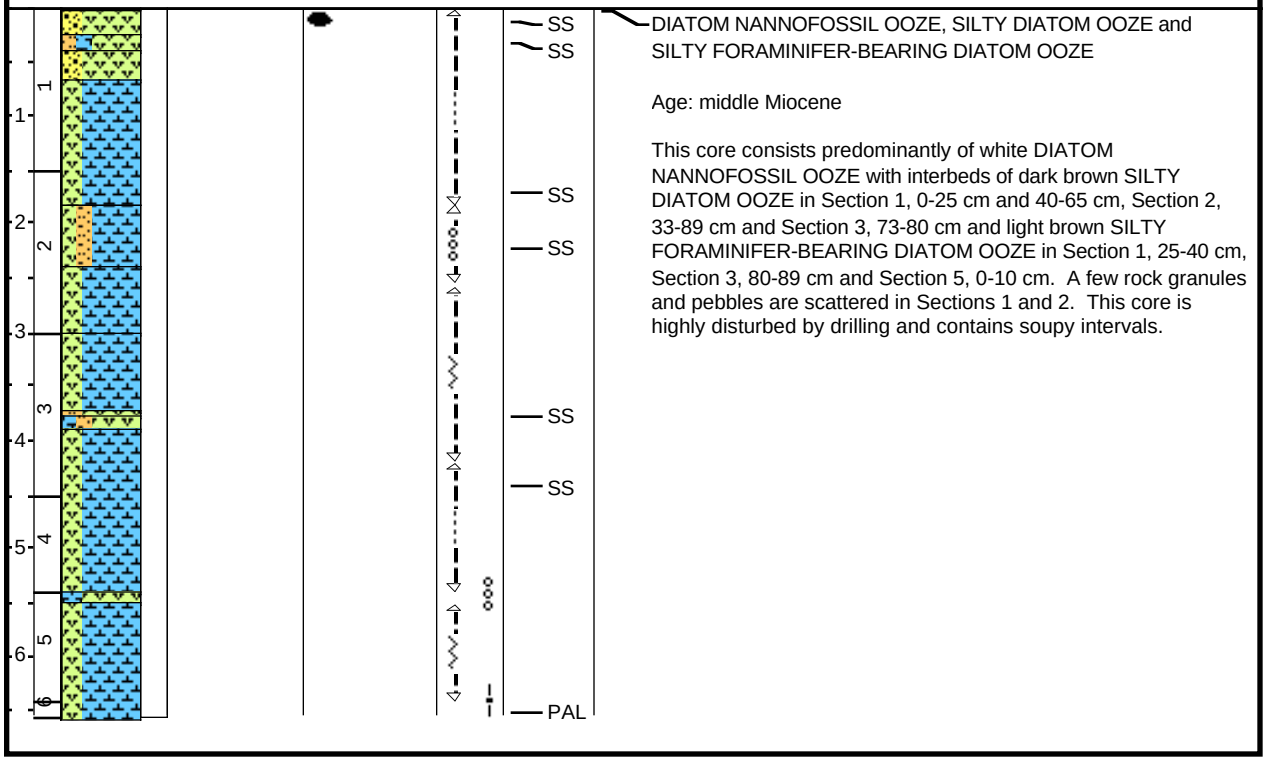
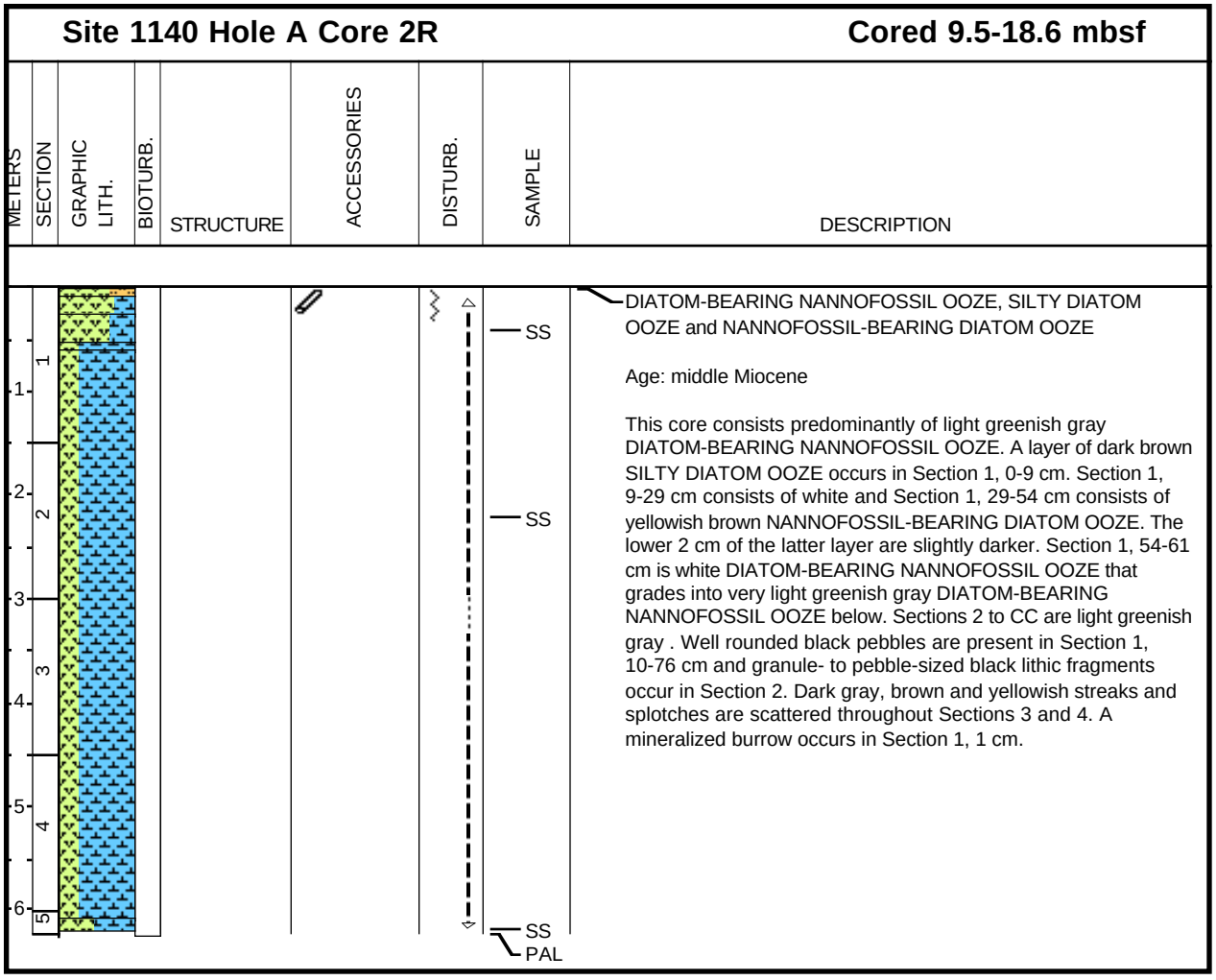
Core Photo

Site 1140 Hole A Core 1R **Cored 0-9.5 mbsf**

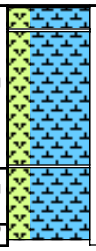


Core Photo

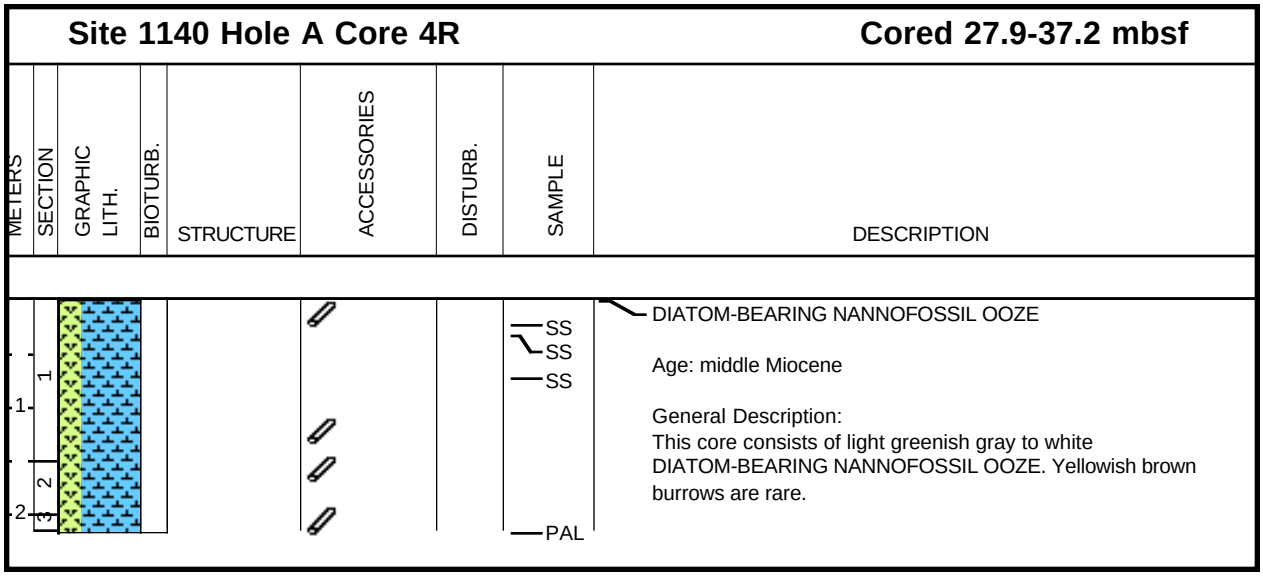

Site 1140 Hole A Core 2R
Cored 9.5-18.6 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
DESCRIPTION
SS
SS
SS
PAL
DIATOM-BEARING NANNOFOSSIL OOZE, SILTY DIATOM OOZE and NANNOFOSSIL-BEARING DIATOM OOZE
Age: middle Miocene
This core consists predominantly of light greenish gray DIATOM-BEARING NANNOFOSSIL OOZE. A layer of dark brown SILTY DIATOM OOZE occurs in Section 1, 0-9 cm. Section 1, 9-29 cm consists of white and Section 1, 29-54 cm consists of yellowish brown NANNOFOSSIL-BEARING DIATOM OOZE. The lower 2 cm of the latter layer are slightly darker. Section 1, 54-61 cm is white DIATOM-BEARING NANNOFOSSIL OOZE that grades into very light greenish gray DIATOM-BEARING NANNOFOSSIL OOZE below. Sections 2 to CC are light greenish gray . Well rounded black pebbles are present in Section 1, 10-76 cm and granule- to pebble-sized black lithic fragments occur in Section 2. Dark gray, brown and yellowish streaks and splotches are scattered throughout Sections 3 and 4. A mineralized burrow occurs in Section 1, 1 cm.

Core Photo

Site 1140 Hole A Core 3R **Cored 18.6-27.9 mbsf**

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	DISTURB.	SAMPLE	DESCRIPTION
1	1						SS	DIATOM-BEARING NANNOFOSSIL OOZE age: middle Miocene This core consists of light greenish gray DIATOM-BEARING NANNOFOSSIL OOZE. A greenish gray layer occurs in Section 1, 0-23 cm and is underlain by a 1-cm-thick layer of yellowish brown color and a 1-cm-thick white layer. Rare black and gray splotches are present throughout the core.
2	2						SS	
	3						PAL	

Core Photo


Site 1140 Hole A Core 4R
Cored 27.9-37.2 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
DESCRIPTION
1
2
3
SS
SS
SS
PAL
DIATOM-BEARING NANNOFOSSIL OOZE
Age: middle Miocene
General Description:
This core consists of light greenish gray to white DIATOM-BEARING NANNOFOSSIL OOZE. Yellowish brown burrows are rare.

Core Photo

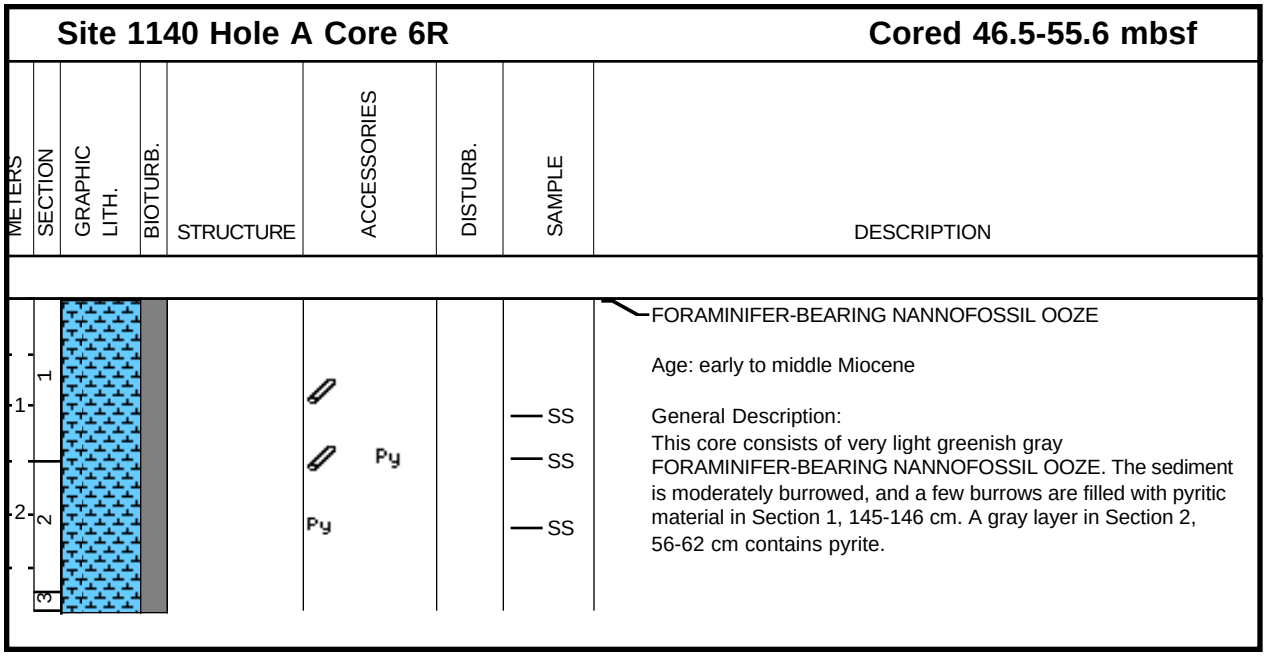
Site 1140 Hole A Core 5R **Cored 37.2-46.5 mbsf**

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	DISTURB.	SAMPLE	DESCRIPTION
	1						SS	DIATOM-BEARING NANNOFOSSIL OOZE

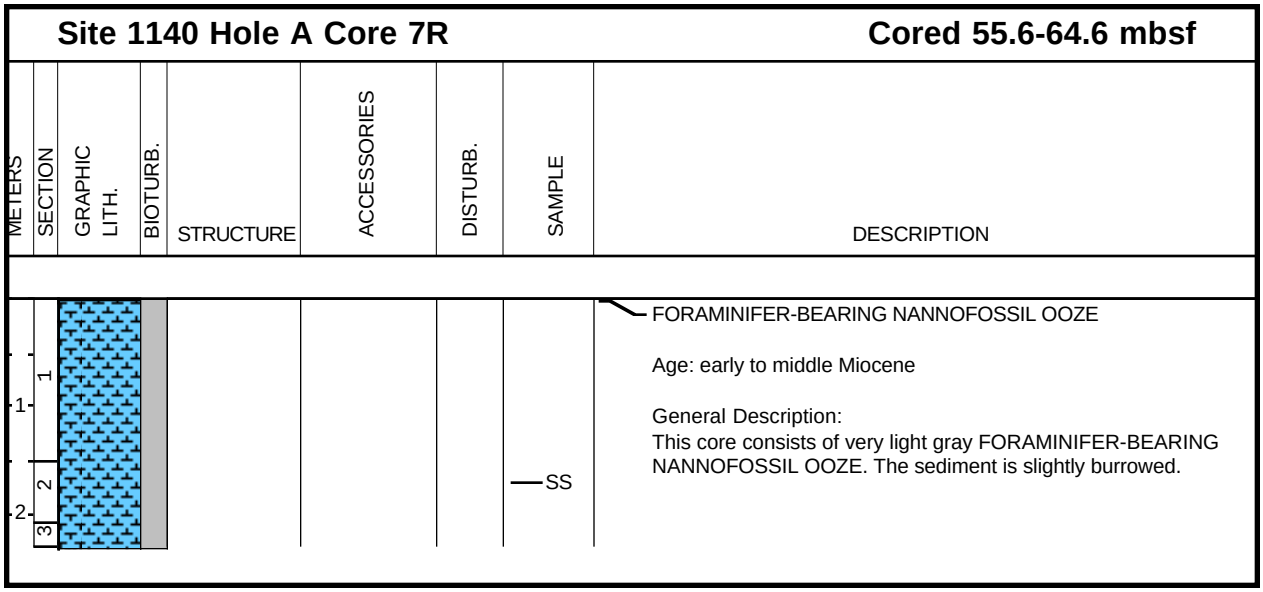
Age: middle Miocene

General Description:
This core consists of very light greenish gray DIATOM-BEARING NANNOFOSSIL OOZE. Brown burrows are rare.

Core Photo


Site 1140 Hole A Core 6R
Cored 46.5-55.6 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
DESCRIPTION
1
2
3
Py
Py
SS
SS
SS
FORAMINIFER-BEARING NANNOFOSSIL OOZE
Age: early to middle Miocene
General Description:
This core consists of very light greenish gray FORAMINIFER-BEARING NANNOFOSSIL OOZE. The sediment is moderately burrowed, and a few burrows are filled with pyritic material in Section 1, 145-146 cm. A gray layer in Section 2, 56-62 cm contains pyrite.

Core Photo


Site 1140 Hole A Core 7R
Cored 55.6-64.6 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
DESCRIPTION
1
2
1
2
3
SS
FORAMINIFER-BEARING NANNOFOSSIL OOZE
Age: early to middle Miocene
General Description:
This core consists of very light gray FORAMINIFER-BEARING NANNOFOSSIL OOZE. The sediment is slightly burrowed.

Core Photo

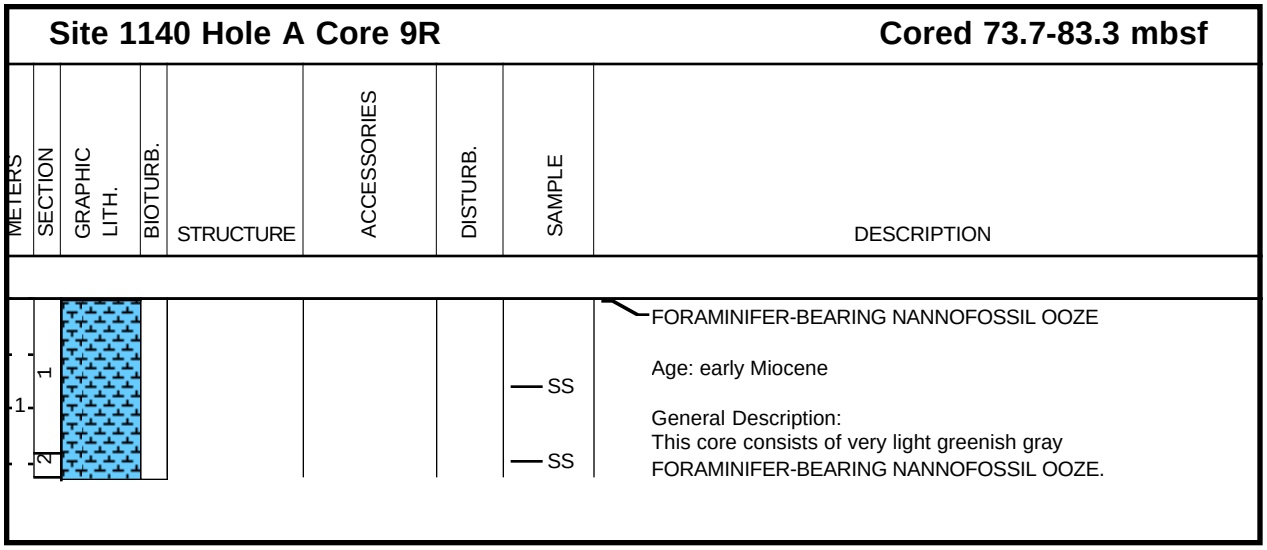
Site 1140 Hole A Core 8R **Cored 64.6-73.7 mbsf**

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	DISTURB.	SAMPLE	DESCRIPTION
	1							FORAMINIFER-BEARING NANNOFOSSIL OOZE

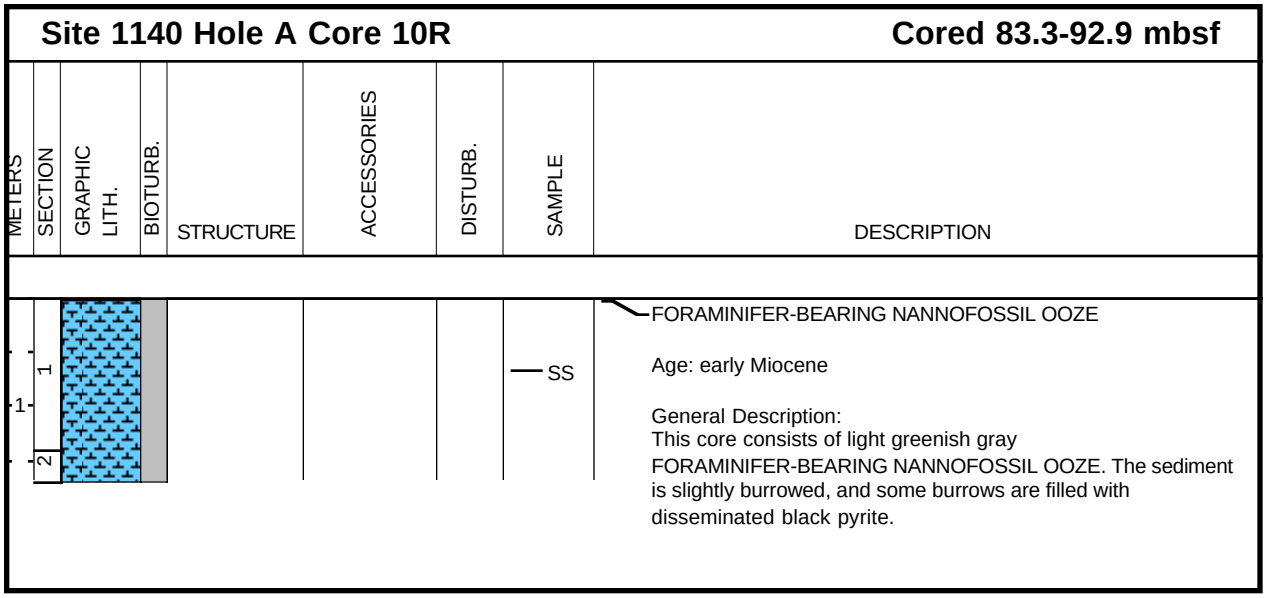
Age: early Miocene

General Description:
This core consists of very light gray FORAMINIFER-BEARING NANNOFOSSIL OOZE.

Core Photo


Site 1140 Hole A Core 9R
Cored 73.7-83.3 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
DESCRIPTION
1
1
2
SS
SS
FORAMINIFER-BEARING NANNOFOSSIL OOZE
Age: early Miocene
General Description:
This core consists of very light greenish gray
FORAMINIFER-BEARING NANNOFOSSIL OOZE.

Core Photo


Site 1140 Hole A Core 10R
Cored 83.3-92.9 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
DESCRIPTION
1
1
2
SS
FORAMINIFER-BEARING NANNOFOSSIL OOZE
Age: early Miocene
General Description:
This core consists of light greenish gray FORAMINIFER-BEARING NANNOFOSSIL OOZE. The sediment is slightly burrowed, and some burrows are filled with disseminated black pyrite.

Core Photo

Site 1140 Hole A Core 11R **Cored 92.9-102.5 mbsf**

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	DISTURB.	SAMPLE	DESCRIPTION
	1							FORAMINIFER-BEARING NANNOFOSSIL OOZE

Age: early Miocene

General Description:
This core consists of very light greenish gray FORAMINIFER-BEARING NANNOFOSSIL OOZE.

