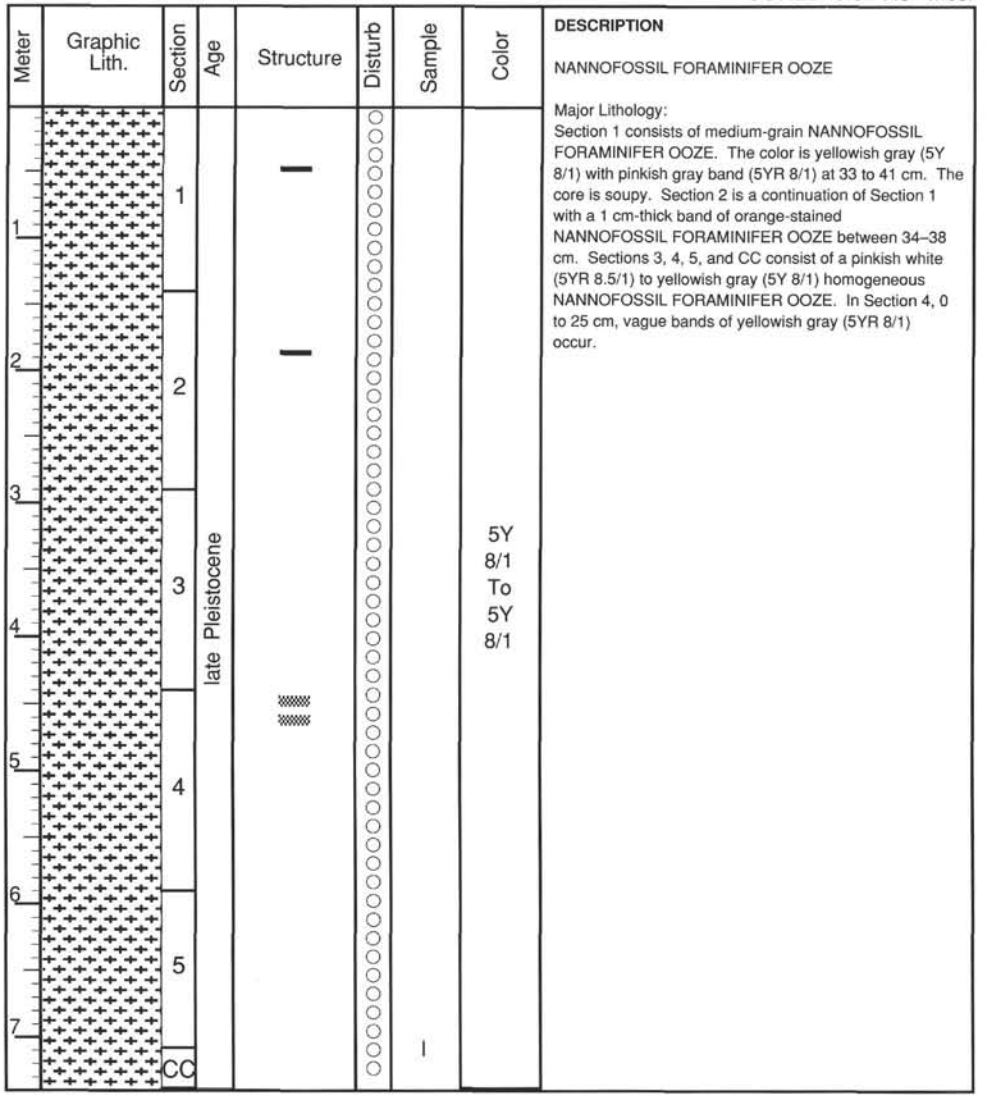
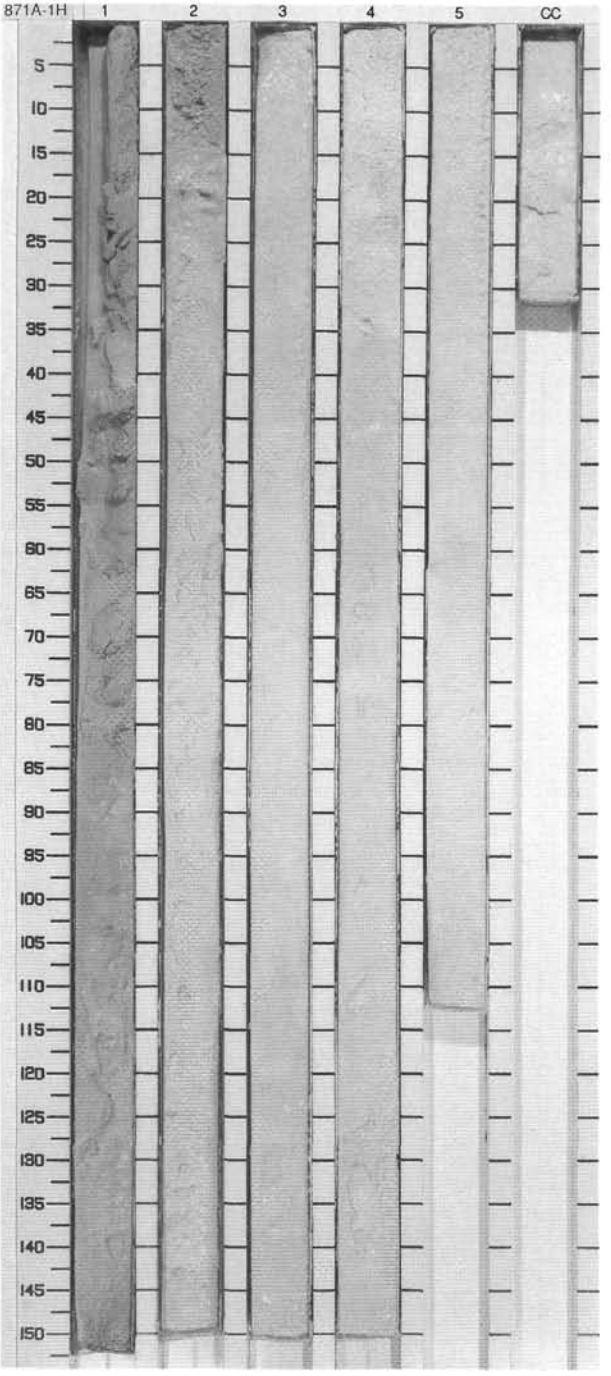
SITE 871 HOLE A CORE 1H CORED 0.0 - 7.5 mbsf



DESCRIPTION

NANNOFOSSIL FORAMINIFER OOZE

Major Lithology:
Section 1 consists of medium-grain NANNOFOSSIL FORAMINIFER OOZE. The color is yellowish gray (5Y 8/1) with pinkish gray band (5YR 8/1) at 33 to 41 cm. The core is soupy. Section 2 is a continuation of Section 1 with a 1 cm-thick band of orange-stained NANNOFOSSIL FORAMINIFER OOZE between 34–38 cm. Sections 3, 4, 5, and CC consist of a pinkish white (5YR 8.5/1) to yellowish gray (5Y 8/1) homogeneous NANNOFOSSIL FORAMINIFER OOZE. In Section 4, 0 to 25 cm, vague bands of yellowish gray (5YR 8/1) occur.



Information on Core Description Forms, for ALL sites, represents field notes taken aboard ship. Some of this information has been refined in accord with post-cruise findings, but production schedules prohibit definitive correlation of these forms with subsequent findings. Thus, the reader should be alerted to the occasional ambiguity or discrepancy.

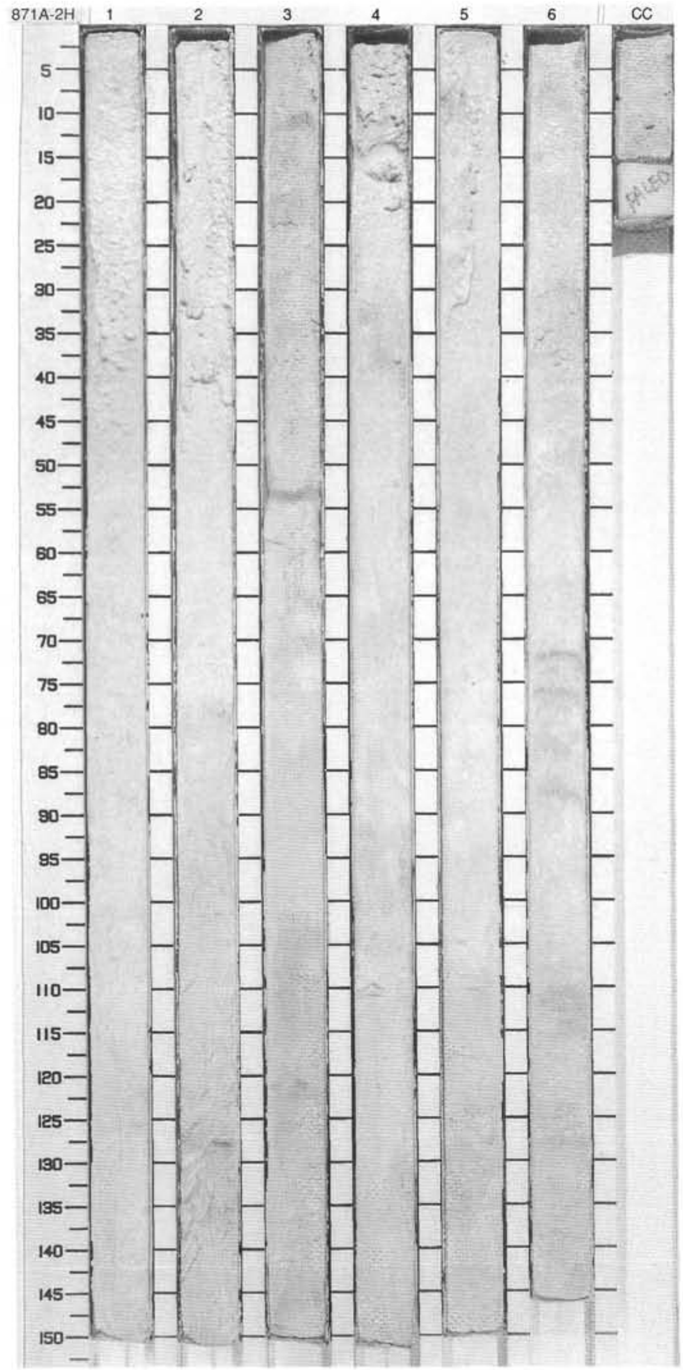
SITE 871 HOLE A CORE 2H CORED 7.5 - 17.0 mbsf

Meter	Section	Age	Structure	Disturb	Sample	Color
0–1.5	1	early Pleistocene		○		
1.5–3	2		≋	○	S	
3–4.5	3			○		
4.5–6	4			○	P, S	5YR 8/1
6–7.5	5			○		
7.5–9	6		≋	○	S, S	
9	CC			○	I	

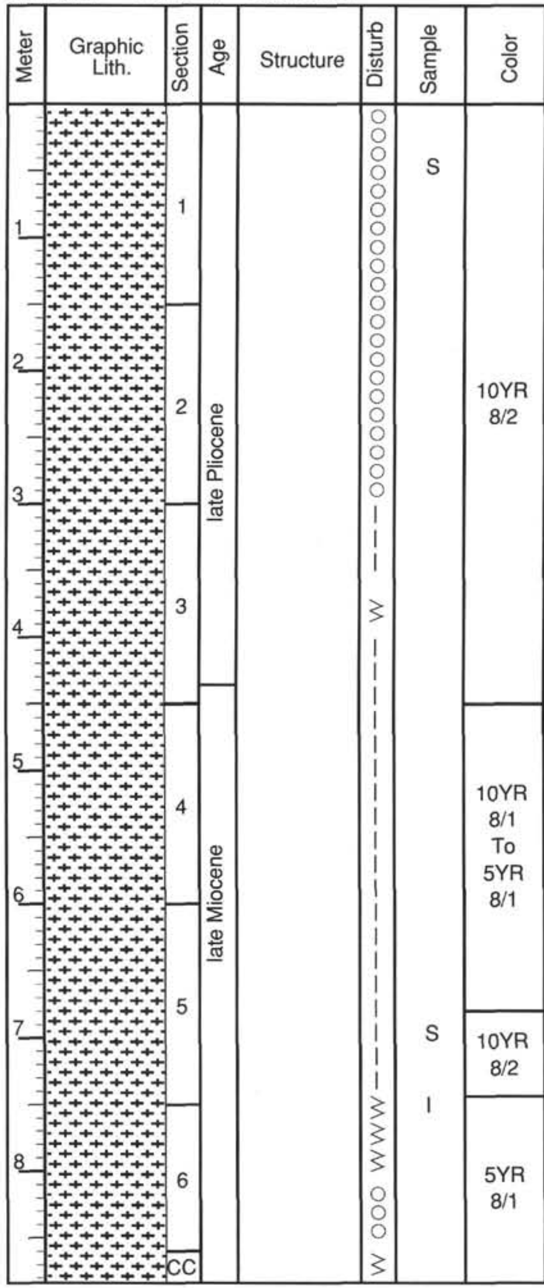
DESCRIPTION

NANNOFOSSIL FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (5YR 8/1), NANNOFOSSIL FORAMINIFER OOZE, soupy to highly disturbed. Sections 2, 3, and 6 contain vague color bands that are light brownish gray (2.5Y 6/2). Medium to fine grain black specks are scattered throughout the entire core.



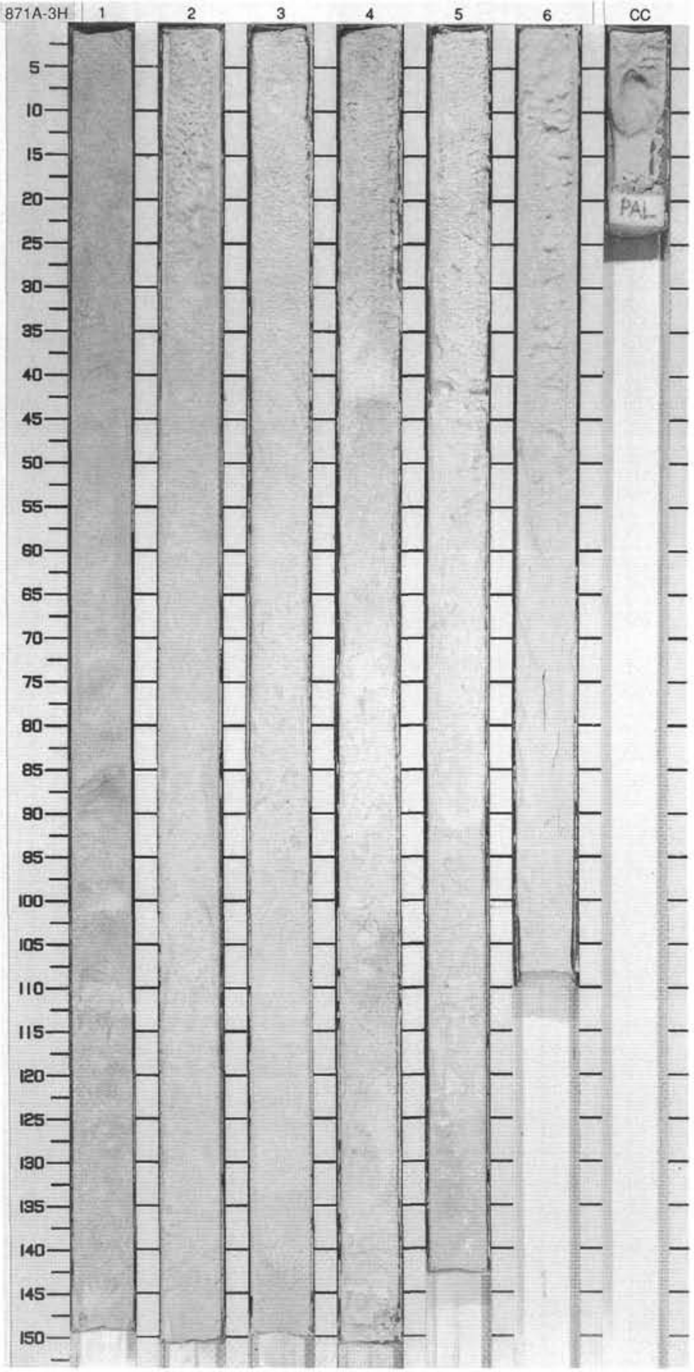
SITE 871 HOLE A CORE 3H CORED 17.0 - 26.5 mbsf



DESCRIPTION

NANNOFOSSIL FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/1 to 10YR 8/2), NANNOFOSSIL FORAMINIFER OOZE, soupy to moderately disturbed. Medium- to fine-grained dark specks are scattered throughout the core and are especially abundant in Sections 1 and 2.



871A-1H
CORED 0.0 - 7.5 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
late Pleistocene
P. lacunosa
G. oceanica
E. huxleyi
E. huxleyi Acme
N22
5Y 8/1 to 5Y 8/1
871A-2H
CORED 7.5 - 17.0 mbsf
early Pleistocene
C. macintyrei
H. sellii
Small Gephyrocapsa
P. lacunosa
N22
5YR 8/1
871A- 3H
CORED 17.0 - 26.5 mbsf
late Pliocene
late Miocene
C. macintyrei
CN 12d
CN 12a
CN 10a
N21
N19/20
N17b
Mixed
10YR 8/2
10YR 8/1 to 5 YR 8/1
5YR 8/1

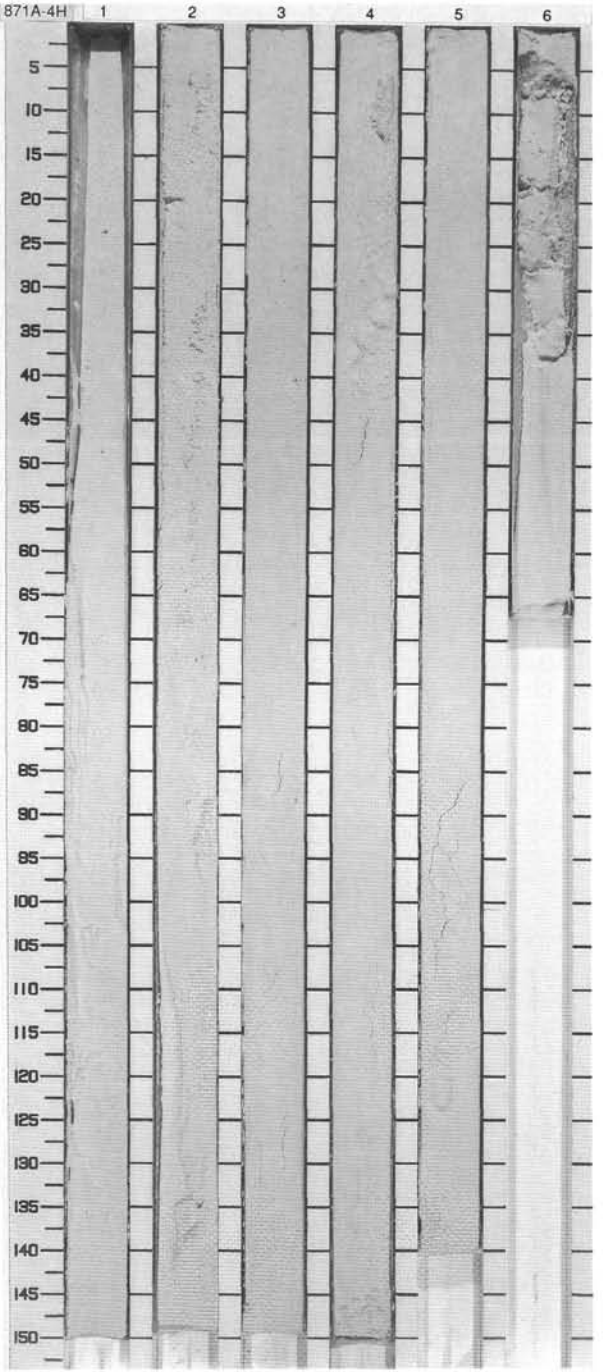
SITE 871 HOLE A CORE 4H CORED 26.5 - 36.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–8		1	middle Miocene				10YR 8/2
		2				S	10YR 8/2 To 10YR 8/3
		3					
		4					10YR 8/2
		5				S	
		6				I	
		CC					

DESCRIPTION

NANNOFOSSIL FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/1 to 10YR 8/2), NANNOFOSSIL FORAMINIFER OOZE, soupy and structureless. In Section 2 many foraminifers are stained very pale brown (10YR 8/3). Medium- to fine-grained black specks are scattered throughout the core, but are most abundant in Sections 1 and 2. Several brown flakes in Sections 1 and 2 appear to be rust or oil from drilling.



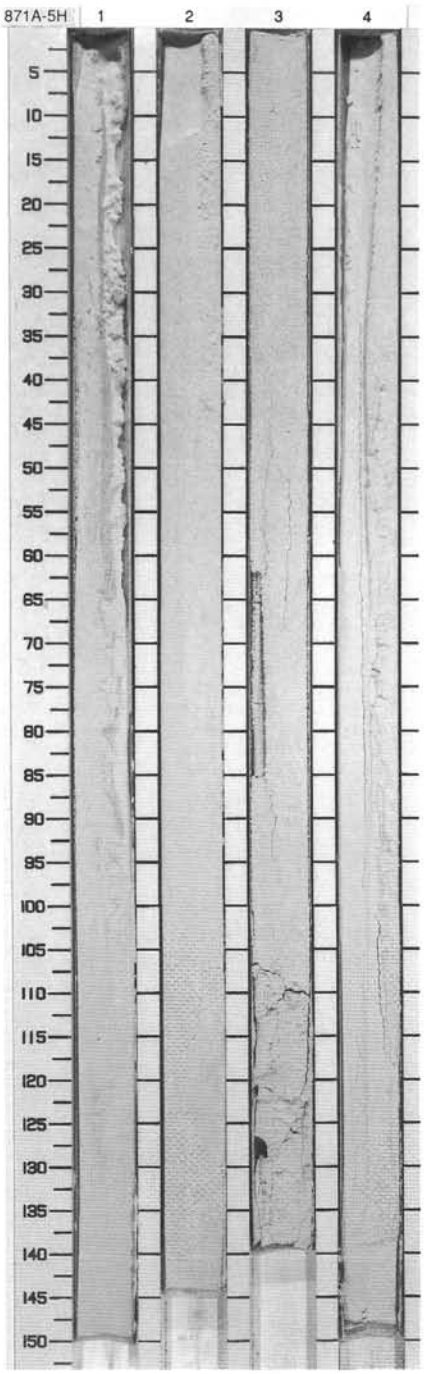
SITE 871 HOLE A CORE 5H CORED 36.0 - 45.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–6		1, 2, 3, 4	middle Miocene			I, S, P, S	10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/2) FORAMINIFER OOZE.
The entire core is soupy.



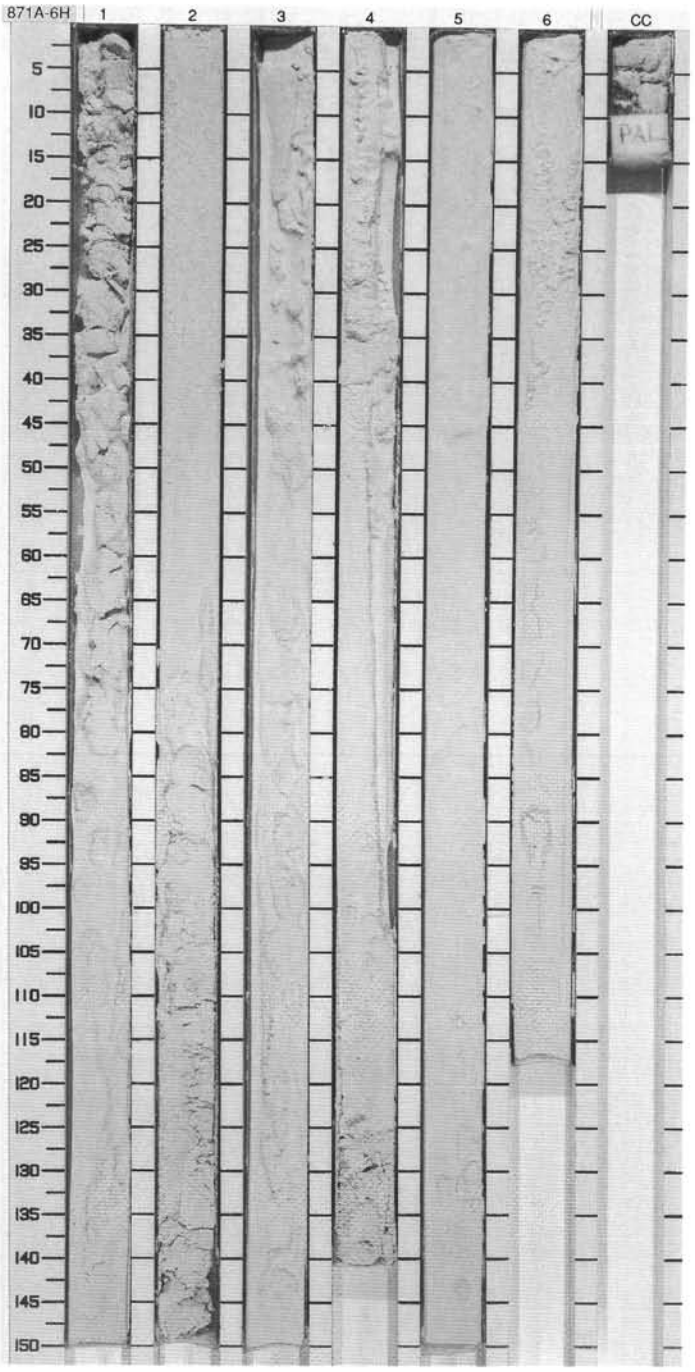
SITE 871 HOLE A CORE 6H CORED 45.5 - 55.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–8		1, 2, 3, 4, 5, 6, CC	middle Miocene			S, I, S	10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/2), fine- to medium-grained FORAMINIFER OOZE, soupy and structureless.



871A-4H CORED 26.5 - 36.0 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1		1	middle Miocene	CN 5e	mixed				S	10YR 8/2
2		2								10YR 8/2 to 10YR8/3
3		3			N12					
4		4								10YR 8/2
5		5							S	
7									I	
8		CC		R/M	A/G	B				

871A-5H CORED 36.0 - 45.5 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1		1	middle Miocene	CN 5b	N12				I	10YR 8/2
2		2							S	
3		3							P	
4		4							S	
6				R/M	A/G	B				

871A- 6H CORED 45.5 - 55.0 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1		1	middle Miocene	CN 5b	N12				S	10YR 8/2
2		2								
3		3			N11				I	
4		4								
5		5		CN 4	N10				S	
6		6								
8		CC		R/M	A/G	B				

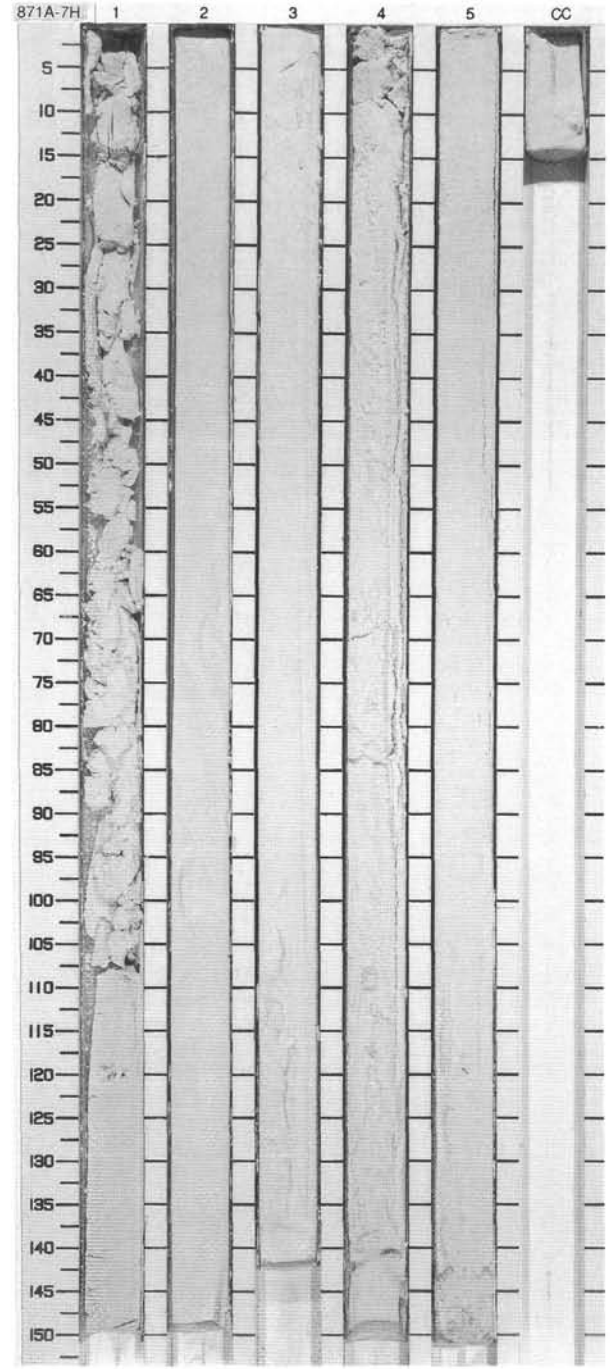
SITE 871 HOLE A CORE 7H CORED 55.0 - 64.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–7		1–5, CC	middle Miocene			S, S, S, S, S	10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/2), fine- to medium-grained FORAMINIFER OOZE, soupy and structureless.



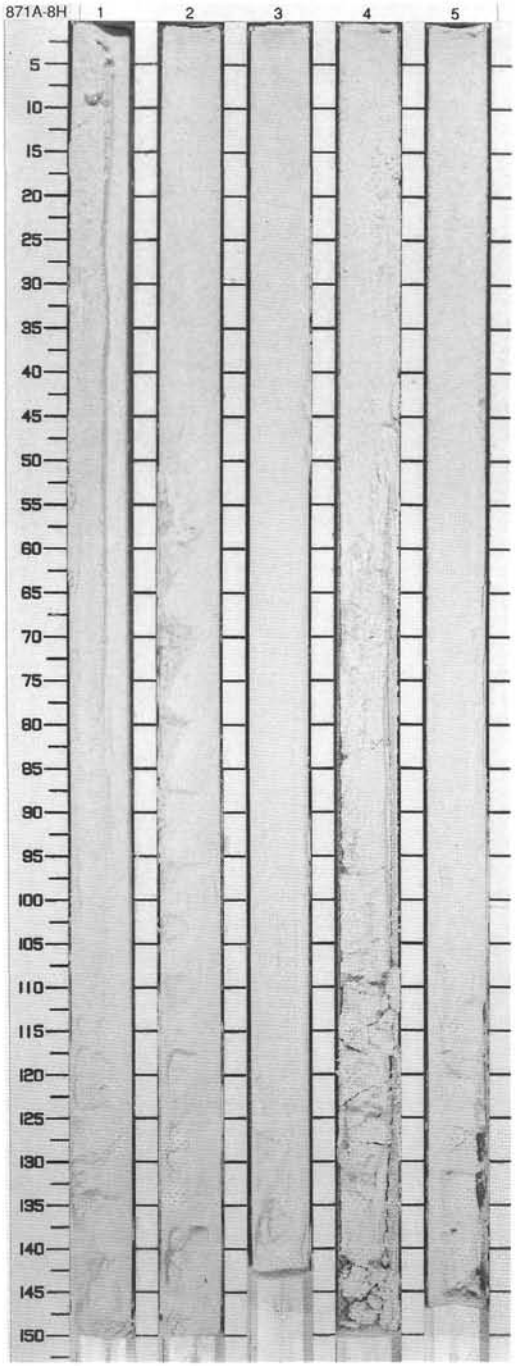
SITE 871 HOLE A CORE 8H CORED 64.5 - 74.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–7		1, 2, 3, 4, 5, CC	middle Miocene			S, I, S	10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/2), fine- to medium-grained FORAMINIFER OOZE. The entire core is soupy and structureless. The core catcher was only 4 cm long; all of it went to the paleontologists.



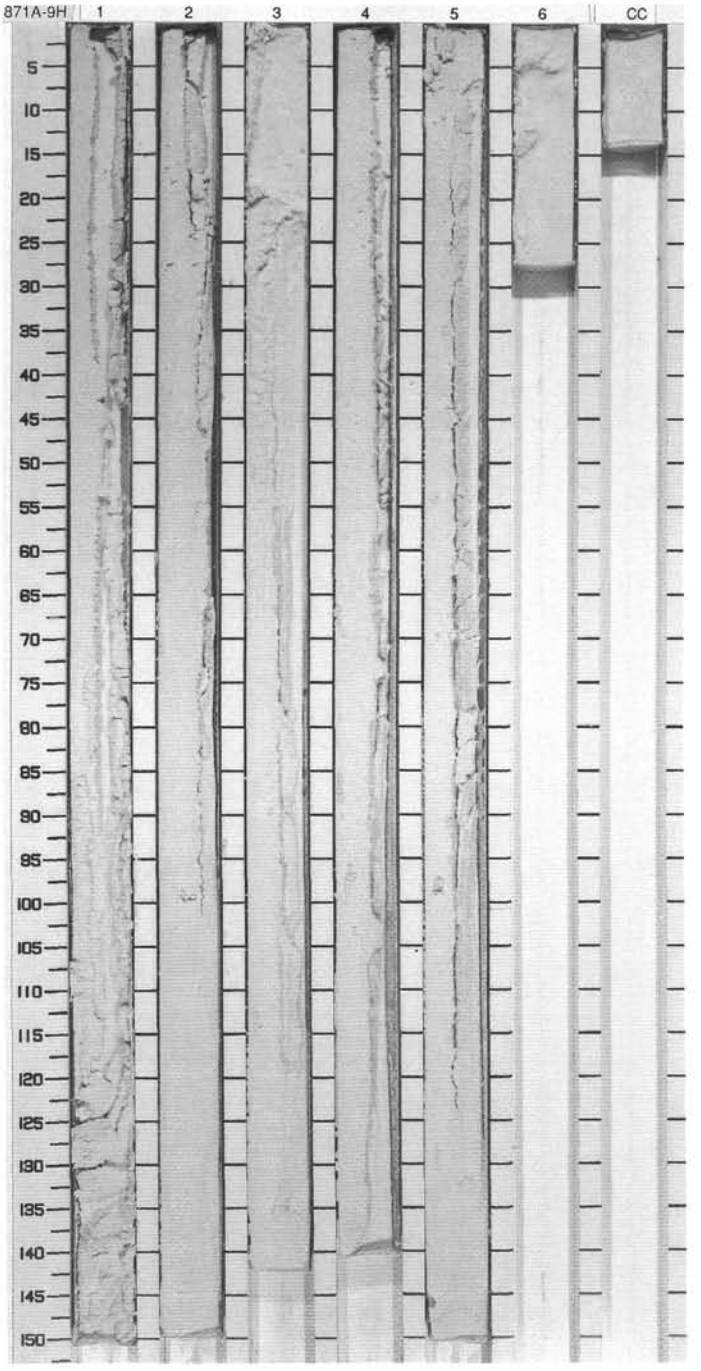
SITE 871 HOLE A CORE 9H CORED 74.0 - 83.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–7		1	middle Miocene			S I P S	10YR 8/2
		2					10YR 8/1
		3					
		4					
		5					10YR 8/2
		6					10YR 8/1
		CC					

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/2 to 10YR 8/1), fine- to medium-grained FORAMINIFER OOZE. The entire core is soupy and structureless.



871A-7H CORED 55.0 - 64.5 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1–7		1	middle Miocene	CN 4	N9	B			S	10YR 8/2
		2							S	
		3							S	
		4							I	
		5							S	
		CC		R/M	A/G				S	

871A-8H CORED 64.5 - 74.0 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1–7		1	middle Miocene	CN 4	N8	B			S	10YR 8/2
		2								
		3							I	
		4							S	
		5								
		CC		R/M	A/G					

871A- 9H CORED 74.0 - 83.5 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1–7		1	middle Miocene	CN 4	N8	B			S	10YR 8/2
		2								
		3			N7				I	
		4							P	
		5							S	10YR 8/1
		6								
		CC		R/M	A/G					

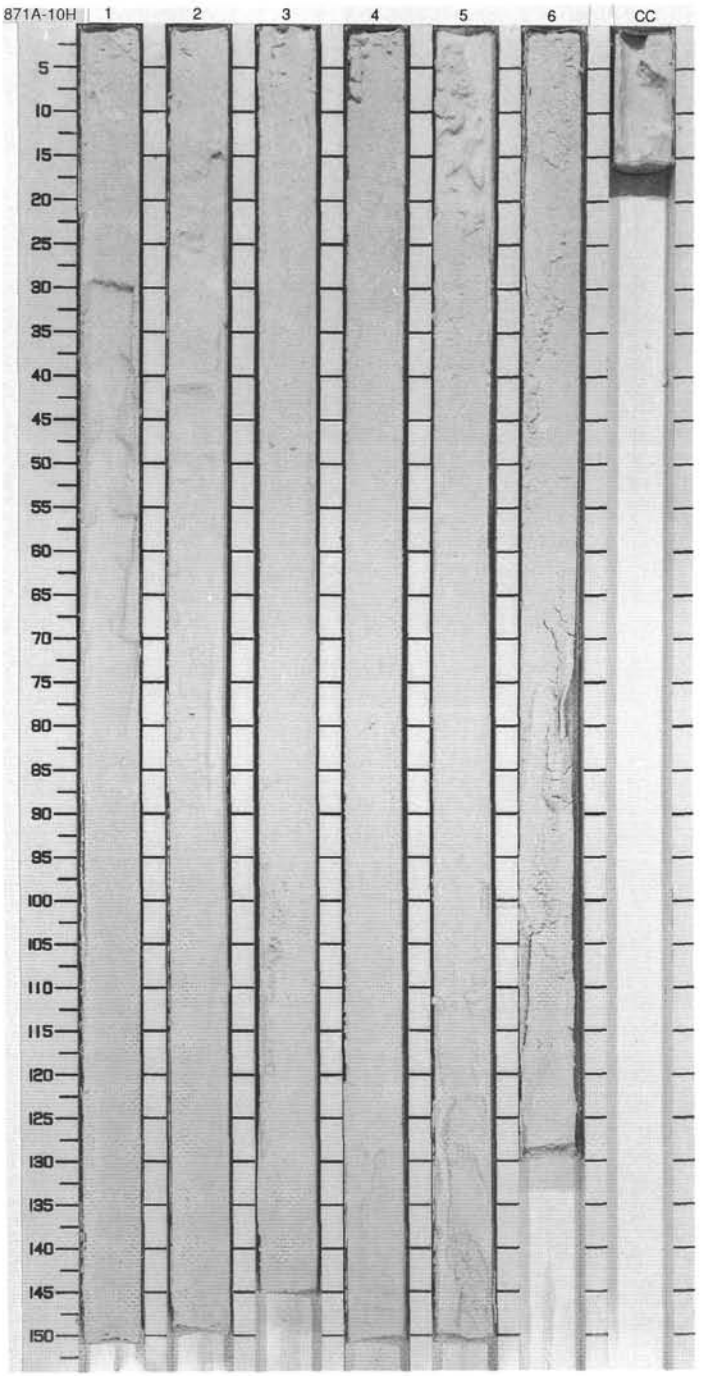
SITE 871 HOLE A CORE 10H CORED 83.5 - 93.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–9		1–6, CC	early Miocene			S, I, S, P	10YR 8/1

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/2) FORAMINIFER OOZE consisting of medium- to fine-grained sands. The entire core is soupy and structureless.



