LOG created using LPLOT VH Version 3.0, April 24, 2013, Copyright (C) 1999-2009 Pason Systems Corp.

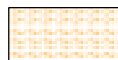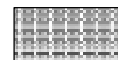|	
OPERATOR:	**NOBLE ENERGY INC**
WELL:	**SHABLE LB32-68HN**
LOCATION:	**SEC33 T9N R60W**
COUNTY:	**WELD**
STATE:	**COLORADO**
SPOT:	**288' FNL, 250' FWL**
ELEVATION:	**4940' GL, 4956' KB**
FIELD:	**WILDCAT**
SPUD DATE:	**4/15/2013**
TD DATE:	**4/23/2013**
DATES LOGGED:	**4/16/2013 - 4/23/2013**
DEPTHS LOGGED:	**1000' - 10687'**
GEOLOGISTS:	**CHRIS WILLATT, TED STOCKWELL**
DRILLING FLUID:	**LSND**
DRILLING RIG:	**PRECISION 828**
API:	**05-123-36800**
LOG TYPE:	**VERTICAL**
SCALE:	**1:240 (5 inches per 100 feet)**
REMARKS:	**WELLSITE GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING INC.**
	LOG CONTINUES ON FILE: Shable LB32-68HN Horiz.lplot

LITHOLOGIES

Sandstone	Shaly Sandstone	Shaly Siltstone	Silty Shale

ENGINEERING SYMBOLS

Connection	Connection Gas	Midnight Depth	Arrow

GAS
| 0 | UNITS | 200 |

C1
| 0 | PPM | 20000 |

C2
| 0 | PPM | 20000 |

C3
| 0 | PPM | 20000 |

C4
| 0 | PPM | 20000 |

ROP			ROTATE/SLIDE	GAMMA		INTERPRETIVE LITHOLOGY	PICTURE	DEPTH (FEET)	CUTTINGS LITHOLOGY				LITHOLOGY DESCRIPTION
0	MIN/FT	2		0 AP 200				980		0	UNITS	200	

BIT #2
SMITH
SDi611, 8.75"
SER# JG5868
IN @ MD 638'

| 0 | MIN/FT | 2 |
| 0 AP 200 |

COLUMBINE LOGGING, INC. ON LOCATION 04/15/2013 MANNED 2-PERSON LOGGING WITH BLOODHOUND GAS CHROMATOGRAPH UNIT #0331

BEGAN DRILLING OUT OF SHOE @ 02:50 HRS 4/16/2013

| 0 | UNITS | 200 |
| 0 | | 20000 |

BEGIN 100' SAMPLES 100' DESCRIPTIONS

WOB 15
RPM 25
PP 1420
SPM 140

MD	1014'
INC	0.7°
AZI	84.7°
TVD	1014.0'

38u
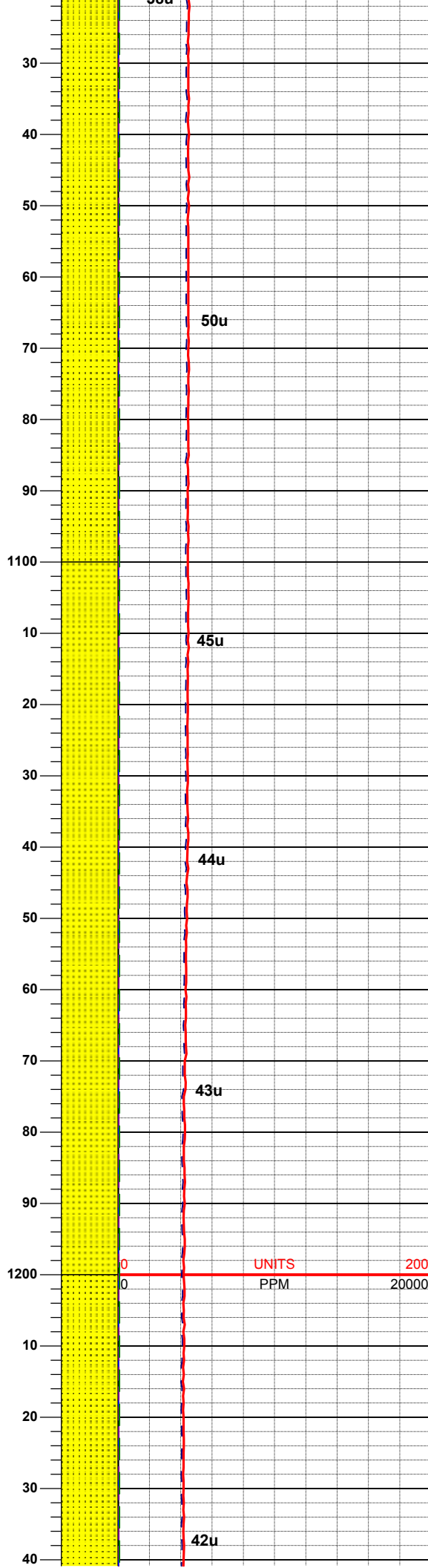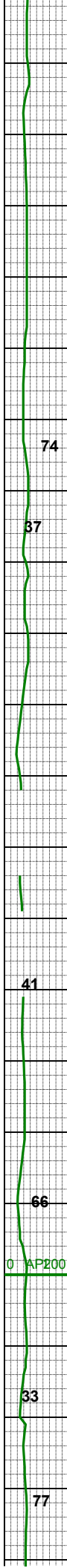
SS:lt gy-clr, firm-fri, m-fgr, sbrndd-
sbang, mod srt, p consol, grn support
- arg mtx, non calc, tr glau, tr sh

50u

74

37

45u

MD   1122'
INC   1.0°
AZI   67.2°
TVD   1122.0'

44u
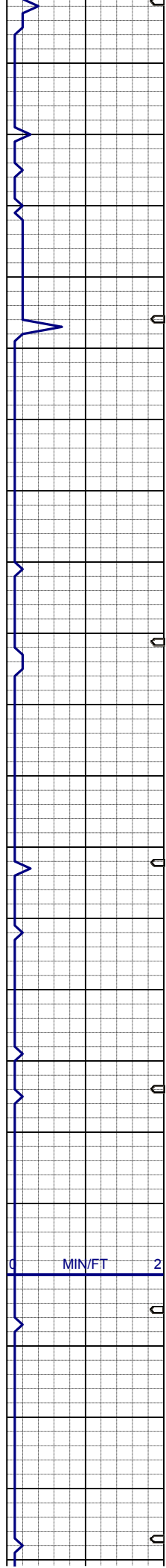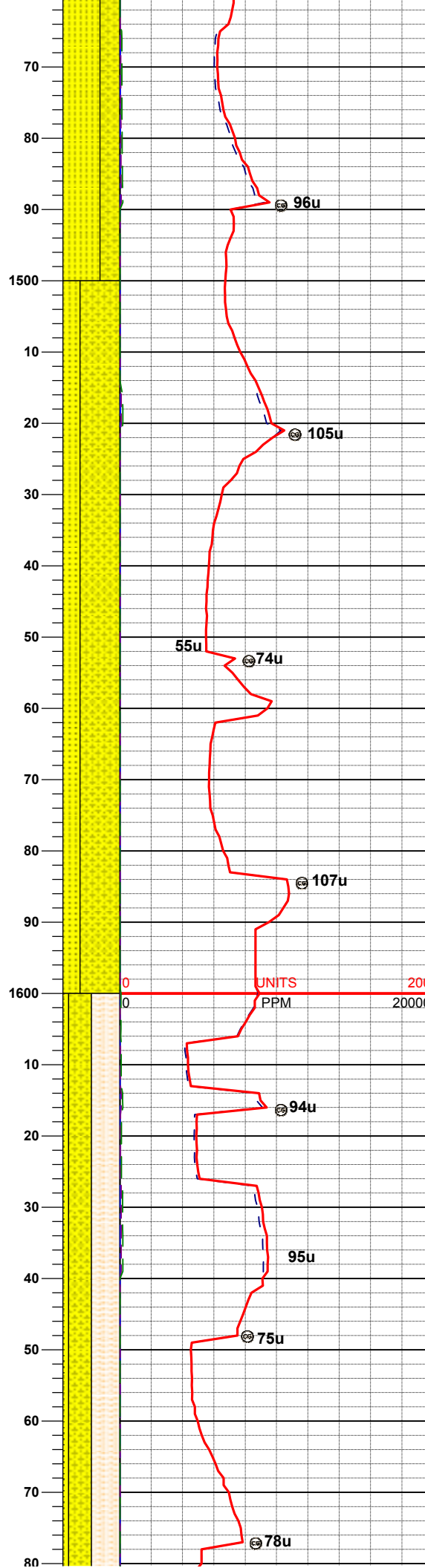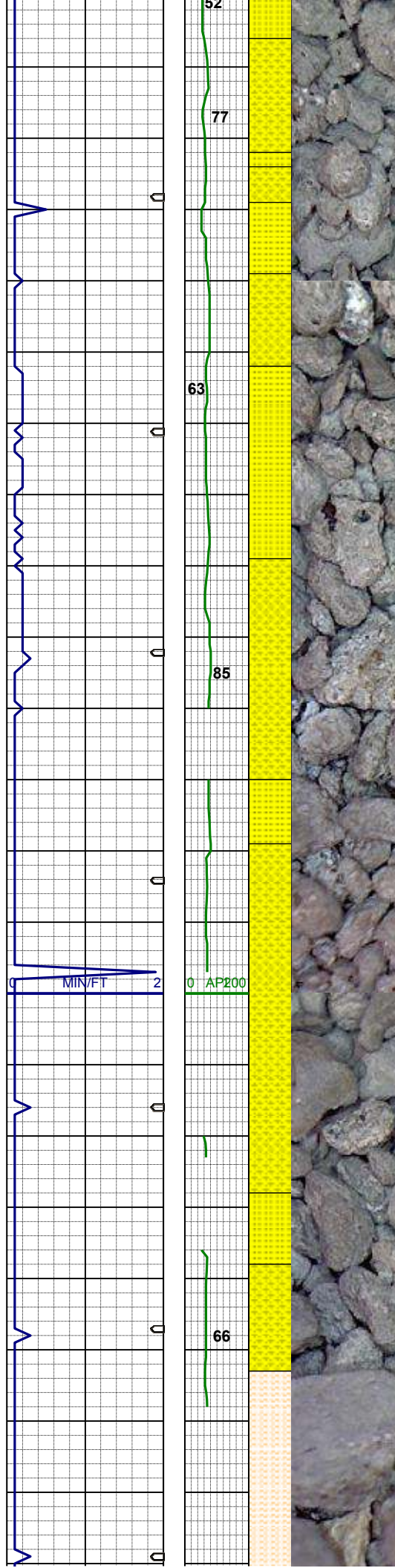
SS:lt gy-clr, firm-fri, m-fgr, sbrndd-
sbang, mod srt, p consol, grn support
- arg mtx, non calc, tr glau, tr sh

41

43u

66

| 0 | MIN/FT | 2 | 0 | AP200 | 1200 | 0 | UNITS | 200 |
| | | | | | | 0 | PPM | 20000 |

MD   1216'
INC   0.8°
AZI   25.3°
TVD   1216.0'

33

77

42u

SS:lt gy-clr, firm-fri, m-fgr, sbrndd-sbang, mod srt, p consol, grn support - arg mtx, non calc, tr biot, tr sh

83u

60u

59

77

96u

SS:lt gy-clr, firm-fri, m-vfgr, sbrndd-sbang, mod srt, p consol, grn support - arg mtx, non calc, tr biot, tr sh

93u

91u

MD   1311'
INC   0.8°
AZI   46.1°
TVD   1311.0'

0   MIN/FT   2   0   AP200

0   UNITS   200
0   PPM   20000

WT 8.6 / VIS 33

MD   1406'
INC   1.1°
AZI   226.4°
TVD   1496.0'

60u

100u

117u

SS:lt gy-clr, firm-fri, m-vfgr, sbrndd-sbang, mod srt, p consol, grn support - arg mtx, non calc, tr biot, tr sh
SHYSS: vlt-mgy, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, p cmt, sl calc

Track scales:
0 MIN/FT 2 | 0 API 200 | 0 UNITS 200 / 0 PPM 20000

Green curve values (API): 52, 77, 63, 85, 52, 66

Gas show readings: 96u, 105u, 55u, 74u, 107u, 94u, 95u, 75u, 78u
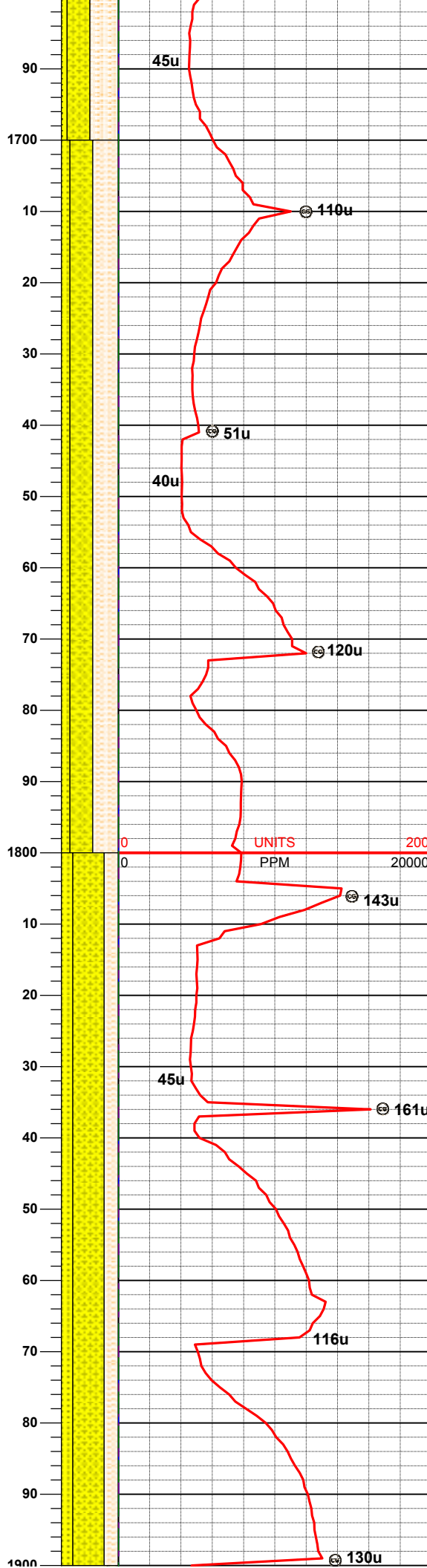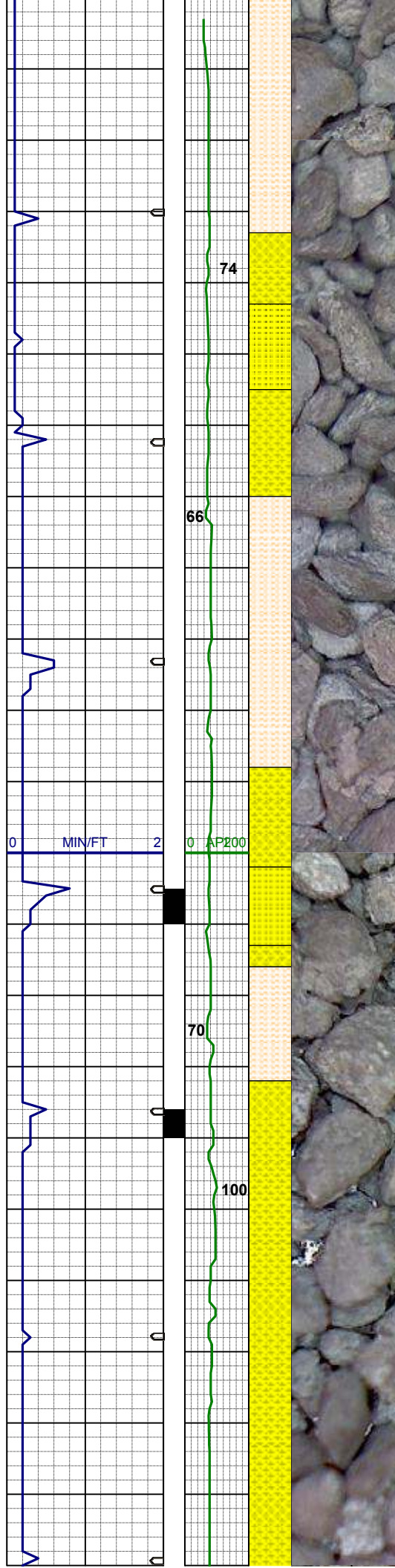
MD 1500'
INC 1.1°
AZI 256.8°
TVD 1500.0'

