

UNIT (2)

Cont'd.
PIECE 10-15
VOLCANIC
BRECCIA

→ HYALOCLASTITE

3% OLIVINE
4mm max
1mm mod.
SUBHEPHERAL
PERVASIVELY ALT.

MOTTLED GREEN
BLACK GRAY
APHANITIC
MODERATELY ACRYIC
SLIGHTLY TO
MODERATELY ACT.
FRESH GLASS
BRECCIATED.

100% VOLCANIC
CLASTS
4mm mod
MODERATE
SUBANGULAR
POOR.



1 vein, $n=1$, 1mm
straight, 84-160
2.5-3.5 vein, $n=2$, 0.9
branched, 79 → 170

2-8 vein, $n=1$, 0.7mm,
branched, 83 → 360

14-16 vein network,
 $n=6$, straight, 0.4
branched, 60 → 012

17-19 vein network,
 $n=2$, 0.3mm, branched,
71 → 011

27-33 vein network,
 $n=3$, max 2mm, straight
- irregular, 48 → 214

35-36 vein, $n=1$, 0.4mm,
straight, 75 → 608

50-54 conjugate vein, $n=2$
0.4mm, straight, 89 → 025
63 → 380

56-63 vein, $n=1$, 0.2mm,
branched, 89 → 255

67-76 vein network, $n=2$,
max. 1mm, mod, 0.5mm
straight, 81 → 304

68-72 vein, $n=1$, 0.7mm
curved, 41 → 157



7% VESICLES
14mm max
1mm mod
high
rounded
102-104 vein, $n=1$, 2mm,
straight, 33 → 339

112-113, vein, $n=1$, 0.3mm
straight
78 → 181

121-123 vein network,
 $n=8$, 0.1mm, straight,
steep dip, horizontal

140-144 veins, $n=5$, 1.2mm
max, irregular, steep dip

UNIT (21)
CONTD.
PIECE 1-11



1-2 vein, $\mu=1$, 2mm, irregular, non-orient.

15% VESICLES
5mm max
1.5mm mod
low

100% VOLCANIC ATTRIBUTES
2mm mod

35-44 vein, $\mu=1$, 0.35, straight, 80 \rightarrow 040

50-53, aligned vesicle band (in clast)



64-67 vein, $\mu=1$, 1mm, straight, 80 \rightarrow 051

Slightly affected matrix w/ high % of fresh glass.

83-86 vein, $\mu=1$, 0.4mm irregular

102-105 vein, $\mu=1$, 2mm straight, 70 \rightarrow 238

UNIT (21)
(Continued)

Hyaloclastite
breccia

100% volcanic

4mm modal

low sphericity
highly angular
slightly altered
glass

glassy fragments
cemented with
thin film of clay.

open voids between
clasts

5% vesicles

high sphericity
rounded

1mm max

0.5mm modal

10/cm²

2% filled

3% olivine
phenocrysts

6mm max

3mm modal

subhedral

completely altered.

Mottled green
gray black

Moderately
olivine-phyric
basalt

26-37 v n=1 2mm straight
90→294

44-45 v n=1 1mm straight
70→320



0137
111

Unit (21)
(Continued)

Hyaloclastite
breccia

Moderately
olivine-phyric
basalt



3-10 v n=1 3mm straight
857305

12-21 fracture n=1
straight 90-86°

33-37 v 0.5mm straight
non-orient

46-50 v n=1 5mm straight
non-orient

66 v n=1 1mm non-orient

hyaloclastite
breccia

clast of
moderately ol-phyric
basalt



clast of moderately
ol-phyric basalt

NOT RECOVERED

UNIT (22)

Aphyric basalt

Medium gray
fine-grained (0.1mm)
no phenocrysts

Vesicles

15%

low sphericity
subrounded

20mm max

2mm modal

uneven distribution

10/cm²

1% filled

150:1

117-122 v n=1 3-1mm
curved
non-orient

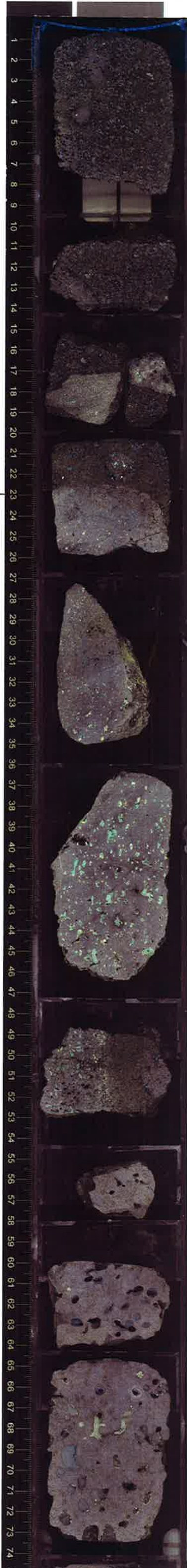
129-132 v n=1 0.5mm straight
90-7306

← ? celestine?

