

UNIT 4

TOP CONTACT NOT RECOVERED

TO 7R-3 57cm

DESCRIPTION: LAVA FLOW INTERPRETATION: SWEET FLOW

NO PHENOCRYSTS  
▷ APHYRIC BASALT

FINE-GRAINED, 0.1mm MEDIUM GRAY

OLIVINE IN GROUNDMASS, 0.1mm ELONGATE IN PLACES (SKELETAL)

HORIZONTAL MAGMATIC FOLIATION

VESICULAR PATCH

15-19cm  
5%  
MODERATE SPHERICITY  
SUBANGULAR  
1.5mm, 0.2mm MODE

VESICLES

19-57cm  
0.5%  
LOW, SUBANGULAR  
3mm MAX, 0.6mm MODE

VESICULAR PATCH

59-62.5cm  
10%  
LOW, SUBANGULAR  
3mm MAX, 0.5mm MODE



VESICLES  
0-15cm  
0.5%  
LOW SPHERICITY  
SUBANGULAR  
1mm MAX, 0.6mm MODE

4-16.5cm  
vein network branch  
110x 1.5mm  
avg 0.5mm  
n=7

0-14cm  
magmatic foliation  
90-185°

16.5cm  
vein 0.5mm  
80-355  
straight

19.5cm-20cm vein  
single straight 80-355

22.5-35cm  
vein 1mm  
straight 85-285

26.5-27.5cm  
conjugate vein 0.1mm  
80-190

30.5cm conjugate vein 0.1mm  
85-005°

33.5  
conjugate vein  
1mm 35-180°  
35.5cm

35-43cm  
vein 1mm  
90-260°

45.5-46.5cm vein 0.1mm  
80-212

46-54cm  
magmatic foliation  
85-190

49-52cm vein 0.1mm  
branched 80-350

51.5-56.5cm vein 0.1mm  
90-290

59-64cm  
vein 0.5mm 75-225°  
85-164

vein 1mm curved 65-675  
85-164°

65-72cm vein 1mm wide  
straight 75-310°

VESICLES  
62.5-80  
0.5%  
LOW, SUBANGULAR  
3mm, 0.6mm

69-72cm vein 1-2mm wide  
90-220°



74.5-75cm vein 4mm  
50-2020

UNIT 4

PIECE 1a-7

76-79cm vein irregular  
0.5mm 50-240°

79-87cm vein curved  
1mm  
VESICULAR PATCH  
80-85cm  
15%  
MODERATE, SUBROUNDED  
5mm MAX, 0.5mm MODE

