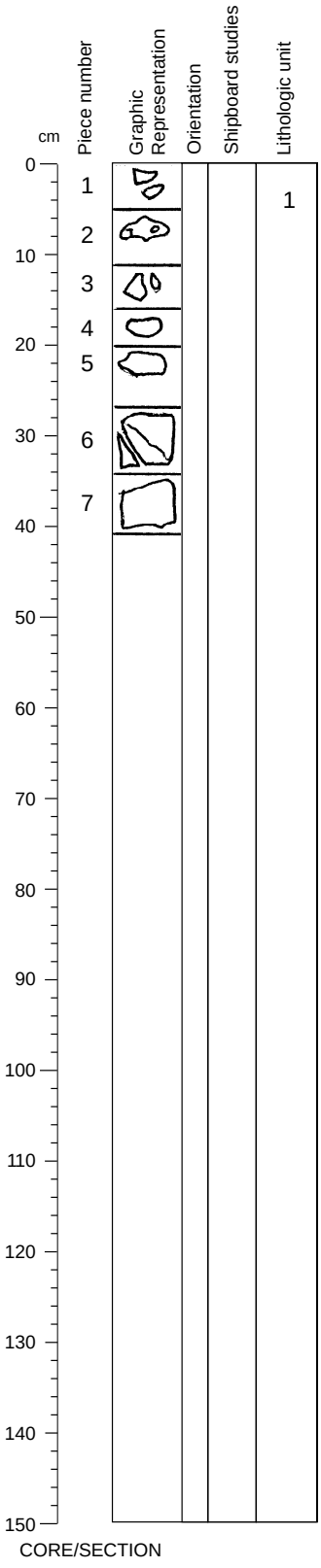
# Core Photo




**183-1142A-1W-1** **Section : 0.00-91.00 (mbsf)**

**UNIT 1: SPARSELY TO MODERATELY OLIVINE-PLAGIOCLASE-PHYRIC BASALT**

**Pieces:** 1-7

**CONTACTS:** Not recovered (but see comments below).

| **PHENOCRYSTS:** | **% Mode** | **Grain Size (mm): Max** | **Min** | **Avg.** | **Shape/Habit** |
|---|---|---|---|---|---|
| Plagioclase: | 1 | 1 | 0.5 | | Euhedral to subhedral; partially altered to pale green and dark green clay |
| Olivine: | 2 | 1.5 | 0.5 | 1 | Euhedral to subhedral; largely replaced by green and brownish orange clay |

**GROUNDMASS:** Fine grained (see comments below).

**VESICLES:** Sparsely vesicular. Vesicles are round to oblate, ≤2 mm, and filled with pale green to dark green clay and white zeolite.

**COLOR:** Medium gray to greenish gray.

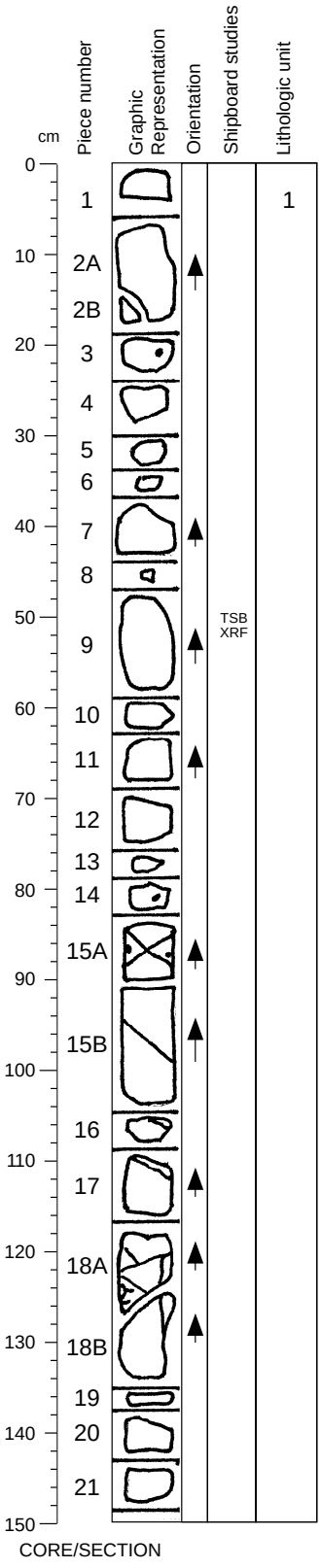
**STRUCTURE:** Massive.

**ALTERATION:** Slight in interiors of pieces to moderate in alteration rinds. Prominent oxidation halos are present at margins in contact with foraminifer packstone.

**VEINS/FRACTURES:** Thin veins are filled with dark green clay and surrounded by ~5-mm dark green halos.

**COMMENTS:** Pieces 1 and 2 are sandy, nannofossil-bearing foraminifer limestone that contains subangular pebbles of chert and altered basalt. Pieces 3-7 are basalt with traces of limestone cement on their surfaces. Thus, limestone and basalt were in contact before drilling. Pieces 5-7 are fine-grained, sparsely olivine-plagioclase-phyric basalt, whereas Piece 4 is slightly coarser grained and may contain clinopyroxene rather than olivine.

## Core Photo




**183-1142A-2R-1** **Section top: 91.00 (mbsf)**

**UNIT 1: APHYRIC AND MODERATELY PLAGIOCLASE-OLIVINE-PHYRIC BASALT**

**Pieces:** 1-21

**CONTACTS:** None.

| **PHENOCRYSTS:** | **% Mode** | **Grain Size (mm): Max** | **Min** | **Avg.** | **Shape/Habit** |
|---|---|---|---|---|---|
| Plagioclase: | 0-5 | 3 | 0.3 | 1 | Subhedral, blocky |
| Olivine: | 0-2 | 0.8 | 0.2 | 0.4 | Euhedral, equant; partially altered to pale green clay and yellowish brown clay: |

**GROUNDMASS:** Fine grained to aphanitic.

**VESICLES:** Nonvesicular. Rare vesicles are 1-4 mm, round, and filled with zeolite (?) and calcite.

**COLOR:** Pale gray.

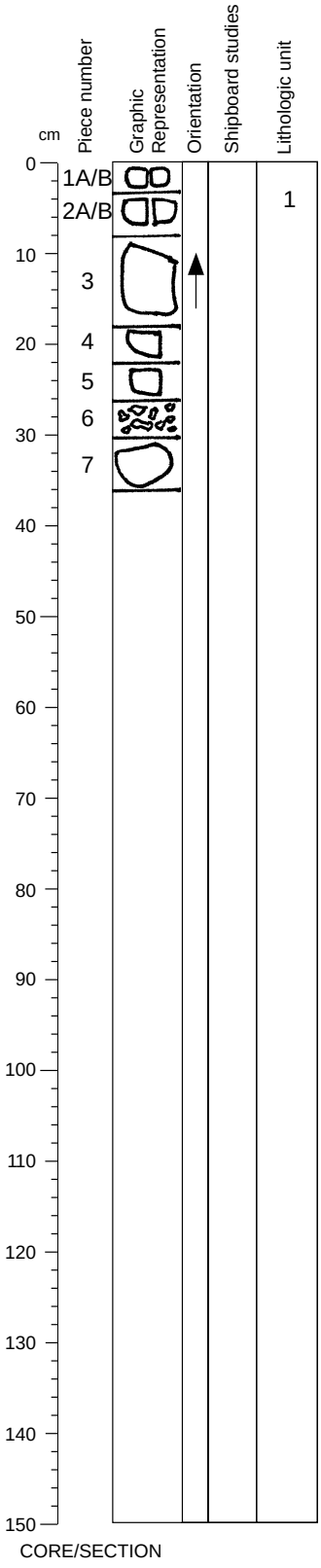
**STRUCTURE:** Massive.

**ALTERATION:** Slight.

**VEINS/FRACTURES:** Sparse, variably inclined 1- to 2-mm-wide veins are filled with green clay and calcite.

**COMMENTS:**

## Core Photo




**183-1142A-2R-2** **Section top: 92.49 (mbsf)**

**UNIT 1: MODERATELY PLAGIOCLASE-PHYRIC BASALT**

**Pieces:** 1-7

**CONTACTS:** Not recovered. The contact between Units 1 and 2 is inferred to be between Sections 2R-2 and 3R-1.

| PHENOCRYSTS: | % Mode | Grain Size (mm): Max | Min | Avg. | Shape/Habit |
|---|---|---|---|---|---|
| Plagioclase: | 2-5 | 1 | 0.2 | 0.5 | Subhedral to euhedral, blocky |

**GROUNDMASS:** Fine grained to aphanitic.

**VESICLES:** Nonvesicular. Rare 0.5-5-mm, round vesicles are filled with zeolite and calcite.

**COLOR:** Medium gray.

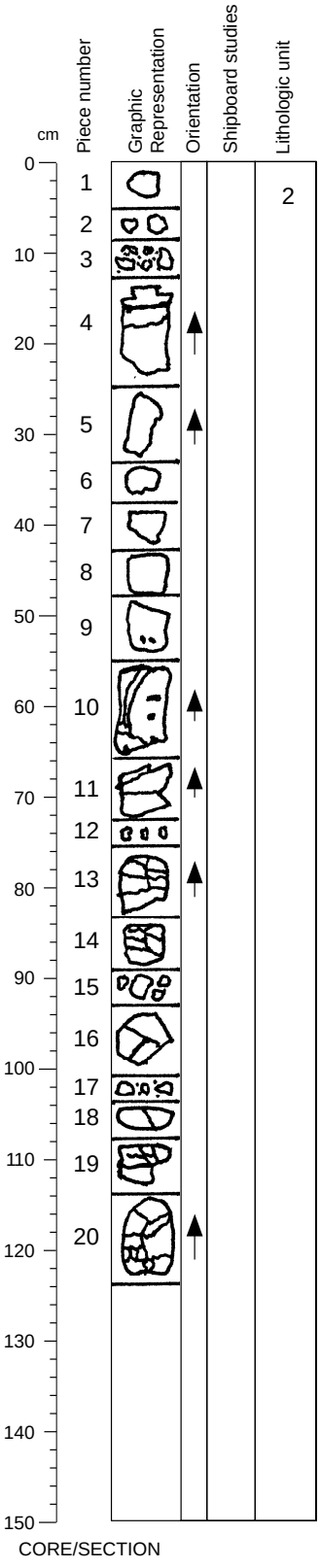
**STRUCTURE:** Massive.