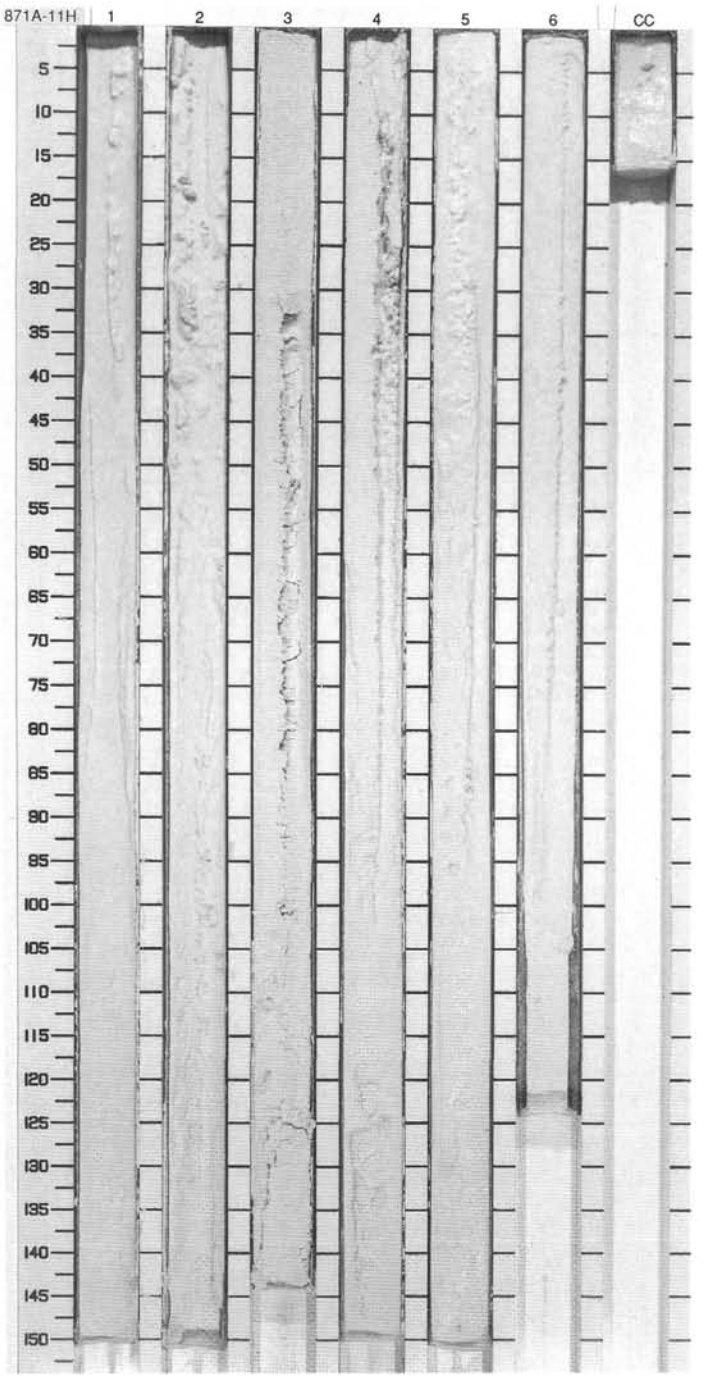
SITE 871 HOLE A CORE 11H CORED 93.0 - 102.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–8		1, 2, 3, 4, 5, 6, CC	early Miocene			S, S, I	10YR 8/1

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/2) FORAMINIFER OOZE. The entire core is soupy and structureless.



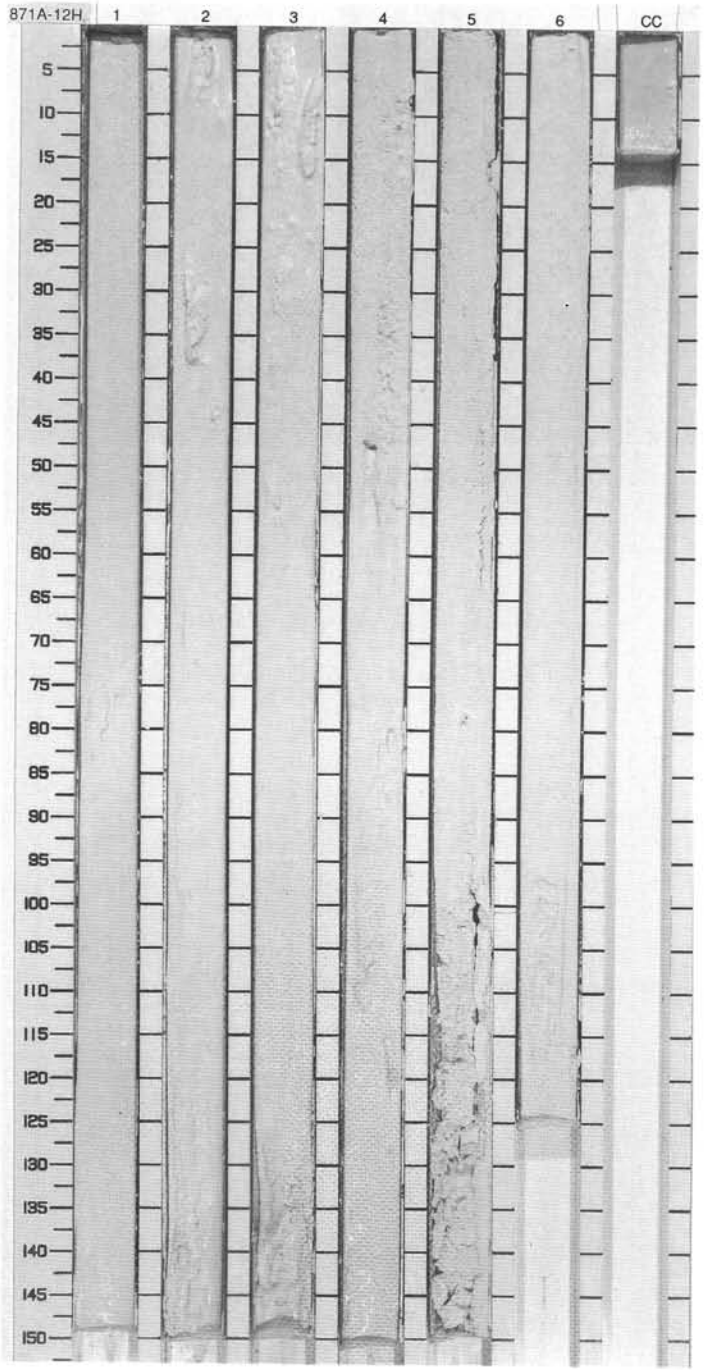
SITE 871 HOLE A CORE 12H CORED 102.5 - 112.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–8		1, 2, 3, 4, 5, 6, CC	early Miocene			S (Sections 2 and 5)	10YR 8/1

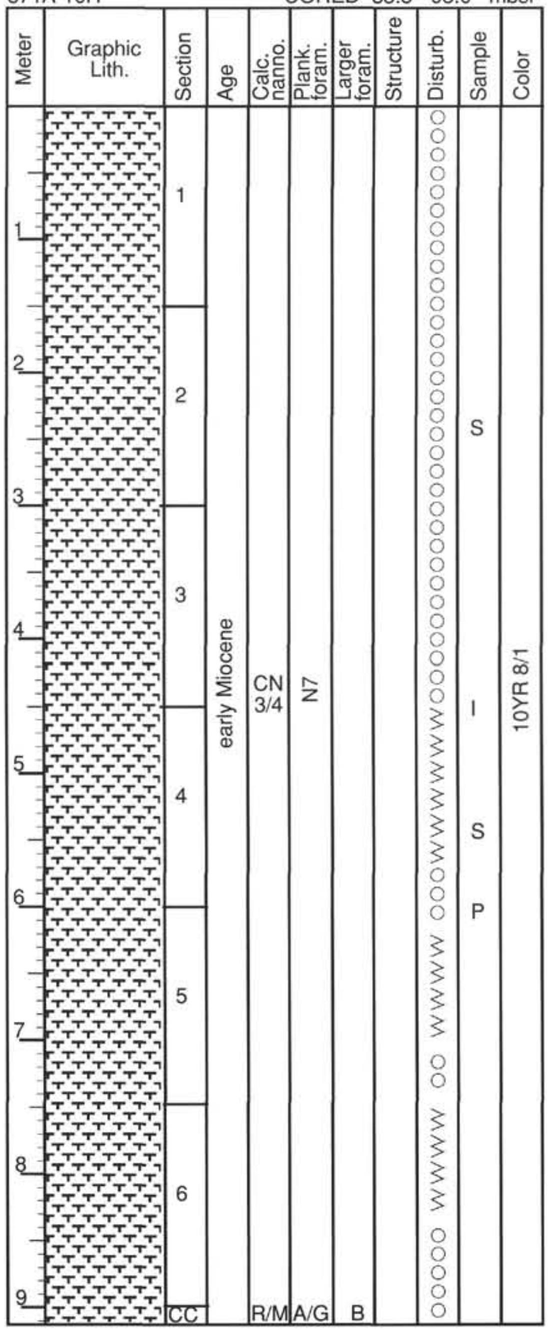
DESCRIPTION

FORAMINIFER OOZE

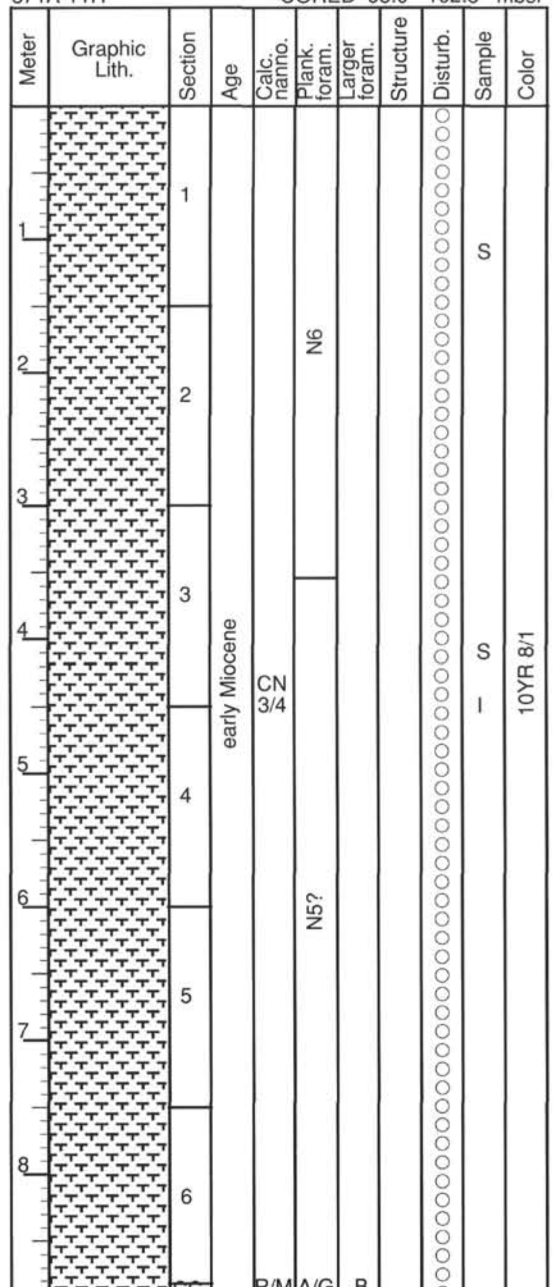
Major Lithology:
Homogeneous, white (10YR 8/2), medium- to fine-grained FORAMINIFER OOZE. The entire core is soupy and structureless.



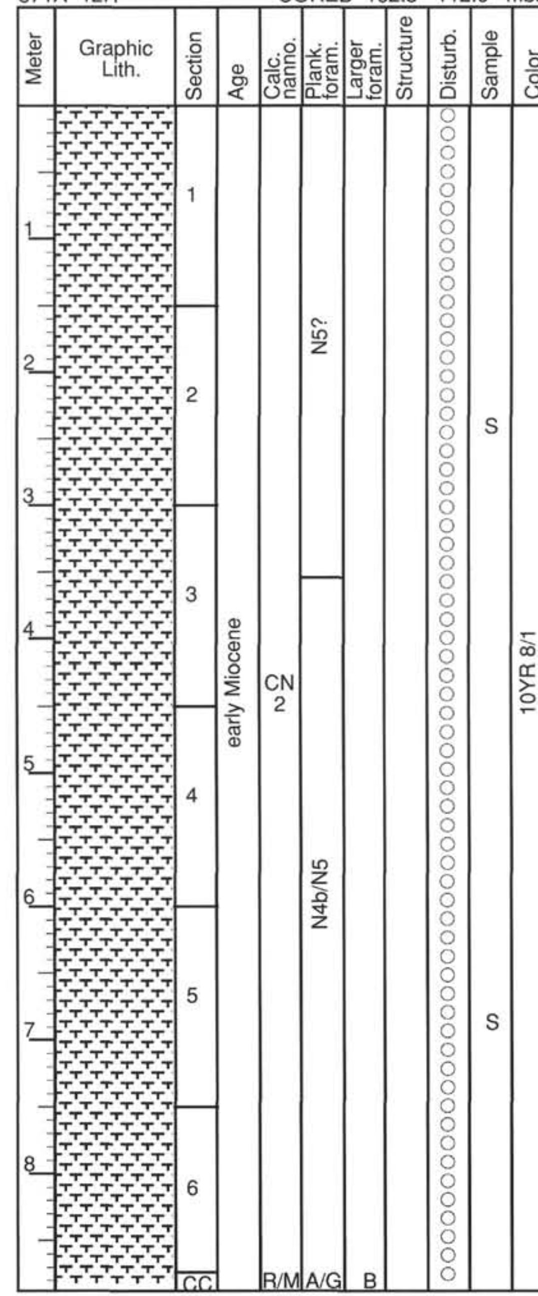
871A-10H CORED 83.5 - 93.0 mbsf



871A-11H CORED 93.0 - 102.5 mbsf



871A- 12H CORED 102.5 - 112.0 mbsf



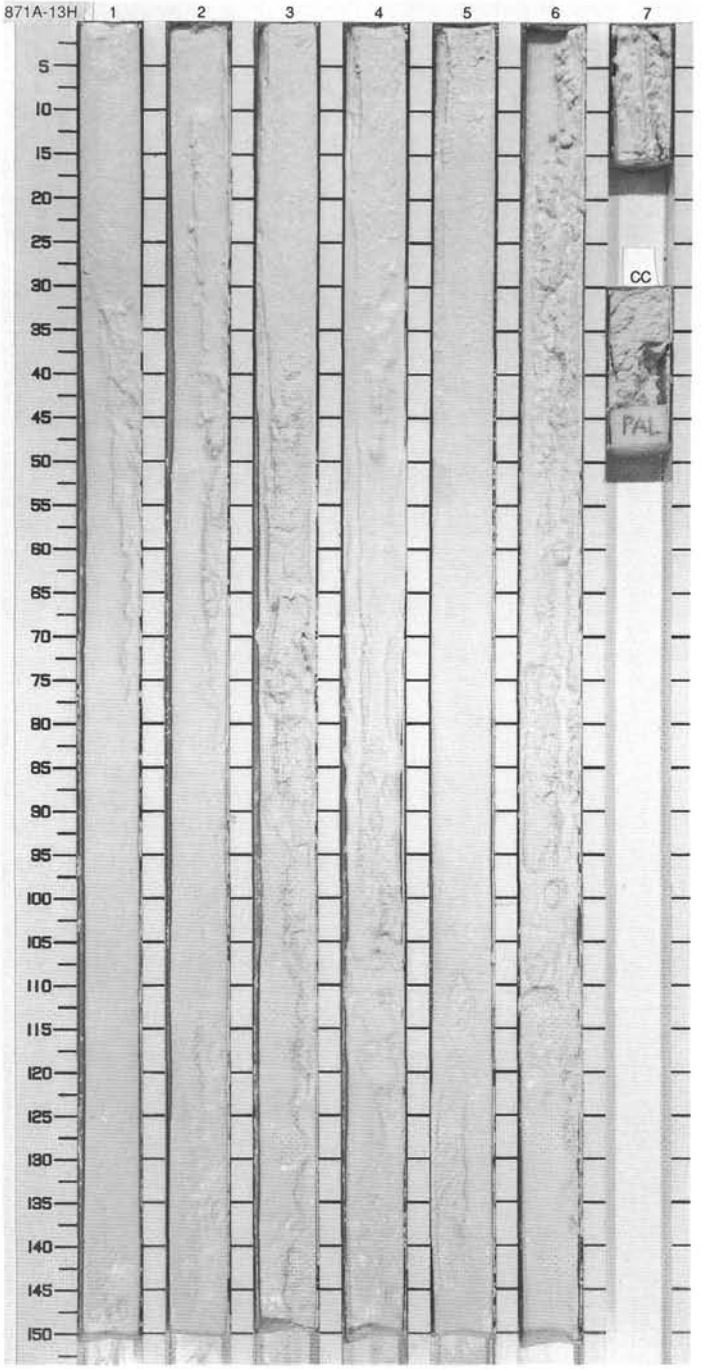
SITE 871 HOLE A CORE 13H CORED 112.0 - 121.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–9		1, 2, 3, 4, 5, 6, 7, CC	early Miocene			S, S	10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/2), FORAMINIFER OOZE with a medium- to fine-grained texture. The entire core is soupy and structureless.



SITE 871 HOLE A CORE 14H

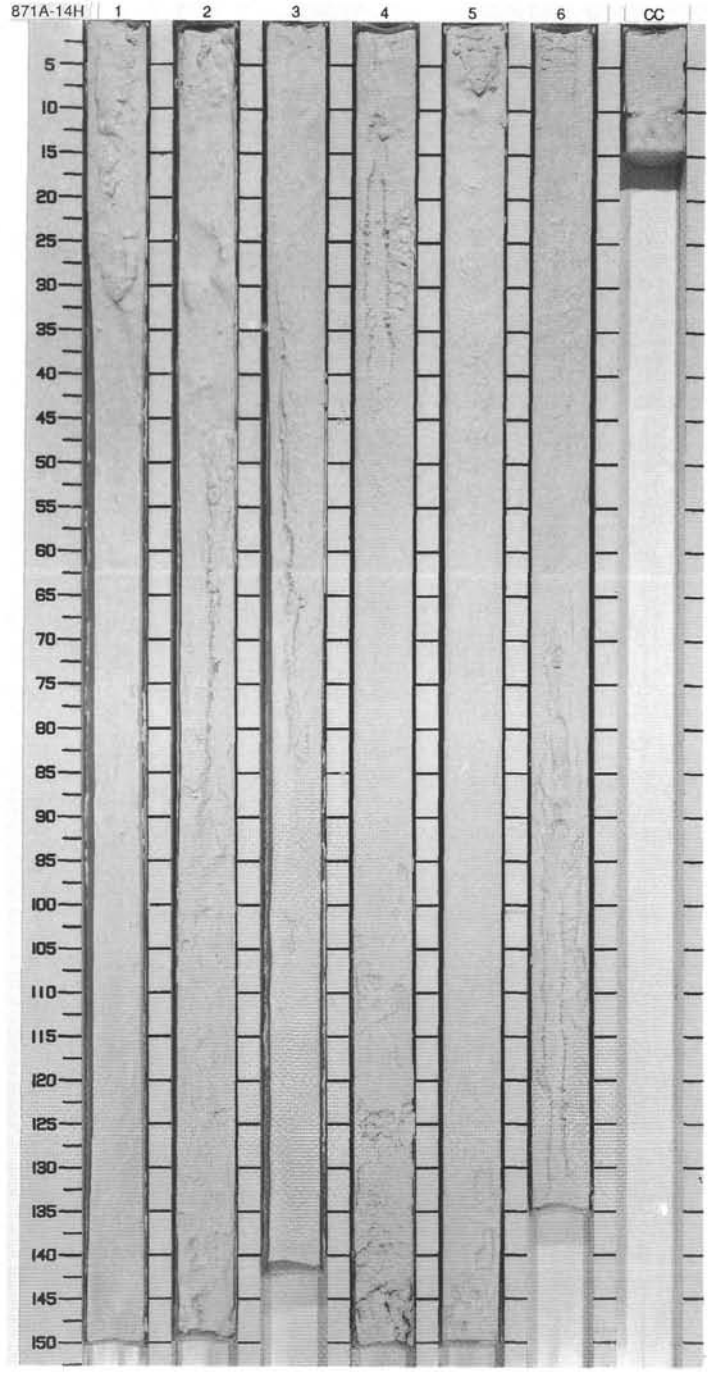
CORED 121.5 - 130.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–8		1, 2, 3, 4, 5, 6, CC	early Miocene		W	S, I, S	

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 9/2) FORAMINIFER OOZE. *The entire core is highly disturbed to soupy.* Any structures or variations in color, texture, and composition have been destroyed. Firm to hard lumps up to 2 cm long, in Sections 1, 4, 5, 6, and CC, may reflect the onset of lithification. A single smear slide from a lump showed very little breakage of foraminifers.



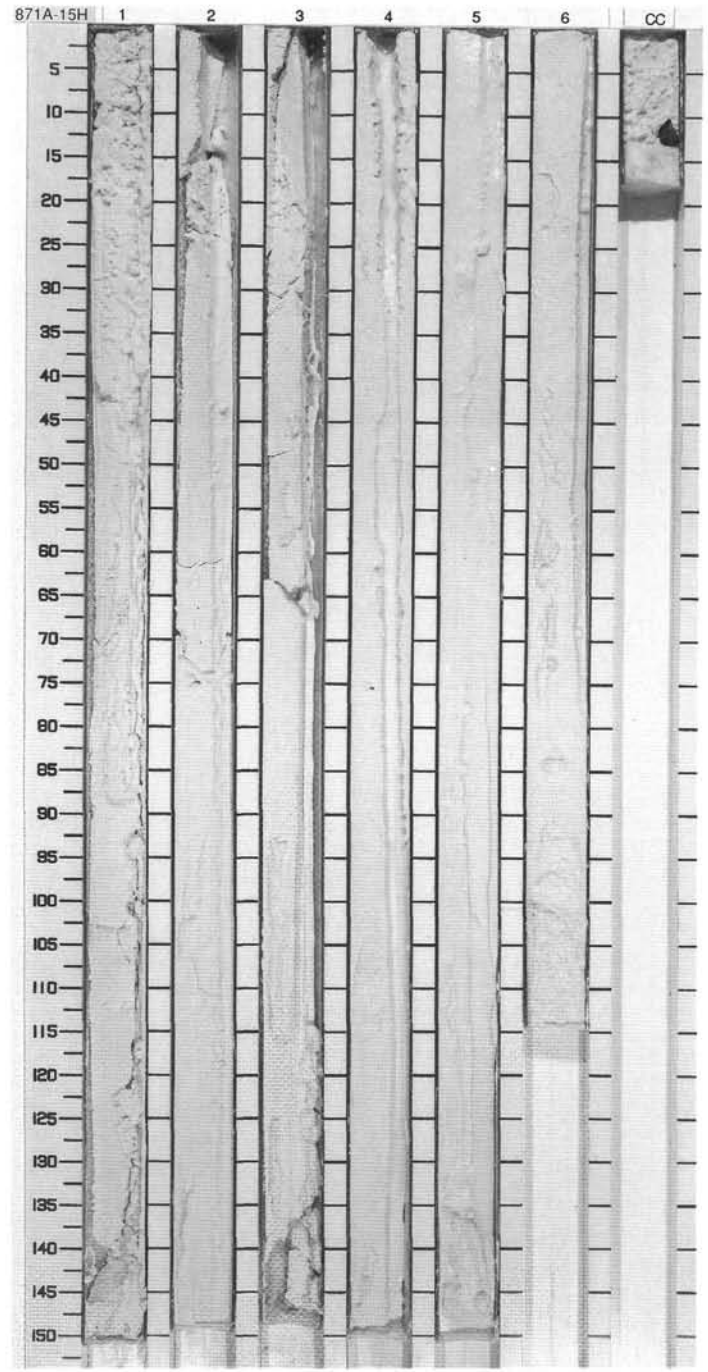
SITE 871 HOLE A CORE 15H CORED 130.5 - 139.5 mbsf

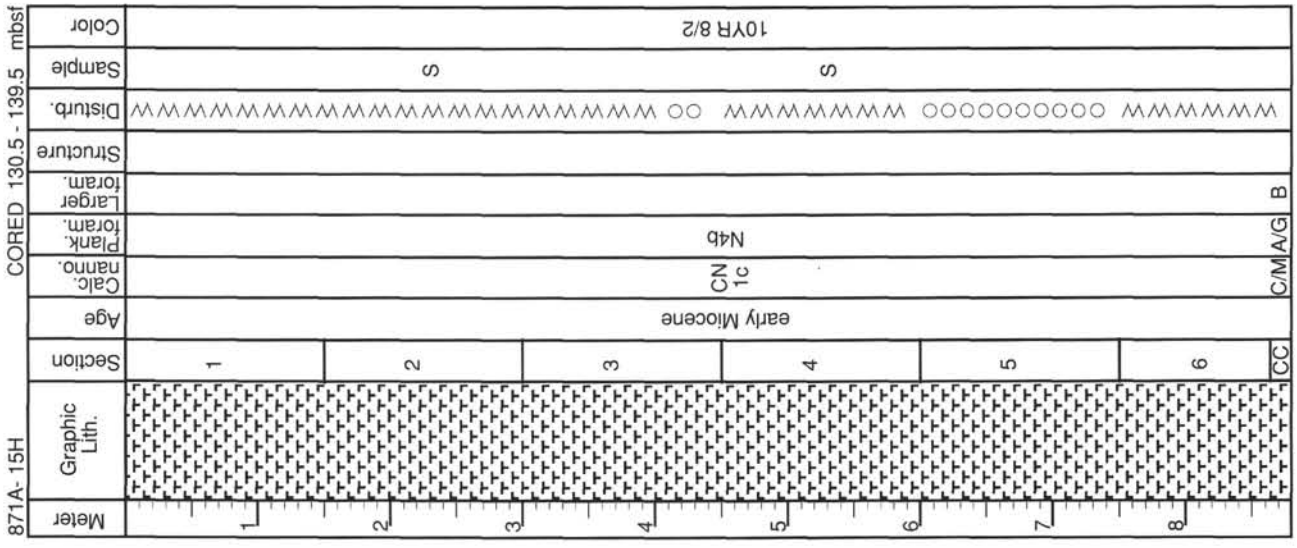
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0–1		1	early Miocene				10YR 8/2
2		2				S	
3–4		3					
5		4				S	
6–7		5					
8		6					
		CC					

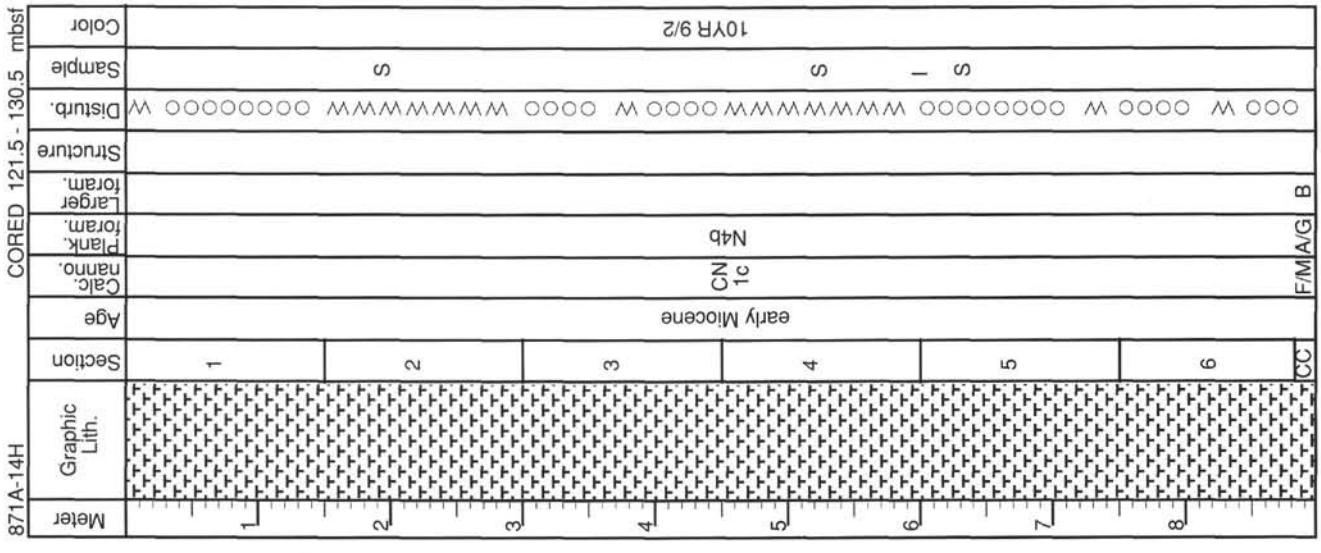
DESCRIPTION

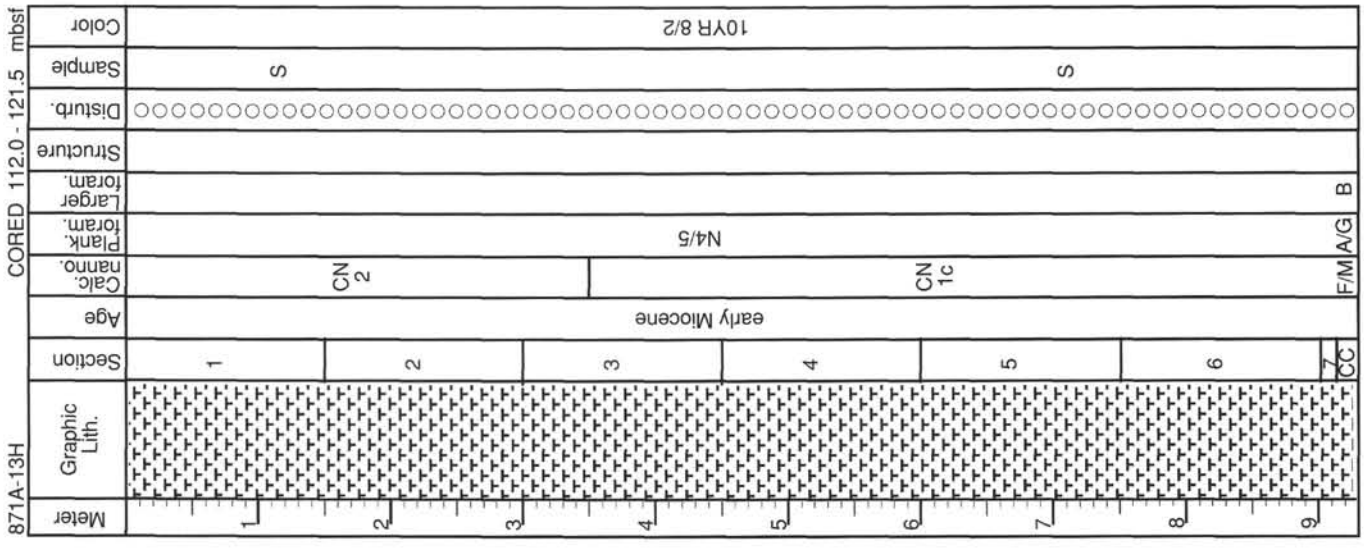
FORAMINIFER OOZE

Major Lithology:
Homogenous, white (10YR 8/2) FORAMINIFER OOZE; highly disturbed to soupy throughout. Minor amounts of dark fine grains in Section 6 are thought to be limonite. One manganese-coated pebble of a skeletal packestone was recovered in the core catcher.




871A- 15H
CORED 130.5 - 139.5 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
5
6
CC
early Miocene
CN 1c
N4b
C/MA/G
B
S
S
10YR 8/2


871A-14H
CORED 121.5 - 130.5 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
5
6
CC
early Miocene
CN 1c
N4b
F/MA/G
B
S
I
S
10YR 9/2


871A-13H
CORED 112.0 - 121.5 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
5
6
7
CC
early Miocene
CN 2
CN 1c
N4/5
F/MA/G
B
S
S
10YR 8/2

SITE 871 HOLE A CORE 16X CORED 139.5 – 145.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1		CC	middle Eocene			M	7.5YR 8/2 to 7.5YR 7/2

DESCRIPTION

SKELETAL GRAINSTONE

Major Lithology:
Pinkish white (7.5YR 8/2) to pinkish gray (7.5YR 7/2) SKELETAL GRAINSTONE with foraminifers (including miliolids), gastropod molds, bivalve molds, amber-colored peloids, and red algae. At least one burrow is heavily lined. Moldic and intergranular porosity, frequently lined with euhedral cements.

SITE 871 HOLE A CORE 17X CORED 145.7 – 151.9 mbsf

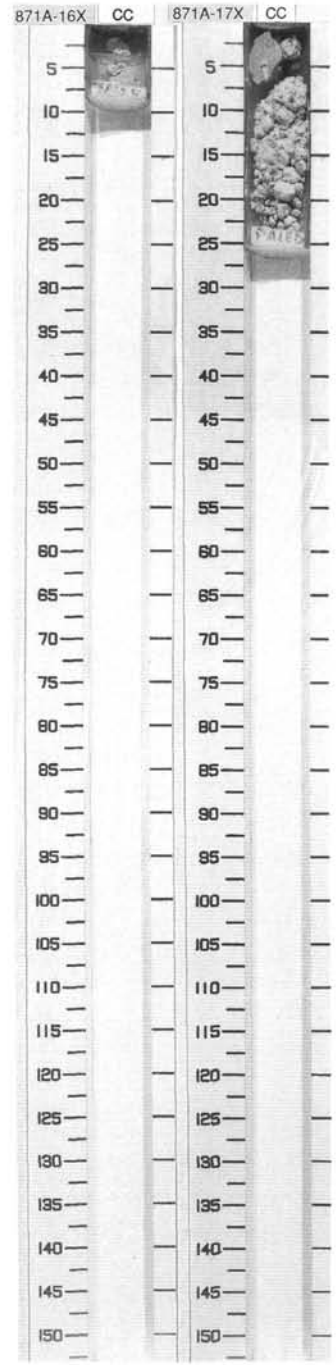
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1		CC	middle Eocene		X X X X	M	10YR 7/2 to 10YR 6/3 7.5YR 8/2

DESCRIPTION

SKELETAL GRAINSTONE

Major Lithology:
20 cm of the core contain fragments of pinkish white (7.5YR 8/2) SKELETAL GRAINSTONE consisting of foraminifers (including miliolids), molds of bivalves lined with euhedral crystals, gastropod molds, and other bioclasts. Pebble-sized fragments are packed in a calcareous mud of 3 to 10 μ-sized crystals. The mud contains traces of orange grains that appear to be plant material.

Minor Lithology:
3 pieces of light gray (10YR 7/2) to pale brown (10YR 6/3) SKELETAL WACKESTONE consisting of small encrusted bivalves, lined and filled borings, and gastropod molds. Other vugs of uncertain origin have a chalky surface.



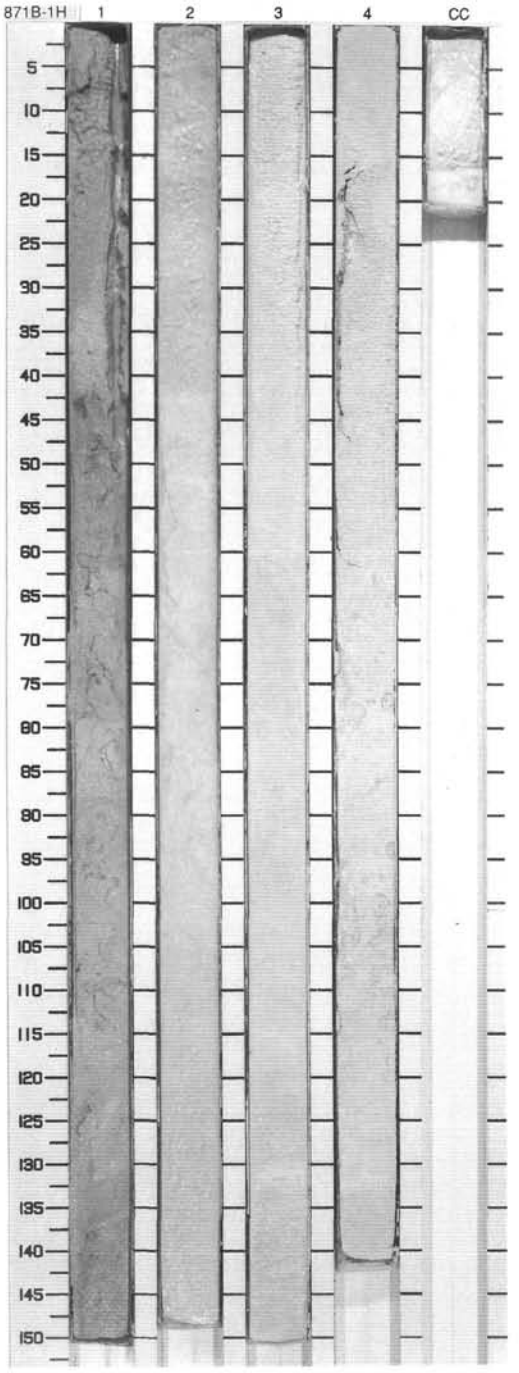
SITE 871 HOLE B CORE 1H CORED 0.0 - 6.1 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1		1	late Pleistocene			S	5Y 7/2 To 5Y 6/2
2		2				S	10YR 8/2 To 10YR 8/3
3		3				S	10YR 8/1 To 10YR 8/2
4		4				S	
5							
6		CC					

DESCRIPTION

NANNOFOSSIL FORAMINIFER OOZE

Major Lithology:
Homogeneous NANNOFOSSIL FORAMINIFER OOZE with a fine- to medium-grained texture. The color is light gray (5Y 7/2) to light olive gray (5Y 6/2) in Section 1, white (10YR 8/2) to very pale brown (10YR 8/3) with a mottled aspect in Section 2, and white (10YR 8/1 to 10YR 8/2) in Sections 3 and 4. The core is highly disturbed to soupy throughout.



871A-16X CORED 139.5 - 145.7 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1		CC	middle Eocene	B	B	C,P			M	7.5YR 8/2 to 7.5YR 7/4

871A-17X CORED 145.7 - 151.9 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1		CC	middle Eocene	B	B	F,P		X X X X	M	10YR 7/2 to 10YR 6/3 7.5YR 8/2

871B - 1H CORED 0.0 - 6.1 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1 2 3 4 5 6		1 2 3 4 CC	late Pleistocene	*P. lacunosa*	N22				S S S S	10YR 8/1 to 10YR 8/2 10YR 8/2 to 10YR 8/3 5Y 7/2 to 5Y 6/2

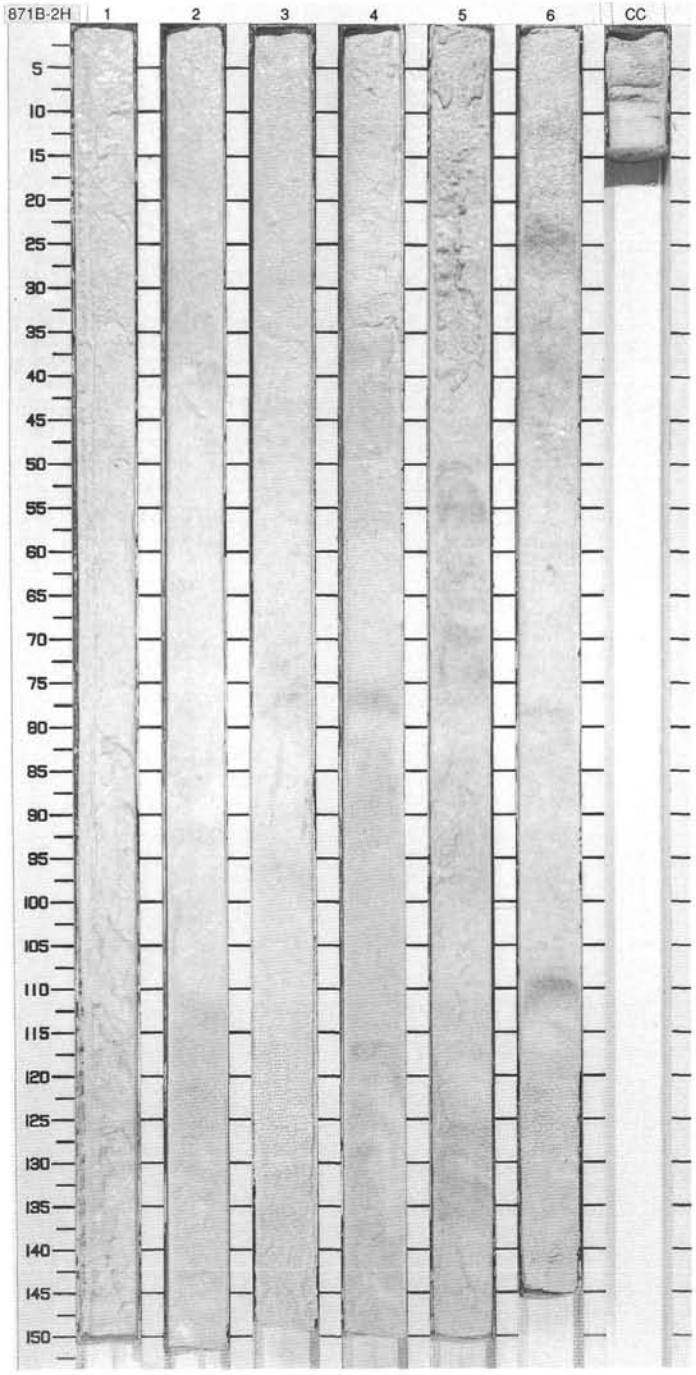
SITE 871 HOLE B CORE 2H CORED 6.1 - 15.6 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–9		1	early Pleistocene				10YR 8/2
		2				S	10YR 8/2 To 10YR 8/3
		3					
		4				S	
		5				S	10YR 8/3
		6				S	
		CC				S	

DESCRIPTION

NANNOFOSSIL FORAMINIFER OOZE

Major Lithology:
Soupy to highly disturbed NANNOFOSSIL FORAMINIFER OOZE with a fine- to medium-grained texture throughout. The color is white (10YR 8/2) in Section 1 and mottled white (10YR 8/2) to very pale brown (10YR 8/3) in Sections 2 and 3. There is a distinct boundary between white (10YR 8/2) and very pale brown (10YR 8/3) at 30 cm in Section 4. The rest of Sections 4 and 5 are very pale brown (10 YR 8/3). Specks of black are sparsely disseminated throughout Section 3 and are concentrated in vague bands and streaks in Sections 4, 5, and 6. The bands range from 1 to 5 cm in thickness.



