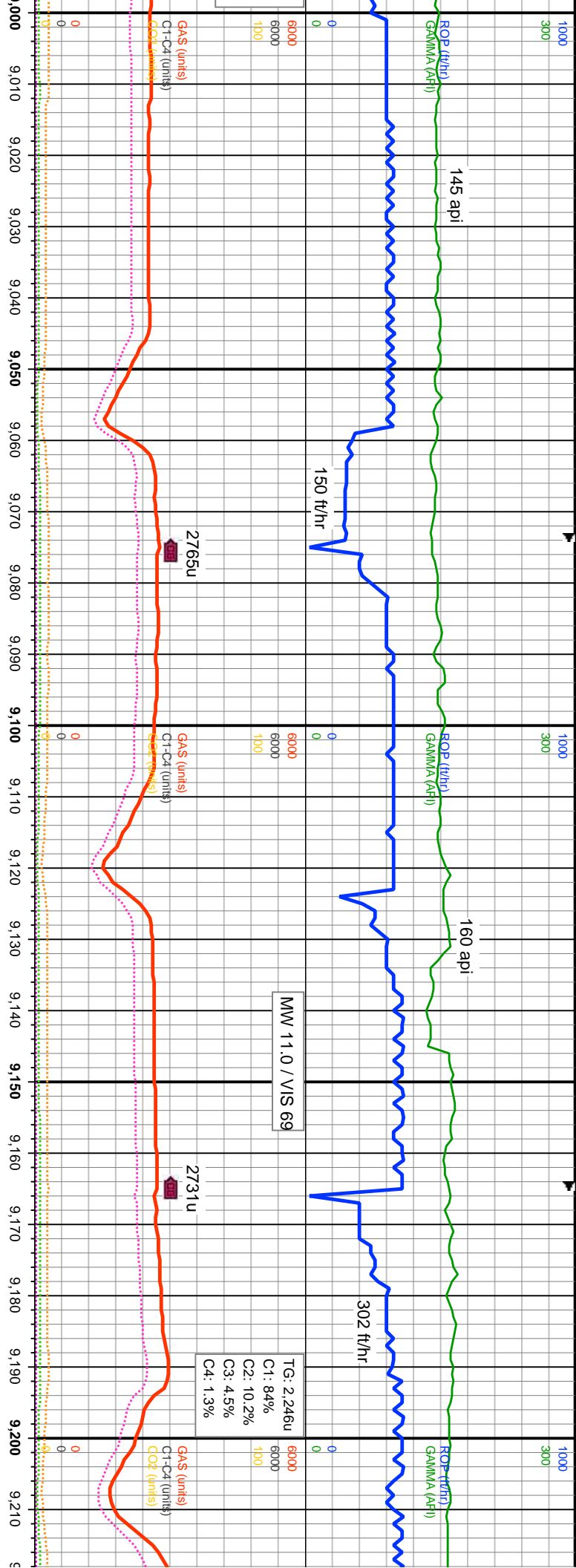


7300	MD: 8.409 INC: 75.22° AZM: 184.93° TVD: 7.639.8' VS: 280.32'	70% MRL: med-dkgy, ip blk, med-dkbn, mod sft-mod frm, sb blk-y-sb ang, rthy, sl stly, arg, calc, rr inoc, rr nod pyr, rr bent: 30% CHK: medbn-gyshbn, medgy, rr lbn, tr intbd mrl, mod sft, fr, sb blk-y, rthy-sb wxy, v calc
7300	MD: 8.498 INC: 79.5° AZM: 184.12° TVD: 7.659.27' VS: 366.62'	75% MRL: med-dkgy, ip blk, med-dkbn, mod sft-mod frm, sb blk-y-sb ang, rthy, sl stly, arg, calc, rr inoc, rr nod pyr, rr bent: 25% CHK: medbn-gyshbn, medgy, rr lbn, tr intbd mrl, mod sft, fr, sb blk-y, rthy-sb wxy, v calc
7300	MD: 8.498 INC: 79.5° AZM: 184.12° TVD: 7.659.27' VS: 366.62'	65% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blk-y-sb ang, rthy, sl stly, arg, calc, rr inoc, rr nod pyr, rr bent: 35% CHK: medbn-dry brn, medgy-gyshbn, tr intbd mrl, mod sft, fr, sb blk-y, rthy-sb wxy, v calc
7300	MD: 8.498 INC: 79.5° AZM: 184.12° TVD: 7.659.27' VS: 366.62'	60% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blk-y-sb ang, rthy, sl stly, arg, calc, rr inoc, rr nod pyr, rr bent: 30% CHK: medbn-gyshbn, medgy, rr lbn, tr intbd mrl, mod sft, fr, sb blk-y, rthy-sb wxy, v calc



MD: 8.588'	INC: 84.83°	AZM: 182.95°	TVD: 7.671.54'	VS: 455.03'	81
RL: med-dkgy, med-dkbn, mod					
sft mod frm, sb blkly-sb ang, rthy, sl stly, arg,					
inoc, rr nod pyr: 40% CHK:					
medbn-drtv brn, medgy-gyshbn, tr intbd mrl,					
mod sft, fr, sb blkly, rthy-sb wxy, v calc					
TVD SCALE CHANGE					
MD: 8.677' <td>INC: 88.65°</td> <td>AZM: 182.32°</td> <td>TVD: 7.676.6'</td> <td>VS: 542.96'</td> <td>82</td>	INC: 88.65°	AZM: 182.32°	TVD: 7.676.6'	VS: 542.96'	82
65% MRL: med-dkgy, med-dkbn, mod					
sft-mod frm, sb blkly-sb ang, rthy, sl stly, arg,					
calc, tr inoc, rr nod pyr: 35% CHK:					
medbn-drtv brn, medgy-gyshbn, tr intbd mrl,					
mod sft, fr, sb blkly, rthy-sb wxy, v calc					
MD: 8.767' <td>INC: 89.61° <td>AZM: 183.72° <td>TVD: 7.677.97' <td>VS: 632.12' <td>83</td> </td></td></td></td>	INC: 89.61° <td>AZM: 183.72° <td>TVD: 7.677.97' <td>VS: 632.12' <td>83</td> </td></td></td>	AZM: 183.72° <td>TVD: 7.677.97' <td>VS: 632.12' <td>83</td> </td></td>	TVD: 7.677.97' <td>VS: 632.12' <td>83</td> </td>	VS: 632.12' <td>83</td>	83
55% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blkly-sb ang, rth					
calc, tr inoc: 45% CHK: lt-medbn, medgy-gyshbn, tr intbd mrl, mod sft					
rthy-sb wxy, v calc					





MD: 9.036'  
INC: 89.72°  
AZM: 179.08°  
TVD: 7.679.57'  
VS: 896.79'

MD: 9.125'  
INC: 89.65°  
AZM: 179.65°  
TVD: 7.680.07'  
VS: 984.01'

9148' MD: 8' D/T Fault

MD: 9.215'  
INC: 89.61°  
AZM: 179.1°  
TVD: 7.688°  
VS: 1.072.1°

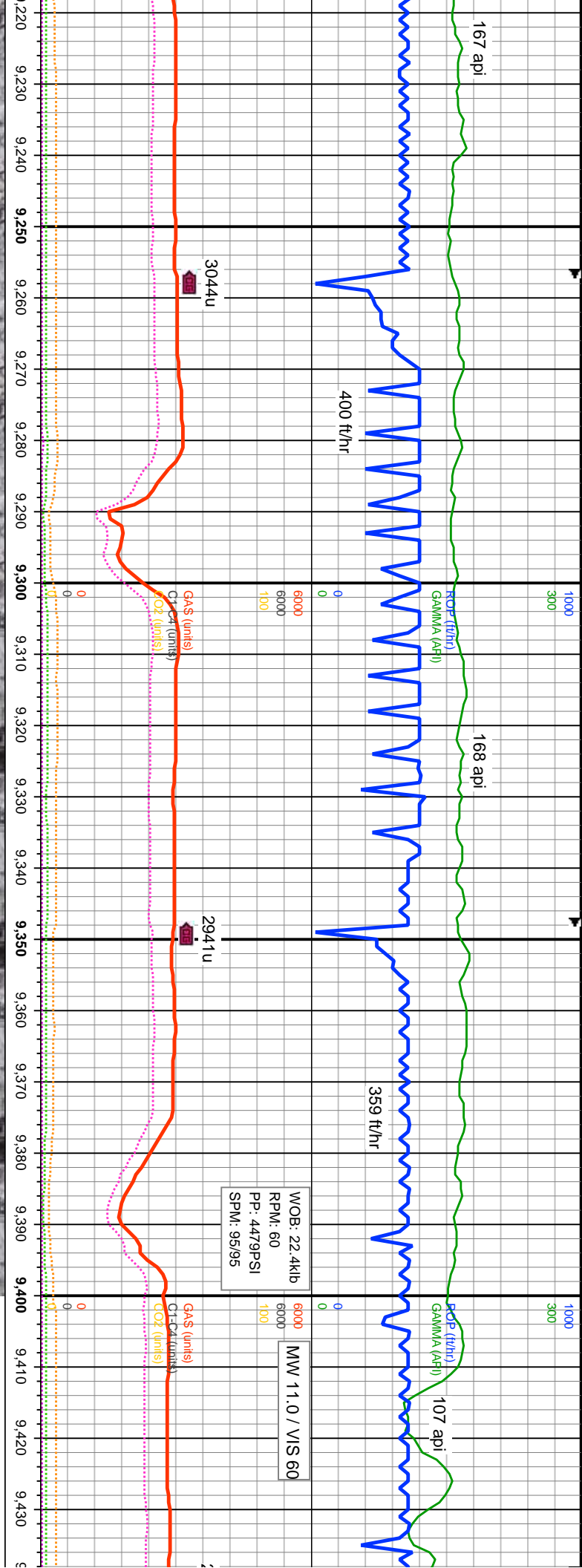
55% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blk-y-sb ang, rthy, sl slty, arg, calc, tr inoc; 45% CHK: lt-medbn, medgy-gyshbn, tr intbd mrl, mod sft, fri, sb blk-y, rthy-sb wxy, v calc

60% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blk-y-sb ang, rthy, sl slty, arg, calc, tr inoc; 40% CHK: lt-medbn, medgy-gyshbn, tr intbd mrl, mod sft, fri, sb blk-y, rthy-sb wxy, v calc

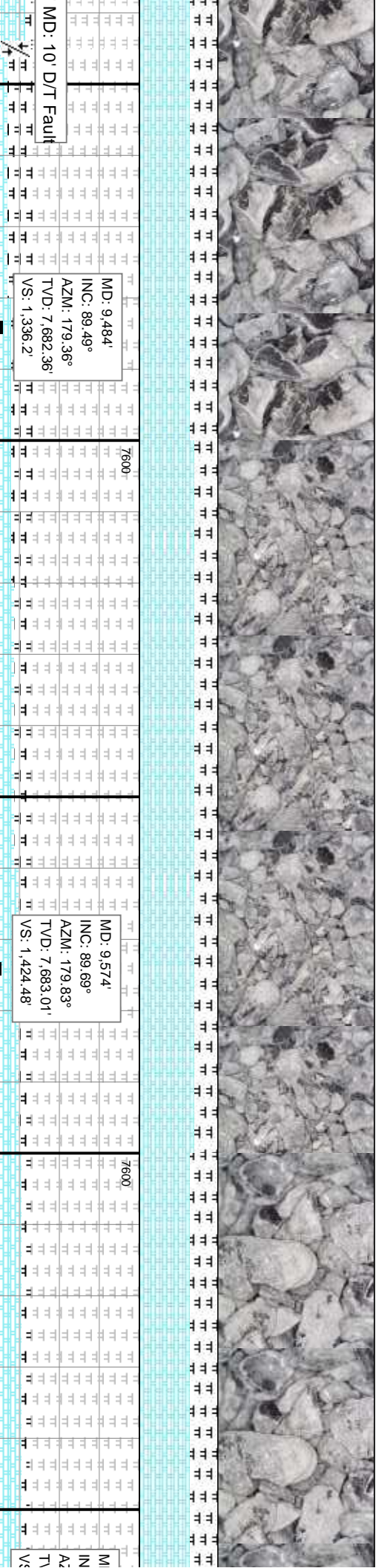
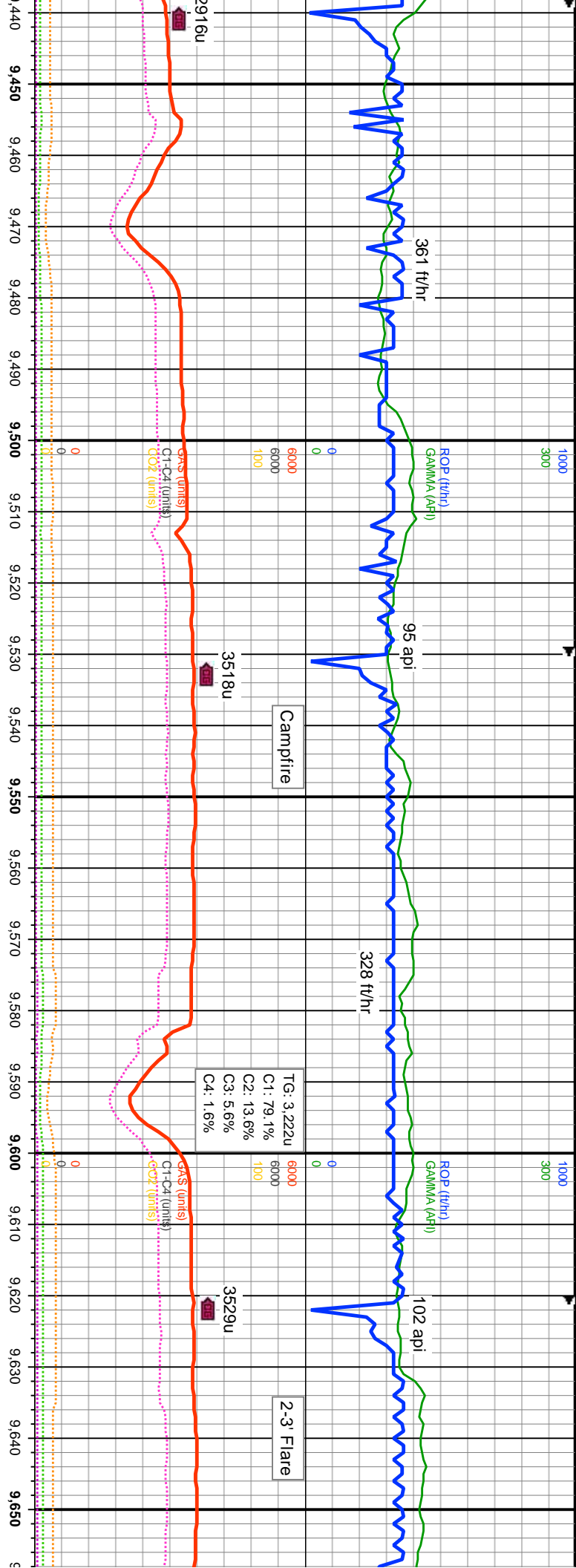
60% CHK: lt-medbn, medgy-gyshbn, tr intbd mrl, mod sft, fri, sb blk-y, rthy-sb wxy, v calc

TVD (ft)

7600  
7800



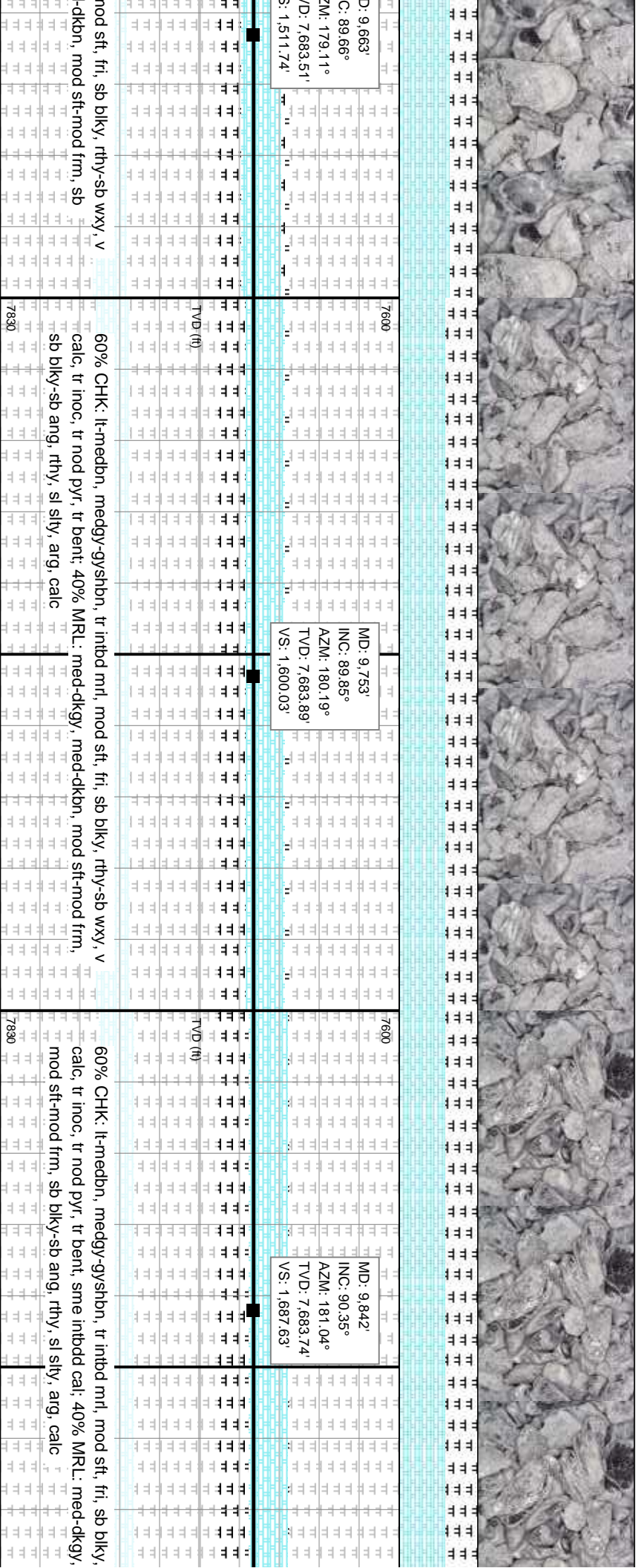
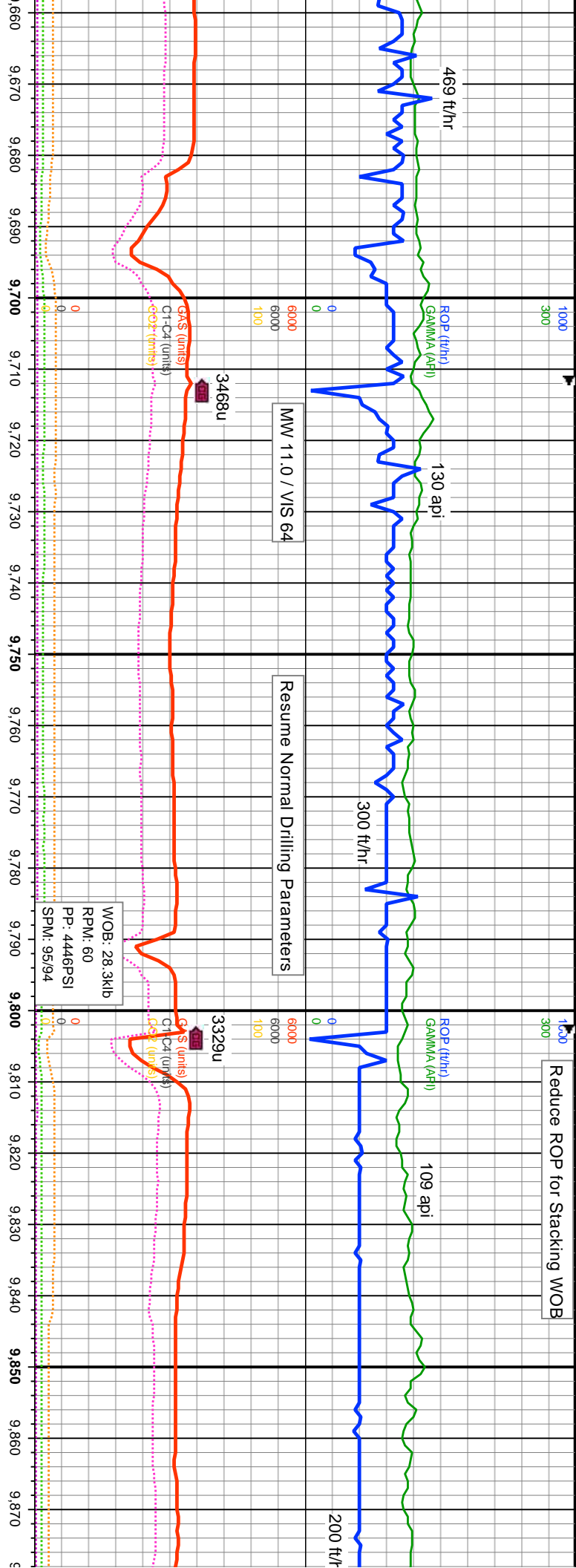
MD (ft)	INC. (°)	AZM. (°)	TVD (ft)	VS. (ft)	Remarks
7600	9.304°	89.92°	7.681.02'	1.159.64'	MD: 9.304° INC: 89.92° AZM: 179.6° TVD: 7.681.02' VS: 1.159.64'
7830					60% CHK: It-medbn, medgy-gyshbn, tr intbd mrl, mod sft, fri, sb blkly, rhy-sb wxy, v calc, v rr inoc, rr nod pyr, tr bent; 40% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blkly-sb ang, rhy, sl slty, arg, calc
7600	9.394°	89.44°	7.681.52'	1.247.94'	MD: 9.394° INC: 89.44° AZM: 179.7° TVD: 7.681.52' VS: 1.247.94'
9411'					MD: 40' U/T Fault
9445					65% CHK: It-medbn, medgy-gyshbn, tr intbd mrl, mod sft, fri, sb blkly, rhy-sb wxy, v calc, v rr inoc, rr nod pyr, tr bent; 40% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blkly-sb ang, rhy, sl slty, arg, calc



