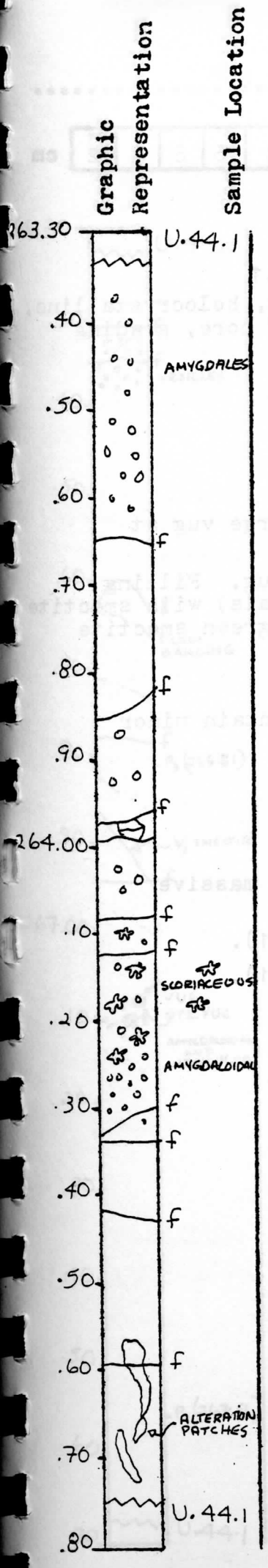
ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 26333 **cm to** 26475 **cm**

Box 44 , Section 2



LITHOLOGY PETROGRAPHY
Continuing unit 44.1

Fine-grained, amygdaloidal, reddish-grey, holocrystalline, aphyric basalt. Amygdales absent 263.60 to 263.80, perhaps due to a large clast. Material appears very altered. Below 263.80 material is same as above, 263.60 to 264.10, where basalt goes to a red scoriaceous zone about 5cm to 10cm thick, contact at top horizontal, on bottom dipping about 80°.

264.34 Large amygdales and many fine amygdales below scoriaceous, medium grey, fine-grained, aphyric, holocrystalline basalt.

264.65 Bottom 30cm has large alteration patches and some zeolite filling or replacement.

VESICLES/AMYGDALES
273.33 Amygdales scattered (about 1%) and large (1cm x .75cm) and zones of finer vesicles and amygdales. Most are green smectite lined, zeolite (laumontite) filled.

FRACTURES - VEINS - BRECCIA
263.33 Fractures sub-horizontal to about 45°, rare smectite on the fracture surfaces.

ROCK ALTERATION
264.65 Quartz filling of zones in altered area. Green smectite lining.

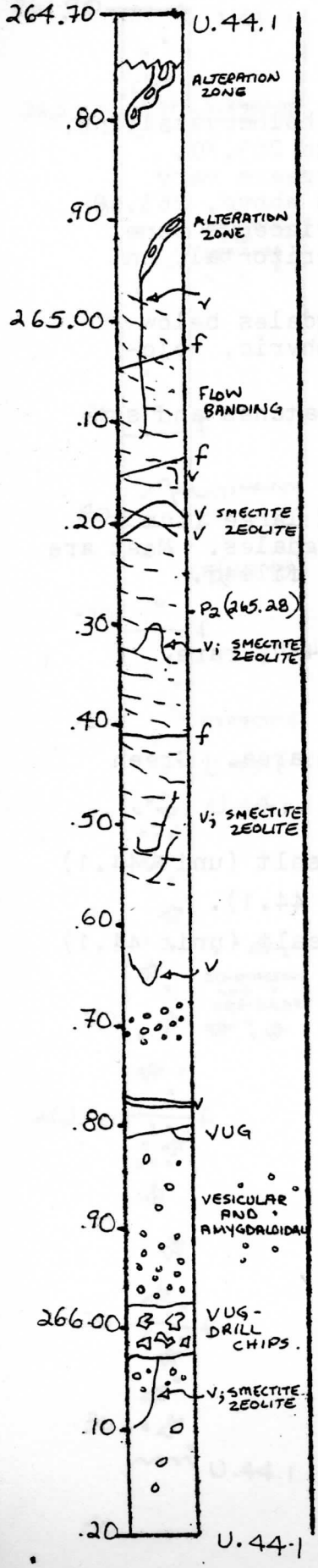
STRUCTURE
263.33 - 264.10 Fine-grained, massive basalt (unit 44.1)
264.10 - 264.30 Scoriaceous basalt (unit 44.1).
264.30 - 264.75 Fine-grained, massive basalt (unit 44.1)

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 26475 cm to 26622 cm

Box 44 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 44.1
Medium- to fine-grained, grey-green basalt, holocrystalline, aphyric, granular. Altered zone at top of core, grading into a banded zone 265.00 to 265.80.

265.70 Amygdaloidal /vesicular zone

265.90 Amygdaloidal/vesicular zone

VESICLES/AMYGDALES
Amygdales large (1-2cm) and rare to

265.85 then concentrated (5-10%) above large vug at 266.00.

266.03 Decreasing frequency again below vug. Filling zeolite (laumontite where visible as crystals) with smectite lining. Smaller amygdales throughout are green smectite filled.

FRACTURES - VEINS - BRECCIA
Fractures all subhorizontal (0-10°) and contain minor amounts of black smectite.

ROCK ALTERATION
None observed.

STRUCTURE
264.75 - 265.00 Fine- to medium-grained, massive basalt (unit 44.1).

265.00 - 265.80 Banded segment (unit 44.1).

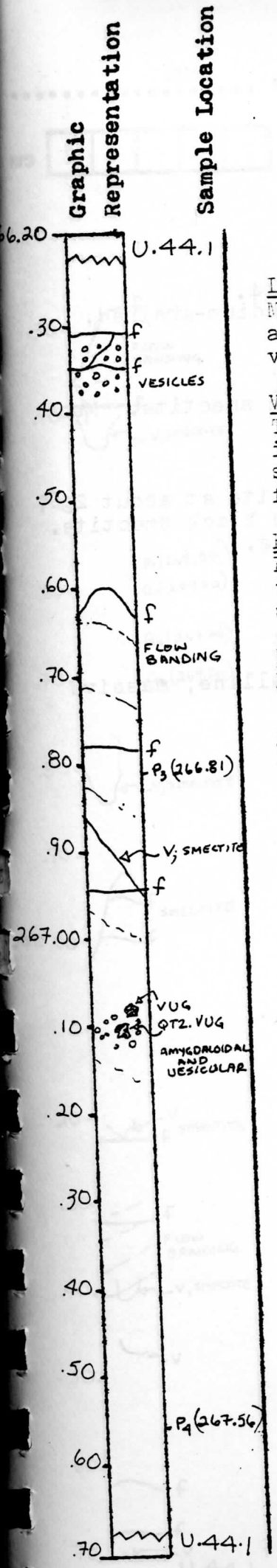
265.80 - 266.22 Massive basalt (unit 44.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 2 6 6 2 2 **cm to** 2 6 7 6 6 **cm**

Box 44 , Section 4



LITHOLOGY PETROGRAPHY- continues unit 44.1
Medium-grained, greenish-grey, equigranular, granular, aphyric, holocrystalline basalt. Two zones of amygdales/ vesicles and vugs. Faintly banded.

VESICLES/AMYGDALES
Two zones of vesicles/amygdales, generally less than .5cm in diameter, zeolite (laumontite) and quartz filled, smectite lined. Smaller vesicles sometimes smectite filled.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal, up to about 25°, one veinlet 1mm thick, 70° dip. Fracture surfaces covered with black smectite, veinlet has zeolite filling.

ROCK ALTERATION
None observed.

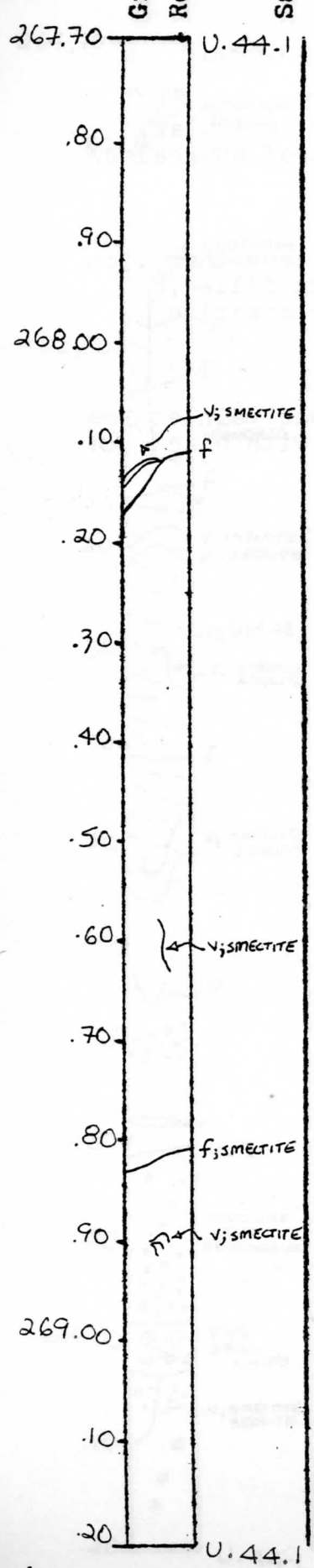
STRUCTURE
Medium-grained, massive basalt (unit 44.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 26767 cm to 26922 cm

Box 45 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 44.1
Light grey, aphyric, holocrystalline, medium-grained, granular, equigranular basalt.

VESICLES/AMYGDALES
Rare small (1-2mm) amygdales filled with smectite. Much less than 1%.

FRACTURES - VEINS - BRECCIA
Only two fractures, one with black smectite at about 25°, one at a high angle (65°) with green and black smectite. Veinlets - hairline with smectite filling.

ROCK ALTERATION
None observed.

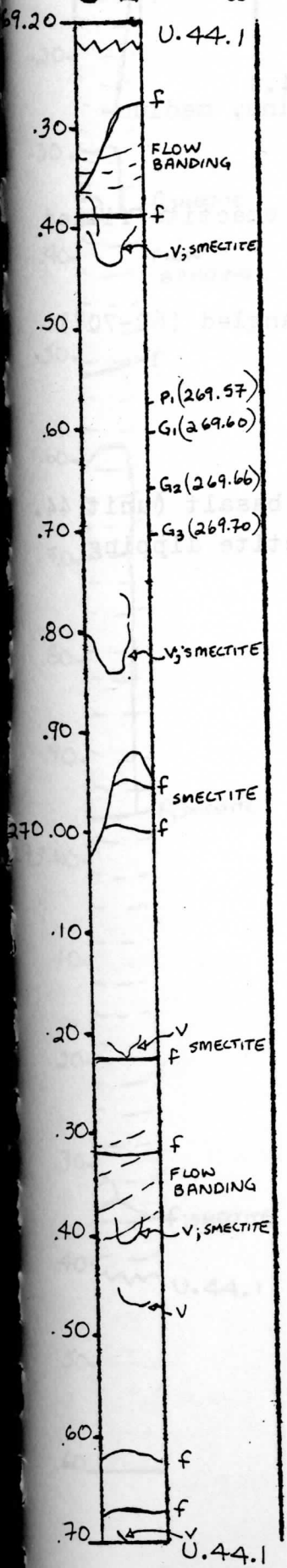
STRUCTURE
Medium-grained, equigranular, holocrystalline, massive basalt (unit 44.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 26922 **cm to** 27076 **cm**

Box 45 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 44.1
Medium-grained, aphyric, greenish-grey, holocrystalline, equigranular, granular basalt.

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

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-15°) and subvertical (65°) lined with smectite, green and black.

ROCK ALTERATION
None observed.

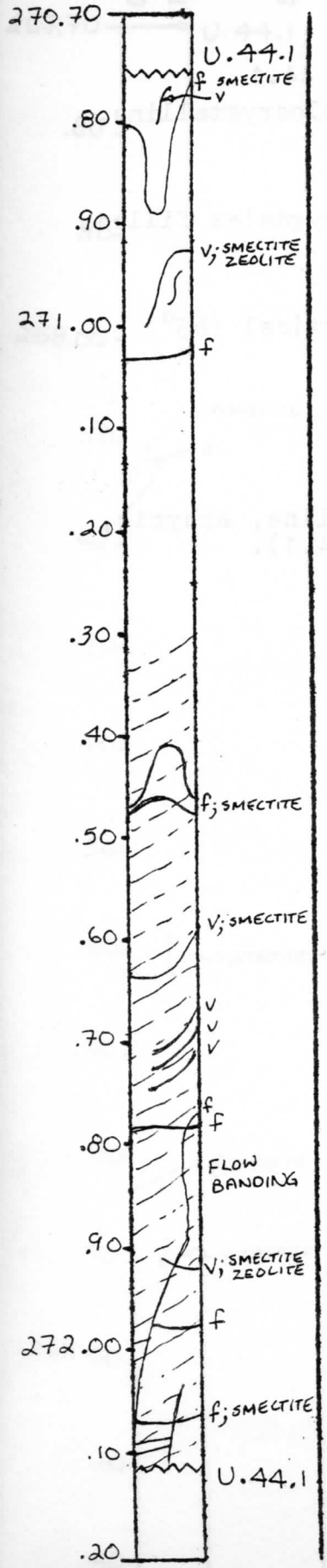
STRUCTURE
Medium-grained, equigranular, holocrystalline, aphyric, massive basalt with vague banding (unit 44.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description Observer RHW

Depth Interval 27076 cm to 27211 cm

Box 45 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 44.1
Light grey, banded, aphyric, holocrystalline, medium-grained, granular, equigranular basalt.