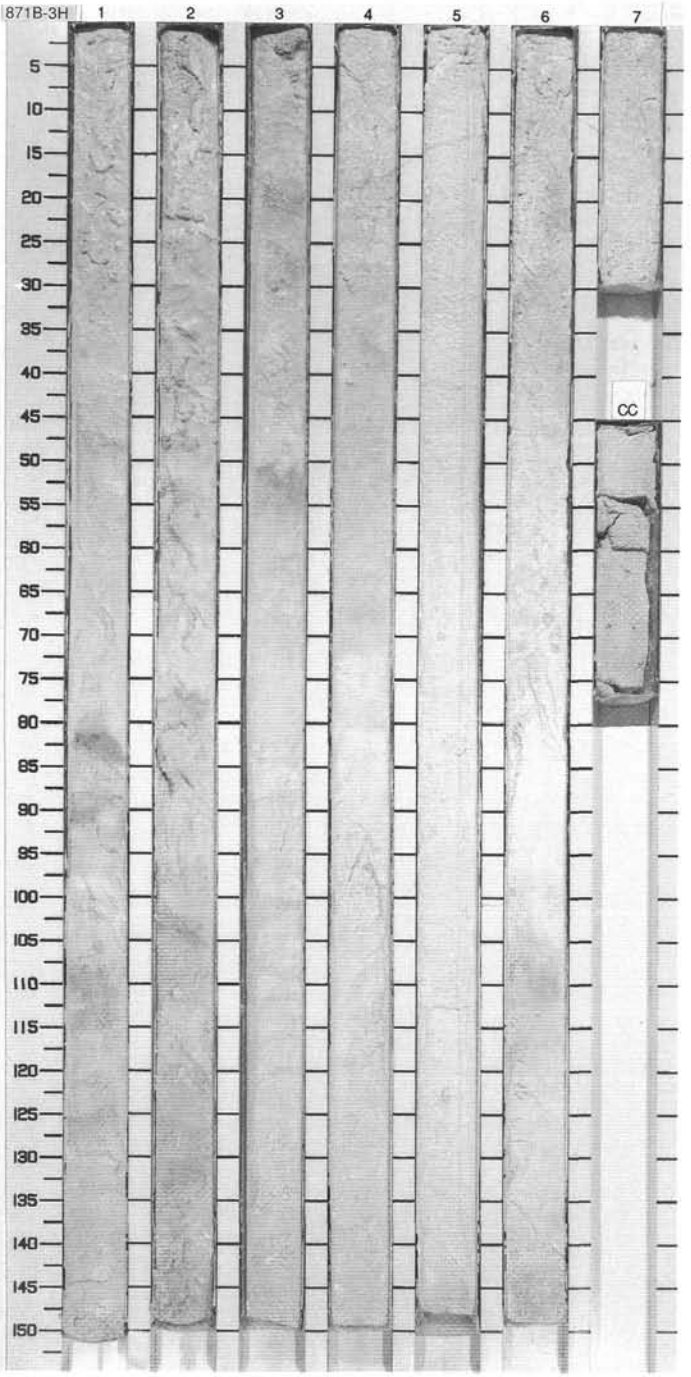
SITE 871 HOLE B CORE 3H CORED 15.6 - 25.1 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–9		1–6, 7, CC	middle Pliocene			S	10YR 8/2 To 10YR 7/2

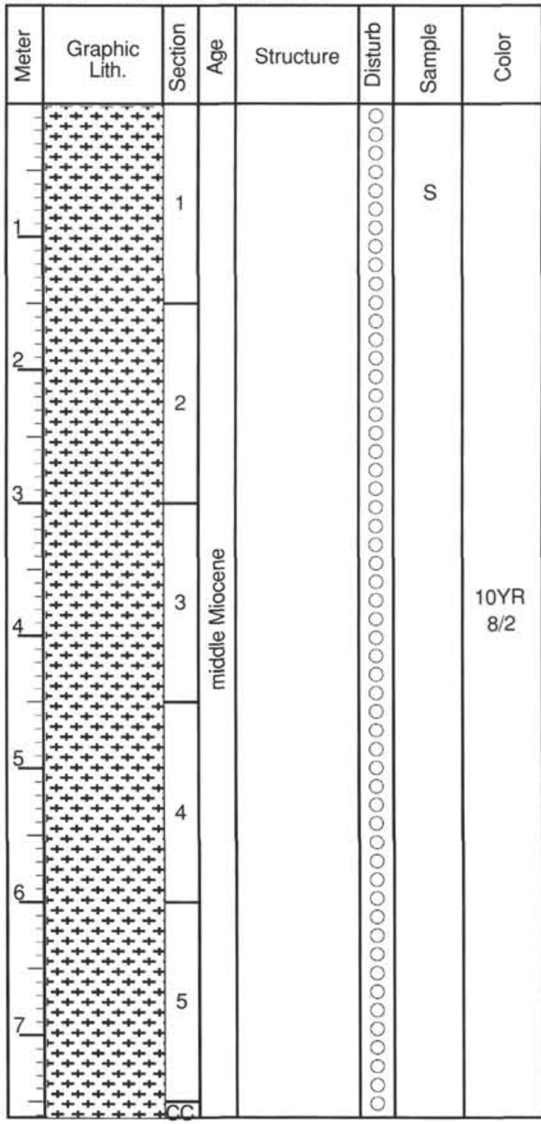
DESCRIPTION

NANNOFOSSIL FORAMINIFER OOZE

Major Lithology:
Soupy and highly disturbed NANNOFOSSIL FORAMINIFER OOZE. Color is predominantly white (10YR 8/2) with many bands of light gray (10YR 7/2). Smear slides of insoluble residues in the light gray bands have 60% clay minerals. The bands range in thickness from 3 to 8 cm.



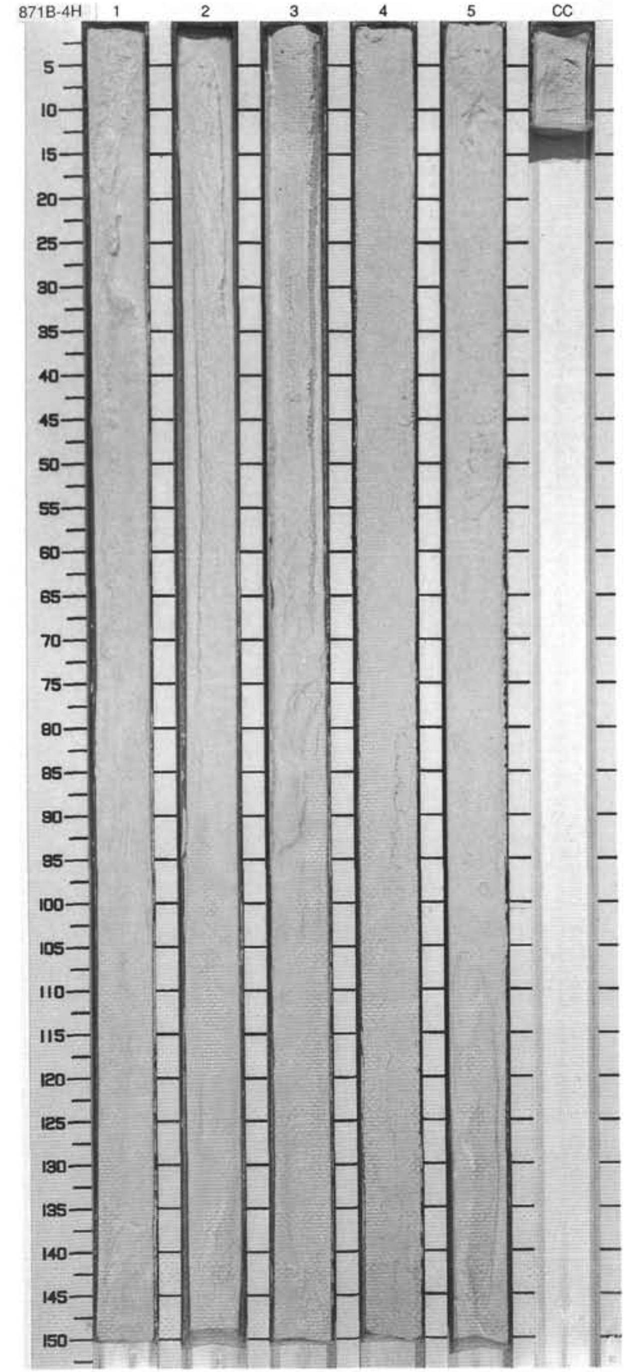
SITE 871 HOLE B CORE 4H CORED 25.1 - 34.6 mbsf



DESCRIPTION

NANNOFOSSIL FORAMINIFER OOZE

Major Lithology:
Homogenous, white (10YR 8/2) NANNOFOSSIL FORAMINIFER OOZE. The ooze is well sorted and fine to medium grained.



871B-2H
CORED 6.1 - 15.6 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
5
6
CC
early Pleistocene
H. sellii
A/G
A/G
N22
B
S
S
S
S
10YR 8/3
10YR 8/2 to 10YR 8/3
10YR 8/2

871B-3H
CORED 15.6 - 25.1 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
5
6
7
CC
middle Pliocene
CN 11
N18/19
A/M
A/G
B
S
S
S
S
10YR 8/2 to 10YR 7/2

871B- 4H
CORED 25.1 - 34.6 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
5
CC
middle Miocene
CN 5b
N12
C/M
A/G
B
S
10YR 8/2

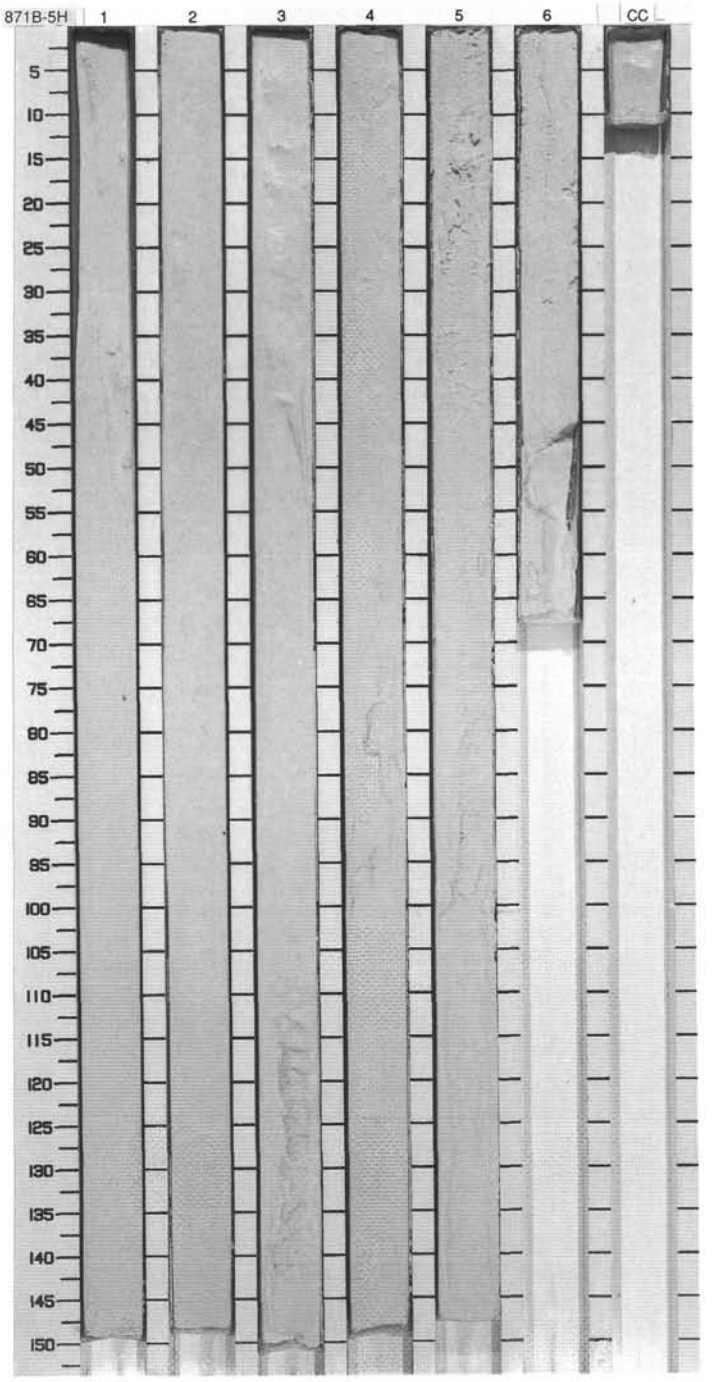
SITE 871 HOLE B CORE 5H CORED 34.6 - 44.1 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–8		1, 2, 3, 4, 5, 6, CC	middle Miocene			S	10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogeneous, white (10YR 8/2), fine- to medium-grained, well-sorted, FORAMINIFER OOZE. The entire core is soupy and disturbed.



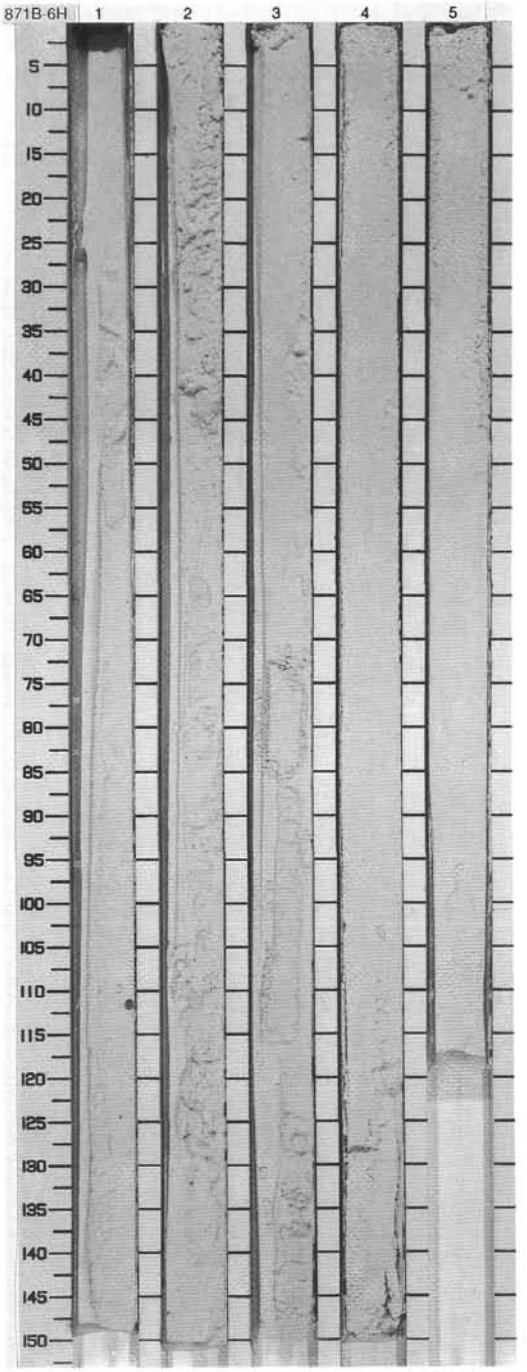
SITE 871 HOLE B CORE 6H CORED 44.1 - 53.6 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–7		1–5, CC	middle Miocene	A•		S, S	10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogenous FORAMINIFER OOZE, white (10YR 8/2), fine- to medium-grained. A 1-cm diameter pebble of VOLCANIC PUMICE is in Section 1, 110 cm. Black, coarse-grained particles, especially in Section 2, are probably drilling lubricant.



SITE 871 HOLE B CORE 7H CORED 53.6 - 63.1 mbsf

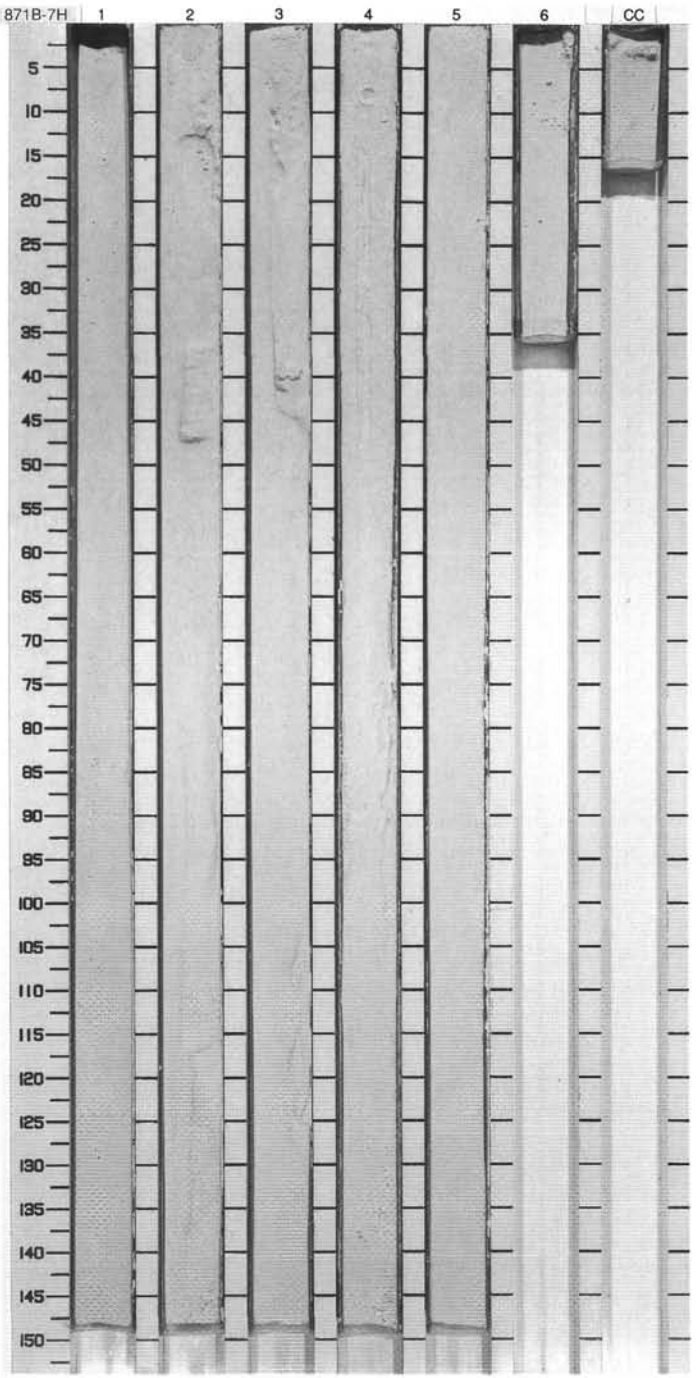
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–8		1, 2, 3, 4, 5, 6, CC	middle Miocene			S	10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogenous FORAMINIFER OOZE, white (10YR 8/2), with a medium- to fine-grained sandy texture. The entire core is disrupted to a slurry or homogenized paste. Section 1 has several black particles and smears, probably from drilling lubricant.

871B 8H NO RECOVERY



871B-8H NO RECOVERY

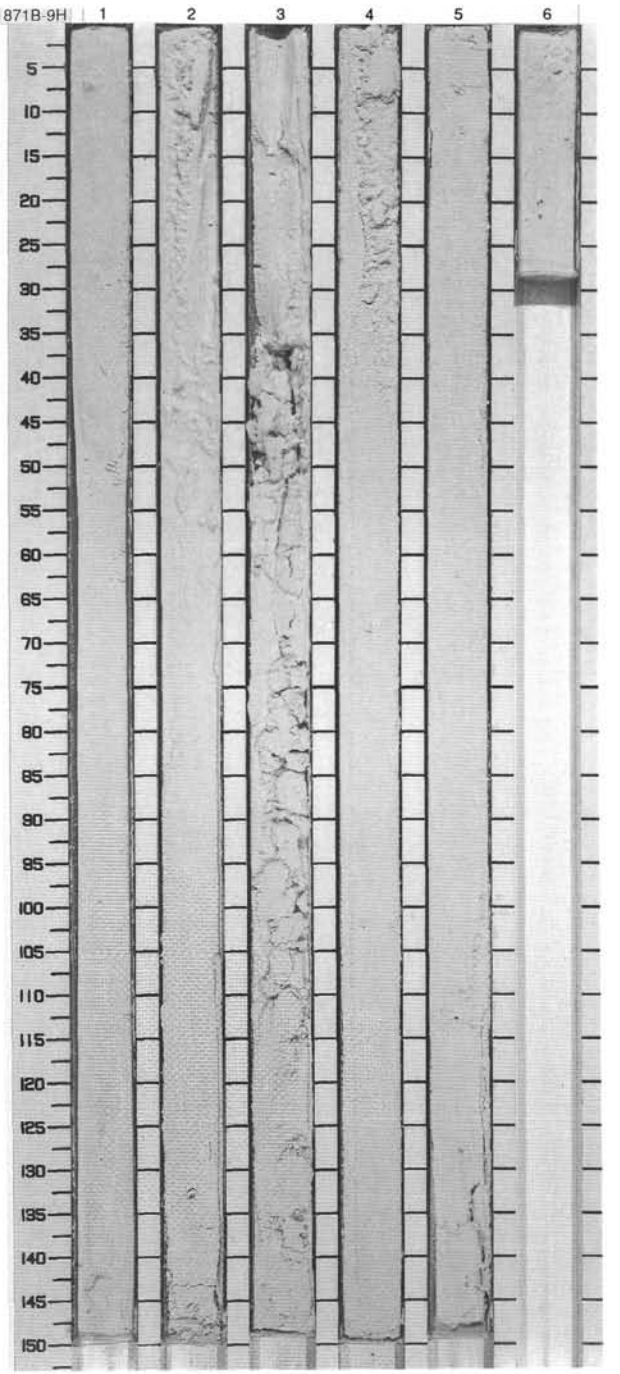
SITE 871 HOLE B CORE 9H CORED 72.6 - 82.1 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–7		1–6	middle Miocene			S	10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogenous FORAMINIFER OOZE, white (10YR 8/2), fine- to medium-grained sandy texture. The entire core is soupy and structureless.



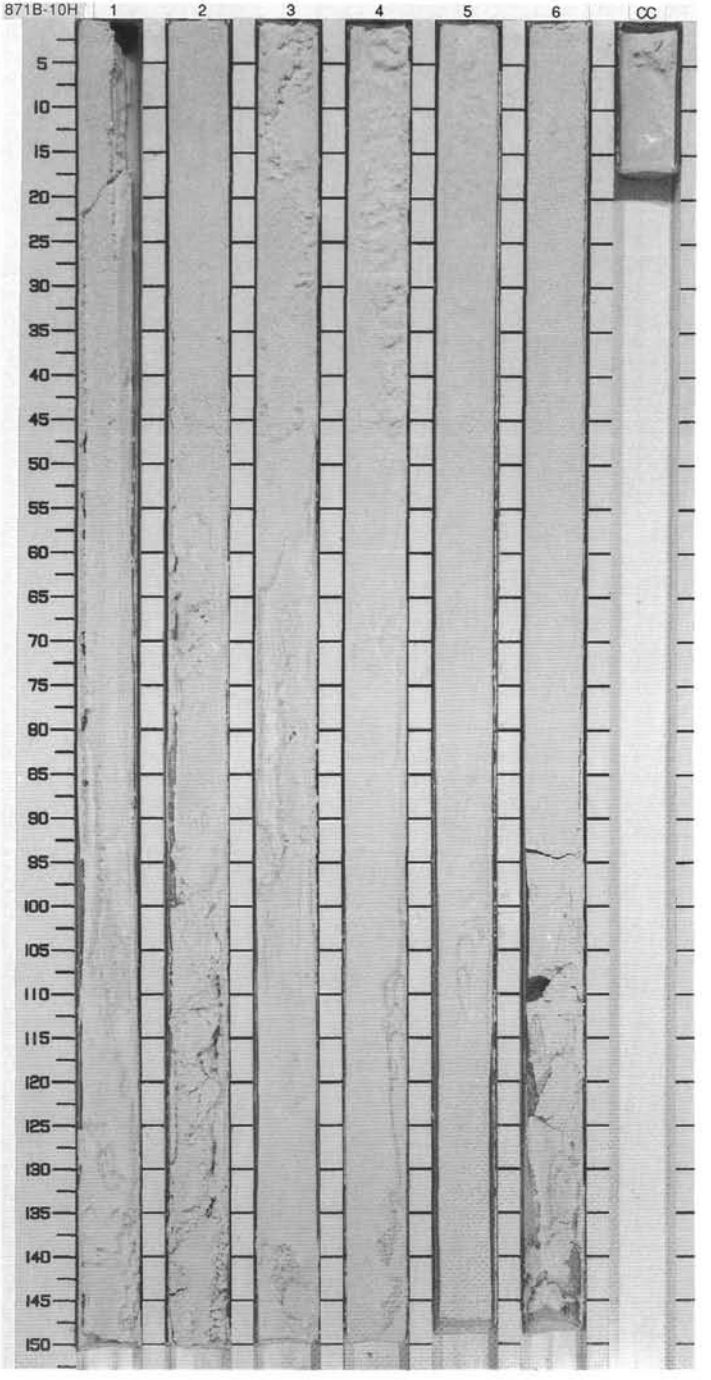
SITE 871 HOLE B CORE 10H CORED 82.1 - 91.6 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–9		1, 2, 3, 4, 5, 6, CC	early Miocene			S	10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogenous FORAMINIFER OOZE, white with tannish tint (10YR 8/2), medium- to fine-grained sandy texture. Most of core is highly disrupted by coring, but semiconsolidated intervals in Section 2, 70–100 cm, are also devoid of any sedimentary structures. Local black-gray streaks and specks are probably drilling lubricant.



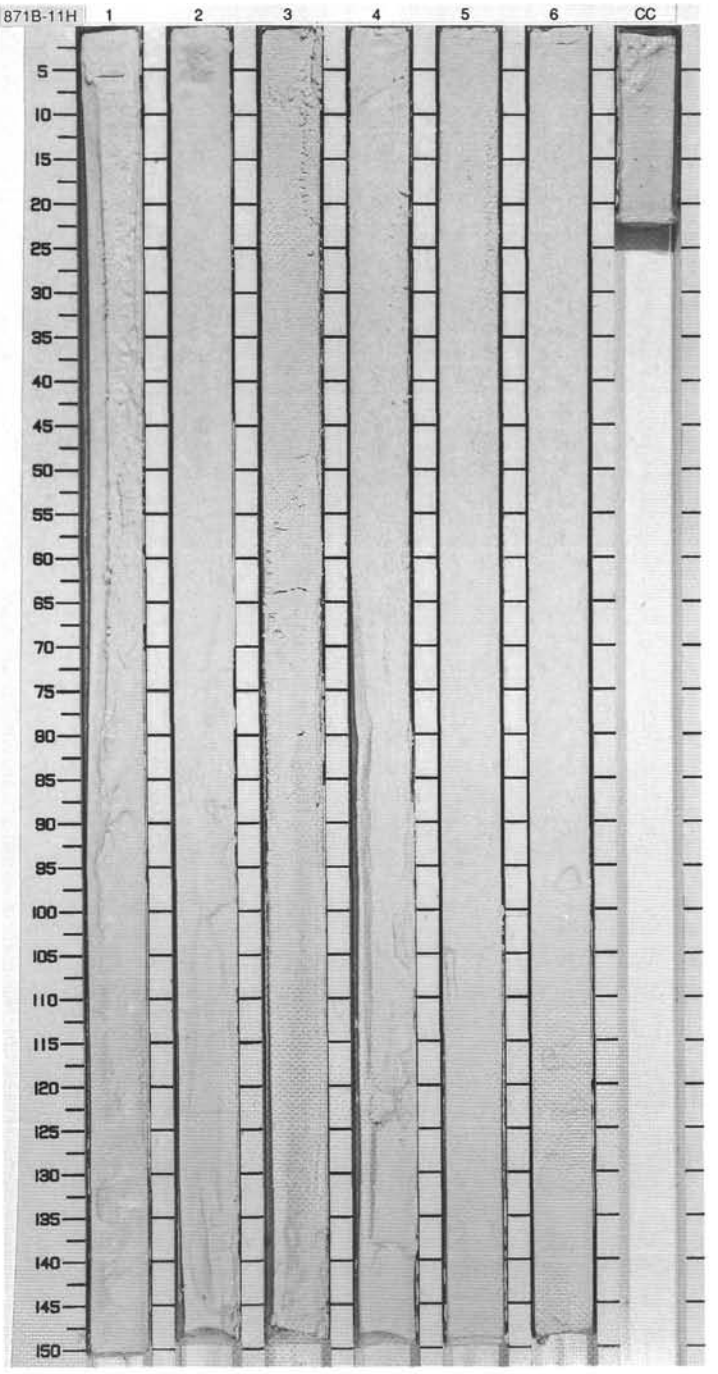
SITE 871 HOLE B CORE 11H CORED 91.6 - 101.1 mbsf

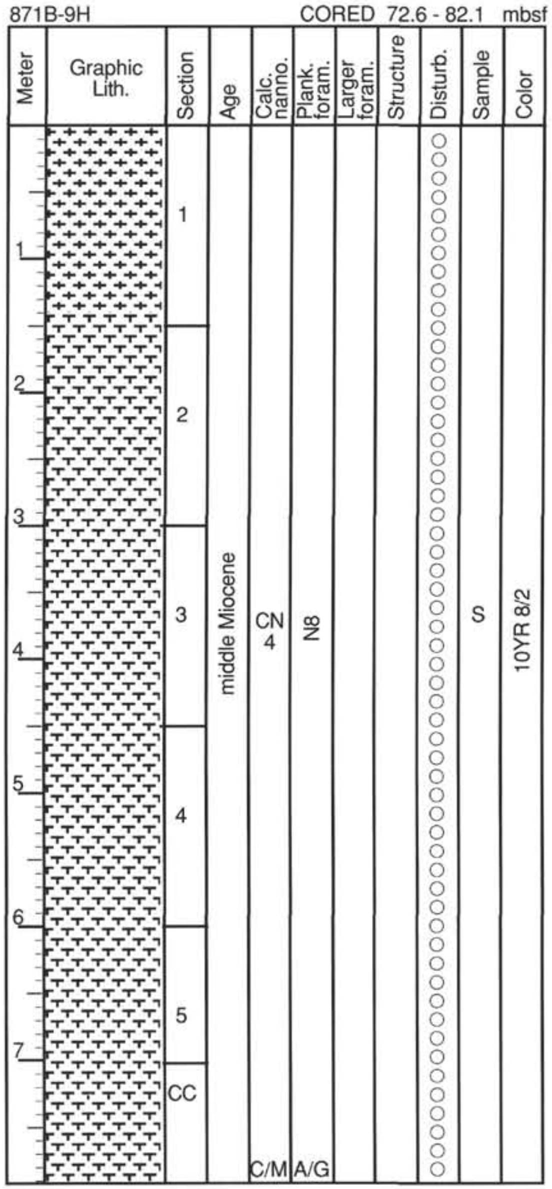
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–9		1–6, CC	early Miocene			S	10YR 8/2

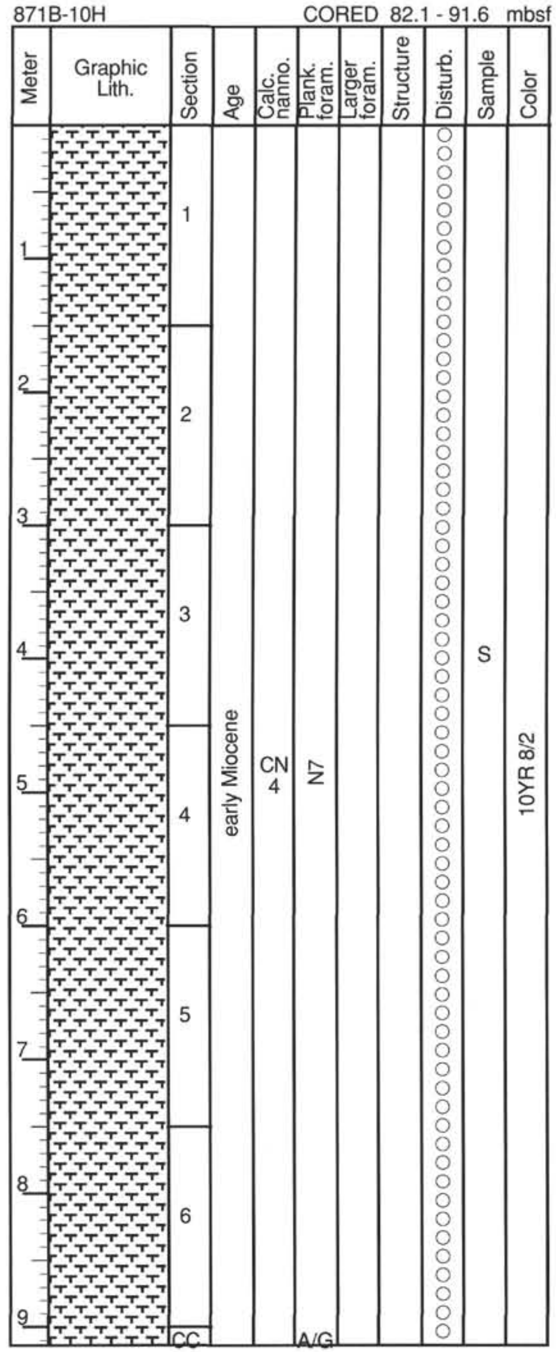
DESCRIPTION

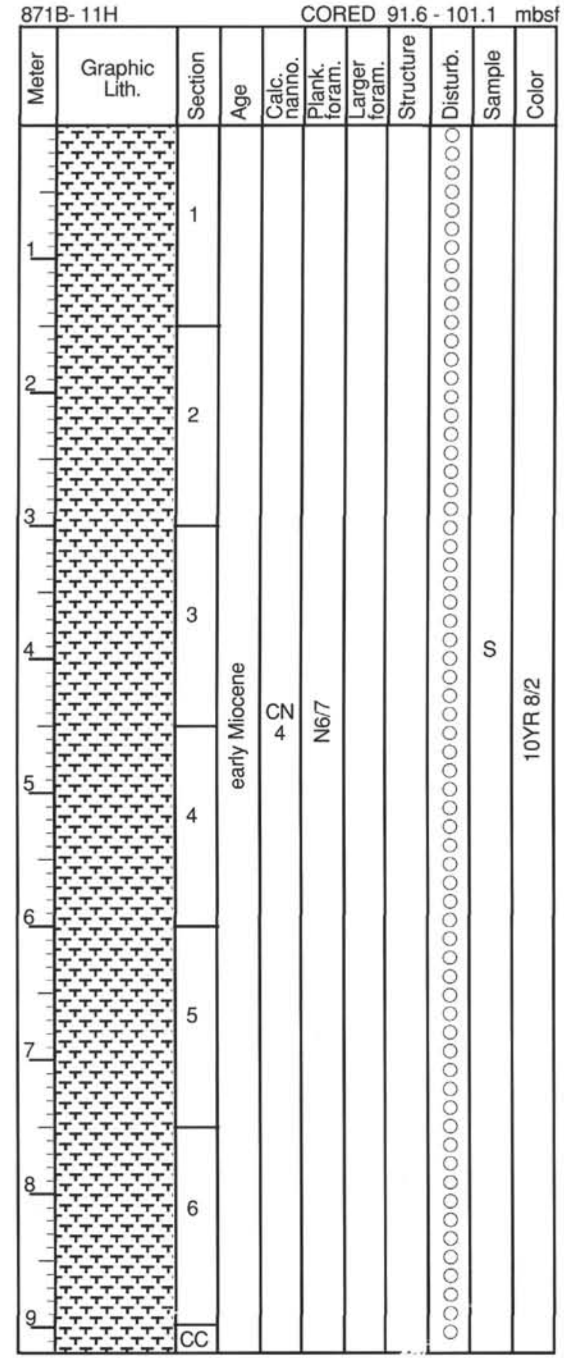
FORAMINIFER OOZE

Major Lithology:
Homogenous, white (10YR 8/2) FORAMINIFER OOZE.
The entire core is soupy and structureless.



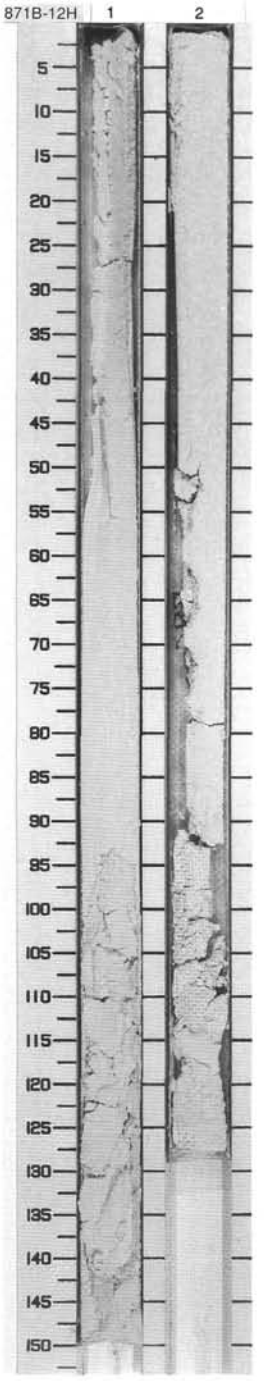

871B-9H
CORED 72.6 - 82.1 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
5
CC
middle Miocene
CN 4
N8
S
10YR 8/2
C/M
A/G


871B-10H
CORED 82.1 - 91.6 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
5
6
CC
early Miocene
CN 4
N7
S
10YR 8/2
A/G


871B-11H
CORED 91.6 - 101.1 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
5
6
CC
early Miocene
CN 4
N6/7
S
10YR 8/2

SITE 871 HOLE B CORE 12H CORED 101.1 - 110.6 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION
1 2		1 2 CC	early Miocene				10YR 8/2	FORAMINIFER OOZE Major Lithology: Homogenous FORAMINIFER OOZE, white (10YR 8/2), medium- to fine-grained texture.