UNIT (23)

see section 3

UNIT (23)
(Continued)
hyaloclastite breccia
moderately
ol-phyric basalt.
V. similar to Unit 21



UNIT (24)

APHYRIC
BASALT

V. similar to
Unit (22)

ISCI 2

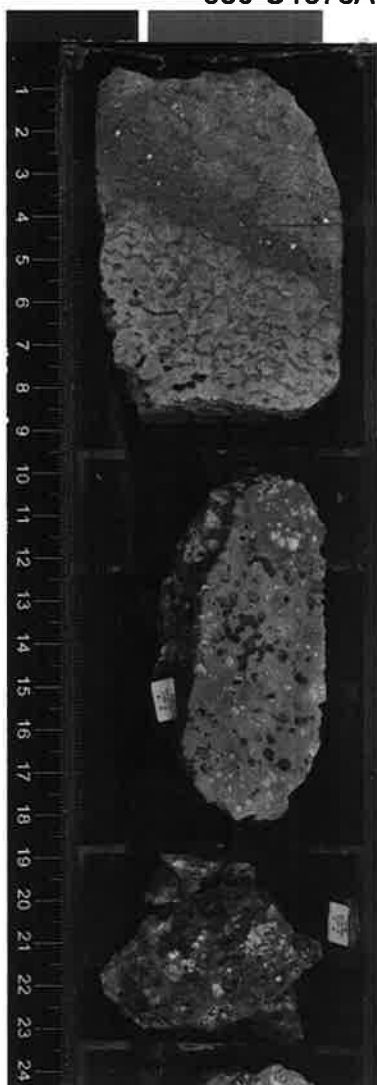
23 chilled contact,
non-met-1

37-40 v n=1 smj⁶
0.3mm 86-2302

patch of
hyaloclastite



Unit (24)
(continued)
as section 3



glassy, highly vesicular patch

39-43 v
n=2
straight,
branch
1mm
non-miner



UNIT (25)

sparsely ol-phyric basalt
1% olivine phenor

4mm max

1mm modal

subhedral

completely altered

fine-grained (0.2mm)

medium gray

Vesicles 0.5%

low sphericity, subrounded

0.5 mm max

0.2 mm modal

10/cm²

50% filled

ISCI 0

UNIT 26

Highly ol-phyric
to aphyric
basalt breccia
(heterolithic)

mottled green -
brownish gray

rounded clasts
of basalt in
green hyalochalkite
matrix

Matrix:

2 mm nodal
100% volcanic
low sphericity
highly angular
glass partly
altered

Clasts

Upto 140 mm
low sphericity
subrounded

0 - 30% olivine
phenocrysts

3 mm max.

