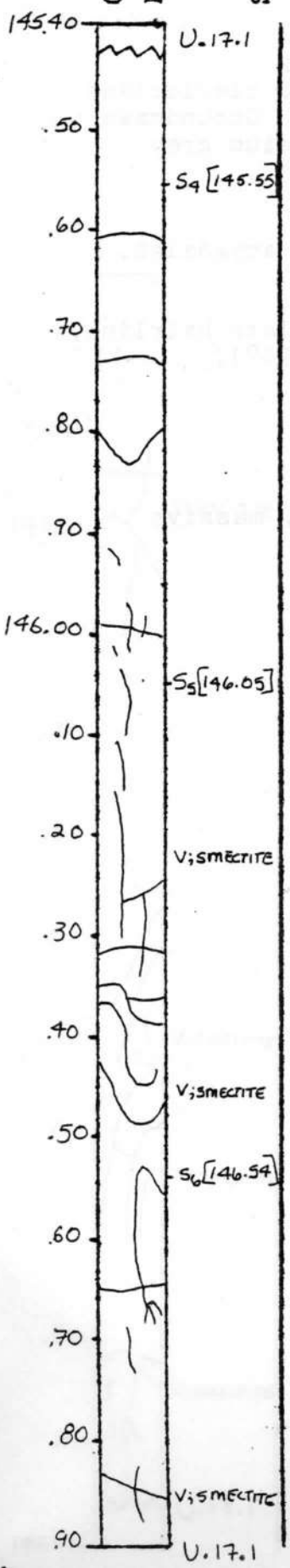
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 14543 **cm to** 14692 **cm**

Box 24 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 17.1
Porphyritic basalt. Phenocrysts (20-25%) of euhedral plagioclase laths and rare clinopyroxene (1-2%). Plagioclase micro to 1.5cm, clinopyroxene 1-3mm. Groundmass medium grey, holocrystalline, granular, equigranular basalt.

VESICLES/AMYGDALES
Rare small (1-2mm) vesicles and dark filled amygdales.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-30°) and higher angled at 145.80. Veinlets at high angles (80-90°), smectite filled, as are the cracks. Vein from 146.55 to 146.70 filled with smectite and minor calcite and zeolite.

ROCK ALTERATION
None observed.

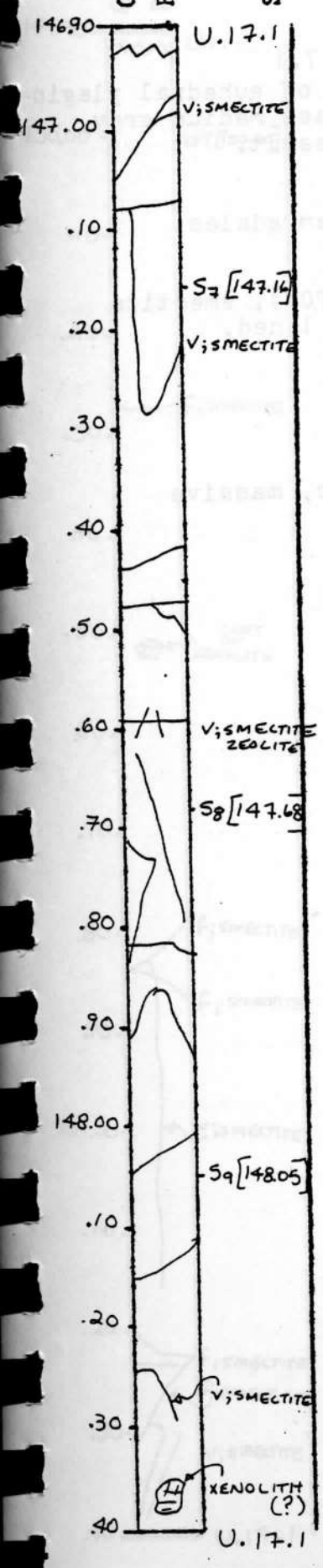
STRUCTURE
Equigranular, holocrystalline, porphyritic, massive basalt (unit 17.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 14692 **cm to** 14840 **cm**

Box 24 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 17.1
Porphyritic basalt. Phenocrysts of euhedral plagioclase micro to 1.5cm in length (20-25%). Groundmass equigranular, granular, holocrystalline, medium grey basalt.

VESICLES/AMYGDALES
Rare small (1-2mm) vesicles and amygdales with dark filling (smectite).

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-15°) and about 45°, smectite filled. 0.5 cm thick smectite filled vein at 147.20 - 147.25. Another 0.5cm vein at 147 - 148, smectite and zeolite filled.

ROCK ALTERATION
None observed.

OTHER
148.35 A clot of medium to coarse grained plagioclase and clinopyroxene. Ophitic texture. Plagioclase grains about 0.5 to 1.5cm in length. Clot about 3cm x 2cm.

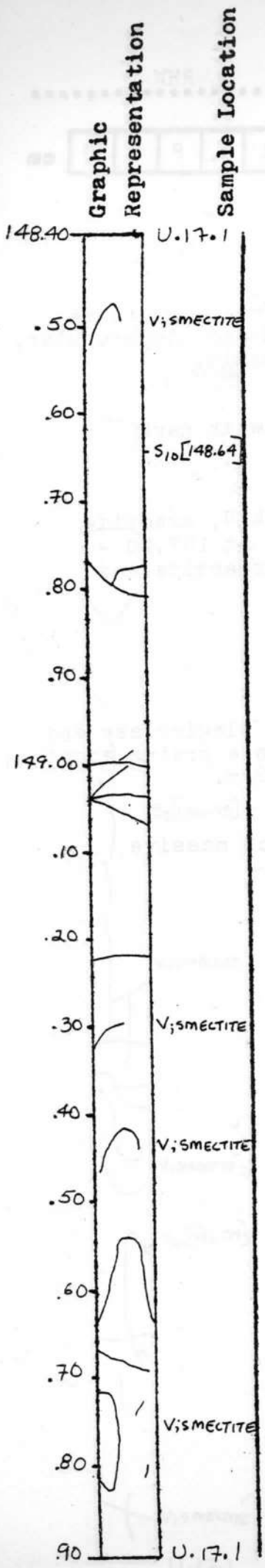
STRUCTURE
Equigranular, holocrystalline, porphyritic, massive basalt (unit 17.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 1 4 8 4 0 **cm to** 1 4 9 9 0 **cm**

Box 24 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 17.1
Porphyritic basalt. Phenocrysts (20-25%) of euhedral plagioclase, micro to 1.5cm in length. Groundmass medium grey, granular, equigranular, holocrystalline basalt.

VESICLES/AMYGDALES
Minor vesicles and green smectite filled amygdales.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal and high angled (70°), smectite lined. Veinlets high angled and smectite lined.

ROCK ALTERATION
None observed.

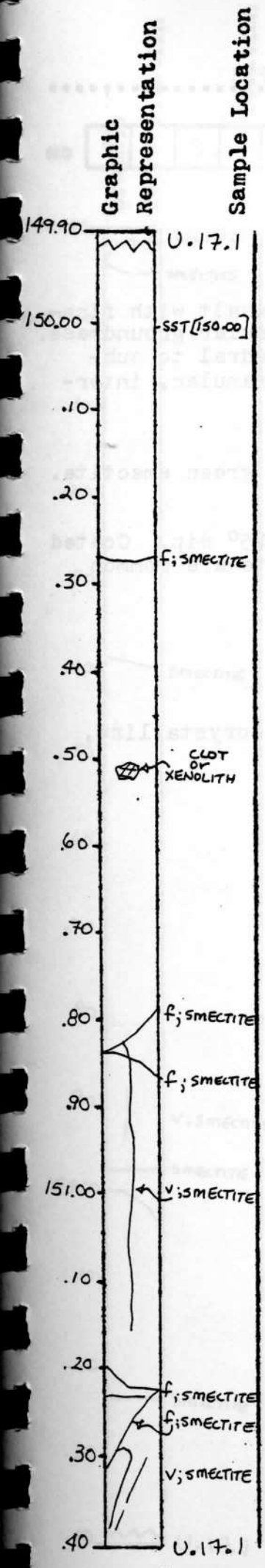
STRUCTURE
Equigranular, holocrystalline, porphyritic, massive basalt (unit 17.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 14991 **cm to** 15140 **cm**

Box 25 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 17.1
Grey to greenish-grey, plagioclase-phyric basalt with fine- to medium-grained, holocrystalline, equigranular groundmass. Plagioclase phenocrysts 15-20%, 2-15mm seriate, euhedral to subhedral laths. Clinopyroxene phenocrysts 2-3mm, anhedral intergrowths with plagioclase, about 2%. Grain size uniform through section. No contacts.

VESICLES/AMYGDALES
Less than 1%, 1-2mm, spherical, filled with green smectite,

FRACTURES - VEINS - BRECCIA
Fractures sparse, either subhorizontal or dipping about 60°. Hairline veinlets of smectite dip 70-80°.

ROCK ALTERATION
None observed.

OTHER
Coarse-grained clot or xenolith at 150.52. Consists of moderately coarse-grained mixture of plagioclase, about 10mm long intergrown with clinopyroxene in ophitic arrangement.

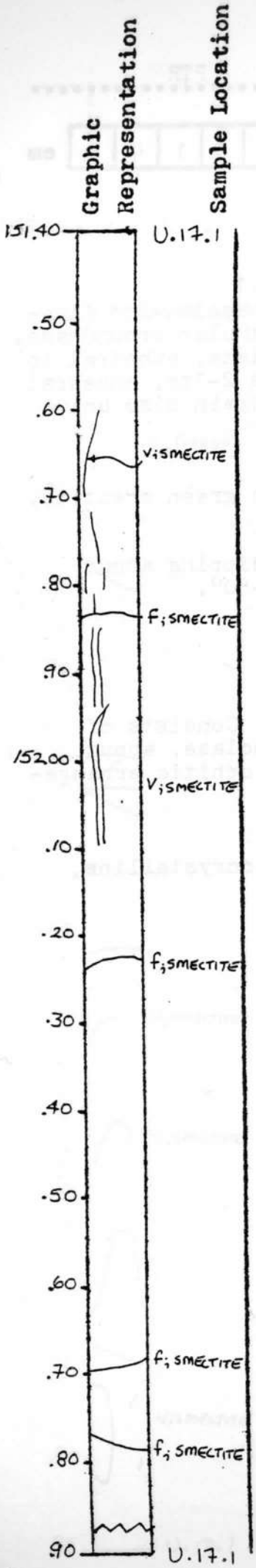
STRUCTURE
Fine- to medium-grained, equigranular, holocrystalline, massive basalt (unit 17.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 151.40 **cm to** 152.87 **cm**

Box 25 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 17.1
Grey to greenish-grey, plagioclase phyric basalt with fine- to medium-grained, holocrystalline, equigranular groundmass. Plagioclase phenocrysts 15-20%, 2-15mm, euhedral to sub-hedral laths. Clinopyroxene 1-2%, 1-2mm, granular, inter-grown with plagioclase.

VESICLES/AMYGDALES
Less than 1%, 1-2mm, spherical, filled with green smectite.

FRACTURES - VEINS - BRECCIA
Very few natural fractures. All less than 15° dip. Coated with smectite. Veinlets filled with smectite are common and steep - 80-90°.

ROCK ALTERATION
None observed.

STRUCTURE
Fine- to medium-grained, equigranular, holocrystalline, massive basalt (unit 17.1).

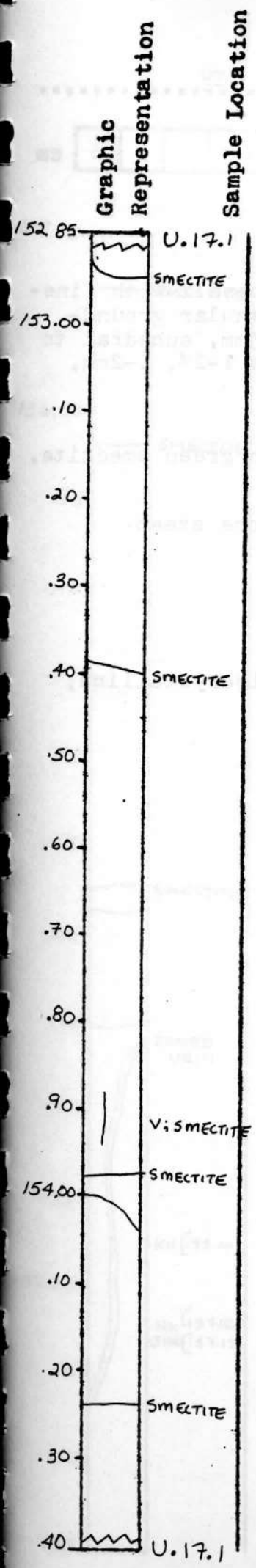
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 1 5 2 8 7 **cm to** 1 5 4 3 9 **cm**

Box 25 , Section 3

Depth interval adjusted at top.



LITHOLOGY PETROGRAPHY - continues unit 17.1
Grey to greenish-grey plagioclase phyric basalt with fine- to medium-grained, holocrystalline, equigranular groundmass. Plagioclase phenocrysts 15-20%, 2-15mm, euhedral to subhedral laths. Clinopyroxene granular, 1-2%, 1-2mm.

VESICLES/AMYGDALES
Less than 1%, 1-2mm, spherical, filled with green smectite.

FRACTURES - VEINS - BRECCIA
Sparse fractures, mostly subhorizontal, i.e. less than 15°. A few about 40-50°. All coated with smectite.

ROCK ALTERATION
None observed.

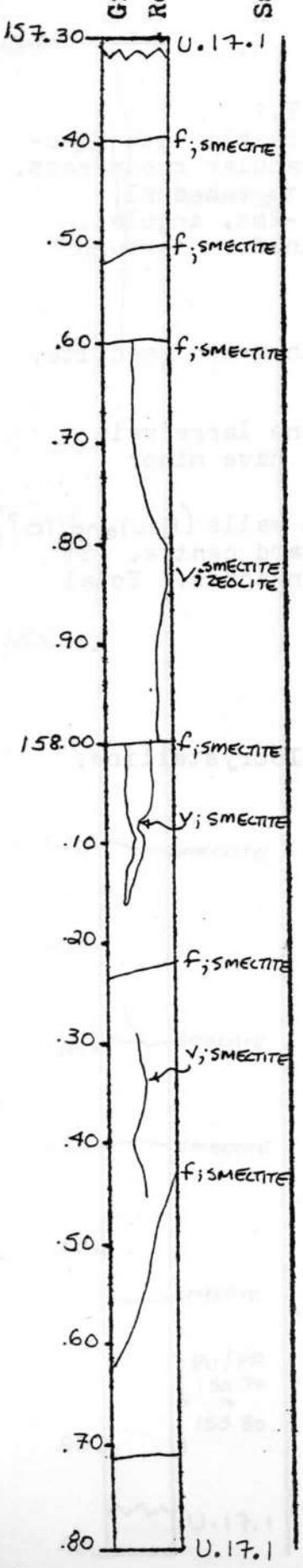
STRUCTURE
Fine- to medium-grained, holocrystalline, massive basalt (unit 17.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 157.32 cm to 158.83 cm

Box 26 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 17.1
Grey to greenish-grey, plagioclase phyric basalt with fine- to medium-grained, holocrystalline, equigranular groundmass. Plagioclase phenocrysts, 15-20%, euhedral to subhedral laths seriate from 2-15mm. Clinopyroxene phenocrysts 1-2%, 1-2mm, angular, intergrown with plagioclase. Grain size uniform through section. No contacts.

VESICLES/AMYGDALES
Less than 1%, 1-2mm, spherical, filled with green smectite.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal except for one at about 80°. All coated with smectite. Hairline veinlets filled mostly with smectite and minor zeolite.

ROCK ALTERATION
None observed.

STRUCTURE
Fine- to medium-grained, equigranular, holocrystalline, massive basalt (unit 17.1).

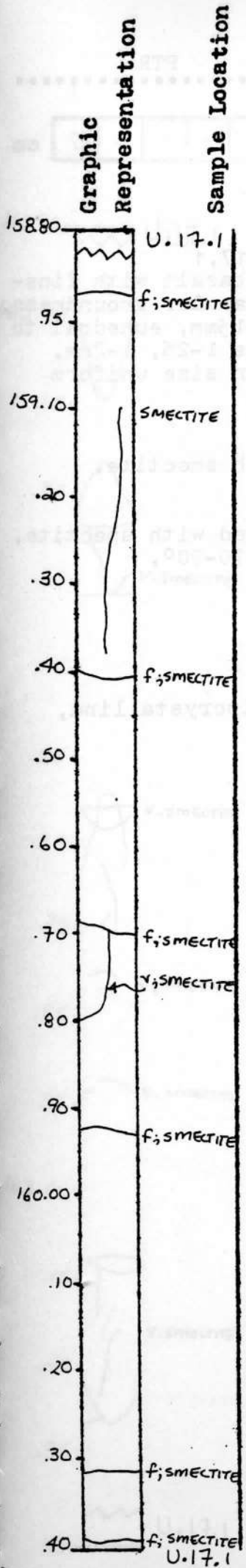
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 15883 **cm to** 16040 **cm**

Box 26 , Section 3

Depth interval adjusted at top.



LITHOLOGY PETROGRAPHY - continues unit 17.1
Grey to greenish-grey plagioclase-phyric basalt with fine- to medium-grained, holocrystalline, equigranular groundmass. Plagioclase phenocrysts 15-20%, seriate from 2-15mm, euhedral to subhedral laths. Clinopyroxene phenocrysts 1-2%, 1-2mm, angular, intergrown with plagioclase.

VESICLES/AMYGDALES
Less than 1%, 102mm, spherical, filled with green smectite.

FRACTURES - VEINS - BRECCIA
Most fractures about 15°, one at 50°. All coated with smectite. Hairline veinlets 80-90°, filled with smectite.

ROCK ALTERATICN
None observed.

STRUCTURE
Fine- to medium-grained, equigranular, holocrystalline, massive basalt (unit 17.1).

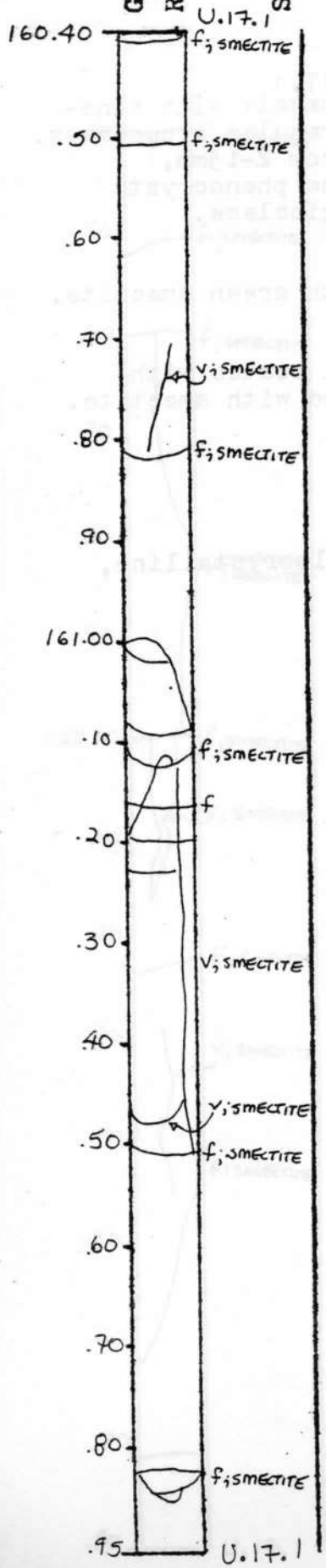
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 16040 **cm to** 16196 **cm**

Box 26 , Section 4

Depth adjusted at base.



LITHOLOGY PETROGRAPHY - continues unit 17.1
Grey to greenish-grey, plagioclase phyric basalt with fine- to medium-grained, holocrystalline, equigranular groundmass. Plagioclase phenocrysts 15-20%, seriate 2-15mm, euhedral to subhedral laths. Clinopyroxene phenocrysts 1-2%, 1-2mm, angular, intergrown with plagioclase. Grain size uniform through section. No contacts.

VESICLES/AMYGDALES
Less than 1%, 1-2mm, spherical, filled with smectite.

FRACTURES - VEINS - BRECCIA
Most fractures 10-15°, a few 50-60°. Coated with smectite. Hairline veinlets of smectite are steep - 70-90°.

ROCK ALTERATION
None observed.

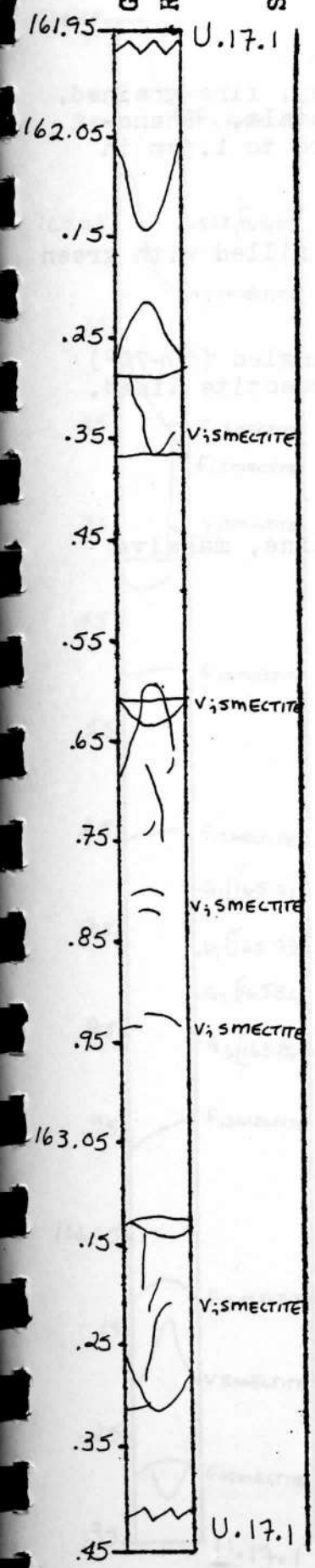
STRUCTURE
Fine- to medium-grained, equigranular, holocrystalline, massive basalt (unit 17.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 16196 **cm to** 16342 **cm**

Box 27 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 17.1
Porphyritic basalt. Groundmass granular, equigranular, holocrystalline, medium grey basalt. Phenocrysts (20-25%) generally euhedral, micro to 1.5cm length. Rare clinopyroxene phenocrysts, 2-3mm diameter.

VESICLES/AMYGDALES
Rare small (1-2mm) vesicles and amygdales filled with dark green smectite.

FRACTURES - VEINS - BRECCIA
Fractures both subhorizontal (0-20°) and high angled (70°) lined with smectite. Veinlets generally high angled (60-70°) and hairline, smectite filled.

ROCK ALTERATION
None observed.

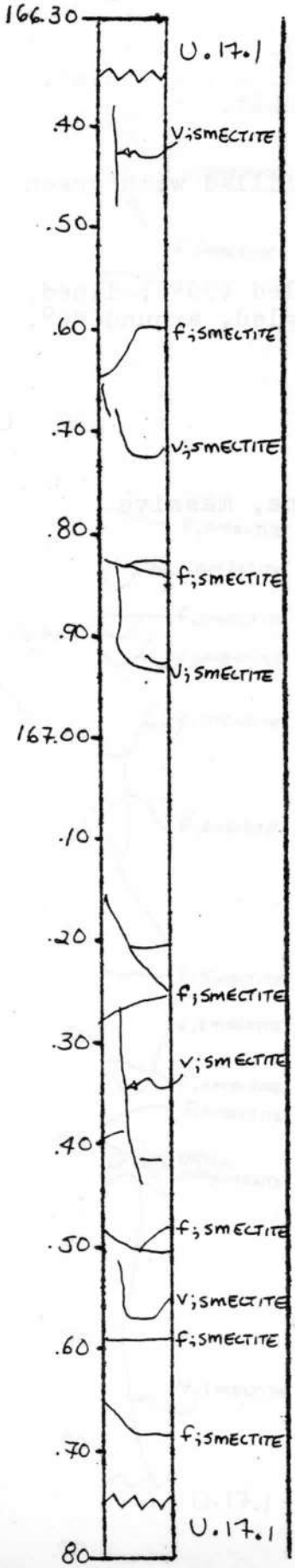
STRUCTURE
Equigranular, holocrystalline, porphyritic, massive basalt (unit 17.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 16635 **cm to** 16775 **cm**

Box 27 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 17.1
Porphyritic basalt. Groundmass medium grey, granular, equigranular, holocrystalline, fine-grained basalt. Phenocrysts (20-25%) euhedral plagioclase laths, micro to 1.5cm in length. Rare clinopyroxene (1-2%).