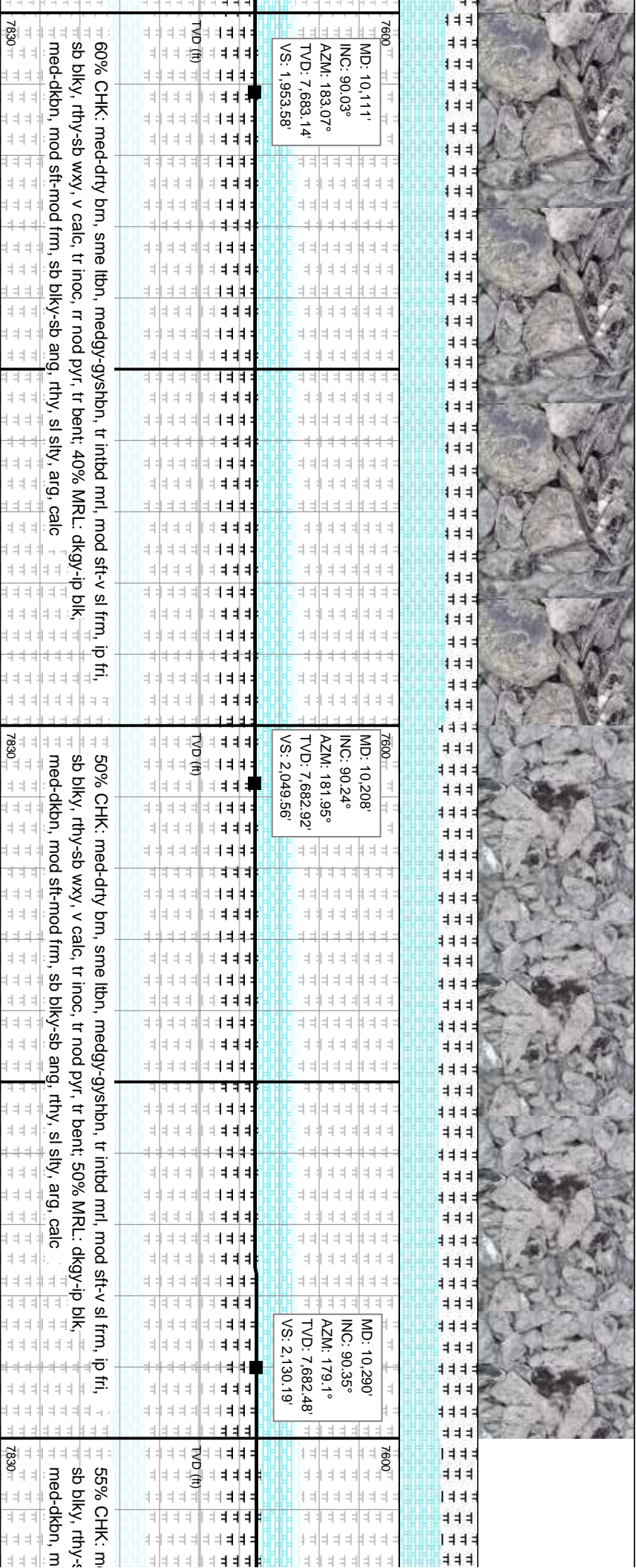
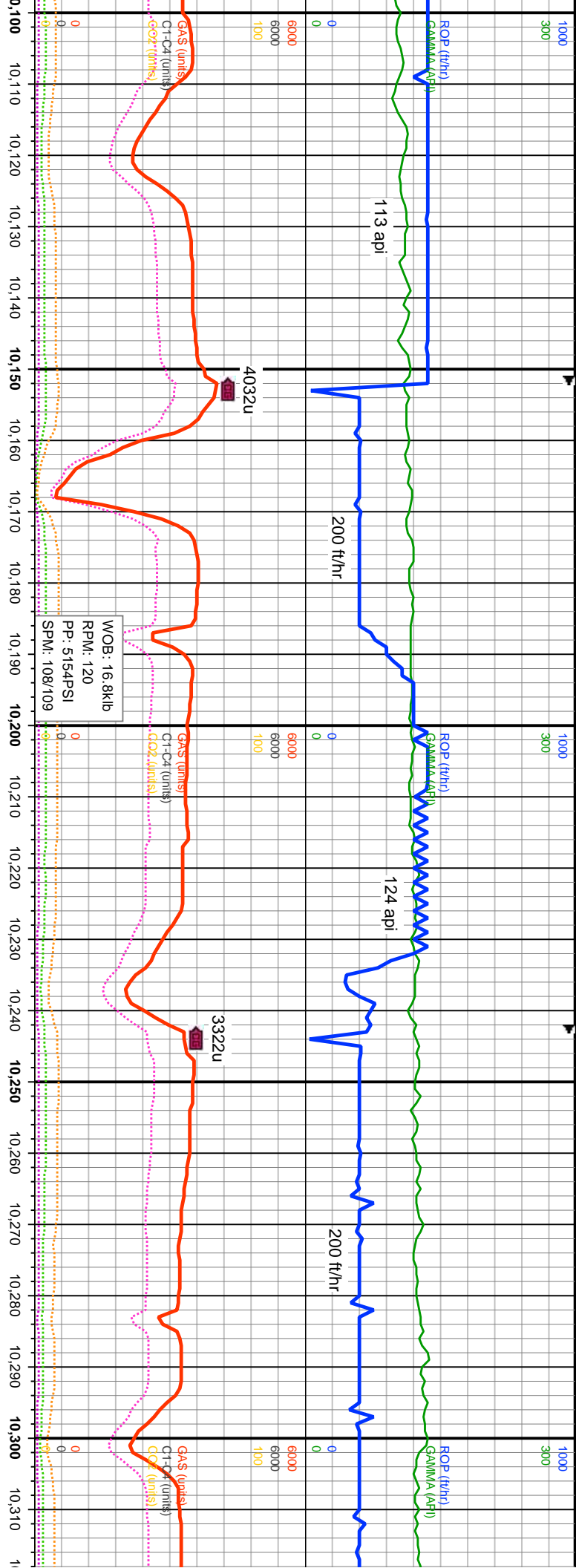
MD: 10' D/T Fault	MD: 9.484'	MD: 9.574'	MD: 9.683.01'
INC: 89.49°	INC: 89.69°	INC: 89.69°	INC: 89.69°
AZM: 179.36°	AZM: 179.83°	AZM: 179.83°	AZM: 179.83°
TVD: 7.682.36'	TVD: 7.683.01'	TVD: 7.683.01'	TVD: 7.683.01'
VS: 1.336.2	VS: 1.424.48	VS: 1.424.48	VS: 1.424.48

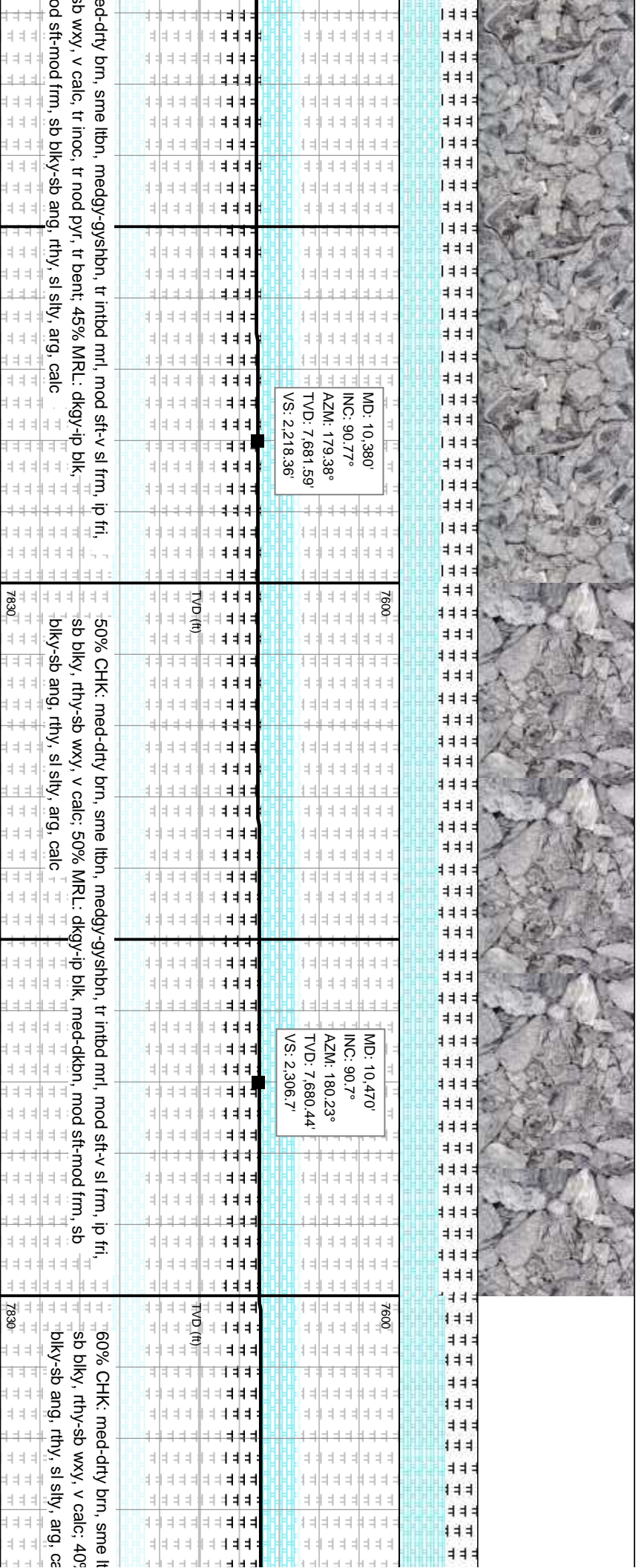
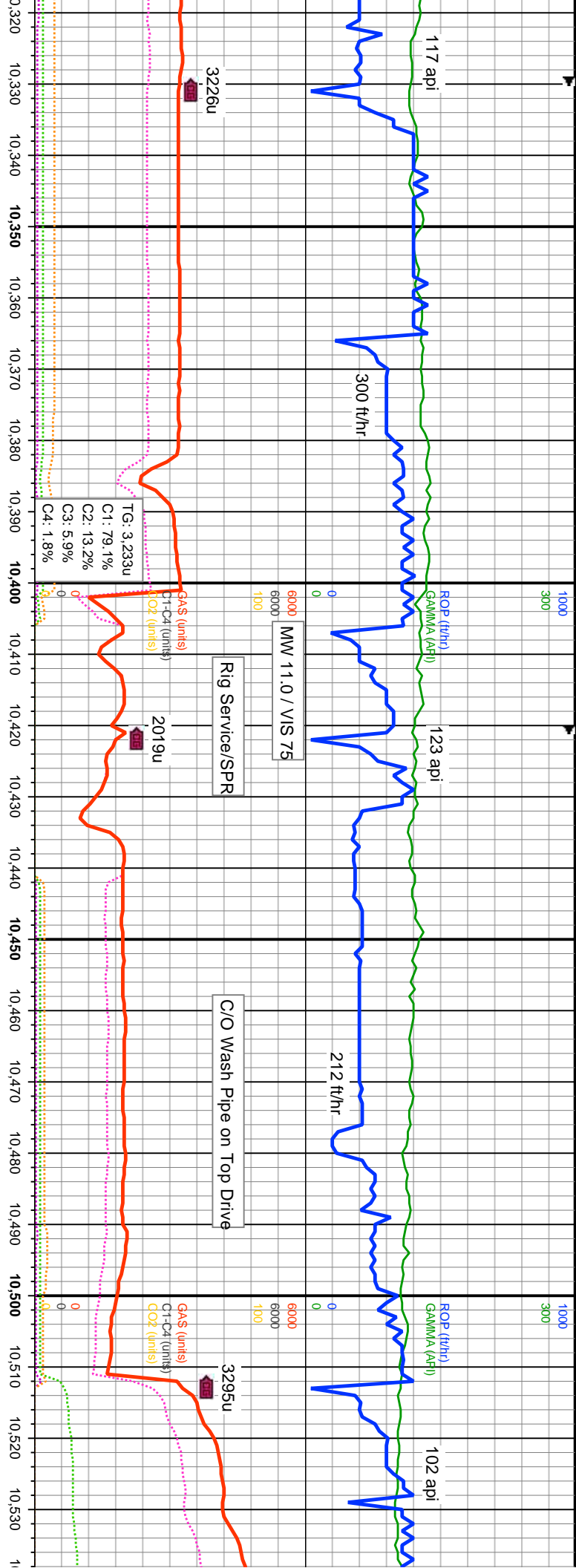
70% CHK: lt-medbn, medgy-gyshbn, tr intbd mrl, mod sft, fri, sb blkly, rhy-sb wxy, v  
 calc, tr inc, tr nod pyr. 30% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blkly-sb ang, rhy, sl sily, arg, calc

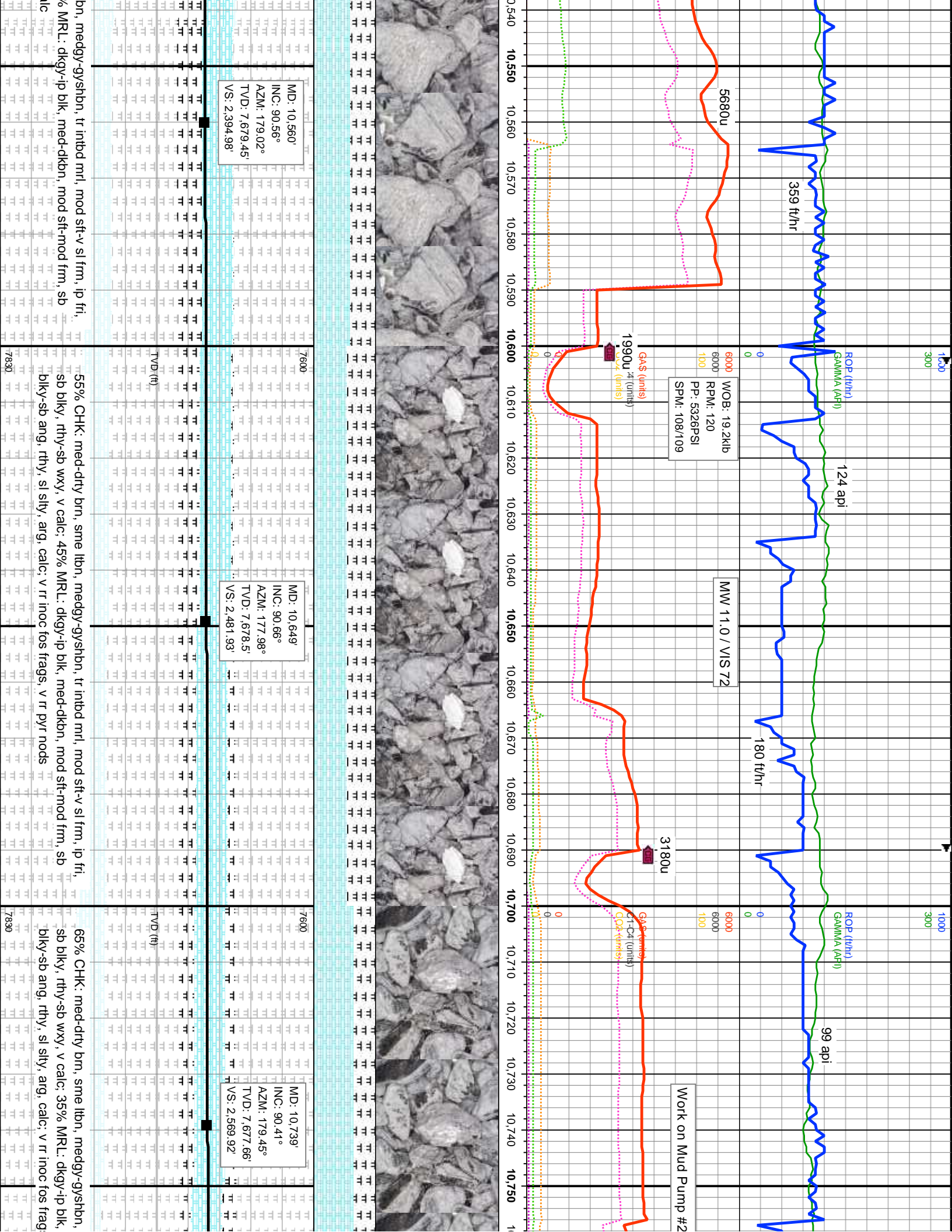
65% CHK: lt-medbn, medgy-gyshbn, tr intbd mrl, r...  
 calc, tr inc, tr nod pyr. 35% MRL: med-dkgy, medi...