86-91cm vein 3mm  
straight 80-040°

87-91cm vein network 1mm irregular

92-96.5cm conjugate vein 0.5mm  
75-125

VESICLES  
85-72.2 29cm  
1%  
ELONGATE, SUBROUNDED  
16mm, 2mm

102.5cm vein 0.1mm curved

105cm vein 0.5mm

106.5-110cm vein network branched  
n=5 1mm wide

109.5-114cm vein 0.5mm straight  
85-230°

117.5-120cm vein 0.5mm straight  
n=2 branched 75-025

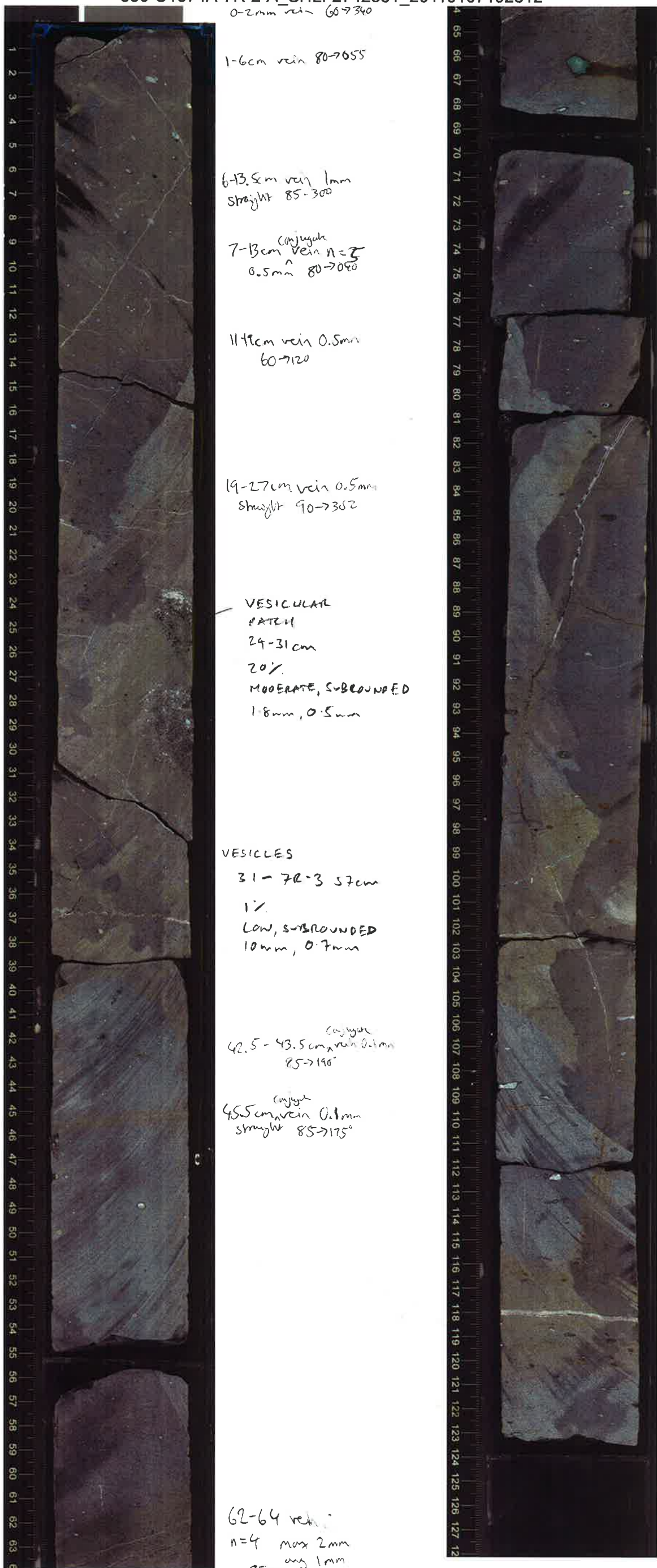
124-131cm vein 1mm  
no skeletal measure MB10

133-135cm vein n=2 1mm 80-40

137-143cm vein 0.5mm 50-210

141-144cm vein network max 1mm  
80-055 avg 0.5mm

UNIT (4)  
PIECE 1a-3e



0-2mm vein 60→340

1-6cm vein 80→055

6-13.5cm vein 1mm  
straight 85→300

7-13cm conjugate vein n=5  
0.5mm 80→090

11cm vein 0.5mm  
60→120

19-27cm vein 0.5mm  
straight 90→302

VESICULAR  
FACIES  
24-31cm  
20%  
MODERATE, SUBROUNDED  
1.8mm, 0.5mm

VESICLES  
31-72-3 57cm  
1%  
Low, SUBROUNDED  
10mm, 0.7mm

42.5-43.5cm conjugate vein 0.1mm  
85→190

45.5cm conjugate vein 0.1mm  
straight 85→175

62-64 vein  
n=4 max 2mm  
avg 1mm  
85→160

GREEN ALTERATION  
MINERAL (Very soft)

70-81cm magmatic foliation  
85→355

74cm vein 0.1mm 80→355

77cm vein 0.1mm 80→355  
single, straight

79.5-118.5cm vein  
max 2mm 85→095  
avg 1mm

80-112cm  
conjugate veins n=13  
Sub vertical 0.1mm  
→ 180

82-123cm  
magmatic foliation  
Sub vertical → 180

102.5cm conjugate vein 2mm  
70→005

118cm vein 3mm  
85→182

18-25cm  
conjugate  
vein  
n=12  
70→005

29-36cm  
conjugate  
veins  
n=6  
irreg

37cm vein  
1mm  
20→005

UNIT (4)  
PIECE 1a-2



0-38cm  
magmatic foliation  
85-010°

6cm vein 0.1mm  
straight 90-005°

16-17cm vein 0.5mm  
75-012° straight

20.5-24cm  
vein 2mm  
80-019°

27.5-30cm  
conjugate vein 0.1mm  
85-035°

33.5cm max  
conjugate vein 0.5mm  
40-038°

42-57cm  
vein 10mm  
shallow dip  
irregular

yellowish  
micrite  
surround clast  
and partly filled  
the inter-grain spaces.