SS:lt gy-clr, firm-fri, m-vfgr, sbrndd-sbang, mod srt, p consol, grn support - arg mtx, non calc, tr biot, tr sh
SHYSS: vlt-mgy, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, p cmt, sl calc

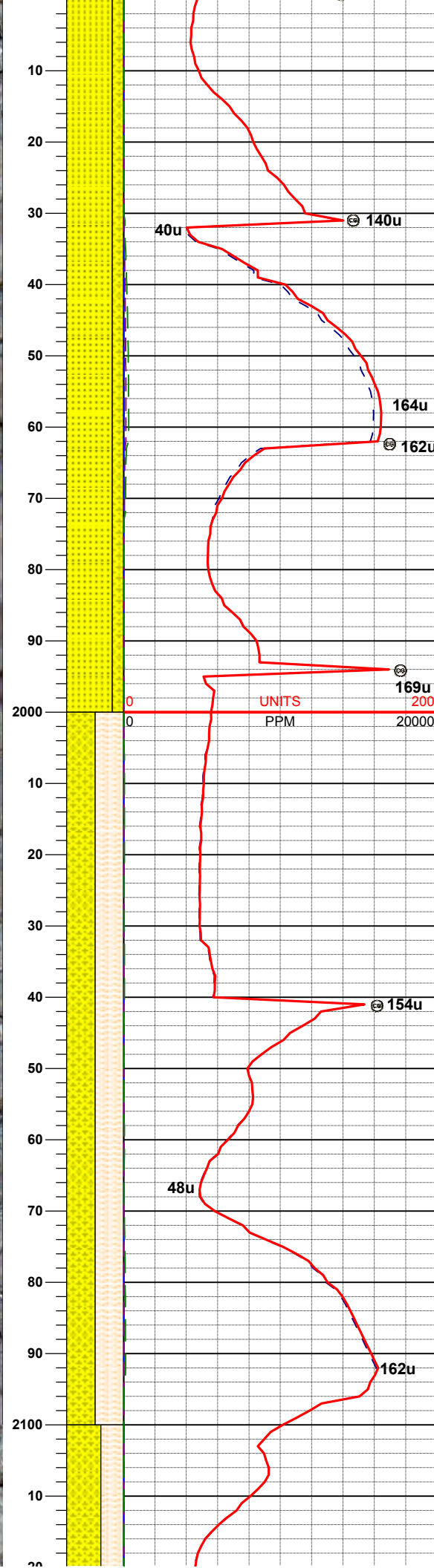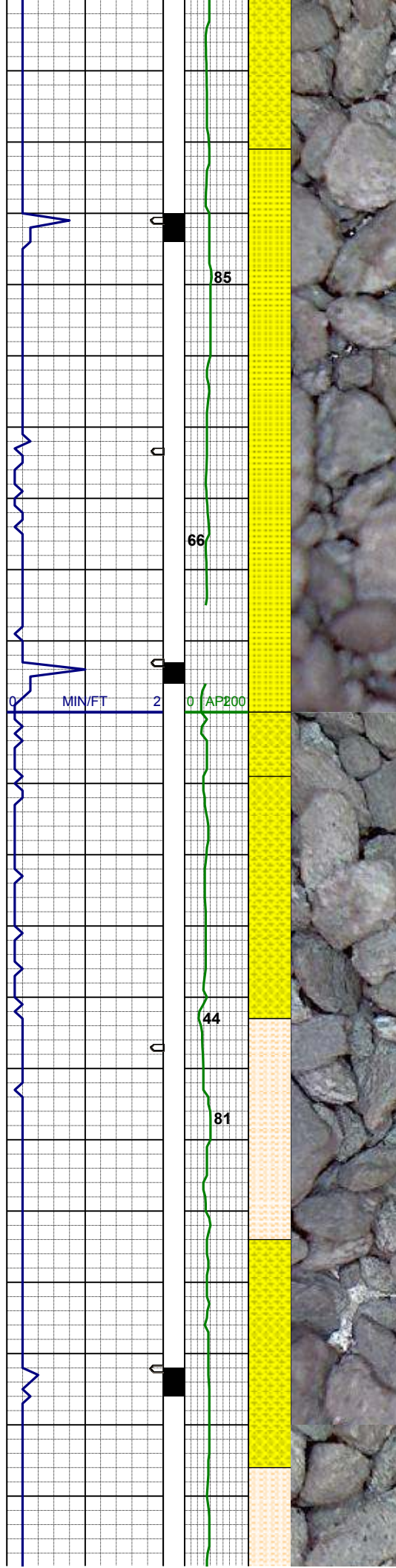**MD 1595'**
INC 1.0°
AZI 278.3°
TVD 1594.9'

SS:lt gy-clr, firm-fri, m-vfgr, sbrndd-sbang, mod srt, p consol, grn support - arg mtx, non calc, tr biot, tr sh
SHYSS: vlt-mgy, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, p cmt, sl calc
SHYSLTST: lt-modgy, sbblky-sbplty, sft -firm, slty, arg- sl sil mtx, mod calc

MIN/FT		API			UNITS	
0	2	0	200	0	PPM	200
				0		20000

Depth track (left): 90, 1700, 10, 20, 30, 40, 50, 60, 70, 80, 90, 1800, 10, 20, 30, 40, 50, 60, 70, 80, 90, 1900

Gamma (green) values: 74, 66, 70, 100

Gas (red) values: 45u, 110u, 51u, 40u, 120u, 143u, 45u, 161u, 116u, 130u

MD 1690'
INC 1.0°
AZI 277.6°
TVD 1689.9'

WT 8.6 / VIS 34

SS:lt gy-clr, firm-fri, m-vfgr, sbrndd-
sbang, mod srt, p consol, grn support
- arg mtx, non calc, tr biot, tr sh
SHYSS: vlt-mgy, vf- fgr, sbplty, mod
srt, vsft- sft, arg mtx, p cmt, sl calc
SHYSLTST: lt-modgy, sbblky-sbplty,
sft -firm, slty, arg- sl sil mtx, mod calc
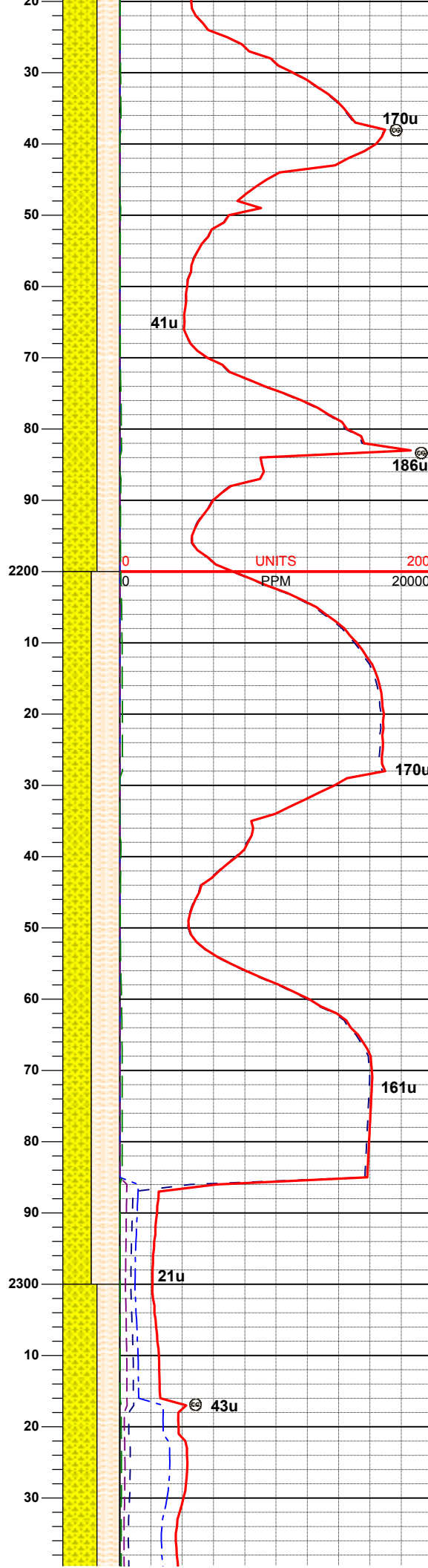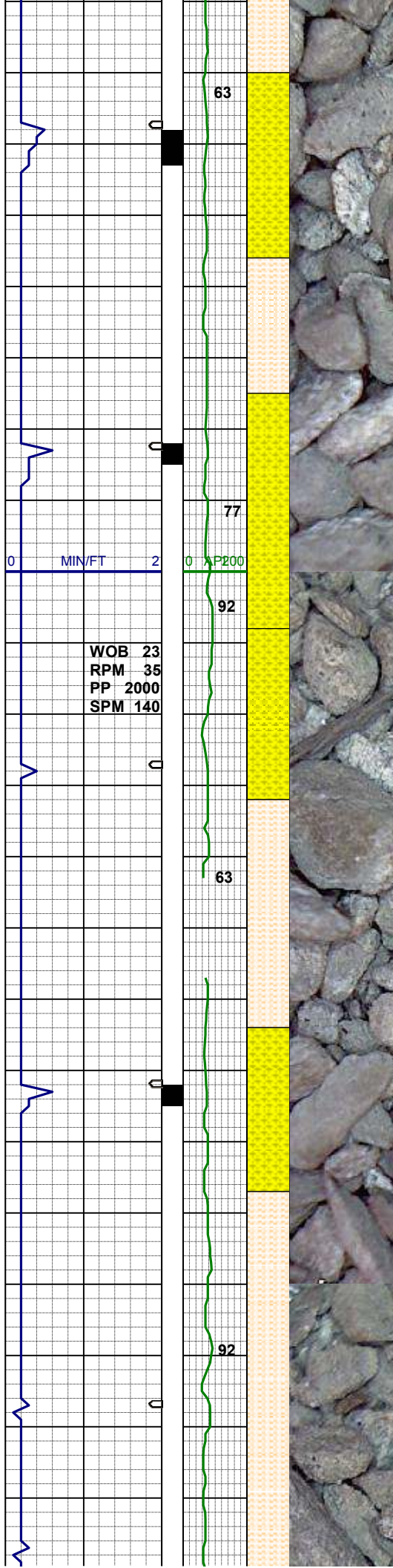
MD 1784'
INC 1.5°
AZI 223.4°
TVD 1783.9'

SS:lt gy-clr, firm-fri, m-vfgr, sbrndd-
sbang, mod srt, p consol, grn support
- arg mtx, non calc, tr biot, tr sh
SHYSS: vlt-mgy, vf- fgr, sbplty, mod
srt, vsft- sft, arg mtx, p cmt, sl calc
SHYSLTST: lt-modgy, sbblky-sbplty,
sft -firm, slty, arg- sl sil mtx, mod calc

MD 1879'
INC 4.6°
AZI 227.3°
TVD 1878.8'

Depth scale (left track, top): 10, 20, 30, 40, 50, 60, 70, 80, 90, 2000

85

66

0 MIN/FT 2   0 APT200

40u   140u

164u

162u

169u

0   UNITS   200
0   PPM   20000

SS: lt gy-clr, firm-fri, m-vfgr, sbrndd-sbang, mod srt, p consol, grn support - arg mtx, non calc, tr biot, tr sh
SHYSS: vlt-mgy, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, p cmt, sl calc, grdg - shysltst

MD   1995'
INC   6.1°
AZI   210.3°
TVD   1994.3'