MD: 10,560'  
 INC: 90.56°  
 AZM: 179.02°  
 TVD: 7,679.45'  
 VS: 2,394.98'

MD: 10,649'  
 INC: 90.66°  
 AZM: 177.98°  
 TVD: 7,678.5'  
 VS: 2,481.93'

MD: 10,739'  
 INC: 90.41°  
 AZM: 179.45°  
 TVD: 7,677.66'  
 VS: 2,569.92'

ROP (ft/hr)  
 GAMMA (API)  
 WOB: 19.2klb  
 RPM: 120  
 PP: 5326PSI  
 SPM: 108/109

MW 11.0 / VIS 72

ROP (ft/hr)  
 GAMMA (API)  
 WOB: 6000  
 RPM: 6000  
 PP: 100  
 SPM: 100

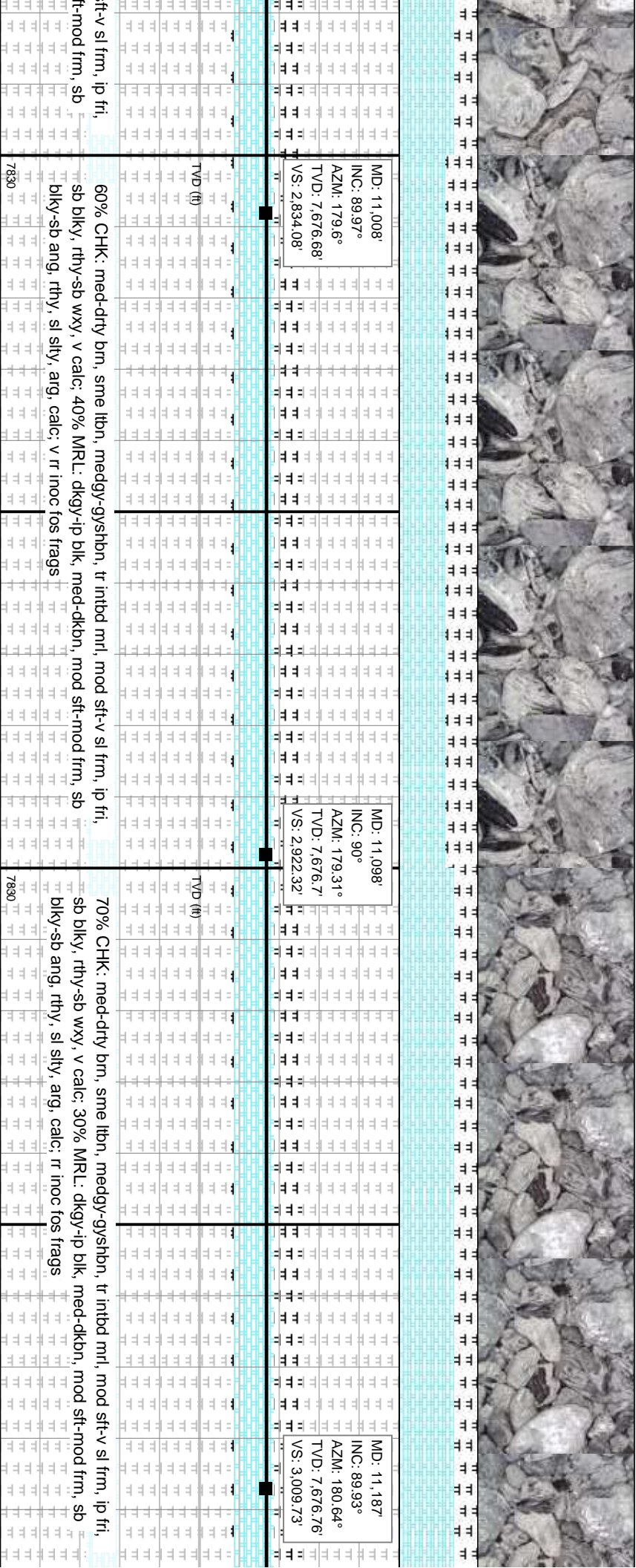
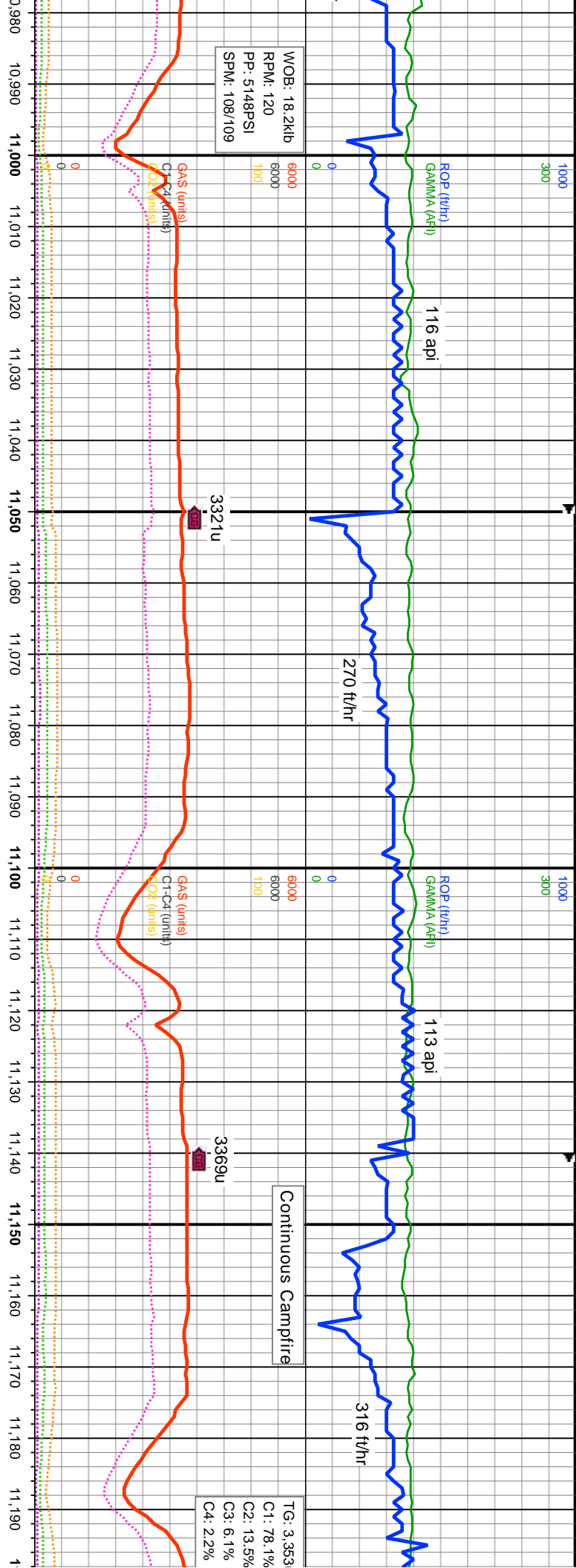
Work on Mud Pump #2

bn, medgy-gyshbn, tr intbd mrl, mod stf-v sl frm, ip fri,  
 % MRL: dkgy-ip blk, med-dkbn, mod stf-mod frm, sb  
 % MRL: dkgy-ip blk, med-dkbn, mod stf-mod frm, sb  
 % MRL: dkgy-ip blk, med-dkbn, mod stf-mod frm, sb

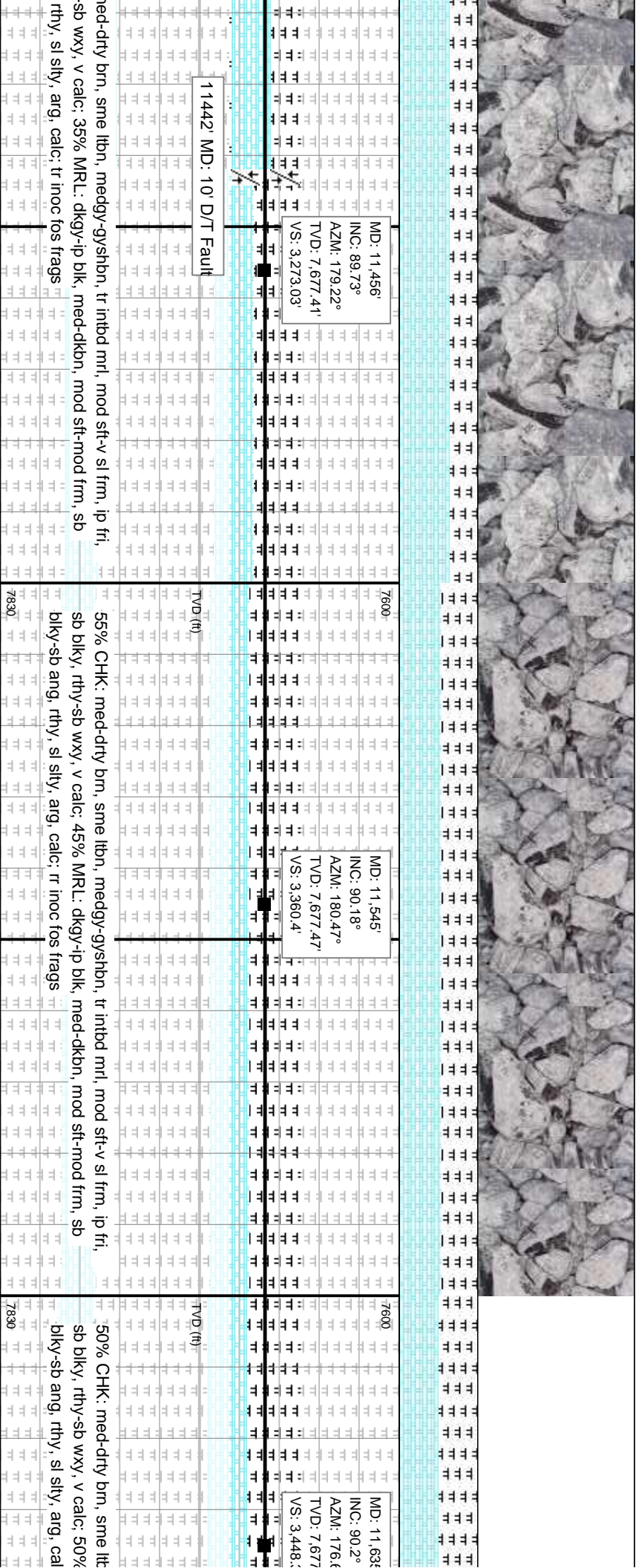
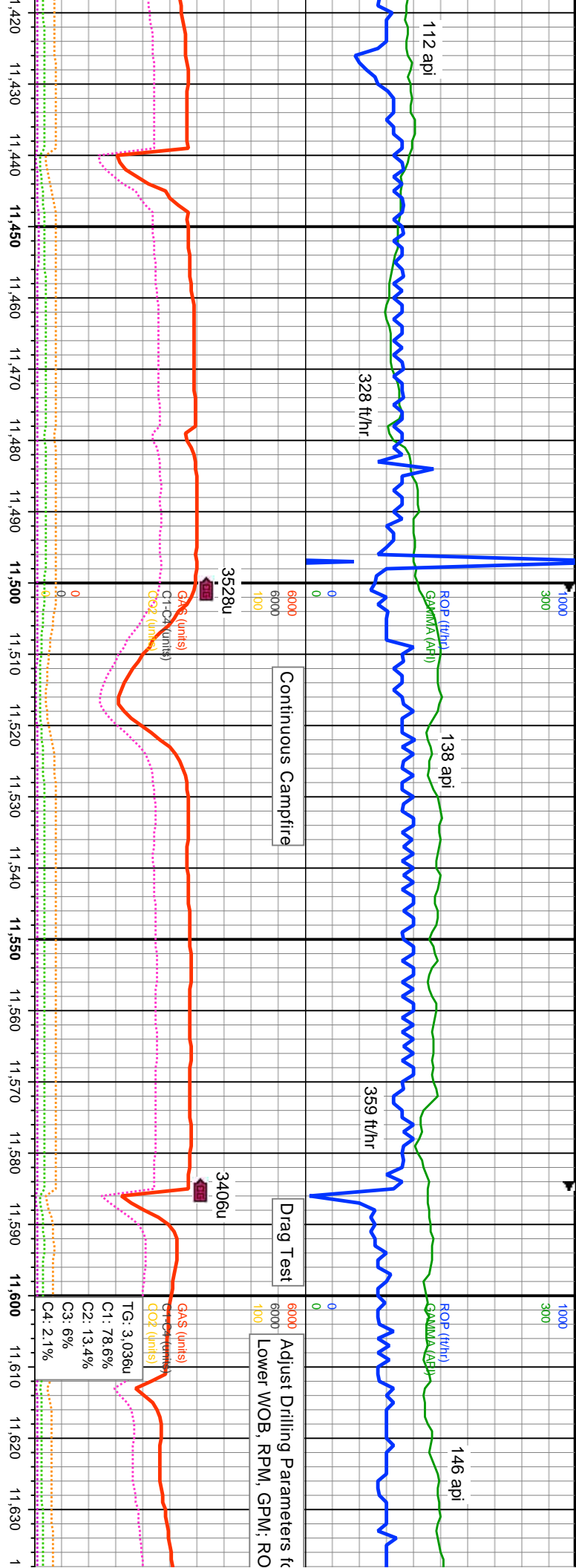
55% CHK: med-dry brn, sme lbn, medgy-gyshbn, tr intbd mrl, mod stf-v sl frm, ip fri,  
 sb blkly, rthy-sb wxy, v calc: 45% MRL: dkgy-ip blk, med-dkbn, mod stf-mod frm, sb  
 blkly-sb ang, rthy, sl slty, arg, calc: v rr inoc fos frags, v rr pyr nods

65% CHK: med-dry brn, sme lbn, medgy-gyshbn,  
 sb blkly, rthy-sb wxy, v calc: 35% MRL: dkgy-ip blk,  
 blkly-sb ang, rthy, sl slty, arg, calc: v rr inoc fos frag







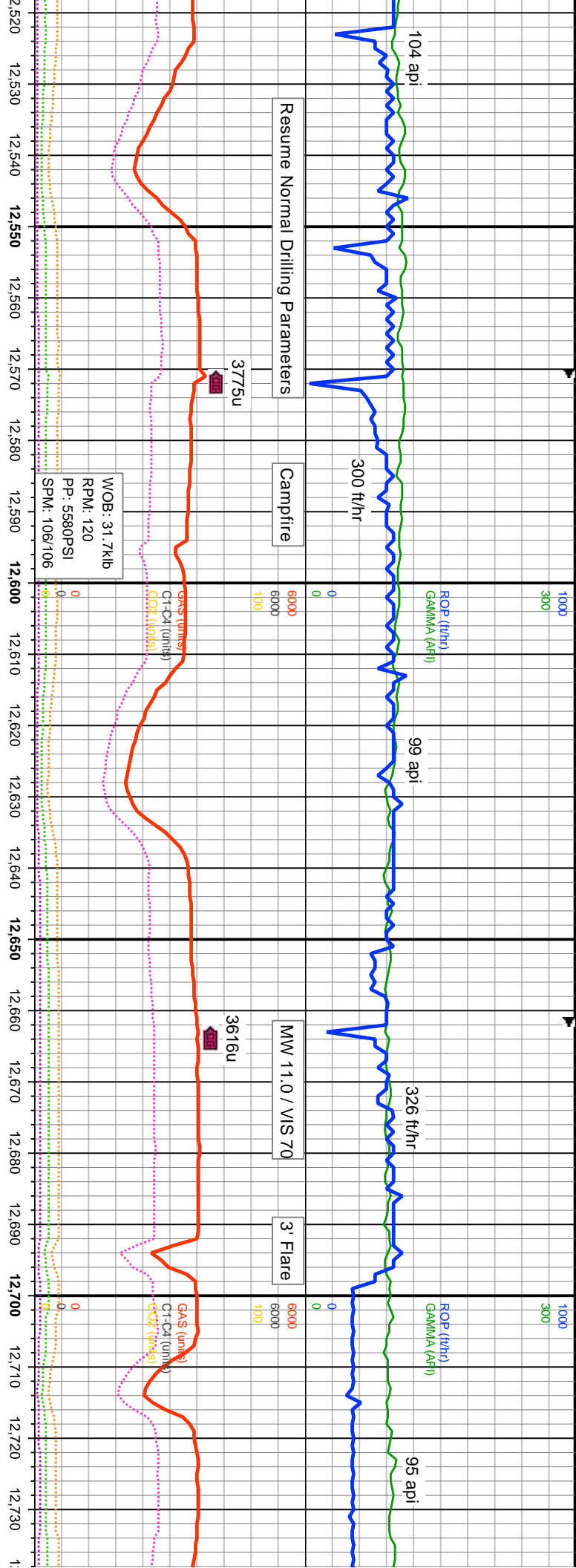












MD: 12.530'  
 INC: 89.67°  
 AZM: 179.71°  
 TVD: 7.678.86'  
 VS: 4.324.45'

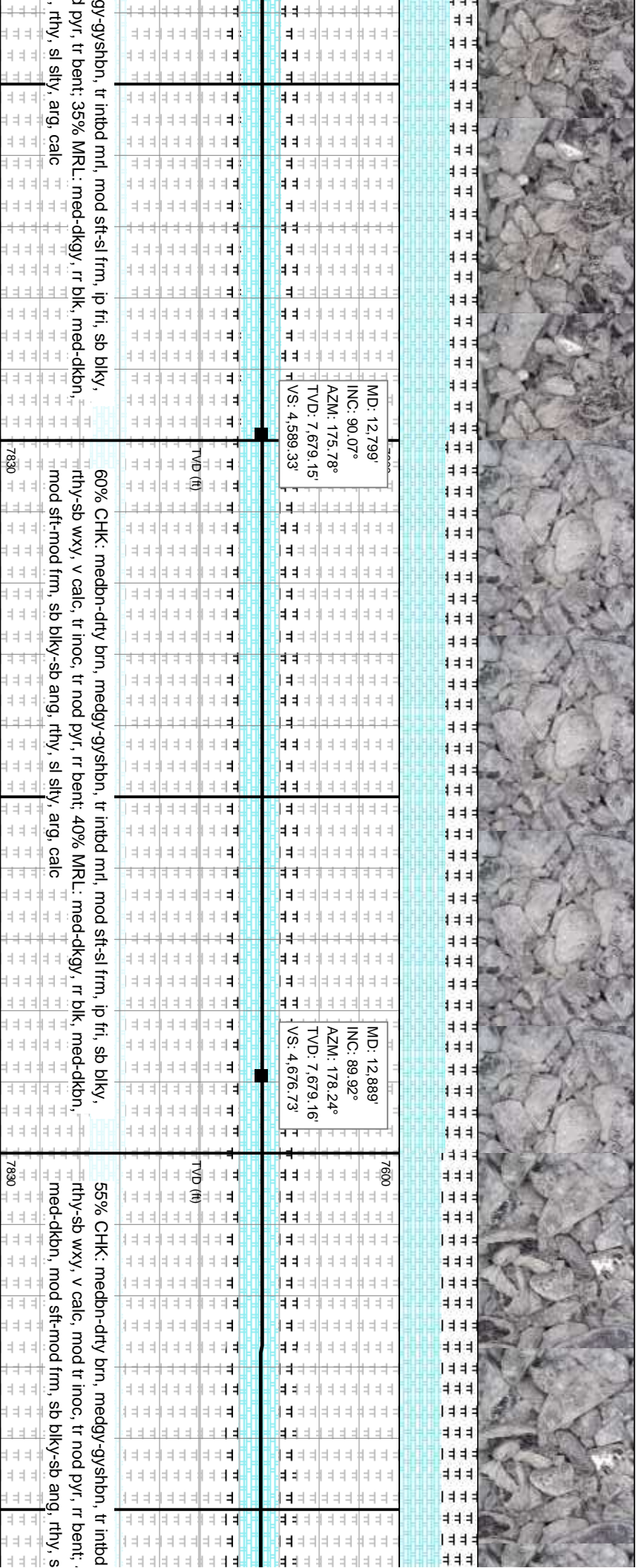
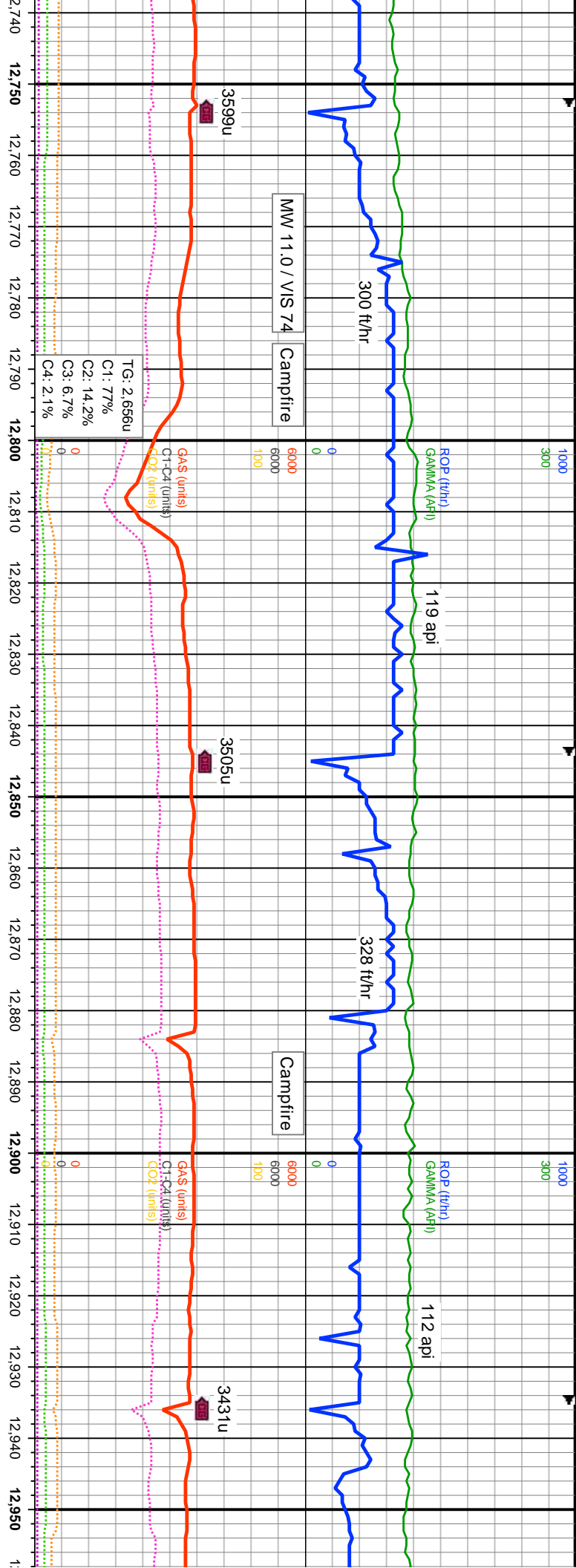
MD: 12.620'  
 INC: 90.12°  
 AZM: 182.43°  
 TVD: 7.679.03'  
 VS: 4.413.14'