← Geopetal  
← Geopetal  
← Geopetal } no compaction  
closed or  
none

61cm geopetal 180°

TEXTURE:  
FLOW BASE

UNIT (5)  
57-72cm  
UPPER CONTACT:  
BASE OF FLOW ABOVE  
LOWER CONTACT:  
MATRIX BECOMES SANDY  
IN BOTTOM OF PIECE 2

UNIT (5) is  
debris shed from  
flow (UNIT (4))



← Geopetal 180°

TOP OF UNIT (6)  
very dark brown  
coarse sand size  
LITHIC - VITRIC  
VOLCANIC SAND  
calcite cemented

CLAST OF  
UNIT (4)  
MINGLED  
WITH SAND AT  
TOP OF (6)

70% basalt  
sand  
25% palagmit  
sand  
5% carbonate  
cement  
some bioclasts

dark yellowish brown  
very coarse ss  
subangular  
carbonated cemented

annelid (up to 2mm)  
alga (up to 2mm)  
BIVALVE (up to 7mm)  
& GASTROPOD (2mm)  
FRAGMENTS

dip 80-042°

lamina

bedding  
0-18cm  
85→010

bedding  
20-34cm  
85→168

finest rich

35-43cm  
bedding  
80→199  
finest rich

50 mm  
rounded pebble  
of basalt

BASE OF  
UNIT (6)

TOP OF  
UNIT (7)

dark reddish brown, subangular  
(granule to medium sand size)

