COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name	Cruickshank 1C-24HZ		
Location	Sec 24 T3N R66W		
State	COLORADO	**County**	WELD
Country	UNITED STATES OF AMERICA	**Rig Number**	ENSIGN 145
API Number	05-123-39498-0000	**AFE #**	2059236
Region	DJ BASIN	**Field**	WATTENBERG
Spud Date	9/8/2014	**Drilling Completed**	9/16/2014
Surface Coordinates	634' FSL 664' FEL Section 24 T3N R66W Lat/Long 40.2053901/-104.7176098		
Ground Elevation	5,014'	**K.B. Elevation**	5,027'
Logged Interval	7000' **To** 13,661'	**Total Depth**	13,661'
Formation	CODELL		
Type of Drilling Fluid	LSND		

Operator

Company Anadarko

Address 1099 18TH ST.
DENVER, CO. 80202

Geologist

Name RHEAD CANNON

Company ANADARKO PETROLEUM CORPORATION

Address 1099 18TH ST.
Denver, CO 80202

Other

WELLSITE GEOLOGISTS JASON BEACH

Zone Color Codin

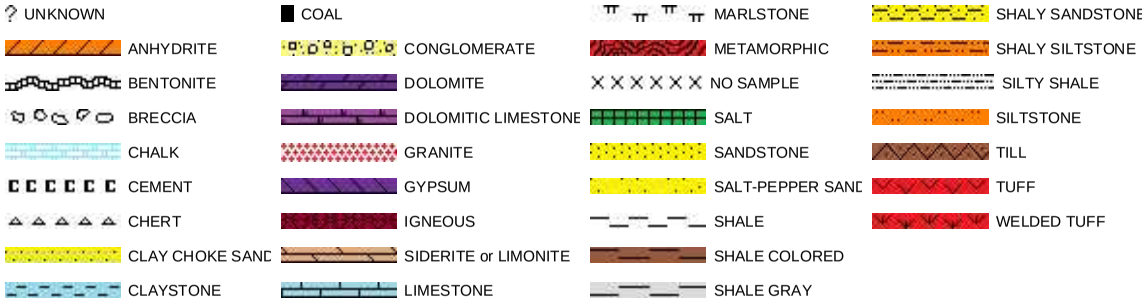
- Oil
- Note
- Error
- Condensate
- Core
- Water

, TED STOCKWELL

g

Gas
Pressure
Seal

Rock Types



Accessories

Fossils

ALGAE
AMPHIPORA
BELEMNITE
BIOCLASTIC
BRACHOIPOD
BRYOZOA
CEPHALOPOD
CORAL
CRINOID
ECHINOID
FISH
FORAMINIFERA
FOSSIL
GASTROPOD
INOCERAMUS
OOLITE
OSTRACOD
PELECYPOD
PELLET
PISOLITE
PLANT REMAINS
PLANT SPORES
SCAPHOPOD
STROMATOPOROID

Minerals

ANHYDRITIC
ARGILLACEOUS
ARGILLITE GRAIN
BENTONITE
BITUMENOUS SUBSTANCE
BRECCIA FRAGMENTS
CALCAREOUS
CARBONACEOUS FLAKES
CHTDK
CHTLT
COAL - THIN BEDS
DOLOMITIC
FELDSPAR
FERRUGINOUS PELLET
FERRUGINOUS
GLAUCONITE
GYPSIFEROUS
HEAVY MINERAL
KAOLIN
MARLSTONE
MICACEOUS
MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY
TUFFACEOUS

Stringer

ANHYDRITE STRINGER
BENTONITE STRINGER
COAL STRINGER
DOLOMITE STRINGER
GYPSUM STRINGER
LIMESTONE STRINGER
MARLSTONE (CALC) STRG
MARLSTONE (DOL) STRG
SANDSTONE STRINGER
SHALE STRINGER
SILTSTONE STRINGER

Oil Show

DEAD
EVEN
QUESTIONABLE
SPOTTED STAINING
PINPO
VUGG

Engir

BIT
CONNI

Porosity

CONNI
CONN
EARTHY
CON
FENESTRAL
TRIP
FRACTURE
TRI
INTERCRYSTALLINE
DOWN
INTEROOLITIC
DO
MOLDIC
CORE
ORGANIC
CORE

Other Symbols

INT

Y

neering

ECTION (UP)

ECTION (DOWN)

NECTION GAS

NNECTION GAS (LEFT)

GAS

P GAS (LEFT)

N TIME GAS

WN TIME GAS (LEFT)

- LOST

- RECOVERED

DST INTERVAL

FAULT

FORMATION TOP

GAS SHOW

OIL SHOW

MN DEPTH UP

MN DEPTH (DOWN)