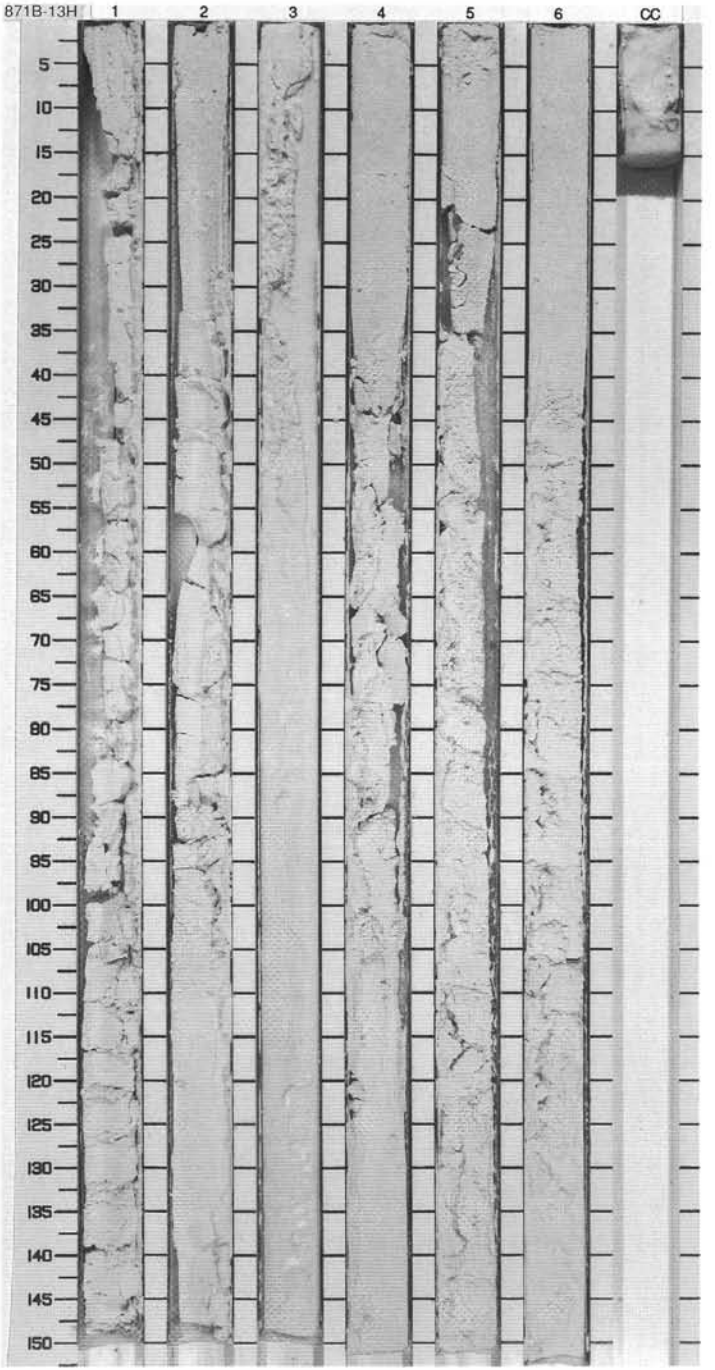
SITE 871 HOLE B CORE 13H CORED 110.6 - 120.1 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–9		1–6, CC	early Miocene				10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogenous FORAMINIFER OOZE, white (10YR 8/2), medium- to fine-grained texture. Highly disturbed by drilling.



SITE 871 HOLE B CORE 14H CORED 120.1 - 129.6 mbsf

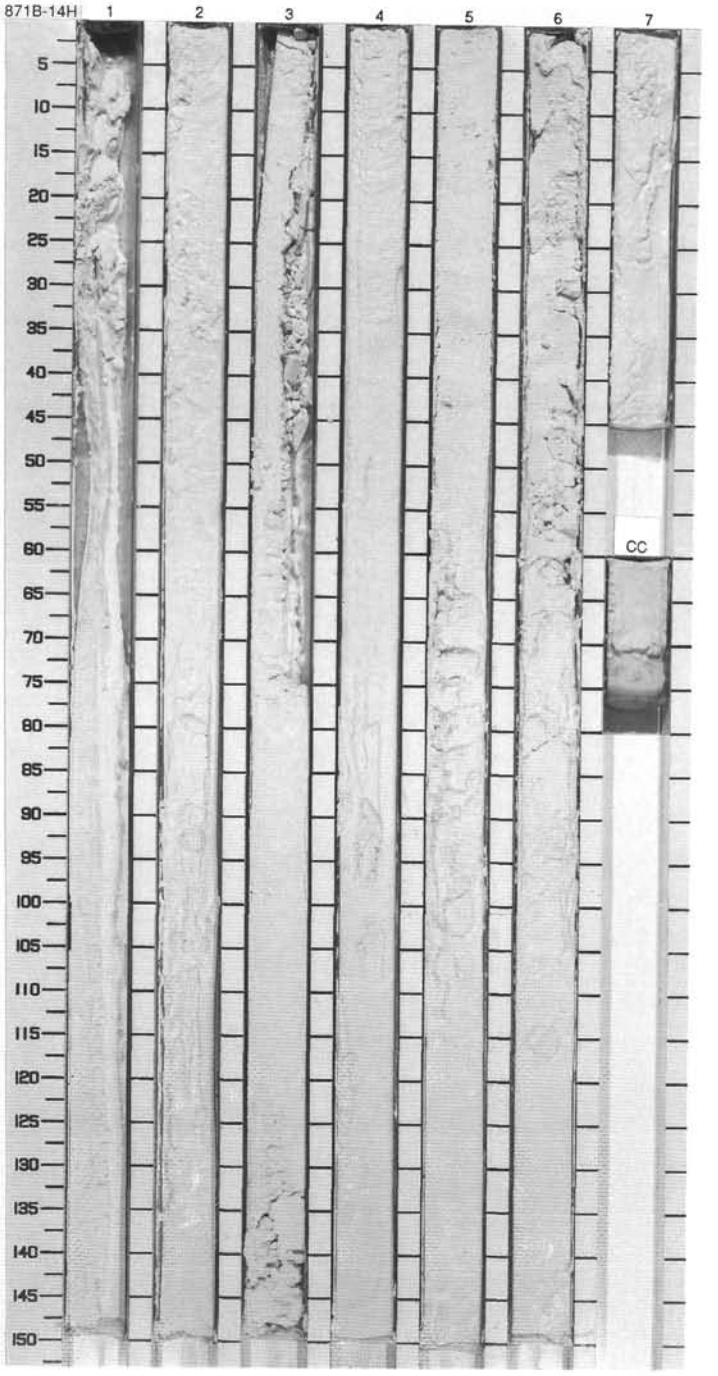
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–9		1, 2, 3, 4, 5, 6, 7, CC	early Miocene				10YR 8/2

DESCRIPTION

FORAMINIFER OOZE

Major Lithology:
Homogenous FORAMINIFER OOZE, white (10YR 8/2), medium- to fine-grained texture. Highly disrupted by drilling.

871B 15H NO RECOVERY



871B-12H CORED 101.1 - 110.6 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1–2		1, 2, CC	early Miocene	CN 3/4	N5					10YR 8/2
				F/M	A/G					

871B-13H CORED 110.6 - 120.1 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1–9		1, 2, 3, 4, 5, 6, CC	early Miocene	CN 2	N4b					10YR 8/2
				F/M	A/G					

871B- 14H CORED 120.1 - 129.6 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1–9		1, 2, 3, 4, 5, 6, 7, CC	early Miocene	CN 1c	N45					10YR 8/2
				F/M	A/G					

871B-15H NO RECOVERY

SITE 871 HOLE B CORE 16X CORED 133.2 – 142.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	W	CC	middle Eocene				10YR 8/2
	P						10YR 7/2

DESCRIPTION

SKELETAL WACKESTONE and SKELETAL PACKSTONE

Major Lithologies:
Only a few limestone fragments were recovered. 0–3 cm, is a very pale orange (10YR 8/2) crust of WACKESTONE with its upper surface coated by a <1 mm, bored, yellowish brown (10YR 5/6) crust of iron-manganese-oxide and phosphate. Bioclasts are small gastropods, mollusk shells about 1 cm in size, and miliolid and alveolinid foraminifers. A patch of rounded, miliolid and alveolinid foraminifers. A patch of rounded, brownish, a sand-size grains is on one fragment. 3–13 cm, are two pieces of very pale orange (10YR 8/2) SKELETAL WACKESTONE. Bioclasts of mullusk shells (15%) and small gastropods are leached out. Several shell fragments that are not leached out are probably composed of low-Mg calcite. Miliolid foraminifers are rare. One coral fragment in piece from 8–13 cm. Some molds and vugs are lined by yellowish coatings. Whitish coloration suggests chalkification. Other molds are partly filled by euhedral calcite crust with scalenohedral terminations (PE4C). 13–16 cm, is darker (very pale brown, 10YR 7/2) and harder than the overlying pieces. This SKETETAL PACKSTONE has leached moolusk shell fragments, producing a moldic porosity. Rare small fragments of coral are also leached. Matrix is comprised of subangular, fine sand-sized carbonate grains.

SITE 871 HOLE B CORE 17X CORED 142.7 – 152.4 mbsf

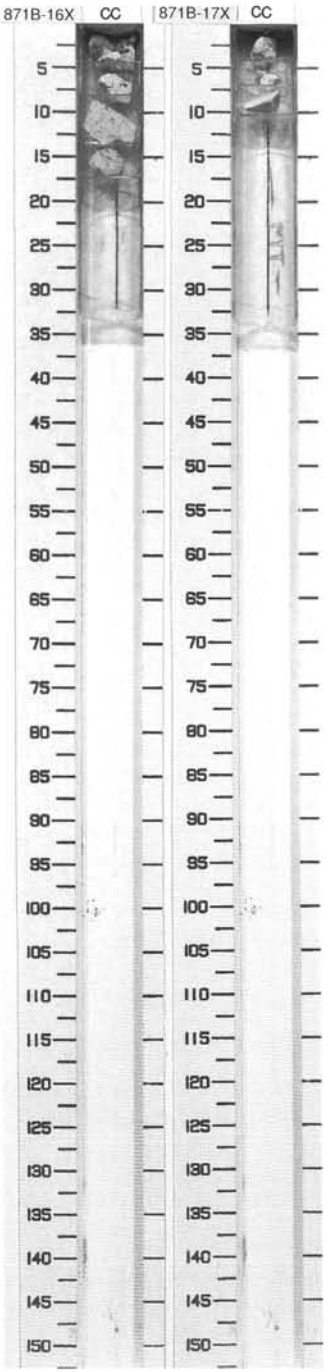
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	P	CC	middle Eocene				10YR 8/3 to 10YR 8.5/2

DESCRIPTION

SKELETAL (FORAMINIFER) PACKSTONE

Major Lithology:
Recovery consists of a few pieces of SKELETAL (FORAMINIFER) PACKSTONE, very pale brown (10YR 8/3) to very pale tan (10YR 8.5/2) with a few coarse grains of dark yellowish red. The packstone is comprised of (1) foraminifers, mainly miliolids, of medium- to coarse-grained size; (2) molds of former shell fragments (about 5%), mainly of gastropods, up to 1 cm in length; and (3) molds of coral fragments (One piece, 0–3 cm, has a 6 mm-diamter horn coral mold). Unlike the overlying Core 16X, these molds do not have any yellowish coatings. The limestone is well cemented, with perhaps 5% moldic porosity.

871C 1R NO RECOVERY



SITE 871 HOLE C CORE 2R CORED 133.2 – 143.3 mbsf

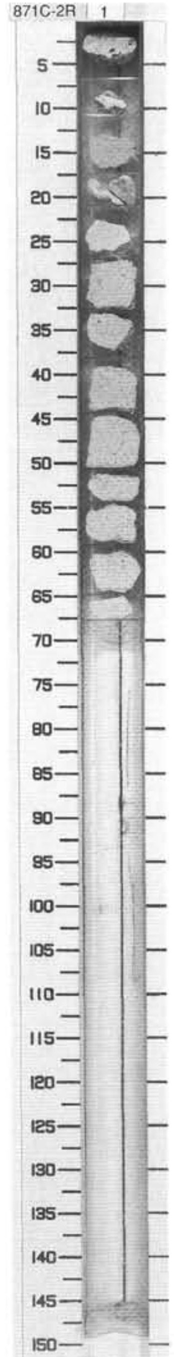
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	W (wackestone), 0–27 cm; P (packstone), 27–68 cm	1	middle Eocene	Mn, V		T T T	10YR 8/2 10YR 8/2 to 10YR 7/3 10YR 8/2 to 10YR 7/3

DESCRIPTION

SKELETAL (FORAMINIFER) WACKESTONE and PACKSTONE

Major Lithologies:
0-6 cm, is a well-cemented, light tan (10YR 8/2), SKELETAL WACKESTONE with its top surface coated by a black, laminated, iron-manganese oxide, and phosphatic crust. This crust and the underlying limestone have features of a hardground, including borings, one of which is filled by a white planktonic-foraminifer-rich wackestone. Bioclasts include foraminifers (10% miliolids), yellow-lined molds of mollusk shells (5%–7%; mainly greater than 1 cm in length), and rare echinoid fragments. Some molds are partially infilled by white micrite. 6–27 cm, are white (10YR 8/2) to very pale brown (10YR 7/3) FORAMINIFER WACKESTONE with molds of mollusk, gastropod, and coral fragments (5%), calcareous sponges, and miliolid foraminifers (7%–10%). 6–10 cm appears to contain a contact between packstone and wackestone textures. Some vugs in 10–17 cm are infiltrated by white planktonic foraminifers, as in 0–6 cm; some vugs in 17–21 cm have micritized linings. 27–68 cm, are fine-grained, moldic, and chalky PACKSTONES, skeletal, that are white (10YR 8/2) mottled with very pale brown (10YR 7/3). These mottles coincide with variable degrees of lithification that may be associated with bioturbation. Silt-sized grains surround bioclasts of miliolid foraminifers (10%), rare larger benthic foraminifers (intensely bored), rare algal fragments and mostly leached mollusk shells.

General Description:
Cylinders: 27–33 cm, 38–50 cm; Rollers: 0–27 cm, 33–38 cm, 50–68 cm. Thin section samples from intervals 0–6 cm, 11–14 cm, and 51–54 cm.



871C-1R NO RECOVERY

SITE 871 HOLE C CORE 3R CORED 143.3 – 152.9 mbsf

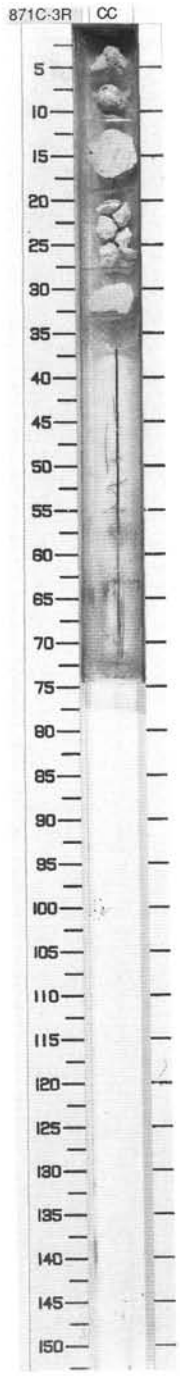
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	P	CC	middle Eocene			T	10YR 8/2 to 10YR 7/2 to 10YR 8/3

DESCRIPTION

FORAMINIFER PACKSTONE

Major Lithology:
0–33 cm, consists of white (10YR 8/2 to 10YR 7/2) to very pale brown (10YR 8/3) foraminifer PACKSTONE.. Yellow (10YR 8/6) spots occur in 19–28 cm. The texture is fine- to medium-grained. Foraminifers are abundant and include miliolids and textulariids. Coral and bivalve molds are common. Small gastropods (2–5 mm) are rare. 0–6 cm, has mostly moldic porosity. Bioturbation (2 mm to 1 cm in diameter) is evident in 11–19 cm. Burrows are infilled with darker (10YR 7/3) sediments. Porosity (3%–5%) is moderate and vuggy. Coarser, recrystallized grains occur in 28–33 cm. 28–33 cm, has mostly interparticle porosity (~10%) and possibly solution enlaged interparticle porosity.

General Description:
Rollers: 0–6 cm, 11–18 cm, 27–33 cm; Drilling Pebbles: 6–11 cm and 18–27 cm. Thin section samples from interval 28–34 cm.



SITE 871 HOLE C CORE 4R CORED 152.9 – 167.6 mbsf

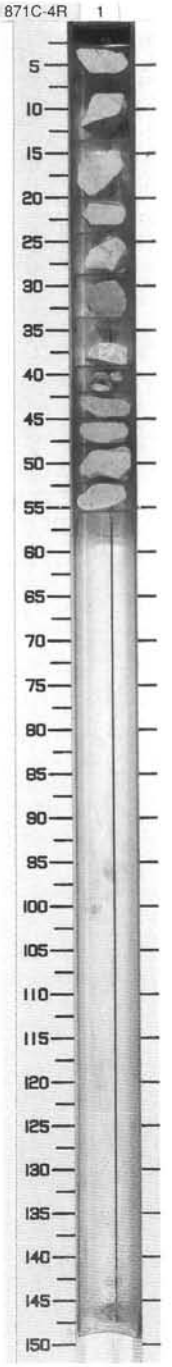
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	P/W/G	1	middle Eocene			T	10YR 7/4
						T	

DESCRIPTION

MILIOLID WACKESTONE, PELOID-MILIOLID PACKSTONE, SKELETAL WACKESTONE, and MILIOLID-INTRACLAST GRAINSTONE

Major Lithologies:
0–2 cm: SKELETAL PACKSTONE that has been stained black and tan by Mn and Fe?, respectively. Grains include mollusks and foraminifers (miliolids? and biserial). Moldic porosity (30%) lined with white- and brown-stained foraminifer ooze. [Probably caved from uphole. Appears that it may have been a pebble before drilling; not scarred; only one face is broken.] 2–19 cm: MILIOLID WACKESTONE, very pale brown (10YR 7/4). Grains include foraminifers (miliolids common; biserial and uniserial forms few), many bivalves, few gastropods, and rare peloids (visible only in burrows and shelters). 2%–5% porosity as cement-reduced molds of mollusks, partial molds of foraminifers, and microintraparticle pores in foraminifer chambers. All foraminifers are white (chalky). 19–28 cm: PELOID-MILIOLID PACKSTONE, very pale brown (10YR 7/4). Grains include foraminifers (miliolids common, uniserial forms many, biserial forms few, rare branching corals, few bivalves, many peloids, and rare intraclasts. Burrows are few. 3%–5% porosity as molds (~3%) and as micro-intraparticle porosity in miliolid chambers (1%). 28–33 cm: SKELETAL WACKESTONE, very pale brown (10YR 7/4). Small pale brown-white mottles are probably burrows filled by shell fragments but possibly are oncolites. Grains include foraminifers (common miliolids, many coiled forms, rare biserial), few bivalves, and possible peloids. 2% vuggy and solution-enlarged moldic porosity (some filled by coarsely crystalline cement crust). 33–55 cm: MILIOLID INTRACLAST GRAINSTONE. Intralasts, angular (possible lithoclasts) and muddy (wackestone) with sparse miliolids, are moderately sorted and average 1 to 3 mm. Bioclasts include foraminifers (common miliolids, rare to many biserial forms), rare worm tubes, rare gastropods, and rare bivalves. 48–52 cm is closer to a foraminifer grainstone with some muddy intraclasts. Porosity is 1%–5% (exceptionally 10% in small fragments (39–42 cm). Cementation-reduced interparticle porosity in 34–42 cm. Moldic porosity (< 1%) in 42–48 cm. Fenestral vugs, vertically elongate (oriented by geopetals) to equant are probably keystone vugs (42–55 cm). The first generation cement is thick, isopachous crust, cloudy throughout. It is overlain by light gray internal sediment that forms geopetals (34–55 cm). The second generation is clear, equant spar that forms a crust; terminations are scalenahedral.

General Description:
Rollers: 2–39 cm, 42–55 cm; Drilling Pebbles: 0–2 cm, 39–42 cm. Thin section samples: 14–19 cm, 48–52 cm.



SITE 871 HOLE C CORE 5R CORED 167.6 – 172.3 mbsf

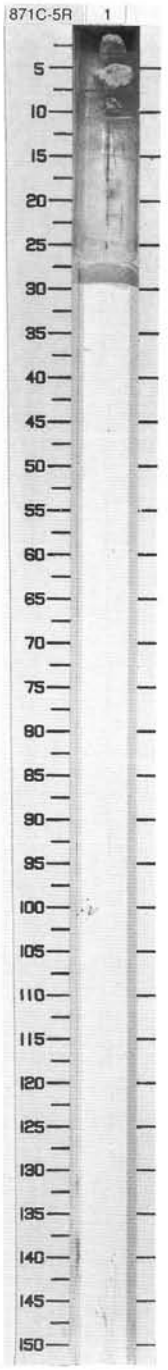
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1		1	middle Eocene		T		10YR 8/2

DESCRIPTION

PACKSTONE

Major Lithology:
0–14 cm: PACKSTONE, very pale orange (10 YR 8/2) on fresh broken surface. The outer surface is white, in places highly leached. Molds(?) are tiny, uncemented, and open. Grains include miliolids (7%), rare gastropods, and possibly ostracods. Ostracod shells are leached. Matrix is a mixture of micrite and fine silt-size carbonate particles. Limestone is well cemented and hard.

General Description:
Drilling Pebbles: 0–14 cm. Thin section sample: 0–3 cm.



871C-3R CORED 143.3 - 152.9 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1	P	CC	middle Eocene	B	B	F/P	Large *Nummulites*		T	10YR 8/2 to 10YR 7/2 to 10YR 8/3

871C-4R CORED 152.9 - 167.6 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1	P / E / G	1	middle Eocene	B	B	F/P	Large *Nummulites*		T / T	10YR 7/4

871C- 5R CORED 167.6 - 172.3 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1	P	1	middle Eocene	B	B	C/M		T		10YR 8/2

Miliolids and agglutinated foraminifers

SITE 871 HOLE C CORE 6R CORED 172.3 – 181.9 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1		1	middle Eocene			T	7.5YR 7/2
						T	10YR 8/2 to 10YR 6/3

DESCRIPTION

FORAMINIFER WACKESTONE and SKELETAL GRAINSTONE

Major Lithologies:
0–17 cm: FORAMINIFER WACKESTONE, pinkish gray (7.5YR 7/2). Grains include abundant miliolids; common uniserial and biserial foraminifers, bivalve molds (2–10 mm), coral molds, and gastropod molds. A 2 cm long high-spired gastropod mold passes through a piece in 0–5 cm. Other grains include indistinct amber peloids? and rare large foraminifers (nummulite?), one of which is bored. Most porosity is moldic. Some intergranular porosity is lined with or filled by euhedral cement. 17–60 cm: SKELETAL GRAINSTONE, white (10YR 8/2) to pale brown (10YR 6/3), fine grained. The grains are dominated by small and fragmented foraminifers (miliolids?), peloids? and other unidentified fragmented skeletal debris deposited in low angle cross-laminae. Color variations appear to be related to degree of cementation. Porosity is less than 5% in the pale brown bands and is 5% to 10% in the light bands. The color banding does not coincide with laminae in all cases; occasional mottled appearance may be related to burrowing.

General Description:
Cylinder: 17–24 cm, 37–43 cm; Roller: 3–17 cm, 24–37 cm, 43–60 cm; Drilling Pebble: 0–3 cm. Thin section samples: 4–11 cm, 43–47 cm.

SITE 871 HOLE C CORE 7R CORED 181.9 – 191.5 mbsf

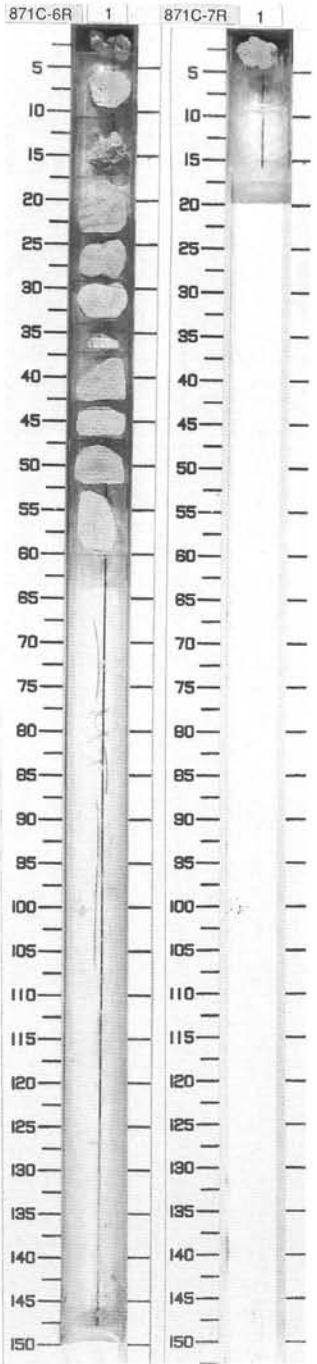
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
		1	middle Eocene				10YR 7/4

DESCRIPTION

SKELETAL PACKSTONE

Major Lithology:
0–5 cm: SKELETAL PACKSTONE, very pale brown (10YR 7/4). Grains include common miliolids, rare uniserial benthic foraminifers, few bivalves, rare gastropods, and many peloids(?). 5% porosity as molds of mollusks (microvugs may be solution enlarged molds of mollusks).

General Description:
Roller: 0–5 cm. Thin section sample: none.



SITE 871 HOLE C CORE 8R CORED 191.5 – 201.2 mbsf

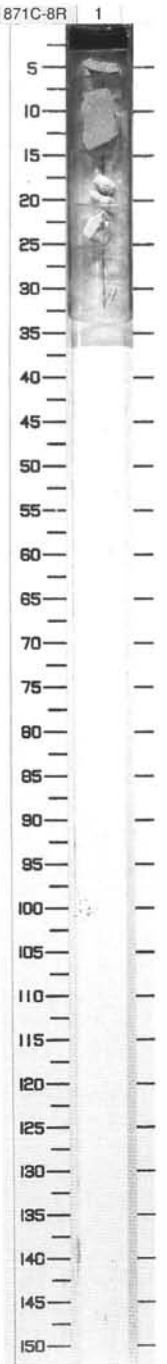
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1		1	middle Eocene			T	10 YR 8/2
						T	10YR 6/4
							10YR 8/2

DESCRIPTION

FORAMINIFER WACKESTONE

Major Lithology:
0–3 cm, 14–25 cm: FORAMINIFER WACKESTONE with local grain support, white (10YR 8/2). Grains include many miliolids, few other small benthic foraminifers, very rare larger benthic foraminifers, few bivalves (large in 14–19 cm), and few gastropods. 5% porosity as solution enlarged moldic porosity of bivalves, gastropods, and foraminifers(?). Casts of sponge borings in bivalve mold (14–19 cm). Interval 14–19 cm also contains nummulites (~10%). 3–14 cm: FORAMINIFER WACKESTONE, light yellowish brown (10YR 6/4). There are many miliolids, few biserial foraminifers, rare bivalves, and gastropods. Branching white tubes may be worm tubes. Porosity is 1% as molds of bivalves and gastropods and microvuggy porosity.

General Description:
Cylinder: 7–14 cm; Drilling Pebbles: 0–7 cm, 14–25 cm.
Thin section samples: 7–14 cm, 21–25 cm.



871C-6R
CORED 172.3 - 181.9 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
0.1
1
middle Eocene
B
B
C/M
Miliolids and agglutinated foraminifers
T
T
7.5YR 7/2
10YR 8/2 to 10YR 6/3

871C-7R
CORED 181.9 - 191.5 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
B
B
F/P
middle Eocene
Miliolids and agglutinated foraminifers
10YR 7/4

871C- 8R
CORED 191.5 - 201.2 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
0.1
1
middle Eocene
B
B
S. praeturritilina
F/P
T
T
10 YR 8/2
10 YR 6/4
10 YR 8/2
Miliolids and agglutinated foraminifers

SITE 871 HOLE C CORE 9R CORED 201.2 – 210.9 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1.0	P / M / P / W / M / P / W	1	middle Eocene			T T T	10YR 6/3 to 10YR 7/3 10YR 8/2

DESCRIPTION

FORAMINIFER PACKSTONE, MUDSTONE and WACKESTONE - PACKSTONE

Major Lithologies:
0–4 cm, 12–16 cm, and 30–33 cm: FORAMINIFER PACKSTONE, white (10 YR 7/2) to very pale brown (10 YR 7/3). Grains include foraminifers (miliolids, small Nummulites, textulariids (uniserial and biserial), and probable small alveolinids), small bivalve fragments (leached), gastropod molds (up to 4 cm long), coral fragments and micritized bioclasts (?). The texture is fine- to medium-grained. 4–12 cm and 19–30 cm: MUDSTONE, pale brown (10 YR 6/3) with conchoidal fracture. Very rare fragments of thin-shelled bivalves in 4–12 cm. Borings, 2–3 cm long and several mm in diameter, are infilled with white silty carbonate (10 YR 8/2). 16–19 cm and 33–52 cm: WACKESTONE, white (10 YR 8/2) (16–19 cm) and PACKSTONE (33–53 cm) *rich in benthic foraminifers (especially miliolids and* uniserial textulariids). Other components include small bivalve fragments (usually leached). Drusy cements occur in cavities. PACKSTONE texture is fine- to medium-grained with vuggy porosity common.

General Description:
Cylinder: 4–12 cm, 23–30 cm; Rollers: 30–53 cm; Drilling Pebbles: 0–4 cm, 12–23 cm. Thin section samples: 5–7 cm, 30–33 cm, 46–53 cm.

SITE 871 HOLE C CORE 10R CORED 210.9 – 220.5 mbsf

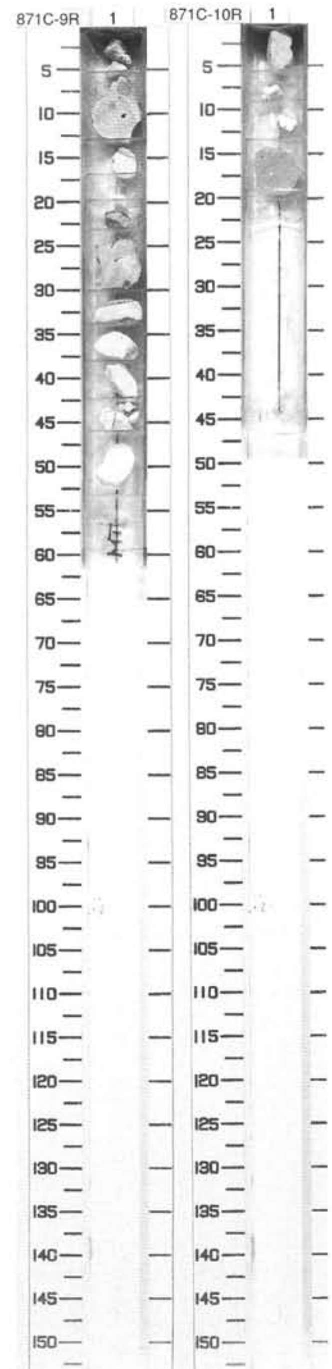
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	W / G / W	1	middle Eocene			T	10YR 7/3 to 10YR 6/3

DESCRIPTION

FORAMINIFER WACKESTONE

Major Lithology:
0–10 cm and 13–19 cm: FORAMINIFER WACKESTONE, very pale brown (10YR 7/3) to pale brown (10YR 6/3) containing abundant miliolids and common biserial and uniserial foraminifers. Gastropod, coral, and bivalve molds are common; at least one bivalve was encrusted prior to dissolution. Rare large foraminifers (nummulites?) are chalky; some lenticular molds may be dissolved large foraminifers. 10–13 cm: PACKSTONE(?) is moderately chalky; complete and partial foraminifer molds are common.

General Description:
Rollers: 0–6 cm, 14–19 cm; Drilling Pebbles: 6–14 cm. Thin section sample: 14–19 cm.



SITE 871 HOLE C CORE 11R

CORED 220.5 – 230.1 mbsf

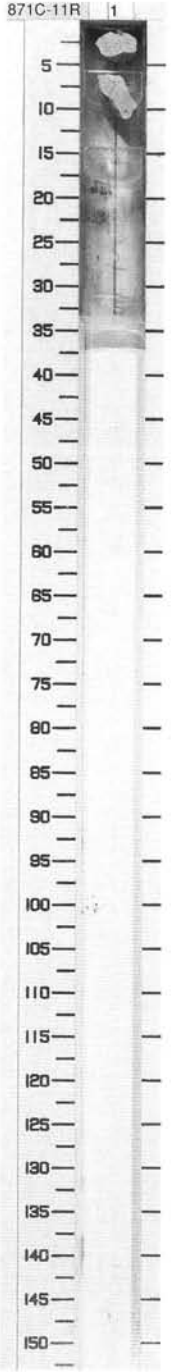
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	P P P P P P P P P P P P P P P P P P P P P P P P	1	middle Eocene			T	10YR 7/3

DESCRIPTION

PACKSTONE

Major Lithology:
0–15 cm: PACKSTONE, very pale brown (10 YR 7/3). 5 cm-wide borings with rare fecal pellets at the bottom. Particle size is bimodal with sand-size miliolids, textularids (biserial), rare nummulites, and peloids (3%–4%) in a lime mud matrix. Interparticle sparry calcite cement occurs in burrows. 5–15 cm contains a coral mold and a burrow filled with chalky pellets.

General Description:
Rollers: 0–15 cm. Thin section sample: 5–15 cm.



871C-9R CORED 201.2 - 210.9 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1.0		1	middle Eocene	B	B	F/P	Miliolids and agglutinated foraminifers		T T T	10YR 6/3 to 10YR 7/3 10YR 8/2

871C-10R CORED 210.9 - 220.5 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1		1	middle Eocene	B	B	F/P			T	10YR 7/3 to 10YR 6/3

Miliolids and agglutinated foraminifers

871C- 11R CORED 220.5 - 230.1 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1		1	middle Eocene	B	B	R/P			T	10YR 7/3

Miliolids and agglutinated foraminifers

SITE 871 HOLE C CORE 12R — CORED 230.1 – 239.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
		1	middle Eocene			T	10YR 7/3

DESCRIPTION

WACKESTONE

Major Lithology:
0–9 cm: WACKESTONE, very pale brown (10 YR 7/3). Leached porosity about 7%. Pellet filled burrows are rare. The two pieces consist of very small miliolids (5%), white, silt-sized skeletal particles (7%), molds after mollusk shells (1%–2%) and a lime mud matrix.

General Description:
Drilling Pebbles: 0–9 cm. Thin section sample: 0–5 cm.

SITE 871 HOLE C CORE 13R — CORED 239.8 - 249.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1		1	middle Eocene			T	10YR 8/3 to 10YR 7/2

DESCRIPTION

SKELETAL PACKSTONE

Major Lithology:
0–13 cm: SKELETAL PACKSTONE, color ranges from very pale brown (10 YR 8/3) to light gray (10 YR 7/2). Skeletal grains are dominated by foraminifers (mainly miliolids). Mollusk molds are common. Grain size is mainly coarse sand. Mud is sparse. Porosity is partly solution-enlarged intergranular, partly moldic. 10–13 cm has a few 1 cm-long fine-grained bodies (which may be sponges or algae). It is somewhat finer grained than other intervals and is chalky at its "top."

General Description:
Rollers: 0–13 cm; Thin section sample: 10–13 cm.

SITE 871 HOLE C CORE 14R — CORED 249.5 – 259.2 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1		1	early Eocene			T	10YR 8/3 to 10YR 7/2

DESCRIPTION

SKELETAL PACKSTONE

Major Lithology:
0–25 cm: SKELETAL PACKSTONE, very pale brown (10 YR 8/3) to light gray (10 YR 7/2), with a chalky aspect. Texture is medium grained with some coarser grained foraminifers (miliolids). Other grains include intraclasts. Packing and cementation variations suggest burrowing. Less porous than Core 13R. Porosity includes moldic (after mollusks), interparticle, and microvuggy. 0–5 cm contains a coral (Pocillopora ?) and bivalves. 20–25 cm is more porous, similar to Core 15R, with a lighter, less-dense texture.

General Description:
Rollers 5–20 cm; Drilling pebbles: 0–5 cm, 20–25 cm. Thin section sample: 11–15 cm.

871C-12R CORED 230.1 – 239.8 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
		1		B	B	R,P			T	10YR 7/3

middle Eocene

Miliolids and agglutinated foraminifers

871C-13R CORED 239.8 – 249.5 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1		1		B	B	R,P			T	10YR 8/3 To 10YR 7/2

middle Eocene

Miliolids and agglutinated foraminifers

871C- 14R CORED 249.5 – 259.2 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1		1	early Eocene	B	B	F,P			T	10YR 7/3 To YR 7/2

Miliolids and agglutinated foraminifers

SITE 871 HOLE C CORE 15R CORED 259.2 – 268.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	P	1	early Eocene			T	10YR 8/2

DESCRIPTION

PACKSTONE

Major Lithology:
0–25 cm: PACKSTONE, white (10YR 8/2), with a chalky aspect. Minor constituents are casts of mollusk debris, gastropod shell, and unidentifiable sand-size skeletal debris. Leaching resulted in development of moldic porosity (5%–7%). 10–15 cm contains a cast of bivalve internal fill, which is bounded by honey colored (10YR 7/6) sparry calcite cement formed between the internal wall of the shell and the sediment infill.

General Description:
Rollers: 0–25 cm. Thin section sample: 4–8 cm.

SITE 871 HOLE C CORE 16R CORED 268.8 – 278.1 mbsf

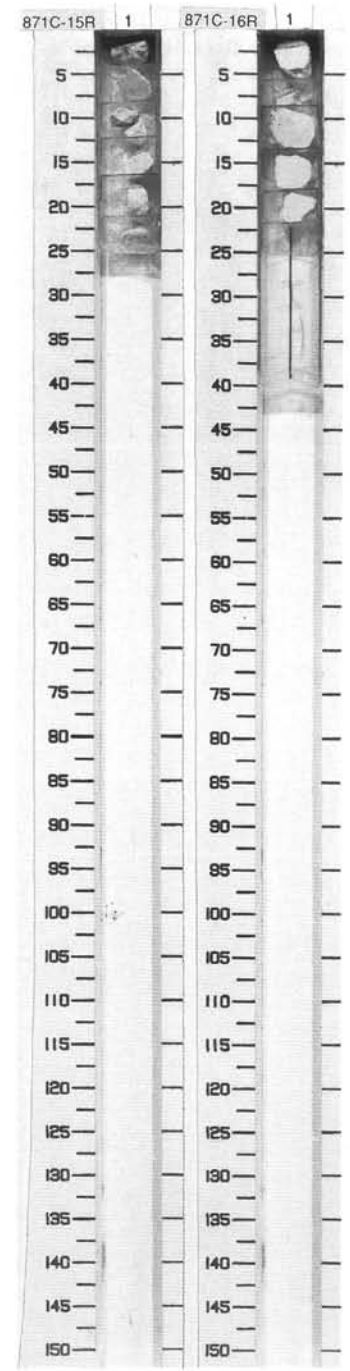
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	W P	1	early Eocene			T	N9

DESCRIPTION

SKELETAL PACKSTONE AND SKELETAL WACKESTONE

Major Lithology:
5–21 cm: SKELETAL PACKSTONE and 0–5 cm: SKELETAL WACKESTONE. Foraminifers (miliolids) are the dominant skeletal allochem with leached mollusks (bivalves and gastropods; 2%–5%). 13–21 cm is more PACKSTONE in texture versus 0–5 cm and 8–13 cm which are closer to WACKESTONE. 5–8 cm has mottling, resembling lower half of Core 2R (downhole displaced?). Color is white (N9) with a tan tint. Mottles are very pale brown (10YR 7/3). Grain size is mainly medium to coarse grained for the nonmud particles. Porosity types include moldic, solution enlarged interparticle, and microvugs.

General Description:
Rollers: 0–5 cm, 8–21 cm; Drilling Pebbles: 3–8 cm. Thin section sample: 13–17 cm.