**ALTERATION:** Slight.

**VEINS/FRACTURES:** Thin calcite veins are present.

**COMMENTS:**

## Core Photo




**183-1142A-3R-1** **Section top: 98.70 (mbsf)**

**UNIT 2: MIXED VOLCANIC ROCKS**

**Pieces:** 1-20

**CONTACTS:** Not recovered. The contact between Units 1 and 2 is inferred to be between Sections 2R-2 and 3R-1. The contact between Units 2 and 3 is inferred to be between Sections 3R-1 and 3R-CC.

**GENERAL DESCRIPTION:** This section consists of fragments of several genetically unrelated rock types, including limestone, basalt, and felsic volcanic rock. Approximately half of the pieces are round to subround cobbles with abraded, slightly weathered surfaces.

**ROCK TYPES AND MAIN FEATURES:**

Pieces 1, 2: Sandy foraminifer limestone. These pieces are very similar to Pieces 1 and 2 of Section 1W-1, and probably fell from a higher stratigraphic level.

Pieces 3, 4, 12-15: Completely altered, dark reddish brown volcanic breccia.

Piece 5: Greenish gray, highly altered, moderately vesicular, moderately clinopyroxene-phyric basalt.

Pieces 6, 7: Medium gray, moderately altered, nonvesicular, moderately plagioclase-phyric basalt.

Piece 8: Pale green, highly altered, fine-grained basalt with sparse green-clay-filled vesicles.

Piece 9: Pale green, highly altered, sparsely vesicular, fine-grained, aphyric basalt.

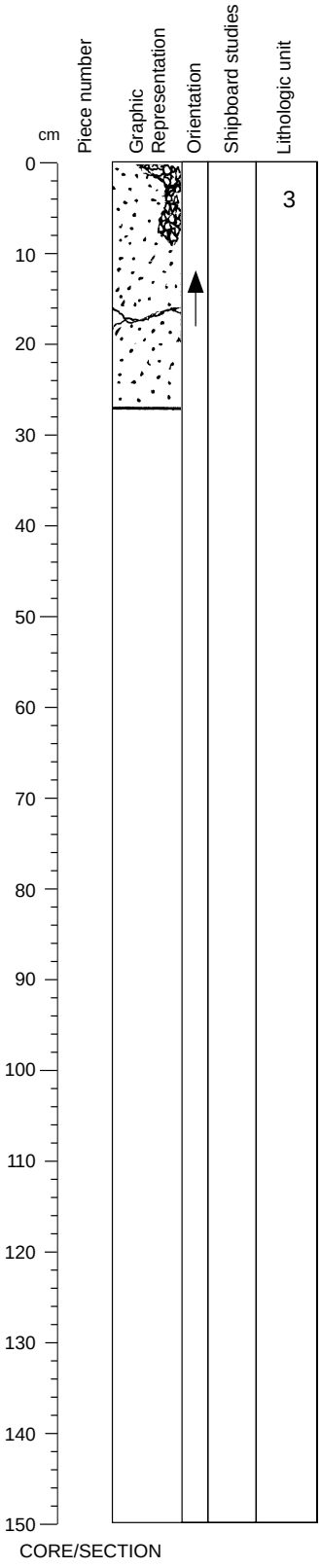
Piece 10: Dark green, completely altered, nonvesicular, aphanitic, aphyric basalt.

Piece 11: Pinkish gray, moderately altered, feldspar-phyric felsic volcanic rock.

Pieces 16-18: Moderately olivine-phyric basalt. Olivine phenocrysts are <3 mm and completely altered to clay and oxides. Groundmass is fine grained and completely altered.

Pieces 19, 20: Pale pinkish gray, completely altered, nonvesicular, moderately feldspar-quartz-phyric felsic volcanic rock.

## Core Photo




**183-1142A-3R-CC** **Section top: 99.94 (mbsf)**

**UNIT 3: APHYRIC BASALTIC BRECCIA**

**Pieces:** NA

**CONTACTS:** Not recovered. The contact between Units 2 and 3 is inferred to be between Sections 3R-1 and 3R-CC.

**PHENOCRYSTS:** None.

**GROUNDMASS:** Aphanitic; completely altered to clay.

**VESICLES:** Nonvesicular.

**COLOR:** Dark brown.

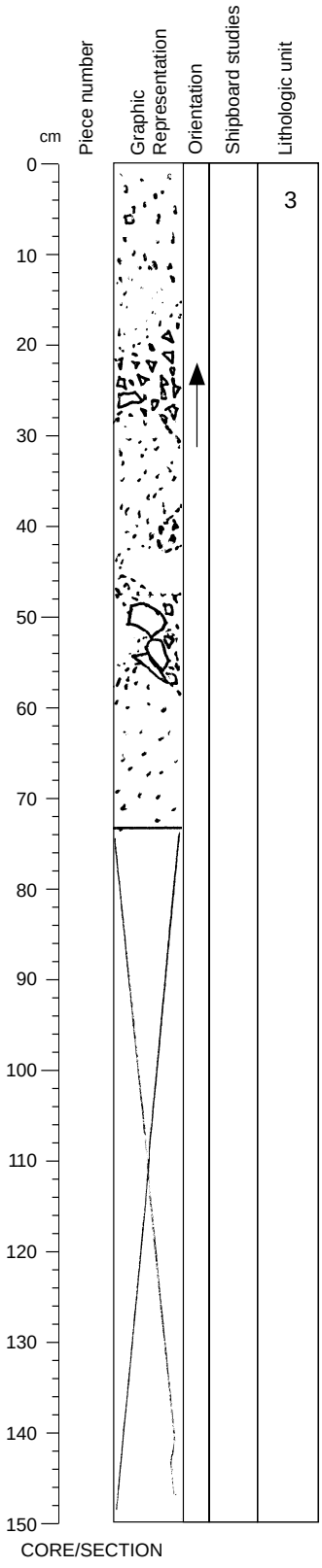
**STRUCTURE:** Brecciated. Round fragments, 1-5 cm, with diffuse margins are embedded in a fine-grained clay-rich matrix.

**ALTERATION:** Complete.

**VEINS/FRACTURES:** None.

**COMMENTS:** The coarse fragments are the only original lithological feature preserved in this section.

## Core Photo




**183-1142A-4R-1** **Section top: 108.30 (mbsf)**

**UNIT 3: APHYRIC BASALTIC BRECCIA**

**Pieces:** NA

**CONTACTS:** None.

**PHENOCRYSTS:** None.

**GROUNDMASS:** Aphanitic; completely altered to clay.

**VESICLES:** Nonvesicular.

**COLOR:** Dark brown.

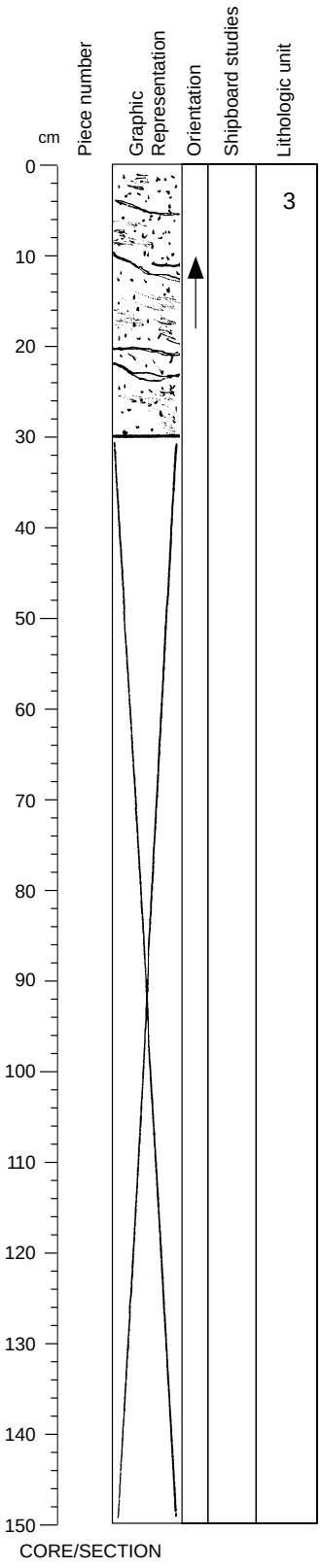
**STRUCTURE:** Brecciated. Subangular fragments, <1 mm to 3 cm, are embedded in a fine-grained clay-rich matrix.

