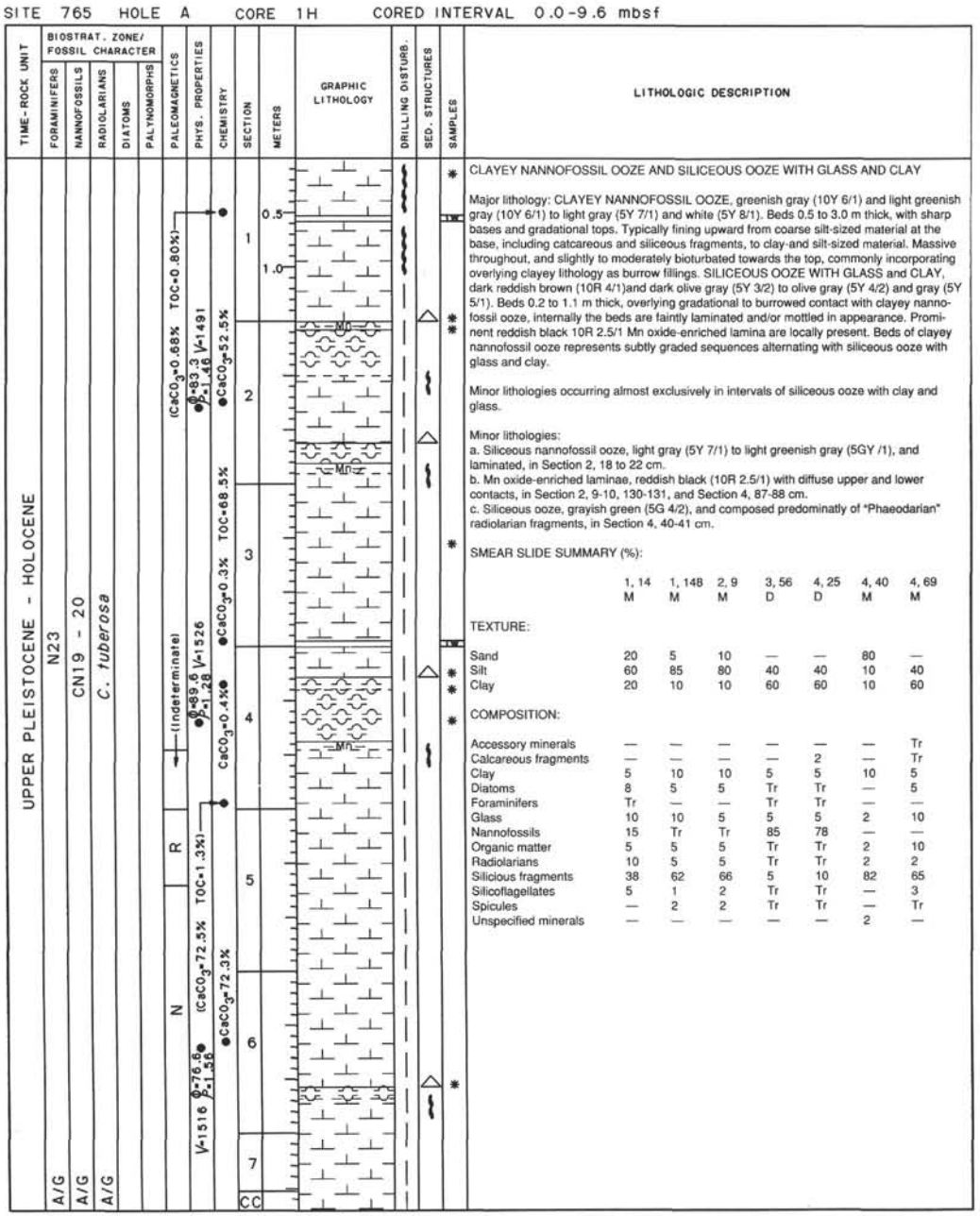
SITE 765 HOLE A CORE 1H CORED INTERVAL 0.0-9.6 mbsf



LITHOLOGIC DESCRIPTION

CLAYEY NANNOFOSSIL OOZE AND SILICEOUS OOZE WITH GLASS AND CLAY

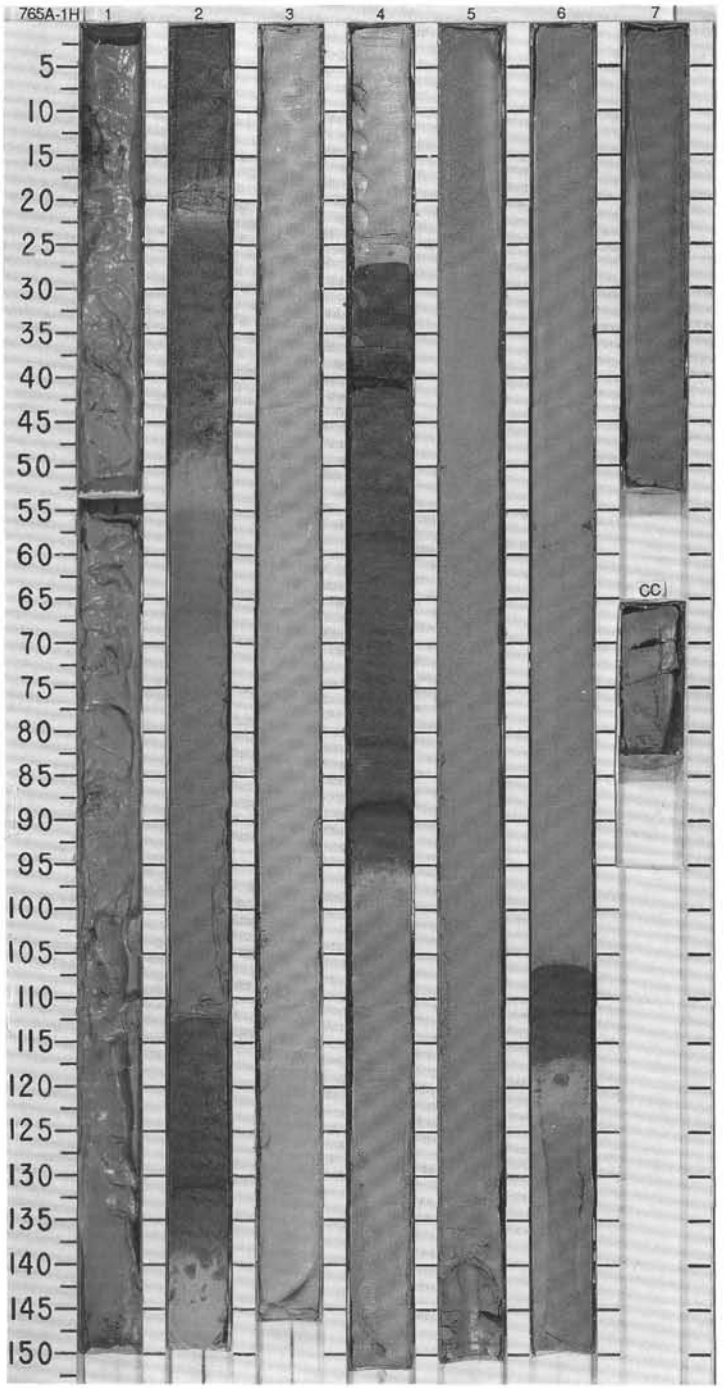
Major lithology: CLAYEY NANNOFOSSIL OOZE, greenish gray (10Y 6/1) and light greenish gray (10Y 6/1) to light gray (5Y 7/1) and white (5Y 8/1). Beds 0.5 to 3.0 m thick, with sharp bases and gradational tops. Typically fining upward from coarse silt-sized material at the base, including calcareous and siliceous fragments, to clay-and silt-sized material. Massive throughout, and slightly to moderately bioturbated towards the top, commonly incorporating overlying clayey lithology as burrow fillings. SILICEOUS OOZE WITH GLASS and CLAY, dark reddish brown (10R 4/1)and dark olive gray (5Y 3/2) to olive gray (5Y 4/2) and gray (5Y 5/1). Beds 0.2 to 1.1 m thick, overlying gradational to burrowed contact with clayey nannofossil ooze, internally the beds are faintly laminated and/or mottled in appearance. Prominent reddish black 10R 2.5/1 Mn oxide-enriched lamina are locally present. Beds of clayey nannofossil ooze represents subtly graded sequences alternating with siliceous ooze with glass and clay.

Minor lithologies occurring almost exclusively in intervals of siliceous ooze with clay and glass.

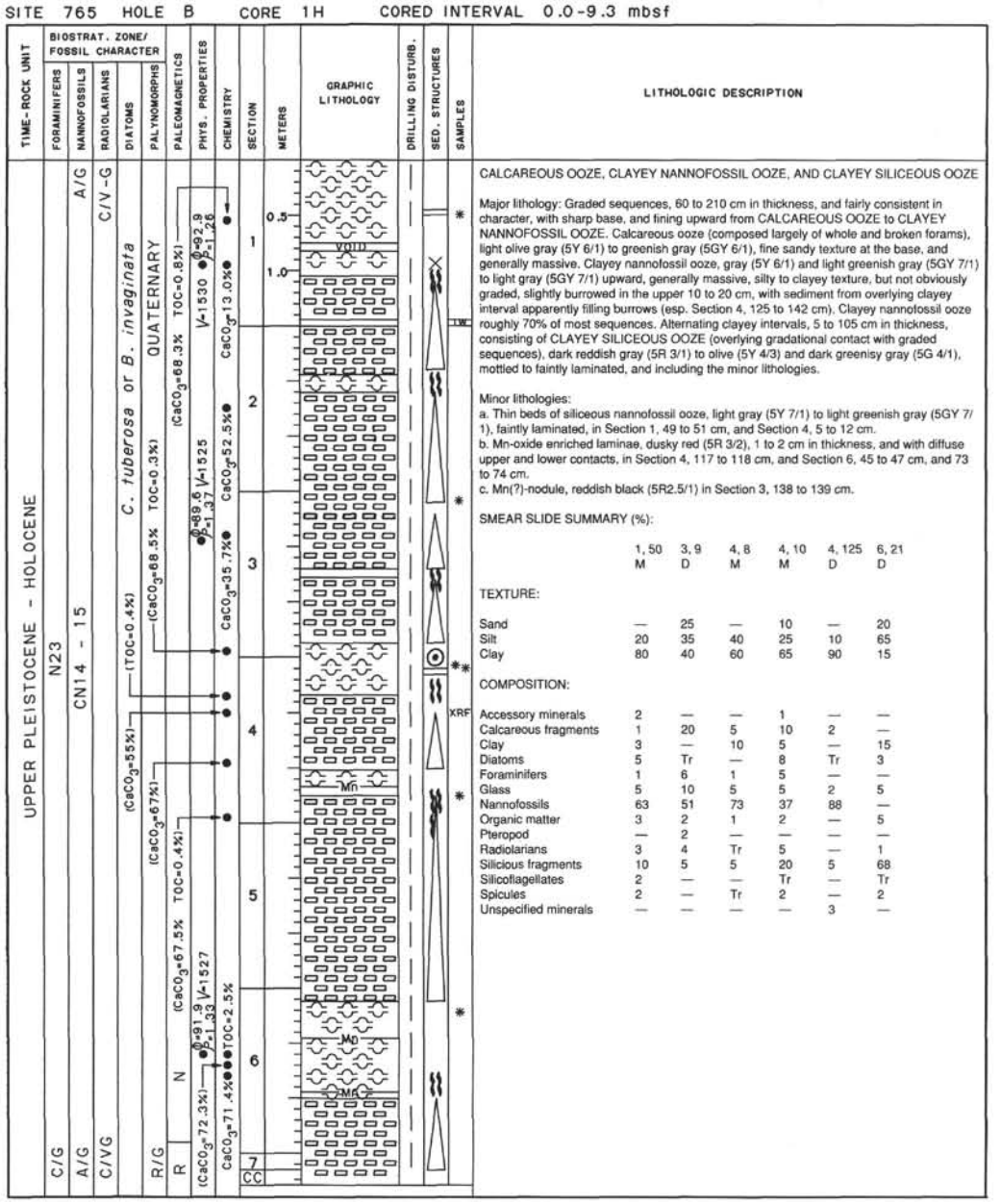
Minor lithologies:
a. Siliceous nannofossil ooze, light gray (5Y 7/1) to light greenish gray (5GY /1), and laminated, in Section 2, 18 to 22 cm.
b. Mn oxide-enriched laminae, reddish black (10R 2.5/1) with diffuse upper and lower contacts, in Section 2, 9-10, 130-131, and Section 4, 87-88 cm.
c. Siliceous ooze, grayish green (5G 4/2), and composed predominatly of "Phaeodarian" radiolarian fragments, in Section 4, 40-41 cm.

SMEAR SLIDE SUMMARY (%):

	1, 14 M	1, 148 M	2, 9 M	3, 56 D	4, 25 D	4, 40 M	4, 69 M
TEXTURE:							
Sand	20	5	10	—	—	80	—
Silt	60	85	80	40	40	10	40
Clay	20	10	10	60	60	10	60
COMPOSITION:							
Accessory minerals	—	—	—	—	—	—	Tr
Calcareous fragments	—	—	—	—	2	—	Tr
Clay	5	10	10	5	5	10	5
Diatoms	8	5	5	Tr	Tr	—	5
Foraminifers	Tr	—	—	Tr	Tr	—	—
Glass	10	10	5	5	5	2	10
Nannofossils	15	Tr	Tr	85	78	—	—
Organic matter	5	5	5	Tr	Tr	2	10
Radiolarians	10	5	5	Tr	Tr	2	2
Silicious fragments	38	62	66	5	10	82	65
Silicoflagellates	5	1	2	Tr	Tr	—	3
Spicules	—	2	2	Tr	Tr	—	Tr
Unspecified minerals	—	—	—	—	—	2	—



SITE 765 HOLE B CORE 1H CORED INTERVAL 0.0-9.3 mbsf



LITHOLOGIC DESCRIPTION

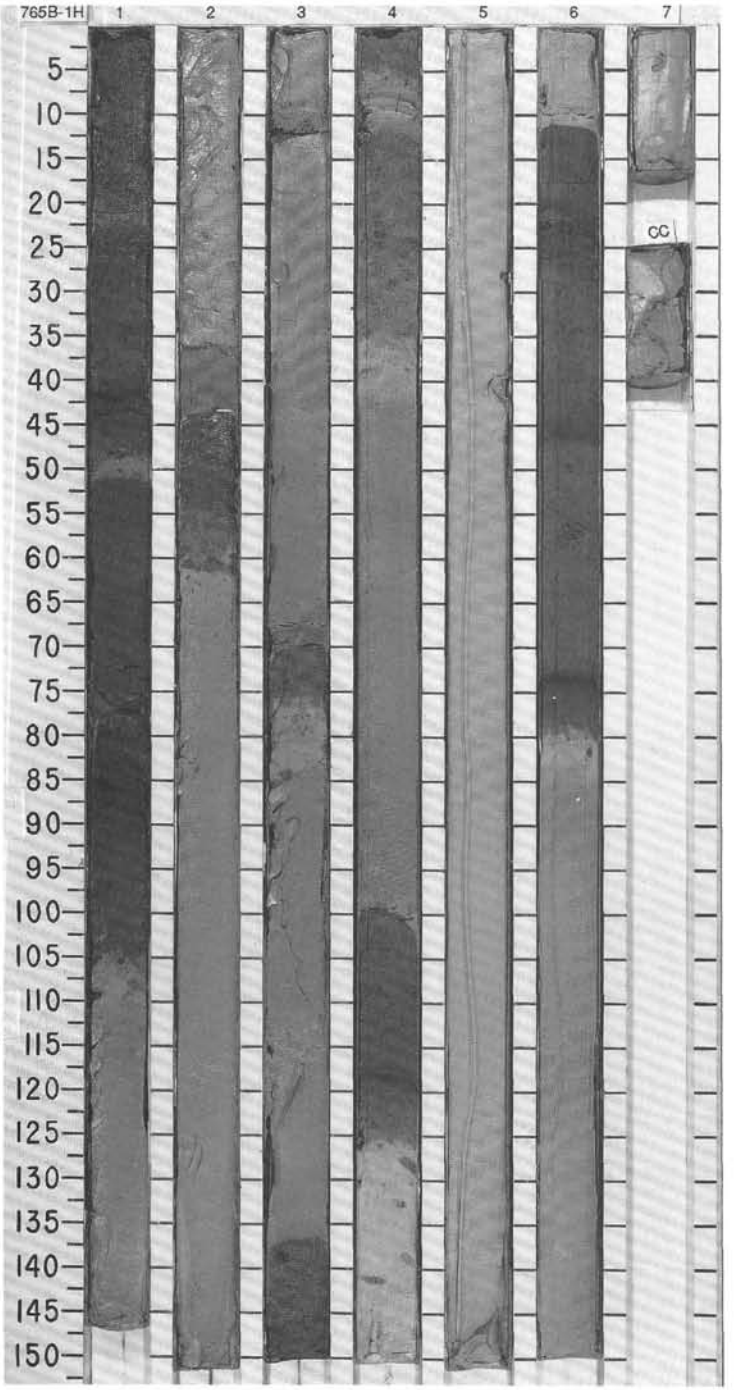
CALCAREOUS OOZE, CLAYEY NANNOFOSSIL OOZE, AND CLAYEY SILICEOUS OOZE

Major lithology: Graded sequences, 60 to 210 cm in thickness, and fairly consistent in character, with sharp base, and fining upward from CALCAREOUS OOZE to CLAYEY NANNOFOSSIL OOZE. Calcareous ooze (composed largely of whole and broken forams), light olive gray (5Y 6/1) to greenish gray (5GY 6/1), fine sandy texture at the base, and generally massive. Clayey nannofossil ooze, gray (5Y 6/1) and light greenish gray (5GY 7/1) to light gray (5GY 7/1) upward, generally massive, silty to clayey texture, but not obviously graded, slightly burrowed in the upper 10 to 20 cm, with sediment from overlying clayey interval apparently filling burrows (esp. Section 4, 125 to 142 cm). Clayey nannofossil ooze roughly 70% of most sequences. Alternating clayey intervals, 5 to 105 cm in thickness, consisting of CLAYEY SILICEOUS OOZE (overlying gradational contact with graded sequences), dark reddish gray (5R 3/1) to olive (5Y 4/3) and dark greenisy gray (5G 4/1), mottled to faintly laminated, and including the minor lithologies.

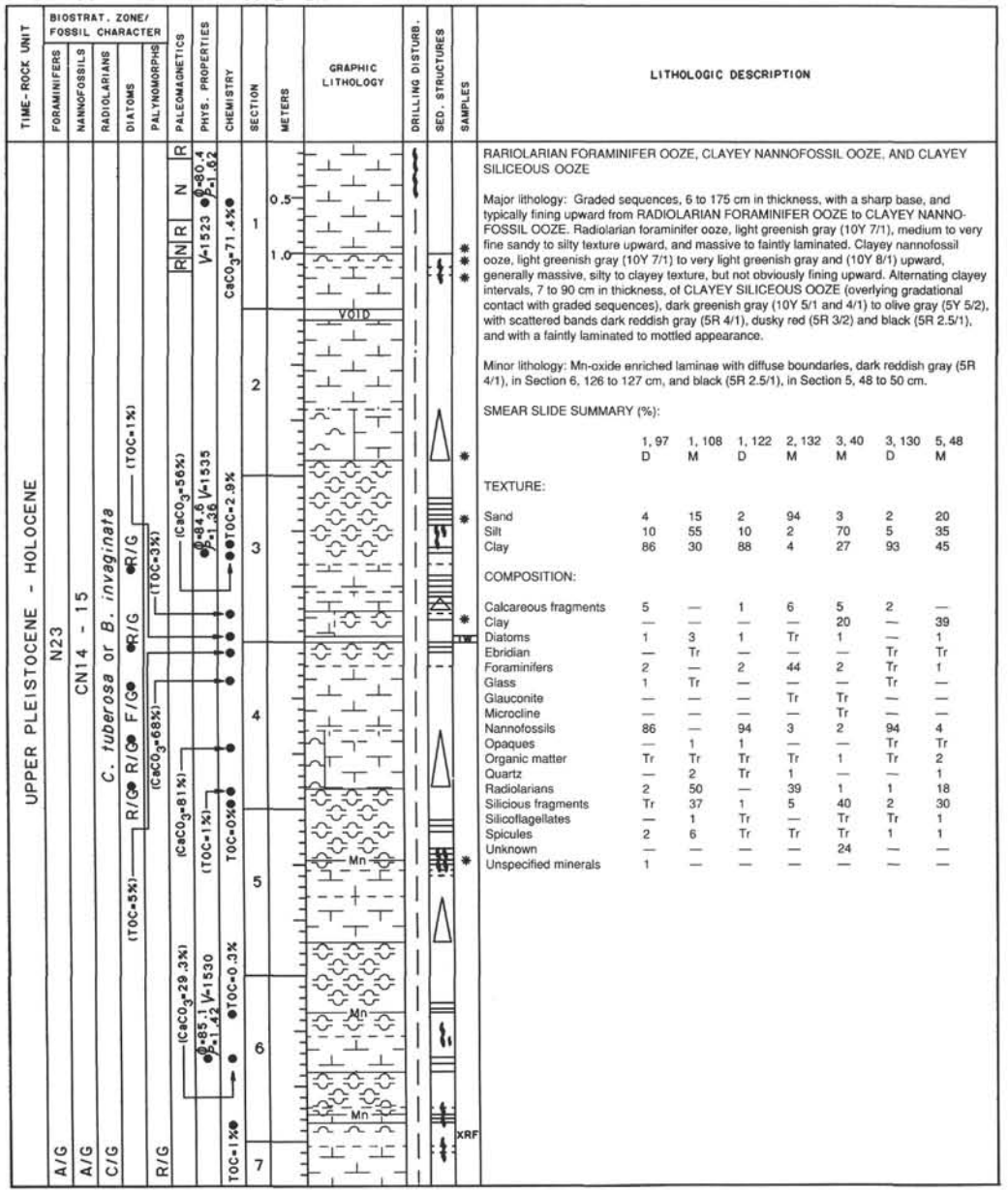
Minor lithologies:
a. Thin beds of siliceous nannofossil ooze, light gray (5Y 7/1) to light greenish gray (5GY 7/1), faintly laminated, in Section 1, 49 to 51 cm, and Section 4, 5 to 12 cm.
b. Mn-oxide enriched laminae, dusky red (5R 3/2), 1 to 2 cm in thickness, and with diffuse upper and lower contacts, in Section 4, 117 to 118 cm, and Section 6, 45 to 47 cm, and 73 to 74 cm.
c. Mn(?)-nodule, reddish black (5R2.5/1) in Section 3, 138 to 139 cm.

SMEAR SLIDE SUMMARY (%):

	1, 50 M	3, 9 D	4, 8 M	4, 10 M	4, 125 D	6, 21 D
TEXTURE:						
Sand	—	25	—	10	—	20
Silt	20	35	40	25	10	65
Clay	80	40	60	65	90	15
COMPOSITION:						
Accessory minerals	2	—	—	1	—	—
Calcareous fragments	1	20	5	10	2	—
Clay	3	—	10	5	—	15
Diatoms	5	Tr	—	8	Tr	3
Foraminifers	1	6	1	5	—	—
Glass	5	10	5	5	2	5
Nannofossils	63	51	73	37	88	—
Organic matter	3	2	1	2	—	5
Pteropod	—	2	—	—	—	—
Radiolarians	3	4	Tr	5	—	1
Silicious fragments	10	5	5	20	5	68
Silicoflagellates	2	—	—	Tr	—	Tr
Spicules	2	—	Tr	2	—	2
Unspecified minerals	—	—	—	—	3	—



SITE 765 HOLE B CORE 2H CORED INTERVAL 9.3-18.8 mbsf



LITHOLOGIC DESCRIPTION

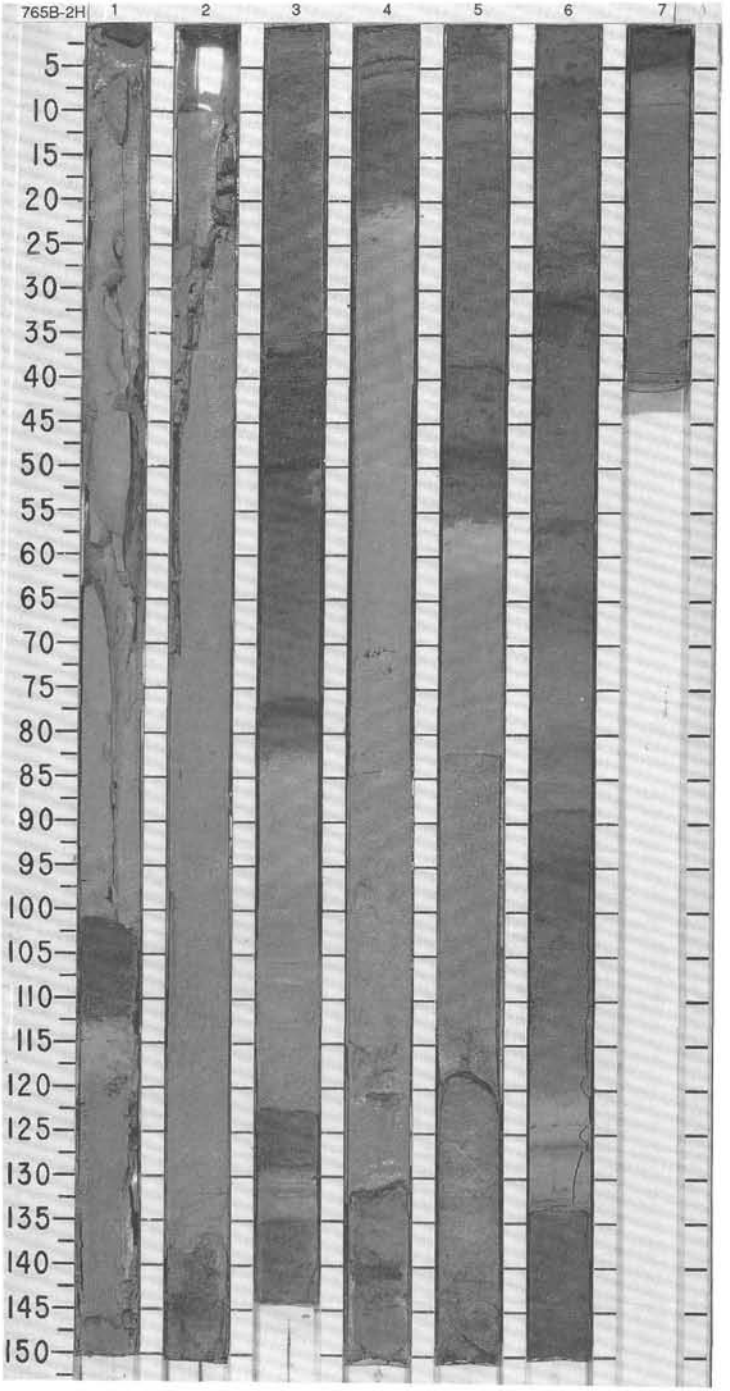
RARIOLARIAN FORAMINIFER OOZE, CLAYEY NANNOFOSSIL OOZE, AND CLAYEY SILICEOUS OOZE

Major lithology: Graded sequences, 6 to 175 cm in thickness, with a sharp base, and typically fining upward from RADIOLARIAN FORAMINIFER OOZE to CLAYEY NANNOFOSSIL OOZE. Radiolarian foraminifer ooze, light greenish gray (10Y 7/1), medium to very fine sandy to silty texture upward, and massive to faintly laminated. Clayey nannofossil ooze, light greenish gray (10Y 7/1) to very light greenish gray and (10Y 8/1) upward, generally massive, silty to clayey texture, but not obviously fining upward. Alternating clayey intervals, 7 to 90 cm in thickness, of CLAYEY SILICEOUS OOZE (overlying gradational contact with graded sequences), dark greenish gray (10Y 5/1 and 4/1) to olive gray (5Y 5/2), with scattered bands dark reddish gray (5R 4/1), dusky red (5R 3/2) and black (5R 2.5/1), and with a faintly laminated to mottled appearance.

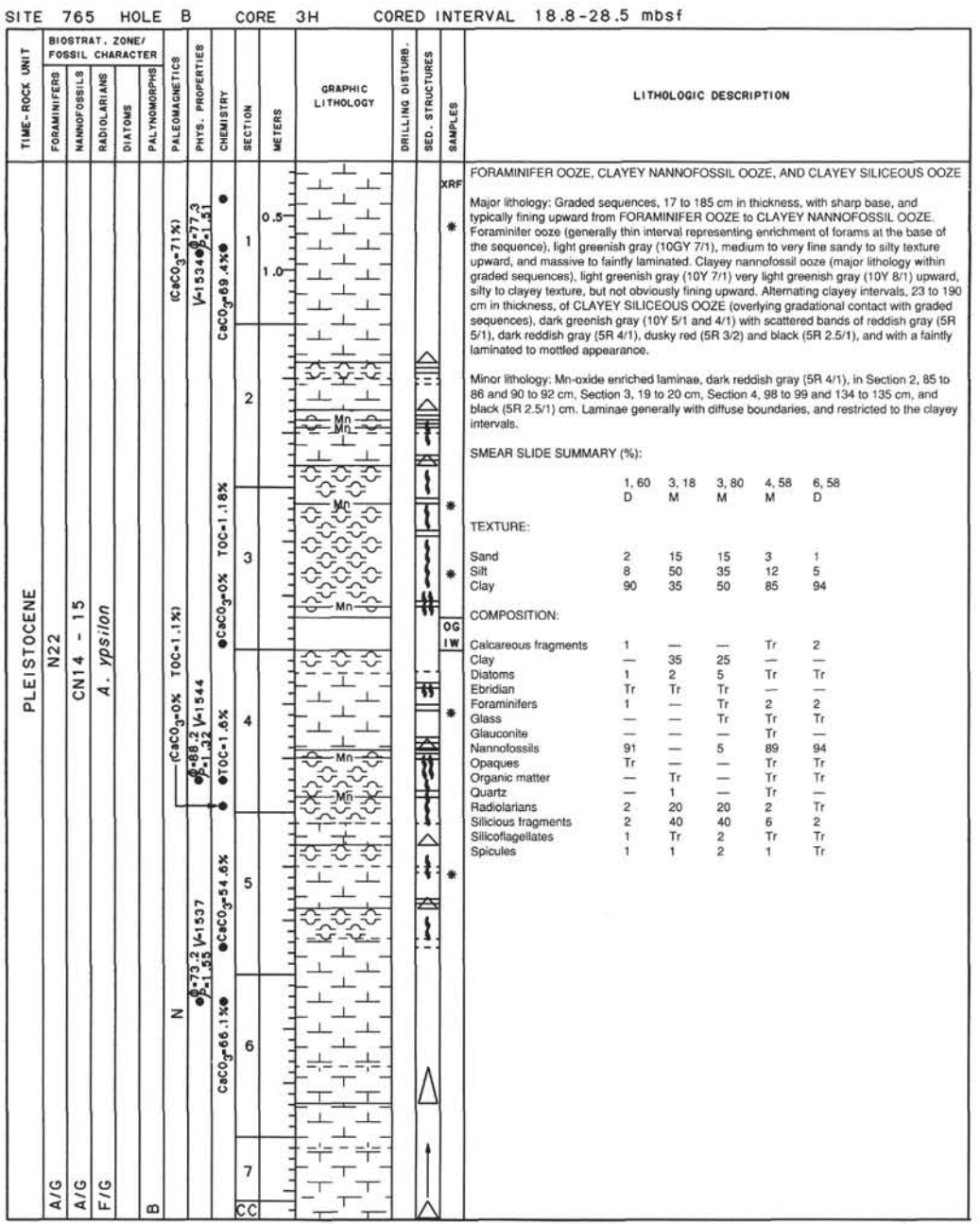
Minor lithology: Mn-oxide enriched laminae with diffuse boundaries, dark reddish gray (5R 4/1), in Section 6, 126 to 127 cm, and black (5R 2.5/1), in Section 5, 48 to 50 cm.

SMEAR SLIDE SUMMARY (%):

	1, 97 D	1, 108 M	1, 122 D	2, 132 M	3, 40 M	3, 130 D	5, 48 M
TEXTURE:							
Sand	4	15	2	94	3	2	20
Silt	10	55	10	2	70	5	35
Clay	86	30	88	4	27	93	45
COMPOSITION:							
Calcareous fragments	5	—	1	6	5	2	—
Clay	—	—	—	—	20	—	39
Diatoms	1	3	1	Tr	1	—	1
Ebridian	—	Tr	—	—	—	Tr	Tr
Foraminifers	2	—	2	44	2	Tr	1
Glass	1	Tr	—	—	—	Tr	—
Glauconite	—	—	—	Tr	Tr	—	—
Microcline	—	—	—	—	Tr	—	—
Nannofossils	86	—	94	3	2	94	4
Opaques	—	1	1	—	—	Tr	Tr
Organic matter	Tr	Tr	Tr	Tr	1	Tr	2
Quartz	—	2	Tr	1	—	—	1
Radiolarians	2	50	—	39	1	1	18
Silicious fragments	Tr	37	1	5	40	2	30
Silicoflagellates	—	1	Tr	—	Tr	Tr	1
Spicules	2	6	Tr	Tr	Tr	1	1
Unknown	—	—	—	—	24	—	—
Unspecified minerals	1	—	—	—	—	—	—



SITE 765 HOLE B CORE 3H CORED INTERVAL 18.8-28.5 mbsf



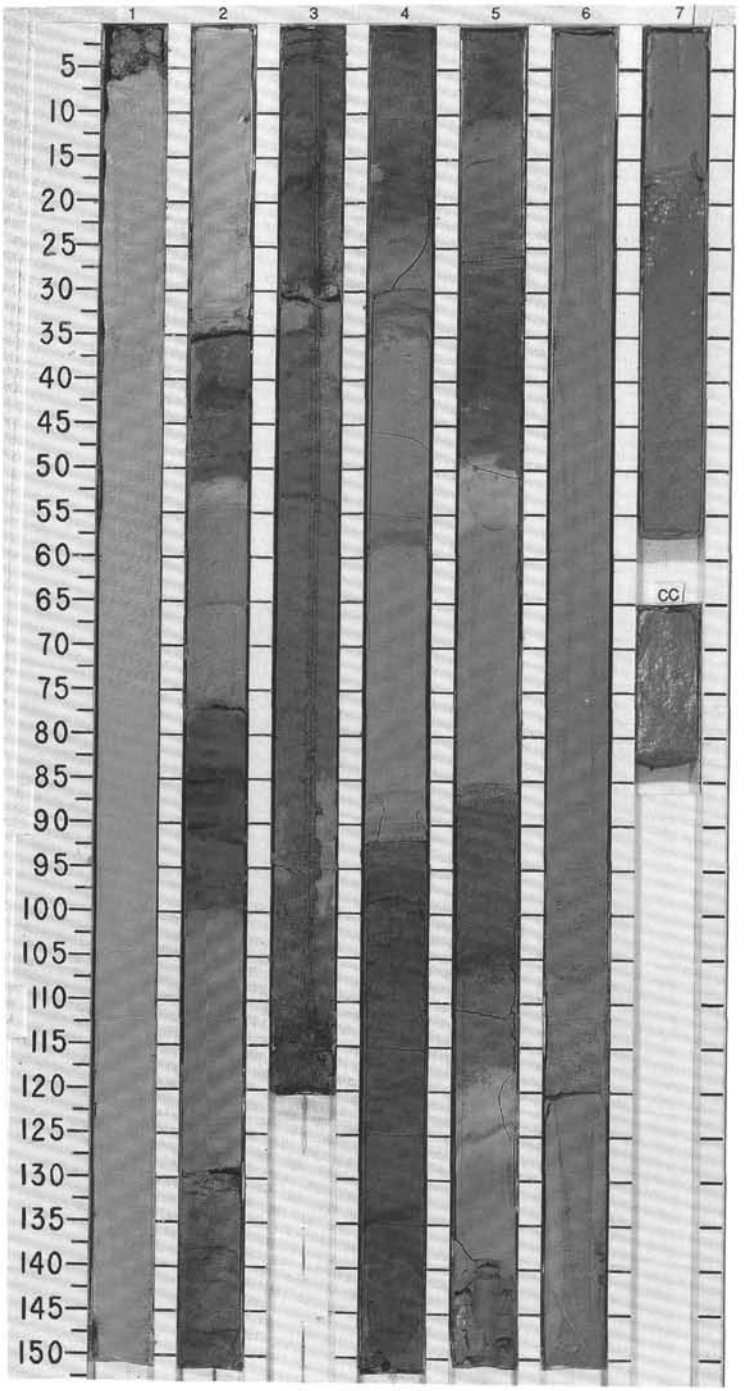
FORAMINIFER OOZE, CLAYEY NANNOFOSSIL OOZE, AND CLAYEY SILICEOUS OOZE

Major lithology: Graded sequences, 17 to 185 cm in thickness, with sharp base, and typically fining upward from FORAMINIFER OOZE to CLAYEY NANNOFOSSIL OOZE. Foraminifer ooze (generally thin interval representing enrichment of forams at the base of the sequence), light greenish gray (10GY 7/1), medium to very fine sandy to silty texture upward, and massive to faintly laminated. Clayey nannofossil ooze (major lithology within graded sequences), light greenish gray (10Y 7/1) very light greenish gray (10Y 8/1) upward, silty to clayey texture, but not obviously fining upward. Alternating clayey intervals, 23 to 190 cm in thickness, of CLAYEY SILICEOUS OOZE (overlying gradational contact with graded sequences), dark greenish gray (10Y 5/1 and 4/1) with scattered bands of reddish gray (5R 5/1), dark reddish gray (5R 4/1), dusky red (5R 3/2) and black (5R 2.5/1), and with a faintly laminated to mottled appearance.

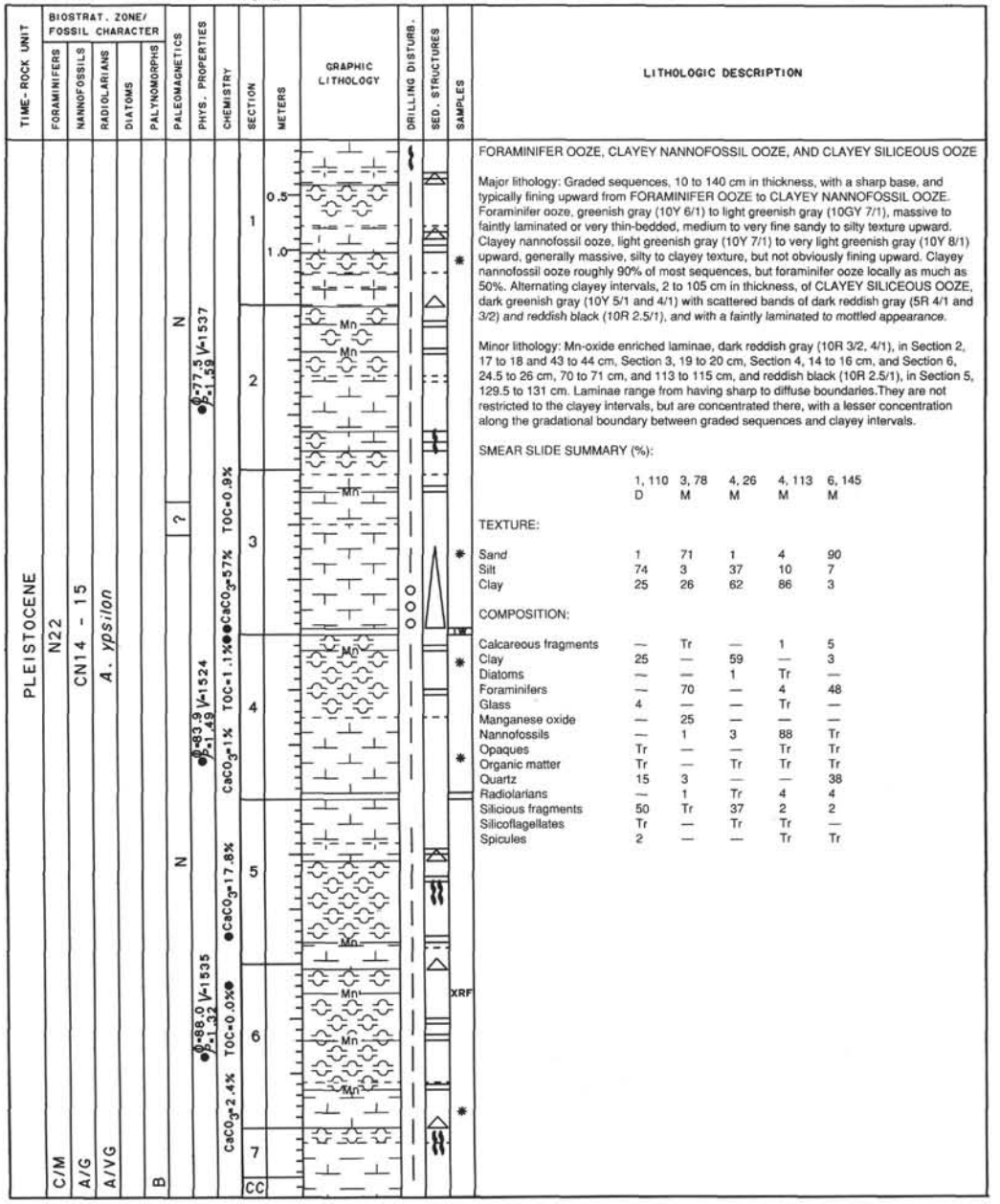
Minor lithology: Mn-oxide enriched laminae, dark reddish gray (5R 4/1), in Section 2, 85 to 86 and 90 to 92 cm, Section 3, 19 to 20 cm, Section 4, 98 to 99 and 134 to 135 cm, and black (5R 2.5/1) cm. Laminae generally with diffuse boundaries, and restricted to the clayey intervals.

SMEAR SLIDE SUMMARY (%):

	1, 60 D	3, 18 M	3, 80 M	4, 58 M	6, 58 D
TEXTURE:					
Sand	2	15	15	3	1
Silt	8	50	35	12	5
Clay	90	35	50	85	94
COMPOSITION:					
Calcareous fragments	1	—	—	Tr	2
Clay	—	35	25	—	—
Diatoms	1	2	5	Tr	Tr
Ebridian	Tr	Tr	Tr	—	—
Foraminifers	1	—	Tr	2	2
Glass	—	—	Tr	Tr	Tr
Glauconite	—	—	—	Tr	—
Nannofossils	91	—	5	89	94
Opaques	Tr	—	—	Tr	Tr
Organic matter	—	Tr	—	Tr	Tr
Quartz	—	1	—	Tr	—
Radiolarians	2	20	20	2	Tr
Silicious fragments	2	40	40	6	2
Silicoflagellates	1	Tr	2	Tr	Tr
Spicules	1	1	2	1	Tr



SITE 765 HOLE B CORE 4H CORED INTERVAL 28.5-38.1 mbsf



LITHOLOGIC DESCRIPTION

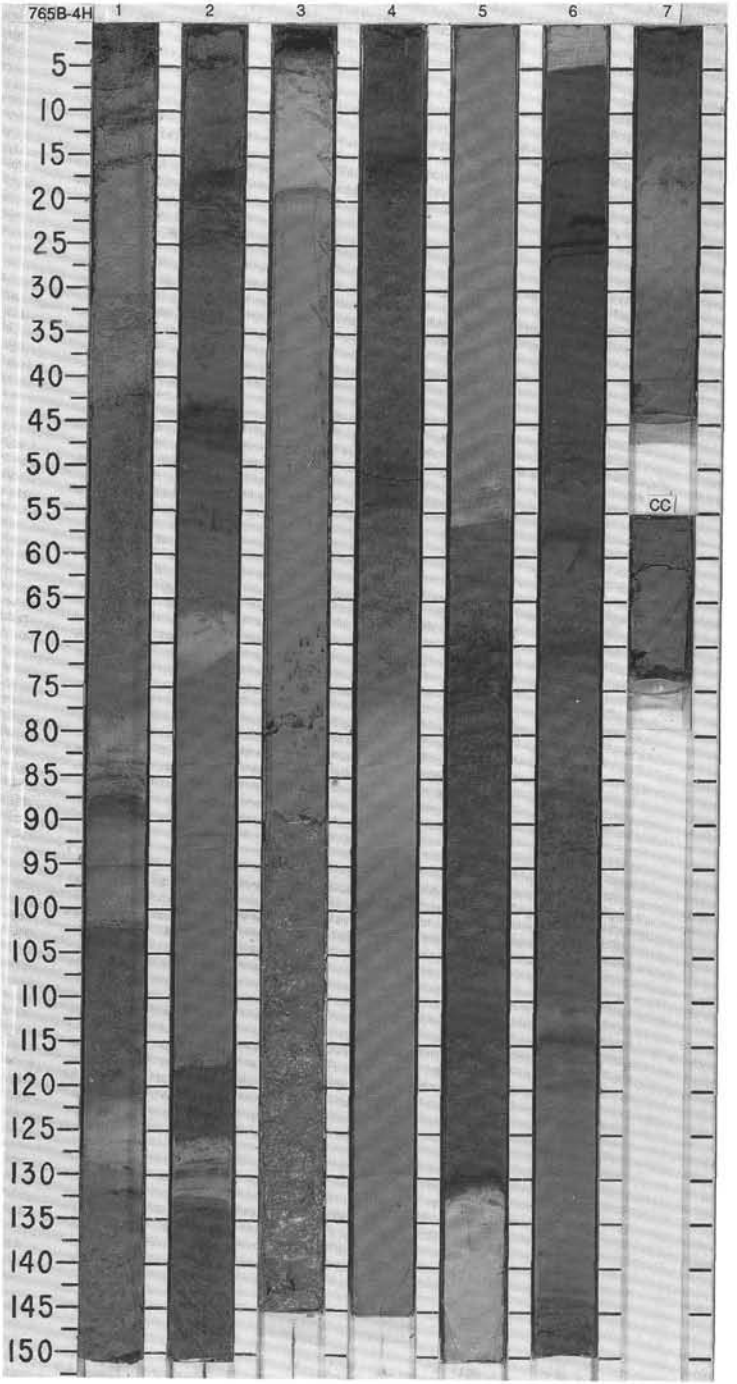
FORAMINIFER OOZE, CLAYEY NANNOFOSSIL OOZE, AND CLAYEY SILICEOUS OOZE

Major lithology: Graded sequences, 10 to 140 cm in thickness, with a sharp base, and typically fining upward from FORAMINIFER OOZE to CLAYEY NANNOFOSSIL OOZE. Foraminifer ooze, greenish gray (10Y 6/1) to light greenish gray (10GY 7/1), massive to faintly laminated or very thin-bedded, medium to very fine sandy to silty texture upward. Clayey nannofossil ooze, light greenish gray (10Y 7/1) to very light greenish gray (10Y 8/1) upward, generally massive, silty to clayey texture, but not obviously fining upward. Clayey nannofossil ooze roughly 90% of most sequences, but foraminifer ooze locally as much as 50%. Alternating clayey intervals, 2 to 105 cm in thickness, of CLAYEY SILICEOUS OOZE, dark greenish gray (10Y 5/1 and 4/1) with scattered bands of dark reddish gray (5R 4/1 and 3/2) and reddish black (10R 2.5/1), and with a faintly laminated to mottled appearance.

Minor lithology: Mn-oxide enriched laminae, dark reddish gray (10R 3/2, 4/1), in Section 2, 17 to 18 and 43 to 44 cm, Section 3, 19 to 20 cm, Section 4, 14 to 16 cm, and Section 6, 24.5 to 26 cm, 70 to 71 cm, and 113 to 115 cm, and reddish black (10R 2.5/1), in Section 5, 129.5 to 131 cm. Laminae range from having sharp to diffuse boundaries. They are not restricted to the clayey intervals, but are concentrated there, with a lesser concentration along the gradational boundary between graded sequences and clayey intervals.

SMEAR SLIDE SUMMARY (%):

	1, 110 D	3, 78 M	4, 26 M	4, 113 M	6, 145 M
TEXTURE:					
Sand	1	71	1	4	90
Silt	74	3	37	10	7
Clay	25	26	62	86	3
COMPOSITION:					
Calcareous fragments	—	Tr	—	1	5
Clay	25	—	59	—	3
Diatoms	—	—	1	Tr	—
Foraminifers	—	70	—	4	48
Glass	4	—	—	Tr	—
Manganese oxide	—	25	—	—	—
Nannofossils	—	1	3	88	Tr
Opaques	Tr	—	—	Tr	Tr
Organic matter	Tr	—	Tr	Tr	Tr
Quartz	15	3	—	—	38
Radiolarians	—	1	Tr	4	4
Silicious fragments	50	Tr	37	2	2
Silicoflagellates	Tr	—	Tr	Tr	—
Spicules	2	—	—	Tr	Tr



SITE 765 HOLE B CORE 5H CORED INTERVAL 38.1-47.8 mbsf

TIME-ROCK UNIT: PLEISTOCENE

BIOSTRAT. ZONE/FOSSIL CHARACTER
- FORAMINIFERS: A/G
- NANNOFOSSILS: A/G
- RADIOLARIANS: F/G
- DIATOMS
- PALYNOMORPHS: B

PALEOMAGNETICS: R ? N R N R
PHYS. PROPERTIES: ●ρ=89.4 V=1322 ●ρ=1.35 ●ρ=77.4 V=1526 ●ρ=1.58
CHEMISTRY: ●$CaCO_3$=31.7% TOC=0.6% ●$CaCO_3$=56% TOC=0.6%● ●$CaCO_3$=56% TOC=0.6%

SECTION: 1 2 3 4 5 6 7 CC

METERS: 0.5 1.0

GRAPHIC LITHOLOGY

DRILLING DISTURB.

SED. STRUCTURES

SAMPLES

LITHOLOGIC DESCRIPTION

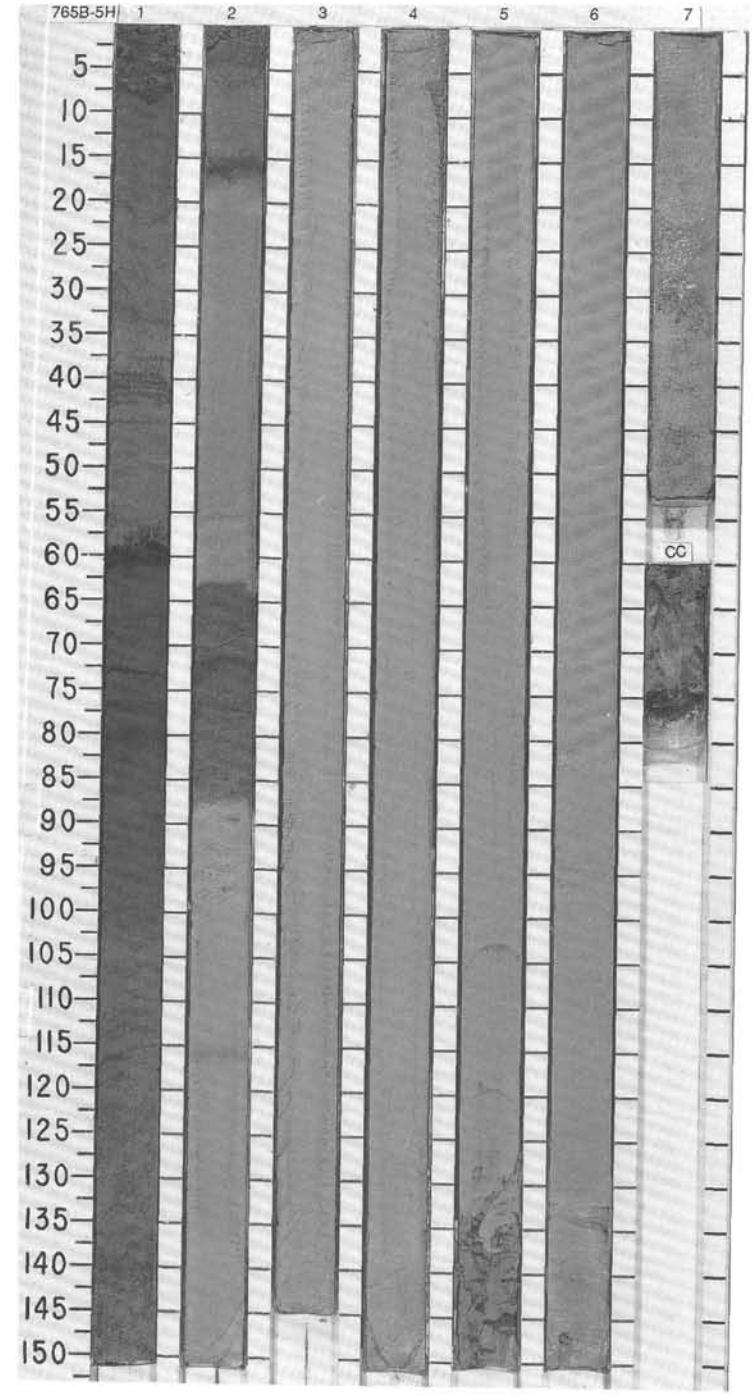
FORAMINIFER OOZE, CLAYEY NANNOFOSSIL OOZE,SILICEOUS OOZE WITH CLAY, AND RADIOLARIAN OOZE WITH CLAY

Major lithology: Two graded sequences with alternating clayey intervals. The top of the core is RADIOLARIAN OOZE WITH CLAY to SILICEOUS OOZE WITH CLAY, dark greenish gray (10Y 5/1) with scattered bands of dark reddish gray (10R 4/1,3/2) and reddish black (10R 2.5/1), and with a faintly laminated to mottled appearance. The first graded sequence, in Section 2, 17 to 63 cm, is CLAYEY NANNOFOSSIL OOZE, light greenish gray (10Y 6/2), with a sharp base overlying siliceous ooze, not noticeable fining upward, and with gradational top into the overlying siliceous ooze. The second graded sequence, in Section 2, 87.5 cm to the bottom of the core, is intraformational conglomerate (minor lithology) grading upward into FORAMINIFER OOZE (dominantly foraminifers and quartz at the base, nannofossils increasing upward), light greenish gray (10GY 7/1), massive to faintly laminated, coarse to medium sandy to silty texture upward, and grading finally into clayey nannofossil ooze, light greenish gray (5GY 7/1) to light gray (5GY 7/1) upward, generally massive, silty to clayey texture, but not obviously fining upward.

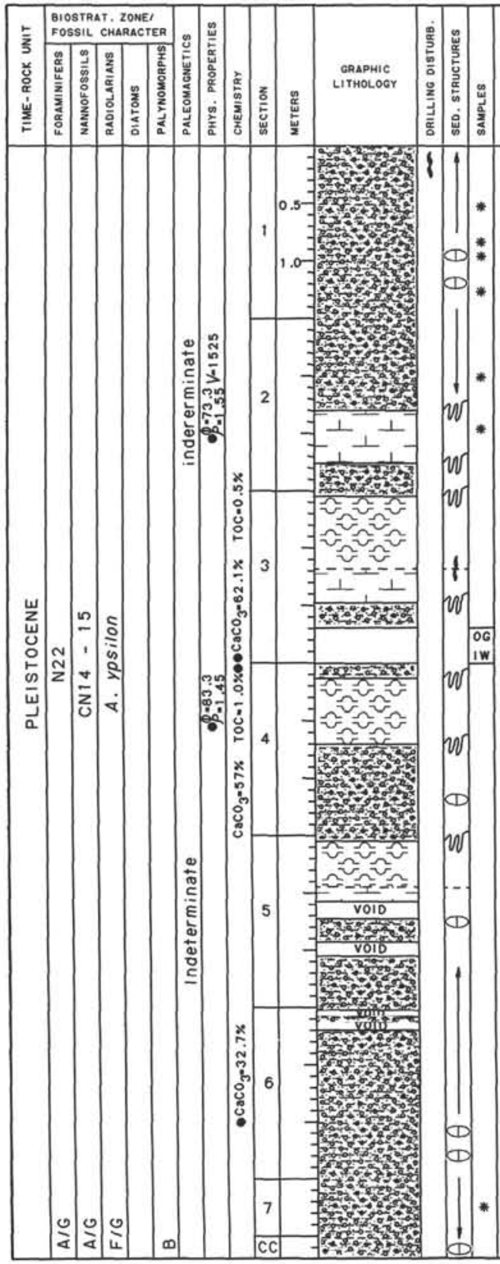
Minor lithologies:
a. Mn-oxide-enriched laminae, dark reddish gray (10R 3/2, 4/1) with diffuse boundaries, in Section 2, 15 to 17 cm, and reddish black (10R 2.5/1) with sharp boundaries, in Section 1, 7 to 8, 59 to 61.5, and at 73 cm.
b. Intraformational conglomerate, variable colored nannofossil ooze pebbles (rounded to deformed), 1 to 3 cm diameter, in a light greenish gray (10Y 7/1) clayey nannofossil ooze matrix. Sharp to scoured upper contact with foraminifer ooze.

SMEAR SLIDE SUMMARY (%):

	1, 74 M	2, 80 M	4, 74 D	6, 93 M	6, 134 M
TEXTURE:					
Sand	15	15	—	30	85
Silt	25	70	20	5	5
Clay	60	15	80	65	10
COMPOSITION:					
Calcareous fragments	—	—	1	5	5
Clay	20	15	—	—	—
Diatoms	1	1	—	—	—
Ebridian	—	Tr	—	—	—
Echinoid spine	—	—	—	3	1
Fecal pellet	—	—	—	—	Tr
Foraminifers	—	—	Tr	30	50
Glass	Tr	1	1	—	Tr
Nannofossils	—	—	87	58	10
Opaques	Tr	3	Tr	Tr	Tr
Organic matter	Tr	2	Tr	Tr	Tr
Quartz	—	2	Tr	3	30
Radiolarians	40	12	—	—	—
Silicious fragments	35	57	11	—	2
Silicoflagellates	1	Tr	Tr	—	—
Spicules	1	2	Tr	—	—
	—	—	—	—	Tr



SITE 765 HOLE B CORE 6H CORED INTERVAL 47.8-57.4 mbsf



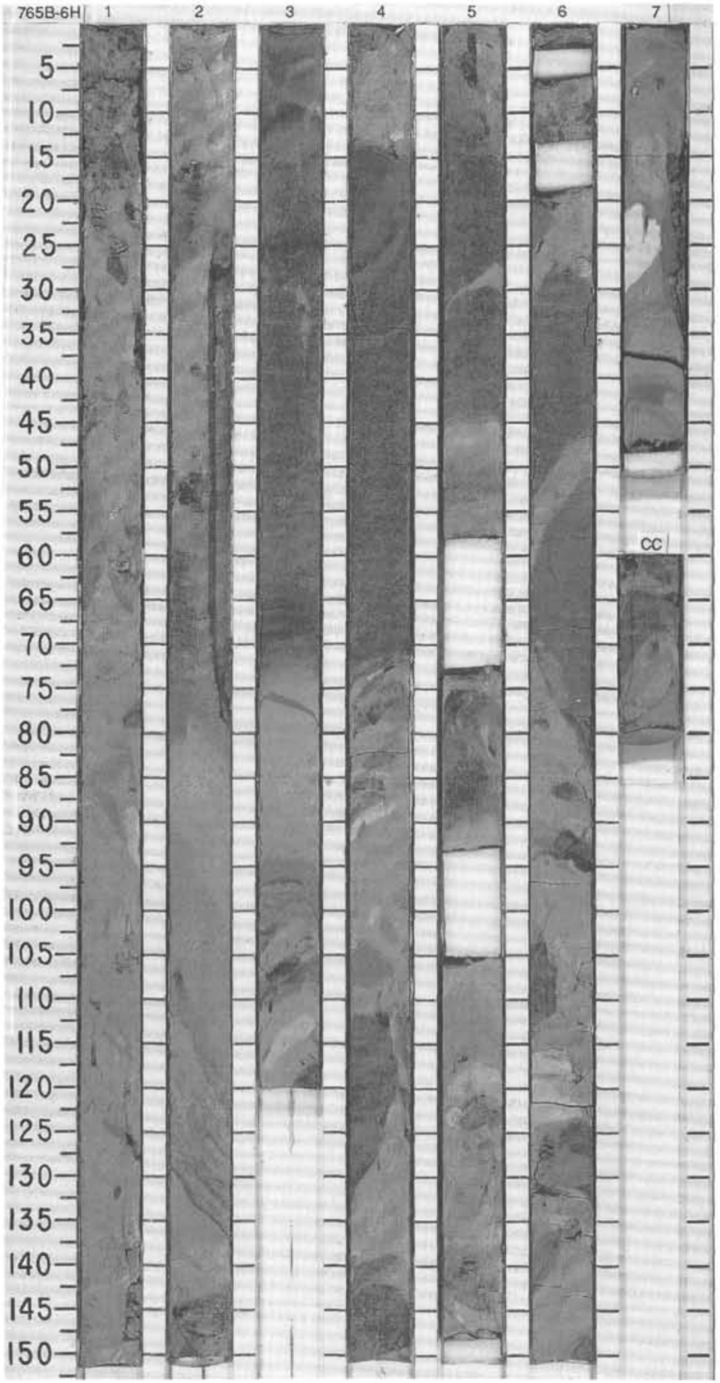
LITHOLOGIC DESCRIPTION

INTRAFORMATIONAL CONGLOMERATE, CLAYEY NANNOFOSSIL OOZE, AND CLAYEY SILICEOUS OOZE

Major lithology: INTRAFORMATIONAL CONGLOMERATE incorporating blocks of CLAYEY NANNOFOSSIL OOZE and CLAYEY SILICEOUS OOZE. The intraformational conglomerate consisting of rounded to deformed pebbles, 1 to 32 cm diameter (poorly sorted), color variable, but generally of a similar degree of consolidation and composition as the adjacent matrix. The pebbles are composed of nannofossil ooze with varying amounts of clay (smear slides from pebbles listed as minor lithology). Matrix predominantly nannofossil ooze, with a *clayey texture, and a flowing appearance.Pebbles are not obviously graded throughout, but* definitely smaller in Section 1. Intervals of alternating lithologies are generally deformed where in contact with intraformational conglomerate. They are of the same lithology as the deformed pebbles within the intraformational conglomerate, and apparently represent blocks floating within the conglomerate. Observed diameter of blocks ranging form 40 to 90 cm. *Clayey nannofossil ooze intervals are predominantly light greenish gray (5GY 7/1), and* in some cases grade upward into clayey siliceous ooze (two lithologies within the same block). Clayey siliceous ooze intervals are greenish gray (10Y 5/1) to dark greenish gray (10Y 4/2).

SMEAR SLIDE SUMMARY (%):

	1, 53 M	1, 84 M	1, 96 D	1, 127 M	2, 51 D	2, 96 D	7, 25 M
TEXTURE:							
Sand	10	1	3	2	1	—	—
Silt	75	5	22	60	79	5	—
Clay	15	94	75	38	20	95	100
COMPOSITION:							
Calcareous fragments	3	2	—	3	5	1	—
Clay	15	—	10	36	20	—	—
Diatoms	—	—	—	Tr	—	—	—
Dolomite	Tr	—	Tr	—	—	—	—
Echinoid Spine	—	Tr	—	—	—	1	—
Foraminifers	5	2	3	—	—	2	—
Glass	Tr	Tr	Tr	1	2	—	—
Nannofossils	55	94	80	43	—	93	100
Opaques	—	Tr	Tr	5	5	—	—
Organic matter	—	Tr	Tr	2	3	Tr	—
Quartz	Tr	1	Tr	5	6	1	—
Radiolarians	2	Tr	Tr	—	3	—	—
Silicious fragments	20	1	5	5	50	1	—
Spicules	—	Tr	Tr	—	2	Tr	—



SITE 765 HOLE B CORE 7H CORED INTERVAL 59.4-67.1 mbsf

TIME-ROCK UNIT: PLEISTOCENE

BIOSTRAT. ZONE/FOSSIL CHARACTER: FORAMINIFERS: F/P; N22; A/G; NANNOFOSSILS: CN14 - 15; A/G; RADIOLARIANS: R/G; DIATOMS: B; PALYNOMORPHS: B

PALEOMAGNETICS: R; N

PHYS. PROPERTIES: Indeterminate; (CaCO3=62% TOC=0.7%); ϕ=66.8 V=1556 ρ=1.63; ϕ=63.8 V=1521 ρ=1.88; ϕ=72.1 V=1482 ρ=1.58; CaCO3=69% TOC=1.1%; TOC=65.6%

CHEMISTRY: CaCO3

SECTION: 1 2 3 4 5 6 7 CC

METERS: 0.5 1.0

GRAPHIC LITHOLOGY

DRILLING DISTURB.

SED. STRUCTURES

SAMPLES: XRF

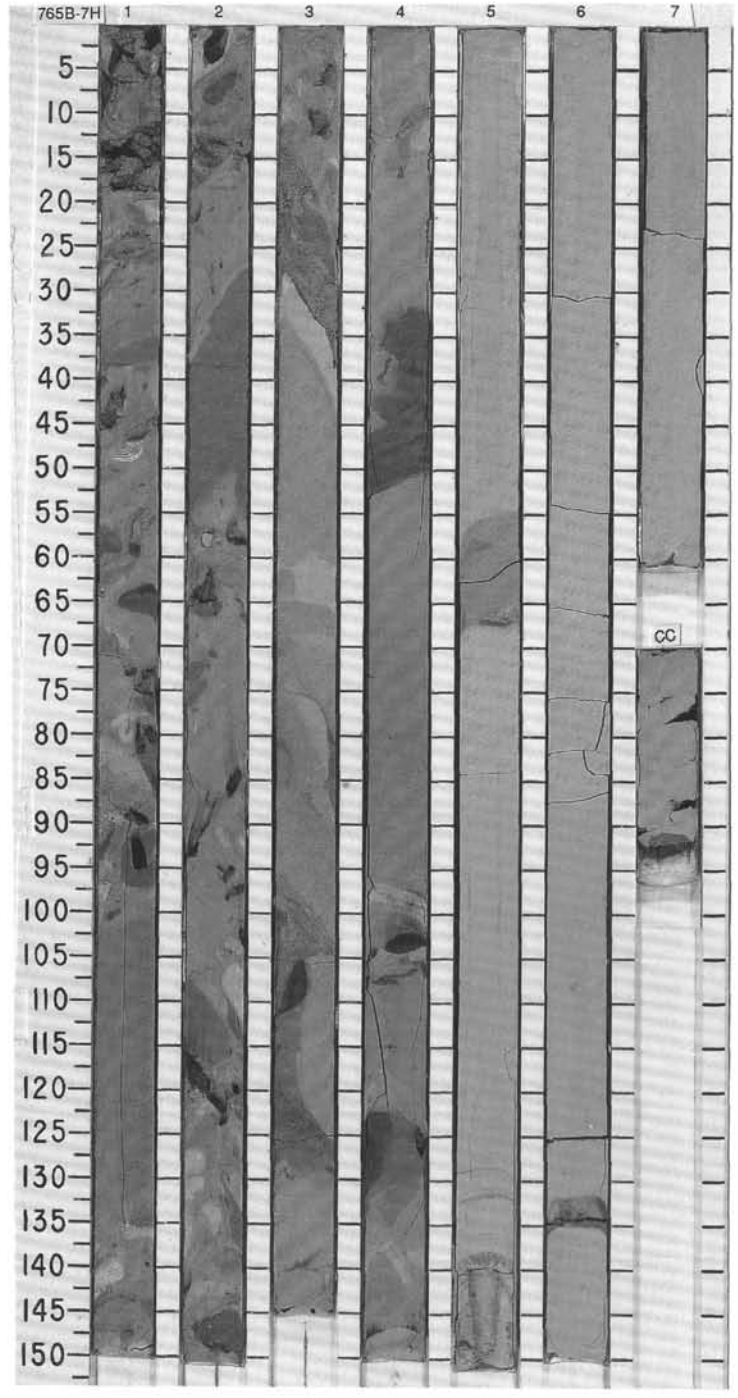
LITHOLOGIC DESCRIPTION

INTRAFORMATIONAL CONGLOMERATE, CLAYEY NANNOFOSSIL OOZE

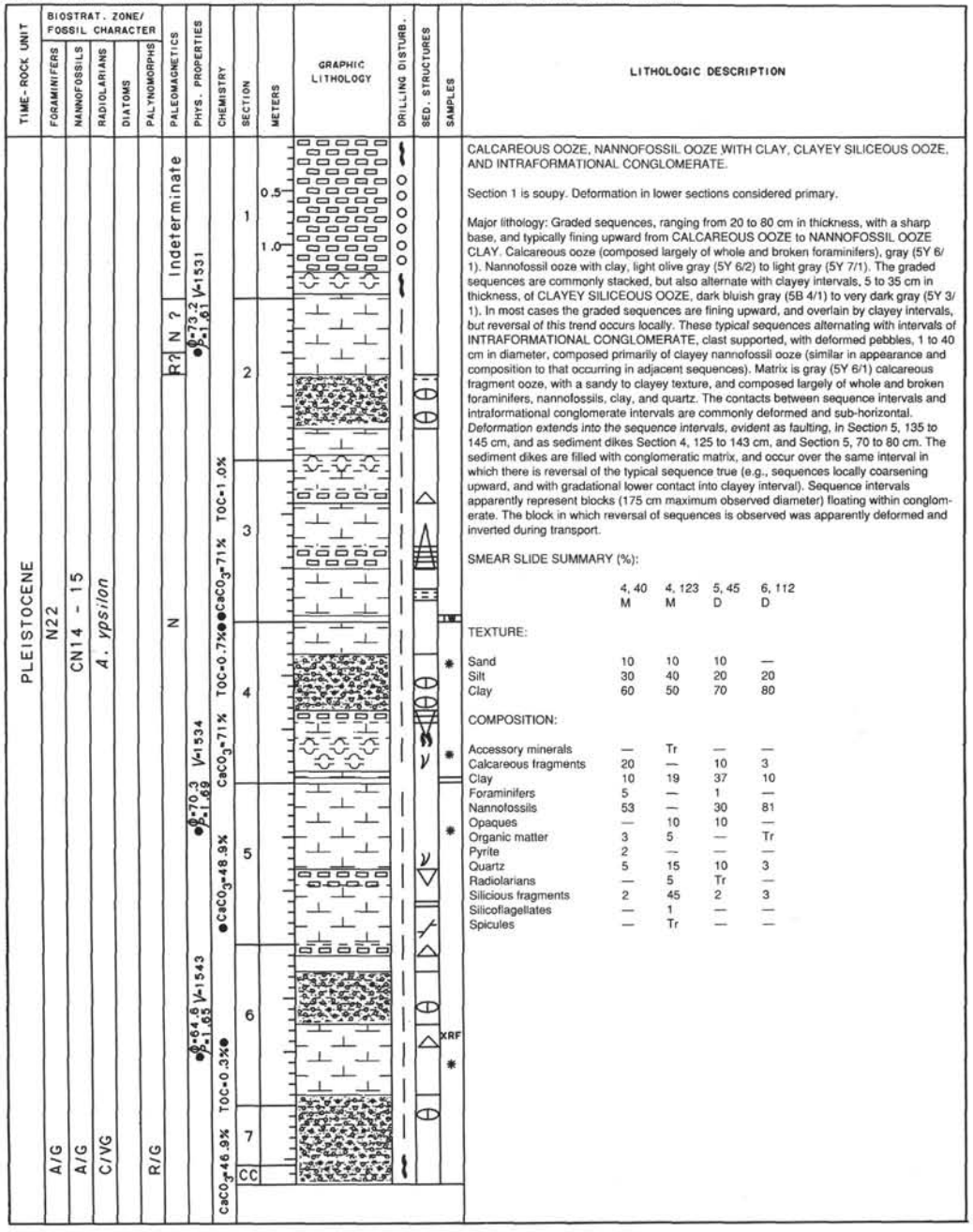
Major lithology: INTRAFORMATIONAL CONGLOMERATE alternating with intervals of CLAYEY NANNOFOSSIL OOZE. The intraformational conglomerate is matrix supported. Pebbles are rounded to deformed, and 1 to 30 cm diameter. They are variable in color and composition, but generally ranging between clay and nannofossil ooze, with similar degree of consolidation as the adjacent matrix (smear slides from obvious pebbles are listed as minor lithologies). Pebbles are not obviously graded through the sequence. Matrix is clay nannofossil mixed sediment, with clayey texture, and a flowing appearance. Matrix locally with a speckled appearance (imparted by scattered calcareous fragments and very small pebbles), as well as local patches of calcareous ooze with a sandy texture. Alternating intervals of clayey nannofossil ooze are predominantly light olive gray (5Y 6/2) and light greenish gray (5GY 7/1), homogeneous, and range from 20 to 215 cm in thickness. The contacts between intervals and adjacent conglomerate are commonly sub-vertical and deformed. Clayey nannofossil ooze intervals apparently represent large blocks floating in intraformation conglomerate sequence.

SMEAR SLIDE SUMMARY (%):

	1, 48 M	1, 51 D	2, 34 D	2, 37 M	2, 85 M	4, 73 D	4, 101 D
TEXTURE:							
Sand	10	—	—	3	5	5	20
Silt	10	10	10	7	15	5	20
Clay	80	90	90	90	80	90	60
COMPOSITION:							
Accessory minerals	—	—	—	1	1	—	—
Calcareous fragments	10	10	4	—	—	5	15
Clay	40	20	10	87	25	41	30
Collophane	—	—	—	1	—	—	—
Foraminifers	2	—	1	—	—	1	10
Nannofossils	41	63	82	—	52	40	31
Organic matter	Tr	2	Tr	1	10	1	2
Pyrite	—	—	—	—	2	—	—
Quartz	5	5	3	10	10	10	10
Radiolarians	Tr	Tr	—	—	Tr	—	Tr
Silicious fragments	2	—	Tr	—	—	2	2
Spicules	—	Tr	—	—	—	Tr	—



SITE 765 HOLE B CORE 8H CORED INTERVAL 67.1-76.8 mbsf



LITHOLOGIC DESCRIPTION

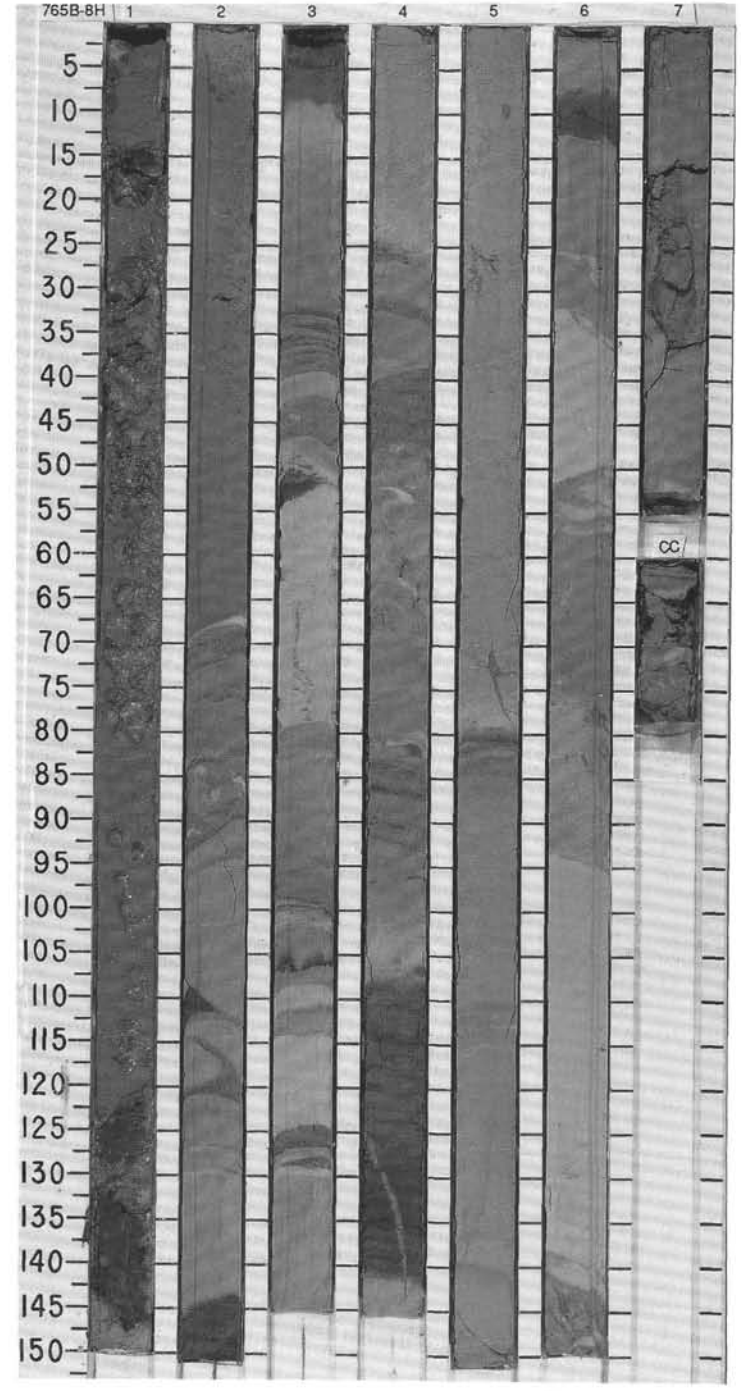
CALCAREOUS OOZE, NANNOFOSSIL OOZE WITH CLAY, CLAYEY SILICEOUS OOZE, AND INTRAFORMATIONAL CONGLOMERATE.

Section 1 is soupy. Deformation in lower sections considered primary.

Major lithology: Graded sequences, ranging from 20 to 80 cm in thickness, with a sharp base, and typically fining upward from CALCAREOUS OOZE to NANNOFOSSIL OOZE CLAY. Calcareous ooze (composed largely of whole and broken foraminifers), gray (5Y 6/1). Nannofossil ooze with clay, light olive gray (5Y 6/2) to light gray (5Y 7/1). The graded sequences are commonly stacked, but also alternate with clayey intervals, 5 to 35 cm in thickness, of CLAYEY SILICEOUS OOZE, dark bluish gray (5B 4/1) to very dark gray (5Y 3/1). In most cases the graded sequences are fining upward, and overlain by clayey intervals, but reversal of this trend occurs locally. These typical sequences alternating with intervals of INTRAFORMATIONAL CONGLOMERATE, clast supported, with deformed pebbles, 1 to 40 cm in diameter, composed primarily of clayey nannofossil ooze (similar in appearance and composition to that occurring in adjacent sequences). Matrix is gray (5Y 6/1) calcareous fragment ooze, with a sandy to clayey texture, and composed largely of whole and broken foraminifers, nannofossils, clay, and quartz. The contacts between sequence intervals and intraformational conglomerate intervals are commonly deformed and sub-horizontal. Deformation extends into the sequence intervals, evident as faulting, in Section 5, 135 to 145 cm, and as sediment dikes Section 4, 125 to 143 cm, and Section 5, 70 to 80 cm. The sediment dikes are filled with conglomeratic matrix, and occur over the same interval in which there is reversal of the typical sequence true (e.g., sequences locally coarsening upward, and with gradational lower contact into clayey interval). Sequence intervals apparently represent blocks (175 cm maximum observed diameter) floating within conglomerate. The block in which reversal of sequences is observed was apparently deformed and inverted during transport.

SMEAR SLIDE SUMMARY (%):

	4, 40 M	4, 123 M	5, 45 D	6, 112 D
TEXTURE:				
Sand	10	10	10	—
Silt	30	40	20	20
Clay	60	50	70	80
COMPOSITION:				
Accessory minerals	—	Tr	—	—
Calcareous fragments	20	—	10	3
Clay	10	19	37	10
Foraminifers	5	—	1	—
Nannofossils	53	—	30	81
Opaques	—	10	10	—
Organic matter	3	5	—	Tr
Pyrite	2	—	—	—
Quartz	5	15	10	3
Radiolarians	—	5	Tr	—
Silicious fragments	2	45	2	3
Silicoflagellates	—	1	—	—
Spicules	—	Tr	—	—



SITE 765 HOLE B CORE 9H CORED INTERVAL 76.8-86.4 mbsf

TIME-ROCK UNIT: PLEISTOCENE

BIOSTRAT. ZONE/FOSSIL CHARACTER:
- FORAMINIFERS: A/M — N22
- NANNOFOSSILS: A/M — CN14 - 15
- RADIOLARIANS: F/G — *A. angulare*
- DIATOMS:
- PALYNOMORPHS: R/G

PALEOMAGNETICS: N — Indeterminate — R ?

PHYS. PROPERTIES: Indeterminate; ●=72.6 ρ=1.65 I=1537; ●=65.0 ρ=1.67 I=1557; ●=76.2 ρ=1.61 I=1498

CHEMISTRY: ●CaCO3=55% TOC=0.7%; ●CaCO3=68.5%●; ●CaCO3=75% TOC=0.1%I; ●●CaCO3=72% TOC=0.1%

SECTION: 1 2 3 4 5 6 7 CC

METERS: 0.5 1.0

GRAPHIC LITHOLOGY

DRILLING DISTURB.

SED. STRUCTURES: W

SAMPLES: * OG IW * XRF

LITHOLOGIC DESCRIPTION

INTRAFORMATIONAL CONGLOMERATE, NANNOFOSSIL OOZE WITH CLAY, AND CLAY NANNOFOSSIL MIXED SEDIMENT

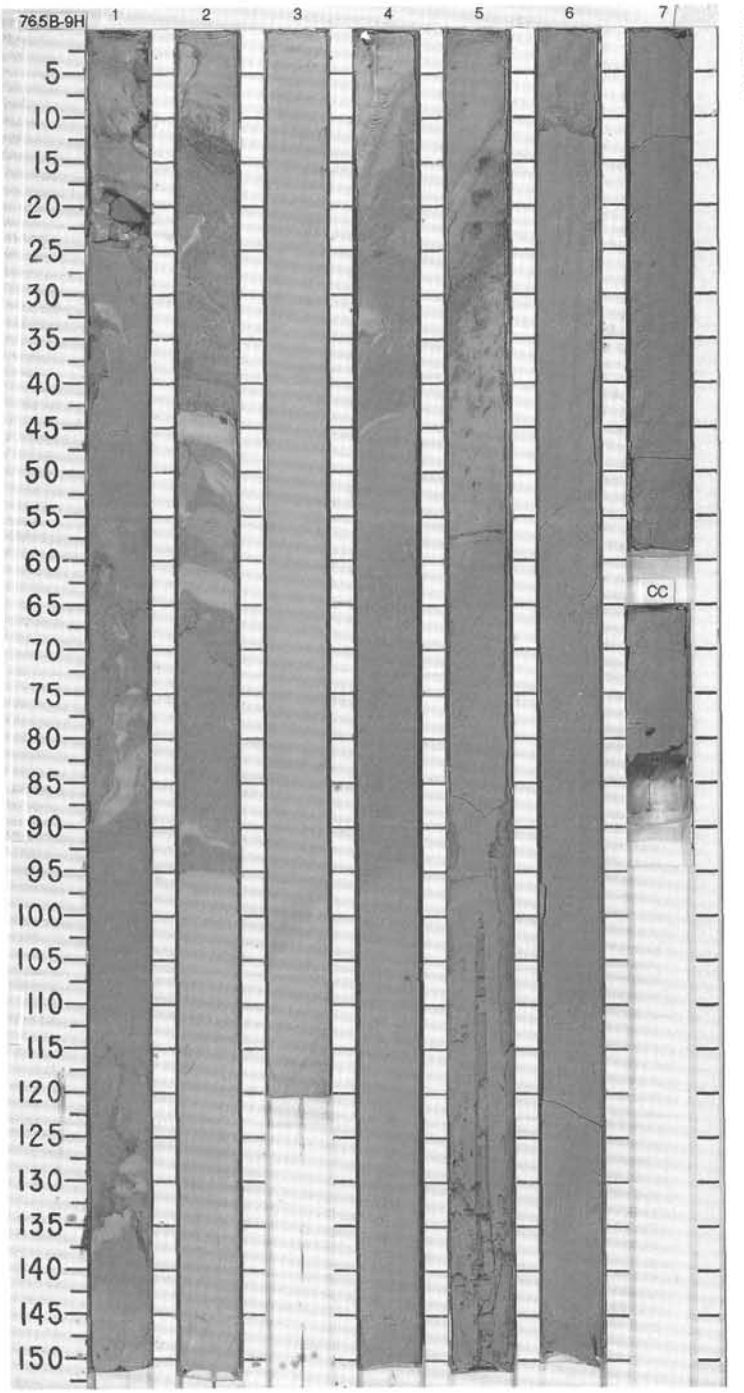
Core disturbance considered primary.

Major lithology: The upper part of the core, through Section 5, approximately 25 cm, consists of INTRAFORMATIONAL CONGLOMERATE alternating with intervals of NANNOFOSSIL OOZE WITH CLAY. The conglomerate ranges between being matrix and clast supported. The clasts are deformed pebbles of clayey nannofossil ooze, 1 to 20 cm diameter, variable in color, but of a similar degree of consolidation as the alternating intervals of nannofossil ooze with clay. The matrix is a foraminifer nannofossil ooze, gray (5G 6/1), and with a silty to clayey texture. The alternating intervals of nannofossil ooze with clay are greenish gray (5GY 6/1) to light gray (5Y 7/1), and generally featureless, except for deformed boundaries in contact with the conglomerates. These intervals appear to represent an increasingly coherent succession downward, with conglomerate becoming increasingly sparse, and less well defined. The lower part of the core, beginning with Section 5, 25 cm, below a deformed contact, is CLAY NANNOFOSSIL MIXED SEDIMENT, greenish gray (5Y 6/1), representing two stacked graded sequences seperated by a sharp contact in Section 6, 12 cm. The sequence above the sharp contact is noticeably fining upward, and progressively burrowed within the upper 25 cm, with sediment from the overlying clayey interval (minor lithology) filling the burrows.

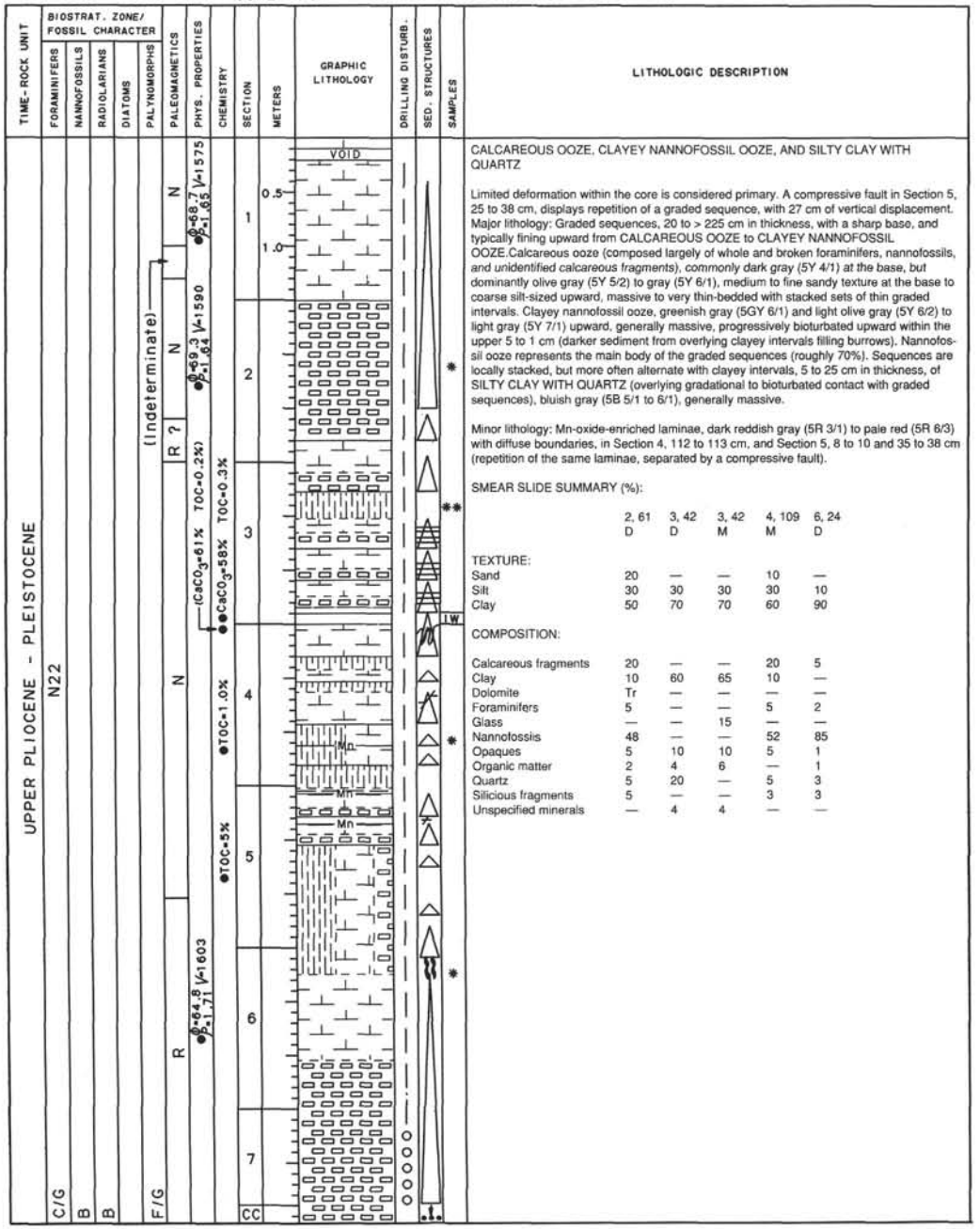
Minor lithology: Clayey siliceous ooze, greenish gray (5GY 5/1), in Section 5, 25 to 30 cm (2 cm in thickness, but stretched along deformed contact).

SMEAR SLIDE SUMMARY (%):

	3, 16 D	4, 5 D
TEXTURE:		
Sand	5	20
Silt	—	30
Clay	95	50
COMPOSITION:		
Calcareous fragments	—	20
Clay	40	—
Diatoms	Tr	—
Foraminifers	5	15
Nannofossils	45	50
Opaques	—	3
Organic matter	Tr	1
Quartz	—	8
Silicious fragments	10	3
Spicules	Tr	—



SITE 765 HOLE B CORE 10H CORED INTERVAL 86.4-96.0 mbsf



LITHOLOGIC DESCRIPTION

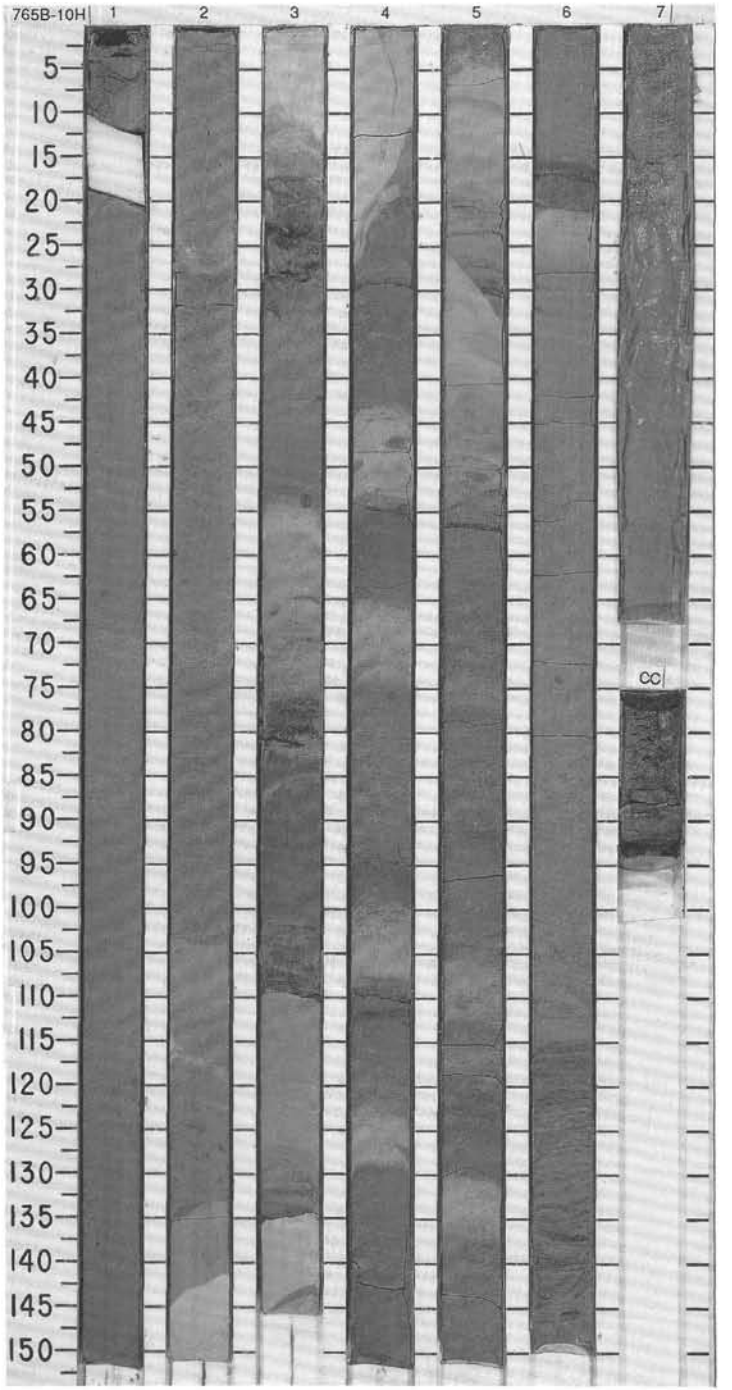
CALCAREOUS OOZE, CLAYEY NANNOFOSSIL OOZE, AND SILTY CLAY WITH QUARTZ

Limited deformation within the core is considered primary. A compressive fault in Section 5, 25 to 38 cm, displays repetition of a graded sequence, with 27 cm of vertical displacement. Major lithology: Graded sequences, 20 to > 225 cm in thickness, with a sharp base, and typically fining upward from CALCAREOUS OOZE to CLAYEY NANNOFOSSIL OOZE.Calcareous ooze (composed largely of whole and broken foraminifers, nannofossils, *and unidentified calcareous fragments), commonly dark gray (5Y 4/1) at the base, but* dominantly olive gray (5Y 5/2) to gray (5Y 6/1), medium to fine sandy texture at the base to coarse silt-sized upward, massive to very thin-bedded with stacked sets of thin graded intervals. Clayey nannofossil ooze, greenish gray (5GY 6/1) and light olive gray (5Y 6/2) to light gray (5Y 7/1) upward, generally massive, progressively bioturbated upward within the upper 5 to 1 cm (darker sediment from overlying clayey intervals filling burrows). Nannofossil ooze represents the main body of the graded sequences (roughly 70%). Sequences are locally stacked, but more often alternate with clayey intervals, 5 to 25 cm in thickness, of SILTY CLAY WITH QUARTZ (overlying gradational to bioturbated contact with graded sequences), bluish gray (5B 5/1 to 6/1), generally massive.

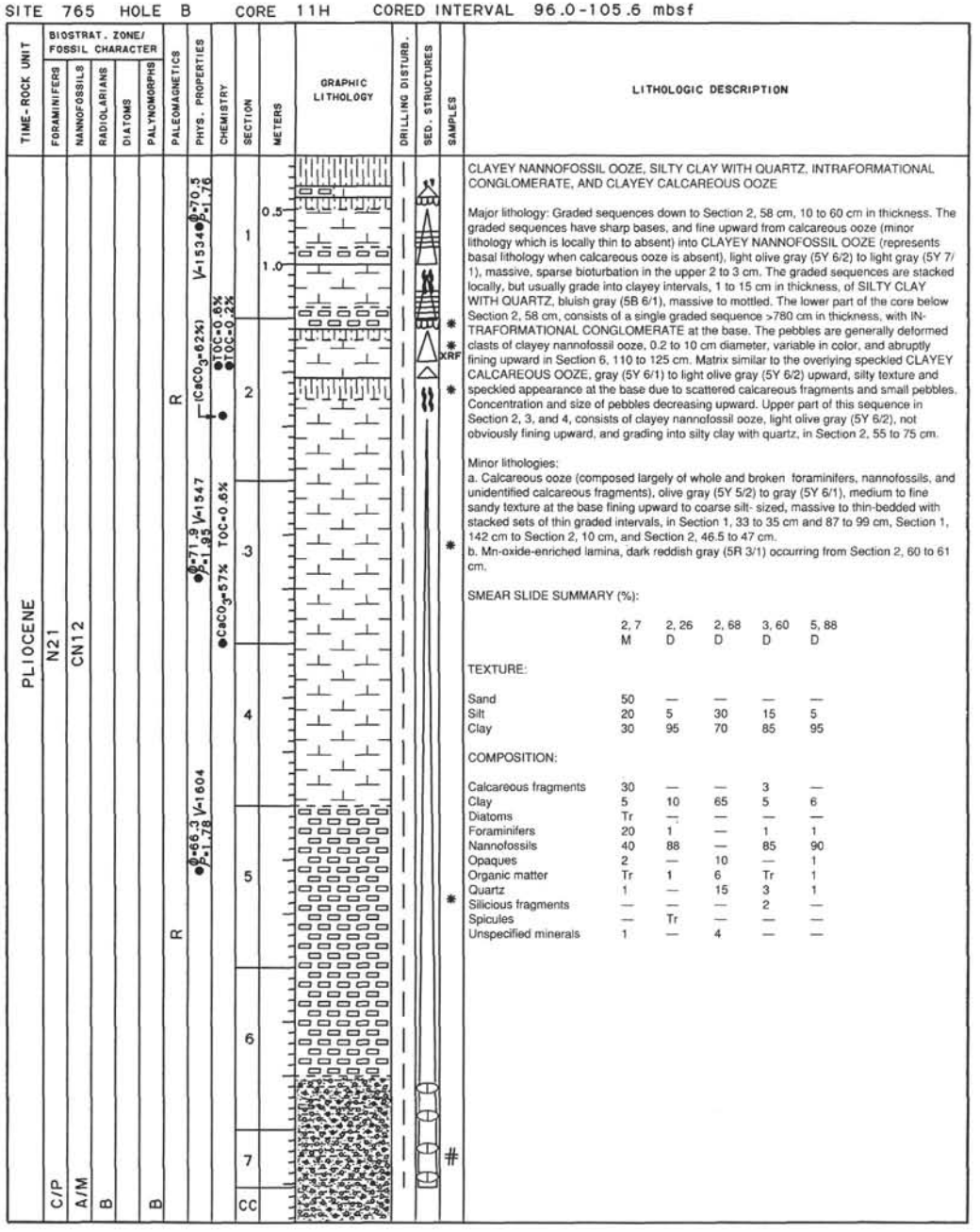
Minor lithology: Mn-oxide-enriched laminae, dark reddish gray (5R 3/1) to pale red (5R 6/3) with diffuse boundaries, in Section 4, 112 to 113 cm, and Section 5, 8 to 10 and 35 to 38 cm (repetition of the same laminae, separated by a compressive fault).

SMEAR SLIDE SUMMARY (%):

	2, 61 D	3, 42 D	3, 42 M	4, 109 M	6, 24 D
TEXTURE:					
Sand	20	—	—	10	—
Silt	30	30	30	30	10
Clay	50	70	70	60	90
COMPOSITION:					
Calcareous fragments	20	—	—	20	5
Clay	10	60	65	10	—
Dolomite	Tr	—	—	—	—
Foraminifers	5	—	—	5	2
Glass	—	—	15	—	—
Nannofossils	48	—	—	52	85
Opaques	5	10	10	5	1
Organic matter	2	4	6	—	1
Quartz	5	20	—	5	3
Silicious fragments	5	—	—	3	3
Unspecified minerals	—	4	4	—	—



SITE 765 HOLE B CORE 11H CORED INTERVAL 96.0-105.6 mbsf



LITHOLOGIC DESCRIPTION

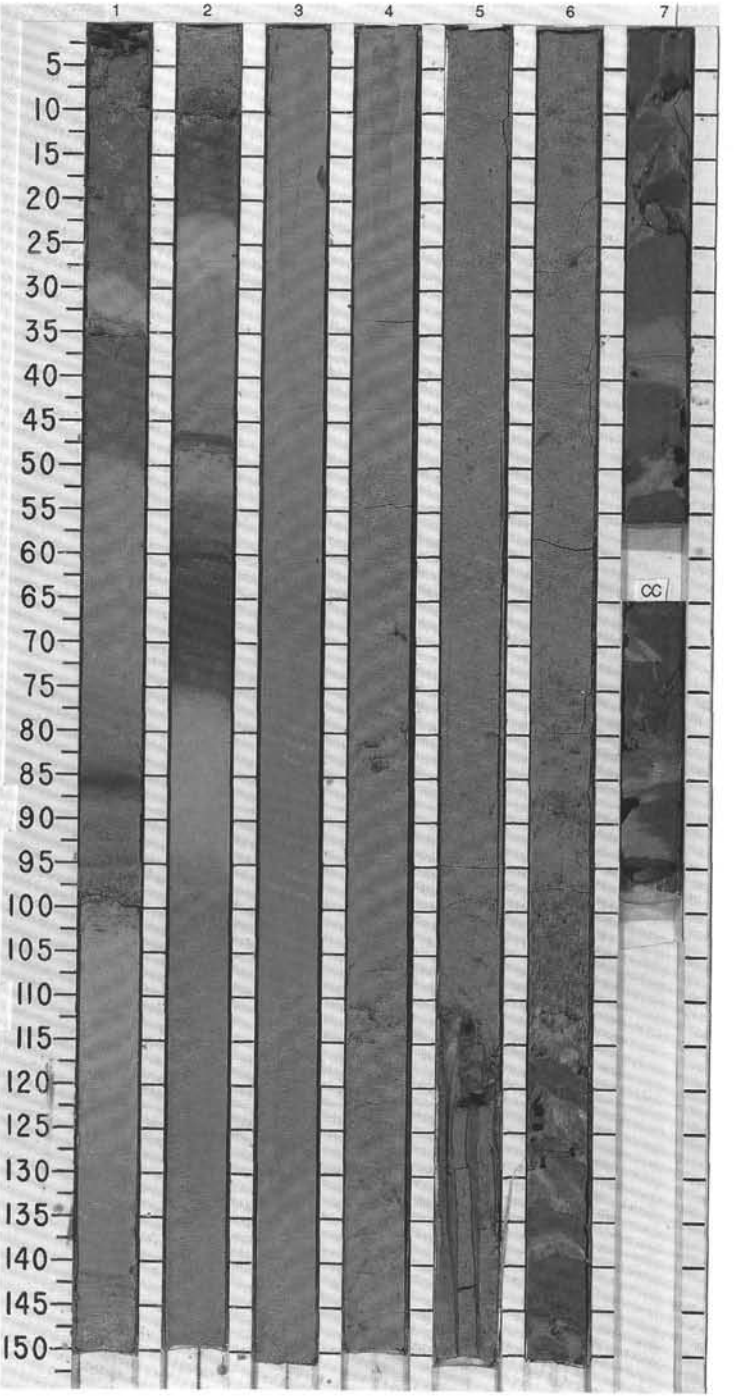
CLAYEY NANNOFOSSIL OOZE, SILTY CLAY WITH QUARTZ, INTRAFORMATIONAL CONGLOMERATE, AND CLAYEY CALCAREOUS OOZE

Major lithology: Graded sequences down to Section 2, 58 cm, 10 to 60 cm in thickness. The graded sequences have sharp bases, and fine upward from calcareous ooze (minor lithology which is locally thin to absent) into CLAYEY NANNOFOSSIL OOZE (represents basal lithology when calcareous ooze is absent), light olive gray (5Y 6/2) to light gray (5Y 7/1), massive, sparse bioturbation in the upper 2 to 3 cm. The graded sequences are stacked locally, but usually grade into clayey intervals, 1 to 15 cm in thickness, of SILTY CLAY WITH QUARTZ, bluish gray (5B 6/1), massive to mottled. The lower part of the core below Section 2, 58 cm, consists of a single graded sequence >780 cm in thickness, with INTRAFORMATIONAL CONGLOMERATE at the base. The pebbles are generally deformed clasts of clayey nannofossil ooze, 0.2 to 10 cm diameter, variable in color, and abruptly fining upward in Section 6, 110 to 125 cm. Matrix similar to the overlying speckled CLAYEY CALCAREOUS OOZE, gray (5Y 6/1) to light olive gray (5Y 6/2) upward, silty texture and speckled appearance at the base due to scattered calcareous fragments and small pebbles. Concentration and size of pebbles decreasing upward. Upper part of this sequence in Section 2, 3, and 4, consists of clayey nannofossil ooze, light olive gray (5Y 6/2), not obviously fining upward, and grading into silty clay with quartz, in Section 2, 55 to 75 cm.

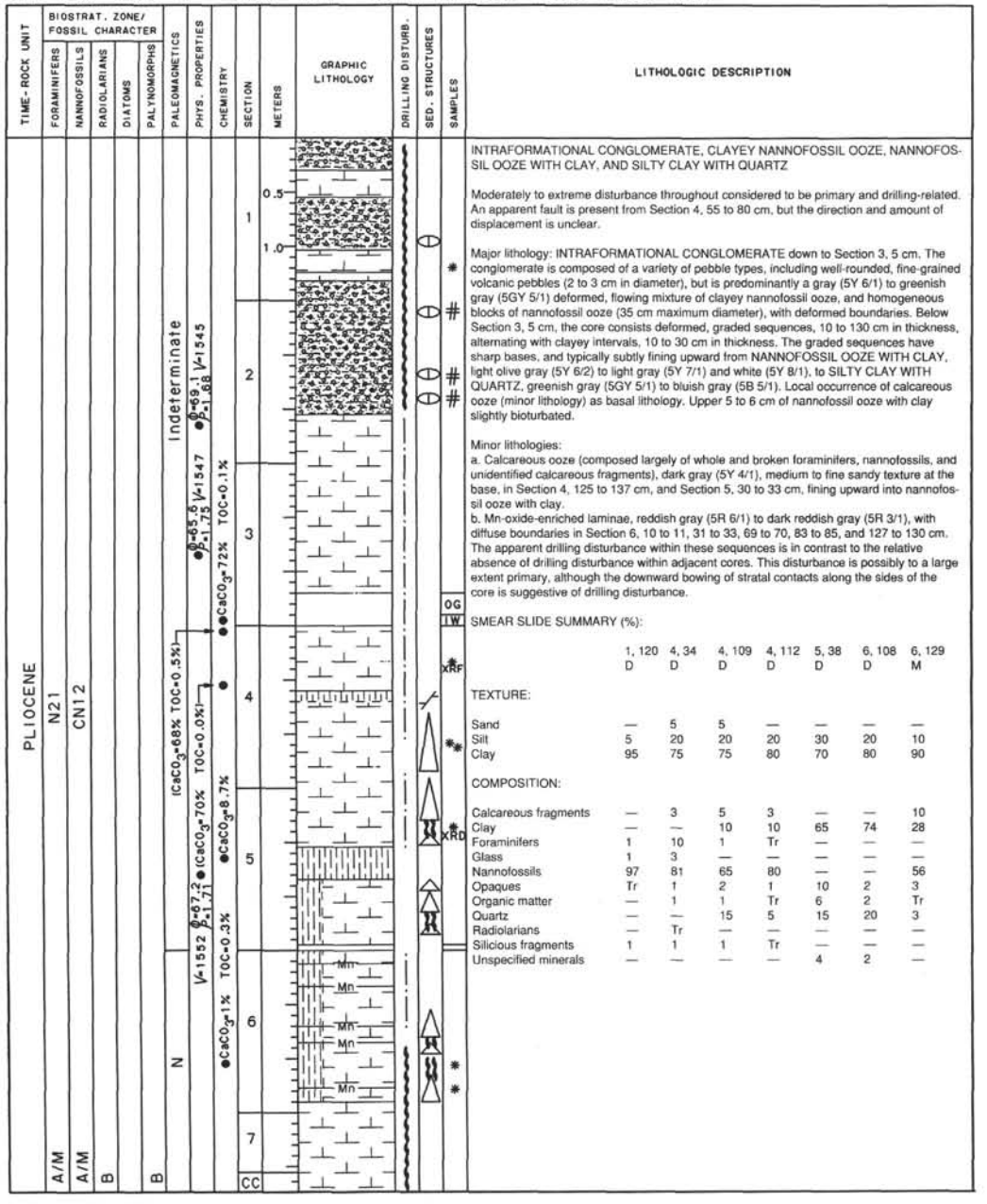
Minor lithologies:
a. Calcareous ooze (composed largely of whole and broken foraminifers, nannofossils, and unidentified calcareous fragments), olive gray (5Y 5/2) to gray (5Y 6/1), medium to fine sandy texture at the base fining upward to coarse silt- sized, massive to thin-bedded with stacked sets of thin graded intervals, in Section 1, 33 to 35 cm and 87 to 99 cm, Section 1, 142 cm to Section 2, 10 cm, and Section 2, 46.5 to 47 cm.
b. Mn-oxide-enriched lamina, dark reddish gray (5R 3/1) occurring from Section 2, 60 to 61 cm.

SMEAR SLIDE SUMMARY (%):

	2, 7 M	2, 26 D	2, 68 D	3, 60 D	5, 88 D
TEXTURE:					
Sand	50	—	—	—	—
Silt	20	5	30	15	5
Clay	30	95	70	85	95
COMPOSITION:					
Calcareous fragments	30	—	—	3	—
Clay	5	10	65	5	6
Diatoms	Tr	—	—	—	—
Foraminifers	20	1	—	1	1
Nannofossils	40	88	—	85	90
Opaques	2	—	10	—	1
Organic matter	Tr	1	6	Tr	1
Quartz	1	—	15	3	1
Silicious fragments	—	—	—	2	—
Spicules	—	Tr	—	—	—
Unspecified minerals	1	—	4	—	—



SITE 765 HOLE B CORE 12H CORED INTERVAL 105.6-115.2 mbsf



LITHOLOGIC DESCRIPTION

INTRAFORMATIONAL CONGLOMERATE, CLAYEY NANNOFOSSIL OOZE, NANNOFOSSIL OOZE WITH CLAY, AND SILTY CLAY WITH QUARTZ

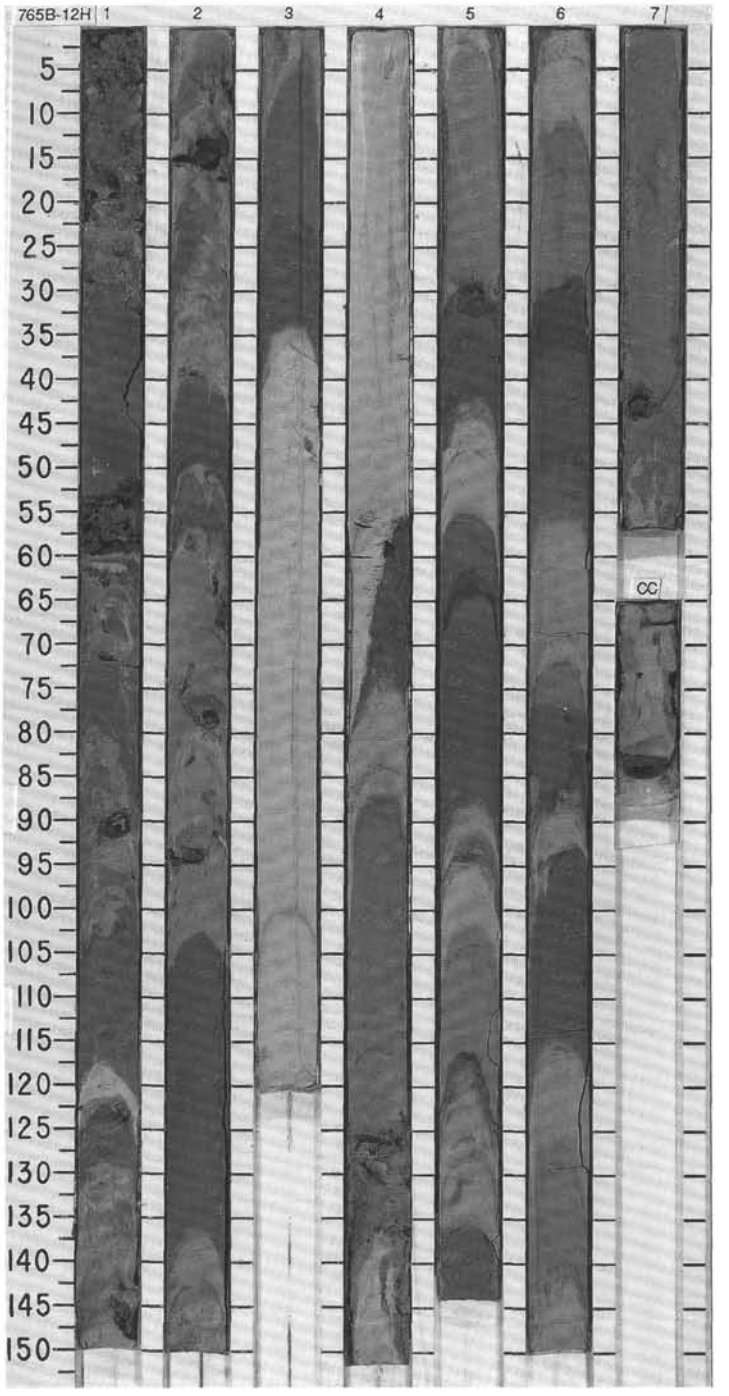
Moderately to extreme disturbance throughout considered to be primary and drilling-related. An apparent fault is present from Section 4, 55 to 80 cm, but the direction and amount of displacement is unclear.

Major lithology: INTRAFORMATIONAL CONGLOMERATE down to Section 3, 5 cm. The conglomerate is composed of a variety of pebble types, including well-rounded, fine-grained volcanic pebbles (2 to 3 cm in diameter), but is predominantly a gray (5Y 6/1) to greenish gray (5GY 5/1) deformed, flowing mixture of clayey nannofossil ooze, and homogeneous blocks of nannofossil ooze (35 cm maximum diameter), with deformed boundaries. Below Section 3, 5 cm, the core consists deformed, graded sequences, 10 to 130 cm in thickness, alternating with clayey intervals, 10 to 30 cm in thickness. The graded sequences have sharp bases, and typically subtly fining upward from NANNOFOSSIL OOZE WITH CLAY, light olive gray (5Y 6/2) to light gray (5Y 7/1) and white (5Y 8/1), to SILTY CLAY WITH QUARTZ, greenish gray (5GY 5/1) to bluish gray (5B 5/1). Local occurrence of calcareous ooze (minor lithology) as basal lithology. Upper 5 to 6 cm of nannofossil ooze with clay slightly bioturbated.

Minor lithologies:
a. Calcareous ooze (composed largely of whole and broken foraminifers, nannofossils, and unidentified calcareous fragments), dark gray (5Y 4/1), medium to fine sandy texture at the base, in Section 4, 125 to 137 cm, and Section 5, 30 to 33 cm, fining upward into nannofossil ooze with clay.
b. Mn-oxide-enriched laminae, reddish gray (5R 6/1) to dark reddish gray (5R 3/1), with diffuse boundaries in Section 6, 10 to 11, 31 to 33, 69 to 70, 83 to 85, and 127 to 130 cm. The apparent drilling disturbance within these sequences is in contrast to the relative absence of drilling disturbance within adjacent cores. This disturbance is possibly to a large extent primary, although the downward bowing of stratal contacts along the sides of the core is suggestive of drilling disturbance.

SMEAR SLIDE SUMMARY (%):

	1, 120 D	4, 34 D	4, 109 D	4, 112 D	5, 38 D	6, 108 D	6, 129 M
TEXTURE:							
Sand	—	5	5	—	—	—	—
Silt	5	20	20	20	30	20	10
Clay	95	75	75	80	70	80	90
COMPOSITION:							
Calcareous fragments	—	3	5	3	—	—	10
Clay	—	—	10	10	65	74	28
Foraminifers	1	10	1	Tr	—	—	—
Glass	1	3	—	—	—	—	—
Nannofossils	97	81	65	80	—	—	56
Opaques	Tr	1	2	1	10	2	3
Organic matter	—	1	1	Tr	6	2	Tr
Quartz	—	—	15	5	15	20	3
Radiolarians	—	Tr	—	—	—	—	—
Silicious fragments	1	1	1	Tr	—	—	—
Unspecified minerals	—	—	—	—	4	2	—



SITE 765 HOLE B CORE 13H CORED INTERVAL 115.2-124.8 mbsf

TIME-ROCK UNIT: PLIOCENE

BIOSTRAT. ZONE/FOSSIL CHARACTER: FORAMINIFERS A/P; NANNOFOSSILS A/M (N21, CN12); RADIOLARIANS B; DIATOMS; PALYNOMORPHS R/G (indeterminate)

PALEOMAGNETICS: N R N R N? R N

PHYS. PROPERTIES: $CaCO_3$=62.9% TOC=0.1% V=1573 $CaCO_3$=61.1% V=1554 $CaCO_3$=60.9% TOC=0.3% V=1592

CHEMISTRY

SECTION: 1 2 3 4 5 6 7 CC

METERS: 0.5 1.0

GRAPHIC LITHOLOGY: Mn Mn Mn Mn

DRILLING DISTURB.

SED. STRUCTURES: XRF

SAMPLES

LITHOLOGIC DESCRIPTION

NANNOFOSSIL OOZE, CLAYEY NANNOFOSSIL OOZE, AND NANNOFOSSIL CLAY MIXED SEDIMENT

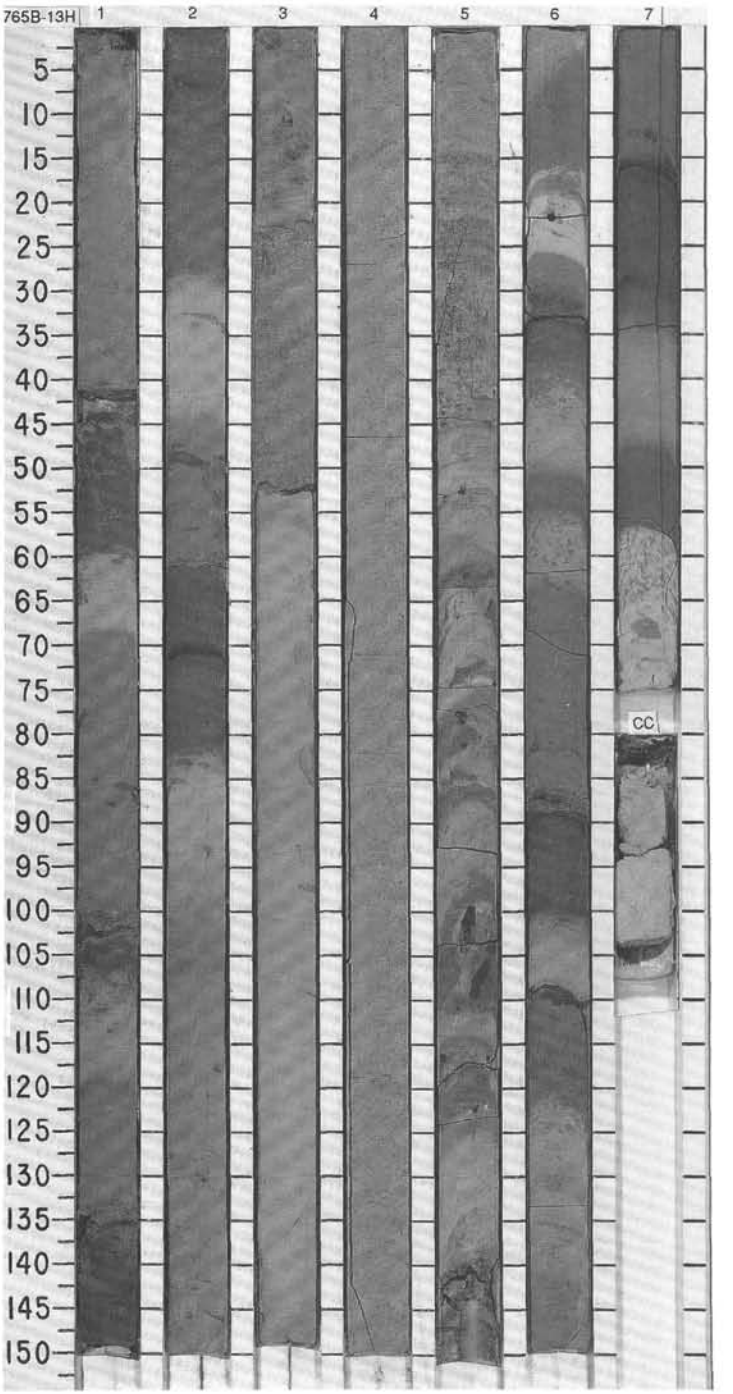
Core is dominantly undisturbed to slightly disturbed.

Major lithology: NANNOFOSSIL OOZE, CLAYEY NANNOFOSSIL OOZE, and NANNOFOSSIL CLAY MIXED SEDIMENT, gray (5Y 6/1, 5/1) to light gray (5Y 7/1) or light olive gray (5Y 6/2), in fining-upward sequences 30 cm to 1 m thick, or, less commonly, in coarse/fine-grained couplets a few cm thick. Sequence bases are sharp to scoured; tops gradational, lighter colored, and bioturbated. Lower parts of sequences contain foraminifera and are fine-sand-sized; upper parts contain silt- to clay-sized nannofossils. Clay content generally increases upward within a single sequence. Interval from Section 4, 0 cm to Section 5, 14 cm contains scattered medium-to coarse-sand-sized foraminifers in a clay-sized matrix.

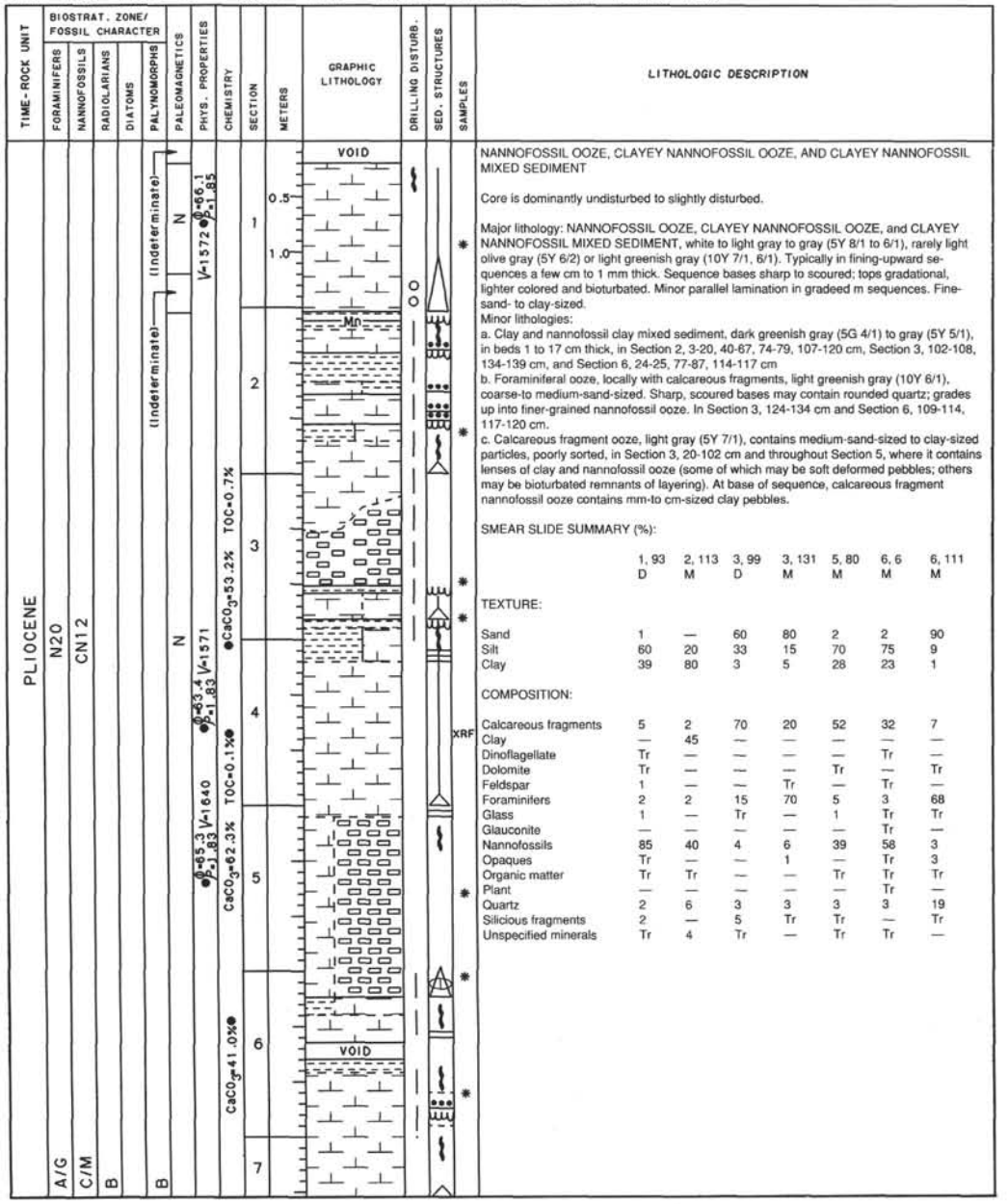
Minor lithologies:
a. Clay, dark greenish gray (10Y 4/1 to 5/1, 5G 4/1), in beds 1-8 cm thick, in Section 1, 45-59, 103-107, 137-150 cm, Section 2, 0-6, 61-82 cm), Section 6, 34-42, 53-54, 89-100, 109-122 cm, and Section 7, 16-34, 48-57 cm.
b. Manganese oxide-enriched horizons, reddish gray (5R 4/1 to 6/1), occur within thin clay layers or in the upper parts of fining-upward nannofossil ooze sequences, in Section 1, 67-69 cm , Section 2, 6-7, 70-71 cm and Section 6, 89, 100, 130-132 cm
c. Carbonate conglomerate (Section 5, 45-140 cm). Matrix is nannofossil ooze, locally clayey, with scattered sand-sized foraminifers. Matrix-supported. Pebbles firm to lithified, 0.25 to 5 cm maximum diameter, dark and light greenish gray (10Y 5/1, 5GY 7/1), light gray (5Y 7/2), reddish gray (5Y 8/1), and white (5Y 8/1), mostly nannofossil chalk and clay, also very dark gray (5 YR 3/1) calcareous clay, pyrite, and coal. Sequence contains several intervals of convolute bedding (possible slump folds) and is overlain by thin (1 mm to 2 cm) interbeds of medium- to coarse- sand-sized calcareous fragment nannofossil ooze with local coal (?) fragments, and locally clayey nannofossil ooze (Section 5, 14-45 cm).

SMEAR SLIDE SUMMARY (%):

	1, 21 M	2, 75 M	3, 53 D	4, 39 M	4, 57 D	5, 36 M	6, 58 M
TEXTURE:							
Sand	1	—	—	1	5	32	—
Silt	51	29	70	20	25	35	55
Clay	48	71	30	79	70	33	45
COMPOSITION:							
Calcareous fragments	Tr	5	Tr	1	3	20	Tr
Clay	—	70	—	48	—	—	39
Dinoflagellate	Tr	—	Tr	—	—	Tr	Tr
Dolomite	—	—	—	—	—	—	Tr
Echinoid spine	—	—	Tr	—	2	—	—
Feldspar	Tr	—	—	3	—	Tr	—
Foraminifers	1	—	2	—	4	10	Tr
Glass	—	—	—	1	—	—	Tr
Glauconite	—	—	—	—	—	Tr	—
Nannofossils	90	1	94	39	85	60	50
Opaques	2	3	—	—	—	2	1
Organic matter	Tr	2	—	5	1	1	2
Plant	—	1	—	Tr	—	—	Tr
Quartz	5	15	Tr	3	—	5	8
Silicious fragments	1	3	3	Tr	1	Tr	Tr
Silicoflagellates	—	—	—	—	—	Tr	—



SITE 765 HOLE B CORE 14H CORED INTERVAL 124.8-134.5 mbsf



NANNOFOSSIL OOZE, CLAYEY NANNOFOSSIL OOZE, AND CLAYEY NANNOFOSSIL MIXED SEDIMENT

Core is dominantly undisturbed to slightly disturbed.

Major lithology: NANNOFOSSIL OOZE, CLAYEY NANNOFOSSIL OOZE, and CLAYEY NANNOFOSSIL MIXED SEDIMENT, white to light gray to gray (5Y 8/1 to 6/1), rarely light olive gray (5Y 6/2) or light greenish gray (10Y 7/1, 6/1). Typically in fining-upward sequences a few cm to 1 mm thick. Sequence bases sharp to scoured; tops gradational, lighter colored and bioturbated. Minor parallel lamination in gradeed m sequences. Fine-sand- to clay-sized.

Minor lithologies:

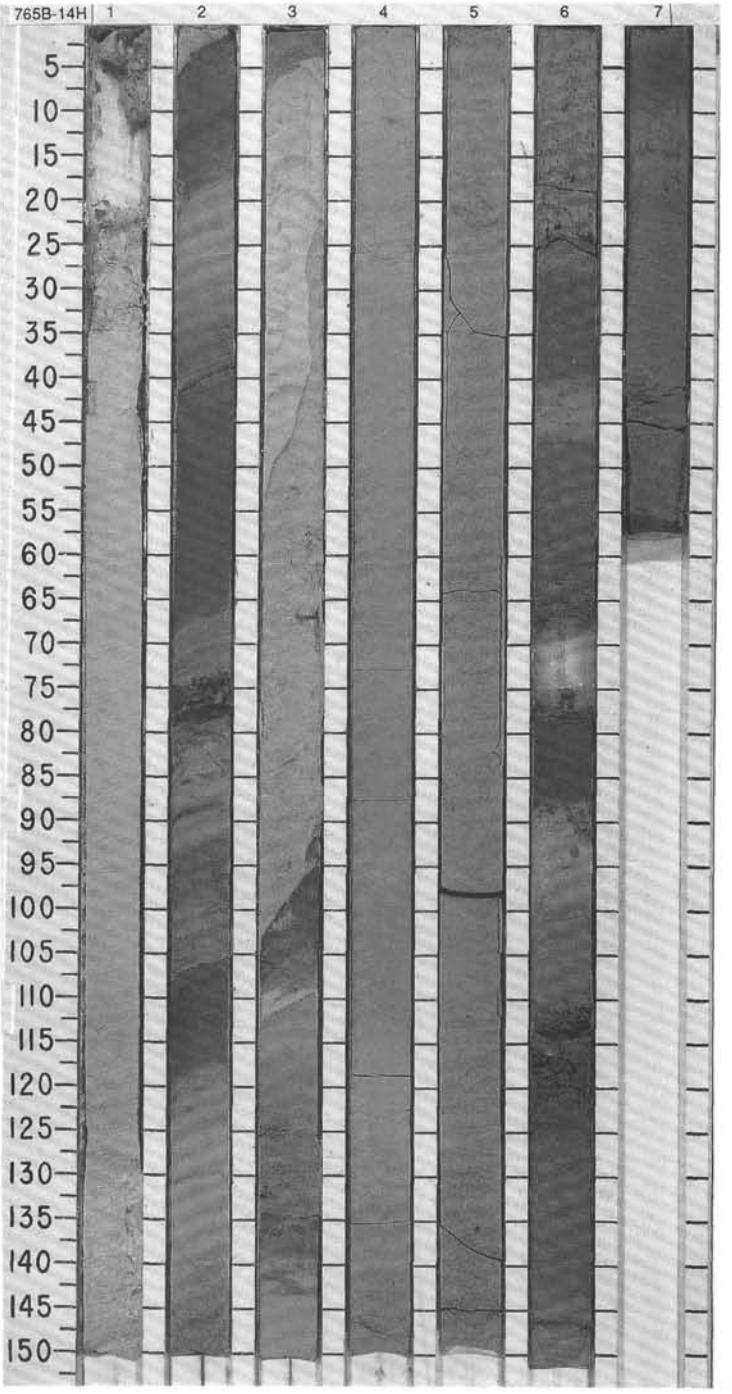
a. Clay and nannofossil clay mixed sediment, dark greenish gray (5G 4/1) to gray (5Y 5/1), in beds 1 to 17 cm thick, in Section 2, 3-20, 40-67, 74-79, 107-120 cm, Section 3, 102-108, 134-139 cm, and Section 6, 24-25, 77-87, 114-117 cm

b. Foraminiferal ooze, locally with calcareous fragments, light greenish gray (10Y 6/1), coarse-to medium-sand-sized. Sharp, scoured bases may contain rounded quartz; grades up into finer-grained nannofossil ooze. In Section 3, 124-134 cm and Section 6, 109-114, 117-120 cm.

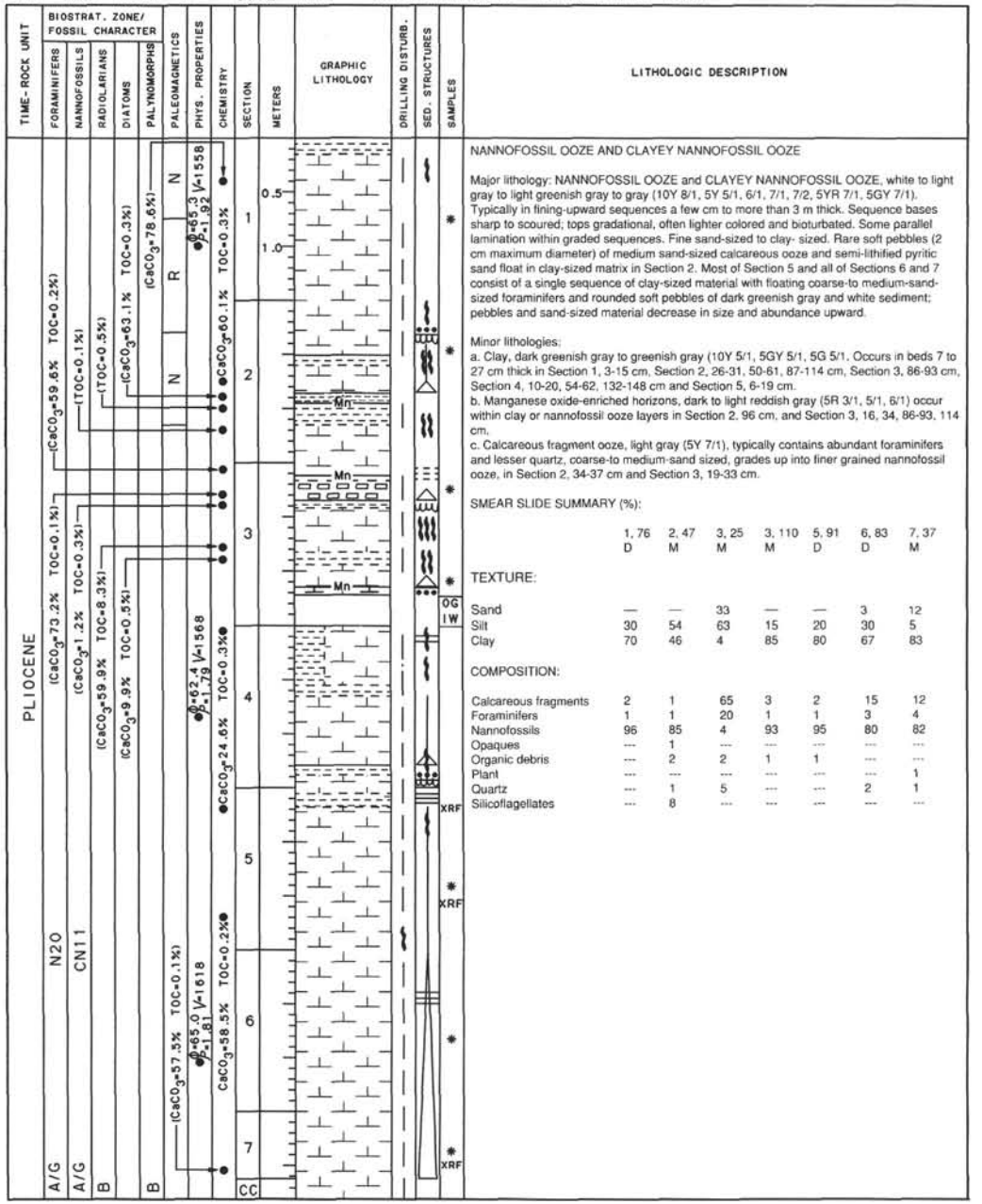
c. Calcareous fragment ooze, light gray (5Y 7/1), contains medium-sand-sized to clay-sized particles, poorly sorted, in Section 3, 20-102 cm and throughout Section 5, where it contains lenses of clay and nannofossil ooze (some of which may be soft deformed pebbles; others may be bioturbated remnants of layering). At base of sequence, calcareous fragment nannofossil ooze contains mm-to cm-sized clay pebbles.

SMEAR SLIDE SUMMARY (%):

	1, 93 D	2, 113 M	3, 99 D	3, 131 M	5, 80 M	6, 6 M	6, 111 M
TEXTURE:							
Sand	1	—	60	80	2	2	90
Silt	60	20	33	15	70	75	9
Clay	39	80	3	5	28	23	1
COMPOSITION:							
Calcareous fragments	5	2	70	20	52	32	7
Clay	—	45	—	—	—	—	—
Dinoflagellate	Tr	—	—	—	—	Tr	—
Dolomite	Tr	—	—	—	Tr	—	Tr
Feldspar	1	—	—	Tr	—	Tr	—
Foraminifers	2	2	15	70	5	3	68
Glass	1	—	Tr	—	1	Tr	Tr
Glauconite	—	—	—	—	—	Tr	—
Nannofossils	85	40	4	6	39	58	3
Opaques	Tr	—	—	1	—	Tr	3
Organic matter	Tr	Tr	—	—	Tr	Tr	Tr
Plant	—	—	—	—	—	Tr	—
Quartz	2	6	3	3	3	3	19
Silicious fragments	2	—	5	Tr	Tr	—	Tr
Unspecified minerals	Tr	4	Tr	—	Tr	Tr	—



SITE 765 HOLE B CORE 15H CORED INTERVAL 134.5-144.2 mbsf



LITHOLOGIC DESCRIPTION

NANNOFOSSIL OOZE AND CLAYEY NANNOFOSSIL OOZE

Major lithology: NANNOFOSSIL OOZE and CLAYEY NANNOFOSSIL OOZE, white to light gray to light greenish gray to gray (10Y 8/1, 5Y 5/1, 6/1, 7/1, 7/2, 5YR 7/1, 5GY 7/1). Typically in fining-upward sequences a few cm to more than 3 m thick. Sequence bases sharp to scoured; tops gradational, often lighter colored and bioturbated. Some parallel lamination within graded sequences. Fine sand-sized to clay- sized. Rare soft pebbles (2 cm maximum diameter) of medium sand-sized calcareous ooze and semi-lithified pyritic sand float in clay-sized matrix in Section 2. Most of Section 5 and all of Sections 6 and 7 consist of a single sequence of clay-sized material with floating coarse-to medium-sand-sized foraminifers and rounded soft pebbles of dark greenish gray and white sediment; pebbles and sand-sized material decrease in size and abundance upward.

Minor lithologies:

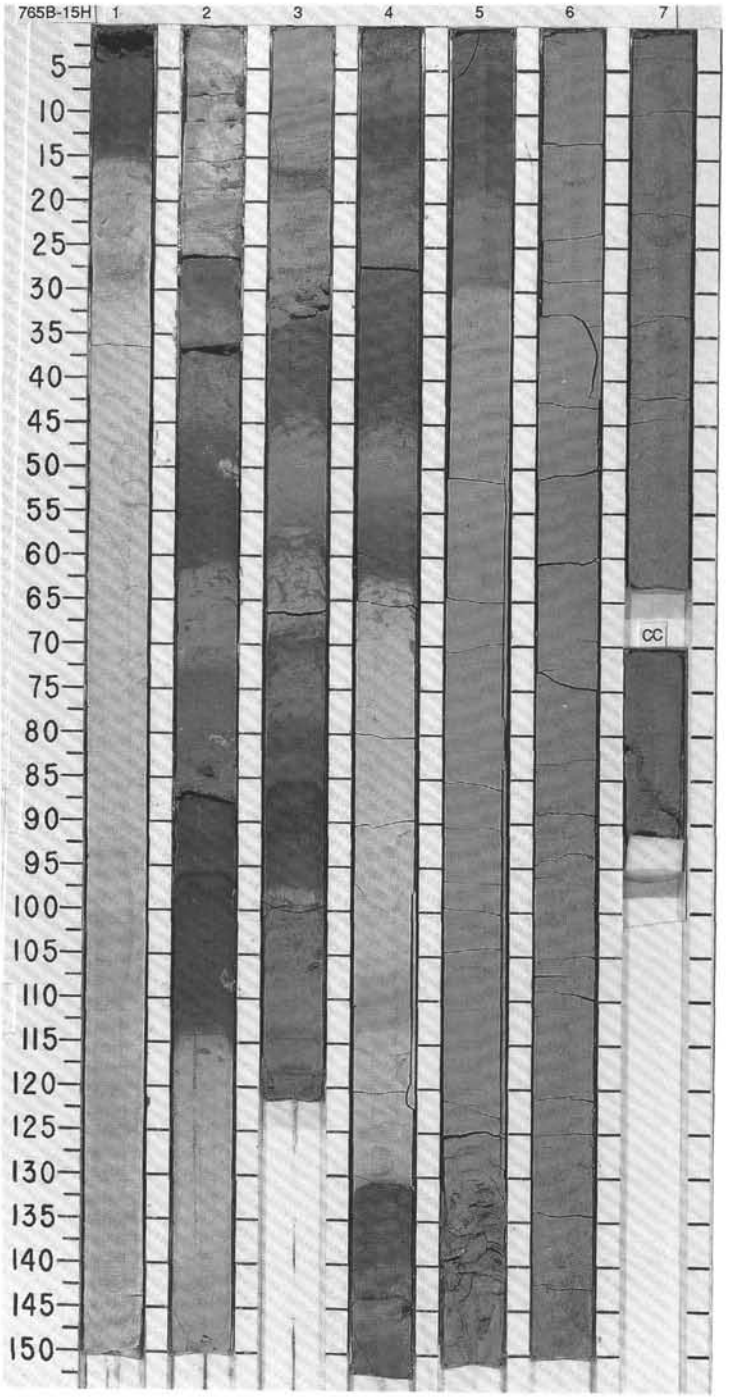
a. Clay, dark greenish gray to greenish gray (10Y 5/1, 5GY 5/1, 5G 5/1. Occurs in beds 7 to 27 cm thick in Section 1, 3-15 cm, Section 2, 26-31, 50-61, 87-114 cm, Section 3, 86-93 cm, Section 4, 10-20, 54-62, 132-148 cm and Section 5, 6-19 cm.

b. Manganese oxide-enriched horizons, dark to light reddish gray (5R 3/1, 5/1, 6/1) occur within clay or nannofossil ooze layers in Section 2. 96 cm, and Section 3, 16, 34, 86-93, 114 cm.

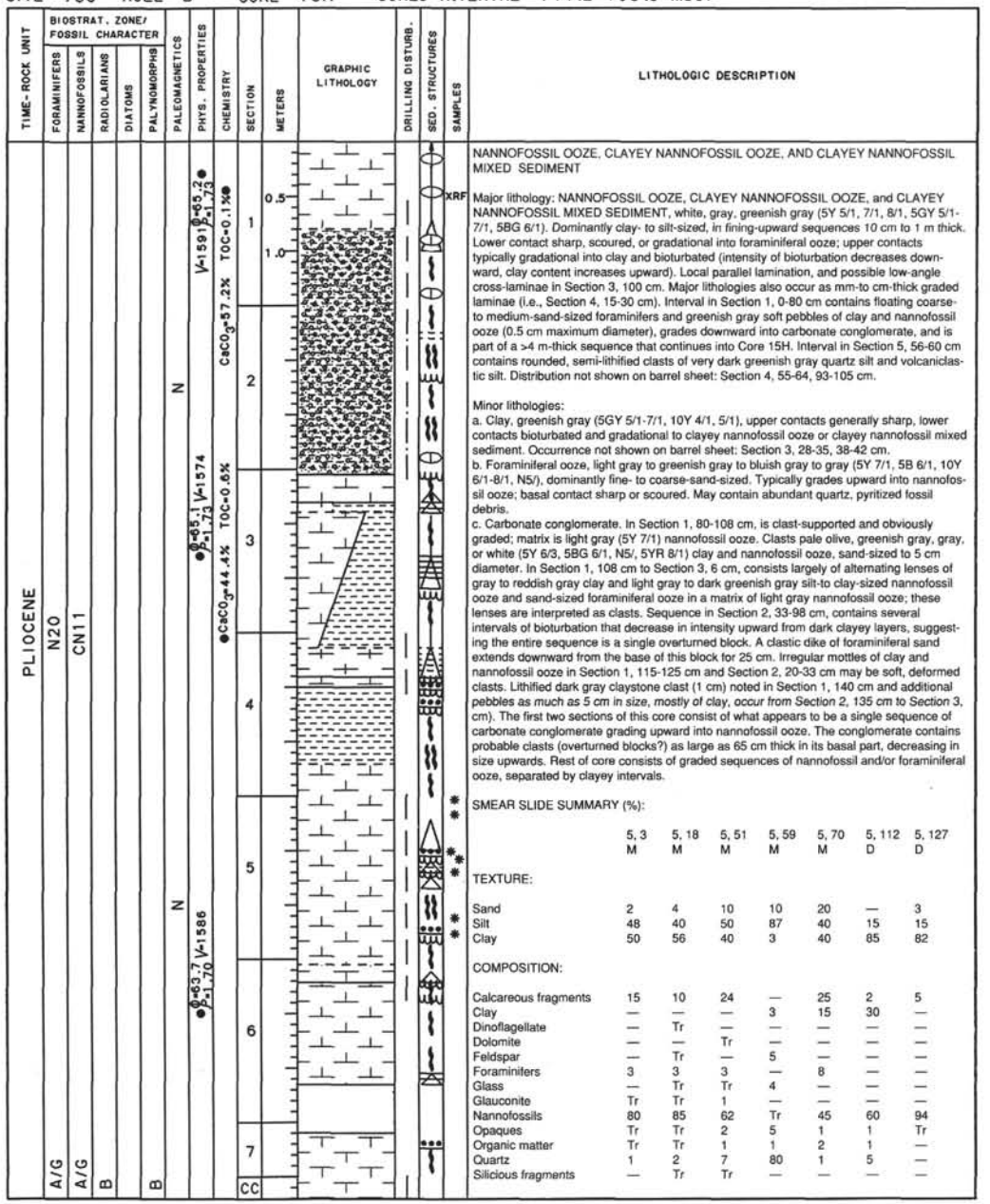
c. Calcareous fragment ooze, light gray (5Y 7/1), typically contains abundant foraminifers and lesser quartz, coarse-to medium-sand sized, grades up into finer grained nannofossil ooze, in Section 2, 34-37 cm and Section 3, 19-33 cm.

SMEAR SLIDE SUMMARY (%):

	1, 76 D	2, 47 M	3, 25 M	3, 110 M	5, 91 D	6, 83 D	7, 37 M
TEXTURE:							
Sand	—	—	33	—	—	3	12
Silt	30	54	63	15	20	30	5
Clay	70	46	4	85	80	67	83
COMPOSITION:							
Calcareous fragments	2	1	65	3	2	15	12
Foraminifers	1	1	20	1	1	3	4
Nannofossils	96	85	4	93	95	80	82
Opaques	---	1	---	---	---	---	---
Organic debris	---	2	2	1	1	---	---
Plant	---	---	---	---	---	---	1
Quartz	---	1	5	---	---	2	1
Silicoflagellates	---	8	---	---	---	---	---



SITE 765 HOLE B CORE 16H CORED INTERVAL 144.2-153.9 mbsf



LITHOLOGIC DESCRIPTION

NANNOFOSSIL OOZE, CLAYEY NANNOFOSSIL OOZE, AND CLAYEY NANNOFOSSIL MIXED SEDIMENT

Major lithology: NANNOFOSSIL OOZE, CLAYEY NANNOFOSSIL OOZE, and CLAYEY NANNOFOSSIL MIXED SEDIMENT, white, gray, greenish gray (5Y 5/1, 7/1, 8/1, 5GY 5/1-7/1, 5BG 6/1). Dominantly clay- to silt-sized, in fining-upward sequences 10 cm to 1 m thick. Lower contact sharp, scoured, or gradational into foraminiferal ooze; upper contacts typically gradational into clay and bioturbated (intensity of bioturbation decreases downward, clay content increases upward). Local parallel lamination, and possible low-angle cross-laminae in Section 3, 100 cm. Major lithologies also occur as mm-to cm-thick graded laminae (i.e., Section 4, 15-30 cm). Interval in Section 1, 0-80 cm contains floating coarse- to medium-sand-sized foraminifers and greenish gray soft pebbles of clay and nannofossil ooze (0.5 cm maximum diameter), grades downward into carbonate conglomerate, and is part of a >4 m-thick sequence that continues into Core 15H. Interval in Section 5, 56-60 cm contains rounded, semi-lithified clasts of very dark greenish gray quartz silt and volcaniclastic silt. Distribution not shown on barrel sheet: Section 4, 55-64, 93-105 cm.