VESICLES/AMYGDALES
Rare vesicles and amygdales filled with dark green smectite (1-2mm).

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-30°) and high angled (60-70°). High angled veinlets with smectite filling - hairline.

ROCK ALTERATION
None observed.

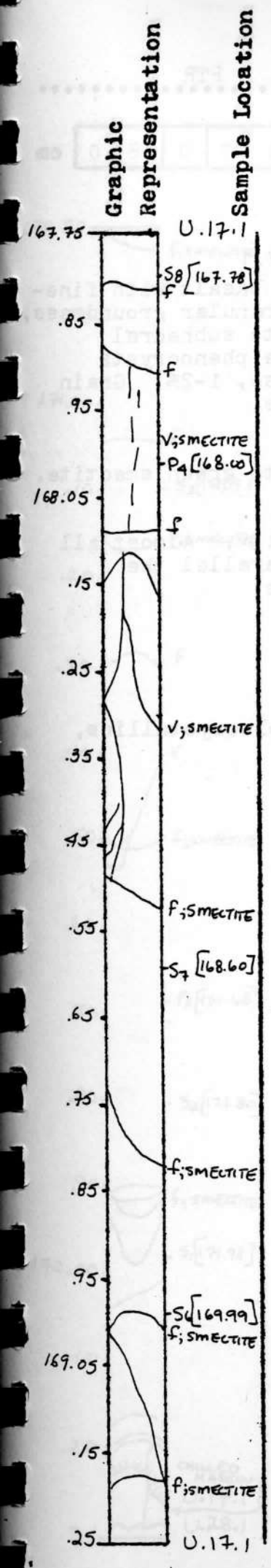
STRUCTURE
Fine-grained, equigranular, holocrystalline, porphyritic, massive basalt (unit 17.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 16775 **cm to** 16925 **cm**

Box 28 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 17.1
Grey to greenish-grey, plagioclase phyric basalt with fine- to medium-grained, holocrystalline, equigranular groundmass. Plagioclase phenocrysts 15-20%, euhedral to subhedral laths, seriate from 2-15mm. Clinopyroxene phenocrysts 1-2%, 2-3mm, granular, intergrown with plagioclase.

VESICLES/AMYGDALES
Less than 1%, 1-2mm, spherical, filled with green smectite.

FRACTURES - VEINS - BRECCIA
Fractures 0-15° and 50-70°. All smectite coated. Many hairline smectite veinlets are near vertical.

ROCK ALTERATION
None observed.

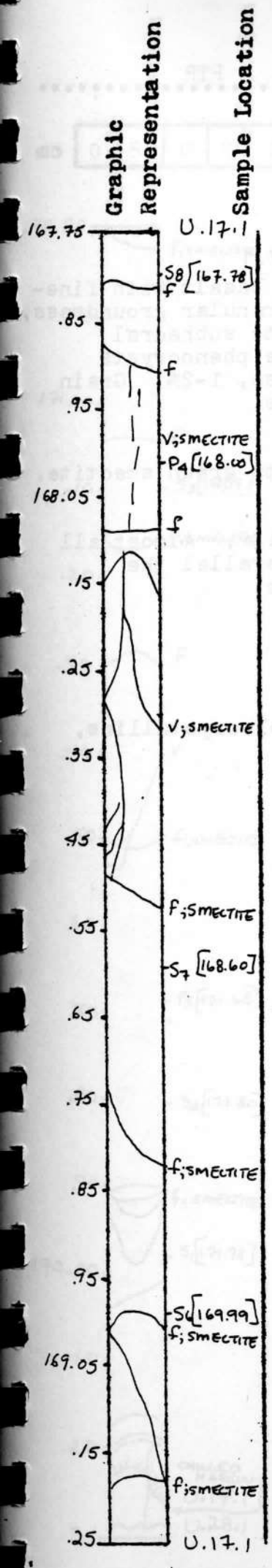
STRUCTURE
Fine- to medium-grained, equigranular, holocrystalline, porphyritic, massive basalt (unit 17.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 167.75 **cm to** 169.25 **cm**

Box 28 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 17.1
Grey to greenish-grey, plagioclase phyric basalt with fine- to medium-grained, holocrystalline, equigranular groundmass. Plagioclase phenocrysts 15-20%, euhedral to subhedral laths, seriate from 2-15mm. Clinopyroxene phenocrysts 1-2%, 2-3mm, granular, intergrown with plagioclase.

VESICLES/AMYGDALES
Less than 1%, 1-2mm, spherical, filled with green smectite.

FRACTURES - VEINS - BRECCIA
Fractures 0-15° and 50-70°. All smectite coated. Many hairline smectite veinlets are near vertical.

ROCK ALTERATION
None observed.

STRUCTURE
Fine- to medium-grained, equigranular, holocrystalline, porphyritic, massive basalt (unit 17.1).

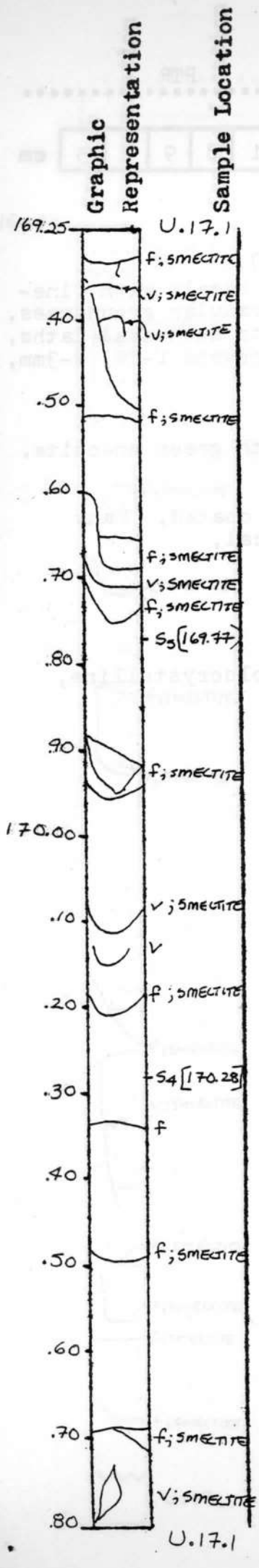
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 16925 **cm to** 17080 **cm**

Box 28 , Section 2

Depth adjusted at top.



LITHOLOGY PETROGRAPHY - continues unit 17.1

Grey to greenish-grey, plagioclase-phyric basalt with fine- to medium-grained, holocrystalline, equigranular groundmass. Plagioclase phenocrysts 15-20%, euhedral to subhedral laths, seriate from 2-15mm. Clinopyroxene phenocrysts 2-3mm, angular, intergrown with plagioclase, 1-2%. Grain size uniform through section. No contacts.

VESICLES/AMYGDALES

Less than 1%, 1-2mm, spherical, filled with green smectite.

FRACTURES - VEINS - BRECCIA

Fractures mostly steep 60-70°. A few 10-15°. Almost all lined with smectite. Smectite veinlets parallel the steep fractures and are less than 1mm wide.

ROCK ALTERATION

None observed.

STRUCTURE

Fine- to medium-grained, equigranular, holocrystalline, porphyritic, massive basalt (unit 17.1).

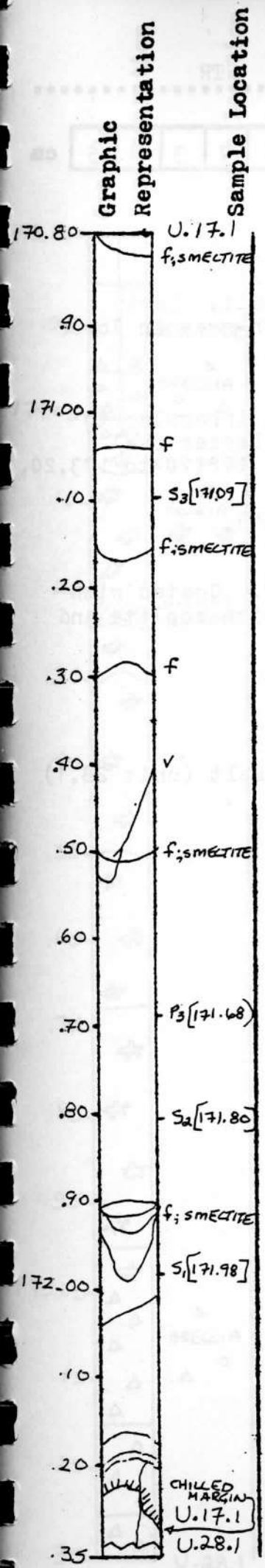
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 170 80 cm to 172 33 cm

Box 28 , Section 3

Depth interval adjusted at base.



LITHOLOGY PETROGRAPHY . - continues unit 17.1
Upper part of core to about 171.80 is very similar to preceeding section. It is grey to greenish-grey, fine- to medium-grained, porphyritic basalt with fine- to medium-grained holocrystalline, equigranular groundmass. Plagioclase phenocrysts 15-20%, seriate 2-15mm, euhedral to subhedral laths. Clinopyroxene phenocrysts 1-2%, 2-3mm, anhedral intergrown with plagioclase.

171.80 The rock rapidly becomes less phyric and phenocrysts decrease in size.

171.96 Phenocryst content drops to about 2% and rock is aphyric by 172.10. Groundmass also becomes fine-grained, passing into chilled margin at about 172.27. Some steep discoloured bands occur at 172.15 down to contact. Origin of these not clear but appear to be due to minor alteration.

172.27 Contact is very irregular on small scale, but overall dips about 60°.

Unit 28.1. This unit is fine-grained, greenish-grey, aphyric basalt. Irregular colour pattern, probably due to minor alteration along fractures. Non-vesicular.

VESICLES/AMYGDALES
Less than 1%, 1-2mm, spherical, filled with green smectite.

172.27 None

FRACTURES - VEINS - BRECCIA
Fractures mostly less than 20°, a few fractures and veinlets about 60°. All filled with smectite.

172.27 Minor fracture and veinlet with smectite.

ROCK ALTERATION
172.27 Discolouration along fractures.

STRUCTURE
170.80 - 172 30 Fine- to medium-grained, equigranular, holocrystalline, porphyritic, massive basalt (unit 17.1), chilled against the underlying unit.

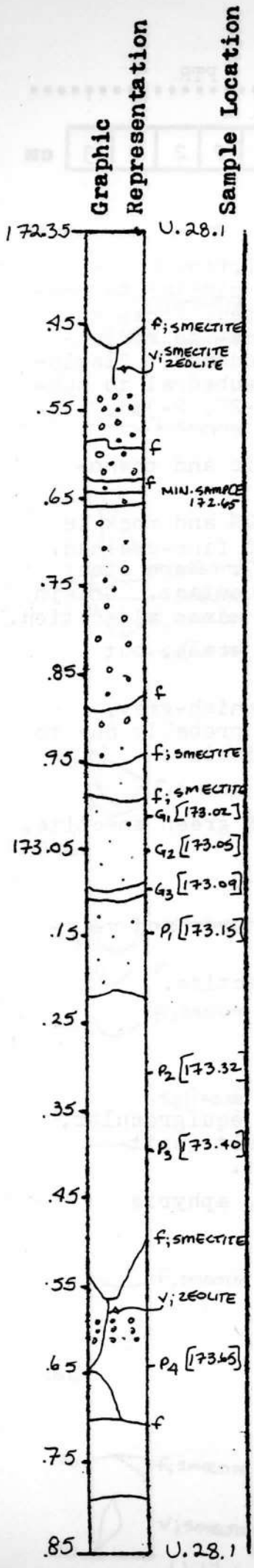
172.30 - 172.33 Unit 28.1 ; Fine-grained, aphyric basalt.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR .....

Depth Interval 172.33 cm to 173.85 cm

Box 28 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 28.1
Fine-grained, holocrystalline, aphyric basalt. Dark greenish-grey in upper 15cm, light greenish-grey in lower part. Interpreted as vesicular lava flow.

VESICLES/AMYGDALES
Sparsely vesicular throughout, mostly 1mm, irregular to ovate, filled with zeolite and smectite. Larger oval amygdales to 1cm long in zone from approx. 172.70 to 173.20. Filled with smectite and zeolite.

172.65 Large patch of zeolite (laumontite?).

FRACTURES - VEINS - BRECCIA
Most fractures less than 20°, a few 50-60°. Coated with smectite. A few hairline veinlets lined with zeolite and smectite.

ROCK ALTERATION
None observed.

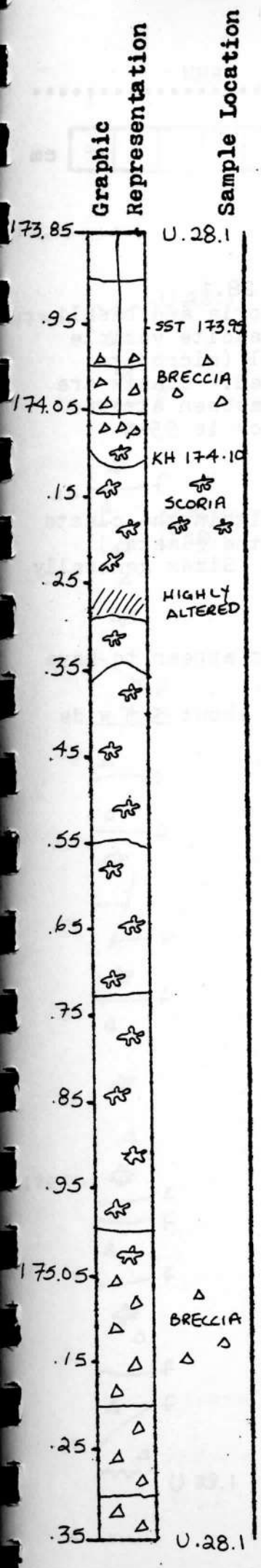
STRUCTURE
Fine-grained, holocrystalline, aphyric basalt (unit 28.1)

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 17385 **cm to** 17535 **cm**

Box 29 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 28.1
Top consisting of grey-green, aphyric altered vesicular amygdaloidal basalt, grading into a thin breccia zone of small angular clasts (1-2cm).

174.08 Abrupt change to scoria. Much more vesicular than the above unit including a large block in the flow breccia 174.20 to 174.40. Possible unit boundary if large block is actually scoriaceous flow top of next unit.

175.05 Scoria continues, grading into a breccia at this point. Breccia is amygdaloidal, vesicular, poorly sorted, sizes of angular fragments from 1mm to greater that the core diameter.

VESICLES/AMYGDALES
In altered basalt unit, vesicles and amygdales common but not plentiful (1-3% of volume). Zeolite filling. Size up to 5mm.

174.08 In scoria zone, vesicles vary between 20-30%. Amygdales filled with calcite and zeolite (laumontite) (except in highly altered zone). Towards the bottom of the zone, vesicles decrease to about 5% of volume. Amygdales vary in size from 2-3mm up to 2-3cm).

175.05 Brecciated zone vesicular and amygdaloidal, 10% by volumefilled with calcite and zeolite. Vesicles are elongate, 0.5cm to 1mm in length.

FRACTURES - VEINS - BRECCIA
Fractures are generally subhorizontal, 0-15°. They aren't lined with any special mineral. The single vein is zeolite filled, and 3-5mm thick.

ROCK ALTERATION
174.30 Extreme alteration has caused loss of original features. Rock is light grey and very soft, chalky.

STRUCTURE
173.85 - 173.97 Fine-grained, holocrystalline, aphyric, massive basalt (unit 28.1).

173.97 - 174.08 Brecciated zone (unit 28.1).

174.08 - 175.05 Scoriaceous zone (unit 28.1).

175.05 - 175.35 Brecciated zone (unit 28.1).

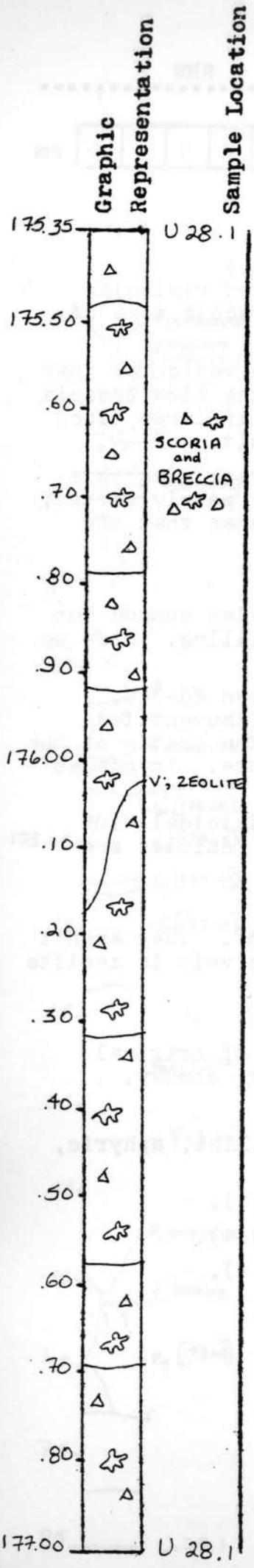
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 175.35 **cm to** 176.98 **cm**

Box 29 , Section 2

Depth interval adjusted top and bottom.



LITHOLOGY PETROGRAPHY - continues unit 28.1
Scoriaceous breccia. Breccia blocks of scoria and basalt. Scoria is amygdaloidal, with zeolite and calcite vesicle filling. Block size ranges from very small (micro) to larger than the core diameter, poorly sorted. Clasts are somewhat angular. Matrix of the breccia hasbeen altered and replaced by zeolites (laumontite). Rock is 95+% clasts.

VESICLES/AMYGDALES
Vesicles in the clasts constitute 20-30% within the clasts that are scoriaceous. (Perhaps 30-40% of the clasts.) Amygdales filled with zeolite and calcite. Sizes generally small, 3-5mm.

FRACTURES - VEINS - BRECCIA
Fractures all subhorizontal (0-10°), do not appear to have any special mineral lining.

176.01 The single vein is zeolite filled, about 5mm wide at widest.

ROCK ALTERATION
None observed.

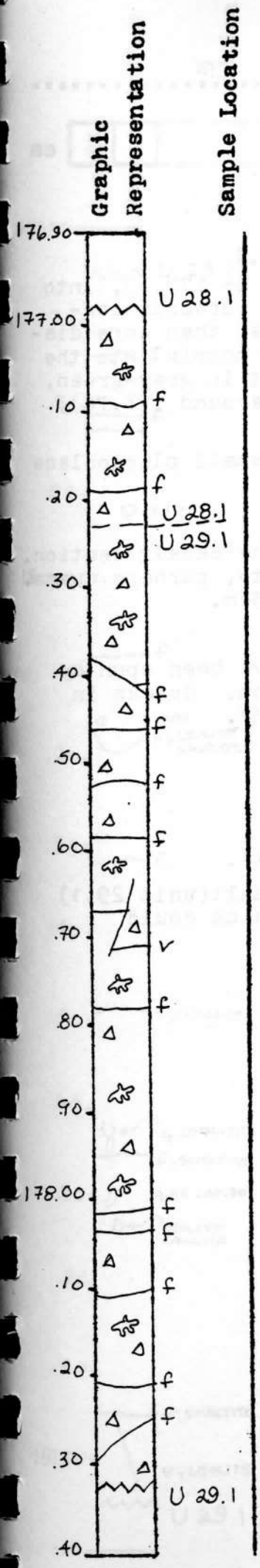
STRUCTURE
Scoriaceous breccia.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 176.98 cm to 178.33 cm

Box 29 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 28.1
Scoriaceous breccia. Amygdaloidal, scoriaceous breccia blocks, poorly sorted. Angular blocks of scoria and basalt (40-60%). Matrix partially replaced by zeolite (laumontite?). Size range micro to greater than core diameter.

177.23 Unit 29.1. The character of the breccia changes. Clasts are much more rounded and the scoriaceous component goes down to about 10% (still amygdaloidal). Matrix has only slight zeolite replacement (1-2%). Size range still great, micro to greater than core diameter. Clasts greater than 90% of volume, as in upper breccia.

VESICLES/AMYGDALES
Vesicles and amydales are located in the scoriaceous clasts. They are generally small (1-3mm), filled with calcite and zeolites. Character doesn't appreciably change across the chosen contact point, but the amount does.

FRACTURES - VEINS - BRECCIA
Fractures generally subhorizontal, occasionally to 30°. Many have been spun in the drill pipe and leave little detail. The one vein is hairline, and filled with a dark material (smectite?).

ROCK ALTERATION
None observed.

STRUCTURE
176.98 - 177.23 Scoriaceous (angular)breccia (unit 28.1)

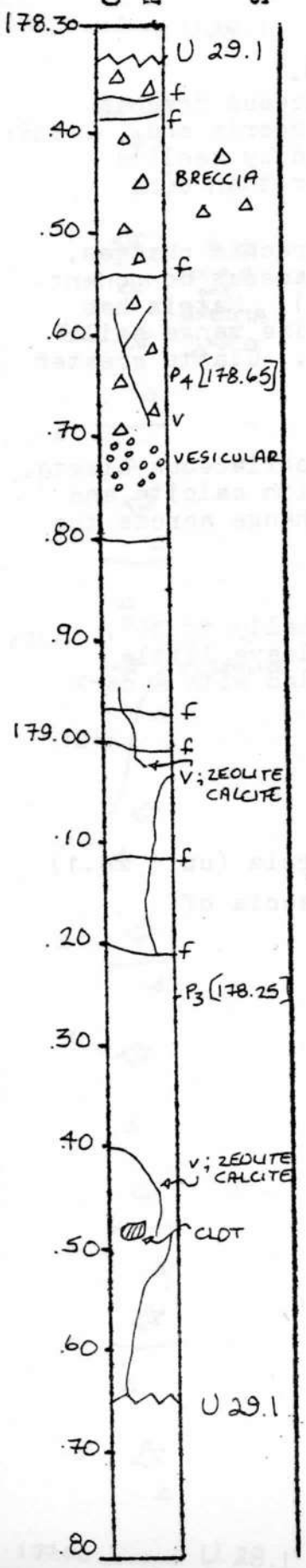
177.23 - 178.33 Scoriaceous (rounded) breccia of unit 29.1.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 178.33 cm to 179.65 cm

Box 29 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 29.1

Basalt breccia at top of section, grading, by 178.80, into a massive, fine-grained grey-green basalt. Breccia consisting of unsorted clasts, micro to greater than core diameter, rounded, aphyric. Grading from 40% matrix into the massive basalt (no clasts). Massive basalt is grey-green, fine-grained, vesicular in only one spot (around 178.70), aphyric.

179.40 There is a small (0.75cm) clot of small plagioclase laths.

VESICLES/AMYGDALES

Amygdales exist in the vesicular part of the basalt section. Filling consists of both calcite and zeolite, perhaps quartz. Vesicles are small, generally less than 0.5cm.

FRACTURES - VEINS - BRECCIA

Fractures are subhorizontal (0-10°) and have been spun by the drilling at the upper end of the section. Cracks in the massive part have a thin smectite lining.

ROCK ALTERATION

None observed.

STRUCTURE

178.33 - 178.80 Basalt breccia (unit 29.1).

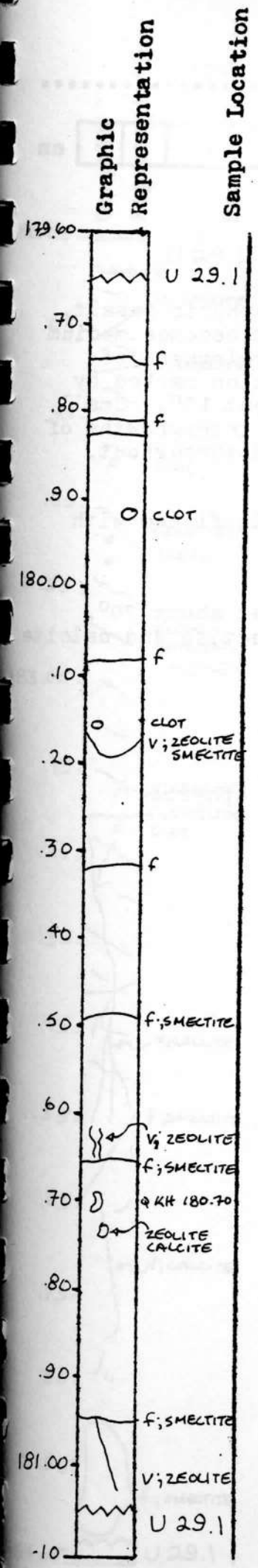
178.80 - 179.65 Fine-grained, massive basalt(unit 29.1) Near base of segment, dark bands appear which could be traces of flow banding.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR .....

