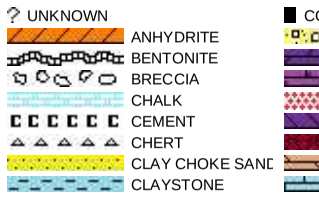
COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name	05123365180000_Brotemarkle_4C_13HZ_MUD		
Location	SESW: SEC: 13 TWP: 3N 66W 6 PM		
State	COLORADO	**County**	WELD
Country	U.S.A.	**Rig Number**	XTREME 6
API Number	05123365180000	**AFE #**	2075284.DRL
Region	DJ BASIN	**Field**	WATTENBERG
Spud Date	1/10/2014	**Drilling Completed**	3/10/2014
Surface Coordinates	294' FSL, 1391' FWL		
Bottom Hole Coordinates	460' FFNLL, 170' FFWLL		
Ground Elevation	5,024'	**K.B. Elevation**	5044'
Logged Interval	7000' **To** 12100'	**Total Depth**	12100'
Formation	CODELL		
Type of Drilling Fluid	LSND/ PHPA		

Company	Anadarko
Address	Granite Tower 1099 18th St. # Denver, CO 802

Name	ISAAC SMITH &
Company	COLUMBINE L
Address	2385 S. Lipan S Denver, CO 802



Operator

1800
202

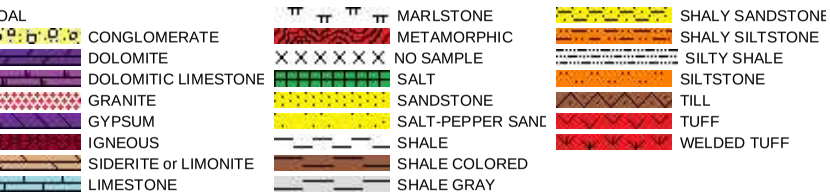
Geologist

& TED STOCKWELL

OGGING INC.

Street
223

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

Other Symbols

Oil Show

PINPOINT
VUGGY

Engineering

DEAD
EVEN
QUESTIONABLE
SPOTTED STAINING
BIT
CONNECTION (UP)
CONNECTION (DOWN)
CONNECTION GAS
CONNECTION GAS (LEFT)
TRIP GAS
TRIP GAS (LEFT)
DOWN TIME GAS
DOWN TIME GAS (LEFT)
CORE - LOST
CORE - 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

Porosity

EARTHY
FENESTRAL
FRACTURE
INTERCRYSTALLINE
INTEROOLITIC
MOLDIC
ORGANIC

Rounding

ANGULAR
ROUNDED
SUBANG
SUBRND
BOUNDSTONE
CHALKY
CRYPTOXLN

Textures

EARTHY
FINELYXLN
GRAINSTONE
LITHOGRAPHIC
MICROXLN
MUDSTONE
PACKSTONE
WACKESTONE

Sorting

MODERATE
POOR
WELL

Slide/Rotate

ROP
ROF
GAMMA

BEGIN BROTEMARKLE 4C-13HZ @ 7000' MD. DRILLING 8.75" HOLE. BIT #1, HCC DP306S, 7039748. DEPTH IN: 1320' MD. KOP: 7051' MD.

ROP & GAS DATA PROVIDED BY IBALL/ BLOODHOUND - GAMMA & SURVEY DATA PROVIDED BY BAKER HUGHES

134

105

0

Total Gas & Chromatograph
GAS
C1
C2
C3
C4

COLUMBINE LOGGING INC., 2-MAN LOGGING CREW 3/5/2014 - BLOODHOUND UNIT #0312

3979u

3726u

1850u

GAS (units)
C1-C4 (PPM)

MISWACO MPD (MANAGED PRESSURE DRILLING) SERVICES ARE NO LONGER ON LOCATION. NOT DRILLING UNDERBALANCED.

PIERRE SHALE

0
0

Depth Labels

6,960 6,970 6,980 6,990 7,000 7,010 7,020 7,030 7,040 7,050 7,060 7,070 7,080 7,090 7,100 7,110 7,120 7,130

% Lith

Well Bore
TVD

MD: 6,979
TVD: 6,819.88
Inclination: 1.3
Azimuth: 243.72
VS: -260.33

6500

THE INTERPRETATION OF THE WELLBORE LITHOLOGY IS NOT TO SCALE

MD: 7,063
TVD: 6,903.85
Inclination: 1.78
Azimuth: 324.98
VS: -259.68

MUD DATA
WT: 10
FV: 42
PV: 11
YP: 13
CK: 1
Sol: 8
pH: 9.4
Chl: 1,400

MD: 7,106
TVD: 6,946.73
Inclination: 6.65
Azimuth: 352.56
VS: -256.66

100' SAMPLE INTERVAL
100' SAMPLE DESCRIPTION

ACETONE WAS USED AS THE CUTTING AGENT WITH THE DIMPLE FILLED TO THE RIM. THE RATINGS ARE BASED ON 7 DESCRIPTORS: NONE, SLIGHT TRACE, TRACE,FAIR, MODERATE, GOOD, AND EXCELLENT.THE DESCRIPTOR USED IS BASED ON THE LOGGERS OBSERVATIONS AND BEST JUDGMENT OF BRILLIANCE, COLOR AND LONGEVITY OF THE CUT.

SLTY SH: med gy-dk gy, occ lt tan, sb blky-sb plty, occ plty, frm-sft, mod fri, slty; difse stmg dull bl cut, thn dull bl resdl ring

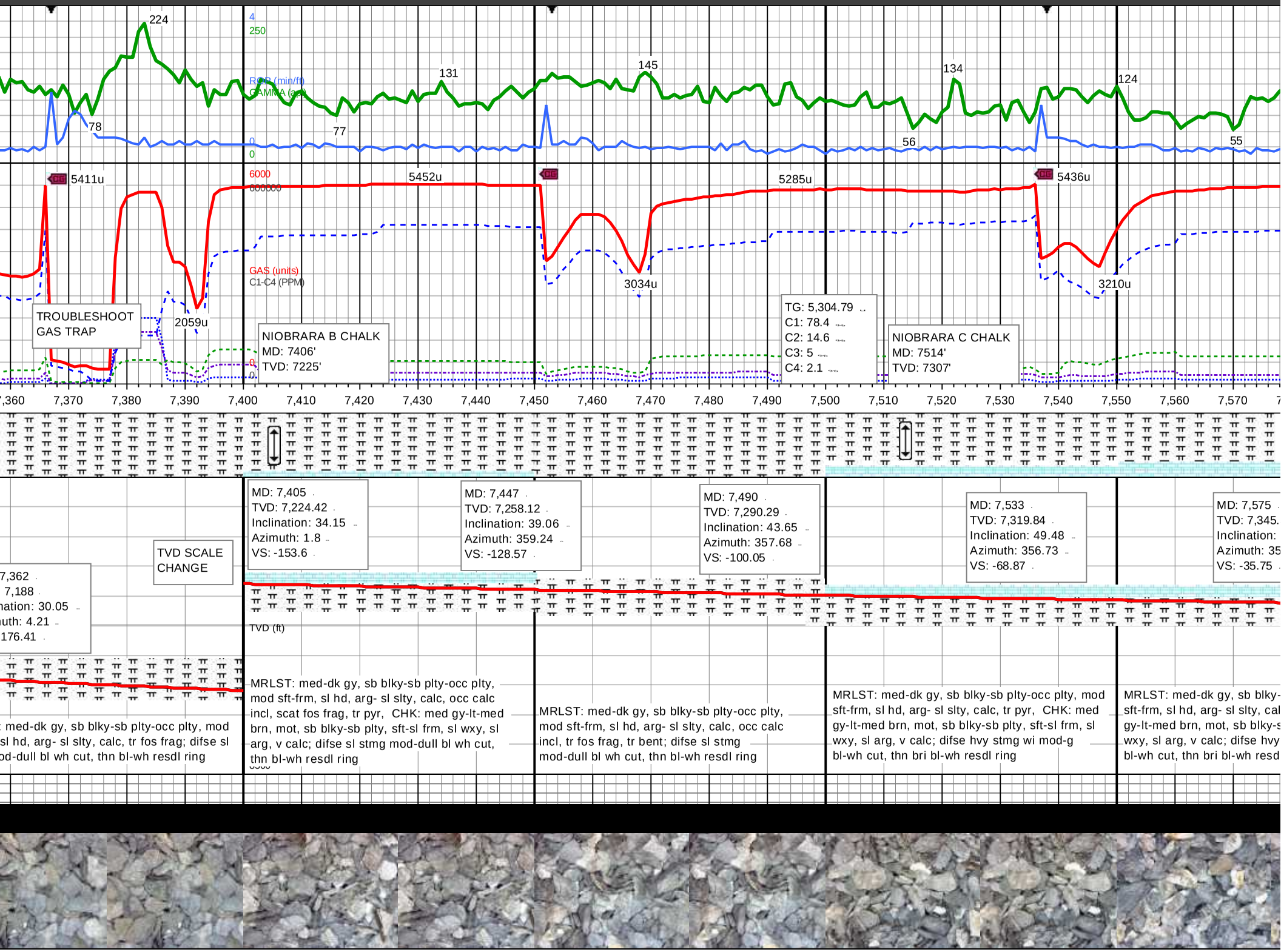
SLTY SH: med gy-dk gy, sb blky-sb plty, occ plty, frm-sft, mod fri, slty; difse stmg dull bl cut, thn dull bl resdl ring

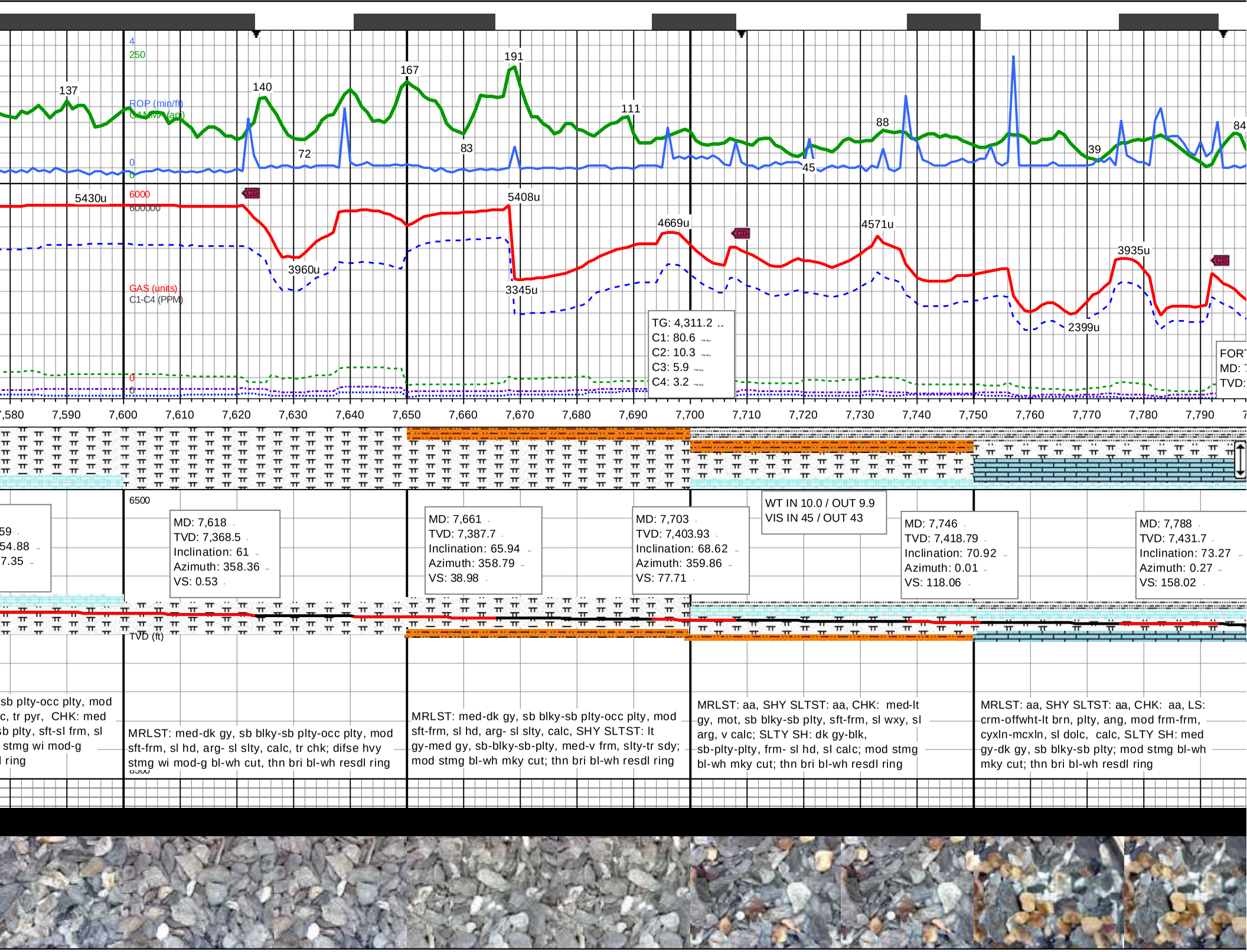
SLTY SH: med gy-dk gy, sb difse stmg dull bl cut, thn du