1 mm nodal

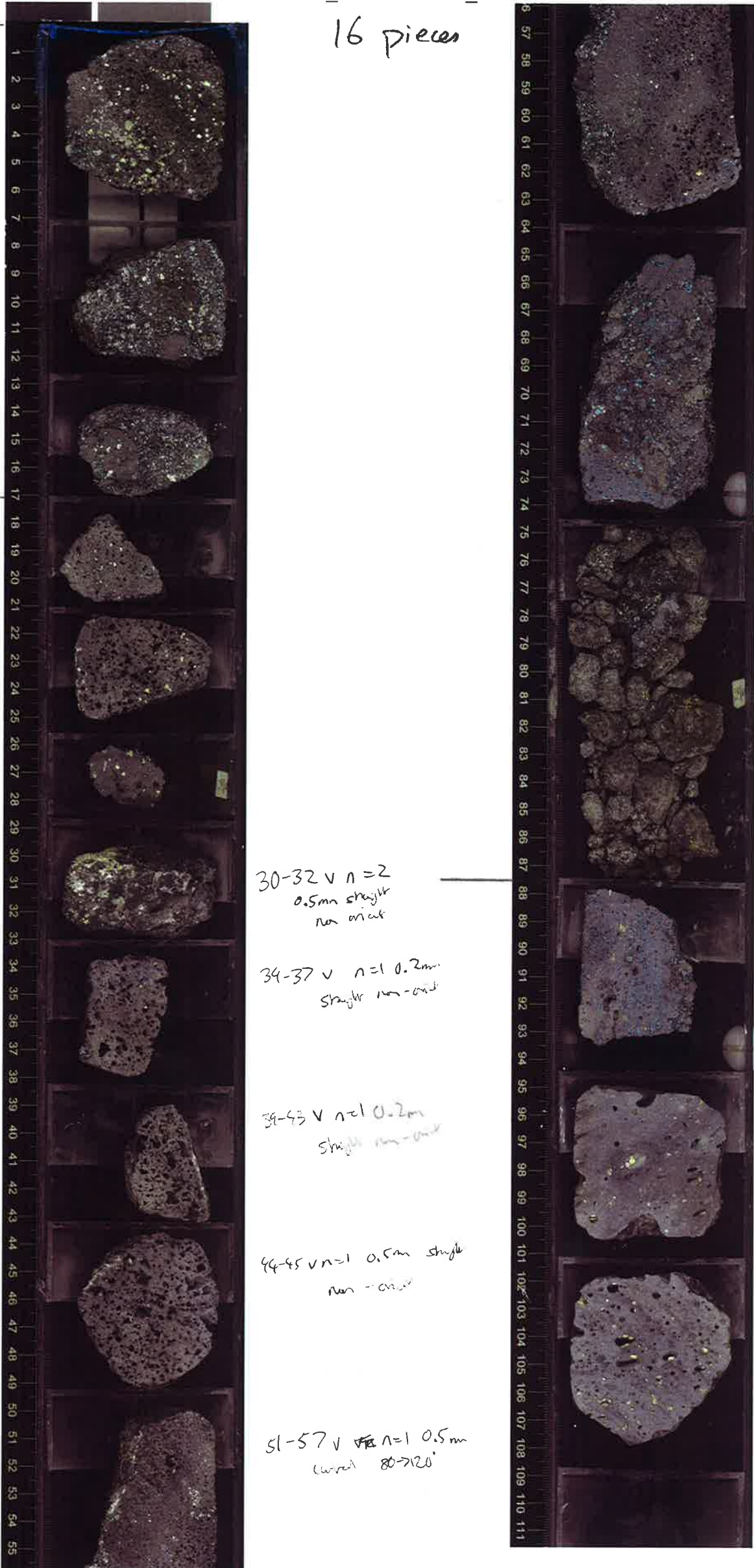
embedded

completely altered.

Vesicles in clasts

10% elongate, subrounded
6 mm max, 1 mm nodal
50/cm², 5% filled

16 pieces



30-32 v n=2
0.5mm single
non-nodal

34-37 v n=1 0.2mm
single non-nodal

39-43 v n=1 0.2mm
single non-nodal

44-45 v n=1 0.5mm single
non-nodal

51-57 v n=1 0.5mm
nodal 80-120°

UNIT 27

Aphyric basalt
(? lava lobe)

Medium gray

Fine grained (0.1 mm)

No phenocrysts

Vesicles

5% low sphericity
rounded

10 mm max

2 mm nodal

5/cm²

UNIT (28)

Hyaloclastite breccia

moderately olivine-phyric basalt.

Mottled green - brownish gray

clasts:

120 mm max
10 mm modal
poorly sorted
100% volcanic
low sphericity
angular

3% olivine phenocrysts
2 mm max.
1 mm modal
completely altered.

Glass:
partly altered.

Vesicles in clasts:

20%
moderate sphericity
rounded
8 mm max.
1 mm modal
50/cm²



19 pieces

11-12 v n=1 0.3 mm single
75-7010

11-16 v n=1 0.2 mm irregular
80-250

22 v n=1 0.2 irregular non-oval
75-7325
96-98 fracture
90-7045 str

2% olivine phenos
92-106 cm
104-106 fracture str
62-210

35 v n=1 0.2 irregular non-oval

0% olivine phenos
106-144 cm

53-56 v n=2 0.1 mm irregular, branch, non-oval

64-69 v n=2 0.3 mm irregular, branch, non-oval

71-75 v n=3 2-1 mm curved branch, non-oval



77-82 v n=3 0.3 mm irregular non-oval

93-95 fracture non-oval

UNIT (29)

Aphyric to highly olivine-phyric basalt.

massive sheet flow

Medium gray

Fine grained (0.1 mm)

108 fracture 60-154 single
15C1 3

phenocrysts

0-20% olivine in whole unit.

117-119 v n=1 1 mm curved 88-158

0-2% in this section.

119-120 v n=1 0.5 curved 35-194

123-124 fracture n=1 75-202

No vesicles in whole unit.

