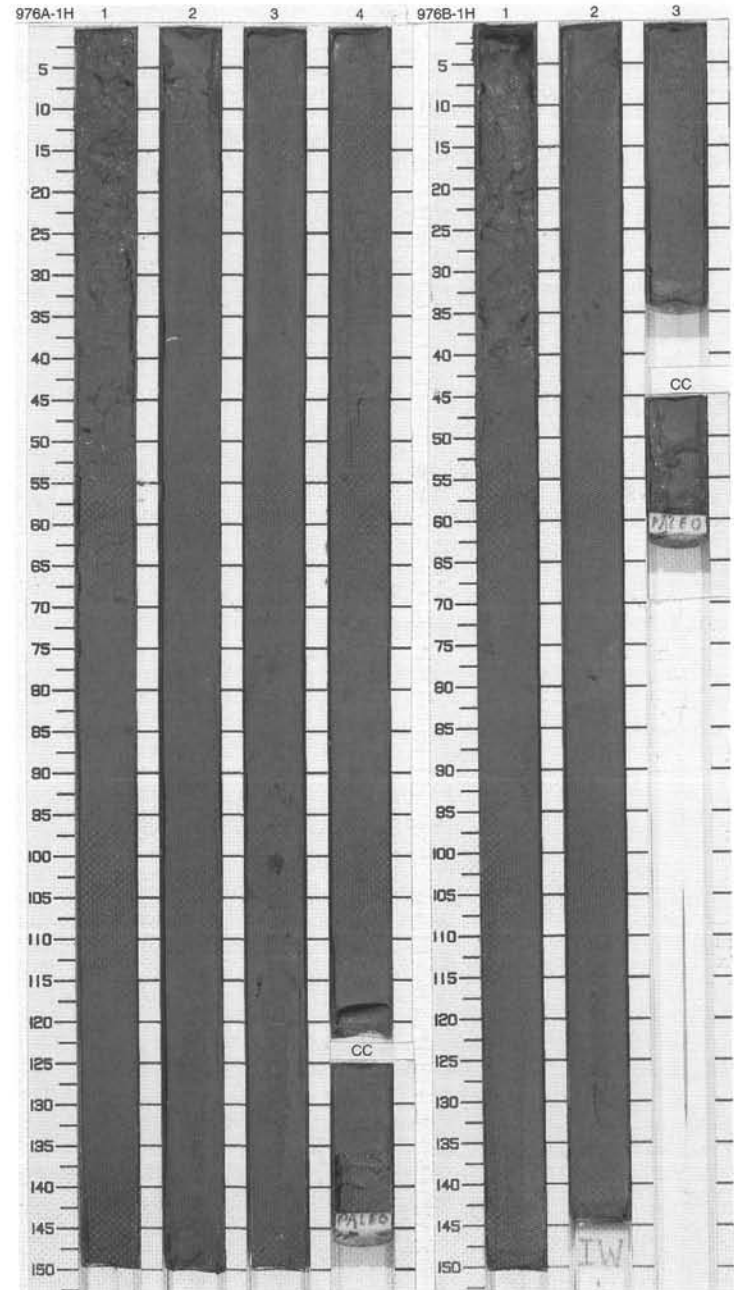


SITE 976 HOLE A CORE 1H CORED 0.0 - 5.9 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	∩	W	S	5Y 4/4	<p>NANNOFOSSIL-RICH SILTY CLAY AND NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithologies are grayish olive (10Y 4/2) NANNOFOSSIL-RICH SILTY CLAY AND NANNOFOSSIL CLAY.</p> <p>Minor Lithology: Moderate olive brown (5Y 4/4) nannofossil-rich clay is present in Section 1.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills occur throughout the core.</p>
2	[Pattern]	2	∩		S		
3	[Pattern]	3	∩		S	10Y 4/2	
4	[Pattern]	3	∩		S		
5	[Pattern]	4	∩		S		
	[Pattern]	CC			M		

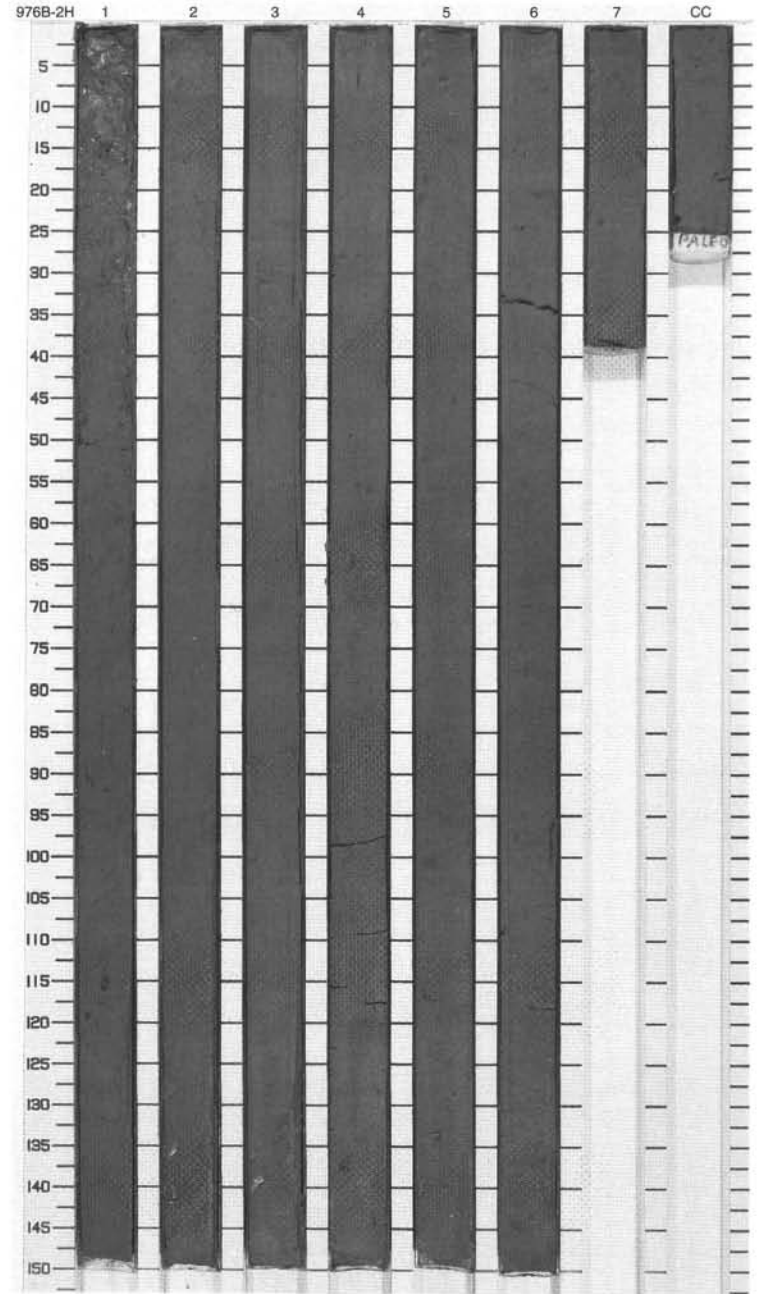
SITE 976 HOLE B CORE 1H CORED 0.0 - 3.5 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	∩	W	S	5Y 4/4	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is moderate olive brown to grayish olive (5Y 4/4 to 10Y 4/2) NANNOFOSSIL-RICH CLAY.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills occur throughout the core.</p>
2	[Pattern]	2	∩		I	10Y 4/2	
3	[Pattern]	3	∩		S		
	[Pattern]	CC			M		



SITE 976 HOLE B CORE 2H CORED 3.5 - 13.0 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Graphic Lith. Pattern]	1	[Structure]	WW			<p>MICRITE-RICH SANDY SILTY CLAY</p> <p>Major Lithology: The major lithology is grayish olive (10Y 4/2) MICRITE-RICH SANDY SILTY CLAY.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills and a moderate content of shell fragments occur throughout the core.</p>
2	[Graphic Lith. Pattern]	2	[Structure]				
3	[Graphic Lith. Pattern]	3	[Structure]				
4	[Graphic Lith. Pattern]	3	[Structure]				
5	[Graphic Lith. Pattern]	4	[Structure]			10Y 4/2	
6	[Graphic Lith. Pattern]	4	[Structure]				
7	[Graphic Lith. Pattern]	5	[Structure]		S		
8	[Graphic Lith. Pattern]	6	[Structure]				
9	[Graphic Lith. Pattern]	7	[Structure]				
		CC			M		



SITE 976 HOLE B CORE 3H

CORED 13.0 - 22.5 mbsf

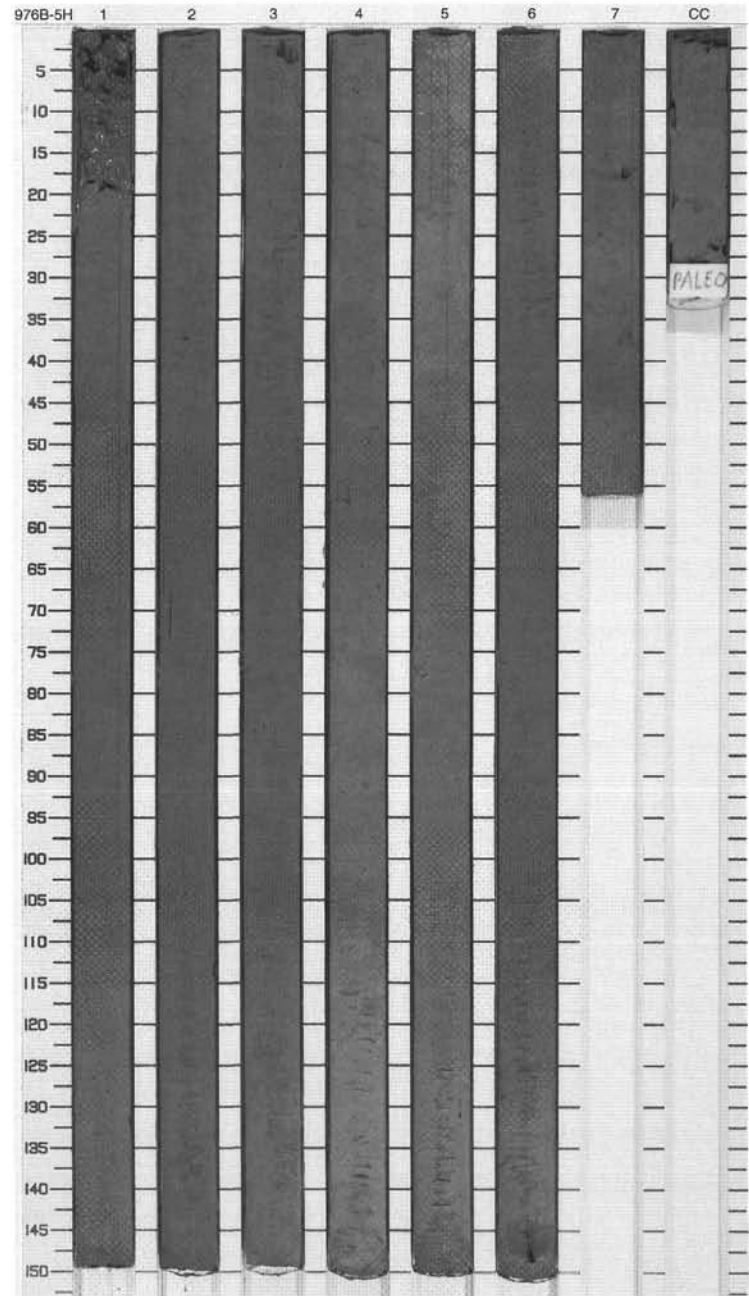
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Symbol]	1	Pleistocene	[Symbol]	[Symbol]	S	5Y 4/1 To 10Y 4/2	<p>NANNOFOSSIL-RICH SILTY CLAY</p> <p>Major Lithology: The major lithology is olive gray to grayish olive (5Y 4/1 to 10Y 4/2) NANNOFOSSIL-RICH SILTY CLAY with shell fragments.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills occur throughout the core.</p>
2	[Symbol]	2				S		
3	[Symbol]	3				M		



SITE 976 HOLE B CORE 5H

CORED 32.0 - 41.5 mbsf

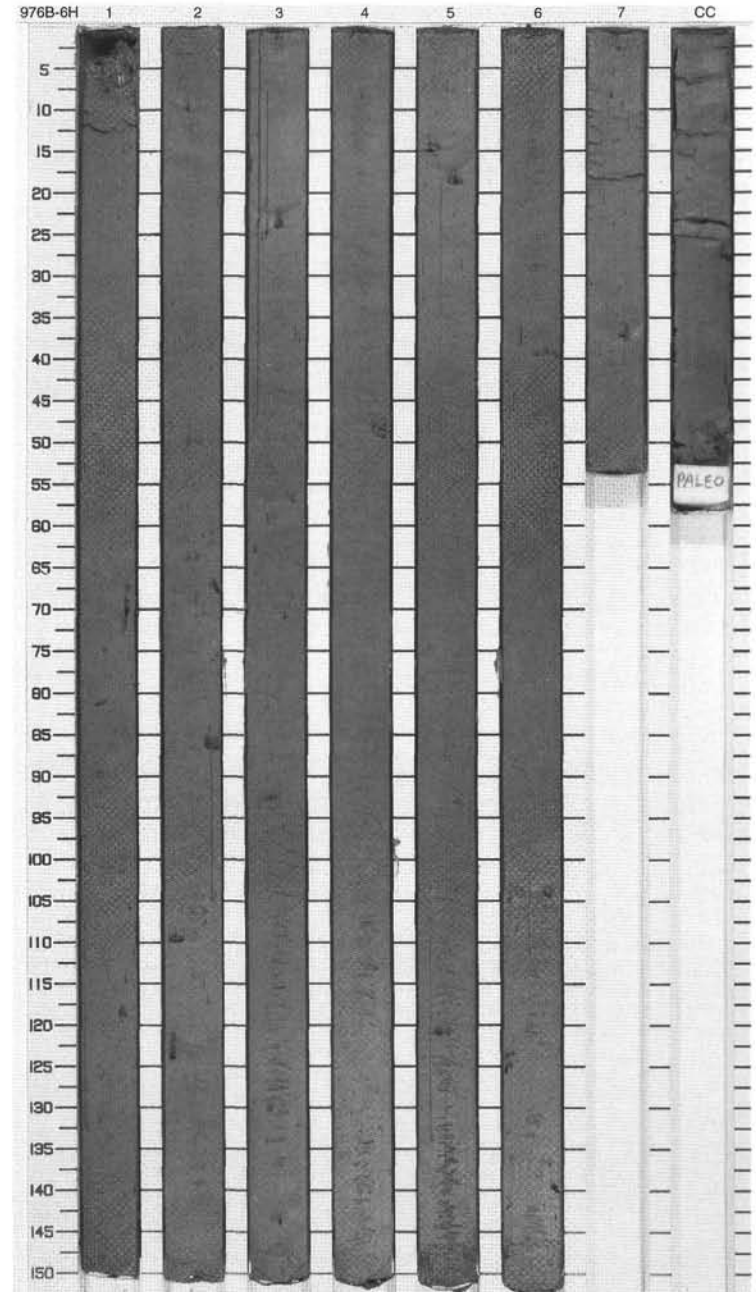
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1		1	~ ~ ~ ~ ~ ~ ~	O	S	5GY 4/1	<p>NANNOFOSSIL-RICH CLAY TO NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithologies are dark greenish gray (5GY 4/1) to olive gray and grayish olive gray (5Y 4/1 to 5GY 3/2) NANNOFOSSIL-RICH CLAY TO NANNOFOSSIL CLAY.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills occur throughout the core.</p>
2		2				5GY 4/1 To 5Y 4/1	
3		3					
4		3					
5		4					
6		4					
7		5					
8		6	~ ~ ~ ~ ~ ~ ~	S	S	5GY 3/2	
9		7					
CC		CC					M



SITE 976 HOLE B CORE 6H

CORED 41.5 - 51.0 mbsf

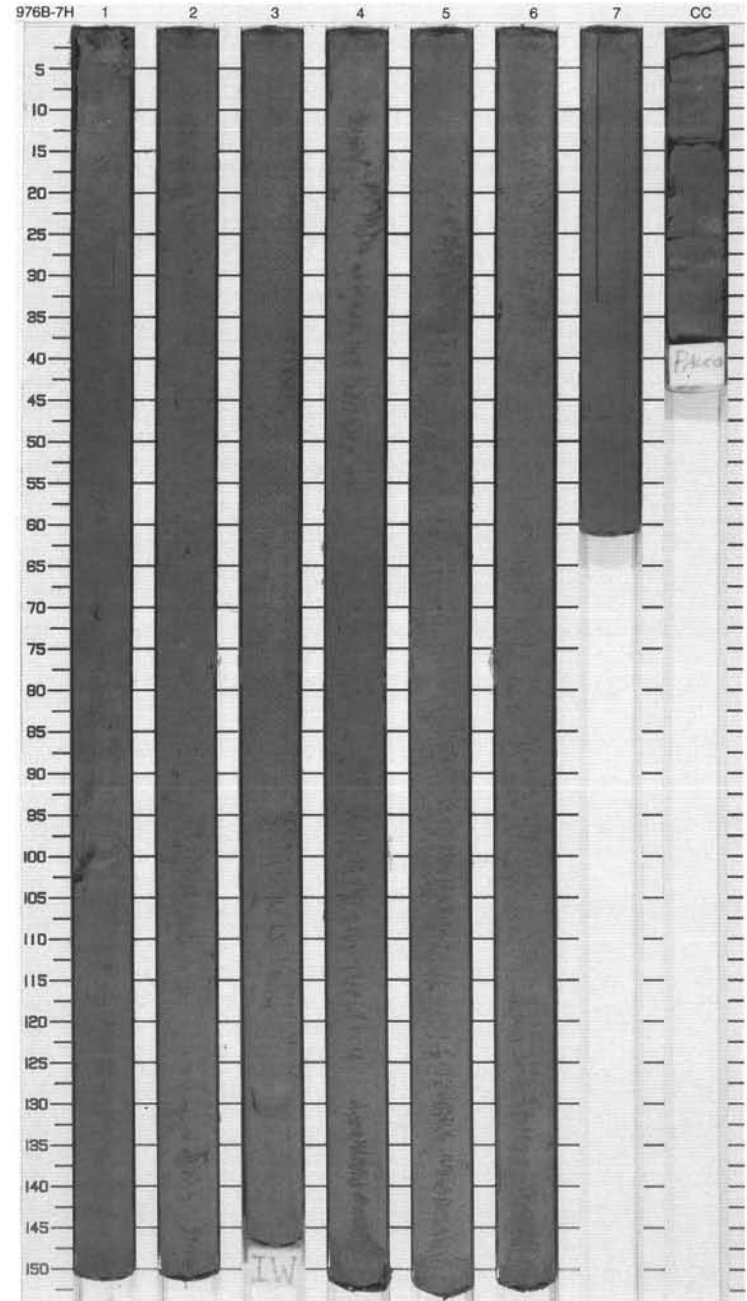
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Hatched pattern]	1	Pleistocene	~ ⊗ ~ ⊗ ~ ⊗ ~ ⊗ ~ ⊗ ~ ⊗				<p>NANNOFOSSIL-RICH SILTY CLAY</p> <p>Major Lithology: The dominant lithology is a NANNOFOSSIL-RICH SILTY CLAY in which the carbonate component is dominated by calcareous nannofossils with subordinate foraminifers and micritic cement. The main color is olive gray (5Y 4/1), with very rare bands of greenish black (5GY 2/1) and dark greenish gray (5GY 4/1).</p> <p>Minor Lithologies: Minor amounts of opaque-rich nannofossil clayey silt are present, irregularly intermixed with the principle sediment type (mainly as a result of bioturbation).</p> <p>General Description: Many burrows are greenish black (5GY 2/1). Shell fragments are irregularly distributed throughout the core. Rock fragments (schist is predominant) comprise up to 20% by volume of some intervals.</p>
2	[Hatched pattern]	2						
3	[Hatched pattern]	3						
4	[Hatched pattern]	4						
5	[Hatched pattern]	5					S	
6	[Hatched pattern]	6						
7	[Hatched pattern]	7						
8	[Hatched pattern]	8						
9	[Hatched pattern]	9					S	
10	[Hatched pattern]	10		CC			M	



SITE 976 HOLE B CORE 7H

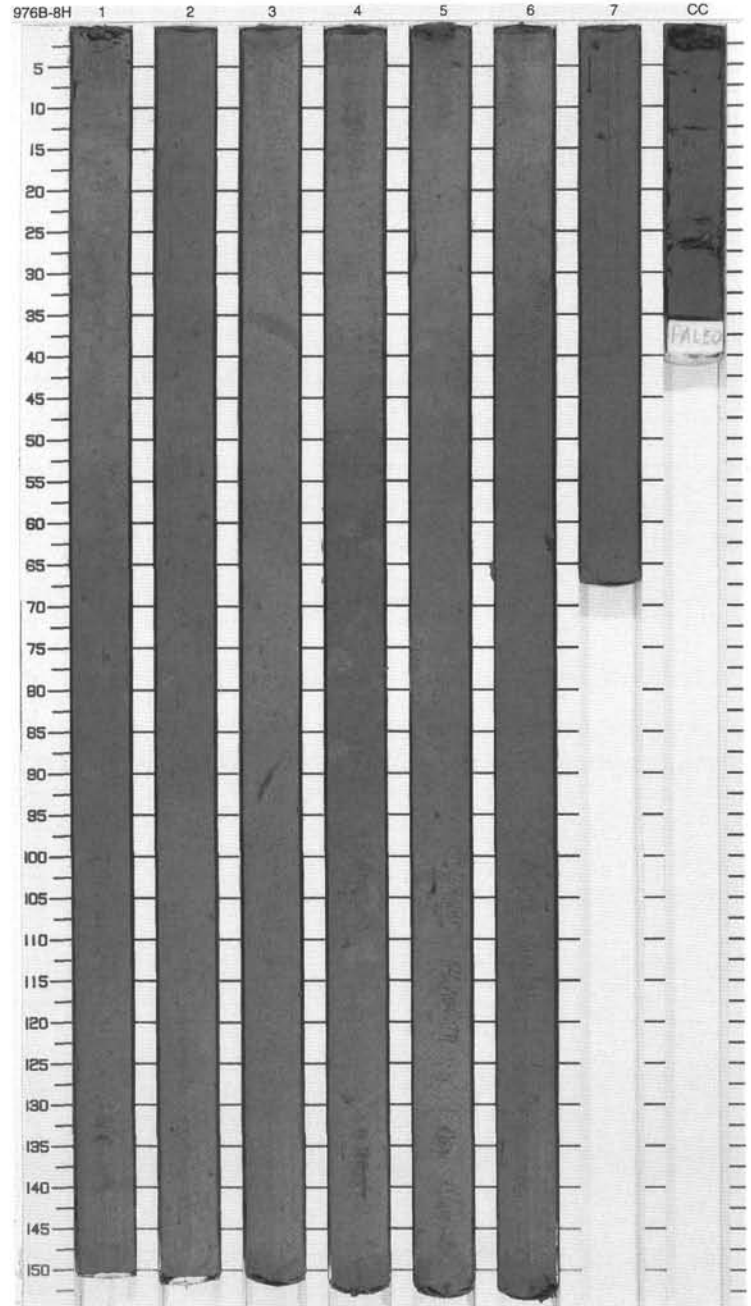
CORED 51.0 - 60.5 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	[Wavy lines]				<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The main sediment type is dark greenish gray (5GY 4/1) to olive gray (5Y 4/1) NANNOFOSSIL-RICH CLAY with minor amounts of foraminifers, micrite, and silt-sized quartz.</p> <p>General Description: Shell fragments are common throughout, and color mottling and visible burrows represent biological activity. Rare, faint color bands are also present.</p>
2	[Dotted pattern]	2	[Wavy lines]				
3	[Dotted pattern]	3	[Wavy lines]				
4	[Dotted pattern]	3	[Wavy lines]				
5	[Dotted pattern]	4	[Wavy lines]				
6	[Dotted pattern]	5	[Wavy lines]				
7	[Dotted pattern]	6	[Wavy lines]				
8	[Dotted pattern]	6	[Wavy lines]				
9	[Dotted pattern]	7	[Wavy lines]				
10	[Dotted pattern]	CC	[Wavy lines]				
<p>Pleistocene</p> <p>I</p> <p>S</p> <p>S</p> <p>M</p> <p>5GY 4/1 To 5Y 4/1</p>							



SITE 976 HOLE B CORE 8H CORED 60.5 - 70.0 mbsf

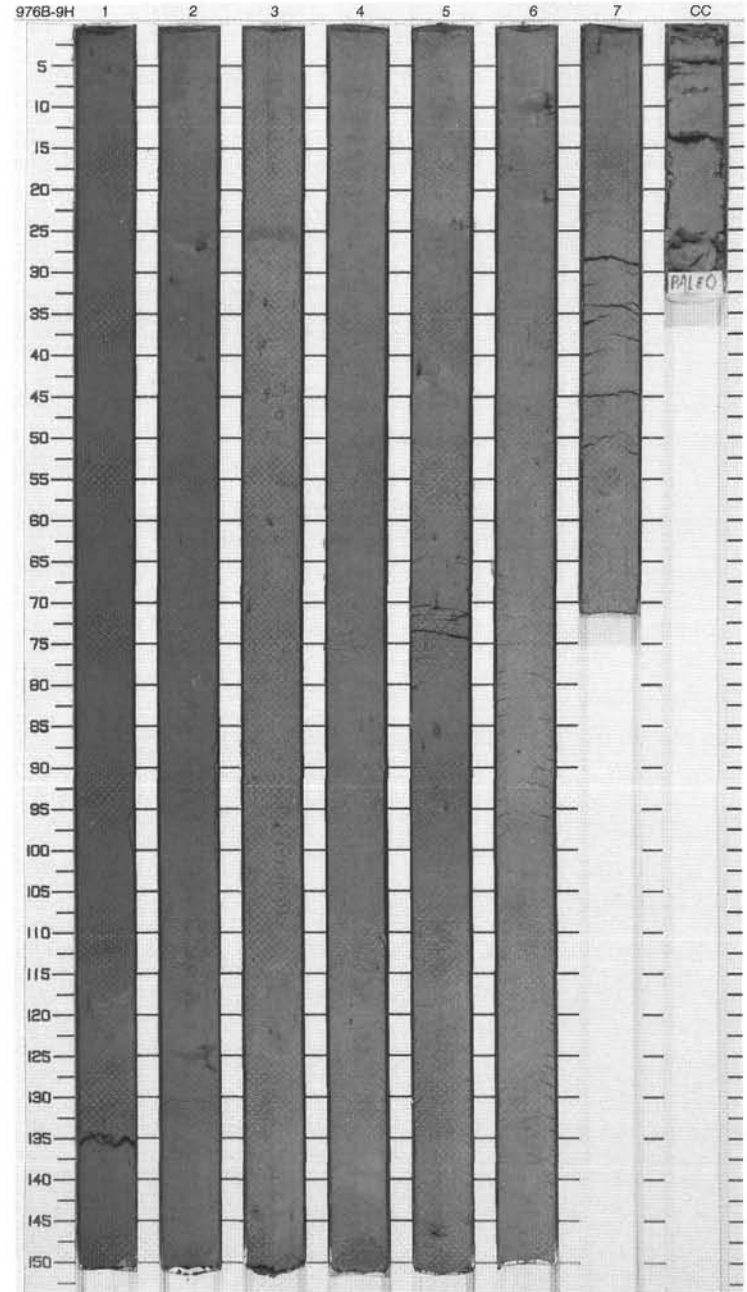
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	Pleistocene			S	5Y 4/1 To 5GY 4/1	<p>QUARTZ- AND NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The principal sediment type is dark greenish gray (5GY 4/1) to olive gray (5Y 4/1), burrowed to mottled QUARTZ- AND NANNOFOSSIL-RICH CLAY.</p> <p>General Description: Shell fragments are visible throughout. Burrows are dark gray (N3).</p>
2		2						
3		3						
4		4						
5		5						
6		6						
7		7						
8		8						
9		9						
10		CC						



SITE 976 HOLE B CORE 9H

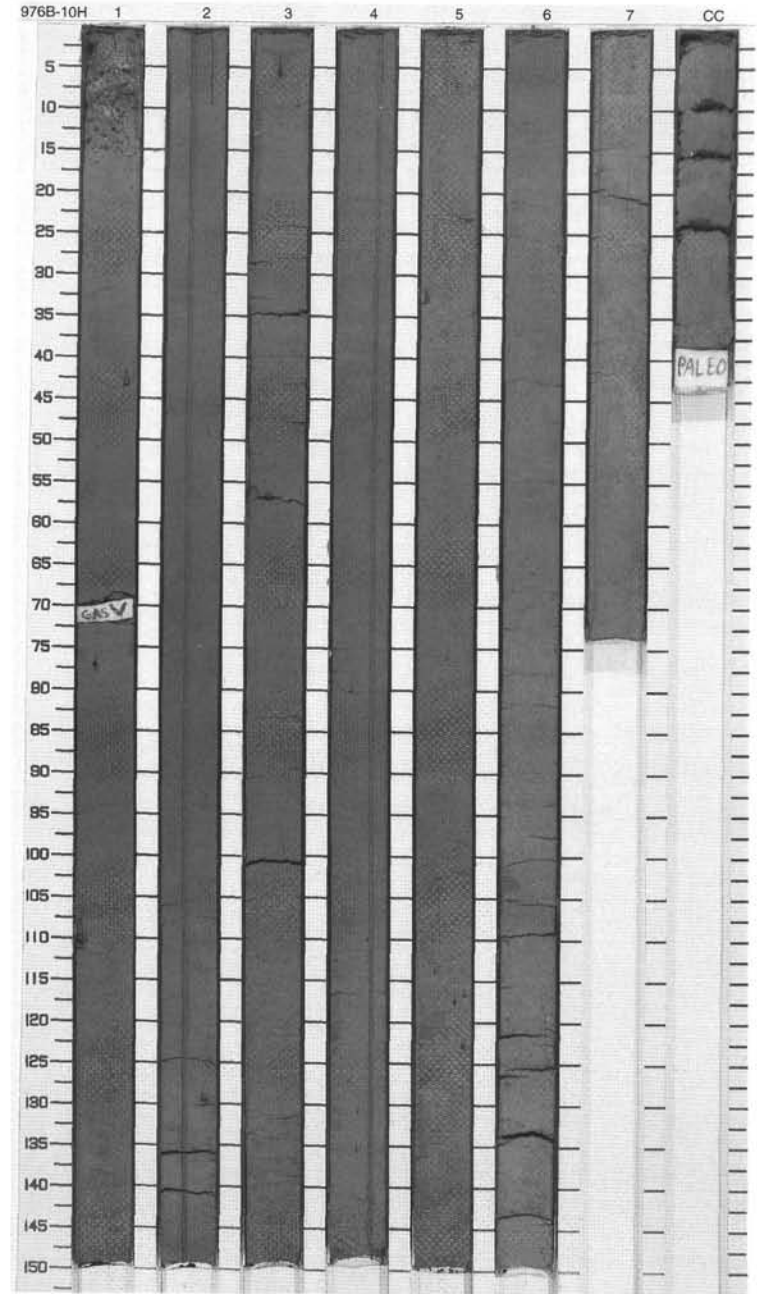
CORED 70.0 - 79.5 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1		1		-	-	-	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The main sediment type is a NANNOFOSSIL-RICH CLAY that is variously olive gray (5Y 4/1), dark greenish gray (5GY 4/1), and grayish olive (10Y 4/2) in color.</p> <p>General Description: The clay is mostly burrowed to mottled, with the latter being most prominent near the base. Dispersed shell fragments occur throughout.</p> <p>Section 1 expanded 0-2cm and 150-152 cm - boxed separately. Section 2 expanded 150-155 cm - boxed separately. Section 3 expanded 150-153 cm - boxed separately. Section 4 expanded 150-153 cm - boxed separately. Section 5 expanded 150-159 cm - boxed separately. Section 6 expanded 150-155 cm - boxed separately.</p>
2		2					
3		3					
4		3					
5		4					
6		5					
7		5					
8		6					
9		7					
10		CC					

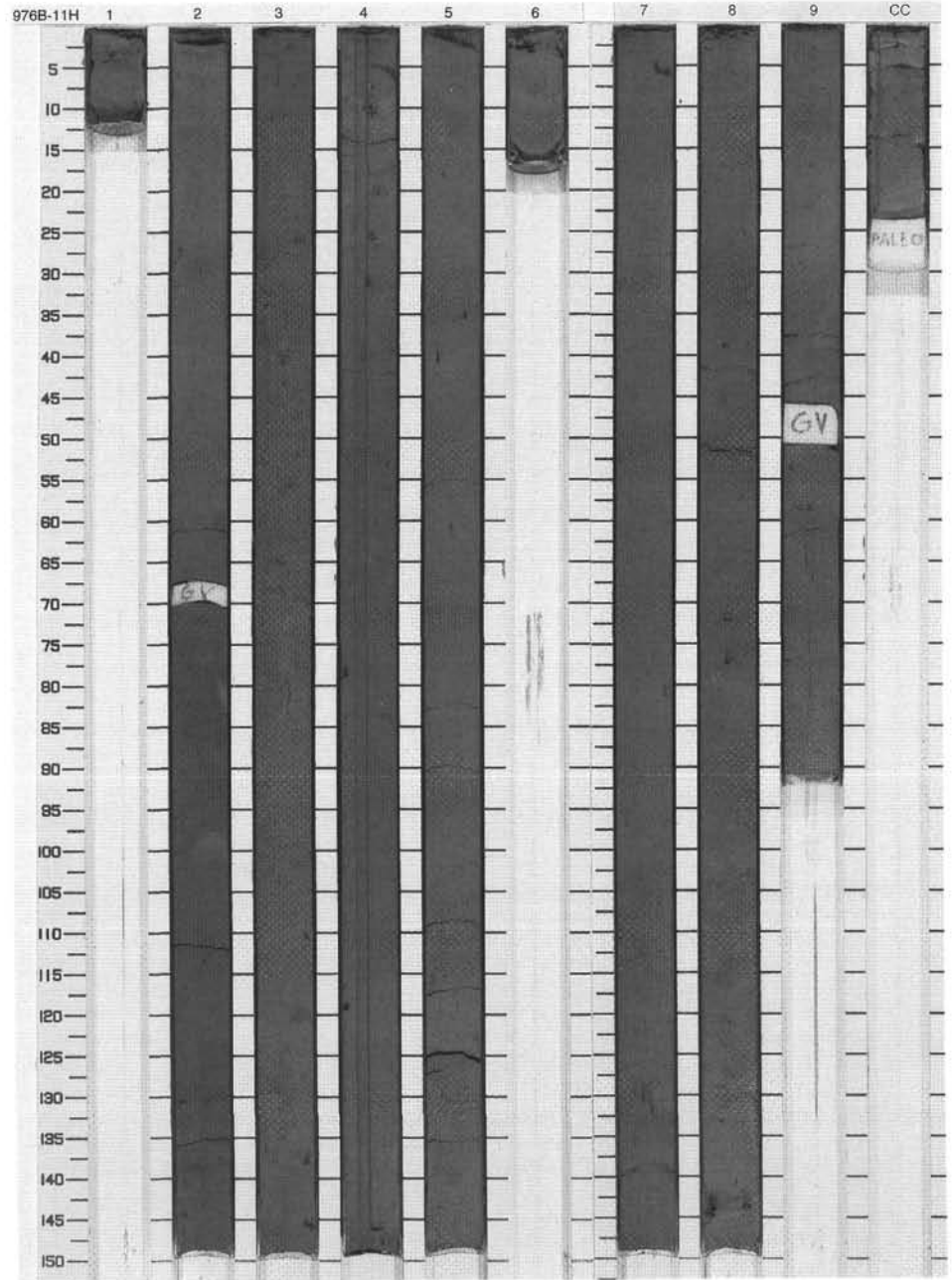


SITE 976 HOLE B CORE 10H CORED 79.5 - 89.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		~				<p>NANNOFOSSIL-CLAY</p> <p>Major Lithology: The main sediment type is NANNOFOSSIL CLAY, dark greenish gray (5GY 4/1) in color.</p> <p>General Description: Dispersed shell fragments and up to 8% detrital quartz are present. Burrows are present in a few places and these are filled with pyrite and are medium dark gray (N4) in color.</p> <p>Section 3 expanded 150-155 cm - all to chemists for IW. Section 4 expanded 150-162 cm - boxed separately. Section 5 expanded 150-159 cm - boxed separately.</p>
2	[Pattern]	2		~				
3	[Pattern]	3		~				
4	[Pattern]	3		~		S		
5	[Pattern]	4	Pleistocene	☼			5GY 4/1	
6	[Pattern]	4		~				
7	[Pattern]	5		~				
8	[Pattern]	6		☼				
9	[Pattern]	6		~				
10	[Pattern]	7		~		S		
		CC				M		



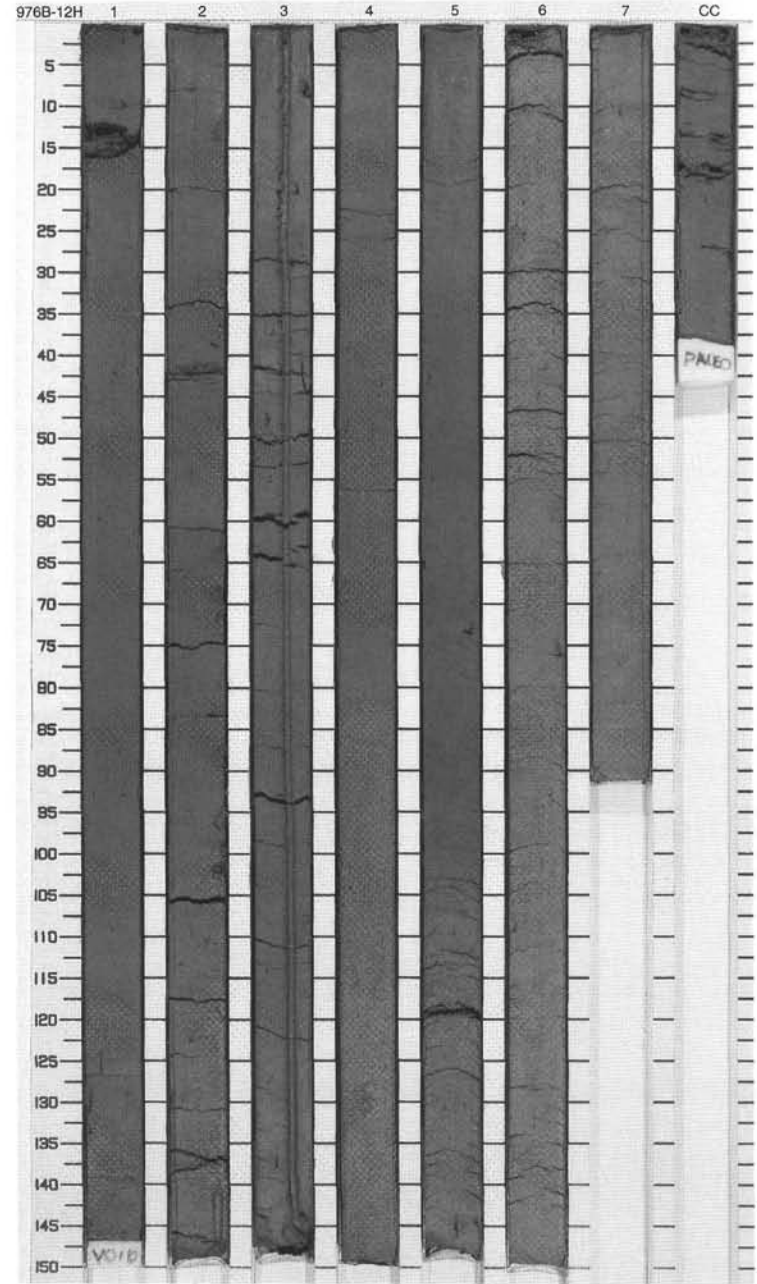
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	2	[Symbol]		S	5GY 4/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The main sediment type is a mottled to burrowed NANNOFOSSIL CLAY which is grayish olive (10Y 4/2) to dark greenish gray (5GY 4/1) in color.</p> <p>Minor Lithologies: The sediment contains dispersed shell fragments and up to 8% detrital quartz. Burrows are present in a few places and these contain up to 10% pyrite.</p> <p>General Description: Section 3 expanded 150-155 cm; boxed separately. Section 6 expanded 150-154 cm; boxed separately.</p>
2	[Pattern]	3	[Symbol]		S	10Y 4/2	
3	[Pattern]	4	[Symbol]		S	5GY 4/1	
4	[Pattern]	5	[Symbol]		S	5GY 4/1	
5	[Pattern]	6	[Symbol]		S	5GY 4/1	
6	[Pattern]	7	[Symbol]		S	5GY 4/1	
7	[Pattern]	8	[Symbol]		S	5GY 4/1	
8	[Pattern]	9	[Symbol]		S	5GY 4/1	
9	[Pattern]	9	[Symbol]		S	5GY 4/1	
10	[Pattern]	CC	[Symbol]		M		



SITE 976 HOLE B CORE 12H

CORED 98.5 - 108.0 mbsf

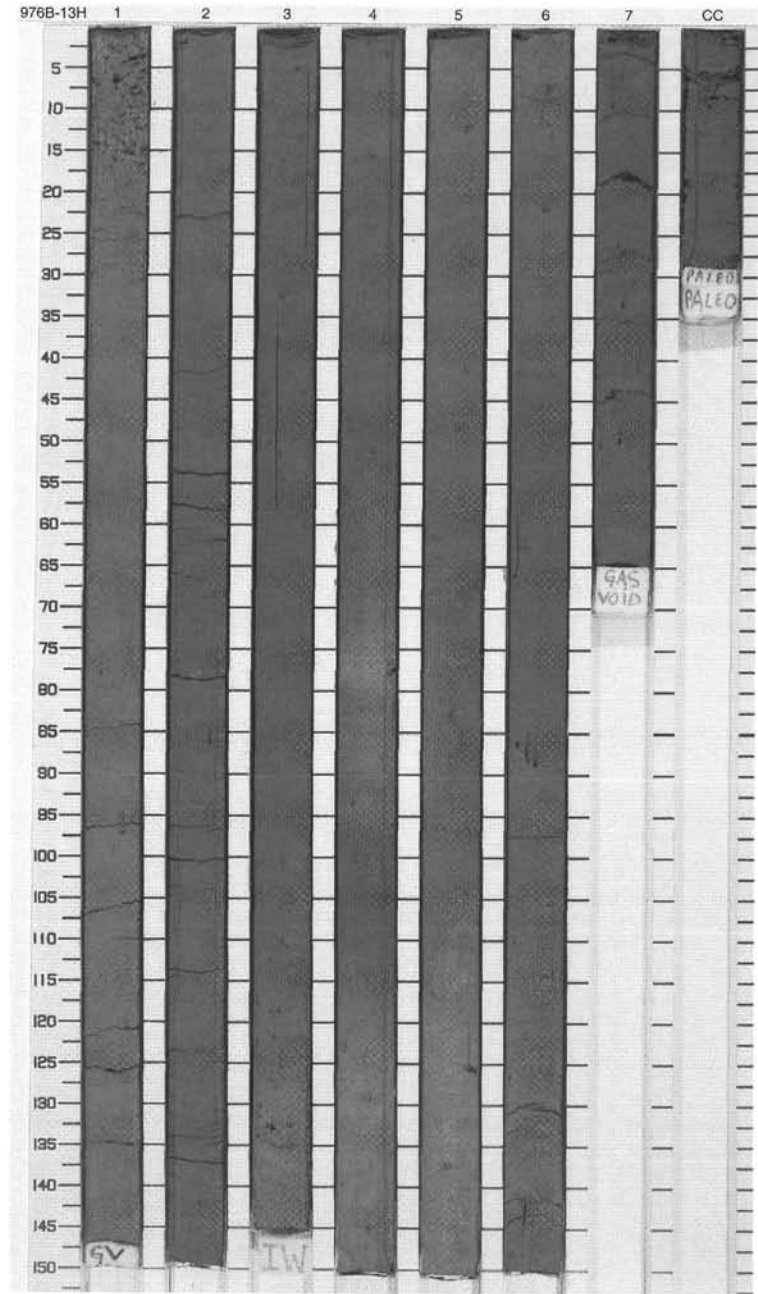
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	✗		S		<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL CLAY with a pale color change from greenish to grayish olive gray (5Y 4/1) in Section 5.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills and gas expansion cracks occur throughout the core.</p> <p>Section 5 expanded 150-156 cm - boxed separately.</p>
2	[Dotted pattern]	2		✗				
3	[Dotted pattern]	3		✗				
4	[Dotted pattern]	3		✗				
5	[Dotted pattern]	4		✗			5Y 4/1	
6	[Dotted pattern]	4		✗				
7	[Dotted pattern]	5		✗				
8	[Dotted pattern]	5		✗				
9	[Dotted pattern]	6		✗				
10	[Dotted pattern]	7		✗			S	
	[Dotted pattern]	CC		✗		M		



SITE 976 HOLE B CORE 13H

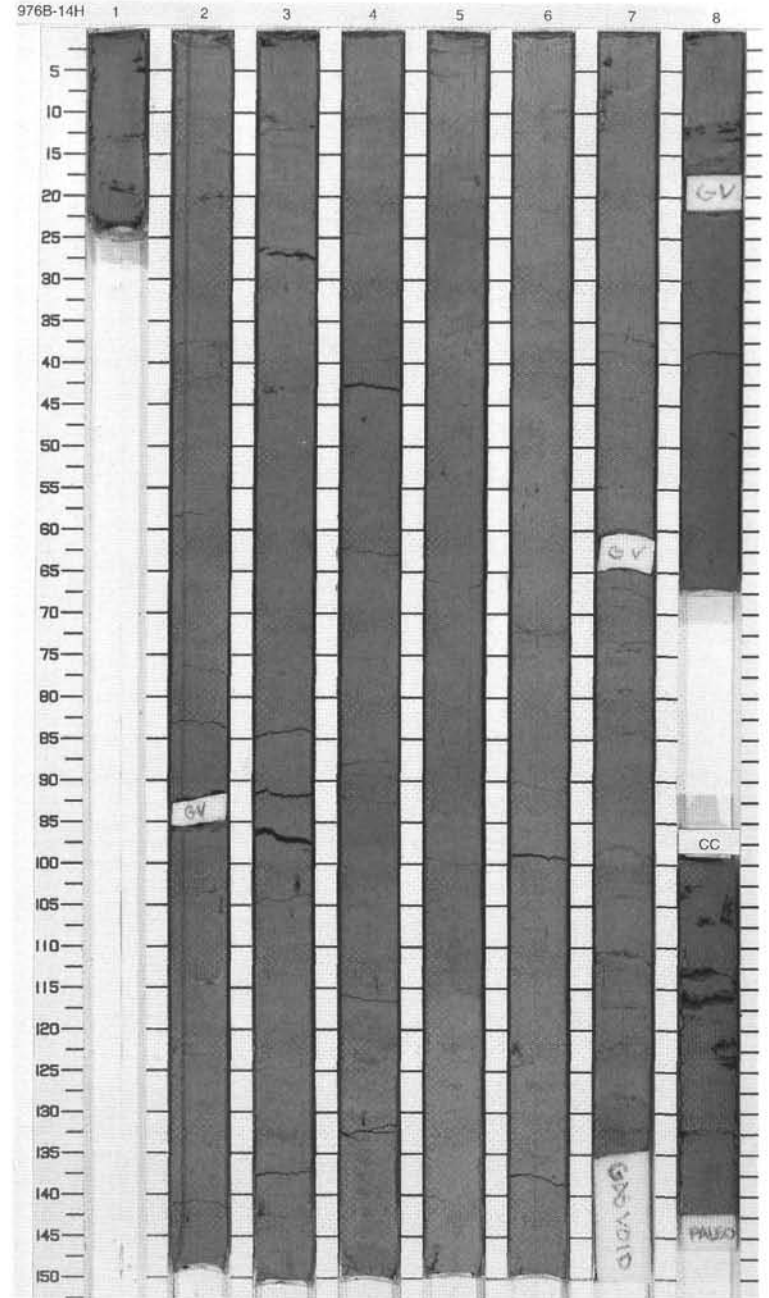
CORED 108.0 - 117.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		⌘ Ⓟ	w			<p>NANNOFOSSIL SILTY CLAY</p> <p>Major Lithology: The major lithology is olive gray (5Y 4/1) to grayish olive green (5GY 3/2) NANNOFOSSIL SILTY CLAY, with pale grayish to olive green color bands in Section 4.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills and gas expansion cracks occur throughout the core.</p>
2	[Pattern]	2		⌘ Ⓟ			5Y 4/1	
3	[Pattern]	3		⌘			S	
4	[Pattern]	3		⌘			I	
5	[Pattern]	4	Pleistocene	⌘				
6	[Pattern]	4		⌘				
7	[Pattern]	5		⌘ Ⓟ			5GY 3/2	
8	[Pattern]	6		⌘ Ⓟ			S	
9	[Pattern]	7		⌘ Ⓟ				
10	[Pattern]	CC					M	



SITE 976 HOLE B CORE 14H CORED 117.5 - 127.0 mbsf

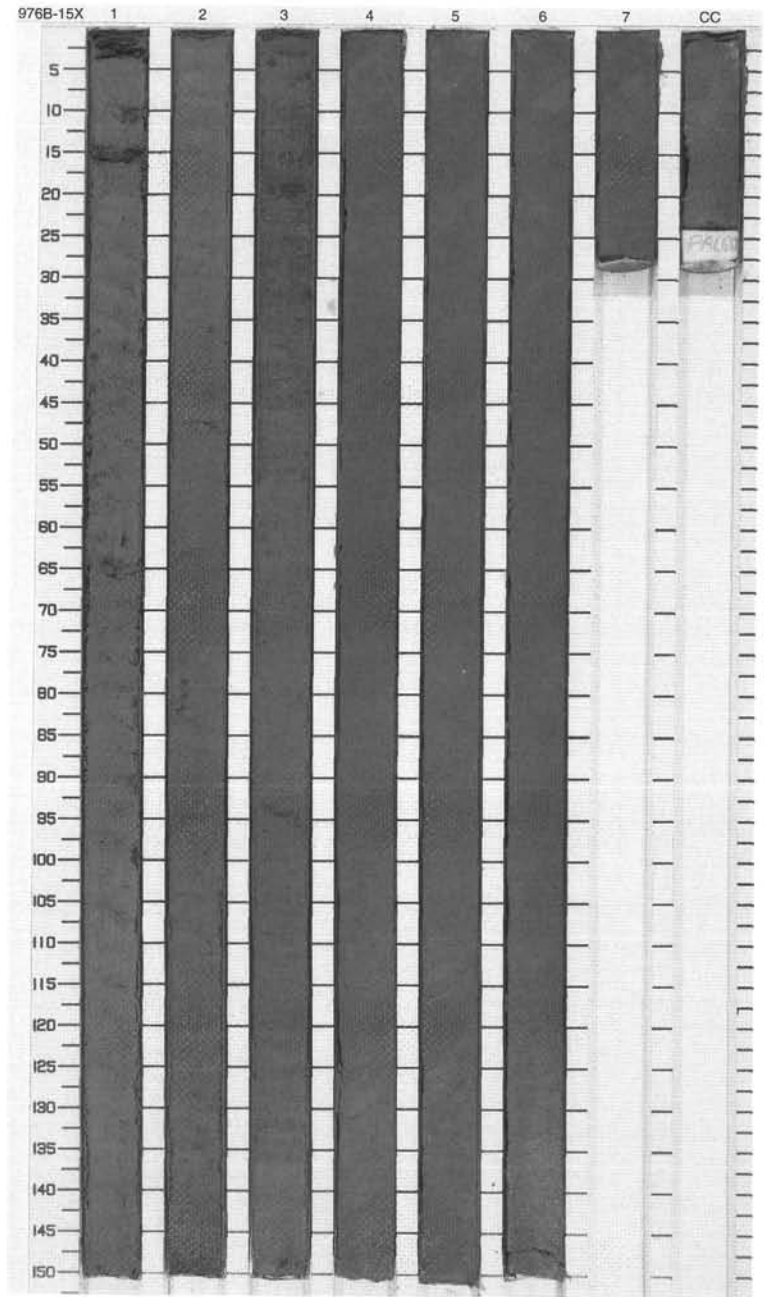
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1		~				<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is olive gray to grayish olive green (5Y 4/1 to 5GY 3/2) NANNOFOSSIL CLAY.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills and gas expansion cracks occur throughout the core.</p>
2	[Dotted pattern]	2		~		S		
3	[Dotted pattern]	3		~			5Y 4/1	
4	[Dotted pattern]	4		~				
5	[Dotted pattern]	5	Pleistocene	~				
6	[Dotted pattern]	5		~				
7	[Dotted pattern]	6		~				
8	[Dotted pattern]	7		~			5GY 3/2 To 5Y 4/1	
9	[Dotted pattern]	8		~			S	
10	[Dotted pattern]	CC		~			M	
	[Dotted pattern]							Void



SITE 976 HOLE B CORE 15X

CORED 127.0 - 136.5 mbsf

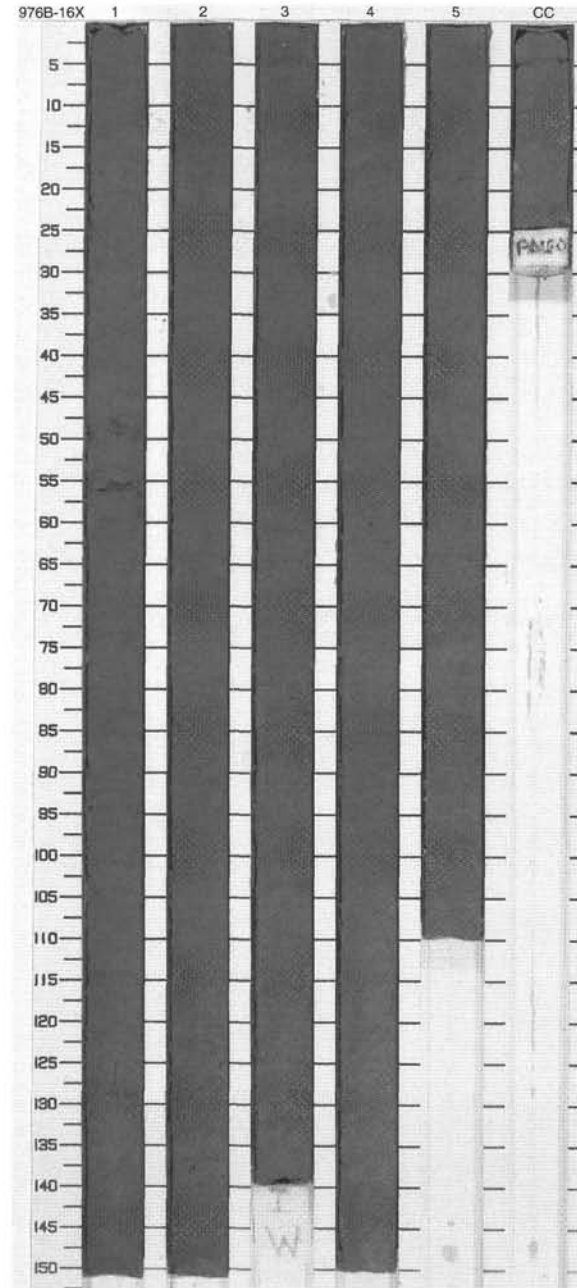
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Hatched pattern]	1	Pleistocene	(P)	-	S	5Y 4/1	<p>NANNOFOSSIL SILTY CLAY</p> <p>Major Lithology: Major lithology is olive gray (5Y 4/1) NANNOFOSSIL SILTY CLAY.</p> <p>Minor Lithologies: Light olive gray (5Y 6/1) diatom-nannofossil ooze is present in Section 3, 0-55 cm.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills occur throughout the core.</p>
2	[Hatched pattern]	2		⊗				
3	[Hatched pattern]	3		⊗				
4	[Hatched pattern]	4		⊗		S	5Y 6/1	
5	[Hatched pattern]	5		⊗		S	5Y 4/1	
6	[Hatched pattern]	6		⊗				
7	[Hatched pattern]	7		⊗				
8	[Hatched pattern]	6	⊗	M				
9	[Hatched pattern]	7	⊗					
		CC						



SITE 976 HOLE B CORE 16X

CORED 136.5 - 146.2 mbsf

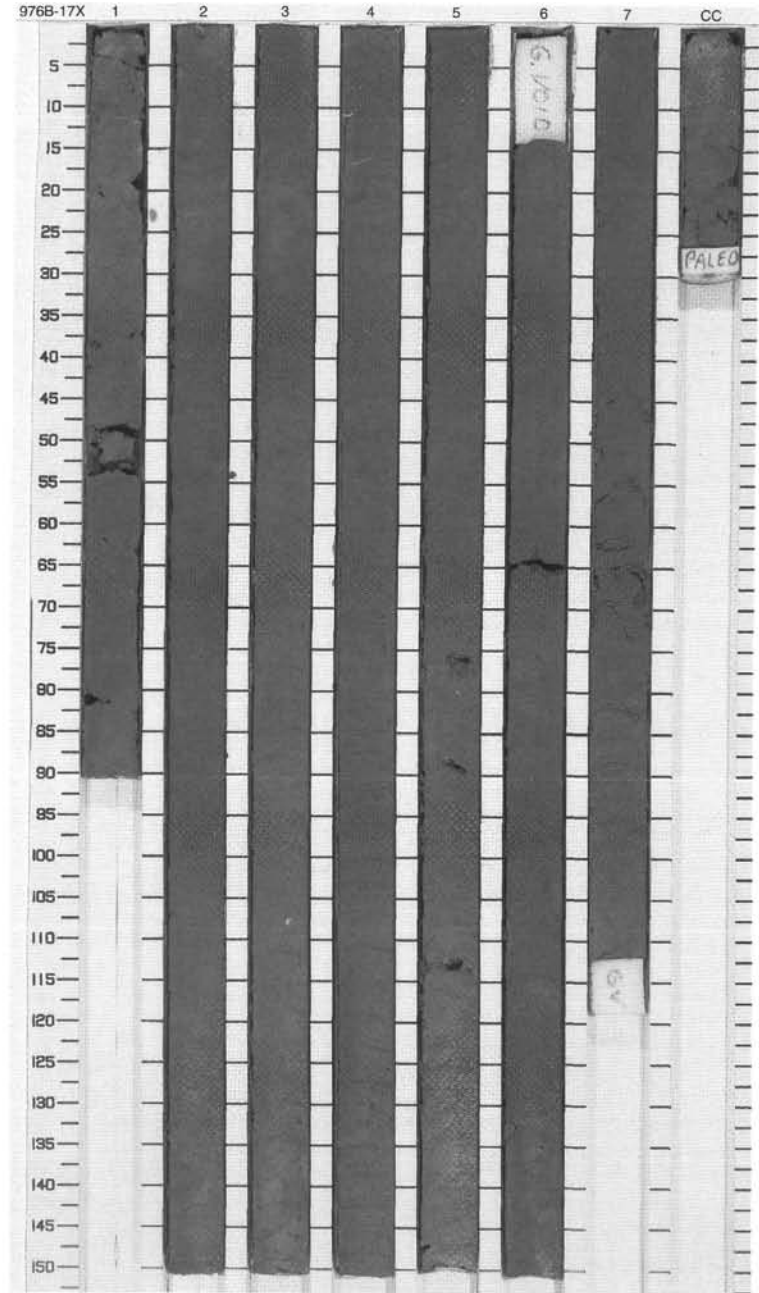
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	Pleistocene	X	-	S	5Y 5/1	<p>NANNOFOSSIL CLAY TO NANNOFOSSIL SILTY CLAY</p> <p>Major Lithology: The major lithology is olive gray to dark greenish gray (5Y 4/1 to 5GY 4/1) NANNOFOSSIL CLAY TO NANNOFOSSIL SILTY CLAY.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills occur throughout the core.</p>
2	[Pattern]	2						
3	[Pattern]	3						
4	[Pattern]	4						
5	[Pattern]	5						
6	[Pattern]					S		
7	[Pattern]						5GY 4/1	
		CC				M		



SITE 976 HOLE B CORE 17X

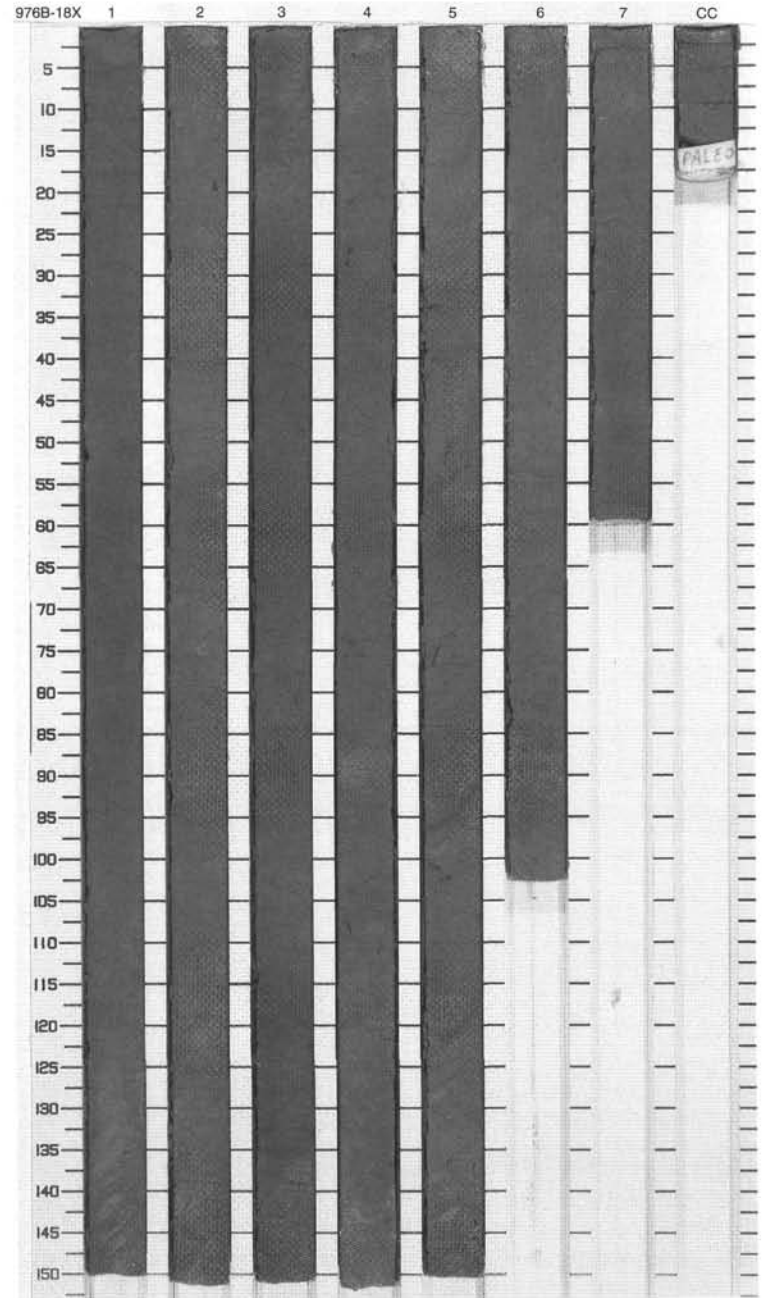
CORED 146.2 - 155.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene					<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH CLAY.</p> <p>Minor Lithologies: Laminae of dark greenish gray (5GY 4/1) calcareous silty clay are present in the core.</p> <p>General Description: Gas expansion cracks occur in Sections 1, 4, 6, 7, and CC.</p>
2	[Dotted pattern]	2				S		
3	[Dotted pattern]	3			∅			
4	[Dotted pattern]	4					5GY 4/1	
5	[Dotted pattern]	4			∅			
6	[Dotted pattern]	5			∅			
7	[Dotted pattern]	6			∅			
8	[Dotted pattern]	6			∅			
9	[Dotted pattern]	7			∅	S		
	[Dotted pattern]	CC			M			



SITE 976 HOLE B CORE 18X CORED 155.8 - 165.4 mbsf

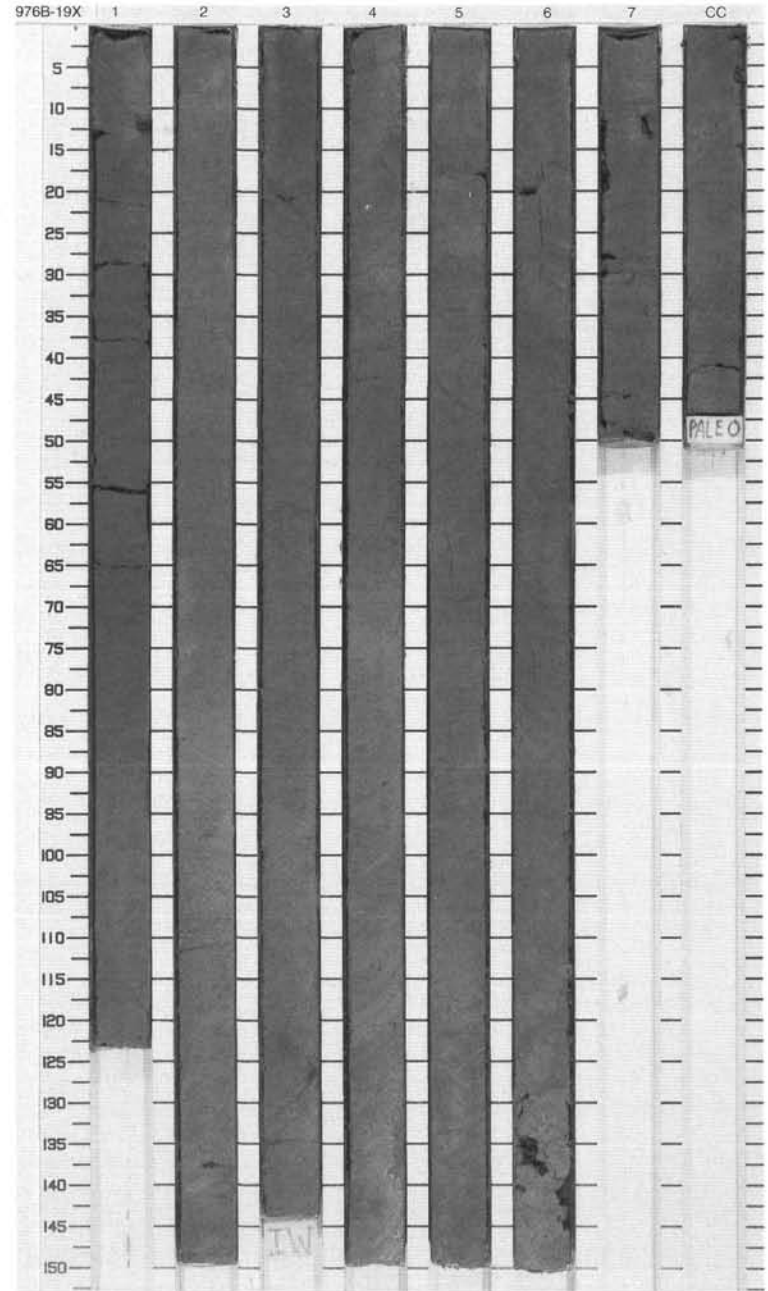
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1		∅		S		<p>NANNOFOSSIL-RICH CLAY TO NANNOFOSSIL-RICH SILTY CLAY</p> <p>Major Lithology: The major lithologies are dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH CLAY TO NANNOFOSSIL-RICH SILTY CLAY with a moderate content of shell fragments and foraminifers throughout the core.</p>
2	[Dotted pattern]	2		∅		S		
3	[Dotted pattern]	3		∅		S		
4	[Dotted pattern]	3		∅		S		
5	[Dotted pattern]	4	Pleistocene	∅		S	5GY 4/1	
6	[Dotted pattern]	4		∅				
7	[Dotted pattern]	5		∅				
8	[Dotted pattern]	6		∅				
9	[Dotted pattern]	7		∅				
		CC				M		



SITE 976 HOLE B CORE 19X

CORED 165.4 - 175.1 mbsf

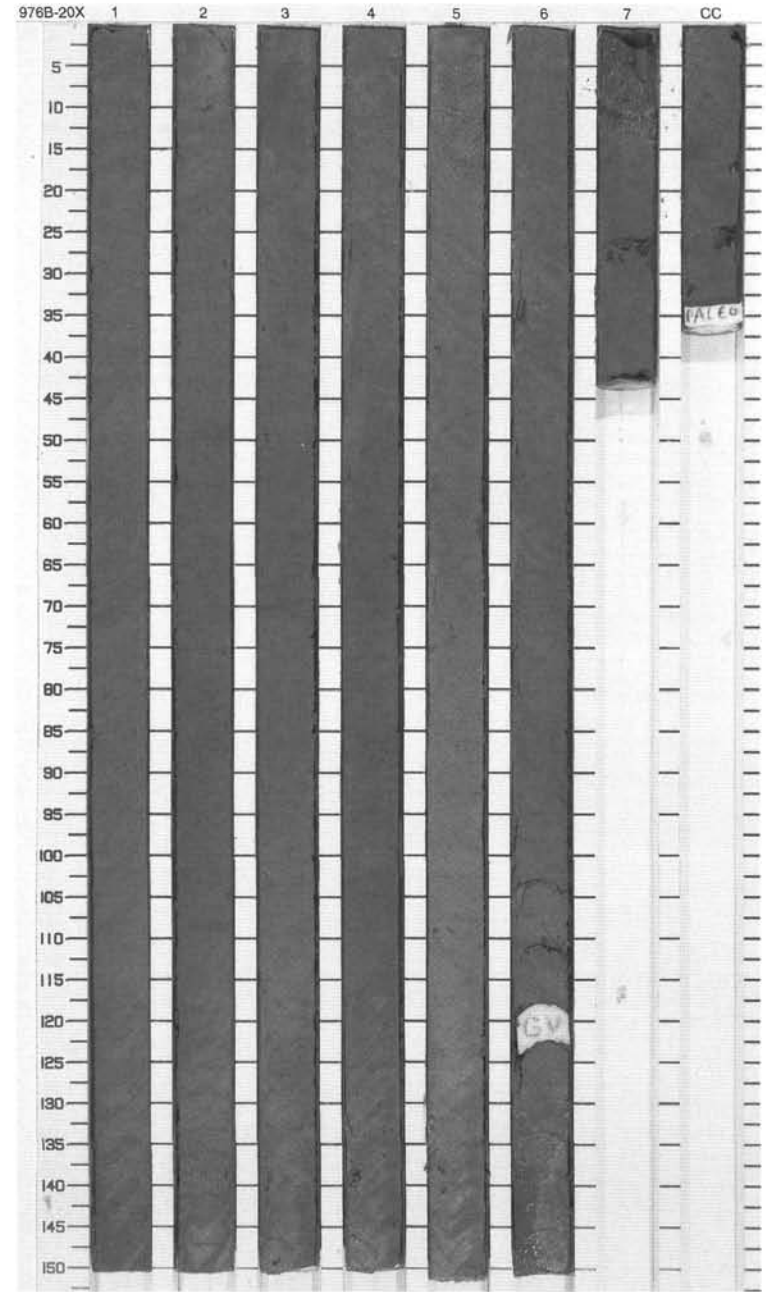
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	∅		S	5GY 4/1	<p>CALCAREOUS CLAY TO NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The main lithology is CALCAREOUS CLAY to NANNOFOSSIL-RICH CLAY, dark greenish gray (5GY 4/1) to olive gray (5Y 4/1) in color.</p> <p>General Description: Broken shells occur throughout the cored interval. Bioturbation is only slight, except in Section 4. Pyritized burrows are present in Section 3. Top of Section 1 extruded and left in core barrel. Placed in split liner.</p>
2	[Dotted pattern]	2	∅			5Y 4/1	
3	[Dotted pattern]	3	∅ (P)		I		
4	[Dotted pattern]	4	∅ (P)			5GY 4/1	
5	[Dotted pattern]	5	∅				
6	[Dotted pattern]	6	∅		S	5Y 4/1	
7	[Dotted pattern]	7	∅				
8	[Dotted pattern]	CC	∅		M		



SITE 976 HOLE B CORE 20X

CORED 175.1 - 184.7 mbsf

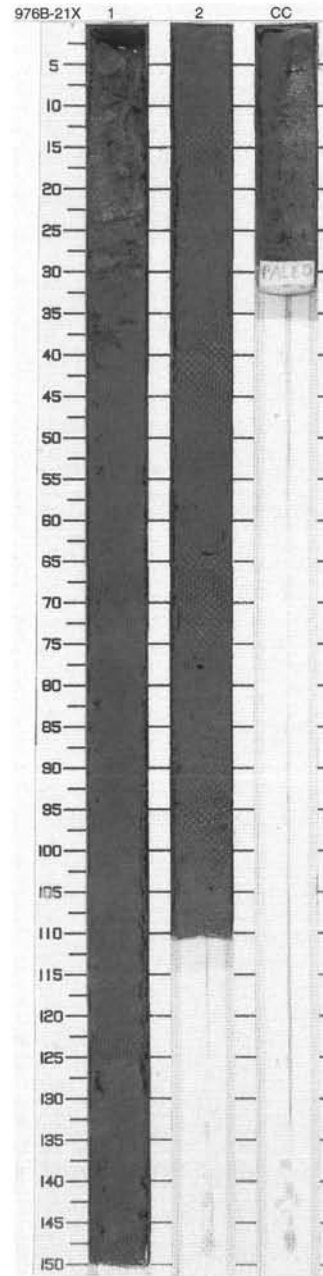
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	∕				<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The main sediment type is a structureless to burrowed grayish olive (10Y 4/2) to dusky yellow green (5GY 5/2) or dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH CLAY which contains sparse dispersed shell fragments and rare discrete burrows.</p> <p>General Description: Section 1 disturbed—top 35 cm left in core barrel. Placed in split liner.</p>
2	[Dotted pattern]	2		∕		S	10Y 4/2	
3	[Dotted pattern]	3		∕		S	5GY 4/2	
4	[Dotted pattern]	4		∕				
5	[Dotted pattern]	5		∕				
6	[Dotted pattern]	6		∕		S	10Y 4/2	
7	[Dotted pattern]	7		∕				
8	[Dotted pattern]	6		∕			5GY 4/1	
9	[Dotted pattern]	7		∕				
		CC		∕		M		



SITE 976 HOLE B CORE 21X

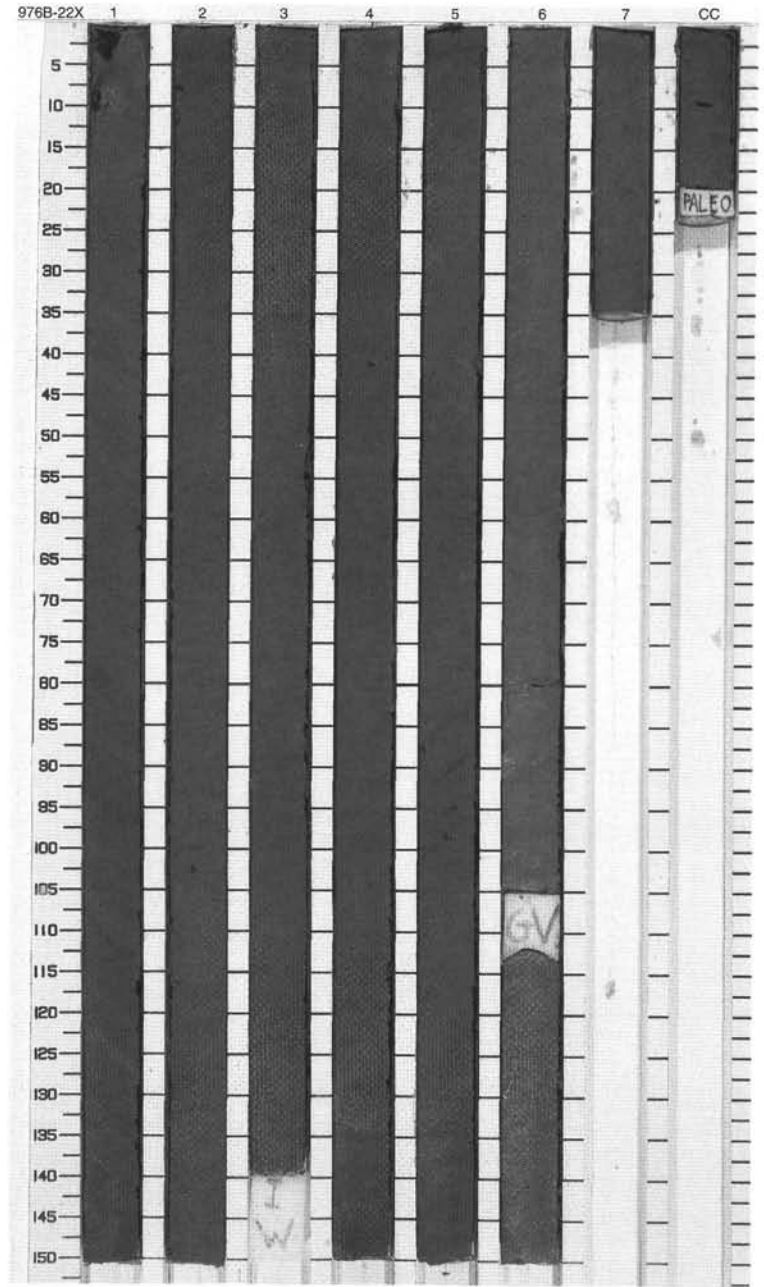
CORED 184.7 - 194.4 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	[Symbol]	○	S	5GY 4/1 To 10Y 4/2	NANNOFOSSIL-RICH CLAY Major Lithology: The main sediment type is a structureless to mottled grayish olive (10Y 4/2) to dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH CLAY which contains sparse dispersed shell fragments and rare burrows.
2	[Dotted pattern]	2						
CC	[Dotted pattern]	CC		[Symbol]		M		