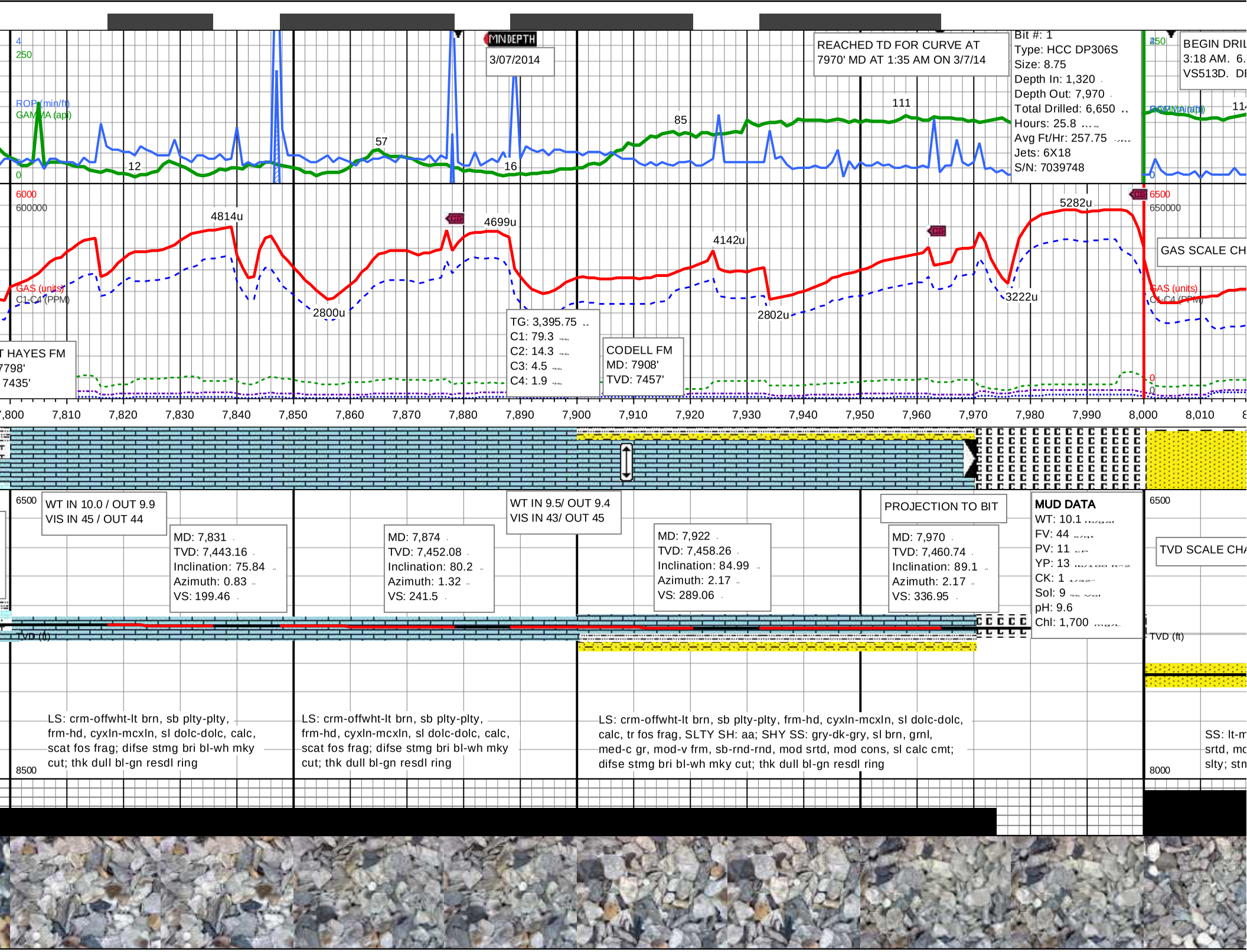
Oil Show
83
66
50
33
16

Images


4
250
ROP (min/ft)
GAMMA (api)
0
0
136
112
117
163
119
203
125
155
98
6000
600000
GAS (units)
C1-C4 (PPM)
0
0
4127u
4337u
1654u
429u
4738u
1430u
5040u
1810u
5291u
TG: 2,945.14
C1: 78.4
C2: 14.4
C3: 5.2
C4: 1.9
SHARON SPRINGS FM
MD: 7287'
TVD: 7121'
NIOBRARA FM
MD: 7348'
TVD: 7176'
7,140
7,150
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
6500
WT IN 10.2 / OUT 10.2
VIS IN 37 / OUT 37
MD: 7,149
TVD: 6,989.2
Inclination: 11.12
Azimuth: 356.02
VS: -250.9
MD: 7,192
TVD: 7,031.1
Inclination: 14.74
Azimuth: 358.18
VS: -240.44
50' SAMPLE INTERVAL
50' SAMPLE DESCRIPTION
MD: 7,234
TVD: 7,071.37
Inclination: 18.26
Azimuth: 359.64
VS: -228.52
MD: 7,277
TVD: 7,111.68
Inclination: 22.45
Azimuth: 2.54
VS: -213.57
MD: 7,319
TVD: 7,150.01
Inclination: 25.77
Azimuth: 4.97
VS: -196.47
TVD (ft)
blky-sb plty, occ plty, frm-sft, mod fri, slty;
ll bl resdl ring
SLTY SH: med gy-dk gy, tr lt tan-lt gy, sb blky-sb plty, occ plty, frm-sft, mod fri, slty; difse stmg dull bl cut, thn dull bl resdl ring
SLTY SH: med gy-dk gy, occ lt tan-lt gy, sb blky-sb plty, occ plty, frm-sft, mod fri, slty; difse stmg dull bl cut, thn dull bl resdl ring
MRLST: med-dk gy, sb blky-sb plty-occ plty, mod sft-frm, arg- sl slty, calc, tr fos frag, tr bent; difse sl stmg mod-dull bl wh cut, thn bl-wh resdl ring
7500


224
78
131
77
145
134
56
124
55
4
250
0
0
ROP (min/ft)
GAMMA (api)
5411u
5452u
5285u
5436u
3034u
3210u
2059u
6000
GAS (units)
C1-C4 (PPM)
TROUBLESHOOT
GAS TRAP
NIOBRARA B CHALK
MD: 7406'
TVD: 7225'
TG: 5,304.79
C1: 78.4
C2: 14.6
C3: 5
C4: 2.1
NIOBRARA C CHALK
MD: 7514'
TVD: 7307'
7,360
7,370
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
TVD SCALE
CHANGE
MD: 7,405
TVD: 7,224.42
Inclination: 34.15
Azimuth: 1.8
VS: -153.6
MD: 7,447
TVD: 7,258.12
Inclination: 39.06
Azimuth: 359.24
VS: -128.57
MD: 7,490
TVD: 7,290.29
Inclination: 43.65
Azimuth: 357.68
VS: -100.05
MD: 7,533
TVD: 7,319.84
Inclination: 49.48
Azimuth: 356.73
VS: -68.87
MD: 7,575
TVD: 7,345.
Inclination:
Azimuth: 35
VS: -35.75
7,362
7,188
nation: 30.05
uth: 4.21
176.41
TVD (ft)
: med-dk gy, sb blky-sb plty-occ plty, mod
sl hd, arg- sl slty, calc, tr fos frag; difse sl
od-dull bl wh cut, thn bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty-occ plty,
mod sft-frm, sl hd, arg- sl slty, calc, occ calc
incl, scat fos frag, tr pyr, CHK: med gy-lt-med
brn, mot, sb blky-sb plty, sft-sl frm, sl wxy, sl
arg, v calc; difse sl stmg mod-dull bl wh cut,
thn bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty-occ plty,
mod sft-frm, sl hd, arg- sl slty, calc, occ calc
incl, tr fos frag, tr bent; difse sl stmg
mod-dull bl wh cut, thn bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty-occ plty, mod
sft-frm, sl hd, arg- sl slty, calc, tr pyr, CHK: med
gy-lt-med brn, mot, sb blky-sb plty, sft-sl frm, sl
wxy, sl arg, v calc; difse hvy stmg wi mod-g
bl-wh cut, thn bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-
sft-frm, sl hd, arg- sl slty, cal
gy-lt-med brn, mot, sb blky-s
wxy, sl arg, v calc; difse hvy
bl-wh cut, thn bri bl-wh resd


4
250
ROP (min/ft)
GAMMA (api)
0
0
137
140
72
167
83
191
111
45
88
39
84
6000
600000
GAS (units)
C1-C4 (PPM)
5430u
3960u
5408u
3345u
4669u
4571u
2399u
3935u
TG: 4,311.2
C1: 80.6
C2: 10.3
C3: 5.9
C4: 3.2
7,580
7,590
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
6500
MD: 7,618
TVD: 7,368.5
Inclination: 61
Azimuth: 358.36
VS: 0.53
MD: 7,661
TVD: 7,387.7
Inclination: 65.94
Azimuth: 358.79
VS: 38.98
MD: 7,703
TVD: 7,403.93
Inclination: 68.62
Azimuth: 359.86
VS: 77.71
WT IN 10.0 / OUT 9.9
VIS IN 45 / OUT 43
MD: 7,746
TVD: 7,418.79
Inclination: 70.92
Azimuth: 0.01
VS: 118.06
MD: 7,788
TVD: 7,431.7
Inclination: 73.27
Azimuth: 0.27
VS: 158.02
TVD (ft)
MRLST: med-dk gy, sb blky-sb plty-occ plty, mod sft-frm, sl hd, arg- sl slty, calc, tr chk; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty-occ plty, mod sft-frm, sl hd, arg- sl slty, calc, SHY SLTST: lt gy-med gy, sb-blky-sb-plty, med-v frm, slty-tr sdy; mod stmg bl-wh mky cut; thn bri bl-wh resdl ring
MRLST: aa, SHY SLTST: aa, CHK: med-lt gy, mot, sb blky-sb plty, sft-frm, sl wxy, sl arg, v calc; SLTY SH: dk gy-blk, sb-plty-plty, frm- sl hd, sl calc; mod stmg bl-wh mky cut; thn bri bl-wh resdl ring
MRLST: aa, SHY SLTST: aa, CHK: aa, LS: crm-offwht-lt brn, plty, ang, mod frm-frm, cyxln-mcxln, sl dolc, calc, SLTY SH: med gy-dk gy, sb blky-sb plty; mod stmg bl-wh mky cut; thn bri bl-wh resdl ring


MNDEPTH
3/07/2014
REACHED TD FOR CURVE AT
7970' MD AT 1:35 AM ON 3/7/14
Bit #: 1
Type: HCC DP306S
Size: 8.75
Depth In: 1,320
Depth Out: 7,970
Total Drilled: 6,650
Hours: 25.8
Avg Ft/Hr: 257.75
Jets: 6X18
S/N: 7039748
BEGIN DRIL
3:18 AM. 6.
VS513D. DE
ROP (min/ft)
GAMMA (api)
GAMMA (api)
4
250
0
12
57
16
85
111
6000
600000
6500
650000
4814u
4699u
4142u
5282u
2800u
2802u
3222u
GAS (units)
C1-C4 (PPM)
GAS SCALE CH
TG: 3,395.75
C1: 79.3
C2: 14.3
C3: 4.5
C4: 1.9
CODELL FM
MD: 7908'
TVD: 7457'
T HAYES FM
7798'
7435'
7,800
7,810
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
WT IN 10.0 / OUT 9.9
VIS IN 45 / OUT 44
MD: 7,831
TVD: 7,443.16
Inclination: 75.84
Azimuth: 0.83
VS: 199.46
WT IN 9.5/ OUT 9.4
VIS IN 43/ OUT 45
MD: 7,874
TVD: 7,452.08
Inclination: 80.2
Azimuth: 1.32
VS: 241.5
PROJECTION TO BIT
MD: 7,922
TVD: 7,458.26
Inclination: 84.99
Azimuth: 2.17
VS: 289.06
MD: 7,970
TVD: 7,460.74
Inclination: 89.1
Azimuth: 2.17
VS: 336.95
MUD DATA
WT: 10.1
FV: 44
PV: 11
YP: 13
CK: 1
Sol: 9
pH: 9.6
Chl: 1,700
6500
8500
TVD (ft)
TVD SCALE CHA
8000
LS: crm-offwht-lt brn, sb plty-plty, frm-hd, cyxln-mcxln, sl dolc-dolc, calc, scat fos frag; difse stmg bri bl-wh mky cut; thk dull bl-gn resdl ring
LS: crm-offwht-lt brn, sb plty-plty, frm-hd, cyxln-mcxln, sl dolc-dolc, calc, scat fos frag; difse stmg bri bl-wh mky cut; thk dull bl-gn resdl ring
LS: crm-offwht-lt brn, sb plty-plty, frm-hd, cyxln-mcxln, sl dolc-dolc, calc, tr fos frag, SLTY SH: aa; SHY SS: gry-dk-gry, sl brn, grnl, med-c gr, mod-v frm, sb-rnd-rnd, mod srtd, mod cons, sl calc cmt; difse stmg bri bl-wh mky cut; thk dull bl-gn resdl ring
SS: lt-m
srtd, mo
slty; stn

LLING LATERAL ON 3/9/14 AT
125" HOLE W/ BIT #2, VAREL,
EPTH IN: 7970' MD

4
250
ROP (min/ft)
GAMMA (api)
0
0
6500
650000

4 100 120 115 95 109

ANGE

3627u 2569u 2966u 4280u

GAS (units)
C1-C4 (PPM)