**ALTERATION:** Complete.

**VEINS/FRACTURES:** None.

**COMMENTS:** The brecciation is inferred from angularity of fragments to be partly a result of drilling disturbance.

## Core Photo




**183-1142A-4R-CC** **Section top: 109.04 (mbsf)**

**UNIT 3: APHYRIC BASALTIC BRECCIA**

**Pieces:** NA

**CONTACTS:** None.

**PHENOCRYSTS:** None.

**GROUNDMASS:** Aphanitic; completely altered to clay.

**VESICLES:** Nonvesicular.

**COLOR:** Dark brown to gray, with a diffuse mottling of reddish brown and bluish gray.

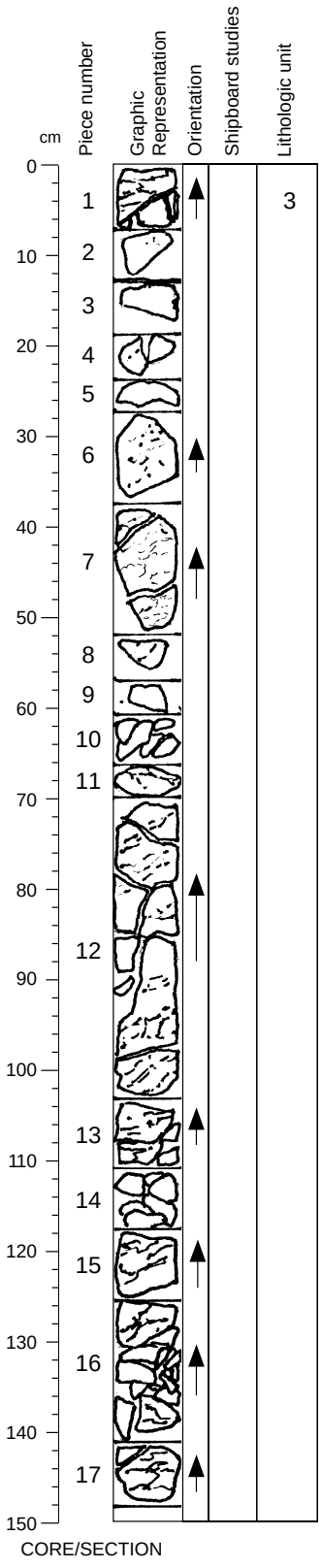
**STRUCTURE:** Brecciated. Fine (<3 mm) fragments are embedded in a clay-rich matrix.

**ALTERATION:** Complete.

**VEINS/FRACTURES:** None.

**COMMENTS:** Zeolite growths are present in the matrix.

## Core Photo




**183-1142A-5R-1** **Section top: 113.10 (mbsf)**

**UNIT 3: APHYRIC BASALT**

**Pieces:** 1-17

**CONTACTS:** None.

| **PHENOCRYSTS:** | **% Mode** | **Grain Size (mm): Max** | **Min** | **Avg.** | **Shape/Habit** |
|---|---|---|---|---|---|
| Olivine: | 0-1 | 0.8 | 0.2 | 0.5 | Euhedral, equant; completely altered to brown clay |
| Plagioclase | 0-1 | 1.2 | 0.6 | 0.8 | Subhedral laths |

**GROUNDMASS:** Aphanitic.

**VESICLES:** Nonvesicular.

**COLOR:** Dark brown.

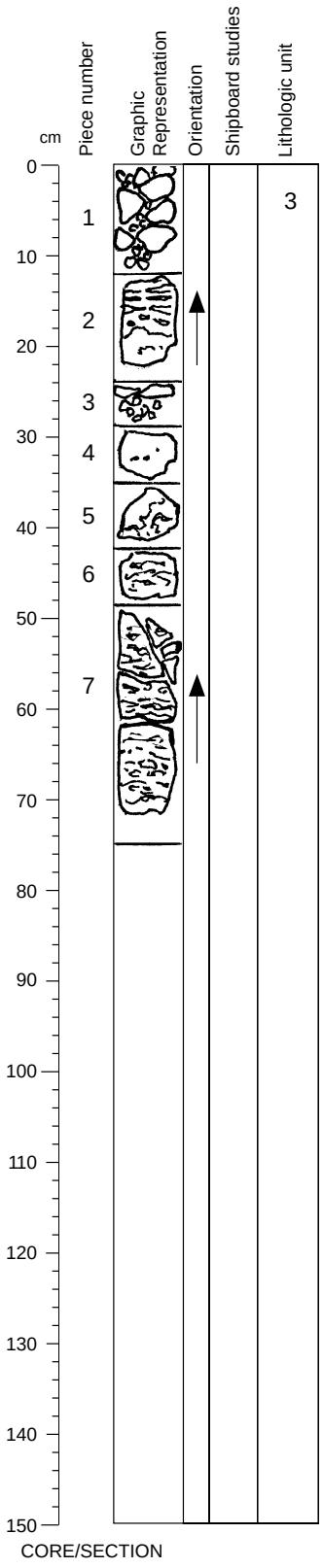
**STRUCTURE:** Pieces 1-5, 8, 9, and 11-17 are massive; Pieces 6, 7, and 10 are brecciated. Fabric between 67 and 90 cm (dipping ~30° in Piece 12) is produced by discontinuous lighter brown wisps that originally were probably mesostasis or coalesced, highly irregular vesicles.

**ALTERATION:** Complete.

**VEINS/FRACTURES:** Moderately abundant, irregular veins, 1-2 mm wide, are filled with light brown clay.

**COMMENTS:** Margin of Piece 5 may contain highly altered glass. However, original features of this section are difficult to determine because of alteration.

## Core Photo




**183-1142A-5R-2** **Section top: 114.59 (mbsf)**

**UNIT 3: APHYRIC TO MODERATELY OLIVINE-PLAGIOCLASE-PHYRIC BASALT AND BASALTIC BRECCIA**

**Pieces:** 1-7

**CONTACTS:** None.

| **PHENOCRYSTS:** | **%** | **Grain Size (mm):** | | | |
|---|---|---|---|---|---|
| | **Mode** | **Max** | **Min** | **Avg.** | **Shape/Habit** |
| Olivine: | 0-5 | 1 | 0.1 | 0.3 | Euhedral, equant; completely altered to yellow or brown clay |
| Plagioclase | 0-2 | 1.2 | 0.5 | 0.7 | Subhedral laths |

**GROUNDMASS:** Aphanitic.

**VESICLES:** Moderately vesicular? See comment below.

**COLOR:** Dark brown.

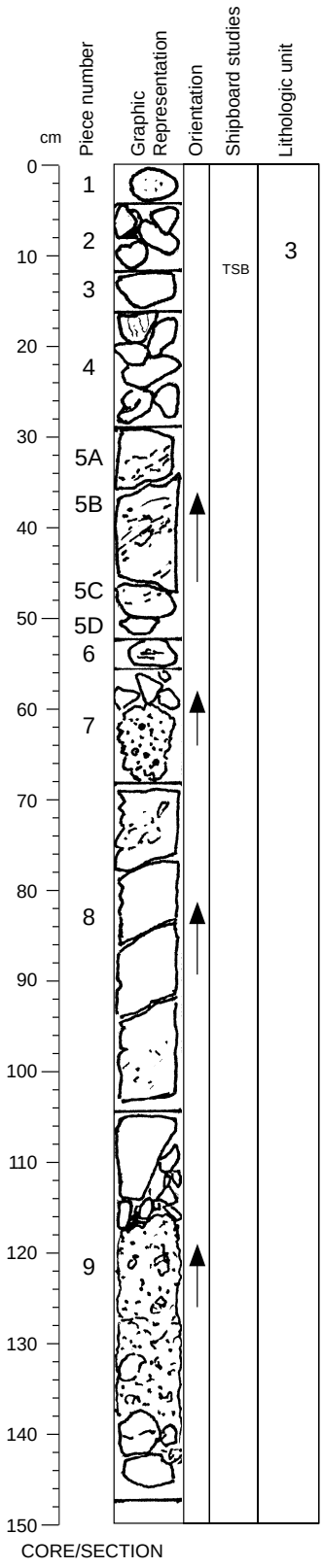
**STRUCTURE:** Intervals from 0-13 cm and 18-49 cm are massive. Intervals from 13-18 cm and 49-72 cm are brecciated. Subhorizontal sheared zone between 13 and 16 cm.