Core Photo

Site 1140 Hole A Core 12R **Cored 102.5-112.2 mbsf**

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	DISTURB.	SAMPLE	DESCRIPTION
	1							FORAMINIFER-BEARING NANNOFOSSIL OOZE

Age: early Miocene

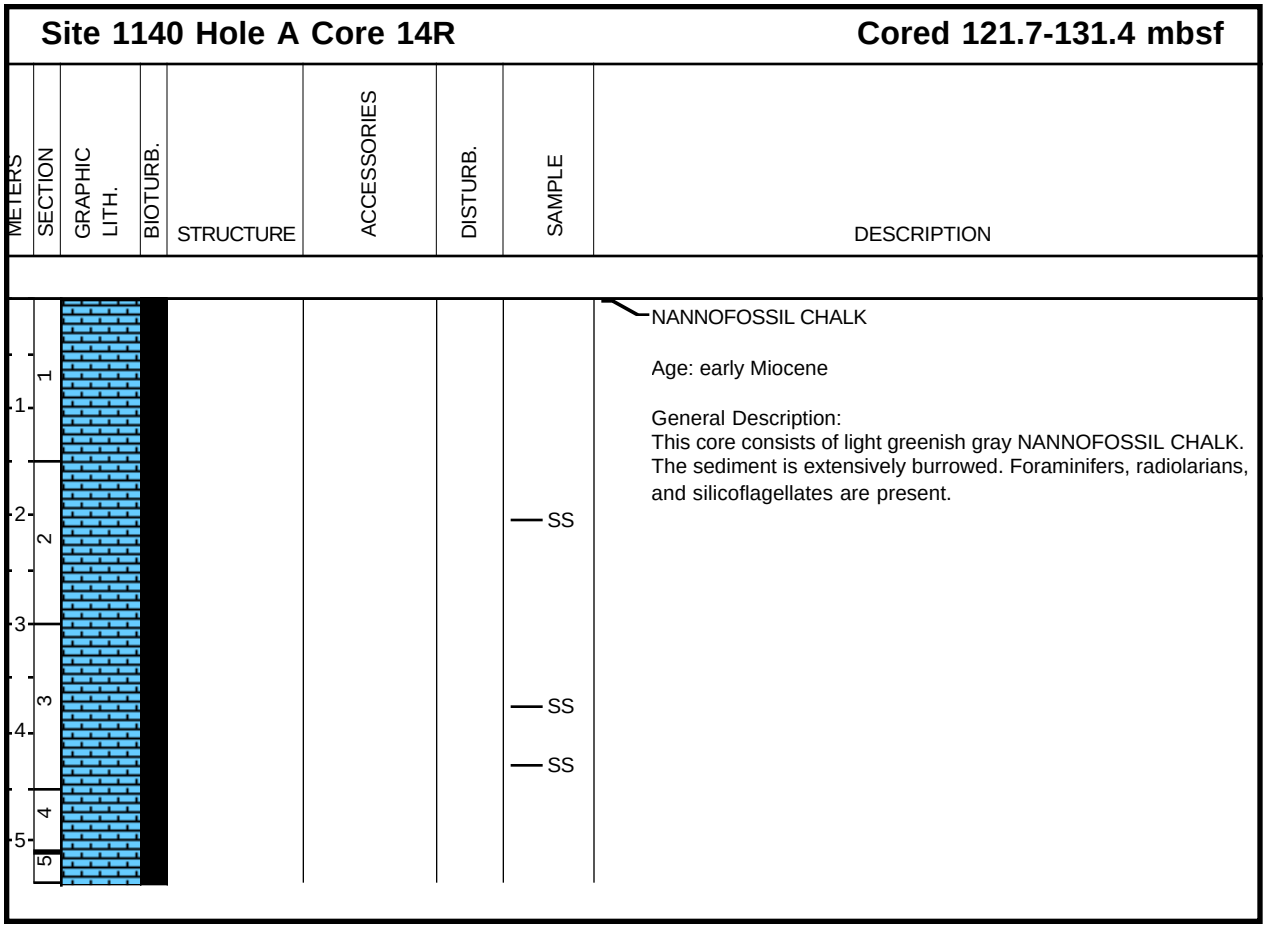
General Description:
This core consists of very light greenish gray FORAMINIFER-BEARING NANNOFOSSIL OOZE.

Core Photo

Site 1140 Hole A Core 13R **Cored 112.2-121.7 mbsf**

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	DISTURB.	SAMPLE	DESCRIPTION
1	1, 2, 3							FORAMINIFER-BEARING NANNOFOSSIL OOZE Age: early Miocene General Description: This core consists of light greenish gray FORAMINIFER-BEARING NANNOFOSSIL OOZE. The sediment is moderately burrowed.
2								

Core Photo


Site 1140 Hole A Core 14R
Cored 121.7-131.4 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
DESCRIPTION
1
2
3
4
5
SS
SS
SS
NANNOFOSSIL CHALK
Age: early Miocene
General Description:
This core consists of light greenish gray NANNOFOSSIL CHALK. The sediment is extensively burrowed. Foraminifers, radiolarians, and silicoflagellates are present.

Core Photo

Site 1140 Hole A Core 15R **Cored 131.4-141 mbsf**

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	DISTURB.	SAMPLE	DESCRIPTION
	1							NANNOFOSSIL CHALK

Age: early Miocene

General Description:
This core consists of light greenish gray NANNOFOSSIL CHALK.

Core Photo

Site 1140 Hole A Core 16R **Cored 141-150.7 mbsf**

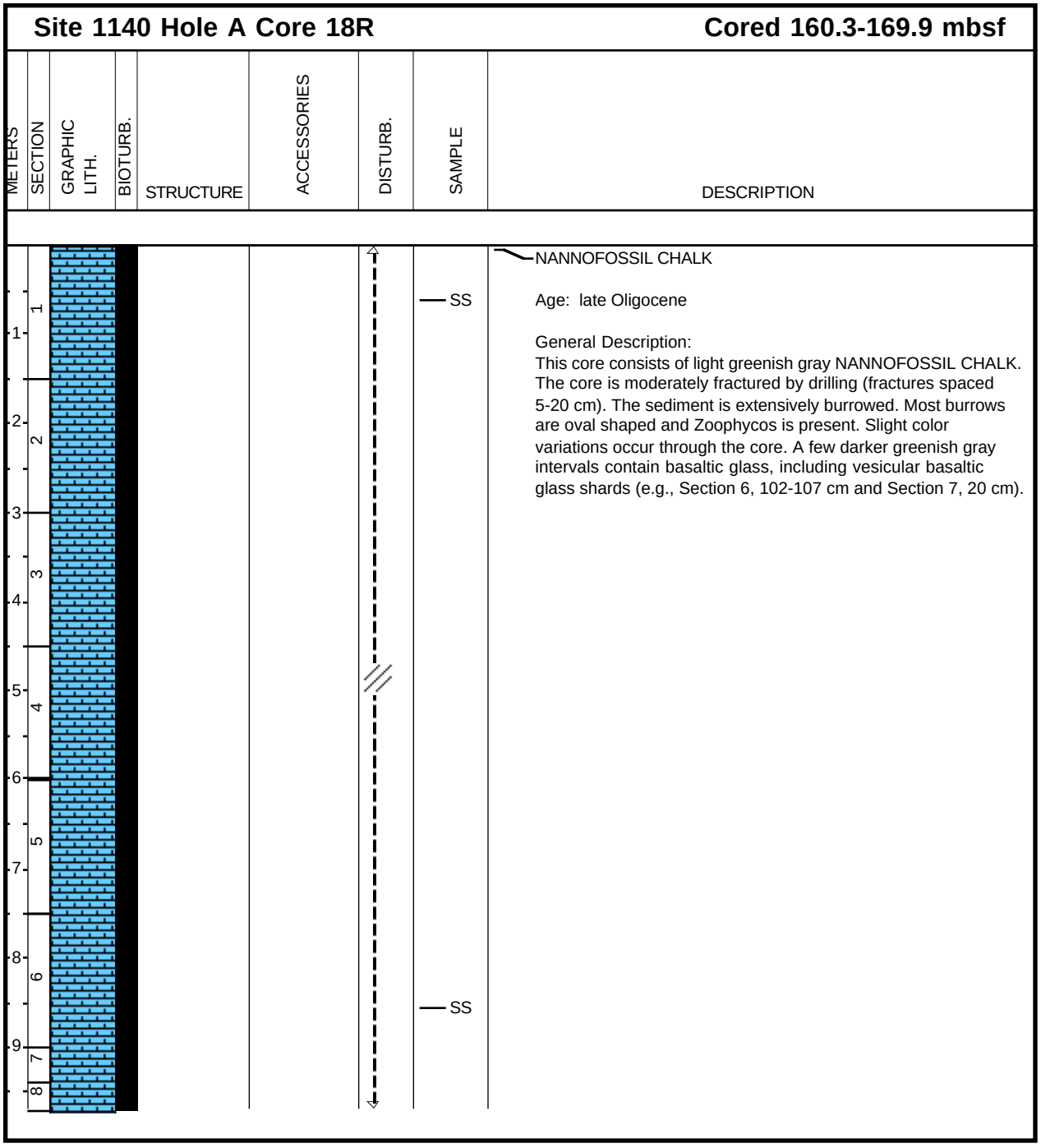
METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	DISTURB.	SAMPLE	DESCRIPTION
1	1							NANNOFOSSIL CHALK Age: early Miocene to late Oligocene General Description: This core consists of light greenish gray NANNOFOSSIL CHALK. The sediment is extensively burrowed.
	2							

Core Photo

Site 1140 Hole A Core 17R **Cored 150.7-160.3 mbsf**

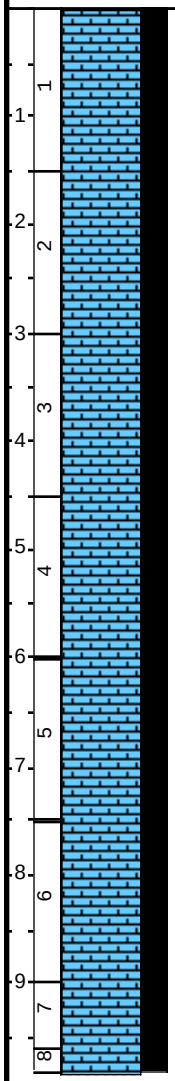
METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	DISTURB.	SAMPLE	DESCRIPTION
1	1							NANNOFOSSIL CHALK Age: late Oligocene General Description: This core consists of light greenish gray NANNOFOSSIL CHALK. The core is biscuited and fractured by drilling. The sediment is extensively burrowed.
	2							

Core Photo


Site 1140 Hole A Core 18R
Cored 160.3-169.9 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
DESCRIPTION
SS
SS
NANNOFOSSIL CHALK
Age: late Oligocene
General Description:
This core consists of light greenish gray NANNOFOSSIL CHALK. The core is moderately fractured by drilling (fractures spaced 5-20 cm). The sediment is extensively burrowed. Most burrows are oval shaped and Zoophycos is present. Slight color variations occur through the core. A few darker greenish gray intervals contain basaltic glass, including vesicular basaltic glass shards (e.g., Section 6, 102-107 cm and Section 7, 20 cm).

Core Photo

Site 1140 Hole A Core 19R **Cored 169.9-179.5 mbsf**



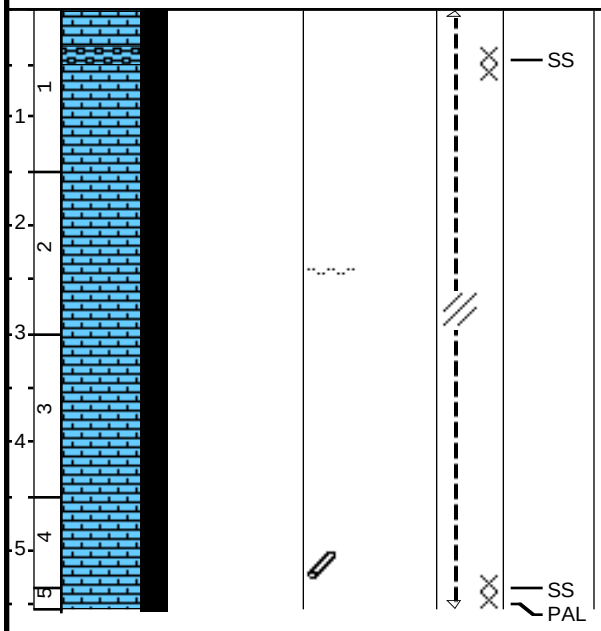
NANNOFOSSIL CHALK

Age: late Oligocene

General Description:
This core consists of light greenish gray NANNOFOSSIL CHALK. The core is moderately fractured by drilling (fractures spaced 5-20 cm). The sediment is extensively burrowed. Zoophycos and Chondrites are present. Good examples of early burrows re-burrowed by Chondrites are present in Section 4. Slight color variations in some portions of the core are caused by disseminated black silt-sized particles. The magnetic susceptibility of these darker intervals is approximately twice that of the lighter intervals, which suggests these black particles are magnetite. The darker intervals also contain brownish green basaltic glass, some of which is vesicular.

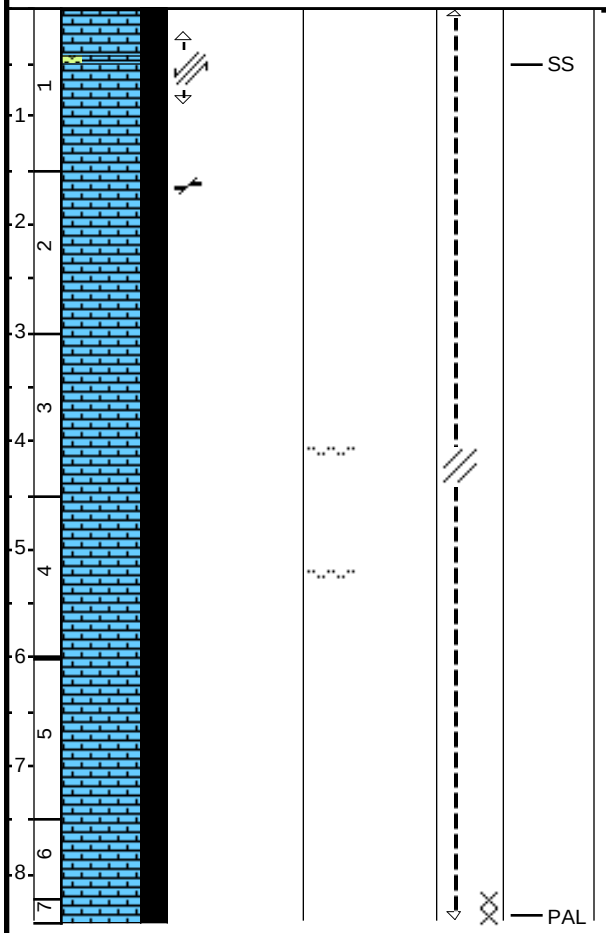
Core Photo

Site 1140 Hole A Core 20R **Cored 179.5-189.1 mbsf**



Core Photo

Site 1140 Hole A Core 21R **Cored 189.1-198.7 mbsf**



DESCRIPTION

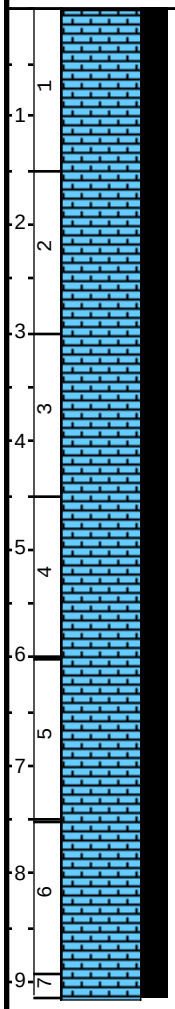
NANNOFOSSIL CHALK and DIATOM-BEARING NANNOFOSSIL CHALK

Age: late Oligocene

General Description:
This core predominantly consists of light greenish gray NANNOFOSSIL CHALK. Section 1, 45-50 cm is brown DIATOM-BEARING NANNOFOSSIL CHALK. The core is moderately fractured by drilling. The sediment is extensively burrowed. Chondrites are present. Slight color variations in some portions of the core are caused by disseminated black silt-sized particles. Section 1 contains numerous brittle normal faults with small offsets.

Core Photo

Site 1140 Hole A Core 22R **Cored 198.7-208.3 mbsf**



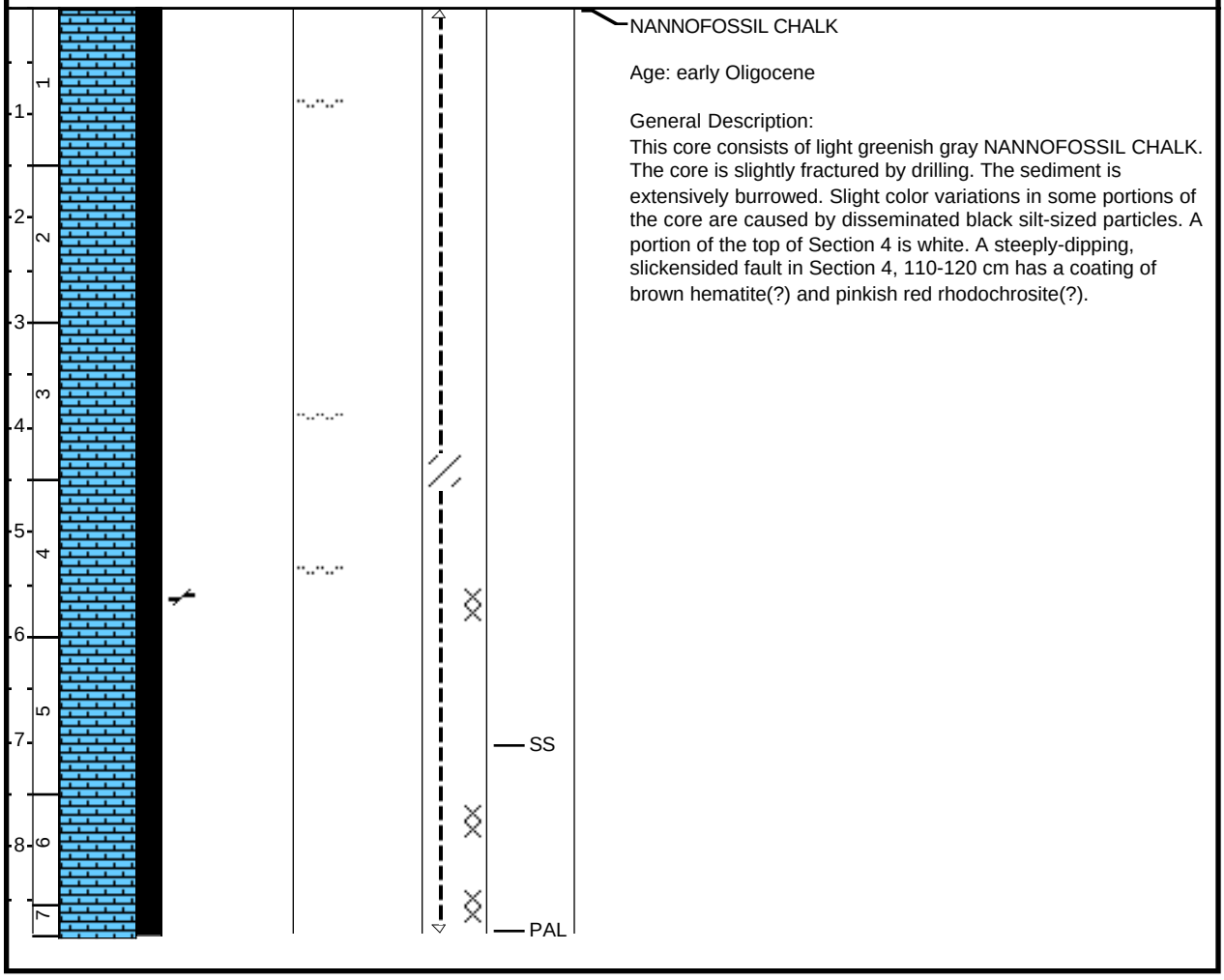
NANNOFOSSIL CHALK

Age: early Oligocene

General Description:
This core consists of light greenish gray NANNOFOSSIL CHALK. The core is moderately fractured by drilling (fractures spaced 5-20 cm). The sediment is extensively burrowed. Slight color variations in some portions of the core are caused by disseminated black silt-sized particles. Coarse sand disseminated in Section 4 is volcanic (black vesicular basalt).

Core Photo

Site 1140 Hole A Core 23R **Cored 208.3-218 mbsf**



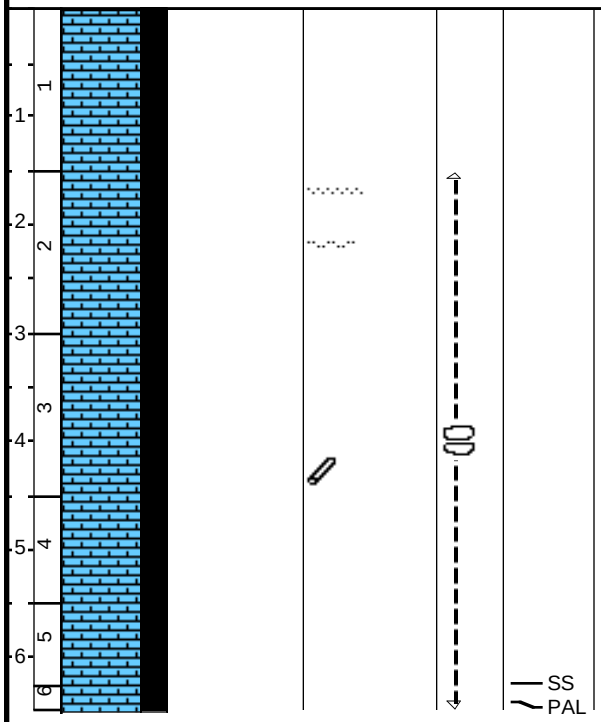
NANNOFOSSIL CHALK

Age: early Oligocene

General Description:
This core consists of light greenish gray NANNOFOSSIL CHALK. The core is slightly fractured by drilling. The sediment is extensively burrowed. Slight color variations in some portions of the core are caused by disseminated black silt-sized particles. A portion of the top of Section 4 is white. A steeply-dipping, slickensided fault in Section 4, 110-120 cm has a coating of brown hematite(?) and pinkish red rhodochrosite(?).

Core Photo

Site 1140 Hole A Core 24R **Cored 218-227.6 mbsf**



DESCRIPTION

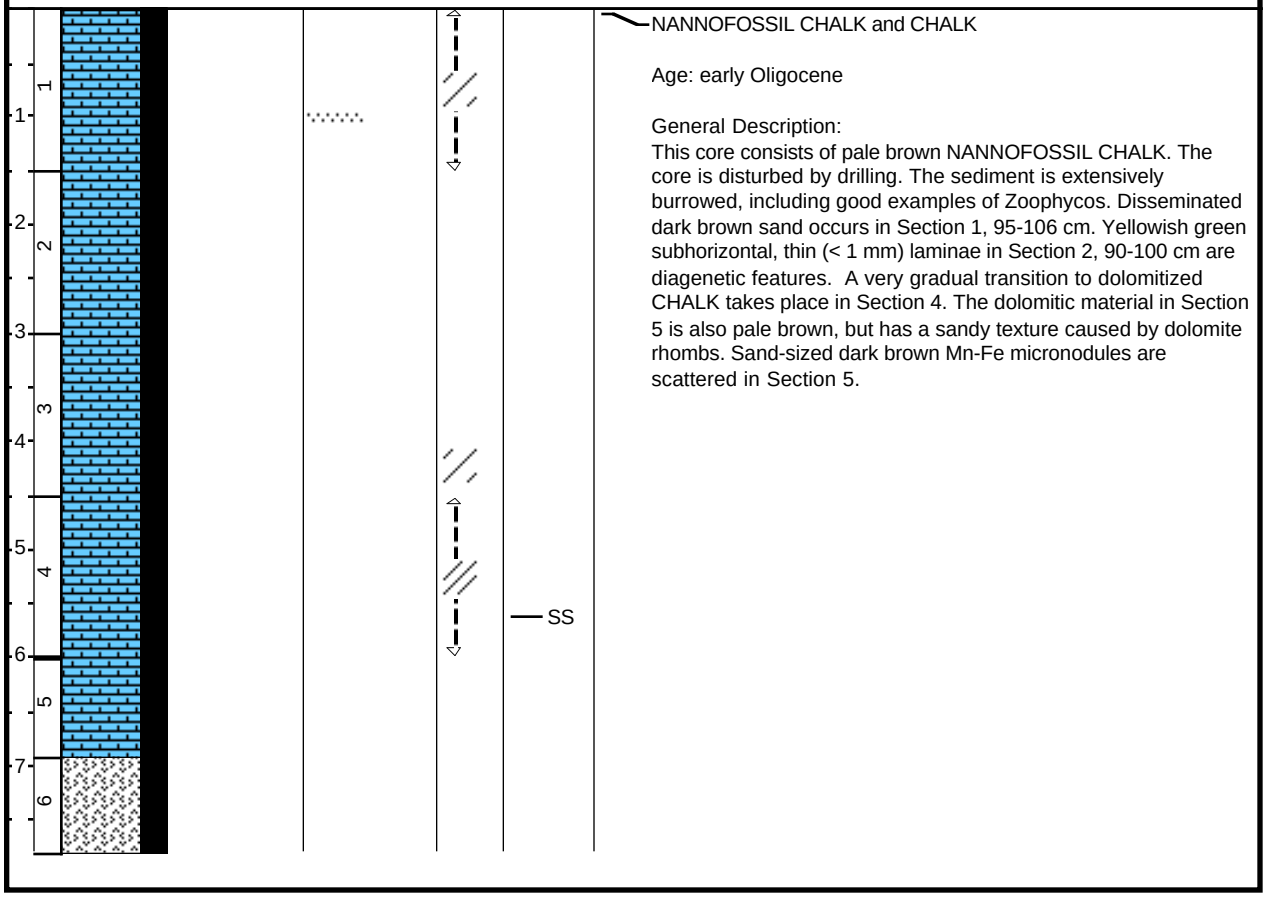
NANNOFOSSIL CHALK

Age: early Oligocene

General Description:
This core consists of pale brown NANNOFOSSIL CHALK. The pale brown color is caused by disseminated yellowish orange grains of altered basalt(?). Sections 2 through CC are highly fragmented by drilling. The sediment is extensively burrowed, including abundant Zoophycos. A few burrows are filled with a yellowish green material (e.g., Section 3, 120-130 cm). Slight color variations in some portions of the core are caused by disseminated black silt-sized (e.g., Section 2, 65-75 cm) and sand-sized (Section 2, 12-24 cm) particles. Faint laminae in Section 5 are most likely diagenetic features.