BEDDED  
LITHIC-VITRIC  
SANDSTONE

No BIOCLAST  
caliche cemented

well bedded

bedding 77-86.5cm  
80→150

4mm

88-100.5cm  
bedding  
80→160

43mm

152-116.5cm bedding  
80→160

45mm

45mm

118-132cm  
bedding  
80→160

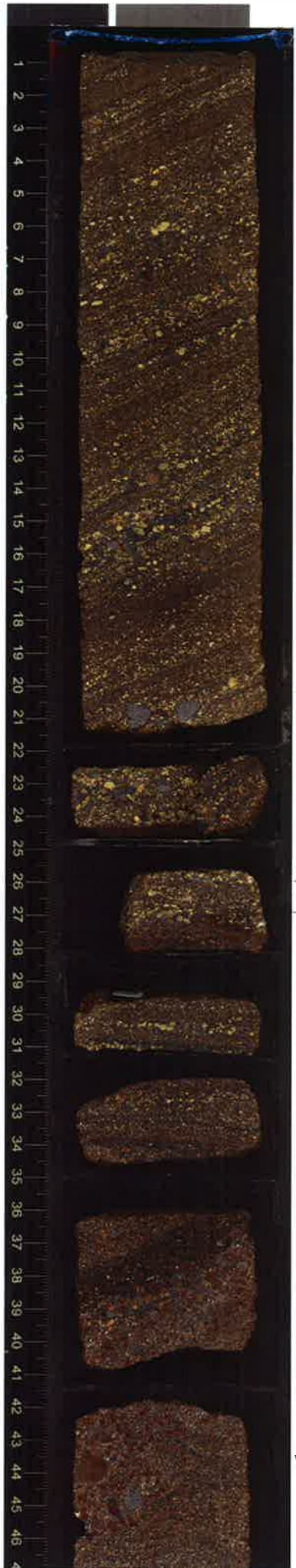
45mm

← gasped  
2mm

4mm  
56-75cm bedding  
75→030

4mm





0-21.5cm bedding  
80 → 162

φ 9mm

φ 6mm

φ 9mm

bedding is at angle to core edge

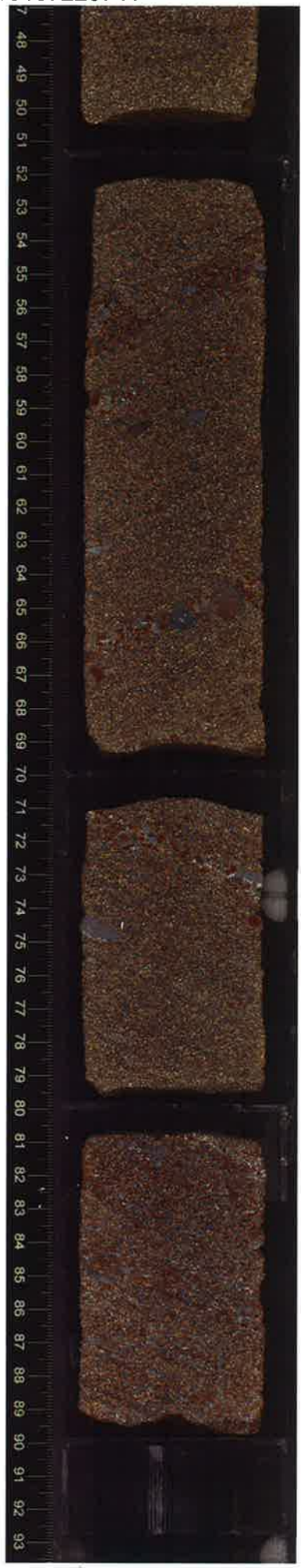
~~Horizontal bedding~~

inclined

φ 4mm

φ 10mm

46-50cm bedding  
70 → 010



φ 5mm

52-69cm bedding  
80 → 340

φ 12.5mm

φ 7mm

71-79.5cm bedding  
80 → 020

φ 7mm

81-89.5  
80 → 020°

φ 6mm

porosity rich.

whitish altered grain zone

43-46cm  
erosive contact?  
65 → 150°

UNIT (7)  
(continued)

Lithic-Vitric  
Volcanic sand

Aphyric basalt sand

reddish brown



0-8cm  
bedding  
80-9200°

4.5mm

11-13cm  
vein, single, straight  
6.5mm 85-9200

4.5mm

10-31.5cm  
bedding  
85-9200

4.5mm

4.5mm

0.5mm  
32.5-34.5cm → vein 85-9200  
33.5-35cm → vein 85-9200  
0.1mm

32-45cm  
bedding  
85-9200

4.5mm

SEDIMENTS



4.5mm

erosional  
(opposite side)

4.5mm

MB10

4.5mm

bedding  
75-9010

4.5mm



25-40cm bedding 80-102

vein  
bedding

↓  
91cm  
ppt

# SEDIMENTS

91cm

91cm

91cm

91cm

91cm

91cm

91cm

91cm

45-57cm bedding 85-170

bedding slightly pink (shell fragments, algae)