122-127 vein n=1 0.2 mm single 80-140

almost certainly the same vein

128-137 v n=1 1 mm str 88-235

129-136 v n=2 0.1 mm str, branch 85-245

134-137 v n=1 1 mm str 80-135

single, elongate olivine pheno.

Um. (29)
(Continued)

0.1% of phenos
0 - 28 cm.

20% of phenos
28 - 66 cm.

1% of phenos.
65 - 95 cm.



0-2 v n=1 0.1 m 58-7014
0-4 v n=1 0.2 curd 80-312

3-5 v n=1 0.3 str 84-7514

14-17 v 0.1 irreg
> nm-ord

17-19 fine str

10% of

24-25.5 fine phenos.
70-7230
24-26 fine 86-140
95-128 cm

27-30 v 0.1 curd 60-7206

27-32 v 0.1 curd 75-7054

35 v 0.3 step 58-340

37-39 v 0.2 step 45-7325

40-49 v 1mm str 85-7082

42-51 v 1.5-1mm str 90-7310

43 v n=3 0.2mm branch 80-7184

47 v n=2 0.2mm branch 90-7180

49-59 v n=2 0.2mm branch
80-7116

59-62 v 2mm str 62-7034

61-63 v 1mm str 72-7330

67 v n=3 0.3mm
branch
25-7182



72-76 v 0.5m str 62-7032
PYRITE

77-80 v 0.5mm str 75-7330

81-86 v 0.1 curd 55-7265

85-86 v 0.5 str 72-7324

90-98 v 0.5mm 45-7066
str

95-99 v 1mm str 80-7324

96 v 0.2mm str 68-7192

101 fine str 25-7335

101-105 v 0.5mm str 80-7308

27-30 v 0.1 curd 60-7206

27-32 v 0.1 curd 75-7054

35 v 0.3 step 58-340

37-39 v 0.2 step 45-7325

40-49 v 1mm str 85-7082

42-51 v 1.5-1mm str 90-7310

43 v n=3 0.2mm branch 80-7184

47 v n=2 0.2mm branch 90-7180

49-59 v n=2 0.2mm branch
80-7116

59-62 v 2mm str 62-7034

61-63 v 1mm str 72-7330

67 v n=3 0.3mm
branch
25-7182

112-114 v 1.5mm str 88-7198

114-118 v 8mm str 85-7196

118-124 vein network n=8
0.5mm irreg

121-126 v 1mm stepped 78-7042

133 v 5mm str irreg nm-ord
130 v 0.6mm irreg, nm-ord

UNIT (30)

Heterolithic aphyric
and highly olivine
-phyric basalt breccia

135 v n=2 3-1mm str nm-ord

Various type of
basalt clasts in
green hyaloclastite
flattened dark green
glass

UNIT (30)

(continued)

Hydrothermalitic aphyric and highly olivinephyric basalt breccia

Phenocrysts:

15 → 0% olivine
8 mm max
3 mm mod
euhedral
completely altered

Texture:

Glassy → fine grained (in clast)

Mottled dark green-grey

Clasts: up to 180 mm

Vesicles: variable 0 → 20%
8 mm max
1 mm mod

See 20R1 for
clasts classification.



1v 2mm str 85→210
2-4v 0.5mm curd 80→205
3-6v 2-1mm step 80→218
5-9v 1mm step 90→226
9-11v 0.5mm step 88→204
14-15v n=2 0.5mm step 80→340
25-26.5v 0.5 curd 75→166
27-39 vein network n=3 2-1mm step 85→340



55-56v 1.5mm stepped 90→166
64v 0.5mm str around edge of clast

UNIT (30)
(continued)