Depth scale (lower section): 10, 20, 30, 40, 50, 60, 70, 80, 90, 2100, 10, 20
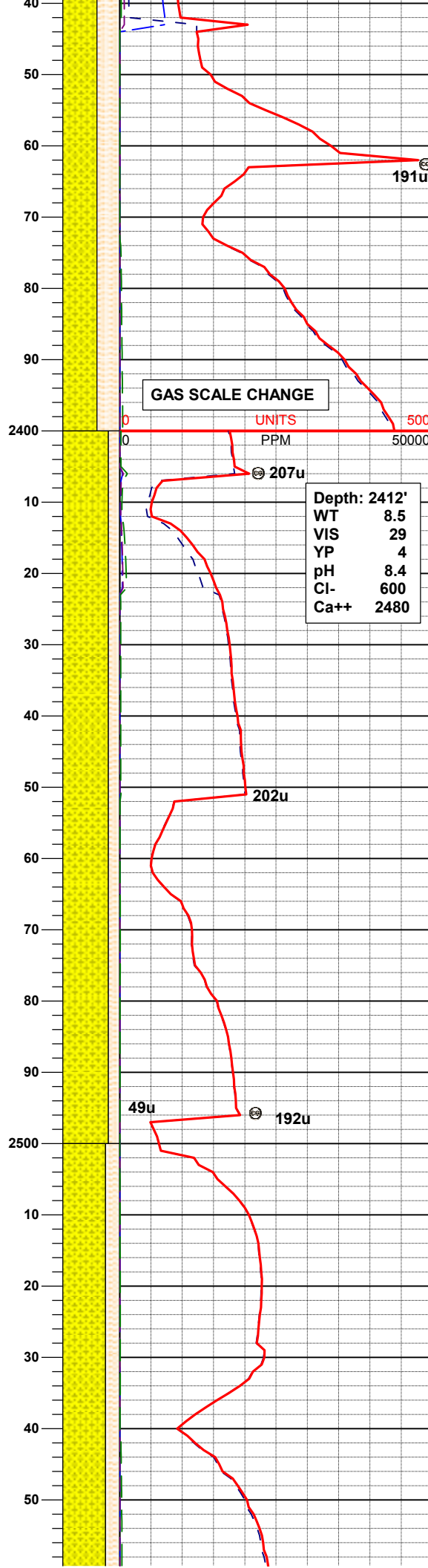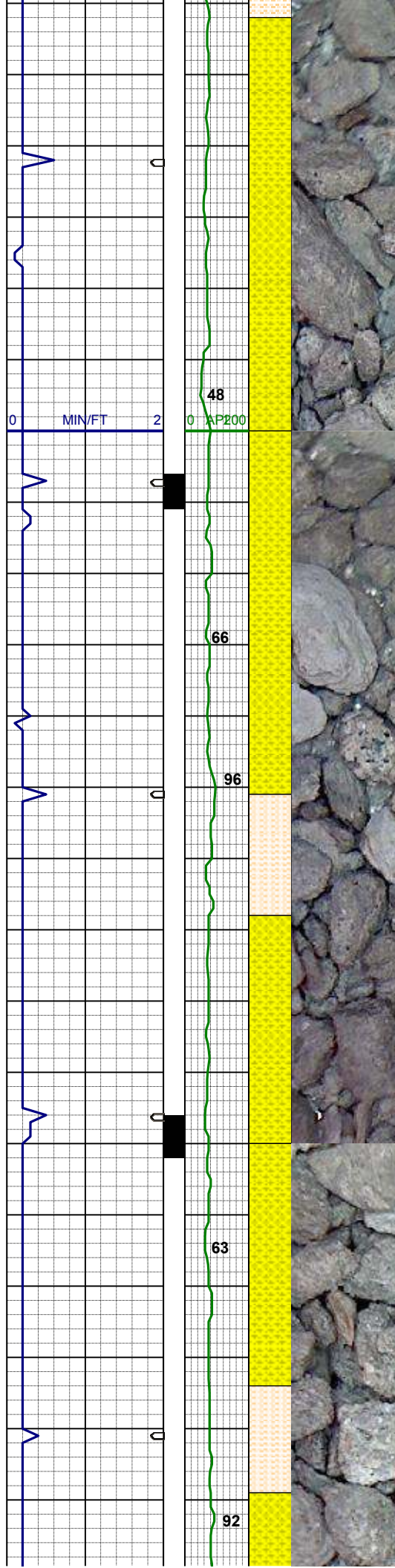
44

81

154u

48u

162u

SHYSS: vlt-mgy, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, tr biot, sl calc, grdg - SHYSLTST: lt-modgy, sbblky-sbplty, sft -firm, slty, arg- sl sil mtx, mod calc

MD   2085'
INC   6.6°
AZI   206.4°
TVD   2083.7'

Track 1 (left)

0   MIN/FT   2

WOB 23
RPM 35
PP 2000
SPM 140

Track 2 (green)

0   XP200

63

77

92

63

92

Depth / Units track (red)

0   UNITS   200

0   PPM   20000

170u

41u

186u

170u

161u

21u

43u

Depth values

20
30
40
50
60
70
80
90
2200
10
20
30
40
50
60
70
80
90
2300
10
20
30

Descriptions (right)

SHYSS: vlt-mgy, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, tr biot, sl calc, grdg - SHYSLTST: lt-modgy, sbblky- sbplty, sft -firm, slty, arg- sl sil mtx, mod calc

MD   2175'
INC   7.8°
AZI   208.8°
TVD   2173.0'

SHYSS: vlt-mgy, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, tr biot, tr glau, sl calc, grdg - SHYSLTST: lt-modgy, sbblky-sbplty, sft -firm, slty, arg- sl sil mtx, mod calc
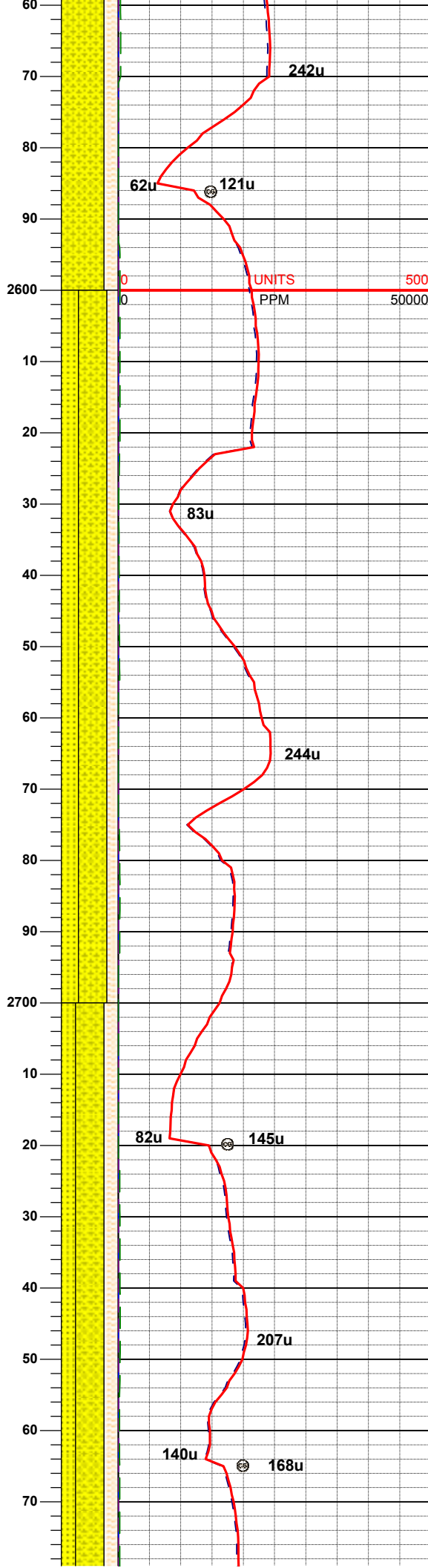
MD   2265'
INC   8.3°
AZI   208.3°
TVD   2262.1'

SHYSS: vlt-mgy, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, tr biot, tr glau, sl calc, grdg - SHYSLTST: lt-modgy, sbblky-sbplty, sft -firm, slty, arg- sl sil mtx, mod calc

MD 2355'
INC 8.4°
AZI 208.8°
TVD 2351.1'

191u

GAS SCALE CHANGE

0   MIN/FT   2
0   AP200
48

2400

207u

Depth: 2412'
WT   8.5
VIS   29
YP   4
pH   8.4
Cl-   600
Ca++   2480
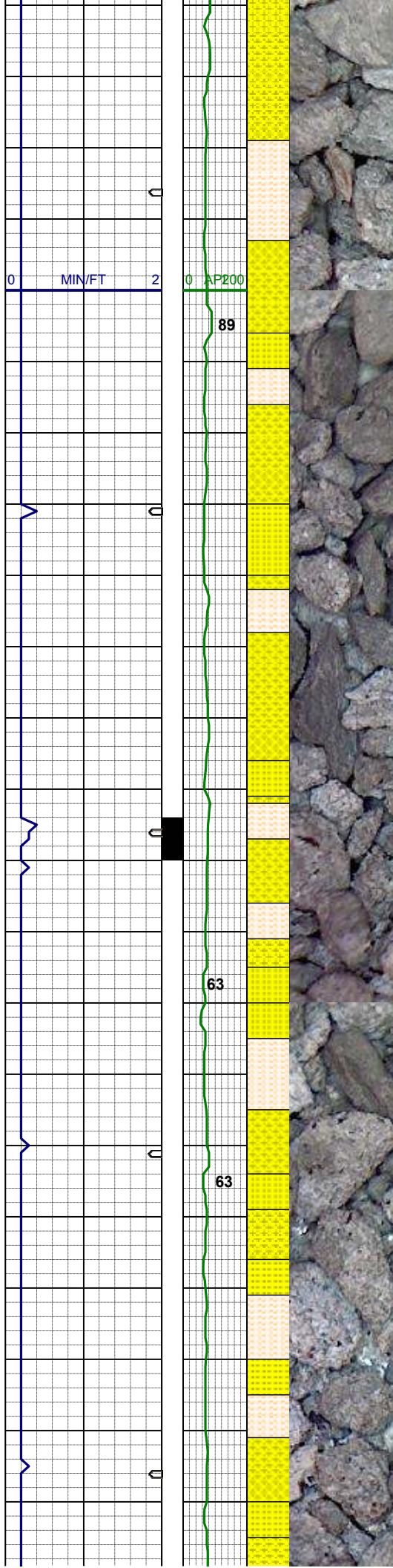
66

96

202u

MD 2444'
INC 8.0°
AZI 214.1°
TVD 2439.2'

SHYSS: vlt-mgy, occ clr, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, tr biot, tr glau, sl calc, grdg - SHYSLTST: lt-modgy, sbblky-sbplty, sft -firm, slty, arg mtx, mod calc

49u   192u

2500

63

MD 2534'
INC 8.8°
AZI 212.5°
TVD 2528.3'

SHYSS: vlt-mgy, occ clr, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, tr biot, tr glau, sl calc, grdg - SHYSLTST: lt-modgy, sbblky-sbplty, sft -firm, slty, arg mtx, mod calc
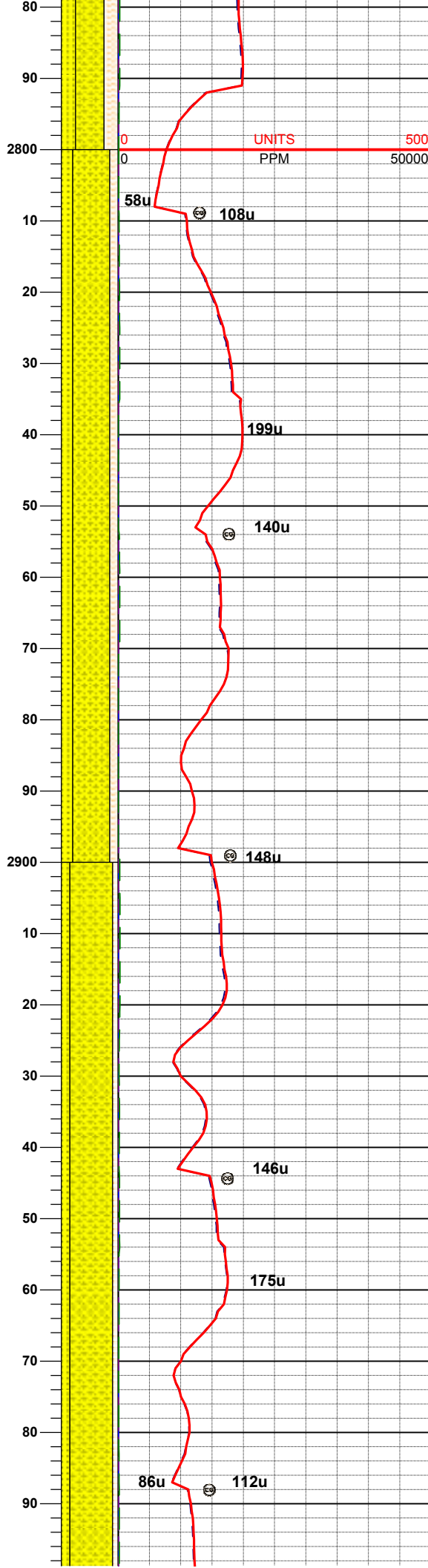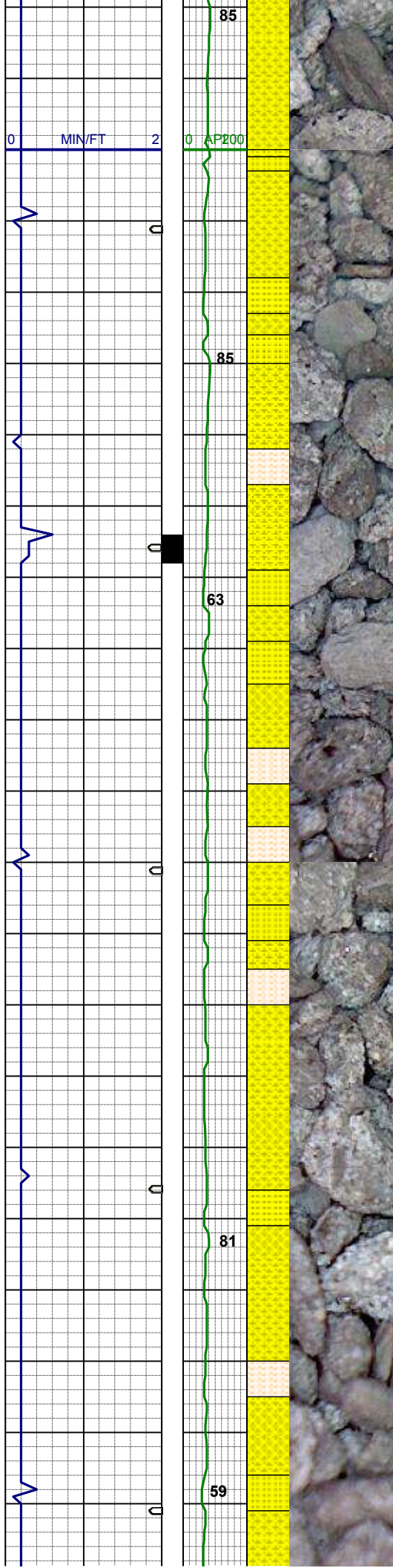
92

UNITS   500
PPM   50000
0

MIN/FT		API			PPM / UNITS		
0	2	0	200		0 ... 500		

89

63

63

Depth markings: 60, 70, 80, 90, 2600, 10, 20, 30, 40, 50, 60, 70, 80, 90, 2700, 10, 20, 30, 40, 50, 60, 70

Gas curve annotations:
242u
62u 121u
83u
244u
82u 145u
207u
140u 168u

WT 8.5+ / VIS 29

MD	2624'
INC	8.7°
AZI	208.1°
TVD	2617.2'

SHYSS: vlt-mgy, occ clr, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, tr biot, tr glau, sl calc
SS:lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, mod consol, grn support - arg mtx, non calc, tr biot
SHYSLTST: lt-modgy, sbblky-sbplty, sft -firm, slty, arg mtx, mod calc

WT 8.5+ / VIS 29

MD	2714'
INC	8.5°
AZI	210.3°
TVD	2706.2'

SHYSS: vlt-mgy, occ clr, vf- fgr, sbplty, mod srt, vsft- sft, arg mtx, tr biot, tr glau, sl calc
SS:lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, mod consol, grn support - arg mtx, non calc, tr mica, tr glauc
SHYSLTST: lt-modgy, sbblky-sbplty, occ plty, sft -firm, slty, arg mtx, mod calc

This is a composite well log (mud log) showing depth track, lithology, gas/chromatograph data, and descriptions.