Minor lithologies:

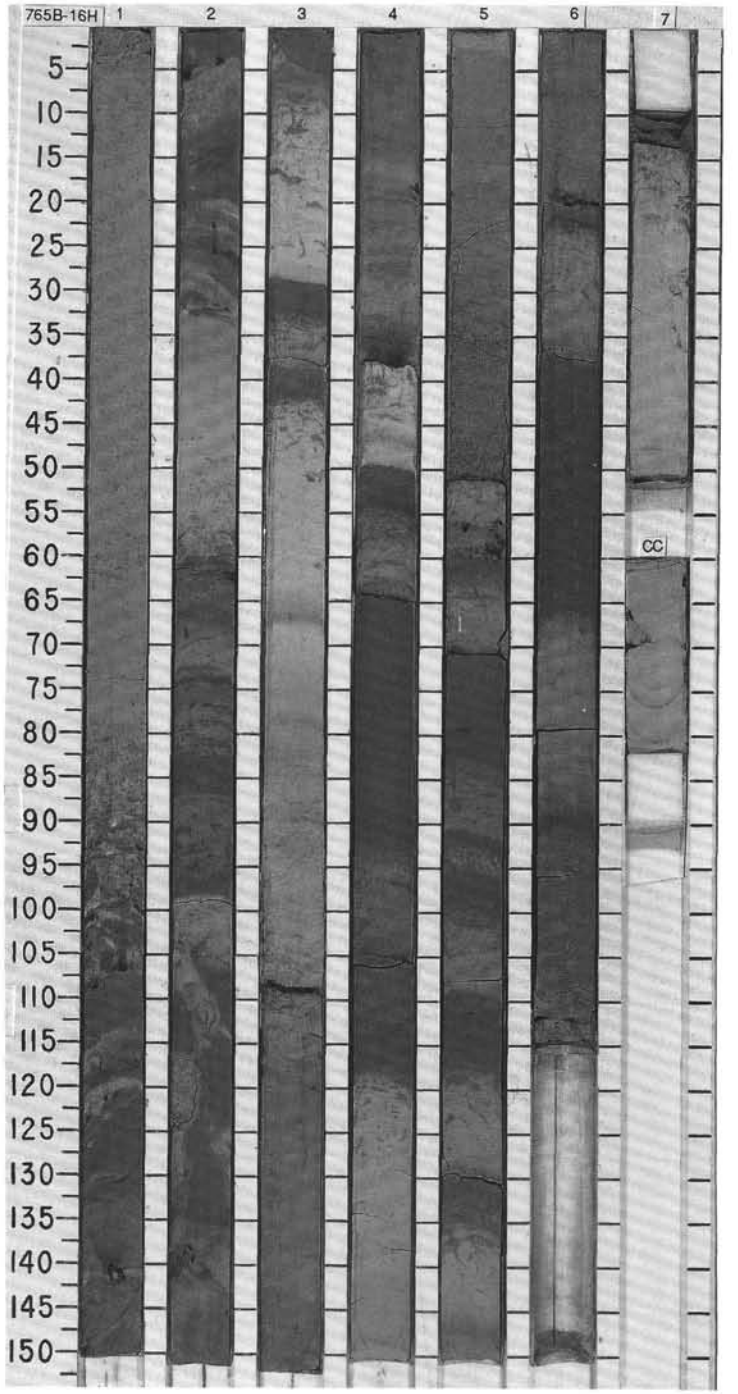
a. Clay, greenish gray (5GY 5/1-7/1, 10Y 4/1, 5/1), upper contacts generally sharp, lower contacts bioturbated and gradational to clayey nannofossil ooze or clayey nannofossil mixed sediment. Occurrence not shown on barrel sheet: Section 3, 28-35, 38-42 cm.

b. Foraminiferal ooze, light gray to greenish gray to bluish gray to gray (5Y 7/1, 5B 6/1, 10Y 6/1-8/1, N5/), dominantly fine- to coarse-sand-sized. Typically grades upward into nannofossil ooze; basal contact sharp or scoured. May contain abundant quartz, pyritized fossil debris.

c. Carbonate conglomerate. In Section 1, 80-108 cm, is clast-supported and obviously graded; matrix is light gray (5Y 7/1) nannofossil ooze. Clasts pale olive, greenish gray, gray, or white (5Y 6/3, 5BG 6/1, N5/, 5YR 8/1) clay and nannofossil ooze, sand-sized to 5 cm diameter. In Section 1, 108 cm to Section 3, 6 cm, consists largely of alternating lenses of gray to reddish gray clay and light gray to dark greenish gray silt-to clay-sized nannofossil ooze and sand-sized foraminiferal ooze in a matrix of light gray nannofossil ooze; these lenses are interpreted as clasts. Sequence in Section 2, 33-98 cm, contains several intervals of bioturbation that decrease in intensity upward from dark clayey layers, suggesting the entire sequence is a single overturned block. A clastic dike of foraminiferal sand extends downward from the base of this block for 25 cm. Irregular mottles of clay and nannofossil ooze in Section 1, 115-125 cm and Section 2, 20-33 cm may be soft, deformed clasts. Lithified dark gray claystone clast (1 cm) noted in Section 1, 140 cm and additional pebbles as much as 5 cm in size, mostly of clay, occur from Section 2, 135 cm to Section 3, cm). The first two sections of this core consist of what appears to be a single sequence of carbonate conglomerate grading upward into nannofossil ooze. The conglomerate contains probable clasts (overturned blocks?) as large as 65 cm thick in its basal part, decreasing in size upwards. Rest of core consists of graded sequences of nannofossil and/or foraminiferal ooze, separated by clayey intervals.

SMEAR SLIDE SUMMARY (%):

	5, 3 M	5, 18 M	5, 51 M	5, 59 M	5, 70 M	5, 112 D	5, 127 D
TEXTURE:							
Sand	2	4	10	10	20	—	3
Silt	48	40	50	87	40	15	15
Clay	50	56	40	3	40	85	82
COMPOSITION:							
Calcareous fragments	15	10	24	—	25	2	5
Clay	—	—	—	3	15	30	—
Dinoflagellate	—	Tr	—	—	—	—	—
Dolomite	—	—	Tr	—	—	—	—
Feldspar	—	Tr	—	5	—	—	—
Foraminifers	3	3	3	—	8	—	—
Glass	—	Tr	Tr	4	—	—	—
Glauconite	Tr	Tr	1	—	—	—	—
Nannofossils	80	85	62	Tr	45	60	94
Opaques	Tr	Tr	2	5	1	1	Tr
Organic matter	Tr	Tr	1	1	2	1	—
Quartz	1	2	7	80	1	5	—
Silicious fragments	—	Tr	Tr	—	—	—	—



SITE 765 HOLE B CORE 17H CORED INTERVAL 153.9-163.6 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
PLIOCENE	A/G	N20			B									
	A/G	CN11												
	B													
	B	Indeterminate	R			N	R		1	0.5	Mn		*	
							V=1580@62.6 / 2.87			1.0				
									2		Mn		*	
								●TOC=2.3%	3					
								●$CaCO_3$=22.7% TOC=0.3%	4				*	
								●$CaCO_3$=52.0% TOC=0.1%	5				*	XRF
									6					
									7					
									CC					

LITHOLOGIC DESCRIPTION

NANNOFOSSIL OOZE

Major lithology: NANNOFOSSIL OOZE, gray, greenish gray, reddish gray (5G 5/1, 5Y 5/1 to 7/1, 5GY 4/1 to 6/1, 5/2, 10Y 5/2 to 7/2, 6/1, 7/1, 8/1, 10GY 5/2, N4, N6, N7, 5R 5/1, 6/1). Massive, bioturbated, or laminated; bioturbation tends to decrease downward from discrete surfaces. Particles clay- to silt-sized. Locally stained with Mn oxide or contains soft pebbles of nannofossil ooze. Most contacts sharp, may grade up to clay or down to foraminiferal ooze, foraminiferal-nannofossil ooze, or nannofossil-foraminiferal ooze. Individual units as thin as 4 cm and as thick as 1.1 meters. Locally interlaminated on 1-cm scale with graded foraminiferal-nannofossil ooze, nannofossil-foraminiferal ooze, or foraminiferal ooze.

Minor lithologies:

a. Nannofossil-foraminiferal ooze/foraminiferal-nannofossil ooze, gray, greenish gray (10Y 5/1, 6/1, 5Y 4/1 to 7/1, 5GY 5/2, 7/1). Graded; laminated, massive, or vaguely laminated. Contains as much as 25% calcareous fragments (probably mostly foraminiferal fragments). Foraminifers silt-to fine-sand-sized, nannofossils clay- to silt-sized. Units as much as 8 cm thick, but commonly <3 cm. Most common in middle of core. Most contacts sharp, may grade up to nannofossil ooze or intergrade on cm scale with nannofossil ooze. Basal contact may be scoured. Section 1, 82-90, Section 2, 35-36, Section 4, 108-110 , Section 5, 24-26, 38-40, 55-62 , Section 6, 20-23 (thin laminae alternating with nannofossil ooze), 23-24, 69-70, 101-105 (thin laminae alternating with nannofossil ooze), 125-127), Section 7 (45-61 cm).

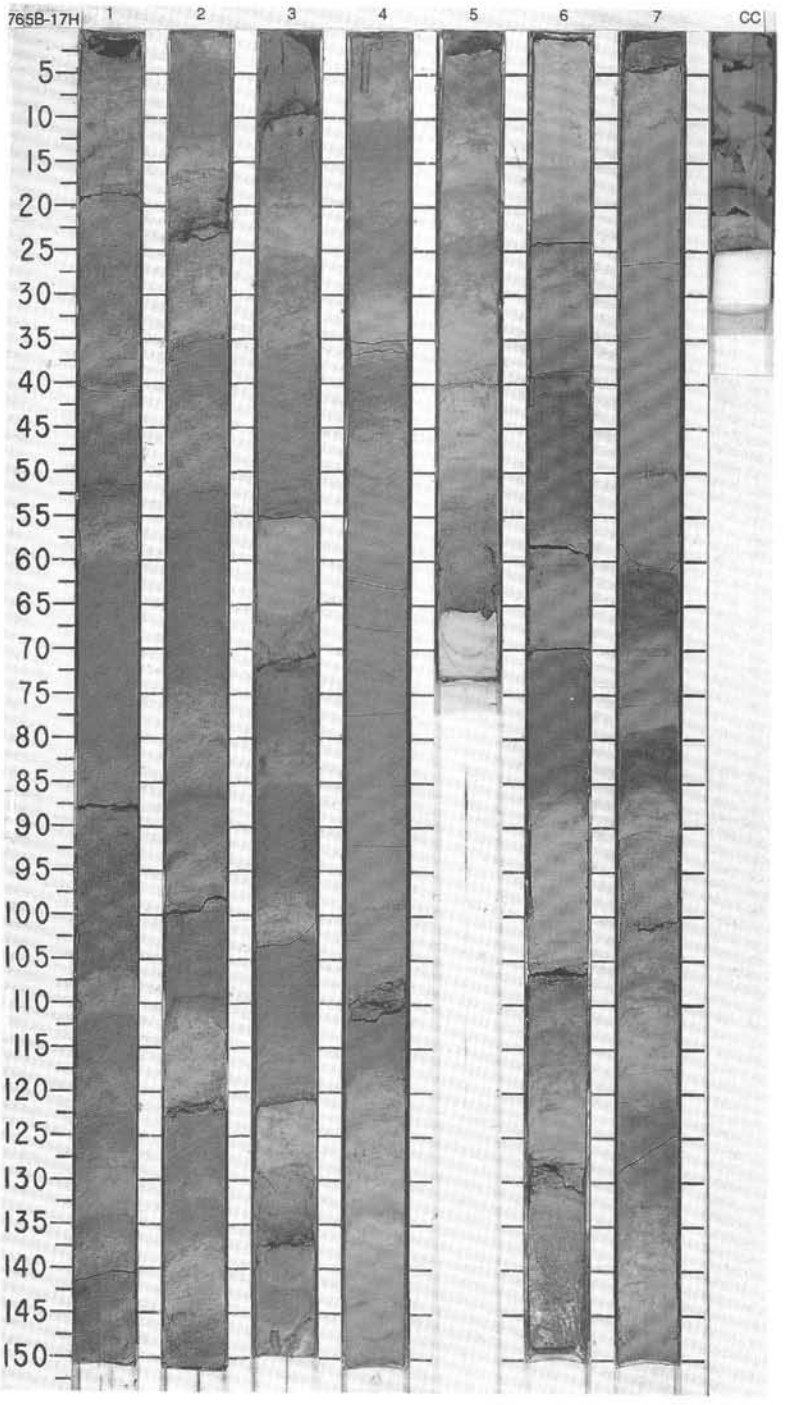
b. Foraminiferal ooze, gray, greenish gray, reddish gray (5Y 5/1 to 7/1, 10Y 6/1, 5GY 4/1, 5/1, N4, N5, 5R 5/1). Graded, laminated, vaguely laminated, or massive, commonly consists of thin graded units interlaminated with nannofossil ooze on cm scale, contains as much as 8% quartz sand, foraminifers silt-to medium-sand-sized. Most contacts sharp, may grade up to nannofossil ooze. Basal contact may be scoured. Units as much as 27 cm thick, commonly much thinner. Section 2, 16-21, 95-100 (thin laminae alternating with nannofossil ooze), 112-121, 147-(Section 3)10, 51-55 (thin laminae alternating with nannofossil ooze), 65-71, 99-103, 116-121 (thin laminae alternating with nannofossil ooze), 129-138), Section 4, 34-36, 98-108 (thin laminae alternating with nannofossil ooze), Section 5, 0-2, 62-65, Section 6, 105-106, 127-(Section 7)4, 90-100 cm.

c. Clay, gray, greenish gray (5G 4/1, 5/1, 5GY 4/1, 10Y 5/1). Massive or, uncommonly, bioturbated. Contacts sharp, units as much as 13 cm thick; commonly <10 cm. Section 1, 105, 137-150, Section 2, 100-112, 121-130, 131-136, Section 3, 71-80, 85-96, 138-146, Section 4, 110-118, 134, Section 5, 2-10, Section 6, 42-55, Section 7, 61-68, 79-86, 122-132, CC 10, 21 cm.

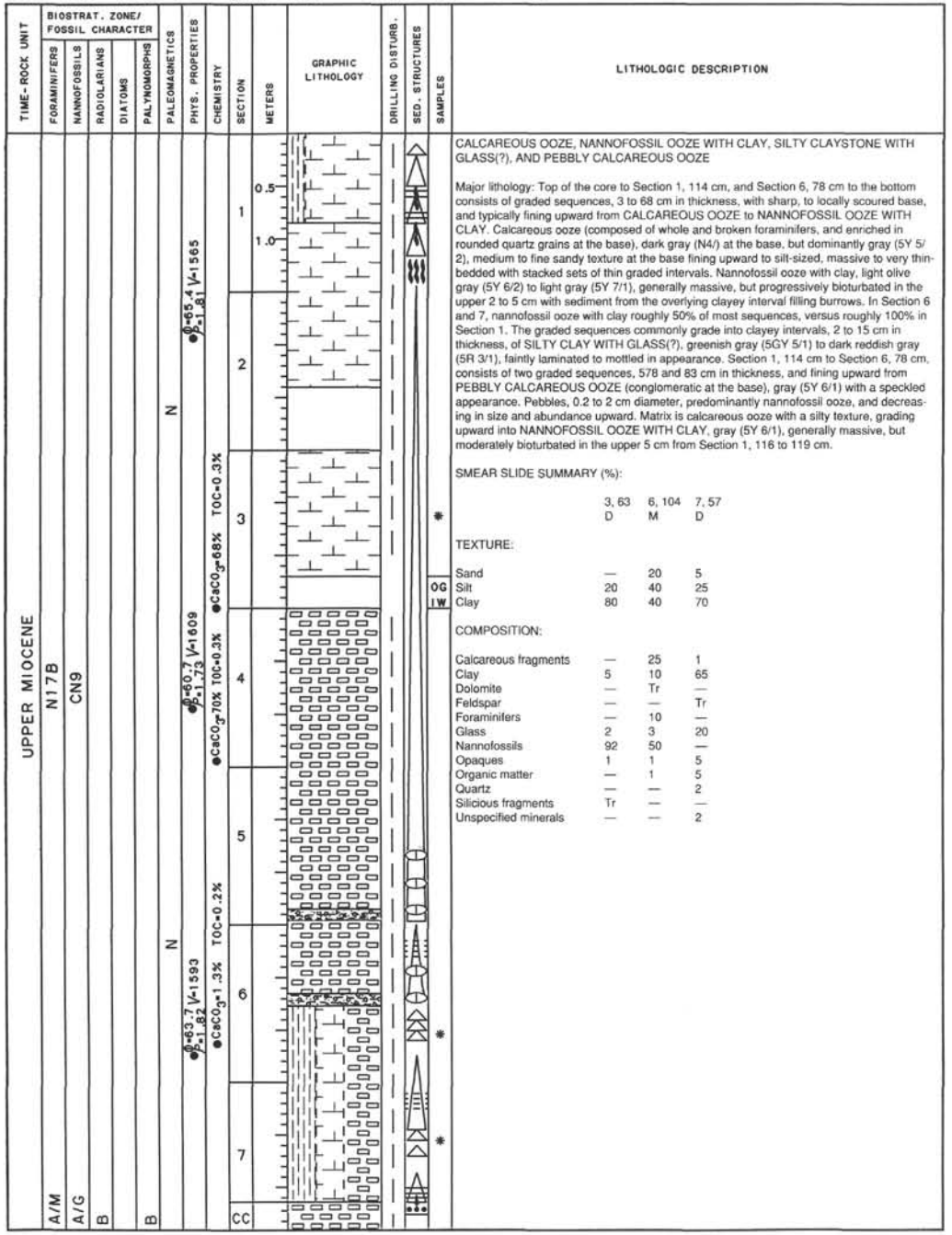
d. Siliceous ooze, greenish gray (5GY 5/2), Section 2, 4-11 cm, contacts sharp. Composition unknown, but probably dominated by radiolarians and radiolarian fragments. Core consists of fine-grained graded carbonate sequences, uncommonly capped with clay. Most sequences consist of nannofossil ooze only. Bioturbated in upper part (intensity decreasing downward). Breaks between adjacent sequences recognized by color change and obvious break in bioturbation. Less commonly, basal portions of sequences consist of nannofossil-foraminiferal to foraminiferal ooze; maximum grain size medium sand. Mn-oxide-stained horizons occur sporadically. Sequences range from 1 to 57 cm thick; thickness commonly <10 cm.

SMEAR SLIDE SUMMARY (%):

	1, 72 D	2, 105 D	4, 108 M	5, 5 M
TEXTURE:				
Sand	—	—	30	—
Silt	48	10	20	15
Clay	52	90	50	85
COMPOSITION:				
Calcareous fragments	2	—	25	—
Clay	—	90	—	80
Dolomite	Tr	—	—	—
Feldspar	—	Tr	—	—
Foraminifers	Tr	—	12	—
Glass	1	3	—	—
Glauconite	Tr	—	—	—
Nannofossils	90	—	55	5
Opaques	—	2	—	1
Organic matter	—	1	—	1
Plant	Tr	1	—	—
Quartz	1	2	1	8
Silicious fragments	Tr	Tr	—	—
Spicules	3	—	2	—



SITE 765 HOLE B CORE 18H CORED INTERVAL 163.6-173.3 mbsf



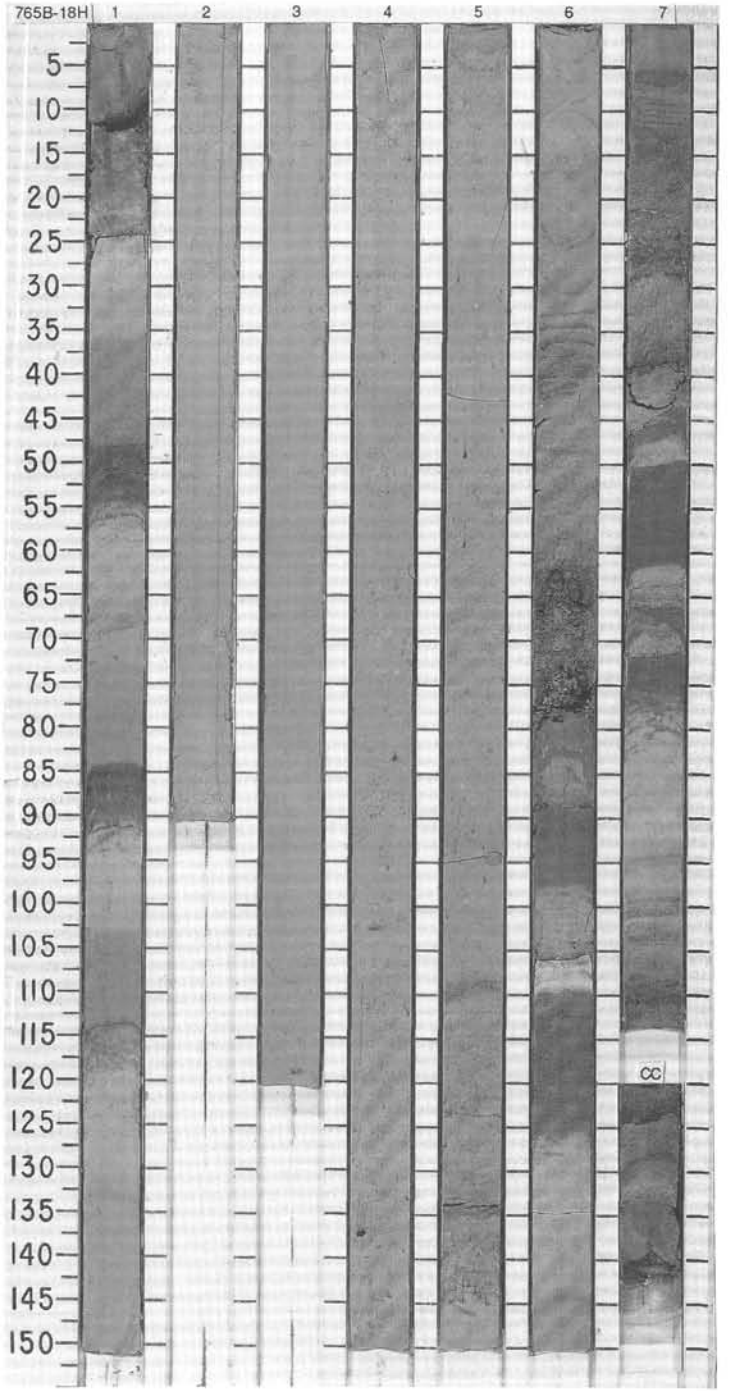
LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE, NANNOFOSSIL OOZE WITH CLAY, SILTY CLAYSTONE WITH GLASS(?), AND PEBBLY CALCAREOUS OOZE

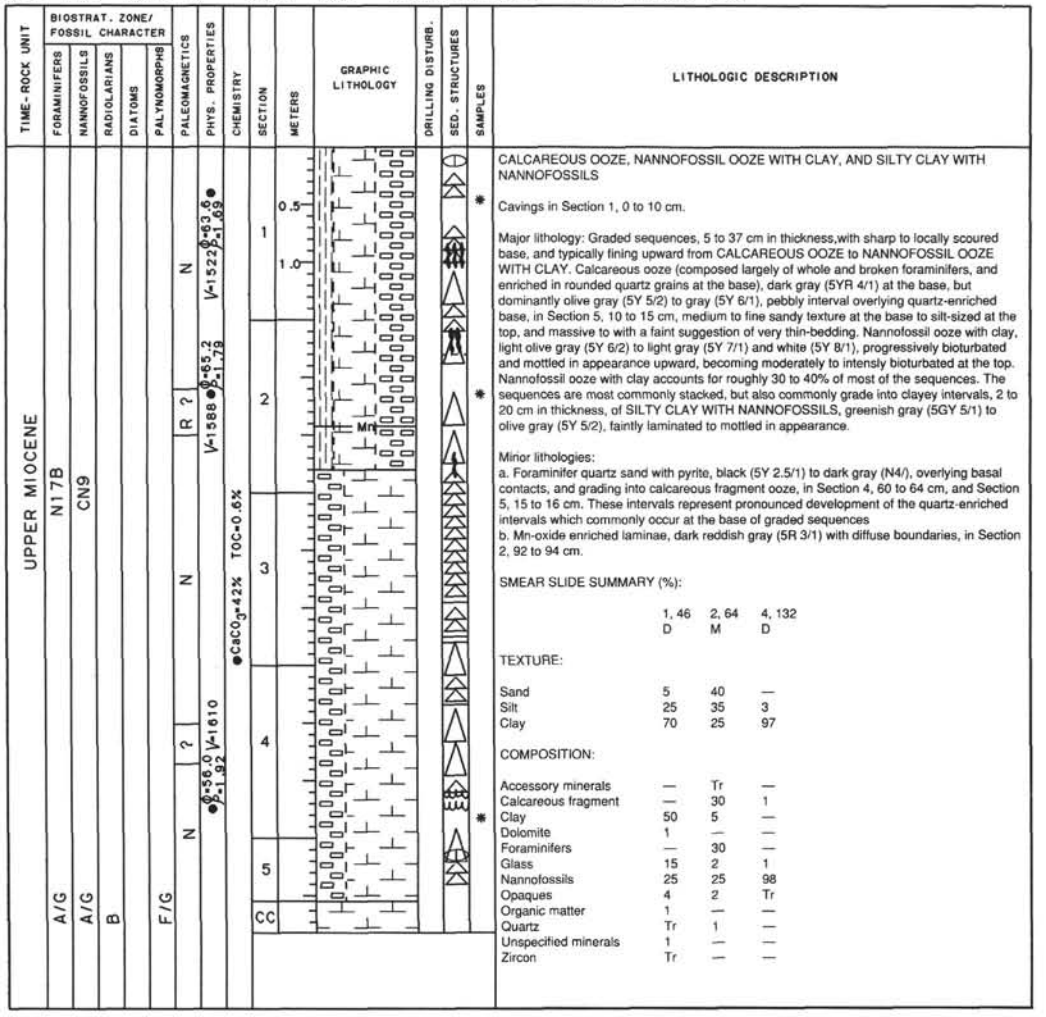
Major lithology: Top of the core to Section 1, 114 cm, and Section 6, 78 cm to the bottom consists of graded sequences, 3 to 68 cm in thickness, with sharp, to locally scoured base, and typically fining upward from CALCAREOUS OOZE to NANNOFOSSIL OOZE WITH CLAY. Calcareous ooze (composed of whole and broken foraminifers, and enriched in rounded quartz grains at the base), dark gray (N4/) at the base, but dominantly gray (5Y 5/2), medium to fine sandy texture at the base fining upward to silt-sized, massive to very thin-bedded with stacked sets of thin graded intervals. Nannofossil ooze with clay, light olive gray (5Y 6/2) to light gray (5Y 7/1), generally massive, but progressively bioturbated in the upper 2 to 5 cm with sediment from the overlying clayey interval filling burrows. In Section 6 and 7, nannofossil ooze with clay roughly 50% of most sequences, versus roughly 100% in Section 1. The graded sequences commonly grade into clayey intervals, 2 to 15 cm in thickness, of SILTY CLAY WITH GLASS(?), greenish gray (5GY 5/1) to dark reddish gray (5R 3/1), faintly laminated to mottled in appearance. Section 1, 114 cm to Section 6, 78 cm, consists of two graded sequences, 578 and 83 cm in thickness, and fining upward from PEBBLY CALCAREOUS OOZE (conglomeratic at the base), gray (5Y 6/1) with a speckled appearance. Pebbles, 0.2 to 2 cm diameter, predominantly nannofossil ooze, and decreasing in size and abundance upward. Matrix is calcareous ooze with a silty texture, grading upward into NANNOFOSSIL OOZE WITH CLAY, gray (5Y 6/1), generally massive, but moderately bioturbated in the upper 5 cm from Section 1, 116 to 119 cm.

SMEAR SLIDE SUMMARY (%):

	3, 63 D	6, 104 M	7, 57 D
TEXTURE:			
Sand	—	20	5
Silt	20	40	25
Clay	80	40	70
COMPOSITION:			
Calcareous fragments	—	25	1
Clay	5	10	65
Dolomite	—	Tr	—
Feldspar	—	—	Tr
Foraminifers	—	10	—
Glass	2	3	20
Nannofossils	92	50	—
Opaques	1	1	5
Organic matter	—	1	5
Quartz	—	—	2
Silicious fragments	Tr	—	—
Unspecified minerals	—	—	2



SITE 765 HOLE B CORE 19X CORED INTERVAL 173.3-183.0 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE, NANNOFOSSIL OOZE WITH CLAY, AND SILTY CLAY WITH NANNOFOSSILS

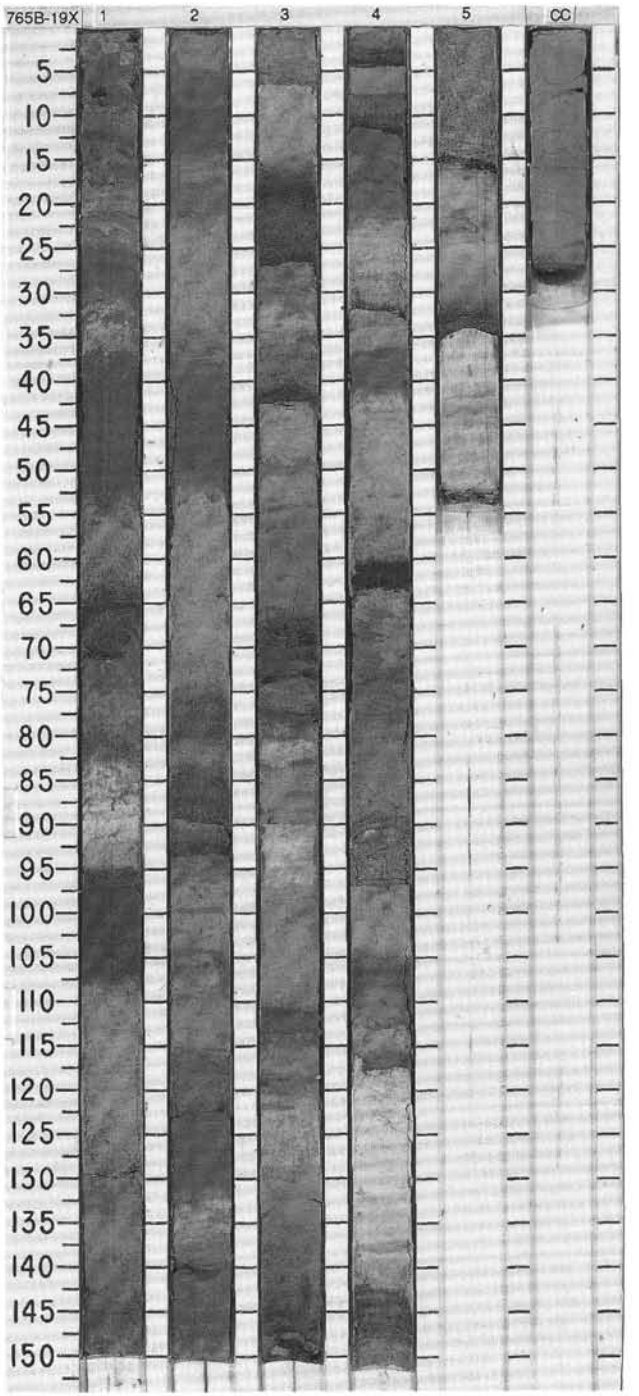
Cavings in Section 1, 0 to 10 cm.

Major lithology: Graded sequences, 5 to 37 cm in thickness,with sharp to locally scoured base, and typically fining upward from CALCAREOUS OOZE to NANNOFOSSIL OOZE WITH CLAY. Calcareous ooze (composed largely of whole and broken foraminifers, and enriched in rounded quartz grains at the base), dark gray (5YR 4/1) at the base, but dominantly olive gray (5Y 5/2) to gray (5Y 6/1), pebbly interval overlying quartz-enriched base, in Section 5, 10 to 15 cm, medium to fine sandy texture at the base to silt-sized at the top, and massive to with a faint suggestion of very thin-bedding. Nannofossil ooze with clay, light olive gray (5Y 6/2) to light gray (5Y 7/1) and white (5Y 8/1), progressively bioturbated and mottled in appearance upward, becoming moderately to intensly bioturbated at the top. Nannofossil ooze with clay accounts for roughly 30 to 40% of most of the sequences. The sequences are most commonly stacked, but also commonly grade into clayey intervals, 2 to 20 cm in thickness, of SILTY CLAY WITH NANNOFOSSILS, greenish gray (5GY 5/1) to olive gray (5Y 5/2), faintly laminated to mottled in appearance.

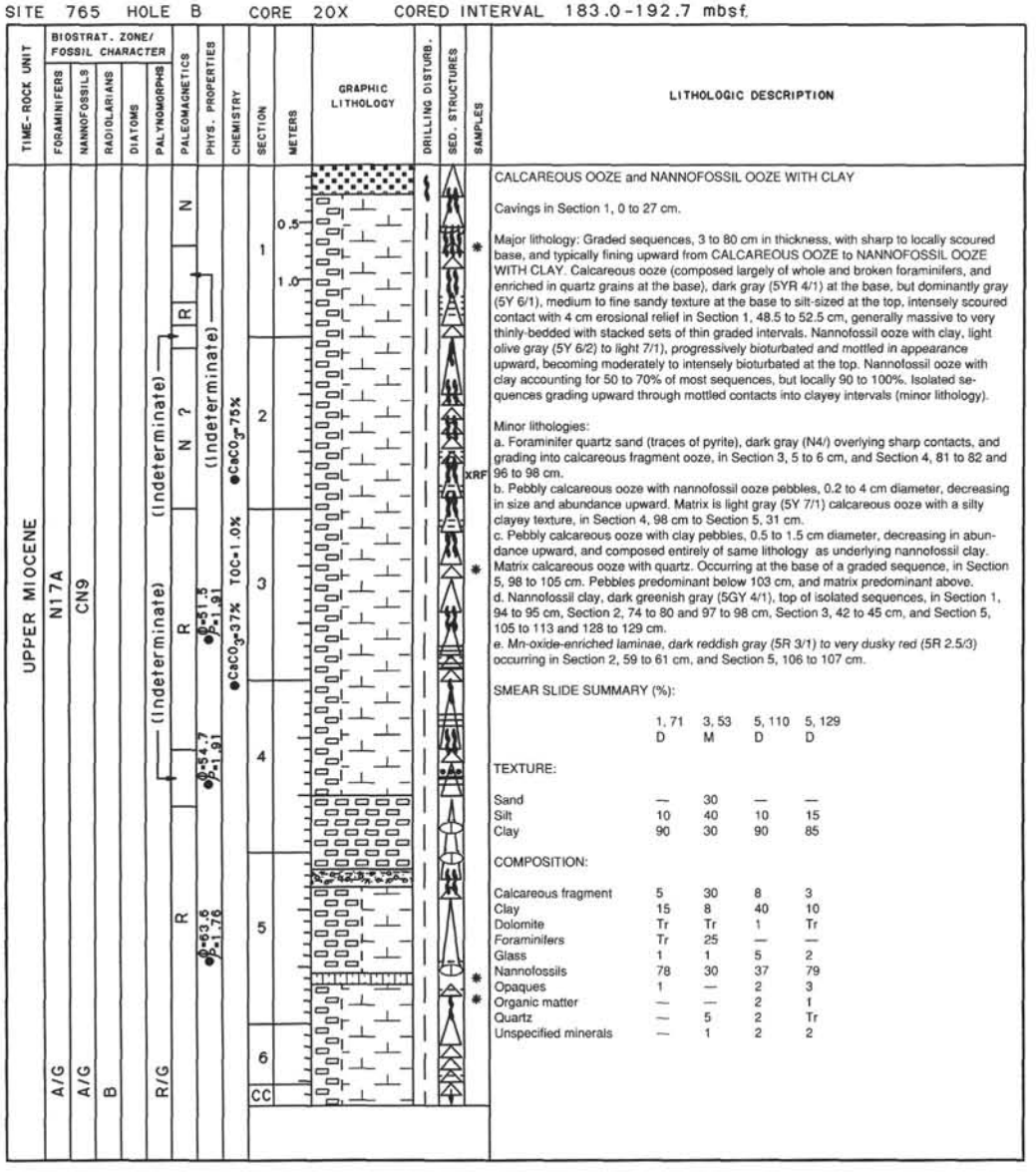
Minor lithologies:
a. Foraminifer quartz sand with pyrite, black (5Y 2.5/1) to dark gray (N4/), overlying basal contacts, and grading into calcareous fragment ooze, in Section 4, 60 to 64 cm, and Section 5, 15 to 16 cm. These intervals represent pronounced development of the quartz-enriched intervals which commonly occur at the base of graded sequences
b. Mn-oxide enriched laminae, dark reddish gray (5R 3/1) with diffuse boundaries, in Section 2, 92 to 94 cm.

SMEAR SLIDE SUMMARY (%):

	1, 46 D	2, 64 M	4, 132 D
TEXTURE:			
Sand	5	40	—
Silt	25	35	3
Clay	70	25	97
COMPOSITION:			
Accessory minerals	—	Tr	—
Calcareous fragment	—	30	1
Clay	50	5	—
Dolomite	1	—	—
Foraminifers	—	30	—
Glass	15	2	1
Nannofossils	25	25	98
Opaques	4	2	Tr
Organic matter	1	—	—
Quartz	Tr	1	—
Unspecified minerals	1	—	—
Zircon	Tr	—	—



SITE 765 HOLE B CORE 20X CORED INTERVAL 183.0-192.7 mbsf.



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and NANNOFOSSIL OOZE WITH CLAY

Cavings in Section 1, 0 to 27 cm.

Major lithology: Graded sequences, 3 to 80 cm in thickness, with sharp to locally scoured base, and typically fining upward from CALCAREOUS OOZE to NANNOFOSSIL OOZE WITH CLAY. Calcareous ooze (composed largely of whole and broken foraminifers, and enriched in quartz grains at the base), *dark gray* (5YR 4/1) at the base, but dominantly gray (5Y 6/1), medium to fine sandy texture at the base to silt-sized at the top, intensely scoured contact with 4 cm erosional relief in Section 1, 48.5 to 52.5 cm, generally massive to very thinly-bedded with stacked sets of thin graded intervals. Nannofossil ooze with clay, light *olive gray* (5Y 6/2) *to light* 7/1), *progressively bioturbated and mottled in appearance* upward, becoming moderately to intensely bioturbated at the top. Nannofossil ooze with clay accounting for 50 to 70% of most sequences, but locally 90 to 100%. Isolated sequences grading upward through mottled contacts into clayey intervals (minor lithology).

Minor lithologies:

a. Foraminifer quartz sand (traces of pyrite), dark gray (N4/) overlying sharp contacts, and grading into calcareous fragment ooze, in Section 3, 5 to 6 cm, and Section 4, 81 to 82 and 96 to 98 cm.

b. Pebbly calcareous ooze with nannofossil ooze pebbles, 0.2 to 4 cm diameter, decreasing in size and abundance upward. Matrix is light gray (5Y 7/1) calcareous ooze with a silty clayey texture, in Section 4, 98 cm to Section 5, 31 cm.

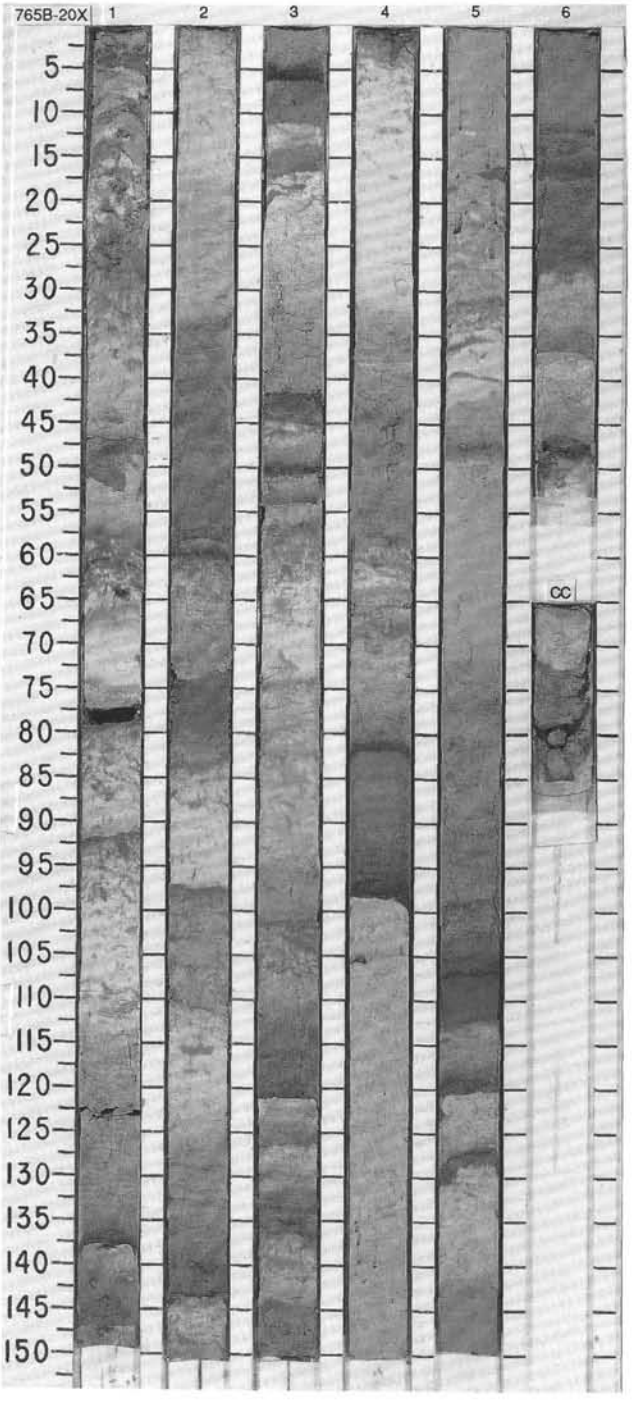
c. Pebbly calcareous ooze with clay pebbles, 0.5 to 1.5 cm diameter, decreasing in abundance upward, and composed entirely of same lithology as underlying nannofossil clay. Matrix calcareous ooze with quartz. Occurring at the base of a graded sequence, in Section 5, 98 to 105 cm. Pebbles predominant below 103 cm, and matrix predominant above.

d. Nannofossil clay, dark greenish gray (5GY 4/1), top of isolated sequences, in Section 1, 94 to 95 cm, Section 2, 74 to 80 and 97 to 98 cm, Section 3, 42 to 45 cm, and Section 5, 105 to 113 and 128 to 129 cm.

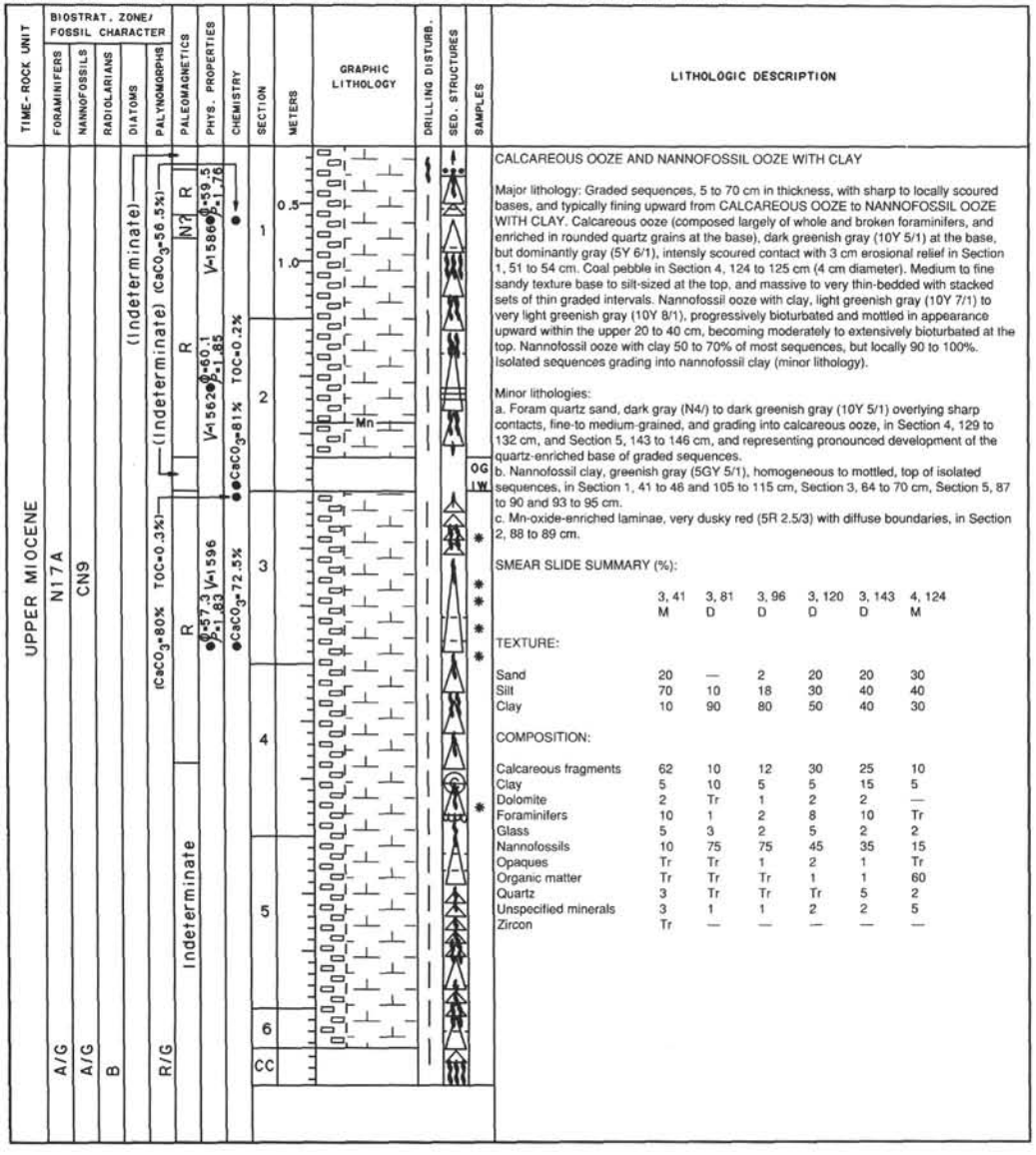
e. Mn-oxide-enriched laminae, dark reddish gray (5R 3/1) *to very dusky red* (5R 2.5/3) occurring in Section 2, 59 to 61 cm, and Section 5, 106 to 107 cm.

SMEAR SLIDE SUMMARY (%):

	1, 71 D	3, 53 M	5, 110 D	5, 129 D
TEXTURE:				
Sand	—	30	—	—
Silt	10	40	10	15
Clay	90	30	90	85
COMPOSITION:				
Calcareous fragment	5	30	8	3
Clay	15	8	40	10
Dolomite	Tr	Tr	1	Tr
Foraminifers	Tr	25	—	—
Glass	1	1	5	2
Nannofossils	78	30	37	79
Opaques	1	—	2	3
Organic matter	—	—	2	1
Quartz	—	5	2	Tr
Unspecified minerals	—	1	2	2



SITE 765 HOLE B CORE 21X CORED INTERVAL 192.7-202.4 mbsf



LITHOLOGIC DESCRIPTION

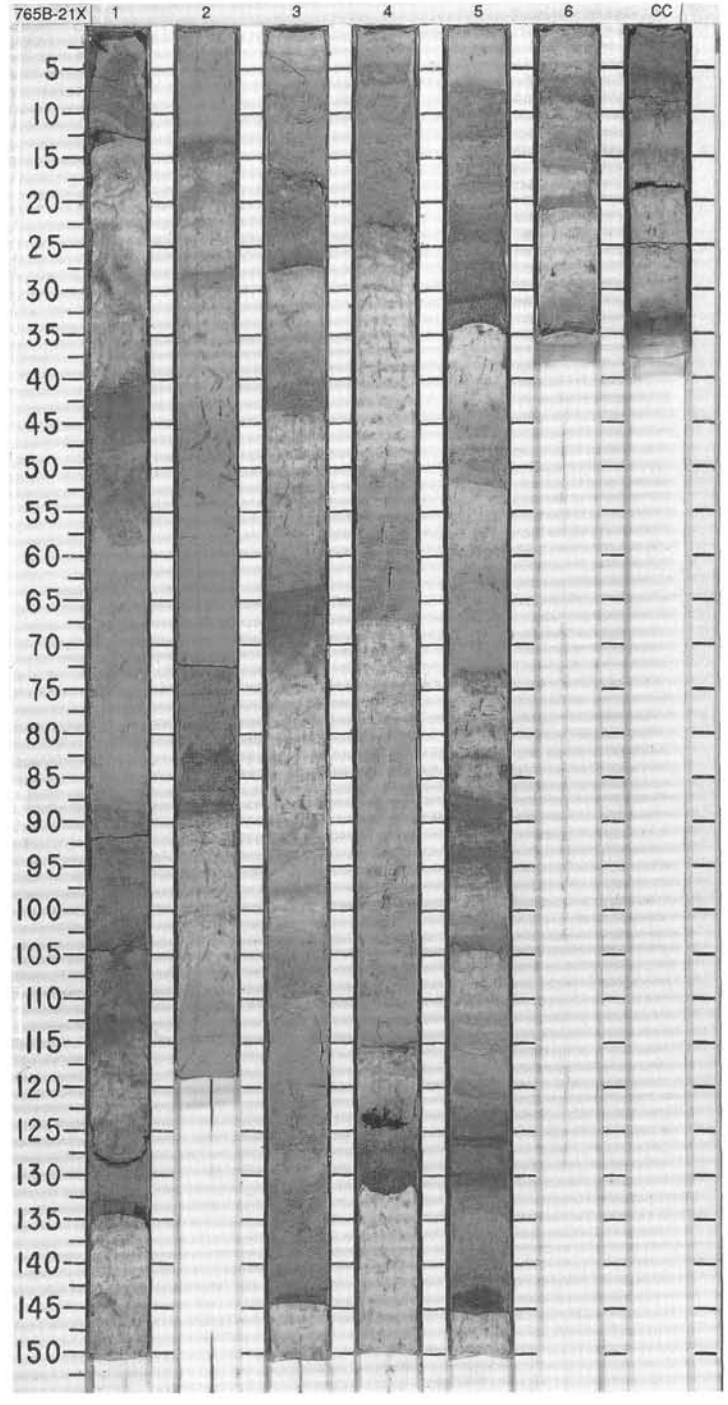
CALCAREOUS OOZE AND NANNOFOSSIL OOZE WITH CLAY

Major lithology: Graded sequences, 5 to 70 cm in thickness, with sharp to locally scoured bases, and typically fining upward from CALCAREOUS OOZE to NANNOFOSSIL OOZE WITH CLAY. Calcareous ooze (composed largely of whole and broken foraminifers, and enriched in rounded quartz grains at the base), dark greenish gray (10Y 5/1) at the base, but dominantly gray (5Y 6/1), intensly scoured contact with 3 cm erosional relief in Section 1, 51 to 54 cm. Coal pebble in Section 4, 124 to 125 cm (4 cm diameter). Medium to fine sandy texture base to silt-sized at the top, and massive to very thin-bedded with stacked sets of thin graded intervals. Nannofossil ooze with clay, light greenish gray (10Y 7/1) to very light greenish gray (10Y 8/1), progressively bioturbated and mottled in appearance upward within the upper 20 to 40 cm, becoming moderately to extensively bioturbated at the top. Nannofossil ooze with clay 50 to 70% of most sequences, but locally 90 to 100%. Isolated sequences grading into nannofossil clay (minor lithology).

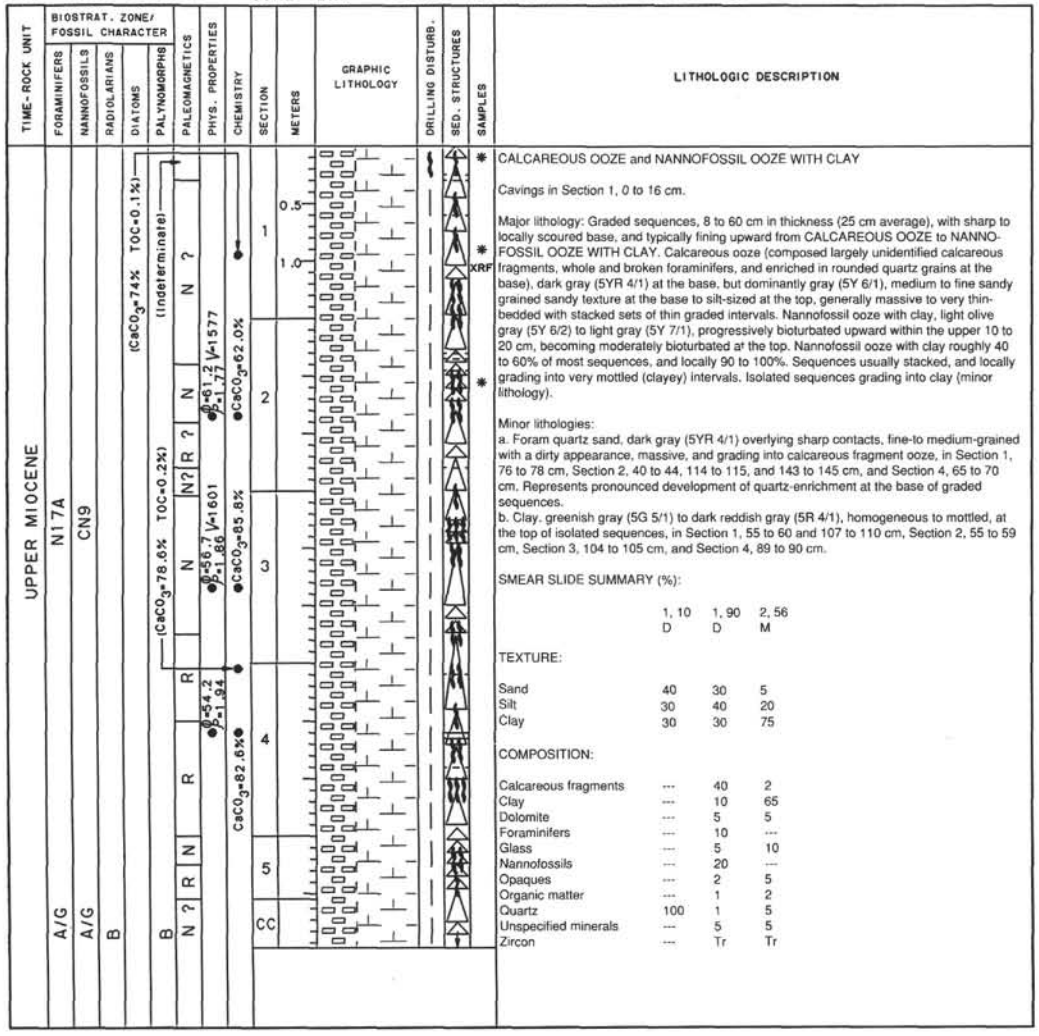
Minor lithologies:
a. Foram quartz sand, dark gray (N4/) to dark greenish gray (10Y 5/1) overlying sharp contacts, fine-to medium-grained, and grading into calcareous ooze, in Section 4, 129 to 132 cm, and Section 5, 143 to 146 cm, and representing pronounced development of the quartz-enriched base of graded sequences.
b. Nannofossil clay, greenish gray (5GY 5/1), homogeneous to mottled, top of isolated sequences, in Section 1, 41 to 46 and 105 to 115 cm, Section 3, 64 to 70 cm, Section 5, 87 to 90 and 93 to 95 cm.
c. Mn-oxide-enriched laminae, very dusky red (5R 2.5/3) with diffuse boundaries, in Section 2, 88 to 89 cm.

SMEAR SLIDE SUMMARY (%):

	3, 41 M	3, 81 D	3, 96 D	3, 120 D	3, 143 D	4, 124 M
TEXTURE:						
Sand	20	—	2	20	20	30
Silt	70	10	18	30	40	40
Clay	10	90	80	50	40	30
COMPOSITION:						
Calcareous fragments	62	10	12	30	25	10
Clay	5	10	5	5	15	5
Dolomite	2	Tr	1	2	2	—
Foraminifers	10	1	2	8	10	Tr
Glass	5	3	2	5	2	2
Nannofossils	10	75	75	45	35	15
Opaques	Tr	Tr	1	2	1	Tr
Organic matter	Tr	Tr	Tr	1	1	60
Quartz	3	Tr	Tr	Tr	5	2
Unspecified minerals	3	1	1	2	2	5
Zircon	Tr	—	—	—	—	—



SITE 765 HOLE B CORE 22X CORED INTERVAL 202.4-212.1 mbsf



CALCAREOUS OOZE and NANNOFOSSIL OOZE WITH CLAY

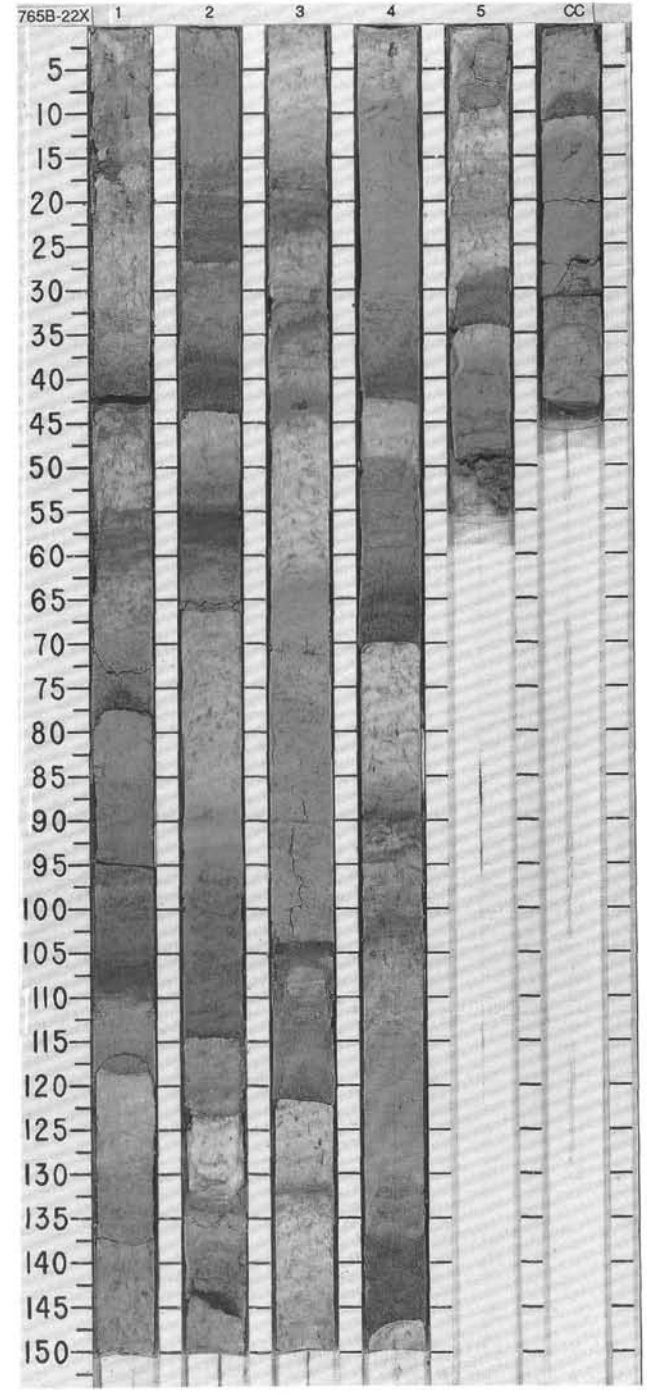
Cavings in Section 1, 0 to 16 cm.

Major lithology: Graded sequences, 8 to 60 cm in thickness (25 cm average), with sharp to locally scoured base, and typically fining upward from CALCAREOUS OOZE to NANNOFOSSIL OOZE WITH CLAY. Calcareous ooze (composed largely unidentified calcareous fragments, whole and broken foraminifers, and enriched in rounded quartz grains at the base), dark gray (5YR 4/1) at the base, but dominantly gray (5Y 6/1), medium to fine sandy grained sandy texture at the base to silt-sized at the top, generally massive to very thin-bedded with stacked sets of thin graded intervals. Nannofossil ooze with clay, light olive gray (5Y 6/2) to light gray (5Y 7/1), progressively bioturbated upward within the upper 10 to 20 cm, becoming moderately bioturbated at the top. Nannofossil ooze with clay roughly 40 to 60% of most sequences, and locally 90 to 100%. Sequences usually stacked, and locally grading into very mottled (clayey) intervals. Isolated sequences grading into clay (minor lithology).

Minor lithologies:
a. Foram quartz sand, dark gray (5YR 4/1) overlying sharp contacts, fine-to medium-grained with a dirty appearance, massive, and grading into calcareous fragment ooze, in Section 1, 76 to 78 cm, Section 2, 40 to 44, 114 to 115, and 143 to 145 cm, and Section 4, 65 to 70 cm. Represents pronounced development of quartz-enrichment at the base of graded sequences.
b. Clay, greenish gray (5G 5/1) to dark reddish gray (5R 4/1), homogeneous to mottled, at the top of isolated sequences, in Section 1, 55 to 60 and 107 to 110 cm, Section 2, 55 to 59 cm, Section 3, 104 to 105 cm, and Section 4, 89 to 90 cm.

SMEAR SLIDE SUMMARY (%):

	1, 10 D	1, 90 D	2, 56 M
TEXTURE:			
Sand	40	30	5
Silt	30	40	20
Clay	30	30	75
COMPOSITION:			
Calcareous fragments	---	40	2
Clay	---	10	65
Dolomite	---	5	5
Foraminifers	---	10	---
Glass	---	5	10
Nannofossils	---	20	---
Opaques	---	2	5
Organic matter	---	1	2
Quartz	100	1	5
Unspecified minerals	---	5	5
Zircon	---	Tr	Tr



SITE 765 HOLE B CORE 23X CORED INTERVAL 212.1-221.8 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
UPPER MIOCENE	A/G	N17A	A/P	CN9	B	(Indeterminate)	($CaCO_3$=63.4% TOC=0.0%)	B	(Indeterminate)	N? R?	R	V=1588 ρ=60.0 ρ=1.98	$CaCO_3$=76.5%	1	0.5	1.0				*
							V=1590 ρ=35.5 ρ=1.98	$CaCO_3$=80.4%	2											
									CC											

LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE AND NANNOFOSSIL OOZE WITH CLAY

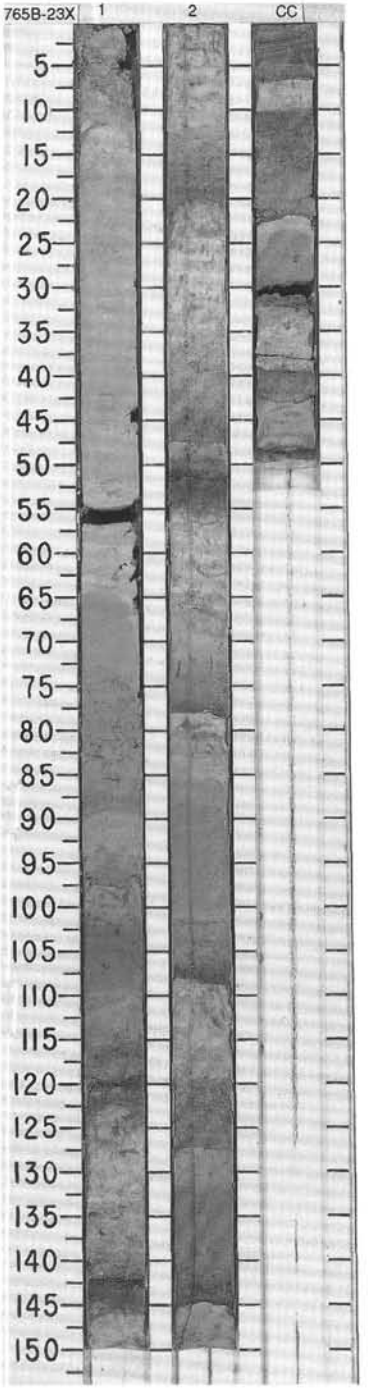
Cavings in Section 1, 0 to 16 cm.

Major lithology: Graded sequences, 5 to 85 cm in thickness (25 cm average), with sharp to locally scoured base,and fining upward from CALCAREOUS OOZE to NANNOFOSSIL OOZE WITH CLAY. Calcareous ooze (composed largely of unidentified calcareous fragments, whole and broken foraminifers, and enriched in rounded quartz grains at the base), dark gray (5YR 4/1) at the base, but dominantly pinkish gray (5YR 6/1) to gray (5Y 6/1), scoured basal contact with 2 cm erosional relief in Section 1, 96 to 98 cm, medium to fine sandy texture at the base to silt-sized at the top, massive to very thin-bedded with stacked sets of thin graded intervals. Nannofossil ooze with clay, gray (5Y 6/1) to light gray (5Y 7/1), progressively bioturbated upward in the upper 10 to 20 cm, becoming slightly to moderately bioturbated at the top. Nannofossil ooze with clay roughly 50 to 70% of most sequences. Isolated sequences grading into clay (minor lithology).

Minor lithology: Clay, greenish gray (5G 5/1), massive to mottled, at the top of isolated sequences grading upward from nannofossil ooze with clay, in Section 1, 120 to 122 and 142 to 146 cm, and Section 2, 52 to 59 cm.

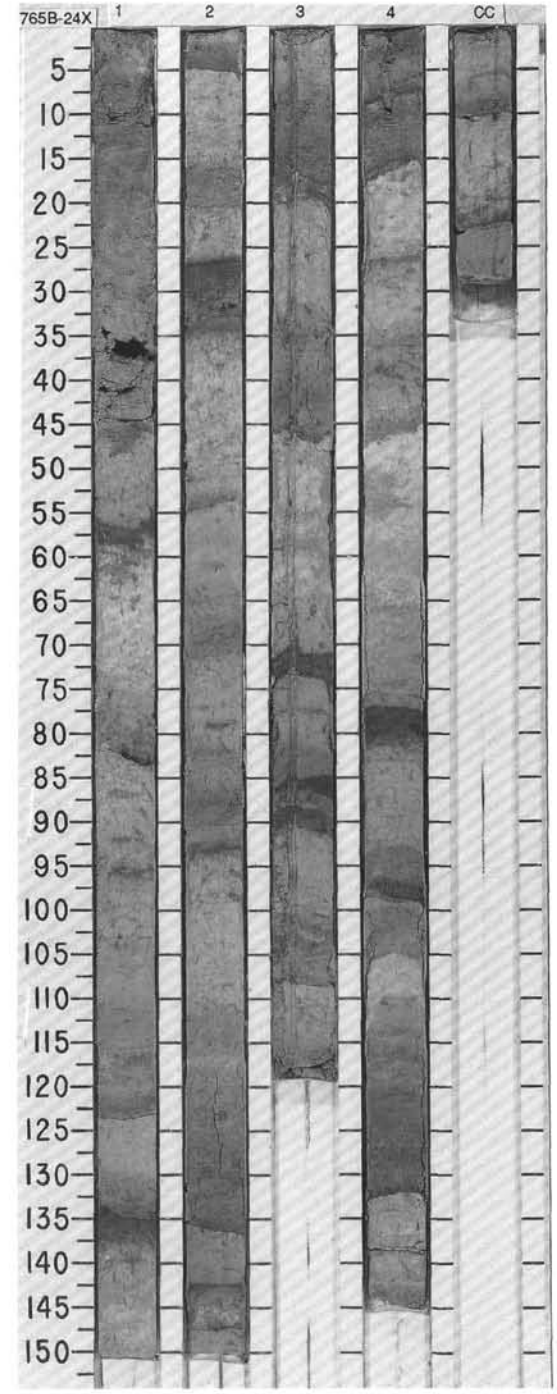
SMEAR SLIDE SUMMARY (%):

	1, 38 D
TEXTURE:	
Sand	—
Silt	25
Clay	75
COMPOSITION:	
Calcareous fragments	5
Clay	10
Dolomite	Tr
Foraminifers	Tr
Glass	3
Nannofossils	79
Opaques	1
Organic matter	1
Quartz	Tr
Unspecified minerals	1



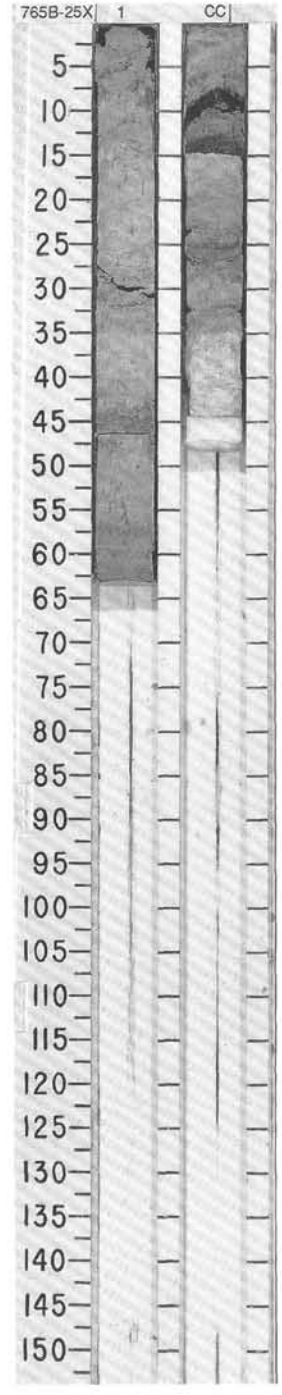
SITE 765 HOLE B CORE 24X CORED INTERVAL 221.8-231.5 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
UPPER MIOCENE	A/M N17A	A/P CN9	B	B (Indeterminate)	(Indeterminate)	R		$CaCO_3$=72.3%	1	0.5					CALCAREOUS OOZE AND NANNOFOSSIL OOZE WITH CLAY
	Indeterminate	R				R		$CaCO_3$=74.6%	2	1.0					Section 1, 0 to 10 cm disturbed to with cavings, otherwise slightly disturbed. Major lithology: Graded sequences, 5 to > 40 cm in thickness (20 cm average), with sharp to locally scoured base, and typically fining upward m from CALCAREOUS OOZE to NANNOFOSSIL OOZE WITH CLAY. Calcareous ooze (composed largely of unidentified calcareous fragments, whole and broken foraminifers, and enriched in rounded quartz grains at the base), dark gray (5YR 4/1) at the base, but dominantly gray (5Y 6/1), medium to fine sand- sized to silt-sized upward, massive to with faint suggestion of very thin-bedding. Nannofossil ooze with clay, greenish gray (5G 6/1) to light greenish gray (10Y 7/1), progressively bioturbated upward in the upper 10 to 25 cm, becoming moderately bioturbated at the top. Nannofossil ooze with clay roughly 70 to 100% of most sequences, and less commonly 25 to 50%. Sequences commonly with mottled (clayey) tops, and isolated sequences grading into clay (minor lithology).
									3				OG IW		Minor lithologies: a. Foraminifer quartz sand, dark gray (5YR 4/1) to dark greenish gray (10Y 5/1), fine to *medium grained, overlying sharp basal contact, and grading into calcareous fragment ooze* (pronounced quartz-rich base of graded sequences), dirty in appearance, and with silt-and very fine sand-sized heavy minerals, in Section 3, 72 to 75 cm, and Section 4, 97 to 99 cm. b. Clay, greenish gray (5G 5/1), massive to mottled, at the top of isolated sequences *grading upward from nannofossil ooze with clay*, in Section 1, 56 to 58 and 135 to 137.5 cm, Section 2, 27 to 35 cm, Section 3, 85 to 87 and 89 to 91 cm, and Section 4, 77 to 82 cm.
									4						
									CC						

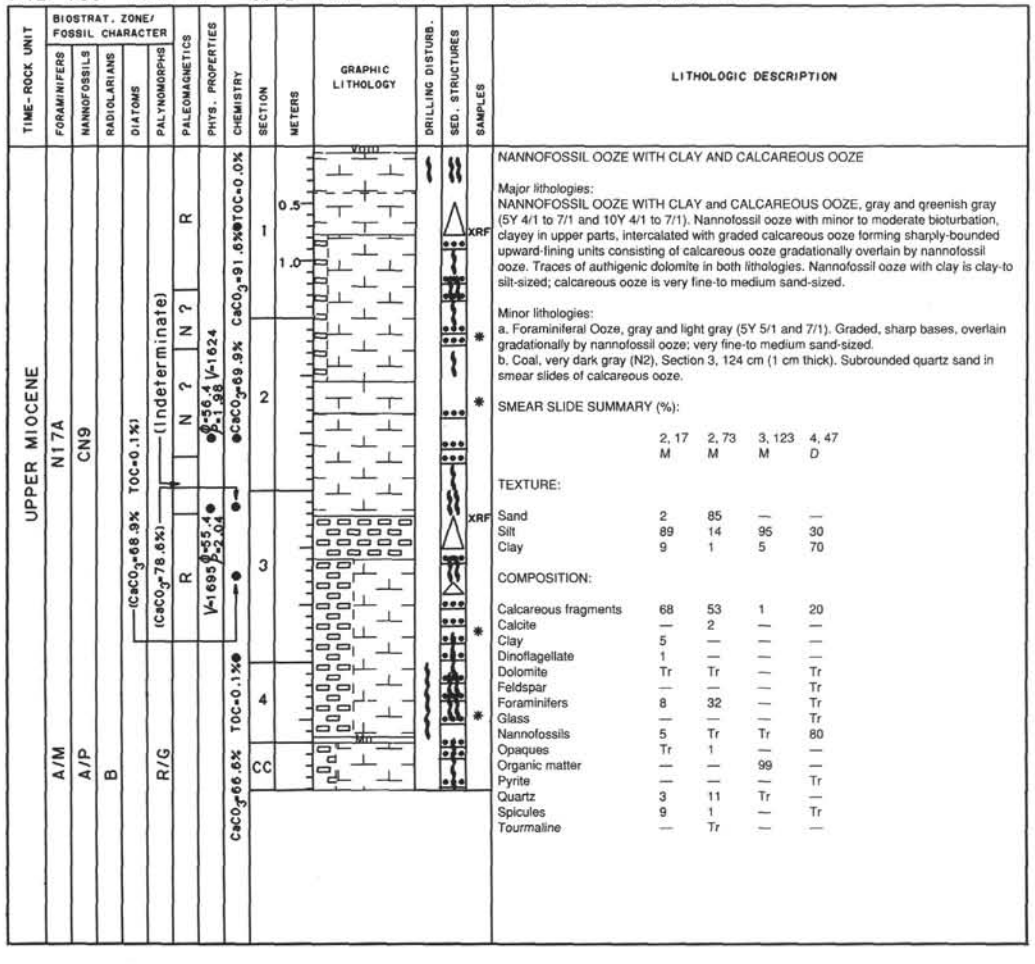


SITE 765 HOLE B CORE 25X CORED INTERVAL 231.5-241.2 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
UPPER MIOCENE	A/G	A/P	B		B	R	χ 1657 ϕ 55.0 ρ 1.95	$CaCO_3$ 62.5%	1						CALCAREOUS OOZE AND NANNOFOSSIL OOZE WITH CLAY
	N17A	CN9				N			CC						Cavings in Section 1, 0 to 16 cm. Major lithology: Graded sequences, 8 to 18 cm in thickness (15 cm average), with sharp to locally scoured base, and typically fining upward from CALCAREOUS OOZE to NANNOFOSSIL OOZE WITH CLAY. Calcareous ooze (composed largely of unidentified calcareous fragments, whole and broken foraminifers, and enriched in rounded quartz grains at the base), dark gray (5YR 4/1) at the base, but dominantly gray (5Y 6/1), fine to very fine sand-sized at the base to silt-sized upward, massive to with faint suggestion of very thin bedding or planar lamination. Nannofossil ooze with clay, greenish gray (5g 6/1) to white (5Y 7/1), slightly bioturbated in the upper 10 to 20 cm.. Minor lithologies: Two minor lithologies occurring within the same graded sequence. a. Foraminifer quartz sand, dark gray (5YR 4/1), fine to medium grained, overlying sharp basal contact, and grading upward into calcareous ooze. Dirty appearance, and silt to very fine sand-sized heavy minerals, in Section CC, 13 to 15 cm. b. Coal, black (5Y 2.5/1), in Section CC, 9 to 11 cm, occurs at the gradational boundary between calcareous ooze to nannofossil ooze with clay, as a layer of nearly pure coaly fragments, and probably represents a fragmented coal clast versus a very thin bed of coaly particles.



SITE 765 HOLE B CORE 26X CORED INTERVAL 241.2-250.9 mbsf



LITHOLOGIC DESCRIPTION

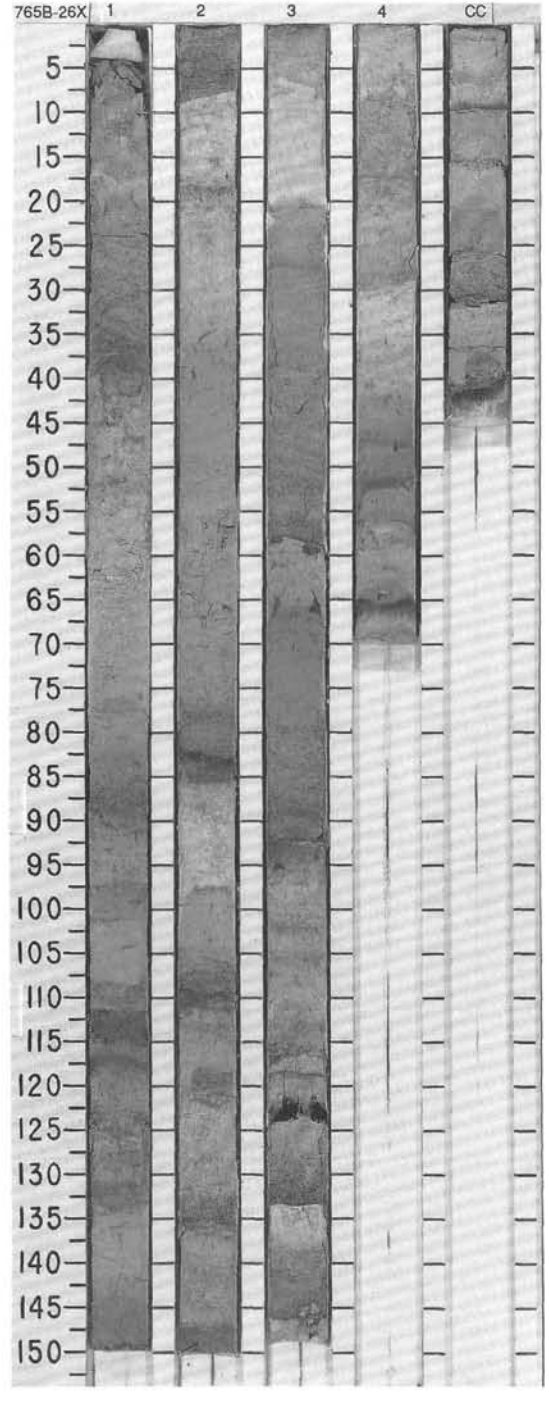
NANNOFOSSIL OOZE WITH CLAY AND CALCAREOUS OOZE

Major lithologies:
NANNOFOSSIL OOZE WITH CLAY and CALCAREOUS OOZE, gray and greenish gray (5Y 4/1 to 7/1 and 10Y 4/1 to 7/1). Nannofossil ooze with minor to moderate bioturbation, clayey in upper parts, intercalated with graded calcareous ooze forming sharply-bounded upward-fining units consisting of calcareous ooze gradationally overlain by nannofossil ooze. Traces of authigenic dolomite in both lithologies. Nannofossil ooze with clay is clay-to silt-sized; calcareous ooze is very fine-to medium sand-sized.

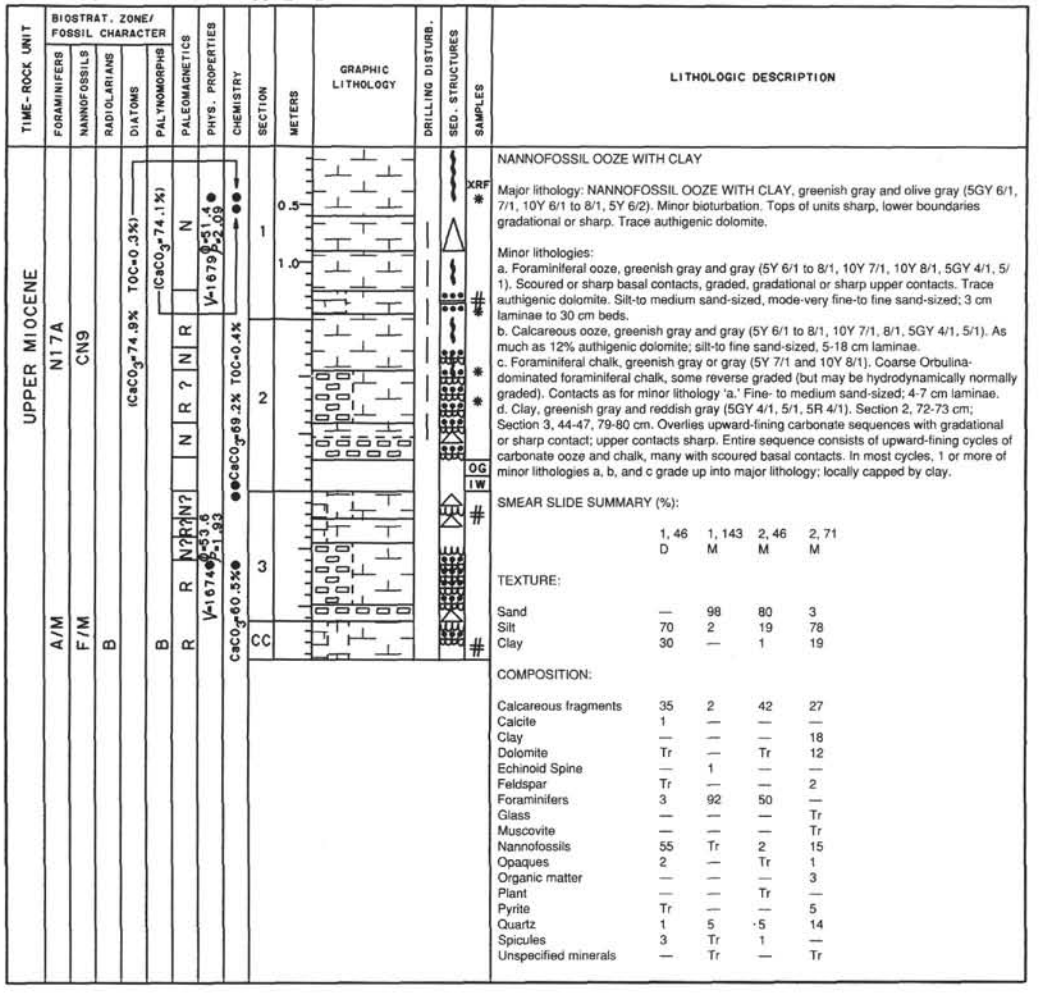
Minor lithologies:
a. Foraminiferal Ooze, gray and light gray (5Y 5/1 and 7/1). Graded, sharp bases, overlain gradationally by nannofossil ooze; very fine-to medium sand-sized.
b. Coal, very dark gray (N2), Section 3, 124 cm (1 cm thick). Subrounded quartz sand in smear slides of calcareous ooze.

SMEAR SLIDE SUMMARY (%):

	2, 17 M	2, 73 M	3, 123 M	4, 47 D
TEXTURE:				
Sand	2	85	—	—
Silt	89	14	95	30
Clay	9	1	5	70
COMPOSITION:				
Calcareous fragments	68	53	1	20
Calcite	—	2	—	—
Clay	5	—	—	—
Dinoflagellate	1	—	—	—
Dolomite	Tr	Tr	—	Tr
Feldspar	—	—	—	Tr
Foraminifers	8	32	—	Tr
Glass	—	—	—	Tr
Nannofossils	5	Tr	Tr	80
Opaques	Tr	1	—	—
Organic matter	—	—	99	—
Pyrite	—	—	—	Tr
Quartz	3	11	Tr	—
Spicules	9	1	—	Tr
Tourmaline	—	Tr	—	—



SITE 765 HOLE B CORE 27X CORED INTERVAL 250.9-260.6 mbsf



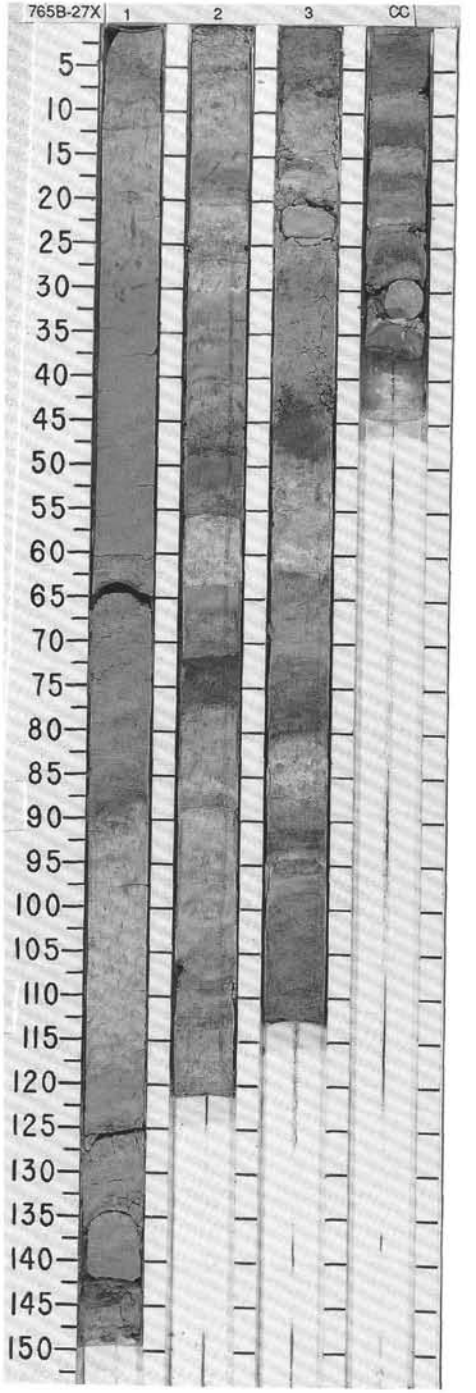
NANNOFOSSIL OOZE WITH CLAY

Major lithology: NANNOFOSSIL OOZE WITH CLAY, greenish gray and olive gray (5GY 6/1, 7/1, 10Y 6/1 to 8/1, 5Y 6/2). Minor bioturbation. Tops of units sharp, lower boundaries gradational or sharp. Trace authigenic dolomite.

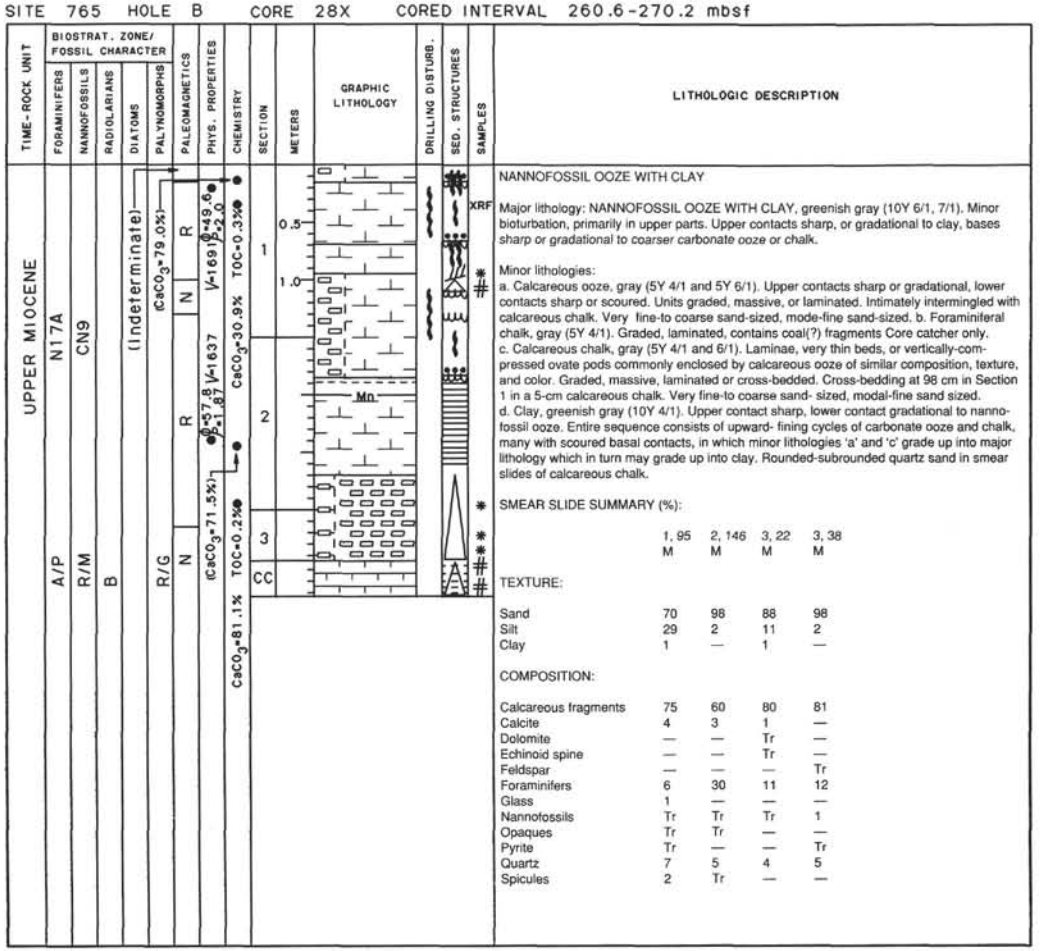
Minor lithologies:
a. Foraminiferal ooze, greenish gray and gray (5Y 6/1 to 8/1, 10Y 7/1, 10Y 8/1, 5GY 4/1, 5/1). Scoured or sharp basal contacts, graded, gradational or sharp upper contacts. Trace authigenic dolomite. Silt-to medium sand-sized, mode-very fine-to fine sand-sized; 3 cm laminae to 30 cm beds.
b. Calcareous ooze, greenish gray and gray (5Y 6/1 to 8/1, 10Y 7/1, 8/1, 5GY 4/1, 5/1). As much as 12% authigenic dolomite; silt-to fine sand-sized, 5-18 cm laminae.
c. Foraminiferal chalk, greenish gray or gray (5Y 7/1 and 10Y 8/1). Coarse Orbulina-dominated foraminiferal chalk, some reverse graded (but may be hydrodynamically normally graded). Contacts as for minor lithology 'a.' Fine- to medium sand-sized; 4-7 cm laminae.
d. Clay, greenish gray and reddish gray (5GY 4/1, 5/1, 5R 4/1). Section 2, 72-73 cm; Section 3, 44-47, 79-80 cm. Overlies upward-fining carbonate sequences with gradational or sharp contact; upper contacts sharp. Entire sequence consists of upward-fining cycles of carbonate ooze and chalk, many with scoured basal contacts. In most cycles, 1 or more of minor lithologies a, b, and c grade up into major lithology; locally capped by clay.

SMEAR SLIDE SUMMARY (%):

	1, 46 D	1, 143 M	2, 46 M	2, 71 M
TEXTURE:				
Sand	—	98	80	3
Silt	70	2	19	78
Clay	30	—	1	19
COMPOSITION:				
Calcareous fragments	35	2	42	27
Calcite	1	—	—	—
Clay	—	—	—	18
Dolomite	Tr	—	Tr	12
Echinoid Spine	—	1	—	—
Feldspar	Tr	—	—	2
Foraminifers	3	92	50	—
Glass	—	—	—	Tr
Muscovite	—	—	—	Tr
Nannofossils	55	Tr	2	15
Opaques	2	—	Tr	1
Organic matter	—	—	—	3
Plant	—	—	Tr	—
Pyrite	Tr	—	—	5
Quartz	1	5	5	14
Spicules	3	Tr	1	—
Unspecified minerals	—	Tr	—	Tr



SITE 765 HOLE B CORE 28X CORED INTERVAL 260.6-270.2 mbsf



LITHOLOGIC DESCRIPTION

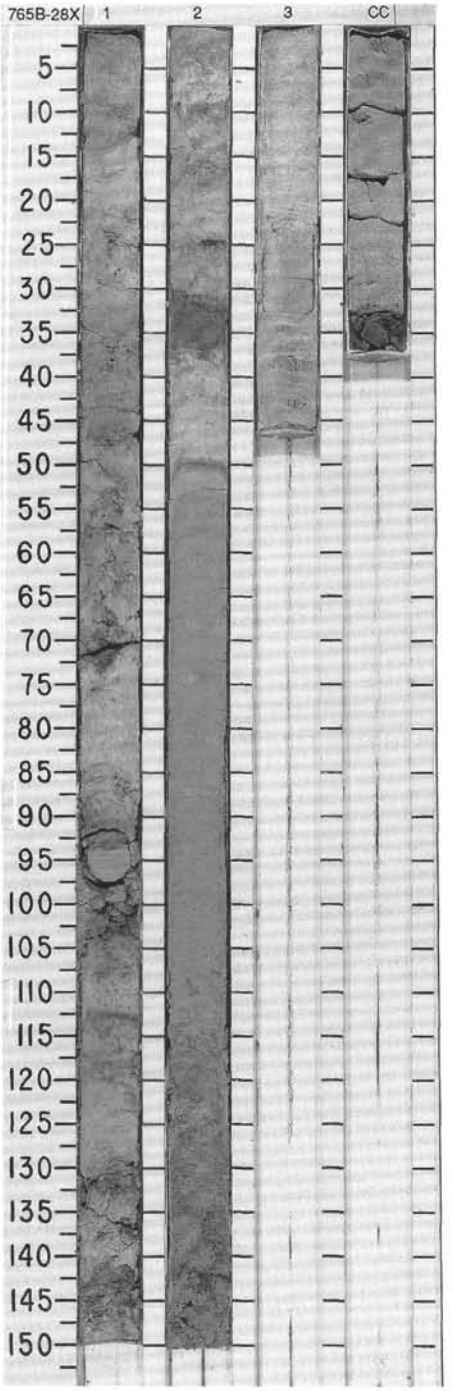
NANNOFOSSIL OOZE WITH CLAY

Major lithology: NANNOFOSSIL OOZE WITH CLAY, greenish gray (10Y 6/1, 7/1). Minor bioturbation, primarily in upper parts. Upper contacts sharp, or gradational to clay, bases *sharp or gradational to coarser carbonate ooze or chalk.*

Minor lithologies:
a. Calcareous ooze, gray (5Y 4/1 and 5Y 6/1). Upper contacts sharp or gradational, lower contacts sharp or scoured. Units graded, massive, or laminated. Intimately intermingled with calcareous chalk. Very fine-to coarse sand-sized, mode-fine sand-sized. b. Foraminiferal chalk, gray (5Y 4/1). Graded, laminated, contains coal(?) fragments Core catcher only.
c. Calcareous chalk, gray (5Y 4/1 and 6/1). Laminae, very thin beds, or vertically-compressed ovate pods commonly enclosed by calcareous ooze of similar composition, texture, and color. Graded, massive, laminated or cross-bedded. Cross-bedding at 98 cm in Section 1 in a 5-cm calcareous chalk. Very fine-to coarse sand- sized, modal-fine sand sized.
d. Clay, greenish gray (10Y 4/1). Upper contact sharp, lower contact gradational to nannofossil ooze. Entire sequence consists of upward- fining cycles of carbonate ooze and chalk, many with scoured basal contacts, in which minor lithologies 'a' and 'c' grade up into major lithology which in turn may grade up into clay. Rounded-subrounded quartz sand in smear slides of calcareous chalk.

SMEAR SLIDE SUMMARY (%):

	1, 95 M	2, 146 M	3, 22 M	3, 38 M
TEXTURE:				
Sand	70	98	88	98
Silt	29	2	11	2
Clay	1	—	1	—
COMPOSITION:				
Calcareous fragments	75	60	80	81
Calcite	4	3	1	—
Dolomite	—	—	Tr	—
Echinoid spine	—	—	Tr	—
Feldspar	—	—	—	Tr
Foraminifers	6	30	11	12
Glass	1	—	—	—
Nannofossils	Tr	Tr	Tr	1
Opaques	Tr	Tr	—	—
Pyrite	Tr	—	—	Tr
Quartz	7	5	4	5
Spicules	2	Tr	—	—



SITE 765 HOLE B CORE 29X CORED INTERVAL 270.2-279.9 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
UPPER MIOCENE	A/P	N17A	F/P	CN8B	B	N ?	R	N	V-1626 0-59.2 >1.87	$CaCO_3$=53.4%	1	0.5 1.0	VOID			
											2					
										TOC=0.3%	CC					
										$CaCO_3$=77.5%						

LITHOLOGIC DESCRIPTION

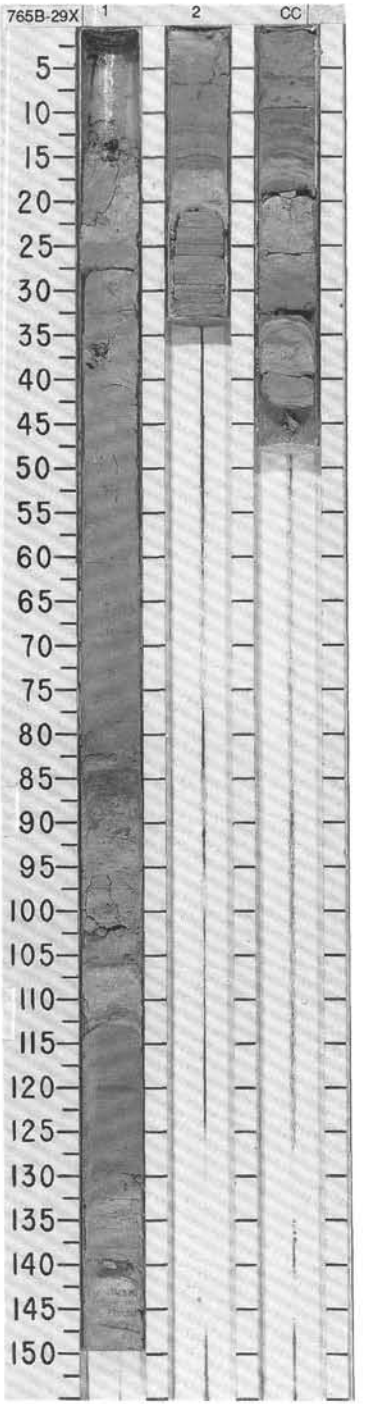
NANNOFOSSIL OOZE WITH CLAY AND FORAMINIFERAL OOZE

Major lithologies:
NANNOFOSSIL OOZE WITH CLAY and FORAMINIFERAL OOZE, gray and greenish gray (5Y 4/1 to 7/1, 10Y 4/1 to 10Y 8/1, and 6/2). Variable bioturbation in nannofossil ooze, some laminated. Foraminiferal ooze laminated, graded, graded with faint laminae, or bioturbated. Contacts sharp, bases of foraminiferal oozes commonly scoured. Foraminifers very fine-to fine sand-sized. Soft pebbles of nannofossil ooze and hard pebbles of variable lithology (including chert) occur in Section 1 in nannofossil ooze at 11-24 cm and at 36 cm in foraminiferal ooze. Authigenic dolomite in both lithologies, commonly trace but as much as 12%.

Minor lithology: Foraminiferal chalk,gray (5Y 5/1), laminated. Scattered pods and laminae of foraminiferal chalk occur within foraminiferal ooze between 27 and 82, 132 and 140, and 142 and 150 cm in Section 1, and between 20 and 25 and 35 and 42 cm in CC. Very fine-to medium sand-sized, mode-very fine sand- sized. Graded and/or laminated units (rarely bioturbated) of foraminiferal ooze or chalk, commonly with scoured bases, alternating with nannofossil ooze, comprise this core.

SMEAR SLIDE SUMMARY (%):

	1, 23 M	1, 25 M	1, 72 D	1, 141 M	2, 30 M
TEXTURE:					
Sand	1	2	80	1	92
Silt	60	65	18	84	7
Clay	39	33	2	15	1
COMPOSITION:					
Bryozoa	—	—	Tr	—	—
Calcareous fragments	45	29	38	44	35
Calcite	1	1	—	6	—
Clay	—	—	5	13	—
Dolomite	1	Tr	—	12	Tr
Echinoid spine	—	—	Tr	—	—
Feldspar	—	1	—	1	—
Foraminifers	1	5	50	2	60
Glass	—	—	—	2	—
Nannofossils	47	58	5	9	Tr
Opaques	Tr	—	Tr	2	—
Organic matter	—	—	—	1	—
Pyrite	1	1	Tr	—	—
Quartz	Tr	1	2	3	4
Spicules	2	4	—	—	Tr
Unknown	—	Tr	—	—	—



SITE 765 HOLE B CORE 30X CORED INTERVAL 279.9-289.6 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
UPPER MIOCENE	A/P	F/P	B	($CaCO_3$=77.8%)	F/G	N N R	V=1568 ρ=64.5 ρ=1.79	$CaCO_3$=84.7% TOC=0.3%	1					
	N17A	CN8B							CC					

LITHOLOGIC DESCRIPTION

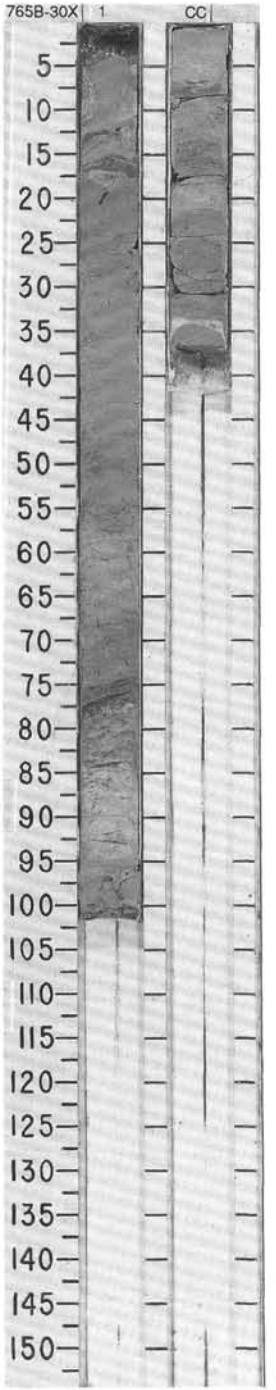
CALCAREOUS OOZE AND NANNOFOSSIL OOZE WITH CLAY

Major lithologies:
CALCAREOUS OOZE and NANNOFOSSIL OOZE WITH CLAY, greenish gray and gray (10Y 7/1, 10Y 8/1, 10Y 6/2, 5GY 6/1, 5GY 7/1, 5Y 7/1, 5Y 8/1). Bioturbation variable; sediment massive, graded, cross-laminated, laminated, or contorted. Pyrite nodule (clast?) at 19 cm in section 1.

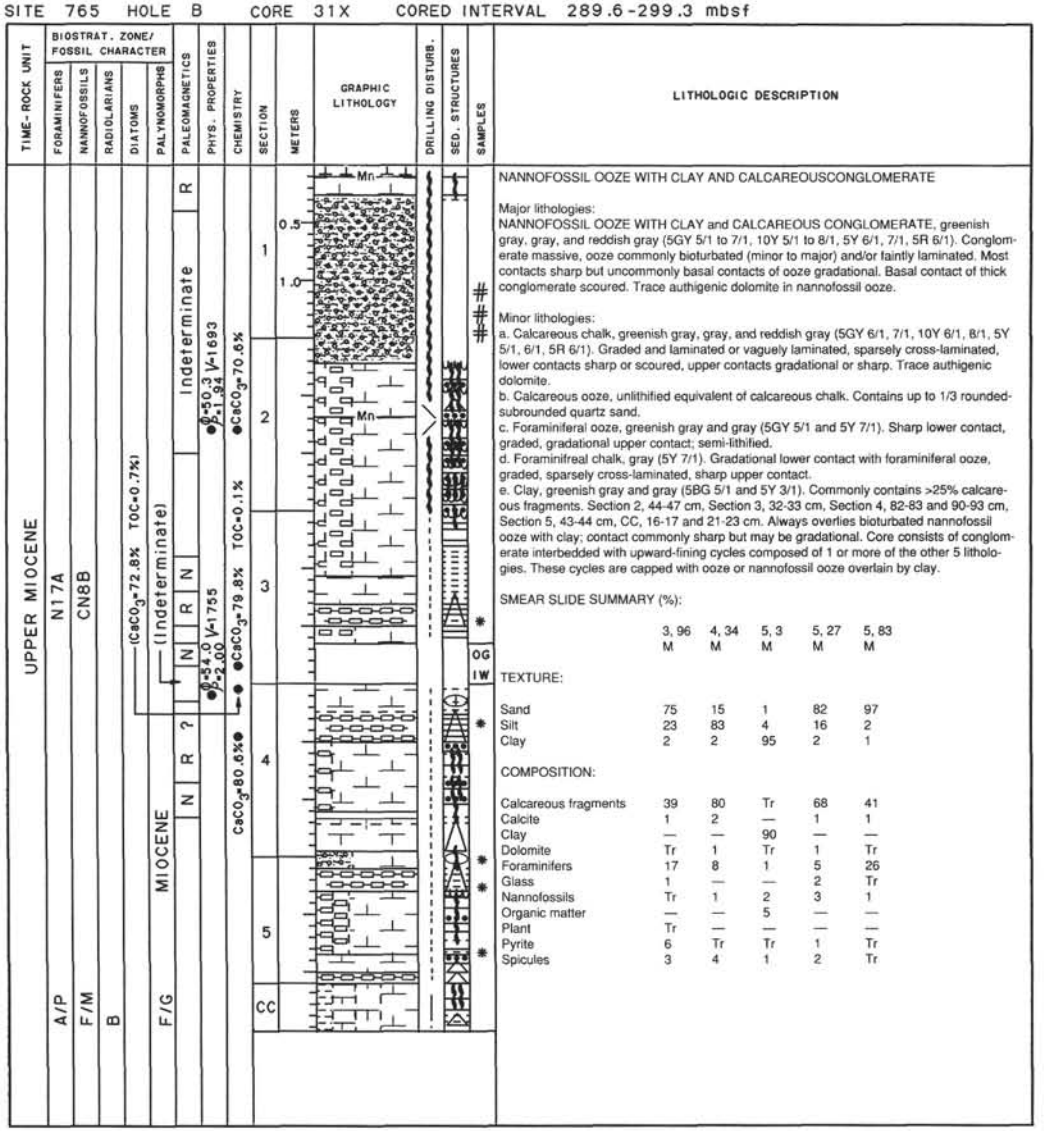
Minor lithologies:
a. Carbonate conglomerate, greenish gray (5G 6/1, 10Y 7/1, 10Y 8/1, 5GY 6/1). Matrix-supported, matrix nannofossil ooze, clasts mm-cm size, black, green, brown, white, sedimentary rocks.
b. Calcareous chalk, greenish gray (10Y 7/1). Massive, semi-lithified.

SMEAR SLIDE SUMMARY (%):

	1, 19 M	1, 42 M	1, 96 M
TEXTURE:			
Sand	—	95	1
Silt	100	5	97
Clay	—	—	2
COMPOSITION:			
Calcareous fragments	Tr	69	82
Calcite	Tr	3	3
Dolomite	Tr	Tr	—
Feldspar	—	Tr	—
Foraminifers	—	18	4
Glass	Tr	Tr	1
Nannofossils	Tr	Tr	—
Opaques	—	—	Tr
Plant	—	—	1
Pyrite	99	1	1
Quartz	Tr	7	5
Spicules	Tr	2	2



SITE 765 HOLE B CORE 31X CORED INTERVAL 289.6-299.3 mbsf



LITHOLOGIC DESCRIPTION

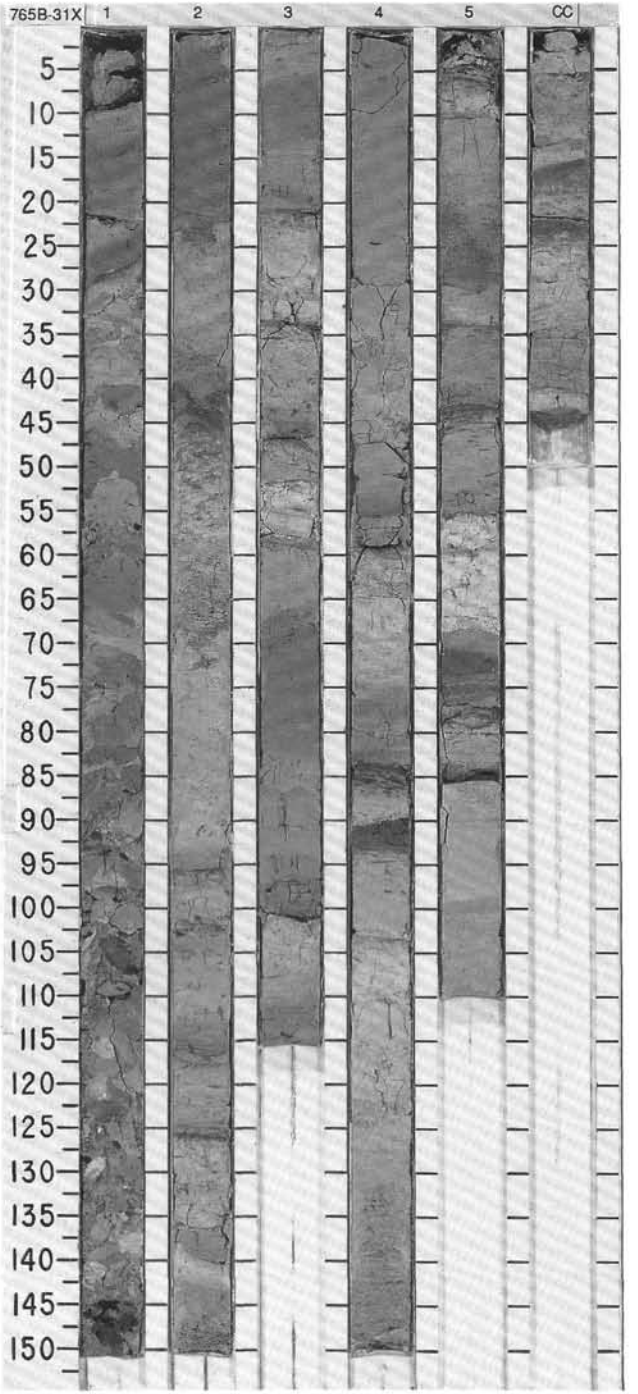
NANNOFOSSIL OOZE WITH CLAY AND CALCAREOUSCONGLOMERATE

Major lithologies:
NANNOFOSSIL OOZE WITH CLAY and CALCAREOUS CONGLOMERATE, greenish gray, gray, and reddish gray (5GY 5/1 to 7/1, 10Y 5/1 to 8/1, 5Y 6/1, 7/1, 5R 6/1). Conglomerate massive, ooze commonly bioturbated (minor to major) and/or faintly laminated. Most contacts sharp but uncommonly basal contacts of ooze gradational. Basal contact of thick conglomerate scoured. Trace authigenic dolomite in nannofossil ooze.

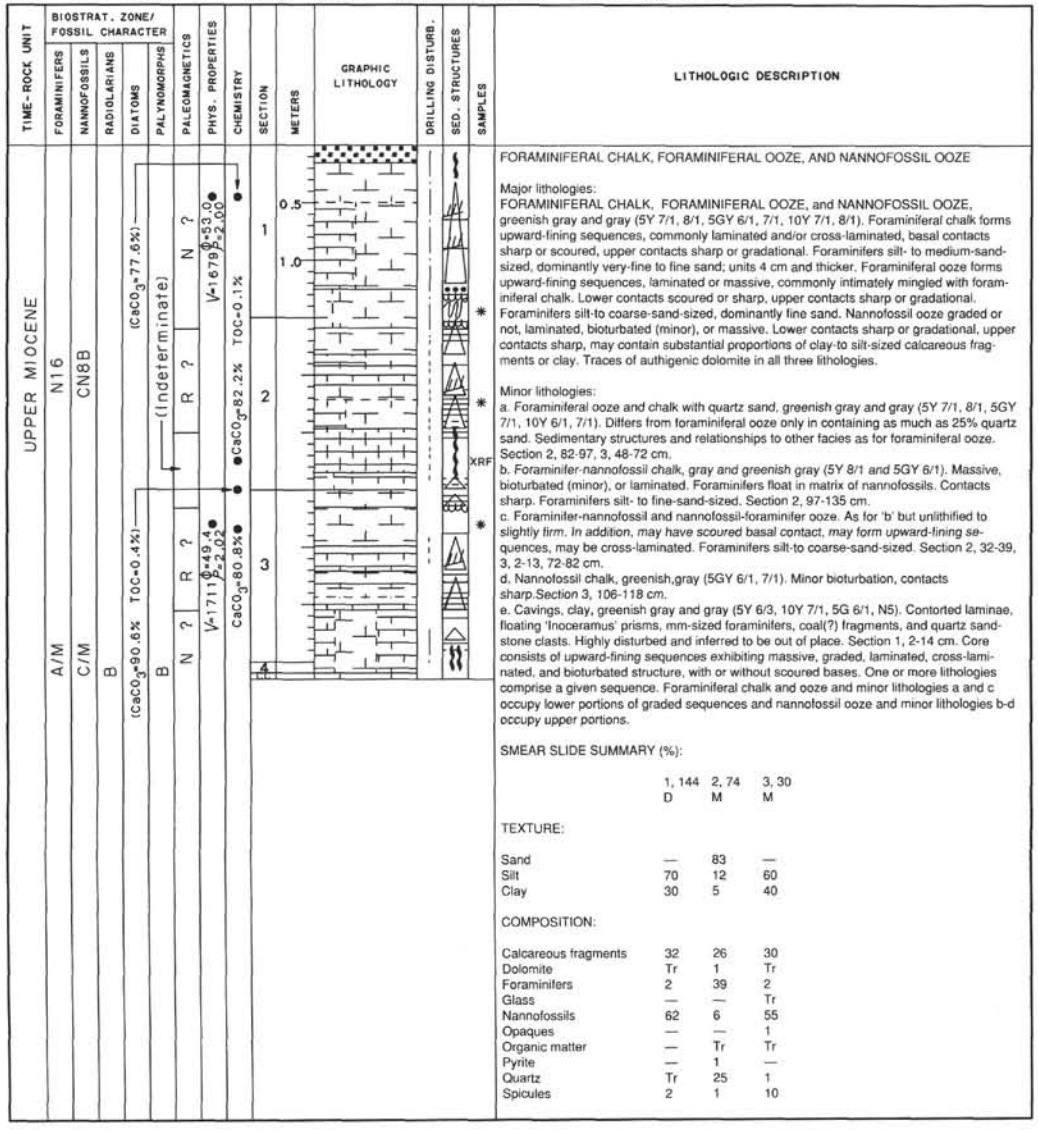
Minor lithologies:
a. Calcareous chalk, greenish gray, gray, and reddish gray (5GY 6/1, 7/1, 10Y 6/1, 8/1, 5Y 5/1, 6/1, 5R 6/1). Graded and laminated or vaguely laminated, sparsely cross-laminated, lower contacts sharp or scoured, upper contacts gradational or sharp. Trace authigenic dolomite.
b. Calcareous ooze, unlithified equivalent of calcareous chalk. Contains up to 1/3 rounded-subrounded quartz sand.
c. Foraminiferal ooze, greenish gray and gray (5GY 5/1 and 5Y 7/1). Sharp lower contact, graded, gradational upper contact; semi-lithified.
d. Foraminifreal chalk, gray (5Y 7/1). Gradational lower contact with foraminiferal ooze, graded, sparsely cross-laminated, sharp upper contact.
e. Clay, greenish gray and gray (5BG 5/1 and 5Y 3/1). Commonly contains >25% calcareous fragments. Section 2, 44-47 cm, Section 3, 32-33 cm, Section 4, 82-83 and 90-93 cm, Section 5, 43-44 cm, CC, 16-17 and 21-23 cm. Always overlies bioturbated nannofossil ooze with clay; contact commonly sharp but may be gradational. Core consists of conglomerate interbedded with upward-fining cycles composed of 1 or more of the other 5 lithologies. These cycles are capped with ooze or nannofossil ooze overlain by clay.

SMEAR SLIDE SUMMARY (%):

	3, 96 M	4, 34 M	5, 3 M	5, 27 M	5, 83 M
TEXTURE:					
Sand	75	15	1	82	97
Silt	23	83	4	16	2
Clay	2	2	95	2	1
COMPOSITION:					
Calcareous fragments	39	80	Tr	68	41
Calcite	1	2	—	1	1
Clay	—	—	90	—	—
Dolomite	Tr	1	Tr	1	Tr
Foraminifers	17	8	1	5	26
Glass	1	—	—	2	Tr
Nannofossils	Tr	1	2	3	1
Organic matter	—	—	5	—	—
Plant	Tr	—	—	—	—
Pyrite	6	Tr	Tr	1	Tr
Spicules	3	4	1	2	Tr



SITE 765 HOLE B CORE 32X CORED INTERVAL 299.3-309.0 mbsf



LITHOLOGIC DESCRIPTION

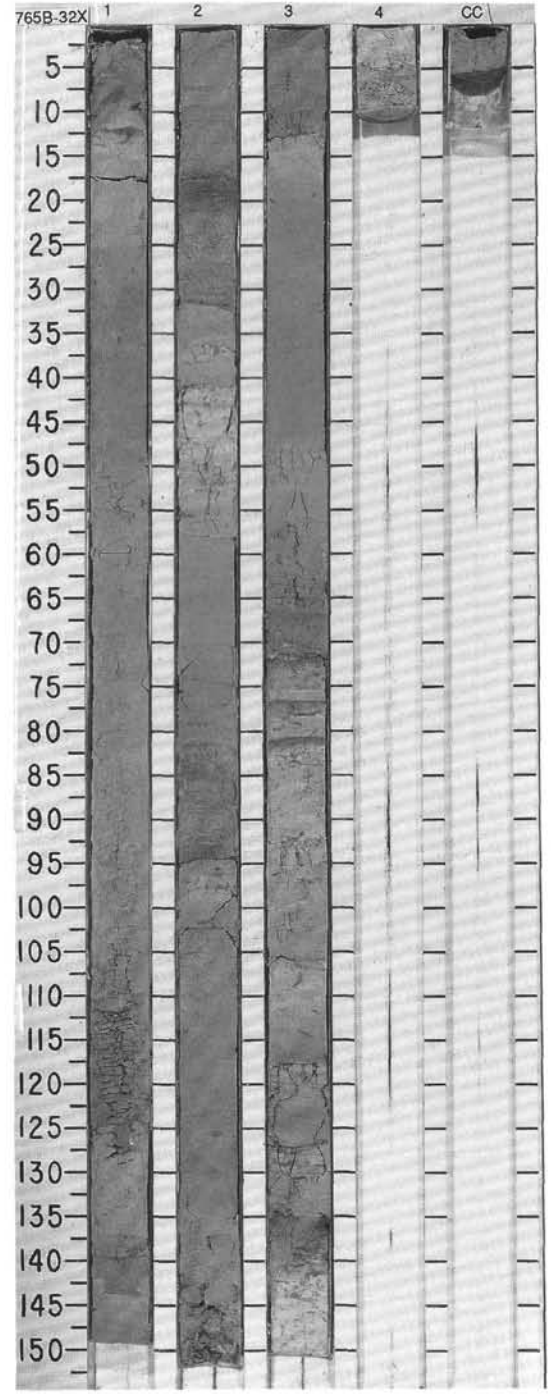
FORAMINIFERAL CHALK, FORAMINIFERAL OOZE, AND NANNOFOSSIL OOZE

Major lithologies:
FORAMINIFERAL CHALK, FORAMINIFERAL OOZE, and NANNOFOSSIL OOZE, greenish gray and gray (5Y 7/1, 8/1, 5GY 6/1, 7/1, 10Y 7/1, 8/1). Foraminiferal chalk forms upward-fining sequences, commonly laminated and/or cross-laminated, basal contacts sharp or scoured, upper contacts sharp or gradational. Foraminifers silt- to medium-sand-sized, dominantly very-fine to fine sand; units 4 cm and thicker. Foraminiferal ooze forms upward-fining sequences, laminated or massive, commonly intimately mingled with foraminiferal chalk. Lower contacts scoured or sharp, upper contacts sharp or gradational. Foraminifers silt-to coarse-sand-sized, dominantly fine sand. Nannofossil ooze graded or not, laminated, bioturbated (minor), or massive. Lower contacts sharp or gradational, upper contacts sharp, may contain substantial proportions of clay-to silt-sized calcareous fragments or clay. Traces of authigenic dolomite in all three lithologies.

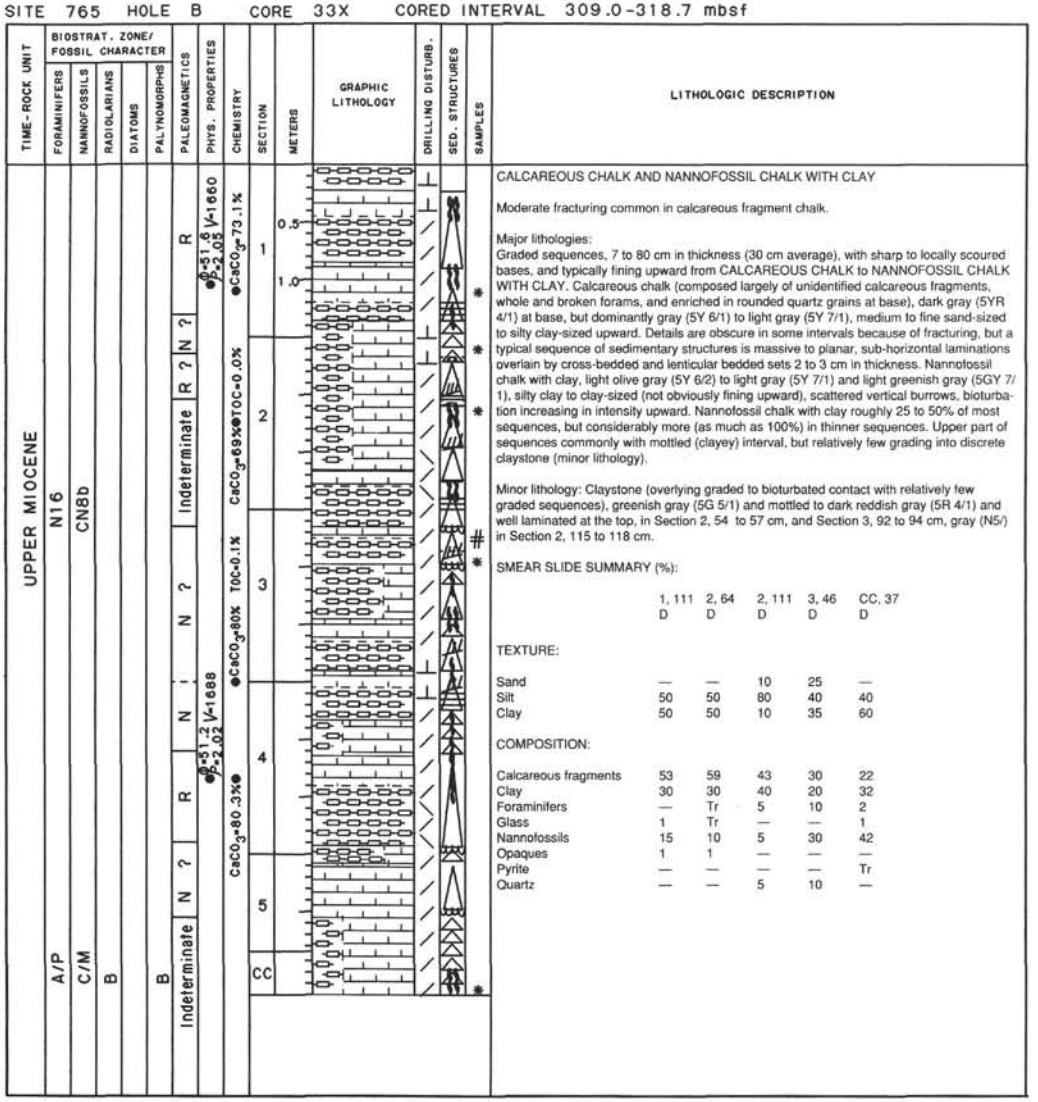
Minor lithologies:
a. Foraminiferal ooze and chalk with quartz sand, greenish gray and gray (5Y 7/1, 8/1, 5GY 7/1, 10Y 6/1, 7/1). Differs from foraminiferal ooze only in containing as much as 25% quartz sand. Sedimentary structures and relationships to other facies as for foraminiferal ooze. Section 2, 82-97, 3, 48-72 cm.
b. Foraminifer-nannofossil chalk, gray and greenish gray (5Y 8/1 and 5GY 6/1). Massive, bioturbated (minor), or laminated. Foraminifers float in matrix of nannofossils. Contacts sharp. Foraminifers silt- to fine-sand-sized. Section 2, 97-135 cm.
c. Foraminifer-nannofossil and nannofossil-foraminifer ooze. As for 'b' but unlithified to slightly firm. In addition, may have scoured basal contact, may form upward-fining sequences, may be cross-laminated. Foraminifers silt-to coarse-sand-sized. Section 2, 32-39, 3, 2-13, 72-82 cm.
d. Nannofossil chalk, greenish,gray (5GY 6/1, 7/1). Minor bioturbation, contacts sharp.Section 3, 106-118 cm.
e. Cavings, clay, greenish gray and gray (5Y 6/3, 10Y 7/1, 5G 6/1, N5). Contorted laminae, floating 'Inoceramus' prisms, mm-sized foraminifers, coal(?) fragments, and quartz sandstone clasts. Highly disturbed and inferred to be out of place. Section 1, 2-14 cm. Core consists of upward-fining sequences exhibiting massive, graded, laminated, cross-laminated, and bioturbated structure, with or without scoured bases. One or more lithologies comprise a given sequence. Foraminiferal chalk and ooze and minor lithologies a and c occupy lower portions of graded sequences and nannofossil ooze and minor lithologies b-d occupy upper portions.

SMEAR SLIDE SUMMARY (%):

	1, 144 D	2, 74 M	3, 30 M
TEXTURE:			
Sand	—	83	—
Silt	70	12	60
Clay	30	5	40
COMPOSITION:			
Calcareous fragments	32	26	30
Dolomite	Tr	1	Tr
Foraminifers	2	39	2
Glass	—	—	Tr
Nannofossils	62	6	55
Opaques	—	—	1
Organic matter	—	Tr	Tr
Pyrite	—	1	—
Quartz	Tr	25	1
Spicules	2	1	10



SITE 765 HOLE B CORE 33X CORED INTERVAL 309.0-318.7 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS CHALK AND NANNOFOSSIL CHALK WITH CLAY

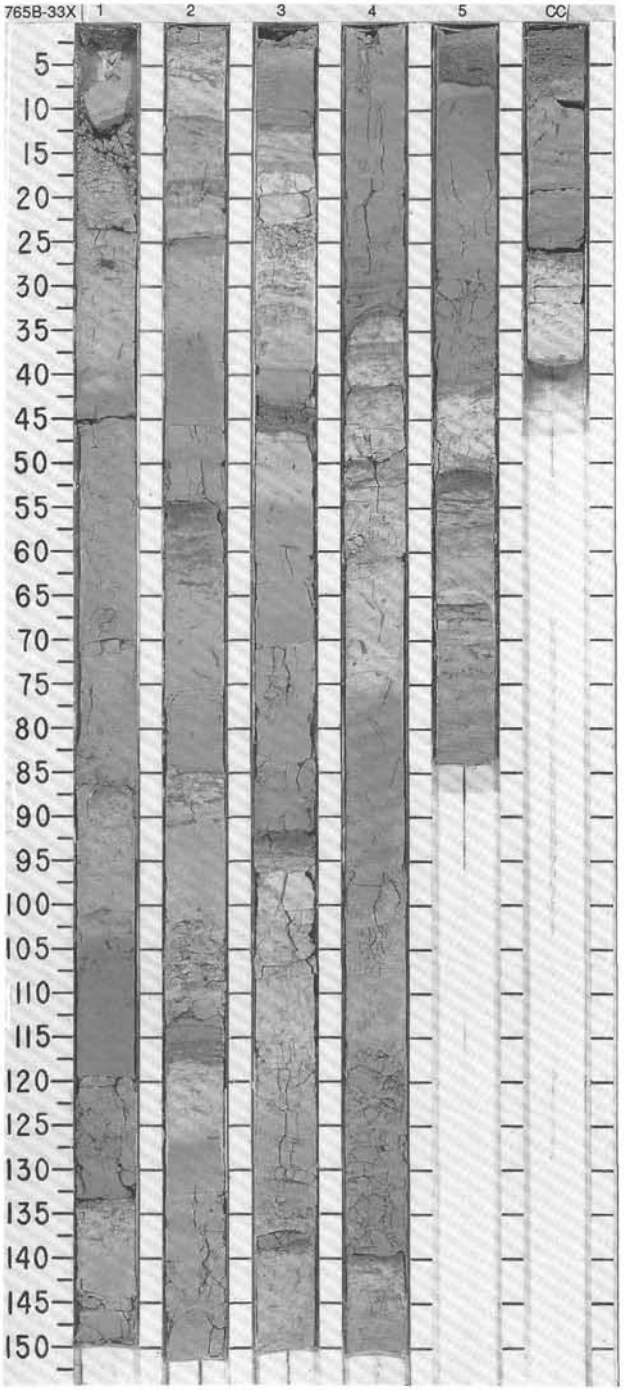
Moderate fracturing common in calcareous fragment chalk.

Major lithologies:
Graded sequences, 7 to 80 cm in thickness (30 cm average), with sharp to locally scoured bases, and typically fining upward from CALCAREOUS CHALK to NANNOFOSSIL CHALK WITH CLAY. Calcareous chalk (composed largely of unidentified calcareous fragments, whole and broken forams, and enriched in rounded quartz grains at base), dark gray (5YR 4/1) at base, but dominantly gray (5Y 6/1) to light gray (5Y 7/1), medium to fine sand-sized to silty clay-sized upward. Details are obscure in some intervals because of fracturing, but a typical sequence of sedimentary structures is massive to planar, sub-horizontal laminations overlain by cross-bedded and lenticular bedded sets 2 to 3 cm in thickness. Nannofossil chalk with clay, light olive gray (5Y 6/2) to light gray (5Y 7/1) and light greenish gray (5GY 7/1), silty clay to clay-sized (not obviously fining upward), scattered vertical burrows, bioturbation increasing in intensity upward. Nannofossil chalk with clay roughly 25 to 50% of most sequences, but considerably more (as much as 100%) in thinner sequences. Upper part of sequences commonly with mottled (clayey) interval, but relatively few grading into discrete claystone (minor lithology).

Minor lithology: Claystone (overlying graded to bioturbated contact with relatively few graded sequences), greenish gray (5G 5/1) and mottled to dark reddish gray (5R 4/1) and well laminated at the top, in Section 2, 54 to 57 cm, and Section 3, 92 to 94 cm, gray (N5/) in Section 2, 115 to 118 cm.

SMEAR SLIDE SUMMARY (%):

	1, 111 D	2, 64 D	2, 111 D	3, 46 D	CC, 37 D
TEXTURE:					
Sand	—	—	10	25	—
Silt	50	50	80	40	40
Clay	50	50	10	35	60
COMPOSITION:					
Calcareous fragments	53	59	43	30	22
Clay	30	30	40	20	32
Foraminifers	—	Tr	5	10	2
Glass	1	Tr	—	—	1
Nannofossils	15	10	5	30	42
Opaques	1	1	—	—	—
Pyrite	—	—	—	—	Tr
Quartz	—	—	5	10	—



SITE 765 HOLE B CORE 34X CORED INTERVAL 318.7-328.3 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
UPPER MIOCENE	A/P	F/M	B		B (Indeterminate)	Indeterminate	N ?	$CaCO_3$=83% TOC=0.2% ●	1	0.5			*	
	N16	CN7b					V-1673 ●0-50.6 ●2-2.00	●TOC=78.1%	2	1.0				
									CC				#	

LITHOLOGIC DESCRIPTION

CALCAREOUS CHALK AND NANNOFOSSIL CHALK WITH CLAY

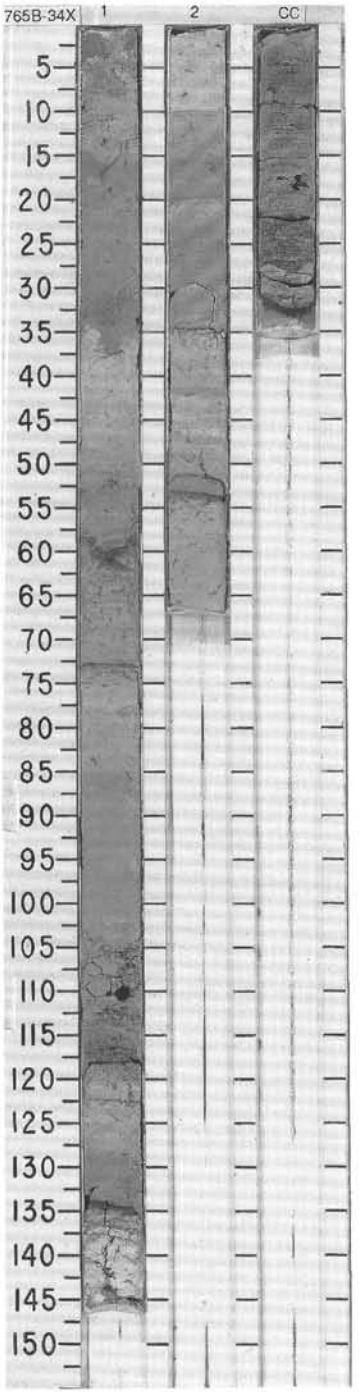
Cavings in Section 1, 0 to 13 cm. Slight to moderate fracturing in calcareous chalk.

Major lithologies:
Graded sequences, 13 to 50 cm in thickness (28 cm average), with sharp to locally scoured bases, and with the most complete sequences fining upward from CALCAREOUS CHALK to NANNOFOSSIL CHALK WITY CLAY. Calcareous chalk (composed largely of unidentified calcareous fragments, whole and broken forams, and enriched in rounded quartz grains at base), dark gray (5YR 4/1) at base, but dominantly gray (5Y 6/1), medium to fine sand-sized to silt- sized upward, typical sequence of sedimentary structures is massive to planar, sub-horizontal laminations overlain by cross-bedded sets 2 to 3 cm in thickness, coal pebbles along laminations at Section 1, 110 cm and Section CC, 23 to 24 cm. Nannofossil chalk with clay, light olive gray (5Y 6/2) to light greenish gray (5GY7/1), silty clay to clay-sized, slight to moderate bioturbation (intensity increasing upward). Nannofossil ooze with clay roughly 90 to 100% if most sequences, but locally 50 to 60% in thicker sequences. Relatively few sequences grade upward into a very thin (< 1 cm), mottled greenish gray (5GY 5/1) to dark reddish gray (5R 4/1) claystone.

Minor lithology: Mn-oxide enriched laminae, dark reddish gray (5R 4/1), at top of a graded sequence, in Section 1, 134 to 135 cm.

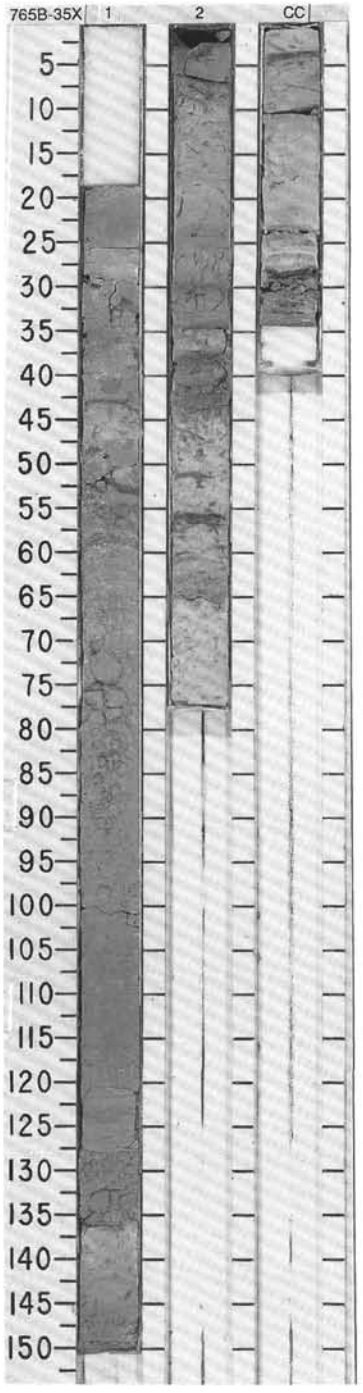
SMEAR SLIDE SUMMARY (%):

	1, 117 M
TEXTURE:	
Sand	20
Silt	30
Clay	50
COMPOSITION:	
Calcareous fragments	20
Calcite	3
Clay	25
Foraminifers	2
Nannofossils	25
Organic matter	2
Pyrite	7
Quartz	10
Unspecified minerals	5



SITE 765 HOLE B CORE 35X CORED INTERVAL 328.3-337.9 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
UPPER MIOCENE	A/P N16	A/M CN7b	B		R/G R ?	Indeterminate N	ρ=48.3 γ=2.07 γ=1679	$CaCO_3$=80.2% TOC=0.3% $CaCO_3$=80%	1 2 CC	0.5 1.0	VOID				CALCAREOUS CHALK AND NANNOFOSSIL CHALK WITH CLAY Void in Section 1, 0 to 17 cm. Calcareous chalk intervals moderately to highly fractured. Nannofossil chalk with clay intervals characterized by slight flowage around sparse drilling biscuits. *Major lithologies:* Graded sequences, 10 to 57 cm in thickness, typically fining upward from CALCAREOUS CHALK to NANNOFOSSIL CHALK WITH CLAY. Nature of boundaries and detail of internal structures obscured by disturbance. Calcareous chalk (composed largely of unidentified calcareous fragments, whole and broken forams, and enriched in rounded quartz grains base), commonly dark gray (5YR 4/1) at the base, but dominantly gray (5Y 6/1), medium to fine sand-sized to silt-sized upward, massive appearance, planar laminations, and very thin lenticular beds are all recognizable within various intervals. Nannofossil ooze with clay, light greenish gray (5GY 7/1) to white (5Y 8/1), silty clay to clay-sized, slight to moderate bioturbation (intensity increasing upward). Relatively few sequences grading upward into a very thin (< 1 cm), mottled greenish gray (5GY 5/1) claystone.



SITE 765 HOLE B CORE 36X CORED INTERVAL 337.9-347.5 mbsf

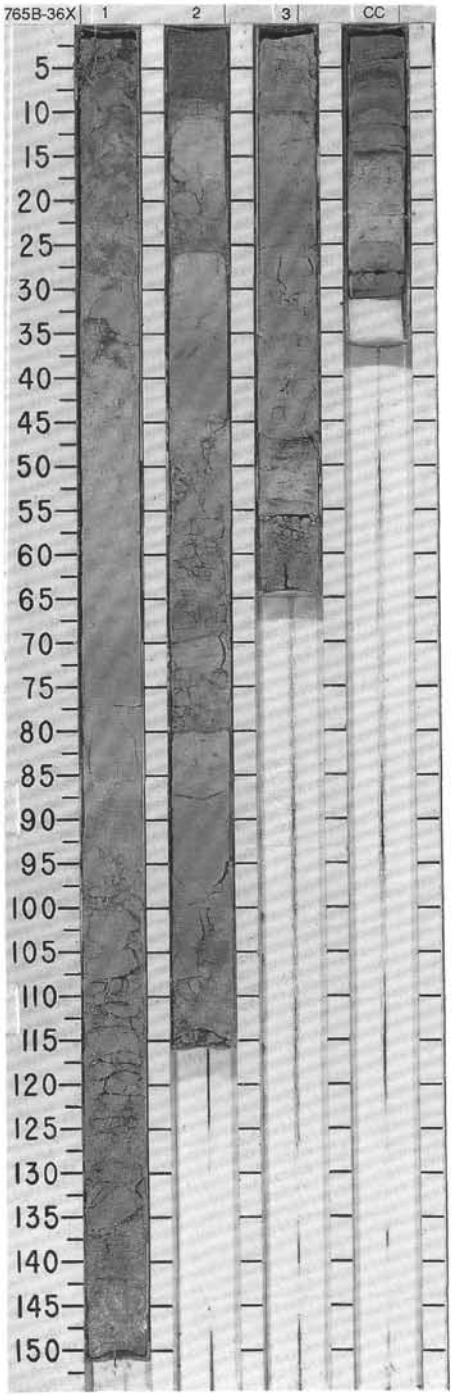
TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
UPPER MIOCENE	A/P	N16	C/M	CN6	B	R/G	(indeterminate)	ϕ=46.5 γ=1631 β=2.02	$CaCO_3$=78.7% TOC=0.3% $CaCO_3$=86.6% $CaCO_3$=71% TOC=0.0%	1 2 3 CC	0.5 1.0		# #	OG JW

LITHOLOGIC DESCRIPTION

CALCAREOUS CHALK AND NANNOFOSSIL CHALK WITH CLAY

Cavings in Section 1, 0 to 35 cm. Calcareous fragment chalk intervals moderately to highly fractured. Nannofossil chalk with clay intervals relatively undisturbed to with slight flowage around sparse drilling biscuits.

Major lithologies:
Graded sequences, 10 to 110 cm in thickness (44 cm average), with sharp bases, and typically fining upward from CALCAREOUS CHALK (composed largely of unidentified calcareous fragments, whole and broken forams and enriched in rounded quartz grains at base), commonly dark gray (5YR 4/1 at base, but dominantly gray (5Y 6/1) to light greenish gray (10Y 7/1), medium to fine sand-sized to silt-sized upward, typical sequence of sedimentary structures appears to be massive to planar, sub-horizontal laminations to thin cross-bedded sets. Nannofossil ooze with clay, light greenish gray (5Y 7/1) to white (5Y 8/1), silty clay to clay-sized, slight to moderate bioturbation (intensity increasing upward). Relatively few sequences grading upward into a very thin (< 1 cm), mottled greenish gray (5GY 5/1) claystone.



SITE 765 HOLE B CORE 37X CORED INTERVAL 347.5-357.1 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
UPPER MIOCENE	A/P	R/P	B		B	N R N ?	Indeterminate ϕ=47.1 ρ_b=2.02 V-1696	$CaCO_3$=87.1% TOC=0.2% $CaCO_3$=84%	1 2 CC	0.5 1.0			P *	

LITHOLOGIC DESCRIPTION

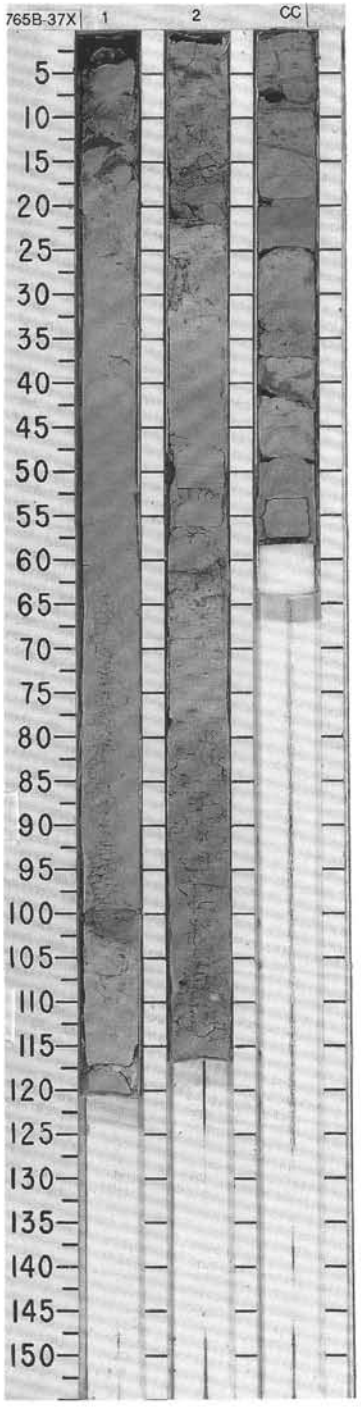
CALCAREOUS CHALK AND NANNOFOSSIL CHALK WITH CLAY

Cavings in Section 1, 0 to 25 cm including a pyrite nodule (3 to 5 cm diameter) from 2 to 3 cm. Calcareous chalk intervals moderately to highly fractured. Nannofossil chalk with clay intervals relatively undisturbed to with flowage around common drilling bisquits.

Major lithologies:
Graded sequences, 5 to 80 cm in thickness, with sharp to obscure bases, and typically fining upward from CALCAREOUS CHALK to NANNOFOSSIL CHALK WITH CLAY. Calcareous chalk (composed largely of unidentified calcareous fragments, whole and broken forams, and enriched in rounded quartz grains at base), pale red (5R 6/3) top inkish gray (5YR 6/2) at base, but dominantly gray (5YR 6/1), fine to very fine sand-sized to silt-sized upward, observed sedimentary structures include massive bedding and planar laminations, but the intervals are disturbed, and a typical sequence of sedimentary structures is not evident. Nannofossil chalk with clay, light greenish gray (10Y 7/1) to white (5Y 8/1), silty clay to clay-sized, slight to moderate bioturbation (intensity increasing upward). Relatively few sequences grading upward into thin (< 1 cm), mottled greenish gray (5GY 5/1) claystone.

SMEAR SLIDE SUMMARY (%):

	1, 96 D
TEXTURE:	
Sand	30
Silt	60
Clay	10
COMPOSITION:	
Calcareous fragments	25
Clay	35
Dolomite	Tr
Foraminifers	25
Nannofossils	10
Organic matter	Tr
Quartz	5
Unspecified minerals	Tr

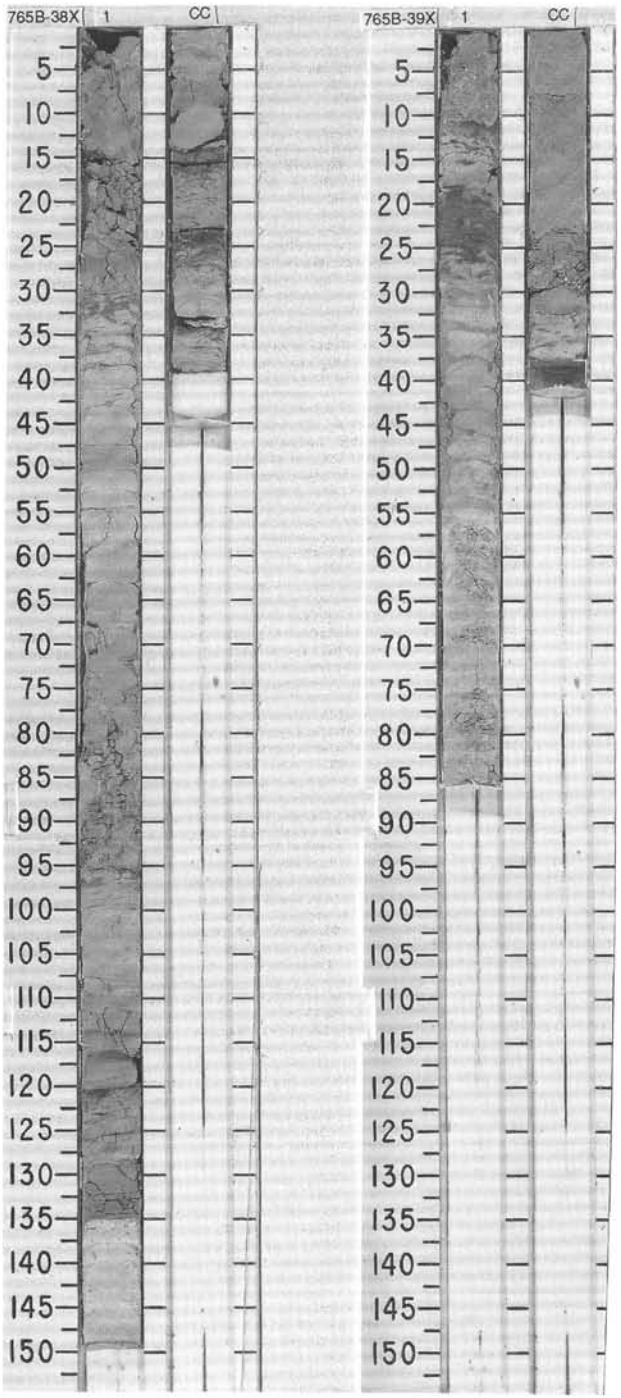


SITE 765 HOLE B CORE 38X CORED INTERVAL 357.1-366.7 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
UPPER MIOCENE	A/P	R/M	B	($CaCO_3$=76.8% TOC=0.2%)	B (Indeterminate)		ϕ=48.1 ϕ=1688 ϕ=53.4 ϕ=2.01 ϕ=2.01 ϕ=2062	$CaCO_3$=82.4% $CaCO_3$=91.5%	1 CC	0.5 1.0					CALCAREOUS CHALK AND NANNOFOSSIL CHALK WITH CLAY Cavings in Section 1, 0 to 30 cm. Calcareous fragment chalk intervals moderately to highly fractured. Nannofossil chalk with clay intervals relatively undisturbed to with flowage around sparse drilling biscuits. Nature of boundaries between adjacent lithologies obscured by disturbance. Major lithologies: Graded sequences, 4 to 65 cm in thickness, with sharp to obscure bases, and typically fining upward from CALCAREOUS CHALK to NANNOFOSSIL CHALK WITH CLAY, gray (5YR 6/1), fine to very fine sand-sized to silty clay-sized upward, sedimentary structures include massive bedding, sub-horizontal and inclined planar laminatons, but a typical progression of sedimentary structures is not evident. Nannofossil chalk with clay, light greenish gray (10Y 7/1) to white (5Y 8/1) silty clay to clay-sized, slight to moderate bioturbation (intensity increasing upward). Nannofossil chalk with clay roughly 40 to 60% of most sequences. Relatively few sequences grading upward into thin (< 1 cm), mottled greenish gray (5GY 5/1) claystone. Minor lithologies: a. Mn-oxide enriched laminae, reddish gray (5R 5/1) with diffuse boundaries, in Section 1, 48 to 49 cm, and Section CC, 14 to 15 cm. b. Claystone, dark greenish gray (10Y 4/1) occurring at the top of a graded sequence in Section CC, 23 to 25 cm.

SITE 765 HOLE B CORE 39X CORED INTERVAL 366.7-376.4 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	C/P	C/P	B	($CaCO_3$=76.5%)	F/G	Indeterminate	ϕ=53.5 ϕ=1.94	$CaCO_3$=95% TOC=0.1%	1 CC						CALCAREOUS CHALK AND NANNOFOSSIL CHALK Cavings in Section 1, 0 to 10 cm. The Calcareous chalk interval characterized by widely spaced, brecciated drilling biscuits floating in a homogenized matrix. Closely spaced drilling biscuits, 3 to 4 cm in thickness, within nannofossil chalk intervals. Major lithologies: Core consists primarily of a single graded sequence, 98 cm in thickness, with a sharp base, and lining upward from CALCAREOUS CHALK to NANNOFOSSIL OOZE WITH CLAY. Calcareous chalk (composed largely of unidentified calcareous fragments, and whole and broken forams), light greenish gray (10Y 7/1), fine to very fine sand-sized to silt-sized upward, 62 cm thickness. Nannofossil chalk with clay, light gray (5YR 7/1), silty clay to clay-sized, bioturbated to disturbed at top, 38 cm thickness. Minor lithology: Dolomitic claystone, dark greenish gray (10 Y 4/1) at top of the graded sequence, in Section 1, 19 to 25 cm.