**ALTERATION:** Complete.

**VEINS/FRACTURES:** None.

**COMMENTS:** Pervasive alteration makes distinction of olivine, vesicles, and secondary structures difficult.

## Core Photo




**183-1142A-6R-1** **Section top: 117.80 (mbsf)**

**UNIT 3: APHYRIC TO SPARSELY OLIVINE-PLAGIOCLASE-PHYRIC BASALT**

**Pieces:** 1-9

**CONTACTS:** Not recovered. The contact between Units 3 and 4 is inferred to be between Sections 6R-1 and 6R-2.

| PHENOCRYSTS: | % Mode | Grain Size (mm): Max | Min | Avg. | Shape/Habit |
|---|---|---|---|---|---|
| Olivine: | 0-2 | 0.8 | 0.1 | 0.2 | Euhedral, equant; completely altered to brown clay |
| Plagioclase | 0-2 | 1.5 | 0.6 | 0.9 | Subhedral laths |

**GROUNDMASS:** Aphanitic.

**VESICLES:** Nonvesicular

**COLOR:** Dark brown.

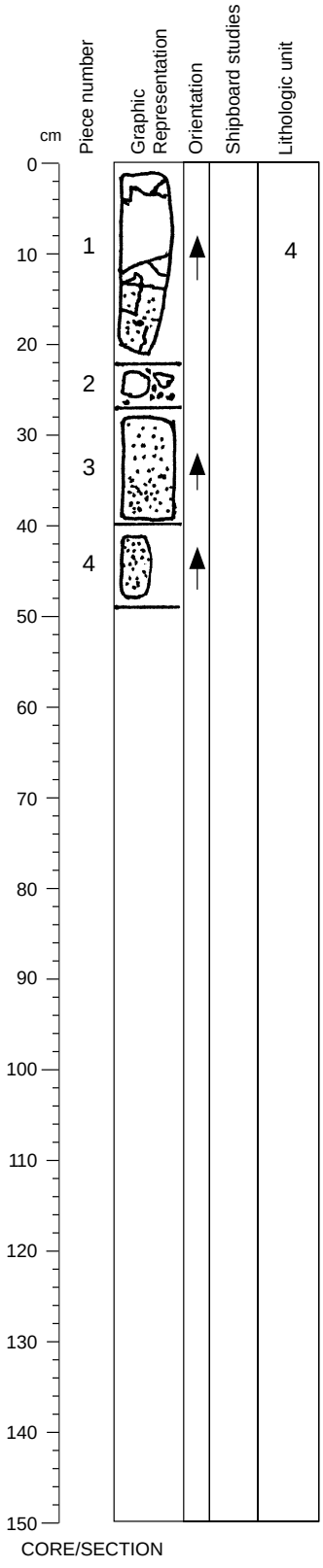
**STRUCTURE:** Massive. Piece 7 and 115-140 cm interval of Piece 9 are very highly disturbed by drilling.

**ALTERATION:** Complete.

**VEINS/FRACTURES:** Several moderately to steeply dipping fractures have greenish brown clay and slickensides on their surfaces.

**COMMENTS:** Pieces 1-3 are round, abraded cobbles (1-5 cm) of plagioclase-phyric and aphyric basalt and felsic igneous rock which probably fell from higher stratigraphic levels.

## Core Photo




**183-1142A-6R-2** **Section top: 119.26 (mbsf)**

**UNIT 4: GRANULE-BEARING MUDSTONE**

**Pieces:** 1-4

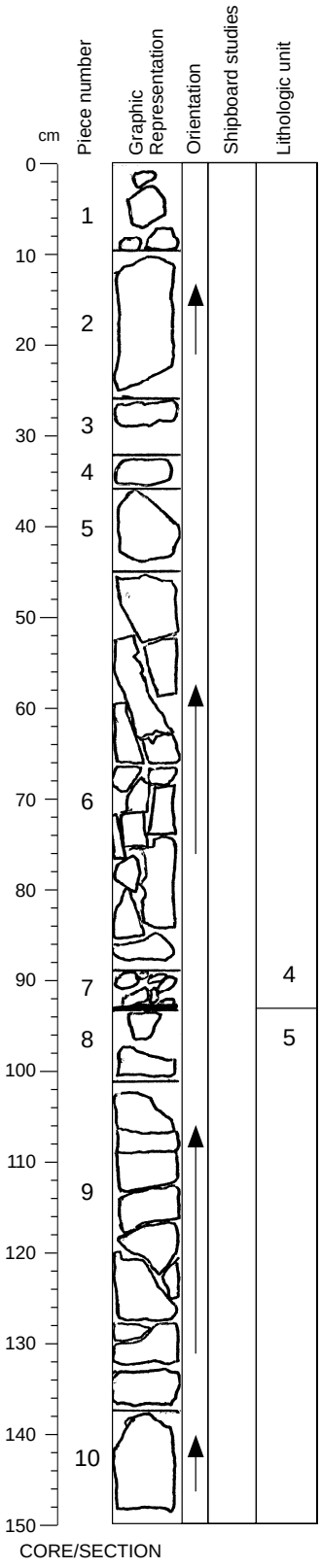
**CONTACTS:** Not recovered. The contact between Units 3 and 4 is inferred to be between Sections 6R-1 and 6R-2.

**COLOR:** Moderate reddish brown.

**VEINS AND FRACTURES:** None.

**GENERAL DESCRIPTION:** Subround to angular lithic fragments and crystals (<1 to 10 mm) are almost completely altered to red or white clay and supported in a well-indurated, fine-grained, predominantly clay matrix. Pieces 1 and 2 are ungraded; Pieces 3 and 4 are reversely graded.

## Core Photo




**183-1142A-7R-1** **Section top: 122.60 (mbsf)**

**UNIT 4: GRANULE-BEARING MUDSTONE**

**Pieces:** 1-7

**CONTACTS:** Not recovered. The contact between Units 4 and 5 is inferred to be at 92 cm, between Pieces 7 and 8.

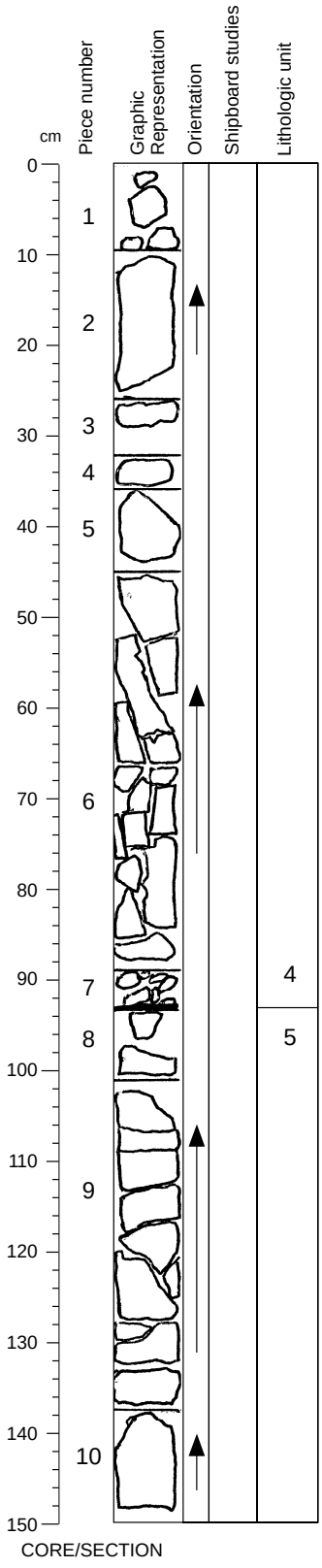
**COLOR:** Piece 1 is very dusky red; Pieces 2-7 are reddish brown.

**VEINS/FRACTURES:** Numerous steeply dipping fractures are present.

**COMMENTS:** Piece 1 consists of three banded pebbles which are similar to material in Section 6R-1 and probably fell from a higher stratigraphic level. Pieces 2-7 are composed of subround lithic and crystal fragments (<1 to 6 mm) supported in a well-indurated, clay-rich matrix. Lithic fragments are completely replaced by reddish brown and black clay. Pedogenic structures are absent. Modal abundance of crystals (5-10%) is consistent with a resedimented tuff or mud flow.

## Core Photo

**183-1142A-7R-1** **Section top: 122.60 (mbsf)**




**UNIT 5: VOLCANIC BRECCIA**

**Pieces:** 8-10

**CONTACTS:** Not recovered. The contact between Units 4 and 5 is inferred to be at 92 cm, between Pieces 7 and 8.

**PHENOCRYSTS:** None.

**GROUNDMASS:** Aphanitic.

**VESICLES:** Nonvesicular. White patches of devitrification (<0.5 mm) in clasts mimic vesicles.

**COLOR:** Grayish red.

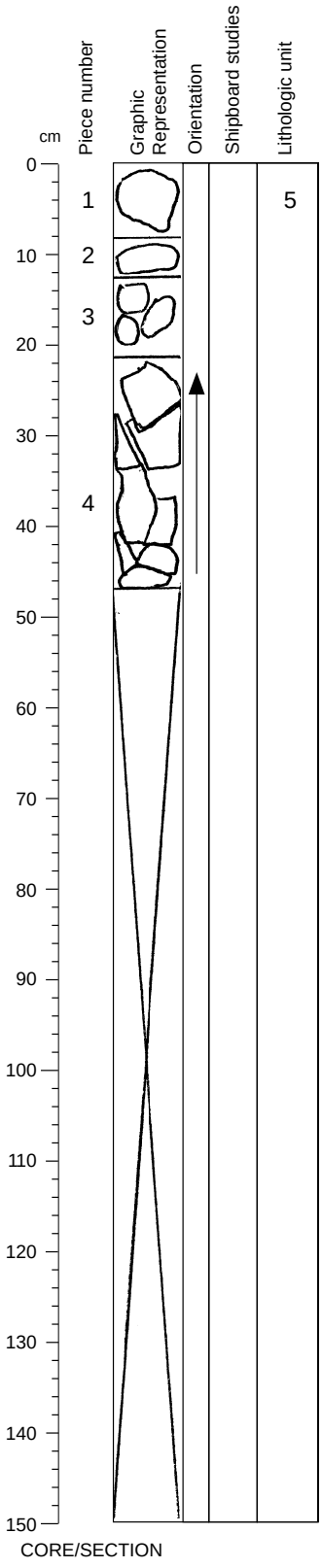
**STRUCTURE:** Brecciated. Subround to subangular, elongate clasts in a clay matrix produce a subhorizontal texture.