VESICLES/AMYGDALES
Essentially absent - rarely small (1-2mm) smectite filled amygdales.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-20°) and high angled (60-70°) lined with black and green smectite.

ROCK ALTERATION
None observed.

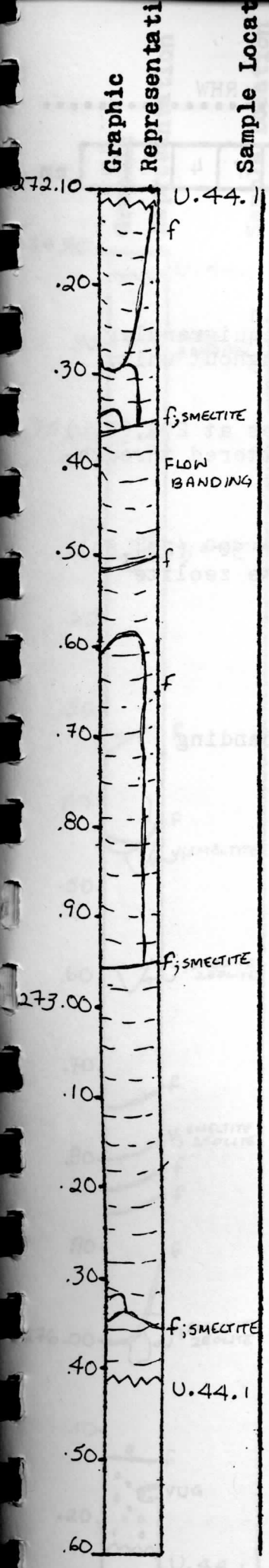
STRUCTURE
270.76 - 271.30 Medium-grained, massive basalt (unit 44.

271.30 - 272.11 Segment banded with smectite dipping 25°. (unit 44.1).

Visual Core Description **Observer** RHW

Depth Interval 272.11 cm to 274.10 cm

Box 45 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 44.1
Light grey, banded, aphyric, holocrystalline, medium-grained, granular, equigranular basalt.

VESICLES/AMYGDALES
Essentially absent - rarely small (1-2mm) smectite filled amygdales.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-20°) and high angled (60-70°) lined with black and green smectite.

ROCK ALTERATION
None observed.

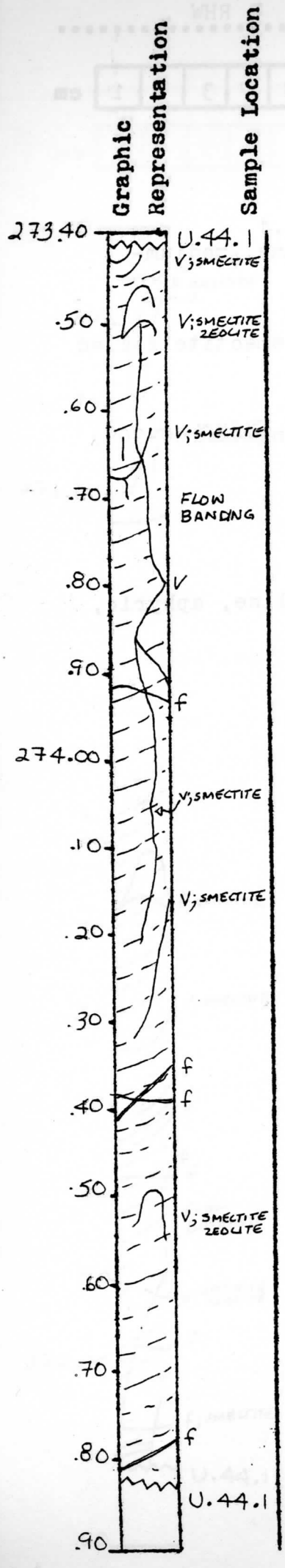
STRUCTURE
Medium-grained, equigranular, holocrystalline, aphyric, banded basalt (unit 44.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 273.41 cm to 274.82 cm

Box 46 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 44.1
Medium-grained, aphyric, holocrystalline, equigranular, granular, grey-green basalt. Banding throughout unit.

VESICLES/AMYGDALES
Rare zeolite filled, smectite lined vesicles at 273.80. Small smectite filled vesicles (1-2mm) scattered throughout, much less than 1%.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-10°), and one at 50° (274.80). Veinlets hairline, smectite lined, with some zeolite filling.

ROCK ALTERATION
None observed.

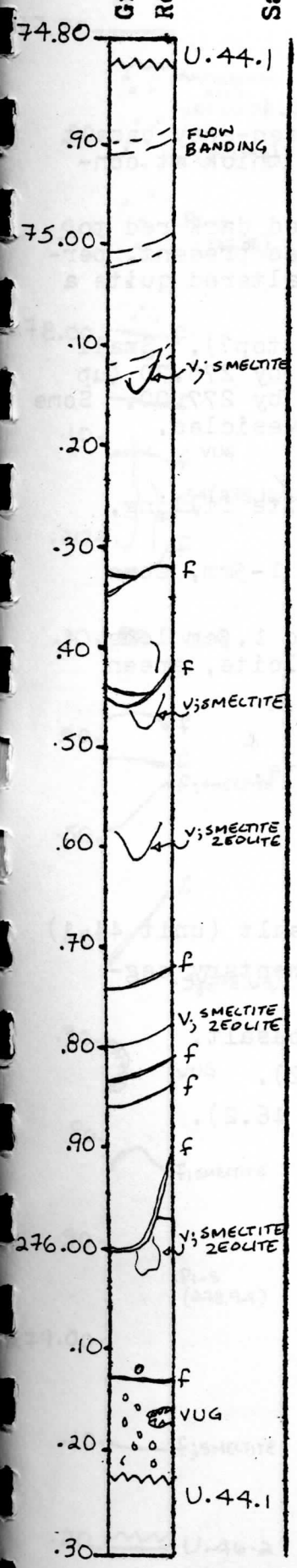
STRUCTURE
Medium-grained, aphyric basalt with flow banding dipping 35°.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 27482 **cm to** 27622 **cm**

Box 46 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 44.1
Grey-green, medium-grained, aphyric, holocrystalline, granular, equigranular basalt.

275.80 The grain size begins to fine to a fine-grain size by the bottom of the section.

VESICLES/AMYGDALES
Rare small smectite filled amygdales (much less than 1%, 1mm). One large (1.5cm) vug filled with zeolite, lined with smectite and minor quartz.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal (0-10°) and high angled (65°), lined with green and black smectite, and some zeolite. Veins and veinlets mainly hairline, smectite filled, occasional zeolite in wide (1-2mm) veins.

ROCK ALTERATION
None observed.

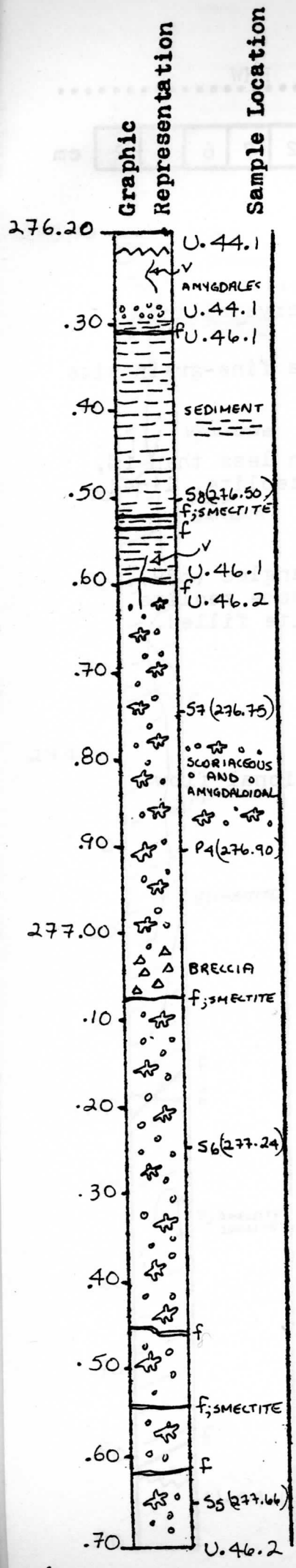
STRUCTURE
Medium-grained, massive basalt with occasional flow banding (unit 44.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 27622 cm to 27773 cm

Box 46 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 44.1
Fine-grained, aphyric, holocrystalline, green-grey basalt with a vesicular (amygdaloidal) zone 1-2cm thick at contact with unit 46.1.

276.30 Unit 46.1. Sedimentary unit - baked dark red to brown or black. Vesicles and rare amygdales present, perhaps in clasts in the sediment which have altered quite a bit. No sedimentary structures visible.

276.60 Unit 46.2. Scoriaceous lava (flow top?). Small amygdales close to contact (1-3mm), larger by 276.70 (up to 1.5cm long) and getting smaller (3-7mm) by 277.00. Some areas in lower 50cm contain predominantly vesicles.

VESICLES/AMYGDALES
In basalt, just above contact, mainly calcite filling, minor zeolite (.1 - 1cm).

276.30 In sediments, mostly open vesicles 1-5mm, some calcite filling.

276.60 In scoria, sizes of amygdales up to 1.5cm long, .5cm wide, mostly zeolite filled, minor calcite, green smectite lining.

FRACTURES - VEINS - BRECCIA
Fractures subhorizontal, lined with smectite.

ROCK ALTERATION
None observed.

STRUCTURE

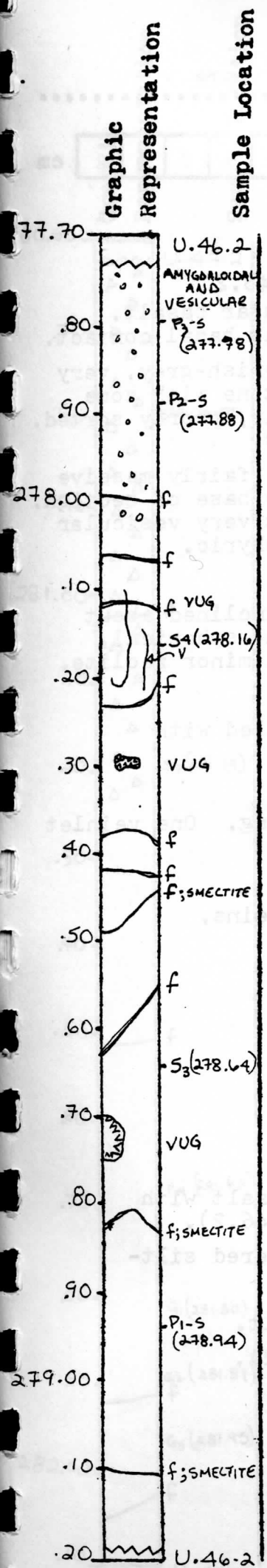
276.22 - 276.30	Fine-grained, massive basalt (unit 44.1)
276.30 - 276.60	Unit 46.1 ; Massive sedimentary segment.
276.60 - 277.00	Unit 46.2 ; Scoriaceous basalt.
277.00 - 277.07	Basalt breccia (unit 46.2).
277.07 - 277.73	Scoriaceous basalt (unit 46.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** RHW

Depth Interval 27773 **cm to** 27919 **cm**

Box 46 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 46.2
Medium-grained, grey-red to brown-red, granular, aphyric, holocrystalline, equigranular, granular basalt. Colour more greyish at either end. Several large vugs throughout.

VESICLES/AMYGDALES
Large vugs, mostly zeolite filled (laumontite), 278.06 vug is large crystals (1cm on a side) of calcite. Vugs up to the size of the core diameter. All lined with green smectite, perhaps black smectite. Smaller amygdales occur from 278.10 downward, always rare, but less frequent with depth.

FRACTURES - VEINS - BRECCIA
Fractures mainly subhorizontal (0-20°). Several at higher angles, from 45° to 75°. All are lined with smectite, mainly green smectite. Veinlets are rare, hairline, smectite filled.

ROCK ALTERATION
None observed.