8-11 vein width $\mu = 0.3$ mm,
 $n=7$, 79 \rightarrow 1340, straight, etc

24-25 v, 0.4 mm, straight
21 \rightarrow 329

Type 1

27-29 v, 1 mm, irreg., 74 \rightarrow 324

29-30 v, 2.8 mm, curved, 69
 \rightarrow 184

34-37 v, 0.3, clipped, 75 \rightarrow 164

Type 3

Aphyric basalt

Greenish medium
gray

fine grained

< 1% olivine

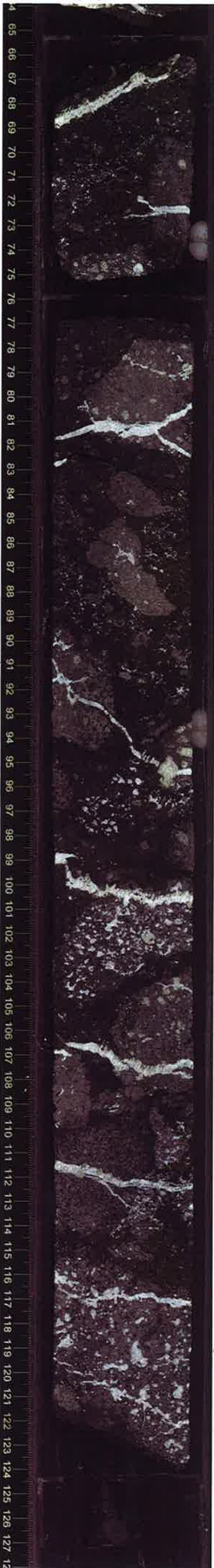
voids: 10-20%

60 v, 2 mm, straight, 82 \rightarrow 003

63-64 vein, straight, 6 mm,
64 \rightarrow 002

46-50 v, 4-1,
1 mm, 83 \rightarrow 155
branching & rec

51-53 vein width
 $n=2$, 1.5-0.3 mm,
straight, branched
82 \rightarrow 346



66-69 v, 4 mm, straight, 88 \rightarrow
152

72 v, 3 mm, str., 80 \rightarrow 180

78-79 v, 0.6, irreg., 14 clast

80-82 v, 5 mm, straight, 25 \rightarrow 179
branched

91-95 v, 7 mm, irreg., branched
82 \rightarrow 272

99-101 v, 4 mm, branched,
branching, 80 \rightarrow 195

104 v, 0.8 mm, irreg., 14 clast only

107-108 v, 4 mm, straight, 88 \rightarrow
003

111.5-113 v, 4 mm, branched,
4 mm, branching & reconnected
83 \rightarrow 005

117 v, 2.2 mm, stepped, 80 \rightarrow
011

Type 3

120 aligned vesicles, 80 \rightarrow 180

119-122 v, 4 mm, stepped, 70
 \rightarrow 023, 1 mm

UNIT (30)
(continued) 3v, 1mm, straight, 81-804

6-8 v, w=1
2.2mm, stepped
90-160
9-9 v, 3mm, irregular
80-354

Type 3
10-11 v, 1mm, vety, 83-162
1mm
15-18 vein, 1.5mm stepped, 71-155

with a
network
of
straight
veins

Type 4
Highly olivine-phyric
basalt

Greenish dark
grey
>10% olivine
(completely altered)
aphanitic
Vesicles: 20%
Olivine size:
4mm max
2mm mod