NORMAL FAULT

OVERTURNED STRATA

REVERSE FAULT

CASING

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE

SURVEY

WIRELINE TESTED - LEFT

WIRELINE TESTED - RT

DRILL STEM TEST

MN DEPTH

Rounding

ANGULAR

ROUNDED

SUBANG

SUBRND

Textures

BOUNDSTONE

CHALKY

CRYPTOXLN

EARTHY

FINELYXLN

GRAINSTONE

LITHOGRAPHIC

MICROXLN

MUDSTONE

PACKSTONE

WACKESTONE

Sorting

MODERATE

POOR

WELL

Slide/Rotate

ROP

ROP

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

Depth Labels

% Lith

Curves

GAMMA

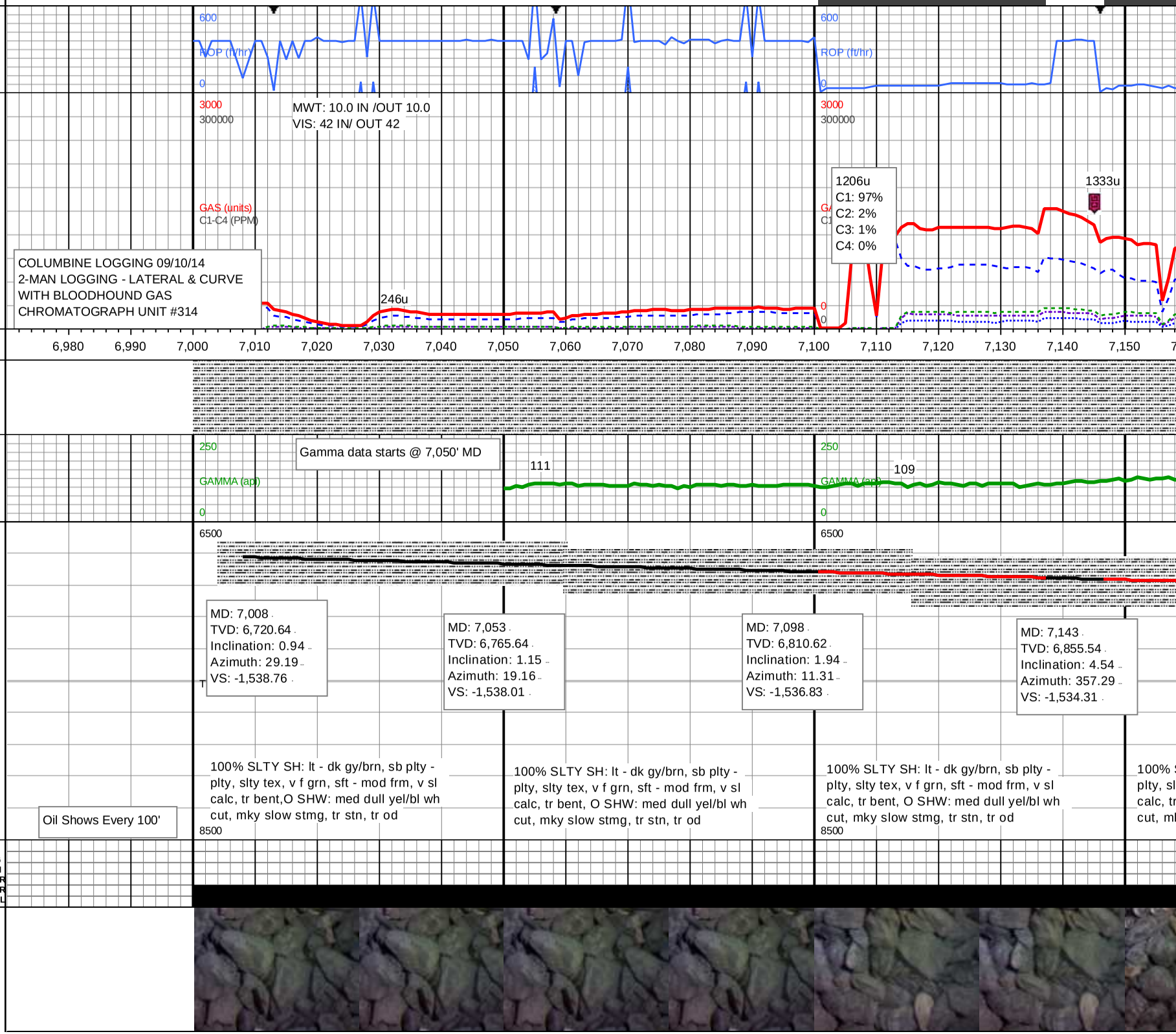
Well Bore

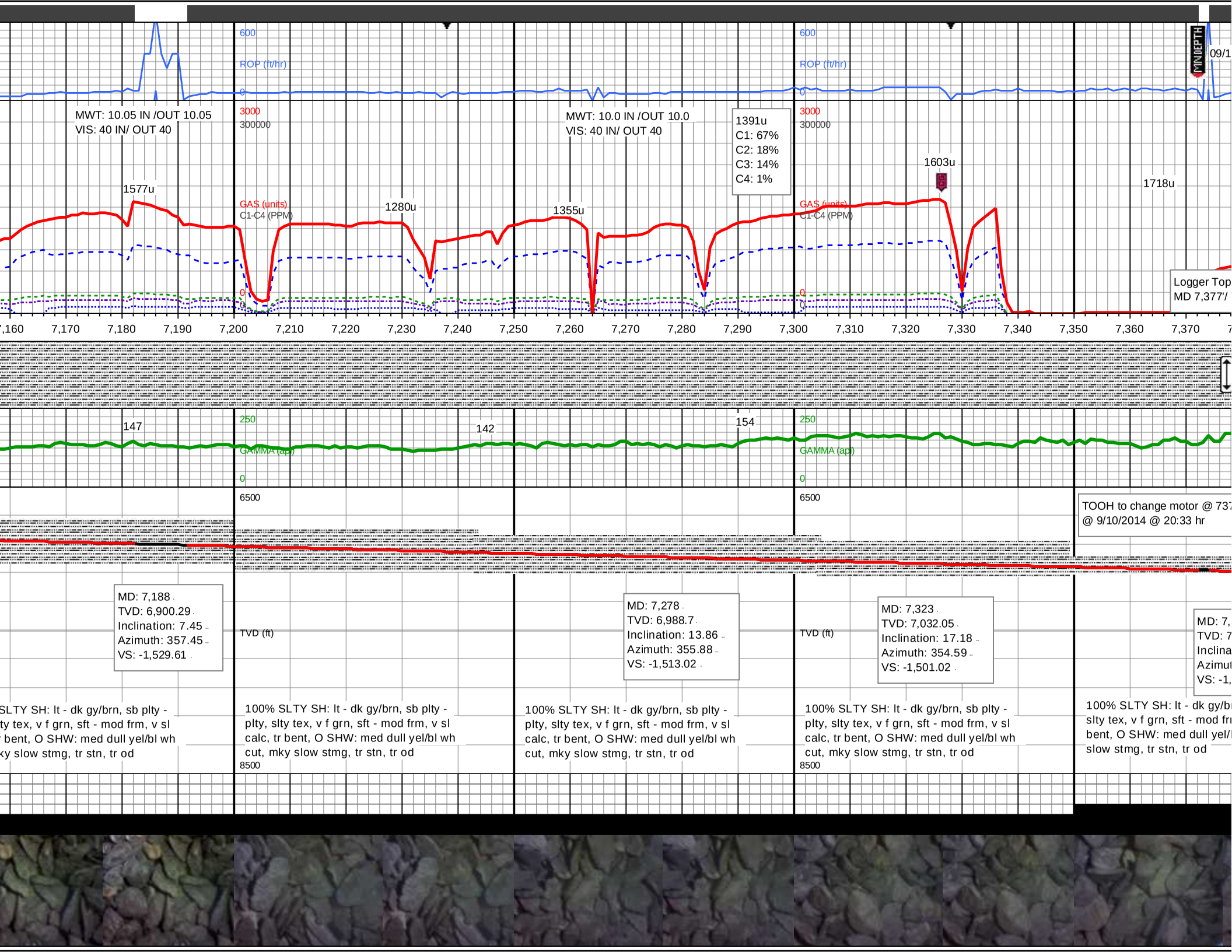
TVD

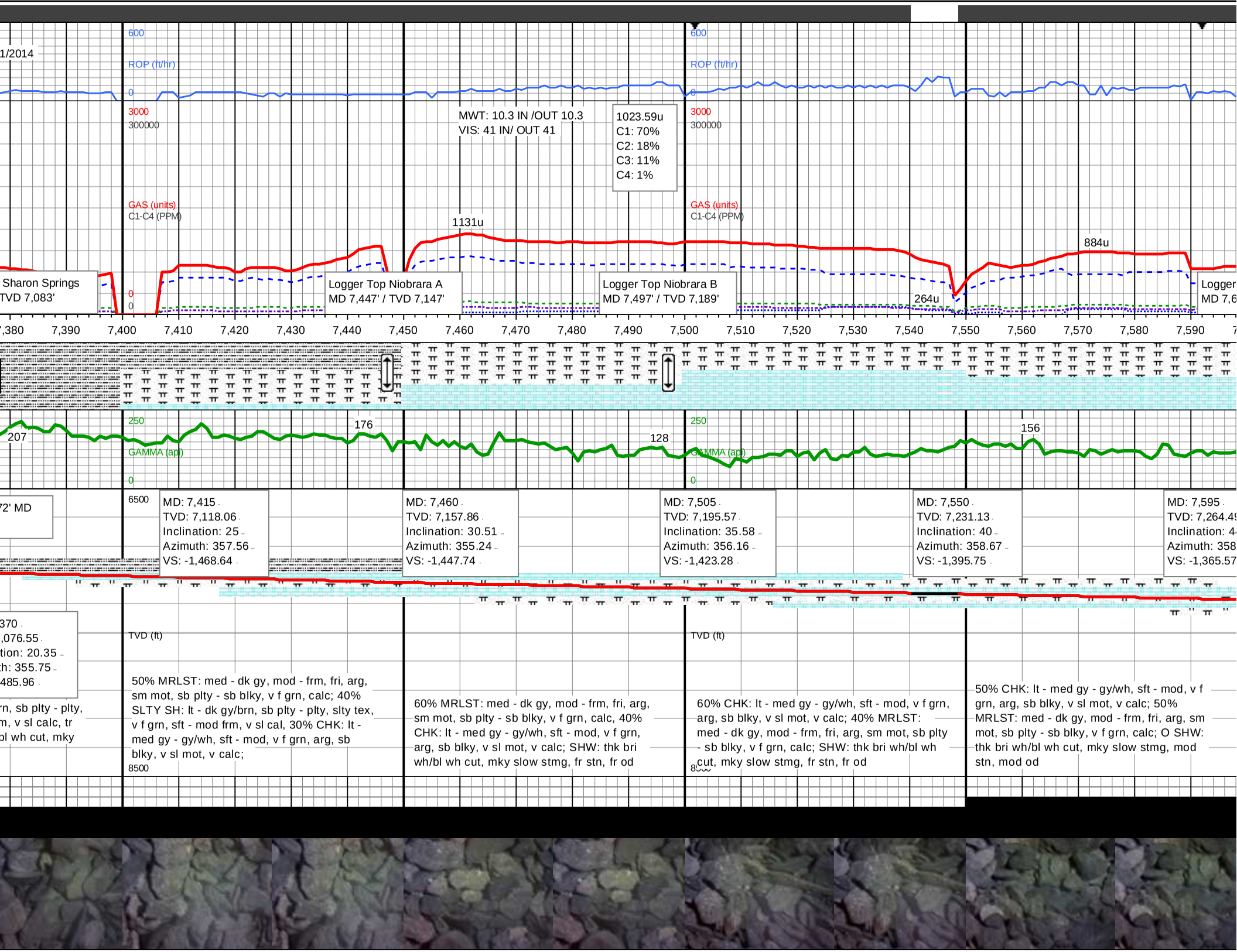
Oil Show

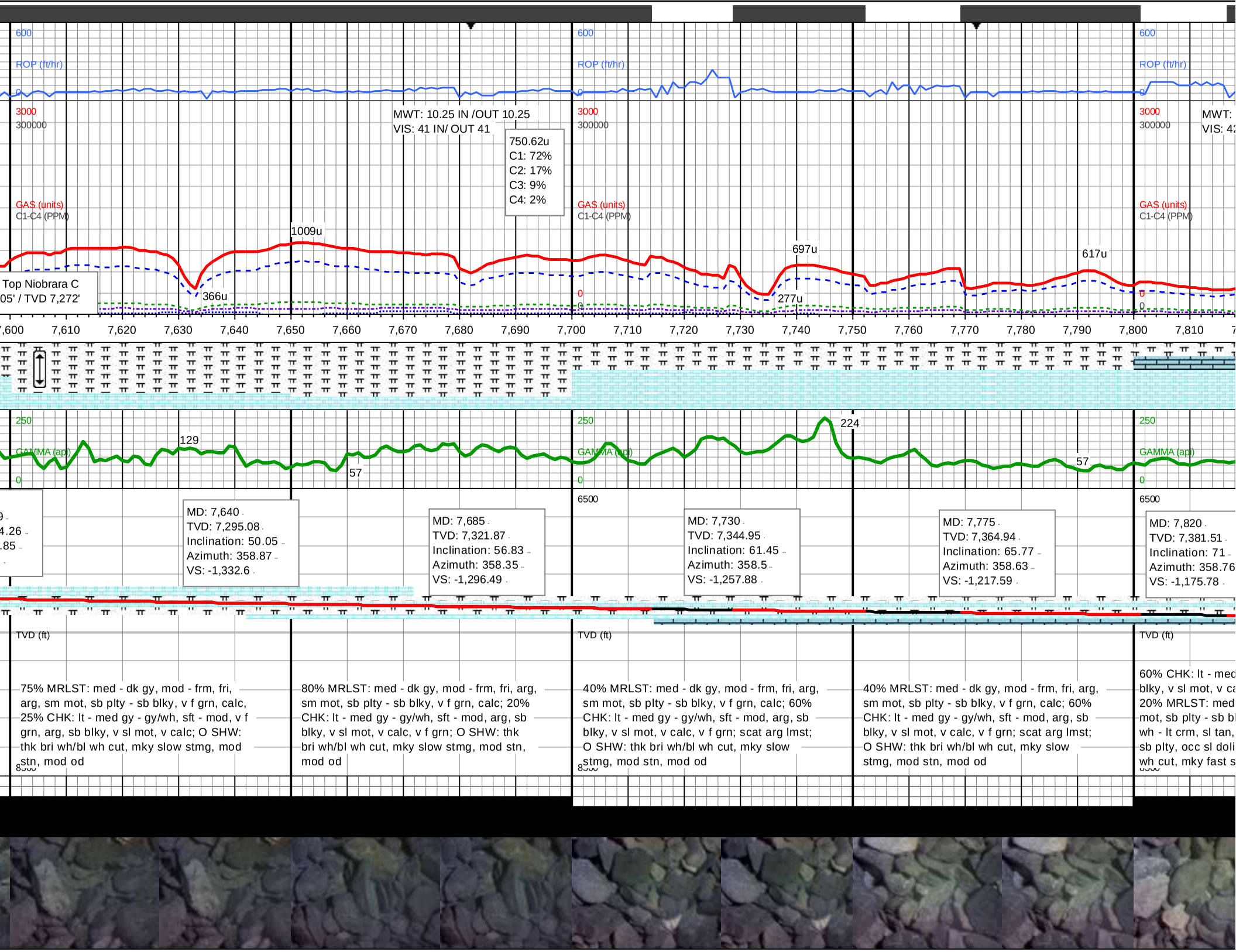
E
G
M
FR
TR
SL

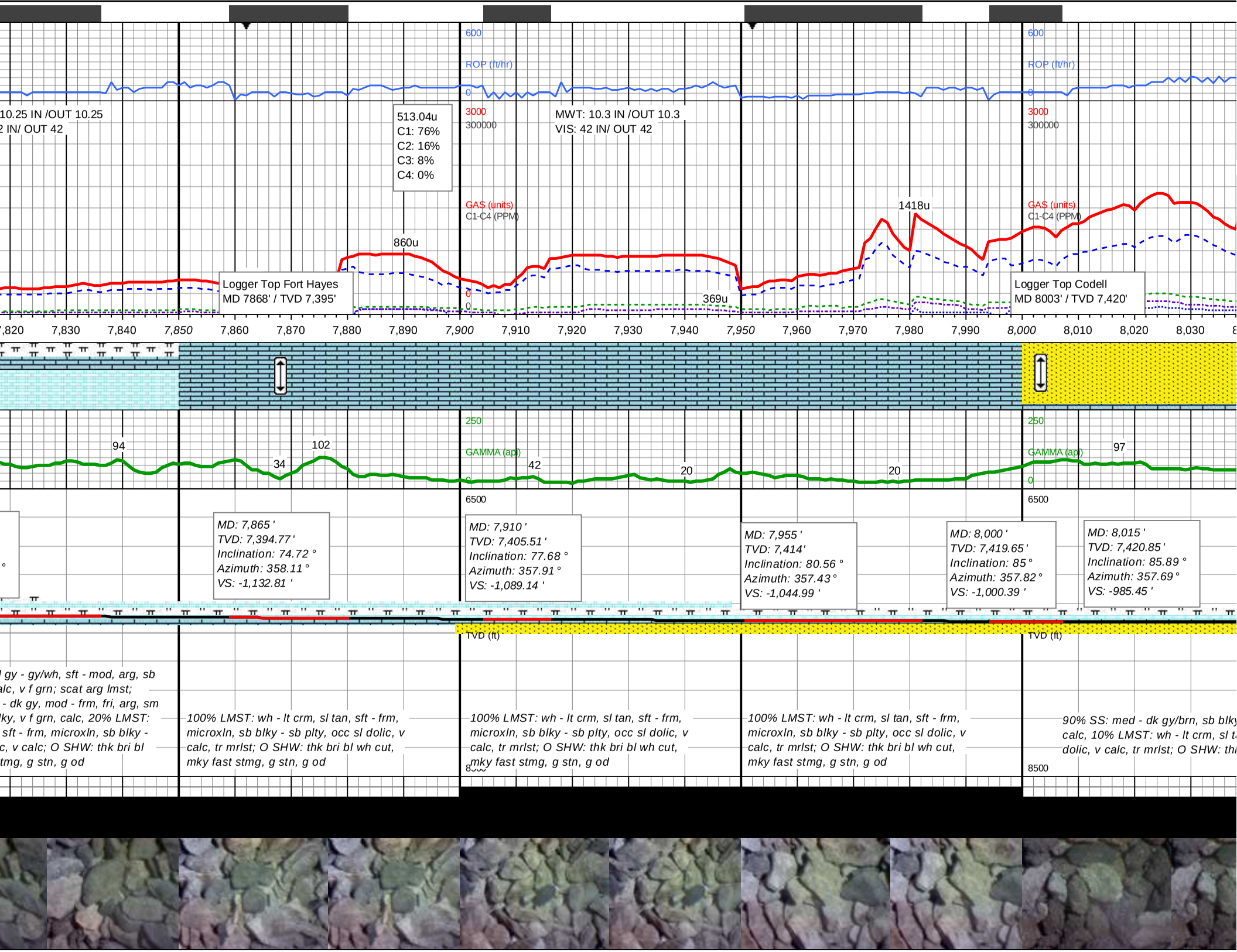
Images

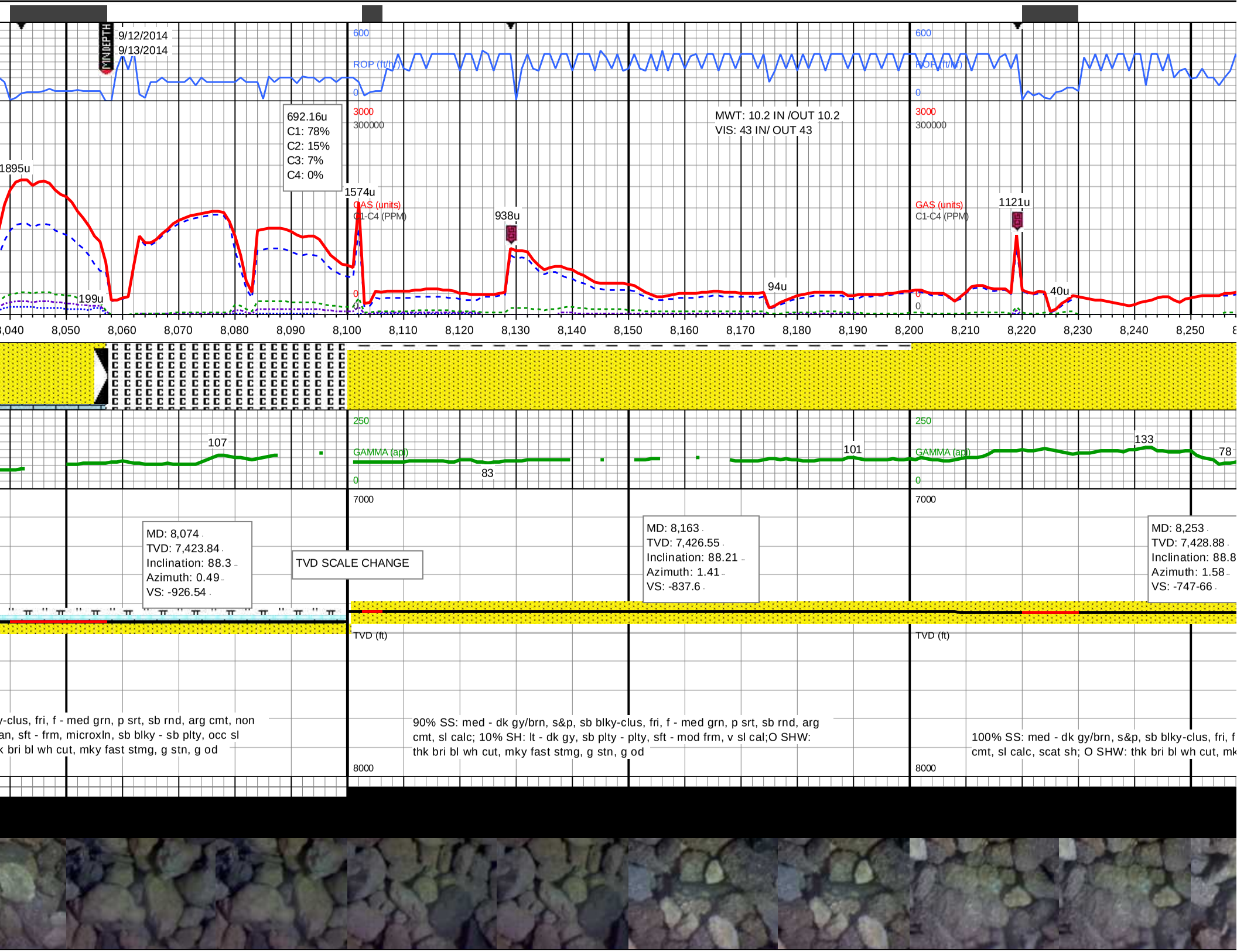


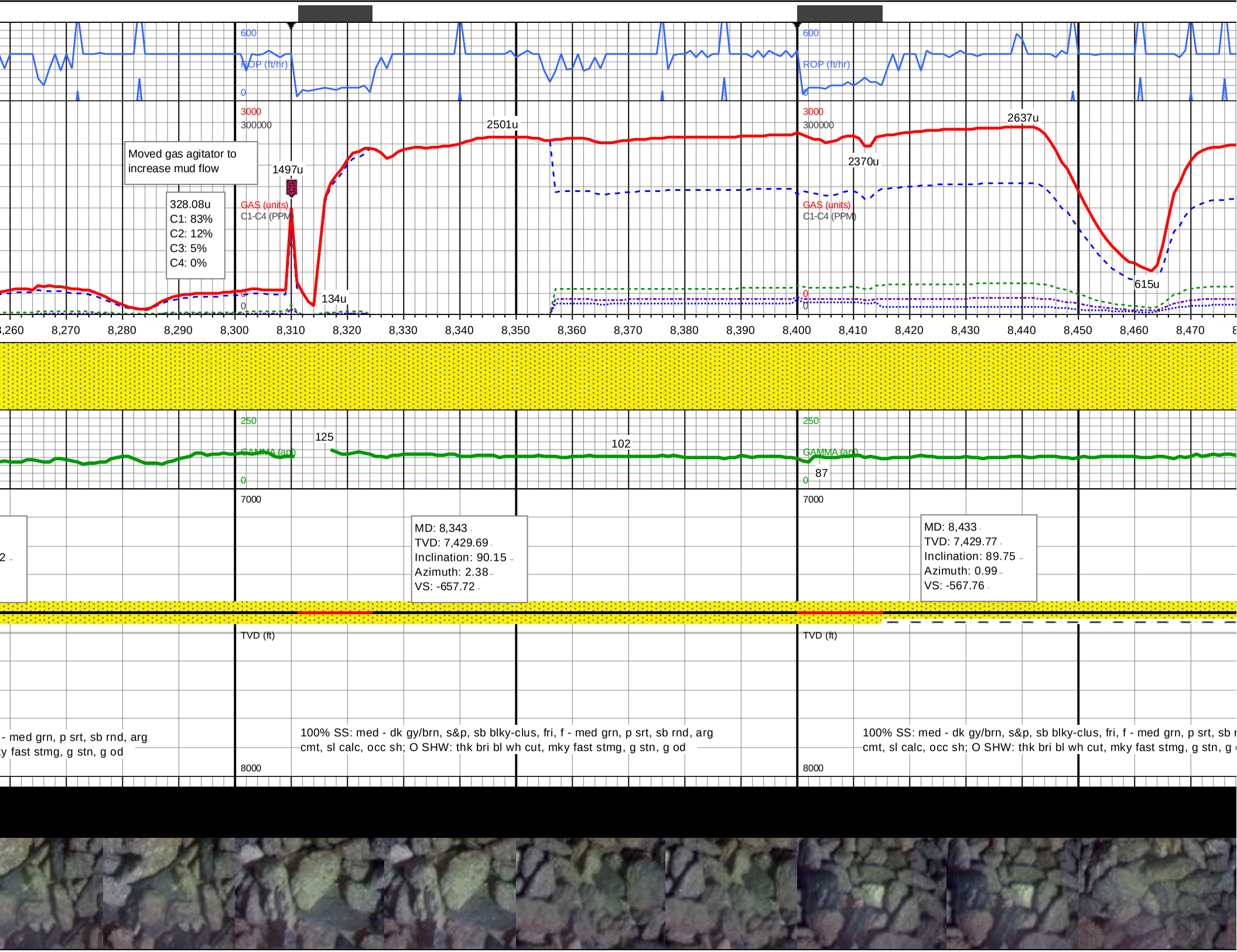

600
ROP (ft/hr)
0
3000
300000
MWT: 10.05 IN /OUT 10.05
VIS: 40 IN/ OUT 40
1577u
GAS (units)
C1-C4 (PPM)
1280u
MWT: 10.0 IN /OUT 10.0
VIS: 40 IN/ OUT 40
1355u
1391u
C1: 67%
C2: 18%
C3: 14%
C4: 1%
1603u
1718u
MD 10DEPTH
09/1
Logger Top
MD 7,377'/
7,160
7,170
7,180
7,190
7,200
7,210
7,220
7,230
7,240
7,250
7,260
7,270
7,280
7,290
7,300
7,310
7,320
7,330
7,340
7,350
7,360
7,370
147
250
GAMMA (api)
0
142
154
6500
TOOH to change motor @ 737
@ 9/10/2014 @ 20:33 hr
MD: 7,188
TVD: 6,900.29
Inclination: 7.45
Azimuth: 357.45
VS: -1,529.61
TVD (ft)
MD: 7,278
TVD: 6,988.7
Inclination: 13.86
Azimuth: 355.88
VS: -1,513.02
MD: 7,323
TVD: 7,032.05
Inclination: 17.18
Azimuth: 354.59
VS: -1,501.02
MD: 7,
TVD: 7
Inclina
Azimut
VS: -1,
SLTY SH: lt - dk gy/brn, sb plty -
ty tex, v f grn, sft - mod frm, v sl
bent, O SHW: med dull yel/bl wh
ky slow stmg, tr stn, tr od
100% SLTY SH: lt - dk gy/brn, sb plty -
plty, slty tex, v f grn, sft - mod frm, v sl
calc, tr bent, O SHW: med dull yel/bl wh
cut, mky slow stmg, tr stn, tr od
8500
100% SLTY SH: lt - dk gy/brn, sb plty -
plty, slty tex, v f grn, sft - mod frm, v sl
calc, tr bent, O SHW: med dull yel/bl wh
cut, mky slow stmg, tr stn, tr od
100% SLTY SH: lt - dk gy/brn, sb plty -
plty, slty tex, v f grn, sft - mod frm, v sl
calc, tr bent, O SHW: med dull yel/bl wh
cut, mky slow stmg, tr stn, tr od
100% SLTY SH: lt - dk gy/br
slty tex, v f grn, sft - mod fr
bent, O SHW: med dull yel/
slow stmg, tr stn, tr od