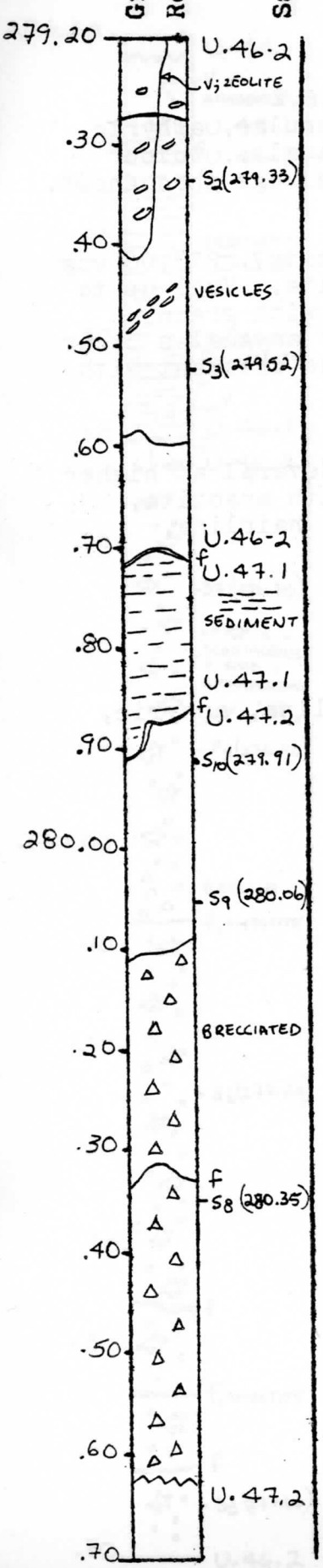
STRUCTURE
Medium-grained, equigranular, holocrystalline, aphyric, massive basalt (unit 46.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 27919 **cm to** 28062 **cm**

Box 47 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 46.2
Greyish-red, fine-grained, aphyric, vesicular basalt. Grain size is apparently uniform, even near basal contact.

279.73 Unit 47.1. Very dark grey or greenish-grey, very slightly layered, soft siltstone or claystone with some sand-size fragments. Fragments are angular, poorly sorted. Green is probably celadonite in groundmass.

279.85 Unit 47.2. Grey to greenish-grey, fairly massive basalt to about 280.10, then brecciated to base of section. Fragments are angular, poorly defined, not very vesicular or scoriaceous. Basalt is fine-grained aphyric.

VESICLES/AMYGDALES
Vesicles to 3cm, oval to spherical, some inclined about 40°. Vesicles 10-15% in lower 10cm, 1-2mm, spherical, filled mostly with green celadonite(?) and minor zeolite.

279.73 None.

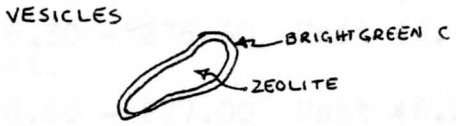
279.85 Very minor vesicles about 1mm, filled with calcite.

FRACTURES - VEINS - BRECCIA.
Fractures sparse, less than 20°. No coating. One veinlet of zeolite at about 80°.

279.73 None

280.35 One fracture dips about 80°. No veins.

ROCK ALTERATION
None observed.



STRUCTURE
279.19 - 279.72 Fine-grained, massive basalt with vesicular or scoriaceous fragments (unit 46.2).

279.72 - 279.85 Unit 47.1 ; Slightly layered siltstone.

279.85 - 280.10 Unit 47.2 ; Massive basalt.

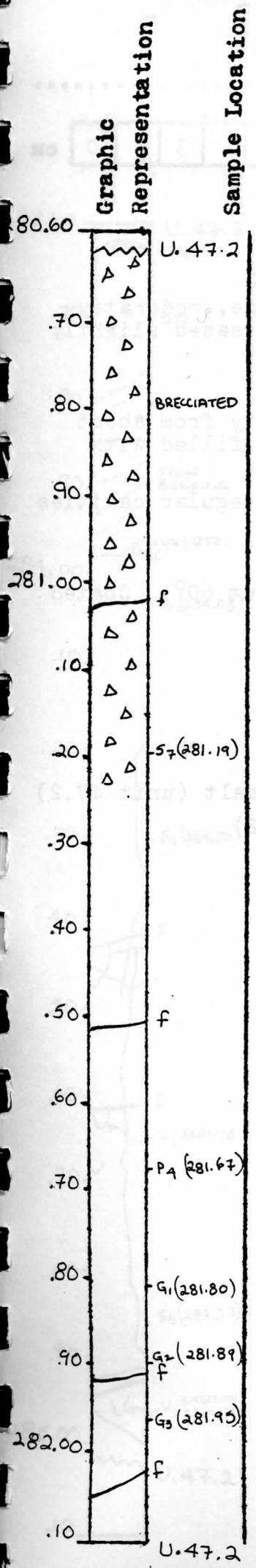
280.10 - 280.62 Basalt breccia (unit 47.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 28062 **cm to** 28210 **cm**

Box 47 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 47.2
Light reddish-grey basalt breccia composed of angular fragments of rather vesicular, fine-grained aphyric basalt. This zone is interpreted as flow top breccia.

281.25 Greenish-grey, fine-grained, holocrystalline, aphyric basalt. This zone is more massive flow interior.

VESICLES/AMYGDALES
Some fragments are finely vesicular.

281.25 Rock is highly vesicular, about 5%, 1-3mm, very irregular, filled with smectite.

FRACTURES - VEINS - BRECCIA
281.03 One fracture about 15°, no coating.

281.25 A few fractures, mostly subhorizontal, one at 282.05, dips about 30°. No veinlets.

ROCK ALTERATION
None observed.

STRUCTURE
280.62 - 281.25 Basalt breccia (unit 47.2).

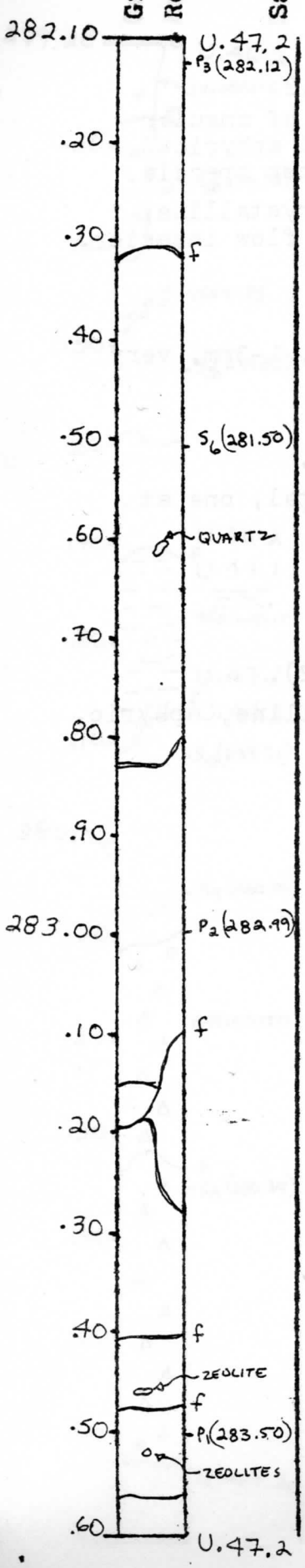
281.25 - 282.10 Fine-grained, holocrystalline, aphyric, massive basalt (unit 47.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 28210 cm to 28360 cm

Box 47 , Section 3



LITHOLOGY PETROGRAPHY - contines unit 47.2
Greenish-grey, fine-grained, holocrystalline, moderately vesicular, aphyric basalt. Grain size increases slightly downward in section.

VESICLES/AMYGDALES
Vesicles throughout but variable in quantity from about 2-5%. Most much less than 1mm, irregular, filled with green smectite.

283.45 Sparse vesicles to 1cm and some irregular cavities filled with zeolite.

FRACTURES - VEINS - BRECCIA
Fractures mostly less than 15°. A few about 60°. Coated with smectite.

283.10 A few hairline veinlets of quartz?

ROCK ALTERATION
None observed.

STRUCTURE
282.10 - 283.30 Fine-grained, massive basalt (unit 47.2)

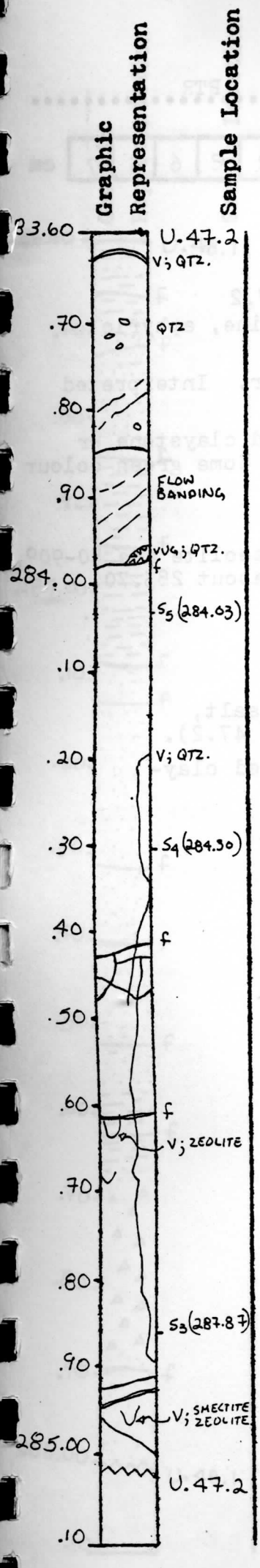
283.30 - 283.60 Banded segment (unit 47.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 2836 0 **cm to** 2850 2 **cm**

Box 47 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 47.2
Greenish-grey, fine-grained, holocrystalline, aphyric basalt, slightly banded (flow banded?) in places, banding defined by green smectite streaks.

VESICLES/AMYGDALES
A few large 1-2cm vesicles in upper 30cm, filled with quartz Elsewhere vesicles sparse, much less than 1%, 1mm or less, filled with smectite.

FRACTURES - VEINS - BRECCIA
Most fractures about 20° roughly parallel to banding, coated with smectite. Sparse veinlets filled with zeolite, about 1mm wide.

ROCK ALTERATION
None observed.

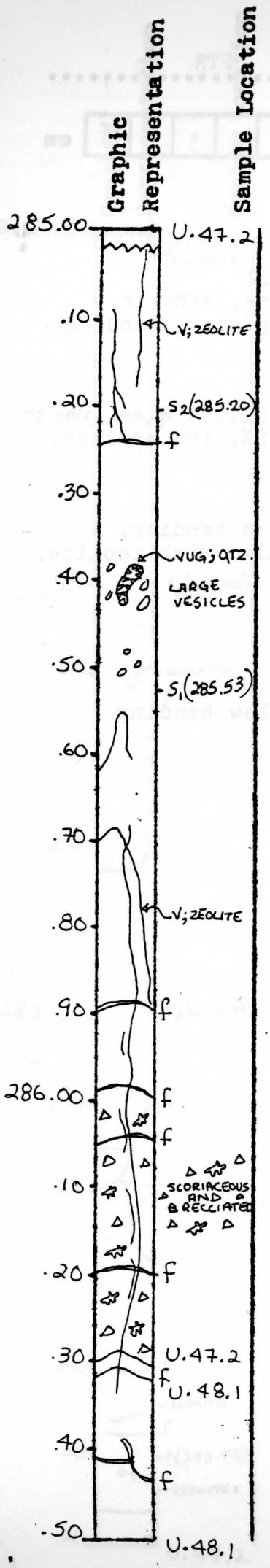
STRUCTURE
Fine-grained, aphyric basalt with minor flow banding (unit 47.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 28502 **cm to** 28657 **cm**

Box 48 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 47.2
Greenish-grey, fine-grained, holocrystalline, aphyric basalt.

286.30 Contact not chilled and not planar. Interpreted as a flow contact.

Unit 48.1. Deep red-brown, poorly layered claystone or siltstone with some sand-size particles. Some green colour due to celadonite(?).

VESICLES/AMYGDALES
Fractures mostly about 15°. Veinlets of zeolite are 80-90°, hairline to 2mm wide, particularly below about 285.70.

ROCK ALTERATION
None observed.

STRUCTURE
285.02 - 286.30 Fine-grained, aphyric basalt, slightly scoriaceous in lower 30 cm.(unit 47.2).