Type 2

29-30 v, 2mm, curved, 89-167

32 v, 0.2mm, straight, 80-007

34-36 vein, irreg, w=1, 0.8mm
82-155

34-42 veins, w=10, 0.1mm
straight, 67-203

41 v, 1mm, straight, 80-136

Type 2

56-58 vein netw, w=7, 0.4mm,
branched, 80-177

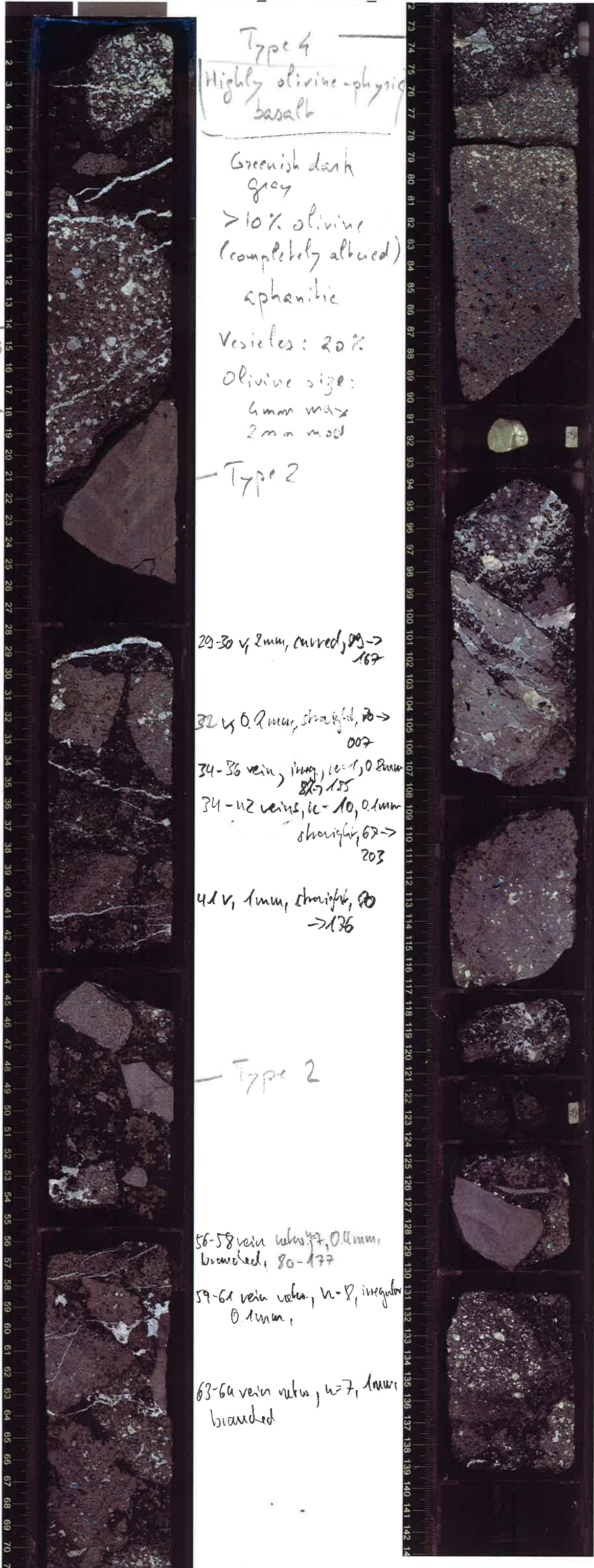
59-61 vein netw, w=8, irregular
0.1mm,

63-64 vein netw, w=7, 1mm,
branched

Type 3

88-101 v, 0.3mm, str, 81-230
99-104 v, w=2, 2mm, irregular
41-041, straight

Type 3



UNIT (30)
(Continued)



Type 3

Type 2

225-22 v, 3.4, straight,
87-214
23-27 v, 0.5mm, straight,
86-144
26-27 v, 0.5mm, straight,
90-237

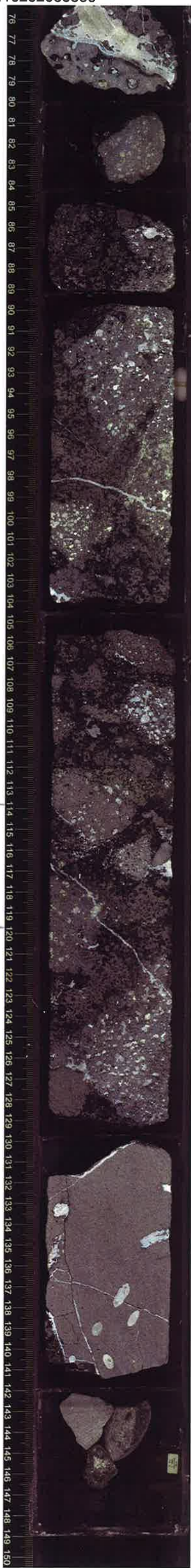
Type 1

Type 1
43-47 vesicles, 0.3mm,
irreg., non-oriented, u=2

Type 2

55-60 fack., straight, 20
→ 129

67-72 v, 4mm, straight,
slap clip → 266
64-74 v holes, u=15,
max. 6.2, mode 2mm,
irreg., slap clip