TG: 2,981.21
C1: 78.8
C2: 4.6
C3: 5.7
C4: 1.9

0
0

8,020 8,030 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

WT IN 9.3 / OUT 9.4
VIS IN 43 / OUT 44

6500

ANGE

MD: 8,037
TVD: 7,461.41
Inclination: 89.75
Azimuth: 2.32
VS: 403.88

100' SAMPLE INTERVAL
100' SAMPLE DESCRIPTION

MD: 8,122
TVD: 7,461.3
Inclination: 90.4
Azimuth: 0.17
VS: 488.85

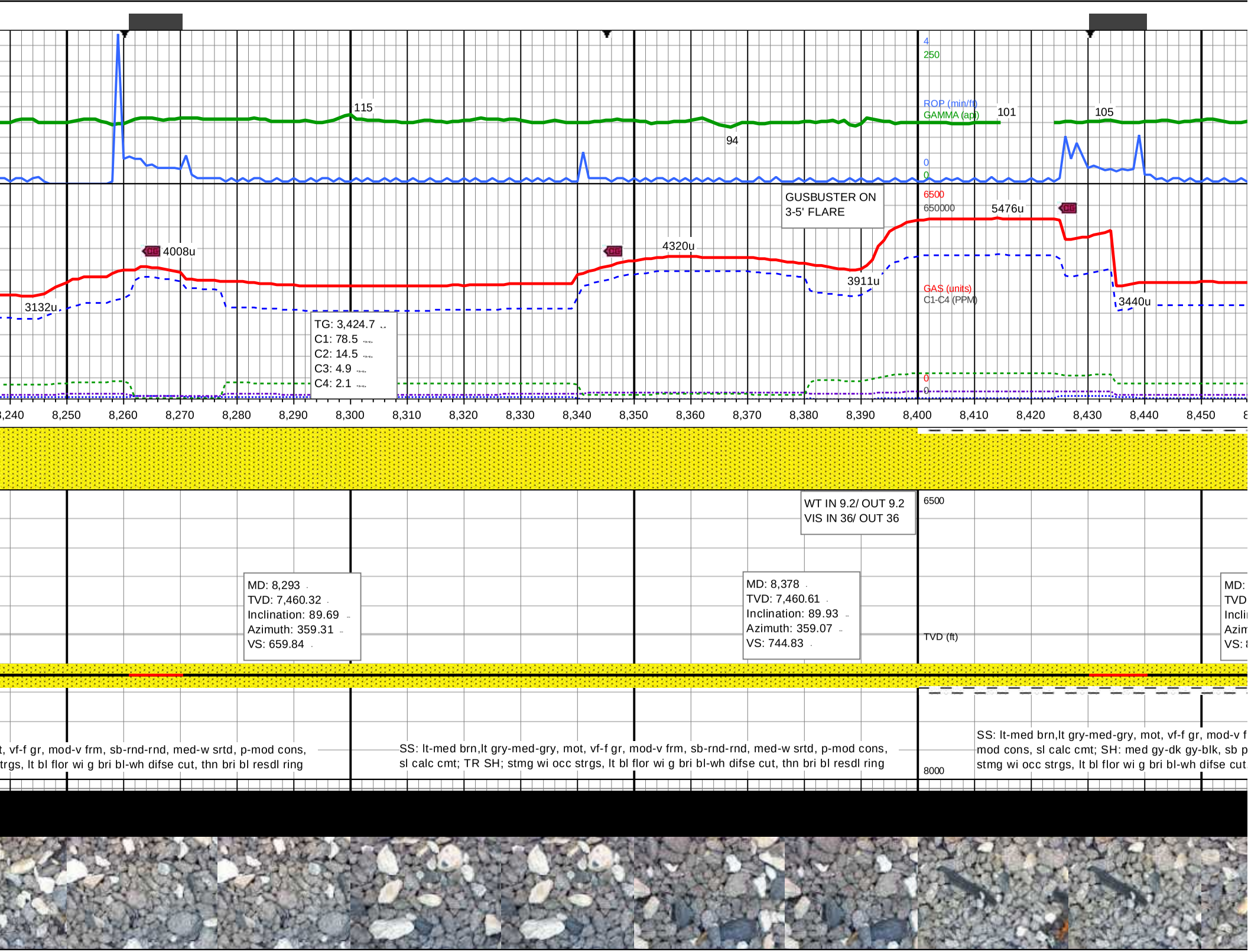
MD: 8,207
TVD: 7,460.55
Inclination: 90.61
Azimuth: 359.15
VS: 573.85

ed brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w
od cons, sl calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri,
ng wi occ strgs, lt bl flor wi g bri bl-wh difse cut, thn bri bl resdl ring

SS: lt-med brn,lt gry-med-gry, mot, vf-f gr, mod-v frm, sb-rnd-rnd, med-w srtd, p-mod cons, sl calc cmt; TR SH; stmg wi occ strgs, lt bl flor wi g bri bl-wh difse cut, thn bri bl resdl ring

SS: lt-med brn,lt gry-med-gry, mot
sl calc cmt; TR SH; stmg wi occ s

8000


4
250
ROP (min/ft)
GAMMA (api)
115
94
101
105
0
0
GUSBUSTER ON
3-5' FLARE
6500
650000
5476u
4008u
4320u
3911u
3132u
3440u
GAS (units)
C1-C4 (PPM)
TG: 3,424.7
C1: 78.5
C2: 14.5
C3: 4.9
C4: 2.1
0
0
8,240
8,250
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
WT IN 9.2/ OUT 9.2
VIS IN 36/ OUT 36
6500
MD: 8,293
TVD: 7,460.32
Inclination: 89.69
Azimuth: 359.31
VS: 659.84
MD: 8,378
TVD: 7,460.61
Inclination: 89.93
Azimuth: 359.07
VS: 744.83
TVD (ft)
MD:
TVD
Incli
Azim
VS:
t, vf-f gr, mod-v frm, sb-rnd-rnd, med-w srtd, p-mod cons,
trgs, lt bl flor wi g bri bl-wh difse cut, thn bri bl resdl ring
SS: lt-med brn,lt gry-med-gry, mot, vf-f gr, mod-v frm, sb-rnd-rnd, med-w srtd, p-mod cons,
sl calc cmt; TR SH; stmg wi occ strgs, lt bl flor wi g bri bl-wh difse cut, thn bri bl resdl ring
SS: lt-med brn,lt gry-med-gry, mot, vf-f gr, mod-v f
mod cons, sl calc cmt; SH: med gy-dk gy-blk, sb p
stmg wi occ strgs, lt bl flor wi g bri bl-wh difse cut
8000


GAPS IN GAMMA DATA - NOT PROVIDED BY BAKER HUGHES
122
129
98
136
90
118
105
ROP (min/ft)
GAMMA (api)
4
250
0
0
GUSBUSTER ON
3-5' FLARE
5477u
4689u
5481u
5427u
6500
650000
GAS (units)
C1-C4 (PPM)
TG: 3,636.56
C1: 80.4
C2: 13.8
C3: 4.8
C4: 1
0
0
8,460
8,470
8,480
8,490
8,500
8,510
8,520
8,530
8,540
8,550
8,560
8,570
8,580
8,590
8,600
8,610
8,620
8,630
8,640
8,650
8,660
8,670
6500
TVD (ft)
8000
WT IN 9.3/ OUT 9.3
VIS IN 37/ OUT 38
8,463
7,461.1
nation: 89.41
uth: 358.55
329.82
MD: 8,548
TVD: 7,461.81
Inclination: 89.63
Azimuth: 358.6
VS: 914.8
MD: 8,633
TVD: 7,461.9
Inclination: 90.24
Azimuth: 358.19
VS: 999.77
rm, sb-rnd-rnd, med-w srtd,
lty-plty, frm, mod fri, slty;
thn bri bl resdl ring
SS: lt-med brn,lt gry-med-gry, mot, vf-f gr, mod-v frm, sb-rnd-rnd, med-w srtd,
mod cons, sl calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri, slty;
stmg wi occ strgs, lt bl flor wi g bri bl-wh difse cut, thn bri bl resdl ring
SS: lt-med brn,lt gry-med-gry, mot, vf-f gr, mod-v frm, sb-rnd-rnd, med-w
mod cons, sl calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri,
wi occ strgs, lt bl flor wi g bri bl-wh difse cut, thn bri bl resdl ring

TOOH FOR NEW MUD MOTOR AT 8764' MD.

Bit #: 2
Type: DP406
Size: 6.12
Depth In: 7,970
Depth Out: 8,764
Total Drilled: 794
Hours: 3.2
Avg Ft/Hr: 248.12
Jets: 3X18 3X20
S/N: 7150087

MNDEPTH
3/10/2014

119
97
104
116
90

4
250
ROP (min/ft)
GAMMA (api)
0
0

6500
650000
GAS (units)
C1-C4 (PPM)
0
0

TROUBLESHOOT POLYFLOW LINES

078u
2970u
3510u
961u

TG: 3,510
C1: 76.5
C2: 13.7
C3: 5.3
C4: 4.5

TG: 1,
C1: 85
C2: 8.
C3: 4.
C4: 1.

8,680 8,690 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

MUD DATA
WT: 9.2
FV: 44
PV: 11
YP: 14
CK: 1
Sol: 5.5
pH: 9.6
Chl: 1,600

6500
TVD (ft)
8000

MD: 8,695
TVD: 7,461.73
Inclination: 90.09
Azimuth: 358.45
VS: 1,061.75

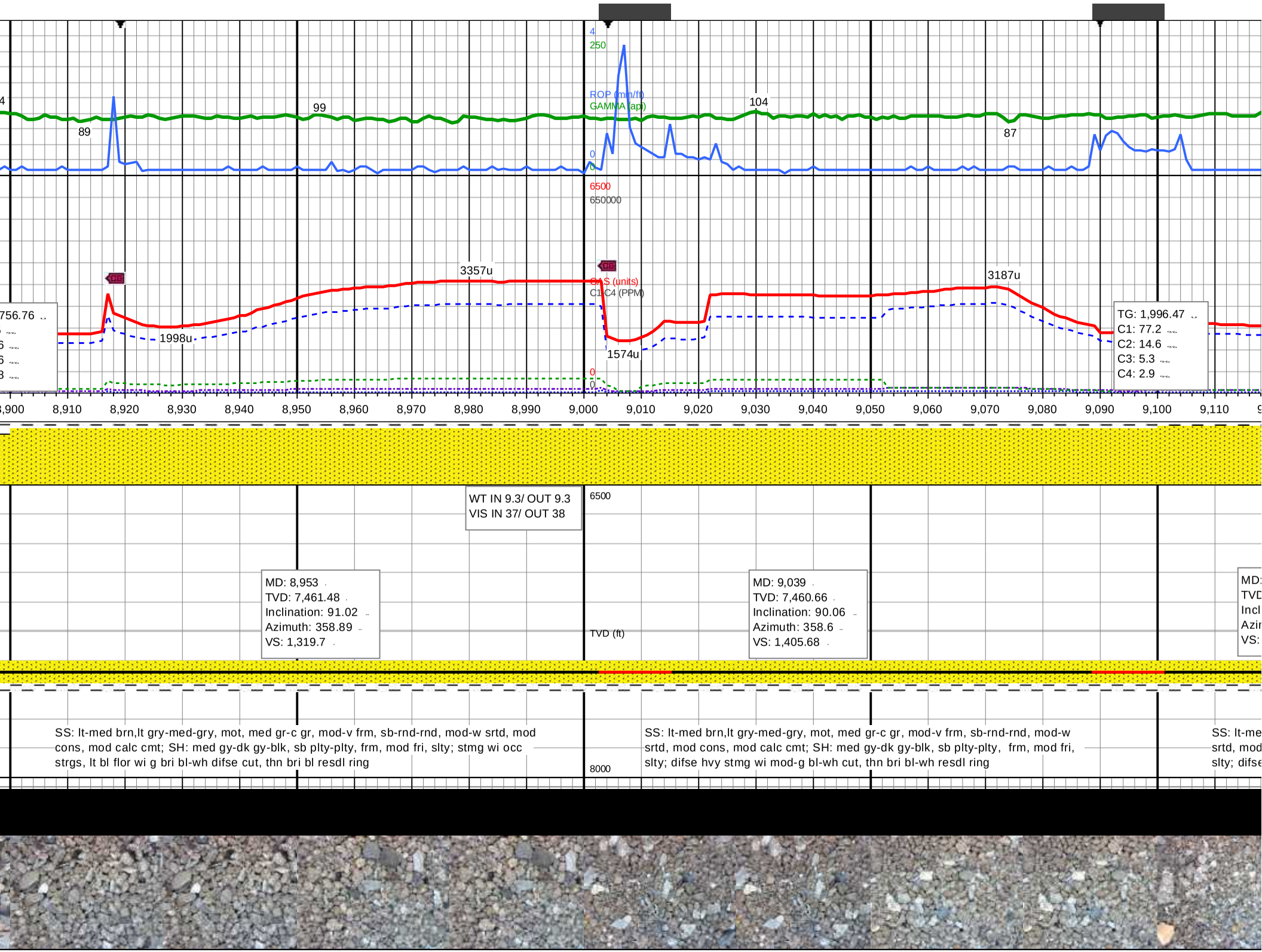
MD: 8,782
TVD: 7,461.99
Inclination: 89.56
Azimuth: 358.66
VS: 1,148.73