Core Photo

Site 1140 Hole A Core 25R **Cored 227.6-237.3 mbsf**

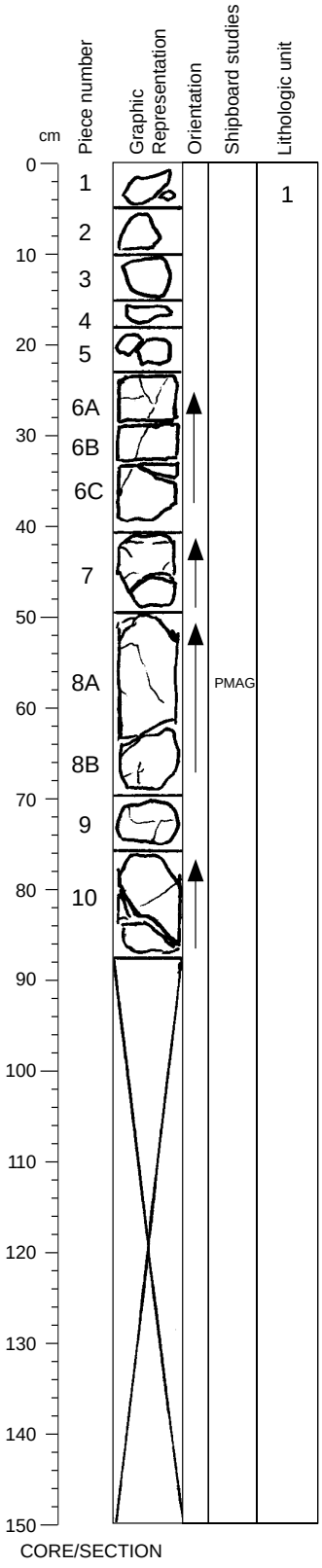


NANNOFOSSIL CHALK and CHALK

Age: early Oligocene

General Description:
This core consists of pale brown NANNOFOSSIL CHALK. The core is disturbed by drilling. The sediment is extensively burrowed, including good examples of Zoophycos. Disseminated dark brown sand occurs in Section 1, 95-106 cm. Yellowish green subhorizontal, thin (< 1 mm) laminae in Section 2, 90-100 cm are diagenetic features. A very gradual transition to dolomitized CHALK takes place in Section 4. The dolomitic material in Section 5 is also pale brown, but has a sandy texture caused by dolomite rhombs. Sand-sized dark brown Mn-Fe micronodules are scattered in Section 5.

Core Photo



183-1140A-25R-6 **Section top: 234.52 (mbsf)**

UNIT 1: SPARSELY PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-10

CONTACTS: Not recovered; the contact between Lithostratigraphic Unit II and Basement Unit 1 is inferred to be between Sections 25R-5 and 25R-6.

PHENOCRYSTS:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Plagioclase:	1	2	0.5	1	Euhedral, blocky and as laths
Olivine:	trace	0.5	0.2		Subhedral, equant

GROUNDMASS: Fine grained. Pale to dark green glass forms irregular patches in the groundmass.

VESICLES: Pillow margins are sparsely vesicular; massive interiors contain rare vesicles. Vesicles are <1 mm, round, and filled with green clay.

COLOR: Medium gray. Brownish gray in upper part of section.

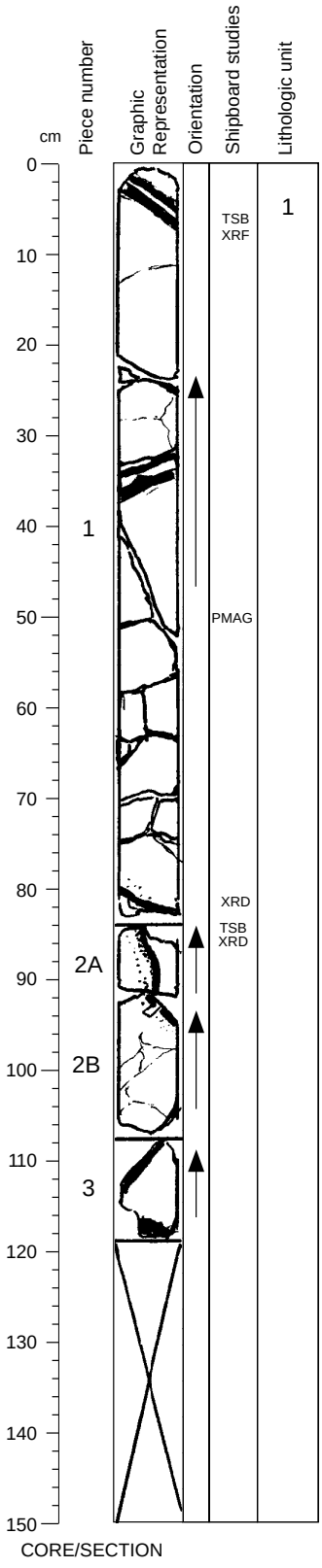
STRUCTURE: Pillowed.

ALTERATION: Slight. Brown alteration halos are present near pillow margins and some veins.

VEINS/FRACTURES: Sparse, <1-mm-wide, irregular veins are filled with calcite, clay, and/or iron oxides and hydroxides.

COMMENTS: Glassy pillow margins are present at 16-17 cm, 21 cm, and 50-52 cm.

Core Photo



183-1140A-26R-1 **Section top: 237.30 (mbsf)**

UNIT 1: SPARSELY PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-3

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	1	2	0.3	0.5	Euhedral and subhedral laths
Olivine:	trace				

GROUNDMASS: Fine grained; glassy at pillow margins.

VESICLES: Pillow margins are sparsely vesicular. Calcite- and clay-filled vesicles (≤3-mm) are located near, and elongated perpendicularly to, pillow margins. Massive interiors contain rare, <1-mm, round vesicles filled with green clay.

COLOR: Medium gray to brown.

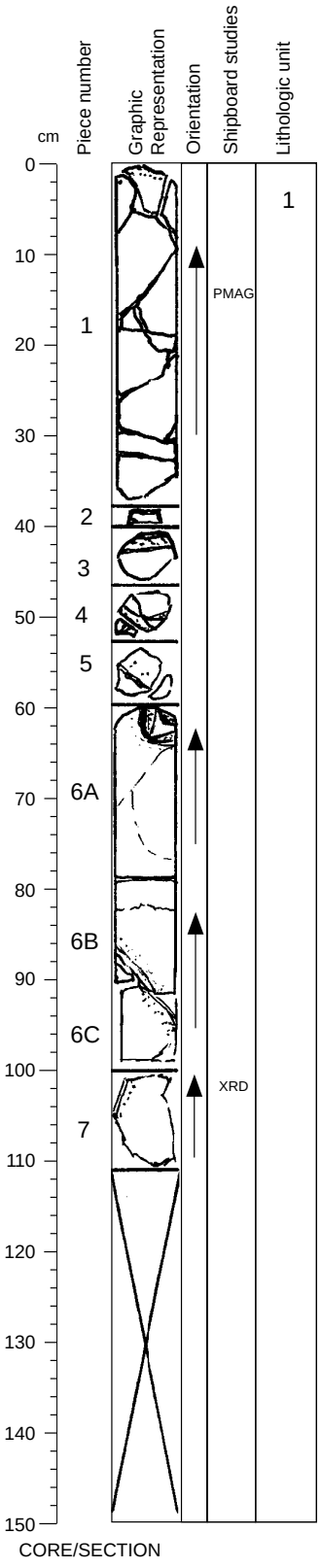
STRUCTURE: Pillowed.

ALTERATION: Fresh to slight. Some glass at pillow margins appears fresh.

VEINS/FRACTURES: Small (<2 mm wide), calcite-filled veins in both pillow interiors and margins are concentric to pillow margins or irregularly oriented. Numerous irregular fractures commonly have ~1-cm-wide, brown alteration halos.

COMMENTS: Pillow margins are present at 4 and 32 cm, and in the interval from 80-120 cm. Baked, white calcareous sediment fills spaces between glassy pillow rims.

Core Photo



183-1140A-26R-2 **Section top: 238.49 (mbsf)**

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

Pieces: 1-7

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	1-2	2	0.3	1	Euhedral and subhedral laths
Olivine:	1-3	1	<0.1	0.1	Euhedral equant, with some skeletal overgrowths

GROUNDMASS: Fine grained; glassy at pillow margins.

VESICLES: Generally nonvesicular. Pillow margins are sparsely vesicular; massive interiors contain rare vesicles. Vesicles are <1 mm, round, and filled with green clay and calcite.

COLOR: Medium gray to brown.

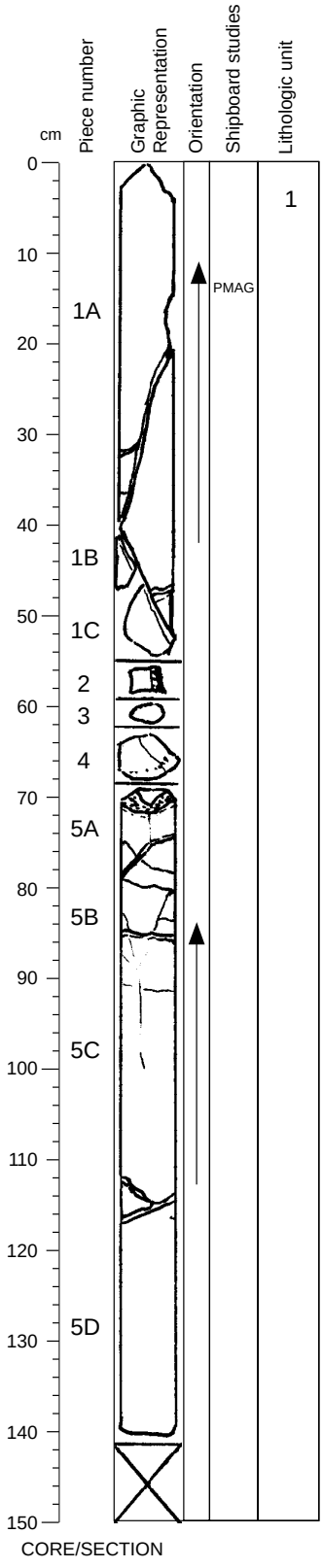
STRUCTURE: Pillowed.

ALTERATION: Fresh to slight. Some glass at pillow margins is unaltered.

VEINS/FRACTURES: Calcite- and clay-filled, <3-mm-wide veins in both pillow interiors and margins are concentric to margins or oriented irregularly.

COMMENTS: Pillow margins are present at 40, 44, 50, 56, and 61 cm, and in the interval from 86-105 cm. Baked, white calcareous sediment fills spaces between glassy pillow rims.

Core Photo



183-1140A-27R-1 **Section top: 239.30 (mbsf)**

UNIT 1: APHYRIC BASALT

Pieces: 1-5

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	3	0.2	0.5	Subhedral
Olivine:	<1	<0.5			Euhedral, equant

GROUNDMASS: Fine grained; glassy at pillow margins.

VESICLES: Pillow margins are sparsely vesicular; vesicles are <2 mm, elongate, and carbonate- or hematite-filled. Massive interiors contain rare vesicles; vesicles are <1 mm, round, and filled with green clay and calcite.

COLOR: Medium gray to pale brown.

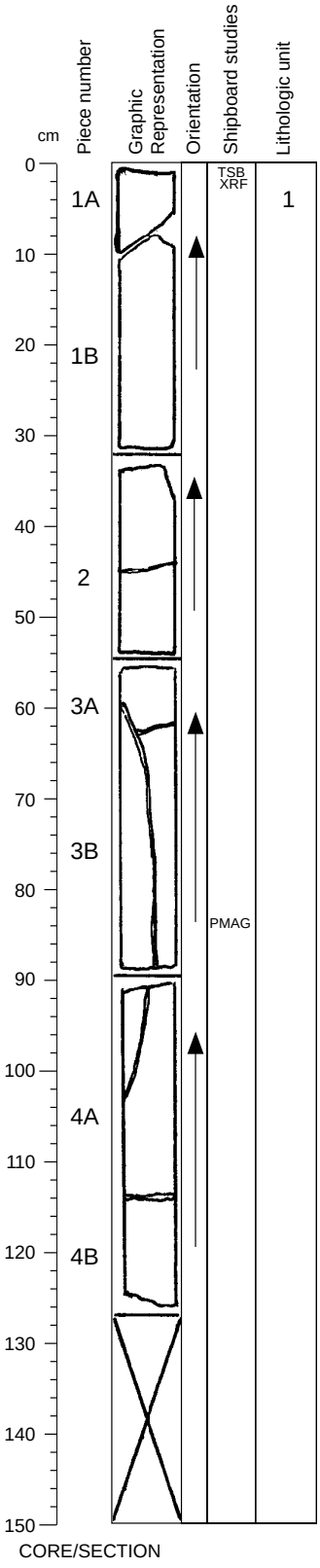
STRUCTURE: Pillowed.

ALTERATION: Slight.

VEINS/FRACTURES: Sparse, steeply dipping, <1-mm-wide veins are filled with clay and carbonate.

COMMENTS: Calcareous sediment fills pillow interstices at 70 cm. Olivine phenocrysts are conspicuous (and appear fresh) in slightly altered, very fine-grained rock adjacent to glassy pillow margins, but are difficult to see in flow interiors. Pillow margins are at 57, 67, and 70 cm.

Core Photo



183-1140A-27R-2 **Section top: 240.71 (mbsf)**

UNIT 1: APHYRIC BASALT

Pieces: 1-4

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	2	0.2	0.5	Subhedral

GROUNDMASS: Fine grained.

VESICLES: Rare vesicles are <1 mm, round, and filled with green clay.

COLOR: Medium gray.

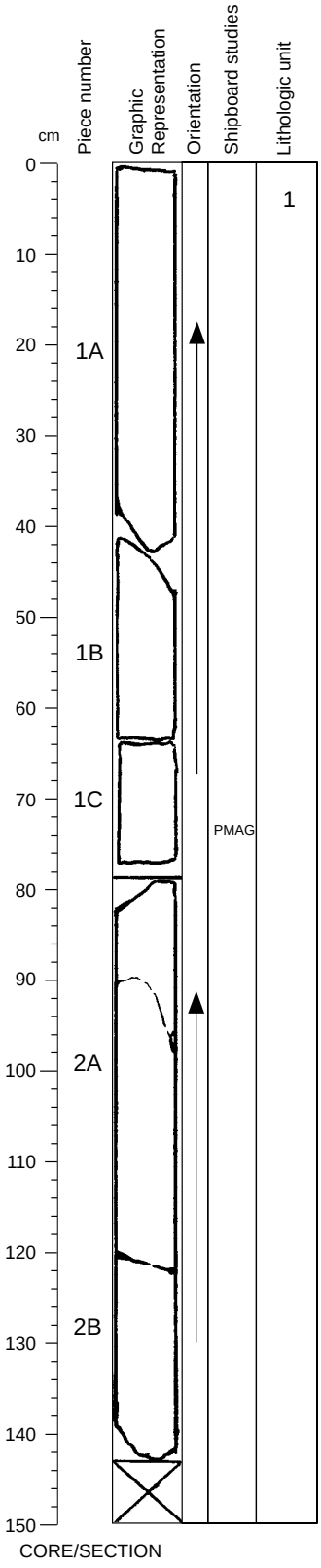
STRUCTURE: Massive.

ALTERATION: Slight.

VEINS/FRACTURES: Sparse, steeply dipping, <1-mm-wide, veins are filled with clay and carbonate. A subvertical ~3-mm-wide vein is present from 60-105 cm.

COMMENTS:

Core Photo



183-1140A-27R-3 **Section top: 241.99 (mbsf)**

UNIT 1: APHYRIC BASALT

Pieces: 1, 2

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	2	0.5	1	Subhedral

GROUNDMASS: Fine grained.

VESICLES: Rare vesicles are <1 mm, round, and filled with green clay.

COLOR: Medium gray.

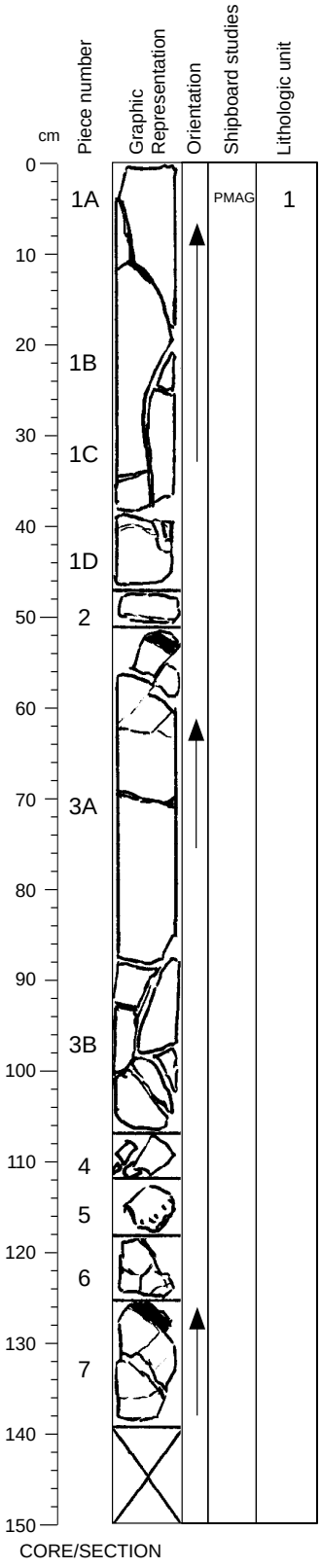
STRUCTURE: Massive.

ALTERATION: Very slightly altered.

VEINS/FRACTURES: Sparse, <1-mm-wide, veins are filled with clay and carbonate.

COMMENTS:

Core Photo



183-1140A-27R-4 **Section top: 243.42 (mbsf)**

UNIT 1: APHYRIC BASALT

Pieces: 1, 2

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	2	0.5	1	Subhedral

GROUNDMASS: Fine grained; glassy at pillow margins.

VESICLES: Pillow margins have sparse, <2-mm, elongate, carbonate-filled vesicles. Rare vesicles in massive interiors are <1 mm, round, and filled with green clay.

COLOR: Medium gray to pale brown.

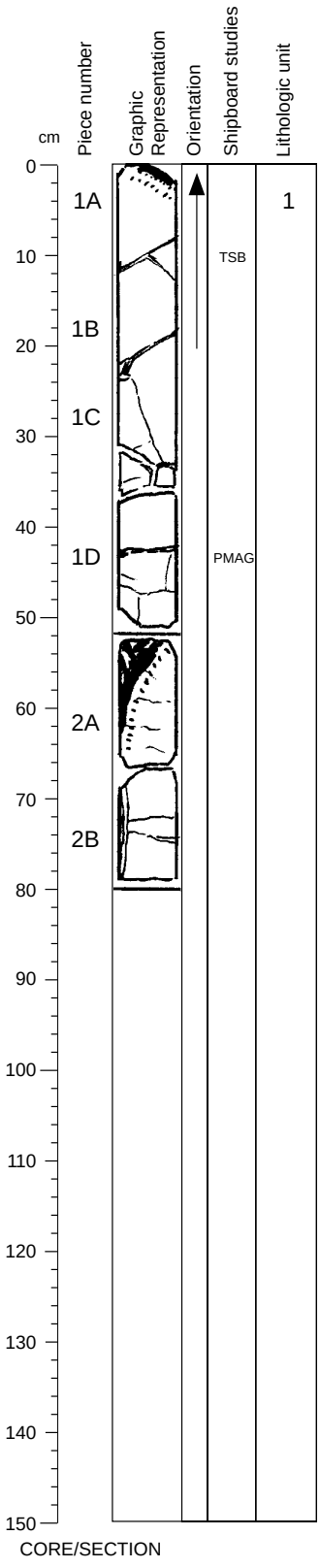
STRUCTURE: Massive and pillowed.

ALTERATION: Fresh to slight.

VEINS/FRACTURES: Calcite- and clay-filled veins, <2 mm wide, are present in sutures between pillows, and distributed irregularly in massive interiors.

COMMENTS: Pillow margins are present at 53 and 126 cm.

Core Photo



183-1140A-27R-5 **Section top: 244.81 (mbsf)**

UNIT 1: APHYRIC TO SPARSELY OLIVINE-PLAGIOCLASE-PHYRIC BASALT

Pieces: 1,2

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	2	0.2	0.5	Subhedral
Olivine:	<2	0.6	<0.1	0.2	Euhedral, equant

GROUNDMASS: Fine grained; glassy at pillow margins.

VESICLES: Pillow margins have sparse, <2 mm, elongate, carbonate-filled vesicles. Rare vesicles in massive interiors are <1 mm, round, and filled with green clay.

COLOR: Medium gray to pale brown.

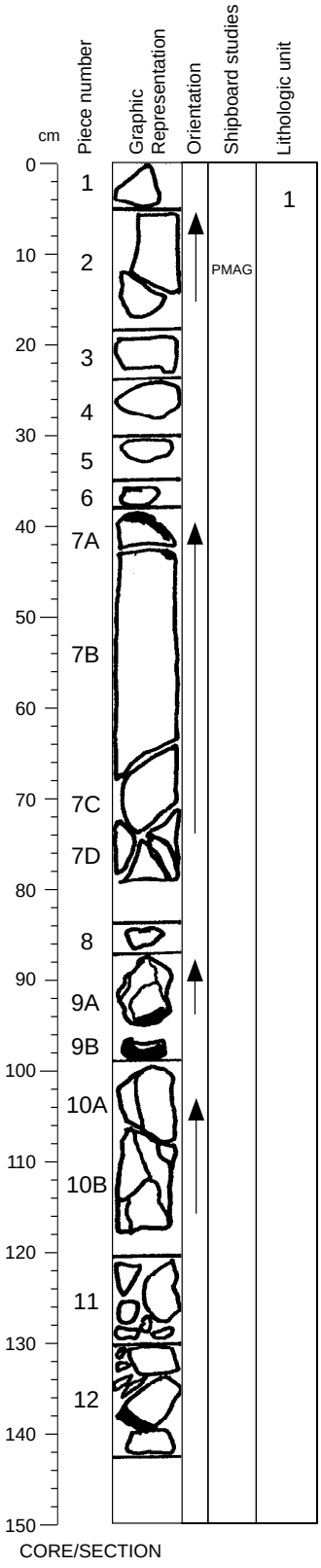
STRUCTURE: Pillowed.

ALTERATION: Fresh to slight.