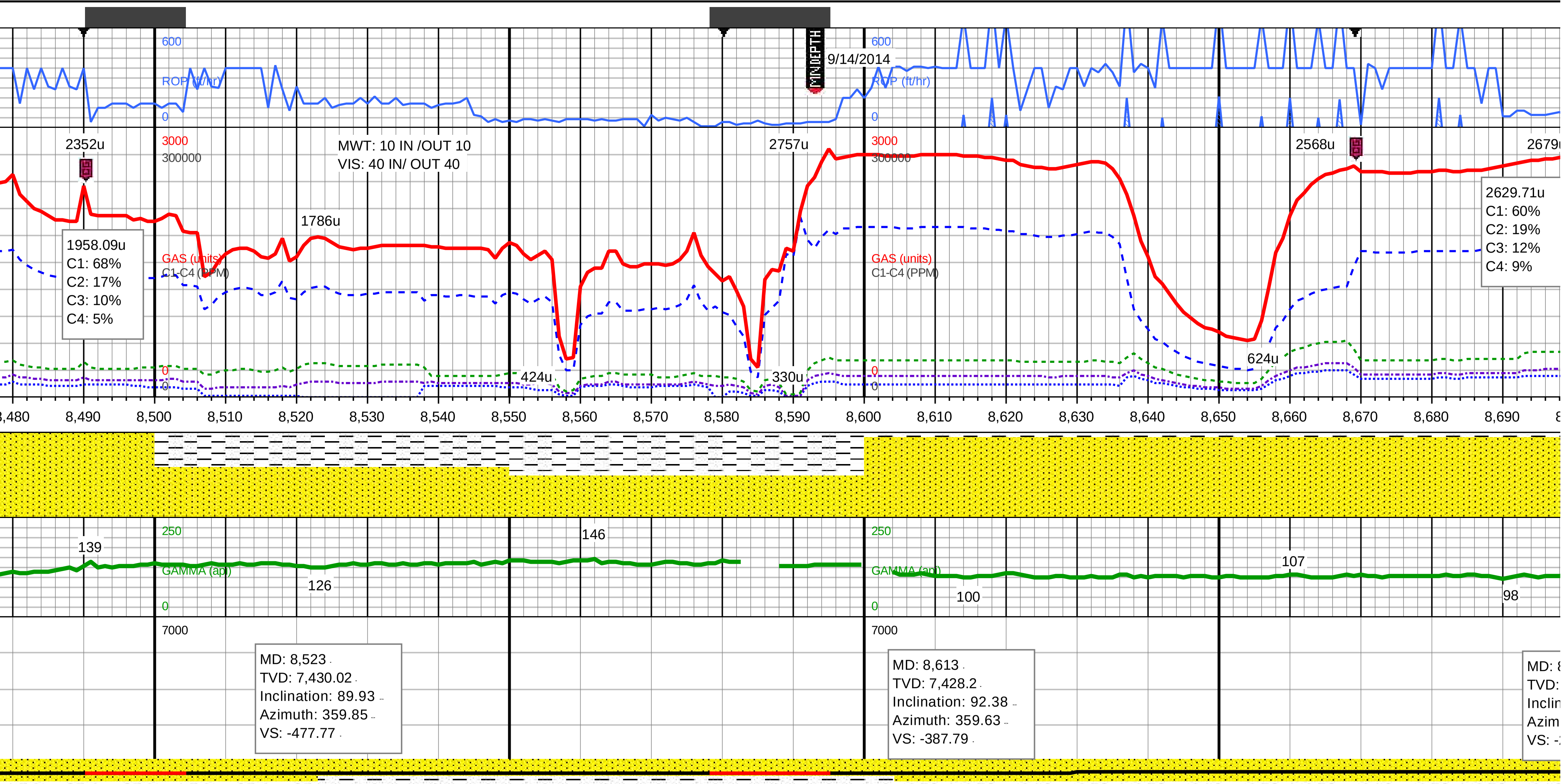

1/2014
600
ROP (ft/hr)
0
3000
300000
MWT: 10.3 IN /OUT 10.3
VIS: 41 IN/ OUT 41
1023.59u
C1: 70%
C2: 18%
C3: 11%
C4: 1%
GAS (units)
C1-C4 (PPM)
1131u
884u
264u
Sharon Springs
TVD 7,083'
Logger Top Niobrara A
MD 7,447' / TVD 7,147'
Logger Top Niobrara B
MD 7,497' / TVD 7,189'
Logger
MD 7,6
0
7,380
7,390
7,400
7,410
7,420
7,430
7,440
7,450
7,460
7,470
7,480
7,490
7,500
7,510
7,520
7,530
7,540
7,550
7,560
7,570
7,580
7,590
250
GAMMA (api)
207
176
128
156
6500
72' MD
MD: 7,415
TVD: 7,118.06
Inclination: 25
Azimuth: 357.56
VS: -1,468.64
MD: 7,460
TVD: 7,157.86
Inclination: 30.51
Azimuth: 355.24
VS: -1,447.74
MD: 7,505
TVD: 7,195.57
Inclination: 35.58
Azimuth: 356.16
VS: -1,423.28
MD: 7,550
TVD: 7,231.13
Inclination: 40
Azimuth: 358.67
VS: -1,395.75
MD: 7,595
VS: -1,365.57
370
,076.55
tion: 20.35
h: 355.75
485.96
TVD (ft)
8500
50% MRLST: med - dk gy, mod - frm, fri, arg, sm mot, sb plty - sb blky, v f grn, calc; 40% SLTY SH: lt - dk gy/brn, sb plty - plty, slty tex, v f grn, sft - mod frm, v sl cal, 30% CHK: lt - med gy - gy/wh, sft - mod, v f grn, arg, sb blky, v sl mot, v calc;
60% MRLST: med - dk gy, mod - frm, fri, arg, sm mot, sb plty - sb blky, v f grn, calc, 40% CHK: lt - med gy - gy/wh, sft - mod, v f grn, arg, sb blky, v sl mot, v calc; SHW: thk bri wh/bl wh cut, mky slow stmg, fr stn, fr od
60% CHK: lt - med gy - gy/wh, sft - mod, v f grn, arg, sb blky, v sl mot, v calc; 40% MRLST: med - dk gy, mod - frm, fri, arg, sm mot, sb plty - sb blky, v f grn, calc; SHW: thk bri wh/bl wh cut, mky slow stmg, fr stn, fr od
50% CHK: lt - med gy - gy/wh, sft - mod, v f grn, arg, sb blky, v sl mot, v calc; 50% MRLST: med - dk gy, mod - frm, fri, arg, sm mot, sb plty - sb blky, v f grn, calc; O SHW: thk bri wh/bl wh cut, mky slow stmg, mod stn, mod od


600
ROP (ft/hr)
0
3000
300000
MWT: 10.25 IN /OUT 10.25
VIS: 41 IN/ OUT 41
750.62u
C1: 72%
C2: 17%
C3: 9%
C4: 2%
GAS (units)
C1-C4 (PPM)
1009u
366u
697u
277u
617u
Top Niobrara C
05' / TVD 7,272'
7,600
7,610
7,620
7,630
7,640
7,650
7,660
7,670
7,680
7,690
7,700
7,710
7,720
7,730
7,740
7,750
7,760
7,770
7,780
7,790
7,800
7,810
250
GAMMA (api)
129
57
224
MD: 7,640
TVD: 7,295.08
Inclination: 50.05
Azimuth: 358.87
VS: -1,332.6
MD: 7,685
TVD: 7,321.87
Inclination: 56.83
Azimuth: 358.35
VS: -1,296.49
6500
MD: 7,730
TVD: 7,344.95
Inclination: 61.45
Azimuth: 358.5
VS: -1,257.88
MD: 7,775
TVD: 7,364.94
Inclination: 65.77
Azimuth: 358.63
VS: -1,217.59
MD: 7,820
TVD: 7,381.51
Inclination: 71
Azimuth: 358.76
VS: -1,175.78
TVD (ft)
75% MRLST: med - dk gy, mod - frm, fri, arg, sm mot, sb plty - sb blky, v f grn, calc, 25% CHK: lt - med gy - gy/wh, sft - mod, v f grn, arg, sb blky, v sl mot, v calc; O SHW: thk bri wh/bl wh cut, mky slow stmg, mod stn, mod od
80% MRLST: med - dk gy, mod - frm, fri, arg, sm mot, sb plty - sb blky, v f grn, calc; 20% CHK: lt - med gy - gy/wh, sft - mod, arg, sb blky, v sl mot, v calc, v f grn; O SHW: thk bri wh/bl wh cut, mky slow stmg, mod stn, mod od
40% MRLST: med - dk gy, mod - frm, fri, arg, sm mot, sb plty - sb blky, v f grn, calc; 60% CHK: lt - med gy - gy/wh, sft - mod, arg, sb blky, v sl mot, v calc, v f grn; scat arg lmst; O SHW: thk bri wh/bl wh cut, mky slow stmg, mod stn, mod od
40% MRLST: med - dk gy, mod - frm, fri, arg, sm mot, sb plty - sb blky, v f grn, calc; 60% CHK: lt - med gy - gy/wh, sft - mod, arg, sb blky, v sl mot, v calc, v f grn; scat arg lmst; O SHW: thk bri wh/bl wh cut, mky slow stmg, mod stn, mod od


600
ROP (ft/hr)
0
3000
300000
10.25 IN /OUT 10.25
2 IN/ OUT 42
513.04u
C1: 76%
C2: 16%
C3: 8%
C4: 0%
MWT: 10.3 IN /OUT 10.3
VIS: 42 IN/ OUT 42
GAS (units)
C1-C4 (PPM)
860u
1418u
369u
Logger Top Fort Hayes
MD 7868' / TVD 7,395'
Logger Top Codell
MD 8003' / TVD 7,420'
7,820
7,830
7,840
7,850
7,860
7,870
7,880
7,890
7,900
7,910
7,920
7,930
7,940
7,950
7,960
7,970
7,980
7,990
8,000
8,010
8,020
8,030
250
GAMMA (api)
94
34
102
42
20
20
97
6500
MD: 7,865 '
TVD: 7,394.77 '
Inclination: 74.72 °
Azimuth: 358.11 °
VS: -1,132.81 '
MD: 7,910 '
TVD: 7,405.51 '
Inclination: 77.68 °
Azimuth: 357.91 °
VS: -1,089.14 '
MD: 7,955 '
TVD: 7,414'
Inclination: 80.56 °
Azimuth: 357.43 °
VS: -1,044.99 '
MD: 8,000 '
TVD: 7,419.65 '
Inclination: 85 °
Azimuth: 357.82 °
VS: -1,000.39 '
MD: 8,015 '
TVD: 7,420.85 '
Inclination: 85.89 °
Azimuth: 357.69 °
VS: -985.45 '
TVD (ft)
8500
100% LMST: wh - lt crm, sl tan, sft - frm, microxln, sb blky - sb plty, occ sl dolic, v calc, tr mrlst; O SHW: thk bri bl wh cut, mky fast stmg, g stn, g od
90% SS: med - dk gy/brn, sb blky
calc, 10% LMST: wh - lt crm, sl t
dolic, v calc, tr mrlst; O SHW: thi


9/12/2014
9/13/2014
MD DEPTH
600
ROP (ft/hr)
0
3000
300000
692.16u
C1: 78%
C2: 15%
C3: 7%
C4: 0%
MWT: 10.2 IN /OUT 10.2
VIS: 43 IN/ OUT 43
1895u
1574u
938u
94u
1121u
40u
199u
GAS (units)
C1-C4 (PPM)
8,040
8,050
8,060
8,070
8,080
8,090
8,100
8,110
8,120
8,130
8,140
8,150
8,160
8,170
8,180
8,190
8,200
8,210
8,220
8,230
8,240
8,250
250
GAMMA (api)
107
83
101
133
78
7000
8000
MD: 8,074
TVD: 7,423.84
Inclination: 88.3
Azimuth: 0.49
VS: -926.54
TVD SCALE CHANGE
MD: 8,163
TVD: 7,426.55
Inclination: 88.21
Azimuth: 1.41
VS: -837.6
MD: 8,253
TVD: 7,428.88
Inclination: 88.8
Azimuth: 1.58
VS: -747-66
TVD (ft)
y-clus, fri, f - med grn, p srt, sb rnd, arg cmt, non
an, sft - frm, microxln, sb blky - sb plty, occ sl
k bri bl wh cut, mky fast stmg, g stn, g od
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg
cmt, sl calc; 10% SH: lt - dk gy, sb plty - plty, sft - mod frm, v sl cal;O SHW:
thk bri bl wh cut, mky fast stmg, g stn, g od
100% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f
cmt, sl calc, scat sh; O SHW: thk bri bl wh cut, mk


600
ROP (ft/hr)
0
3000
300000
Moved gas agitator to increase mud flow
328.08u
C1: 83%
C2: 12%
C3: 5%
C4: 0%
1497u
2501u
2370u
2637u
615u
134u
GAS (units)
C1-C4 (PPM)
0
8,260
8,270
8,280
8,290
8,300
8,310
8,320
8,330
8,340
8,350
8,360
8,370
8,380
8,390
8,400
8,410
8,420
8,430
8,440
8,450
8,460
8,470
250
GAMMA (api)
125
102
87
7000
MD: 8,343
TVD: 7,429.69
Inclination: 90.15
Azimuth: 2.38
VS: -657.72
MD: 8,433
TVD: 7,429.77
Inclination: 89.75
Azimuth: 0.99
VS: -567.76
TVD (ft)
100% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg
cmt, sl calc, occ sh; O SHW: thk bri bl wh cut, mky fast stmg, g stn, g od
8000

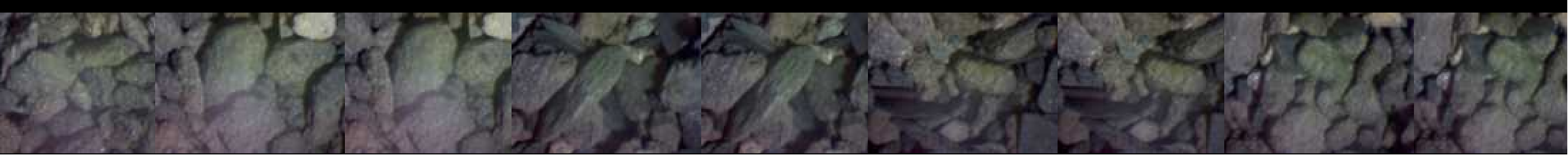


rnd, arg
od

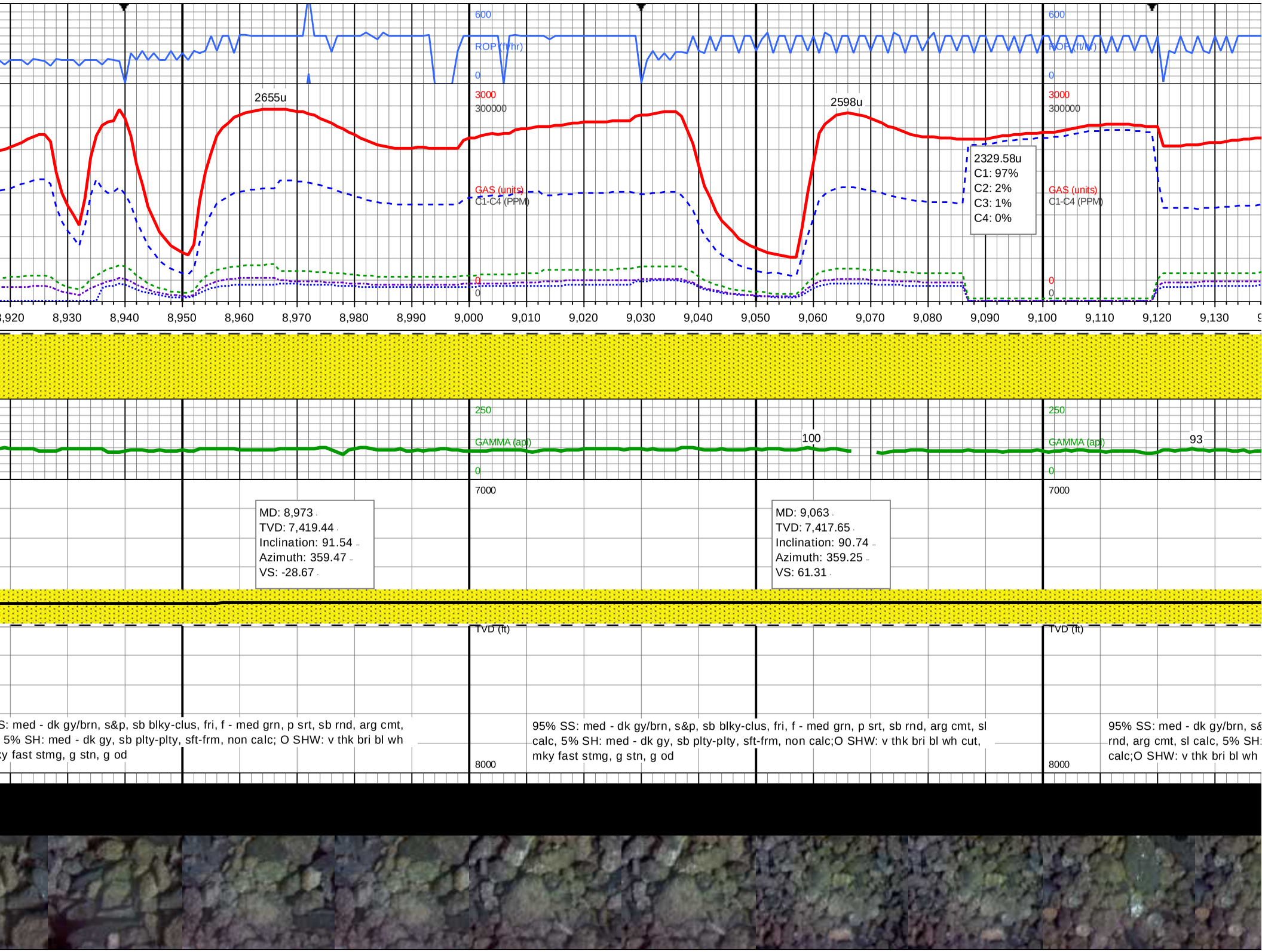
60% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 40% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: thk bri bl wh cut, mky fast stmg, g stn, g od