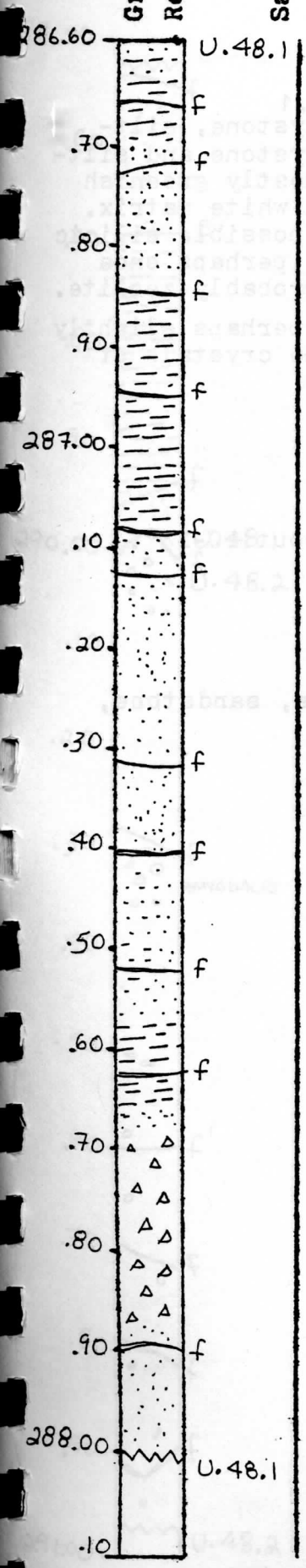
286.30 - 286.57 Unit 48.1 ; Poorly layered claystone or siltstone.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 28657 cm to 28800 cm

Box 48 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 48.1

Well bedded, thin bedded, interlayered claystone, siltstone, sandstone and granule breccia. Claystone and siltstone grey (reddish-grey at top of section). Sandy units are greenish- to reddish-grey, composed of subangular to subrounded grains, (over about 1mm) of lithic and once glassy material. Granule breccias are similar to sandstones except fragments are larger (over 1cm, up to 5cm) and are more angular. Most clasts are matrix supported - matrix appears to be largely white zeolite. Some quartz? and feldspar crystals.

This unit is interpreted as an airfall tuff of probable silicic character. Slight rounding of some grains and clasts suggests that some reworking has occurred.

VESICLES/AMYGDALES

None observed.

FRACTURES - VEINS - BRECCIA

Fractures dip about 10-15°, all parallel to bedding.

ROCK ALTERATION

None observed.

STRUCTURE

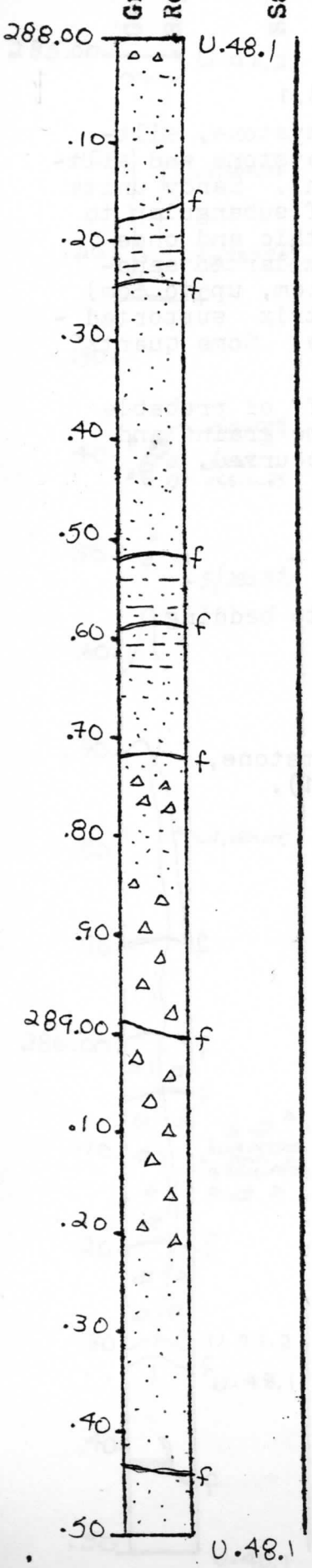
Well bedded, interlayered claystone, siltstone, sandstone, and granule breccia (unit 48.1).

ICELAND RESEARCH DRILLING PROJECT

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

Depth Interval 2880 0 cm to 2895 2 cm

Box 48 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 48.1
Well bedded, thin bedded, interlayered claystone, siltstone, sandstone and granule breccia. Claystone and siltstone grey to reddish-grey, sandy layers mostly greenish and breccia has red and green fragments in white matrix. Fragments consist of lithic fragments, of possible silicic character. Some appear vesicular and were perhaps once glassy. Matrix is white, not carbonate, probably zeolite.

Unit is interpreted as an indurated tuff, perhaps slightly reworked, probably silicic in nature. Some crystals of quartz? and feldspar.

VESICLES/AMYGDALES
None observed.

FRACTURES - VEINS - BRECCIA
Fractures all parallel to bedding - dip about 10-15°.

ROCK ALTERATION
None observed.

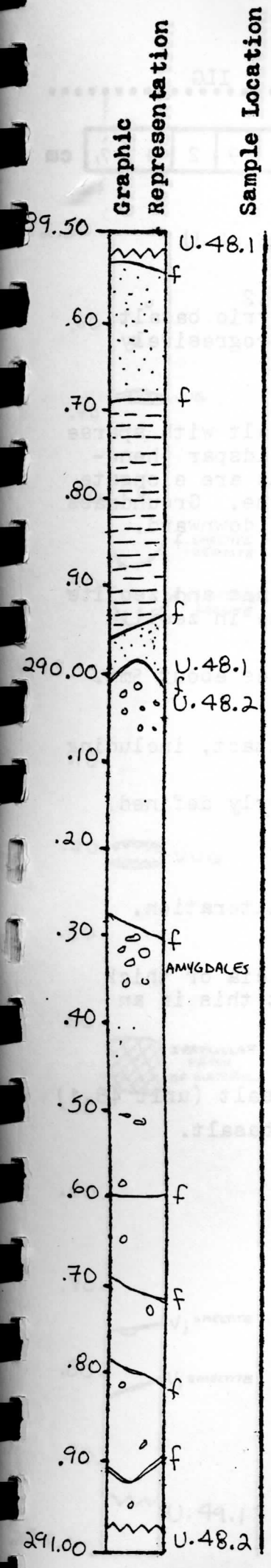
STRUCTURE
Well bedded layers of claystone, siltstone, sandstone, and granule breccia.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** PTR

Depth Interval 28952 **cm to** 29097 **cm**

Box 48 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 48.1
Green coarse-grained sandstone, with subangular to sub-rounded fragments to 3mm.

289.69 Grey sandy to silty claystone, poorly layered.

289.90 Green sandy siltstone.

290.00 Unit 48.2. Grey, fine-grained, holocrystalline, aphyric basalt.

VESICLES/AMYGDALES
290.00 Highly vesicular in upper 10cm, 3-5mm, filled with zeolite, oval and irregular in shape.

Large oval to irregular amygdales scattered through section. These are 1-2cm, lined with smectite and filled with zeolite (laumontite?). Some filled entirely with green smectite.

FRACTURES - VEINS - BRECCIA
289.52 Fractures parallel to bedding - dip of about 10-15°.

290.00 Fractures 30° or less, some have very slight smectite coating.

ROCK ALTERATION
None observed.

STRUCTURE
289.52 - 290.00 Layered sandstone, claystone, and siltstone (unit 48.1).

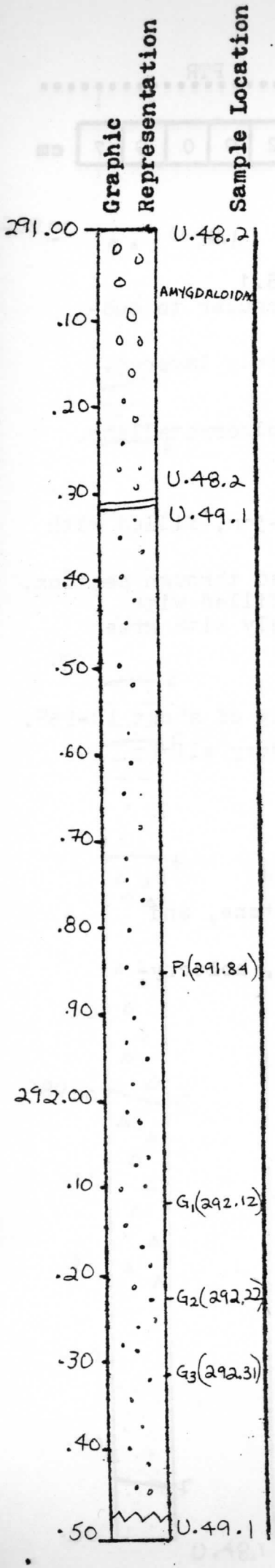
290.00 - 290.97 Unit 48.2 ; Fine-grained, holocrystalline, aphyric, massive basalt.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** IIG

Depth Interval 2 9 0 9 7 **cm to** 2 9 2 4 7½ **cm**

Box 49 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 48.2
Amygdaloidal grey-green, fine-grained, aphyric basalt becoming finer grained towards base with progresively smaller amygdales.

291.32 Thin baked soil? at base of lava.

291.33 Unit 49.1. Richly porphyritic basalt with sparse amygdales up to 1cm diameter. Some 20% feldspar phenocryst up to 5mm in diameter. Many crystals are elongate lath shaped crystals. ?Sparse clinopyroxene. Groundmass relatively fine-grained to coarser grained downward.

VESICLES/AMYGDALES
290.97 Amygdales with green smectite linings and zeolite infilling. Some contain dendritic smectite in zeolite matrix. Some are filled with smectite.

291.50 Zeolite and smectite filled cavities about 5mm.

FRACTURES - VEINS - BRECCIA
291.33 Much dark green smectite along contact, including faulting.

291.80 Some smectite fractures - very poorly defined.

ROCK ALTERATION
291.20 Haematite alteration near base.

291.70 ? Pervasive smectite and zeolite alteration.

OTHER
291.33 Almost total absence of usual breccia or thick amygdaloidal flow top. Just possible that this is an intrusion but very unlikely.

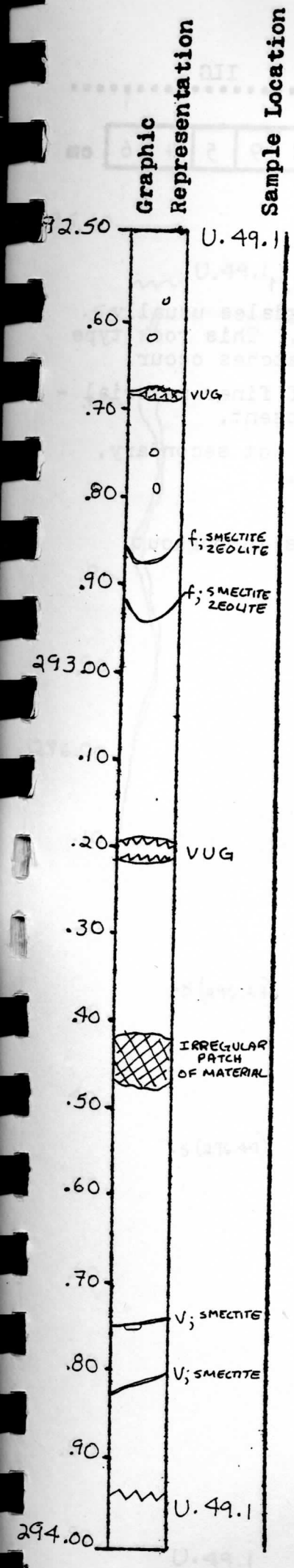
STRUCTURE
290.97 - 291.32 Fine-grained, aphyric basalt (unit 48.1)
291.32 - 292.47 Unit 49.1 ; Porphyritic basalt.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** ILG

Depth Interval 292.47 **cm to** 293.94 **cm**

Box 49 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 49.1
Grey-green richly porphyritic basalt with sparse amygdales. 20% feldspar up to 5mm diameter.

293.42 Irregular patch of material in flow (? late stage residual patch).

VESICLES/AMYGDALES
292.55 Small open amydales.

292.67 Large open cavity with zeolites.

292.90 Open tension gashes. ?very late stage movement filled with zeolite.

293.20 Large open cavity filled with zeolite and calcite.

FRACTURES - VEINS - BRECCIA
292.85 Two marked planar fractures filled with smectite and zeolite.

293.75 Smectite veins with zeolite filled cavity.

ROCK ALTERATION
292.90 Pervasive smectite and zeolite.

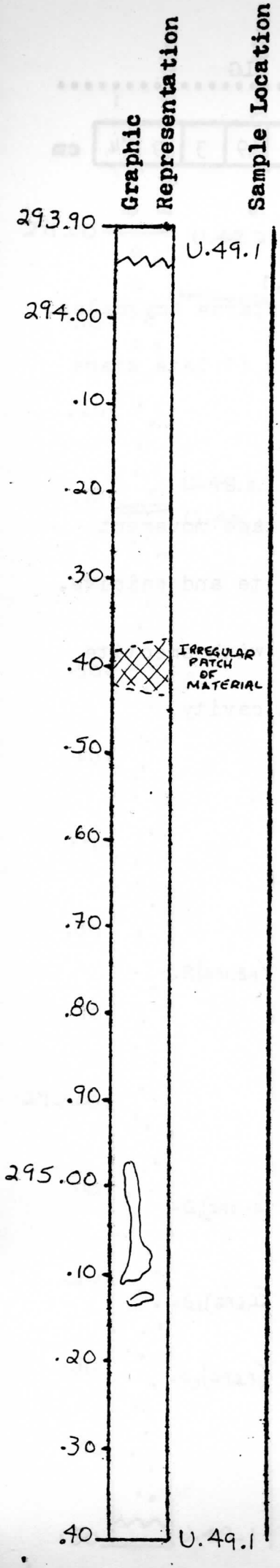
STRUCTURE
Porphyritic basalt of unit 49.1.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** ILG

Depth Interval 29394 **cm to** 29546 **cm**

Box 49 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 49.1
Richly porphyritic basalt with sparse amygdales usually about 0.5mm diameter. About 20% feldspar. This rock type continues through section but irregular patches occur.