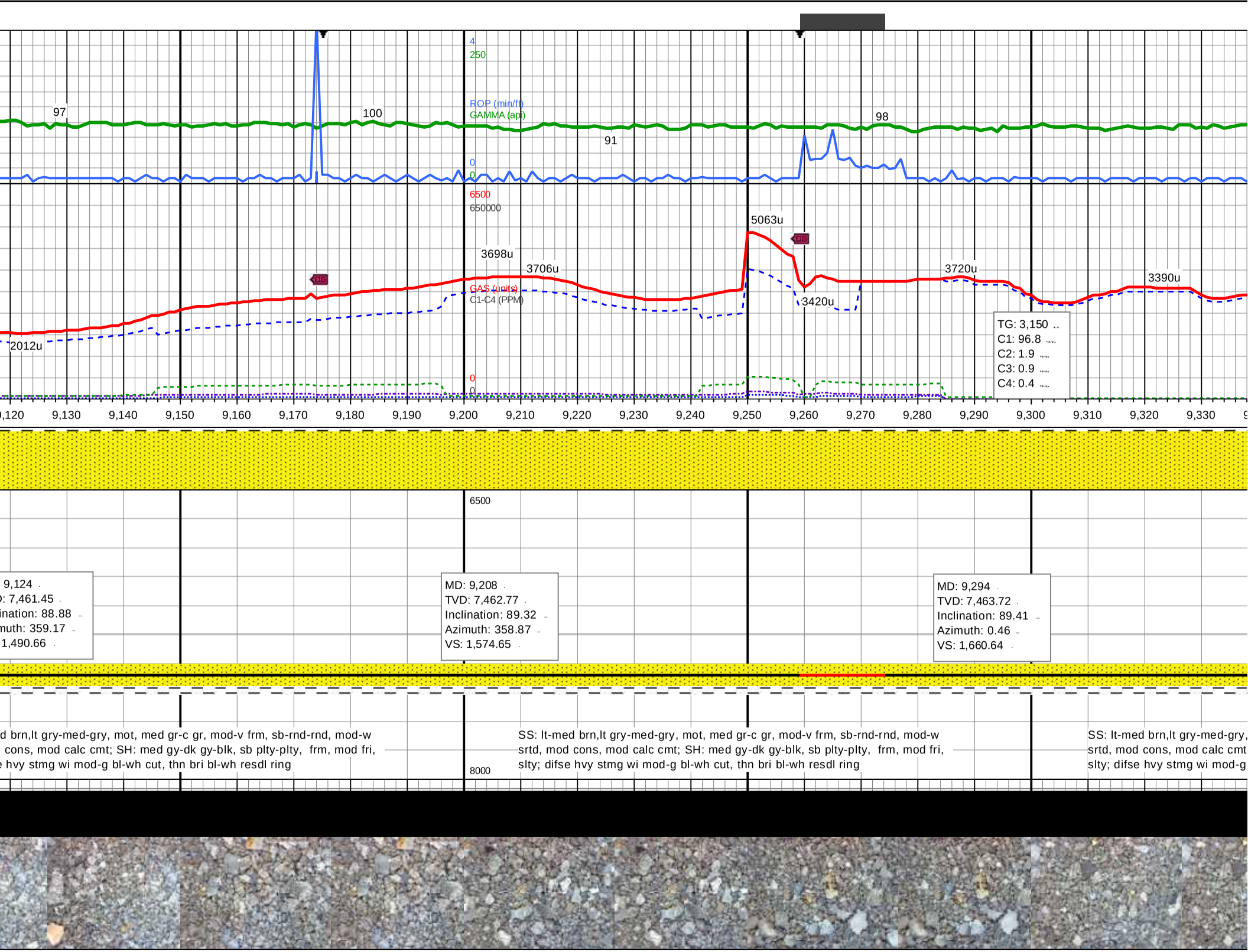
MD: 8,868
TVD: 7,462.28
Inclination: 90.06
Azimuth: 359.15
VS: 1,234.71

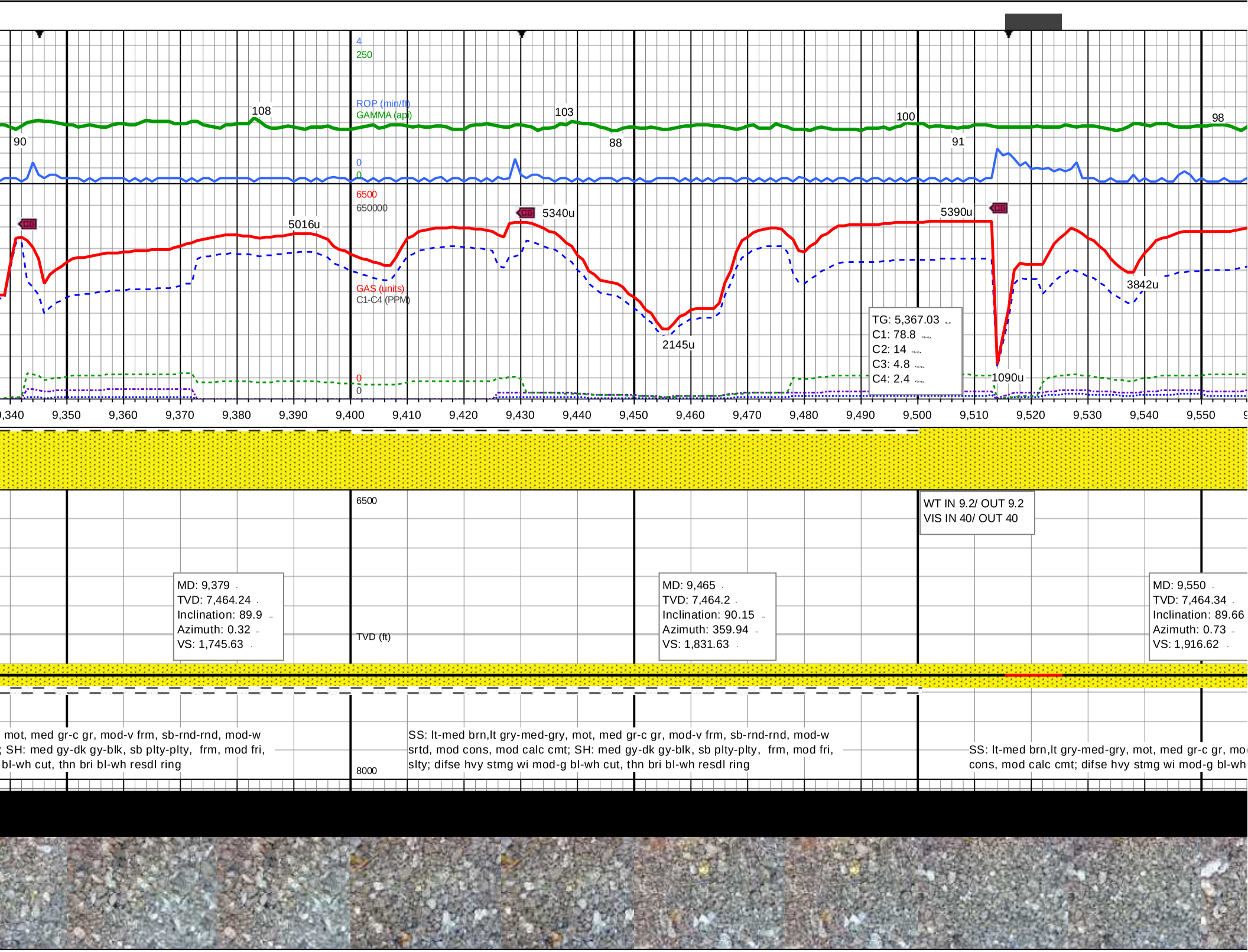
w srtd,
slty; stmg

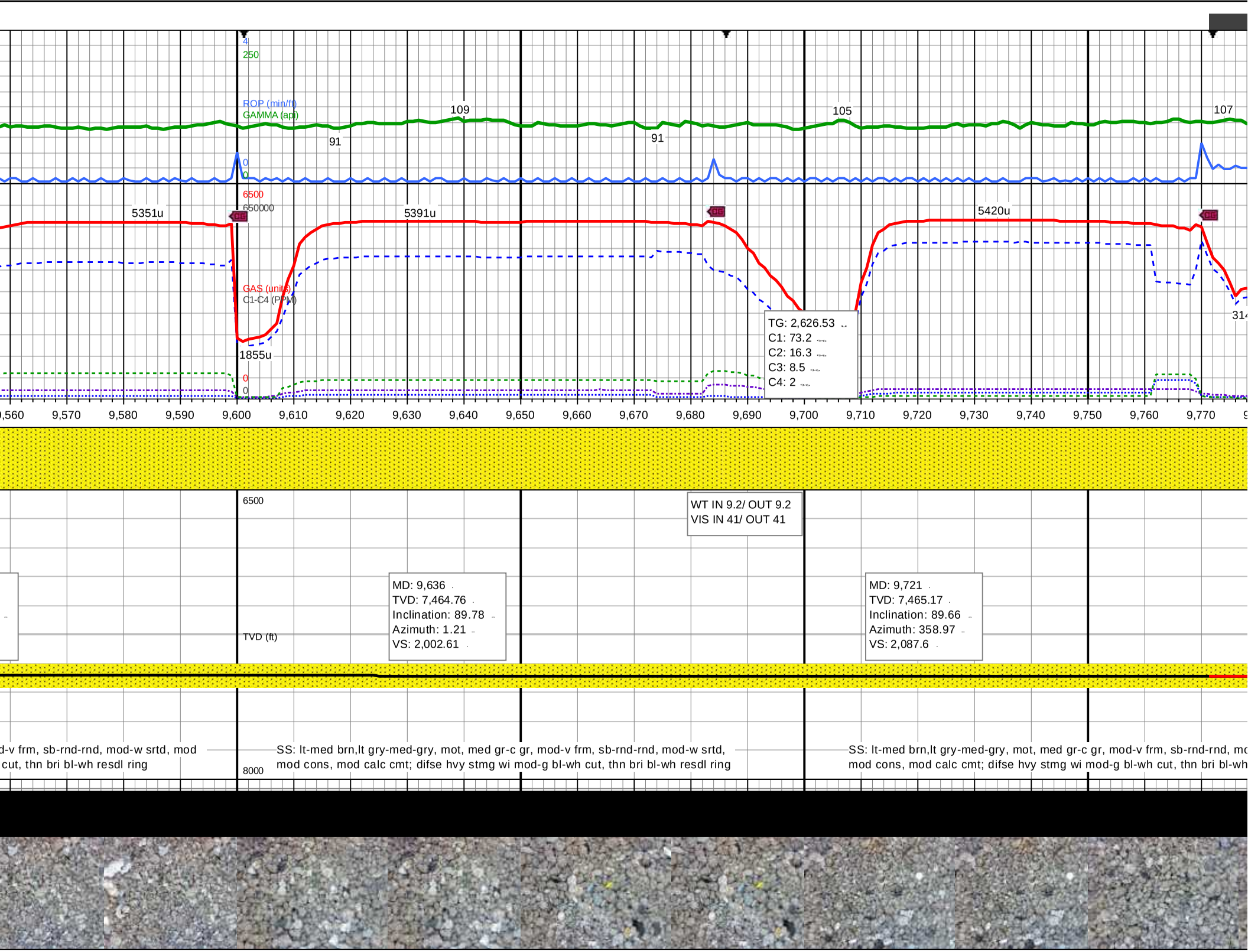
SS: lt-med brn,lt gry-med-gry, mot, vf-f gr, mod-v frm, sb-rnd-rnd, med-w srtd, mod cons, sl calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri, slty; stmg wi occ strgs, lt bl flor wi g bri bl-wh difse cut, thn bri bl resdl ring

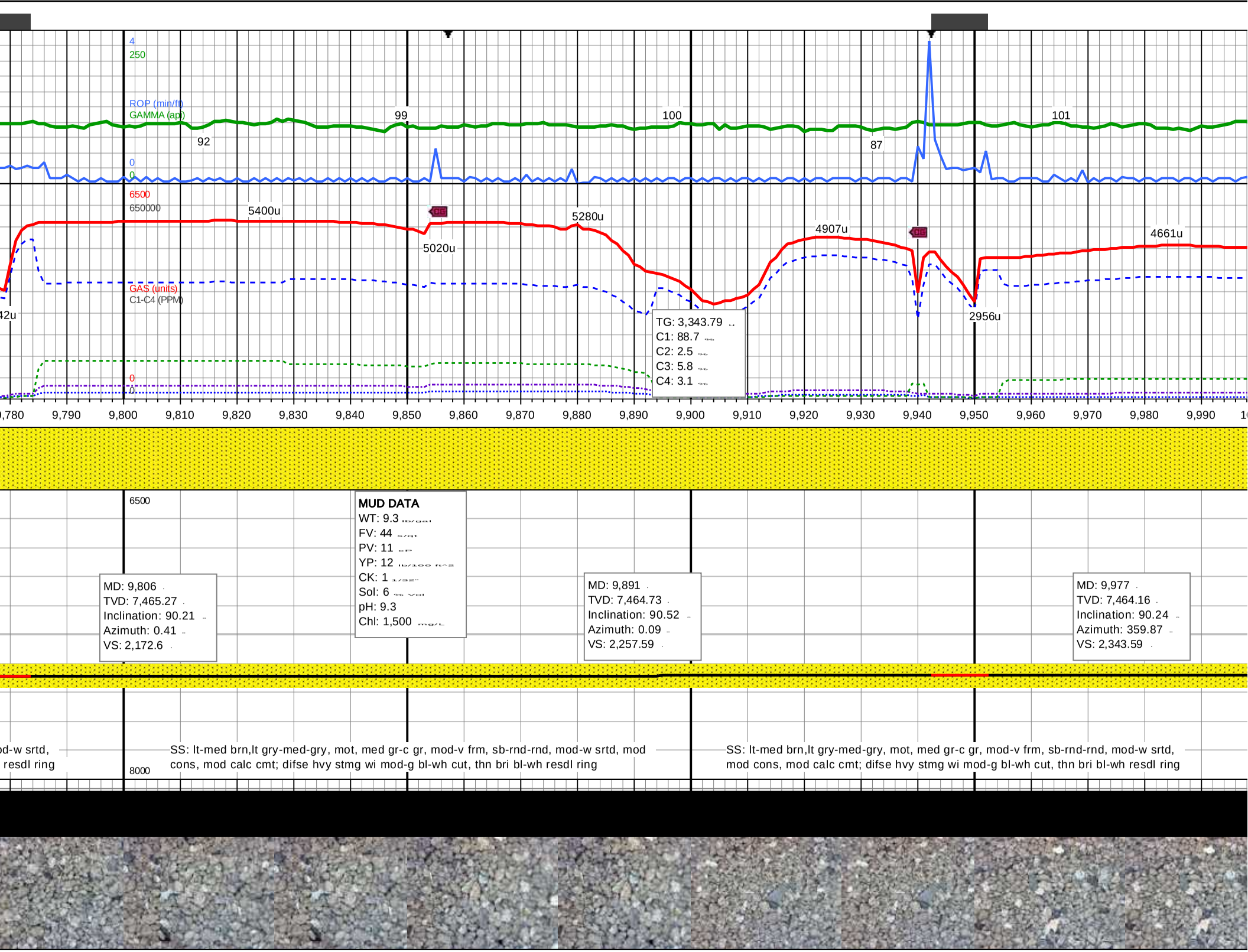
SS: lt-med brn,lt gry-med-gry, mot, vf-f gr, mod-v frm, sb-rnd-rnd, med-w srtd, mod cons, sl calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri, slty, tr brn sltst; stmg wi occ strgs, lt bl flor wi g bri bl-wh difse cut, thn bri bl resdl ring