78cm bedding 80-136

78-101cm bedding 85-105

114.5-116cm vein 3mm straight 80-134

115.5-117cm vein 2mm straight 72-105

91cm

91cm

91cm

91cm

91cm

91cm

91cm

UNIT 7



boundary  
clast

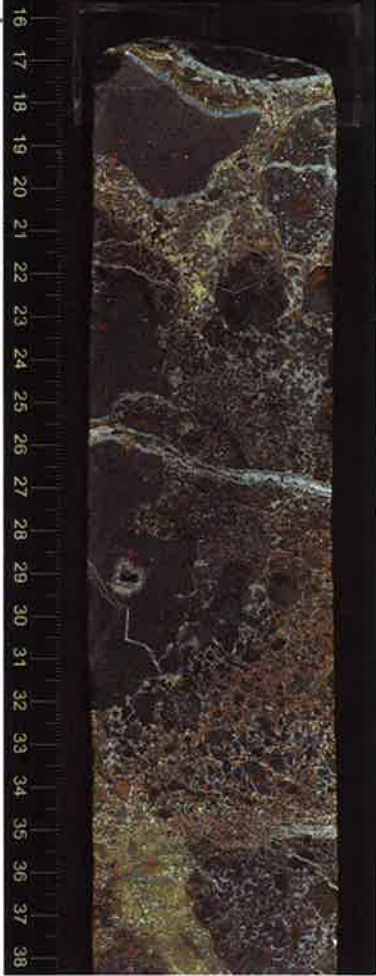
UNIT 7  
UNIT 8

Volcanic breccia

Sparsely olivine-phyric  
basalt

3% olivine (altered)  
fine grained

Geopetal  
180°

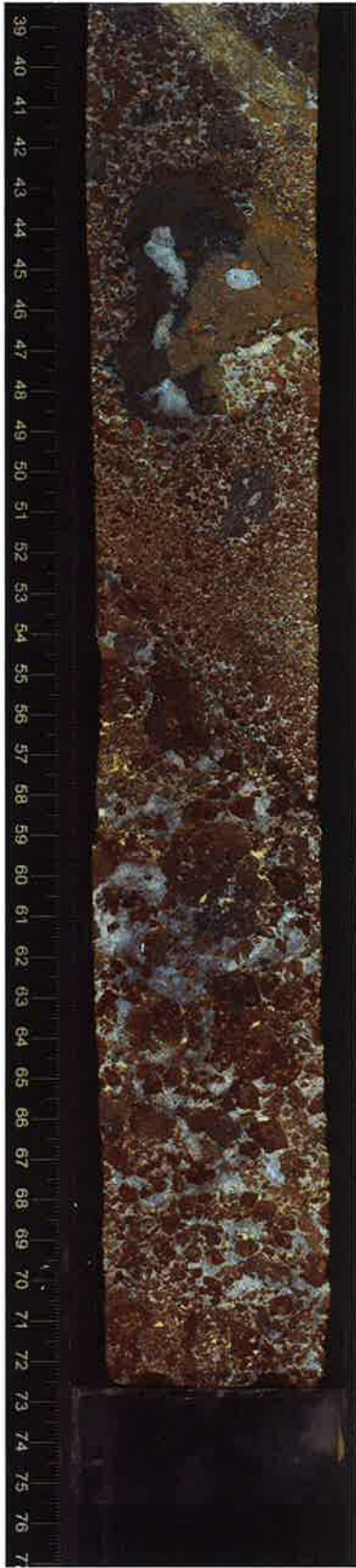


many  
bubbles  
(in grain)  
bubbles, olivine  
K-feldspar  
calcite coated  
matrix for reformed  
powder

26-27cm  
vein 5mm  
strongly sig  
75-7020

Geopetal →

Unit 8 →



45cm geopetal 180°

calcite coated  
yellowish micrite  
fill some space



UNIT (8)  
(continued)

moderately  
ol - phyric  
basalt breccia

max. clast  
size > 120 mm

calcite cemented  
voids.