Track headers:

0	MIN/FT	2
0	AP200	

Gas track:
0	UNITS	500
0	PPM	50000

Depth column values (left to right gamma/ROP curve numbers):
85, 85, 63, 81, 59

Depth scale: 80, 90, 2800, 10, 20, 30, 40, 50, 60, 70, 80, 90, 2900, 10, 20, 30, 40, 50, 60, 70, 80, 90

Gas readings (annotated):
- 58u
- 108u
- 199u
- 140u
- 148u
- 146u
- 175u
- 86u 112u

Right column — survey data:

MD 2804'
INC 8.7°
AZI 208.5°
TVD 2795.2'

SHYSS: vlt-mgy, occ clr, vf- fgr, sbplty, mod srt, sft-firm, arg mtx, sl mica, tr glau, sl calc
SS: lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, mod consol, sl arg mtx, non calc, tr mica, tr glauc
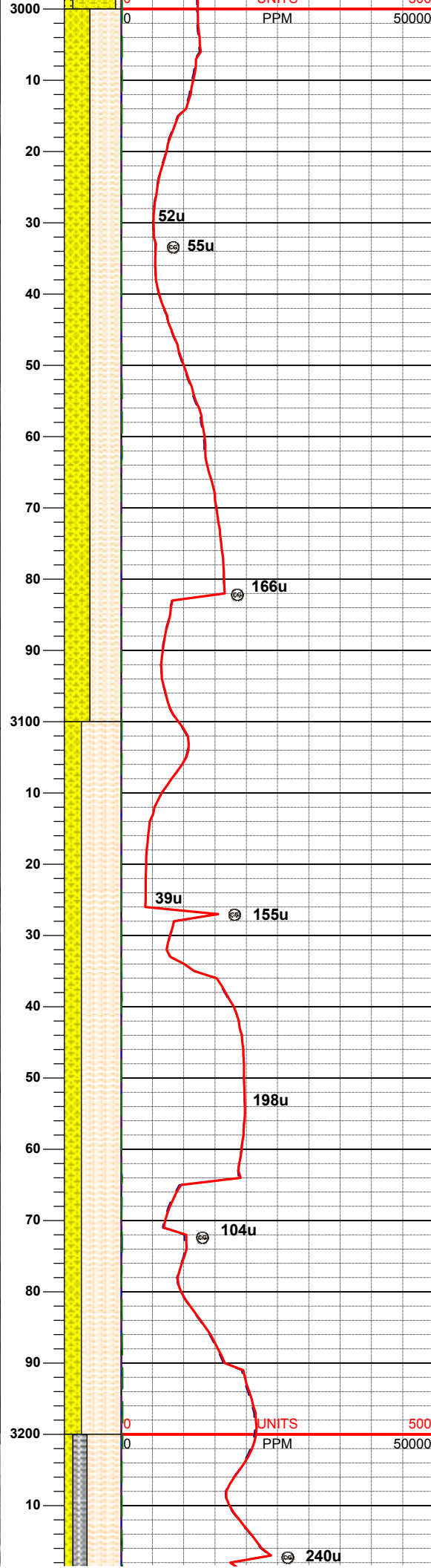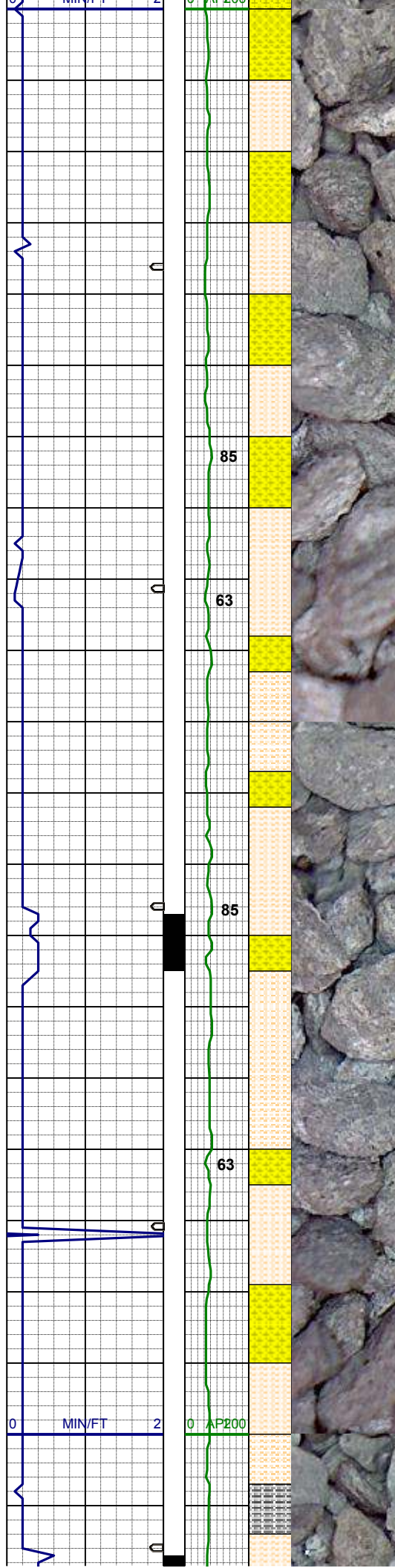SHYSLTST: lt-modgy, sbblky-sbplty, occ plty, sft -firm, slty, arg mtx, mod calc

MD 2894'
INC 8.7°
AZI 212.2°
TVD 2884.2'

WT 8.50 / VIS 29

SHYSS: vlt-mgy, occ clr, vf- fgr, sbplty, mod srt, sft-firm, arg mtx, sl mica, tr glau, sl calc
SS: lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, mod consol, sl arg mtx, non calc, tr mica, tr glauc
SHYSLTST: lt-modgy, sbblky-sbplty, occ plty, sft -firm, slty, arg mtx, mod calc

MD 2984'
INC 9.1°
AZI 209.5°
TVD 2973.1'

Track depth scale: 3000 – 3200 (feet)

Left track (blue curve): MIN/FT, scale 0 to 2

Center-left track (green curve): AP200, scale 0 to 200

Green curve annotations (top to bottom):
- 85
- 63
- 85
- 63

Gas track (red curve): UNITS, scale 0 to 500; PPM, scale 0 to 50000

Red curve / gas peak annotations:
- 52u
- 55u
- 166u
- 39u
- 155u
- 198u
- 104u
- 240u

Lithology descriptions (right margin):

SHYSLTST: lt-modgy, sbblky-sbplty, occ plty, sft -firm, slty, arg mtx, mod calc
SHYSS: vlt-mgy, occ clr, vf-fgr, sbblky -sbplty, mod srt, sft-firm, arg mtx, sl mica, tr glau, sl calc,sdy ip, tr ss

MD	3073'
INC	9.2°
AZI	208.3°
TVD	3061.0'

SHYSLTST: lt-modgy, sbblky-sbplty, occ plty, sft -firm, slty, arg mtx, mod calc
SHYSS: vlt-mgy, occ clr, vf-fgr, sbblky -sbplty, mod srt, sft-firm, arg mtx, sl mica, tr glau, sl calc,sdy ip, tr ss

MD	3163'
INC	9.4°
AZI	211.3°
TVD	3149.8'
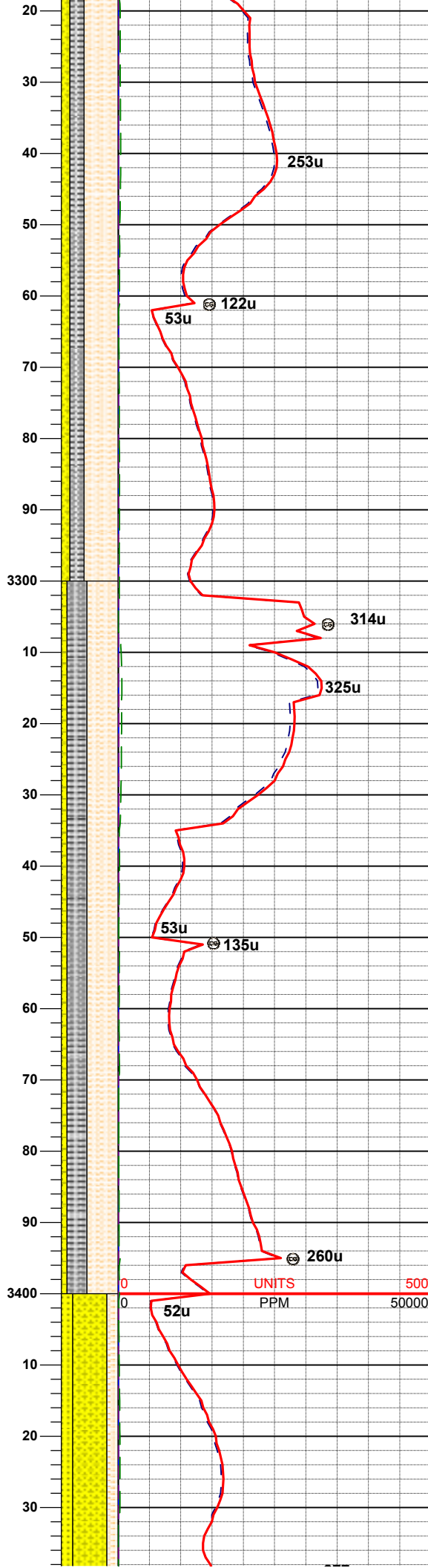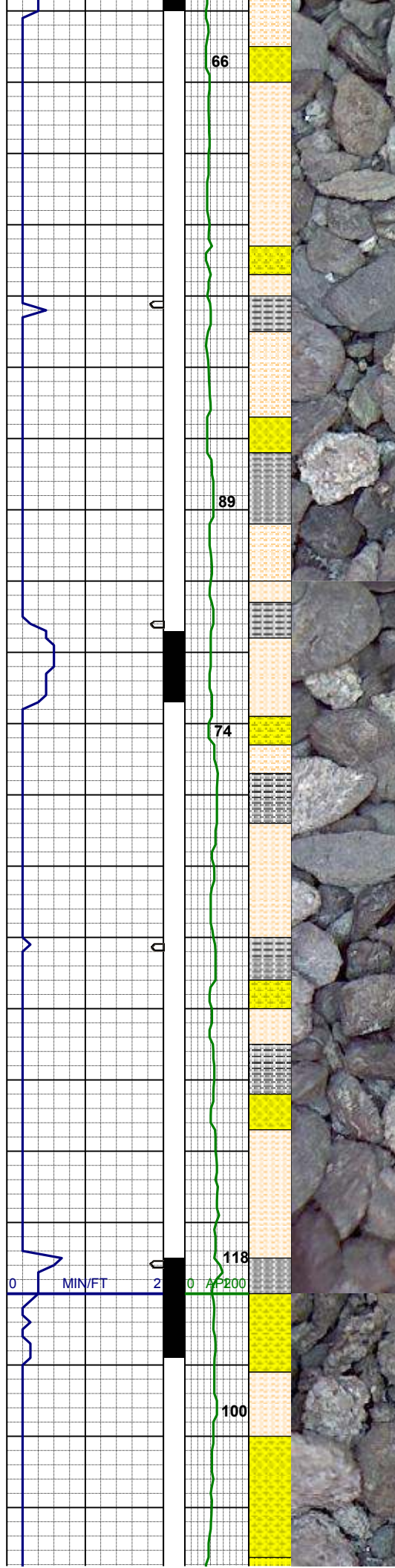
SHYSLTST: lt-modgy, sbblky-sbplty,
occ plty, sft -firm, slty, arg mtx, mod
calc. tr pyr
SLTYSH: mod-dkgy, sbblky-sbplty, tr
plty, sft-firm, sl calc
SHYSS: vlt-mgy, occ clr, vf-fgr, sbblky
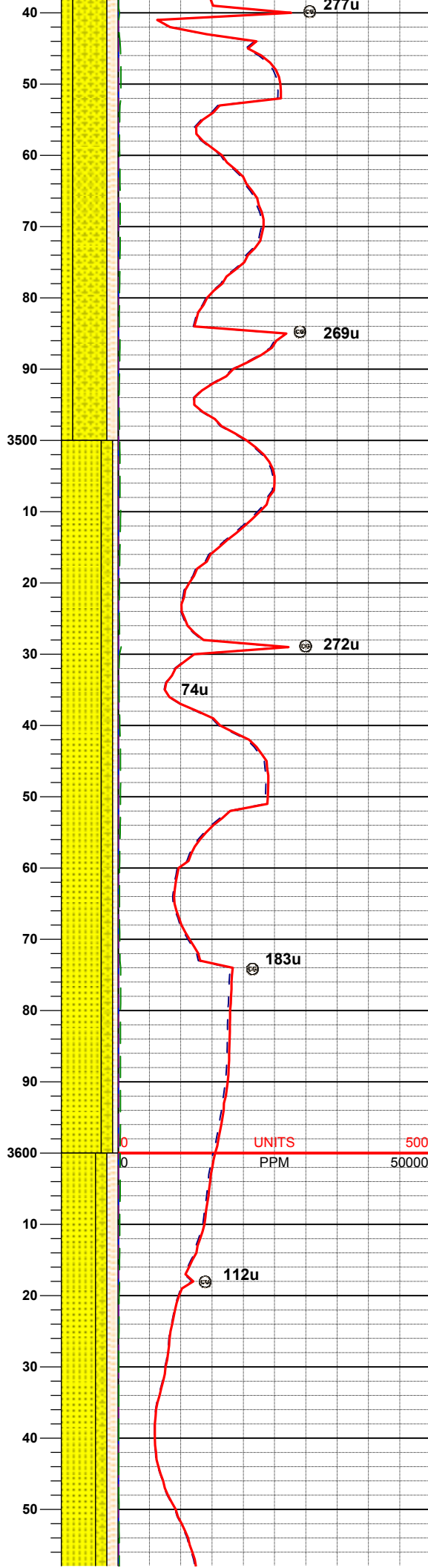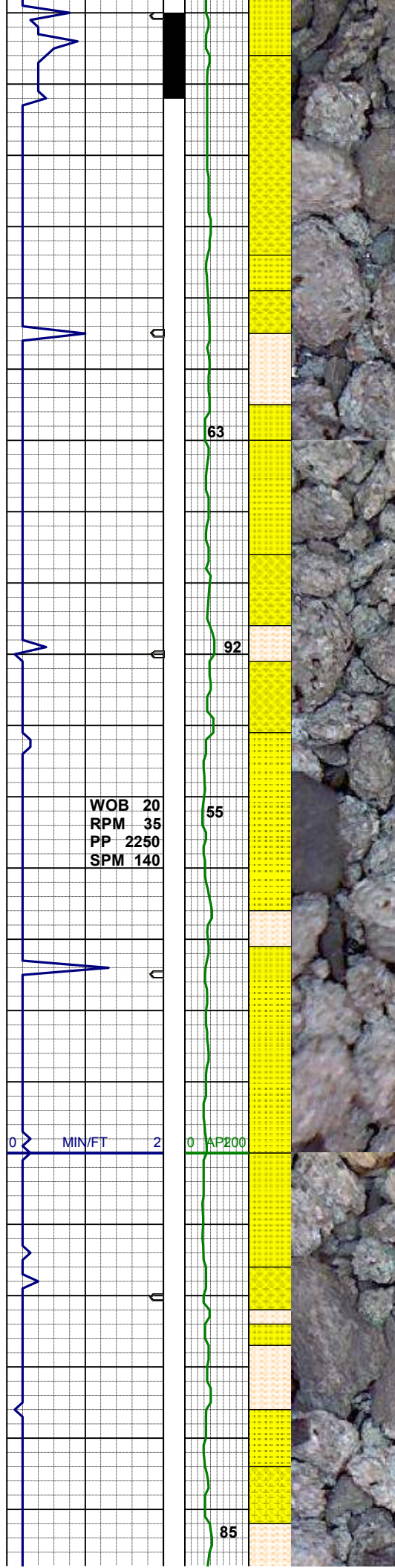-sbplty, mod srt, sft-firm, arg mtx, sl
mica, tr glau, sl calc,sdy ip, tr ss