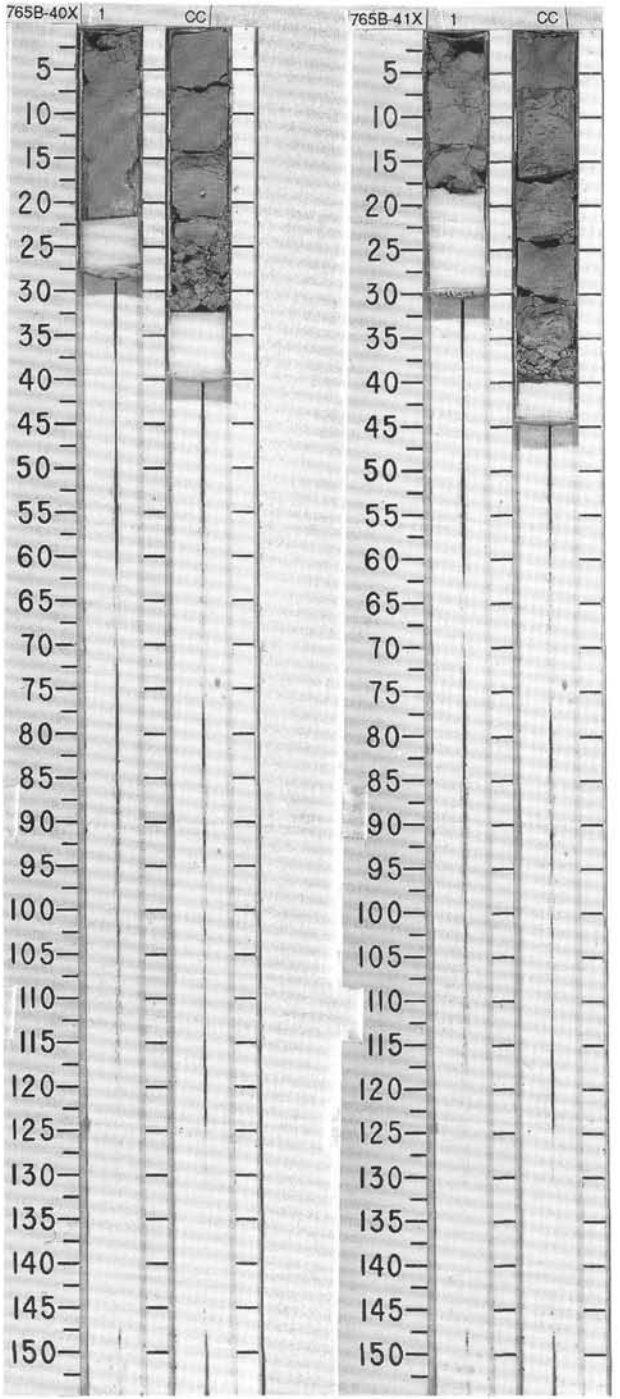


SITE 765 HOLE B CORE 40X CORED INTERVAL 376.4-386.0 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	N13 - 14 A/G CN3 - 5 (?) C/P	B	(Indeterminate)	B	R ?		$CaCO_3$=73% TOC=0.3%	1 CC						CALCAREOUS CHALK AND NANNOFOSSIL CHALK Fragmentation to brecciation from 25 to 32 cm. Major lithologies: NANNOFOSSIL CHALK occurs from the top of the core down to Section, light greenish gray (10Y 7/1), silty to clay-sized, homogeneous to disturbed in appearance. Section CC, 15 cm to the bottom consists of a graded sequence, fining upward from CALCAREOUS CHALK to nannofossil chalk. Calcareous chalk, light greenish gray (10Y 7/1), very fine sand-sized to silt-sized upward. Nannofossil chalk, light greenish gray (10Y 7/1), silty clay to clay-sized, faintly laminated, and grading finally into mottled, greenish gray (5G 5/1) clayey nannofossil chalk at the top.

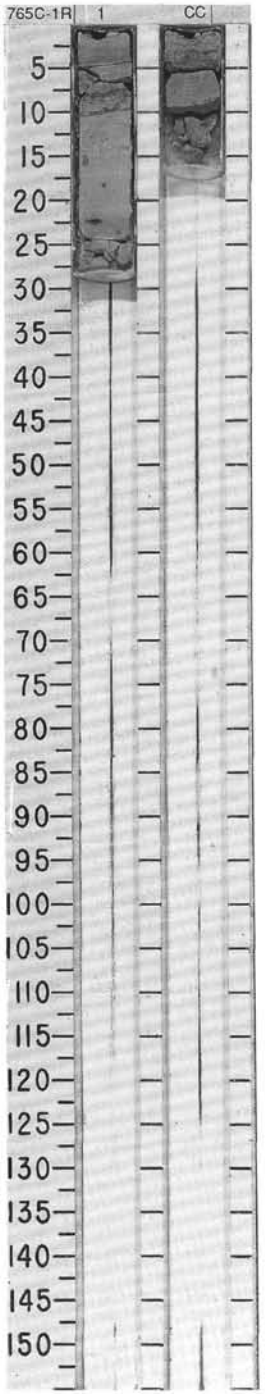
SITE 765 HOLE B CORE 41X CORED INTERVAL 386.0-395.6 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	N13 - 14 A/P CN3 - 5 (?) F/P	B			B	N R			1 CC		VOID				NANNOFOSSIL CHALK Core is broken up into rectangular to rounded blocks with disturbance around the edges. Contacts between adjacent lithologies are not intact (nature unclear). Major lithology: The core appears to consist of several sequences, 15 to 20 cm in thickness, of NANNOFOSSIL CHALK, silty clay to clay-sized,light greenish gray (10Y 7/1), homogeneous to progressively bioturbated upward.



SITE 765 HOLE C CORE 1R CORED INTERVAL 350.2-359.6 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	A/M	A/G	B		B	R			1 CC						CALCAREOUS CHALK AND NANNOFOSSIL CHALK WITH CLAY Major lithology: Graded sequences, 5 to 20 cm, boundaries are not intact, but typically fining upward from CALCAREOUS OOZE to NANNOFOSSIL CHALK. Calcareous chalk (largely whole and broken foraminifers), gray (5YR 6/1),and fine sand-sized at the base. Generally massive with planar laminations, and with dark gray (N4/), well laminated pebble (1 cm maximum diameter) in Section 1, 22 cm. Nannofossil chalk, light gray (5Y 7/1) to light greenish gray (5GY 7/1), silt to clay-sized, but not obviously fining upward, and progressively bioturbated upward. Pale red (5R 6/2) to reddish gray (5R 6/1) clayey chalk with a mottled to disrupted laminated appearance within the upper few centimeters of the sequence.
	N14 - 15	CN6													



SITE 765 HOLE C CORE 2R CORED INTERVAL 359.6-369.3 mbsf

TIME-ROCK UNIT	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
MIDDLE MIOCENE	A/M	N13 - 15	F/M	B	Indeterminate B	N? R	ϕ= 44.7 V= 1839 ● ρ_b= 2.06 ϕ= 34.0 V= 2559 ● ρ_b= 2.36		1 2 3 CC	0.5 1.0				

LITHOLOGIC DESCRIPTION

CALCAREOUS CHALK AND NANNOFOSSIL CHALK

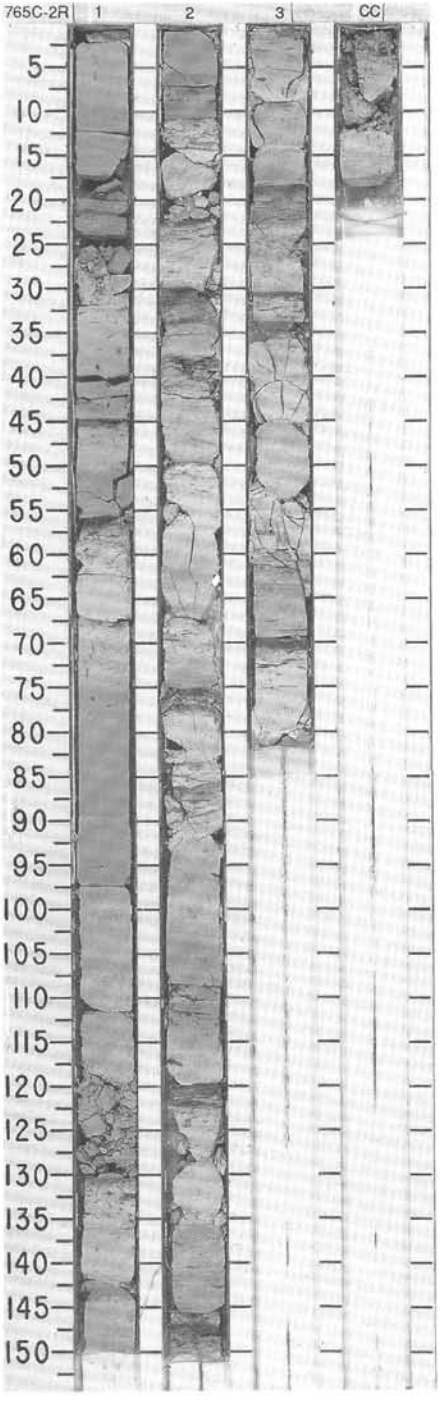
Slight to extreme fracturing within a few restricted intervals. Flowage and disturbance along a few contacts.

Major lithology: Graded sequences, 1 to 62 cm, occasionally stacked, but usually alternating with thin clayey intervals. The graded sequences typically with sharp bases and gradational tops, fining upward from CALCAREOUS CHALK to NANNOFOSSIL CHALK. Calcareous chalk (largely whole and broken foraminifers), gray (5YR 6/1) to light gray (5Y 7/1), and fine to coarse sand-sized at the base. The general progression of sedimentary structures upward includes cut-and-fill scours at the base, massive to planar laminations, convoluted to planar cross-laminations, and faint, horizontal laminations to massive at the transition to nannofossil chalk. Dark fragments (organics?) and claystone clasts concentrated along planar laminations towards the base, esp. in Section 2, 140 to 145 cm. Nannofossil chalk, light gray (5Y 7/1) and progressively with black (5Y 2.5/1) and dark greenish gray (10Y 4/1) burrow fillings and disrupted laminae upward (thinner sequences bioturbated throughout), silt- to clay-sized, but not obviously fining upward. Abundance of burrow fillings and disrupted laminae at the top grading into claystone of same appearance.

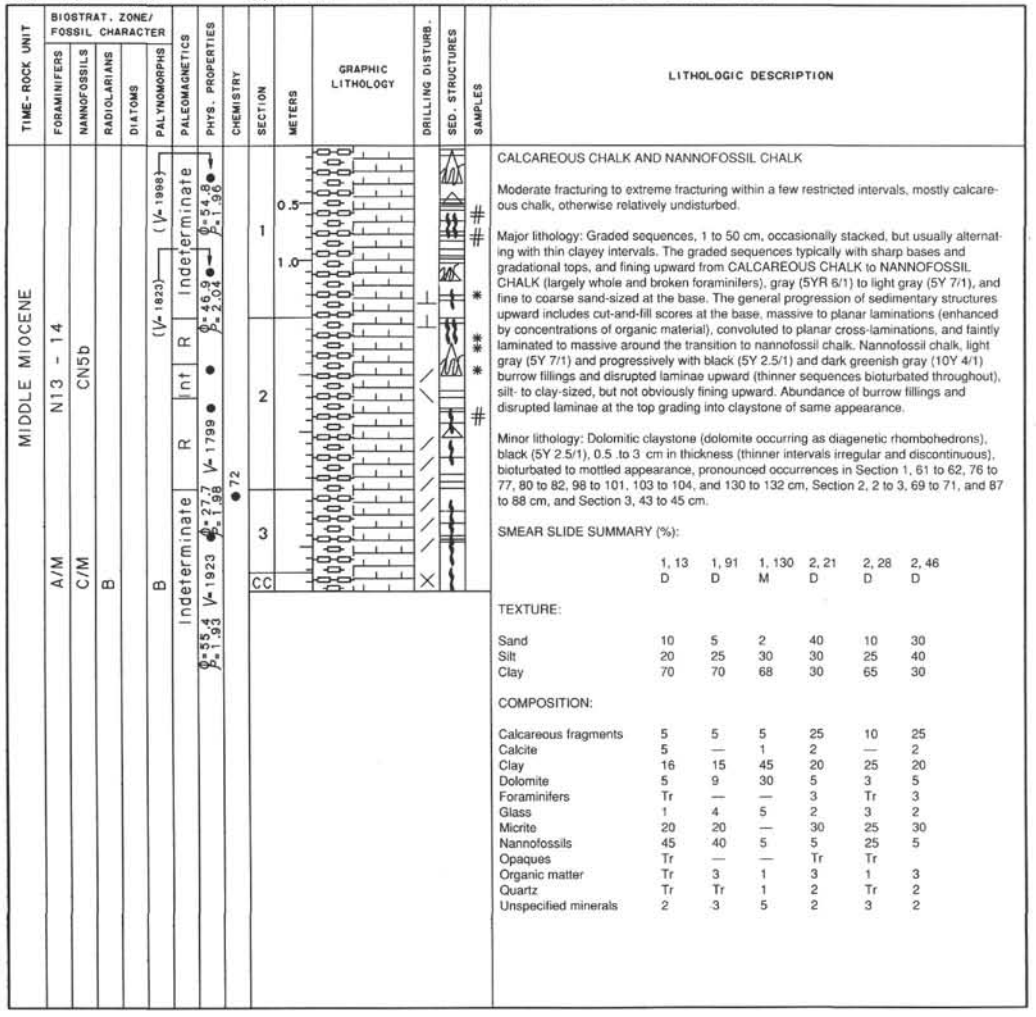
Minor lithology: Dolomitic claystone (dolomite occurring as diagenetic rhombohedrons), black (5Y 2.5/1), 0.5 to 3 cm in thickness (thinner intervals irregular and discontinuous), bioturbated to mottled appearance, pronounced occurrences in Section 2, 30 to 32, 120 to 122, and 147 to 148 cm, and Section 3, 18 to 19, 34 to 36, 70 to 71 cm.

SMEAR SLIDE SUMMARY (%):

	1, 56 M	1, 65 M	2, 30 M	2, 30 M	3, 25 M	3, 69 M
TEXTURE:						
Sand	—	—	—	5	23	10
Silt	25	10	20	20	23	20
Clay	75	90	80	75	54	70
COMPOSITION:						
Accessory minerals	—	—	—	—	Tr	—
Calcareous fragments	—	39	5	—	—	10
Chert	—	—	—	—	Tr	—
Clay	54	30	50	64	—	68
Dolomite	30	—	20	20	—	10
Feldspar	Tr	—	—	—	Tr	—
Foraminifers	Tr	1	—	—	29	1
Glass	2	Tr	2	5	—	2
Glauconite	—	—	—	—	6	—
Inorganic calcite	—	—	—	—	2	—
Mica	—	—	—	—	2	—
Micrite	—	—	5	—	39	—
Nannofossils	2	30	5	—	—	1
Opaques	3	Tr	2	5	—	1
Organic matter	3	—	1	3	—	2
Quartz	2	—	Tr	Tr	19	—
Unknown	—	—	—	—	2	—
Unspecified minerals	3	Tr	5	3	—	5



SITE 765 HOLE C CORE 3R CORED INTERVAL 369.3-379.0 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS CHALK AND NANNOFOSSIL CHALK

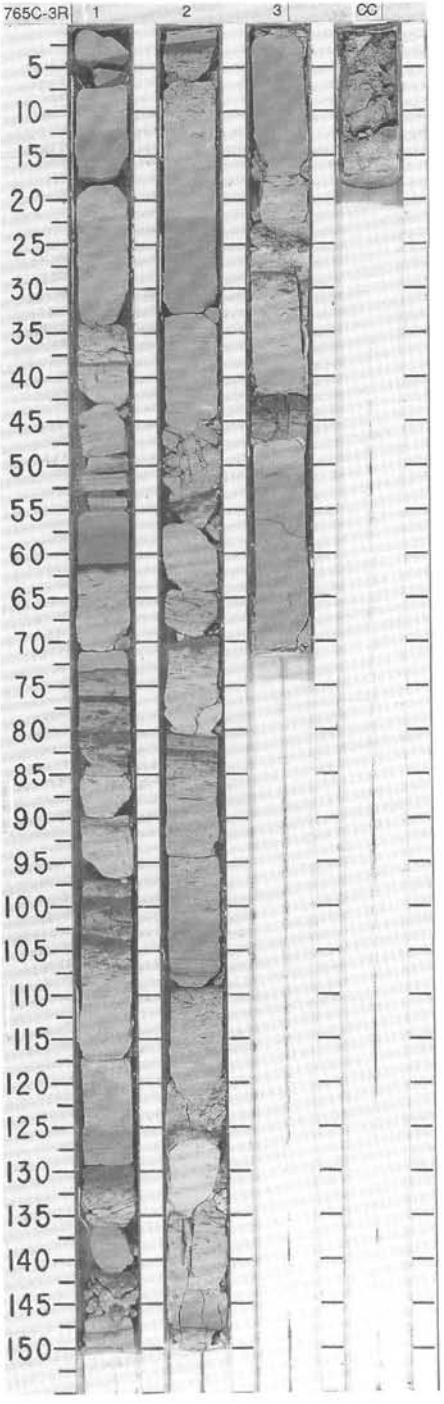
Moderate fracturing to extreme fracturing within a few restricted intervals, mostly calcareous chalk, otherwise relatively undisturbed.

Major lithology: Graded sequences, 1 to 50 cm, occasionally stacked, but usually alternating with thin clayey intervals. The graded sequences typically with sharp bases and gradational tops, and fining upward from CALCAREOUS CHALK to NANNOFOSSIL CHALK (largely whole and broken foraminifers), gray (5YR 6/1) to light gray (5Y 7/1), and fine to coarse sand-sized at the base. The general progression of sedimentary structures upward includes cut-and-fill scores at the base, massive to planar laminations (enhanced by concentrations of organic material), convoluted to planar cross-laminations, and faintly laminated to massive around the transition to nannofossil chalk. Nannofossil chalk, light gray (5Y 7/1) and progressively with black (5Y 2.5/1) and dark greenish gray (10Y 4/1) burrow fillings and disrupted laminae upward (thinner sequences bioturbated throughout), silt- to clay-sized, but not obviously fining upward. Abundance of burrow fillings and disrupted laminae at the top grading into claystone of same appearance.

Minor lithology: Dolomitic claystone (dolomite occurring as diagenetic rhombohedrons), black (5Y 2.5/1), 0.5 .to 3 cm in thickness (thinner intervals irregular and discontinuous), bioturbated to mottled appearance, pronounced occurrences in Section 1, 61 to 62, 76 to 77, 80 to 82, 98 to 101, 103 to 104, and 130 to 132 cm, Section 2, 2 to 3, 69 to 71, and 87 to 88 cm, and Section 3, 43 to 45 cm.

SMEAR SLIDE SUMMARY (%):

	1, 13 D	1, 91 D	1, 130 M	2, 21 D	2, 28 D	2, 46 D
TEXTURE:						
Sand	10	5	2	40	10	30
Silt	20	25	30	30	25	40
Clay	70	70	68	30	65	30
COMPOSITION:						
Calcareous fragments	5	5	5	25	10	25
Calcite	5	—	1	2	—	2
Clay	16	15	45	20	25	20
Dolomite	5	9	30	5	3	5
Foraminifers	Tr	—	—	3	Tr	3
Glass	1	4	5	2	3	2
Micrite	20	20	—	30	25	30
Nannofossils	45	40	5	5	25	5
Opaques	Tr	—	—	Tr	Tr	
Organic matter	Tr	3	1	3	1	3
Quartz	Tr	Tr	1	2	Tr	2
Unspecified minerals	2	3	5	2	3	2



SITE 765 HOLE C CORE 4R CORED INTERVAL 379.0-388.6 mbsf

TIME-ROCK UNIT: MIDDLE MIOCENE

BIOSTRAT. ZONE/FOSSIL CHARACTER:
- FORAMINIFERS: A/M; N13 - 14
- NANNOFOSSILS: C/G; CN5b
- RADIOLARIANS: B
- DIATOMS:
- PALYNOMORPHS: B

PALEOMAGNETICS: R | N? | R | N? | R? | N? | R | N? | int | R | N? | R

PHYS. PROPERTIES: ϕ=35.5 ρ_b=2.18 V$_p$=2141 ● ϕ=52.5 ρ_b=1.97 V$_p$=1980 ● ϕ=26.1 ρ_b=2.34 V$_p$=3296 ● ϕ=51.6 ρ_b=1.96 V$_p$=1830

CHEMISTRY: ● $CaCO_3$=72 TOC=0.1 ● $CaCO_3$=52

SECTION: 1, 2, 3, 4, CC

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY

DRILLING DISTURB.

SED. STRUCTURES

SAMPLES: OG, IW

LITHOLOGIC DESCRIPTION

CALCAREOUS CHALK AND NANNOFOSSIL CHALK

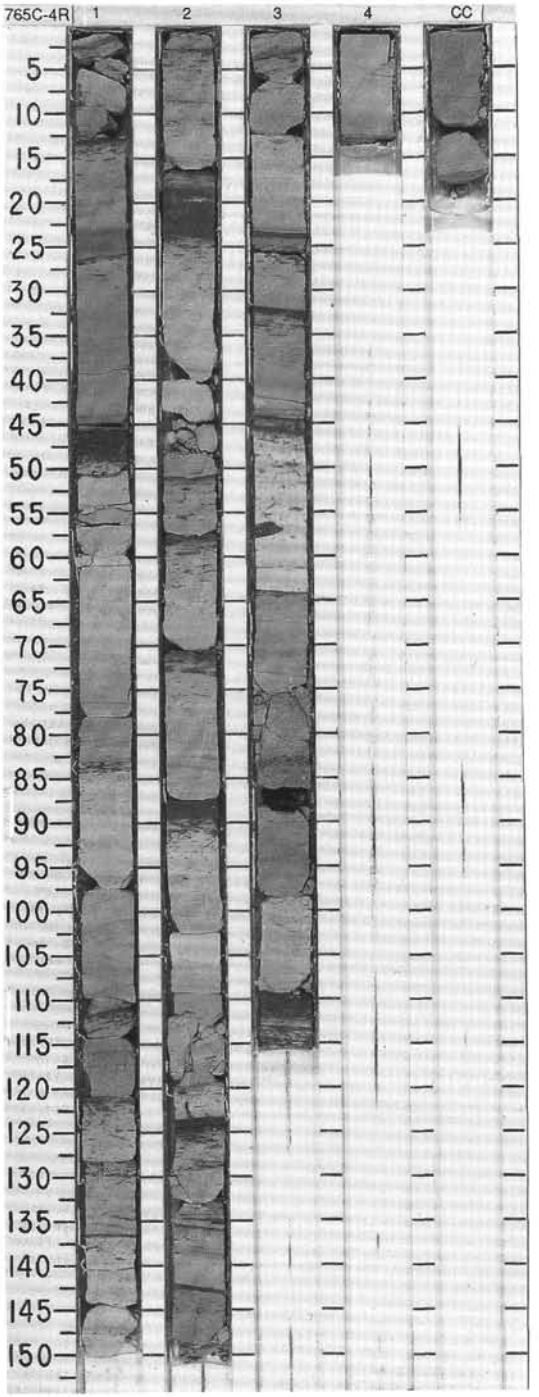
Moderate fracturing within a few intervals of calcareous fragment ooze, otherwise relatively undisturbed.

Major lithology: Graded sequences, 1 to 30 cm, occasionally stacked, but usually alternating with thin clayey intervals. The graded sequences typically with sharp bases and gradational tops, and fining upward from CALCAREOUS CHALK to NANNOFOSSIL CHALK. Calcareous chalk (largely whole and broken foraminifers), gray (5YR 6/1) to light gray (5Y 7/1), and fine to coarse sand-sized at the base. The general progression of sedimentary structures upward includes cut-and-fill scores at the base (generally filled with coarse sediment, but with coal clast in Section 3, 86 to 88 cm), massive to planar laminations (organic fragments along laminations, esp. in Section 3, 83 to 86 cm), convoluted to planar cross-laminations, and with faint laminations to massive around the transition to nannofossil ooze. Nannofossil chalk, light gray (5Y 7/1) and progressively with black (5Y 2.5/1) and dark greenish gray (10Y 4/1) burrow fillings and disrupted laminae upward, silt to clay-sized, but not obviously fining upward. Abundance of burrow fillings and disrupted laminae at the top grading into claystone of same appearance.

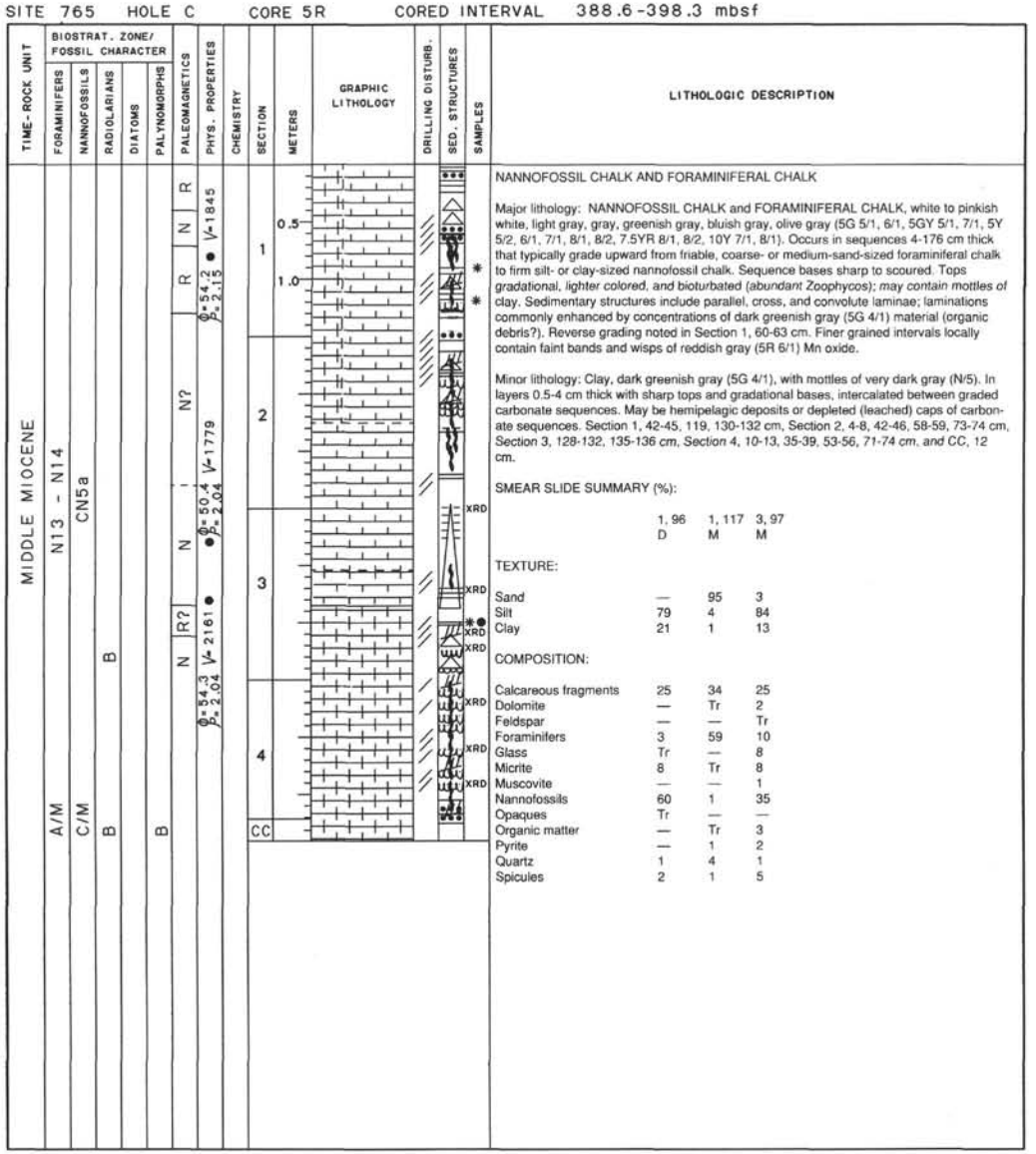
Minor lithology: Dolomitic claystone (dolomite occurring as diagenetic rhombohedrons), black (5Y 2.5/1), 0.5 to 6 cm (thinner intervals irregular and discontinuous), bioturbated to mottled appearance, pronounced occurrences in Section 1, 45 to 49 cm, Section 2, 18 to 24, 88 to 90, and 123 to 125 cm, and Section 3, 110 to 113 cm.

SMEAR SLIDE SUMMARY (%):

	1, 47 M	1, 59 D	1, 82 D	2, 113 D	3, 57 D	3, 75 D	3, 108 D
TEXTURE:							
Sand	—	5	30	20	—	20	5
Silt	25	45	35	50	25	50	40
Clay	75	50	35	30	75	30	55
COMPOSITION:							
Calcareous fragments	2	30	36	45	8	43	8
Calcite	—	—	5	5	—	3	5
Clay	65	36	10	30	25	15	25
Dolomite	21	—	2	5	20	5	8
Foraminifers	—	—	10	5	—	1	—
Glass	2	1	2	—	Tr	2	5
Micrite	—	—	20	—	25	—	25
Nannofossils	1	30	10	5	20	25	20
Opaques	2	1	1	1	Tr	1	Tr
Organic matter	2	Tr	Tr	Tr	Tr	2	Tr
Quartz	—	—	2	—	Tr	1	1
Unspecified minerals	5	2	2	2	2	2	2



SITE 765 HOLE C CORE 5R CORED INTERVAL 388.6-398.3 mbsf



LITHOLOGIC DESCRIPTION

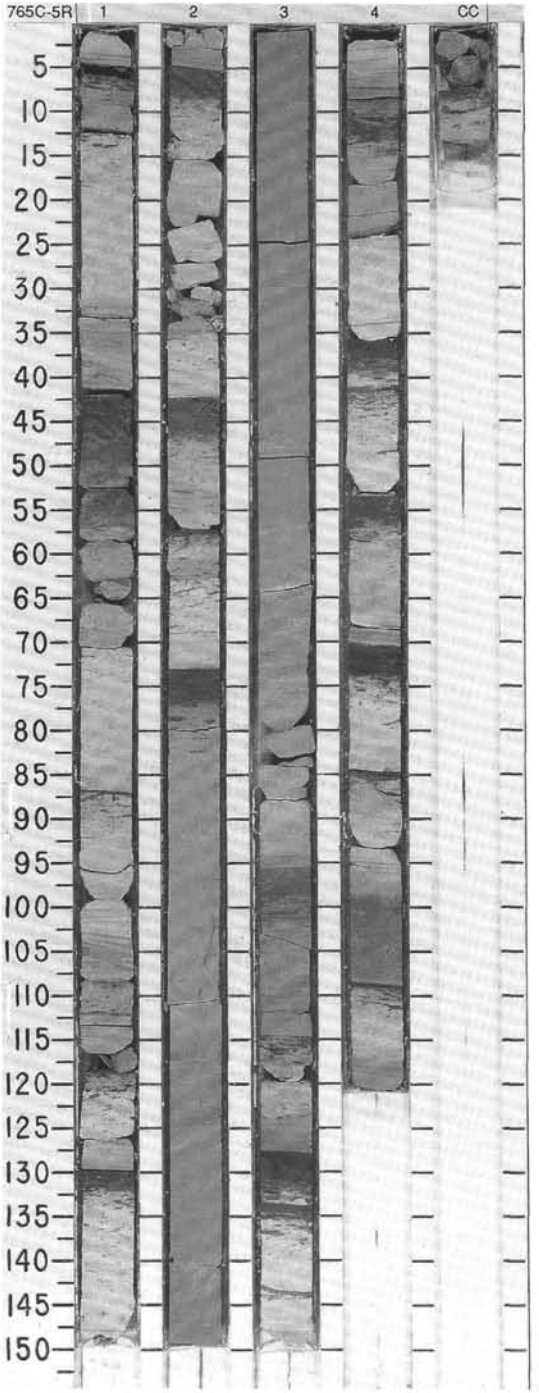
NANNOFOSSIL CHALK AND FORAMINIFERAL CHALK

Major lithology: NANNOFOSSIL CHALK and FORAMINIFERAL CHALK, white to pinkish white, light gray, gray, greenish gray, bluish gray, olive gray (5G 5/1, 6/1, 5GY 5/1, 7/1, 5Y 5/2, 6/1, 7/1, 8/1, 8/2, 7.5YR 8/1, 8/2, 10Y 7/1, 8/1). Occurs in sequences 4-176 cm thick that typically grade upward from friable, coarse- or medium-sand-sized foraminiferal chalk to firm silt- or clay-sized nannofossil chalk. Sequence bases sharp to scoured. Tops *gradational, lighter colored, and bioturbated (abundant Zoophycos); may contain mottles of* clay. Sedimentary structures include parallel, cross, and convolute laminae; laminations commonly enhanced by concentrations of dark greenish gray (5G 4/1) material (organic debris?). Reverse grading noted in Section 1, 60-63 cm. Finer grained intervals locally contain faint bands and wisps of reddish gray (5R 6/1) Mn oxide.

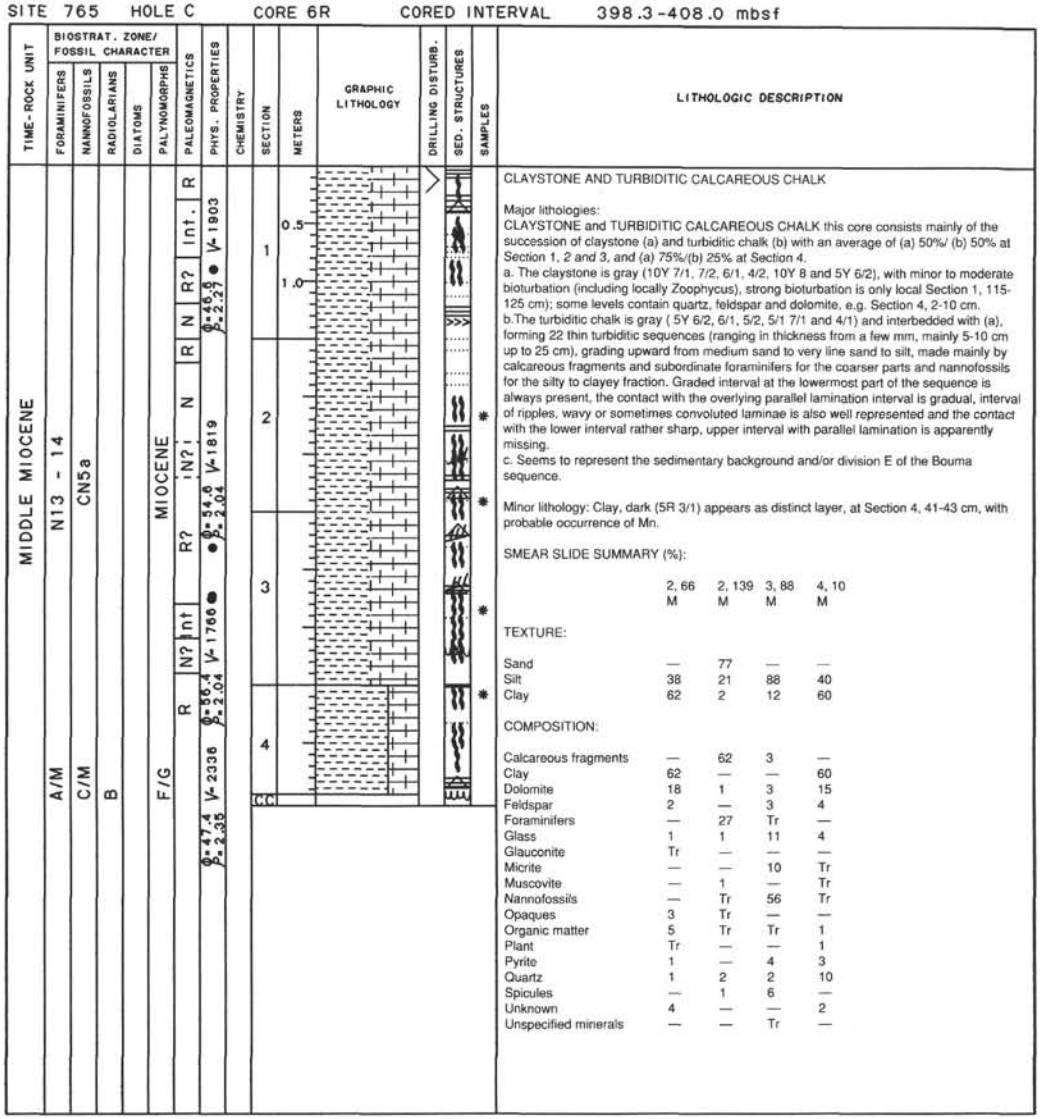
Minor lithology: Clay, dark greenish gray (5G 4/1), with mottles of very dark gray (N/5). In layers 0.5-4 cm thick with sharp tops and gradational bases, intercalated between graded carbonate sequences. May be hemipelagic deposits or depleted (leached) caps of carbonate sequences. Section 1, 42-45, 119, 130-132 cm, Section 2, 4-8, 42-46, 58-59, 73-74 cm, *Section 3, 128-132, 135-136 cm, Section 4, 10-13, 35-39, 53-56, 71-74 cm, and CC,* 12 cm.

SMEAR SLIDE SUMMARY (%):

	1, 96 D	1, 117 M	3, 97 M
TEXTURE:			
Sand	—	95	3
Silt	79	4	84
Clay	21	1	13
COMPOSITION:			
Calcareous fragments	25	34	25
Dolomite	—	Tr	2
Feldspar	—	—	Tr
Foraminifers	3	59	10
Glass	Tr	—	8
Micrite	8	Tr	8
Muscovite	—	—	1
Nannofossils	60	1	35
Opaques	Tr	—	—
Organic matter	—	Tr	3
Pyrite	—	1	2
Quartz	1	4	1
Spicules	2	1	5



SITE 765 HOLE C CORE 6R CORED INTERVAL 398.3-408.0 mbsf



LITHOLOGIC DESCRIPTION

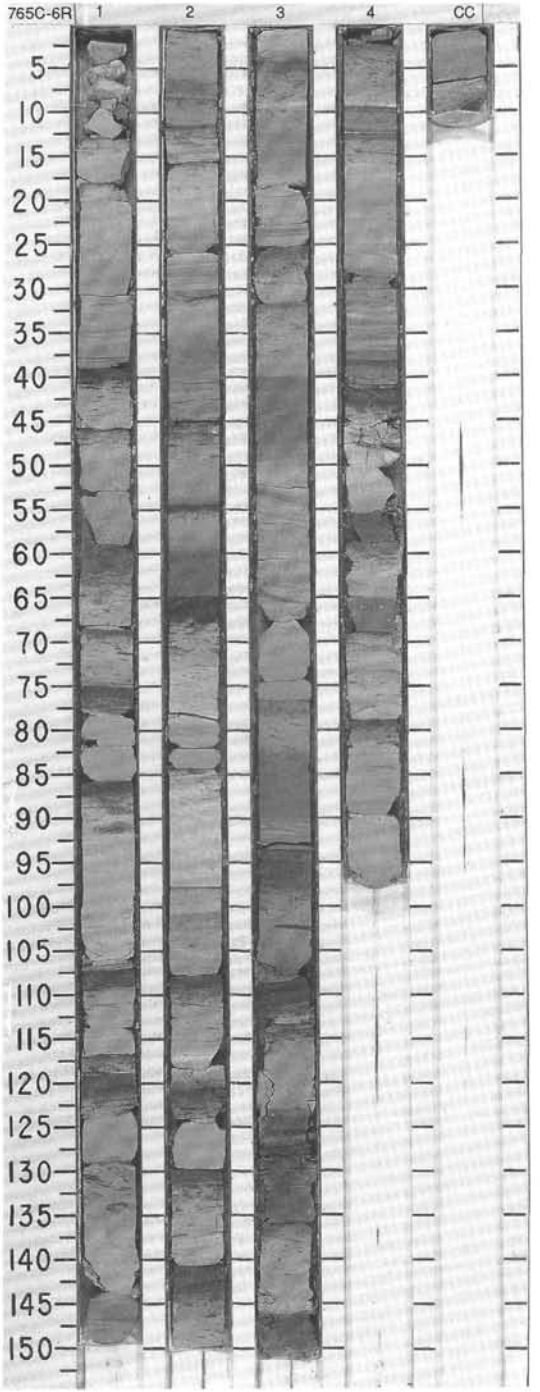
CLAYSTONE AND TURBIDITIC CALCAREOUS CHALK

Major lithologies:
CLAYSTONE and TURBIDITIC CALCAREOUS CHALK this core consists mainly of the succession of claystone (a) and turbiditic chalk (b) with an average of (a) 50%/ (b) 50% at Section 1, 2 and 3, and (a) 75%/(b) 25% at Section 4.
a. The claystone is gray (10Y 7/1, 7/2, 6/1, 4/2, 10Y 8 and 5Y 6/2), with minor to moderate bioturbation (including locally Zoophycus), strong bioturbation is only local Section 1, 115-125 cm); some levels contain quartz, feldspar and dolomite, e.g. Section 4, 2-10 cm.
b.The turbiditic chalk is gray (5Y 6/2, 6/1, 5/2, 5/1 7/1 and 4/1) and interbedded with (a), forming 22 thin turbiditic sequences (ranging in thickness from a few mm, mainly 5-10 cm up to 25 cm), grading upward from medium sand to very line sand to silt, made mainly by calcareous fragments and subordinate foraminifers for the coarser parts and nannofossils for the silty to clayey fraction. Graded interval at the lowermost part of the sequence is always present, the contact with the overlying parallel lamination interval is gradual, interval of ripples, wavy or sometimes convoluted laminae is also well represented and the contact with the lower interval rather sharp, upper interval with parallel lamination is apparently missing.
c. Seems to represent the sedimentary background and/or division E of the Bouma sequence.

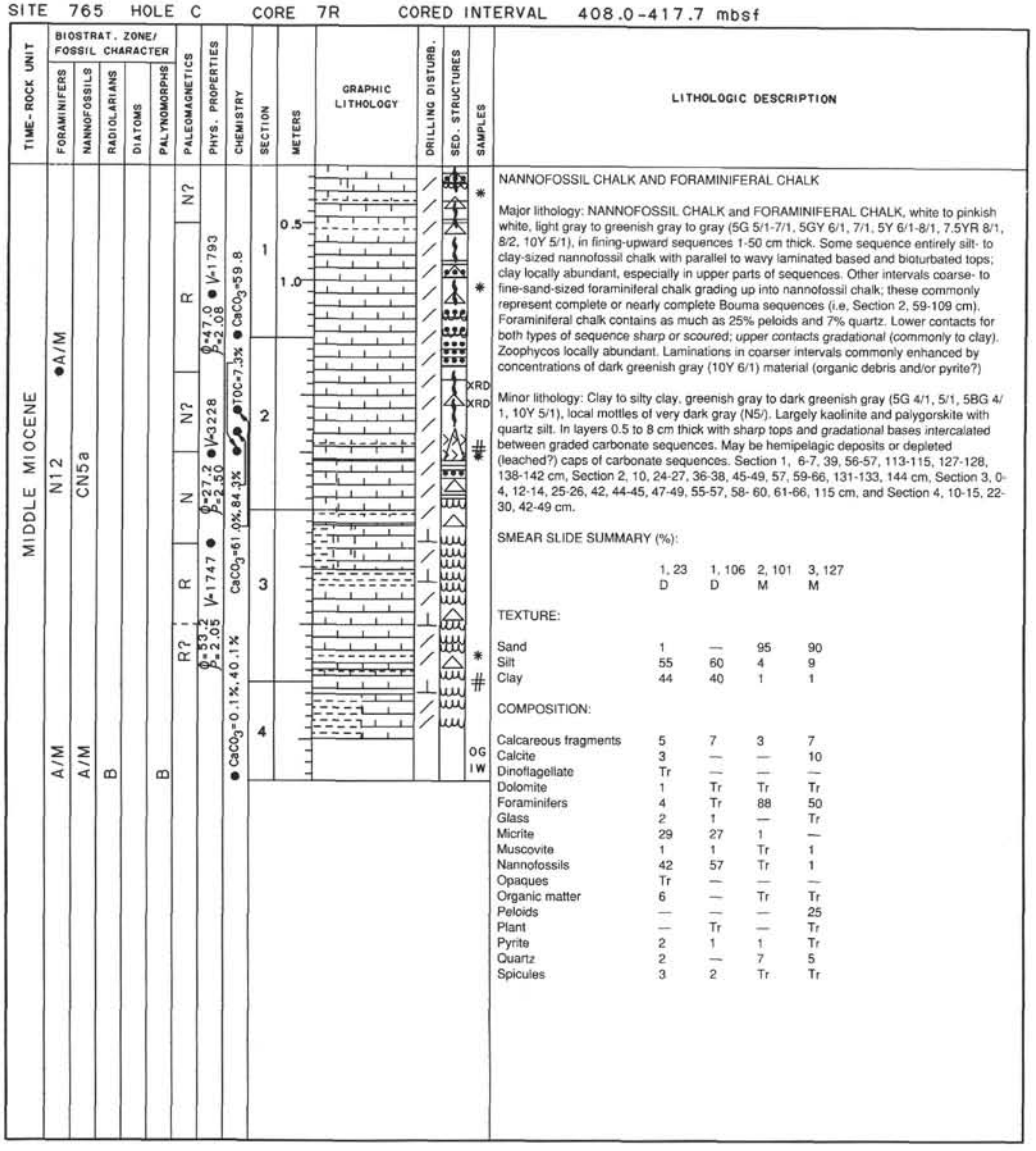
Minor lithology: Clay, dark (5R 3/1) appears as distinct layer, at Section 4, 41-43 cm, with probable occurrence of Mn.

SMEAR SLIDE SUMMARY (%):

	2, 66 M	2, 139 M	3, 88 M	4, 10 M
TEXTURE:				
Sand	—	77	—	—
Silt	38	21	88	40
Clay	62	2	12	60
COMPOSITION:				
Calcareous fragments	—	62	3	—
Clay	62	—	—	60
Dolomite	18	1	3	15
Feldspar	2	—	3	4
Foraminifers	—	27	Tr	—
Glass	1	1	11	4
Glauconite	Tr	—	—	—
Micrite	—	—	10	Tr
Muscovite	—	1	—	Tr
Nannofossils	—	Tr	56	Tr
Opaques	3	Tr	—	—
Organic matter	5	Tr	Tr	1
Plant	Tr	—	—	1
Pyrite	1	—	4	3
Quartz	1	2	2	10
Spicules	—	1	6	—
Unknown	4	—	—	2
Unspecified minerals	—	—	Tr	—



SITE 765 HOLE C CORE 7R CORED INTERVAL 408.0-417.7 mbsf



LITHOLOGIC DESCRIPTION

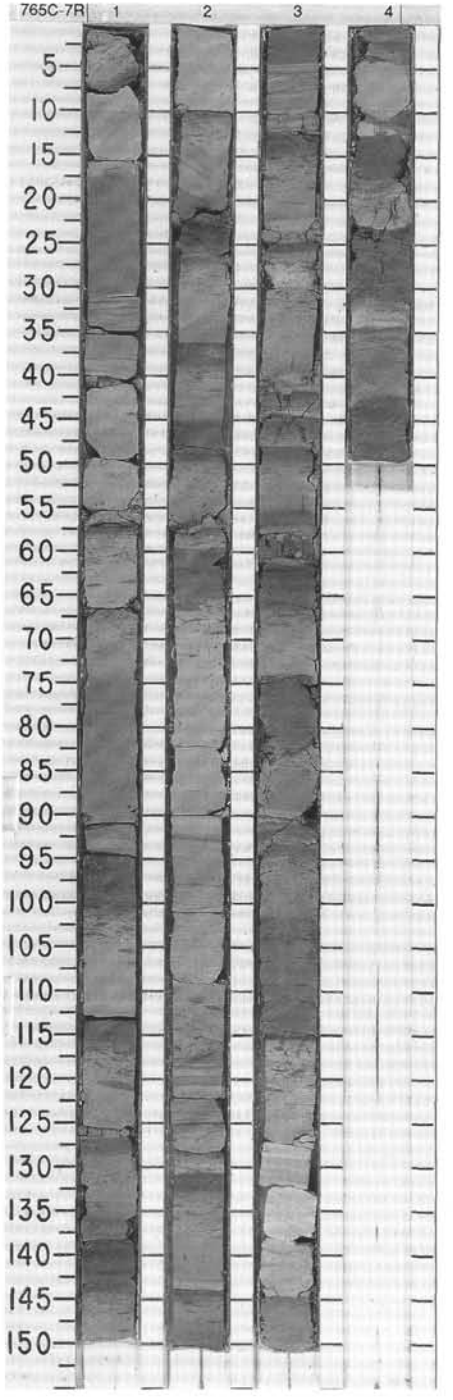
NANNOFOSSIL CHALK AND FORAMINIFERAL CHALK

Major lithology: NANNOFOSSIL CHALK and FORAMINIFERAL CHALK, white to pinkish white, light gray to greenish gray to gray (5G 5/1-7/1, 5GY 6/1, 7/1, 5Y 6/1-8/1, 7.5YR 8/1, 8/2, 10Y 5/1), in fining-upward sequences 1-50 cm thick. Some sequence entirely silt- to clay-sized nannofossil chalk with parallel to wavy laminated based and bioturbated tops; clay locally abundant, especially in upper parts of sequences. Other intervals coarse- to fine-sand-sized foraminiferal chalk grading up into nannofossil chalk; these commonly represent complete or nearly complete Bouma sequences (i.e, Section 2, 59-109 cm). Foraminiferal chalk contains as much as 25% peloids and 7% quartz. Lower contacts for *both types of sequence sharp or scoured; upper contacts gradational (commonly to clay).* Zoophycos locally abundant. Laminations in coarser intervals commonly enhanced by concentrations of dark greenish gray (10Y 6/1) material (organic debris and/or pyrite?)

Minor lithology: Clay to silty clay, greenish gray to dark greenish gray (5G 4/1, 5/1, 5BG 4/1, 10Y 5/1), local mottles of very dark gray (N5/). Largely kaolinite and palygorskite with quartz silt. In layers 0.5 to 8 cm thick with sharp tops and gradational bases intercalated between graded carbonate sequences. May be hemipelagic deposits or depleted (leached?) caps of carbonate sequences. Section 1, 6-7, 39, 56-57, 113-115, 127-128, 138-142 cm, Section 2, 10, 24-27, 36-38, 45-49, 57, 59-66, 131-133, 144 cm, Section 3, 0-4, 12-14, 25-26, 42, 44-45, 47-49, 55-57, 58- 60, 61-66, 115 cm, and Section 4, 10-15, 22-30, 42-49 cm.

SMEAR SLIDE SUMMARY (%):

	1, 23 D	1, 106 D	2, 101 M	3, 127 M
TEXTURE:				
Sand	1	—	95	90
Silt	55	60	4	9
Clay	44	40	1	1
COMPOSITION:				
Calcareous fragments	5	7	3	7
Calcite	3	—	—	10
Dinoflagellate	Tr	—	—	—
Dolomite	1	Tr	Tr	Tr
Foraminifers	4	Tr	88	50
Glass	2	1	—	Tr
Micrite	29	27	1	—
Muscovite	1	1	Tr	1
Nannofossils	42	57	Tr	1
Opaques	Tr	—	—	—
Organic matter	6	—	Tr	Tr
Peloids	—	—	—	25
Plant	—	Tr	—	Tr
Pyrite	2	1	1	Tr
Quartz	2	—	7	5
Spicules	3	2	Tr	Tr



SITE 765 HOLE C CORE 8R CORED INTERVAL 417.7-427.3 mbsf

TIME-ROCK UNIT: MIDDLE MIOCENE

BIOSTRAT. ZONE/FOSSIL CHARACTER:
- FORAMINIFERS: A/P N10-N11 ● N11 ● A/G
- NANNOFOSSILS: C/M ● CN5a
- RADIOLARIANS: B
- DIATOMS:
- PALYNOMORPHS: B

PALEOMAGNETICS: R R? R N R N? R? N R? R INT R

PHYS. PROPERTIES: Φ=44.2 ρ=2.09 V=1886 ● V=2134 Φ=54.3 ρ=1.96 Φ=26.0 ρ=2.59 V=3624 Φ=52.6 ρ=2.00 V=1766

CHEMISTRY: $CaCO_3$=88.5%,65.4% ● ● $CaCO_3$=16.8% ● $CaCO_3$=49.0

SECTION: CC, 1, 2, 3, 4

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY

DRILLING DISTURB.

SED. STRUCTURES: WW, WW, >>>, WW

SAMPLES: * * * # * * * *

LITHOLOGIC DESCRIPTION

CALCAREOUS TURBIDITIC CHALK

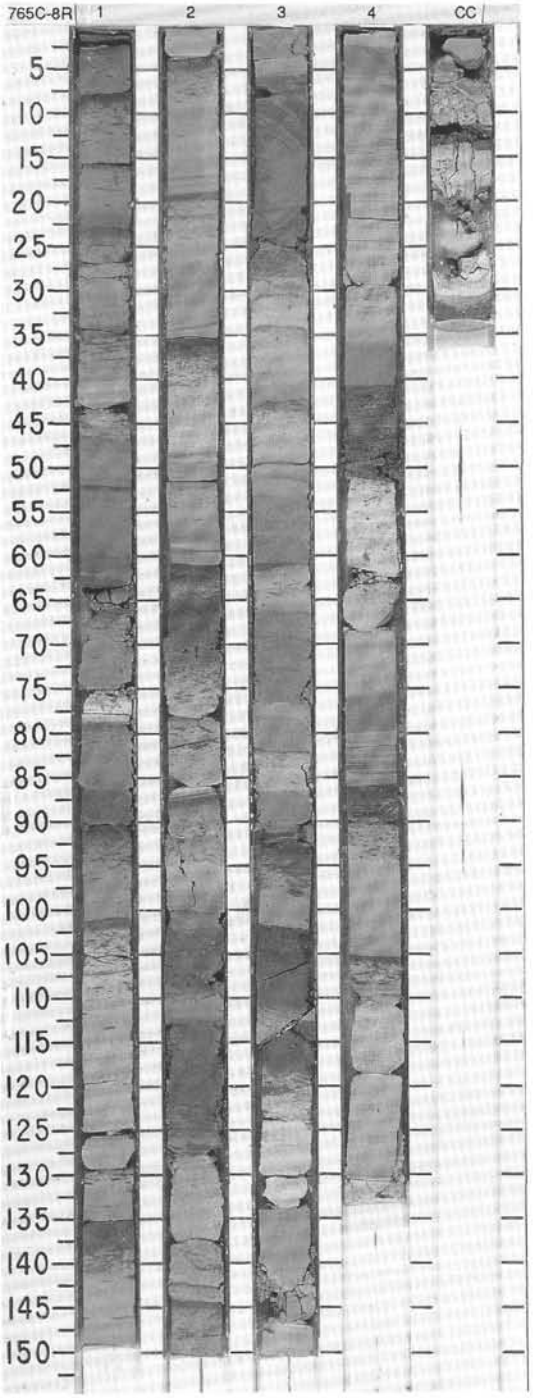
The core is highly fragmented at Section 1, 65-75 cm; Section 2, 70-120 cm; Section 3, 30-90 cm and also CC.

Major lithology: CALCAREOUS TURBIDITIC CHALK, greenish gray (10Y 4/1, 6/1, 7/1) to gray (5Y 5/1, 5/3, 4/1, 7/1); forming about 30 thin turbiditic sequences (ranging in thickness from a few mm to commonly 10-15 cm, up to a maximum of 30 cm : at Section 4, 0-30 cm); the graded interval (with medium sandy to very fine sandy calcareous fragments and foraminifers) at the bottom is commonly missing: Section 1, 2- 34, 90-101, 139-150 cm; Section 2, 137-150 cm; the lower interval of parallel lamination is commonly present but in some ,case missing; e.g., Section 2, 19-35 cm; Section 3, 124-134 cm : the interval of ripple lamination overlying directly the basal graded interval; the intervals D and E of the Bouma sequence are represented in the core by silty to clayey nannofossil and/or by chalk with micrite, moderately to highly bioturbated. All these features suggests that these turbidites are still distal. Dolomite and pyrite occurs Section 1 at 48 and 60 cm, Section 3 at 70 cm and Section 4 at 53 cm.

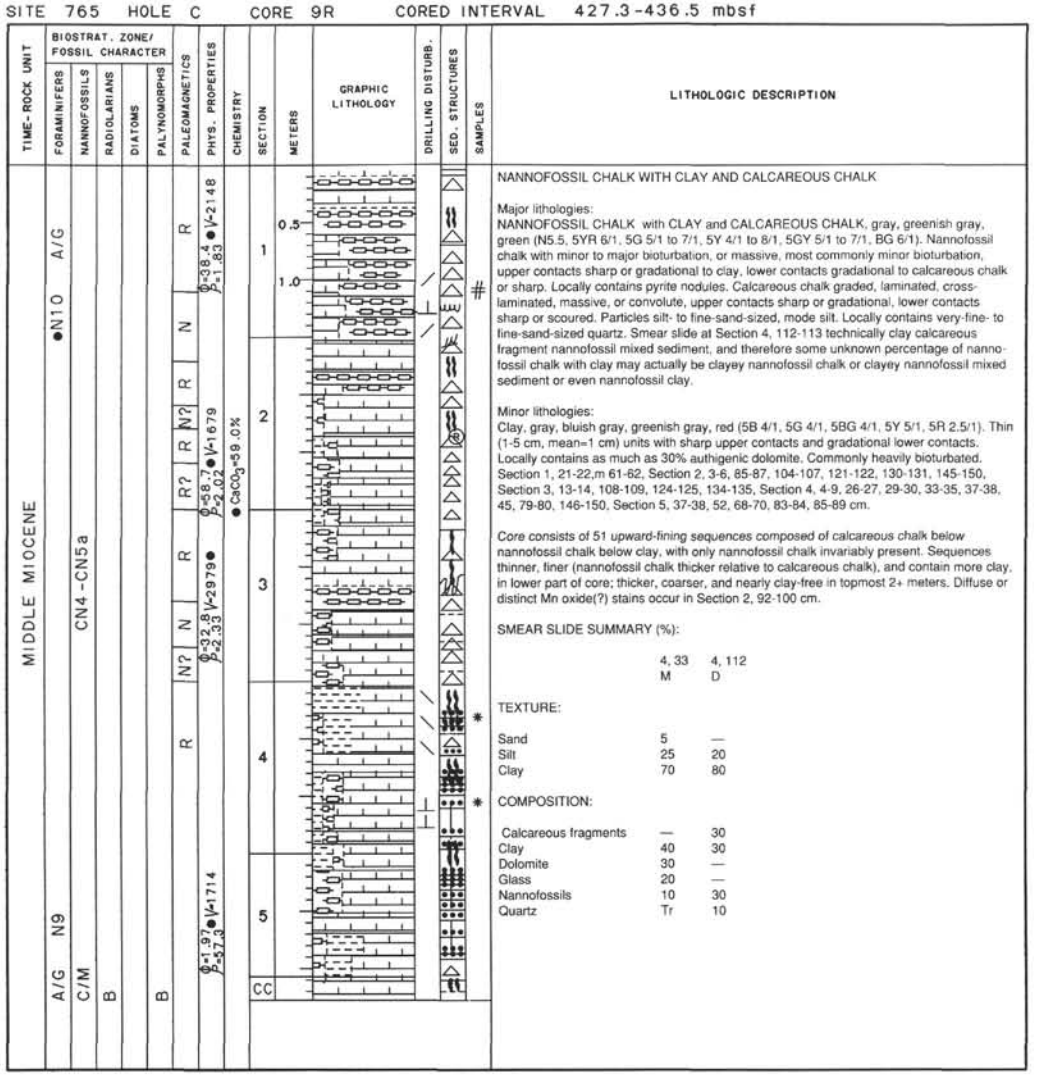
Minor lithology: Claystone, *dark reddish gray (5R 3/1), very thin (few mm to 10 cm in thickness)* appears, Section 2, 122 cm; Section 4, 40-51 and 86-90 cm.

SMEAR SLIDE SUMMARY (%):

	1, 48 D	1, 60 D	2, 133 M	3, 15 M	3, 70 D	4, 53 M
TEXTURE:						
Sand	1	—	85	—	—	—
Silt	91	79	14	30	30	44
Clay	8	21	1	70	70	56
COMPOSITION:						
Calcareous fragments	30	33	12	—	3	17
Calcite	7	Tr	1	—	2	—
Dinoflagellate	—	—	Tr	2	Tr	1
Dolomite	16	9	1	—	4	2
Feldspar	—	—	—	—	—	Tr
Foraminifers	Tr	2	35	2	Tr	Tr
Glass	3	5	—	2	3	—
Micrite	11	20	1	5	—	—
Muscovite	3	3	Tr	—	1	—
Nannofossils	12	12	Tr	75	72	74
Organic matter	—	—	—	6	1	—
Peloids	—	—	42	—	—	—
Plant	Tr	—	—	—	—	—
Pyrite	9	6	Tr	4	4	2
Quartz	Tr	—	8	—	1	Tr
Unspecified minerals	—	Tr	—	—	—	—



SITE 765 HOLE C CORE 9R CORED INTERVAL 427.3-436.5 mbsf



NANNOFOSSIL CHALK WITH CLAY AND CALCAREOUS CHALK

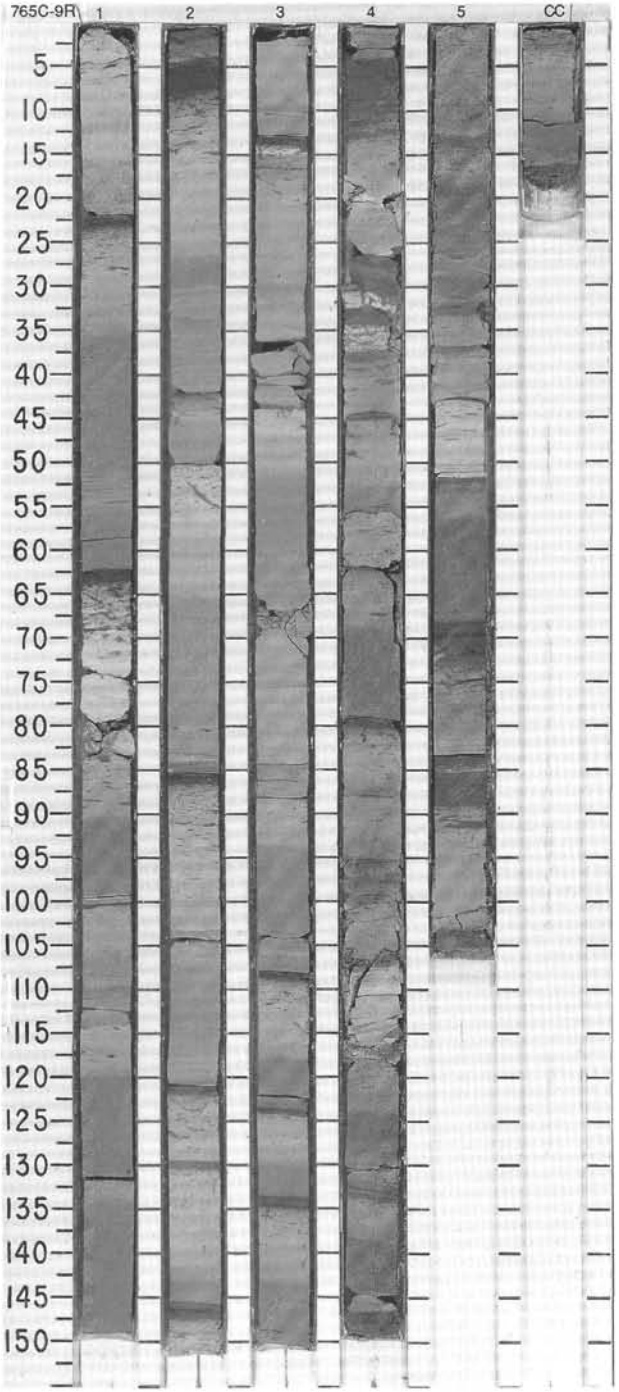
Major lithologies:
NANNOFOSSIL CHALK with CLAY and CALCAREOUS CHALK, gray, greenish gray, green (N5.5, 5YR 6/1, 5G 5/1 to 7/1, 5Y 4/1 to 8/1, 5GY 5/1 to 7/1, BG 6/1). Nannofossil chalk with minor to major bioturbation, or massive, most commonly minor bioturbation, upper contacts sharp or gradational to clay, lower contacts gradational to calcareous chalk or sharp. Locally contains pyrite nodules. Calcareous chalk graded, laminated, cross-laminated, massive, or convolute, upper contacts sharp or gradational, lower contacts sharp or scoured. Particles silt- to fine-sand-sized, mode silt. Locally contains very-fine- to fine-sand-sized quartz. Smear slide at Section 4, 112-113 technically clay calcareous fragment nannofossil mixed sediment, and therefore some unknown percentage of nannofossil chalk with clay may actually be clayey nannofossil chalk or clayey nannofossil mixed sediment or even nannofossil clay.

Minor lithologies:
Clay, gray, bluish gray, greenish gray, red (5B 4/1, 5G 4/1, 5BG 4/1, 5Y 5/1, 5R 2.5/1). Thin (1-5 cm, mean=1 cm) units with sharp upper contacts and gradational lower contacts. Locally contains as much as 30% authigenic dolomite. Commonly heavily bioturbated. Section 1, 21-22,m 61-62, Section 2, 3-6, 85-87, 104-107, 121-122, 130-131, 145-150, Section 3, 13-14, 108-109, 124-125, 134-135, Section 4, 4-9, 26-27, 29-30, 33-35, 37-38, 45, 79-80, 146-150, Section 5, 37-38, 52, 68-70, 83-84, 85-89 cm.

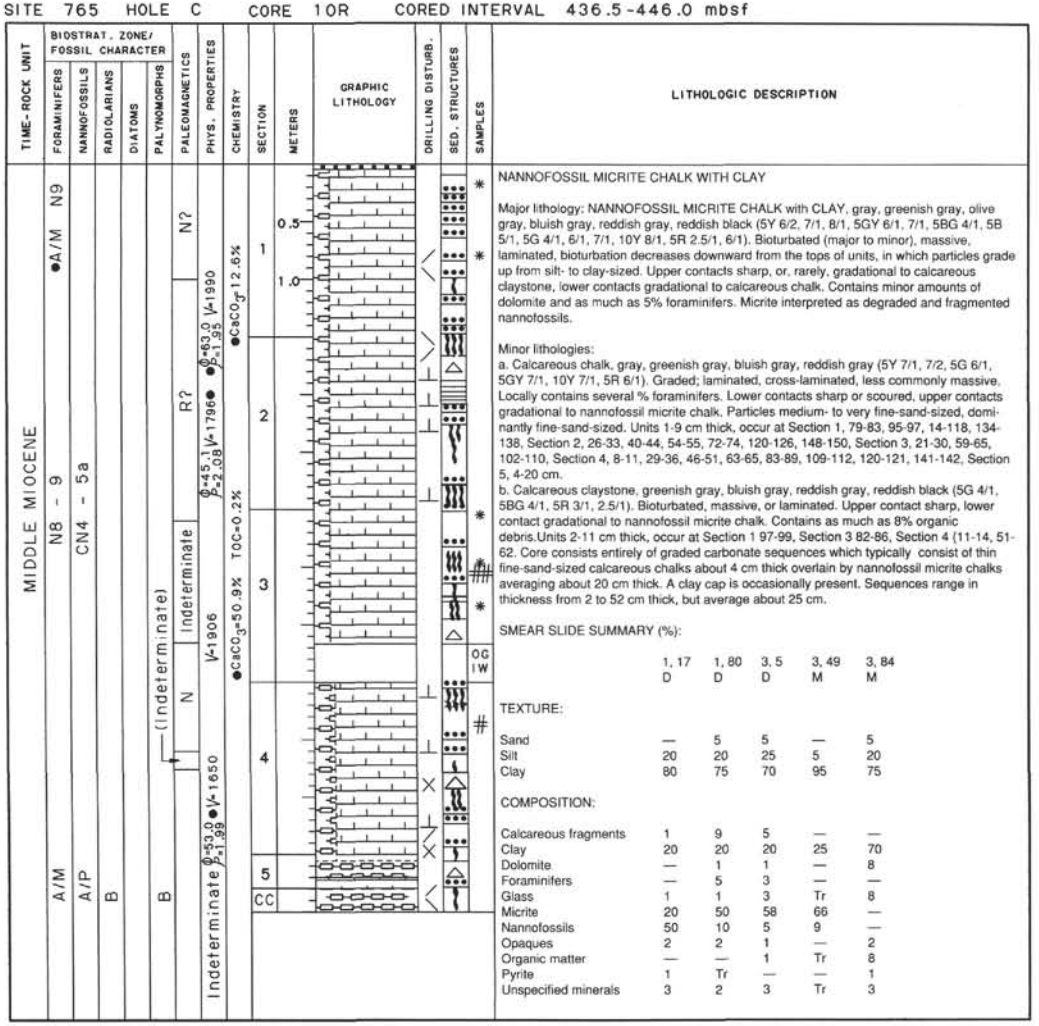
Core consists of 51 upward-fining sequences composed of calcareous chalk below nannofossil chalk below clay, with only nannofossil chalk invariably present. Sequences thinner, finer (nannofossil chalk thicker relative to calcareous chalk), and contain more clay, in lower part of core; thicker, coarser, and nearly clay-free in topmost 2+ meters. Diffuse or distinct Mn oxide(?) stains occur in Section 2, 92-100 cm.

SMEAR SLIDE SUMMARY (%):

	4, 33 M	4, 112 D
TEXTURE:		
Sand	5	—
Silt	25	20
Clay	70	80
COMPOSITION:		
Calcareous fragments	—	30
Clay	40	30
Dolomite	30	—
Glass	20	—
Nannofossils	10	30
Quartz	Tr	10



SITE 765 HOLE C CORE 10R CORED INTERVAL 436.5-446.0 mbsf



LITHOLOGIC DESCRIPTION

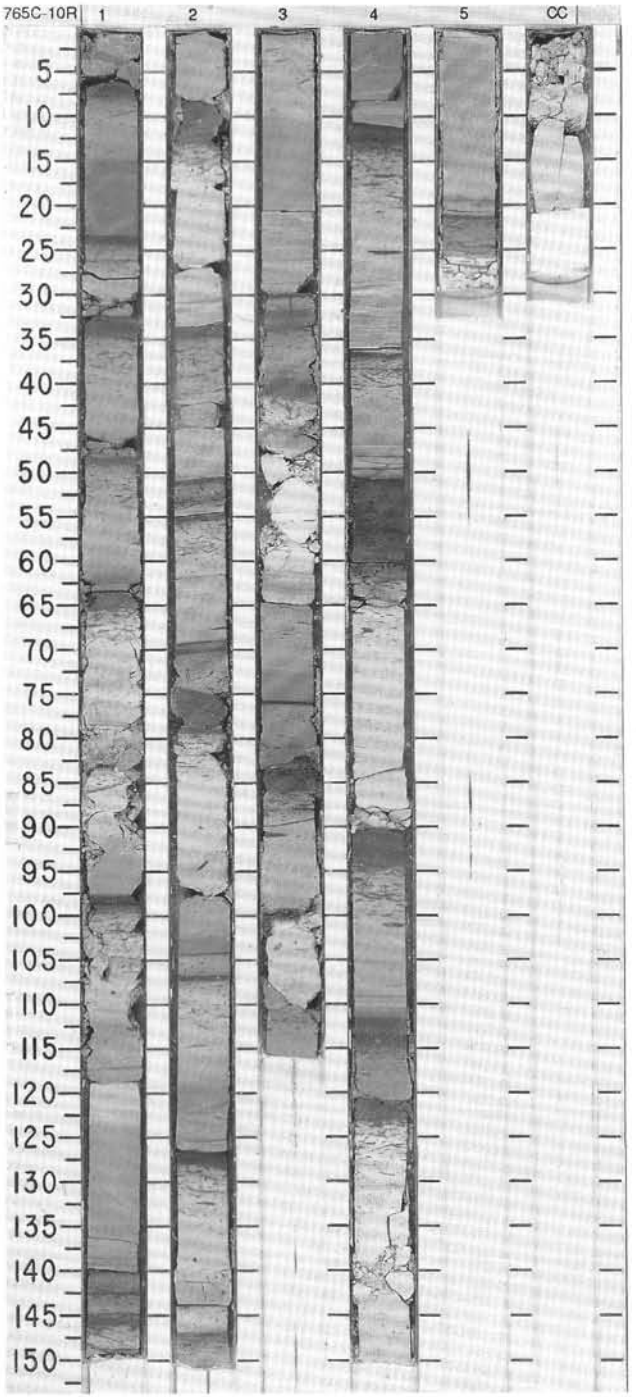
NANNOFOSSIL MICRITE CHALK WITH CLAY

Major lithology: NANNOFOSSIL MICRITE CHALK with CLAY, gray, greenish gray, olive gray, bluish gray, reddish gray, reddish black (5Y 6/2, 7/1, 8/1, 5GY 6/1, 7/1, 5BG 4/1, 5B 5/1, 5G 4/1, 6/1, 7/1, 10Y 8/1, 5R 2.5/1, 6/1). Bioturbated (major to minor), massive, laminated, bioturbation decreases downward from the tops of units, in which particles grade up from silt- to clay-sized. Upper contacts sharp, or, rarely, gradational to calcareous claystone, lower contacts gradational to calcareous chalk. Contains minor amounts of dolomite and as much as 5% foraminifers. Micrite interpreted as degraded and fragmented nannofossils.

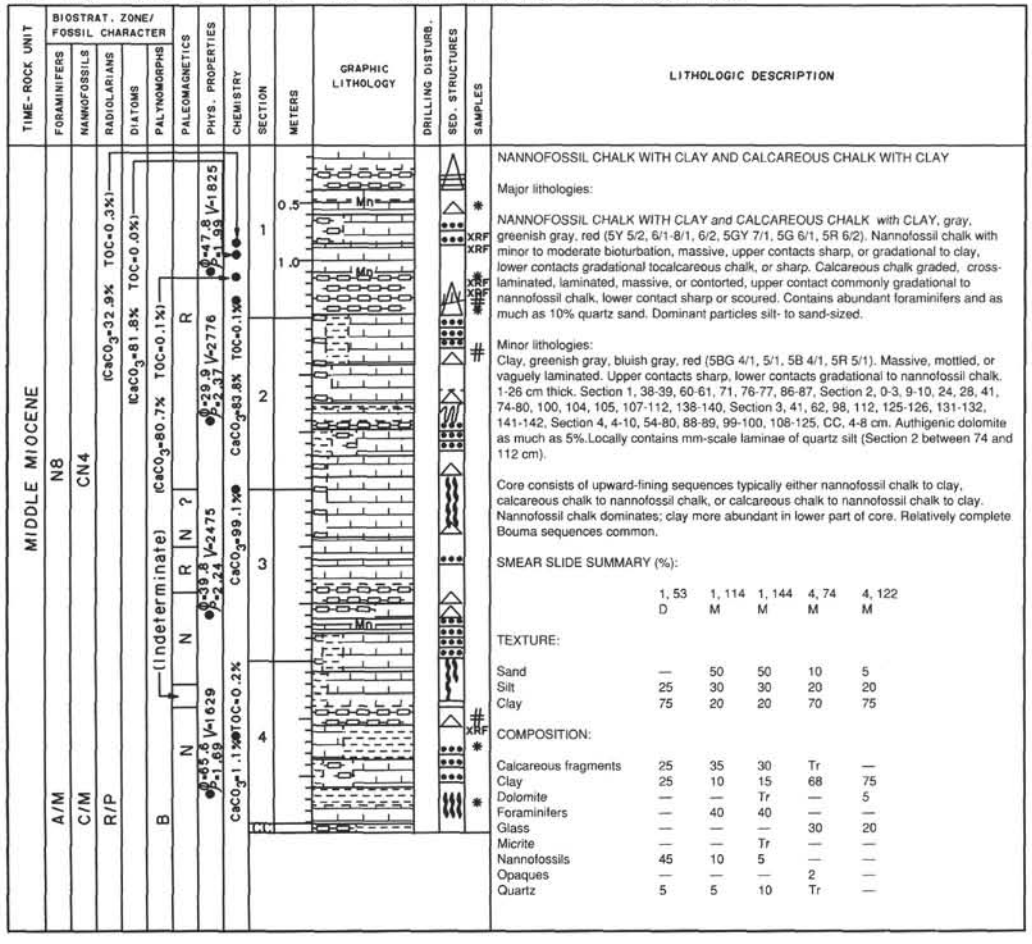
Minor lithologies:
a. Calcareous chalk, gray, greenish gray, bluish gray, reddish gray (5Y 7/1, 7/2, 5G 6/1, 5GY 7/1, 10Y 7/1, 5R 6/1). Graded; laminated, cross-laminated, less commonly massive. Locally contains several % foraminifers. Lower contacts sharp or scoured, upper contacts gradational to nannofossil micrite chalk. Particles medium- to very fine-sand-sized, dominantly fine-sand-sized. Units 1-9 cm thick, occur at Section 1, 79-83, 95-97, 14-118, 134-138, Section 2, 26-33, 40-44, 54-55, 72-74, 120-126, 148-150, Section 3, 21-30, 59-65, 102-110, Section 4, 8-11, 29-36, 46-51, 63-65, 83-89, 109-112, 120-121, 141-142, Section 5, 4-20 cm.
b. Calcareous claystone, greenish gray, bluish gray, reddish gray, reddish black (5G 4/1, 5BG 4/1, 5R 3/1, 2.5/1). Bioturbated, massive, or laminated. Upper contact sharp, lower contact gradational to nannofossil micrite chalk. Contains as much as 8% organic debris. Units 2-11 cm thick, occur at Section 1 97-99, Section 3 82-86, Section 4 (11-14, 51-62. Core consists entirely of graded carbonate sequences which typically consist of thin fine-sand-sized calcareous chalks about 4 cm thick overlain by nannofossil micrite chalks averaging about 20 cm thick. A clay cap is occasionally present. Sequences range in thickness from 2 to 52 cm thick, but average about 25 cm.

SMEAR SLIDE SUMMARY (%):

	1, 17 D	1, 80 D	3, 5 D	3, 49 M	3, 84 M
TEXTURE:					
Sand	—	5	5	—	5
Silt	20	20	25	5	20
Clay	80	75	70	95	75
COMPOSITION:					
Calcareous fragments	1	9	5	—	—
Clay	20	20	20	25	70
Dolomite	—	1	1	—	8
Foraminifers	—	5	3	—	—
Glass	1	1	3	Tr	8
Micrite	20	50	58	66	—
Nannofossils	50	10	5	9	—
Opaques	2	2	1	—	2
Organic matter	—	—	1	Tr	8
Pyrite	1	Tr	—	—	1
Unspecified minerals	3	2	3	Tr	3



SITE 765 HOLE C CORE 11R CORED INTERVAL 446.0-455.2 mbsf



NANNOFOSSIL CHALK WITH CLAY AND CALCAREOUS CHALK WITH CLAY

Major lithologies:

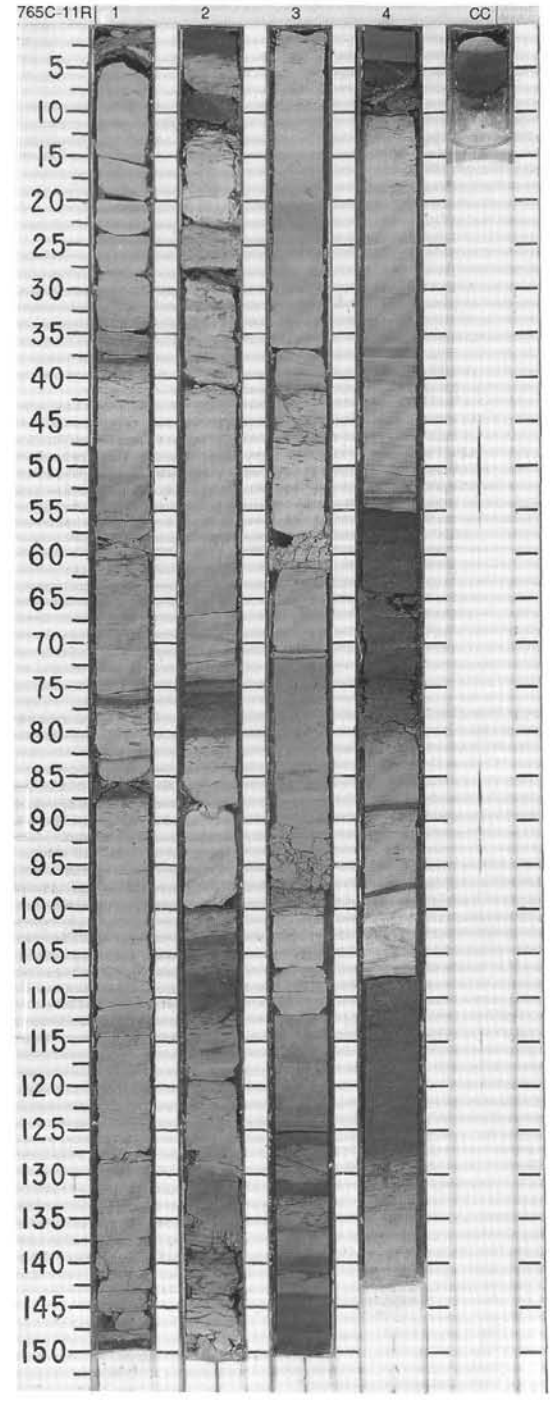
NANNOFOSSIL CHALK WITH CLAY and CALCAREOUS CHALK with CLAY, gray, greenish gray, red (5Y 5/2, 6/1-8/1, 6/2, 5GY 7/1, 5G 6/1, 5R 6/2). Nannofossil chalk with minor to moderate bioturbation, massive, upper contacts sharp, or gradational to clay, lower contacts gradational tocalcareous chalk, or sharp. Calcareous chalk graded, cross-laminated, laminated, massive, or contorted, upper contact commonly gradational to nannofossil chalk, lower contact sharp or scoured. Contains abundant foraminifers and as much as 10% quartz sand. Dominant particles silt- to sand-sized.

Minor lithologies:
Clay, greenish gray, bluish gray, red (5BG 4/1, 5/1, 5B 4/1, 5R 5/1). Massive, mottled, or vaguely laminated. Upper contacts sharp, lower contacts gradational to nannofossil chalk. 1-26 cm thick. Section 1, 38-39, 60-61, 71, 76-77, 86-87, Section 2, 0-3, 9-10, 24, 28, 41, 74-80, 100, 104, 105, 107-112, 138-140, Section 3, 41, 62, 98, 112, 125-126, 131-132, 141-142, Section 4, 4-10, 54-80, 88-89, 99-100, 108-125, CC, 4-8 cm. Authigenic dolomite as much as 5%.Locally contains mm-scale laminae of quartz silt (Section 2 between 74 and 112 cm).

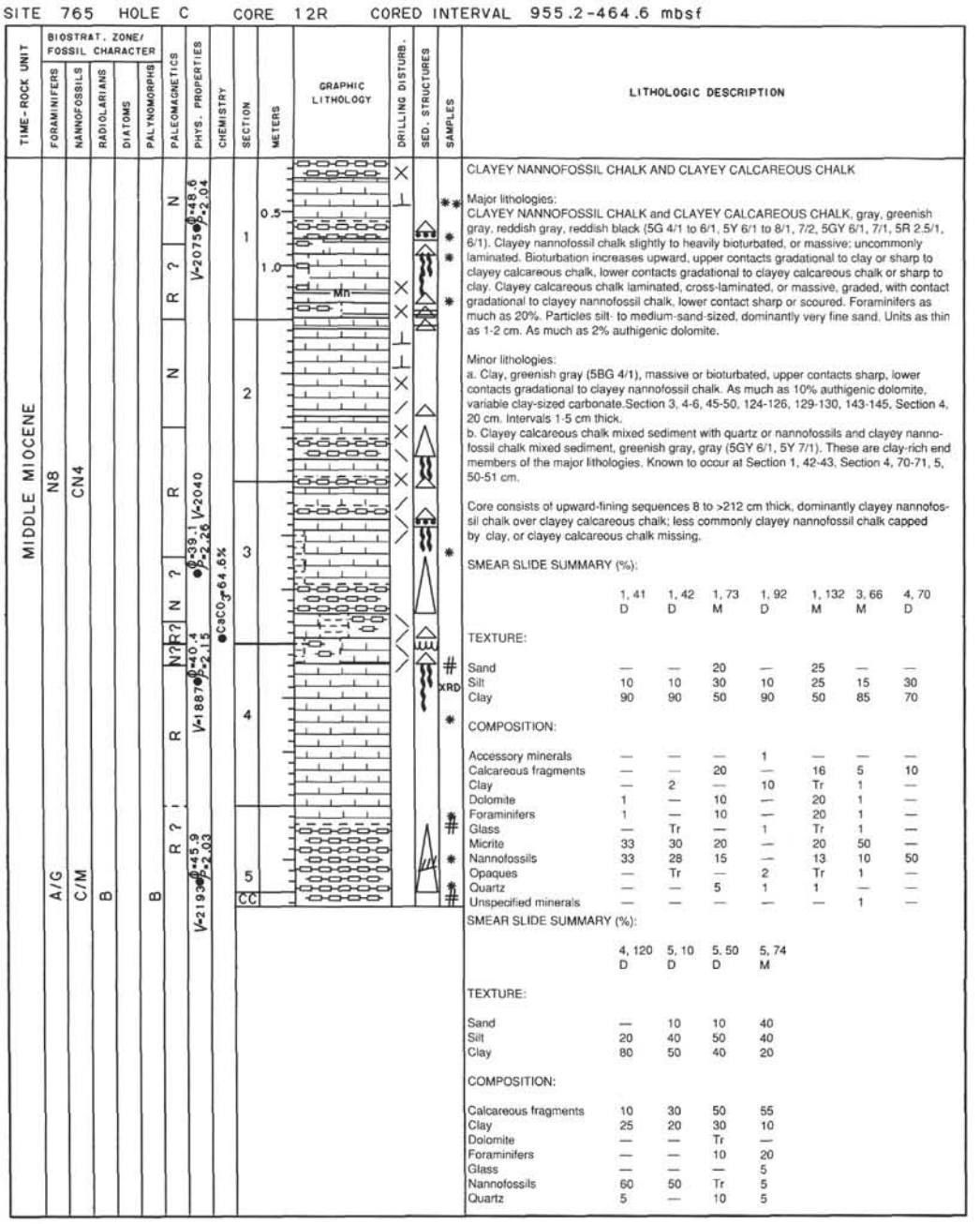
Core consists of upward-fining sequences typically either nannofossil chalk to clay, calcareous chalk to nannofossil chalk, or calcareous chalk to nannofossil chalk to clay. Nannofossil chalk dominates; clay more abundant in lower part of core. Relatively complete Bouma sequences common.

SMEAR SLIDE SUMMARY (%):

	1, 53 D	1, 114 M	1, 144 M	4, 74 M	4, 122 M
TEXTURE:					
Sand	—	50	50	10	5
Silt	25	30	30	20	20
Clay	75	20	20	70	75
COMPOSITION:					
Calcareous fragments	25	35	30	Tr	—
Clay	25	10	15	68	75
Dolomite	—	—	*Tr*	—	5
Foraminifers	—	40	40	—	—
Glass	—	—	—	30	20
Micrite	—	—	Tr	—	—
Nannofossils	45	10	5	—	—
Opaques	—	—	—	2	—
Quartz	5	5	10	Tr	—



SITE 765 HOLE C CORE 12R CORED INTERVAL 955.2-464.6 mbsf



LITHOLOGIC DESCRIPTION

CLAYEY NANNOFOSSIL CHALK AND CLAYEY CALCAREOUS CHALK

Major lithologies:
CLAYEY NANNOFOSSIL CHALK and CLAYEY CALCAREOUS CHALK, gray, greenish gray, reddish gray, reddish black (5G 4/1 to 6/1, 5Y 6/1 to 8/1, 7/2, 5GY 6/1, 7/1, 5R 2.5/1, 6/1). Clayey nannofossil chalk slightly to heavily bioturbated, or massive; uncommonly laminated. Bioturbation increases upward, upper contacts gradational to clay or sharp to clayey calcareous chalk, lower contacts gradational to clayey calcareous chalk or sharp to clay. Clayey calcareous chalk laminated, cross-laminated, or massive, graded, with contact gradational to clayey nannofossil chalk, lower contact sharp or scoured. Foraminifers as much as 20%. Particles silt- to medium-sand-sized, dominantly very fine sand. Units as thin as 1-2 cm. As much as 2% authigenic dolomite.

Minor lithologies:
a. Clay, greenish gray (5BG 4/1), massive or bioturbated, upper contacts sharp, lower contacts gradational to clayey nannofossil chalk. As much as 10% authigenic dolomite, variable clay-sized carbonate. Section 3, 4-6, 45-50, 124-126, 129-130, 143-145, Section 4, 20 cm. Intervals 1-5 cm thick.
b. Clayey calcareous chalk mixed sediment with quartz or nannofossils and clayey nannofossil chalk mixed sediment, greenish gray, gray (5GY 6/1, 5Y 7/1). These are clay-rich end members of the major lithologies. Known to occur at Section 1, 42-43, Section 4, 70-71, 5, 50-51 cm.

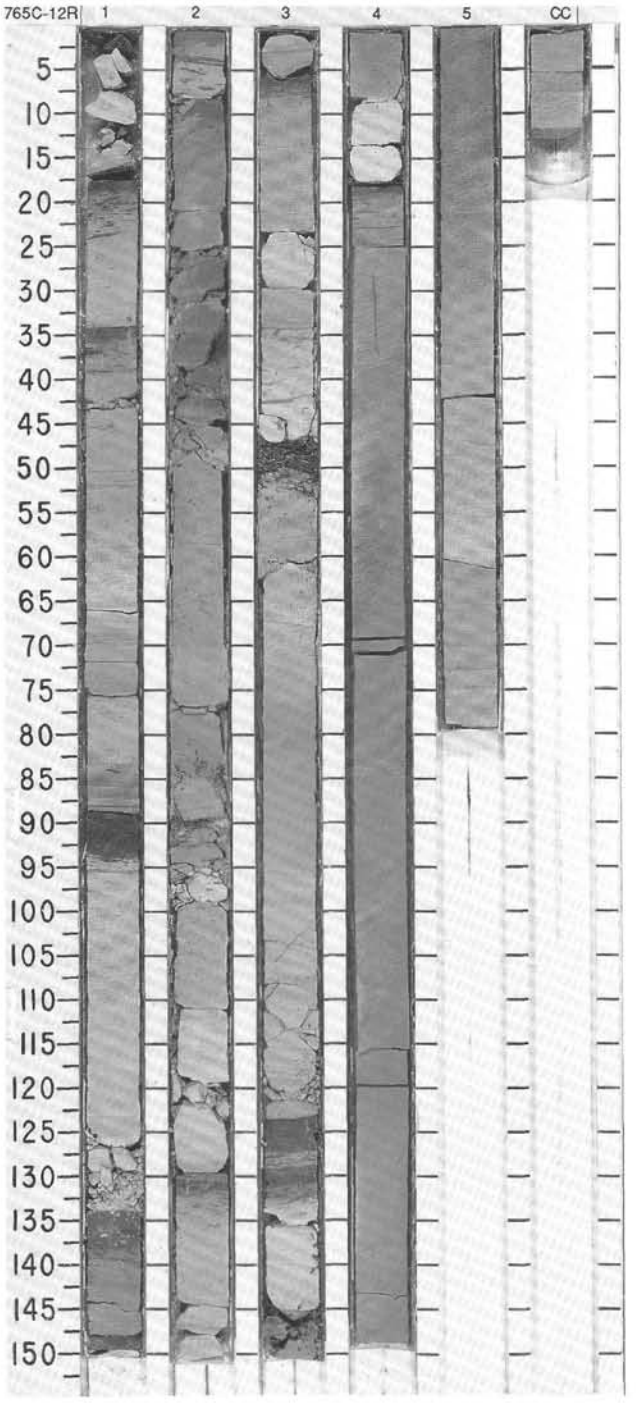
Core consists of upward-fining sequences 8 to >212 cm thick, dominantly clayey nannofossil chalk over clayey calcareous chalk; less commonly clayey nannofossil chalk capped by clay, or clayey calcareous chalk missing.

SMEAR SLIDE SUMMARY (%):

	1, 41 D	1, 42 D	1, 73 M	1, 92 D	1, 132 M	3, 66 M	4, 70 D
TEXTURE:							
Sand	—	—	20	—	25	—	—
Silt	10	10	30	10	25	15	30
Clay	90	90	50	90	50	85	70
COMPOSITION:							
Accessory minerals	—	—	—	1	—	—	—
Calcareous fragments	—	—	20	—	16	5	10
Clay	—	2	—	10	Tr	1	—
Dolomite	1	—	10	—	20	1	—
Foraminifers	1	—	10	—	20	1	—
Glass	—	Tr	—	1	Tr	1	—
Micrite	33	30	20	—	20	50	—
Nannofossils	33	28	15	—	13	10	50
Opaques	—	Tr	—	2	Tr	1	—
Quartz	—	—	5	1	1	—	—
Unspecified minerals	—	—	—	—	—	1	—

SMEAR SLIDE SUMMARY (%):

	4, 120 D	5, 10 D	5, 50 D	5, 74 M
TEXTURE:				
Sand	—	10	10	40
Silt	20	40	50	40
Clay	80	50	40	20
COMPOSITION:				
Calcareous fragments	10	30	50	55
Clay	25	20	30	10
Dolomite	—	—	Tr	—
Foraminifers	—	—	10	20
Glass	—	—	—	5
Nannofossils	60	50	Tr	5
Quartz	5	—	10	5



SITE 765 HOLE C CORE 13R CORED INTERVAL 464.6-974.1 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
LOWER MIOCENE	A/G N5	C/M CN4	B		B	N/A	ρ: 50.3 V: 2.08 ρ: 40.0 V: 2.14 ρ: 16.4 V: 2.68 ρ: 2003 V: 2021 ρ: 2.68 4670	$CaCO_3$ = 4.1 TOC=0.0 TOC=76.1	1 2 3 CC	0.5 1.0				# XRD XRF # XRF # XRF

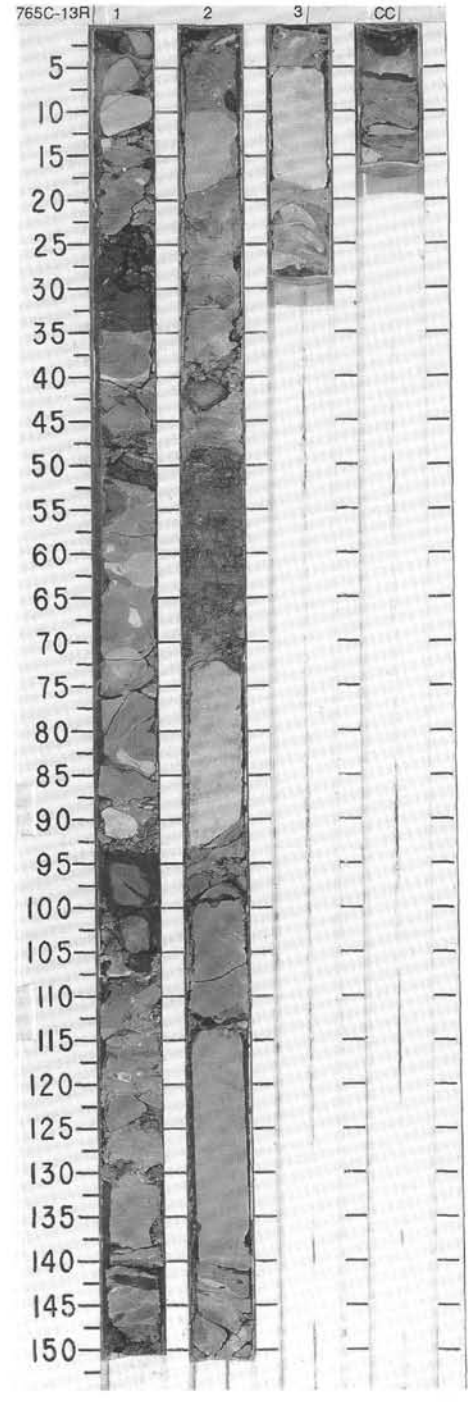
LITHOLOGIC DESCRIPTION

CARBONATE CONGLOMERATE

Major lithology: CARBONATE CONGLOMERATE, gray and greenish gray (5G 6/1, 5Y 7/1, 5GY 4/1 to 6/1). Clasts apparently graded, conglomerate matrix supported, clasts well rounded: altered basalt, white bioturbated limestone with foraminifers, calcareous chalk, clayey nannofossil chalk, Middle Jurassic black silty clay. Matrix clayey nannofossil chalk. Matrix clay- to silt-sized, clasts <1 to 26 cm. Thick homogeneous intervals with convex-up upper contacts and convex-down lower contacts in Section 2, 48-72, 72-93, 97-113, 114-140(?) and Section 3, 5-18 cm, interpreted as boulders. Core badly disturbed by drilling and precise depositional structures of unit uncertain. Carbonate conglomerate not observed in cores 12 and 14, so contacts unknown. Top two TSBs are of volcanic (basalt) pebbles.

SMEAR SLIDE SUMMARY (%):

	2, 87 D	2, 96 D	2, 102 M
TEXTURE:			
Sand	10	10	—
Silt	15	20	2
Clay	75	70	98
COMPOSITION:			
Bioclast	1	—	—
Calcareous fragments	—	10	—
Clay	—	15	10
Foraminifers	4	5	—
Glass	—	3	1
Mica	Tr	—	—
Micrite	90	25	48
Nannofossils	—	34	40
Opaques	—	2	—
Organic matter	—	1	—
Other	5	—	—
Quartz	—	3	—
Unspecified minerals	—	2	1



SITE 765 HOLE C CORE 14R CORED INTERVAL 474.1-483.7 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
LOWER MIOCENE	A/G N4B	R/M CN1c	B		B	N/A	ϕ=40.2 ●1.1958 ρ=2.13	$CaCO_3$=51.1 ●	1 2 CC	0.5 1.0				# * XRD

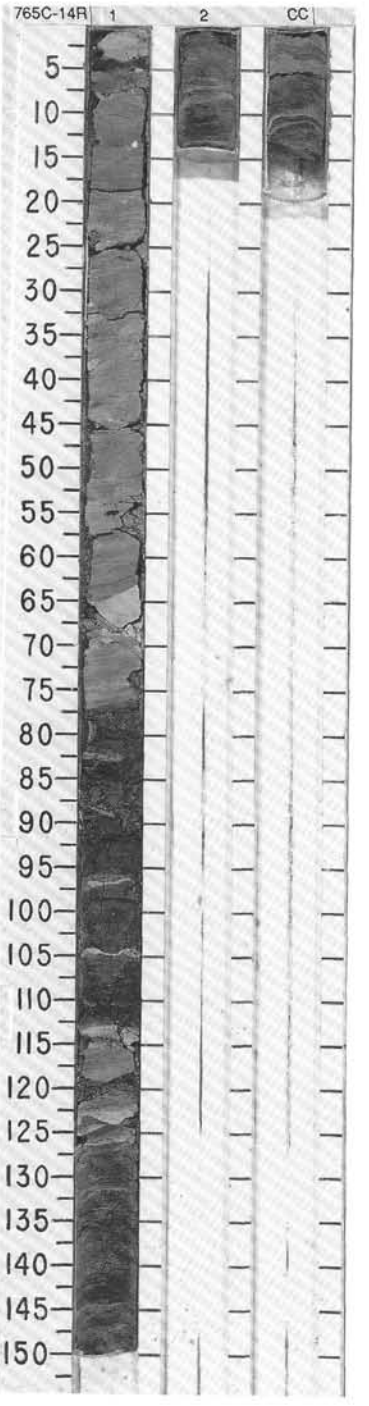
LITHOLOGIC DESCRIPTION

CLAYEY NANNOFOSSIL CHALK AND CLAY

Major lithologies:
CLAYEY NANNOFOSSIL CHALK and CLAY, gray, greenish gray, brown, reddish brown (5GY 6/1, 5G 4/1 to 6/1, 10YR 3/3, 5YR 5/4). Clayey nannofossil chalk massive or laminated, contains clasts of clayey nannofossil chalk, fine-sand-sized calcareous chalk, and chert up to 4 cm, typically < 2 cm, in diameter. Lower contacts sharp, with coarser interval of very fine-sand-sized clayey calcareous chalk. Clay massive, contacts sharp. Kaolinite dominant, palygorskite major, clinoptilolite(?) and dolomite(?) minor. Contains clayey nannofossil chalk at Section 1, 0-80, 85, 97, 105, 113-118, 120-123, 125. These intervals may be lenses, laminae or platy clasts. Some "clasts" appear to have increasing clay content upward, suggesting that they are upright, if not in situ.

SMEAR SLIDE SUMMARY (%):

	1, 27 M	1, 91 D
TEXTURE:		
Sand	16	—
Silt	16	—
Clay	67	100
COMPOSITION:		
Bioclast	2	—
Clay	20	95
Foraminifers	15	—
Glass	—	2
Micrite	55	—
Nannofossils	—	1
Organic matter	2	—
Other	5	—
Unspecified minerals	—	2



SITE 765 HOLE C CORE 15R CORED INTERVAL 483.7-493.2 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
UPPERMOST OLIGOCENE - LOWEST MIOCENE	R/P N4a-b	B	B		B	N R	Φ=64.2 V=1741 ρ=1.92	$CaCO_3$=8.1 $CaCO_3$=2.3 TOC=0.2	1 CC	0.5 1.0			XRD IW	# * *

LITHOLOGIC DESCRIPTION

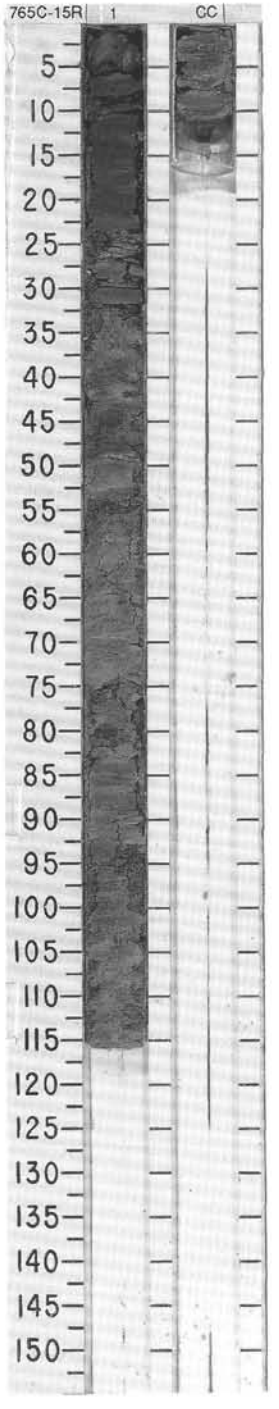
CLAYEY NANNOFOSSIL CHALK AND CLAYSTONE

Major lithologies:
CLAYEY NANNOFOSSIL CHALK and CLAYSTONE, reddish brown, yellowish red, and greenish gray (5YR 4/4, 4/6, 5BG 4/1). Claystone locally moderately fissile, contains greenish gray patches (5GY 5/1), contacts not observed, kaolinite and palygorskite are major constituents. Clayey nannofossil chalk variable in clay content, much may actually be mixed sediment or even nannofossil claystone.

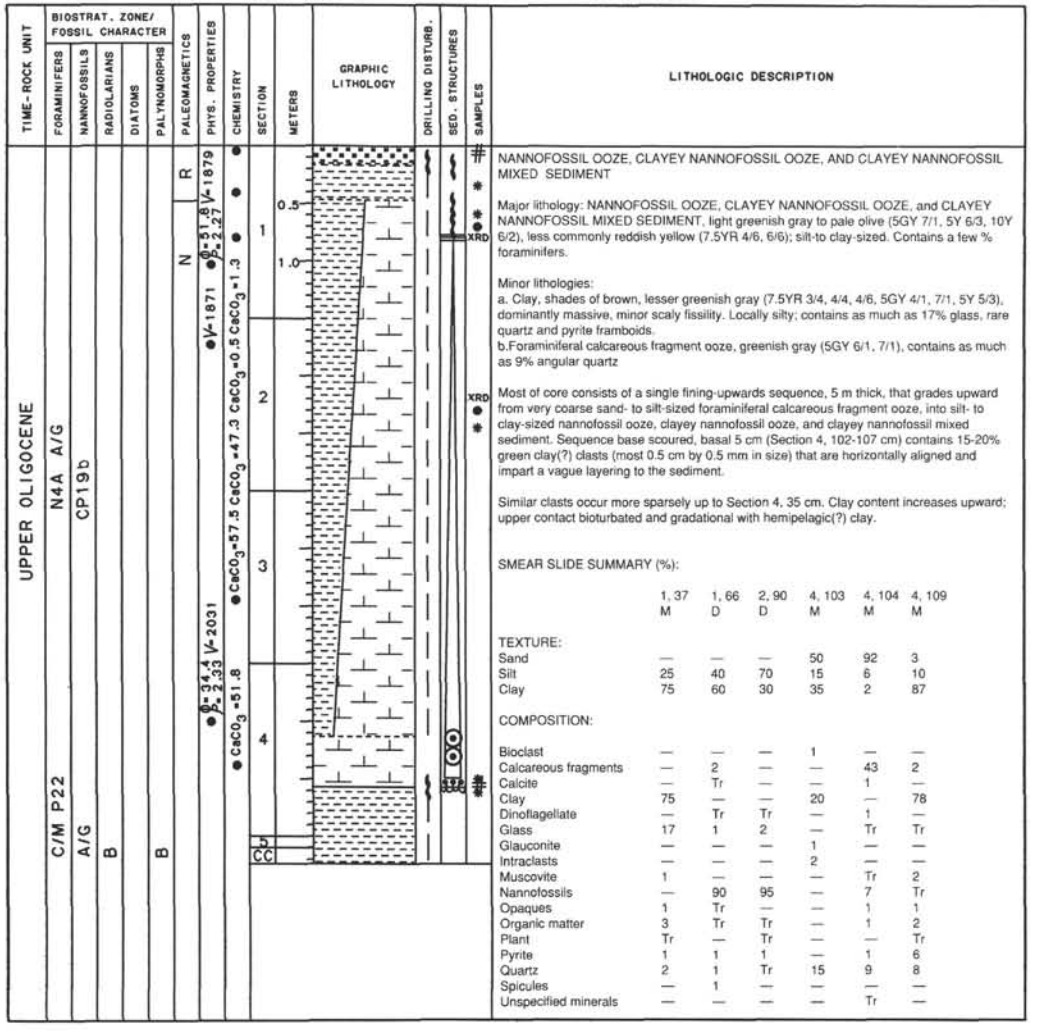
Minor lithologies:
a. Cavings, 0-6 cm, dominated by 2 basalt pebbles, both thin-sectioned.
b. Foraminiferal sandstone, 1 cm lens at 49 cm consisting of subrounded coarse- to very coarse-sand-sized foraminiferal quartz sandstone with a polymineralic suite of accessories.

SMEAR SLIDE SUMMARY (%):

	1, 19 D	1, 102 D
TEXTURE:		
Sand	—	5
Silt	0	20
Clay	100	75
COMPOSITION:		
Calcareous fragments	—	5
Clay	95	20
Foraminifers	—	5
Glass	1	2
Micrite	—	10
Nannofossils	—	50
Opaques	Tr	2
Organic matter	—	Tr
Quartz	—	3
Unspecified minerals	3	3



SITE 765 HOLE C CORE 16R CORED INTERVAL 493.2-502.4 mbsf



LITHOLOGIC DESCRIPTION

NANNOFOSSIL OOZE, CLAYEY NANNOFOSSIL OOZE, AND CLAYEY NANNOFOSSIL MIXED SEDIMENT

Major lithology: NANNOFOSSIL OOZE, CLAYEY NANNOFOSSIL OOZE, and CLAYEY NANNOFOSSIL MIXED SEDIMENT, light greenish gray to pale olive (5GY 7/1, 5Y 6/3, 10Y 6/2), less commonly reddish yellow (7.5YR 4/6, 6/6); silt-to clay-sized. Contains a few % foraminifers.

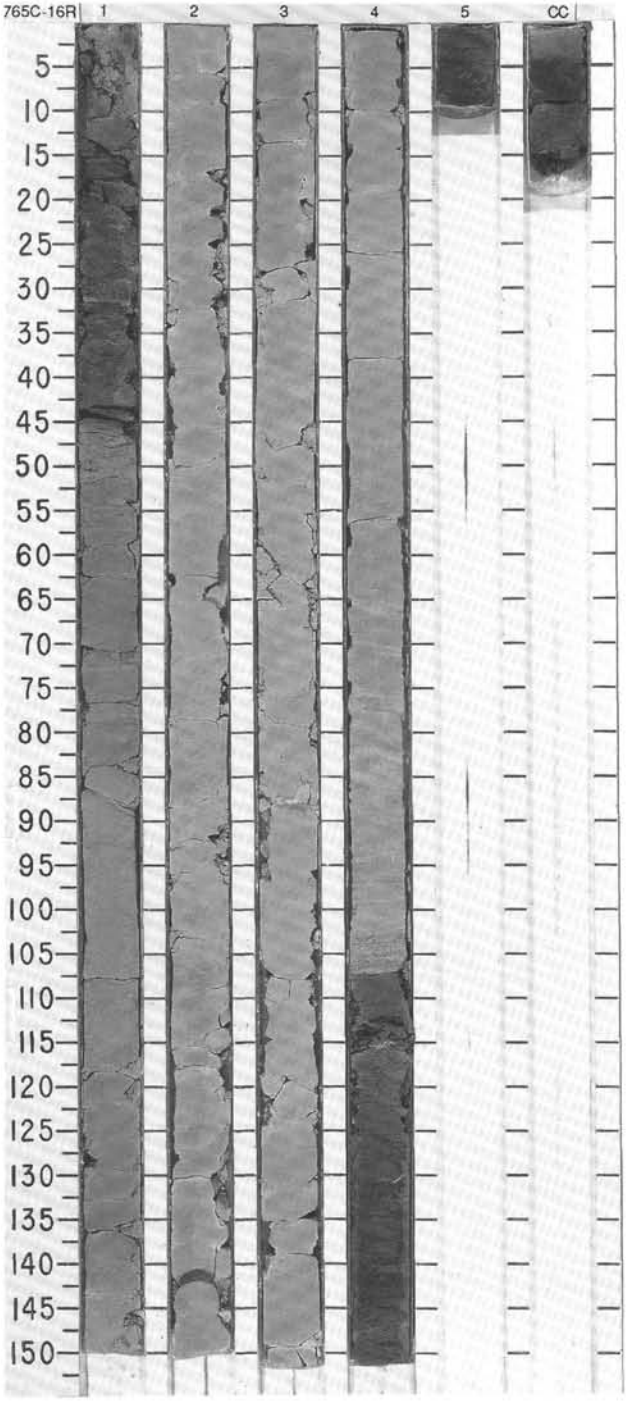
Minor lithologies:
a. Clay, shades of brown, lesser greenish gray (7.5YR 3/4, 4/4, 4/6, 5GY 4/1, 7/1, 5Y 5/3), dominantly massive, minor scaly fissility. Locally silty; contains as much as 17% glass, rare quartz and pyrite framboids.
b.Foraminiferal calcareous fragment ooze, greenish gray (5GY 6/1, 7/1), contains as much as 9% angular quartz

Most of core consists of a single fining-upwards sequence, 5 m thick, that grades upward from very coarse sand- to silt-sized foraminiferal calcareous fragment ooze, into silt- to clay-sized nannofossil ooze, clayey nannofossil ooze, and clayey nannofossil mixed sediment. Sequence base scoured, basal 5 cm (Section 4, 102-107 cm) contains 15-20% green clay(?) clasts (most 0.5 cm by 0.5 mm in size) that are horizontally aligned and impart a vague layering to the sediment.

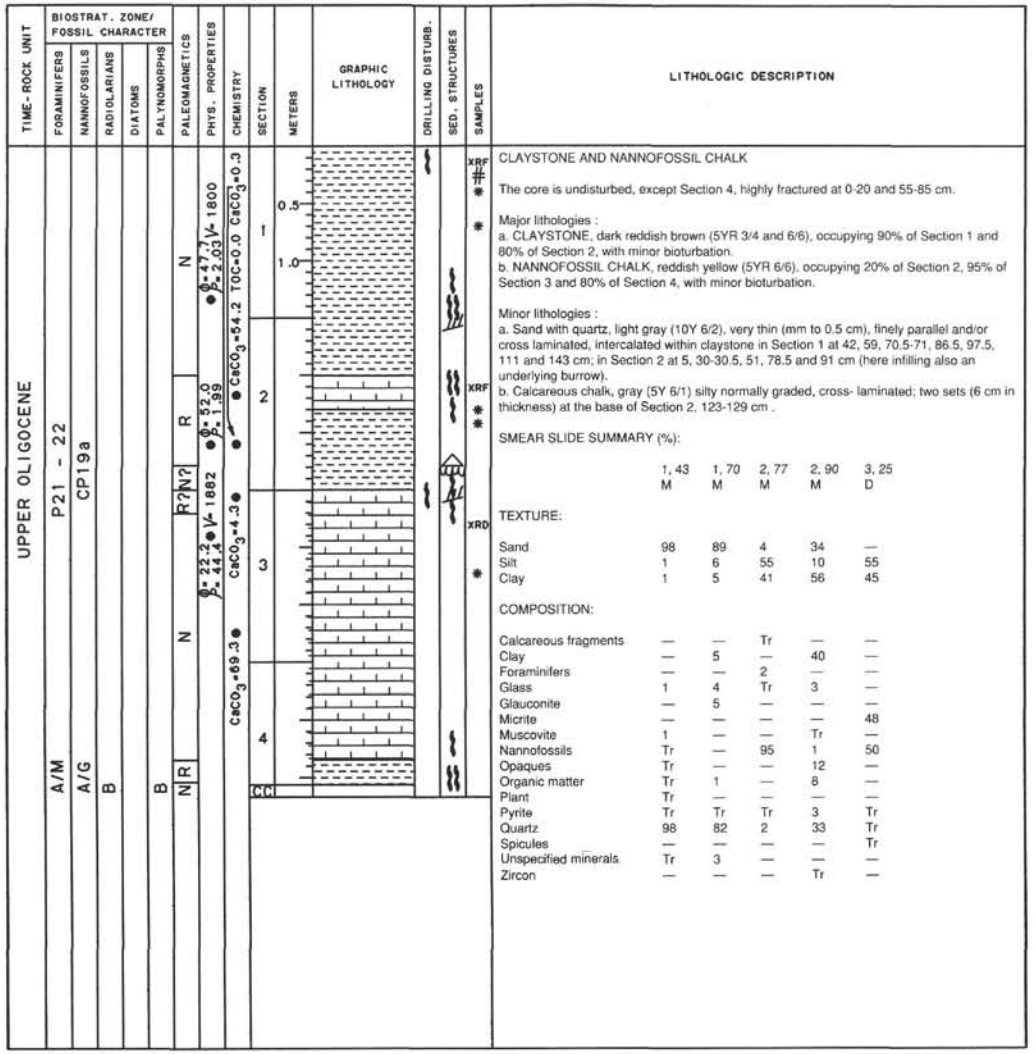
Similar clasts occur more sparsely up to Section 4, 35 cm. Clay content increases upward; upper contact bioturbated and gradational with hemipelagic(?) clay.

SMEAR SLIDE SUMMARY (%):

	1, 37 M	1, 66 D	2, 90 D	4, 103 M	4, 104 M	4, 109 M
TEXTURE:						
Sand	—	—	—	50	92	3
Silt	25	40	70	15	6	10
Clay	75	60	30	35	2	87
COMPOSITION:						
Bioclast	—	—	—	1	—	—
Calcareous fragments	—	2	—	—	43	2
Calcite	—	Tr	—	—	1	—
Clay	75	—	—	20	—	78
Dinoflagellate	—	Tr	Tr	—	1	—
Glass	17	1	2	—	Tr	Tr
Glauconite	—	—	—	1	—	—
Intraclasts	—	—	—	2	—	—
Muscovite	1	—	—	—	Tr	2
Nannofossils	—	90	95	—	7	Tr
Opaques	1	Tr	—	—	1	1
Organic matter	3	Tr	Tr	—	1	2
Plant	Tr	—	Tr	—	—	Tr
Pyrite	1	1	1	—	1	6
Quartz	2	1	Tr	15	9	8
Spicules	—	1	—	—	—	—
Unspecified minerals	—	—	—	—	Tr	—



SITE 765 HOLE C CORE 17R CORED INTERVAL 502.4-511.9 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE AND NANNOFOSSIL CHALK

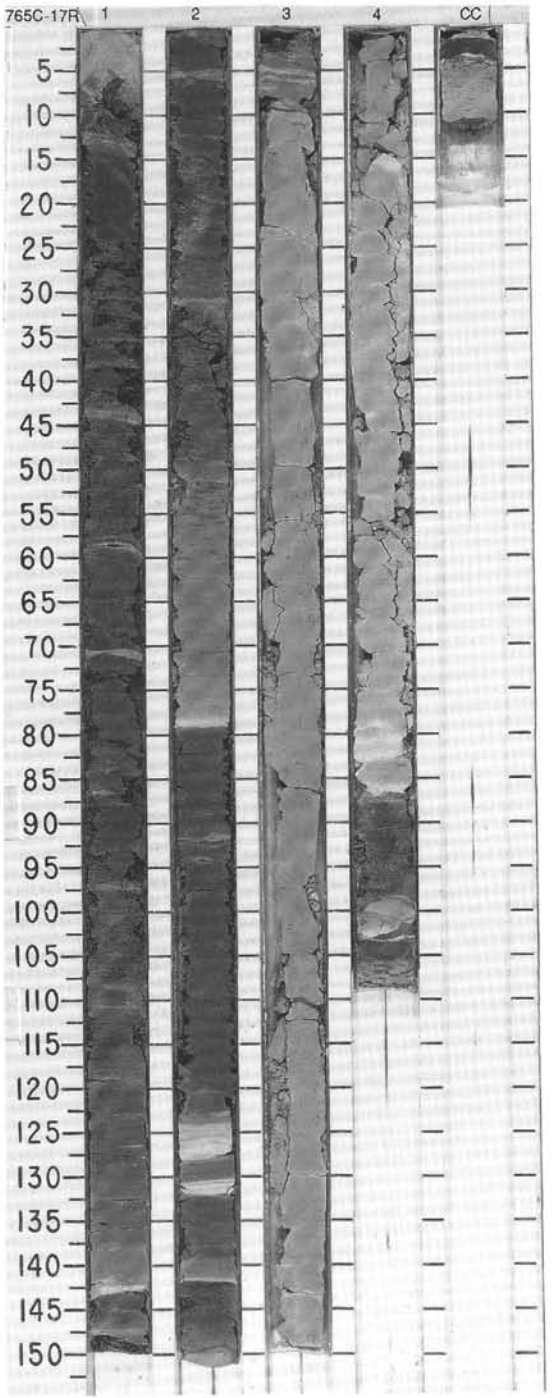
The core is undisturbed, except Section 4, highly fractured at 0-20 and 55-85 cm.

Major lithologies :
a. CLAYSTONE, dark reddish brown (5YR 3/4 and 6/6), occupying 90% of Section 1 and 80% of Section 2, with minor bioturbation.
b. NANNOFOSSIL CHALK, reddish yellow (5YR 6/6), occupying 20% of Section 2, 95% of Section 3 and 80% of Section 4, with minor bioturbation.

Minor lithologies :
a. Sand with quartz, light gray (10Y 6/2), very thin (mm to 0.5 cm), finely parallel and/or cross laminated, intercalated within claystone in Section 1 at 42, 59, 70.5-71, 86.5, 97.5, 111 and 143 cm; in Section 2 at 5, 30-30.5, 51, 78.5 and 91 cm (here infilling also an underlying burrow).
b. Calcareous chalk, gray (5Y 6/1) silty normally graded, cross- laminated; two sets (6 cm in thickness) at the base of Section 2, 123-129 cm .

SMEAR SLIDE SUMMARY (%):

	1, 43 M	1, 70 M	2, 77 M	2, 90 M	3, 25 D
TEXTURE:					
Sand	98	89	4	34	—
Silt	1	6	55	10	55
Clay	1	5	41	56	45
COMPOSITION:					
Calcareous fragments	—	—	Tr	—	—
Clay	—	5	—	40	—
Foraminifers	—	—	2	—	—
Glass	1	4	Tr	3	—
Glauconite	—	5	—	—	—
Micrite	—	—	—	—	48
Muscovite	1	—	—	Tr	—
Nannofossils	Tr	—	95	1	50
Opaques	Tr	—	—	12	—
Organic matter	Tr	1	—	8	—
Plant	Tr	—	—	—	—
Pyrite	Tr	Tr	Tr	3	Tr
Quartz	98	82	2	33	Tr
Spicules	—	—	—	—	Tr
Unspecified minerals	Tr	3	—	—	—
Zircon	—	—	—	Tr	—



SITE 765 HOLE C CORE 18R CORED INTERVAL 511.9-521.3 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
OLIGOCENE	P21 - 22 C/G	CP16c				N / R / N	Φ=49.4 ρ=2.11 V=1854; Φ=56.2 ρ=1.98 V=1708; Φ=45.4 ρ=2.08 V=1907	$CaCO_3$=1.2; $CaCO_3$=76.5	1	0.5				
	P18 - 19					Int.			2	1.0				*
	A/G	A/G	B		B	R			3					*
						N			4				OG IW	*
						R?			5					*
						N			CC					* #

LITHOLOGIC DESCRIPTION

NANNOFOSSIL CHALK AND CLAYSTONE

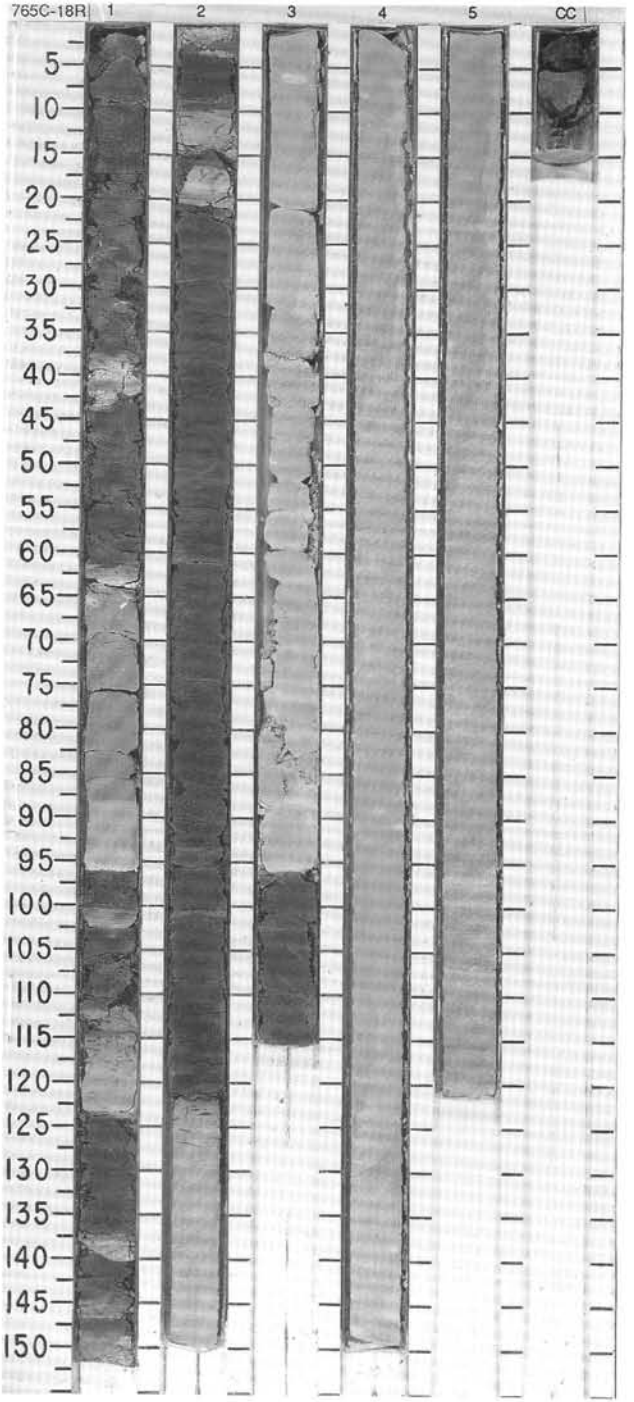
Entire core is undisturbed to very slightly disturbed.

Major lithologies :
a. NANNOFOSSIL CHALK, very pale brown (10R 7/4 to 6/4)., with minor bioturbation, mainly featureless, occupying 30% of Section 1, 30-% of Section 2, 90% of Section 3 and 100% of Section 4 and 5;
b. CLAYSTONE with QUARTZ, dark yellowish brown (10YR 4/4), commonly massive and featureless; quartz is commonly silty.

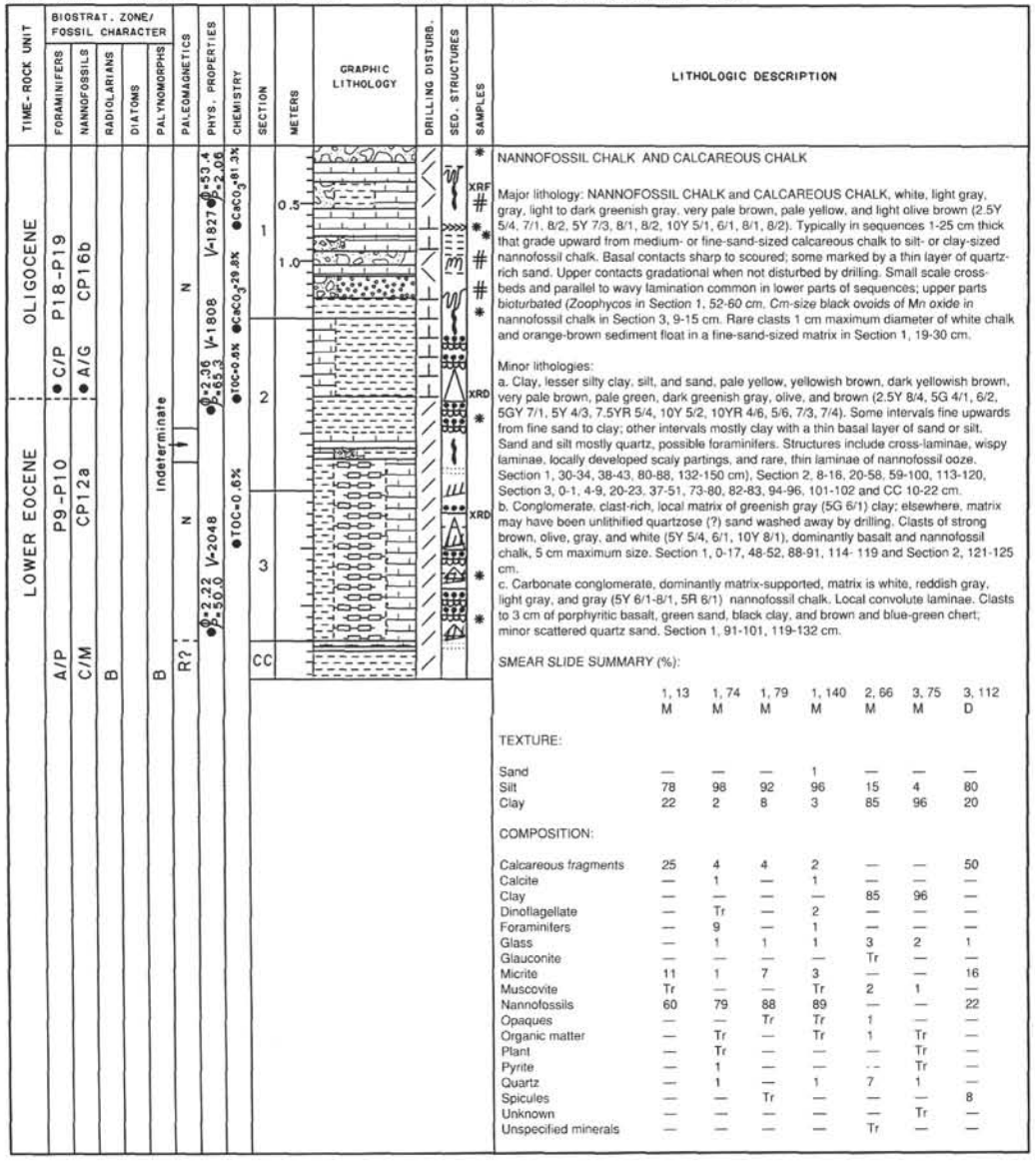
Minor lithologies :
a. Sand with quartz, gray, medium sandy, very thin (few mm in thickness) and cross-laminated intercalation within the claystone, in Section 1 at 9, 43, 64, 103, 115 cm, and in Section 2 at 95 and 100cm
b. Nannofossil-foraminifer chalk, gray (10YR 5/1), normally graded, medium sandy to silty in Section 2 at 15-20 cm, cross and wavy laminated, Section 3 at 90-95 cm, and well developed as a more complete.turbiditic sequence in Section 5 at 90-120 cm, parallel laminae at bottom and top, cross-laminated at the middle interval, (may be the base of a relatively thick turbidite ranging upward to Section 4).

SMEAR SLIDE SUMMARY (%):

	2, 19 M	2, 74 M	3, 5 D	4, 25 D	5, 90 D	5, 107 D
TEXTURE:						
Sand	42	—	—	—	—	30
Silt	52	15	88	97	99	30
Clay	6	85	12	3	1	40
COMPOSITION:						
Accessory minerals	—	—	—	—	—	Tr
Calcareous fragments	9	—	—	2	2	—
Calcite	1	—	—	—	—	—
Clay	—	85	—	—	—	—
Feldspar	—	—	—	—	—	1
Foraminifers	37	—	1	1	Tr	30
Glass	3	1	—	Tr	Tr	—
Glauconite	—	—	—	—	—	Tr
Mica	—	—	—	—	—	2
Micrite	5	—	11	—	1	50
Muscovite	—	2	—	1	—	—
Nannofossils	35	—	87	95	95	—
Opaques	Tr	1	—	—	Tr	—
Organic matter	3	—	—	Tr	Tr	—
Other	—	—	—	—	—	10
Plant	—	Tr	—	—	—	—
Quartz	3	11	Tr	—	Tr	7
Spicules	1	—	Tr	—	—	—



SITE 765 HOLE C CORE 19R CORED INTERVAL 521.3-530.8 mbsf



LITHOLOGIC DESCRIPTION

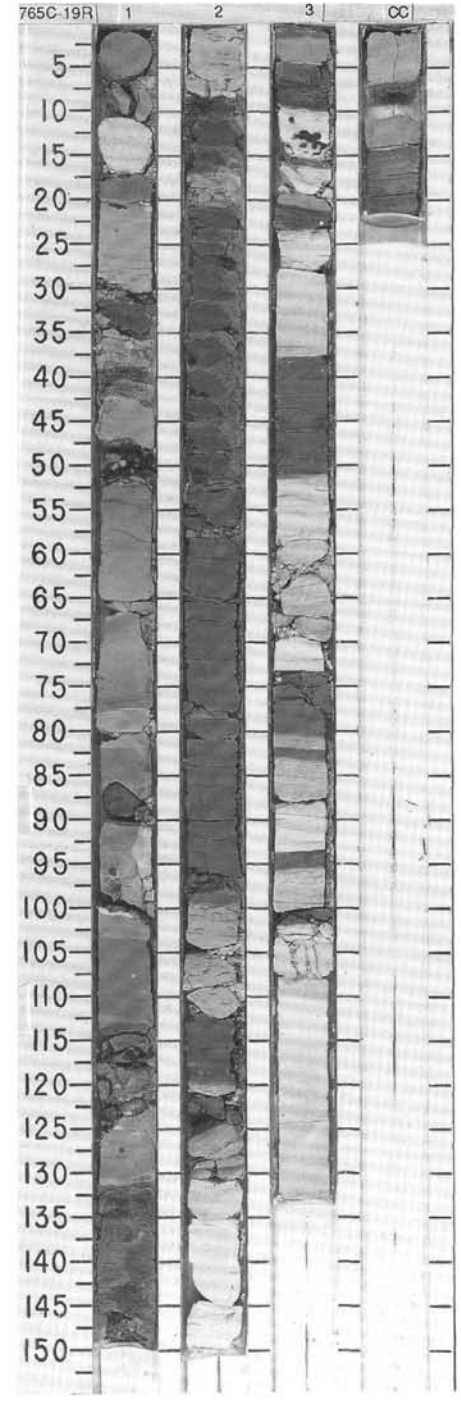
NANNOFOSSIL CHALK AND CALCAREOUS CHALK

Major lithology: NANNOFOSSIL CHALK and CALCAREOUS CHALK, white, light gray, gray, light to dark greenish gray, very pale brown, pale yellow, and light olive brown (2.5Y 5/4, 7/1, 8/2, 5Y 7/3, 8/1, 8/2, 10Y 5/1, 6/1, 8/1, 8/2). Typically in sequences 1-25 cm thick that grade upward from medium- or fine-sand-sized calcareous chalk to silt- or clay-sized nannofossil chalk. Basal contacts sharp to scoured; some marked by a thin layer of quartz-rich sand. Upper contacts gradational when not disturbed by drilling. Small scale cross-beds and parallel to wavy lamination common in lower parts of sequences; upper parts *bioturbated (Zoophycos in Section 1, 52-60 cm. Cm-size black ovoids of Mn oxide in* nannofossil chalk in Section 3, 9-15 cm. Rare clasts 1 cm maximum diameter of white chalk and orange-brown sediment float in a fine-sand-sized matrix in Section 1, 19-30 cm.

Minor lithologies:
a. Clay, lesser silty clay, silt, and sand, pale yellow, yellowish brown, dark yellowish brown, very pale brown, pale green, dark greenish gray, olive, and brown (2.5Y 8/4, 5G 4/1, 6/2, 5GY 7/1, 5Y 4/3, 7.5YR 5/4, 10Y 5/2, 10YR 4/6, 5/6, 7/3, 7/4). Some intervals fine upwards from fine sand to clay; other intervals mostly clay with a thin basal layer of sand or silt. Sand and silt mostly quartz, possible foraminifers. Structures include cross-laminae, wispy laminae, locally developed scaly partings, and rare, thin laminae of nannofossil ooze. Section 1, 30-34, 38-43, 80-88, 132-150 cm), Section 2, 8-16, 20-58, 59-100, 113-120, Section 3, 0-1, 4-9, 20-23, 37-51, 73-80, 82-83, 94-96, 101-102 and CC 10-22 cm.
b. Conglomerate, clast-rich, local matrix of greenish gray (5G 6/1) clay; elsewhere, matrix may have been unlithified quartzose (?) sand washed away by drilling. Clasts of strong brown, olive, gray, and white (5Y 5/4, 6/1, 10Y 8/1), dominantly basalt and nannofossil chalk, 5 cm maximum size. Section 1, 0-17, 48-52, 88-91, 114- 119 and Section 2, 121-125 cm.
c. Carbonate conglomerate, dominantly matrix-supported, matrix is white, reddish gray, light gray, and gray (5Y 6/1-8/1, 5R 6/1) nannofossil chalk. Local convolute laminae. Clasts to 3 cm of porphyritic basalt, green sand, black clay, and brown and blue-green chert; minor scattered quartz sand. Section 1, 91-101, 119-132 cm.

SMEAR SLIDE SUMMARY (%):

	1, 13 M	1, 74 M	1, 79 M	1, 140 M	2, 66 M	3, 75 M	3, 112 D
TEXTURE:							
Sand	—	—	—	1	—	—	—
Silt	78	98	92	96	15	4	80
Clay	22	2	8	3	85	96	20
COMPOSITION:							
Calcareous fragments	25	4	4	2	—	—	50
Calcite	—	1	—	1	—	—	—
Clay	—	—	—	—	85	96	—
Dinoflagellate	—	Tr	—	2	—	—	—
Foraminifers	—	9	—	1	—	—	—
Glass	—	1	1	1	3	2	1
Glauconite	—	—	—	—	Tr	—	—
Micrite	11	1	7	3	—	—	16
Muscovite	Tr	—	—	Tr	2	1	—
Nannofossils	60	79	88	89	—	—	22
Opaques	—	—	Tr	Tr	1	—	—
Organic matter	—	Tr	—	Tr	1	Tr	—
Plant	—	Tr	—	—	—	Tr	—
Pyrite	—	1	—	—	—	Tr	—
Quartz	—	1	—	1	7	1	—
Spicules	—	—	Tr	—	—	—	8
Unknown	—	—	—	—	—	Tr	—
Unspecified minerals	—	—	—	—	Tr	—	—



SITE 765 HOLE C CORE 20R CORED INTERVAL 530.8-540.4 mbsf

TIME-ROCK UNIT	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
LOWER EOCENE	R/P P5-P8 / A/P P6-P8 / A/P P7-P8	C/MP CP9b / A/P CP9b	B		B	N / R	Φ=51.6 ρ=1.95 V=1823 ● Φ=42.5 ρ=2.37 V=2038 ● Φ=40.9 ρ=2.15 V=2033 ● TOC=1.5%		1 2 CC	0.5 1.0				XRD

LITHOLOGIC DESCRIPTION

NANNOFOSSIL CHALK AND CLAY

Major lithologies:
NANNOFOSSIL CHALK and CLAY, gray, brown, yellowish brown, brownish yellow, yellow, olive yellow, olive brown, white (10YR 3/6 to 5/6, 7/2, 7/4, 2.5Y 5/6, 6/6, 7/2, 7/4, 8/2). Nannofossil chalk commonly laminated, vaguely laminated, massive, or slightly bioturbated. Upper contact sharp or gradational (to clay), lower contact sharp or gradational (to calcareous chalk). Some is nannofossil chalk with clay.Clay massive or vaguely laminated, upper contact sharp, lower contact sharp or gradational, to nannofossil chalk. Clinoptilolite dominant, montmorillonite/illite-GR major.

Minor lithologies:
a. Calcareous chalk, brown, white, gray, yellow (10YR 8/3, 8/4, 7/4, 2.5Y 7/2, 8/2, 7/4). Cross-laminated, graded, massive, or vaguely laminated.Basal contacts sharp, upper contacts sharp or gradational to nannofossil chalk. Contains as much as 40% quartz sand (commonly 1-2%) and as much as 25% foraminifers. Very-fine- to medium-sand-sized, dominantly fine sand. Section 1, 36-37, 54-56, 103-105, 113-116, 123-131, Section 2, 49-53, 61-66, 78-82 cm. Locally with clay.
b. Cavings, Section 1, 0-10 cm, basalt, sandstone, and siltstone pebbles (6 TSBs).
c. Silty clay, gray or yellowish brown (2.5Y 7/3, 10YR 3/6), Section 2, 0-4, locally between 4 and 21 cm.

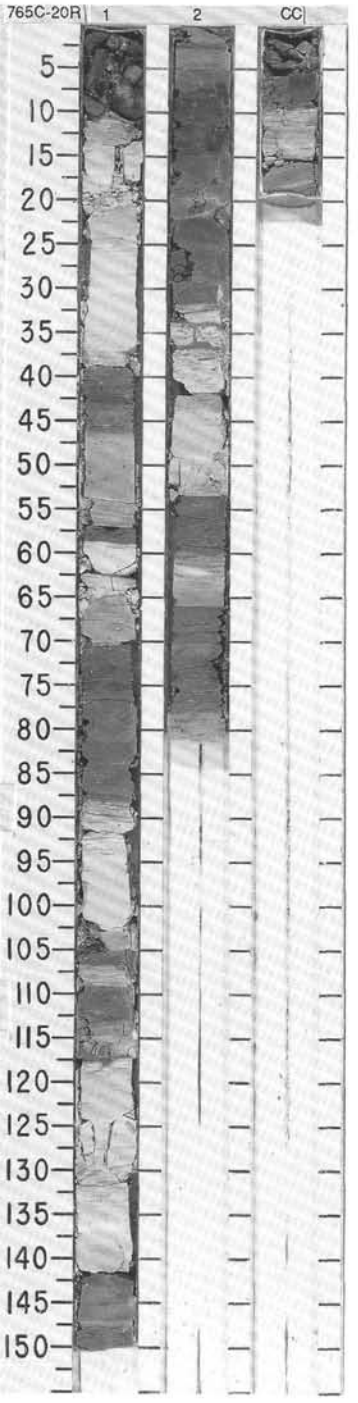
Core dominated by graded carbonate sequences capped by clay. Clays relatively thick; some may represent, in part, pelagic deposition, especially in lower part of core (Section 2, 4-21, 53-59 cm). Or, these intervals may be extremely fine-grained event deposits. Sequences 3-36 cm thick.

SMEAR SLIDE SUMMARY (%):

	1, 0 M	1, 2 M	1, 31 D	1, 78 M	1, 129 M	1, 130 M	2, 9 M
TEXTURE:							
Sand	70	—	—	3	90	40	2
Silt	30	25	99	87	9	25	87
Clay	—	75	1	10	1	35	11
COMPOSITION:							
Accessory minerals	—	—	—	—	—	Tr	—
Calcareous fragments	—	—	39	—	33	5	Tr
Calcite	—	—	1	—	—	—	—
Clay	100	—	—	92	—	—	94
Dinoflagellate	—	—	Tr	—	Tr	—	—
Feldspar	—	—	—	—	—	5	—
Foraminifers	—	—	1	—	20	32	—
Glass	—	—	1	Tr	3	—	Tr
Glauconite	—	—	—	—	—	5	—
Inorganic calcite	—	—	—	—	—	2	—
Mica	—	Tr	—	—	—	2	—
Micrite	—	70	—	—	—	20	—
Muscovite	—	—	—	3	—	—	1
Nannofossils	—	—	58	—	1	—	—
Opaques	—	—	Tr	Tr	1	—	Tr
Organic matter	—	15	—	Tr	2	2	1
Other	—	—	—	—	—	2	—
Quartz	—	10	Tr	2	40	25	1
Zircon	—	—	—	—	Tr	—	—

SMEAR SLIDE SUMMARY (%):

	2, 56 M
TEXTURE:	
Sand	2
Silt	90
Clay	8
COMPOSITION:	
Calcareous fragments	1
Clay	95
Glass	Tr
Muscovite	2
Opaques	Tr
Organic matter	Tr
Quartz	1



SITE 765 HOLE C CORE 21R CORED INTERVAL 540.4-550.1 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
LOWER EOCENE	PF:B	B CP8	C/M C/P		B		Φ=42.5 ρ=2.29 V=2000	$CaCO_3$=1.2%	1 CC	0.5				* ** **

LITHOLOGIC DESCRIPTION

CLAYSTONE WITH ZEOLITES AND CLAYEY NANNOFOSSIL CHALK WITH ZEOLITES

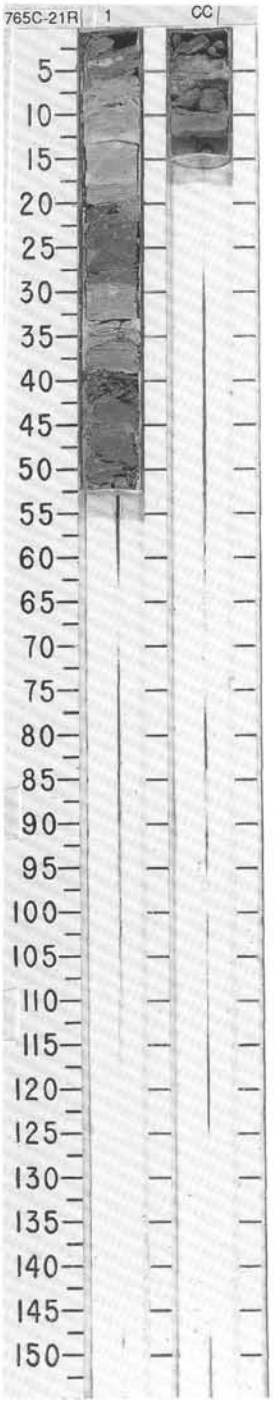
Major lithologies:
CLAYSTONE with ZEOLITES and CLAYEY NANNOFOSSIL CHALK with ZEOLITES, brown, brownish yellow, gray, greenish gray (10YR 6/6, 8/4, 5GY 5/1, 5Y 6/1). Claystone massive, clayey nannofossil chalk massive or slightly bioturbated. Contacts sharp or gradational except upper contacts of claystones sharp.

Minor lithology: Interlaminated quartz sand/silt and clayey silt with zeolites and nannofossils, gray (5Y 6/1). Lower contacts sharp, upper contacts gradational, finely laminated, percent clayey silt increases upward and percent quartz sand/silt decreases upward.

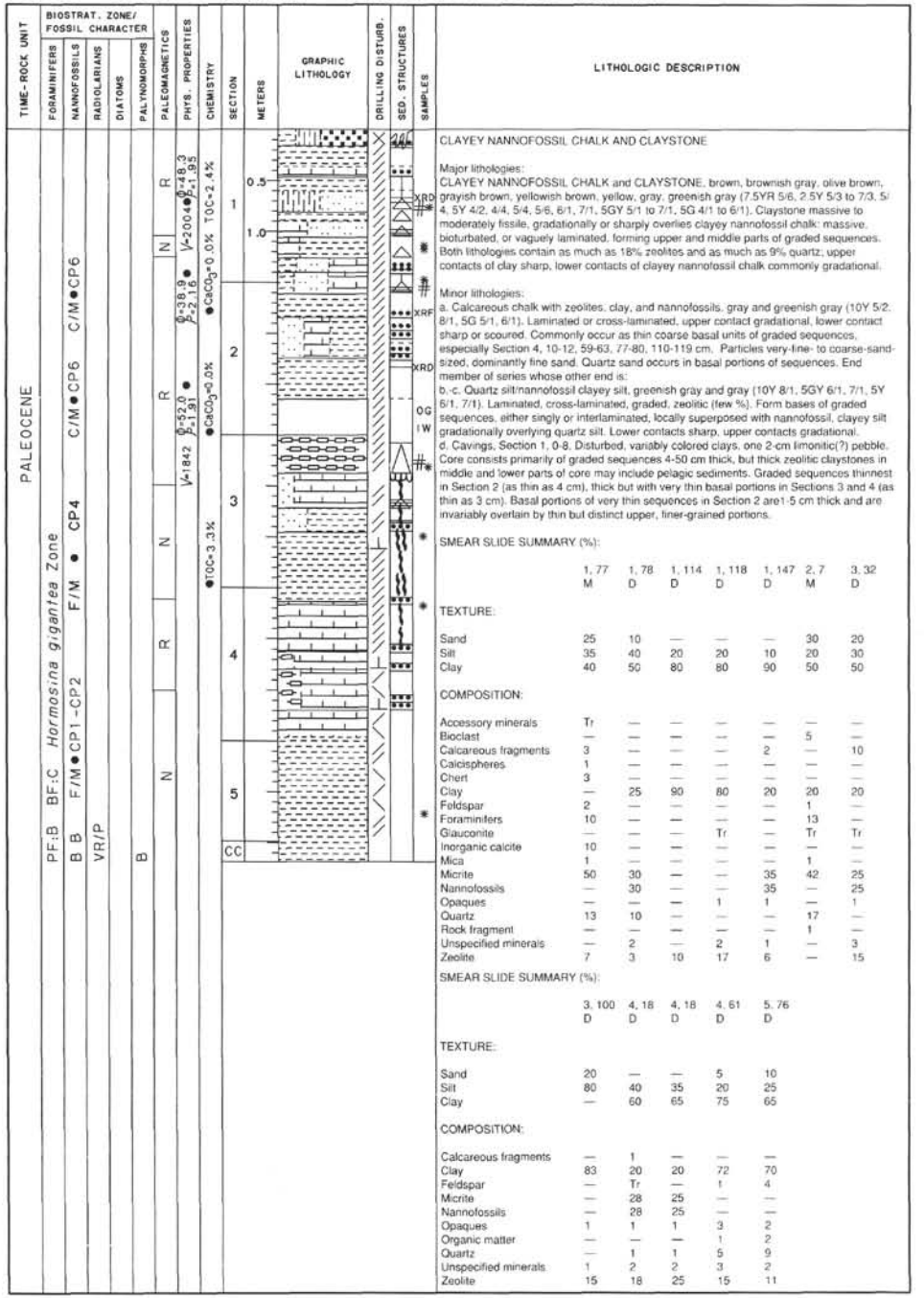
Claystone with zeolites and clayey nannofossil chalk with zeolites form the upper and middle parts, respectively, of graded sequences. Basal portions consist of interlaminated quartz sand/silt and clayey silt with zeolites and nannofossils.

SMEAR SLIDE SUMMARY (%):

	1, 3 D	1, 37 M	1, 47 D
TEXTURE:			
Sand	—	10	—
Silt	30	30	30
Clay	70	60	70
COMPOSITION:			
Clay	80	30	85
Feldspar	—	1	Tr
Glass	—	Tr	Tr
Micrite	—	30	—
Nannofossils	—	17	—
Opaques	—	1	1
Quartz	—	3	2
Unspecified minerals	2	3	2
Zeolite	18	15	10



SITE 765 HOLE C CORE 22R CORED INTERVAL 550.1-559.7 mbsf



LITHOLOGIC DESCRIPTION

CLAYEY NANNOFOSSIL CHALK AND CLAYSTONE

Major lithologies:
CLAYEY NANNOFOSSIL CHALK and CLAYSTONE, brown, brownish gray, olive brown, grayish brown, yellowish brown, yellow, gray, greenish gray (7.5YR 5/6, 2.5Y 5/3 to 7/3, 5/4, 5Y 4/2, 4/4, 5/4, 5/6, 6/1, 7/1, 5GY 5/1 to 7/1, 5G 4/1 to 6/1). Claystone massive to moderately fissile, gradationally or sharply overlies clayey nannofossil chalk: massive, bioturbated, or vaguely laminated, forming upper and middle parts of graded sequences. Both lithologies contain as much as 18% zeolites and as much as 9% quartz; upper contacts of clay sharp, lower contacts of clayey nannofossil chalk commonly gradational.