VEINS/FRACTURES: Calcite- and clay-filled veins, <2 mm wide, are present in sutures between pillows, and distributed irregularly in massive interiors. Breccia of <2-cm, angular basalt fragments in a carbonate matrix is present at pilow margin (53-66 cm).

COMMENTS:

Core Photo



183-1140A-28R-1 **Section top: 246.90 (mbsf)**

UNIT 1: APHYRIC BASALT

Pieces: 1-12

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	5	1	3	Euhedral to subhedral
Olivine:	trace	1	0.5		Euhedral

GROUNDMASS: Fine grained interiors; glassy pillow margins.

VESICLES: Pillow margins have sparse, <2-mm, elongate, carbonate-filled vesicles. Rare vesicles in massive interiors are <1 mm, round, and filled with clay.

COLOR: Medium to brownish gray.

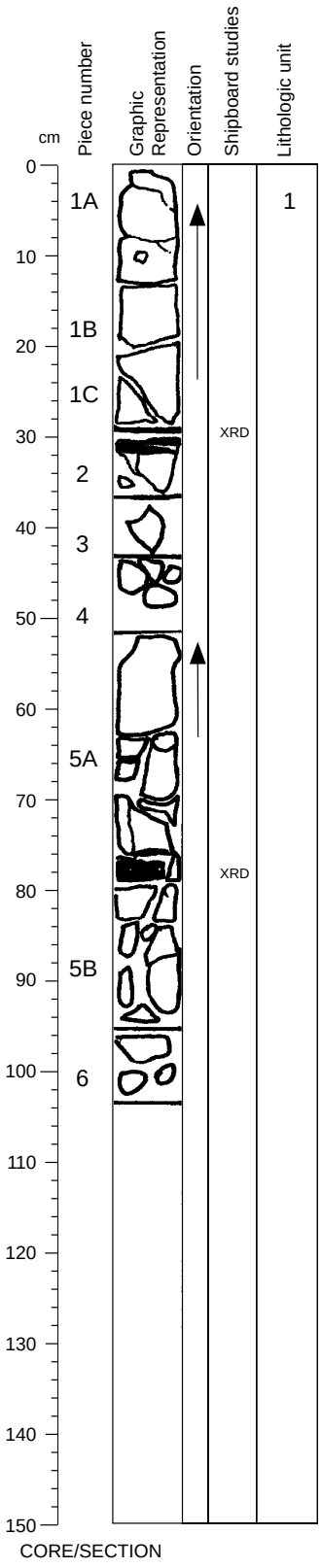
STRUCTURE: Pillowed.

ALTERATION: Slight in interiors to moderate at glassy margins.

VEINS/FRACTURES: Hairline veins are most abundant in pillow margins and are filled with calcite and brown clay.

COMMENTS: Glassy pillow margins are present in the intervals from 40-44 cm, 94-97 cm, and 137-139 cm.

Core Photo



183-1140A-28R-2 **Section top: 248.32 (mbsf)**

UNIT 1: APHYRIC TO SPARSELY PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-6

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	1	5	1	2	Euhedral to subhedral
Olivine:	trace	1			Euhedral

GROUNDMASS: Glassy in pillow margins; fine grained in interiors.

VESICLES: Pillow margins are sparsely vesicular; vesicles are <5 mm, elongate, and carbonate- or clay-filled. Massive interiors contain rare vesicles, which are <1 mm, round, and filled with clay.

COLOR: Medium gray; brownish gray near veins.

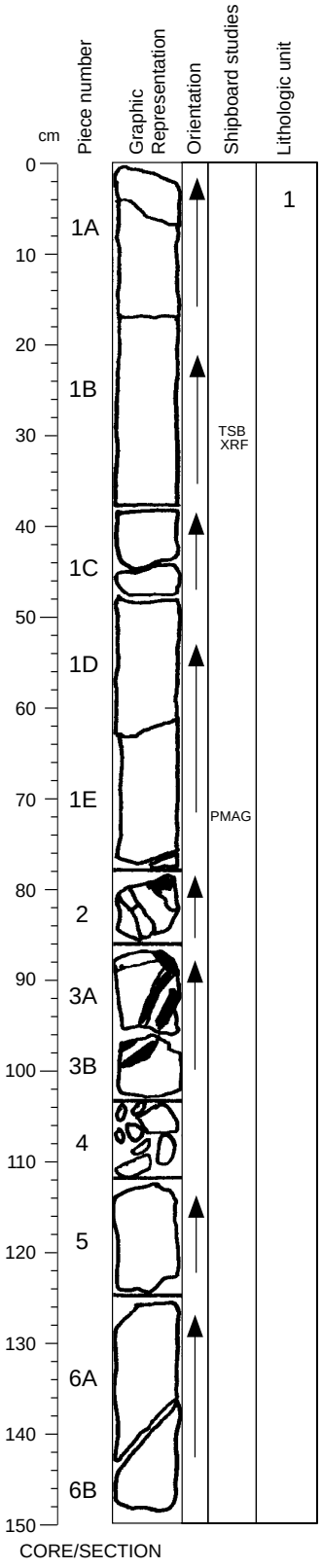
STRUCTURE: Pillowed.

ALTERATION: Slight in interior to moderate at glassy pillow margins. Groundmass is altered to light brown clay and iron hydroxide.

VEINS/FRACTURES: Pieces 1 and 5 are fractured at 5-10 cm spacing. Carbonate- and clay-filled veins (0.5-2 cm wide) are present.

COMMENTS: Pillow margins are in the intervals from 30-31 cm and 77-80 cm.

Core Photo



183-1140A-28R-3 **Section top: 249.35 (mbsf)**

UNIT 1: SPARSELY PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-6

CONTACTS: Not recovered; the contact between Units 1 and 2 is inferred to be between Sections 28R-3 and 31R-1 (see comments below).

PHENOCRYSTS:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Plagioclase:	1	5	1	3	Euhedral to subhedral
Olivine:	< 1	1	0.5		Euhedral to subhedral

GROUNDMASS: Pillow interiors are fine grained; pillow margins are glassy.

VESICLES: Sparsely vesicular. Vesicles in pillow margins are 1-10 mm and aligned perpendicular to the margins; most are ~1 cm from glassy rims. Vesicles are filled with carbonate and clay.

COLOR: Medium to brownish gray.

STRUCTURE: Pillowed.

ALTERATION: Slight to moderate.

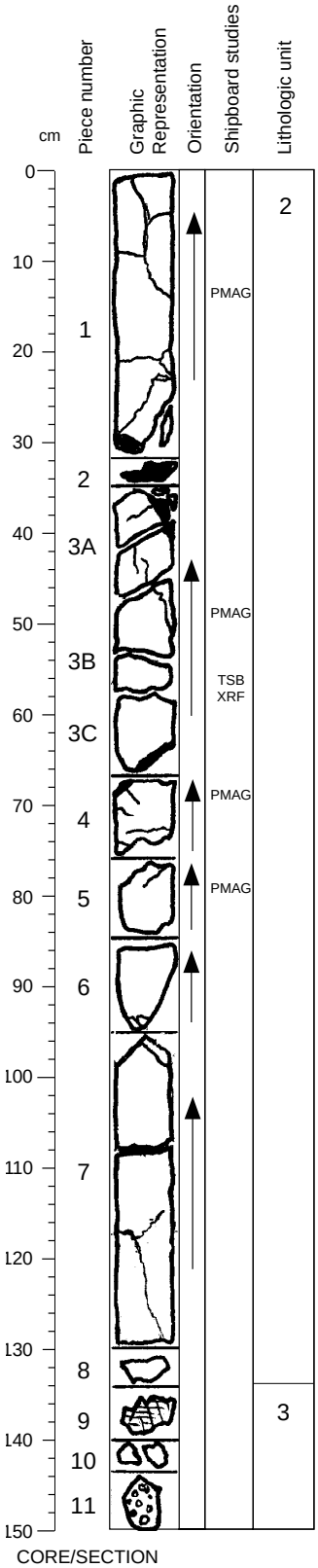
VEINS/FRACTURES: Veins are filled with calcite and brown clay; veins are more abundant in pillow margins.

COMMENTS: Glassy pillow margins are at 80 and 87 cm, and in the interval from 89-99 cm. Note: Cores 29R and 30R had no recovery.

1140A-29R NO RECOVERY

1140A-30R NO RECOVERY

Core Photo



183-1140A-31R-1 **Section top: 270.50 (mbsf)**

UNIT 2: HIGHLY PLAGIOCLASE-OLIVINE-PHYRIC BASALT

Pieces: 1-8

CONTACTS: Not recovered. The contact between Units 1 and 2 is inferred to be between Sections 28R-3 and 31R-1. The contact between Units 2 and 3 is inferred to be between Pieces 8 and 9, at 135 cm.

PHENOCRYSTS:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Plagioclase:	10-15	8	0.2	1	Subhedral to euhedral laths
Olivine:	2	2	0.1	0.8	Euhedral, equant
Clinopyroxene:	trace	0.5			

GROUNDMASS: Pillow margins are glassy; interiors are fine grained.

VESICLES: Sparsely to moderately vesicular. Vesicles are <3 mm, round, and empty or filled with brown or green clay.

COLOR: Piece 1 is pale brown; Pieces 2-8 are medium gray.

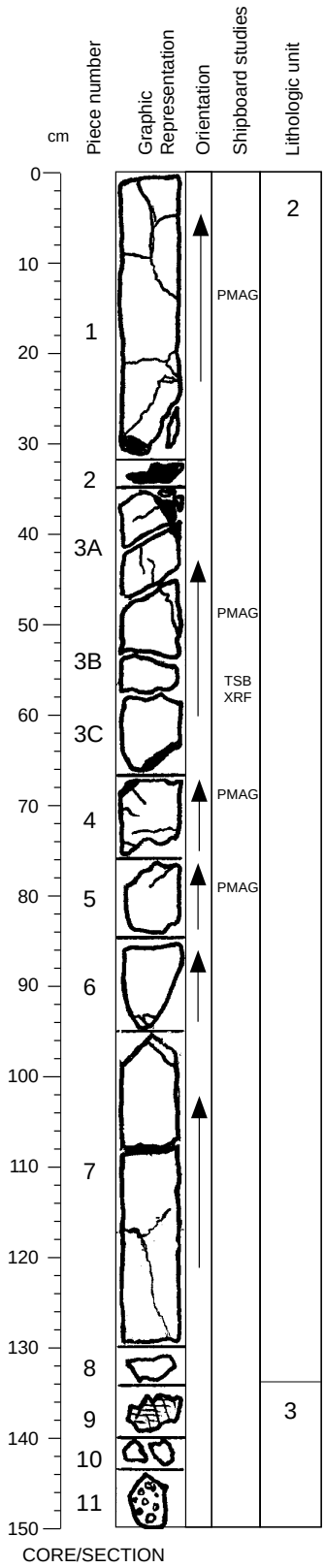
STRUCTURE: Pillowed.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Sparse, irregular veins are <1 mm wide and filled with clay and pyrite.

COMMENTS: Glassy pillow margins are at 32, 34, 38, and 66 cm.

Core Photo



183-1140A-31R-1 **Section top: 270.50 (mbsf)**

UNIT 3: APHYRIC BASALT

Pieces: 9-11

CONTACTS: Not recovered; the contact between Units 2 and 3 is inferred to be between Pieces 8 and 9 (see comments below).

PHENOCRYSTS:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Plagioclase:	<1	2	0.4	1	Subhedral laths
Olivine:	1	0.4	0.1	0.2	Euhedral, equant

GROUNDMASS: Fine grained. Contains disseminated <0.5-mm grains of pyrite.

VESICLES: Sparsely vesicular. Vesicles are round, <1 to 2 mm, and empty or lined with bluish gray clay and pyrite.

COLOR: Dark gray.

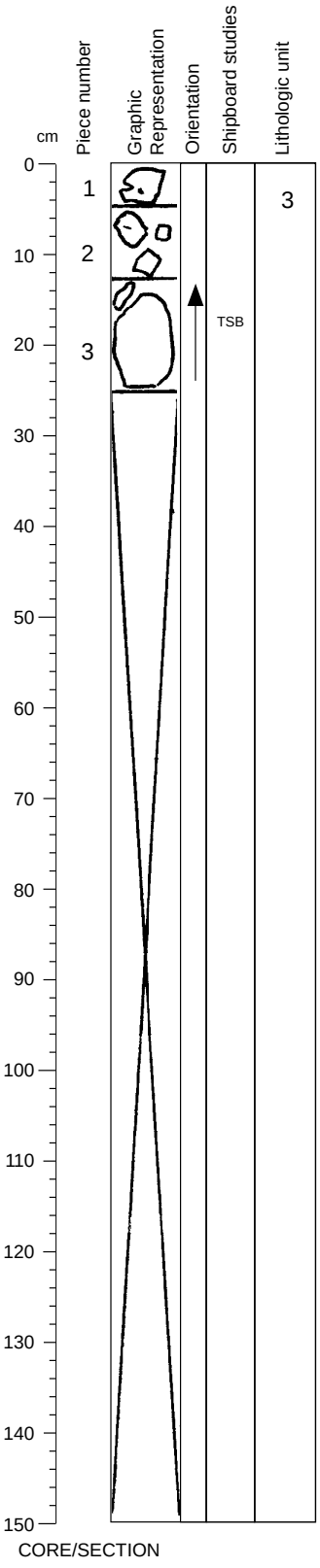
STRUCTURE: Pieces 10 and 11 could be parts of pillows, but are too small for definite identification.

ALTERATION: Slight.

VEINS/FRACTURES: None.

COMMENTS: Piece 9 is fine-grained, pale green, poorly laminated, nannofossil chalk.

Core Photo



183-1140A-31R-2 **Section top: 272.00 (mbsf)**

UNIT 3: SPARSELY OLIVINE-PHRYIC BASALT

Pieces: 1-3

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	2	0.4	1	Subhedral laths
Olivine:	1	0.4	0.1	0.2	Euhedral, equant

GROUNDMASS: Fine grained.

VESICLES: Slightly vesicular. Vesicles are round, <1 to 2 mm, and empty or lined with bluish gray clay, pyrite, and zeolite.

COLOR: Medium dark gray.

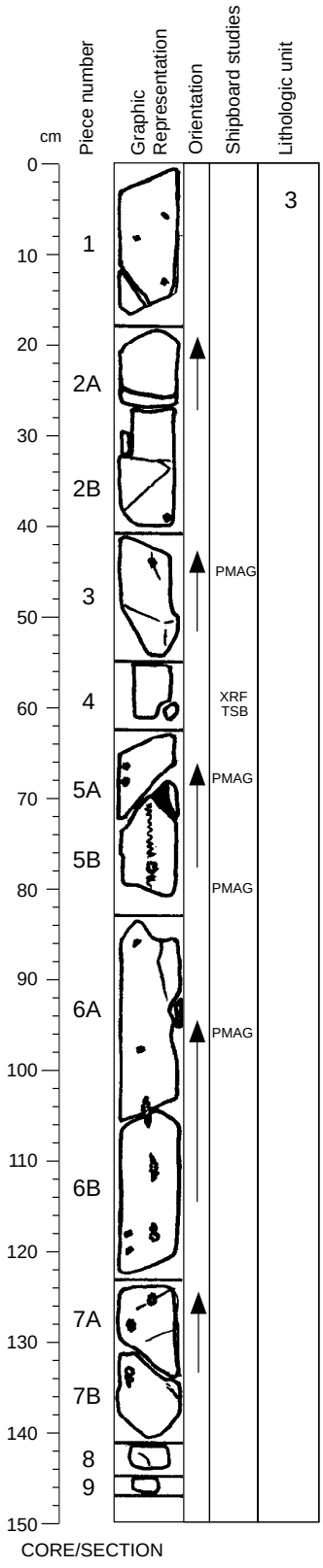
STRUCTURE: Pieces 1-3 may be parts of pillows, but lack distinctive margins.

ALTERATION: Slight.

VEINS/FRACTURES: Sparse, ~0.1-mm-wide veins are filled with pyrite and clay.

COMMENTS:

Core Photo



183-1140A-32R-1 **Section top: 275.20 (mbsf)**

UNIT 3: APHYRIC BASALT

Pieces: 1-9

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	5	0.5	1	Subhedral laths
Olivine:	1	0.5	0.1	0.3	Euhedral, equant

GROUNDMASS: Fine grained. Contains finely disseminated pyrite.

VESICLES: Sparsely vesicular. Vesicles are ~1 mm, round, and lined or partially filled with blue clay, pyrite, and green clay. Pipe vesicles, >10 cm long, are present in the lower half of the section.

COLOR: Medium gray.

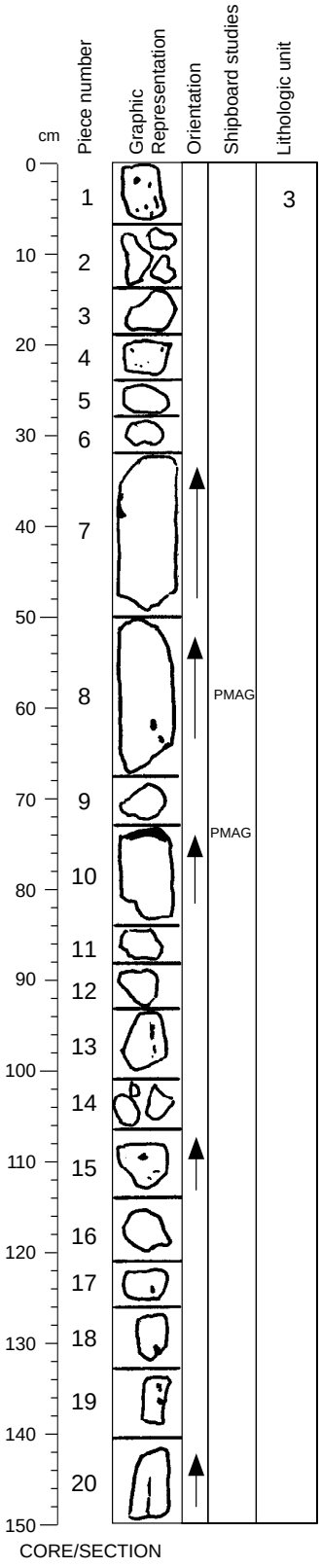
STRUCTURE: Massive (see comment below). Mesostasis-rich wisps produce a fabric dipping 35-45° in Pieces 1-3.

ALTERATION: Slight.

VEINS/FRACTURES: Rare, subvertical, <1-mm-wide veins are filled with blue clay, green clay, zeolite, and pyrite.

COMMENTS: Glassy margins are not present, but ~1-cm-thick aphanitic zones in Pieces 8 and 9 are probably from close to pillow margin(s).

Core Photo



183-1140A-32R-2 **Section top: 276.70 (mbsf)**

UNIT 3: APHYRIC BASALT

Pieces: 1-20

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	10	<0.1	1	Subhedral to euhedral laths
Olivine:	1	0.5	0.1	0.3	Euhedral, equant

GROUNDMASS: Fine grained. Contains finely disseminated pyrite.

VESICLES: Sparsely to moderately vesicular. Vesicles include ≤3-cm-long, irregular, vertical pipe vesicles (more common lower in the section) and ~1-mm round vesicles (most commonin Pieces 1-4 and 10-11). Vesicles are lined with blue clay and partially filled with blue clay, pyrite and zeolite.

COLOR: Medium gray.

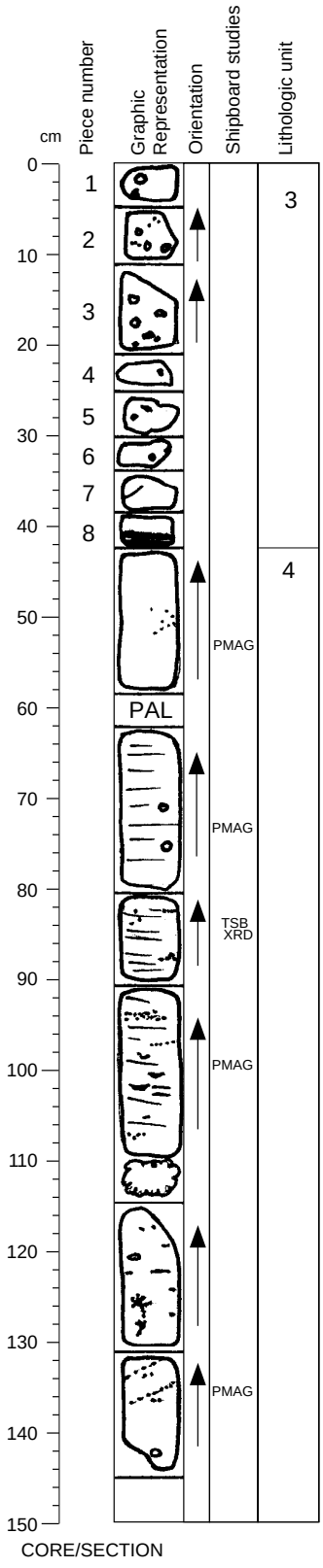
STRUCTURE: Massive.

ALTERATION: Slight.

VEINS/FRACTURES: Sparse, <1-mm-wide veins have irregular orientations and are filled with blue clay, zeolite, and pyrite.

COMMENTS: A chilled margin is at 74 cm.

Core Photo



183-1140A-32R-3 **Section top: 278.20 (mbsf)**

UNIT 3: APHYRIC TO SPARSELY OLIVINE-PHYRIC BASALT

Pieces: 1-8

CONTACTS: Not recovered; the contact between Units 3 and 4 is inferred to be at the base of Piece 8, at 43 cm.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	5	0.2	1	Subhedral to euhedral laths
Olivine:	<2	1	0.1	0.2	Euhedral, equant

GROUNDMASS: Fine grained.

VESICLES: Sparsely to moderately vesicular. Vesicles are round to irregular, 1-6 mm, typically lined with blue clay, and partially filled with blue, yellow, or green clay, zeolite, and trace pyrite.

COLOR: Medium gray to brownish orange.

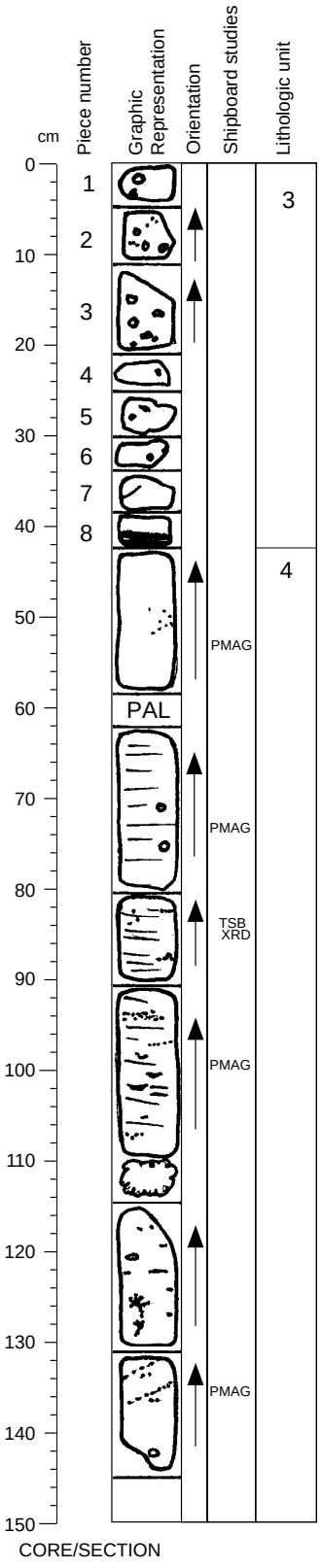
STRUCTURE: Massive.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Rare clay- and zeolite-filled veins are <1 mm wide.

COMMENTS: A chilled margin is at 43 cm.