SITE 871 HOLE C CORE 17R CORED 278.1 – 287.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1		1	early Eocene			T	N9

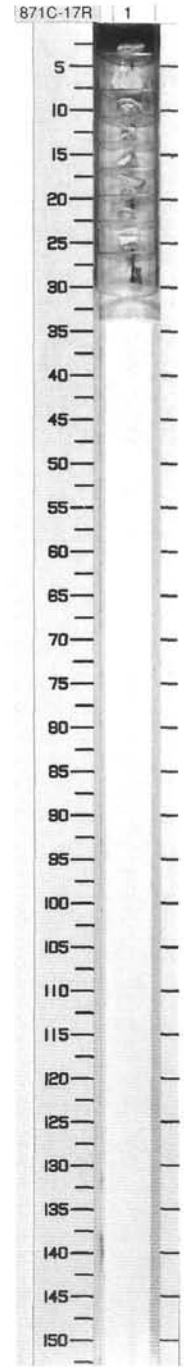
DESCRIPTION

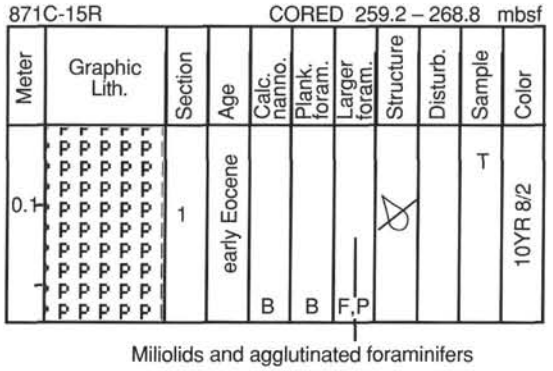
FORAMINIFER WACKESTONE

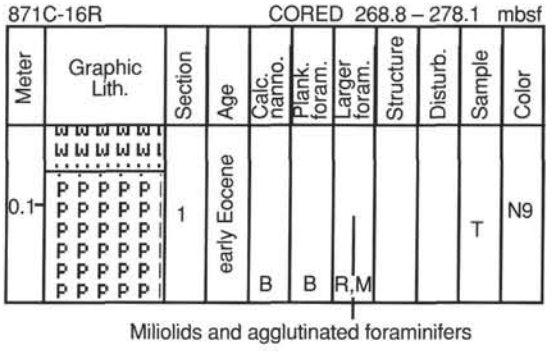
Major Lithology:
0–25 cm: FORAMINIFER WACKESTONE, white (N9). Many molds of foraminifers and gastropods. Pieces have a "chalky" appearance - micritized? Abundant 0.1–1.0 mm voids, some may be leached skeletal allochems (fragments of thin-shelled bivalves). Lowest piece has some 2 mm-diameter foraminifers; other pieces have much smaller foraminifers (miliolids). The lowest piece also seems closer to a PACKSTONE in texture.

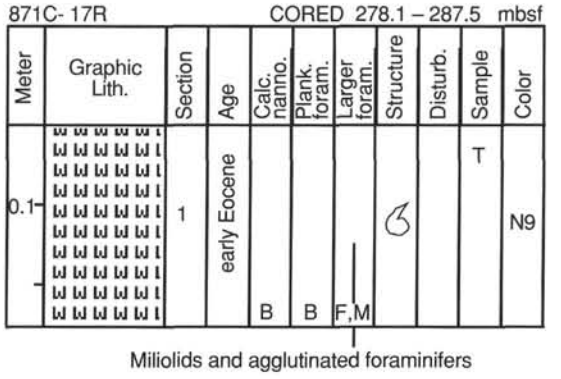
General Description:
Drilling Pebbles: 0–25 cm; Thin section sample: 4–7 cm.

871C 18R NO RECOVERY









871 18R NO RECOVERY

SITE 871 HOLE C CORE 19R — CORED 297.2– 306.9 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1		1	early Eocene			T	7.5YR 7/2

DESCRIPTION

MOLLUSK WACKESTONE and FORAMINIFER WACKESTONE

Major Lithologies:
0–3 cm: MOLLUSK WACKESTONE, pinkish gray (7.5 YR 7/2). Bivalves and gastropods mainly represented by molds. Porosity 5%, moldic. Sample in archive half is a FORAMINIFER PACKSTONE. 3–13 cm: FORAMINIFER WACKESTONE, pinkish gray (7.5YR 7/2). Benthic foraminifers: alveolinids are moderate; miliolids are rare. High-spired gastropods are rare. Porosity trace to 2%, mollusk molds and foraminifer intraparticle.

General Description:
Rollers: 3–9 cm; Drilling pebbles: 0–3 cm, 9–13. Thin section sample: 4–10 cm.

SITE 871 HOLE C CORE 20R — CORED 306.9 – 316.5 mbsf

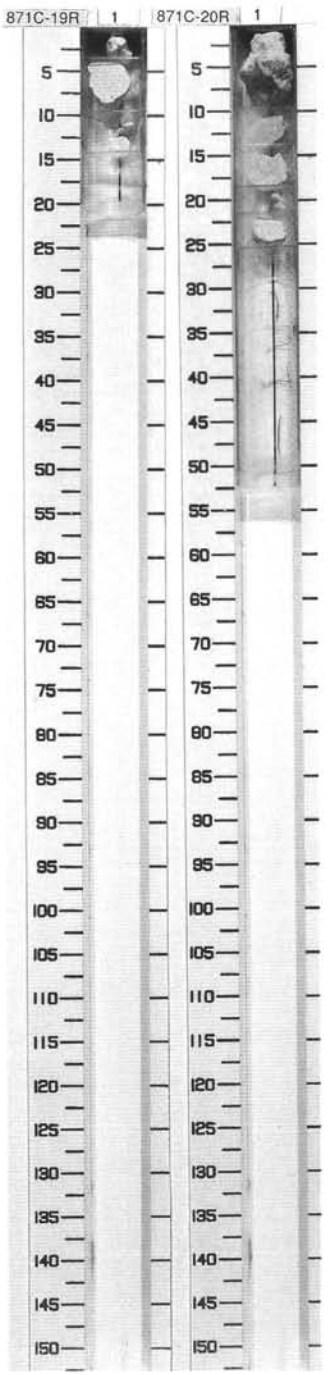
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1		1	early Eocene			T	2.5YR 8/2 to 2.5YR 7/2

DESCRIPTION

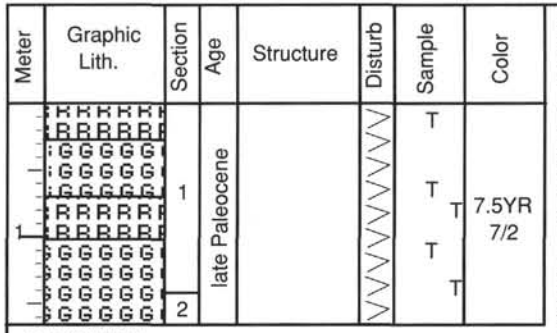
PACKSTONE and FORAMINIFER PACKSTONE

Major Lithologies:
0–9 cm: PACKSTONE, white (2.5Y 8/2), with a large coral head (Pocillopora), gastropods, benthic foraminifers (alveolinids), and bivalve fragments. 9–13 cm: FORAMINIFER PACKSTONE, white (2.5Y 8/2) with benthic foraminifers (alveolinids and miliolids), branching coral (Porites) pieces and bivalve fragments. 13–18 cm, 20–25 cm: FORAMINIFER PACKSTONE, light gray (2.5Y 7/2) with benthic foraminifers (abundant alveolinids and miliolids), bivalve fragments, locally leached, and gastropods. Some vugs locally rimmed by drusy calcite cements. 18–20 cm: PACKSTONE, white (10YR 8/2) with benthic foraminifers (miliolids), coral fragments (Porites), and leached bivalve fragments.

General Description:
Cylinder: 0–9 cm; Rollers: 9–18 cm, 20–25 cm; Drilling pebbles: 18–21 cm. Thin section sample: 13–17 cm.



SITE 871 HOLE C CORE 21R CORED 316.5 - 326.2 mbsf



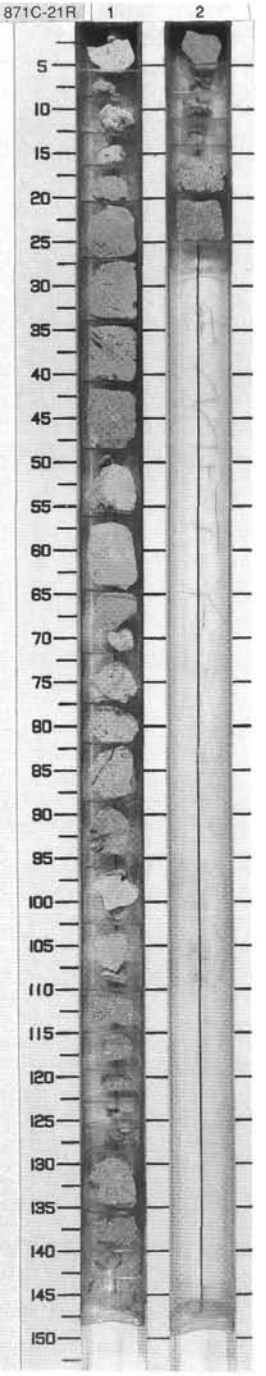
DESCRIPTION

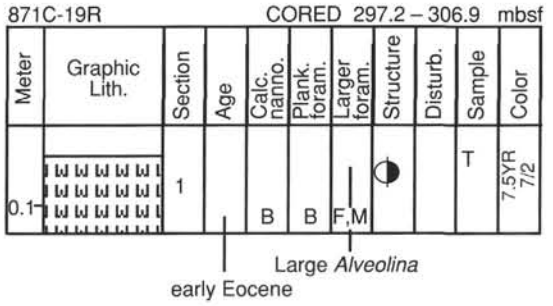
FORAMINIFER RUDSTONE, SKELETAL WACKESTONE AND GRAINSTONE, CORAL-MOLD RUDSTONE, and ALGAL-MOLD GRAINSTONE

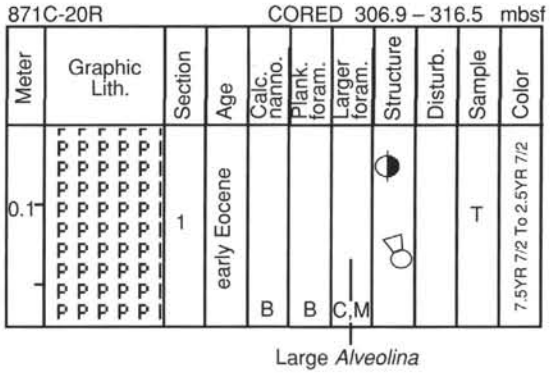
Major Lithologies:
0–16 cm: FORAMINIFER RUDSTONE, pinkish gray (7.5 YR 7/2) with benthic foraminifers (alveolinids common; miliolids moderate), molds of foraminifers (?) and gastropods, and rare bivalves and gastropods. Cementation-reduced interparticle porosity (2%). SKELETAL WACKESTONE, white (N9) with many molds of high-spired gastropods, rare miliolid foraminifers. Porosity (10%) consists of moldic (after mollusks and forams), small vugs, and probably enlarged molds. SKELETAL GRAINSTONE, pinkish gray (7.5YR 7/2) with miliolids, peloids (probably altered skeletal grains), branching and globular corals (Porites and Pocillopora ?, resp.), and coralline algal fragments, in order of decreasing abundance. Moldic porosity (5%). CORAL-MOLD RUDSTONE, pinkish gray (7.5YR 7/2) with corals (Porites > Pocillopora ?), gastropods, miliolids. Similar to 71–97 cm. 16–71 cm: SKELETAL GRAINSTONE, pinkish gray (7.5YR 7/2) with miliolids common, larger benthic foraminifers very rare, corals (Porites > Pocillopora ?), peloids, coralline algae, and mollusks. Grain size about 1 mm; coral fragments as large as 6 mm in length. Porosity (5%) mainly molds of corals, also mollusks and probably benthic foraminifers. Possibly some solution enlarged intergranular pores, some with fringes of bladed carbonate cement crytals. 48–64 cm are white (N9) and appear much denser, apparently a result of recrystallization. Composition and porosity (size abundance and type) do not appear to change across a sharp, curving, and possibly near vertical contact in Section 1, 48–56 cm. The denser appearance results from "homogenization" of grains and cement to a chalky white. Cement burrow lining, 6 mm diameter, in Section 1, 41–48 cm. Section 1, 72–96 cm: CORAL-MOLD RUDSTONE, very pale brown (10 YR 7/3). Grains are coral fragments (Porites branches > Pocillopora ? heads; probably 4 or more coral species present), benthic foraminifers (miliolids), coralline algal fragments, bivalvesm, and gastropods. Coral and mollusk fragements to 7 mm long form a grain support with a matrix of miliolid grainstone. Porosity is 5%–10%; partial molds of corals and molds of mollusks. Cement partially fills some molds with clear, bladed, coarse-grained, steep scalenahedra. Many corals in Section 1, 89–96 cm are neomorphosed to coarse clear spar with ghosts of skeletal structure. Section 1, 96–110 cm: FORAMINIFER PACKSTONE (OR GRAINSTONE), somewhat chalky, very pale brown (10YR 8/3). Grains are benthic foraminifers (miliolids), peloids (altered skeletal grains ?), bivalves, and gastropods. Porosity is 3% molds, mainly of mollusks. Section 1, 102–110 cm has 25% moldic porosity, owing to a concentration of large mollusks and a few coral fragments. Casts of sponge (clionid) borings line molds. Section 1, 102–110 cm includes a large irregular vug filled partially by miliolid-mollusk packstone with calcisilt matrix. The vug margin is lined with coarse scalenahedral spar; locally it is stained yellow (limonite ?). Section 1, 110–143 cm: ALGAL-FRAGMENT GRAINSTONE. Pale brown (10 YR 6/3). Grains in decreasing abundance: coralline algae, peloids (altered skeletons ?), miliolids, corals (Porites > Pocillopera ?), other benthic foraminifers, cemented intraclasts, mollusks (gastropods > bivalves> scaphopods ?); encrusting coralline algae and worms are very rare. Coralline algae and corals increase in abundance near the base and miliolids decrease; however, in Section 1, 140–143 cm, which is finer grained, miliolids > alga > peloids > corals. Grain size is about 2 mm; sorting is moderate. Porosity is about 7%, mostly molds of corals and bivalves; some enlarged to small vugs.

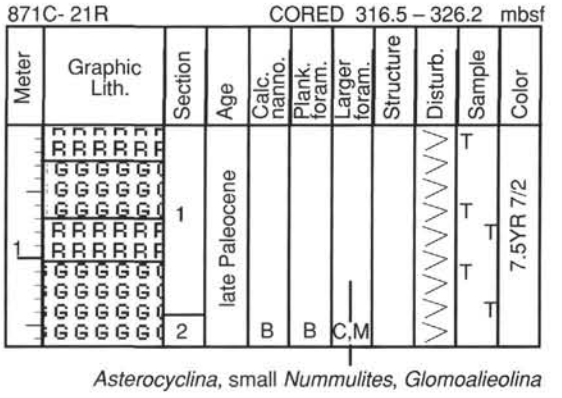
Section 2:
Section 2, 0–25 cm: ALGAL-FRAGMENT GRAINSTONE, pale brown (10YR 6/3). Continuation of Section 1 lithology. Grains in decreasing abundance: coralline algal fragments, corals (Porites > Pocillopera ?), miliolids, gastropods, bivalves, peloids (some likely soft fecal pellets). Grain size averages 2 mm. Sorting is moderate. Porosity is ~ 10%, molds of corals and bivalves; small vugs.

General description:
Cylinders: Section 1, 20–64 cm; Rollers: Section 1, 0–5 cm, Section 1, 16–20 cm, Section 1, 64–115 cm, Section 1, 129–140, Section 2, 0–5 cm, Section 2, 14–25 cm; Drilling Pebbles: Section 1 5–16 cm, Section 2, 115–129 cm, Section 1, 140–143 cm, Section 2, 5–14 cm. Thin section samples: Section 1, 0–5 cm, Section 1, 56–64 cm, Section 1, 71–77 cm, Section 1, 103–110 cm, Section 1, 130–136 cm.




871C-19R
CORED 297.2 – 306.9 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
0.1
1
B
B
F,M
T
7.5YR 7/2
Large Alveolina
early Eocene


871C-20R
CORED 306.9 – 316.5 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
0.1
1
early Eocene
B
B
C,M
T
7.5YR 7/2 To 2.5YR 7/2
Large Alveolina


871C- 21R
CORED 316.5 – 326.2 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
late Paleocene
B
B
C,M
T
7.5YR 7/2
Asterocyclina, small Nummulites, Glomoalieolina

SITE 871 HOLE C CORE 22R CORED 326.2 – 335.8 mbsf

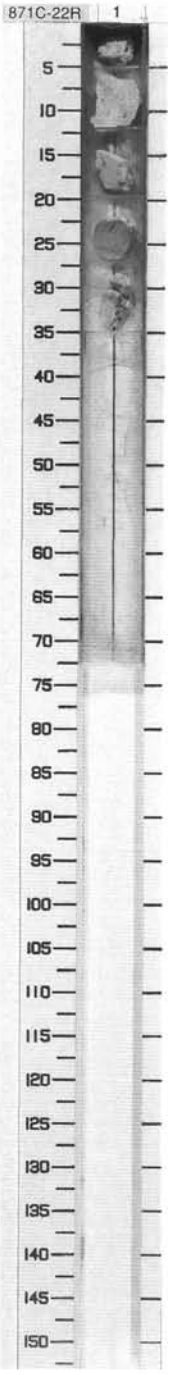
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P G G G G G G G G G G G G W W W P P P	1	late Paleocene	R		T	10YR 8/2 to 10YR 7/2

DESCRIPTION

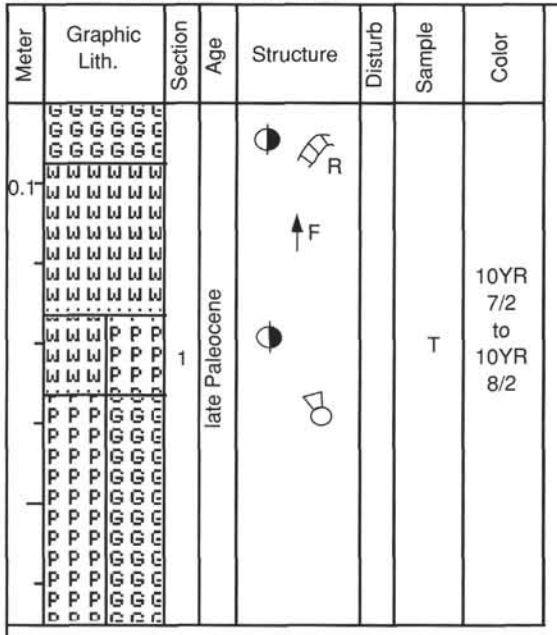
PACKSTONE, FORAMINIFER PACKSTONE, CORAL-FORAMINIFER PACKSTONE, *and* FORAMINIFER GRAINSTONE

Major Lithologies:
0–5 cm: PACKSTONE, white (10YR 8/2) with benthic foraminifers, leached bivalve fragments, leached coral fragments, and vuggy porosity. 5–12 cm: FORAMINIFER PACKSTONE, white (10YR 8/2) to light gray (10YR 7/2) with abundant benthic foraminifers (miliolids and small nummulites), locally leached bivalve fragments, locally leached coral fragments, and gastropods. Mottling present. 12–26 cm: CORAL-FORAMINIFER PACKSTONE, white (10YR 8/2) with abundant benthic foraminifers (miliolids and small nummulites), bivalve fragments, large coral fragments (mostly branching) encrusted by red algae, pieces of red algae and possibly green algae. Bivalve fragments are locally leached and the pores are filled with drusy calcite. Intergranular pores are infilled with calcite cement. 26–30 cm: FORAMINIFER GRAINSTONE, light gray (10YR 7/2) with benthic foraminifers (miliolids and alveolinids), coral fragments, red algae, and possible green algal fragments. Intergranular pores are infilled with calcite cement. 30–34 cm: FORAMINIFER WACKESTONE TO PACKSTONE, white (10 YR 8/2) with benthic foraminifers (miliolids and alveolinids), bivalve fragments, and small gastropods. Open molds in gray stained area, cement filled mold below.

General Description:
Rollers: 0–34 cm. Thin section sample: 19–26 cm.



SITE 871 HOLE C CORE 23R CORED 335.8 – 345.4 mbsf



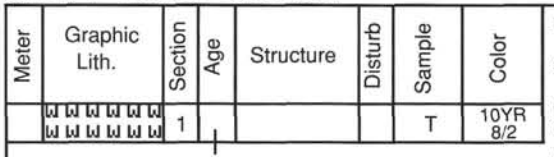
DESCRIPTION

ALGAL GRAINSTONES, FORAMINIFER WACKESTONES, FORAMINIFER WACKESTONES TO PACKSTONES, and FORAMINIFER PACKSTONES TO GRAINSTONES

Major Lithologies:
0–5 cm: ALGAL GRAINSTONE, very pale brown (10YR 7/3) and medium to coarse grained. Red algae are abundant and locally bored; other components include coral fragments, benthic foraminifers (alveolinids, miliolids). Some skeletal fragments are leached; the porosity is moldic to vuggy. Drusy calcite cements occur within intergranular pores. 5–26 cm: FORAMINIFER WACKESTONES, light gray (10YR 7/2) with a porcellaneous aspect. Benthic foraminifers are few and often leached (small miliolids). Other components are leached bivalve fragments, small gastropods (cerithids). Bioturbation gives a mottled aspect to the rock; fenestrae occur at 20 cm. Porosity is moderate, moldic to vuggy (20 to 26 cm). 26–37 cm, FORAMINIFER WACKESTONES TO PACKSTONES, fine grained and light gray (10YR 7/2). Benthic foraminifers are abundant (miliolids). Other components include coral fragments (usually leached), small gastropods (cerithids), bivalve pieces (usually leached). The porosity is moldic to vuggy. 37–65 cm: FORAMINIFER PACKSTONES TO GRAINSTONES, white (10YR 8/2). Benthic foraminifers include miliolids that are usually leached (moldic porosity). Fragments of thin-shelled bivalves are also recorded.

General Description:
Cylinders: 37–55 cm; Rollers: 0–4.5 cm, 14–26 cm, 55–61 cm; Drilling Pebbles: 4.5–14 cm, 26–37 cm, 61–65 cm. Thin section sample: 37–45 cm.

SITE 871 HOLE C CORE 24R CORED 345.4 – 355.1 mbsf

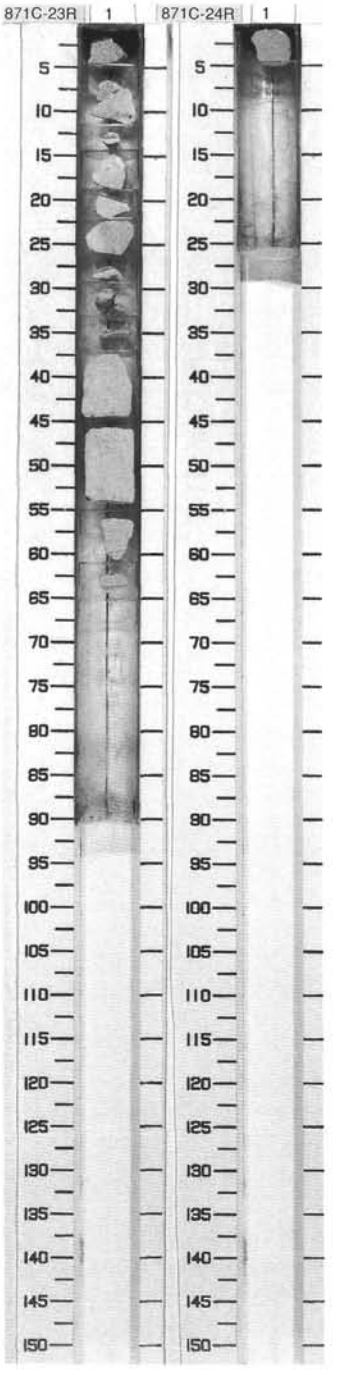


DESCRIPTION

SKELETAL WACKESTONE

Major Lithology:
0–4 cm: SKELETAL WACKESTONE, white (10 YR 8/2) with grayish tint. Skeletal allochems are mainly foraminifers (miliolids-25%?) with leached bivalve and gastropod molds, a possible coral fragment, many peloids, and gray, soft (fecal?) pellets. One mold is lined with small drusy calcite crystals. Lime mud fills all interparticle porosity; porosity is mainly intraparticle. Largest shell fragment is ~ 5 mm. Foraminifers are about 0.5 mm or less in diameter.

General Description:
Rollers: 0–4 cm. Thin Section sample: 0–4 cm.



871C-22R CORED 326.2 – 335.8 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1	P, G, W	1	late Paleocene	B	B	F,M		R	T	10YR 8/2 To 10YR 7/2

Asterocyclina, small *Nummulites*, *Glomoalieolina*

871C-23R CORED 335.8 – 345.4 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1	G, W, P	1	late Paleocene	B	B	C,P	R, F		T	10YR 7/2 To 10YR 8/2

Asterocyclina, small *Nummulites*, *Glomoalieolina*

871C- 24R CORED 345.4 – 355.1 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
	W	1	late Paleocene	B	B	C,M			T	10YR 8/2

Asterocyclina, small *Nummulites*, *Glomoalieolina*

SITE 871 HOLE C CORE 25R CORED 355.1 – 364.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	P B F	1	late Paleocene	R			7.5YR 7/2

DESCRIPTION

FORAMINIFER-PELOID PACKSTONE, ALGAL BOUNDSTONE, and SKELETAL FLOATSTONE

Major Lithologies:
0–12 cm: FORAMINIFER-PELOID PACKSTONE, color is pinkish gray (7.5YR 7/2). Texture is medium to fine grained. Skeletal fragments rare, some are white and up to 1 cm-long (curved-bifurcating); others are molds. 5–12 cm have tubular cavities, 0.5 cm-diameter and exceeding 3 cm-long, that are lined with brown drusy calcite. The origin of these cavities is unknown, but seems to be prior to the leaching of other skeletal fragments which are not lined with drusy calcite.
12–16 cm: ALGAL BOUNDSTONE, encrusting red algal thalli over (1) irregular, 0.5 cm-scale, lime mud, and foraminifer wackestone-filled zones and (2) possible geopetal cavity-fill of pale brown lime mud, locally peloidal. Overall color is pinkish gray (7.5YR 7/2). Rare worm tubes, 1 mm-length. 16–27 cm: SKELETAL FLOATSTONE, pinkish gray (7.5YR 7/2) with abundant mollusk fragments (bivalves and gastropods), typically 0.5 cm-long and recrystallized (?) with brown calcite. Scattered 1-cm molds of coral; red algal fragments and green algal plates. Matrix is foraminifer (miliolid) wackestone.

General Description:
Cylinders: 16–27 cm; Rollers: 0–16 cm. Thin section samples: 0–4 cm, 12–17 cm, 18–28 cm.

SITE 871 HOLE C CORE 26R CORED 364.7 – 374.3 mbsf

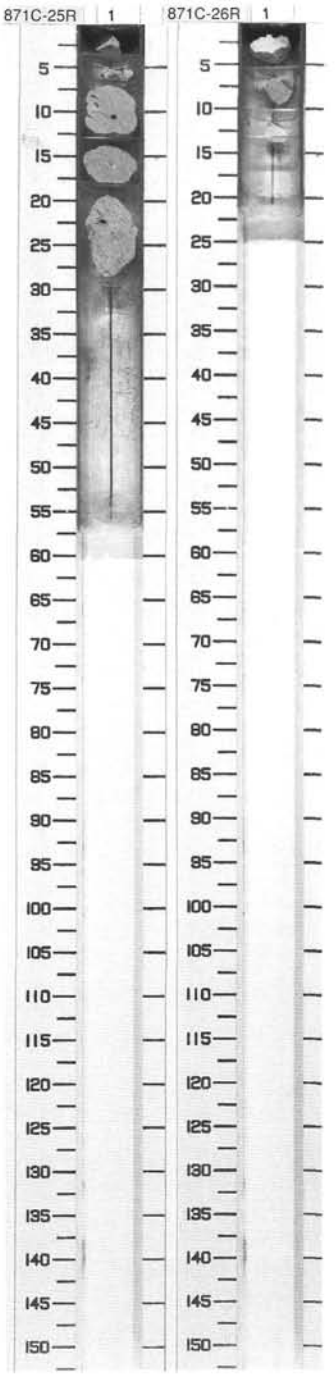
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	W Y P	1	late Paleocene			T	N9 to 10YR 8/2

DESCRIPTION

SKELETAL WACKESTONE AND SKELETAL PACKSTONE and FORAMINIFER WACKESTONE

Major Lithologies:
0–5 cm: SKELETAL WACKESTONE, white (N9 to 10YR 8/2) with rare skeletal fragments and foraminifers (miliolids). Abundant lime mud. 5–10 cm: FORAMINIFER PACKSTONE, pinkish gray (7.5YR 8/2) with numerous skeletal fragments and shell molds (gastropods and green algae; all <0.5 cm). 10–13 cm: SKELETAL PACKSTONE. White (N9 to 10YR 8/2) with common skeletal fragments and foraminifers (miliolids). Abundant lime mud.

General Description:
Drilling Pebbles: 0–13 cm. Thin section sample: 4–10 cm.



SITE 871 HOLE C CORE 27R CORED 374.3 – 383.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
	P P P P P P P P P P P P	1	late Paleocene	R		T	10YR 8/2

DESCRIPTION

ALGAL-FORAMINIFER PACKSTONE-BOUNDSTONE

Major Lithology:
1–6 cm: ALGAL-FORAMINIFER PACKSTONE, white (10YR 8/2) with foraminifers (miliolids), skeletal fragments, coral fragments, peloids, and abundant red algal fragments. Piece at 0–3 cm has red algal laminae encrusting a zone 3 cm-wide, 1 cm-thick. This is a continuation of the algal-dominated samples of Core 28R. Coral fragments and some mollusk shells have been leached. Interparticle porosity is ~ 5%

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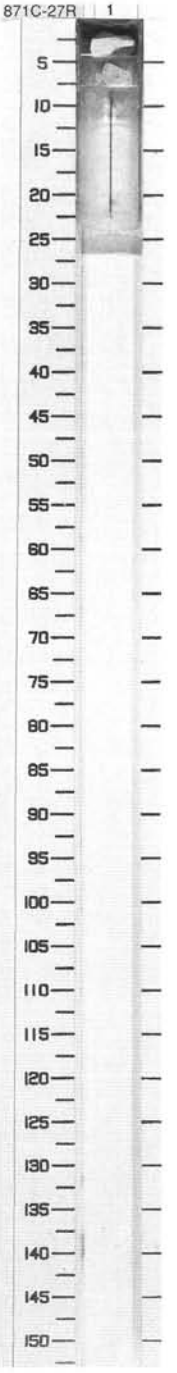
General Description:
Rollers: 0–3 cm; Drilling Pebbles: 3–6 cm. Thin section *sample: 0–4 cm.*



871C-25R CORED 355.1 – 364.7 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1	P / B / F	1	late Paleocene	B	B	C,P	R			7.5YR 7/2

Asterocyclina, small *Nummulites*, *Glomoalieolina*

871C-26R CORED 364.7 – 374.3 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1	W / P	1		B	B	F,P			T	N9 To10YR 8/2

late Paleocene

Asterocyclina, small *Nummulites*, *Glomoalieolina*

871C- 27R CORED 374.3 – 383.7 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
	P	1		B	B	I R,M	R		T	10YR 8/2

late Paleocene

Asterocyclina, small *Nummulites*, *Glomoalieolina*

SITE 871 HOLE C CORE 28R CORED 383.7 - 393.4 mbsf

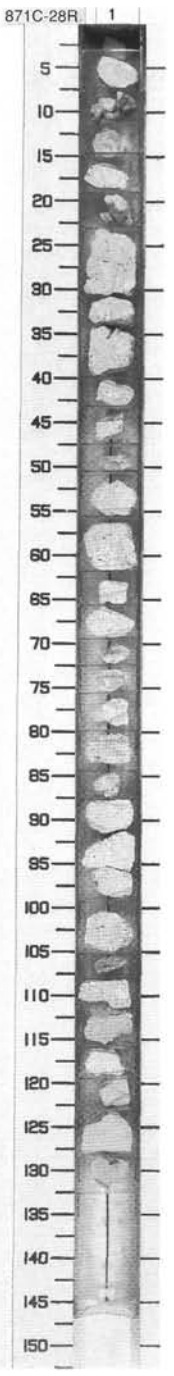
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
	PGGGGG	1	late Paleocene	R		T T T T	10YR 8/2

DESCRIPTION

SKELETAL GRAINSTONES - PACKSTONES

Major Lithology:
0–133 cm: SKELETAL GRAINSTONES-PACKSTONES, white (10YR 8/2), poorly sorted. The texture is usually medium to coarse grained, except between 116 and 133 cm where it is fine to medium grained. Red algae are abundant and consist of reworked pieces of branching forms or of rhodolites of few cm in size. (e.g. between 11 and 63 cm). Nuclei of rhodolites consist of skeletal sands and/or algal remains. Algal crusts are usually bored either by worms or by bivalves (Lithophagus ?). Two types of red algae identified: Corallinaceans (especially in the inner layers) and Squamariaceans (especially in the outer layers). Branching red algae are especially abundant between 50 and 70 cm. *Other components include benthic foraminifers (small* nummulites, miliolids), pieces of branching corals (usually leached), leached bivalve fragments (some whole thin-shelled bivalves), gastropods, echinoid spines, peloids, and intraclasts. The porosity is generally low (moldic porosity or locally vuggy). Intergranular and moldic pores are rimmed by drusy calcite cements.

General Description:
Cylinders: 23–40 cm, 56–62 cm, 124–128 cm; Rollers: 3–7 cm, 11–19 cm, 50–56 cm, 62–70 cm, 80–124 cm, 128–133 cm; Drilling Pebbles: 0–3 cm, 7–11 cm, 19–23 cm, 40–50 cm, 70–80 cm; Thin section samples: 3–7 cm, 23–39 cm, 105–108 cm, 123–128 cm.



SITE 871 HOLE C CORE 29R CORED 393.4 – 403.1 mbsf

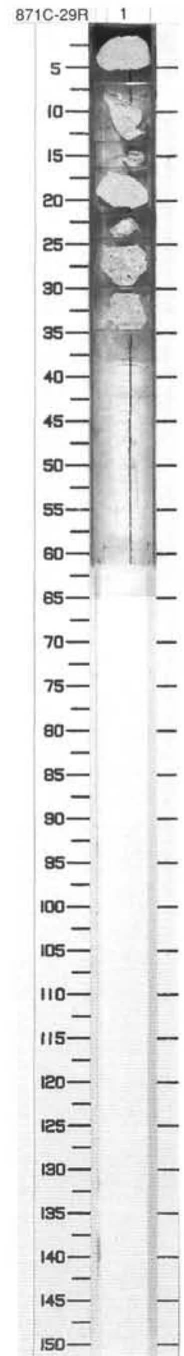
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	G G G G G G / P P P P P P	1	late Paleocene	R		T	10YR 8/4

DESCRIPTION

FORAMINIFER-PELOID GRAINSTONE and ALGAL PACKSTONE WITH RHODOLITHS

Major Lithologies:
0–6 cm: FORAMINIFER-PELOID GRAINSTONE, very pale brown (10 YR 8/4), fine sand, ~ 0.25 mm, well sorted, rounded. Grains dominantly peloids (altered skeletal particles?) with miliolid foraminifers, coralline algal fragments, and worm tubes. An area of floatstone with 1–3 cm coralline algal fragments at the clast margin may represent a coarser layer or a burrow fill. Porosity is 3%, skeletal molds with some solution enlarged interparticle pores (sxBP). 6–35 cm, ALGAL PACKSTONE WITH RHODOLITHS, very pale brown (10YR 8/4), lower coarse sand, moderately sorted, well rounded. Grains dominantly rounded algal fragments (corallines slightly > codiacians) with small benthic foraminifers and peloids. Mollusk and coral fragments are rare. Rhodoliths are as large as 60 mm. Cores are large skeletal fragments or sand; sand in 3–7 cm forms geopetal, the sand was unlithified. Layering varies from irregular and wavy with enclosed sediment, typical of the inner cortex, to dense and concentric in the outer cortex. Porosity varies from 2%–5%, dominantly skeletal molds with solution enlarged interparticle and intraparticle, small vugs, and shelter pores. Cement is clear, euhedral bladed calcite. A distinct 3 mm layer of FORAMINIFER GRAINSTONE forms the top (oriented by geopetals) of 3–7 cm. It contains unbroken large and small benthic foraminifers with a thick cement coating. Base is irregular, top is planar (cavity fill ?).

General Description:
Rollers: 0–11 cm, 16–35 cm; Drilling pebbles: 11–16 cm.
Thin section sample: 16–21 cm.



SITE 871 HOLE C CORE 30R CORED 403.1 - 412.8 mbsf

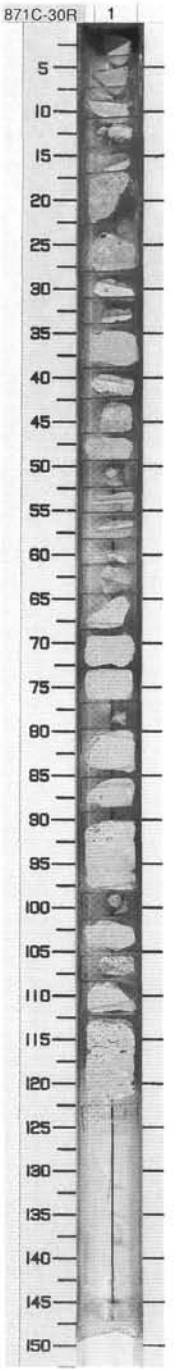
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1	P P P G G G P P P G G G P P P G G G P P P G G G P P P P P P P P P P P P P P P P P P	1	late Paleocene		⊢⊢⊢⊢⊢	T	10YR 8/2

DESCRIPTION

SKELETAL-ALGAL PACKSTONE-GRAINSTONE

Major Lithology:
0–68 cm: SKELETAL-ALGAL PACKSTONE-GRAINSTONE, medium grained, white (10YR 8/2), with skeletal fragments (coarse sand to gravel size) of red algae (branching red algae in 4–7 cm and 42–46 cm; rhodoliths in pieces at 17–24 cm, 38–42 cm, and 62–65 cm), corals (38–42 cm), bivalves and gastropods. Small foraminifer tests, and unidentifiable sand-size grains of skeletal debris are recognizable in the finer grained matrix. In some of the limestone pieces there is moldic to vuggy porosity (5%). A burrow is visible in 52–56 cm. Reworked volcanogenic grains occur in 52–56 cm. 68–89 cm: SKELETAL PACKSTONE of a same color as above. Differs from that above by lack of coarser algal and skeletal debris. Moldic porosity is 1%. 89–123 cm: medium-grained PACKSTONE, with about 10% rhodoliths and coral fragments (e.g. 90–98 cm and 113–123 cm). Other components are: mollusk debris (5%), and rare gastropods, all preserved only as molds. Moldic porosity is 5%–7%.

General Description:
Cylinders: 89–98 cm, 113–123 cm; Rollers: 17–32 cm, 34–48 cm, 62–77 cm, 81–89 cm, 102–113 cm; Drilling pebbles: 0–17 cm, 32–34 cm, 48–62 cm, 77–81 cm, 98–102 cm. Thin section sample: 57–50 cm.