294.37 Irregular, poorly defined patch of finer material - late stage? - phenocrysts and amygdales absent.

294.96 Unusual leucocratic segregation. Not secondary. Very irregular but sharply defined margin.

VESICLES/AMYGDALES
Relatively sparse zeolite filled amygdales throughout section.

FRACTURES - VEINS - BRECCIA
None observed.

ROCK ALTERATION
Zeolite and smectite.

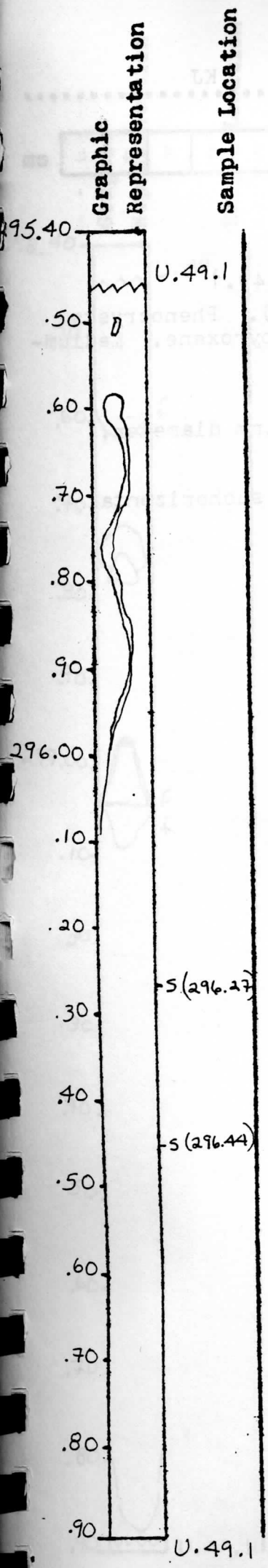
STRUCTURE
Porphyritic basalt of unit 49.1.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** ILG

Depth Interval 29546 **cm to** 29692 **cm**

Box 49 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 49.1
Richly parphyritic basalt with approximately 20% phenocryst feldspars. Rare clinopyroxene?

296.10 Becoming progressively coarser grained and more homogeneous.

296.27 Palaeomagnetic? Schoenhert

296.44 Palaeomagnetic? Schoenhert

VESICLES/AMYGDALES
295.50 Approximately spherical amygdales filled with zeolite.

FRACTURES - VEINS - BRECCIA
Brecciated fractures with smectite and zeolite alteration.

295.57 Smectite and zeolite vein running down through section.

ROCK ALTERATION
None observed.

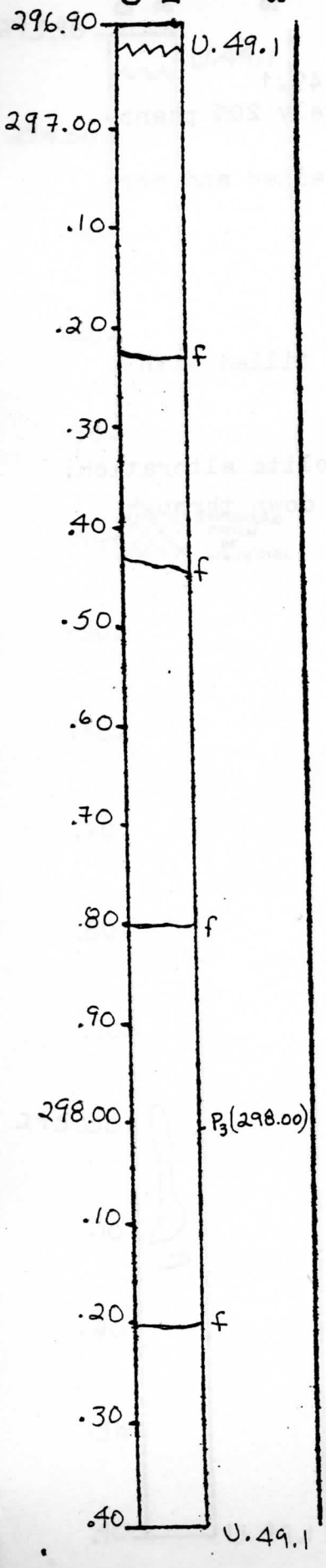
STRUCTURE
Porphyritic basalt of unit 49.1.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KJ

Depth Interval 29692 **cm to** 29844 **cm**

Box 50 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 49.1
Holocrystalline, porphyritic basalt (30%). Phenocrysts 1-3mm long; green-white plagioclase and pyroxene. Medium-grained matrix.

VESICLES/AMYGDALES
Minor smectite amygdales(less than 1%), 1mm diameter.

FRACTURES - VEINS - BRECCIA
Black and green smectite. All fractures subhorizontal (0-15°).

ROCK ALTERATION
None observed.

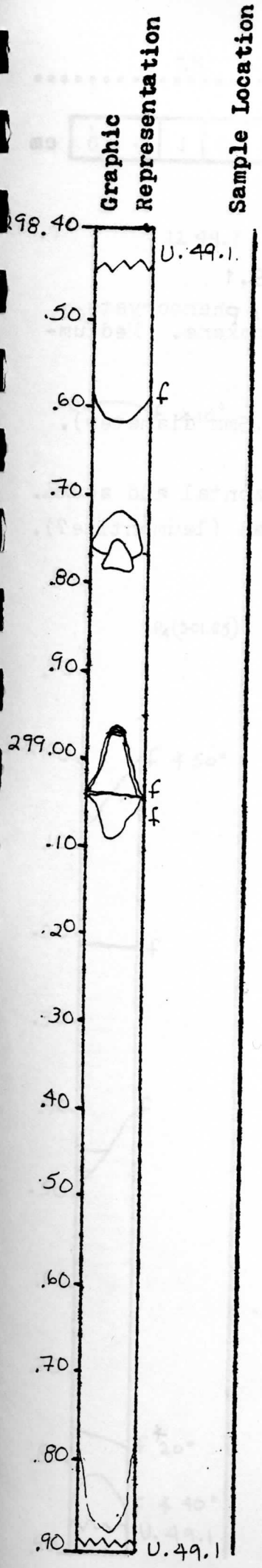
STRUCTURE
Porphyritic, massive basalt (unit 49.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KJ

Depth Interval 2984 **cm to** 2998 **cm**

Box 50 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 49.1
Holocrystalline porphyritic basalt (25-30%). Phenocrysts 1-3mm long, green-white plagioclase, pyroxene. Medium-grained matrix.

VESICLES/AMYGDALES
Minor smectite amygdales (less than 1%, 1mm diameter).

FRACTURES - VEINS - BRECCIA
Black and green smectite. Fractures both subhorizontal (0°) and acute (70-80°).

ROCK ALTERATION
None observed.

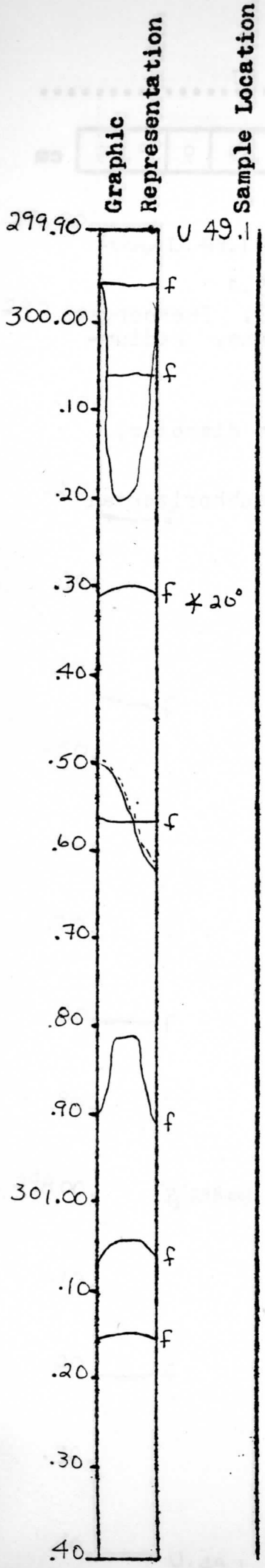
STRUCTURE
Porphyritic, massive basalt (unit 49.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KJ

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

Box 50 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 49.1
Holocrystalline porphyritic basalt, 25% phenocrysts 0.5-6mm long, green-white plagioclase, pyroxene. Medium-grained matrix.

VESICLES/AMYGDALES
Minor smectite amygdales (less than 1%, 0.5mm diameter).

FRACTURES - VEINS - BRECCIA
Black and green smectite. Fractures horizontal and acute.
300.50 Vein - soft white secondary mineral (laumontite?).

ROCK ALTERATION
None observed.

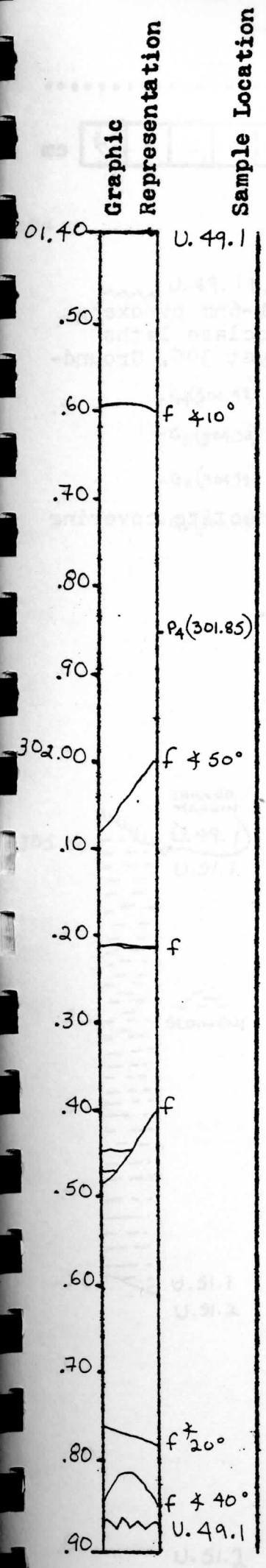
STRUCTURE
Porphyritic, massive basalt (unit 49.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KJ

Depth Interval 3 0 1 4 0 **cm to** 3 0 2 8 7 **cm**

Box 50 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 49.1
Holocrystalline porphyritic basalt 25% , phenocrysts 0.5-5mm long, green-white plagioclase, pyroxene. Medium-grained matrix.

VESICLES/AMYGDALES
Minor smectite amygdales (4%, 0.5mm diameter).

FRACTURES - VEINS - BRECCIA
Black and green smectite. Fractures horizontal and acute.

ROCK ALTERATION
None observed.

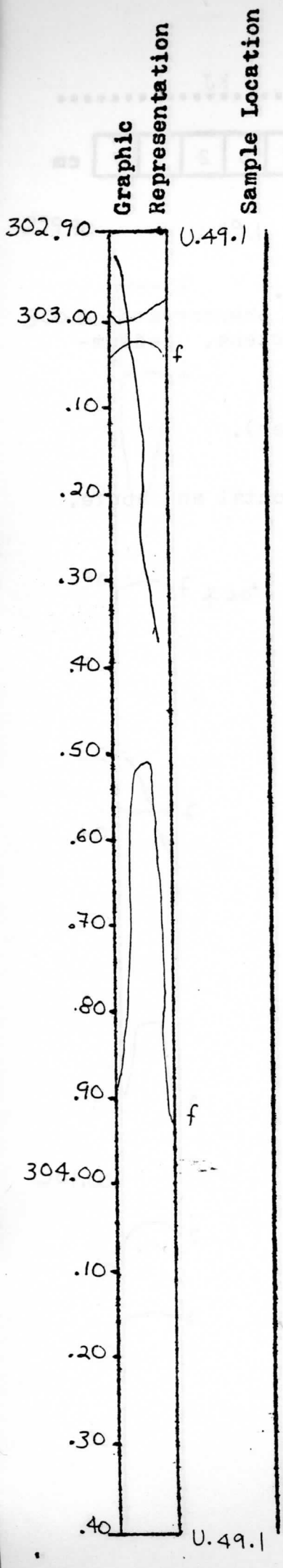
STRUCTURE
Porphyritic, massive basalt (unit 49.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** JM

Depth Interval 3 0 2 8 7 **cm to** 3 0 4 3 7 **cm**

Box 51 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 49.1
Brown, medium-grained porphyritic basalt, 1-6mm pyroxene and plagioclase phenocryst, euhedral plagioclase laths and anhedral pyroxene phenocrysts, phenocryst 30%, Groundmass 70%.