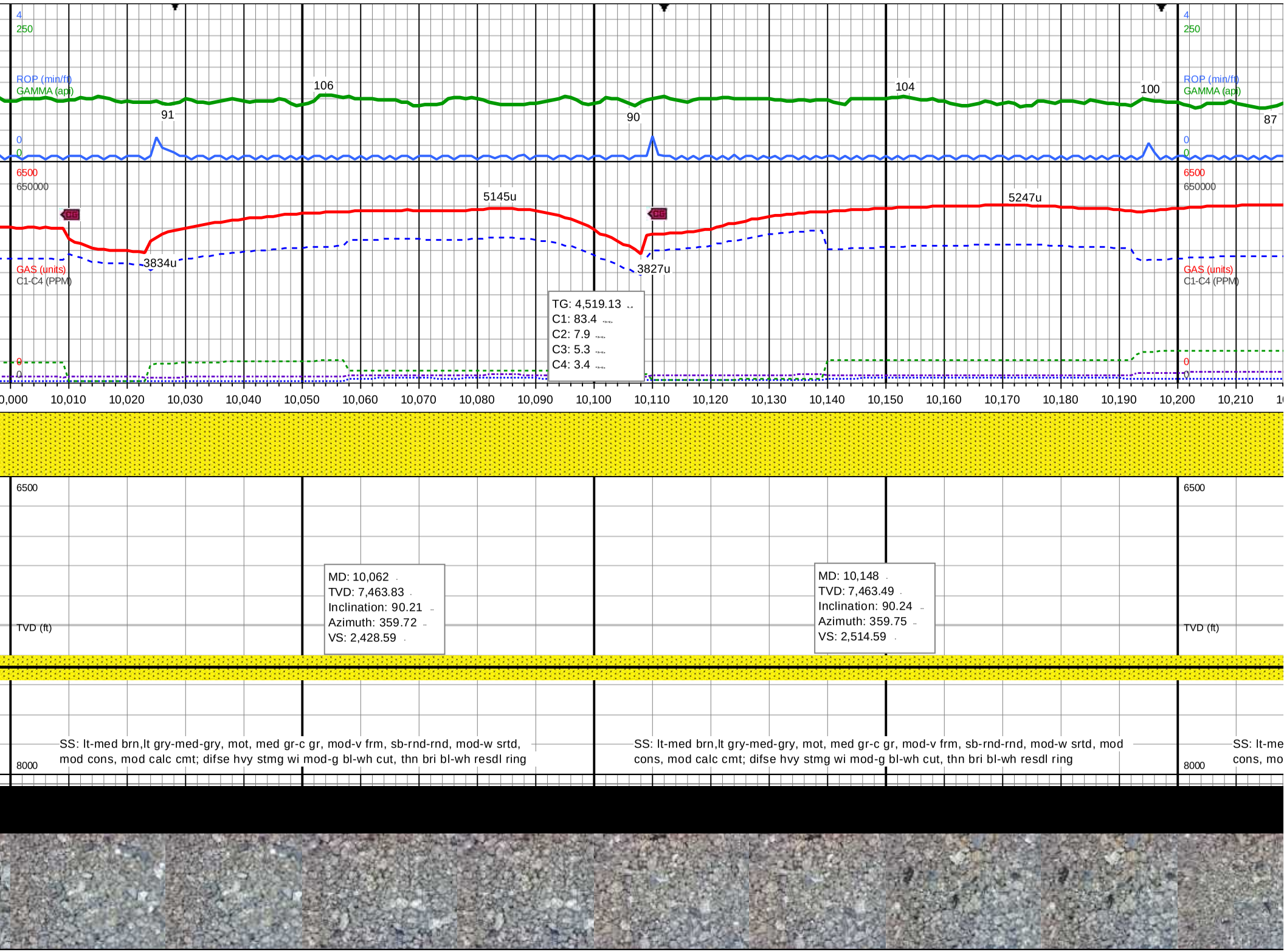

4
250
ROP (min/ft)
GAMMA (api)
89
99
104
87
0
0
6500
650000
3357u
3187u
1998u
1574u
GAS (units)
C1:C4 (PPM)
0
0
756.76
TG: 1,996.47
C1: 77.2
C2: 14.6
C3: 5.3
C4: 2.9
8,900
8,910
8,920
8,930
8,940
8,950
8,960
8,970
8,980
8,990
9,000
9,010
9,020
9,030
9,040
9,050
9,060
9,070
9,080
9,090
9,100
9,110
WT IN 9.3/ OUT 9.3
VIS IN 37/ OUT 38
6500
MD: 8,953
TVD: 7,461.48
Inclination: 91.02
Azimuth: 358.89
VS: 1,319.7
MD: 9,039
TVD: 7,460.66
Inclination: 90.06
Azimuth: 358.6
VS: 1,405.68
TVD (ft)
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, mod calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri, slty; stmg wi occ strgs, lt bl flor wi g bri bl-wh difse cut, thn bri bl resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, mod calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri, slty; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
8000

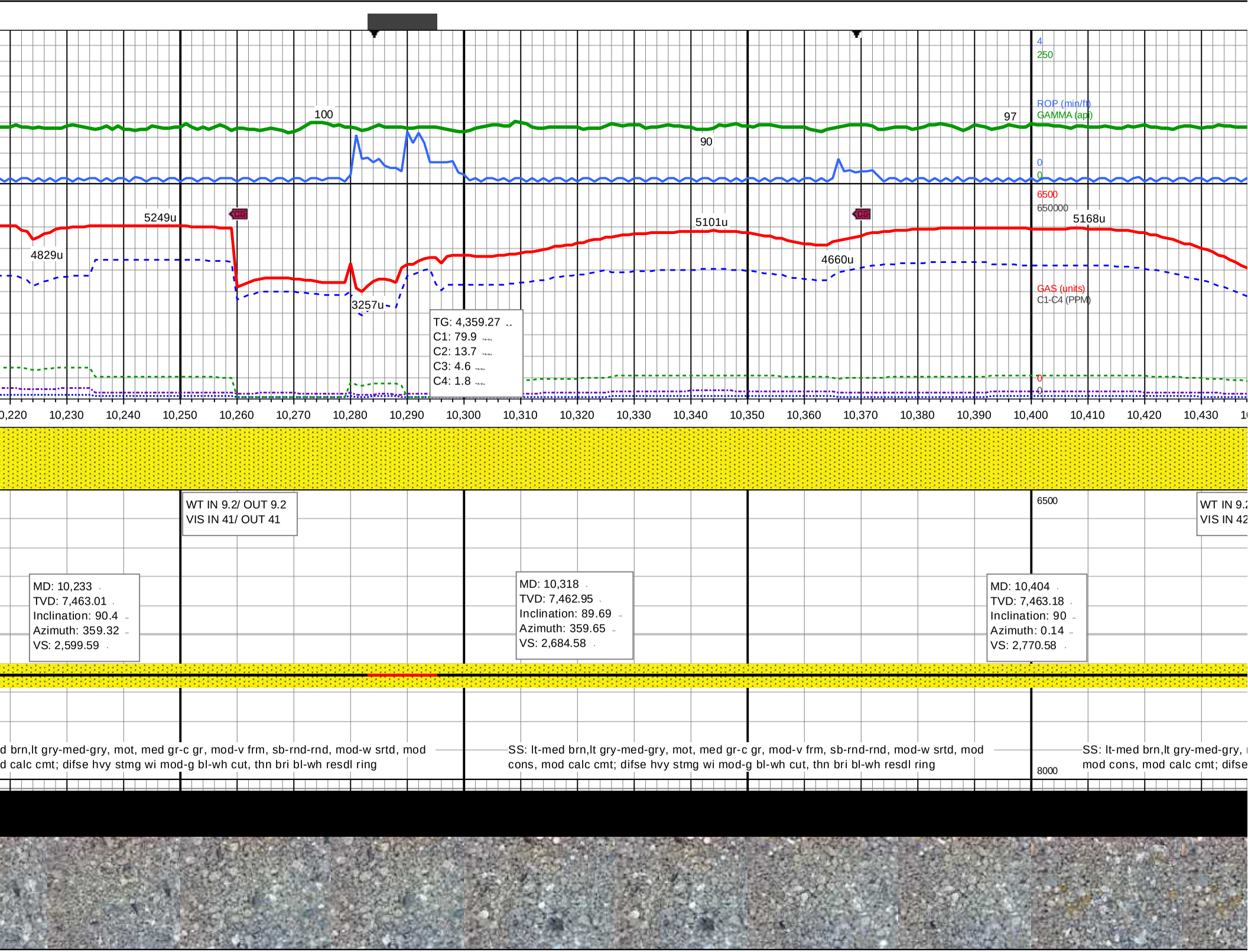

4
250
ROP (min/ft)
GAMMA (api)
0
0
97
100
91
98
6500
650000
5063u
3698u
3706u
3720u
3390u
3420u
GAS (units)
C1-C4 (PPM)
2012u
0
0
TG: 3,150
C1: 96.8
C2: 1.9
C3: 0.9
C4: 0.4
9,120
9,130
9,140
9,150
9,160
9,170
9,180
9,190
9,200
9,210
9,220
9,230
9,240
9,250
9,260
9,270
9,280
9,290
9,300
9,310
9,320
9,330
6500
9,124
: 7,461.45
ination: 88.88
muth: 359.17
1,490.66
MD: 9,208
TVD: 7,462.77
Inclination: 89.32
Azimuth: 358.87
VS: 1,574.65
MD: 9,294
TVD: 7,463.72
Inclination: 89.41
Azimuth: 0.46
VS: 1,660.64
d brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w
cons, mod calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri,
e hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w
srtd, mod cons, mod calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri,
slty; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry,
srtd, mod cons, mod calc cmt
slty; difse hvy stmg wi mod-g
8000

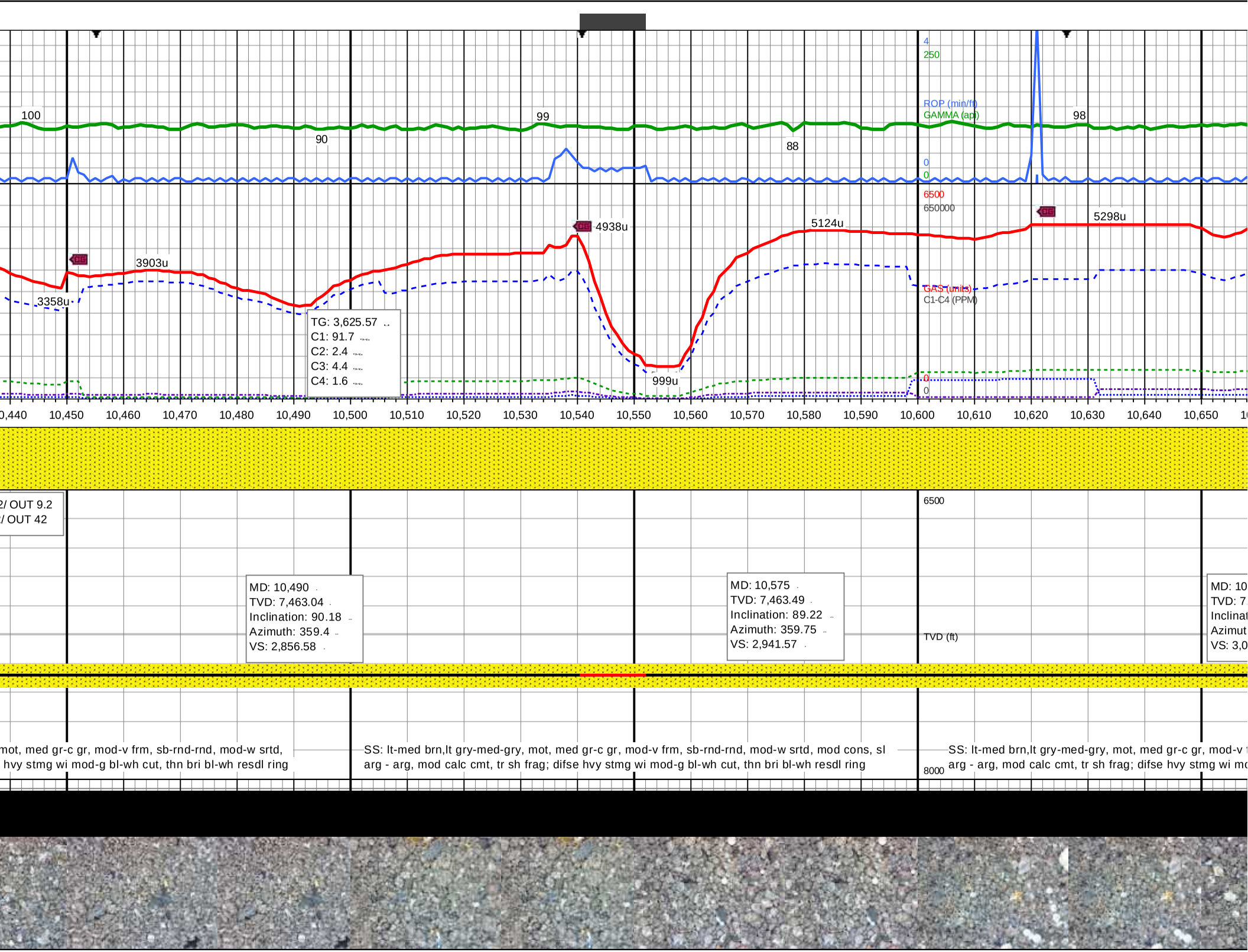

4
250
ROP (min/ft)
GAMMA (api)
108
103
100
98
90
88
91
0
0
6500
650000
5016u
5340u
5390u
3842u
GAS (units)
C1-C4 (PPM)
2145u
1090u
TG: 5,367.03
C1: 78.8
C2: 14
C3: 4.8
C4: 2.4
0
0
9,340
9,350
9,360
9,370
9,380
9,390
9,400
9,410
9,420
9,430
9,440
9,450
9,460
9,470
9,480
9,490
9,500
9,510
9,520
9,530
9,540
9,550
6500
WT IN 9.2/ OUT 9.2
VIS IN 40/ OUT 40
MD: 9,379
TVD: 7,464.24
Inclination: 89.9
Azimuth: 0.32
VS: 1,745.63
MD: 9,465
TVD: 7,464.2
Inclination: 90.15
Azimuth: 359.94
VS: 1,831.63
MD: 9,550
TVD: 7,464.34
Inclination: 89.66
Azimuth: 0.73
VS: 1,916.62
TVD (ft)
mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w
; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri,
bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w
srtd, mod cons, mod calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri,
slty; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mo
cons, mod calc cmt; difse hvy stmg wi mod-g bl-wh
8000