SITE 976 HOLE B CORE 22X CORED 194.4 - 203.9 mbsf

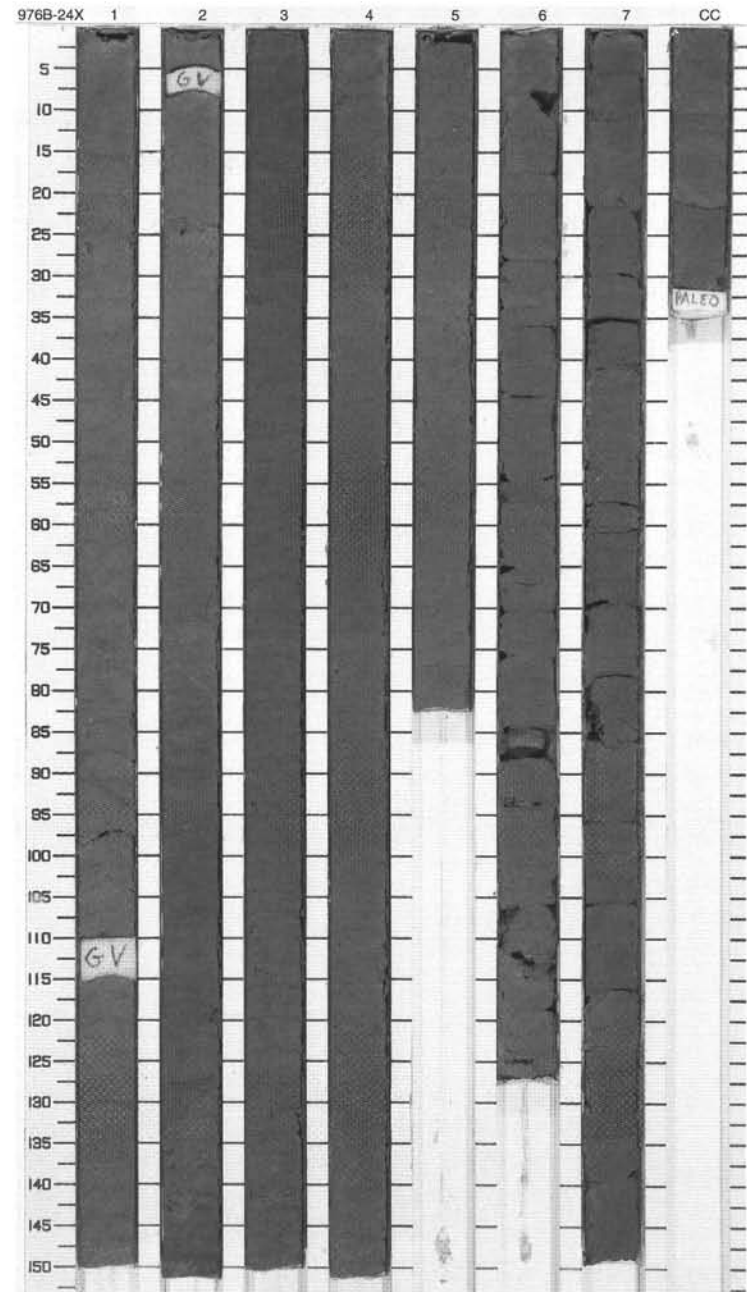
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	⊗	I S		5GY 4/1	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The main lithology is NANNOFOSSIL-RICH CLAY, dark greenish gray (5Y 4/1) to grayish olive (10Y 4/2) in color.</p> <p>General Description: The sediment ranges from slightly to moderately bioturbated. Some burrows are pyritized. Shell fragments are dispersed throughout the core but are most abundant in Sections 2-5.</p>
2	[Dotted pattern]	2		⊗				
3	[Dotted pattern]	3		⊗				
4	[Dotted pattern]	4		⊗				
5	[Dotted pattern]	5		⊗				
6	[Dotted pattern]	6		⊗				
7	[Dotted pattern]	7		⊗				
8	[Dotted pattern]	6	⊗	M		10Y 4/2		
9	[Dotted pattern]	7	⊗				5GY 4/1 To 10Y 4/2	
		CC						



SITE 976 HOLE B CORE 24X

CORED 213.5 - 223.1 mbsf

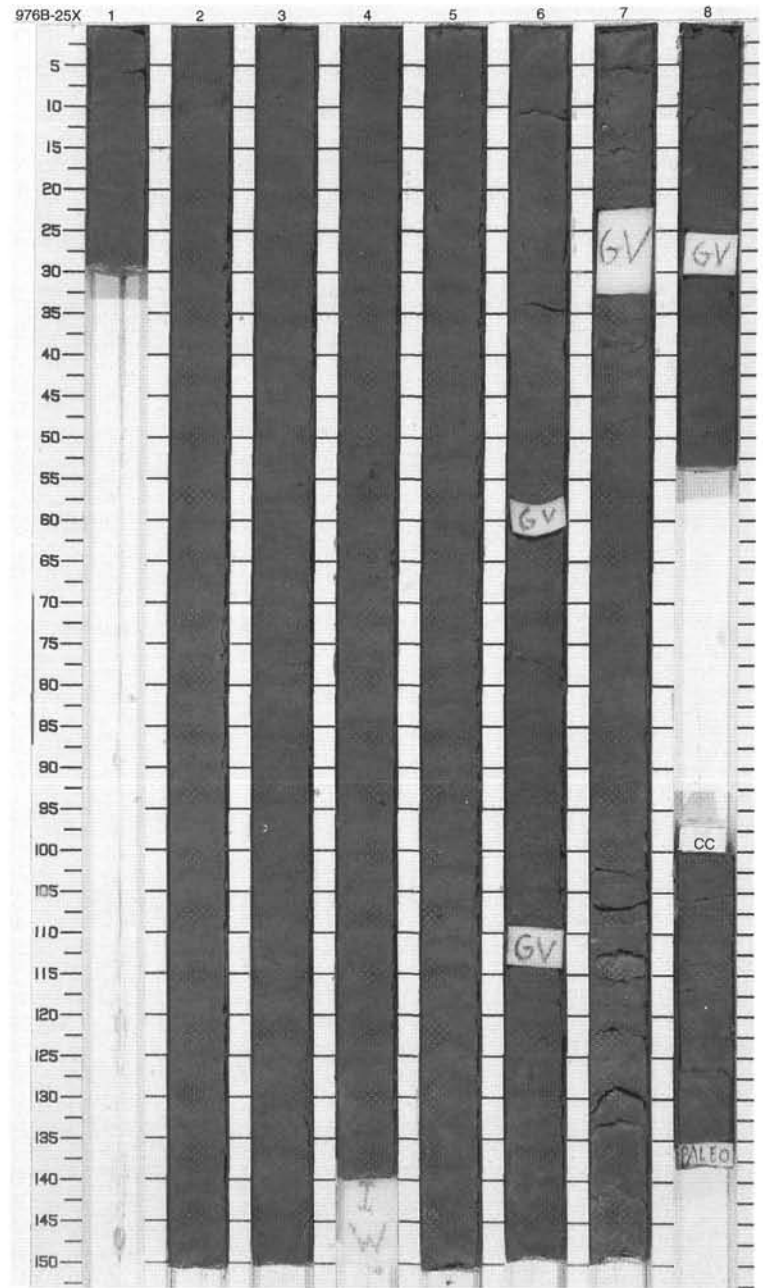
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description	
1		1	Pleistocene	}}	✗	S	10Y 4/2	NANNOFOSSIL CLAY TO NANNOFOSSIL-RICH CLAY Major Lithology: The main lithology is NANNOFOSSIL CLAY to NANNOFOSSIL-RICH CLAY, grayish olive (10Y 4/2) to dark greenish gray (5GY 4/1) in color.	
2		2		}}	✗		5GY 4/1	General Description: Shell fragments are visible throughout the core but are most abundant in Sections 1, 2, and 7. The sediment is moderately bioturbated. Locally, burrows are pyritized.	
3		3		}}	✗		S		Sections 6 and 7 blown out of pipe; order of pieces unsure.
4		3		}}	✗				
5		4		}}	✗		S		
6		4		}}	✗				
7		5		}}	✗				
8		6		}}	✗		S		
9		6		}}	✗				
		7		}}	✗		S		
		7	}}	✗					
		CC		}}	✗	M	5GY 4/1		



SITE 976 HOLE B CORE 25X

CORED 223.1 - 232.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Hatched pattern]	1		⌘				<p>NANNOFOSSIL CLAYEY SILT TO NANNOFOSSIL SILTY CLAY</p> <p>Major Lithology: The major lithologies are olive gray (5Y 4/1) NANNOFOSSIL CLAYEY SILT TO NANNOFOSSIL SILTY CLAY.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills are present throughout the core. Gas expansion cracks occur in Sections 6, 7, 8, and CC.</p> <p>Section 1 - displaced from liner; material removed from pipe.</p>
1	[Hatched pattern]	2		Ⓟ ⌘		S		
2	[Hatched pattern]	3		Ⓟ ⌘				
3	[Hatched pattern]	4		Ⓟ ⌘				
4	[Hatched pattern]	4		Ⓟ ⌘				
5	[Hatched pattern]	5	Pleistocene	⌘		I	5Y 4/1	
6	[Hatched pattern]	5		Ⓟ ⌘				
7	[Hatched pattern]	6		Ⓟ ⌘				
8	[Hatched pattern]	7		⌘		S		
9	[Hatched pattern]	8		Ⓟ ⌘				
10	[Hatched pattern]	CC				M		

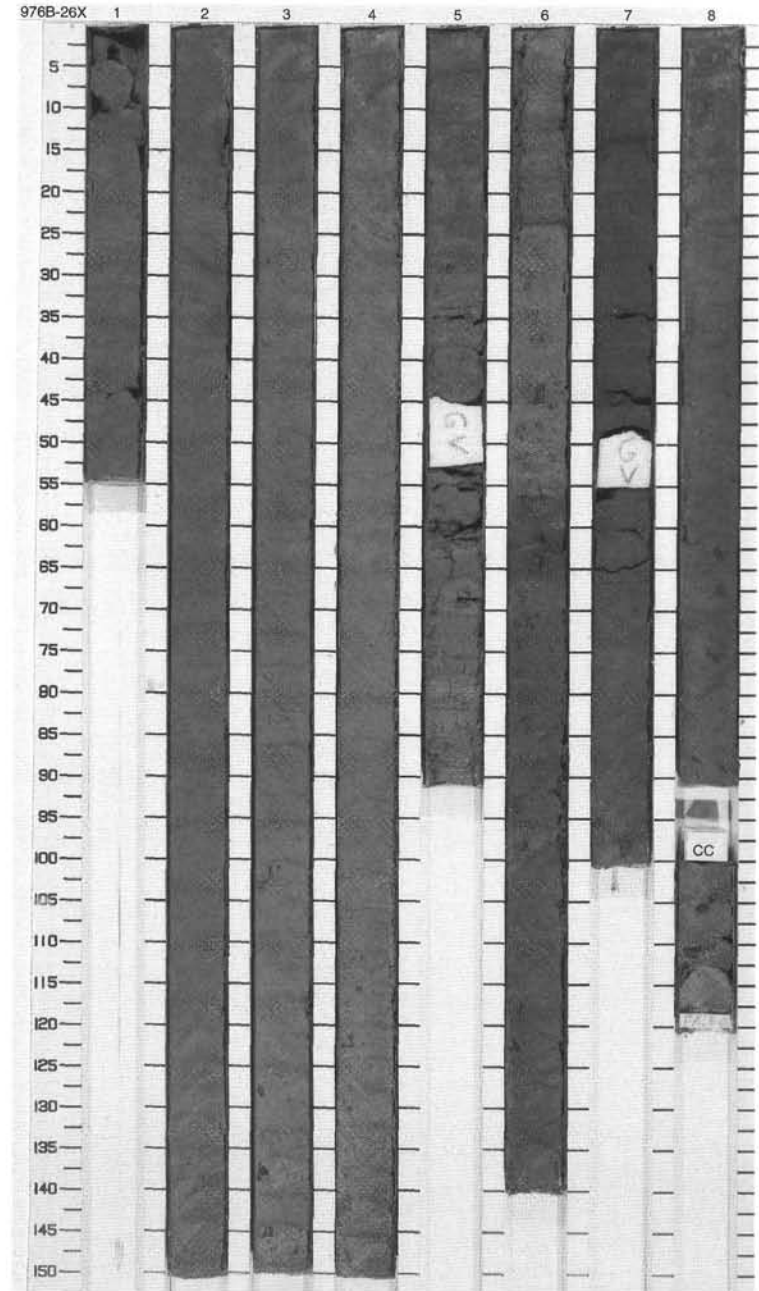


SITE 976 HOLE B CORE 26X

CORED 232.7 - 242.4 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1			✓			<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is olive gray to light olive gray (5Y 4/1 to 5Y 5/2) NANNOFOSSIL CLAY.</p> <p>Minor Lithologies: Intervals of laminated light brownish gray (5YR 6/1) to olive gray (5Y 4/1) diatomaceous ooze (Section 5 at 60-64, 77-81, and 84-90 cm and in Section 6 at 0-24 cm) alternate with beds of diatom clayey silt (Sections 6, 7, and 8) and nannofossil clay in the lower half of the core.</p> <p>General Description: An olive gray (5Y 3/2) organic-rich layer is present in Section 6, 55-60 cm.</p> <p>Section 1 - displaced from liner; material removed from pipe.</p>
2		2						
3		3		∩		S	5Y 4/1	
4		4		∩				
5		5	Pleistocene	∩		S	5Y 5/2	
6		6		∩		S		
7		6		P ∩				
8		7		∩		S	5Y 4/1	
9		8						
		CC		∩		M		

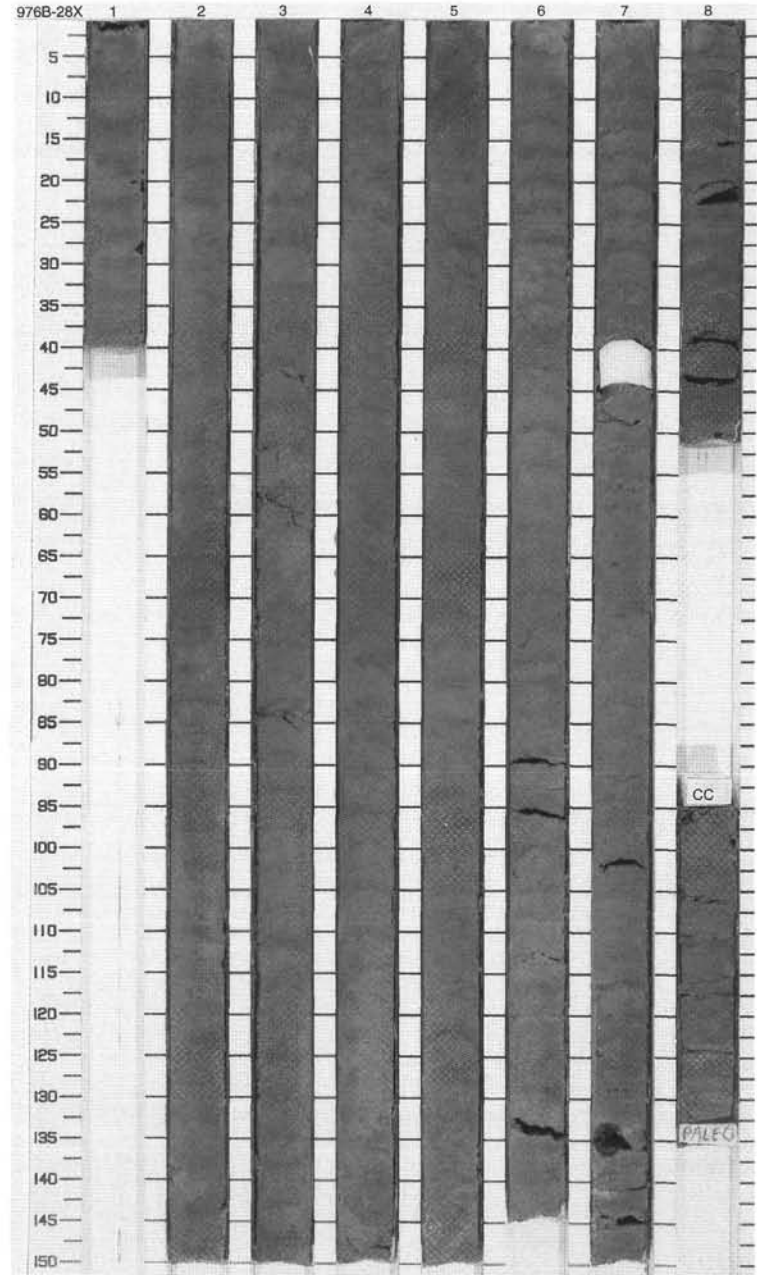
976B 27X NO RECOVERY



SITE 976 HOLE B CORE 28X

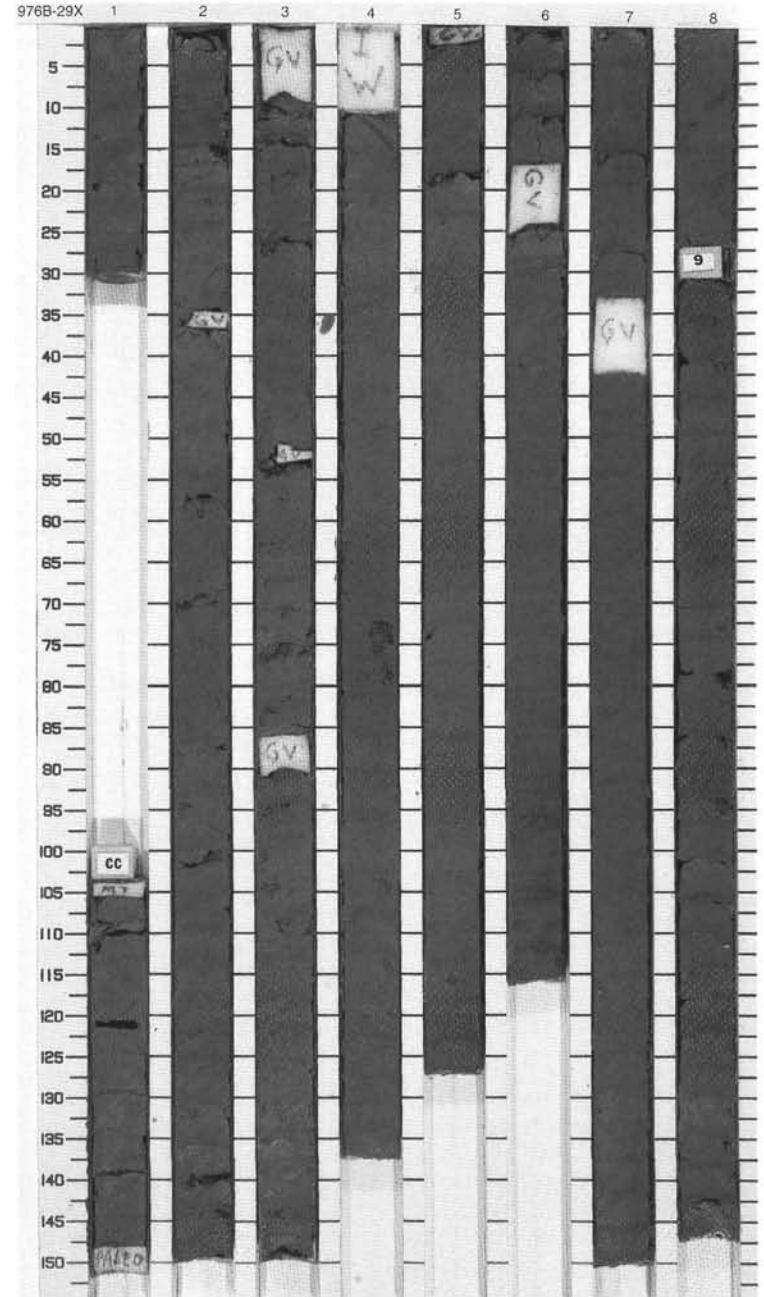
CORED 252.1 - 261.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene					<p>NANNOFOSSIL SILTY CLAY AND CALCAREOUS CLAY</p> <p>Major Lithology: The major lithologies are olive gray (5Y 4/1) NANNOFOSSIL SILTY CLAY AND CALCAREOUS CLAY.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills occur throughout the core. Gas expansions cracks are present in Sections 6, 7, and 8.</p>
2	[Dotted pattern]	2		∅				
3	[Dotted pattern]	3		∅		S		
4	[Dotted pattern]	4		∅				
5	[Dotted pattern]	5		∅			5Y 4/1	
6	[Dotted pattern]	6		∅				
7	[Dotted pattern]	7		∅				
8	[Dotted pattern]	8		∅				
9	[Dotted pattern]	9		∅		S		
10	[Dotted pattern]	10		CC			M	



SITE 976 HOLE B CORE 29X CORED 261.8 - 271.3 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	∅		S		<p>CALCAREOUS CLAY AND CALCAREOUS SILTY CLAY</p> <p>Major Lithology: The major lithologies are dark greenish gray (5GY 4/1) CALCAREOUS CLAY AND CALCAREOUS SILTY CLAY.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills and gas expansion cracks occur throughout the core.</p> <p>Section 1 - displaced from liner; material removed from pipe. Section 2 - upper 30 cm disturbed. Section 9 - blown out of pipe; no stratigraphic order.</p>
1	[Pattern]	2	∅		S		
2	[Pattern]	2	∅				
2	[Pattern]	3	∅				
3	[Pattern]	3	∅				
4	[Pattern]	4	∅		I	5GY 4/1	
5	[Pattern]	5	∅		S		
6	[Pattern]	5	∅				
7	[Pattern]	6	∅			5Y 4/1	
8	[Pattern]	7	∅				
9	[Pattern]	8	∅			5GY 4/1	
10	[Pattern]	9	∅				
		CC			M		

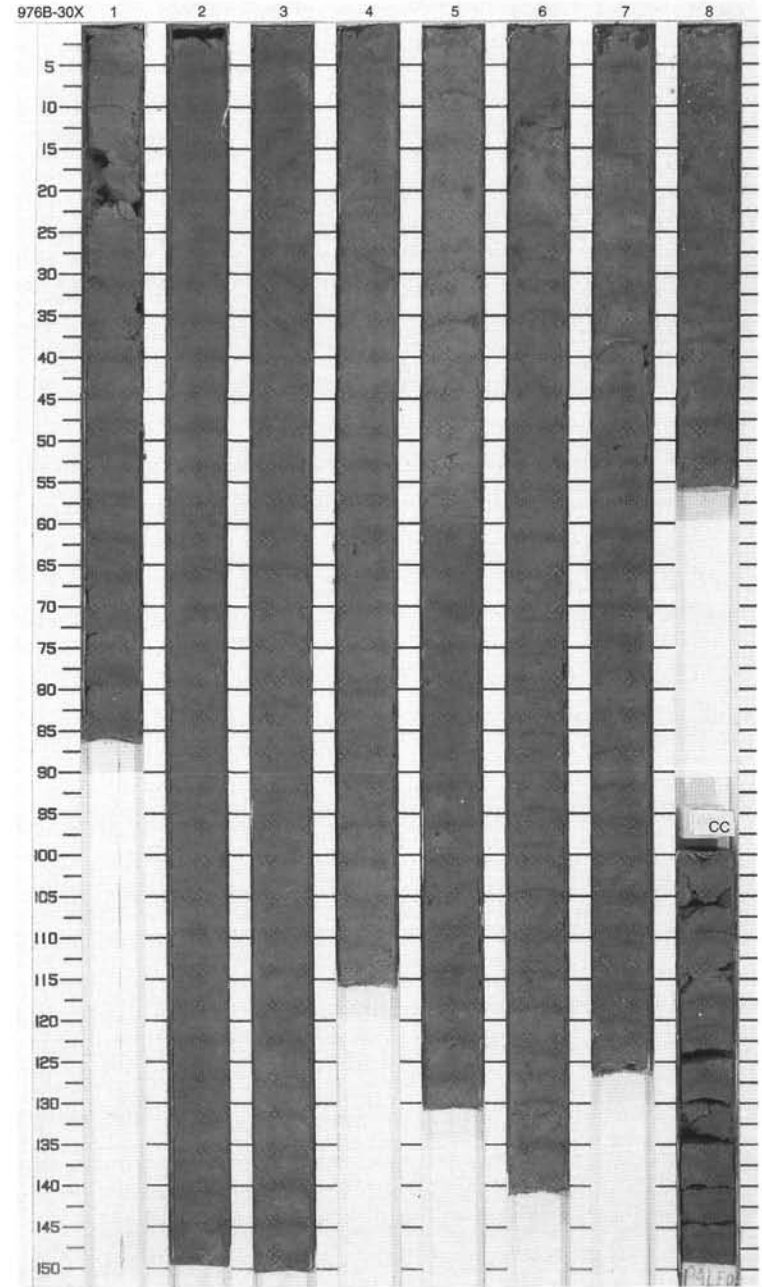


SITE 976 HOLE B CORE 30X

CORED 271.3 - 280.9 mbsf

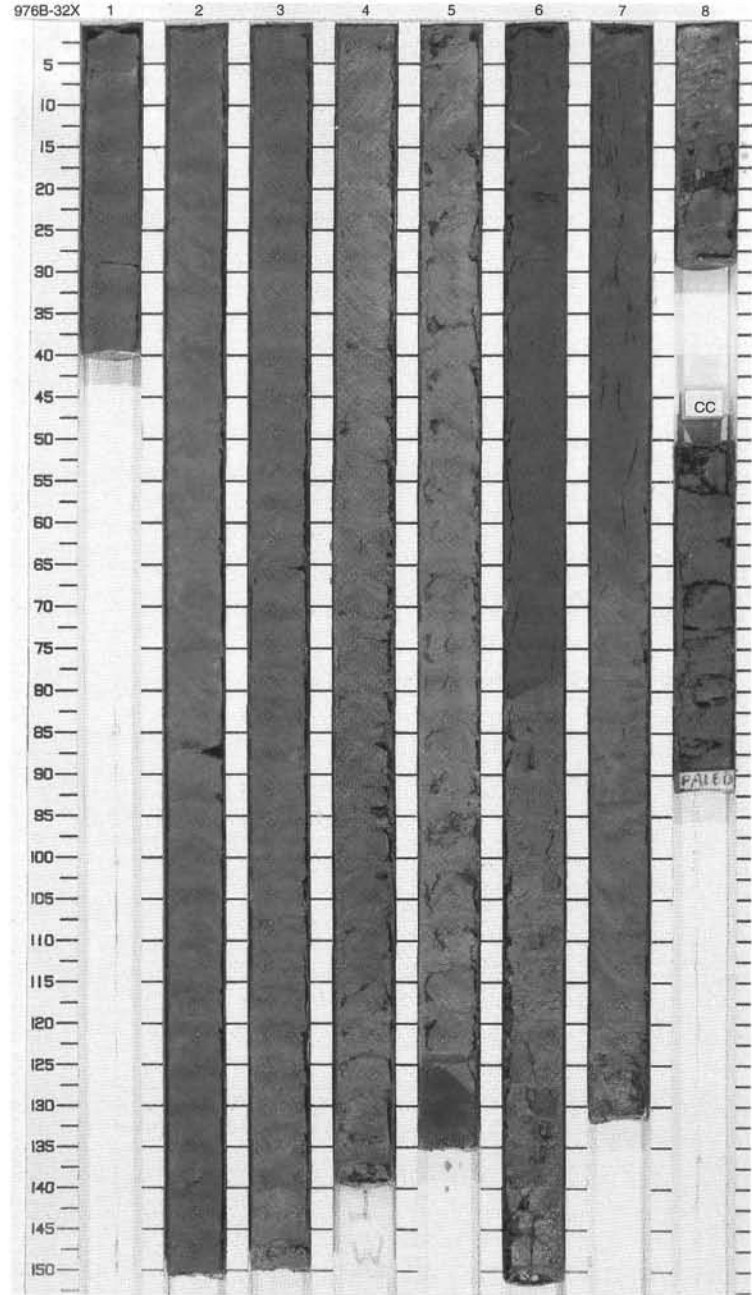
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	(P) X		S	5Y 4/1	<p>CALCAREOUS CLAY</p> <p>Major Lithology: The major lithology is olive gray (5Y 4/1) to dark greenish gray (5GY 4/1) CALCAREOUS CLAY.</p> <p>Minor Lithologies: Laminae of olive gray (5Y 4/1) and light olive gray (5Y 6/1) calcareous ooze(?) are present in Section 5, 48-61 cm.</p> <p>General Description: Grayish black (N2), pyrite-bearing(?) burrow fills are present in Sections 1, 2, 3, 6, and 7. Gas expansions cracks occur in Section 1 and CC.</p>
2	[Dotted pattern]	2		(P) X				
3	[Dotted pattern]	3		X				
4	[Dotted pattern]	4		X				
5	[Dotted pattern]	5		X				
6	[Dotted pattern]	6		(P) X				
7	[Dotted pattern]	7		X				
8	[Dotted pattern]	8		X				
9	[Dotted pattern]	8		X				
10	[Dotted pattern]	CC						
						M		

976B 31X NO RECOVERY



SITE 976 HOLE B CORE 32X CORED 290.6 - 300.1 mbsf

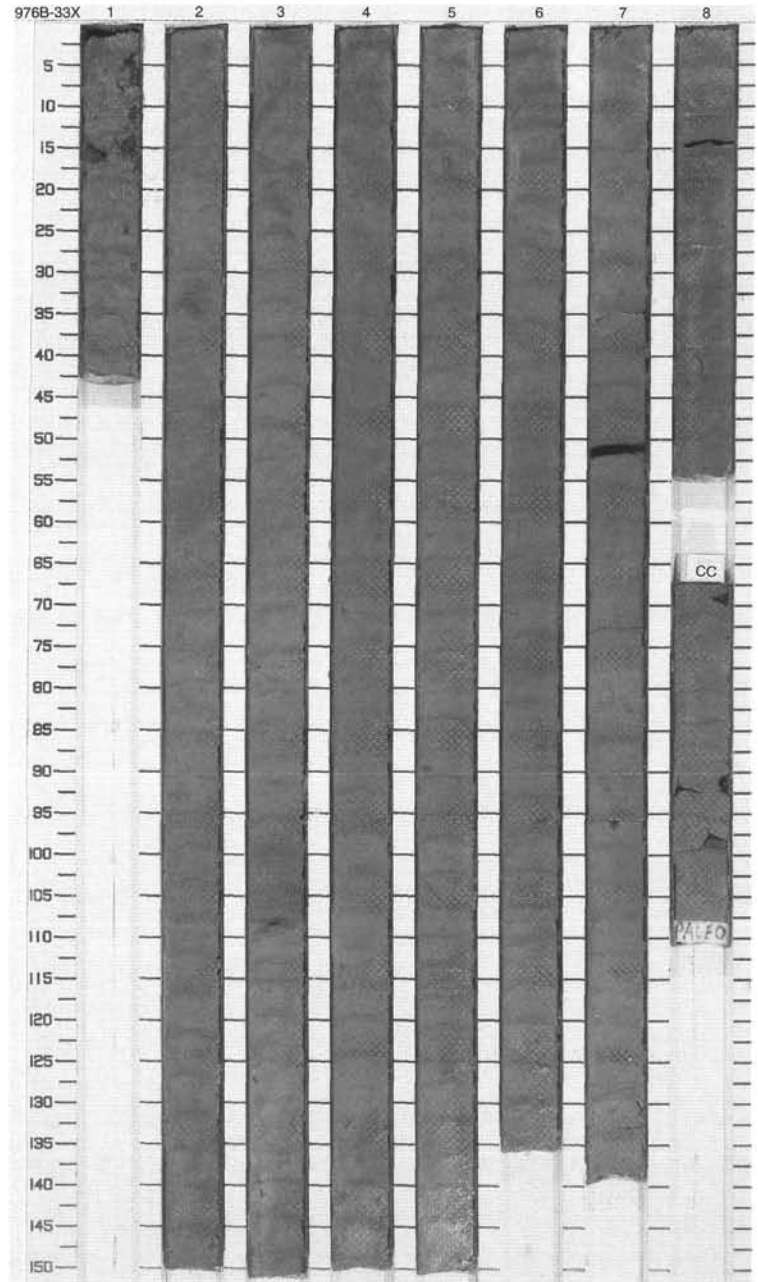
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description	
1	[Dotted pattern]	1	Pleistocene					<p>NANNOFOSSIL CLAY and DIATOMACEOUS SILTY CLAY</p> <p>Major Lithologies: The major lithologies are dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY and olive gray (5Y 3/2) DIATOMACEOUS SILTY CLAY.</p> <p>Minor Lithologies: Nannofossil clay layers include scattered dark opaque minerals (pyrite?), foraminifers, and shell fragments throughout the core. Locally, thin parallel-laminated diatomaceous silty clay layers occur.</p> <p>General Description: DIATOMACEOUS SILTY CLAY layers are present at 125 cm in Section 5 to 80 cm in Section 6, and at 134 cm in Section 6 to 56 cm in Section 7. Sedimentary contacts between NANNOFOSSIL CLAY and DIATOMACEOUS SILTY CLAY layers are always sharp. A burrow replaced by pyrite occurs at 139-141 cm in Section 2.</p>	
2	[Dotted pattern]	2							
3	[Dotted pattern]	3			⌋ (P)		S		5GY 4/1
4	[Dotted pattern]	4					I		
5	[Dotted pattern]	5			o				
6	[Dotted pattern]	6			⊗		S		
7	[Dotted pattern]	6					S		5Y 3/2
8	[Dotted pattern]	7					S		5GY 4/1
9	[Dotted pattern]	7				S	5Y 3/2		
	[Dotted pattern]	8				S	5GY 4/1		
	[Dotted pattern]	CC			ww	M			



SITE 976 HOLE B CORE 33X

CORED 300.1 - 309.7 mbsf

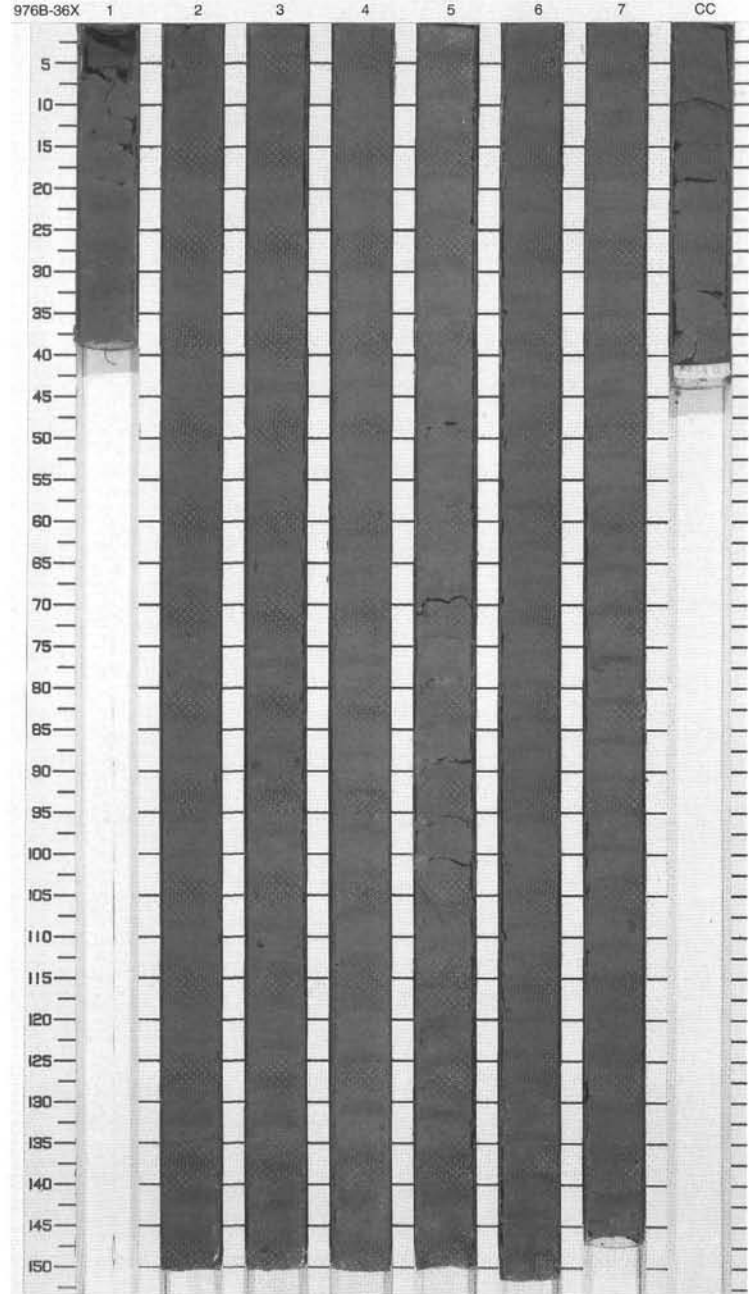
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	~ ~ ~ ~ ~ x x x x x x x x x x	-	S	10Y 4/2	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The primary lithology is a NANNOFOSSIL-RICH CLAY, grayish olive (10Y 4/2) to dark greenish gray (5GY 4/1) in color.</p> <p>General Description: The sediment is slightly to moderately burrowed. Shell fragments are scattered throughout; locally shells are concentrated in (discontinuous) laminae.</p>
2	[Dotted pattern]	2						
3	[Dotted pattern]	3						
4	[Dotted pattern]	4						
5	[Dotted pattern]	5						
6	[Dotted pattern]	6						
7	[Dotted pattern]	7						
8	[Dotted pattern]	8						
9	[Dotted pattern]	9						
10	[Dotted pattern]	10						
						M		



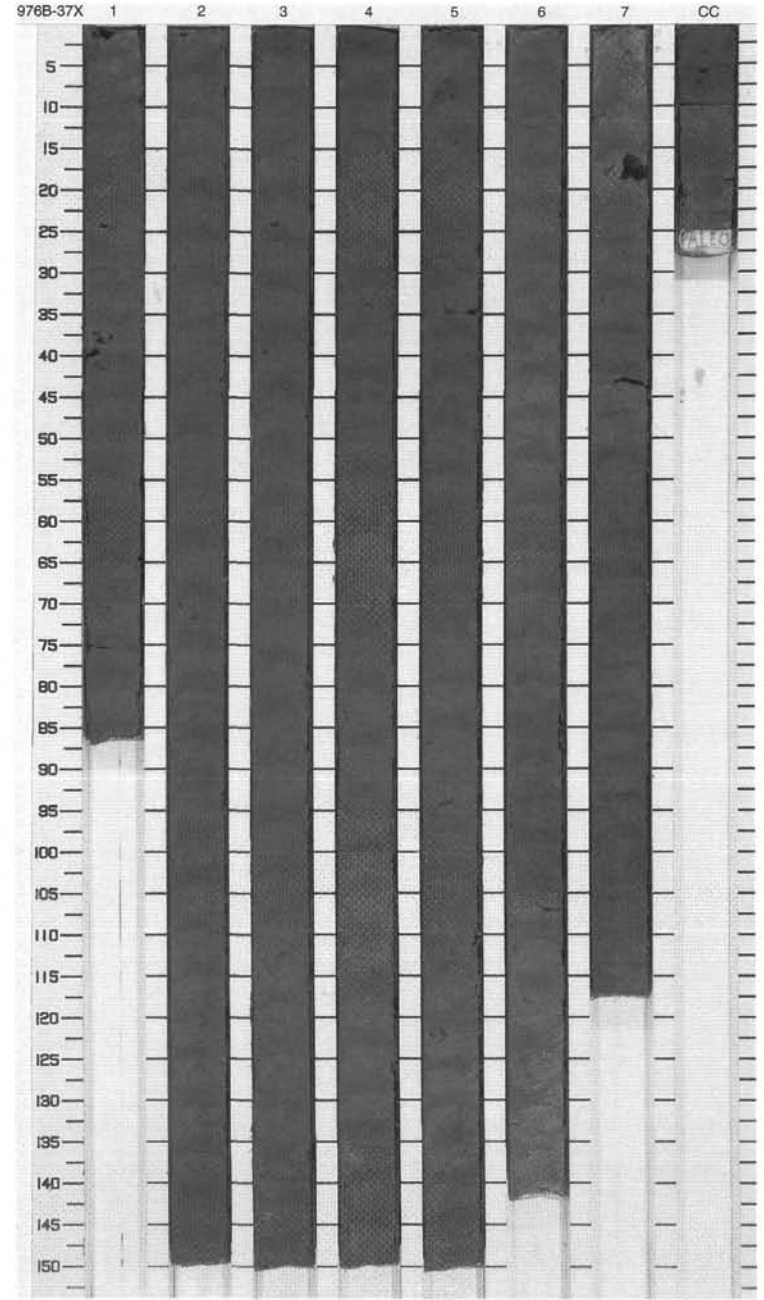
SITE 976 HOLE B CORE 36X

CORED 328.9 - 338.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description	
		1						NANNOFOSSIL CLAY	
1		2	Pleistocene	} ✕			5GY 2/1 To 10Y 4/1	Major Lithology: The main sediment type is a dark greenish gray (5GY 4/1) to grayish olive (10Y 4/2) NANNOFOSSIL CLAY which contains dispersed shell fragments. It is structureless above Section 5 and weakly burrowed to mottled below the top of Section 5.	
2									
3		} ✕							
4									
5		~ ✕		S					10Y 4/2
6									
7									
8		~ ✕		S					5GY 4/1 To 10Y 4/2
9									
		CC						M	



Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	∅				<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The main lithology is a structureless, dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH CLAY that contains dispersed shell fragments throughout. Pyritized burrows are present in a few places.</p> <p>General Description: Section 1 - Stuck in core barrel; placed in split liner.</p>
2	[Dotted pattern]	2	} (P)				
3	[Dotted pattern]	3	} (P) ∅				
4	[Dotted pattern]	4	∅		S		
5	[Dotted pattern]	4	∅			5GY 4/1	
6	[Dotted pattern]	5	∅				
7	[Dotted pattern]	5	} (P) ∅				
8	[Dotted pattern]	6	∅				
9	[Dotted pattern]	7	∅				
CC					M		



SITE 976 HOLE B CORE 39X

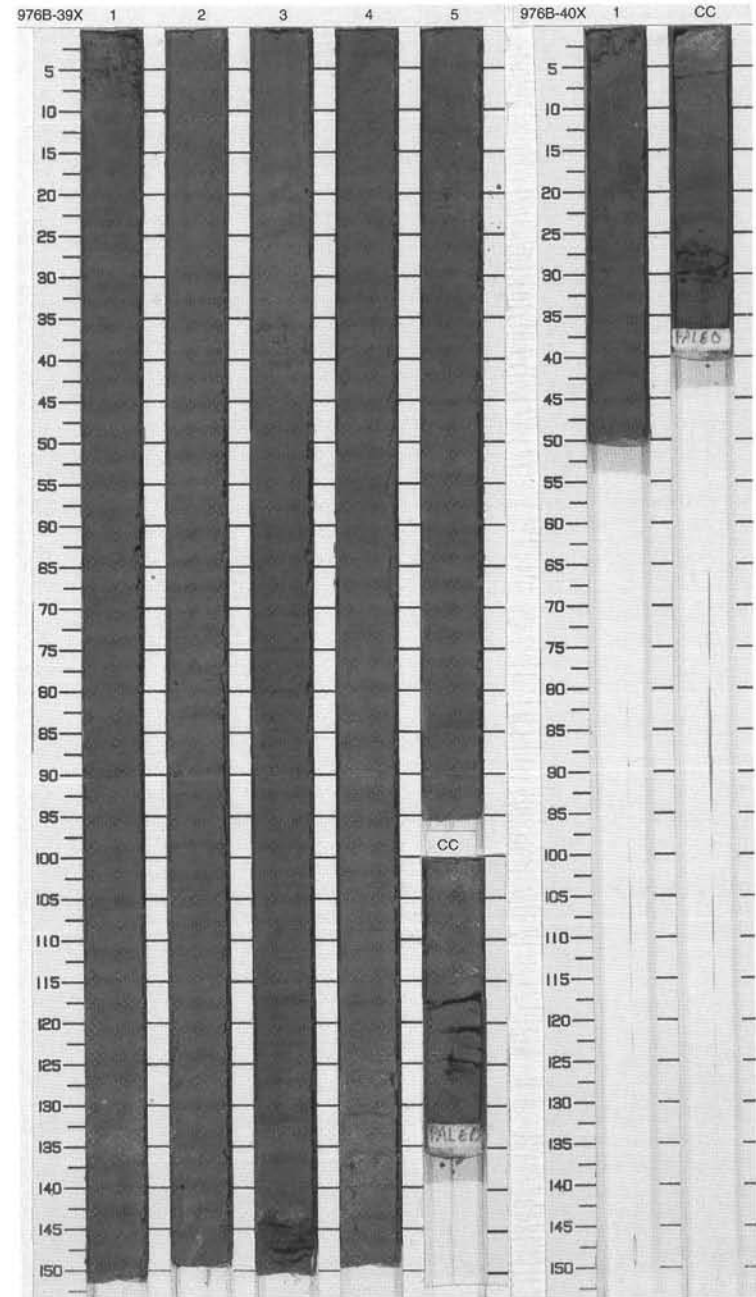
CORED 357.7 - 367.4 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Pliocene-early Pleistocene	X	-	S	5Y 4/1	CALCAREOUS CLAY Major Lithology: The major lithology is olive gray (5Y 4/1) to dark greenish gray (5GY 4/1) CALCAREOUS CLAY that includes scattered dark opaque minerals (pyrite?) and shell fragments. Minor Lithology: Medium dark gray (N4) sandy silt layers occur in Sections 3, 144-149 cm and CC, 16-26 cm.
2	[Pattern]	2						
3	[Pattern]	3						
4	[Pattern]	3						
5	[Pattern]	4						
6	[Pattern]	5						
7	[Pattern]	CC						
								M

SITE 976 HOLE B CORE 40X

CORED 367.4 - 377.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
	[Pattern]	1	late Pliocene		W	S	5Y 4/1	NANNOFOSSIL-RICH CLAY Major Lithology: The major lithology is olive gray (5Y 4/1) NANNOFOSSIL-RICH CLAY with scattered dark opaque minerals (pyrite?). Minor Lithology: Thin laminated, medium dark gray (N4) sandy silty clay layer occurs at 26-37 cm in Section CC.
	[Pattern]	CC						



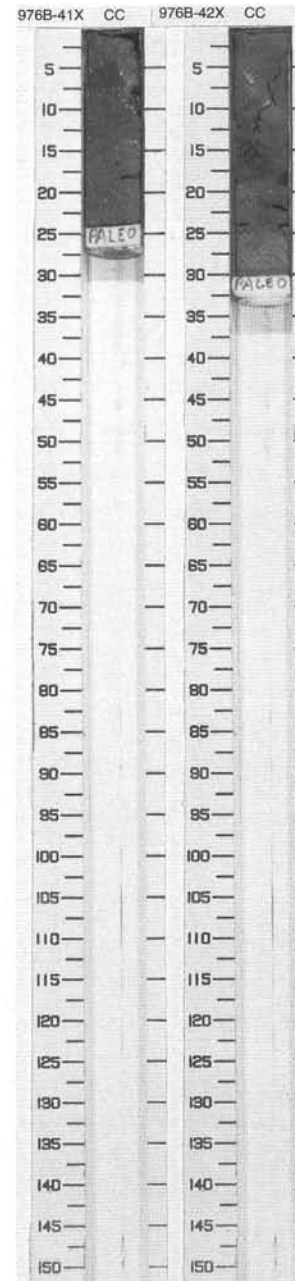
SITE 976 HOLE B CORE 41X CORED 377.0 - 386.6 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		CC	late Pliocene			S M		SANDY SILTY CLAY
								Major Lithology: The major lithology is olive gray (5Y 4/1) SANDY SILTY CLAY with scattered shell fragments.

SITE 976 HOLE B CORE 42X CORED 386.6 - 396.3 mbsf

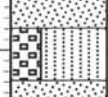


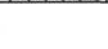
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		CC	late Pliocene			S M S		SAND AND CALCAREOUS CLAYEY SILT
								Major Lithology: The major lithologies are olive gray (5Y 4/1) to dark greenish gray (5GY 4/1) SAND and light olive gray (5Y 5/2) CALCAREOUS CLAYEY SILT. The SAND layers consist mainly of fine- to coarse-grained sand and scattered shell fragments. Several granule-sized gravel clasts occur in the basal part of the SAND layer.

976B 43X NO RECOVERY



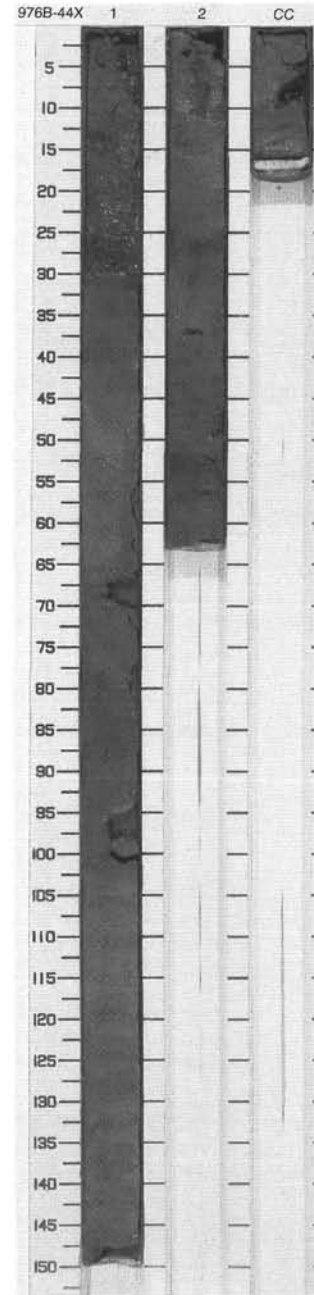
SITE 976 HOLE B CORE 44X

CORED 405.9 - 415.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	late Pliocene			S	5Y 4/1 To 5GY 4/1	<p>CALCAREOUS SANDY CLAY AND SAND</p> <p>Major Lithology: The major lithologies are olive gray (5Y 4/1) to dark greenish gray (5GY 4/1) CALCAREOUS SANDY CLAY and olive gray (5Y 4/1) SAND. The sand fraction consists mainly of carbonate bioclasts, carbonate lithic fragments, metamorphic rock fragments, and quartz.</p> <p>Minor Lithologies: Dark gray (N3), very fine-grained sand to sandy silt layer with organic debris occurs at 52-57 cm in Section CC.</p> <p>General Description: Sedimentary contacts between CALCAREOUS SANDY CLAY and SAND layers are gradational.</p>
2		2		S	5GY 4/1			
				S				
				S	N3			
		CC				M		

976B-45X NO RECOVERY

976B-46X Entire core given to paleontologists.



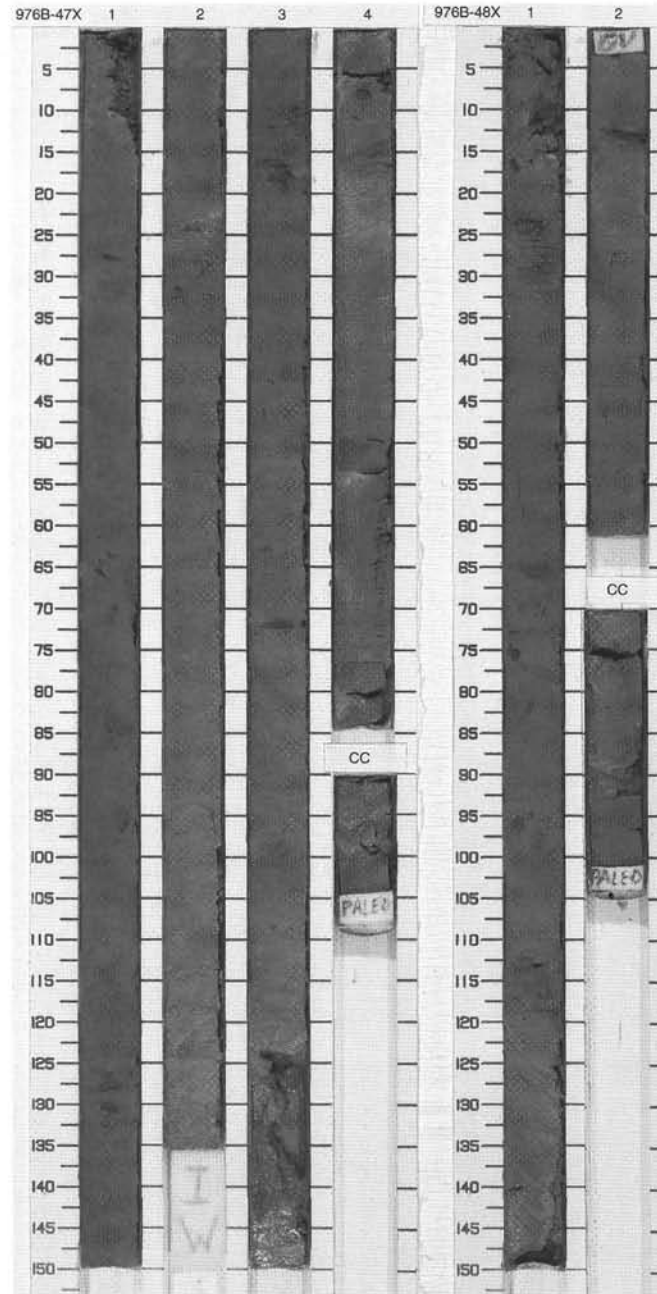
SITE 976 HOLE B CORE 47X CORED 434.8 - 444.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Pliocene			S	5GY 4/1	<p>NANNOFOSSIL CLAY AND CALCAREOUS SILTY CLAY</p> <p>Major Lithology: The major lithologies are dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY AND CALCAREOUS SILTY CLAY.</p> <p>Minor Lithologies: Olive gray (5Y 4/1) to dark gray (N3), fine- to medium-grained sand layers are present; several intervals are lithified sandstone with carbonate cement; the sand fraction consists of mainly carbonate bioclasts, metamorphic rock fragments, and quartz grains. Fragments of calcareous siltstone with micrite matrix/cement occur within the CC.</p> <p>General Description: Bacteria sample was taken at 130-135 cm in Section 3.</p>
2	[Pattern]	2				S		
3	[Pattern]	3		~		S		
4	[Pattern]	4		**		S		
5	[Pattern]	CC				T		
						S M T		

SITE 976 HOLE B CORE 48X CORED 444.5 - 454.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Pliocene			S	5GY 4/1	<p>SANDY SILTY CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) SANDY SILTY CLAY.</p> <p>Minor Lithology: Dark greenish gray (5GY 4/1) to medium gray (N4), fine- to medium-grained sand layers occur throughout the core. A normal-graded medium to fine sand layer with sharp basal contact occurs at 97-104 cm in Section 1. The sand fraction consists mainly of carbonate lithic fragments, metamorphic rock fragments and quartz.</p>
2	[Pattern]	2		**		S		
		CC				M		

976B-49X Entire core given to paleontologists.



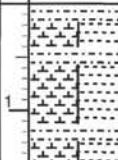

SITE 976 HOLE B CORE 50X

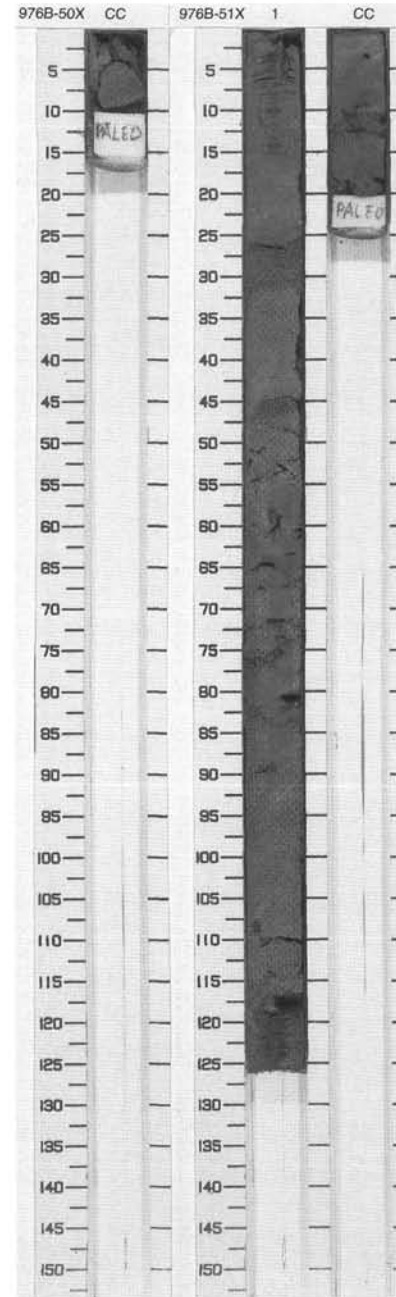
CORED 463.7 - 473.3 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		CC						<p>CARBONATE-CEMENTED SILTY SANDSTONE</p> <p>Major Lithology: The major lithology is olive gray (5Y 4/1) fine- to medium-grained CARBONATE-CEMENTED SILTY SANDSTONE. Thin sections of this material (0-4, 4-5 cm) indicate that the major grain types include metamorphic rock fragments, quartz, carbonate lithic fragments, bioclasts, and dense (accessory) minerals.</p> <p>General Description: 4 cm paleontology sample.</p>

SITE 976 HOLE B CORE 51X

CORED 473.3 - 482.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		1	late Pliocene			S S	5GY 4/1 To N4	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY.</p> <p>Minor Lithologies: Medium dark gray (N4) calcareous sandy silty clay layers occur throughout the core. A medium-grained, carbonate-cemented sandstone layer occurs at 44-46 cm in Section 1.</p> <p>General Description: 3 cm paleontology sample.</p>

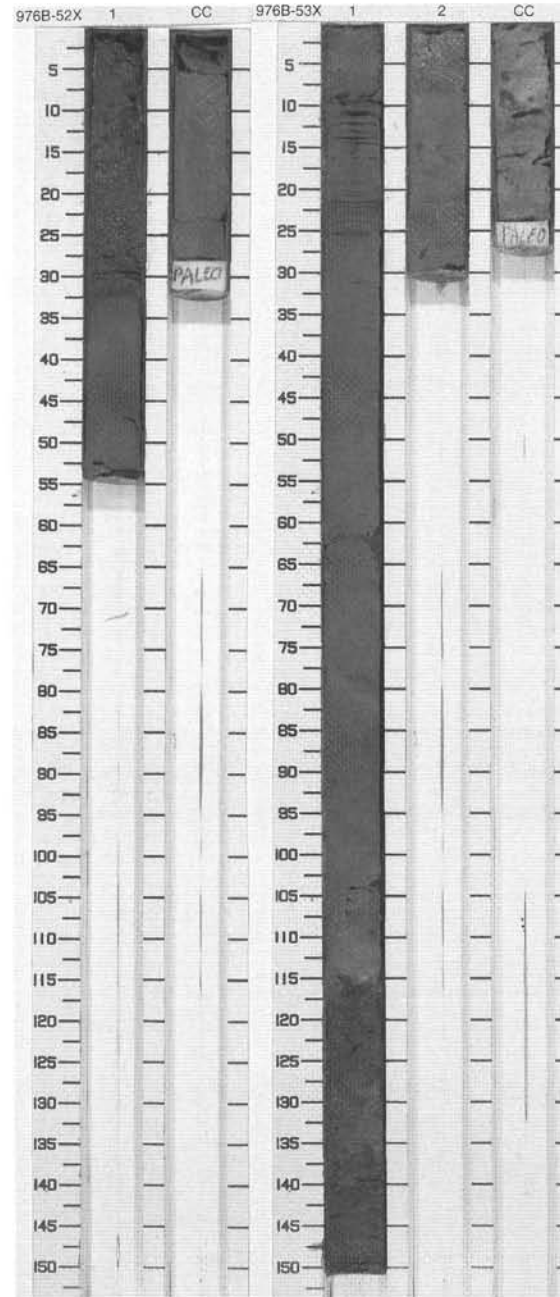


SITE 976 HOLE B CORE 52X CORED 482.8 - 492.4 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		1	late Pliocene	...		S	5GY 4/1	<p>NANNOFOSSIL CLAY AND NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithologies are dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY AND NANNOFOSSIL-RICH CLAY.</p> <p>Minor Lithology: A medium dark gray (N4), coarse- to medium-grained sand layer with normal grading occurs at 15-32 cm in Section 1. The basal part of this sand layer includes granule sized grains.</p>
		CC		}}		S M		

SITE 976 HOLE B CORE 53X CORED 492.4 - 502.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	late Pliocene	}}		S	N4	<p>NANNOFOSSIL-RICH CLAY AND NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithologies are dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH CLAY AND NANNOFOSSIL CLAY.</p> <p>Minor Lithology: Medium dark gray (N4) silty sand layers with organic debris occur throughout the core. The sand fraction mainly consists of quartz and bioclasts.</p>
						S	5GY 4/1	
2		2				S M	5GY 4/1 To N4	



SITE 976 HOLE B CORE 54X

CORED 502.0 - 511.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		1	late Pliocene	◊	---	S T S M	5GY 4/1	<p>CALCAREOUS SANDY SILTY CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) CALCAREOUS SANDY SILTY CLAY.</p> <p>Minor Lithology: A thin-section of sandstone (Section 1, 8-10 cm) shows mainly sand-sized bioclasts, quartz, and metamorphic rock fragments cemented by microcrystalline carbonate.</p> <p>General Description: Gas expansion cracks are present in Section 1, 5-20 cm.</p>

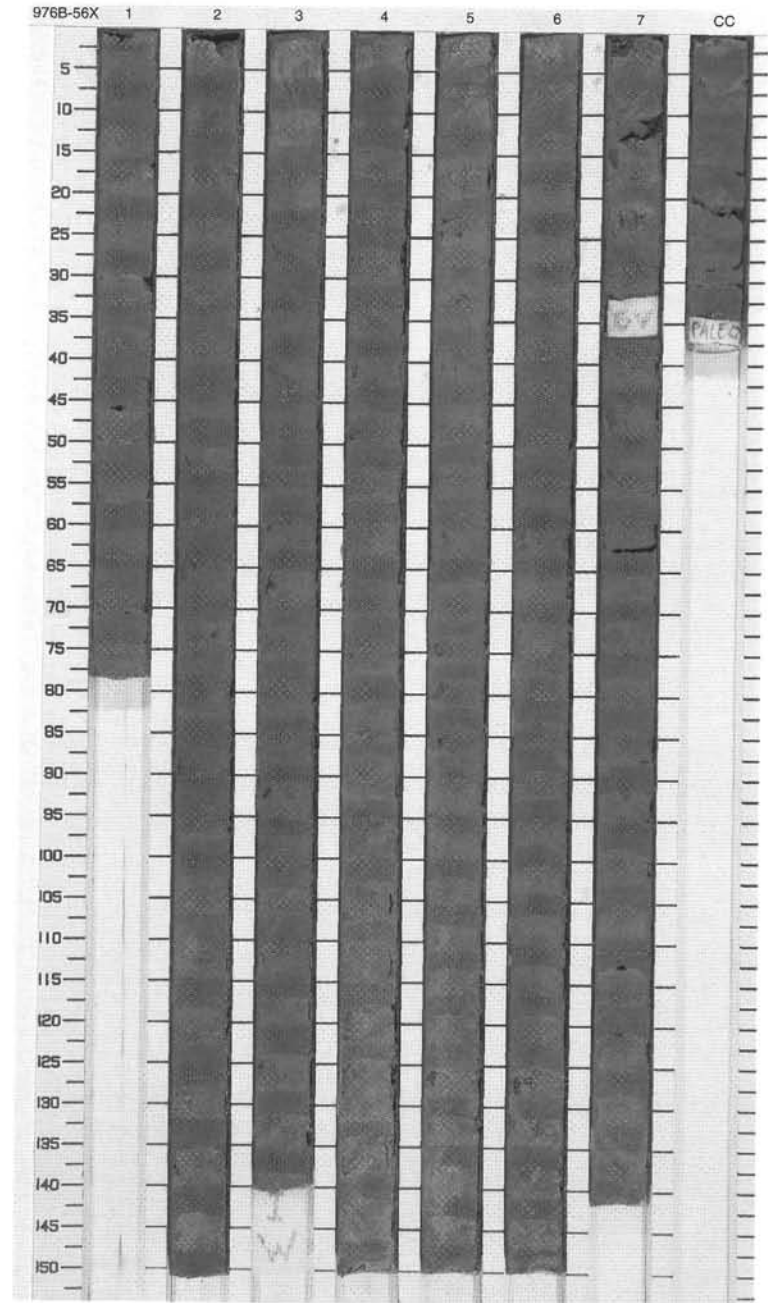
976B 55X Entire core given to paleontologists.



SITE 976 HOLE B CORE 56X

CORED 518.3 - 525.3 mbsf

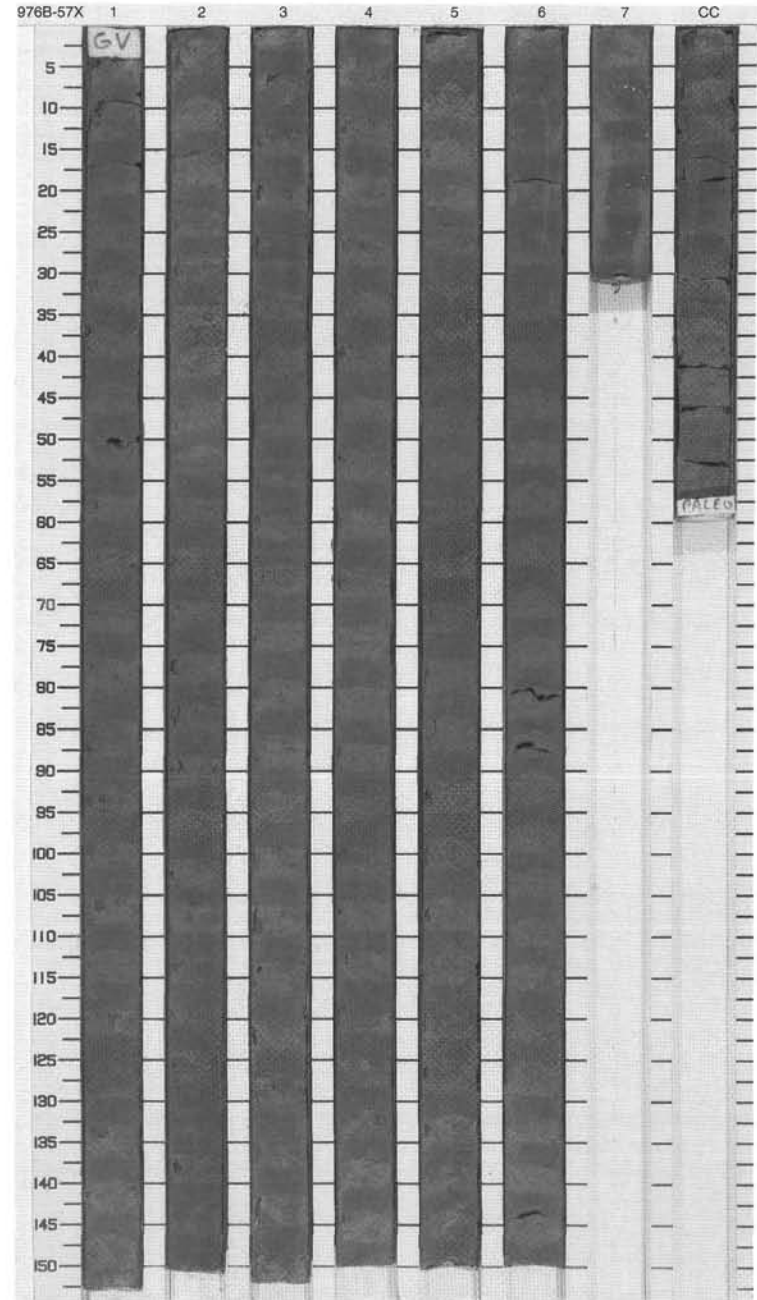
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1						<p>CALCAREOUS CLAY</p> <p>Major Lithology: The main lithology is a CALCAREOUS CLAY that is dark greenish gray (5GY 4/1) to grayish olive (10Y 4/2) in color, contains rare dispersed shell fragments, and is weakly bioturbated, including rare burrows.</p> <p>General Description: Section 1 stuck in core barrel. Stratigraphic order and orientation unsure.</p>
2		2		~				
3		3				I		
4		4	early Pliocene-late Pliocene	~ &			5GY 4/1 To 10Y 4/2	
5		5		~				
6		6				ST		
7		7		~			10Y 4/2	
8								
9								
10		CC				M		



SITE 976 HOLE B CORE 57X

CORED 525.3 - 534.9 mbsf

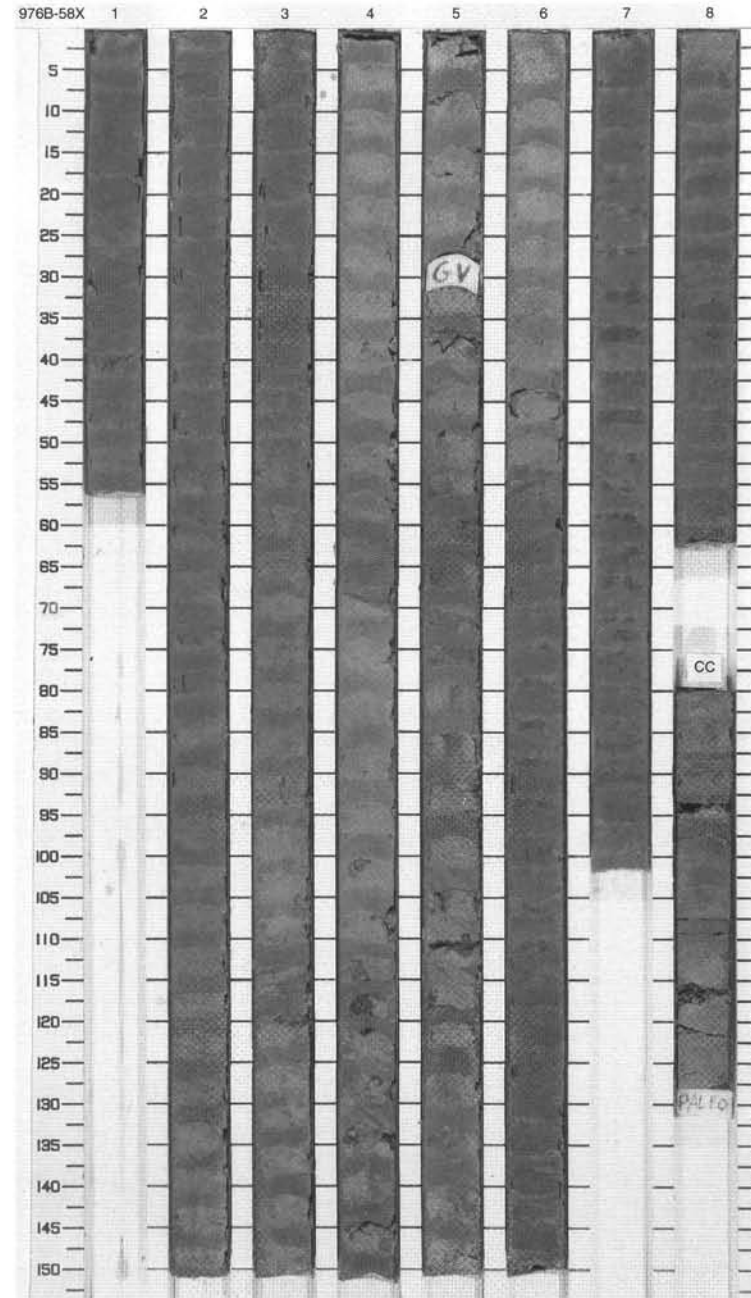
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	}}			5GY 4/1	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The main sediment type is a NANNOFOSSIL-RICH CLAY which varies in color from dark greenish gray (5GY 4/1) and olive gray (5Y 4/1) to grayish olive (10Y 4/2). Traces of shell fragments are present, mainly near the base of the core. Visible evidence for burrowing comprises dark-colored flecks, but these are not clearly identifiable as biogenic structures.</p> <p>General Description: Section 1 - top 50 cm stuck in core barrel; placed in liner. Sections 6 and 7 - liner diameter expanded.</p>
2	[Pattern]	2	}}			5GY 4/1 To 5Y 4/1	
3	[Pattern]	3	}}			5Y 4/1	
4	[Pattern]	3	}}			5Y 4/1	
5	[Pattern]	4	}}			5GY 4/1	
6	[Pattern]	4	}}			5Y 5/2	
7	[Pattern]	5	}}			10Y 4/2	
8	[Pattern]	6	}}			5GY 4/1	
9	[Pattern]	7	}}			10Y 4/2	
		CC	}}				
					M		



SITE 976 HOLE B CORE 58X

CORED 534.9 - 544.6 mbsf

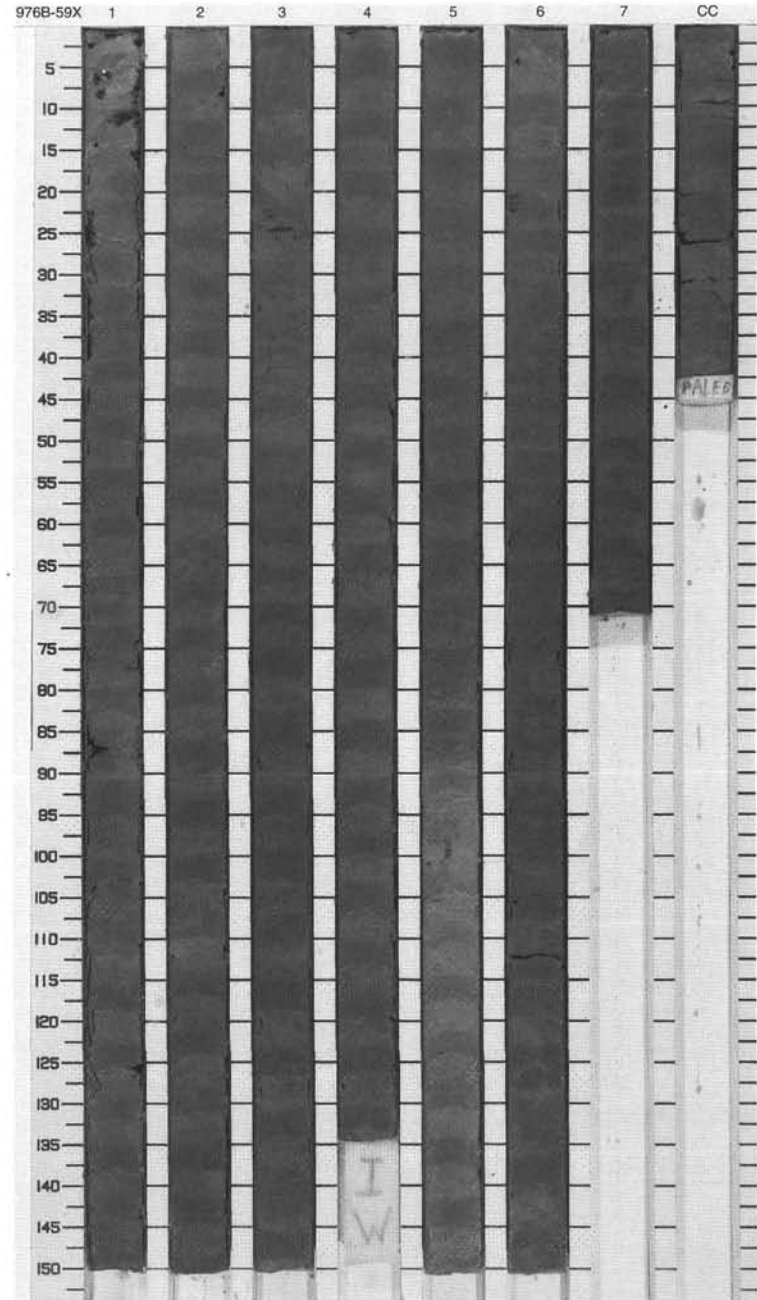
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	early Pliocene			S	10Y 4/2	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The principal lithology is a grayish olive (10Y 4/2) to dusky yellow green (5GY 5/2) NANNOFOSSIL CLAY which is variably laminated or burrowed.</p> <p>Minor Lithologies: Section 1 and Section 2 (0-84 cm) are conspicuously laminated. The laminations are inclined. It is not possible to determine if these laminations are horizontal burrows, or are due to non-biological, sedimentary processes. At least some of the laminae contain exichnial burrows. Elsewhere, burrows are filled by silty nannofossil-rich clay which is dusky yellow green (5GY 5/2) in color.</p>
2		2						
3		3						
4		4						
5		5				S	5GY 5/2	<p>General Description: Section 1 - expanded out of liner. Replaced in new liner. Sections 7 and 8 - liner diameter expanded.</p>
6		6						
7		7				S	10Y 4/2	
8		8						
9		8				M		
10		CC						



SITE 976 HOLE B CORE 59X

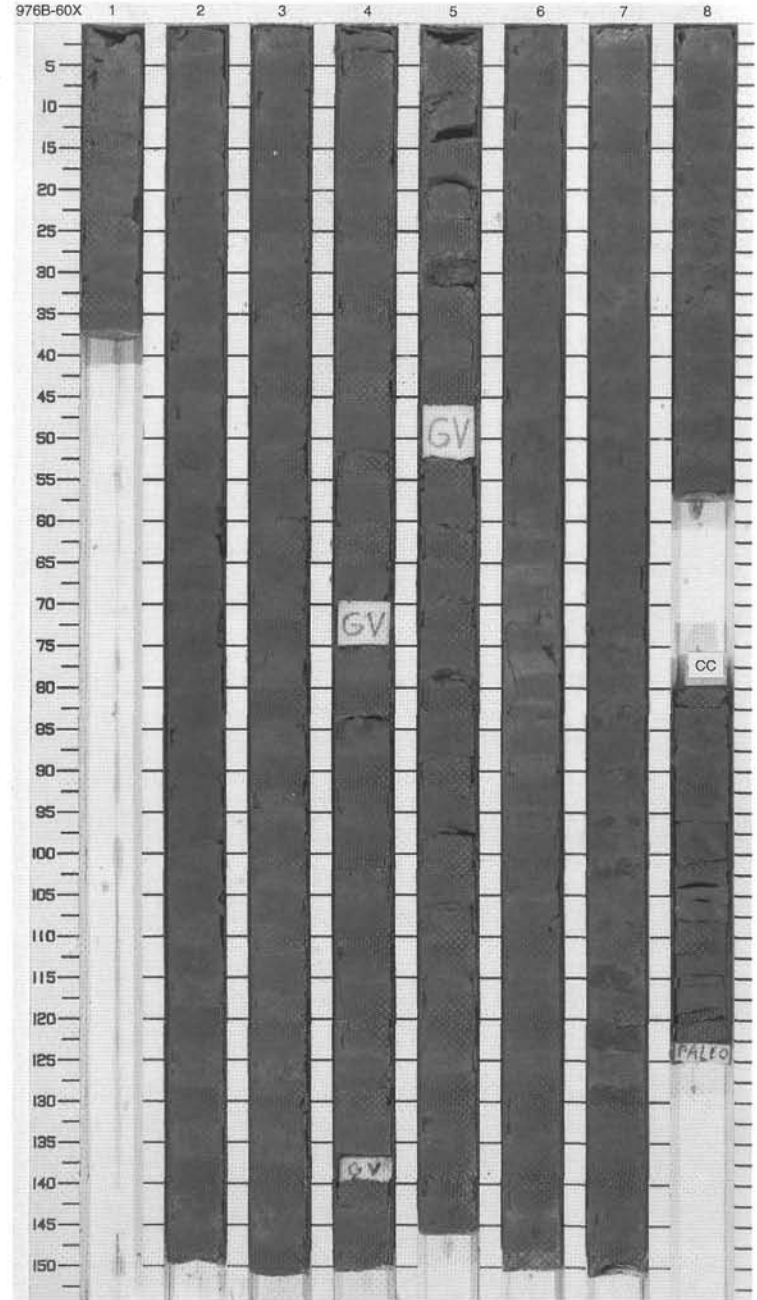
CORED 544.6 - 554.2 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		}}	○			<p>NANNOFOSSIL SILTY CLAY AND NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The main lithologies are NANNOFOSSIL SILTY CLAY and NANNOFOSSIL-RICH CLAY. They range in color from olive gray (5Y 4/1) to light olive gray (5Y 5/2) and grayish olive (10Y 4/2). Both types are mainly moderately burrowed, but in a few places intense burrowing is evident.</p> <p>Minor Lithologies: Rare shell fragments and dispersed foraminifers are present. Burrows are delineated by both darker and lighter colors than those of the adjacent sediment.</p> <p>General Description: Section 1 - stuck in core barrel; placed in split liner. Section 7 - liner diameter expanded.</p>
2	[Pattern]	2		}}			5Y 4/1	
3	[Pattern]	3		}}		S	5Y 5/2	
4	[Pattern]	4		}}		S	5Y 4/1	
5	[Pattern]	4	early Pliocene	}}		I		
6	[Pattern]	5		}}		S	5Y 5/2	
7	[Pattern]	6		}}			5Y 4/1	
8	[Pattern]	7		}}			10Y 4/2	
9	[Pattern]	7		}}				
10	[Pattern]	CC		}}		M		



SITE 976 HOLE B CORE 60X CORED 554.2 - 563.9 mbsf

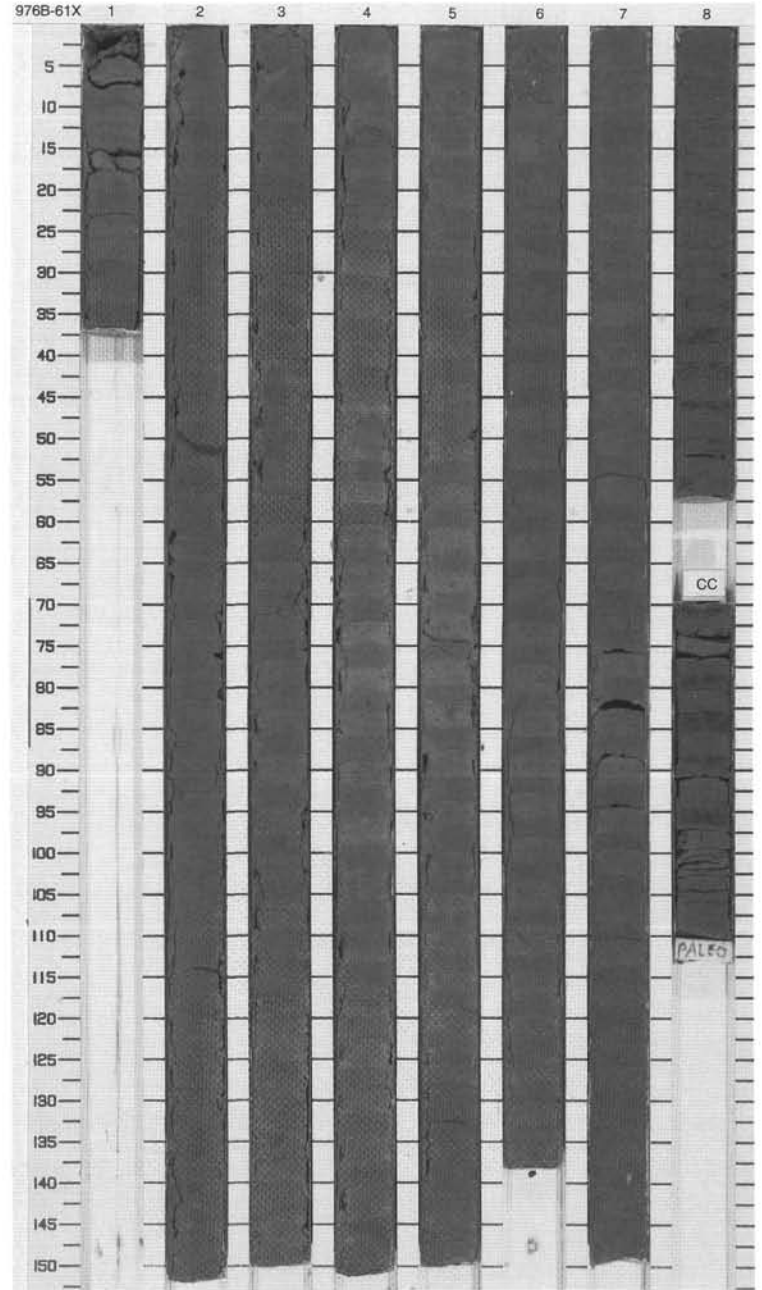
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		~			5GY 4/1	NANNOFOSSIL-RICH CLAY
2	[Pattern]	2		~			5Y 4/1	Major Lithology: The main sediment in this core is a dark greenish gray (5GY 4/1) to grayish olive (10Y 4/2) NANNOFOSSIL-RICH CLAY which is slightly to moderately burrowed throughout. Shell fragments are rare.
3	[Pattern]	3		~			5GY 4/1	Minor Lithology: The laminated interval between 52 and 82 cm in Section 6 is a nannofossil ooze which is light olive gray (5Y 5/2) in color.
4	[Pattern]	4		~		S	10Y 4/2	General Description: Section 1 - out of top of core barrel; put into split liner.
5	[Pattern]	5	early Pliocene	~			5GY 4/1	
6	[Pattern]	6		~		S	5Y 5/2	
7	[Pattern]	7		~			5GY 4/1	
8	[Pattern]	8		~			10Y 4/2	
9	[Pattern]	9		~			5GY 5/2	
10	[Pattern]	10		~		M	5GY 4/1	



SITE 976 HOLE B CORE 61X


CORED 563.9 - 573.5 mbsf

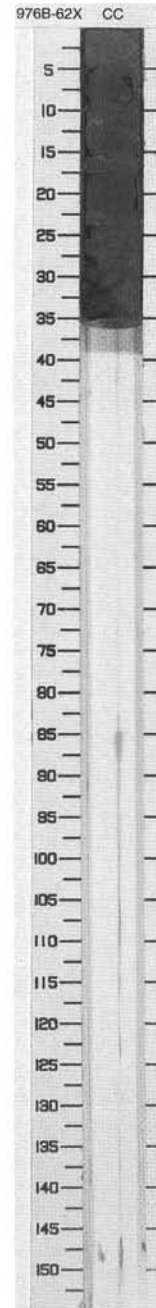
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Cross-hatched pattern]	1	late Miocene-early Pliocene	~	-	S	5Y 4/1	NANNOFOSSIL CLAY
2	[Cross-hatched pattern]	2						Major Lithology: The major lithology is light olive gray (5Y 4/1) NANNOFOSSIL CLAY with a minor to moderate content of dispersed foraminifers throughout the core.
3	[Cross-hatched pattern]	3						General Description: The core consists of alternating intervals (up to 4 cm in thickness) of grayish olive gray (5Y 4/1) drilling matrix and biscuit NANOFOSSIL CLAY.
4	[Cross-hatched pattern]	4						Section 1 - out of top of core barrel; placed in split liner.
5	[Cross-hatched pattern]	5						
6	[Cross-hatched pattern]	6						
7	[Cross-hatched pattern]	7						
8	[Cross-hatched pattern]	8						
9	[Cross-hatched pattern]	9						
10	[Cross-hatched pattern]	CC						
						M		



SITE 976 HOLE B CORE 62X

CORED 573.5 - 583.1 mbsf

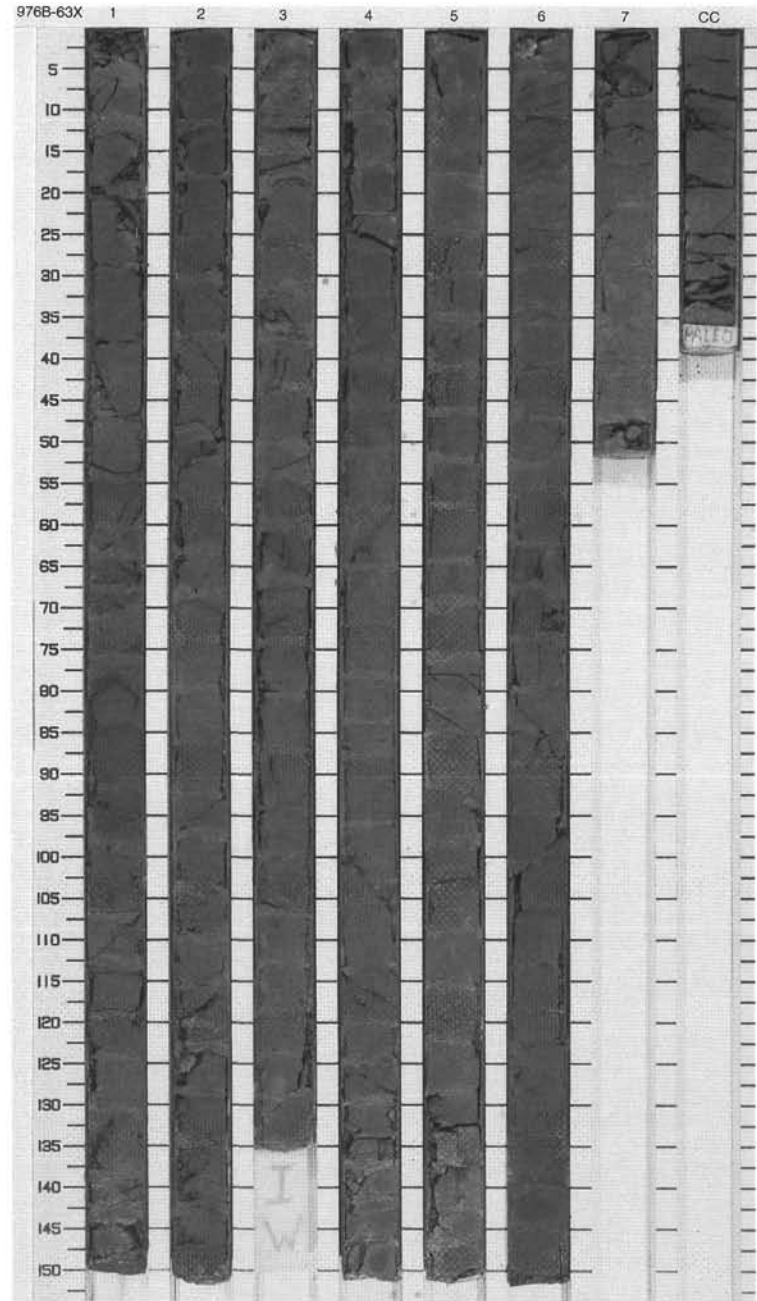
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		CC	late Miocene		..	S M		NANNOFOSSIL-RICH CLAY
								Major Lithology: The major lithology is grayish olive (10Y 4/2) NANNOFOSSIL-RICH CLAY.