Depth Interval 1 7 9 6 5 **cm to** 1 8 1 0 6 **cm**

Box 30 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 29.1
Grey to greenish-grey, fine-grained, holocrystalline, aphyric basalt. Scattered clots of medium to coarse-grained intergrowths of plagioclase and clinopyroxene are present throughout. These are subrounded and range from about 4-12mm. This section interpreted as massive centre of a flow because of relation to adjacent sections.

VESICLES/AMYGDALES
Vesicles sparse except in upper 3cm of section. Vesicles about 1mm, spherical to irregular, mostly filled with smectite.

FRACTURES - VEINS - BRECCIA
Fractures all less than 20°. Some coated with smectite. Rare calcite-filled veinlets dip about 60°. Irregular patches of quartz, zeolite and calcite about 1cm across, occur between 180.70 and 180.75.

ROCK ALTERATION
None observed.

STRUCTURE
Fine-grained, holocrystalline, aphyric, massive basalt (unit 29.1).
180.30 - 180.90 Dark streaks that appear nearly vertical.

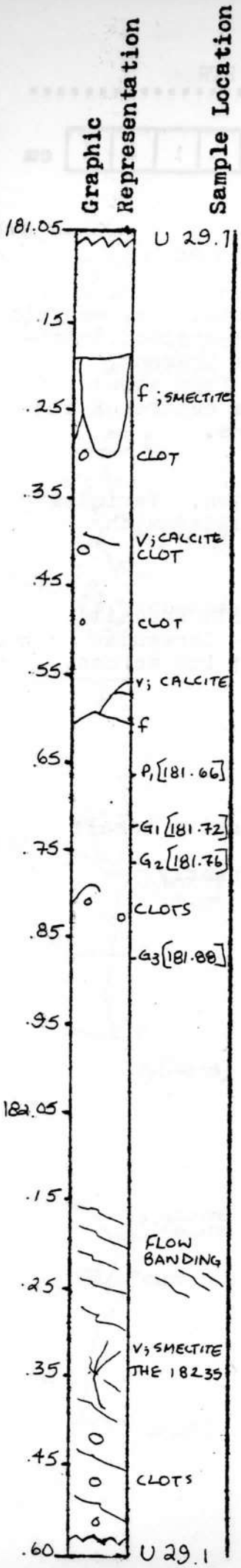
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 18106 cm to 19258 cm

Box 30 , Section 2

Depth adjusted.



LITHOLOGY PETROGRAPHY - continues unit 29.1
Fine- to medium-grained, holocrystalline, aphyric basalt. Grain size is fine to about 182.15, then it becomes medium grained. This change is accompanied by development of prominant flow banding in lower part of section marked by streaks of smectite. Flow banding dips about 10°. Small subrounded clots, 5-12mm of medium-grained intergrowths of plagioclase and clinopyroxene are scattered throughout.

VESICLES/AMYGDALES
Much less than 1%, less than 1mm, spherical, filled with smectite.

FRACTURES - VEINS - BRECCIA
Fractures sparse; most less than 20°, one at about 70°. Coated with smectite. Rare veinlets of smectite and calcite dip 60-70°.

ROCK ALTERATION
None observed.

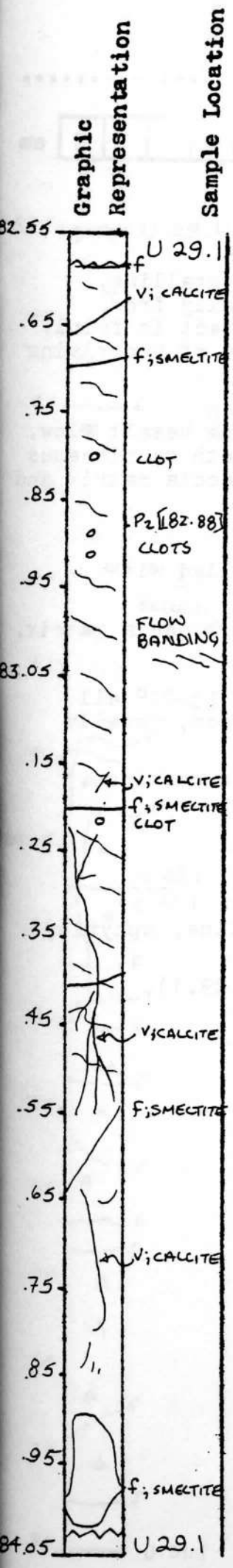
STRUCTURE
Fine- to medium-grained, holocrystalline, aphyric, massive basalt (unit 29.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 1 8 2 5 8 **cm to** 1 8 4 0 2 **cm**

Box 30 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 29.1
Fine- to medium grained, greenish-grey, holocrystalline, aphyric basalt. Medium-grained and flow banded to a depth of about 183.50. Then becomes finer grained and loses flow banding. Flow banding defined by streaks of green smectite and is subhorizontal. Clots of medium-grained intergrowths of plagioclase and clinopyroxene are common throughout and average about 6mm.

VESICLES/AMYGDALES
Much less than 1%, about 1mm, spherical, filled with smectite.

FRACTURES - VEINS - BRECCIA
Fractures sparse, most about 15°, a few about 70°. All coated with smectite. Veinlets of carbonate and possibly zeolite to 2mm wide are common and steeply dipping 70-90°.

ROCK ALTERATION
None observed.

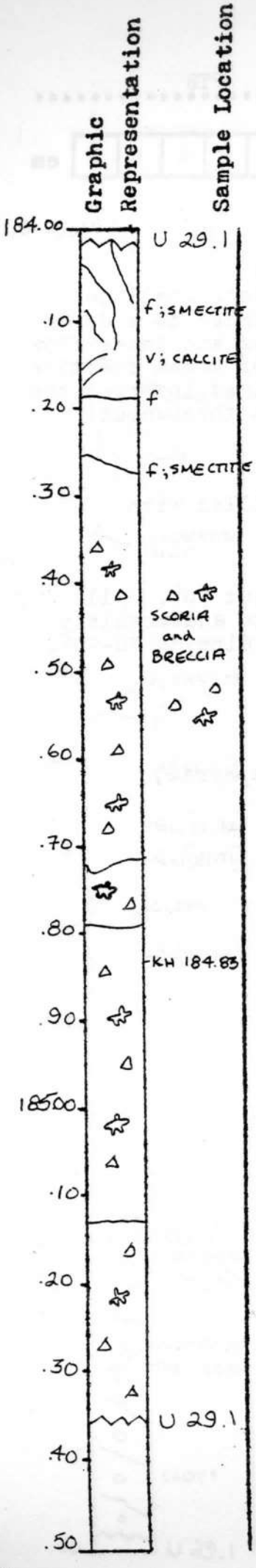
STRUCTURE
Fine- to medium-grained, holocrystalline, aphyric, massive basalt (unit 29.1).
182.58 - 183.50 Flow banded segment.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 18402 **cm to** 18536 **cm**

Box 30 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 29.1
Grey to greenish-grey, fine-grained, holocrystalline, aphyric basalt. Grain size decreases gradually from previous section to contact at 184.36. Contact is fairly sharp transition to scoriaceous flow breccia of underlying unit. No quenching of contact.

184.36 Unit 30.1. Reddish-grey, scoriaceous breccia. Fairly sharp contact with overlying basalt flow. Fragments are angular, mostly 5mm to 5cm, both scoriaceous and massive. Acicular zeolite common in breccia matrix and in scoria amygdales.

VESICLES/AMYGDALES
Much less than 1%, about 1mm, spherical, filled with smectite.

184.36 Zeolite (laumontite?) in scoria and breccia matrix.

FRACTURES - VEINS - BRECCIA
One steep fracture about 70°, several about 15-20° all coated with smectite. Calcite veinlets common, usually hairline to 1mm wide.

184.36 Fractures sparse, less than 15°. No coatings.

ROCK ALTERATION
None observed.

STRUCTURE
184.02 - 184.35 Fine-grained, holocrystalline, aphyric, massive basalt (unit 29.1).

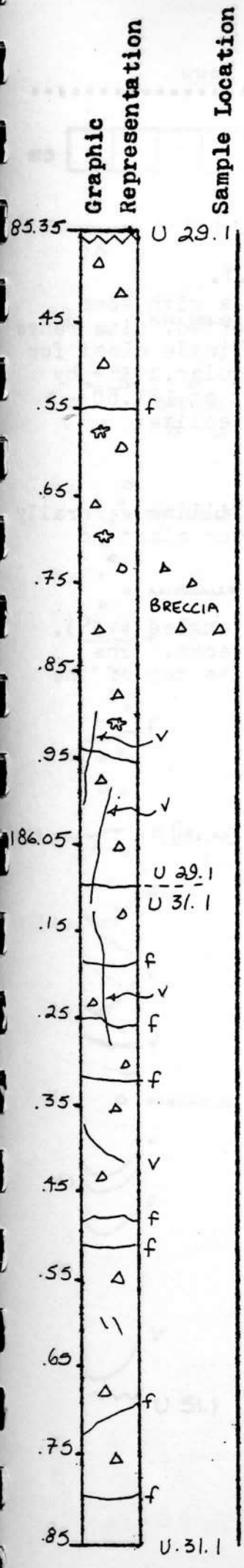
184.35 - 185.36 Scoriaceous breccia (unit 29.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 1 8 5 3 6 **cm to** 1 8 6 8 5 **cm**

Box 31 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 29.1
Basalt breccia. Predominantly basaltic breccia with some scoriaceous clasts. Clasts unsorted, sizes from micro to much greater than core diameter. Generally angular fragments, 95+% by volume. Matrix replaced in part by calcite and zeolite (laumontite). Rarely, vesicular, amygdaloidal clasts (10-15% of total clasts). Contact with unit 31.1 at approximately 186.10.

VESICLES/AMYGDALES
Vesicles and amygdales in selected clasts, filled with calcite and zeolite (laumontite). Size range generally small (1-5mm).

FRACTURES - VEINS - BRECCIA
Fractures generally subhorizontal (0-15°), veinlets high angled and mid angled (60-80°), hairline, and zeolite filled.

ROCK ALTERATION
None observed.

STRUCTURE
185.36 - 186.10 Basalt breccia with some scoriaceous clasts (unit 29.1).

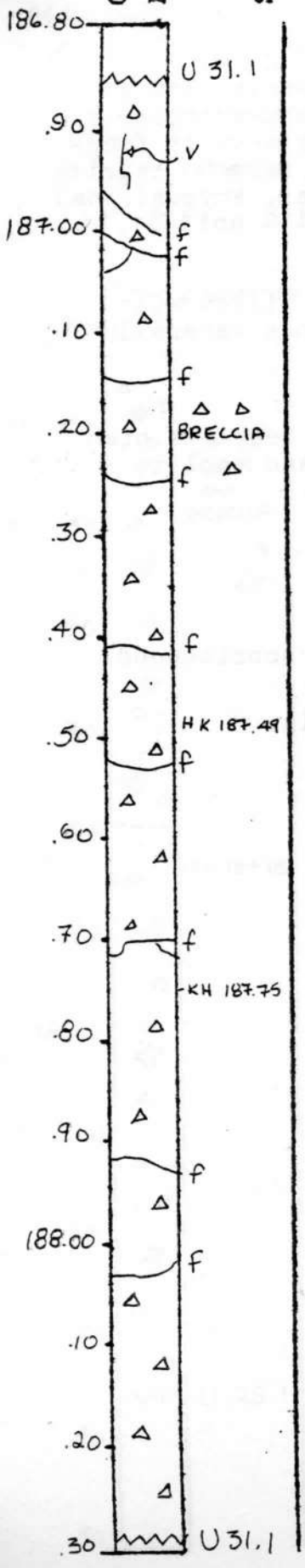
186.10 - 186.85 Unit 31.1 ; Basalt breccia.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 18685 cm to 18829 cm

Box 31 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 31.1.
Basalt breccia - predominantly basalt breccia with some vesicular, amygdaloidal clasts. Clasts unsorted, size range micro to much greater than core diameter. Single clast for first 15cm of section. Clasts generally angular, 95%+ by volume. Large vesicular, amygdaloidal clast at 187.60 - 187.65. Groundmass altered to calcite and zeolite (laumontite?) in many cases (50%+).

VESICLES/AMYGDALES
Vesicles and amygdales in certain clasts. Filling generally calcite and zeolite. Vesicle size varies from clast to clast, largest up to 1cm, down to 1mm.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-10°) or moderate angled (45°). At 187.14, 187,23 pyrite is formed in the cracks. The only real veinlet is in the large clast at the top of the section. 1mm wide and calcite filled.

ROCK ALTERATION
None observed.

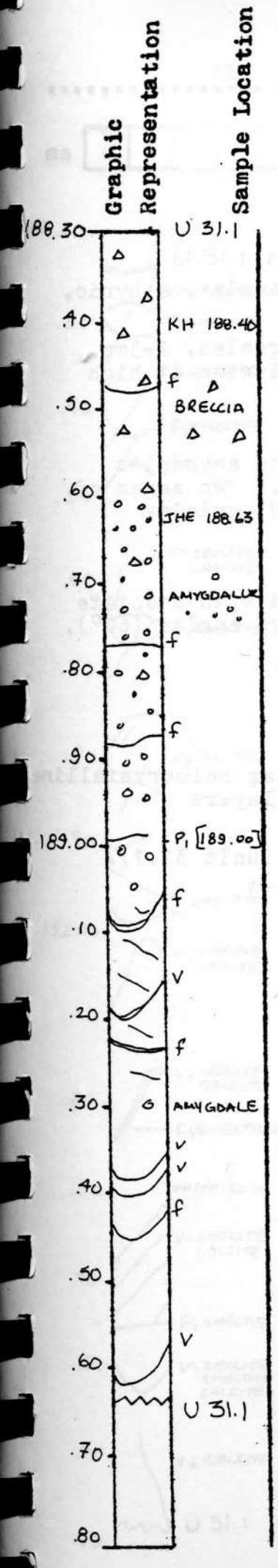
STRUCTURE
Basalt breccia of unit 31.1.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** ....RHW.....

Depth Interval 18829 **cm to** 18964 **cm**

Box 31 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 31.1

Basalt breccia with rare clasts of scoria. Angular, poorly sorted clasts to 188.60, where clasts become generally smaller and rounded, and amygdaloidal zone shares the core. Rounded breccia has distinct red-purple tinge. Clasts 80-90% of volume, groundmass replaced by calcite and zeolite (laumontite?). Vesicular zone brecciated for first 10cm (188.75-188.85), then somewhat massive. Most vesicles (amygdales) elongate at high angles.

189.00 Unit grades into vesicular basalt with small vesicles, flow banding 189.10 to 189.30, high angled (70°).

189.30 Large calcite amygdale.

Basalt is grey-green, fine-grained, aphyric, holocrystalline equigranular.

VESICLES/AMYGDALES

Vesicles and amygdales rarely in clasts, filled with calcite and zeolite (laumontite). Vesicle size 1-5mm.

188.75 Amygdale-vesicle zone - elongate vesicles, 1-3mm wide, 3-5cm long, with interlacing pattern, filled with green alteration product (smectite).

Lower section includes small vesicles/amygdales, 1-2mm in diameter, filled with smectite.

ROCK ALTERATION

None observed.

STRUCTURE

188.29 - 188.60 Basalt breccia with rare scoria clasts (unit 31.1).

188.60 - 188.80 Amygdaloidal basalt breccia (unit 31.1).

188.80 - 189.00 Amygdaloidal basalt (unit 31.1).

189.00 - 189.64 Fine-grained, equigranular, holocrystalline, aphyric, massive basalt (unit 31.1). Flow bands from 189.10 to 189.30.

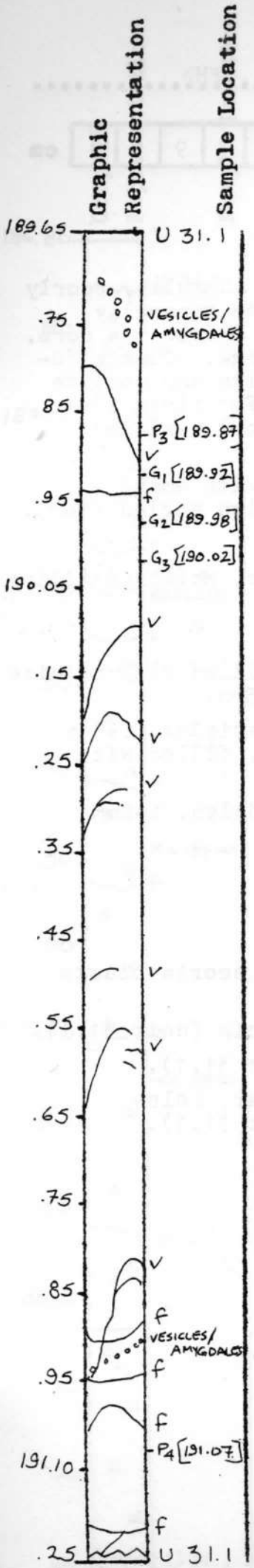
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 189.64 cm to 191.24 cm

Box 31 , Section 4

Depth interval adjusted at base.



LITHOLOGY PETROGRAPHY - continues unit 31.1
Grey-green, fine-grained, granular, equigranular, aphyric, holocrystalline basalt.

Two zones (189.75 and 190.90) of small amygdales, 1-3mm, filled with calcite and zeolites. Zones dipping at high angles (60-70°).

VESICLES/AMYGDALES
Extremely small (less than 1mm) vesicles and amygdales throughout the top of the core (to 190.30). Two zones of dipping bands of calcite and zeolite filled vesicles (amygdales).

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal or about 60°, lined with smectite and in some cases calcite. Veinlets at high angles (60°), calcite and smectite filled.

ROCK ALTERATION
None observed.

STRUCTURE
189.64 - 189.90 Fine-grained, equigranular holocrystalline aphyric, basalt in fine, nearly vertical layers (unit 31.1).

190.10 - 190.65 Segment of flow banding (unit 31.1).

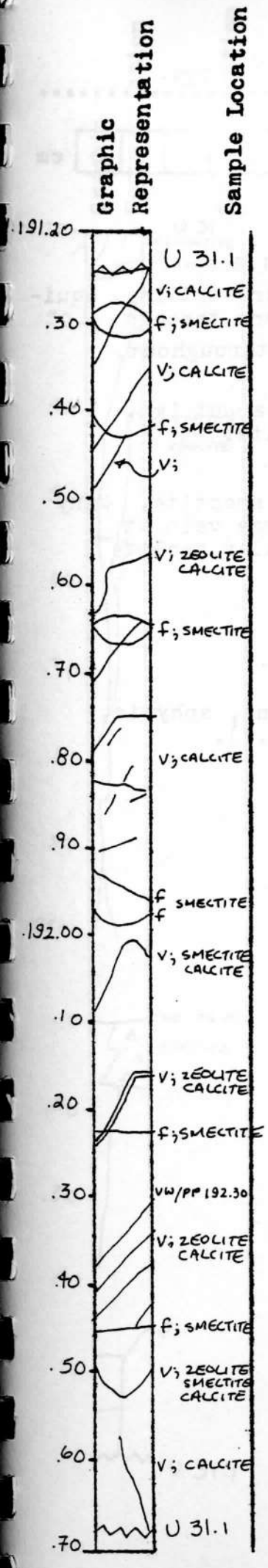
190.65 - 191.24 Massive basalt (unit 31.1),

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 19124 **cm to** 19268 **cm**

Box 32 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 31.1
Grey to greenish-grey, fine-grained, holocrystalline, equigranular, aphyric basalt. Grain size uniform through section. No contacts.

VESICLES/AMYGDALES
Sparsely vesicular throughout. About 1-2%, 1mm, spherical to irregular, filled with smectite.

FRACTURES - VEINS - BRECCIA
Most fractures about 40°, coated with smectite. Many hairline to 2mm veins filled with calcite, zeolite and minor smectite mostly dip about 60°.

ROCK ALTERATION
None observed.

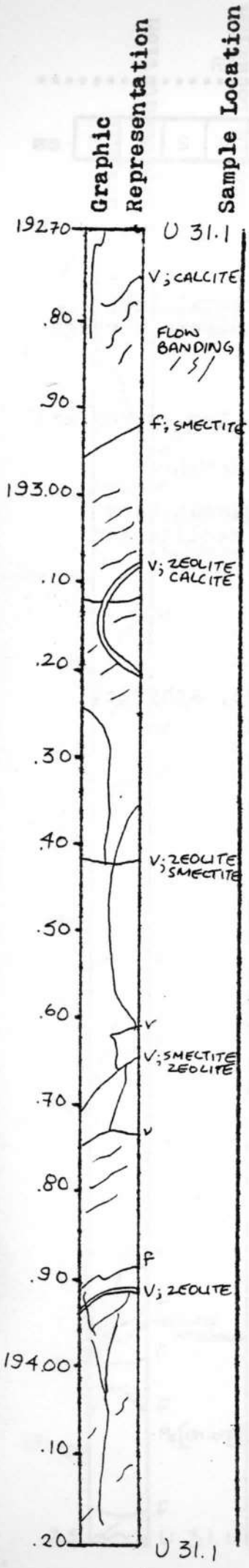
STRUCTURE
Fine-grained, equigranular, holocrystalline, aphyric, massive basalt (unit 31.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 19268 **cm to** 19420 **cm**

Box 32 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 31.1
Grey to greenish-grey, fine-grained, holocrystalline, equigranular aphyric basalt. Grain size uniform through section. No contacts. Minor flow banding throughout.

VESICLES/AMYGDALES
Sparse vesicles throughout, less than 1%, about 1mm, spherical to irregular, filled with smectite.

FRACTURES - VEINS - BRECCIA
Fractures sparse, dip 15-30°, coated with smectite. Many veinlets of zeolite are steep 70-90°. Large vein at 193.10 is about 5mm wide, filled with tabular zeolite crystals, probably heulandite.

ROCK ALTERATION
None observed.

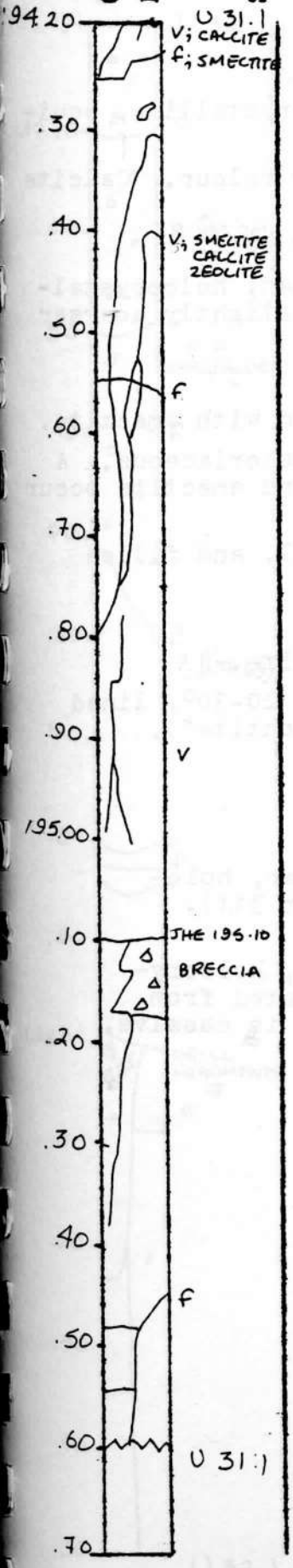
STRUCTURE
Fine-grained, equigranular, holocrystalline, aphyric, massive basalt with flow banding (unit 31.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 194.20 **cm to** 195.60 **cm**

Box 32 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 31.1
Grey to greenish-grey, fine-grained, holocrystalline, equigranular, aphyric basalt. Grain size uniform through section. No contacts.

VESICLES/AMYGDALES
1-2% vesicles throughout, 1-2mm, spherical to slightly ovate, filled with green smectite and rare calcite.

FRACTURES - VEINS - BRECCIA
Fractures mostly less than 20°. Two large fractures in lower part about 80°. Coated with smectite. Many veinlets, hairline to 2mm, very steep (80-90°) filled with minor smectite, calcite and zeolite.