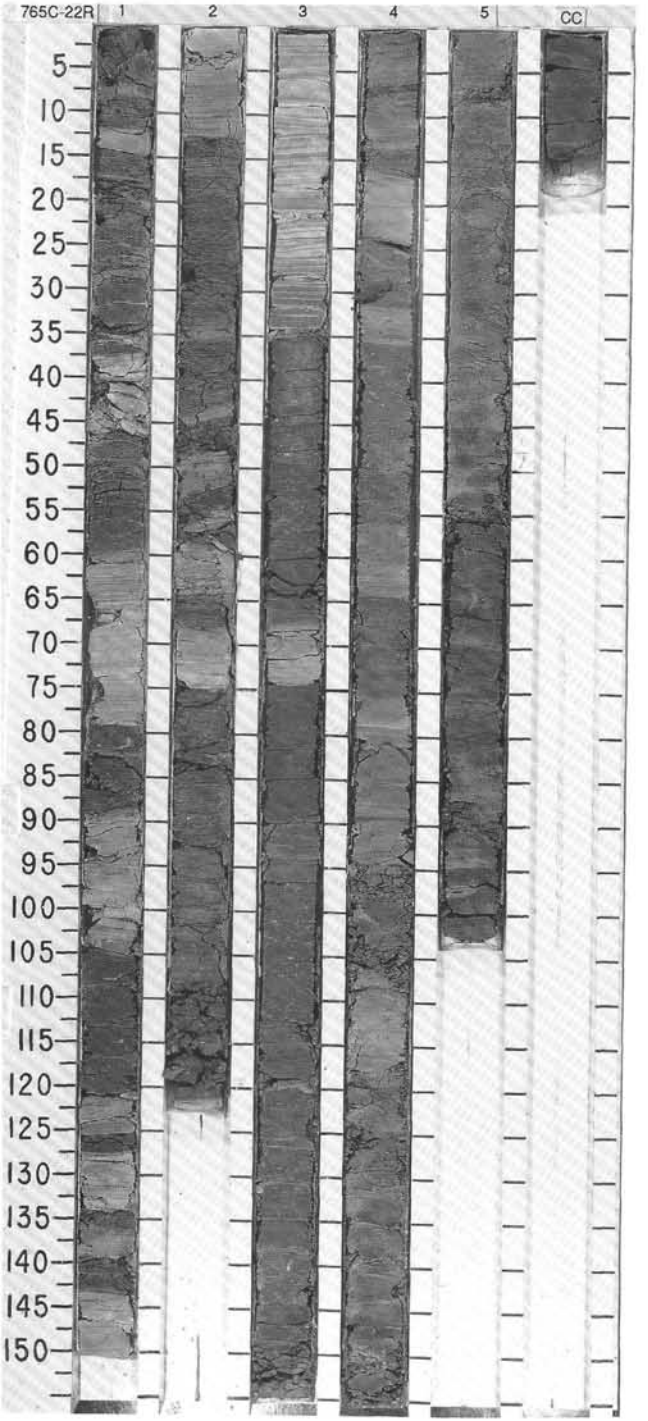
Minor lithologies:
a. Calcareous chalk with zeolites, clay, and nannofossils, gray and greenish gray (10Y 5/2, 8/1, 5G 5/1, 6/1). Laminated or cross-laminated, upper contact gradational, lower contact sharp or scoured. Commonly occur as thin coarse basal units of graded sequences, especially Section 4, 10-12, 59-63, 77-80, 110-119 cm. Particles very-fine- to coarse-sand-sized, dominantly fine sand. Quartz sand occurs in basal portions of sequences. End member of series whose other end is:
b.-c. Quartz silt/nannofossil clayey silt, greenish gray and gray (10Y 8/1, 5GY 6/1, 7/1, 5Y 6/1, 7/1). Laminated, cross-laminated, graded, zeolitic (few %). Form bases of graded sequences, either singly or interlaminated, locally superposed with nannofossil, clayey silt gradationally overlying quartz silt. Lower contacts sharp, upper contacts gradational.
d. Cavings, Section 1, 0-8. Disturbed, variably colored clays, one 2-cm limonitic(?) pebble. Core consists primarily of graded sequences 4-50 cm thick, but thick zeolitic claystones in middle and lower parts of core may include pelagic sediments. Graded sequences thinnest in Section 2 (as thin as 4 cm), thick but with very thin basal portions in Sections 3 and 4 (as thin as 3 cm). Basal portions of very thin sequences in Section 2 are1-5 cm thick and are invariably overlain by thin but distinct upper, finer-grained portions.

SMEAR SLIDE SUMMARY (%):

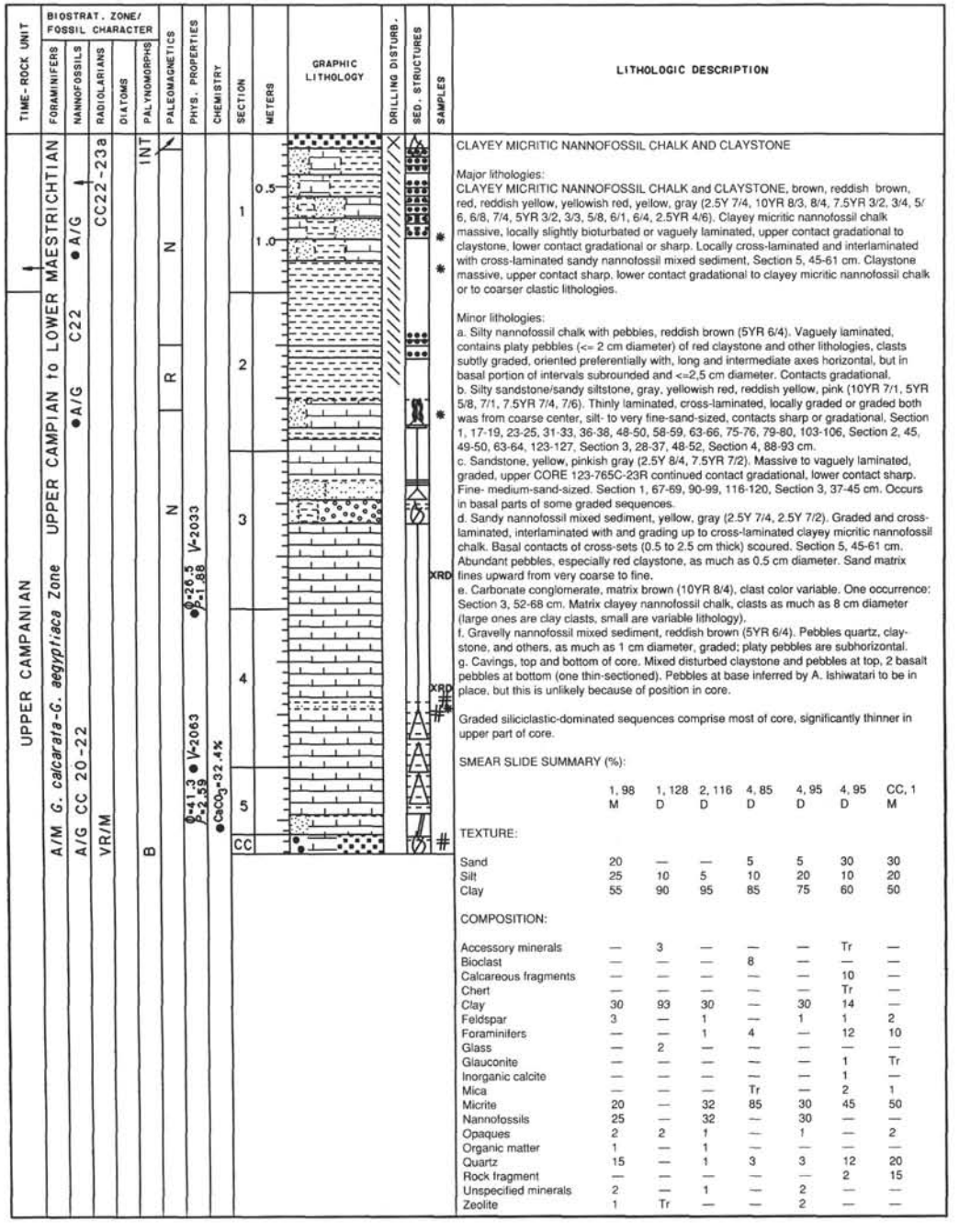
	1, 77 M	1, 78 D	1, 114 D	1, 118 D	1, 147 D	2, 7 M	3, 32 D
TEXTURE:							
Sand	25	10	—	—	—	30	20
Silt	35	40	20	20	10	20	30
Clay	40	50	80	80	90	50	50
COMPOSITION:							
Accessory minerals	Tr	—	—	—	—	—	—
Bioclast	—	—	—	—	—	5	—
Calcareous fragments	3	—	—	—	2	—	10
Calcispheres	1	—	—	—	—	—	—
Chert	3	—	—	—	—	—	—
Clay	—	25	90	80	20	20	20
Feldspar	2	—	—	—	—	1	—
Foraminifers	10	—	—	—	—	13	—
Glauconite	—	—	—	Tr	—	Tr	Tr
Inorganic calcite	10	—	—	—	—	—	—
Mica	1	—	—	—	—	1	—
Micrite	50	30	—	—	35	42	25
Nannofossils	—	30	—	—	35	—	25
Opaques	—	—	—	1	1	—	1
Quartz	13	10	—	—	—	17	—
Rock fragment	—	—	—	—	—	1	—
Unspecified minerals	—	2	—	2	1	—	3
Zeolite	7	3	10	17	6	—	15

SMEAR SLIDE SUMMARY (%):

	3, 100 D	4, 18 D	4, 18 D	4, 61 D	5, 76 D
TEXTURE:					
Sand	20	—	—	5	10
Silt	80	40	35	20	25
Clay	—	60	65	75	65
COMPOSITION:					
Calcareous fragments	—	1	—	—	—
Clay	83	20	20	72	70
Feldspar	—	Tr	—	1	4
Micrite	—	28	25	—	—
Nannofossils	—	28	25	—	—
Opaques	1	1	1	3	2
Organic matter	—	—	—	1	2
Quartz	—	1	1	5	9
Unspecified minerals	1	2	2	3	2
Zeolite	15	18	25	15	11



SITE 765 HOLE C CORE 23R CORED INTERVAL 559.7-569.3 mbsf



LITHOLOGIC DESCRIPTION

CLAYEY MICRITIC NANNOFOSSIL CHALK AND CLAYSTONE

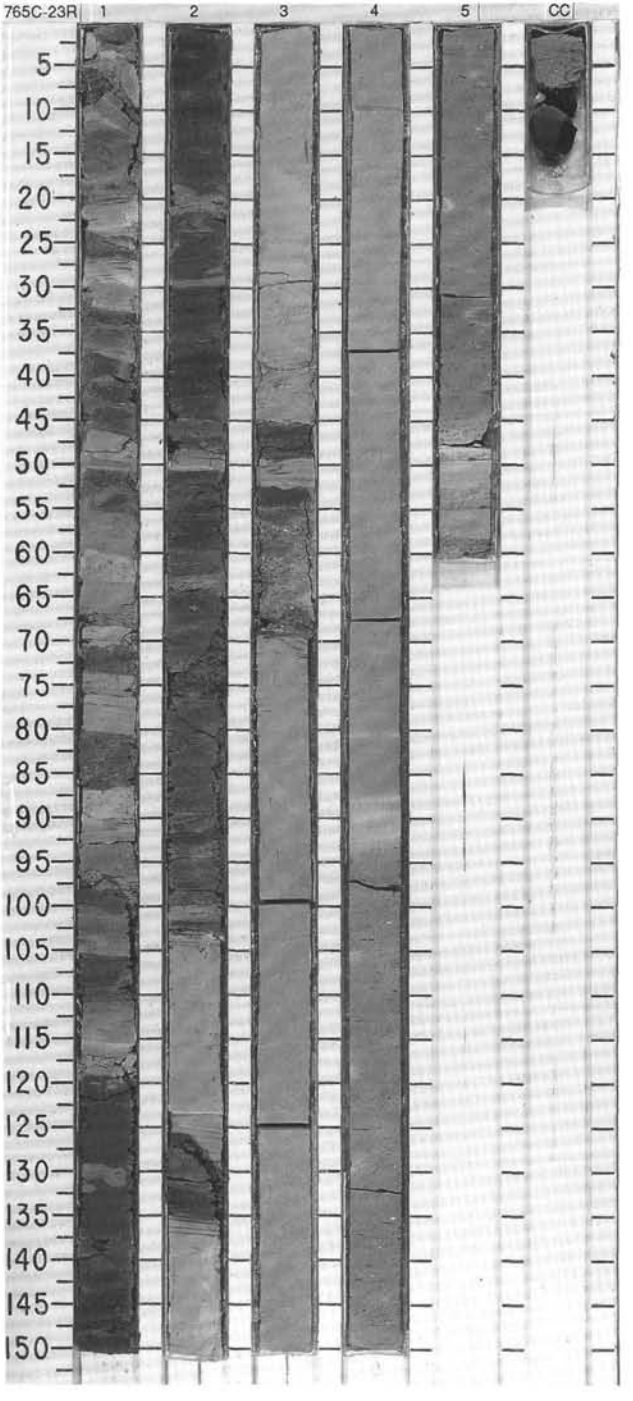
Major lithologies:
CLAYEY MICRITIC NANNOFOSSIL CHALK and CLAYSTONE, brown, reddish brown, red, reddish yellow, yellowish red, yellow, gray (2.5Y 7/4, 10YR 8/3, 8/4, 7.5YR 3/2, 3/4, 5/6, 6/8, 7/4, 5YR 3/2, 3/3, 5/8, 6/1, 6/4, 2.5YR 4/6). Clayey micritic nannofossil chalk massive, locally slightly bioturbated or vaguely laminated, upper contact gradational to claystone, lower contact gradational or sharp. Locally cross-laminated and interlaminated with cross-laminated sandy nannofossil mixed sediment, Section 5, 45-61 cm. Claystone massive, upper contact sharp, lower contact gradational to clayey micritic nannofossil chalk or to coarser clastic lithologies.

Minor lithologies:
a. Silty nannofossil chalk with pebbles, reddish brown (5YR 6/4). Vaguely laminated, contains platy pebbles (<= 2 cm diameter) of red claystone and other lithologies, clasts subtly graded, oriented preferentially with, long and intermediate axes horizontal, but in basal portion of intervals subrounded and <=2,5 cm diameter. Contacts gradational.
b. Silty sandstone/sandy siltstone, gray, yellowish red, reddish yellow, pink (10YR 7/1, 5YR 5/8, 7/1, 7.5YR 7/4, 7/6). Thinly laminated, cross-laminated, locally graded or graded both was from coarse center, silt- to very fine-sand-sized, contacts sharp or gradational. Section 1, 17-19, 23-25, 31-33, 36-38, 48-50, 58-59, 63-66, 75-76, 79-80, 103-106, Section 2, 45, 49-50, 63-64, 123-127, Section 3, 28-37, 48-52, Section 4, 88-93 cm.
c. Sandstone, yellow, pinkish gray (2.5Y 8/4, 7.5YR 7/2). Massive to vaguely laminated, graded, upper CORE 123-765C-23R continued contact gradational, lower contact sharp. Fine- medium-sand-sized. Section 1, 67-59, 90-99, 116-120, Section 3, 37-45 cm. Occurs in basal parts of some graded sequences.
d. Sandy nannofossil mixed sediment, yellow, gray (2.5Y 7/4, 2.5Y 7/2). Graded and cross-laminated, interlaminated with and grading up to cross-laminated clayey micritic nannofossil chalk. Basal contacts of cross-sets (0.5 to 2.5 cm thick) scoured. Section 5, 45-61 cm. Abundant pebbles, especially red claystone, as much as 0.5 cm diameter. Sand matrix fines upward from very coarse to fine.
e. Carbonate conglomerate, matrix brown (10YR 8/4), clast color variable. One occurrence: Section 3, 52-68 cm. Matrix clayey nannofossil chalk, clasts as much as 8 cm diameter (large ones are clay clasts, small are variable lithology).
f. Gravelly nannofossil mixed sediment, reddish brown (5YR 6/4). Pebbles quartz, claystone, and others, as much as 1 cm diameter, graded; platy pebbles are subhorizontal.
g. Cavings, top and bottom of core. Mixed disturbed claystone and pebbles at top, 2 basalt pebbles at bottom (one thin-sectioned). Pebbles at base inferred by A. Ishiwatari to be in place, but this is unlikely because of position in core.

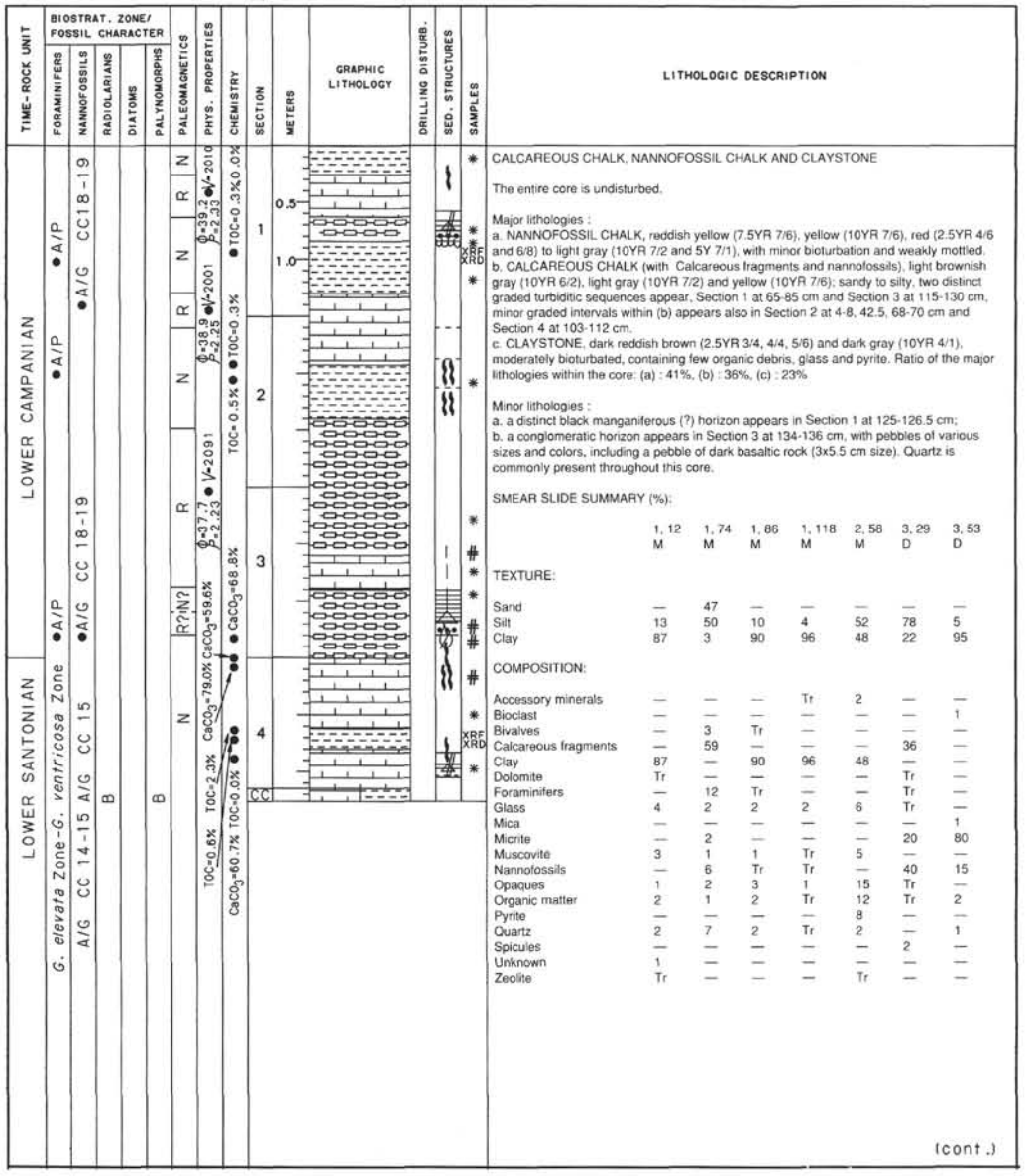
Graded siliciclastic-dominated sequences comprise most of core, significantly thinner in upper part of core.

SMEAR SLIDE SUMMARY (%):

	1, 98 M	1, 128 D	2, 116 D	4, 85 D	4, 95 D	4, 95 D	CC, 1 M
TEXTURE:							
Sand	20	—	—	5	5	30	30
Silt	25	10	5	10	20	10	20
Clay	55	90	95	85	75	60	50
COMPOSITION:							
Accessory minerals	—	3	—	—	—	Tr	—
Bioclast	—	—	—	8	—	—	—
Calcareous fragments	—	—	—	—	—	10	—
Chert	—	—	—	—	—	Tr	—
Clay	30	93	30	—	30	14	—
Feldspar	3	—	1	—	1	1	2
Foraminifers	—	—	1	4	—	12	10
Glass	—	2	—	—	—	—	—
Glauconite	—	—	—	—	—	1	Tr
Inorganic calcite	—	—	—	—	—	1	—
Mica	—	—	—	Tr	—	2	1
Micrite	20	—	32	85	30	45	50
Nannofossils	25	—	32	—	30	—	—
Opaques	2	2	1	—	1	—	2
Organic matter	1	—	1	—	—	—	—
Quartz	15	—	1	3	3	12	20
Rock fragment	—	—	—	—	—	2	15
Unspecified minerals	2	—	1	—	2	—	—
Zeolite	1	Tr	—	—	2	—	—



SITE 765 HOLE C CORE 24R CORED INTERVAL 569.3-579.0 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS CHALK, NANNOFOSSIL CHALK AND CLAYSTONE

The entire core is undisturbed.

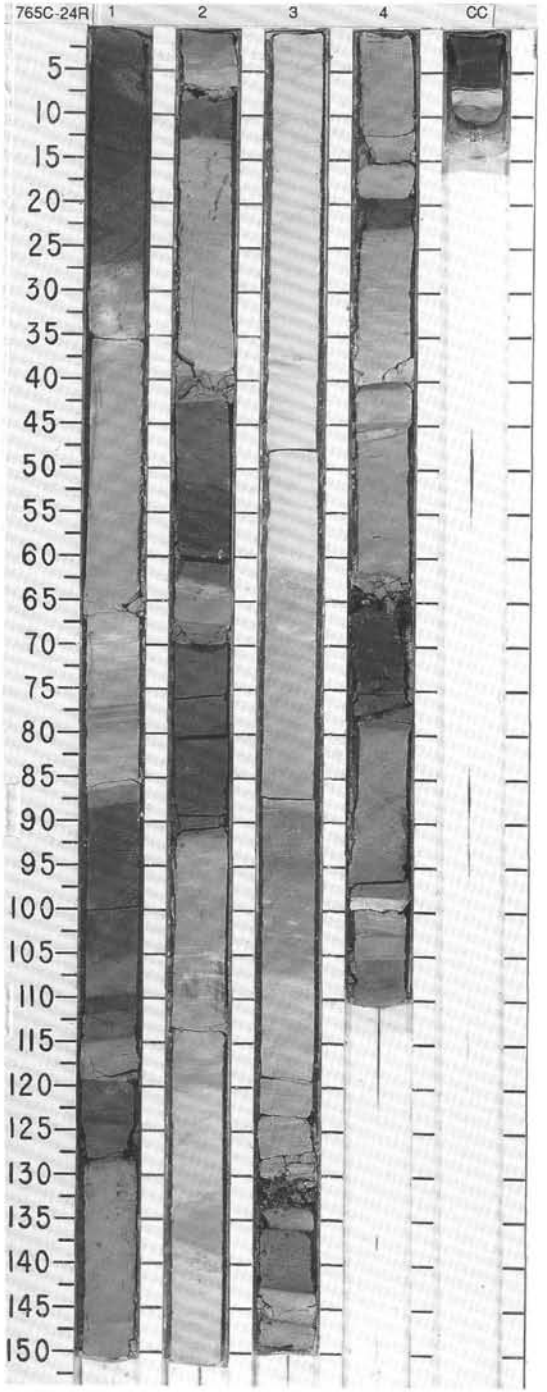
Major lithologies :
a. NANNOFOSSIL CHALK, reddish yellow (7.5YR 7/6), yellow (10YR 7/6), red (2.5YR 4/6 and 6/8) to light gray (10YR 7/2 and 5Y 7/1), with minor bioturbation and weakly mottled.
b. CALCAREOUS CHALK (with Calcareous fragments and nannofossils), light brownish gray (10YR 6/2), light gray (10YR 7/2) and yellow (10YR 7/6); sandy to silty, two distinct graded turbiditic sequences appear, Section 1 at 65-85 cm and Section 3 at 115-130 cm, minor graded intervals within (b) appears also in Section 2 at 4-8, 42.5, 68-70 cm and Section 4 at 103-112 cm.
c. CLAYSTONE, dark reddish brown (2.5YR 3/4, 4/4, 5/6) and dark gray (10YR 4/1), moderately bioturbated, containing few organic debris, glass and pyrite. Ratio of the major lithologies within the core: (a) : 41%, (b) : 36%, (c) : 23%

Minor lithologies :
a. a distinct black manganiferous (?) horizon appears in Section 1 at 125-126.5 cm;
b. a conglomeratic horizon appears in Section 3 at 134-136 cm, with pebbles of various sizes and colors, including a pebble of dark basaltic rock (3x5.5 cm size). Quartz is commonly present throughout this core.

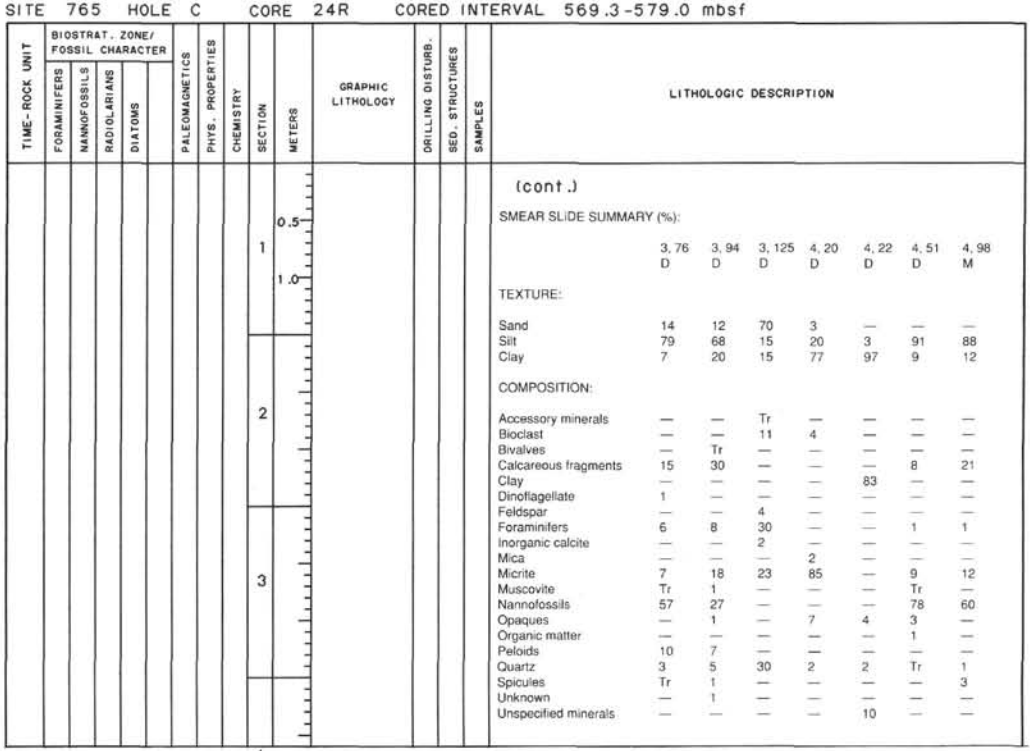
SMEAR SLIDE SUMMARY (%):

	1, 12 M	1, 74 M	1, 86 M	1, 118 M	2, 58 M	3, 29 D	3, 53 D
TEXTURE:							
Sand	—	47	—	—	—	—	—
Silt	13	50	10	4	52	78	5
Clay	87	3	90	96	48	22	95
COMPOSITION:							
Accessory minerals	—	—	—	Tr	2	—	—
Bioclast	—	—	—	—	—	—	1
Bivalves	—	3	Tr	—	—	—	—
Calcareous fragments	—	59	—	—	—	36	—
Clay	87	—	90	96	48	—	—
Dolomite	Tr	—	—	—	—	Tr	—
Foraminifers	—	12	Tr	—	—	Tr	—
Glass	4	2	2	2	6	Tr	—
Mica	—	—	—	—	—	—	1
Micrite	—	2	—	—	—	20	80
Muscovite	3	1	1	Tr	5	—	—
Nannofossils	—	6	Tr	Tr	—	40	15
Opaques	1	2	3	1	15	Tr	—
Organic matter	2	1	2	Tr	12	Tr	2
Pyrite	—	—	—	—	8	—	—
Quartz	2	7	2	Tr	2	—	1
Spicules	—	—	—	—	—	2	—
Unknown	1	—	—	—	—	—	—
Zeolite	Tr	—	—	—	Tr	—	—

(cont.)



SITE 765 HOLE C CORE 24R CORED INTERVAL 569.3-579.0 mbsf

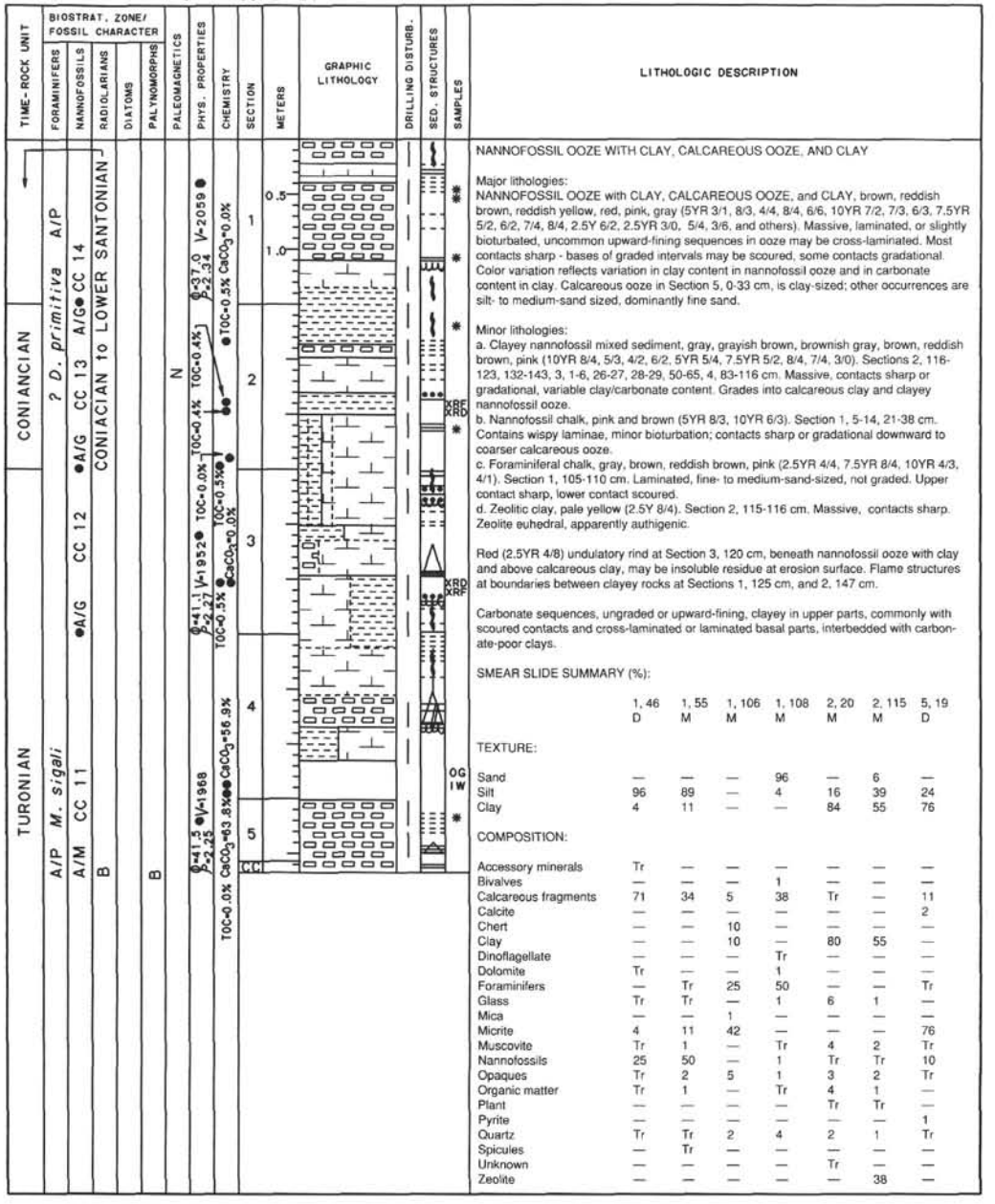


(cont.)

SMEAR SLIDE SUMMARY (%):

	3, 76 D	3, 94 D	3, 125 D	4, 20 D	4, 22 D	4, 51 D	4, 98 M
TEXTURE:							
Sand	14	12	70	3	—	—	—
Silt	79	68	15	20	3	91	88
Clay	7	20	15	77	97	9	12
COMPOSITION:							
Accessory minerals	—	—	Tr	—	—	—	—
Bioclast	—	—	11	4	—	—	—
Bivalves	—	Tr	—	—	—	—	—
Calcareous fragments	15	30	—	—	—	8	21
Clay	—	—	—	—	83	—	—
Dinoflagellate	1	—	—	—	—	—	—
Feldspar	—	—	4	—	—	—	—
Foraminifers	6	8	30	—	—	1	1
Inorganic calcite	—	—	2	—	—	—	—
Mica	—	—	—	2	—	—	—
Micrite	7	18	23	85	—	9	12
Muscovite	Tr	1	—	—	—	Tr	—
Nannofossils	57	27	—	—	—	78	60
Opaques	—	1	—	7	4	3	—
Organic matter	—	—	—	—	—	1	—
Peloids	10	7	—	—	—	—	—
Quartz	3	5	30	2	2	Tr	1
Spicules	Tr	1	—	—	—	—	3
Unknown	—	1	—	—	—	—	—
Unspecified minerals	—	—	—	—	10	—	—

SITE 765 HOLE C CORE 25R CORED INTERVAL 579.0-588.3 mbsf



LITHOLOGIC DESCRIPTION

NANNOFOSSIL OOZE WITH CLAY, CALCAREOUS OOZE, AND CLAY

Major lithologies:
NANNOFOSSIL OOZE with CLAY, CALCAREOUS OOZE, and CLAY, brown, reddish brown, reddish yellow, red, pink, gray (5YR 3/1, 8/3, 4/4, 8/4, 6/6, 10YR 7/2, 7/3, 6/3, 7.5YR 5/2, 6/2, 7/4, 8/4, 2.5Y 6/2, 2.5YR 3/0, 5/4, 3/6, and others). Massive, laminated, or slightly bioturbated, uncommon upward-fining sequences in ooze may be cross-laminated. Most contacts sharp - bases of graded intervals may be scoured, some contacts gradational. Color variation reflects variation in clay content in nannofossil ooze and in carbonate content in clay. Calcareous ooze in Section 5, 0-33 cm, is clay-sized; other occurrences are silt- to medium-sand sized, dominantly fine sand.

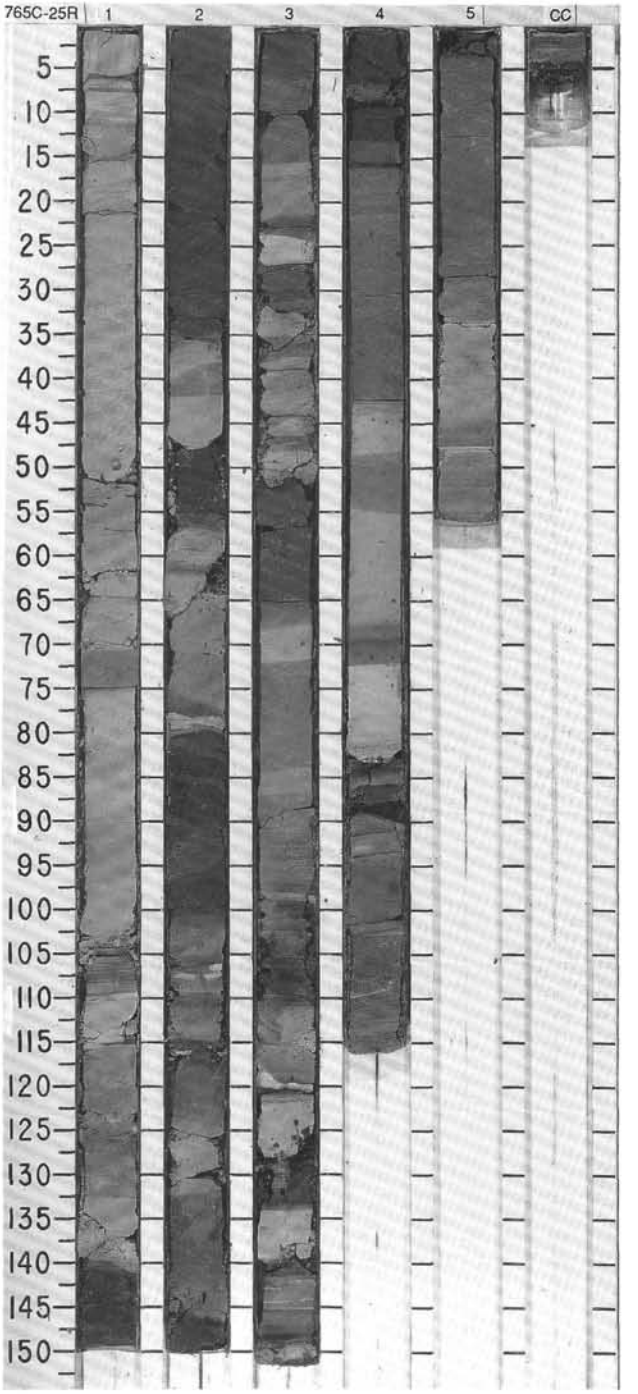
Minor lithologies:
a. Clayey nannofossil mixed sediment, gray, grayish brown, brownish gray, brown, reddish brown, pink (10YR 8/4, 5/3, 4/2, 6/2, 5YR 5/4, 7.5YR 5/2, 8/4, 7/4, 3/0). Sections 2, 116-123, 132-143, 3, 1-6, 26-27, 28-29, 50-65, 4, 83-116 cm. Massive, contacts sharp or gradational, variable clay/carbonate content. Grades into calcareous clay and clayey nannofossil ooze.
b. Nannofossil chalk, pink and brown (5YR 8/3, 10YR 6/3). Section 1, 5-14, 21-38 cm. Contains wispy laminae, minor bioturbation; contacts sharp or gradational downward to coarser calcareous ooze.
c. Foraminiferal chalk, gray, brown, reddish brown, pink (2.5YR 4/4, 7.5YR 8/4, 10YR 4/3, 4/1). Section 1, 105-110 cm. Laminated, fine- to medium-sand-sized, not graded. Upper contact sharp, lower contact scoured.
d. Zeolitic clay, pale yellow (2.5Y 8/4). Section 2, 115-116 cm. Massive, contacts sharp. Zeolite euhedral, apparently authigenic.

Red (2.5YR 4/8) undulatory rind at Section 3, 120 cm, beneath nannofossil ooze with clay and above calcareous clay, may be insoluble residue at erosion surface. Flame structures at boundaries between clayey rocks at Sections 1, 125 cm, and 2, 147 cm.

Carbonate sequences, ungraded or upward-fining, clayey in upper parts, commonly with scoured contacts and cross-laminated or laminated basal parts, interbedded with carbonate-poor clays.

SMEAR SLIDE SUMMARY (%):

	1, 46 D	1, 55 M	1, 106 M	1, 108 M	2, 20 M	2, 115 M	5, 19 D
TEXTURE:							
Sand	—	—	—	96	—	6	—
Silt	96	89	—	4	16	39	24
Clay	4	11	—	—	84	55	76
COMPOSITION:							
Accessory minerals	Tr	—	—	—	—	—	—
Bivalves	—	—	—	1	—	—	—
Calcareous fragments	71	34	5	38	Tr	—	11
Calcite	—	—	—	—	—	—	2
Chert	—	—	10	—	—	—	—
Clay	—	—	10	—	80	55	—
Dinoflagellate	—	—	—	Tr	—	—	—
Dolomite	Tr	—	—	1	—	—	—
Foraminifers	—	Tr	25	50	—	—	Tr
Glass	Tr	Tr	—	1	6	1	—
Mica	—	—	1	—	—	—	—
Micrite	4	11	42	—	—	—	76
Muscovite	Tr	1	—	Tr	4	2	Tr
Nannofossils	25	50	—	1	Tr	Tr	10
Opaques	Tr	2	5	1	3	2	Tr
Organic matter	Tr	1	—	Tr	4	1	—
Plant	—	—	—	—	Tr	Tr	—
Pyrite	—	—	—	—	—	—	1
Quartz	Tr	Tr	2	4	2	1	Tr
Spicules	—	Tr	—	—	—	—	—
Unknown	—	—	—	—	Tr	—	—
Zeolite	—	—	—	—	—	38	—



SITE 765 HOLE C CORE 26R CORED INTERVAL 588.3-597.5 mbsf

TIME-ROCK UNIT: TURONIAN / CENOMANIAN

BIOSTRAT. ZONE/FOSSIL CHARACTER:
- FORAMINIFERS: R/M *H. delrioensis* ●A/P *R. reicheli - R. cushmani* ●A/G
- NANNOFOSSILS: B C/G ●C/G CC 10 ●A/G CC 10 ●A/G CC 11
- RADIOLARIANS: B
- DIATOMS
- PALYNOMORPHS: B
- PALEOMAGNETICS: N
- PHYS. PROPERTIES: ρ=60.8 γ=1677 ρ=1.88 ρ=61.6 γ=1655 ρ=1.91
- CHEMISTRY: $CaCO_3$=0.1% TOC=0.7% TOC=0.4% TOC=0.3% $CaCO_3$=0.0% TOC=4.9% $CaCO_3$=35.7%
- SECTION: 1, 2, 3, 4, 5, CC
- METERS: 0.5, 1.0
- GRAPHIC LITHOLOGY
- DRILLING DISTURB.
- SED. STRUCTURES
- SAMPLES: XRF

LITHOLOGIC DESCRIPTION

ZEOLITIC CLAYSTONE AND NANNOFOSSIL CHALK

Part of the core is slightly disturbed

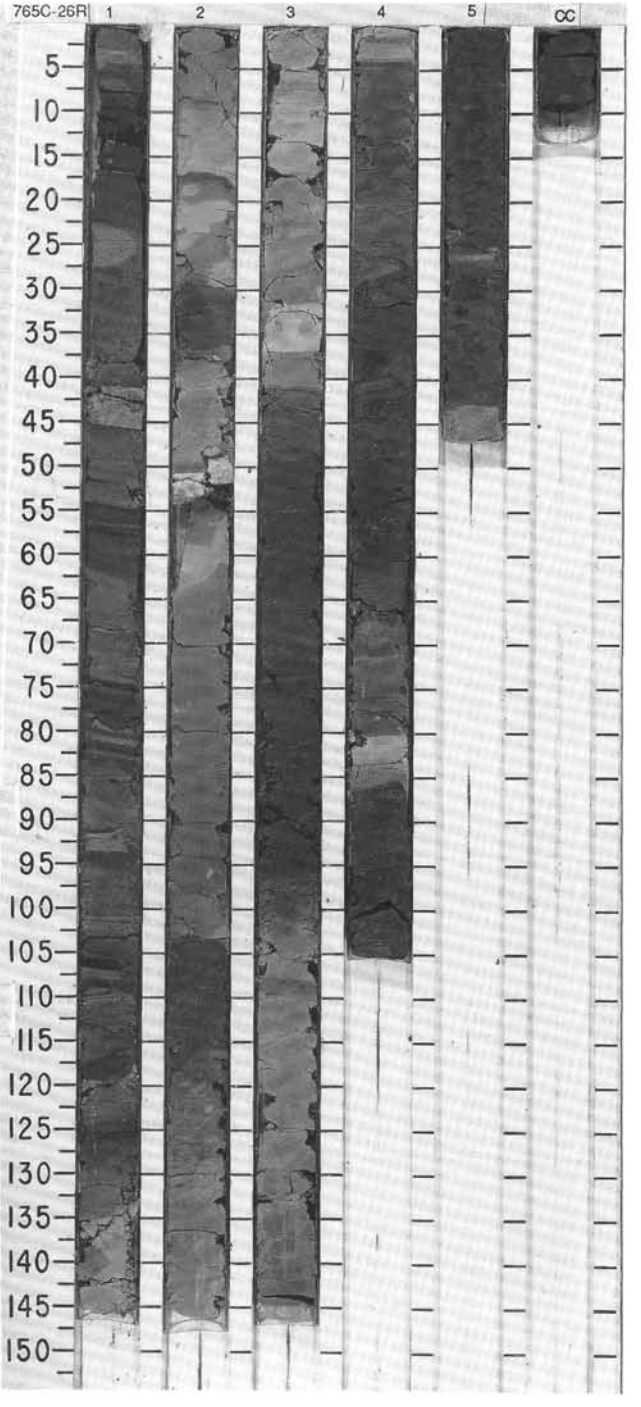
Major lithologies :

a. CLAYSTONE, gray to very dark gray and dark grayish brown (5YR 5/1, 10YR 5/1, 3/1, 4/2), red brown (5YR 4/4) to exceptionally red (2.5YR 4/6); common diagenetic (?) features as : banding, lamination and/or mottles, e.g.; in Section 1, at 4-38, 72-85, 119-129 cm, and Section 3 at 48-100 cm, with correlative gradual change in the color; no distinct bioturbation. Zeolite first appearance in Section 3 at 39 cm (ratio of 16% according to smear slide description).

b. NANNOFOSSIL CHALK, color ranging from gray (10YR 5/7), light greenish gray and very dark greenish gray (10Y 7, 5), brownish (10YR 4/2, 6/4, 7/4) to red (2.5YR 4/8, 5YR 6/8); silty, massive, mainly featureless, except two thin intervals (4 cm thick) graded and parallel laminated (small turbidite ?) : Section 4, 77-81 cm and Section 5, 42-46 cm.

SMEAR SLIDE SUMMARY (%):

	1, 65 M	2, 80 D	2, 109 D	3, 23 D	3, 39 M	3, 46 M
TEXTURE:						
Sand	—	1	—	—	—	—
Silt	16	85	14	83	24	12
Clay	84	14	86	17	76	88
COMPOSITION:						
Calcareous fragments	—	15	—	19	—	Tr
Clay	84	—	86	—	76	88
Foraminifers	Tr	1	—	4	—	Tr
Glass	4	—	1	—	1	1
Micrite	—	14	—	17	—	—
Muscovite	4	Tr	3	1	3	2
Nannofossils	—	68	Tr	57	Tr	Tr
Opaques	1	2	1	1	3	1
Organic matter	2	Tr	Tr	1	—	1
Plant	—	Tr	Tr	—	—	Tr
Pyrite	—	—	4	—	—	1
Quartz	3	—	2	Tr	1	1
Zeolite	Tr	—	2	—	16	5



SITE 765 HOLE C CORE 27R CORED INTERVAL 597.5-607.0 mbsf

TIME-ROCK UNIT: ALBIAN — ALBIAN-LOWER CENOMANIAN

BIOSTRAT. ZONE/FOSSIL CHARACTER

FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS
PF:B BF:C	*Plectorecurvoides alternans*	*H. delriensis*		
B	R/M● CC 8 CC 9	B● ●C/M ↑ ●C/M↓	VR/M●	B
B				
B				

PALEOMAGNETICS: N

PHYS. PROPERTIES: TOC-3.2% $CaCO_3$=13.3% Φ=65.0 ● V-1632 ρ=2.80 Φ=59.9 ● V-1650 ρ=2.67

CHEMISTRY: TOC-0.3% $CaCO_3$=0.0% ● ●TOC=0.4%

SECTION: 1, 2, CC

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY

DRILLING DISTURB.

SED. STRUCTURES: XRD XRF

SAMPLES

LITHOLOGIC DESCRIPTION

CLAY

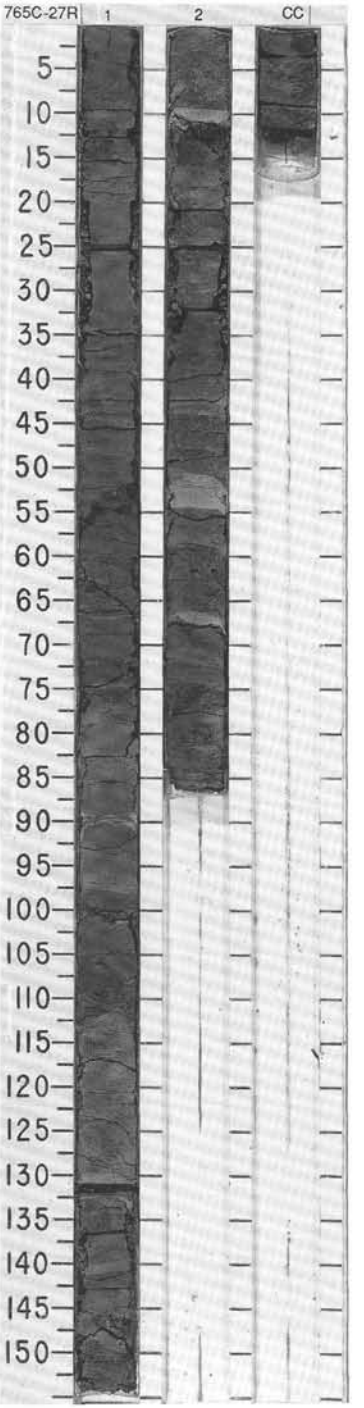
Core is dominantly slightly disturbed; Sections 1 and 2 both expanded by 3 cm.

Major lithology: CLAY, dominantly reddish brown or dark gray, more rarely light reddish brown, dark reddish gray, pinkish gray, light brown, light to dark greenish gray, or very dark gray (2.5 YR 3/0, 3/6, 4/4, 4/6, 4/8, 5/4, 5/6, 6/4; 5 YR 3/1, 4/1, 4/2, 5/3, 5/4, 6/3; 7.5 YR 6/2, 6/4; 5 BG 7/1; 5G 7/1). Contains minor muscovite, zeolite, and glass. Locally developed scaly fabric; common faint parallel to wispy laminations and mottles caused by diagenesis and bioturbation. One interval in Section 2, 66-67 cm contains floating sand- and silt-sized quartz grains.

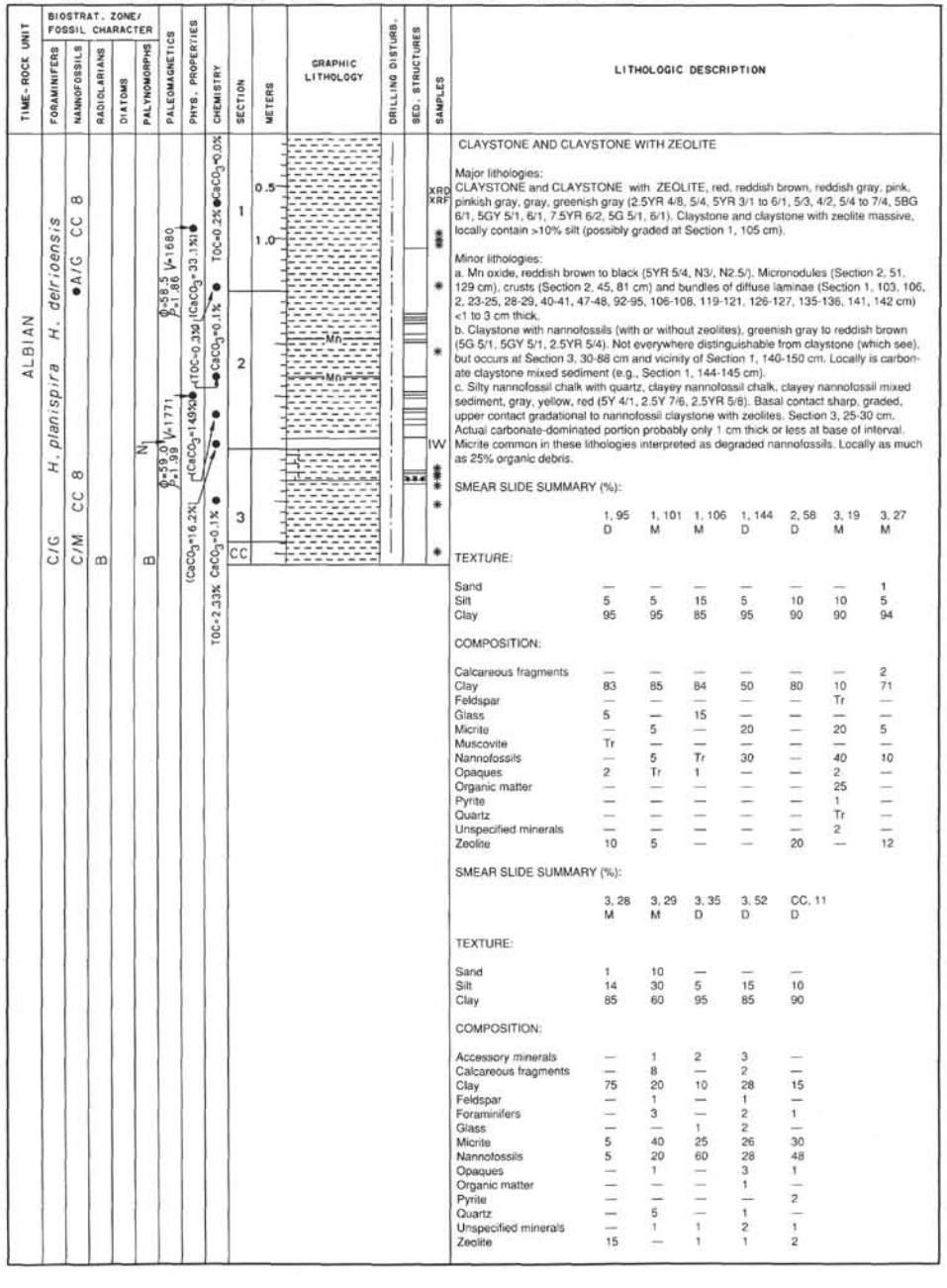
Minor lithologies:
a. Nannofossil ooze with micrite, very dark gray to weak red with rare red to light red (5 YR 3/1, 2.5 YR 5/2, 4/6 to 6/6) patches, mottles, and lenses. Clay to silt sized.
b. Quartz silt to fine-grained sand, reddish brown (5 YR 4/4), in Section 1, 79-90 cm. Irregular base, fines upward to clay. Contains minor muscovite, radiolarians, and foraminifers.
c. Calcareous fragment quartz mixed sediment Section 2, 9-10 cm, light greenish gray (5G 7/1). Scoured base marked by 1 mm of coarse quartz sand; main interval medium sand grading upward to silt. Contains minor nannofossils, foraminifers, clay, and zeolite.

SMEAR SLIDE SUMMARY (%):

	1, 30 D	1, 94 M	1, 132 M	2, 9 D	2, 52 D
TEXTURE:					
Sand	—	—	—	71	—
Silt	86	12	7	22	4
Clay	14	88	93	7	96
COMPOSITION:					
Bivalves	—	—	—	1	—
Calcareous fragments	6	—	—	31	—
Clay	—	88	93	5	96
Dinoflagellate	—	—	—	Tr	—
Foraminifers	—	Tr	—	5	—
Glass	—	2	Tr	2	Tr
Micrite	14	—	—	2	—
Muscovite	3	3	2	1	2
Nannofossils	65	—	—	6	—
Opaques	3	1	2	1	—
Organic matter	4	1	1	1	Tr
Plant	—	Tr	Tr	—	Tr
Quartz	2	1	1	37	1
Unknown	—	—	—	—	1
Zeolite	—	2	Tr	3	—



SITE 765 HOLE C CORE 28R CORED INTERVAL 607.0-616.4 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE AND CLAYSTONE WITH ZEOLITE

Major lithologies:
CLAYSTONE and CLAYSTONE with ZEOLITE, red, reddish brown, reddish gray, pink, pinkish gray, gray, greenish gray (2.5YR 4/8, 5/4, 5YR 3/1 to 6/1, 5/3, 4/2, 5/4 to 7/4, 5BG 6/1, 5GY 5/1, 6/1, 7.5YR 6/2, 5G 5/1, 6/1). Claystone and claystone with zeolite massive, locally contain >10% silt (possibly graded at Section 1, 105 cm).

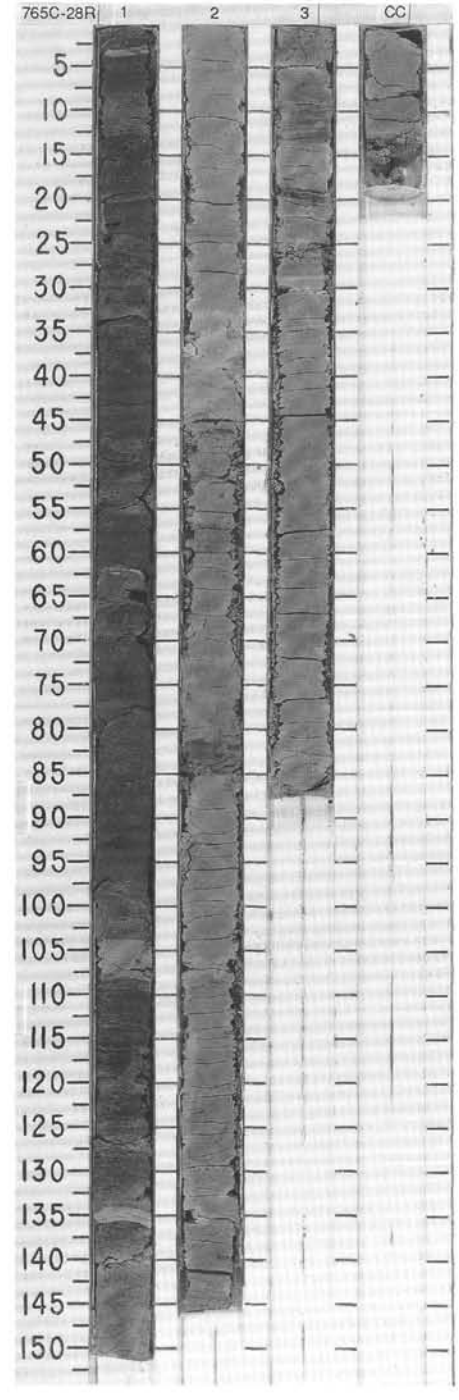
Minor lithologies:
a. Mn oxide, reddish brown to black (5YR 5/4, N3/, N2.5/). Micronodules (Section 2, 51, 129 cm), crusts (Section 2, 45, 81 cm) and bundles of diffuse laminae (Section 1, 103, 106, 2, 23-25, 28-29, 40-41, 47-48, 92-95, 106-108, 119-121, 126-127, 135-136, 141, 142 cm) <1 to 3 cm thick.
b. Claystone with nannofossils (with or without zeolites), greenish gray to reddish brown (5G 5/1, 5GY 5/1, 2.5YR 5/4). Not everywhere distinguishable from claystone (which see), but occurs at Section 3, 30-88 cm and vicinity of Section 1, 140-150 cm. Locally is carbonate claystone mixed sediment (e.g., Section 1, 144-145 cm).
c. Silty nannofossil chalk with quartz, clayey nannofossil chalk, clayey nannofossil mixed sediment, gray, yellow, red (5Y 4/1, 2.5Y 7/6, 2.5YR 5/8). Basal contact sharp, graded, upper contact gradational to nannofossil claystone with zeolites. Section 3, 25-30 cm. Actual carbonate-dominated portion probably only 1 cm thick or less at base of interval. Micrite common in these lithologies interpreted as degraded nannofossils. Locally as much as 25% organic debris.

SMEAR SLIDE SUMMARY (%):

	1, 95 D	1, 101 M	1, 106 M	1, 144 D	2, 58 D	3, 19 M	3, 27 M
TEXTURE:							
Sand	—	—	—	—	—	—	1
Silt	5	5	15	5	10	10	5
Clay	95	95	85	95	90	90	94
COMPOSITION:							
Calcareous fragments	—	—	—	—	—	—	2
Clay	83	85	84	50	80	10	71
Feldspar	—	—	—	—	—	Tr	—
Glass	5	—	15	—	—	—	—
Micrite	—	5	—	20	—	20	5
Muscovite	Tr	—	—	—	—	—	—
Nannofossils	—	5	Tr	30	—	40	10
Opaques	2	Tr	1	—	—	2	—
Organic matter	—	—	—	—	—	25	—
Pyrite	—	—	—	—	—	1	—
Quartz	—	—	—	—	—	Tr	—
Unspecified minerals	—	—	—	—	—	2	—
Zeolite	10	5	—	—	20	—	12

SMEAR SLIDE SUMMARY (%):

	3, 28 M	3, 29 M	3, 35 D	3, 52 D	CC, 11 D
TEXTURE:					
Sand	1	10	—	—	—
Silt	14	30	5	15	10
Clay	85	60	95	85	90
COMPOSITION:					
Accessory minerals	—	1	2	3	—
Calcareous fragments	—	8	—	2	—
Clay	75	20	10	28	15
Feldspar	—	1	—	1	—
Foraminifers	—	3	—	2	1
Glass	—	—	1	2	—
Micrite	5	40	25	26	30
Nannofossils	5	20	60	28	48
Opaques	—	1	—	3	1
Organic matter	—	—	—	1	—
Pyrite	—	—	—	—	2
Quartz	—	5	—	1	—
Unspecified minerals	—	1	1	2	1
Zeolite	15	—	1	1	2



SITE 765 HOLE C CORE 29R CORED INTERVAL 616.4-625.9 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
ALBIAN	PF:B BF:C	B	B		B	N	Φ=54.5 ρ=1.99 ●V=1775 Φ=52.6 ρ=1.93 ●V=1769 Φ=53.4 ρ=1.97	TOC=3.3% ● $CaCO_3$=0.0% ● $CaCO_3$=93.7%	1 2 3 4 5 6 CC	0.5 1.0			XRF	OC

●C/M *H. planispira, H. delrioensis*

●A/G CC 8

LITHOLOGIC DESCRIPTION

CLAYSTONE AND NANNOFOSSIL CLAYSTONE

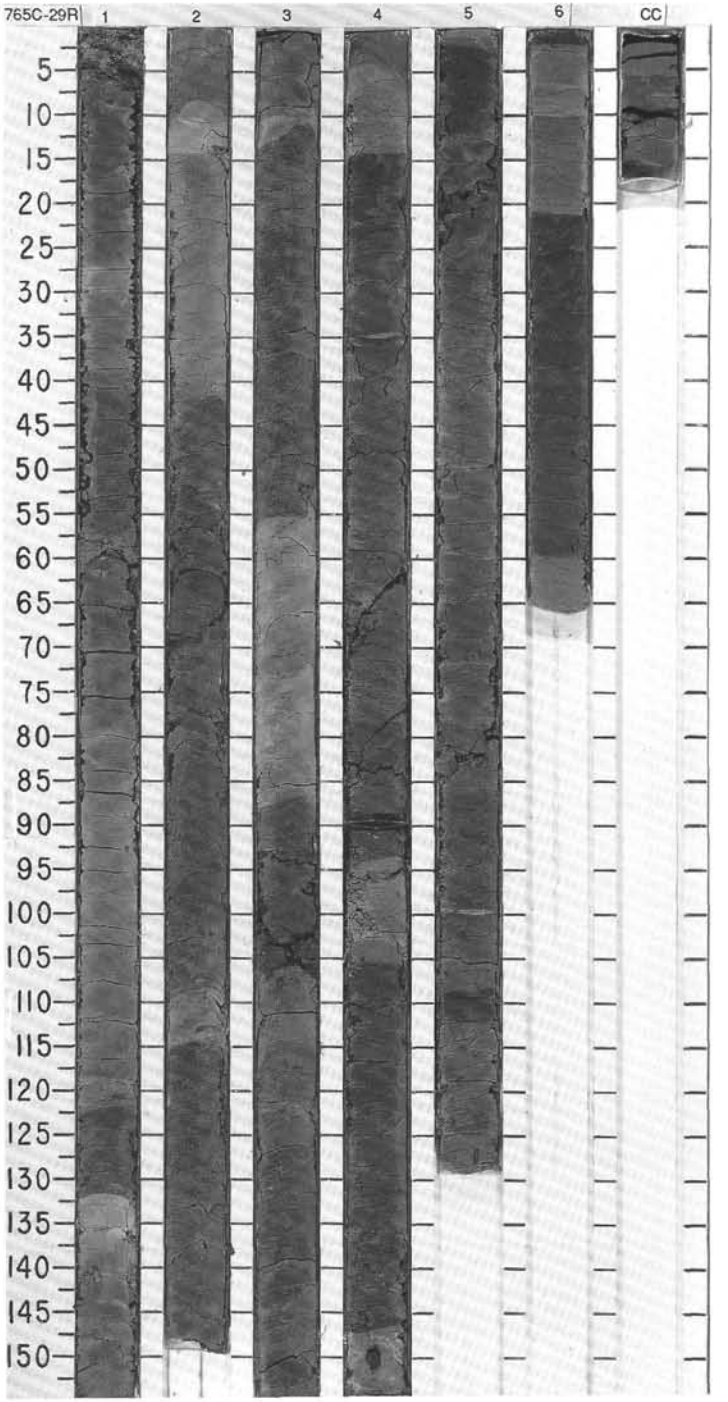
Major lithologies:
CLAYSTONE and NANNOFOSSIL CLAYSTONE, grayish green, greenish gray, yellowish red, reddish brown, brown (5G 6/1, 5GY 5/1, 6/1, 5BG 5/1, 5YR 3/4, 5/4, 5/6, 2.5YR 4/4, 7.5YR 3/4 to 5/4, 10YR 5/4, 10G 5/1, 5/2, 10GY 5/2). Claystone massive, locally graded, locally bioturbated, locally silty and laminated (may contain poorly preserved radiolarians), locally contains soft intraformational pebbles. Contacts sharp or gradational. Zeolites as much as 10% locally. Nannofossil claystone massive, laminated, or bioturbated (especially at tops of units —intensity decreases downward); locally graded. Contains substantial amounts of micrite. Occurs at Section 1, 128-136 Section 2 0-9, Section 4, 93-105, Section 5, 48-125 cm. May be more widely distributed because it is difficult to distinguish from claystone.

Minor lithology: Nannofossil micrite chalk with clay, greenish gray (5GY 7/1), graded, silty, laminated, or massive. Lower contact sharp, upper contact gradational.Occurs at Section 2, 9-13 and CC 2-5 cm.

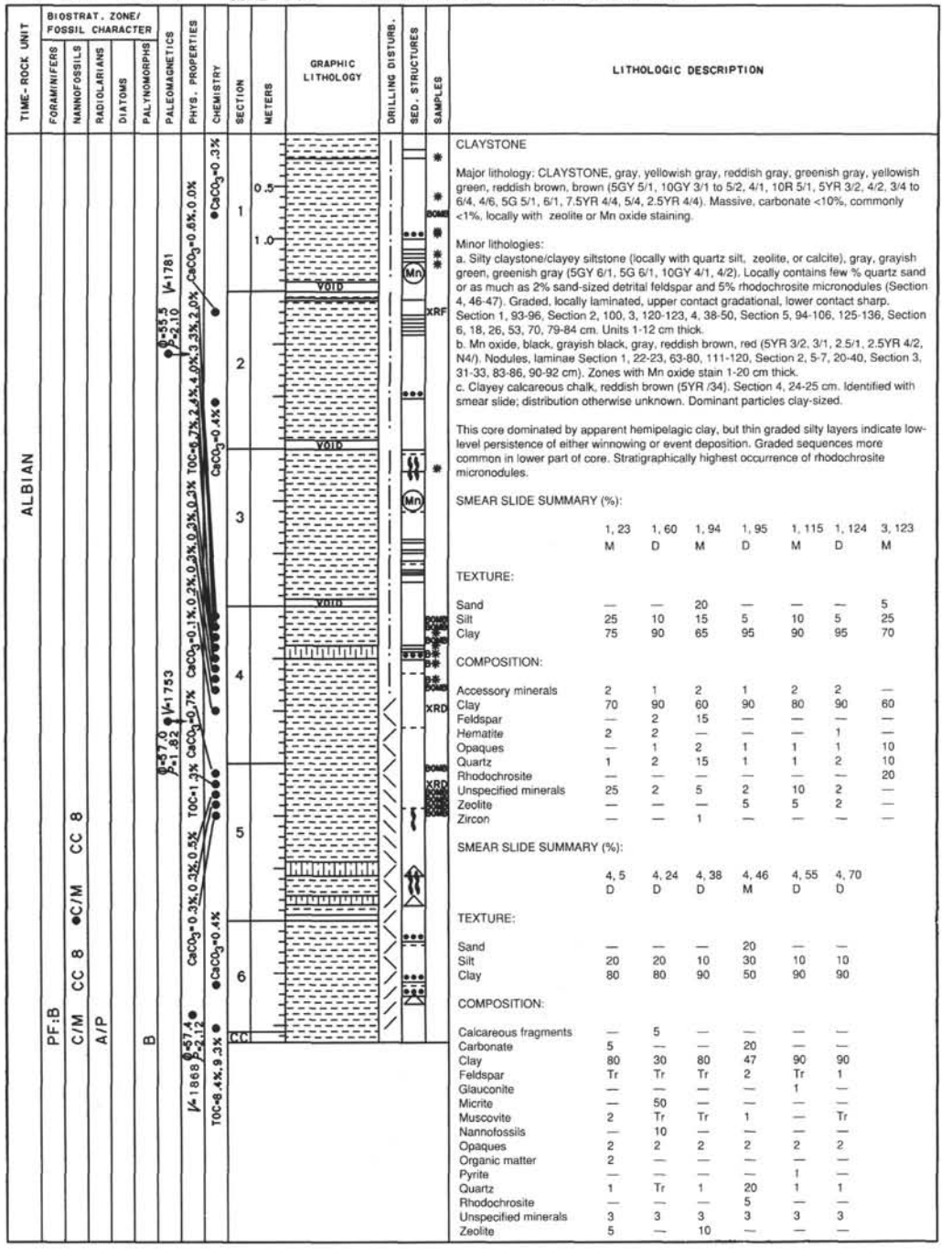
Core dominated by claystone and lesser nannofossil claystone. Generally devoid of sedimentary structures, but nannofossil claystones commonly form fine-grained graded sequences 10-15 cm thick with bioturbated tops and silty bases.

SMEAR SLIDE SUMMARY (%):

	2, 5 D	2, 13 M	2, 33 D	2, 62 D
TEXTURE:				
Sand	—	10	—	—
Silt	5	20	10	—
Clay	95	70	90	—
COMPOSITION:				
Accessory minerals	—	1	2	1
Calcareous fragments	2	9	—	—
Clay	20	20	78	70
Feldspar	—	1	—	3
Foraminifers	Tr	2	—	—
Hematite	2	—	2	3
Micrite	40	30	1	—
Nannofossils	30	30	1	—
Opaques	1	1	3	3
Organic matter	—	—	1	—
Quartz	—	3	—	5
Unspecified minerals	2	—	—	3
Zeolite	—	1	10	10



SITE 765 HOLE C CORE 30R CORED INTERVAL 625.9-635.3 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE

Major lithology: CLAYSTONE, gray, yellowish gray, reddish gray, greenish gray, yellowish green, reddish brown, brown (5GY 5/1, 10GY 3/1 to 5/2, 4/1, 10R 5/1, 5YR 3/2, 4/2, 3/4 to 6/4, 4/6, 5G 5/1, 6/1, 7.5YR 4/4, 5/4, 2.5YR 4/4). Massive, carbonate <10%, commonly <1%, locally with zeolite or Mn oxide staining.

Minor lithologies:
a. Silty claystone/clayey siltstone (locally with quartz silt, zeolite, or calcite), gray, grayish green, greenish gray (5GY 6/1, 5G 6/1, 10GY 4/1, 4/2). Locally contains few % quartz sand or as much as 2% sand-sized detrital feldspar and 5% rhodochrosite micronodules (Section 4, 46-47). Graded, locally laminated, upper contact gradational, lower contact sharp. Section 1, 93-96, Section 2, 100, 3, 120-123, 4, 38-50, Section 5, 94-106, 125-136, Section 6, 18, 26, 53, 70, 79-84 cm. Units 1-12 cm thick.
b. Mn oxide, black, grayish black, gray, reddish brown, red (5YR 3/2, 3/1, 2.5/1, 2.5YR 4/2, N4/). Nodules, laminae Section 1, 22-23, 63-80, 111-120, Section 2, 5-7, 20-40, Section 3, 31-33, 83-86, 90-92 cm). Zones with Mn oxide stain 1-20 cm thick.
c. Clayey calcareous chalk, reddish brown (5YR /34). Section 4, 24-25 cm. Identified with smear slide; distribution otherwise unknown. Dominant particles clay-sized.

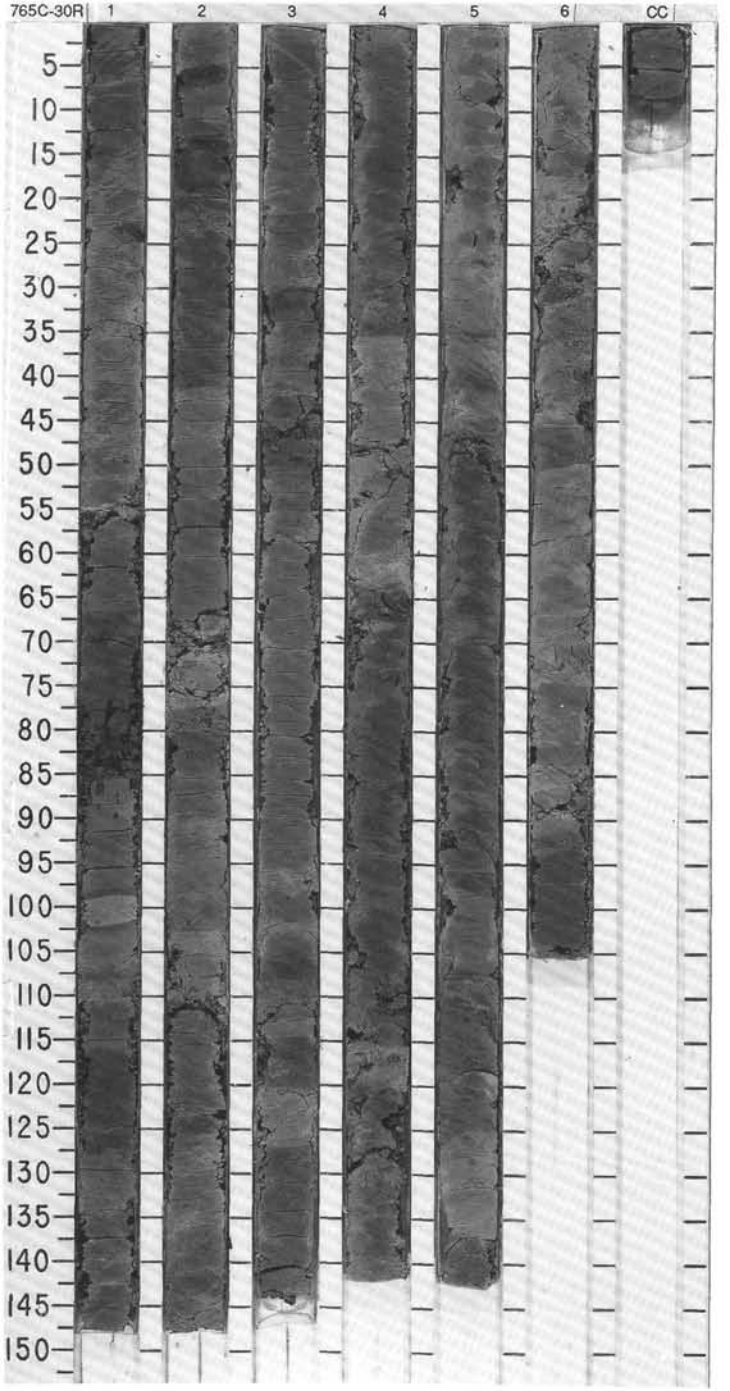
This core dominated by apparent hemipelagic clay, but thin graded silty layers indicate low-level persistence of either winnowing or event deposition. Graded sequences more common in lower part of core. Stratigraphically highest occurrence of rhodochrosite micronodules.

SMEAR SLIDE SUMMARY (%):

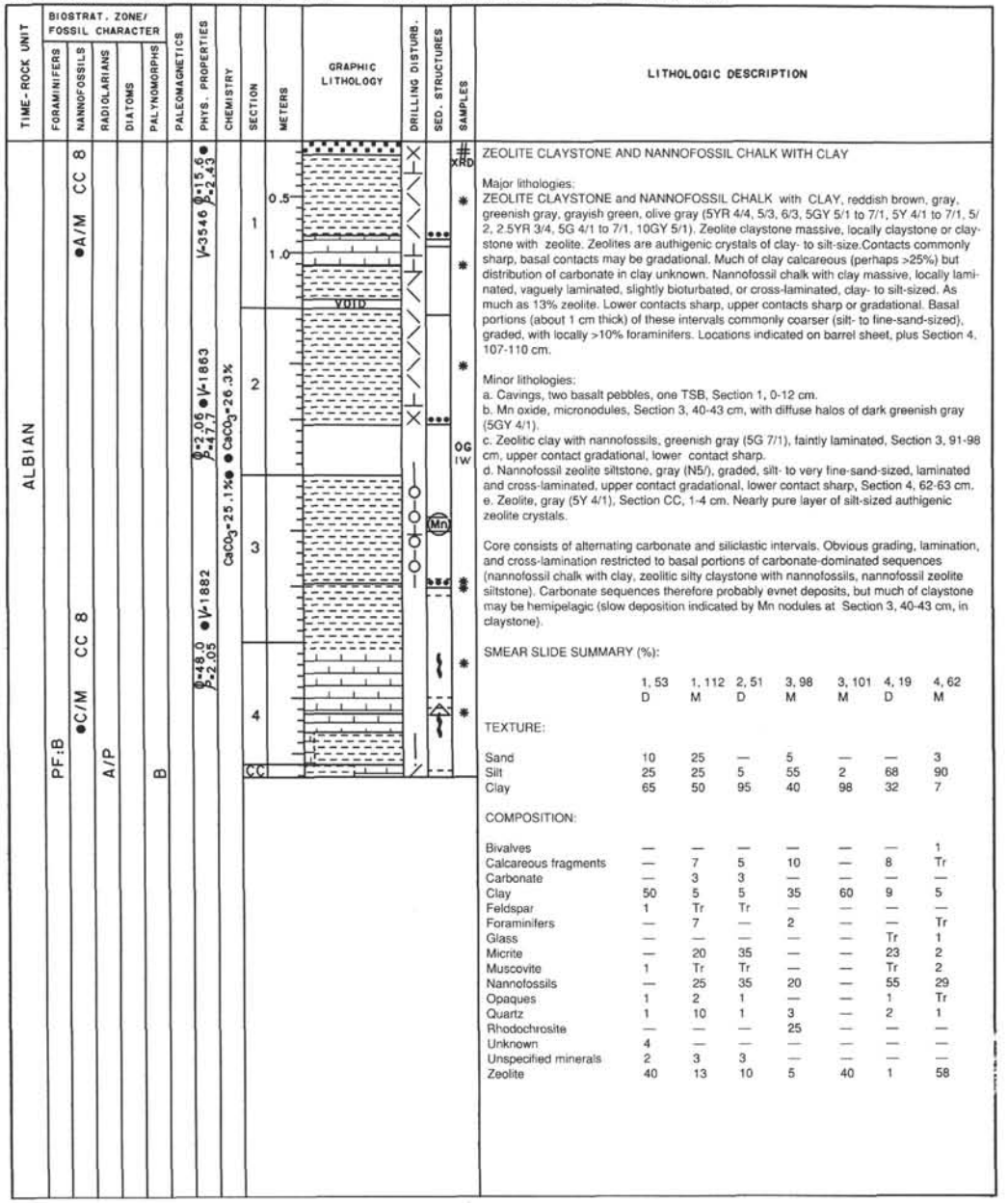
	1, 23 M	1, 60 D	1, 94 M	1, 95 D	1, 115 M	1, 124 D	3, 123 M
TEXTURE:							
Sand	—	—	20	—	—	—	5
Silt	25	10	15	5	10	5	25
Clay	75	90	65	95	90	95	70
COMPOSITION:							
Accessory minerals	2	1	2	1	2	2	—
Clay	70	90	60	90	80	90	60
Feldspar	—	2	15	—	—	—	—
Hematite	2	2	—	—	—	1	—
Opaques	—	1	2	1	1	1	10
Quartz	1	2	15	1	1	2	10
Rhodochrosite	—	—	—	—	—	—	20
Unspecified minerals	25	2	5	2	10	2	—
Zeolite	—	—	—	5	5	2	—
Zircon	—	—	1	—	—	—	—

SMEAR SLIDE SUMMARY (%):

	4, 5 D	4, 24 D	4, 38 D	4, 46 M	4, 55 D	4, 70 D
TEXTURE:						
Sand	—	—	—	20	—	—
Silt	20	20	10	30	10	10
Clay	80	80	90	50	90	90
COMPOSITION:						
Calcareous fragments	—	5	—	—	—	—
Carbonate	5	—	—	20	—	—
Clay	80	30	80	47	90	90
Feldspar	Tr	Tr	Tr	2	Tr	1
Glauconite	—	—	—	—	1	—
Micrite	—	50	—	—	—	—
Muscovite	2	Tr	Tr	1	—	Tr
Nannofossils	—	10	—	—	—	—
Opaques	2	2	2	2	2	2
Organic matter	2	—	—	—	—	—
Pyrite	—	—	—	—	1	—
Quartz	1	Tr	1	20	1	1
Rhodochrosite	—	—	—	5	—	—
Unspecified minerals	3	3	3	3	3	3
Zeolite	5	—	10	—	—	—



SITE 765 HOLE C CORE 31R CORED INTERVAL 635.3-645.0 mbsf



LITHOLOGIC DESCRIPTION

ZEOLITE CLAYSTONE AND NANNOFOSSIL CHALK WITH CLAY

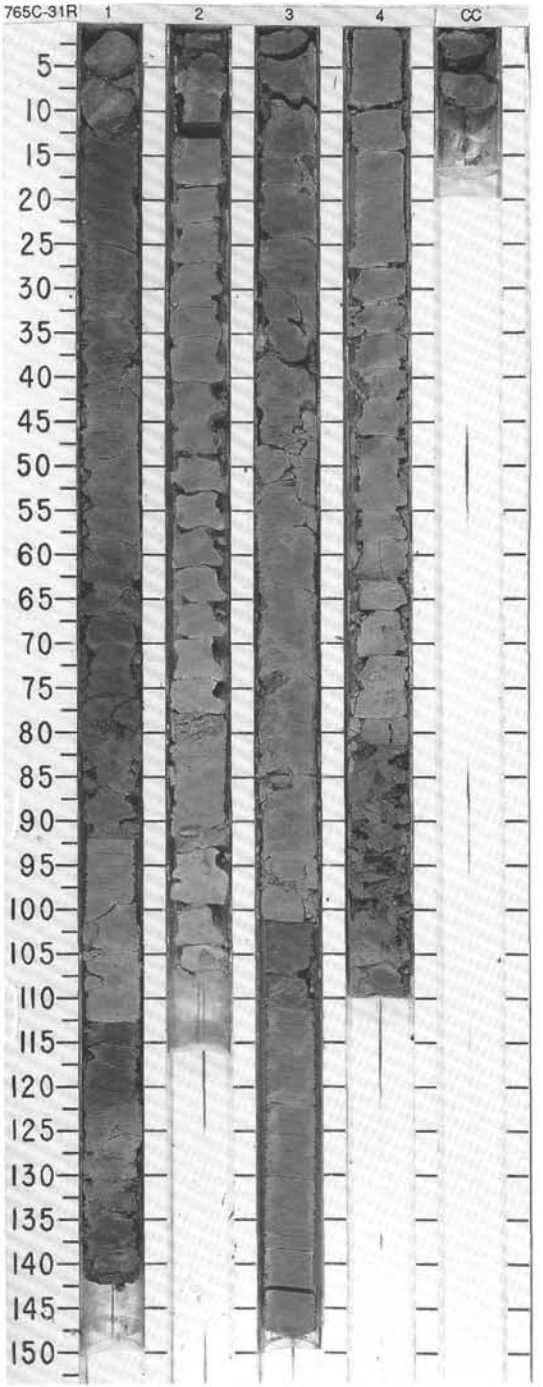
Major lithologies:
ZEOLITE CLAYSTONE and NANNOFOSSIL CHALK with CLAY, reddish brown, gray, greenish gray, grayish green, olive gray (5YR 4/4, 5/3, 6/3, 5GY 5/1 to 7/1, 5Y 4/1 to 7/1, 5/2, 2.5YR 3/4, 5G 4/1 to 7/1, 10GY 5/1). Zeolite claystone massive, locally claystone or claystone with zeolite. Zeolites are authigenic crystals of clay- to silt-size.Contacts commonly sharp, basal contacts may be gradational. Much of clay calcareous (perhaps >25%) but distribution of carbonate in clay unknown. Nannofossil chalk with clay massive, locally laminated, vaguely laminated, slightly bioturbated, or cross-laminated, clay- to silt-sized. As much as 13% zeolite. Lower contacts sharp, upper contacts sharp or gradational. Basal portions (about 1 cm thick) of these intervals commonly coarser (silt- to fine-sand-sized), graded, with locally >10% foraminifers. Locations indicated on barrel sheet, plus Section 4, 107-110 cm.

Minor lithologies:
a. Cavings, two basalt pebbles, one TSB, Section 1, 0-12 cm.
b. Mn oxide, micronodules, Section 3, 40-43 cm, with diffuse halos of dark greenish gray (5GY 4/1).
c. Zeolitic clay with nannofossils, greenish gray (5G 7/1), faintly laminated, Section 3, 91-98 cm, upper contact gradational, lower contact sharp.
d. Nannofossil zeolite siltstone, gray (N5/), graded, silt- to very fine-sand-sized, laminated and cross-laminated, upper contact gradational, lower contact sharp, Section 4, 62-63 cm.
e. Zeolite, gray (5Y 4/1), Section CC, 1-4 cm. Nearly pure layer of silt-sized authigenic zeolite crystals.

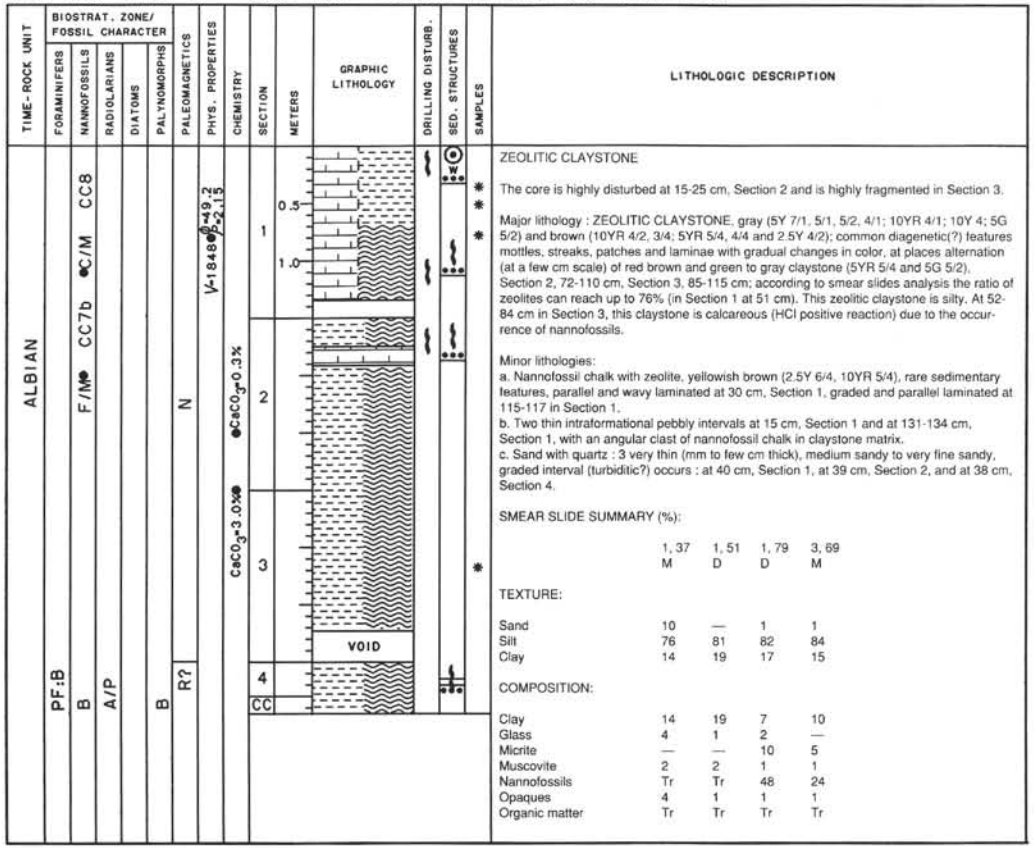
Core consists of alternating carbonate and siliclastic intervals. Obvious grading, lamination, and cross-lamination restricted to basal portions of carbonate-dominated sequences (nannofossil chalk with clay, zeolitic silty claystone with nannofossils, nannofossil zeolite siltstone). Carbonate sequences therefore probably evnet deposits, but much of claystone may be hemipelagic (slow deposition indicated by Mn nodules at Section 3, 40-43 cm, in claystone).

SMEAR SLIDE SUMMARY (%):

	1, 53 D	1, 112 M	2, 51 D	3, 98 M	3, 101 M	4, 19 D	4, 62 M
TEXTURE:							
Sand	10	25	—	5	—	—	3
Silt	25	25	5	55	2	68	90
Clay	65	50	95	40	98	32	7
COMPOSITION:							
Bivalves	—	—	—	—	—	—	1
Calcareous fragments	—	7	5	10	—	8	Tr
Carbonate	—	3	3	—	—	—	—
Clay	50	5	5	35	60	9	5
Feldspar	1	Tr	Tr	—	—	—	—
Foraminifers	—	7	—	2	—	—	Tr
Glass	—	—	—	—	—	Tr	1
Micrite	—	20	35	—	—	23	2
Muscovite	1	Tr	Tr	—	—	Tr	2
Nannofossils	—	25	35	20	—	55	29
Opaques	1	2	1	—	—	1	Tr
Quartz	1	10	1	3	—	2	1
Rhodochrosite	—	—	—	25	—	—	—
Unknown	4	—	—	—	—	—	—
Unspecified minerals	2	3	3	—	—	—	—
Zeolite	40	13	10	5	40	1	58



SITE 765 HOLE C CORE 32R CORED INTERVAL 645-654.7 mbsf



LITHOLOGIC DESCRIPTION

ZEOLITIC CLAYSTONE

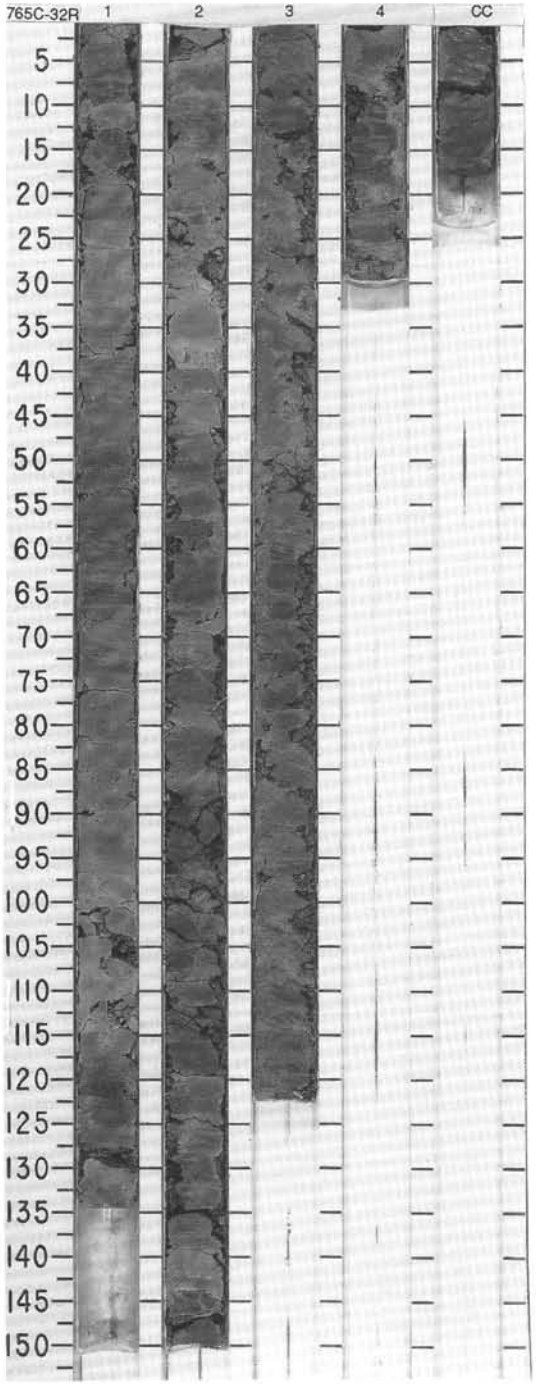
The core is highly disturbed at 15-25 cm, Section 2 and is highly fragmented in Section 3.

Major lithology : ZEOLITIC CLAYSTONE, gray (5Y 7/1, 5/1, 5/2, 4/1; 10YR 4/1; 10Y 4; 5G 5/2) and brown (10YR 4/2, 3/4; 5YR 5/4, 4/4 and 2.5Y 4/2); common diagenetic(?) features mottles, streaks, patches and laminae with gradual changes in color, at places alternation (at a few cm scale) of red brown and green to gray claystone (5YR 5/4 and 5G 5/2). Section 2, 72-110 cm, Section 3, 85-115 cm; according to smear slides analysis the ratio of zeolites can reach up to 76% (in Section 1 at 51 cm). This zeolitic claystone is silty. At 52-84 cm in Section 3, this claystone is calcareous (HCl positive reaction) due to the occurrence of nannofossils.

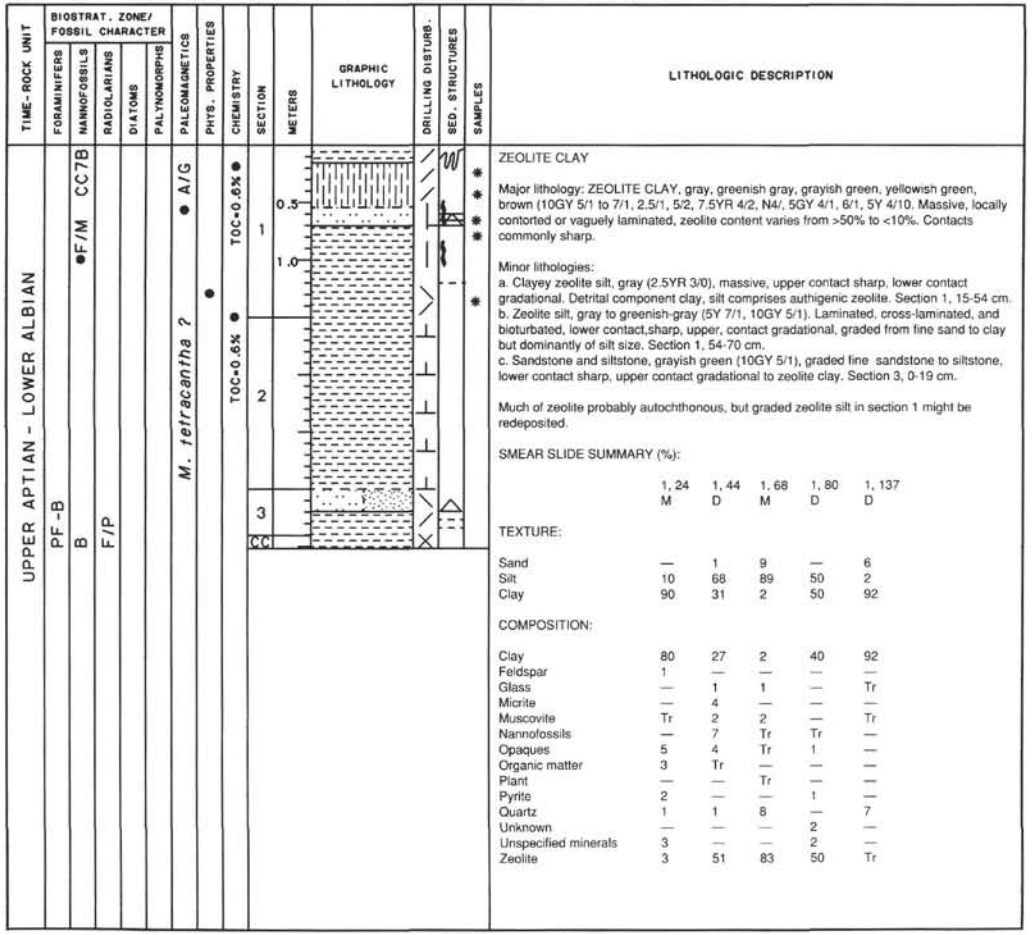
Minor lithologies:
a. Nannofossil chalk with zeolite, yellowish brown (2.5Y 6/4, 10YR 5/4), rare sedimentary features, parallel and wavy laminated at 30 cm, Section 1, graded and parallel laminated at 115-117 in Section 1.
b. Two thin intraformational pebbly intervals at 15 cm, Section 1 and at 131-134 cm, Section 1, with an angular clast of nannofossil chalk in claystone matrix.
c. Sand with quartz : 3 very thin (mm to few cm thick), medium sandy to very fine sandy, graded interval (turbiditic?) occurs : at 40 cm, Section 1, at 39 cm, Section 2, and at 38 cm, Section 4.

SMEAR SLIDE SUMMARY (%):

	1, 37 M	1, 51 D	1, 79 D	3, 69 M
TEXTURE:				
Sand	10	—	1	1
Silt	76	81	82	84
Clay	14	19	17	15
COMPOSITION:				
Clay	14	19	7	10
Glass	4	1	2	—
Micrite	—	—	10	5
Muscovite	2	2	1	1
Nannofossils	Tr	Tr	48	24
Opaques	4	1	1	1
Organic matter	Tr	Tr	Tr	Tr



SITE 765 HOLE C CORE 33R CORED INTERVAL 654.7-664.4 mbsf



LITHOLOGIC DESCRIPTION

ZEOLITE CLAY

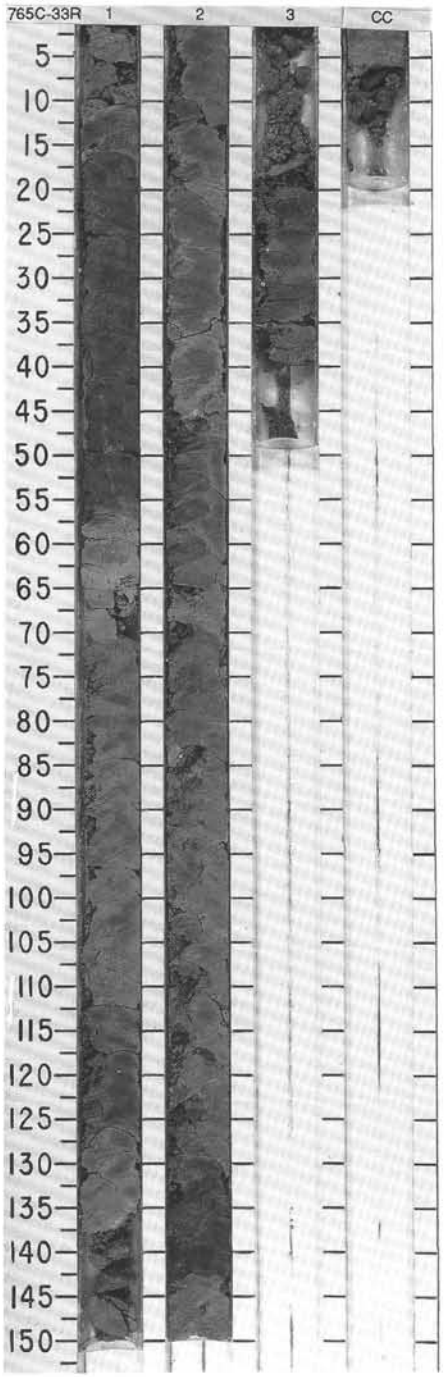
Major lithology: ZEOLITE CLAY, gray, greenish gray, grayish green, yellowish green, brown (10GY 5/1 to 7/1, 2.5/1, 5/2, 7.5YR 4/2, N4/, 5GY 4/1, 6/1, 5Y 4/10. Massive, locally contorted or vaguely laminated, zeolite content varies from >50% to <10%. Contacts commonly sharp.

Minor lithologies:
a. Clayey zeolite silt, gray (2.5YR 3/0), massive, upper contact sharp, lower contact gradational. Detrital component clay, silt comprises authigenic zeolite. Section 1, 15-54 cm.
b. Zeolite silt, gray to greenish-gray (5Y 7/1, 10GY 5/1). Laminated, cross-laminated, and bioturbated, lower contact,sharp, upper, contact gradational, graded from fine sand to clay but dominantly of silt size. Section 1, 54-70 cm.
c. Sandstone and siltstone, grayish green (10GY 5/1), graded fine sandstone to siltstone, lower contact sharp, upper contact gradational to zeolite clay. Section 3, 0-19 cm.

Much of zeolite probably autochthonous, but graded zeolite silt in section 1 might be redeposited.

SMEAR SLIDE SUMMARY (%):

	1, 24 M	1, 44 D	1, 68 M	1, 80 D	1, 137 D
TEXTURE:					
Sand	—	1	9	—	6
Silt	10	68	89	50	2
Clay	90	31	2	50	92
COMPOSITION:					
Clay	80	27	2	40	92
Feldspar	1	—	—	—	—
Glass	—	1	1	—	Tr
Micrite	—	4	—	—	—
Muscovite	Tr	2	2	—	Tr
Nannofossils	—	7	Tr	Tr	—
Opaques	5	4	Tr	1	—
Organic matter	3	Tr	—	—	—
Plant	—	—	Tr	—	—
Pyrite	2	—	—	1	—
Quartz	1	1	8	—	7
Unknown	—	—	—	2	—
Unspecified minerals	3	—	—	2	—
Zeolite	3	51	83	50	Tr



SITE 765 HOLE C CORE 34R CORED INTERVAL 664.4-674.1 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
UPPER APTIAN - LOWER ALBIAN	C/M *H. planispira - H. delrioensis - G. ferreolensis*	C/M CC7B	F/P		●A/G *D. davidii*			● TOC=4.3% ● TOC=21.7%	1 2 3 4 CC	0.5 1.0	Mn? VOID			BOMB

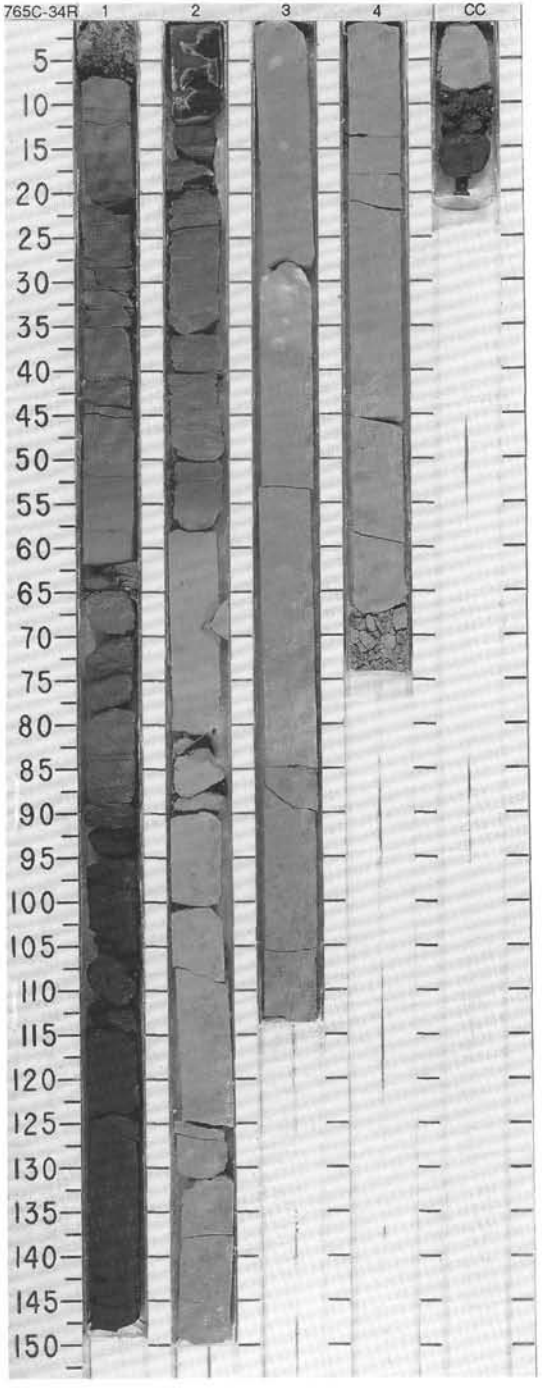
LITHOLOGIC DESCRIPTION

CLAYSTONE AND CLAYSTONE WITH NANNOFOSSILS

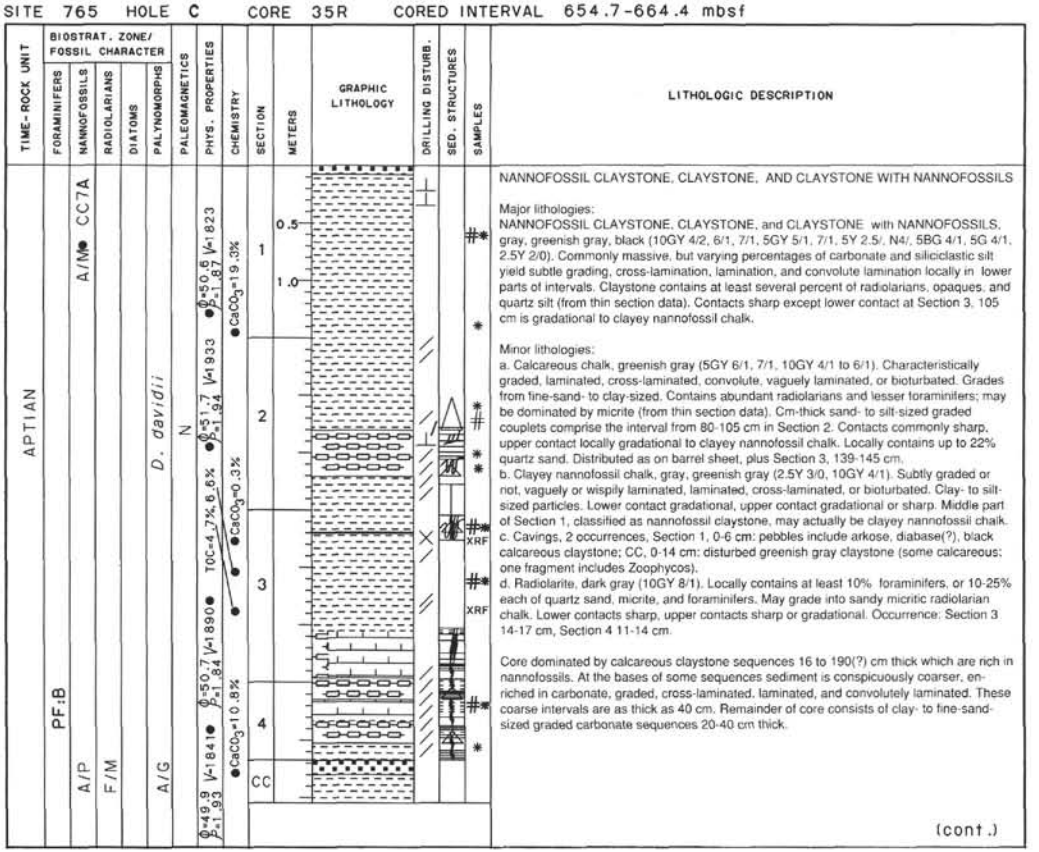
Entire core is undisturbed to slightly disturbed.

Major lithologies :
a. CLAYSTONE, pale green to greenish gray (5G 6/2, 5/2, 4/2), light gray to very dark gray (10YR 7/1, 6/1, 5Y 5/1, 4/1, 2.5YR N3) and black (10YR 2/1); mainly massive and featureless except intervals with cross-laminae and/or black diagenetic (?) streaks of Mn oxide (?) diagenetic diffusion, in Section 1, at 20-25 cm, also Section 2 at 25-35 cm with parallel laminae; a distinct silty interval with parallel laminae occurs in Section 2, 0-15 cm
b. CLAYSTONE with NANNOFOSSILS, with the same color and aspect : the claystone (a) is partly calcareous (presence of nannofossils?), HCl positive reaction; $CaCO_3$ = 21.7% at the very base of Section 3; repartition as follow : Section 1, at 11-20, and 90-150 cm; Section 2, at 55-150 cm; entire Section 3, and Section 4, at 0-40 cm. Scanty dark mottles appearing in Section 2 at 140-150 cm.

Minor lithologies:
a. Calcareous chalk (calcareous fragments with quartz) occurs Section 4 at 40-74 cm, light gray (10YR 7/1), forming a graded interval, sandy to silty grained, parallel laminated (probable base of a turbidite).
b. Two distinct black mm thick horizon (Mn?) occurs in Section 1 at 20 cm and in Section 3 at 18 cm.



SITE 765 HOLE C CORE 35R CORED INTERVAL 654.7-664.4 mbsf



LITHOLOGIC DESCRIPTION

NANNOFOSSIL CLAYSTONE, CLAYSTONE, AND CLAYSTONE WITH NANNOFOSSILS

Major lithologies:
NANNOFOSSIL CLAYSTONE, CLAYSTONE, and CLAYSTONE with NANNOFOSSILS, gray, greenish gray, black (10GY 4/2, 6/1, 7/1, 5GY 5/1, 7/1, 5Y 2.5/, N4/, 5BG 4/1, 5G 4/1, 2.5Y 2/0). Commonly massive, but varying percentages of carbonate and siliciclastic silt yield subtle grading, cross-lamination, lamination, and convolute lamination locally in lower parts of intervals. Claystone contains at least several percent of radiolarians, opaques, and quartz silt (from thin section data). Contacts sharp except lower contact at Section 3, 105 cm is gradational to clayey nannofossil chalk.

Minor lithologies:
a. Calcareous chalk, greenish gray (5GY 6/1, 7/1, 10GY 4/1 to 6/1). Characteristically graded, laminated, cross-laminated, convolute, vaguely laminated, or bioturbated. Grades from fine-sand- to clay-sized. Contains abundant radiolarians and lesser foraminifers; may be dominated by micrite (from thin section data). Cm-thick sand- to silt-sized graded couplets comprise the interval from 80-105 cm in Section 2. Contacts commonly sharp, upper contact locally gradational to clayey nannofossil chalk. Locally contains up to 22% quartz sand. Distributed as on barrel sheet, plus Section 3, 139-145 cm.
b. Clayey nannofossil chalk, gray, greenish gray (2.5Y 3/0, 10GY 4/1). Subtly graded or not, vaguely or wispily laminated, laminated, cross-laminated, or bioturbated. Clay- to silt-sized particles. Lower contact gradational, upper contact gradational or sharp. Middle part of Section 1, classified as nannofossil claystone, may actually be clayey nannofossil chalk.
c. Cavings, 2 occurrences, Section 1, 0-6 cm: pebbles include arkose, diabase(?), black calcareous claystone; CC, 0-14 cm: disturbed greenish gray claystone (some calcareous; one fragment includes Zoophycos).
d. Radiolarite, dark gray (10GY 8/1). Locally contains at least 10% foraminifers, or 10-25% each of quartz sand, micrite, and foraminifers. May grade into sandy micritic radiolarian chalk. Lower contacts sharp, upper contacts sharp or gradational. Occurrence: Section 3 14-17 cm, Section 4 11-14 cm.

Core dominated by calcareous claystone sequences 16 to 190(?) cm thick which are rich in nannofossils. At the bases of some sequences sediment is conspicuously coarser, enriched in carbonate, graded, cross-laminated, laminated, and convolutely laminated. These coarse intervals are as thick as 40 cm. Remainder of core consists of clay- to fine-sand-sized graded carbonate sequences 20-40 cm thick.

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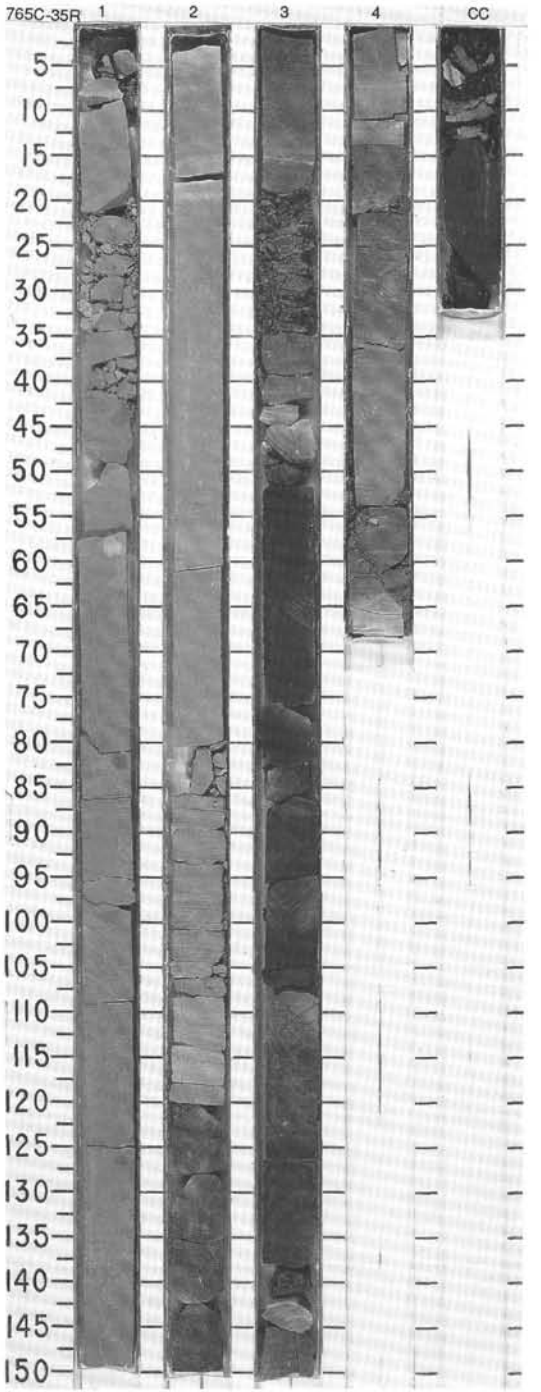


TIME-ROCK UNIT | BIOSTRAT. ZONE/FOSSIL CHARACTER: FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS | PALEOMAGNETICS | PHYS. PROPERTIES | CHEMISTRY | SECTION | METERS | GRAPHIC LITHOLOGY | DRILLING DISTURB. | SED. STRUCTURES | SAMPLES

LITHOLOGIC DESCRIPTION

(cont.)

SMEAR SLIDE SUMMARY (%):

	1, 58 D	1, 140 D	2, 60 D	2, 102 M	2, 113 M	3, 13 M	3, 15 M
TEXTURE:							
Sand	—	—	8	88	25	5	—
Silt	—	40	42	10	15	8	10
Clay	100	60	50	2	60	87	90
COMPOSITION:							
Accessory minerals	—	—	—	—	Tr	—	—
Bioclast	—	—	—	—	2	—	—
Bivalves	—	—	—	2	—	—	—
Calcareous fragments	—	—	16	60	—	1	—
Calcispheres	—	—	—	—	—	—	1
Clay	15	60	50	2	10	87	38
Feldspar	—	—	—	—	2	—	—
Fish	—	—	—	—	2	—	—
Foraminifers	—	—	—	8	15	—	—
Glass	—	—	2	2	—	1	—
Glauconite	—	—	—	—	Tr	Tr	—
Matrix	—	—	—	—	—	—	18
Mica	—	—	—	—	2	—	1
Micrite	83	—	—	—	50	—	38
Nannofossils	—	36	18	2	—	5	—
Opaques	—	Tr	—	Tr	—	—	—
Organic matter	—	Tr	—	—	5	—	—
Plant	—	Tr	—	Tr	Tr	—	—
Pyrite	—	—	—	—	—	1	—
Quartz	—	1	7	22	10	1	1
Radiolarians	—	—	—	—	2	—	—
Rhodochrosite	—	3	3	1	—	—	—
Zeolite	—	—	—	—	Tr	Tr	—

SMEAR SLIDE SUMMARY (%):

	3, 63 M	3, 63 D	4, 11 M	4, 56 D
TEXTURE:				
Sand	1	2	16	5
Silt	7	25	16	3
Clay	92	73	67	92
COMPOSITION:				
Accessory minerals	—	—	1	—
Clay	92	40	20	92
Feldspar	—	—	1	—
Fish	—	—	3	—
Foraminifers	—	—	3	—
Glass	—	—	—	Tr
Mica	—	—	3	—
Micrite	—	40	60	—
Muscovite	2	—	—	4
Nannofossils	2	—	—	Tr
Opaques	—	10	—	—
Organic matter	Tr	5	Tr	2
Pyrite	1	—	—	—
Quartz	1	—	3	1
Radiolarians	—	—	6	—
Unspecified minerals	—	5	—	Tr

SITE 765 HOLE C CORE 36R CORED INTERVAL 683.3-693.0 mbsf

TIME-ROCK UNIT: APTIAN

BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS: PF:B; NANNOFOSSILS: A/M CC 7A; RADIOLARIANS: R/P; DIATOMS: B; PALYNOMORPHS

PALEOMAGNETICS: N

PHYS. PROPERTIES: Φ=46.1 ρ=1.89 V=2315; Φ=49.2 ρ=1.97 V=1777; Φ=42.7 ρ=1.99 V=1676

CHEMISTRY: ●TOC=0.8%

SECTION: 1, 2, 3, 4, 5, 6

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY: VOID; VOID; VOID

DRILLING DISTURB.

SED. STRUCTURES

SAMPLES: XRF

LITHOLOGIC DESCRIPTION

CLAYSTONE AND CLAYSTONE WITH NANNOFOSSILS

Section 1 of the core is highly fragmented

Major lithologies :
a. CLAYSTONE, dusky red (2.5YR 3/2), dusky green (10G 3/2) and very dark greenish (10Y 3), commonly massive, except in Section 5 at 61-114 cm mottled and layered by grayish green (5G 4/2) claystone.
b. CLAYSTONE with NANNOFOSSILS, gray and green (5Y 3/1, 10YR 4/1, 5G 5/2 and 10Y 5/), commonly featureless.

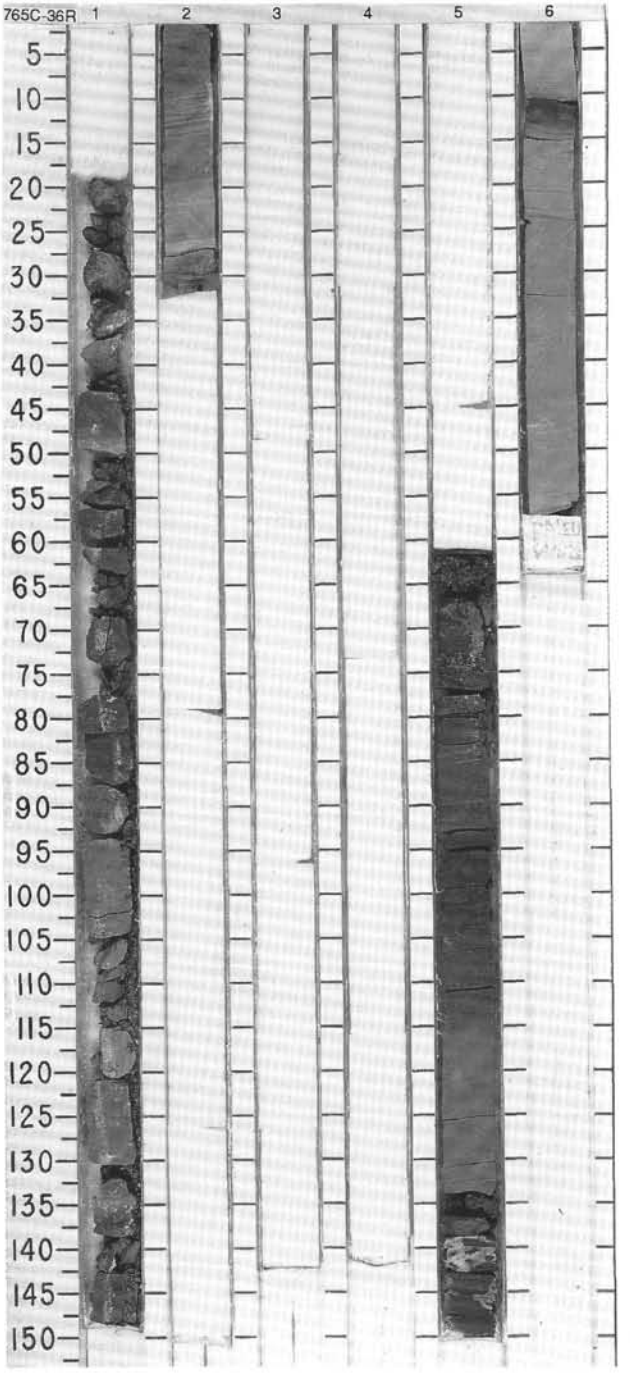
Minor lithologies :
a. Calcareous chalk, gray and green (5Y 3/1, 5Y 5/1, 10Y 6 and 5G 5/2), forming 3 graded interval: Section 2 at 0-29 cm (parallel laminae at the base, cross-laminae at the median part and again parallel laminae at the top of the turbiditic sequence), abundant foraminifers and radiolarians (filled with chalcedony or with micritic chalk), coal, glauconite and quartz occurs only in coarse bases Section 6 at 0-8 cm, with parallel laminae and at 40-57 cm, with only few cross- lamination at 30 cm.
b. Conglomerate in Section 1 at 18-42 cm : mixed volcanic basaltic pebbles (4.5x5.5 to 1x1 cm size), subrounded to subangular and one angular clast of green chert.

SMEAR SLIDE SUMMARY (%):

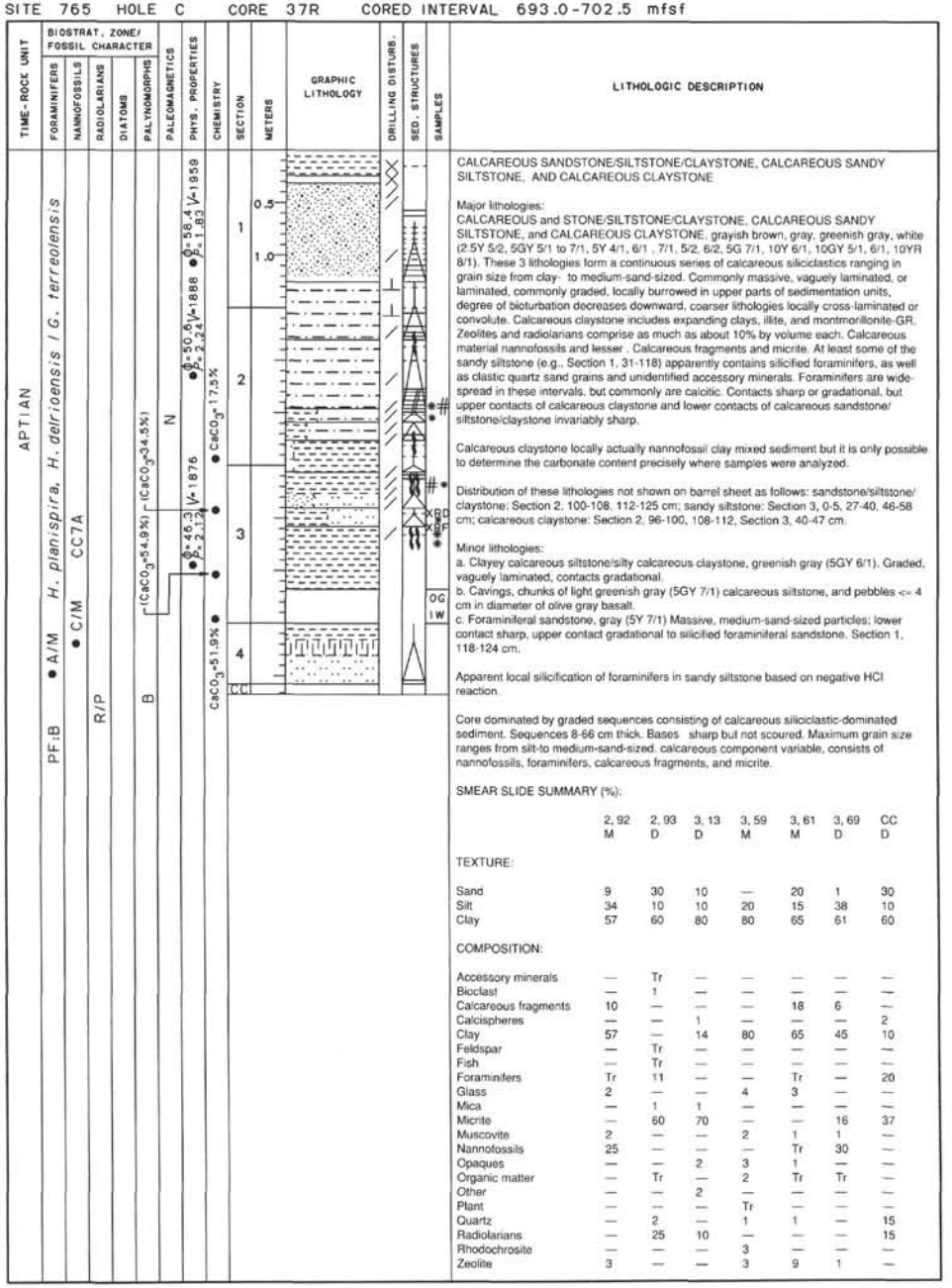
	2, 24 D	2, 24 M	2, 25 D	2, 25 M	5, 86 D	5, 116 D	5, 120 D
TEXTURE:							
Sand	—	40	—	40	—	—	—
Silt	—	30	—	30	4	5	64
Clay	—	30	—	30	96	95	36
COMPOSITION:							
Accessory minerals	Tr	Tr	—	—	—	—	—
Bioclast	—	—	6	—	—	—	—
Calcareous fragments	—	Tr	—	5	—	—	Tr
Calcispheres	—	—	45	4	—	—	—
Chalcedony	—	12	—	—	—	—	—
Clay	1	—	—	—	96	15	38
Coal	—	—	—	10	—	—	—
Fish	—	—	4	—	—	—	—
Foraminifers	15	19	—	24	—	—	Tr
Glass	—	—	—	—	1	—	2
Glauconite	1	1	10	12	—	—	—
Mica	Tr	Tr	1	Tr	—	—	—
Micrite	30	30	Tr	—	—	—	—
Muscovite	—	—	—	—	1	1	Tr
Nannofossils	—	25	—	—	—	80	34
Opaques	—	—	—	—	1	1	1
Organic matter	1	—	—	—	Tr	—	—
Quartz	1	1	28	45	Tr	—	1
Radiolarians	49	12	6	—	—	—	—
Spicules	2	—	—	—	—	—	—
Unspecified minerals	—	—	—	—	—	3	Tr
Zeolite	—	—	—	—	Tr	—	20

SMEAR SLIDE SUMMARY (%):

	6, 28 M
TEXTURE:	
Sand	—
Silt	29
Clay	71
COMPOSITION:	
Calcareous fragments	3
Clay	71
Glass	1
Muscovite	1
Nannofossils	12
Opaques	Tr
Quartz	1
Zeolite	8



SITE 765 HOLE C CORE 37R CORED INTERVAL 693.0-702.5 mfsf



LITHOLOGIC DESCRIPTION

CALCAREOUS SANDSTONE/SILTSTONE/CLAYSTONE, CALCAREOUS SANDY SILTSTONE, AND CALCAREOUS CLAYSTONE

Major lithologies:
CALCAREOUS and STONE/SILTSTONE/CLAYSTONE, CALCAREOUS SANDY SILTSTONE, and CALCAREOUS CLAYSTONE, grayish brown, gray, greenish gray, white (2.5Y 5/2, 5GY 5/1 to 7/1, 5Y 4/1, 6/1 , 7/1, 5/2, 6/2, 5G 7/1, 10Y 6/1, 10GY 5/1, 6/1, 10YR 8/1). These 3 lithologies form a continuous series of calcareous siliciclastics ranging in grain size from clay- to medium-sand-sized. Commonly massive, vaguely laminated, or laminated, commonly graded, locally burrowed in upper parts of sedimentation units, degree of bioturbation decreases downward, coarser lithologies locally cross-laminated or convolute. Calcareous claystone includes expanding clays, illite, and montmorillonite-GR. Zeolites and radiolarians comprise as much as about 10% by volume each. Calcareous material nannofossils and lesser . Calcareous fragments and micrite. At least some of the sandy siltstone (e.g., Section 1, 31-118) apparently contains silicified foraminifers, as well as clastic quartz sand grains and unidentified accessory minerals. Foraminifers are widespread in these intervals, but commonly are calcitic. Contacts sharp or gradational, but upper contacts of calcareous claystone and lower contacts of calcareous sandstone/siltstone/claystone invariably sharp.

Calcareous claystone locally actually nannofossil clay mixed sediment but it is only possible to determine the carbonate content precisely where samples were analyzed.

Distribution of these lithologies not shown on barrel sheet as follows: sandstone/siltstone/claystone: Section 2, 100-108, 112-125 cm; sandy siltstone: Section 3, 0-5, 27-40, 46-58 cm; calcareous claystone: Section 2, 96-100, 108-112, Section 3, 40-47 cm.

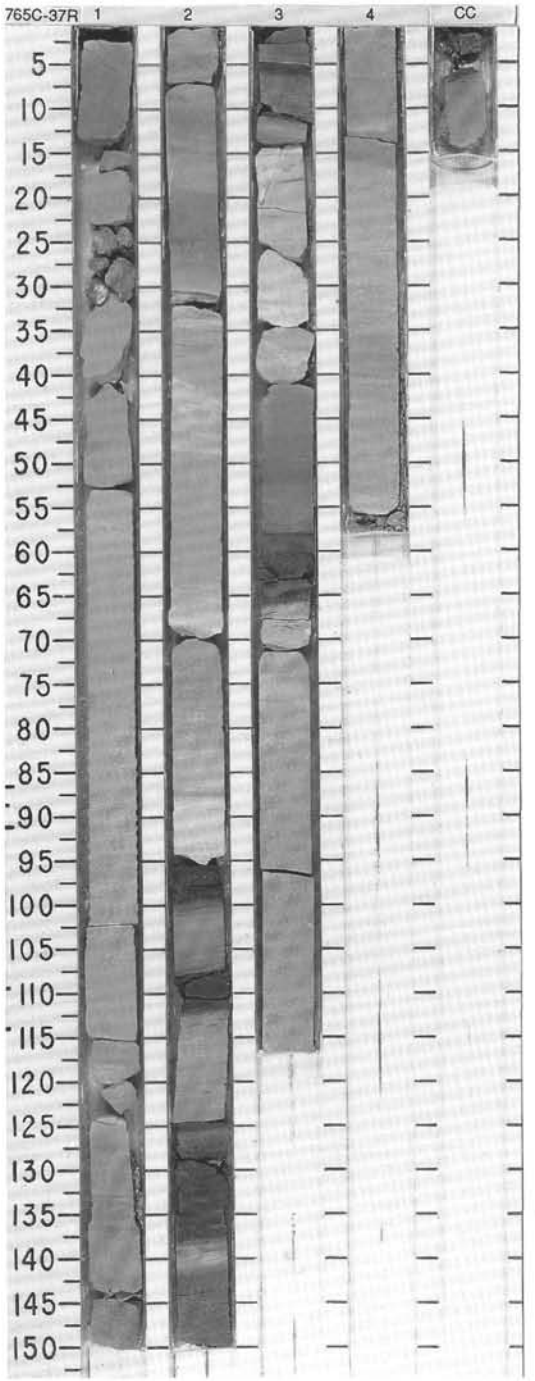
Minor lithologies:
a. Clayey calcareous siltstone/silty calcareous claystone, greenish gray (5GY 6/1). Graded, vaguely laminated, contacts gradational.
b. Cavings, chunks of light greenish gray (5GY 7/1) calcareous siltstone, and pebbles <= 4 cm in diameter of olive gray basalt.
c. Foraminiferal sandstone, gray (5Y 7/1) Massive, medium-sand-sized particles; lower contact sharp, upper contact gradational to silicified foraminiferal sandstone. Section 1, 118-124 cm.

Apparent local silicification of foraminifers in sandy siltstone based on negative HCl reaction.

Core dominated by graded sequences consisting of calcareous siliciclastic-dominated sediment. Sequences 8-66 cm thick. Bases sharp but not scoured. Maximum grain size ranges from silt-to medium-sand-sized. calcareous component variable, consists of nannofossils, foraminifers, calcareous fragments, and micrite.

SMEAR SLIDE SUMMARY (%):

	2, 92 M	2, 93 D	3, 13 D	3, 59 M	3, 61 M	3, 69 D	CC D
TEXTURE:							
Sand	9	30	10	—	20	1	30
Silt	34	10	10	20	15	38	10
Clay	57	60	80	80	65	61	60
COMPOSITION:							
Accessory minerals	—	Tr	—	—	—	—	—
Bioclast	—	1	—	—	—	—	—
Calcareous fragments	10	—	—	—	18	6	—
Calcispheres	—	—	1	—	—	—	2
Clay	57	—	14	80	65	45	10
Feldspar	—	Tr	—	—	—	—	—
Fish	—	Tr	—	—	—	—	—
Foraminifers	Tr	11	—	—	Tr	—	20
Glass	2	—	—	4	3	—	—
Mica	—	1	1	—	—	—	—
Micrite	—	60	70	—	—	16	37
Muscovite	2	—	—	2	1	1	—
Nannofossils	25	—	—	—	Tr	30	—
Opaques	—	—	2	3	1	—	—
Organic matter	—	Tr	—	2	Tr	Tr	—
Other	—	—	2	—	—	—	—
Plant	—	—	—	Tr	—	—	—
Quartz	—	2	—	1	1	—	15
Radiolarians	—	25	10	—	—	—	15
Rhodochrosite	—	—	—	3	—	—	—
Zeolite	3	—	—	3	9	1	—



SITE 765 HOLE C CORE 38R CORED INTERVAL 702.5-711.7 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
APTIAN	*H. planispira/ H. delrioensis* • A/M	A/G CC7A C/G CC7A	• VR/M	C/VP	B		• ϕ=2.06 ρ=50.0 V=1938 • ϕ=2.01 ρ=45.8 V=2035 • ϕ=2.03 ρ=43.6 V=2438 • ϕ=2.14 ρ=47.2 V=1949	• $CaCO_3$=1.6%	1 2 3 4 5 6 7 CC	0.5 1.0			P	*

LITHOLOGIC DESCRIPTION

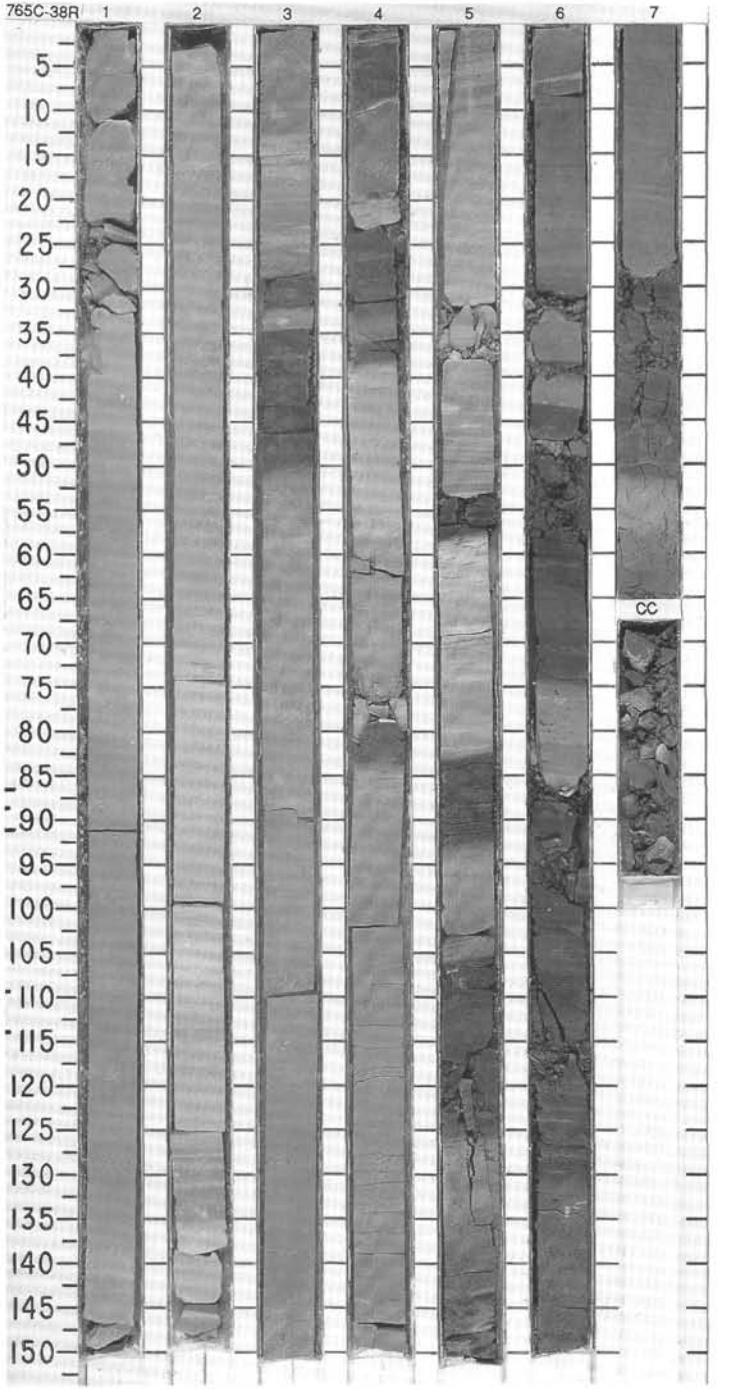
CALCAREOUS CLAYSTONE AND CLAYEY NANNOFOSSIL CHALK

Major lithologies:
CALCAREOUS CLAYSTONE and CLAYEY NANNOFOSSIL CHALK, gray, brownish gray, brown, olive gray, greenish gray, grayish brown (2.5Y 5/2, 6/2, 5Y 3/2, 5/2 to 7/2, 4/1, 6/1, 5G 5/1, 6/1, 5GY 5/1, 7/1, 10YR 3/1, 3/2, 4/2.5, 7.5YR 5/2, 5BG 4/1). Calcareous claystone massive, laminated, vaguely laminated, slightly-moderately bioturbated, locally graded. Pyrite nodule at Section 2, 71-72 cm. Intergrades compositionally with clayey nannofossil chalk, clayey calcareous chalk, and with calcareous silty claystone. Contains as much as several %. radiolarians (thin Section data). Upper contact commonly sharp, lower contact commonly gradational. Zeolites as much as 2%, carbonate near 0-30%. Distribution not shown on barrel sheet: Section 3, 53-58, 145-Section 4 8, 19-20, 24-34 cm. Clayey nannofossil chalk, commonly graded; laminated, vaguely laminated, massive, or bioturbated. Contacts gradational or sharp. Intergrades compositionally with calcareous claystone, calcareous chalk, and nannofossil silty clay mixed sediment. Includes substantial amounts of micrite (as much as 30%) interpreted as nannofossil fragments.

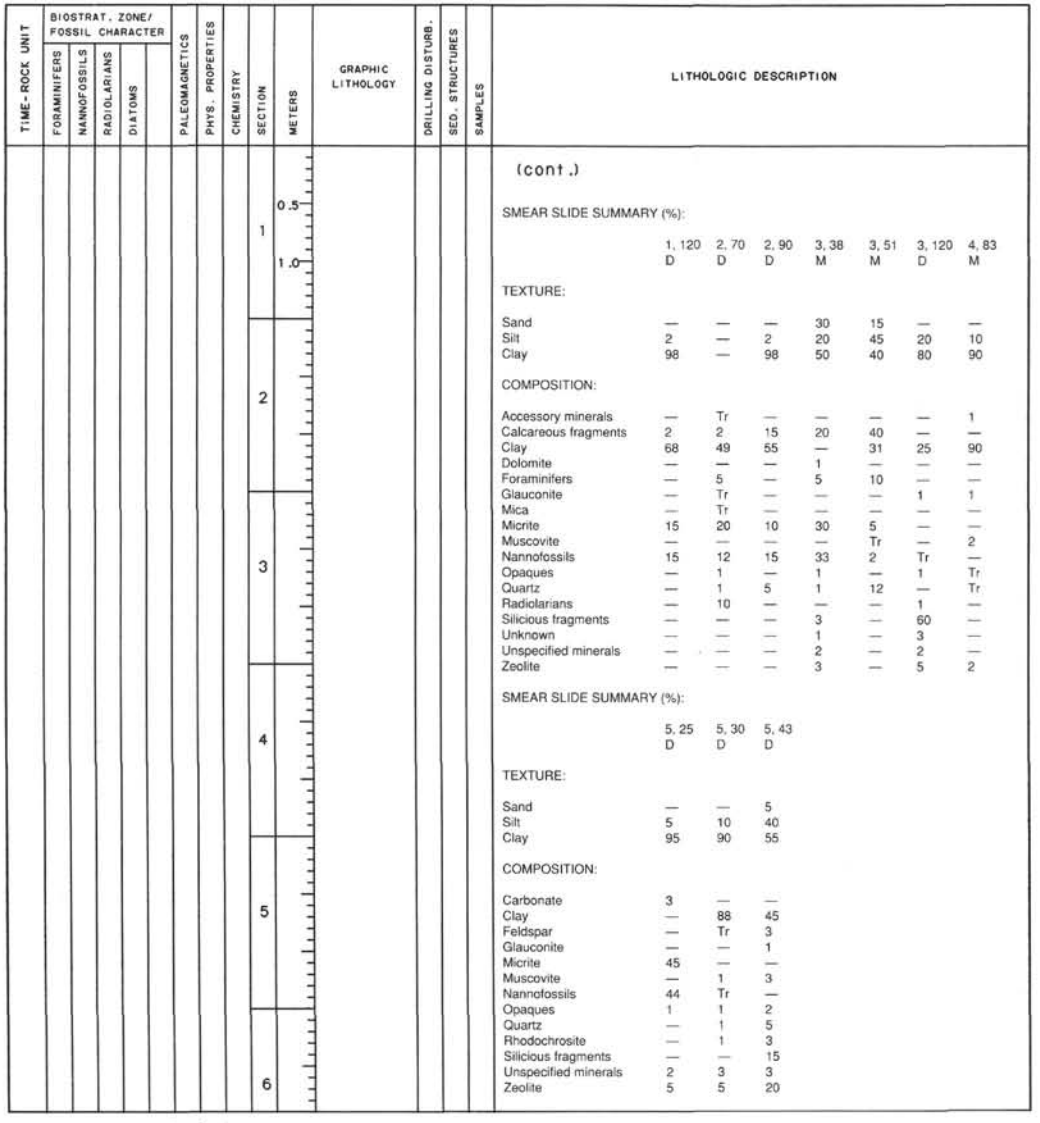
Minor lithologies:
a. Nannofossil claystone mixed sediment, gray, brownish gray (5Y 5/2, 6/1, 2.5Y 6/2, 10YR 7/2). Massive, bioturbated, laminated. Commonly graded. Contacts sharp or gradational. Distribution not shown on barrel sheet: Sections 3, 58-65, 70-74, Section 4, 8-18, 20-22, 33-38 cm.
b. Calcareous siltstone, gray and greenish gray (5Y 6/1, 5GY 7/1). Graded; laminated or massive. Lower contact sharp, upper contact gradational. Occurs at Section 3, 65-70, Section 4, 76-80 cm
c. Clayey or silty calcareous chalk, greenish gray, reddish brown (5G 6/1, 5YR 5/3, 5GY 6/1). Laminated, graded. Lower contact sharp, upper contact gradational. Calcareous particles dominantly clay-sized: micrite and nannofossils. Zeolites as much as 5%. Distribution not shown on barrel sheet: Section 6, 85-90 cm.
d. Silty calcareous fragment mixed sediment, gray (5Y 5/1). Laminated, graded. Lower contact sharp, upper contact gradational. Particles silt-very fine-sand-sized: foraminifers, quartz, calcareous fragments.
e. Clayey siliceous mixed sediment, grayish brown (10YR 3/2), massive. Upper contact sharp, lower contact gradational. Dominated by clay and siliceous fragments (dominantly of radiolarians); minor zeolites.

Core dominated by sediments with large proportions of both siliciclastic and carbonate components, though most not technically mixed sediments. Fine-grained graded sequences comprise about 2 meters in the middle of the core and about 1 meter in the lower part. These sequences are 8-42 cm thick (much thicker intervals such as Section 4, 80 cm to Section 5, 28 cm, may also be graded sequences). Typical sequence consists, from bottom to top, of calcareous siltstone (may be absent), clayey calcareous chalk (may be absent), clayey nannofossil chalk, and calcareous claystone.

(cont.)



SITE 765 HOLE C CORE 38R CORED INTERVAL 702.5-711.7 mbsf



(cont.)

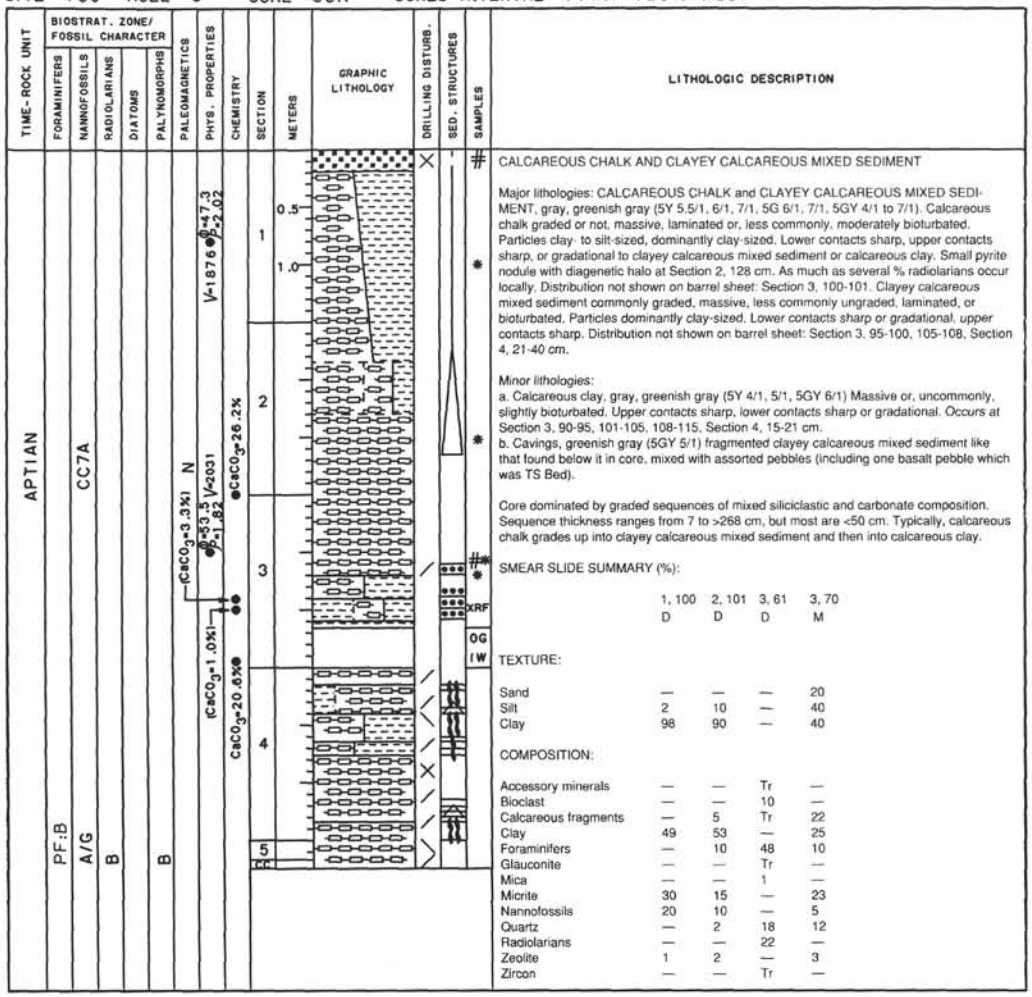
SMEAR SLIDE SUMMARY (%):

	1, 120 D	2, 70 D	2, 90 D	3, 38 M	3, 51 M	3, 120 D	4, 83 M
TEXTURE:							
Sand	—	—	—	30	15	—	—
Silt	2	—	2	20	45	20	10
Clay	98	—	98	50	40	80	90
COMPOSITION:							
Accessory minerals	—	Tr	—	—	—	—	1
Calcareous fragments	2	2	15	20	40	—	—
Clay	68	49	55	—	31	25	90
Dolomite	—	—	—	1	—	—	—
Foraminifers	—	5	—	5	10	—	—
Glauconite	—	Tr	—	—	—	1	1
Mica	—	Tr	—	—	—	—	—
Micrite	15	20	10	30	5	—	—
Muscovite	—	—	—	—	Tr	—	2
Nannofossils	15	12	15	33	2	Tr	—
Opaques	—	1	—	1	—	1	Tr
Quartz	—	1	5	1	12	—	Tr
Radiolarians	—	10	—	—	—	1	—
Silicious fragments	—	—	—	3	—	60	—
Unknown	—	—	—	1	—	3	—
Unspecified minerals	—	—	—	2	—	2	—
Zeolite	—	—	—	3	—	5	2

SMEAR SLIDE SUMMARY (%):

	5, 25 D	5, 30 D	5, 43 D
TEXTURE:			
Sand	—	—	5
Silt	5	10	40
Clay	95	90	55
COMPOSITION:			
Carbonate	3	—	—
Clay	—	88	45
Feldspar	—	Tr	3
Glauconite	—	—	1
Micrite	45	—	—
Muscovite	—	1	3
Nannofossils	44	Tr	—
Opaques	1	1	2
Quartz	—	1	5
Rhodochrosite	—	1	3
Silicious fragments	—	—	15
Unspecified minerals	2	3	3
Zeolite	5	5	20

SITE 765 HOLE C CORE 39R CORED INTERVAL 711.7-720.9 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS CHALK AND CLAYEY CALCAREOUS MIXED SEDIMENT

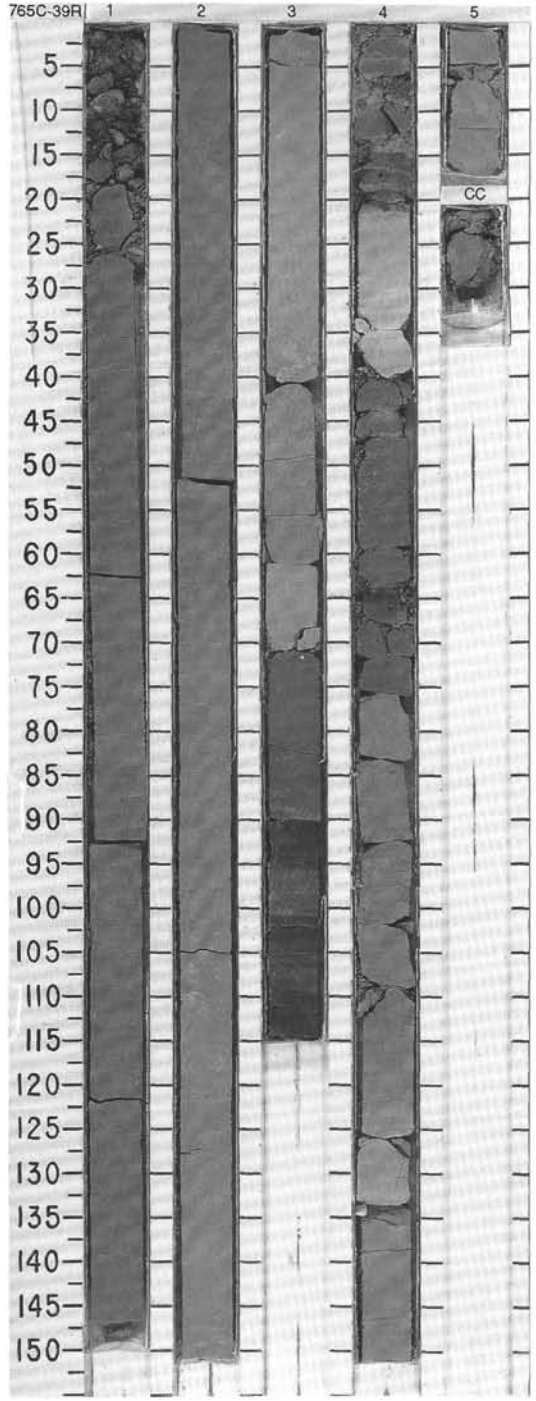
Major lithologies: CALCAREOUS CHALK and CLAYEY CALCAREOUS MIXED SEDIMENT, gray, greenish gray (5Y 5.5/1, 6/1, 7/1, 5G 6/1, 7/1, 5GY 4/1 to 7/1). Calcareous chalk graded or not, massive, laminated or, less commonly, moderately bioturbated. Particles clay- to silt-sized, dominantly clay-sized. Lower contacts sharp, upper contacts sharp, or gradational to clayey calcareous mixed sediment or calcareous clay. Small pyrite nodule with diagenetic halo at Section 2, 128 cm. As much as several % radiolarians occur locally. Distribution not shown on barrel sheet: Section 3, 100-101. Clayey calcareous mixed sediment commonly graded, massive, less commonly ungraded, laminated, or bioturbated. Particles dominantly clay-sized. Lower contacts sharp or gradational, upper contacts sharp. Distribution not shown on barrel sheet: Section 3, 95-100, 105-108, Section 4, 21-40 cm.