SITE 976 HOLE B CORE 63X

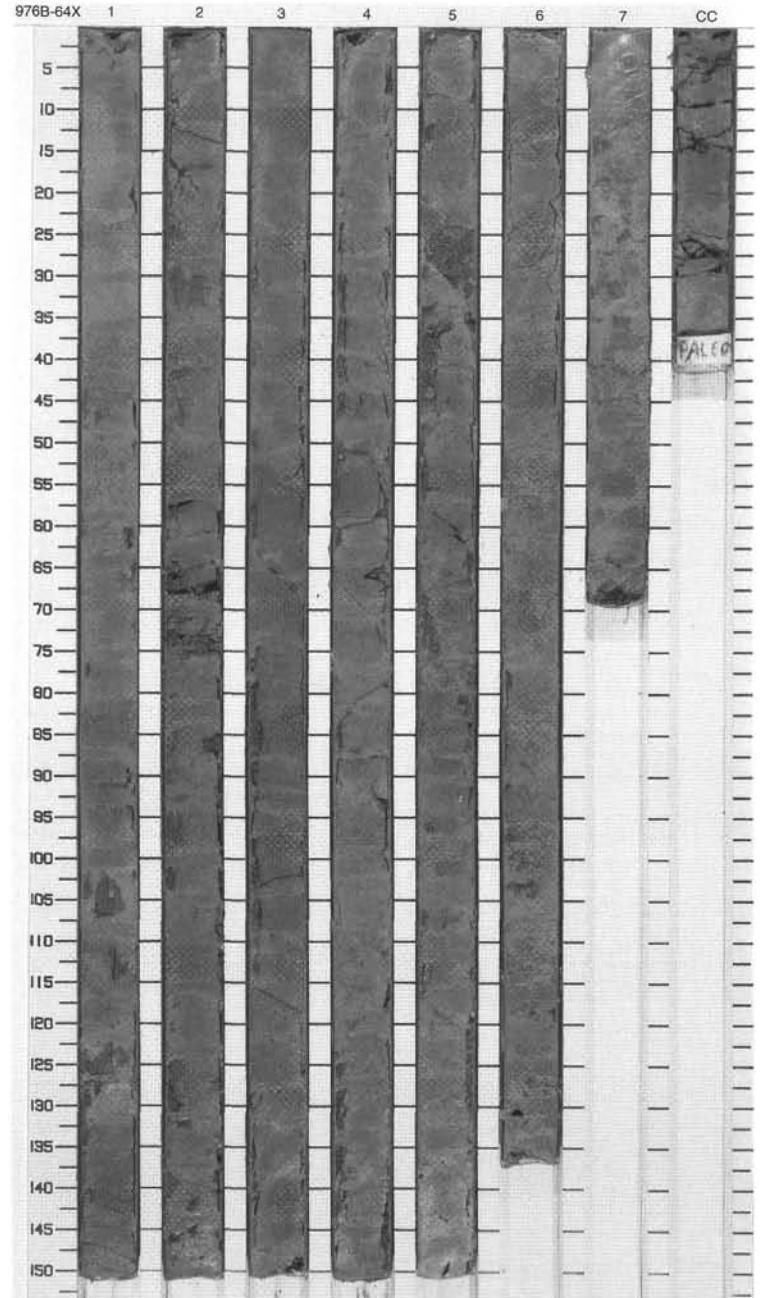
CORED 583.1 - 592.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Miocene	}}		S	5GY 4/1	NANNOFOSSIL-RICH CLAYSTONE and NANNOFOSSIL SANDY CLAYSTONE
2	[Pattern]	2		}}		S	10Y 4/2	Major Lithologies: The major lithology is dark greenish gray (5GY 4/1) to grayish olive (10Y 4/2) NANNOFOSSIL-RICH CLAYSTONE that locally grades into NANNOFOSSIL SANDY CLAYSTONE throughout the core.
3	[Pattern]	3		}}		S	5GY 4/1	Minor Lithology: Grayish olive (10Y 4/2) nannofossil-foraminifer claystone is present in Section CC.
4	[Pattern]	4		}}		S	5GY 4/1 To 10Y 4/2	General Description: Alternating beds of biscuitied NANNOFOSSIL-RICH CLAYSTONE and grayish olive gray (5Y 4/1) drilling matrix occur throughout the core.
5	[Pattern]	5		}}		I		Section 7 - liner diameter expanded.
6	[Pattern]	6		}}		S	5GY 4/1	
7	[Pattern]	7		}}		S	5GY 3/2	
8	[Pattern]	8		}}		S	5GY 4/1	
9	[Pattern]	9		}}		S	10Y 4/2 To 5Y 4/1	
		CC			MS			



SITE 976 HOLE B CORE 64X CORED 592.8 - 602.4 mbsf

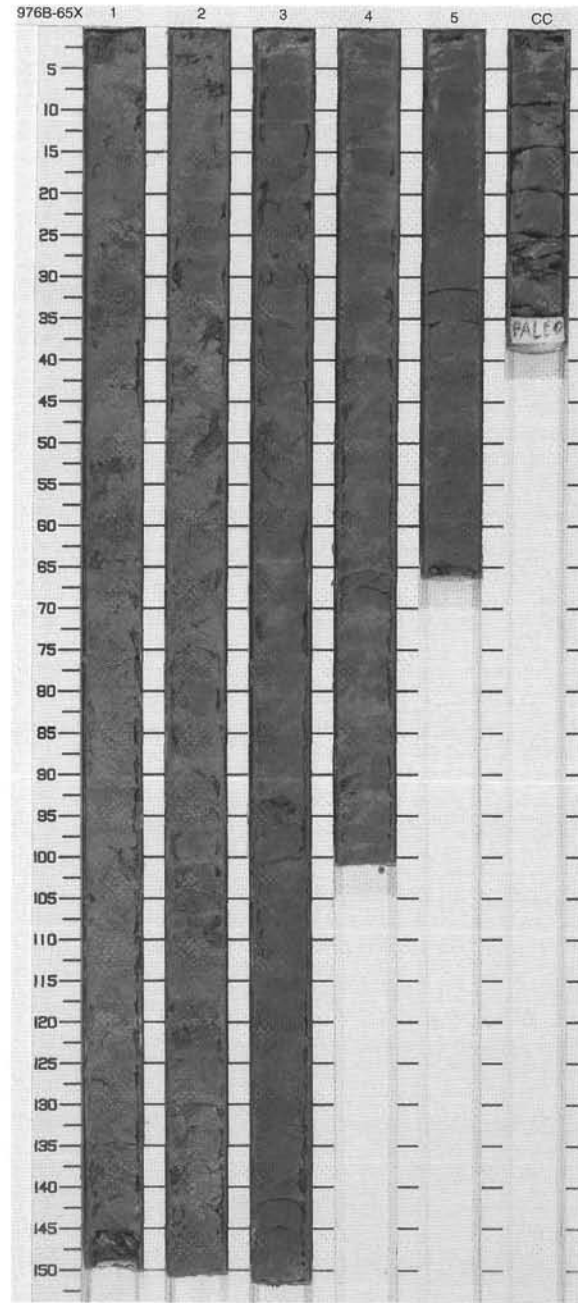
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	late Miocene	}}	-	S	5GY 4/1	NANNOFOSSIL CLAYSTONE TO NANNOFOSSIL SILTY CLAYSTONE
2	[Dotted pattern]	2					10GY 5/2	Major Lithology: The major lithology is dark greenish gray (5GY 4/1) to olive gray (5Y 4/1) NANNOFOSSIL CLAYSTONE TO NANNOFOSSIL SILTY CLAYSTONE.
3	[Dotted pattern]	3					5Y 4/1	General Description: Alternating intervals of biscuitied NANNOFOSSIL CLAYSTONE TO NANNOFOSSIL SILTY CLAYSTONE and grayish olive gray (5Y 4/1) drilling matrix occur throughout the core. Olive black (5Y 2/1), pyrite-bearing(?) burrow fills are present in Sections 1, 2, and 6.
4	[Dotted pattern]	4					10GY 5/2	Section 1 - expanded 150-157; boxed separately. Section 6 - liner patched at bottom of this section.
5	[Dotted pattern]	5					5Y 4/1	
6	[Dotted pattern]	6					10GY 5/2	
7	[Dotted pattern]	7						
8	[Dotted pattern]	8						
9	[Dotted pattern]	9						
	[Dotted pattern]	CC						



SITE 976 HOLE B CORE 65X

CORED 602.4 - 612.0 mbsf

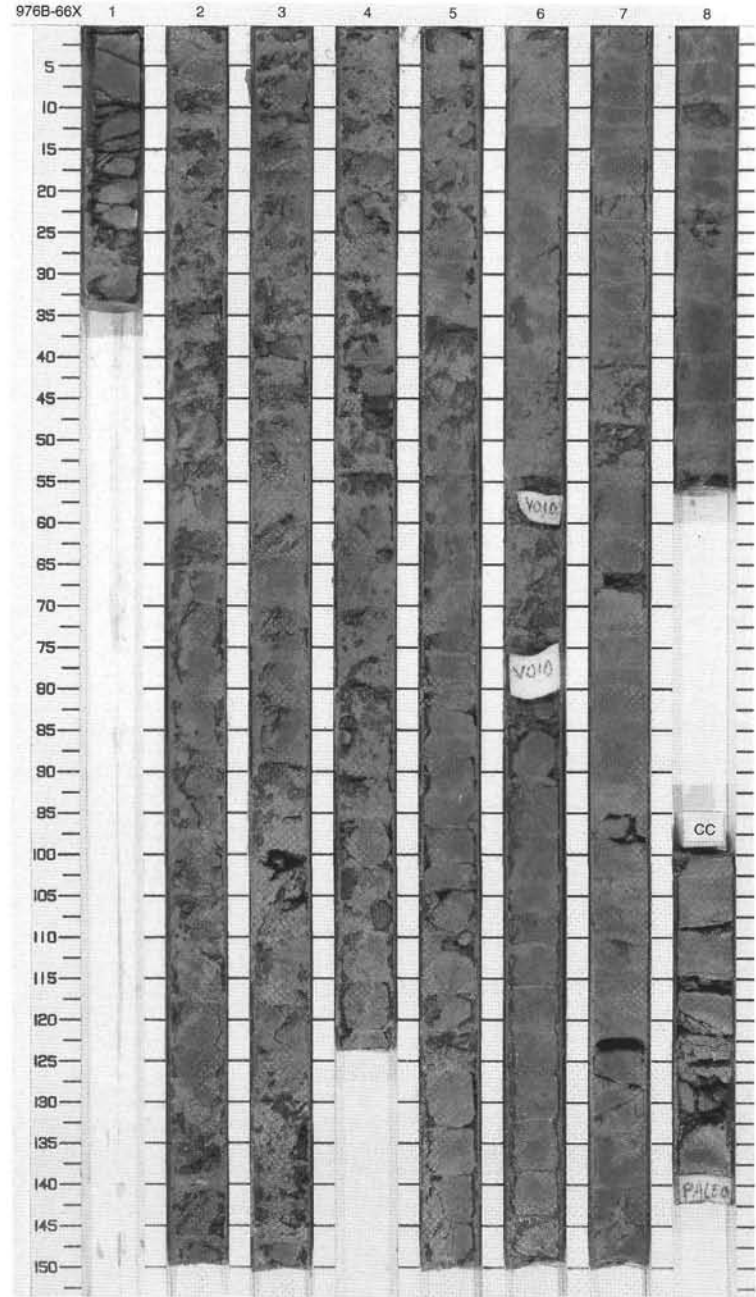
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Miocene	~~~~~	~~~~~	S	5GY 6/1 To 5GY 4/1	NANNOFOSSIL CLAYSTONE TO NANNOFOSSIL SILTY CLAYSTONE Major Lithology: The major lithology is dark greenish gray (5GY 4/1) to greenish gray (5GY 4/1) NANNOFOSSIL CLAYSTONE TO NANNOFOSSIL SILTY CLAYSTONE.
2	[Pattern]	2						
3	[Pattern]	3						
4	[Pattern]	4						
5	[Pattern]	5						
6	[Pattern]	CC				S	5GY 4/1	
						M		



SITE 976 HOLE B CORE 66X

CORED 612.0 - 621.6 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		~		S		CALCAREOUS CLAYSTONE AND CALCAREOUS SILTY CLAYSTONE
2	[Pattern]	2		~			5GY 4/1	
3	[Pattern]	3		~			5GY 4/1 To 5Y 4/1	Major Lithology: The major lithologies are dark greenish gray (5GY 4/1) to olive gray (5Y 4/1) and grayish olive (10Y 4/2) CALCAREOUS CLAYSTONE AND CALCAREOUS SILTY CLAYSTONE.
4	[Pattern]	4		~			General Description: Gas voids are present in Section 6.	
5	[Pattern]	5	late Miocene	~		I	10Y 4/2	Section 1 - out of top of core barrel; placed in split liner.
6	[Pattern]	6		~			5Y 5/2	
7	[Pattern]	7		~		S	5Y 4/1 To 5GY 4/1	
8	[Pattern]	8		~				
9	[Pattern]	CC		~		M		
10	[Pattern]			~				



SITE 976 HOLE B CORE 67X

CORED 621.6 - 631.2 mbsf

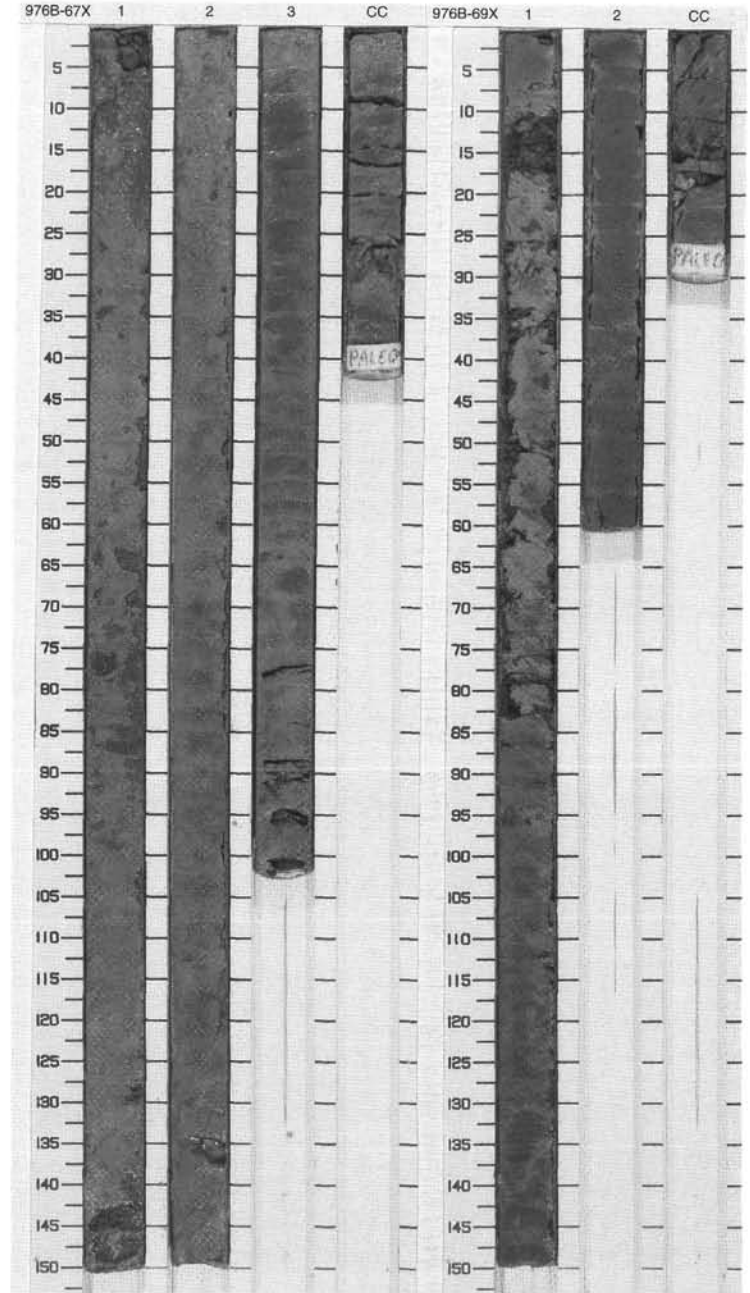
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	late Miocene		WW	S	5GY 4/1 To 5GY 6/1	NANNOFOSSIL-RICH CLAYSTONE Major Lithology: The major lithology is dark greenish gray to greenish gray (5GY 4/1 to 5GY 6/1) NANNOFOSSIL-RICH CLAYSTONE.
2	[Dotted pattern]	2				S		
3	[Dotted pattern]	3				S		
4	[Dotted pattern]	CC				M		

976B 68X Entire core given to paleontologists.

SITE 976 HOLE B CORE 69X

CORED 633.9 - 640.9 mbsf

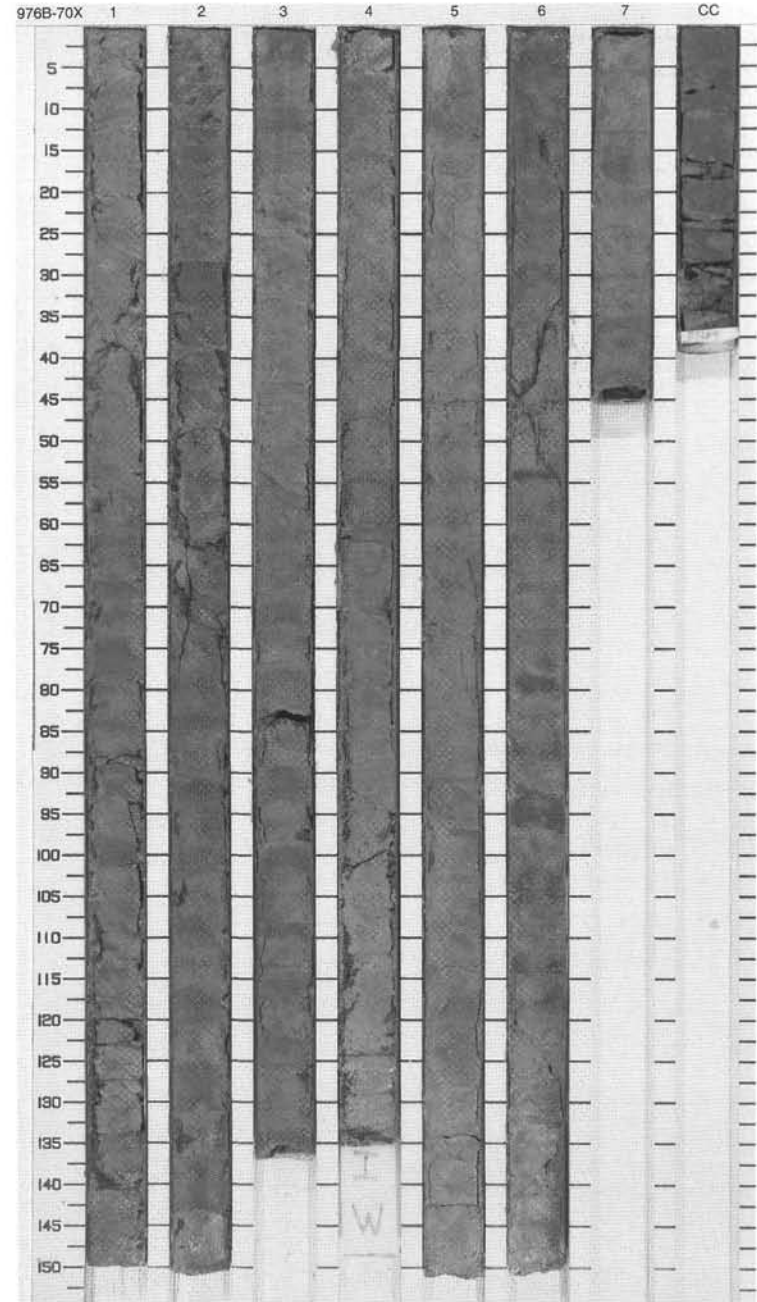
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Horizontal dashed pattern]	1	late Miocene	P	---	S	10Y 4/2	NANNOFOSSIL-RICH SILTY CLAYSTONE Major Lithology: The main sediment type in this core is a grayish olive (10Y 4/2) NANNOFOSSIL-RICH SILTY CLAYSTONE which is slightly bioturbated locally. Some of the burrows are pyritized.
2	[Horizontal dashed pattern]	2						



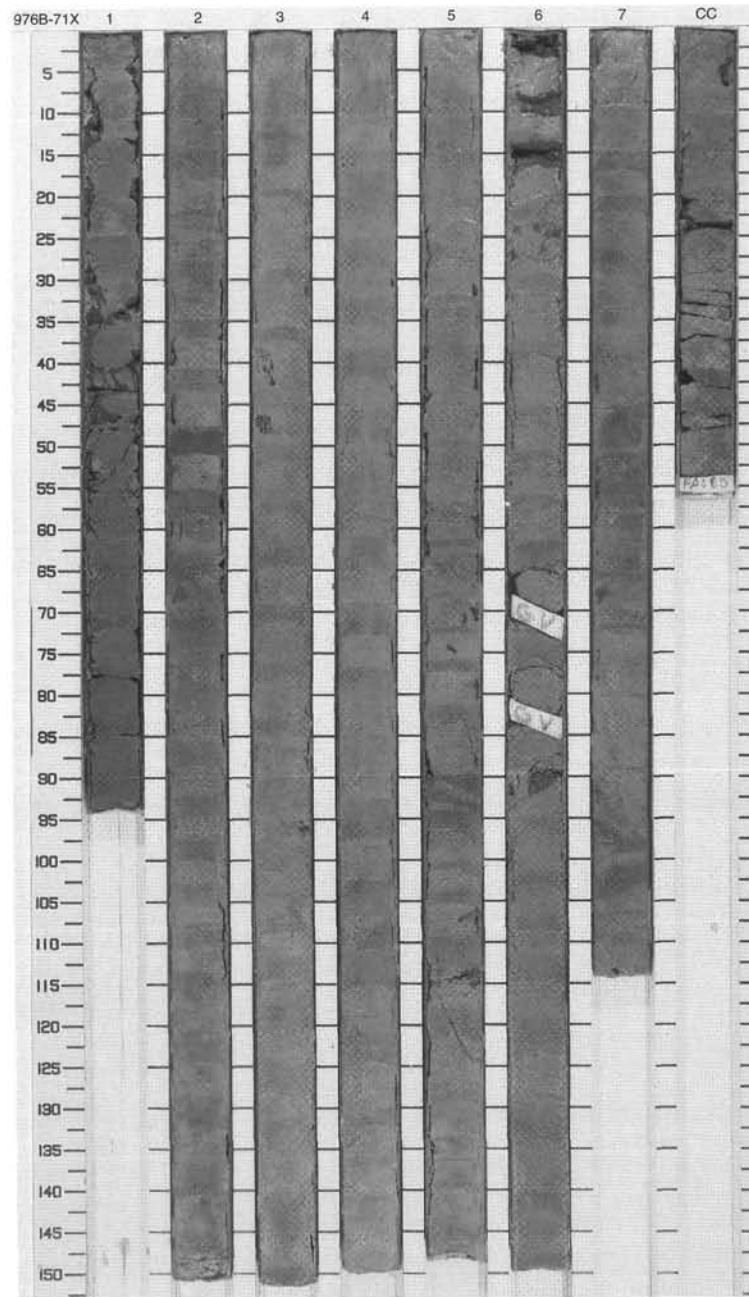
SITE 976 HOLE B CORE 70X

CORED 640.9 - 650.5 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	~ (P)			5Y 5/2	<p>NANNOFOSSIL CLAY TO CALCAREOUS SILTY CLAY</p> <p>Major Lithology: The main sediment type is a light olive gray (5Y 5/2) to grayish olive (10Y 4/2) NANNOFOSSIL CLAY to CALCAREOUS SILTY CLAY in which foraminifers and nannofossils are subequal in abundance. The sediment is moderately to heavily burrowed, and some of the burrows are pyritized.</p> <p>General Description: Sections 6 and 7 - liner diameter expanded.</p>
2	[Dotted pattern]	2	~ (P)		S	5Y 5/2 To 5GY 4/1	
3	[Dotted pattern]	3	~			5Y 5/2 To 10Y 4/2	
4	[Dotted pattern]	3	~				middle Miocene-late Miocene
5	[Dotted pattern]	4	~ (P) (P)		I		
6	[Dotted pattern]	5	~ (P)				S
7	[Dotted pattern]	5	~ (P)				
8	[Dotted pattern]	6	~			10Y 4/2 To 5Y 5/2	M
9	[Dotted pattern]	7	~				
		CC					



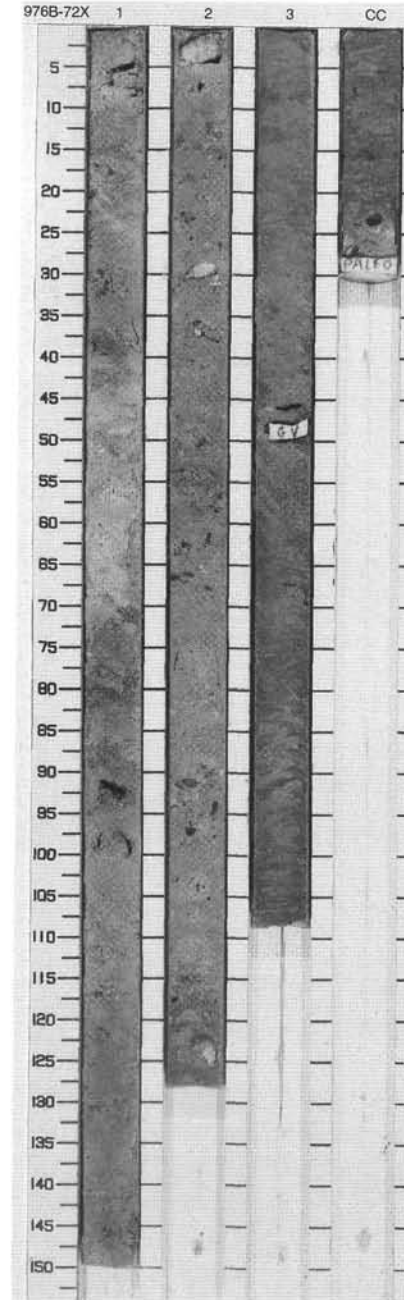
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	~				<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The principal sediment type is a grayish olive (10Y 4/2) to dusky yellow green (5GY 5/2) NANNOFOSSIL CLAY which is intensely bioturbated throughout. Most of the burrows belong to the ichnogenus <i>Chondrites</i>. Locally some of the burrows are pyritized.</p> <p>General Description: Drilling slurry is common between biscuits.</p> <p>Section 1 - out of the top of barrel; put into split liner.</p>
2	[Pattern]	2	~ (P)		S	10Y 4/2	
3	[Pattern]	3	~ (P)		S	5Y 4/1 To 5Y 5/2	
4	[Pattern]	4	~			10Y 4/2	
5	[Pattern]	4	~				
6	[Pattern]	5	~				
7	[Pattern]	5	~			5GY 5/2	
8	[Pattern]	6	~				
9	[Pattern]	7	~ (P)		S		
10	[Pattern]	CC	~		M		



SITE 976 HOLE B CORE 72X

CORED 660.2 - 669.7 mbsf

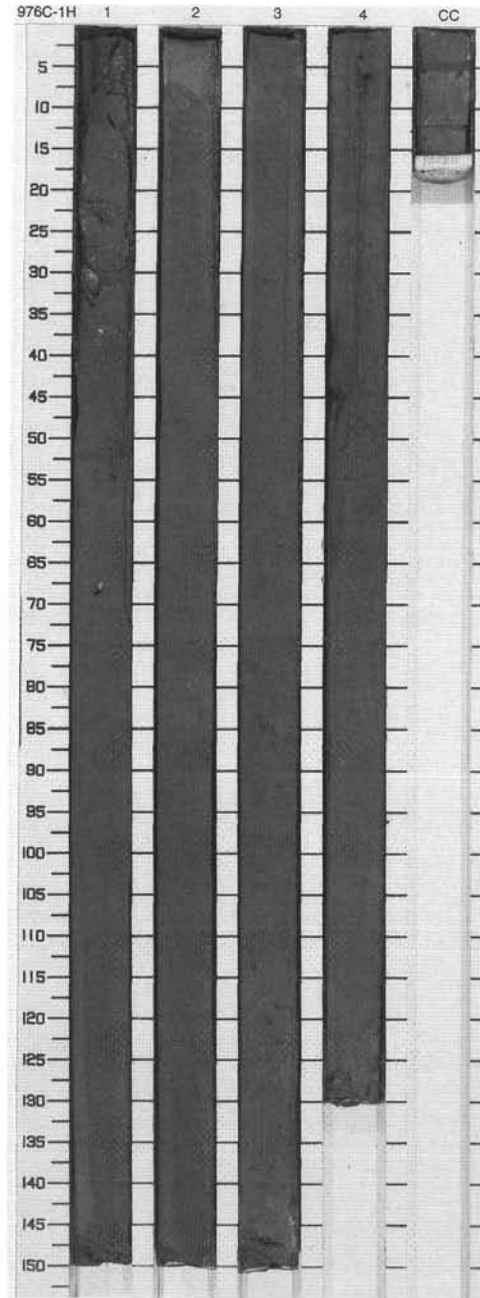
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern representing pebbly sandstone]	1	middle Miocene		[Vertical wavy lines representing disturbance]	T	5GY 5/2	<p>PEBBLY SANDSTONE and GRAVEL</p> <p>Major Lithologies: The main sediment types in this core are PEBBLY SANDSTONE and thin extraformational GRAVEL in which the matrix ranges from calcitic silty clay and zeolitic silty clay, the latter being predominant in Sections 3 and CC. The sediment is flecked with black biotite but is mostly dusky yellow green (5GY 5/2) in color.</p> <p>Minor Lithologies: Clast types include biotite gneiss, quartzite, schist, and marble. They range up to 2 cm in diameter. Sand grains are medium to coarse, with a few very coarse grains.</p> <p>General Description: Poor sorting is probably partly due to drilling disturbance.</p>
2		S						
3		S						
4		M						
		CC						



SITE 976 HOLE C CORE 1H

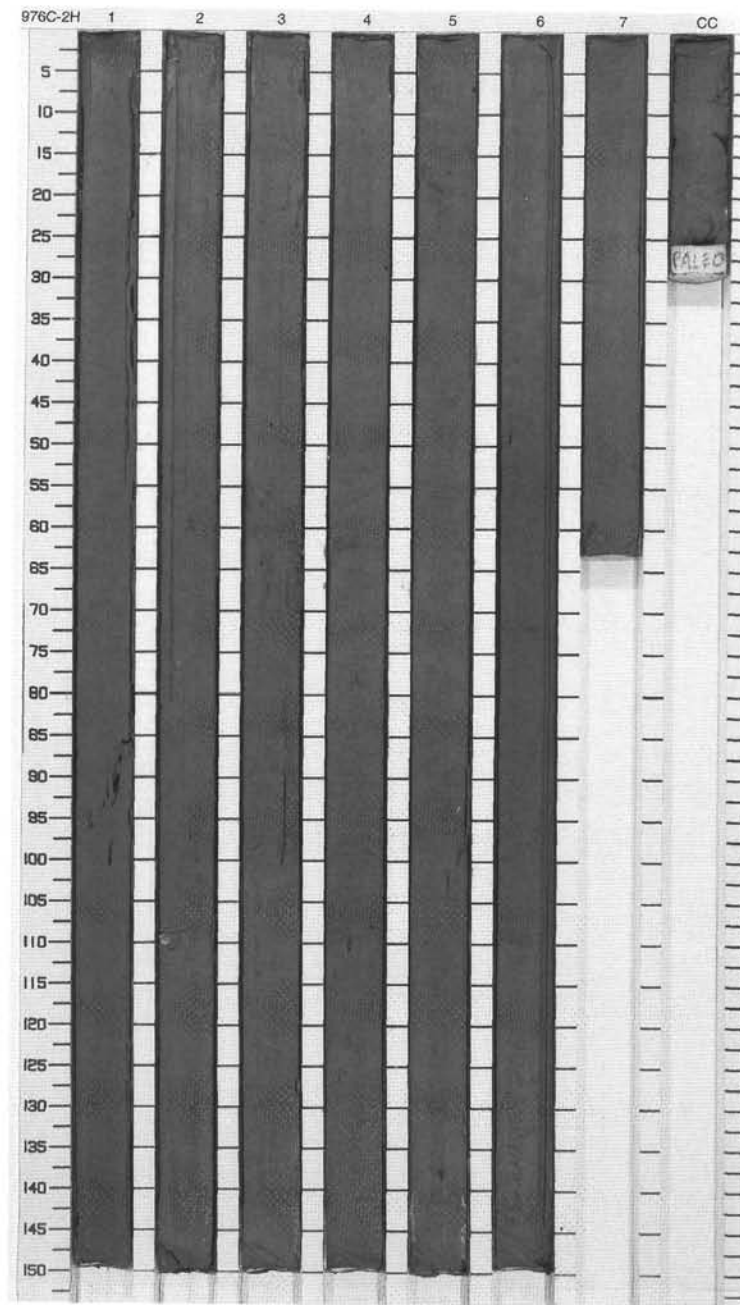
CORED 0.0 - 6.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
0.0 - 1.0	[Dotted pattern]	1	Pleistocene	o	-	S	5Y 4/4	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL-RICH CLAY, grayish olive (10Y 4/2) to olive gray (5Y 4/1) in color. Shell fragments are visible throughout. Bioturbation ranges from slight to moderate; the more heavily bioturbated intervals are color mottled.</p> <p>Minor Lithologies: Burrow fill is opaque- and nannofossil-rich silty clay.</p>
1.0 - 2.0	[Dotted pattern]	2		~	-	S	5Y 4/1	
2.0 - 3.0	[Dotted pattern]	3		~	-	S	10Y 4/2	
3.0 - 4.0	[Dotted pattern]	4		~	o	S	5Y 4/1	
4.0 - 5.0	[Dotted pattern]	CC		o	M			



SITE 976 HOLE C CORE 2H CORED 6.0 - 15.5 mbsf

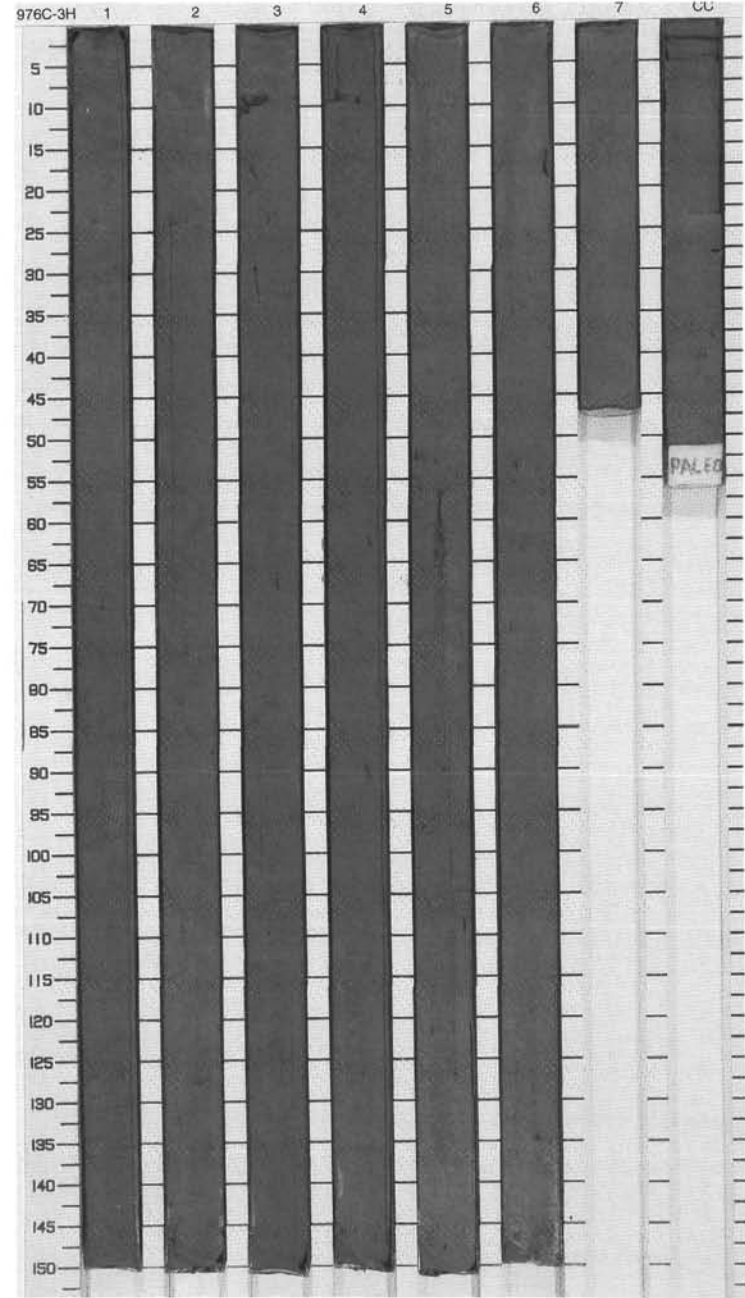
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	~ ☼	-	S	5Y 4/1	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL-RICH CLAY, ranging in color from olive gray (5Y 4/1; dominant) to grayish olive (10Y 4/2) and dark greenish gray (5GY 4/1). Shell fragments are dispersed throughout. The sediment is slightly to moderately bioturbated; the more heavily bioturbated intervals are color mottled. Locally, burrows are pyritized.</p>
2	[Dotted pattern]	2		~ ☼				
3	[Dotted pattern]	3		~ ☼				
4	[Dotted pattern]	4		~ ☼			5Y 4/1 To 10Y 6/2	
5	[Dotted pattern]	5		~ ☼				
6	[Dotted pattern]	6		~ ☼			5Y 4/1	
7	[Dotted pattern]	7		~ ☼				
8	[Dotted pattern]	8	~ ☼	S	5GY 4/1			
9	[Dotted pattern]	9	~ ☼					
		CC			M			



SITE 976 HOLE C CORE 3H

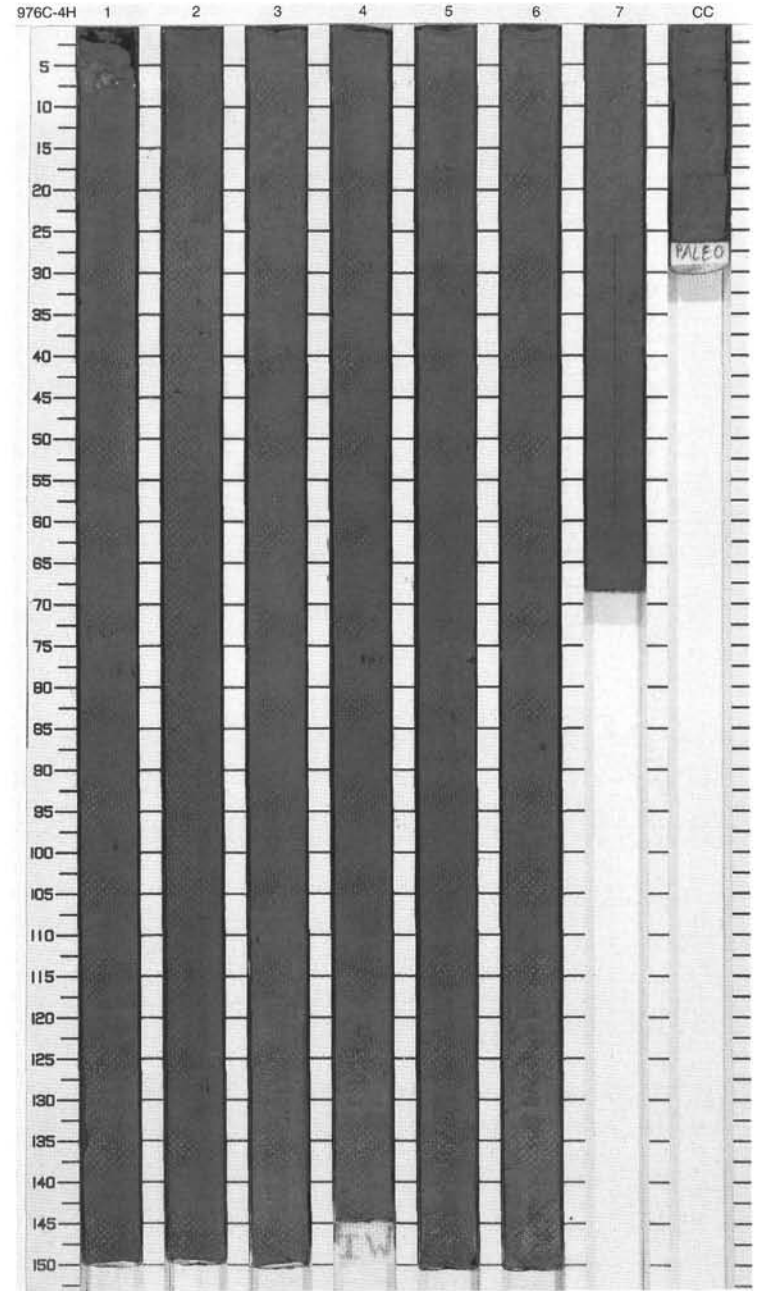
CORED 15.5 - 25.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	[Wavy line]	[X]	S	10Y 4/2	<p>NANNOFOSSIL-RICH CLAY and QUARTZ-RICH CALCAREOUS CLAY</p> <p>Major Lithologies: The major lithologies are NANNOFOSSIL-RICH CLAY AND QUARTZ-RICH CALCAREOUS CLAY, ranging in color from grayish olive (10Y 4/2; dominant) to olive gray (5Y 4/1). Shell fragments are visible throughout the sediment. Bioturbation is slight, with some intervals showing color mottling related to burrow frequency. Locally, burrows are pyritized.</p>
2	[Dotted pattern]	2		[Wavy line]	[X]	S		
3	[Dotted pattern]	3		[Wavy line]	[X]	S		
4	[Dotted pattern]	4		[Wavy line]	[X]			
5	[Dotted pattern]	5		[Wavy line]	[X]			
6	[Dotted pattern]	6		[Wavy line]	[X]			
7	[Dotted pattern]	7		[Wavy line]	[X]			
8	[Dotted pattern]	8		[Wavy line]	[X]	10Y 4/2 To 5Y 4/1		
9	[Dotted pattern]	9		[Wavy line]	[X]			
10	[Dotted pattern]	10	CC	[Wavy line]	[X]		M	



SITE 976 HOLE C CORE 4H CORED 25.0 - 34.5 mbsf

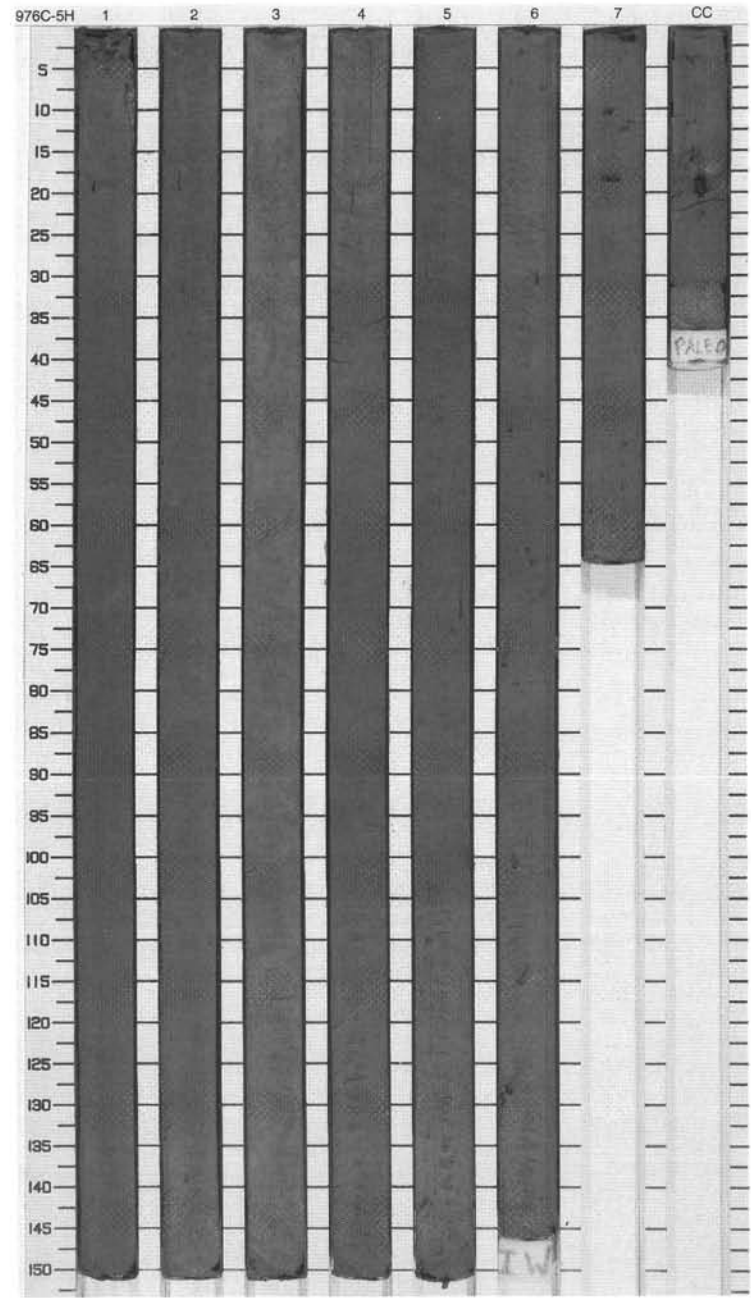
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	[Wavy line]	[X]	S	5Y 4/1	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL-RICH CLAY, dark greenish gray (5GY 4/1) to olive gray (5Y 4/1) in color. Shell fragments are visible throughout the sediment. Bioturbation is slight, though pervasive; as a result, color mottling is well-developed. Locally, burrows are pyritized.</p> <p>Minor Lithology: Burrow fill is nannofossil clayey silt.</p>
2	[Dotted pattern]	2	[Wavy line]	[X]	S		
3	[Dotted pattern]	3	[Wavy line]	[X]		5GY 4/1	
4	[Dotted pattern]	3	[Wavy line]	[X]			
5	[Dotted pattern]	4	[Wavy line]	[X]			
6	[Dotted pattern]	4	[Wavy line]	[X]	I		
7	[Dotted pattern]	5	[Wavy line]	[X]			
8	[Dotted pattern]	6	[Wavy line]	[X]		5Y 4/1	
9	[Dotted pattern]	7	[Wavy line]	[X]			
		CC			M		



SITE 976 HOLE C CORE 5H

CORED 34.5 - 44.0 mbsf

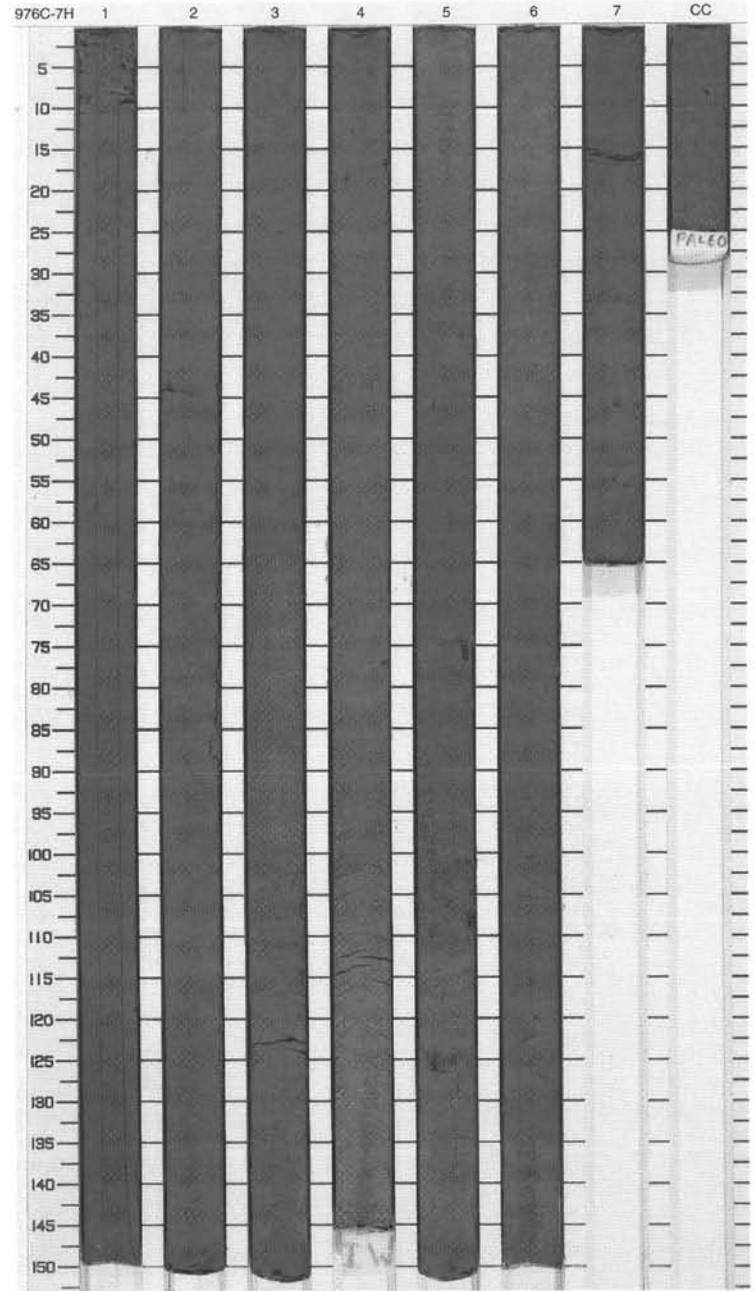
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description	
1	[Dotted pattern]	1	[Wavy line]	[X]	S	5GY 4/1	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL-RICH CLAY, mainly dark greenish gray (5GY 4/1) in color. Bioturbation is slight, though pervasive. Color mottling is present, but is strongest where burrows are pyritized. Shell fragments are present throughout.</p> <p>Minor Lithology: Locally, calcareous clay occurs. It is recognized as slightly lighter tones in dark greenish gray (5GY 4/1) intervals.</p>	
2		2						S
3		3						
4		4			S			
5		5						
6		6						
7		7			I	5GY 4/1		
8	8							
9	9	M	5GY 4/1					
CC	CC							



SITE 976 HOLE C CORE 7H

CORED 53.5 - 63.0 mbsf

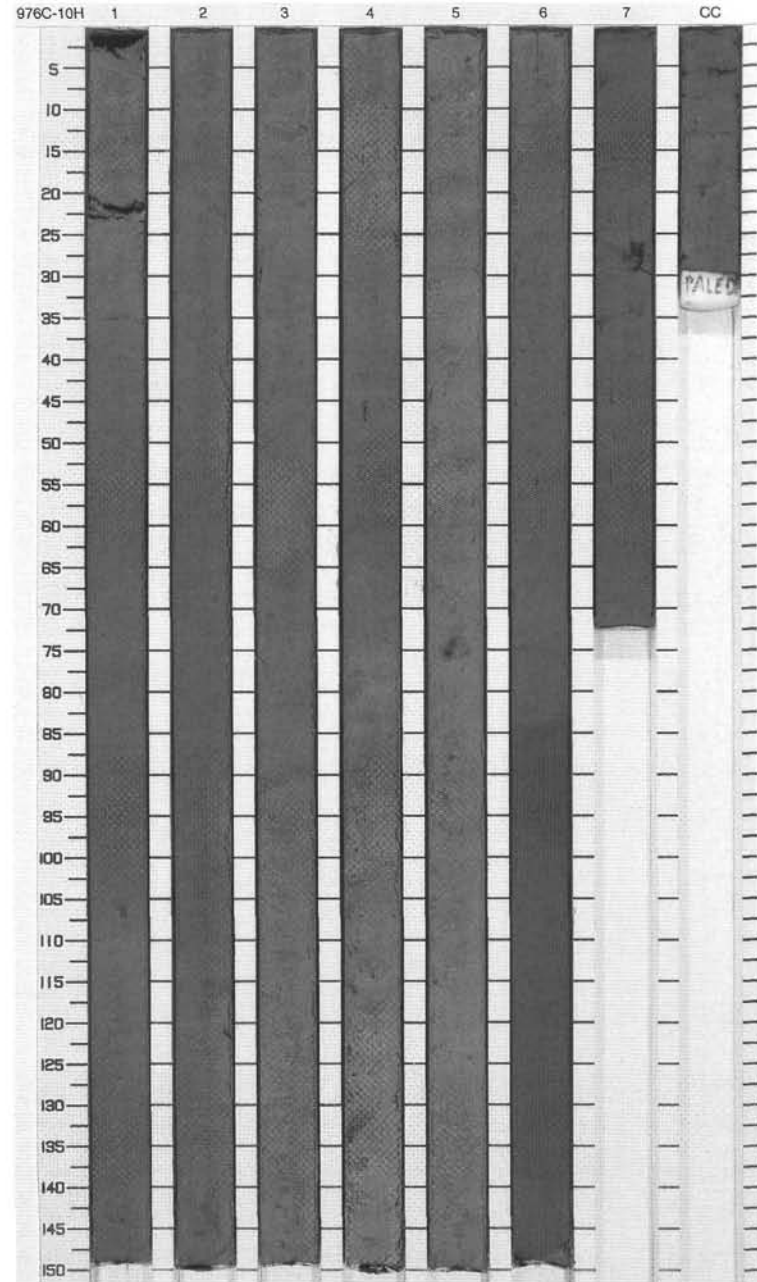
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		∞		S	5GY 4/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) to olive gray (5Y 4/1) NANNOFOSSIL CLAY with scattered grayish black (N2) pods (pyrite-rich burrows?) and shell fragments.</p> <p>Minor Lithology: The composition ranges to nannofossil-rich clay at the base of the core (Sections 5, 6, 7, and CC). Burrow fills are slightly more silty than the surrounding sediment.</p> <p>General Description: Burrows replaced by pyrite occur at 73-74 cm and 125-126 cm in Section 5.</p>
2	[Pattern]	2		∞ (P)				
3	[Pattern]	3		∞			5Y 4/1	
4	[Pattern]	3		∞ P			5GY 4/1	
5	[Pattern]	3		∞ P			5Y 4/1	
6	[Pattern]	4	Pleistocene	∞ P			5GY 4/1	
7	[Pattern]	4		∞ P		S	5Y 4/1	
8	[Pattern]	5		∞ (P)			5GY 4/1	
9	[Pattern]	5		∞ (P)		S		
10	[Pattern]	6		∞		S	5GY 4/1 To 5Y 4/1	
11	[Pattern]	6		∞				
12	[Pattern]	7		∞			5Y 4/1	
13	[Pattern]	7		∞				
14	[Pattern]	7		∞				
15	[Pattern]	CC		∞ P		M	5GY 4/1	



SITE 976 HOLE C CORE 10H

CORED 82.0 - 91.5 mbsf

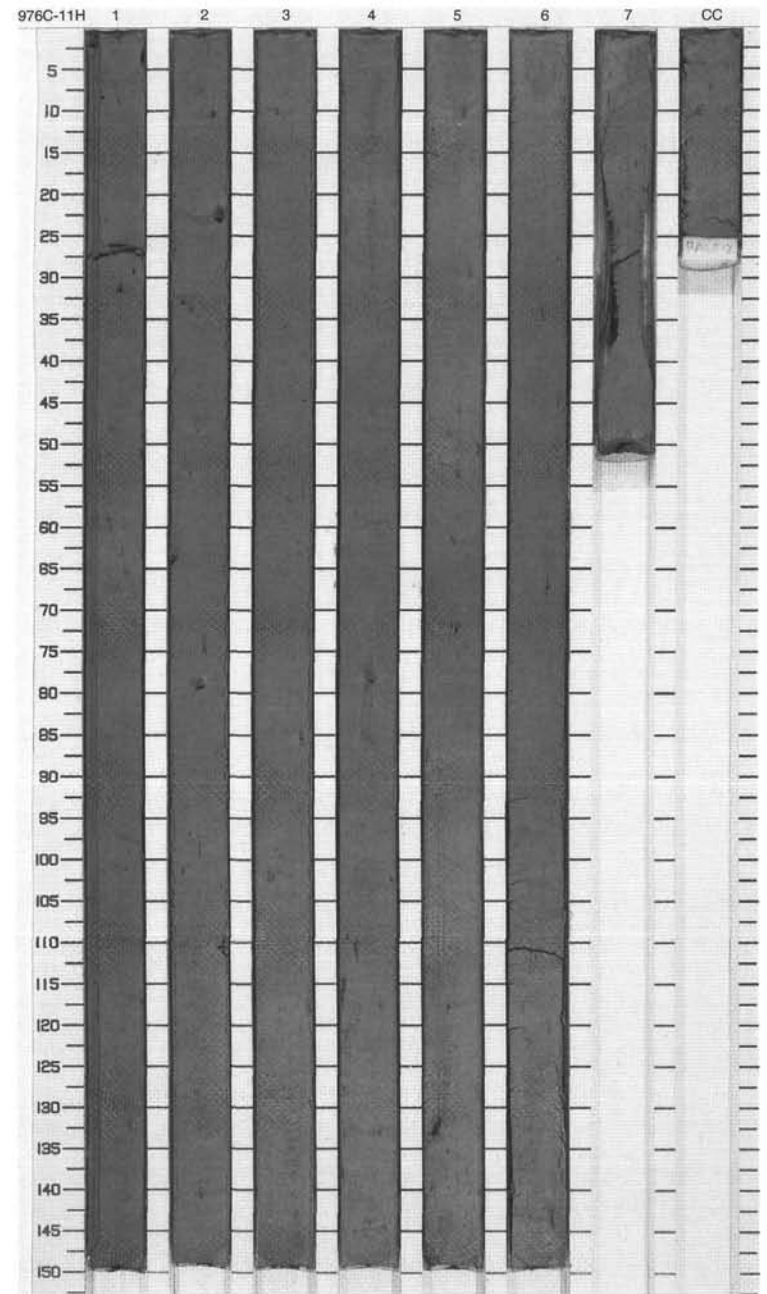
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1		P	X		5Y 4/1	NANNOFOSSIL CLAY Major Lithology: The major lithology is olive gray (5Y 4/1; 5Y 3/2), grayish olive (10Y 4/2), and dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY with scattered shell fragments and grayish black (N2) pyrite-rich to completely pyritized burrow fills.
							5GY 4/1	
2	[Dotted pattern]	2		P	X		5Y 4/1	
							5GY 4/1	
3	[Dotted pattern]	3		P	X		5Y 4/1	
							5GY 4/1	
4	[Dotted pattern]	4		P	X		5Y 4/1	
							5GY 4/1	
5	[Dotted pattern]	5		P	X		5Y 4/1 To 5GY 4/1	
							5GY 4/1	
6	[Dotted pattern]	6		P	X		5Y 4/1	
							5GY 4/1	
7	[Dotted pattern]	7		P	X		10Y 4/2 To 5Y 4/1	
							5Y 4/1	
8	[Dotted pattern]	7		P	X		10Y 4/2 To 5Y 4/1	
							5Y 4/1	
9	[Dotted pattern]	7		P	X		10Y 4/2 To 5Y 4/1	
							5Y 4/1	
10	[Dotted pattern]	CC		P			M	



SITE 976 HOLE C CORE 11H

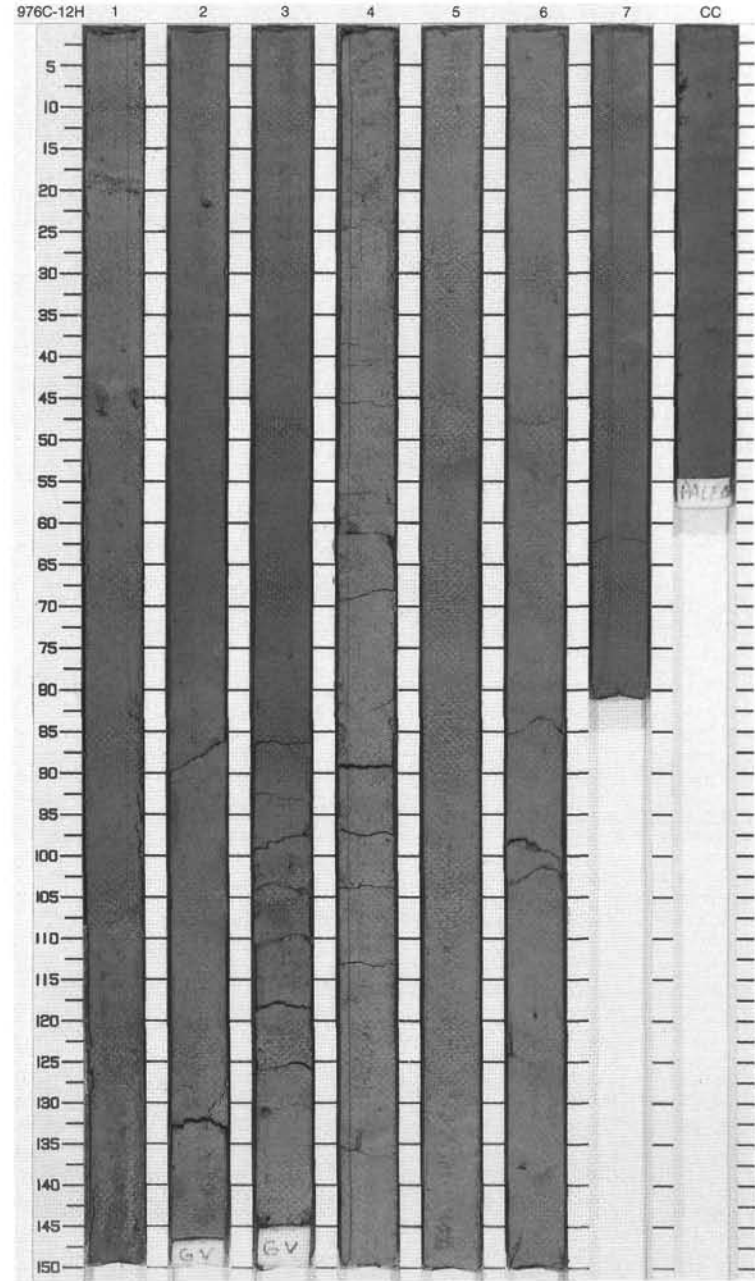
CORED 91.5 - 101.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	Pleistocene	~	X	S	5GY 4/1	<p>NANNOFOSSIL-RICH SILTY CLAY</p> <p>Major Lithology: The major lithology is olive gray (5Y 4/1) to dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH SILTY CLAY with scattered shell fragments.</p> <p>Minor Lithology: Lighter pods of nannofossil-rich sandy silty clay occur at 30-32 cm in Section 2, 100-122 cm in Section 3, and throughout Section 4. These contain a significant proportion (50%) of quartz and feldspar.</p> <p>General Description: Pyrite-rich to pyritized burrow fills occur throughout the core.</p>
2							5Y 4/1	
3							5Y 4/1 To 5GY 4/1	
4							5GY 4/1	
5							5GY 4/1	
6							5Y 4/1 To 5GY 4/1	
7							5GY 4/1	
8								
9								
		CC						



SITE 976 HOLE C CORE 12H CORED 101.0 - 110.5 mbsf

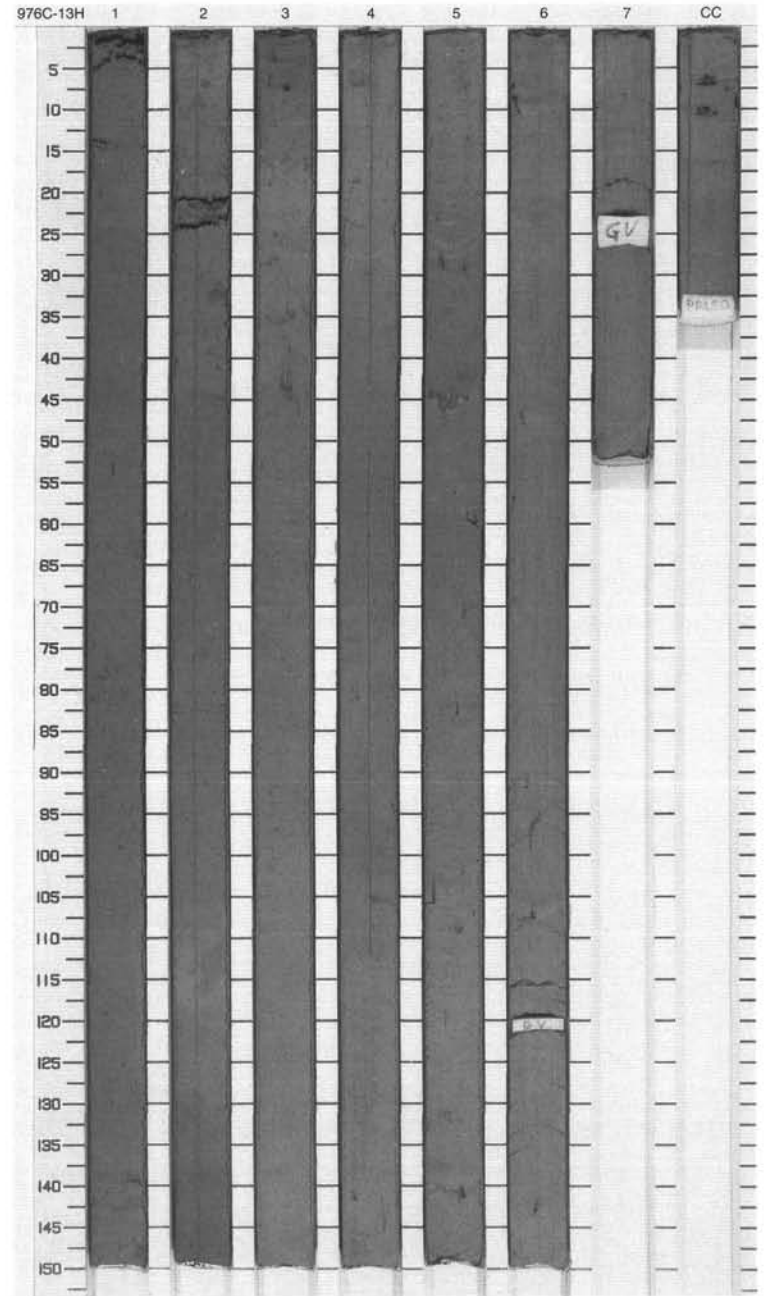
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	o			5GY 4/1	<p>NANNOFOSSIL CLAY TO CALCAREOUS CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) to olive gray (5Y 4/1) NANNOFOSSIL CLAY TO CALCAREOUS CLAY with grayish black (N2), pyrite-rich to completely pyritized burrow fills.</p>
2	[Dotted pattern]	2	o		S	5Y 4/1 To 5GY 4/1	
3	[Dotted pattern]	3	o				
4	[Dotted pattern]	4	o				
5	[Dotted pattern]	4	o				
6	[Dotted pattern]	5	o				
7	[Dotted pattern]	5	o		S	5GY 4/1	
8	[Dotted pattern]	6	o				
9	[Dotted pattern]	7	o			5Y 4/1	
10	[Dotted pattern]	CC	o		M		