VESICLES/AMYGDALES
Vesicles rare, smaller than 2mm.

FRACTURES - VEINS - BRECCIA
Fracture, planar and simple. Have black smectite covering surface.

ROCK ALTERATION
Groundmass altering to reddish-brown clays.

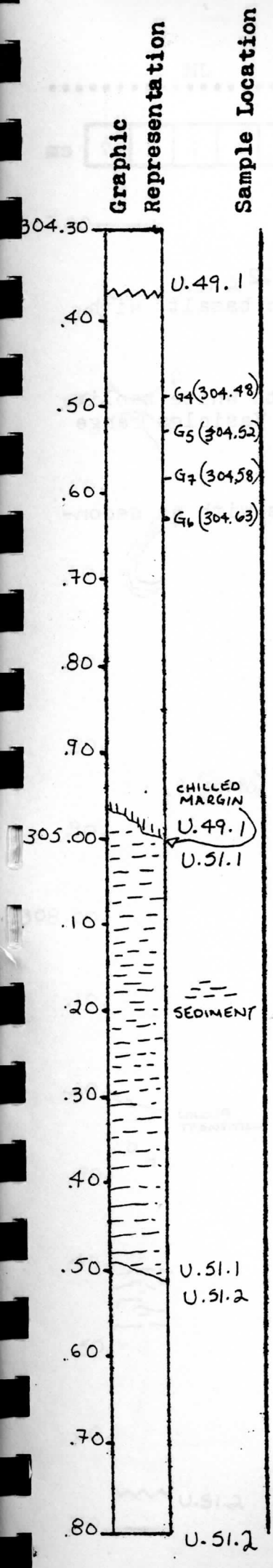
STRUCTURE
Porphyritic, massive basalt (unit 49.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** JM

Depth Interval 3043.7 **cm to** 3058.0 **cm**

Box 51 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 49.1
Brown vesicular, medium- to coarse-grained, porphyritic basalt, with 20% white vesicles, 20% white altered plagioclase phenocrysts, 5% pyroxene phenocrysts; phenocrysts range from 5mm-1mm in size, vesicles 7mm-1mm.

Grain size decreasing. Vesicles increasing.

305.00 Red, very fine-grained to fine-grained sediment, soft.

305.50 Medium-grained, vesicular, greenish-grey, porphyritic basalt; vesicles comprise 15-20% of rock, 15% plagioclase and pyroxene phenocryst; phenocryst 3-1mm.

VESICLES/AMYGDALES
Vesicles rounded and irregular ranging from 1cm-1mm in size, filled with green smectite and white zeolite, some vesicles lined with green smectite and filled with white zeolite.

304.90 Vesicles filled with coarse sparry calcite and white zeolite.

305.00 None.

305.50 Vesicles; rounded and irregular, white zeolite and green smectite fill the vesicles with green smectite lining the cavities. Vesicles 1cm-1mm in size.

FRACTURES - VEINS - BRECCIA
304.37 Rare

305.00 None

305.50 None

ROCK ALTERATION
304.37 Plagioclase phenocryst appear altered and weathered. Groundmass altering to clays.

305.50 Alteration of groundmass but phenocryst seem moderately fresh.

OTHER
305.00 Contact between sediments and basalt somewhat irregular and chilled zone in basalt.

STRUCTURE
304.37 - 305.00 Porphyritic, massive basalt (unit 49.1)

305.00 - 305.49 Unit 51.1 ; Fine-grained, bedded sediment.

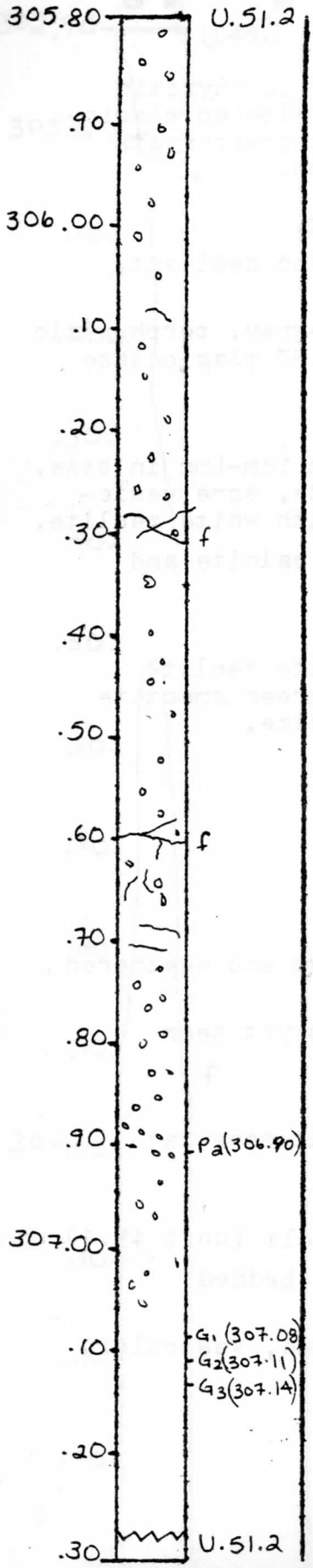
305.49 - 305.80 Unit 51.2 ; Medium-grained, vesicular, porphyritic, massive basalt.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** JM

Depth Interval 30580 **cm to** 30727 **cm**

Box 51 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 51.2
Light-greenish-grey vesiculated porphyritic basalt, with plagioclase phenocryst 4mm-1mm in size.

VESICLES/AMYGDALES
Vesicles, rounded and irregular, filled with white zeolite laumontite and lined with green smectite. Vesicles range in size 1cm-1mm.

FRACTURES - VEINS - BRECCIA
306.30 Fracture, irregular fresh fractures with no secondary mineralogy.

ROCK ALTERATION
Minor red oxidation of groundmass.

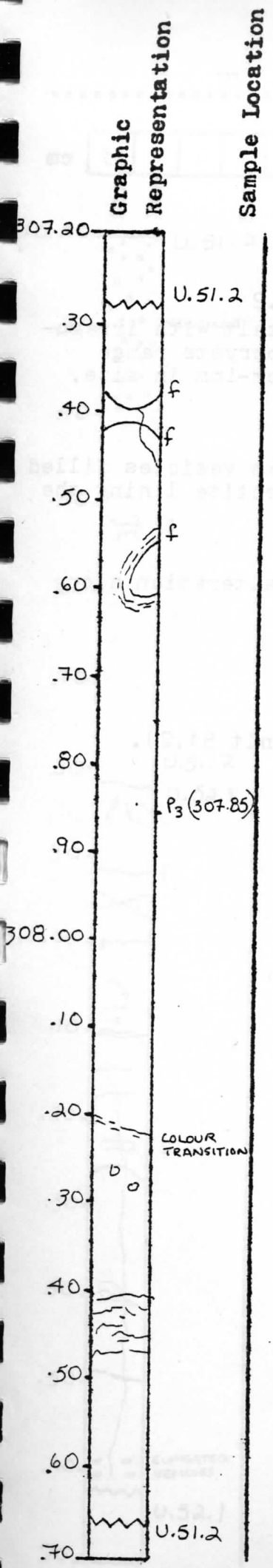
STRUCTURE
Porphyritic, massive basalt (unit 51.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** JM

Depth Interval 30727 **cm to** 30866 **cm**

Box 51 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 51.2
Coarse- to medium-grained, highly porphyritic massive, vesicular grey basalt; plagioclase laths 7mm-1mm; euhedral, anhedral pyroxene crystals.

308.20 Transition in colour from light grey to dark grey colour and increase vesicles.

VESICLES/AMYGDALES
Vesicles, laumontite, calcite, minor green smectite occur as vesicle filling, 1mm to irregular masses which are a couple of cm across at 308.45. Irregular in shape.

308.42 Zeolite (laumontite) and calcite in brecciated veinlike vesicles.

FRACTURES - VEINS - BRECCIA
None observed.

ROCK ALTERATION
Plagioclase crystals seem highly altered.

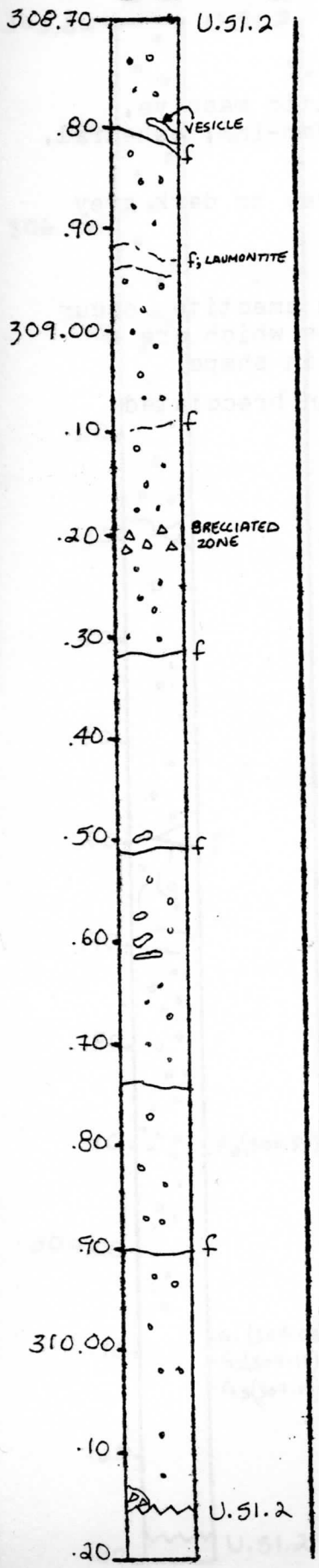
STRUCTURE
Porphyritic, massive basalt (unit 51.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** JM

Depth Interval 30867 **cm to** 31015 **cm**

Box 52 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 51.2
Light grey vesicular highly porphyritic basalt with irregular and rounded vesicles; plagioclase phenocrysts range from 6cm-1mm in size; vesicles range from 2cm-1mm in size. Vesicles 30% of rock.

VESICLES/AMYGDALES
Vesicles both rounded and irregular veinlike vesicles filled with white zeolite; might be some green smectite lining the cavities.

FRACTURES - VEINS - BRECCIA
Fractures, irregular, both fresh and some alteration along fracture due to increased colouration.

ROCK ALTERATION
Plagioclase laths appear altered.

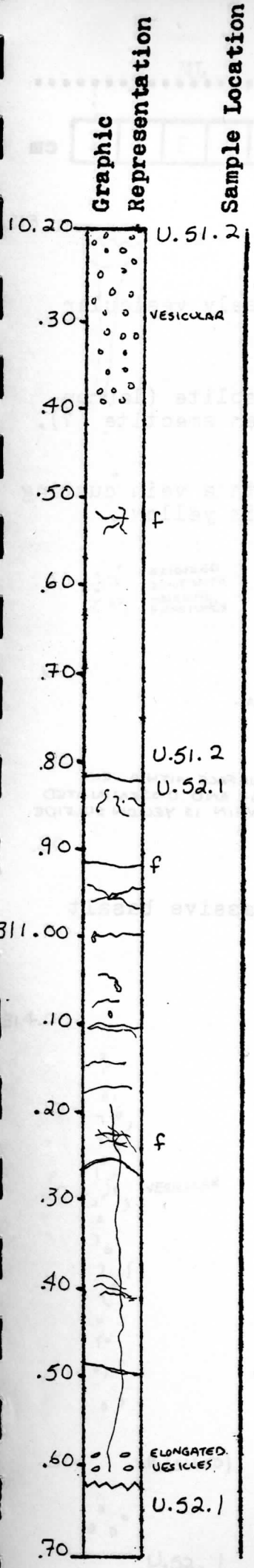
STRUCTURE
Porphyritic, vesicular, massive basalt (unit 51.2).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** JM

Depth Interval 3101.5 **cm to** 3116.2 **cm**

Box 52 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 51.2
Light grey-bluish grey, porphyritic, vesicular, coarse-grain basalt, grading downward to a medium- to fine-grained basalt.

310.80 Black fine-grained sediment and aphyric clast, with an irregular contact between sediment at top of unit 52.1 and bottom of 51.2's basalt.

310.82 Contact between fine-grained sediment and reddish-gray, fine-grained, aphyric vesiculated basalt.

311.27 Transition from moderately vesiculated - to only minor vesiculation, downward.

VESICLES/AMYGDALES
310.15 Vesicles - rounded vesicles, filled with white zeolite (laumontite), no or little smectite, vesicles 1-5mm. Decreasing in quantity and size downward.