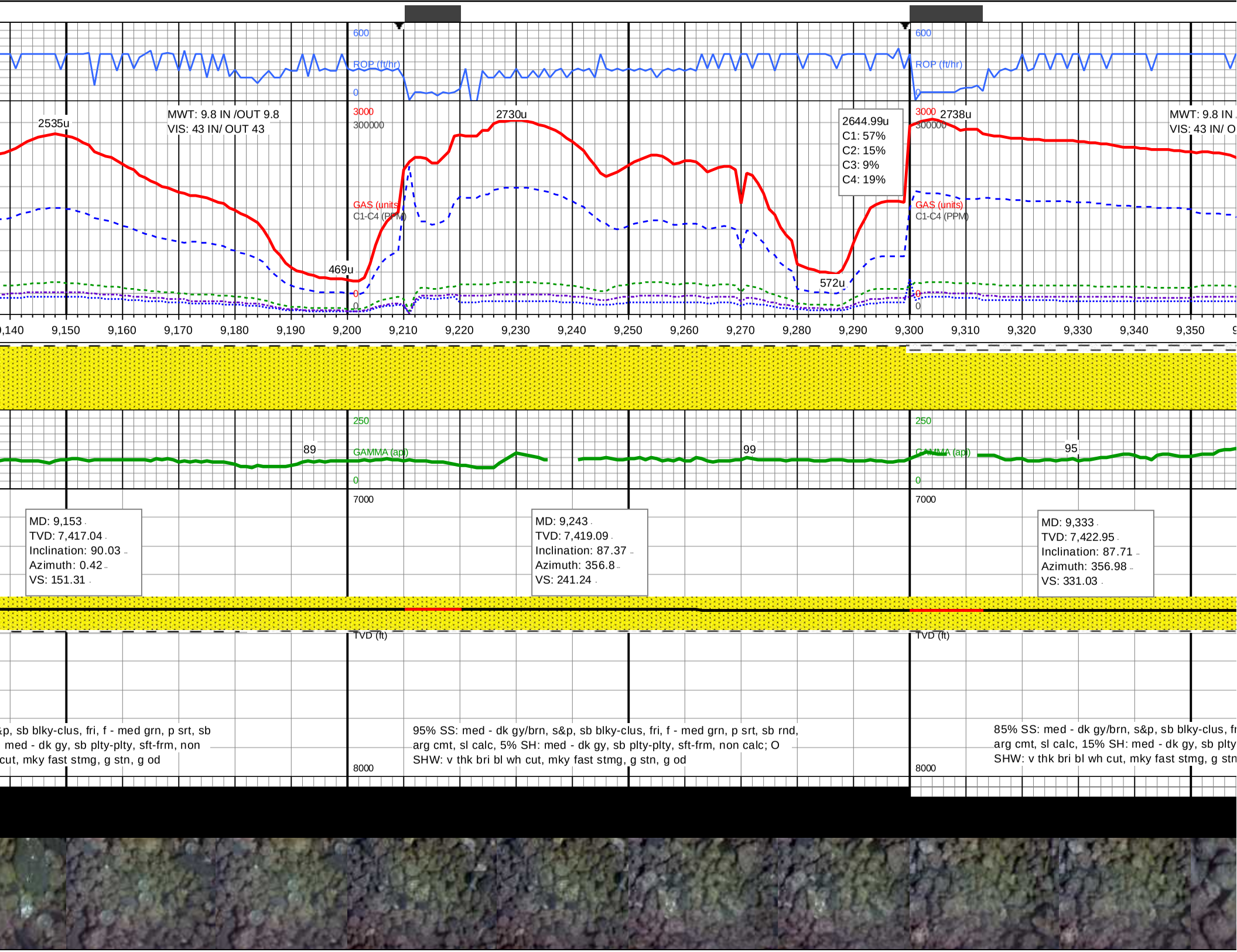
50% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 50% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: thk bri bl wh cut, mky fast stmg, g stn, g od

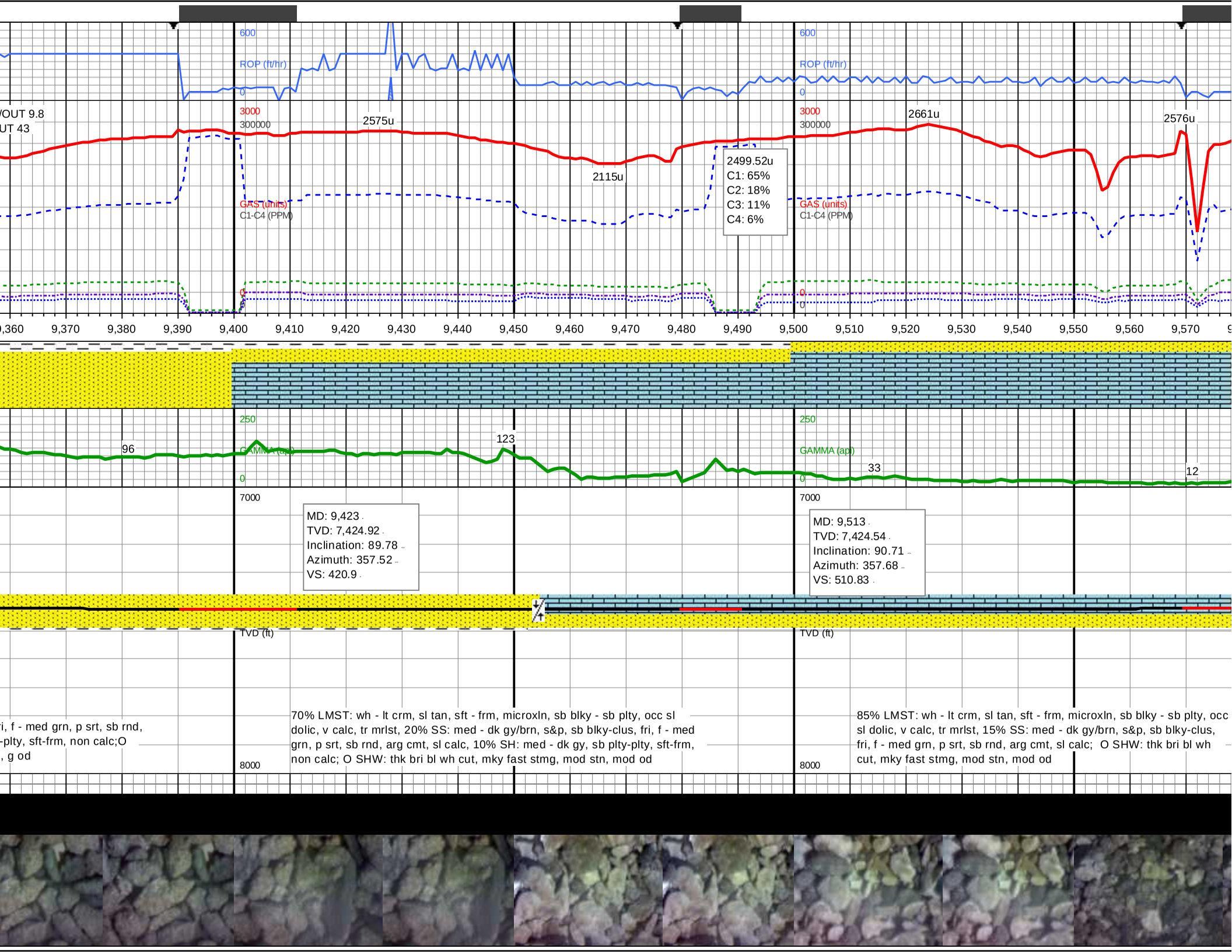
95% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 5% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: thk bri bl wh cut, mky fast stmg, g stn, g od




600
ROP (ft/hr)
0
3000
300000
2530u
1999u
2469u
562u
MWT: 9.9 IN /OUT 9.9
VIS: 44 IN/ OUT 44
674.87u
C1: 44%
C2: 26%
C3: 16%
C4: 14%
2548u
GAS (units)
C1-C4 (PPM)
8,700
8,710
8,720
8,730
8,740
8,750
8,760
8,770
8,780
8,790
8,800
8,810
8,820
8,830
8,840
8,850
8,860
8,870
8,880
8,890
8,900
8,910
250
GAMMA (api)
116
7000
MD: 8,793
TVD: 7,424.14
Inclination: 91.01
Azimuth: 0.13
VS: -207.85
MD: 8,883
TVD: 7,422
Inclination: 91.72
Azimuth: 359.14
VS: -117.88
TVD (ft)
100% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, occ sh;O SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
95% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 5% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
8000

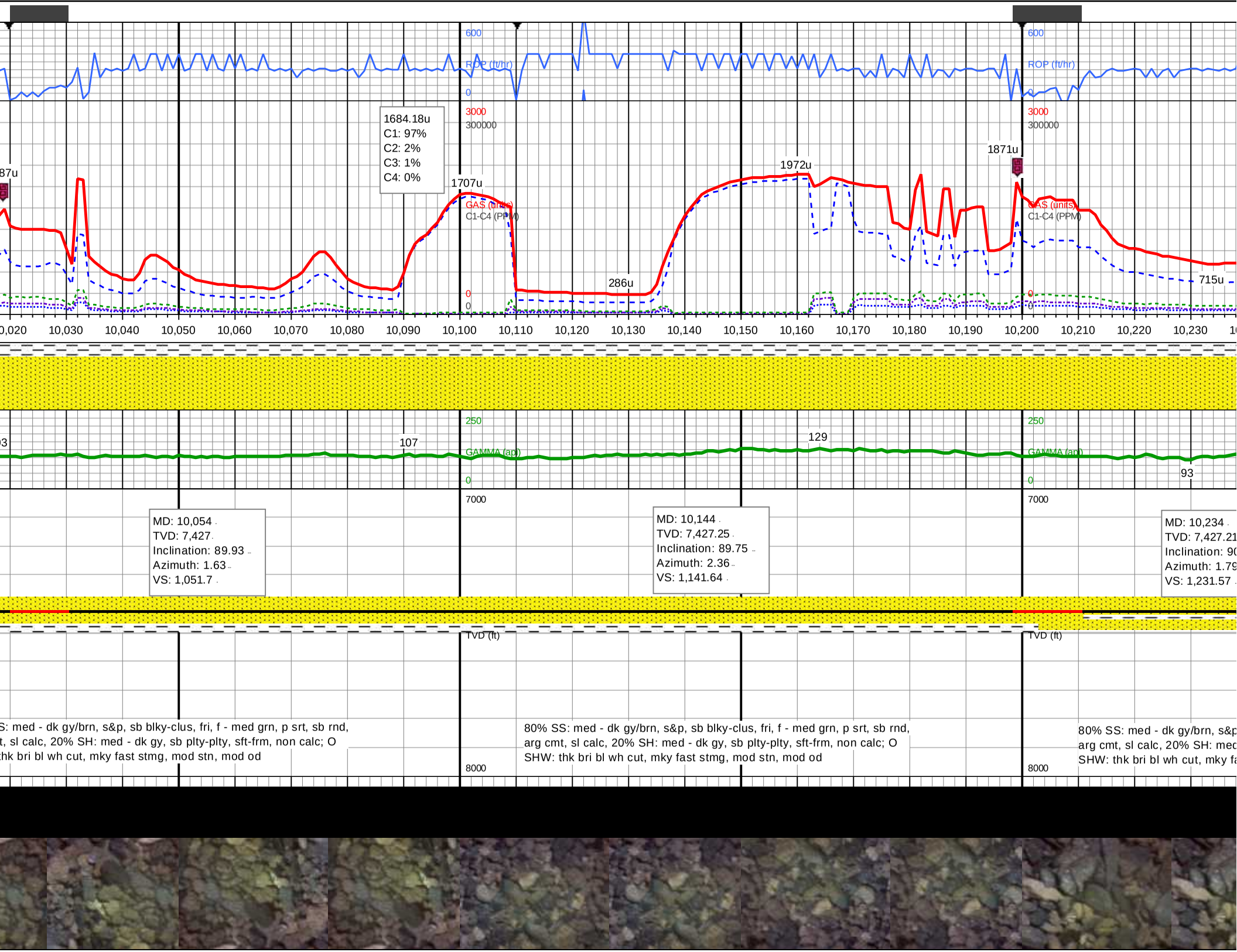

600
ROP (m/hr)
0
3000
300000
2655u
GAS (units)
C1-C4 (PPM)
0
0
2598u
2329.58u
C1: 97%
C2: 2%
C3: 1%
C4: 0%
8,920
8,930
8,940
8,950
8,960
8,970
8,980
8,990
9,000
9,010
9,020
9,030
9,040
9,050
9,060
9,070
9,080
9,090
9,100
9,110
9,120
9,130
250
GAMMA (api)
0
100
93
7000
MD: 8,973
TVD: 7,419.44
Inclination: 91.54
Azimuth: 359.47
VS: -28.67
MD: 9,063
TVD: 7,417.65
Inclination: 90.74
Azimuth: 359.25
VS: 61.31
TVD (ft)
8000
S: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt,
5% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: v thk bri bl wh
y fast stmg, g stn, g od
95% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl
calc, 5% SH: med - dk gy, sb plty-plty, sft-frm, non calc;O SHW: v thk bri bl wh cut,
mky fast stmg, g stn, g od
95% SS: med - dk gy/brn, s&
rnd, arg cmt, sl calc, 5% SH
calc;O SHW: v thk bri bl wh


600
ROP (ft/hr)
0
3000
300000
GAS (units)
C1-C4 (PPM)
0
2535u
MWT: 9.8 IN /OUT 9.8
VIS: 43 IN/ OUT 43
469u
2730u
2644.99u
C1: 57%
C2: 15%
C3: 9%
C4: 19%
572u
2738u
MWT: 9.8 IN
VIS: 43 IN/ O
9,140
9,150
9,160
9,170
9,180
9,190
9,200
9,210
9,220
9,230
9,240
9,250
9,260
9,270
9,280
9,290
9,300
9,310
9,320
9,330
9,340
9,350
250
GAMMA (api)
0
7000
89
99
95
MD: 9,153
TVD: 7,417.04
Inclination: 90.03
Azimuth: 0.42
VS: 151.31
MD: 9,243
TVD: 7,419.09
Inclination: 87.37
Azimuth: 356.8
VS: 241.24
MD: 9,333
TVD: 7,422.95
Inclination: 87.71
Azimuth: 356.98
VS: 331.03
TVD (ft)
8000
&p, sb blky-clus, fri, f - med grn, p srt, sb
med - dk gy, sb plty-plty, sft-frm, non
cut, mky fast stmg, g stn, g od
95% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd,
arg cmt, sl calc, 5% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O
SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
85% SS: med - dk gy/brn, s&p, sb blky-clus, fr
arg cmt, sl calc, 15% SH: med - dk gy, sb plty
SHW: v thk bri bl wh cut, mky fast stmg, g stn