195.10 Zeolite probably laumontite. Open spaces with crystal projecting into cavities, associated with quartz and calcite.

ROCK ALTERATION
None observed.

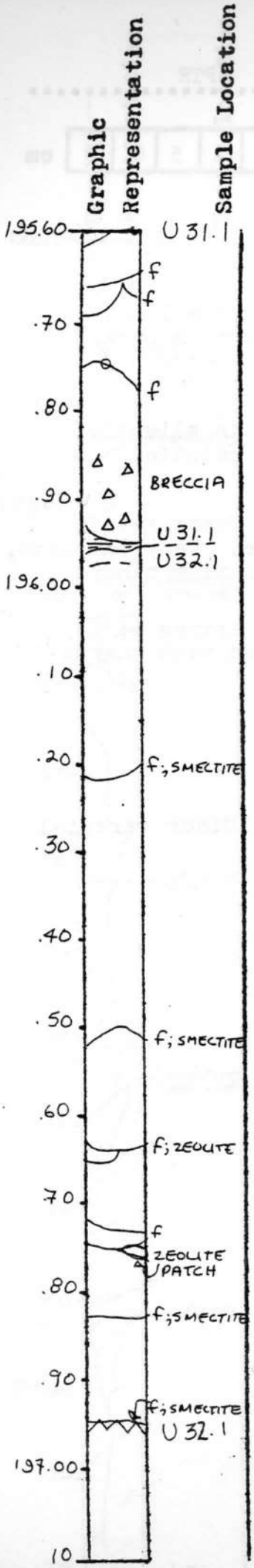
STRUCTURE
Fine-grained, massive basalt of unit 31.1. Minor vertical banding in upper 30 cm.
195.10 - 195.20 basalt breccia (unit 31.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** ....PTR.....

Depth Interval 19560 **cm to** 19695 **cm**

Box 32 , Section4



LITHOLOGY PETROGRAPHY - continues unit 31.1
Grey to greenish-grey, fine-grained, holocrystalline, equigranular, aphyric basalt.

195.85 Breccia zone, slightly darker grey colour. Calcite and zeolite in matrix.

195.9 Thin 3-4cm zone of red sediment or soil.

195.95 Unit 32.1. Light grey, fine-grained, holocrystalline, aphyric basalt. Grain size becomes slightly coarser grained toward base of section.

VESICLES/AMYGDALES
1-2%, 1-2mm, spherical to irregular, filled with smectite.

195.95 Upper portion of rock is slightly scoriaceous.' A few larger amygdales filled with zeolite and smectite occur in upper 10cm.

196.50 Vesicles are about 5%, 2-15mm, oval, and filled with zeolite and minor smectite.

FRACTURES - VEINS - BRECCIA
Fractures mostly 60-90° coated with smectite.

195.95 Fractures mostly irregular and dip 20-30°, lined with green smectite and some zeolite (laumontite?).

ROCK ALTERATION
None observed.

STRUCTURE
195.60 - 195.94 Fine-grained, equigranular, holocrystalline, aphyric, massive basalt (unit 31.1). Lower 10 cm. is brecciated.

195.94 - 196.95 Unit 32.1 ; Fine-grained, holocrystalline, aphyric basalt. Slightly brecciated from start of unit to 196.50 cm. Below this it is massive.

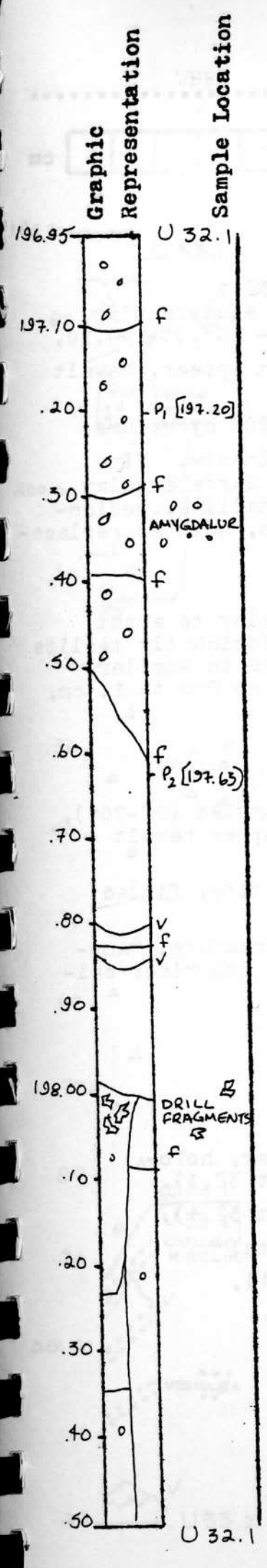
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 19695 cm to 19850 cm

Box 33 , Section 1

Depth interval adjusted at top.



LITHOLOGY PETROGRAPHY - continues unit 32.1
Altered amygdaloidal basalt. Fine-grained, granular, equigranular, aphyric, colour grading from reddish-grey to distinct reddish trend, then back to grey and grey-green (197.90). Amygdales perhaps 20% by volume in upper section, becoming only rare (less than 1%) by 197.70. "Mottled" texture from 197.50 to 197.90.

VESICLES/AMYGDALES
Amygdales common (20%) in upper part of section. Size range from 1mm to 2cm. Filling is zeolite (laumontite?) and minor calcite. Density changes quickly from 20% to minor (over 10cm).

FRACTURES - VEINS - BRECCIA
Fractures both subhorizontal (0-10°) and high angled (75-90°), smectite lined. Veinlets rare, high angled (70°), lined with calcite and zeolite.

ROCK ALTERATION
None observed.

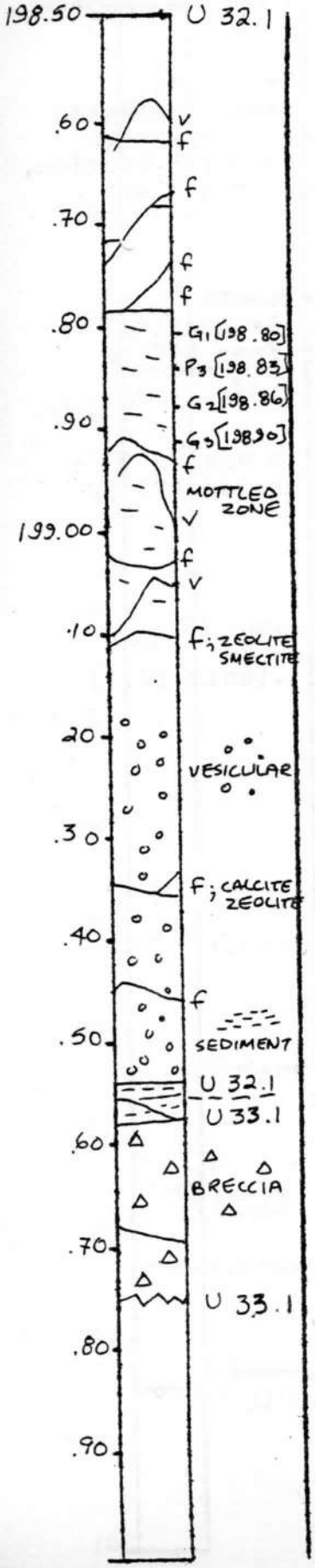
STRUCTURE
Fine-grained, equigranular, aphyric, basalt.(unit 32.1)
196.95 - 197.70 Amygdaloidal basalt.
197.70 - 198.50 Massive basalt.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 19850 **cm to** 19975 **cm**

Box 33 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 32.1
Grey-green, finer-grained aphyric basalt, equigranular, holocrystalline with a "mottled" texture - 198.70-199.10.

199.10 Amygdales and a large, filled vein appear, basalt takes on reddish tinge.

199.30 Amygdales and vesicles are about 20% by volume.

199.53 Unit 33.1. 5cm of baked, red sediments. Fine grained, grading into a basalt breccia of large angular clasts of fine-grained, aphyric, holocrystalline, medium-grey basalt. Groundmass contains zeolites, both as replacement and pre-filling.

VESICLES/AMYGDALES
199.10 Amygdales starting rarely, increasing to about 20% by contact at 199.50. Filling is predominantly zeolite (laumontite), smectite linings, and filling in smaller vesicles and minor calcite. Size range from 2mm to 1.5cm, vesicles in the same range.

199.53 Rare vesicles in clasts - 1-5mm.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-10°) and high angled (65-70°), lined with green smectite and calcite in upper basalt section.

199.10 Thick vein (.75cm) lined with smectite, filled with zeolite (laumontite?).

199.35 Calcite and zeolite (laumontite) fracture. Amygdales smectite lined, filled with zeolite and minor calcite. (laumontite).

199.53 Rare and small (1-2mm)

ROCK ALTERATION
None observed.

STRUCTURE
198.50-- 199.10 Fine-grained, equigranular, holocrystalline, aphyric, massive basalt (unit 32.1).

199.10 - 199.52 Amygdaloidal basalt.(unit 32.1).

199.52 - 199.58 Fine-grained red sediments.

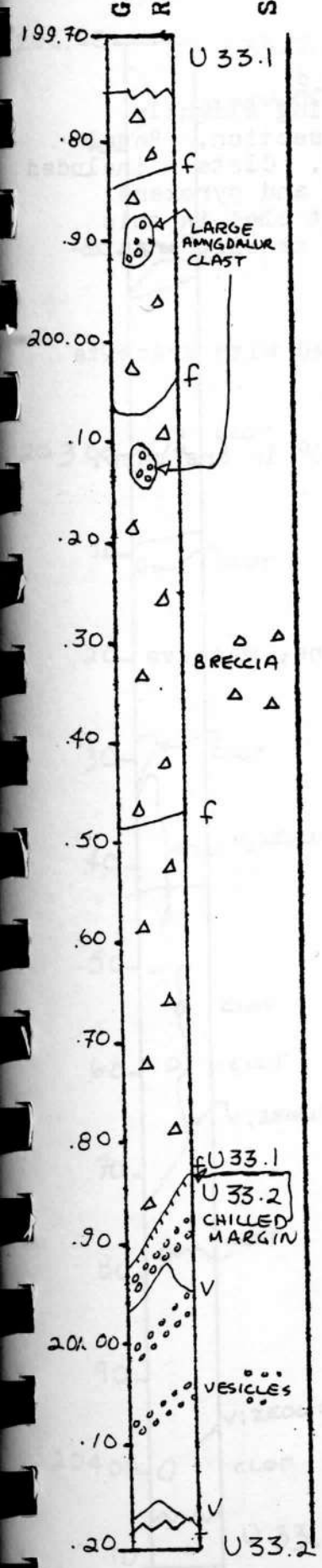
199.58 - 199.75 Basalt breccia (unit 33.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 19975 **cm to** 20118 **cm**

Box 33 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 33.1
Basaltic breccia with several large amygdaloidal clasts, but predominantly basaltic clasts of fine grained, medium grey basalt; aphyric, holocrystalline angular fragments. Matrix of basalt and zeolite filling or replacement. Minor calcite. Clast size from micro to greater than the core diameter.

200.86 Very narrow chilled contact, about 1cm thick. The chilled margin is rather obscure, but the parallel vesicle bands have been observed elsewhere at less equivocal contacts. Also the unit has a lower chilled margin without rubble zone. Separates vesicular basalt from generally mm or micro-vesicular unit below. Lower unit has three bands of small vesicles paralleling the contact, which dips about 65°.

Lower basalt is light grey, fine-grained, aphyric, and holocrystalline; Unit 33.2.

VESICLES/AMYGDALES
Vesicles and amygdales in two large clasts. Size ranges from 2mm to 1cm long. Filling consists of mainly zeolite (laumontite?) and minor calcite, green smectite lining, filling in smaller vesicles.

200.86 Three bands of predominantly vesicles of small size parallel to the chilled contact, 2-5mm length, amygdales filled with zeolite. Largest vesicles closest to contact, size decreasing downwards.

FRACTURES - VEINS - BRECCIA
Not severely broken. Two low angled fractures (0-10°) and two high angled (65°). Minor smectite (green) and zeolite on all of the fracture surfaces.

200.86 Several zeolite filled, smectite lined veinlets (1-2mm thick) at high angles (60-70°).

ROCK ALTERATION
None observed.

STRUCTURE
199.75 - 200.90 basalt breccia of unit 33.1.

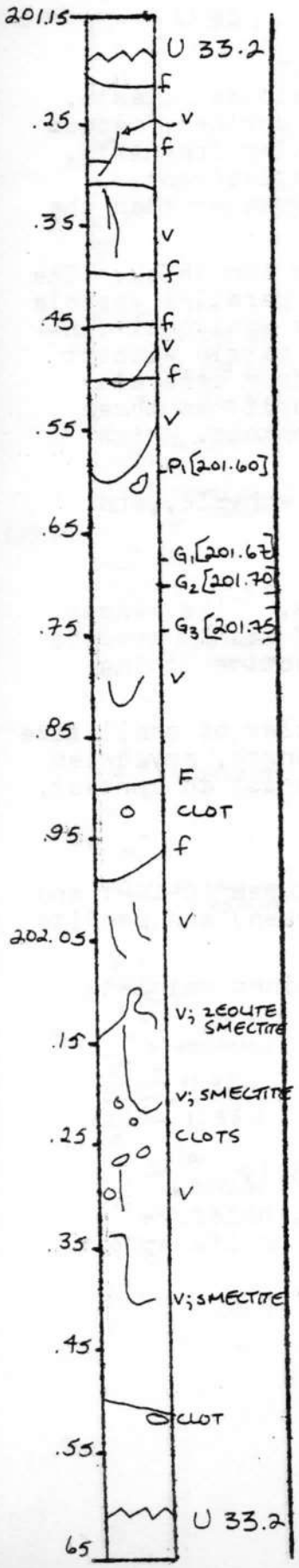
200.90 - 201.18 Unit 33.2 ; Fine-grained, holocrystalline, aphyric, massive basalt bounded on its upper margin by a chilled contact.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 20118 cm to 20261 cm

Box 33 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 33.2
Fine-grained, greenish-grey basalt, becoming slightly larger grained towards the bottom of the section. Basalt is aphyric, holocrystalline, equigranular. Clots - included in the basalt are clots of feldspar laths and pyroxene, laths up to about .5cm in length. Largest clot in this section is about 2.5cm across. (Possible xenolith or autolith.) Clots are subrounded.

VESICLES/AMYGDALES
Very small (less than 1mm) amygdales filled with smectite scattered throughout.

FRACTURES - VEINS - BRECCIA
Fractures all subhorizontal, perhaps to 30° in one case. Lined with smectite.

ROCK ALTERATION
None observed.

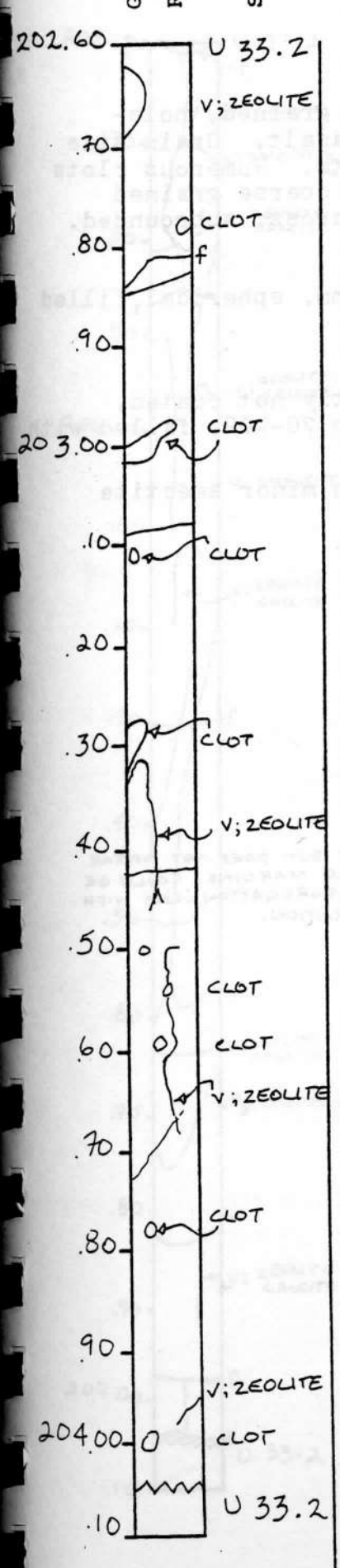
STRUCTURE
Fine-grained, equigranular, holocrystalline, massive basalt (unit 33.2).

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer PTR?

Depth Interval 20260 cm to 20406 cm

Box 34 , Section 1



LITHOLOGY PETROGRAPHY

Continues unit 33.2

Grey to greenish-grey, fine-grained holocrystalline, equigranular, aphyric basalt. Grain size uniform through section. No contacts.

202.80 Basalt contains numerous coarse grained gabbroic clots.

202.90 This unit has chilled contacts top and bottom, and is interpreted as a dike.

VESICLES/AMYGDALES

202.60 About 1%, Approximately 1 mm, spherical, filled with greenish-black smectite.

FRACTURES - VEINS - BRECCIA

202.60 Fractures 5-20°, most not coated with secondary minerals. einlets, hairline to 2mm, filled with zeolite.

ROCK ALTERATION

None observed.

OTHER

Crystal clots range from about 2cm to 20cm or more across and are subrounded. They have coarse-grained texture with plagioclase laths approximately 1cm intergrown with dark glassy crystals (clinopyroxene) also about 1cm across.

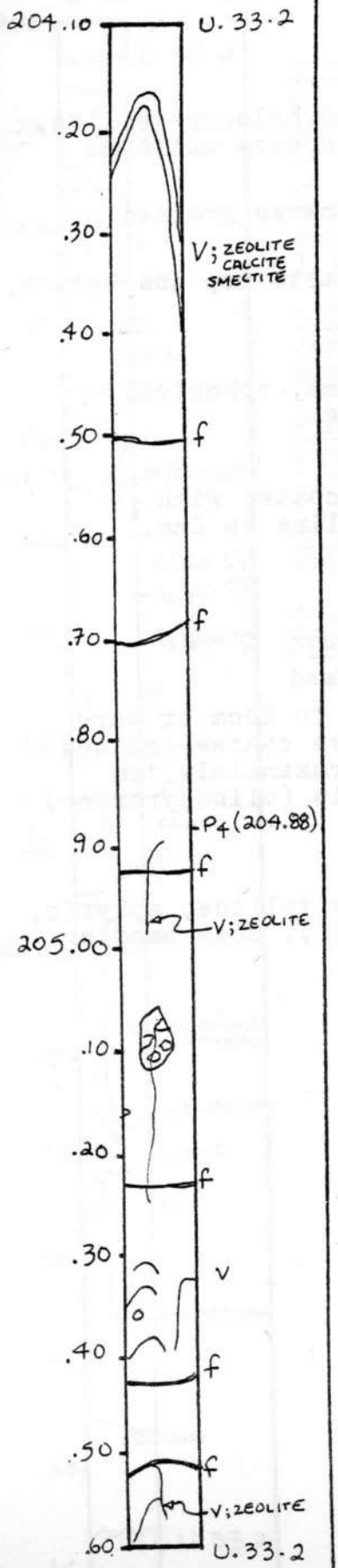
STRUCTURE

Fine-grained, equigranular, holocrystalline, aphyric, generally massive basalt (unit 33.2). Some banding also apparent.

Visual Core Description Observer PTR

Depth Interval 20406 cm to 20560 cm

Box 34 , Section 2



LITHOLOGY PETROGRAPHY

Continues unit 33.2.

204.20 Grey to greenish-grey, fine grained, holocrystalline, equigranular aphyric basalt. Grain size uniform through section. No contacts. Numerous clots of plagioclase and clinopyroxene in coarse grained intergrowths. Clots mostly 1-3cm across, subrounded.

VESICLES/AMYGDALES

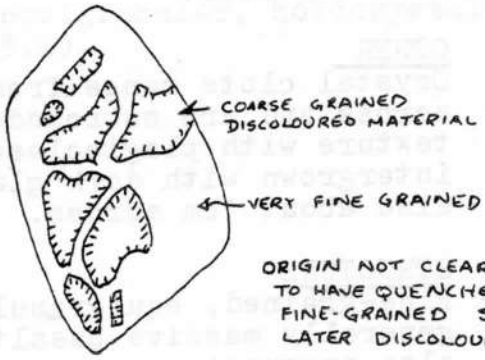
Less than 1%, less than and up to 1mm, spherical, filled with green smectite.

FRACTURES - VEINS - BRECCIA

204.06 Fractures less than 15° mostly not coated. Hairline to 1cm wide veins are steep 70-90°, filled with zeolite.

204.16 Large vein, 16cm filled with minor smectite and calcite and abundant zeolite.

205.09



ORIGIN NOT CLEAR BUT DOES NOT APPEAR TO HAVE QUENCHED MARGINS. COULD BE FINE-GRAINED SEGREGATION VEINS WITH LATER DISCOLOURATION.

STRUCTURE

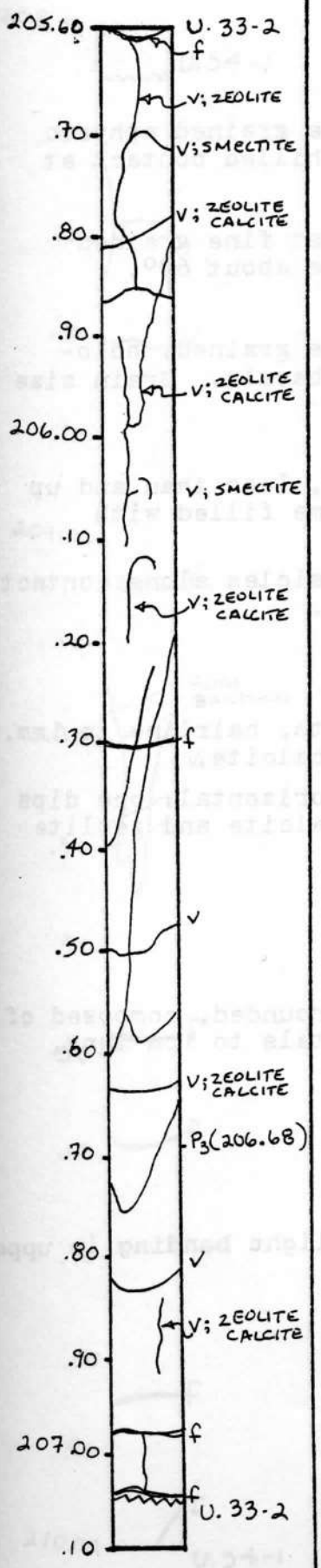
Massive.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer PTR

Depth Interval 2056.0 cm to 2070.5 cm

Box 34 ,Section 3



LITHOLOGY PETROGRAPHY

Continues unit 33.2

205.70 Grey to greenish-grey, fine grained, holocrystalline, equigranular aphyric basalt. Grain size decreases slightly toward base of section. No contacts. A few clots of gabbroic material.

VESICLES/AMYGDALES

205.70 Less than 1%, 1-2mm, spherical, filled with green smectite.

FRACTURES - VEINS - BRECCIA

205.70 Fractures sparse, mostly horizontal, not coated with secondary minerals.

Many hairline to 2mm veinlets filled mostly with calcite and zeolite with some smectite, dip 70-90°.

ROCK ALTERATION

None observed.

OTHER

Gabbroic clots are 1-2cm across, subrounded, composed of plagioclase and clinopyroxene. Grain size about 3mm.

STRUCTURE

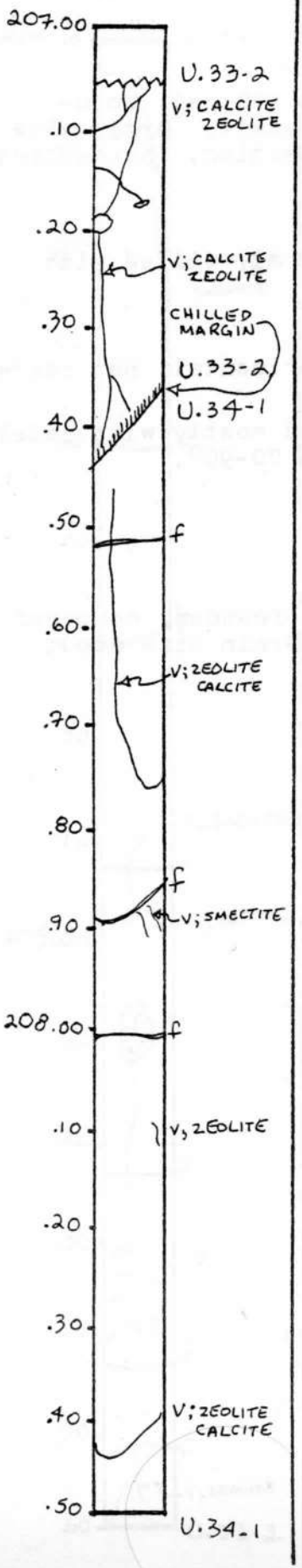
Massive.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 197

Visual Core Description Observer PTR

Depth Interval 207.05 cm to 208.54 cm

Box 34 , Section 4



LITHOLOGY PETROGRAPHY
Continues unit 33.2

207.05 Grey to greenish-grey, fine grained aphyric basalt. Grain size decreases to chilled contact at 207.34m. Crystal clots common.