Core Photo



183-1140A-32R-3 **Section top: 278.20 (mbsf)**

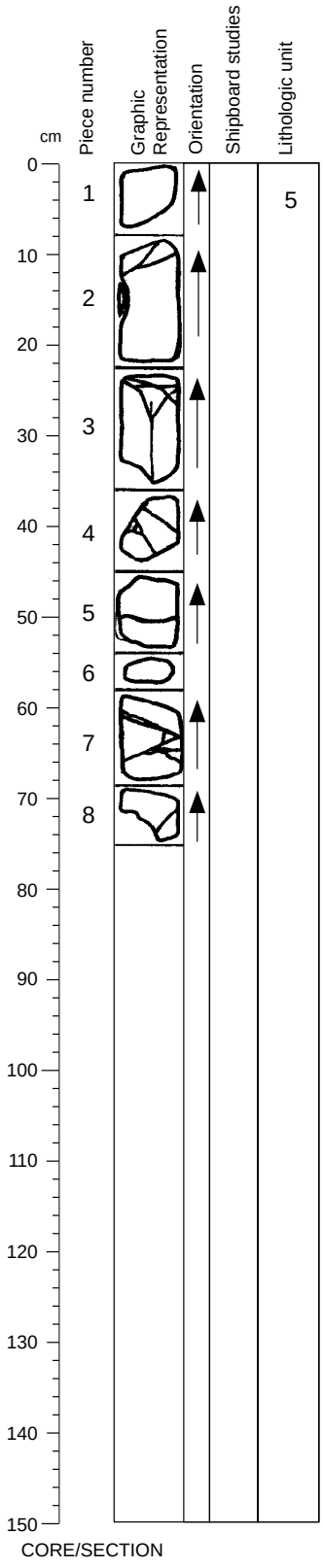
UNIT 4: DOLOMITE

CONTACTS: Not recovered; the contact between Units 3 and 4 is inferred to be at the base of Piece 4, at 43 cm.

COLOR: Brownish orange from 43-91 cm and 115-146 cm; very pale brown from 91-115 cm.

GENERAL DESCRIPTION: The intervals from 3-91 cm and 115-146 cm are moderately burrowed dolomite. Dolomite crystals are fine to medium sand size. Some burrows are filled with black material (manganese oxide?). The interval from 91-115 cm is well burrowed, dolomitic nannofossil chalk.

Core Photo



183-1140A-32R-4 **Section top: 279.66 (mbsf)**

UNIT 5: MODERATELY PLAGIOCLASE-OLIVINE-PHYRIC BASALT

Pieces: 1-8

CONTACTS: Not recovered; the contact between Units 4 and 5 is inferred to be between Sections 32R-3 and 32R-4.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	5	3	0.5	1	Subhedral laths
Olivine:	1	0.6	0.2	0.3	Euhedral, equant

GROUNDMASS: Fine grained.

VESICLES: None.

COLOR: Pale brownish gray.

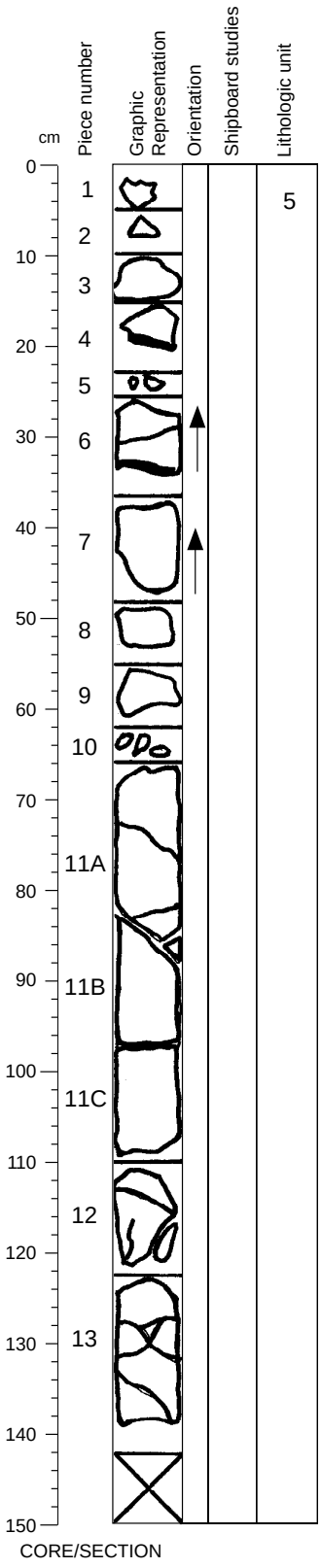
STRUCTURE: Massive.

ALTERATION: Moderate.

VEINS/FRACTURES: Abundant, irregular veins, <1 mm to 3 mm wide, are surrounded by oxidation halos and filled with carbonate, brown clay and, rarely, zeolite.

COMMENTS:

Core Photo



183-1140A-33R-1 **Section top: 284.60 (mbsf)**

UNIT 5: MODERATELY OLIVINE-PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-13

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	2-3	3	0.5	1.5	Subhedral to euhedral, in glomerocrysts
Olivine:	3-5	0.5	0.2	0.4	Euhedral

GROUNDMASS: Fine grained. Contains plagioclase, clinopyroxene, and oxides.

VESICLES: Generally nonvesicular; sparsely vesicular near pillow margins. Vesicles are ≤5 mm and partially filled with brown and green clay.

COLOR: Light gray to pale yellowish brown.

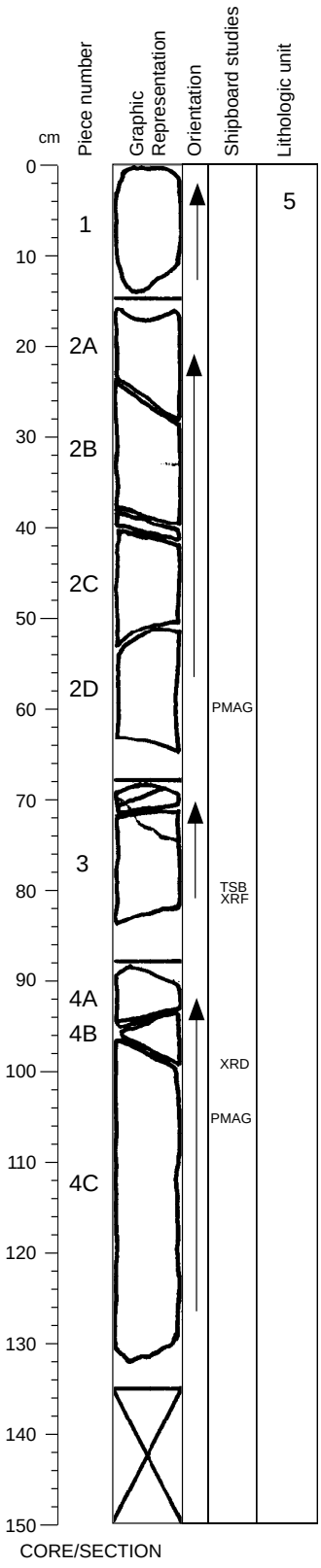
STRUCTURE: Massive and pillowed.

ALTERATION: Moderate to high in the brownish areas. Mafic groundmass phase is altered to yellowish orange clay in pale yellowish brown areas.

VEINS/FRACTURES: Numerous veins (<5 mm wide) are filled with calcite, clay, and zeolite.

COMMENTS: Olivine is unaltered in light gray areas. Pillow margins are in the intervals from 19-20 cm and 36-38 cm; glass is palagonitized or missing.

Core Photo



183-1140A-33R-2 **Section top: 286.020 (mbsf)**

UNIT 5: MODERATELY OLIVINE-PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-4

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	2-4	2.5	0.5	1	Subhedral to euhedral; in glomerocrysts
Olivine:	3-5	0.7	0.1	0.3	Euhedral

GROUNDMASS: Fine grained. Contains plagioclase, clinopyroxene, and oxides.

VESICLES: Sparsely vesicular. Vesicles are filled with green clay.

COLOR: Piece 1 is pale yellowish brown; Pieces 2-4 are medium gray.

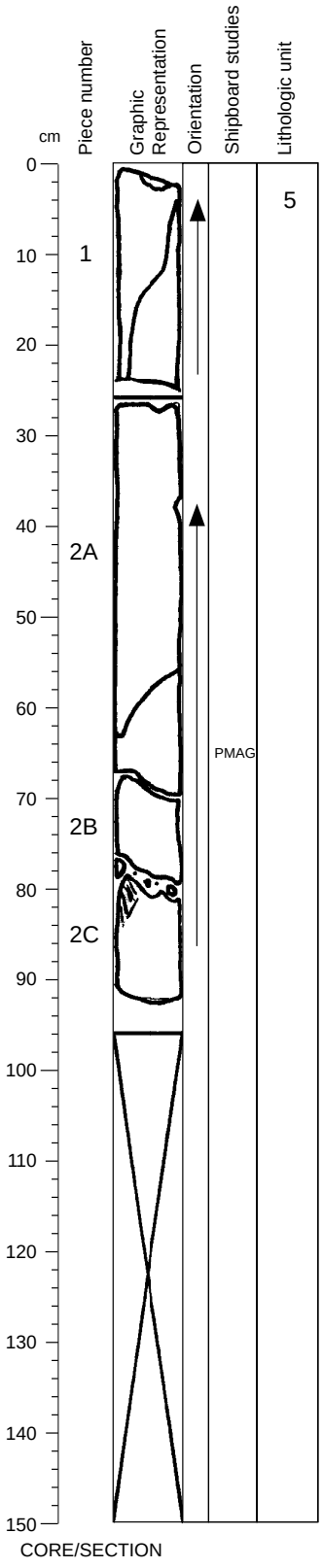
STRUCTURE: Massive.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Numerous veins and fractures (<1 mm wide) are filled with clay, carbonate, and pyrite.

COMMENTS:

Core Photo



183-1140A-33R-3 **Section top: 287.38 (mbsf)**

UNIT 5: MODERATELY PLAGIOCLASE-OLIVINE-PHYRIC BASALT

Pieces: 1-2

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	5	5	1	3	Euhedral to subhedral
Olivine:	≤2	1	0.5		Euhedral to subhedral

GROUNDMASS: Fine grained.

VESICLES: Piece 1 is nonvesicular to sparsely vesicular. Piece 2, 64-90 cm, is moderately vesicular. In Pieces 2A and 2B, vesicles are 1-5 mm and subround to round. Vesicles are 10-30 mm and irregular in Piece 2C. Vesicles are filled with light green clay.

COLOR: Medium gray.

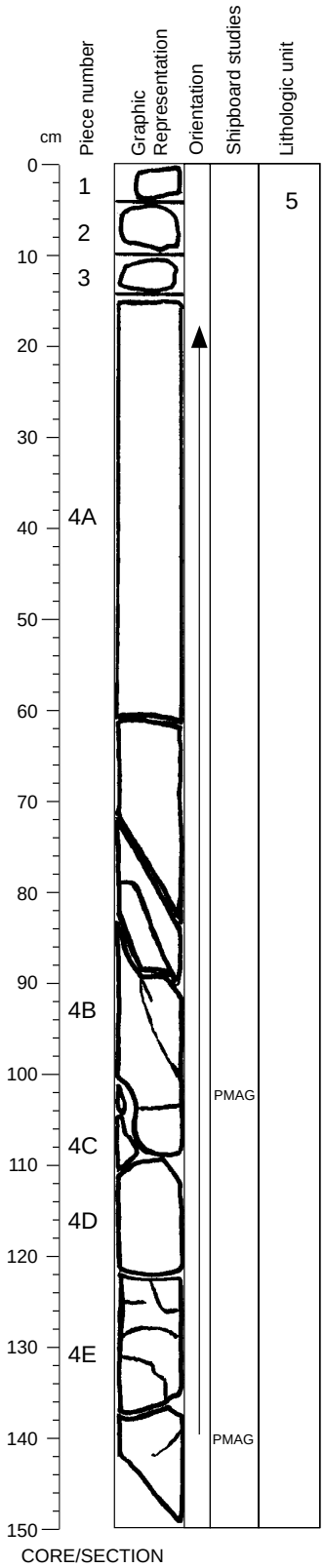
STRUCTURE: Massive. A vesicular melt segregation is present between 64 and 85 cm.

ALTERATION: Slight in Piece 1. Pieces 2B and 2C are moderately to highly altered near large clay-filled vesicles; completely altered to green clay in the melt segregation from 64-85 cm. Overall, groundmass is slightly altered; groundmass clinopyroxene is slightly altered to grayish green clay.

VEINS/FRACTURES: Subhorizontal and subvertical veins (0.5-2 mm wide) are filled with light green clay, calcite, and pyrite.

COMMENTS:

Core Photo



183-1140A-34R-1 **Section top: 294.10 (mbsf)**

UNIT 5: MODERATELY PLAGIOCLASE-OLIVINE-PHYRIC BASALT

Pieces: 1-4

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	3-5	4	1.5	2	Subhedral, in glomerocrysts
Olivine:	1-3	0.6	0.4	0.5	Euhedral; relatively unaltered

GROUNDMASS: Fine grained. Contains glass, plagioclase, clinopyroxene, oxides, and possibly olivine.

VESICLES: Sparsely vesicular. Vesicles are 0.5-12 mm, round to irregular, and filled with light green clay.

COLOR: Medium dark gray to medium gray.

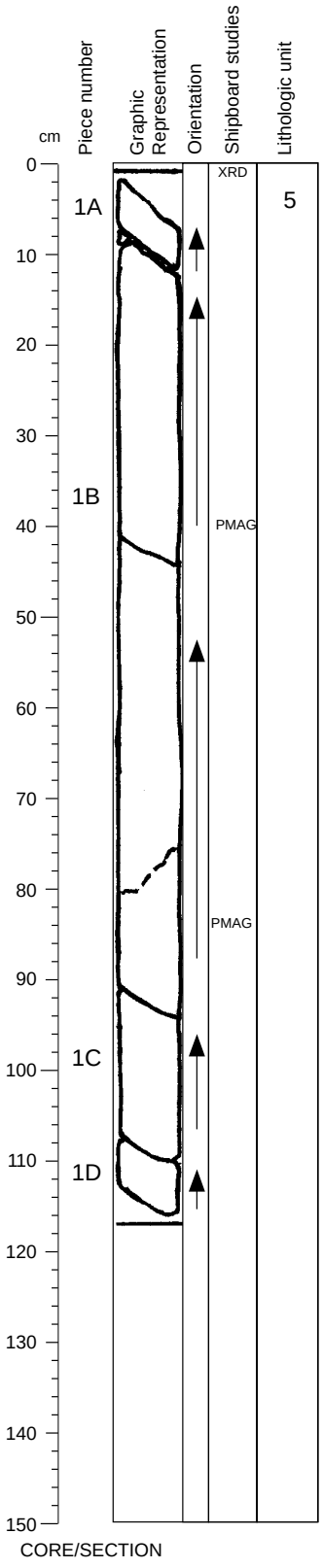
STRUCTURE: Massive.

ALTERATION: Moderate.

VEINS/FRACTURES: Sparsely veined; veins are <0.5 mm to 3 mm wide and filled with carbonate, clay and, rarely, pyrite.

COMMENTS: Some light green, translucent olivine phenocrysts have a black rim.

Core Photo



183-1140A-34R-2 **Section top: 295.60 (mbsf)**

UNIT 5: MODERATELY PLAGIOCLASE-OLIVINE-PHYRIC BASALT

Pieces: 1

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	3-5	5	0.5	4	Subhedral; in glomerocrysts
Olivine:	1-3	0.6	0.4	0.5	Euhedral; relatively unaltered

GROUNDMASS: Fine grained. Contains glass, plagioclase, clinopyroxene, oxides, and olivine.

VESICLES: Sparsely vesicular; vesicles are filled with green clay.

COLOR: Medium gray to medium light gray.

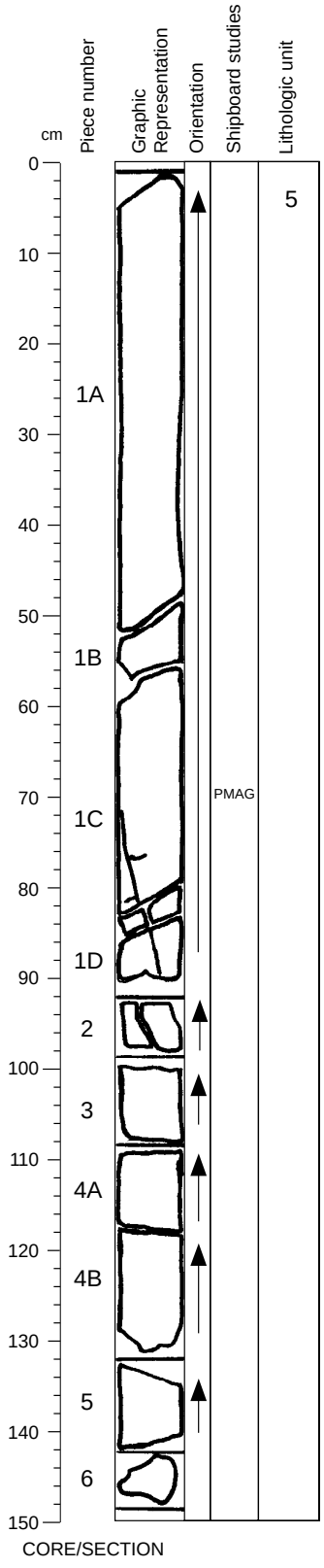
STRUCTURE: Massive.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Veins (<3 mm wide) are filled with green clay, carbonate, and pyrite.

COMMENTS: Some light green, translucent olivine phenocrysts have a black rim.

Core Photo



183-1140A-34R-3 **Section top: 296.78 (mbsf)**

UNIT 5: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

Pieces: 1-6

CONTACTS: Not recovered; the contact between Units 5 and 6 is inferred to be between Sections 34R-3 and 34R-4.

PHENOCRYSTS:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Plagioclase:	3-5	5	0.5	4	Subhedral
Olivine:	1-3	0.6	0.4	0.5	Euhedral

GROUNDMASS: Fine grained; very fine grained near vesicle train in Piece 1. Groundmass contains plagioclase, clinopyroxene, oxides, and glass.

VESICLES: Sparsely vesicular. Pieces 1 and 4 have vertical vesicle trains. Vesicles are ≤10 mm and irregular; some are coalesced. Vesicle fill in Piece 1 is light green clay; reddish brown clay fills vesicles in Piece 4.

COLOR: Pieces 1A through 1C are medium gray to medium light gray; Pieces 1D through 6 are pale yellowish brown.

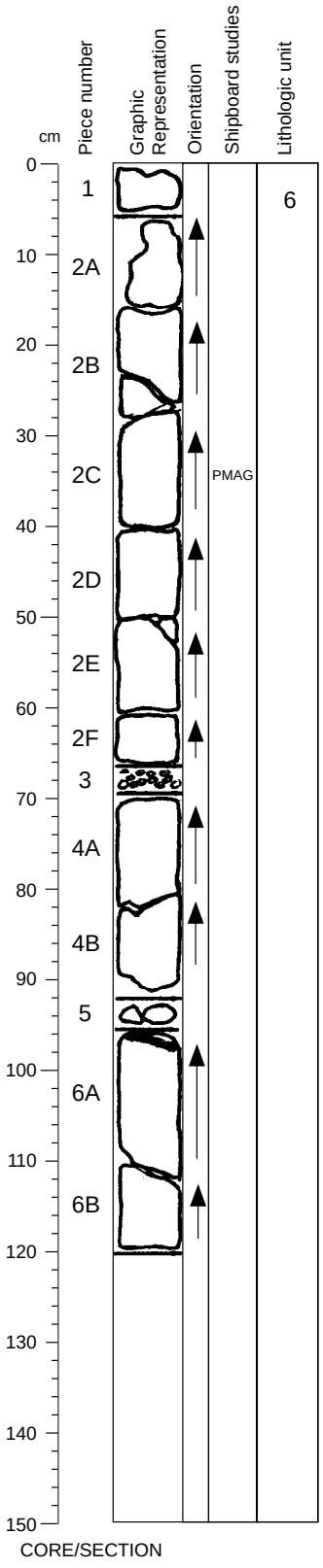
STRUCTURE: Massive.

ALTERATION: Slight in Pieces 1A through 1C; moderate in Pieces 1D through 6.

VEINS/FRACTURES: Sparsely veined; veins (<0.5 to 2 mm wide) are mainly in Pieces 1D through 6. Zeolite, clay and, rarely, pyrite fill veins.

COMMENTS: The color change between Pieces 1C and 1D is distinct. In Pieces 1A through 1C, olivine phenocrysts are translucent light green with black rims. In Pieces 1D through 6, olivine phenocrysts are black.

Core Photo



183-1140A-34R-4 **Section top: 298.20 (mbsf)**

UNIT 6: MODERATELY CLINOPYROXENE-PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-6

CONTACTS: Not recovered; the contact between Units 5 and 6 is inferred to be between Sections 34R-3 and 34R-4 (see comments below).

PHENOCRYSTS:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Plagioclase:	1	7	0.8	2	Subhedral, in glomerocrysts
Clinopyroxene:	3-5	0.8	0.4	0.5	Euhedral

GROUNDMASS: Fine grained. Contains plagioclase, clinopyroxene, oxides, olivine, and glass.

VESICLES: Nonvesicular.

COLOR: Medium light gray overall. Pale yellowish brown near veins, pillow margin, and in parts of Pieces 2A and 2B.

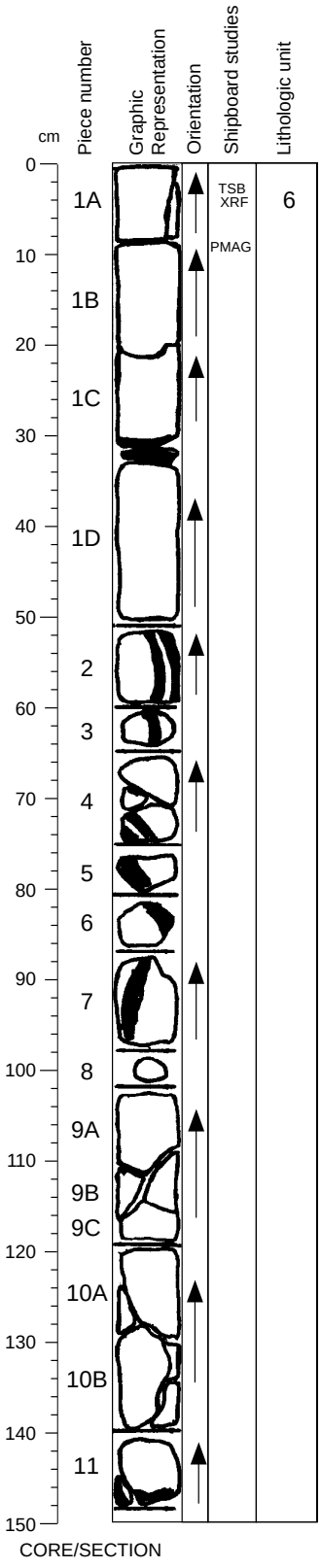
STRUCTURE: Massive and pillowed.

ALTERATION: Slight, except in areas near veins and in parts of Pieces 2A and 2B, which are moderately altered.

VEINS/FRACTURES: Sparsely veined. Veins are <0.5 to 3 mm, and filled with carbonate and clay.

COMMENTS: Piece 1 is a well-indurated, pink to orange, fine- to medium-grained dolomite. A glassy pillow margin is present between 95 and 97 cm.

Core Photo



183-1140A-34R-5 **Section top: 299.41 (mbsf)**

UNIT 6: SPARSELY CLINOPYROXENE-PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-11

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	1	2.5	0.5	1	Subhedral; in glomerocrysts
Clinopyroxene:	1	0.8	0.4	0.5	Euhedral

GROUNDMASS: Fine grained. Contains plagioclase, clinopyroxene, oxides, glass, and possibly olivine.

VESICLES: Nonvesicular; sparsely vesicular at pillow margins. Vesicles are ~2 mm, round to subangular, and empty or partially filled with reddish brown and green clay.

COLOR: Medium light gray.

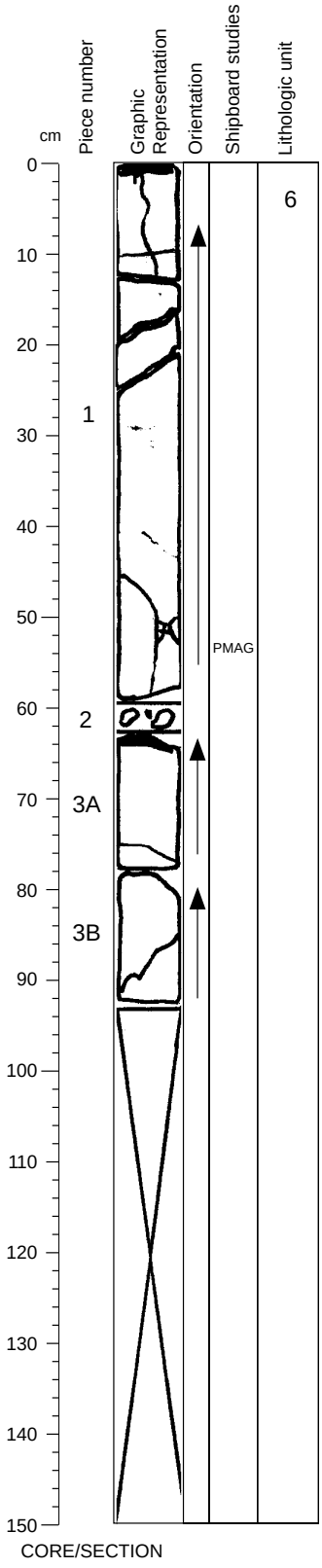
STRUCTURE: Pillowed.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Veins are moderately abundant. Pieces 2-4 and 7 have ≤2-cm-wide pillow-rim veins filled with carbonate and lined with clay. Veins in interiors of pieces are <0.5 to 2 mm wide, and filled with clay and carbonate. Hairline veins (<0.1 mm wide) contain clay and sulfide.