871C-28R CORED 383.7 – 393.4 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1	G, R, P	1	late Paleocene	B	B	F,M	R		T, T, T, T	10YR 8/2

Asterocyclina, small *Nummulites*, *Glomoalieolina*

871C-29R CORED 393.4 – 403.1 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
0.1	G, P	1	late Paleocene	B	B	F,P	R		T	10YR 8/4

Asterocyclina, small *Nummulites*, *Glomoalieolina*

871C- 30R CORED 403.1 – 412.8 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1	G, P	1	late Paleocene	B	B	R,P			T	10YR 8/2

Asterocyclina, small *Nummulites*, *Glomoalieolina*

SITE 871 HOLE C CORE 31R CORED 412.8 – 422.5 mbsf

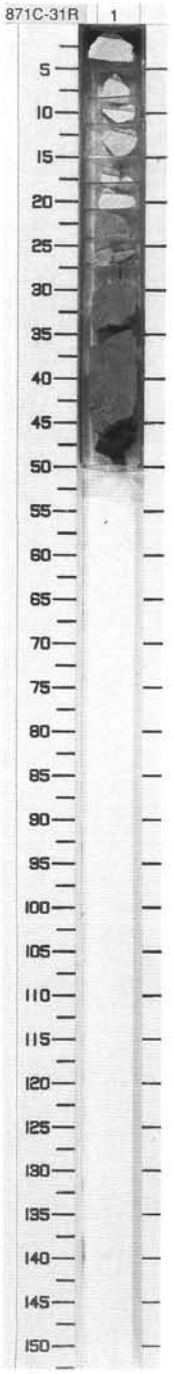
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.1	W W W W W W W W W W W W W W W W W W W W W W W W W W W W W W G G G G G G G G G G G G F F F F F F P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P	1	late Paleocene				10YR 7/2 to 10YR 8/4 10YR 7/6 to 2.5YR 4.0

DESCRIPTION

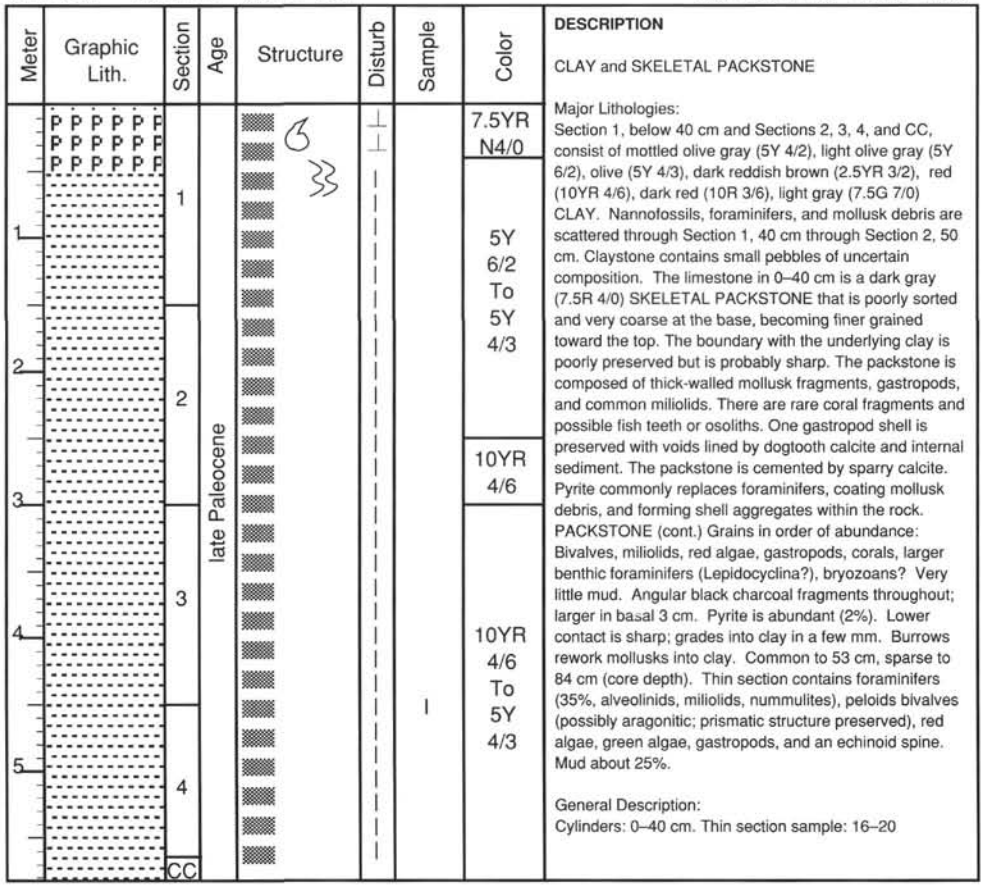
MILIOLID PACKSTONE, GASTROPOD WACKESTONE, FORAM-ALGAL GRAINSTONE, and MOLLUSK-MILIOLID PACKSTONE

Major Lithologies:
0–12 cm: GASTROPOD WACKESTONE, light gray (10YR 7/2) with 10% white (N9) mottles. Dominant grains: Gastropods (low-spired) with small benthic foraminifers. Bivalves rare. Small, irregular burrows (0.3 mm diameter) with mud fill (5–8 cm) are the likely source of mottles through chalkification of burrow fill. Porosity 2%. Solution enlarged gastropod molds is lined with coarse, clear, euhedral rhombic calcite. Irregular, (soft sediment?), cement-filled cracks in 0–5 cm. 12–18 cm: FORAMINIFERAL ALGAL GRAINSTONE, skeletal moldic, yellow (2.5Y 8/2) with patches of deeper yellow (stain?), coarse sand (1/2 mm) with bioclasts to 2 mm; well sorted. Dominant grains are benthic foraminifers and coralline algal fragments with bivalve fragments, high-spired gastropods, and codiacian? algal plates. Porosity 10% as molds of mollusks and foraminifers. 18–21 cm: ALGAL GRAINSTONE, very pale brown (10YR 8/4). Very coarse sand (2 mm), moderately sorted. Rhodoliths up to 10 mm. Dominant grains: coralline and codiacian algal fragments with rhodoliths, benthic foraminifers, bivalves. Porosity 3%; as skeletal molds. 21–27 cm: MOLLUSK-MILIOLID PACKSTONE, yellow (10YR 7/6). Very coarse sand (1–2 mm), moderately sorted. Grains dominantly miliolid foraminifers, bivalve fragments, and gastropods, with dascyclad algae (rare). Porosity 2%–5%, molds of bivalves and miliolids (partial). Cement in molds is coarse, euhedral, bladed scalenohedral calcite. Many grains and some calcite crystals are stained black. Black, soft residue fills some pores and cracks. A few distinct crystals appear metallic. 27–50 cm: MILIOLID PACKSTONE, dark gray 2.5YR 4/0). Very coarse sand, poorly sorted. Grains dominantly miliolids (40%–80%) and mollusks (10%–40%) with echinoderms rare. Porosity <1%, small skeletal molds (mcMO) of miliolids (?). Matrix about 30%, appears to contain appreciable siliciclastic detritus but insoluble residue of bulk sample is only 1.9%. The outer rims of many miliolids and other fossils are blackened.

General Description:
Cylinders: 27–50 cm; Rollers: 0–27 cm. .



SITE 871 HOLE C CORE 32R CORED 422.5 - 432.2 mbsf

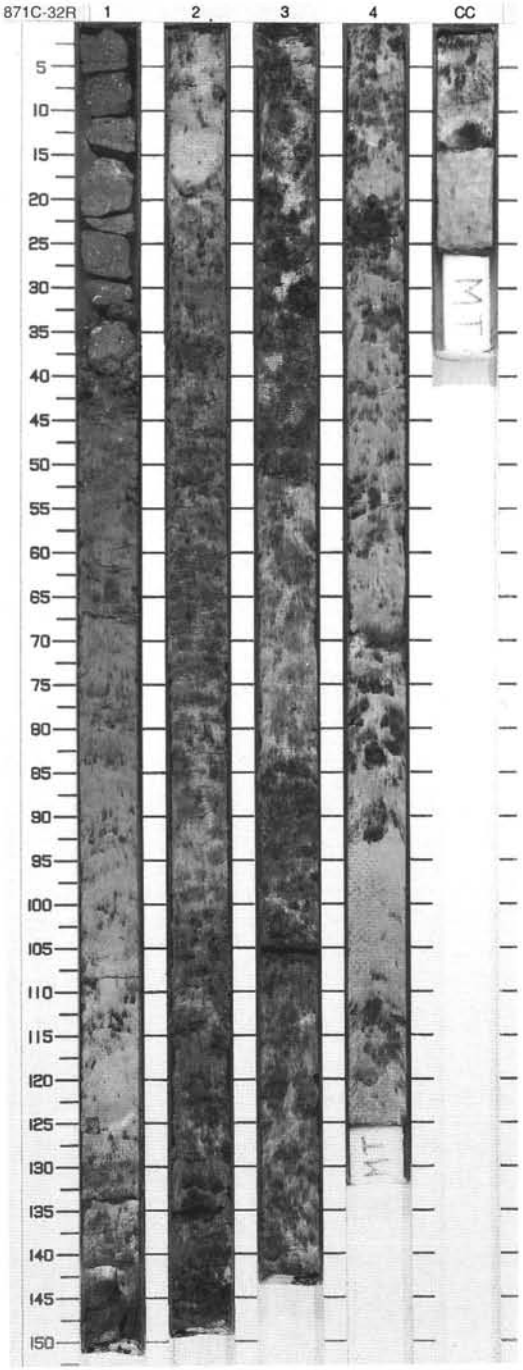


DESCRIPTION

CLAY and SKELETAL PACKSTONE

Major Lithologies:
Section 1, below 40 cm and Sections 2, 3, 4, and CC, consist of mottled olive gray (5Y 4/2), light olive gray (5Y 6/2), olive (5Y 4/3), dark reddish brown (2.5YR 3/2), red (10YR 4/6), dark red (10R 3/6), light gray (7.5G 7/0) CLAY. Nannofossils, foraminifers, and mollusk debris are scattered through Section 1, 40 cm through Section 2, 50 cm. Claystone contains small pebbles of uncertain composition. The limestone in 0–40 cm is a dark gray (7.5R 4/0) SKELETAL PACKSTONE that is poorly sorted and very coarse at the base, becoming finer grained toward the top. The boundary with the underlying clay is poorly preserved but is probably sharp. The packstone is composed of thick-walled mollusk fragments, gastropods, and common miliolids. There are rare coral fragments and possible fish teeth or osoliths. One gastropod shell is preserved with voids lined by dogtooth calcite and internal sediment. The packstone is cemented by sparry calcite. Pyrite commonly replaces foraminifers, coating mollusk debris, and forming shell aggregates within the rock. PACKSTONE (cont.) Grains in order of abundance: Bivalves, miliolids, red algae, gastropods, corals, larger benthic foraminifers (Lepidocyclina?), bryozoans? Very little mud. Angular black charcoal fragments throughout; larger in basal 3 cm. Pyrite is abundant (2%). Lower contact is sharp; grades into clay in a few mm. Burrows rework mollusks into clay. Common to 53 cm, sparse to 84 cm (core depth). Thin section contains foraminifers (35%, alveolinids, miliolids, nummulites), peloids bivalves (possibly aragonitic; prismatic structure preserved), red algae, green algae, gastropods, and an echinoid spine. Mud about 25%.

General Description:
Cylinders: 0–40 cm. Thin section sample: 16–20



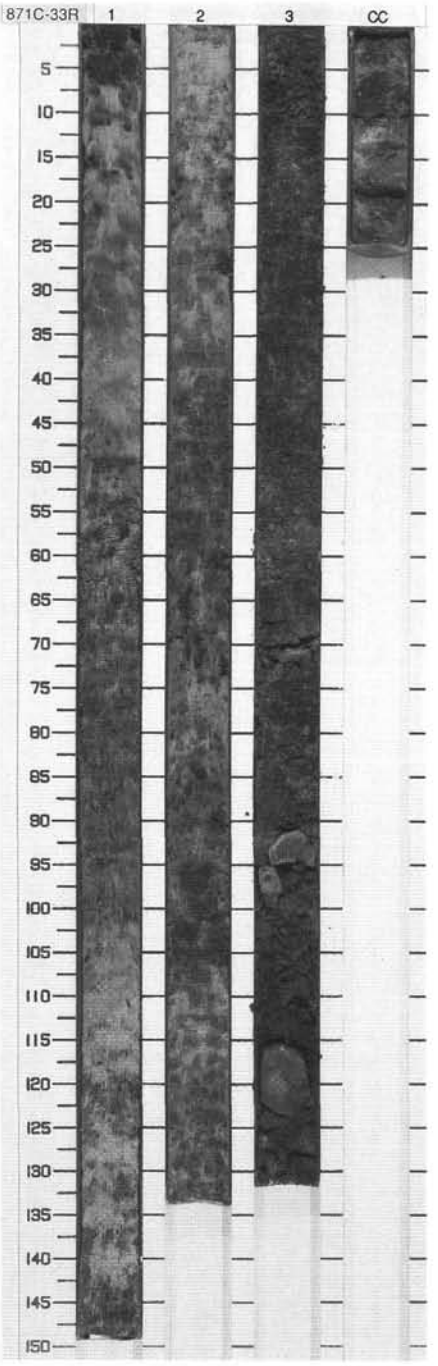
SITE 871 HOLE C CORE 33R CORED 432.2 - 441.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–4		1					10YR 3/3 To 2.5YR 4/4
		2	?			P I	10G 7/2 To 2.5YR 4/4
		3		◇ ◇ ◇ ◇			
		CC					

DESCRIPTION

CLAY

Major Lithology:
CLAY, mottled, dominantly dark red (10YR 3/3) to light olive brown (2.5Y 5/4) with pale red (10YR 6/3) and olive brown (2.5YR 4/4) mottles in Section 1, 0–50 cm. Light olive brown (2.5YR 5/4) to olive brown (2.5Y 4/4) in Section 1, 50–100 cm. Dominantly greenish gray (10G 7/2) with pale red (10R 6/3) to light olive brown (2.5Y 5/4) mottles in Section 1, 100–150 cm and in Section 2. Section 3, 0–70 cm is dominantly light olive brown (2.5Y 5/4) with greenish gray (10G 7/2) and grayish brown (2.5Y 5/2) mottles. Basalt(?) clasts in Section 3, 70–131 cm.



871C-31R
CORED 412.8 – 422.5 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
0.1
1
late Paleocene
late Paleocene
R,G
B
B
F,M
Asterocyclina, small Nummulites, Glomoalieolina
10YR 7/2 To 10YR 8/4
10YR 7/6 To 2.5YR 4.0

871C-32R
CORED 422.5 – 432.2 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
5
1
2
3
4
late Paleocene
late Paleocene
R,G
B
F,M
Asterocyclina, small Nummulites, Glomoalieolina
10YR 4/6 To 5Y 4/3
10YR 4/6
5Y 6/2 To 5Y 4/3
7.5YR N4/0

871C- 33R
CORED 432.2 – 441.8 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
4
1
2
3
CC
?
B
B
B
P
10G 7/2 To 2.5YR 4/4
10YR 3/3 To 2.5YR 4/4

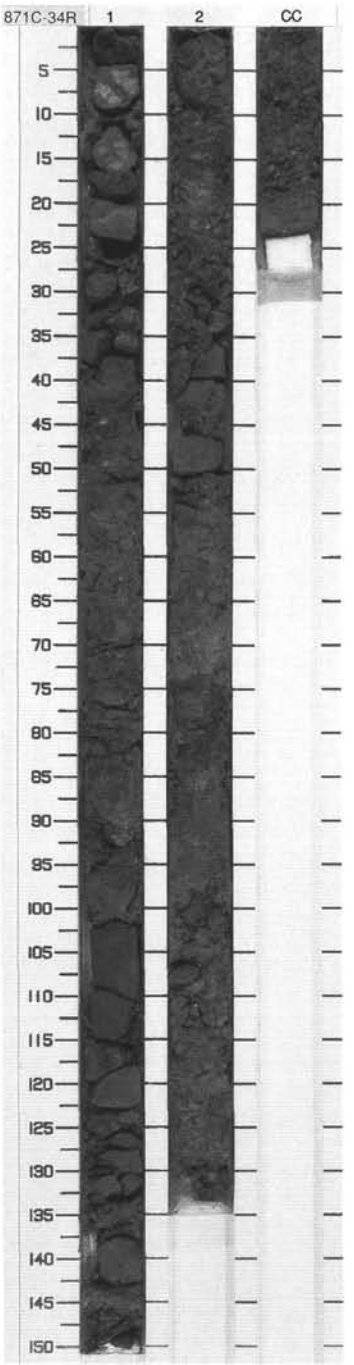
SITE 871 HOLE C CORE 34R CORED 441.8 - 451.5 mbsf

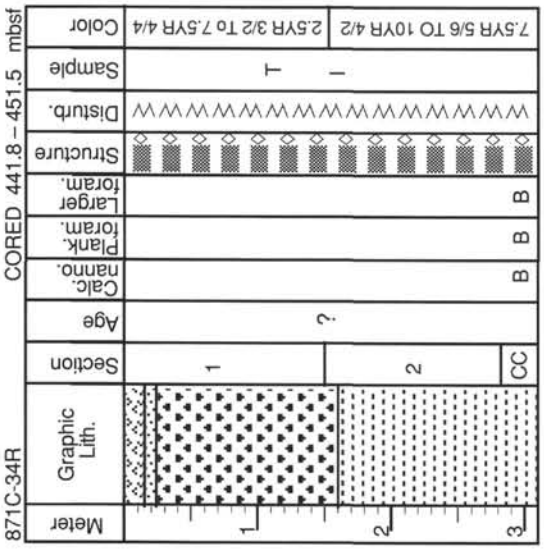
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1–3		1, 2, CC	?			T, I	2.5YR 3/2 To 7.5YR 4/4; 7.5YR 5/6 To 10YR 4/2

DESCRIPTION

BASALT, CLAYSTONE, and VOLCANIC BRECCIA

Major Lithologies:
Mix of mottled CLAYSTONE with 60% BASALT and VOLCANOGENIC SANDSTONE clasts. Section 1, 1–15 cm: medium gray clinopyroxene-phyric basalt with <2 mm calcite veins; 16–23 cm: dusky red (10R 3/4) fine-grained epiclastic volcanogenic sandstone; 23–78 cm: highly altered (mostly to clay) volcanic rock (2.5YR 3/2); 78–101 cm: brown (7.5YR 4/4) highly altered (mostly to clay) volcanic rock; 101–150 cm: broken, extremely altered clay and volcaniclastic clasts, brown (7.5YR 4/4) with green spots. Section 2, 10–26 cm: strong brown (7.5YR 5/6) CLAYSTONE; 26–61 cm: dark grayish brown (10YR 4/2); 61–144 cm: strong brown (7.5YR 5/6).

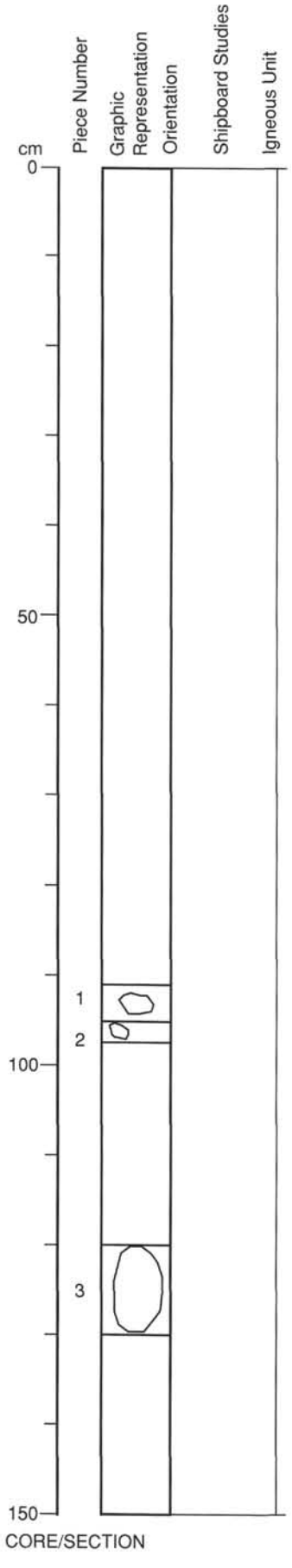


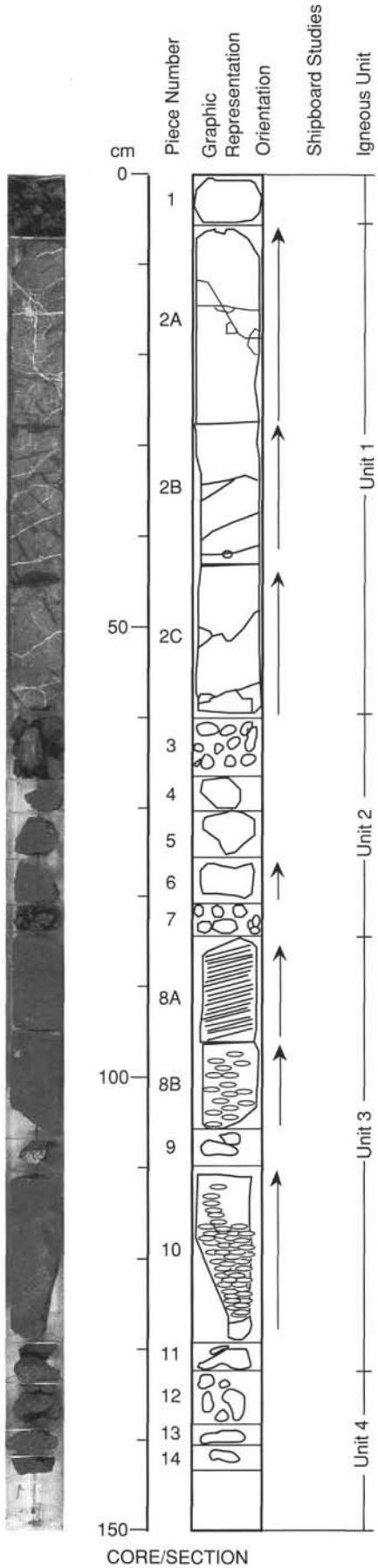

871C-34R
CORED 441.8 – 451.5 mbsf
Meter
Graphic Lith.
Section
Age
Calc. nanno.
Plank. foram.
Larger foram.
Structure
Disturb.
Sample
Color
1
2
3
CC
?
B
B
B
T
—
2.5YR 3/2 To 7.5YR 4/4
7.5YR 5/6 TO 10YR 4/2

144-871C-33R-3

Pieces 1–3

Embedded in the claystone, there are three igneous clasts.
Piece 1 (91–95 cm) is comprised of dark green aphyric basalt with a lighter green weathering rind.
Piece 2 (94–97 cm) is comprised of light green, very phyric, very weathered basalt with a darker green weathering rind.
Piece 3 (120–130 cm) is comprised of medium gray, slightly phyric (clinopyroxene) basalt with an upper weathering rind about 3 cm thick.





144-871C-35R-1

UNIT 1: CLINOPYROXENE BASALT

Pieces 2A–2C

CONTACTS: None.
PHENOCRYSTS:
Clinopyroxene - 4%; 6 mm; Often altered.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Medium gray (N5).
STRUCTURE: None.
ALTERATION: Groundmass is slightly altered; calcite has been introduced.
VEINS/FRACTURES: 3%; 5 mm; Stockwork; White calcite. Veins open up as they approach xenoliths and are most likely to cross one another through or around the xenoliths.
ADDITIONAL COMMENTS: 5% ultramafic xenoliths. These are quite strongly altered (iddingsitized).

UNIT 2: OLIVINE-CLINOPYROXENE-PLAGIOCLASE BASALT

Pieces 3–7

CONTACTS: None.
PHENOCRYSTS:
Plagioclase - 2%; 1–3 mm; Altered (to epidote?).
Olivine - 5%; 1–4 mm; Altered to iddingsite.
Clinopyroxene - 2%; 1–3 mm; Altered to a dark reddish brown (10R 3/4) in upper portion of unit.
GROUNDMASS: Oxidized.
VESICLES: None.
COLOR: Grayish red (5R 4/2).
STRUCTURE: None.
ALTERATION: Groundmass and most phenocrysts are extensively oxidized and replaced.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: None.

UNIT 3: GRADED VOLCANICLASTIC SANDSTONE

Pieces 8A–11

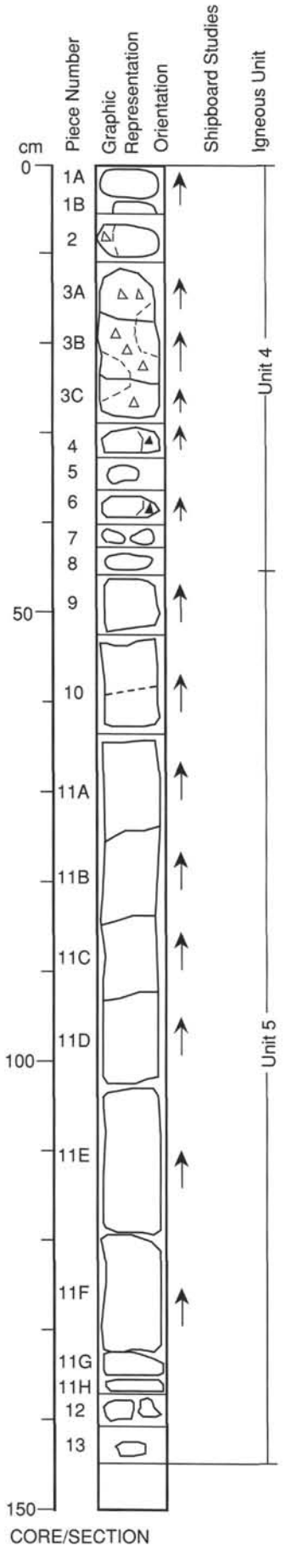
CONTACTS: The lower 2–3 cm of Piece 10 is a basalt clast, likely the top of Unit 4.
PHENOCRYSTS: None.
GROUNDMASS: Fine matrix; Clasts increase downward through the top 20 cm of the unit, reaching 0.5–1.0 cm.
VESICLES: None.
COLOR: Matrix is moderate dusky red (5R 4/4); Clasts are pale yellowish orange (10Y 8/6).
STRUCTURE: Strong horizontal fabric caused by flattening and orientation of the clasts.
ALTERATION: Clasts all replaced by clays. Baked or weathered moderate dusky red (5R 4/4).
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: None.

UNIT 4: VERY COARSE BASALT BRECCIA

Pieces 12–14

CONTACTS: Bottom of Piece 10 may be a contact.
PHENOCRYSTS: Aphyric.
GROUNDMASS: Large >5 cm aphyric basalt clasts in a moderate reddish brown (10R 4/6) volcanogenic granular matrix (<2 mm).
VESICLES: <2%; 2–5 mm; Irregular; Filled with calcite.
COLOR: Clasts are greenish gray (5G 6/1); Matrix is moderate reddish brown (10R 4/6).
STRUCTURE: None.
ALTERATION: Moderately altered. Development of clay minerals seems to have cemented the unit very well.
VEINS/FRACTURES: <1%; <1 mm; Filled with calcite.
ADDITIONAL COMMENTS: None.

144-871C-35R-2



UNIT 4: VERY COARSE BASALT BRECCIA (continued)

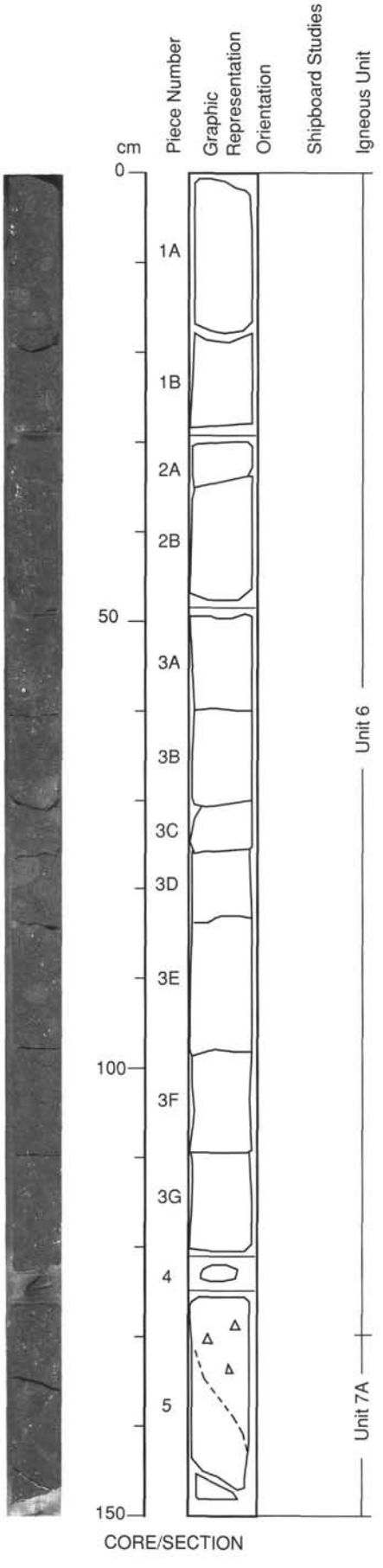
Pieces 1A–8

CONTACTS: Continuous with the previous section.
PHENOCRYSTS: Aphyric.
GROUNDMASS: Clasts are >5 cm; Matrix is volcanogenic granular material (<2 mm).
VESICLES: <2%; 2–5 mm; Irregular; Filled with calcite.
COLOR: Clasts are greenish gray (5G 6/1); Matrix is moderate reddish brown (10R 4/6).
STRUCTURE: None.
ALTERATION: Moderate clay formation has authigenically created a cement.
VEINS/FRACTURES: <1%; <1 mm; Filled with calcite.
ADDITIONAL COMMENTS: None.

UNIT 5: BASALT BRECCIA

Pieces 9–13

CONTACTS: None.
PHENOCRYSTS: Aphyric.
GROUNDMASS: Clasts are 1–5 cm, angular; Matrix is fine volcanogenic material.
VESICLES: <1%; 2–5 mm; Irregular; Filled with calcite.
COLOR: Clasts are blackish red (5R 2/2) through moderate grayish brown (5YR 4/2); Matrix is very dusky red purple (5RP 2/2).
STRUCTURE: None.
ALTERATION: Moderate clay formation has authigenically created a cement.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: May be a smaller-clasted portion of Unit 4.



144-871C-35R-3

UNIT 6: MATRIX-RICH BASALT BRECCIA

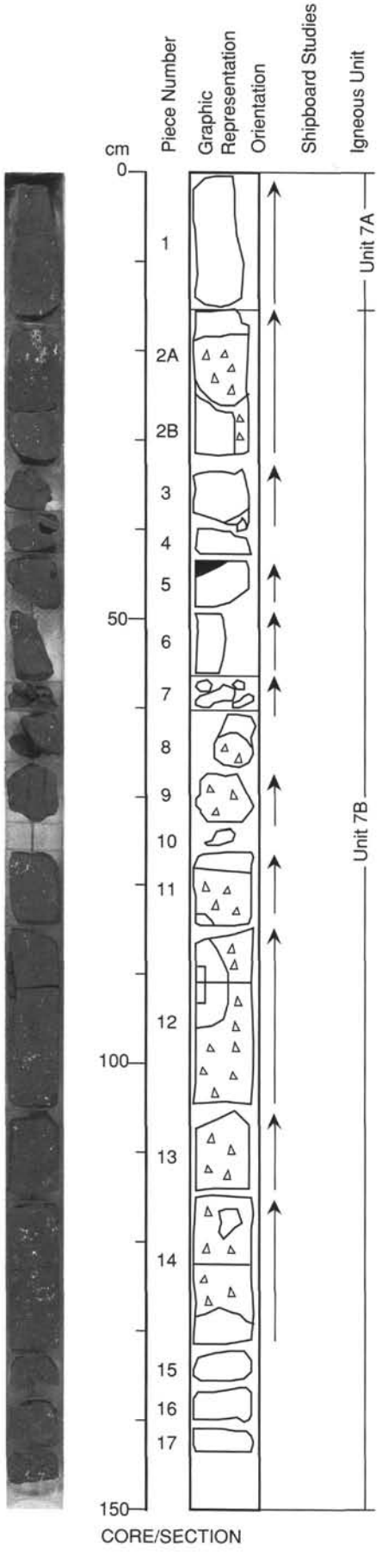
Pieces 1A–4, top of 5

CONTACTS: Lower contact with basalt boulder of Unit 7A in the lower part of Piece 5.
PHENOCRYSTS: Aphanitic to sparsely olivine microphyric.
GROUNDMASS: Clasts are 1 cm, subrounded; Matrix is fine volcanogenic material.
VESICLES: <1%; 1–3 mm; Irregular; Filled with calcite.
COLOR: Clasts are dark gray (N3) to light brownish gray (5YR 3/1); Matrixis purplish red.
STRUCTURE: None.
ALTERATION: Moderate clay formation has authigenically created a cement.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: May be a more matrix-rich subunit of Unit 5. Two xenoliths (?), completely iddingsitized, are near 57 cm.

UNIT 7A: VERY COARSE BASALT BRECCIA

Piece 5

CONTACTS: Subunit 7A starts at the breccia/large clast contact in Piece 5. Large clast ends in Section 35R-4, Piece 2A.
PHENOCRYSTS: Aphyric.
GROUNDMASS: Clast is >30 cm. It is surrounded by a volcanogenic sand-sized matrix.
VESICLES: <1%; 1–3 mm; Irregular; Filled with calcite. These occur only in the clasts.
COLOR: Clast is dark gray (N5).
STRUCTURE: None.
ALTERATION: Moderate clay formation.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Subunit 7A is a rounded basalt clast; it has been made a separate unit because its size and relative freshness make it a good candidate for geochemical study.



144-871C-35R-4

UNIT 7A: VERY COARSE BASALT BRECCIA (continued)

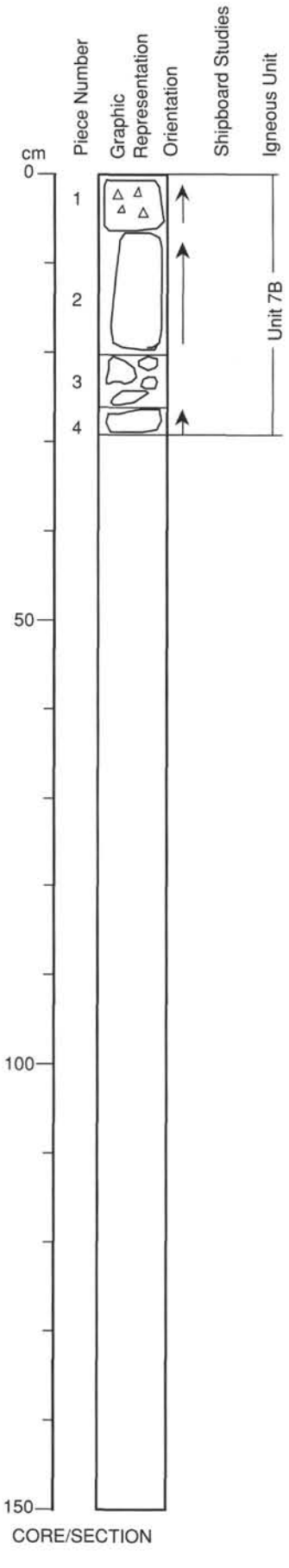
Pieces 1, top of 2A

CONTACTS: Continuous with the previous section. Large clast ends in Piece 2A.
PHENOCRYSTS: Aphyric.
GROUNDMASS: Clast is >30 cm. It is surrounded by a volcanogenic sand-sized matrix.
VESICLES: <1%; 1–3 mm; Irregular; Filled with calcite. These are only in the clasts.
COLOR: Clast is dark gray (N5).
STRUCTURE: None.
ALTERATION: Moderate clay formation.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Subunit 7A is a single, rounded basalt clast; It has been made a separate unit because its size and relative freshness make it a good candidate for geochemical study.

UNIT 7B: VERY COARSE BASALT BRECCIA

Pieces Bottom of 2A, 2B–17

CONTACTS: Subunit 7B starts at the large clast/breccia contact in Piece 2A.
PHENOCRYSTS:
Olivine - <2%; <3 mm; Iddingsitized. Angular and found only in the clasts.
Clinopyroxene - <1%; 1 mm; Throughout the clasts. Appear unaltered.
GROUNDMASS: Large basalt clasts in a matrix of sand-sized volcanogenic material.
VESICLES: 5%; 1–5 mm; Calcite blotches and stringers. Some of these may have been irregular vesicles.
COLOR: Clasts are grayish red (5Y 4/2); Matrix is brownish gray (5YR 4/1).
STRUCTURE: None.
ALTERATION: Moderate clay formation, more pervasive in the matrix.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: None.

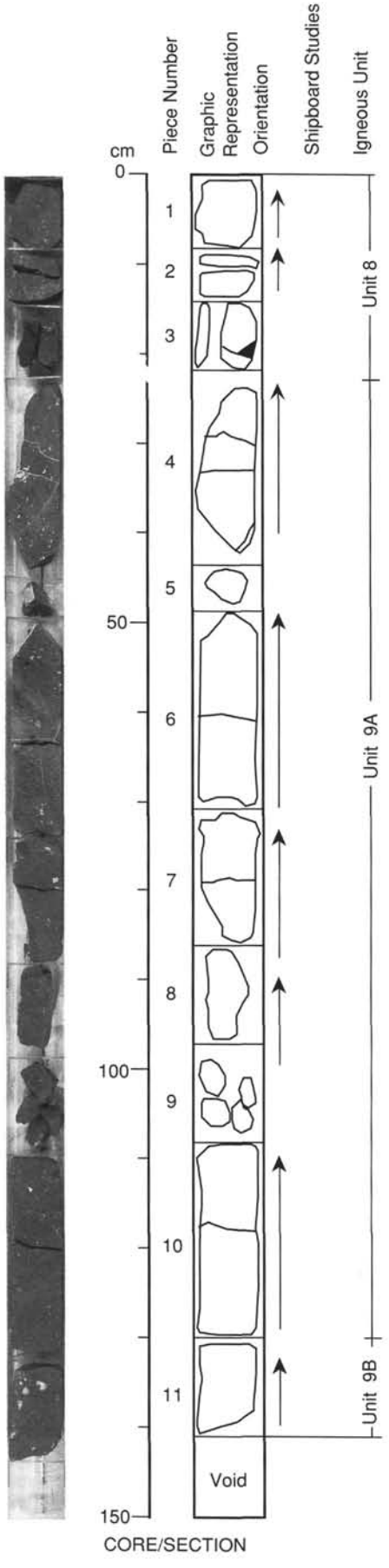


144-871C-35R-5

UNIT 7B: VERY COARSE BASALT BRECCIA

Pieces 1–4

CONTACTS: Continued from Section 35R-4.
PHENOCRYSTS:
Olivine - <2%; <3 mm; Iddingsitized. Angular and found only in the clasts.
Clinopyroxene - <1%; 1 mm; Throughout the clasts. Appear unaltered.
GROUNDMASS: Large basalt clasts in a matrix of sand-sized volcanogenic material.
VESICLES: 5%; 1–5 mm; Calcite blotches and stringers. Some of these may have been irregular vesicles.
COLOR: Clasts are grayish red (5Y 4/2); Matrix is brownish gray (5YR 4/1).
STRUCTURE: None.
ALTERATION: Moderate clay formation, more pervasive in the matrix.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Coarse pyroclastic material similar to that found in Section 35R-4.



144-871C-36R-1

UNIT 8: FINE-GRAINED VOLCANICLASTIC SANDSTONE

Pieces 1–3

CONTACTS: None.
PHENOCRYSTS: So altered that identification is very difficult.
Olivine - 5%; 1–3 mm; Iddingsitized.
GROUNDMASS: Silt-sized VOLCANICLASTIC grains.
VESICLES: None.
COLOR: Greenish gray (5G 6/1).
STRUCTURE: None.
ALTERATION: Extremely altered; much development of clay minerals. There is calcite in tiny stringers in the matrix.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Just what this unit is is very unclear. Piece 1 is mottled in green and gray hues (5GY 6/1, 5G 6/1); this may be due to weathering, but it might also be part of Unit 7B. However, Pieces 2 and 3 are easily distinguished from Unit 7B by the green matrix.