207.32 Aphanitic chill zone against fine grained basalt of lower unit. Contact dips about 60°.

207.34 Unit 34.1

207.52 Grey to greenish-grey, fine grained, holocrystalline, equigranular aphyric basalt. Grain size uniform through section.

VESICLES/AMYGDALES
207.05 Moderately vesicular 2-4%, less than and up to 1mm, spherical, usually open, some filled with calcite and zeolite.

207.10 A few large, about 1cm, vesicles along contact zone, elongate parallel to contact.

207.52 None.

FRACTURES - VEINS - BRECCIA
207.05 No fractures. Many veinlets, hairline to 1mm, filled with smectite, zeolite and calcite.

207.52 Fractures rare. Most subhorizontal; one dips about 60°. Hairline veinlets of calcite and zeolite dip about 70-60°.

ROCK ALTERATION
None observed.

OTHER
207.05 Crystal clots to 10cm, subrounded, composed of plagioclase and clinopyroxene crystals to 1cm long.

207.32 Intrusive contact.

STRUCTURE

Unit 33.2 Massive.

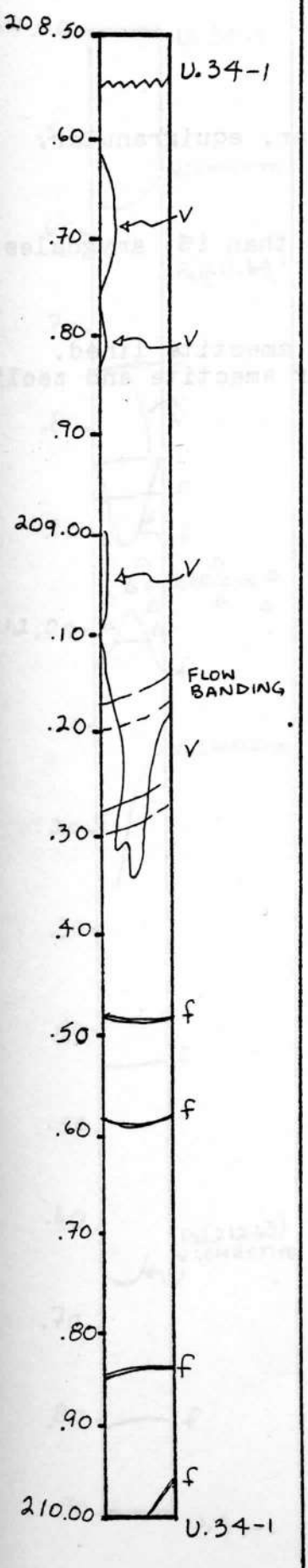
Unit 34.1 Massive , except for slight banding in upper 10 cm.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer ...RHW.....

Depth Interval 20854 cm to 21003 cm

Box 35 ,Section 1



LITHOLOGY PETROGRAPHY
Continuing unit 34.1.

Fine grained, equigranular, aphyric, holocrystalline, greenish-grey basalt.

VESICLES/AMYGDALES
Scattered small amygdales (less than 1%), 1-2mm across, smectite filled.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal, one at 45°. All smectite lined. Veinlets high angled (70°) and filled of smectite or smectite and zeolite.

ROCK ALTERATION
None observed.

STRUCTURE

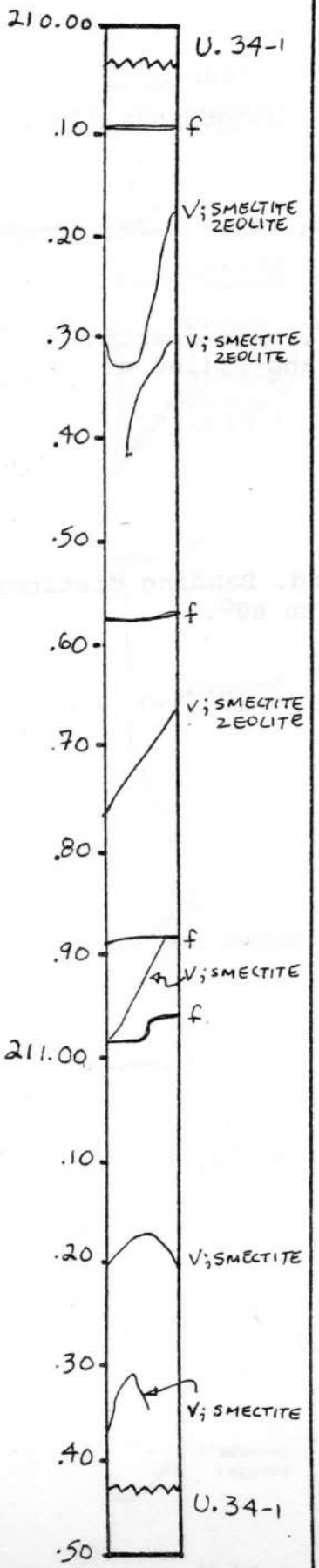
Massive basalt , vaguely flow banded. Banding distinct from 209.20 to 209.30 , dipping 55 to 60°.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 197

Visual Core Description Observer RHW

Depth Interval 2100 3 cm to 2114 3 c

Box 35 , Section 2



LITHOLOGY PETROGRAPHY
Continuing unit 34.1

Greenish-grey, fine grained, granular, equigranular, holocrystalline, aphyric basalt.

VESICLES/AMYGDALES
Very small (1-2mm), scattered (less than 1%) amygdales filled with smectite.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-15°) and smectite lined. Vesicles at high angles, smectite or smectite and zeolite filled.

ROCK ALTERATION
None observed.

STRUCTURE

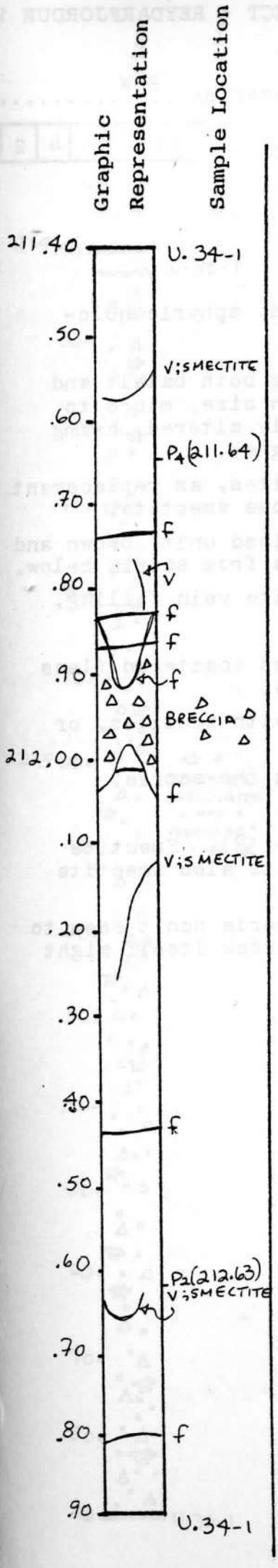
Massive basalt.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer RHW

Depth Interval 211.43 cm to 212.95 cm

Box 35 , Section 3



LITHOLOGY PETROGRAPHY
Continuing unit 34.1

211.43 Fine grained, greenish-grey, aphyric, holocrystalline, equigranular, granular basalt.

211.95 Small brecciated zone consisting of angular basalt fragments and a zeolite and quartz matrix (some open cavities), smectite lining.

VESICLES/AMYGDALES
Small (1-2mm), rare (less than 1%) amygdales, smectite filled.

FRACTURES - VEINS - BRECCIA
Fractures sub-horizontal (one high angled - 65°). Smectite lined. Veinlets at high angles and smectite or smectite and zeolite filled.

ROCK ALTERATION
None observed.

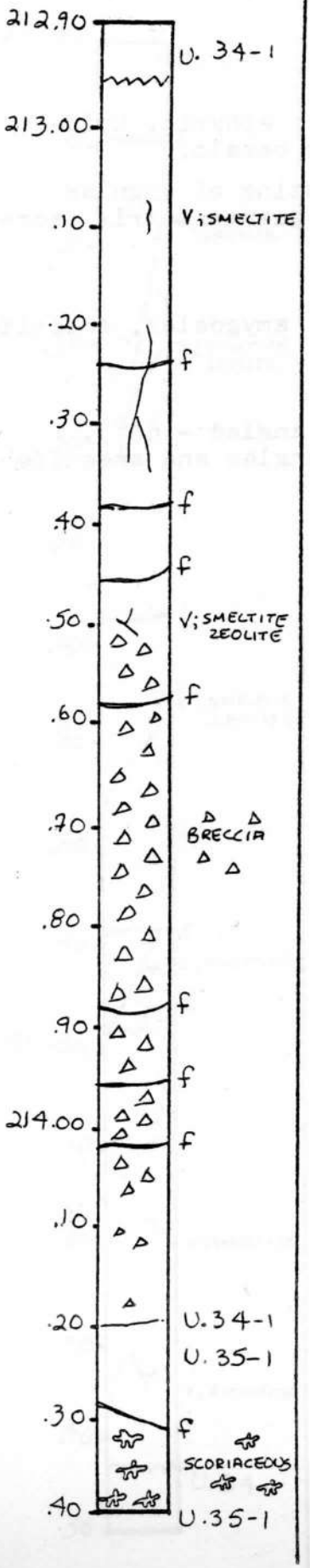
STRUCTURE

Massive basalt.

Visual Core Description Observer RHW

Depth Interval 212.95 cm to 214.42 cm

Box 35 ,Section 4



LITHOLOGY PETROGRAPHY
Continuing unit 34.1

212.95 Greenish-grey, fine grained, aphyric holocrystalline basalt.

213.45 Basaltic breccia containing both basalt and scoriaceous clasts. Clasts vary in size, micro to several cm diameter, some are highly altered, having a dull red colour, others are mid grey.

Matrix of breccia consists of zeolites, as replacement or void filling (laumontite) and some smectite.

214.18 Somewhat massive, fine grained unit, brown and dark grey, separating breccia above from scoria below.

214.28 Brick red scoria with zeolite vein filling.

VESICLES/AMYGDALES
212.95 Amygdales, small (1-2mm) and scattered (less than 1%) filled with green smectite.

213.45 Vesicles in clasts filled with zeolites, or empty, all smectite lined.

214.28 Zeolite filling of voids in the scoria.

FRACTURES - VEINS - BRECCIA
212.95 Fractures subhorizontal (0-15°). Smectite lined in fine grained basalt veinlets also smectite lined.

213.70 Fractures in breccia and scoria don't seem to be lined, but altered state of the rock itself might disguise existing lining.

ROCK ALTERATION
None observed.

STRUCTURE

212.95 - 213.45 Massive.

213.45 - 214.20 Basaltic breccia.

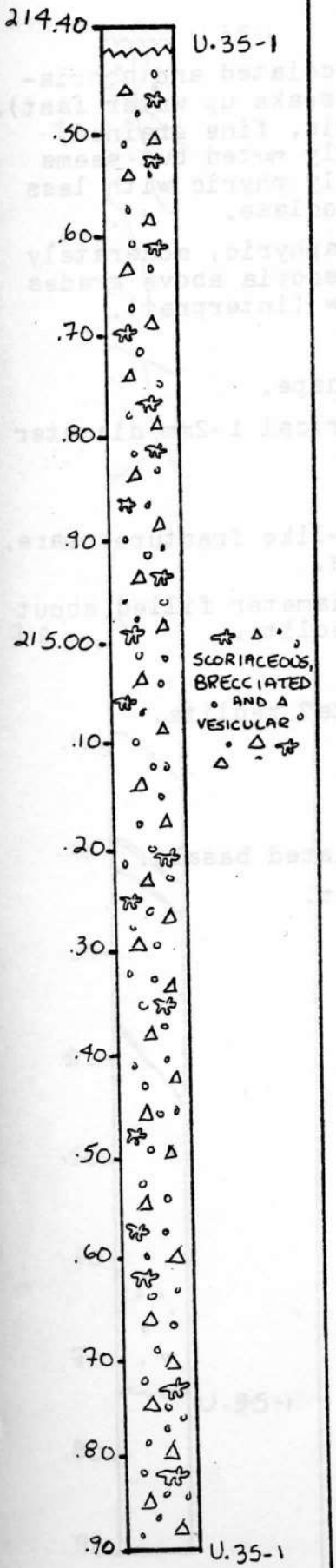
214.20 - 214.42 Scoriaceous basalt.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer NG

Depth Interval 214.42 cm to 215.93 cm

Box 36 , Section 1



LITHOLOGY PETROGRAPHY

Unit 35.1 continued

Rusty-red extremely permeable vesicular, scoriaceous and brecciated portion of lava flow top.

Clasts are of altered fine to medium grained vesicular basalt, angular, 2.5cm across long axis.

VESICLES/AMYGDALES

1-2mm irregular shape in clasts and groundmass. Filled with calcite, also commonly lined or filled with green smectite.

FRACTURES - VEINS - BRECCIA

Not highly fractured. Tiny irregular hair-like fractures about 1cm long.

ROCK ALTERATION

Alteration products are green and red smectite? - pervasive throughout clasts and groundmass, and clays and zeolites in vesicles and spaces between clasts.

STRUCTURE

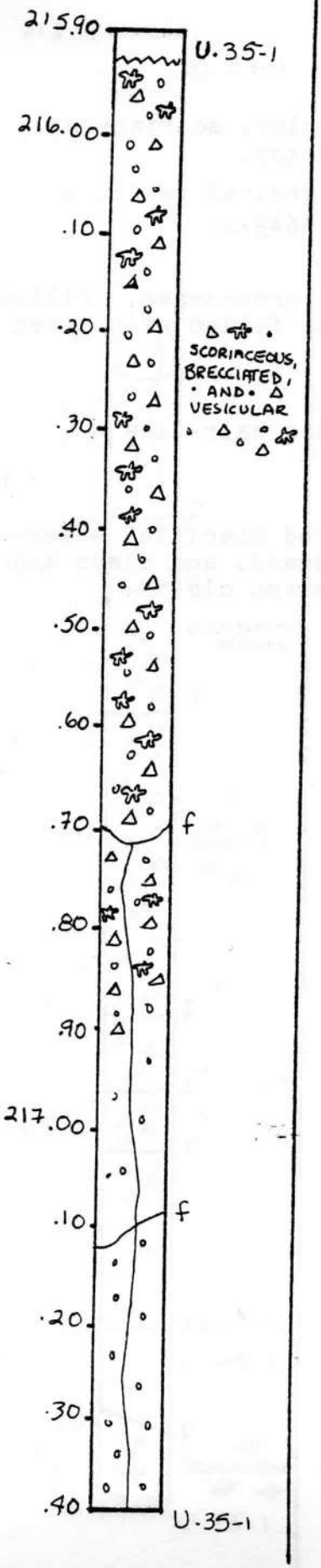
Brecciated , scoriaceous basalt.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 197

Visual Core Description Observer ...NG.....

Depth Interval 2159.3 cm to 2174.1 cm

Box 36 , Section 2



LITHOLOGY PETROGRAPHY

215.93-216.90 Continuation of brecciated and scoriaceous flow top, highly permeable (soaks up water fast). Clasts are ½ to 3cm across long axis, fine grained, and vesicular. Clast size is poorly sorted but seems to fine downward. Some are sparsely phyric with less than 1mm long phenocrysts of plagioclase.

216.90 Green-gray, fine grained, aphyric, moderately vesicular flow unit. Breccia and scoria above grades into this more massive parting flow (interpret).

VESICLES/AMYGDALES

215.93 1.5mm diameter irregular shape.

216.90 Vesicles 3-5% of rock spherical 1-2mm diameter lined with green smectite.

FRACTURES - VEINS - BRECCIA

215.93 Not highly fractured, hair-like fractures rare, to 10cm long. Filled with zeolites.

216.90 Few long fractures 1-2mm diameter filled, about 80% green smectite and about 20% zeolite.

ROCK ALTERATION

215.93 Green and red clay? smectite? zeolite.

216.90 As above

STRUCTURE=

215.93 - 216.90 Scoriaceous, brecciated basalt.

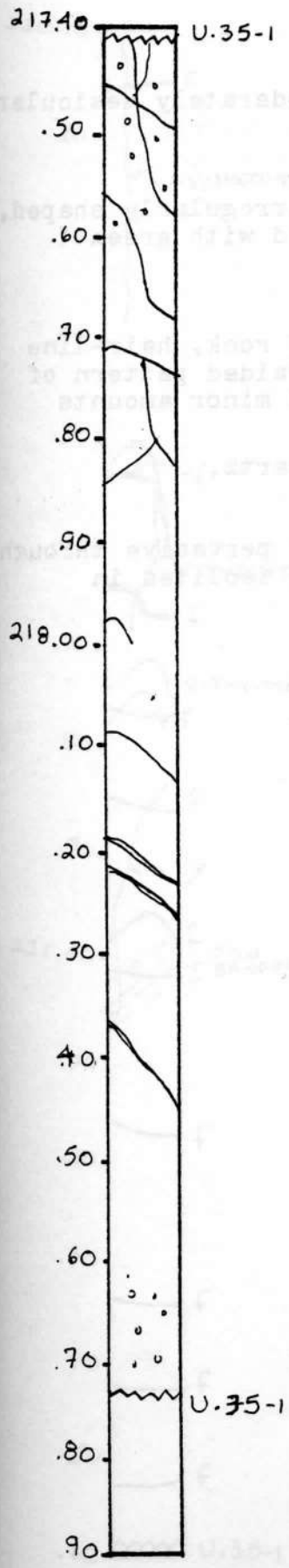
216.90 - 217.41 More massive basalt.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer ...NG.....

Depth Interval 217.41 cm to 218.73 cm

Box 36 ,Section 3



LITHOLOGY PETROGRAPHY

Green-grey fine grained aphyric, moderately vesicular flow unit, continued from above.

VESICLES/AMYGDALES

217.41 Vesicles are 3-5% of rock, 2-3mm. Some filled with zoned arrangement of green clays.

217.60 Vesicles 1-2%, less than 1mm, spherical to irregular shape. About 2% of rock filled with green smectite,

218.60 Vesicles 3-5% of rock primarily irregular shape. 2-3mm filled with green smectite?

FRACTURES - VEINS - BRECCIA

217.41 Section about 2% fractured. Fracture measured as 40-50°. Fractures commonly lined with green smectite? and filled with massive white zeolite commonly hair-line to 2mm wide.

218.23 Fracture is ½cm wide and filled with green clay and massive and euhedral laumontite, and euhedral quartz.

ROCK ALTERATION

Zeolite and green smectite and smectite.

STRUCTURE

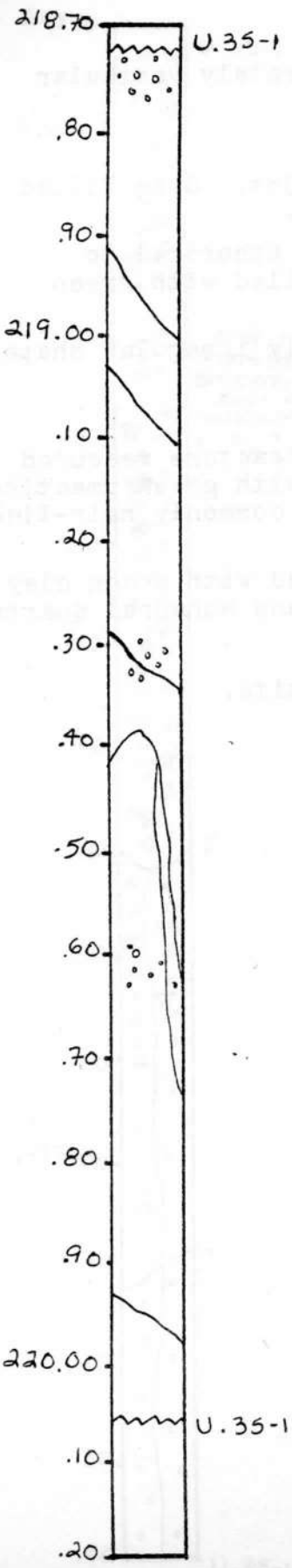
Massive basalt.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 197

Visual Core Description Observer NG

Depth Interval 2187.3 cm to 2200.6 c

Box 36 , Section 4



LITHOLOGY PETROGRAPHY

Green-grey, fine grained, aphyric, moderately vesicular basalt.

VESICLES/AMYGDALES

Vesicles are 3-5% or rock, commonly irregularly shaped, 1-4mm across long axis filled or lined with green smectite.

FRACTURES - VEINS - BRECCIA

218.73 Fractures over or about 1% of rock, hair-line to 4mm wide irregular, filled with braided pattern of green smectite and white zeolite with minor amounts of black smectite.

219.95 Fractures may also contain quartz.

ROCK ALTERATION

Green and black smectite? alternative pervasive throughout rock and filling vesicles. White zeolites in fractures.

STRUCTURE

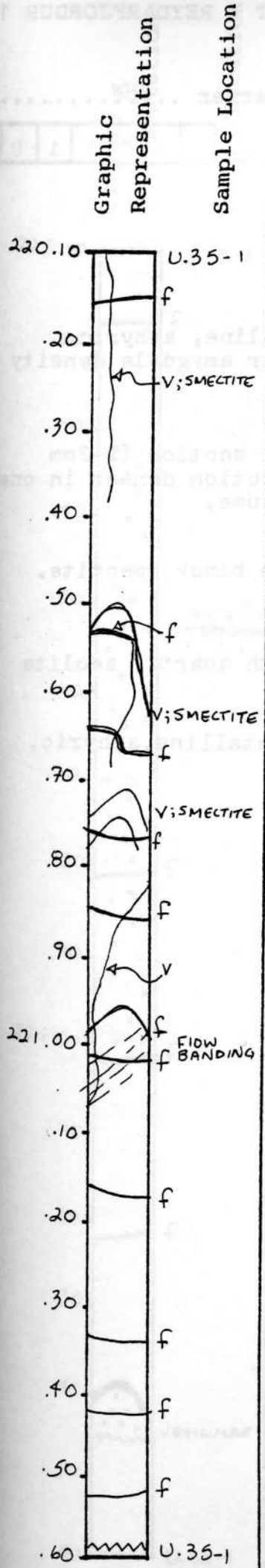
Massive , moderately vesicular basalt.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer ..RHW.....

Depth Interval | | 2 | 2 | 0 | 0 | 6 | cm to | | 2 | 2 | 1 | 5 | 9 | cm

Box 37 ,Section 1



LITHOLOGY PETROGRAPHY
Continuing unit 35.1

Fine grained, grey-green, aphyric, holocrystalline, equigranular basalt. Very small amygdales about 1%.

VESICLES/AMYGDALES
Small (1-2mm) amygdales filled with black smectite scattered throughout, perhaps 1% of volume.

FRACTURES - VEINS - BRECCIA
Fractures sub-horizontal (0-10°) or high angled (65°). Lined with smectite, both black, and in some cases black and green.

ROCK ALTERATION
None observed.

STRUCTURE

Massive basalt.

220.06 - 220.96 Vague flow banding.