COMMENTS: Large parts of Pieces 2-7 are glassy pillow margins; glassy margins are also present between 30 and 33 cm and at 147 cm.

Core Photo



183-1140A-34R-6 **Section top: 300.89 (mbsf)**

UNIT 6: MODERATELY PLAGIOCLASE-CLINOPYROXENE-PHYRIC BASALT

Pieces: 1-3

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	3	2	0.5	1	Euhedral to subhedral, in glomerocrysts
Clinopyroxene:	1	1	0.3	0.5	Euhedral

GROUNDMASS: Fine grained.

VESICLES: Nonvesicular; sparsely vesicular at pillow margins. Vesicles are 2 mm, round to subangular, and empty or partially filled with green clay, calcite and, rarely, zeolite.

COLOR: Medium light gray.

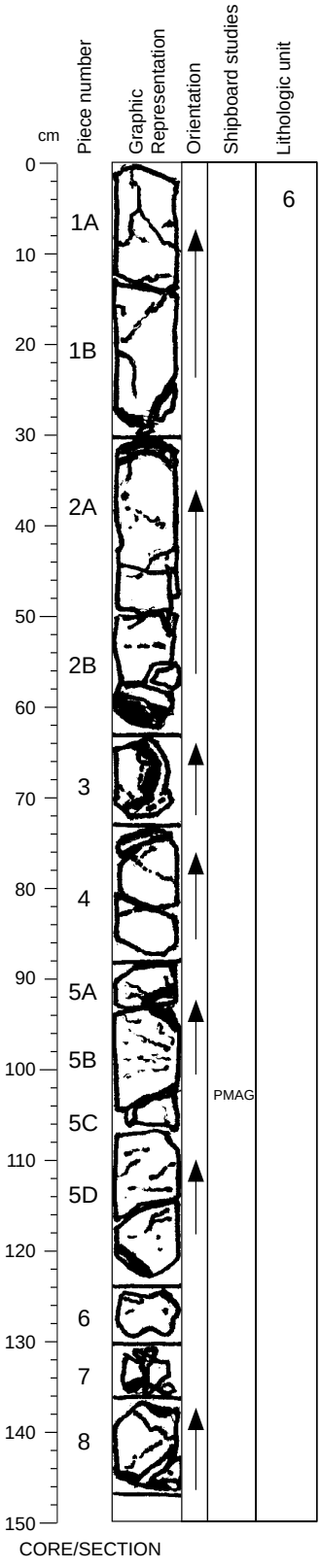
STRUCTURE: Massive.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Thin (0.5-2 mm) sinuous veins are filled with green and brown clay, calcite, and pyrite.

COMMENTS: Glassy pillow contacts are present from 0-1 cm and 63-64 cm. Glomerocrysts are ≤5 mm in Piece 3B.

Core Photo



183-1140A-35R-1 **Section top: 303.50 (mbsf)**

UNIT 6: MODERATELY CLINOPYROXENE-PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-8

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	2	4	0.5	1	Subhedral to euhedral laths
Clinopyroxene:	<3	1	<0.1	0.2	Euhedral, equant

GROUNDMASS: Fine grained; glassy in pillow margins.

VESICLES: Sparsely vesicular. Elongate vesicles (<2 mm) in bands parallel to pillow margins are oriented perpendicular to the margins; vesicles are filled with clay, calcite, and zeolite.

COLOR: Pale gray to yellowish brown.

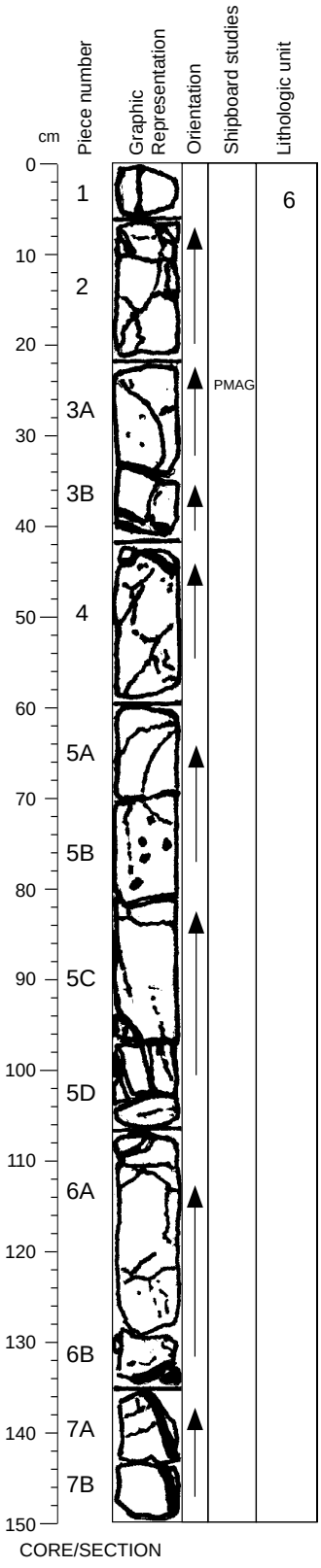
STRUCTURE: Pillowed.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Moderately abundant, irregularly oriented veins (<1 mm wide) are filled with carbonate, pyrite, and brown clay. Irregular fractures are abundant.

COMMENTS: Glassy pillow margins are at 30 and 146 cm, and from 60-76 cm, 92-95 cm, 120-123 cm, and 130-133 cm. Abundance of clinopyroxene phenocrysts is ≤3% in glassy pillow margins; in fine-grained pillow interiors, clinopyroxene grains are the same size as groundmass plagioclase.

Core Photo



183-1140A-35R-2 **Section top: 304.97 (mbsf)**

UNIT 6: MODERATELY CLINOPYROXENE-PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-7

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	2	4	0.5	2	Subhedral to euhedral laths
Clinopyroxene:	<5	0.6	<0.1	0.2	Euhedral, equant

GROUNDMASS: Fine grained; glassy in pillow margins.

VESICLES: Sparsely vesicular. Elongate vesicles (<2 mm) in bands parallel to pillow margins are oriented perpendicular to margins, and filled with brown clay and carbonate.

COLOR: Pale gray to yellowish brown.

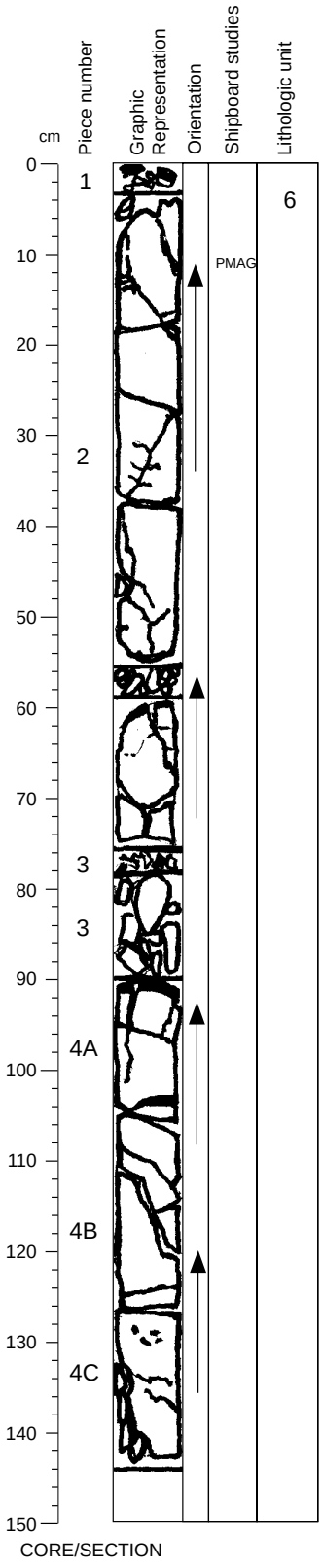
STRUCTURE: Pillowed.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Moderately abundant, irregularly oriented veins (<4 mm wide) are filled with carbonate, pyrite, and brown clay. Irregular fractures are abundant.

COMMENTS: Glassy pillow margins are present from 40-42 cm and 133-149 cm. Abundance of clinopyroxene phenocrysts is variable.

Core Photo



183-1140A-35R-3 **Section top: 306.47 (mbsf)**

UNIT 6: MODERATELY CLINOPYROXENE-PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-4

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	2	5	0.5	2	Subhedral to euhedral laths
Clinopyroxene:	<3	1	<0.1	0.2	Euhedral, equant

GROUNDMASS: Fine grained; glassy in pillow margins.

VESICLES: Sparsely vesicular. Elongate vesicles (<2 mm) in bands parallel to pillow margins are oriented perpendicular to margins, and filled with clay and calcite. Irregular vesicles (<3 mm) are filled with green clay.

COLOR: Pale gray to yellowish brown.

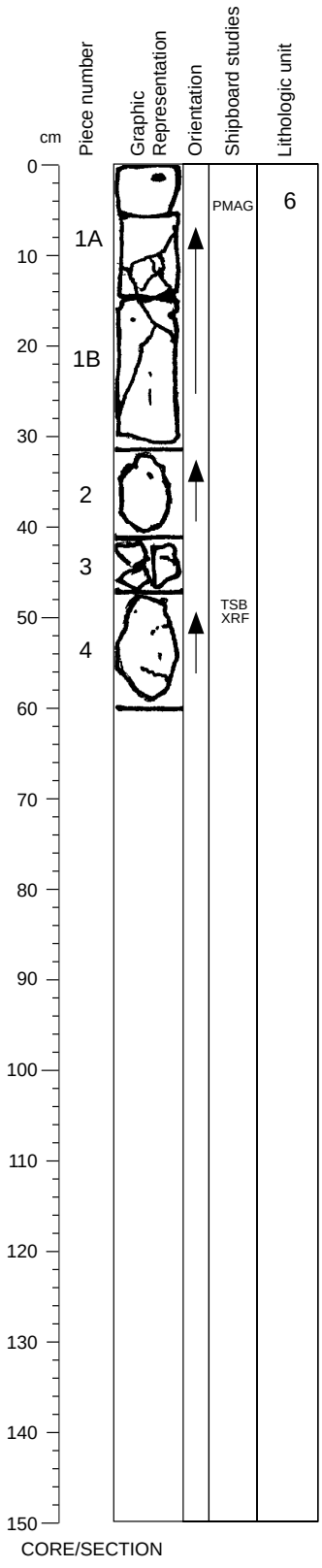
STRUCTURE: Pillowed.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Moderately abundant, irregularly oriented veins (<1 mm wide) are filled with brown clay, calcite, and pyrite. Irregular fractures are abundant.

COMMENTS: Glassy pillow margins are at 0, 59, 79, and 90 cm. Abundance of clinopyroxene phenocrysts is variable.

Core Photo



183-1140A-35R-4 **Section top: 307.91 (mbsf)**

UNIT 6: APHYRIC BASALT

Pieces: 1-4

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	1.5	0.5		Subhedral, blocky crystals; rare laths and acicular forms; ~50% is in glomerocrysts
Clinopyroxene:	<1	1	0.5		Subhedral to anhedral, equant; ~25% is in glomerocrysts with plagioclase

GROUNDMASS: Fine grained. Pieces 2-4 are finer grained than Piece 1. Groundmass clinopyroxene or olivine is visible in alteration halos around veins; rimmed by reddish brown clay.

VESICLES: Nonvesicular. Rare, green-clay-filled vesicles are round and <0.3 mm.

COLOR: Medium gray.

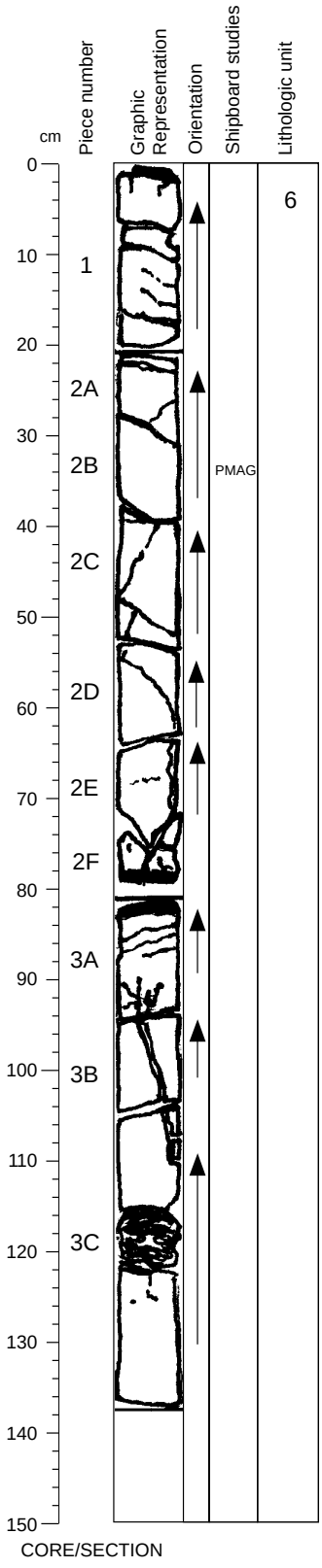
STRUCTURE: Massive, but inferred to be the interiors of pillows on the basis of more complete recovery in Sections 35R-1 through -3 and 36R-1.

ALTERATION: Fresh to slight. Groundmass is fresh, except in 1- to 3-mm-wide (15 mm in Piece 4) alteration halos around veins, where mafic phases and/or glass are altered to reddish brown clay.

VEINS/FRACTURES: Common, <1-mm-wide veins are filled with green and brown clay and carbonate. Brown clay veins have distinct, ~2-mm oxidation halos.

COMMENTS: Fresh and altered clinopyroxene phenocrysts occur together in glomerocrysts. Pyrite is present in some clinopyroxene phenocrysts and rims some plagioclase phenocrysts.

Core Photo



183-1140A-36R-1 **Section top: 312.70 (mbsf)**

UNIT 6: SPARSELY TO MODERATELY CLINOPYROXENE-PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-3

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	1	9	1	2	Subhedral laths and glomerocrysts
Clinopyroxene:	<3	1	0.2	0.5	Euhedral, equant

GROUNDMASS: Fine grained; glassy at pillow margins. Contains disseminated, very fine-grained pyrite.

VESICLES: Sparsely vesicular near pillow margins, where vesicles are irregular, <3 mm, and filled with green clay. Nonvesicular in pillow interiors.

COLOR: Pale gray to yellowish brown.

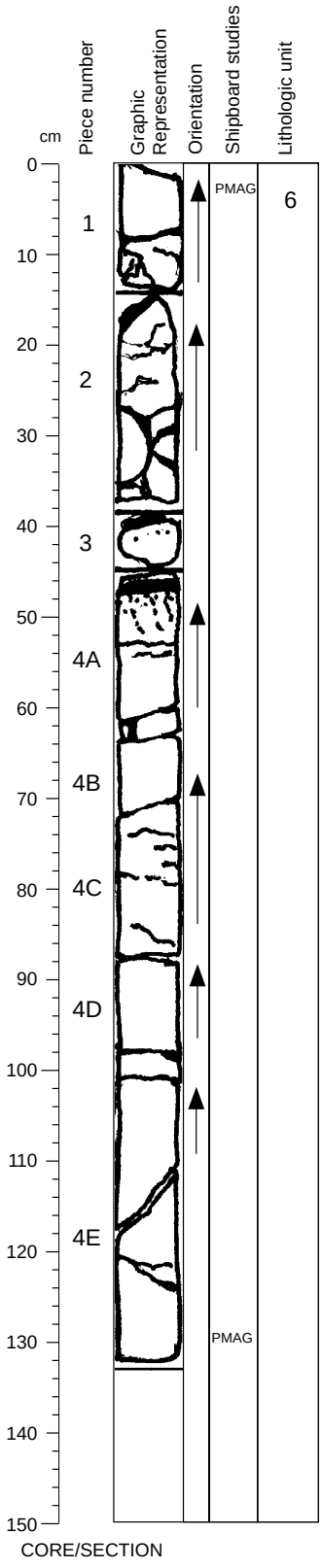
STRUCTURE: Pillowed.

ALTERATION: Slight to moderate. Alteration is complete from 115-121 cm (Piece 3D), where a late-stage, originally vesicular and glassy segregation is completely altered to black clay, with green clay and minor carbonate filling vesicles.

VEINS/FRACTURES: Several irregular, <1-mm-wide veins are filled with green clay, carbonate, and pyrite. Fractures are abundant.

COMMENTS: Glassy pillow margins are at 0 cm and 81 cm. Abundance of clinopyroxene phenocrysts is variable.

Core Photo



183-1140A-36R-2 **Section top: 314.07 (mbsf)**

UNIT 6: SPARSELY TO MODERATELY CLINOPYROXENE-PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-4

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	1	5	0.5	2	Subhedral laths and glomerocrysts
Clinopyroxene:	<2	2	0.2	0.5	Euhedral, equant

GROUNDMASS: Fine grained; glassy at pillow margins. Contains disseminated, very fine-grained pyrite.

VESICLES: Sparsely vesicular near pillow margins, where vesicles are irregular, <3 mm, and filled with green clay. Pillow interiors are nonvesicular.

COLOR: Pale gray to yellowish brown.

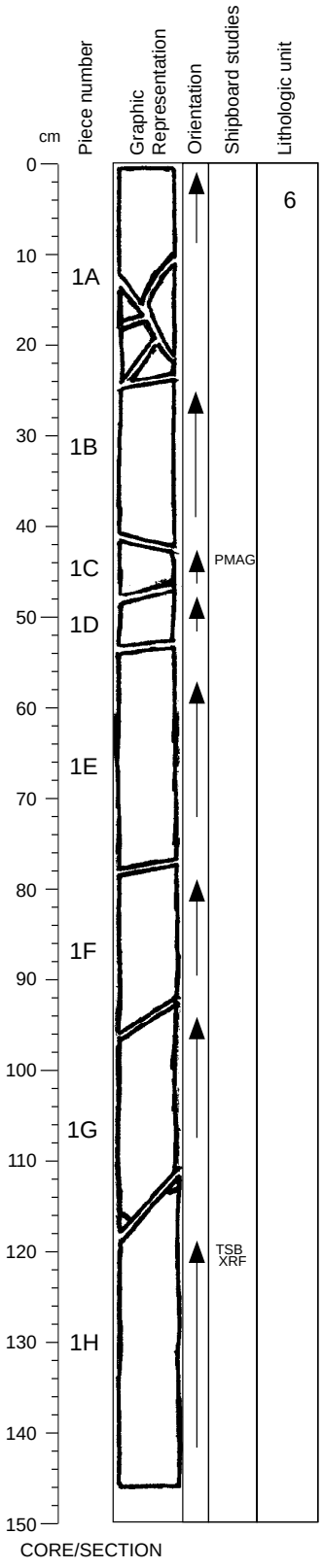
STRUCTURE: Pillowed. Discontinuous, <1-mm-wide bands of mesostasis define a subhorizontal fabric in the interval from 73-90 cm (Pieces 4B-4D).

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Numerous veins (<1 mm wide) are filled with green clay, carbonate and, rarely, pyrite.

COMMENTS: Glassy pillow margins are present from 13-20 cm and 40-46 cm. Abundance of clinopyroxene phenocrysts is greater near pillow margins.

Core Photo



183-1140A-36R-3 **Section top: 315.41 (mbsf)**

UNIT 6: APHYRIC BASALT

Pieces: 1

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<1	3	0.5	2	Subhedral laths and glomerocrysts
Clinopyroxene:	<1	0.8	0.2		Euhedral, equant

GROUNDMASS: Fine grained.

VESICLES: Nonvesicular. Rare vesicles are <1 mm and round.

COLOR: Pale gray.

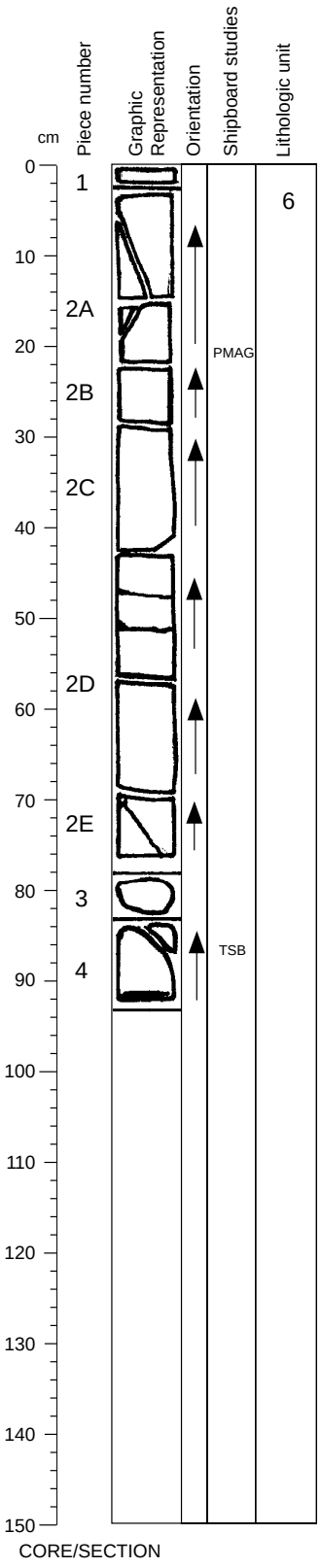
STRUCTURE: Massive.

ALTERATION: Fresh.

VEINS/FRACTURES: Contains sparse irregular fractures filled with green clay and carbonate.

COMMENTS:

Core Photo



183-1140A-36R-4 **Section top: 316.91 (mbsf)**

UNIT 6: SPARSELY PLAGIOCLASE-PHYRIC BASALT

Pieces: 1-4

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	1	5	0.5	1.5	Subhedral, blocky crystals and rare, fine laths
Clinopyroxene:	<1	1.5	0.25	0.5	Subhedral to euhedral; mostly altered

GROUNDMASS: Fine grained. Wispy trails of mafic and opaque phases define a subhorizontal fabric in Piece 2. Groundmass clinopyroxene or olivine is visible in alteration halos around veins and is rimmed by reddish brown clay. Pyrite is disseminated in the groundmass.

VESICLES: Nonvesicular.

COLOR: Medium gray. Piece 4 is brownish orange because of alteration halos.

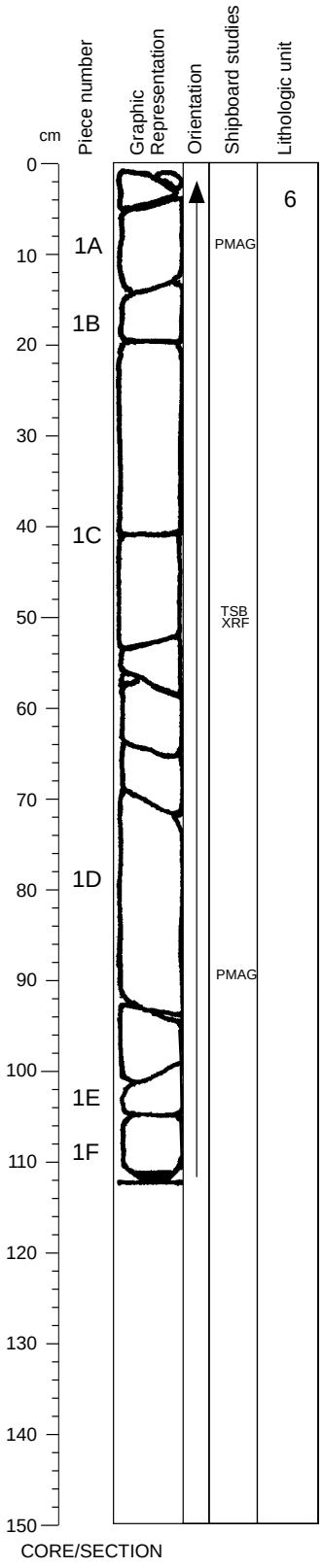
STRUCTURE: Massive.