UNIT 9A: OLIVINE BASALT

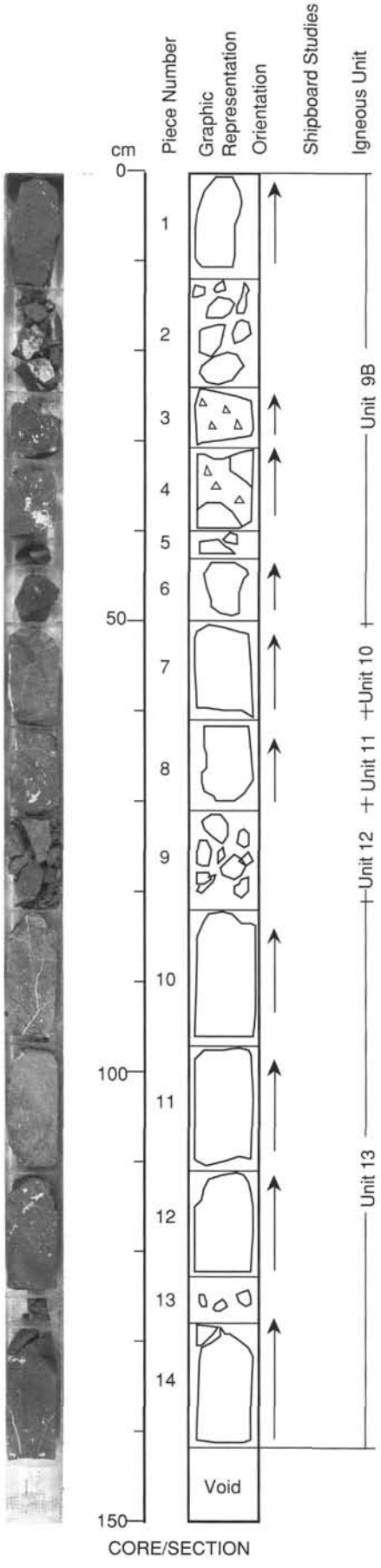
Pieces 4–10

CONTACTS: None.
PHENOCRYSTS: Olivine - 10%; 1–2 mm; Mostly iddingsitized.
GROUNDMASS: Microcrystalline.
VESICLES: <2%; 1–5 mm; Irregular; Filled with mixed calcite and green (5BG 4/6) clays.
COLOR: Medium gray (N5).
STRUCTURE: None.
ALTERATION: Quite extensive addition of calcite and formation of green clays (5BG 4/6).
VEINS/FRACTURES: 2%; To 3 mm; Calcite and green (5BG 4/6) clay mixed on a submillimeter scale.
ADDITIONAL COMMENTS: None.

UNIT 9B: OLIVINE BASALT

Piece 11

CONTACTS: More altered portion of Unit 9A, but there is no definite contact.
PHENOCRYSTS:
Olivine - 10%; 1–3 mm; Mostly iddingsitized.
GROUNDMASS: Microcrystalline.
VESICLES: 2%; 2–5 mm; Irregular; Filled vesicles and patches of calcite and green (5BG 4/6) clays.
COLOR: Mottled medium gray (N3) and dusky red (5R 3/4).
STRUCTURE: None.
ALTERATION: Invasive (hydrothermal?) alteration has resulted in a mottled matrix.
VEINS/FRACTURES: 2%; To 3 mm; Calcite and green (5BG 4/6) clay, mixed on a submillimeter scale.
ADDITIONAL COMMENTS: None.



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UNIT 9B: OLIVINE BASALT (continued)

Pieces 1–6

CONTACTS: Gradational with Unit 9A, but there is no definite contact.
PHENOCRYSTS:
Olivine - 10%; 1–3 mm; Mostly iddingsitized.
GROUNDMASS: Microcrystalline.
VESICLES: Calcite and green (5BG 4/6) clay-filled irregular vesicles and patches to 5 mm and 2%.
COLOR: Mottled medium gray (N3) and dusky red (5R 3/4).
STRUCTURE: None.
ALTERATION: Invasive (hydrothermal?) alteration has resulted in a mottled matrix.
VEINS/FRACTURES: 2%; To 3 mm; Calcite and green (5BG 4/6) clay, mixed on a submillimeter scale.
ADDITIONAL COMMENTS: At first glance, this section of the core strongly resembles a volcaniclastic basalt breccia. However, the gradation upsection into Subunit 9A, and the evidence of phenocrysts crossing the color boundaries attests to the subunit being an invasively altered basalt.

UNIT 10: OLIVINE BASALT

Piece 7

CONTACTS: None.
PHENOCRYSTS:
Olivine - <2%; <2 mm; Tiny iddingsite pseudomorphs; Identification as olivine is tentative.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Brownish gray (5YR 4/1).
STRUCTURE: None.
ALTERATION: Extreme development of clay minerals.
VEINS/FRACTURES: <1%; 0.5–2 mm; Calcite and hematite veining.
ADDITIONAL COMMENTS: A few very altered xenoliths to 1.5 cm are present.

UNIT 11: BASALT

Piece 8

CONTACTS: None.
PHENOCRYSTS: None that can be seen, but this unit is extremely altered.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Mottled with brownish gray (5YR 4/1) patches separated by a dark red (5R 2/6) material.
STRUCTURE: None.
ALTERATION: Extensively altered, with much clay development and pervasive oxidation.
VEINS/FRACTURES: 2%; <1 mm; Subparallel; Horizontal; Calcite blotches (to 10 mm) and tiny calcite veins.
ADDITIONAL COMMENTS: Interpreted as invasively altered by low temperature hydrothermal circulation.

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UNIT 12: VOLCANICLASTIC SANDSTONE

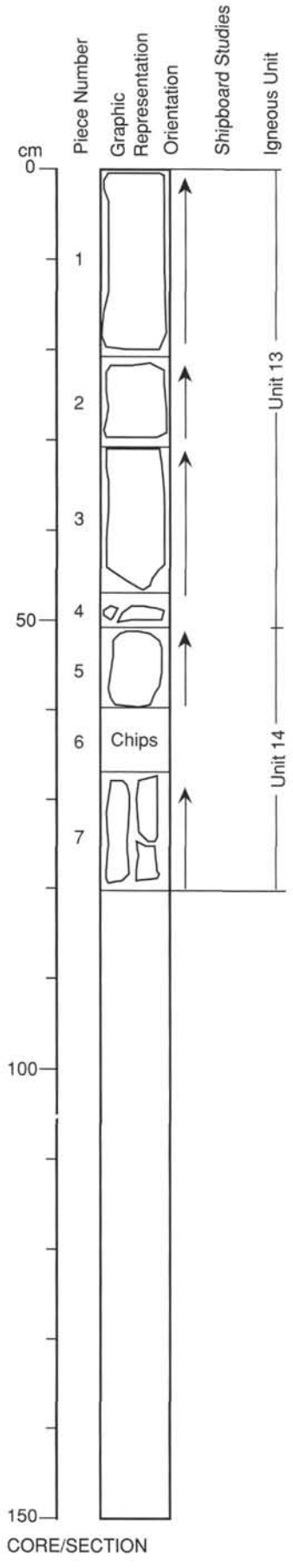
Piece 9

CONTACTS: None.
PHENOCRYSTS: None.
GROUNDMASS: Small (<1 cm) clasts in a fine matrix.
VESICLES: None.
COLOR: Clasts are pale yellowish orange (10YR 8/6); Matrix is moderate dusky red (5R 4/4).
STRUCTURE: Clasts are flattened, creating a fabric. However, none of the small fragments making up this "piece" was large enough to demonstrate direction.
ALTERATION: Mostly altered to soft clays.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Looks very like Unit 3.

UNIT 13: OLIVINE BASALT

Pieces 10–14

CONTACTS: None.
PHENOCRYSTS: Some of the green pseudomorphs may be after clinopyroxene.
Olivine - 2%; 1–3 mm; Pseudomorphs of iddingsite and green (5BG 4/6) clay.
GROUNDMASS: Microcrystalline.
VESICLES: 2%; 2–5 mm; Round; Calcite-filled.
COLOR: Light gray (N7).
STRUCTURE: None.
ALTERATION: Extensive alteration to clays and addition of calcite.
VEINS/FRACTURES: 2%; 1–3 mm; Calcite-filled.
ADDITIONAL COMMENTS: A few, very altered xenoliths to 1.5 cm.



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UNIT 13: OLIVINE BASALT (continued)

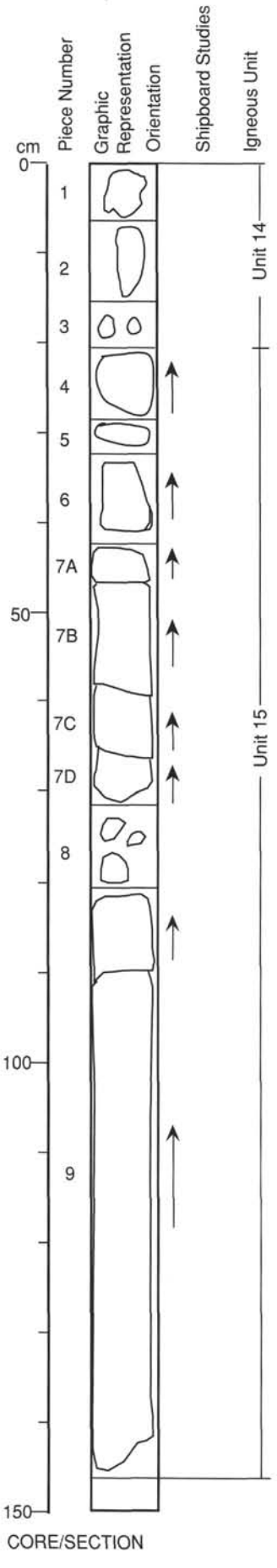
Pieces 1–4

CONTACTS: None.
PHENOCRYSTS: Some of the green pseudomorphs may be after clinopyroxene.
Olivine - 2%; 1–3 mm; Pseudomorphs of iddingsite and green (5BG 4/6) clay.
GROUNDMASS: Microcrystalline.
VESICLES: 2%; 2–5 mm; Round; Calcite-filled.
COLOR: Light gray (N7).
STRUCTURE: None.
ALTERATION: Extensive alteration to clays and addition of calcite.
VEINS/FRACTURES: 2%; 1–3 mm; Calcite-filled.
ADDITIONAL COMMENTS: A few, very altered xenoliths to 1.5 cm.

UNIT 14: OLIVINE-CLINOPYROXENE BASALT

Pieces 5–7

CONTACTS: None.
PHENOCRYSTS: Phenocrysts are so altered that the identification of clinopyroxene is tentative.
Olivine - 2%; 1–4 mm; Mostly iddingsitized.
Clinopyroxene - <1%; 1–3 mm; Mostly altered to a dark reddish brown (10R 3/4).
GROUNDMASS: Microcrystalline.
VESICLES: <2%; 1–4 mm; Round; Calcite and "celadonite"-filled.
COLOR: Dark gray (N3).
STRUCTURE: None.
ALTERATION: Extensive alteration to clays, including a green (5BG 4/6) vesicle-filling clay which may be celadonite, and addition of calcite.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: None.



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UNIT 14: OLIVINE-CLINOPYROXENE BASALT (continued)

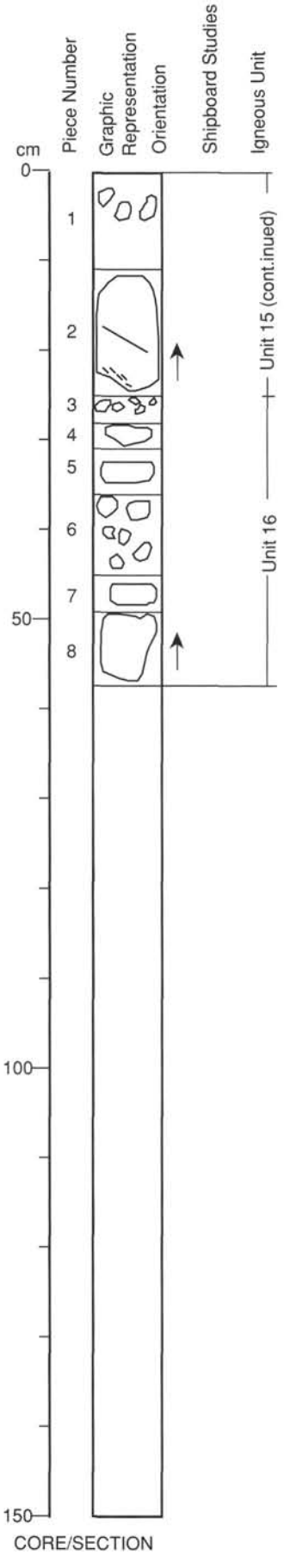
Pieces 1–2

CONTACTS: None.
PHENOCRYSTS: Phenocrysts are so altered that the identification of clinopyroxene is tentative.
Olivine - 2%; 1–4 mm; Mostly iddingzitized.
Clinopyroxene - <1%; 1–3 mm; Mostly altered to a dark reddish brown (10R 3/4).
GROUNDMASS: Microcrystalline.
VESICLES: <2%; 1–4 mm; Round; Calcite and "celadonite"-filled.
COLOR: Dark gray (N3).
STRUCTURE: None.
ALTERATION: Extensive alteration to clays, including a green (5BG 4/6), vesicle-filling clay which may be celadonite, and addition of calcite, which occurs as a vesicle-fill and in irregular patches.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: None.

UNIT 15: CLINOPYROXENE-OLIVINE BASALT

Pieces 3–9

CONTACTS: None.
PHENOCRYSTS:
Olivine - 2%–3%; 3–5 mm; Completely iddingsitized; Euhedral prisms to rounded aggregates.
Clinopyroxene - 10%; 1 mm; Mostly altered to a dark reddish brown (5BG 4/6).
GROUNDMASS: Microcrystalline.
VESICLES: To 5%; 1–7 mm; Round; Calcite and "celadonite"-filled.
COLOR: Dusky red (5R 3/4).
STRUCTURE: None.
ALTERATION: Extensive alteration to clays, including a green (5BG 4/6) vesicle-filling clay which may be celadonite, and addition of calcite.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: 100–125 cm there is up to 5% irregular patches of calcite. 141–144 cm olivine is altered to a white (5B 9/1) mineraloid rather than iddingsite.



144-871C-37R-2

UNIT 15: CLINOPYROXENE-OLIVINE BASALT (continued)

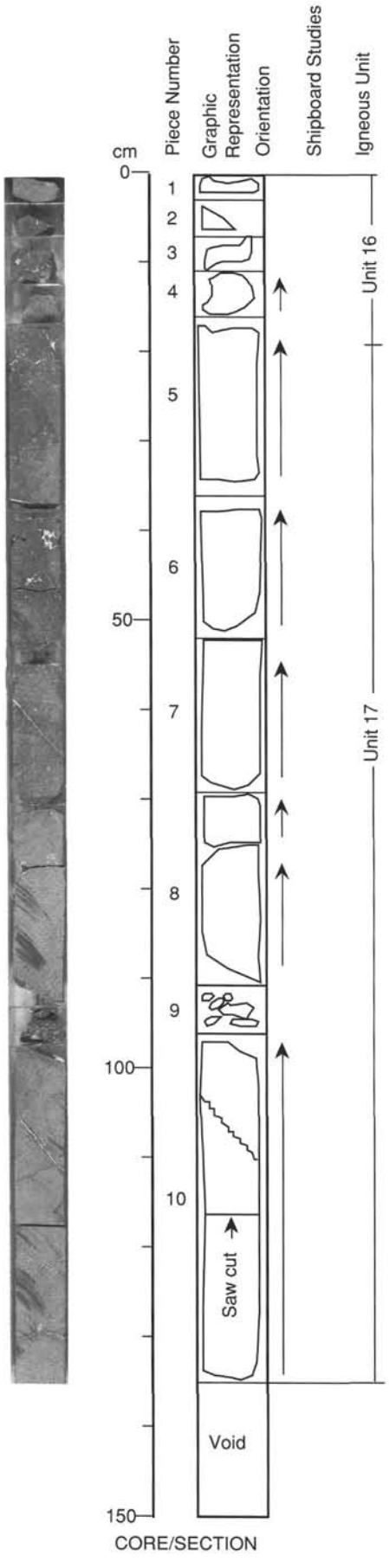
Pieces 1–2

CONTACTS: None.
PHENOCRYSTS:
Olivine - 2%–3%; 3–5 mm; Completely iddingsitized; Euhedral prisms to rounded aggregates.
Clinopyroxene - 10%; 1 mm; Mostly altered to a dark reddish brown (10R 3/4).
GROUNDMASS: Microcrystalline.
VESICLES: 3%–5%; 1–5 mm; Round; Calcite and "celadonite"-filled.
COLOR: Medium gray (N5).
STRUCTURE: None.
ALTERATION: Extensive alteration to clays, including a green (5BG 4/6), vesicle-filling clay which may be celadonite, and addition of calcite.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: None.

UNIT 16: CLINOPYROXENE-OLIVINE BASALT

Pieces 3–8

CONTACTS: None.
PHENOCRYSTS: Clinopyroxene is often rimmed (0.5 mm) in black (N1) (pyrite?).
Olivine - 2%–3%; 1–4 mm; Completely iddingsitized.
Clinopyroxene - 10%–15%; 1–4 mm; Altered to a dark reddish brown (10R 3/4).
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Dusky red (5R 3/4).
STRUCTURE: None.
ALTERATION: Extensive alteration to clays, and addition of calcite.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: 80–90 cm irregular patchy calcite is very abundant (20%–30%). 100–105 cm has a fresher gray groundmass.



144-871C-38R-1

UNIT 16: CLINOPYROXENE-OLIVINE BASALT (continued)

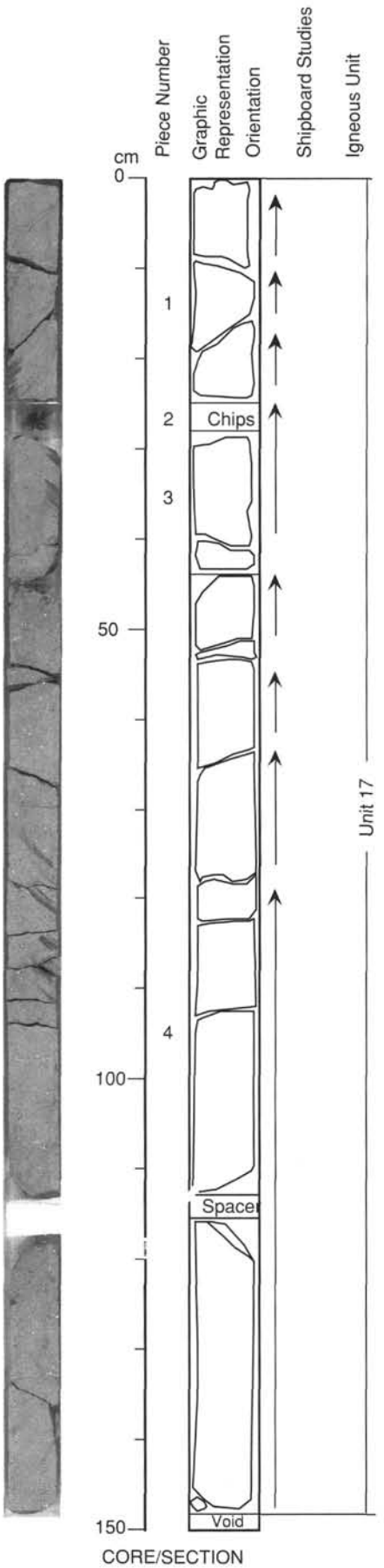
Pieces 1–4

CONTACTS: None.
PHENOCRYSTS: Clinopyroxene is often rimmed (0.5 mm) in black (N1) (pyrite?).
Olivine - 2%–3%; 1–4 mm; Completely iddingsitized.
Clinopyroxene - 10%–15%; 1–4 mm; Altered to a dark reddish brown (10R 3/4).
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Dusky red (5R 3/4).
STRUCTURE: None.
ALTERATION: Extensive alteration to clays, and addition of calcite.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: None.

UNIT 17: CLINOPYROXENE-OLIVINE BASALT

Pieces 5–10

CONTACTS: May be a less altered portion of Unit 16, contact between Pieces 4 and 5 not recovered.
PHENOCRYSTS:
Olivine - 2%–3%; 1–4 mm; Completely altered to iddingsite and a grayish green (10GY 5/2) clay.
Clinopyroxene - 10%–15%; 1–7 mm; Some, in certain small intervals, are fresh. The rest are altered.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Dark gray (N3).
STRUCTURE: None.
ALTERATION: Moderate alteration to clays, and addition of calcite.
VEINS/FRACTURES: <1%; 1–3 mm; Sparse calcite veins.
ADDITIONAL COMMENTS: 16–72 cm abundant 1–7 mm phenocrysts, entirely altered. 72–135 cm there are abundant 1–4 mm clinopyroxene phenocrysts, mostly fresh.

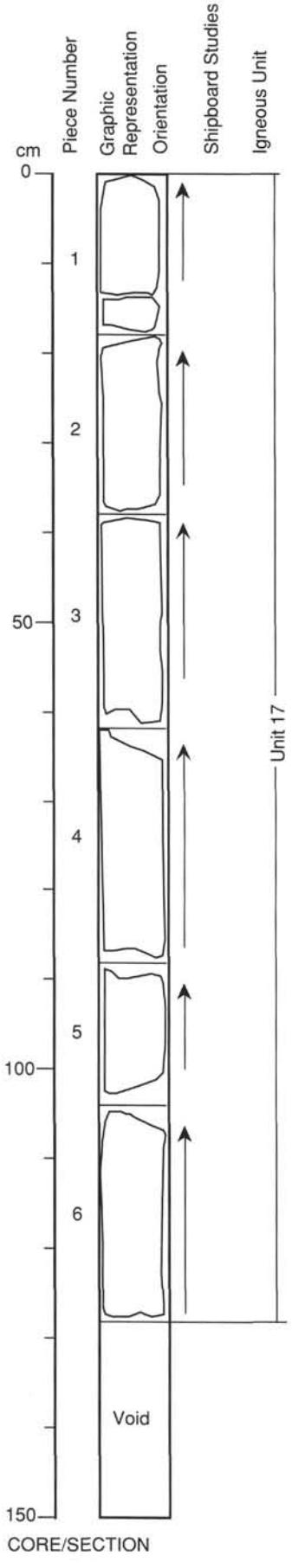


144-871C-38R-2

UNIT 17: CLINOPYROXENE-OLIVINE BASALT (continued)

Pieces 1–4

CONTACTS: Continues to adjacent sections.
PHENOCRYSTS:
Olivine - 2%–3%; 1–4 mm; Completely altered to iddingsite and a grayish green (10GY 5/2) clay.
Clinopyroxene - 10%–15%; 1–7 mm; Some, in certain small intervals, are fresh. The rest are altered.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Dark gray (N3).
STRUCTURE: None.
ALTERATION: Moderate alteration to clays, and addition of calcite.
VEINS/FRACTURES: <1%; 1–3 mm; Sparse calcite veins.
ADDITIONAL COMMENTS: 1–28 cm there are abundant 1–4 mm clinopyroxene phenocrysts, mostly fresh. 28–131 cm there are vesicles filled with a pale green (5G 7/2) expanding clay. These are usually 1.5 mm, but up to 5 mm and <1%. Between 131–148 cm there are vesicles.

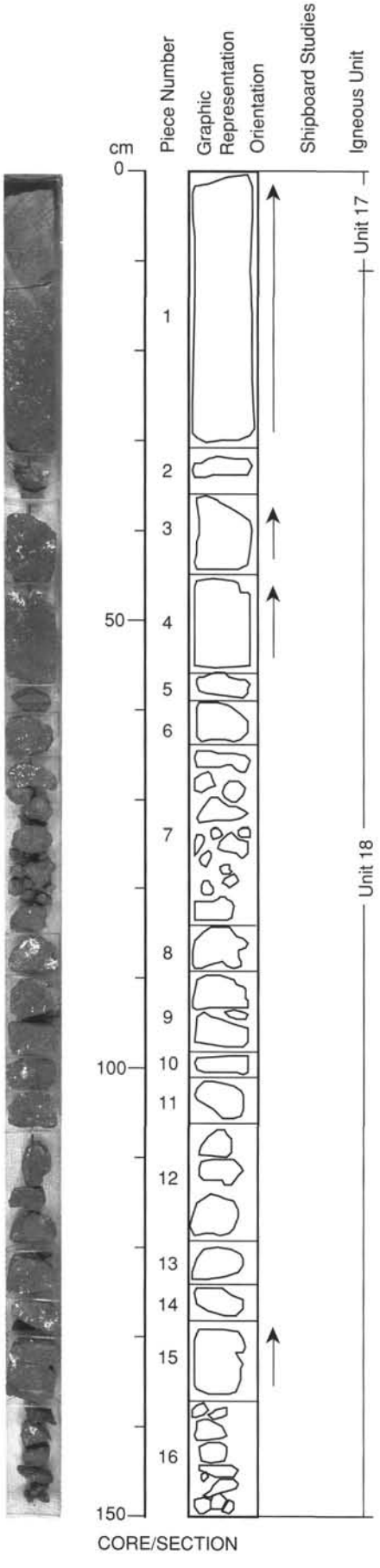


144-871C-38R-3

UNIT 17: CLINOPYROXENE-OLIVINE BASALT (continued)

Pieces 1–6

CONTACTS: Continues to adjacent sections.
PHENOCRYSTS:
Olivine - 2%–3%; 1–4 mm; Completely altered to iddingsite and a grayish green (10GY 5./2) clay.
Clinopyroxene - 10%–15%; 1–7 mm; Some, in certain small intervals, are fresh. The rest are altered.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Dark gray (N3).
STRUCTURE: None.
ALTERATION: Moderate alteration to clays, and addition of calcite.
VEINS/FRACTURES: <1%; 1–3 mm; Sparse calcite veins.
ADDITIONAL COMMENTS: As in Section 2, between 131–148 cm there are no vesicles.



144-871C-38R-4

UNIT 17: CLINOPYROXENE-OLIVINE BASALT (continued)

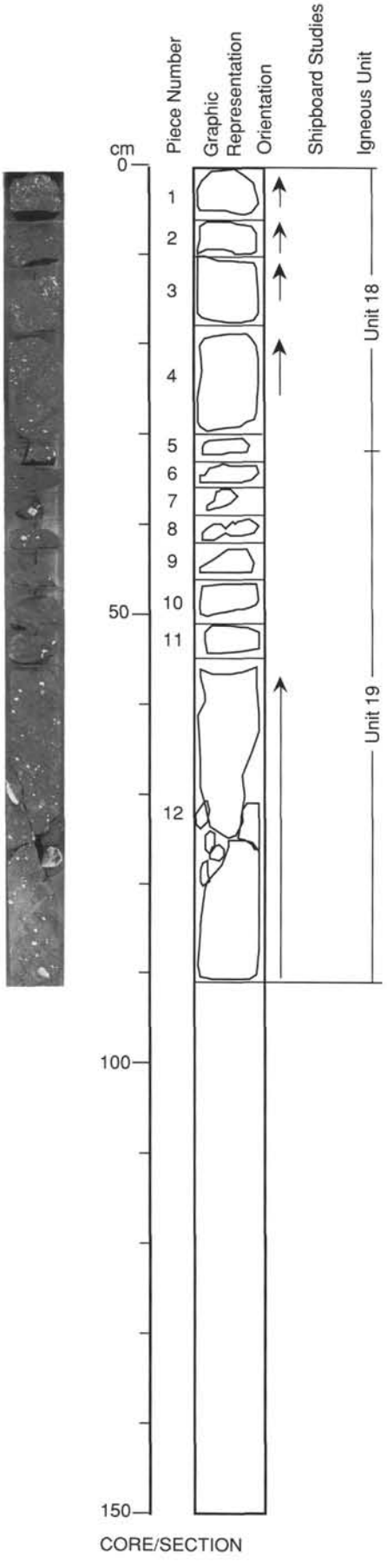
Pieces Upper part of 1

CONTACTS: Halfway down Piece 1 there is an abrupt contact into a more altered basalt.
PHENOCRYSTS:
Olivine - 2%–3%; 1–4 mm; Completely altered to iddingsite and a grayish green (10GY 5/2) clay.
Clinopyroxene - 10%–15%; 1–4 mm; Some, in certain small zones, are fresh. The rest are altered.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Dark gray (N3).
STRUCTURE: None.
ALTERATION: Moderate alteration to clays, and addition of calcite.
VEINS/FRACTURES: <1%; 1–3 mm; Sparse calcite veins.
ADDITIONAL COMMENTS: As in Section 2, 131–148 cm, there are no vesicles.

UNIT 18: CLINOPYROXENE-OLIVINE BASALT

Pieces Lower part of 1, 2–16

CONTACTS: Halfway down Piece 1 there is an abrupt contact with the lower part of Unit 17.
PHENOCRYSTS:
Olivine - 3%; 1–4 mm; All are altered to iddingsite or grayish green (10GY 5/2) clay.
Clinopyroxene - 10%; 1–4 mm; Completely altered.
GROUNDMASS: Aphanitic.
VESICLES: <2%; 1–3 mm; Irregular; Calcite and green (5G 7/2) clays fill vesicles.
COLOR: Mottled with greenish gray (5G 6/1) patches surrounded by very dark red (5R 2/6) material.
STRUCTURE: None.
ALTERATION: Extensively altered to clay minerals; especially strong development of clays pseudomorphing phenocrysts and replacing the groundmass in isolated areas. Much calcite has been added in stringers and vesicles. Invasive alteration has preferentially oxidized certain areas.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Sufficiently altered that if the contact had not been recovered we would not know what type of phenocrysts had been present.



144-871C-38R-5

UNIT 18: CLINOPYROXENE-OLIVINE BASALT (continued)

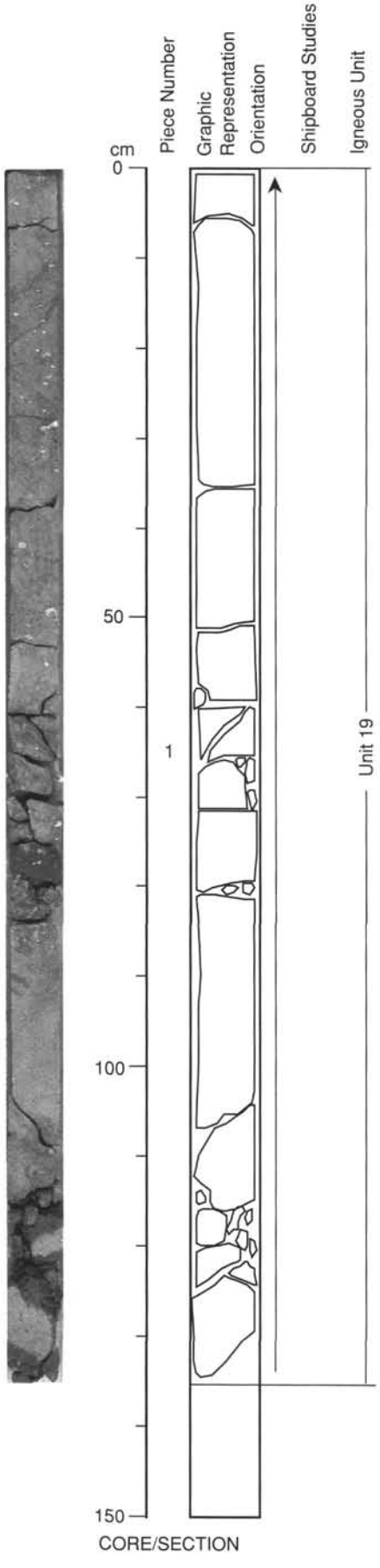
Pieces 1–4

CONTACTS: Continues from Section 4.
PHENOCRYSTS:
Olivine - 3%; 1–4 mm; All are altered to iddingsite or grayish green (10GY 5/2) clay.
Clinopyroxene - 10%; 1–4 mm; Completely altered.
GROUNDMASS: Aphanitic.
VESICLES: <2%; 1–3 mm; Irregular; Calcite and green (5G 7/2) clays fill vesicles.
COLOR: Mottled with greenish gray (5G 6/1) patches surrounded by very dark red (5R 2/6) material.
STRUCTURE: None.
ALTERATION: Extensively altered to clay minerals; especially strong development of clays pseudomorphing phenocrysts and replacing the groundmass in isolated areas. Much calcite has been added in stringers and vesicles. Invasive alteration has preferentially oxidized certain areas.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Sufficiently altered that if the contact had not been recovered we would not know what type of phenocrysts had been present.

UNIT 19: CLINOPYROXENE BASALT

Pieces 5–12

CONTACTS: None.
PHENOCRYSTS:
Clinopyroxene - 5%; 2–5 mm; Altered to dark reddish brown (10R 3/4) and grayish green (10GY 5/2) clays.
GROUNDMASS: Aphanitic.
VESICLES: To 15%; 1–10 mm; Rounded; Filled with calcite (20%) and green (5BG 4/6) "celadonite" (80%).
COLOR: Dark greenish gray (5G 4/1).
STRUCTURE: None.
ALTERATION: Matrix may be relatively unaltered, despite the vesicle-filling and phenocryst alteration.
VEINS/FRACTURES: <1%; <1 mm; Sparse, very thin, calcite veins.
ADDITIONAL COMMENTS: None.

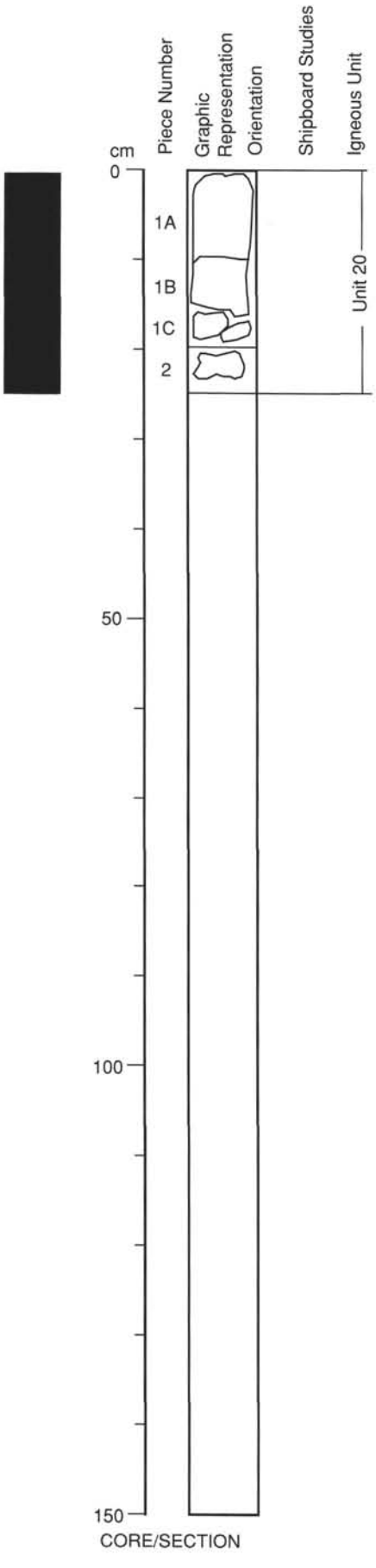


144-871C-38R-6

UNIT 19: CLINOPYROXENE BASALT (continued)

Piece 1

CONTACTS: None.
PHENOCRYSTS:
Clinopyroxene - 5%; 2–5 mm; Altered to dark reddish brown (10R 3/4) and grayish green (10GY 5/2) clays.
GROUNDMASS: Aphanitic.
VESICLES: To 10%; 1–10 mm; Rounded; Filled with calcite (20%) and "celadonite" (80%). Vesicularity decreases downsection and is very rare after 85 cm.
COLOR: Dark greenish gray (5G 4/1).
STRUCTURE: None.
ALTERATION: Matrix may be relatively unaltered, despite the vesicle-filling and phenocryst alteration.
VEINS/FRACTURES: <1%; <1 mm; Sparse, very thin, calcite veins.
ADDITIONAL COMMENTS: None.



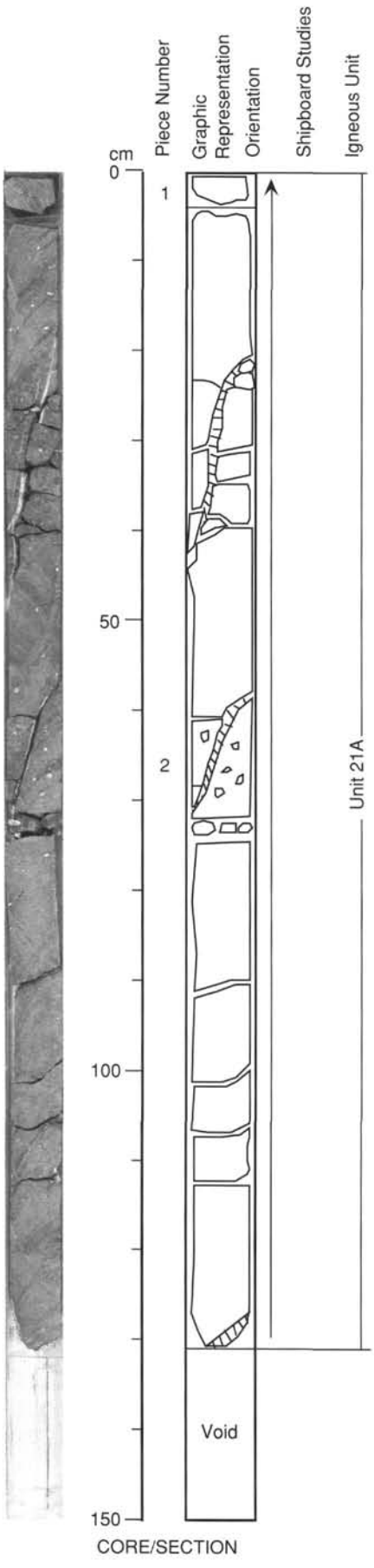
144-871C-38R-7

UNIT 20: OLIVINE BASALT

Pieces 1A–2

CONTACTS: None.
PHENOCRYSTS:
Olivine - 25%; 1–4 mm; Altered to bright orange (no appropriate Munsell color) iddingsite.
GROUNDMASS: Aphanitic.
VESICLES: <1%; 10–12 mm; Round; Filled with calcite.
COLOR: Brownish gray (5YR 4/1).
STRUCTURE: None.
ALTERATION: Matrix color suggests that the groundmass has been extensively altered to clay minerals.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: At 10 cm there is a small, completely altered xenolith. The interval 20–25 cm contains clasts of clay with basalt fragments to 1 cm. We believe that it is caused by drilling and hence have not identified it as a new unit.

No photo available

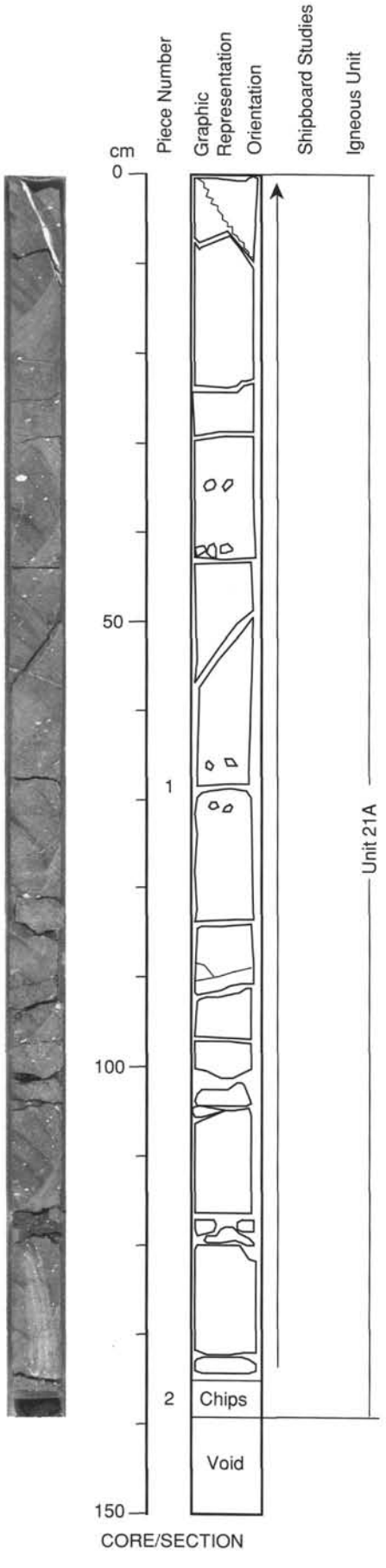


144-871C-39R-1

UNIT 21A: CLINOPYROXENE-OLIVINE BASALT

Pieces 1–2

CONTACTS: None.
PHENOCRYSTS: Glomerocrysts to 7 mm.
Olivine - 6%; 1–4 mm; Some are altered to bright orange (no appropriate Munsell color) iddingsite. Some are just rimmed (0.25 mm) with iddingsite and are fresh in the center.
Clinopyroxene - 10%; 1–4 mm; Altered to a dark reddish brown (10R 3/4), often only around the rim (0.25 mm).
GROUNDMASS: Microcrystalline.
VESICLES: <1%; 3–10 mm; Round; Calcite and clay-filled.
COLOR: Dusky red (5R 3/4).
STRUCTURE: None.
ALTERATION: Matrix color suggests that the groundmass has been moderately altered to clay minerals.
VEINS/FRACTURES: <1%; 1–7 mm; 45 degrees from vertical; A few, large, mixed calcite and clay veins, mostly subparallel to one another.
ADDITIONAL COMMENTS: None.