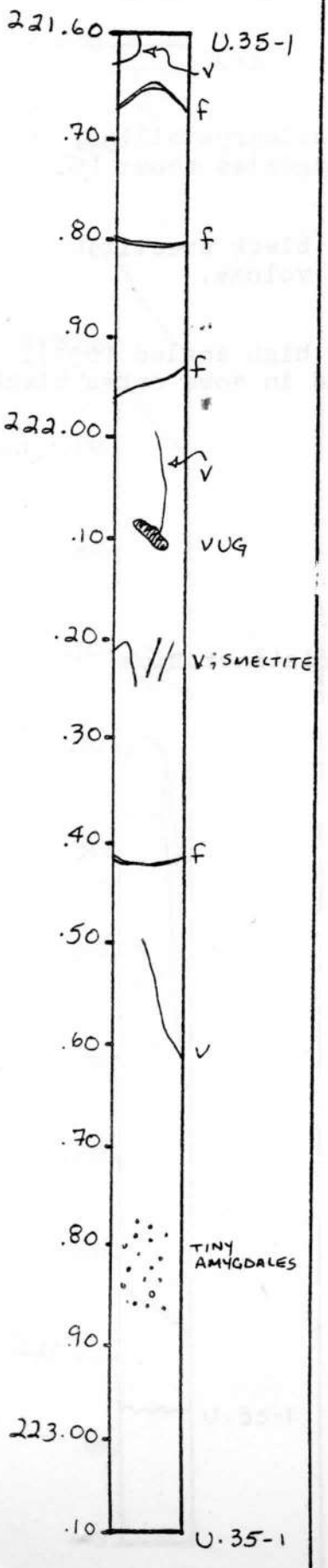
220.96 - 22].59 Flow banding more distinct. Dips 45 to 50°.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 197

Visual Core Description Observer ..RHW.....

Depth Interval 221591 cm to 223100 cm

Box 37 , Section 2



LITHOLOGY PETROGRAPHY
Continuing unit 35.1

Fine grained, grey-green holocrystalline, aphyric, equigranular basalt. Zone of greater amygdale density around 222.80.

VESICLES/AMYGDALES
Small amygdales scattered throughout section (1-2mm diameter), smectite filled. Distribution denser in one or two areas, getting up to 1-2% volume.

FRACTURES - VEINS - BRECCIA
Fractures sub-horizontal, lined with black smectite. Veinlets hairline, smectite filled.

ROCK ALTERATION
Vugs at 222.10 and 222.45 filled with quartz, zeolite (laumontite) and smectite lined.

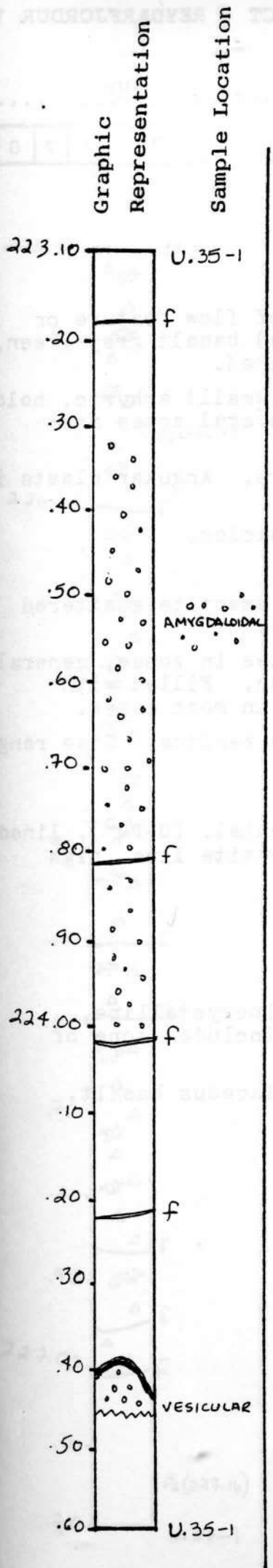
STRUCTURE
Fine-grained, equigranular, holocrystalline, aphyric, massive basalt (unit 35.1).

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer ...RHW.....

Depth Interval . 2 2 3 1 0 cm to 2 2 4 4 6 cm

Box 37 , Section 3



LITHOLOGY PETROGRAPHY
Continuing unit 35.1

Fine grained, aphyric, equigranular, holocrystalline, grey-green basalt.

Zone of large amygdales in centre of section.

VESICLES/AMYGDALES
223.10 Very small (1-2mm), rare (less than 1%) amygdales throughout, filled with smectite.

Vesicles in the amygdaloidal zone are quartz and zeolite filled, smectite lined, very minor calcite. Maximum length 2cm, width 5mm.

224.40 Vesicles parallel to some sort of flow feature or piece caught in flow. Amygdales have zeolite (laumontite?) filling.

FRACTURES - VEINS - BRECCIA
223.10 Fractures rare, smectite lined and sub-horizontal (0-10°).

ROCK ALTERATION
None observed.

OTHER
Secondary mineral sample - quartz vug.

STRUCTURE

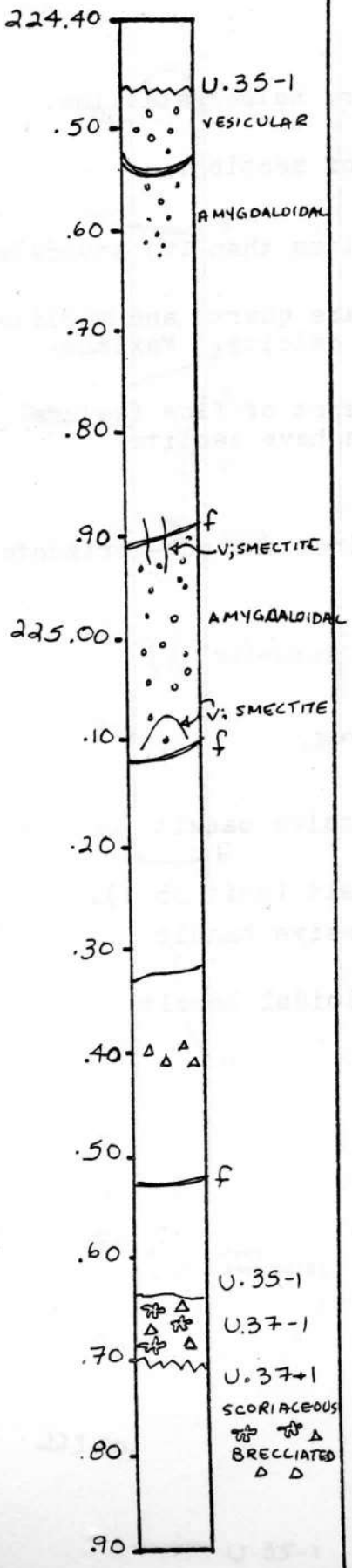
223.10 - 223.30	Fine-grained, massive basalt (unit 35.1).
223.30 - 224.00	Amygdaloidal basalt (unit 35.1).
224.00 - 224.40	Fine-grained, massive basalt (unit 35.1).
224.40 - 224.46	Vesicular/amygdaloidal basalt (unit 35.1).

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1977

Visual Core Description Observer RHW

Depth Interval 22446 cm to 22570 cm

Box 37 , Section 4



LITHOLOGY PETROGRAPHY
Continuing unit 35.1
Top of the core to 244.55 m. is a continuation of flow feature or block in flow. Amygdaloidal (large) basalt grey-green, aphyric, holocrystalline, fine grained.

224.55 Fine grained amygdaloidal (small) aphyric, holocrystalline, gray-green basalt. Several zones are amygdale rich.

225.40 Minor breccia along fracture. Angular clasts in zeolite matrix.

225.64 Brick red scoria, small vesicles.

VESICLES/AMYGDALES
224.46 Small vesicles filled with smectite scattered throughout (1-2cm and less than 1%).

224.55 Larger amygdales and vesicles in zones, generally elongate, up to 2cm long, 0.5cm wide. Filled with zeolite and quartz, smectite lined in most cases.

225.64 Scoria vesicles filled with zeolite. Size range small, size small (1-2mm).

FRACTURES - VEINS - BRECCIA
224.46-225.64 Fractures sub-horizontal, (0-10°), lined with green and black smectite. Smectite line, high angled hairline veinlets.

ROCK ALTERATION
None observed.

STRUCTURE
224.46 - 225.64 Fine-grained, holocrystalline, amygdaloidal basalt (unit 35.1). Includes zone of minor brecciation.

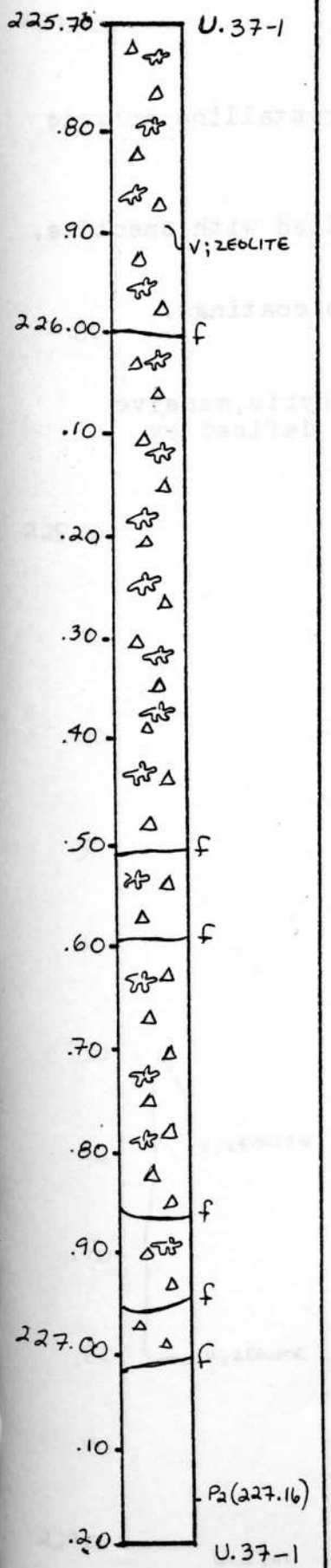
225.64 - 225.70 Unit 37.1 ; Scoriaceous basalt.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer PTR

Depth Interval 22570 cm to 22720 cm

Box 38 , Section 1



LITHOLOGY PETROGRAPHY
Continues unit 37.1

Reddish to greenish-grey scoriaceous basalt breccia. Basalt is aphyric.

226.15 Breccia is interpreted as scoriaceous top of flow.

226.90 Gradational to226.98.

227.00 Light greenish-grey, vesicular aphyric basalt, essentially massive.

VESICLES/AMYGDALES
225.70 Highly vesicular and scoriaceous flow top. Vesicles filled with green smectite or celadonite(?). Zeolite fills cavities in interval from 226.60 to about 227.00m.

227.00 Smectite and zeolite in vesicles.

FRACTURES/AMYGDALES
225.70 Fractures at angle 20°, not coated with secondary minerals.

ROCK ALTERATION
Reddish oxidation in upper 30cm grading into red- and greenish-grey colour lower in second.

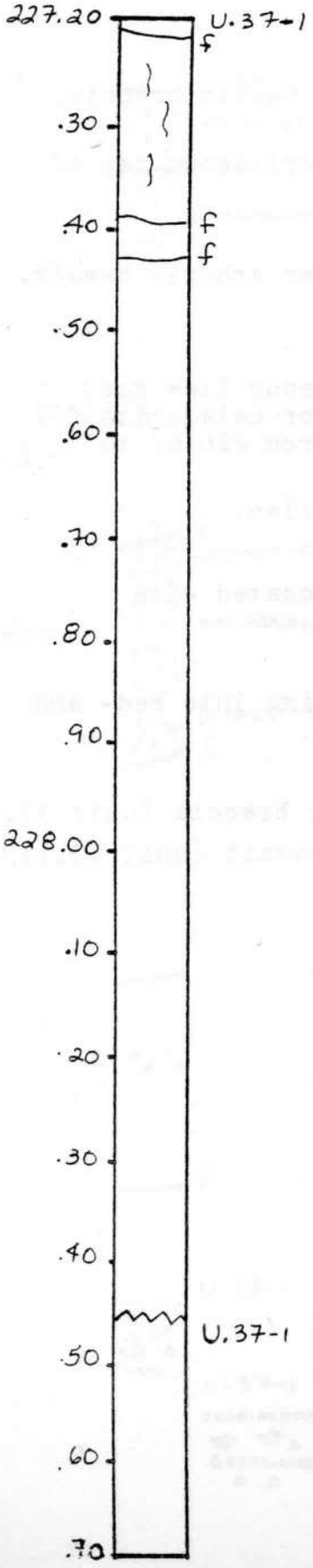
STRUCTURE
225.70 - 227.00 Scoriaceous basalt breccia (unit 37.1).
227.00 - 227.20 Aphyric, massive basalt (unit 37.1).

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 197

Visual Core Description Observer PTR

Depth Interval 22720 cm to 22745 cm

Box 38 , Section 1 ... continued



LITHOLOGY PETROGRAPHY
Continues unit 37.1

Greenish-grey, fine grained, holocrystalline aphyric basalt.

VESICLES/AMYGDALES
227.20 2-3%, 1-2mm, irregular, filled with smectite.

FRACTURES - VEINS - BRECCIA
227.20 Fractures subhorizontal, no coatings.

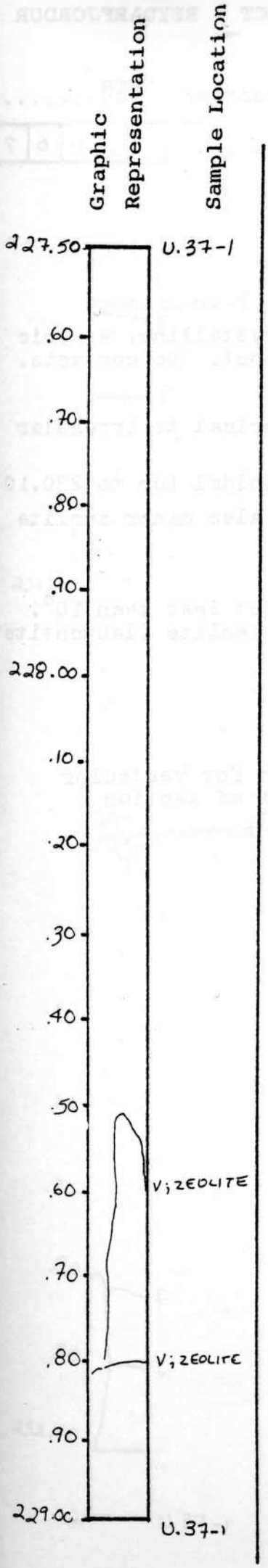
STRUCTURE
Fine-grained, holocrystalline, aphyric, massive basalt with some vertical banding defined by smectite streaks (unit 37.1).

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer PTR .....

Depth Interval 227.45 cm to 229.11 cm

Box 38 , Section 2



LITHOLOGY PETROGRAPHY
Continues unit 37.1

Greenish-grey, fine grained, holocrystalline, aphyric basalt. Grain size uniform through section. No contacts.

VESICLES/AMYGDALES
Moderately vesicular (5-8%) throughout, 1-3mm, irregular, filled with green smectite.

FRACTURES - VEINS - BRECCIA
No fractures. Rare hairline veinlets about 80° filled with zeolite.

228.80 Patchy zeolite zone.

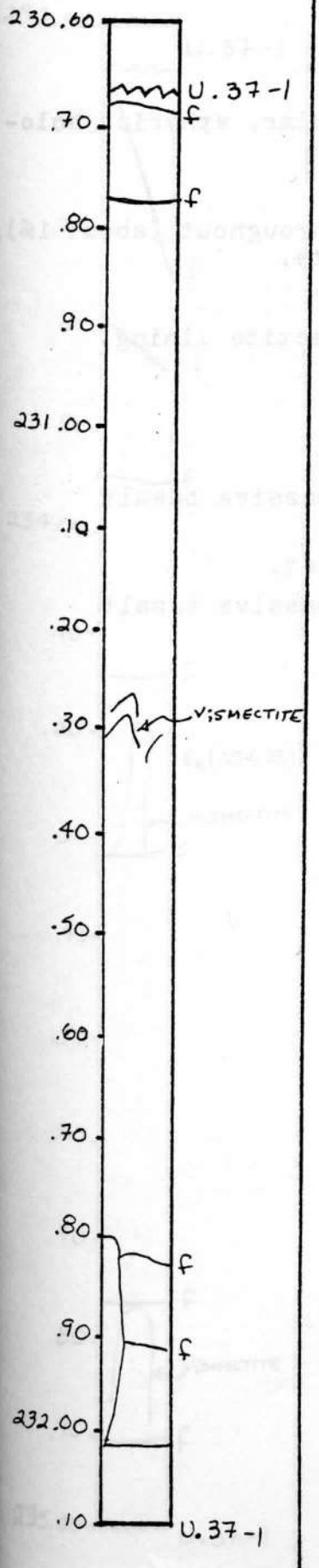
ROCK ALTERATION
Smectite in vesicles.

STRUCTURE
Fine-grained, holocrystalline, aphyric, massive basalt with steep-angle banding between 227.50 and 227.75 (unit 37.1).

Visual Core Description Observer PTR

Depth Interval 2306.7 cm to 2321.1 cm

Box 38 , Section 4



LITHOLOGY PETROGRAPHY
Continues 37.1

Grey-green, fine grained, holocrystalline, aphyric basalt. Grain size uniform through section. No contacts.

230.80 Unit 37.1 interpreted as a flow.

VESICLES/AMYGDALES
230.67 About 1%, 1-2mm, spherical, filled with green smectite.

FRACTURES - VEINS - BRECCIA
230.67 Fractures and veins sparse, most fractures about 15°. One fracture and several veinlets dip about 70°, veinlets about 1mm wide, filled with green smectite.

ROCK ALTERATION
None observed.

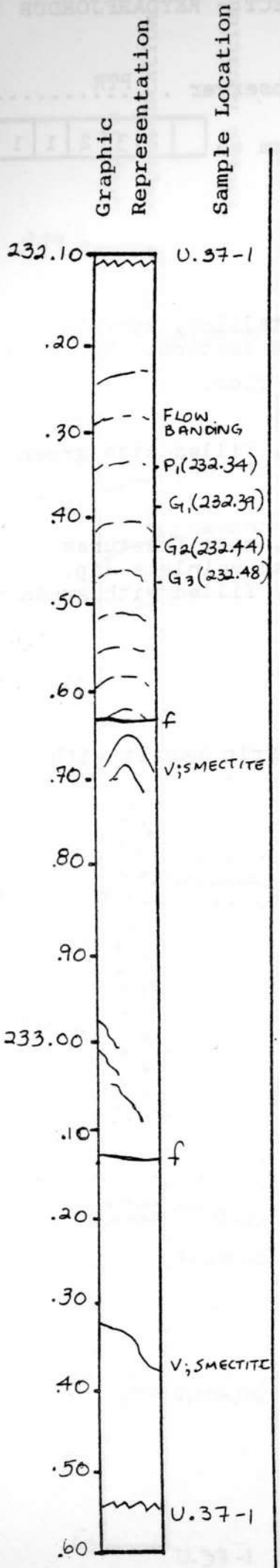
STRUCTURE
Fine-grained, holocrystalline, aphyric basalt with flow banding (unit 37.1).

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 197

Visual Core Description Observer RHW

Depth Interval | | 2 | 3 | 2 | 1 | 1 | cm to | | 2 | 3 | 3 | 5 | 4 | cm

Box 39 , Section 1



LITHOLOGY PETROGRAPHY
Continuing unit 37.1

Medium grained, equigranular, granular, aphyric, holocrystalline, greenish-grey basalt.

VESICLES/AMYGDALES
Small (1-3mm) vesicles scattered throughout (about 1%), mostly smectite filled, some zeolite.

FRACTURES - VEINS - BRECCIA
Fractures sub-horizontal, black smectite lining.

ROCK ALTERATION
None observed.

STRUCTURE

232.11 - 232.24 Medium-grained, massive basalt (unit 37.1).

232.24 - 232.60 Flow banded segment.

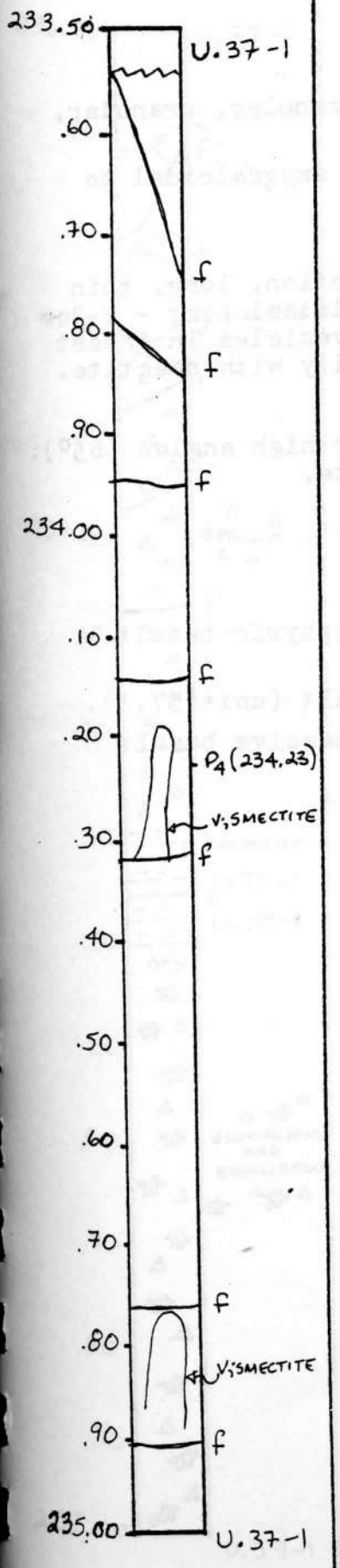
232.60 - 233.54 Medium-grained, massive basalt (unit 37.1).

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer ..RHW.....

Depth Interval 2335.4 cm to 2350.0 cm

Box 39 , Section 2



LITHOLOGY PETROGRAPHY
Continuing unit 37.1

Medium grained, greenish-grey, equigranular, granular, aphyric, holocrystalline, banded basalt.

VESICLES/AMYGDALES
Small (1-2mm) amygdales scattered throughout the section. Less than 1% volume, smectite filled.

FRACTURES - VEINS - BRECCIA
Fractures at high angles (70°) and sub-horizontal (0-10°) - filled with smectite.

ROCK ALTERATION
None observed.

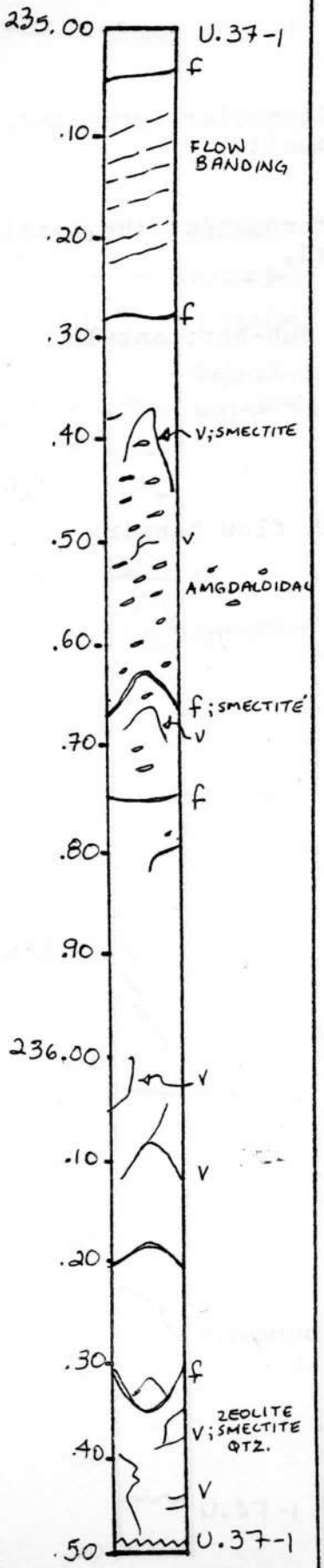
STRUCTURE
Medium-grained, aphyric basalt with flow banding (unit 37.1).

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 197

Visual Core Description Observer RHW

Depth Interval 2350 0 cm to 2364 9 c

Box 39 , Section 3



LITHOLOGY PETROGRAPHY
Continuing 37.1

Green-grey, medium grained, equigranular, granular, aphyric, holocrystalline basalt.

Section to 235.20 is banded, then amygdaloidal to 235.80, then to massive.

VESICLES/AMYGDALES
Rare 1-2mm amygdales in banded section, long, thin shape and some numerous in amygdaloidal part - 2-3cm long, 1mm or less across. Small vesicles in lowest section. Amygdales filled primarily with smectite.

FRACTURES - VEINS - BRECCIA
Fractures at low angles (0-10°) or high angles (65°). Lined with green and black smectite.

ROCK ALTERATION
None observed.

STRUCTURE
235.00 - 235.38 Medium-grained, aphyric basalt with banding (Unit 37.1).

235.38 - 235.80 Amygdaloidal basalt (unit 37.1).