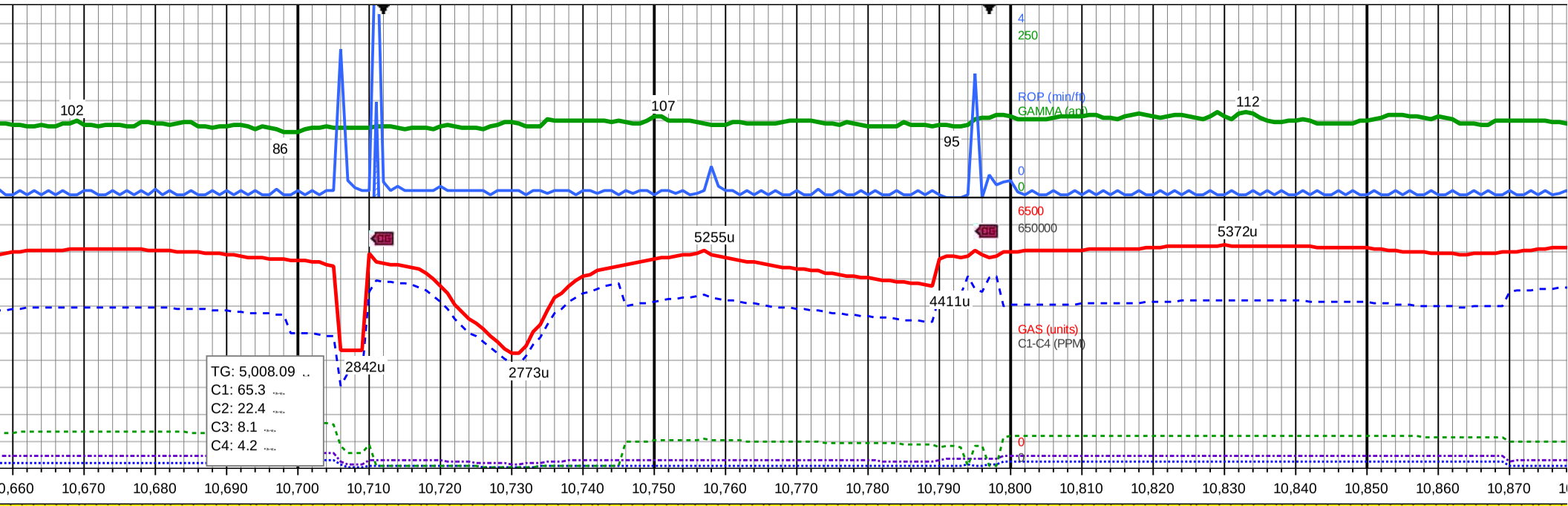

4
250
ROP (min/ft)
GAMMA (api)
109
91
91
105
107
0
0
6500
650000
5351u
5391u
5420u
GAS (units)
C1-C4 (PPM)
1855u
0
0
TG: 2,626.53
C1: 73.2
C2: 16.3
C3: 8.5
C4: 2
314
9,560
9,570
9,580
9,590
9,600
9,610
9,620
9,630
9,640
9,650
9,660
9,670
9,680
9,690
9,700
9,710
9,720
9,730
9,740
9,750
9,760
9,770
6500
WT IN 9.2/ OUT 9.2
VIS IN 41/ OUT 41
MD: 9,636
TVD: 7,464.76
Inclination: 89.78
Azimuth: 1.21
VS: 2,002.61
MD: 9,721
TVD: 7,465.17
Inclination: 89.66
Azimuth: 358.97
VS: 2,087.6
TVD (ft)
d-v frm, sb-rnd-rnd, mod-w srtd, mod
cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd,
mod cons, mod calc cmt; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mo
mod cons, mod calc cmt; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh
8000

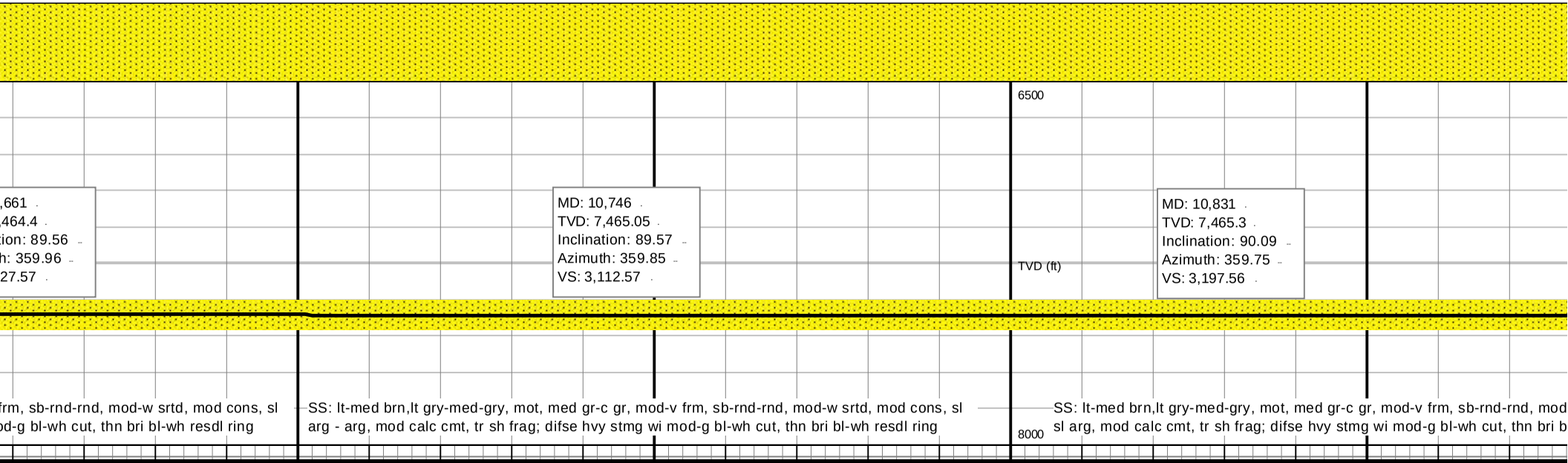

4
250
ROP (min/ft)
GAMMA (api)
99
100
101
92
87
0
0
6500
650000
5400u
5280u
4907u
4661u
5020u
2956u
42u
GAS (units)
C1-C4 (PPM)
TG: 3,343.79
C1: 88.7
C2: 2.5
C3: 5.8
C4: 3.1
0
0
9,780
9,790
9,800
9,810
9,820
9,830
9,840
9,850
9,860
9,870
9,880
9,890
9,900
9,910
9,920
9,930
9,940
9,950
9,960
9,970
9,980
9,990
6500
MUD DATA
WT: 9.3
FV: 44
PV: 11
YP: 12
CK: 1
Sol: 6
pH: 9.3
Chl: 1,500
MD: 9,806
TVD: 7,465.27
Inclination: 90.21
Azimuth: 0.41
VS: 2,172.6
MD: 9,891
TVD: 7,464.73
Inclination: 90.52
Azimuth: 0.09
VS: 2,257.59
MD: 9,977
TVD: 7,464.16
Inclination: 90.24
Azimuth: 359.87
VS: 2,343.59
od-w srtd,
resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, mod calc cmt; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, mod calc cmt; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
8000


4
250
ROP (min/ft)
GAMMA (api)
106
91
90
104
100
87
0
0
6500
650000
5145u
5247u
3834u
3827u
GAS (units)
C1-C4 (PPM)
TG: 4,519.13
C1: 83.4
C2: 7.9
C3: 5.3
C4: 3.4
0
0
0,000
10,010
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
6500
TVD (ft)
MD: 10,062
TVD: 7,463.83
Inclination: 90.21
Azimuth: 359.72
VS: 2,428.59
MD: 10,148
TVD: 7,463.49
Inclination: 90.24
Azimuth: 359.75
VS: 2,514.59
8000
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, mod calc cmt; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, mod calc cmt; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring


4
250
ROP (min/ft)
GAMMA (api)
100
90
97
0
0
6500
650000
5249u
4829u
3257u
5101u
4660u
5168u
GAS (units)
C1-C4 (PPM)
TG: 4,359.27
C1: 79.9
C2: 13.7
C3: 4.6
C4: 1.8
0
0
10,220
10,230
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
WT IN 9.2/ OUT 9.2
VIS IN 41/ OUT 41
6500
WT IN 9.2
VIS IN 42
MD: 10,233
TVD: 7,463.01
Inclination: 90.4
Azimuth: 359.32
VS: 2,599.59
MD: 10,318
TVD: 7,462.95
Inclination: 89.69
Azimuth: 359.65
VS: 2,684.58
MD: 10,404
TVD: 7,463.18
Inclination: 90
Azimuth: 0.14
VS: 2,770.58
d brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod
d calc cmt; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod
cons, mod calc cmt; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
8000
SS: lt-med brn,lt gry-med-gry,
mod cons, mod calc cmt; difse


100
90
99
88
98
4
250
ROP (min/ft)
GAMMA (api)
0
0
6500
650000
3358u
3903u
4938u
999u
5124u
5298u
GAS (units)
C1-C4 (PPM)
TG: 3,625.57
C1: 91.7
C2: 2.4
C3: 4.4
C4: 1.6
0
0
10,440
10,450
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
2/ OUT 9.2
/ OUT 42
MD: 10,490
TVD: 7,463.04
Inclination: 90.18
Azimuth: 359.4
VS: 2,856.58
MD: 10,575
TVD: 7,463.49
Inclination: 89.22
Azimuth: 359.75
VS: 2,941.57
6500
TVD (ft)
mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd,
hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, sl
arg - arg, mod calc cmt, tr sh frag; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v
arg - arg, mod calc cmt, tr sh frag; difse hvy stmg wi mo
8000