**ALTERATION:** Complete.

**VEINS/FRACTURES:** Gently to moderately dipping fractures with rare slickensides are present.

**COMMENTS:** Most of the unit is composed of clasts with a well-developed but highly altered fabric; matrix is minor (~20%) and composed of red clay and small (<1 mm) clasts. Matrix material is flattened and granular between clasts in Pieces 9 and 10 (sedimentary matrix?). The clay in the matrix is similar in appearance to material in Unit 4.

## Core Photo




**183-1142A-7R-2** **Section top: 124.10 (mbsf)**

**UNIT 5: VOLCANIC BRECCIA**

**Pieces:** 1-4

**CONTACTS:** None.

**PHENOCRYSTS:** Very rare quartz crystals (~1 mm) are present.

**GROUNDMASS:** Aphanitic.

**VESICLES:** Nonvesicular. White patches of devitrification (<0.5 mm) mimic vesicles.

**COLOR:** Grayish red purple to very dusky red.

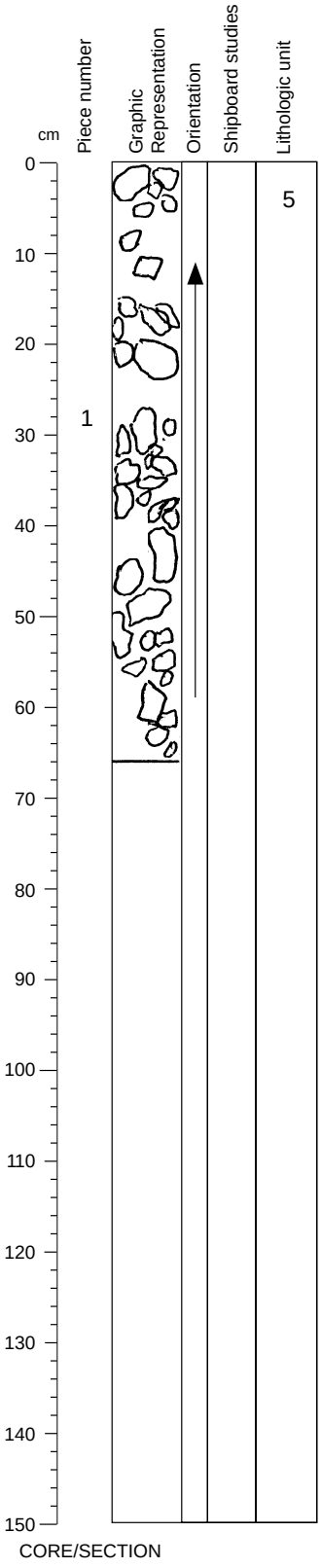
**STRUCTURE:** Brecciated. Clasts are mm to cm size and commonly elongate; some clasts appear to fit together.

**ALTERATION:** Complete. Alteration phases include iron oxides and oxyhydroxides.

**VEINS/FRACTURES:** Rare, smooth, unmineralized fractures or joints are present; some have well-developed slickensides.

**COMMENTS:** Several clasts in Piece 2 have possible chilled margins.

## Core Photo




**183-1142A-8R-1** **Section top: 127.50 (mbsf)**

**UNIT 5: VOLCANIC BRECCIA**

**Pieces:** 1

**CONTACTS:** Not recovered. The contact between Units 5 and 6 is inferred to be between Sections 8R-1 and 9R-1.

**PHENOCRYSTS:** None.

**GROUNDMASS:** Aphanitic to fine grained; altered to clay.

**VESICLES:** Nonvesicular.

**COLOR:** Grayish red to very dusky red.

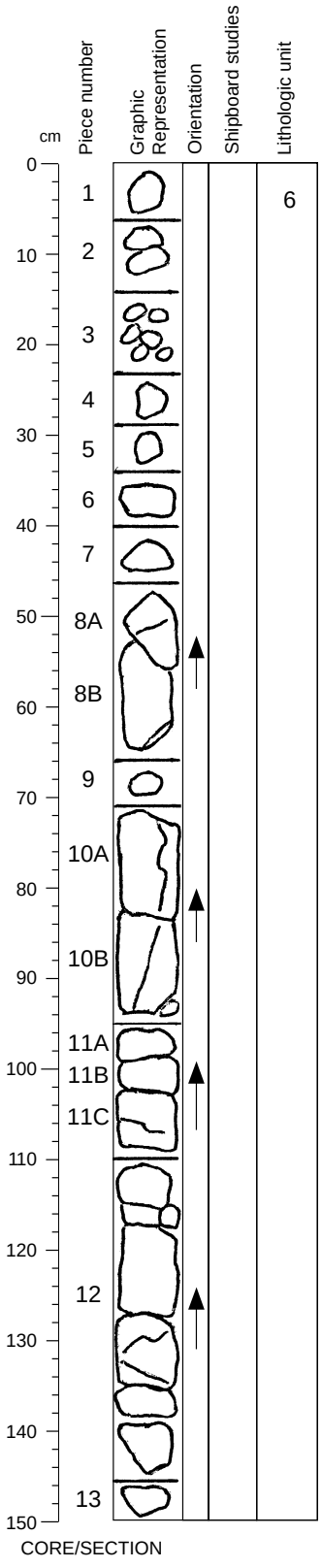
**STRUCTURE:** Brecciated. Considerably disturbed by drilling.

**ALTERATION:** Very high to complete.

**VEINS/FRACTURES:** Completely fractured and disturbed. Some surfaces contain abundant pyrite.

**COMMENTS:**

## Core Photo




**183-1142A-9R-1** **Section top: 132.30 (mbsf)**

**UNIT 6: APHYRIC BASALT**

**Pieces:** 1

**CONTACTS:** Not recovered. The contact between Units 5 and 6 is inferred to be between Sections 8R-1 and 9R-1.

**PHENOCRYSTS:** See comments below.

**GROUNDMASS:** Fine grained to aphanitic. PIeces 7-9 have variolitic groundmass texture.

**VESICLES:** Sparsely vesicular. Vesicles are irregular, <1 mm, and filled with green clay and white carbonate. A vesicle in Piece 8A contains sulfide and hematite.

**COLOR:** Greenish black to medium gray with light brown, curving alteration bands.

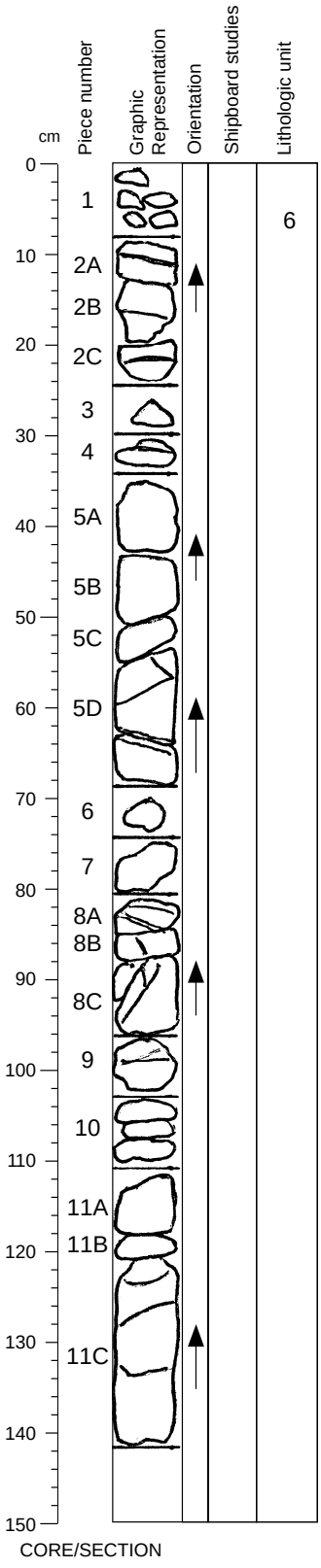
**STRUCTURE:** Pillowed? Pillowed structure is suggested by curving alteration bands and groundmass grain size variation, but alteration of possible glassy margins and fine-grained groundmass is too advanced for a positive identification.

**ALTERATION:** High to complete. Piece 10 is the least altered piece (about 70%). Carbonate, iron oxide, and dark green to bluish green clay (celadonite?) are present on pebble surfaces and in veins. Well-developed alteration halos are present.

**VEINS/FRACTURES:** Veins are moderately abundant, <2 mm wide, and filled with carbonate, iron oxide and clay.

**COMMENTS:** A possible pillow margin is at the top of Piece 8A. Piece 8B contains ~1% of altered olivine (0.2-0.7 mm), which is more abundant near the top of the piece (pillow center?) than in the lower portion; clinopyroxene phenocrysts (<<1%) are <0.5 mm.

## Core Photo




**183-1142A-9R-2** **Section top: 133.80 (mbsf)**

**UNIT 6: APHYRIC BASALT**

**Pieces:** 1-11

**CONTACTS:** None.

**PHENOCRYSTS:**

| | % Mode | Grain Size (mm): Max | Min | Avg. | Shape/Habit |
|---|---|---|---|---|---|
| Plagioclase: | <1 | 1 | 0.5 | | Subhedral |

**GROUNDMASS:** Fine grained to aphanitic. Variolitic groundmass texture is rarely present (e.g., in Piece 11). Streaks of altered mesostasis are prominent.