75-79 v, u=6, max. 2.3
mode, 1mm, irreg., non-oriented

95-99 v network, u=2, 0.2mm,
conspic., slap clip

98-100 v, 1.1mm, curved,
80 → 196

117-124 v, u=1, 1mm, irreg.,
73 → 253

Type 3
125-127 aliquot vesicle bands,
80 → 139

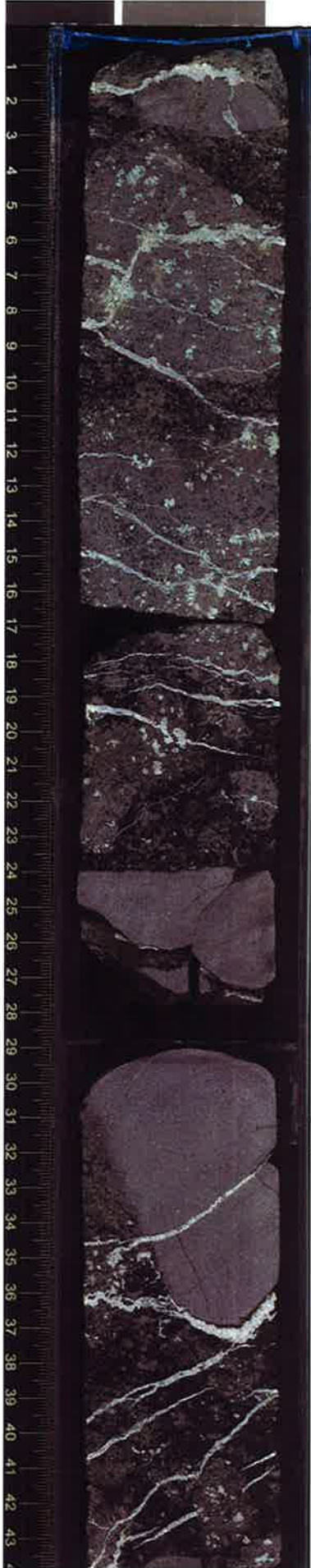
150-153 v, 1mm, straight,
89 → 120

Type 2

132-141 v, 1mm, irreg.,
81 → 284
137-139 v, 0.5mm, straight, 75 → 020
138-141 v, 1.5mm, str.,
78 → 021

aliquot

UNIT (30)
(continued)



1-3 v, 2.5mm, irreg, 71-173

5-15 vein, n=4, max. 2mm,
mode 0.5mm, straight,
75-100

Type 1

5-11 vein, n=2, 2mm,
branched, main vein
D at 82-110

13-17 vein, n=1, 1mm,
branched, 80-118

18-20 vein network, n=8
max. 2mm, mode 0.4mm,
straight, branching, 81-180

Type 2

32-35 v, n=1, 1.5mm, curved,
85-141

36-40 v, 1.8mm, straight,
75-149

36-37 v, 3mm, irregular,
59-182

38-44 veins, n=4, 1.5mm
straight, 81-140



Type 4

48-63 vein, n=6, max 3mm
mode 0.5mm, 64-174
54 v, n=1, 0.7mm, straight,
75-100

58-59 v, 1.8, irreg, 71-170

66-70 v, 3mm, straight, 60-178

67-72 v, 2mm, straight,
85-138

77-79 vein, D.L. 1, 86-140
straight

65-72 v, 0.8 mm, irreg, branching
 80 -> 752
 73-74 v, 0.9, straight, 80 -> 342
 74-79 v, 0.1, stepped, 82-100
 Type 1
 81-82 v, 0.1, irreg, 80 -> 300
 82-83 v, 0.1, straight, 85 -> 301
 84-85 v, 0.1, straight, 85 -> 301
 NOTTED BLACK
 89-91
 V. 0.2
 GREEN GRAY
 88-90
 APHANTIC
 Pervasively
 ALTERED
 BRECCIATED
 100% VOLCANIC
 CLASTS
 LOW SPH,
 SUBANGULAR,
 V. POORLY SORTED,
 50% VESICLES,
 17mm max
 3mm mod
 moderate
 subangular
 1.1 v, 0.3 mm, straight, 67-74
 1.3-1.4 v, 0.4, w-8
 67-74
 1.1 v, 0.3 mm, straight, 77-81
 Type 3
 V. vesicular
 close
 n 10%
 elongate
 subangular



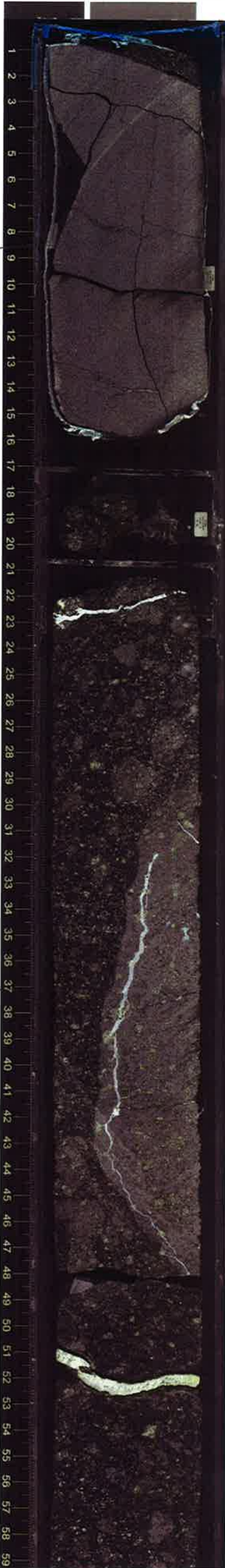
69-72 v, 0.8 mm, irreg, branching
 80 -> 752
 73-74 v, 0.9, straight, 80 -> 342
 74-79 v, 0.1, stepped, 82-100
 Type 1
 81-82 v, 0.1, irreg, 80 -> 300
 82-83 v, 0.1, straight, 85 -> 301
 84-85 v, 0.1, straight, 85 -> 301
 NOTTED BLACK
 89-91
 V. 0.2
 GREEN GRAY
 88-90
 APHANTIC
 Pervasively
 ALTERED
 BRECCIATED
 100% VOLCANIC
 CLASTS
 LOW SPH,
 SUBANGULAR,
 V. POORLY SORTED,
 50% VESICLES,
 17mm max
 3mm mod
 moderate
 subangular
 1.1 v, 0.3 mm, straight, 67-74
 1.3-1.4 v, 0.4, w-8
 67-74
 1.1 v, 0.3 mm, straight, 77-81
 Type 3
 V. vesicular
 close
 n 10%
 elongate
 subangular
 62-66 v, 3.2 mm, irreg, 59 -> 322
 60 v, 0.4 mm, str, 30 -> 360
 56-59 v, 1.9 mm, stepped, 60 -> 460
 55-56 v, 0.2 mm, straight, 75 -> 463
 53-55 v, 1 mm, stepped, 66 -> 342
 Type 4
 48-57 v, 0.1-0.6, irreg, 60 -> 356
 46 v, 0.4 mm, str, 80 -> 356
 42 v, 0.2 mm, stepped, 75 -> 324
 25-26 v, 0.1-0.3 mm, branched, 82 -> 172
 29-31 v, 0.4 mm, straight, 80 -> 203
 23-25 v, 0.1, straight, 85 -> 152
 Type 1
 Type 4