SITE 976 HOLE C CORE 13H

CORED 110.5 - 120.0 mbsf

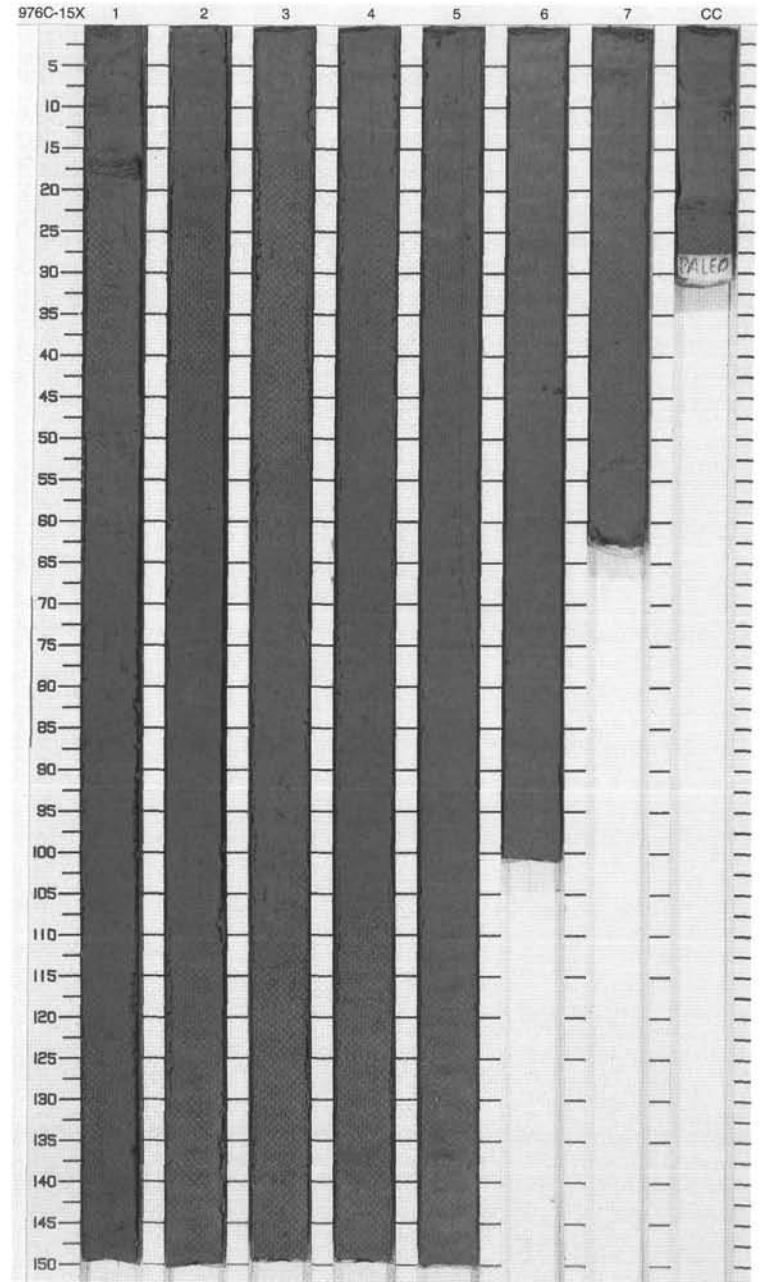
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	}}			10Y 4/2	<p>CALCAREOUS SILTY CLAY and NANNOFOSSIL-RICH CLAY</p> <p>Major Lithologies: The major lithologies are CALCAREOUS SILTY CLAY and NANNOFOSSIL-RICH CLAY, grayish olive (10Y 4/2) and dark greenish gray (5Gy 4/1) in color, respectively. Bioturbation in both sediment types is slight. Color mottling is found in bioturbated intervals, especially where burrows are pyritized.</p>
2	[Pattern]	2	}}				
3	[Pattern]	3	}}		S		
4	[Pattern]	3	}}				
5	[Pattern]	4	}}		S		
6	[Pattern]	5	}}			5GY 4/1	
7	[Pattern]	6	}}				
8	[Pattern]	6	}}				
9	[Pattern]	7	}}				
		CC	}}		M		



SITE 976 HOLE C CORE 15X

CORED 129.5 - 139.2 mbsf

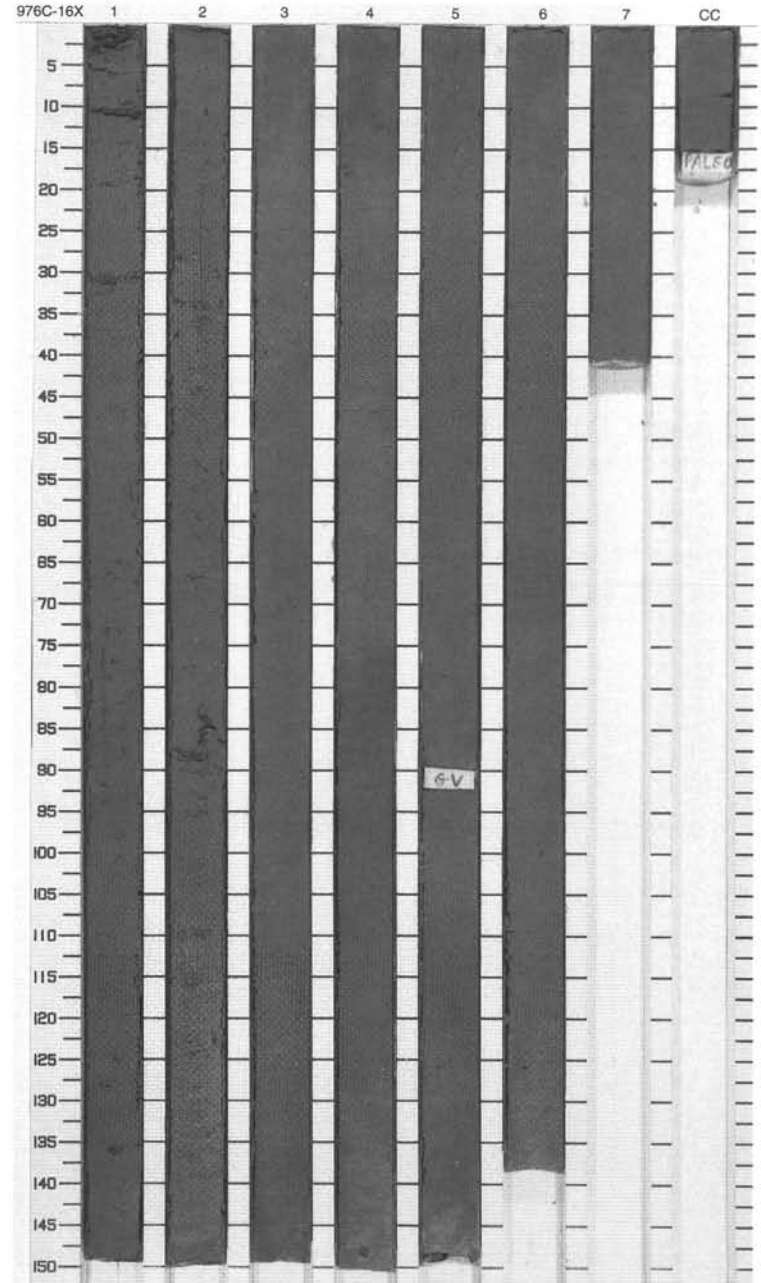
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	~	-	S	5GY 4/1	<p>CALCAREOUS CLAY</p> <p>Major Lithology: The major lithology is CALCAREOUS CLAY, dark greenish gray (5GY 4/1) in color. The sediment varies from slightly to moderately bioturbated. Shell fragments are present but rare. Many burrows are pyritized.</p> <p>Minor Lithology: A small interval of calcareous sandy silty clay, grayish olive (10Y 4/2) is located in Section 1, 50-70 cm.</p>
2	[Dotted pattern]	2		~				
3	[Dotted pattern]	3		~				
4	[Dotted pattern]	4		~				
5	[Dotted pattern]	5		~				
6	[Dotted pattern]	6		~				
7	[Dotted pattern]	7		~				
8	[Dotted pattern]	8	M	~	-		5Y 4/1	
9	[Dotted pattern]	9		~				
		CC						



SITE 976 HOLE C CORE 16X

CORED 139.2 - 148.8 mbsf

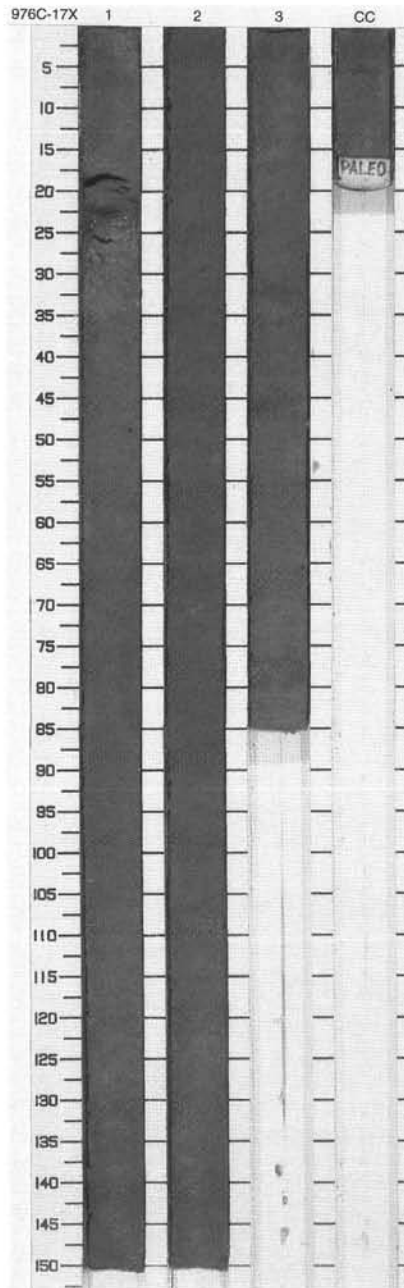
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	[Wavy lines]	[Dashed line]	S	5Y 4/1 To 5GY 4/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL CLAY, grayish olive (10Y 4/2) to dark greenish gray (5GY 4/1) in color. Shell fragments are present throughout. The sediment is slightly bioturbated with local color mottling in intervals with the more extensive bioturbation. Locally, burrows are pyritized.</p>
2							10Y 4/2	
3								
4								
5								
6								
7								
8		6			S	5GY 4/1		
9		7						
		CC				M		



SITE 976 HOLE C CORE 17X

CORED 148.8 - 158.5 mbsf

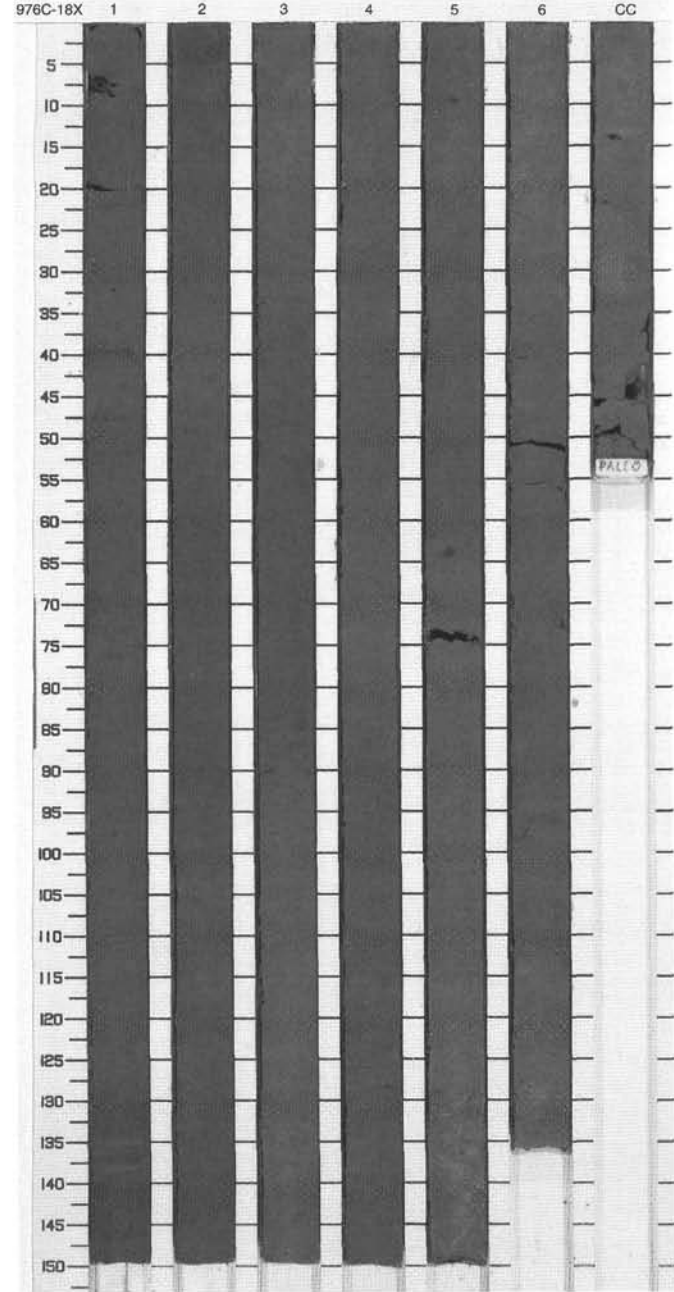
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	~ (P)	○ ○		5GY 4/1	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL-RICH CLAY, dark greenish gray (5GY 4/1) in color. Shell fragments are rare in the sediment. Bioturbation appears to be slight but biscuiting makes characterization difficult. Color mottling is associated with burrowed intervals.</p>
2	[Dotted pattern]	2		~				
3	[Dotted pattern]	3		~ (P)		S		
4	[Dotted pattern]	CC				M		



SITE 976 HOLE C CORE 18X

CORED 158.5 - 168.1 mbsf

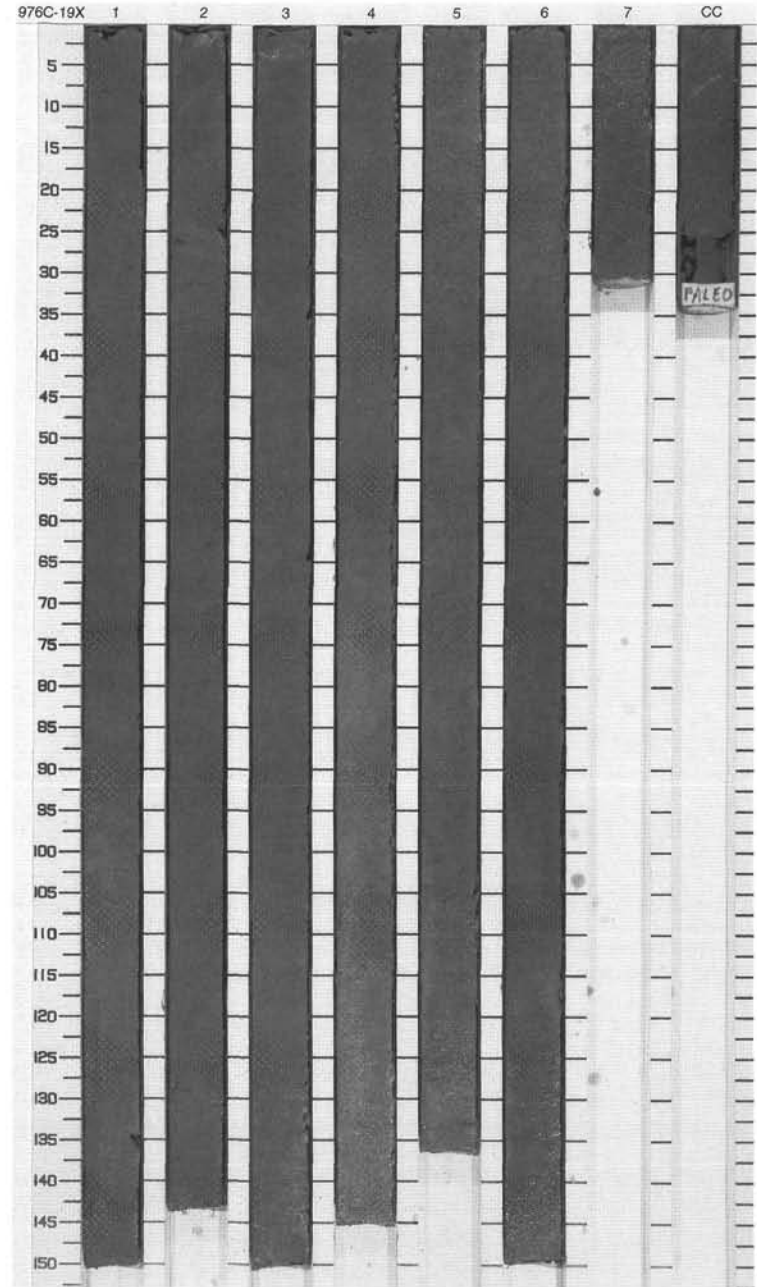
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	~		S	10Y 4/2	<p>NANNOFOSSIL-RICH CLAY and DIATOM- AND QUARTZ-RICH CALCAREOUS SANDY SILTY CLAY</p> <p>Major Lithologies: The major lithologies are NANNOFOSSIL-RICH CLAY and DIATOM- AND QUARTZ-RICH CALCAREOUS SANDY SILTY CLAY, grayish olive (10Y 4/2; dominant) and dark greenish gray (5GY 4/1) in color, respectively. Shell fragments are present throughout both sediment types.</p> <p>Minor Lithology: Calcareous clay is present locally in Section 1.</p> <p>General Description: Bioturbation ranges from moderate to slight; Cylindricus burrows are recognizable in some areas. A laminated interval at the base of Section 1 and top of Section 2 may show some cross-cutting relationships.</p>
2	[Pattern]	2	~		S	5GY 4/2	
3	[Pattern]	3	~		S	10Y 4/2	
4	[Pattern]	4	~		S	5GY 3/2	
5	[Pattern]	5	~		S	10Y 4/2	
6	[Pattern]	6	~		S	5GY 4/1	
7	[Pattern]	7	~		S	5GY 4/1	
8	[Pattern]	8	~		S	5GY 4/1	
9	[Pattern]	9	~		S	5GY 4/1	
		CC			M		



SITE 976 HOLE C CORE 19X

CORED 168.1 - 177.8 mbsf

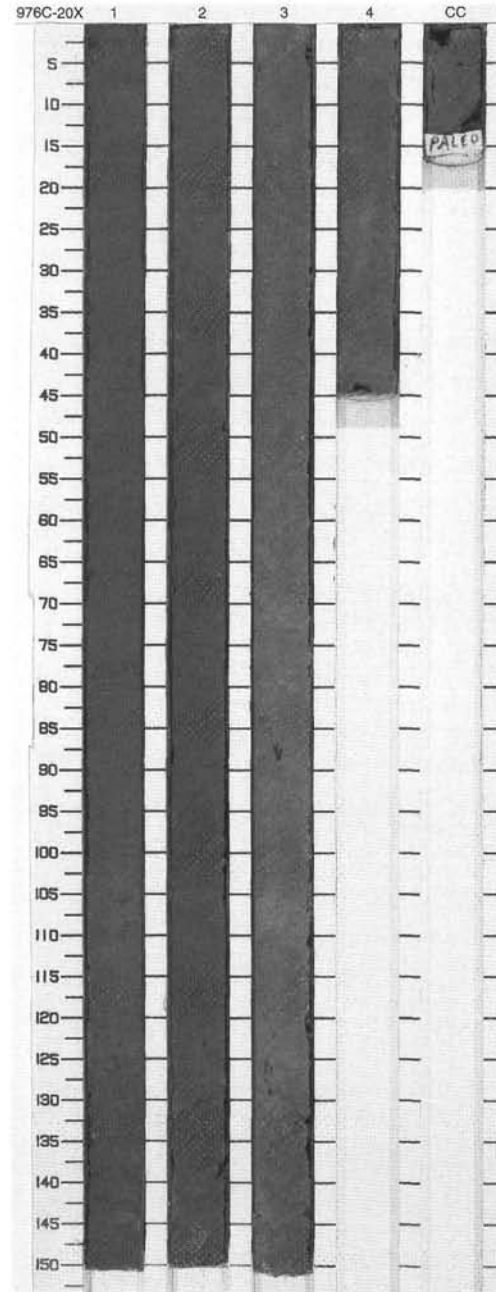
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	∕				<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY with scattered pyrite and shell fragments.</p> <p>Minor Lithology: Olive gray (5y 4/1) calcareous clay layers occur at 36–53 cm in Section 2, 37–71 cm in Section 4, 30–45 cm in Section 5, and 55–70 cm in Section 6.</p>
2	[Dotted pattern]	2	∕				
3	[Dotted pattern]	3	∕				
4	[Dotted pattern]	3	∕				
5	[Dotted pattern]	4	∕			5GY 4/1	
6	[Dotted pattern]	4	∕ P			S	
7	[Dotted pattern]	5	∕ P				
8	[Dotted pattern]	6	∕ P			S	
9	[Dotted pattern]	7	∕				
	[Dotted pattern]	CC				M	



SITE 976 HOLE C CORE 20X CORED 177.8 - 187.4 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	⊗ ⊗ ⊗ ⊗				<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH CLAY with scattered shell fragments and rare discrete burrows filled with pyrite.</p>
2	[Dotted pattern]	2		⊗		S	5GY 4/1	
3	[Dotted pattern]	3		⊗		S		
4	[Dotted pattern]	4		⊗		M		
5	[Dotted pattern]	CC						

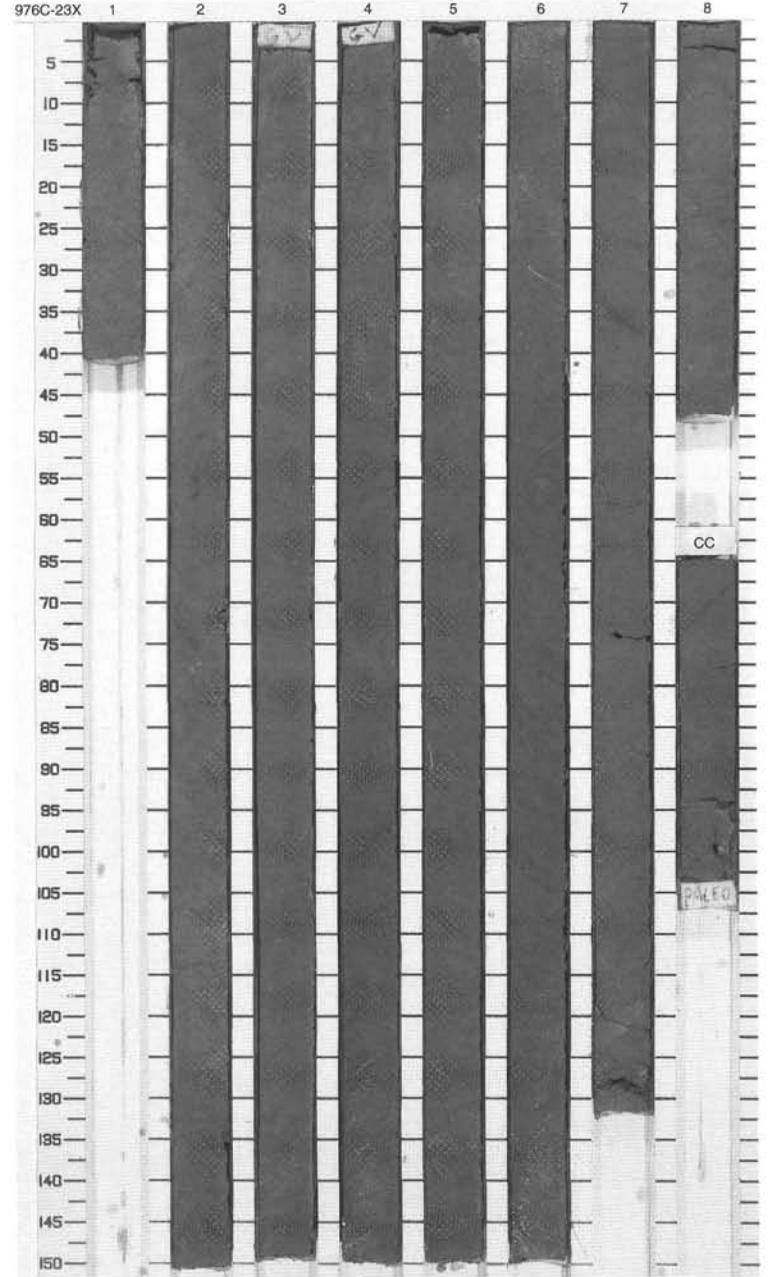
976C-21X NO RECOVERY



SITE 976 HOLE C CORE 23X

CORED 206.6 - 216.2 mbsf

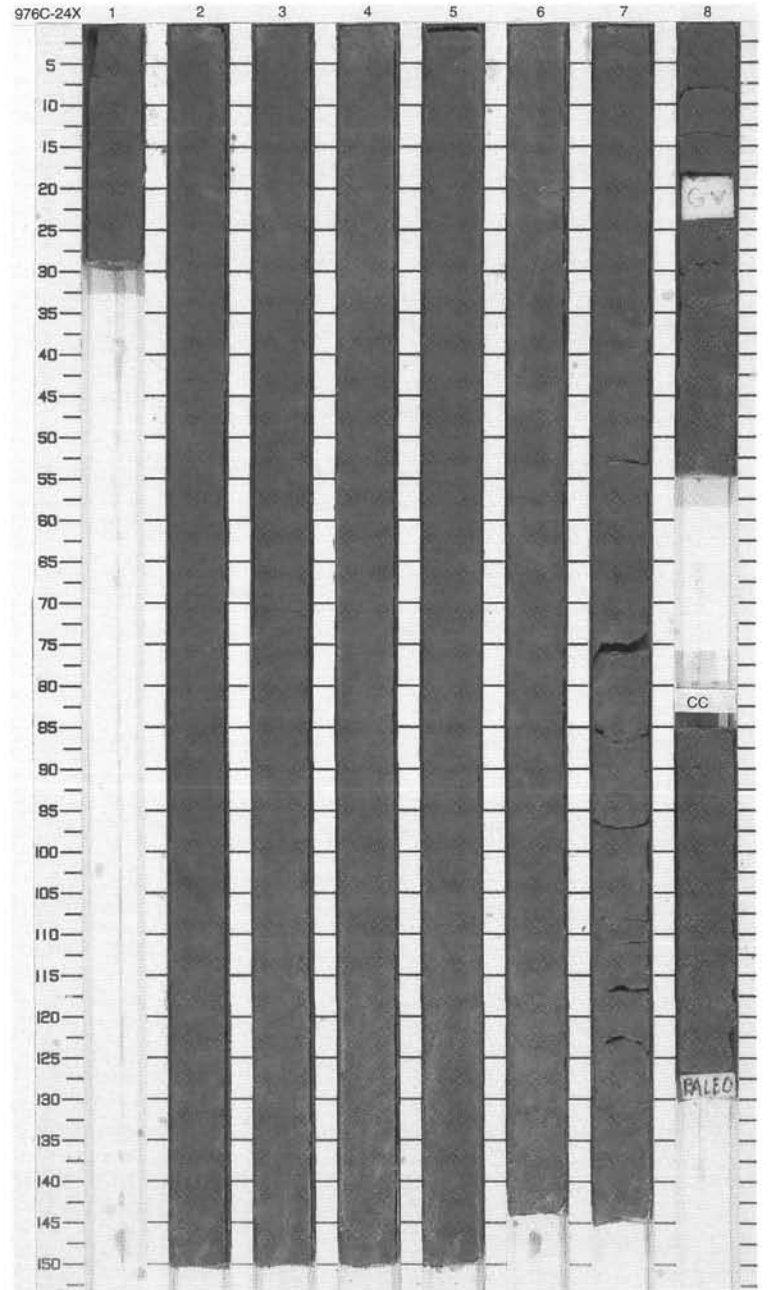
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	o	-	-	5GY 4/1	NANNOFOSSIL-RICH CLAY Major Lithology: The major lithology is dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH CLAY. Pyrite-rich and completely pyritized burrows occur throughout the core.
2		2		o				
3		3		o				
4		4		o				
5		5		o				
6		6		o				
7		7		o				
8		8		o				
9		9		o				
10		10		o				
		CC				M		



SITE 976 HOLE C CORE 24X

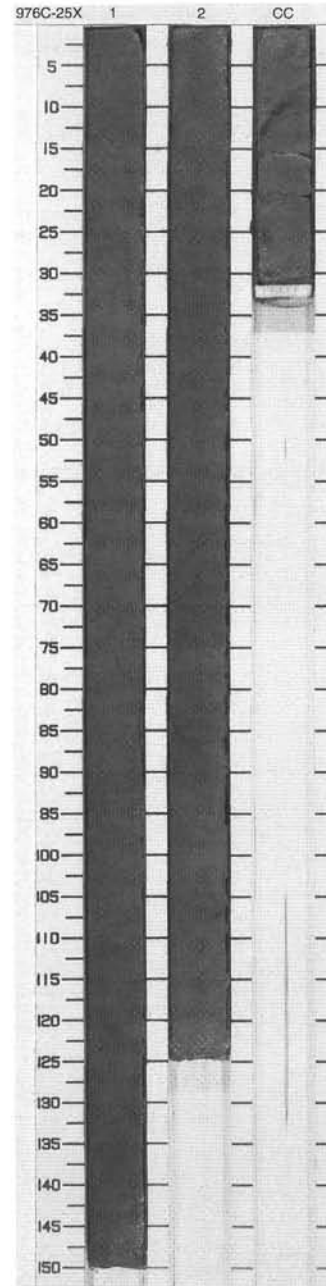
CORED 216.2 - 225.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
0		1		~				<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) to light olive gray (10Y 4/2) NANNOFOSSIL-RICH CLAY with scattered shell fragments and grayish black (N2) pyrite-rich and completely pyritized burrow fills.</p>
1		2		~				
2		3		~				
3		4		~				
4		5		~				
5		6		~				
6		7		~				
7		8		~				
8		9		~				
9		10		~				
			Pleistocene		S		5GY 4/1	
								M



SITE 976 HOLE C CORE 25X CORED 225.8 - 235.4 mbsf

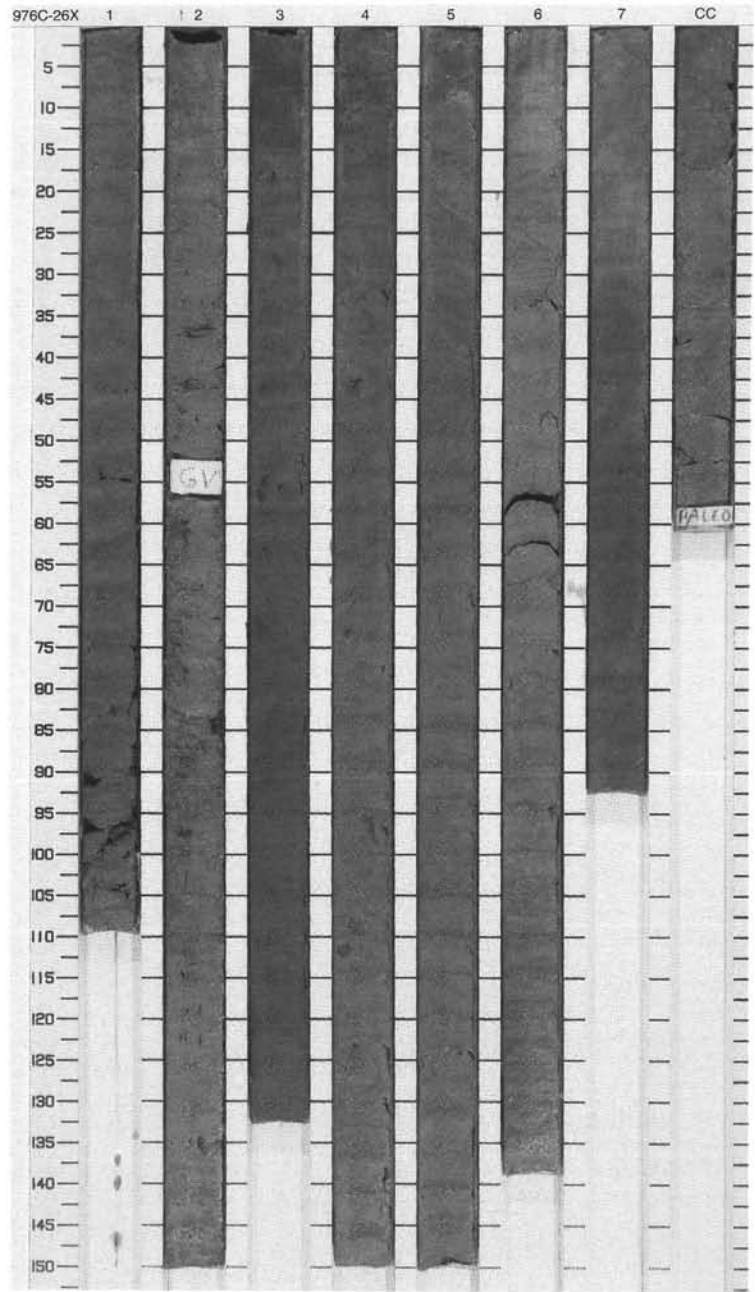
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	Pleistocene	~	-	S	5GY 4/1	CALCAREOUS CLAY Major Lithology: The major lithology is dark greenish gray (5GY 4/1) CALCAREOUS CLAY with pyritized burrow fills.
2		2						
3		CC						



SITE 976 HOLE C CORE 26X

CORED 235.4 - 245.1 mbsf

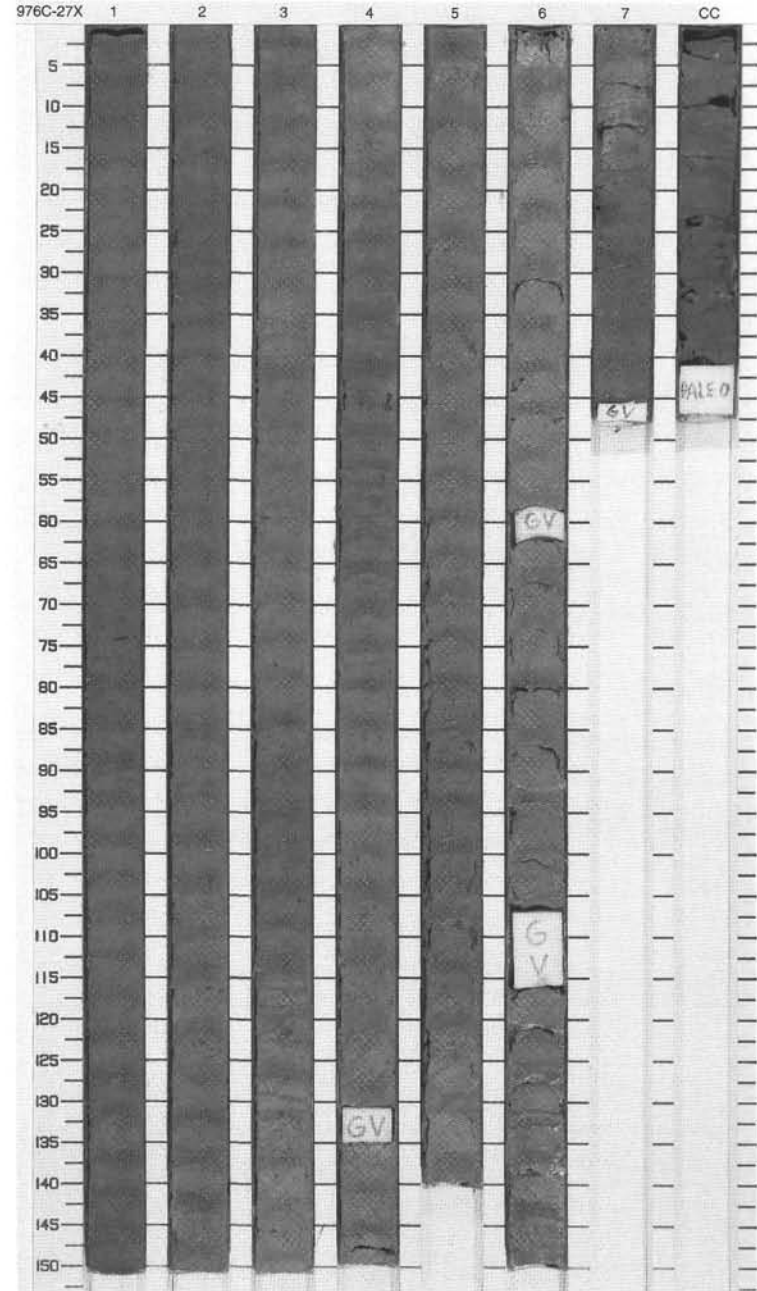
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Cross-hatched pattern]	1	[Wavy lines]		S	10Y 4/2 To 5GY 4/1	<p>NANNOFOSSIL-RICH CLAY and NANNOFOSSIL CLAY</p> <p>Major Lithologies: The major lithologies are dark greenish gray to olive gray (5GY 4/1 to 5Y 4/1) NANNOFOSSIL-RICH CLAY and NANNOFOSSIL CLAY.</p> <p>Minor Lithology: Grayish olive to light olive gray (10Y 4/2 to 5Y 5/2) diatom-nannofossil ooze and diatom ooze are present in Sections 1 and 2.</p>
2	[Cross-hatched pattern]	2	[Horizontal lines]		S	5Y 5/2	
3	[Cross-hatched pattern]	3	[Wavy lines]		S	5Y 4/1 To 5GY 4/1	
4	[Cross-hatched pattern]	4	[Wavy lines]		S		
5	[Cross-hatched pattern]	4	[Wavy lines]		S		
6	[Cross-hatched pattern]	5	[Wavy lines]		S	5GY 4/1	
7	[Cross-hatched pattern]	5	[Wavy lines]		S		
8	[Cross-hatched pattern]	6	[Wavy lines]		S		
9	[Cross-hatched pattern]	7	[Wavy lines]		S	5GY 4/1 To 10Y 4/2	
		CC			M		



SITE 976 HOLE C CORE 27X

CORED 245.1 - 254.8 mbsf

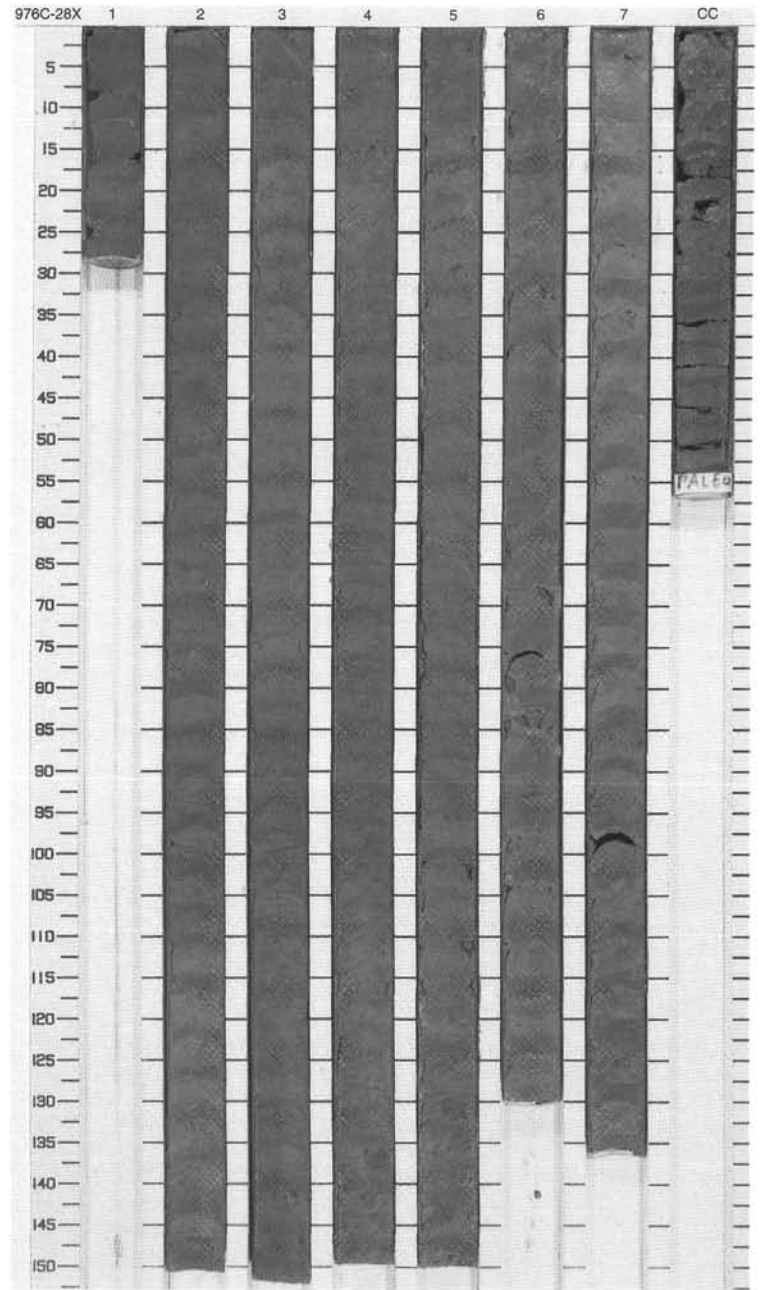
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	}}	✗			<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL-RICH CLAY, dark greenish gray (5GY 4/1; dominant) to grayish olive (10Y 4/2) in color.</p> <p>Minor Lithology: Locally, in Section 6, calcareous clay (light olive gray, 5Y 5/2) occurs.</p> <p>General Description: The sediment is variously slightly to heavily bioturbated. Horizontal burrows are well developed in Section 5, giving the sediment a laminated appearance. Locally, burrows are pyritized.</p>
2	[Dotted pattern]	2	}}	✗		5GY 4/1	
3	[Dotted pattern]	3	}}	✗	S		
4	[Dotted pattern]	3	}}	✗			
5	[Dotted pattern]	4	}}	✗		10Y 4/2	
6	[Dotted pattern]	4	}}	✗			
7	[Dotted pattern]	5	}}	✗		5GY 4/1	
8	[Dotted pattern]	6	}}	✗	S	5Y 5/2	
9	[Dotted pattern]	7	}}	✗	S	10Y 4/2	
		CC	}}	✗	M		



SITE 976 HOLE C CORE 28X

CORED 254.8 - 264.4 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	Pleistocene	~ x		S	5GY 4/1	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The main lithology is NANNOFOSSIL-RICH CLAY, dark greenish gray (5GY 4/1; dominant) to olive gray (5Y 4/1) in color.</p> <p>Minor Lithology: Nannofossil-rich diatomaceous silty clay, olive gray in color (5Y 4/1) is present in the Core Catcher.</p> <p>General Description: Visible shell fragments are present throughout the cored interval. The sediment varies from slightly to moderately bioturbated. In Section 3, 92-112 cm, horizontal burrows impart a laminated appearance to the sediment.</p>
2	[Pattern]	2		~ x				
3	[Pattern]	3		~ x				
4	[Pattern]	4		~ x				
5	[Pattern]	5		~ x		5Y 4/1 To 5GY 4/1		
6	[Pattern]	5		~ x		5GY 4/1 To 5Y 4/1		
7	[Pattern]	6		~ x		5GY 4/1		
8	[Pattern]	7		~ x				
9	[Pattern]	CC		~ x		S	5Y 4/1	
					M			

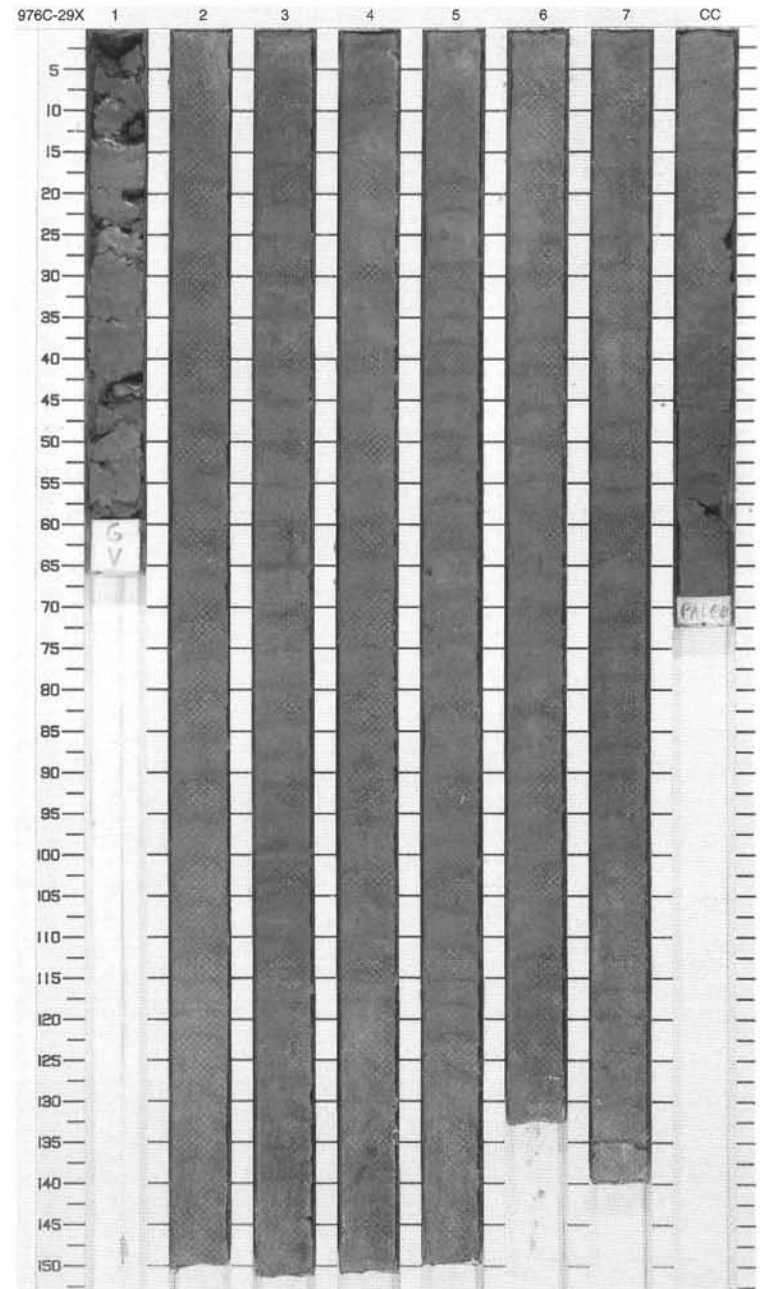


SITE 976 HOLE C CORE 29X

CORED 264.4 - 274.0 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1		1	⊗	WWW			NANNOFOSSIL-RICH CLAY Major Lithology: The major lithology is NANNOFOSSIL-RICH CLAY, dark greenish gray (5GY 4/1) to olive gray (5Y 4/1) in color. Sparse dispersed shell fragments and flecks of pyrite are common.
2		2	⊗				
3		3	⊗			5GY 4/1	
4		4	⊗				
5			⊗				
6		5	⊗				
7			⊗		S	5GY 4/1 To 5Y 4/1	
8		6	⊗				
9		7	⊗			5GY 4/1	
10		CC	⊗		M		

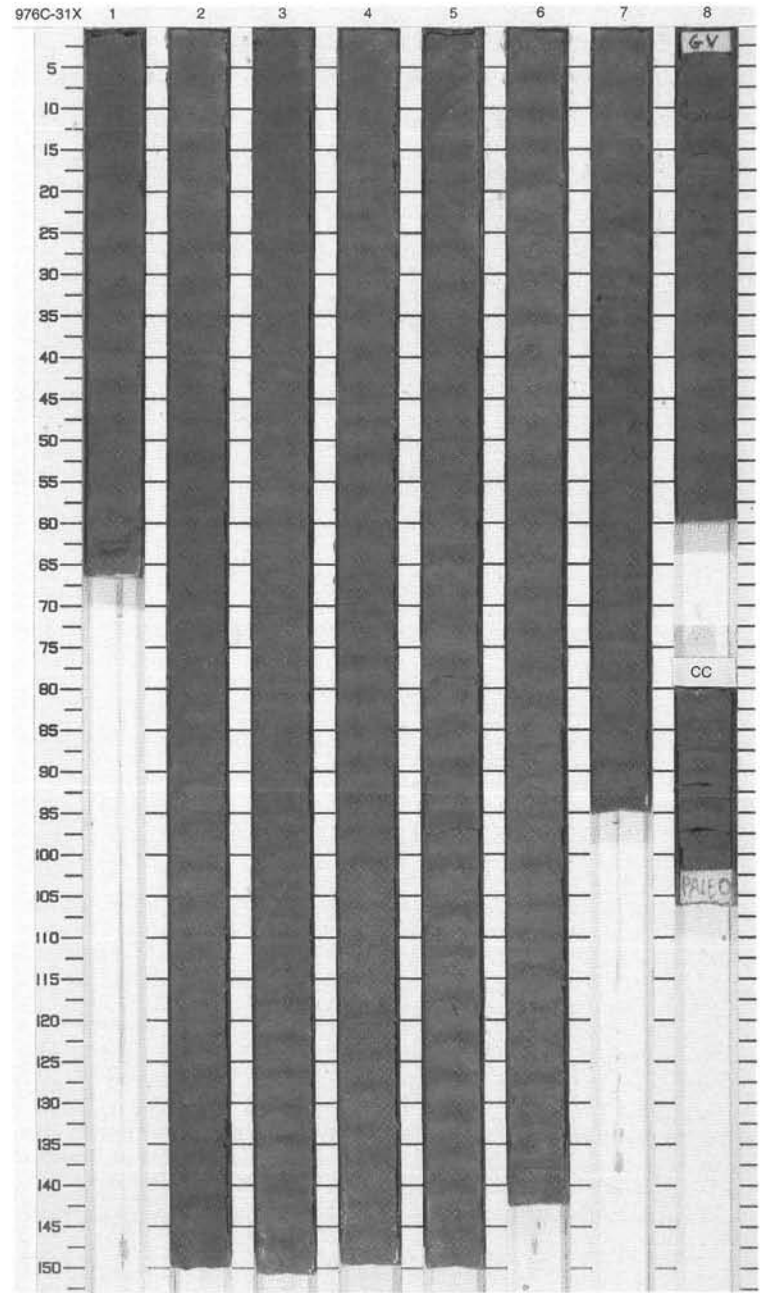
978C-30X Entire core given to palentologists.



SITE 976 HOLE C CORE 31X

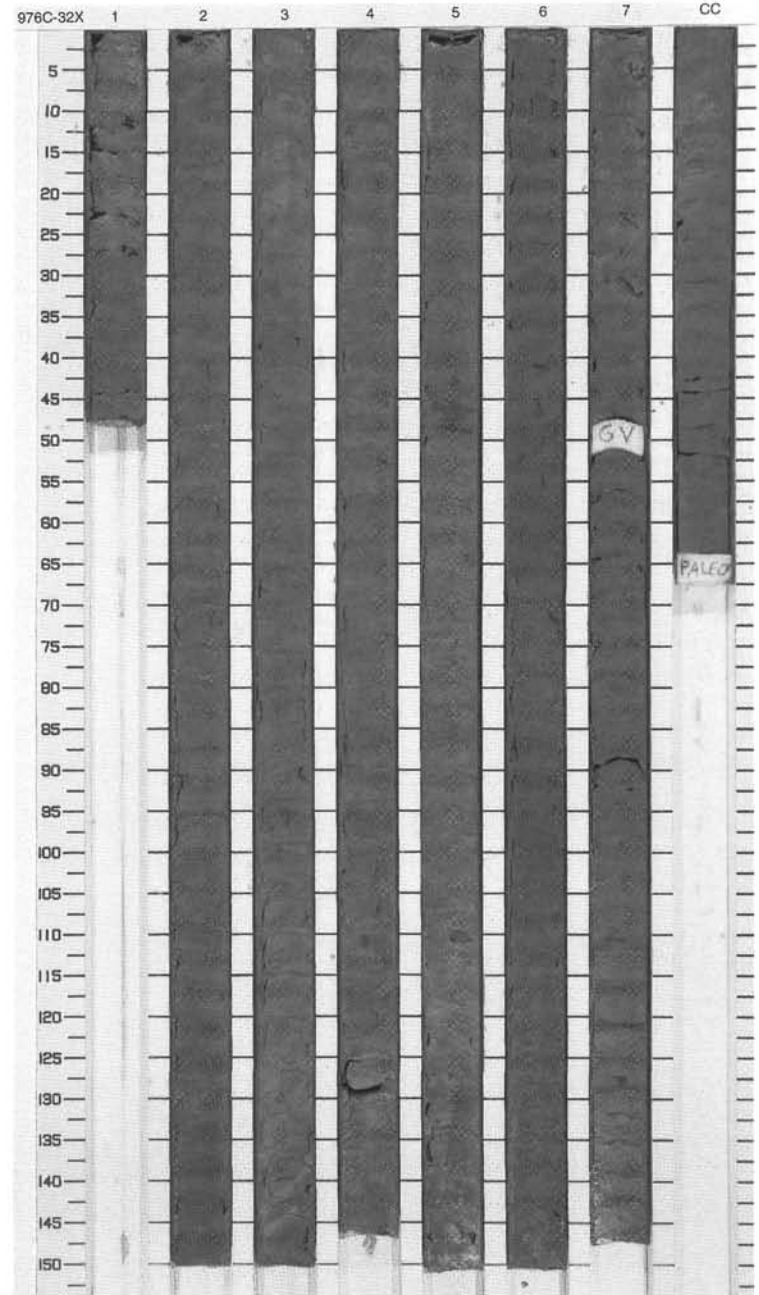
CORED 283.6 - 293.2 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	⌘ ⋈			5GY 4/1	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) to grayish olive (10Y 4/2) NANNOFOSSIL-RICH CLAY with common dispersed shell fragments.</p>
2	[Pattern]	2	⌘ ⋈				
3	[Pattern]	3	⌘ ⋈		S		
4	[Pattern]	4	⌘ ⋈				
5	[Pattern]	4	⌘ ⋈				
6	[Pattern]	5	⌘ ⋈			10Y 4/2	
7	[Pattern]	6	⌘ ⋈				
8	[Pattern]	7	⌘ ⋈		S		
9	[Pattern]	8	⌘ ⋈			5GY 4/1	
	[Pattern]	CC	⌘ ⋈		M		



SITE 976 HOLE C CORE 32X CORED 293.2 - 302.7 mbsf

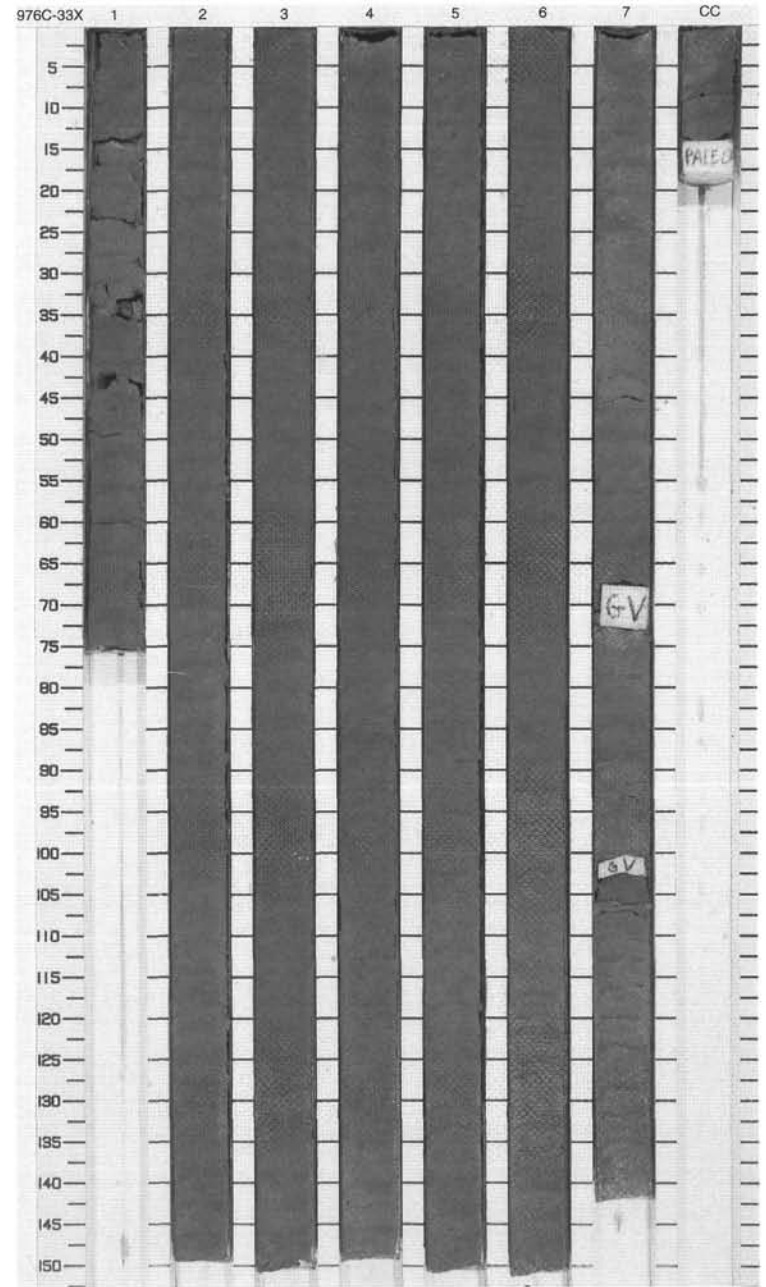
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	∞ ∞	VVV	S	5GY 4/1	<p>NANNOFOSSIL-RICH CLAY, DIATOM-, QUARTZ-RICH CLAY and CALCAREOUS CLAY</p> <p>Major Lithologies: The major lithologies are dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH CLAY, DIATOM-, NANNOFOSSIL-RICH CLAY, and CALCAREOUS CLAY. The transitions between lithologies are not obvious and are probably gradational. The CALCAREOUS CLAY contains 10% nannofossils and 10% micrite.</p> <p>Minor Lithology: Opaque-, nannofossil-rich diatomaceous sandy/silty clay is present as burrow fill.</p>
2	[Dotted pattern]	2		∞ ∞				
3	[Dotted pattern]	3		∞ ∞				
4	[Dotted pattern]	4		∞ ∞				
5	[Dotted pattern]	5		∞ ∞				
6	[Dotted pattern]	6		∞ ∞				
7	[Dotted pattern]	7		∞ ∞				
8	[Dotted pattern]	8		∞ ∞				
9	[Dotted pattern]	9		∞ ∞				
10	[Dotted pattern]	CC		∞ ∞				



SITE 976 HOLE C CORE 33X

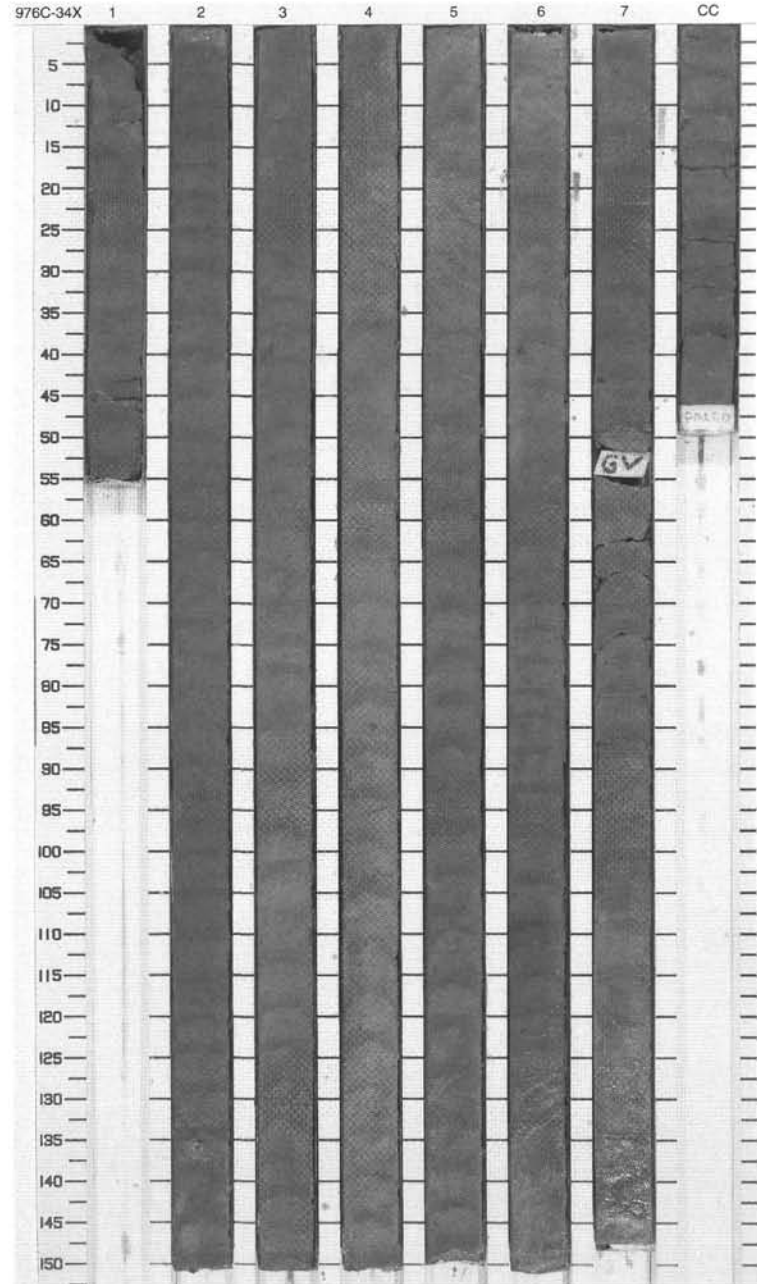
CORED 302.7 - 312.3 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description					
1	[Dotted pattern]	1	~	-	S	5GY 4/1	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL-RICH CLAY, dark greenish gray (5GY 4/1) in color.</p> <p>General Description: The sediment appears to be slightly bioturbated throughout, although the degree of bioturbation is difficult to evaluate because of intense biscuiting induced by drilling. Shell fragments are dispersed throughout. Locally, shells are concentrated into pods or diffuse laminae.</p>					
2		2										
3		3										
4		4										
5		4										
6		5										
7		5										
8		6										
9		7										
		CC									M	



SITE 976 HOLE C CORE 34X CORED 312.3 - 321.9 mbsf

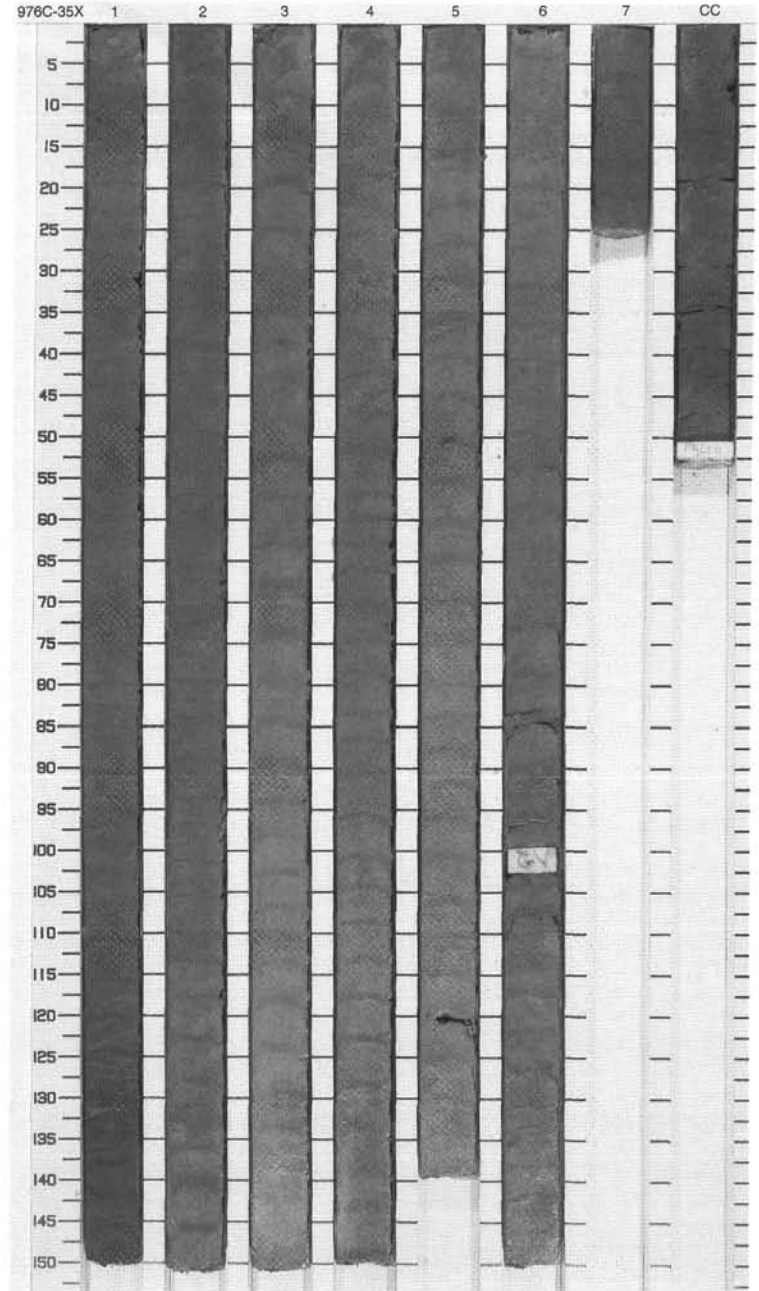
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	☼ (P)				<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is light olive gray (5GY 4/1) NANNOFOSSIL CLAY.</p> <p>General Description: The core consists of drilling biscuits of grayish olive gray (5Y 4/1) NANNOFOSSIL-RICH CLAY alternating with drilling matrix.</p>
2	[Pattern]	2	⌘				
3	[Pattern]	3	⌘ (P)				
4	[Pattern]	4	⌘		S		
5	[Pattern]	5	⌘			5GY 4/1	
6	[Pattern]	5	⌘				
7	[Pattern]	6	⌘				
8	[Pattern]	6	⌘				
9	[Pattern]	7	⌘ (P)				
10	[Pattern]	CC			M		



SITE 976 HOLE C CORE 35X

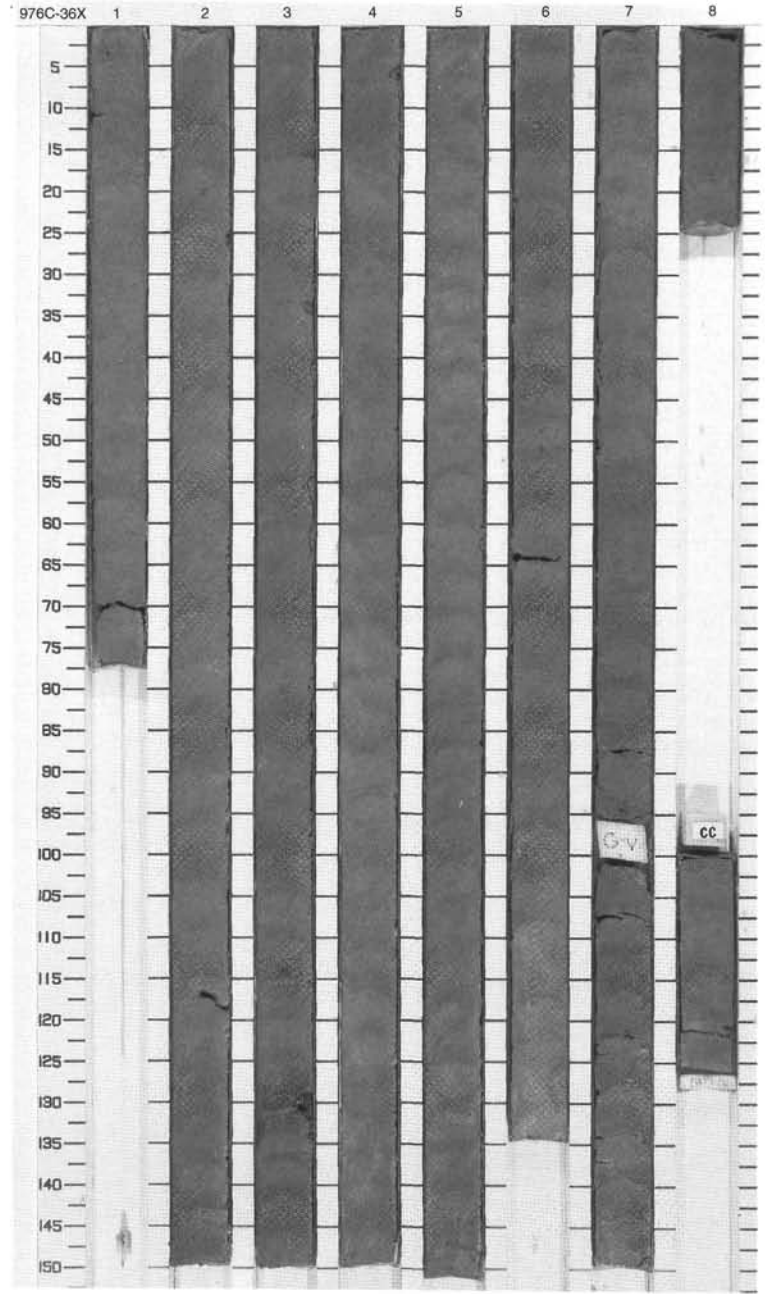
CORED 321.9 - 331.6 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description				
1	[Dotted pattern]	1	Pleistocene	x	S	S	5GY 4/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY with scattered shell fragments.</p>				
2	[Dotted pattern]	2					5Y 4/1					
3	[Dotted pattern]	3					5GY 2/1	S	S	<p>Minor Lithologies: Dark greenish gray (5GY 4/1) calcareous silty clay to clay and olive gray (5Y 4/1) nannofossil-rich clay occur in Sections 1 and 2.</p> <p>General Description: <i>Zoophycos</i> and <i>Chondrites</i> occur at 109-140 cm in Section 1.</p>		
4	[Dotted pattern]	4										
5	[Dotted pattern]	5										
6	[Dotted pattern]	6					M	x	S	S	5GY 2/1	
7	[Dotted pattern]	7										
CC												

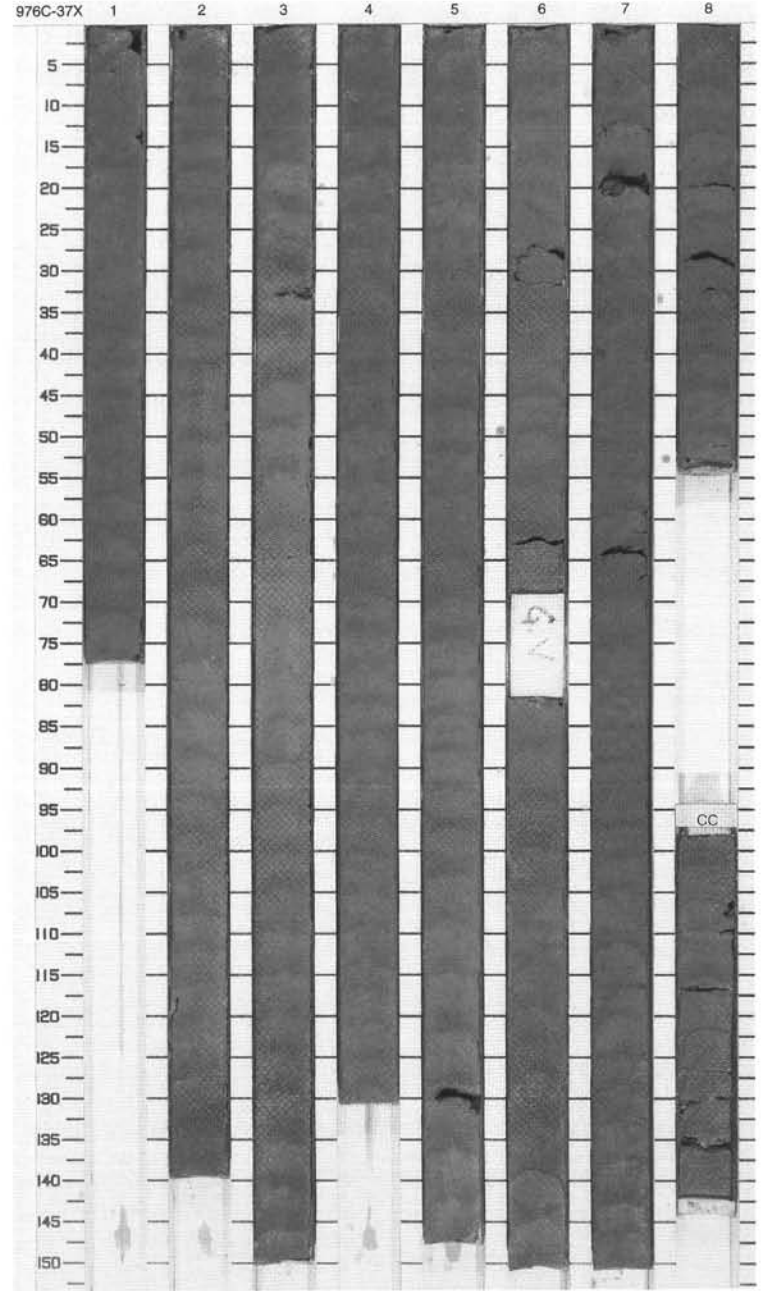


SITE 976 HOLE C CORE 36X CORED 331.6 - 341.1 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description		
1	[Pattern]	1	Pleistocene	X	S	S	5Y 4/1	CALCAREOUS SILTY CLAY Major Lithology: The major lithology is olive gray to dark greenish gray (5Y4/1 to 5GY 4/1) CALCAREOUS SILTY CLAY with scattered shell fragments.		
2	[Pattern]	2								
3	[Pattern]	3								
4	[Pattern]	4								
5	[Pattern]	4								
6	[Pattern]	5								
7	[Pattern]	6							P	
8	[Pattern]	6								
9	[Pattern]	7							P	5GY 4/1
10	[Pattern]	8								
	[Pattern]	CC				M				

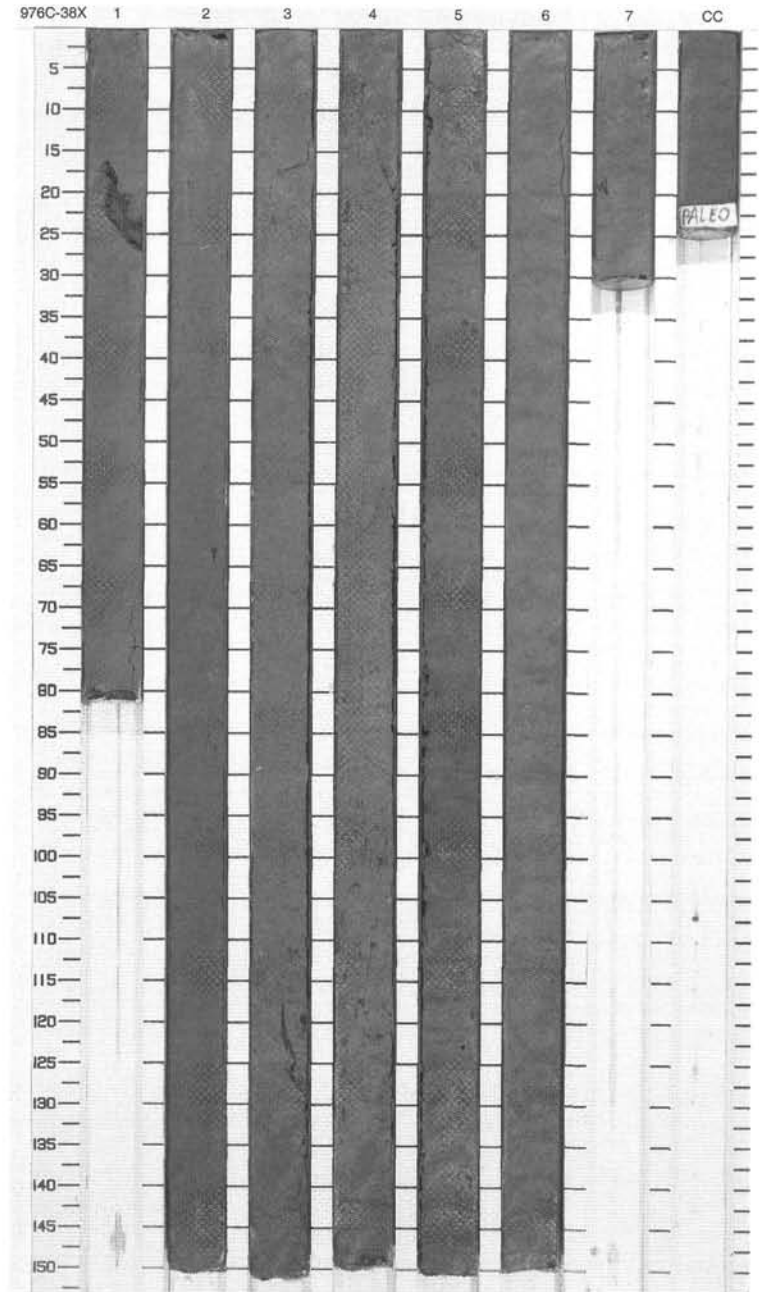


Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted lithology pattern]	1	Pleistocene	(P)		S	5GY 4/1 To 5Y 4/1	NANNOFOSSIL-RICH CLAY TO NANNOFOSSIL-RICH SILTY CLAY Major Lithology: The major lithology is dark greenish gray to olive gray (5GY 4/1 to 5Y 4/1) NANNOFOSSIL-RICH CLAY to NANNOFOSSIL-RICH SILTY CLAY with scattered shell fragments.
2		2						
3		3						
4		4						
5		5						
6		6						
7		7						
8		8						
9		9						
10		10						
		CC				M		



SITE 976 HOLE C CORE 38X CORED 350.8 - 360.4 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	⌘				NANNOFOSSIL-RICH CLAY TO NANNOFOSSIL-RICH SILTY CLAY Major Lithology: The major lithology is dark greenish gray to olive gray (5GY 4/1 to 5Y 4/1) NANNOFOSSIL-RICH CLAY TO NANNOFOSSIL-RICH SILTY CLAY with scattered shell fragments.
2		2	⌘		S		
3		3	⌘				
4		4	⌘				
5		4	⌘			5GY 4/1 To 5Y 4/1	
6		5	⌘			S	
7		6	⌘				
8	6	⌘					
		7	⌘				
		CC	⌘		M		

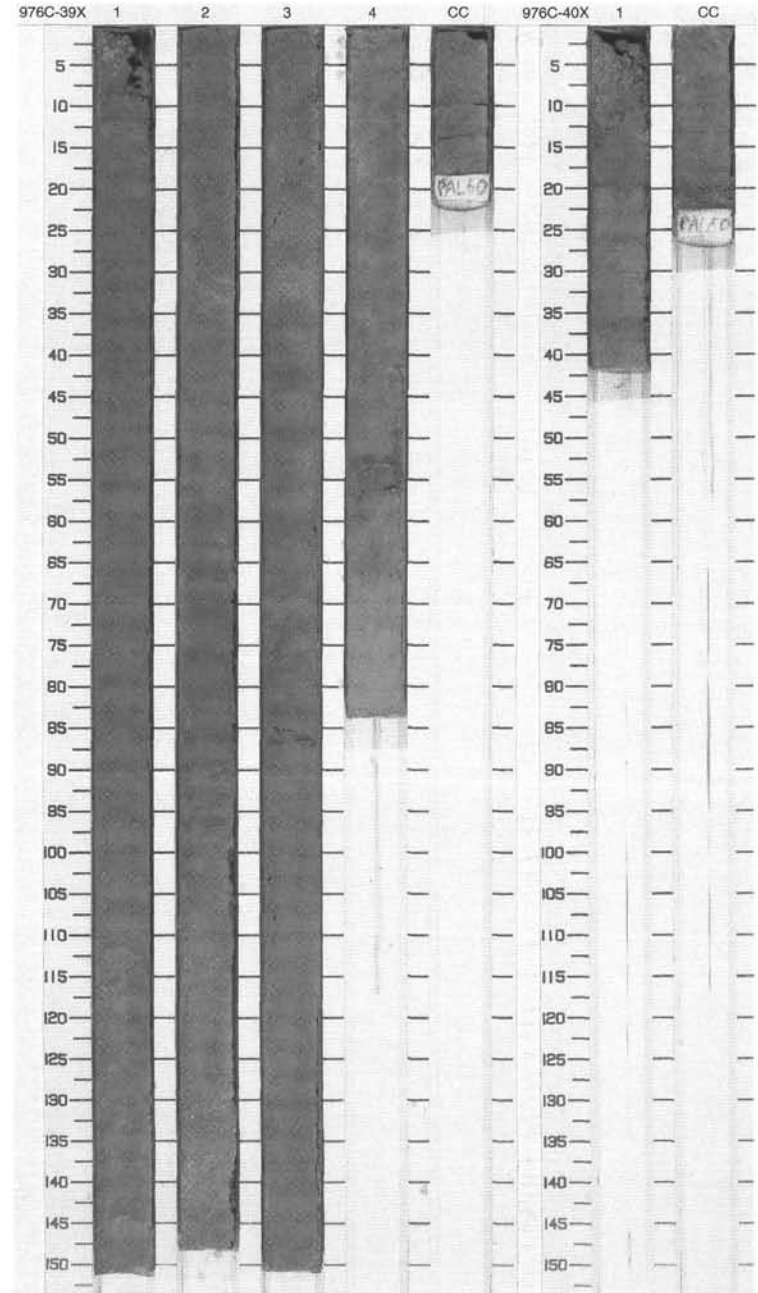


SITE 976 HOLE C CORE 39X CORED 360.4 - 370.1 mbsf

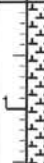
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
0-1	[Graphic Lith. 1]	1	late Pliocene-Pleistocene	~	-	S	5GY 4/1	<p>CALCAREOUS CLAY and CALCAREOUS SILTY CLAY</p> <p>Major Lithologies: The dominant lithology is dark greenish gray (5GY 4/1) CALCAREOUS CLAY to CALCAREOUS SILTY CLAY.</p> <p>Minor Lithologies: Faintly laminated to structureless dark greenish gray (5GY 4/1) to medium dark gray (N4) sandy silt to sandy silty clay occurs in Section 2 at 77-97 cm, in Section 3 at 50-87 cm, and in Section 4 at 50-55 cm. The sand and silt fraction includes quartz, feldspar, mica, metamorphic rock fragments, carbonate, and bioclastic debris.</p>
1-2	[Graphic Lith. 2]	2						
2-3	[Graphic Lith. 3]	3						
3-4	[Graphic Lith. 4]	4						
4-4.5	[Graphic Lith. CC]	CC						
								M

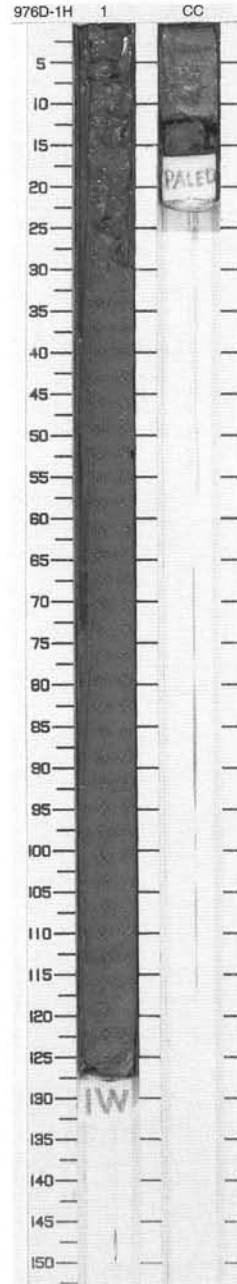
SITE 976 HOLE C CORE 40X CORED 370.1 - 379.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
0-15	[Graphic Lith. 1]	1	late Pliocene	~	www	SMS	5GY 4/1	<p>NANNOFOSSIL-RICH DOLOMITIC SILTY CLAY</p> <p>Major Lithology: The major lithology is a NANNOFOSSIL-RICH DOLOMITIC SILTY CLAY, dark greenish gray (5GY 4/1) in color.</p> <p>Minor Lithology: The minor lithology is a nannofossil-, lithic-, and quartz-rich sandy clay, dark greenish gray (5GY 4/1) in color (CC, 19.5-22 cm).</p> <p>General Description: The top 15 cm of Section 1 is soupy. Sand is also found dispersed in the soupy portion of Section 1 and as a small, discontinuous pocket near the bottom of Section 1.</p>
15-19.5	[Graphic Lith. CC]	CC						



SITE 976 HOLE D CORE 1H CORED 0.0 - 1.5 mbsf

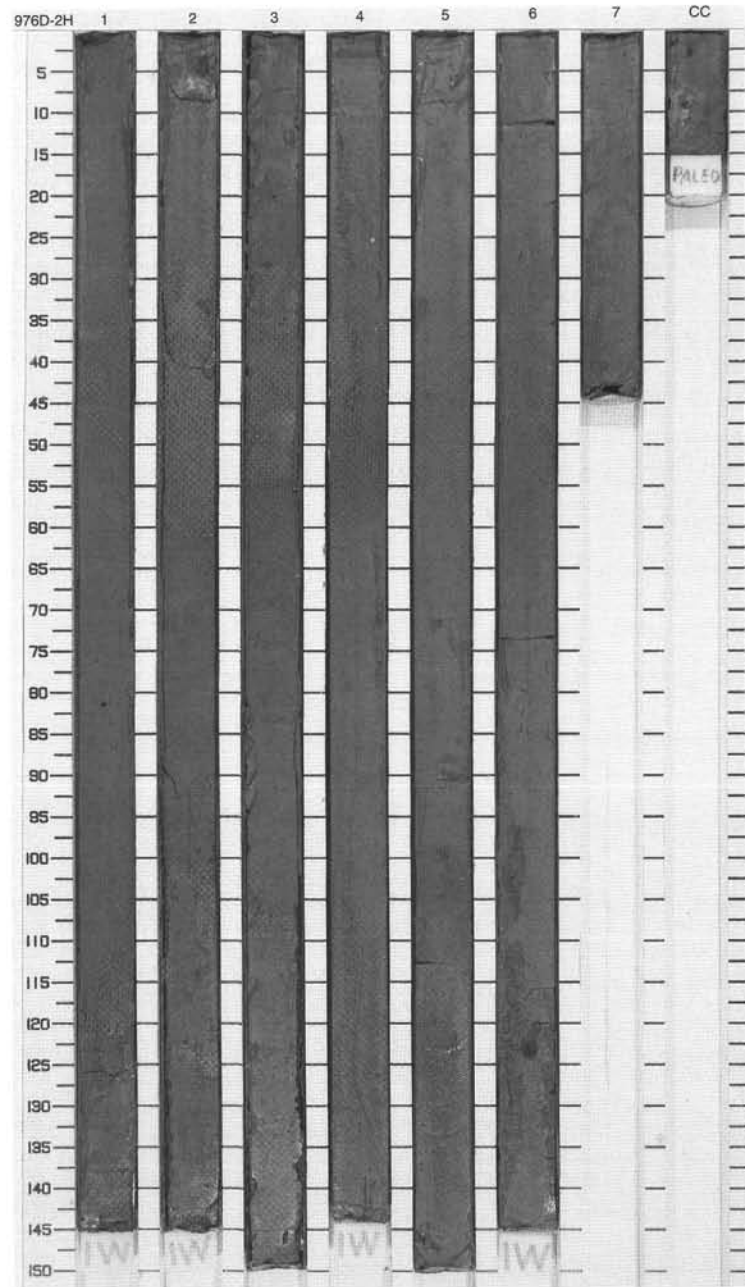
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		1	Pleistocene		○	I M	5Y 5/2	NANNOFOSSIL-RICH CLAY Major Lithology: The major lithology is homogeneous light olive brown (5Y 5/2) NANNOFOSSIL-RICH CLAY.