MD: 12.710'  
 INC: 89.83°  
 AZM: 182.61°  
 TVD: 7.679.07'  
 VS: 4.502.2'

bedn-dry brn, medgy-gyshbn, tr intbd mrl, mod sft-v sl frm, ip fri, sb blkly.  
 calc, tr inoc, tr nod pyr: 40% MRL: med-dkgy, rr blk, med-dkbn, mod  
 sb blkly-sb ang, rthy, sl slty, arg, calc

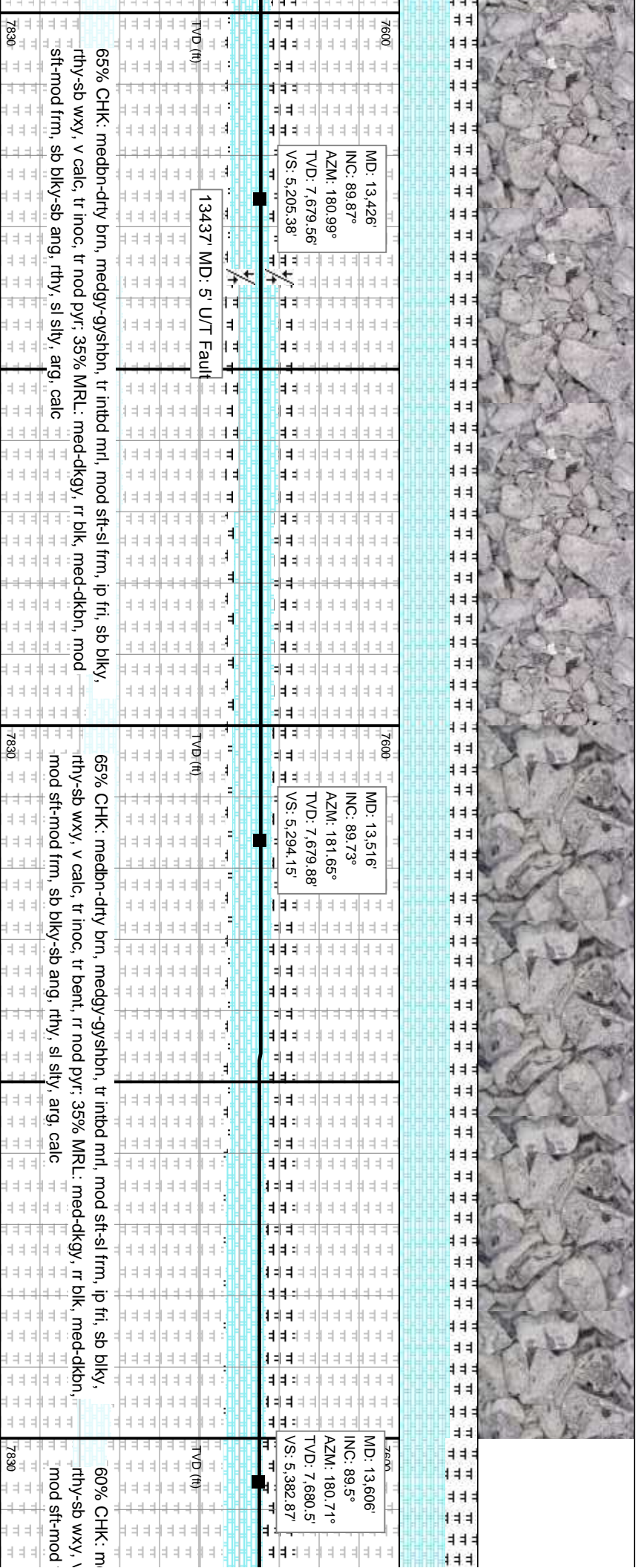
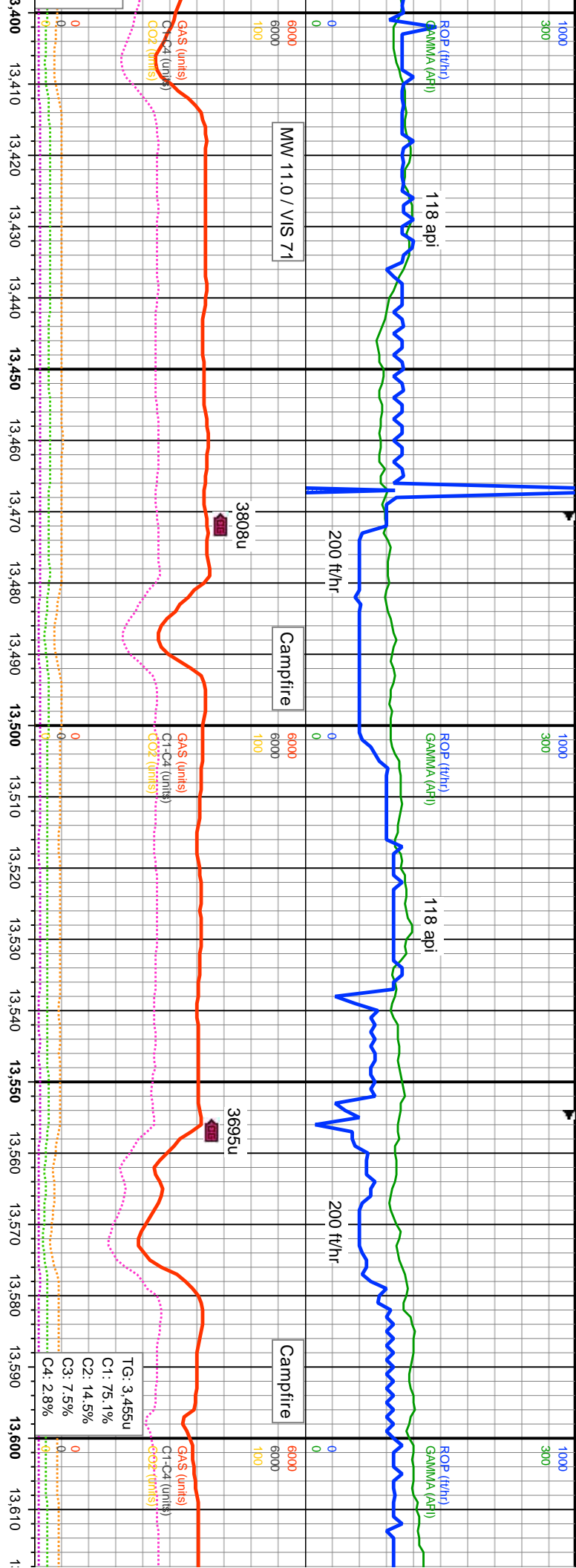
65% CHK: medn-dry brn, medgy-gyshbn, tr intbd mrl, mod sft-sl frm, ip fri, sb blkly,  
 rthy-sb wxy, v calc, tr inoc: 35% MRL: med-dkgy, rr blk, med-dkbn, mod sft-mod frm,  
 sb blkly-sb ang, rthy, sl slty, arg, calc

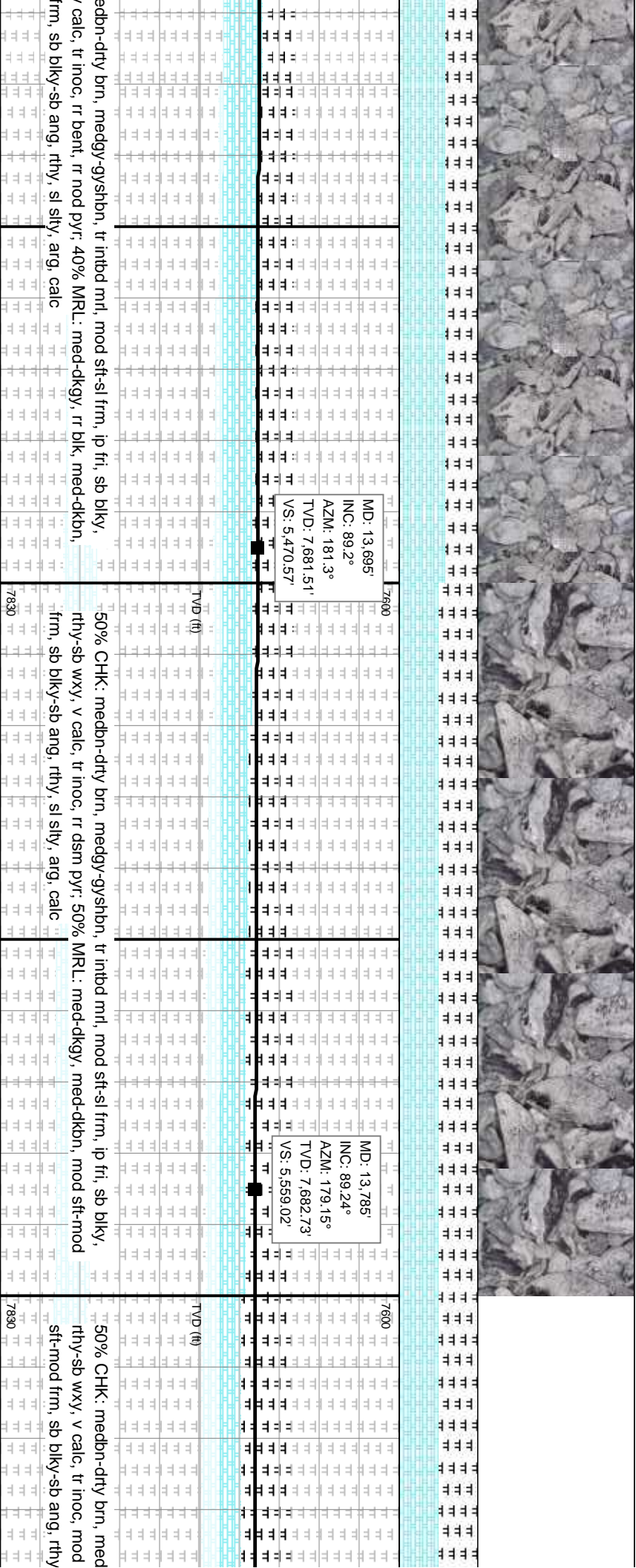
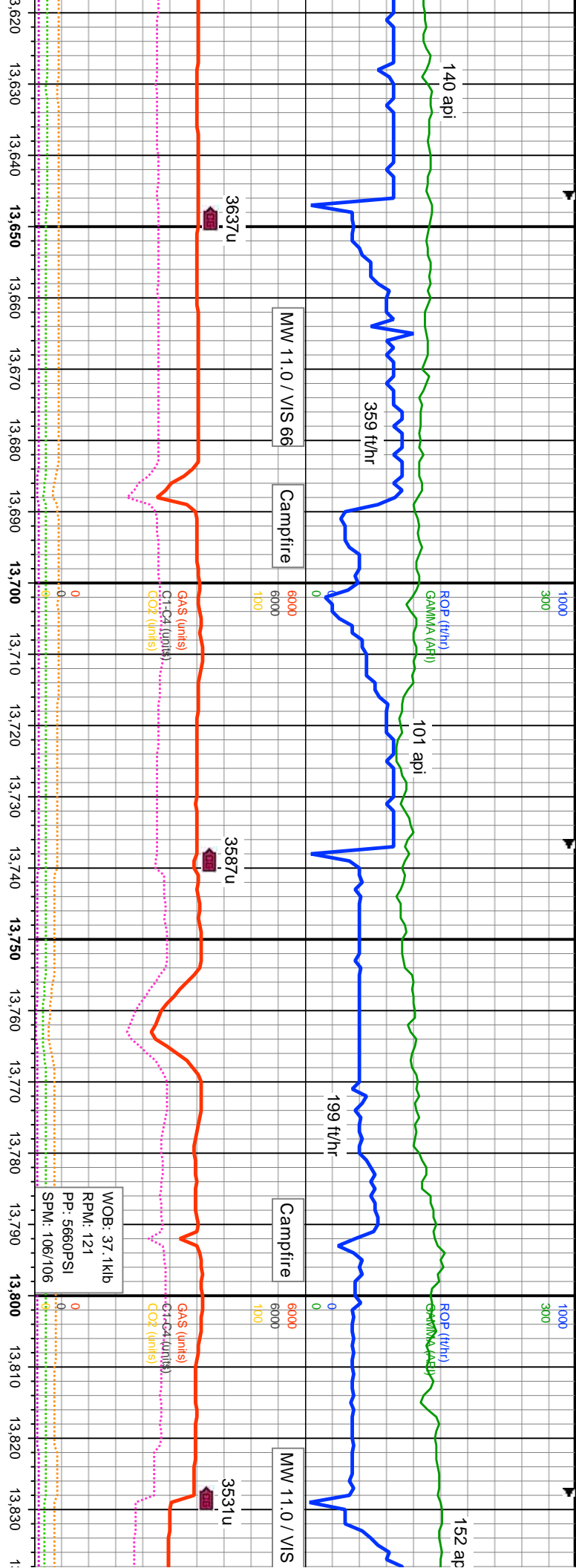
65% CHK: medn-dry brn, medgy-gyshbn, tr intbd mrl, mod sft-sl frm, ip fri, sb blkly,  
 rthy-sb wxy, v calc, tr inoc: 35% MRL: med-dkgy, rr blk, med-dkbn, mod sft-mod frm,  
 sb blkly-sb ang, rthy, sl slty, arg, calc