**VESICLES:** None.

**COLOR:** Light bluish gray with light brown alteration bands and dark greenish gray vein halos.

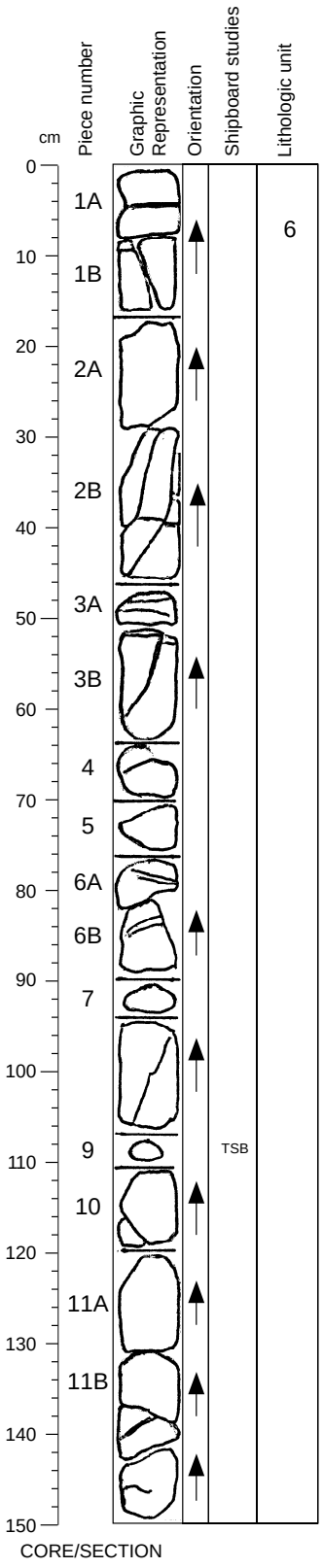
**STRUCTURE:** Massive.

**ALTERATION:** Moderate to very high. Groundmass alteration is primarily to iron oxides, with rare sulfides; originally glassy areas are altered to clay. Late-stage,

**VEINS/FRACTURES:** Veins are 1 mm to 1 cm wide and filled with carbonate, iron oxides, green clay, green zeolite, and secondary sulfide. Dark vein halos cut brown alteration bands.

**COMMENTS:**

## Core Photo




**183-1142A-9R-3** **Section top: 135.23 (mbsf)**

**UNIT 6: APHYRIC BASALT**

**Pieces:** 1-11

**CONTACTS:** None.

| **PHENOCRYSTS:** | **% Mode** | **Grain Size (mm): Max** | **Min** | **Avg.** | **Shape/Habit** |
|---|---|---|---|---|---|
| Plagioclase: | trace | 0.8 | <0.2 | <0.2 | |

**GROUNDMASS:** Aphanitic to fine grained. Contains oxides and relatively unaltered plagioclase. Variolitic texture is present in groundmass of Piece 1.

**VESICLES:** Nonvesicular.

**COLOR:** Medium light gray. Alteration bands are light brown. Possible pillow margins are dark greenish gray (e.g., Piece 3A).

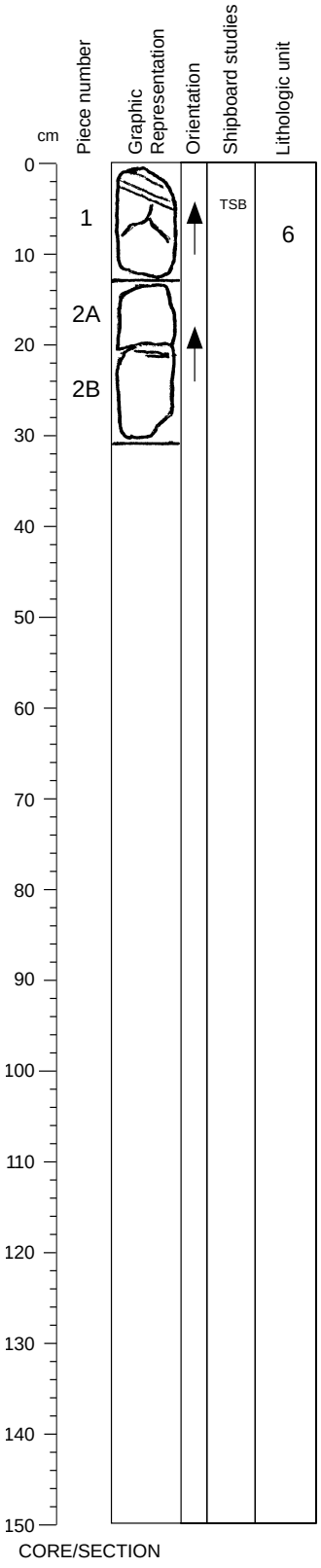
**STRUCTURE:** PIllowed? Grain size decreases near possible pillow margins; however, alteration is too advanced in these areas to make a definite identification of original structure.

**ALTERATION:** Moderate to very high.

**VEINS/FRACTURES:** Moderately abundant veins are 2-5 mm wide and filled with white carbonate, green and reddish brown clay, iron hydroxide, and sulfide.

**COMMENTS:** A single clinopyroxene phenocryst (~0.2 mm) is noted.

## Core Photo




**183-1142A-9R-4** **Section top: 136.73 (mbsf)**

**UNIT 6: APHYRIC BASALT**

**Pieces:** 1-2

**CONTACTS:** None.

| **PHENOCRYSTS:** | **%** | **Grain Size (mm):** | | | |
|---|---|---|---|---|---|
| | **Mode** | **Max** | **Min** | **Avg.** | **Shape/Habit** |
| Plagioclase: | trace | | | <0.4 | Altered |

**GROUNDMASS:** Fine grained; possible pillow margin at the top of Piece 1 is aphanitic. Groundmass contains plagioclase and clinopyroxene; Piece 1 may contain altered olivine.

**VESICLES:** Nonvesicular.

**COLOR:** Medium light gray. Alteration bands are orange, and possible pillow margin is dark greenish gray.

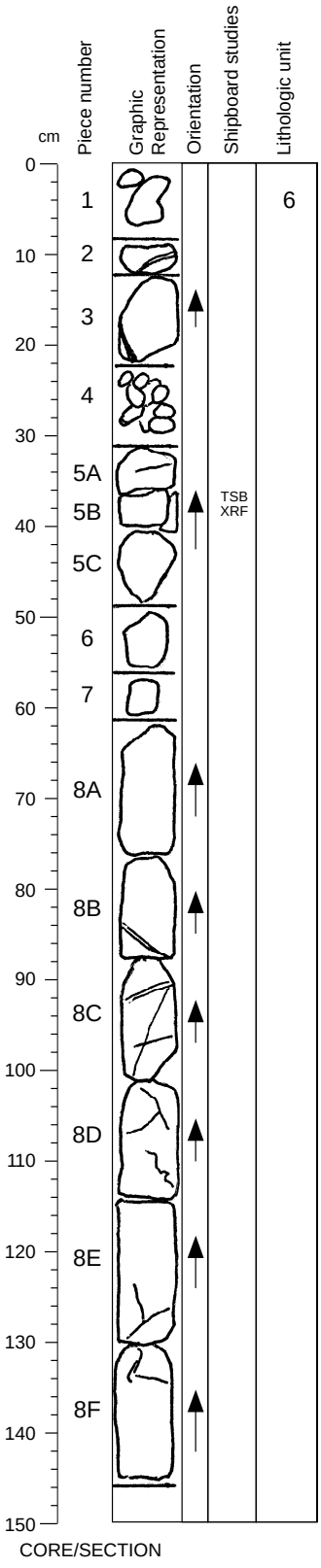
**STRUCTURE:** Pillowed? Top of PIece 1 contains a possible pillow margin.

**ALTERATION:** High. Some of the orange alteration bands in Piece 2B are roughly concentric. The possible glassy pillow margin at the top of Piece 1 is altered to dark green clay.

**VEINS/FRACTURES:** Veins are 0.2-10 mm wide and filled with carbonate, red and green clay, and hematite. Large carbonate vein parallel to the possible margin at the top of Piece 1 contains altered glass fragments (pillow margin breccia?). Green-clay-filled veins in this margin are oriented both parallel and perpendicular to it.

**COMMENTS:**

## Core Photo




**183-1142A-10R-1** **Section top: 137.10 (mbsf)**

**UNIT 6: APHYRIC BASALT**

**Pieces:** 1-8

**CONTACTS:** None.

**PHENOCRYSTS:** None.

**GROUNDMASS:** Fine grained. Groundmass is intergranular to variolitic.

**VESICLES:** None.

**COLOR:** Varies from light bluish gray to greenish gray, and light gray to medium brown. Possible pilow margin is dark greenish gray.