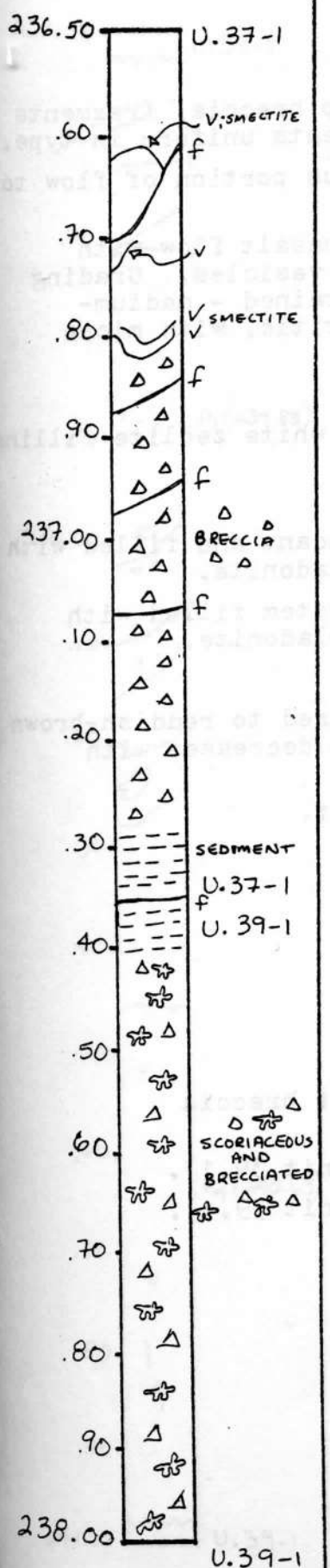
235.80 - 236.49 Medium-grained, massive basalt (unit 37.1).

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer RHW

Depth Interval 2364 9 cm to 2380 9 cm

Box 39 , Section 4



LITHOLOGY PETROGRAPHY

Continuing unit 37.1

Medium grained, aphyric, holocrystalline, grey-green, granular, equigranular basalt.

236.85 Sharp transition (dip = 30°) to extremely altered breccia, reddish weathered dust, vesicular and amygdaloidal clasts, angular and ranging in size from micro to several cm diameter. Some vein filling in the breccia by calcite.

237.27 About 8-10cm of sediment, baked to brick red, with some "vesicles".

237.37 Lower part of the section is a scoria, or scoriaceous breccia; brick red, altered, filled with calcite and zeolite.

VESICLES/AMYGDALES

236.49 Vesicles filled with smectite (black), small, rare in massive basalt.

236.85 Breccia has vesicular clasts with zeolite calcite fillings, some open vesicles.

237.27 Sedimentary zone has a few vesicles, small (2-3mm).

237.37 Scoriaceous zone filled by zeolite and calcite. Size varies greatly, up to 1.5cm by 1cm.

FRACTURES - VEINS - BRECCIA

236.49 Fractures in basalt are black smectite lined. Veinlets the same, are hairline. Either 0-10° or 60-70°.

237.37 Scoria fractures lined with black smectite and either green smectite or celadonite.

ROCK ALTERATION

None observed.

STRUCTURE

236.49 - 236.82 Medium-grained, massive basalt (unit 37.1).

236.82 - 237.27 Basalt breccia (unit 37.1).

237,27 - 237.37 Massive, red sediment.

237.37 - 238.09 Unit 39.1 ; Scoriaceous basalt breccia.

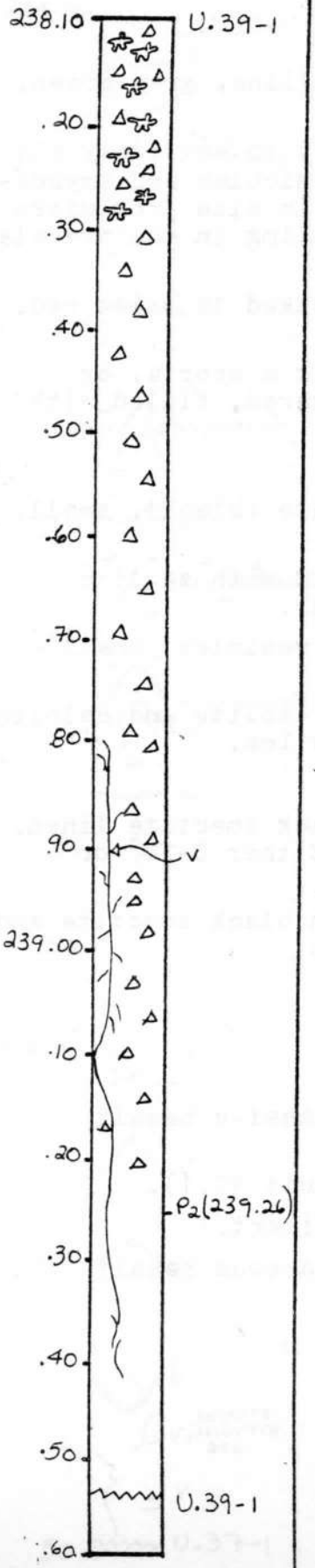
ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 197

Visual Core Description Observer JM

Depth Interval 2380 9 cm to 2395 3 c

Box 40 , Section 1

Graphic Representation | Sample Location



LITHOLOGY PETROGRAPHY
Continuing unit 39.1

Reddish brown scoriaceous flow top breccia, fragments subrounded 4cm-4mm in size, fragments uniform in type.

238.30 Transition from scoriaceous portion of flow to less brecciated portion.

238.30 Reddish brown brecciated basalt flow with irregular shape celadonite filled vesicles. Grading downward to a more massive fine-grained - medium-grained basalt flow, microphorphyritic, with micro plagioclase phenocryst.

VESICLES/AMYGDALES
238.09 Vesicles in clast contain white zeolite filling and are 2mm or less.

FRACTURES - VEINS - BRECCIA
238.30 Fractures, rare, veins abundant and filled with white zeolite and bluish-green celadonite.

238.80 Very irregular fracture system filled with white zeolites and bluish-green celadonite.

ROCK ALTERATION
238.09 Groundmass and clast oxidized to reddish-brown colour, the intensity of oxidation decreases with depth in the core.

238.80 Celadonite becomes abundant.

STRUCTURE
238.09 - 238.30 Scoriaceous basalt breccia (unit 39.1).

238.30 - 239.20 Basalt breccia (unit 39.1).

239.20 - 239.53 Massive basalt (unit 39.1).

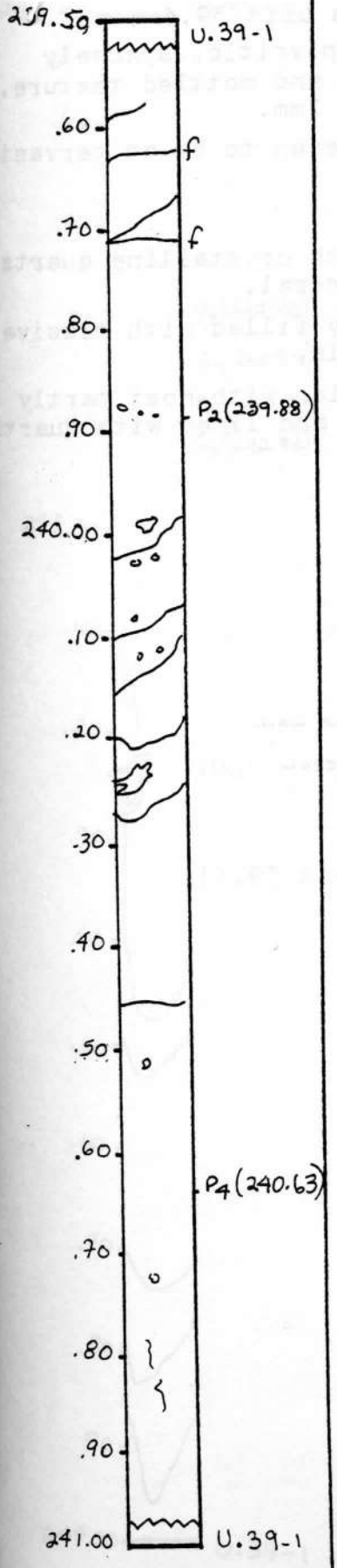
ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer JM

Depth Interval 2395 3 cm to 2409 7 cm

Box 40 , Section 2

Graphic Representation | Sample Location



LITHOLOGY PETROGRAPHY - continues unit 39.1
Medium grain porphyritic, bluish-grey basalt, with fine grained plagioclase phenocryst throughout, massive, 50% vesicles, filled with quartz, celadonite and white zeolite.

VESICLES/AMYGDALES
239.53 Very abundant, irregular shaped celadonite (bluish-green) amygdale, 3mm-1mm in size, 50% of rock covered with them.

239.90 Abundant vesicles similar to the description above and vein like white zeolite and quartz filled vesicle.

240.75 Vesicles decreasing in abundance.

FRACTURES - VEINS - BRECCIA
239.53 Planar simple fractures, minor black smectite.

ROCK ALTERATION
239.53 Green and black smectite on broken surfaces.

STRUCTURE
Medium-grained, massive basalt (unit 39.1).

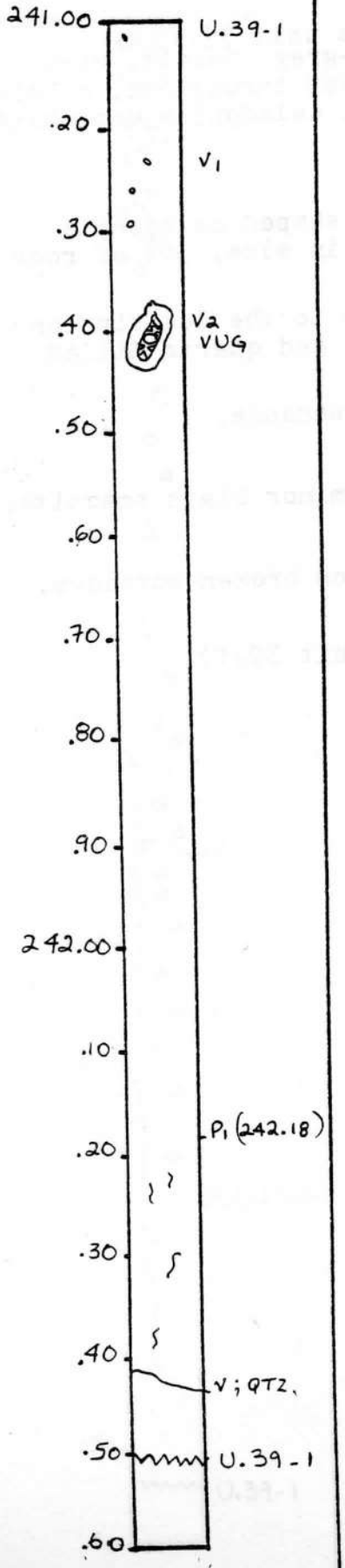
ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 197

Visual Core Description Observer JM

Depth Interval 2409.7 cm to 2425.0 cm

Box 40 , Section 3

Graphic Representation | Sample Location



LITHOLOGY PETROGRAPHY - continues unit 39.1
Medium grain, greenish-brown, porphyritic, sparsely vesicular basalt, holocrystalline and mottled texture. Plagioclase phenocrysts less than 1mm.

Bluish-green celadonite does not seem to be as pervasive throughout the section.

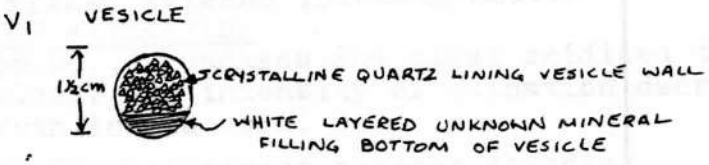
VESICLES/AMYGDALES
241.20 Rounded vesicles lined with crystalline quartz and fine grained white unknown mineral.

241.40 Large irregular vug partly filled with massive quartz and euhedral quartz crystals.

Vesicles are less than 5% of section with most partly filled by massive unknown mineral and lined with quartz.

FRACTURES - VEINS - BRECCIA
Fractures rare.

ROCK ALTERATION
None observed.



STRUCTURE
Medium-grained, massive basalt (unit 39.1).

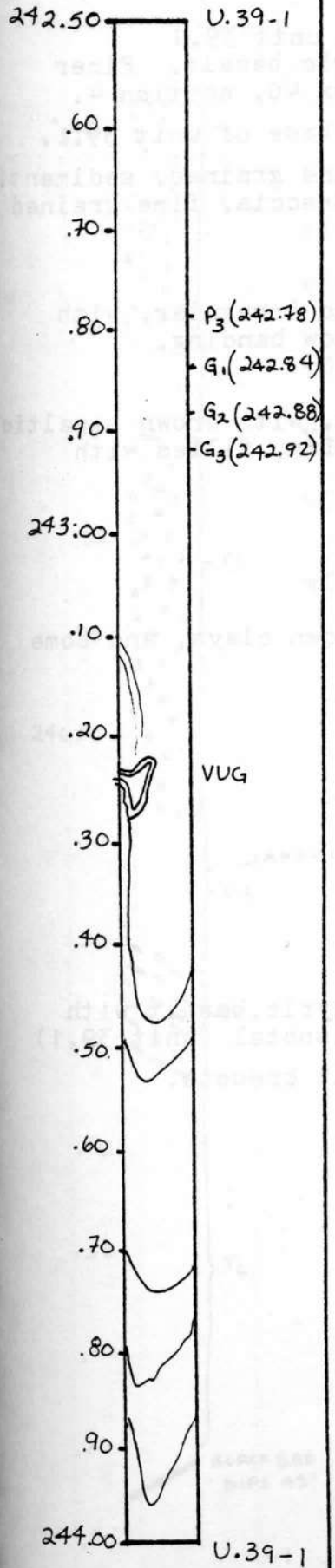
ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer ..JM.....

Depth Interval 2425 0 cm to 2440 0 cm

Box 40 , Section 4

Graphic Representation | Sample Location



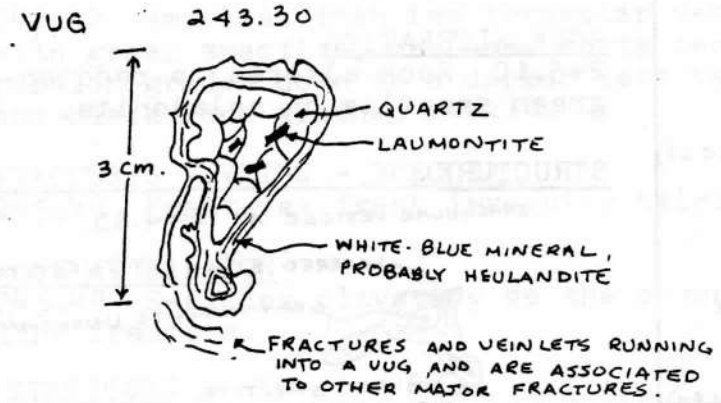
LITHOLOGY PETROGRAPHY - continues unit 39.1
242.70 Brownish-green, medium grained, porphyritic, holocrystalline, basalt. Mottled.

VESICLES/AMYGDALES
243.25 Vesicles. Vug lined with white unknown mineral and partially filled with botryoidal blue quartz - with laumontite growing on quartz.

FRACTURES - VEINS - BRECCIA
242.50 Fracture
243.30 Fracture, arranged in a systematic arrangement with fractures dipping 70° from horizontal.

ROCK ALTERATION
242.70 Rock altered to (?) brownish-green clays.

OTHER
Note: no recognized celadonite.

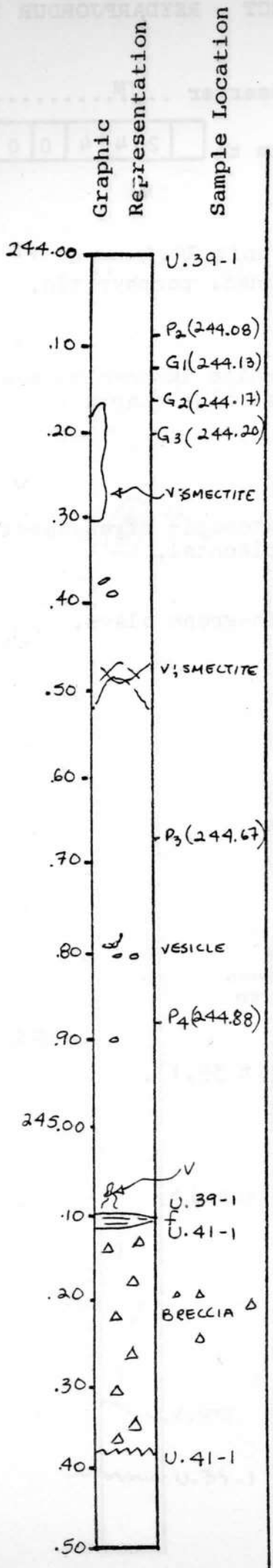


STRUCTURE
Medium-grained, massive basalt (unit 39.1).

Visual Core Description Observer JM

Depth Interval 2440 cm to 2458 cm

Box 41 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 39.1

244.20 Brown, fine grained, aphyric basalt. Finer grained than portion of unit in box 40, section 4.

244.82 Increased vesicles in the base of unit 39.1.

245.10 7cm dark brown, earthy, fine grained, sediment. Overlying reddish-brown flow top breccia, fine grained groundmass.

VESICLES/AMYGDALES

244.07 Vesicles, are elongated and irregular, with vesicles oriented parallel with flow banding.

244.83 Irregular vesicle.

245.07 Calcite filled vesicle 3cm, with brown basaltic fragment vesicles, irregular, 4mm-1mm, filled with green smectite and calcite.

FRACTURES - VEINS - BRECCIA

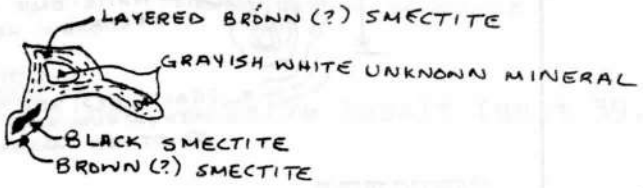
None observed.

ROCK ALTERATION

245.10 Rock altered to reddish-brown clays, and some green smectite on celadonite.

STRUCTURE

IRREGULAR VESICLE AT 244.83.



STRUCTURE

244.00 - 245.10 Fine-grained, aphyric, basalt with flow banding dipping 35° from horizontal (unit 39.1)

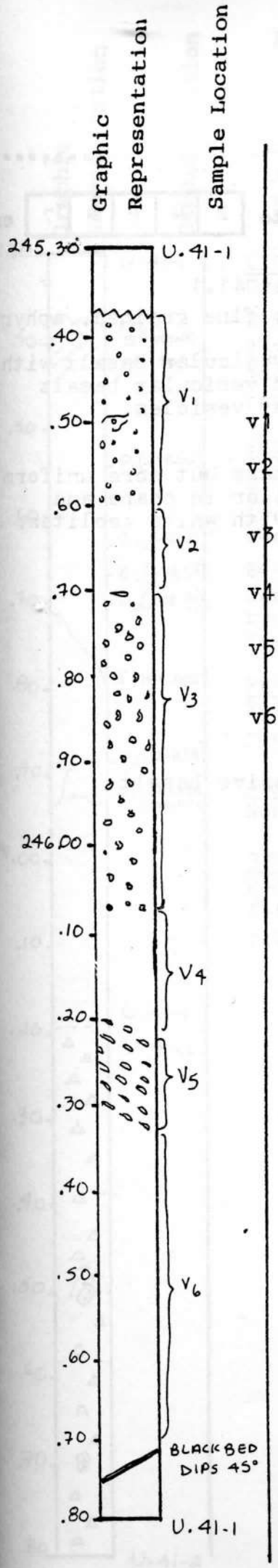
245.10 - 245.38 Unit 41.1 ; Basalt breccia.

ICELAND RESEARCH DRILLING PROJECT - REYDARFJORDUR 1978

Visual Core Description Observer ..JM.....

Depth Interval 245380 cm to 246820 cm

Box 41 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 41.1
Grey vesicular, fine grained, aphyric, basalt, with vertical variation in vesicle size and variations in predominent vesicle filling.

246.65 Black, fine grain non-porphyritic bed.

VESICLES/AMYGDALES

245.38 Vesicles 5mm irregular, lined with green smectite/celadonite.

245.58 Vesicles, smaller than in above zone filled with green smectite, 1mm-2mm.

245.70 Vesicles, 3cm-1mm white laumontite filled and green smectite lined vesicles, irregular shaped.

246.06 3mm-1mm green smectite filled vesicles, rounded and irregular in shape.

246.20 1.5cm-2mm white zeolite filled vesicles, vesicles are lined by green smectite.

246.32 4mm-less than 1mm irregular vesicles filled with green smectite, and some white zeolites. This portion grades down to a darker less vesiculated bed and black fine grained basalt.

FRACTURES - VEINS - BRECCIA

245.48 Fracture; fresh irregular hairline fractures.

ROCK ALTERATION

245.48 Swelling clays may be the cause of fresh hairline fracture.

STRUCTURE

Fine-grained, aphyric, vesicular, massive basalt (unit 41.1).
246.72 Fine-grained black bed.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** JM

Depth Interval 246.82 cm to 248.37 cm

Box 41 , Section 3

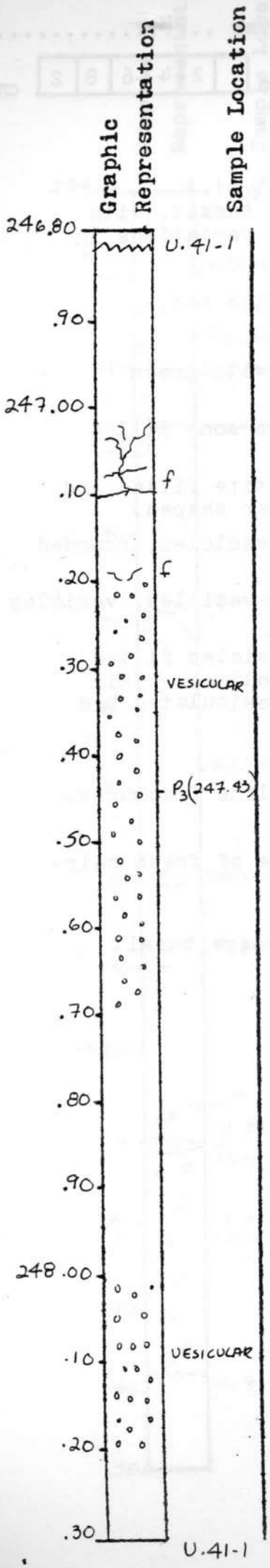
LITHOLOGY PETROGRAPHY - continues unit 41.1
Light greyish-green, highly vesicular, fine grained, aphyric basalt.
247.80 Transition from fine-grained vesicular basalt with white zeolite fillings to fine-grained vesicular basalt with green smectite filling and smaller vesicles.

VESICLES/AMYGDALES
248.82 Vesicles, same as preceeding page but more uniform in size distribution. Vesicles irregular in shape and lined with green smectite and filled with white zeolites. Size range 8mm-1mm.

FRACTURES - VEINS - BRECCIA
247.03 Fresh irregular fractures.
247.18 Fresh irregular fractures.

ROCK ALTERATION
None observed.

STRUCTURE
Fine-grained, aphyric, vesicular, massive basalt (unit 41.1).

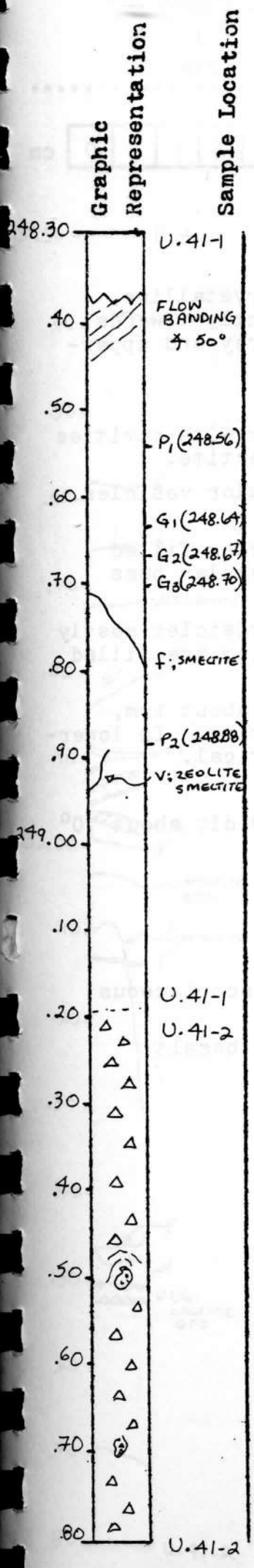


ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** JM

Depth Interval 2483.7 **cm to** 2498.0 **cm**

Box 41 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 41.1
Greenish-grey, vesiculated basalt, fine-grained, aphyric.