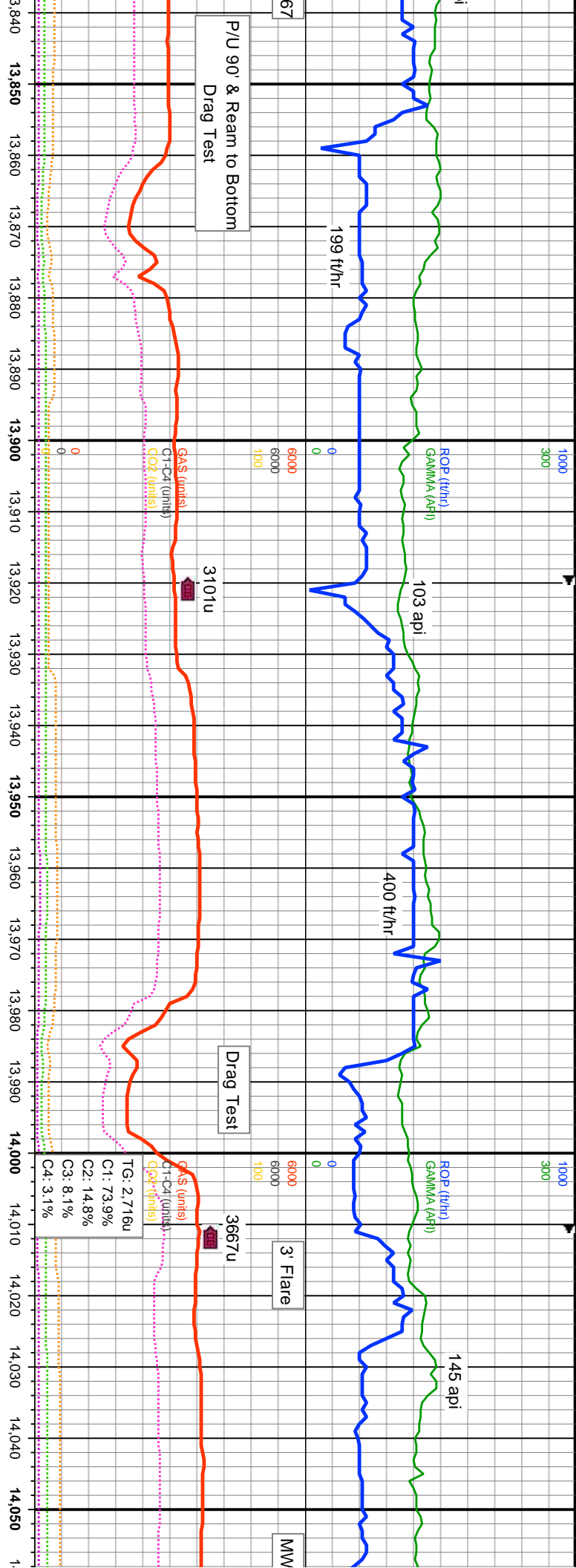




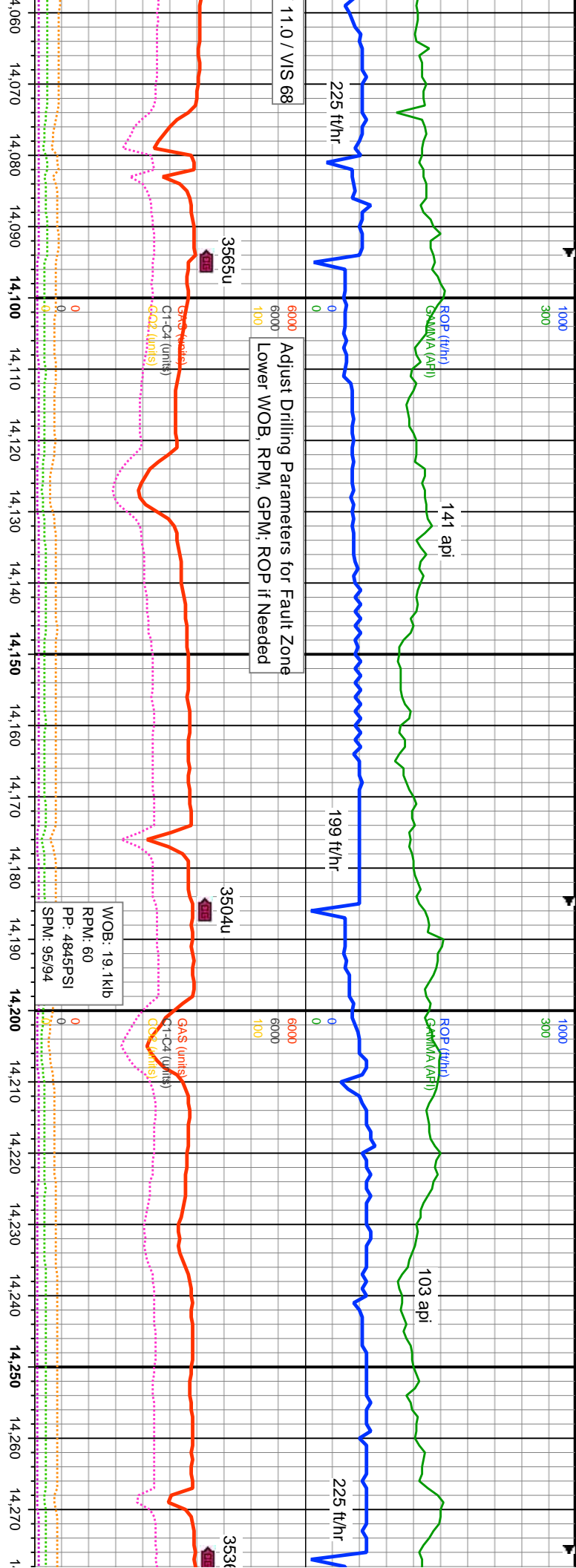




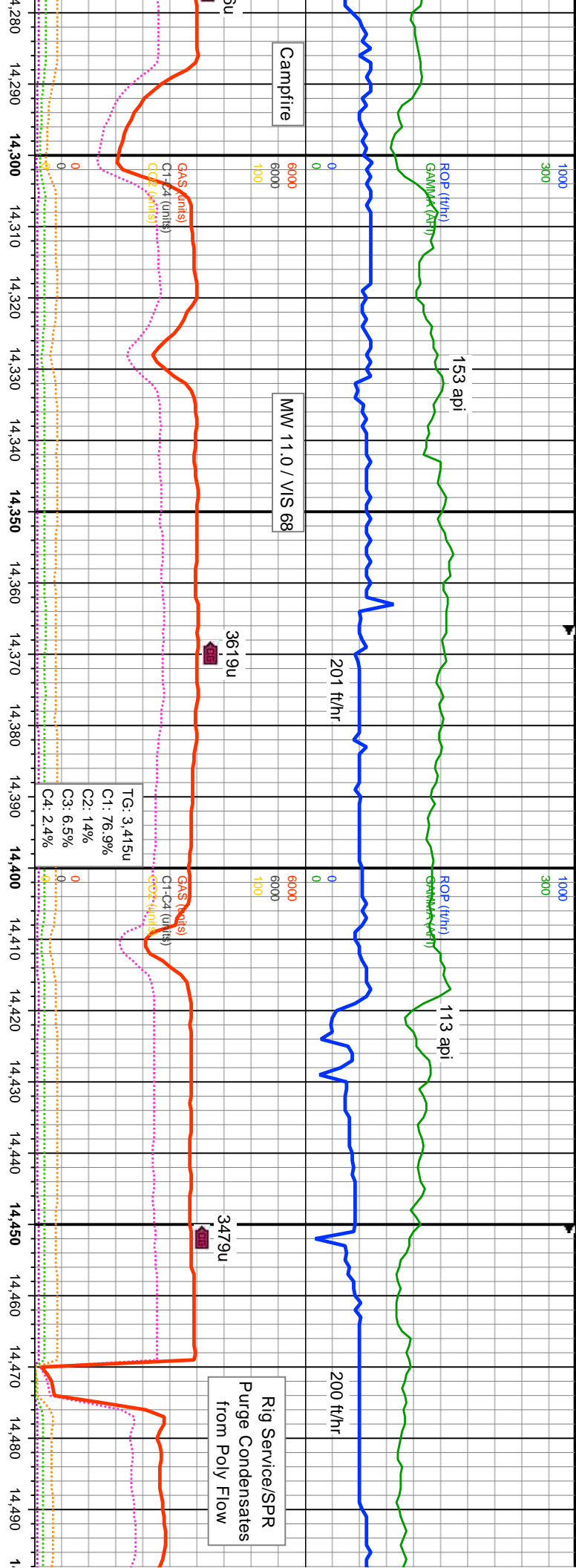




MD	INC	AZM	TVD	VS	Remarks
13,875	89.58°	179.85°	7,683.66'	5.647, 27'	mod sft-sl frm, ip fri, sb blk, mod pvf, 50% MRL, med-dkgy, med-dkbn, mod sl sty, arg, calc
13,964	89.64°	178.93°	7,684.27'	5.734, 5'	60% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blk-sb ang, rthy, sl sty, arg, calc, tr inoc, tr nod pvr, 40% CHK: medbn-dty brn, medgy-mot gyshbn, tr intbd mrl, mod sft-sl frm, ip fri, sb blk, rthy-sb wxy, v calc
13,986	MD: 8	U/T Fault			
14,053	89.35°	180.33°	7,685.0'	5.821, 81'	50% MRL: med-dkgy, med-dkbn, mod sft-mod frm, calc, tr inoc, tr nod pvr, rr bent: 50% CHK: medbn intbd mrl, mod sft-sl frm, ip fri, sb blk, rthy-sb wxy



1. sb blyk-sb ang, rthy, sl sily, arg, dtry brn, medgy-mot gysbhn, tr	7600	MD: 14.143 INC: 89.57° AZM: 177.92° TVD: 7.686.9' VS: 5.909.93'	14128' MD: 12' U/T Fault	7600	MD: 14.233' INC: 89.62° AZM: 177.44° TVD: 7.686.53' VS: 5.997.58'	60% CHK: medbn-dty brn, medgy-mot gysbhn, tr inbnd nrl, mod sft-s frn, ip fir, sb blyk, rthy-sb wxy, v calc, tr inoc, tr nod pyr: 45%, MRL: med-dkgy, med-dkbn, mod sft-mod frn, sb blyk-sb ang, rthy, sl sily, arg, calc	7600	60% CHK: medbn-dty brn, medgy-mot gysbhn, tr inbnd nrl, mod sft-s frn, ip fir, sb blyk, rthy-sb wxy, v calc, tr inoc, tr nod pyr: 45%, MRL: med-dkgy, med-dkbn, mod sft-mod frn, sb blyk-sb ang, rthy, sl sily, arg, calc	7600
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Depth (ft)	ROP (ft/hr)	GAS (ml/s)	C1-C4 (units)	Notes
14,280	~1000	~100	~100	153 api
14,290	~1000	~100	~100	
14,300	~1000	~100	~100	
14,310	~1000	~100	~100	
14,320	~1000	~100	~100	
14,330	~1000	~100	~100	
14,340	~1000	~100	~100	
14,350	~1000	~100	~100	
14,360	~1000	~100	~100	
14,370	~1000	~100	~100	3619u
14,380	~1000	~100	~100	
14,390	~1000	~100	~100	
14,400	~1000	~100	~100	
14,410	~1000	~100	~100	
14,420	~1000	~100	~100	
14,430	~1000	~100	~100	
14,440	~1000	~100	~100	
14,450	~1000	~100	~100	
14,460	~1000	~100	~100	
14,470	~1000	~100	~100	
14,480	~1000	~100	~100	
14,490	~1000	~100	~100	

Campfire

MW 11.0 / VIS 68

3619u

201 ft/hr

3479u

200 ft/hr

Rig Service/SPR  
Purge Condensates  
from Poly Flow

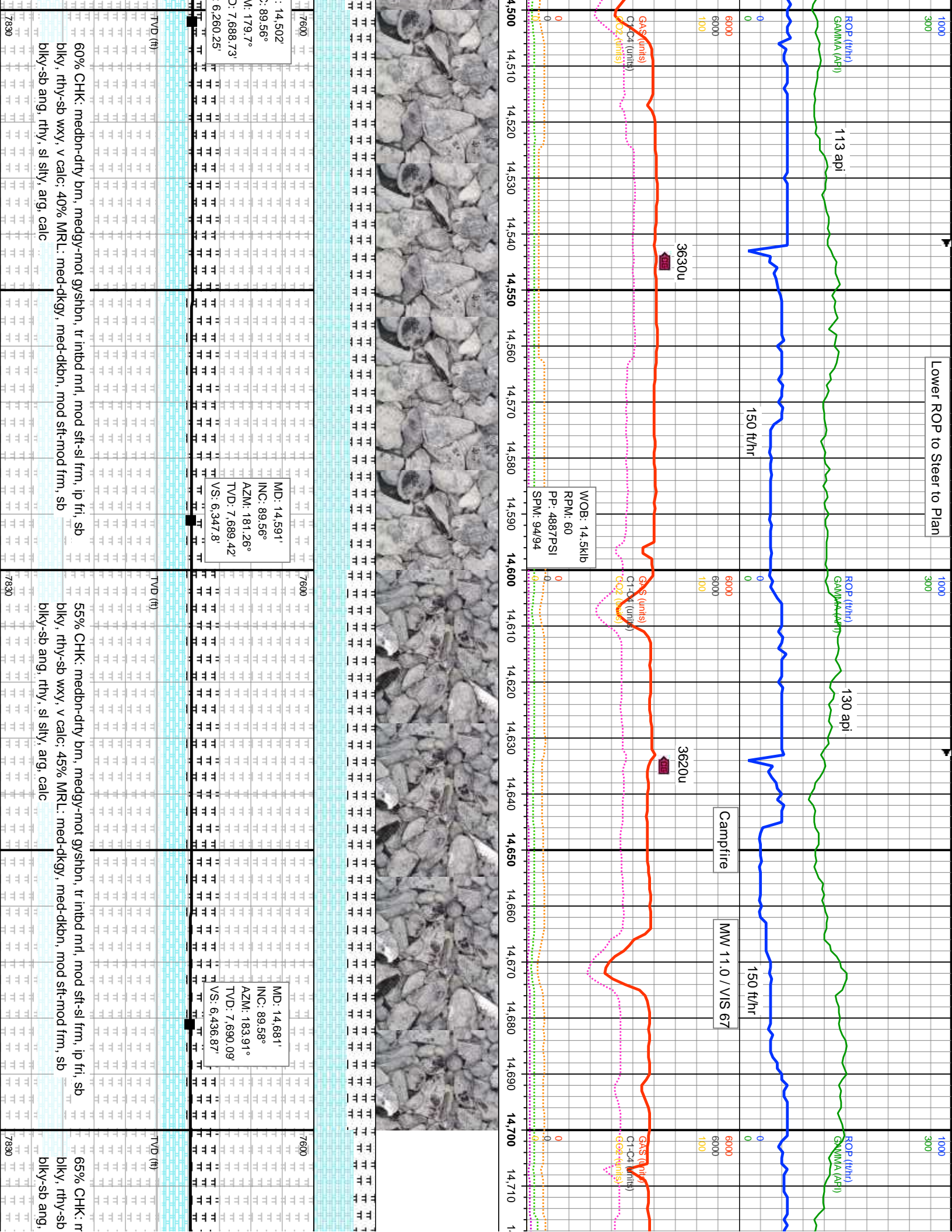
MD: 14.322'  
INC: 89.52°  
AZM: 178°  
TVD: 7.687.2'  
VS: 6.084.26'

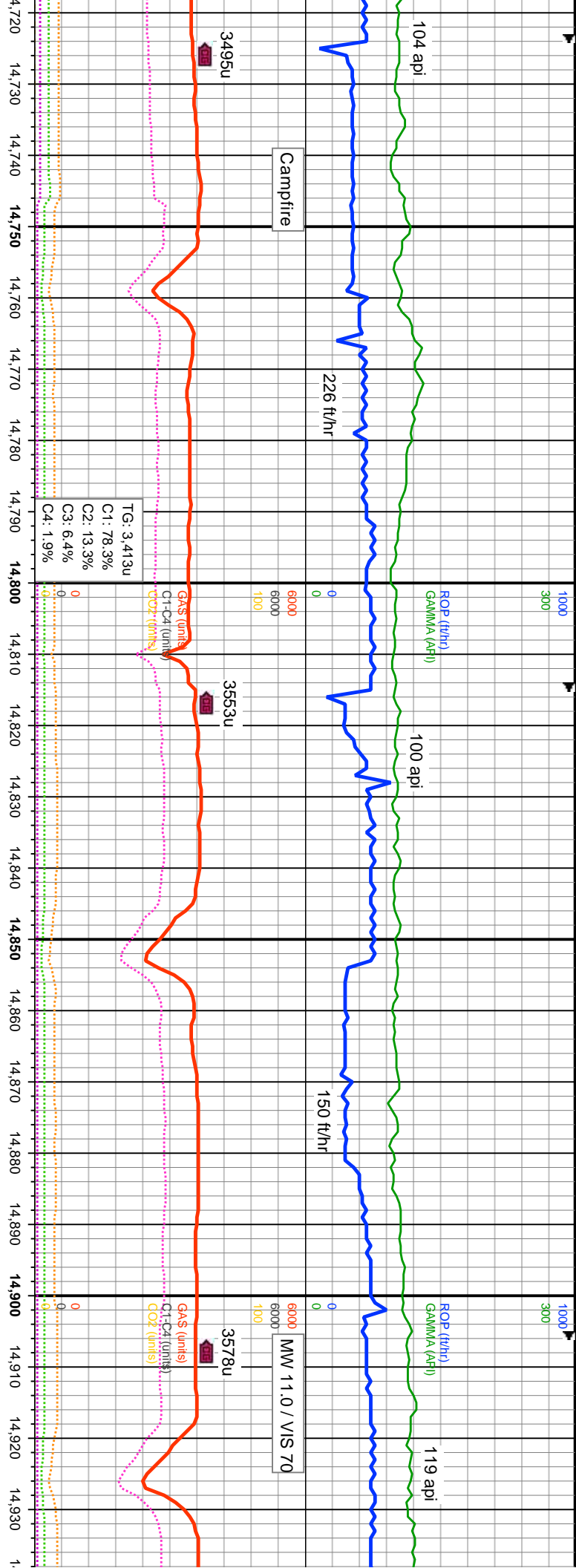
MD: 14.412'  
INC: 89.48°  
AZM: 178.57°  
TVD: 7.687.98'  
VS: 6.172.12'

MD:  
INC:  
AZI:  
TVD:  
VS:

60% CHK: medbn-dty brn, medgy-mot gysbhn, tr inbnd mri, mod sft-sl frm, ip fri, sb  
blky, rthy-sb wxy, v calc, tr inoc, rr dsrn pyr, 40% MRL: med-dkgy, med-dkbn, mod  
sft-mod frm, sb blk-sb ang, rthy, sl sily, arg, calc

50% CHK: medbn-dty brn, medgy-mot gysbhn, tr inbnd mri, mod sft-sl frm, ip fri, sb  
blky, rthy-sb wxy, v calc, 50% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb  
blk-sb ang, rthy, sl sily, arg, calc





MD: 14.771'  
 INC: 89.47°  
 AZM: 182.63°  
 TVD: 7.690.84'  
 VS: 6.526.08'

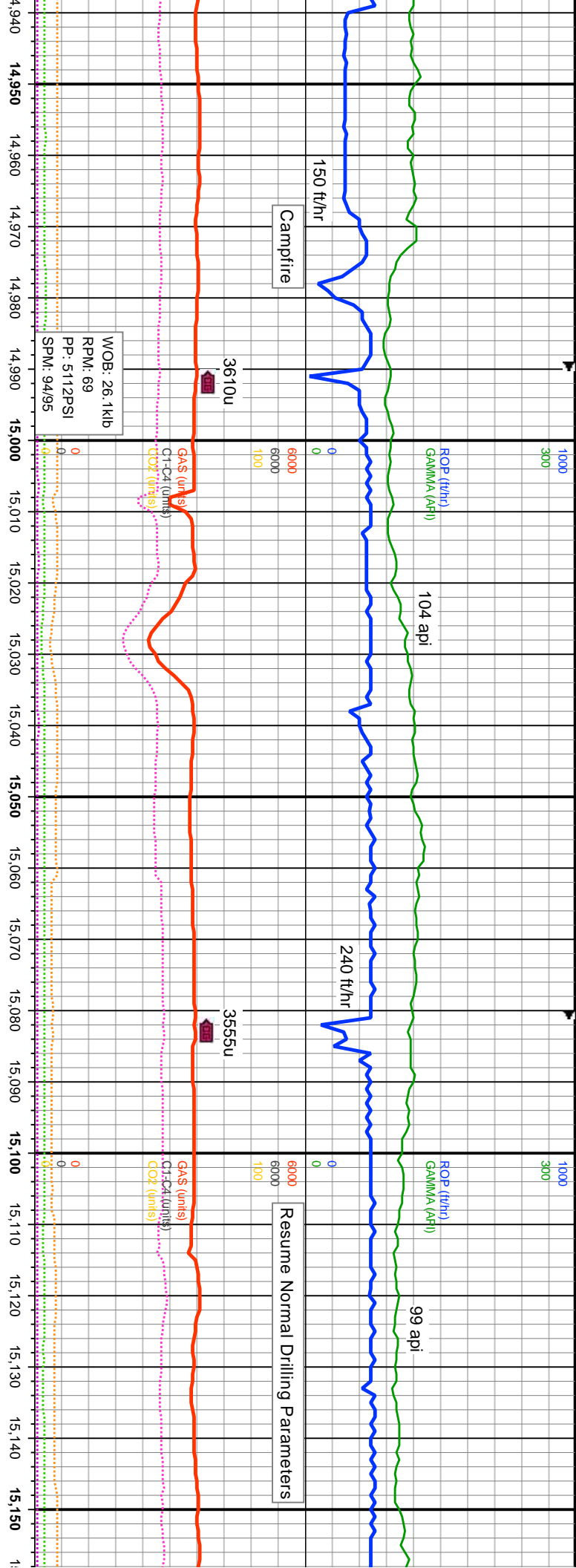
MD: 14.861'  
 INC: 89.32°  
 AZM: 181.06°  
 TVD: 7.691.8'  
 VS: 6.614.98'

Depth (ft)	ROP (ft/hr)	GAMMA (API)	GAS (units)	C1-C4 (units)	CO2 (units)	TG	C1 (%)	C2 (%)	C3 (%)	C4 (%)	Notes
14,720											
14,730											
14,740											
14,750											
14,760											
14,770											
14,780											
14,790											
14,800											
14,810											
14,820											
14,830											
14,840											
14,850											
14,860											
14,870											
14,880											
14,890											
14,900											
14,910											
14,920											
14,930											

medbn-dty brn, medgy-mot gysbhn, tr inbd nri, mod stf-sl frm, ip fri, sb  
 wxy, v calc: 35% MRL: med-dkgy, med-dkbn, mod stf-mod frm, sb  
 rthy, sl sily, arg, calc

60% CHK: medbn-dty brn, medgy-mot gysbhn, tr inbd nri, mod stf-sl frm, ip fri, sb  
 blk, rthy-sb wxy, v calc: 40% MRL: med-dkgy, med-dkbn, mod stf-mod frm, sb  
 blk-sb ang, rthy, sl sily, arg, calc: v rr inoc fos frags