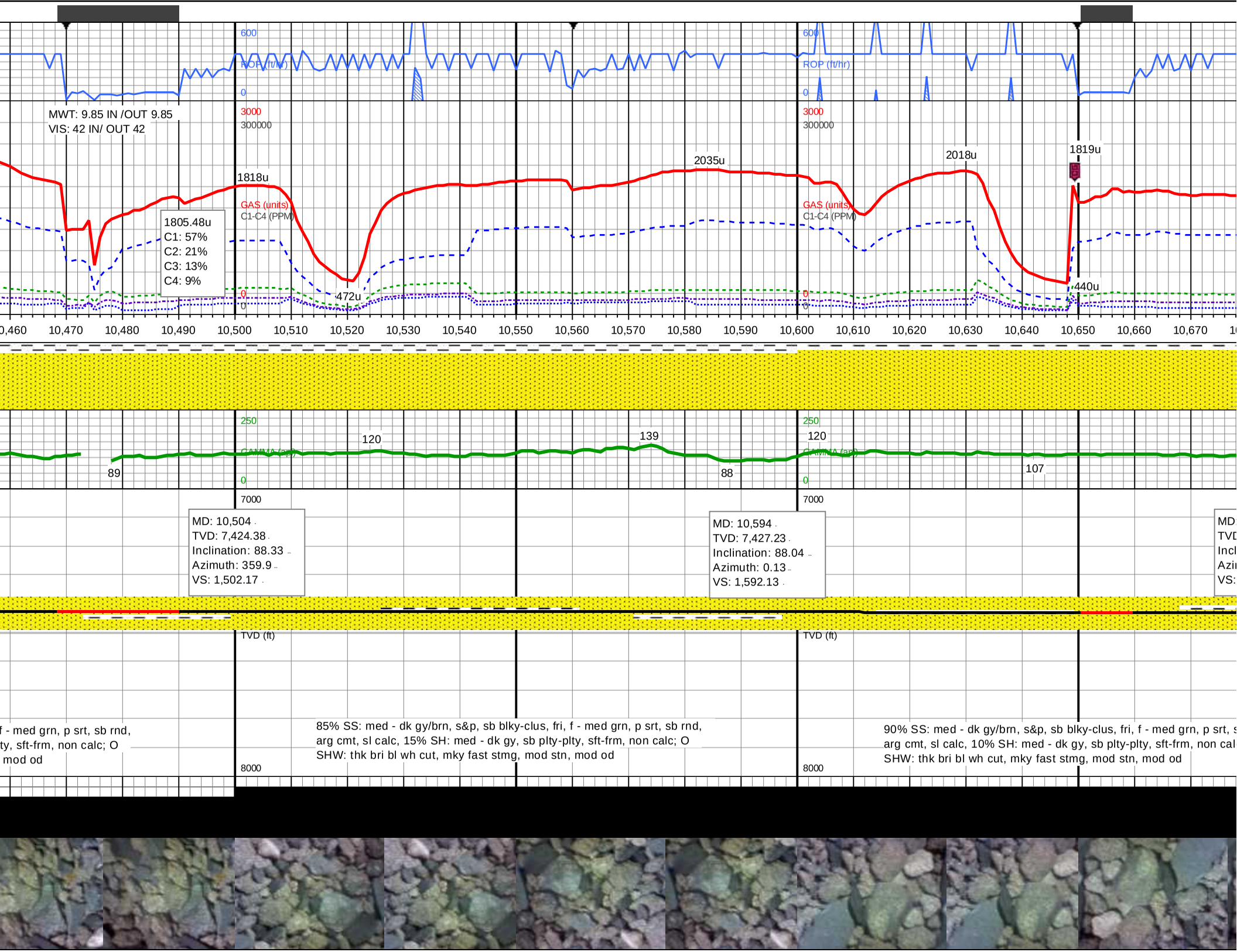

600
ROP (ft/hr)
0
3000
300000
2575u
2115u
2499.52u
C1: 65%
C2: 18%
C3: 11%
C4: 6%
GAS (units)
C1-C4 (PPM)
2661u
2576u
9,360
9,370
9,380
9,390
9,400
9,410
9,420
9,430
9,440
9,450
9,460
9,470
9,480
9,490
9,500
9,510
9,520
9,530
9,540
9,550
9,560
250
GAMMA (api)
96
123
33
12
7000
MD: 9,423
TVD: 7,424.92
Inclination: 89.78
Azimuth: 357.52
VS: 420.9
MD: 9,513
TVD: 7,424.54
Inclination: 90.71
Azimuth: 357.68
VS: 510.83
TVD (ft)
8000
70% LMST: wh - lt crm, sl tan, sft - frm, microxln, sb blky - sb plty, occ sl dolic, v calc, tr mrlst, 20% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od
85% LMST: wh - lt crm, sl tan, sft - frm, microxln, sb blky - sb plty, occ sl dolic, v calc, tr mrlst, 15% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc; O SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od

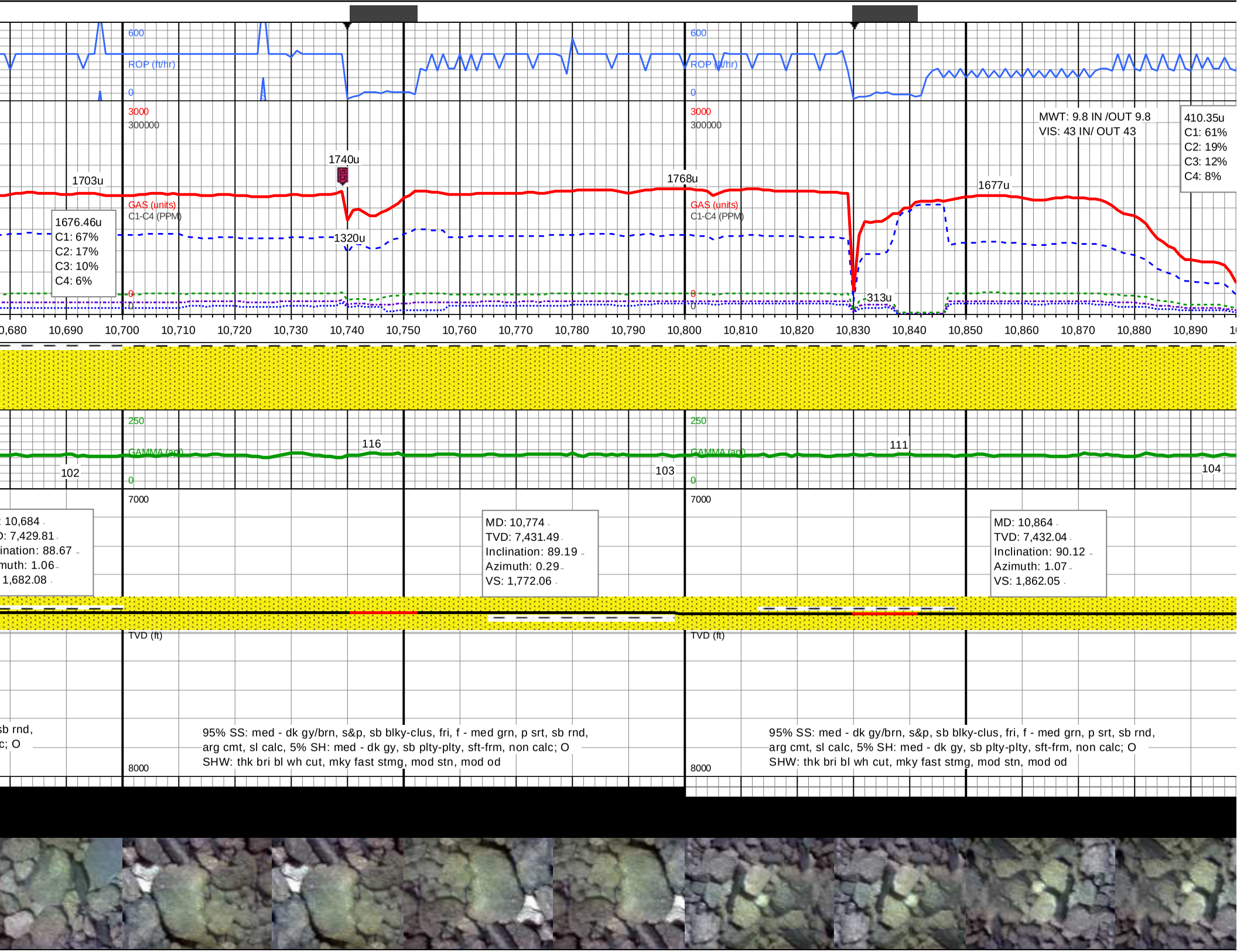

600
ROP (ft/hr)
0
3000
300000
MWT: 9.8 IN /OUT 9.8
VIS: 43 IN/ OUT 43
2317u
2238u
1146u
1721.03u
C1: 49%
C2: 22%
C3: 16%
C4: 13%
GAS (units)
C1-C4 (PPM)
0
9,580
9,590
9,600
9,610
9,620
9,630
9,640
9,650
9,660
9,670
9,680
9,690
9,700
9,710
9,720
9,730
9,740
9,750
9,760
9,770
9,780
9,790
250
GAMMA (api)
77
96
95
7000
MD: 9,604
TVD: 7,423.19
Inclination: 90.98
Azimuth: 358.82
VS: 601.78
MD: 9,694
TVD: 7,423.61
Inclination: 88.49
Azimuth: 358.58
VS: 691.75
MD: 9,784
TVD: 7,425.48
Inclination: 89.13
Azimuth: 359.55
VS: 781.72
TVD (ft)
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od
8000

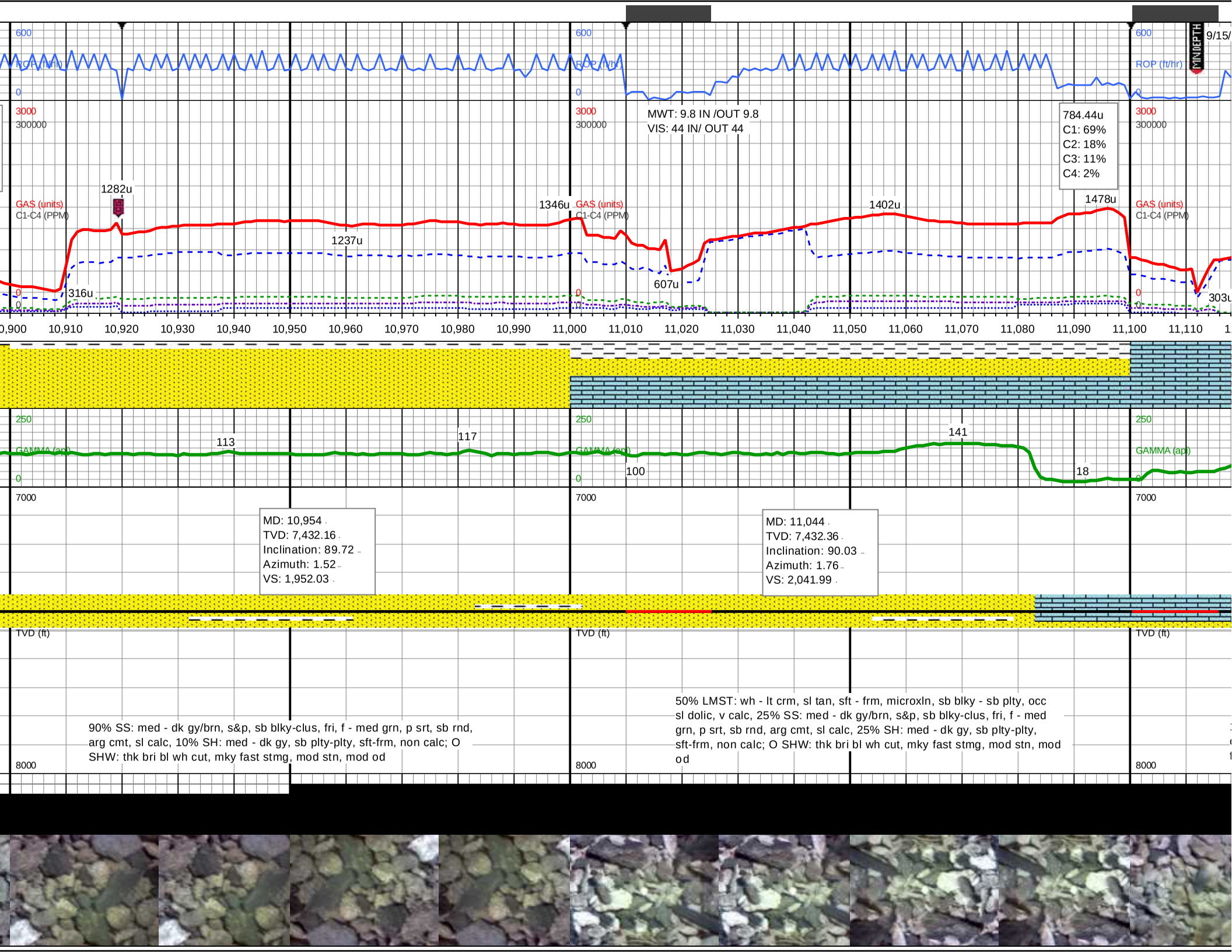

600
ROP (ft/hr)
0
3000
300000
GAS (units)
C1-C4 (PPM)
0
0
622.02u
C1: 50%
C2: 23%
C3: 15%
C4: 12%
2053u
436u
2034u
9,800
9,810
9,820
9,830
9,840
9,850
9,860
9,870
9,880
9,890
9,900
9,910
9,920
9,930
9,940
9,950
9,960
9,970
9,980
9,990
10,000
10,010
250
GAMMA (api)
0
102
106
102
7000
MD: 9,874
TVD: 7,426.14
Inclination: 90.03
Azimuth: 359.7
VS: 871.71
MD: 9,964
TVD: 7,426.53
Inclination: 89.47
Azimuth: 359.27
VS: 961.71
TVD (ft)
8000
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od

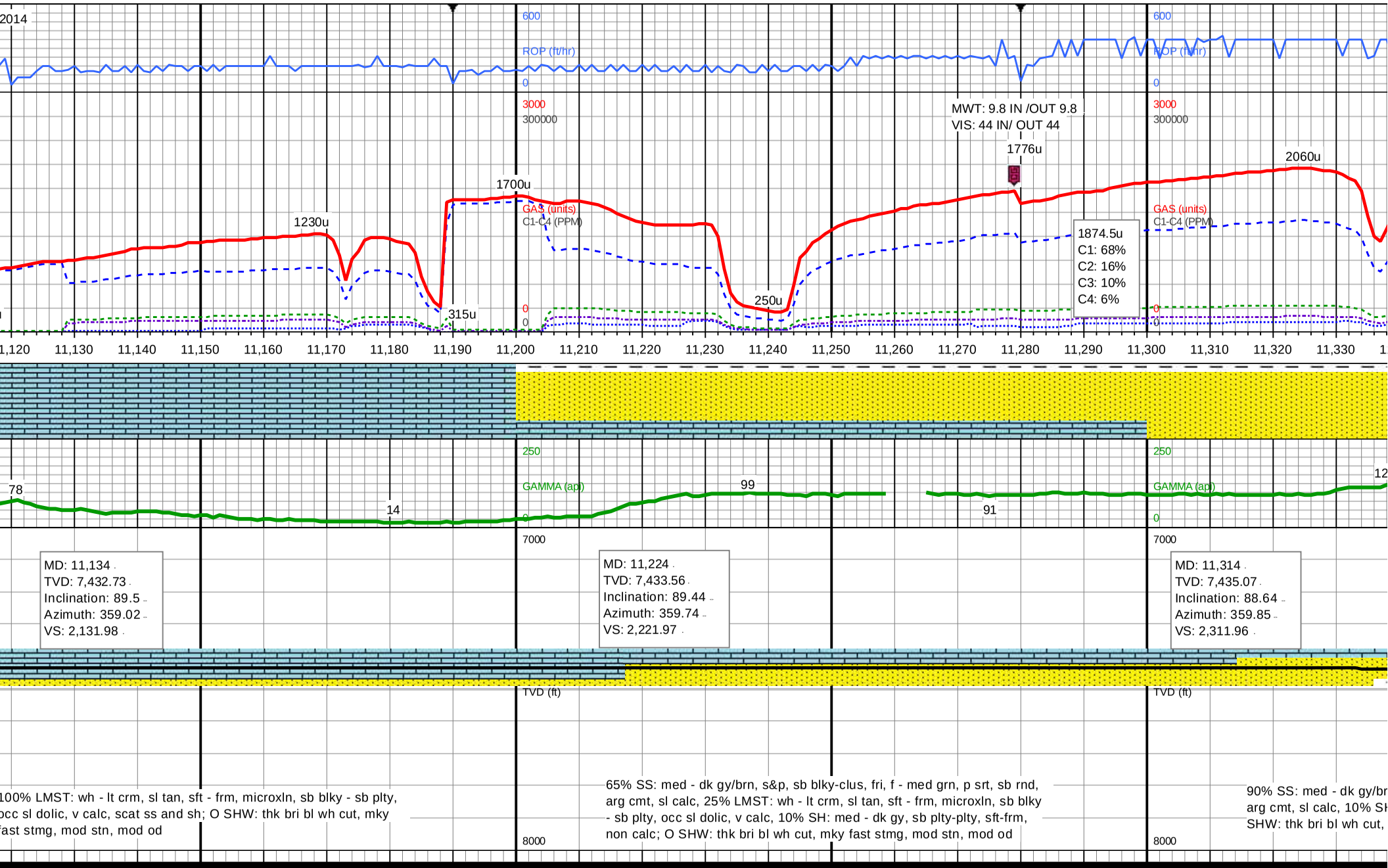

600
ROP (ft/hr)
0
3000
300000
1684.18u
C1: 97%
C2: 2%
C3: 1%
C4: 0%
1707u
GAS (units)
C1-C4 (PPM)
1871u
1972u
286u
715u
0
10,020
10,030
10,040
10,050
10,060
10,070
10,080
10,090
10,100
10,110
10,120
10,130
10,140
10,150
10,160
10,170
10,180
10,190
10,200
10,210
10,220
10,230
250
GAMMA (api)
107
129
93
7000
MD: 10,054
TVD: 7,427
Inclination: 89.93
Azimuth: 1.63
VS: 1,051.7
MD: 10,144
TVD: 7,427.25
Inclination: 89.75
Azimuth: 2.36
VS: 1,141.64
MD: 10,234
TVD: 7,427.21
Inclination: 90
Azimuth: 1.79
VS: 1,231.57
TVD (ft)
8000
S: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd,
t, sl calc, 20% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O
thk bri bl wh cut, mky fast stmg, mod stn, mod od
80% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd,
arg cmt, sl calc, 20% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O
SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od
80% SS: med - dk gy/brn, s&p
arg cmt, sl calc, 20% SH: med
SHW: thk bri bl wh cut, mky fa