MD 3253'
INC 8.9°
AZI 207.8°
TVD 3286.6'

MD 3343'
INC 7.5°
AZI 210.3°
TVD 3327.7'

SHYSLTST: lt-modgy, sbblky-sbplty,
occ plty, sft -firm, slty, arg mtx, mod
calc. tr pyr
SLTYSH: mod-dkgy, sbblky-sbplty, tr
plty, sft-firm, sl calc
SHYSS: vlt-mgy, occ clr, vf-fgr, sbblky
-sbplty, mod srt, sft-firm, arg mtx, sl
mica, tr glau, sl calc,sdy ip, tr ss

MD 3433'
INC 6.6°
AZI 212.5°
TVD 3417.0'

253u
122u
53u
314u
325u
53u
135u
260u
52u

66
89
74
118
100

20
30
40
50
60
70
80
90
3300
10
20
30
40
50
60
70
80
90
3400
10
20
30

0   MIN/FT   2   0   API   200
0   UNITS   500
0   PPM   50000

Depth track (left, center): 40, 50, 60, 70, 80, 90, 3500, 10, 20, 30, 40, 50, 60, 70, 80, 90, 3600, 10, 20, 30, 40, 50

Track labels:
- MIN/FT: 0 ... 2
- AP 200 / AP100: 0 ... 200
- UNITS: 0 ... 500
- PPM: 0 ... 50000

Gas peak annotations:
- 277u
- 269u
- 272u
- 74u
- 183u
- 112u
- 63
- 92
- 55
- 85

Drilling parameters:
```
WOB   20
RPM   35
PP    2250
SPM   140
```

Survey data (right):
```
MD     3523'
INC    7.3°
AZI    214.1°
TVD    3506.4'
```

Lithology descriptions (top right):

SHYSS: vlt-mgy, occ clr, vf-fgr, sbblky -sbplty, mod srt, sft-firm, arg mtx, sl mica, tr glau, sl calc

SHYSLTST: lt-modgy, sbblky-sbplty, occ plty, sft -firm, slty, arg mtx, mod calc

SS:lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, mod consol, sl arg mtx, non calc, tr mica, tr glauc

Lithology descriptions (middle right):

SS:lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, tr sl arg mtx, non calc, sl mica, tr glauc, tr pyr

SHYSS: lt-mgy, occ clr, vf-fgr, sbblky-sbplty, mod srt, sft-firm, arg mtx, sl mica, sl calc, tr glau

SHYSLTST: mod-dkgy, sbblky-sbplty, sft -firm, slty, arg mtx, sl calc

Survey data (right):
```
MD     3613'
INC    7.5°
AZI    214.3°
TVD    3595.6'
```

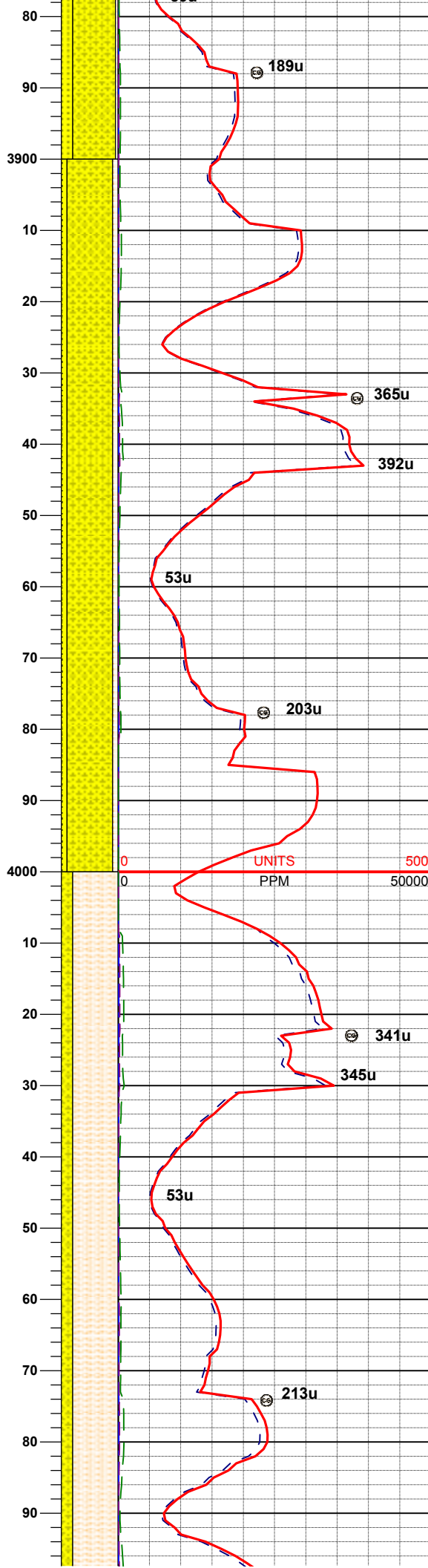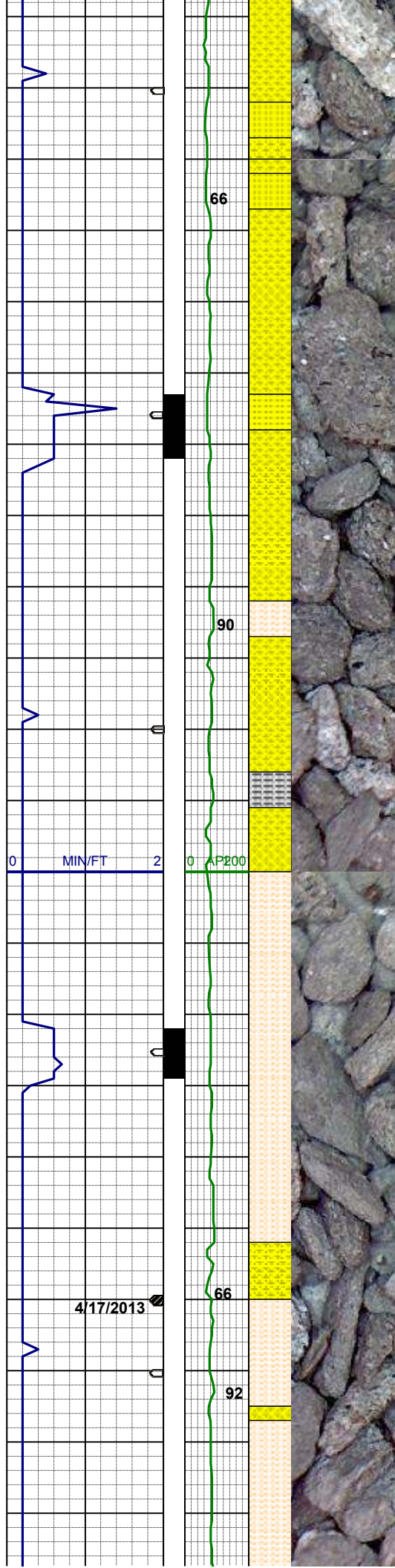**Lithology descriptions (bottom right):**

SS:lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, tr sl arg mtx, non calc, sl mica, tr glauc, tr pyr

SHYSS: lt-mgy, occ clr, vf-fgr, sbblky-sbplty, mod srt, sft-firm, arg mtx, sl mica, sl calc, tr glauc

SHYSLTST: mod-dkgy, sbblky-sbplty

SHYSLTST: mod-dkgy, sbblky-sbplty, tr plty, sft -firm, slty, arg mtx, sl calc, grdg-sltysh

124u

50u

178u
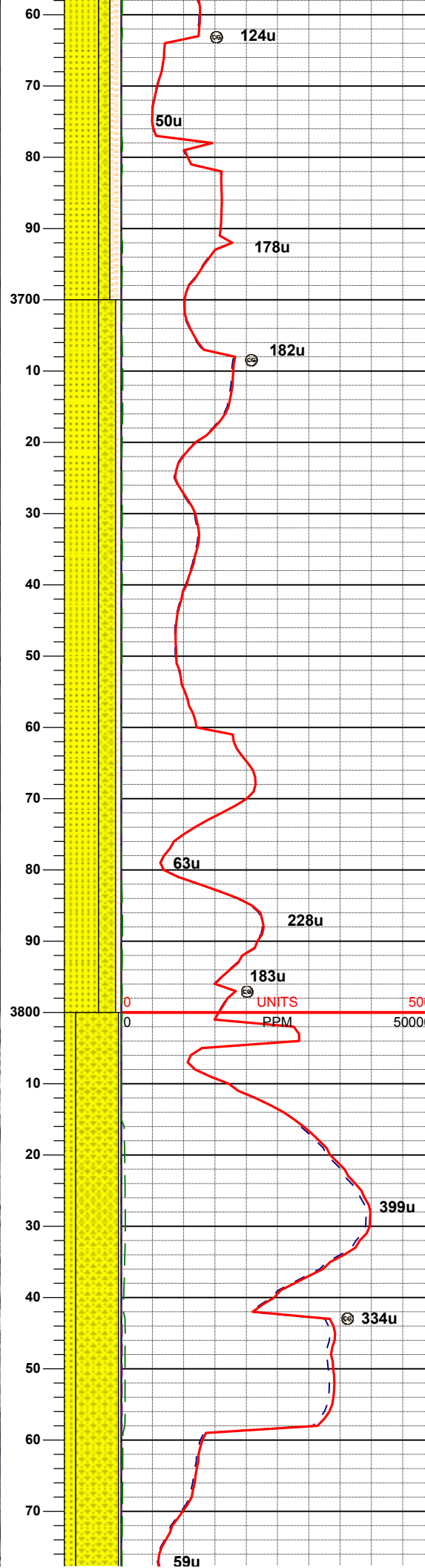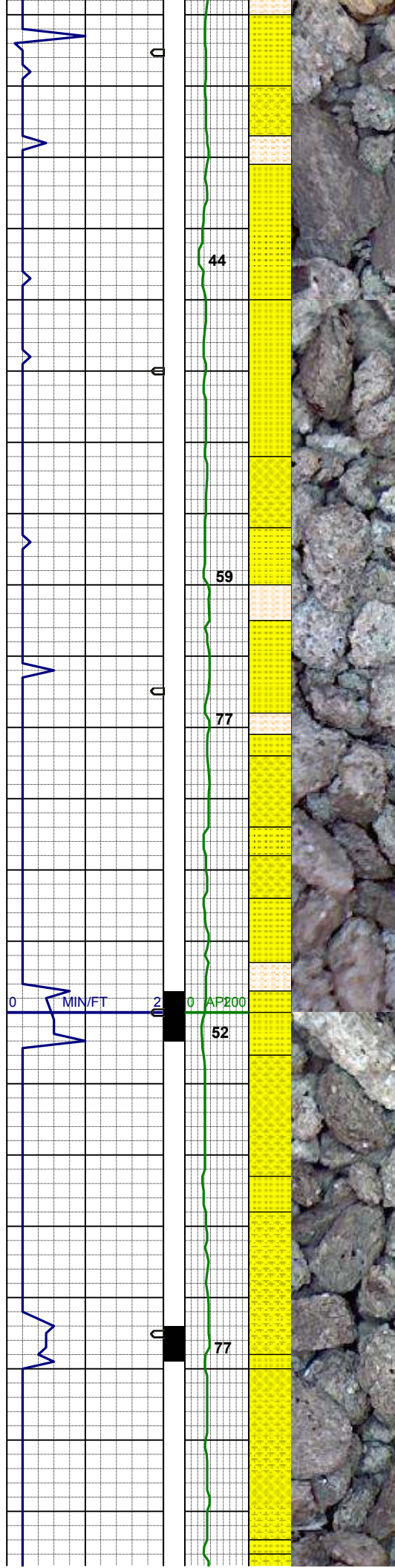
MD   3702'
INC   7.7°
AZI   212.2°
TVD   3683.8'

182u

44

59

77

SS:lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, tr sl arg mtx, non calc, sl mica, tr glauc, tr pyr
SHYSS: lt-mgy, occ clr, vf-fgr, sbblky-sbplty, mod srt, sft-firm, arg mtx, sl mica, sl calc, tr glauc
SHYSLTST: mod-dkgy, sbblky-sbplty, tr plty, sft -firm, slty, arg mtx, sl calc, grdg-sltysh