Minor lithologies:
a. Calcareous clay, gray, greenish gray (5Y 4/1, 5/1, 5GY 6/1) Massive or, uncommonly, slightly bioturbated. Upper contacts sharp, lower contacts sharp or gradational. Occurs at Section 3, 90-95, 101-105, 108-115, Section 4, 15-21 cm.
b. Cavings, greenish gray (5GY 5/1) fragmented clayey calcareous mixed sediment like that found below it in core, mixed with assorted pebbles (including one basalt pebble which was TS Bed).

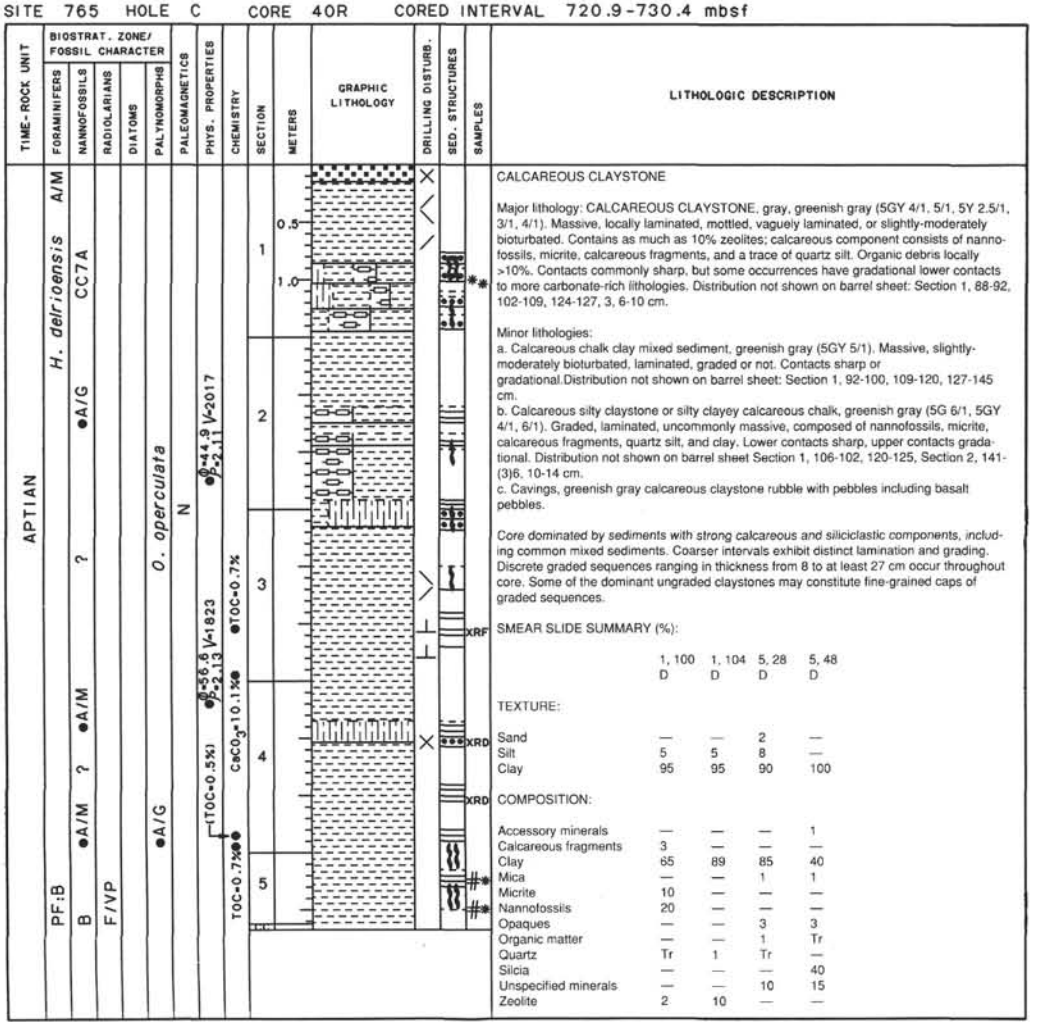
Core dominated by graded sequences of mixed siliciclastic and carbonate composition. Sequence thickness ranges from 7 to >268 cm, but most are <50 cm. Typically, calcareous chalk grades up into clayey calcareous mixed sediment and then into calcareous clay.

SMEAR SLIDE SUMMARY (%):

	1, 100 D	2, 101 D	3, 61 D	3, 70 M
TEXTURE:				
Sand	—	—	—	20
Silt	2	10	—	40
Clay	98	90	—	40
COMPOSITION:				
Accessory minerals	—	—	Tr	—
Bioclast	—	—	10	—
Calcareous fragments	—	5	Tr	22
Clay	49	53	—	25
Foraminifers	—	10	48	10
Glauconite	—	—	Tr	—
Mica	—	—	1	—
Micrite	30	15	—	23
Nannofossils	20	10	—	5
Quartz	—	2	18	12
Radiolarians	—	—	22	—
Zeolite	1	2	—	3
Zircon	—	—	Tr	—



SITE 765 HOLE C CORE 40R CORED INTERVAL 720.9-730.4 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS CLAYSTONE

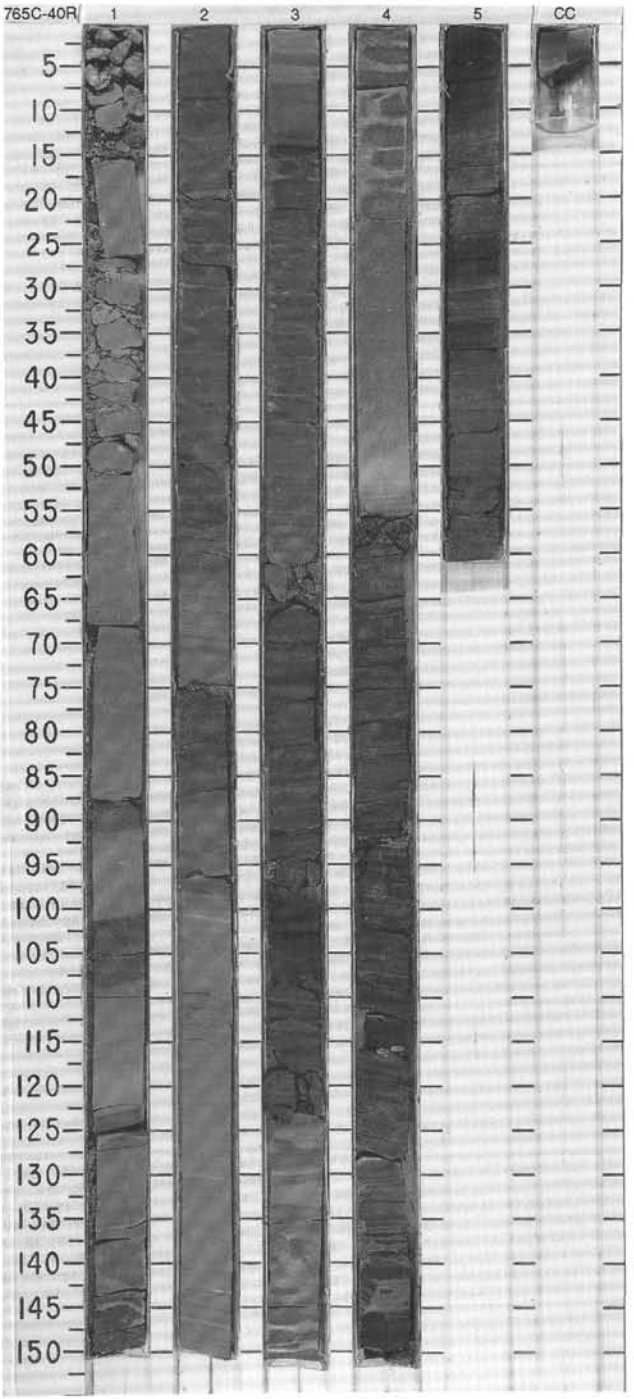
Major lithology: CALCAREOUS CLAYSTONE, gray, greenish gray (5GY 4/1, 5/1, 5Y 2.5/1, 3/1, 4/1). Massive, locally laminated, mottled, vaguely laminated, or slightly-moderately bioturbated. Contains as much as 10% zeolites; calcareous component consists of nannofossils, micrite, calcareous fragments, and a trace of quartz silt. Organic debris locally >10%. Contacts commonly sharp, but some occurrences have gradational lower contacts to more carbonate-rich lithologies. Distribution not shown on barrel sheet: Section 1, 88-92, 102-109, 124-127, 3, 6-10 cm.

Minor lithologies:
a. Calcareous chalk clay mixed sediment, greenish gray (5GY 5/1). Massive, slightly-moderately bioturbated, laminated, graded or not. Contacts sharp or gradational.Distribution not shown on barrel sheet: Section 1, 92-100, 109-120, 127-145 cm.
b. Calcareous silty claystone or silty clayey calcareous chalk, greenish gray (5G 6/1, 5GY 4/1, 6/1). Graded, laminated, uncommonly massive, composed of nannofossils, micrite, calcareous fragments, quartz silt, and clay. Lower contacts sharp, upper contacts gradational. Distribution not shown on barrel sheet Section 1, 106-102, 120-125, Section 2, 141-(3)6, 10-14 cm.
c. Cavings, greenish gray calcareous claystone rubble with pebbles including basalt pebbles.

Core dominated by sediments with strong calcareous and siliciclastic components, including common mixed sediments. Coarser intervals exhibit distinct lamination and grading. Discrete graded sequences ranging in thickness from 8 to at least 27 cm occur throughout core. Some of the dominant ungraded claystones may constitute fine-grained caps of graded sequences.

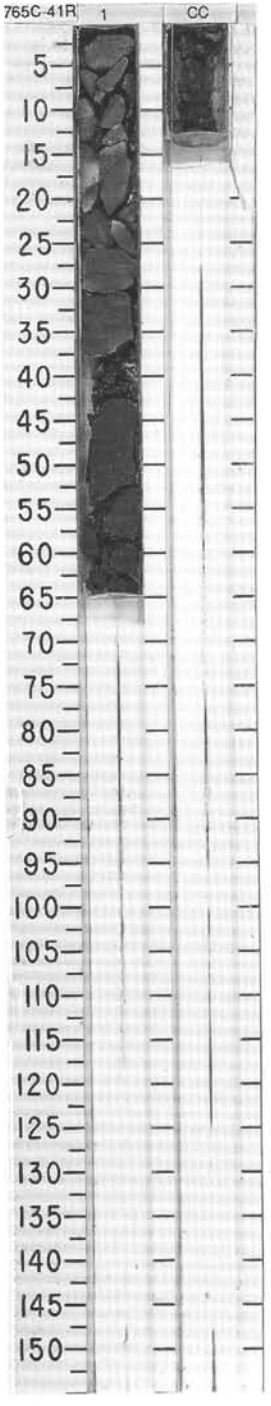
SMEAR SLIDE SUMMARY (%):

	1, 100 D	1, 104 D	5, 28 D	5, 48 D
TEXTURE:				
Sand	—	—	2	—
Silt	5	5	8	—
Clay	95	95	90	100
COMPOSITION:				
Accessory minerals	—	—	—	1
Calcareous fragments	3	—	—	—
Clay	65	89	85	40
Mica	—	—	1	1
Micrite	10	—	—	—
Nannofossils	20	—	—	—
Opaques	—	—	3	3
Organic matter	—	—	1	Tr
Quartz	Tr	1	Tr	—
Silcia	—	—	—	40
Unspecified minerals	—	—	10	15
Zeolite	2	10	—	—

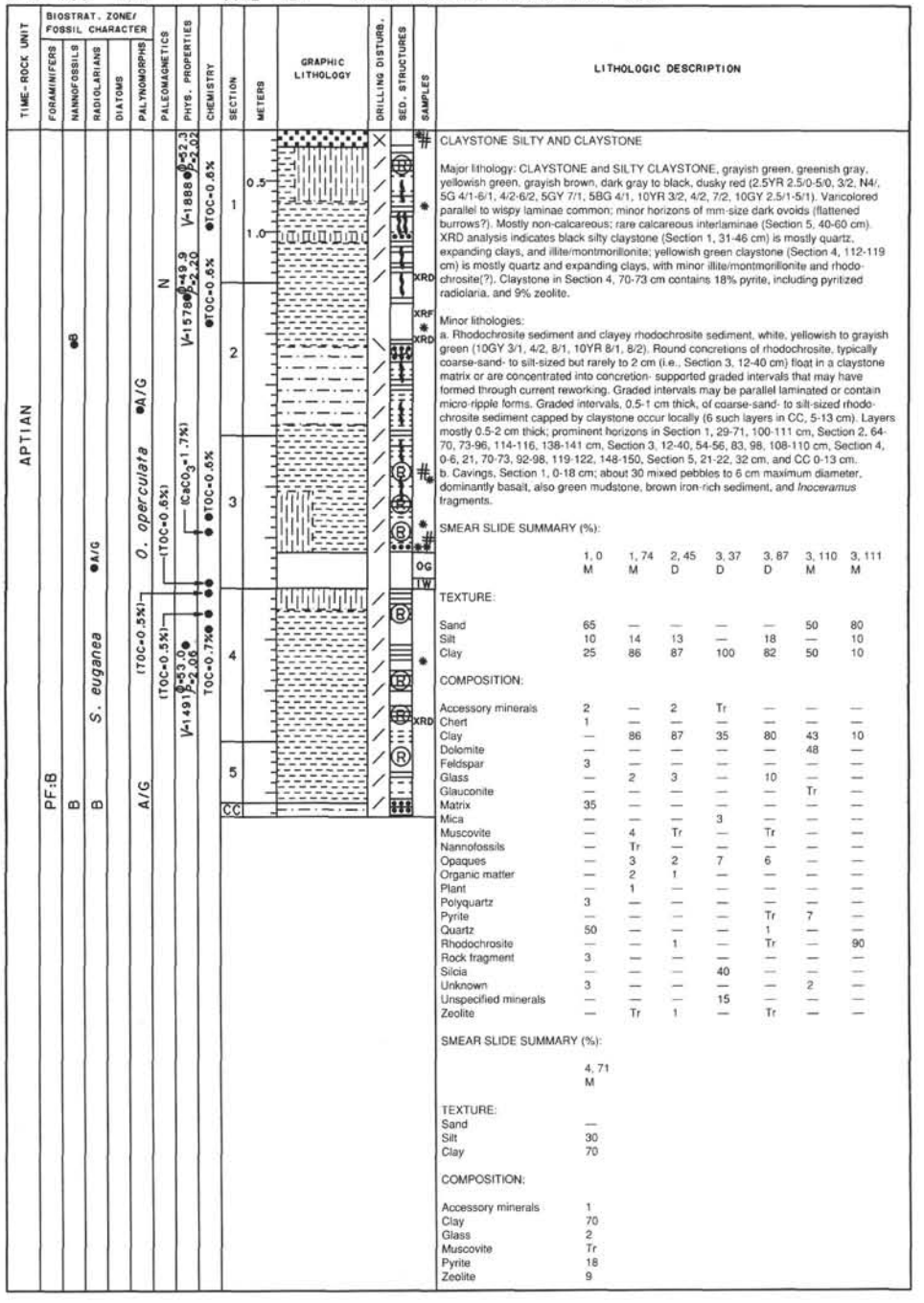


SITE 765 HOLE C CORE 41R CORED INTERVAL 730.4-739.8 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
APTIAN	PF:B	B	B		*O. operculata* A/G ●A/G	N	V-1553@44.5 P-2.16	TOC-0.8%●	1 CC			X X X	- -		CLAYSTONE Entire core highly fragmented . Major lithology: CLAYSTONE, olive gray (5Y 4/2) and very dark gray (2.5Y N3/), extremely fragmented.



SITE 765 HOLE C CORE 42R CORED INTERVAL 739.8-749.1 mbsf



CLAYSTONE SILTY AND CLAYSTONE

Major lithology: CLAYSTONE and SILTY CLAYSTONE, grayish green, greenish gray, yellowish green, grayish brown, dark gray to black, dusky red (2.5YR 2.5/0-5/0, 3/2, N4/, 5G 4/1-6/1, 4/2-6/2, 5GY 7/1, 5BG 4/1, 10YR 3/2, 4/2, 7/2, 10GY 2.5/1-5/1). Varicolored parallel to wispy laminae common; minor horizons of mm-size dark ovoids (flattened burrows?). Mostly non-calcareous; rare calcareous interlaminae (Section 5, 40-60 cm). XRD analysis indicates black silty claystone (Section 1, 31-46 cm) is mostly quartz, expanding clays, and illite/montmorillonite; yellowish green claystone (Section 4, 112-119 cm) is mostly quartz and expanding clays, with minor illite/montmorillonite and rhodochrosite(?). Claystone in Section 4, 70-73 cm contains 18% pyrite, including pyritized radiolaria, and 9% zeolite.

Minor lithologies:

a. Rhodochrosite sediment and clayey rhodochrosite sediment, white, yellowish to grayish green (10GY 3/1, 4/2, 8/1, 10YR 8/1, 8/2). Round concretions of rhodochrosite, typically coarse-sand- to silt-sized but rarely to 2 cm (i.e., Section 3, 12-40 cm) float in a claystone matrix or are concentrated into concretion- supported graded intervals that may have formed through current reworking. Graded intervals may be parallel laminated or contain micro-ripple forms. Graded intervals, 0.5-1 cm thick, of coarse-sand- to silt-sized rhodochrosite sediment capped by claystone occur locally (6 such layers in CC, 5-13 cm). Layers mostly 0.5-2 cm thick; prominent horizons in Section 1, 29-71, 100-111 cm, Section 2, 64-70, 73-96, 114-116, 138-141 cm, Section 3, 12-40, 54-56, 83, 98, 108-110 cm, Section 4, 0-6, 21, 70-73, 92-98, 119-122, 148-150, Section 5, 21-22, 32 cm, and CC 0-13 cm.

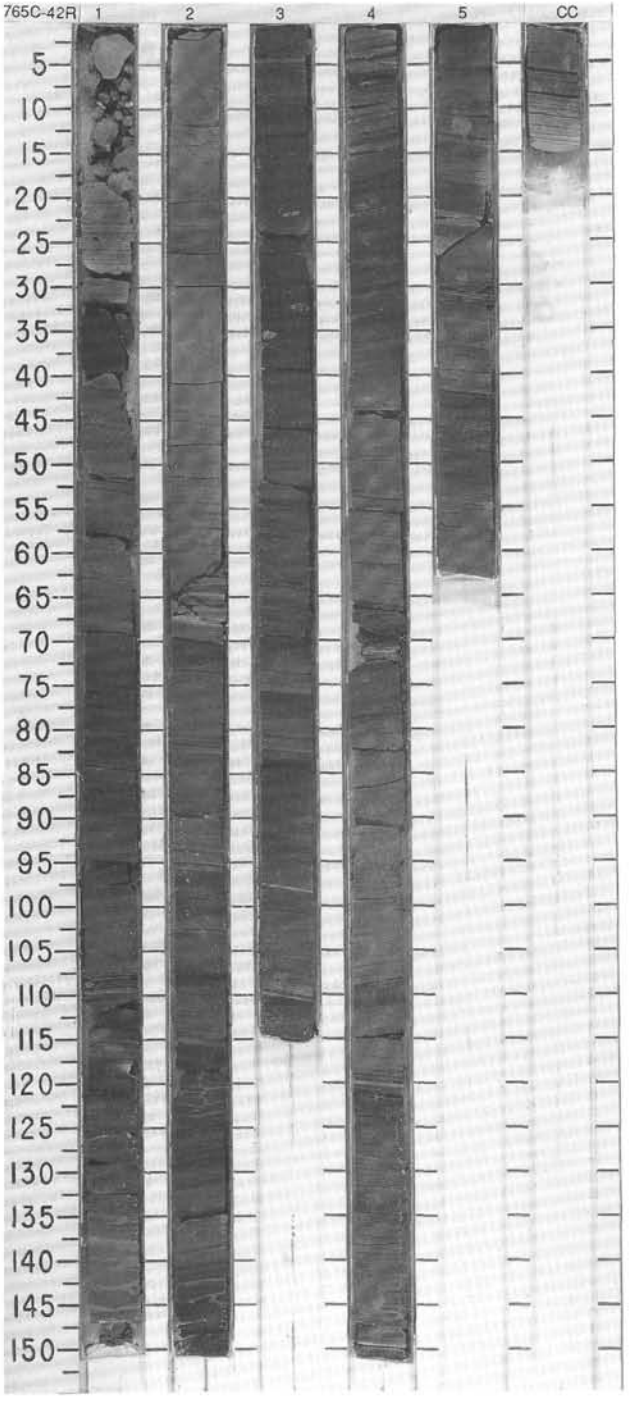
b. Cavings, Section 1, 0-18 cm; about 30 mixed pebbles to 6 cm maximum diameter, dominantly basalt, also green mudstone, brown iron-rich sediment, and *Inoceramus* fragments.

SMEAR SLIDE SUMMARY (%):

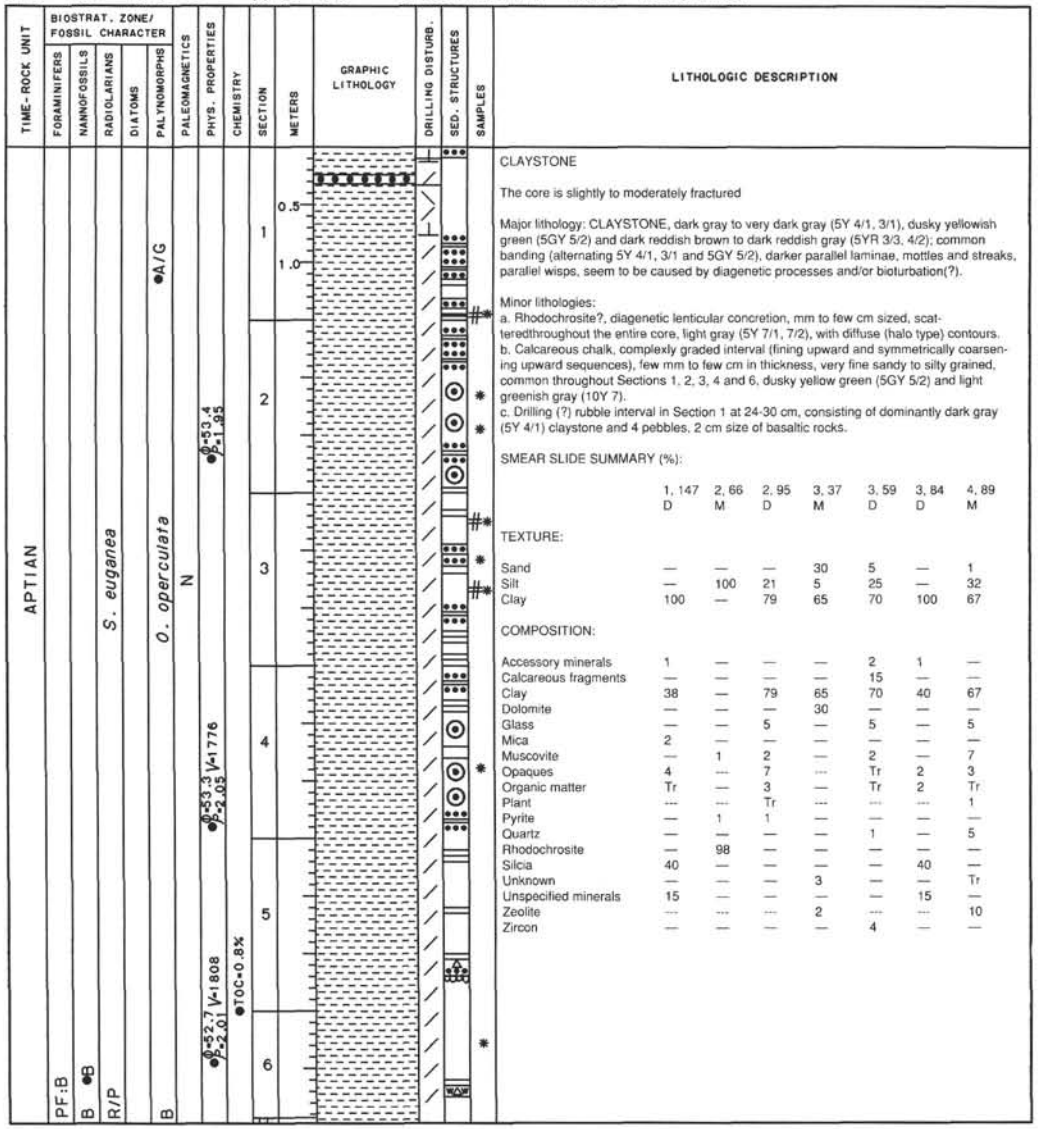
	1, 0 M	1, 74 M	2, 45 D	3, 37 D	3, 87 D	3, 110 M	3, 111 M
TEXTURE:							
Sand	65	—	—	—	—	50	80
Silt	10	14	13	—	18	—	10
Clay	25	86	87	100	82	50	10
COMPOSITION:							
Accessory minerals	2	—	2	Tr	—	—	—
Chert	1	—	—	—	—	—	—
Clay	—	86	87	35	80	43	10
Dolomite	—	—	—	—	—	48	—
Feldspar	3	—	—	—	—	—	—
Glass	—	2	3	—	10	—	—
Glauconite	—	—	—	—	—	Tr	—
Matrix	35	—	—	—	—	—	—
Mica	—	—	—	3	—	—	—
Muscovite	—	4	Tr	—	Tr	—	—
Nannofossils	—	Tr	—	—	—	—	—
Opaques	—	3	2	7	6	—	—
Organic matter	—	2	1	—	—	—	—
Plant	—	1	—	—	—	—	—
Polyquartz	3	—	—	—	—	—	—
Pyrite	—	—	—	—	Tr	7	—
Quartz	50	—	—	—	1	—	—
Rhodochrosite	—	—	1	—	Tr	—	90
Rock fragment	3	—	—	—	—	—	—
Silicia	—	—	—	40	—	—	—
Unknown	3	—	—	—	—	2	—
Unspecified minerals	—	—	—	15	—	—	—
Zeolite	—	Tr	1	—	Tr	—	—

SMEAR SLIDE SUMMARY (%):

	4, 71 M
TEXTURE:	
Sand	—
Silt	30
Clay	70
COMPOSITION:	
Accessory minerals	1
Clay	70
Glass	2
Muscovite	Tr
Pyrite	18
Zeolite	9



SITE 765 HOLE C CORE 43R CORED INTERVAL 799.1-758.5 mbsf



CLAYSTONE

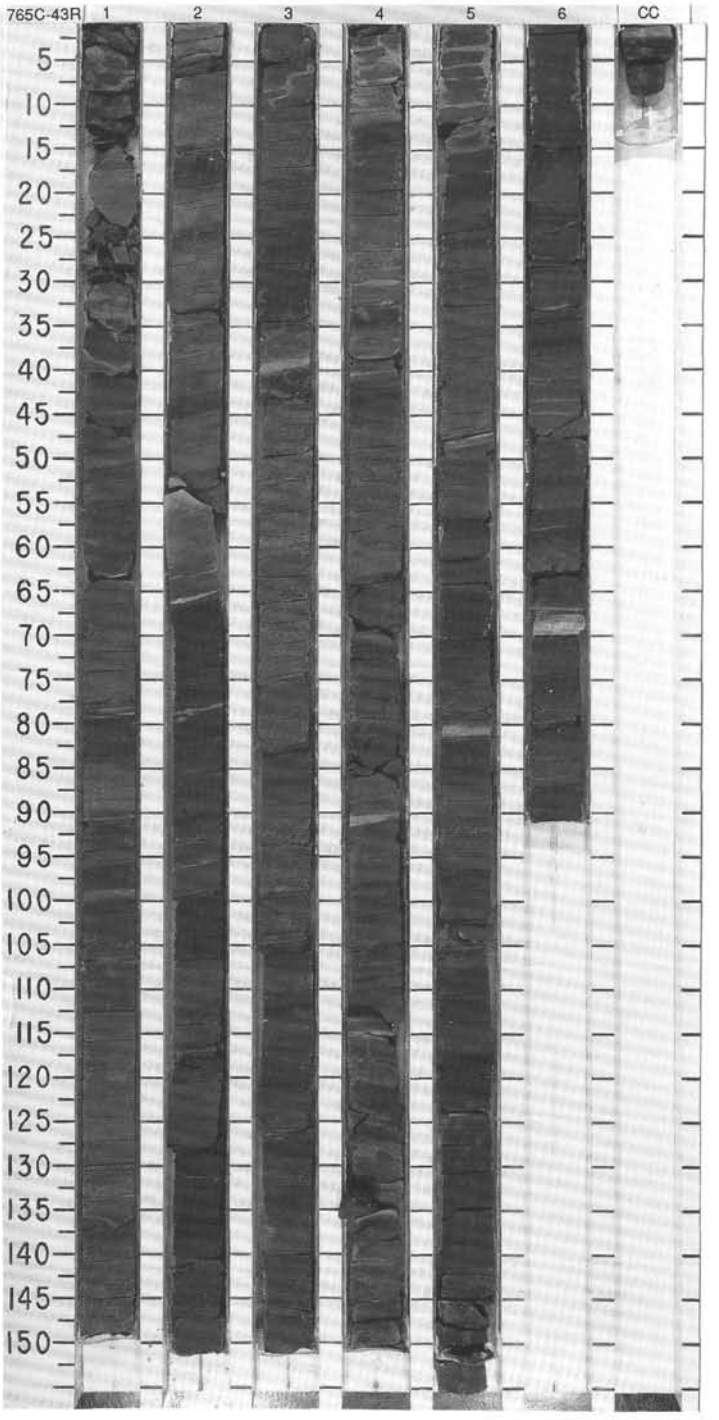
The core is slightly to moderately fractured

Major lithology: CLAYSTONE, dark gray to very dark gray (5Y 4/1, 3/1), dusky yellowish green (5GY 5/2) and dark reddish brown to dark reddish gray (5YR 3/3, 4/2); common banding (alternating 5Y 4/1, 3/1 and 5GY 5/2), darker parallel laminae, mottles and streaks, parallel wisps, seem to be caused by diagenetic processes and/or bioturbation(?).

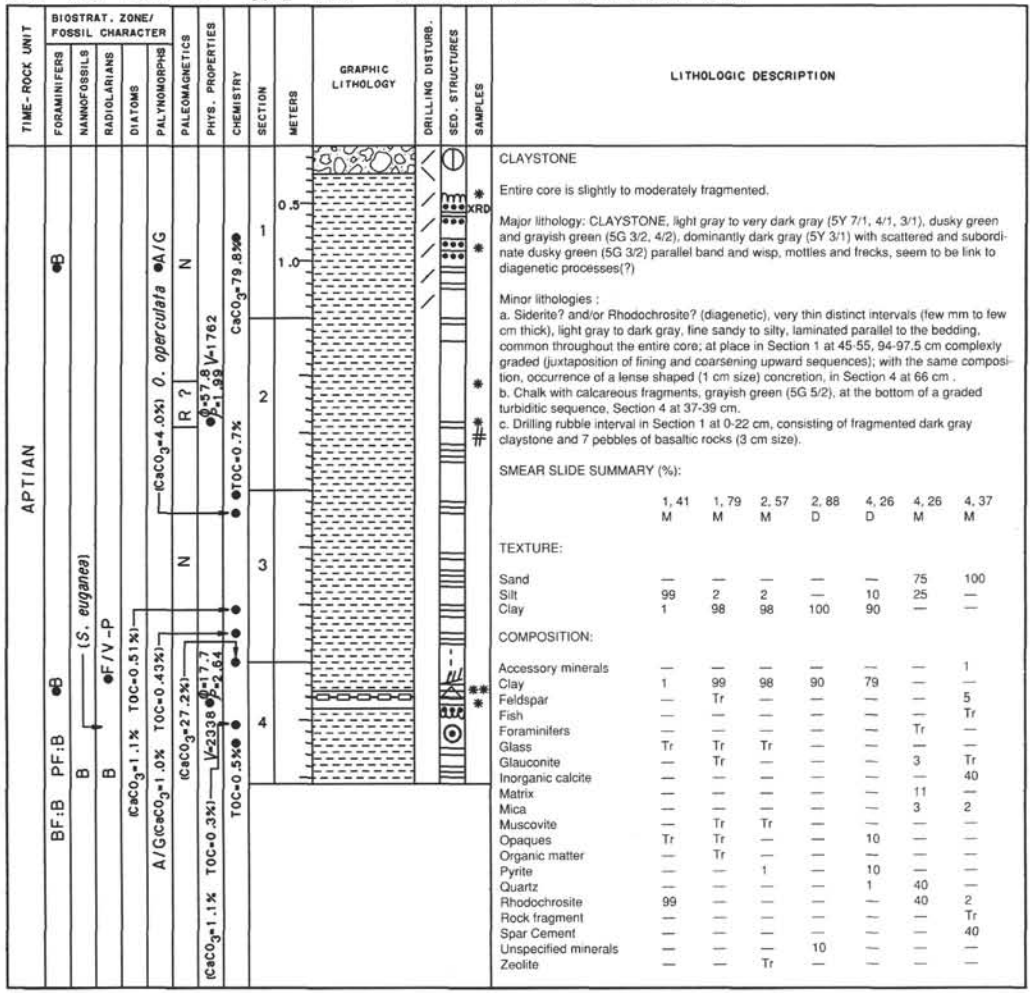
Minor lithologies:
a. Rhodochrosite?, diagenetic lenticular concretion, mm to few cm sized, scatteredthroughout the entire core, light gray (5Y 7/1, 7/2), with diffuse (halo type) contours.
b. Calcareous chalk, complexly graded interval (fining upward and symmetrically coarsening upward sequences), few mm to few cm in thickness, very fine sandy to silty grained, common throughout Sections 1, 2, 3, 4 and 6, dusky yellow green (5GY 5/2) and light greenish gray (10Y 7).
c. Drilling (?) rubble interval in Section 1 at 24-30 cm, consisting of dominantly dark gray (5Y 4/1) claystone and 4 pebbles, 2 cm size of basaltic rocks.

SMEAR SLIDE SUMMARY (%):

	1, 147 D	2, 66 M	2, 95 D	3, 37 M	3, 59 D	3, 84 D	4, 89 M
TEXTURE:							
Sand	—	—	—	30	5	—	1
Silt	—	100	21	5	25	—	32
Clay	100	—	79	65	70	100	67
COMPOSITION:							
Accessory minerals	1	—	—	—	2	1	—
Calcareous fragments	—	—	—	—	15	—	—
Clay	38	—	79	65	70	40	67
Dolomite	—	—	—	30	—	—	—
Glass	—	—	5	—	5	—	5
Mica	2	—	—	—	—	—	—
Muscovite	—	1	2	—	2	—	7
Opaques	4	---	7	---	Tr	2	3
Organic matter	Tr	—	3	—	Tr	2	Tr
Plant	---	---	Tr	---	---	---	1
Pyrite	—	1	1	—	—	—	—
Quartz	—	—	—	—	1	—	5
Rhodochrosite	—	98	—	—	—	—	—
Silcia	40	—	—	—	—	40	—
Unknown	—	—	—	3	—	—	Tr
Unspecified minerals	15	—	—	—	—	15	—
Zeolite	---	---	---	2	---	---	10
Zircon	—	—	—	—	4	—	—



SITE 765 HOLE C CORE 44R CORED INTERVAL 758.5-768.2 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE

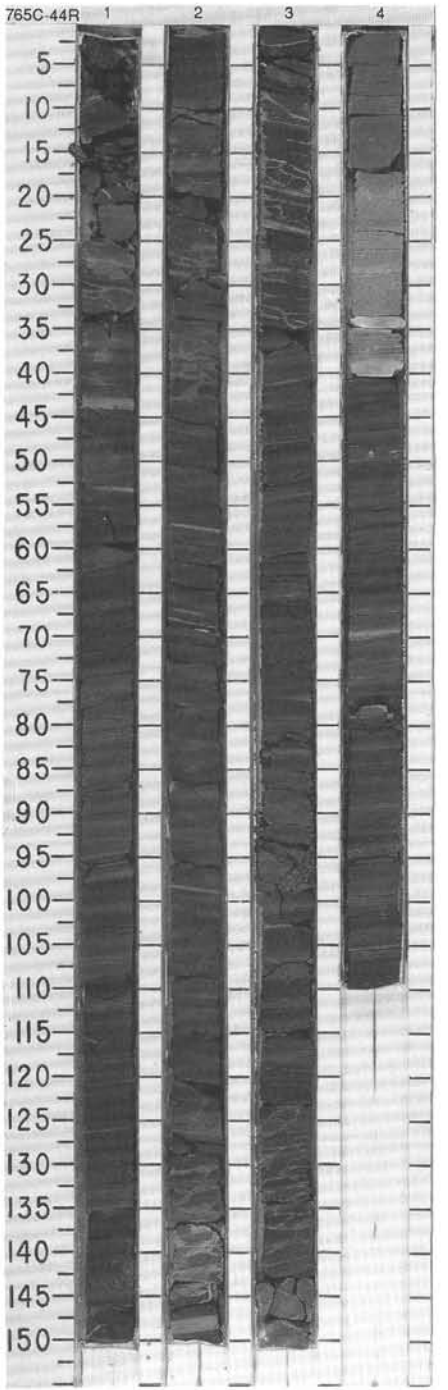
Entire core is slightly to moderately fragmented.

Major lithology: CLAYSTONE, light gray to very dark gray (5Y 7/1, 4/1, 3/1), dusky green and grayish green (5G 3/2, 4/2), dominantly dark gray (5Y 3/1) with scattered and subordinate dusky green (5G 3/2) parallel band and wisp, mottles and frecks, seem to be link to diagenetic processes(?)

Minor lithologies :
a. Siderite? and/or Rhodochrosite? (diagenetic), very thin distinct intervals (few mm to few cm thick), light gray to dark gray, fine sandy to silty, laminated parallel to the bedding, common throughout the entire core; at place in Section 1 at 45-55, 94-97.5 cm complexly graded (juxtaposition of fining and coarsening upward sequences); with the same composition, occurrence of a lense shaped (1 cm size) concretion, in Section 4 at 66 cm .
b. Chalk with calcareous fragments, grayish green (5G 5/2), at the bottom of a graded turbiditic sequence, Section 4 at 37-39 cm.
c. Drilling rubble interval in Section 1 at 0-22 cm, consisting of fragmented dark gray claystone and 7 pebbles of basaltic rocks (3 cm size).

SMEAR SLIDE SUMMARY (%):

	1, 41 M	1, 79 M	2, 57 M	2, 88 D	4, 26 D	4, 26 M	4, 37 M
TEXTURE:							
Sand	—	—	—	—	—	75	100
Silt	99	2	2	—	10	25	—
Clay	1	98	98	100	90	—	—
COMPOSITION:							
Accessory minerals	—	—	—	—	—	—	1
Clay	1	99	98	90	79	—	—
Feldspar	—	Tr	—	—	—	—	5
Fish	—	—	—	—	—	—	Tr
Foraminifers	—	—	—	—	—	Tr	—
Glass	Tr	Tr	Tr	—	—	—	—
Glauconite	—	Tr	—	—	—	3	Tr
Inorganic calcite	—	—	—	—	—	—	40
Matrix	—	—	—	—	—	11	—
Mica	—	—	—	—	—	3	2
Muscovite	—	Tr	Tr	—	—	—	—
Opaques	Tr	Tr	—	—	10	—	—
Organic matter	—	Tr	—	—	—	—	—
Pyrite	—	—	1	—	10	—	—
Quartz	—	—	—	—	1	40	—
Rhodochrosite	99	—	—	—	—	40	2
Rock fragment	—	—	—	—	—	—	Tr
Spar Cement	—	—	—	—	—	—	40
Unspecified minerals	—	—	—	10	—	—	—
Zeolite	—	—	Tr	—	—	—	—



SITE 765 HOLE C CORE 45R CORED INTERVAL 768.2-777.8 mbsf

TIME-ROCK UNIT: APTIAN

BIOSTRAT. ZONE/FOSSIL CHARACTER:
- FORAMINIFERS: C/M — *Guembelitria sp., Caucasella hoterivica, Hedbergella sp*
- NANNOFOSSILS: B
- RADIOLARIANS: R/V-P
- DIATOMS: ●C/M — *S. euganea* — ●A/M ●A/M
- PALYNOMORPHS: A/G — (CaCO3=4.9% TOC=2.3%) — (CaCO3=3.6% TOC=0.1%) *O. operculata* ●A/G
- PALEOMAGNETICS: Indeterminate — N — R — N
- PHYS. PROPERTIES: V-1806 ● 0=50.8 ρ=2.00 — V-1829 ● 0=49.3 ρ=2.01
- CHEMISTRY: CaCO3=5.4%● — (CaCO3=8.2% TOC=1.0%) — ●CaCO3=0.7% TOC=0.1%

SECTION: 1, 2, 3, 4, 5, 6, CC

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY

DRILLING DISTURB.

SED. STRUCTURES

SAMPLES: XRF, OG, IW, XRD, XRD

LITHOLOGIC DESCRIPTION

CLAYSTONE

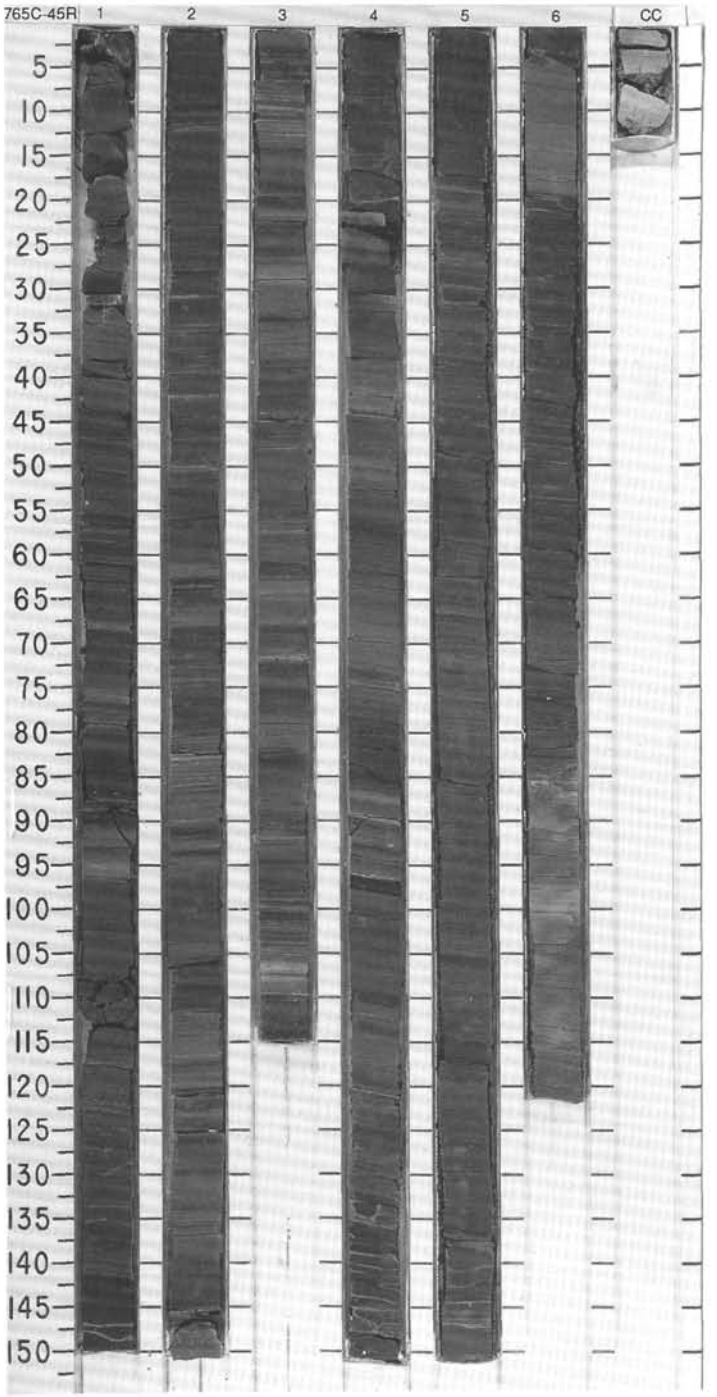
Major lithology:
CLAYSTONE, color variable on a scale from tens of cm to less than a mm. Dominantly shades of red to reddish brown to reddish gray, with laminae of bluish gray or greenish gray; also dark, to very dark gray (with laminae of white or light gray), dark greenish gray (mostly in Section 1), and grayish brown (2.5YR 2.5/4, 1/2, 3/4, 5B 5/1, 7/1, 5BG 6/1, 7/1, 5G 4/1, 5/1, 7/2, 5R 3/2, 6/2, 5YR 4/1, 5Y 6/1, N4/, N7/, N8/, 10R 3/1, 10YR 5/2). Cyclic color alternations especially prominent in Section 3, where subtly fining-upward sequences (average 10 cm thick) grade from dark gray laminated claystone to faintly laminated, locally bioturbated, dusky red claystone. Most intervalsmassive, with concentrations of parallel to wispy laminae, mottles, and mm-size burrows. Local calcareous laminae (most notable in Section 3), and one interval of black (N2/) organic claystone Section 4, 97 cm Micro-faults (cm-scale) in Section 4 (90 cm).

Minor lithologies:
a. Clayey rhodochrosite sediment and rhodochrosite claystone, white, light to dark greenish gray (5GY 4/1, 7/1, 10YR 8/2, 10Y 6/2, 8/4). Round concretions of rhodochrosite, coarse-sand- to silt-sized (but one crescent-shaped nodule, 0.5 cm diameter, in Section 4, 93 cm) float in a claystone matrix or are concentrated into concretion-supported, graded intervals that may have formed through current reworking. Graded intervals more abundant in upper half of core Thin layers, less than a mm to 3 cm thick; most prominent horizons in Section 1, 31, 67-68, 74-76, 76-79 cm, Section 2, 63, 108-109, 120 cm, Section 3, 20, 27-29, 57 cm, Section 4, 40-45, 52-53 cm, Section 5, 10, 21, 25-27, 35, 45-50, 63, 66, 85, 95, 110, 125, 140, 145 cm, and Section 6, 93-95 cm
b. Clayey siltstone and clayey sandstone, former dark greenish gray and massive, latter light greenish gray and cross-laminated, in CC, 0-12 cm.
c. Cavings, mixed cm-sized green, red, and gray claystone and olive volcanic pebbles. Section 1, 0-3 cm.

SMEAR SLIDE SUMMARY (%):

	1, 59 D	1, 78 M	1, 126 D	3, 54 D	3, 105 M	4, 44 M	4, 44 M
TEXTURE:							
Sand	—	51	—	—	40	15	30
Silt	10	6	1	20	10	25	20
Clay	90	43	99	80	50	60	50
COMPOSITION:							
Accessory minerals	—	—	—	2	1	2	—
Clay	88	40	99	70	50	80	50
Feldspar	—	—	—	2	—	1	—
Glass	6	2	—	—	—	—	—
Glauconite	Tr	—	—	—	—	Tr	—
Inorganic calcite	—	—	—	—	3	—	—
Mica	—	—	—	—	2	—	—
Muscovite	2	—	—	1	—	1	—
Opaques	—	—	—	1	5	3	5
Organic matter	Tr	—	—	5	3	—	—
Pyrite	3	3	1	1	—	—	—
Quartz	—	—	—	2	1	1	—
Rhodochrosite	—	52	—	10	30	10	20
Unspecified minerals	—	—	—	3	5	—	10
Zeolite	—	—	—	2	—	—	—

(cont.)



SITE 765 HOLE C CORE 45R CORED INTERVAL 768.2-777.8 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS		PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
									1	0.5 1.0					(cont.)
									2						
									3						

SMEAR SLIDE SUMMARY (%):

	4, 90 M	4, 99 M	5, 89 D	6, 15 D	6, 98 D	CC, 3 M
TEXTURE:						
Sand	10	—	2	5	5	
Silt	30	35	10	40	35	50
Clay	60	65	90	58	60	45
COMPOSITION:						
Accessory minerals	5	1	Tr	Tr	—	—
Barite	—	—	—	3	—	—
Calcareous fragments	1	—	—	—	—	—
Chalcedony	—	—	2	—	2	—
Clay	50	60	77	35	50	40
Feldspar	Tr	1	—	Tr	—	—
Fish	—	—	—	2	—	—
Glauconite	—	—	—	—	Tr	—
Matrix	—	—	—	35	—	—
Mica	—	—	Tr	Tr	Tr	—
Opaques	1	1	10	5	5	4
Organic matter	—	36	—	—	—	1
Pyrite	—	Tr	—	—	—	—
Quartz	Tr	1	1	5	5	10
Rhodochrosite	40	—	—	15	30	45
Unspecified minerals	—	—	10	—	8	—
Zeolite	Tr	—	—	—	—	—

SITE 765 HOLE C CORE 46R CORED INTERVAL 777.8-787.4 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALYNOMORPHS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
APTIAN		B ●B	B		A/G ●A/G *O. operculata*	R? N	V=1772 Φ=51.3 ρ=1.95 ● V=1850 Φ=50.4 ρ=2.05 ●	●	1 2 CC	0.5 1.0			•••	* * *

LITHOLOGIC DESCRIPTION

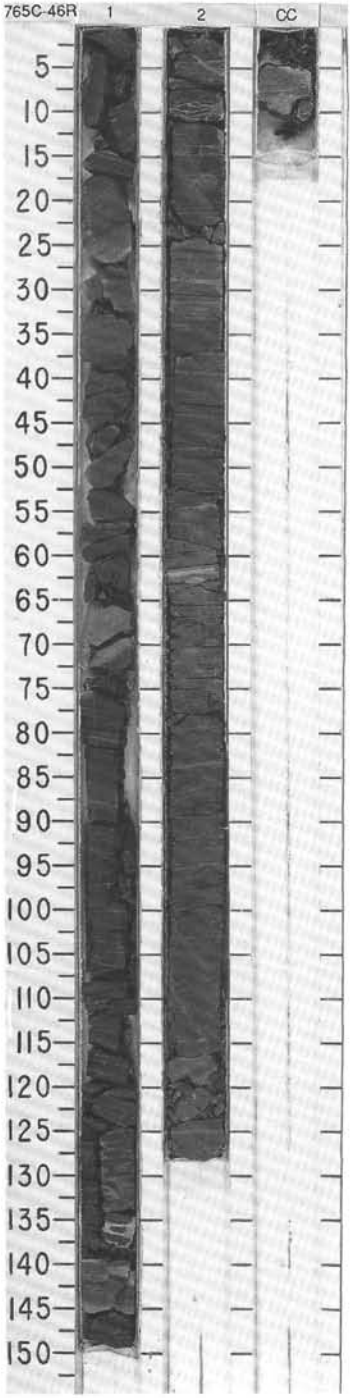
CLAYSTONE

Major lithology: CLAYSTONE, reddish brown, brown, gray, greenish gray (5YR 3/1, 3/3, 7.5YR 4/2, N4/, N5/, 5G 4/1, 5/1, 5Y 5/1, 5BG 3/1). Reddish hues dominate, alternate with greenish colors on scale of several 10 s of cm. Massive; locally laminated due to complex color banding. Locally contains at least 10% rhodochrosite micronodules, as much as 3% pyrite, as much as 5% zeolites.

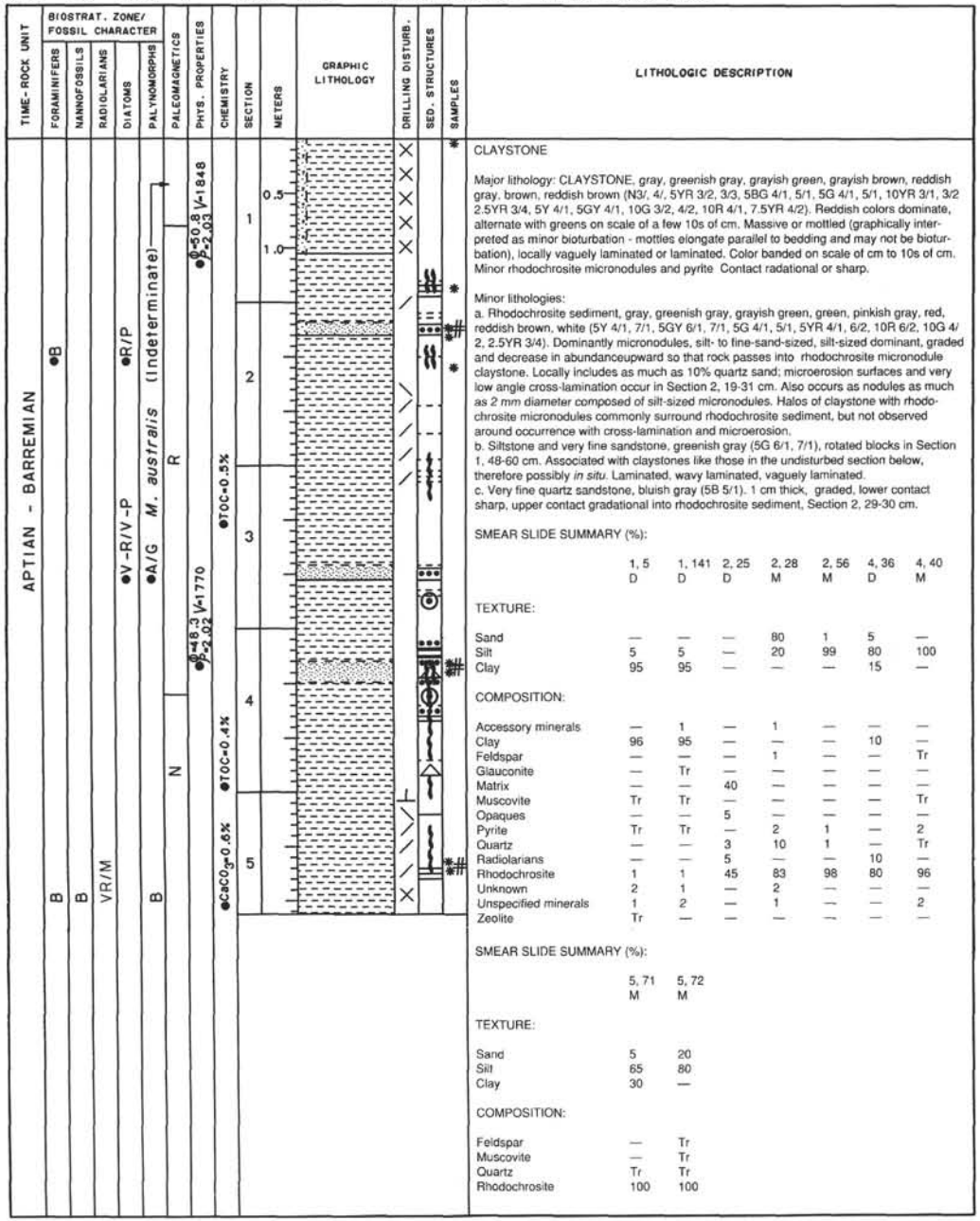
Minor lithology: Rhodochrosite sediment, gray (5Y 7/1, 10YR 6/1), thin laminae in Section 1, (145-146), Section 2, (29, 62 cm). Greenish-gray rhodochrosite micronodules in clay matrix, decreasing in size and abundance both up and down Section from central concentration, or, "graded". Sediment is locally at least 80% rhodochrosite. Where concentrations are highest, sediment is nodule-supported, where rhodochrosite is less concentrated, micronodules float in clay matrix. Zones of high micronodule concentration commonly well-defined and concentration of micronodules decreases sharply to low levels at boundaries of these zones. Some occurrences of "graded" nodules have boundaries as just described, but others appear genuinely graded, and may have been redeposited by currents. Minor amounts of clay matrix in these may have infiltrated after deposition.

SMEAR SLIDE SUMMARY (%):

	1, 144 M	1, 147 M	2, 61 M
TEXTURE:			
Sand	—	5	1
Silt	10	75	4
Clay	90	20	95
COMPOSITION:			
Clay	80	20	95
Muscovite	—	—	1
Opaques	1	Tr	—
Organic matter	—	—	Tr
Pyrite	—	—	3
Rhodochrosite	10	80	Tr
Unknown	4	—	—
Zeolite	5	—	1



SITE 765 HOLE C CORE 47R CORED INTERVAL 787.4-796.9 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE

Major lithology: CLAYSTONE, gray, greenish gray, grayish green, grayish brown, reddish gray, brown, reddish brown (N3/, 4/, 5YR 3/2, 3/3, 5BG 4/1, 5/1, 5G 4/1, 5/1, 10YR 3/1, 3/2 2.5YR 3/4, 5Y 4/1, 5GY 4/1, 10G 3/2, 4/2, 10R 4/1, 7.5YR 4/2). Reddish colors dominate, alternate with greens on scale of a few 10s of cm. Massive or mottled (graphically interpreted as minor bioturbation - mottles elongate parallel to bedding and may not be bioturbation), locally vaguely laminated or laminated. Color banded on scale of cm to 10s of cm. Minor rhodochrosite micronodules and pyrite. Contact radational or sharp.

Minor lithologies:

a. Rhodochrosite sediment, gray, greenish gray, grayish green, green, pinkish gray, red, reddish brown, white (5Y 4/1, 7/1, 5GY 6/1, 7/1, 5G 4/1, 5/1, 5YR 4/1, 6/2, 10R 6/2, 10G 4/2, 2.5YR 3/4). Dominantly micronodules, silt- to fine-sand-sized, silt-sized dominant, graded and decrease in abundanceupward so that rock passes into rhodochrosite micronodule claystone. Locally includes as much as 10% quartz sand; microerosion surfaces and very low angle cross-lamination occur in Section 2, 19-31 cm. Also occurs as nodules as much as 2 mm diameter composed of silt-sized micronodules. Halos of claystone with rhodochrosite micronodules commonly surround rhodochrosite sediment, but not observed around occurrence with cross-lamination and microerosion.

b. Siltstone and very fine sandstone, greenish gray (5G 6/1, 7/1), rotated blocks in Section 1, 48-60 cm. Associated with claystones like those in the undisturbed section below, therefore possibly *in situ*. Laminated, wavy laminated, vaguely laminated.

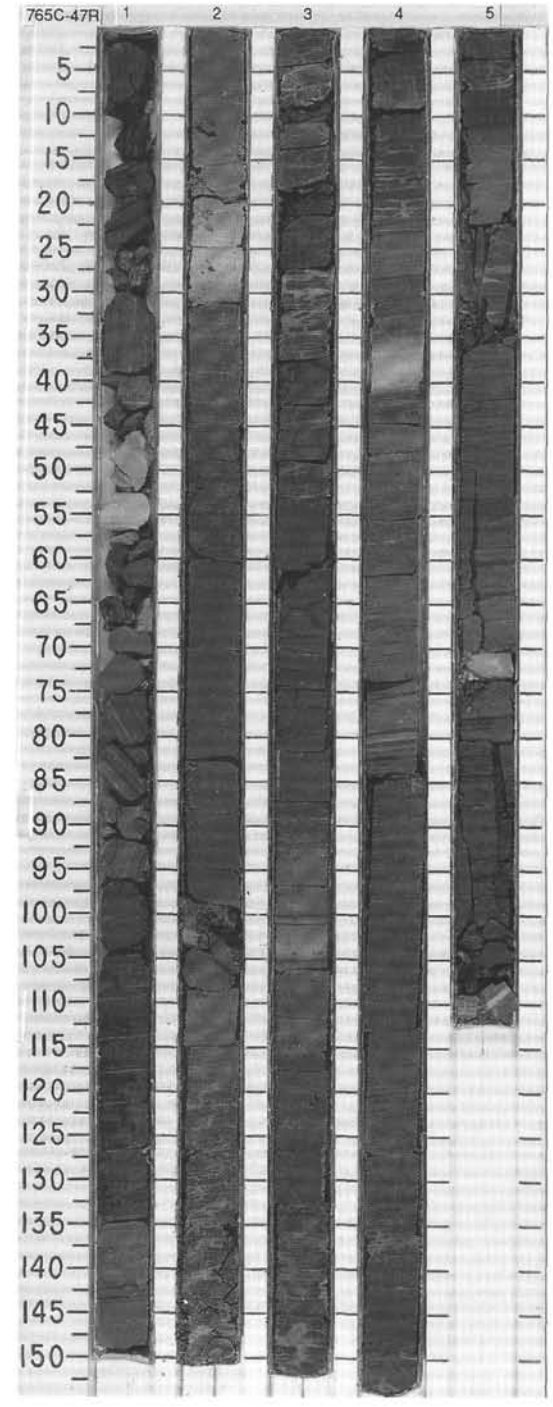
c. Very fine quartz sandstone, bluish gray (5B 5/1). 1 cm thick, graded, lower contact sharp, upper contact gradational into rhodochrosite sediment, Section 2, 29-30 cm.

SMEAR SLIDE SUMMARY (%):

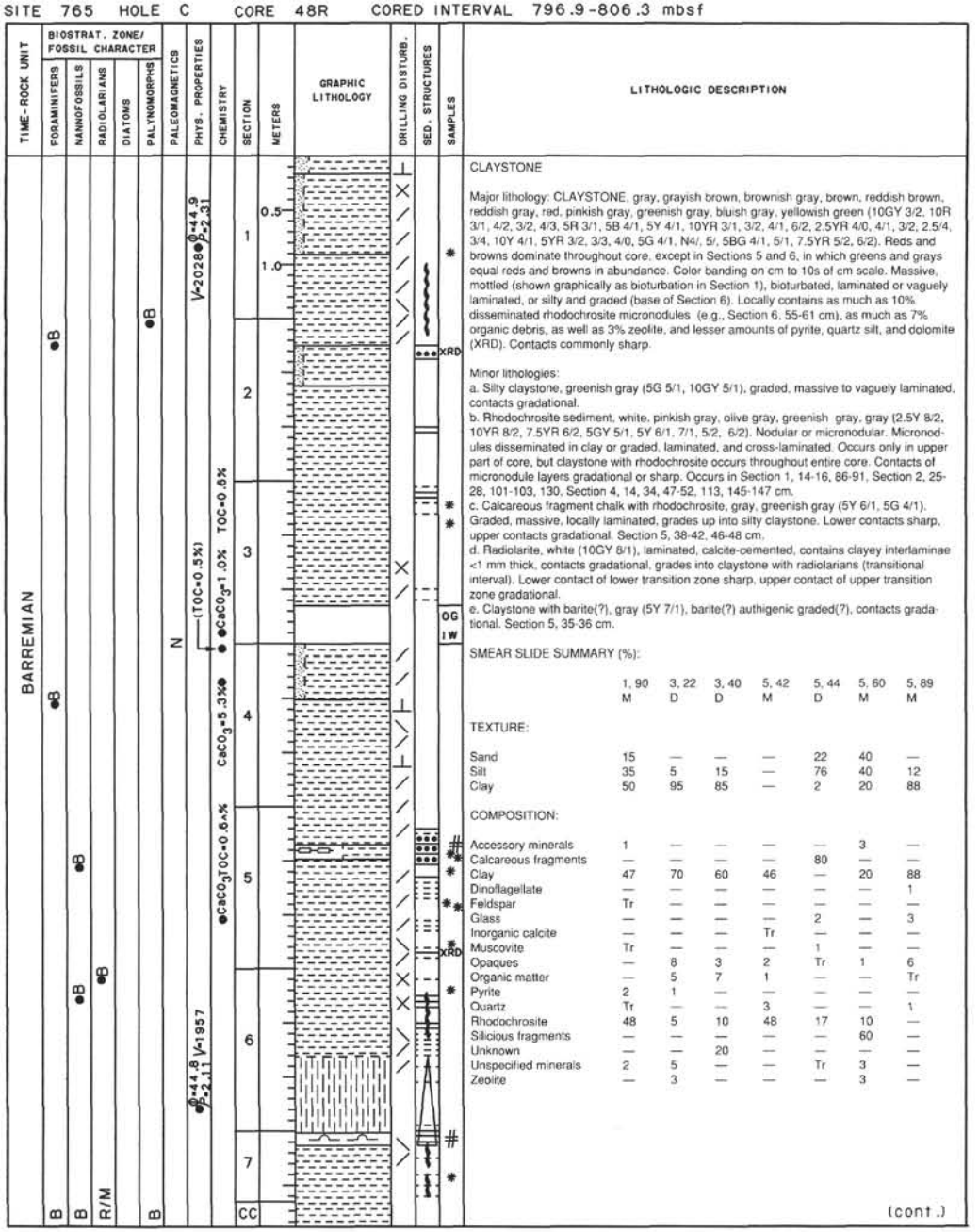
	1, 5 D	1, 141 D	2, 25 D	2, 28 M	2, 56 M	4, 36 D	4, 40 M
TEXTURE:							
Sand	—	—	—	80	1	5	—
Silt	5	5	—	20	99	80	100
Clay	95	95	—	—	—	15	—
COMPOSITION:							
Accessory minerals	—	1	—	1	—	—	—
Clay	96	95	—	—	—	10	—
Feldspar	—	—	—	1	—	—	Tr
Glauconite	—	Tr	—	—	—	—	—
Matrix	—	—	40	—	—	—	—
Muscovite	Tr	Tr	—	—	—	—	Tr
Opaques	—	—	5	—	—	—	—
Pyrite	Tr	Tr	—	2	1	—	2
Quartz	—	—	3	10	1	—	Tr
Radiolarians	—	—	5	—	—	10	—
Rhodochrosite	1	1	45	83	98	80	96
Unknown	2	1	—	2	—	—	—
Unspecified minerals	1	2	—	1	—	—	2
Zeolite	Tr	—	—	—	—	—	—

SMEAR SLIDE SUMMARY (%):

	5, 71 M	5, 72 M
TEXTURE:		
Sand	5	20
Silt	65	80
Clay	30	—
COMPOSITION:		
Feldspar	—	Tr
Muscovite	—	Tr
Quartz	Tr	Tr
Rhodochrosite	100	100



SITE 765 HOLE C CORE 48R CORED INTERVAL 796.9-806.3 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE

Major lithology: CLAYSTONE, gray, grayish brown, brownish gray, brown, reddish brown, reddish gray, red, pinkish gray, greenish gray, bluish gray, yellowish green (10GY 3/2, 10R 3/1, 4/2, 3/2, 4/3, 5R 3/1, 5B 4/1, 5Y 4/1, 10YR 3/1, 3/2, 4/1, 6/2, 2.5YR 4/0, 4/1, 3/2, 2.5/4, 3/4, 10Y 4/1, 5YR 3/2, 3/3, 4/0, 5G 4/1, N4/, 5/, 5BG 4/1, 5/1, 7.5YR 5/2, 6/2). Reds and browns dominate throughout core, except in Sections 5 and 6, in which greens and grays equal reds and browns in abundance. Color banding on cm to 10s of cm scale. Massive, mottled (shown graphically as bioturbation in Section 1), bioturbated, laminated or vaguely laminated, or silty and graded (base of Section 6). Locally contains as much as 10% disseminated rhodochrosite micronodules (e.g., Section 6, 55-61 cm), as much as 7% organic debris, as well as 3% zeolite, and lesser amounts of pyrite, quartz silt, and dolomite (XRD). Contacts commonly sharp.

Minor lithologies:

a. Silty claystone, greenish gray (5G 5/1, 10GY 5/1), graded, massive to vaguely laminated, contacts gradational.

b. Rhodochrosite sediment, white, pinkish gray, olive gray, greenish gray, gray (2.5Y 8/2, 10YR 8/2, 7.5YR 6/2, 5GY 5/1, 5Y 6/1, 7/1, 5/2, 6/2). Nodular or micronodular. Micronodules disseminated in clay or graded, laminated, and cross-laminated. Occurs only in upper part of core, but claystone with rhodochrosite occurs throughout entire core. Contacts of micronodule layers gradational or sharp. Occurs in Section 1, 14-16, 86-91, Section 2, 25-28, 101-103, 130, Section 4, 14, 34, 47-52, 113, 145-147 cm.

c. Calcareous fragment chalk with rhodochrosite, gray, greenish gray (5Y 6/1, 5G 4/1). Graded, massive, locally laminated, grades up into silty claystone. Lower contacts sharp, upper contacts gradational. Section 5, 38-42, 46-48 cm.

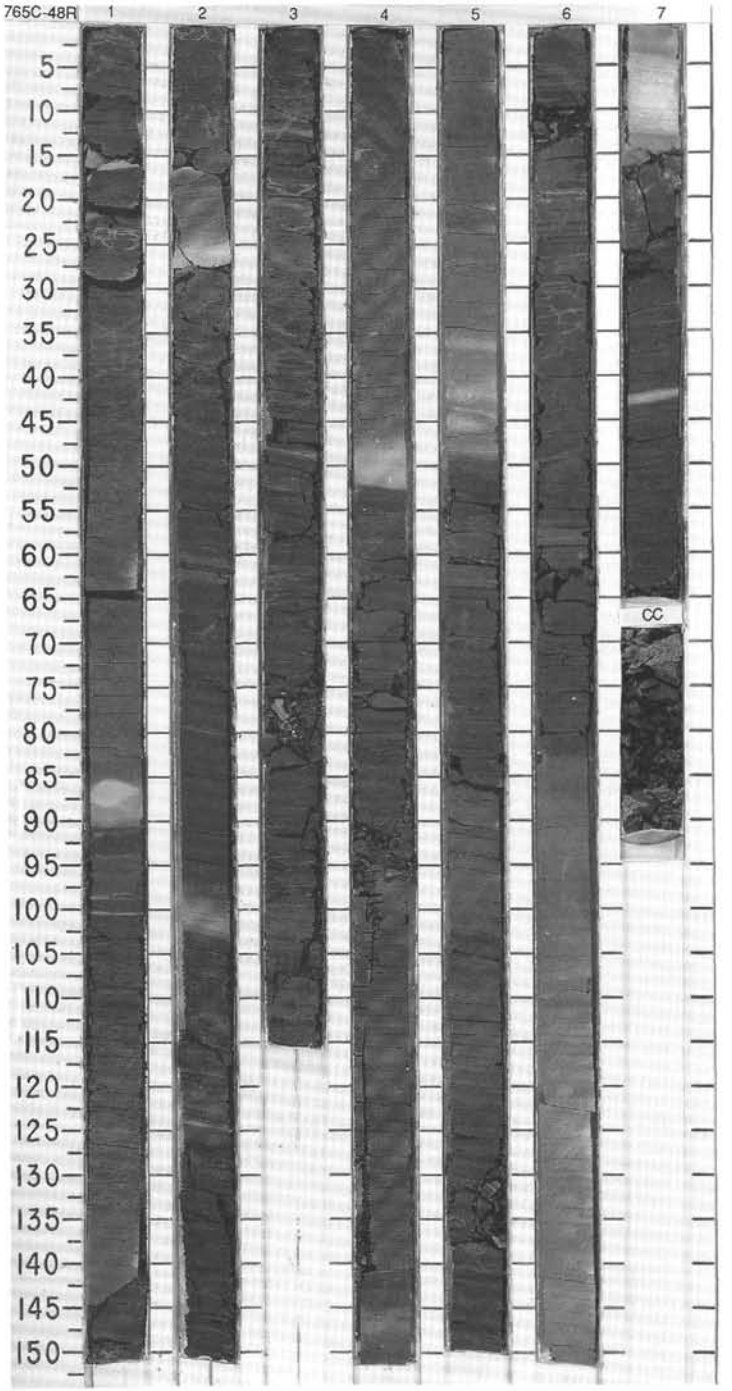
d. Radiolarite, white (10GY 8/1), laminated, calcite-cemented, contains clayey interlaminae <1 mm thick, contacts gradational, grades into claystone with radiolarians (transitional interval). Lower contact of lower transition zone sharp, upper contact of upper transition zone gradational.

e. Claystone with barite(?), gray (5Y 7/1), barite(?) authigenic graded(?), contacts gradational. Section 5, 35-36 cm.

SMEAR SLIDE SUMMARY (%):

	1, 90 M	3, 22 D	3, 40 D	5, 42 M	5, 44 D	5, 60 M	5, 89 M
TEXTURE:							
Sand	15	—	—	—	22	40	—
Silt	35	5	15	—	76	40	12
Clay	50	95	85	—	2	20	88
COMPOSITION:							
Accessory minerals	1	—	—	—	—	3	—
Calcareous fragments	—	—	—	—	80	—	—
Clay	47	70	60	46	—	20	88
Dinoflagellate	—	—	—	—	—	—	1
Feldspar	Tr	—	—	—	—	—	—
Glass	—	—	—	—	2	—	3
Inorganic calcite	—	—	—	Tr	—	—	—
Muscovite	Tr	—	—	—	1	—	—
Opaques	—	8	3	2	Tr	1	6
Organic matter	—	5	7	1	—	—	Tr
Pyrite	2	1	—	—	—	—	—
Quartz	Tr	—	—	3	—	—	1
Rhodochrosite	48	5	10	48	17	10	—
Silicious fragments	—	—	—	—	—	60	—
Unknown	—	—	20	—	—	—	—
Unspecified minerals	2	5	—	—	Tr	3	—
Zeolite	—	3	—	—	—	3	—

(cont.)



SITE 765 HOLE C CORE 48R CORED INTERVAL 796.9-806.3 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS		PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
									1	0.5 1.0					(cont.)
									2						
									3						

SMEAR SLIDE SUMMARY (%):

	5, 93 M	5, 125 D	6, 20 M	7, 42 M
TEXTURE:				
Sand	—	—	1	—
Silt	4	5	4	2
Clay	96	95	95	98
COMPOSITION:				
Clay	96	89	95	98
Glass	1	—	Tr	—
Muscovite	1	—	3	—
Nannofossils	—	—	Tr	—
Opaques	1	1	Tr	Tr
Organic matter	Tr	—	—	Tr
Quartz	Tr	—	—	—
Radiolarians	—	—	Tr	—
Rhodochrosite	—	—	—	1
Spicules	—	—	Tr	—
Unspecified minerals	—	10	—	Tr
Zeolite	—	—	—	Tr

SITE 765 HOLE C CORE 49R CORED INTERVAL 806.3-815.6 mbsf

TIME-ROCK UNIT: BARREMIAN

BIOSTRAT. ZONE/FOSSIL CHARACTER: FORAMINIFERS: B; PF:B ●● BF:R/P; NANNOFOSSILS: B ●B; RADIOLARIANS: B; C. pythiae; ●R/G; DIATOMS: ●A/M; PALYNOMORPHS: M. australis; F/G

PALEOMAGNETICS: N

PHYS. PROPERTIES: ●CaCO3=2.1%; ●CaCO3=1.0%; ●CaCO3=1.1%; TOC=0.5%); TOC=0.3%; ●TOC=0.3%; ●TOC=0.3%; ρ=1.938; ρ=2.06; ρ=1.907; ρ=2.03; ρ=2.44.6

CHEMISTRY

SECTION: 1, 2, 3, 4, 5, 6, CC

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY

DRILLING DISTURB.

SED. STRUCTURES

SAMPLES

LITHOLOGIC DESCRIPTION

CLAYSTONE

Entire core is slightly disturbed.

Major lithology: CLAYSTONE, gray (10Y 8/1, 6/1, 4/1, 3/1; 5YR 4/2; 5R 3/1), dusky red (2.5YR 3/2), reddish brown (5YR 3/3) and dusky green (5G 3/2), common throughout the entire core features as : mottles, laminae (parallel and wispy), streaks, caused by diagenetic processes and/or flattened (by compaction) burrows(?). Sparse micronodules (Siderite? versus Rhodochrosite?) and pyrite appears in Section 2 at 14-39 cm and in Section 3 at 31-38 cm.

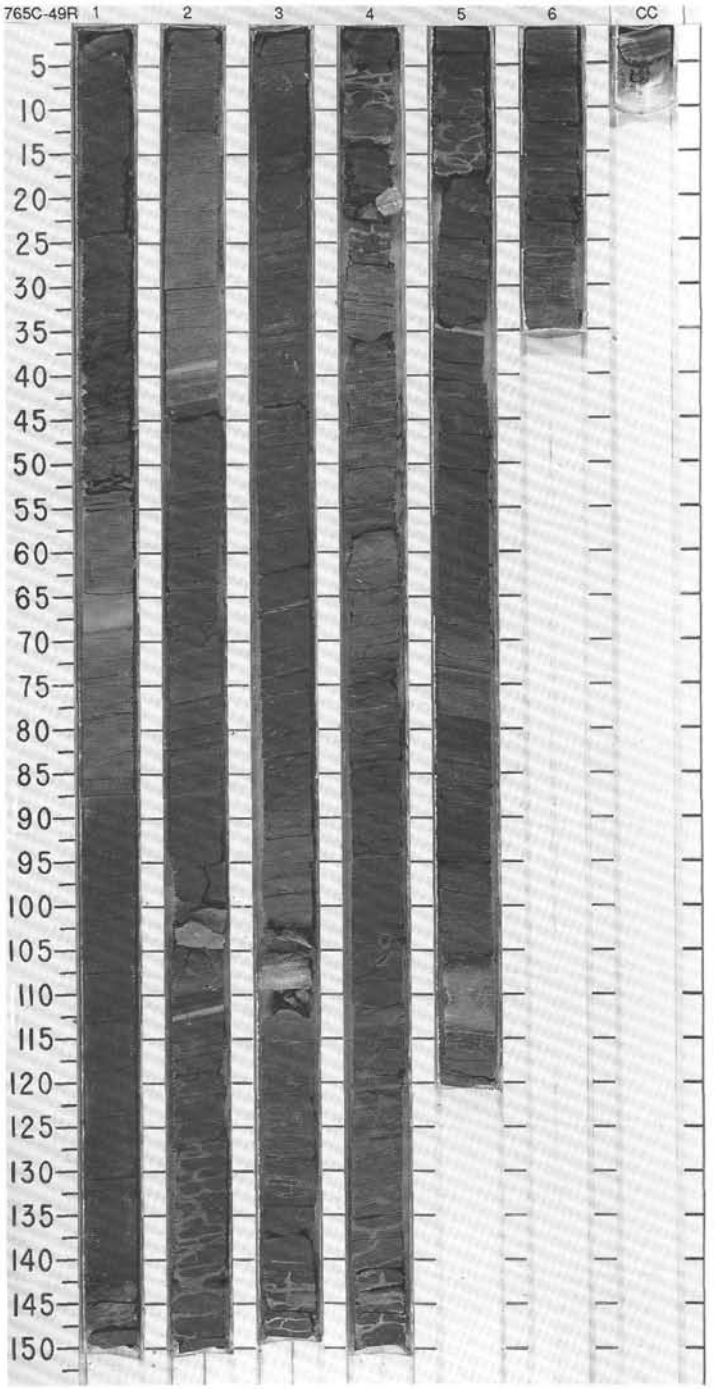
Minor lithologies :

a. Rhodochrosite? concretion, very thin layers (few mm to 1 cm thick), sandy to silty, commonly light gray to very light gray, in Section 1 at 67-68 cm, in Section 2 at 101 (lense shaped) and 113 cm.

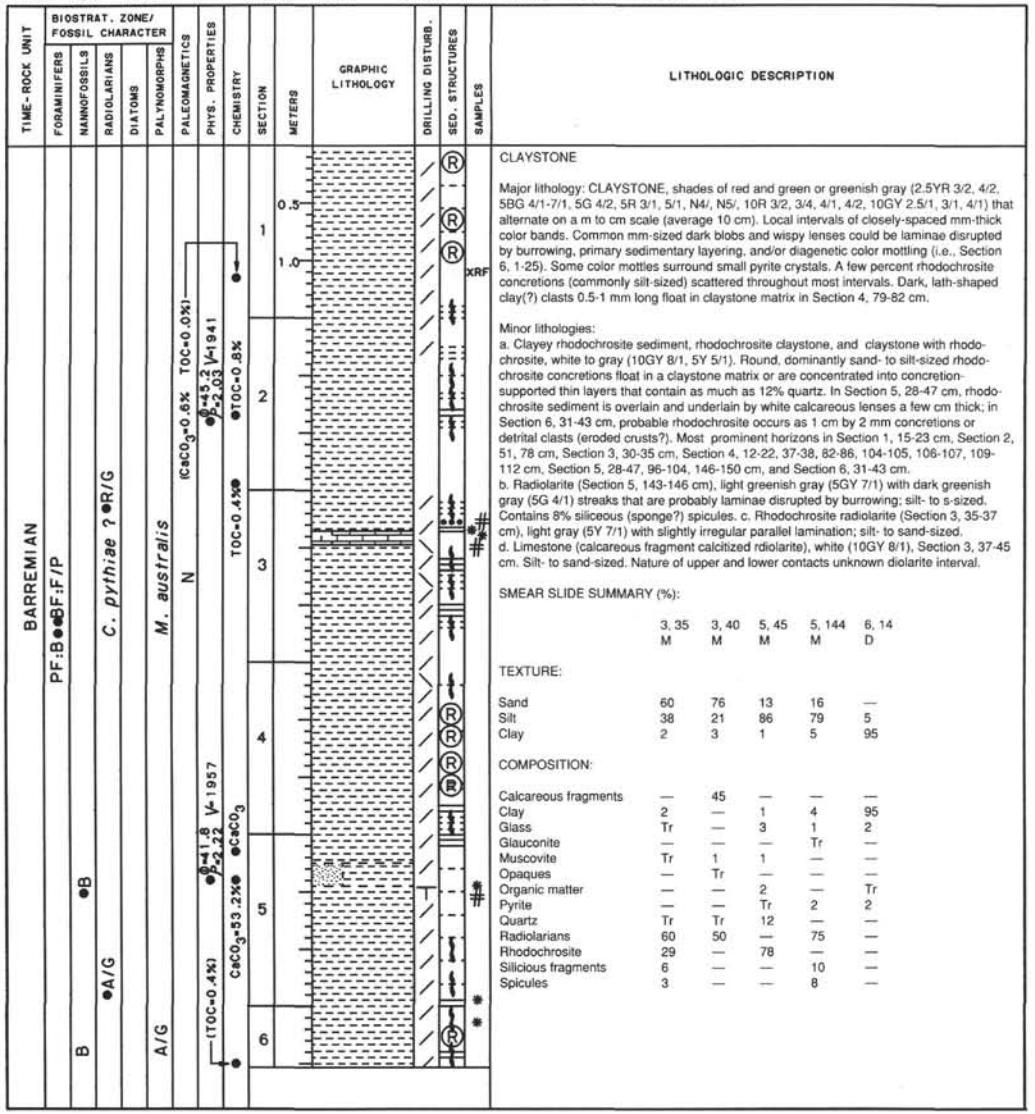
b. Radiolarite, light green (5GY 7/1), silty to fine sandy grained, 1 cm thick layer, wavy and parallel laminated, with spicules, in Section 2, at 39 cm, in Section 3 at 14, 43 and 101 cm, in Section 4, at 120 cm.

SMEAR SLIDE SUMMARY (%):

	1, 68 M	2, 39 M	2, 39 M	3, 43 M	4, 12 M	4, 12 M	4, 91 D
TEXTURE:							
Sand	7	64	3	92	32	—	—
Silt	85	33	16	6	59	—	5
Clay	8	3	81	2	6	—	95
COMPOSITION:							
Barite	—	—	—	—	—	5	—
Clay	8	3	81	2	6	22	95
Feldspar	—	—	Tr	—	—	—	—
Glass	1	1	3	Tr	—	—	2
Muscovite	Tr	Tr	Tr	Tr	1	—	1
Nannofossils	—	Tr	Tr	—	—	—	—
Opaques	Tr	—	1	Tr	—	—	1
Organic matter	Tr	1	2	—	—	—	Tr
Pyrite	—	2	—	—	—	—	—
Quartz	4	1	8	—	14	—	—
Radiolarians	—	63	—	92	—	—	—
Rhodochrosite	84	—	—	—	—	73	—
Silicious fragments	—	—	—	5	—	—	—
Spicules	—	26	—	Tr	—	—	—
Unknown	—	—	—	—	38	—	—
Unspecified minerals	1	—	—	—	36	—	—
Zeolite	Tr	—	Tr	—	—	—	—



SITE 765 HOLE C CORE 50R CORED INTERVAL 815.6-825.0 mbsf



LITHOLOGIC DESCRIPTION

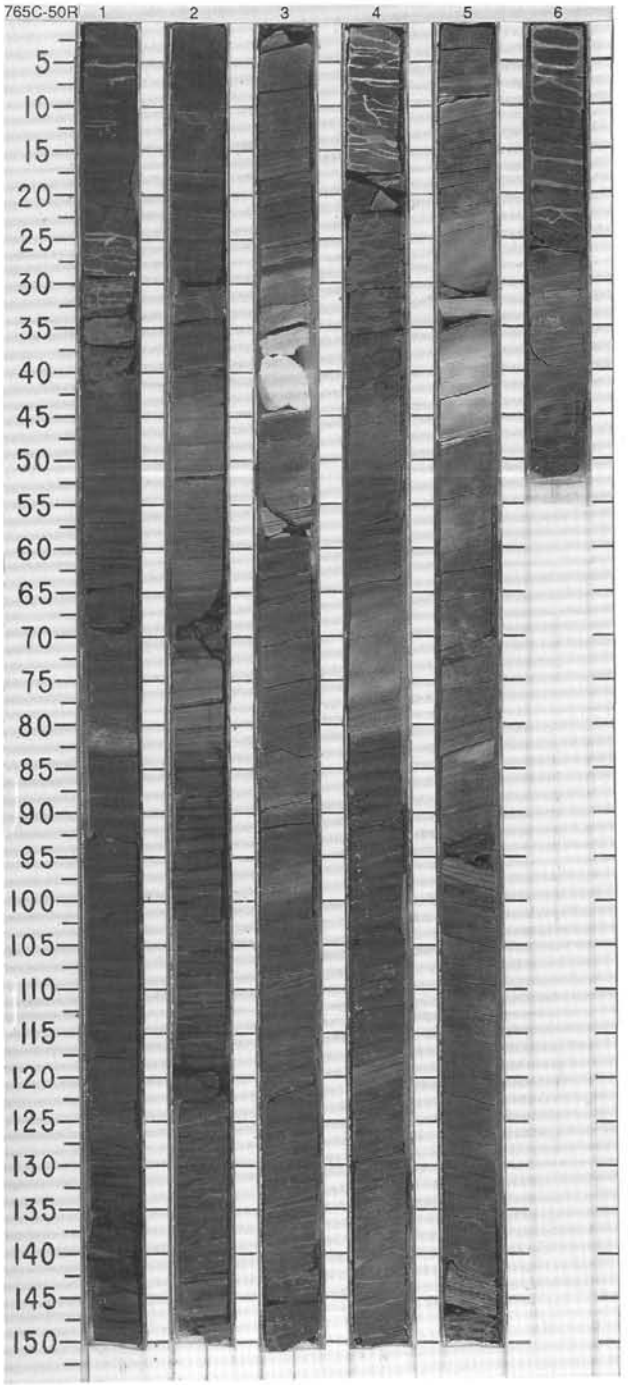
CLAYSTONE

Major lithology: CLAYSTONE, shades of red and green or greenish gray (2.5YR 3/2, 4/2, 5BG 4/1-7/1, 5G 4/2, 5R 3/1, 5/1, N4/, N5/, 10R 3/2, 3/4, 4/1, 4/2, 10GY 2.5/1, 3/1, 4/1) that alternate on a m to cm scale (average 10 cm). Local intervals of closely-spaced mm-thick color bands. Common mm-sized dark blobs and wispy lenses could be laminae disrupted by burrowing, primary sedimentary layering, and/or diagenetic color mottling (i.e., Section 6, 1-25). Some color mottles surround small pyrite crystals. A few percent rhodochrosite concretions (commonly silt-sized) scattered throughout most intervals. Dark, lath-shaped clay(?) clasts 0.5-1 mm long float in claystone matrix in Section 4, 79-82 cm.

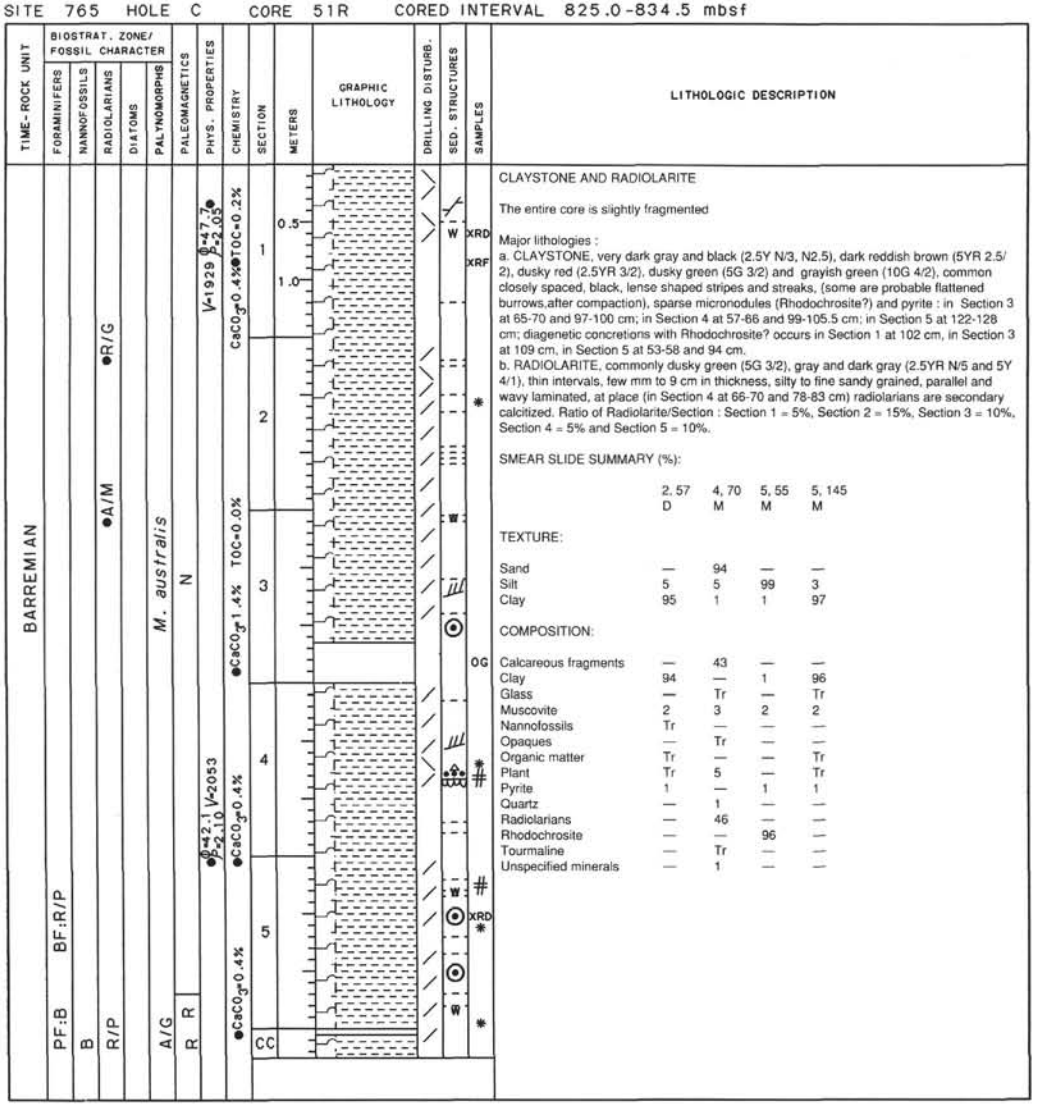
Minor lithologies:
a. Clayey rhodochrosite sediment, rhodochrosite claystone, and claystone with rhodochrosite, white to gray (10GY 8/1, 5Y 5/1). Round, dominantly sand- to silt-sized rhodochrosite concretions float in a claystone matrix or are concentrated into concretion-supported thin layers that contain as much as 12% quartz. In Section 5, 28-47 cm, rhodochrosite sediment is overlain and underlain by white calcareous lenses a few cm thick; in Section 6, 31-43 cm, probable rhodochrosite occurs as 1 cm by 2 mm concretions or detrital clasts (eroded crusts?). Most prominent horizons in Section 1, 15-23 cm, Section 2, 51, 78 cm, Section 3, 30-35 cm, Section 4, 12-22, 37-38, 82-86, 104-105, 106-107, 109-112 cm, Section 5, 28-47, 96-104, 146-150 cm, and Section 6, 31-43 cm.
b. Radiolarite (Section 5, 143-146 cm), light greenish gray (5GY 7/1) with dark greenish gray (5G 4/1) streaks that are probably laminae disrupted by burrowing; silt- to s-sized. Contains 8% siliceous (sponge?) spicules. c. Rhodochrosite radiolarite (Section 3, 35-37 cm), light gray (5Y 7/1) with slightly irregular parallel lamination; silt- to sand-sized.
d. Limestone (calcareous fragment calcitized rdiolarite), white (10GY 8/1), Section 3, 37-45 cm. Silt- to sand-sized. Nature of upper and lower contacts unknown diolarite interval.

SMEAR SLIDE SUMMARY (%):

	3, 35 M	3, 40 M	5, 45 M	5, 144 M	6, 14 D
TEXTURE:					
Sand	60	76	13	16	—
Silt	38	21	86	79	5
Clay	2	3	1	5	95
COMPOSITION:					
Calcareous fragments	—	45	—	—	—
Clay	2	—	1	4	95
Glass	Tr	—	3	1	2
Glauconite	—	—	—	Tr	—
Muscovite	Tr	1	1	—	—
Opaques	—	Tr	—	—	—
Organic matter	—	—	2	—	Tr
Pyrite	—	—	Tr	2	2
Quartz	Tr	Tr	12	—	—
Radiolarians	60	50	—	75	—
Rhodochrosite	29	—	78	—	—
Silicious fragments	6	—	—	10	—
Spicules	3	—	—	8	—



SITE 765 HOLE C CORE 51R CORED INTERVAL 825.0-834.5 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE AND RADIOLARITE

The entire core is slightly fragmented

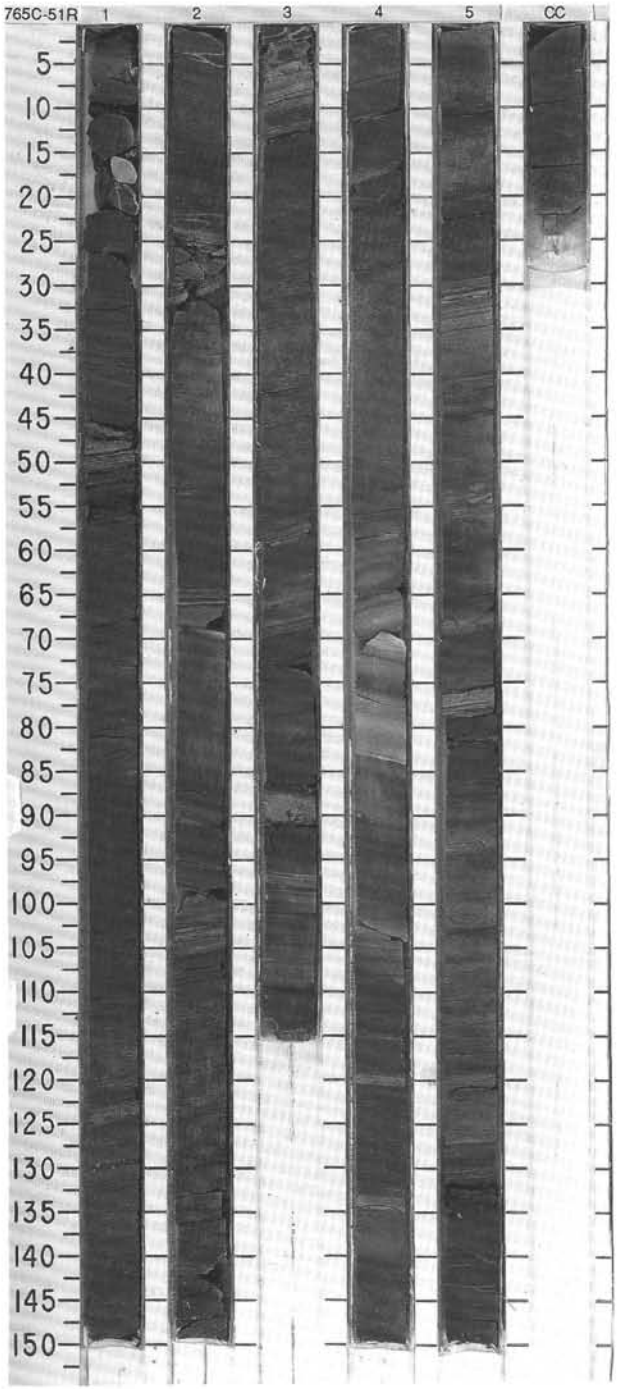
Major lithologies :

a. CLAYSTONE, very dark gray and black (2.5Y N/3, N2.5), dark reddish brown (5YR 2.5/2), dusky red (2.5YR 3/2), dusky green (5G 3/2) and grayish green (10G 4/2), common closely spaced, black, lense shaped stripes and streaks, (some are probable flattened burrows,after compaction), sparse micronodules (Rhodochrosite?) and pyrite : in Section 3 at 65-70 and 97-100 cm; in Section 4 at 57-66 and 99-105.5 cm; in Section 5 at 122-128 cm; diagenetic concretions with Rhodochrosite? occurs in Section 1 at 102 cm, in Section 3 at 109 cm, in Section 5 at 53-58 and 94 cm.

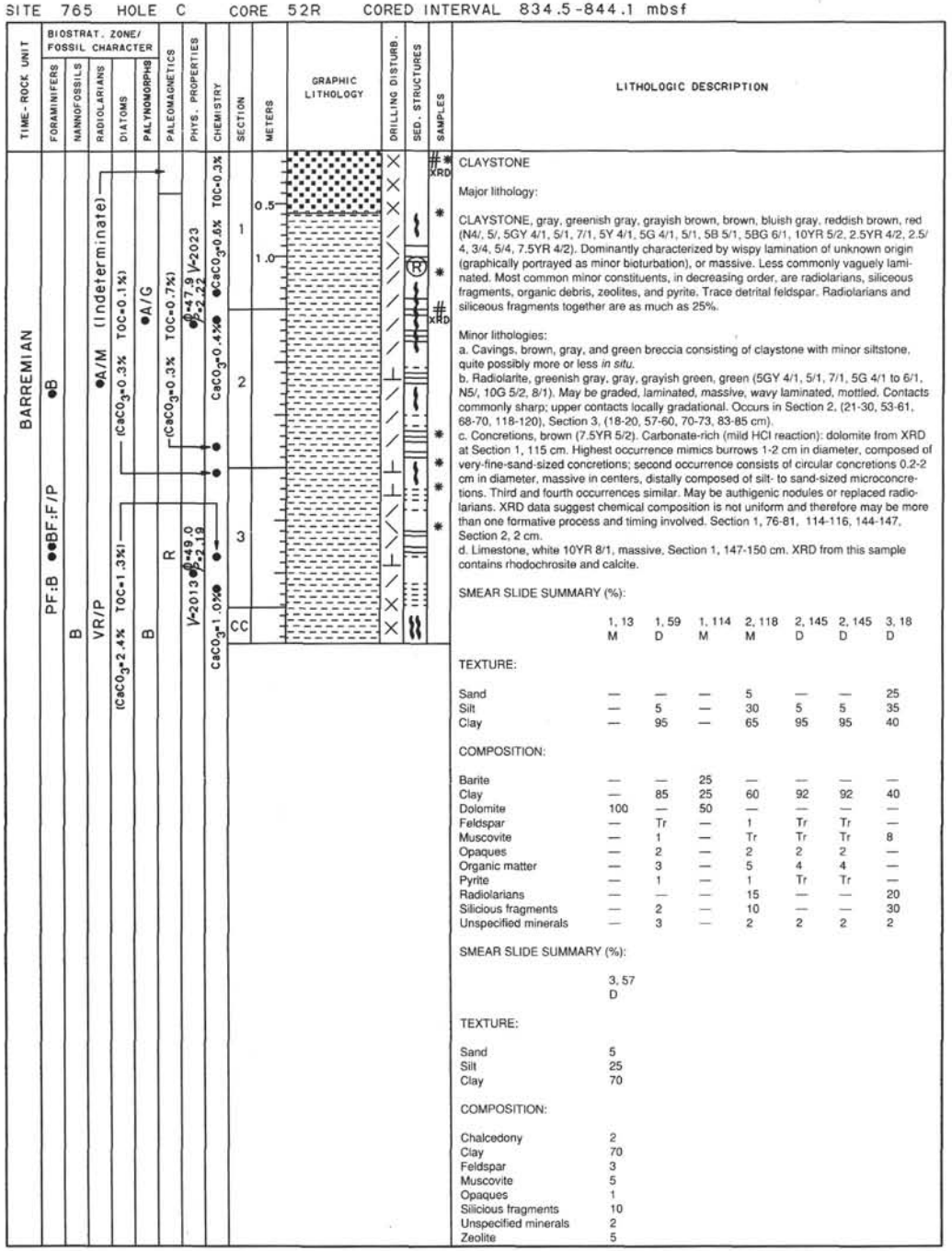
b. RADIOLARITE, commonly dusky green (5G 3/2), gray and dark gray (2.5YR N/5 and 5Y 4/1), thin intervals, few mm to 9 cm in thickness, silty to fine sandy grained, parallel and wavy laminated, at place (in Section 4 at 66-70 and 78-83 cm) radiolarians are secondary calcitized. Ratio of Radiolarite/Section : Section 1 = 5%, Section 2 = 15%, Section 3 = 10%, Section 4 = 5% and Section 5 = 10%.

SMEAR SLIDE SUMMARY (%):

	2, 57 D	4, 70 M	5, 55 M	5, 145 M
TEXTURE:				
Sand	—	94	—	—
Silt	5	5	99	3
Clay	95	1	1	97
COMPOSITION:				
Calcareous fragments	—	43	—	—
Clay	94	—	1	96
Glass	—	Tr	—	Tr
Muscovite	2	3	2	2
Nannofossils	Tr	—	—	—
Opaques	—	Tr	—	—
Organic matter	Tr	—	—	Tr
Plant	Tr	5	—	Tr
Pyrite	1	—	1	1
Quartz	—	1	—	—
Radiolarians	—	46	—	—
Rhodochrosite	—	—	96	—
Tourmaline	—	Tr	—	—
Unspecified minerals	—	1	—	—



SITE 765 HOLE C CORE 52R CORED INTERVAL 834.5-844.1 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE

Major lithology:

CLAYSTONE, gray, greenish gray, grayish brown, brown, bluish gray, reddish brown, red (N4/, 5/, 5GY 4/1, 5/1, 7/1, 5Y 4/1, 5G 4/1, 5/1, 5B 5/1, 5BG 6/1, 10YR 5/2, 2.5YR 4/2, 2.5/4, 3/4, 5/4, 7.5YR 4/2). Dominantly characterized by wispy lamination of unknown origin (graphically portrayed as minor bioturbation), or massive. Less commonly vaguely laminated. Most common minor constituents, in decreasing order, are radiolarians, siliceous fragments, organic debris, zeolites, and pyrite. Trace detrital feldspar. Radiolarians and siliceous fragments together are as much as 25%.

Minor lithologies:

a. Cavings, brown, gray, and green breccia consisting of claystone with minor siltstone, quite possibly more or less *in situ*.

b. Radiolarite, greenish gray, gray, grayish green, green (5GY 4/1, 5/1, 7/1, 5G 4/1 to 6/1, N5/, 10G 5/2, 8/1). May be graded, laminated, massive, wavy laminated, mottled. Contacts commonly sharp; upper contacts locally gradational. Occurs in Section 2, (21-30, 53-61, 68-70, 118-120), Section 3, (18-20, 57-60, 70-73, 83-85 cm).

c. Concretions, brown (7.5YR 5/2). Carbonate-rich (mild HCl reaction): dolomite from XRD at Section 1, 115 cm. Highest occurrence mimics burrows 1-2 cm in diameter, composed of very-fine-sand-sized concretions; second occurrence consists of circular concretions 0.2-2 cm in diameter, massive in centers, distally composed of silt- to sand-sized microconcretions. Third and fourth occurrences similar. May be authigenic nodules or replaced radiolarians. XRD data suggest chemical composition is not uniform and therefore may be more than one formative process and timing involved. Section 1, 76-81, 114-116, 144-147, Section 2, 2 cm.

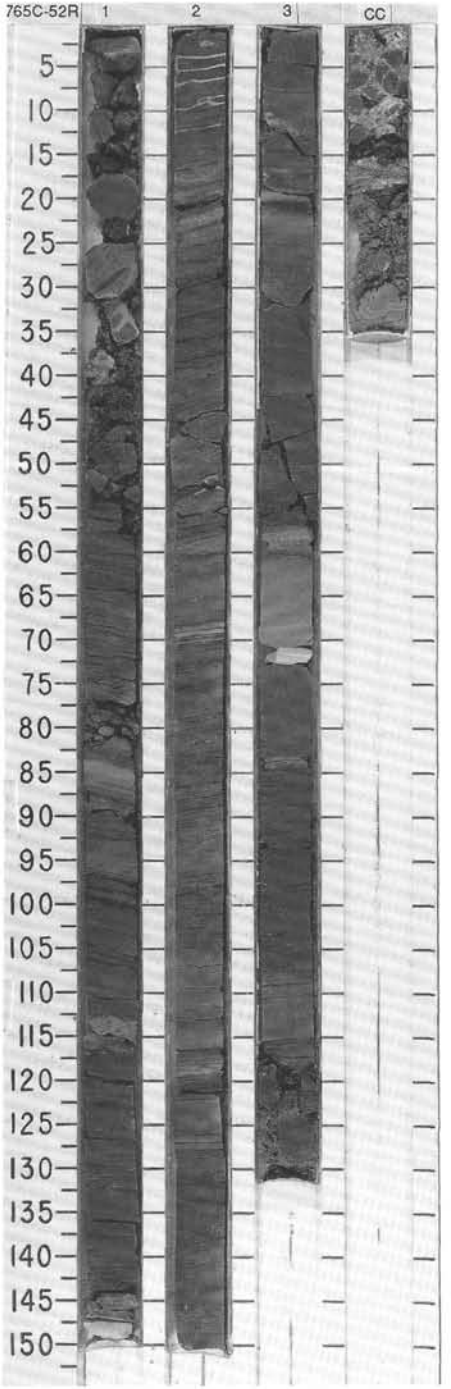
d. Limestone, white 10YR 8/1, massive, Section 1, 147-150 cm. XRD from this sample contains rhodochrosite and calcite.

SMEAR SLIDE SUMMARY (%):

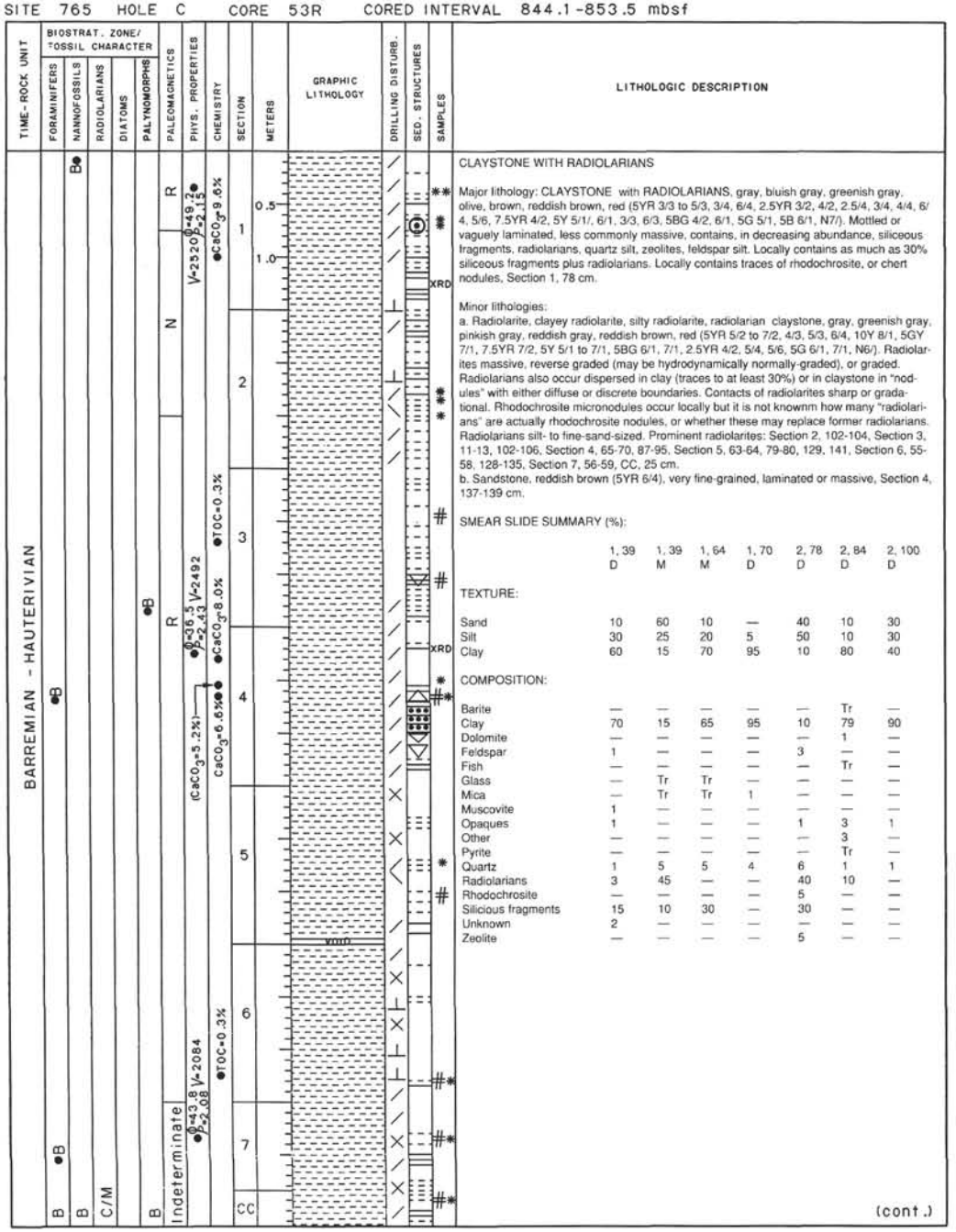
	1, 13 M	1, 59 D	1, 114 M	2, 118 M	2, 145 D	2, 145 D	3, 18 D
TEXTURE:							
Sand	—	—	—	5	—	—	25
Silt	—	5	—	30	5	5	35
Clay	—	95	—	65	95	95	40
COMPOSITION:							
Barite	—	—	25	—	—	—	—
Clay	—	85	25	60	92	92	40
Dolomite	100	—	50	—	—	—	—
Feldspar	—	Tr	—	1	Tr	Tr	—
Muscovite	—	1	—	Tr	Tr	Tr	8
Opaques	—	2	—	2	2	2	—
Organic matter	—	3	—	5	4	4	—
Pyrite	—	1	—	1	Tr	Tr	—
Radiolarians	—	—	—	15	—	—	20
Silicious fragments	—	2	—	10	—	—	30
Unspecified minerals	—	3	—	2	2	2	2

SMEAR SLIDE SUMMARY (%):

	3, 57 D
TEXTURE:	
Sand	5
Silt	25
Clay	70
COMPOSITION:	
Chalcedony	2
Clay	70
Feldspar	3
Muscovite	5
Opaques	1
Silicious fragments	10
Unspecified minerals	2
Zeolite	5



SITE 765 HOLE C CORE 53R CORED INTERVAL 844.1-853.5 mbsf



LITHOLOGIC DESCRIPTION

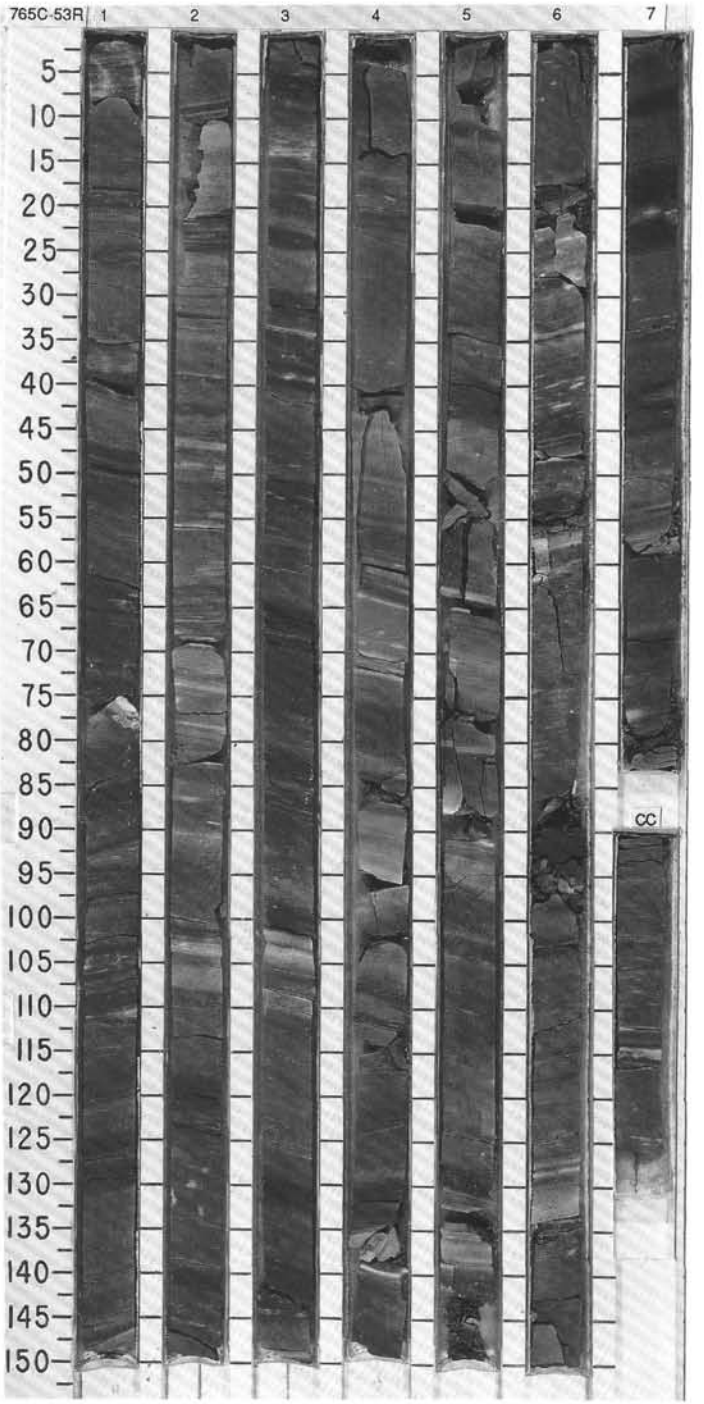
CLAYSTONE WITH RADIOLARIANS

Major lithology: CLAYSTONE with RADIOLARIANS, gray, bluish gray, greenish gray, olive, brown, reddish brown, red (5YR 3/3 to 5/3, 3/4, 6/4, 2.5YR 3/2, 4/2, 2.5/4, 3/4, 4/4, 6/4, 5/6, 7.5YR 4/2, 5Y 5/1/, 6/1, 3/3, 6/3, 5BG 4/2, 6/1, 5G 5/1, 5B 6/1, N7/). Mottled or vaguely laminated, less commonly massive, contains, in decreasing abundance, siliceous fragments, radiolarians, quartz silt, zeolites, feldspar silt. Locally contains as much as 30% siliceous fragments plus radiolarians. Locally contains traces of rhodochrosite, or chert nodules, Section 1, 78 cm.

Minor lithologies:
a. Radiolarite, clayey radiolarite, silty radiolarite, radiolarian claystone, gray, greenish gray, pinkish gray, reddish gray, reddish brown, red (5YR 5/2 to 7/2, 4/3, 5/3, 6/4, 10Y 8/1, 5GY 7/1, 7.5YR 7/2, 5Y 5/1 to 7/1, 5BG 6/1, 7/1, 2.5YR 4/2, 5/4, 5/6, 5G 6/1, 7/1, N6/). Radiolarites massive, reverse graded (may be hydrodynamically normally-graded), or graded. Radiolarians also occur dispersed in clay (traces to at least 30%) or in claystone in "nodules" with either diffuse or discrete boundaries. Contacts of radiolarites sharp or gradational. Rhodochrosite micronodules occur locally but it is not knownm how many "radiolarians" are actually rhodochrosite nodules, or whether these may replace former radiolarians. Radiolarians silt- to fine-sand-sized. Prominent radiolarites: Section 2, 102-104, Section 3, 11-13, 102-106, Section 4, 65-70, 87-95, Section 5, 63-64, 79-80, 129, 141, Section 6, 55-58, 128-135, Section 7, 56-59, CC, 25 cm.
b. Sandstone, reddish brown (5YR 6/4), very fine-grained, laminated or massive, Section 4, 137-139 cm.

SMEAR SLIDE SUMMARY (%):

	1, 39 D	1, 39 M	1, 64 M	1, 70 D	2, 78 D	2, 84 D	2, 100 D
TEXTURE:							
Sand	10	60	10	—	40	10	30
Silt	30	25	20	5	50	10	30
Clay	60	15	70	95	10	80	40
COMPOSITION:							
Barite	—	—	—	—	—	Tr	—
Clay	70	15	65	95	10	79	90
Dolomite	—	—	—	—	—	1	—
Feldspar	1	—	—	—	3	—	—
Fish	—	—	—	—	—	Tr	—
Glass	—	Tr	Tr	—	—	—	—
Mica	—	Tr	Tr	1	—	—	—
Muscovite	1	—	—	—	—	—	—
Opaques	1	—	—	—	1	3	1
Other	—	—	—	—	—	3	—
Pyrite	—	—	—	—	—	Tr	—
Quartz	1	5	5	4	6	1	1
Radiolarians	3	45	—	—	40	10	—
Rhodochrosite	—	—	—	—	5	—	—
Silicious fragments	15	10	30	—	30	—	—
Unknown	2	—	—	—	—	—	—
Zeolite	—	—	—	—	5	—	—



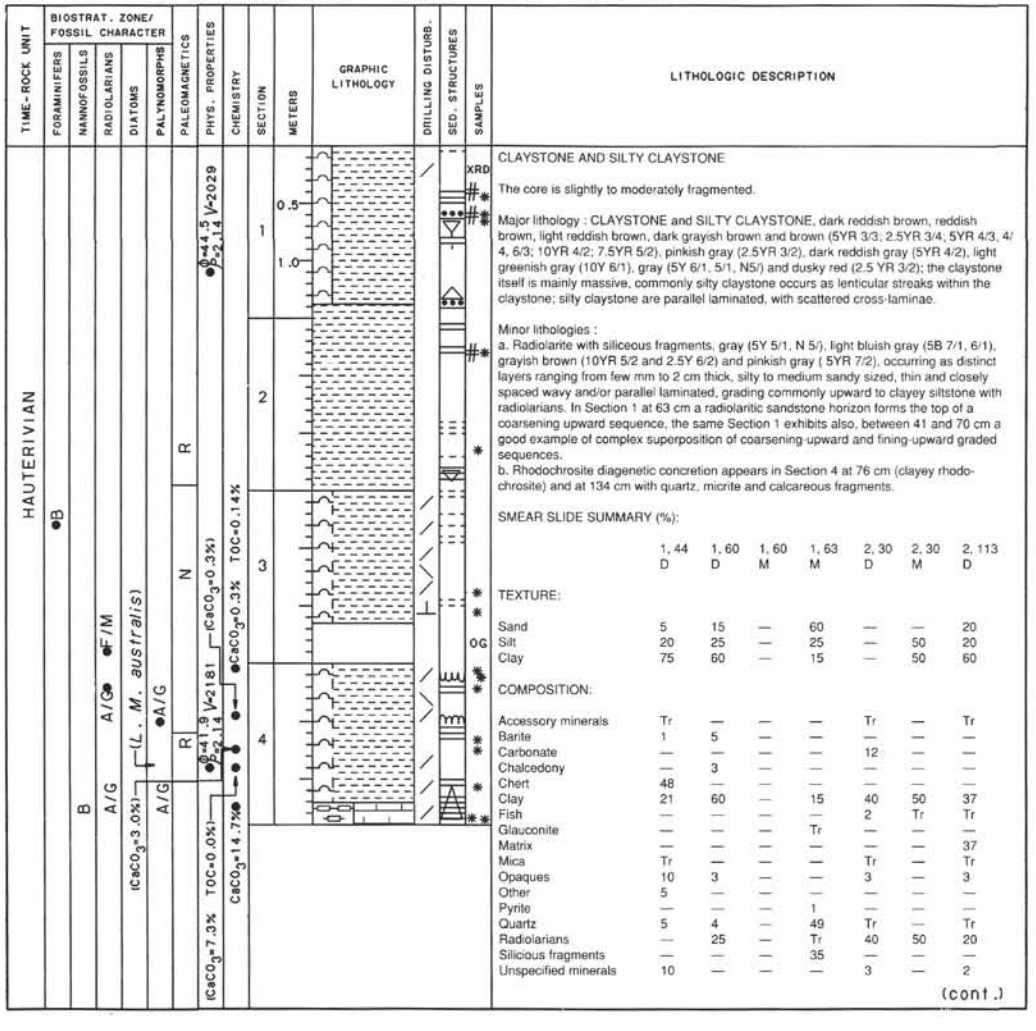
SITE 765 HOLE C CORE 53R CORED INTERVAL 844.1-853.5 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
								1	0.5					(cont.)
								2						
								3						

SMEAR SLIDE SUMMARY (%):

	4, 50 D	4, 65 D	5, 71 M	6, 132 D	7, 36 D	CC, 12 D
TEXTURE:						
Sand	—	20	35	—	10	15
Silt	20	25	15	—	15	15
Clay	80	55	50	—	75	70
COMPOSITION:						
Accessory minerals	—	—	—	—	1	Tr
Barite	—	2	—	2	—	—
Carbonate	—	—	—	1	—	7
Chert	—	—	38	—	—	—
Clay	60	30	18	75	24	70
Feldspar	2	—	—	—	—	—
Fish	—	—	—	1	—	2
Mica	—	—	—	Tr	—	Tr
Muscovite	Tr	—	—	—	—	—
Opaques	2	—	—	10	5	1
Other	—	30	—	—	—	2
Pyrite	Tr	—	—	—	—	—
Quartz	1	2	—	1	5	3
Radiolarians	—	20	39	10	60	15
Rhodochrosite	20	—	—	—	—	—
Unspecified minerals	6	1	2	—	5	—
Zeolite	3	—	—	—	—	—

SITE 765 HOLE C CORE 54R CORED INTERVAL 853.5-863.0 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE AND SILTY CLAYSTONE

The core is slightly to moderately fragmented.

Major lithology : CLAYSTONE and SILTY CLAYSTONE, dark reddish brown, reddish brown, light reddish brown, dark grayish brown and brown (5YR 3/3; 2.5YR 3/4; 5YR 4/3, 4/4, 6/3; 10YR 4/2; 7.5YR 5/2), pinkish gray (2.5YR 3/2), dark reddish gray (5YR 4/2), light greenish gray (10Y 6/1), gray (5Y 6/1, 5/1, N5/) and dusky red (2.5 YR 3/2); the claystone itself is mainly massive, commonly silty claystone occurs as lenticular streaks within the claystone; silty claystone are parallel laminated, with scattered cross-laminae.

Minor lithologies :

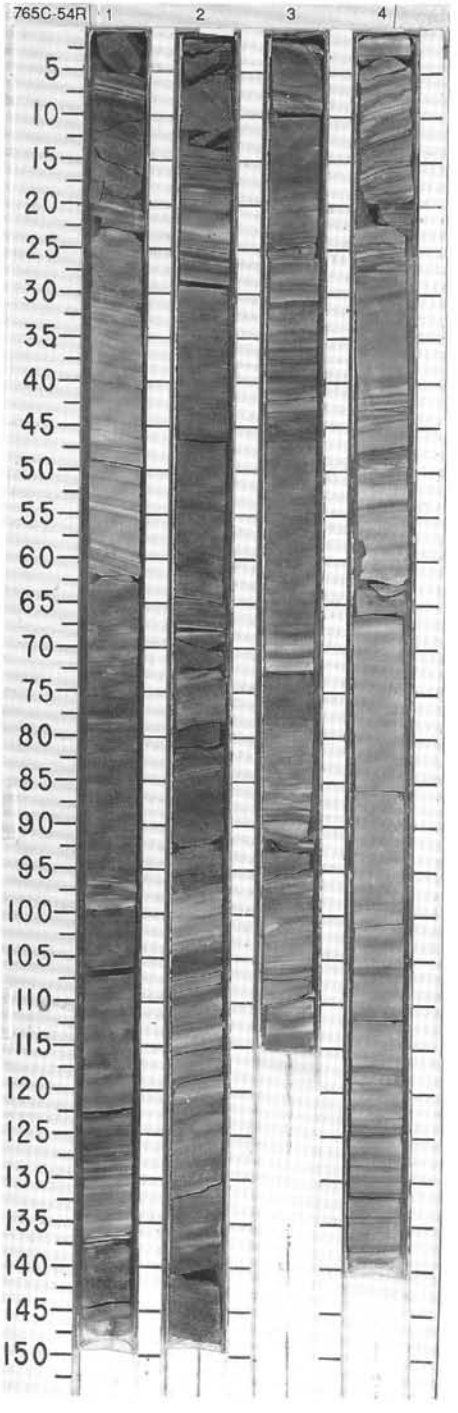
a. Radiolarite with siliceous fragments, gray (5Y 5/1, N 5/), light bluish gray (5B 7/1, 6/1), grayish brown (10YR 5/2 and 2.5Y 6/2) and pinkish gray (5YR 7/2), occurring as distinct layers ranging from few mm to 2 cm thick, silty to medium sandy sized, thin and closely spaced wavy and/or parallel laminated, grading commonly upward to clayey siltstone with radiolarians. In Section 1 at 63 cm a radiolaritic sandstone horizon forms the top of a coarsening upward sequence, the same Section 1 exhibits also, between 41 and 70 cm a good example of complex superposition of coarsening-upward and fining-upward graded sequences.

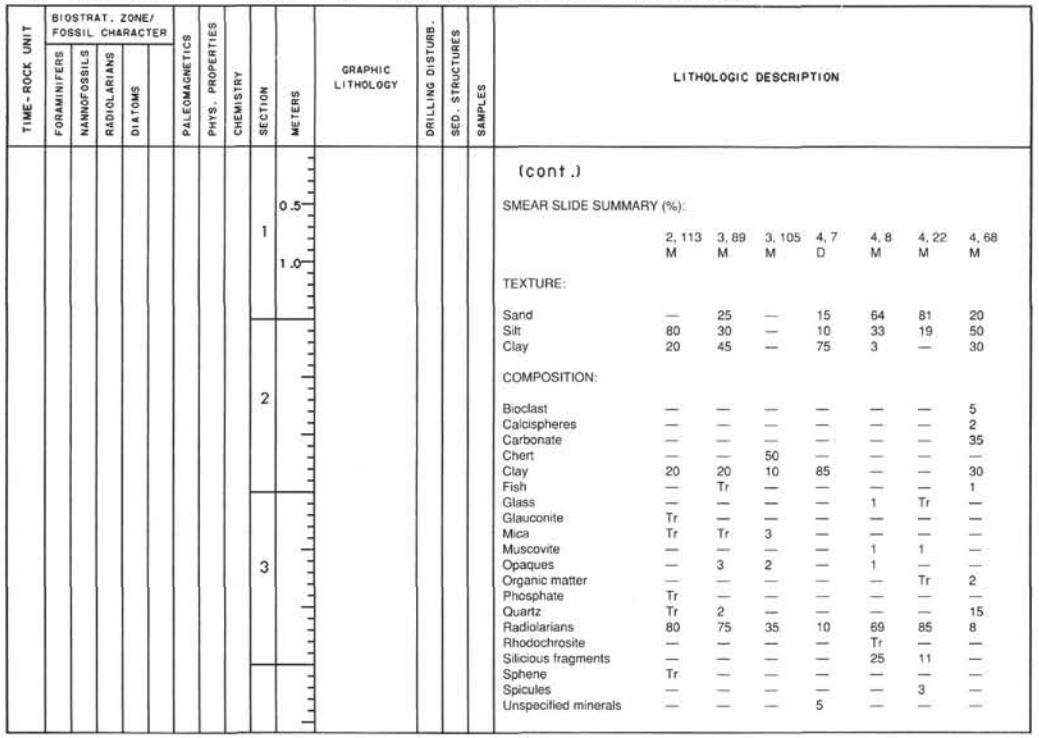
b. Rhodochrosite diagenetic concretion appears in Section 4 at 76 cm (clayey rhodochrosite) and at 134 cm with quartz, micrite and calcareous fragments.

SMEAR SLIDE SUMMARY (%):

	1, 44 D	1, 60 D	1, 60 M	1, 63 M	2, 30 D	2, 30 M	2, 113 D
TEXTURE:							
Sand	5	15	—	60	—	—	20
Silt	20	25	—	25	—	50	20
Clay	75	60	—	15	—	50	60
COMPOSITION:							
Accessory minerals	Tr	—	—	—	Tr	—	Tr
Barite	1	5	—	—	—	—	—
Carbonate	—	—	—	—	12	—	—
Chalcedony	—	3	—	—	—	—	—
Chert	48	—	—	—	—	—	—
Clay	21	60	—	15	40	50	37
Fish	—	—	—	—	2	Tr	Tr
Glauconite	—	—	—	Tr	—	—	—
Matrix	—	—	—	—	—	—	37
Mica	Tr	—	—	—	Tr	—	Tr
Opaques	10	3	—	—	3	—	3
Other	5	—	—	—	—	—	—
Pyrite	—	—	—	1	—	—	—
Quartz	5	4	—	49	Tr	—	Tr
Radiolarians	—	25	—	Tr	40	50	20
Silicious fragments	—	—	—	35	—	—	—
Unspecified minerals	10	—	—	—	3	—	2

(cont.)



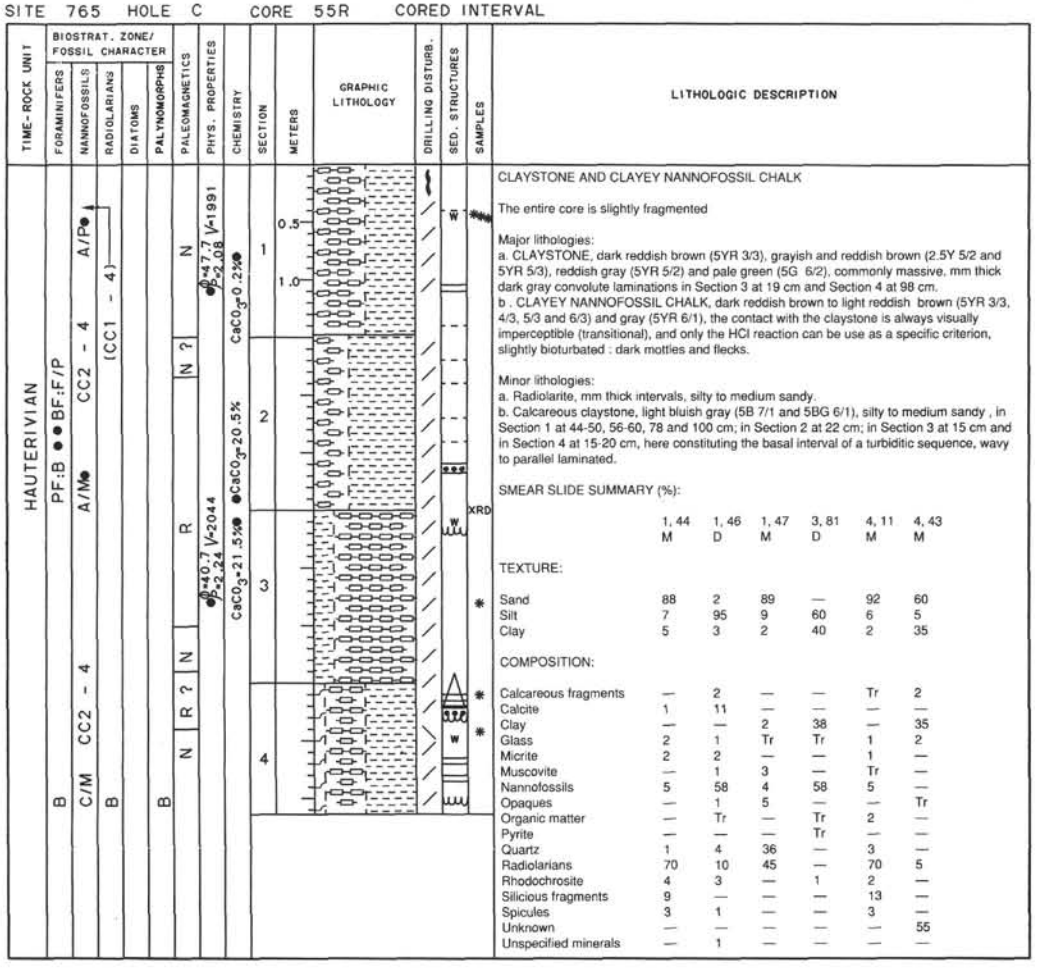


(cont.)

SMEAR SLIDE SUMMARY (%):

	2, 113 M	3, 89 M	3, 105 M	4, 7 D	4, 8 M	4, 22 M	4, 68 M
TEXTURE:							
Sand	—	25	—	15	64	81	20
Silt	80	30	—	10	33	19	50
Clay	20	45	—	75	3	—	30
COMPOSITION:							
Bioclast	—	—	—	—	—	—	5
Calcispheres	—	—	—	—	—	—	2
Carbonate	—	—	—	—	—	—	35
Chert	—	—	50	—	—	—	—
Clay	20	20	10	85	—	—	30
Fish	—	Tr	—	—	—	—	1
Glass	—	—	—	—	1	Tr	—
Glauconite	Tr	—	—	—	—	—	—
Mica	Tr	Tr	3	—	—	—	—
Muscovite	—	—	—	—	1	1	—
Opaques	—	3	2	—	1	—	—
Organic matter	—	—	—	—	—	Tr	2
Phosphate	Tr	—	—	—	—	—	—
Quartz	Tr	2	—	—	—	—	15
Radiolarians	80	75	35	10	69	85	8
Rhodochrosite	—	—	—	—	Tr	—	—
Silicious fragments	—	—	—	—	25	11	—
Sphene	Tr	—	—	—	—	—	—
Spicules	—	—	—	—	—	3	—
Unspecified minerals	—	—	—	5	—	—	—

SITE 765 HOLE C CORE 55R CORED INTERVAL



CLAYSTONE AND CLAYEY NANNOFOSSIL CHALK

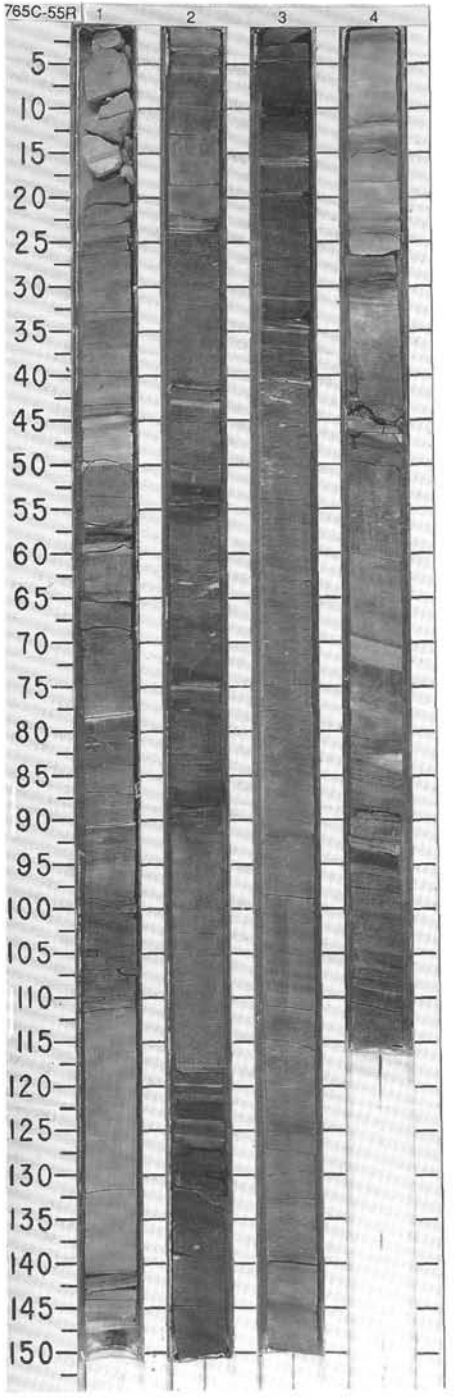
The entire core is slightly fragmented

Major lithologies:
a. CLAYSTONE, dark reddish brown (5YR 3/3), grayish and reddish brown (2.5Y 5/2 and 5YR 5/3), reddish gray (5YR 5/2) and pale green (5G 6/2), commonly massive, mm thick dark gray convolute laminations in Section 3 at 19 cm and Section 4 at 98 cm.
b . CLAYEY NANNOFOSSIL CHALK, dark reddish brown to light reddish brown (5YR 3/3, 4/3, 5/3 and 6/3) and gray (5YR 6/1), the contact with the claystone is always visually imperceptible (transitional), and only the HCl reaction can be use as a specific criterion, slightly bioturbated : dark mottles and flecks.

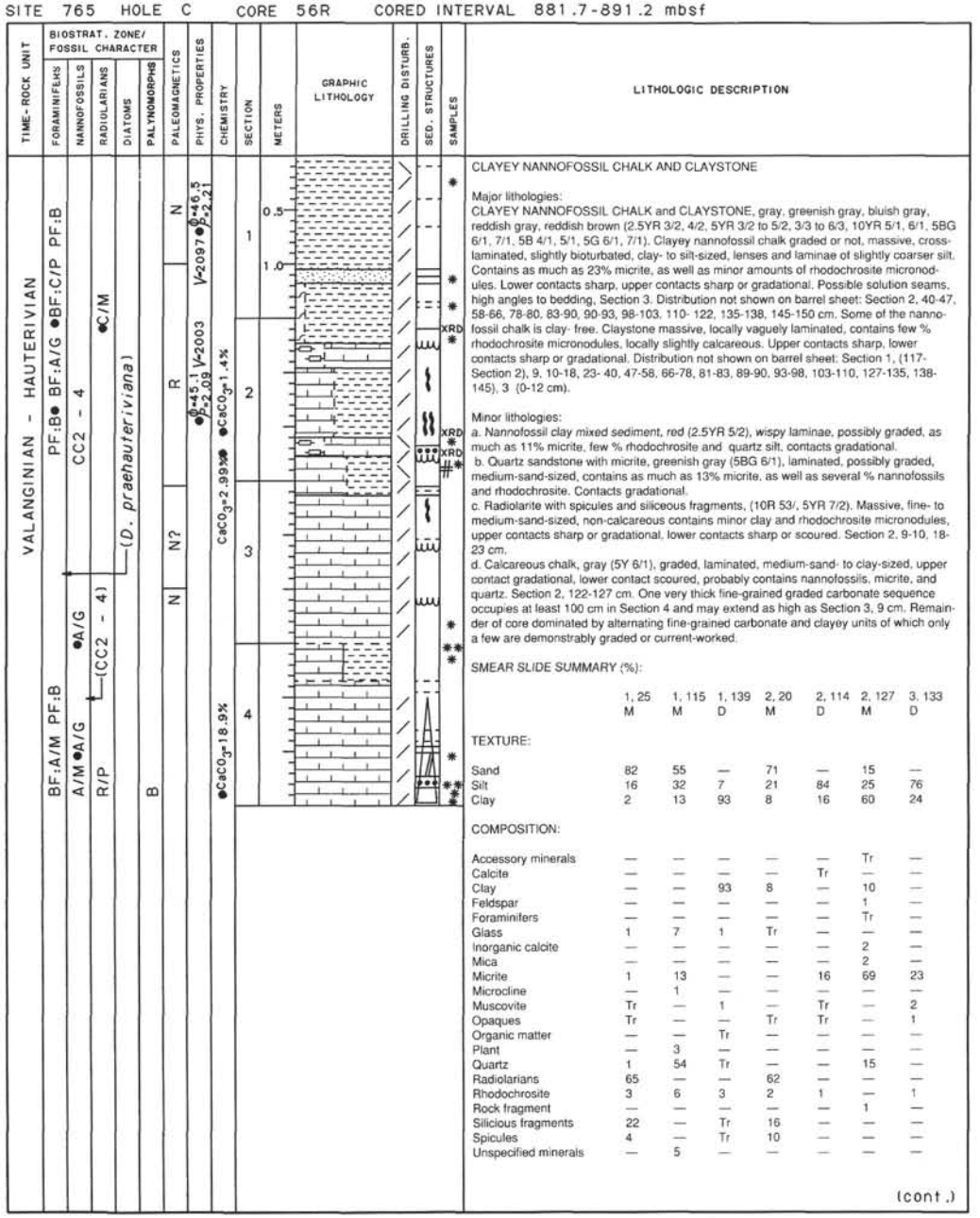
Minor lithologies:
a. Radiolarite, mm thick intervals, silty to medium sandy.
b. Calcareous claystone, light bluish gray (5B 7/1 and 5BG 6/1), silty to medium sandy , in Section 1 at 44-50, 56-60, 78 and 100 cm; in Section 2 at 22 cm; in Section 3 at 15 cm and in Section 4 at 15-20 cm, here constituting the basal interval of a turbiditic sequence, wavy to parallel laminated.