600
ROP (ft/hr)
0
3000
300000
GAS (units)
C1-C4 (PPM)
323.66u
C1: 60%
C2: 19%
C3: 12%
C4: 9%
1343u
306u
2151u
922u
2391u
10,240
10,250
10,260
10,270
10,280
10,290
10,300
10,310
10,320
10,330
10,340
10,350
10,360
10,370
10,380
10,390
10,400
10,410
10,420
10,430
10,440
10,450
250
GAMMA (api)
0
125
98
132
101
116
7000
MD: 10,324
TVD: 7,425.94
Inclination: 91.32
Azimuth: 1.27
VS: 1,322.25
MD: 10,414
TVD: 7,423.99
Inclination: 91.17
Azimuth: 1.88
VS: 1,412.2
TVD (ft)
8000
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd,
arg cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O
SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od
85% SS: med - dk gy/brn, s&p, sb blky-clus, fri,
arg cmt, sl calc, 15% SH: med - dk gy, sb plty-pl
SHW: thk bri bl wh cut, mky fast stmg, mod stn,

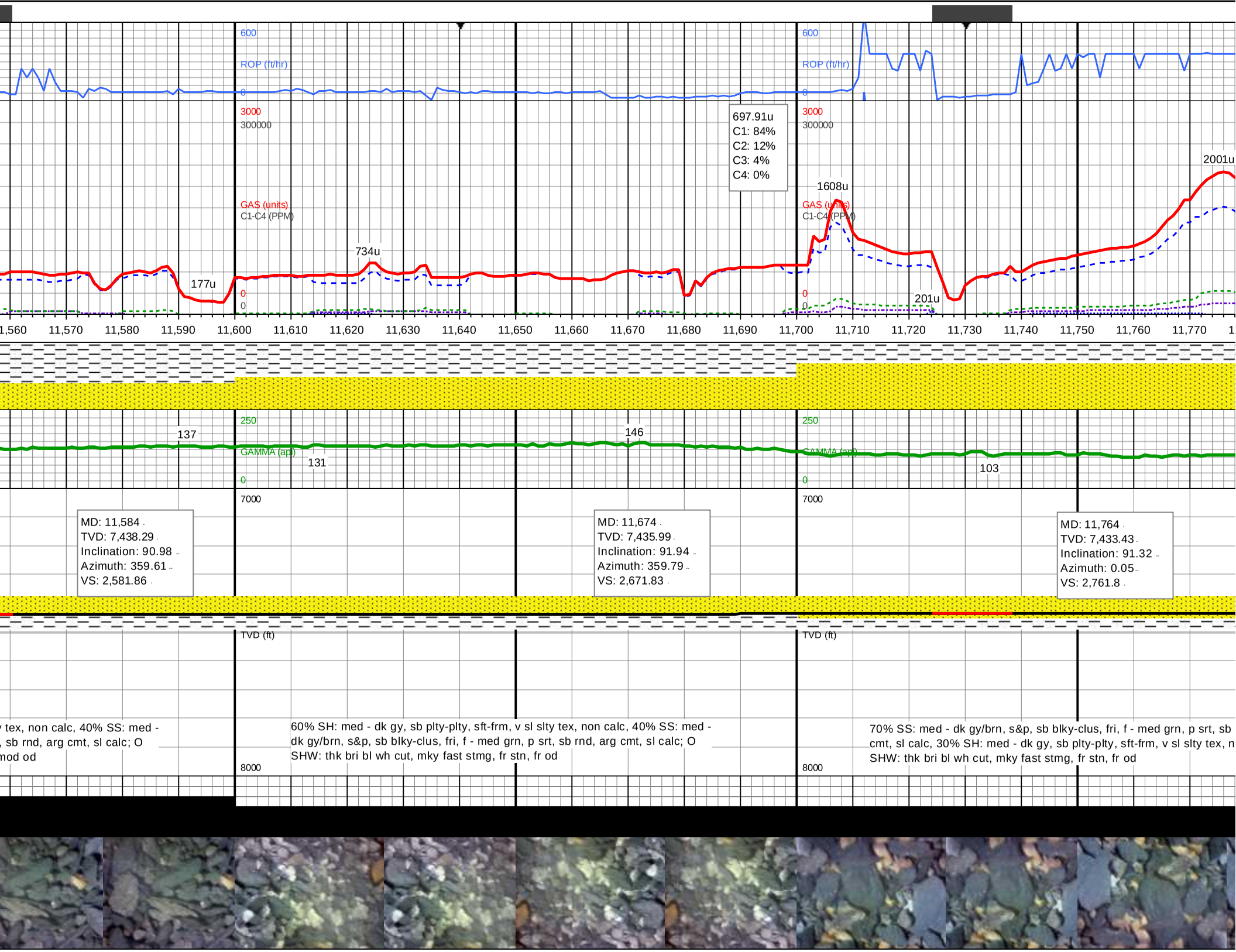

600
ROP (ft/hr)
0
MWT: 9.85 IN /OUT 9.85
VIS: 42 IN/ OUT 42
3000
300000
1818u
2035u
2018u
1819u
GAS (units)
C1-C4 (PPM)
1805.48u
C1: 57%
C2: 21%
C3: 13%
C4: 9%
472u
440u
0
10,460
10,470
10,480
10,490
10,500
10,510
10,520
10,530
10,540
10,550
10,560
10,570
10,580
10,590
10,600
10,610
10,620
10,630
10,640
10,650
10,660
10,670
250
CAMMA (api)
89
120
139
88
107
7000
MD: 10,504
TVD: 7,424.38
Inclination: 88.33
Azimuth: 359.9
VS: 1,502.17
MD: 10,594
TVD: 7,427.23
Inclination: 88.04
Azimuth: 0.13
VS: 1,592.13
TVD (ft)
8000
f - med grn, p srt, sb rnd,
ty, sft-frm, non calc; O
mod od
85% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd,
arg cmt, sl calc, 15% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O
SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt,
arg cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, non cal
SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od

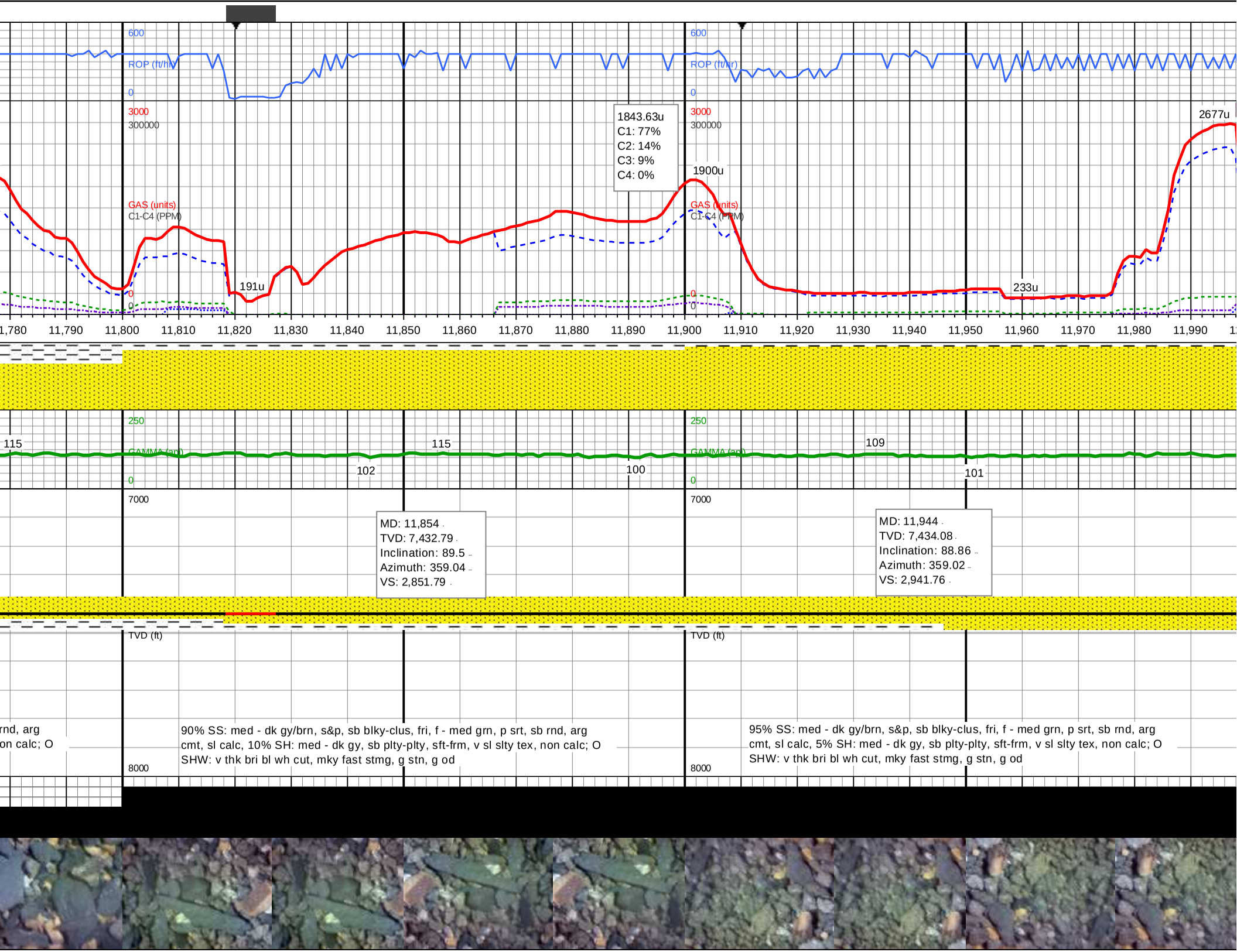

600
ROP (ft/hr)
0
3000
300000
1703u
1740u
1768u
1677u
1320u
313u
GAS (units)
C1-C4 (PPM)
1676.46u
C1: 67%
C2: 17%
C3: 10%
C4: 6%
MWT: 9.8 IN /OUT 9.8
VIS: 43 IN/ OUT 43
410.35u
C1: 61%
C2: 19%
C3: 12%
C4: 8%
10,680
10,690
10,700
10,710
10,720
10,730
10,740
10,750
10,760
10,770
10,780
10,790
10,800
10,810
10,820
10,830
10,840
10,850
10,860
10,870
10,880
10,890
250
GAMMA (api)
102
116
103
111
104
7000
MD: 10,774
TVD: 7,431.49
Inclination: 89.19
Azimuth: 0.29
VS: 1,772.06
MD: 10,864
TVD: 7,432.04
Inclination: 90.12
Azimuth: 1.07
VS: 1,862.05
TVD (ft)
8000
95% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd,
arg cmt, sl calc, 5% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O
SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od

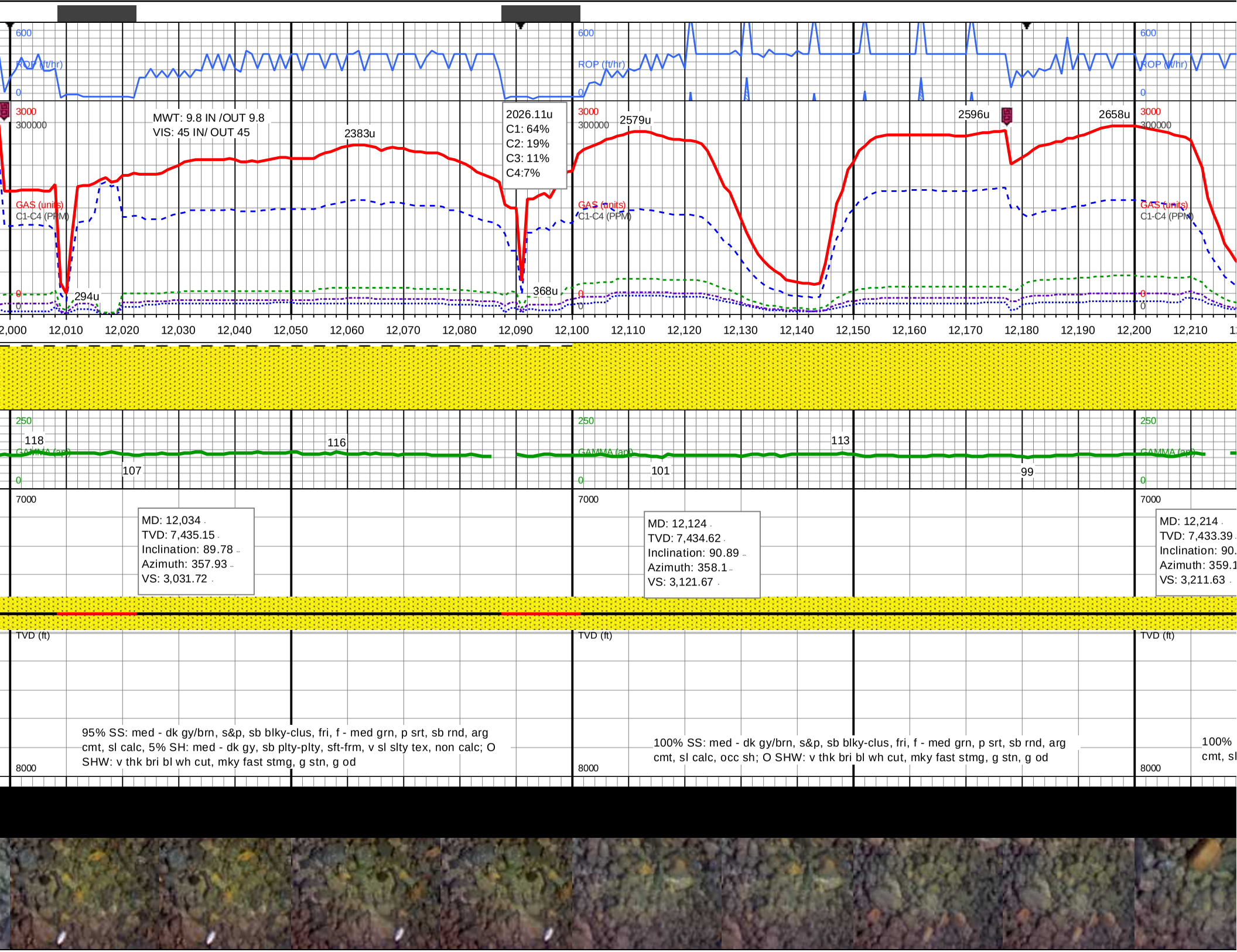

600
ROP (ft/hr)
0
3000
300000
GAS (units)
C1-C4 (PPM)
1282u
316u
1237u
1346u
607u
1402u
1478u
303u
MWT: 9.8 IN /OUT 9.8
VIS: 44 IN/ OUT 44
784.44u
C1: 69%
C2: 18%
C3: 11%
C4: 2%
MINDEPTH
9/15/
10,900
10,910
10,920
10,930
10,940
10,950
10,960
10,970
10,980
10,990
11,000
11,010
11,020
11,030
11,040
11,050
11,060
11,070
11,080
11,090
11,100
11,110
250
GAMMA (api)
113
117
100
141
18
7000
MD: 10,954
TVD: 7,432.16
Inclination: 89.72
Azimuth: 1.52
VS: 1,952.03
MD: 11,044
TVD: 7,432.36
Inclination: 90.03
Azimuth: 1.76
VS: 2,041.99
TVD (ft)
8000
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od
50% LMST: wh - lt crm, sl tan, sft - frm, microxln, sb blky - sb plty, occ sl dolic, v calc, 25% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 25% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od