63u

228u

183u

MD   3792'
INC   7.5°
AZI   214.3°
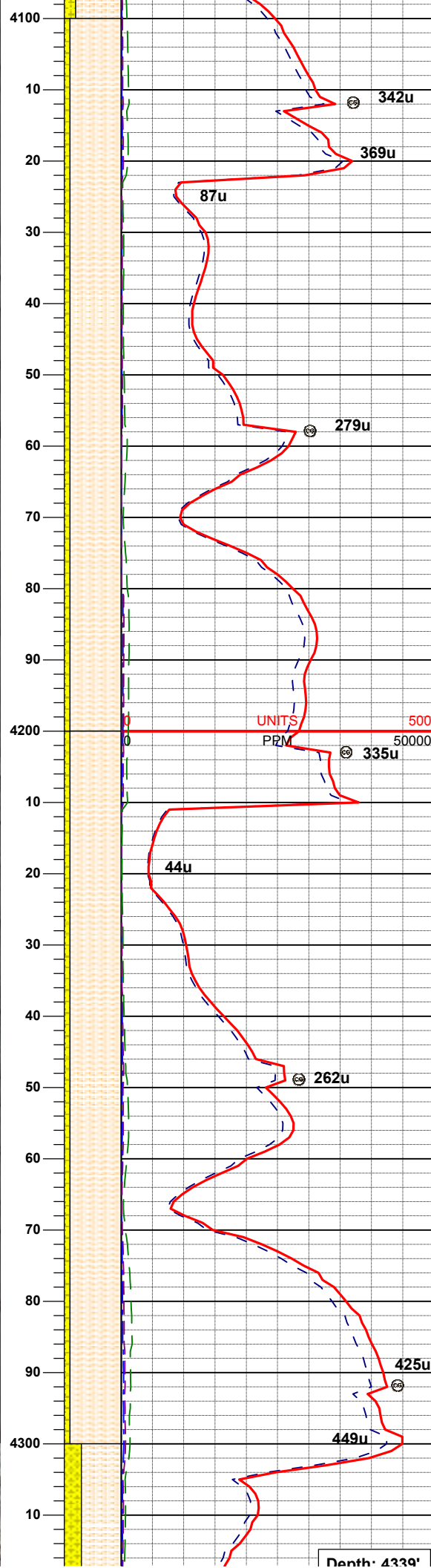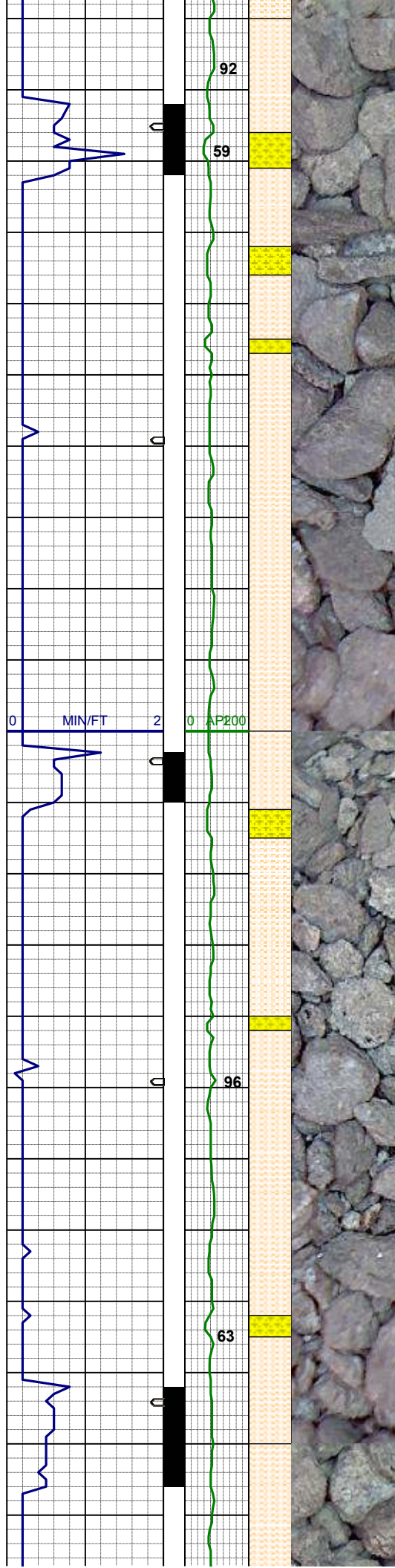**TVD   3773.0'**

52

399u

334u

SHYSS: lt-mgy-brn, occ clr, sbblky-sbplty, mod srt, sft-firm, arg mtx, sl mica, sl calc, tr glauc
SS:lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, tr sl arg mtx, non calc, sl mica, tr glauc, tr pyr
SHYSLTST: mod-dkgy, sbblky-sbplty, vfgr-fgr, tr plty, sft -firm, slty, arg mtx, sl calc, grdg-sltysh

77

59u

MD   3882'

0   MIN/FT   2   0   AP200   0   UNITS   500
0   PPM   50000

Track labels and annotations:

- 66
- 90
- 66
- 90
- 92
- 4/17/2013

Depth scale values (right track):
- 80
- 189u
- 90
- 3900
- 10
- 20
- 30
- 365u
- 40
- 392u
- 50
- 53u
- 60
- 70
- 203u
- 80
- 90
- 4000
- 10
- 20
- 341u
- 30
- 345u
- 40
- 53u
- 50
- 60
- 70
- 213u
- 80
- 90

Bottom axis labels:
- 0 MIN/FT 2
- 0 API 200
- 0 UNITS 500
- 0 PPM 50000

Survey data (right margin):

INC   7.7°
AZI   221.9°
TVD   3862.2'

SHYSS: lt-mgy-brn, occ clr, sbblky-
sbplty, mod srt, sft-firm, arg mtx, sl
mica, sl calc, tr glauc
SS:lt gy-clr, firm- hd, m-fgr, sbrndd-
sbang, mod srt, tr sl arg mtx, non
calc, sl mica, tr glauc, tr pyr
SHYSLTST: mod-dkgy, vfgr-fgr,
sbblky-sbplty, tr plty, sft -firm, slty, arg
mtx, sl calc, grdg-sltysh

MD   3972'
INC   8.1°
AZI   211.3°
TVD   3951.4'

SHYSLTST: lt-modgy, tr dk gy, sbblky
-sbplty, tr plty, sft -firm, occ sdy ip, arg
mtx, sl calc, grdg-sltysh
SHYSS: lt-mgy-brn, occ clr, vf-fgr, occ
mgr, sbblky-sbplty, mod srt, sft-firm,
arg mtx, sl mica, sl calc, tr glauc

MD   4062'
INC   9.0°
AZI   207.8°
TVD   4040.4'

Track depth labels: 4100, 10, 20, 30, 40, 50, 60, 70, 80, 90, 4200, 10, 20, 30, 40, 50, 60, 70, 80, 90, 4300, 10

Curve annotations:
- 92
- 59
- 342u
- 369u
- 87u
- 279u
- 0 MIN/FT 2
- 0 AP200
- 0 UNITS 500
- 0 PPM 50000
- 335u
- 44u
- 96
- 262u
- 63
- 425u
- 449u

SHYSLTST: lt-modgy, tr dk gy, sbblky
-sbplty, tr plty, sft -firm, arg mtx, sl
calc, grdg-sltysh
SHYSS: lt-mgy-brn, occ clr, vf-fgr, occ
mgr, sbblky-sbplty, mod srt, sft-firm,
arg mtx, sl mica, sl calc, tr glauc

MD	4152'
INC	8.0°
AZI	208.3°
TVD	4129.4'

MD	4242'
INC	7.7°
AZI	213.1°
TVD	4218.6'

SHYSLTST: lt-modgy, tr dk gy, sbblky
-sbplty, tr plty, sft -firm, arg mtx, sl
calc, grdg-sltysh
SHYSS: lt-mgy-brn, occ clr, vf-fgr,
sbblky-sbplty, mod srt, sft-firm, arg
mtx, sl mica, sl calc, tr glau

Depth: 4339'
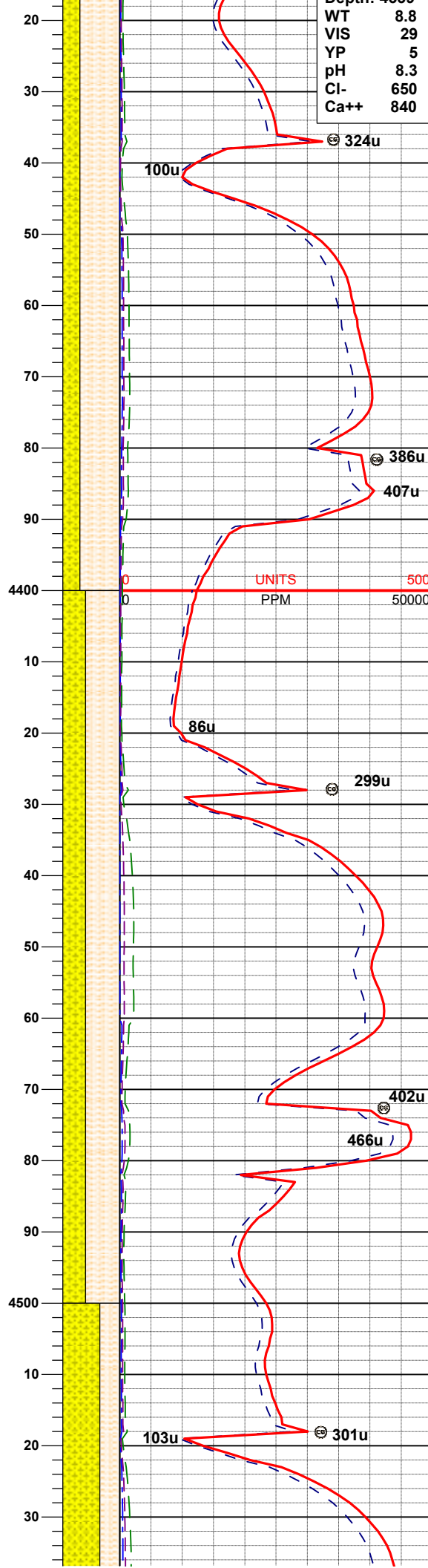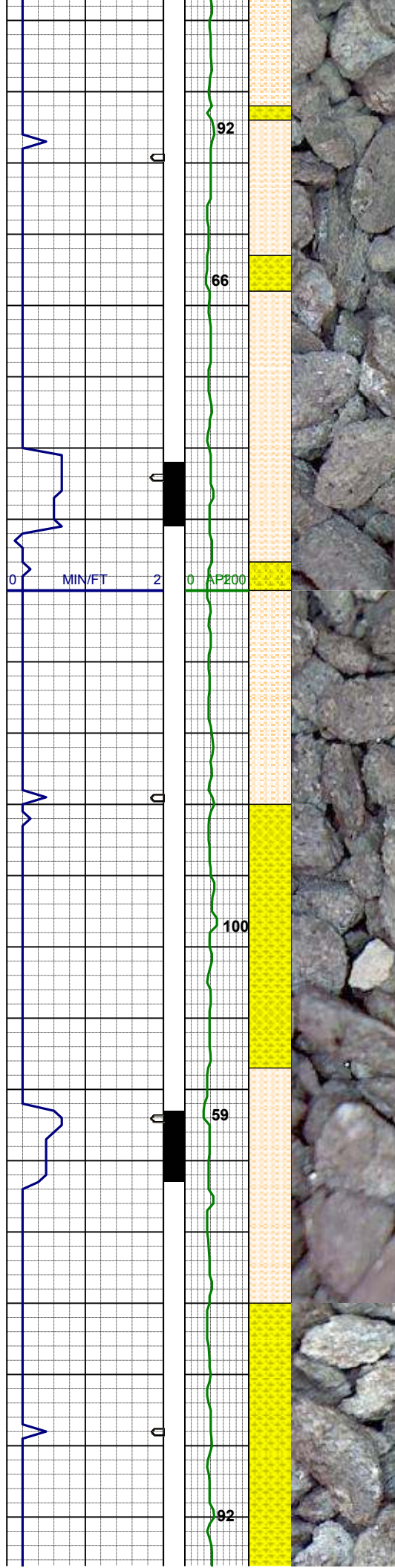
WT	8.8
VIS	29
YP	5
pH	8.3
Cl-	650
Ca++	840