SITE 976 HOLE D CORE 2H

CORED 1.5 - 11.0 mbsf

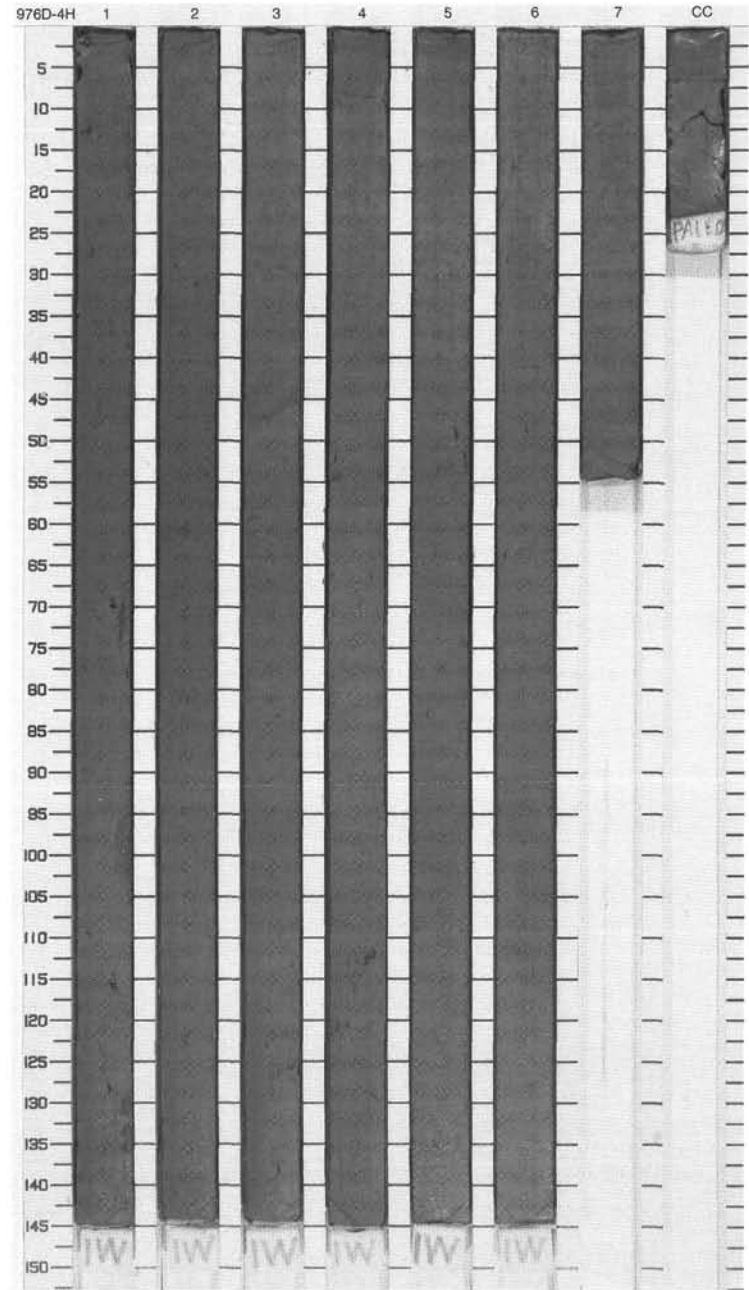
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	Pleistocene	~ ~ ~ ~ ~ ~ ~ ~ ~		S	10Y 4/2	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL-RICH CLAY that varies in color from grayish olive (10Y 4/2) to light olive gray (5Y 5/2) to olive gray (5Y 4/1). Slight to moderate bioturbation is evident throughout the core. Complete shells (pelecypods and gastropods) and shell fragments are common, especially in Sections 1 through 3. Flecks of opaque minerals are dispersed throughout the core and in places are concentrated in pods (burrow fill?).</p> <p>Minor Lithology: A pod of nannofossil, quartz-rich sandy clay is located in Section 6 at 123-125 cm.</p>
2	[Pattern]	2		~ ~ ~ ~ ~ ~ ~ ~ ~		I		
3	[Pattern]	3		~ ~ ~ ~ ~ ~ ~ ~ ~		S		
4	[Pattern]	3		~ ~ ~ ~ ~ ~ ~ ~ ~			5Y 5/2 To 5Y 4/1	
5	[Pattern]	4		~ ~ ~ ~ ~ ~ ~ ~ ~				
6	[Pattern]	5		~ ~ ~ ~ ~ ~ ~ ~ ~		I	10Y 4/2 To 5Y 4/1	
7	[Pattern]	5		~ ~ ~ ~ ~ ~ ~ ~ ~		S		
8	[Pattern]	6		~ ~ ~ ~ ~ ~ ~ ~ ~				
9	[Pattern]	7		~ ~ ~ ~ ~ ~ ~ ~ ~		S		
		CC				M		



SITE 976 HOLE D CORE 4H

CORED 20.5 - 30.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	Pleistocene	[Wavy lines]	(P)	S	10Y 4/2	<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL-RICH CLAY. Color ranges from grayish olive (10Y 4/2) to olive gray (5Y 4/1) and dark greenish gray (5GY 4/1). Pyrite is dispersed throughout the core and concentrated as burrow fill. Bioturbation has produced mottling and color-banding.</p>
2	[Dotted pattern]	2		I	(P)	I	10Y 4/2 To 5Y 4/1	
3	[Dotted pattern]	3		I	(P)	I		
4	[Dotted pattern]	4		S	(P)	S		
5	[Dotted pattern]	5		I	(P)	I	5Y 4/1	
6	[Dotted pattern]	6		S	(P)	S		
7	[Dotted pattern]	7		I	(P)	I	10Y 4/2	
8	[Dotted pattern]	8	I		I	5Y 4/1		
9	[Dotted pattern]	9	I		I	5GY 4/1		
		CC				M		



SITE 976 HOLE E CORE 1R CORED 543.8 - 553.4 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	early Pliocene	}}		S	5Y 4/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The main lithology is olive gray (5Y 4/1; 5Y 5/2) to light olive gray (5Y 6/1) NANNOFOSSIL CLAY with scattered grayish black (N2) minerals (pyrite?).</p> <p>General Description: Burrows occur throughout the core.</p>
2		S				5Y 6/1		
3						5Y 4/1		
4		P				5Y 6/1		
5		P				5Y 5/2		
6		P				5Y 4/1		
7		M				5Y 5/2		
		CC						

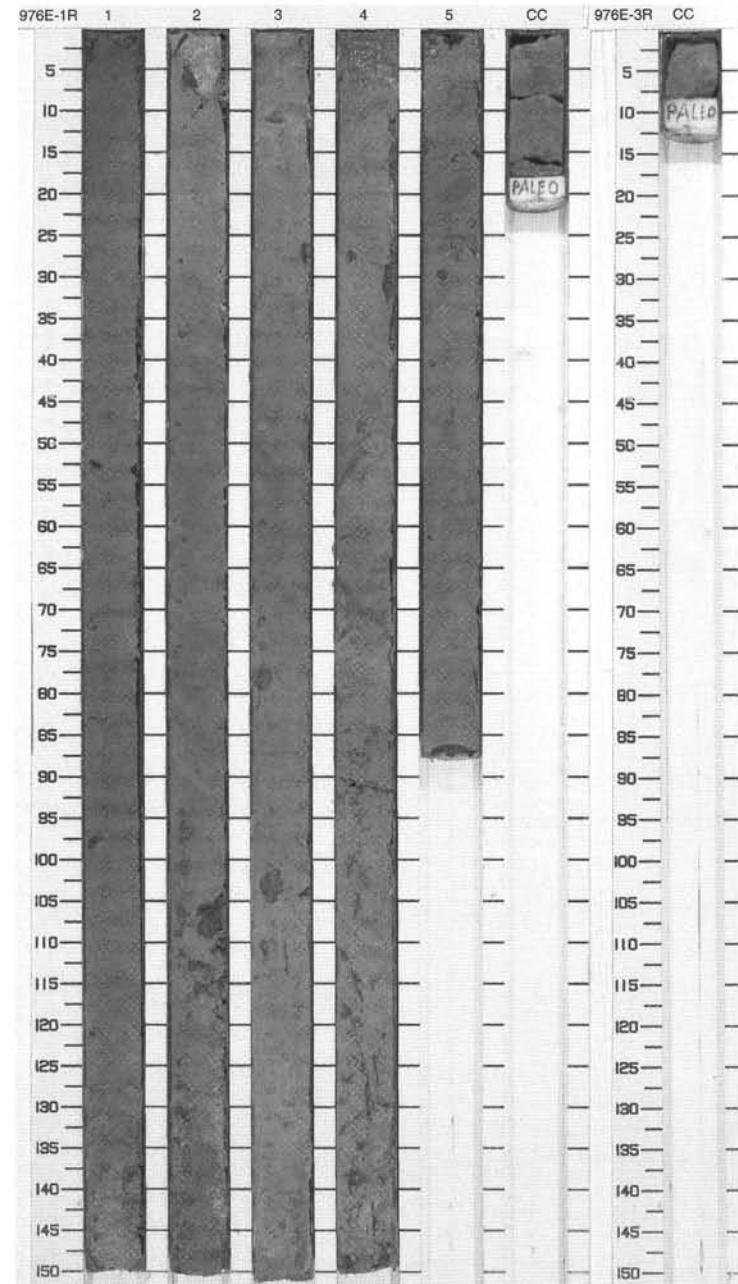
976E-02R NO RECOVERY

SITE 976 HOLE E CORE 3R CORED 563.1 - 572.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		CC						<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The lithology is olive gray (5Y 4/1) NANNOFOSSIL-CLAY.</p> <p>General Description: Only 12 cm recovered in Core Catcher. 5 cm was given to the paleontologists. Age is late Miocene.</p>

976E-04R NO RECOVERY

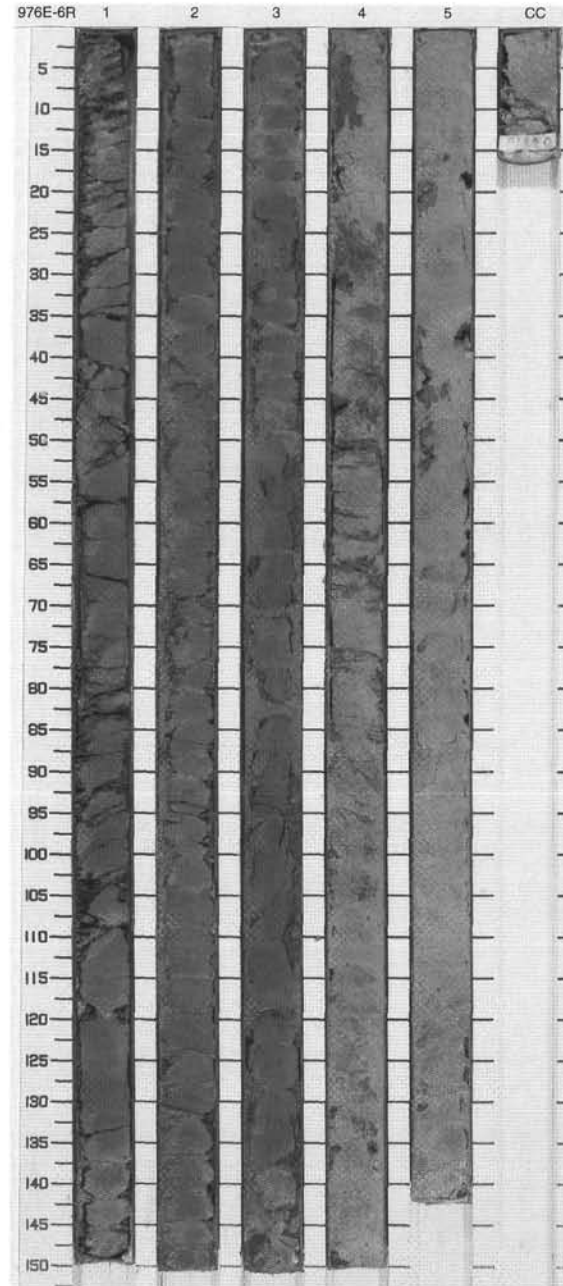
976E-05R NO RECOVERY



SITE 976 HOLE E CORE 6R

CORED 582.3 - 592.0 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	late Miocene	[Wavy lines]	[Vertical wavy lines]	S		<p>CALCAREOUS CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray to olive gray (5GY 4/1 to 5Y 4/1) bioturbated CALCAREOUS CLAY.</p> <p>Minor Lithology: Grayish olive (10Y 4/2) to olive gray (5Y 4/1) nannofossil clay is present in Sections 2, 4, and 5.</p>
2	[Dotted pattern]	2				S	5GY 4/1	
3	[Dotted pattern]	3				S		
4	[Dotted pattern]	4					5Y 4/1	
5	[Dotted pattern]	5				S	5GY 4/1 To 5Y 4/1	
6	[Dotted pattern]							
7	[Dotted pattern]							
		CC				M		



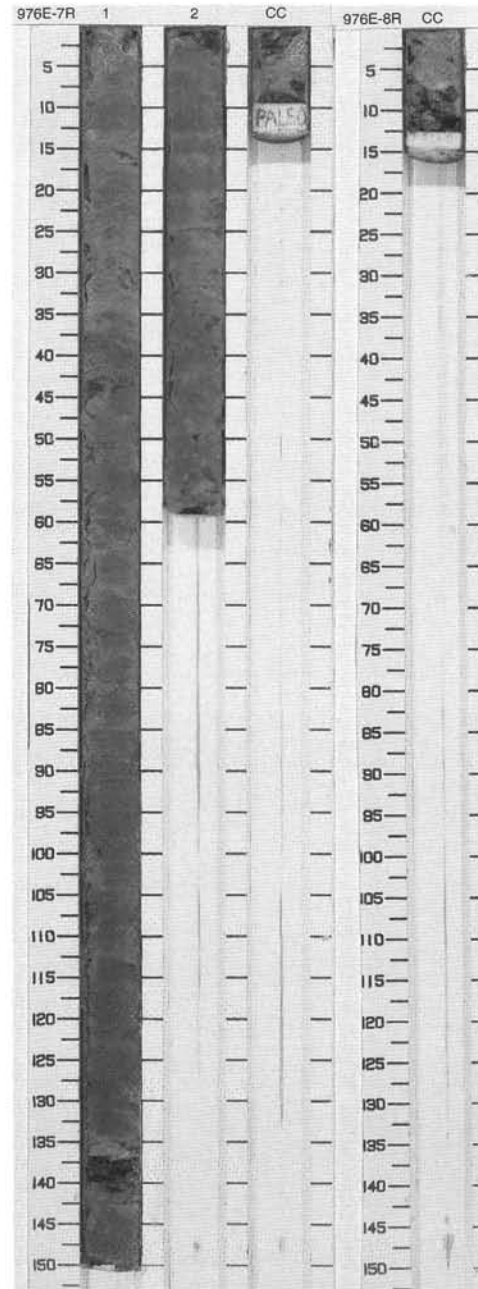
SITE 976 HOLE E CORE 7R CORED 592.0 - 601.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Symbol]	1	late Miocene	[Symbol]	[Symbol]	S	5GY 4/1 To 5Y 4/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1) to olive gray (5Y 4/1), fractured NANNOFOSSIL CLAY with dispersed foraminifers throughout.</p>
2	[Symbol]	2		[Symbol]	[Symbol]	M		

SITE 976 HOLE E CORE 8R CORED 601.7 - 611.3 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		CC						<p>NANNOFOSSIL-RICH CLAY</p> <p>Major Lithology: The lithology present in this core is NANNOFOSSIL-RICH CLAY, light olive gray (5Y 6/1) in color. The sediment is slightly bioturbated and is color mottled.</p> <p>General Description: 3 cm given to the paleontologists. Age is late Miocene.</p>

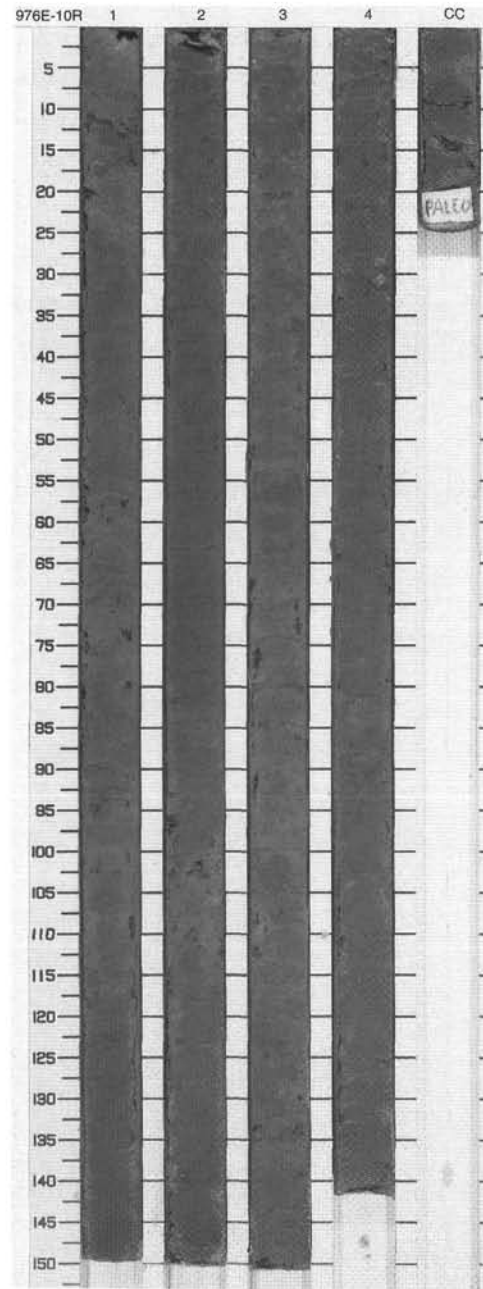
976E09R NO RECOVERY



SITE 976 HOLE E CORE 10R

CORED 620.9 - 630.6 mbsf

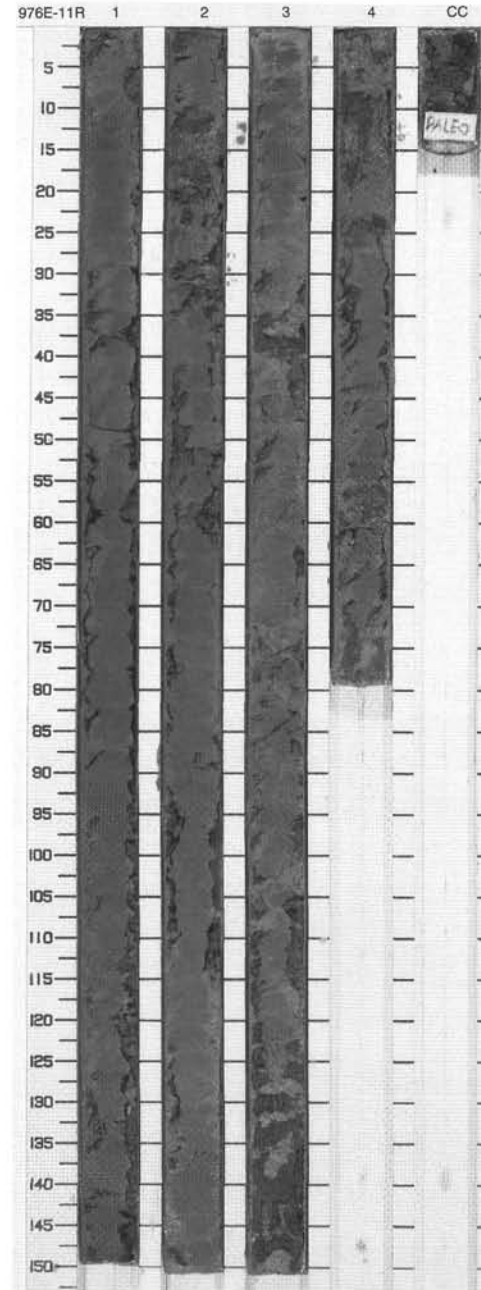
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	late Miocene	}}	-	S	5GY 4/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The main lithology is grayish olive (10Y 4/2; dominant) to dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY.</p> <p>General Description: The sediment is moderately bioturbated throughout. A few discrete burrows are recognizable.</p>
2	[Dotted pattern]	2						
3	[Dotted pattern]	3						
4	[Dotted pattern]	4						
5	[Dotted pattern]	4						
6	[Dotted pattern]	CC					M	



SITE 976 HOLE E CORE 11R

CORED 630.6 - 640.2 mbsf

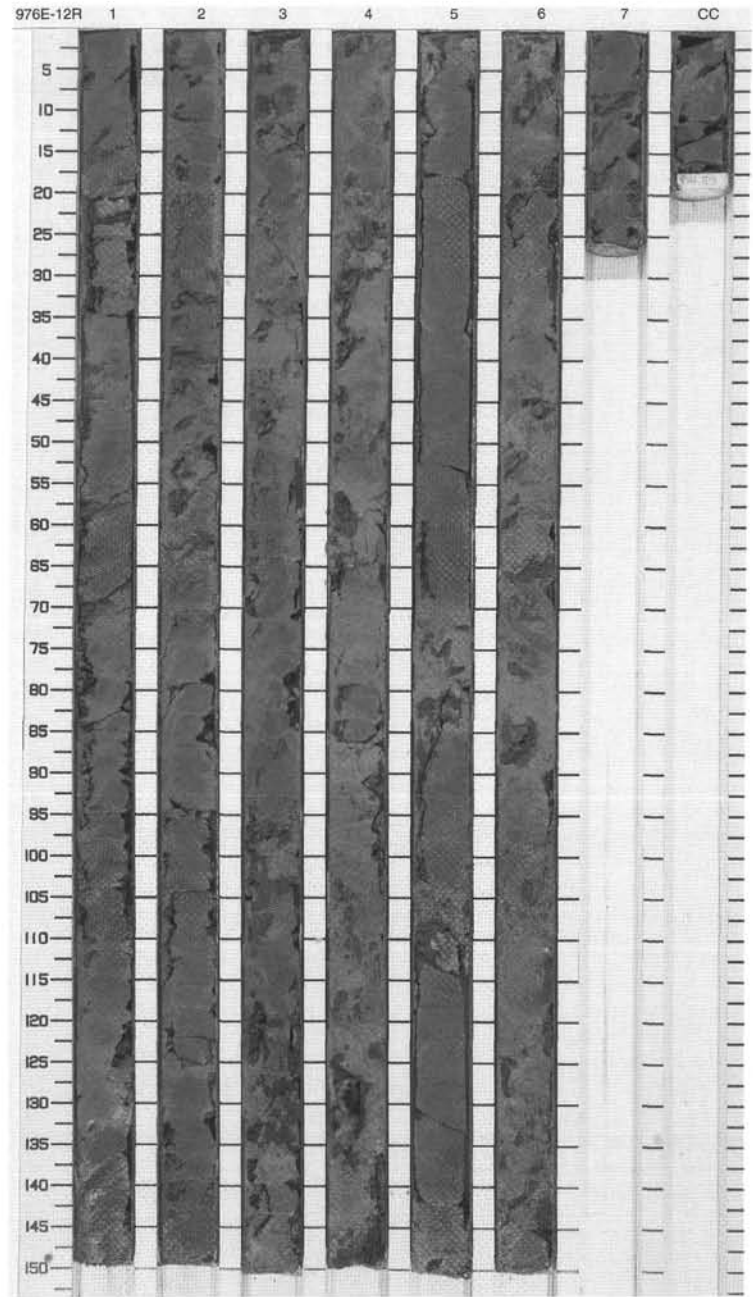
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	late Miocene	P	-	S	5Y 4/1	NANNOFOSSIL-RICH CLAY TO CALCAREOUS CLAY Major Lithology: The major lithologies are olive gray and light olive gray (5Y 4/1, 5Y 5/2) to dark greenish gray (5GY 4/1) NANNOFOSSIL-RICH CLAY TO CALCAREOUS CLAY.
2		2						
3		3						
4		4						
5		CC				M	5Y 5/2 To 5GY 4/1	



SITE 976 HOLE E CORE 12R

CORED 640.2 - 649.8 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	~		S		CALCAREOUS SILTY CLAYSTONE TO CALCAREOUS CLAYSTONE Major Lithology: The major lithology is olive gray (5Y 4/1) to light olive gray (5GY 4/1) CALCAREOUS SILTY CLAYSTONE TO CALCAREOUS CLAYSTONE.
2	[Dotted pattern]	2	~		S	5Y 4/1 To 5GY 4/1	
3	[Dotted pattern]	3	~				
4	[Dotted pattern]	4	~			5GY 4/1	
5	[Dotted pattern]	5	~				
6	[Dotted pattern]	6	~		S	5Y 5/2	
7	[Dotted pattern]	7	~			5Y 4/1 To 5GY 4/1	
8	[Dotted pattern]	CC	~		M		



SITE 976 HOLE E CORE 13R

CORED 649.8 - 659.4 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	middle Miocene	P		S	5GY 4/1	<p>NANNOFOSSIL CLAYSTONE and METAMORPHIC ROCKS</p> <p>Major Lithologies: The dominant lithologies are dark greenish gray (5GY 4/1) NANNOFOSSIL CLAYSTONE and METAMORPHIC ROCKS.</p> <p>Minor Lithologies: The transition from NANNOFOSSIL CLAYSTONE to METAMORPHIC ROCKS is marked by a thin sequence of dark greenish gray (5GY 4/1) to light olive gray (5Y 5/2) calcareous silty claystone, glauconite-bearing sandy silty clay, and a few cobble- to pebble-sized pieces of granite and metamorphic rocks.</p>
2		2				S		
3		3				S		



161-976B-73X-1



Piece number	Graphic representation	Orientation	Shipboard studies	Structure
1		—		
2		—	XRF	
3				
4		—		
5		—	P TSB	
6		—	—	

Piece 1

ROCK TYPE: SANDSTONE
PRIMARY MINERALOGY: Quartz, weathered feldspar, biotite, garnet, dark-green lithic fragments.
TEXTURAL DESCRIPTION: Heterolithic poorly sorted sandstone, pale greenish yellow, with grains up to 1 mm. One echinoid spine, foraminifers.

Piece 2

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar, tourmaline, biotite.
TEXTURAL DESCRIPTION: Very pale greenish white medium-grained (1–2 mm) equigranular with green chlorite alteration.

Piece 3

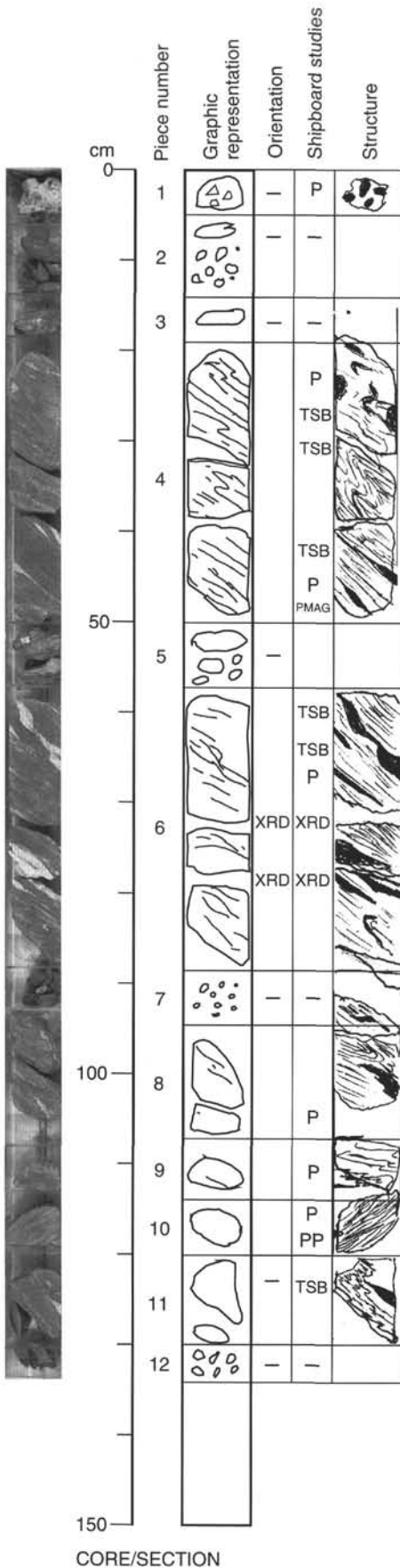
ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Medium dark gray fine-grained biotite schist. Moderate foliation: weak compositional banding and biotite orientation. Chlorite alteration on surface parallel to foliation. Isoclinally folded mm-scale quartz vein.

Piece 4

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Fine-grained biotite schist. Biotite concentrations around veins particularly in fold hinges. Calcareous(?) film on fracture surfaces. Mm- to cm-scale quartz vein with asymmetric folds.

Pieces 5–6

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, 1-mm gray plagioclase, 1-mm sillimanite needles, 1- to 2-mm garnet, minor muscovite.
TEXTURAL DESCRIPTION: Fine-grained biotite schist. Tight 2- to 5-mm-scale asymmetric folds affect faint compositional banding. Biotite fabric may be axial-planar to folds. 6-mm quartz vein associated with 1- to 2-mm selvage of green chlorite. 7-mm fissure filled with coarse sand resembling Piece 1.



Piece 1

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Calcite, biotite, lithic fragments.

TEXTURAL DESCRIPTION: Breccia with angular to subrounded fragments up to 3 cm of fine-grained biotitic high-grade schist, in a light greenish matrix. Matrix is very fine-grained calcite with scattered biotite flakes and lithic fragments. Also, clasts of vein quartz, and laminated fine-grained carbonate.

Pieces 2-5

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, andalusite.

TEXTURAL DESCRIPTION: Fine- to medium-grained, medium gray, well-foliated quartz-biotite-garnet schist. 1-2% of 1- to 2-mm garnet, appears altered, broken, or resorbed. Piece 4C has randomly oriented prismatic porphyroblasts of andalusite up to 8 mm long. 0.5-mm-scale lamination of quartz and biotite parallel to foliation. 2-mm quartz veins with irregular tight to isoclinal folds. Weak biotite lineation on foliation surfaces. Piece 4A has a 2-cm green band of alteration that cuts obliquely across the foliation.

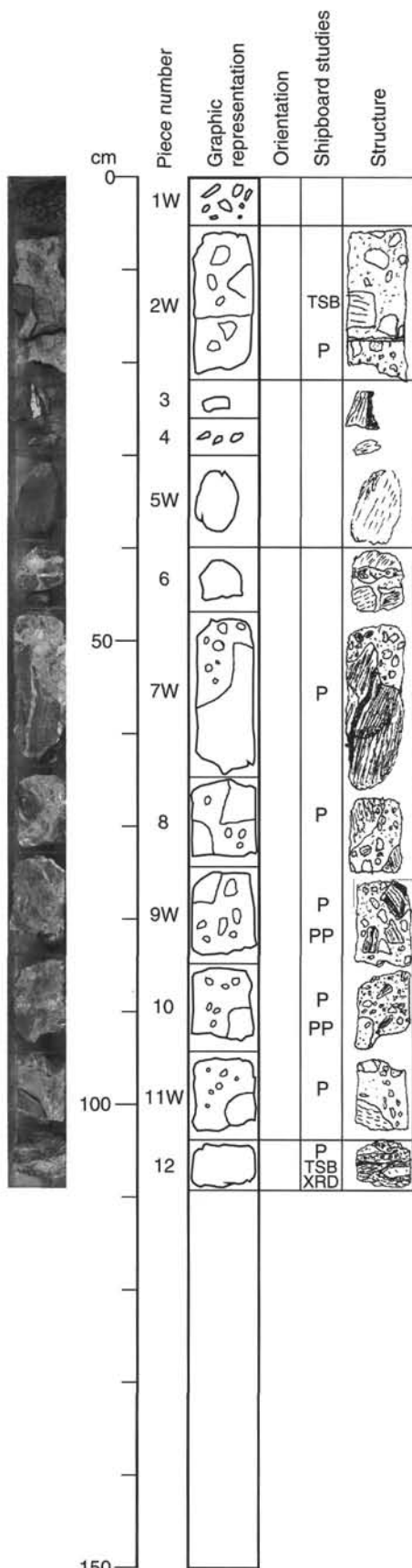
Pieces 6-12

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, feldspar, sillimanite, garnet.

TEXTURAL DESCRIPTION: Medium-grained quartz-biotite schist with approximately 1% of 1-mm corroded garnet. Foliation defined by oriented biotite and 2-mm quartz laminae, refolded by 1- to 5-mm-scale asymmetric folds. Foliation varies from finely laminated and strong to diffuse, apparently due to growth of randomly oriented biotite and feldspar, 1- to 20-mm quartz veins with large recrystallized grains, and randomly oriented large flakes of biotite partially altered to chlorite. The veins show asymmetric folding and strong asymmetric boudinage. Good biotite and sillimanite lineation on foliation surfaces. Garnet becomes progressively more altered downward through Piece 6.

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CORE/SECTION

Piece 1

ROCK TYPE: CLAYSTONE
PRIMARY MINERALOGY: Clay.
TEXTURAL DESCRIPTION: Dark greenish gray claystone with abundant foraminifers.

Piece 2

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Clay, calcite, lithic fragments.
TEXTURAL DESCRIPTION: Totally unsorted breccia with fragments from 0.1- to 50-mm. Fragments are angular, unoriented. Clast types: dark gray biotite schist, including largest clasts (50%, one has coarse garnet), vein quartz (30%), gray-green calcareous silty claystone (10%, nonrounded fragments, some adhering to larger schist clasts), and grayish fine-grained marble (<1%). Matrix is light greenish gray calcareous clay.

Pieces 3-5

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, garnet.
TEXTURAL DESCRIPTION: Grey biotite schist with rare garnet. Quartz vein in Piece 3 is brecciated with schist fragments. Piece 5 has prismatic sillimanite(?), and idiomorphic garnet(?) (1-5 mm). Garnet has many inclusions and appears altered.

Piece 6

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Mainly 1- to 2-cm fragments of gray garnet biotite schist and pale gray-green vein quartz. Small amount of pale gray poorly sorted microbreccia forms matrix.

Piece 7

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: 13-cm-long fragment of biotite schist in contact with breccia. Schist has a 0.5- to 1.5-mm differentiated foliation, 5-mm white quartz vein, and pale green quartz vein. Breccia resembles Piece 2.

Piece 8

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Breccia. Half the sample is made up of two large pieces of biotite schist with similar orientation, separated by 1-5 cm of breccia. Breccia resembles Piece 2.

Piece 9

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Breccia. Similar to Piece 2, but clasts are almost all gray biotite schist and vein quartz, and there seems to be a lower proportion of matrix.

Piece 10

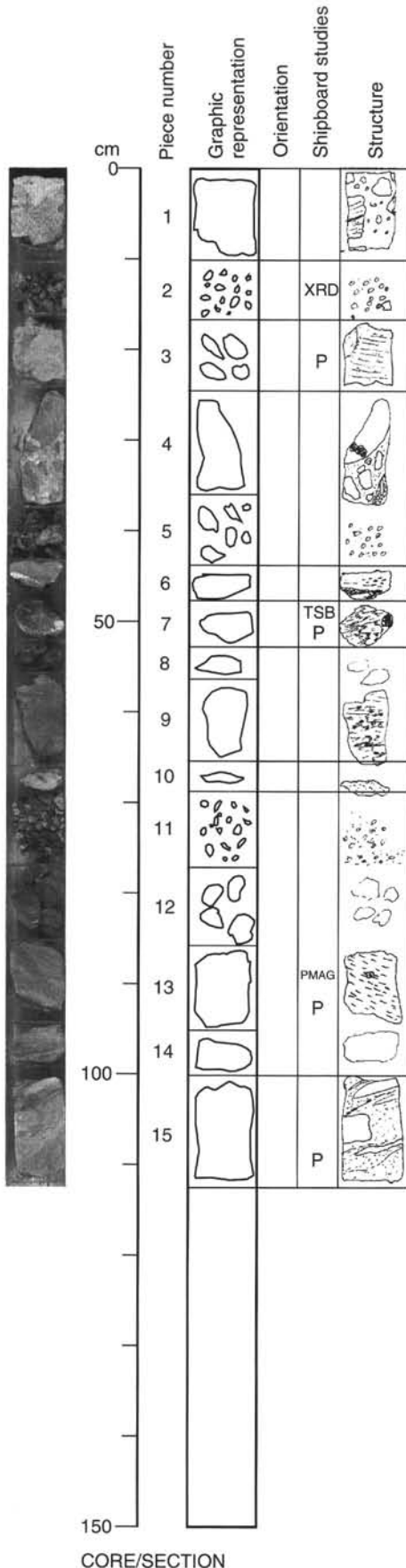
ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, biotite, garnet, epidote(?), calcite, clay.
TEXTURAL DESCRIPTION: Breccia. Clasts of gray biotite schist with garnet (85%), vein quartz (10%), greenish gray calcareous silty claystone (5%). Also isolated crystals of garnet and epidote(?).

Piece 11

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, biotite, garnet, calcite, clay.
TEXTURAL DESCRIPTION: Breccia. 4-cm clasts of biotite schist. Remainder is matrix-dominated pale greenish gray microbreccia with vein quartz (50%), <0.1- to 6-mm clasts of schist (35%), and single garnet crystals (15%). Matrix resembles silty calcareous claystone.

Piece 12

ROCK TYPE: CALC-SILICATE ROCK
PRIMARY MINERALOGY: Calcite, garnet, green clay.
TEXTURAL DESCRIPTION: Retrogressed banded garnet rock with calcite, dark green mineral. Red garnet in folded 5-mm vein or layer.



Pieces 1-3

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, calcite, clay.

TEXTURAL DESCRIPTION: Light greenish gray breccia. Completely unsorted, but visually appears to be about 50% clasts, 50% matrix. Clasts in fact range from <0.1 to 40 mm. Clasts: biotite schist 35%, silty claystone 35%, vein quartz 20%, garnet single crystals 1%. In Piece 3 there is a vertical slip surface with horizontal striations, and a film of fibre-lined calcite.

Piece 4

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, biotite.

TEXTURAL DESCRIPTION: Breccia, similar to Piece 1, but visually 65% clasts, 35% matrix. Clasts are all schist and vein quartz.

Piece 5

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, clay.

TEXTURAL DESCRIPTION: Soft clayey microbreccia. Clasts <5 mm.

Pieces 6-9

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, garnet.

TEXTURAL DESCRIPTION: Quartz-biotite schist with minor garnet. Biotite 0.1 mm, locally up to 0.5 mm. Foliation is defined by oriented biotite and 1-2 mm elongate blebs of quartz and sillimanite. Foliation strongly folded on 1 and 10 mm scales.

Piece 10 (Archive only)

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, calcite, clay.

TEXTURAL DESCRIPTION: Light greenish gray breccia with fragments of biotite schist up to 10 mm in a calcareous clayey matrix.

Pieces 11-12

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, garnet.

TEXTURAL DESCRIPTION: Gray schist with partly altered garnet.

Pieces 13-14

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, garnet, sillimanite, muscovite.

TEXTURAL DESCRIPTION: Banded rock composed of 2- to 10-mm bands rich in garnet, muscovite and retrogressive chlorite; 5- to 10-mm bands rich in sillimanite, well oriented parallel to the foliation; 5- to 10-mm bands of biotite schist. Strong planar fabric defined by banding and by oriented mica and sillimanite. Possible altered feldspar in Piece 14.

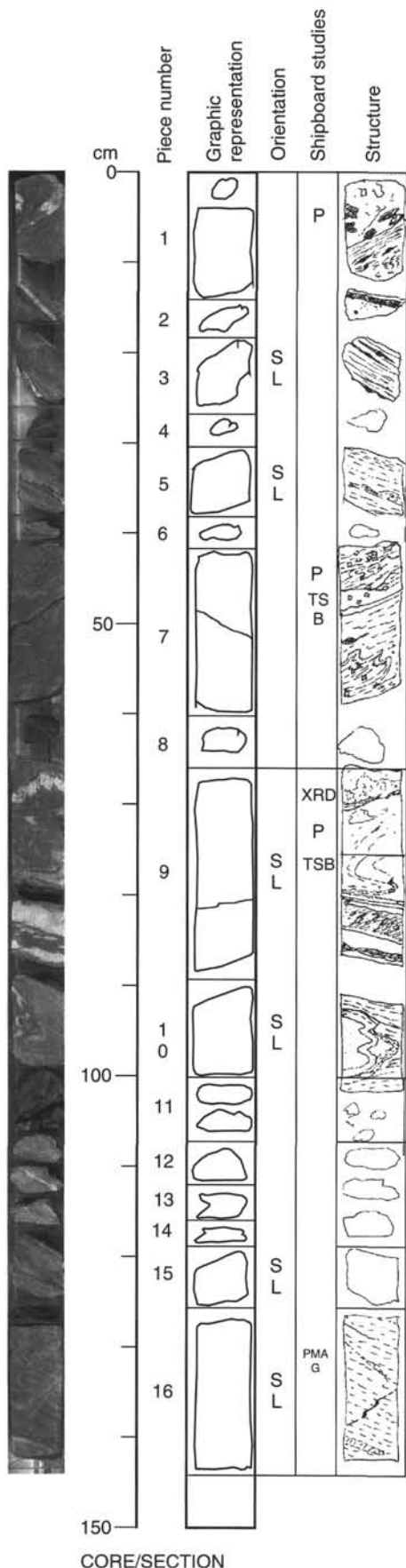
Piece 15

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, garnet, muscovite, albite(?), chlorite, carbonate mineral, pyrite.

TEXTURAL DESCRIPTION: Top 3 cm of piece is relatively unaltered quartz-biotite-garnet schist and quartz vein. Asymmetric tails of chlorite and muscovite around 1- to 2-mm garnet suggest top to west shear sense. Remainder of piece is made up of irregular veins of milky quartz, albite(?) + chlorite, and carbonate mineral as patchy alteration of the schist. Relict garnet, dispersed pyrite.

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CORE/SECTION

Pieces 1-8

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, garnet, sillimanite, andalusite, pyrite.

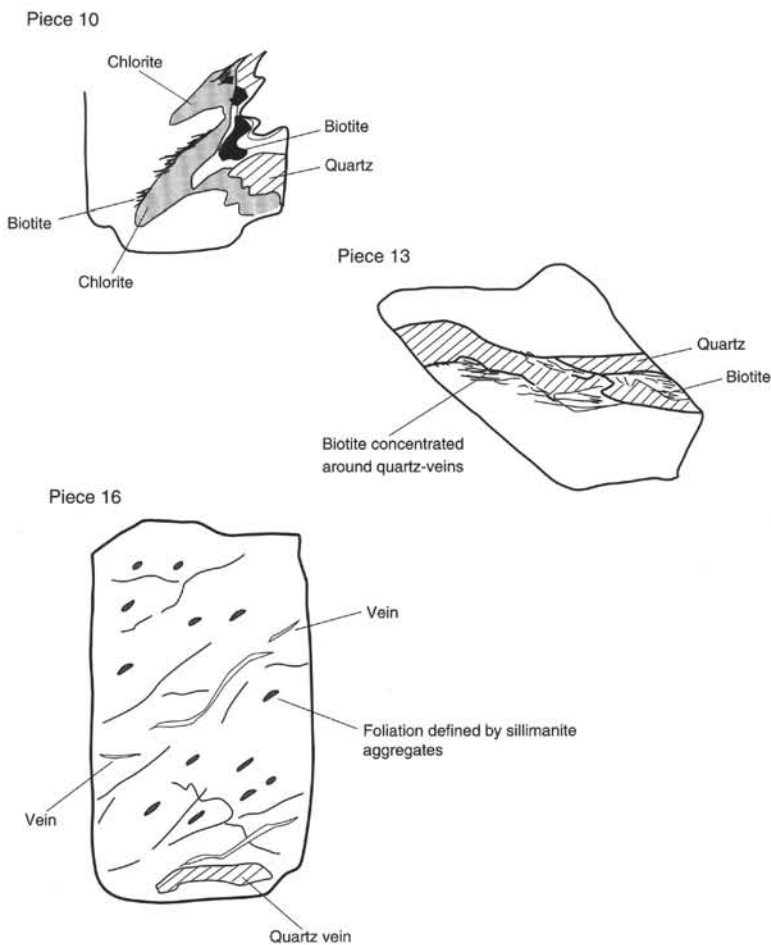
TEXTURAL DESCRIPTION: Schist, with differentiated foliation defined by quartz and biotite laminae, and oriented biotite and sillimanite. 1- to 5-mm garnet, 2- to 10-mm randomly oriented prismatic andalusite that appears to overgrow the foliation. Layer rich in garnet and pyrite in Piece 1 is folded and disrupted. Good sillimanite lineation on foliation surfaces in Pieces 3 and 5, and sillimanite is oriented parallel to axial plane of minor fold in Piece 4. Asymmetric folds in Piece 7. Vein at low angle to foliation in Piece 1 has quartz, zoned or altered porphyroblasts of garnet(?), and coarse muscovite. Disrupted layer in Piece 3 has garnet, muscovite and chlorite(?) 2-cm-wide zone of veining and alteration in Piece 5 has an inner 6- to 8-mm zone rich in chlorite and calcite, and an outer zone of fine grained carbonate.

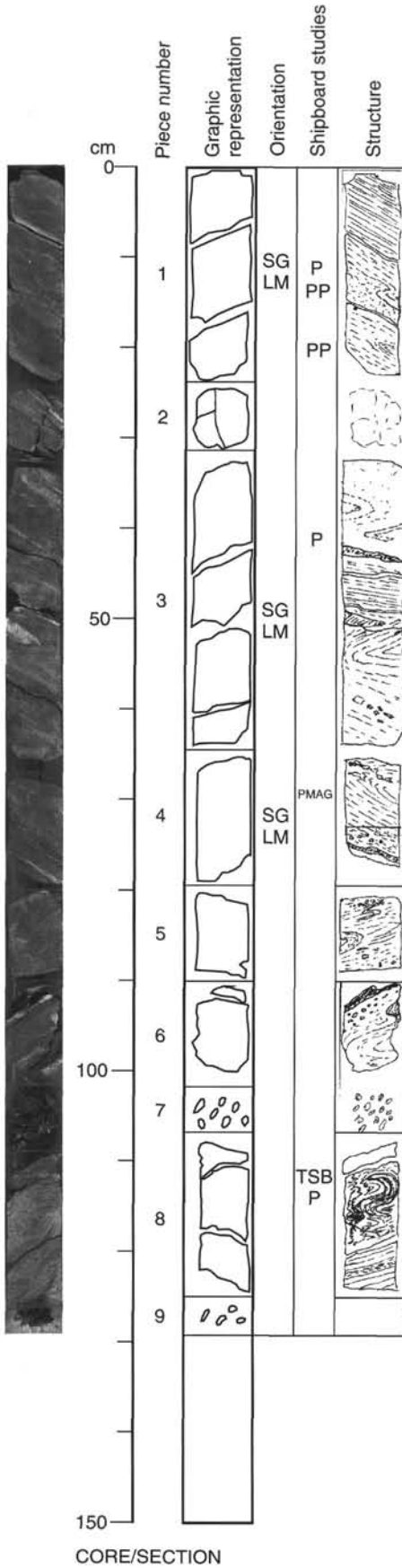
Pieces 9-16

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, garnet, sillimanite, andalusite, pyrite.

TEXTURAL DESCRIPTION: Banded and foliated quartz-biotite schist with quartz veins. The change from the schist higher in the section is gradational, and the boundary placed between Pieces 8 and 9 is to some extent arbitrary. Small square crystals of plagioclase or cordierite(?) in Piece 15. 2- to 3-mm randomly oriented prismatic andalusite appears at the lower half of Piece 16. Folds in the foliation and the quartz veins in Pieces 9, 10, and 12. Mica lineation in Pieces 9-11 and 15. Carbonate vein in Piece 9 and steep hairline cracks filled with pyrite(?) and muscovite(?). Quartz chlorite vein with biotite-rich selvages in Piece 10. Milky quartz vein partly surrounded by randomly oriented plagioclase in Piece 12. Quartz vein with biotite-rich selvages oblique to foliation in Piece 13. Abundant microcracks in Piece 15, filled with plagioclase(?). Remarkable extension cracks filled with sillimanite(?) in Piece 16.





Pieces 1-3

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, cordierite(?).

TEXTURAL DESCRIPTION: Banded and foliated schist with quartz veins. Foliation is defined by the preferred orientation of sillimanite and biotite. Small prismatic randomly oriented crystals of andalusite grow over the foliation in the upper half of Piece 3. Quartz veins with chlorite in Piece 3. Foliation and layer-parallel quartz veins are folded in Pieces 1 and 3. Abundant microcracks cut the foliation in Piece 3, filled with sillimanite(?).

Pieces 4-7

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Foliated and folded rock with quartz veins. Foliation is defined by the preferred orientation of sillimanite and biotite. Maximum length of sillimanite crystals is up to 2 cm in Piece 5. Small square crystals of andalusite in Pieces 1 and 6. Relict elliptical garnet grain parallel to the foliation in Piece 5. Disrupted, layer-parallel quartz veins in Pieces 5 and 6. Folded and disrupted quartz veins with internal ribbon-like structure in Piece 6.

Piece 8

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, diopside, feldspar, sillimanite, calcite.

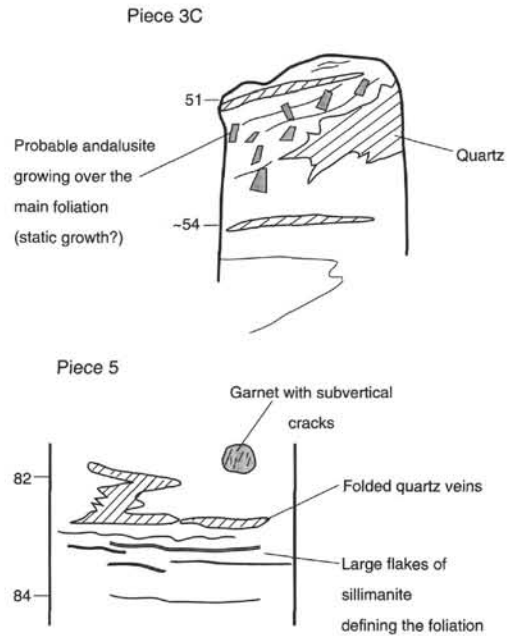
TEXTURAL DESCRIPTION: Banded rock with carbonate-rich bands. Foliation is defined by the alternation between green epidote(?) -rich bands and pale gray biotite-feldspar(?) -sillimanite bands.

Piece 9

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Foliated rock with quartz veins. Foliation is defined by the preferred orientation of biotite and minor sillimanite.



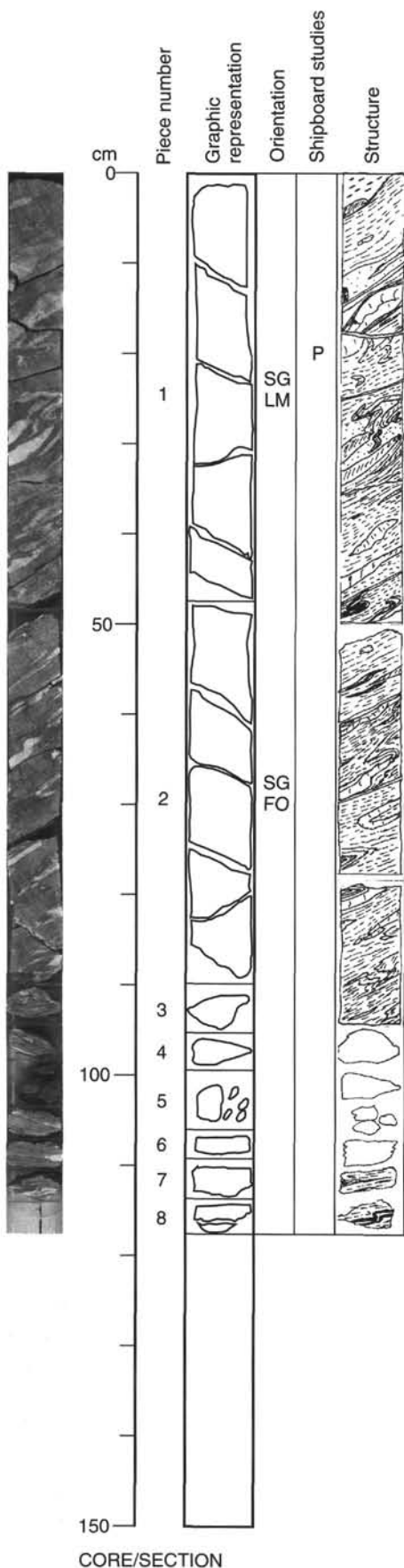
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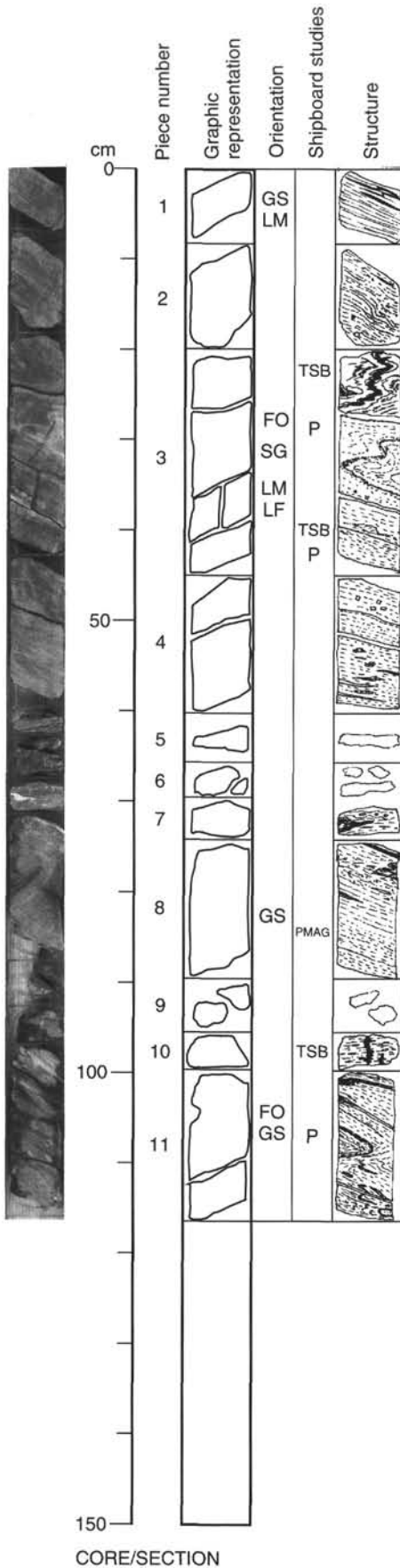
Pieces 1-8

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, pyrite, chlorite, garnet.

TEXTURAL DESCRIPTION: Banded and foliated schist. Foliation is defined by the preferred orientation of sillimanite and biotite. Abundant quartz veins are parallel to the main foliation in Piece 1 (thickness ranging from 5 to 20-25 mm), Pieces 2, 4, and 7. Andalusite is present in Piece 1 as idiomorphic rectangular crystals, together with pyrite also. Garnet is visible as relict small grains in piece 3. Biotite and sillimanite concentrations surrounded by the foliation is present in Pieces 2 and 8 (up to 7 mm long). Pieces 4, 7, and 8 have a mineral lineation on foliation planes, defined by oriented sillimanite-fibrolite crystals. Some quartz veins shows an incipient stretching lineation (e.g., Pieces 1 and 4). Chlorite patches are common on foliation planes (e.g., Piece 6, where it is associated with a fault plane which shows fault lineation and slickensides), and in quartz veins (e.g., Piece 7). Close folds deform both the foliation planes and the quartz veins in Piece 1.





Piece 1

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

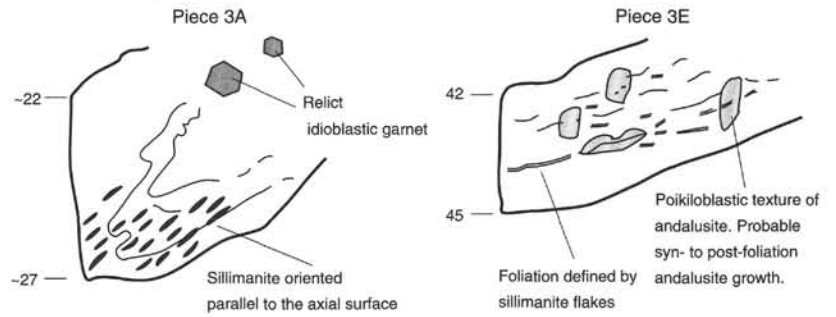
TEXTURAL DESCRIPTION: Banded and foliated schist. Foliation is defined by the preferred orientation of sillimanite and biotite.

Pieces 2-5

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, garnet, chlorite, pyrite(?).

TEXTURAL DESCRIPTION: Banded and foliated rock in which the foliation is defined by the preferred orientation of sillimanite, biotite, and locally by elongate garnet crystals. Quartz-rich layers with chlorite parallel to the foliation are common, and in Piece 3B a layer rich in epidote(?) and pyrite is also distinguishable. Relict idioblastic grains and disaggregated fragments of garnet following the foliation occur in Pieces 3A and 4, respectively. A light corona of cordierite(?) and plagioclase(?) around relict garnets is common in Piece 4. Small rectangular grains (less than 1 mm) of cordierite(?) in Piece 2. Poikiloblastic, randomly oriented, and rectangular andalusite with probable syn- to clearly post-foliation growth in Piece 3E. Tight to close folds with fibrous sillimanite parallel to their axial planes in Piece 3A.



Pieces 6-9

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, garnet, chlorite, cordierite(?).

TEXTURAL DESCRIPTION: Banded and foliated rock in which the foliation is defined by the preferred orientation of sillimanite, biotite, and locally by elongate garnet crystals. Elongated and disaggregated garnet grains following the foliation occur in the lower 60 mm and upper 40 mm of the Piece 8. Garnet is surrounded by coronas with chlorite, mica and a white mineral, probably cordierite(?), in Piece 8.

Piece 10

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, plagioclase.

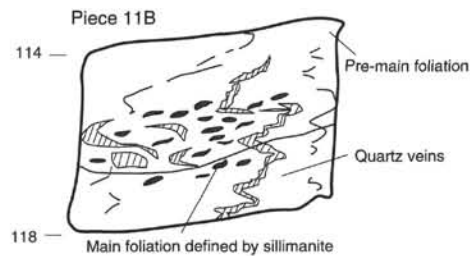
TEXTURAL DESCRIPTION: Banded schist with sillimanite and biotite defining the foliation. Pink felsic bands with plagioclase.

Piece 11

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Banded and foliated rock in which the foliation is defined by quartz veins and the preferred orientation of sillimanite and biotite in the melanocratic bands. Sericite aggregates less than 1 mm thick, are also distinguishable in the foliation planes. Tight folds with sillimanite parallel to their axial planes and also to the external foliation in Piece 11B.10



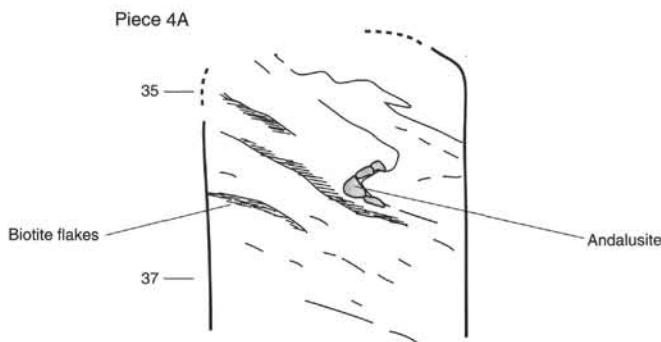
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Pieces 1-6

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, chlorite.

TEXTURAL DESCRIPTION: Banded and folded rock in which the foliation is defined by the preferred orientation of sillimanite, biotite, and by elongate andalusite crystals in Piece 4A. Quartz-rich layers with chlorite in Piece 5. Biotite is concentrated in large aggregates (maximum length 15 mm) parallel to the foliation in Piece 4. Main foliation is axial planar to tight folds in Pieces 2B and 6. Sillimanite fibers are parallel to their axial planes. Small (up to 20 mm) open east-vergent folds deform the main foliation, which includes andalusite crystals, in Piece 4A.



Piece 7

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, garnet, chlorite.

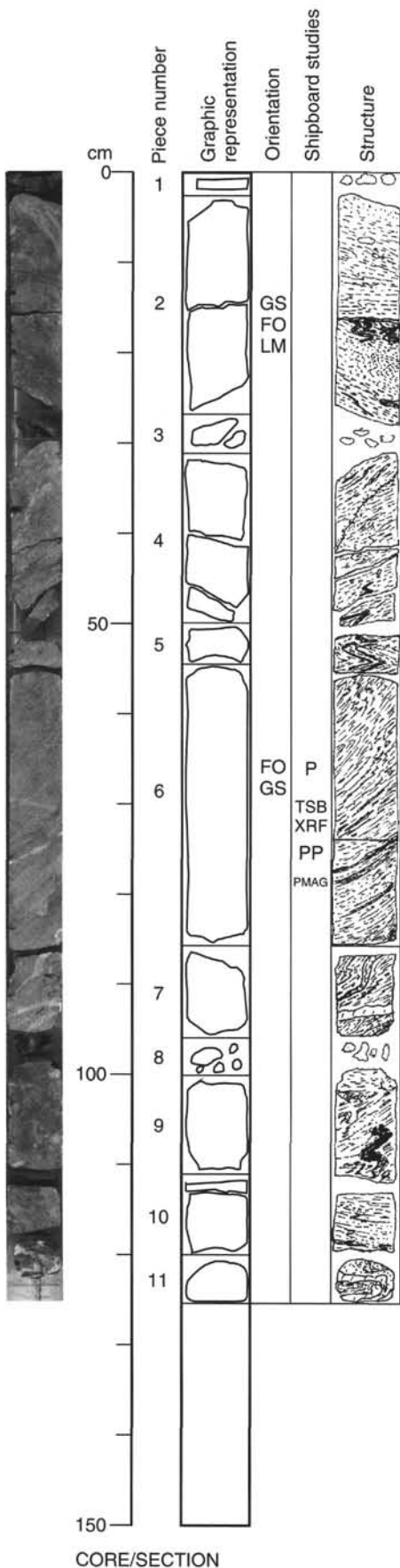
TEXTURAL DESCRIPTION: Banded rock with foliation defined by the preferred orientation of sillimanite and biotite. Relict, partially broken garnet crystals occur parallel to the foliation. Quartz-rich veins with chlorite aggregates concentrated around them are common.

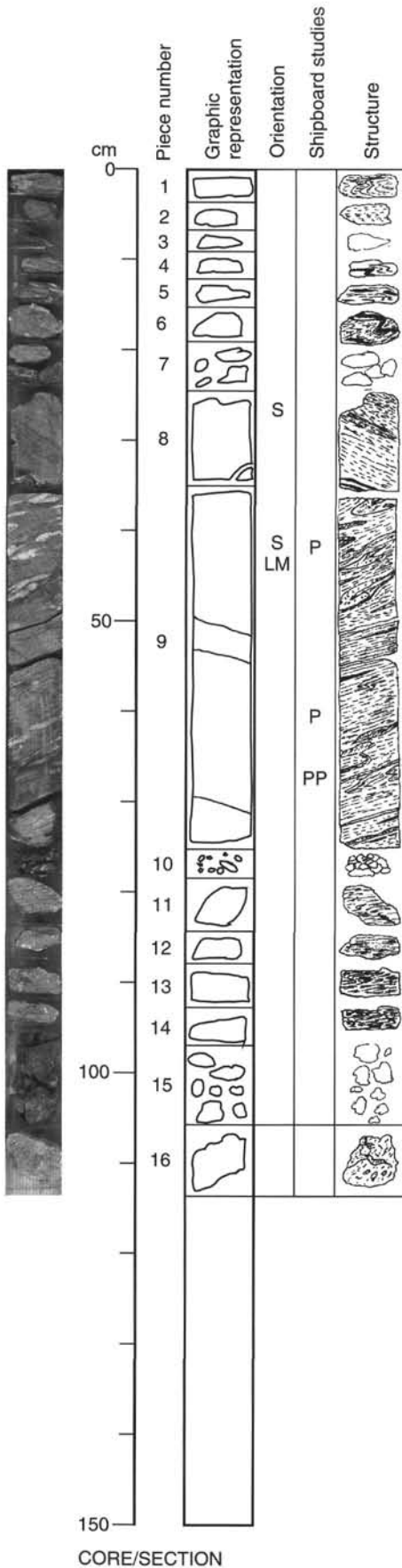
Pieces 8-11

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Banded rock in which the foliation is defined by sillimanite and biotite. Disrupted quartz-rich veins (up to 15 mm thick) with biotite concentrated along their walls.





Pieces 1–15

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Banded rock with a foliation defined by sillimanite and biotite. In Piece 2 the sillimanite fabric appears to be oblique to an older mica fabric. Foliation is folded in Piece 6 and planar in Piece 8. Strong biotite-sillimanite mineral lineation in Piece 9. Abundant disrupted quartz veins in Piece 8. 1-cm shear band in Piece 9A and asymmetric boudinage of quartz veins in Piece 9B suggest top to the east shear sense. Tight asymmetric folds affect the foliation in Pieces 13 and 14. 1- to 2-mm bleached and chloritized alteration zones cross the foliation in Pieces 12 and 13.

Piece 16

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Dolomite, calcite.

TEXTURAL DESCRIPTION: 5- to 20-mm fragments of coarse-grained yellow dolomitic marble with solution cavities, and sub-millimeter schist fragments, in a gray calcite matrix.

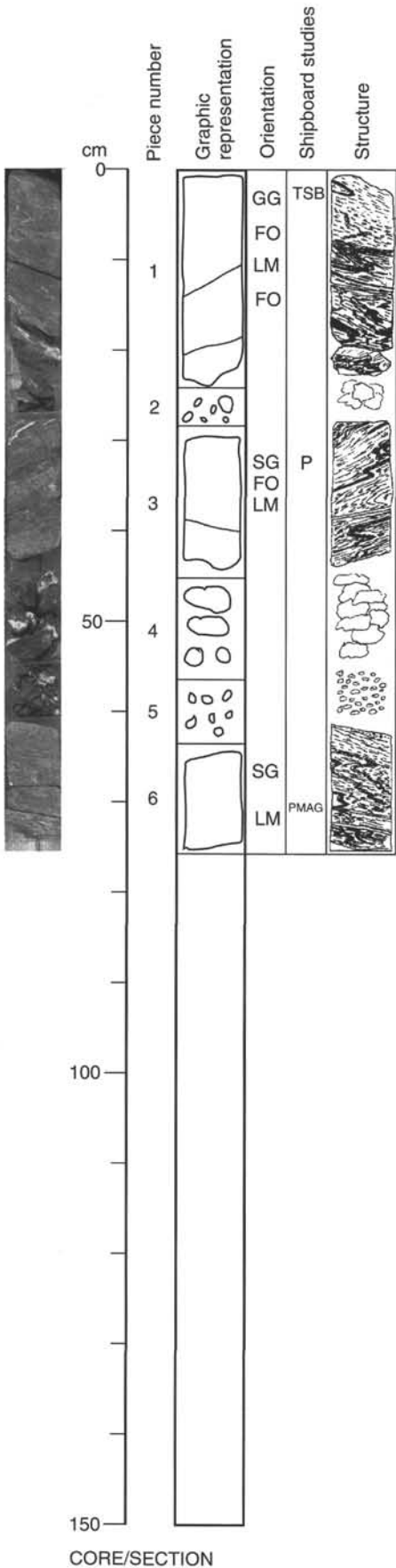
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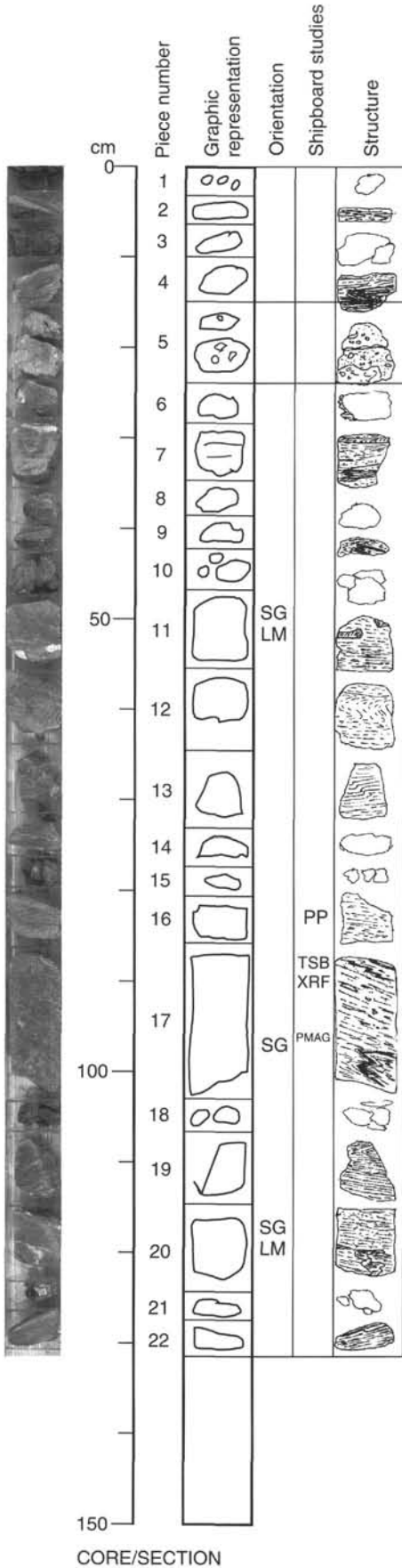
Pieces 1-6

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Foliation is defined by 1-mm quartz-rich laminae, oriented biotite and sillimanite, and elongate aggregates of biotite. Tight west-vergent asymmetric folds in Piece 1, east-vergent folds in Piece 2, and symmetrical folds in Piece 3 (note that orientation data refer to the core-coordinate system, and that different pieces may have different orientations in the geographic reference frame). Biotite lineation on foliation in Piece 1, a strongly lineated interface between Pieces 3A and 3B with parallel sillimanite lineation and quartz and calcite fibre lineations, and a strong sillimanite lineation in Piece 6.