ALTERATION: Pieces 1 through 2D are fresh to slightly altered; Pieces 2E through 4 are slightly to moderately altered. Alteration is in halos around veins.

VEINS/FRACTURES: Pieces 1 through 2D have numerous, subhorizontal, <1-mm-wide veins filled with dark green clay and, rarely, pyrite. Rare, subhorizontal, <1-mm-wide veins have dark green clay and carbonate filling. Pieces 2E through 4 have irregular, <2-mm-wide veins filled with brown clay, and brown alteration halos (<0.4 mm wide) are present in the groundmass.

COMMENTS: In Pieces 1 through 2D plagioclase commonly is in monominerallic glomerocrysts, whereas glomerocrysts in Pieces 2E through 4 also contain clinopyroxene. Clinopyroxene abundance in Pieces 2E through 4 is slightly greater than in Pieces 1through 2D. Piece 4 contains several pinkish gray (more oxidized) regions (3 to 8 mm in size) that are finer-grained than the rest of the rock. The interval from 90-92 cm contains a glassy chill zone.

Core Photo



183-1140A-37R-1 **Section top: 317.30 (mbsf)**

UNIT 6: SPARSELY PLAGIOCLASE-PHYRIC BASALT

Pieces: 1

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	1	4	1	2	Subhedral, in glomerocrysts
Clinopyroxene:	0.5	1.5	0.3	0.5	Euhedral

GROUNDMASS: Fine grained; glassy at base of Piece 1F. Groundmass contains plagioclase, clinopyroxene, oxides, glass, and possibly olivine.

VESICLES: Generally nonvesicular; sparsely vesicular near glassy margin in Piece 1F. Vesicles are 0.1-2 mm, round to irregular, and filled with brown and green clay.

COLOR: Medium light gray.

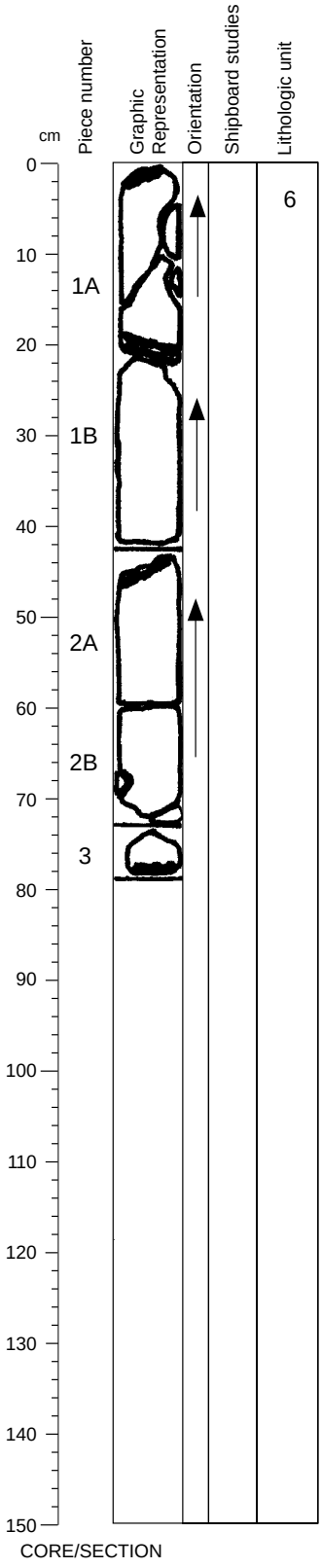
STRUCTURE: Massive.

ALTERATION: Generally slight; moderate in Piece 1F.

VEINS/FRACTURES: Sparse horizontal to subhorizontal veins (0.1-3 mm wide) are filled with carbonate and clay. A long, vertical vein is present on the back of Pieces 1C and 1D.

COMMENTS: A glassy margin occurs at 109 cm, at the base of Piece 1F.

Core Photo



183-1140A-37R-2 **Section top: 318.42 (mbsf)**

UNIT 6: SPARSELY TO MODERATELY CLINOPYROXENE-PLAGIOCLASE-PHYRICBASALT

Pieces: 1-3

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	1	3	0.5	1.2	Subhedral, in glomerocrysts
Clinopyroxene:	1-2	1.5	0.2	0.6	Euhedral

GROUNDMASS: Fine grained to very fine grained in pillow interiors; glassy at pillow margins. Contains plagioclase, clinopyroxene, altered glass, and possibly olivine.

VESICLES: Generally nonvesicular; sparsely vesicular at pillow margins. Vesicles are subangular to subround, <2 mm, and filled with green and brown clay.

COLOR: Light gray to grayish orange to pale yellowish brown.

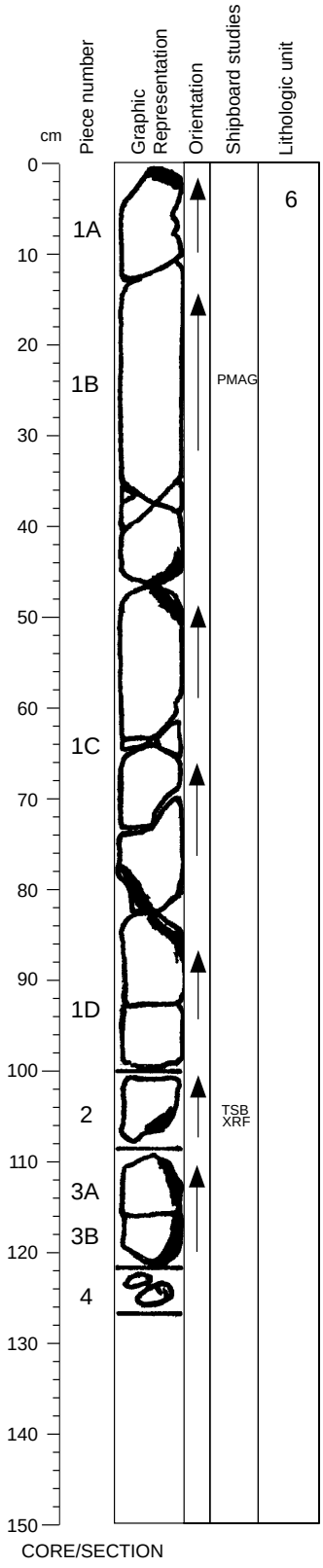
STRUCTURE: Pillowed.

ALTERATION: Moderate. Alteration is higher in groundmass near pillow margins than deeper in interiors.

VEINS/FRACTURES: Sparsely to moderately veined. Pillow margins have carbonate-filled veins, 1-3 mm wide. Veins in pillow interiors are <0.5 mm wide and filled with carbonate and clay.

COMMENTS: Intervals with glassy pillow margins are 0-1 cm, 17-18 cm, 43-46 cm, and 77-78 cm.

Core Photo



183-1140A-37R-3 **Section top: 319.21 (mbsf)**

UNIT 6: SPARSELY TO MODERATELY PLAGIOCLASE-CLINOPYROXENE-PHYRIC BASALT

Pieces: 1-4

CONTACTS: None.

PHENOCRYSTS:	**%**	**Grain Size (mm):**			
	Mode	**Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	1-2	4	0.75	1	Subhedral to euhedral; isolated phenocrysts and glomerocrysts
Clinopyroxene:	1	1.5	0.5	0.5	Euhedral; fresh in pillow interiors

GROUNDMASS: Fine grained; glassy at pillow margins. Contains plagioclase, clinopyroxene, oxides, glass, and possibly olivine

VESICLES: Rare round vesicles, <0.5 mm and filled with brown clay, are present near pillow margins.

COLOR: Light gray in less-altered areas; in more-altered areas, the color is grayish orange.

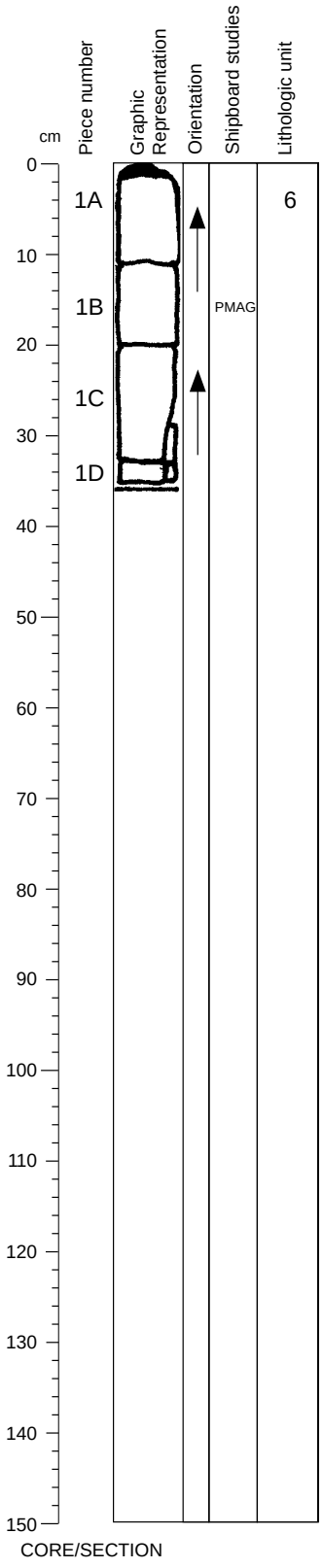
STRUCTURE: Pillowed.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Veins, <0.2 mm wide, are filled with green clay, calcite, and rare pyrite.

COMMENTS: Several 30- to 45-cm-thick pillow lobes are present; intervals with glassy pillow margins are 0-2, 43-50, 78-88, 104-106, and 109-121 cm. Subround, 2- to 4-mm-wide plagioclase glomerocrysts are scattered through the section. Clinopyroxene phenocryst size and abundance decrease inward from glassy pillow margins toward centers. Clinopyroxene (0.2-0.4 mm) microphenocrysts are more abundant in pillow centers.

Core Photo



183-1140A-37R-4 **Section top: 320.48 (mbsf)**

UNIT 6: APHYRIC BASALT

Pieces: 1

CONTACTS: None.

PHENOCRYSTS:	**% Mode**	**Grain Size (mm): Max**	**Min**	**Avg.**	**Shape/Habit**
Plagioclase:	<0.5	2.5	0.8	1.5	Subhedral, in glomerocrysts
Clinopyroxene:	0.5	0.6	0.4	0.5	Euhedral

GROUNDMASS: Fine grained. Contains plagioclase, clinopyroxene, oxides, glass, and possibly olivine.

VESICLES: Nonvesicular; sparsely vesicular near glassy margin. Vesicles are 0.5-2 mm and filled with green clay and carbonate.

COLOR: Medium light gray.

STRUCTURE: Pillowed.

ALTERATION: Slight to moderate.

VEINS/FRACTURES: Sparsely veined. Subhorizontal, carbonate- and clay-filled veins (0-1 mm wide) are present in the glassy margin and, rarely, in the interior.

COMMENTS: Glassy margin is at the top of section, 0-1 cm.

Sample									Texture			Mineral																Biogenic												Rock								Other		
Leg	Site	H	Cor	CT	Sct	Top	Depth	Lithology	Sand	Silt	Clay	Amphibole	Chlorite	Clay	Clinopyroxene	Dolomite	Feldspar	Glauconite	Magnetite	Mica	Opaques	Palagonite	Pyrite	Pyroxene	Quartz	Volcanic Glass	Zeolite	Algae	Benthic Forams	Calcispheres	Diatoms	Discoaster	Foraminifers	Nannofossils	Plant Debris	Radiolarians	Silicoflagellates	Skeletal Debris	Sponge Spicules	Basalt Fragments	Calcareous Fragments	Carbonate Particles	Packstone Clast	Rock Fragment	Silt	Volcanic Ash	Volcanic Fragments	Rad/Diatom/Dino Spines	Unknown	Comments
183	1140	A	1	R	1	10	0.1	D	C	C	D				*										C						D					C	*		P											
183	1140	A	1	R	1	30	0.3	D	C	C	D				*																D		C			R			C					C						
183	1140	A	1	R	2	18	1.68	D			D																				A			D					C					R						
183	1140	A	1	R	2	70	2.2	D		R	D										R	*									D		P	A			R													
183	1140	A	1	R	3	75	3.75																																											
183	1140	A	1	R	3	140	4.4																																											
183	1140	A	2	R	1	41	9.91	M			D											P									A			D					P											
183	1140	A	2	R	2	70	11.7	D			D																				A		R	D					C											
183	1140	A	2	R	CC	14	15.67	M			D																				D			A					C											
183	1140	A	3	R	1	23	18.83	D			D												R								C	R	*	D		P			R											
183	1140	A	3	R	2	30	20.4	D			D												*					R			C		*	D		P	P												*	
183	1140	A	4	R	1	23	28.13	D			D												*			*		R			C		P	D		P	C		R											
183	1140	A	4	R	1	32	28.22	D			D																	*			P		C	D		P	*		*											
183	1140	A	4	R	1	73	28.63	D			D																				C	P	P	D		P	C		R											
183	1140	A	5	R	CC	18	37.38	D			D												P								C	R	C	D		P	P		P											
183	1140	A	6	R	1	84	47.34	D			D															*					P		C	D		P			R										*	
183	1140	A	6	R	1	106	47.56	D			D															R		*			R		P	D		R			P										*	
183	1140	A	6	R	1	146	47.96	D			D												R			R		R			P		P	D		P	*		P											
183	1140	A	6	R	2	60	48.6	D			D															P			*		P	C	C	D		P			P										*	
183	1140	A	7	R	2	18	57.28	D			D												A								R		R	C					*							D				
183	1140	A	9	R	1	79	74.49	D			D															R					P	C	P	D			C		R											
183	1140	A	9	R	CC	4	75.16	D			D															P					R	C	R	D		R	R		R											
183	1140	A	10	R	1	67	83.97	D			D															R					P	C	C	D		P	P		R											
183	1140	A	14	R	2	52	123.72	D			D												*			P					P	P	*	D		C	R		P											
183	1140	A	14	R	3	73	125.43	D			D			P												R					P	P	*	D			R		P											
183	1140	A	14	R	3	129	125.99	D			D															R					P		*	D		C	P		R											
183	1140	A	18	R	1	60	160.9	D			D																				R			D		R			R											
183	1140	A	18	R	6	103	168.83	M	P	P	D															C					P		R	D					R											
183	1140	A	19	R	3	59	173.49	M			D															*					P			D		R	R		P											
183	1140	A	19	R	4	132	175.72	M			D															P					P		R	D					R											
183	1140	A	20	R	1	45	179.95	M			D																				R		P	P								D								
183	1140	A	20	R	4	83	184.83	M			D																				C			D		R			R			P								
183	1140	A	21	R	1	48	189.58	M			D																				A			A																
183	1140	A	21	R	2	55	191.15	D			D																				P		R	D			R		R											
183	1140	A	22	R	3	86	202.56	D			D															R					P		P	D		R			R											
183	1140	A	23	R	5	100	215.3	D			D																						R	D																
183	1140	A	24	R	2	69	220.19	M			D						R									P							R	D					R											
183	1140	A	24	R	5	71	224.21	M			D															D																								
183	1140	A	25	R	4	110	233.2	M			D			A		R										P								A																
183	1140	A	25	R	5	40	234	D			D					R																	P	D																
183	1140	A	32	R	3	98	279.18	M	C	A	A					A										*							R	A																

THIN SECTION:	**183-1140A-26R-1, 5-8, Piece 1A**					**Unit 1**	**OBSERVER:**	**NTA, KN, CRN, JB**
ROCK NAME:	**Aphyric basalt.**							
WHERE SAMPLED:	**Chill-zone adjacent to pillow margin.**							
GRAIN SIZE:	**Fine-grained to glassy.**							
TEXTURE:	**Hyalopilitic.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	<1	<1	0.2	0.8	0.3		Blocky euhedral laths	Faint zonation apparent. Mostly Carlsbad twinned; little albite twinning.
Olivine	2	5	0.02	0.2	0.1		Equant, euhedral	Microphenocrysts. More abundant as glassy pillow margin approached. Completely altered to carbonate with red-brown iron oxide stained rims and fractures near glassy margin; partially altered to pale yellow-green clay elsewhere. Near the glassy margin olivines are surrounded by a wide halo of iron oxide stained groundmass.
GROUNDMASS								
Plagioclase	10 to 20	10 to 20	<.01	0.4	0.1	An60	Slender laths with swallow-tail terminations	The proportion of plagioclase is lowest adjacent to chilled margin.
Mesostasis	65	65				9.75		Cryptocrystalline, pink-brown (clinopyroxene-glass intergrowth?), dusted with fine opaques.
Glass	14	15				2.25		Only present near glassy margin. Completely devitrified, but with only small pockets of alteration to green or yellow clay.
Titanomagnetite	<1	<1		<.01			Anhedral	No maghemite exsolution.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	3				Olivine, glass; fills vesicles	
Carbonate	<1				Olivine; fills vesicles	
Iron oxy-hydroxide	<1				Olivine	Also stains groundmass in large patches around olivines.

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	0 to 10		0.02	2		Filled with green clay and carbonate; irregular shapes	Most abundant adjacent to glassy margin.

COMMENTS : A pronounced variation in the shapes of crystals (from blocky to elongate skeletal), a decrease in grain size, and an increase in the amount of glass as the glassy pillow margin is approached. Trace sulfide (pyrite? but isotropic) associated with alteration.

THIN SECTION:	**183-1140A-26R-1, 84-86, Piece 2A**					**Unit 1**	**OBSERVER:**	**NTA, CRN**
ROCK NAME:	**Moderately plagioclase-olivine-phyric basaltic glass and calcareous sediment.**							
WHERE SAMPLED:	**Margin of pillow in Unit 1.**							
GRAIN SIZE:	**Glassy.**							
TEXTURE:	**Porphyritic with a glassy groundmass.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	5	5	<.01	2	0.2		Euhedral laths	Completely fresh. Zoned.
Olivine	5	5	<.01	0.4	0.1		Euhedral, equant	Most grains are completely fresh. Abundant inclusions of glass and opaque minerals.
GROUNDMASS								
Glass	60	80						Clear, pale yellow-green in center of section, altering to clay adjacent to sediment, devitrifying and becoming opaque toward pillow interior.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	20				Glass	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles				1.5	1	Lined with zeolite; spherical	

COMMENTS : Sediment is a nannofossil- and foraminifer-bearing chalk.
Photomicrograph #:
1140A-1 = Superb euhedral olivine in unaltered glass at pillow margin (x10 objective, ppl);
1140A-2 = Plagioclase laths in glass from pillow margin (x10 objective, ppl);
1140A-3 = Foraminifer test (x10 objective, ppl);
1140A-4 = Boundary of pillow basalt (altered glass) and foraminifer-bearing carbonate (x2.5 objective, ppl);
1140A-17 = Contact between glass and sediment (x2.5 objective, ppl);
1140A-20, 1140A-21 = Melt inclusions in olivine phenocrysts (x10 objective, ppl and xpl).

THIN SECTION:	**183-1140A-27R-2, 0-5, Piece 1A**					**Unit 1**	**OBSERVER:**	**NTA, KN, CRN, JB**
ROCK NAME:	**Aphyric basalt.**							
WHERE SAMPLED:	**Center of pillow in Unit 1.**							
GRAIN SIZE:	**Fine grained.**							
TEXTURE:	**Subophitic to intersertal.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	<1	<1	0.4	1	0.6	An60	Subhedral laths	Compositionally zoned. Abundant, minute (<10 micron), partially crystallized melt inclusion in cores.
Olivine	<1	<1	0.3	1	0.6		Equant, euhedral	Partially altered to clay, but with unaltered relicts.
GROUNDMASS								
Plagioclase	30	30	0.05	0.4			Subhedral laths	
Clinopyroxene	35	35	0.1	0.2	0.15		Anhedral, interstitial	Pale pinkish color.
Olivine	1	1	0.05	0.15	0.1		Anhedral, equant	Altered at margins; many grains enclose small melt inclusions containing gas bubbles.
Titanomagnetite	4	4	0.03	0.1	0.05		Equant to skeletal	Some skeletal textures. No maghemite exsolution.
Mesostasis	0	30						Altered to clay.
Sulphide	Trace	Trace		0.1			Anhedral	Primary sulfides? Intergrown pentlandite, chalcopyrite and magnetite occur in altered glass and as inclusions in primary silicates.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	30				Olivine, glass, veins	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	1		0.3	1		Clay	
Vein				0.2		Clay	

COMMENTS : A very fresh rock with only rare clay filled vesicles dispersed through the section. Radiating plagioclase and clinopyroxene are intergrown with beautiful subophitic to locally ophitic texture. Phenocrysts often occur as glomerocrystic masses.

Photomicrograph #:

1140A-18 = Subophitic intergrowth of plagioclase and clinopyroxene (x10 objective, xpl).

THIN SECTION:	**183-1140A-27R-5, 10-12, Piece 1B**					**Unit 1**	**OBSERVER:**	**NTA, JB, CRN**
ROCK NAME:	**Sparsely olivine-plagioclase-phyric basalt.**							
WHERE SAMPLED:	**Glomerocryst in center of pillow in Unit 1.**							
GRAIN SIZE:	**Medium-grained phenocrysts in a fine-grained groundmass.**							
TEXTURE:	**Porphyritic with a hypohyaline groundmass.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	1	1	0.2	2	0.6	An65	Subhedral and euhedral laths, angular fragments	Plagioclase phenocrysts are zoned and very variable in character. Some appear to be in reaction with groundmass, others have broad internal sieved zones, one has strained extinction. About twenty plagioclase grains and two partially altered olivine grains form a loosely packed glomeroporphyritic cluster.
Olivine	1	3-Jan	0.2	0.6	0.3		Equant, euhedral	Irregularly distributed through thin section. Partially altered to clay.
GROUNDMASS								
Plagioclase	40	40	<.01	0.7	0.2	An60	Elongate subhedral laths	Ragged terminations, some swallow tails. Wide range of grainsizes.
Olivine	1	2	0.05	0.15	0.1		Anhedral, equant	Altered at margins, many contain small melt plus gas inclusions.
Clinopyroxene	35	35	<.01	0.04	0.02		Skeletal intergrowths with glass	Clinopyroxene, titanomagnetite and glass form the mesostasis. The clinopyroxene has just started to crystallize in the groundmass and is not very distinct.
Titanomagnetite	2	2	<.01	0.02	0.01		Equant to skeletal	
Mesostasis	15	20						Cryptocrystalline pink-brown in color. Partially altered to clay. May include a small amount of intersertal glass.
Sulfide	Trace	Trace			<0.01		Anhedral	Pyrite or pentlandite (isotropic) associated with glass. Seen enclosed in fresh glass, therefore primary.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	5				Olivine, mesostasis, glass; fills veins	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	2		0.3	1		Clay, quenched interstitial melt	Many vesicles are partially to completely (in the plane of the thin section) filled with material interpreted as quenched interstitial melt.
Vein				0.1		Brownish green clay	

COMMENTS : A very fresh rock. Olivine is present both as phenocrysts and in the groundmass.
Photomicrograph #:
1140A-5 = Plagioclase glomerocryst (x2.5 objective, xpl).

THIN SECTION:	**183-1140A-28R-3, 29-32, Piece 1B**					**Unit 1**	**OBSERVER:**	**NTA, CRN, JB**
ROCK NAME:	**Aphyric basalt.**							
WHERE SAMPLED:	**Interior of Unit 1.**							
GRAIN SIZE:	**Fine grained.**							
TEXTURE:	**Subophitic, intersertal.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	<1	<1	0.2	1.2	0.4	>An60	Subhedral laths	Plagioclase phenocrysts are zoned. One large glomerocryst has grains up to 2.25 mm in size that enclose numerous irregularly distributed melt±olivine±clinopyroxene±opaque inclusions from sub-micron to 200 microns in size. The largest inclusions are along boundaries between the constituent grains of the glomerocryst. Plagioclase in the glomercryst has mottled extinction.
Olivine	<1	<1	0.2	0.3	0.25		Subhedral, equant	Partially altered to clay.
GROUNDMASS								
Plagioclase	40	40	<.1	0.8	0.4	An70	Slender subhedral laths	
Clinopyroxene	40	40	<.1	0.5	0.2		Anhedral to skeletal	Most grains are interstitial to plagioclase, some in glassy patches are skeletal. Pink color.
Olivine	4	7	0.03	0.2	0.1		Subhedral, equant	Partially altered to clay.
Titanomagnetite	2	2	<.01	0.05	0.02			No maghemite exsolution.
Glass/mesostasis	0	10						Altered to clay
Sulfide	Trace	Trace			<0.01		Anhedral	Chalcopyrite and pentlandite (isotropic, bright yellow). Inclusions in primary minerals and associated with glass.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	15				Glass, olivine; fills vesicles	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	<1		0.1	0.3		Round; clay filled	

COMMENTS : An unusually high proportion of olivine in the groundmass, and much of it unaltered. Plagioclase and clinopyroxene are fresh.