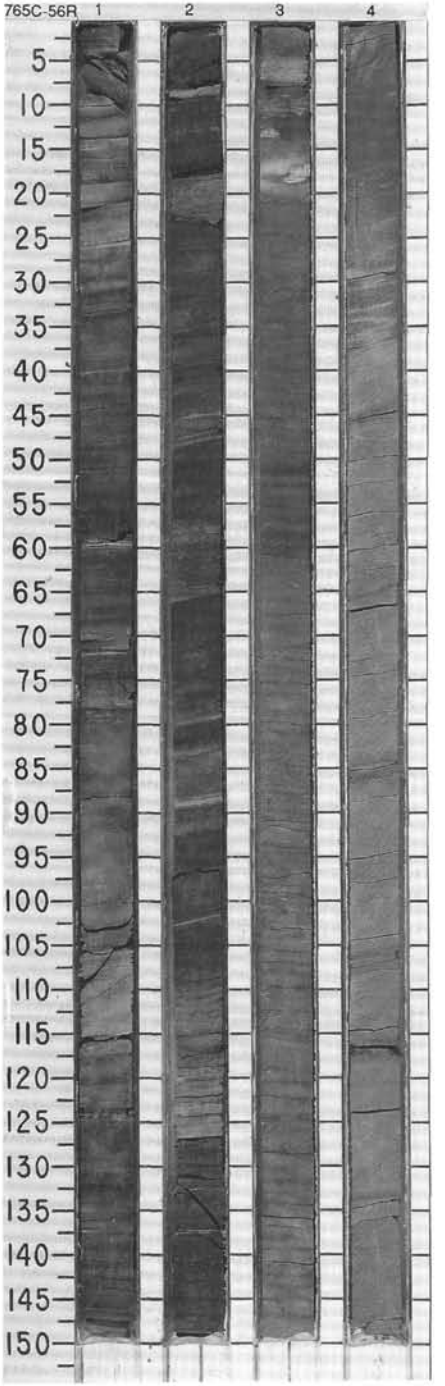
SMEAR SLIDE SUMMARY (%):

	1, 44 M	1, 46 D	1, 47 M	3, 81 D	4, 11 M	4, 43 M
TEXTURE:						
Sand	88	2	89	—	92	60
Silt	7	95	9	60	6	5
Clay	5	3	2	40	2	35
COMPOSITION:						
Calcareous fragments	—	2	—	—	Tr	2
Calcite	1	11	—	—	—	—
Clay	—	—	2	38	—	35
Glass	2	1	Tr	Tr	1	2
Micrite	2	2	—	—	1	—
Muscovite	—	1	3	—	Tr	—
Nannofossils	5	58	4	58	5	—
Opaques	—	1	5	—	—	Tr
Organic matter	—	Tr	—	Tr	2	—
Pyrite	—	—	—	Tr	—	—
Quartz	1	4	36	—	3	—
Radiolarians	70	10	45	—	70	5
Rhodochrosite	4	3	—	1	2	—
Silicious fragments	9	—	—	—	13	—
Spicules	3	1	—	—	3	—
Unknown	—	—	—	—	—	55
Unspecified minerals	—	1	—	—	—	—



SITE 765 HOLE C CORE 56R CORED INTERVAL 881.7-891.2 mbsf





SITE 765 HOLE C CORE 56R CORED INTERVAL 881.7-891.2 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS		PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
									1	0.5 1.0					(cont.)
									2						
									3						
									4						
									5						

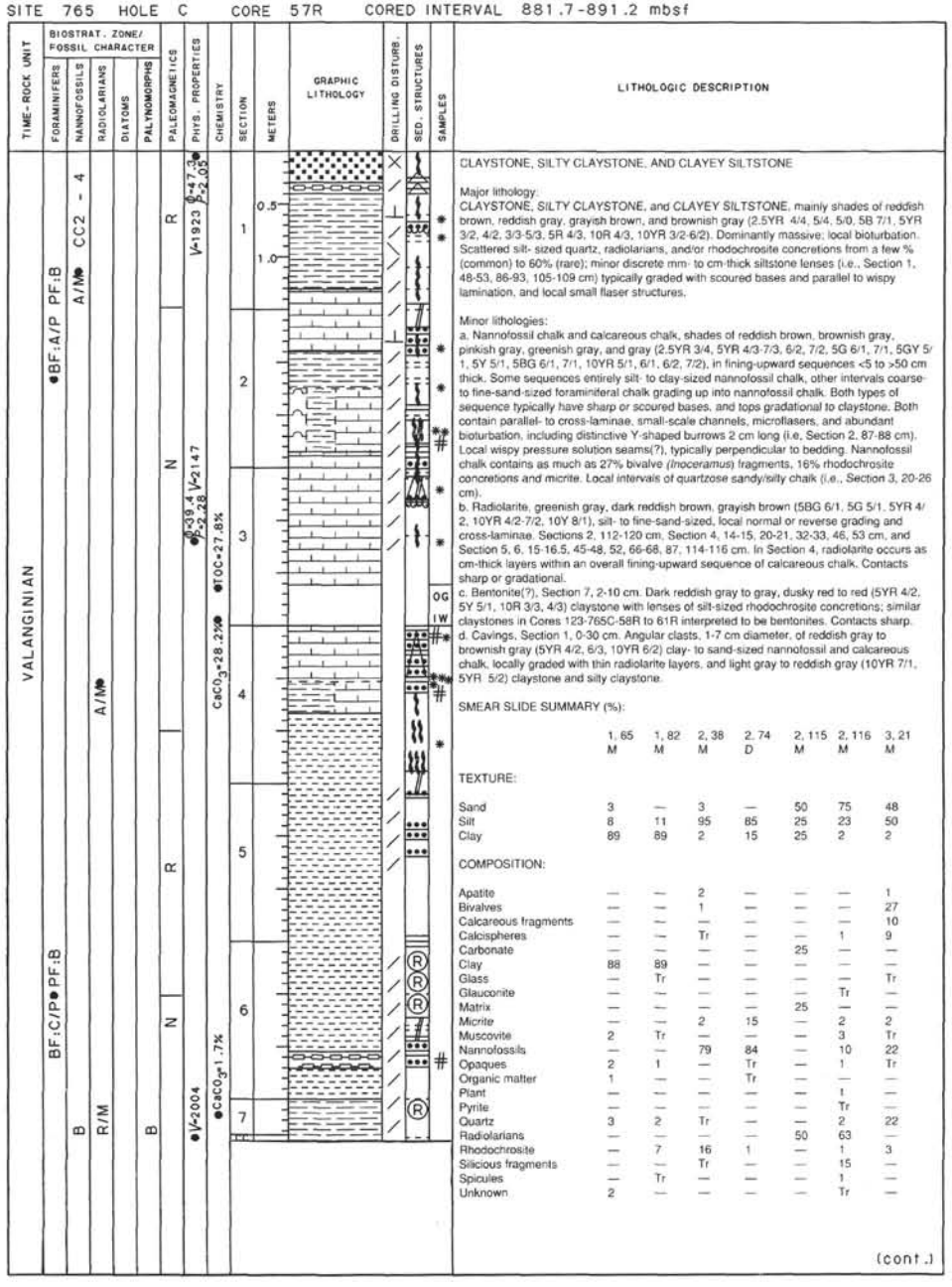
SMEAR SLIDE SUMMARY (%):

	4, 4 M	4, 4 D	4, 12 D	4, 104 D	4, 141 M	4, 141 D	4, 141 M
TEXTURE:							
Sand	—	—	1	15	50	—	—
Silt	2	4	9	20	30	15	—
Clay	98	96	90	65	20	85	—
COMPOSITION:							
Accessory minerals	—	—	—	Tr	—	—	Tr
Bioclast	—	—	—	—	—	—	8
Calcareous fragments	—	Tr	—	—	35	5	—
Calcispheres	—	—	1	3	5	2	2
Chlorite	—	—	—	—	1	1	—
Clay	46	35	20	20	5	40	15
Feldspar	—	—	—	—	—	—	Tr
Fish	—	—	—	1	—	—	Tr
Glauconite	—	—	—	—	1	—	1
Matrix	—	—	—	—	—	—	30
Mica	Tr	—	Tr	1	1	1	—
Micrite	11	25	66	53	5	10	30
Nannofossils	35	38	—	—	15	30	—
Opaques	—	—	2	3	1	1	—
Organic matter	—	—	—	1	—	—	—
Phosphate	—	—	—	—	—	—	1
Plant	—	—	3	—	—	—	—
Quartz	1	Tr	2	3	20	4	10
Radiolarians	—	—	3	15	—	—	2
Rhodochrosite	2	2	—	—	4	5	—
Silicious fragments	—	—	—	—	2	—	—
Unspecified minerals	—	—	3	—	5	1	—

SMEAR SLIDE SUMMARY (%):

	4, 149 M
TEXTURE:	
Sand	45
Silt	40
Clay	15
COMPOSITION:	
Calcareous fragments	15
Calcite	30
Clay	18
Micrite	5
Nannofossils	2
Quartz	10
Rhodochrosite	20

SITE 765 HOLE C CORE 57R CORED INTERVAL 881.7-891.2 mbsf



CLAYSTONE, SILTY CLAYSTONE, AND CLAYEY SILTSTONE

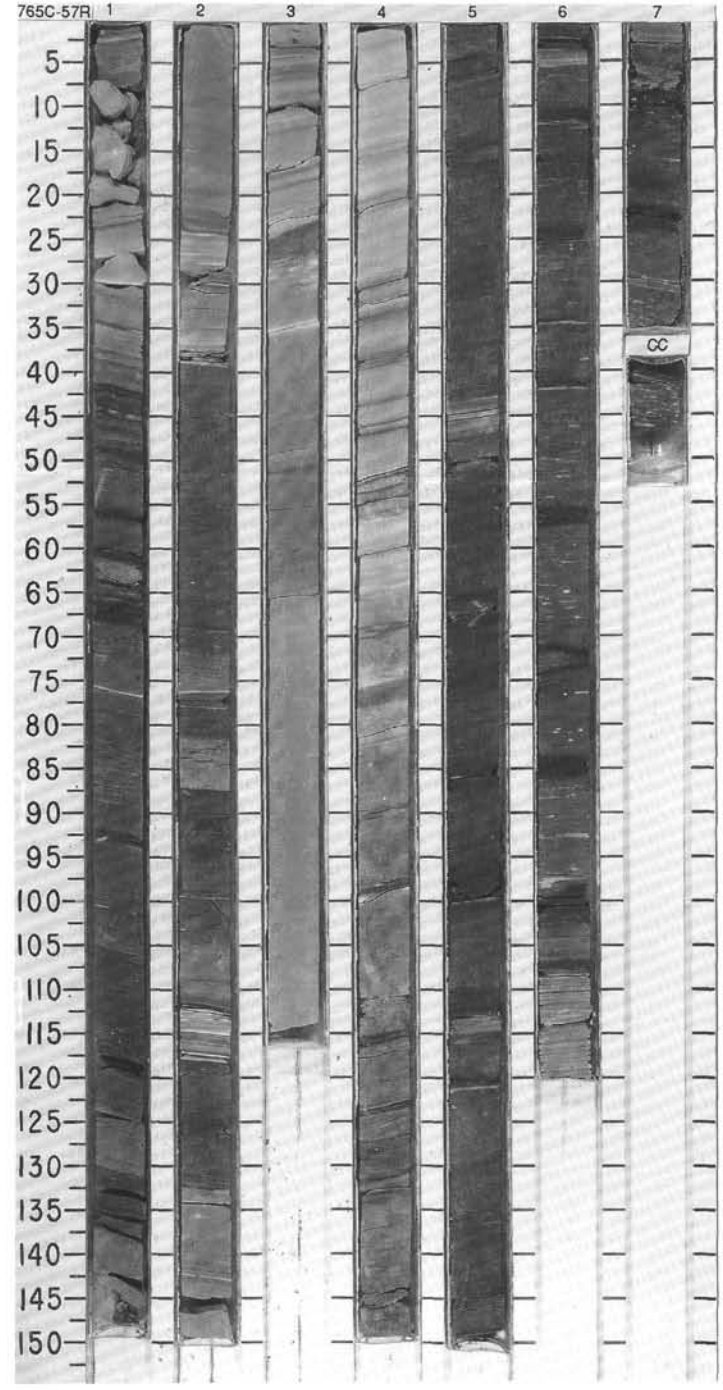
Major lithology:
CLAYSTONE, SILTY CLAYSTONE, and CLAYEY SILTSTONE, mainly shades of reddish brown, reddish gray, grayish brown, and brownish gray (2.5YR 4/4, 5/4, 5/0, 5B 7/1, 5YR 3/2, 4/2, 3/3-5/3, 5R 4/3, 10R 4/3, 10YR 3/2-6/2). Dominantly massive; local bioturbation. Scattered silt- sized quartz, radiolarians, and/or rhodochrosite concretions from a few % (common) to 60% (rare); minor discrete mm- to cm-thick siltstone lenses (i.e., Section 1, 48-53, 86-93, 105-109 cm) typically graded with scoured bases and parallel to wispy lamination, and local small flaser structures.

Minor lithologies:
a. Nannofossil chalk and calcareous chalk, shades of reddish brown, brownish gray, pinkish gray, greenish gray, and gray (2.5YR 3/4, 5YR 4/3-7/3, 6/2, 7/2, 5G 6/1, 7/1, 5GY 5/1, 5Y 5/1, 5BG 6/1, 7/1, 10YR 5/1, 6/1, 6/2, 7/2), in fining-upward sequences <5 to >50 cm thick. Some sequences entirely silt- to clay-sized nannofossil chalk, other intervals coarse- to fine-sand-sized foraminiferal chalk grading up into nannofossil chalk. Both types of sequence typically have sharp or scoured bases, and tops gradational to claystone. Both contain parallel- to cross-laminae, small-scale channels, microflasers, and abundant bioturbation, including distinctive Y-shaped burrows 2 cm long (i.e, Section 2, 87-88 cm). Local wispy pressure solution seams(?), typically perpendicular to bedding. Nannofossil chalk contains as much as 27% bivalve (*Inoceramus*) fragments, 16% rhodochrosite concretions and micrite. Local intervals of quartzose sandy/silty chalk (i.e., Section 3, 20-26 cm).
b. Radiolarite, greenish gray, dark reddish brown, grayish brown (5BG 6/1, 5G 5/1, 5YR 4/2, 10YR 4/2-7/2, 10Y 8/1), silt- to fine-sand-sized, local normal or reverse grading and cross-laminae. Sections 2, 112-120 cm, Section 4, 14-15, 20-21, 32-33, 46, 53 cm, and Section 5, 6, 15-16.5, 45-48, 52, 66-68, 87, 114-116 cm. In Section 4, radiolarite occurs as cm-thick layers within an overall fining-upward sequence of calcareous chalk. Contacts sharp or gradational.
c. Bentonite(?), Section 7, 2-10 cm. Dark reddish gray to gray, dusky red to red (5YR 4/2, 5Y 5/1, 10R 3/3, 4/3) claystone with lenses of silt-sized rhodochrosite concretions; similar claystones in Cores 123-765C-58R to 61R interpreted to be bentonites. Contacts sharp.
d. Cavings, Section 1, 0-30 cm. Angular clasts, 1-7 cm diameter, of reddish gray to brownish gray (5YR 4/2, 6/3, 10YR 6/2) clay- to sand-sized nannofossil and calcareous chalk, locally graded with thin radiolarite layers, and light gray to reddish gray (10YR 7/1, 5YR 5/2) claystone and silty claystone.

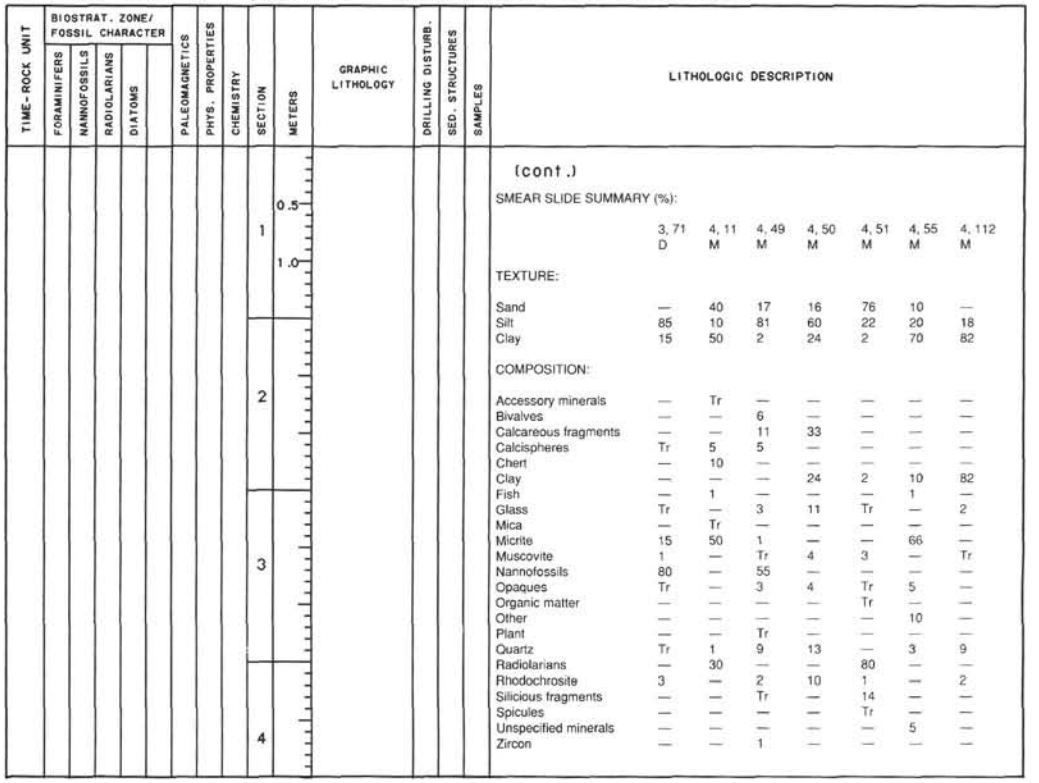
SMEAR SLIDE SUMMARY (%):

	1, 65 M	1, 82 M	2, 38 M	2, 74 D	2, 115 M	2, 116 M	3, 21 M
TEXTURE:							
Sand	3	—	3	—	50	75	48
Silt	8	11	95	85	25	23	50
Clay	89	89	2	15	25	2	2
COMPOSITION:							
Apatite	—	—	2	—	—	—	1
Bivalves	—	—	1	—	—	—	27
Calcareous fragments	—	—	—	—	—	—	10
Calcispheres	—	—	Tr	—	—	1	9
Carbonate	—	—	—	—	25	—	—
Clay	88	89	—	—	—	—	—
Glass	—	Tr	—	—	—	—	Tr
Glauconite	—	—	—	—	—	Tr	—
Matrix	—	—	—	—	25	—	—
Micrite	—	—	2	15	—	2	2
Muscovite	2	Tr	—	—	—	3	Tr
Nannofossils	—	—	79	84	—	10	22
Opaques	2	1	—	Tr	—	1	Tr
Organic matter	1	—	—	Tr	—	—	—
Plant	—	—	—	—	—	1	—
Pyrite	—	—	—	—	—	Tr	—
Quartz	3	2	Tr	—	—	2	22
Radiolarians	—	—	—	—	50	63	—
Rhodochrosite	—	7	16	1	—	1	3
Silicious fragments	—	—	Tr	—	—	15	—
Spicules	—	Tr	—	—	—	1	—
Unknown	2	—	—	—	—	Tr	—

(cont.)



SITE 765 HOLE C CORE 57R CORED INTERVAL 881.7-891.2 mbsf

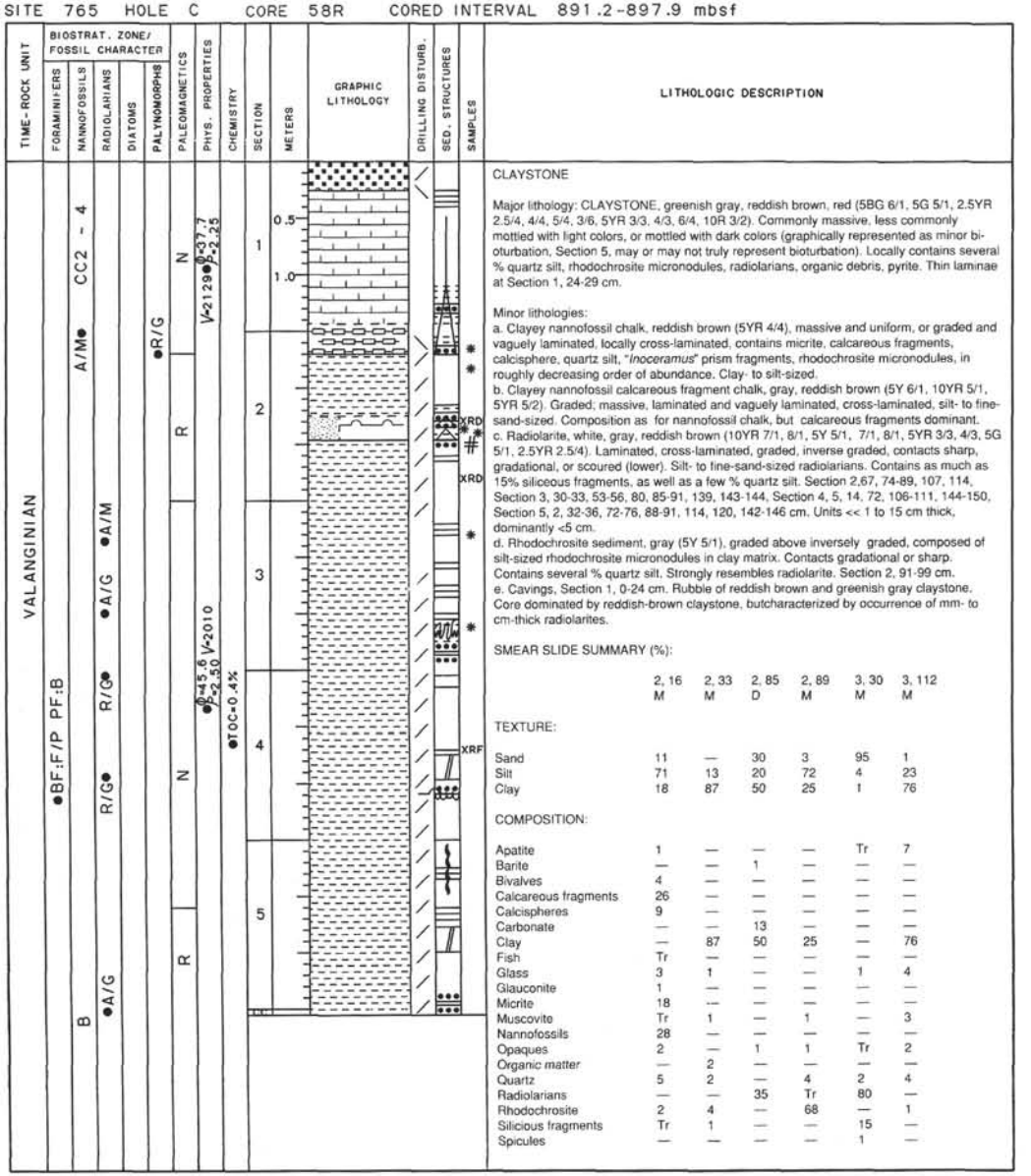


(cont.)

SMEAR SLIDE SUMMARY (%):

	3, 71 D	4, 11 M	4, 49 M	4, 50 M	4, 51 M	4, 55 M	4, 112 M
TEXTURE:							
Sand	—	40	17	16	76	10	—
Silt	85	10	81	60	22	20	18
Clay	15	50	2	24	2	70	82
COMPOSITION:							
Accessory minerals	—	Tr	—	—	—	—	—
Bivalves	—	—	6	—	—	—	—
Calcareous fragments	—	—	11	33	—	—	—
Calcispheres	Tr	5	5	—	—	—	—
Chert	—	10	—	—	—	—	—
Clay	—	—	—	24	2	10	82
Fish	—	1	—	—	—	1	—
Glass	Tr	—	3	11	Tr	—	2
Mica	—	Tr	—	—	—	—	—
Micrite	15	50	1	—	—	66	—
Muscovite	1	—	Tr	4	3	—	Tr
Nannofossils	80	—	55	—	—	—	—
Opaques	Tr	—	3	4	Tr	5	—
Organic matter	—	—	—	—	Tr	—	—
Other	—	—	—	—	—	10	—
Plant	—	—	Tr	—	—	—	—
Quartz	Tr	1	9	13	—	3	9
Radiolarians	—	30	—	—	80	—	—
Rhodochrosite	3	—	2	10	1	—	2
Silicious fragments	—	—	Tr	—	14	—	—
Spicules	—	—	—	—	Tr	—	—
Unspecified minerals	—	—	—	—	—	5	—
Zircon	—	—	1	—	—	—	—

SITE 765 HOLE C CORE 58R CORED INTERVAL 891.2-897.9 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE

Major lithology: CLAYSTONE, greenish gray, reddish brown, red (5BG 6/1, 5G 5/1, 2.5YR 2.5/4, 4/4, 5/4, 3/6, 5YR 3/3, 4/3, 6/4, 10R 3/2). Commonly massive, less commonly mottled with light colors, or mottled with dark colors (graphically represented as minor bioturbation, Section 5, may or may not truly represent bioturbation). Locally contains several % quartz silt, rhodochrosite micronodules, radiolarians, organic debris, pyrite. Thin laminae at Section 1, 24-29 cm.

Minor lithologies:

a. Clayey nannofossil chalk, reddish brown (5YR 4/4), massive and uniform, or graded and vaguely laminated, locally cross-laminated, contains micrite, calcareous fragments, calcisphere, quartz silt, "*Inoceramus*" prism fragments, rhodochrosite micronodules, in roughly decreasing order of abundance. Clay- to silt-sized.

b. Clayey nannofossil calcareous fragment chalk, gray, reddish brown (5Y 6/1, 10YR 5/1, 5YR 5/2). Graded; massive, laminated and vaguely laminated, cross-laminated, silt- to fine-sand-sized. Composition as for nannofossil chalk, but calcareous fragments dominant.

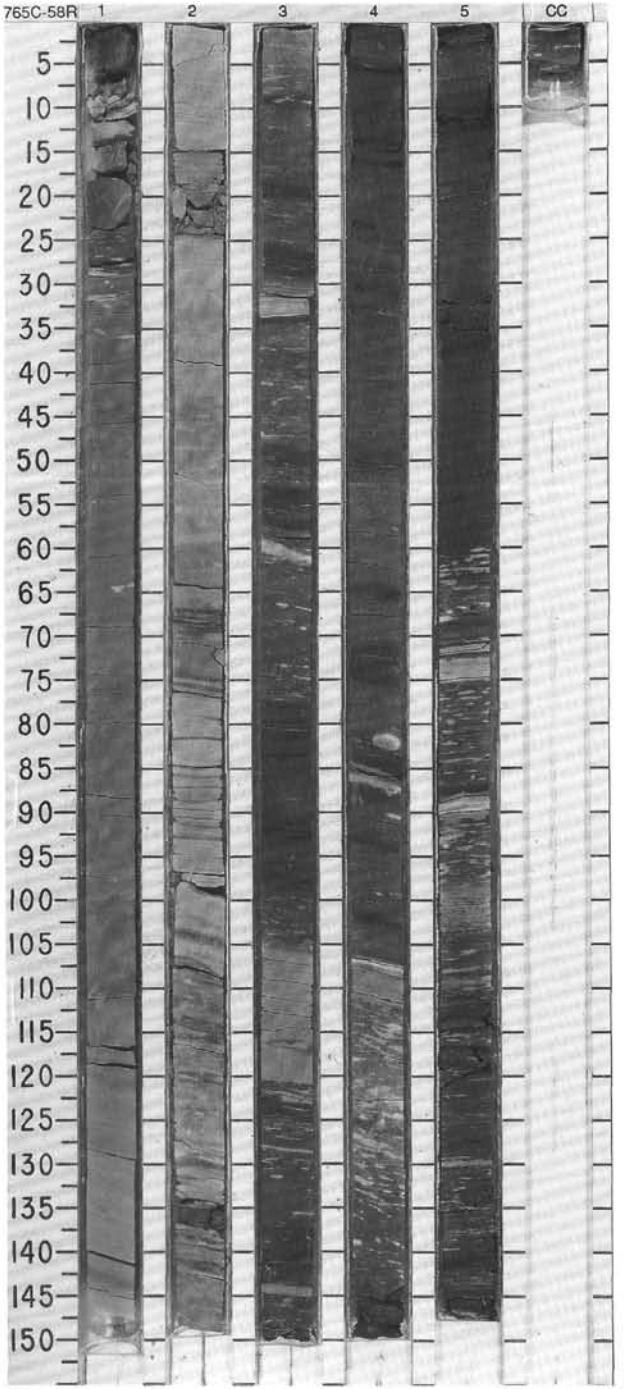
c. Radiolarite, white, gray, reddish brown (10YR 7/1, 8/1, 5Y 5/1, 7/1, 8/1, 5YR 3/3, 4/3, 5G 5/1, 2.5YR 2.5/4). Laminated, cross-laminated, graded, inverse graded, contacts sharp, gradational, or scoured (lower). Silt- to fine-sand-sized radiolarians. Contains as much as 15% siliceous fragments, as well as a few % quartz silt. Section 2,67, 74-89, 107, 114, Section 3, 30-33, 53-56, 80, 85-91, 139, 143-144, Section 4, 5, 14, 72, 106-111, 144-150, Section 5, 2, 32-36, 72-76, 88-91, 114, 120, 142-146 cm. Units << 1 to 15 cm thick, dominantly <5 cm.

d. Rhodochrosite sediment, gray (5Y 5/1), graded above inversely graded, composed of silt-sized rhodochrosite micronodules in clay matrix. Contacts gradational or sharp. Contains several % quartz silt. Strongly resembles radiolarite. Section 2, 91-99 cm.

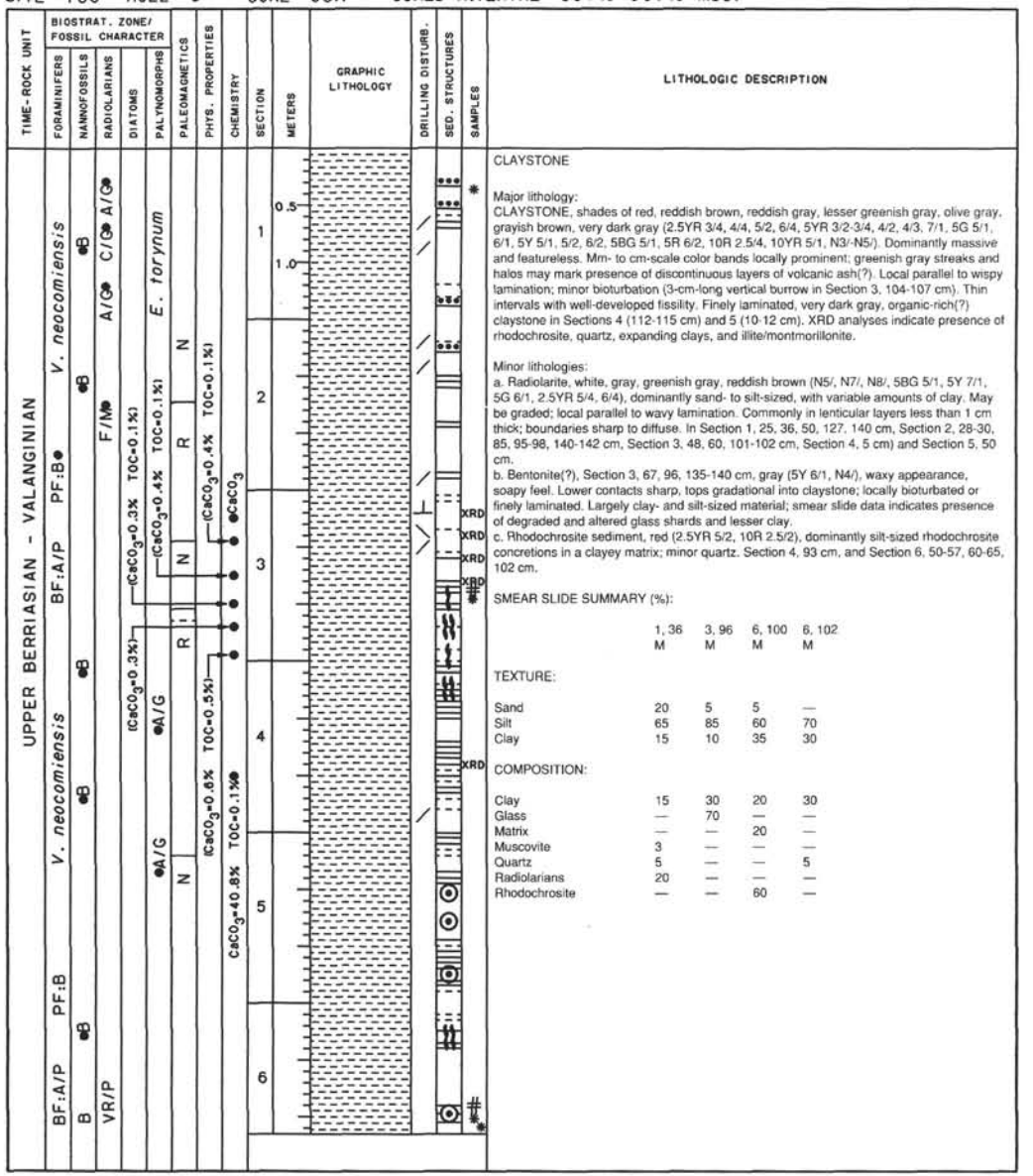
e. Cavings, Section 1, 0-24 cm. Rubble of reddish brown and greenish gray claystone. Core dominated by reddish-brown claystone, butcharacterized by occurrence of mm- to cm-thick radiolarites.

SMEAR SLIDE SUMMARY (%):

	2, 16 M	2, 33 M	2, 85 D	2, 89 M	3, 30 M	3, 112 M
TEXTURE:						
Sand	11	—	30	3	95	1
Silt	71	13	20	72	4	23
Clay	18	87	50	25	1	76
COMPOSITION:						
Apatite	1	—	—	—	Tr	7
Barite	—	—	1	—	—	—
Bivalves	4	—	—	—	—	—
Calcareous fragments	26	—	—	—	—	—
Calcispheres	9	—	—	—	—	—
Carbonate	—	—	13	—	—	—
Clay	—	87	50	25	—	76
Fish	Tr	—	—	—	—	—
Glass	3	1	—	—	1	4
Glauconite	1	—	—	—	—	—
Micrite	18	—	—	—	—	—
Muscovite	Tr	1	—	1	—	3
Nannofossils	28	—	—	—	—	—
Opaques	2	—	1	1	Tr	2
Organic matter	—	2	—	—	—	—
Quartz	5	2	—	4	2	4
Radiolarians	—	—	35	Tr	80	—
Rhodochrosite	2	4	—	68	—	1
Silicious fragments	Tr	1	—	—	15	—
Spicules	—	—	—	—	1	—



SITE 765 HOLE C CORE 59R CORED INTERVAL 897.9-907.5 mbsf



LITHOLOGIC DESCRIPTION

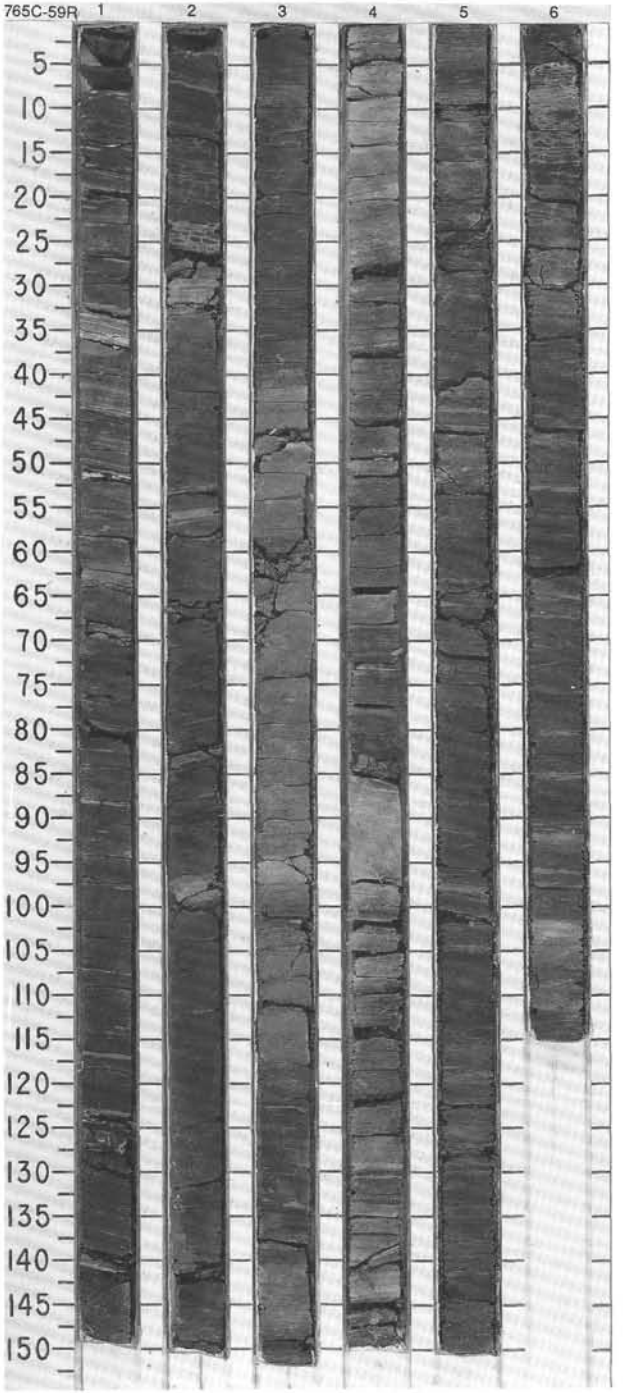
CLAYSTONE

Major lithology:
CLAYSTONE, shades of red, reddish brown, reddish gray, lesser greenish gray, olive gray, grayish brown, very dark gray (2.5YR 3/4, 4/4, 5/2, 6/4, 5YR 3/2-3/4, 4/2, 4/3, 7/1, 5G 5/1, 6/1, 5Y 5/1, 5/2, 6/2, 5BG 5/1, 5R 6/2, 10R 2.5/4, 10YR 5/1, N3/-N5/). Dominantly massive and featureless. Mm- to cm-scale color bands locally prominent; greenish gray streaks and halos may mark presence of discontinuous layers of volcanic ash(?). Local parallel to wispy lamination; minor bioturbation (3-cm-long vertical burrow in Section 3, 104-107 cm). Thin intervals with well-developed fissility. Finely laminated, very dark gray, organic-rich(?) claystone in Sections 4 (112-115 cm) and 5 (10-12 cm). XRD analyses indicate presence of rhodochrosite, quartz, expanding clays, and illite/montmorillonite.

Minor lithologies:
a. Radiolarite, white, gray, greenish gray, reddish brown (N5/, N7/, N8/, 5BG 5/1, 5Y 7/1, 5G 6/1, 2.5YR 5/4, 6/4), dominantly sand- to silt-sized, with variable amounts of clay. May be graded; local parallel to wavy lamination. Commonly in lenticular layers less than 1 cm thick; boundaries sharp to diffuse. In Section 1, 25, 36, 50, 127, 140 cm, Section 2, 28-30, 85, 95-98, 140-142 cm, Section 3, 48, 60, 101-102 cm, Section 4, 5 cm) and Section 5, 50 cm.
b. Bentonite(?), Section 3, 67, 96, 135-140 cm, gray (5Y 6/1, N4/), waxy appearance, soapy feel. Lower contacts sharp, tops gradational into claystone; locally bioturbated or finely laminated. Largely clay- and silt-sized material; smear slide data indicates presence of degraded and altered glass shards and lesser clay.
c. Rhodochrosite sediment, red (2.5YR 5/2, 10R 2.5/2), dominantly silt-sized rhodochrosite concretions in a clayey matrix; minor quartz. Section 4, 93 cm, and Section 6, 50-57, 60-65, 102 cm.

SMEAR SLIDE SUMMARY (%):

	1, 36 M	3, 96 M	6, 100 M	6, 102 M
TEXTURE:				
Sand	20	5	5	—
Silt	65	85	60	70
Clay	15	10	35	30
COMPOSITION:				
Clay	15	30	20	30
Glass	—	70	—	—
Matrix	—	—	20	—
Muscovite	3	—	—	—
Quartz	5	—	—	5
Radiolarians	20	—	—	—
Rhodochrosite	—	—	60	—



SITE 765 HOLE C CORE 60X CORED INTERVAL 907.5-916.9 mbsf

TIME-ROCK UNIT: UPPER BERRIASIAN - VALANGINIAN

BIOSTRAT. ZONE/FOSSIL CHARACTER:
- FORAMINIFERS: BF:A/P PF:B | BF:A/P PF:B ● | ● BF:A/P PF:B
- NANNOFOSSILS: B | *V. neocomiensis* | B
- RADIOLARIANS: R/V-P | ●R/V-P | ●V-R/V-P
- DIATOMS
- PALYNOMORPHS: B | R | B
- PALEOMAGNETICS: R | N | N
- PHYS. PROPERTIES

CHEMISTRY: $CaCO_3$=0.3% TOC=0.1%● | $CaCO_3$=0.3% $CaCO_3$=0.6% TOC=0.0%● | $CaCO_3$=0.4% ●$CaCO_3$=0.4% | ●$CaCO_3$=0.4% ●$CaCO_3$=0.4% | ●$CaCO_3$=0.5%

SECTION: 1, 2, 3, 4, 5

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY

DRILLING DISTURB.: X; ?; W; W?

SED. STRUCTURES: XRD; OG; IW; XRD

SAMPLES: *, #

LITHOLOGIC DESCRIPTION

CLAYSTONE

Major lithology: CLAYSTONE, dark reddish brown (2.5YR 2.5/4, 5YR, 3/3). Dominatly massive and featureless: contains rare to common greenish gray (5G 5/1) mottles (typically flattened parallel prominent in Sections 2 (89-140 cm), 3 (37-52, 80-107 cm) and all of 4. Locally fissile; rare silty horizons. Discreteburrow(?) infilled with silty claystone and oblique to bedding in Section 2, 51 cm. Section 4, 57-78 cm contains mm-thick white flecks and streaks that consist almost entirely of microsparite.

Minor lithologies:

a. Bentonite(?), greenish gray (5G 5/1, 10Y 5/1-7/1); largely silt-to fine-sand-sized material in clayey matrix. Vague wavy to cross-laminae, waxy appearance. Minor pyrite. Smear slides indicate as much as 90% degraded, altered glass, as well as minor clay, apatite, muscovite, opaques; XRD indicates presence of montmorillonite and chlorite. In Sections 1, 23, 119, 129 cm, Section 3, 7.5, 31 cm, Section 4, 121, 147 cm, and Section 5, 58.5-63.5, 112-124 cm.

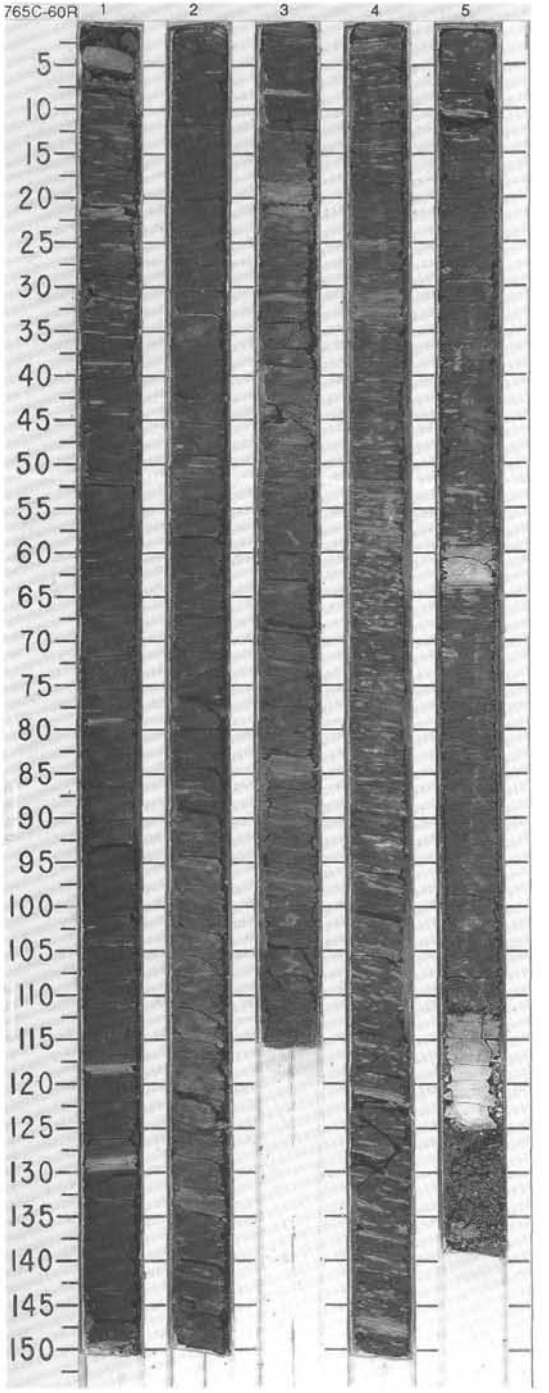
b. Cavings. Section 1, 0-7 cm, rubble of claystone similar to dominant lithology of core, as well as a rounded volcanic(?) pebble coated with goethite (?).

SMEAR SLIDE SUMMARY (%):

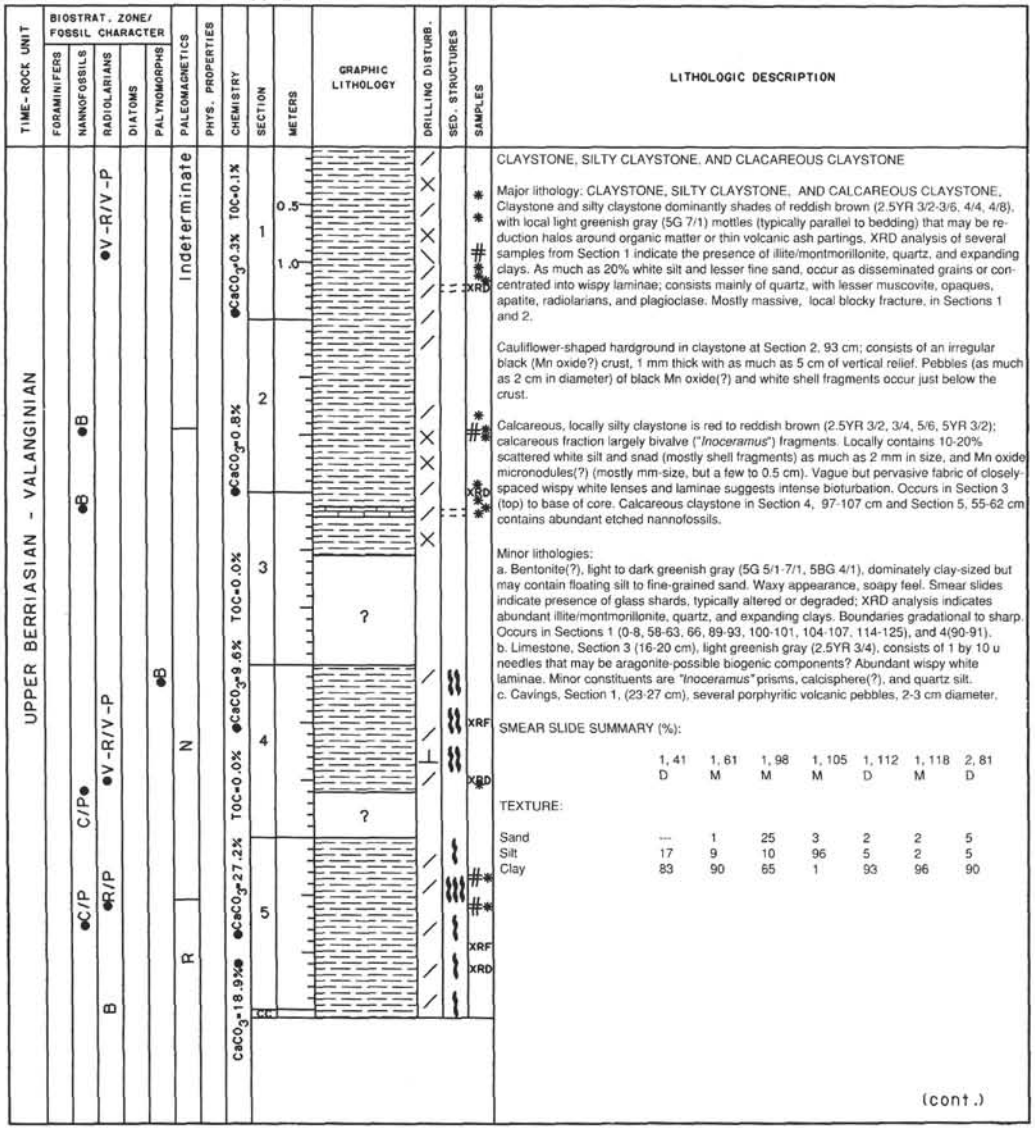
	1, 20 M	1, 70 D	1, 129 M	2, 35 M	2, 79 D	2, 94 M	3, 87 D
TEXTURE:							
Sand	17	---	15	---	3	16	---
Silt	72	15	77	2	5	81	8
Clay	11	85	8	98	92	3	92
COMPOSITION:							
Apatite	2	1	5	---	---	1	1
Clay	11	85	8	96	92	4	92
Foraminifers	---	---	---	---	2	---	---
Glass	79	4	83	1	---	90	3
Mica	---	---	---	---	2	---	---
Muscovite	---	2	---	1	---	2	1
Opaques	---	1	Tr	1	Tr	3	1
Plant	---	---	Tr	Tr	3	---	---
Radiolarians	---	---	---	---	1	---	---
Unknown	---	5	---	---	---	---	---
Unspecified minerals	7	---	2	1	---	---	1

SMEAR SLIDE SUMMARY (%):

	4, 8 D	4, 55 M	4, 68 M	5, 61 M
TEXTURE:				
Sand	---	---	1	---
Silt	11	82	99	12
Clay	89	18	---	88
COMPOSITION:				
Apatite	1	Tr	---	Tr
Calcite	---	---	1	---
Clay	87	18	---	88
Glass	5	75	---	---
Microsparite	---	---	99	---
Muscovite	2	2	---	3
Opaques	Tr	---	---	---
Organic matter	Tr	---	---	---
Plant	---	---	---	Tr
Quartz	Tr	2	---	2
Unspecified minerals	2	Tr	---	6



SITE 765 HOLE C CORE 61R CORED INTERVAL 916.9-926.4 mbsf



LITHOLOGIC DESCRIPTION

CLAYSTONE, SILTY CLAYSTONE, AND CLACAREOUS CLAYSTONE

Major lithology: CLAYSTONE, SILTY CLAYSTONE, AND CALCAREOUS CLAYSTONE. Claystone and silty claystone dominantly shades of reddish brown (2.5YR 3/2-3/6, 4/4, 4/8), with local light greenish gray (5G 7/1) mottles (typically parallel to bedding) that may be reduction halos around organic matter or thin volcanic ash partings. XRD analysis of several samples from Section 1 indicate the presence of illite/montmorillonite, quartz, and expanding clays. As much as 20% white silt and lesser fine sand, occur as disseminated grains or concentrated into wispy laminae; consists mainly of quartz, with lesser muscovite, opaques, apatite, radiolarians, and plagioclase. Mostly massive, local blocky fracture, in Sections 1 and 2.

Cauliflower-shaped hardground in claystone at Section 2, 93 cm; consists of an irregular black (Mn oxide?) crust, 1 mm thick with as much as 5 cm of vertical relief. Pebbles (as much as 2 cm in diameter) of black Mn oxide(?) and white shell fragments occur just below the crust.

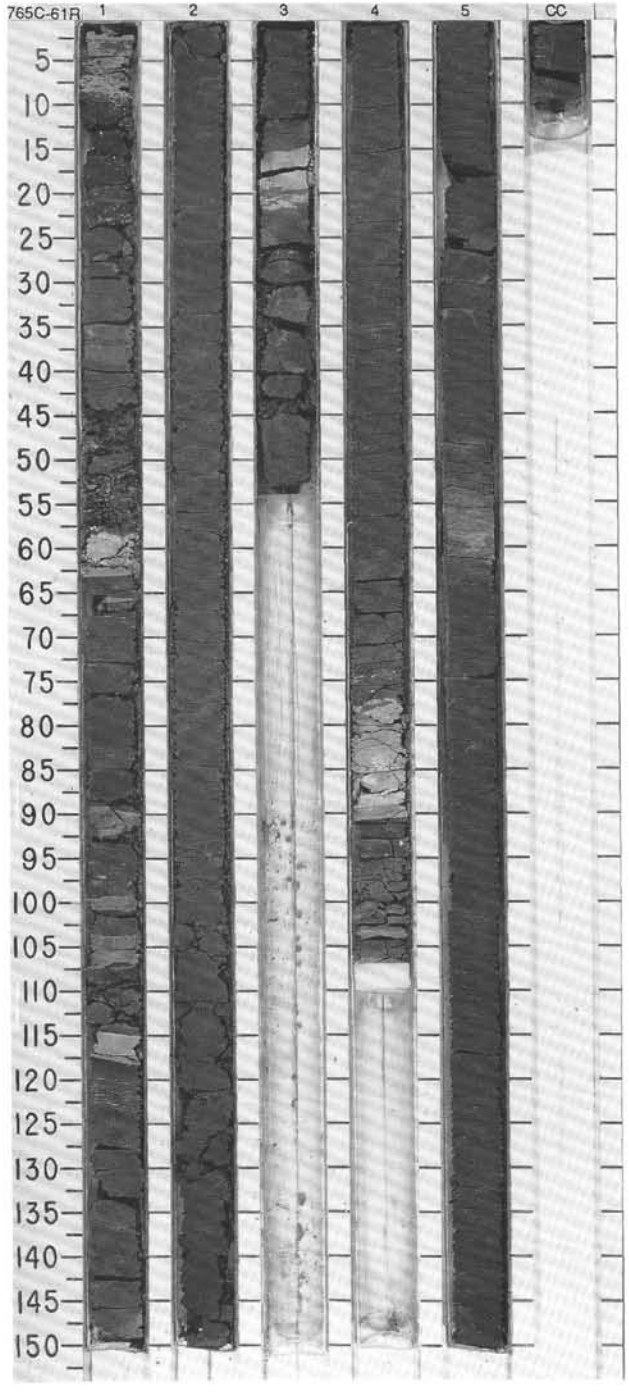
Calcareous, locally silty claystone is red to reddish brown (2.5YR 3/2, 3/4, 5/6, 5YR 3/2); calcareous fraction largely bivalve ("*Inoceramus*") fragments. Locally contains 10-20% scattered white silt and snad (mostly shell fragments) as much as 2 mm in size, and Mn oxide micronodules(?) (mostly mm-size, but a few to 0.5 cm). Vague but pervasive fabric of closely-spaced wispy white lenses and laminae suggests intense bioturbation. Occurs in Section 3 (top) to base of core. Calcareous claystone in Section 4, 97-107 cm and Section 5, 55-62 cm contains abundant etched nannofossils.

Minor lithologies:
a. Bentonite(?), light to dark greenish gray (5G 5/1-7/1, 5BG 4/1), dominately clay-sized but may contain floating silt to fine-grained sand. Waxy appearance, soapy feel. Smear slides indicate presence of glass shards, typically altered or degraded; XRD analysis indicates abundant illite/montmorillonite, quartz, and expanding clays. Boundaries gradational to sharp. Occurs in Sections 1 (0-8, 58-63, 66, 89-93, 100-101, 104-107, 114-125), and 4(90-91).
b. Limestone, Section 3 (16-20 cm), light greenish gray (2.5YR 3/4), consists of 1 by 10 u needles that may be aragonite-possible biogenic components? Abundant wispy white laminae. Minor constituents are "*Inoceramus*" prisms, calcisphere(?), and quartz silt.
c. Cavings, Section 1, (23-27 cm), several porphyritic volcanic pebbles, 2-3 cm diameter.

SMEAR SLIDE SUMMARY (%):

	1, 41 D	1, 61 M	1, 98 M	1, 105 M	1, 112 D	1, 118 M	2, 81 D
TEXTURE:							
Sand	---	1	25	3	2	2	5
Silt	17	9	10	96	5	2	5
Clay	83	90	65	1	93	96	90

(cont.)



SITE 765 HOLE C CORE 61R CORED INTERVAL 916.9-926.4 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE/ FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYS. PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
								1	0.5 1.0					(cont.)
								2						
								3						
								4						
								5						
								6						
								7						
								CC						

(cont.)

COMPOSITION:

Accessory minerals	5	Tr	---	3	Tr	---	---
Apatite	2	3	---	---	2	---	---
Calcite	---	---	---	---	---	2	1
Chert	---	---	---	---	---	---	1
Clay	81	90	40	1	91	94	89
Feldspar	Tr	---	2	6	---	Tr	Tr
Foraminifers	---	---	Tr	---	---	---	1
Glass	---	---	---	12	---	---	---
Mica	---	---	1	---	---	---	Tr
Muscovite	2	1	---	---	---	---	---
Opaques	5	2	---	8	3	Tr	Tr
Plant	Tr	---	---	---	---	---	---
Pyrite	---	---	---	Tr	Tr	---	---
Quartz3	2	20	66	2	2	2	
Radiolarians	---	---	Tr	---	---	2	Tr
Rock fragment	---	---	37	---	---	---	---
Silica	---	---	---	---	Tr	---	---
Spicules	---	---	---	---	Tr	---	---
Tourmaline	---	---	---	Tr	---	---	---

SMEAR SLIDE SUMMARY (%):

	2, 93 M	2, 96 M	2, 142 D	3, 8 D	3, 16 M	3, 19 M	4, 104 M
TEXTURE:							
Sand	2	10	9	11	60	6	3
Sil	12	2	11	12	15	2	12
Clay	86	88	80	77	25	92	85
COMPOSITION:							
Accessory minerals	---	Tr	Tr	---	---	---	---
Bioclast	---	---	---	---	2	---	---
Bivalves	---	---	---	11	---	5	1
Calcareous fragments	3	---	---	---	---	---	4
Calcispheres	---	---	---	---	44	---	---
Calcite	---	2	---	3	---	92	---
Chert	---	---	---	---	3	---	---
Clay	85	56	80	77	5	---	85
Dinoflagellate	---	---	---	---	---	2	---
Feldspar	---	Tr	---	---	---	---	---
Foraminifers	---	Tr	---	---	3	---	---
Glass	---	---	Tr	---	---	---	---
Glauconite	---	---	---	---	Tr	---	---
Micrite	---	---	---	---	40	---	---
Muscovite	---	---	Tr	---	---	---	1
Nannofossils	---	---	---	---	---	---	Tr
Opaques	1	---	2	2	---	---	1
Quartz	1	2	15	3	3	1	4
Radiolarians	---	10	---	---	---	---	---
Rock fragment	---	Tr	---	---	---	---	---
Silica	---	30	---	---	---	---	---
Unknown	6	---	---	---	---	1	
Zircon	---	---	---	---	---	---	Tr

SMEAR SLIDE SUMMARY (%):

	5, 31 D	5, 51 D
TEXTURE:		
Sand	30	---
Silt	5	---
Clay	65	1
COMPOSITION:		
Bioclast	30	15
Calcispheres	---	Tr
Clay	65	68
Feldspar	Tr	Tr
Mica	Tr	Tr

SITE 765 HOLE C CORE 62R CORED INTERVAL 926.4-935.8 mbsf

TIME-ROCK UNIT: UPPER BERRIASIAN - VALANGINIAN (BF:A/P PF:B)

BIOSTRAT. ZONE/FOSSIL CHARACTER: FORAMINIFERS ●BF:A/P PF:B; (P. ciriouniensis); NANNOFOSSILS ●BF:C/P PF:B● C/P● C/P●; RADIOLARIANS ●B A.U.12 - 13 ●R/M; DIATOMS; PALYNOMORPHS ●B

PALEOMAGNETICS: N R N?

PHYS. PROPERTIES

CHEMISTRY: ●$CaCO_3$=40.7% ●$CaCO_3$=43.1% TOC=0.0% ●$CaCO_3$=0.4%

SECTION: 1 2 3 4 CC

METERS: 0.5 1.0

GRAPHIC LITHOLOGY

DRILLING DISTURB.

SED. STRUCTURES

SAMPLES: XRF XRD XRD XRD

LITHOLOGIC DESCRIPTION

CALCAREOUS SILTY CLAYSTONE

Major lithology: CALCAREOUS SILTY CLAYSTONE, dark brown, reddish brown, reddish gray, red (2.5YR 3/2, 5YR 4/2, 4/3, 7.5YR 3/2). Carbonate bomb analyses indicate as much as 43% CaCO3. Silt disseminated or concentrated into faint stringers, layers and lenses; largely calcite and quartz, lesser feldspar, muscovite. Sparsely scattered calcareous shell fragments occur mostly as rounded or subrounded granules a few mm in size; Section 2 contains entire pelecypods 1 cm in diameter (at 3-6 cm) and a belemnite fragment 1 cm long (at 30 cm). Mn oxide(?) nodules, commonly 2 mm in size, rarely as much as 1 cm, are particularly notable in Section 1, 126-134 cm and Section 2, 3-6, 75 cm. In Section 1, 55-65 cm, dark reddish brown to greenish gray (5YR 3/4, 5G 6/1) calcareous claystone with wavy to parallel silty laminae contains relatively abundant etched nannofossils.

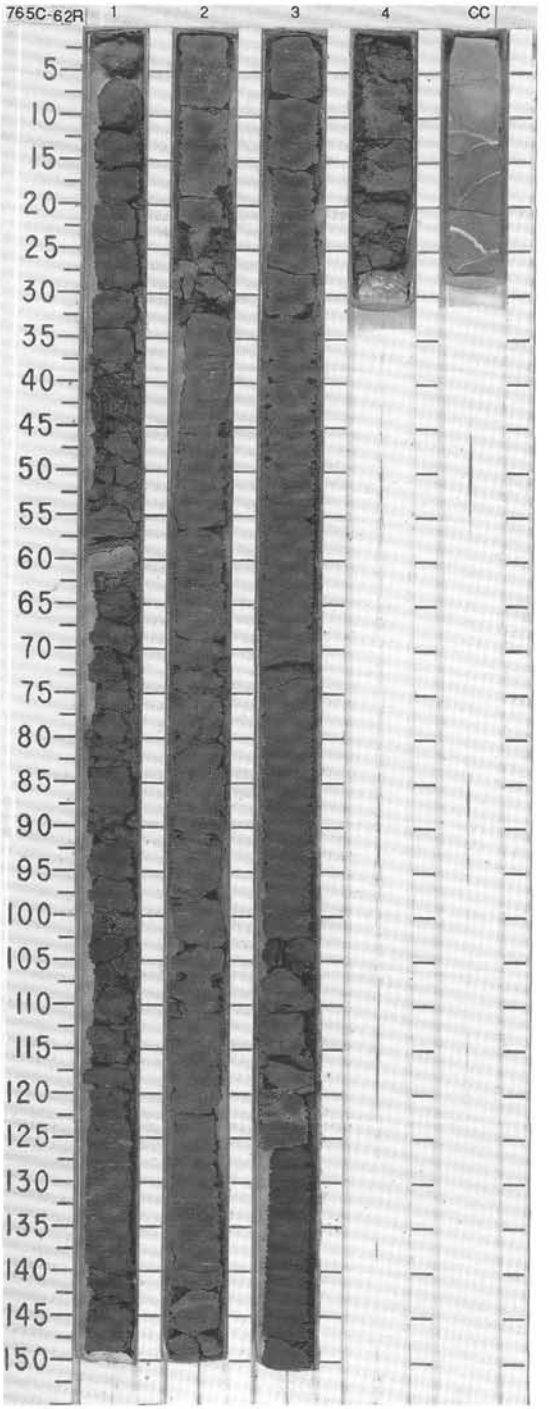
Minor lithology: Claystone, dark reddish brown (5YR 3/2), homogeneous and relatively featureless; contains as much as 7% quartz, minor feldspar, and muscovite. Contact between claystone and basalt marked by chloritized basalt pebbles as much as 3 cm long floating in a matrix of white sparry calcite cement and very dusky red (5R 2.5/4) claystone.

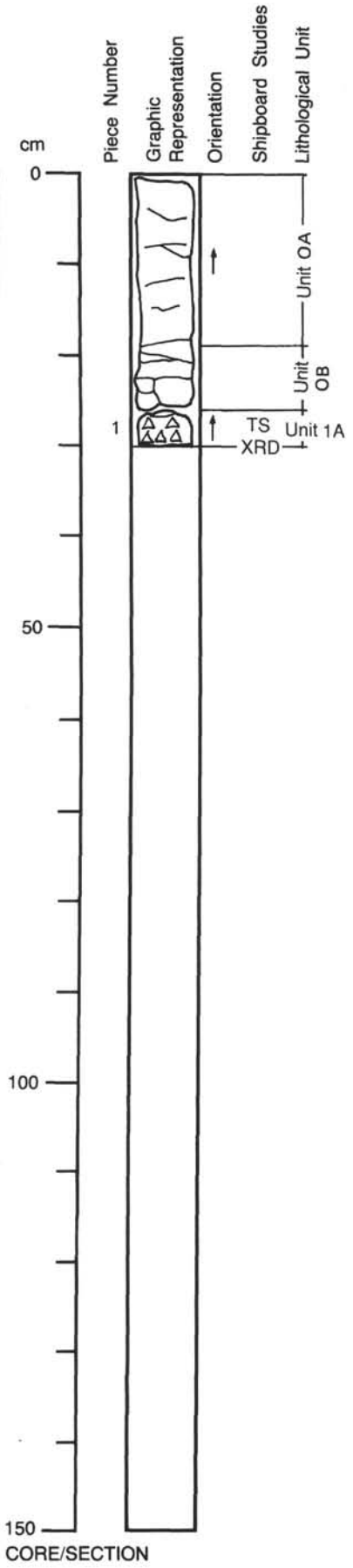
SMEAR SLIDE SUMMARY (%):

	1, 25 D	1, 128 M	1, 135 M	1, 137 D	2, 1 M	3, 4 M	3, 80 D
TEXTURE:							
Sand	1	25	60	10	35	—	—
Silt	34	65	—	50	—	—	5
Clay	65	10	40	40	65	—	95
COMPOSITION:							
Bioclast	—	—	60	—	35	40	—
Calcite	20	78	—	50	—	—	—
Clay	68	10	40	30	65	60	90
Feldspar	5	5	—	15	—	—	2
Foraminifers	—	—	—	—	Tr	—	—
Mica	—	—	—	—	—	Tr	—
Muscovite	2	—	—	—	—	—	1
Nannofossils	—	Tr	—	Tr	—	—	—
Opaques	—	2	—	—	—	—	—
Quartz	5	5	Tr	5	Tr	Tr	7
Silicious fragments	—	—	—	—	—	—	Tr

SMEAR SLIDE SUMMARY (%):

	3, 86 D	4, 24 M
TEXTURE:		
Sand	10	—
Silt	15	2
Clay	75	98
COMPOSITION:		
Accessory minerals	1	—
Chert	3	—
Clay	75	99
Feldspar	2	Tr
Foraminifers	3	—
Mica	1	—
Muscovite	—	Tr
Opaques	4	—
Quartz	10	1
Unspecified minerals	1	—



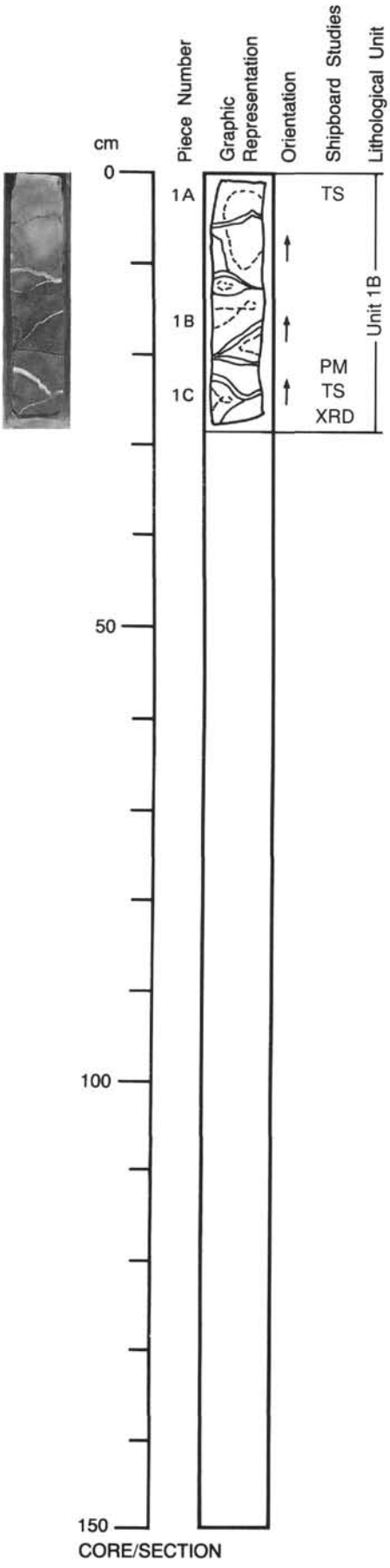


123-765C-62R-4

UNIT 1A: HYALOCLASTITE

Pieces 62R-4, 1

CONTACTS: Subhorizontal; conformably overlain by reddish brown -claystone still attached to hyaloclastite. Glass completely altered to chlorite and veined by calcite.
PHENOCRYSTS: Aphyric
GROUNDMASS: Originally glassy
VESICLES: None
COLOR: Grayish green. The breccia matrix comprises dark reddish brown clay and white calcite giving the rock a variegated appearance. The clay content decreases downward.
STRUCTURE: Hyaloclastite breccia.
ALTERATION: Completely altered. Chloritized.
VEINS/FRACTURES: Frequent calcite veins, 0.1-0.8 mm thick.
ADDITIONAL COMMENTS: The reddish brown overlying claystone contains subhorizontal calcite veins, 1 mm thick. Breccia size/shape: Lapilli (2-30 mm); angular to subrounded, subhorizontal flakes.



123-765C-62R-CC

UNIT 1B: SPARSELY OLIVINE-PLAGIOCLASE PHYRIC BASALT

Pieces 62R-CC, 1A-1C

CONTACTS: None

PHENOCRYSTS: Uniform distribution.
Olivine - 1%; 0.5-2 mm; Euhedral-subhedral, completely replaced by chlorite.
Plagioclase - ~0.1%; 0.5 mm; Subhedral, fresh.

GROUNDMASS: Uniformly fine-grained. Plagioclase microlites, 0.2-0.4 mm in size, are visible using a hand lens.

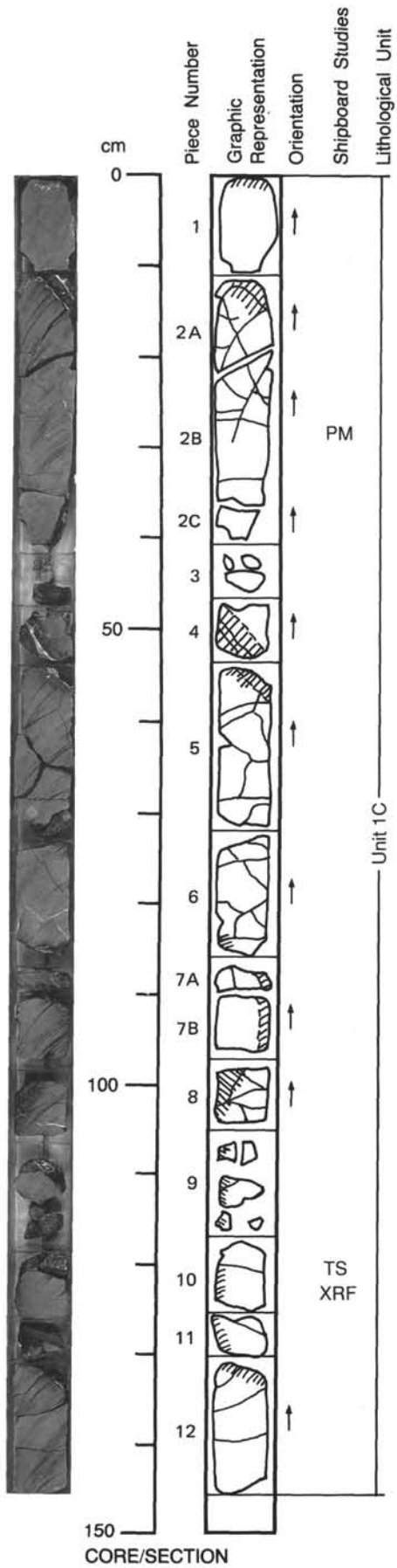
VESICLES: 1-2%; 0.5-1.5 mm; Round; Filled by calcite away from fractures in the greenish gray areas of rock and by chlorite near to fractures. This zonation in vesicle fillings is particularly evident in the upper part of the core.

COLOR: Light bluish gray from 0-10 cm and dark gray from 10-30 cm. Color changes from greenish gray to grayish brown or brownish orange on approaching fractures filled by calcite and chlorite. These alteration fronts, parallel to fracture surfaces, produce liesegang alteration rings varying from 1-10 cm in diameter.

STRUCTURE: Pillow basalts.

ALTERATION: Highly altered; Degree of alteration increases upward from Piece 1C to Piece 1A.

VEINS/FRACTURES: 0.5-6 mm wide, filled mainly by calcite, with some subvertical fractures filled by chlorite. The subvertical fractures are cut by later calcite-filled veins. The calcite veins are symmetrically zoned with 2 to 4 different stages of precipitation.



123-765C-63R-1

UNIT 1C: SPARSELY PLAGICLASE-OLIVINE PHYRIC BASALT

Pieces 63R-1, 1-12 and 63R-2, 1

CONTACTS: This section cuts through at least 6 pillow basalts whose margins are clearly marked by black, fresh glass rinds, 1-3 cm thick. Pillow 1: Piece 1, >10 cm thick. Upper contact is formed by subhorizontal altered glass zone 5 mm thick. Lower contact was not recovered. Pillow 2: Pieces 2-4, >40 cm thick. Upper contact is at the top of Piece 2; azimuth 180 degrees and dip 50 degrees.Composed of fresh glass 2.5 cm thick. Calcite veins are present in the middle of the glass zone. Lower contact is at the bottom of Piece 4; azimuth 180 degrees, dip 55 degrees. Composed of fresh glass 3 cm thick. A 3-10 mm thick calcite vein, which includes red and green particles, cuts through the middle of the glass zone. Pillow 3: Pieces 5 and 6, >35 cm thick. Upper contact is at the top of Piece 5; azimuth 180 degrees and dip 40 degrees. Composed of fresh glass 1.8 cm thick. A 5 mm thick calcite vein, which includes red and green, angular, basaltic particles, cuts through the glass zone. Lower contact is at the bottom of Piece 6; azimuth 70 degrees and dip 60 degrees. Composed of fresh glass 2 mm thick. Pillow 4: Piece 7, ~20 cm thick.Contact down righthand side of piece;azimuth 160 degrees and dip 85 degrees. Composed of fresh glass 5-10 mm thick, slightly curved along a circle with diameter of 20 cm. Pillow 5: Pieces 8-11, >30 cm thick. Upper contact is at the top of Piece 8; azimuth 0-45 degrees and dip 55 degrees. Composed of fresh glass 2.5 cm thick; fractured in the middle at the margin. Lower contact is not seen, although a glass margin seems to continue along the lefthand side of Pieces 9-11; azimuth 0 degrees and dip 90 degrees. Pillow 6: Piece 12, >15 cm thick. Upper contact is at the top of Piece 12; azimuth 180 degrees and dip 40 degrees. Composed of fresh glass 5 mm thick with calcite veins in the middle. Lower contact is at the bottom of Piece 1 (Section 63R-2); azimuth 270 degrees and dip 40 degrees. Composed of fresh glass 3-5 mm thick.

PHENOCRYSTS: Pillow cores.
Plagioclase - 1%; 0.7-2 mm; Subhedral-tabular or equant, fresh.
Olivine - <0.5%; 0.5-0.7 mm; Euhedral, completely replaced by bright green clay minerals.

GROUNDMASS: Uniformly fine-grained in pillow centers; plagioclase microlites are too small to be seen by hand lens. Pillow margins are holohyaline: most glass is fresh. Rare plagioclase phenocrysts, 0.5 mm in size, are present in the glass; olivine phenocrysts are barely visible.

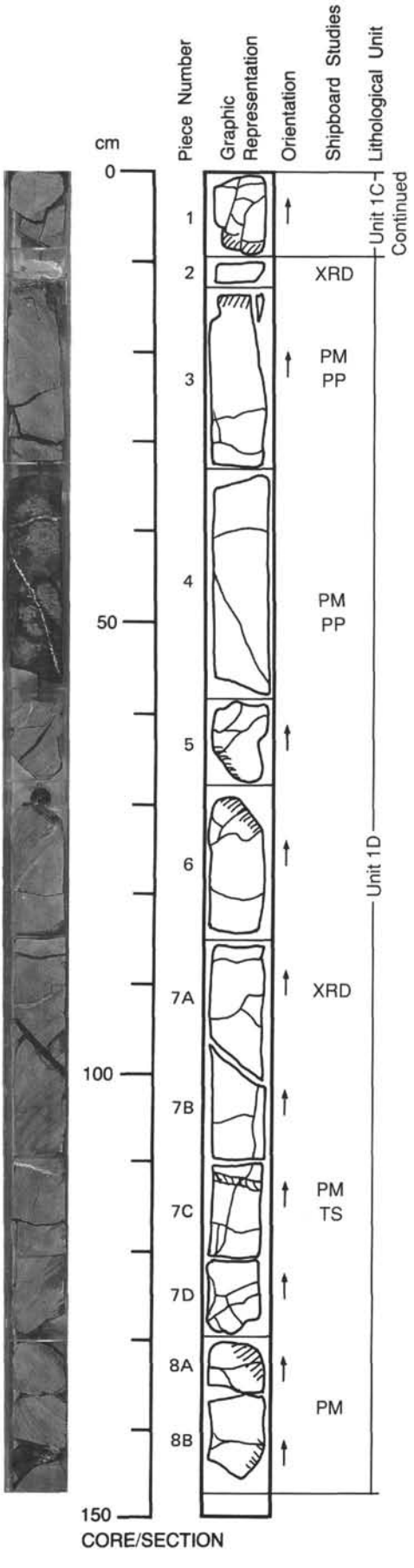
VESICLES: <1%; 0.2-1 mm; Spherical; Even to scarce; Filled with green chlorite or with calcite. Evenly distributed in the pillow core, but scarce in the pillow rims.

COLOR: Pillow cores are medium dark gray: pillow rims are black. The core-rim boundary is sometimes stained brown.

STRUCTURE: Pillow basalts. Although curved glass margins are present, radiating fractures perpendicular to the pillow surface are not developed.

ALTERATION: Slightly altered. The glass may be 40-50% altered, but pillow cores are relatively fresh except for along major fractures. Olivine phenocrysts are completely replaced by chlorite. In the pillow rims, islands of fresh glass, 5-10 mm in size, are surrounded by dark green clay minerals.

VEINS/FRACTURES: Thick calcite veins are developed in the marginal glass zone that run parallel to the contact. These veins often include 1-2 mm sized, red or green, particles of altered basalt. Calcite veins are also present in the pillow cores, but are thinner (<2 mm) and less abundant. Very thin chlorite veins are also present here. Fractures are developed every 2-5 cm in the pillow interiors. As a result, samples disintegrate into many small pieces when cut by the saw.



123-765C-63R-2

UNIT 1D: APHYRIC BASALT

Pieces 63R-2, 2-8B

CONTACTS: The contact between Units 1C and 1D is formed by an isolated 2 cm-thick piece of calcite (Piece 2), possibly a fragment from a thicker zone of calcareous material filling the pillow interstices, or part of a thick calcite vein. This section cuts through a number of pillow basalts. Piece 2: 2-cm-thick piece of calcite with glass fragments on both sides. The sample is zoned: the upper and lower margins, each 3 mm thick, are composed of clear white calcite; the center is composed of pale brown impure calcite. Pillow 1: Pieces 3-5, >50 cm thick. Upper contact is at the top of Piece 3; azimuth 60 degrees and dip 15 degrees. Composed of fresh glass 1 cm thick. Lower contact is at the bottom of Piece 5; azimuth 180 degrees, dip 45 degrees. Composed of glass 2-3 mm thick. Grain size and crystallinity increases dramatically toward the center of the pillow. Pillow 2: Piece 6-7D, >58 cm thick. Upper contact is at the top of Piece 6; azimuth 180 degree and dip 40 degree. Composed of fresh glass 1-2 mm thick. Lower contact not seen, but grain size would suggest likely position 5 cm below the bottom of Piece 7D. Grain size and crystallinity increases inward. Pillow 3: Pieces 8A and 8B; thickness not determined. Upper contact is at the top of Piece 8A; azimuth 180 degrees, dip 50 degrees, slightly convex upward. Composed of fresh glass 1 cm thick. Lower contact is not seen, although there is a spherulitic zone on the lower righthand side of Piece 8B which may represent the marginal part of a pillow. No variation in crystallinity is apparent in this pillow, suggesting small size.

PHENOCRYSTS: Uniformly distributed.
Plagioclase - <0.3%; 0.5-1.0 mm; Tabular-equant, fresh.
Olivine - <0.2%; 0.5 mm; Euhedral, completely replaced by chlorite.

GROUNDMASS: Uniformly fine-grained in the pillow core, where plagioclase microlites are visible by hand lens. Grain size decreases toward pillow margins, becoming glassy at the very rim.

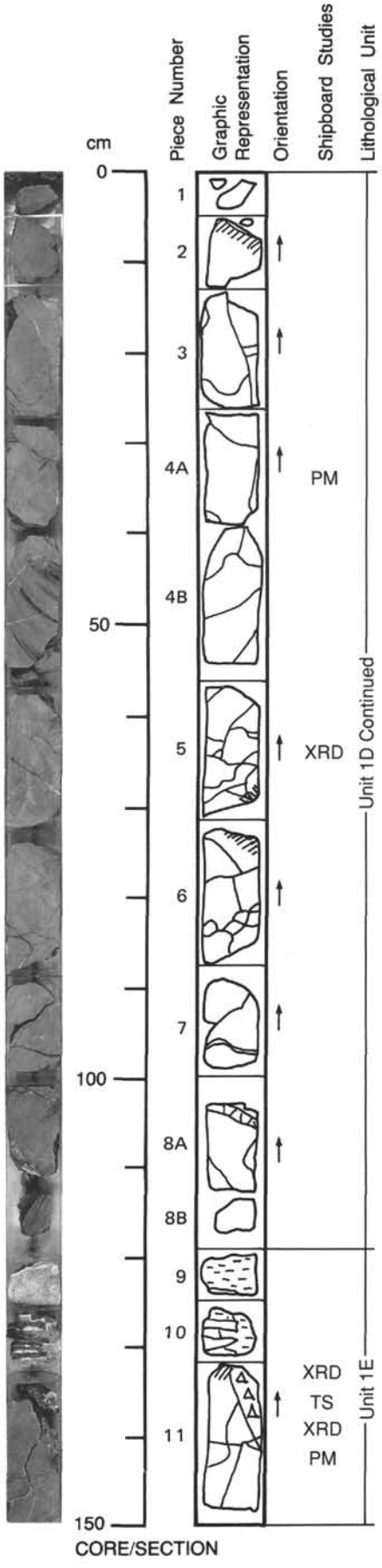
VESICLES: <0.5%; 0.2-0.7 mm; Spherical; ?; Filled by chlorite or zeolites.

COLOR: Pillow core is slightly greenish to medium dark gray; marginal part is dark gray, and the rim is black.

STRUCTURE: Pillow basalts with well defined zonal variation in crystallinity and grain size. Radial joints are not developed.

ALTERATION: Slightly altered. The glass may be 40-50% altered, the pillow cores are relatively fresh except for along major fractures. Olivine phenocrysts are completely replaced by chlorite. In the pillow rims, islands of fresh glass, 5-10 mm in size, are surrounded by dark green clay minerals.

VEINS/FRACTURES: Thin calcite veins are present in all pieces. Piece 7A (91-93 cm): Clay minerals fill a fracture. Piece 7C (111-112 cm): A 4 mm thick calcite vein containing tiny basalt fragments occurs in the middle of the pillow.



123-765C-63R-3

UNIT 1D: APHYRIC BASALT

Pieces 63R-3, 1-8B

CONTACTS: This section cuts through a series of pillow basalts and is a continuation of Unit 1D. Pillow 4: Piece 1; no contacts evident. This piece may be part of pillow number 3. Pillow 5: Pieces 2-5, >66 cm thick. Upper contact is at the top of Piece 2; azimuth 180 degrees and dip 45 degrees. Only a thin slice of the glass rind is preserved. Lower contact is at the bottom of Piece 5; azimuth 0 degrees and dip 45 degrees. Only a thin slice of the glass rind is preserved. Piece 4B is the most coarse-grained; grain size decreases toward Pieces 2 and 5. Pillow 6: Pieces 6-8B, >45 cm thick. Upper contact is at the top of Piece 6; azimuth 180 degrees and dip 50 degrees. Composed of glass 7 mm thick. Lower contact is not seen, but grain size decreases from the pillow center toward Piece 8B.

PHENOCRYSTS: Uniformly distributed.
Plagioclase - <0.3%; 0.5-1.0 mm; Tabular-equant, fresh.
Olivine - <0.2%; 0.5 mm; Euhedral, completely replaced by chlorite.

GROUNDMASS: Uniformly fine-grained in the pillow core, where plagioclase microlites are visible by hand lens. Grain size decreases toward pillow margins, becoming glassy at the very rim.

VESICLES: <0.5%; 0.2-0.7 mm; Spherical; Filled by chlorite or zeolites.

COLOR: Pillow core is slightly greenish to medium dark gray; marginal part is dark gray, and the rim is black.

STRUCTURE: Pillow basalts with well defined zonal variation in crystallinity and grain size. Radial joints are not developed.

ALTERATION: Slightly altered. The glass may be 40-50% altered, but pillow cores are relatively fresh except for along major fractures. Olivine phenocrysts are completely replaced by chlorite. In the pillow rims, islands of fresh glass, 5-10 mm in size, are surrounded by dark green clay minerals.

VEINS/FRACTURES: Thin calcite veins are present in all pieces. Pillow 6: Cut by 2-7 mm wide, red-brown and yellow-brown veins, with or without calcite.

UNIT 1E: APHYRIC BASALT

Pieces 63R-3, 9-11 and 63R-4, 1 and 2

CONTACTS: The upper contact against Unit 1D was not recovered. Units 1D and 1E are separated by inter pillow calcite (Piece 9) and a hyaloclastite with calcite matrix (Piece 10 and the top of Piece 11). This section cuts through a single pillow basalt. Piece 9: 5-cm-thick, pale green, medium-grained calcite vein. Original orientation was approximately subhorizontal. Glassy basalt fragments are present on the top and bottom of the piece. Pieces 10 and 11: Subhorizontal altered glassy basalt flakes (5 cm wide and 3-7 mm thick) and subangular red or green basalt fragments are buried in a calcite matrix. The calcite is partly white, and partly pale green or an impure/dirty pale orange. The breccia is present only in the upper half of Piece 11. Pillow 1: Piece 11 and Pieces 63R-4, 1 and 2, >45 cm thick. Upper contact is in the middle of Piece 11; azimuth 180 degrees and dip 70 degrees. Composed of a dark gray, fine-grained basalt, with a small piece of glass directly in contact with the hyaloclastite. Lower contact is at the bottom of Section 63R-4, Piece 2; azimuth and dip not determined. Composed of abraded glass on the underside of the piece.

PHENOCRYSTS: Aphyric

GROUNDMASS: Fine-grained in pillow center; microcrystalline to glassy at pillow margin.

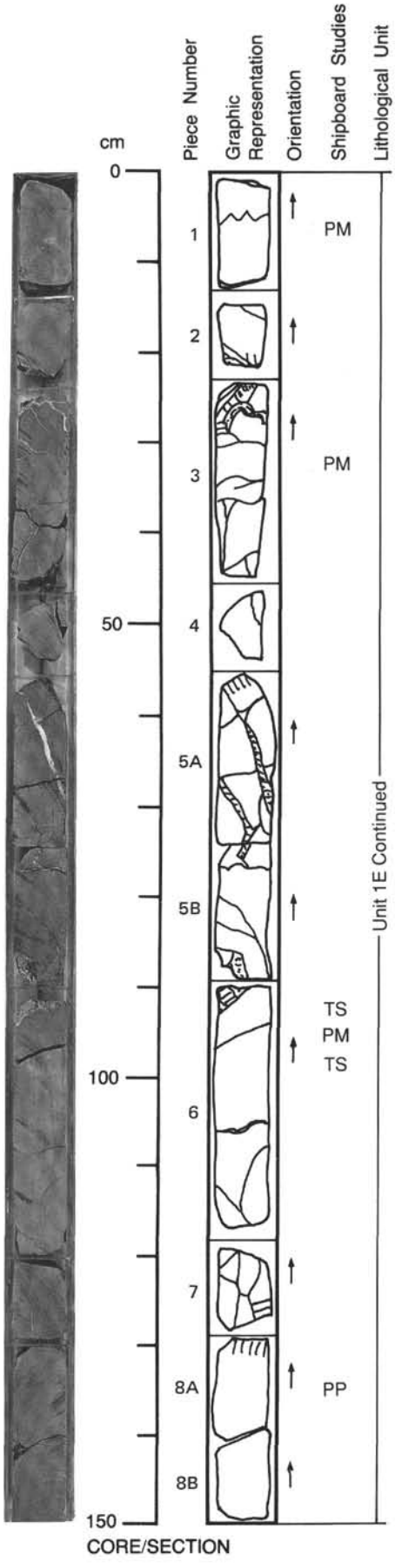
VESICLES: <0.5%; 0.2-0.8 mm; Spherical; ?; Filled with chlorite.

COLOR: Medium dark gray.

STRUCTURE: Pillow basalt: Fragments from a single pillow overlain by hyaloclastite.

ALTERATION: Strongly altered basalt fragments in the hyaloclastite. Slightly altered in the pillow interior.

VEINS/FRACTURES: The pillow is cut by several 1 mm thick calcite veins formed along fractures. In Section 63R-4, Pieces 1 and 2, there are several veins filled with a brown mineral, and with calcite and chlorite.



123-765C-63R-4

UNIT 1E: APHYRIC BASALT

Pieces 63R-4, 3-8B and 63R-5, 1-11

CONTACTS: This section cuts through a series of pillow basalts and is a continuation of Unit 1D. Pillow 2: Piece 63R-4, 3 and 4 >32 cm thick. Upper contact is at the top of Piece 3; azimuth ~0 degree and dip 45 degrees. Composed of glassy flakes altered to chlorite and calcite. Lower contact is not seen. Pillow 3: Pieces 63R-4, 5A-7, >75 cm thick. Upper contact is at the top of Piece 63R-4, 5A; azimuth 340 degrees and dip 40 degrees. Composed of abraded glass with adjacent spherultic texture. Lower contact is at the bottom of Piece 63R-4, 7; azimuth and dip not determined. Composed of spherultic margin with no glass. Grain size increases from the margins toward Piece 63R-4, 5B and the top of Piece 63R-4, 6. Pillow 4: Pieces 63R-4, 8A and 8B and Pieces 63R-5, 1-3, > 55 cm thick. Upper contact is at the top of Piece 8A; azimuth 180 degrees and dip 10 degrees. Composed of glass with adjacent spherulitic texture. Lower contact in Pieces 63R-5, 2 and 3; azimuth and dip not measured as pieces are unoriented. Composed of glass 3-5 mm thick. Grain size increases from glassy at pillow rims to fine-grained in pillow center.

PHENOCRYSTS: Aphyric; with occasional glomerocrysts, several millimeters in diameter. Phenocrysts are uniformly distributed.
Olivine - <1%; 1-2 mm; Euhedral-equant and completely replaced by chlorite, calcite, and iron oxides.
Plagioclase - <1%; 1-2 mm
Clinopyroxene - <1%; 1-2 mm

GROUNDMASS: Glassy to microcrystalline at pillow margins; fine-grained (<1 mm) in pillow center.

VESICLES: ?; < 1 mm; round; ?; Most are filled with calcite.

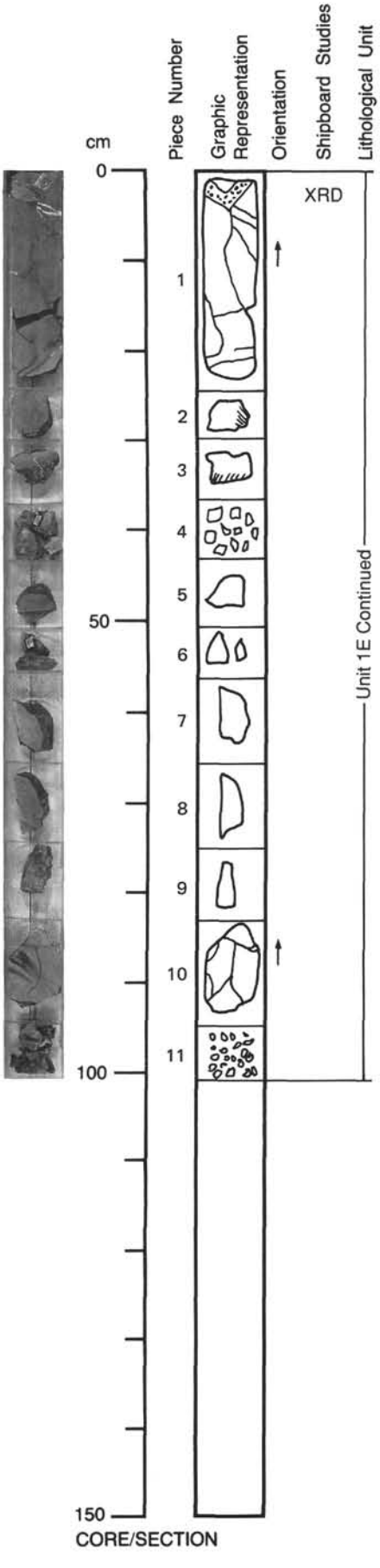
COLOR: Gun metal gray when rock is fine-grained and fresh; browner when coarser grained. Color changes are related to veining in the form of halos.

STRUCTURE: Pillow basalts having glassy margins and spherulitic textures.

ALTERATION: Fresh to slightly altered; most alteration is restricted to veins and alteration halos. A prominent breccia is evident in Pieces 5 and 6. Vesicles are filled by, and olivine replaced by, calcite, chlorite, and iron-oxides.

VEINS/FRACTURES: Veins are present in most pieces and can form up to 5% of the rock in some cases; average vein width is 1 mm and maximum vein width is 5 mm. Associated alteration halos can be up to 1 cm wide. Veins are filled with calcite, chlorite, and/or a brown mineral as multi-stage fillings. The bottom of Piece 63R-4, 5 and top of Piece 63R-4, 6 contains a brecciated vein 1 cm thick filled by calcite and an orange, fibrous, alteration mineral.The top of piece 63R-5, 1, contains a 1.5 cm thick fracture filled with orange, red, green, and white (calcite?) minerals.

ADDITIONAL COMMENTS: Pieces 63R-5, 4-11 have the same characteristics as those described above except Piece 63R-5, 4: Altered grayish green basalt fragments. Maximum size 3 cm. Piece 63R-5, 5: Slightly altered basalt fragment from pillow margin; no glass. 4 cm across. Piece 63r_5, 6: Altered dark gray to dark reddish brown basalt fragment. 4 X 2 cm. Piece 63R-5, 7: Slightly altered basalt fragment from pillow margin. 7 X 3 cm.Piece 63R-5, 9: Altered grayish green to black basalt fragment from pillow margin with glass zone. Piece 63R-5, 10: Slightly altered dark gray basalt fragment from pillow center, 9 cm long. The piece is cut by 1-2 mm thick veins filled by a brown mineral that shows no reaction to dilute HCL.



123-765C-63R-5

UNIT 1E: APHYRIC BASALT

Pieces 63R-4, 3-8B and 63R-5, 1-11

CONTACTS: This section cuts through a series of pillow basalts and is a continuation of Unit 1D. Pillow 2: Piece 63R-4, 3 and 4 >32 cm thick. Upper contact is at the top of Piece 3; azimuth ~0 degree and dip 45 degrees. Composed of glassy flakes altered to chlorite and calcite. Lower contact is not seen. Pillow 3: Pieces 63R-4, 5A-7, >75 cm thick. Upper contact is at the top of Piece 63R-4, 5A; azimuth 340 degrees and dip 40 degrees. Composed of abraded glass with adjacent spherultic texture. Lower contact is at the bottom of Piece 63R-4, 7; azimuth and dip not determined. Composed of spherultic margin with no glass. Grain size increases from the margins toward Piece 63R-4, 5B and the top of Piece 63R-4, 6. Pillow 4: Pieces 63R-4, 8A and 8B and Pieces 63R-5, 1-3, > 55 cm thick. Upper contact is at the top of Piece 8A; azimuth 180 degrees and dip 10 degrees. Composed of glass with adjacent spherulitic texture. Lower contact in Pieces 63R-5, 2 and 3; azimuth and dip not measured as pieces are unoriented. Composed of glass 3-5 mm thick. Grain size increases from glassy at pillow rims to fine-grained in pillow center.

PHENOCRYSTS: Aphyric; with occasional glomerocrysts, several millimeters in diameter. Phenocrysts are uniformly distributed.
Olivine - <1%; 1-2 mm; Euhedral-equant and completely replaced by chlorite, calcite, and iron oxides.
Plagioclase - <1%; 1-2 mm
Clinopyroxene - <1%; 1-2 mm

GROUNDMASS: Glassy to microcrystalline at pillow margins; fine-grained (<1 mm) in pillow center.

VESICLES: ?; < 1 mm; round; ?; Most are filled with calcite.

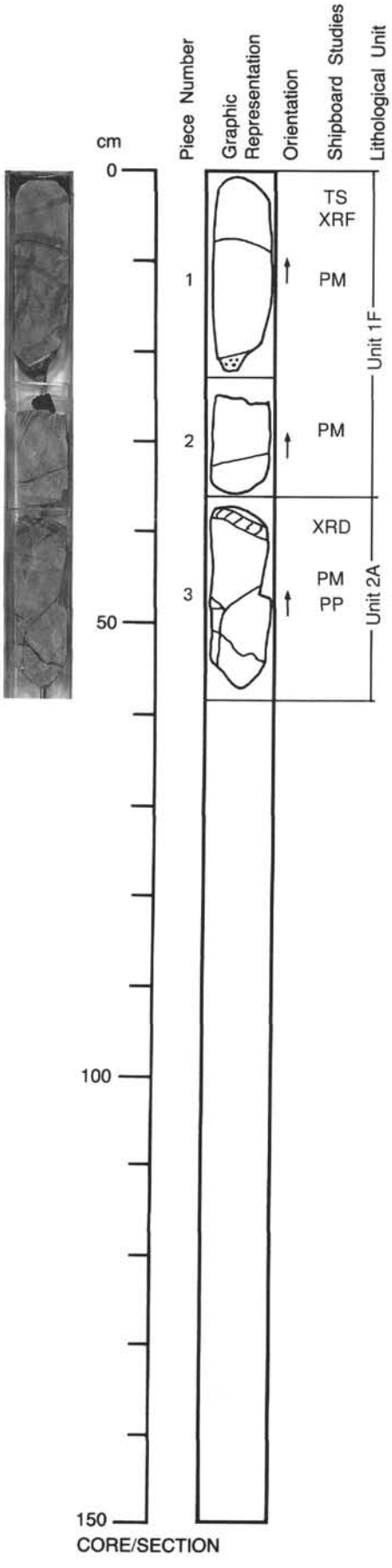
COLOR: Gun metal gray when rock is fine-grained and fresh; browner when coarser grained. Color changes are related to veining in the form of halos.

STRUCTURE: Pillow basalts having glassy margins and spherulitic textures.

ALTERATION: Fresh to slightly altered; most alteration is restricted to veins and alteration halos. A prominent breccia is evident in Pieces 5 and 6. Vesicles are filled by, and olivine replaced by, calcite, chlorite, and iron-oxides.

VEINS/FRACTURES: Veins are present in most pieces and can form up to 5% of the rock in some cases; average vein width is 1 mm and maximum vein width is 5 mm. Associated alteration halos can be up to 1 cm wide. Veins are filled with calcite, chlorite, and/or a brown mineral as multi-stage fillings. The bottom of Piece 63R-4, 5 and top of Piece 63R-4, 6 contains a brecciated vein 1 cm thick filled by calcite and an orange, fibrous, *alteration mineral.The top of piece 63R-5, 1, contains a 1.5 cm thick fracture filled with* orange, red, green, and white (calcite?) minerals.

ADDITIONAL COMMENTS: Pieces 63R-5, 4-11 have the same characteristics as those described above except Piece 63R-5, 4: Altered grayish green basalt fragments. Maximum size 3 cm. Piece 63R-5, 5: Slightly altered basalt fragment from pillow margin; no glass. 4 cm across. Piece 63r_5, 6: Altered dark gray to dark reddish brown basalt fragment. 4 X 2 cm. Piece 63R-5, 7: Slightly altered basalt fragment from pillow margin. 7 X 3 cm.Piece 63R-5, 9: Altered grayish green to black basalt fragment from pillow margin with glass zone. Piece 63R-5, 10: Slightly altered dark gray basalt fragment from pillow center, 9 cm long. The piece is cut by 1-2 mm thick veins filled by a brown mineral that shows no reaction to dilute HCL.



123-765C-64R-1

UNIT 1F: APHYRIC BASALT

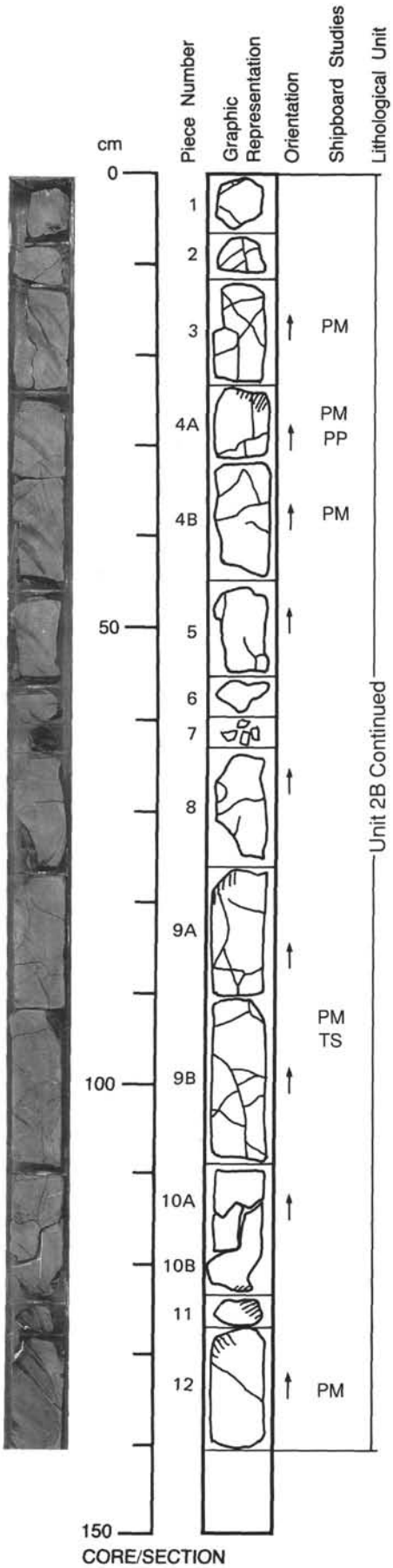
Pieces 64R-1, 1-2

CONTACTS: None
PHENOCRYSTS: Very rare.
Plagioclase - <0.1%; 0.5 mm; Subhedral-equant, fresh.
Olivine - <0.1%; 0.5-2.5 mm; Euhedral, completely replaced by chlorite.
GROUNDMASS: Fine-grained in Piece 2; crystals are visible by naked eye and are doleritic in appearance. Finer grained in Pieces 1 and 3.
VESICLES: ?; < 1 mm; Spherical; Evenly distributed.; Mostly filled with chlorite, but some are filled with calcite.
COLOR: Dark gray in Pieces 1 and 3; medium gray in Piece 2. Moderate brown near veins.
STRUCTURE: Fairly massive; Unit 1F may represent the core of a large pillow (> 1 m thick), a thin sheet flow, or an intrusive body (dike or sheet).
ALTERATION: Altered; more strongly altered along veins. Olivine phenocrysts are completely replaced by chlorite. Plagioclase phenocrysts appear to be mostly fresh, but some are partly replaced by zeolite. Groundmass augite is red under a hands lens and appears to be considerably altered.
VEINS/FRACTURES: Veins of dark yellowish brown and black minerals are common throughout the unit. 1 cm thick veins filled with a reddish brown mineral (?siderite) are present in the bottom of Piece 1 (azimuth 0 degrees dip 35 degrees).

UNIT 2A: APHYRIC BASALT

Pieces 64R-1, 3

CONTACTS: None
PHENOCRYSTS: Very rare.
Plagioclase - <0.1%; 0.5 mm; Subhedral-equant, fresh.
Olivine - <0.1%; 0.5-2.5 mm; Euhedral, completely replaced by chlorite.
GROUNDMASS: Fine-grained
VESICLES: <1 mm; Spherical; Evenly distributed; Mostly filled with chlorite, but some are filled with calcite.
COLOR: Dark gray
STRUCTURE: Fairly massive; Unit 2A may represent the core of a large pillow.
ALTERATION: Altered; More strongly altered along veins. Olivine phenocrysts are completely replaced by chlorite. Plagioclase phenocrysts appear to be mostly fresh, but some are partly replaced by zeolite. Groundmass augite is red under a hand lens and appears to be considerably altered.
VEINS/FRACTURES: Veins of dark yellowish brown and black minerals are common throughout. 1 cm thick vein filled with a reddish brown mineral (?siderite) are present in the top of Piece (azimuth 180 degrees, dip 20 degrees).



123-765C-65R-1

UNIT 2B: APHYRIC BASALT

Pieces 65R-1, 1-12 and 65R-2, 1A-2

CONTACTS: This section cuts through a series of pillow basalts. Pillow 1: Pieces 65R-1, 1-3, >22 cm thick. Upper and lower contacts are not seen, but variation in crystallinity evident: crystalline in Piece 65R-1, 2 and the upper half of Piece 65R-1, 3; glassy in Piece 65R-1, 1 and the lower half of Piece 65R-1, 3. Pillow 2: Pieces 65R-1, 4A-5, >30 cm thick. Upper contact is at the top of Piece 65R-1, 4A; azimuth 180 degrees and dip 35 degrees. Composed of fresh glass zone 6 mm thick. Lower contact is at the bottom of Piece 65R-1, 5 (working half) azimuth 90 degrees and dip 60 degrees. Composed of fresh glass zone 5 mm thick. Variation in crystallinity is evident in the pillow. Pillow 3: Pieces 65R-1, 6-8, >20 cm thick. Upper contact is at the top of Piece 65R-1, 6; azimuth 90 degrees or 270 degrees and dip 60 degrees. Lower contact is not seen. This probably represents a small pillow as variation in crystallinity is not as marked. Pillow 4: Pieces 65R-1, 9A-10B, >45 cm thick. Upper contact is at the top of Piece 65R-1, 9A; azimuth 0 degrees and dip 45 degrees(?). Composed of a small zone of glass. The lower contact is at the bottom of Piece 65R-1, 10B (working half); azimuth 60 degrees dip 40 degrees. Variation in crystallinity is evident in this pillow. Pillow 5: Pieces 65R-1, 11 and 12 and Pieces 65R-2, 1A-2, >29 cm thick. Upper contact at the top of Pieces 65R-1, 11 and 12 (Piece 65R-1, 11 is actually a continuation of Piece 65R-1, 12 in the working half); azimuth 0 degrees and dip 60 degrees. Composed of fresh glass zone 1 cm thick with calcite veining. Lower contact is at the bottom of Piece 65R-2, 2 (working half); azimuth 320 degrees dip 45 degrees. Composed of a glass zone 1 mm thick. Crystallinity greatest in the center of pillow, but still very fine-grained.

PHENOCRYSTS:

Plagioclase - <0.5%; 0.5-3 mm; Subhedral tabular or equant, fresh.
Olivine - <0.5%; 0.5-1 mm; Euhedral, completely replaced by iddingsite or chlorite.
Clinopyroxene - Rare; 0.5 mm; Euhedral-prismatic, fresh. Found only in Piece 65R-1, 11.

GROUNDMASS: Fine-grained subophitic in the pillow core; microcrystalline in the pillow margin; glassy in the pillow rim.

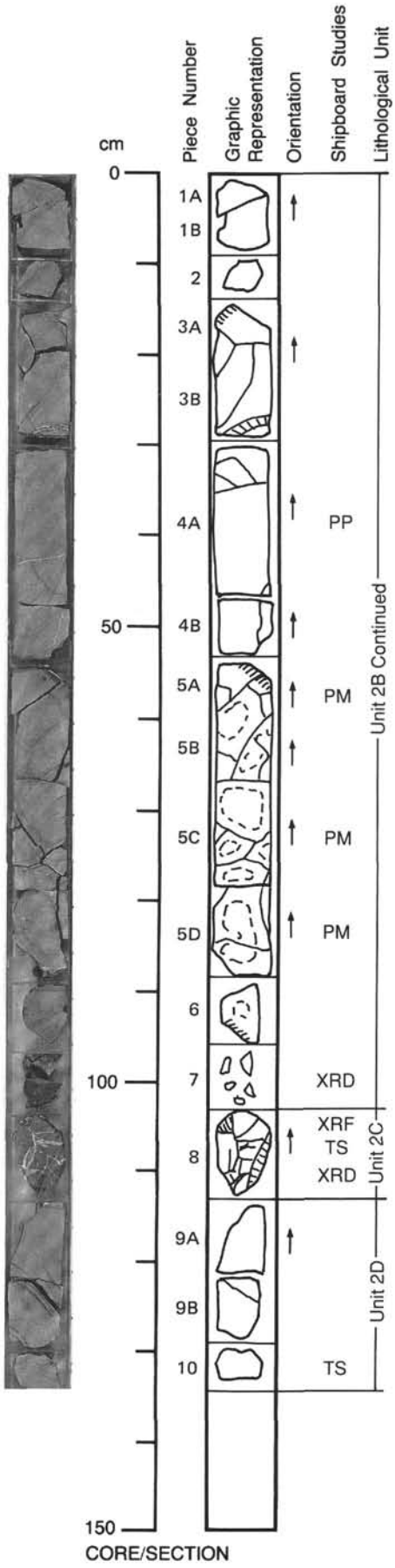
VESICLES: 1-2%; <1 mm; Spherical; Uniformly distributed; Mostly filled with chlorite, but some are filled with calcite.

COLOR: Medium gray in the pillow core, dark gray in the pillow margin, and black at the pillow rim.

STRUCTURE: Pillow basalts. Internal grain size variations remarkably apparent in some of the larger pillows.

ALTERATION: Moderately altered. Olivine is completely replaced by chlorite or iddingsite. Groundmass augite appears to be partly altered. Glass is about 50% replaced by clay minerals. Fresh glass shows obsidian-like luster, but may possibly be devitrified. Vesicles and veins are filled with alteration minerals. The degree of alteration increases down the section, continuing in Section 65R-2.

VEINS/FRACTURES: Calcite and brown veins are present in almost all pieces. the rock breaks easily along the veins. In Piece 65R-1, 3, a thin dark green chlorite vein cuts a 4 mm thick brown vein in a right angle. Dark alteration halos, 1-2 cm wide, are present around the veins; the bulk of the halo free rock is lighter colored and patchy in appearance.



123-765C-65R-2

UNIT 2B: APHYRIC BASALT

Pieces 65R-2, 3A-7

CONTACTS: This sections cuts through a series of pillow basalts and is a continuation of Unit 2B. Pillow 6: Pieces 3A-4B, >38 cm thick. Upper contact is at the top of Piece 3A; subhorizontal contact. Composed of a very thin glass zone. Lower contact is not seen. Coarsest grained in the upper half of Piece 4A, fining toward the margins. Pillow 7: Pieces 5A-6, >40 cm thick. Upper contact is at the top of Piece 5A; azimuth 180 degrees dip 40 degrees. Composed of a partly fresh glass zone 8 cm thick. Lower contact is at the bottom of Piece 6; azimuth 180 degrees, dip 30 degrees. Composed of altered green glassy zone 2 mm thick, Inward changes in grain size are not clear. The degree of alteration increases downward through the pillow toward Piece 8.

PHENOCRYSTS: Evenly distributed.
Plagioclase - <0.5%; 0.5-3 mm; Subhedral tabular or equant, fresh. Piece 3B (25 cm): 5 mm zoned plagioclase megacryst.
Olivine - <0.5%; 0.5-1 mm; Euhedral, completely replaced by chlorite.

GROUNDMASS: Fine-grained subophitic in the pillow core; microcrystalline in the pillow margin; glassy in the pillow rim.

VESICLES: 1-2%; < 1 mm; Spherical; Uniformly distributed.; Mostly filled with chlorite, but some are filled with calcite.

COLOR: Medium gray in pillow core, dark gray in the pillow margin, and black in the pillow rim. Mottled light and dark gray in the halo areas of Pillow 7.

STRUCTURE: Pillow basalts. Internal grain size variations apparent in some of the larger pillows.

ALTERATION: Moderately altered, but degree of alteration increasing toward the breccia of Piece 8. Olivine is completely replaced by chlorite. Glass is about 50% replaced by clay minerals. Vesicles and veins are filled with alteration minerals. Alteration halos evident in Pillow 7.

VEINS/FRACTURES: Calcite and brown veins are present in almost all pieces. Piece 3B (28 cm) contains a basalt breccia veins filled with white calcite; azimuth 110 degrees and dip 50 degrees.

ADDITIONAL COMMENTS: Piece 7: Miscellaneous small fragments of altered basalt resembling Piece 6 (pillow 7) in color and texture. The central part of each fragment is grayish yellow-green, and the margin, medium gray to slightly bluish. Areas of basalt ringed by fractures have dark marginal halos (chlorite-rich?) giving the rock a patchy appearance on the saw-cut surface.

UNIT 2C: SPARSELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

Pieces 65R-2, 8

CONTACTS: None. However, an altered green basaltic breccia is present in the top left corner of the piece and an altered green glass zone, 1-7mm thick, on the bottom right. The breccia size ranges from 2 to 7 mm. The glass zone azimuth is 0 degrees and the dip is 70 degrees. >90% of the sample is composed of a gray brecciated microcrystalline basalt cemented by a network of calcite veins. Breccia size ranges from 2 to 4 cm.

PHENOCRYSTS:
Plagioclase - 1%; 0.5-1.5 mm; Subhedral-euhedral, bladed-tabular, fresh.
Olivine? - <0.5%; 0.5-3 mm; Subhedral-anhedral, form glomerocrystic aggregates with plagioclase, completely replaced by reddish clay minerals.
Clinopyroxene? - Rare; <0.5 mm; Euhedral-prismatic, fresh.

GROUNDMASS: Cryptocrystalline-spherultic, with sparse plagioclase microphenocrysts 0.1-0.5 mm in size.

VESICLES: <1%; <0.5 mm; Spherical; Evenly distributed.; Filled with chlorite.

COLOR: Medium gray in the majority of the piece; dusky green in the altered breccia and glass zones. The network of calcite veins are white.

STRUCTURE: Autobrecciated basalt lava or pillow breccia.

ALTERATION: Moderately to completely altered. The majority of the rock is moderately altered, but the glass zone and microbreccia at the top of the piece is completely altered. Olivine is completely replaced by reddish clay minerals.

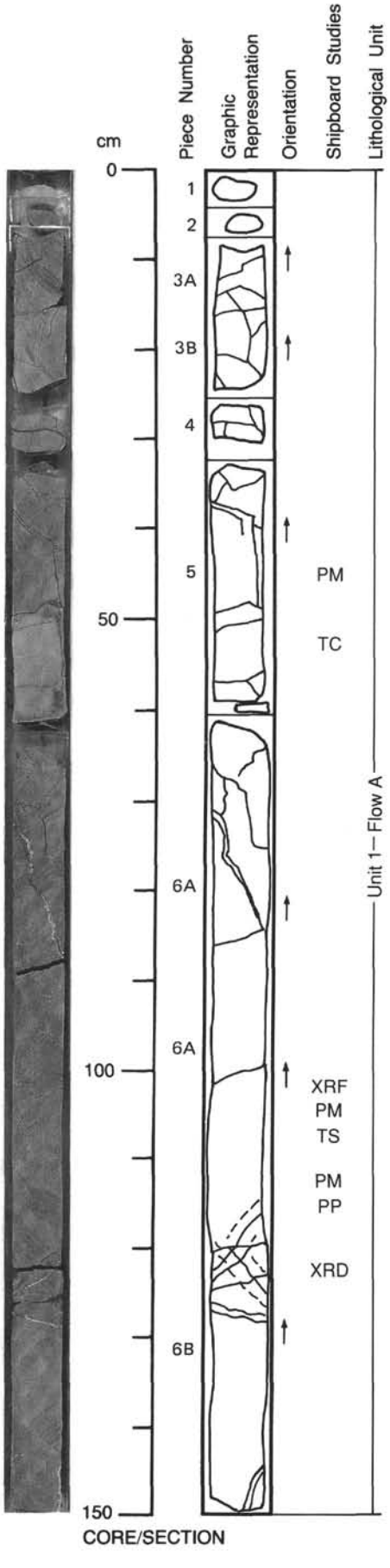
VEINS/FRACTURES: Calcite veins, 1-10 mm thick, fill the interstices between breccia fragments.

123-765C-65R-2

UNIT 2D: APHYRIC BASALT

Pieces 65R-2, 9A-10

CONTACTS: None
PHENOCRYSTS: Uniformly distributed.
Plagioclase - <0.2%; 0.5-0.8 mm; Euhedral, tabular-equant, fresh.
GROUNDMASS: Uniformly fine-grained, intersertal.
VESICLES: <0.5%; 0.2-0.5 mm; Spherical; Evenly distributed.; Filled with calcite and chlorite.
COLOR: Light-medium gray.
STRUCTURE: Probably the core of a large pillow basalt or sheet flow.
ALTERATION: Slightly altered.
VEINS/FRACTURES: Very scarce. A very thin calcite vein and a brown vein are present.

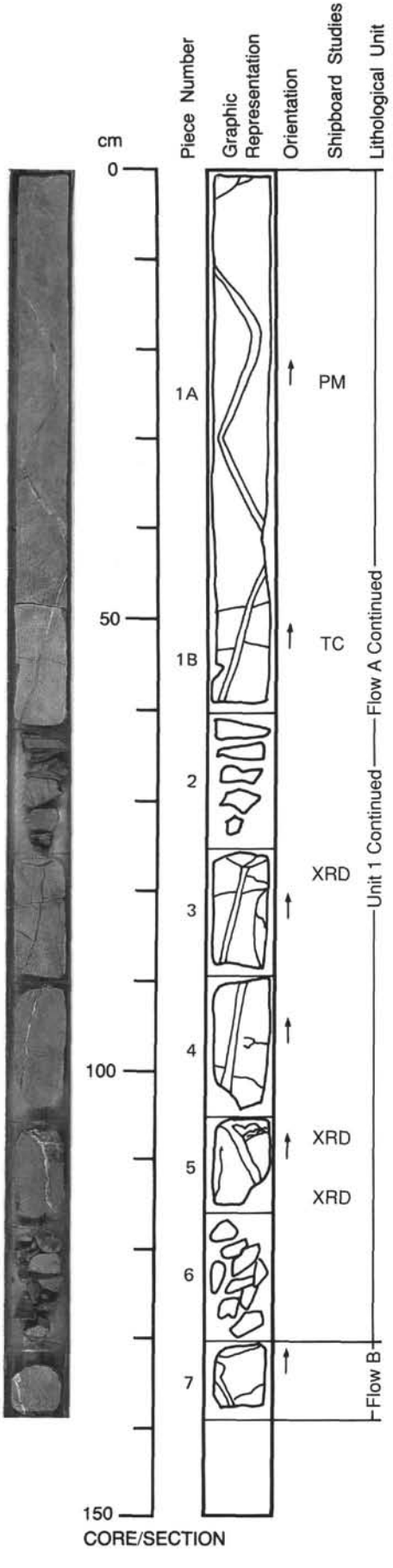


123-765D-1R-1

UNIT 1: APHYRIC BASALT

Pieces 1R-1,1-6B & 1R-2,1A-6 (Flow A)

CONTACTS: None
PHENOCRYSTS: Aphyric; occasional crystal clots of a blocky mafic mineral (clinopyroxene?) about 3 mm across.
GROUNDMASS: Fine-grained throughout. The top of Piece 1R-2, 4 contains finer-grained patches which may be related to chilling or to veining.
VESICLES: 5%; <1 mm; Round; ?; Most are filled with a dark green alteration mineral; Pieces 1R-1, 6A and 1R-2, 4: Vesicles are filled with calcite.
COLOR: Gray; brown halos around veins.
STRUCTURE: Massive flow unit.
ALTERATION: Slightly altered. Glass crystals look fairly fresh (= slightly altered). Alteration is mostly manifest in the form of vesicle and vein fillings, and as alteration halos around veins. Alteration is more intense around the veins in Section 1R-2.
VEINS/FRACTURES: Irregularly distributed down Section 1R-1: Veins form 5% of the rock in Piece 1R-1, 2 and are absent in Piece 1R-1, 6A at 90-110 cm. The maximum width is 7 mm in the upper part of Piece 1R-1, 6A (85 cm); the average width is 1-2 mm. Orientation is variable. The thickest veins (Pieces 1R-1, 6A and 6B) are filled with calcite. Other veins are filled with brown iron-oxides and a green mineral. Pieces 1R-1, 3A and 4 contain good examples of the brown mineral-filled veins. Brown oxidation halos are developed only around brown mineral-filled veins at the contact of Pieces 1R-1, 6A and 6B. Pieces 1R-2, 1A and 1B contain a large zig-zagging vein filled predominantly with calcite. Piece 1R-2 contains a 5 mm thick calcite and celadonite vein.
ADDITIONAL COMMENTS: Piece 1R-1, 1: Whitish pebble of altered plagioclase-rich basalt, presumably derived from the sediment section (see visual core descriptions from Hole 735C, Cores 13R, 17R, 24R, and 36R). Piece 1R-1, 2: Basalt pebble with crystal clots, probably derived from the overlying basement section.



123-765D-1R-2

UNIT 1: APHYRIC BASALT

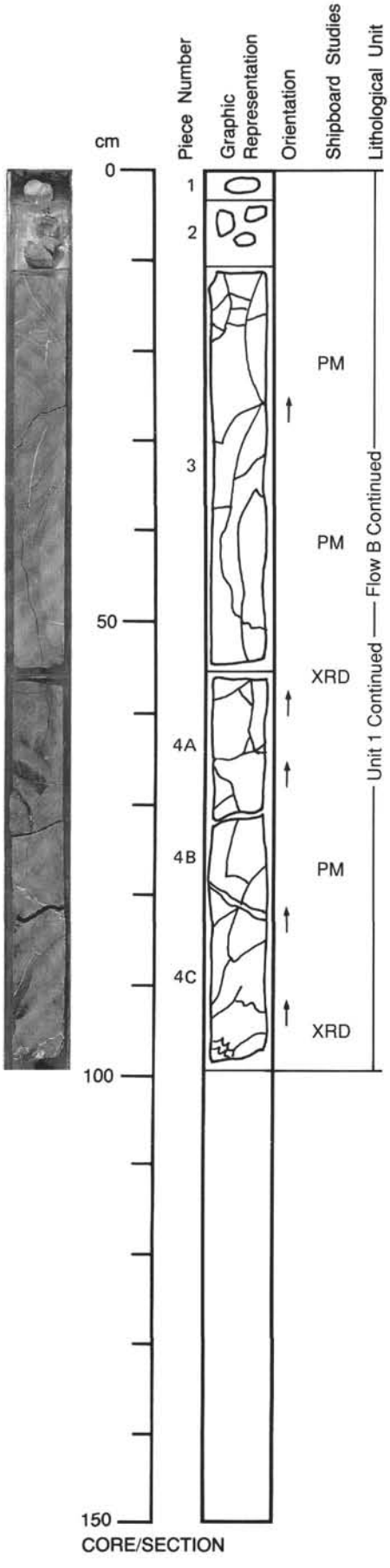
Pieces 1R-1,1-6B & 1R-2,1A-6 (Flow A)

CONTACTS: None
PHENOCRYSTS: Aphyric; occasional crystal clots of a blocky mafic mineral (clinopyroxene?) about 3 mm across.
GROUNDMASS: Fine-grained throughout. The top of Piece 1R-2, 4 contains finer-grained patches which may be related to chilling or to veining.
VESICLES: 5%; <1 mm; Round; ?; Most are filled with a dark green alteration mineral; Pieces 1R-1, 6A and 1R-2, 4: Vesicles are filled with calcite.
COLOR: Gray; brown halos around veins.
STRUCTURE: Massive flow unit.
ALTERATION: Slightly altered. Glass crystals look fairly fresh (= slightly altered). Alteration is mostly manifest in the form of vesicle and vein fillings, and as alteration halos around veins. Alteration is more intense around the veins in Section 1R-2.
VEINS/FRACTURES: Irregularly distributed down Section 1R-1: Veins form 5% of the rock in Piece 1R-1, 2 and are absent in Piece 1R-1, 6A at 90-110 cm. The maximum width is 7 mm in the upper part of Piece 1R-1, 6A (85 cm); the average width is 1-2 mm. Orientation is variable. The thickest veins (Pieces 1R-1, 6A and 6B) are filled with calcite. Other veins are filled with brown iron-oxides and a green mineral. Pieces 1R-1, 3A and 4 contain good examples of the brown mineral-filled veins. Brown oxidation halos are developed only around brown mineral-filled veins at the contact of Pieces 1R-1, 6A and 6B. Pieces 1R-2, 1A and 1B contain a large zig-zagging vein filled predominantly with calcite. Piece 1R-2 contains a 5 mm thick calcite and celadonite vein.
ADDITIONAL COMMENTS: Piece 1R-1, 1: Whitish pebble of altered plagioclase-rich basalt, presumably derived from the sediment section (see visual core descriptions from Hole 735C, Cores 13R, 17R, 24R, and 36R). Piece 1R-1, 2: Basalt pebble with crystal clots, probably derived from the overlying basement section.

UNIT 1: APHYRIC BASALT

Pieces 1R-2, 7 through 2R-2, 1E (Flow B)

CONTACTS: None
PHENOCRYSTS: Aphyric
GROUNDMASS: Piece 1R-2, 7 is fine-grained. Section 2R-1 is finer grained than Core 1R.
VESICLES: 2%, smaller than in Core 1R. Vesicles are filled with dark green mineral, celadonite and calcite.
COLOR: Gray
STRUCTURE: Massive flow
ALTERATION: Alteration halos up to 7 mm wide on either side of 4 veins. Halos are more pervasive than in Core 1R. Halos are golden brown and are particularly good in Piece 2R-1-3.
VEINS/FRACTURES: Piece 2R-1, 3 contains 7% veins; Piece 2R-1, 4 contains 2% veins, one thick vein, up to 5 mm across in middle of Piece 2R-1, 4C; veins in Piece 2R-2-1A are filled with calcite. Piece 2R-2, 1B has well-developed "bulls-eyes" surrounded by alteration halos more than 1-cm thick, and technicolor vein in the middle. Pieces 2R-2, 5-8 have large breccia veins.
ADDITIONAL COMMENTS: Pieces 2R-1, 1 and 2 are rounded, bleached pebbles which fell into core from above. The base of Piece 2R-1, 4C contains bright green celadonite blotch rimmed by calcite. Pieces 2R-2, 2 through 4 are highly altered breccia. Pieces 2R-2, 5 through 8 are finer grained basalt. Pieces 2R-2, 1C through 1E contain brown streaks. Pieces 2R-2, 2 through 4 are breccia: pieces of altered basalt with calcite and celadonite.

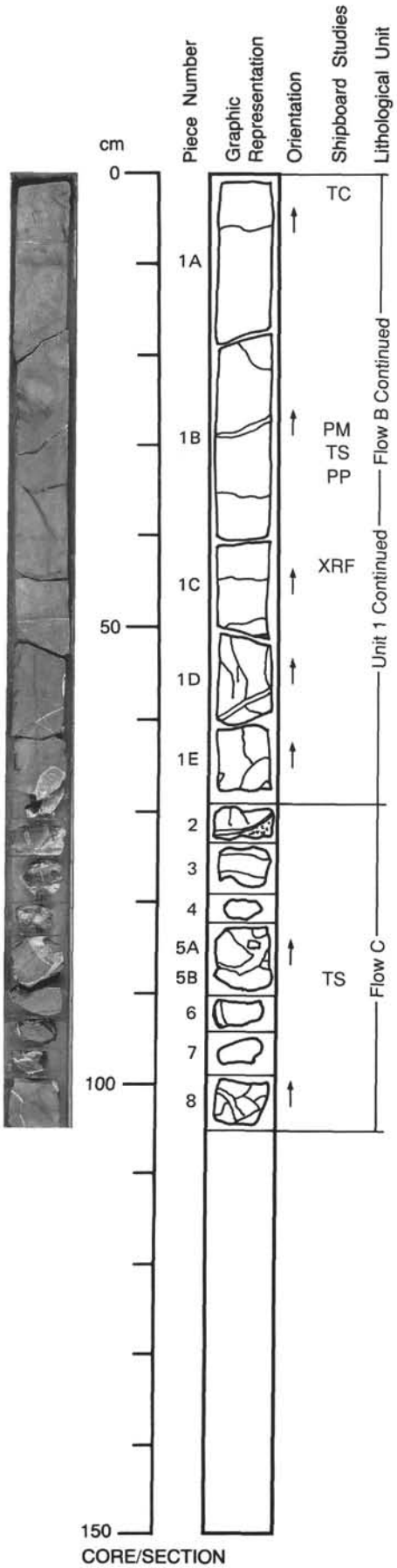


123-765D-2R-1

UNIT 1: APHYRIC BASALT

Pieces 1R-2, 7 through 2R-2, 1E (Flow B)

CONTACTS: None
PHENOCRYSTS: Aphyric
GROUNDMASS: Piece 1R-2, 7 is fine-grained. Section 2R-1 is finer grained than Core 1R.
VESICLES: 2%, smaller than in Core 1R. Vesicles are filled with dark green mineral, celadonite and calcite.
COLOR: Gray
STRUCTURE: Massive flow
ALTERATION: Alteration halos up to 7 mm wide on either side of 4 veins. Halos are more pervasive than in Core 1R. Halos are golden brown and are particularly good in Piece 2R-1-3.
VEINS/FRACTURES: Piece 2R-1, 3 contains 7% veins; Piece 2R-1, 4 contains 2% veins, one thick vein, up to 5 mm across in middle of Piece 2R-1, 4C; veins in Piece 2R-2-1A are filled with calcite. Piece 2R-2, 1B has well-developed "bulls-eyes" surrounded by alteration halos more than 1-cm thick, and technicolor vein in the middle. Pieces 2R-2, 5-8 have large breccia veins.
ADDITIONAL COMMENTS: Pieces 2R-1, 1 and 2 are rounded, bleached pebbles which fell into core from above. The base of Piece 2R-1, 4C contains bright green celadonite blotch rimmed by calcite. Pieces 2R-2, 2 through 4 are highly altered breccia. Pieces 2R-2, 5 through 8 are finer grained basalt. Pieces 2R-2, 1C through 1E contain brown streaks. Pieces 2R-2, 2 through 4 are breccia: pieces of altered basalt with calcite and celadonite.

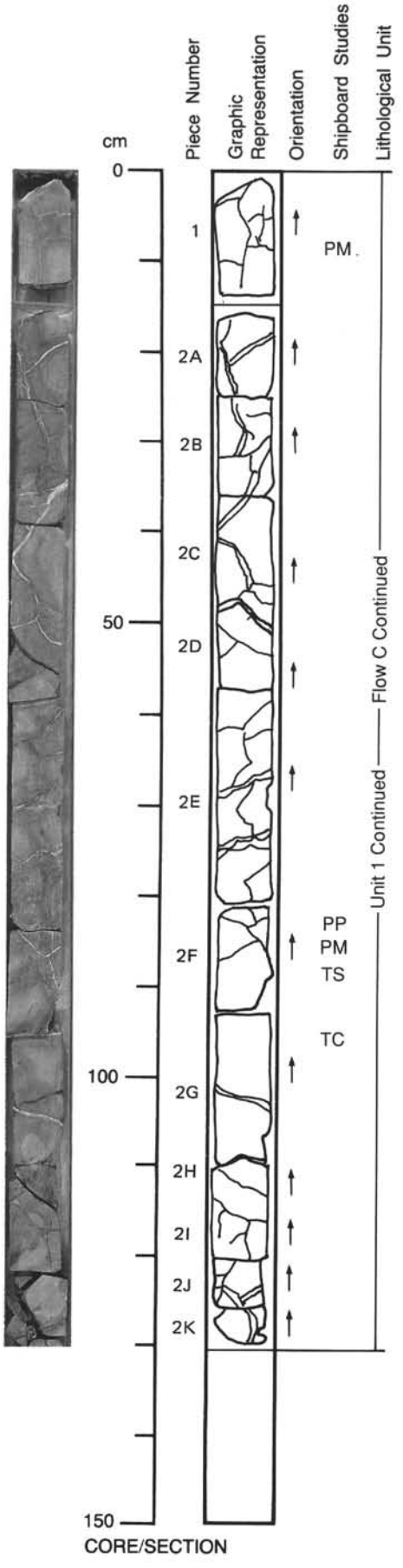


123-765D-2R-2

UNIT 1: APHYRIC BASALT

Pieces 1R-2, 7 through 2R-2, 1E (Flow B)

CONTACTS: None
PHENOCRYSTS: Aphyric
GROUNDMASS: Piece 1R-2, 7 is fine-grained. Section 2R-1 is finer grained than Core 1R.
VESICLES: 2%, smaller than in Core 1R. Vesicles are filled with dark green mineral, celadonite and calcite.
COLOR: Gray
STRUCTURE: Massive flow
ALTERATION: Alteration halos up to 7 mm wide on either side of 4 veins. Halos are more pervasive than in Core 1R. Halos are golden brown and are particularly good in Piece 2R-1-3.
VEINS/FRACTURES: Piece 2R-1, 3 contains 7% veins; Piece 2R-1, 4 contains 2% veins, one thick vein, up to 5 mm across in middle of Piece 2R-1, 4C; veins in Piece 2R-2-1A are filled with calcite. Piece 2R-2, 1B has well-developed "bulls-eyes" surrounded by alteration halos more than 1-cm thick, and technicolor vein in the middle. Pieces 2R-2, 5-8 have large breccia veins.
ADDITIONAL COMMENTS: Pieces 2R-1, 1 and 2 are rounded, bleached pebbles which fell into core from above. The base of Piece 2R-1, 4C contains bright green celadonite blotch rimmed by calcite. Pieces 2R-2, 2 through 4 are highly altered breccia. Pieces 2R-2, 5 through 8 are finer grained basalt. Pieces 2R-2, 1C through 1E contain brown streaks. Pieces 2R-2, 2 through 4 are breccia: pieces of altered basalt with calcite and celadonite.

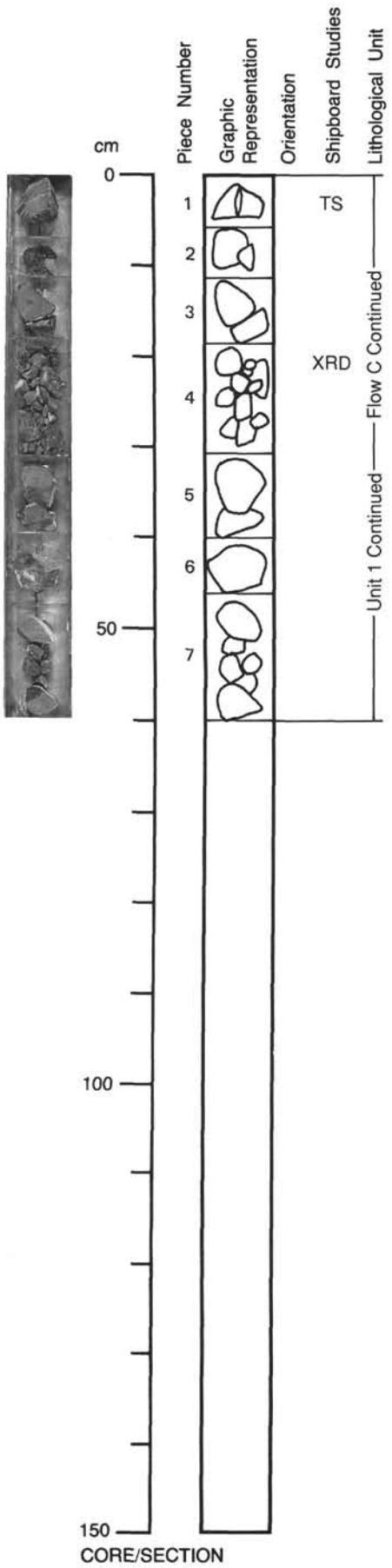


123-765D-2R-3

UNIT 1: APHYRIC BASALT

Pieces 2R-2, 2 through 2R-4, 7 (Flow C)

CONTACTS: None
PHENOCRYSTS: Aphyric
GROUNDMASS: Very fine-grained and altered in Pieces 2R-2, 5-8. Gradual coarsening of grain size from very fine in Piece 2R-3, 1 to fine grained (<1 mm) in Piece 2R-3, 2. Piece 2R-4, 1 is very fine grained.
VESICLES: None
COLOR: Gray
STRUCTURE: Massive flow.
ALTERATION: Extensive and spectacular alteration halos, average 1 cm but up to a few cms wide, containing relatively unaltered "bull eyes" in the center. Halos are brown (as in pieces 2R-3, 2A and 2B) or simply darker. Alteration halo in Piece 2R-2, 8 is similar to that in Piece 2R-4, 1.
VEINS/FRACTURES: Piece 2R-2, 8 comprises 70% veins up to 1 cm in width filled predominantly by peach-colored calcite. Prominent veins (>1 mm) present throughout section 2R-3 are filled by calcite. Piece 2R-4, 1 has calcite vein and alteration halo, similar to Piece 2R-2, 8.
ADDITIONAL COMMENTS: Flow is similar in most aspects to Sections 2R-1 and 2R-2. Piece 2R-4, 2: Random chips. Piece 2R-4, 3: Brown, very altered basalt, 2 small pieces. Piece 2R-4, 4: Random chips, basalt and alteration products. Piece 2R-4, 5: 3 pieces similar to Piece 2R-4, 3. Piece 2R-4, 6: Peach calcite/carbonate replaced basalt. Completely bleached. Piece 2R-4, 7: Chips and two pieces similar to Pieces 2R-4, 3 and 5.

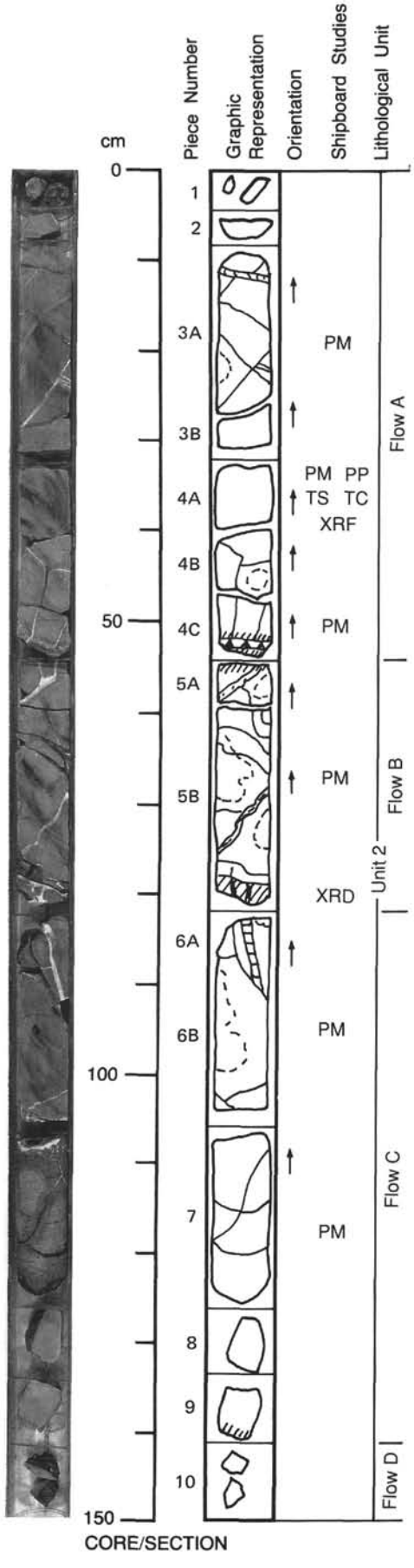


123-765D-2R-4

UNIT 1: APHYRIC BASALT

Pieces 2R-2, 2 through 2R-4, 7 (Flow C)

CONTACTS: None
PHENOCRYSTS: Aphyric
GROUNDMASS: Very fine-grained and altered in Pieces 2R-2, 5-8. Gradual coarsening of grain size from very fine in Piece 2R-3, 1 to fine grained (<1 mm) in Piece 2R-3, 2. Piece 2R-4, 1 is very fine grained.
VESICLES: None
COLOR: Gray
STRUCTURE: Massive flow.
ALTERATION: Extensive and spectacular alteration halos, average 1 cm but up to a few cms wide, containing relatively unaltered "bull eyes" in the center. Halos are brown (as in pieces 2R-3, 2A and 2B) or simply darker. Alteration halo in Piece 2R-2, 8 is similar to that in Piece 2R-4, 1.
VEINS/FRACTURES: Piece 2R-2, 8 comprises 70% veins up to 1 cm in width filled predominantly by peach-colored calcite. Prominent veins (>1 mm) present throughout section 2R-3 are filled by calcite. Piece 2R-4, 1 has calcite vein and alteration halo, similar to Piece 2R-2, 8.
ADDITIONAL COMMENTS: Flow is similar in most aspects to Sections 2R-1 and 2R-2. Piece 2R-4, 2: Random chips. Piece 2R-4, 3: Brown, very altered basalt, 2 small pieces. Piece 2R-4, 4: Random chips, basalt and alteration products. Piece 2R-4, 5: 3 pieces similar to Piece 2R-4, 3. Piece 2R-4, 6: Peach calcite/carbonate replaced basalt. Completely bleached. Piece 2R-4, 7: Chips and two pieces similar to Pieces 2R-4, 3 and 5.



123-765D-3R-1

UNIT 2: MASSIVE APHYRIC BASALT FLOWS

Pieces 3R-1, 1-4C (Flow A)

CONTACTS: Not seen. Upper limit is marked by a pale orange calcite block, 6 x 4 cm size at the bottom of previous core; Piece 2R-4, 6. Lower limit is marked by a sub-horizontal zone of very low crystallinity at the bottom of Piece 4C. The zone is cut by a subhorizontal breccia vein with calcite matrix, 5 mm thick.
PHENOCRYSTS: Very rare. Occasional plagioclase phenocrysts are seen, 2 mm in size.
GROUNDMASS: Fine-grained, crystallinity is good in the center of the flow, but marginal parts are glassy.
VESICLES: <1%; <1 mm; Filled with green clays or calcite.
COLOR: Light gray in relatively fresh part, and greenish gray or brownish gray in alteration halos along veins.
STRUCTURE: Thin flows or sills, more than 50 cm thick.
ALTERATION: Moderately altered. Alteration halos along veins are 1 to 3 cm in width.
VEINS/FRACTURES: Calcite and brown veins are common. Green veins are scarce. Thick veins are listed below: Piece 3, 10-11 cm, brown vein, 3 mm thick. Piece 3, 15-18 cm, brown vein, azimuth 315 degrees, dip 70 degrees, 3 mm thick; Piece 3, 20-28 cm, calcite vein, azimuth 0 degrees, dip 60 degrees, 4 mm thick. Piece 4, 51-52 cm, breccia vein with calcite, subhorizontal, 5 mm thick.

UNIT 2: MASSIVE APHYRIC BASALT FLOWS.

Pieces 3R-1, 5A and 5B (Flow B)

CONTACTS: Upper contact is not seen, but marked by a zone of very low crystallinity at the top of Piece 5A. The topmost zone, 1 mm thick and subhorizontal, is composed of altered glassy material showing spherulitic texture. Some fresh tiny pieces of glass may be preserved. Lower contact is cut by Flow C; azimuth 180 degrees, dip 30 degrees.
PHENOCRYSTS: Plagioclase, 2 mm, very rare.
GROUNDMASS: Grain size decreases toward both contacts from the center of Piece 5B, but is still considerably crystalline at the lower contact.
VESICLES: <1%; <1 mm; Filled with green clays or calcite
COLOR: Light gray in relatively fresh part, and greenish gray or brownish gray in alteration halos along veins.
STRUCTURE: Thin flow or sill, more than 24 cm thick.
ALTERATION: Moderately altered. Alteration halos along veins are 1 to 3 cm in width.
VEINS/FRACTURES: The contact between Flows B and C is obscured by a calcite vein, 5 mm thick, running along it. Calcite and brown veins are common. Green veins are scarce. Thick veins are as follows: 54-59 cm, calcite vein, azimuth 225 degrees, dip 45 degrees, 5-10 mm thick. 70-76 cm, calcite vein, azimuth 0 degrees, dip 60 degrees, 5 mm thick, curved; 79-82 cm, calcite vein network, 3-10 mm thick.

123-765D-3R-1

UNIT 2: MASSIVE APHYRIC BASALT FLOWS

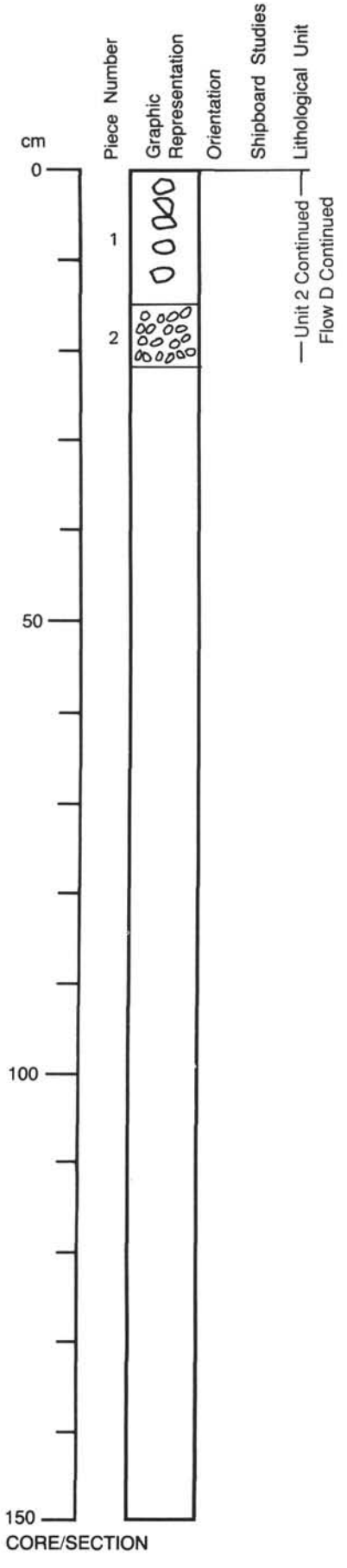
Pieces 3R-1, 6A-9 (Flow C)

CONTACTS: Upper contact is intrusive against Flow B. The chilled margin is brecciated and invaded by calcite veins, 5 mm to 1 cm thick. Lowercontact is not seen, but is marked by the low-crystallinity zone on one side of Piece 9.
PHENOCRYSTS: Occasional plagioclase phenocrysts (very rare), 2 mm.
GROUNDMASS: Fine-grained in the center of the flow, marginal parts are glassy.
VESICLES: <1%; <1 mm; ?; ?; Filled with green clays or calcite.
COLOR: Light gray in relatively fresh part, and greenish gray or brownish gray in alteration halos along veins.
STRUCTURE: Thin flow or sill, more than 50 cm thick.
ALTERATION: Moderately altered. Alteration halos along veins are 1 to 3 cm in width.
VEINS/FRACTURES: Calcite veins are common, one of them is located in Piece 6A, 83-92 cm, azimuth 180 degrees, dip 80 degrees, 5 mm thick. Brown veins are present. Green veins are scarce. The chilled margin is brecciated and invaded by calcite veins, 5 mm to 1 cm thick.

UNIT 2: DRILL BRECCIA

Pieces 3R-1,10 through 4r-1,8 (Flow D)

CONTACTS: None
PHENOCRYSTS: Aphyric. Piece 4R-1, 8: Euhedral phenocryst of mafic mineral, 2 mm in size is present. It is completely replaced by green clays.
GROUNDMASS: Piece 3R-1, 10: Fine-grained. Pieces 3R-2, 1 and 2: Very fine-grained basalt breccia. Pieces 4R-1, 1-5: Very fine-grained. Piece 4R-1, 6: Fine-grained. Pieces 4R-1, 7 and 8: Very fine-grained.
VESICLES: None
COLOR: Gray to light gray. Piece 4R-1, 2: Yellowish brown. Piece 4R-1, 4: Red-brown in margin.
STRUCTURE: Drill breccia
ALTERATION: Variable from relatively fresh to highly altered. Piece 4R-1, 1: Alteration halo 1-3 mm thick on one side. Piece 4R-1, 2: Highly altered yellowish-brown, with calcite vein at margin. Piece 4R-1, 3: Moderately altered. Piece 4R-1, 4: Relatively fresh; red-brown in margin. Piece 4R-1, 5 : Relatively fresh with 2 cm wide alteration halo along 1 mm thick calcite-green clay vein. Piece 4R-1, 6: Relatively fresh with 3 cm wide alteration halo along 1 mm thick calcite vein. Piece 4R-1, 8: Relatively fresh with 2 cm wide alteration halo along curved 1 mm thick calcite vein. VEINS/FRACTURES: Piece 4R-1, 2: 3 mm thick calcite vein at margin. Piece 4 -1, 5: 1 mm thick calcite-green clay vein in center (azimuth 180 degrees, dip 70 degrees). Piece 4R-1, 6: 1 mm thick calcite vein (azimuth 22 degrees, dip 50 degrees). Piece 4R-1, 8: 1 mm thick curved calcite vein in center (azimuth 60 degrees).
ADDITIONAL COMMENTS: Piece 3R-1, 10: Comprises two 3 cm sized pieces of rubble. Piece 3R-2, 1: Angular breccia, 2 or 3 cm in size. Piece 3R-2, 2: About 40 angular breccia fragments, 5 mm to 2 cm in size. Piece 4R-1, 1: 6.5 X 4 cm. Piece 4R-1, 2: 5.5 X 3.5 cm in size. Piece 4R-1, 3: Four pieces of drill breccia, 2-3 cm in size. Piece 4R-1, 6: 6 X 5 cm. Piece 4R-1, 7: About ten pieces of drill breccia, 5 mm to 3 cm in size. Piece 4R-1, 8: 6 X 5 cm.

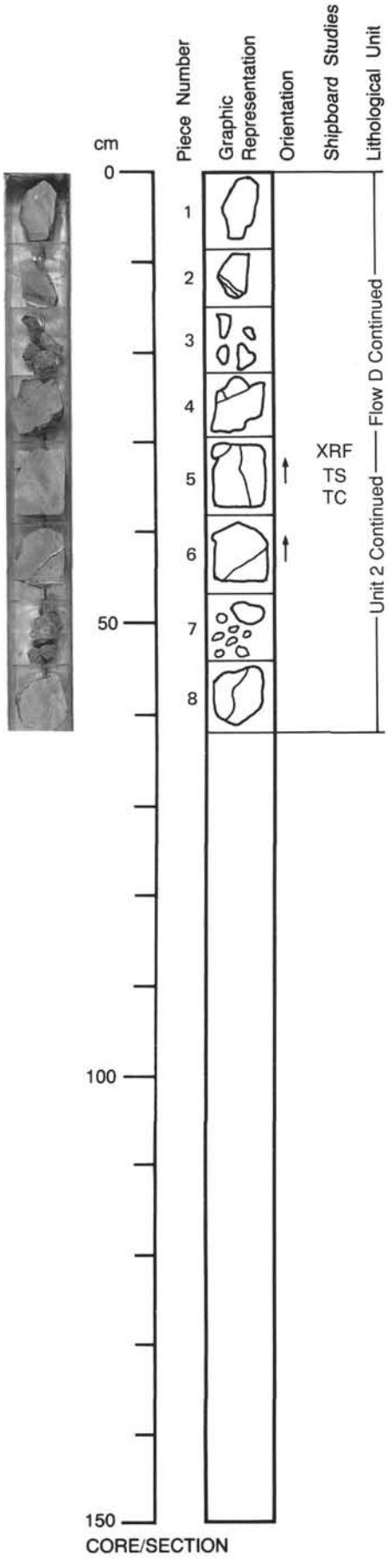


123-765D-3R-2

UNIT 2: DRILL BRECCIA

Pieces 3R-1,10 through 4R-1,8 (Flow D)

CONTACTS: None
PHENOCRYSTS: Aphyric. Piece 4R-1, 8: Euhedral phenocryst of mafic mineral, 2 mm in size is present. It is completely replaced by green clays.
GROUNDMASS: Piece 3R-1, 10: Fine-grained. Pieces 3R-2, 1 and 2: Very fine-grained basalt breccia. Pieces 4R-1, 1-5: Very fine-grained. Piece 4R-1, 6: Fine-grained. Pieces 4R-1, 7 and 8: Very fine-grained.
VESICLES: None
COLOR: Gray to light gray. Piece 4R-1, 2: Yellowish brown. Piece 4R-1, 4: Red-brown in margin.
STRUCTURE: Drill breccia
ALTERATION: Variable from relatively fresh to highly altered. Piece 4R-1, 1: Alteration halo 1-3 mm thick on one side. Piece 4R-1, 2: Highly altered yellowish-brown, with calcite vein at margin. Piece 4R-1, 3: Moderately altered. Piece 4R-1, 4: Relatively fresh; red-brown in margin. Piece 4R-1, 5 : Relatively fresh with 2 cm wide alteration halo along 1 mm thick calcite-green clay vein. Piece 4R-1, 6: Relatively fresh with 3 cm wide alteration halo along 1 mm thick calcite vein. Piece 4R-1, 8: Relatively fresh with 2 cm wide alteration halo along curved 1 mm thick calcite vein. VEINS/FRACTURES: Piece 4R-1, 2: 3 mm thick calcite vein at margin. Piece 4 -1, 5: 1 mm thick calcite-green clay vein in center (azimuth 180 degrees, dip 70 degrees). Piece 4R-1, 6: 1 mm thick calcite vein (azimuth 22 degrees, dip 50 degrees). Piece 4R-1, 8: 1 mm thick curved calcite vein in center (azimuth 60 degrees).
ADDITIONAL COMMENTS: Piece 3R-1, 10: Comprises two 3 cm sized pieces of rubble. Piece 3R-2, 1: Angular breccia, 2 or 3 cm in size. Piece 3R-2, 2: About 40 angular breccia fragments, 5 mm to 2 cm in size. Piece 4R-1, 1: 6.5 X 4 cm. Piece 4R-1, 2: 5.5 X 3.5 cm in size. Piece 4R-1, 3: Four pieces of drill breccia, 2-3 cm in size. Piece 4R-1, 6: 6 X 5 cm. Piece 4R-1, 7: About ten pieces of drill breccia, 5 mm to 3 cm in size. Piece 4R-1, 8: 6 X 5 cm.