highly  
altered  
matrix

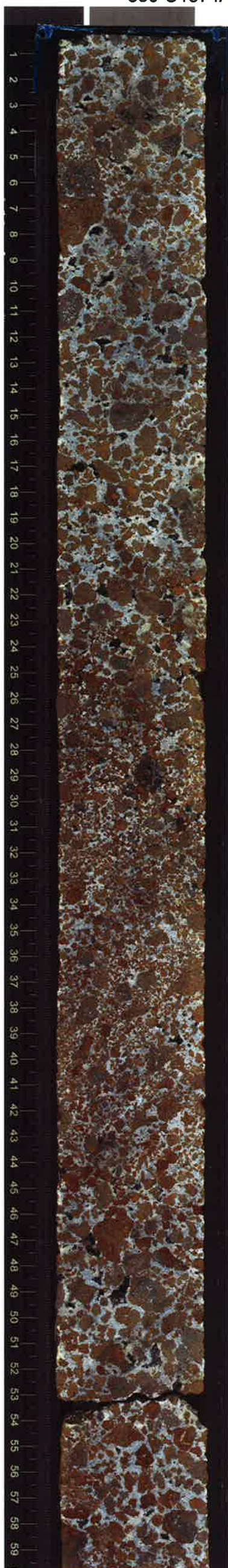


vein =  
not oblique

completely  
altered

60.5-64.5 cm  
vein 2mm  
80-7210





Sand  
~clay  
infilled  
intra-clast  
spall

clay  
infilled  
voids



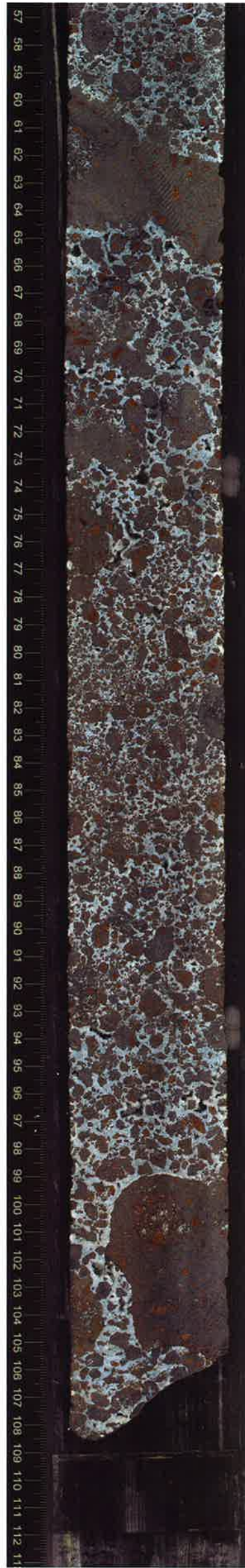
Complete  
spall

plagioclase  
phenocrysts

Complete  
at hand

yellowish  
clay  
partly  
filled  
the  
inter-clast  
space

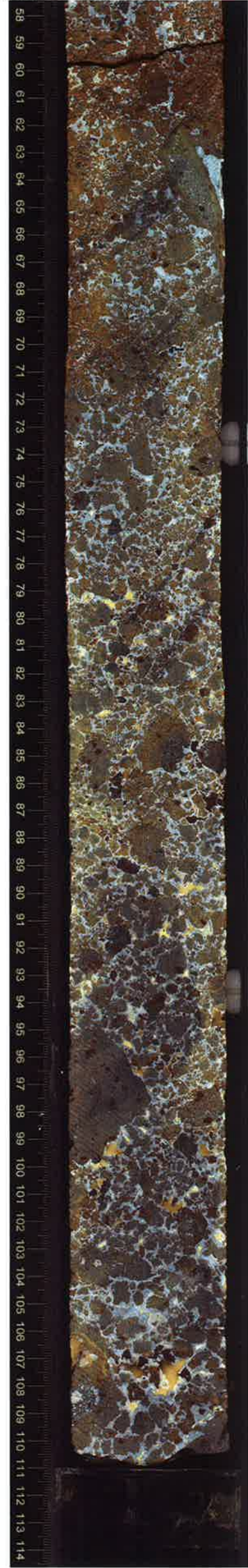
100%  
at hand





highly  
siliceous

Carbonate  
+ zeolite  
cement

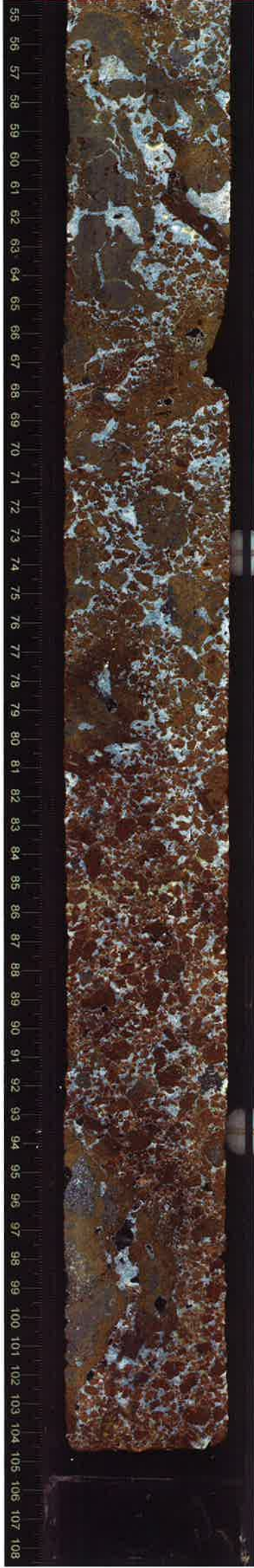
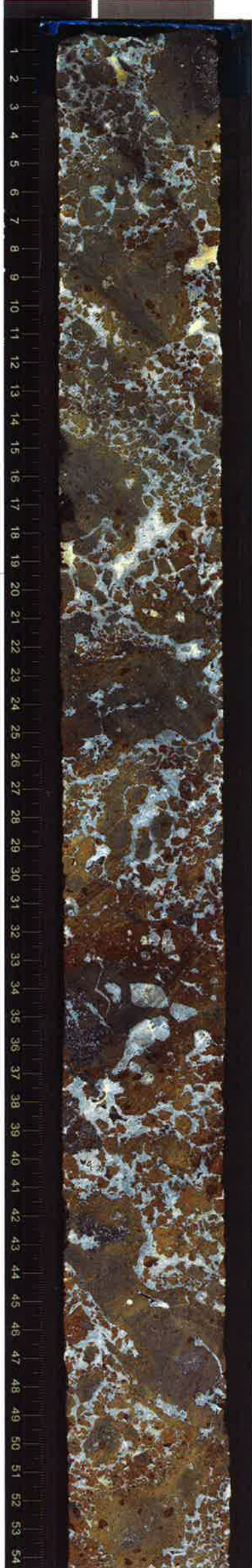