Pieces 1-4

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite.
TEXTURAL DESCRIPTION: Schist with strong foliation and mineral lineation.

Piece 5

ROCK TYPE: FAULT GOUGE
PRIMARY MINERALOGY: Clay.
TEXTURAL DESCRIPTION: Pale gray clayey fault gouge with fragments up to 8 mm of gneiss and dolomite. Random fabric. Striated surfaces.

Pieces 6-22

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Biotite, sillimanite, quartz.
TEXTURAL DESCRIPTION: Homogeneous schist with strong foliation and mineral lineation defined by oriented biotite, sillimanite and biotite aggregates. Rock is noticeably poorer in quartz than quartz-rich banded schists in Core 976B-78R, and quartz veins are rare. Change seems to occur at fault in Piece 5 of this core. Relict 1-mm garnet in Piece 7. Asymmetric folds in Piece 13. Possible pseudomorph in Piece 22.

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Pieces 1-13

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, sillimanite, quartz.

TEXTURAL DESCRIPTION: Finely laminated schist with differentiated foliation defined by 0.5- to 1-mm laminae of quartz and biotite, and bands with abundant prismatic sillimanite up to 3 mm long partly overprinted by zones and patches with coarse (0.5-mm) poorly oriented biotite and plagioclase(?). One relict garnet in Piece 13. Tight asymmetric folds deform the foliation and quartz veins in Pieces 1, 2, and 12.

Piece 14

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, dolomite, clay.

TEXTURAL DESCRIPTION: Fragments up to 15 mm of schist/gneiss (45%), vein quartz (35%), and dolomite (20%) in a compact gray clayey matrix. Brown stains suggest oxidation.

Piece 15

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Clay.

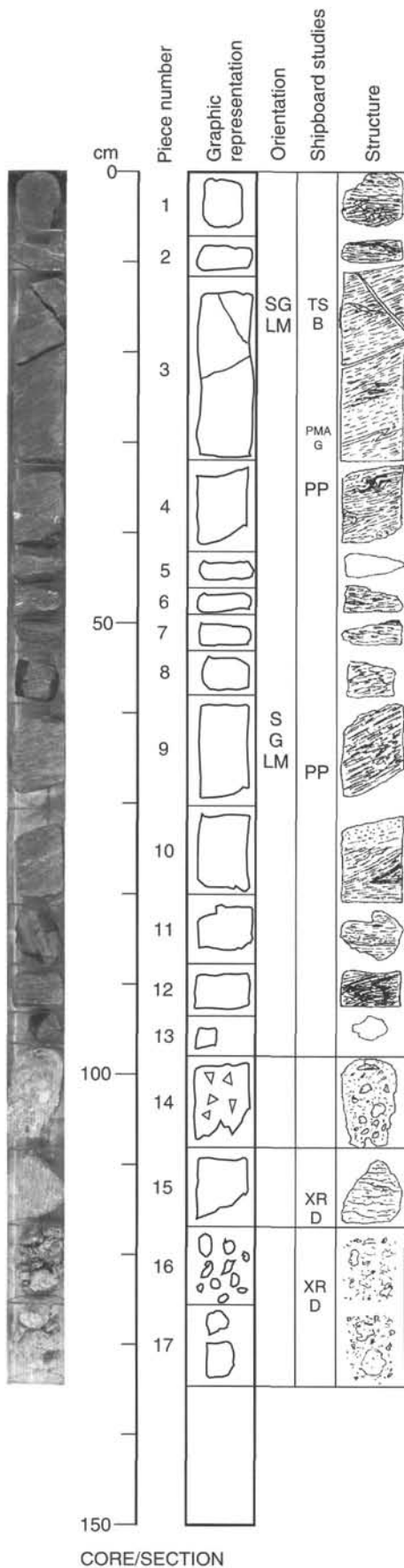
TEXTURAL DESCRIPTION: Schist or gneiss largely altered to clay, with relict texture.

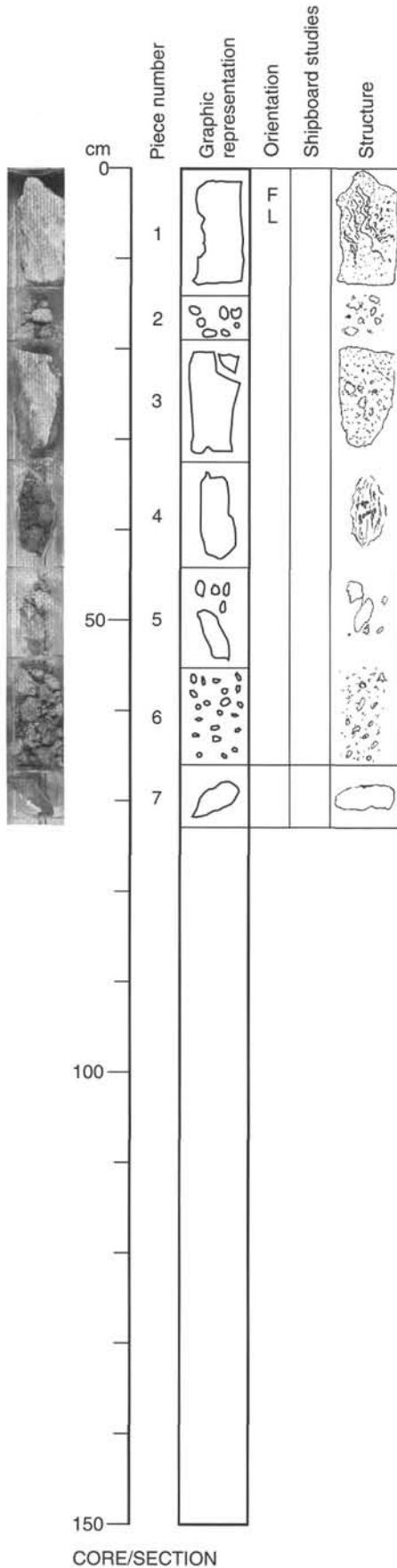
Pieces 16-17

ROCK TYPE: FAULT GOUGE

PRIMARY MINERALOGY: Clay.

TEXTURAL DESCRIPTION: Gray clayey fault gouge with schist fragments.





Pieces 1-6

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Dolomite, clay.

TEXTURAL DESCRIPTION: Pale yellowish-gray breccia with 0.1- to 10-mm fragments of gray hydrothermally altered schist/gneiss in a yellow dolomitic matrix. Gray clayey fault gouge adheres to surfaces of breccia fragments. Slip surface with striations on edge of Pieces 1 and 3.

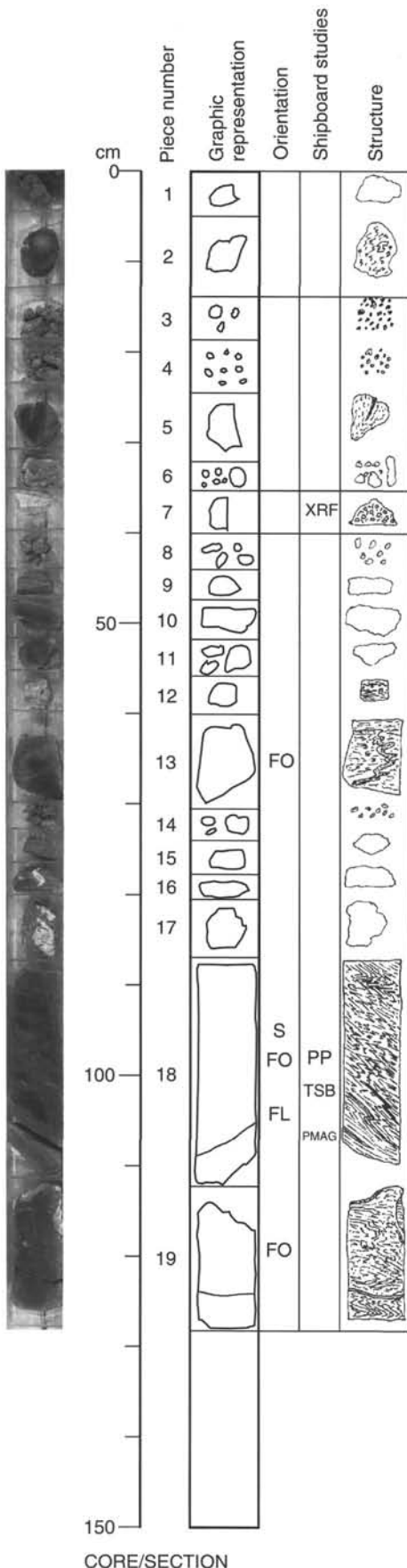
Piece 7

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, sillimanite, quartz, plagioclase(?).

TEXTURAL DESCRIPTION: Schist with 1- to 2-mm aggregates of biotite + plagioclase(?); pseudomorphs after garnet.

161-976B-81R-1



Pieces 1-2

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, andalusite.
TEXTURAL DESCRIPTION: Schist fragments.

Pieces 3-4

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Clay.
TEXTURAL DESCRIPTION: Schist fragments in a clayey gouge matrix.

Piece 5

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Biotite, sillimanite, quartz.
TEXTURAL DESCRIPTION: Schist.

Piece 6

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Clay.
TEXTURAL DESCRIPTION: Schist fragments in a clayey gouge matrix.

Piece 7

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar, tourmaline.
TEXTURAL DESCRIPTION: Equigranular medium-grained (1.5-mm) granitoid, with dispersed 0.5-mm tourmaline. Finer-grained phase of the same rock on the back of the piece. No foliation or evidence of deformation.

Pieces 8-11

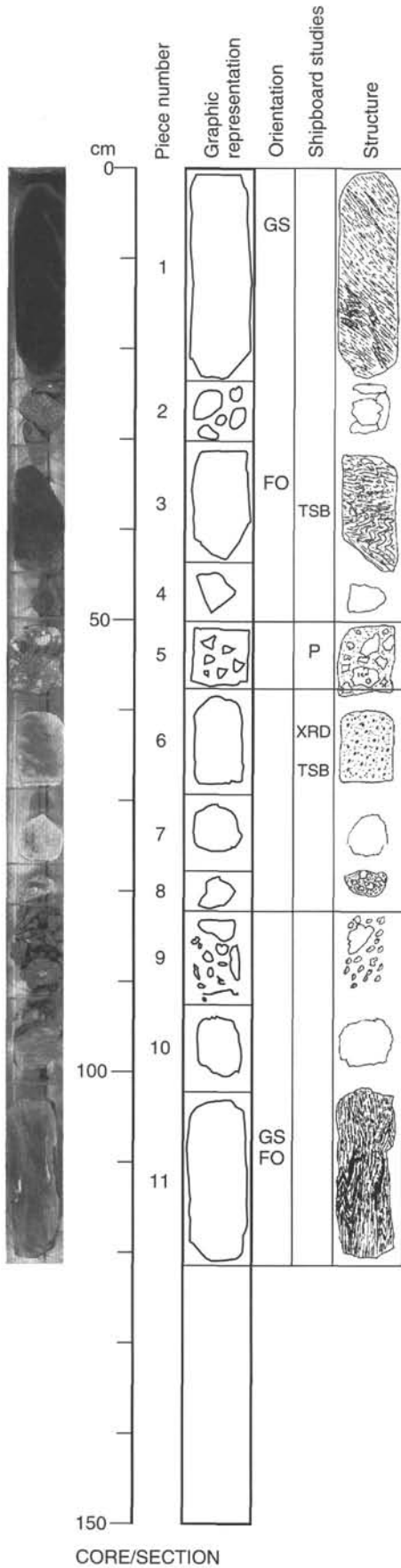
ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Biotite, sillimanite, quartz.
TEXTURAL DESCRIPTION: Schist. Relict garnet in Piece 10. Folds in Piece 9.

Piece 12

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Dolomite.
TEXTURAL DESCRIPTION: Foliated brownish-gray microbreccia or cataclasite with trails of sub-millimeter schist fragments in brown dolomitic matrix with solution cavities.

Pieces 13-19

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, plagioclase, sillimanite.
TEXTURAL DESCRIPTION: Dark gray laminated schist with differentiated foliation defined by 0.5- to 1-mm laminae of quartz and biotite, and elongate 0.5-mm-thick aggregates of biotite and plagioclase. Trails of oxidized pyrite in Piece 13. Pseudomorphs after 1- to 1.5-mm garnet(?) in Piece 19. Symmetrical folds in Pieces 13 and 19. Striated slip surface with calcareous film between Pieces 18A and B.



Pieces 1–4

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Dark gray laminated schist with differentiated foliation defined by 0.5- to 1-mm laminae of quartz and biotite. Pseudomorphs after mm garnet(?) and symmetrical folds in Piece 3.

Piece 5

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Dolomite, quartz, garnet.

TEXTURAL DESCRIPTION: Grey well cemented breccia with 0.5- to 20-mm angular fragments of schist/gneiss with coarse garnet, vein quartz, marble, red dolomitic marble breccia, in a gray compact dolomitic matrix.

Pieces 6–8

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Dolomite, calcite.

TEXTURAL DESCRIPTION: Grey homogeneous marble with 1-mm equant carbonate grains. Weak banding defines foliation, but no shape fabric in carbonate. Layer of calcareous schist and marble breccia adheres to one side of piece.

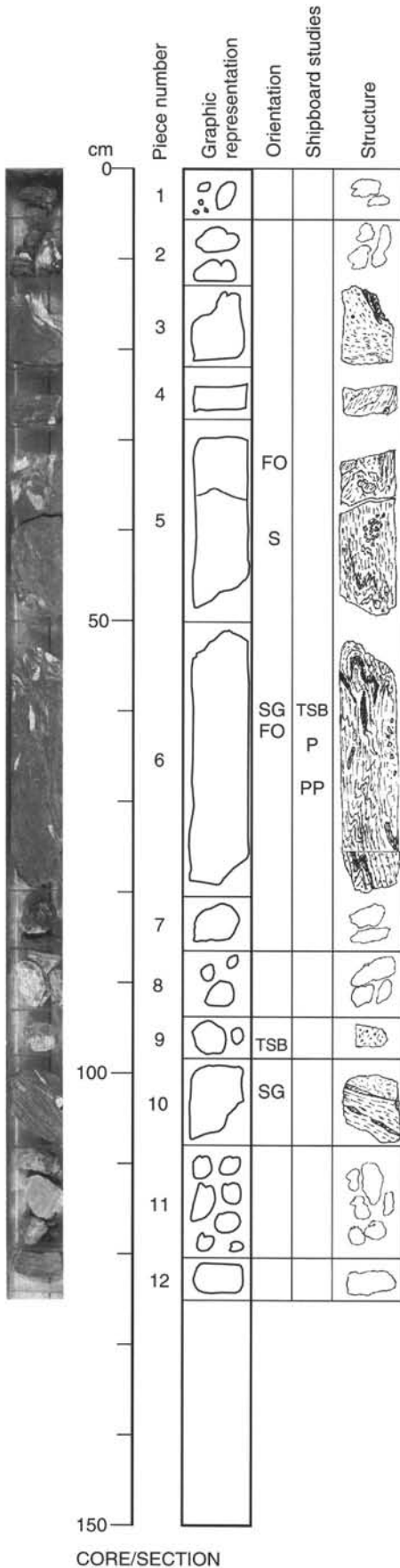
Pieces 9–11

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, plagioclase.

TEXTURAL DESCRIPTION: Dark gray laminated schist with differentiated foliation defined by 0.5- to 1-mm laminae of quartz and biotite. Patches of poorly oriented biotite and plagioclase. Thin quartz veins emphasize tight asymmetric folds in main foliation.

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Piece 1

Clay and rock fragments fallen into hole.

Pieces 2-7

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Dark gray laminated schist with foliation defined by oriented biotite and sillimanite, 1- to 2-mm quartz-rich bands, and disrupted 5- to 10-mm-thick quartz veins. Randomly oriented andalusite up to 18 mm across. Some crystals appear fresh on the outer surface of the core, with abundant inclusions of biotite; on the cut face crystals resemble pseudomorphs, possibly because of abundance of inclusions. Rock has a granular matrix which may contain mm-scale crystals of andalusite. Cm-scale folds with inconsistent vergences in Piece 5, steeply dipping foliation with east-vergent folds in Piece 6. Fracture with 0.5-mm calcareous fill parallel to the foliation in Piece 6.

Piece 8

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, feldspar, clay(?).

TEXTURAL DESCRIPTION: Hydrothermally altered quartz-feldspar rock with granular texture.

Piece 9

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, feldspar, biotite.

TEXTURAL DESCRIPTION: Fine-grained (1-mm) leucogranite. Green potassium-feldspar(?)

Piece 10

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Planar foliation.

Piece 11

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Dolomite.

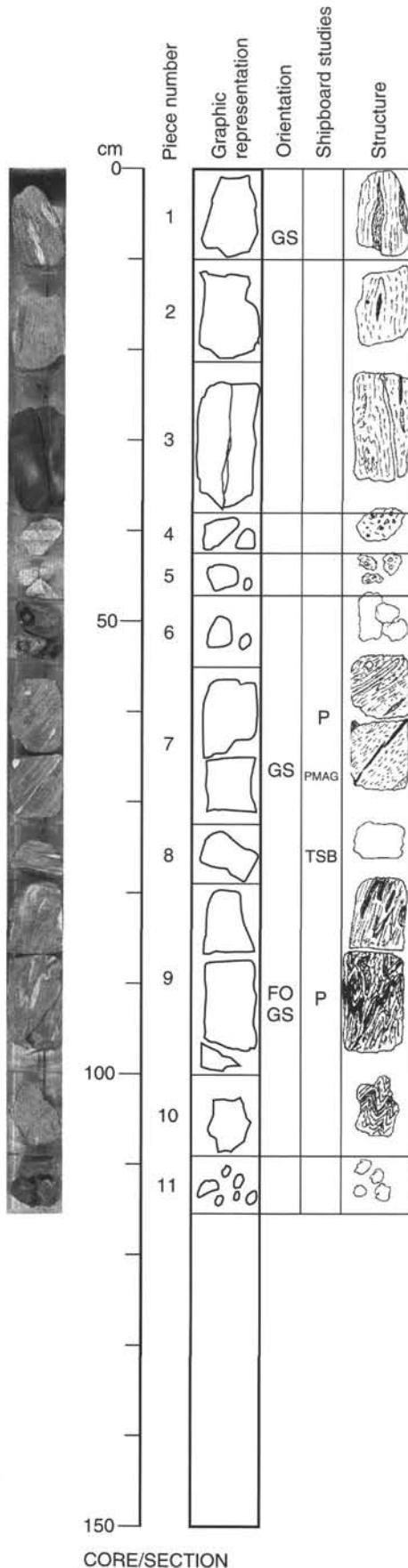
TEXTURAL DESCRIPTION: Fragments up to 5 cm of compact gray dolomitic marble in a gray dolomitic matrix.

Piece 12

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Schist.



Pieces 1–3

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, garnet, chlorite.

TEXTURAL DESCRIPTION: Banded rock with foliation defined by the preferred orientation of sillimanite, biotite, and locally by elongate garnet crystals, and by quartz-rich veins up to 10 mm thick. Large (up to 7 mm long), pink crystals of andalusite parallel to the foliation in Piece 1. Chlorite and quartz surround andalusite and relict garnet crystals in Piece 1. Garnet and andalusite are not visible in Pieces 2 and 3. Melanocratic, well foliated, biotite-rich Pieces 2 and 3 are schistose.

Piece 4

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, feldspar, biotite, tourmaline.

TEXTURAL DESCRIPTION: Granular rock with quartz and feldspar (plagioclase and/or potassium-feldspar). Disseminated green biotite and small prismatic black tourmaline crystals. Quartz is predominant over feldspar. No visible foliation.

Pieces 2–5

ROCK TYPE: QUARTZ ROCK

PRIMARY MINERALOGY: Quartz.

TEXTURAL DESCRIPTION: Two fragments of coarse-grained quartz veins.

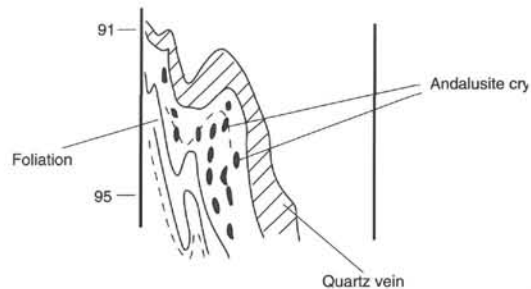
Pieces 6–9

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Banded rock with foliation defined by the preferred orientation of sillimanite and biotite. Quartz-rich layers are common parallel to the foliation in Piece 9. Abundant rectangular and elliptical andalusite crystals (less than 15 mm in length), partly transformed to white sericite aggregates, in Pieces 7, 8, and 9. Some andalusite shows chiastolite twinning in Piece 7. Variably tight, asymmetric, west-vergent folds, deform the foliation. In Piece 7, the axial-planar foliation associated with these folds is a crenulation cleavage. Andalusite is parallel to this crenulation cleavage in Piece 9.

Piece 9B



Pieces 10–11

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, garnet.

TEXTURAL DESCRIPTION: Banded and foliated rock. Foliation is defined by the preferred orientation of sillimanite and biotite. Abundant idioblastic garnet grains (less than 20–25 mm) in Piece 11.

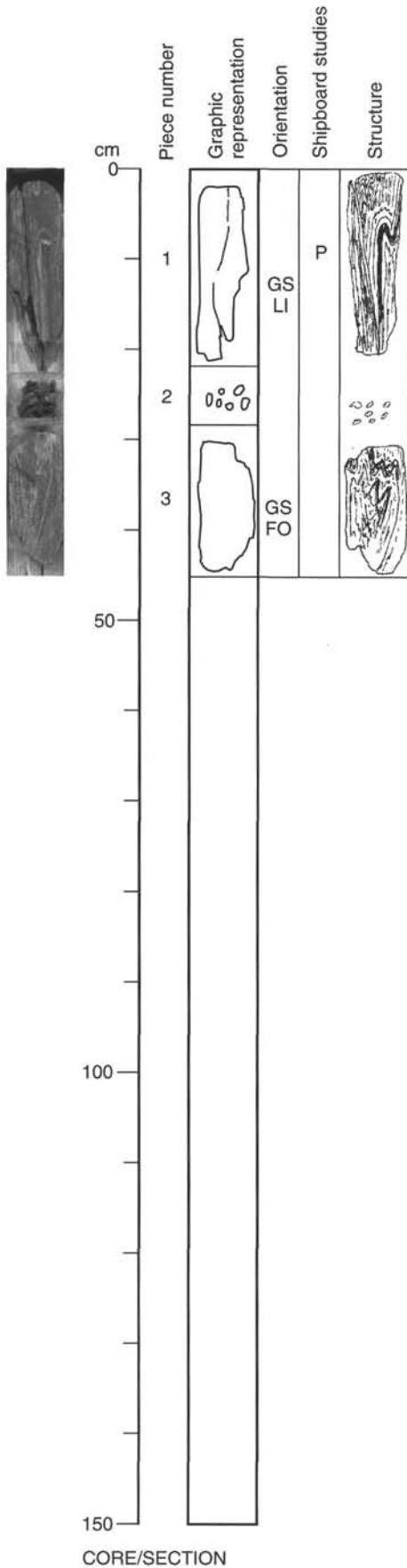
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Pieces 1-3

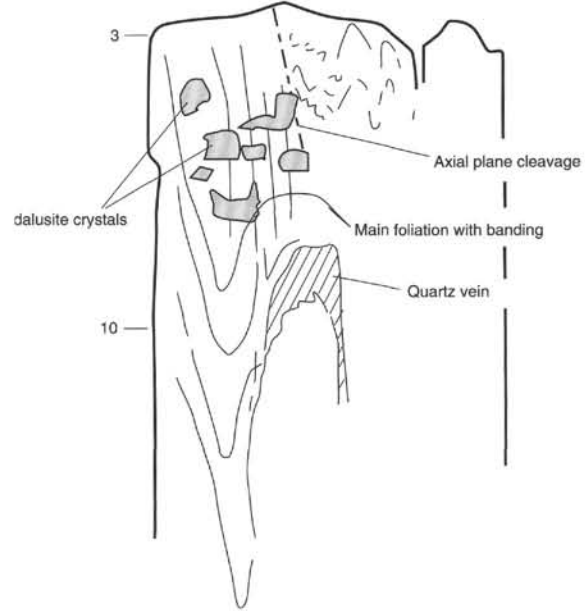
ROCK TYPE: HIGH-GRADE SCHIST

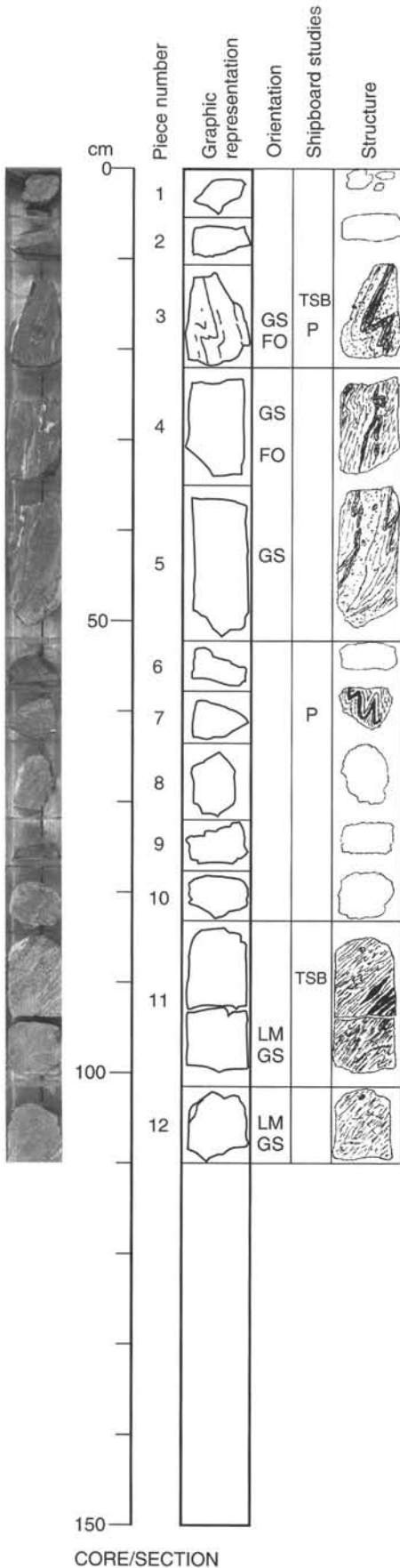
PRIMARY MINERALOGY: Quartz, biotite, andalusite.

TEXTURAL DESCRIPTION: Banded rock with foliation defined by the preferred orientation of biotite and by quartz veins. Andalusite crystals up to 1 cm grow post-kinematically over the axial-plane foliation of tight folds in the main foliation. Folds are tight and asymmetric, verging east in Piece 3.



Piece 1



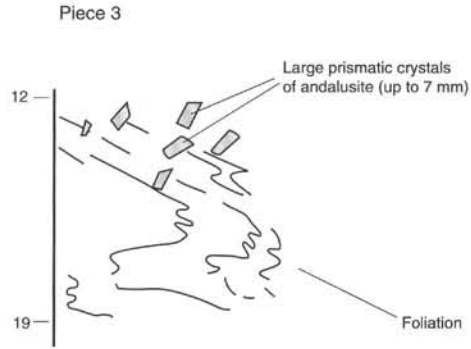


Pieces 1-3

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Banded and folded rock with the main foliation defined by the preferred orientation of sillimanite and biotite. Quartz-vein with chlorite in Piece 1. Tight, asymmetric, east-vergent folds in Piece 3. In Piece 3, large poikiloblastic andalusite crystals (up to 7 mm long) grow over the foliation in fold limbs.



Pieces 4-10

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, garnet.

TEXTURAL DESCRIPTION: Banded and strongly folded rock with folded foliation and banding defined by the preferred orientation of sillimanite, biotite, garnet and andalusite. Crenulation cleavage well defined by mica (biotite?) is present in fold hinges in Piece 4. Rectangular crystals of andalusite, with chiasolite twinning in Piece 4. Relict garnet grains, variable in size, spherical in shape, in Pieces 4, 5, and 7. Corona textures around garnet in Piece 5. In Piece 5 garnet is in contact with andalusite. Garnet is not distinguishable in Pieces 6, 8, 9, and 10. Tight asymmetric folds, east-vergent in Piece 4, are present in all the pieces.

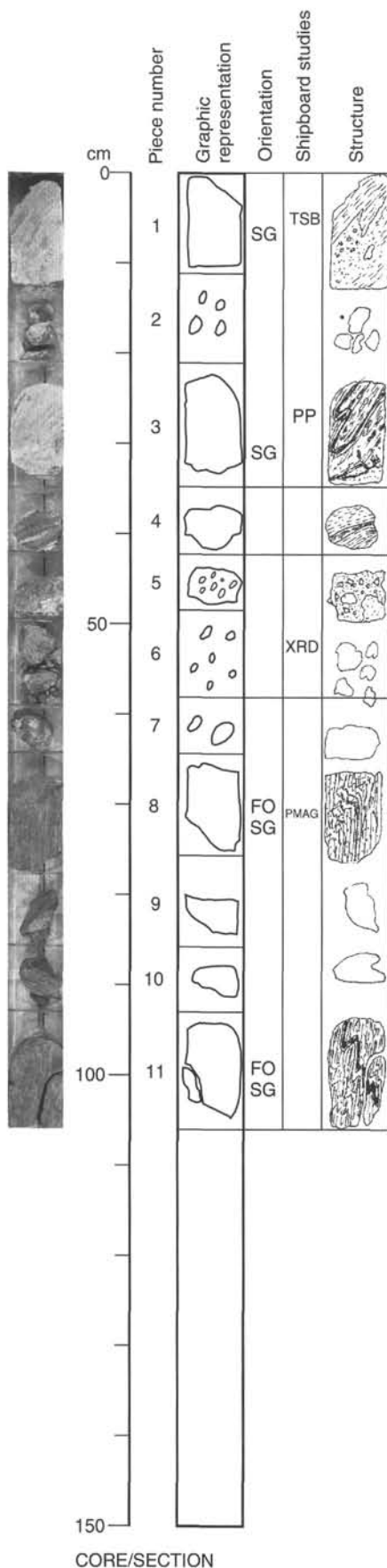
Pieces 11-12

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite(?), quartz, biotite, cordierite(?).

TEXTURAL DESCRIPTION: Banded green marble with alternating gray calcite(?)-rich and biotite-quartz-rich bands. Probable cordierite(?) in Piece 12.

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Pieces 1-3

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite, quartz, biotite.

TEXTURAL DESCRIPTION: Banded green rock with small crystals of biotite. Isoclinal folds parallel to banding in Piece 3.

Piece 4

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Banded rock with abundant carbonate and quartz veins.

Pieces 5-6

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Biotite, chlorite, quartz, calcite(?), clay(?).

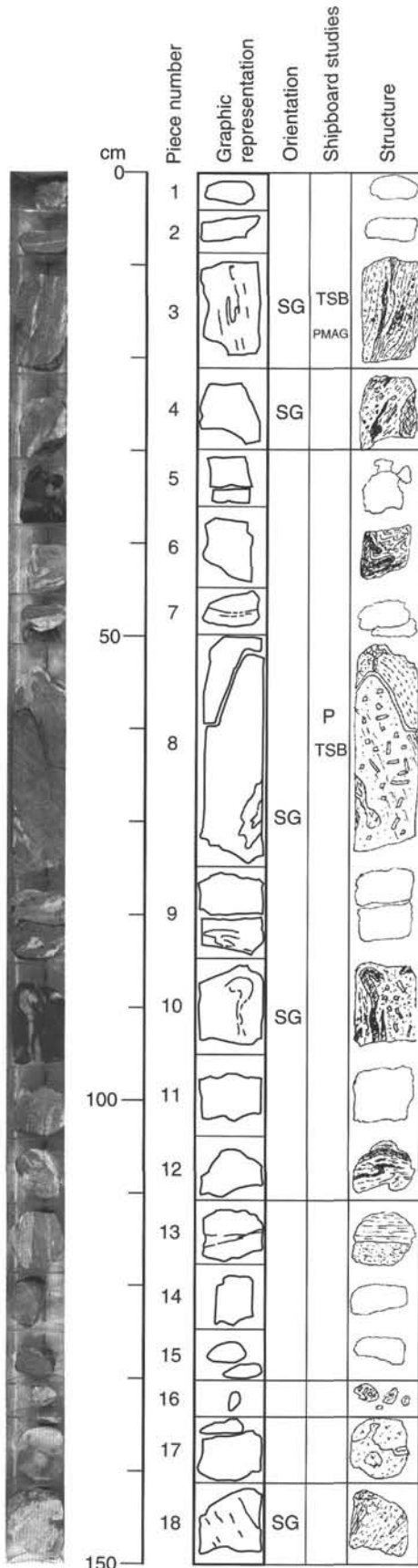
TEXTURAL DESCRIPTION: Heterolithic, foliated, and cemented breccia. Angular fragments up to 15 mm consist of vein quartz and biotite-rich gneiss. Cataclastic foliation in the matrix, surrounding the fragments. Piece 6 is made up of several isolated fragments, similar to those cemented in Piece 5, consisting of one angular fragment (40 mm long) of breccia with a granite fragment inside, an isolated fragment of granite with feldspar, quartz and biotite (20 mm long), and a large fragment (up to 40 mm) of weathered red-brown biotite-rich schist.

Pieces 7-11

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Banded and folded rock with foliation defined by the orientation of sillimanite and biotite. Foliation is deformed by tight asymmetric folds, west-vergent in Piece 7, and east-vergent in Piece 11. Scarce rectangular andalusite grains in Piece 8.



CORE/SECTION

Pieces 1–15

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, garnet, plagioclase, chlorite.

TEXTURAL DESCRIPTION: Banded rock with foliation defined by the orientation of sillimanite and biotite.

Quartz veins parallel to the foliation are common in Piece 2 (<4 mm thick), Piece 4 (up to 8 mm thick), Piece 5 (up to 10 mm thick), Piece 7 (up to 15 mm thick), Pieces 9, 10, 11, and 12. In Piece 11 chlorite is present in and around the quartz veins. Randomly oriented andalusite is recognizable as oriented and elongated grains in Piece 3, with rectangular sections in Piece 3, 4, 10, 11, and 13, and reaching its maximum length in Piece 8 where andalusite with chialstolite twinning is up to 15 mm long. Garnet is only visible in Pieces 4 and 10. Light plagioclase occurs in felsic bands in Piece 4. Biotite is usually concentrated in layer-parallel aggregates in Piece 3 (5 mm long) and Piece 10 (8–10 mm long). Piece 13 has a remarkable banding with a dark melanocratic band composed by andalusite-biotite-sillimanite, and a light felsic band with sillimanite and feldspar. The boundary between the bands is characterized by a concentration of chlorite 2–3 mm thick.

Piece 16

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, calcite(?), chlorite, clay.

TEXTURAL DESCRIPTION: Polymictic cemented breccia. Angular fragments up to 7 mm consist of biotite schist and rounded and elongated quartz. The matrix is fine-grained.

Piece 17

ROCK TYPE: QUARTZ ROCK

PRIMARY MINERALOGY: Quartz.

TEXTURAL DESCRIPTION: White and green quartz vein.

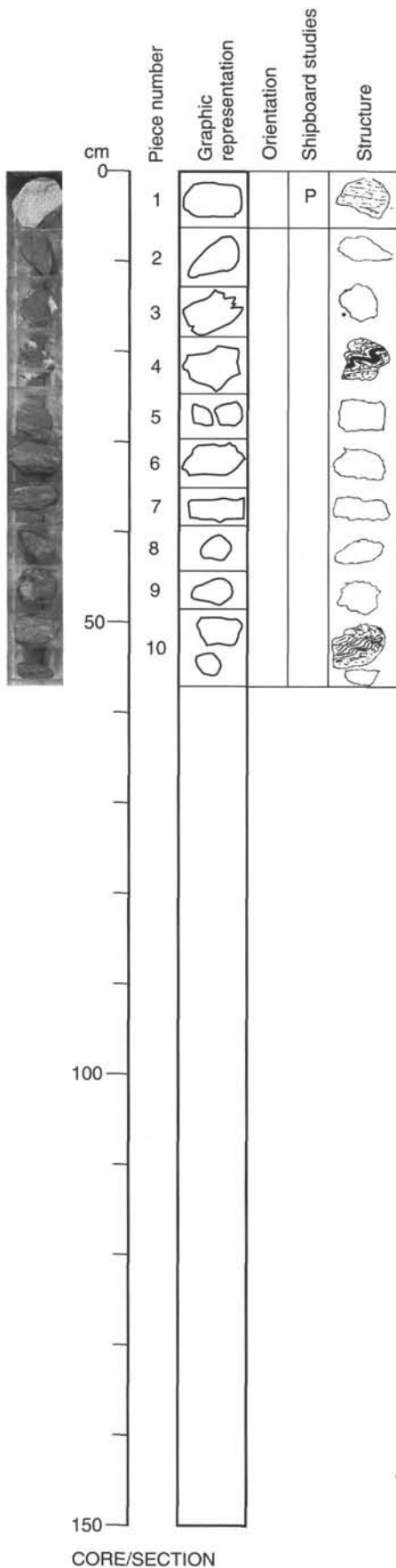
Piece 18

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite, chlorite, biotite.

TEXTURAL DESCRIPTION: Banded marble with interlayered quartz veins. At the top and bottom of the piece there is biotite-rich gneiss.

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Piece 1

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite.

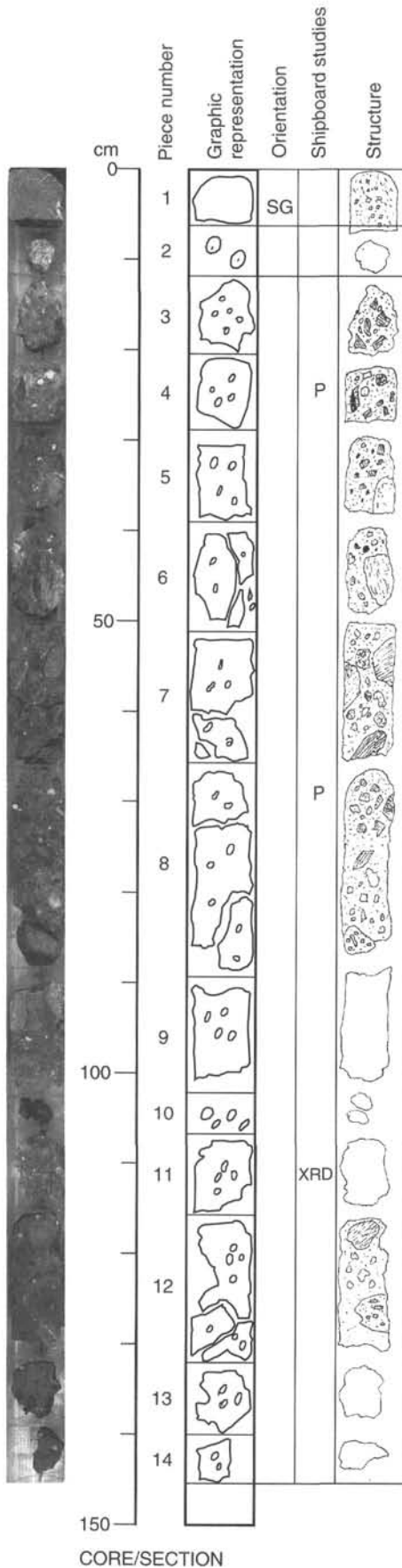
TEXTURAL DESCRIPTION: Gray banded and folded rock. The banding is deformed by an isoclinal fold, with an axial surface parallel to the external foliation.

Pieces 2-10

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, chlorite.

TEXTURAL DESCRIPTION: Banded rock with foliation defined by the orientation of sillimanite and biotite. Abundant quartz veins in Pieces 3, 8, and 9. Andalusite randomly oriented over the foliation in Pieces 2, 5, 6, 7, 9, and 10. Tight folds in Piece 4.



Piece 1

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Foliated melanocratic rock with foliation defined by the orientation of sillimanite and biotite. Randomly oriented andalusite is recognizable with diamond-shape sections and chialstolite twinning.

Pieces 2–14

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, clay, biotite(?), chlorite(?).

TEXTURAL DESCRIPTION: Polymictic, matrix-supported, poorly cemented breccia with variably-sized angular fragments. Dark-gray matrix, with clay(?) and chlorite(?). Massive matrix with randomly oriented clasts in all the pieces. Recognizable clasts in the breccia consist of (in decreasing order of abundance): 1) Biotite-rich foliated schist (1–60 mm); 2) Angular and in some cases elliptical (e.g., in Piece 8) white quartzite grains, (up to 30 mm), composed of quartz, with chlorite in Piece 4; 3) Variable amounts of gray biotite-rich schist in Pieces 3, 4, and 5; and 4) Minor constituent of the breccia are rounded and banded marble fragments in Pieces 3, 9, 11, and 12 (maximum size 40 mm in Piece 9). Broken clasts initially belonging to the same rock fragment are seen in Piece 8. Breccia fragments occur as clasts in the breccia in Piece 10. Schist fragments with tight folds deforming the banding in Piece 7. The different composition of the breccia fragments is summarized as follows:

Piece 3: 70%: Biotite schist (up to 20 mm)

20%: quartz

5%: light colored schist (up to 15 mm)

5%: gray marble

Piece 4: 60%: Biotite schist

25%: quartz fragments with chlorite (up to 30 mm)

15%: gray schist

Piece 8: 70%: Biotite schist (2–20 mm)

20%: quartz

10%: banded green schist (weathered(?))

Piece 12: 60%: Biotite schist

20%: quartz fragments

20%: gray banded marble

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Pieces 1-10

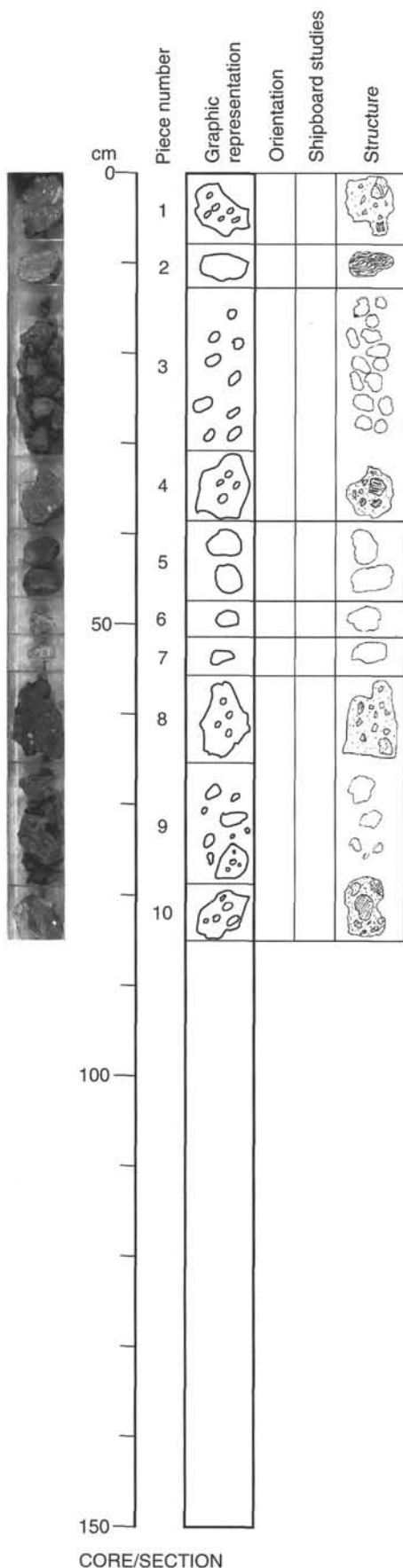
ROCK TYPE: BRECCIA

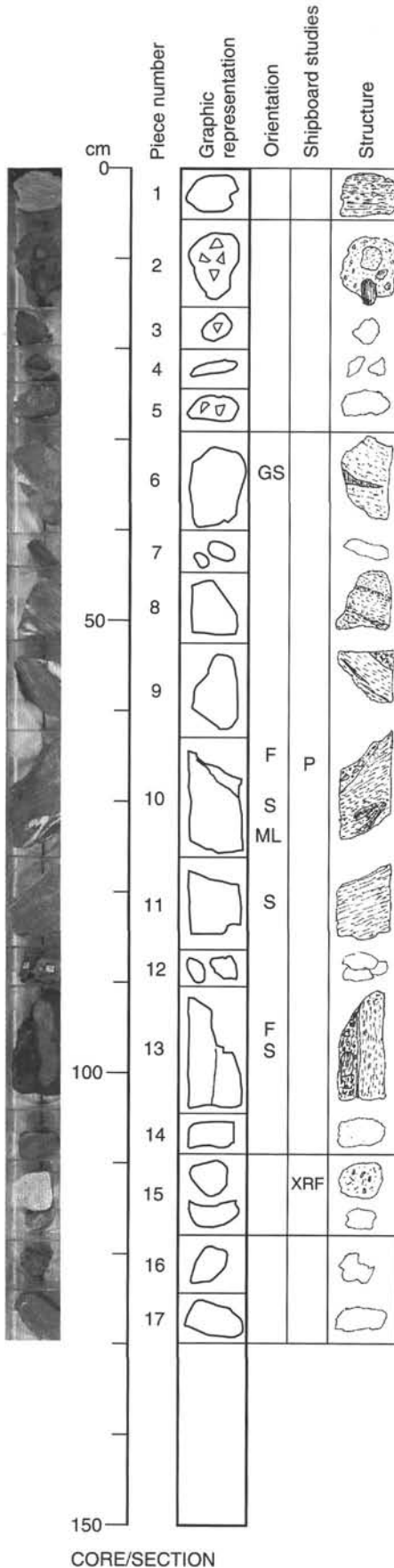
PRIMARY MINERALOGY: Quartz, clay, biotite(?), chlorite(?).

TEXTURAL DESCRIPTION: Polymictic, matrix-supported, and poorly cemented breccia with variably sized angular fragments. Isolated breccia fragments in Pieces 5, 6, and 7. Unconsolidated breccia (fault gouge) in Piece 9. Massive matrix with unoriented clasts in all the pieces. Recognizable clasts in the breccia are composed of (in decreasing order of abundance): 1) Biotite-rich foliated schist; 2) White quartzite grains. Incipient cataclastic foliation in Piece 10, defined by the alignment of quartz fragments, mica(?) and chlorite(?) grains, and mica(?) tails around schist clasts. The different composition of the breccia fragments is summarized as follows:

Piece 4: 80-90%: Banded biotite high grade schist
20-10%: quartz

Piece 8: 80%: Biotite schist (<12 mm)
20%: quartz (<5 mm).





Piece 1

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite.
TEXTURAL DESCRIPTION: Planar foliation.

Pieces 2–5

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Fragments from 0.1–50 mm of dark gray biotitic schist/gneiss in a dark brownish-gray matrix rich in biotite.

Pieces 6–7

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite.
TEXTURAL DESCRIPTION: Dark gray schist; no layering, planar schistosity, quartz veins.

Piece 8

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, plagioclase(?).
TEXTURAL DESCRIPTION: Rock with cm-scale bands of different grain size and composition. Laminae and aggregates up to 2 mm thick of 0.5-mm biotite. Abundant 1- to 2-mm porphyroblasts of gray plagioclase(?) or cordierite(?).

Pieces 9–14

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.
TEXTURAL DESCRIPTION: Schist with ghost-like porphyroblasts up to 20 mm long of andalusite, either altered or crowded with inclusions, some at right angles to foliation. Folded quartz vein and strong mica + sillimanite lineation in Piece 10; inclined fault surface with breccia or gouge adhering to it in Pieces 10, similar vertical fault in Piece 13.

Piece 15A

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar, biotite, tourmaline.
TEXTURAL DESCRIPTION: Fine-grained (1-mm) leucogranite. No deformational fabric.

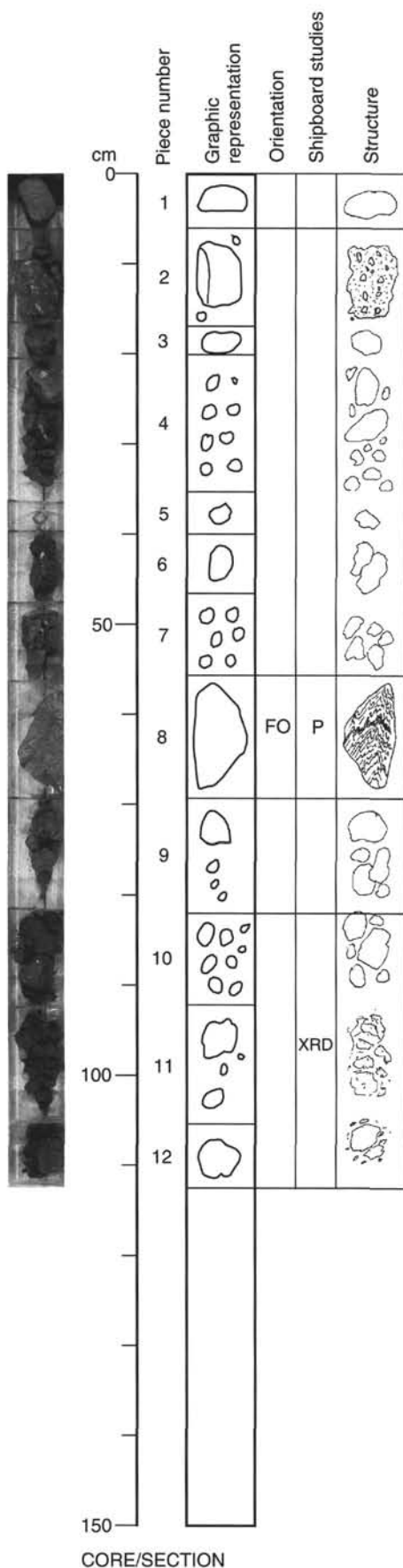
Piece 15B

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, feldspar, dolomite.
TEXTURAL DESCRIPTION: Up to 15 mm clasts of leucogranite and dolomite in a pale gray dolomitic matrix.

Pieces 16–17

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Biotite, sillimanite, andalusite.
TEXTURAL DESCRIPTION: Dark gray schist with "ghost" andalusite.

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Piece 1

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Biotite, sillimanite, andalusite.
TEXTURAL DESCRIPTION: Dark gray schist with "ghost" andalusite.

Pieces 2-4

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, biotite, dolomite.
TEXTURAL DESCRIPTION: Dark gray breccia with about 60% clasts and 40% biotite-rich matrix. Clasts consist of dark gray biotite schist (70%), dolomitic marble (15%), and vein quartz (15%).

Piece 5

ROCK TYPE: MARBLE
PRIMARY MINERALOGY: Dolomite.
TEXTURAL DESCRIPTION: Banded pale greenish-gray dolomitic marble.

Pieces 6-7

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Dark gray breccia with clasts of dark gray biotite schist in a biotite-rich matrix.

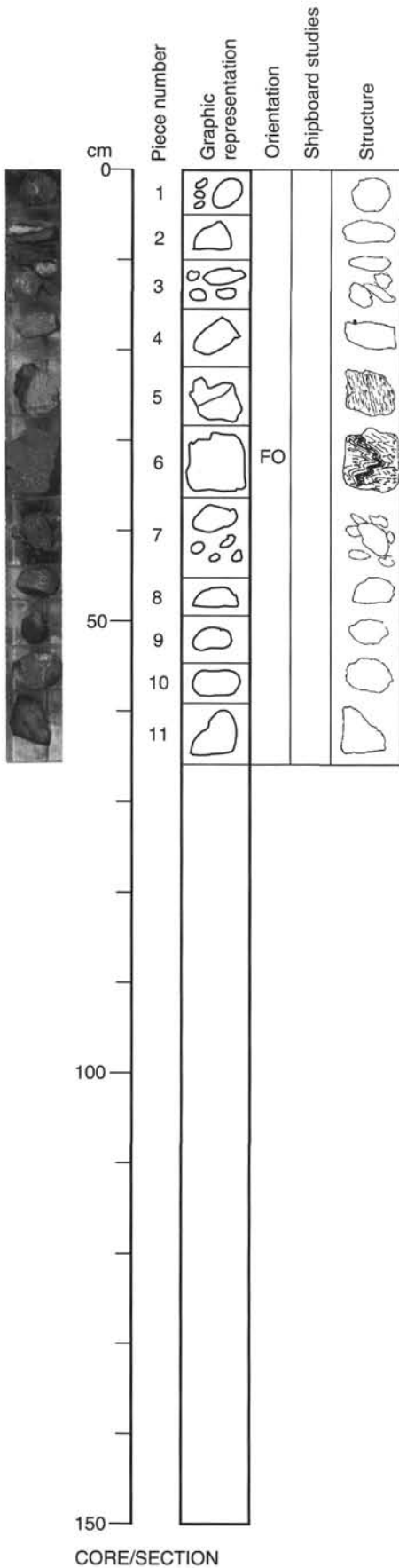
Piece 8

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Laminated schist with mm-scale quartz-rich laminae symmetrically folded on 2-10 mm scale.

Pieces 9-12

ROCK TYPE: FAULT GOUGE
PRIMARY MINERALOGY: Quartz, biotite, clay.
TEXTURAL DESCRIPTION: Dark gray clayey fault gouge with abundant striated slip surfaces, and scattered clasts up to 10 mm of biotite schist and vein quartz.

CORE/SECTION



Pieces 1–6

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, sillimanite.

TEXTURAL DESCRIPTION: Main foliation is defined by mm-scale quartz laminae, bands rich in 0.5-mm plagioclase, and (probably) 0.5-mm biotite. This is symmetrically folded on a cm scale, with 1-mm sillimanite oriented parallel to the axial plane.

Pieces 7–11

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Schist with prisms up to 10 mm of andalusite, apparently with concentrations of sillimanite around their margins.

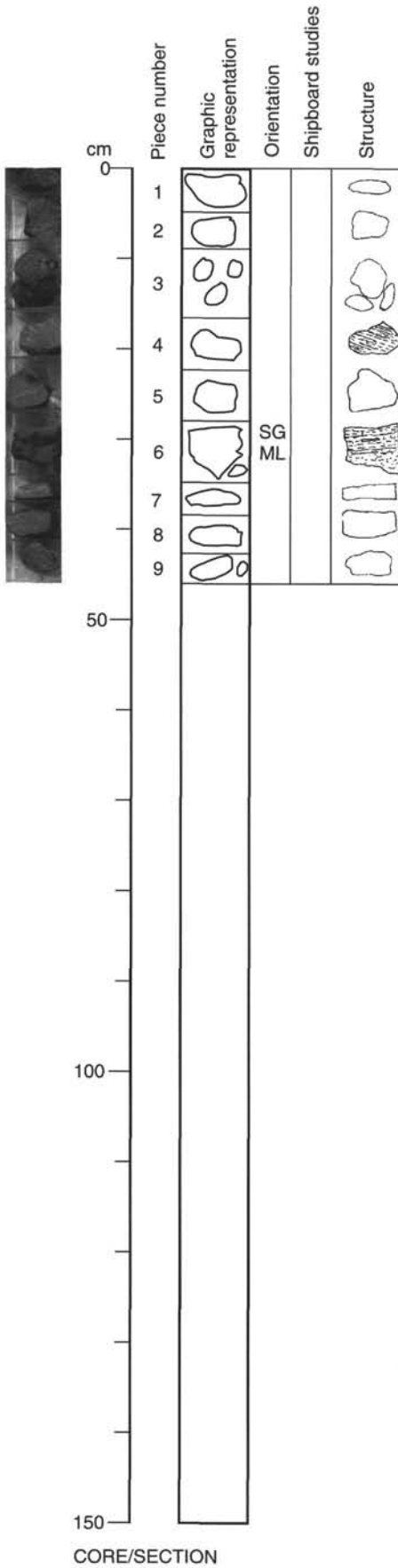
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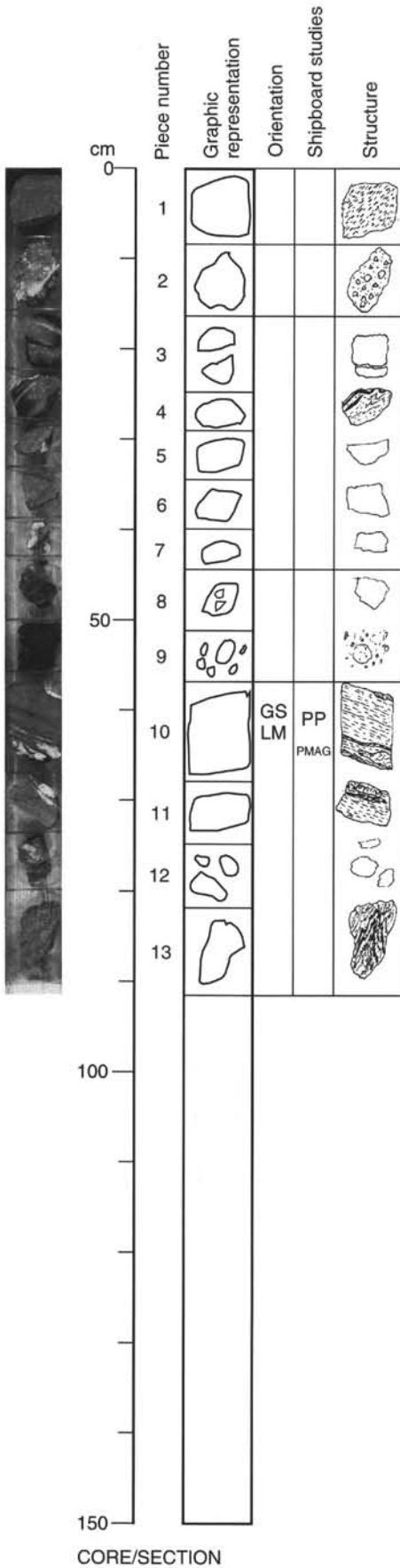
Pieces 1-9

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, sillimanite.

TEXTURAL DESCRIPTION: Schist with a strong planar foliation and mica + sillimanite lineation on the foliation surfaces. Piece 6 has a zone of microbrecciation and quartz veining in the center of the piece, and a polished slip plane on the upper surface. Piece 8 has a lamina 2 mm thick rich in biotite.





Piece 1

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Biotite, sillimanite.
TEXTURAL DESCRIPTION: Schist, with a 0.5-mm-thick fracture filled with quartz.

Piece 2

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Medium gray breccia with angular clasts up to 6 mm of biotite schist (50%) and vein quartz (50%) in a dark gray biotite-rich matrix.

Pieces 3-7

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.
TEXTURAL DESCRIPTION: Schist. In Piece 5 there are aggregates of coarse-grained biotite, and andalusite porphyroblasts have dense concentrations of biotite around their rims. Quartz veins in Pieces 3A and 4. Minor fold in Piece 4. Piece 3B is brecciated.

Pieces 8-9

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Microbreccia with fragments up to 8 mm in a dark gray biotite-rich matrix.

Pieces 10-13

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Biotite, sillimanite.
TEXTURAL DESCRIPTION: Schist. Mineral lineation on foliation plane, and disrupted quartz vein with 0.5- to 1-mm biotite in Piece 10. Minor folds of the foliation in Piece 13.

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Pieces 1-3

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, garnet.
TEXTURAL DESCRIPTION: Schist with compositional bands. In Piece 2, quartz-rich bands up to 5 mm thick parallel to the main foliation contain an oblique fabric defined by thin films of biotite. Age relations between the two fabrics are not clear.

Pieces 4-8

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Calcite, dolomite, pyrite, clay.
TEXTURAL DESCRIPTION: Dolomitic marble breccia with 1- to 20-mm fragments of compact white marble in a very pale green calcareous matrix. Scattered 1- to 2-mm pyrite aggregates. Piece 5 has a higher clay content. Pieces 5 and 6 also contain schist fragments.

Piece 9

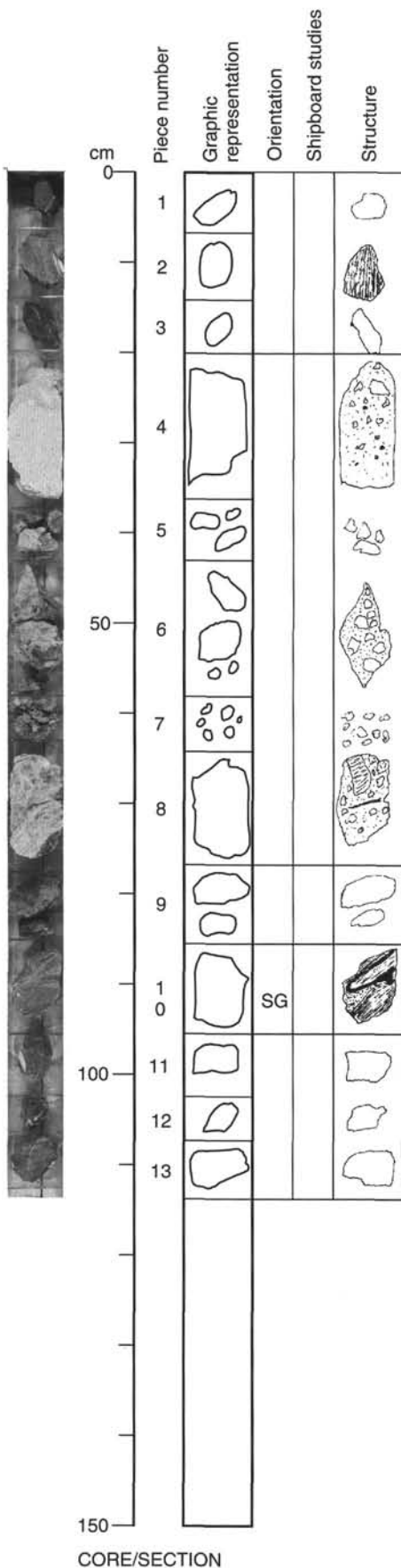
ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.
TEXTURAL DESCRIPTION: Schist. Rock is medium greenish gray, and appears to have been bleached and altered.

Piece 10

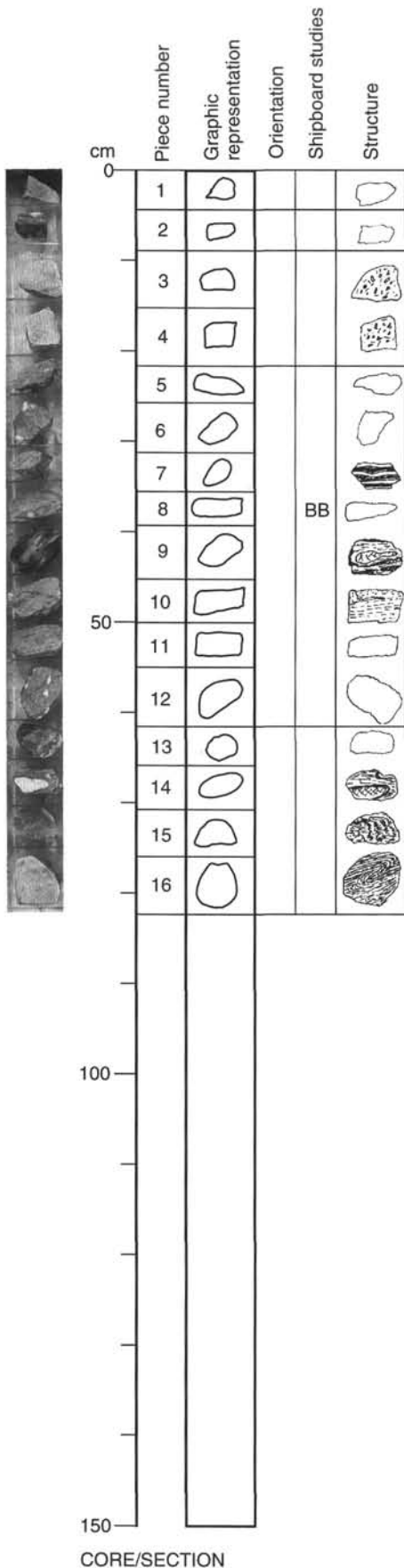
ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, epidote(?), garnet.
TEXTURAL DESCRIPTION: Banded gneiss. Lower half of piece consists of compact fine-grained massive quartz-biotite rock, with irregular layers and patches of coarser-grained quartz-biotite-sillimanite schist. Upper half consists of yellowish-green epidote(?)-quartz-biotite rock with 0.1 mm garnet.

Pieces 11-13

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.
TEXTURAL DESCRIPTION: Schist with abundant randomly oriented andalusite.



CORE/SECTION



Piece 1

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar.
TEXTURAL DESCRIPTION: Very pale green fine-grained (0.5-mm) granofels.

Piece 2

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, cordierite(?).
TEXTURAL DESCRIPTION: Rock appears to have a hornfelsic texture. Spots up to 2 mm of bright blue cordierite(?). Quartz vein.

Pieces 3–4

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar, tourmaline, chlorite.
TEXTURAL DESCRIPTION: Fine-grained (1- to 1.5-mm) leucogranite with 0.1-mm tourmaline and 0.5-mm green chlorite (after biotite(?)). Both pieces have a selvage of quartz-biotite-sillimanite schist.

Pieces 5–16

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, feldspar, biotite, sillimanite, andalusite, cordierite.
TEXTURAL DESCRIPTION: Medium gray gneiss with irregular patches of felsic material. Less biotite than in schistose rocks above. Prismatic sillimanite up to 2 mm long; blue cordierite crystals up to 15 mm across in Piece 6. Cordierite also possible in Pieces 7 and 8; andalusite in Pieces 5, 6, and 12; retrogressive(?) muscovite in Pieces 7 and 16; quartz vein with tourmaline in Piece 8. Strong mica + sillimanite lineation in Piece 9.

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Pieces 1-2

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, feldspar.

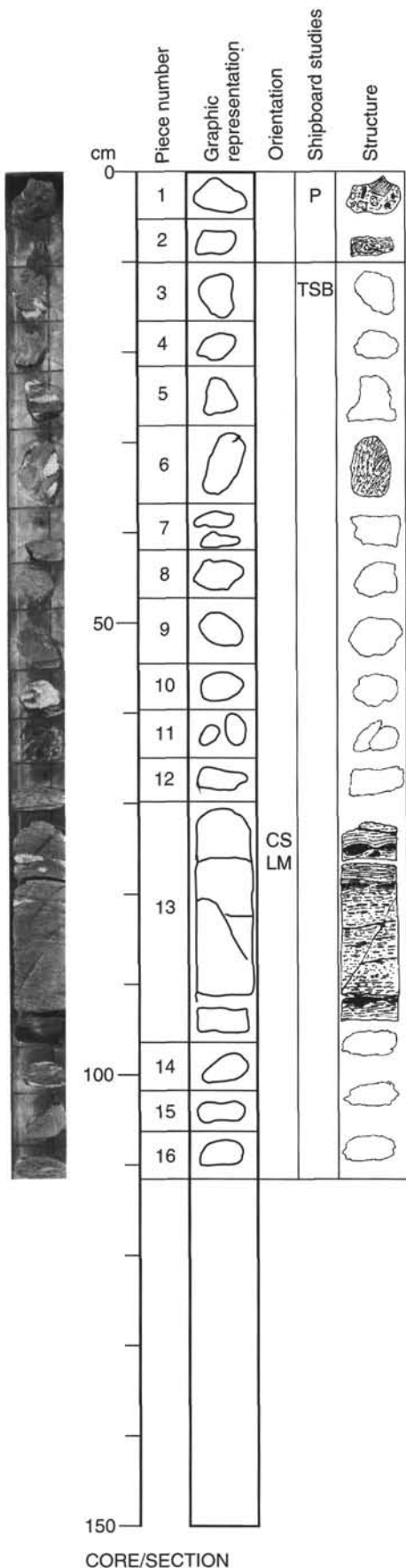
TEXTURAL DESCRIPTION: Medium greenish gray breccia. 1- to 20-mm angular to subrounded fragments of gneiss and vein quartz in a hard, pale gray, finely crystalline(?) matrix, apparently consisting of 0.1-mm granular quartz and feldspar.

Pieces 3-16

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, feldspar, biotite, sillimanite, cordierite.

TEXTURAL DESCRIPTION: Medium gray gneiss, 0.5- to 1-mm grain size with irregular patches of granitic leucosome with 2-mm grain size, particularly in Pieces 5 and 6. Scattered tourmaline in Piece 6. Elongate patches of blue cordierite up to 1.5 cm long in Pieces 3, 8, 10, 11A, and 13A. Shear band disrupts quartz vein in Piece 13A, top to west sense of shear.

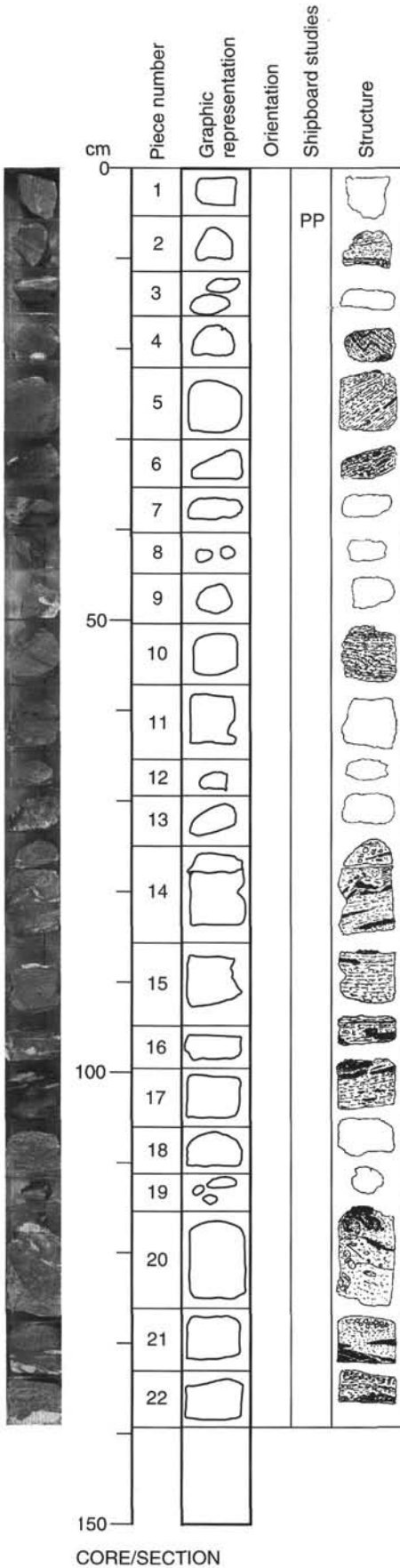


Pieces 1-22

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, feldspar, biotite, sillimanite, cordierite.

TEXTURAL DESCRIPTION: Medium gray medium-grained poorly foliated fairly homogeneous gneiss, with irregular granitic leucosome patches 3-5 mm across. Low content of biotite and sillimanite, fairly abundant 5-mm dark blue cordierite. Scattered 1- to 2-mm aggregates of another dark mineral(?) 1- to 2-mm andalusite(?) in Pieces 11 and 22. 15-mm leucogranite vein, with scattered tourmaline, oblique to foliation in Piece 7; similar in Pieces 9 and 13. Cubes of magnetite(?) in leucogranite in Piece 13. 1- to 2-mm thick irregular quartz veins with coarse (1-mm) biotite selvages in Pieces 11 and 20. Good foliation in Piece 2, good stretching lineation in Piece 5.



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Pieces 1-2

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, cordierite(?), tourmaline.

TEXTURAL DESCRIPTION: Banded rock with foliation defined by the orientation of sillimanite and biotite.

Coarse, equigranular, and leucocratic quartz veins with biotite and scarce tourmaline parallel to the foliation are common in Piece 1. In the outer rims of quartz veins, there is a blue translucent mineral, probably cordierite(?). Open cracks cutting the foliation are filled with sillimanite(?) fibers.

Pieces 3-5

ROCK TYPE: MIGMATITIC GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar, cordierite(?).

TEXTURAL DESCRIPTION: Banded rock extensively veined by equigranular coarse unfoliated felsic leucosome veins with quartz and feldspar. Melanosome is composed of banded gneiss with biotite and sillimanite. Diverse migmatitic textures seen in the rocks are: banded migmatite with granoblastic leucosome with irregular boundaries in Piece 5 (stromatic texture), and intrusive granoblastic leucosome cutting the gneissic banding in Piece 3 (diktyonitic texture).

Piece 6

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Banded rock with foliation defined by the orientation of sillimanite and biotite.

Disrupted, coarse quartz veins are parallel to gneissic banding. Rectangular sections of white andalusite(?) in the edge of the piece.

Piece 7

ROCK TYPE: MIGMATITIC GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar, cordierite(?).

TEXTURAL DESCRIPTION: Banded rock with foliation defined by the orientation of sillimanite and biotite.

Coarse equigranular leucocratic granite vein with feldspar and quartz cuts the foliation (resembling diktyonitic texture).

Pieces 8-10

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar, andalusite, cordierite(?).

TEXTURAL DESCRIPTION: Banded rock with foliation defined by the orientation of sillimanite and biotite.

Small (less than 3-mm) rare relict andalusite is randomly oriented over the foliation in Piece 8. Chistolite twinning in some crystals of Piece 10. Granular light-colored cordierite(?) in Piece 8.

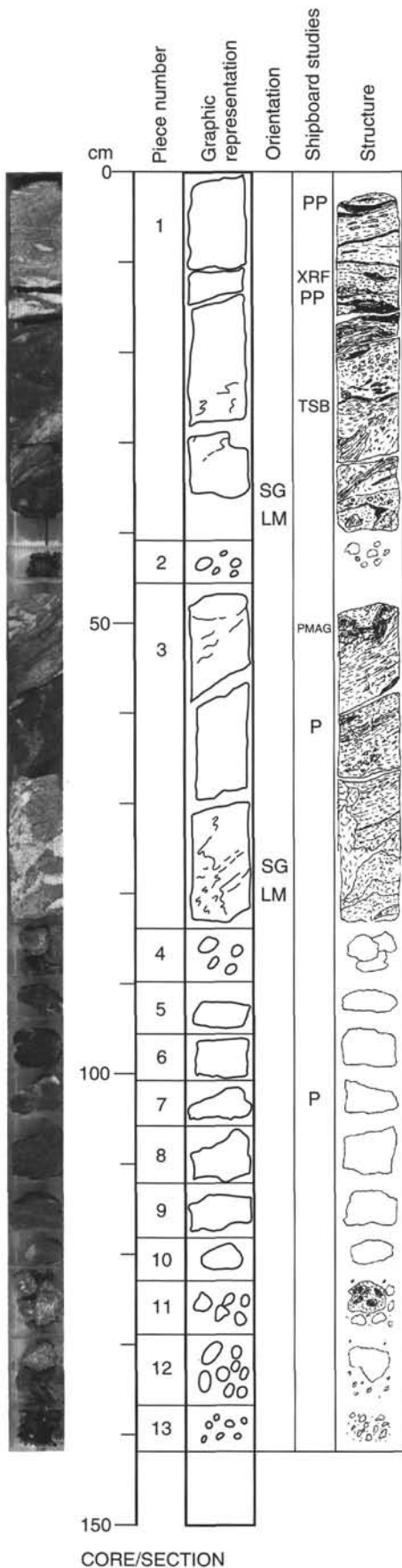
Pieces 11-13

ROCK TYPE: BRECCIA

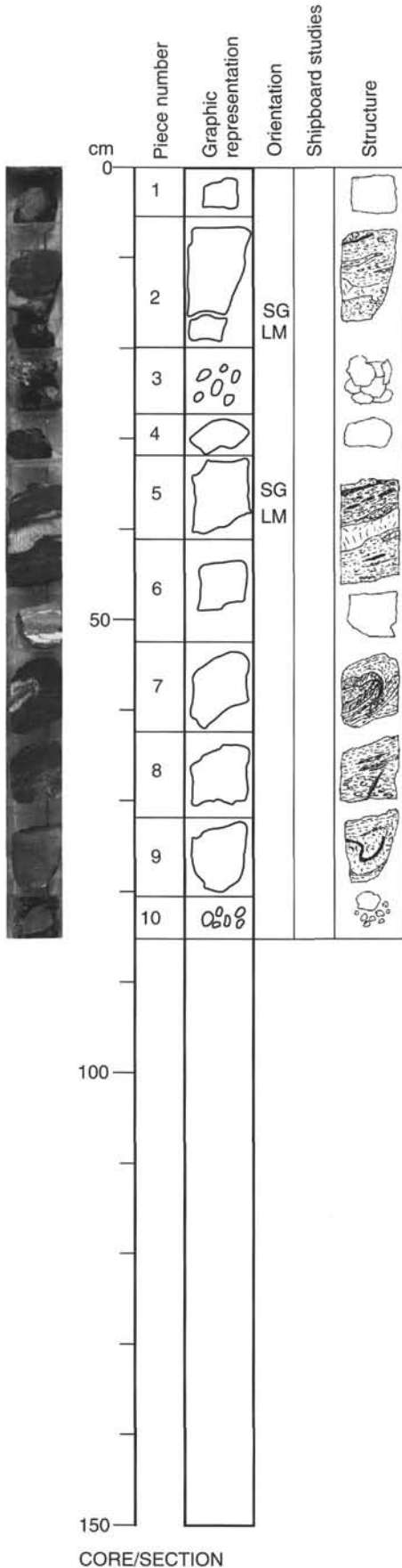
PRIMARY MINERALOGY: Quartz, clay(?), chlorite(?).