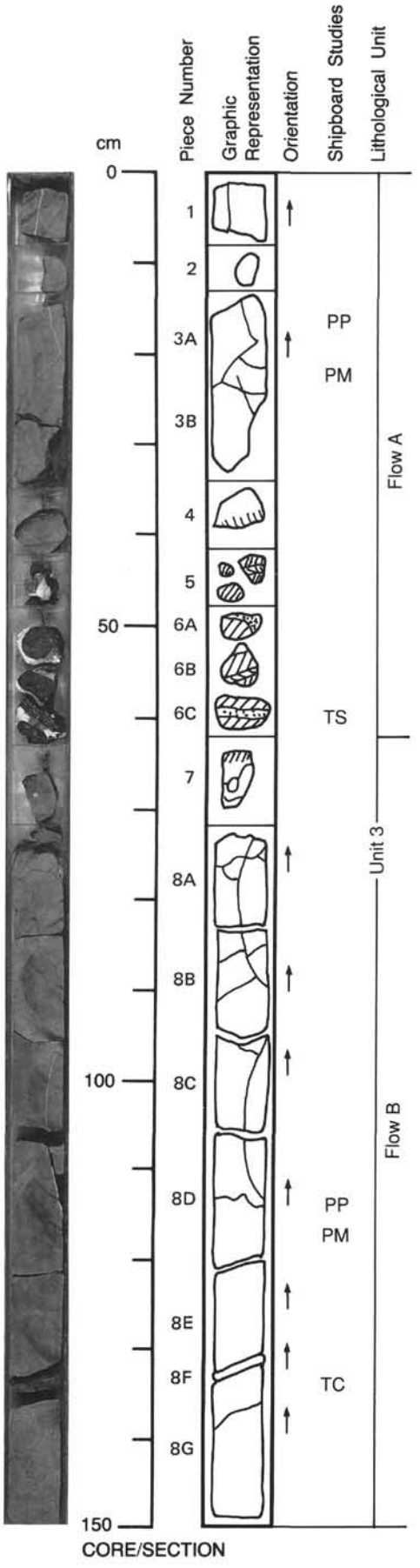


123-765D-4R-1

UNIT 2: DRILL BRECCIA

Pieces 3R-1,10 through 4R-1,8 (Flow D)

CONTACTS: None
PHENOCRYSTS: Aphyric. Piece 4R-1, 8: Euhedral phenocryst of mafic mineral, 2 mm in size is present. It is completely replaced by green clays.
GROUNDMASS: Piece 3R-1, 10: Fine-grained. Pieces 3R-2, 1 and 2: Very fine-grained basalt breccia. Pieces 4R-1, 1-5: Very fine-grained. Piece 4R-1, 6: Fine-grained. Pieces 4R-1, 7 and 8: Very fine-grained.
VESICLES: None
COLOR: Gray to light gray. Piece 4R-1, 2: Yellowish brown. Piece 4R-1, 4: Red-brown in margin.
STRUCTURE: Drill breccia
ALTERATION: Variable from relatively fresh to highly altered. Piece 4R-1, 1: Alteration halo 1-3 mm thick on one side. Piece 4R-1, 2: Highly altered yellowish-brown, with calcite vein at margin. Piece 4R-1, 3: Moderately altered. Piece 4R-1, 4: Relatively fresh; red-brown in margin. Piece 4R-1, 5 : Relatively fresh with 2 cm wide alteration halo along 1 mm thick calcite-green clay vein. Piece 4R-1, 6: Relatively fresh with 3 cm wide alteration halo along 1 mm thick calcite vein. Piece 4R-1, 8: Relatively fresh with 2 cm wide alteration halo along curved 1 mm thick calcite vein. VEINS/FRACTURES: Piece 4R-1, 2: 3 mm thick calcite vein at margin. Piece 4 -1, 5: 1 mm thick calcite-green clay vein in center (azimuth 180 degrees, dip 70 degrees). Piece 4R-1, 6: 1 mm thick calcite vein (azimuth 22 degrees, dip 50 degrees). Piece 4R-1, 8: 1 mm thick curved calcite vein in center (azimuth 60 degrees).
ADDITIONAL COMMENTS: Piece 3R-1, 10: Comprises two 3 cm sized pieces of rubble. Piece 3R-2, 1: Angular breccia, 2 or 3 cm in size. Piece 3R-2, 2: About 40 angular breccia fragments, 5 mm to 2 cm in size. Piece 4R-1, 1: 6.5 X 4 cm. Piece 4R-1, 2: 5.5 X 3.5 cm in size. Piece 4R-1, 3: Four pieces of drill breccia, 2-3 cm in size. Piece 4R-1, 6: 6 X 5 cm. Piece 4R-1, 7: About ten pieces of drill breccia, 5 mm to 3 cm in size. Piece 4R-1, 8: 6 X 5 cm.



123-765D-5R-1

UNIT 3: MASSIVE BASALT FLOWS WITH PILLOW BASALTS AND HYALOCLASTITES

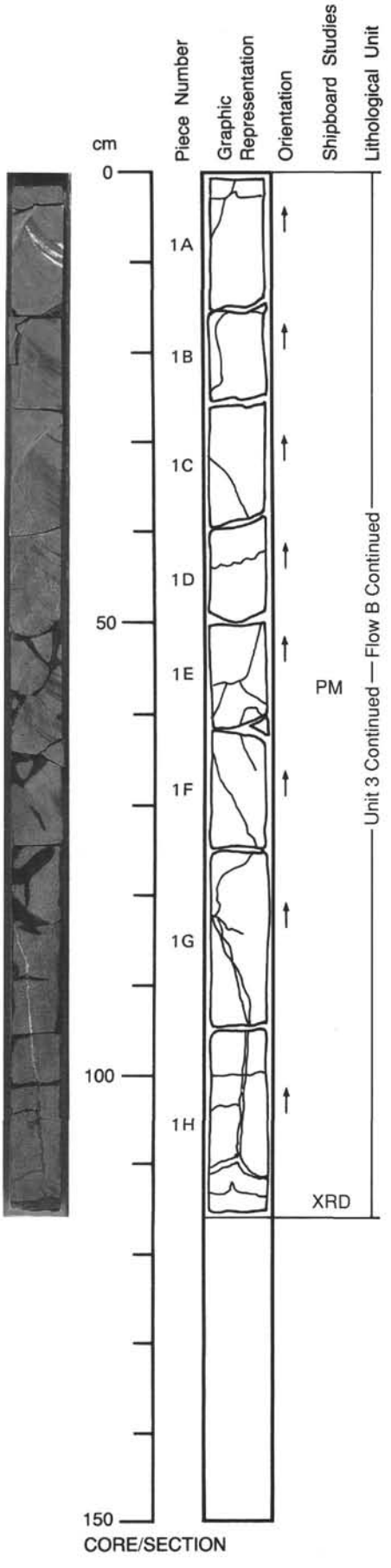
Pieces 5R-1, 1-6C (Flow A)

CONTACTS: Upper contact not seen. Lower contact is marked by a glass zone, 1-2 mm thick, on the bottom side of Piece 4, and, by rounded glass drops buried in calcite matrix (Piece 5 and 6). The glass zone in Piece 4 is curved as a pillow rim with spherulites.
PHENOCRYSTS: Aphyric
GROUNDMASS: Crystallinity is good and uniformly fine grained in Pieces 1 and 2. Grain size decreases downward through pieces 3 and 4.
VESICLES: None
COLOR: Gray
STRUCTURE: Thin flow
ALTERATION: Alteration halos, 3 to 5 cm wide are developed along calcite and brown veins. Pieces 5R-1, 5 and 6 are rounded glass drops, 3 to 5 cm in size, buried in calcite matrix. The glass is fresh and black, aphyric, with obsidian-like luster.
VEINS/FRACTURES: Calcite and brown veins are present.

UNIT 3: MASSIVE BASALT

Pieces 5R-1, 7 through 5R-4, 4 (Flow B)

CONTACTS: Upper contact not seen but glass zone in Piece 5R-1, 7. The bottom is marked by a glassy chilled margin at the top of Flow C in (Section 5R-4, Pieces 6 and 7).
PHENOCRYSTS: Aphyric
GROUNDMASS: Grain size markedly increases downward from the glass zone, 2-3 mm thick at the top of Piece 5R-1, 7. Pieces 5R-1, 8D-G look completely crystalline. Grain size continues to increase through Piece 5R-3, 1D, then fines again to base of Section 5R-3. Pieces 5R-4, 1-4 are microcrystalline, chilled.
VESICLES: Spherical vesicle at the center of Piece Piece 5R-1, 7, 7 mm in diameter, is filled by calcite and chalcedony(?). Chalcedony occupies central part of the vesicle. In general, however, there is a marked lack of vesicles.
COLOR: Gray
STRUCTURE: Flow
ALTERATION: The flow is amazingly fresh, except Piece 5R-2, 1G, which has a slight brown stain. At the base of Piece 5R-2, 1H is a bluish alteration front (celadonite with angular orange bits in it). Pieces 5R-4, 1-4 are mostly fresh with some brown stains.
VEINS/FRACTURES: Marked lack of veins, except for one calcite vein (about2 mm thick) through Pieces 5R-2, 1G and 1H, which becomes variegated (blues and oranges) at its base. Also a small (1 mm thick) calcite vein through Pieces 5R-2, 1D and 1E. Multicolor (blues and oranges), mm thick vein in Piece 5R-3, 1A, with blue splotches. Prominent, 6 mm wide calcite vein snaking through Piece 5R-3, 1B. Vein in Piece 5R-3, 1F is calcite at the top, then turns into park blue-green mineral.
ADDITIONAL COMMENTS: Note: Pieces 5R-2, 1D and 1E don't quite fit together. Pieces 5R-3, 1C-1E are largely featureless. Piece 5R-4, 5 comprises random chips of rubble.

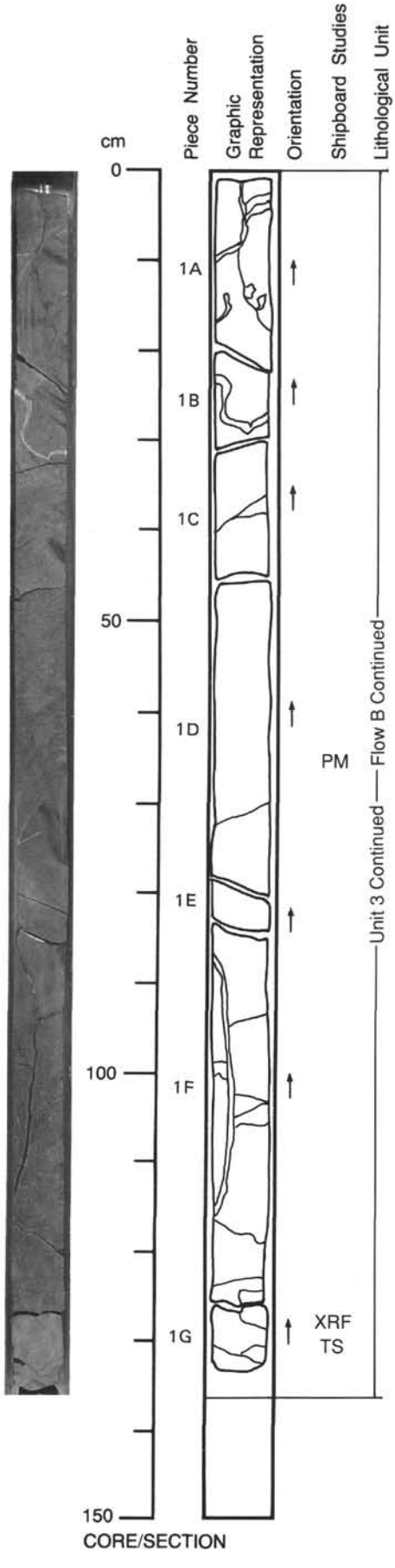


123-765D-5R-2

UNIT 3: MASSIVE BASALT

Pieces 5R-1, 7 through 5R-4, 4 (Flow B)

CONTACTS: Upper contact not seen but glass zone in Piece 5R-1, 7. The bottom is marked by a glassy chilled margin at the top of Flow C in (Section 5R-4, Pieces 6 and 7).
PHENOCRYSTS: Aphyric
GROUNDMASS: Grain size markedly increases downward from the glass zone, 2-3 mm thick at the top of Piece 5R-1, 7. Pieces 5R-1, 8D-G look completely crystalline. Grain size continues to increase through Piece 5R-3, 1D, then fines again to base of Section 5R-3. Pieces 5R-4, 1-4 are microcrystalline, chilled.
VESICLES: Spherical vesicle at the center of Piece Piece 5R-1, 7, 7 mm in diameter, is filled by calcite and chalcedony(?). Chalcedony occupies central part of the vesicle. In general, however, there is a marked lack of vesicles.
COLOR: Gray
STRUCTURE: Flow
ALTERATION: The flow is amazingly fresh, except Piece 5R-2, 1G, which has a slight brown stain. At the base of Piece 5R-2, 1H is a bluish alteration front (celadonite with angular orange bits in it). Pieces 5R-4, 1-4 are mostly fresh with some brown stains.
VEINS/FRACTURES: Marked lack of veins, except for one calcite vein (about2 mm thick) through Pieces 5R-2, 1G and 1H, which becomes variegated (blues and oranges) at its base. Also a small (1 mm thick) calcite vein through Pieces 5R-2, 1D and 1E. Multicolor (blues and oranges), mm thick vein in Piece 5R-3, 1A, with blue splotches. Prominent, 6 mm wide calcite vein snaking through Piece 5R-3, 1B. Vein in Piece 5R-3, 1F is calcite at the top, then turns into park blue-green mineral.
ADDITIONAL COMMENTS: Note: Pieces 5R-2, 1D and 1E don't quite fit together. Pieces 5R-3, 1C-1E are largely featureless. Piece 5R-4, 5 comprises random chips of rubble.

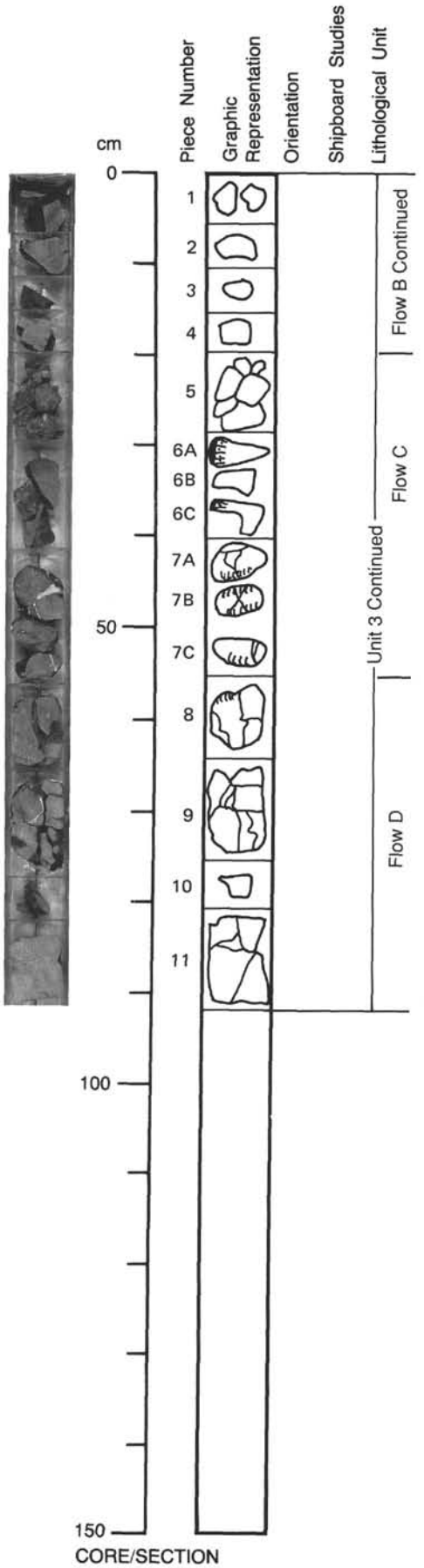


123-765D-5R-3

UNIT 3: MASSIVE BASALT

Pieces 5R-1, 7 through 5R-4, 4 (Flow B)

CONTACTS: Upper contact not seen but glass zone in Piece 5R-1, 7. The bottom is marked by a glassy chilled margin at the top of Flow C in (Section 5R-4, Pieces 6 and 7).
PHENOCRYSTS: Aphyric
GROUNDMASS: Grain size markedly increases downward from the glass zone, 2-3 mm thick at the top of Piece 5R-1, 7. Pieces 5R-1, 8D-G look completely crystalline. Grain size continues to increase through Piece 5R-3, 1D, then fines again to base of Section 5R-3. Pieces 5R-4, 1-4 are microcrystalline, chilled.
VESICLES: Spherical vesicle at the center of Piece Piece 5R-1, 7, 7 mm in diameter, is filled by calcite and chalcedony(?). Chalcedony occupies central part of the vesicle. In general, however, there is a marked lack of vesicles.
COLOR: Gray
STRUCTURE: *Flow*
ALTERATION: The flow is amazingly fresh, except Piece 5R-2, 1G, which has a slight brown stain. At the base of Piece 5R-2, 1H is a bluish alteration front (celadonite with angular orange bits in it). Pieces 5R-4, 1-4 are mostly fresh with some brown stains.
VEINS/FRACTURES: Marked lack of veins, except for one calcite vein (about2 mm thick) through Pieces 5R-2, 1G and 1H, which becomes variegated (blues and oranges) at its base. Also a small (1 mm thick) calcite vein through Pieces 5R-2, 1D and 1E. Multicolor (blues and oranges), mm thick vein in Piece 5R-3, 1A, with blue splotches. Prominent, 6 mm wide calcite vein snaking through Piece 5R-3, 1B. Vein in Piece 5R-3, 1F is calcite at the top, then turns into park blue-green mineral.
ADDITIONAL COMMENTS: Note: Pieces 5R-2, 1D and 1E don't quite fit together. Pieces 5R-3, 1C-1E are largely featureless. Piece 5R-4, 5 comprises random chips of rubble.



123-765D-5R-4

UNIT 3: MASSIVE BASALT

Pieces 5R-1, 7 through 5R-4, 4 (Flow B)

CONTACTS: Upper contact not seen but glass zone in Piece 5R-1, 7. The bottom is marked by a glassy chilled margin at the top of Flow C in (Section 5R-4, Pieces 6 and 7).
PHENOCRYSTS: Aphyric
GROUNDMASS: Grain size markedly increases downward from the glass zone, 2-3 mm thick at the top of Piece 5R-1, 7. Pieces 5R-1, 8D-G look completely crystalline. Grain size continues to increase through Piece 5R-3, 1D, then fines again to base of Section 5R-3. Pieces 5R-4, 1-4 are microcrystalline, chilled.
VESICLES: Spherical vesicle at the center of Piece Piece 5R-1, 7, 7 mm in diameter, is filled by calcite and chalcedony(?). Chalcedony occupies central part of the vesicle. In general, however, there is a marked lack of vesicles.
COLOR: Gray
STRUCTURE: Flow
ALTERATION: The flow is amazingly fresh, except Piece 5R-2, 1G, which has a slight brown stain. At the base of Piece 5R-2, 1H is a bluish alteration front (celadonite with angular orange bits in it). Pieces 5R-4, 1-4 are mostly fresh with some brown stains.
VEINS/FRACTURES: Marked lack of veins, except for one calcite vein (about2 mm thick) through Pieces 5R-2, 1G and 1H, which becomes variegated (blues and oranges) at its base. Also a small (1 mm thick) calcite vein through Pieces 5R-2, 1D and 1E. Multicolor (blues and oranges), mm thick vein in Piece 5R-3, 1A, with blue splotches. Prominent, 6 mm wide calcite vein snaking through Piece 5R-3, 1B. Vein in Piece 5R-3, 1F is calcite at the top, then turns into park blue-green mineral.
ADDITIONAL COMMENTS: Note: Pieces 5R-2, 1D and 1E don't quite fit together. Pieces 5R-3, 1C-1E are largely featureless. Piece 5R-4, 5 comprises random chips of rubble.

UNIT 3: PILLOWS

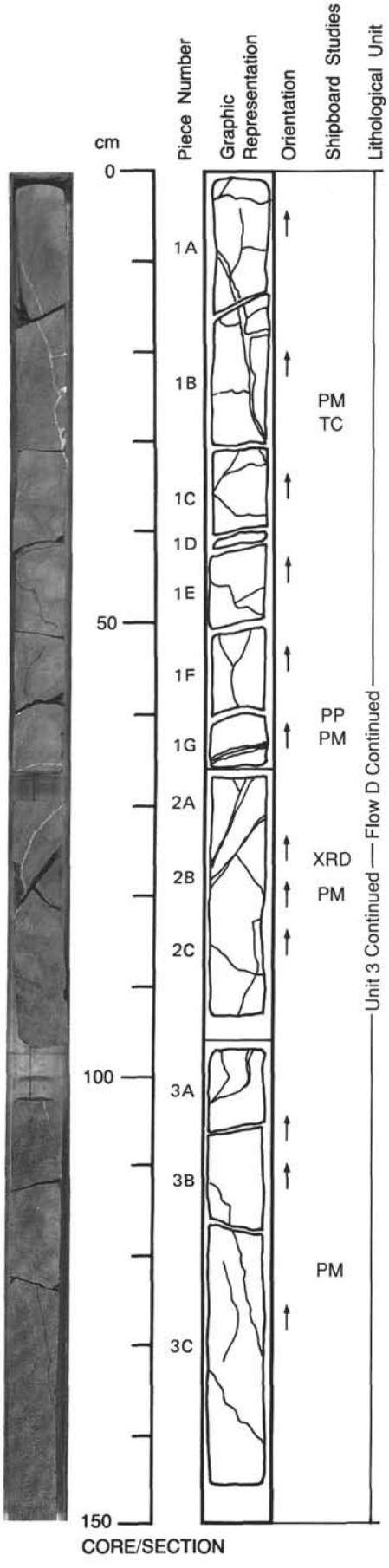
Pieces 5R-4, 6 through 7C (Flow C)

CONTACTS: Piece 6: Fragments of chilled margin, spherulitic and abraded glass. Piece 7: Chilled margin, good spherulitic texture.
PHENOCRYSTS: Aphyric
GROUNDMASS: Glass with spherulitic textures.
VESICLES: None
COLOR: Gray to dull black or green where altered.
STRUCTURE: Thin flow?
ALTERATION: Some fresh glass. Piece 7: Some calcite veins. Most glass altered to dull black or green.
VEINS/FRACTURES: Piece 7: Some calcite veins

UNIT 3: APHYRIC MASSIVE FLOWS

Pieces 5R-4, 8 through 5R-8, 2 (Flow D)

CONTACTS: Microcrystalline flow top with possible margin on top of Piece 5R-4, 8. Fine-grained flow base.
PHENOCRYSTS: Aphyric
GROUNDMASS: Grain size coarsens downward through Sections 5R-5 and 5R-6, then becomes finer-grained through the base of the Section 5R-8 Piece 2. Groundmass is quite pristine in some pieces, particularly Piece 5R-5, 3B.
VESICLES: No obvious or large vesicles are present.
COLOR: Gray with iron oxide staining in alteration halos.
STRUCTURE: Aphyric massive flow with a fine-grained flow base.
ALTERATION: This flow is more altered than flow C, with extensive alteration halos throughout Sections 5R-5 and 5R-6. Some halos are up to 14 mm across in Section 5R-6. The bottom of Piece 5R-8, 1 has well developed, 1 cm wide brown alteration halos. Pieces 5R-7, 5A through 5D are iron oxide stained, not obviously related to veining. Calcite crystals are present on the side of Pieces 5R-6, 1F, and 5R-7, 4 and on the top of Piece 5R-7, 5A.
VEINS/FRACTURES: This flow contains more veins than Flow C. Veins of calcite, orange or dark green minerals are present. The veins are on average 1 mm in size, but up to 4 mm in Section 5R-5. A large (up to 7 mm) calcite vein is present in Piece 5R-6, 1E.

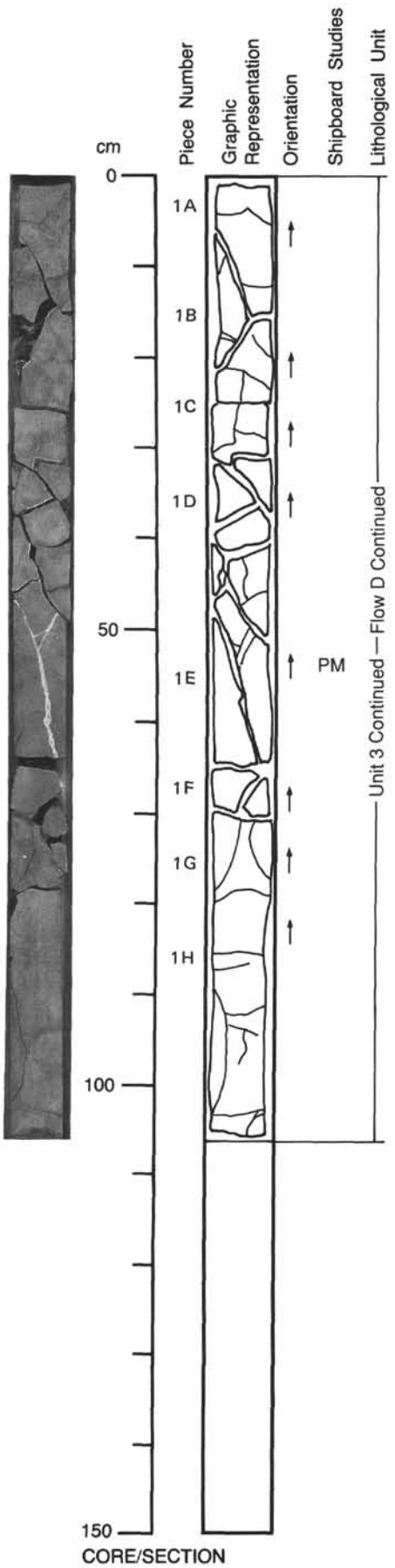


123-765D-5R-5

UNIT 3: APHYRIC MASSIVE FLOWS

Pieces 5R-4, 8 through 5R-8, 2 (Flow D)

CONTACTS: Microcrystalline flow top with possible margin on top of Piece 5R-4, 8. Fine-grained flow base.
PHENOCRYSTS: Aphyric
GROUNDMASS: Grain size coarsens downward through Sections 5R-5 and 5R-6, then becomes finer-grained through the base of the Section 5R-8 Piece 2. Groundmass is quite pristine in some pieces, particularly Piece 5R-5, 3B.
VESICLES: No obvious or large vesicles are present.
COLOR: Gray with iron oxide staining in alteration halos.
STRUCTURE: Aphyric massive flow with a fine-grained flow base.
ALTERATION: This flow is more altered than flow C, with extensive alteration halos throughout Sections 5R-5 and 5R-6. Some halos are up to 14 mm across in Section 5R-6. The bottom of Piece 5R-8, 1 has well developed, 1 cm wide brown alteration halos. Pieces 5R-7, 5A through 5D are iron oxide stained, not obviously related to veining. Calcite crystals are present on the side of Pieces 5R-6, 1F, and 5R-7, 4 and on the top of Piece 5R-7, 5A.
VEINS/FRACTURES: This flow contains more veins than Flow C. Veins of calcite, orange, or dark green minerals are present. The veins are on average 1 mm in size, but up to 4 mm in Section 5R-5. A large (up to 7 mm) calcite vein is present in Piece 5R-6, 1E.

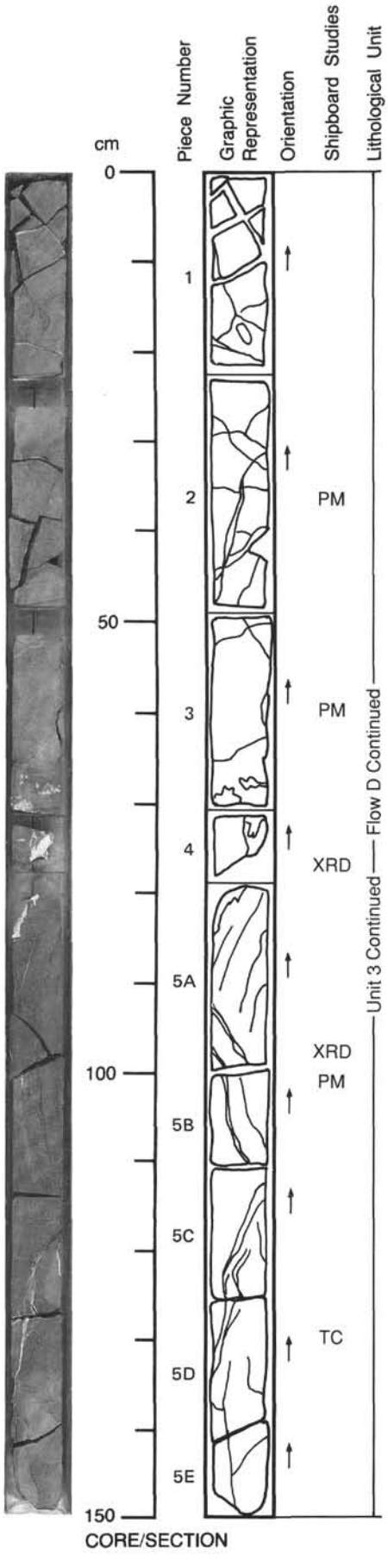


123-765D-5R-6

UNIT 3: APHYRIC MASSIVE FLOWS

Pieces 5R-4, 8 through 5R-8, 2 (Flow D)

CONTACTS: Microcrystalline flow top with possible margin on top of Piece 5R-4, 8. Fine-grained flow base.
PHENOCRYSTS: Aphyric
GROUNDMASS: Grain size coarsens downward through Sections 5R-5 and 5R-6, then becomes finer-grained through the base of the Section 5R-8 Piece 2. Groundmass is quite pristine in some pieces, particularly Piece 5R-5, 3B.
VESICLES: No obvious or large vesicles are present.
COLOR: Gray with iron oxide staining in alteration halos.
STRUCTURE: Aphyric massive flow with a fine-grained flow base.
ALTERATION: This flow is more altered than flow C, with extensive alteration halos throughout Sections 5R-5 and 5R-6. Some halos are up to 14 mm across in Section 5R-6. The bottom of Piece 5R-8, 1 has well developed, 1 cm wide brown alteration halos. Pieces 5R-7, 5A through 5D are iron oxide stained, not obviously related to veining. Calcite crystals are present on the side of Pieces 5R-6, 1F, and 5R-7, 4 and on the top of Piece 5R-7, 5A.
VEINS/FRACTURES: This flow contains more veins than Flow C. Veins of calcite, orange, or dark green minerals are present. The veins are on average 1 mm in size, but up to 4 mm in Section 5R-5. A large (up to 7 mm) calcite vein is present in Piece 5R-6, 1E.

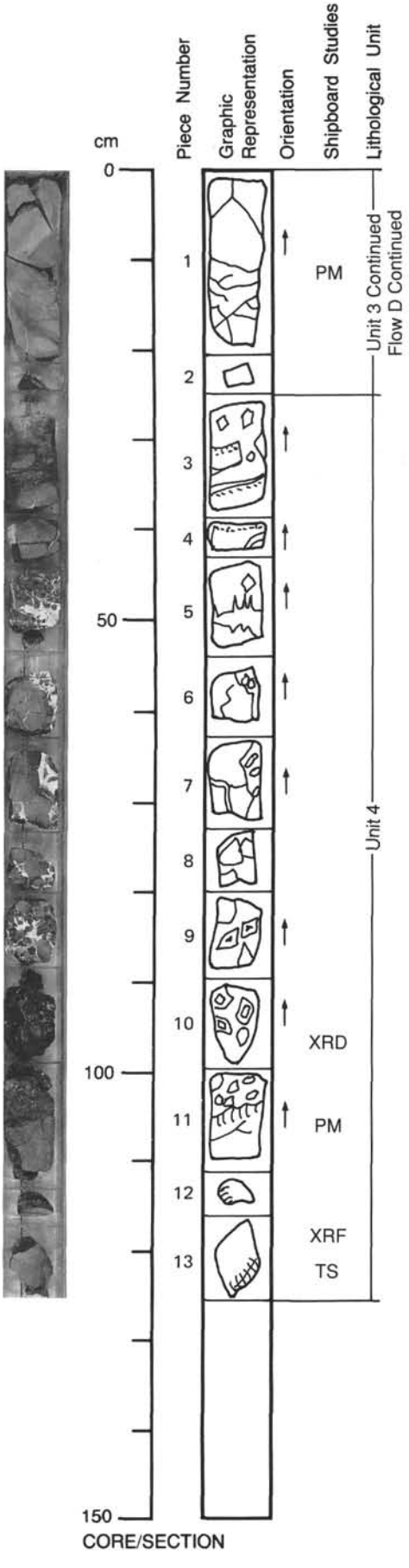


123-765D-5R-7

UNIT 3: APHYRIC MASSIVE FLOWS

Pieces 5R-4, 8 through 5R-8, 2 (Flow D)

CONTACTS: Microcrystalline flow top with possible margin on top of Piece 5R-4, 8. Fine-grained flow base.
PHENOCRYSTS: Aphyric
GROUNDMASS: Grain size coarsens downward through Sections 5R-5 and 5R-6, then becomes finer-grained through the base of the Section 5R-8 Piece 2. Groundmass is quite pristine in some pieces, particularly Piece 5R-5, 3B.
VESICLES: No obvious or large vesicles are present.
COLOR: Gray with iron oxide staining in alteration halos.
STRUCTURE: Aphyric massive flow with a fine-grained flow base.
ALTERATION: This flow is more altered than flow C, with extensive alteration halos throughout Sections 5R-5 and 5R-6. Some halos are up to 14 mm across in Section 5R-6. The bottom of Piece 5R-8, 1 has well developed, 1 cm wide brown alteration halos. Pieces 5R-7, 5A through 5D are iron oxide stained, not obviously related to veining. Calcite crystals are present on the side of Pieces 5R-6, 1F, and 5R-7, 4 and on the top of Piece 5R-7, 5A.
VEINS/FRACTURES: This flow contains more veins than Flow C. Veins of calcite, orange, or dark green minerals are present. The veins are on average 1 mm in size, but up to 4 mm in Section 5R-5. A large (up to 7 mm) calcite vein is present in Piece 5R-6, 1E.



123-765D-5R-8

UNIT 3: APHYRIC MASSIVE FLOWS

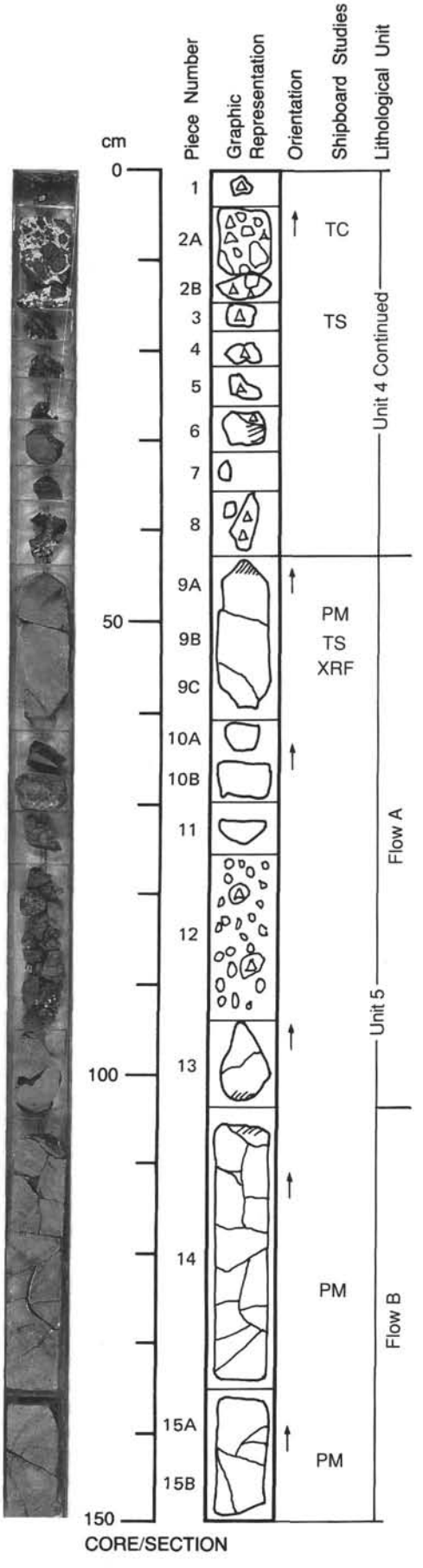
Pieces 5R-4, 8 through 5R-8, 2 (Flow D)

CONTACTS: Microcrystalline flow top with possible margin on top of Piece 5R-4, 8. Fine-grained flow base.
PHENOCRYSTS: Aphyric
GROUNDMASS: Grain size coarsens downward through Sections 5R-5 and 5R-6, then becomes finer-grained through the base of the Section 5R-8 Piece 2. Groundmass is quite pristine in some pieces, particularly Piece 5R-5, 3B.
VESICLES: No obvious or large vesicles are present.
COLOR: Gray with iron oxide staining in alteration halos.
STRUCTURE: Aphyric massive flow with a fine-grained flow base.
ALTERATION: This flow is more altered than flow C, with extensive alteration halos throughout Sections 5R-5 and 5R-6. Some halos are up to 14 mm across in Section 5R-6. The bottom of Piece 5R-8, 1 has well developed, 1 cm wide brown alteration halos. Pieces 5R-7, 5A through 5D are iron oxide stained, not obviously related to veining. Calcite crystals are present on the side of Pieces 5R-6, 1F, and 5R-7, 4 and on the top of Piece 5R-7, 5A.
VEINS/FRACTURES: This flow contains more veins than Flow C. Veins of calcite, orange, or dark green minerals are present. The veins are on average 1 mm in size, but up to 4 mm in Section 5R-5. A large (up to 7 mm) calcite vein is present in Piece 5R-6, 1E.

UNIT 4: APHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 5R-8, 3 to 6R-1, 8

CONTACTS: Series of pillow basalts and hyaloclastites. Chilled margin against hyaloclastite in Piece 5R-8, 11. Chilled margin in Piece 6R-1, 6
PHENOCRYSTS:
Plagioclase - Rare; 1 mm; Subhedral equant, fresh.
Clinopyroxene? - Rare; 1 mm; Euhedral, prismatic, fresh?. (mafic mineral)
GROUNDMASS: Glassy to fine-grained. Grain size varies regularly in isolated pillows.
VESICLES: Rare; Small (<1 mm); Irregular form; Evenly distributed; Filled with dark green clay minerals.
COLOR: Black in fresh glass, dark green in altered hyaloclastite, and dark gray in the central part of isolated pillows, whose margins are often stained brown.
STRUCTURE: Lapilli-size to sand-sized hyaloclastite with calcite matrix and isolated pillows up to 25 cm in size.
ALTERATION: 100% altered in fine-grained or sand-size hyaloclastite. Glass fragments more than 2 cm in size remain fresh at least in their central part. Pillow fragments are slightly altered.
VEINS/FRACTURES: Scarce calcite veins, 0.5 mm wide, cut isolated pillows.
ADDITIONAL COMMENTS: Pieces 5R-8, 3 and 4 are breccia including brown chilled basalt spherulites. Piece 5R-8, 4 is cut by calcite veins. Pieces 5R-8, 5 through 10 are hyaloclastite-basalt in green matrix and calcite. Basalt is highly spherulitic and angular. Pieces 5R-8, 6 and 7 have large chilled basalt chunks. Pieces 5R-8, 9 and 10 have zoned basalt chips. Pieces 5R-8, 11 through 13: Top of Piece 5r-8, 11 comprises a basalt breccia in green matrix. The bottom is chilled. All pieces are fine-grained, spherulitic basalt. Piece 6R-1, 1: Is a fragment of an isolated pillow - no contacts seen. Piece 6R-1, 2: Hyaloclastite with fresh obsidian-like glass fragments, 5 mm to 3 cm in size, in white calcite matrix. The glass to calcite ratio is about 1:1. Pieces 6R-1, 3 to 5: Altered dark green hyaloclastite. Glass fragments are less than 1 cm size and show concentric zoning due to alteration. Calcite matrix occupies only 10-20% of the rock. Pieces 6R-1, 6 and 7: Fragments of an isolated pillow. With a glass margin on one side of Piece 6R-1, 6. A piece of altered hyaloclastite is also attached to Piece 6R-1, 6. Piece 6R-1, 8: Altered, dark green hyaloclastite with calcite matrix.



123-765D-6R-1

UNIT 4: APHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 5R-8, 3 to 6R-1, 8

CONTACTS: Series of pillow basalts and hyaloclastites. Chilled margin against hyaloclastite in Piece 5R-8, 11. Chilled margin in Piece 6R-1, 6
PHENOCRYSTS:
Plagioclase - Rare; 1 mm; Subhedral equant, fresh.
Clinopyroxene? - Rare; 1 mm; Euhedral, prismatic, fresh?. (mafic mineral)
GROUNDMASS: Glassy to fine-grained. Grain size varies regularly in isolated pillows.
VESICLES: Rare; Small (<1 mm); Irregular form; Evenly distributed; Filled with dark green clay minerals.
COLOR: Black in fresh glass, dark green in altered hyaloclastite, and dark gray in the central part of isolated pillows, whose margins are often stained brown.
STRUCTURE: Lapilli-size to sand-sized hyaloclastite with calcite matrix and isolated pillows up to 25 cm in size.
ALTERATION: 100% altered in fine-grained or sand-size hyaloclastite. Glass fragments more than 2 cm in size remain fresh at least in their central part. Pillow fragments are slightly altered.
VEINS/FRACTURES: Scarce calcite veins, 0.5 mm wide, cut isolated pillows.
ADDITIONAL COMMENTS: Pieces 5R-8, 3 and 4 are breccia including brown chilled basalt spherulites. Piece 5R-8, 4 is cut by calcite veins. Pieces 5R-8, 5 through 10 are hyaloclastite-basalt in green matrix and calcite. Basalt is highly spherulitic and angular. Pieces 5R-8, 6 and 7 have large chilled basalt chunks. Pieces 5R-8, 9 and 10 have zoned basalt chips. Pieces 5R-8, 11 through 13: Top of Piece 5r-8, 11 comprises a basalt breccia in green matrix. The bottom is chilled. All pieces are fine-grained, spherulitic basalt. Piece 6R-1, 1: Is a fragment of an isolated pillow - no contacts seen. Piece 6R-1, 2: Hyaloclastite with fresh obsidian-like glass fragments, 5 mm to 3 cm in size, in white calcite matrix. The glass to calcite ratio is about 1:1. Pieces 6R-1, 3 to 5: Altered dark green hyaloclastite. Glass fragments are less than 1 cm size and show concentric zoning due to alteration. Calcite matrix occupies only 10-20% of the rock. Pieces 6R-1, 6 and 7: Fragments of an isolated pillow. With a glass margin on one side of Piece 6R-1, 6. A piece of altered hyaloclastite is also attached to Piece 6R-1, 6. Piece 6R-1, 8: Altered, dark green hyaloclastite with calcite matrix.

UNIT 5: APHYRIC BASALT MASSIVE FLOWS

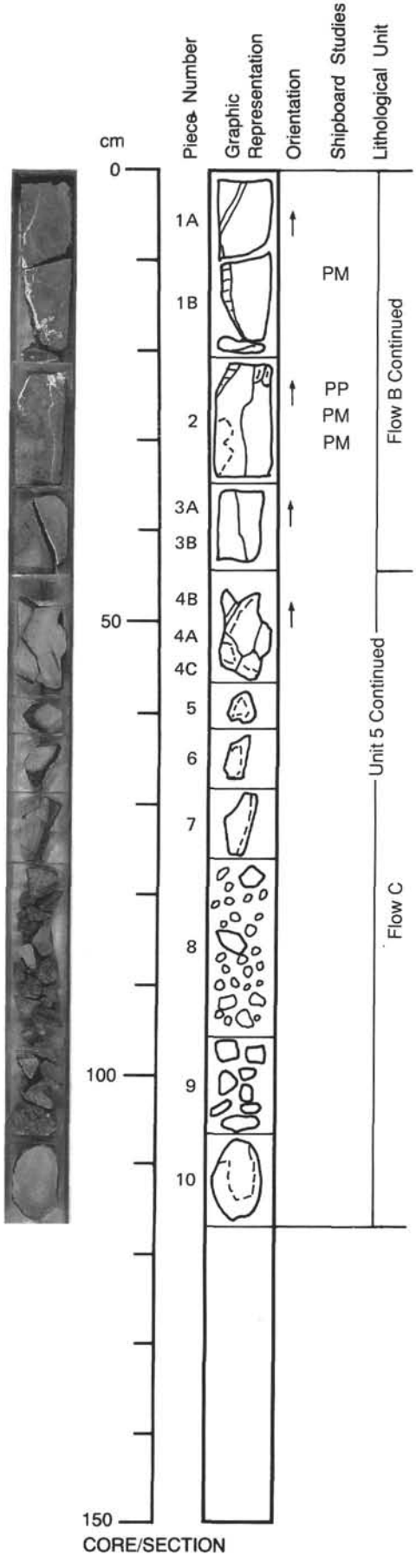
Pieces 6R-1, 9A-13 (Flow A)

CONTACTS: Fragments, single flow(?) >25 cm thick. Upper contact at top of Piece 9A marked by glass margin. Lower contact at bottom of Piece B marked by glass margin.
PHENOCRYSTS: Aphyric
GROUNDMASS: Glass margins, coarser center.
VESICLES: None
COLOR: Dark gray, Piece 9A: Yellow-brown on margins.
STRUCTURE: Flow or pillow basalt
ALTERATION: Yellowish-brown on margin, "fresh" dark gray in center of pieces.
VEINS/FRACTURES: Calcite veining in Piece 12
ADDITIONAL COMMENTS: Piece 12: 25 fragments of altered hyaloclastite with or without calcite matrix.

UNIT 5: APHYRIC BASALT MASSIVE FLOWS

Pieces 6R-1,14 through 6R-2,3B (Flow B)

CONTACTS: Contacts not seen, but microcrystalline margin on top of Piece 6R-1, 14.
PHENOCRYSTS: Aphyric
GROUNDMASS: Upper margin is microcrystalline, coarsening downward to become uniformly fine-grained, (Pieces 6R-1, 1-3B) with grain size of about 1 mm.
VESICLES: None
COLOR: Pieces 6R-2, 1-3B: Light yellowish brown in alteration halos (more than 50% in volume) and light bluish or greenish gray in relatively fresh part.
STRUCTURE: Flow
ALTERATION: Strongly altered
VEINS/FRACTURES: Piece 14 is divided into many fragments along veins and cracks. Veins are filled with calcite, brown, and green materials.

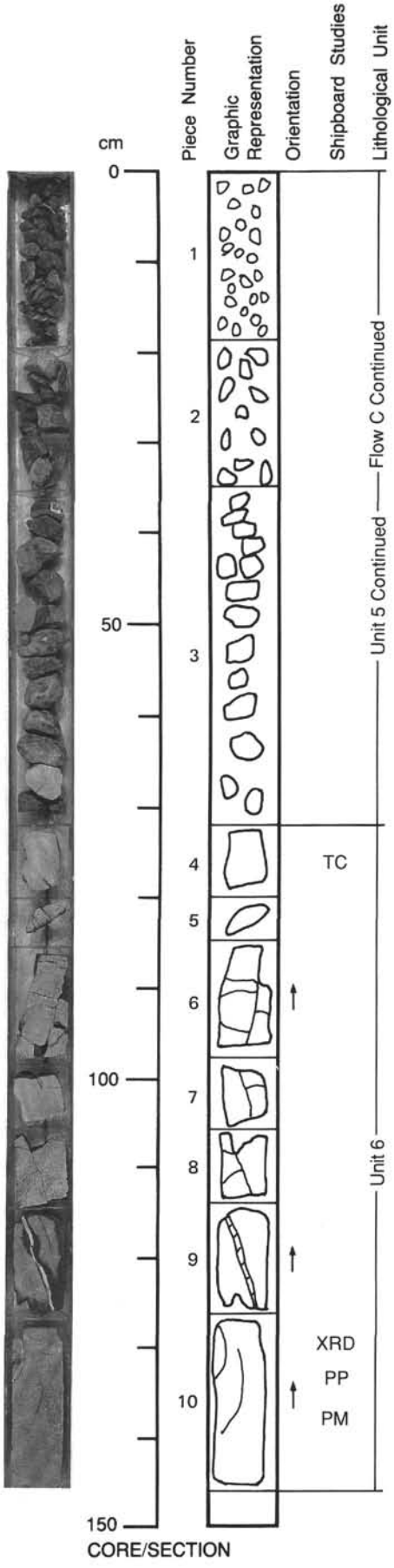


123-765D-6R-2

UNIT 5: APHYRIC BASALT MASSIVE FLOWS

Pieces 6R-2, 4A through 7R-1, 3 (Flow C)

CONTACTS: Not seen. Uniformly very fine grained, apparently finer-grained than Flow B (above).
PHENOCRYSTS: Mafic minerals completely replaced by clays. Rare clinopyroxene(?) (<2.0 mm) subhedral equant or prismatic.
GROUNDMASS: Uniformly very fine-grained.
VESICLES: Absent
COLOR: Variable; Light gray in center and dark gray or light brown in alteration halos along cracks.
STRUCTURE: Massive flow.
ALTERATION: Moderate
VEINS/FRACTURES: The abundant calcite and green clay veins of Flows A and B, are absent in Flow C. The calcite veins are curved and branching, with some clots up to 1 cm in size.
ADDITIONAL COMMENTS: Pieces 7R-1, 1-3 are drill breccia. Piece 7R-1, 1, 1-2 cm in size; Piece 7R-1, 2, 2-4 cm in size; Piece 7R-1, 3, 3-6 cm in size.

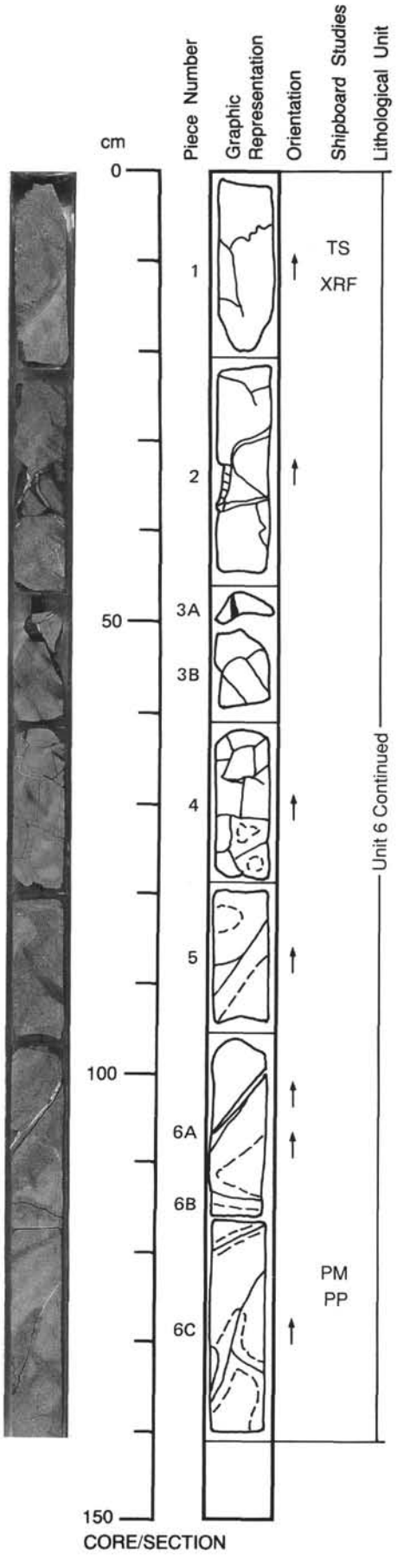


123-765D-7R-1

UNIT 6: MASSIVE APHYRIC BASALT FLOWS

Pieces 7R-1, 4-10

CONTACTS: Not seen
PHENOCRYSTS: Pieces 4-8: A few phenocrysts of mafic mineral (2 mm size) completely replaced by clay minerals. Piece 7: One, considerably altered (>50%), plagioclase phenocryst (1.5 mm) is present. Pieces 9 and 10: Phenocryst-free.
GROUNDMASS: Pieces 4 and 7: Very fine-grained. Pieces 5, 6, and 8: Fine- grained. Pieces 9 and 10: Fine-grained basalt with very good crystallinity.
VESICLES: Pieces 5, 6, and 8: 3%, <1 mm, spherical. Vesicles are scarce in Pieces 9 and 10.
COLOR: Pieces 4 and 7: Light gray. Pieces 5, 6, and 8: Light greenish gray with some green alteration minerals. Pieces 9 and 10: Greenish gray.
STRUCTURE: Massive
ALTERATION: Pieces 4-8: mafic phenocrysts replaced by clay minerals.
VEINS/FRACTURES: 5 mm thick calcite vein cuts through Piece 9.

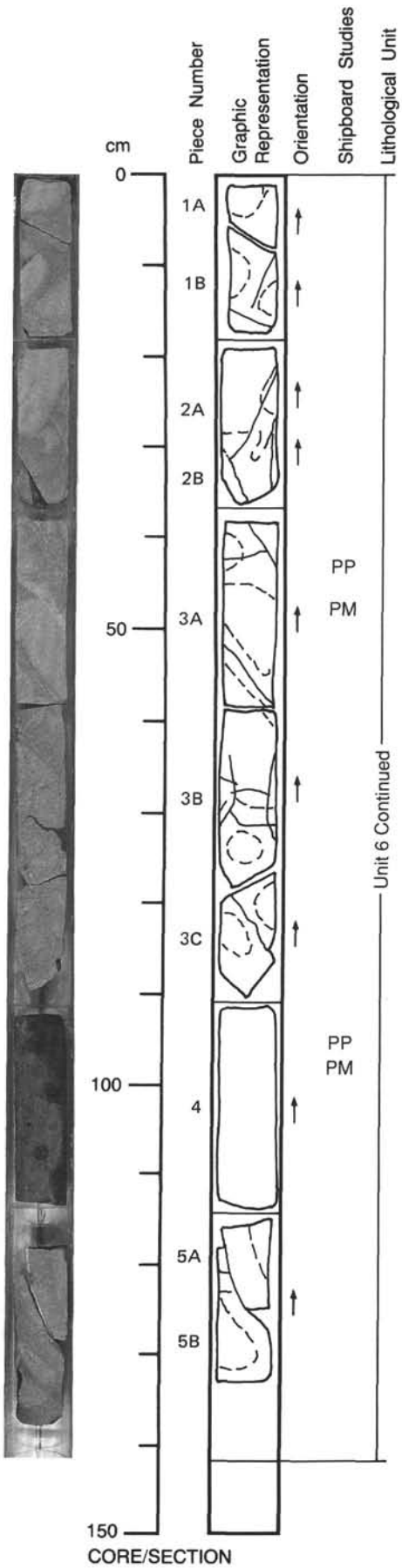


123-765D-7R-2

UNIT 6: MASSIVE APHYRIC BASALT FLOWS

Pieces 7R-2, 1-6C

CONTACTS: None, Unit 6 continued.
PHENOCRYSTS: Piece 1: Rare (<1%) phenocrysts of mafic mineral (clinopyroxene?) and plagioclase. Pieces 2-6: Aphyric.
GROUNDMASS: Piece 1: Fine-grained. Pieces 2, 5, and 6: Fine-grained with very good crystallinity. Pieces 3 and 4: very fine-grained.
VESICLES: Piece 1 is vesicular. Piece 2 is more vesicular than Pieces 5 and 6, the vesicles tend to be filled with calcite in fresher parts and green clays in alteration halos. Some vesicles are empty.
COLOR: Piece 1: Light greenish gray. Pieces 2, 5, and 6: Light gray; yellowish brown or greenish gray in alteration halos. Pieces 3 and 4: Gray with brown calcite veins and pale alteration halos.
STRUCTURE: Massive
ALTERATION: Pieces 2, 5, and 6: Halos along veins, a green vein with alteration halo changes into a calcite vein without halo from Piece 5 to Piece 6. Green clay-filled vesicles are in alteration halos. Pieces 3 and 4: Fractures are associated with pale alteration halos.
VEINS/FRACTURES: Pieces 2, 5, and 6: Halos along veins, A green vein with alteration halo changes into a calcite vein without halo from Piece 5 to Piece 6. Brown veins also exist. Pieces 3 and 4: Fractures are developed with or without calcite/brown veins; Pieces are fragmented along them. The fractures are associated with pale alteration halos.

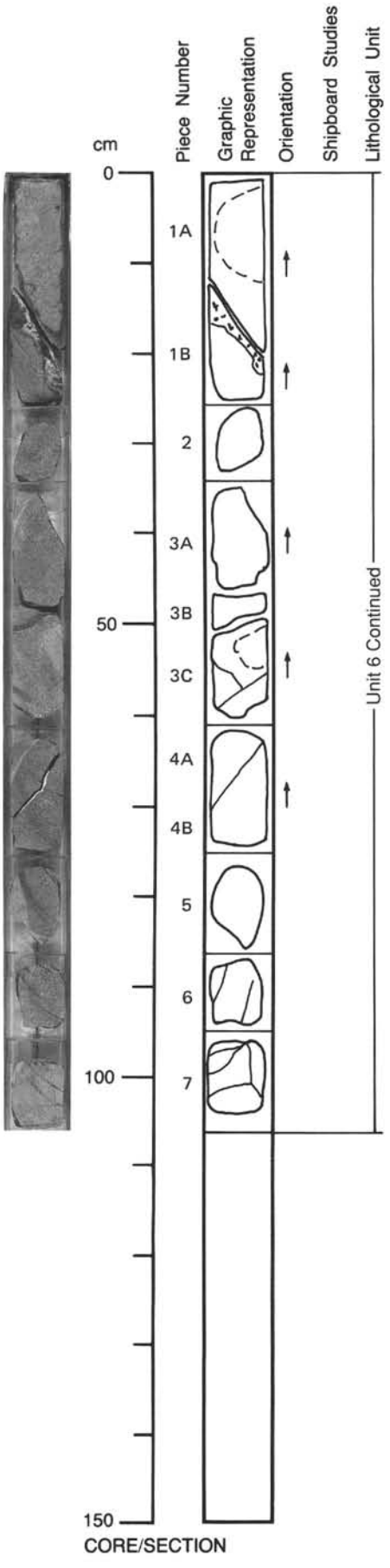


123-765D-7R-3

UNIT 6: MASSIVE APHYRIC BASALT FLOWS

Pieces 7R-3, 1 through 7R-4, 7

CONTACTS: None. Unit 6 continued.
PHENOCRYSTS: Aphyric
GROUNDMASS: Pieces 7R-3, 1-5 and 7R-4, 1-6: Uniformly fine-grained with very good crystallinity. Piece 7R-4, 7: Very fine-grained vesicular.
VESICLES: Piece 7R-4, 7: Vesicular basalt resembling Pieces 5, 6, and 8 of core 7R-1.
COLOR: Yellowish brown or dark greenish gray. Piece 7R-4, 7: Gray.
STRUCTURE: Massive
ALTERATION: Pieces 7R-3, 1-5 and Pieces 7R-4, 1-6: Yellowish brown or dark greenish gray alteration halos developed along veins; mostly brown veins with some calcite veins.
VEINS/FRACTURES: Alteration halos developed along veins. The vein in Piece 7R-4, 1B: is almost parallel to the cut surface and is only 1 mm thick.

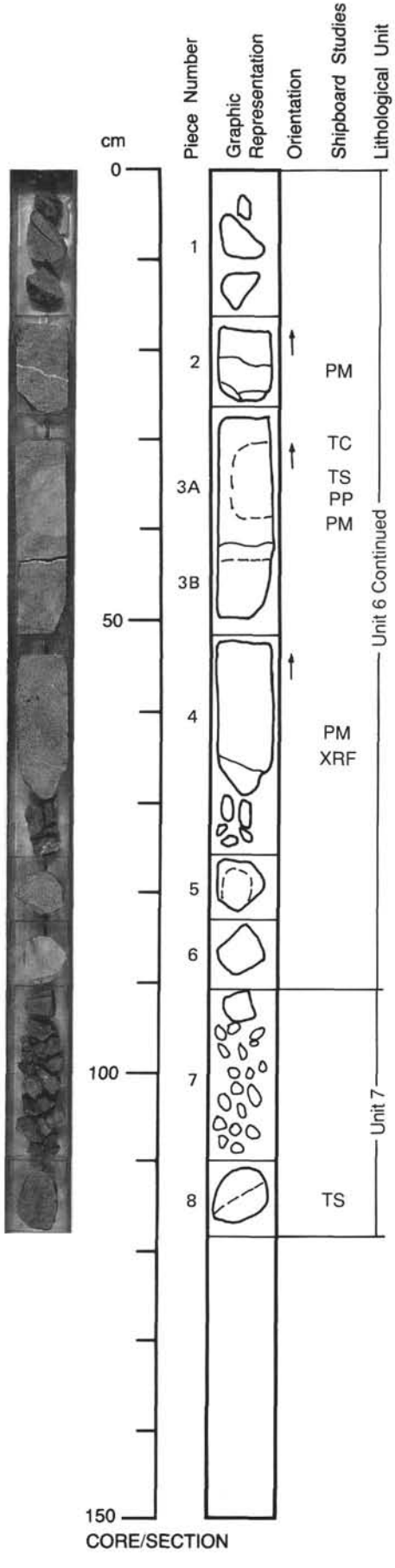


123-765D-7R-4

UNIT 6: MASSIVE APHYRIC BASALT FLOWS

Pieces 7R-3, 1 through 7R-4, 7

CONTACTS: None. Unit 6 continued.
PHENOCRYSTS: Aphyric
GROUNDMASS: Pieces 7R-3, 1-5 and 7R-4, 1-6: Uniformly fine-grained with very good crystallinity. Piece 7R-4, 7: Very fine-grained vesicular.
VESICLES: Piece 7R-4, 7: Vesicular basalt resembling Pieces 5, 6, and 8 of core 7R-1.
COLOR: Yellowish brown or dark greenish gray. Piece 7R-4, 7: Gray.
STRUCTURE: Massive
ALTERATION: Pieces 7R-3, 1-5 and Pieces 7R-4, 1-6: Yellowish brown or dark greenish gray alteration halos developed along veins; mostly brown veins with some calcite veins.
VEINS/FRACTURES: Alteration halos developed along veins. The vein in Piece 7R-4, 1B: is almost parallel to the cut surface and is only 1 mm thick.



123-765D-8R-1

UNIT 6: MASSIVE APHYRIC BASALT FLOWS

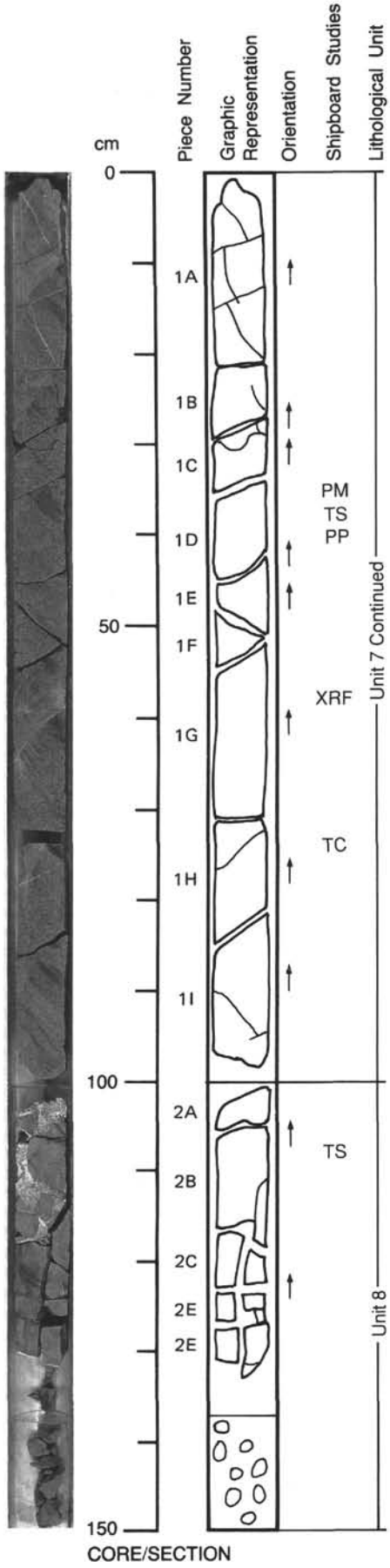
Pieces 8R-1, 1-6

CONTACTS: None. Unit 6 continued. No lower contact seen.
PHENOCRYSTS: Aphyric
GROUNDMASS: Pieces 1-5: Uniformly fine-grained, with very good crystallinity. Piece 6: very fine-grained.
VESICLES: Pieces 1-5: 2%, <1 mm, spherical, uniformly distributed, filled with calcite (fresh part) or green clays (altered part). Piece 6: 1%, tiny, uniformly distributed, filled with calcite.
COLOR: Light gray in fresh parts and yellowish brown or greenish gray in altered parts.
STRUCTURE: Massive
ALTERATION: Pieces 1-5: Altered yellowish brown or greenish gray part is dominant, relatively fresh light gray part is preserved only in the center of Piece 3A. Green clays in altered part.
VEINS/FRACTURES: A calcite vein, 1 mm thick, cuts the central part of Piece 2, azimuth 290 degrees, dip 60 degrees.

UNIT 7: APHYRIC DIABASE

Pieces 8R-1, 7 through 9R-1, 1I

CONTACTS: Not seen. Upper limit is within Piece 8R-1, 7. Lower limit is at the bottom of Piece 9R-1, 1I. Grain size remains almost constant throughout the unit.
PHENOCRYSTS: Phenocrysts are present only in the interval between 20 and 80 cm (Pieces 9R-1, 1B to 1H).
Clinopyroxene? - 1%; 1-4 mm, average 2 mm; Anhedral or subhedral, equant. 50% or more may be replaced by dark green clays.
GROUNDMASS: Uniformly medium-grained (1 mm). Grain size is slightly smaller in the lower half of Piece 9R-1, 1I. (bottom). Subophitic texture.
VESICLES: Rare; 1 mm; Spherical; Filled by dark green clays.
COLOR: Medium gray in fresh parts, yellowish gray or pale reddish brown in altered parts at the top of Piece 9R-1, 1A and at the bottom of Piece 9R-1, 1I.
STRUCTURE: Massive lava flow or sill. The latter is more probable.
ALTERATION: Slightly altered in most parts. The upper half of Piece 8R-1, 8 is very fresh (dark gray), while the lower half is altered (yellow brown). The top and bottom parts of Section 9R-1 (Pieces 1A and 1I) are moderately altered along veins. The alteration halos are 3 cm in width, and yellowish gray or pale reddish brown.
VEINS/FRACTURES: The core is fragmented along fractures; Subhorizontal to 45 degrees dip in the interval between 5 and 20 cm in Section 9R-1. White calcite veins, brown veins, and dark green veins are present.



123-765D-9R-1

UNIT 8: APHYRIC PILLOW BASALTS WITH BRECCIA VEINS

Pieces 9R-1, 2A through 9R-3, 10

CONTACTS: Not seen. The upper half of Pieces 9R-1, 2A and 2B is a hyaloclastite with altered green glass fragments (<1 cm), gray microcrystalline basalt fragments (<3 cm), and variolitic gray basalt fragments (<8 cm) buried in a calcite matrix. The lower half is pale yellowish gray microcrystalline basalt, possibly the top part of a flow, which continues to Section 9R-3. Piece 9R-1, 3 is drilling breccia.

PHENOCRYSTS: Aphyric

GROUNDMASS: Microcrystalline, partly variolitic.

VESICLES: <1%; 0.5 mm in diameter; Spherical; Evenly distributed; Filled with calcite, green clay, or oxidized brown material.

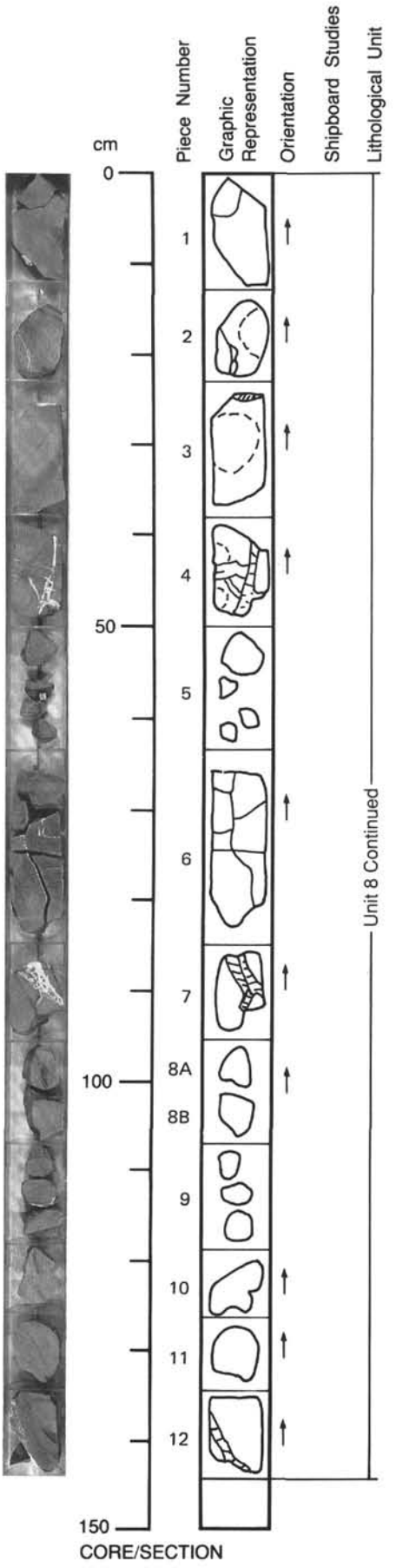
COLOR: Medium to light gray in relatively fresh part, and light yellowish gray in altered part.

STRUCTURE: Massive basalt flows with breccia at the top.

ALTERATION: Moderately altered

VEINS/FRACTURES: Lower part of Piece 9R-1, 2 is highly fragmented and cut by some thin calcite veins.

ADDITIONAL COMMENTS: Piece 9R-1, 2. Light gray, very fine-grained basalt. Reddish brown alteration patches (<2 mm diameter) are developed around vesicles. Red brown vein is also present. Piece 9R-2, 2: Light gray, very fine-grained basalt with a curved greenish gray (partly brown) alteration halo. A thin calcite vein cuts the sample vertically. Pieces 9R-2, 3-5: Light gray, very fine to fine-grained basalt flow coarsening downward. Alteration halo is developed along veins. Subvertical, 5 mm-thick calcite vein in Piece 9R-2, 4. Piece 9R-2, 6: Dark gray, very fine-grained basalt with tiny vesicles filled with calcite, clays, and oxidation products. Hyalophitic texture is evident by hand lens. Pieces 9R-2, 7-8 and 9B-11: Medium gray, very fine-grained or microcrystalline basalt. Intersertal texture. Piece 9R-2, 9A: Greenish gray, altered basalt of good crystallinity. Vesicles filled with calcite and green clay. Yellow and brown oxidation products are common (about 3 %). Piece 9R-2, 12: Medium gray. Very fine-grained basalt, coarser than Piece 9R-2, 11. A breccia vein with calcite matrix, 1 cm-thick, azimuth 180 degrees, dip 70 degrees is present. Yellowish to brownish gray alteration halo, 2 cm- thick is developed along the vein. Pieces 9R-3, 1-2: Fine-grained (Piece 9R-1, 3 is coarser) gray basalt with breccia veins. Brown alteration halo. Piece 9R-3, 2 contains 5% vesicles, filled with calcite and dark green mineral. Piece 9R-3, 3: Featureless, mm-sized grain size, similar to Piece 9R-3, 1. Alteration halo around vein. Piece 9R-3, 4: Breccia vein and calcite blotches; alteration halos. Fine-grained, with vesicles. Pieces 9R-3, 6, 7, 9, and 10: Fine-grained basalt fragments with alteration halos. Piece 9R-3, 6 has (5%) round vesicles filled with dark green mineral. Piece 9R-3, 8: Rubble.



123-765D-9R-2

UNIT 8: APHYRIC PILLOW BASALTS WITH BRECCIA VEINS

Pieces 9R-1, 2A through 9R-3, 10

CONTACTS: Not seen. The upper half of Pieces 9R-1, 2A and 2B is a hyaloclastite with altered green glass fragments (<1 cm), gray microcrystalline basalt fragments (<3 cm), and variolitic gray basalt fragments (<8 cm) buried in a calcite matrix. The lower half is pale yellowish gray microcrystalline basalt, possibly the top part of a flow, which continues to Section 9R-3. Piece 9R-1, 3 is drilling breccia.

PHENOCRYSTS: Aphyric

GROUNDMASS: Microcrystalline, partly variolitic.

VESICLES: <1%; 0.5 mm in diameter; Spherical; Evenly distributed; Filled with calcite, green clay, or oxidized brown material.

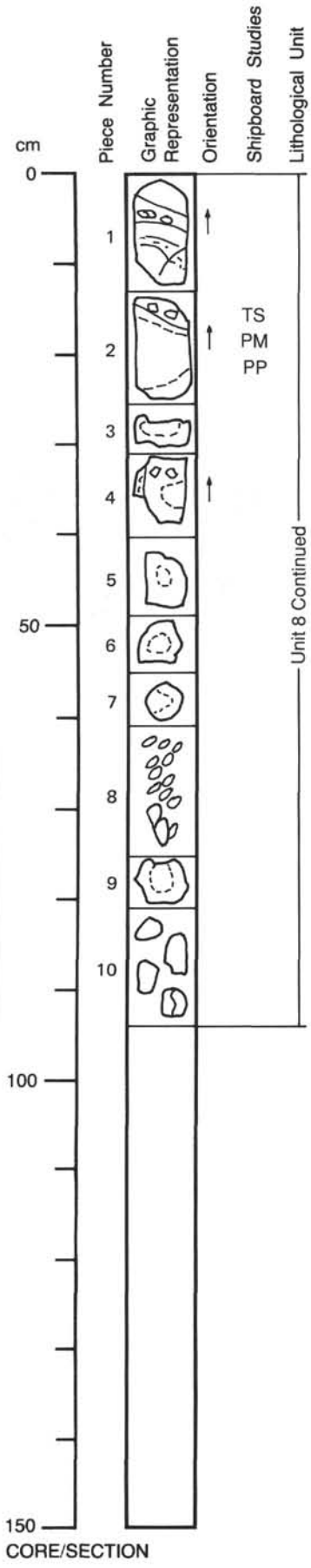
COLOR: Medium to light gray in relatively fresh part, and light yellowish gray in altered part.

STRUCTURE: Massive basalt flows with breccia at the top.

ALTERATION: Moderately altered

VEINS/FRACTURES: Lower part of Piece 9R-1, 2 is highly fragmented and cut by some thin calcite veins.

ADDITIONAL COMMENTS: Piece 9R-1, 2. Light gray, very fine-grained basalt. Reddish brown alteration patches (<2 mm diameter) are developed around vesicles. Red brown vein is also present. Piece 9R-2, 2: Light gray, very fine-grained basalt with a curved greenish gray (partly brown) alteration halo. A thin calcite vein cuts the sample vertically. Pieces 9R-2, 3-5: Light gray, very fine to fine-grained basalt flow coarsening downward. Alteration halo is developed along veins. Subvertical, 5 mm-thick calcite vein in Piece 9R-2, 4. Piece 9R-2, 6: Dark gray, very fine-grained basalt with tiny vesicles filled with calcite, clays, and oxidation products. Hyalophitic texture is evident by hand lens. Pieces 9R-2, 7-8 and 9B-11: Medium gray, very fine-grained or microcrystalline basalt. Intersertal texture. Piece 9R-2, 9A: Greenish gray, altered basalt of good crystallinity. Vesicles filled with calcite and green clay. Yellow and brown oxidation products are common (about 3 %). Piece 9R-2, 12: Medium gray. Very fine-grained basalt, coarser than Piece 9R-2, 11. A breccia vein with calcite matrix, 1 cm-thick, azimuth 180 degrees, dip 70 degrees is present. Yellowish to brownish gray alteration halo, 2 cm- thick is developed along the vein. Pieces 9R-3, 1-2: Fine-grained (Piece 9R-1, 3 is coarser) gray basalt with breccia veins. Brown alteration halo. Piece 9R-3, 2 contains 5% vesicles, filled with calcite and dark green mineral. Piece 9R-3, 3: Featureless, mm-sized grain size, similar to Piece 9R-3, 1. Alteration halo around vein. Piece 9R-3, 4: Breccia vein and calcite blotches; alteration halos. Fine-grained, with vesicles. Pieces 9R-3, 6, 7, 9, and 10: Fine-grained basalt fragments with alteration halos. Piece 9R-3, 6 has (5%) round vesicles filled with dark green mineral. Piece 9R-3, 8: Rubble.



123-765D-9R-3

UNIT 8: APHYRIC PILLOW BASALTS WITH BRECCIA VEINS

Pieces 9R-1, 2A through 9R-3, 10

CONTACTS: Not seen. The upper half of Pieces 9R-1, 2A and 2B is a hyaloclastite with altered green glass fragments (<1 cm), gray microcrystalline basalt fragments (<3 cm), and variolitic gray basalt fragments (<8 cm) buried in a calcite matrix. The lower half is pale yellowish gray microcrystalline basalt, possibly the top part of a flow, which continues to Section 9R-3. Piece 9R-1, 3 is drilling breccia.

PHENOCRYSTS: Aphyric

GROUNDMASS: Microcrystalline, partly variolitic.

VESICLES: <1%; 0.5 mm in diameter; Spherical; Evenly distributed; Filled with calcite, green clay, or oxidized brown material.

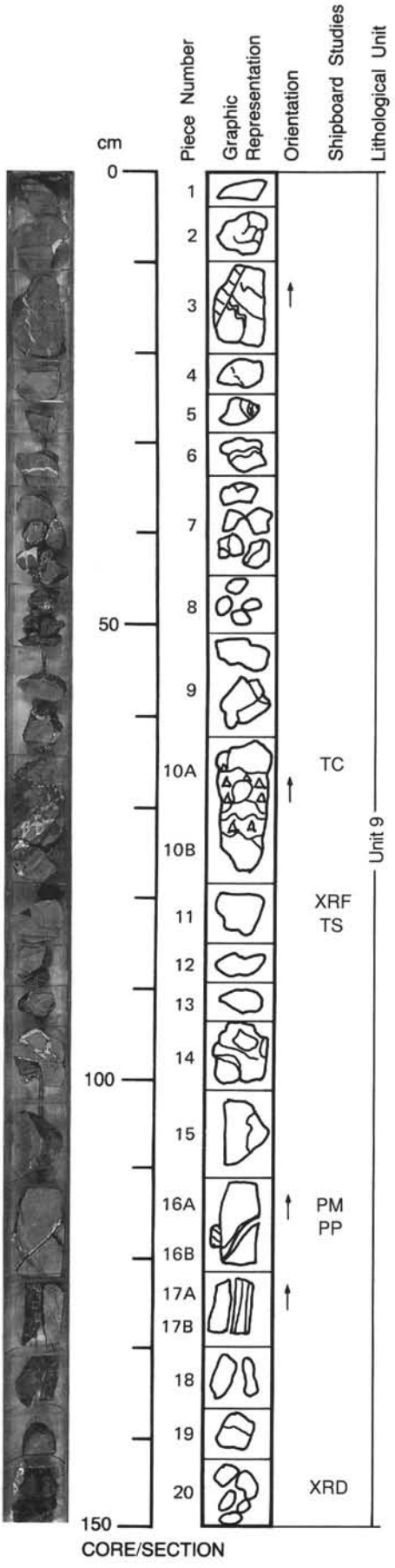
COLOR: Medium to light gray in relatively fresh part, and light yellowish gray in altered part.

STRUCTURE: Massive basalt flows with breccia at the top.

ALTERATION: Moderately altered

VEINS/FRACTURES: Lower part of Piece 9R-1, 2 is highly fragmented and cut by some thin calcite veins.

ADDITIONAL COMMENTS: Piece 9R-1, 2. Light gray, very fine-grained basalt. Reddish brown alteration patches (<2 mm diameter) are developed around vesicles. Red brown vein is also present. Piece 9R-2, 2: Light gray, very fine-grained basalt with a curved greenish gray (partly brown) alteration halo. A thin calcite vein cuts the sample vertically. Pieces 9R-2, 3-5: Light gray, very fine to fine-grained basalt flow coarsening downward. Alteration halo is developed along veins. Subvertical, 5 mm-thick calcite vein in Piece 9R-2, 4. Piece 9R-2, 6: Dark gray, very fine-grained basalt with tiny vesicles filled with calcite, clays, and oxidation products. Hyalophitic texture is evident by hand lens. Pieces 9R-2, 7-8 and 9B-11: Medium gray, very fine-grained or microcrystalline basalt. Intersertal texture. Piece 9R-2, 9A: Greenish gray, altered basalt of good crystallinity. Vesicles filled with calcite and green clay. Yellow and brown oxidation products are common (about 3 %). Piece 9R-2, 12: Medium gray. Very fine-grained basalt, coarser than Piece 9R-2, 11. A breccia vein with calcite matrix, 1 cm-thick, azimuth 180 degrees, dip 70 degrees is present. Yellowish to brownish gray alteration halo, 2 cm- thick is developed along the vein. Pieces 9R-3, 1-2: Fine-grained (Piece 9R-1, 3 is coarser) gray basalt with breccia veins. Brown alteration halo. Piece 9R-3, 2 contains 5% vesicles, filled with calcite and dark green mineral. Piece 9R-3, 3: Featureless, mm-sized grain size, similar to Piece 9R-3, 1. Alteration halo around vein. Piece 9R-3, 4: Breccia vein and calcite blotches; alteration halos. Fine-grained, with vesicles. Pieces 9R-3, 6, 7, 9, and 10: Fine-grained basalt fragments with alteration halos. Piece 9R-3, 6 has (5%) round vesicles filled with dark green mineral. Piece 9R-3, 8: Rubble.

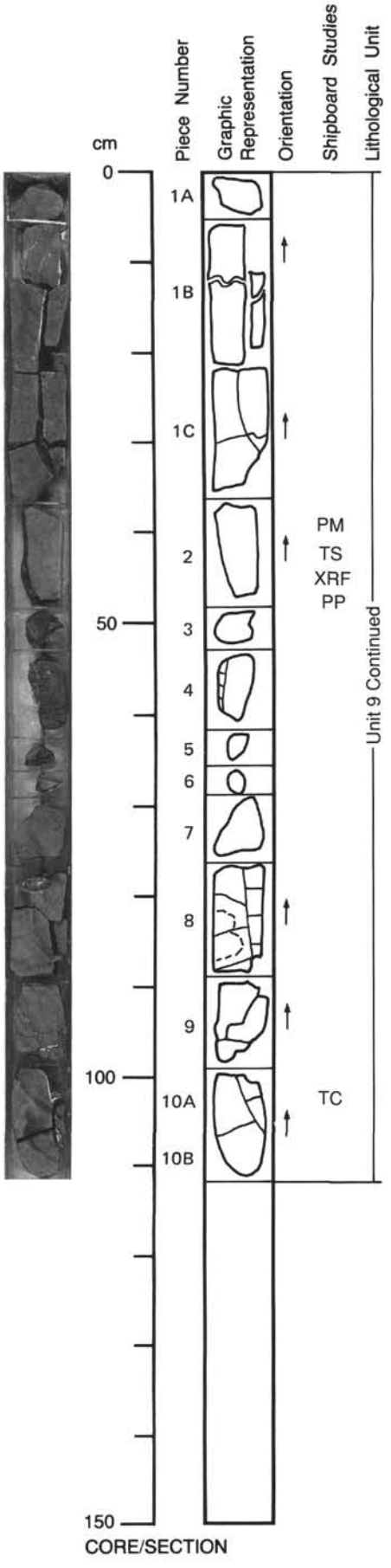


123-765D-10R-1

UNIT 9: SPARSELY PHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 10R-1, 1-20

CONTACTS: Not seen, mostly fragments. Piece 10R-1, 3: 1 cm chill margin comprising altered (dull black) glass and spherulites.
PHENOCRYSTS: Pieces 1 and 13: Aphyric. Pieces 2-12 and 14-20: Sparsely phyric.
Plagioclase - ~2%; 1-2 mm; Blocky.
Clinopyroxene - ~2%; 1-2 mm; Blocky.
GROUNDMASS: Very fine-grained to microcrystalline.
VESICLES: Rare, except Piece 10R-1, 1
COLOR: Grey when fresh to orange brown in alteration halos. Slightly mottled in Pieces 11 and 15.
STRUCTURE: Pillow basalts with hyaloclastites
ALTERATION: Variable. Some pieces mostly fresh (Piece 16), some with thick (cms) brown halos (Piece 2), some completely stained orange-brown (Piece 3).
VEINS/FRACTURES: Some veins. Piece 6: Calcite vein 3 mm thick. Breccia veins in Pieces 7, 8, 10, 14, and 20.

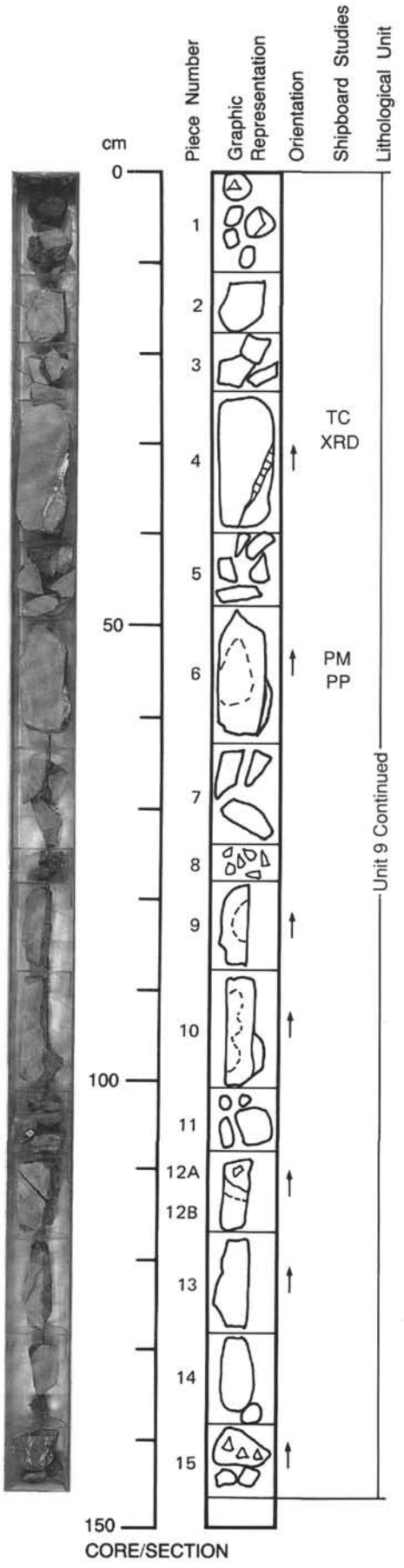


123-765D-11R-1

UNIT 9: SPARSELY PHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 11R-1, 1A-10B

CONTACTS: Not seen.
PHENOCRYSTS: Clinopyroxene(?), very rare, 0.5 mm, anhedral
GROUNDMASS: Microcrystalline to very fine-grained. Pieces 1 and 10: Very fine-grained. Pieces 2-7: Microcrystalline, plagioclase needles 0.3 mm long, visible with hand lens (random orientation).
VESICLES: <1%; *<0.5 mm; Spherical; Filled by green clays.*
COLOR: Light gray in fresh parts; medium gray, medium greenish gray, or reddish brown in alteration halos.
STRUCTURE: Thin massive flows(?), 40-50 cm thick.
ALTERATION: Moderately altered. Alteration halos 2 cm wide developed along veins and fractures. Vesicles filled with green clays; glassy material is replaced; Oxidation halos are present.
VEINS/FRACTURES: Dominant. Calcite is main filling phase; brown and green clays are also common. Piece 1: Vertical calcite vein. Pieces 8-10: Calcite veins, brown veins, and green veins.

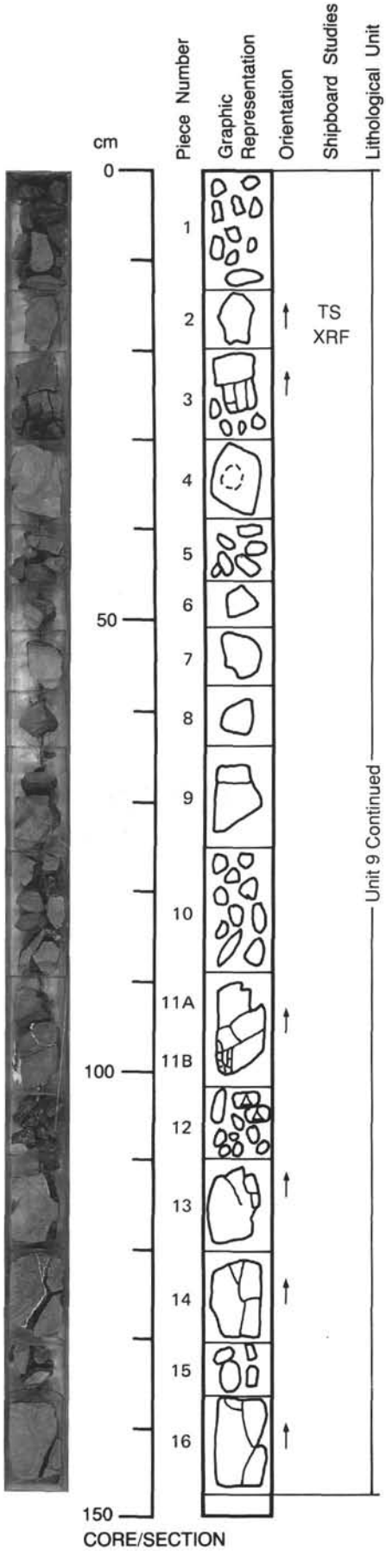


123-765D-12R-1

UNIT 9: SPARSELY PHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 12R-1, 1-15

CONTACTS: Not seen.
PHENOCRYSTS: Aphyric. Piece 2: 3 mm plagioclase phenocrysts completely replaced by clays. Piece 15: Rare plagioclase phenocrysts.
GROUNDMASS: Piece 1: Hyaloclastite-microcrystalline. Pieces 2-10: Grain size increases from Piece 2 toward the top of Piece 4, then uniformly fine-grained. Bottom of Piece 10 is microcrystalline, Pieces 11 and 15: Microcrystalline. Pieces 12 and 14 very fine-grained.
VESICLES: Non vesicular.
COLOR: Dark green to light gray. Yellow gray to grayish red/brown in oxidation halos.
STRUCTURE: Piece 1: Hyaloclastite. Pieces 2-10: One massive flow. Piece 11: Rubble. Piece 15: Breccia.
ALTERATION: Piece 1: Altered hyaloclaststite. Pieces 2-10: Alteration halos along breccia and calcite veins (2-10 mm thick). Piece 4: azimuth 0 degrees, dip 70 degrees; Piece 6: azimuth 0 degrees subvertical. Piece 11: Dark brown altered glass margins. Pieces 12-14: altered; Middle of Piece 12 strongly altered. Piece 15: altered breccias with calcite matrix forming <10%.
VEINS/FRACTURES: Pieces 2-10: Calcite veins. Pieces 9 and 10 fragmented along vertical fractures. Piece 15: Breccia with calcite matrix.

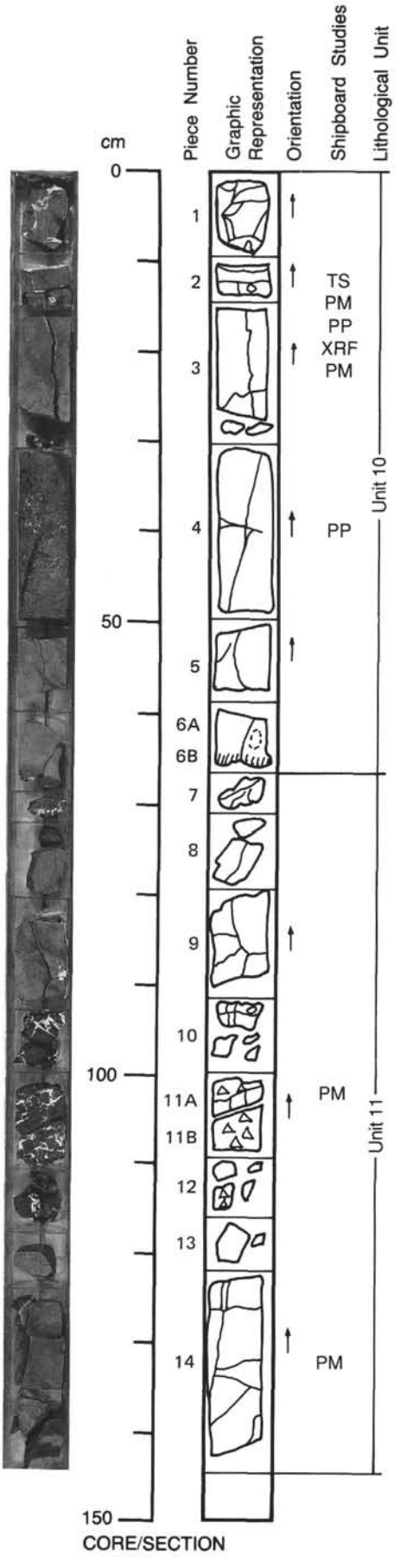


123-765D-12R-2

UNIT 9: SPARSELY PILLOW BASALTS WITH HYALOCLASTITES

Pieces 12R-2, 1-16

CONTACTS: Not seen.
PHENOCRYSTS: Pieces 1-3: 1-2% fragmented plagioclase phenocrysts, euhedral to subhedral tabular. Piece 15: Rare plagioclase (<1 mm).
GROUNDMASS: Pieces 1-3: Microcrystalline. Pieces 4-7: Microcrystalline to fine-grained. Piece 8: Fine-grained. Piece 9: Very fine-grained. Pieces 10 and 11: Fine-grained, good crystallinity. Piece 13: Microcrystalline to fine-grained (coarsening downward). Piece 14: fine-grained, good crystallinity. Piece 15: Microcrystalline. Piece 16: Fine-grained.
VESICLES: Non vesicular.
COLOR: Grayish red, light gray, gray.brown in oxidation halos.
STRUCTURE: Pillow basalts
ALTERATION: Pieces 4-7: Light yellowish gray alteration halos. Piece 9: Brown patches. Piece 11B: Calcite veins and brown veins developed. Piece 12: Basalt breccia with calcite matrix. Piece 13: Calcite veins and brown veins. Piece 14: Calcite veins. Piece 16: Calcite veins and brown veins with alteration halos.
VEINS/FRACTURES: Pieces 4-7: Alteration halos developed. Piece 11B: Calcite veins and brown veins. Piece 12: Basalt breccia with calcite matrix. Piece 13: Thin subvertical calcite veins and brown veins. Piece 14: Subvertical calcite veins 1 mm thick. Piece 16: Thin calcite veins and veins with alteration halos.



123-765D-13R-1

UNIT 10: MODERATELY PLAGIOCLASE PHYRIC PILLOW BASALTS

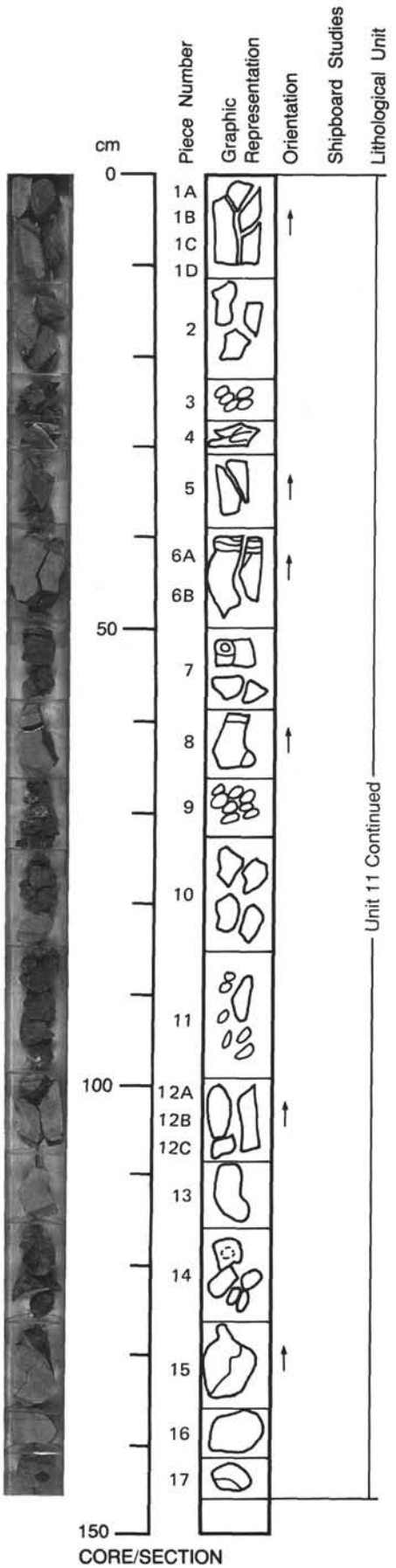
Pieces 13R-1, 1-6B

CONTACTS: Upper contact not seen. Lower contact in Piece 6 comprising chilled margin and breccia.
PHENOCRYSTS:
Clinopyroxene - 5-10%; 1 mm; Bladey, fairly fresh and glassy looking crystals.
Plagioclase - 5-10%; 1 mm; Fairly fresh and glassy looking crystals.
GROUNDMASS: Fine grained
VESICLES: Small.
COLOR: Orange brown, Piece 3 is mottled with gray (fresher basalt). Pieces 4-6 are gray.
STRUCTURE: Pillow basalts
ALTERATION: Pervasively altered, fresher basalt at the base of Piece 3. Pieces 4-5 have few crystals and are less altered. Piece 6B contains a brown alteration halo in the bottom 1 cm.
VEINS/FRACTURES: Pieces 1 and 2: Calcite veins up to 5 mm thick. Piece 5 is largely featureless, but has a crack which runs vertically and is stained with red iron oxide. Breccia veins filled by calcite.

UNIT 11: SPARSELY PHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 13R-1, 7-14

CONTACTS: Not seen. Pieces 10-12: Breccia containing chilled basalt (some glassy).
PHENOCRYSTS: Pieces 8 and 9: Sparsely to moderately plagioclase or clinopyroxene phyric. Pieces 10 to 12: Glassy aphyric. Pieces 13 and 14: Largely aphyric.
GROUNDMASS: Pieces 10-12: Breccia of chilled basalt, some glassy.
VESICLES: Non vesicular.
COLOR: Brownish gray. Pieces 10-12: Black glass. Piece 14: Mottled.
STRUCTURE: Pillow basalts. Pieces 10-12: Breccia.
ALTERATION: Piece 8: Pervasively altered brown. Pieces 10-12: Glass in calcite matrix. Piece 13: Fresh. Piece 14: Mottled.
VEINS/FRACTURES: Calcite matrix to breccia.

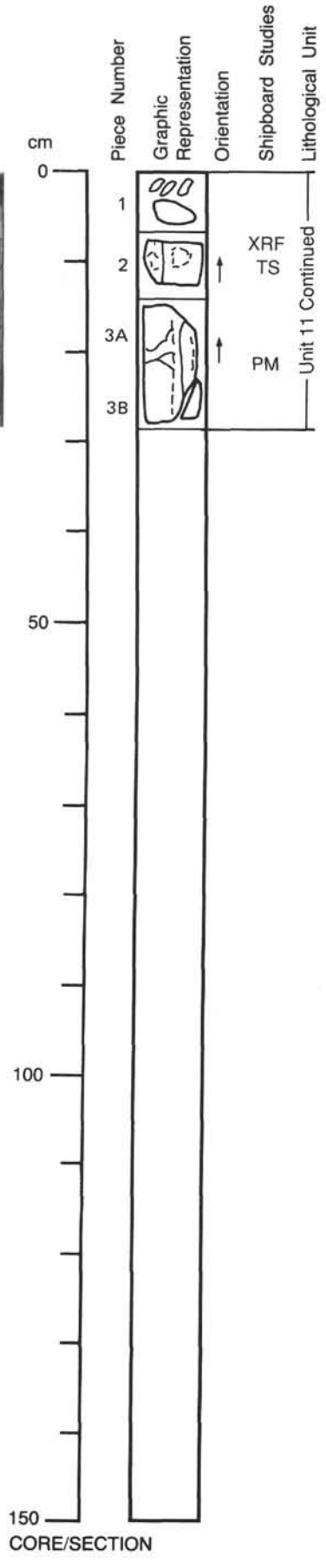


123-765D-13R-2

UNIT 11: SPARSELY PHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 13R-2, 1A-17

CONTACTS: Not seen. Piece 6: Possible chilled margin.
PHENOCRYSTS: Pieces 1, 2 and 5: Sparsely plagioclase and clinopyroxene phyric. Clinopyroxene(?) crystal clots up to 3 mm in diameter. Pieces 6-8 and 12-17: Aphyric. Piece 16: 3 mm plagioclase clot. Piece 17: Mini phenocrysts.
GROUNDMASS: Pieces 2-3: Drill chips. Pieces 6-8: Very fine-grained. Pieces 9-11: Drill breccia and drill chips. Pieces 12-17: Fine-grained, coarsening downward.
VESICLES: Pieces 6 and 8 contain mm sized calcite-filled vesicles. Piece 17 contains orange mineral filled vesicles.
COLOR: Gray. Piece 6: Green and black alteration zones. Piece 7: Alteration halo. Pieces 9-11: Coated by yellow ochre stain.
STRUCTURE: Pillow basalts and hyaloclastites. Pieces 2-3: Drill chips. Pieces 9-11: Drill breccia and chips.
ALTERATION: Pieces 1, 2, and 6-8: Mostly fresh. Piece 4: Calcite plates. Pieces 6 and 7: Contains alteration halo. Pieces 9-11: Drill breccia. Piece 9: Breccia with calcite matrix. Pieces 12-17: Fairly fresh. Piece 17: Contains orange mineral-filled vesicles.
VEINS/FRACTURES: Piece 9: Calcite cemented breccia.

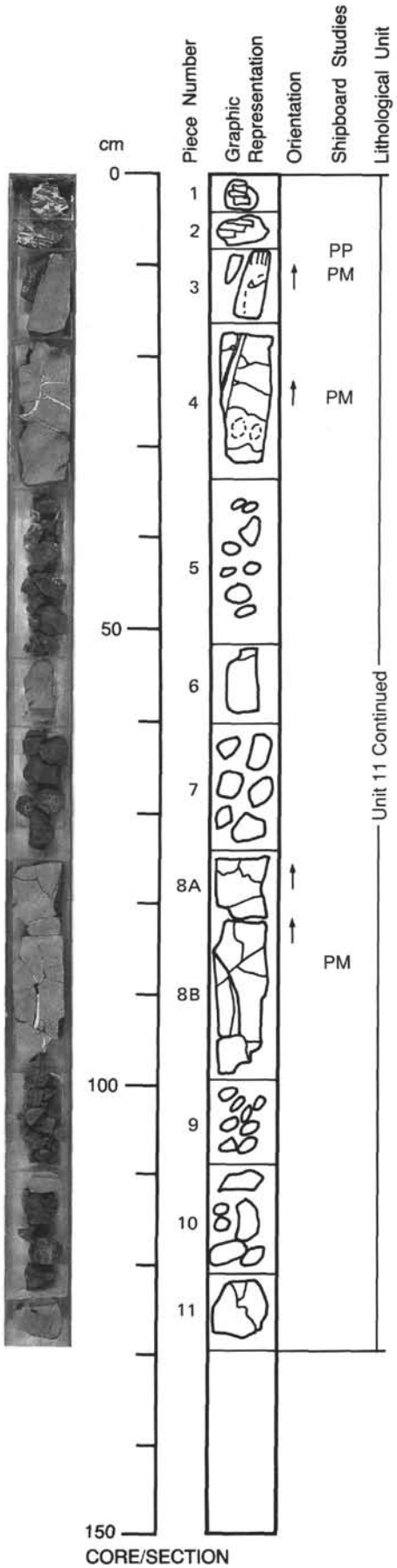


123-765D-13R-3

UNIT 11: SPARSELY PHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 13R-3, 1-3B

CONTACTS: Not seen.
PHENOCRYSTS: Plagioclase: Two phenocrysts in Piece 2, <1 mm
GROUNDMASS: Fine-grained.
VESICLES: Non-vesicular.
COLOR: Gray, except in alteration halos.
STRUCTURE: Pillow basalts
ALTERATION: Pieces 2 and 3: 5-10 mm wide alteration halos are present around veins.
VEINS/FRACTURES: Pieces 2 and 3: Veins with alteration halos.

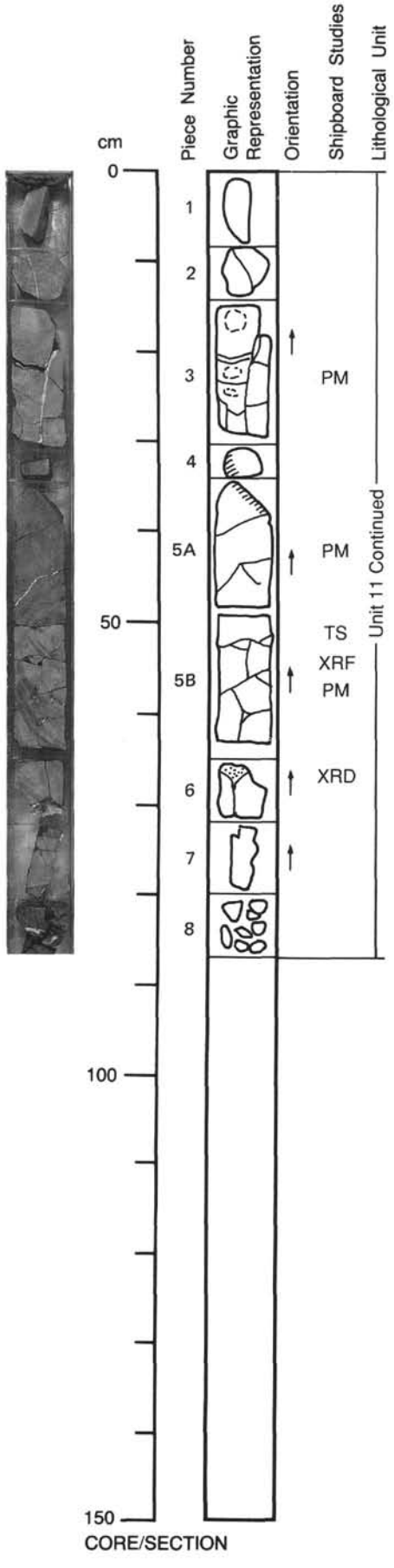


123-765D-14R-1

UNIT 11: SPARSELY PHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 14R-1, 1-11

CONTACTS: Not seen. Piece 3: Spherulitic top to pillow.
PHENOCRYSTS: Pieces 3, 6 and 8: Plagioclase microphenocrysts.
GROUNDMASS: Pieces 1 and 2: Hyaloclastite breccia. Piece 3: Spherulitic.
VESICLES: Non-vesicular.
COLOR: Breccia: Dark green with calcite matrix. Gray to yellowish green to orange brown in oxidation halos.
STRUCTURE: Hyaloclastite breccia and pillows (Pieces 5, 7, 9, and 10: drilling rubble).
ALTERATION: Piece 3: Fairly fresh with faint alteration halo. Pieces 4-11: Alteration halos, rare calcite veins and hyaloclastite breccia cemented by calcite.
VEINS/FRACTURES: Pieces 1 and 2: Hyaloclastite breccia cemented by calcite vein. Piece 4: Calcite vein up to 4 mm wide. Piece 8: Calcite vein ~ 4 mm thick.



123-765D-14R-2

UNIT 11: SPARSELY PHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 14R-2, 1-8

CONTACTS: Pillow 1: Pieces 1-4, upper contact not seen. Lower contact on one side of Piece 4 marked by 3 mm glass zone. Pillow 2: Pieces 5-7, upper contact marked by glass zone 5 mm thick, on top of Piece 5A azimuth 180 degrees, dip 45 degrees. Lower contact not seen. Coarsens from Piece 5 to 6 to fine-grained in Piece 7. Piece 8: Hyaloclastite containing angular glass fragments.

PHENOCRYSTS: Aphyric.

GROUNDMASS: Pieces 1-4: Single pillow coarsening toward center. Pieces 5-7: Single pillow coarsening toward center. Piece 8: Hyaloclastite.

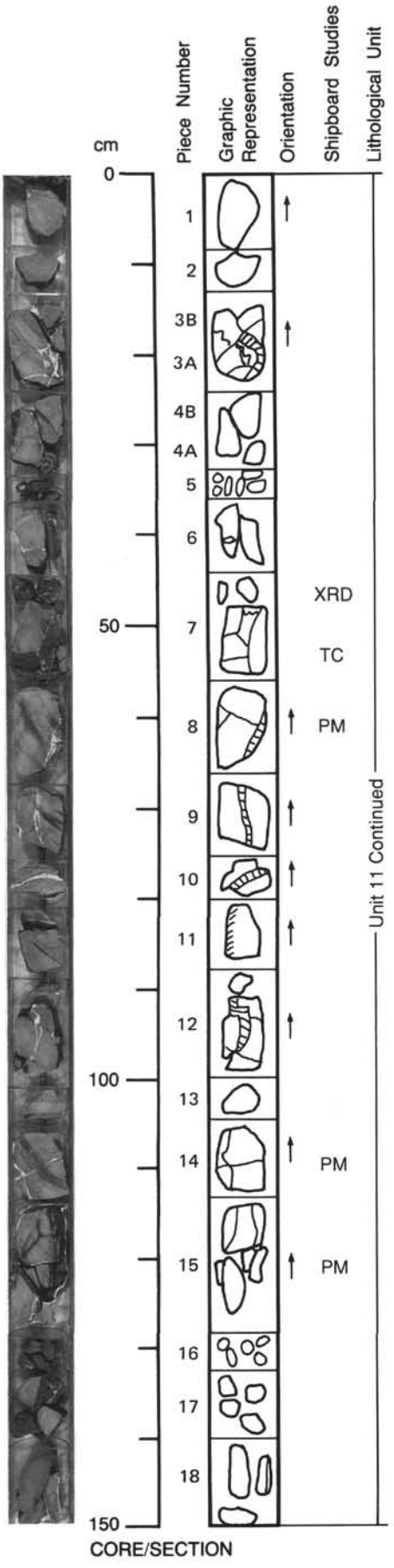
VESICLES: Non vesicular.

COLOR: Light gray in relatively fresh areas, medium gray in alteration halos. Piece 5A: Glass rim is pale brown. Piece 8: Hyaloclastite is greenish with white calcite matrix.

STRUCTURE: Pillow basalts and hyaloclastites. Piece 8: Hyaloclastite, pieces of massive very fine-grained basalt with calcite veins present. Angular glass fragments and flakes are 1-10 mm in size.

ALTERATION: Relatively fresh but with alteration halos along calcite filled veins. Hyaloclastites highly altered.

VEINS/FRACTURES: Piece 3: 2 mm thick vertical calcite veins in center (azimuth 310 degrees). Piece 2: Cut by thin calcite veins. Pieces 5-7: Calcite veins developed. Piece 6 (top): 2 cm thick calcite vein contains green clay and chalcedony. Piece 8: Hyaloclastite cemented by calcite.

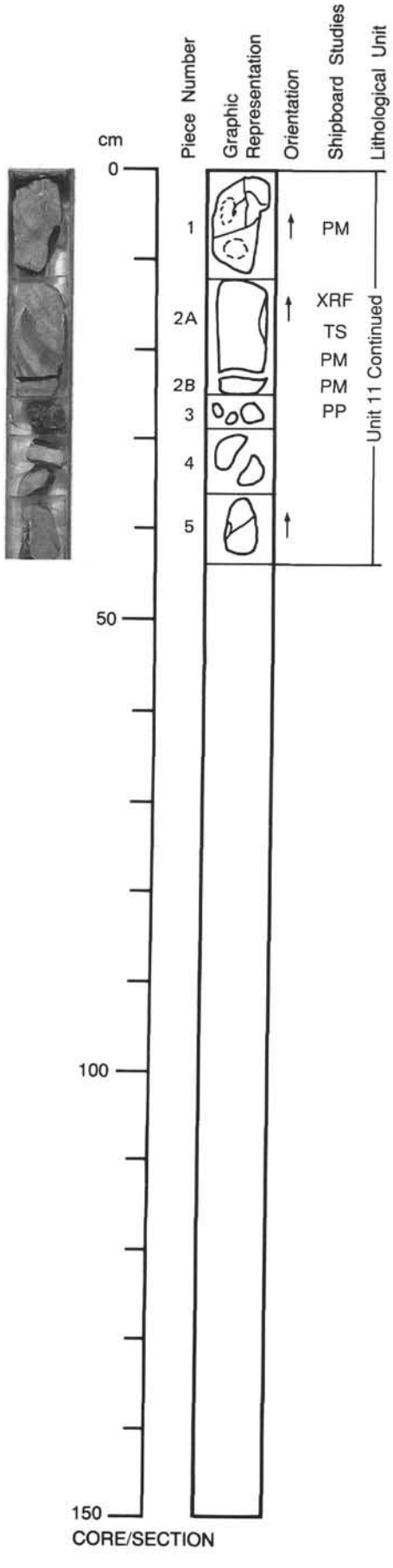


123-765D-15R-1

UNIT 11: SPARSELY PHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 15R-1, 1-18

CONTACTS: Pillow 3: Pieces 7-11, upper contact formed by altered glass nodule 5 mm thick. Lower contact on lower left side of Piece 11 formed by altered glass margin.
PHENOCRYSTS: Aphyric.
GROUNDMASS: Pieces 1-6: Very fine-grained. Pieces 7-11: Pillow basalt with glass margins with regular coarsening toward the center. Pieces 12-18: Very fine-grained.
VESICLES: Non-vesicular.
COLOR: Medium gray in pillow margins to light gray in pillow core.
STRUCTURE: Pillow basalts
ALTERATION: Glass margins altered, fractures filled by calcite.
VEINS/FRACTURES: Pieces 1-6: Calcite veins developed. Lower half of Piece 3: Fragmented calcite fills interstices between basalt fragments. Pieces 8-10: Cut by calcite veins 2-10 mm thick. Pieces 12-18: Cut by many calcite veins. Piece 15: Highly fragmented along fractures and veins.

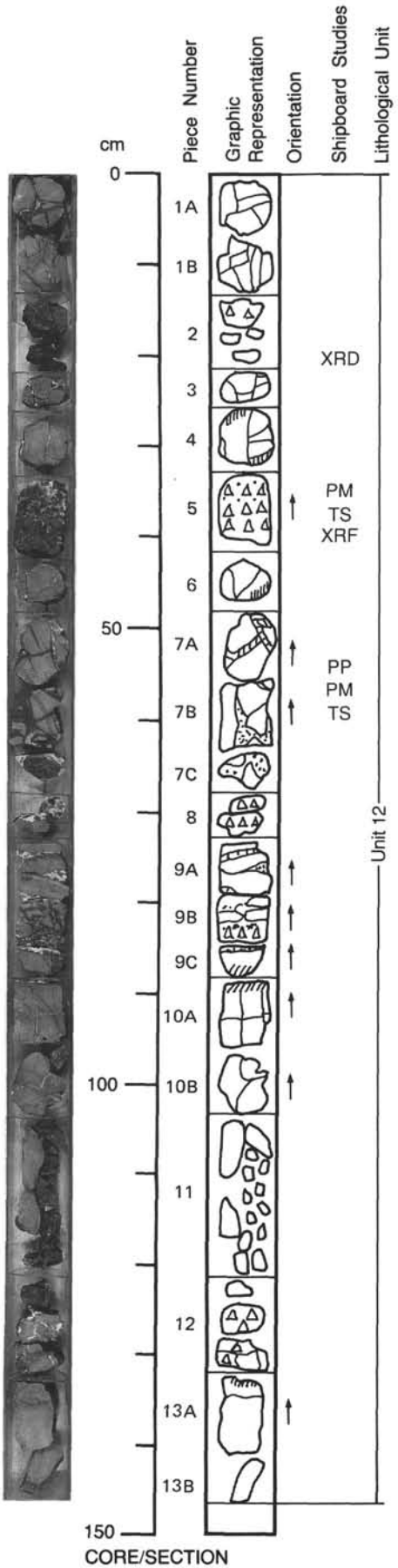


123-765D-15R-2

UNIT 11: SPARSELY PHYRIC PILLOW BASALTS WITH HYALOCLASTITES

Pieces 15R-2, 1-5

CONTACTS: Not seen
PHENOCRYSTS: Aphyric.
GROUNDMASS: Very fine-grained. Piece 2: Relatively good crystallinity.
VESICLES: Non-vesicular.
COLOR: Light gray to medium gray.
STRUCTURE: Pillow basalt
ALTERATION: Not determined
VEINS/FRACTURES: Thin calcite veins, <1 mm thick, contain brown and green minerals. Veins not as abundant as in preceding section.

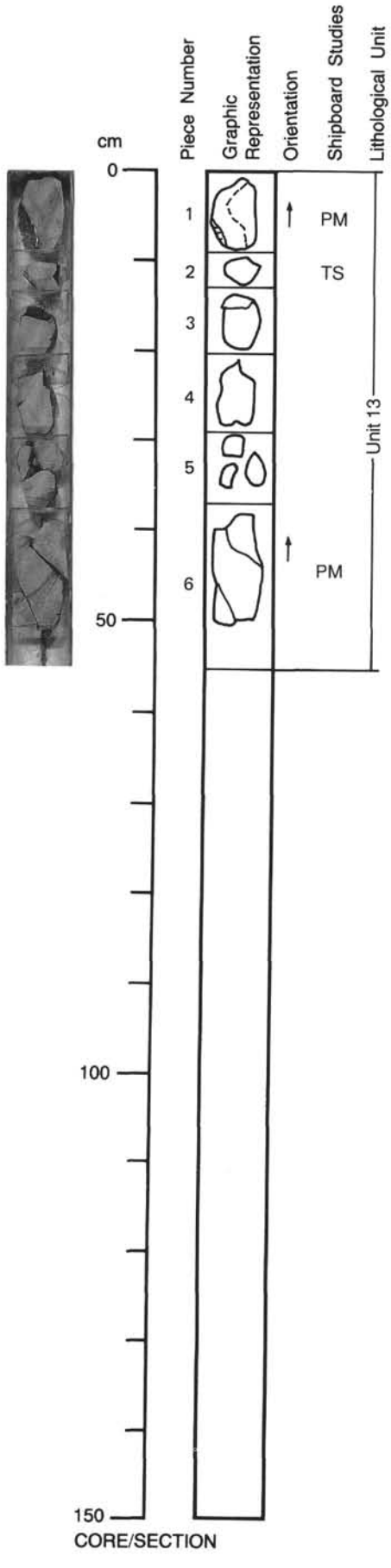


123-765D-16R-1

UNIT 12: HYALOCLASTITE SUPPORTED APHYRIC PILLOW BASALTS

Pieces 16R-1, 1A-13B

CONTACTS: Not seen
PHENOCRYSTS: Aphyric; Rare, tiny, plagioclase and clinopyroxene phenocrysts present.
GROUNDMASS: Glassy in hyaloclastites (Pieces 2, 5, 7C, 8, 9 and 12); Very fine-grained in basalt blocks (Pieces 1, 3, 4, 6, 7A, 7B, 10, and 11); Piece 13 is fine-grained, coarsens downward and is well crystallized.
VESICLES: Scarce.
COLOR: Dark green in glassy part and dark gray in basalt blocks; Yellowish brown in altered parts along veins. Hyaloclastite matrix is white. Grayish blocks are far more abundant than greenish fragments.
STRUCTURE: Lava blocks are autobrecciated, to angular fragments of 2 to 5 cm in size, are invaded by calcite veins. Some fragments exhibit tabular shape (1-2 cm thick and more than 6 cm wide). Piece 13 is massive, and coarsens downward.
ALTERATION: Glassy fragments are completely altered. Fine-grained basalt blocks are moderately altered.
VEINS/FRACTURES: Calcite veins are abundant in brecciated basalt blocks.

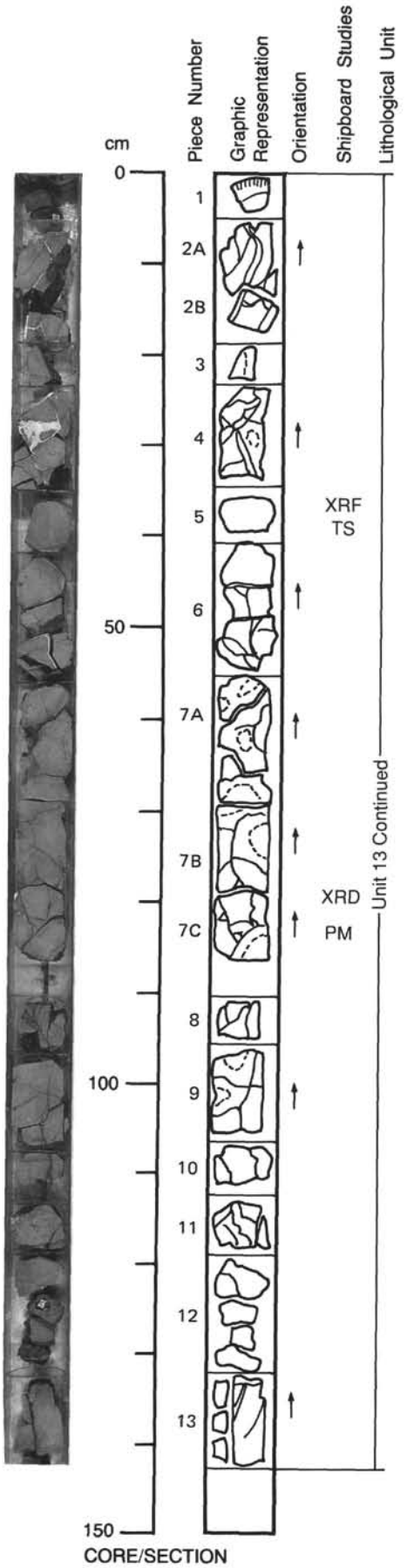


123-765D-16R-2

UNIT 13: APHYRIC PILLOW BASALTS

Pieces 16R-2, 1 through 17R-3, 5

CONTACTS: Upper contact not seen. Lower contact rubble with brown coloration and calcite veining.
PHENOCRYSTS: Rare plagioclase phenocrysts replaced by yellow/green clay.
GROUNDMASS: Very fine-grained. Altered chilled margins with spherulitic tops. Some variation in grain size occurs within individual flows.
VESICLES: <1%, <1 mm, filled with lime-green celadonite(?).
COLOR: Light gray in fresher parts; Brown/gray in more altered areas.
STRUCTURE: Pillow basalts, some having chilled margins.
ALTERATION: Brown alteration halos are present around calcite veins. Vesicles are filled with lime-green celadonite(?).
VEINS/FRACTURES: Calcite filled fractures surrounded by alteration halos.

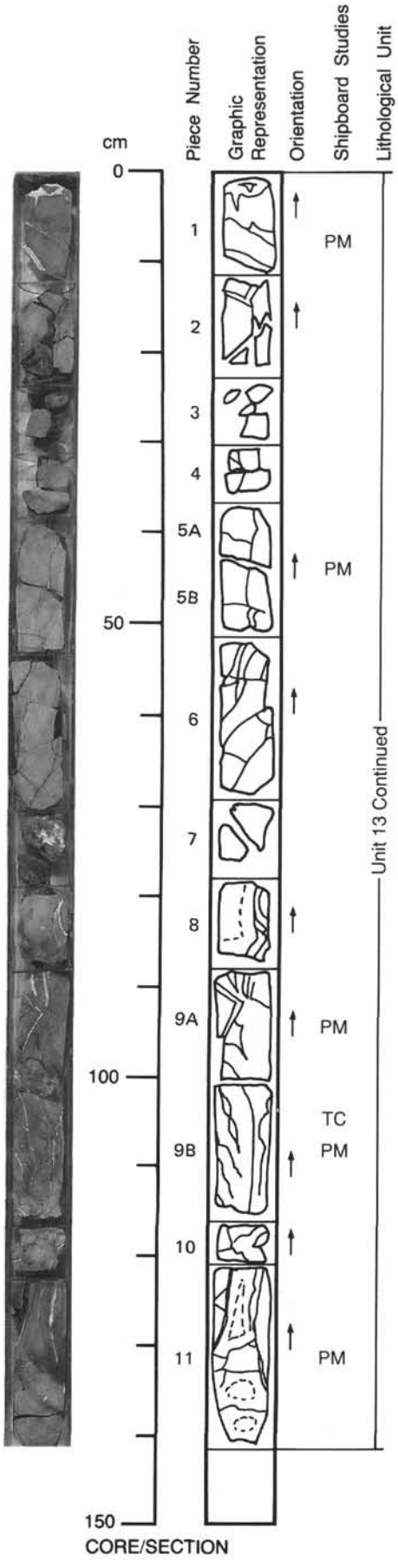


123-765D-17R-1

UNIT 13: APHYRIC PILLOW BASALTS

Pieces 16R-2, 1 through 17R-3, 5

CONTACTS: Upper contact not seen. Lower contact rubble with brown coloration and calcite veining.
PHENOCRYSTS: Rare plagioclase phenocrysts replaced by yellow/green clay.
GROUNDMASS: Very fine-grained. Altered chilled margins with spherulitic tops. Some variation in grain size occurs within individual flows.
VESICLES: <1%, <1 mm, filled with lime-green celadonite(?).
COLOR: Light gray in fresher parts; Brown/gray in more altered areas.
STRUCTURE: Pillow basalts, some having chilled margins.
ALTERATION: Brown alteration halos are present around calcite veins. Vesicles are filled with lime-green celadonite(?).
VEINS/FRACTURES: Calcite filled fractures surrounded by alteration halos.

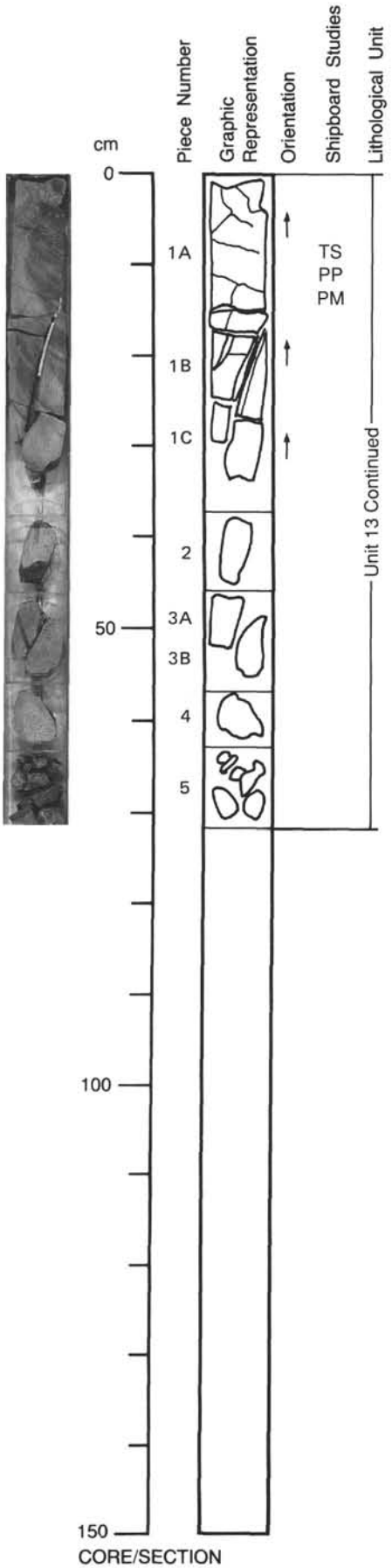


123-765D-17R-2

UNIT 13: APHYRIC PILLOW BASALTS

Pieces 16R-2, 1 through 17R-3, 5

CONTACTS: *Upper contact not seen. Lower contact rubble with brown coloration and* calcite veining.
PHENOCRYSTS: Rare plagioclase phenocrysts replaced by yellow/green clay.
GROUNDMASS: Very fine-grained. Altered chilled margins with spherulitic tops. Some variation in grain size occurs within individual flows.
VESICLES: <1%, <1 mm, filled with lime-green celadonite(?).
COLOR: Light gray in fresher parts; Brown/gray in more altered areas.
STRUCTURE: Pillow basalts, some having chilled margins.
ALTERATION: Brown alteration halos are present around calcite veins. Vesicles are filled with lime-green celadonite(?).
VEINS/FRACTURES: Calcite filled fractures surrounded by alteration halos.

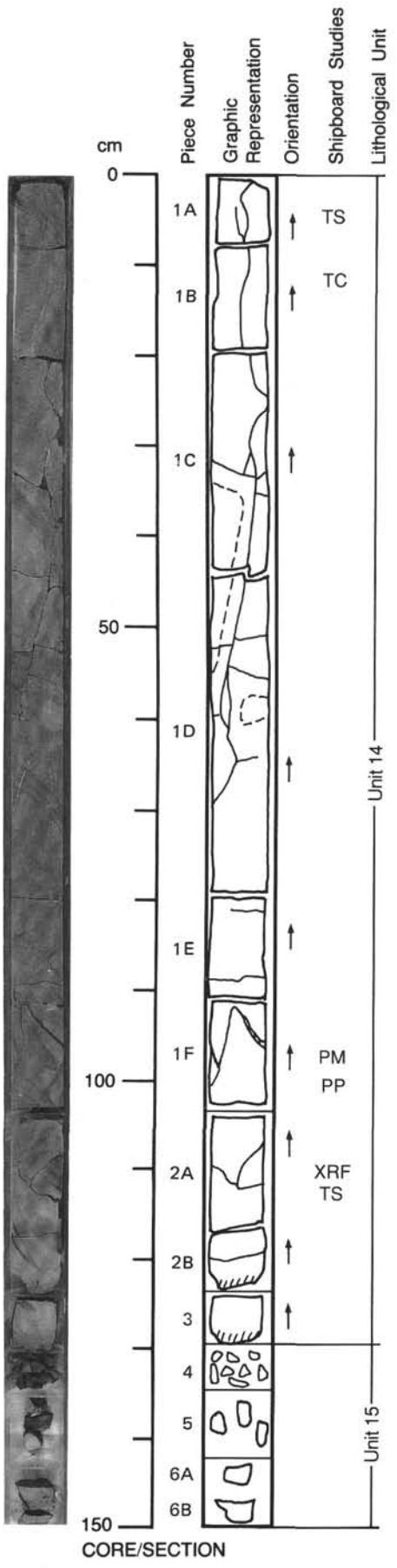


123-765D-17R-3

UNIT 13: APHYRIC PILLOW BASALTS

Pieces 16R-2, 1 through 17R-3, 5

CONTACTS: Upper contact not seen. Lower contact rubble with brown coloration and calcite veining.
PHENOCRYSTS: Rare plagioclase phenocrysts replaced by yellow/green clay.
GROUNDMASS: Very fine-grained. Altered chilled margins with spherulitic tops. Some variation in grain size occurs within individual flows.
VESICLES: <1%, <1 mm, filled with lime-green celadonite(?).
COLOR: Light gray in fresher parts; Brown/gray in more altered areas.
STRUCTURE: Pillow basalts, some having chilled margins.
ALTERATION: Brown alteration halos are present around calcite veins. Vesicles are filled with lime-green celadonite(?).
VEINS/FRACTURES: Calcite filled fractures surrounded by alteration halos.



123-765D-18R-1

UNIT 14: MASSIVE APHYRIC BASALT FLOW

Pieces 18R-1, 1A-3

CONTACTS: Upper contact not seen. Lower contact is marked by microcrystalline to glassy zone at the bottom of Piece 2B.

PHENOCRYSTS: Rare phenocrysts of clinopyroxene (?).
Plagioclase - Rare; 2 mm; Replaced by green clay, forms glomeroporphyritic aggregates in Piece 1B (15-17 cm).
Olivine - Rare; 2 mm; Completely replaced by yellow-brown clay, forms glomeroporphyritic aggregates in Piece 1B (15-17 cm).

GROUNDMASS: Very fine-grained to fine-grained. Grain size coarsens upward; Piece 1A shows good crystallinity.

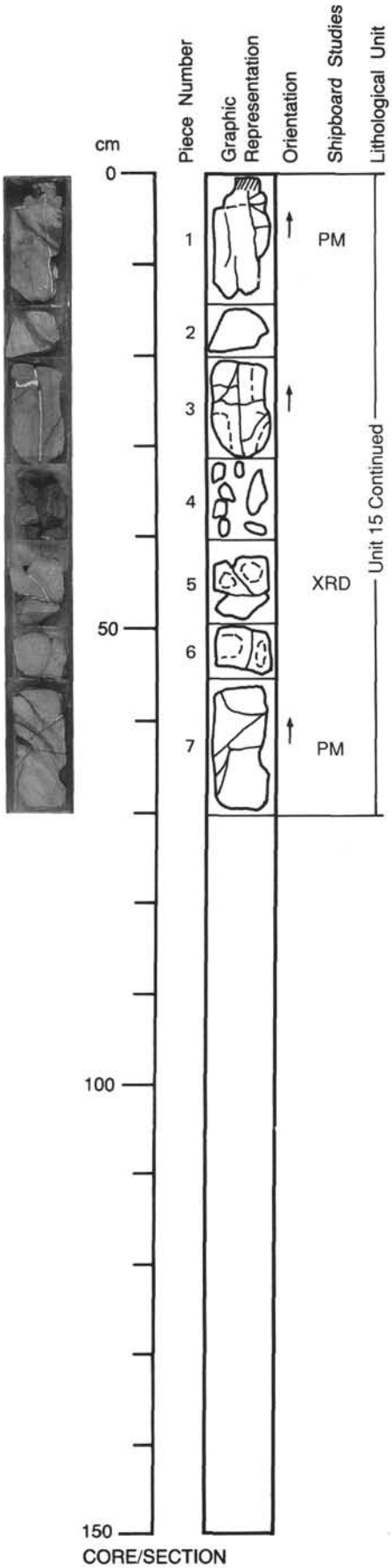
VESICLES: Non-vesicular.

COLOR: Relatively fresh part (10%) is light gray; altered part (90%) is pale brownish gray or greenish gray.

STRUCTURE: Massive.

ALTERATION: Moderately altered with well developed alteration halos along veins.

VEINS/FRACTURES: Deep green/dark brown veins are present in Pieces 1F and 2A. Continuous subvertical fractures with calcite and brown clay fillings present throughout section (Pieces 1A to 1D).



123-765D-18R-2

UNIT 15: APHYRIC PILLOW BASALTS

Pieces 18R-1, 4-6B and 18R-2, 1-7

CONTACTS: Pieces 18R-1, 4-6B are drill rubble. Upper contact is marked by altered, glass zone, 6 mm thick at the top of Piece 18R-2, 1, and microcrystalline, spherulitic zone, 2 cm thick under the glass zone. The zone boundaries are slightly curved and are convex upward. The lower contact is not seen.

PHENOCRYSTS: Pieces 18R-2, 1: Plagioclase phenocrysts. All other pieces: Aphyric. Plagioclase - 1-2 mm, glomerophyric, present in middle of piece.

GROUNDMASS: Upper contact marked by a glass zone underlain by microcrystalline spherulitic zone. Grain size coarsens downward to Piece 3 and then fines toward the bottom of Piece 7.

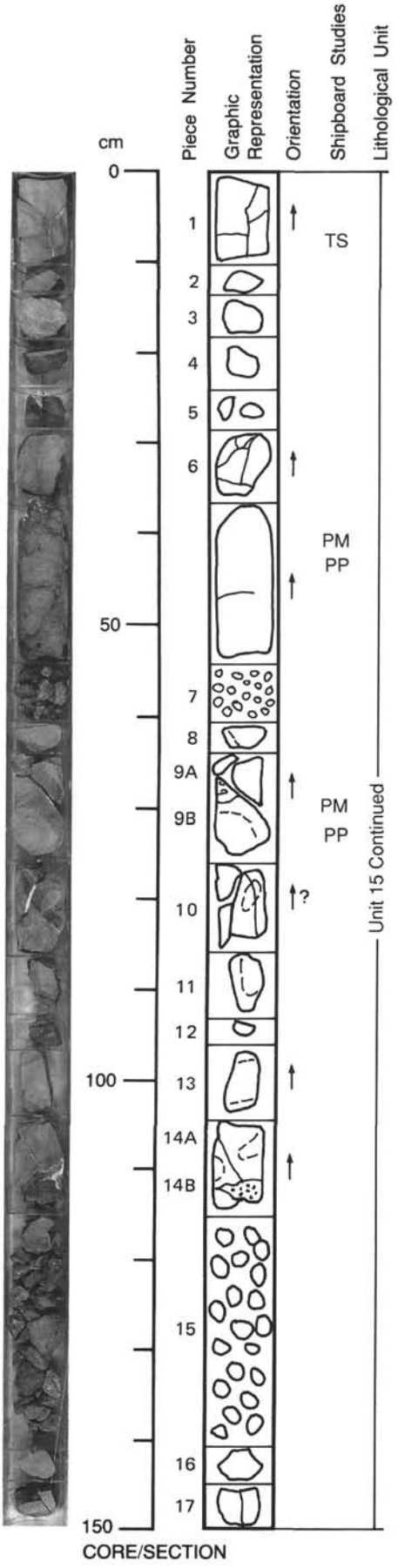
VESICLES: Non-vesicular.

COLOR: Very light gray glass zone at upper contact. Alteration halos are brownish or greenish gray, and easily distinguished from light gray, relatively fresh parts.

STRUCTURE: Pillow basalts

ALTERATION: Alteration halos, 2 cm thick, are very well developed along the veins. The halos are brownish or greenish gray, and are easily distinguished from the light gray, relatively fresh parts.

VEINS/FRACTURES: Subvertical calcite veins, 1 mm thick, cut Pieces 18R-2, 1, 3, and 5. Alteration halos are developed along the veins.

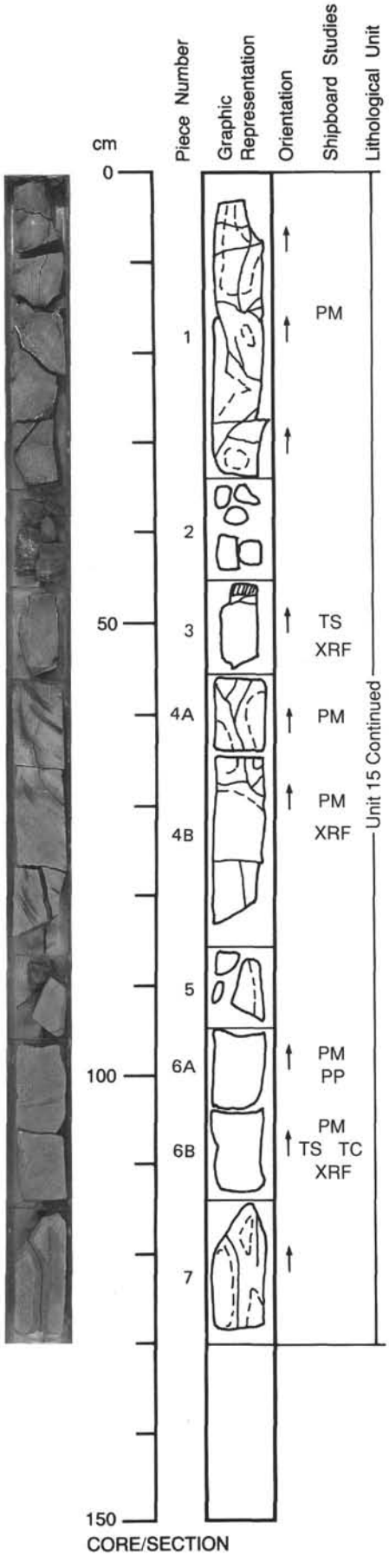


123-765D-18R-3

UNIT 15: APHYRIC PILLOW BASALTS

Pieces 18R-3, 1-17

CONTACTS: Not seen
PHENOCRYSTS: Plagioclase - Rare, found throughout section. Olivine, 1 mm, a few are present in the lower part of Piece 1, completely replaced by yellow-brown clays.
GROUNDMASS: Uniformly very fine-grained
VESICLES: Pieces 16 and 17: Sparsely vesicular (2%), <0.5 mm, spherical, filled with green clays. The other pieces are non-vesicular.
COLOR: Yellow brown clays replace olivine phenocrysts. A brown mineral fills veins; vesicles are filled with green clays.
STRUCTURE: Pillow basalts
ALTERATION: Alteration halos are developed along fractures, and along calcite and brown mineral-filled veins. Vesicles are filled with clays in Pieces 16 and 17. Olivine phenocrysts are replaced by clays in lower part of Piece 1.
VEINS/FRACTURES: Fractures are open or filled by calcite and a brown mineral. A thick, subvertical calcite vein, 3 mm wide, is present in Piece 10. Thin calcite veins are present in Pieces 1, 6, 9, and 14.



123-765D-19R-1

UNIT 15: APHYRIC PILLOW BASALTS

Pieces 19R-1, 1-7

CONTACTS: Pillow basalts. Grain size coarsens towards center of Piece 1 from both directions, from microcrystalline to fine-grained. Piece 3: Microcrystalline, sparsely vesicular basalt sill(?), 9 cm thick, with altered glassy zones on both top and bottom sides. Pieces 4-7: Grain size coarsens from the top of Piece 4A to 4B, and is then uniformly fine-grained to the bottom of Piece 7.

PHENOCRYSTS: Rare plagioclase phenocrysts are present.

GROUNDMASS: Grain size coarsens toward the center of Piece 1 from both directions, from microcrystalline to fine-grained. Piece 3: Microcrystalline. Grain size coarsens from the top of Piece 4A to 4B, and is then uniformly fine-grained to the bottom of Piece 7. The groundmass is homogeneous.

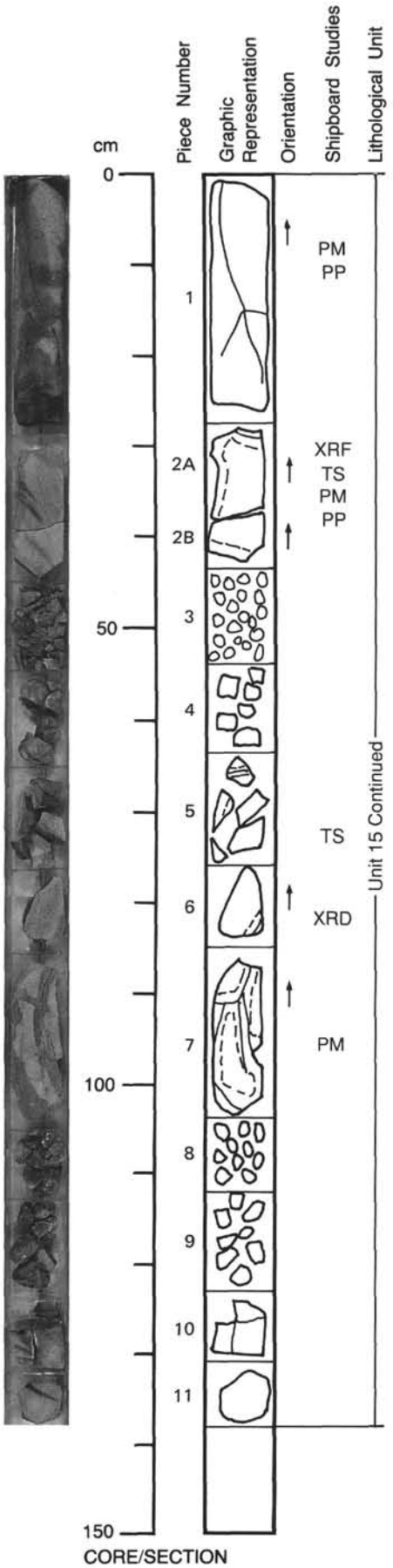
VESICLES: Pieces 1 and 2: Non-vesicular. Piece 3: Sparsely vesicular. Vesicles are less than 0.5 mm in size and filled with green clays or rarely with oxidized brown material. Pieces 4-7: Non-vesicular.

COLOR: Pieces 1, 2, and 3: Vesicles are filled with green clays or rarely with oxidized brown material. Pieces 4-7 contain brown veins.

STRUCTURE: Pillow basalts. Piece 1 is fragmented by fractures, mostly filled with brown vein.

ALTERATION: Pieces 1 and 2: Alteration halos are developed along fractures. Piece 3: altered glassy zones on both top and bottom sides of sparsely vesicular basalt sill(?). Vesicles filled with clays or oxidized brown material. Brown veins and alteration halos are developed in Piece 4A and the upper half of Piece 4B as well as in Piece 7; the rock is fresh elsewhere.

VEINS/FRACTURES: Pieces 1 and 2: Fractured. Alteration halos present. Pieces 4A, 4B, and 7: Brown veins with alteration halos.

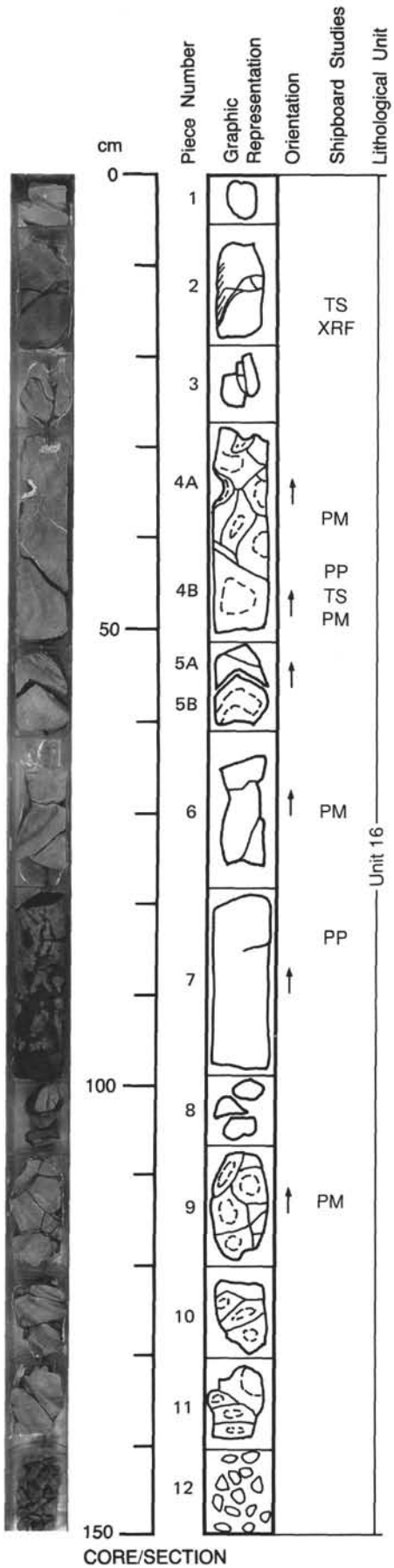


123-765D-19R-2

UNIT 15: APHYRIC PILLOW BASALTS

Pieces 19R-2, 1-11

CONTACTS: Not seen
PHENOCRYSTS: Rare plagioclase phenocrysts are present.
GROUNDMASS: Pieces 1-10: Groundmass is heterogeneous and patchy, each patch is irregular or spherical, 2 to 3 cm in size, and lighter colored than the matrix. Grain size is uniformly fine-grained, and crystallinity is moderate. Piece 11: The groundmass is homogeneous and uniformly very fine-grained.
VESICLES: Pieces 1-11: <1%, <0.5 mm, either void or filled with green or blue green clays (celadonite?).
COLOR: Pieces 1-10: Vesicles filled with blue green clays (celadonite?). Pieces 2 and 7: Fresh part is light gray, altered part is greenish gray. Piece 10 and 11: Alteration halos are developed along calcite-brown veins. Outer part of halo is greenish gray, inner part is brownish gray.
STRUCTURE: Pillow basalts
ALTERATION: Some vesicles are filled with green or blue green clays (celadonite?). Alteration halos are developed in Pieces 2 and 7 along thin brown veins. The altered part is greenish gray, and the fresh part is light gray. Pieces 10 and 11: Greenish gray in outer part of alteration halo and brownish gray in inner part of alteration halos. These are developed along calcite-brown veins. Fresher parts are light gray.
VEINS/FRACTURES: Pieces 2 and 7: Alteration halos are developed along thin brown veins. Pieces 10 and 11: Alteration halos are developed along calcite-filled veins.



123-765D-20R-1

UNIT 16: APHYRIC PILLOW BASALTS

Pieces 20R-1, 1-12

CONTACTS: Piece 2: Glass margin, 5 mm wide, present on left side. The glass is black and has obsidian-like luster, but is apparently devitrified. Azimuth 310 degrees, subvertical. No lower contact seen.

PHENOCRYSTS: Pieces 1 and 3-12: Aphyric basalt with rare phenocrysts of olivine (Piece 5B), plagioclase, and clinopyroxene (Piece 5B). Piece 2: Sparsely olivine-clinopyroxene-plagioclase phyric basalt. Olivine phenocrysts (or xenocrysts) are 2 mm in size. Pieces 1 and 3-12: Very fine-grained. Piece 2: Microcrystalline to glassy.

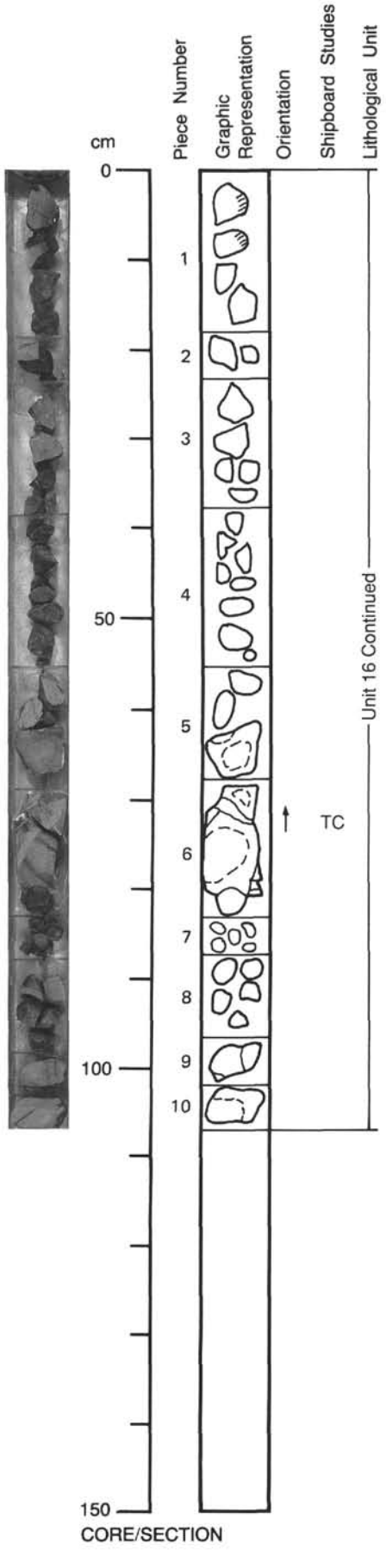
VESICLES: Piece 1: Non-vesicular. Piece 2: <1 mm, irregular shape, concentrated in some places, and filled with calcite. Piece 4A (upper half): Two calcite filled miaroles present, 2 cm in size, with void spaces in center.