original  
color

Voidr filled  
with yellow  
clay in this  
interval.  
after cement!

330-U1374A-9R-5-A\_SHLF2744771\_20110108075223

Yellowish  
clay  
partly  
filled  
the void  
after  
cement



330-U1374A-10R-1-A\_SHLF2745111\_20110108122752

UNIT 8  
CONTINUED  
PIECE 1

▷ MODERATELY OLIVINE-  
PHYRIC BASALT BRECCIA

OLIVINE 5%  
4mm, 2mm  
EUXENIAL  
COMPLETELY  
ALTERED

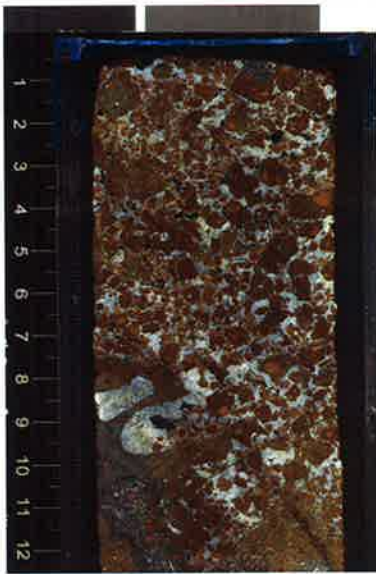
DESCRIPTION: VOLCANIC  
BRECCIA

INTERPRETATION:  
VOLCANICLASTIC

ORANGE-GRAY  
FINE-GRAINED, 0.1mm  
FELDSPAR LAMIS IN GROUNDMASS  
COMPLETELY ALTERED RIMS  
TO CLASTS (ALTERED GLASS)

VOLCANIC ATTRIBUTES:

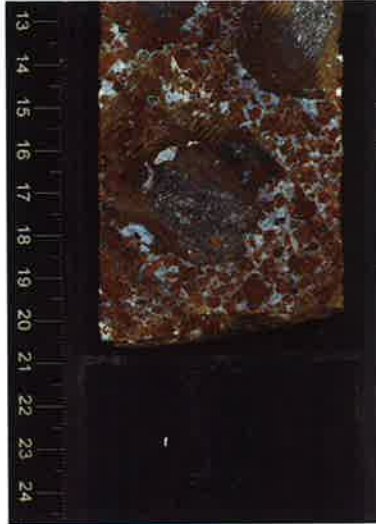
- 75% CLASTS + MATRIX
- 8mm MODE
- LOW SPHERICITY
- ANGULAR
- POORLY SORTED
- LARGER FRAGMENTS (>50mm) MORE  
ROUNDED WITH ALTERED MARGINS (GLASS?)
- PILLOWS?



completely (Altered)  
altered  
3-A, 4-A +  
5-A

7.5-15cm  
CLAST VESICULARITY  
10% TYPE 1  
MODERATE  
SUBROUNDED  
3mm, 0.1mm

Calcite  
matrix  
(Altered)  
altered margins  
(KAR)