310.80 Vesicles are irregular shaped, 1cm-1mm in size, 10-15% of rock. Filled with white zeolite.

FRACTURES - VEINS - BRECCIA .
310.50 Fractures fresh, irregular, no minerals. White filled vein.

310.82 Rock extremely fractured with fractures showing both effects of alteration along fractures and no alteration

ROCK ALTERATION
310.82 Red stains along fractures and red clay.

STRUCTURE
310.15 - 310.80 Porphyritic, massive basalt (unit 51.2)

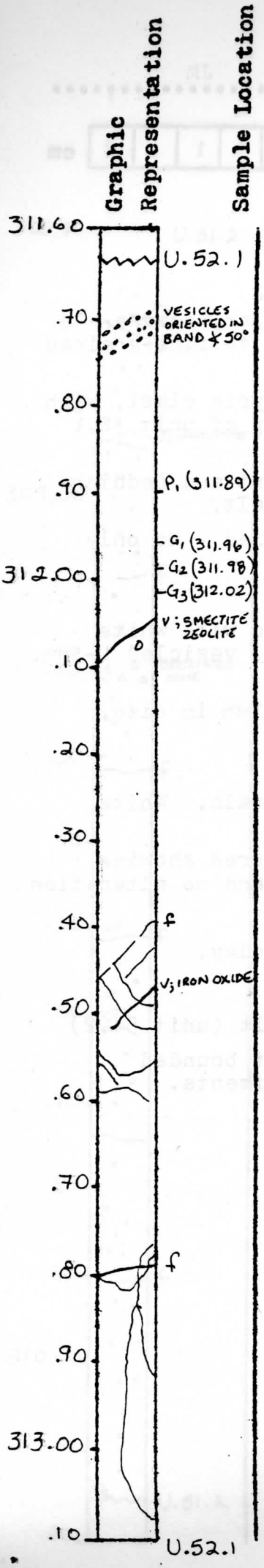
310.80 - 311.62 Unit 52.1 ; Massive basalt bounded on upper contact by Fine-grained black sediments.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** JM

Depth Interval 3 1 1 6 3 **cm to** 3 1 3 1 2 **cm**

Box 52 , Section 3

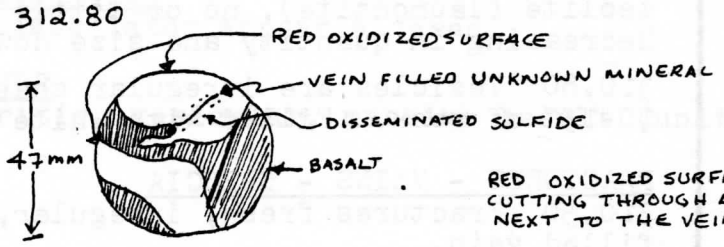


LITHOLOGY PETROGRAPHY - continues unit 52.1
Greenish-grey, fine-grained, aphyric, sparsely vesicular basalt, holocrystalline.

VESICLES/AMYGDALES
311.68 Round vesicles filled with white zeolite (laumontite) and reddish-brown iron oxide and green smectite (?).

FRACTURES - VEINS - BRECCIA
312.80 Fracture - red oxidized surface with a vein cutting through and disseminated next to the vein is yellow sulphide.

ROCK ALTERATION
311.68 Groundmass and vesicles oxidized.



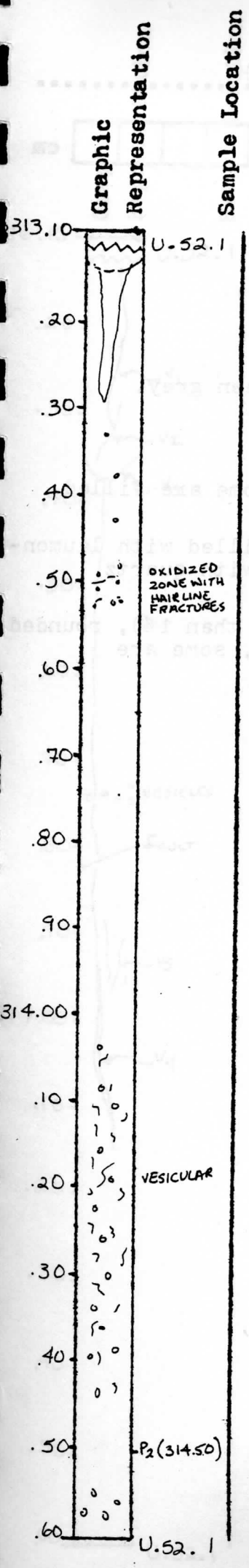
STRUCTURE
Fine-grained, holocrystalline, aphyric, massive basalt with possible flow banding (unit 52.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** JM

Depth Interval 31312 cm to 31464 cm

Box 52 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 52.1
Light greyish-green, fine-grained, aphyric, vesicular basalt.

313.55 Grading into black, fine-grained, aphyric, non-vesicular basalt.

314.00 Red stained, greenish-grey, moderately vesicular, aphyric basalt. 10% vesicles, filled with green smectite and white zeolite and iron oxide.

VESICLES/AMYGDALES
313.12 Moderately vesiculated portion, 1-7mm vesicles, filled with green smectite, iron oxide and white zeolite (laumontite).

314.00 Vesicles, 1cm-1mm filled with white zeolite and reddish-brown, with rounded vesicles and some irregular vein-like vesicles.

FRACTURES - VEINS - BRECCIA
314.00 - 314.40 Hairline fractures with red iron oxidation stains in and around.

ROCK ALTERATION
None observed.

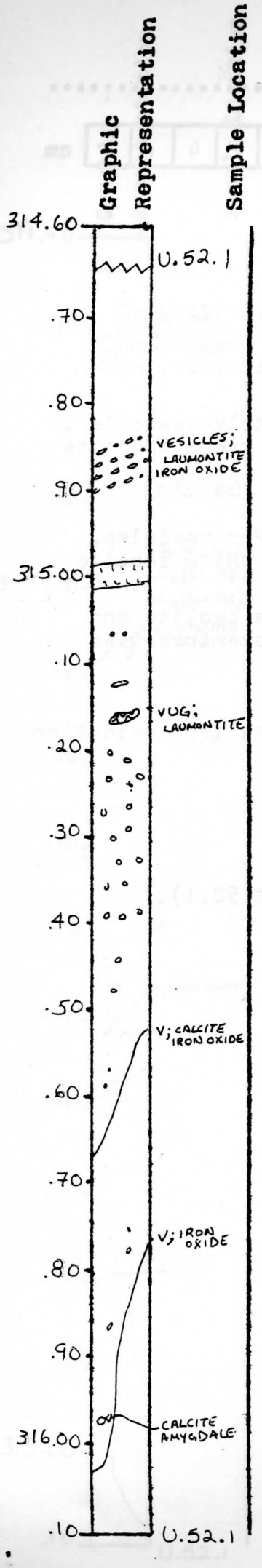
STRUCTURE
Fine-grained, aphyric, massive basalt (unit 52.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KH

Depth Interval 3 1 4 6 4 **cm to** 3 1 6 1 2 **cm**

Box 53 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 52.1
Blue-green, vesicular basalt flow.

314.98 Laumontite vein.

315.07 Laumontite vug. Vesicular, blue-green grey.

315.50 Dark greenish colour.

VESICLES/AMYGDALES
314.83 Vesicles filled with iron oxides, some are filled with laumontite (diameter about 1cm).

315.15 More than 20%; rounded. Vesicles filled with laumontite, (diameter about 3mm) some are filled with quartz and laumontite.

315.40 Very small amount of vesicles (less than 1%), rounded shape. Some are filled with green smectite, some are filled with iron oxides.

FRACTURES - VEINS - BRECCIA
314.98 Laumontite vein.

315.52 Calcite, iron oxides.- vein.

315.73 Iron oxide vein.

ROCK ALTERATION
Argillitized.

315.10 Fairly intensely altered.

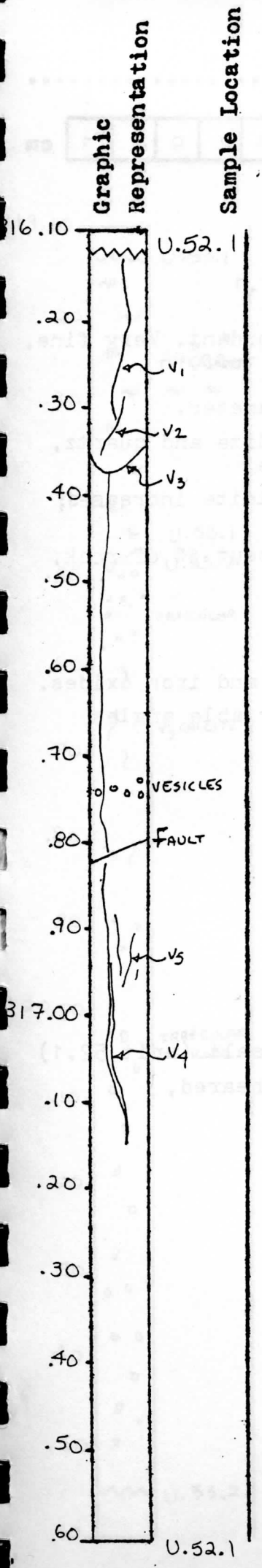
STRUCTURE
Fine-grained, massive basalt (unit 52.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KH

Depth Interval 3161.2 **cm to** 3176.0 **cm**

Box 53 , Section 2

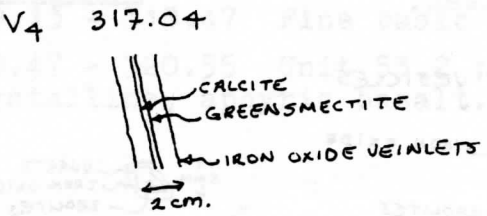


LITHOLOGY PETROGRAPHY - continues unit 52.1
Dark green coloured, fine-grained basalt flow.

VESICLES/AMYGDALES
316.12 Less than 1% of rock.
316.73 Vesicles - diameter about 5mm.
317.40 Zeolite filled amygdales become more abundant.

FRACTURES - VEINS - BRECCIA
316.12 Vein - iron oxides.
316.25 Vein - zeolites
316.32 Vein - calcite
316.80 Fault plane - green smectite and iron oxides.
316.95 Vein - calcite
317.30 Small veinlets are filled with calcite.

ROCK ALTERATION
Oxidized, argillitized.



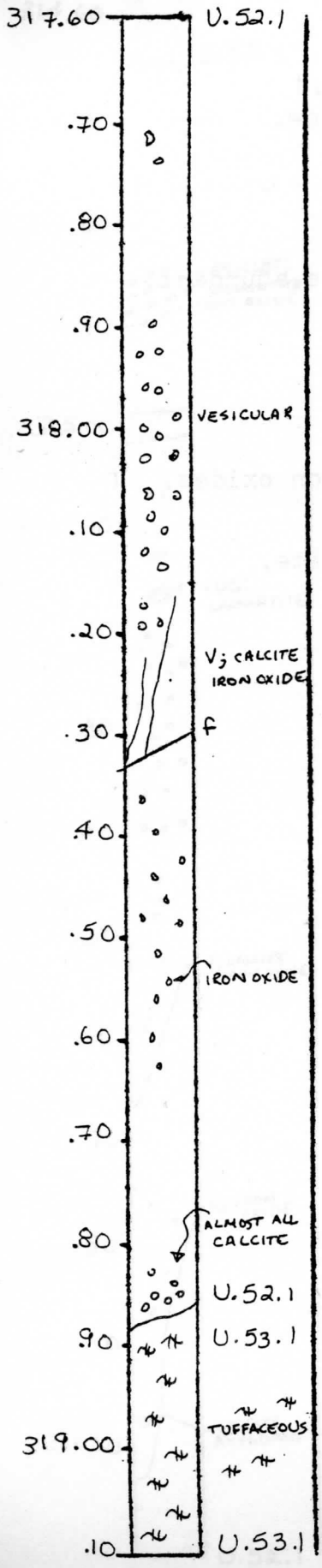
STRUCTURE
Fine-grained, massive basalt (unit 52.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KH .....

Depth Interval 3 1 7 6 0 **cm to** 3 1 9 1 3 **cm**

Box 53 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 52.1
Vesicular, green coloured basalt.

318.87 Unit 53.1. Boundary of units concordant. Very fine, basic tuff.

VESICLES/AMYGDALES
317.60 Irregular shape, usually 5mm in diameter.

317.90 Vesicles about 10% of rock, haulandite and quartz, diameter about 1cm. Iron oxide and zeolite.

318.40 Irregular shape. The amount of calcite increases; iron oxides decrease.

318.77 Round shape, diameter about 3mm, about 5% of rock, calcite.

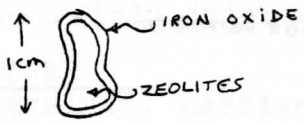
318.87 None.

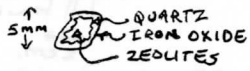
FRACTURES - VEINS - BRECCIA
318.25 Vein - thickness about 1mm, calcite and iron oxides.