THIN SECTION:	**183-1140A-31R-1, 53-57, Piece 3B**					**Unit 2**	**OBSERVER:**	**DD, MSP, CRN, JB**
ROCK NAME:	**Highly plagioclase-clinopyroxene-olivine-phyric basalt.**							
WHERE SAMPLED:	**Massive interior of Unit 2.**							
GRAIN SIZE:	**Medium grained glomerocrysts and phenocrysts in a fine grained groundmass.**							
TEXTURE:	**Glomeroporphyritic and porphyritic (seriate?) with intergranular to intersertal groundmass.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
GLOMEROCRYSTS	12	12	0.4	4	0.9	An70, Ti-aug?	Subhedral masses	Glomerocrysts contain plagioclase (50 %), clinopyroxene (30 %) and olivine (20 %). Plagioclase is prismatic to tabular, subhedral to anhedral and shows complex strong zoning (oscillatory zones, resorption zones and mantled cores). Larger grains commonly contain coarse melt inclusions and some have resorbed and embayed rims. Clinopyroxene is equant, subhedral to rounded and is often strongly and multiply zoned. Some clinopyroxene show sector-zoning and the anomalous blue-brown extinction colors characteristic of titan-augite compositions. The larger clinopyroxene grains form subophitic intergrowths with plagioclase and olivine. Olivine is euhedral to subhedral and completely altered.
PHENOCRYSTS								
Plagioclase	7	7	0.1	4.6	0.3	An70	Subhedral to euhedral, prismatic to tabular	Well -developed, complex zoning (oscillatory zones, resorption zones, with An75-80 cores and An45-50 rims); coarse melt inclusions. Some grains have embayed rims.
Clinopyroxene	4	4	0.1	0.7	0.3	Ti-Aug?	Euhedral to subhedral equant	Strongly and multiply zoned. Some grains show sector-zoning characteristic of titan-augite. Others contain melt inclusions at inner rims.
Olivine	0	1	0.1	1.3	0.2		Euhedral to subhedral equant	Completely altered.
GROUNDMASS								
Plagioclase	25	25					Subhedral, prismatic microlites	Sometimes spherulitic, with plagioclase laths and clinopyroxene nucleating from common centers.
Clinopyroxene	20	20					Anhedral, equant to prismatic	
Titanomagnetite	5	5					Acicular to dendritic needles	Skeletal habits, no maghemite exsolution.
Mesostasis	15	25						Cryptocrystalline, pink-brown color. Partially altered to green clay. The altered patches may have been intersertal glass.
Sulfide	Trace	Trace	0.01	0.1	0.05		Anhedral	Intergrown with titanomagnetite in mesostasis.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Green clay	10				Olivine and glass	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	1	randomly	0.1	0.8	0.3	Zeolites and clay; spherical	

COMMENTS : One phenocryst relict (0.4 mm) is surrounded by a ring of radiating, equant to prismatic subhedral clinopyroxene (0.06 mm). The center is replaced by a microlitic assemblage of plagioclase, clinopyroxene and magnetite.
Photomicrograph #:
1140A-11 - Clinopyroxene phenocryst with weak sector zoning (x10 objective, xpl);
1140A-6,1140A-12 - Plagioclase phenocryst with calcic core and sodic rim (x10 objective, xpl).

THIN SECTION:	**183-1140A-31R-2, 16-20, Piece 3**					**Unit 2**	**OBSERVER:**	**NTA, CRN, JB**
ROCK NAME:	**Aphyric basalt.**							
WHERE SAMPLED:	**Interior of Unit 2, with sulfide vein.**							
GRAIN SIZE:	**Fine grained.**							
TEXTURE:	**Hypohyaline.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	<1	<1	0.2	2			Euhedral laths	Zoned. Some have sieve textured interiors.
Olivine	<1	<1	0.2	0.6			Skeletal, sub-equant	Completely altered to clay.
GROUNDMASS								
Plagioclase	25	25	<.01	0.8	0.3		Subhedral laths	In clusters with clinopyroxene, and as microlites in the glassy mesostasis.
Clinopyroxene	30	30	<.01	0.4	0.2		Anhedral	Zoned.
Olivine	0	5-10?	0.05	0.2	0.1		Equant, euhedral	Altered to green clay; difficult to distinguish from altered glass.
Titanomagnetite	5	5	<.01	0.03	0.02		Skeletal to equant	Skeletal morphologies from tiny parallel laths to chevrons and fishbones. No maghemite exsolution.
Glass	10	35-40						Well-defined pools of partially altered glass (0.1-0.2 mm) are evenly distributed through the groundmass. Fresh glass is devitrified.
Sulfide	Trace	Trace			<0.01		Anhedral	Inclusions in primary minerals and glass.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	35				Glass and olivine	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	<1			1		Clay	
Vein	1			0.2		Sulfide	

COMMENTS : A single 0.2 mm wide sulfide vein crosses the thin section. Sulfide is bright yellow but isotropic and is therefore probably not pyrite. Chalcopyrite seen in altered glass .

THIN SECTION:	**183-1140A-32R-1, 58-60, Piece 4**					**Unit 3**	**OBSERVER:**	**NTA, MSP, CRN, JB**
ROCK NAME:	**Aphyric basalt.**							
WHERE SAMPLED:	**Interior of Unit 3.**							
GRAIN SIZE:	**Fine grained.**							
TEXTURE:	**Originally hypohyaline with ophitic patches.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	<1	<1	0.5	3	1	An70 to 40	Euhedral laths	An-rich cores surrounded by strongly zoned mantles, essentially bimodal composition, with average An70-75 cores and An45-50 mantles.
Olivine?	<1	<1	0.2	0.6			Euhedral to skeletal?	Completely altered to clay.
GROUNDMASS								
Plagioclase	25	25	<.01	0.8	0.3		Subhedral laths	In clusters with clinopyroxene, and as microlites in the glassy mesostasis.
Clinopyroxene	30	30	<.01	0.4	0.2		Anhedral	Pale pink.
Olivine	0	<10?	0.05	0.2	0.1		Equant, euhedral	Altered to green clay; difficult to distinguish from altered glass.
Titanomagnetite	2	2	<.01	0.03	0.02		Skeletal to equant	Spectacular variety of skeletal morphologies. No maghemite exsolution.
Glass	10	35						Partially altered to clay.
Mesostasis	5	5						Cryptocrystaline, pink-brown color. Dusted with micron size opaques.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	35				Olivine, glass, plagioclase	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	<1			1		Clay	
Vein				0.2		Pyrite	

COMMENTS : Very fine veins (10-20 microns) of sulfide and disseminated (50 micron) grains of sulfide. The sulfide is isotropic and has internal reflection, suggesting that it may not be pyrite. Several vesicle-rich segregations are present. These are ellipsoidal areas (1 to 10 mm across) filled with <0.1 to 10 mm irregular vesicles and altered glass.
Photomicrograph #:
1140A-7 = Skeletal titanomagnetite (x50 objective, reflected light);
1140A-8 = Plagioclase phenocryst with calcic core and sodic rim (x10 objective, xpl);
1140A-9,10 = Sulfide veins and skeletal titanomagnetite (x50 objective, reflected light).

THIN SECTION:	**183-1140A-32R-3, 82-85**						**OBSERVER:**	**FB, DR**
ROCK NAME:	**Dolostone.**							
WHERE SAMPLED:	**From dolomitized chalk adjacent to basalt.**							
GRAIN SIZE:	**0.1-0.2 mm.**							
TEXTURE:	**Equicrystalline, dominantly euhedral dolomite crystals**							

PRIMARY MINERALOGY	**PERCENT category**	**PERCENT item**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
					0.15			
MINERAL(*)								
Dolomite		90					Most are euhedral.	
Dolomite var.#2		5						High relief compared to most of the dolomite.
BIOCLASTIC								
Planktonic foraminifer		1						Occur in burrows.
Benthic foraminifer								Single example occurs in burrow.
MATRIX								
Clay		5						Locally developed subhorizontal fabric. Lenticular voids within clay were probably formed during the thin section preparation.

CEMENT	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
(*)Technically, the majority of this sample is dolomite cement replacing nannofossil chalk.					
Burrow fill					Two burrow fills (each ~1 mm x 5 mm) consist of dark mixture of clays(?) and Mn/Fe oxides. Foraminifers are preserved these.

COMMENTS : The texture of this dolomite-rich rock is equigranular. Where dolomite is near 100%, the crystals are interlocking. Elsewhere, they are enclosed in a carbonate or clay matrix, which locally displays a subhorizontal lineation. Some of the dolomite shows anomalous high relief. This dolostone is inferred from core relationships to have formed by nearly complete dolomitization of pelagic ooze.

THIN SECTION:	**183-1140A-33R-2, 78-81, Piece 3**					**Unit 5**	**OBSERVER:**	**MSP, RD, CRN, JB**
ROCK NAME:	**Moderately plagioclase-phyric basalt.**							
WHERE SAMPLED:	**Interior of Unit 5.**							
GRAIN SIZE:	**Medium grained phenocrysts in a fine grained groundmass.**							
TEXTURE:	**Porphyritic with a subophitic, hypocrystalline groundmass.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	10	10	0.5	2.5	1	An70 (avg.)	Euhedral laths to anhedral grains with well-rounded margins	An-rich cores surrounded by strongly zoned mantles, distinctly bimodal with ~An75 cores and ~An50 mantles. Most are clustered in glomerocrysts but some are isolated.
Olivine	0	<1	0.2	1			Euhedral, prismatic	Several relatively large phenocrysts have completely altered to clay which has been plucked out during polishing.
GROUNDMASS								
Plagioclase	35	35	<.01	0.05	0.5		Subhedral laths	Gradation in size from microphenocryst to groundmass. In clusters with clinopyroxene, sometimes spherulitic, and as microlites in the glassy mesostasis. Slightly altered.
Clinopyroxene	30	30	<.01	0.8	0.2		Anhedral	Pale pink, sometimes with weak sector zoning. Slightly altered.
Olivine	0	<5?	0.05	0.2	0.1		Equant, euhedral	Altered to green clay; difficult to distinguish from altered glass.
Titanomagnetite	2	2	<.01	0.03	0.02		Skeletal equant	No maghemite exsolution.
Mesostasis	0	20						

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	20				Mainly olivine and glass, also groundmass clinopyroxene and plagioclase	
Calcite	Trace				Olivine	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	<1					Round, partially filled with brown clay	

COMMENTS : More altered than samples higher in section. The alteration is seen mainly as more crystalline clay after groundmass glass and olivine, but also as incipient alteration along glass inclusions and cleavage planes in plagioclase.

THIN SECTION:	**183-1140A-34R-5, 3-6, Piece 1A**					**Unit 6**	**OBSERVER:**	**RD, CRN**
ROCK NAME:	**Highly plagioclase-clinopyroxene-phyric basalt.**							
WHERE SAMPLED:	**Flow interior.**							
GRAIN SIZE:	**Medium grained phenocrysts in a fine grained groundmass.**							
TEXTURE:	**Seriate; intergranular to intersertal, ophitic to subophitic in patches.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
GLOMEROCRYSTS								
Plagioclase	2	2	3	6		~An70	Euhedral	Tightly packed clots of oscillatory zoned crystals.
PHENOCRYSTS								
Plagioclase	6	6	0.5	1		An65	Euhedral to subhedral	
Clinopyroxene	4	4	0.5	1			Subhedral to anhedral	Poikilitic around plagioclase laths.
GROUNDMASS								
Plagioclase	35	35	0.1	0.5	0.3		Subhedral	Range of grain sizes from phenocrysts through laths poikilitically included in clinopyroxene phenocrysts.
Clinopyroxene	35	35	0.1	0.5	0.3		Anhedral	Smallest grains are equant, intergranular. Slight alteration to clay.
Olivine	0	1					Euhedral	Possibly microphenocrysts. Altered to clay.
Titanomagnetite	<1	<1	<0.01	0.01			Acicular, anhedral	Dendritic ("fishbone") patterns in intersertal glass.
Mesostasis	10	20					Intersertal pools	Largely replaced by green-brown clay.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	10				Mesostasis and groundmass clinopyroxene, olivine	Clay replacing olivine is more crystalline and birefringent.
Sulfide	1				Veins	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Veins	<1				0.05	Sporadic pyrite	Sulfide (pyrite) found in groundmass around vein.

COMMENTS : The groundmass has patches of ophitic to subophitic texture and several areas (up to 2-5 mm) of small (0.05 mm) clinopyroxene intergrown with plagioclase laths (0.1 mm) and little to no glass.

THIN SECTION:	**183-1140A-35R-4, 49-50, Piece 1A**					**Unit 6**	**OBSERVER:**	**NTA, RD, CRN**
ROCK NAME:	**Highly plagioclase-clinopyroxene-phyric basalt.**							
WHERE SAMPLED:	**Massive interior of Unit 6.**							
GRAIN SIZE:	**Fine to medium-grained phenocrysts in a fine-grained groundmass.**							
TEXTURE:	**Porphyritic to seriate with an intergranular to intersertal groundmass.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	8	8	0.2	1	0.5	An70	Subhedral and euhedral laths	Most phenocrysts form parts of glomeroporphyritic clusters (2-6 mm across), together with clinopyroxene. Large grains have strongly zoned cores and distinct margins with less pronounced zoning.
Clinopyroxene	5	5	0.3	1	0.6		Blocky subhedral prisms	Poikilitic around plagioclase laths. Almost colorless. Occasional sector zoning but no pleochroism.
Olivine	0	<1		0.8			Equant, euhedral	"One large grain, completely altered to clay."
GROUNDMASS								
Plagioclase	35	35	<.01	0.7	0.2	An60	Elongate subhedral laths	Larger grains are blocky laths, smaller grains are spikey with irregular terminations. Wide range of grainsizes.
Clinopyroxene	30	30	<.01	0.5	0.3		Subhedral to anhedral, blocky grains	
Olivine	0	<1	0.05	0.3	0.1		Anhedral, equant"	Probably microphenocrysts. Completely altered and difficult to distinguish from patches of altered glass.
Titanomagnetite	2	2	<.01	0.02	0.01		Equant, skeletal	No maghemite exsolution.
Mesostasis	5	15						Crystallized to very fine-grained clinopyroxene, plagioclase and titanomagnetite in a glassy matrix. Clinopyroxene and plagioclase partly altered, glass completely altered.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	15				Olivine, mesostasis	Clay replacing olivine is more crystalline and birefringent.

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	1		0.3	1.6		Brown and green clay	

COMMENTS : The rock is almost seriate, but contains a population of larger phenocrysts of plagioclase and clinopyroxene. Excepting these, the grainsize varies continuously from ~0.7 mm to cryptocrystalline. Fine patches of pyrite are disseminated through the section, and look intergrown with silicates, however this is probably replacing altered groundmass. Pyrite also replaces part of a large altered olivine phenocryst.

THIN SECTION:	**183-1140A-36R-3, 119-121, Piece 1H**					**Unit: 6**	**OBSERVER:**	**KN, RD, JB, CRN**
ROCK NAME:	**Moderately plagioclase-glomerophyric basalt.**							
WHERE SAMPLED:	**Flow interior containing two glomerocrysts.**							
GRAIN SIZE:	**Fine grained groundmass.**							
TEXTURE:	**Glomeroporphyritic, porphyritic with a subophitic to intersertal groundmass.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
GLOMEROCRYSTS	5	5	4.5	8	6	An68	Subhedral to anhedral	Large (1.4 - 6 mm) plagioclase grains (90%) are intergrown with clinopyroxene (0.9 to 2.6 mm; 10%) and rare fresh olivine (0.3-1 mm). The plagioclase grains have zoned mantles around sieve-textured cores.
PHENOCRYSTS								
Plagioclase	2	2	0.7	1	0.8		Subhedral	
GROUNDMASS								
Plagioclase	40	40				An65	Subhedral	The plagioclase laths commonly radiate outward from common centers.
Clinopyroxene	35	35	0.1	0.7	0.5		Subhedral to anhedral	Grains have pink-brown rims and appear to have crystallized at the same time or just after the plagioclase. A small fraction is altered.
Olivine	<1	<1		0.2	0.3		Equant, anhedral	Rare grains distributed through the groundmass.
Titanomagnetite	5	5					Skeletal to euhedral equant crystals	No maghemite exsolution. Quench texture.
Sulfide	Trace	Trace			0.02		Anhedral	Some of these are intergrown with the primary oxide and silicate minerals but most appear secondary as they are associated with altered glass.
Glass	5	15						Some still fresh.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	10				Glass, clinopyroxene	The main alteration phase is olive-greenish brown with radiating habit and very low birefringence.

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

COMMENTS : This sample contains rare grains of fresh olivine, both in the largest glomerocryst and in the groundmass.
There is a patch (2 mm diameter) which has a much finer grained plagioclase-clinopyroxene-opaque groundmass. It looks continuous with the host groundmass (no chill) much like a reaction texture. This is a very crystalline pillow interior.

THIN SECTION:	**183-1140A-36R-4, 86-89, Piece 4**					**Unit 6**	**OBSERVER:**	**NTA, CRN**
ROCK NAME:	**Moderately plagioclase-clinopyroxene-phyric basalt.**							
WHERE SAMPLED:	**Margin of pillow.**							
GRAIN SIZE:	**Medium-grained phenocrysts in a fine-grained groundmass.**							
TEXTURE:	**Porphyritic with a hyalopilitic groundmass.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	5	5	0.4	1.6	0.8		Larger grains are blocky subhedral prisms; smaller grains are laths	Many grains form closely packed glomeroporphyritic clusters together with clinopyroxene; others are isolated. Most have unzoned cores with abundant glass inclusions and strongly zoned mantles.
Clinopyroxene	2	2	0.1	0.6	0.4			Possible sector zoning but no pleochroism.
GROUNDMASS								
Plagioclase	10	10	<.1	0.4	0.2	An70	Subhedral laths and microlties	
Clinopyroxene	10	10	<.1	0.3	0.2		Euhedral to subhedral	Almost colorless.
Olivine	<1	<1		0.3			Equant to blocky, euhedral	Altered to clay and replaced by hematite/maghemite around veins and alteration zones.
Titanomagnetite	5	5	<.01	0.08	<.01		Equant, skeletal	Some tabular forms. No maghemite exsolution.
Mesostasis	50	65						Mesostasis surprising fresh.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay, magnetite	15				Mesostasis, olivine	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	0-10			1.5		Clay and carbonate; irregular	The fine-grained part of the section is moderately vesicular.
Veins	1-3			0.1		Opaque clay, hematite, goethite	In transmitted light, one vein is filled with orange-brown glass which grades into opaque areas/clots (up to 0.2 mm). The vein was probably filled originally with iron-rich glass which has altered to hematite/maghemite.

COMMENTS : One side of the thin section is dark yellowish-brown, and an irregular deep-brown streak crosses the center of the section. These changes of color result from alteration around veins that appears to have altered glass to hematite/maghemite masses. In this area sieve-textured plagioclase with abundant glass inclusions now have secondary opaque inclusions.

The distinction between phenocrysts and groundmass grains is arbitrary (the texture could be described as seriate) but there is a population of plagioclase and pyroxene grains with larger-than average size. Equally arbitrary is the distinction between mesostasis and finely crystallized groundmass. Irregular patches with slightly coarser grain size but similar mineralogy are present through the section, there is also a change in groundmass crystallinity from one side of the section to the other.

No sulfide present.

THIN SECTION:	**183-1140A-37R-1, 46-49, Piece 1C**					**Unit: 6**	**OBSERVER:**	**KN, JB, CRN**
ROCK NAME:	**Moderately plagioclase-clinopyroxene glomerocrystic basalt.**							
WHERE SAMPLED:	**Interior of a pillow basalt.**							
GRAIN SIZE:	**Fine grained.**							
TEXTURE:	**Glomeroporphyritic and porphyritic with a subophitic to intersertal groundmass.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
GLOMEROCRYSTS	5	5	2	3.5	3		Subhedral	Large strongly zoned plagioclase laths (0.5-1.5 mm) form ~85% of the glomerocryst; the remainder is composed of anhedral clinopyroxene (0.2-0.6 mm) and rare subhedral olivine (0.5 - 0.8 mm). The latter totally replaced by olive-green clay.
PHENOCRYSTS								
Plagioclase	1	1	0.2	0.5	0.3		Subhedral	Some isolated, strongly zoned grains are not parts of glomerocrysts.
GROUNDMASS								
Plagioclase	35	35	0.2	0.7	0.5	An70		
Clinopyroxene	35	35	0.1	0.6	0.4			The larger clinopyroxene microphenocrysts have undulatory extinction and appear strained, although this could be sector zoning seen in an oblique section of the crystal.
Olivine	0	1	0.15	0.5	0.4		Subhedral	The olivine microphenocrysts have been completely altered to clay and zeolite.
Titanomagnetite	4	4	0.05	0.2			Skeletal	No maghemite exsolution.
Glass/mesostasis	<5	20						Intersertal pools of glass are scattered unevenly through the section. Some fresh areas still present.
Sulfides	Trace	Trace		0.1	<0.01		Anhedral	One large patch of pyrite is probably secondary; several small grains of pyrite or pentlandite and chalcopyrite in pools of groundmass glass may also result from alteration.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	20				Glass, mesostasis and olivine; fills vesicles	Olive-greenish brown, fibrous.

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	<1				0.1	Round; filled with clay	

COMMENTS : Irregular patches have far smaller grain size but similar mineralogy to the rest of the sample. Could these be fragments of crust that foundered and were entrained into the interior of the pillow?
Sulfide (pyrite) inclusions seen in primary phases, especially titanomagnetite.
Photomicrograph #:
1140A-27 = Sulfide (pyrite?) inclusion in primary (skeletal) titanomagnetite (x50 objective, reflected light).

THIN SECTION:	**183-1140A-37R-3, 104-107, Piece 2**					**Unit 6**	**OBSERVER:**	**NTA, JB, CRN**
ROCK NAME:	**Highly plagioclase-clinopyroxene-phyric basalt.**							
WHERE SAMPLED:	**Margin of pillow in Unit 6.**							
GRAIN SIZE:	**Fine-grained phenocrysts in a glassy groundmass.**							
TEXTURE:	**Porphyritic with a hyalopilitic groundmass.**							

PRIMARY MINERALOGY	**PERCENT PRESENT**	**PERCENT ORIGINAL**	**SIZE (mm) min.**	**max.**	**av.**	**APPROX. COMP.**	**MORPHOLOGY**	**COMMENTS**
PHENOCRYSTS								
Plagioclase	7	7	<.1	1.5	0.2	An70	Subhedral and euhedral laths	Zoned. Occurs as isolated grains and in glomerocrysts with clinopyroxene.
Clinopyroxene	8	8	<.1	0.4	0.2		Equant, subhedral to euhedral	Sector zoned. No pleochroism.
Olivine	0	<1		0.2	0.1		Equant, euhedral	Completely altered to brown and colorless clay and carbonate. As the glassy margin is approached alteration is typically to carbonate and is accompanied by red-brown (iron (hydr)oxide staining of rims, fractures and the surrounding groundmass.
GROUNDMASS								
Titanomagnetite	3	3		<0.01			Skeletal	Occurs around perimeters of microspherules in places forming a network between impinging microspherules. No maghemite exsolution.
Glass/mesostasis	60	85						The groundmass is still mostly fresh and grades from cryptocrystalline mesostasis to devitrified glass as the pillow margin is neared. Devitrification of the glass has resulted in microspherulites (0.02 mm) probably consisting of cryptocrystalline plagioclase and clinopyroxene.

SECONDARY MINERALOGY	**PERCENT**	**SIZE (mm) min.**	**max.**	**av.**	**REPLACING / FILLING**	**COMMENTS**
Clay	25				Glass, olivine	
Carbonate	<1				Olivine; fills vesicles	

VESICLES/ CAVITIES	**PERCENT**	**LOCATION**	**SIZE (mm) min.**	**max.**	**av.**	**FILLING / MORPHOLOGY**	**COMMENTS**
Vesicles	2		0.1	2	0.6	Filled with clay and calcite, lined with goethite	

COMMENTS : Section has a brown (altered) hue.
No sulfide observed.