70% CHK: medbn-dty brn, medgy-mot gysbhn, tr inbd nri, mod stf-sl frm, ip fri, sb  
 blk, rthy-sb wxy, v calc: 30% MRL: med-dkgy, med-dkbn, mod stf-mod frm, sb  
 blk-sb ang, rthy, sl sily, arg, calc

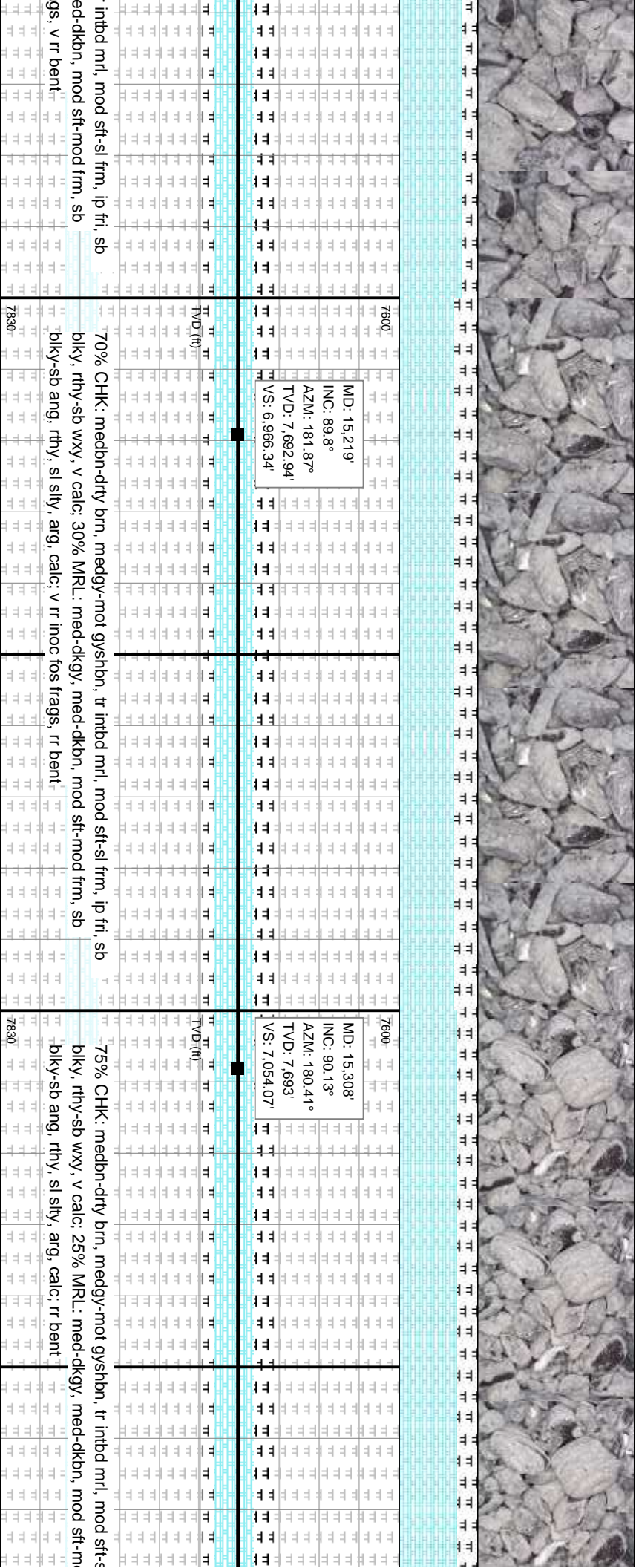
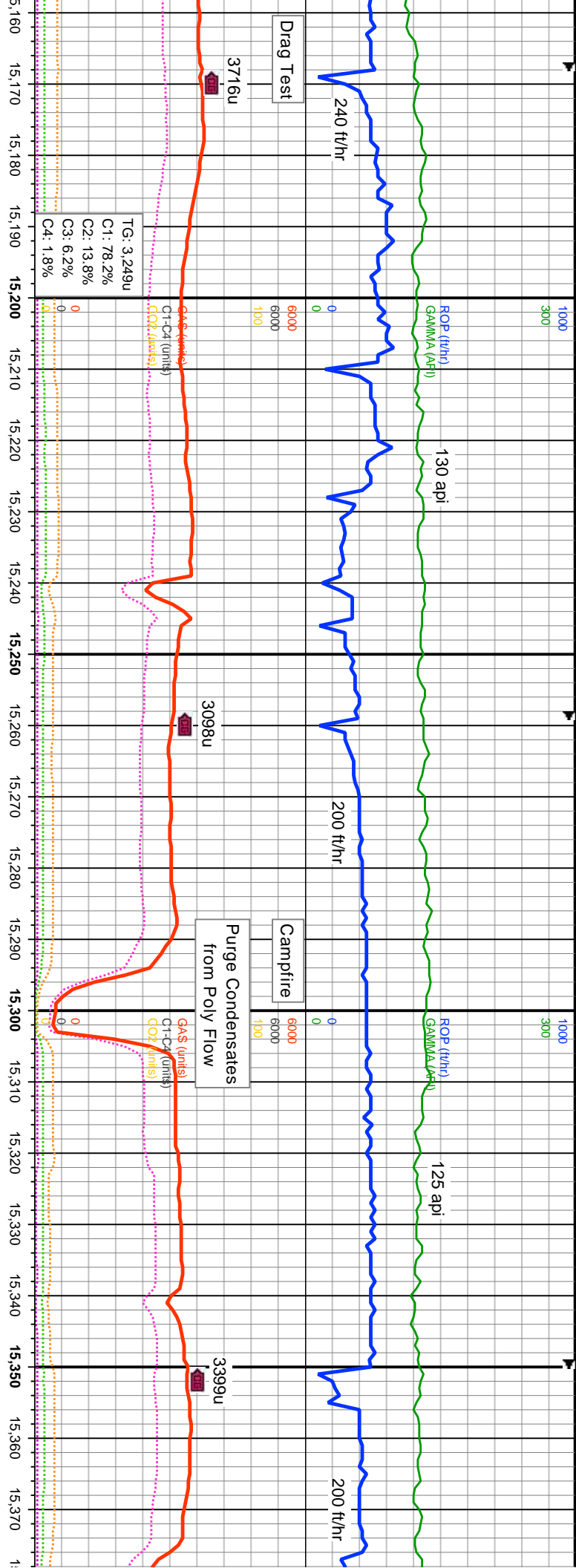


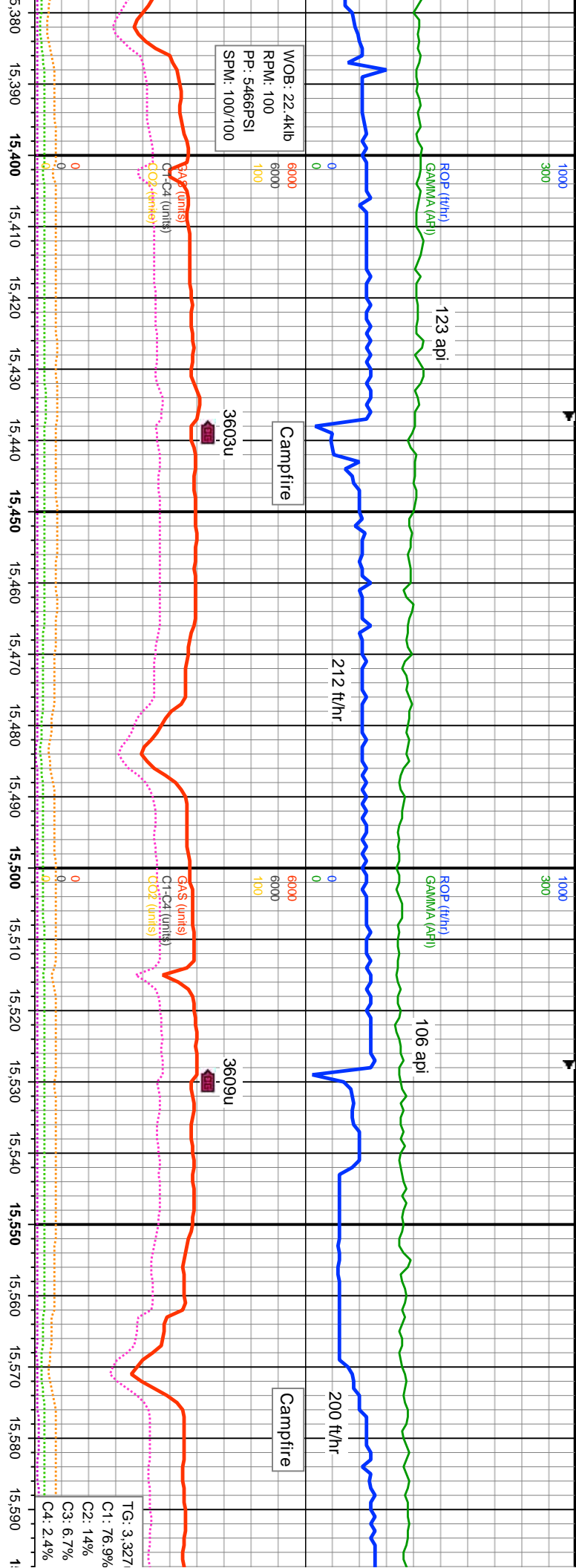
MD: 14.950°  
 INC: 89.52°  
 AZM: 178.5°  
 TVD: 7.692.7  
 VS: 6.702.32

MD: 15.040°  
 INC: 90.11°  
 AZM: 180.32°  
 TVD: 7.693  
 VS: 6.790.54

MD: 15.129°  
 INC: 90.08°  
 AZM: 178.88°  
 TVD: 7.692.85  
 VS: 6.877.84

80% CHK: medbn-drvy brn, medgy-mot gysbhn, tr inbd mrl, mod sft-sl frm, ip fri, sb	80% CHK: medbn-drvy brn, medgy-mot gysbhn, tr inbd mrl, mod sft-sl frm, ip fri, sb	80% CHK: medbn-drvy brn, medgy-mot gysbhn, tr inbd mrl, mod sft-sl frm, ip fri, sb
blky, rthy-sb wxy, v calc: 20% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb	blky, rthy-sb wxy, v calc: 20% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb	blky, rthy-sb wxy, v calc: 20% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb
blky-sb ang, rthy, sl sily, arg, calc: v rr inoc fos frags	blky-sb ang, rthy, sl sily, arg, calc: v rr inoc fos frags	blky-sb ang, rthy, sl sily, arg, calc: v rr inoc fos frags
7830	7830	7830





MD: 15,398'  
INC: 89.94°  
AZM: 180.73°  
TVD: 7,692.94'  
VS: 7.142.64'

MD: 15,488'  
INC: 90.33°  
AZM: 181.39°  
TVD: 7,692.73'  
VS: 7.231.34'

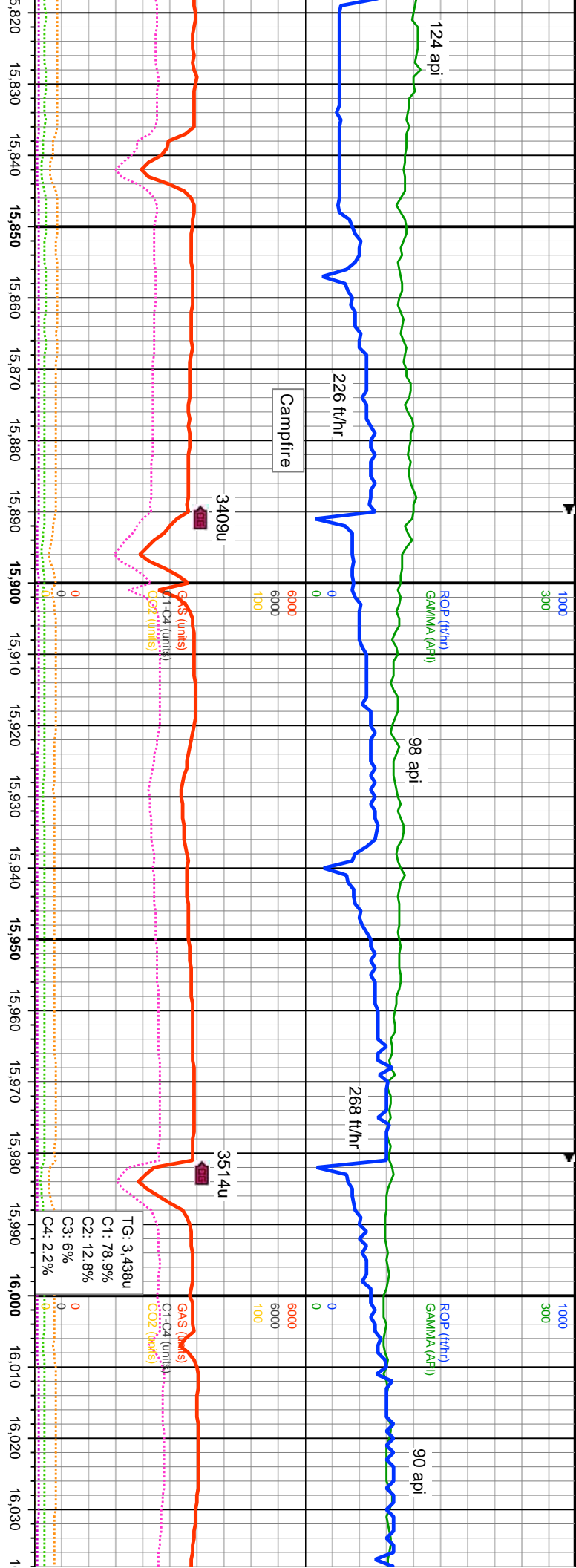
MD: 15,577'  
INC: 89.71°  
AZM: 180.53°  
TVD: 7,692.69'  
VS: 7.319.02'

Depth (ft)	Interval	Notes
15,380 - 15,390	sl frm, ip fri, sb	
15,390 - 15,400	sl frm, sb	
15,400 - 15,410	sl frm, sb	
15,410 - 15,420	sl frm, sb	
15,420 - 15,430	sl frm, sb	
15,430 - 15,440	sl frm, sb	
15,440 - 15,450	sl frm, sb	
15,450 - 15,460	sl frm, sb	
15,460 - 15,470	sl frm, sb	
15,470 - 15,480	sl frm, sb	
15,480 - 15,490	sl frm, sb	
15,490 - 15,500	sl frm, sb	
15,500 - 15,510	sl frm, sb	
15,510 - 15,520	sl frm, sb	
15,520 - 15,530	sl frm, sb	
15,530 - 15,540	sl frm, sb	
15,540 - 15,550	sl frm, sb	
15,550 - 15,560	sl frm, sb	
15,560 - 15,570	sl frm, sb	
15,570 - 15,580	sl frm, sb	
15,580 - 15,590	sl frm, sb	
15,590 - 15,600	sl frm, sb	

85% CHK: medn-dty brn, medgy-mot gysbhn, tr inbd mri, mod stf-sl frm, ip fri, sb  
 blk, rhy-sb wxy, v calc: 15% MRL: med-dkgy, med-dkbn, mod stf-mod frm, sb  
 blk-sb ang, rhy, sl sily, arg, calc: v rr inoc fos frags

80% CHK: medn-dty brn, medgy-mot gysbhn, tr inbd mri, mod stf-sl frm, ip fri, sb  
 blk, rhy-sb wxy, v calc: 20% MRL: med-dkgy, med-dkbn, mod stf-mod frm, sb  
 blk-sb ang, rhy, sl sily, arg, calc: v rr inoc fos frags





MD: 15,846'  
INC: 90.03°  
AZM: 178.74°  
TVD: 7,693.18'  
VS: 7,583.49'

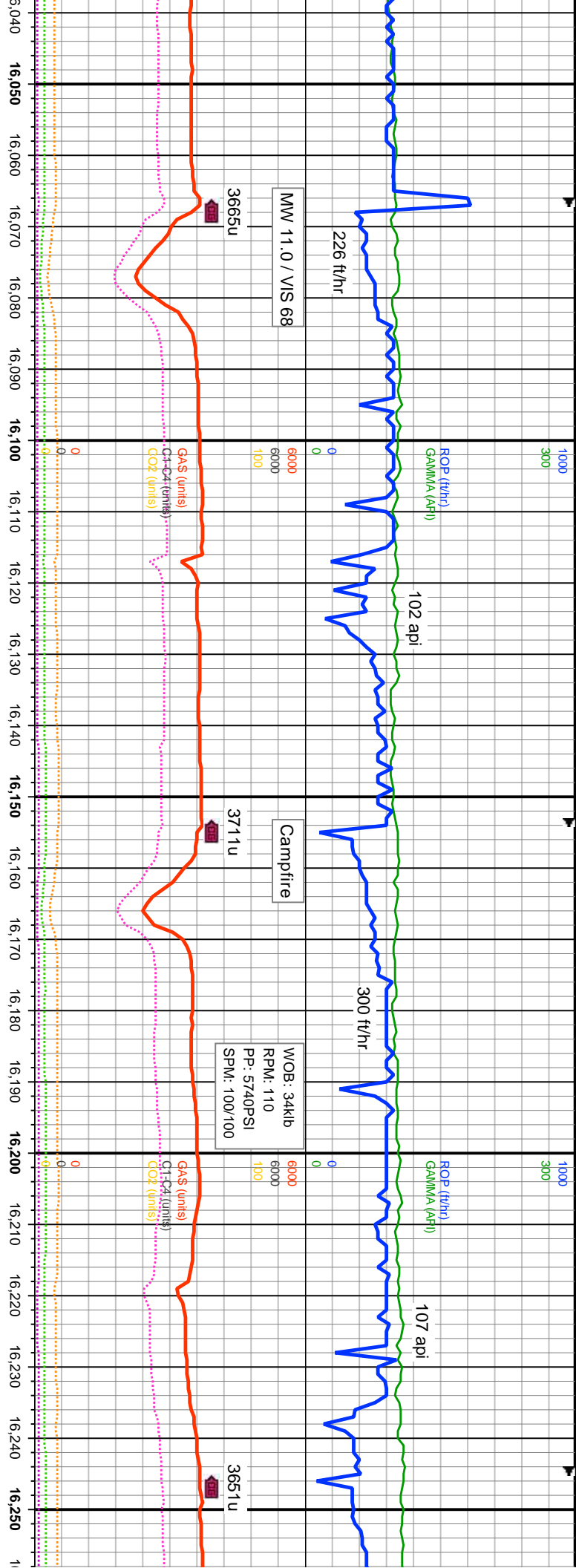
MD: 15,936'  
INC: 89.91°  
AZM: 178.99°  
TVD: 7,693.23'  
VS: 7,671.54'

MD: 16,025'  
INC: 89.86°  
AZM: 180.61°  
TVD: 7,693.41'  
VS: 7,758.9'

medbn-dty brn, medgy-mot gysbhn, tr inbd mri, mod sft-sl frm, ip fri, sb  
wxy, v calc; 30% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb  
rthy, sl sily, arg, calc; rr inoc fos frags

80% CHK: medbn-dry brn, medgy-mot gysbhn, tr inbd mri, mod sft-sl frm, ip fri, sb  
blky, rthy-sb wxy, v calc; 20% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb  
blky-sb ang, rthy, sl sily, arg, calc; v rr inoc fos frags

70% CHK: medbn-dry brn, medgy-mot gysbhn, tr inbd mri, mod sft-sl frm, ip fri, sb  
blky, rthy-sb wxy, v calc; 30% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb  
blky-sb ang, rthy, sl sily, arg, calc; rr inoc fos frags