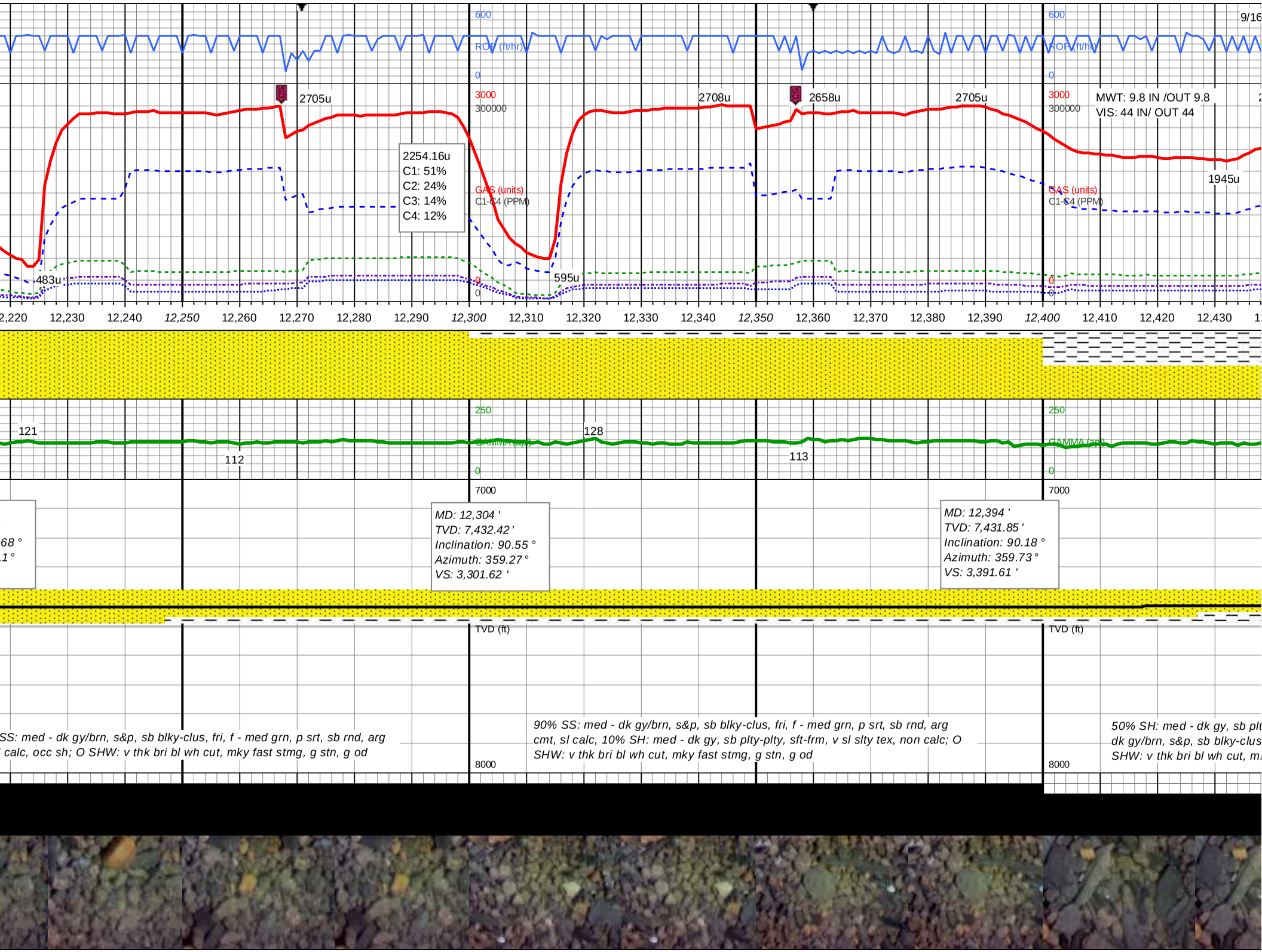

2014
600
ROP (ft/hr)
0
3000
300000
MWT: 9.8 IN /OUT 9.8
VIS: 44 IN/ OUT 44
1776u
2060u
1700u
1230u
315u
250u
GAS (units)
C1-C4 (PPM)
1874.5u
C1: 68%
C2: 16%
C3: 10%
C4: 6%
11,120
11,130
11,140
11,150
11,160
11,170
11,180
11,190
11,200
11,210
11,220
11,230
11,240
11,250
11,260
11,270
11,280
11,290
11,300
11,310
11,320
11,330
250
GAMMA (api)
78
14
99
91
7000
MD: 11,134
TVD: 7,432.73
Inclination: 89.5
Azimuth: 359.02
VS: 2,131.98
MD: 11,224
TVD: 7,433.56
Inclination: 89.44
Azimuth: 359.74
VS: 2,221.97
MD: 11,314
TVD: 7,435.07
Inclination: 88.64
Azimuth: 359.85
VS: 2,311.96
TVD (ft)
8000
100% LMST: wh - lt crm, sl tan, sft - frm, microxln, sb blky - sb plty, occ sl dolic, v calc, scat ss and sh; O SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od
65% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 25% LMST: wh - lt crm, sl tan, sft - frm, microxln, sb blky - sb plty, occ sl dolic, v calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, non calc; O SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od
90% SS: med - dk gy/br
arg cmt, sl calc, 10% SH
SHW: thk bri bl wh cut,

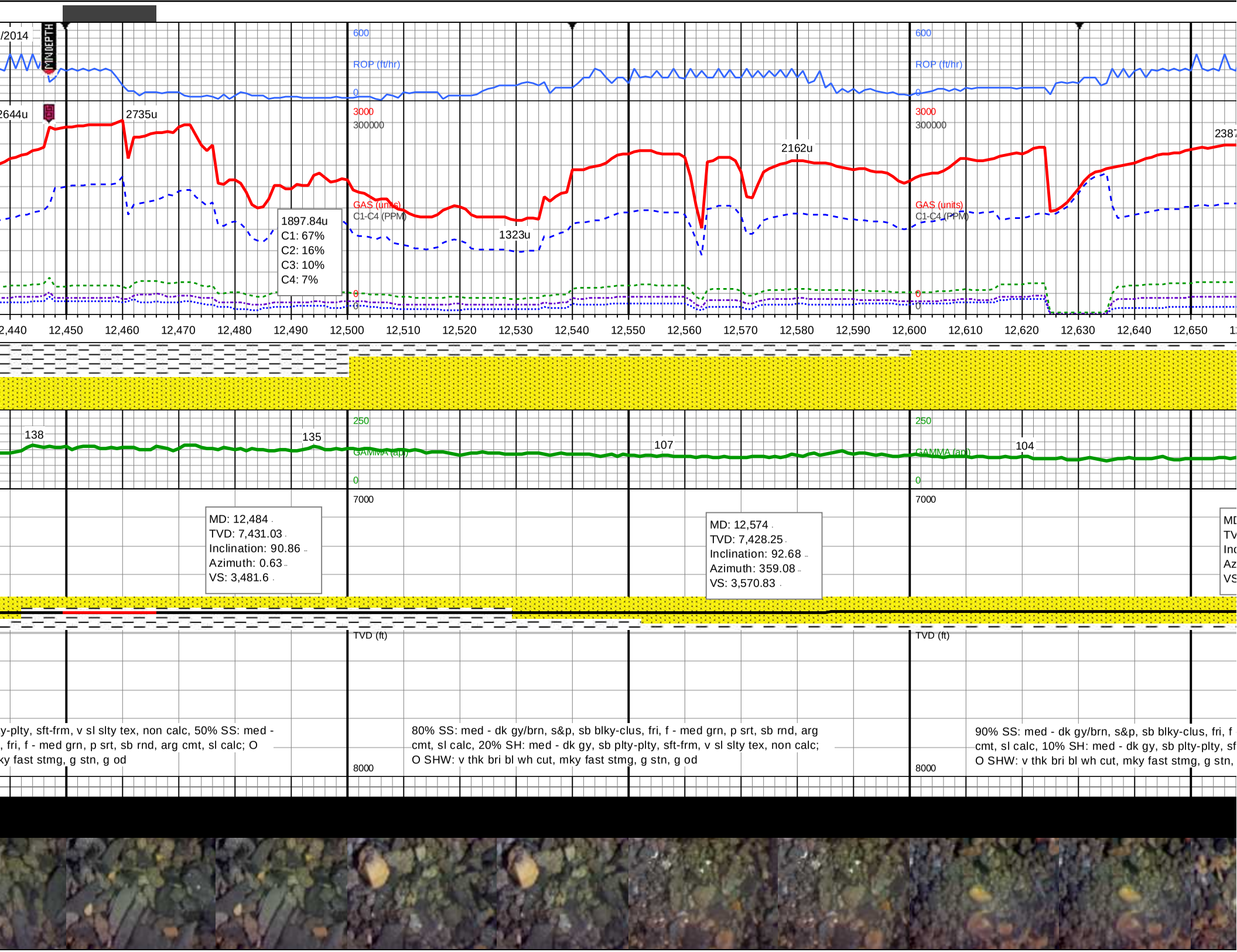

600
ROP (ft/hr)
0
3000
300000
GAS (units)
C1-C4 (PPM)
0
1824u
250u
1086.74u
C1: 70%
C2: 16%
C3: 10%
C4: 4%
1102u
2622u
No flow to gas agitator
11,340
11,350
11,360
11,370
11,380
11,390
11,400
11,410
11,420
11,430
11,440
11,450
11,460
11,470
11,480
11,490
11,500
11,510
11,520
11,530
11,540
11,550
250
GAMMA (api)
0
7000
135
106
103
144
122
MD: 11,404
TVD: 7,437.32
Inclination: 88.49
Azimuth: 358.94
VS: 2,401.92
MD: 11,494
TVD: 7,438.78
Inclination: 89.65
Azimuth: 358.41
VS: 2,491.88
TVD (ft)
8000
n, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd,
H: med - dk gy, sb plty-plty, sft-frm, non calc; O
mky fast stmg, mod stn, mod od
60% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg
cmt, sl calc, 40% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc;
O SHW: thk bri bl wh cut, mky fast stmg, mod stn, mod od
60% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty
dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt
SHW: thk bri bl wh cut, mky fast stmg, mod stn,


600
ROP (ft/hr)
0
3000
300000
GAS (units)
C1-C4 (PPM)
0
0
697.91u
C1: 84%
C2: 12%
C3: 4%
C4: 0%
177u
734u
1608u
201u
2001u
11,560
11,570
11,580
11,590
11,600
11,610
11,620
11,630
11,640
11,650
11,660
11,670
11,680
11,690
11,700
11,710
11,720
11,730
11,740
11,750
11,760
11,770
250
GAMMA (api)
0
7000
137
131
146
103
MD: 11,584
TVD: 7,438.29
Inclination: 90.98
Azimuth: 359.61
VS: 2,581.86
MD: 11,674
TVD: 7,435.99
Inclination: 91.94
Azimuth: 359.79
VS: 2,671.83
MD: 11,764
TVD: 7,433.43
Inclination: 91.32
Azimuth: 0.05
VS: 2,761.8
TVD (ft)
8000
y tex, non calc, 40% SS: med -
, sb rnd, arg cmt, sl calc; O
mod od
60% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc, 40% SS: med -
dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc; O
SHW: thk bri bl wh cut, mky fast stmg, fr stn, fr od
70% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb
cmt, sl calc, 30% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, n
SHW: thk bri bl wh cut, mky fast stmg, fr stn, fr od

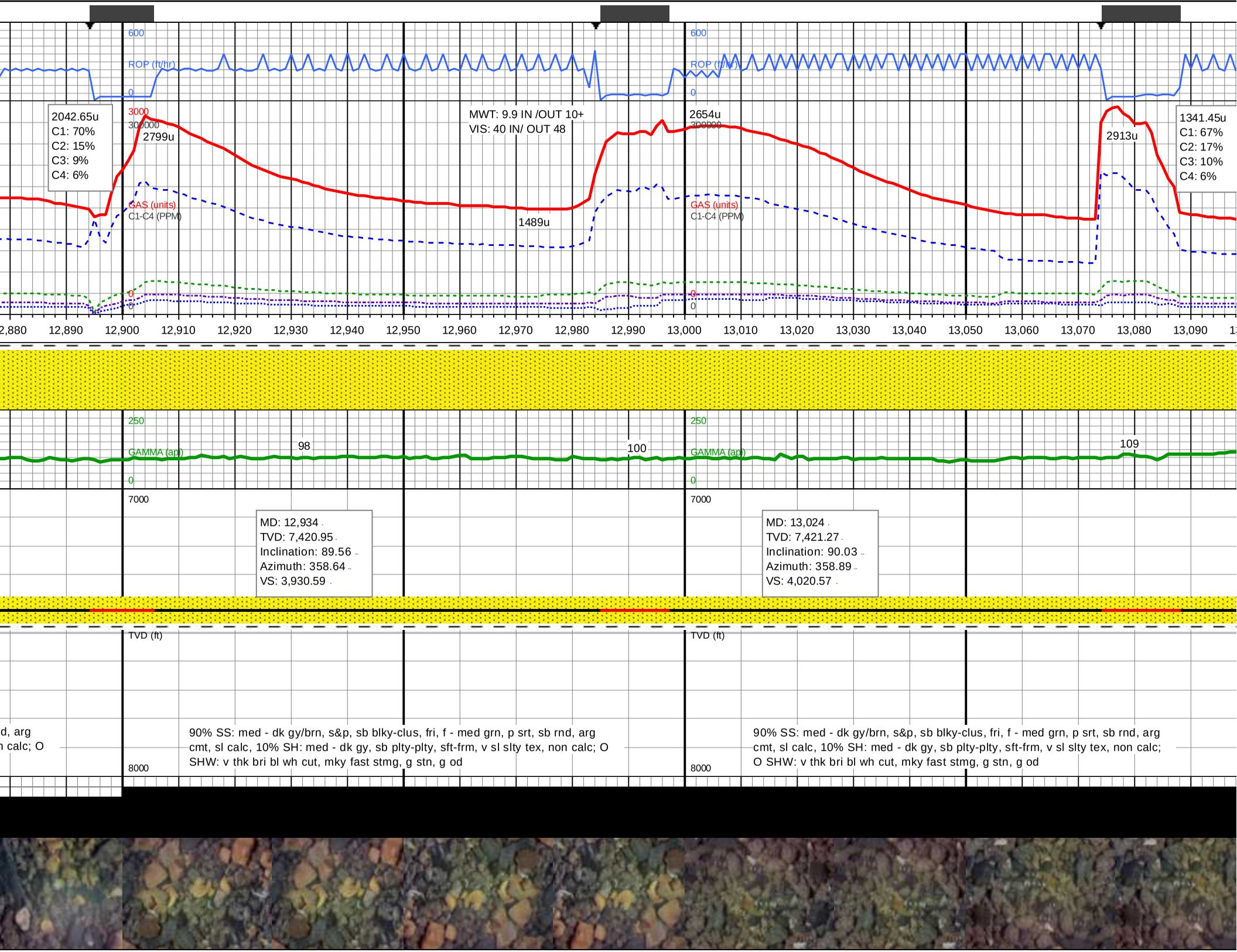

600
ROP (ft/hr)
0
3000
300000
GAS (units)
C1-C4 (PPM)
0
0
1843.63u
C1: 77%
C2: 14%
C3: 9%
C4: 0%
191u
1900u
233u
2677u
11,780
11,790
11,800
11,810
11,820
11,830
11,840
11,850
11,860
11,870
11,880
11,890
11,900
11,910
11,920
11,930
11,940
11,950
11,960
11,970
11,980
11,990
250
GAMMA (api)
0
115
102
115
100
109
101
7000
MD: 11,854
TVD: 7,432.79
Inclination: 89.5
Azimuth: 359.04
VS: 2,851.79
MD: 11,944
TVD: 7,434.08
Inclination: 88.86
Azimuth: 359.02
VS: 2,941.76
TVD (ft)
8000
rnd, arg
on calc; O
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg
cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc; O
SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
95% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg
cmt, sl calc, 5% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc; O
SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od