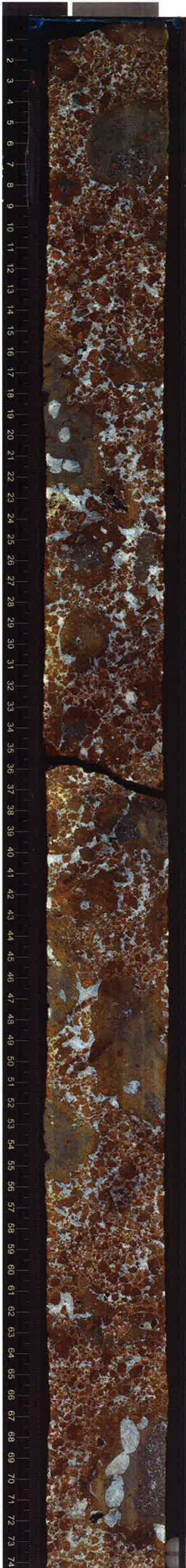


15cm  
15.5 15.5-18.5  
CLAST VESICULARITY  
TYPE 1  
18.5

Slightly altered  
matrix of matrix  
clasts. Completely  
altered margins  
(Altered to section  
10R-1A, 2A  
3-A, 4-A + 5-A)

Calcite in  
veins  
generally 100% filled  
Some zeolite in  
veins

UNIT 8  
CONTINUED  
1a-1c



4.5  
4.5-8.5cm  
CLAST VESICULARITY  
TYPE 1

8.5

15.5  
15.5-24  
CLAST VESICULARITY  
TYPE 2  
3%  
10mm MAX,  
7mm MODE  
MODEANTE,  
SUBANGULAR

24  
24.5  
24.5-27cm  
CLAST VESICULARITY  
TYPE 1

27

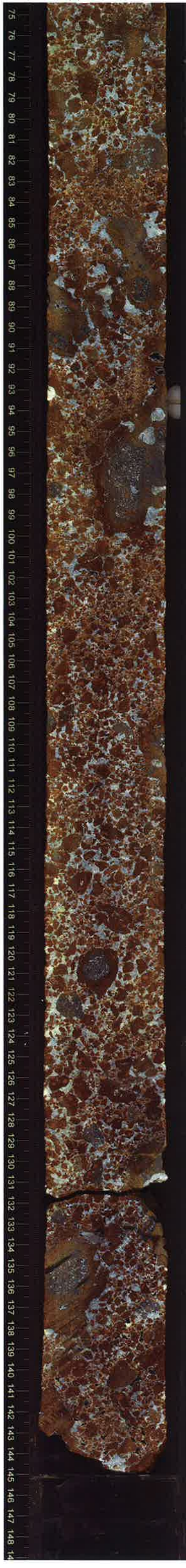
37.5  
37.5-40cm  
CLAST VESICULARITY  
40 TYPE 1

46  
46-53cm  
CLAST  
VESICULARITY  
TYPE 2

53

67  
67.5-73cm  
CLAST  
VESICULARITY  
TYPE 1

73



85  
SEVERAL  
CLASTS  
WITH  
TYPE 1  
VESICULARITY  
85-100.5cm

100.5

120  
CLAST VESICULARITY  
TYPE 1 120-122cm  
122

134.5  
CLAST  
VESICULARITY  
TYPE 1  
134.5-137cm

137cm

UNIT 8  
CONTINUED  
PIECE 1 - 117



1 CLAST  
VESICULARITY  
2 TYPE 1  
1-2cm

6  
CLAST  
VESICULARITY  
TYPE 1  
6-10cm

10

24  
CLAST  
VESICULARITY  
TYPE 2  
WITH BIGGER  
VESICLE  
29mm MAX  
29-42cm

42

43  
CLAST  
VESICULARITY  
TYPE 1 43-46cm

46

54-58 vein,  
irreg., loc. oriented

62  
CLAST  
VESICULARITY  
TYPE 1  
62-66.5cm

68.5

71.5  
CLAST  
VESICULARITY  
TYPE 1  
71.5-74.5cm

74.5

*Calcite*



Some  
zeolite

93  
CLAST VESICULARITY  
TYPE 1 93-98cm

98

113  
CLAST VESICULARITY  
TYPE 1, 113-117cm

117

133 CLAST VESICULARITY  
TYPE 1, 133-137cm

137

139  
CLAST VESICULARITY  
TYPE 2, 139-142cm

142