UNIT 30
 Cont'd.
 Page 1-9
 METEOLITHIC
 BRECCIA
 4 CLAST TYPES
 Type 1
 highly siliceous
 phytic breccia
 Type 2
 Aphytic breccia
 Type 3
 Aphytic, vesicular
 Type 4
 highly siliceous
 phytic breccia, vesicular
 DOMINANTLY
 OLIVINE-APHANTIC
 15% OLIVINE
 EUTECTAL
 COMPLETELY ACCRETE
 12mm max
 5mm mod.
 METEOLITHIC
 HIGHLY OLIVINE-
 PHANTIC AND APHANTIC
 BASALT BRECCIA

UNIT 30
Cont'd
Piece 1-5

Type 2



2-10 fracture, $n=2$, straight
65-7005

2-14 vein, $n=2$, 0.2mm,
straight, 61-1013

3-16 fracture, $n=1$,
curved, 82-269

22-23 vein, $n=1$, 1.5mm
straight, 87-170

31 vein, 0.4mm, straight,
35-222, in clast

32-48 vein, $n=1$, 1.5mm
curved, 63-275, in clast

39-38 v, 0.5, straight, 29
→169

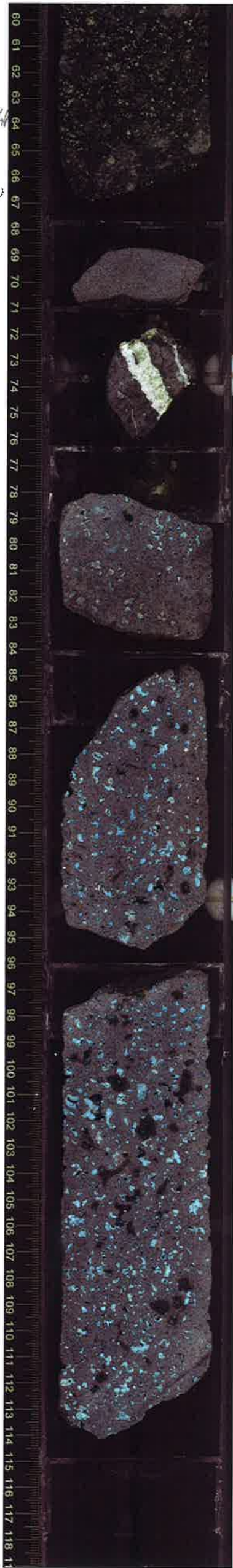
sl. Alth. altered ground

42 vein, 0.3, straight,
67-174

35-41 v, 0.2mm, curved,

51-53 v, 3mm, curved,
72-182

Type 1
Only moderately
altered dikes.
30-46cm.



Type 2

72-75
vein betw., max 9mm, mod
1.5, straight, non-oriented
 $n=3$

← NOT RECOVERED.

UNIT 31

76cm - 61cm
Section 3

Piece 6-8

VESICULATED
BASALT
SMALL LAVA
FLOW OR LAVA
LOBE

(ISC1=1)
0% PHENOCRYSTS.

APHYRIC BASALT
MEDIUM GRAY
WITH WHITE &
BLUE SPECKS
FINE GRAINED
0.2

10% VESICLES
ELONGATE
SUBROUNDED
1mm max
3mm mod