COLOR: Pieces 1 and 3-12: Light gray. Alteration halos developed along calcite and brown veins. Piece 2: Grayish red-yellow brown.

STRUCTURE: Pillow basalts

ALTERATION: Moderately altered. Piece 2: Olivine phenocrysts completely replaced by yellow brown clays. Piece 4A: Euhedral calcite crystals in miaroles are coated by pale green clays. Alteration halos developed along calcite and brown veins.

VEINS/FRACTURES: Piece 2: Fragmented along fractures and calcite-filled veins.



123-765D-20R-2

UNIT 16: APHYRIC PILLOW BASALTS

Pieces 20R-2, 1-10

CONTACTS: Piece 1: Basalt pillow fragments with black devitrified glass margin, 5 mm thick, on their sides. Pieces 2-10: No contacts seen.

PHENOCRYSTS: Rare phenocrysts of plagioclase and olivine.
Olivine - Rare; 2 mm; Euhedral, completely replaced by yellow brown clays.
Plagioclase - Rare; 1-2 mm; Tabular subhedral, mostly fresh.

GROUNDMASS: Piece 1: Microcrystalline with devitrified glass margins. Piece 2-10: Very fine-grained.

VESICLES: Pieces 8-10 more vesicular than Pieces 1-7 which are almost void of vesicles. Vesicles are <1 mm, mostly spherical, and filled with green clays.

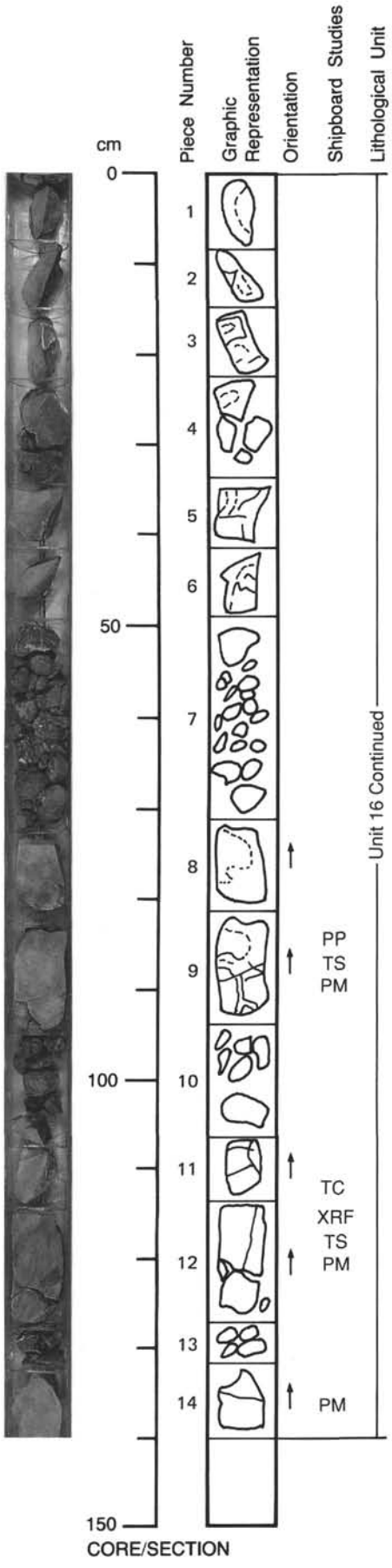
COLOR: Piece 1: Gray with black devitrified glass. Pieces 2-10: Light gray. Alteration hals throughout.

STRUCTURE: Pillow basalts

ALTERATION: Piece 1: Devitrified glass. Olivine phenocrysts altered to yellow brown clays. Pale reddish brown alteration halos formed along fractures. Pieces 2-10: Alteration halos developed along calcite and brown veins. These are particularly evident in Pieces 5 and 6 where a dark greenish gray, 2 cm wide alteration halo is again rimmed by a reddish brown oxidation zone adjacent to the fracture. Piece 3: Irregular patches of calcite and green clays, 2-5 mm in diameter, are present. Piece 6 (bottom):

VEINS/FRACTURES: Calcite and brown veins developed with associated alteration halos. Piece 6: Breccia vein.

ADDITIONAL COMMENTS: Breccia vein with calcite matrix present. Piece 1-10: Vesicles filled with green clays.

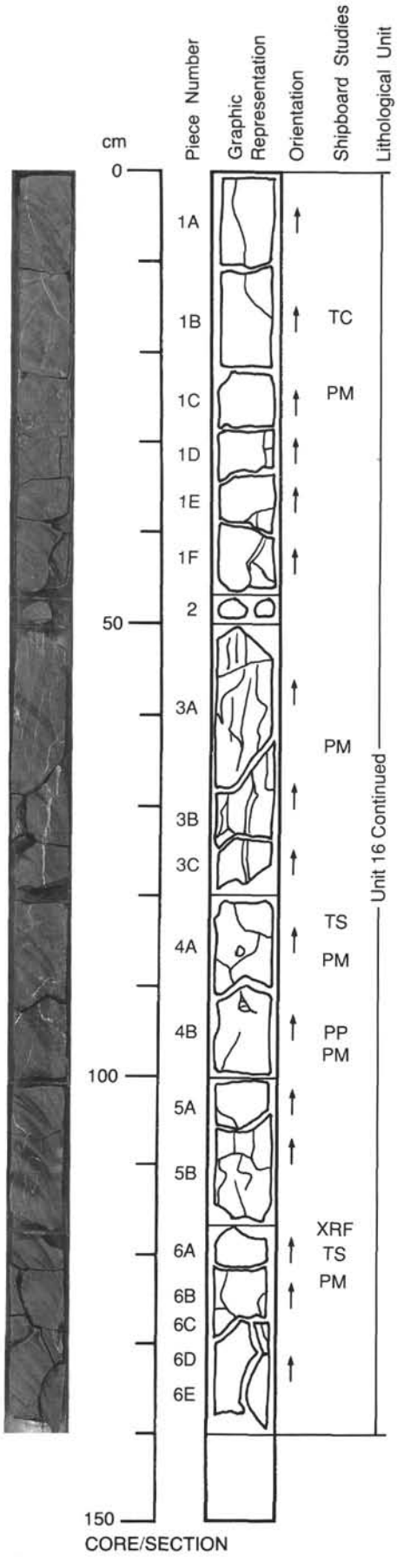


123-765D-21R-1

UNIT 16: APHYRIC PILLOW BASALTS

Pieces 21R-1, 1-14

CONTACTS: Not seen
PHENOCRYSTS: Aphyric. Plagioclase - Rare, 2 mm crystal aggregates in Piece 1, 2 mm phenocryst outline in Piece 12, 1 mm in Piece 14, altered. Clinopyroxene - few mm sized in Piece 5, altered.
GROUNDMASS: Fine-grained throughout.
VESICLES: Pieces 1-11: 1-5%, <1 mm, filled with orange or green minerals. Pieces 12-14: Less vesicular (rare), 1 mm (Piece 14), filled with orange mineral in Piece 14.
COLOR: Gray with alteration halos along veins.
STRUCTURE: Pillow basalts
ALTERATION: Fairly fresh. Plagioclase and clinopyroxene phenocrysts altered. Vesicles filled with orange or green minerals. Piece 3: 5 mm wide alteration halo around orange vein. Piece 8: Irregular orange iron-oxide stain. Pieces 9 and 11: Mottled. Pieces 12-14: Less mottled. Piece 12: 4 mm wide orange alteration halo around sub-vertical vein. Alteration halos throughout section.
VEINS/FRACTURES: Piece 3: Orange vein. Piece 12: Subvertical vein. Alteration halos throughout section indicate the presence of fine fractures.

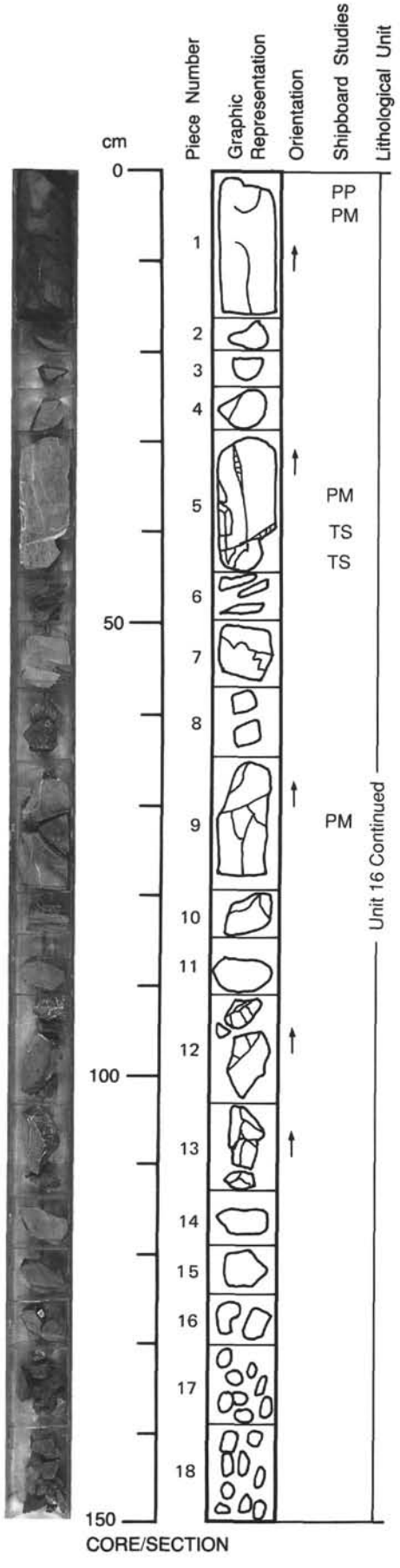


123-765D-22R-1

UNIT 16: APHYRIC PILLOW BASALTS

Pieces 22R-1, 1A-6E

CONTACTS: Not seen
PHENOCRYSTS: Aphyric except for Piece 4A which is sparsely olivine-plagioclase phyric. Olivine - 1-2 mm, euhedral or subhedral, mostly replaced by yellowish brown clays, though central parts of some crystals may be fresh. Plagioclase - 1 mm, subhedral tabular, partly or completely replaced by green clays.
GROUNDMASS: Uniformly very fine-grained
VESICLES: Pieces 4A and 4B: ~2%, <1 mm, irregularly shaped, mostly filled by green clays. Other pieces are non-vesicular.
COLOR: Medium dark gray (slightly reddish, the dark-colored section begins with Piece 21R-1, 12) with alteration halos.
STRUCTURE: Pillow basalts
ALTERATION: Alteration halos are formed along veins and fractures, but color contrast is not clear because of dark color in relatively fresh part of rock.
VEINS/FRACTURES: Subvertical calcite veins developed in Pieces 1A-B, 3A-C, 4B, and 5A-B. Piece 3 is intensely penetrated by calcite veins. The pieces are not so fragmented as in the previous cores.

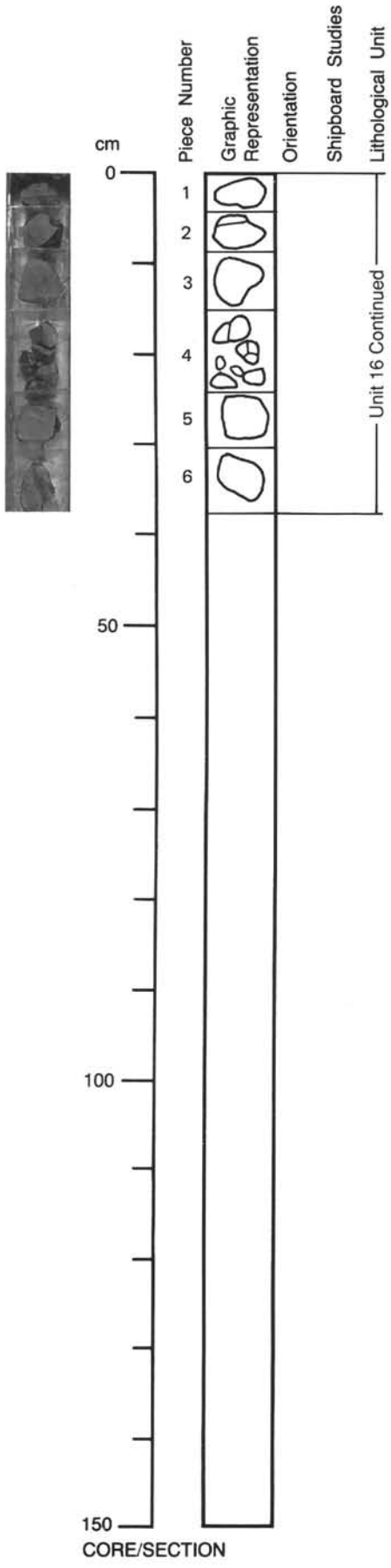


123-765D-22R-2

UNIT 16: APHYRIC PILLOW BASALTS

Pieces 22R-2, 1-18

CONTACTS: Not seen
PHENOCRYSTS: Aphyric except for Piece 9 which is sparsely olivine-plagioclase phyric. Olivine - 1 mm, euhedral, completely replaced by yellow brown clays. Plagioclase - rarely present through section; mostly replaced by green clays.
GROUNDMASS: Uniformly very fine-grained.
VESICLES: Non-vesicular.
COLOR: Medium dark gray, to slightly reddish where altered, to yellow brown and reddish brown in alteration halos.
STRUCTURE: Pillow basalts
ALTERATION: Pieces 5, 10, and 15: Highly altered in some areas with repeated alteration bands, yellowish brown and reddish brown on wet surfaces. The degree of alteration decreases downward. Olivine phenocrysts are replaced by yellow brown clays; plagioclase phenocrysts by green clays.
VEINS/FRACTURES: Piece 5: Abundant calcite veins, <5 mm thick. Pieces 7, 9, 10, 12, and 13: Thin calcite veins present.

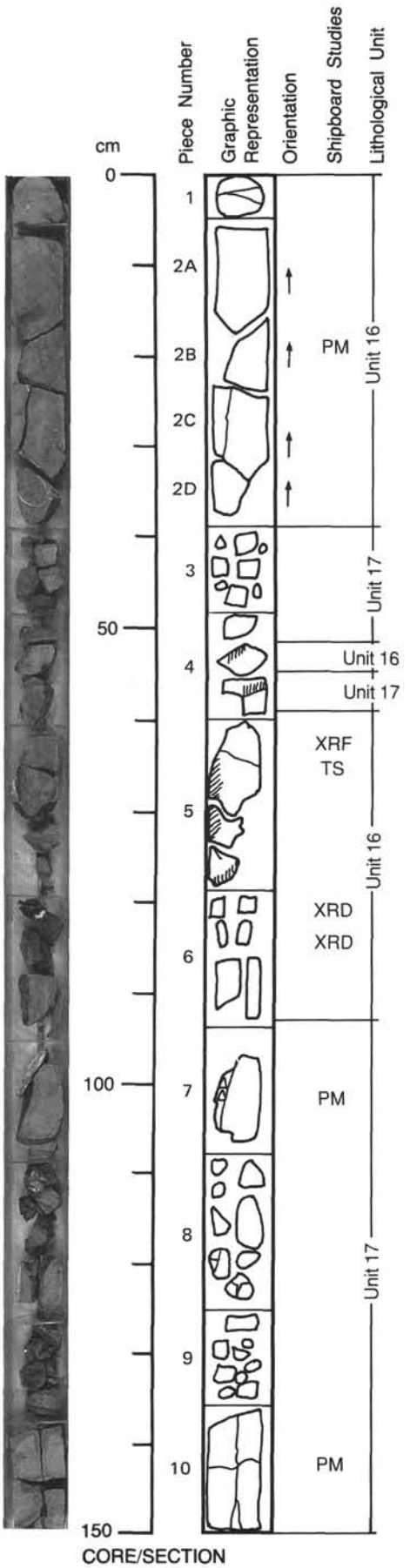


123-765D-22R-3

UNIT 16: APHYRIC PILLOW BASALTS

Pieces 22R-3, 1-6

CONTACTS: Not seen
PHENOCRYSTS: Rare phenocrysts present.
Olivine - Rare; <1 mm; Euhedral, completely altered.
Plagioclase - Rare; ?; Mostly replaced by green clays.
GROUNDMASS: Very fine-grained
VESICLES: Piece 5: <1 mm, filled with calcite; other pieces, non-vesicular.
COLOR: Medium dark gray, slightly reddish.
STRUCTURE: Pillow basalts
ALTERATION: Moderately altered. Olivine phenocrysts completely altered; plagioclase phenocrysts variably altered.
VEINS/FRACTURES: Pieces 2 and 4: Thin calcite veins present.



123-765D-23R-1

UNIT 16: APHYRIC PILLOW BASALTS

Pieces 23R-1, 1-7

CONTACTS: This unit includes Pieces 1-2D, a part of Piece 4, Pieces 5 and 6, and a part of Piece 8. Unit 16 is partly intrusive into Unit 17, and overlies Unit 17 as a whole. The upper contact is not seen.

PHENOCRYSTS:
Plagioclase - <1%; 2 mm; Subhedral tabular, completely replaced by green clay minerals.

GROUNDMASS: Microcrystalline or glassy in sill and pillow margins, very fine-grained elsewhere.

VESICLES: Very rare, <0.5 mm, spherical, filled by green clay minerals or calcite.

COLOR: Medium gray in pillow center with brownish gray alteration bands parallel to the pillow rim and to glass fragments in the breccia. Light gray in chilled zones of the sill margins.

STRUCTURE: Pillow basalts, sill, and breccia (hyaloclastite) intruding and overlying Unit 17. Piece 3, part of Piece 4, Piece 7, and part of Piece 8 may be fragments of the underlying Unit 17 incorporated in the pillow flow of Unit 16. Igneous intrusive contact between the two units is recovered in Piece 4, where fine-grained highly vesicular basalt of Unit 17 is cut by a sill at least 4 cm thick. The lower(?) contact of the sill is subhorizontal, but the upper(?) contact is subvertical. Its shape must have been irregular. A pillow constituting Piece 5 is also of very irregular shape: its long axis is in a high angle.

ALTERATION: Glass margin of pillows and glass fragments in hyaloclastite are completely replaced by dark green clay minerals. Core of pillow and sill is relatively fresh, but several brownish gray oxidized bands are developed parallel to the margins. Thus, the intrusion of Unit 17 is earlier than the alteration.

VEINS/FRACTURES: Very thin calcite veins are rarely present along small fractures. Matrix of hyaloclastite is dominated by calcite.

UNIT 17: MASSIVE APHYRIC BASALT FLOWS

Pieces 23R-1,7 through 23R-2,10 (Flow A)

CONTACTS: Upper contact is intruded by and overlain by previous unit. Piece 3, a part of Piece 4, Piece 7 and a part of Piece 8 may represent surfacial detached fragments of Unit 17 included as foreign blocks in Unit 16. Lower contact not seen.

PHENOCRYSTS: Pieces 23R-2, 1B, 4, and 5: in unhaloed areas, plagioclase(?) is present. Plagioclase(?) - 3%, sub-millimeter, blocky, replaced by white mineral (not calcite).

GROUNDMASS: Fine grained, appears coarse where altered.

VESICLES: 1%, up to 2 mm in diameter, unfilled. They are rimmed with celadonite(?) and calcite (or white zeolite sprays), but are bottomless or deep pits in some cases. Many seem deeper than they are wide. Locally up to 1%, vesicles within alteration halos are filled with calcite or orange/green minerals.

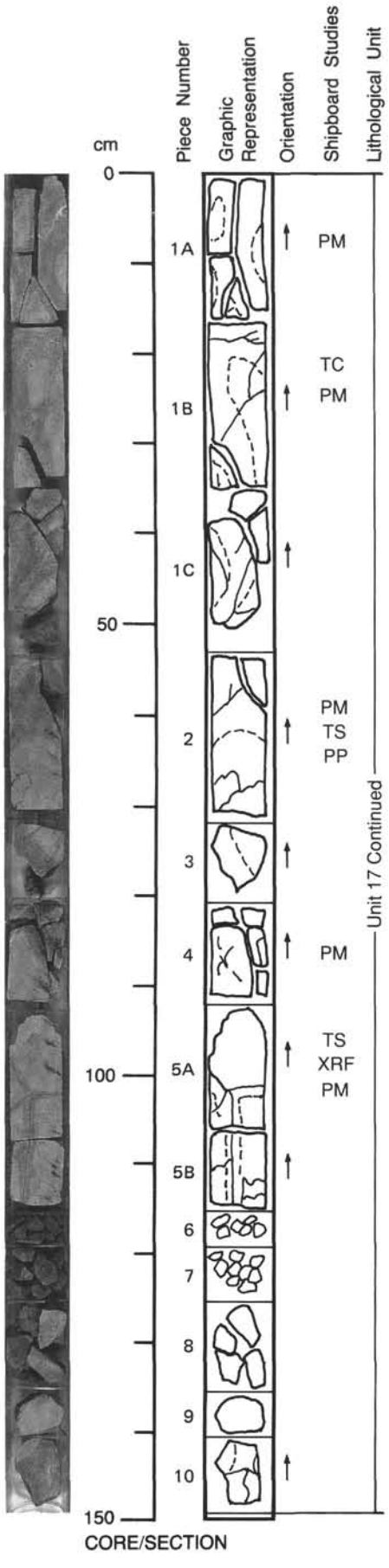
COLOR: Gray, where unaltered, to orange around veins in halos.

STRUCTURE: Basalt flows

ALTERATION: Most altered around veins. Halos only developed about some veins; Lower most vein in Piece 2 has no associated halo. Immediately adjacent to veins, alteration is orangish, then grades into darker green away from the vein. Beautiful halos in Pieces 23R-3, 1A and 1B.

VEINS/FRACTURES: Veins are in general <1 mm thick and either calcite or orange-brown mineral-filled.

ADDITIONAL COMMENTS: Pieces 23R-2, 6-10: May be a different flow; Vesicle content is less than in flow A and there are no prominent open vesicles present. However, these pieces don't look like part of Flow A or B.



123-765D-23R-2

UNIT 17: MASSIVE APHYRIC BASALT FLOWS

Pieces 23R-1,7 through 23R-2,10 (Flow A)

CONTACTS: Upper contact is intruded by and overlain by previous unit. Piece 3, a part of Piece 4, Piece 7 and a part of Piece 8 may represent surfacial detached fragments of Unit 17 included as foreign blocks in Unit 16. Lower contact not seen.

PHENOCRYSTS: Pieces 23R-2, 1B, 4, and 5: in unhaloed areas, plagioclase(?) is present. Plagioclase(?) - 3%, sub-millimeter, blocky, replaced by white mineral (not calcite).

GROUNDMASS: Fine grained, appears coarse where altered.

VESICLES: 1%, up to 2 mm in diameter, unfilled. They are rimmed with celadonite(?) and calcite (or white zeolite sprays), but are bottomless or deep pits in some cases. Many seem deeper than they are wide. Locally up to 1%, vesicles within alteration halos are filled with calcite or orange/green minerals.

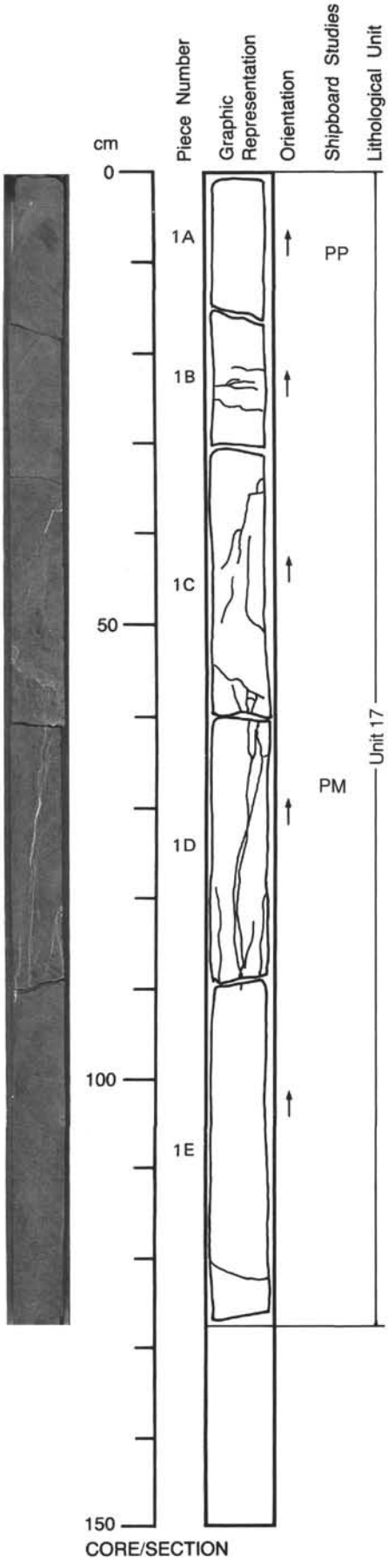
COLOR: Gray, where unaltered, to orange around veins in halos.

STRUCTURE: Basalt flows

ALTERATION: Most altered around veins. Halos only developed about some veins; Lower most vein in Piece 2 has no associated halo. Immediately adjacent to veins, alteration is orangish, then grades into darker green away from the vein. Beautiful halos in Pieces 23R-3, 1A and 1B.

VEINS/FRACTURES: Veins are in general <1 mm thick and either calcite or orange-brown mineral-filled.

ADDITIONAL COMMENTS: Pieces 23R-2, 6-10: May be a different flow; Vesicle content is less than in flow A and there are no prominent open vesicles present. However, these pieces don't look like part of Flow A or B.

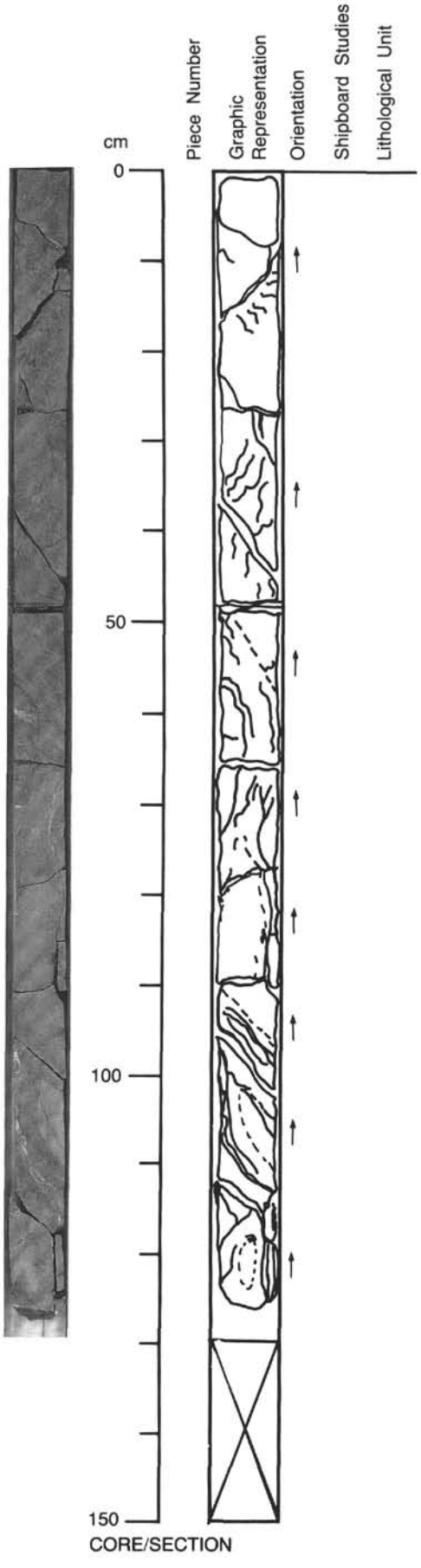


123-765D-24R-1

UNIT 17: MASSIVE APHYRIC BASALT FLOWS

Pieces 24R-1,1A through 24R-3,1C (Flow B)

CONTACTS: Top contact not seen. Lower contact in Piece 24R-3, 1C: Chilled to very fine-grained, altered, buff colored to gray patchy basalt.
PHENOCRYSTS: Aphyric; well crystallized. Rare, mm sized clinopyroxene phenocrysts.
GROUNDMASS: Equigranular 1 mm. Between fine and medium-grained.
VESICLES: <1%, <1 mm, filled with black-dark green minerals. Pieces 24R-2, 2E and 2F filled with calcite.
COLOR: Gray-brown
STRUCTURE: Basalt flows.
ALTERATION: Alteration halos around veins, Piece 24R-1, 10: Brown stains not spatially related to veins. Piece 24R-1, 1E is notably fresh in lower two thirds.
VEINS/FRACTURES: Pieces 24R-1, 1A and 1E: <1-3 mm wide, essentially devoid of fractures or veins. Pieces 24R-1, 1C-1D: Calcite veins and feathery vein. Piece 24R-1, 1B: <1 mm multi-color veins.
ADDITIONAL COMMENTS: Pieces 24R-2, 1A-2F: Pronounced increase in staining/alteration toward base of section and into Section 24R-3; Pieces 24R-2, 1A-1E do not have alteration halos around veins, whereas Pieces 24R-2, 2A-2F have extensive centimeter thick halos about all veins. Lower contact is chilled to very fine-grained, and altered to a buff color. Grey patches outside the alteration halos appear to be bleached. Halos are extensive and up to centimeters in width; brown stains permeate 80% of Pieces 24R-3, 1A and 1B. Piece 24R-3 is brown to buff and chilled. It is similar to Piece 1C, but set in calcite matrix.

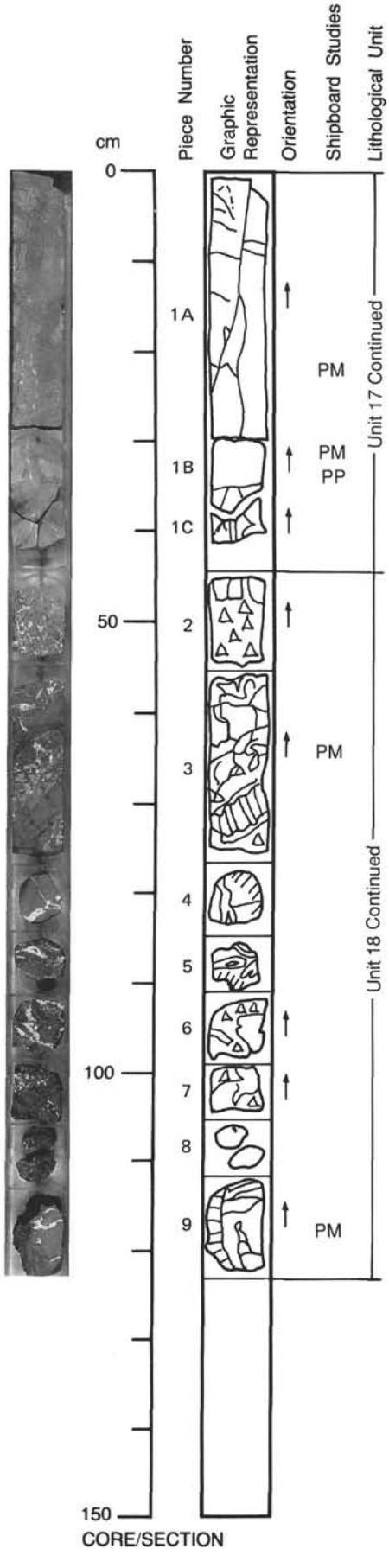


123-765D-24R-2

UNIT 17: MASSIVE APHYRIC BASALT FLOWS

Pieces 24R-1,1A through 24R-3,1C (Flow B)

CONTACTS: Top contact not seen. Lower contact in Piece 24R-3, 1C: Chilled to very fine-grained, altered, buff colored to gray patchy basalt.
PHENOCRYSTS: Aphyric; well crystallized. Rare, mm sized clinopyroxene phenocrysts.
GROUNDMASS: Equigranular 1 mm. Between fine and medium-grained.
VESICLES: <1%, <1 mm, filled with black-dark green minerals. Pieces 24R-2, 2E and 2F filled with calcite.
COLOR: Gray-brown
STRUCTURE: Basalt flows.
ALTERATION: Alteration halos around veins, Piece 24R-1, 10: Brown stains not spatially related to veins. Piece 24R-1, 1E is notably fresh in lower two thirds.
VEINS/FRACTURES: Pieces 24R-1, 1A and 1E: <1-3 mm wide, essentially devoid of fractures or veins. Pieces 24R-1, 1C-1D: Calcite veins and feathery vein. Piece 24R-1, 1B: <1 mm multi-color veins.
ADDITIONAL COMMENTS: Pieces 24R-2, 1A-2F: Pronounced increase in staining/alteration toward base of section and into Section 24R-3; Pieces 24R-2, 1A-1E do not have alteration halos around veins, whereas Pieces 24R-2, 2A-2F have extensive centimeter thick halos about all veins. Lower contact is chilled to very fine-grained, and altered to a buff color. Grey patches outside the alteration halos appear to be bleached. Halos are extensive and up to centimeters in width; brown stains permeate 80% of Pieces 24R-3, 1A and 1B. Piece 24R-3 is brown to buff and chilled. It is similar to Piece 1C, but set in calcite matrix.



123-765D-24R-3

UNIT 17: MASSIVE APHYRIC BASALT FLOWS

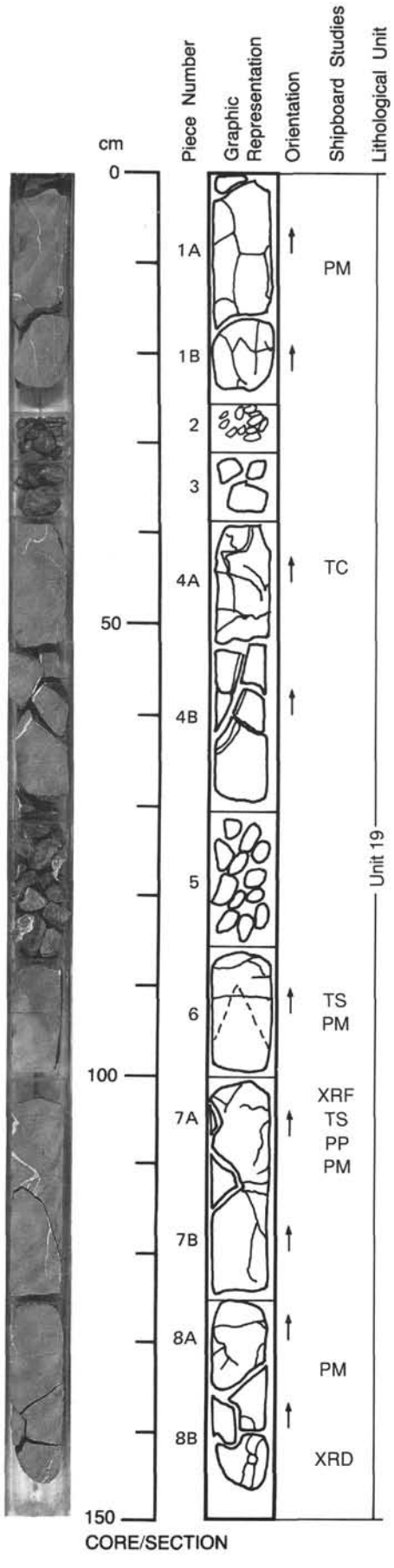
Pieces 24R-1,1A through 24R-3,1C (Flow B)

CONTACTS: Top contact not seen. Lower contact in Piece 24R-3, 1C: Chilled to very fine-grained, altered, buff colored to gray patchy basalt.
PHENOCRYSTS: Aphyric; well crystallized. Rare, mm sized clinopyroxene phenocrysts.
GROUNDMASS: Equigranular 1 mm. Between fine and medium-grained.
VESICLES: <1%, <1 mm, filled with black-dark green minerals. Pieces 24R-2, 2E and 2F filled with calcite.
COLOR: Gray-brown
STRUCTURE: Basalt flows.
ALTERATION: Alteration halos around veins, Piece 24R-1, 10: Brown stains not spatially related to veins. Piece 24R-1, 1E is notably fresh in lower two thirds.
VEINS/FRACTURES: Pieces 24R-1, 1A and 1E: <1-3 mm wide, essentially devoid of fractures or veins. Pieces 24R-1, 1C-1D: Calcite veins and feathery vein. Piece 24R-1, 1B: <1 mm multi-color veins.
ADDITIONAL COMMENTS: Pieces 24R-2, 1A-2F: Pronounced increase in staining/alteration toward base of section and into Section 24R-3; Pieces 24R-2, 1A-1E do not have alteration halos around veins, whereas Pieces 24R-2, 2A-2F have extensive centimeter thick halos about all veins. Lower contact is chilled to very fine-grained, and altered to a buff color. Grey patches outside the alteration halos appear to be bleached. Halos are extensive and up to centimeters in width; brown stains permeate 80% of Pieces 24R-3, 1A and 1B. Piece 24R-3 is brown to buff and chilled. It is similar to Piece 1C, but set in calcite matrix.

UNIT 18: PILLOW BRECCIA

Pieces 24R-3, 2-9

CONTACTS: Not seen at base. Top represents brecciated hyaloclastite.
PHENOCRYSTS: Aphyric.
GROUNDMASS: Microcrystalline glassy. Spherulitic glassy rims to pillow fragments.
VESICLES: Non-vesicular.
COLOR: Buff/brown unaltered material. Black/gray in fresh material.
STRUCTURE: Pillow breccia. Piece 24R-3, 4 is a tongue of pillow basalt intruded into the hyaloclastite.
ALTERATION: Relatively unaltered.
VEINS/FRACTURES: Calcite filled veins up to 4 mm wide.

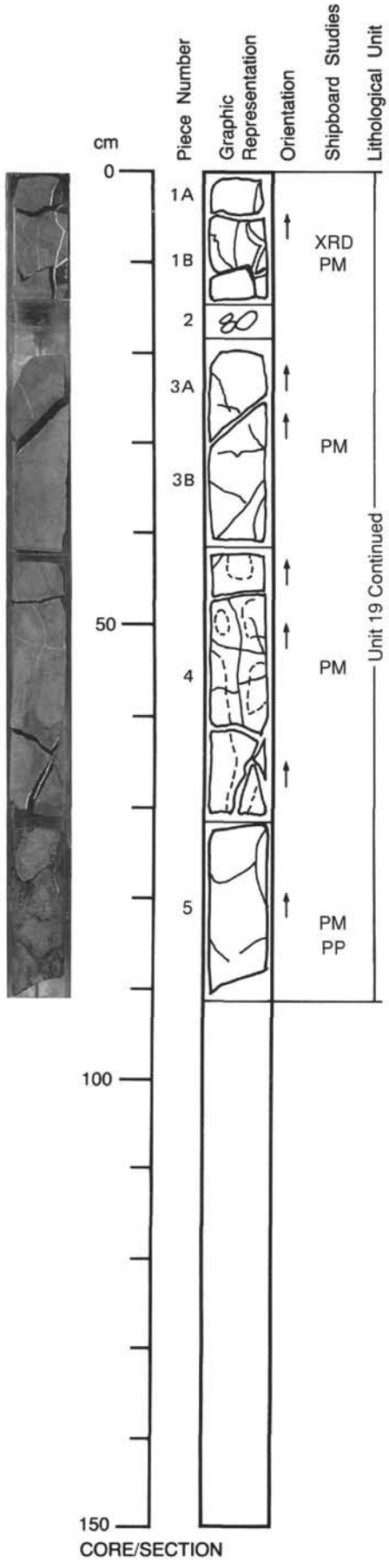


123-765D-24R-4

UNIT 19: MASSIVE APHYRIC BASALT FLOW

Pieces 24R-4, 1A through 25R-1. 1

CONTACTS: Upper contact not seen. Lower contact formed by 2 cm thick glass zone in Piece 25R-1, 1, moderately to highly altered.
PHENOCRYSTS: Aphyric. Piece 24R-4, 4: Clinopyroxene phenocryst, 1 mm.
GROUNDMASS: Fine grained
VESICLES: <1%, <1 mm, calcite filled. Section 24R-4: Filled by green mineral. Section 24R-5 has tiny, calcite-filled vesicles.
COLOR: Gray when fresh, red-orange stains and splotches; Green-brown stains in alteration halos about veins.
STRUCTURE: Massive
ALTERATION: Alteration halos extensive in Piece 24R-4, 6. Prominent orange halo (about 1 cm) in Piece 24R-4, 1. The rest of the veins have little or no halos. Piece 24R-5, 4 has beautiful halos up to 1 cm wide around some calcite veins, other veins cut halos; halo is fringed in deep red.
VEINS/FRACTURES: Up to a maximum of 3 mm wide. Largest veins are calcite, in Piece 24R-4, 7A.
ADDITIONAL COMMENTS: Pieces 24R-1, 2 and 3: Include fresh and altered glass fragments, 1 to 3 cm in size.

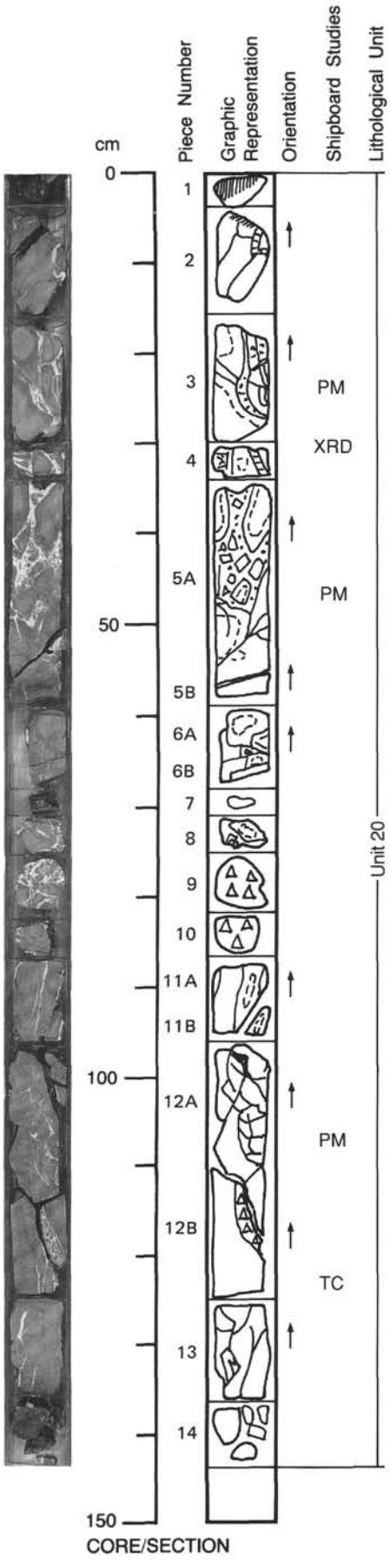


123-765D-24R-5

UNIT 19: MASSIVE APHYRIC BASALT FLOW

Pieces 24R-4, 1A through 25R-1. 1

CONTACTS: Upper contact not seen. Lower contact formed by 2 cm thick glass zone in Piece 25R-1, 1, moderately to highly altered.
PHENOCRYSTS: Aphyric. Piece 24R-4, 4: Clinopyroxene phenocryst, 1 mm.
GROUNDMASS: Fine grained
VESICLES: <1%, <1 mm, calcite filled. Section 24R-4: Filled by green mineral. Section 24R-5 has tiny, calcite-filled vesicles.
COLOR: Gray when fresh, red-orange stains and splotches; Green-brown stains in alteration halos about veins.
STRUCTURE: Massive
ALTERATION: Alteration halos extensive in Piece 24R-4, 6. Prominent orange halo (about 1 cm) in Piece 24R-4, 1. The rest of the veins have little or no halos. Piece 24R-5, 4 has beautiful halos up to 1 cm wide around some calcite veins, other veins cut halos; halo is fringed in deep red.
VEINS/FRACTURES: Up to a maximum of 3 mm wide. Largest veins are calcite, in Piece 24R-4, 7A.
ADDITIONAL COMMENTS: Pieces 24R-1, 2 and 3: Include fresh and altered glass fragments, 1 to 3 cm in size.



123-765D-25R-1

UNIT 19: MASSIVE APHYRIC BASALT FLOW

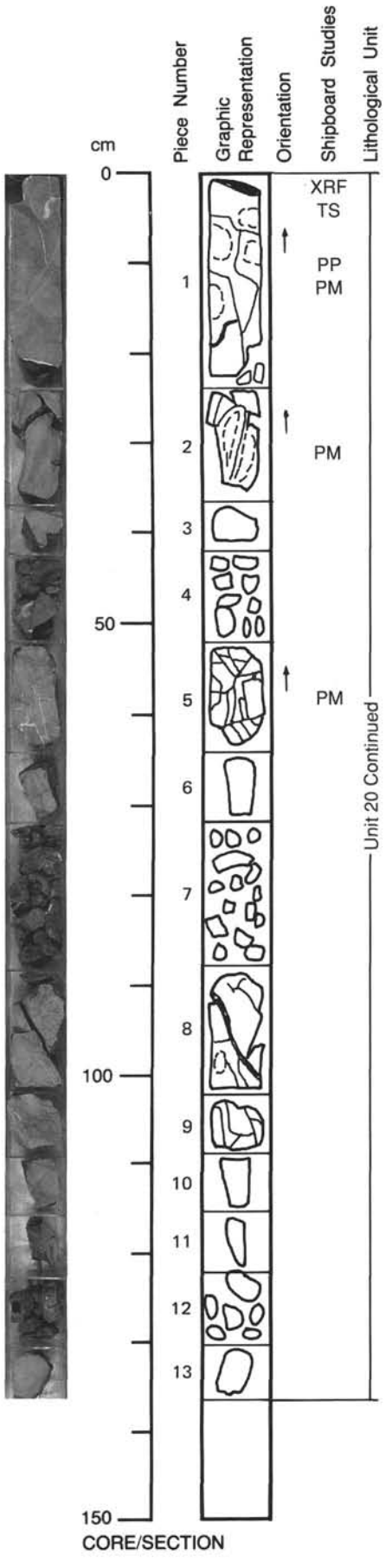
Pieces 24R-4, 1A through 25R-1. 1

CONTACTS: Upper contact not seen. Lower contact formed by 2 cm thick glass zone in Piece 25R-1, 1, moderately to highly altered.
PHENOCRYSTS: Aphyric. Piece 24R-4, 4: Clinopyroxene phenocryst, 1 mm.
GROUNDMASS: Fine grained
VESICLES: <1%, <1 mm, calcite filled. Section 24R-4: Filled by green mineral. Section 24R-5 has tiny, calcite-filled vesicles.
COLOR: Gray when fresh, red-orange stains and splotches; Green-brown stains in alteration halos about veins.
STRUCTURE: Massive
ALTERATION: Alteration halos extensive in Piece 24R-4, 6. Prominent orange halo (about 1 cm) in Piece 24R-4, 1. The rest of the veins have little or no halos. Piece 24R-5, 4 has beautiful halos up to 1 cm wide around some calcite veins, other veins cut halos; halo is fringed in deep red.
VEINS/FRACTURES: Up to a maximum of 3 mm wide. Largest veins are calcite, in Piece 24R-4, 7A.
ADDITIONAL COMMENTS: Pieces 24R-1, 2 and 3: Include fresh and altered glass fragments, 1 to 3 cm in size.

UNIT 20: BRECCIATED APHYRIC PILLOW BASALTS

Pieces 25R-1, 2-14

CONTACTS: Upper contact marked by 3 mm-thick glass zone at the top of Piece 2. Glass is moderately to highly altered. Lower contact is not seen.
PHENOCRYSTS: Aphyric with rare plagioclase phenocrysts, about 1 mm, subhedral.
GROUNDMASS: Uniformly very fine-grained in the central part of the section. Microcrystalline near the glass zone at the top.
VESICLES: <1%; <0.5 mm; Spherical or irregular; Filled by green clays, calcite, or hematite (in alteration halos).
COLOR: Light gray in relative fresh part, grayish orange or reddish brown in alteration halos, and greenish black in altered glass zones.
STRUCTURE: Pillow basalts with glass margins. Strongly brecciated; breccia interstices are filled by calcite. Pieces 3-5B, 8-10, and 12 are actually basalt breccia with calcite matrix. They are not hyaloclastite, because breccia fragments are crystalline, not glassy.
ALTERATION: Slight in some parts, moderately or highly altered in halos and glass zones.
VEINS/FRACTURES: Calcite veins are abundant throughout the section. Network calcite vein present in Piece 12A.

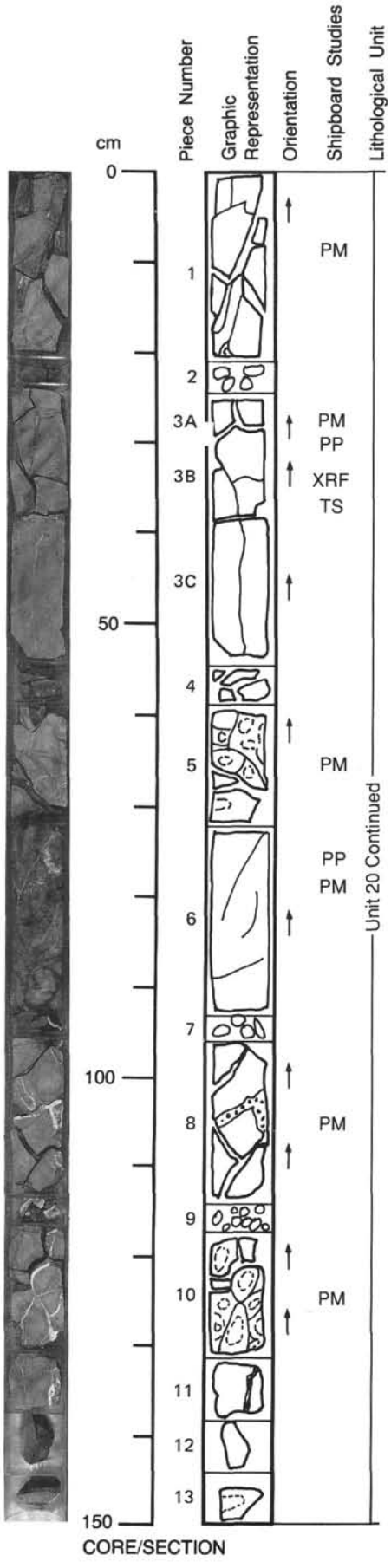


123-765D-25R-2

UNIT 20: BRECCIATED APHYRIC PILLOW BASALTS

Pieces 25R-2, 1-13

CONTACTS: Not seen. Unit 20 continued.
PHENOCRYSTS: Aphyric with very rare plagioclase phenocrysts, 1 mm, fresh.
GROUNDMASS: Uniformly very fine grained.
VESICLES: Non vesicular.
COLOR: Light gray in relatively fresh part, medium gray - grayish orange in alteration halos.
STRUCTURE: Brecciated pillow basalts
ALTERATION: Slight in some parts, moderately or highly altered in halos and glass zones.
VEINS/FRACTURES: Network of calcite veins in Piece 5. Thin calcite veins, green veins, and oxidized brown veins are common.

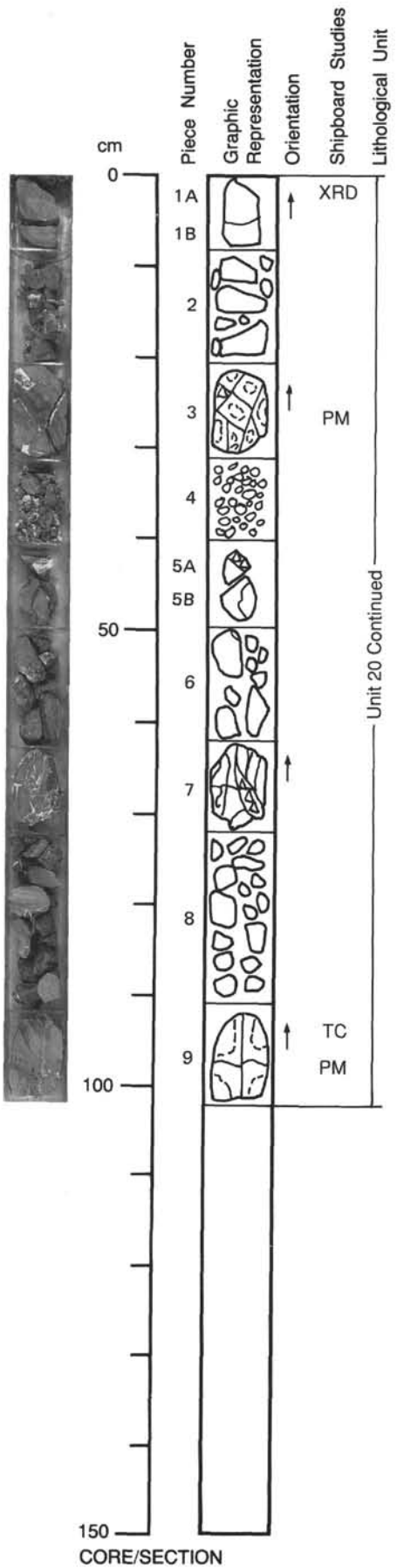


123-765D-26R-1

UNIT 20: APHYRIC BASALT MASSIVE FLOWS

Pieces 26R-1, 1-13

CONTACTS: Not seen. Unit 20 continued.
PHENOCRYSTS: Aphyric with very rare plagioclase phenocrysts, 1 mm, fresh.
GROUNDMASS: Uniformly very fine-grained.
VESICLES: Pieces 3C (top): 5%, irregularly shaped, filled with calcite, green clays and iron hydroxides(?) (yellows or red brown). All other pieces are non-vesicular.
COLOR: Light gray in relatively fresh part, medium gray or grayish orange in alteration halos. Piece 3 is darker colored.
STRUCTURE: Brecciated pillow basalts.
ALTERATION: Slight in some parts, moderately or highly altered in halos. Piece 3: Less altered than all other pieces which contain well developed alteration halos and calcite veins.
VEINS/FRACTURES: Pieces 8, 10, and 11: Thick (5 mm) calcite veins developed.

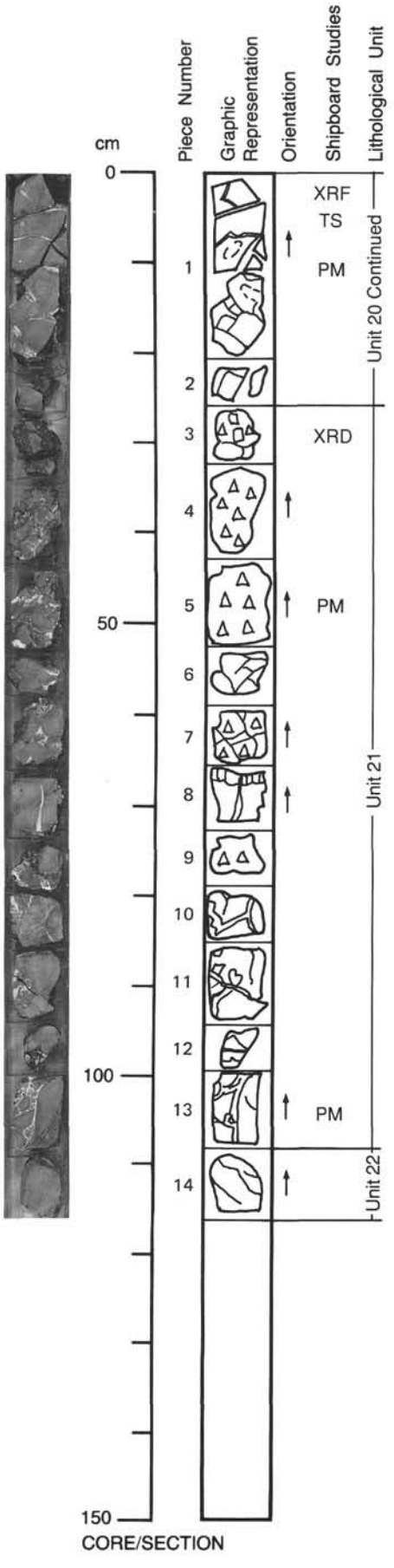


123-765D-26R-2

UNIT 20: BRECCIATED APHYRIC PILLOW BASALTS

Pieces 26R-2, 1A through 27R-1, 2

CONTACTS: Not seen. Unit 20 continued.
PHENOCRYSTS: Very rare plagioclase phenocrysts, 1 mm, fresh.
GROUNDMASS: Uniformly fine-grained
VESICLES: Piece 26R-2, 6: 5%, irregular shape, filled with calcite, green clays, and iron oxide or hydroxides. All other pieces are non-vesicular
COLOR: Gray with darker alteration halos, cut by calcite and red brown veins. Halos are grayish orange or pale reddish brown adjacent to the vein or fracture, then medium gray to slightly greenish (center of the halo) to light gray in the relatively fresh part farthest from the vein.
STRUCTURE: Brecciated pillow basalts
ALTERATION: Alteration halos with veining. Halos up to 2 cm wide.
VEINS/FRACTURES: Network calcite veins are developed in Piece 26R-2, 7, which looks like basalt breccia in calcite matrix. A thick, calcite vein containing basalt fragments, and miaroles containing euhedral calcites, is present at the top of Piece 26R-2, 5A.



123-765D-27R-1

UNIT 21: APHYRIC BASALT BRECCIA

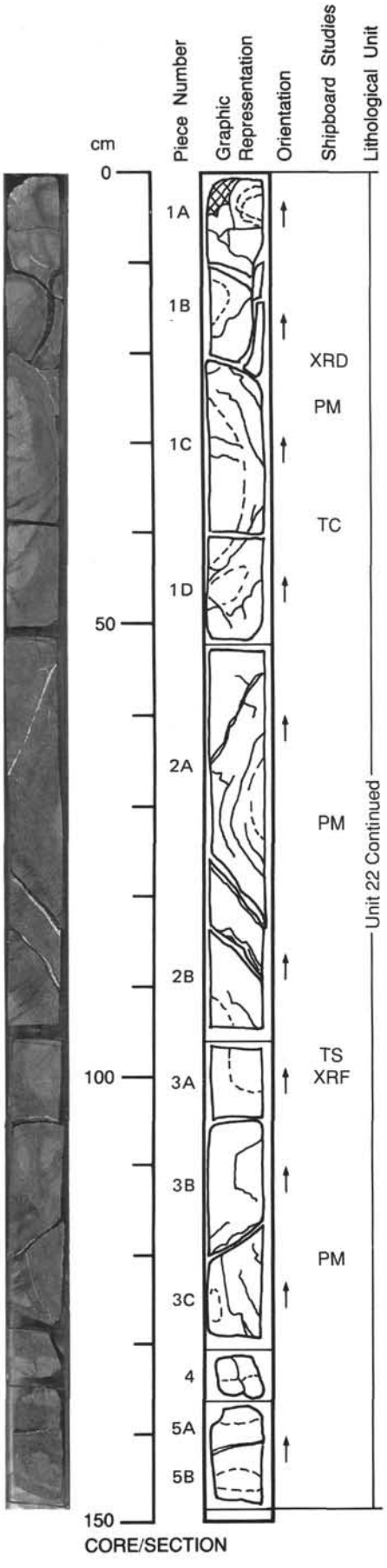
Pieces 27R-1, 3-13

CONTACTS: Fragmented top and bottom
PHENOCRYSTS: Aphyric
GROUNDMASS: Fine-grained basalt fragments
VESICLES: Non-vesicular
COLOR: Gray in basalt fragments. Green in altered hyaloclastites.
STRUCTURE: Basaltic breccia cemented by spary calcite vein.
ALTERATION: Basaltic fragments are zoned. Green clay matrix interspersed with calcite.
VEINS/FRACTURES: Network veins of calcite.
ADDITIONAL COMMENTS: Pieces 3, 7, and 9 are hyaloclastite breccia. Chunks of grey, fine-grained basalt floating in a calcite and green clay mineral breccia matrix. Piece 3 is composed almost entirely of green clay (alteration product of glass/palagonite). Piece 8: Big chunk of breccia(?) with chilled margin on top(?), cut by calcite vein which widens to 6 mm at the base. Pieces 10-13: basalt flow fragments cut by calcite veins. 1-3 mm thick (Piece 10). Piece 13: Network of calcite veins in breccia.

UNIT 22: MASSIVE APHYRIC BASALT FLOWS

Pieces 27R-1, 14 through 27R-3, 16

CONTACTS: Fragmented flow top to massive lava. Base, fining in grain size toward the underlying unit.
PHENOCRYSTS: Aphyric with rare megacrysts of olivine(?).
GROUNDMASS: Fine-grained with coarsening toward the center of the massive flows.
VESICLES: Abundance increases down section (27R-2) in same flow. Other flows are non-vesicular (Pieces 27R-3, 11-16). Vesicles up to 5%, mm sized, filled with iron oxides, calcite, and dark green mineral. Piece 27R-3, 7: Vesicles are empty.
COLOR: Gray/brown for most samples. Brown is dominant with increasing alteration.
STRUCTURE: Massive aphyric basalt flows. Heavily fractured with calcite veining and associated alteration halos.
ALTERATION: Well developed alteration zones (2-4 cm wide) around the calcite veins. Color of these zones varies from brown to reddish as veins are approached.
VEINS/FRACTURES: Quite extensive veining of 1 mm size, calcite filled.

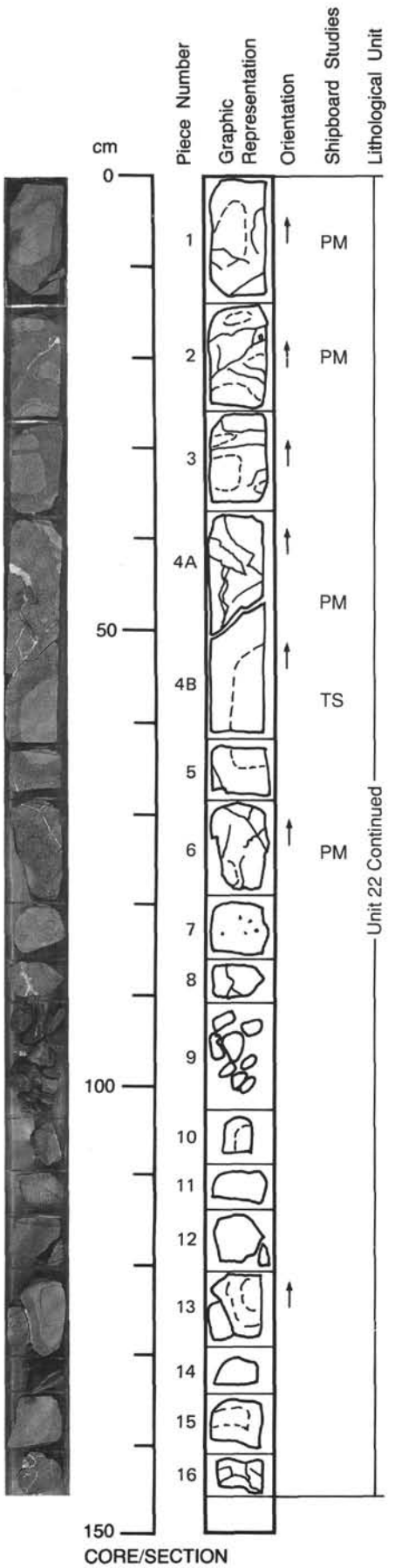


123-765D-27R-2

UNIT 22: MASSIVE APHYRIC BASALT FLOWS

Pieces 27R-1, 14 through 27R-3, 16

CONTACTS: Fragmented flow top to massive lava. Base, fining in grain size toward the underlying unit.
PHENOCRYSTS: Aphyric with rare megacrysts of olivine(?).
GROUNDMASS: Fine-grained with coarsening toward the center of the massive flows.
VESICLES: Abundance increases down section (27R-2) in same flow. Other flows are non-vesicular (Pieces 27R-3, 11-16). Vesicles up to 5%, mm sized, filled with iron oxides, calcite, and dark green mineral. Piece 27R-3, 7: Vesicles are empty.
COLOR: Gray/brown for most samples. Brown is dominant with increasing alteration.
STRUCTURE: Massive aphyric basalt flows. Heavily fractured with calcite veining and associated alteration halos.
ALTERATION: Well developed alteration zones (2-4 cm wide) around the calcite veins. Color of these zones varies from brown to reddish as veins are approached.
VEINS/FRACTURES: Quite extensive veining of 1 mm size, calcite filled.



123-765D-27R-3

UNIT 22: MASSIVE APHYRIC BASALT FLOWS

Pieces 27R-1, 14 through 27R-3, 16

CONTACTS: Fragmented flow top to massive lava. Base, fining in grain size toward the underlying unit.
PHENOCRYSTS: Aphyric with rare megacrysts of olivine(?).
GROUNDMASS: Fine-grained with coarsening toward the center of the massive flows.
VESICLES: Abundance increases down section (27R-2) in same flow. Other flows are non-vesicular (Pieces 27R-3, 11-16). Vesicles up to 5%, mm sized, filled with iron oxides, calcite, and dark green mineral. Piece 27R-3, 7: Vesicles are empty.
COLOR: Gray/brown for most samples. Brown is dominant with increasing alteration.
STRUCTURE: Massive aphyric basalt flows. Heavily fractured with calcite veining and associated alteration halos.
ALTERATION: Well developed alteration zones (2-4 cm wide) around the calcite veins. Color of these zones varies from brown to reddish as veins are approached.
VEINS/FRACTURES: Quite extensive veining of 1 mm size, calcite filled.

123-765B-7H-01 (Piece 1, 72-75 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.5	0.5	0.7		Euhedral	
GROUNDMASS						
Plagioclase	30	30	0.1-0.3		Laths	
Augite	10	10	~ 0.2		Subophitic	Fresh, but partly oxidized in a margin.
Olivine(?)	0	2	~ 0.15		Anhedral	Replaced by iddingsite.
Mesostasis	44.5	52			Interstitial	Cryptocrystalline, partly showing radial extinction.
Ti-magnetite	3	5	~ 0.05		Euhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Mesostasis, vesicles	Yellowish brown.
Chlorite	3	Mesostasis, vesicles	Smectite(?) Pale yellowish green to very pale brown.
Sphene	2	Ti-magnetite	Dirty.
Iddingsite	2	Mesostasis, olivine	
Vesicles	3		

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	3	Disseminated	0.1-0.3		Spherical	Mostly void, partly filled by chlorite.

COMMENTS: The thin section is thinner than usual. The rock is relatively fresh and bears relic augite, aided by the relatively good crystallinity. In situ thin section #1.

123-765B-12H-01 (Piece 1, 90-92 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Moderately plagioclase-olivine phyric glassy basalt

GRAIN SIZE: Fine-grained

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	1.3	0.5-0.8		Euhedral	Including tiny fresh spinel grains.
Plagioclase	2	4	0.7-1.3	Labradorite	Euhedral	Partly altered to zeolites.
Spinel	<0.01	<0.01	0.03	Al-rich	Euhedral	Occurs only included in olivine. Glomeroporphyritic.
GROUNDMASS						
Glass	86.5	86.5				Devitrified glass, dense brown.
Plagioclase	2	2	~ 0.1		Needles	Needles less than 0.1 mm long.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Carbonate	2	Vesicles	
Zeolites	3	Vesicles, plagioclase	
Chlorite	1.5	Vesicles, olivine	
Vesicles	3	Void	Void.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	6.2	Random	0.03-3	Chlorite, zeolite, calcite.	Rounded or irrregular

COMMENTS: In situ thin section #03.

123-765B-28X-CC (Piece 1, 34-36 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Sparsely plagioclase phyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	1	1	0.5-2		Subhedral laths	Some are blocky.
GROUNDMASS						
Plagioclase	10	10	0.2-0.7		Laths, needles, forks	
Augite	5	5	~ 0.2		Radial, dendritic	Radial aggregate of dendritic crystallites.
Mesostasis	81	83				Cryptocrystalline, variolitic devitrified glass.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Glass	Bright greeen smectites.
Clays	trace	Vesicles	Bright green celadonite or smectite.
Carbonate	1	Vesicles	Mosaic aggregates.
Chlorite	trace	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1	Disseminated	0.5	Calcite	Spherical	Generally filled by mosaic calcites.

COMMENTS: In situ thin section #11. Relatively fresh, gray-colored core is rimmed by reddish brown, severely weathered crust up to 5 mm thick. A part of the outer crust is greenish gray, poorly crystalline, and spherulitic. This pebble may represent a fragment of a pillow rim.

123-765B-31X-01 (Piece 1, 151-153 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Sparsely plagioclase phyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	1	1	1.2		Equant, anhedral	Oscillatory zoning, carlsbad twin (xenocryst?). Fresh.
Plagioclase	1.5	1.5	0.7-1.5		Euhedral, bladed	Glomeroporphyritic. Fresh.
GROUNDMASS						
Plagioclase	5	5	0.2-0.7		Forks, needles	Sometimes variolitic.
Glass	90	92				Devitrified. Cryptocrystalline. Red patches (1-2 mm) in brown matrix. Partly fresh, very pale brown. Fresh glass remains in a margin (1%).

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	0.5	Vesicles	Bright green celadonite or smectite.
Clays	2	Glass	Pale olive green cryptocrystalline clays.
Carbonate	trace	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	2	Disseminated	0.5-1	Void or carbonate	Spherical or irregular

COMMENTS: The groundmass is composed of reddish patches, 1 or 2 mm in diameter, and brown matrix. The patches sometimes include variolitic aggregates of plagioclase laths. The anhedral, zoned plagioclase (phenocryst) may be a xenocryst. In situ thin section #15.

123-765C-13R-01 (Piece 1, 94-96 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Moderately olivine-spinel phyric basalt

GRAIN SIZE: Fine-grained (0.5 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	7.5	0.3-1.0		Euhedral-subhedral	Completely replaced by yellow brown highly birefringent clay.
Spinel	0	0.3	0.1-0.3		Euhedral	Associated with or included in olivine. Completely replaced by hematite.
GROUNDMASS						
Plagioclase	30	40	0.4-0.8		Laths	
Clinopyroxene	0	10	0.2-0.4		Anhedral	Completely replaced by pale green clay.
Mesostasis	40	42%				Cryptocrystalline material including minute Fe-Ti oxides.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	22	Olivine, cpx, plag, mesostasis	Light green, yellow brown.
Carbonate	trace	Vesicle	
Zeolites	8	Plagioclase	
Hematite or limonite	0.3	Spinel	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	trace	Sparse	0.5	Clay, calcite	Spherical	Calcite in center, pale green clay in margin.

COMMENTS: A 14 cm-high boulder placed in situ in the sediments. Thin section sample was taken from its upper part, and XRF sample was taken from its lower part. In situ thin section #45.

123-765C-13R-02 (Piece 1, 39-42 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Moderately olivine-plagioclase phyric basalt

GRAIN SIZE: Fine-grained (0.2 mm)

TEXTURE: Glomeroporphyritic/hyalopilitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	5.1	0.2-1.0		Euhedral-subhedral	Some are skeletal. Completely replaced.
Plagioclase	0	0.3	0.8-2.3		Euhedral, bladed	Very pale yellow green clays, completely replaced by zeolites.
Spinel	trace	trace	0.02		Euhedral	Included in olivine. Dense brown, translucent, fresh.
GROUNDMASS						
Plagioclase	15	20	0.1-0.3		Needles	Aligned along flow lines.
Glass	60	74.6				Devitrified cryptocrystalline material.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	20	Olivine, mesostasis	Very pale yellow green smectites with moderate or weak birefringence.
Zeolites	5	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: In situ thin section #46.

123-765C-15R-01 (Piece 1, 3-6 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Sparsely olivine phyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	1	0.4-1.1		Euhedral-subhedral	Completely replaced by dirty yellowish clays.
GROUNDMASS						
Plagioclase	15	20	0.1-0.5		Laths	
Olivine	0	5	0.1-0.2		Subhedral	Completely replaced by yellowish brown clays.
Clinopyroxene	0	25	0.1-0.3		Broom-like dendrite	Quench crystals in mesostasis. Completely replaced by yellowish brown clays.
Mesostasis	40	49				Devitrified glass.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	40	Olivine, clinopyroxene, mesostasis	Dirty yellowish clay replaces olivine, and dense yellow brown clay replaces quench clinopyroxene.
Zeolites	5	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1	Disseminated	0.2-1	Mostly void	Spherical, irregular	Spherical(smaller ones), irregular(larger ones). Very small vesicles are filled by pale yellow green clay.

COMMENTS: Drill breccia thin section #48.

123-765C-15R-01 (Piece 1, 1-3 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Aphyric (alkali?) basalt

GRAIN SIZE: Fine-grained (0.4 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.2	0.4		Euhedral	Completely replaced by iddingsite frame-work and low-birefringent clays.
GROUNDMASS						
Plagioclase	20	40	0.2-0.7		Tabular, bladed	Partly replaced by zeolites and clays.
Olivine	0	10	0.05-0.1		Subhedral, equant	Completely replaced by yellow-red clays.
Clinopyroxene	0	10	0.2		Subophitic	Completely replaced by reddish limonitic clay.
Mesostasis	30	40				Cryptocrystalline aggregate.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	35	Olivine, cpx, plag, mesostasis.	Red-stained yellowish, highly birefringent clay is dominant. Bright green clays also occur in veins and replacing olivine.
Zeolites	15	Plagioclase	Plagioclase remains as linear alignment of islands.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	1.0	Disseminated	0.2-0.7	Mostly void	Irregular

COMMENTS: Thin veins, 0.05 mm wide, are present in the center of the section, and are filled by bright green clays. The occurrence of relatively abundant olivine pseudomorphs in the groundmass suggests alkali-basaltic affinity. Drill breccia thin section #49.

123-765C-16R-01 (Piece 1, 6-10 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Sparsely olivine-plagioclase phyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Variolitic/hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	trace	0.6	0.3-1.0		Euhedral-skeletal	Replaced by green clays except for one tiny relict.
Plagioclase	0	0.5	1.0-2.5		Bladed	Completely replaced by zeolites & clays.
Spinel	trace	trace	0.01-0.03		Euhedral	Included in olivine phenocrysts. Fresh. Almost opaque.
GROUNDMASS						
Plagioclase	5	15	0.1-0.5		Needles	Mostly replaced by zeolites and clays.
Glass	84	84				Devitrified, cryptocrystalline, possibly replaced by clays.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	84	Glass	
Clays	7	Olivine, plagioclase, vesicles	Vesicles (not including altered glass). Bright green, pale green.
Zeolites	4	Plagioclase, vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1.5	Disseminated	0.8-1.2	Void or clay/zeolite	Spherical	Some are zoned (bright green clay in margin, and pale green clay in interior). One vesicle is filled by zeolites.

COMMENTS: The rock is composed of red brown patches, 2 or 3 mm in diameter and occupying 30% volume, in the grayish green matrix. The patch is microscopically made of several varioles of plagioclase microlites. Olivine phenocrysts are more abundant in patches than in the matrix. Preservation of one tiny olivine relic is astonishing in such an altered rock. Drill breccia thin section #51.

123-765C-17R-01 (Piece 1, 6-8 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Sparsely olivine-plagioclase phyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Intersertal/partly variolitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	2	0.4-1.0		Euhedral-subhedral	Completely replaced by yellow, highly birefringent clays (resembling epidote).
Plagioclase	0.5	0.5	0.3		Anhedral, equant	
GROUNDMASS						
Plagioclase	10	35	0.2-0.7		Laths	Mostly replaced by clays and zeolites.
Clinopyroxene	0	10	0.2		Anhedral, subophitic	Completely replaced by clays.
Mesostasis	40	52				Cryptocrystalline.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	50	Plag, cpx, olivine, mesostasis, vesicles	Yellow strongly birefringent clays.
Zeolites	10	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	1	Even	0.1-0.3	Yellow clay	Spherical

COMMENTS: Drill breccia thin section #63.

123-765C-17R-01 (Piece 1, 8-10 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal/variolitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	10	35	0.1-0.5		Laths	Partly replaced by clays and zeolites.
Clinopyroxene	0	10	0.2-0.4		Subhedral	Completely altered to yellow clay.
Olivine(?)	0	1	0.2-0.4		Subhedral	Completely replaced by red-brown clay.
Mesostasis	50	54				

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	30	Plag, cpx, olivine, mesostasis	Yellow, highly birefringent clays.
Clays		Vesicles	
Zeolites	10	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1.5%	Uneven	0.3-0.6 mm	Clays	Spherical	Vesicles are gathered in a marginal part of the thin-section. Mostly filled by radial aggregate of yellow clay.

COMMENTS: The thin section has many void spaces made during preparation. Drill breccia thin section #62.

123-765C-19R-01 (Piece 1, 46-47 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Ferruginous claystone

GRAIN SIZE: Cryptocrystalline

TEXTURE: Massive, vesicular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Clay	100	100				Dense red, almost opaque clay. Cryptocrystalline or amorphous.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	5	Even	0.1-1.2	Quartz, chalcedony	Irregular

COMMENTS: In situ thin section #55.

123–765C–19R–01 (Piece 1, 85–86 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Sparsely olivine–plagioclase phyric basalt

GRAIN SIZE: Fine-grained (avg. 0.2 mm)

TEXTURE: Subophitic, holocrystalline

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.5	0.3		Euhedral–subhedral	Completely replaced by yellow–brown clays.
Plagioclase	0.1	0.5	1.7		Subhedral equant	Replaced by zeolites.
GROUNDMASS						
Plagioclase	35	69	0.1–0.7		Subhedral laths	Partly replaced by zeolites and clays.
Clinopyroxene	0	25	0.05–0.2		Subophitic	Completely replaced by yellow brown clay.
Fe–Ti oxide	2	5	< 0.1		Subhedral	Partly replaced by sphene.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Olivine, clinopyroxene	Green, low–birefringence.
Clays	23	Olivine, clinopyroxene	Yellow brown, high–birefringence.
Zeolites	35	Plagioclase	Cryptocrystalline aggregate replacing plagioclase, mostly disappeared during thin section preparation, refractive index is lower than the resin.
Sphene	3	Fe–Ti oxide	Dirty aggregate.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non–vesicular.

COMMENTS: Some olivine may have been present in the groundmass, but is indistinguishable. The rock may also be called "very fine-grained diabase." This is a rare, well crystallized, rock among the basaltic pebbles in the sediments of Site 765. It is possible that the rock is trachytic in chemistry. In situ thin section #53.

123–765C–19R–01 (Piece 1, 119–120 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Sparsely plagioclase–olivine phyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.5	0.5–1.0		Euhedral–subhedral	Completely replaced by pale brown clay.
Plagioclase	0	0.4	1.0–2.1		Euhedral–tabular	Completely replaced by zeolites and clays.
Spinel	trace	trace	0.05–0.15		Euhedral	Microphenocryst in groundmass; inclusion in olivine. Partly replaced by hematite.
GROUNDMASS						
Plagioclase	10	25	0.1–0.3		Laths, forks	Mostly replaced by clay and zeolites.
Clinopyroxene	0	5	0.2		Broom–like	Subophitic. Completely replaced by yellow or red clay + iron oxide.
Mesostasis	60	69				Cryptocrystalline, altered.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	20	Plag, olivine, cpx, mesostasis, vesicles	Pale yellow brown dirty clays are dominant.
Zeolites	10	Plagioclase	
Hematite	trace	Spinel	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	3	Disseminated	0.1–0.3	Clay	Spherical	Pale green clay and dirty yellow brown clay mixed.

COMMENTS: In situ thin section #57.

123-765C-19R-02 (Piece 1, 123-124 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (avg. 0.2 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.2	0.2	0.3		Anhedral equant	Xenocryst, no reaction rim.
GROUNDMASS						
Plagioclase	20	20	0.1-0.5		Forks, laths, needles	Sometimes form variolitic aggregate.
Glass	75	78				Devitrified, radial aggregates of cryptocrystalline material are common.
Olivine(?)	0	2	< 0.2		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Olivine, vesicles	Bright green celadonite or smectite.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	3			Bright green celadonite or smectite	

COMMENTS: In situ thin section #54.

123-765C-19R-02 (Piece 1, 124-125 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Moderately plagioclase-olivine phyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.1	0.2		Euhedral	Replaced by yellow clays.
Plagioclase	3	5.2	0.5-1.2		Subhedral tabular	Some are equant shaped, partly replaced by zeolites and pale brown clays. Sometimes form glomeroporphyritic aggregates.
GROUNDMASS						
Plagioclase	5	10	0.05-0.1		Needles	Needles partly replaced by zeolites.
Clinopyroxene	0	0.3	0.2		Broom-like dendrites	Forming irregular aggregate.
Glass	82	83.4				Devitrified, dense red color around plagioclase microlites, and pale green color in the interspace.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Vesicles, plag, cpx, olivine, glass	Bright green, yellow, pale brown, pale green etc.. Color is very variable. See below for vesicle-filling features.
Zeolites	5	Plagioclase	Forming patchy aggregate in plagioclase phenocrysts and microlites.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1.0	Disseminated	0.5	Clays	Spherical	Some are void, some are filled by clays, some of the filled vesicles show remarkable zoning; bright green clay in the margin, very pale brown, low birefringent clay in the interior, and void space in the center.

COMMENTS: In situ thin section #56.

123-765C-20R-01 (Piece 1, 3-5 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.1 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.8	0.8	0.8-1.8	An70	Euhedral-subhedral, tabular or equant	Fresh.
GROUNDMASS						
Plagioclase	10	15	0.05-0.5		Laths	
Glass	80	84				Devitrified, cryptocrystalline, red stained.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	7	Plagioclase, "glass"	Yellow-greeen clays.
Zeolites	2	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.2	Even	0.2 mm	Void or pale brown clay	Spherical

COMMENTS: Drill breccia thin section #59.

123-765C-20R-01 (Piece 1, 5-10 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Sparsely plagioclase phyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	1	2	~ 0.5 X 0.1		Euhedral laths	Microphenocrysts, partly replaced by zeolites and clays.
GROUNDMASS						
Plagioclase	5	15	0.1-0.3		Needles, forks	Partly replaced by zeolites and clays.
Clinopyroxene	0	5	0.1-0.3		Anhedral subophitic	
Glass	74	78				Devitrified, cryptocrystalline, red-stained.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	10	Plagioclase, clinopoxene, glass	Dirty green, yellow, highly-birefringent clays.
Zeolites	10	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	2	Even	0.2-2.8	Void	Spherical

COMMENTS: Drill breccia thin section #58.

123-765C-23R-CC (Piece 1, 12-14 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Aphyric altered basalt

GRAIN SIZE: Fine-grained

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0	0.2	0.9		Subhedral equant	Completely replaced by green/brown clays.
Spinel(?)	0	0.4	0.3-0.5		Euhedral-anhedral rounded	Completely replaced by hematite. Independent phenocrysts.
GROUNDMASS						
Plagioclase	3	15	0.1-0.2		Laths	
Clinopyroxene	0	5	~ 0.2		Subophitic	
Glass	0	79				Completely replaced by clays.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	87	Plag, clinopyroxene, glass, vesicles	Dirty pale green - pale brown clays.
Zeolites	10	Plagioclase	
Hematite	0.4	Spinel	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1	Even	0.1-0.3	Green clays	Spherical-irregular	Some are zoned; green clays in margin, pale brown clays in interior, void space or hematite(?) in center.

COMMENTS: In situ thin section #67.

123-765C-24R-03 (Piece 1, 125-127 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Sparsely plagioclase-olivine phyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.4	0.2-0.7		Subhedral-anhedral equant	Completely replaced by dirty brown clay.
Plagioclase	0	0.6	1.5-2.0		Subhedral tabular	Completely replaced by zeolites (mostly removed during thin-sectioning).
GROUNDMASS						
Plagioclase	10	30	0.1-0.5		Laths	Mostly replaced by zeolites and clays.
Clinopyroxene	0	20	0.2-0.4		Subophitic	Completely replaced by clays.
Fe-Ti oxides	2	2	0.05-0.1		Euhedral-subhedral	
Mesostasis	23	48				Cryptocrystalline aggregate.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	50	Olivine, cpx, plagioclase, mesostasis	Yellow brown highly birefringent clays.
Zeolites	15	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.4	Even	0.2-0.3	Clays	Spherical

COMMENTS: In situ thin section #68.

123-765C-31R-01 (Piece 1, 4-8 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Intersertal/variolitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	< 0.1	0.4		Euhedral	Completely replaced by dark yellow-brown clay.
Plagioclase	< 0.1	< 0.4	0.4-0.7		Euhedral tabular	Mostly replaced by zeolites (mostly lost during preparation).
GROUNDMASS						
Plagioclase	20	30	0.1-0.7		Bladed, forked	
Clinopyroxene	0	15	0.1-0.5	Augite	Anhedral grains or elongated curved microlites	Microlites forming broom-like aggregate.
Mesostasis	44	55				Cryptocrystalline material with tiny sphene and iron oxides.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	26	Olivine, clinopyroxene, plag, vesicle	Yellow and yellow-brown dirty clays, highly birefringent.
Zeolites	10	Plagioclase	
Sphene	trace	Fe-Ti oxide	In mesostasis. Tiny (<0.05 mm).

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.4	Even	0.2	Yellow clays	Spherical	Filled by radial aggregates of yellow clays.

COMMENTS: Drill breccia thin section #93.

123-765C-36R-01 (Piece 1, 20-22 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Moderately plagioclase-olivine phyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.5	0.5-0.7		Euhedral	Replaced by red iddingsite.
Plagioclase	0.5	4	0.5-1.5		Subhedral equant	Mostly replaced by clays. Glomerophyric.
GROUNDMASS						
Plagioclase	10	30	0.1-0.3		Laths	Mostly replaced by clays and zeolites.
Clinopyroxene	0	10	0.1-0.3		Anhedral subophitic	Completely replaced by yellow clays.
Mesostasis	50	55				

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	30	Olivine, plag, clinopyroxene, mesostasis	Yellow or yellow green smectites(?). The clays replacing olivine are heavily stained by iron oxides.
Zeolites	10	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.2	Even	0.3	Yellow clays	Spherical

COMMENTS: Drill breccia thin section #66.

123-765C-36R-01 (Piece 1, 43-45 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Aphyric altered basalt

GRAIN SIZE: Microcrystalline

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	15	35	0.1-0.2		Subhedral tabular	Partly replaced by clays.
Clinopyroxene	0	10	0.05-0.1		Anhedral	
Mesostasis	20	55				Cryptocrystalline aggregate, mostly replaced by yellow-green clays.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	55	Plag, cpx, mesostasis, vesicles, vein	Mostly pale yellow green or pale yellow brown highly birefringent clay. Rarely, bright green low-birefringent clay.
Zeolites	10	Plagioclase, vein	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1	Even	0.2	Clays	Spherical	(35/square cm). Filled by radial aggregate of birefringent clays (pale yellow green).

COMMENTS: Vein: 0.05 mm thick, cutting through the section. Filling: bright green clay, yellow brown clay, and zeolite. Andesite composition is also possible. Drill breccia thin section #100.

123-765C-36R-01 (Piece 1, 52-54 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.1	0.7		Euhedral	Completely replaced by bright green clays.
Plagioclase	0	0.2	0.8-1.1		Euhedral tabular	Completely replaced by clays and zeolites.
GROUNDMASS						
Plagioclase	5	10	0.2-0.5		Blade, needle, fork	Partly replaced by clays.
"Glass"	80	90				Composed of dirty red isotropic patches and dirty pale green cryptocrystalline part with minute iron oxides. The ratio of the two parts is about 1:1.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	> 15	Plagioclase, vesicles, olivine, "glass"	Pale yellow brown clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.6	Even	0.1-0.4	Clays	Spherical	(20/square cm). Dirty, very fine-grained pale yellow brown clays.

COMMENTS: Drill breccia thin section #101.

123-765C-39R-01 (Piece 1, 6-8 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Moderately plagioclase-olivine phyric basalt

GRAIN SIZE: Microcrystalline in groundmass

TEXTURE: Glomeroporphyritic/intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.3	0.3-0.7		Euhedral-subhedral	Completely replaced by "iddingsite."
Plagioclase	0(?)	4.8	0.5-2.0		Subhedral tabular or equant	Mostly albitized (refractive index lower than the resin) and partly replaced by clays.
GROUNDMASS						
Plagioclase	5	20	0.05-0.1		Subhedral laths	Replaced by clays and albite(?).
Clinopyroxene	0	5	0.05		Anhedral	Granular, completely replaced by yellow-brown clays.
Mesostasis	55	70				Cryptocrystalline. Partly replaced by clays.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	20	Olivine, cpx, plag, mesostasis, vesicles	Dirty yellow-brown and yellow-green clays.
Albite	20	Plagioclase	Topotactically replacing.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.2	Even	0.05-0.4	Clays	Spherical

COMMENTS: It is possible that the rock is andesitic in composition. Drill breccia thin section #103.

123-765C-62R-01 (Piece 1, 3-4 cm) OBSERVER: ISH WHERE SAMPLED: Pebble in sediments

ROCK NAME: Aphyric altered basalt

GRAIN SIZE: Fine-grained (0.2 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	30	40	0.1-0.3		Laths, needles	Partly replaced by clay minerals.
Clinopyroxene	0	10	0.1		Subophitic	Completely replaced by clays. Broom-like aggregate of feather crystals.
Mesostasis	20	50				Cryptocrystalline.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	50	Mesostasis, plagioclase, vesicles	Green clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	1	Even	0.2-0.6	Clays	Spherical or irregular

COMMENTS: Thin section #104.

123-765C-62R-04 (Piece 1, 27-30 cm) OBSERVER: ISH WHERE SAMPLED: Sediment boundary, basement unit 1

ROCK NAME: Aphyric hyaloclastite

GRAIN SIZE: Medium-grained

TEXTURE: Parallel growth/glassy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Calcite	80	80	0.5-3		Elongated and parallel growth	Elongated along c-axis, which lies perpendicular to vein wall, making spine-leaves aggregate.
"Glass"	20	20		Basaltic		Completely devitrified with bubble-like patchy structures. The glass occurs as flakes parallel with vein wall.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: Calcite vein with glass fragments. Thin section #134.

123-765C-62R-CC (Piece 1A, 1-3 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 1

ROCK NAME: Sparsely plagioclase-clinopyroxene altered basalt

GRAIN SIZE: Very fine-grained

TEXTURE: Glassy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	0.2	1	0.1-0.5		Euhedral laths	Mostly replaced by calcite and clays.
Clinopyroxene	0	0.2	0.1		Euhedral equant	Completely replaced by pale green or yellow clays 2V(-)=5 degrees, high birefringence.
Glass	0	97				Completely replaced by cryptocrystalline clays.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	100	"Glass", plagioclase, vesicles, veins	Glass-replacing cryptocrystalline clays are white or light gray. Vesicle-filling clays are bright green.
Hematite	trace	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	2	Even	0.2-1	Clays, hematite	Spherical, irregular	(18/square cm). Sometimes concentric zoning present.

COMMENTS: Thin section #137.

123-765C-62R-CC (Piece 1C, 23-25 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 1

ROCK NAME: Aphyric altered basalt

GRAIN SIZE: Fine-grained

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0	0.8	1-3		Subhedral tabular	Completely replaced by clays and calcite.
Spinel(?)	0	trace	0.4		Rounded	Completely replaced by hematite.
GROUNDMASS						
Plagioclase	3	5	0.1-0.3		Needles	
Glass	0	93(?)				Completely replaced by pale brown clays (microcrystalline).

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	96	Glass, plagioclase, vesicles	Pale brown in glass, bright green in vesicles, and pale yellow in plagioclase pseudomorph.
Carbonate	1	Vein, plagioclase	Forming plagioclase pseudomorph with pale yellow clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	2	Even	0.1-0.6	Clays	Spherical or irregular	(25/square cm). Bright green clays forming radial aggregate.

COMMENTS: Calcite veins along one margin. Thin section #133.

123-765C-63R-01 (Piece 10, 122-124 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 1

ROCK NAME: Sparsely plagioclase-olivine-spinel phyric basalt

GRAIN SIZE: Glassy

TEXTURE: Glassy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine(?)	0.3	0.3			Anhedral equant	Xenocryst, forming xenolithic aggregate.
Plagioclase	2.4	2.4	4.2	> An60	Subhedral tabular	Xenocryst. Fresh. Cumulus texture.
Spinel	0	0.2				Completely replaced by hematite, many glass inclusions in plagioclase.
GROUNDMASS						
Plagioclase	1	1	0.1-0.6		Laths	Fresh, sometimes variolitic.
Olivine	trace	trace	0.1		Euhedral equant	Fresh.
Glass	20	96				Completely fresh in margin, but replaced by clays elsewhere.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	76	Glass	Dirty red brown clays; bubble-like aggregate.
Clays	0.5	Vesicles	Bright green smectites.
Carbonate	trace	Vesicles	
Hematite	trace	Spinel	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.5	Even	0.3	Clay	Spherical	Some are zoned, colorless mineral on the very rim, bright green clay in margins, and pale yellow clay in center.

COMMENTS: Thin section #127.

123-765C-63R-02 (Piece 7C, 111-114 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 1

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal/intergranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.15	0.2	0.5-0.7		Subhedral tabular or equant	Partly replaced by clays and zeolites.
GROUNDMASS						
Plagioclase	40	40	0.1-0.5		Laths	Fresh.
Clinopyroxene	30	30	0.1	Augite	Subophitic, anhedral.	Granular; sometimes dendritic to form broom-like aggregates. Fresh.
Glass	0	10				Completely replaced by pale yellow clays.
Mesostasis	17	17				Cryptocrystalline aggregate of plagioclase + clinopyroxene + oxide(?).
Fe-Ti oxide	3	3	0.05-0.1		Elongated	Elongated ilmenite is dominant.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	10	Glass, vein, vesicle	Pale yellow green or pale yellow brown clays in vesicles and replacing glass. Bright green clays in veins.
Carbonate	trace	Vesicles	Rare as vesicle fillings, but abundant in vein.
Zeolites	trace	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.2	Even but scarce	0.5-0.7	Clays	Spherical

COMMENTS: A clay-filled vein in the center of the thin section, and a calcite-filled vein margin. Thin section #131.

123-765C-63R-03 (Piece 11, 133-135 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 1

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.2	0.2	0.5		Subhedral, equant, ~ tabular	Fresh.
Clinopyroxene	0.2	0.2	0.5-0.8	Augite	Anhedral, equant	Fresh, rounded, twinned.
GROUNDMASS						
Plagioclase	2	2	0.1-0.3		Laths, needles	
Clinopyroxene	0.1	0.1	0.2		Anhedral	
Glass	96	96				Dusky brown. Completely devitrified.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	1	Vesicles	Bright green smectites.
Carbonate	1		Calcite fills vein.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1.0	Even	0.1-0.6	Clays		(3/square cm).

COMMENTS: Calcite vein, 1.5 mm thick at the margin. Thin section #135.

123-765C-63R-04 (Piece 6, 90-92 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 1

ROCK NAME: Aphyric basalt breccia and vein

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	35	35	0.1-0.7		Laths, needles	Fresh.
Clinopyroxene	15	15	0.1-0.3		Anhedral, subophitic	Partly dendritic. Fresh.
Mesostasis	40	40				Cryptocrystalline. Fresh.
Glass	0	5				Completely replaced by green clays.
Fe-Ti oxide	5	5	0.05-0.1		Anhedral-subhedral	Low-crystallinity patches exist (< 1 mm in diameter).

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Glass, vesicles	Green smectite.
Chalcedony	52		(Vein mineral) Length-slow, fibrous, forming spherulitic aggregate 0.2-2.5 mm in diameter.
Calcite	29		(Vein mineral) Anhedral, 0.2-2.0 mm in diameter, partly comb-like intergrowth.
Clays	16		(Vein mineral) Cryptocrystalline aggregate, moss green to pale green, 1-2 mm in diameter.
Hematite	3		(Vein mineral) Anhedral, amoeboid, occupying central part of clay patches, 0.1-0.6 mm.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.7	Even	0.2-0.5	Clays	Spherical

COMMENTS: Basalt breccia 27%; Vein 63%. Percentage in the vein (total makes 100%). Thin section #125.

123-765C-63R-04 (Piece 6, 97-99 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 1

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.7	0.9	2.7		Subhedral equant	Fresh, concentric oscillatory zoning, xenocrystic, partly replaced by clay minerals.
GROUNDMASS						
Plagioclase	40	40	0.2-0.3		Laths, needles	Fresh.
Clinopyroxene	25	25	0.1		Anhedral subophitic	Fresh.
Mesostasis	22	32				Dirty dense brown cryptocrystalline material.
Fe-Ti oxide	2	2	0.05		Subhedral equant	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	10	Vesicles, glassy part of mesostasis	Green, low birefringence clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.2	Even	0.2-0.3	Clays	Spherical	Scarce.

COMMENTS: Thin section #138.

123-765C-64R-01 (Piece 1, 2-4 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 1

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.8	0.8	0.8-1.5		Subhedral tabular	Fresh, occurring as aggregates, 2 mm in size.
GROUNDMASS						
Plagioclase	35	35	0.3-0.5		Laths	Fresh.
Clinopyroxene	25	25	0.1-0.2		Subophitic anhedral	Fresh.
Mesostasis	25	25				Cryptocrystalline aggregate.
Fe-Ti oxide	5	5	< 0.1		Euhedral-anhedral	
Glass	0	10				Completely replaced by pale green chlorite or clays.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	10	Glass, vesicles	Light yellowish green, low index, low birefringence clay.
Clays	trace	Glass	Bright green, highly birefringent, high index clay (pumpellyite?).
Carbonate	0.5	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.8	Even	0.4	Clay, calcite	Spherical	Zoned, clays in margins, and calcite in center.

COMMENTS: Thin section #126.

123-765C-65R-01 (Piece 9B, 96-98 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 2

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.4	0.7	0.5-0.8		Subhedral bladed or tabular	Partly replaced by clays.
Clinopyroxene	0.1	0.1	0.7		Anhedral subophitic	Fresh.
GROUNDMASS						
Plagioclase	25	25	0.1-0.5		Laths, needles	Fresh.
Clinopyroxene	10	10	0.1		Anhedral granular or subophitic	Fresh.
Mesostasis	60	64				Crystallinity varies from place to place. Low-crystallinity patches 1-2 mm in size and irregular shape, occupies 30% of the rock.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Plagioclase, vesicles, veins, mesostasis	Olive green - brownish gray dirty clays dominant. Bright green clays in vein.
Carbonate	trace	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.5	Even	0.3-0.7	Clays, calcite	Irregular, rarely spherical	Some show radial, zoned structure.

COMMENTS: A vein filled with bright green clay cuts one margin of the thin section. Thin section #136.

123-765C-65R-02 (Piece 8, 106-108 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 2

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.2	0.5-1.2		Euhedral tabular	Partly replaced by zeolites.
Clinopyroxene	0.2	0.2	0.4-0.7	Augite	Euhedral-subhedral equant	Fresh. Sector zoning and concentric zoning present.
GROUNDMASS						
Plagioclase	2	3	0.1-0.5		Laths	Partly replaced by zeolite.
Clinopyroxene	0.2	0.2	0.1		Anhedral	Fresh.
Glass	86	86				Completely devitrified cryptocrystalline.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	1	Vesicles	Bright green smectites dominant. Light yellow clays occupy the center of vesicles.
Carbonate	10	Veins, vesicles	
Zeolites	1		
Hematite	trace	Vesicle	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.6	Even	0.1-0.3	Clays, calcite, hematite	Spherical or irregular	Some are zoned; bright green clay in margins, pale yellow clay in center.

COMMENTS: Calcite veins, 1-4 mm thick cut through the thin section, occupying 10% of total volume. Thin section #129.

123-765C-65R-02 (Piece 10, 130-132 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 2

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained

TEXTURE: Intergranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.3	0.3	0.4-0.7		Subhedral tabular	Concentrated in the center of the thin-section, partly replaced by sericitic clays.
GROUNDMASS						
Plagioclase	45	45	0.1-0.3		Laths	Fresh.
Clinopyroxene	25	25	0.1-0.2	Augite	Anhedral, granular, subophitic	Fresh.
Mesostasis	27	27				15% dark brown material stained by minute ores, 12% cryptocrystalline, high refractive index (clinopyroxene-rich?).
Glass	0	3				Completely replaced by green clays.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	3	Glass, vesicles, plagioclase	Dusky green clays, highly birefringent. Colorless sericitic clays replace plagioclase.
Carbonate	trace	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1	Even	0.2-0.3	Clay, calcite, void	Spherical	(13/square cm). Most vesicles have clays in margins and void space in center. Some are filled with calcite.

COMMENTS: Thin section #132.

123-765D-1R-01 (Piece 6A, 106-108 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 1

ROCK NAME: Sparsely plagioclase-clinopyroxene phyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal/intergranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.7	0.7	0.5-1.2	An50(?)	Subhedral bladed	Fresh, glomeroporphyritic.
Clinopyroxene	0.5	0.5	0.3-0.8	Augite	Anhedral equant	Fresh, possibly detached microgabbro xenolith concentrated in a marginal part of thin-section.
GROUNDMASS						
Plagioclase	40	40	0.1-0.5		Laths	Fresh.
Clinopyroxene	25	25	0.1		Anhedral	Fresh.
Mesostasis	26	30				Dirty dark brown cryptocrystalline.
Fe-Ti oxide	3	3	0.1-0.2		Elongated needles	Ilmenite dominant. (In mesostasis.)

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Vesicles, mesostasis	Dirty brown clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.9	Even	0.1-0.4	Brown clay	Spherical irregular	(13/square cm).

COMMENTS: Thin section #171.

123-765D-2R-02 (Piece 1B, 31-33 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 1

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intergranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	40	40	0.2-0.5		Laths	Fresh.
Clinopyroxene	40	40	0.1-0.2	Augite	Anhedral	Fresh, colorless, very pale yellow in margins, 2V(t)=40 degrees.
Mesostasis	10	14				Dirty cryptocrystalline material partly replaced by green clay.
Fe-Ti oxide	1	5	< 0.1		Subhedral	Mostly replaced by hematite and leucoxene(?).

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	4	Mesostasis	Bright green clays.
Hematite	5	Oxide, veins	
Leucoxene		Oxide	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1.2	Even	0.2-0.3	Hematite		(26/square cm).

COMMENTS: A calcite-hematite vein, 7 mm thick, passes through the center of thin section. Thin section #170.

123-765D-2R-02 (Piece 5B, 88-90 cm) OBSERVER: ISH WHERE SAMPLED: Flow margin, basement unit 1

ROCK NAME: Aphyric basalt with diabase xenolith

GRAIN SIZE: Microcrystalline

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.2	0.5	0.5-1.2		Euhedral-subhedral tabular	Mostly replaced by zeolite and clays. A diabase xenolith. Some plagioclase crystals are detached from the xenolith, and look like phenocrysts.
Clinopyroxene	1	1	3.5		Ophitic, oikocryst	Fresh.
GROUNDMASS						
Plagioclase	5	10	< 0.1		Needles	Partly replaced by zeolites.
Clinopyroxene	5	5	< 0.05		Anhedral, irregular	Fresh.
Mesostasis	83	83				Cryptocrystalline.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	3	Plagioclase, vesicles	Green clays fill vesicles. Illitic dirty pale yellowish clays replace plagioclase.
Zeolites	3	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.4	Even	0.1	Green clays	Spherical	(51/square cm).

COMMENTS: Thin section #169.

123-765D-2R-03 (Piece 2F, 89-91 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 1

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.1 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.5	0.3-1.0		Subhedral tabular	Mostly replaced by zeolites.
Clinopyroxene	0.1	0.1	0.7	Augite	Elliptical	
GROUNDMASS						
Plagioclase	20	25	0.1-0.2		Laths	Partly replaced by zeolites.
Clinopyroxene	25	25	0.03-0.07		Anhedral equant	Fresh.
Mesostasis	49	49				Cryptocrystalline.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	0.1	Vesicles	Green or greenish brown.
Zeolites	6	Plagioclase, vesicles	Length-slow, radial.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.9	Even	0.1-0.2	Zeolite	Spherical	(51/square cm). Filled with radial aggregate of length-slow fibrous zeolite (natrolite?), some are filled by clays.

COMMENTS: Thin section #168.

123-765D-2R-04 (Piece 1, 2-4 cm) OBSERVER: ISH WHERE SAMPLED: Pillow rim, basement unit 1

ROCK NAME: Aphyric basalt

GRAIN SIZE: Glassy/microcrystalline

TEXTURE: Glassy/intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.2	0.3-0.5		Euhedral-subhedral tabular	Partly replaced by zeolites.
GROUNDMASS						
Plagioclase	3	4	< 0.1		Laths	Partly replaced by zeolites.
Clinopyroxene	1	1	< 0.1		Anhedral granular subophitic	Fresh, colorless.
Glass	3	5				Completely devitrified.
Mesostasis	75	90				Cryptocrystalline.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	16	Mesostasis, vesicles	Dirty yellow brown clays replace glass. Green clays replace mesostasis.
Zeolites	2	Vesicles, plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1	Even	0.1-0.3	Clays, zeolites	Spherical	Filled by clays in glassy parts, and by zeolites in relatively crystalline parts.

COMMENTS: A glass zone, 3 mm thick, at margin of the thin section. Thin section #166.

123-765D-3R-01 (Piece 4A, 35-37 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 2

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intergranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Clinopyroxene	0.01	0.01	0.5	Augite	Anhedral equant	Fresh. 2V(+)40 degrees, colorless.
GROUNDMASS						
Plagioclase	34	35	0.2-0.6		Laths	Fresh.
Clinopyroxene	35	35	0.1	Augite	Anhedral equant	Fresh, colorless.
Mesostasis	25	30				Cryptocrystalline.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Mesostasis, vesicles	Green or brownish green dirty clays.
Zeolites	1	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.4	Even	0.1-0.2	Mostly void	Spherical	Some are irregular. Partly filled with green clays.

COMMENTS: An ovoidal patch of low crystallinity is present in center (2 mm in size). XRF sample was taken from 33-35 cm. Thin section #167.

123-765D-4R-01 (Piece 5, 35-37 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 2

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.3	0.5-1.1		Tabular	Mostly replaced by zeolite and calcite.
GROUNDMASS						
Plagioclase	30	30	0.1-0.6		Needles, laths aligned along flow lines	
Clinopyroxene	20	20	< 0.1		Dendritic, anhedral, irregular	
Mesostasis	45	47				Cryptocrystalline.
Fe-Ti oxide	3	3	< 0.05		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Vesicles, plagioclase, mesostasis	
Carbonate	trace	Plagioclase	
Zeolites	trace	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.1	Even	< 0.1	Green clays	Spherical

COMMENTS: A vein filled by bright green clays passes through the center. Thin section #252.

123-765D-5R-01 (Piece 6C, 56-58 cm) OBSERVER: ISH WHERE SAMPLED: Pillow rim, basement unit 3

ROCK NAME: Aphyric basalt

GRAIN SIZE: Glassy

TEXTURE: Glassy to spherulitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0.4	0.4	0.5-1.3	Forsterite	Euhedral	Embayed only in glassy part, not in spherulitic part. Fresh.
Plagioclase	0.3	0.3	0.1-0.5	An70	Euhedral tabular	
GROUNDMASS						
Plagioclase	0.2	0.2	0.2		Needles	
Mesostasis	64	69				Spherulitic.
Glass (fresh)	25	30				Partly devitrified. Dendritic crystallites are evenly distributed.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	9	Glass, vesicles	Pale green clays.
Zeolites	1		Colorless, length-slow, vertical extinction.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1.4	Even	0.05-0.2	Zeolite, clays	Spherical	Mostly zoned. Length-slow zeolites (colorless) in the margin, and length-fast clay (pale green) in the core. Maximum size 0.5 mm.

COMMENTS: Pillow rim zonation - from rim to core zone 1 (4 mm) glass with minor (< 10%) crystallites and olivine phenocrysts; Zone 2:(3 mm) glass with abundant (~ 30%) crystallites. Zone 3:(3 mm) devitrified altered glass with abundant (~ 50%) spherulites. Zone 4:(5 mm) oxidized spherulite zone (red). Zone 5:(> 5 mm) spherulite zone with plagioclase microlites (~ 1%) brown, not oxidized. Plagioclase phenocrysts in every zone. Thin section #247.

123-765D-5R-03 (Piece 1G, 131-133 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 3

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.2 mm)

TEXTURE: Intergranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.3	0.3-0.6		Euhedral tabular	Mostly replaced by dirty opaque clays.
GROUNDMASS						
Plagioclase	20	38	0.1-0.3		Laths	Partly replaced by clays.
Clinopyroxene	28	28	0.05		Anhedral	Fresh.
Mesostasis	25	30				Cryptocrystalline.
Fe-Ti oxide	4	4	0.03		Prismatic subhedral	Mostly ilmenite.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	13	Plagioclase, mesostasis	Glassy parts of mesostasis are replaced by green clays; plagioclase is partly replaced by dirty opaque clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: Thin section #172. XRF analysis available from 117-120 and 131-133 cm.

123-765D-6R-01 (Piece 9B, 49-51 cm) OBSERVER: ISH WHERE SAMPLED: Isolated pillow center, basement unit 4

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.2 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	5	5	0.1-0.4		Needles, forks	
Clinopyroxene	1	1	0.1		Anhedral, irregular	
Mesostasis	90	94				Cryptocrystalline.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	4	Vesicles, glassy part of mesostasis	Green clays.
Carbonate	trace	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.2	Even	0.1	Green clays	Spherical	(23/square cm).

COMMENTS: Closely resembling thin section #181. Thin section #175.

123-765D-5R-08 (Piece 13, 117-120 cm) OBSERVER: ISH WHERE SAMPLED: Pillow rim, basement unit 4

ROCK NAME: Glassy aphyric basalt

GRAIN SIZE: Glassy

TEXTURE: Spherulitic, glassy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.3	0.4	0.4-0.8		Euhedral tabular	
Clinopyroxene	0.2	0.2	0.4-0.6		Subhedral equant	
GROUNDMASS						
Plagioclase	1	1	0.2		Laths	
Clinopyroxene	0.1	0.1	0.05		Anhedral	
Glass	2	2				Devitrified.
Spherulites	96	96	0.5-1.0		Spherical	Red - yellow brown.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	0.1	Plagioclase	Dirty grayish clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: Thin section #173.

123-765D-6R-01 (Piece 3, 16-18 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 4

ROCK NAME: Hyaloclastite aphyric basalt

GRAIN SIZE: 1-7 mm

TEXTURE: Glassy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.3	0.3	0.2-0.3		Euhedral-subhedral tabular	Fresh.
Clinopyroxene	0.5	0.5	0.4-0.7		Euhedral-subhedral equant	Fresh.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	39	Glass	Dark green-greenish brown clays, cryptocrystalline, each glass flake shows remarkable zoning.
Carbonate	20		Anhedral, 0.5-2.0 mm.
Zeolites	40		Euhedral-subhedral, prismatic or rhombic, very low birefringence, chabazite(?).

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: Thin section #174.

123-765D-7R-02 (Piece 1, 9-11 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 5

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.2 mm)

TEXTURE: Hyalophitic, patchy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.4	0.5	0.05-1.1		Subhedral, bladed	Fresh, partly replaced by clays. Several high-crystallinity patches are disseminated in matrix of very low crystallinity.
GROUNDMASS						
Plagioclase	4	4	0.1-0.5		Needles, forks	Fresh.
Clinopyroxene	1	1	0.1-0.2		Anhedral, irregular	Fresh. Present only in high-crystallinity patches.
Mesostasis	91	94				Cryptocrystalline. Including tiny Fe-Ti oxides (~ 3%?).

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	4	Vesicles, mesostasis	Bright green clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1.2	Even	0.3-0.7	Bright green clays	Spherical	Beautiful radial aggregates of bright green clays fill the vesicles. The clays show abnormal interference colors.

COMMENTS: Thin section #176.

123-765D-8R-01 (Piece 3A, 37-39 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 6

ROCK NAME: Highly plagioclase-clinopyroxene phyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal, patchy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	12.8	12.8	0.5-1.5		Subhedral bladed	Fresh.
Clinopyroxene	1	1	0.5		Anhedral, irregular	Fresh. Phenocryst distribution is uneven. No phenocryst in irregular low-crystallinity patches, 5 mm in size.
GROUNDMASS						
Plagioclase	10	10	0.1-0.5		Laths, forks	Fresh.
Clinopyroxene	20	20	0.1-0.4		Anhedral, irregular or broom-like	Fresh.
Mesostasis	47	50				Yellowish brown cryptocrystalline with broom-like clinopyroxene microlites.
Fe-Ti oxide	4	4	0.1-0.2		Subhedral	Altered to leucoxene.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Vesicles, mesostasis	Green clays sometimes opaque in center of vesicles.
Carbonate	trace	Vesicles	
Zeolites	trace	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1.6	Even	0.4-0.8	Green clays	Spherical, irregular	(6/square cm). Some are filled with calcite.

COMMENTS: Very thin (< 0.1 mm) bright green clay veins are present. This is a patchy diabase. Thin section #177.

123-765D-8R-01 (Piece 8, 111-114 cm) OBSERVER: ISH WHERE SAMPLED: Sill center, basement unit 7

ROCK NAME: Aphyric diabase

GRAIN SIZE: Medium-grained (1.2 mm)

TEXTURE: Subophitic holocrystalline

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	55	55	0.5-3.2	An50	Subhedral, bladed	Fresh. 2V(+)70 degrees.
Clinopyroxene	40	40	0.4-2.2	Augite	Anhedral, subophitic	Fresh. 2V(+)40 degrees, mostly colorless, very pale brown in margins and in small crystals.
Fe-Ti oxide	3	5	0.1-0.7		Anhedral, irregular	Partly replaced by sphene.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	trace	Clinopyroxene	Green clays.
Sphene	2	Fe-Ti oxide	Dirty, minute crystals.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: Thin section #178. Partly variolitic.

123-765D-9R-01 (Piece 10, 38-40 cm) OBSERVER: ISH WHERE SAMPLED: Sill center, basement unit 7

ROCK NAME: Aphyric diabase

GRAIN SIZE: Medium-grained (1.2 mm)

TEXTURE: Subophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	50	50	0.3-2.7	An50	Subhedral bladed tabular	Fresh.
Clinopyroxene	40	40	0.3-0.8	Augite	Anhedral, subophitic	Colorless in the core, pale brown in the rim. Fresh.
Fe-Ti oxide	3	5	0.1-0.2			Partly replaced by sphene.
Mesostasis	0	5				Completely replaced by clays.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Mesostasis	Dirty brownish clays.
Sphene	2	Fe-Ti oxide	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: Relatively fine-grained part with mesostasis forming several patches, 1-2 mm in size; looks like mafic "phenocryst" in hand specimen. Partly variolitic. Thin section #180.

123-765D-9R-01 (Piece 2B, 107-109 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 8

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine(?)	0	0.5	0.4-1.5		Euhedral-subhedral embayed	Completely replaced by iddingsite and calcite.
Plagioclase	trace	trace	0.5	An60	Subhedral equant	Fresh.
GROUNDMASS						
Plagioclase	20	20	0.1-0.5		Needles, forks	Fresh.
Clinopyroxene	5	5	0.1		Dendritic	Forming broom-like aggregates.
Mesostasis	74	74				Cryptocrystalline.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	1	Olivine, vesicles	Yellowish clays replace olivine, green clays fill vesicles.
Carbonate	0.2	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.5	Even	0.1-0.2	Green clays	Spherical	(26/square cm). Some are filled with calcite.

COMMENTS: Thin section #179.

123-765D-9R-03 (Piece 2, 17-19 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 8

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.05	0.2	0.8		Euhedral tabular	Mostly replaced by illitic clays and zeolites. Plagioclase relic is present only in the rim of pseudomorph.
Clinopyroxene	0.2	0.2	0.4		Anhedral irregular	Fresh.
GROUNDMASS						
Plagioclase	4	4	0.2-0.7		Needles	
Clinopyroxene	1	1	0.1		Anhedral equant	
Mesostasis	89	91				Brownish gray cryptocrystalline material with tiny iron oxide and clinopyroxene crystallites.
Fe-Ti oxide	3	3	0.01-0.1		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	3	Mesostasis, vesicles	Green clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1	Even	0.2-0.5	Clays, calcite	Spherical	(8/square cm).

COMMENTS: Thin section #181.

123-765D-10R-01 (Piece 11, 81-83 cm) OBSERVER: ISH WHERE SAMPLED: Pillow fragment, basement unit 9

ROCK NAME: Sparsely plagioclase-clinopyroxene phyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	1.0	1-2		Euhedral tabular	Mostly replaced by pale green dirty clays.
Clinopyroxene	0.1	0.1	0.4		Anhedral equant	Fresh.
GROUNDMASS						
Plagioclase	20	20	0.2-1.0		Forks, needles	Fresh. Aligned in one direction.
Clinopyroxene	15	15	0.1		Dendritic (fish bone)	Sometimes small granular crystals. Fresh.
Mesostasis	33	54				Cryptocrystalline.
Fe-Ti oxide	5	5	< 0.01		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Plag, glassy, mesostasis, vesicles	Pale green dirty clays.
Carbonate	trace	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.3	Even	< 0.1	Calcite clays	Spherical

COMMENTS: Thin section #182.

123-765D-11R-01 (Piece 2, 43-45 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 9

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0	0.5	0.6-1.8		Euhedral-subhedral tabular	Completely replaced by high-index pale yellow green mineral (pumpellyite?).
GROUNDMASS						
Plagioclase	15	20	0.1-2.0		Needles, forks	Partly replaced by clays.
Clinopyroxene	3	3	0.1		Anhedral, irregular	Fresh.
Mesostasis	69	71				Heterogeneous, cryptocrystalline.
Fe-Ti oxide	1	5	0.05		Euhedral-anhedral equant	Mostly replaced by hematite or iron hydroxide.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	8	Vesicles, mesostasis, plagioclase	Green dirty clays, distribution limited.
Pumpellyite(?)	trace	Plagioclase phenocrysts	
Hematite	4	Vesicles, Fe-Ti oxide, mesostasis,	Also iron hydroxides. Under high magnification, the mesostasis include dendritic clinopyroxene microlites.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.4	Even	0.2	Iron hydroxide	Spherical	A few vesicles are filled with green clays.

COMMENTS: Several iron-hydroxide veins are present. XRF analysis available. Thin section #186.

123-765D-12R-02 (Piece 2, 13-15 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 9

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.2 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.5	0.5-0.9		Euhedral-subhedral tabular	Mostly replaced by calcite and clays.
GROUNDMASS						
Plagioclase	25	30	0.1-0.5		Needles, forks	Partly replaced by clays.
Clinopyroxene	0.2	0.2	0.1		Anhedral, irregular	Fresh.
"Glass"	63	69				Partly replaced by calcite, forming irregular patches, < 1 mm in size. Plagioclase microlites are preserved in the patches.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Vesicles, "glass", plagioclase	Pale yellow green clays.
Carbonate	9	Vesicles, plagioclase, glass	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.4	Even	0.05-0.2	Calcite clay	Spherical	(55/square cm).

COMMENTS: XRF analysis available. Thin section #185.

123-765D-13R-01 (Piece 3, 18-21 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow or pillow center, unit 10

ROCK NAME: Moderately plagioclase phyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Hyalopilitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	6.0	8.3	0.3-1.0		Euhedral subhedral tabular	Partly replaced by pale yellow clays. Distribution uneven, concentrated in a marginal part of thin-section.
GROUNDMASS						
Plagioclase	9	10	0.1-0.8		Needles, forks	Fresh, partly replaced by clays. Aligned along flow line, partly forming variolitic aggregate.
"Glass"	80	81				Cryptocrystalline, dense red brown.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Vesicles, plagioclase, "glass"	Pale yellow sericitic clays.
Carbonate	0.2	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.3	Even	0.05-0.3	Calcite clay	Spherical or irregular	(51/square cm).

COMMENTS: Thin section #184.

123-765D-13R-03 (Piece 2, 10-12 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow or pillow margin, unit 11

ROCK NAME: Sparsely plagioclase phyric basalt

GRAIN SIZE: Fine-grained (0.2 mm)

TEXTURE: Spherulitic/glassy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.5	1.0	0.3-2.0		Subhedral euhedral tabular bladed	Partly replaced by zeolites.
GROUNDMASS						
Plagioclase	1.5	2	0.1-0.5		Needles, forks	Partly replaced by zeolites.
Clinopyroxene	0.5	0.5	0.2		Anhedral, irregular	Fresh.
"Glass"	94	95				Spherulitic.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Vesicles, mesostasis	Bright green clays.
Zeolites	1	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.6	Even	0.05-0.2	Green clays	Spherical	(78/square cm).

COMMENTS: Thin section #183.

123-765D-14R-02 (Piece 5B, 51-53 cm) OBSERVER: ISH WHERE SAMPLED: Pillow core, basement unit 11

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.3	0.5	0.5-0.7		Subhedral-euhedral tabular	The central part is almost completely replaced by zeolites.
GROUNDMASS						
Plagioclase	9	10	0.1-0.7		Laths, needles, forks	Fresh, partly replaced by zeolites.
Clinopyroxene	5	5	0.1-0.2		Anhedral, irregular	Fresh. Partly ophitic.
Olivine(?)	0	0.5	0.1-0.3		Subhedral equant, anhedral	Completely replaced by green clays.
Mesostasis	73	78				Cryptocrystalline.
Fe-Ti oxide	5	5	0.05		Subhedral	Fresh.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	7	Vesicles, olivine, mesostasis	Bright green clays abundant, pale brown clays also common.
Zeolites	1	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.3	Even	0.1-0.2	Green clay	Spherical	(20/square cm). Partly filled by light brown clay.

COMMENTS: Thin section #188.

123-765D-15R-02 (Piece 2A, 17-20 cm) OBSERVER: ISH WHERE SAMPLED: Flow center(?), basement unit 11

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0	0.3	0.5-1.1		Subhedral, equant	Completely replaced by zeolites and clays.
GROUNDMASS						
Plagioclase	40	40	0.1-0.6		Laths	Fresh.
Clinopyroxene	40	40	0.1-0.2		Anhedral	Fresh, partly dendritic.
Mesostasis	0	15				Mostly replaced by green clays.
Fe-Ti oxide	5	5	< 0.1		Elongated euhedral equant	Elongated, ilmenite dominant.
Spinel	0	trace	0.1-0.3		Euhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	MORPHOLOGY	COMMENTS
Clays	15	Mesostasis	Green clays.	
Carbonate	trace			
Hematite	trace			

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.2	Even	0.1-0.2	Green clays	Spherical

COMMENTS: Thin section #201.

123-765D-16R-01 (Piece 5, 39-42 cm) OBSERVER: ISH WHERE SAMPLED: Between pillows, basement unit 12

ROCK NAME: Hyaloclastite (altered)

GRAIN SIZE:

TEXTURE: Clastic/glassy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.2	0.2-1.0		Euhedral tabular bladed	Partly replaced by pale green clays.
GROUNDMASS						
Altered glass	80				Bulky polygons meniscus	Completely replaced by pale green clays. Marked zonal alteration structure is common. Clays in the center show higher birefringence.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays in matrix	8		Relatively high birefringence. Pale green, resembling the clays in the central part of altered glass.
Carbonate	2		Distribution uneven, forming ovoidal or irregular clots.
Zeolites	10		Euhedral-anhedral equant or tabular crystals, optically nearly isotropic (analcite?). Euhedral crystals are more common in calcite than in clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: Thin section #246.

123–765D–16R–01 (Piece 7B, 58–60 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 12

ROCK NAME: Sparsely plagioclase–spinel phyric basalt

GRAIN SIZE: Very fine–grained (0.1 mm)

TEXTURE: Glassy spherulitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0	0.9	0.4–0.7		Euhedral–subhedral	Completely replaced by dirty green clays.
Spinel(?)	0	0.2	0.5–0.7		Euhedral equant	Completely replaced by hematite.
GROUNDMASS						
Plagioclase	2	2	0.05–0.2		Needles	Fresh.
Clinopyroxene	trace	trace	0.02		Subhedral	Fresh.
"Glass"	97	97				Spherulitic, banded (flow lamination?). Maybe considerably altered, but percentage is hard to evaluate.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	1	Plagioclase	Dirty green clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non–vesicular.

COMMENTS: A thin zeolite vein (0.05 mm) with brown alteration halos (2 mm) is present. Thin section #200. Sampled from autobrecciated lava block in hyaloclastite.

123–765D–16R–02 (Piece 2, 11–13 cm) OBSERVER: ISH WHERE SAMPLED: Small piece, basement unit 13

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine–grained (0.1 mm)

TEXTURE: Intersertal with low crystallinity patches

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine(?)	0	0.5	1.6		Euhedral	Completely replaced by calcite.
Plagioclase	0	0.2	1		Subhedral equant	Completely replaced by zeolite and clay minerals.
GROUNDMASS						
Plagioclase	43	45	0.1–0.2		Laths	Mostly fresh.
Clinopyroxene	25	25	< 0.1		Anhedral irregular	Fresh. Slightly yellow brown.
Mesostasis	23	26				Cryptocrystalline, patchy.
Fe–Ti oxides	3	3	< 0.05		Euhedral–subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Plagioclase, mesostasis	Bright green or pale brown clays.
Carbonate	0.5	Olivine(?)	
Zeolites	trace		

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non–vesicular. Very small vesicles (< 0.1 mm) are rarely present (filled with light brown clays).

COMMENTS: Thin section #199.

123-765D-17R-01 (Piece 5, 37-39 cm) OBSERVER: ISH WHERE SAMPLED: Small piece, basement unit 13

ROCK NAME: Sparsely plagioclase-olivine-clinopyroxene phyric basalt

GRAIN SIZE: Very fine-grained (0.1 mm)

TEXTURE: Glassy spherulitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine(?)	0	0.3	0.9		Euhedral	Completely replaced by single calcite crystals.
Plagioclase	0.2	0.5	0.2-0.5		Subhedral tabular	Partly replaced by yellowish clays.
Clinopyroxene	0.2	0.2	0.2-0.5	Augite	Subhedral equant	Fresh.
GROUNDMASS						
Plagioclase	1	1	0.05-0.2		Laths, needles	Fresh.
Clinopyroxene	0.3	0.3	< 0.05		Anhedral irregular	Fresh.
"Glass"	97	97				Devitrified, spherulitic, partly oxidized.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	1	Plagioclase, vesicles	Green or yellowish clays.
Carbonate	0.3	Olivine(?)	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.6	Even	0.05-0.2	Green clays	Spherical or irregular	(80/square cm).

COMMENTS: Thin section #202.

123-765D-17R-03 (Piece 1A, 9-11 cm) OBSERVER: ISH WHERE SAMPLED: Pillow core, basement unit 13

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.2 mm)

TEXTURE: Intersertal/patchy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	35	35	0.1-0.3		Laths	Fresh.
Clinopyroxene	15	15	0.05-0.1	Augite	Anhedral granular	Fresh.
Mesostasis	44	47				Cryptocrystalline, almost opaque.
Fe-Ti oxide	3	3	< 0.1		Needles, anhedral grains	Concentrated in patches.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	3	Vesicles, mesostasis	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.4	Even	0.05-0.2	Green clays	Spherical	(47/square cm).

COMMENTS: The groundmass includes irregular, low crystallinity patches, 1-2 mm in diameter, occupying 20% of the rock. Thin section #253.

123-765D-18R-01 (Piece 1A, 3-7 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 14

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.5 mm)

TEXTURE: Subophitic/patchy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0	0.3	0.7-1.2		Subhedral tabular	Cores are completely replaced by dirty green clays.
GROUNDMASS						
Plagioclase	40	40	0.3-1.0		Laths, blades maximum length 2 mm (rare)	
Clinopyroxene	40	40	0.1-0.3		Anhedral granular to subophitic	Fresh, pale brown, partly dendritic in low crystallinity patches.
Mesostasis	13	17				Cryptocrystalline.
Fe-Ti oxides	3	3	< 0.1 mm		Subhedral	Concentrated in low crystallinity patches.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	4	Mesostasis, vesicles, plagioclase	Bright or dirty green clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.1	Even	0.05-0.2	Green clays	Rounded	(15/square cm).

COMMENTS: A zoned calcite-hematite-green clay vein at the margin. Calcite occupies the central part, and hematite is on both sides. Thin green clay vein runs parallel to the calcite-hematite vein. An oxidation front is present 4 mm apart from the veins. Pyroxenes are yellow-stained at the oxidation front. Thin section #254.

123-765D-18R-01 (Piece 2A, 112-114 cm) OBSERVER: ISH WHERE SAMPLED: Flow margin (10 cm inward), unit 14

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.1 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0	0.5	0.5-1.1		Subhedral tabular equant	Completely replaced by dirty green-brown clays, glomerophyric.
GROUNDMASS						
Plagioclase	20	20	0.05-0.2		Laths	Fresh.
Clinopyroxene	10	10	< 0.1		Anhedral, irregular	Fresh, mostly dendritic.
Mesostasis	63	64				Cryptocrystalline, including microcrystalline augite dendrites.
Fe-Ti oxide	5	5	< 0.05		Euhedral-subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Plagioclase, mesostasis	Dirty green or brown clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: Thin section #205.

123-765D-18R-03 (Piece 1, 8-10 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 15

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.1 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.3	0.7-1.3		Subhedral equant	Completely replaced by hematite and clays.
Plagioclase	0.1	0.4	0.5-0.7		Subhedral tabular	Mostly replaced by zeolites and clays.
GROUNDMASS						
Plagioclase	10	10	0.05-0.2		Laths	Mostly fresh.
Clinopyroxene	3	3	< 0.05		Anhedral granular	Fresh.
Mesostasis	82	85				Cryptocrystalline, partly replaced by clays.
Fe-Ti oxide	1	1	0.05		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	4	Vesicles, mesostasis, plag, olivine	
Carbonate	0.1	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.2	Even	0.1	Yellow brown clays	Sperical irregular	(26/square cm). Partly filled by calcite.

COMMENTS: Thin section #207.

123-765D-19R-01 (Piece 3, 51-52 cm) OBSERVER: ISH WHERE SAMPLED: Thin flow 10 cm center, basement unit 15

ROCK NAME: Sparsely plagioclase-olivine phyric basalt

GRAIN SIZE: Very fine-grained (0.1 mm)

TEXTURE: Glassy spherulitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.5	0.8-1.3		Subhedral, skeletal	Completely replaced by yellow green clays.
Plagioclase	0.2	1	0.5-1.3		Euhedral-subhedral tabular	Mostly replaced by zeolites and clays. Phenocryst distribution uneven.
GROUNDMASS						
Plagioclase	0.5	0.5	0.05-0.3		Laths	Fresh, concentrated in patches.
Clinopyroxene	0.2	0.2	0.05-0.1		Anhedral granular	Fresh.
"Glass"	98	98				Devitrified, spherulitic.
Fe-Ti oxide		1%	< 0.05		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	1	Plagioclase, olivine, vesicles	Green or yellow green clays.
Hematite	trace	Vesicles	Near fracture.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.3	Even	0.05-0.2	Green clay	Spherical	Some are void. (30/square cm).

COMMENTS: Hematite in alteration halos. Thin section #208.

123-765D-19R-01 (Piece 6B, 108-110 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 15

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.2 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.2	0.5-1.0		Euhedral tabular	Mostly replaced by zeolites.
GROUNDMASS						
Plagioclase	37	40	0.1-0.4		Laths, needles	Mostly fresh, partly replaced by zeolite.
Clinopyroxene	30	30	< 0.1		Anhedral irregular	Fresh.
Mesostasis	23	25				
Fe-Ti oxide	5	5	< 0.1		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	3	Plagioclase, mesostasis	Green clays.
Zeolites	2	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.9	Even	0.1-0.3	Green clays or void	Spherical	(29/square cm).

COMMENTS: Thin section #204.

123-765D-19R-02 (Piece 2A, 32-34 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 15

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intergranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.3	0.5-0.8		Subhedral equant	Mostly replaced by zeolites. Glomerophyric.
GROUNDMASS						
Plagioclase	40	45	0.2-0.6		Laths	Partly replaced by zeolites.
Clinopyroxene	35	35	0.05-0.4		Anhedral, granular, subophitic	Fresh, pale brown.
Mesostasis	10	15				Cryptocrystalline. Partly replaced by green clays.
Fe-Ti oxide	5	5	0.05		Euhedral-subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	4	Plagioclase, mesostasis, vesicles	Bright green clays.
Carbonate	0.5	Vesicles	Calcite.
Zeolites	5	Plagioclase, mesostasis	
Chalcedony(?)	trace	Vesicles	Length slow, radial aggregate.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	7	Even	0.2-0.7	Calcite, green clay, chalcedony, void	Spherical	(16/square cm).

COMMENTS: The groundmass includes fine-grained patches composed of dendritic clinopyroxenes (~ 10%, 1-2 mm). Thin section #203.

123-765D-20R-01 (Piece 4B, 47-49 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 6

ROCK NAME: Sparsely plagioclase-clinopyroxene-olivine phyric basalt

GRAIN SIZE: Very fine-grained (0.2 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.2	0.7		Euhedral equant	Completely replaced by calcite and hematite.
Plagioclase	0.1	0.5	0.3-1.7		Euhedral-subhedral tabular	Mostly replaced by clays.
Clinopyroxene	0.3	0.3	0.3-0.7		Euhedral-subhedral equant	Some are concentrically zoned.
GROUNDMASS						
Plagioclase	25	25	0.1-0.3		Needles, laths	Fresh.
Clinopyroxene	15	15	0.05-0.1		Anhedral granular	Fresh.
Mesostasis	54	56				Partly replaced by clays.
Fe-Ti oxide	3	3	< 0.05		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	3	Plagioclase, mesostasis	
Carbonate	trace	Olivine	
Hematite	trace	Olivine	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: Thin section #229.

123-765D-21R-01 (Piece 9, 86-89 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 16

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.2 mm)

TEXTURE: Intersertal patchy

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	40	40	0.1-0.3		Laths, needles	Mostly fresh.
Clinopyroxene	15	15	0.05-0.1		Anhedral irregular	Fresh.
Mesostasis	40	44				Cryptocrystalline including 1 mm size irregular low crystallinity patches.
Fe-Ti oxide	1	1	< 0.05		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	4	Mesostasis, vesicles	Pale brown or bright green clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.5	Even	0.05-0.2	Clays	Spherical or irregular	(40/square cm). Pale brown or bright green clays.

COMMENTS: Thin section #248.

123-765D-19R-02 (Piece 5, 71-73 cm) OBSERVER: ISH WHERE SAMPLED: Flow center(?)rubble, basement unit 15

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.6 mm)

TEXTURE: Subophitic/intergranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.2	1.3		Subhedral tabular	Partly replaced by zeolites and clays.
GROUNDMASS						
Plagioclase	44	47	0.3-1.0		Laths	Partly replaced by zeolites and clays.
Clinopyroxene	40	40	0.1-0.2		Anhedral, irregular	Fresh, partly yellowish.
Mesostasis	7	10				Cryptocrystalline, partly replaced by clays.
Fe-Ti oxide	3	3	< 0.1		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	4	Vesicles, mesostasis, plagioclase	Bright green clays.
Zeolites	2	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.7	Even	0.1-1.0	Bright green clays	Spherical	(9/square cm). Radial structure.

COMMENTS: Groundmass: Fine-grained patches, 1-2 mm in size, made of radial aggregates of dendritic augite and plagioclase laths, occupy 10% of the rock. A hematite-clay vein, 1.0 mm wide, in the middle. Thin section #206.

123-765D-20R-01 (Piece 2, 14-16 cm) OBSERVER: ISH WHERE SAMPLED: Pillow(?) margin, basement unit 16

ROCK NAME: Aphyric vesicular basalt

GRAIN SIZE: Very fine-grained (0.2 mm)

TEXTURE: Hyalopilitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.4	0.5	0.7-1.3		Euhedral-subhedral bladed	Partly replaced by clays.
GROUNDMASS						
Plagioclase	15	15	0.1-0.3		Needles	
"Glass"	80	80				Dense red, devitrified.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Vesicles, plagioclase	Bright green or dirty yellow brown.
Carbonate	3	Vesicles	Dusty.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	4	Even	0.5-1.0	Calcite, and green clays	Irregular

COMMENTS: Thin section #228.

123-765D-21R-01 (Piece 12, 117-119 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 16

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.2 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0	0.4	1.2-1.6		Tabular	Completely replaced by dirty yellow brown clays.
GROUNDMASS						
Plagioclase	20	20	0.1-0.3		Laths, needles	Mostly fresh.
Clinopyroxene	5	5	0.05		Anhedral granular dendritic	Fresh.
Mesostasis	70	72				Cryptocrystalline, including clinopyroxene dendrites.
Fe-Ti oxide	3	3	< 0.1		Subhedral	Microcrystalline.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Mesostasis, vesicles	Dirty yellow brown clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	< 0.1	Even	< 0.1	Calcite, green clays	Round	Almost non-vesicular.

COMMENTS: Thin section #231.

123-765D-22R-01 (Piece 4A, 83-85 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 16

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0	0.4	2.2		Subhedral tabular	Completely replaced by dirty yellow brown clays.
GROUNDMASS						
Plagioclase	14	15	0.1-0.6		Laths	Mostly fresh.
Clinopyroxene	2	2	0.1		Anhedral	Fresh.
Mesostasis	76	78				Including dusty minute Fe-Ti oxides.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	5	Mesostasis, plagioclase	Green or dirty yellow brown clays.
Carbonate	3	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	5	Even	0.1-0.9	Calcite, green clays		(66/square cm). Mostly irregular, some small ones are round.

COMMENTS: Thin section #232.

123-765D-22R-01 (Piece 6A, 118-121 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 16

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.2 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	< 0.1	0.3	2.3-3.3		Subhedral tabular	Mostly replaced by greenish dirty clays.
GROUNDMASS						
Plagioclase	30	30	0.1-0.3		Needles, laths	Mostly fresh.
Clinopyroxene	20	20	< 0.1		Anhedral, granular, dendritic	Fresh.
Mesostasis	55	56				Cryptocrystalline.
Fe-Ti oxide	3	3	< 0.05		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	MORPHOLOGY	COMMENTS
Clays	1.5	Vesicles, plagioclase, mesostasis	Green clays.	
Carbonate	0.5	Vesicles, mesostasis		

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.6	Even	0.1	Calcite, green clays	Spherical or irregular	(80/square cm).

COMMENTS: Thin section #230.

123-765D-22R-02 (Piece 5, 37-39 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 6

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.2 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.1	1		Euhedral	Completely replaced by iddingsite.
Plagioclase	0	0.3	1.0-2.1		Subhedral tabular	Completely replaced by dirty yellow brown clays.
GROUNDMASS						
Plagioclase	19	20	0.1-0.4		Laths	
Clinopyroxene	2	2	< 0.05		Dendritic microlites	
Mesostasis	73	75				Cryptocrystalline.
Fe-Ti oxide	3	3	< 0.05		Subhedral-anhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	MORPHOLOGY	COMMENTS
Clays	3	Vesicles, mesostasis	Green or dirty yellow brown clays.	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	< 0.1	Even	< 0.1	Calcite, green clays	Spherical	Almost non-vesicular.

COMMENTS: Calcite veins, 0.1 to 0.8 mm thick, are present in the middle. Thin section #233.

123-765D-22R-02 (Piece 5, 40-42 cm) OBSERVER: ISH WHERE SAMPLED: Flow margin, basement unit 16

ROCK NAME: Glassy aphyric basalt

GRAIN SIZE: Microcrystalline (0.1 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.1	0.6		Subhedral	Completely replaced by iddingsite.
Plagioclase	0.1	0.7	0.7-2.0		Euhedral tabular or bladed	Mostly replaced by dirty yellow clays.
GROUNDMASS						
Plagioclase	3	3	0.05-0.2		Needles	Fresh.
Glass	96	96				Devitrified.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	1	Vesicles, plagioclase, glassy material	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.2	Even	< 0.1	Green clays	Spherical

COMMENTS: Network calcite veins, 1 or 2 mm thick, occupy 15% of the thin section. Thin section #251.

123-765D-23R-01 (Piece 5, 62-64 cm) OBSERVER: ISH WHERE SAMPLED: Pillow center, basement unit 16

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.1 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0	0.4	0.5-1.6		Subhedral-euhedral tabular	Completely replaced by calcite and clays.
GROUNDMASS						
Plagioclase	20	20	0.05-0.2		Needles	Fresh.
Clinopyroxene	trace	trace	< 0.05		Anhedral, irregular, dendritic	Fresh.
Mesostasis	59	79				Including dusty minute iron oxides.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	20(?)	Mesostasis	
Carbonate	0.5	Vesicles, plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.2	Even	< 0.1	Calcite	Spherical

COMMENTS: Thin section #239.

123-765D-23R-02 (Piece 2, 64-66 cm) OBSERVER: ISH WHERE SAMPLED: Basement unit 17

ROCK NAME: Highly plagioclase-clinopyroxene phyric basalt (or patchy diabase)

GRAIN SIZE: Fine-grained (0.5 mm)

TEXTURE: Patchy (dendritic/subophitic)

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	22.3	22.3	0.3-1.0		Subhedral blades, laths	Fresh.
Clinopyroxene	9	9	0.1-0.2		Anhedral, subophitic	Fresh.
GROUNDMASS						
Plagioclase	10	10	0.1-0.2		Needles, laths	Fresh.
Clinopyroxene	2	2	< 0.1		Anhedral, irregular, or dendritic	Fresh.
Fe-Ti oxide	4	4	< 0.1		Subhedral	
Mesostasis	50	51				Aggregate of poorly crystallized dendritic augite and plagioclase needles as well as cryptocrystalline material and iron oxides.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	3	Vesicles, mesostasis	Pale green pleochroic.
Carbonate	trace	Mesostasis	Calcite.
"Chondrule"			1.5 to 2 mm in size. Aggregate of brown Fe, Ti-augite dendrites and long ilmenite needles(~ 0.3 mm). Some "chondrules" have vesicles filled with clays and high-index clays(?)in the center. 2V(-)20 degrees pleochroic (pale green-colorless).

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1.5	Even	0.7-1.5	Clays	Spherical	(8/thin section). Pale green, high birefringence, pleochroic clays occupy the central part, and cryptocrystalline bright green clays are in the margin.

COMMENTS: Thin section #250.

123-765D-23R-02 (Piece 5A, 97-100 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 17

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.5 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	39	40	0.1-1.3		Laths, needles	Patchy, a fine-grained patch is composed of clinopyroxene dendrite and plagioclase microlites.
Clinopyroxene	25	25	0.1-0.2		Anhedral, granular, or dendritic	Dendritic in low crystallinity patches.
Olivine(?)	0	2	0.4-0.5		Subhedral equant	Completely replaced by calcite.
Mesostasis	27	29				Cryptocrystalline.
Fe-Ti oxide	3	3	0.05			

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	3	Vesicles, mesostasis, plagioclase	Dirty yellow brown clays.
Carbonate	3	Olivine, vesicles	Calcite.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1	Even	0.5-1.5	Void, clays, calcite	Spherical	(5/thin section, 4/square cm).

COMMENTS: Thin section #242.

123-765D-24R-02 (Piece 1C, 21-24 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow or sill center, unit 17

ROCK NAME: Aphyric basalt (diabase)

GRAIN SIZE: Fine-grained (0.8 mm)

TEXTURE: Intergranular holocrystalline

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	50	50	0.4-2.0	An50	Subhedral tabular laths	
Clinopyroxene	42	42	0.1-0.7	Subcalcic augite	Anhedral equant	2V(+)30 degrees. Partly subophitic. Yellowish stains along cleavage planes and grain boundaries.
Mesostasis	0	3				Replaced by dirty dark green clays.
Fe-Ti oxide	3	5	< 0.1		Subhedral	Interstitial - partly replaced by sphene.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	2	Mesostasis	Dirty dark green clays.
Sphene	2	Fe-Ti oxide	
Hematite	1	Vesicles, mesostasis	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	0.4	Even	0.4-0.7	Hematite	Spherical-irregular

COMMENTS: Thin section #240.

123-765D-24R-04 (Piece 6, 93-95 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 19

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal/intergranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.1	0.6		Subhedral	Completely replaced by clays.
Plagioclase	0.2	0.4	0.5-1.5		Euhedral equant	Partly replaced by clays.
GROUNDMASS						
Plagioclase	40	40	0.2-0.5		Laths	Fresh.
Clinopyroxene	35	35	0.1-0.3		Anhedral, subophitic	Fresh.
Mesostasis	22	23				Dark colored cryptocrystalline material.
Fe-Ti oxide	2	2	< 0.05		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	1	Vesicles, plag, olivine, mesostasis	Green or brown dirty clays.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.1	Even	0.1	Clays, hematite	Spherical	Very rare.

COMMENTS: Thin section #249.

123-765D-24R-04 (Piece 7A, 106-109 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 19

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
Plagioclase	27	27	0.2-0.6		Needles, laths	Fresh.
Clinopyroxene	8	8	< 0.05		Dendritic	Fresh.
Mesostasis	59	61				Cryptocrystalline.
Fe-Ti oxide	3	3	< 0.1		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	3	Vesicles, mesostasis	Bright green.
Carbonate	trace	Vesicles	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1	Even	0.2-0.3	Clays, calcite	Spherical irregular	(24/square cm). Bright green clays.

COMMENTS: A calcite-clay-hematite (or limonite) vein, 1 mm wide, is present in the middle. Thin section #241.

123-765D-25R-02 (Piece 1, 2-4 cm) OBSERVER: ISH WHERE SAMPLED: Massive flow center, basement unit 20

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.2 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.2	0.4-0.6		Subhedral equant, tabular	Mostly replaced by zeolites.
GROUNDMASS						
Plagioclase	5	10	0.1-0.3		Needles	Partly replaced by clays.
Clinopyroxene	1	1	0.1		Anhedral, granular	Fresh.
Mesostasis	84	86				Cryptocrystalline.
Fe-Ti oxide	2	2	< 0.05		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	7	Plagioclase, mesostasis	
Zeolites	1	Vesicles, plagioclase	Length fast (chalcedony?).

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0.3	Even	0.1	Zeolites	Spherical	(43/square cm).

COMMENTS: Thin section #238.

123-765D-26R-01 (Piece 3B, 35-37 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 20

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.2 mm)

TEXTURE: Intersertal

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	< 0.1	0.4		Euhedral equant	Completely replaced by calcite.
Plagioclase	0	< 0.1	0.8		Subhedral tabular	Pale yellow clays.
GROUNDMASS						
Plagioclase	20	30	0.1-0.3		Laths, needles	Partly replaced by clays.
Clinopyroxene	5	5	< 0.05		Dendritic	Gradational to cryptocrystalline mesostasis.
Mesostasis	50	60				Cryptocrystalline.
Fe-Ti oxide	5	5	< 0.02		Subhedral	Very small.

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	15	Vesicles, mesostasis, clays	
Carbonate	5	Mesostasis	Occur as irregular patches, < 0.5 mm in size.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	< 0.1	Even	< 0.1	Yellow brown clays	Spherical	Almost non-vesicular.

COMMENTS: Thin section #237.

123-765D-27R-01 (Piece 1, 4-6 cm) OBSERVER: ISH WHERE SAMPLED: Flow fragment center, basement unit 20

ROCK NAME: Aphyric basalt

GRAIN SIZE: Very fine-grained (0.1 mm)

TEXTURE: Hyalophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.2	0.3	0.4-0.7		Subhedral tabular	Partly replaced by clays.
GROUNDMASS						
Plagioclase	12	12	0.05-0.2		Needles, laths	Fresh.
Clinopyroxene	8	8	0.05		Anhedral granular	Fresh.
Mesostasis	76	76				Cryptocrystalline.
Fe-Ti oxide	4	4	< 0.05		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	trace	Plagioclase	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	0					Non-vesicular.

COMMENTS: Thin section #236.

123-765D-27R-02 (Piece 3A, 96-98 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 22

ROCK NAME: Aphyric basalt

GRAIN SIZE: Fine-grained (0.4 mm)

TEXTURE: Subophitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.2	0.7	0.5-1.5		Euhedral-subhedral tabular equant	Mostly replaced by zeolites and clays.
GROUNDMASS						
Plagioclase	45	45	0.2-0.7		Laths	Fresh.
Clinopyroxene	33	33	0.1-0.3		Anhedral subophitic	Fresh, pale yellow.
Mesostasis	4	15				
Fe-Ti oxide	5	5	0.05-0.1		Subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	9	Mesostasis, vesicles, plagioclase	Green clays.
Zeolites	1	Plagioclase	Replacing the core of plagioclase phenocrysts.
Hematite	3	Vesicles, mesostasis	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1	Even	0.2-0.8	Hematite, green clays	Spherical	(8/square cm).

COMMENTS: Thin section #235.

123-765D-27R-03 (Piece 4B, 54-55 cm) OBSERVER: ISH WHERE SAMPLED: Flow center, basement unit 22

ROCK NAME: Aphyric vesicular basalt

GRAIN SIZE: Fine-grained (0.3 mm)

TEXTURE: Intergranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine(?)	0	0.1	0.5		Subhedral equant	Completely replaced by iddingsite and calcite.
Plagioclase	0.5	0.6	0.5-1.3		Subhedral tabular	Partly replaced by zeolite 2V(-)80 degrees.
GROUNDMASS						
Plagioclase	40	40	0.1-0.9		Needles, laths	Fresh.
Clinopyroxene	30	30	0.05-0.4		Anhedral, granular, or subophitic	Fresh, pale yellow.
Mesostasis	12	17				Cryptocrystalline. Partly replaced by clays.
Fe-Ti oxide	4	4	0.05		Euhedral or subhedral	

SECONDARY MINERALOGY	PERCENT	REPLACING/ FILLING	COMMENTS
Clays	11	Vesicles, mesostasis	
Carbonate	trace	Olivine	
Zeolites	trace	Plagioclase phenocrysts	
Hematite	4		

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	8	Even	0.4-1.3	Hematite, green clays	Spherical	(17/square cm).

COMMENTS: Thin section #236.