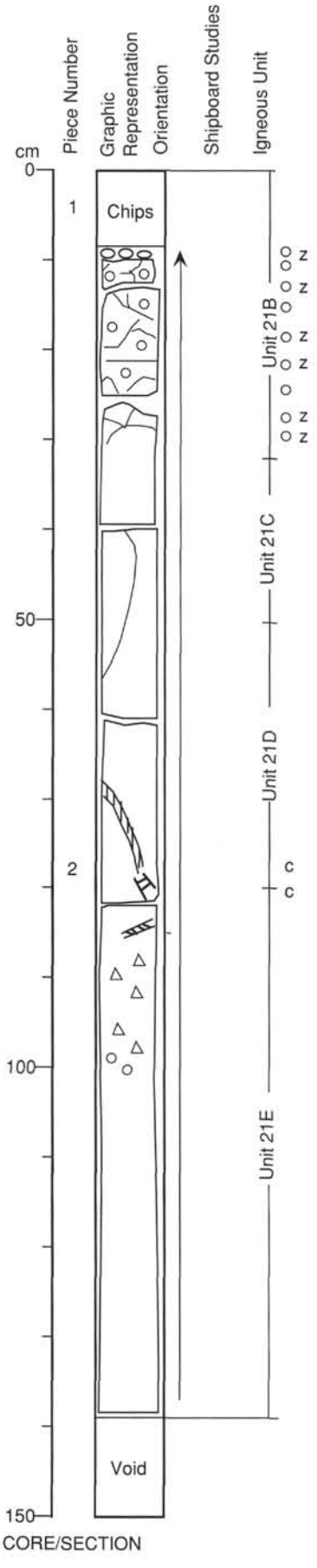


144-871C-39R-2

UNIT 21A: CLINOPYROXENE-OLIVINE BASALT (continued)

Pieces 1–2

CONTACTS: None.
PHENOCRYSTS: Glomerocrysts to 7 mm.
Olivine - 6%; 1–4 mm; Some are altered to bright orange (no appropriate Munsell color) iddingsite. Some are just rimmed (0.25 mm) with iddingsite and are fresh in the center.
Clinopyroxene - 10%; 1–4 mm; Altered to dark reddish brown (10R 3/4), often only around the rim (0.25 mm).
GROUNDMASS: Microcrystalline.
VESICLES: <1%; 3–10 mm; Round; Calcite and clay-filled.
COLOR: Dusky red (5R 3/4).
STRUCTURE: None.
ALTERATION: Matrix color suggests that the groundmass has been moderately altered to clay minerals.
VEINS/FRACTURES: <1%; 1–7 mm; 45 degrees from vertical; A few, large, mixed calcite and clay veins, mostly subparallel to one another.
ADDITIONAL COMMENTS: None.



144-871C-39R-3

UNIT 21B: CLINOPYROXENE-OLIVINE BASALT

Piece 1, top of 2 to 33 cm

CONTACTS: At 33 mm this subunit grades into Subunit 21C.
PHENOCRYSTS: Glomerocrysts to 7 mm.
Olivine - 6%; 1–4 mm; Some are altered to bright orange (no appropriate Munsell color) iddingsite. Some are just rimmed (0.25 mm) with iddingsite and are fresh in the center.
Clinopyroxene - 10%; 1–4 mm; Altered to dark reddish brown (10R 3/4), often only around the rim (0.25 mm).
GROUNDMASS: Microcrystalline.
VESICLES: 10%; 1–7 mm; Round; Filled with a white (N9) to grayish green (5G 7/2) expanding clay which is fracturing the basalt apart in this subunit.
COLOR: Dark greenish gray (5G 4/1).
STRUCTURE: None.
ALTERATION: Moderately altered to grayish green (5G 7/2) clays.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Basalt is highly fractured, splitting open as the expanding clays dry.

Calcite green clay
△ Patchy calcite
o Highly vesicular
z Zeolites?
c Celadonite

UNIT 21C: CLINOPYROXENE-OLIVINE BASALT

Piece 2, from 33–50 cm and 70–80 cm

CONTACTS: At 33 cm this subunit grades into Subunit 21B above it. Subunit 21C is from 33–50 cm and from 70–80 cm, in sharp contact with Subunit 21D (from 50–70 cm) and with Subunit 21E (below 80 cm).
PHENOCRYSTS: Glomerocrysts to 7 mm.
Olivine - 6%; 1–4 mm; Some are altered to bright orange (no appropriate Munsell color) iddingsite. Some are just rimmed (0.25 mm) with iddingsite and are fresh in the center.
Clinopyroxene - 10%; 1–4 mm; Altered to dark reddish brown (10R 3/4), often only around the rim (0.25 mm).
GROUNDMASS: Microcrystalline.
VESICLES: 15%; 1–2 mm; Round; Filled with a white (N9) to grayish green (5G 7/2) expanding clay which is not fracting the basalt apart (because the vesicles are too small?).
COLOR: Dark greenish gray (5G 4/1).
STRUCTURE: None.
ALTERATION: Moderately altered to green clays.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: None.

144-871C-39R-3

UNIT 21D: CLINOPYROXENE-OLIVINE BASALT

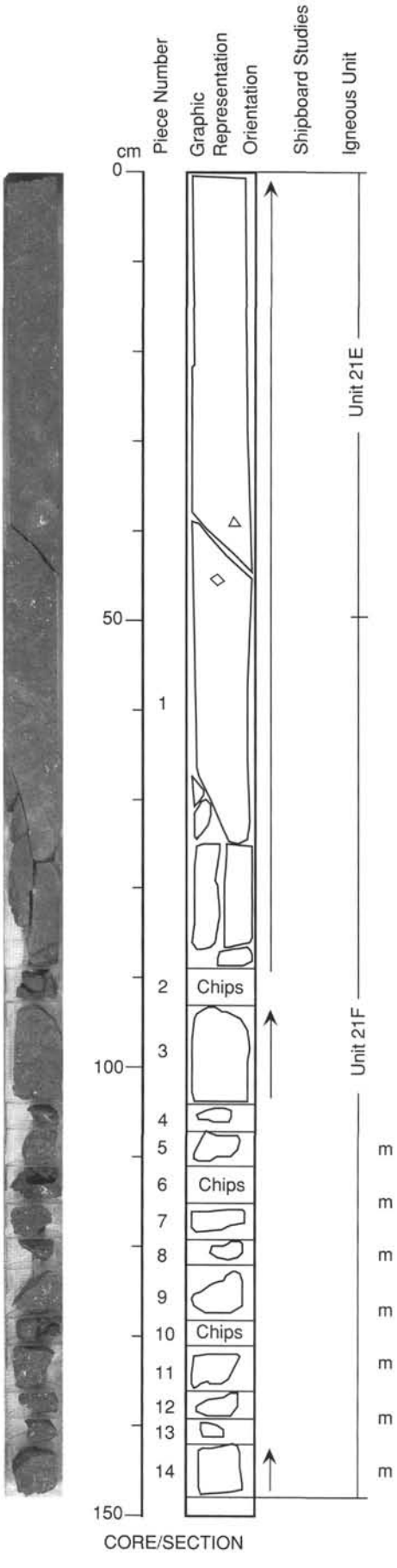
Piece 2 from 50 cm

CONTACTS: At 50 cm and 70 cm Subunit 21D sharply contacts Subunit 21C.
PHENOCRYSTS: Glomerocrysts to 7 mm.
Olivine - 6%; 1–4 mm; Most are altered to bright orange (no appropriate Munsell color) iddingsite.
Clinopyroxene - 10%; 1–4 mm; Altered to dark reddish brown (10R 3/4), often only around the rim (0.25 mm).
GROUNDMASS: Microcrystalline.
VESICLES: <1%; 1–3 mm; Round; In this subunit there are just a few vesicles filled with a white (N9) to grayish green (5G 7/2) clay.
COLOR: Dark greenish gray (5G 4/1).
STRUCTURE: None.
ALTERATION: Moderately altered to grayish green (5G 7/2) clays.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Differs from Subunit 21C by the complete alteration of all olivine which begins abruptly at 50 cm.

UNIT 21E: CLINOPYROXENE-OLIVINE BASALT

Piece 2 from 80 cm

CONTACTS: Subunit 21E contacts 21D at 80 cm; It contacts 21F at 50 cm, Section 4.
PHENOCRYSTS: Glomerocrysts to 7 mm. Increasing xenolith population suggests that glomerocrysts are xenocrysts.
Olivine - 6%; 1–4 mm; Most are altered to bright orange (no appropriate Munsell color) iddingsite, mottled with white (N9) mineral.
Clinopyroxene - 10%; 1–4 mm; Altered to dark reddish brown (10R 3/4), often completely. May be mottled with a white (N9) mineral. Only a few cores are fresh.
GROUNDMASS: Microcrystalline stringers of calcite and clay. These are 20% and larger in the 82–103 cm zone.
COLOR: Mottled brownish gray (5YR 4/1) and medium gray (N5).
STRUCTURE: None.
ALTERATION: Quite altered; Much clay development.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Differs from Subunit 21D in becoming increasingly mottled downsection, so that towards the bottom there are distinct medium gray (N5) patches in a brownish-gray (5YR 4/1) material. This subunit is the first appearance of small (to 8 mm) xenoliths.



144-871C-39R-4

UNIT 21E: CLINOPYROXENE-OLIVINE BASALT (continued)

Piece 1, 0–50 cm

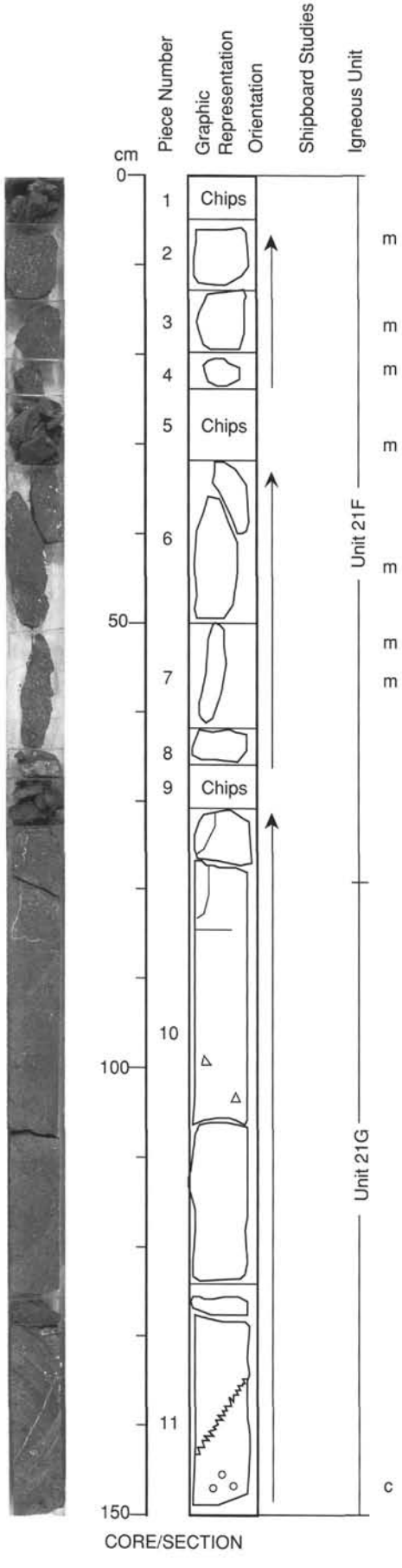
CONTACTS: Continues from Section 39R-3. It contacts Subunit 21F at 50 cm.
PHENOCRYSTS: Glomerocrysts to 7 mm. Increasing xenolith population suggests that glomerocrysts are xenocrysts.
Olivine - 6%;1–4mm. Most are altered to bright orange (no appropriate Munsell color) iddingsite, mottled with a white (N9) mineral.
Clinopyroxene - 10%; 1–4 mm; Altered to dark reddish brown (10R 3/4), often completely. May be mottled with a white (N9) mineral. Only a few cores are fresh.
GROUNDMASS: Microcrystalline.
VESICLES: 3%–5%; <1 cm; Irregular; Filled vesicles, blotches, and stringers of calcite and clay.
COLOR: Mottled brownish gray (5YR 4/1) and medium gray (N5).
STRUCTURE: None.
ALTERATION: Quite altered; Much clay development.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Differs from Subunit 21D in becoming increasingly mottled downsection, so that towards the bottom there are distinct medium gray (N5) patches in a brownish gray (5YR 4/1) material. This subunit is the first appearance of small (to 8 mm) xenoliths.

UNIT 21F: CLINOPYROXENE-OLIVINE BASALT

Pieces 1, after 50–89 cm, and 2–14

CONTACTS: Subunit 21F grades into Subunit 21E at 50 cm.
PHENOCRYSTS: Glomerocrysts to 7 mm. Increasing xenolith population suggests that glomerocrysts are xenocrysts.
Olivine - 10%; 1–4 mm; Most are altered to bright orange (no appropriate Munsell color) iddingsite, often with a 0.25 mm rim of pyrite.
Clinopyroxene - 15%; 1–4 mm; Completely altered to dark reddish brown (10R 3/4) with 0.25 mm rims of pyrite.
GROUNDMASS: Microcrystalline.
VESICLES: 3%–5%; <1 cm; Irregular; Filled vesicles, blotches, and stringers of calcite and clay.
COLOR: Mottled light greenish gray (5G 8/1) and medium gray (N5).
STRUCTURE: None.
ALTERATION: Very altered; Much clay development.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Altered domains have become very distinct. Xenolith population has increased to 2%.

m Mottled alteration



144-871C-39R-5

UNIT 21F: CLINOPYROXENE-OLIVINE BASALT (continued)

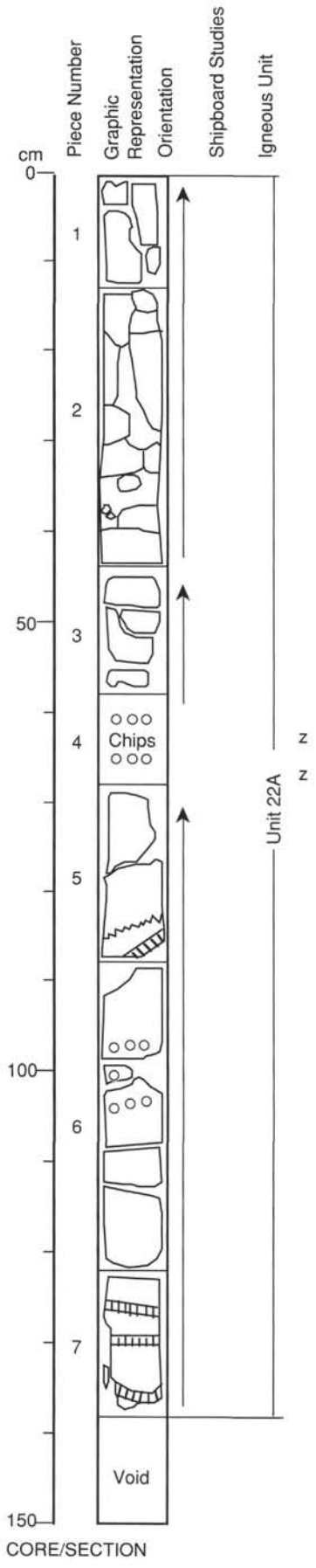
Pieces 1–9, 10 to 79 cm

CONTACTS: Continues from Section 39R-4. Subunit 21E grades into Subunit 21G at 79 cm.
PHENOCRYSTS: Glomerocrysts to 7 mm. Increasing xenolith population suggests that glomerocrysts are xenocrysts.
Olivine - 10%; 1–4 mm; Most are altered to bright orange (no appropriate Munsell color) iddingsite, often with a 0.25 mm rim of pyrite.
Clinopyroxene - 15%; 1–4 mm; Completely altered to dark reddish brown (10R 3/4) with 0.25 mm rims of pyrite.
GROUNDMASS: Microcrystalline.
VESICLES: 3%–5%; <1 cm; Irregular; Filled vesicles, blotches, and stringers of calcite and clay.
COLOR: Mottled light greenish gray (5G 8/1) and medium gray (N5).
STRUCTURE: None.
ALTERATION: Very altered; Much clay development.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Altered domains have become very distinct. Xenolith population has increased to 2%.

UNIT 21G: CLINOPYROXENE-OLIVINE BASALT

Pieces 10 from 79 cm, 11

CONTACTS: Subunit 21G grades into subunit 21F at 79 cm.
PHENOCRYSTS: Glomerocrysts to 7 mm. Increasing xenolith population suggests that glomerocrysts are xenocrysts.
Olivine - 10%; 1–4 mm; Most are altered to bright orange (no appropriate Munsell color) iddingsite, mottled with a white (N9) mineral.
Clinopyroxene - 15%; 1–4 mm; Some are altered to dark reddish brown (10R 3/4), but largely unaltered.
GROUNDMASS: Microcrystalline.
VESICLES: 3%; <1 cm; Irregular; Filled vesicles and stringers of calcite and clay.
COLOR: Medium gray (N5).
STRUCTURE: None.
ALTERATION: Not as altered as Subunits 21E and 21F. The mottled alteration is no longer present.
VEINS/FRACTURES: <1%; 1–3 mm; More of the calcite is in veins (as compared with other subunits).
ADDITIONAL COMMENTS: Xenolith population is still 2%.



144-871C-39R-6

UNIT 22A: CLINOPYROXENE-OLIVINE BASALT

Pieces 1–7

CONTACTS:
PHENOCRYSTS:
Clinopyroxene - 15%; 2–5 mm; Prism-shaped euhedral, dusky green (5G 8/2) to black (N1) in color, but altered to chlorite(?).
Olivine - <5%; 2–5 mm; Completely altered with iddingsite rims and grayish green (10GY 5/2) to clear clay or zeolite centers.
GROUNDMASS: Microcrystalline.
VESICLES: 2%–5%; 3–5 mm; Round; Filled with a white (N9) clay or zeolite. Concentrations up to 20% at 60–68 cm and 96–106 cm which coincide with the most intense fracturing.
COLOR: Medium to dark gray (N5–N3).
STRUCTURE: None.
ALTERATION: Alteration of phenocrysts suggests that the groundmass is pervasively altered (to clays and zeolites), despite the fresh looking groundmass colors.
VEINS/FRACTURES: Pale green (5G 7/2) 3–5 mm swelling veins at 130 cm, 134 cm, and 138 cm. Irregular, closely spaced (1 cm), randomly oriented fractures develop rapidly as the rock dries.
ADDITIONAL COMMENTS: None.

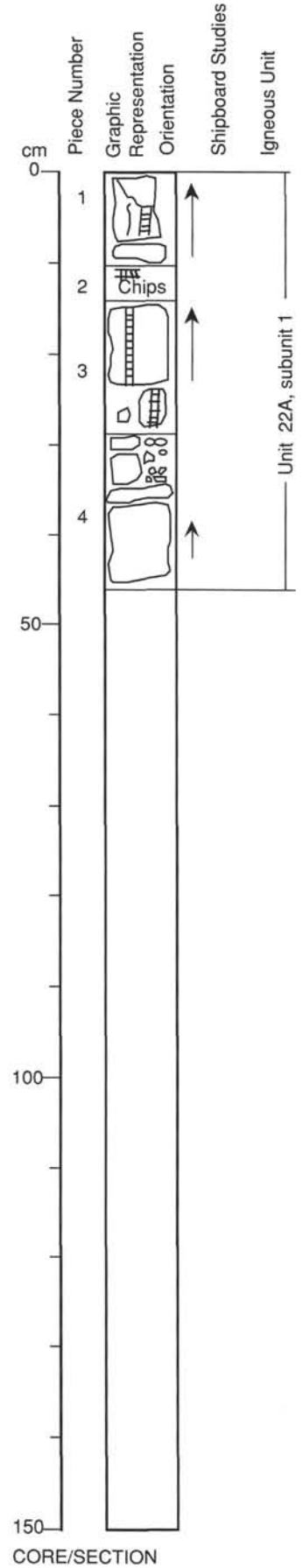
o Vesicle concentrations
Calcite
White and green swelling vein
Zeolite?
z

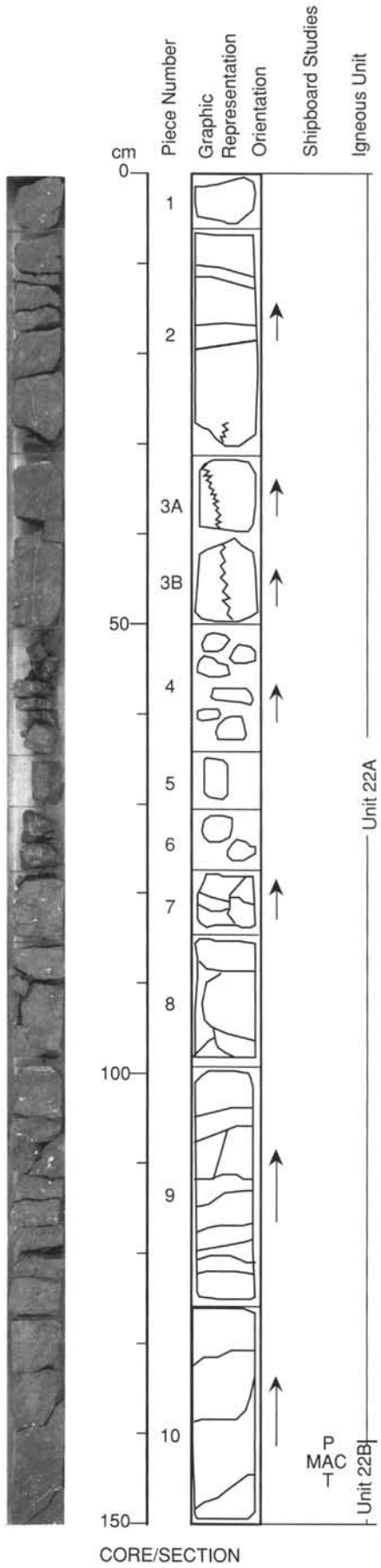
144-871C-39R-7

UNIT 22A: CLINOPYROXENE-OLIVINE BASALT (continued)

Pieces 1–4

CONTACTS: Continuous with adjacent sections.
PHENOCRYSTS:
Clinopyroxene - 15%; 2–5 mm; Prism-shaped, euhedral, dusky green (5G 3/2) to black (N1) in color, but altered to chlorite(?).
Olivine - <5%; 2–5 mm; Completely altered with iddingsite rims and grayish green (10GY 5/2) to clear clay or zeolite centers.
GROUNDMASS: Microcrystalline.
VESICLES: 2%–5%; 3–5 mm; Round; Filled with a white (N9) clay or zeolite.
COLOR: Medium to dark gray (N5-3).
STRUCTURE: None.
ALTERATION: Alteration of phenocrysts suggests that the groundmass is pervasively altered, but the groundmass color suggests that its relatively fresh.
VEINS/FRACTURES: <5%; 1–3 mm; Calcite plus an expanding clay are abundant from 0–28 cm. Irregular, randomly oriented fractures are occurring as the rock dries.
ADDITIONAL COMMENTS: None.





144-871C-40R-1

UNIT 22A: CLINOPYROXENE-OLIVINE BASALT (continued)

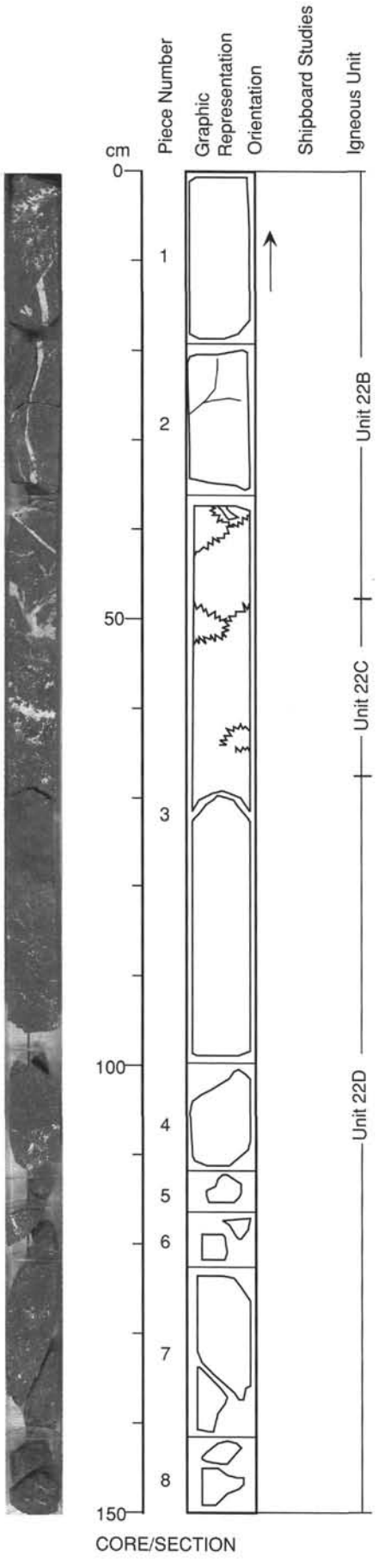
Pieces 1–9, 10 to 142 cm

CONTACTS: Contact with Subunit 22B in Core 40, Section 1, 142 cm.
PHENOCRYSTS:
Clinopyroxene - 15%; 2–5 mm; Prism-shaped, euhedral, dusky green (5G 3/2) to black (N1) in color, but altered to chlorite(?).
Olivine - <5%; 2–5 mm; Completely altered with iddingsite rims and grayish-green (10GY 5/2) clay and clear calcite centers.
GROUNDMASS: Microcrystalline.
VESICLES: 2%–5%; 3–5 mm; Round; Filled with a white (N9) clay or zeolite. Lots of expanding clay from 98–116 cm.
COLOR: Medium to dark gray (N5-3).
STRUCTURE: None.
ALTERATION: Alteration of phenocrysts suggests that the groundmass is pervasively altered, but the matrix is a "fresh" color.
VEINS/FRACTURES: 2%; 1–2 mm; Calcite plus an expanding clay. Irregular, randomly oriented fractures are occurring as the rock dries.
ADDITIONAL COMMENTS: None.

UNIT 22B: CLINOPYROXENE-OLIVINE BASALT

Piece 10 below 142 cm

CONTACTS: Sharp contact with Subunit 22A at 142 cm.
PHENOCRYSTS: Sudden onset of complete alteration to iddingsite and clay.
Clinopyroxene - 15%; 2–5 mm; Altered to dark reddish brown (10R 3/4), mottled orange (10YR 4/6) and white (N9).
Olivine - <5%; 2–5 mm; Iddingsitized completely, mottled with orange (10YR 4/6) and white (N9) alteration.
GROUNDMASS: Microcrystalline.
VESICLES: 5%–20%; 3–5 mm; Round; Filled with a white (N9) clay or zeolite.
COLOR: Mottled on a millimeter scale, dark gray (N3) and dark yellowish brown (10YR 4/3).
STRUCTURE: None.
ALTERATION: Alteration is more severe in this subunit. The matrix must be extensively altered to clays.
VEINS/FRACTURES: 5%; 1–8 mm; Calcite plus an expanding clay. More abundant in this more altered portion of the unit.
ADDITIONAL COMMENTS: None.



144-871C-40R-2

UNIT 22B: CLINOPYROXENE-OLIVINE BASALT (continued)

Pieces 1–2, 3 to 53 cm

CONTACTS: Sharply contacts Subunit 22C in Piece 3 at 53 cm.
PHENOCRYSTS: 40–53 cm many phenocrysts are replaced by "celadonite".
Clinopyroxene - 15%; 2–5 mm; Mottled orange (10YR 4/6) and white (N9), or replaced by a green (5BG 4/6) clay "celadonite"(?).
Olivine - <5%; 1–4 mm; Same as the clinopyroxene.
GROUNDMASS: Microcrystalline.
VESICLES: 5%–20%; 3–5 mm; Round; Filled with a white (N9) clay or zeolite, or with a green (5BG 4/6) clay (celadonite?).
COLOR: Mottled on a millimeter scale, dark gray (N3) and dark yellowish-brown (10YR 4/3).
STRUCTURE: None.
ALTERATION: Alteration is more severe in this subunit. The matrix must be extensively altered to clays. 1–12 cm there is a lot of a green(5BG 4/6) mineral (celadonite?) in the matrix.
VEINS/FRACTURES: 5%; 1–8 mm; Calcite plus an expanding clay. More abundant in this more altered portion of the unit.
ADDITIONAL COMMENTS: None.

UNIT 22C: CLINOPYROXENE-OLIVINE BASALT

Piece 3 from 53 cm to 70 cm

CONTACTS: Sharply contacts SubunitS 22B and 22D in Piece 3 at 53 cm and 70 cm respectively.
PHENOCRYSTS:
Clinopyroxene - 15%; 2–5 mm; Mottled orange (10YR 4/6) and white (N9), or replaced by a green (5BG 4/6) clay "celadonite"(?).
Olivine - <5%; 1–4 mm; Same as the clinopyroxene.
GROUNDMASS: Microcrystalline.
VESICLES: 15%; 3–5 mm; Round; Filled vesicles and irregular stringers and blotches of a white (N9) clay or zeolite, and a green (5BG 4/6) clay (celadonite?).
COLOR: Mottled on a 2–3 millimeter scale, dark gray (N3) and dusky red (5R 3/4).
STRUCTURE: None.
ALTERATION: Alteration is very severe in this subunit. Further, a great deal of calcite addition has occurred.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Boundaries between the two matrix colors are very sharp.

UNIT 22D: CLINOPYROXENE-OLIVINE BASALT

Piece 3 from 70 cm

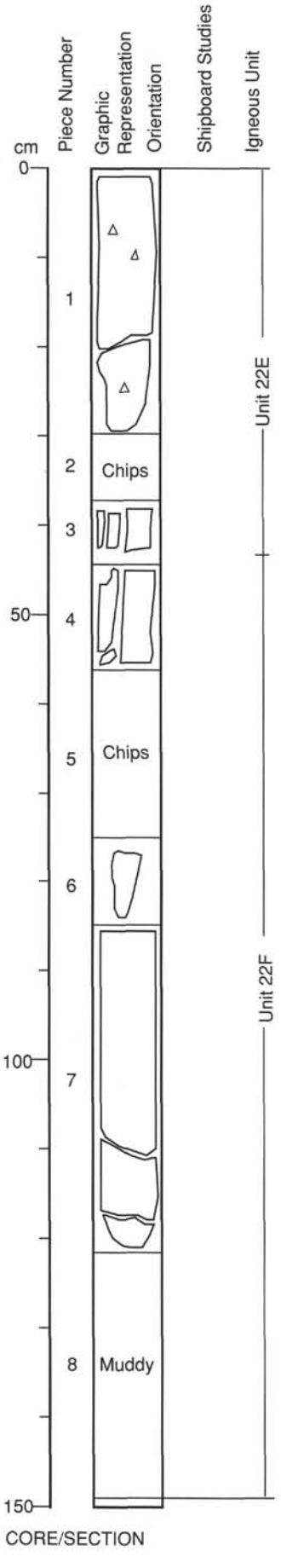
CONTACTS: Sharply contacts Subunit 22C in Piece 3 at 70 cm.
PHENOCRYSTS:
Clinopyroxene - 15%; 2–5 mm; Altered to a dark reddish brown (10R 3/4).
Olivine - <5%; 1–4 mm; Iddingsitized.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Upper half has dark gray (N3) and grayish red purple (5RP 4/2) domains in dusky red (5R 3/4) matrix. Lower half less distinctly mottled, dark gray (N3) and dusky red (5Y 3/4).
STRUCTURE: None.
ALTERATION: Onset of extreme oxidation. Alteration is quite severe in this subunit.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Subunit defined by the complete oxidation of phenocrysts, the absence of the green (5BG 4/6) alteration clay, and the larger phenocrysts or xenocrysts, to 7 mm, which are occasionally appearing.

144-871C-40R-2

UNIT 22E: CLINOPYROXENE-OLIVINE BASALT

Pieces 4–8

CONTACTS: None.
PHENOCRYSTS:
Clinopyroxene - 15%; 2–5 mm; Altered to dark reddish brown (10R 3/4).
Olivine - <5%; 1–4 mm; Iddingsitized.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Matrix is slightly mottled, in dusky red (5R 3/4) and dark gray (N3) shades.
STRUCTURE: None.
ALTERATION: Calcite is in thin stringers and blotches to 5 mm and 5%.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Subunit defined by the development of matrix mottling. Xenoliths are 3% and to 1 cm. They are all severely altered.



144-871C-40R-3

UNIT 22E: CLINOPYROXENE-OLIVINE BASALT (continued)

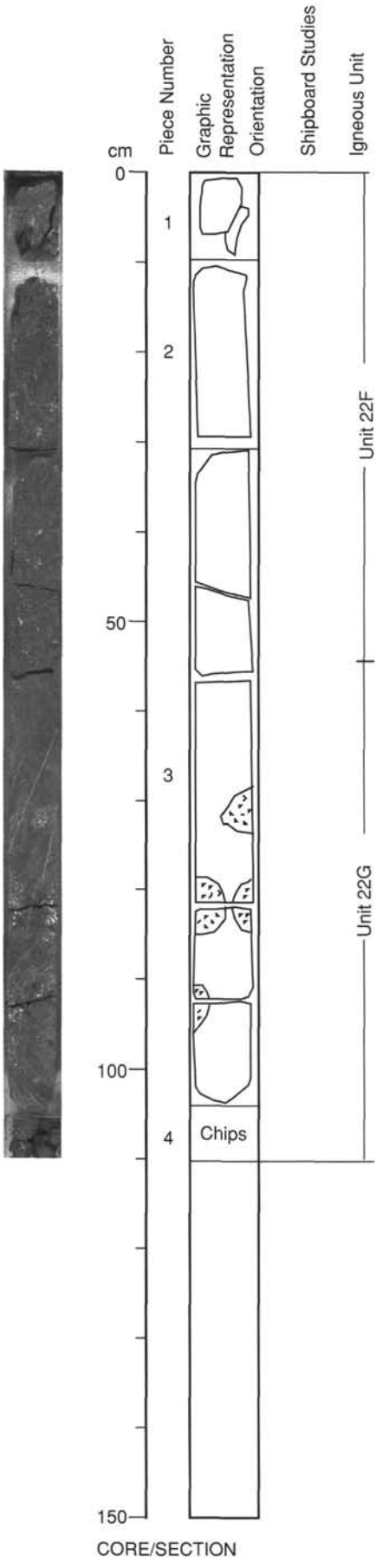
Pieces 1–3

CONTACTS: None.
PHENOCRYSTS:
Clinopyroxene - 15%; 2–5 mm; Altered to a dark reddish brown (10R 3/4).
Olivine - <5%; 1—4 mm; Iddingsitized.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Matrix is slightly mottled, in dusky red (5R 3/4) and dark gray (N3) shades.
STRUCTURE: None.
ALTERATION: Calcite is in thin stringers and blotches to 5 mm and 5%.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Xenoliths are 3% and to 1 cm. They are all severely altered.

UNIT 22F: CLINOPYROXENE-OLIVINE BASALT

Pieces 4–7

CONTACTS: None.
PHENOCRYSTS:
Clinopyroxene - 10%; 1–2 mm; Altered dark reddish brown (10R 3/4) to dusky green (5G 3/2), elongate prisms.
Olivine - <5%; 1–3 mm; Iddingsitized. Euhedral.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Matrix is light greenish gray (5G 8/1).
STRUCTURE: None.
ALTERATION: Calcite is in thin stringers and blotches to 5 mm and 5%.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Subunit is change in matrix appearance. Xenoliths are 3% and to 1 cm. They are all severely altered.



144-871C-40R-4

UNIT 22F: CLINOPYROXENE-OLIVINE BASALT (continued)

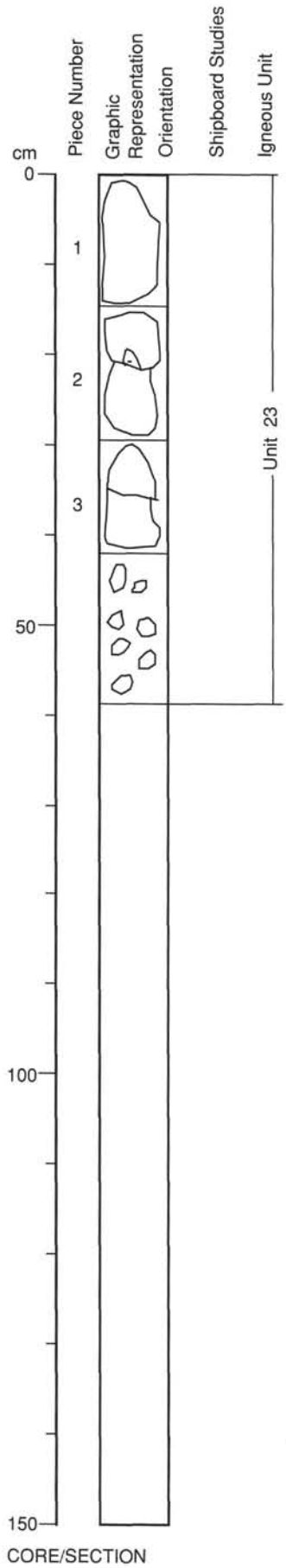
Pieces 1–2, 3 to 55 cm

CONTACTS: Continues from 40R-3.
PHENOCRYSTS:
Clinopyroxene - 10%; 1–2 mm; Altered dark reddish brown (10R 3/4) to dusky green (5G 3/2), elongate prisms.
Olivine - <5%; 1–3 mm; Iddingsitized. Euhedral.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Matrix is light greenish gray (5G 8/1).
STRUCTURE: None.
ALTERATION: Calcite is in thin stringers and blotches to 5 mm and 5%.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Xenoliths are 3% and to 1 cm. They are all severely altered.

UNIT 22G: CLINOPYROXENE-OLIVINE BASALT

Piece 3 from 55 cm

CONTACTS: None.
PHENOCRYSTS: Clinopyroxene - 8%; 1–2 mm; Altered dark reddish brown (10R 3/4) to dusky green (5G 3/2), elongate prisms.
Olivine - <3%; 1–3 mm; Iddingsitized. Euhedral.
GROUNDMASS: Microcrystalline.
VESICLES: To 50%; 1–3 mm; Subround; Filled with a light green (5G 7/2) clay. Concentrations at 70–72 cm, 78–82 cm, and 89–93 cm.
COLOR: Matrix is dusky red (5R 3/4).
STRUCTURE: None.
ALTERATION: Severe.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: Subunit defined because phenocryst concentrations decrease and vesicle abundances increase drastically. Xenoliths are 5% and to 2 cm. They are all severely altered. Mostly concentrated in the 30–60 cm zone.



144-871C-41R-1

UNIT 23: CLINOPYROXENE-OLIVINE BASALT

Pieces 1–3

CONTACTS: None.
PHENOCRYSTS:
Clinopyroxene - 10%; <1 mm; Most are dusky green (5G 3/2)(fresh?) but some are dark reddish brown (10R 3/4).
Olivine - 5%; 1–2 mm; Fresh or iddingsitized. Euhedral to subhedral.
GROUNDMASS: Microcrystalline.
VESICLES: None.
COLOR: Dark greenish gray (5G 4/1).
STRUCTURE: None.
ALTERATION: Moderate.
VEINS/FRACTURES: None.
ADDITIONAL COMMENTS: This "core" came up in bits as a result of cleaning the hole for logging. The pieces are not in order, nor is the orientation for any of them known. At 20 cm there is a small, altered xenolith.