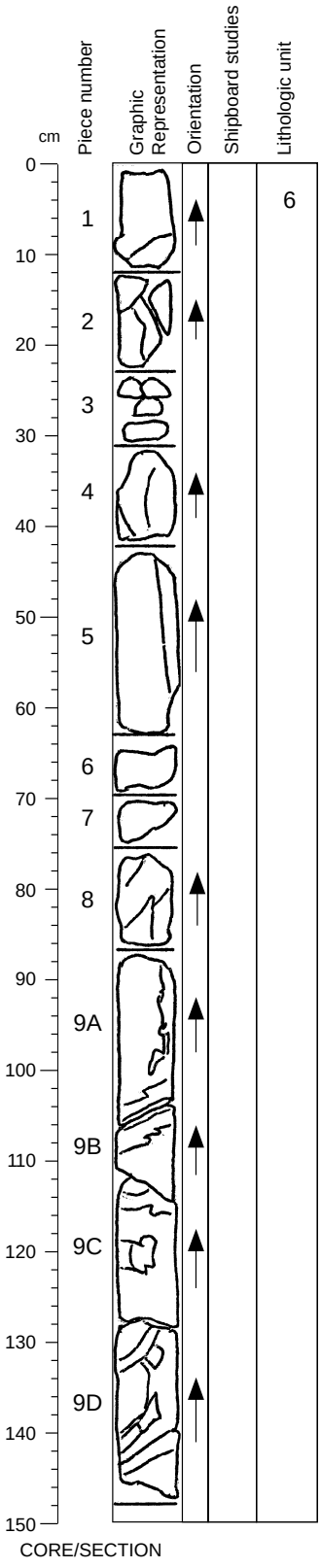
**STRUCTURE:** Pillowed? Piece 2 contains a possible pillow margin.

**ALTERATION:** Slight to high. Groundmass clinopyroxene is partially replaced by dark green clay.

**VEINS/FRACTURES:** Numerous veins (<1 to 5 mm wide) are subhorizontal to subvertical and filled with carbonate, clay, and abundant pyrite.

**COMMENTS:** Curved, roughly concentric, alteration bands are subparallel to possible pillow margin and form alteration halos around veins.

## Core Photo




**183-1142A-10R-2** **Section top: 138.57 (mbsf)**

**UNIT 6: APHYRIC BASALT**

**Pieces:** 1-9

**CONTACTS:** None.

**PHENOCRYSTS:** None.

**GROUNDMASS:** Fine grained. Groundmass contains variolitic plagioclase, and intergranular clinopyroxene and oxides.

**VESICLES:** None.

**COLOR:** Dark greenish gray to light gray and moderate brown.

**STRUCTURE:** Massive? Appearance is very similar to that of Sections 9R-1 through 10R-1, but evidence for pillow margins is absent.

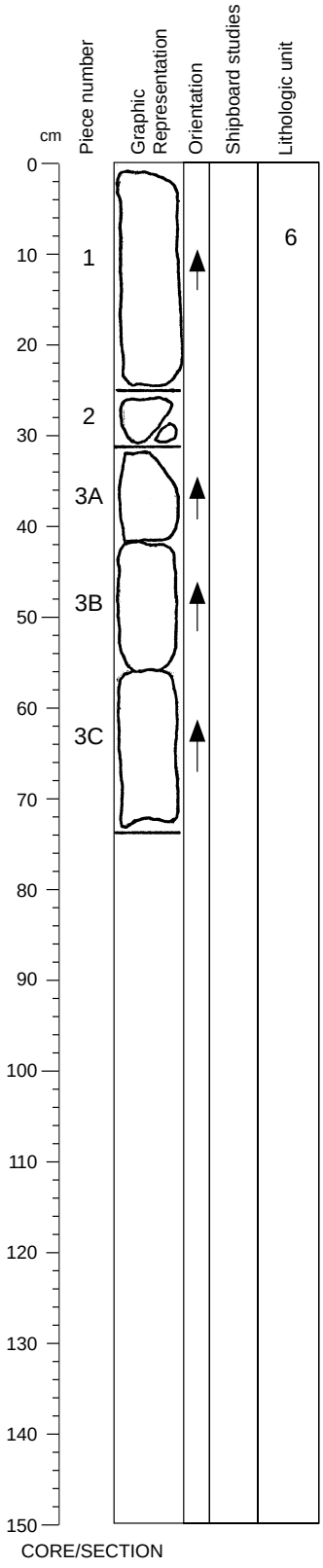
**ALTERATION:** Moderate to high. Brown alteration bands are curved and roughly concentric; some are subparallel to vein margins.

**VEINS/FRACTURES:** Carbonate- and clay-filled veins (1-5 mm wide) are moderately abundant and contain trace amounts of pyrite. Pieces 9C and 9D contain large (>3 cm) veinlike features filled with carbonate, minor quartz, and pieces of wallrock that appear to have filled open space.

**COMMENTS:** Portions (~2 cm wide) of Pieces 1 and 2 are brown clay that could be altered sediment adjacent to basalt; no indication of an originally glassy texture is present in or near these regions.

## Core Photo

**183-1142A-10R-3** **Section top: 140.05 (mbsf)**




**UNIT 6: APHYRIC BASALT**

**Pieces:** 1-3

**CONTACTS:** None.

**PHENOCRYSTS:** None.

**GROUNDMASS:** Fine grained. Groundmass contains variolitic plagioclase, and intergranular clinopyroxene and oxides.

**VESICLES:** None.

**COLOR:** Dark greenish gray.

**STRUCTURE:** Massive.

**ALTERATION:** Moderate. Orange or brown, curved alteration bands are absent from this section.

**VEINS/FRACTURES:** Sparse veins are <2 mm wide and filled with carbonate and brown clay.

**COMMENTS:**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **THIN SECTION:** | **183-1142A-2R-1, 50-53** | | | | | **Unit 1** | **OBSERVER:** | **CRN** |
| **ROCK NAME:** | **Moderately olivine-plagioclase-phyric basalt.** | | | | | | | |
| **WHERE SAMPLED:** | **Interior of Unit 1.** | | | | | | | |
| **GRAIN SIZE:** | **Medium to fine-grained phenocrysts in a fine-grained groundmass.** | | | | | | | |
| **TEXTURE:** | **Porphyritic with an intergranular groundmass.** | | | | | | | |

| **PRIMARY MINERALOGY** | **PERCENT PRESENT** | **PERCENT ORIGINAL** | **SIZE (mm) min.** | **max.** | **av.** | **APPROX. COMP.** | **MORPHOLOGY** | **COMMENTS** |
|---|---|---|---|---|---|---|---|---|
| **PHENOCRYSTS** | | | | | | | | |
| Olivine | 2 | 5 | 0.6 | 1.5 | 1 | | Subhedral laths | Partially altered and replaced with calcite, but fresh cores are still present in some. Euhedral chromite inclusions are present. |
| Plagioclase | 2 | 2 | 0.4 | 0.8 | 0.6 | | | Compositionally zoned. |
| **GROUNDMASS** | | | | | | | | |
| Plagioclase | 35 | 40 | 0.1 | 0.3 | 0.2 | An60 | Subhedral laths | Many are compositionally zoned. Slightly replaced by carbonate. |
| Clinopyroxene | 25 | 38 | 0.01 | 0.2 | 0.05 | | Anhedral | Partially replaced by carbonate. |
| Titanomagnetite | 5 | 5 | <0.01 | 0.1 | 0.05 | | Subhedral | Acicular (skeletal) and tabular forms present. No maghemite exsolution. |
| Mesostasis | 0 | 10 | | | | | | Completely replaced by carbonate. |

| **SECONDARY MINERALOGY** | **PERCENT** | **SIZE (mm) min.** | **max.** | **av.** | **REPLACING / FILLING** | **COMMENTS** |
|---|---|---|---|---|---|---|
| Carbonate | 31 | | | | Olivine, clinopyroxene, plagioclase, mesostasis; fills vesicle | |

| **VESICLES/ CAVITIES** | **PERCENT** | **LOCATION** | **SIZE (mm) min.** | **max.** | **av.** | **FILLING / MORPHOLOGY** | **COMMENTS** |
|---|---|---|---|---|---|---|---|
| Vesicles | <1 | | | | 2 | Round; filled with carbonate | |

**COMMENTS :** Macroscopic observation: fine-grained, no veins, one vesicle seen (2 mm). Several lighter colored patches are present (up to 6 mm long) in the section. Upon microscopic inspection, these are areas of intense carbonate replacement of the primary mineralogy.

No sulfide observed.

Photomicrograph #:

1142A-3 = Corroded olivine microphenocrysts (x5 objective, ppl);

1142A-4 = As 1142A - 3, but xpl.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **THIN SECTION:** | **183-1142A-6R-1, 11-14, Piece 3** | | | | | **Unit 3** | **OBSERVER:** | **CRN** |
| **ROCK NAME:** | **Sparsely plagioclase-olivine-phyric basalt.** | | | | | | | |
| **WHERE SAMPLED:** | **Cobble within Unit 3.** | | | | | | | |
| **GRAIN SIZE:** | **Fine-grained.** | | | | | | | |
| **TEXTURE:** | **Porphyritic with a subtrachytic to intergranular groundmass which is locally sub-ophitic.** | | | | | | | |

| **PRIMARY MINERALOGY** | **PERCENT PRESENT** | **PERCENT ORIGINAL** | **SIZE (mm) min.** | **max.** | **av.** | **APPROX. COMP.** | **MORPHOLOGY** | **COMMENTS** |
|---|---|---|---|---|---|---|---|---|
| **PHENOCRYSTS** | | | | | | | | |
| Plagioclase | 1 | 2 | 0.5 | 1 | 0.8 | | Subhedral, corroded | Sieve textured cores with corroded margins. Glomerocrystic clusters. Compositional zonation is evident. Zonation and sieve textures preclude petrographic determination of An content. |
| Olivine | 0 | 1 | 0.2 | 0.5 | 0.4 | | Euhedral? | Microphenocrysts. Completely altered and replaced by clays. |
| **GROUNDMASS** | | | | | | | | |
| Plagioclase | 50 | 50 | 0.05 | 0.2 | 0.1 | An60 | Subhedral laths | Composition difficult to obtain petrographically because of zonation. |
| Olivine | 3 | 5 | 0.05 | 0.1 | 0.08 | | Anhedral | Contains minute melt and chromite inclusions. |
| Clinopyroxene | 35 | 40 | 0.05 | 0.4 | 0.2 | | Anhedral | |
| Titanomagnetite | 2 | 2 | 0.01 | 0.1 | 0.08 | | Subhedral to anhedral | |

| **SECONDARY MINERALOGY** | **PERCENT** | **SIZE (mm) min.** | **max.** | **av.** | **REPLACING / FILLING** | **COMMENTS** |
|---|---|---|---|---|---|---|
| Clay | 8 | | | | Clinopyroxene, olivine | |
| Fe-oxide | 1 | | | | Olivine | |

| **VESICLES/ CAVITIES** | **PERCENT** | **LOCATION** | **SIZE (mm) min.** | **max.** | **av.** | **FILLING / MORPHOLOGY** | **COMMENTS** |
|---|---|---|---|---|---|---|---|