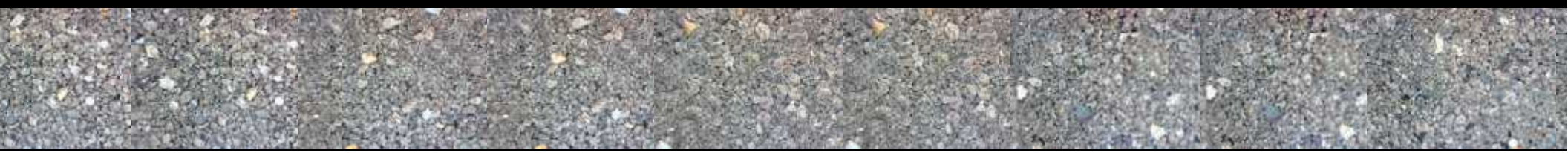


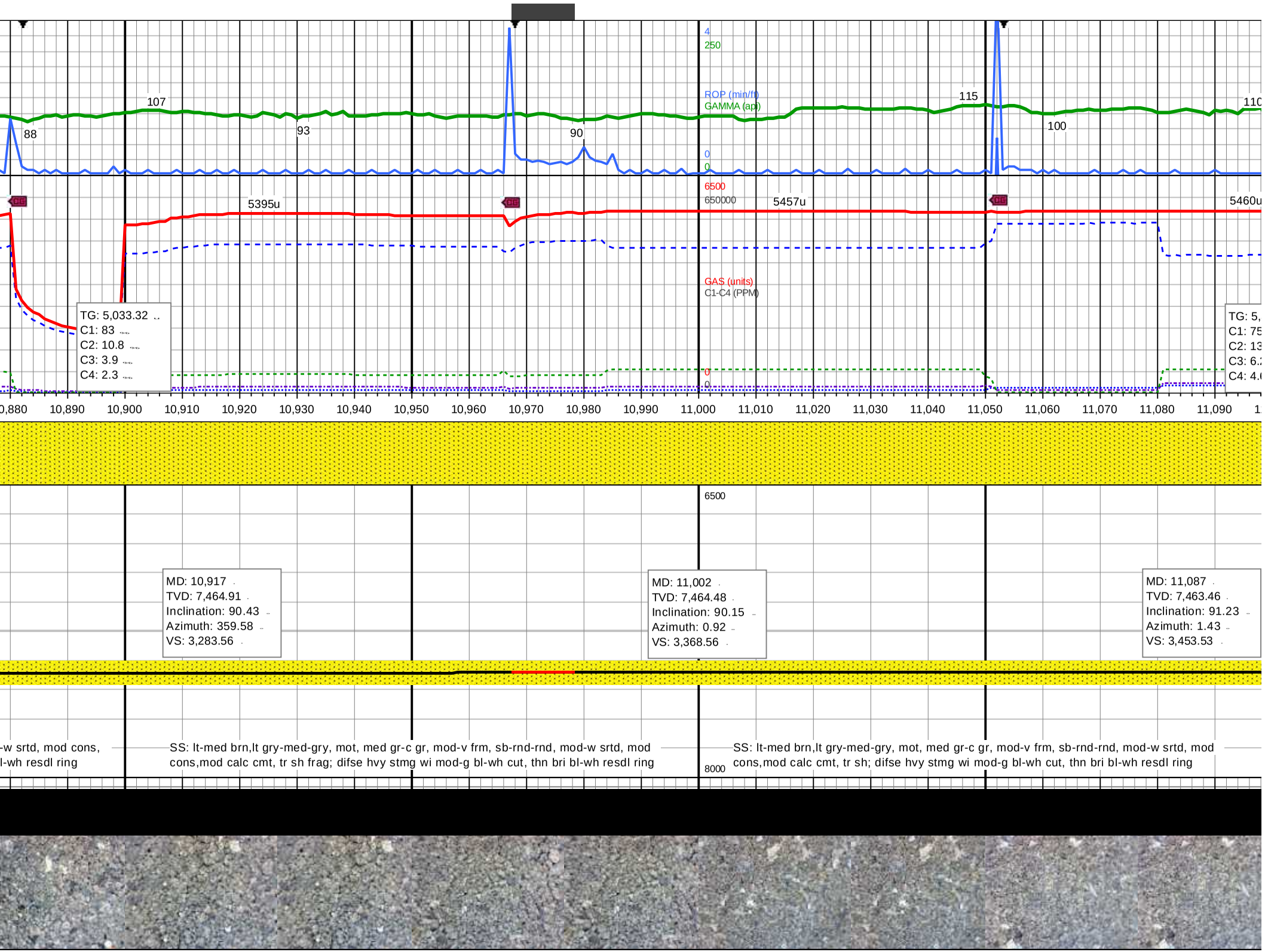


frm, sb-rnd-rnd, mod-w srtd, mod cons, sl od-g bl-wh cut, thn bri bl-wh resdl ring

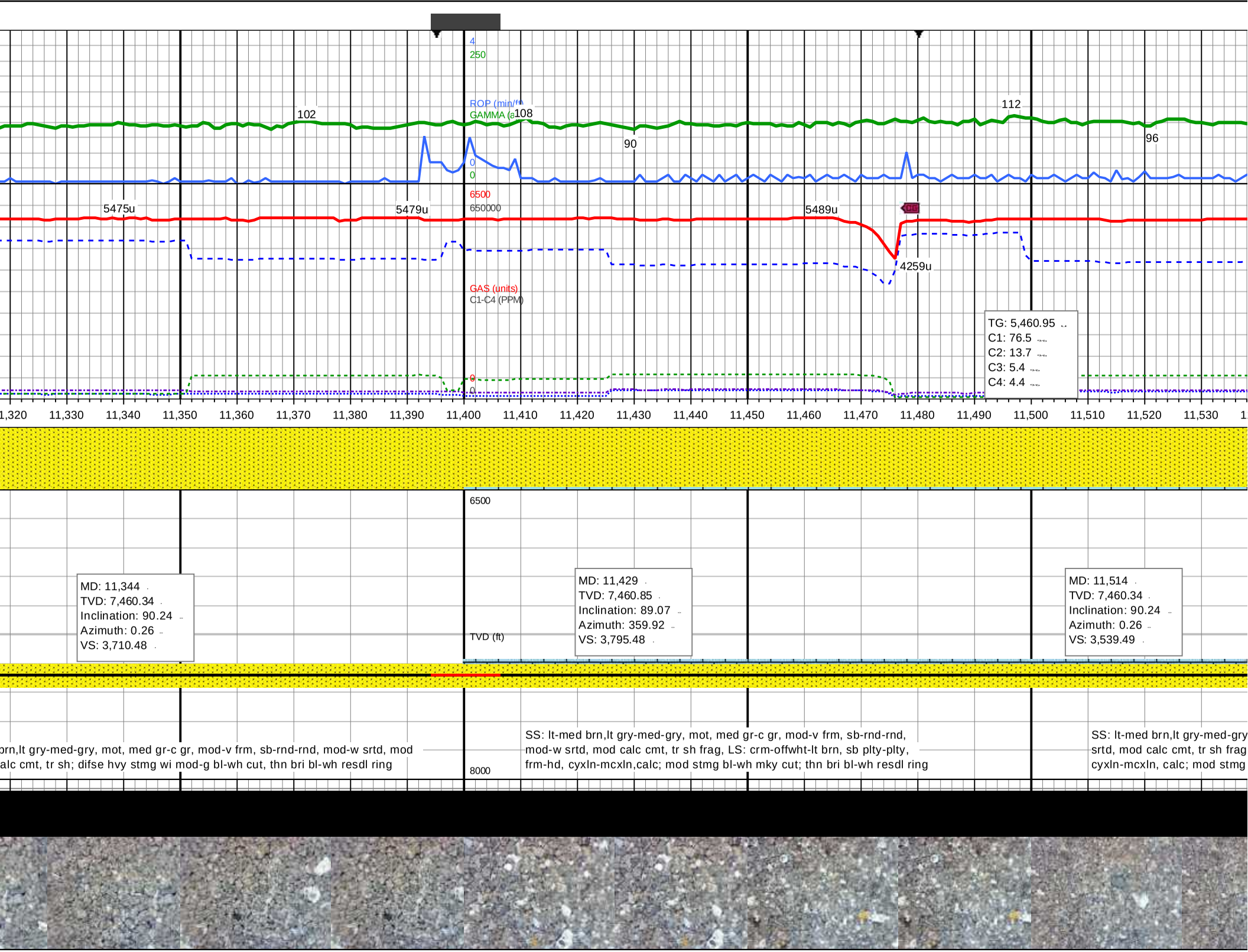
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, sl arg - arg, mod calc cmt, tr sh frag; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring

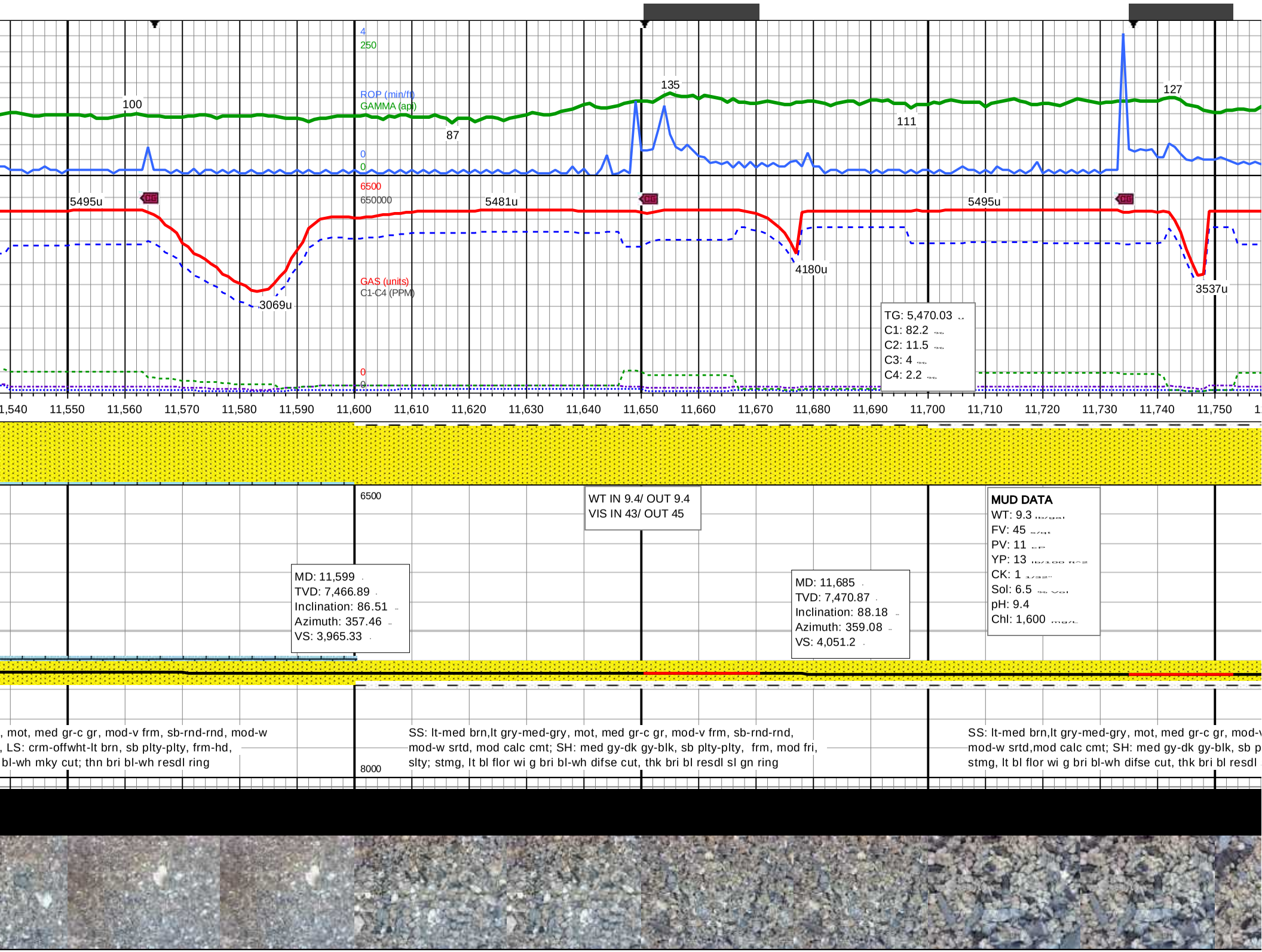
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod sl arg, mod calc cmt, tr sh frag; difse hvy stmg wi mod-g bl-wh cut, thn bri b