MD 4332'
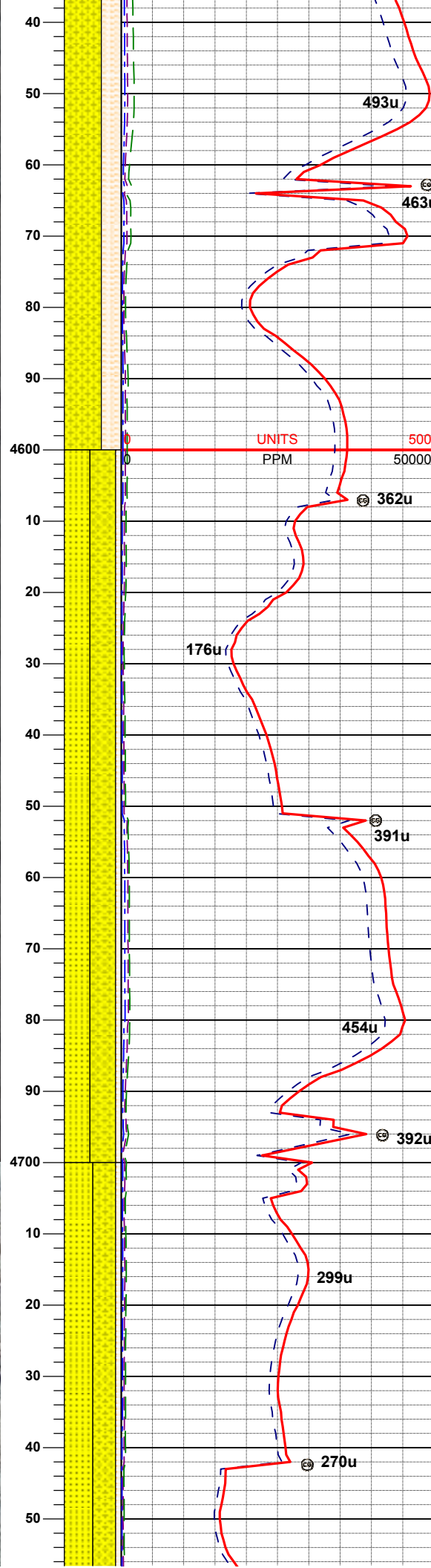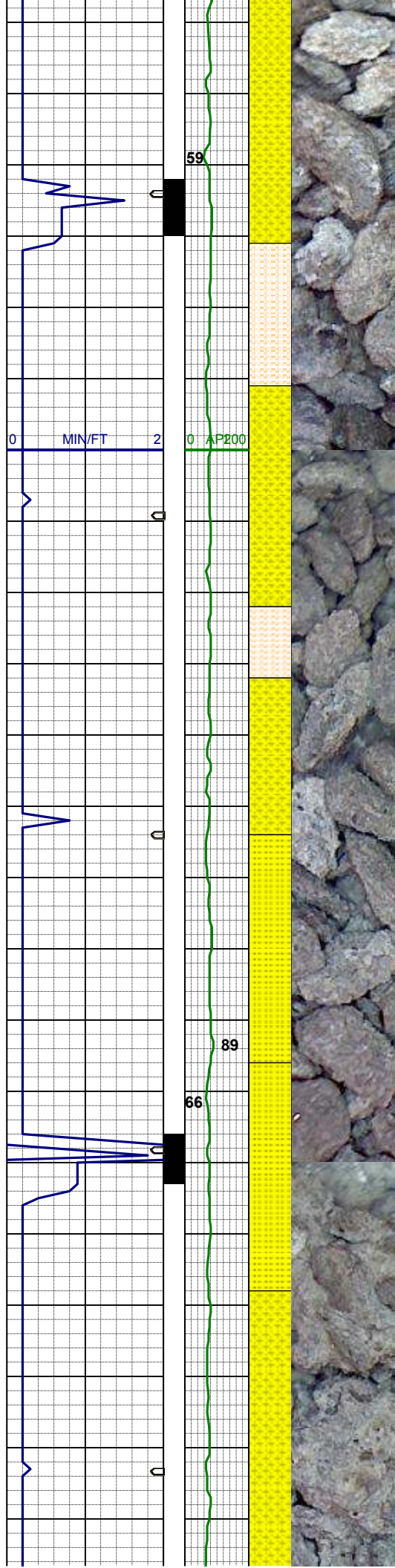**INC** 8.7°
AZI 209.7°
TVD 4307.6'

324u
100u

SHYSLTST: lt-modgy, tr dk gy, sbblky -sbplty, tr plty, sft -firm, sl sdy ip, arg mtx, sl calc, grdg-sltysh
SHYSS: lt-mgy-brn, occ clr, vf-fgr, sbblky-sbplty, mod srt, sft-firm, arg mtx, sl mica, sl calc

386u
407u

92
66

0 MIN/FT 2
0 AP 200

0 UNITS 500
0 PPM 50000

4400

WT 8.8 / VIS 29

86u

299u

MD 4422'
INC 8.1°
AZI 214.3°
TVD 4396.7'

100

SHYSLTST: lt-modgy, tr dkgy, sbblky-sbplty, tr plty, sft -firm, sdy ip, arg mtx, sl calc, tr glau grdg-sltysh
SHYSS: lt-mgy-brn, occ clr, vf-fgr, sbblky-sbplty, mod srt, sft-firm, arg mtx, sl mica, sl calc

402u
466u

59

4500

MD 4512'
INC 8.8°
AZI 211.5°
TVD 4485.7'

103u
301u

92
92

Track 1 (MIN/FT): 0 — MIN/FT — 2

Track 2 (API / porosity):
- 59
- 0 API 200
- 89
- 66

Depth track: 40, 50, 60, 70, 80, 90, 4600, 10, 20, 30, 40, 50, 60, 70, 80, 90, 4700, 10, 20, 30, 40, 50

Gas curve (UNITS / PPM):
- 0 — UNITS — 500
- 0 — PPM — 50000
- 493u
- 463u
- 362u
- 176u
- 391u
- 454u
- 392u
- 299u
- 270u

Lithology descriptions (right margin):

SHYSS: lt-mgy-brn, occ clr, ml-vfgr, sbblky, mod srt, sft-firm, arg mtx, sl mica, sl calc
SHYSLTST: lt-modgy, tr dkgy, sbblky-sbplty, tr plty, sft -firm, sdy ip, arg mtx, sl calc, tr glau grdg-sltysh
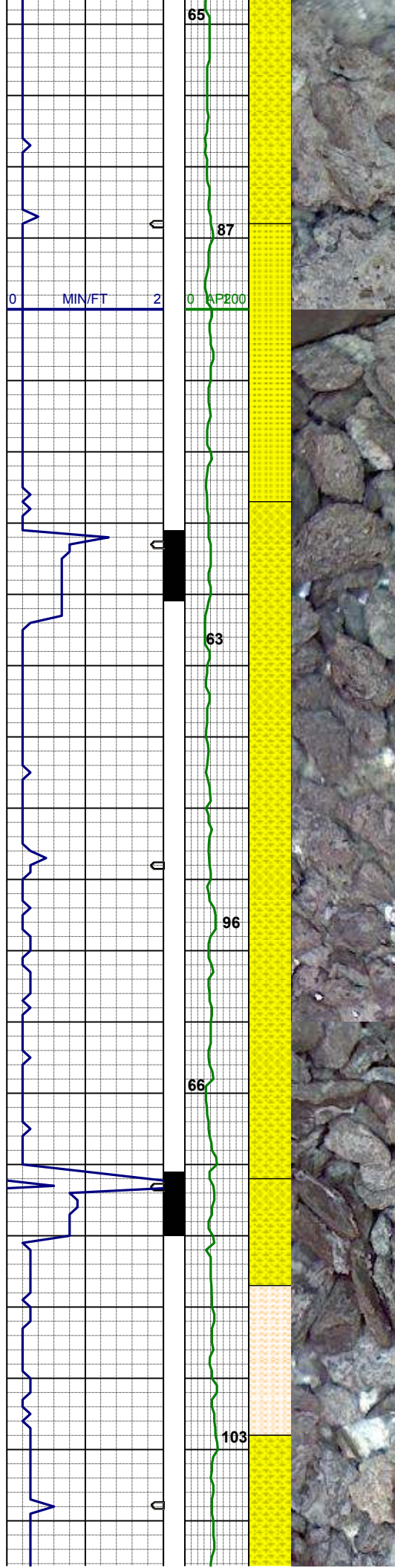
WT 8.8 / VIS 29
MD   4602'
INC   8.4°
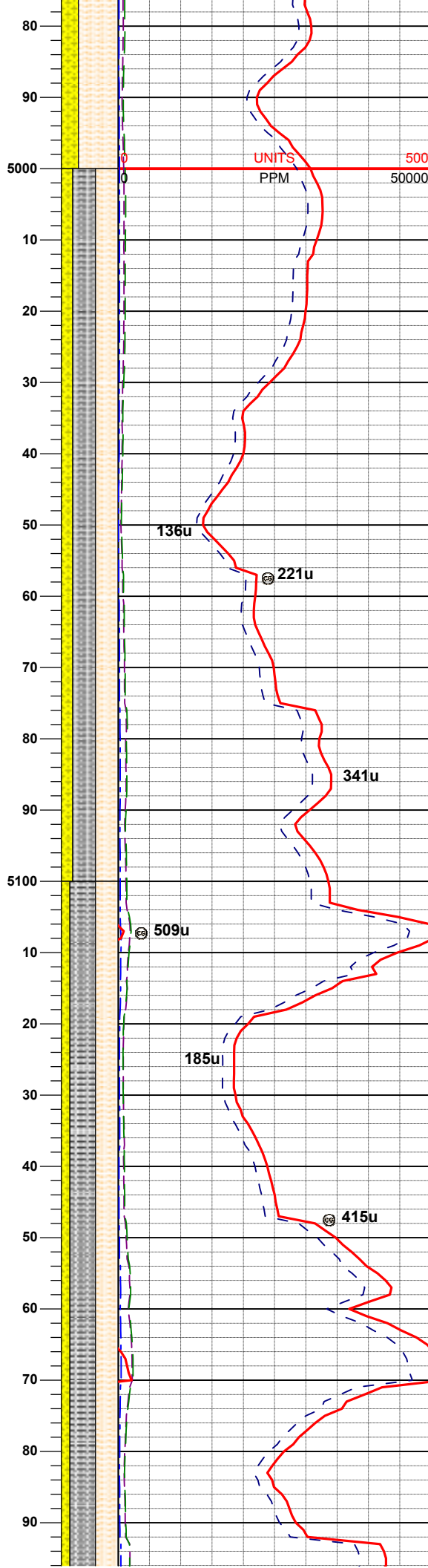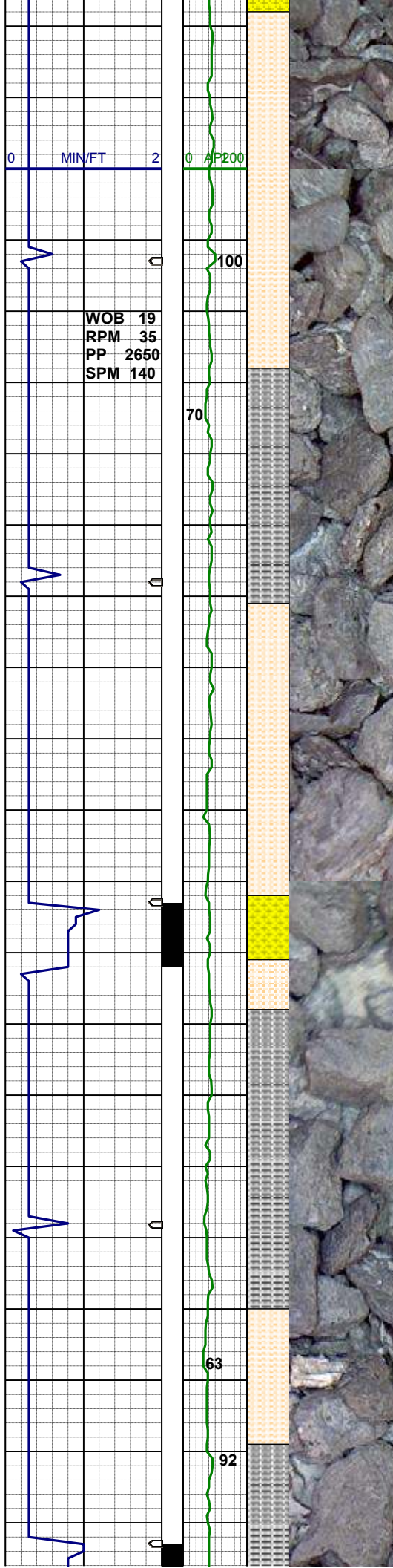AZI   216.1°
TVD   4574.7'

SHYSS: lt-mgy-brn, occ clr, ml-vfgr, sbblky, mod srt, mod firm, arg mtx, sl mica, sl calc
SS:lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, arg mtx, tr calc, sl mica, qtz wkst
SHYSLTST: lt-modgy, tr dkgy, sbblky-sbplty, tr plty, sft -firm, sdy ip, arg mtx, sl calc, tr glau grdg-sltysh

MD   4691'
INC   7.7°
AZI   214.1°
TVD   4662.8'

SS:lt gy-clr, firm- hd, m-fgr, sbrndd-sbang, mod srt, arg mtx, tr calc, sl mica, qtz wkst
SHYSS: lt-mgy-brn, occ clr, ml-vfgr, sbblky, mod srt, mod firm, arg mtx, sl mica, sl calc
SHYSLTST: lt-modgy, tr dkgy, sbblky-

SHYSLTST: lt-modgy, tr dkgy, sbblky-
sbplty, tr plty, sft -firm, sdy ip, arg mtx,
sl calc, tr glau grdg-sltysh

65

87

0   MIN/FT   2   0   AP200

63

96

66

103

60

70

80

128u   187u

90

4800

0   UNITS   500
0   PPM   50000

10

20

30

⊚ 296u

40

50

60

70

GAS LINE BLOCKED

80

90

4900

10

20

374u

30

40

200u

50

60

⊚ 388u

70
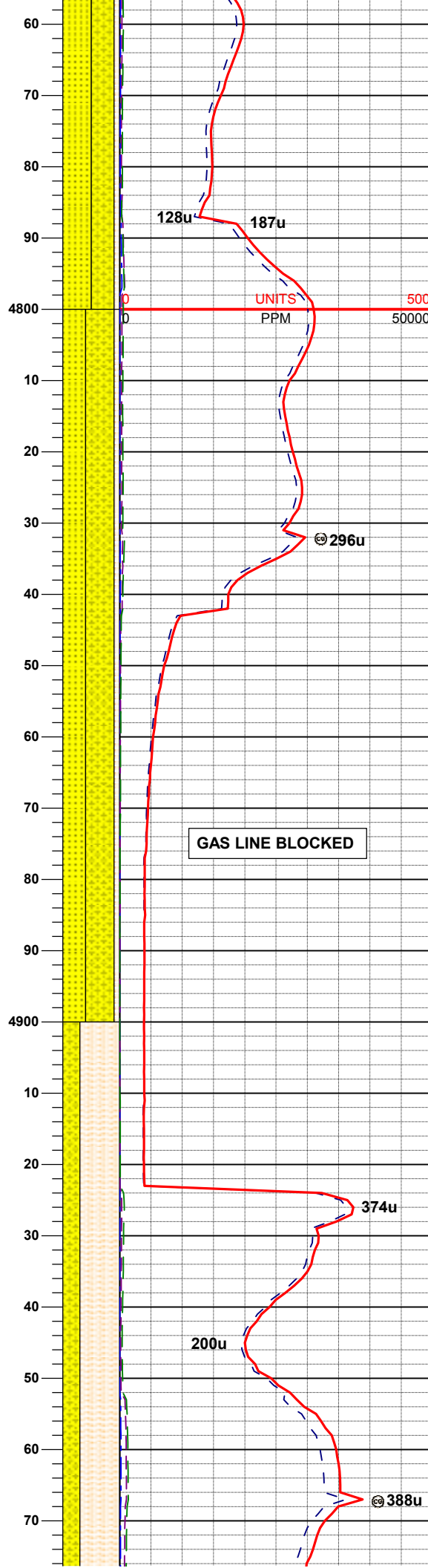
MD   4781'
INC   7.9°
AZI   211.5°
TVD   4752.0'

SHYSS: lt-mgy-brn, occ clr, ml-vfgr,
sbblky, mod srt, mod firm, arg mtx, sl
mica, sl calc
SS:lt gy-clr, firm- hd, m-fgr, sbrndd-
sbang, mod srt, arg mtx, tr calc, sl
mica, qtz wkst
SHYSLTST: lt-modgy, tr dkgy, sbblky-
sbplty, tr plty, sft -firm, sdy ip, arg mtx,
sl calc, tr glau grdg-sltysh