TEXTURAL DESCRIPTION: Polymictic inequigranular matrix-supported breccia. Isolated breccia fragments in Pieces 12 and 13. Unconsolidated breccia (fault gouge) in Piece 11. Microgranular matrix with biotite, quartz and feldspar(?) in Piece 11. Recognizable clasts in the breccia are composed of biotite gneiss (up to 15 mm long), vein quartz, and granular biotite-bearing granite in Piece 11. In Piece 11 clasts consist of:

- 80%: banded biotite gneiss
- 20%: quartz and granite fragments



CORE/SECTION



Pieces 1–6

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, cordierite(?), plagioclase(?).

TEXTURAL DESCRIPTION: Banded gneiss with a strong foliation marked by biotite and sillimanite crystals. Ghost rectangular andalusite crystals (up to 3 mm) in Piece 2. Small rectangular and idioblastic plagioclase(?) or cordierite(?) in Piece 4. Bluish color in the matrix of Piece 5 is probably due to the presence of cordierite(?). Abundant quartz veins parallel to foliation in Pieces 2 and 5; in Piece 5 the veins contain small tourmaline crystals and are laterally discontinuous.

Pieces 7–10

ROCK TYPE: MIGMATITIC GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar, cordierite(?) muscovite(?).

TEXTURAL DESCRIPTION: Banded gneiss with foliation defined by biotite and sillimanite crystals. The rock is broken up by disseminated granoblastic leucosome with quartz, feldspar, probable cordierite(?) in Piece 7, and also abundant obliquely oriented muscovite in Piece 8. Quartz segregations with globular shapes are common in Piece 7. Relationship between leucosome veins and melanosome banded gneiss gives the rock a breccia-like aspect (agmatitic texture).

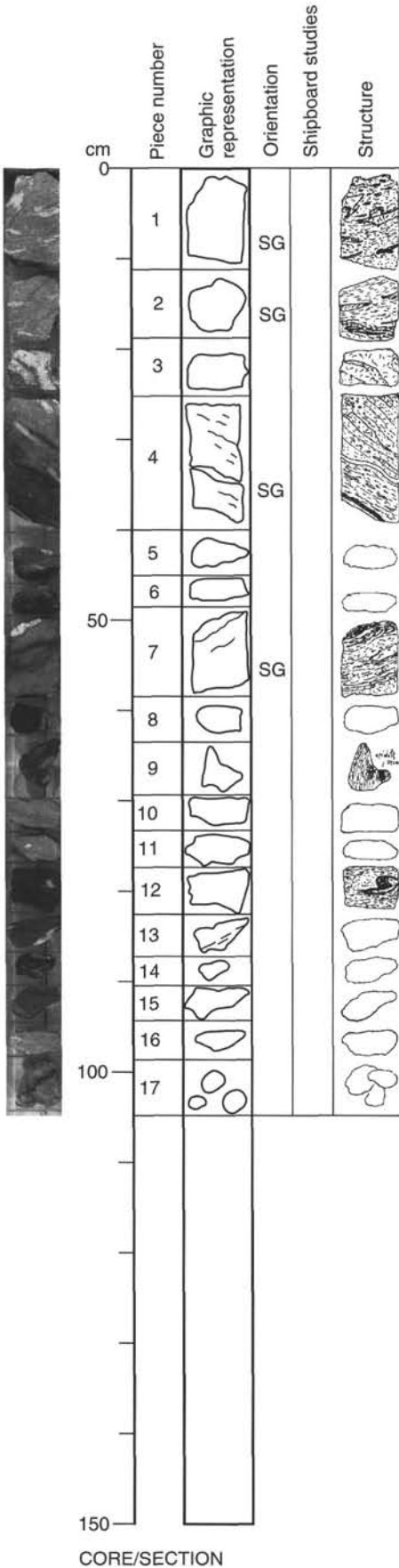
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Pieces 1-17

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, epidote(?).

TEXTURAL DESCRIPTION: Banded gneiss with a strong foliation marked by biotite and sillimanite crystals. Abundant quartz veins parallel to the foliation in Pieces 1 and 3 (up to 25-30 mm thick), Pieces 7, 13, and 16 (less than 3-mm-thick), and 17. Relict randomly oriented andalusite in Pieces 1, 6, and 16 grows over the foliation. Piece 9 has two pods of green epidote(?). Piece 15 is a gray banded quartzite.

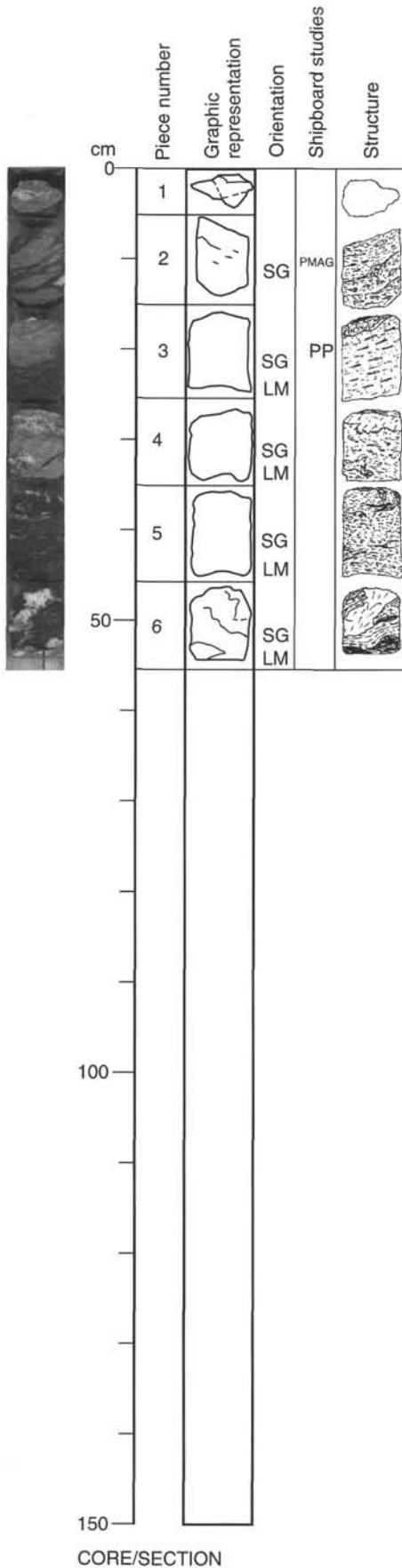


Pieces 1-6

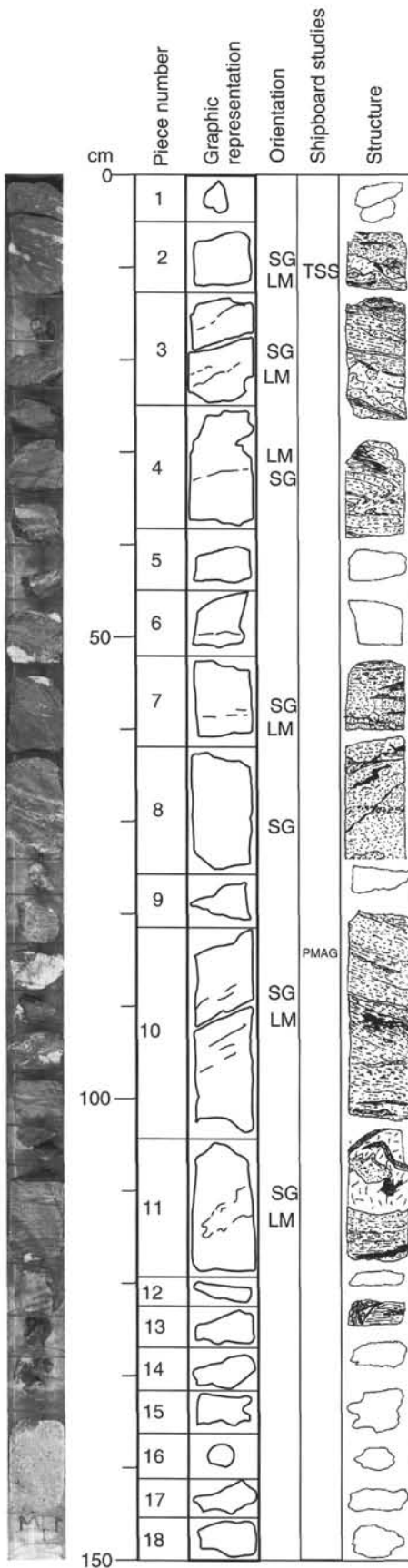
ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, tourmaline.

TEXTURAL DESCRIPTION: Banded and foliated schist in which the foliation is defined by biotite and sillimanite. Rectangular andalusite crystals are distinguishable in Pieces 2, 3, and 4. Quartz veins parallel to the foliation in Pieces 1, 4, 5, and 6 (up to 20 mm thick). In Piece 4 the veins contain small tourmaline crystals.



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Pieces 1-5

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Banded gneiss with foliation defined by biotite and sillimanite crystals. Andalusite crystals in Pieces 1, 3, and 4. Bluish short rectangular mineral included in and surrounding quartz veins in Pieces 2 and 3.

Piece 6

ROCK TYPE: QUARTZ ROCK

PRIMARY MINERALOGY: Quartz, tourmaline.

TEXTURAL DESCRIPTION: Banded quartzite with small needles of black tourmaline.

Pieces 7-12

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, chlorite.

TEXTURAL DESCRIPTION: Banded gneiss with foliation marked by biotite and sillimanite crystals. Ghost diamond-shaped andalusite grows over the foliation in Pieces 7, 8, 9, 10 (less than 2-3 mm), and 11. Coarse-grained quartz veins parallel to the foliation in Piece 12, and in Piece 11 with large aggregates of chlorite (up to 30-35 mm thick).

Pieces 13-15

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, clay(?), dolomite(?), biotite(?), chlorite(?).

TEXTURAL DESCRIPTION: Cemented inequigranular matrix-supported breccia with angular fragments. Dark green matrix contains dolomite(?). Homogeneous breccia in Piece 15, and polymictic breccia in Piece 15. Clasts consist of:

Piece 13: 100% quartzite angular fragments (up to 30 mm, mean size 5 to 10 mm)

Piece 15: 80%: Banded light-green quartzite,
20%: biotite gneiss.

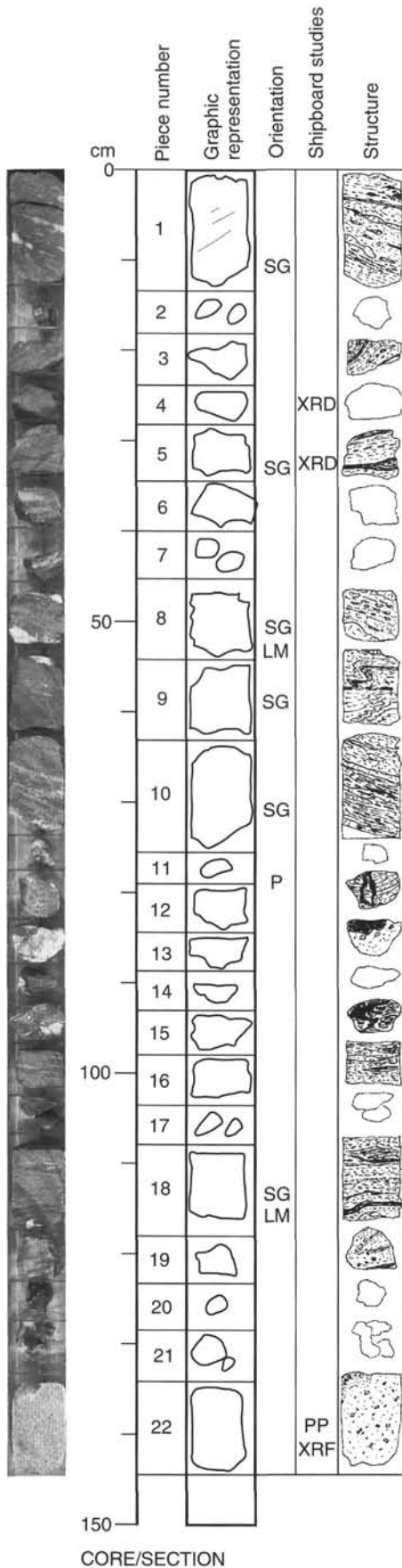
Pieces 16-18

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Banded gneiss with foliation marked by biotite and sillimanite crystals. Andalusite recognizable in Pieces 16 and 17. Coarse-grained quartz veins parallel to foliation in Piece 17.

CORE/SECTION



Pieces 1–12

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, garnet, muscovite, chlorite, tourmaline.
TEXTURAL DESCRIPTION: Main foliation is defined by oriented biotite and sillimanite crystals. Short prismatic andalusite grows randomly oriented over the foliation in Pieces 1, 3 (up to 30 mm), 4, 5, 8, and 10. Scarce garnet is only visible as relict grains in Piece 4. Coarse-grained quartz veins parallel to foliation in Pieces 1 and 4 (also with large crystals of muscovite). Shear bands disrupt layer-parallel quartz veins in Pieces 6 and 9, with west and east sense of shear, respectively. Black tourmaline needles inside quartz veins in Piece 11. Biotite is concentrated at the border of quartz veins particularly in Piece 6. Tight folds in Piece 9 with axial planes parallel to the outer foliation. Tension cracks in Piece 12, perpendicular to the foliation, are filled by quartz, tourmaline and rectangular green crystals of feldspar(?).

Pieces 13–14

ROCK TYPE: MIGMATITIC GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, feldspar, tourmaline.
TEXTURAL DESCRIPTION: Banded gneiss with leucogranite veins. Leucosome with feldspar, quartz, and tourmaline needles impregnating the banded biotite-rich gneiss (agmatite-like texture).

Pieces 15–20

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, ilmenite.
TEXTURAL DESCRIPTION: Banded gneiss with large concentrations of biotite and fibrolite parallel to the foliation. Andalusite is distinguishable as pink crystals in Pieces 15 and 20.

Piece 21

ROCK TYPE: MIGMATITE GNEISS

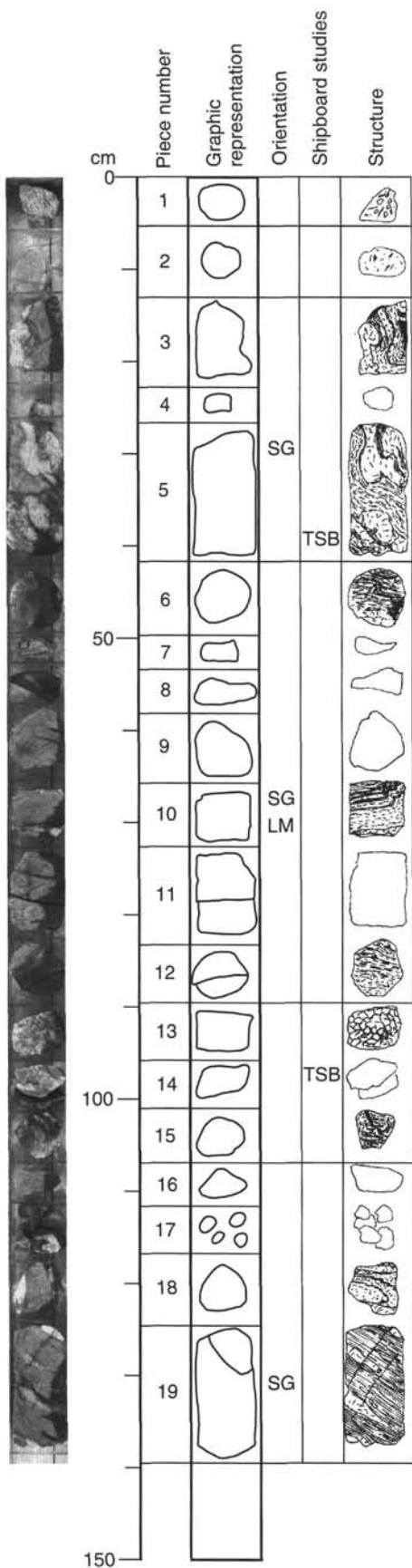
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, tourmaline, feldspar.
TEXTURAL DESCRIPTION: Granular leucogranite vein with feldspar, quartz, and tourmaline, parallel to the foliation in biotite gneiss.

Piece 22

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, feldspar, biotite, tourmaline, cordierite(?).
TEXTURAL DESCRIPTION: Granular leucogranite with feldspar, quartz, and minor biotite and tourmaline. Aggregates of biotite and probable cordierite(?).

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CORE/SECTION

Piece 1

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, tourmaline.
TEXTURAL DESCRIPTION: Biotite-rich gneiss with irregular 2-cm-thick quartz-tourmaline vein.

Piece 2

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar, biotite, tourmaline.
TEXTURAL DESCRIPTION: Fine-grained (1- to 1.5-mm) leucogranite with cluster of tourmaline.

Piece 3

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, tourmaline.
TEXTURAL DESCRIPTION: Folded biotite-rich gneiss with 2-cm-thick quartz-tourmaline vein.

Piece 4

ROCK TYPE: QUARTZ ROCK
PRIMARY MINERALOGY: Quartz, tourmaline.
TEXTURAL DESCRIPTION: 1- to 2-mm granular quartz and tourmaline.

Piece 5

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, garnet, andalusite, tourmaline.
TEXTURAL DESCRIPTION: Folded biotite-rich gneiss with rare 0.5-mm relict garnet, and abundant quartz-tourmaline veins (probably some feldspar is also present).

Pieces 6-12

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite.
TEXTURAL DESCRIPTION: Thinly laminated biotite-rich gneiss.

Pieces 13-15

ROCK TYPE: MIGMATITE GNEISS
PRIMARY MINERALOGY: Quartz, biotite, feldspar, tourmaline, cordierite.
TEXTURAL DESCRIPTION: Migmatite with biotite-rich gneiss paleosome and biotite-tourmaline-leucogranite neosome. Neosome in Pieces 13 and 14 also contains crystals up to 3 mm of blue-green cloudy uncleaved mineral-altered cordierite. 1-mm-wide vein filled with dolomite in Piece 15.

Pieces 16-17

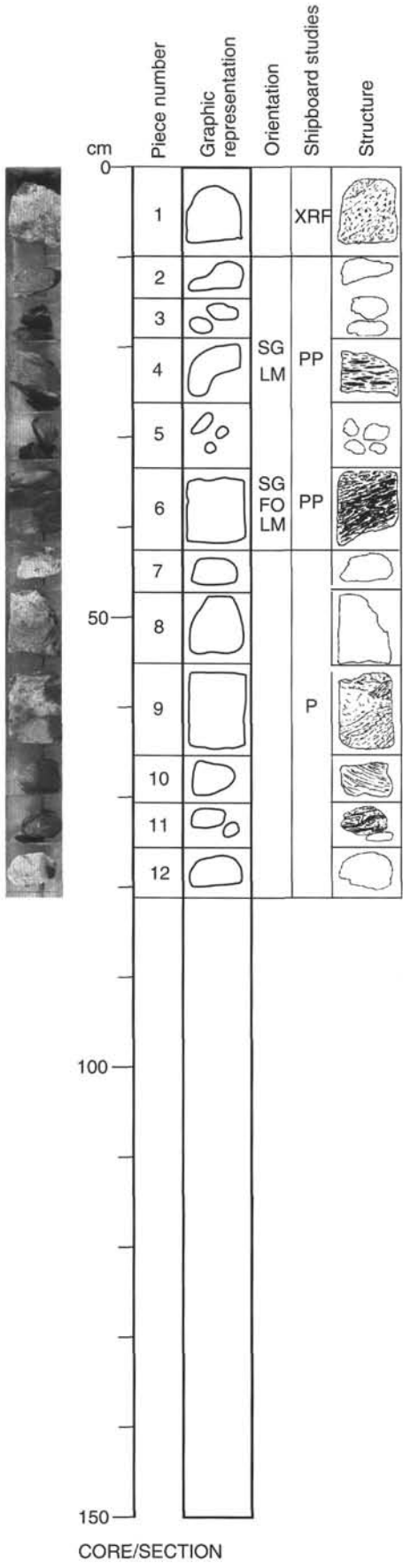
ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Grey banded gneiss.

Piece 18

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.
TEXTURAL DESCRIPTION: Biotite-rich gneiss.

Piece 19

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Gneiss with abundant disrupted quartz veins and chloritic alteration. Disrupted quartz vein suggests top to west shear sense.



Piece 1

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar, biotite, tourmaline, chlorite.
TEXTURAL DESCRIPTION: Fine-grained (1- to 1.5-mm) leucogranite with a selvage of biotite-rich gneiss.

Pieces 2-6

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.
TEXTURAL DESCRIPTION: Gneiss with abundant 1- to 2-mm andalusite. Good foliation and mineral lineation (in Piece 4), east-vergent minor folds in Piece 6.

Pieces 7-9

ROCK TYPE: MIGMATITE GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar, cordierite(?).
TEXTURAL DESCRIPTION: Gneiss paleosome with 1- to 2-cm irregular leucogranite neosome veins. Neosome contains abundant 1- to 4-mm crystals of blue-green cloudy unclesaved mineral. Cores of some of these grains are inky blue and resemble cordierite, rims look like green perthitic potassium-feldspar.

Pieces 10-11

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Dark gray biotite-rich gneiss.

Piece 12

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar, biotite, tourmaline, chlorite.
TEXTURAL DESCRIPTION: Fine-grained (1- to 1.5-mm) leucogranite.

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cm	Piece number	Graphic representation	Orientation	Shipboard studies	Structure
0	1				
	2				
	3				
	4				
	5				
	6				
	7		SG		
50	8				
	9				
100					
150					

Piece 1

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar, biotite, tourmaline.
TEXTURAL DESCRIPTION: Fine-grained (1- to 1.5-mm) leucogranite.

Piece 2

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, feldspar, biotite.
TEXTURAL DESCRIPTION: Gray felsic gneiss.

Piece 3

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar, biotite, tourmaline.
TEXTURAL DESCRIPTION: Fine-grained (1- to 1.5-mm) leucogranite.

Piece 4

ROCK TYPE: MIGMATITE GNEISS
PRIMARY MINERALOGY: Quartz, feldspar, biotite, tourmaline, cordierite(?).
TEXTURAL DESCRIPTION: Biotite-rich gneiss paleosome with leucogranitic neosome containing tourmaline and blue-green cloudy unclesaved mineral.

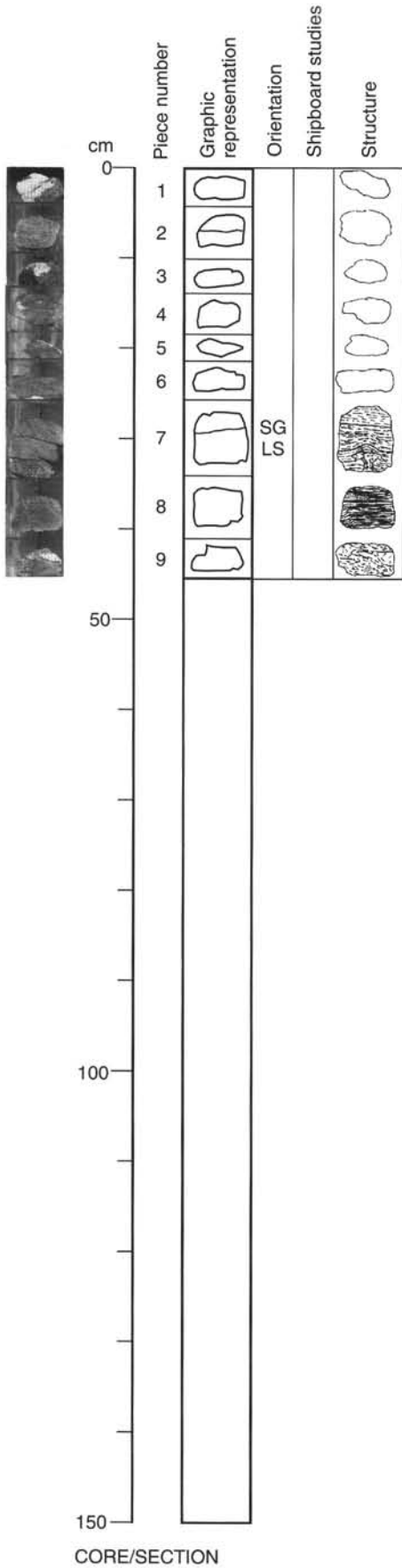
Pieces 5-7

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.
TEXTURAL DESCRIPTION: Gneiss with abundant 1- to 2-mm andalusite. Folded vein or layer of sillimanite in Piece 6.

Pieces 8-9

ROCK TYPE: MIGMATITE GNEISS
PRIMARY MINERALOGY: Quartz, feldspar, biotite.
TEXTURAL DESCRIPTION: Gneiss paleosome with leucogranitic neosome veins. Both components have been heavily altered and have a greenish tinge.

CORE/SECTION



Pieces 1-4

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Medium gray gneiss with quartz veins.

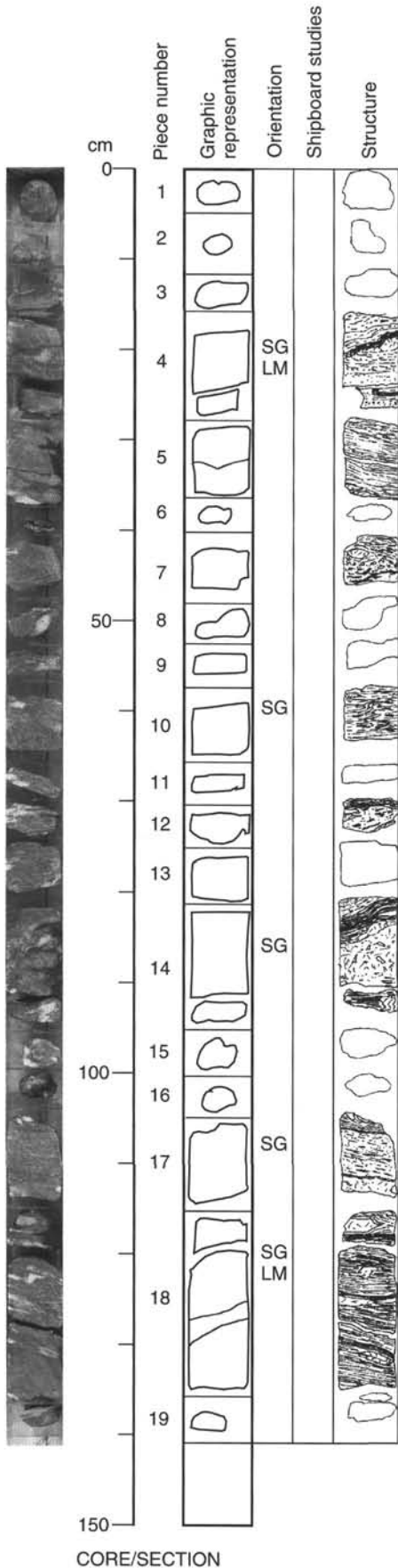
Pieces 5-7

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.
TEXTURAL DESCRIPTION: Medium gray gneiss.

Pieces 8-9

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, feldspar, biotite.
TEXTURAL DESCRIPTION: Foliated light gray felsic gneiss.

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Pieces 1–2

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar.
TEXTURAL DESCRIPTION: Fine-grained (1- to 1.5-mm) leucogranite.

Pieces 3-8

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, cordierite(?), andalusite(?).
TEXTURAL DESCRIPTION: Medium gray gneiss. 5-mm-thick band of coarse (1- to 2-mm) biotite in Piece 4, above a zone of anastomosing epidote veins.

Piece 9

ROCK TYPE: MIGMATITE GNEISS
PRIMARY MINERALOGY: Quartz, feldspar, biotite, muscovite.
TEXTURAL DESCRIPTION: Medium gray gneiss paleosome with leucogranitic neosome veins filling pull-apart structure. Coarse (2- to 3-mm) muscovite in pull-apart.

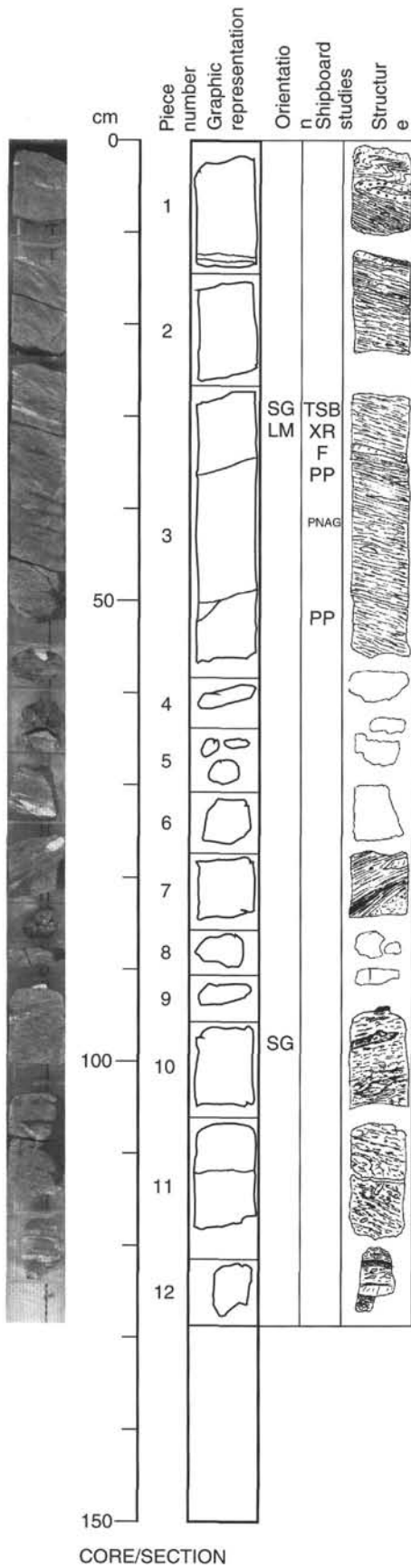
Pieces 10–15

ROCK TYPE: MIGMATITE GNEISS
PRIMARY MINERALOGY: Quartz, feldspar, biotite, andalusite, tourmaline, muscovite.
TEXTURAL DESCRIPTION: Medium gray gneiss with "ghost" andalusite, quartz tourmaline veins, and granitic leucosome patches. Coarse (2- to 3-mm) muscovite in Piece 15.

Pieces 16–19

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite.
TEXTURAL DESCRIPTION: Medium gray gneiss with disrupted quartz veins.

CORE/SECTION



Pieces 1-6

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, cordierite.

TEXTURAL DESCRIPTION: Medium gray gneiss with "ghost" andalusite and blebs up to 10 mm long and 2 mm thick of cordierite. Good planar foliation defined by 5- to 20-mm compositional bands, quartz veins, oriented biotite, and cordierite blebs. Mica lineation on foliation surfaces. east-vergent cm-scale folds in Piece 1.

Piece 7

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, epidote(?).

TEXTURAL DESCRIPTION: Medium gray gneiss with 1-cm layer rich in biotite surrounding a vein or pod of green epidote(?).

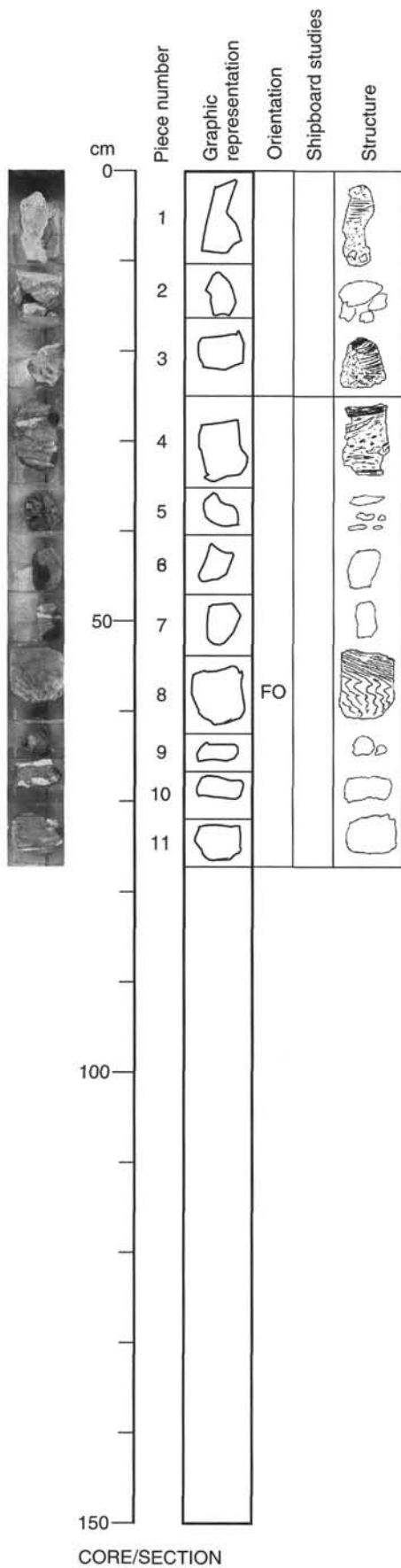
Pieces 8-12

ROCK TYPE: MIGMATITE GNEISS

PRIMARY MINERALOGY: Quartz, feldspar, biotite, sillimanite, andalusite, cordierite, tourmaline.

TEXTURAL DESCRIPTION: Medium gray gneiss with granitic leucosome patches containing tourmaline.

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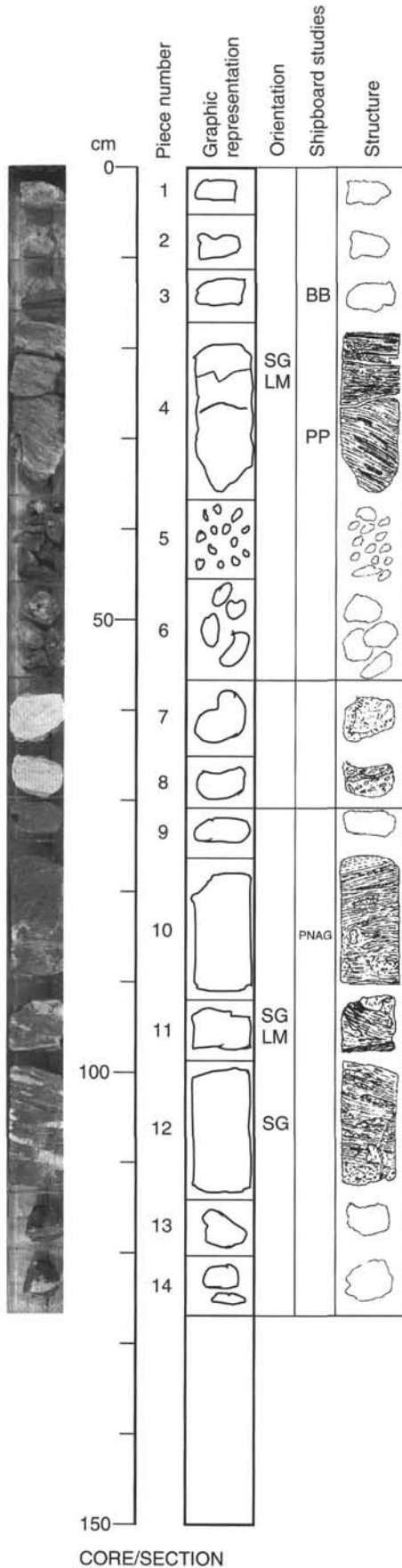


Pieces 1-2

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, feldspar.
TEXTURAL DESCRIPTION: Leucogneiss and fine-grained leucogranite. Virtually no dark minerals.
 Gneiss appears to be bleached, granite seems altered.

Pieces 3-11

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite(?), cordierite.
TEXTURAL DESCRIPTION: Gray gneiss. Piece 3 is altered and has a pale green color.



Pieces 1-6

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, muscovite, cordierite, sillimanite.

TEXTURAL DESCRIPTION: Medium gray gneiss. Muscovite is probably retrogressive.

Pieces 7-8

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Dolomite.

TEXTURAL DESCRIPTION: Pale gray to white dolomitic marble breccia.

Piece 9

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Dark gray schist.

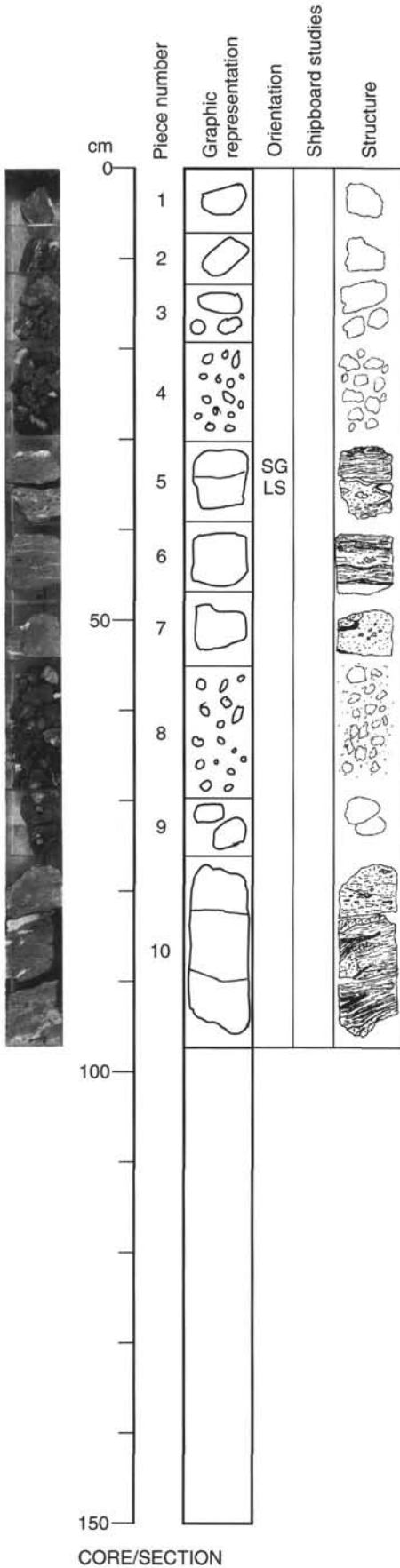
Pieces 10-14

ROCK TYPE: MIGMATITE GNEISS

PRIMARY MINERALOGY: Quartz, feldspar, biotite, sillimanite, andalusite, cordierite.

TEXTURAL DESCRIPTION: Medium gray gneiss with disrupted quartz veins and irregular granitic leucosome veins containing blue-green mineral.

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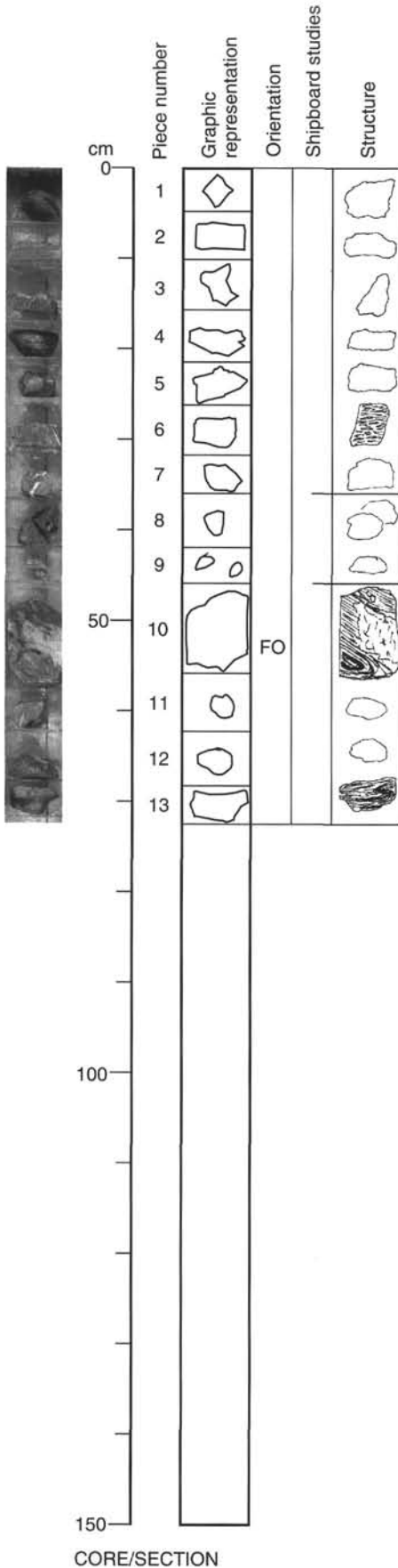


Pieces 1-4

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, biotite.
TEXTURAL DESCRIPTION: Medium gray gneiss.

Pieces 5-10

ROCK TYPE: MIGMATITE GNEISS
PRIMARY MINERALOGY: Quartz, feldspar, biotite, sillimanite, andalusite, cordierite, muscovite.
TEXTURAL DESCRIPTION: Medium gray gneiss with granitic leucosome veins. Pieces 1 and 10 have 5-mm blue cordierite and 1- to 2-mm muscovite in the leucosome.



Pieces 1-7

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Banded gneiss with foliation marked by biotite and sillimanite crystals. Scarce andalusite.

Piece 8

ROCK TYPE: QUARTZ ROCK

PRIMARY MINERALOGY: Quartz, epidote(?), feldspar.

TEXTURAL DESCRIPTION: Banded green quartz-rich rock, with probable green epidote(?) and feldspar(?).

Piece 9

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, feldspar(?).

TEXTURAL DESCRIPTION: Two small fragments of altered feldspar-rich rock.

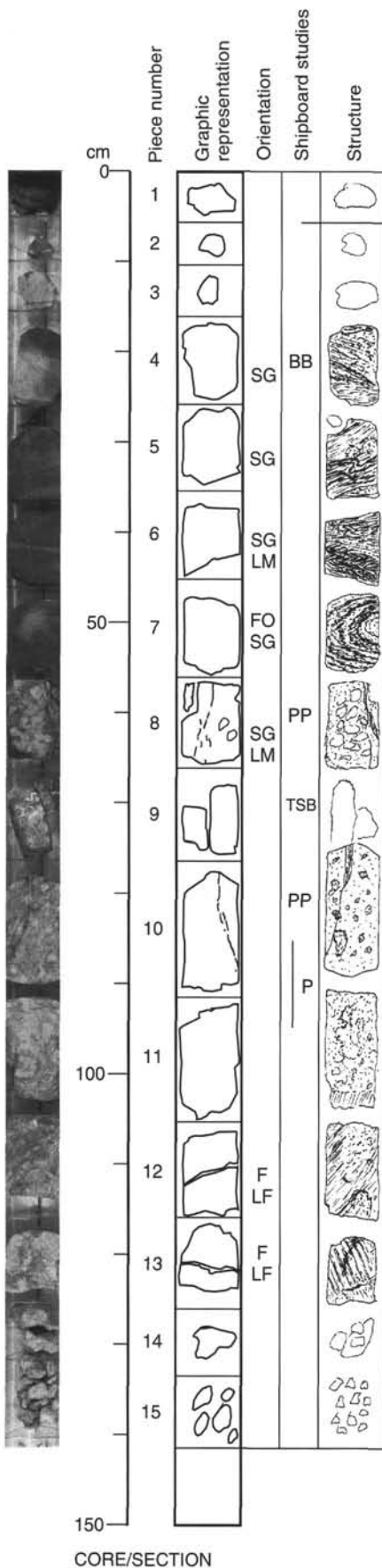
Pieces 10-13

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, epidote(?).

TEXTURAL DESCRIPTION: Banded gneiss with foliation marked by biotite and sillimanite crystals. Small amount of andalusite. Large irregular quartz vein in Piece 10 has green biotite and another pale green mineral in aggregates, probably epidote(?).

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Piece 1

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar(?).

TEXTURAL DESCRIPTION: Biotite-sillimanite gneiss with thin segregations of quartz and feldspar(?).

Pieces 2-7

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, biotite, chlorite, tourmaline, feldspar, plagioclase(?).

TEXTURAL DESCRIPTION: Felsic granular rock with a poorly defined foliation. Minor amounts of biotite, chlorite and subordinate tourmaline. In Piece 7 there are tight folds with axial planes parallel to the banding.

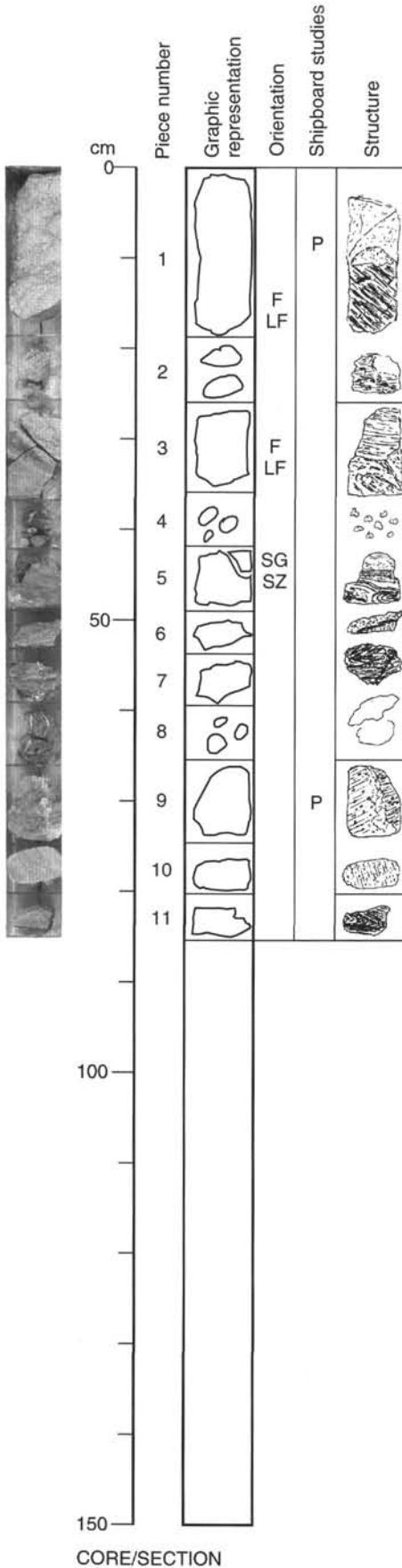
Pieces 8-15

ROCK TYPE: CALC-SILICATE ROCK

PRIMARY MINERALOGY: Calcite, plagioclase, diopside.

TEXTURAL DESCRIPTION: The rock has a mottled appearance with large pale green crystals surrounded by a dark-green granular matrix. These relationships resemble an orbicular texture. Thick quartz veins are visible in Piece 14. Pieces 8, 9, and 10 have near vertical cracks filled by quartz. Pieces 12 and 13 have near vertical fault planes with oblique slickenside striations.

CORE/SECTION



Pieces 1-2

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, biotite, feldspar, plagioclase(?).
TEXTURAL DESCRIPTION: Leucogranite with many fault planes and fault striations.

Piece 3

ROCK TYPE: MIGMATITE GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar.
TEXTURAL DESCRIPTION: Foliation-parallel contact between leucogranite and banded biotite-rich gneiss.

Pieces 4-8

ROCK TYPE: MIGMATITE GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar.
TEXTURAL DESCRIPTION: Banded biotite-rich gneiss, with chlorite-rich layers. Variably oriented veins of feldspar with quartz cut the foliation and give a breccia-like structure to the rock.

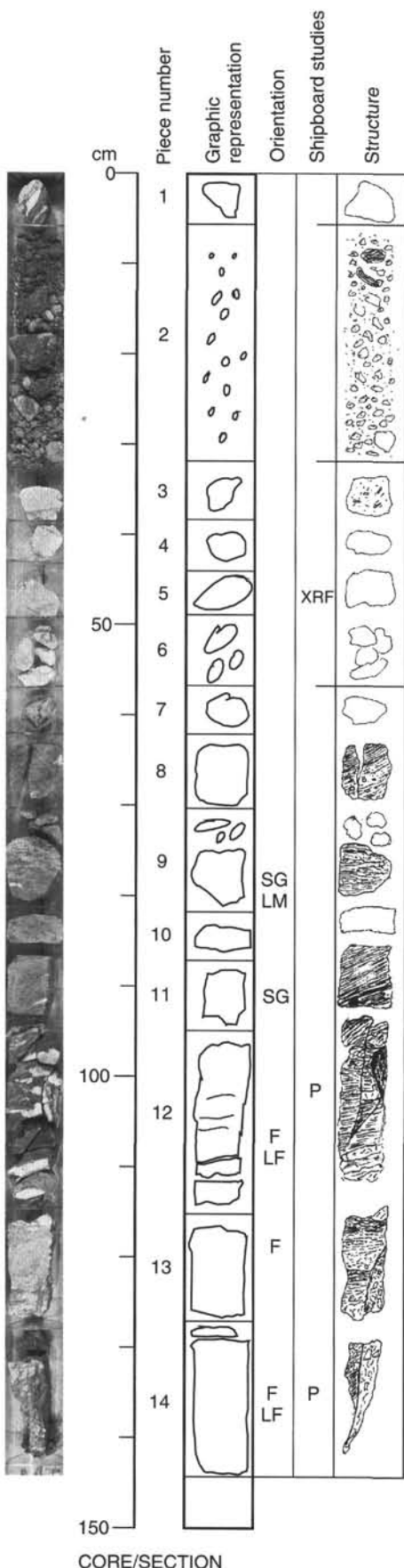
Piece 9

ROCK TYPE: MIGMATITE GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar.
TEXTURAL DESCRIPTION: Dispersed fragments of medium size (usually less than 10 mm) of biotite-rich gneiss cemented by a felsic matrix, with granular texture and a quartz + feldspar composition. Agmatite-like texture.

Pieces 10-11

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite.
TEXTURAL DESCRIPTION: Banded gneiss rich in green biotite parallel to foliation. Piece 11 has tight folds deforming the foliation, and a quartz vein parallel to banding with a pinch-and-swell boudinage structure.

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Piece 1

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite.
TEXTURAL DESCRIPTION: Banded biotite-sillimanite gneiss with foliation-parallel quartz veins.

Piece 2

ROCK TYPE: FAULT GOUGE
PRIMARY MINERALOGY: Quartz, clay(?), chlorite(?).
TEXTURAL DESCRIPTION: Many variably sized fragments of biotite-rich gneiss in a fault gouge, some of them (up to 60 mm long) with fault striations on their surfaces.

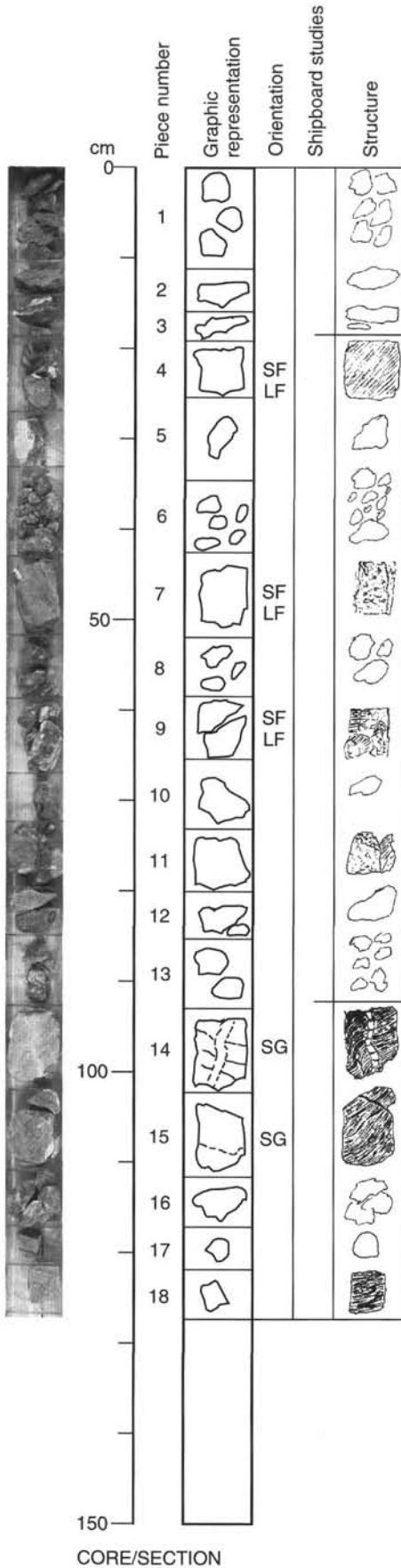
Pieces 3–6

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, biotite, feldspar, tourmaline.
TEXTURAL DESCRIPTION: Granular felsic leucogranite with abundant randomly oriented tourmaline and biotite.

Pieces 7–14

ROCK TYPE: GNEISS
PRIMARY MINERALOGY: Quartz, biotite, sillimanite, cordierite(?).
TEXTURAL DESCRIPTION: Banded biotite-sillimanite rich gneiss with blue aggregates, probably cordierite(?). Abundant fault surfaces with oblique fault striations, and penetrative brecciation producing foliated cataclasites in Pieces 12, 13, and 14.

CORE/SECTION



Piece 1

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, clay(?), biotite, sillimanite.

TEXTURAL DESCRIPTION: Several fragments of brecciated biotite-sillimanite gneiss with striations on fault surfaces.

Pieces 2-3

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Banded gneiss with biotite and sillimanite defining the foliation.

Pieces 4-13

ROCK TYPE: FAULT GOUGE

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar(?).

TEXTURAL DESCRIPTION: Faulted fragments of biotite-sillimanite gneiss with common fault planes showing curved striations (e.g., Piece 11).

Pieces 14-18

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar.

TEXTURAL DESCRIPTION: Banded felsic gneiss. Foliation defined by alternating feldspar(?) rich felsic bands and mica-rich layers. Open gentle folds deform the banding in Piece 14, and a near-vertical quartz vein cuts the foliation right across the Piece. In the vein quartz has grown from the wall towards the center. Quartz-rich veins parallel to the foliation in Piece 15.

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Pieces 1-9

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, feldspar, biotite, sillimanite.

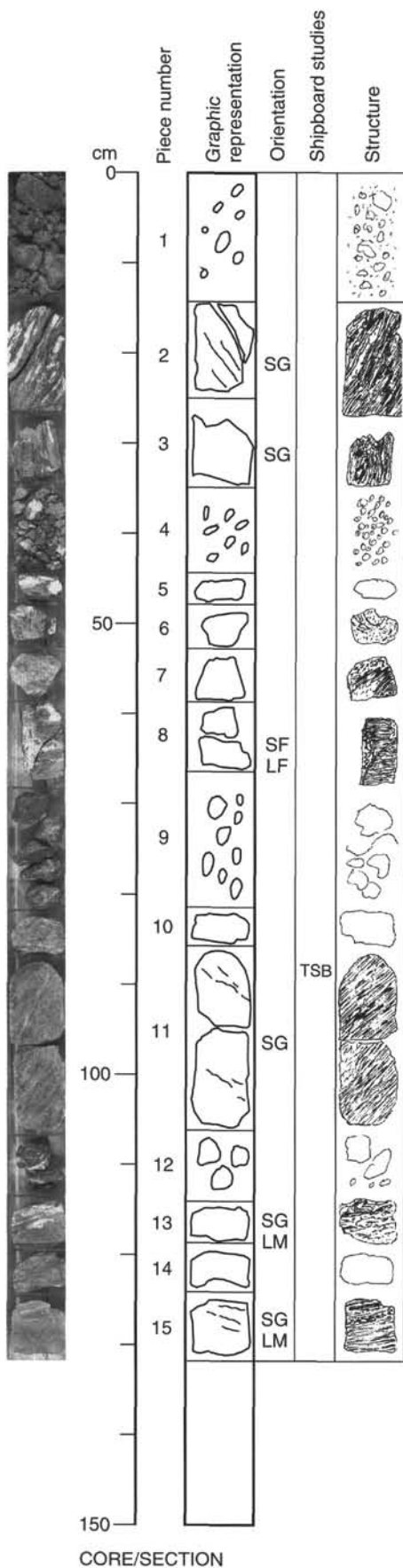
TEXTURAL DESCRIPTION: Banded biotite-sillimanite-rich gneiss. Piece 1 is made up of multiple breccia fragments of gneiss covered by silty grains of biotite and quartz. Abundant foliation-parallel quartz veins, with some pinch-and-swell boudinage structures in Pieces 2 and 3. Fault brecciated gneiss with fault planes and striations in Piece 8.

Pieces 10-15

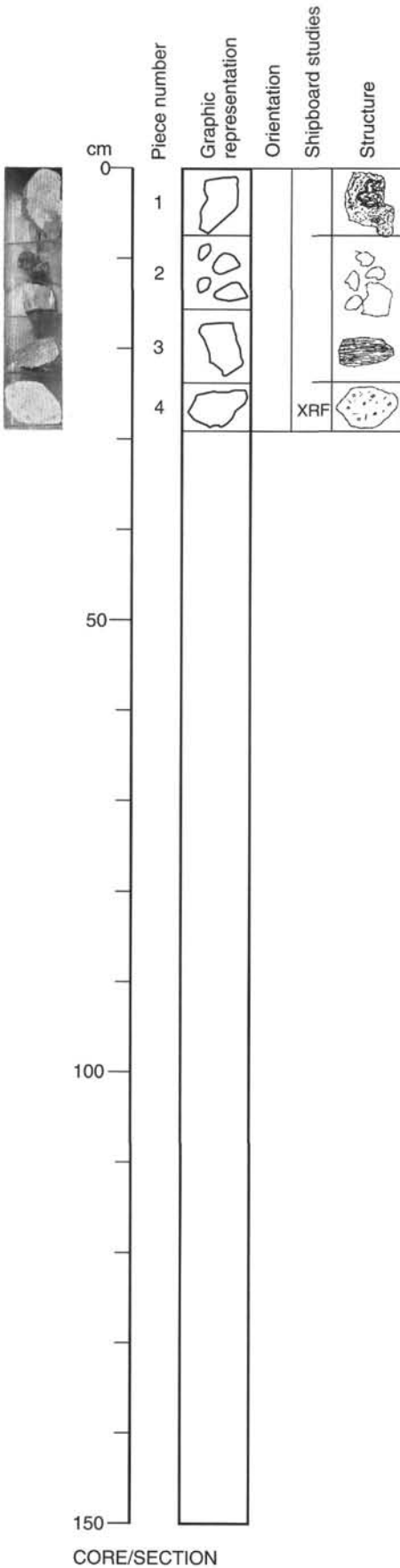
ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, feldspar, biotite, sillimanite, andalusite, cordierite(?).

TEXTURAL DESCRIPTION: Gneiss with a poorly defined banding. Rare andalusite is randomly oriented over the foliation planes in Piece 13. Bluish areas with probable concentrations of cordierite(?) in Pieces 10 and 11.



CORE/SECTION



Pieces 1-3

ROCK TYPE: GNEISS

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, feldspar, chlorite.

TEXTURAL DESCRIPTION: Felsic, banded gneiss with feldspar(?), quartz, and rare biotite and chlorite in Piece 1. Sillimanite abundant in Pieces 2 and 3.

Piece 4

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, feldspar, biotite, plagioclase(?), tourmaline.

TEXTURAL DESCRIPTION: Granular leucogranite with biotite and minor tourmaline. Green rectangular crystals of probable plagioclase(?).

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Piece 1

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite, quartz, plagioclase.

TEXTURAL DESCRIPTION: Piece 1 is a fragment 5.5 x 4.5 x 3-cm of very pale gray dolomite marble with equant 1-mm dolomite, and a 1- to 5-mm layering defined by varying amounts of white plagioclase. The fragment is subrounded, with indentations on several of its surfaces containing sedimentary material or alteration products. Indentation (1) has a 1- to 2-mm-thick crust of cemented calcareous sediment, very pale green to white in color, containing numerous foraminifers and 0.5-mm grains of glauconite or a similar green clay mineral. Indentation (2) is a primary cavity in the rock partly filled with inward growing quartz with crystal terminations. The cavity contains 1-mm fragments of sediment and a laminated yellowish-brown calcareous crust that may have been produced by an encrusting organism. It also contains pockets filled with green clay, probably produced by the alteration of pre-existing metamorphic minerals. Indentation (3) is 3 x 10 mm and >2 mm deep, and contains greenish gray clay with abundant foraminifers. This clay somewhat resembles the sediment above the fragments, but lacks silt and sand grains. Indentation (4) is 3 x 4 mm and >2 mm deep: it is oval in shape, and appears to be located on a weathered out aggregate of green material forming part of the rock. It contains a white calcareous crust containing foraminifers. Numerous other pockets 1–2 mm across and >1 mm deep contain medium to dark green clay. The shape of this fragment, and the fact that it has cemented sedimentary material adhering to irregular indentations over much of its surface strongly suggest that it is a pebble from a conglomerate. It lies directly beneath 5 other pebbles of basement rock types, 1–3 cm in diameter, in the overlying sediment of Lithologic Unit IV.

Piece 2

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, plagioclase, K-feldspar, biotite, tourmaline.

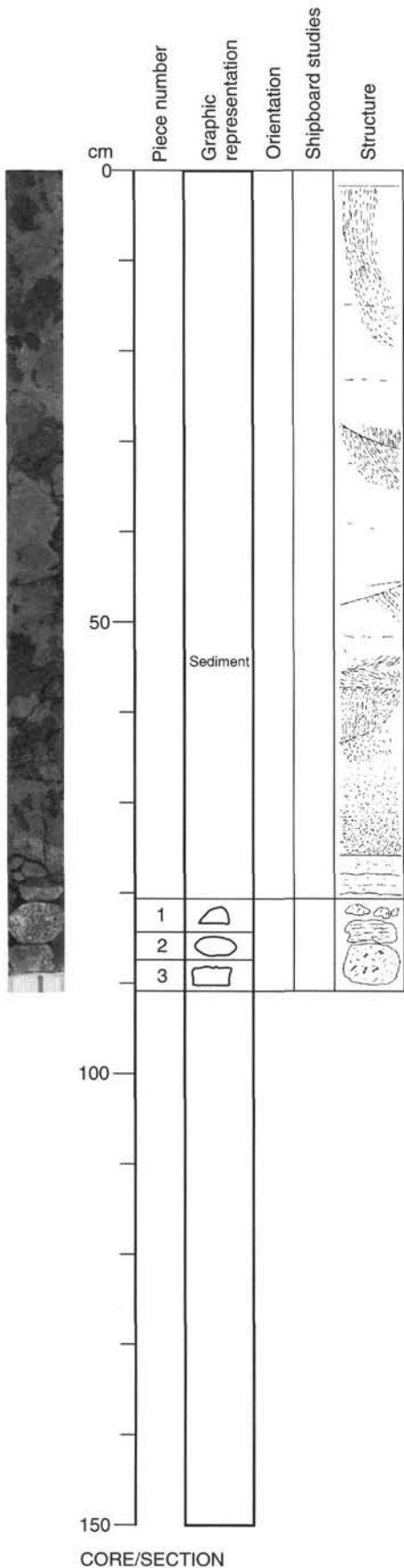
TEXTURAL DESCRIPTION: Piece 2 is a fragment 7 x 5 x 5 cm of medium gray granite: grain size 1-2 mm. No foliation. The fragment is well rounded. It is fresh and has no sedimentary material adhering to it. It may be a drilling induced "roller" of basement.

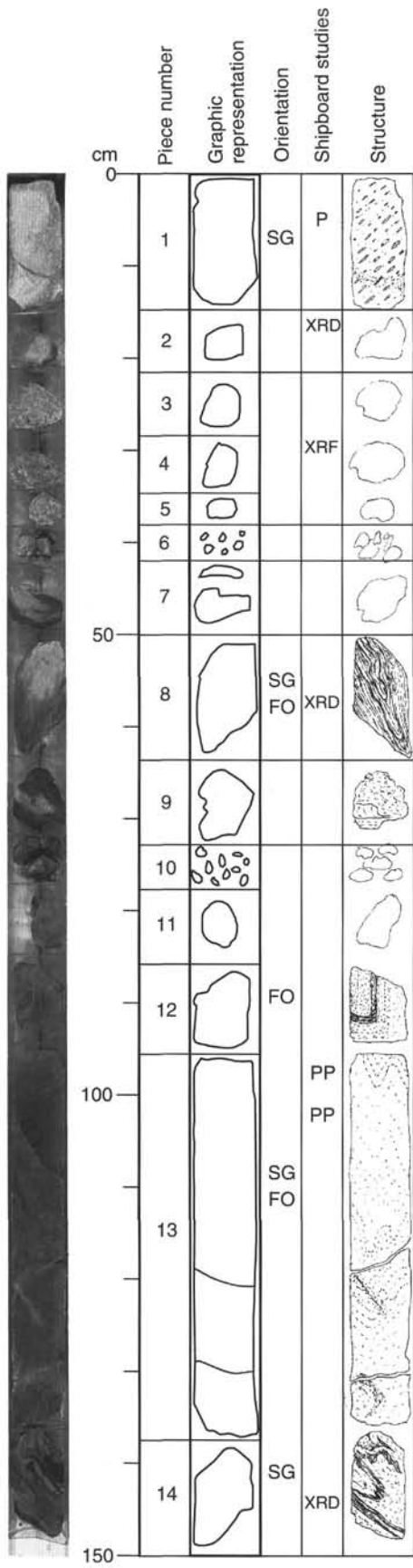
Piece 3

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite, plagioclase, biotite.

TEXTURAL DESCRIPTION: Piece 3 is a fragment 6 x 3.5 x 3 cm of medium gray unfoliated calcite marble with equant 1- to 2-mm calcite, about 10% 1-mm white plagioclase, and a trace of biotite. The fragment is sub-angular, with numerous embayments. One surface has a thin (<0.5 mm) irregular crust of fine-grained (<10 μm) white calcite. No fossils are visible. Another surface has a very irregular indentation about 1 mm deep with a similar calcareous crust, which contains angular silt fragments of quartz and biotite. These crusts resemble the fills of fissures deeper in the basement, and do not necessarily mean that the fragment is a pebble, although that is the simplest interpretation.





CORE/SECTION

Piece 1

ROCK TYPE: MARBLE
PRIMARY MINERALOGY: Calcite, pyrite, chlorite(?).
TEXTURAL DESCRIPTION: Medium gray foliated calcite marble with equant 1-mm calcite, and 1-mm blebs of pyrite surrounded by elongate patches of lighter colored marble. Minor amounts of green chlorite(?) and possibly other calc-silicate minerals. 0.5-mm vein of dark green material cuts foliation.

Piece 2

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Biotite, dolomite, epidote(?).
TEXTURAL DESCRIPTION: Clasts up to 1 mm of biotite schist, and up to 4 mm of dolomite marble, in a matrix of gray dolomite with solution cavities, and pale green epidote(?).

Pieces 3-5

ROCK TYPE: GRANITE
PRIMARY MINERALOGY: Quartz, plagioclase, K-feldspar, biotite, tourmaline.
TEXTURAL DESCRIPTION: Medium gray fine-grained granite. No foliation. Diffuse felsic band in Piece 3.

Piece 6

ROCK TYPE: Loose material fallen into the hole?
PRIMARY MINERALOGY:
TEXTURAL DESCRIPTION: Small subrounded pebbles of marble and schist, some with clayey chlorite-rich sand adhering.

Piece 7

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Biotite, muscovite, quartz.
TEXTURAL DESCRIPTION: Dark gray fine-grained homogeneous schist. Some muscovite. Quartz vein.

Piece 8

ROCK TYPE: MARBLE
PRIMARY MINERALOGY: Calcite, plagioclase, biotite, garnet, diopside.
TEXTURAL DESCRIPTION: Dark gray calcite marble with equant 1- to 2-mm calcite. 2- to 10-mm banding defined by relative abundance of biotite and plagioclase. 6-mm calc-silicate layer on one side with garnet, diopside, chlorite(?) or serpentine(?). Foliation is tightly folded.

Piece 9

ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Biotite, sillimanite, garnet.
TEXTURAL DESCRIPTION: Dark gray fine-grained homogeneous schist with occasional 1-mm garnet. Folded quartz veins.

Pieces 10-14

ROCK TYPE: MARBLE
PRIMARY MINERALOGY: Calcite, plagioclase, biotite, garnet, diopside.
TEXTURAL DESCRIPTION: Dark gray calcite marble with equant 1- to 2-mm calcite. Brownish bands rich in biotite and plagioclase in Pieces 12 and 13A. 2- to 3-mm vein of green calc-silicate minerals in Piece 13B, and several bands with diopside and scattered garnet in Piece 14. Layering in Piece 13A shows tight symmetrical 1-cm-scale pygmatic folds. Disrupted quartz vein in Piece 14.

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Piece 1

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, plagioclase, K-feldspar, biotite, tourmaline.

TEXTURAL DESCRIPTION: Medium gray granite, grain size 1–3 mm. Small rectangular white plagioclase. No foliation.

Pieces 2 and 3A

ROCK TYPE: HIGH-GRADE SCHIST/MARBLE/CALC-SILICATE ROCK

PRIMARY MINERALOGY: Biotite, sillimanite, calcite, diopside, garnet, pyrite.

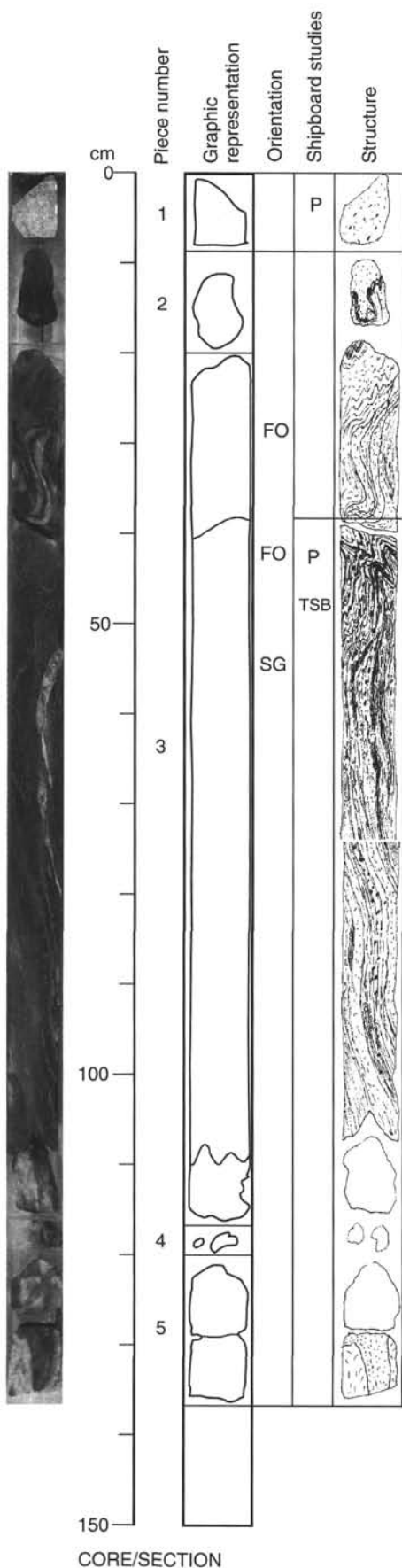
TEXTURAL DESCRIPTION: Interlayered dark gray schist and medium gray marble, with green calc-silicate layers along the contacts composed mainly of diopside with minor garnet. Abundant disseminated pyrite. Several 5- to 8-mm quartz veins in Piece 3A. Open to tight irregular folds in the layering.

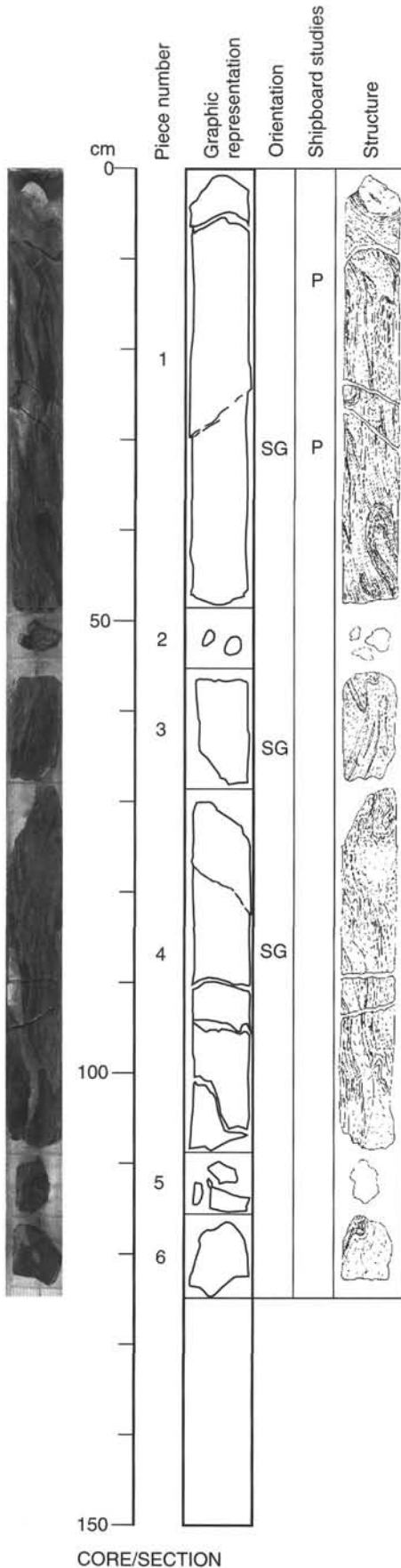
Pieces 3B–5

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, garnet, andalusite.

TEXTURAL DESCRIPTION: Dark gray well-foliated schist with scattered 1- to 2-mm garnet and abundant 2- to 5-mm andalusite porphyroblasts. Near vertical foliation defined by 1-cm quartz-rich and biotite-rich bands; 0.5- to 1-mm quartz and biotite laminae, and 2- to 15-mm quartz veins. Tight west-vergent asymmetric folds in the foliation. Sillimanite is oriented parallel to the axial surfaces of these folds. 2-cm quartz vein in Piece 3C, 3 cm vein in Piece 5, surrounded by a narrow zone of greenish clay(?) alteration.





Pieces 1–6

ROCK TYPE: HIGH-GRADE SCHIST/CALC-SILICATE ROCK

PRIMARY MINERALOGY: Quartz, biotite, andalusite, sillimanite(?), plagioclase(?), mica, calcite, chlorite, epidote, pyrite.

TEXTURAL DESCRIPTION: Interlayered gray graphite schist with andalusite porphyroblasts (only in Piece 1C, up to 3–4 mm long) and calc-silicate rock. Abundant calc-silicate bands parallel to the main foliation are deformed and folded. The contact between mica-rich bands and calcite bands is defined by a green layer, probably rich in chlorite and epidote. Pyrite is concentrated in calc-silicate bands in Piece 1B, and dispersed pyrite crystals are abundant everywhere. Schist bands are highly deformed, and have lenticular shapes defining ductile almond-like structures and big mica-fish (Piece 1B). The sense of shear deduced by the asymmetry of these structures is towards the top of the Piece. Spatially associated with this fabric, there are common asymmetric folds with considerable thinning in their short limbs (e.g., Piece 1B). The fold vergence is congruent with the sense of shear deduced from the mica-fish structures. There are open east-vergent folds with variable shape, probably due to contrast differences between pelitic and calc-silicate layers, in Pieces 4 and 6.

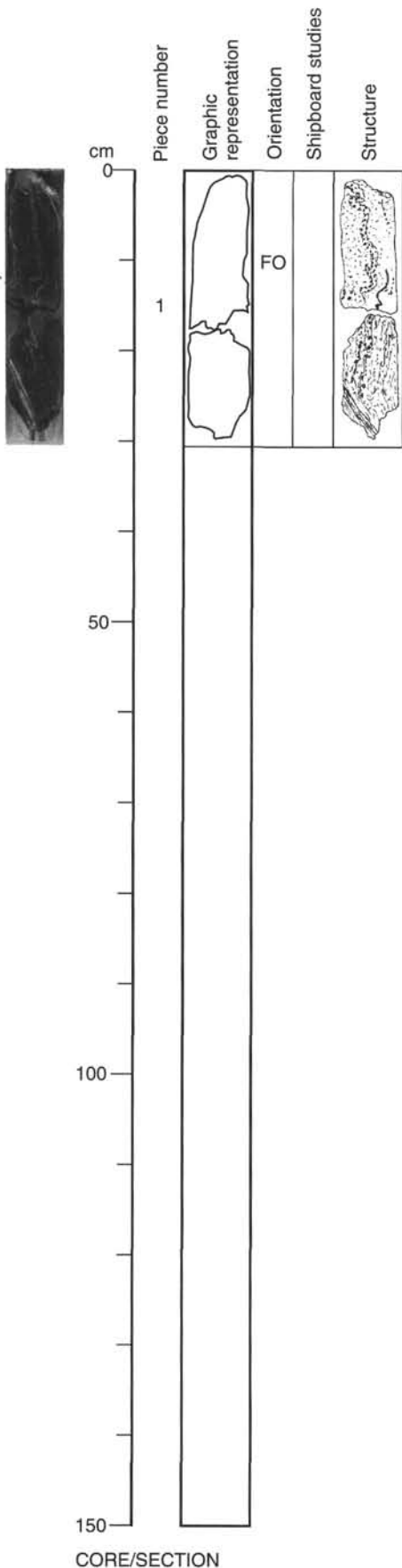
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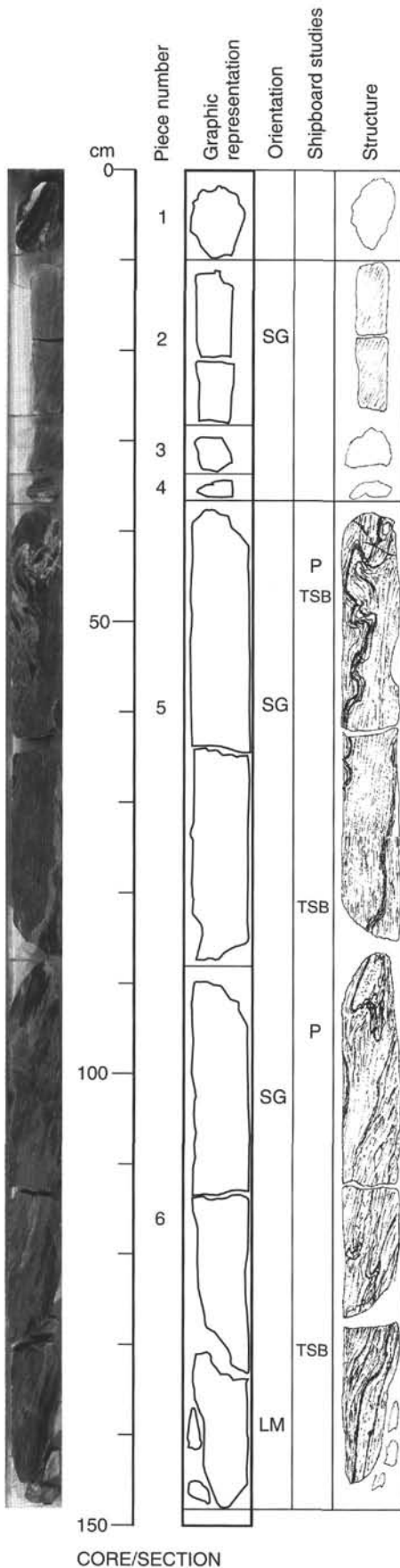
Piece 1

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, garnet, sillimanite, plagioclase, andalusite.