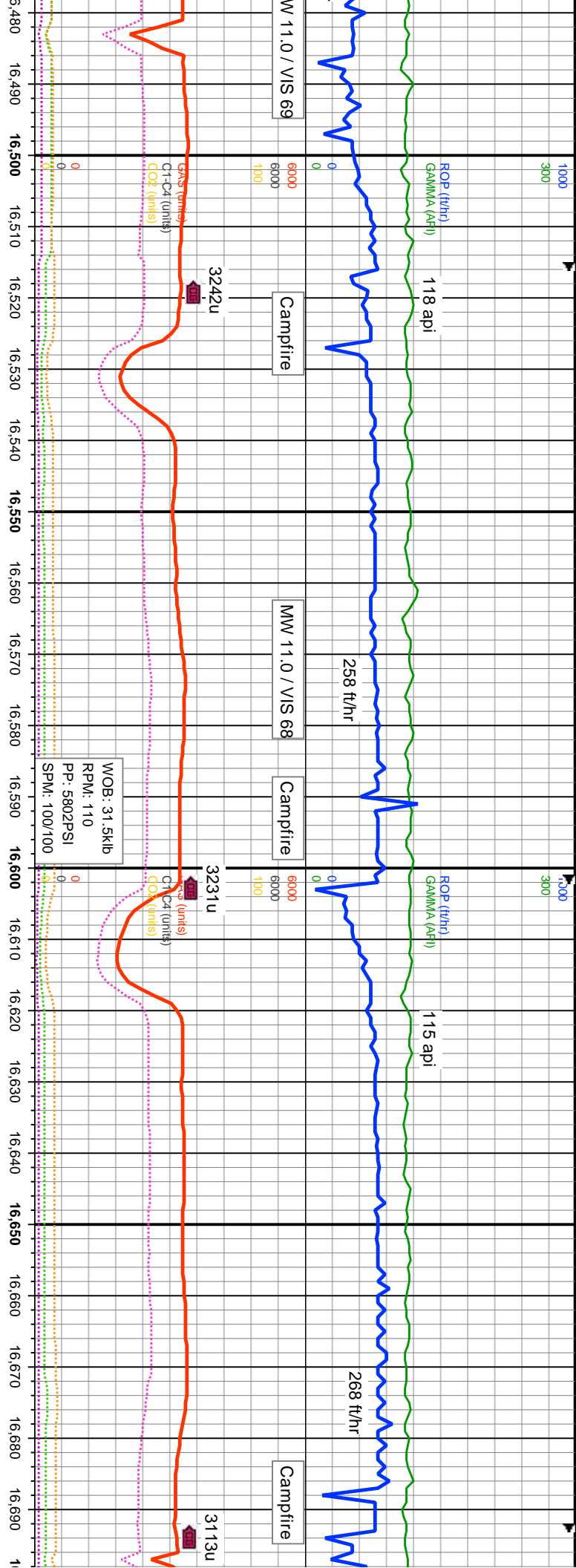


MD: 16,115'  
 INC: 89.95°  
 AZM: 178.92°  
 TVD: 7,693.55'  
 VS: 7,847.22'

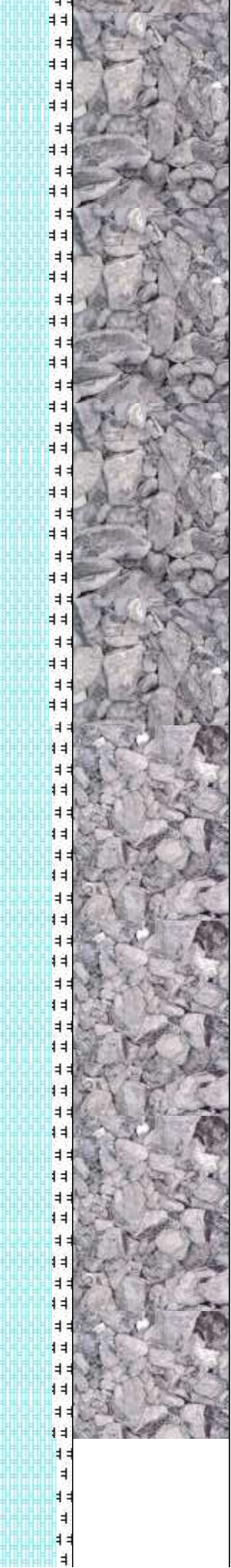
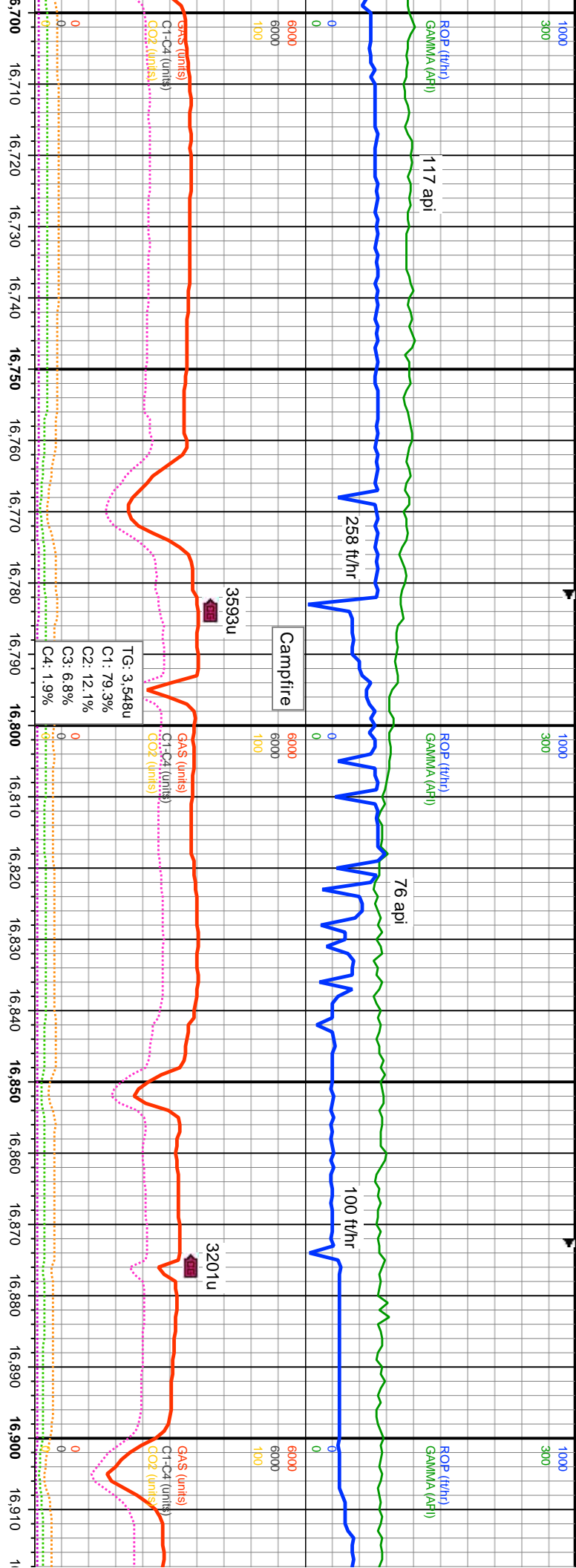
MD: 16,205'  
 INC: 90.04°  
 AZM: 179.94°  
 TVD: 7,693.55'  
 VS: 7,935.45'

80% CHK: medbn-dfry brn, medgy-mot gysbhn, tr inbnd mri, mod stf-sl frm, ip fri, sb	80% CHK: medbn-dfry brn, medgy-mot gysbhn, tr inbnd mri, mod stf-sl frm, ip fri, sb	70% CHK: medbn-dfry brn, medgy-mot gysbhn, tr
blky, rthy-sb wxy, v calc: 20% MRL: med-dkgy, med-dkbn, mod stf-mod frm, sb	blky, rthy-sb wxy, v calc: 20% MRL: med-dkgy, med-dkbn, mod stf-mod frm, sb	blky, rthy-sb wxy, v calc: 30% MRL: med-dkgy, me
blky-sb ang, rthy, sl sily, arg, calc: rr inoc fos frags	blky-sb ang, rthy, sl sily, arg, calc: rr inoc fos frags	blky-sb ang, rthy, sl sily, arg, calc: rr inoc fos frags
80% CHK: medbn-dfry brn, medgy-mot gysbhn, tr inbnd mri, mod stf-sl frm, ip fri, sb	80% CHK: medbn-dfry brn, medgy-mot gysbhn, tr inbnd mri, mod stf-sl frm, ip fri, sb	70% CHK: medbn-dfry brn, medgy-mot gysbhn, tr
blky, rthy-sb wxy, v calc: 20% MRL: med-dkgy, med-dkbn, mod stf-mod frm, sb	blky, rthy-sb wxy, v calc: 20% MRL: med-dkgy, med-dkbn, mod stf-mod frm, sb	blky, rthy-sb wxy, v calc: 30% MRL: med-dkgy, me
blky-sb ang, rthy, sl sily, arg, calc: rr inoc fos frags	blky-sb ang, rthy, sl sily, arg, calc: rr inoc fos frags	blky-sb ang, rthy, sl sily, arg, calc: rr inoc fos frags

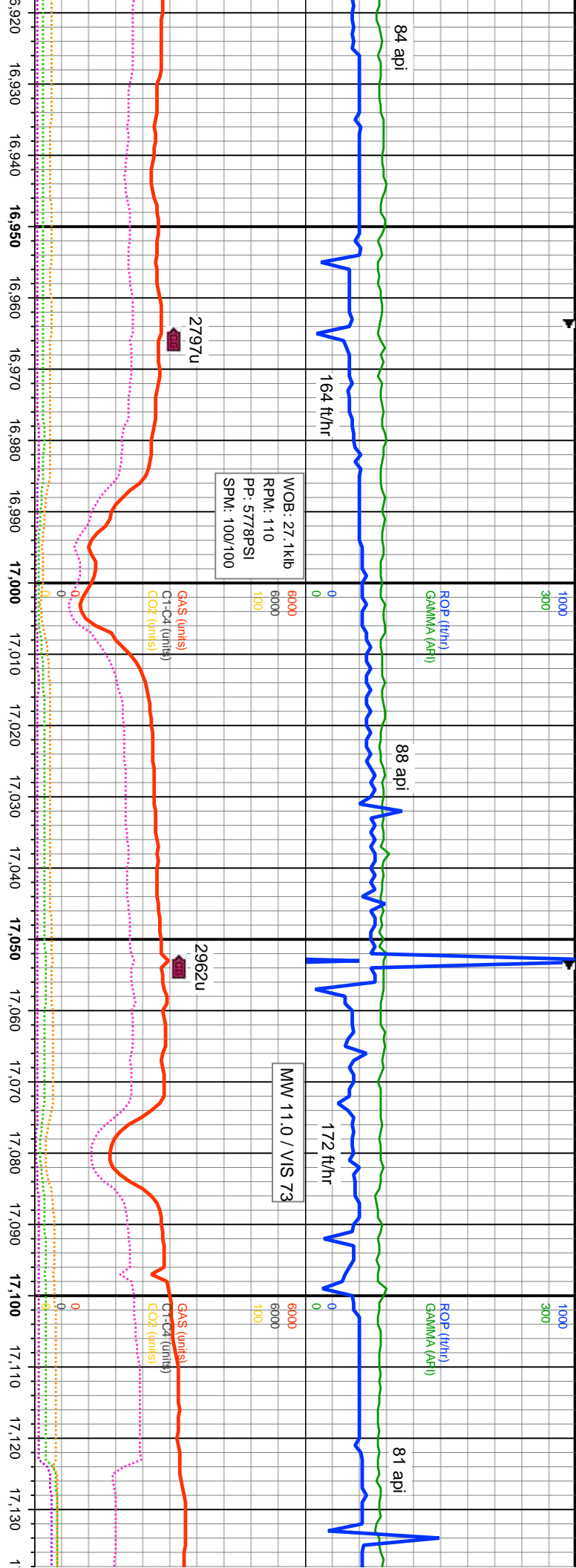




Depth (ft)	MD: 16.563	INC: 89.88°	AZM: 179.32°	TVD: 7.693.76'	VS: 8.286.86'	Formation	Notes
16,480 - 16,500						mod sft-sl frm, ip	65% CHK: medbn-dty brn, tr tbn, medgy-mot gysbhn, tr intbd mrl, mod sft-sl frm, ip
16,500 - 16,520						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,520 - 16,540						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,540 - 16,560						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,560 - 16,580						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,580 - 16,600						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,600 - 16,620						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,620 - 16,640						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,640 - 16,660						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,660 - 16,680						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,680 - 16,700						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,700 - 16,720						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,720 - 16,740						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,740 - 16,760						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,760 - 16,780						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,780 - 16,800						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,800 - 16,820						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,820 - 16,840						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,840 - 16,860						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,860 - 16,880						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,880 - 16,900						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,900 - 16,920						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,920 - 16,940						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,940 - 16,960						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,960 - 16,980						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,
16,980 - 16,990						mod sft-sl frm, ip	fri, sb blkly, rhy-sb wxy, v calc, tr inoc, tr nod pyr, 35% MRL: med-dkgy, med-dkbn,



Depth (ft)	MD	INC	AZM	TVD	VS	Notes
7600	16.742'	89.89°	176.72°	7.693.8'	8.460.43'	70% CHK: medbn-dty brn, tr tbn, medgy-mot gyshbn, tr intbd mrl, mod sft-sl frm, ip fri, sb blkly, rthy-sb wxy, v calc, tr-mod inoc, rr bent, rr dsm pyr; 30% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blkly-sb ang, rthy, sl slty, arg, calc
7600	16.832'	90.19°	178.26°	7.693.73'	8.548.01'	75% CHK: medbn-dty brn, tr tbn, medgy-mot gyshbn, tr intbd mrl, mod sft-sl frm, ip fri, sb blkly, rthy-sb wxy, v calc, tr inoc; 25% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blkly-sb ang, rthy, sl slty, arg, calc
7600	16.832'	90.19°	178.26°	7.693.73'	8.548.01'	80% CHK: blkly, rthy-sl sb blkly-sb ang, rthy, sl slty, arg, calc



16,922  
: 89.59°  
M: 179.67°  
D: 7.693.91'  
8.636.09'

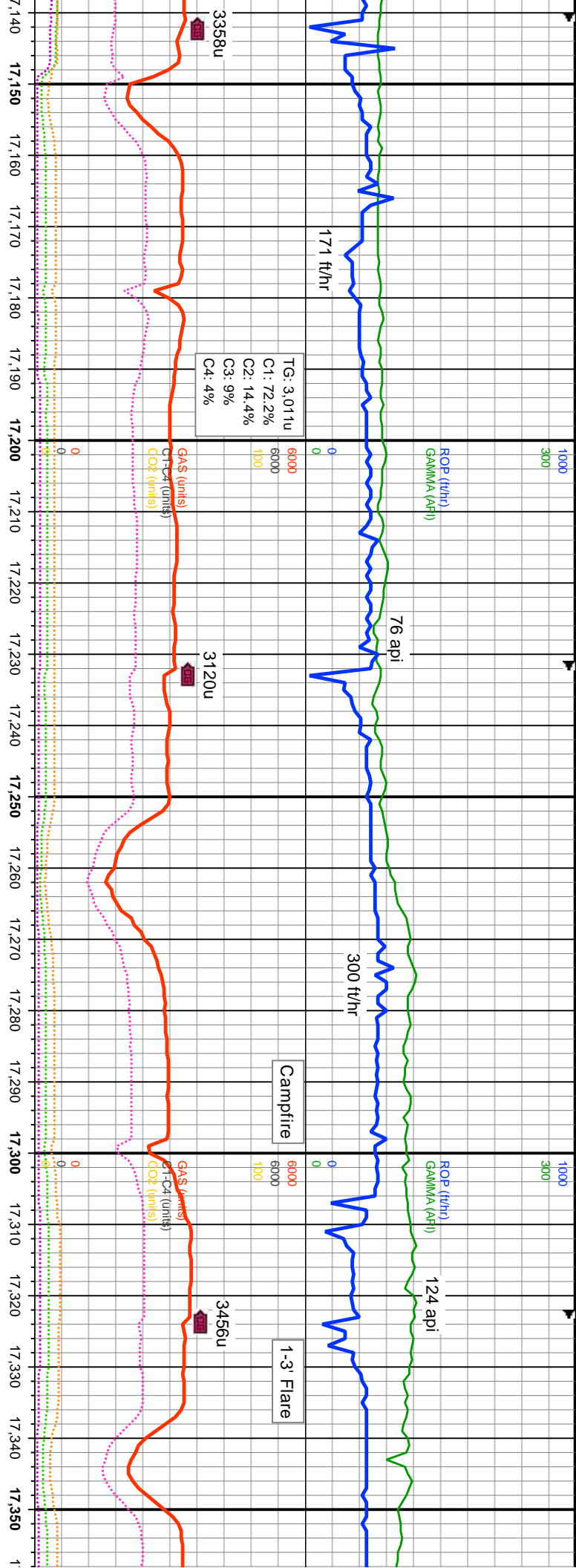
7600  
MD: 17.012  
INC: 89.56°  
AZM: 179.37°  
TVD: 7.694.58'  
VS: 8.724.35'

7600  
MD: 17.101'  
INC: 89.49°  
AZM: 179.71°  
TVD: 7.695.32'  
VS: 8.811.63'

It-medbn, medgy-mot gysbhn, sme inbd mrl, mod sft-sl frm, ip fri, sb  
wxy, v calc, tr inoc, 20% MRL: med-dkgy, med-dkbn, mod sft-mod frm,  
ang, rthy, sl stly, arg, calc.