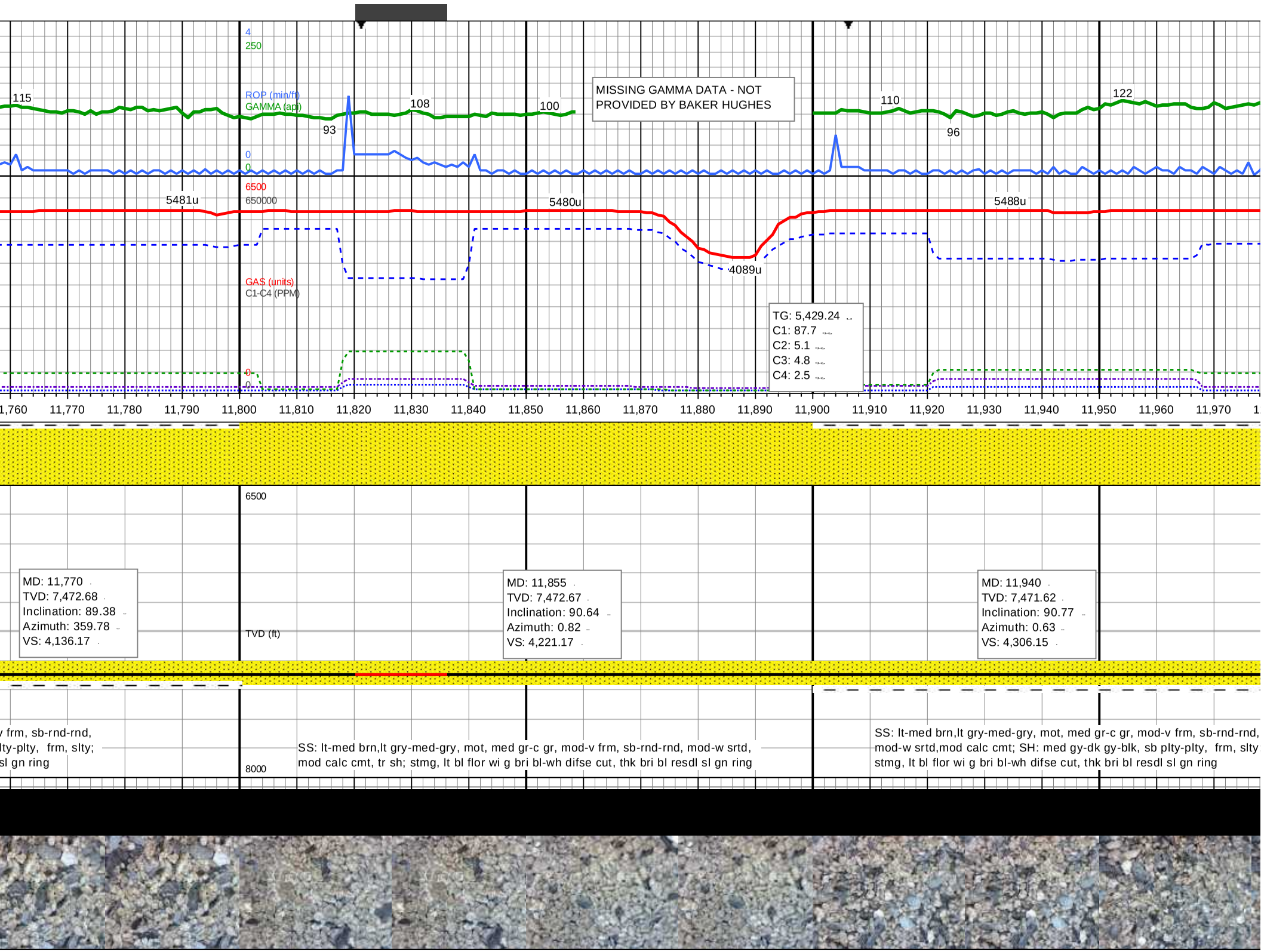


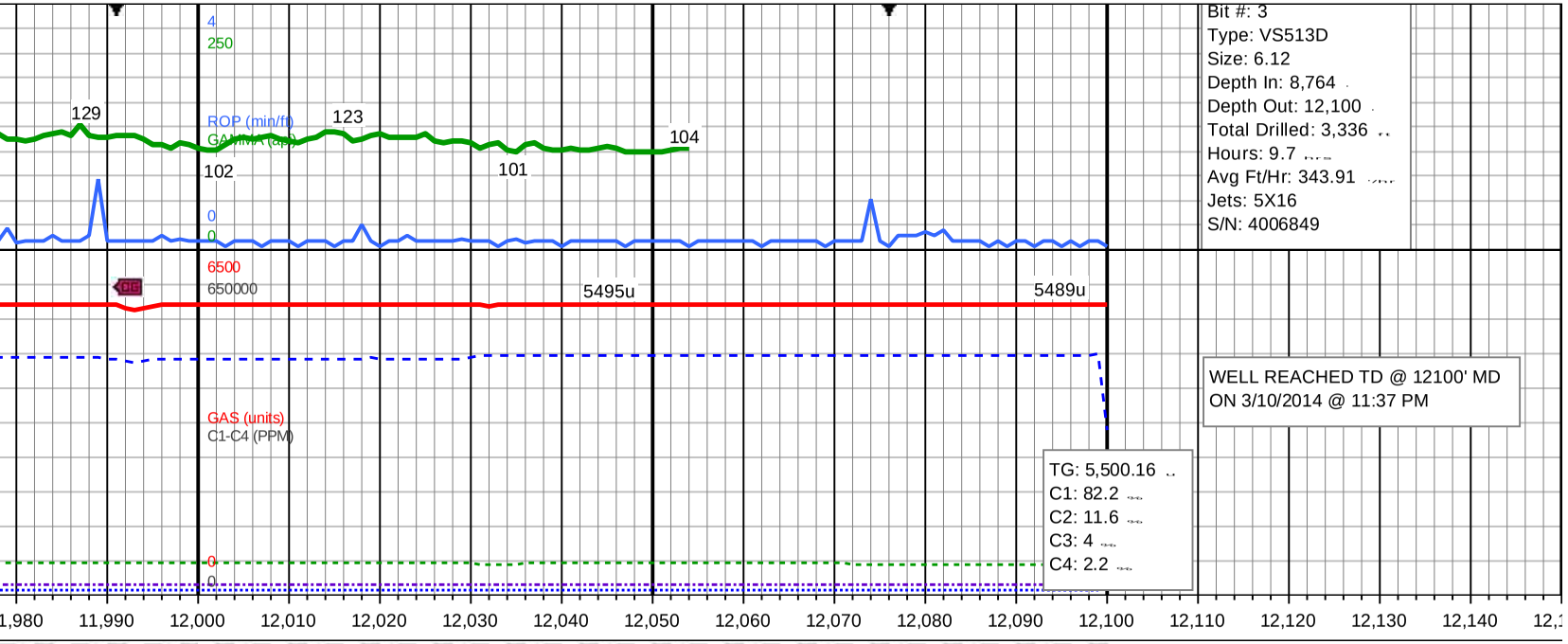

4
250
ROP (min/ft)
GAMMA (api)
0
0
88
107
93
90
115
100
110
6500
650000
5395u
5457u
5460u
GAS (units)
C1-C4 (PPM)
0
0
TG: 5,033.32
C1: 83
C2: 10.8
C3: 3.9
C4: 2.3
TG: 5,
C1: 75
C2: 13
C3: 6.2
C4: 4.0
10,880
10,890
10,900
10,910
10,920
10,930
10,940
10,950
10,960
10,970
10,980
10,990
11,000
11,010
11,020
11,030
11,040
11,050
11,060
11,070
11,080
11,090
6500
MD: 10,917
TVD: 7,464.91
Inclination: 90.43
Azimuth: 359.58
VS: 3,283.56
MD: 11,002
TVD: 7,464.48
Inclination: 90.15
Azimuth: 0.92
VS: 3,368.56
MD: 11,087
TVD: 7,463.46
Inclination: 91.23
Azimuth: 1.43
VS: 3,453.53
-w srtd, mod cons,
l-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons,mod calc cmt, tr sh frag; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons,mod calc cmt, tr sh; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
8000


4
250
ROP (min/ft)
GAMMA (api)
0
0
90
98
88
100
84
6500
650000
5471u
4739u
5494u
GAS (units)
C1-C4 (PPM)
2790u
0
0
398.35
TG: 3,600
C1: 88
C2: 3.7
C3: 5.1
C4: 3.1
11,100
11,110
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
6500
WT IN 9.3/ OUT 9.3
VIS IN 43/ OUT 44
MD: 11,173
TVD: 7,461.4
Inclination: 91.51
Azimuth: 359.35
VS: 3,539.49
MD: 11,258
TVD: 7,460.4
Inclination: 89.84
Azimuth: 359.77
VS: 3,624.48
TVD (ft)
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, mod calc cmt, tr sh; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, mod calc cmt, tr sh frag; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
8000


4
250
ROP (min/ft)
GAMMA (a
102
108
90
112
96
0
0
6500
650000
5475u
5479u
5489u
4259u
GAS (units)
C1-C4 (PPM)
TG: 5,460.95
C1: 76.5
C2: 13.7
C3: 5.4
C4: 4.4
11,320
11,330
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
6500
MD: 11,344
TVD: 7,460.34
Inclination: 90.24
Azimuth: 0.26
VS: 3,710.48
MD: 11,429
TVD: 7,460.85
Inclination: 89.07
Azimuth: 359.92
VS: 3,795.48
MD: 11,514
TVD: 7,460.34
Inclination: 90.24
Azimuth: 0.26
VS: 3,539.49
TVD (ft)
8000
brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod
alc cmt, tr sh; difse hvy stmg wi mod-g bl-wh cut, thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd,
mod-w srtd, mod calc cmt, tr sh frag, LS: crm-offwht-lt brn, sb plty-plty,
frm-hd, cyxln-mcxln,calc; mod stmg bl-wh mky cut; thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry
srtd, mod calc cmt, tr sh frag
cyxln-mcxln, calc; mod stmg


4
250
ROP (min/ft)
GAMMA (api)
0
0
100
87
135
111
127
6500
650000
GAS (units)
C1-C4 (PPM)
0
0
5495u
3069u
5481u
4180u
5495u
3537u
TG: 5,470.03
C1: 82.2
C2: 11.5
C3: 4
C4: 2.2
11,540
11,550
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
6500
WT IN 9.4/ OUT 9.4
VIS IN 43/ OUT 45
MUD DATA
WT: 9.3
FV: 45
PV: 11
YP: 13
CK: 1
Sol: 6.5
pH: 9.4
Chl: 1,600
MD: 11,599
TVD: 7,466.89
Inclination: 86.51
Azimuth: 357.46
VS: 3,965.33
MD: 11,685
TVD: 7,470.87
Inclination: 88.18
Azimuth: 359.08
VS: 4,051.2
, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w
, LS: crm-offwht-lt brn, sb plty-plty, frm-hd,
bl-wh mky cut; thn bri bl-wh resdl ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd,
mod-w srtd, mod calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri,
slty; stmg, lt bl flor wi g bri bl-wh difse cut, thk bri bl resdl sl gn ring
8000
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v
mod-w srtd,mod calc cmt; SH: med gy-dk gy-blk, sb p
stmg, lt bl flor wi g bri bl-wh difse cut, thk bri bl resdl

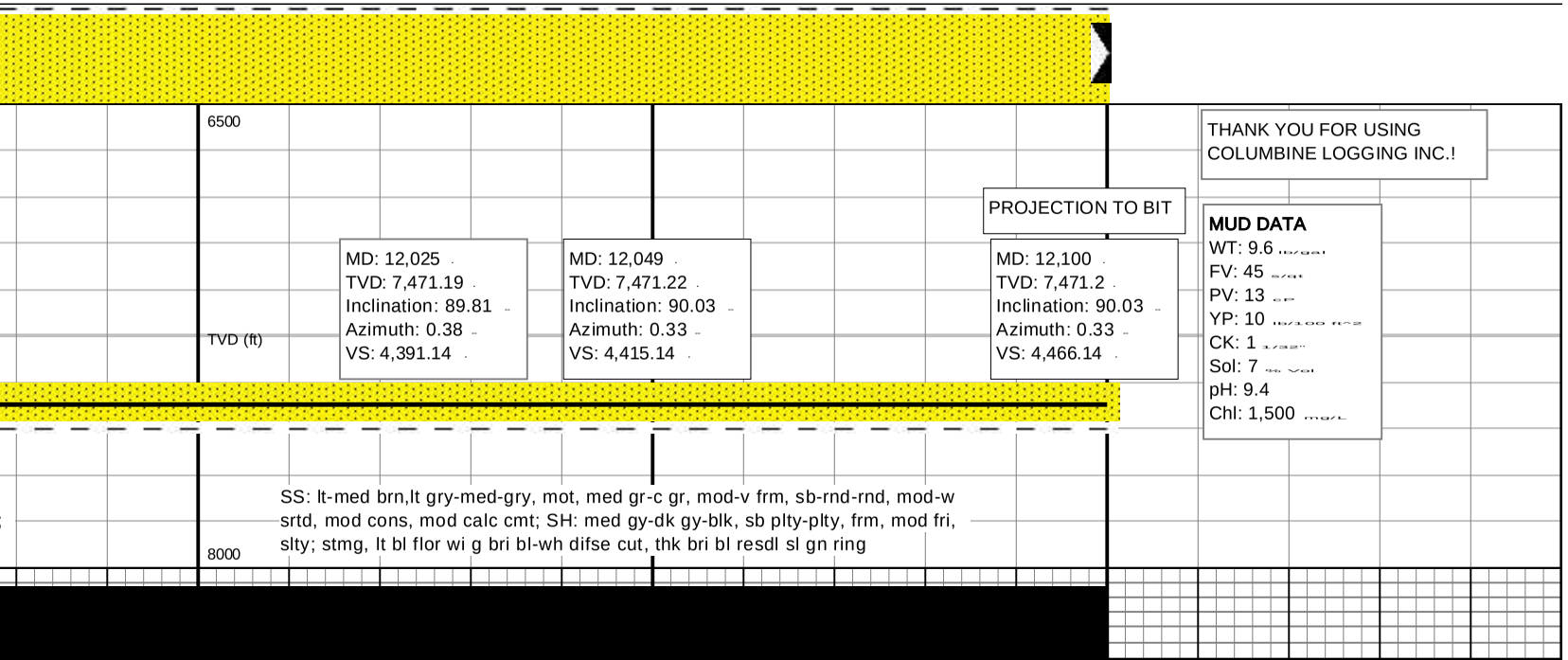

4
250
ROP (min/ft)
GAMMA (api)
115
93
108
100
MISSING GAMMA DATA - NOT PROVIDED BY BAKER HUGHES
110
96
122
0
0
6500
650000
5481u
5480u
4089u
5488u
GAS (units)
C1-C4 (PPM)
TG: 5,429.24
C1: 87.7
C2: 5.1
C3: 4.8
C4: 2.5
0
0
1,760
11,770
11,780
11,790
11,800
11,810
11,820
11,830
11,840
11,850
11,860
11,870
11,880
11,890
11,900
11,910
11,920
11,930
11,940
11,950
11,960
11,970
6500
MD: 11,770
TVD: 7,472.68
Inclination: 89.38
Azimuth: 359.78
VS: 4,136.17
MD: 11,855
TVD: 7,472.67
Inclination: 90.64
Azimuth: 0.82
VS: 4,221.17
MD: 11,940
TVD: 7,471.62
Inclination: 90.77
Azimuth: 0.63
VS: 4,306.15
TVD (ft)
v frm, sb-rnd-rnd,
lty-plty, frm, slty;
sl gn ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod calc cmt, tr sh; stmg, lt bl flor wi g bri bl-wh difse cut, thk bri bl resdl sl gn ring
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd,mod calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, slty stmg, lt bl flor wi g bri bl-wh difse cut, thk bri bl resdl sl gn ring
8000



Bit #: 3
Type: VS513D
Size: 6.12
Depth In: 8,764
Depth Out: 12,100
Total Drilled: 3,336
Hours: 9.7
Avg Ft/Hr: 343.91
Jets: 5X16
S/N: 4006849

WELL REACHED TD @ 12100' MD
ON 3/10/2014 @ 11:37 PM

TG: 5,500.16
C1: 82.2
C2: 11.6
C3: 4
C4: 2.2



THANK YOU FOR USING
COLUMBINE LOGGING INC.!

PROJECTION TO BIT

MD: 12,025
TVD: 7,471.19
Inclination: 89.81
Azimuth: 0.38
VS: 4,391.14

MD: 12,049
TVD: 7,471.22
Inclination: 90.03
Azimuth: 0.33
VS: 4,415.14

MD: 12,100
TVD: 7,471.2
Inclination: 90.03
Azimuth: 0.33
VS: 4,466.14

MUD DATA
WT: 9.6
FV: 45
PV: 13
YP: 10
CK: 1
Sol: 7
pH: 9.4
Chl: 1,500

SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srtd, mod cons, mod calc cmt; SH: med gy-dk gy-blk, sb plty-plty, frm, mod fri, slty; stmg, lt bl flor wi g bri bl-wh difse cut, thk bri bl resdl sl gn ring