TEXTURAL DESCRIPTION: Graphite schist with andalusite, sillimanite and plagioclase. The main foliation, with many layer-parallel crystals of garnet, is folded by west-vergent folds. In the fold hinges sillimanite lenticles are parallel to the axial foliation plane. Garnet is aligned parallel to discrete foliation planes, defining thin bands of garnet aggregates up to 5–10 mm thick.





Piece 1

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, andalusite, sillimanite, plagioclase.

TEXTURAL DESCRIPTION: Banded gray graphite schist, with scattered andalusite porphyroblast. Andalusites are randomly oriented over the foliation plane, which is defined by sillimanite aggregates.

Pieces 2-4

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite.

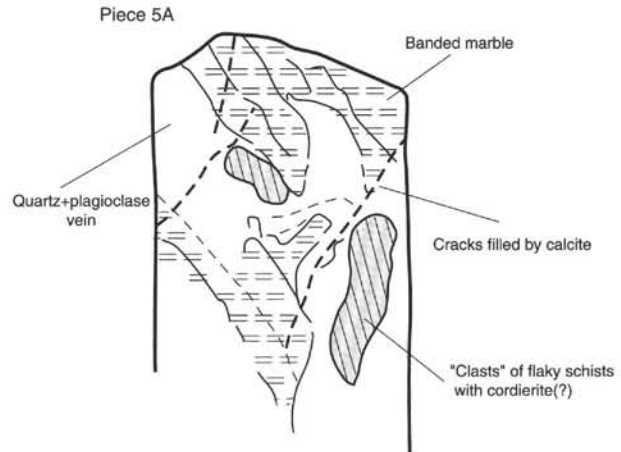
TEXTURAL DESCRIPTION: Banded light gray calcite marble.

Pieces 5-6

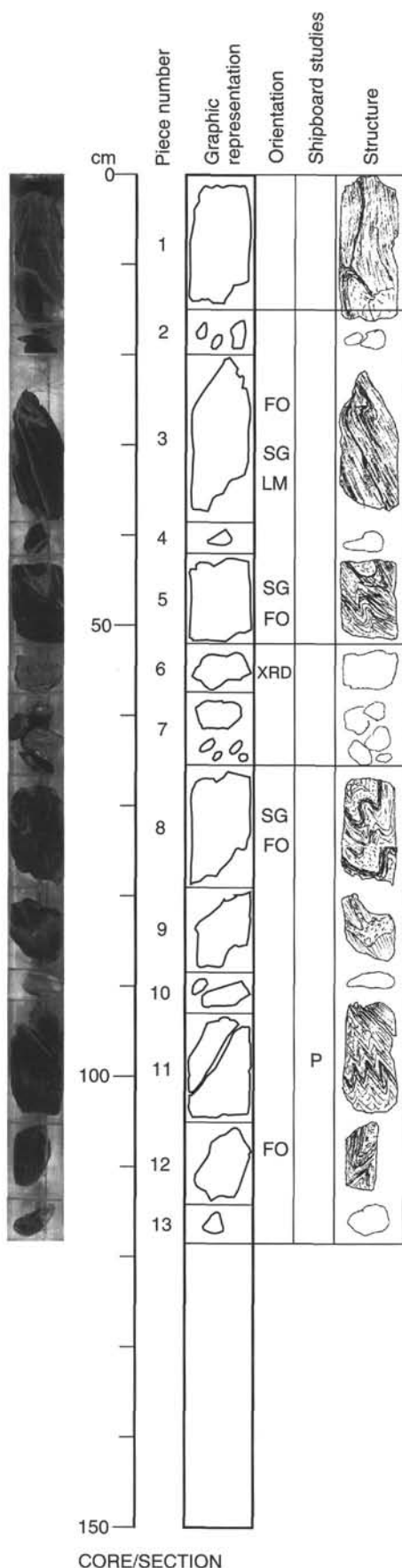
ROCK TYPE: CALC-SILICATE ROCK/MARBLE

PRIMARY MINERALOGY: Calcite, diopside(?), epidote, plagioclase, quartz, cordierite(?).

TEXTURAL DESCRIPTION: Banded gray calcite marble with small (up to 3 mm long) elongate crystals of probable diopside, oriented parallel to the foliation. The marble in Piece 5A has disrupted, foliation-parallel, quartz veins with probable plagioclase(?). Irregular fragments of dark schist with probable cordierite, are disrupted and have a dark green corona texture (resembling a reaction corona texture) in their contact with the marble. These coronas have epidote and chlorite(?). Quartz veins cut the foliation.



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Piece 1

ROCK TYPE: MARBLE/CALC-SILICATE ROCK/HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Calcite, quartz, biotite, epidote, chlorite, pyrite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Sharp contact between banded, granoblastic, gray, calcite marble and graphite schist with sillimanite and andalusite. Along the contact there are veins with chlorite and epidote. Marble has pyrite, plagioclase and common chlorite + epidote veins.

Pieces 2-5

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Dark gray graphite schist with sillimanite and scarce small rectangular andalusite (only seen in Piece 3), that could also be plagioclase crystals. Foliation is defined by a compositional banding, which contains a mineral lineation defined by oriented sillimanite fibers, in Piece 3. Sub-spherical concentrations of biotite are surrounded by the foliation in Piece 3. There are tight folds with angular hinges. Sillimanite is oriented parallel to their fold axial plane.

Pieces 6-7

ROCK TYPE: CALC-SILICATE ROCK

PRIMARY MINERALOGY: Green amphibole, biotite, pyrite.

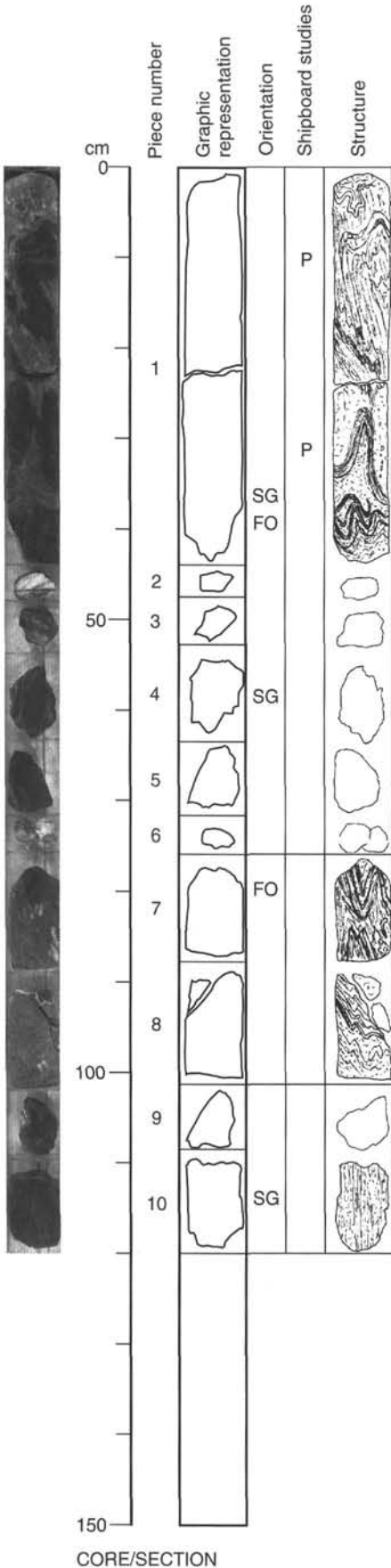
TEXTURAL DESCRIPTION: Foliated rock with concentrations of large (up to 10 mm long in Piece 6) randomly oriented green amphibole crystals, surrounded by the foliation. Outside these aggregates, the foliation is defined by biotite-rich bands. Amphibole concentrations and foliation are deformed by tight folds.

Pieces 8-13

ROCK TYPE: HIGH-GRADE SCHIST/CALC-SILICATE ROCK

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, pyrite, andalusite.

TEXTURAL DESCRIPTION: Graphite schist with a foliation defined by alternating quartz-rich and biotite-rich bands. Sillimanite is also distinguishable in the biotite-rich domains, parallel to the foliation. Biotite and sillimanite are always present, andalusite is scarce and appears as small square crystals (2- to 1-mm) in Piece 12. Common calc-silicate bands with pyrite lie parallel to the foliation (e.g., Pieces 8 and 11), and are congruently folded with the schist by tight folds. Pieces 11 and 12 have tight folds deforming a quartz-rich banding. Sillimanite is parallel to the axial planes of the folds. Piece 13 is a coarse quartz vein.



Pieces 1–6

ROCK TYPE: MARBLE/CALC-SILICATE ROCK/HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Calcite, epidote, chlorite, pyrite, quartz, biotite.

TEXTURAL DESCRIPTION: Gray calcite marble alternating with biotite schist, intensely folded by symmetric folds. In marble the foliation is defined by calcite-rich thin bands (3-mm-thick in Piece 1A), and epidote-chlorite(?) bands. Gradational contact with lower schist intercalation. Schist and marble are folded by disharmonic folds with variable fold profiles, hinge shape and fold limb thickness. In the schist part of the Piece, sillimanite is oriented parallel to the axial planes of the folds (e.g., Pieces 1B and 5). Epidote-rich bands are common in marble, at the contact with the schist.

Pieces 7–8

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite

TEXTURAL DESCRIPTION: Light gray calcite marble, foliation defined by alternating light-gray and dark-gray calcite bands. Calcite veins parallel to the foliation have granoblastic texture. Common symmetric folds.

Pieces 9–10

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, andalusite, sillimanite.

TEXTURAL DESCRIPTION: Dark, graphite schist with biotite aggregates. Foliation defined by biotite and sillimanite. Andalusite is present in Piece 10 as randomly oriented square crystals growing over the foliation.

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Pieces 1-5

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, plagioclase.

TEXTURAL DESCRIPTION: Graphite schist with sillimanite and in some Pieces visible euhedral andalusite (e.g., Pieces 2, 3, and 5). Foliation with oriented sillimanite. Irregular coarse grained quartz-vein (up to 15 mm thick) is parallel or slightly oblique to the foliation in Piece 2. Plagioclase is also distinguishable in Piece 5, giving a mottled aspect to the rock.

Piece 6

ROCK TYPE: HIGH-GRADE SCHIST/MARBLE

PRIMARY MINERALOGY: Biotite, calcite, andalusite.

TEXTURAL DESCRIPTION: Two small fragments of schist in contact with marble layer. Andalusite is present in the schistose portion of one of the fragments.

Pieces 7-9

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite

TEXTURAL DESCRIPTION: Gray and light gray banded calcite marble. With abundant scattered small white crystals (<1 mm) of calcite in Piece 8.

Pieces 10-12

ROCK TYPE: CALC-SILICATE ROCK/MARBLE/HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Calcite, epidote, chlorite(?), plagioclase(?) .

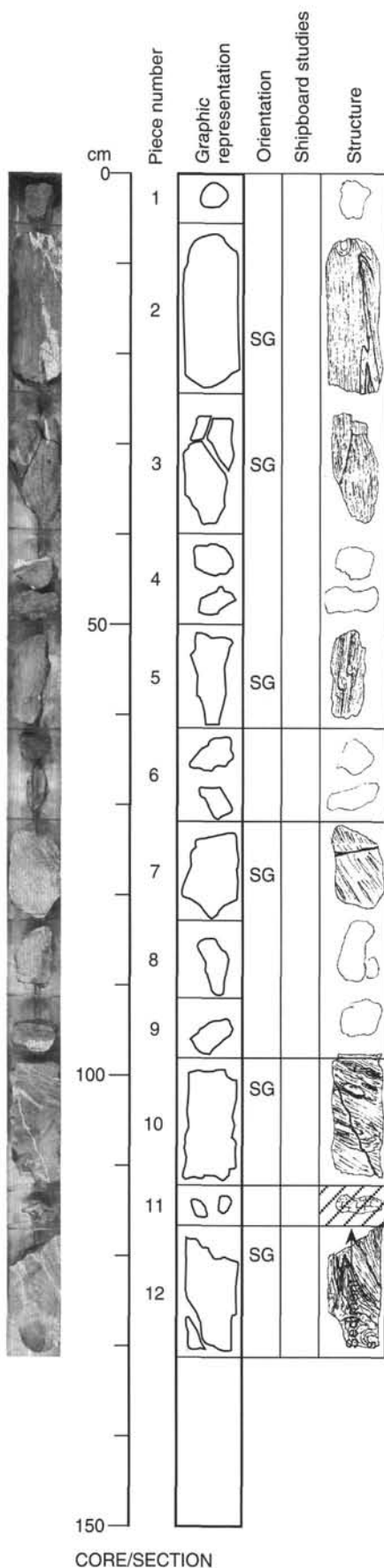
TEXTURAL DESCRIPTION: Banded calc-silicate rock with calcite-rich bands, alternating with green bands with epidote, plagioclase(?), and chlorite. Some dark bands are biotite-rich schist. Piece 10 has a near vertical calcite vein cutting the foliation.

Piece 11

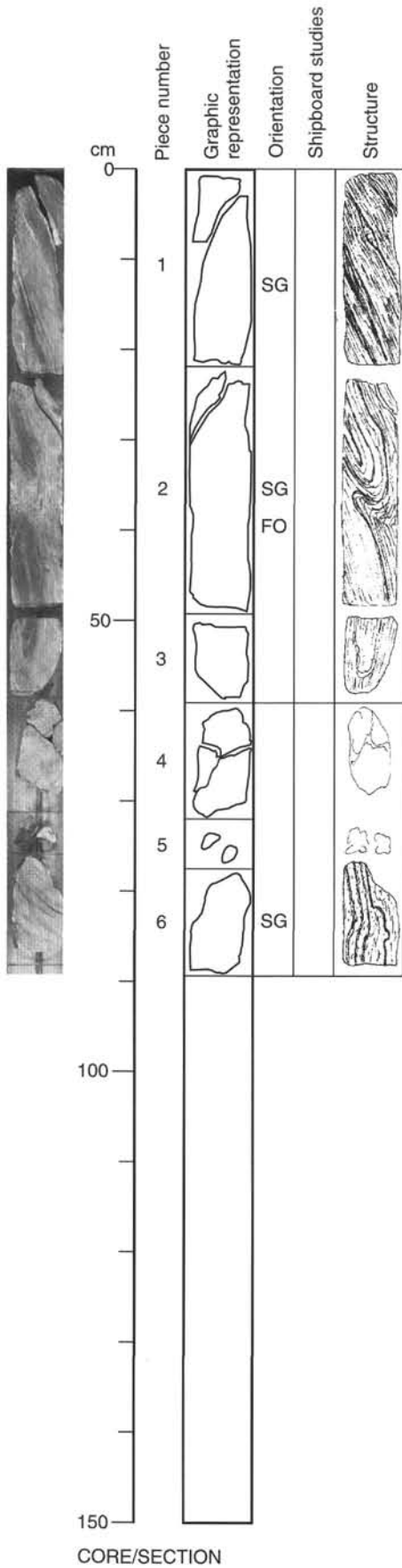
ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Calcite, biotite, quartz.

TEXTURAL DESCRIPTION: Two small fragments of white brecciated limestone and banded gneiss, cemented by calcite.



CORE/SECTION



Pieces 1-3

ROCK TYPE: CALC-SILICATE ROCK/HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, calcite, chlorite.

TEXTURAL DESCRIPTION: Banded rock with alternating dark biotite-rich bands and grayish calcite-rich bands with granoblastic texture. The foliation is parallel to this lithological banding. Schist has biotite, sillimanite and rare idioblastic and rectangular crystals (1 mm) of andalusite in Piece 1. In Piece 3 there is incipient boudinage structure between marble and schist bands. Foliation is vertical.

Pieces 4-6

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite, pyrite, quartz, chlorite, sillimanite(?).

TEXTURAL DESCRIPTION: Light gray banded marble, with pyrite, chlorite, and sillimanite(?) in Piece 6.

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Piece 1

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, garnet.

TEXTURAL DESCRIPTION: Graphite schist with sillimanite and small relict garnet (up to 1.5-mm), in the back side of the Piece.

Pieces 2–3

ROCK TYPE: MARBLE

PRIMARY MINERALOGY: Calcite, chlorite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Gray marble with granoblastic texture. The foliation is defined by greenish bands with chlorite. White segregation veins with calcite are lenticular in shape and are surrounded by the foliation (e.g., Piece 2). The lowermost part of Piece 3 is a biotite-rich schist with sillimanite and andalusite.

Piece 4

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Dark, graphite schist with biotite. Foliation, defined by sillimanite, is folded in asymmetric east-vergent folds. Andalusite is present also in the fold hinges; it has no clear relationships with the fold axial plane, but in some cases it appears to be parallel to the axial plane.

Pieces 5–7A

ROCK TYPE: CALC-SILICATE ROCK

PRIMARY MINERALOGY: Calcite, epidote, chlorite, pyrite, mica(?) .

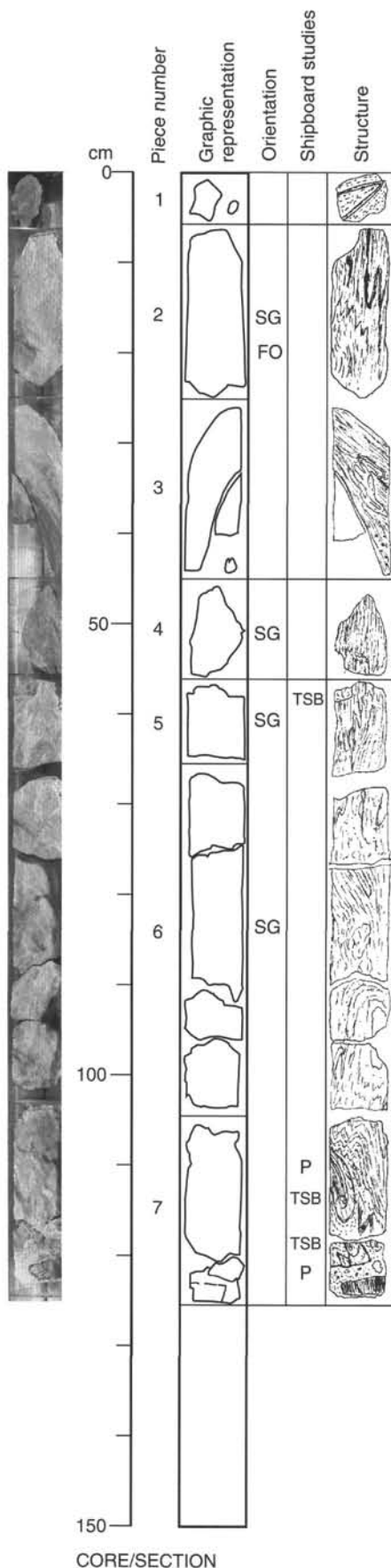
TEXTURAL DESCRIPTION: Banded calc-silicate rock with flaky and irregular boundaries with interlayered marble (calcite-rich domain of the rock) and with epidote-rich green bands. The rock has a well-defined planar fabric parallel to the compositional banding. There are thin aggregates of gold-colored mica-like minerals parallel to the foliation in Piece 7A. The foliation is deformed by east-vergent asymmetric folds.

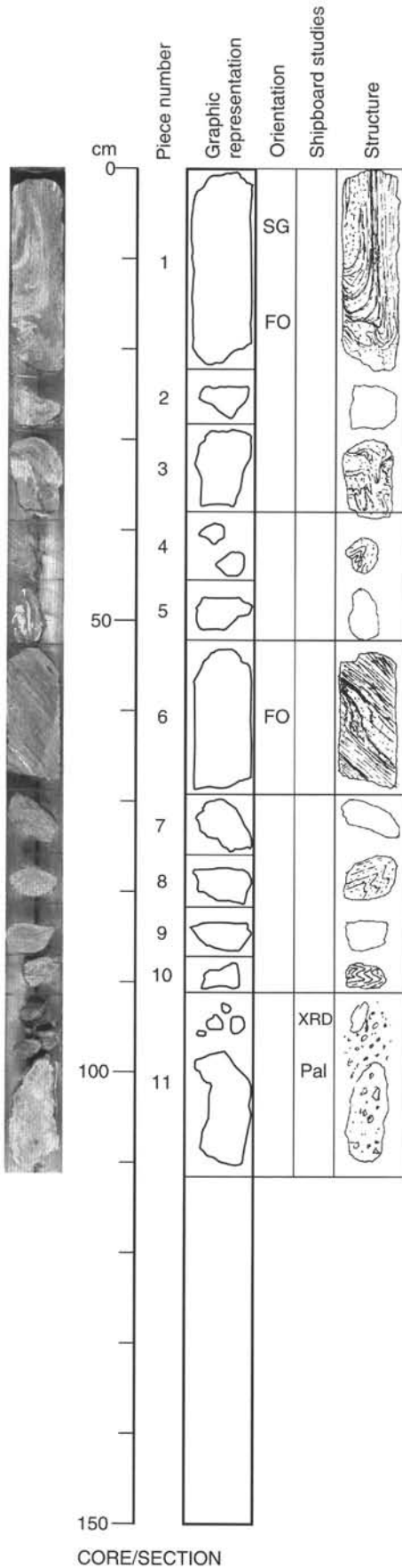
Piece 7B

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Calcite.

TEXTURAL DESCRIPTION: Heterogranular homomictic breccia with micrite cement. Angular fragments of calc-silicate rock have variable size, ranging from 40-mm-long to matrix-size. The matrix has a laminated structure, defined by aligned small fragments. Some of the larger fragments are broken, and their cracks are filled by micrite.





Pieces 1-6

ROCK TYPE: HIGH-GRADE SCHIST/MARBLE/CALC-SILICATE ROCK

PRIMARY MINERALOGY: Biotite, sillimanite, andalusite, diopside, plagioclase.

TEXTURAL DESCRIPTION: Interlayered dark-gray biotite-sillimanite schist with greenish calc-silicate and light-colored marble layers. Schist has 1- to 2-mm andalusite porphyroblasts in Piece 1; calc-silicate layers contain grass-green diopside and white plagioclase. In Piece 3 calc-silicates form reaction zone between marble and schist. Open to tight irregular folds in Pieces 1, 2, and 3, with a complete fold closure in Piece 3. Quartz veins in Pieces 1 and 5.

Pieces 7-10

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, sillimanite, quartz, garnet.

TEXTURAL DESCRIPTION: Dark-gray schist with relict garnet and thin green calc-silicate(?) bands in Piece 7. Foliation defined by mm-scale quartz-biotite laminae. Tight chevron folds of foliation in Pieces 8 and 10.

Piece 11

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Biotite, dolomite, clay.

TEXTURAL DESCRIPTION: Fragments up to 5 mm of dolomitic marble (90%) and biotite schist (10%) in a yellowish dolomitic matrix. Fragments of clayey fault gouge adhere to the piece.

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Piece 1

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Biotite, calcite.
TEXTURAL DESCRIPTION: Fragments up to 2 cm of calcite marble (90%) and biotite schist (10%) in a pale green calcareous matrix.

Pieces 2-5

ROCK TYPE: MARBLE
PRIMARY MINERALOGY: Calcite.
TEXTURAL DESCRIPTION: Light gray marble with equant 1- to 2-mm calcite.

Pieces 6-8

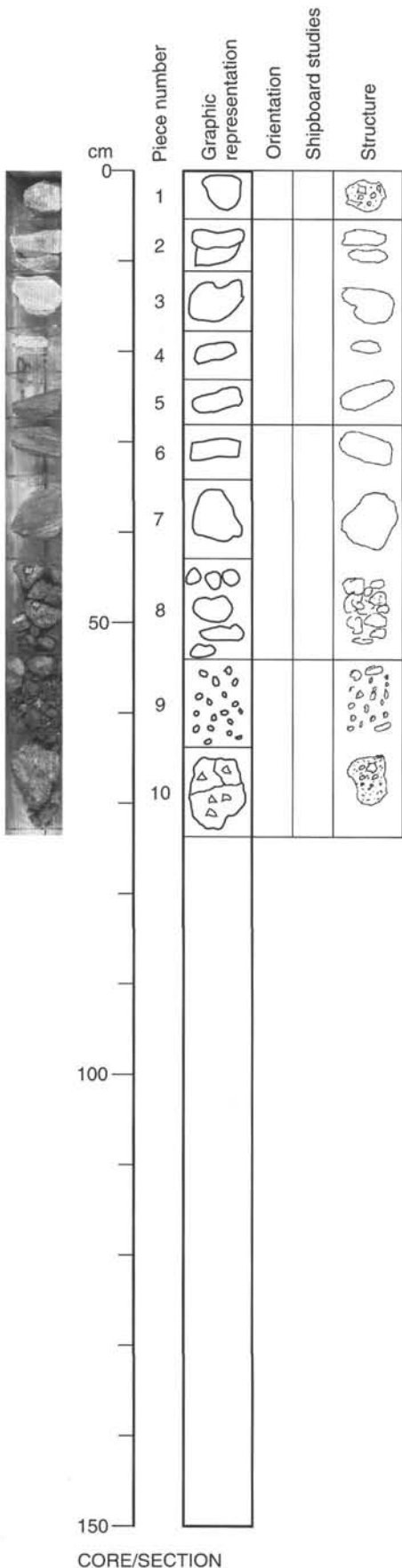
ROCK TYPE: HIGH-GRADE SCHIST
PRIMARY MINERALOGY: Biotite, sillimanite.
TEXTURAL DESCRIPTION: Dark-gray schist.

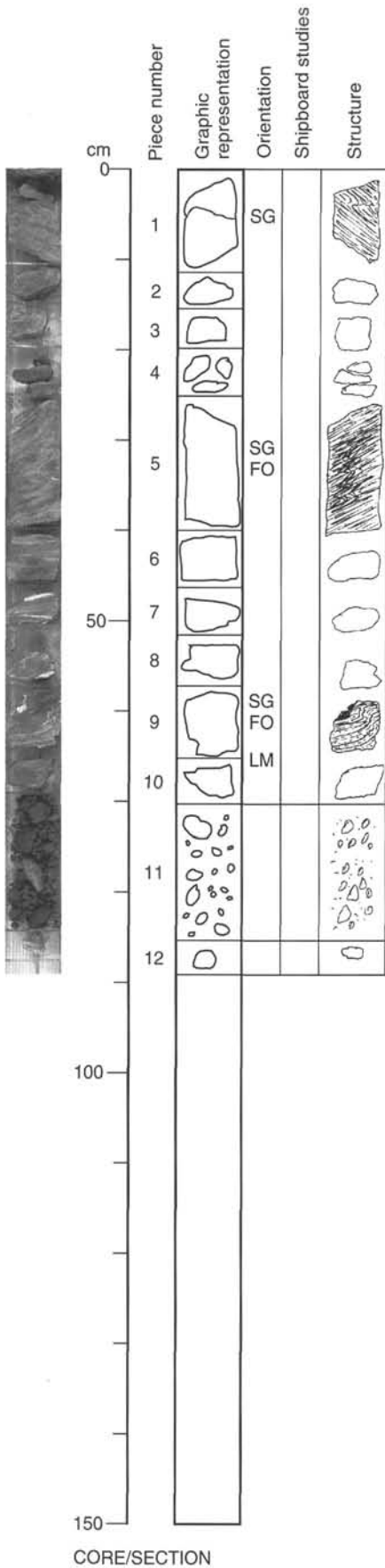
Piece 9

ROCK TYPE: Loose schist fragments with clay. Fallen-in material?
PRIMARY MINERALOGY:
TEXTURAL DESCRIPTION:

Piece 10

ROCK TYPE: BRECCIA/GOUGE
PRIMARY MINERALOGY: Biotite, dolomite, quartz, clay.
TEXTURAL DESCRIPTION: Fragments up to 10 mm of yellow dolomitic marble (40%), biotite schist (50%), and vein quartz (10%) in a firm clay-rich matrix.





Pieces 1-10

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, sillimanite, andalusite, plagioclase.

TEXTURAL DESCRIPTION: Dark gray homogeneous schist with "ghost" andalusite porphyroblasts in Pieces 6 and 9. Tight NE-vergent asymmetric folds in the foliation in Piece 1, symmetrical in Piece 5, and east-vergent in Pieces 9 and 10. Sillimanite is oriented parallel to the axial surfaces of these folds. 1-mm plagioclase and unoriented biotite obscure fabric in Pieces 8 and 10. Piece 5 is somewhat oxidized.

Piece 11

ROCK TYPE: Loose schist fragments with clay. Fallen-in material?

PRIMARY MINERALOGY:

TEXTURAL DESCRIPTION:

Piece 12

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Dolomite.

TEXTURAL DESCRIPTION: Fragments up to 5 mm of brown dolomitic marble in a dolomitic matrix.

161-976E-19R-2

Piece 1

ROCK TYPE: GOUGE /BRECCIA

PRIMARY MINERALOGY: Biotite, dolomite, clay.

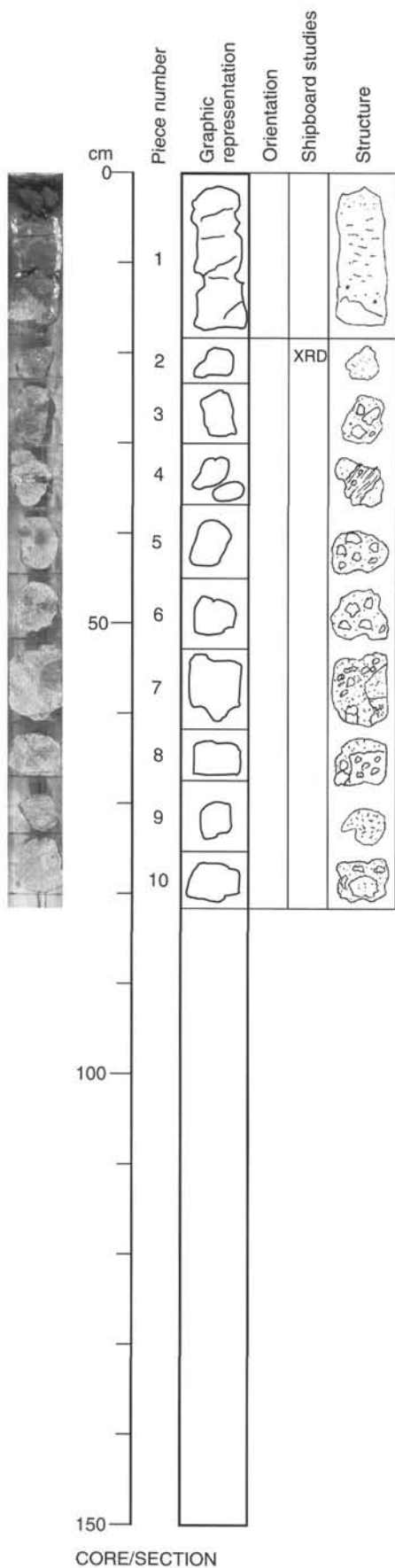
TEXTURAL DESCRIPTION: Fragments up to several cm of gray altered schist (90%) and yellow dolomitic marble (10%) in a firm clay-rich matrix.

Pieces 2-10

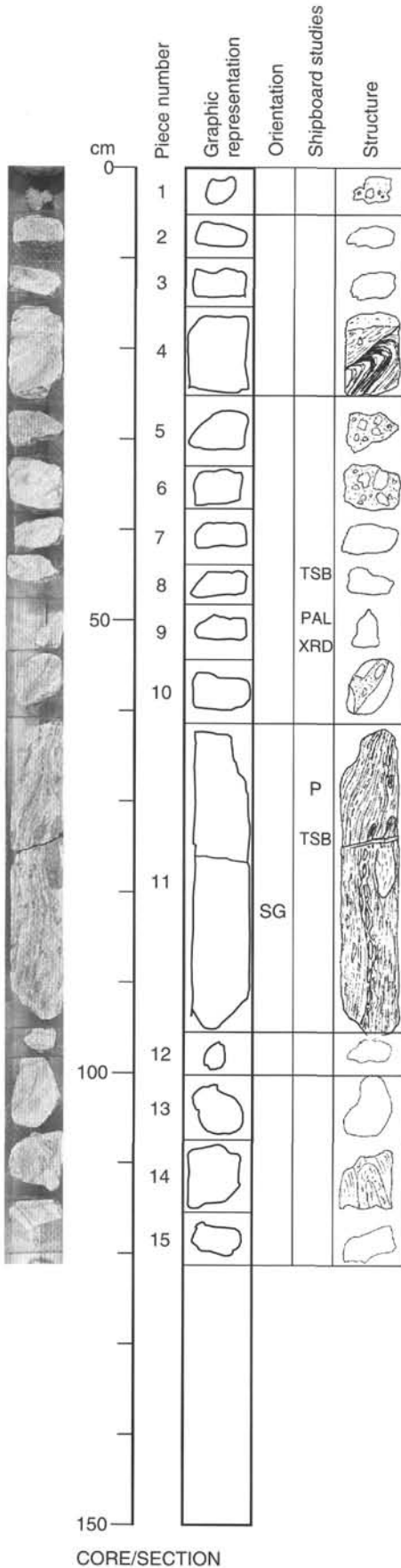
ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Dolomite.

TEXTURAL DESCRIPTION: Fragments up to 2 cm of gray and yellow-brown dolomitic marble in a dolomitic matrix. Piece 1 has 1-mm pieces of a soft white flaky mineral. Piece 4 contains some fragments of schist.



CORE/SECTION



Piece 1

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Dolomite.
TEXTURAL DESCRIPTION: Fragments up to 3 mm of yellow-brown dolomitic marble in a dolomitic matrix.

Pieces 2-4

ROCK TYPE: MARBLE
PRIMARY MINERALOGY: Calcite, dolomite, diopside, plagioclase.
TEXTURAL DESCRIPTION: Gray calcite marble with equant 1- to 2-mm calcite, and a weak foliation. Thin layers of green calc-silicate rock, probably diopside and plagioclase. Irregular patches or disrupted veins of dolomite in Pieces 3-4. Piece 4 is folded in 5-cm-scale. Piece 4 looks oxidized.

Pieces 5-10

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Calcite, dolomite.
TEXTURAL DESCRIPTION: Fragments up to 5 cm or more of variably gray colored calcite marble in a fine-grained light greenish gray dolomitic matrix.

Piece 11

ROCK TYPE: MARBLE/HIGH-GRADE SCHIST/CALC-SILICATE ROCK
PRIMARY MINERALOGY: Biotite, calcite, plagioclase, diopside.
TEXTURAL DESCRIPTION: Banded marble with cm-scale interlayers of schist and calc-silicate rock. Marble has 2-mm equant calcite with scattered plagioclase. Calc-silicate layers have diopside and plagioclase. Schist layers are somewhat disrupted; together with the banding, this gives the rock an extraordinary appearance. The rock is somewhat oxidized.

Piece 12

ROCK TYPE: BRECCIA
PRIMARY MINERALOGY: Calcite, biotite.
TEXTURAL DESCRIPTION: Fragments up to 5 mm of calcite marble (90%) and biotite schist (10%) in a fine-grained light colored calcareous matrix.

Pieces 13-15

ROCK TYPE: MARBLE
PRIMARY MINERALOGY: Calcite.
TEXTURAL DESCRIPTION: Gray marble with equant 1- to 2-mm calcite. Piece 14 has biotite and calc-silicate-rich bands.

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Pieces 1-9

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Calcite, biotite.

TEXTURAL DESCRIPTION: Fragments up to 5 cm or more of gray crystalline calcite marble (100% in most pieces) and biotite schist (10% in Piece 1, 100% in Piece 8) in a fine-grained very pale greenish gray calcareous matrix.

Pieces 10-13

ROCK TYPE: MARBLE/HIGH-GRADE SCHIST/CALC-SILICATE ROCK

PRIMARY MINERALOGY: Calcite.

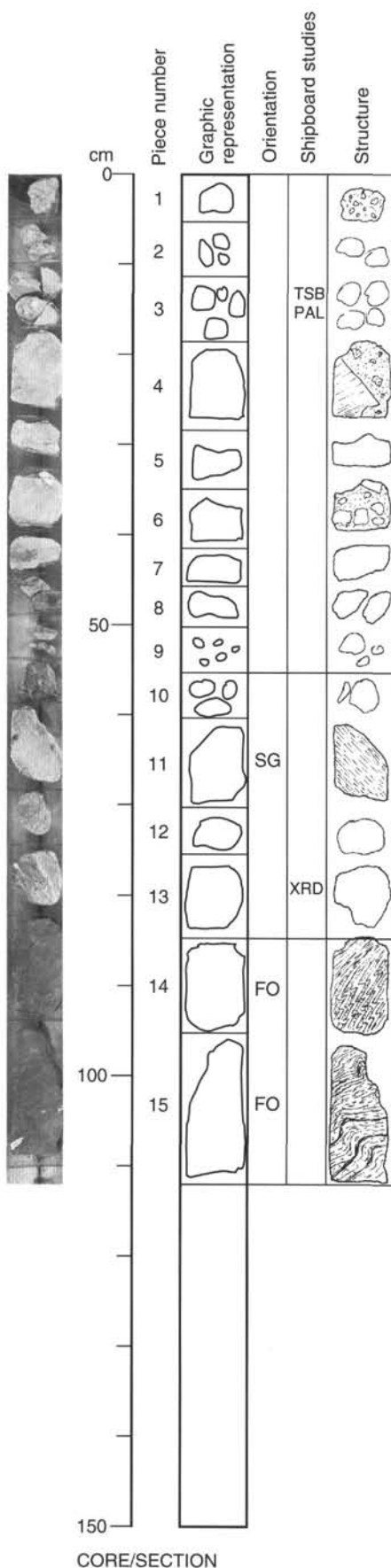
TEXTURAL DESCRIPTION: Gray marble with equant 1- to 2-mm calcite, interlayered with schist and calc-silicate rock. Piece 13 has a disrupted layer of green clay(?).

Pieces 14-15

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Dark gray finely laminated schist with foliation defined by 0.1- to 1-mm quartz and biotite laminae. East-vergent asymmetric 1- to 10-mm-scale folds in the foliation.

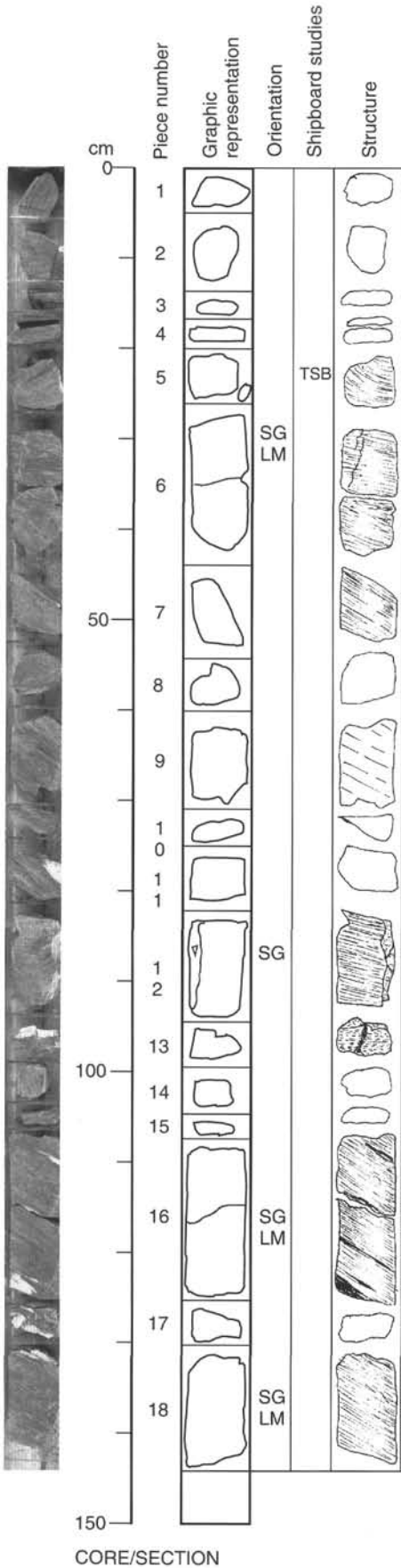


Pieces 1-18

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, plagioclase.

TEXTURAL DESCRIPTION: Dark gray finely laminated homogeneous schist with rare "ghost" andalusite porphyroblasts, and small patches of poorly oriented 0.5- to 1-mm biotite and plagioclase. Mica lineation on foliation surfaces. 2- to 3-mm green bands of chlorite in Piece 18. Zones of fine-grained breccia with <1-mm schist fragments in a calcareous matrix in Piece 12. Fracturing and brecciation in Piece 13. Quartz veins in Pieces 11, 13, 16, 17, and 18.



CORE/SECTION

161-976E-21R-2

Pieces 1-7

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

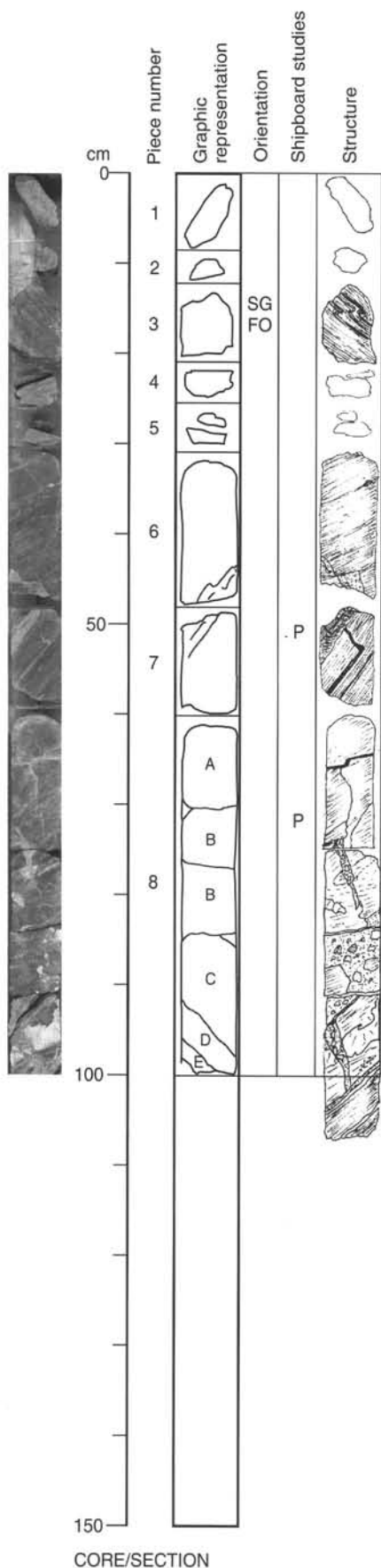
TEXTURAL DESCRIPTION: Dark gray schist with foliation defined by 0.2- to 2-mm quartz and biotite laminae. Andalusite(?) in Piece 3. East-vergent asymmetric folds in Piece 3. Fractures filled with microbreccia in a pale greenish-gray calcareous matrix in Pieces 6 and 7. The breccia in Piece 7 occupies a fissure 1 cm wide, and has 2-mm-thick horizontal laminae, suggesting sedimentation. These laminae are slightly distorted near the top of the fissure.

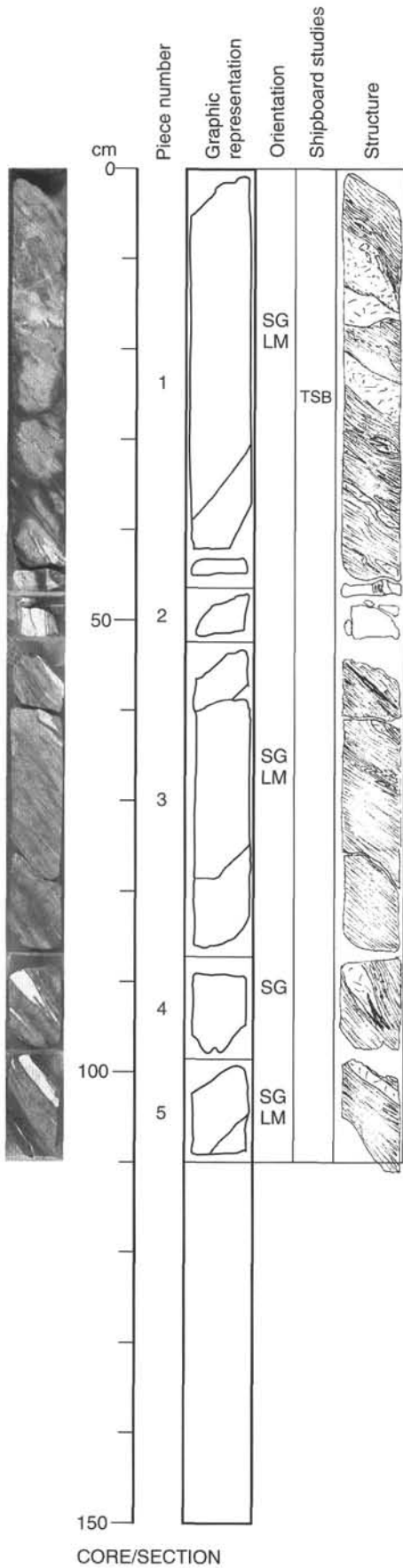
Piece 8

ROCK TYPE: HIGH-GRADE SCHIST/BRECCIA

PRIMARY MINERALOGY: Biotite.

TEXTURAL DESCRIPTION: The top 9 cm of Piece 8A consists of dark greenish gray compact fine-grained rock, possibly rich in chlorite. This is interlayered with biotite schist in the bottom part of the piece. Pieces 8B to 8C consist of breccia with clasts up to 3 cm of biotite schist in a comminuted schist matrix. 1- to 3-mm fissures filled with pale dolomitic microbreccia, of possible sedimentary origin, cut Pieces 8A and 8B, and one follows the foliation on the contact between 8C and 8D. The center of the latter fissure is a slip surface that moved after the fissure was filled. Pieces 8D and 8E are dark-gray biotite schist.





Piece 1

ROCK TYPE: HIGH-GRADE SCHIST/CALC-SILICATE ROCK

PRIMARY MINERALOGY: Biotite, sillimanite, diopside, garnet, plagioclase.

TEXTURAL DESCRIPTION: Well-foliated dark-gray biotite-sillimanite schist with irregular 1- to 4-cm interlayers of calc-silicate rock with diopside, garnet, and plagioclase. Dark haloes of coarse biotite(?) around some garnet-rich layers. A few small patches of dark-green serpentine(?). Strong planar foliation and mineral lineation in schist. 3 cm disrupted quartz vein.

Pieces 2-5

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, sillimanite.

TEXTURAL DESCRIPTION: Homogeneous dark-gray schist with a strong planar foliation and mineral lineation. 1.5-cm quartz veins parallel to foliation in Pieces 4 and 5.

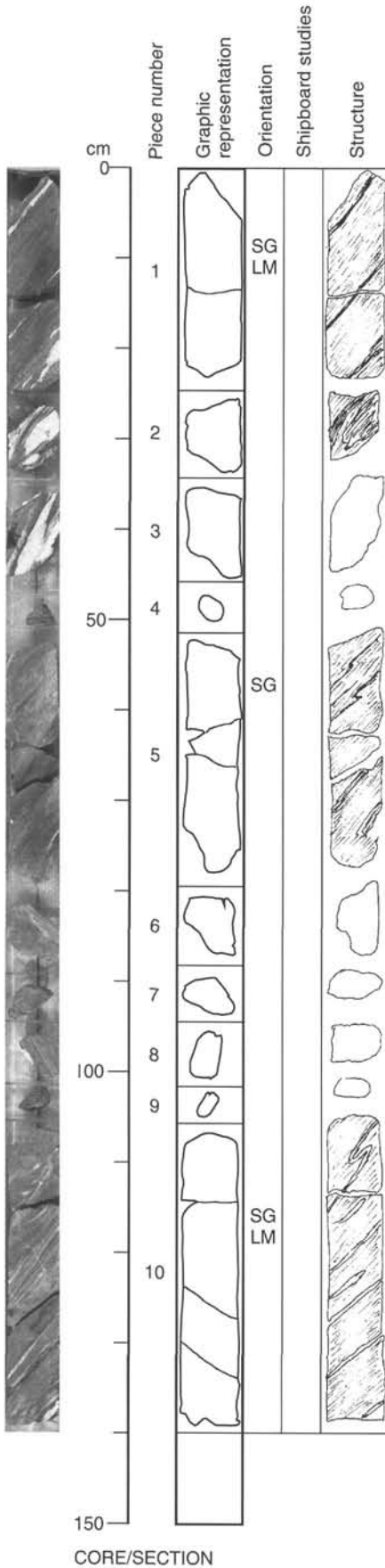
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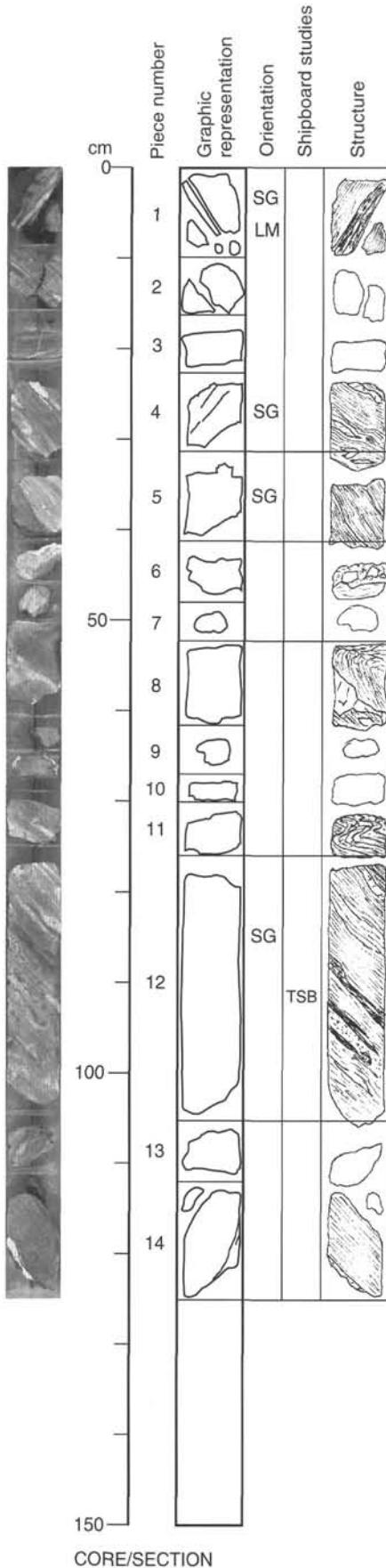
Pieces 1-10

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Homogeneous dark-gray schist with a very strong planar foliation and mineral lineation. "Ghost" andalusite porphyroblasts in Pieces 5A and 10. 2-mm quartz vein in Piece 1 has an asymmetric boudinage, or shear bands, with seams of intensely oriented sillimanite. Top surface of piece has sillimanite fiber lineation in a similar shear band. Sillimanite is parallel to the biotite mineral lineation in the rock as a whole, and is clearly syn-kinematic. Tight fold in Piece 3 with sillimanite parallel to the axial plane. East-vergent tight asymmetric folds in thin quartz-biotite laminae in Piece 6. Quartz veins parallel to foliation in Pieces 1, 2, 3, 8, and 10.





Pieces 1-4

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Graphite biotite-rich schist with sillimanite. Abundant lenticular flakes (<4-mm-long and >1-mm-thick) of small sillimanite crystals. Sillimanite and biotite are parallel to the foliation. Abundant coarse-grained quartz veins are parallel to the foliation in Piece 1 (5 mm), Piece 2 (3-4 mm), Piece 3 (lenticular with <3 mm thick) and Piece 4 (with disrupted shapes and boudinage structures, <8-10 mm). A thin crack (<1 mm) filled by quartz cuts the foliation all along the rock in Piece 3. Biotite is concentrated in quartz vein ends in Piece 4. Piece 4A has attached at one side, a thin (1- to 2-mm-thick), layer-parallel, cemented breccia with small quartz and biotite grains in the matrix.

Piece 5

ROCK TYPE: HIGH-GRADE SCHIST/MARBLE

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, calcite, plagioclase(?).

TEXTURAL DESCRIPTION: Banded graphite schist with biotite and andalusite. Interlayered with a gray calcite marble (20-mm-thick). The marble is surrounded by quartz and plagioclase(?) veins parallel to the foliation. Frequent pinch and swell boudinage structure occurs in these veins.

Pieces 6-7

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Calcite, quartz, biotite, chlorite.

TEXTURAL DESCRIPTION: Polymictic breccia with fragments of biotite schist (up to 50 mm) and quartz-rich rock. The fragments are cemented by a light, micrite limestone cement. Chlorite aggregates are common on the surfaces of schist fragments. Quartz-rich rock has also concentrations of iron ore.

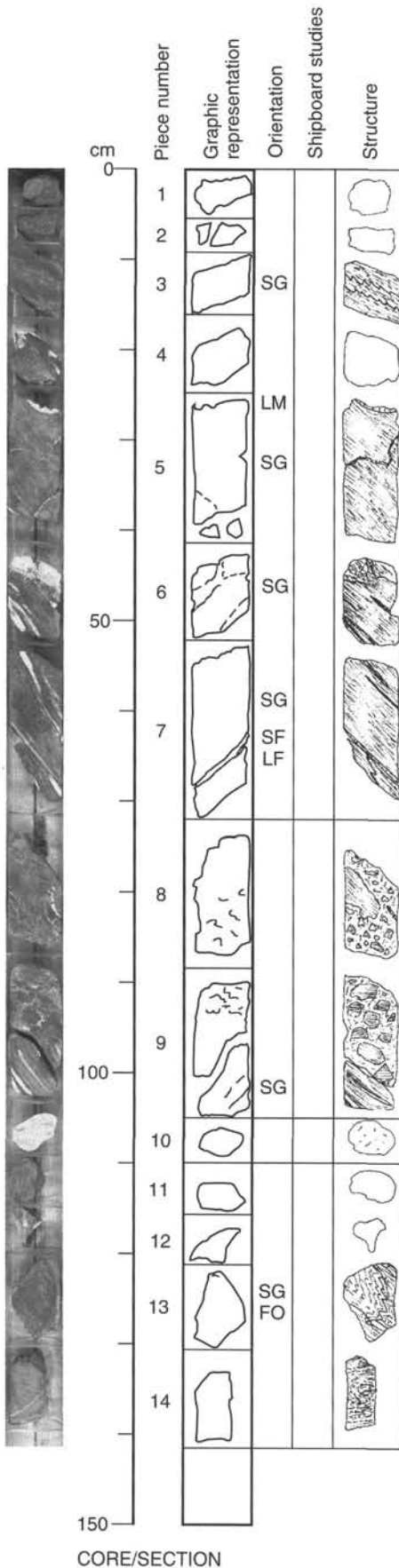
Pieces 8-14

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, sillimanite, biotite, chlorite.

TEXTURAL DESCRIPTION: Dark graphite schist with biotite and sillimanite. Coarse-grained quartz veins with variable thickness are in Piece 8 (up to 30-mm-thick), Piece 10 (3 mm), and Piece 11 (5 mm). In Piece 8 chlorite is common in quartz vein. 10 (3 mm), and 11 (5 mm). In piece 8 chlorite is common in quartz vein.

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Pieces 1-7

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, sillimanite, biotite, andalusite, chlorite, plagioclase(?).

TEXTURAL DESCRIPTION: Graphite biotite-rich schist with sillimanite. Foliation is defined by sillimanite, biotite, and quartz-rich layers. Where the rock has many sillimanite grains (e.g., Pieces 3, 5, and 6) the foliation has a flaky aspect. Andalusite is present in Piece 4. Small, tight, and angular folds (<1 mm) deform the foliation, and have limbs parallel to the main foliation (e.g., Pieces 5 and 7). Foliation-parallel quartz veins, with an anastomosing pattern, are present in Piece 6. In this piece, inside the uppermost quartz vein there are light green rectangular crystals (up to 7 mm) of probable plagioclase(?). In Piece 7 there is a fault plane parallel to the foliation, with an associated thin fault zone (5-mm-thick) filled by silty clay and minute biotite crystals.

Pieces 8-9

ROCK TYPE: BRECCIA/HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Brecciated graphite schist with biotite and sillimanite. Variable-sized fragments are closely located and cemented, resembling an in situ breccia. Thin irregular veins and cracks are filled by a light brown silty matrix.

Piece 10

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, feldspar, plagioclase, biotite.

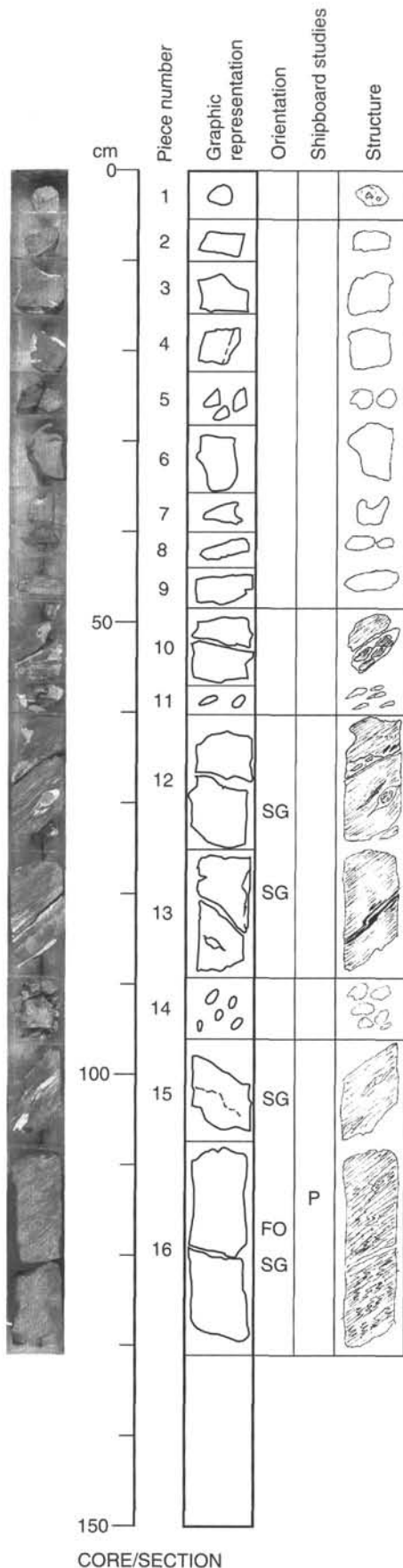
TEXTURAL DESCRIPTION: Microgranular granite with randomly oriented biotite planar crystals. Quartz and feldspar are major components of the rock, with scattered green rectangular crystals of possible plagioclase.

Pieces 11-14

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite

TEXTURAL DESCRIPTION: Graphite schist with biotite and sillimanite. In Piece 13 tight angular folds have sillimanite parallel to their fold axial plane.



Piece 1

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Calcite, quartz.

TEXTURAL DESCRIPTION: Polymictic cemented breccia. Calcite cement with several biotite fragments.

Composition of the clasts:

80%: angular fragments of light-green banded quartz rock with plagioclase (?) (<10 mm),
20%: high-grade biotite schist (<5 mm).

Pieces 2–9

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Graphitic biotite-rich schist with sillimanite. Andalusite is present also in Pieces 3 and 4 (probably in Piece 6 also). Large (up to 3–4 mm long) rectangular andalusite crystals are randomly oriented over open folds with horizontal axial planes that deform the main foliation. Pieces 4 and 7 have calcite-cemented breccia attached to one side; this contains fragments of biotite flakes (2–3 mm) and andalusite crystals (up to 12 mm in Piece 4). There is a mineral lineation defined by biotite and sillimanite on foliation planes in Pieces 3, 6, and 9.

Pieces 10–11

ROCK TYPE: HIGH-GRADE SCHIST/BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, calcite.

TEXTURAL DESCRIPTION: Brecciated biotite schist with a clay matrix in Piece 10. Cemented calcite-rich breccia veins fill cracks between adjacent fragments of schist in both pieces.

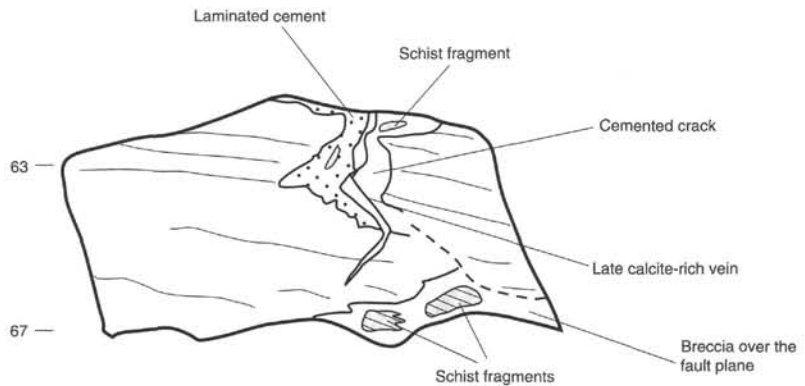
Piece 12

ROCK TYPE: HIGH-GRADE SCHIST/BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, calcite.

TEXTURAL DESCRIPTION: Biotite, sillimanite-bearing schist with large porphyroblast of andalusite in the lower half of Piece 12A. Abundant sillimanite lenticles (<1 mm) define the foliation. There is a crack filled by laminated micritic limestone with small schist fragments in the upper part of Piece 12A. A fault plane divides the piece into two, with a cemented breccia in between.

Piece 12A



Piece 13

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, clay.

TEXTURAL DESCRIPTION: Several small fragments of biotite schist surrounded by clay.

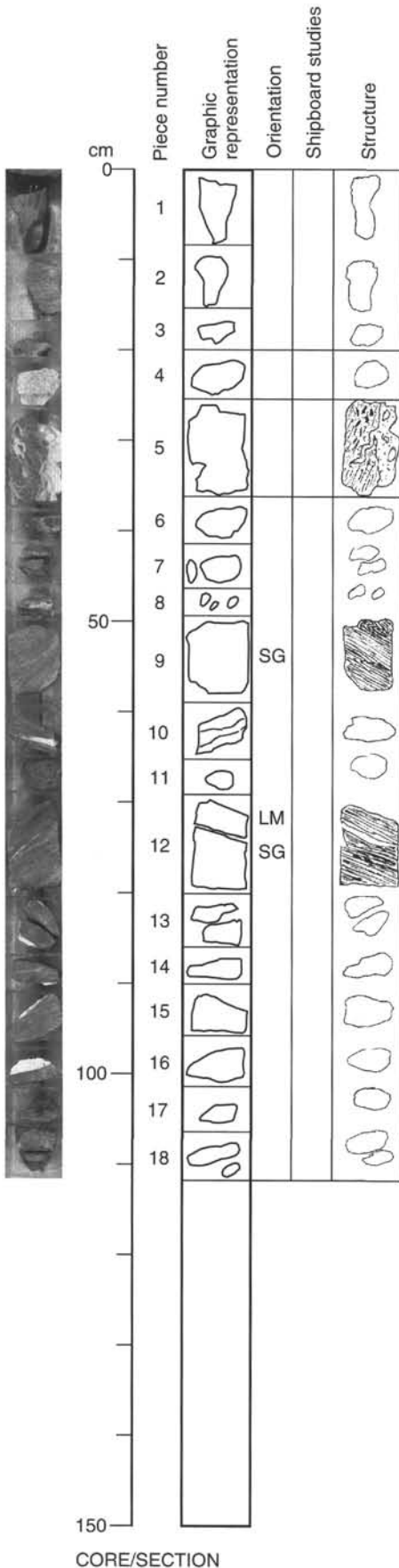
Pieces 15–16

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, plagioclase.

TEXTURAL DESCRIPTION: Graphitic schist with biotite and sillimanite. Quartz vein parallel to the foliation in Piece 15 (4–8 mm thick). Abundant angular folds in Piece 16, with asymmetric profiles and east-vergence. Foliation defined by alternating biotite-rich and quartz-plagioclase-rich bands. Sillimanite is clearly parallel to the fold axial planes.

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Pieces 1-3

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, plagioclase(?).

TEXTURAL DESCRIPTION: Mottled graphite schist with sillimanite and biotite. The mottled aspect is due to sillimanite (and plagioclase?) concentrations along foliation planes.

Piece 4

ROCK TYPE: GRANITE

PRIMARY MINERALOGY: Quartz, feldspar, plagioclase, biotite.

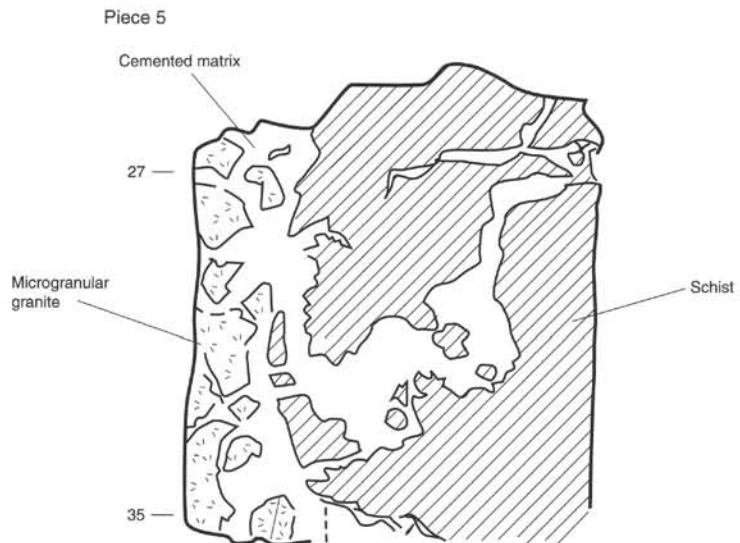
TEXTURAL DESCRIPTION: Granular granite with pink feldspar and flakes of biotite.

Piece 5

ROCK TYPE: HIGH-GRADE SCHIST/BRECCIA

PRIMARY MINERALOGY: Quartz, sillimanite, biotite, andalusite, calcite.

TEXTURAL DESCRIPTION: Sillimanite-bearing graphite schist with biotite and andalusite. The rock fragment is largely brecciated in one-half by a near vertical crack with lateral arms. The cracks are filled by a polymictic cemented breccia with a calcite cement. There are several angular fragment of the nearby rocks in the breccia, including granite and schist.



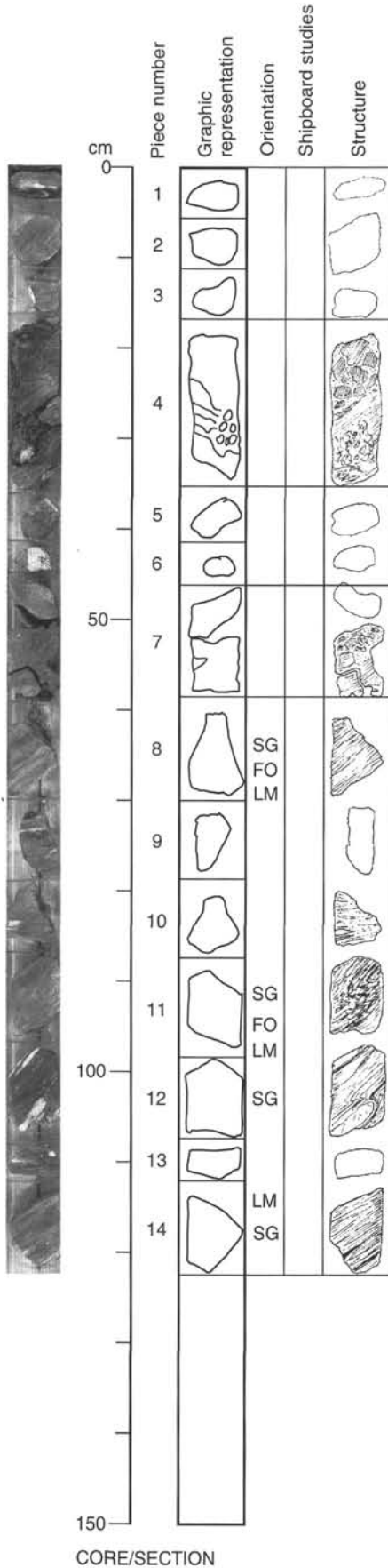
Pieces 6-18

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, plagioclase, andalusite.

TEXTURAL DESCRIPTION: Fragments of graphite schist with biotite, sillimanite and plagioclase.

Andalusite is also present in Pieces 12 and 16 as randomly oriented crystals growing over the foliation. Mineral lineation defined by sillimanite lies in the foliation planes in Pieces 9, 10, 12, 15, and 16. Isoclinal folds with sillimanite parallel to their fold axial plane are in Piece 9.



Pieces 1-3

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Graphite schist with plagioclase and sillimanite. Andalusite is present in Piece 1.

Piece 4

ROCK TYPE: HIGH-GRADE SCHIST/BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, calcite.

TEXTURAL DESCRIPTION: Highly broken piece of graphite schist with biotite and sillimanite. Cracks are partially filled by brownish green cement with a calcite composition.

Pieces 5-6

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite.

TEXTURAL DESCRIPTION: Schist with biotite and sillimanite, andalusite is present as randomly oriented square crystals up to 2 mm long.

Piece 7

ROCK TYPE: HIGH-GRADE SCHIST/BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Broken schist with biotite and sillimanite, with angular fragments slightly separated and cemented.

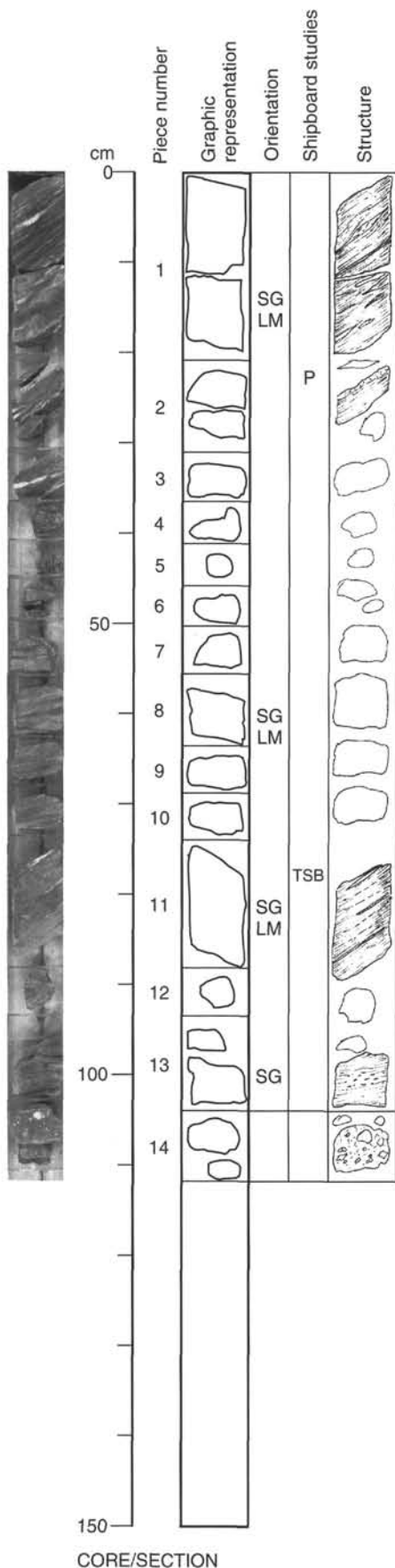
Pieces 8-14

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, plagioclase, andalusite.

TEXTURAL DESCRIPTION: Graphite schist with biotite, sillimanite, and abundant small aligned white crystals (<1.5-2 mm) of plagioclase following the foliation, which give the rock a mottled aspect. Common mineral lineation in foliation planes defined by oriented sillimanite fibers, in Pieces 8, 9, 10, 11, 12, and 14. Andalusite is present as large scarce porphyroblasts in Piece 9. Tight asymmetric east-vergent folds in Pieces 8 and 11. Sillimanite is oriented parallel to their fold axial planes.

161-976E-25R-2



Pieces 1-13

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite, andalusite, plagioclase, garnet.

TEXTURAL DESCRIPTION: Graphite schist with biotite and sillimanite. Plagioclase is a conspicuous mineral in all the pieces, giving a mottled aspect. Andalusite in Pieces 5 and 11 as partially broken euhedral crystals. Relict garnet in Piece 1A. There are rare quartz veins parallel to the foliation in Pieces 1A, 1B, 3, and 11. Veins are variable in thickness and laterally discontinuous, with thicknesses of 10-2 mm in Piece 1A, 4-8 mm in Piece 1B, 10-7 mm in Piece 3, and 3 mm in Piece 11. Pinch and swell boudinage structures are common in quartz veins. Piece 2 has a breccia vein, running parallel to the foliation and with a calcite-dolomite cement. Angular fragments in the breccia have the same composition as the surrounding rocks (i.e., graphite schist with biotite and sillimanite).

Piece 14

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Quartz, biotite, calcite, clay(?).

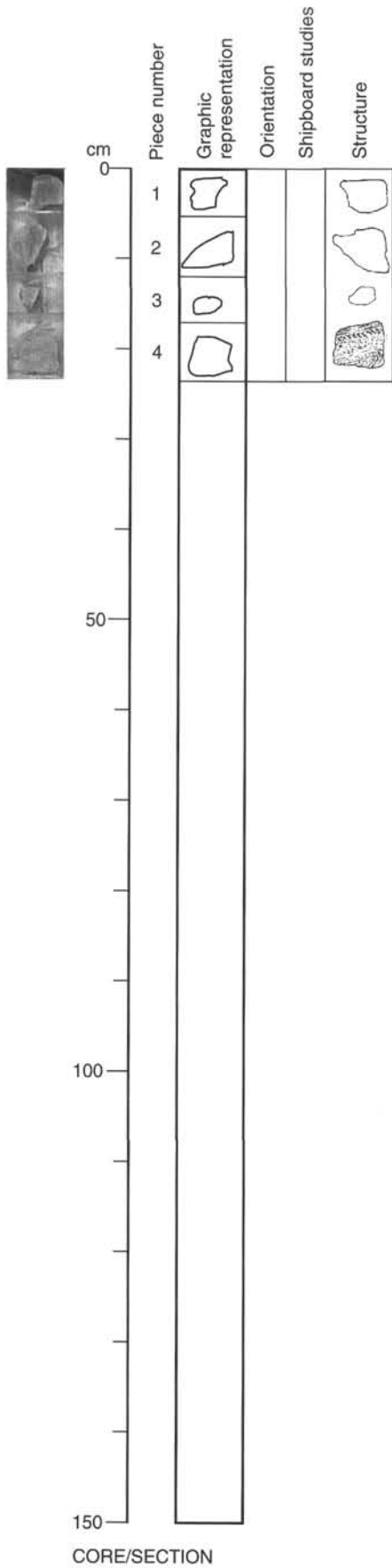
TEXTURAL DESCRIPTION: Two small pieces of polymictic and unsorted cemented breccia with white rounded fragments of quartz rock (up to 10 mm long, mean size <5 mm) and biotite schist (7-4 mm long). Matrix is a clay-dolomite matrix.

Pieces 1-4

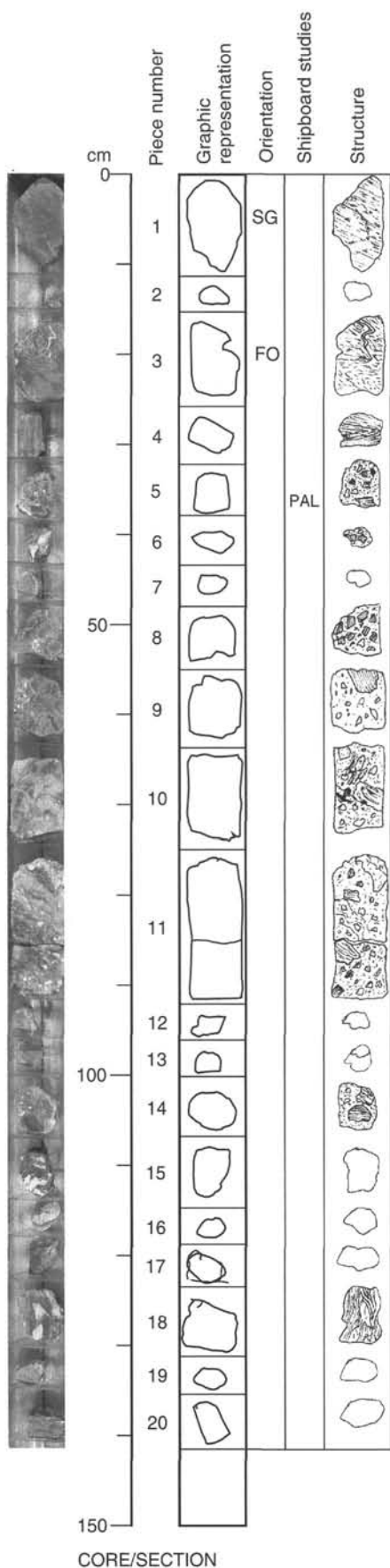
ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Medium gray schist: distinctly lighter in color and more quartz-rich than the bulk of the high-grade schist. In Piece 4 sillimanite is distinctly oblique to the compositional layering, and is parallel to a crenulation cleavage.



161-976E-28R-1



Piece 1

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Dark gray homogeneous schist. Quartz laminae and quartz vein in Piece 3. Tight west-vergent folds in Piece 1, symmetrical folds in Piece 3.

Pieces 5–16

ROCK TYPE: BRECCIA

PRIMARY MINERALOGY: Biotite, dolomite, quartz, clay(?).

TEXTURAL DESCRIPTION: Angular fragments up to 3 cm of biotite schist (predominant in most pieces), vein quartz, yellow-brown dolomitic marble (20% in Piece 10). "Matrix" is finely comminuted biotite schist in most pieces, but is light-colored and dolomitic (possibly sedimentary in origin) in Pieces 5, 14, (in part), and 15 (in part). Pieces 7 and 13 are individual fragments of biotite schist from the breccia. In Piece 16 the schist is heavily altered to clay(?).

Piece 17

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Biotite, garnet.

TEXTURAL DESCRIPTION: Dark gray relatively coarse-grained (0.5-mm) schist with well-preserved 1- to 2-mm garnet.

Pieces 18–19

ROCK TYPE: HIGH-GRADE SCHIST

PRIMARY MINERALOGY: Quartz, biotite, sillimanite.

TEXTURAL DESCRIPTION: Dark gray well-foliated schist.