**COMMENTS :** Macroscopic observation: fine-grained equigranular. No veins evident.
No sulfide observed.
Photomicrograph #:
1142A-5 = Sieve textured plagioclase (x2.5 objective, ppl);
1142A-6 = As 1142A-5, but xpl.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **THIN SECTION:** | **183-1142A-9R-3, 108-111, Piece 9** | | | | | **Unit 6** | **OBSERVER:** | **CRN** |
| **ROCK NAME:** | **Aphyric basalt.** | | | | | | | |
| **WHERE SAMPLED:** | **Interior of pillow.** | | | | | | | |
| **GRAIN SIZE:** | **Fine-grained.** | | | | | | | |
| **TEXTURE:** | **Subtrachytic to intergranular.** | | | | | | | |

| **PRIMARY MINERALOGY** | **PERCENT PRESENT** | **PERCENT ORIGINAL** | **SIZE (mm) min.** | **max.** | **av.** | **APPROX. COMP.** | **MORPHOLOGY** | **COMMENTS** |
|---|---|---|---|---|---|---|---|---|
| **PHENOCRYSTS** | | | | | | | | |
| Plagioclase | <1 | <1 | 0.2 | 0.4 | 0.3 | | Subhedral | Microphenocrysts that are compositionally zoned with sieve textured rims. |
| **GROUNDMASS** | | | | | | | | |
| Plagioclase | 40 | 40 | 0.05 | 0.15 | 0.1 | | Subhedral laths | Larger plagioclase laths exhibit compositional zoning. |
| Clinopyroxene | 45 | 45 | 0.01 | 0.1 | 0.05 | | Anhedral | |
| Titanomagnetite | 8 | 8 | 0.01 | 0.15 | 0.05 | | Subhedral | Predominantly tabular forms. No maghemite exsolution. |
| Sulfide | Trace | Trace | | | <0.01 | | Anhedral blebs | Isotropic - could be pentlandite. |
| Mesostasis | 0 | 7 | | | | | | |

| **SECONDARY MINERALOGY** | **PERCENT** | **SIZE (mm) min.** | **max.** | **av.** | **REPLACING / FILLING** | **COMMENTS** |
|---|---|---|---|---|---|---|
| Clay | 7 | | | | Glass | |

| **VESICLES/ CAVITIES** | **PERCENT** | **LOCATION** | **SIZE (mm) min.** | **max.** | **av.** | **FILLING / MORPHOLOGY** | **COMMENTS** |
|---|---|---|---|---|---|---|---|
| None | | | | | | | |

**COMMENTS :** There are coarser grained areas (0.1-0.2 mm) that contain glass altered to brown clay. These grade into the general groundmass which is essentially glass-free.
Photomicrograph #:
1142A-7 = Plagioclase phenocryst with sieve textured rim (x5 objective, ppl);
1142A-8 = As 1142A - 7, but xpl.

**THIN SECTION:** 183-1142A-9R-4, 3-7, Piece 1 — **Unit 6** — **OBSERVER:** CRN
**ROCK NAME:** Aphyric pillow basalt margin.
**WHERE SAMPLED:** Across pillow margin.
**GRAIN SIZE:** Fine-grained to glassy.
**TEXTURE:** Glassy to intergranular and locally subtrachytic.

| PRIMARY MINERALOGY | PERCENT PRESENT | PERCENT ORIGINAL | SIZE (mm) min. | SIZE (mm) max. | SIZE (mm) av. | APPROX. COMP. | MORPHOLOGY | COMMENTS |
|---|---|---|---|---|---|---|---|---|
| **GROUNDMASS** | | | | | | | | |
| Plagioclase | 10 | 35 | 0.01 | 0.2 | 0.1 | | Subhedral laths | Mostly altered to clay. Poorly crystallized at contact with glass. |
| Clinopyroxene | 0 | 35 | 0.01 | 0.1 | 0.04 | | Subhedral to anhedral | Close to the contact with the glass, where plagioclase is not well crystallized, clinopyroxene is subhedral. Further away from this contact, where plagioclase is well crystallized, clinopyroxene is anhedral. Completely altered to clay. |
| Titanomagnetite | 5 | 5 | <0.01 | 0.1 | 0.05 | | Subhedral to anhedral | Mostly unaltered with maghemite exsolution. Size and abundance decreases toward contact with glass. |
| Glass | 0 | 25 | | | | | | Completely altered to opaque clay. |

| SECONDARY MINERALOGY | PERCENT | SIZE (mm) min. | SIZE (mm) max. | SIZE (mm) av. | REPLACING / FILLING | COMMENTS |
|---|---|---|---|---|---|---|
| Carbonate | 15 | | | | Veins | |
| Clay | 70 | | | | Glass; fills veins | |

| VESICLES/ CAVITIES | PERCENT | LOCATION | SIZE (mm) min. | SIZE (mm) max. | SIZE (mm) av. | FILLING / MORPHOLOGY | COMMENTS |
|---|---|---|---|---|---|---|---|
| Veins | 15 | Top of section | 0.2 | 5 | | Carbonate with minor clay | Thin (0.2 mm) carbonate veins are present in the crystalline basalt as well. |

**COMMENTS :**
Macroscopic observation: Section has a layered appearance with light (transparent) and dark (opaque dark brown) layers.
Opaque dark brown layers are basaltic glass that has been altered to clay and has been veined by calcite (lighter areas).
Crystalline basalt beneath the glass has a brown staining on it close to the contact with the glass.
At the contact with the glass, plagioclase microlites are just visible - these become more prominent away from this contact towards the interior of the pillow. Altered clinopyroxene (up to 0.2 mm) is prominent at the contact.
No sulfide observed.
Photomicrograph #:
1142A-1 = Devitrified, altered, glassy pillow margin (x2.5 objective, ppl);
1142A-2 = As 1142A - 1, but xpl.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **THIN SECTION:** | **183-1142A-10R-1, 37-40, Piece 5B** | | | | | **Unit 6** | **OBSERVER:** | **RD** |
| **ROCK NAME:** | **Aphyric basalt.** | | | | | | | |
| **WHERE SAMPLED:** | **Flow interior.** | | | | | | | |
| **GRAIN SIZE:** | **Fine grained.** | | | | | | | |
| **TEXTURE:** | **Intergranular to intersertal, trachytic.** | | | | | | | |

| **PRIMARY MINERALOGY** | **PERCENT PRESENT** | **PERCENT ORIGINAL** | **SIZE (mm) min.** | **max.** | **av.** | **APPROX. COMP.** | **MORPHOLOGY** | **COMMENTS** |
|---|---|---|---|---|---|---|---|---|
| **PHENOCRYSTS** | | | | | | | | |
| Plagioclase | <1 | <1 | 0.3 | 1 | | An65 | Subhedral to anhedral | A few zoned, corroded cores with overgrown rims. |
| Olivine | 0 | <1 | | 0.6 | | | Anhedral | Almost completely replaced by pale brown clay. |
| **GROUNDMASS** | | | | | | | | |
| Plagioclase | 40 | 40 | 0.05 | 0.1 | | | Euhedral | Flow aligned. |
| Clinopyroxene | 25 | 35 | 0.01 | 0.1 | | | | |
| Titanomagnetite | 3 | 4 | 0.05 | 0.1 | | | Blocky, equant grains | Partly replaced by clay. |
| Mesostasis | 10 | 20 | | | | | Intersertal pools | Reddish-pink glass, often with tiny acicular crystals (apatite?). |

| **SECONDARY MINERALOGY** | **PERCENT** | **SIZE (mm) min.** | **max.** | **av.** | **REPLACING / FILLING** | **COMMENTS** |
|---|---|---|---|---|---|---|
| Clay | 20 | | | | | |
| Carbonate | 2 | | | | | |

| **VESICLES/ CAVITIES** | **PERCENT** | **LOCATION** | **SIZE (mm) min.** | **max.** | **av.** | **FILLING / MORPHOLOGY** | **COMMENTS** |
|---|---|---|---|---|---|---|---|
| Vein | <1 | | | 0.3 | | Sinuous; filled with carbonate | |

**COMMENTS :** Compact rock with a homogeneous, equigranular, fine grained, trachytic groundmass. Rare phenocrysts of plagioclase show resorption features and appear to be xenocrysts; a few small fresh remnants left in otherwise replaced olivine.