75% CHK: It-medbn, medgy-mot gysbhn, sme inbd mrl, mod sft-sl frm, ip fri, sb  
bky, rthy-sb wxy, v calc, tr inoc, rr bent, 25% MRL: med-dkgy, med-dkbn, mod  
sft-mod frm, sb bkly-sb ang, rthy, sl stly, arg, calc

75% CHK: It-medbn, medgy-mo  
rthy-sb wxy, v calc, tr inoc, tr noc  
frm, sb bkly-sb ang, rthy, sl stly,

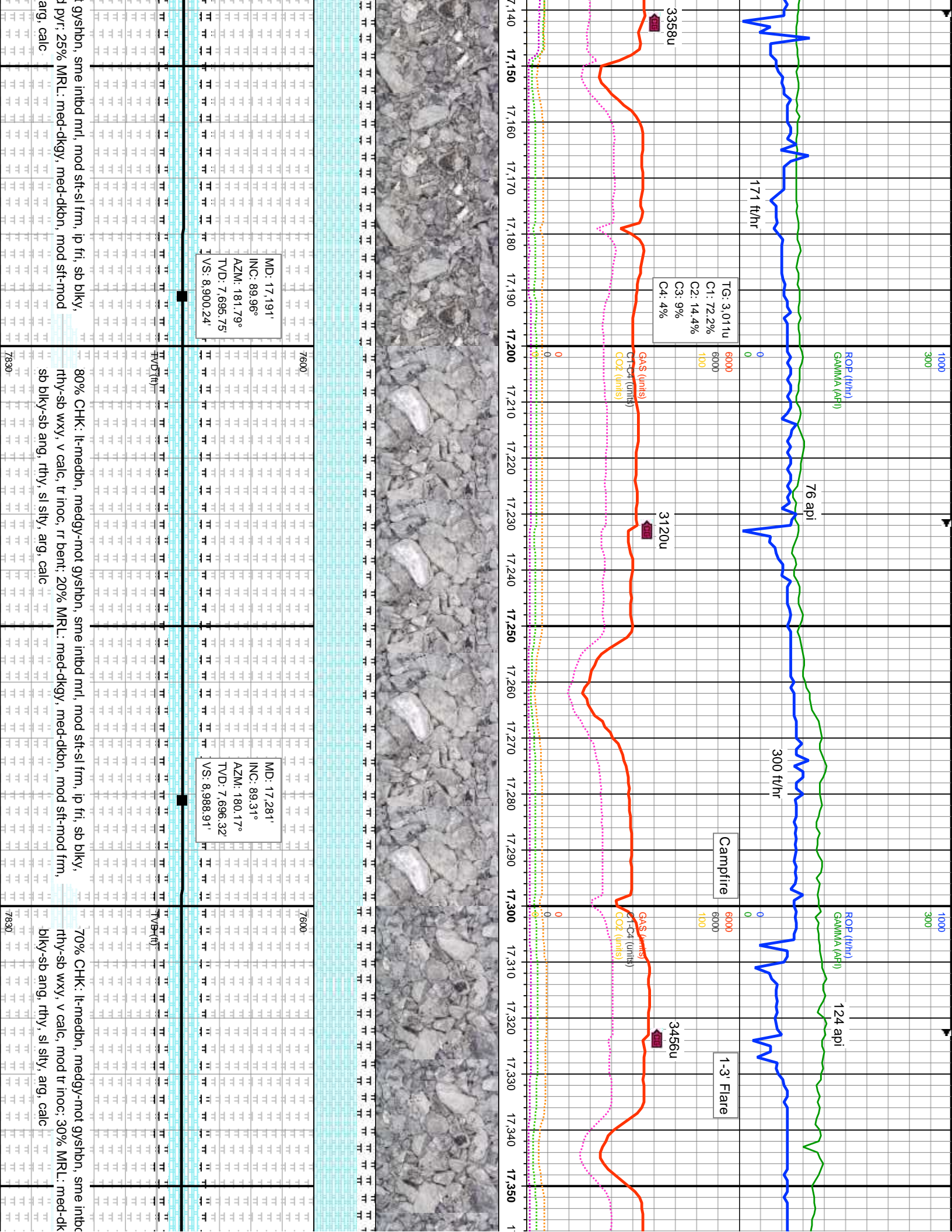


TG: 3.011u  
 C1: 72.2%  
 C2: 14.4%  
 C3: 9%  
 C4: 4%

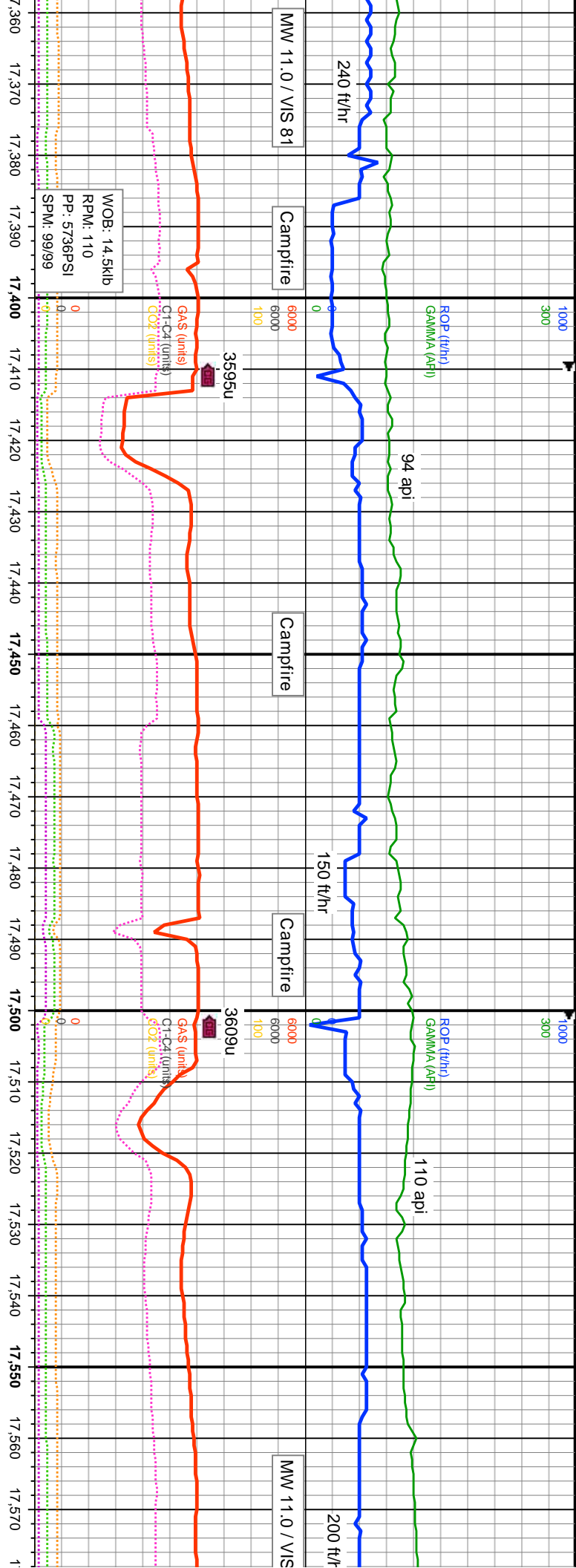
GAS (units)  
 C1-C4 (units)  
 CO2 (units)

MD: 17,191'  
 INC: 89.96°  
 AZM: 181.79°  
 TVD: 7,695.75'  
 VS: 8,900.24'

MD: 17,281'  
 INC: 89.31°  
 AZM: 180.17°  
 TVD: 7,696.32'  
 VS: 8,988.91'



gysbhn, sme intbd mri, mod sft-sl frm, ip fri, sb blyk,  
 arg, calc  
 80% CHK: lt-medbn, medgy-mot gysbhn, sme intbd mri, mod sft-sl frm, ip fri, sb blyk,  
 rthy-sb wxy, v calc, tr inoc, rr bent: 20% MRL: med-dkgy, med-dkbn, mod sft-mod frm,  
 sb blyk-sb ang, rthy, sl slty, arg, calc  
 70% CHK: lt-medbn, medgy-mot gysbhn, sme intbd  
 rthy-sb wxy, v calc, mod tr inoc: 30% MRL: med-dk  
 blyk-sb ang, rthy, sl slty, arg, calc



MD: 17.370'  
 INC: 89.32°  
 AZM: 179.58°  
 TVD: 7.697.38'  
 VS: 9.076.29'

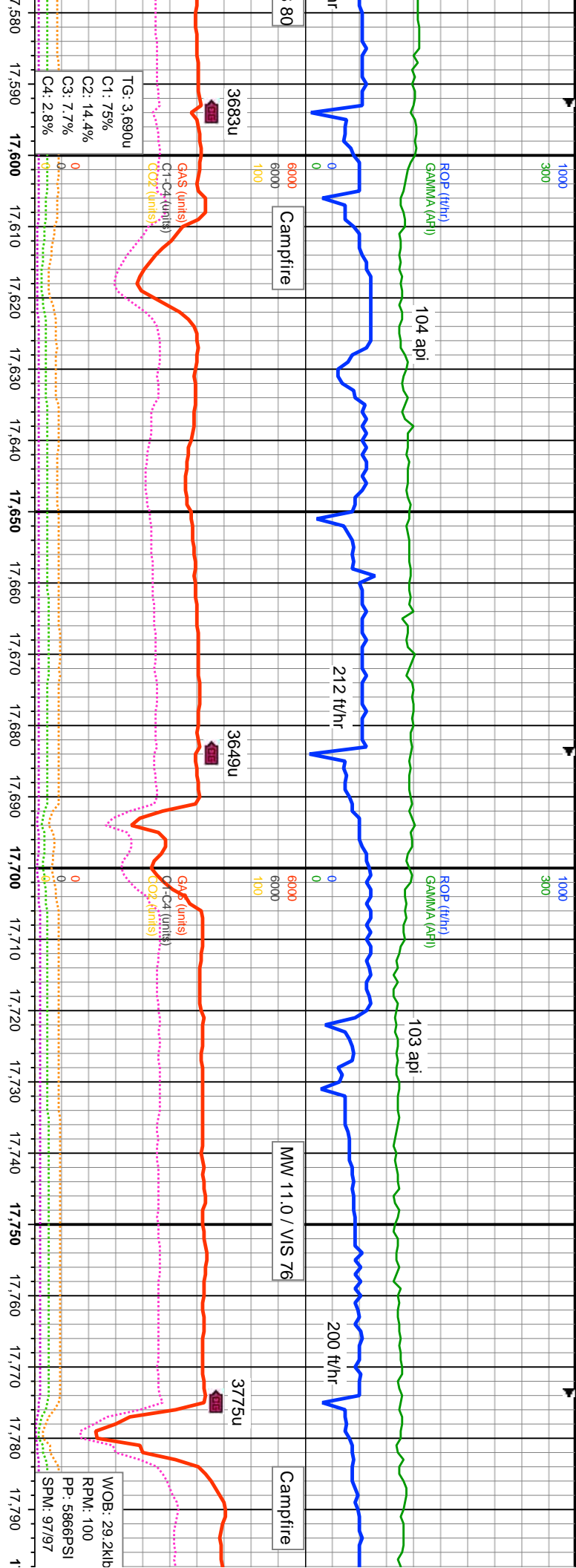
MD: 17.460'  
 INC: 89.59°  
 AZM: 179.55°  
 TVD: 7.698.24'  
 VS: 9.164.55'

MD: 17.549'  
 INC: 89.62°  
 AZM: 179.23°  
 TVD: 7.698.85'  
 VS: 9.251.79'

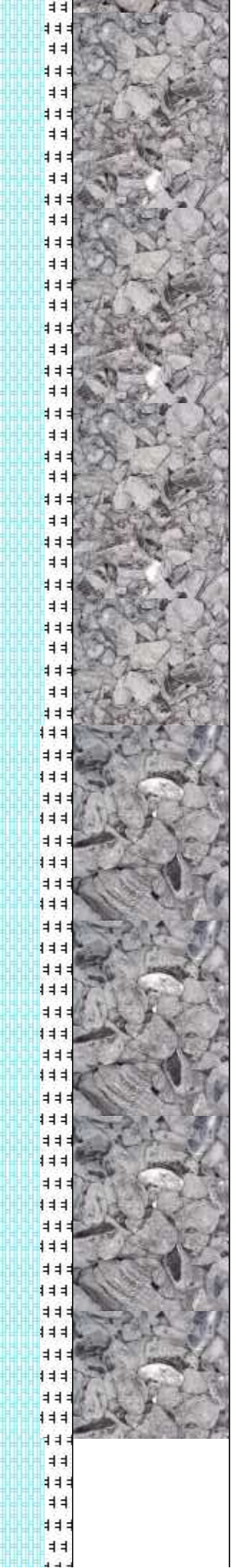
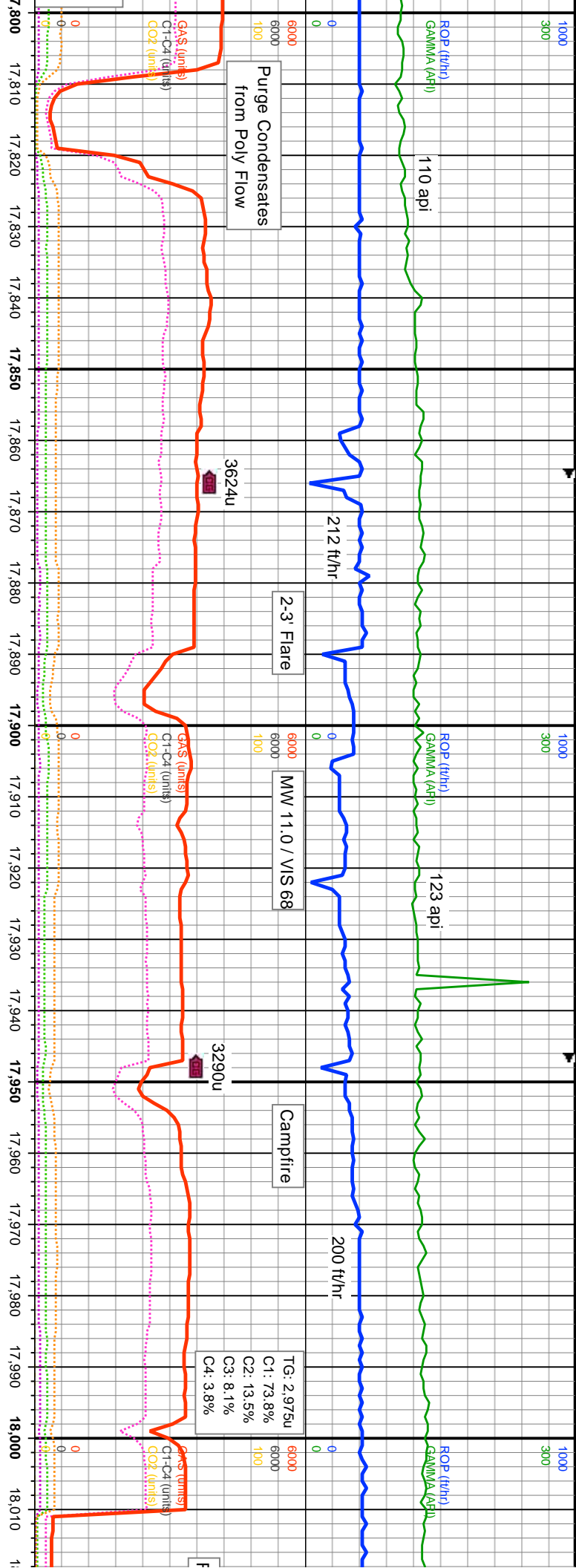
mod sft-sl frm, ip fri, sb blkly, rthy-sb wxy, v calc, tr inoc, rr dsrm pyr: 35% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blkly-sb ang, rthy, sl slty, arg, calc

65% CHK: lt-medbn, medgy-mot gysbhn, sme intbd mri, mod sft-sl frm, ip fri, sb blkly, rthy-sb wxy, v calc, tr inoc, rr dsrm pyr: 35% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blkly-sb ang, rthy, sl slty, arg, calc

65% CHK: lt-medbn, medgy-mot gysbhn, sme intbd mri, mod sft-sl frm, ip fri, sb blkly, rthy-sb wxy, v calc, tr inoc, rr dsrm pyr: 35% MRL: med-dkgy, med-dkbn, mod sft-mod frm, sb blkly-sb ang, rthy, sl slty, arg, calc



Depth (ft)	ROP (ft/hr)	GAMMA (API)	Gas (units)	Notes
7800	~1000	~300	~0	MD: 17.639° INC: 89.84° AZM: 179.65° TVD: 7.699.27' VS: 9.340.02
7800	~1000	~300	~0	MD: 17.729° INC: 89.66° AZM: 178.6° TVD: 7.699.67' VS: 9.428.16



Distance (ft)	ROP (ft/hr)	GAMMA (API)	Flow Rate (u)	Flow Rate (umts)	Flow Rate (umts)	Flow Rate (umts)	Flow Rate (%)
17,800	110	110	3624				
17,810	110	110	3624				
17,820	110	110	3624				
17,830	110	110	3624				
17,840	110	110	3624				
17,850	110	110	3624				
17,860	110	110	3624				
17,870	110	110	3624				
17,880	110	110	3624				
17,890	110	110	3624				
17,900	110	110	3624				
17,910	110	110	3624				
17,920	110	110	3624				
17,930	110	110	3624				
17,940	110	110	3624				
17,950	110	110	3624				
17,960	110	110	3624				
17,970	110	110	3624				
17,980	110	110	3624				
17,990	110	110	3624				
18,000	110	110	3624				
18,010	110	110	3624				

MD: 17.818'  
 INC: 89.51°  
 AZM: 180.24°  
 TVD: 7.700.31'  
 VS: 9.515.4'

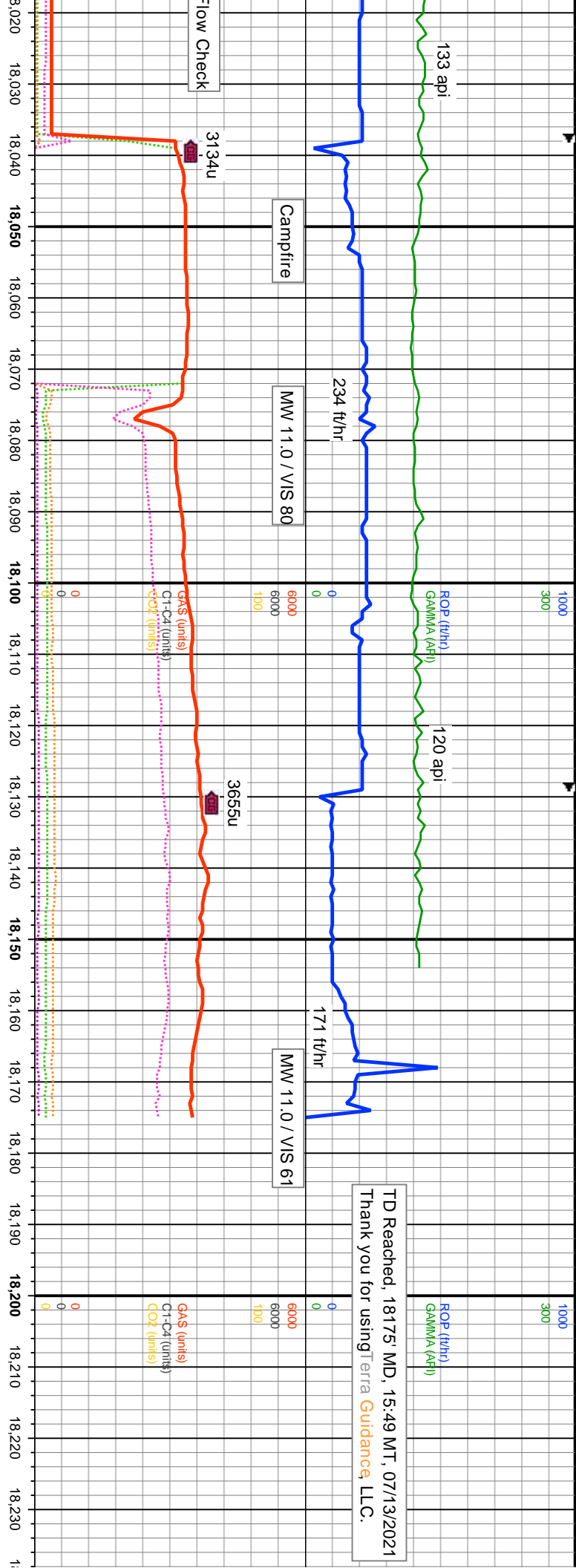
MD: 17.908'  
 INC: 89.55°  
 AZM: 179.21°  
 TVD: 7.701.06'  
 VS: 9.603.72'

MD: 17.998'  
 INC: 89.28°  
 AZM: 179.53°  
 TVD: 7.701.97'  
 VS: 9.691.93'

65% CHK: medn-dry brn, r lbm, medgy-mot gysbhn, tr intbd mri, mod stf-sl frm, ip  
 fri, sb blkly, rthy-sb wxy, v calc, tr inoc: 35% MRL: med-dkgy, med-dkbn, mod stf-mod  
 frm, sb blkly-sb ang, rthy, sl stly, arg, calc

60% CHK: medn-dry brn, r lbm, medgy-mot gysbhn, tr intbd mri, mod stf-sl frm, ip  
 fri, sb blkly, rthy-sb wxy, v calc, tr inoc, r nod pyr: 40% MRL: med-dkgy, med-dkbn,  
 mod stf-mod frm, sb blkly-sb ang, rthy, sl stly, arg, calc

65% CHK: m  
 fri, sb blkly, rth  
 frm, sb blkly-s



TD Reached, 18175' MD, 15:49 MT, 07/13/2021  
Thank you for using Terra Guidance, LLC.