600
ROP (ft/hr)
0
3000
300000
GAS (units)
C1-C4 (PPM)
0
MWT: 9.8 IN /OUT 9.8
VIS: 45 IN/ OUT 45
2383u
2026.11u
C1: 64%
C2: 19%
C3: 11%
C4:7%
294u
368u
2579u
2596u
2658u
12,000
12,010
12,020
12,030
12,040
12,050
12,060
12,070
12,080
12,090
12,100
12,110
12,120
12,130
12,140
12,150
12,160
12,170
12,180
12,190
12,200
12,210
250
GAMMA (api)
118
107
116
113
101
99
7000
MD: 12,034
TVD: 7,435.15
Inclination: 89.78
Azimuth: 357.93
VS: 3,031.72
MD: 12,124
TVD: 7,434.62
Inclination: 90.89
Azimuth: 358.1
VS: 3,121.67
MD: 12,214
TVD: 7,433.39
Inclination: 90.
Azimuth: 359.1
VS: 3,211.63
TVD (ft)
8000
95% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 5% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc; O SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
100% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, occ sh; O SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
100%
cmt, sl

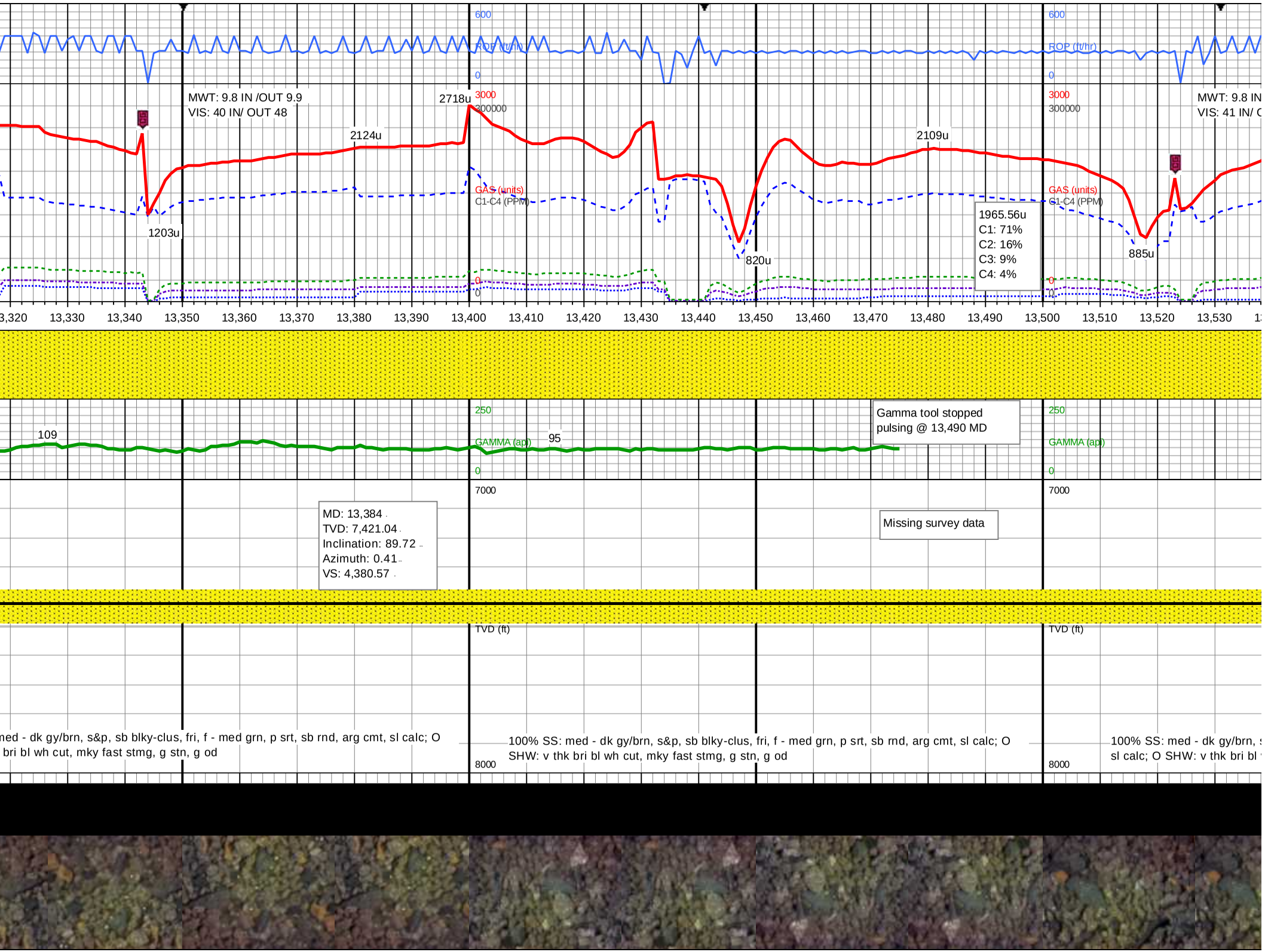

600
ROP (ft/hr)
0
3000
300000
2705u
2708u
2658u
2705u
MWT: 9.8 IN /OUT 9.8
VIS: 44 IN/ OUT 44
1945u
2254.16u
C1: 51%
C2: 24%
C3: 14%
C4: 12%
GAS (units)
C1-C4 (PPM)
483u
595u
12,220
12,230
12,240
12,250
12,260
12,270
12,280
12,290
12,300
12,310
12,320
12,330
12,340
12,350
12,360
12,370
12,380
12,390
12,400
12,410
12,420
12,430
250
GAMMA (api)
121
112
128
113
7000
MD: 12,304 '
TVD: 7,432.42 '
Inclination: 90.55 °
Azimuth: 359.27 °
VS: 3,301.62 '
MD: 12,394 '
TVD: 7,431.85 '
Inclination: 90.18 °
Azimuth: 359.73 °
VS: 3,391.61 '
TVD (ft)
8000
SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg
calc, occ sh; O SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg
cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc; O
SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
50% SH: med - dk gy, sb plt
dk gy/brn, s&p, sb blky-clus
SHW: v thk bri bl wh cut, m

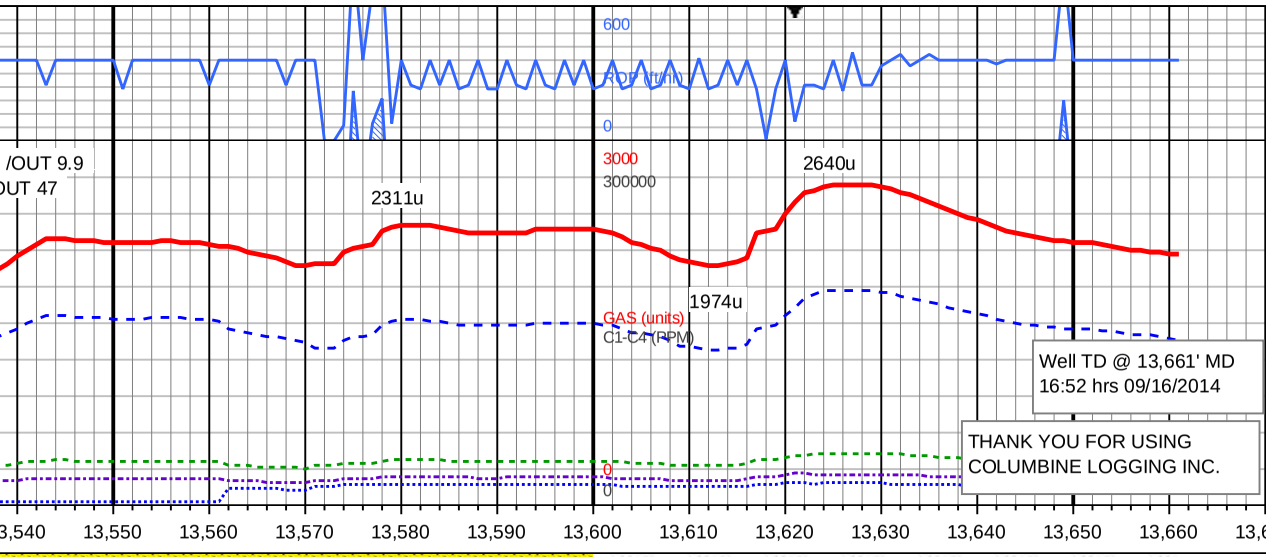

/2014
MINDEPTH
600
ROP (ft/hr)
0
2644u
2735u
3000
300000
GAS (units)
C1-C4 (PPM)
1897.84u
C1: 67%
C2: 16%
C3: 10%
C4: 7%
1323u
2162u
2387
12,440
12,450
12,460
12,470
12,480
12,490
12,500
12,510
12,520
12,530
12,540
12,550
12,560
12,570
12,580
12,590
12,600
12,610
12,620
12,630
12,640
12,650
138
135
107
104
250
GAMMA (api)
7000
MD: 12,484
TVD: 7,431.03
Inclination: 90.86
Azimuth: 0.63
VS: 3,481.6
MD: 12,574
TVD: 7,428.25
Inclination: 92.68
Azimuth: 359.08
VS: 3,570.83
TVD (ft)
8000
y-plty, sft-frm, v sl slty tex, non calc, 50% SS: med -
, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc; O
ky fast stmg, g stn, g od
80% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg
cmt, sl calc, 20% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc;
O SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f
cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sf
O SHW: v thk bri bl wh cut, mky fast stmg, g stn,

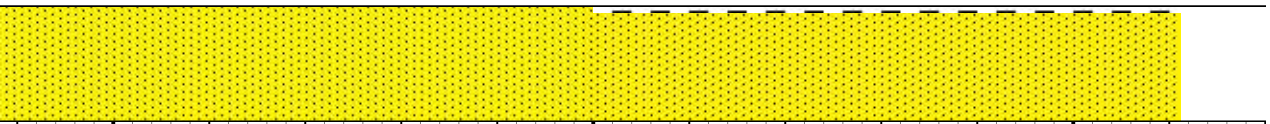

600
ROP (ft/hr)
0
3000
300000
2565u
2525.11u
C1: 64%
C2: 18%
C3: 11%
C4: 8%
GAS (units)
C1-C4 (PPM)
1769u
2353u
MWT: 10 IN /OUT 10.1
VIS: 41 IN/ OUT 43
1639u
12,660
12,670
12,680
12,690
12,700
12,710
12,720
12,730
12,740
12,750
12,760
12,770
12,780
12,790
12,800
12,810
12,820
12,830
12,840
12,850
12,860
12,870
250
GAMMA (api)
101
99
95
7000
MD: 12,754
TVD: 7,420.97
Inclination: 91.89
Azimuth: 358.99
VS: 3,750.68
MD: 12,844
TVD: 7,420.05
Inclination: 89.29
Azimuth: 358
VS: 3,840.63
TVD (ft)
8000
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg
cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc;
O SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od

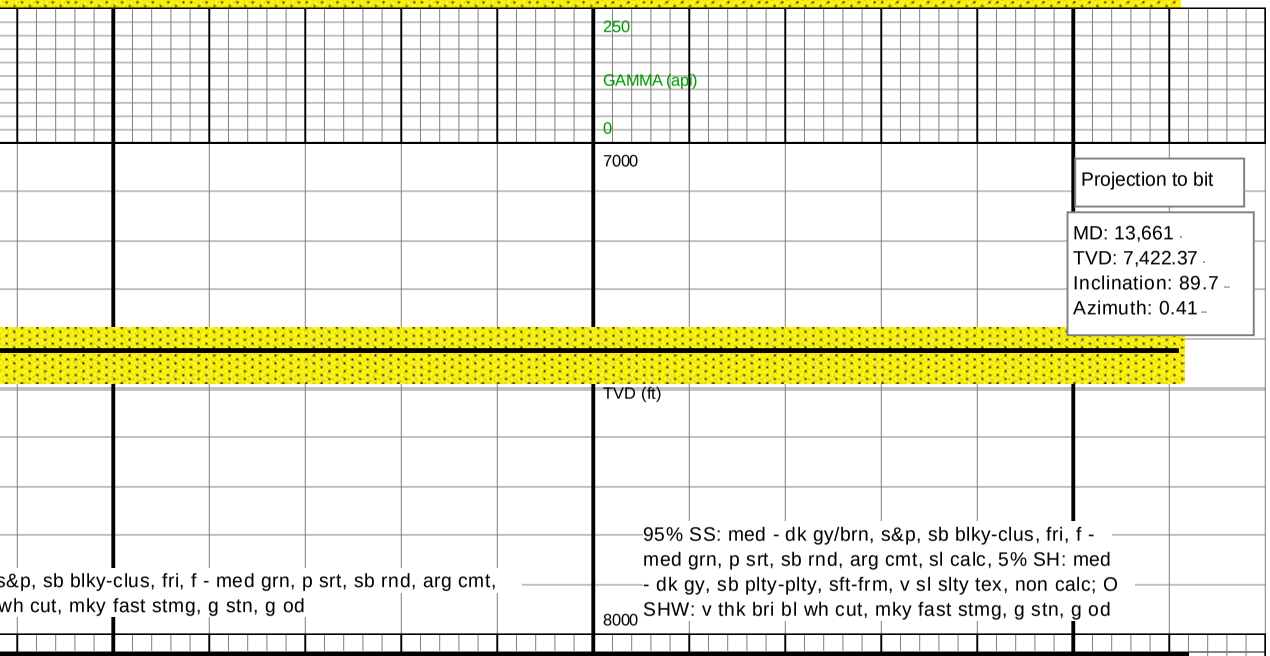

600
ROP (ft/hr)
0
2042.65u
C1: 70%
C2: 15%
C3: 9%
C4: 6%
3000
300000
2799u
GAS (units)
C1-C4 (PPM)
MWT: 9.9 IN /OUT 10+
VIS: 40 IN/ OUT 48
1489u
2654u
2913u
1341.45u
C1: 67%
C2: 17%
C3: 10%
C4: 6%
12,880
12,890
12,900
12,910
12,920
12,930
12,940
12,950
12,960
12,970
12,980
12,990
13,000
13,010
13,020
13,030
13,040
13,050
13,060
13,070
13,080
13,090
250
GAMMA (api)
98
100
109
7000
MD: 12,934
TVD: 7,420.95
Inclination: 89.56
Azimuth: 358.64
VS: 3,930.59
MD: 13,024
TVD: 7,421.27
Inclination: 90.03
Azimuth: 358.89
VS: 4,020.57
TVD (ft)
8000
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc; O SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od


600
ROP (ft/hr)
0
3000
300000
MWT: 9.8 IN /OUT 9.9+
VIS: 40 IN/ OUT 43
1953u
2617u
2476u
1229u
GAS (units)
C1-C4 (PPM)
2441.25u
C1: 73%
C2: 16%
C3: 8%
C4: 3%
311u
0
13,100
13,110
13,120
13,130
13,140
13,150
13,160
13,170
13,180
13,190
13,200
13,210
13,220
13,230
13,240
13,250
13,260
13,270
13,280
13,290
13,300
13,310
250
GAMMA (api)
105
107
7000
MD: 13,114
TVD: 7,421.15
Inclination: 90.12
Azimuth: 0.1
VS: 4,110.57
MD: 13,204
TVD: 7,421.23
Inclination: 89.78
Azimuth: 359.42
VS: 4,200.57
MD: 13,294
TVD: 7,421.11
Inclination: 90.37
Azimuth: 0.3
VS: 4,290.57
TVD (ft)
8000
90% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc, 10% SH: med - dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc;
O SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
100% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc;
O SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od


600
ROP (ft/hr)
0
MWT: 9.8 IN /OUT 9.9
VIS: 40 IN/ OUT 48
2718u
2124u
1203u
3000
300000
GAS (units)
C1-C4 (PPM)
0
2109u
820u
1965.56u
C1: 71%
C2: 16%
C3: 9%
C4: 4%
885u
MWT: 9.8 IN
VIS: 41 IN/ C
13,320
13,330
13,340
13,350
13,360
13,370
13,380
13,390
13,400
13,410
13,420
13,430
13,440
13,450
13,460
13,470
13,480
13,490
13,500
13,510
13,520
13,530
250
GAMMA (api)
109
95
Gamma tool stopped
pulsing @ 13,490 MD
MD: 13,384
TVD: 7,421.04
Inclination: 89.72
Azimuth: 0.41
VS: 4,380.57
Missing survey data
7000
TVD (ft)
8000
med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc; O
bri bl wh cut, mky fast stmg, g stn, g od
100% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt, sl calc; O
SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od
100% SS: med - dk gy/brn,
sl calc; O SHW: v thk bri bl







s&p, sb blky-clus, fri, f - med grn, p srt, sb rnd, arg cmt,
wh cut, mky fast stmg, g stn, g od

95% SS: med - dk gy/brn, s&p, sb blky-clus, fri, f -
med grn, p srt, sb rnd, arg cmt, sl calc, 5% SH: med
- dk gy, sb plty-plty, sft-frm, v sl slty tex, non calc; O
SHW: v thk bri bl wh cut, mky fast stmg, g stn, g od