MD   4871'
INC   6.0°
AZI   203.7°
TVD   4841.3'

SHYSLTST: lt-modgy, tr dkgy, sbblky-
sbplty, tr plty, sft -firm, sdy ip, sl calc,
grdg-sltysh
SHYSS: lt-mgy-brn, occ clr, ml-vfgr,
sbblky, mod srt, mod firm, arg mtx, sl
mica, sl calc

MD   4961'
INC   4.5°
AZI   204.8°
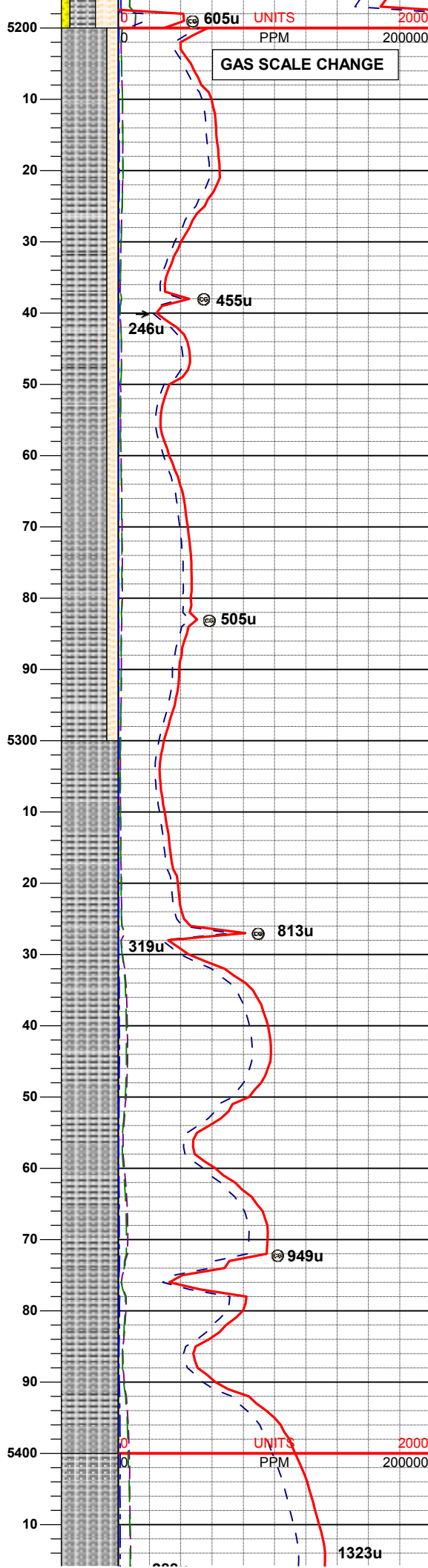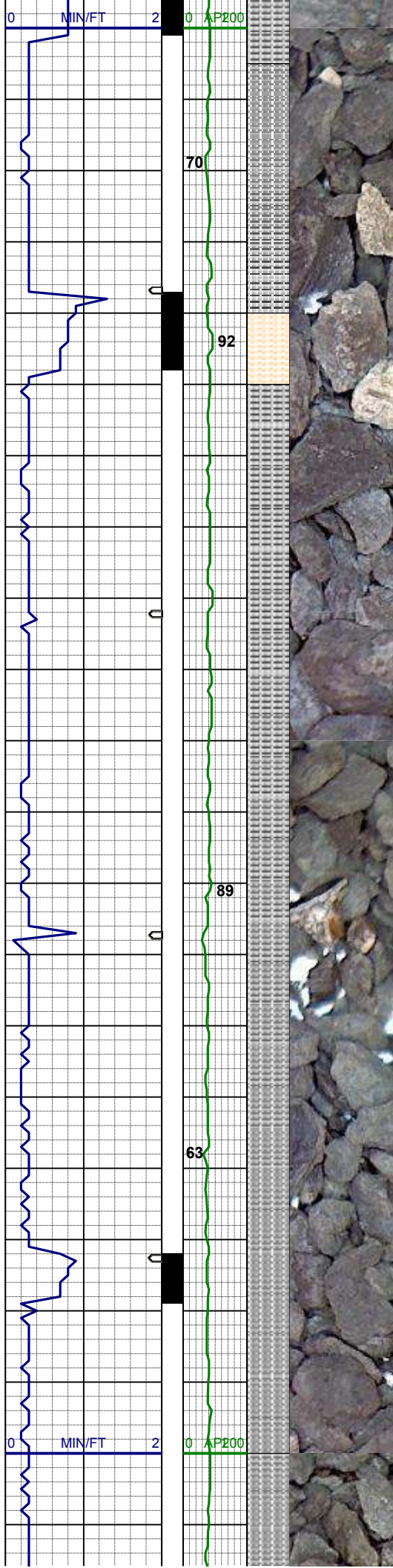TVD   4930.9'

WT 9.2 / VIS 45

WOB 19
RPM 35
PP 2650
SPM 140

0 MIN/FT 2
0 API 200
0 UNITS 500
0 PPM 50000

100

70

136u

221u

341u

509u

185u

341u

63

92

415u

SLTYSH: m- dkgy, sbplty-plty, sft-
firm, rthy- gt tex, slty, sl calc, grdg-
shysltst, sl mica
SHYSLTST: lt-modgy, tr dkgy, sbblky-
sbplty, tr plty, sft -firm, sdy ip, sl calc,
grdg-sltysh
SHYSS: lt-mgy-brn, occ clr, ml-vfgr,
sbblky, mod srt, mod firm, arg mtx, sl
mica, sl calc

MD   5051'
INC   4.0°
AZI   202.0°
TVD   5020.7'

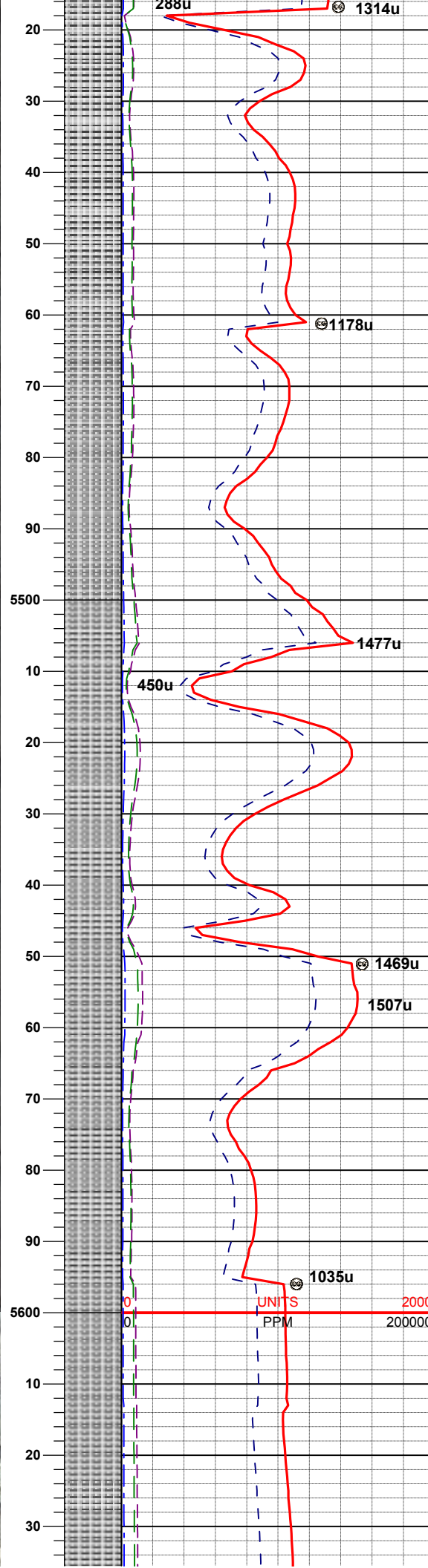MD   5140'
INC   3.0°
AZI   219.0°
TVD   5109.5'

SLTYSH: m- dkgy, sbplty-plty, sft-
firm, rthy- gt tex, slty, sl calc, grdg-
shysltst, sl mica
SHYSLTST: lt-modgy, tr dkgy, sbblky-
sbplty, tr plty, sft -firm, sdy ip, sl calc,
grdg-sltysh
SHYSS: lt-mgy-brn, occ clr, ml-vfgr,
sbblky, mod srt, mod firm, arg mtx, sl
mica, sl calc

0	MIN/FT	2
0	AP200	

GAS SCALE CHANGE

	UNITS	
0	605u	2000
0	PPM	200000

5200

70

92

10

20

30

MD 5230'
INC 2.1°
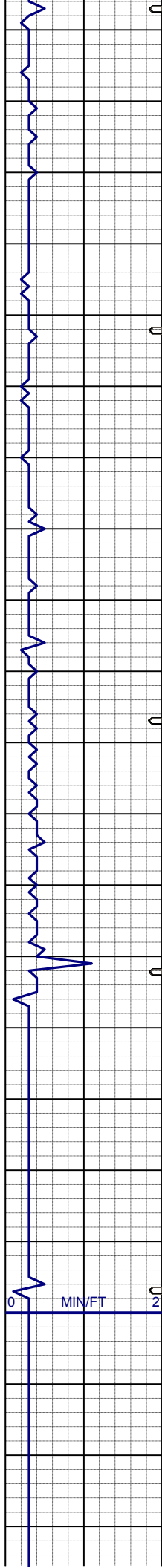**AZI 183.4°**
TVD 5199.4'

@ 455u
246u

40

SLTYSH: m- dkgy, sbplty-plty, sft-firm, rthy- gt tex, slty, sl calc, grdg-shysltst, sl mica
SHYSLTST: lt-modgy, tr dkgy, sbblky-sbplty, tr plty, sft -firm, sdy ip, sl calc, grdg-sltysh

50

60

70

@ 505u

80

90

5300

89

10

20

MD 5320'
INC 1.5°
AZI 120.6°
TVD 5289.4'

@ 813u
319u

30

40

SLTYSH: m- dkgy, sbplty-plty, sft-firm, rthy- gt tex, slty, sl calc, grdg-shysltst

50

63

60

70

@ 949u

80

90

5400

	UNITS	
0	PPM	2000
0		200000

0	MIN/FT	2
0	AP200	

WT 9.3 / VIS 43

10

MD 5410'
INC 0.5°
AZI 141.5°
TVD 5379.4'

1323u

SLTYSH: lt- dkgy, sbplty-plty, sft-firm, rthy- gt tex, slty, sl calc, grdg-shysltst
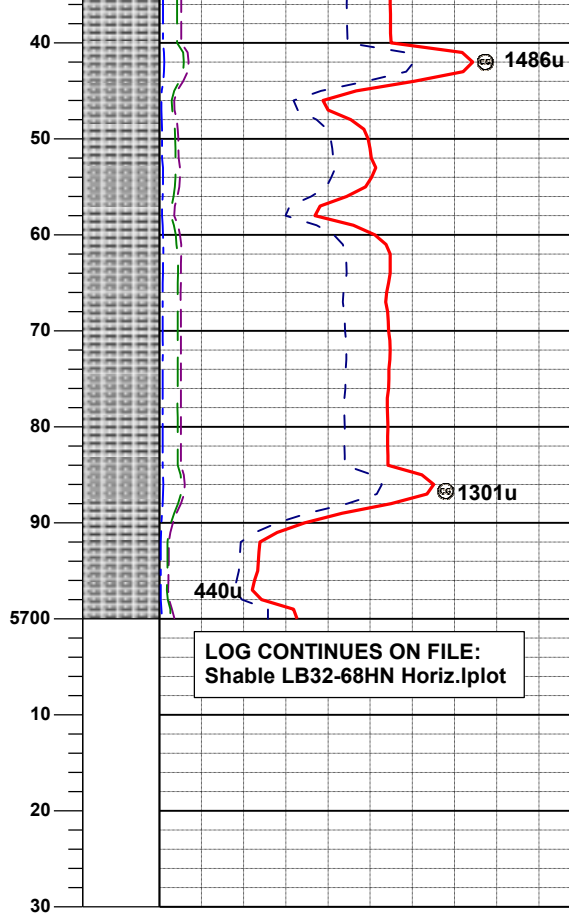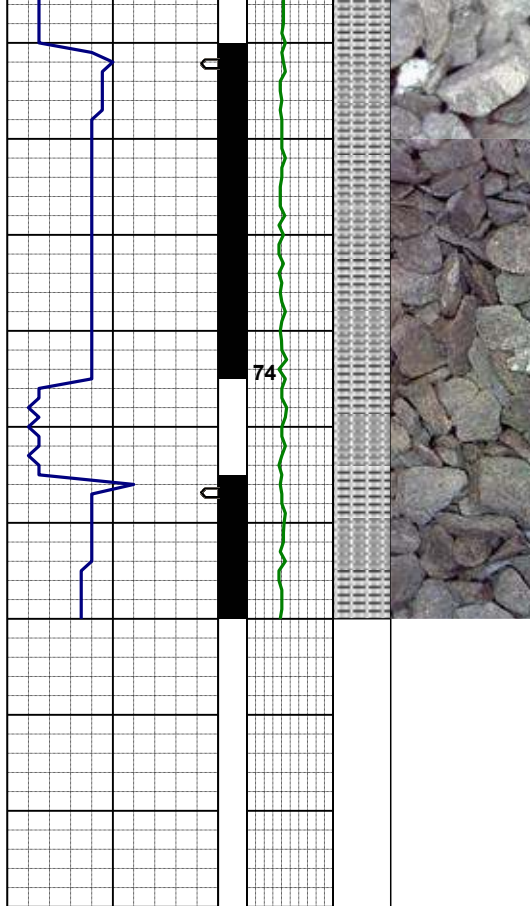
WT 9.7 / VIS 43

MD   5500'
INC   0.4°
AZI   184.6°
TVD   5469.4'

SLTYSH: m- dkgy, sbplty-plty, sft-firm, rthy- gt tex, slty, sl calc, grdg-shysltst

MD   5590'
INC   0.5°
AZI   152.4°
TVD   5559.4'

SLTYSH: m- dkgy, sbplty-plty, sft-
firm, rthy- gt tex, slty, sl calc, grdg-
shysltst

1486u

1301u

440u

LOG CONTINUES ON FILE:
Shable LB32-68HN Horiz.lplot

MD	5680'
INC	4.6°
AZI	258.4°
TVD	5649.3'

THANK YOU FOR CHOOSING
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