249.20 Vesiculated and brecciated flow top breccia, dark grey, fine-grained, aphyric basalt.

249.67 White zeolite vein-like vesicule, with angular basalt fragments surrounded by zeolite.

VESICLES/AMYGDALES
248.37 70-80% of surface covered by green smectite filled vesicles, average size of vesicle 1-2mm, most irregular in shape. White zeolites fill some of the vesicles.

249.20 Vesicles, rounded and vein-like, filled with white zeolite (laumontite(?)). Vesicles 1mm-5mm in size for rounded vesicles, hairline - 3cm in size for vein-like fractures.

FRACTURES - VEINS - BRECCIA
248.37 Very minor occurrence.

249.20 Veins, hairline with white zeolite filling.

ROCK ALTERATION
None observed.

STRUCTURE
248.37 - 249.20 Fine-grained, aphyric basalt with flow banding (unit 41.1).

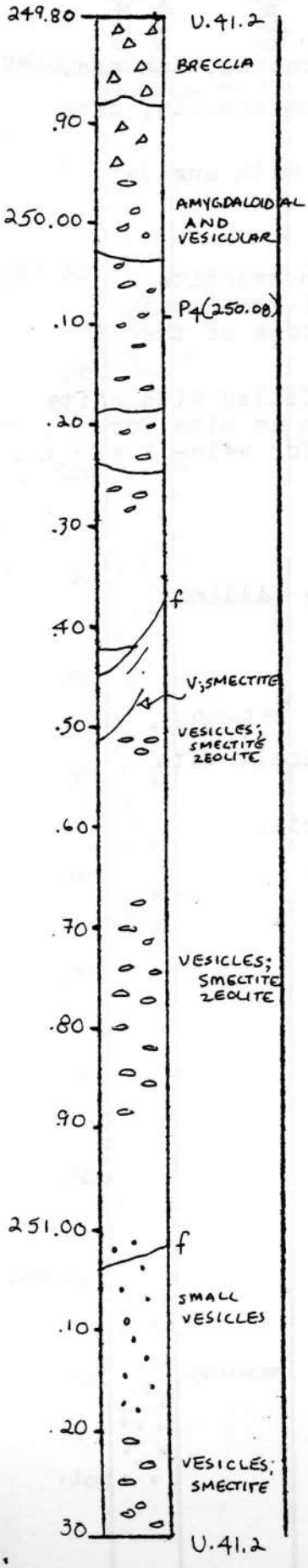
249.20 - 249.80 Unit 41.2 ; Basalt breccia.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR .....

Depth Interval 2 4 9 8 0 **cm to** 2 5 1 3 0 **cm**

Box 42 , Section 1



LITHOLOGY PETROGRAPHY

Unit 41.2 continues

Grey to greenish-grey, fine-grained, holocrystalline, aphyric basalt. Grain size increases slightly towards base of section. Upper 20cm are reddish-grey and uppermost 10cm are slightly brecciated.

VESICLES/AMYGDALES

249.80 Upper scoriaceous zone is vesicular with cavities less than 1mm across, often filled with smectite.

250.00 - 250.30 Has large (5mm-3cm) irregular vesicles. Zoned with green smectite and zeolite.

250.53 - 250.62 There are many small vesicles filled with green smectite and some up to 1cm irregular ones filled with zeolite.

250.65 - 259.92 There are many irregular vesicles mostly 3mm or less. A few irregular cavities to 1cm are filled with quartz.

251.00 Lower 30cm has many small vesicles about 1mm, irregularly shaped, filled with green smectite. In lowermost 10cm vesicles are about 3mm, sub-spherical.

FRACTURES - VEINS - BRECCIA

249.80 Most fractures less than 15°, a few dip about 70° as do a few smectite-lined veinlets.

ROCK ALTERATION

None observed.

STRUCTURE

249.80 - 250.00 Basalt breccia, slightly scoriaceous (unit 41.2).

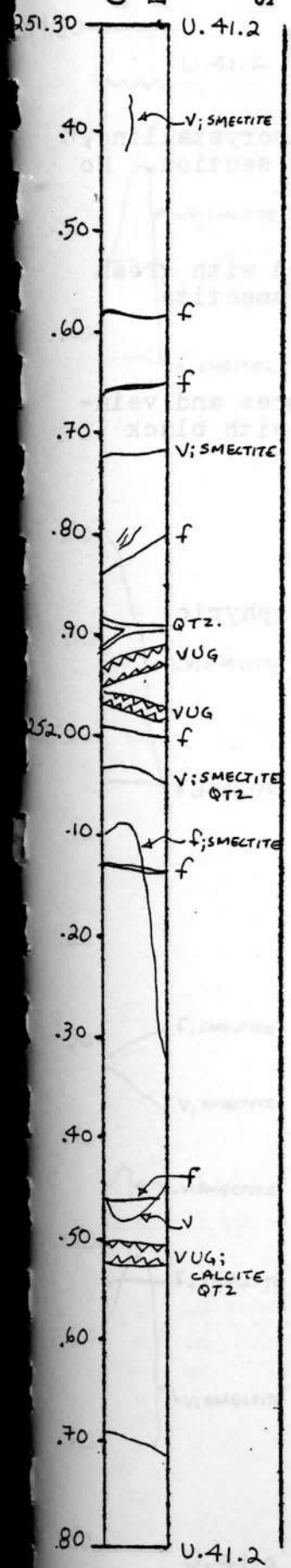
250.00 - 251.30 Vesicular and amygdaloidal basalt (unit 41.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR .....

Depth Interval 251.30 **cm to** 252.84 **cm**

Box 42 , Section 2



LITHOLOGY PETROGRAPHY
Continues unit 41.2

Grey to greenish-grey, fine-grained, holocrystalline, aphyric basalt. Grain size uniform through section, no contact.

VESICLES/AMYGDALES
251.30 Upper 35cm vesicular about 5%, 1-3mm, spherical to irregular, filled with green smectite.

Rest of section has less than 1% vesicles, about 1mm, spherical, filled with green smectite.

Drusy quartz vugs or wide veins occur at 251.90 and 252.50m.

FRACTURES - VEINS - BRECCIA
251.30 Most fractures less than 20°, some dip about 70° as do hairline veinlets of smectite.

ROCK ALTERATION
None observed.

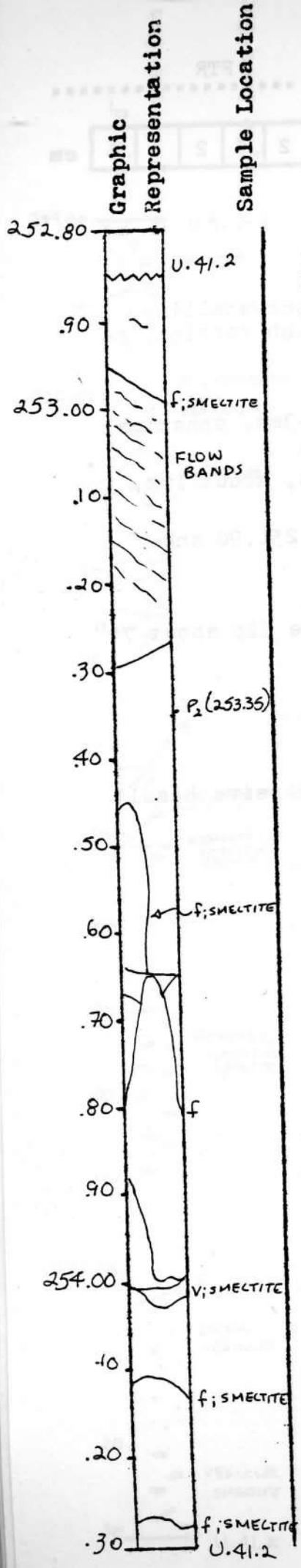
STRUCTURE
Fine-grained, holocrystalline, aphyric, massive basalt (unit 41.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** ....PTR.....

Depth Interval 25284 **cm to** 25435 **cm**

Box 42 , Section 3



LITHOLOGY PETROGRAPHY
Continues unit 41.2

Greenish grey, fine- to medium-grained, holocrystalline, aphyric basalt. Grain size uniform through section. No contacts.

VESICLES/AMYGDALES
Less than 1%, 1mm or less, spherical, filled with green smectite. Many irregular 1-2mm patches of smectite throughout.

FRACTURES - VEINS - BRECCIA
Sparse, mostly less than 30°. A few fractures and veinlets dip 50-60°. All are coated or filled with black smectite.

ROCK ALTERATION
None observed.

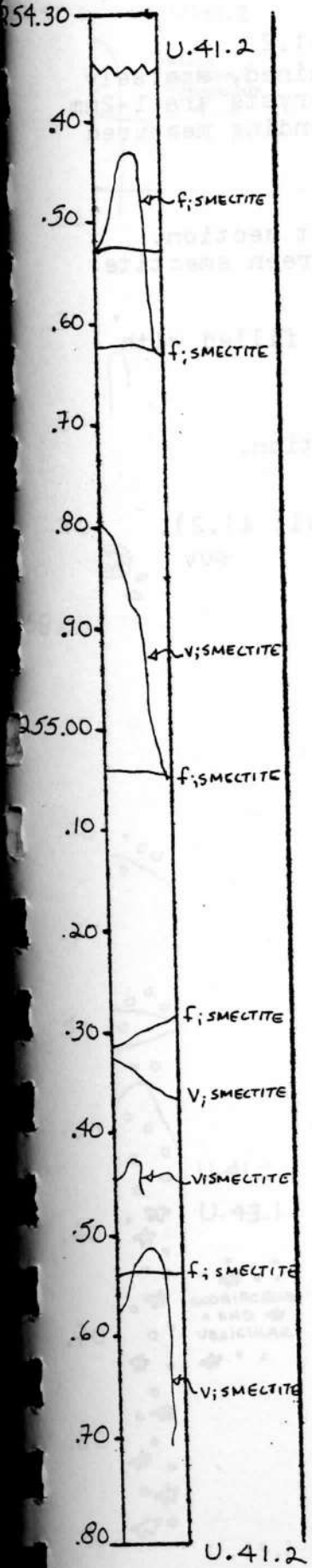
STRUCTURE
Fine- to medium-grained, holocrystalline, aphyric basalt, generally massive (unit 41.2).
252.95 - 253.20 Flow banding.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 25435 **cm to** 25590 **cm**

Box 42 , Section 4



LITHOLOGY PETROGRAPHY
Continues unit 41.2

Grey to greenish-grey, medium-grained, holocrystalline, equigranular, aphyric basalt. Grain size uniform through section. No contacts.

VESICLES/AMYGDALES
Less than 1%, 1mm or less, spherical, filled with green smectite. 1-2mm irregular patches of smectite scattered through section.

FRACTURES - VEINS - BRECCIA
Fractures mostly less than 15°, a few fractures and veinlets 60-70°. All filled with green to black smectite.

ROCK ALTERATION
None observed.

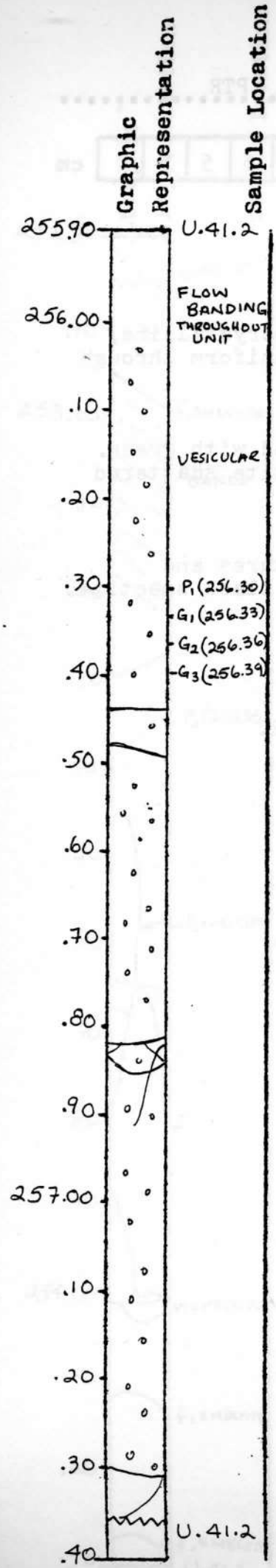
STRUCTURE
Medium-grained, massive basalt of unit 41.2.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** NG

Depth Interval 25590 **cm to** 25736 **cm**

Box 43 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 41.2
Green-grey, very sparsely phyric fine-grained, sparsely vesicular tholeiitic basalt. Rare phenocrysts are 1-2mm long blades of plagioclase. Core flow banding measured about 18°.

VESICLES/AMYGDALES
About 1-2% of section dispersed throughout section. Spherical, 1-2mm diameter. Filled with green smectite.

FRACTURES - VEINS - BRECCIA
About 1% fractures, hairline to 1mm wide, filled with green and black smectite.

ROCK ALTERATION
Pervasive green and black smectite alteration.

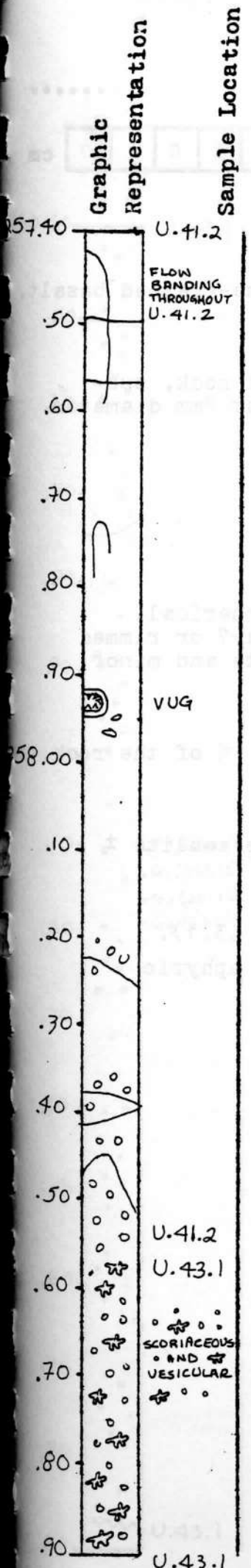
STRUCTURE
Fine-grained basalt with flow banding (unit 41.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** NG

Depth Interval 25736 **cm to** 25890 **cm**

Box 43 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 41.2
Fine-grained, sparsely phyric, sparsely vesicular, green grey tholeiitic basalt with flow banding. Phenocrysts of plagioclase - 1mm long. Core flow banding measured about 30°.

258.57 Rusty-red to purplish-green-grey, highly altered, aphyric, fine-grained scoriaceous basalt.

VESICLES/ AMYGDALES
257.36 Vesicles generally spherical 1-2mm diameter, filled with green and black smectite.
257.90 Large vug about 4cm across long axis is filled with euhedral quartz, green smectite and calcite. Subrounded, to irregular vugs 1-2cm long, rimmed with green smectite and filled with calcite.

258.30 Vesicles more abundant, increase to about 20% of rock at base of unit, 3-5mm in diameter, lined with green smectite, filled with zeolite or calcite. Some contain only green smectite, some are empty.

258.57 Rock equals 60% vesicles subrounded to irregular, 2-5mm diameter rimmed with green clay and filled with zeolite and green clay, or just filled with green or red clay (smectite?).

FRACTURES - VEINS - BRECCIA
257.36 Rock not highly fractured. Fractures are hairline to 1mm wide. All contain green smectite.

Those at 257.50, 258.20 and 258.45 also contain zeolite. Fractures are planar to slightly irregular at variable angle to core axis.

258.57 Hair-line fracture over less than 1% of rock. Filled with zeolite.

ROCK ALTERATION
257.36 Pervasive green and black smectite. Calcite, zeolite and quartz in vesicles and fractures.

258.57 Pervasive green and red clay (smectite?), zeolites in vesicles and fractures.

VUG AT 257.90

STRUCTURE
257.36 - 258.57 Fine-grained, flow banded basalt (unit 41.2).

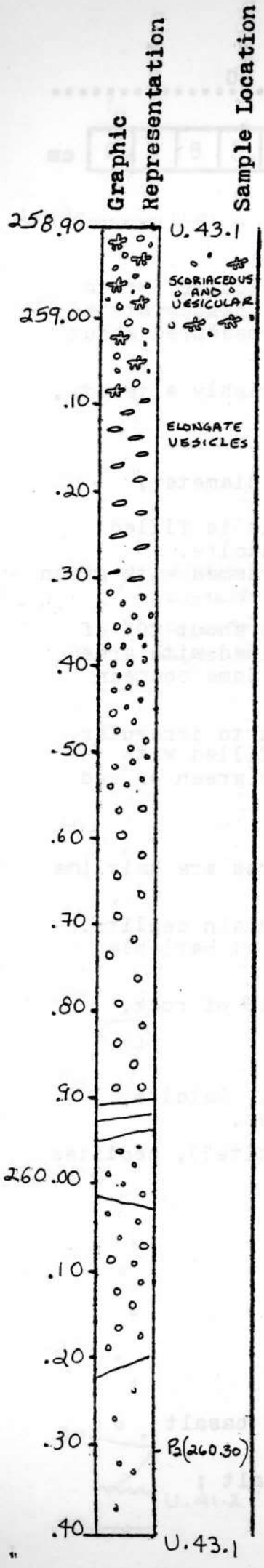
258.57 - 58.90 Vesicular scoriaceous basalt ; Unit 43.1.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** NG

Depth Interval 2589.0 **cm to** 2604.0 **cm**

Bo 43 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 43.1
Purplish-green-grey vesicular, aphyric, fine-grained basalt. To 259.10 unit is scoriaceous.

VESICLES/AMYGDALES
258.36 Highly vesicular-vesicles 20-50% of rock, sub-rounded to irregular. Variable size. About 8mm diameter.

259.10 Elongate vesicles to 3cm long.

259.31 3.5mm diameter.

259.55 About 10mm diameter.

259.90 2-3mm diameter

260.00 3-8mm diameter.

260.20 Rare vesicles about 1mm diameter, spherical. Vesicles commonly filled with turquoise clay? or rimmed with green smectite? and filled with zeolite and minor amounts of calcite.

FRACTURES - VEINS - BRECCIA
258.90 Hair-line fractures over less than 1% of the rock. Filled with white zeolite.

ROCK ALTERATION
258.90 Pervasive green and red clay? white zeolite ± calcite in fractures and vesicles.

STRUCTURE
258.90 - 259.10 Scoriaceous basalt (unit 43.1).

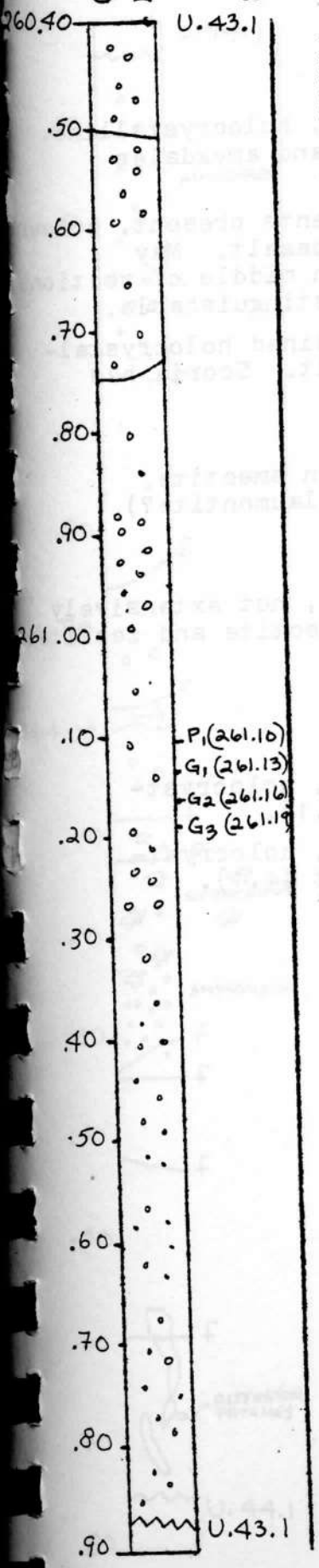
259.10 - 260.40 Fine-grained, vesicular, aphyric basalt (unit 43.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** ...NG.....

Depth Interval 26040 **cm to** 26187 **cm**

Box 43 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 43.1
Green-grey, fine-grained, aphyric, vesicular basalt. Similar to above, but not purplish. Unit coarsens downward, becoming medium-grained.

VESICLES/AMYGDALES
260.40 5-30% of rock more abundant where shown in illustration. 2-5mm long, subrounded to irregular. Size of vesicles decreases downward. Vesicles are commonly lined with turquoise smectite and filled with white zeolite and/or quartz, and/or calcite. Some contain euhedral crystals of quartz and zeolite.

261.40 Vesicles are less than 1mm diameter. These are most commly filled with green smectite.

FRACTURES - VEINS - BRECCIA
260.40 Minor hairline fractures with filling of green or turquoise smectite? Those near base of section also contain white zeolite.

ROCK ALTERATION
Pervasive green smectite? Calcite, quartz, zeolite in fractures and vesicles.

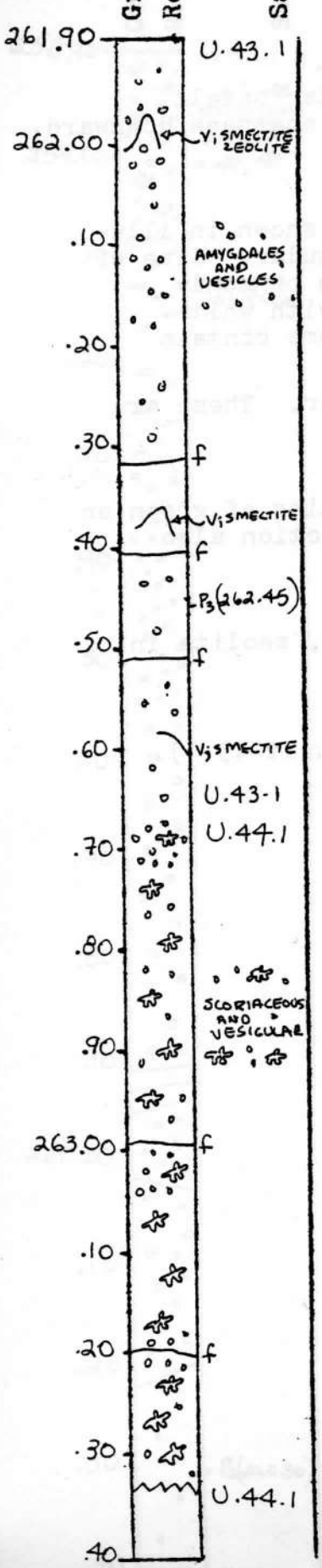
STRUCTURE
Fine-grained, vesicular, aphyric basalt (unit 43.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 26187 cm to 26333 cm

Box 44 , Section 1



LITHOLOGY PETROGRAPHY
Continuing unit 43.1

Medium to fine-grained granular, aphyric, holocrystalline, grey to greenish-grey basalt. Vesicles and amygdales throughout, ranging in concentration.

262.48 Contact rather obscure, no sediments present, colour change to darker grey, slightly reddish basalt. May actually be in section 2. Entire area in middle of sections 1 and 2 is altered, no breccia really distinguishable.

262.70 Reddish-grey, medium- to fine-grained holocrystalline, aphyric, granular scoriaceous basalt. Scoria has small voids generally.

VESICLES/AMYGDALES
261.87 Smaller vesicles filled with green smectite, larger (up to 1cm diameter) filled with (laumontite?) zeolite.

FRACTURES - VEINS - BRECCIA
261.87 Fractures sub-horizontal (0-10°), not extensively lined with alteration products. Minor smectite and zeolite.

ROCK ALTERATION
None observed.

STRUCTURE
261.87 - 262.67 Fine- to medium-grained, holocrystalline, aphyric, massive basalt (unit 43.1).

262.67 - 263.33 Fine- to medium-grained, holocrystalline, aphyric, scoriaceous basalt (unit 44.1).