318.87 Many fractures. Slickensides , variable angles strike.

ROCK ALTERATION
317.60 Oxidized.

317.72 - VESICLES





STRUCTURE
317.60 - 318.86 Fine-grained, massive basalt (unit 52.1)

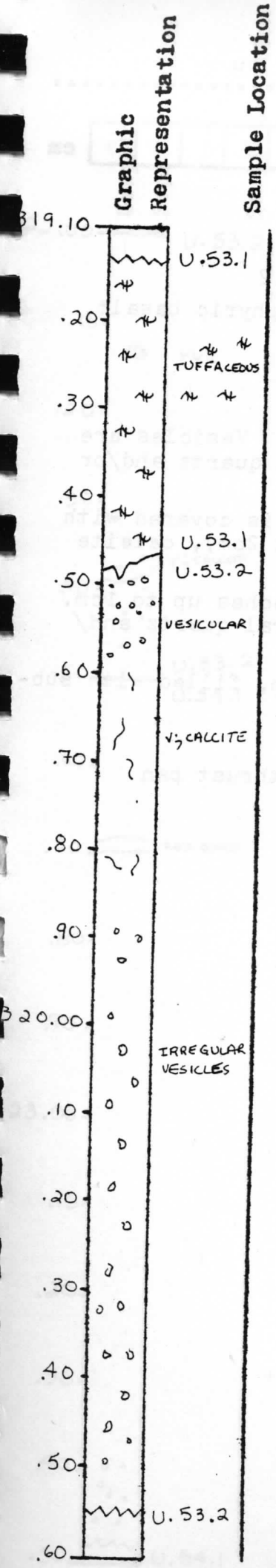
318.86 - 319.13 Unit 53.1 ; Very fine, sheared, crushed basic tuff.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KH

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

Box 53 , Section 4



LITHOLOGY PETROGRAPHY - continues unit 53.1
Basic fine tuff, dark black-brown colour.

319.47 Unit 53.2. Boundary, concordant, irregular. Vesicular, blue-grey coloured lava, very fine-grained.

VESICLES/AMYGDALES
319.47 Vesicles - about 3% of rock. Some quartz, zeolites and minor calcite.

319.90 Vesicles irregular in shape. About 5% of rock.

320.40 Vesicles - variable, 10% of rock. Some reach up to 2cm, filled with euhedral laumontite, calcite, heulandite, green smectite.

FRACTURES - VEINS - BRECCIA
319.60 Calcite veinlets (thickness less than 1mm).

ROCK ALTERATION
319.13 Clayey; very fine-grained, oxidized.

320.40 Green smectite.

STRUCTURE
319.13 - 319.47 Fine basic tuff (unit 53.1).

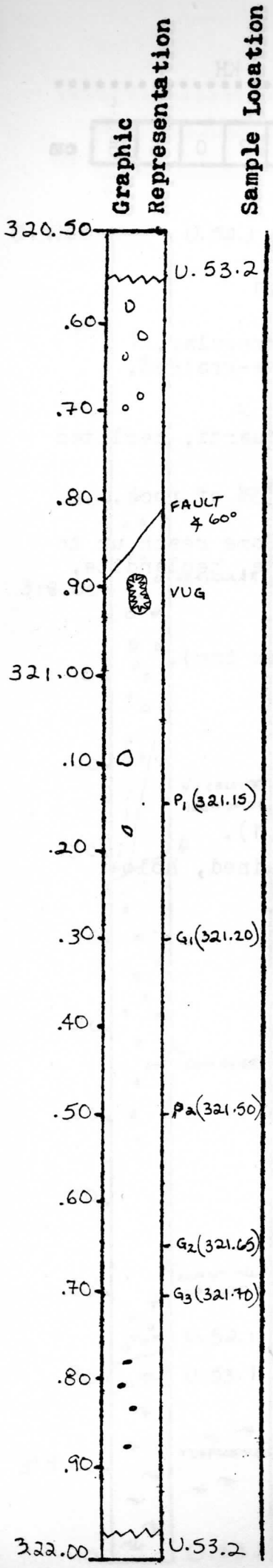
319.47 - 320.55 Unit 53.2 ; Very fine-grained, holocrystalline, aphyric basalt.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KH .....

Depth Interval 3 2 0 5 5 **cm to** 3 2 1 9 7 **cm**

Box 54 , Section 1



LITHOLOGY PETROGRAPHY - continues unit 53.2
Grey, very fine-grained, holocrystalline, aphyric basalt. No contacts in section.

VESICLES/AMYGDALES
320.57 Laumontite vein well crystalline.

320.60 Round shape vesicles, 3-5% of rock. Vesicles are usually lined with green smectite, euhedral quartz and/or zeolite.

320.90 Vug (diameter 7cm). Inner surface is covered with euhedral quartz, euhedral heulandite (about 2cm), calcite (about 1cm) and epistilbite (about 5mm).

321.07 Diameter usually 5mm, sometimes reaches up to 1cm. Vesicles usually have open space and euhedral quartz and/or zeolite crystals.

321.80 Flattened shape, diameter about 1cm, filled with subhedral zeolite.

FRACTURES - VEINS - BRECCIA
320.80 Fault - angle 60°. Slickenside ; thrust pan chlorite covers the fault plane.

ROCK ALTERATION
Green smectite.

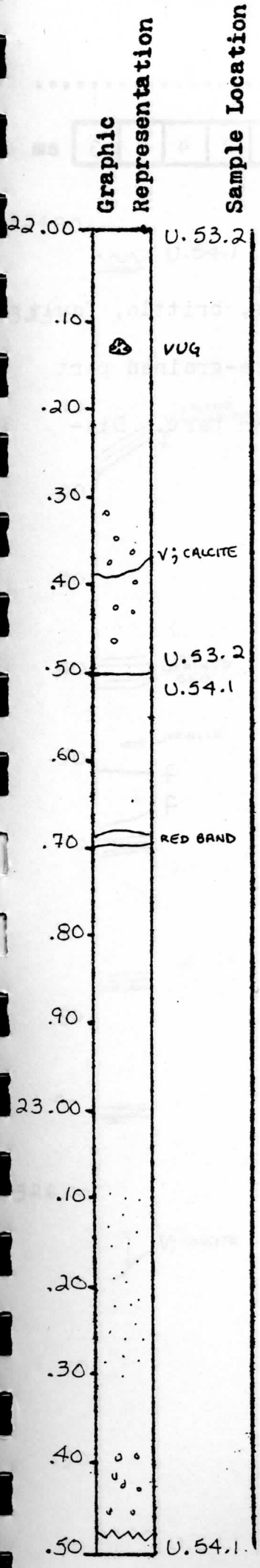
STRUCTURE
Fine-grained, aphyric basalt (unit 53.2)

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KH

Depth Interval 3219.7 **cm to** 3234.8 **cm**

Box 54 , Section 2



LITHOLOGY PETROGRAPHY - continues unit 53.2
Greenish-grey, fine-grained, vesicular basalt.

322.51 Pyroclastic sediments (grain size, colour: very variable). Unit 54.1.

Very coarse grained, dark green colour.

322.68 Red band (width 1.5cm); iron hydro oxides.

322.70 Fairly fine-grained, reddish-brown colour.

322.85 Dark green coloured, fine-grained portion.

323.10 Fairly fine-grained, dark green colour.

323.36 Coarse-grained red spotlets (iron oxides).

VESICLES/AMYGDALES
322.30 Flattened vesicles up to 1cm.

322.51 Fragments (diameter up to 1cm).

FRACTURES - VEINS - BRECCIA
322.14 Vug: inner part is covered with euhedral quartz (about 2mm) and euhedral calcite crystals (about 5mm).

322.35 Very thin calcite veinlets (1mm). Vein - (calcite, zeolite and green smectite).

322.51 None.

ROCK ALTERATION
322.51 Calcite occurs in both matrix fragments.

STRUCTURE
321.97 - 322.50 Fine-grained, vesicular, aphyric basalt (unit 53.2).

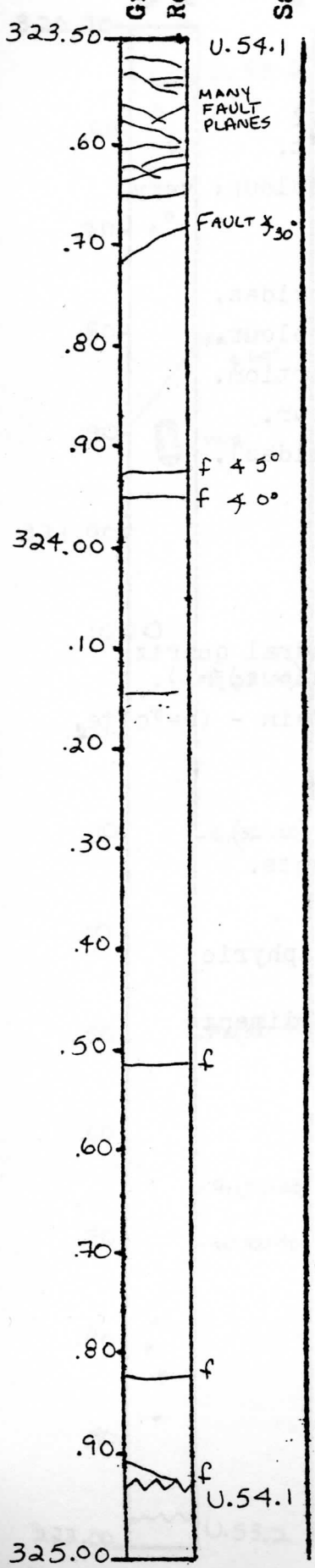
322.50 - 323.48 Unit 54.1 ; Pyroclastic sediments with variable grain size.

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KH

Depth Interval 3 2 3 4 8 **cm to** 3 2 4 9 3 **cm**

Box 54 , Section 3



LITHOLOGY PETROGRAPHY - continues unit 54.1
Very fine-grained, dark reddish-brown colour, brittle, fault planes.

323.65 Yellowish-green colour, fairly coarse-grained part diameter about 5mm.

324.13 Very fine-grained, dark reddish-brown part. Diameter about 3mm.

VESICLES/AMYGDALES
None observed.

FRACTURES - VEINS - BRECCIA
323.70 Fault - angle 30°.

323.93 Fault - angle 5°.

323.96 Fault - angle 0°.

ROCK ALTERATION
323.65 Calcite and green smectite, occurs.

323.90 Iron oxide.

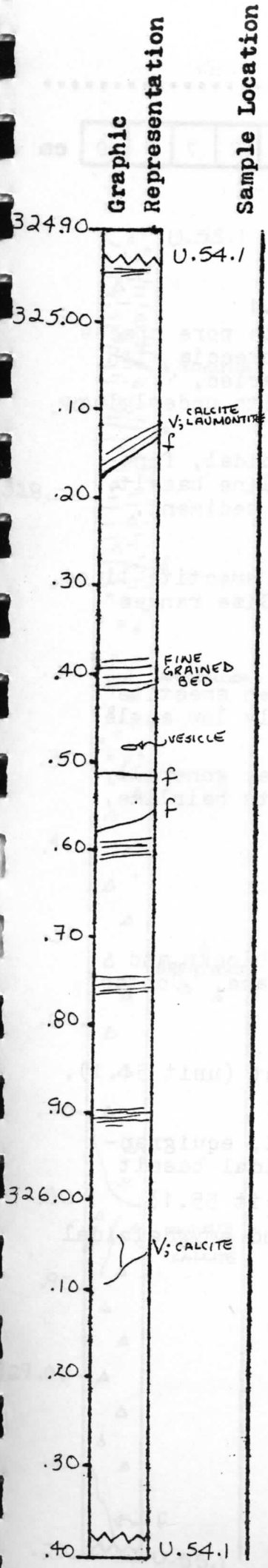
STRUCTURE
Pyroclastic sediments (unit 54.1).

ICELAND RESEARCH DRILLING PROJECT

Visual Core Description **Observer** KH .....

Depth Interval 3 2 4 9 3 **cm to** 3 2 6 3 8 **cm**

Box 54 , Section 4



LITHOLOGY PETROGRAPHY -continues unit 54.1
Very fine-grained, dark reddish-brown.
324.98 Coarse grained.
Grain size decreases.
325.37 Fine-grained bed.
325.42 Coarse-grained.
326.18 Fairly fine-grained.
326.26 Very fine-grained, red colour.

VESICLES/AMYGDALES
325.48 Vesicule - calicte, laumontite filled.

FRACTURES - VEINS - BRECCIA
325.10 Vein - calcite, laumontite, angle 40°.
326.05 Vein - calcite veinlets.

ROCK ALTERATION
324.98 Calcite is disseminated, oxidized.
325.30 Oxidized; argillitized.
325.50 Calcite is disseminated.

STRUCTURE
Pyroclastic sediments (unit 54.1).